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NOTE:
RIGHT OF WAY PLANS FOR THIS PROJECT WERE PREPARED AS PART OF PROJECT FRA-70-12.68 PID 77372 / 3084-E AND ARE NOT INCLUDED IN THIS PLAN SET.

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED SHEETS	CWL	11-5-2021

CITY OF COLUMBUS:

APPROVED Steven Waverly
DATE 5/26/2020 DESIGN SECTION ENGINEER, DIVISION OF DESIGN AND CONSTRUCTION

APPROVED
DATE 5/28/2020 ADMINISTRATOR, DIVISION OF POWER

APPROVED
DATE 5/28/2020 ADMINISTRATOR, DIVISION OF WATER

APPROVED H. Willie Lopez
DATE 5/28/2020 FIRE PREVENTION BUREAU, DIVISION OF FIRE

APPROVED MDT RMV John Newsome
DATE 5/28/2020 ADMINISTRATOR, DIVISION OF SEWERAGE AND DRAINAGE

APPROVED Tracie Davies by RMR
DATE 6/3/2020 DIRECTOR, DEPARTMENT OF PUBLIC UTILITIES

APPROVED Don E. Evans for Paul Rakosky
DATE 5/29/2020 DIRECTOR, DEPARTMENT OF RECREATION AND PARKS

APPROVED James Young
DATE 8/24/2020 CITY ENGINEER/ADMINSTRATOR, DIVISION OF DESIGN AND CONSTRUCTION

APPROVED Jennifer Gallagher
DATE 8/24/2020 DIRECTOR, DEPARTMENT OF PUBLIC SERVICE

APPROVED Brian Mickley
DATE 5/28/2020 ENGINEERING SUPERVISOR, DEPARTMENT OF TECHNOLOGY

CITY OF COLUMBUS APPROVALS

CITY OF COLUMBUS SIGNATURES ON THIS PLAN SIGNIFY ONLY CONCURRENCE WITH THE GENERAL PURPOSES AND GENERAL LOCATION OF THE PROJECT. ALL TECHNICAL DETAILS REMAIN THE RESPONSIBILITY OF THE ENGINEER PREPARING THE PLANS.

ENGINEERS SEAL:	ENGINEERS SEAL:	ENGINEERS SEAL:	ENGINEERS SEAL:	ENGINEERS SEAL:	ENGINEERS SEAL:	ENGINEERS SEAL:	ENGINEERS SEAL:
FOR SHEETS 70 - 210	FOR SHEETS 804 - 864, 889A-891, 893 - 900, 905, 922 - 922C, 926 - 930, 938B - 941A	FOR SHEETS 1122 - 1162	FOR SHEETS 1163 - 1205A	FOR SHEETS 1206 - 1225, 1747 - 1815	FOR SHEETS 1228 - 1363, 1472 - 1563	FOR SHEETS 692 - 803, 865 - 889, 892, 901 - 902, 1364 - 1471C, 1564 - 1746R	FOR ENTIRE PLAN EXCEPT SHEETS OTHERWISE NOTED
STATE OF OHIO EMILIE M. WORLEY E-71927 REGISTERED PROFESSIONAL ENGINEER	STATE OF OHIO WILLIAM CRAIG BRUCE III E-56333 PROFESSIONAL ENGINEER	STATE OF OHIO JOY M. LANHAM PE-75259 REGISTERED PROFESSIONAL ENGINEER	STATE OF OHIO JORDAN C. STEELE E-76138 REGISTERED PROFESSIONAL ENGINEER	STATE OF OHIO TIMOTHY S. SCHMALENBERGER 621 REGISTERED LANDSCAPE ARCHITECT	STATE OF OHIO CRAIG A. SNIVELY E-57757 REGISTERED PROFESSIONAL ENGINEER	STATE OF OHIO DAVIN GIM NG 56972 REGISTERED PROFESSIONAL ENGINEER	STATE OF OHIO MARK R. GROSSMAN E-61120 REGISTERED PROFESSIONAL ENGINEER
SIGNED: Emilie M Worley	SIGNED: William C. Bruce Add'l, P.E.	SIGNED:	SIGNED:	SIGNED:	SIGNED:	SIGNED:	SIGNED:
DATE: 9/6/19	DATE: 8/16/19	DATE: 9/6/19	DATE: 9/6/19	DATE: 9/6/19	DATE:	DATE: 9/6/19	DATE: 9/6/19

CALCULATED ATR CHECKED CWL

SHEET INDEX, ENGINEERS SEALS & COLUMBUS SIGNATURES

FRA-70/71-12.68/14.86

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ENVIRONMENTAL (CONTINUED)

ITEM 208 - VIBRATION CONTROL AND MONITORING, AS PER PLAN

THE CONTRACTOR SHALL CONTROL AND MONITOR VIBRATIONS WHEN PERFORMING DEMOLITION AND CONSTRUCTION ACTIVITIES NEAR BUILDINGS, STRUCTURES, OR UTILITIES THAT MAY BE SUBJECT TO DAMAGE FROM CONSTRUCTION INDUCED GROUND VIBRATIONS. DEMOLITION ACTIVITIES INCLUDE REMOVAL OF EXISTING BRIDGES, RETAINING WALLS, PAVEMENTS, AND FOUNDATIONS. CONSTRUCTION ACTIVITIES INCLUDE INSTALLATION OF DRILLED SHAFTS, PILE DRIVING, USE OF VIBRATORY ROLLERS, OR ANY OTHER OPERATION THAT CAUSES VIBRATION. VIBRATION CONTROL AND MONITORING SHALL CONFORM TO THE CONSTRUCTION AND MATERIALS SPECIFICATION (CMS) ITEM 208.15, EXCEPT AS MODIFIED BELOW:

1. ALL REFERENCES TO BLASTING SHALL INSTEAD APPLY TO DEMOLITION AND CONSTRUCTION ACTIVITIES.

2. THE VIBRATION SPECIALIST'S EXPERIENCE REQUIREMENT SHALL APPLY FOR VIBRATION MONITORING AND NEED NOT BE SPECIFIC TO ROCK BLASTING PROJECTS.

THE CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION SURVEY OF ANY BUILDINGS, STRUCTURES, AND UTILITIES LOCATED WITHIN LIMITS DETERMINED BY THE VIBRATION SPECIALIST AND PROVIDE THE ENGINEER WITH PRE-CONSTRUCTION AUDIO-VIDEO COLOR RECORDING AS FOLLOWS.

A.RECORDING. CONSTRUCTION IN AN AREA SHALL NOT START UNTIL THE AREA HAS BEEN RECORDED AND THE DVDS SUBMITTED TO THE ENGINEER.

B.VISUAL INSPECTION. PRIOR TO RECORDING, ALL AREAS TO BE RECORDED SHALL BE INVESTIGATED VISUALLY WITH NOTATION MADE OF FEATURES NOT READILY VISIBLE BY RECORDING METHODS. THIS WOULD INCLUDE, BUT ARE NOT LIMITED TO, CULVERTS (SIZE, TYPE, AND CONDITION) AND MANHOLES THAT MAY BE PARTIALLY BURIED. RECORD ALL MEASUREMENTS.

C.APPROVALS. ALL RECORDING SHALL BE CONDUCTED IN THE PRESENCE OF THE DEPARTMENT UNLESS WAIVED BY THE ENGINEERS. AT THE START OF RECORDING, THE CONTRACTOR SHALL SUBMIT A SAMPLE RECORDING OF A PORTION OF THIS PROJECT FOR THE ENGINEER TO REVIEW. THE SAMPLE RECORDING SHALL BE APPROVED BEFORE ANY OTHER RECORDING IS ALLOWED.

D.CERTIFICATION. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL PROVIDE CERTIFICATION IN WRITING TO THE ENGINEER THAT ALL REQUIREMENTS OF THE AUDIO-VIDEO COLOR RECORDING FOR THIS PROJECT WERE ACCOMPLISHED IN ACCORDANCE WITH THESE SPECIFICATIONS:

1.IDENTIFICATION. ALL RECORDINGS (DVDS AND CASES) SHALL BE PROPERLY IDENTIFIED BY RECORDING NUMBER, LOCATION, AND PROJECT NAME IN A MANNER ACCEPTABLE TO THE ENGINEER.

2.RECORD. A RECORD OF THE CONTENTS OF EACH RECORDING SHALL BE SUPPLIED ON A RUN SHEET IDENTIFYING EACH SEGMENT IN THE RECORDING NUMBER, LOCATION, AND PROJECT NAME IN A MANNER ACCEPTABLE TO THE ENGINEER.

3.INVENTORY. A BRIEF REPORT AND INVENTORY OF ALL RECORDINGS COMPLETE, REFERENCED BY LOCATION AND RECORDING NUMBER SHALL BE FURNISHED TO THE DEPARTMENT UPON COMPLETION OF THE WORK AND DELIVERY OF THE RECORDINGS. ALL RECORDINGS AND WRITTEN RECORDS SHALL BECOME THE PROPERTY OF THE DEPARTMENT.

THE CONTRACTOR SHALL USE A SURVEY METHOD ACCEPTABLE TO ITS INSURANCE COMPANY. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE RESULTING FROM DEMOLITION AND CONSTRUCTION ACTIVITIES. IF OWNERS OR OCCUPANTS FAIL TO ALLOW ACCESS TO A PROPERTY FOR THE PRE-CONSTRUCTION SURVEY, SEND A CERTIFIED LETTER TO THE OWNER OR OCCUPANT. MAKE THE NOTIFICATION EFFORT AND THE CERTIFIED LETTER PART OF THE PRE-CONSTRUCTION SURVEY RECORDS. DELIVER A COPY OF THE PRE-CONSTRUCTION SURVEY TO THE ENGINEER BEFORE BEGINNING CONSTRUCTION OPERATIONS AT CRITICAL LOCATIONS. CRITICAL LOCATIONS SHALL INCLUDE, BUT ARE NOT LIMITED TO EXISTING BRIDGES, RETAINING WALLS, AND UTILITIES. SUBMIT DELIVERABLES IN ACCORDANCE WITH CMS ITEM 208.

ITEM 208, VIBRATION CONTROL AND MONITORING, AS PER PLAN LUMP SUM

QUANTITIES CARRIED TO GENERAL NOTES SUBSUMMARY ON SHEET 69A

REGULATED WASTE AND WATER PLAN NOTE

SUBGRADE EXCAVATIONS FROM THE AREA AS SHOWN IN CROSS-HATCHING ON SHEET 67A MAY CONTAIN REGULATED MATERIALS. REFER TO SOIL BORING PROFILES AND ENVIRONMENTAL STUDIES ENTITLED "PHASE II ENVIRONMENTAL SITE ASSESSMENTS", PREPARED BY DLZ, OHIO, INC. DATED MAY 2009 AND "ADDENDUM REPORT FOR PHASE II ENVIRONMENTAL SITE ASSESSMENTS" PREPARED BY DLZ, OHIO, INC. DATED SEPTEMBER 2009. ALL EXCAVATED MATERIAL FROM THE AREAS IDENTIFIED BY THIS NOTE SHALL BE MANAGED AS REGULATED MATERIALS UNTIL APPROPRIATELY REUSED AS A CONSTRUCTION MATERIAL OR DISPOSED OF IN LICENSED DISPOSAL FACILITY. EXCAVATED MATERIALS GENERATED WITHIN THE CROSS-HATCHING LIMITS, MEETING THE REQUIREMENTS OF ITEM 203, SHALL BE REUSED AS EMBANKMENT WITHIN THE CROSS-HATCHING LIMITS IDENTIFIED BY THIS NOTE. EXCAVATED MATERIALS NOT SUITABLE FOR USE IN ITEM 203 EMBANKMENT SHALL BE TESTED FOR CHARACTERIZATION AND DISPOSED OF IN A LICENSED DISPOSAL FACILITY. EXCAVATED MATERIALS NOT BEING REUSED FOR EMBANKMENT ARE REFERRED TO AS "WASTE MATERIALS" FOR THE REMAINDER OF THIS NOTE.

PROVIDE AN EXCAVATION AND EMBANKMENT PLAN TO THE ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO PERFORMING EXCAVATION WITHIN THE CROSS-HATCHING LIMITS. THE EXCAVATION AND EMBANKMENT PLAN WILL INCLUDE A SCHEDULE OF EXCAVATION/EMBANKMENT ACTIVITIES, A SCHEDULE FOR TESTING AND DISPOSAL OF WASTE MATERIALS, AND IDENTIFY ALL TEMPORARY STOCKPILE LOCATIONS FOR THE EXCAVATED MATERIALS WITHIN THE CROSS-HATCH LIMITS. PROVIDE A SAMPLING AND TESTING PLAN TO THE ENGINEER FOR THE PURPOSES OF CHARACTERIZING THE WASTE MATERIALS FOR PROPER DISPOSAL. PROVIDE THE SAMPLING AND TESTING PLAN TO THE ENGINEER AT THE SAME TIME AS THE EXCAVATION AND EMBANKMENT PLAN.

THE CONTRACTOR SHALL SEGREGATE WASTE MATERIALS INTO INDIVIDUAL STOCKPILES BY THE PARCEL OF GENERATION. EACH STOCKPILE OF WASTE MATERIAL WILL BE SAMPLED AND TESTED FOR PROPER DISPOSAL. PROVIDE THE ENGINEER WITH ALL WASTE MATERIAL SAMPLING RESULTS WITHIN FORTY-EIGHT (48) HOURS OF RECEIVING THE RESULTS. DO NOT MIX WASTE MATERIALS WITH MATERIALS FROM ANY OTHER SOURCE OF GENERATION UNTIL THE WASTE MATERIALS HAVE BEEN CHARACTERIZED.

WASTE MATERIAL NOT CHARACTERIZED AS HAZARDOUS WASTE SHALL BE MANAGED AS SOLID WASTE. TEMPORARY STORAGE OF SOLID WASTE SHALL BE IN COVERED, PORTABLE CONTAINERS FREE FROM HOLES OR DAMAGES. THE CONTRACTOR MAY ALSO UTILIZE TEMPORARY STOCKPILES OF THE SOLID WASTE WITH A SYNTHETIC COVER THAT PREVENTS INFILTRATION FROM RAINWATER AND SURROUNDED BY BERMS THAT PREVENTS CONTACT WITH STORMWATER RUN-ON. PROVIDE PROPER TRANSPORTATION AND DISPOSAL IN A LICENSED SOLID WASTE DISPOSAL FACILITY. THE CONTRACTOR SHALL FILL OUT AND SIGN ALL WASTE DISPOSAL FACILITY FORMS REQUIRED BY THE DISPOSAL FACILITY INCLUDING, BUT NOT LIMITED TO MATERIAL PROFILES, DATA SHEETS AND MATERIAL CERTIFICATIONS. PROVIDE A COPY OF ALL COMPLETED DISPOSAL FACILITY FORMS TO THE ENGINEER.

WASTE MATERIALS CHARACTERIZED AS HAZARDOUS WASTE SHALL IMMEDIATELY BE PLACED IN AN APPROPRIATE LINED, COVERED CONTAINERS, LABELED AS HAZARDOUS WASTE AND SECURED FOR TEMPORARY STORAGE. NOTIFY THE ENGINEER IMMEDIATELY IF SAMPLING RESULTS INDICATE THAT ANY WASTE MATERIALS ARE CHARACTERIZED AS HAZARDOUS. THE DEPARTMENT WILL SUBMIT A REQUEST FOR A RCRA SUBTITLE C SITE GENERATOR ID FROM OHIO EPA. UTILIZE PROPER HANDLED, STORAGE AND TRANSPORTATION METHODS UNTIL PROPERLY DISPOSED OF IN A LICENSE HAZARDOUS WASTE FACILITY. THE CONTRACTOR SHALL COMPLETE ALL MANIFEST AND PROVIDE THE COMPLETED MANIFESTS TO THE ENGINEER FOR SIGNATURE AS THE GENERATOR. PROVIDE THE ENGINEER WITH A COPY OF THE MANIFEST SIGNED BY THE DESIGNATED HAZARDOUS WASTE DISPOSAL FACILITY. THE CONTRACTOR SHALL FILL OUT AND SIGN ALL WASTE DISPOSAL FACILITY FORMS REQUIRED BY THE DISPOSAL FACILITY INCLUDING, BUT NOT LIMITED TO MATERIAL PROFILES, DATA SHEETS AND MATERIAL CERTIFICATIONS. PROVIDE A COPY OF ALL COMPLETED DISPOSAL FACILITY FORMS TO THE ENGINEER.

IF THE EXCAVATIONS WITHIN THE CROSS-HATCHING LIMITS REQUIRE DEWATERING FOR CONSTRUCTION PURPOSES, THE CONTRACTOR SHALL DEWATER, CONTAINERIZE AND DISPOSE OF THE LIQUID WASTE IN A LICENSED DISPOSAL FACILITY. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND CONDUCTING ALL TESTING NEEDED TO STORE, TRANSPORT, AND DISPOSE OF THE LIQUID WASTE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. INCLUDE DETAILS OF THE WASTE WATER SAMPLING AND TESTING AS PART OF THE WASTE MATERIAL SAMPLING AND TESTING PLAN. THE CONTRACTOR SHALL FILL OUT AND SIGN ALL LIQUID WASTE DISPOSAL FACILITY FORMS REQUIRED BY THE DISPOSAL FACILITY INCLUDING, BUT NOT LIMITED TO MATERIAL PROFILES, DATA SHEETS AND MATERIAL CERTIFICATIONS. PROVIDE A COPY OF ALL COMPLETED DISPOSAL FACILITY FORMS TO THE ENGINEER.

THE CONTRACTOR SHALL DEVELOP A HEALTH AND SAFETY PLAN PER OSHA REGULATION 1910.120 COVERING THE WORK FOR THIS NOTE.

THE CONTRACTOR SHALL PROVIDE ALL THE LABOR, EQUIPMENT, AND MATERIALS NECESSARY TO PROPERLY HANDLE, TEMPORARILY STORE, TEST FOR CHARACTERIZATION, HEALTH AND SAFETY PLAN, TRANSPORT, AND DISPOSE OF THE REGULATED MATERIALS, INCLUDING ANY REQUIRED PERMITS OR FEES. PAYMENT FOR THIS WORK SHALL BE MADE AT THE CONTRACT PRICES BID PER TON AND PER GALLON. THE BASIS FOR CONVERSION OF CUBIC YARDS TO TONS IS 1.5 TON/CUBIC YARD. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE SUBSUMMARY.

THE FOLLOWING ESTIMATED QUANTITIES ARE INCLUDED FOR THE WORK NOTED ABOVE:

690E65000 - ITEM SPECIAL - WORK INVOLVING NON-REGULATED MATERIALS 1000 TON

690E65002 - ITEM SPECIAL - WORK INVOLVING HAZARDOUS WASTE 100 TON

690E65010 - ITEM SPECIAL - WORK INVOLVING SOLID WASTE 500 TON

690E65022 - ITEM SPECIAL - WORK INVOLVING NON-REGULATED WATER 10,000 GAL

690E65024 - ITEM SPECIAL - WORK INVOLVING REGULATED WATER 10,000 GAL

CONSTRUCTION NOISE

THE CONTRACTOR SHALL ENSURE THAT ALL CONSTRUCTION EQUIPMENT SHALL BE OPERATED IN COMPLIANCE WITH ALL APPLICABLE CITY OF COLUMBUS ORDINANCES AND REGULATIONS PERTAINING TO CONSTRUCTION NOISE, INCLUDING SECTION 2329.11 OF THE COLUMBUS CITY CODE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL FINES ASSESSED DUE TO NON-COMPLIANCE WITH THE CITY NOISE ORDINANCE.

THE CONSTRUCTION NOISE MITIGATION IDENTIFIED AND LISTED BELOW SHALL BE USED TO MINIMIZE CONSTRUCTION ACTIVITY DURING NIGHTTIME AND WEEKEND OPERATIONS:

A. DIESEL POWERED VEHICLES SHALL NOT IDLE LONGER THAN 3 MINUTES. IDLING TIMES FOR OTHER VEHICLES AND INTERNAL COMBUSTION ENGINE POWERED EQUIPMENT SHALL ALSO BE MINIMIZED.

B. ROUTING CONSTRUCTION EQUIPMENT THOUGH LOCAL STREET NETWORK SHALL BE AVOIDED OR MINIMIZED.

C. FLASHING ARROW PANELS (FAPS AND PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE SOLAR POWERED.

D. JACKHAMMERS OR PAVEMENT BREAKERS SHALL BE OPERATED ELECTRICALLY OR HYDRAULICALLY. PNEUMATIC JACKHAMMERS SHALL ONLY BE USED IF EQUIPPED WITH PNEUMATIC DISCHARGE MUFFLERS, CERTIFIED BY THE MANUFACTURER.

E. EXHAUST MUFFLERS, CERTIFIED BY THE MANUFACTURER, SHALL BE USED ON ALL INTERNAL COMBUSTION ENGINES.

F. USE OF ELECTRIC SAWS RATHER THAN AIR OR GASOLINE POWERED SAWS SHALL BE REQUIRED.

CONSTRUCTION NOISE AND VIBRATION SHALL BE MINIMIZED NEAR THE HISTORIC RESOURCES COVERED BY SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT.

WORK ON EXISTING PARCEL 1-WL

THE CONTRACTOR SHALL MANAGE ALL WORK ON THIS SITE ACCORDING TO THE SITE SPECIFIC RISK MITIGATION PLAN LIBERTY PLACE (RMP). THE RMP HAS BEEN INCLUDED IN THE PROJECT'S REFERENCE MATERIAL. ALL WORK AND COMPLYING WITH THE RMP IS TO BE PAID FOR UNDER THE ORIGINAL BID ITEMS ON EXISTING PARCEL 1-WL (AREA LOCATED TO THE NORTH OF THE EXISTING LIBERTY PLACE FIRE LANE AND TO THE SOUTH OF EXISTING W. FULTON STREET). LIBERTY PLACE PROPERTY IS LOCATED AT 100 LIBERTY STREET.

IF THE DEWATERING IS REQUIRED FOR CONSTRUCTION PURPOSES ON EXISTING PARCEL 1-WL, THE CONTRACTOR SHALL DEWATER, CONTAINERIZE AND DISPOSE OF THE LIQUID WASTE IN A LICENSED DISPOSAL FACILITY. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND CONDUCTING ALL TESTING NEEDED TO STORE, TRANSPORT, AND DISPOSE OF THE LIQUID WASTE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THE CONTRACTOR SHALL FILL OUT AND SIGN ALL LIQUID WASTE DISPOSAL FACILITY FORMS REQUIRED BY THE DISPOSAL FACILITY INCLUDING, BUT NOT LIMITED TO MATERIAL PROFILES, DATA SHEETS AND MATERIAL CERTIFICATIONS. PROVIDE A COPY OF ALL COMPLETED DISPOSAL FACILITY FORMS TO THE ENGINEER.

WATER REMOVED FROM WITHIN THE ABOVE LIMITS WILL FALL INTO ONE OF TWO FOLLOWING CATEGORIES:

1. ITEM 690E65022 - SPECIAL - WORK INVOLVING NON-REGULATED WATER

THE METHOD FOR DISPOSING OF THE NON-REGULATED WATER WILL BE APPROVED BY THE ENGINEER. WORK INVOLVED WITH THIS ITEM SPECIAL INCLUDES COMPLYING WITH THE RMP, HANDLING, STORAGE, AND DISPOSAL OF NON-REGULATED WATER.

2. ITEM 690E65024 - SPECIAL - WORK INVOLVING REGULATED WATER

THE METHOD FOR DISPOSING OF THE REGULATED WATER WILL BE APPROVED BY THE ENGINEER. WORK INVOLVED WITH THIS ITEM SPECIAL INCLUDES COMPLYING WITH THE RMP, HANDLING, STORAGE, AND DISPOSAL OF REGULATED WATER.

THE CONTRACTOR IS TO COMPLETE ALL MANIFEST FOR MATERIAL TO BE TRANSPORTED AND PROVIDE TO THE ENGINEER FOR SIGNATURE. ALL TRANSPORT VEHICLES USED FOR THE MOVEMENT OF REGULATED SOILS OR WATERS SHALL MEET APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS. THE CONTRACTOR WILL MAINTAIN RECORDS, SUCH AS MANIFESTS, LANDFILL TICKETS, DAILY LOGS, ETC., TO DOCUMENT THE SOURCE, MOVEMENT, AND DESTINATION OF EACH TRUCK LOAD OF REGULATED SOILS AND/OR WATERS. ONE COPY OF EACH OF THESE RECORDS WILL BE SUBMITTED TO THE ENGINEER.

THE FOLLOWING ESTIMATED QUANTITIES ARE INCLUDED FOR THE WORK NOTED ABOVE:

690E65022 - ITEM SPECIAL - WORK INVOLVING NON-REGULATED WATER 1,000 GAL

690E65024 - ITEM SPECIAL - WORK INVOLVING REGULATED WATER 1,000 GAL

⚠

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED LIBERTY RMP NOTE	CWL	11-4-2021

CALCULATED ATR CHECKED CWL

GENERAL NOTES

FRA-70/71-12.68/14.86

66A 1815

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NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED SHEET REF. #	CWL	11-4-2021

SCIOTO RIVER

℄ CONST. I-70 WB

EX. STRUCTURE NO. FRA-70-1343 (TO BE REMOVED)

EX. STRUCTURE NO. FRA-70-1358R (TO REMAIN)

EX. STRUCTURE NO. FRA-70-1321R (TO REMAIN)

℄ ROAD "D"

℄ ROAD "C"

℄ ROAD "CD"

STRUCTURE NO. FRA-70-1358A

℄ CONST. I-70 EB

℄ CONST. FUTURE I-70 EB

℄ CONST. RAMP C5

PROP. WALL 4W10

PROP. WALL 4W20

STRUCTURE NO. FRA-70-1321A

STRUCTURE NO. FRA-70-1357A

℄ CONST. RAMP C6

ex. dog park

ex. waterline (TO REMAIN)

ex. rain garden (DND)

℄ CONST. RELOC. BIKE PATH

℄ R/W WHITTIER ST.

4 STRUCTURE NO. FRA-70-1373R

5 STRUCTURE NO. FRA-70-1373A

6 STRUCTURE NO. FRA-70-1390C

℄ R/W CSX RAILROAD

℄ CONST. PROP. BIKE PATH DETOUR

℄ R/W SHORT ST.

PROP. WALL 4W9

PROP. WALL 4W8

℄ CONST. SHORT ST.

ex. 12'x10.5' OSIS

℄ R/W NORFOLK SOUTHERN RAILROAD

ex. railroad access road (TO REMAIN)

℄ EXIST. SHORT ST.

℄ CONST. SHORT RD.

SEE REGULATED WASTE AND WATER PLAN NOTE ON SHEET 66A ⚠

HORIZONTAL SCALE IN FEET
0 50 100 200

CALCULATED ATR
CHECKED CWL

GENERAL NOTES
ENVIRONMENTAL PLAN

FRA-70/71-12.68/14.86

67A
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GENERAL NOTES SUBSUMMARY

CALCULATED CJC | CHECKED CWL

SHEET NO.	201 CLEARING AND GRUBBING, AS PER PLAN (LS)		202 REMOVAL MISC.: TRASH RECEPTACLES (EACH)		202 CONCRETE BARRIER REMOVED (FT)		204 GEOTEXTILE FABRIC (SY)		208 VIBRATION CONTROL AND MONITORING, AS PER PLAN (LS)				251 PARTIAL DEPTH PAVEMENT REPAIR (442) (SY)		SPECIAL PAVEMENT OVERLAY FABRIC (SY)		SPECIAL SAWING AND SEALING CONCRETE JOINTS (FT)		601 TIED CONCRETE BLOCK MAT, TYPE 1 (SY)		607 FENCE, TYPE CL, AS PER PLAN (FT)		605 6" UNCLASSIFIED PIPE UNDERDRAINS WITH GEOTEXTILE FABRIC (FT)		611 CONDUIT, MISC.: SEWER VIDEO INSPECTION (FT)	611 6" CONDUIT, TYPE B (FT)		611 6" CONDUIT, TYPE C (FT)		611 CONDUIT, MISC.: BYPASS PUMPING FOR VIDEO INSPECTION (LS)
	01/IMS/PV	02/NHS/PV	01/IMS/PV		01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV			01/IMS/PV		01/IMS/PV	02/NHS/PV	01/IMS/PV	10/IMS/OT/COL	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	08/IMS/OT	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	08/IMS/OT
53	LS	LS																													
54			4																												
55													500		102	129															
56					119	151																									
61																	368	44													
63																			4	4			88	112		22	28	22	28		
66A									LS	LS																					
67							880	1120													880	1120									
69																									3300						LS
TOTALS CARRIED TO GENERAL SUMMARY	LS	LS	4		119	151	880	1120	LS	LS			500		102	129	368	44	4	4	880	1120	88	112	3300	22	28	22	28	LS	

SHEET NO.	611 6" CONDUIT, TYPE E (FT)		611 6" CONDUIT, TYPE F (FT)		611 PRECAST REINFORCED CONCRETE OUTLET (EACH)		611 CONDUIT, MISC.: INTERNAL JOINT SEAL (EACH)		SPECIAL MISCELLANEOUS METAL (LB)		622 BARRIER, MISC.: CONCRETE BARRIER, TYPE B (FT)		623 PROVIDING ELECTRONIC INSTRUMENTATION		638 WATER WORK, MISC.: SURVEY COORDINATES (LS)		SPECIAL SURVEY CONTROL VERIFICATION (LS)		SPECIAL WORK INVOLVING NON-REGULATED MATERIALS (TON)		SPECIAL WORK INVOLVING HAZARDOUS WASTE (TON)		SPECIAL WORK INVOLVING SOLID WASTE (TON)		SPECIAL WORK INVOLVING NON-REGULATED WATER (GAL)		SPECIAL WORK INVOLVING REGULATED WATER (GAL)		
	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	08/IMS/OT		01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV	01/IMS/PV	02/NHS/PV		
54																	LS	LS													
56											106	134																			
58													LS	LS																	
63	22	28	110	140	2	2	26	34	440	560																					
66A																			440	560	44	56	220	280	4840	6160	4840	6160			
68															LS																
TOTALS CARRIED TO GENERAL SUMMARY	22	28	110	140	2	2	26	34	440	560	106	134	LS	LS	LS		LS	LS	440	560	44	56	220	280	4840	6160	4840	6160	⚠		

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED LIBERTY RMP NOTE	CWL	11-4-2021

FRA-70/71-12.68/14.86

69A
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SHEET NUMBER								PARTICIPATION						ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
OFFICE CALCS	69A		221		229			01/IMS/PV	02/NHS/PV										
																		EROSION CONTROL	
315								139	176					601	12001	315	SY	RIPRAP, WITH GROUT, AS PER PLAN	582
			1127					496	631					601	21000	1127	SY	CONCRETE SLOPE PROTECTION	
	8		223					102	129					601	21050	231	SY	TIED CONCRETE BLOCK MAT WITH TYPE 1 UNDERLAYMENT	
			243					107	136					601	21060	243	SY	TIED CONCRETE BLOCK MAT WITH TYPE 2 UNDERLAYMENT	
			6					3	3					601	32200	6	CY	ROCK CHANNEL PROTECTION, TYPE C WITH FILTER	
			571					251	320					601	37501	571	FT	PAVED GUTTER, TYPE 1-2, AS PER PLAN	65
					2			1	1					659	00100	2	EACH	SOIL ANALYSIS TEST	
					6118			2692	3426					659	00300	6118	CY	TOPSOIL	
					55114			24250	30864					659	10000	55114	SY	SEEDING AND MULCHING	
					2756			1213	1543					659	14000	2756	SY	REPAIR SEEDING AND MULCHING	
					2756			1213	1543					659	15000	2756	SY	INTER-SEEDING	
					7.69			3.38	4.31					659	20000	7.69	TON	COMMERCIAL FERTILIZER	
					11.39			5.01	6.38					659	31000	11.39	ACRE	LIME	
					305			134	171					659	35000	305	MGAL	WATER	
			95					42	53					660	30000	95	SY	SODDING UNSTAKED	
			2313					1018	1295					670	00700	2313	SY	DITCH EROSION PROTECTION	
			LS					LS	LS					832	15000	LS		STORM WATER POLLUTION PREVENTION PLAN	
			LS					LS	LS					832	15002	LS		STORM WATER POLLUTION PREVENTION INSPECTIONS	
			LS					LS	LS					832	15010	LS		STORM WATER POLLUTION PREVENTION INSPECTION SOFTWARE	
			1150000					506000	644000					832	30000	1150000	EACH	EROSION CONTROL	
																		ENVIRONMENTAL / REMEDIATION	
	1000							440	560					SPECIAL	69065000	1000	TON	WORK INVOLVING NON-REGULATED MATERIALS	66A
	100							44	56					SPECIAL	69065002	100	TON	WORK INVOLVING HAZARDOUS WASTE	66A
	500							220	280					SPECIAL	69065010	500	TON	WORK INVOLVING SOLID WASTE	66A
	11000							4840	6160					SPECIAL	69065022	11000	GAL	WORK INVOLVING NON-REGULATED WATER	66A
⚠	11000							4840	6160					SPECIAL	69065024	11000	GAL	WORK INVOLVING REGULATED WATER	66A

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED LIBERTY RMP NOTE	CWL	11-4-2021

CALCULATED ATR
CHECKED CWL

GENERAL SUMMARY

FRA-70/71-12.68/14.86

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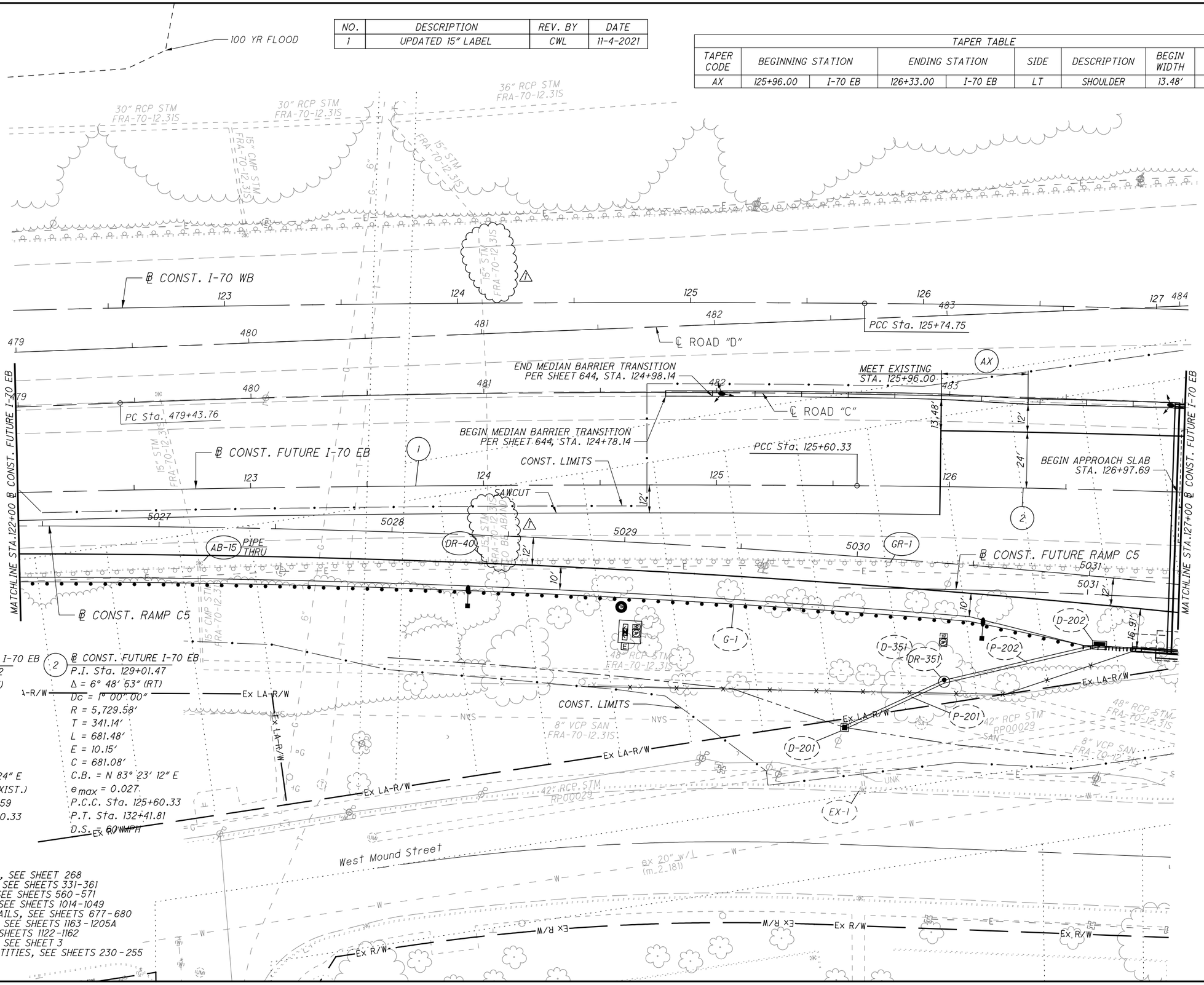
NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED 15" LABEL	CWL	11-4-2021

TAPER TABLE									
TAPER CODE	BEGINNING STATION		ENDING STATION		SIDE	DESCRIPTION	BEGIN WIDTH	END WIDTH	TAPER RATE
AX	125+96.00	I-70 EB	126+33.00	I-70 EB	LT	SHOULDER	13.48'	12.00'	25:1



1 ℄ CONST. FUTURE I-70 EB
P.I. Sta. 116+94.12
Δ = 8° 40' 43" (RT)
Dc = 0° 30' 00"
R = 11,459.16'
T = 869.53'
L = 1,735.74'
E = 32.94'
C = 1,734.08'
C.B. = N 75° 38' 24" E
e max = 0.0264 (EXIST.)
P.C. Sta. 108+24.59
P.C.C. Sta. 125+60.33
D.S. = 60 MPH

2 ℄ CONST. FUTURE I-70 EB
P.I. Sta. 129+01.47
Δ = 6° 48' 53" (RT)
Dc = 1° 00' 00"
R = 5,729.58'
T = 341.14'
L = 681.48'
E = 10.15'
C = 681.08'
C.B. = N 83° 23' 12" E
e max = 0.027
P.C.C. Sta. 125+60.33
P.T. Sta. 132+41.81
D.S. = 60 MPH

FOR I-70 EB PROFILE, SEE SHEET 268
FOR RAMP C5 PLANS, SEE SHEETS 331-361
FOR GORE DETAILS, SEE SHEETS 560-571
FOR SIGNING PLANS, SEE SHEETS 1014-1049
FOR UNDERDRAIN DETAILS, SEE SHEETS 677-680
FOR LIGHTING PLANS, SEE SHEETS 1163-1205A
FOR ITS PLANS, SEE SHEETS 1122-1162
FOR UTILITY LEGEND, SEE SHEET 3
FOR ESTIMATED QUANTITIES, SEE SHEETS 230-255

HORIZONTAL SCALE IN FEET
0 10 20 40

CALCULATED TMT
CHECKED CWL

PLAN - I-70 EASTBOUND
STA. 122+00.00 TO STA. 127+00.00

FRA-70/71-12.68/14.86

267
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NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED HATCH LEGEND	CWL	11-5-2021

SEEDING END WIDTH	SEEDING SQ. YDS.
	339
63	
	339
59	
	319
56	
	997

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
		26	1490
19	780		
		159	1299
153	622		
		696	826
599	270		
		881	3615

CALCULATED ATR
CHECKED CWL

ITEM 202 - PAVEMENT REMOVED

ITEM 202 - PAVEMENT REMOVED, ASPHALT

SELECT GRANULAR BACKFILL PER SS840 (INCLUDED IN WALL QUANTITIES)

LOAD TRANSFER PLATFORM (INCLUDED WITH RETAINING WALL ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS) ⚠1

ITEM 206 - CEMENT STABILIZED SUBGRADE, 14 INCHES DEEP

SAWCUT
MATCHLINE I-70 EB
elec.
5'
70.8' LT
℄=721.8
3:1
6:1
EX LA-R/W
PROP. RET. WALL NO. 4W20
LA
25:1
2:1
2:1
39.8' RT
℄=717.0
P-262 30" TYPE C
730.48
5065+00.00
718.72
EL-15
2x3 DUCT BANK

D-110
STA 5064+42.90 (C5), 46.54' LT
CB-8, A.P.P., SLAB ELEV 726.43
30" (W) 702.80
30" (E) 702.80

SAWCUT
MATCHLINE I-70 EB
elec.
5'
68.8' LT
℄=722.1
3:1
6:1
D-110
EX LA-R/W
D-69
PROP. RET. WALL NO. 4W20
LA
25:1
2:1
2:1
2x3 DUCT BANK
38.2' RT
℄=716.5
EL-15
730.06
5064+50.00
716.40

D-69
STA 5064+56.00 (C5), 22.42' RT
I-3-D, A.P.P.
GRATE ELEV 729.05
15" (SW) 724.45
6" UD (E) 726.07

D-70
STA 5063+92.72 (C5), 22.42' RT
I-3-D, A.P.P.
GRATE ELEV 728.85
15" (NW) 724.25
15" (NE) 724.25
6" UD (N) 724.87
6" UD (E) 725.87
6" UD (W) 725.87

SAWCUT
MATCHLINE I-70 EB
elec.
5'
67.1' LT
℄=722.4
3:1
6:1
P-70
99'-15" TYPE B, 706.02
WITH 706.11 JOINTS @ 2.28%
D-70
PROP. RET. WALL NO. 4W20
EX LA-R/W
25:1
2:1
2:1
38.2' RT
℄=713.9
EL-13
2x3 DUCT BANK
P-110 30" TYPE C
729.90
5064+00.00
719.16

750 740 730 720 710 700

120 100 80 60 40 20 0 20 40 60 80 100 120

CROSS SECTIONS - RAMP C5
STA. 5064+00.00 TO STA. 5065+00.00

FRA-70/71-12.68/14.86

479
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NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED HATCH LEGEND	CWL	11-5-2021

ITEM 202 - PAVEMENT REMOVED

ITEM 202 - PAVEMENT REMOVED, ASPHALT

SELECT GRANULAR BACKFILL PER SS840 (INCLUDED IN WALL QUANTITIES)

LOAD TRANSFER PLATFORM (INCLUDED WITH RETAINING WALL ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS) ⚠

SEEDING END WIDTH	SEEDING SQ. YDS.	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
	586			30	2849
102		14	1450		
	433			19	2204
54		7	929		
	314			14	1628
59		9	829		
	1333			63	6681

CALCULATED ATR

CHECKED CWL

CROSS SECTIONS - RAMP C5
STA. 5065+50.00 TO STA. 5066+50.00

FRA-70/71-12.68/14.86

480
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SEEDING	
END WIDTH	SQ. YDS.
0	
0	
78	
267	
82	
267	

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED HATCH LEGEND	CWL	11-5-2021

GRANULAR BACKFILL, TYPE B (INCLUDED IN WALL QUANTITIES)

ITEM 202 - PAVEMENT REMOVED

LOAD TRANSFER PLATFORM (INCLUDED WITH RETAINING WALL ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS)

ITEM 202 - PAVEMENT REMOVED, ASPHALT

SELECT GRANULAR BACKFILL PER SS840 (INCLUDED IN WALL QUANTITIES)

ITEM 203 - GRANULAR MATERIAL, TYPE C (INCLUDED IN THE WALL QUANTITIES)

<#> ITEM 203 - EMBANKMENT, AS PER PLAN "A"

MATCHLINE 1-TO EB

PROP. RET. WALL NO. 4W8

BEGIN APPROACH SLAB (SKEW)
750.91
5074+10.30
715.83

LA

U

U TMP

DV-15

P-42

27" TYPE C IN 42" STEEL CASING

AH SUSPEND SEEDING

BK RESUME EARTHWORK

SUSPEND EARTHWORK

END APPROACH SLAB (SKEW)
748.95
5071+48.62
713.45

TEMP. RETAINING WALL

2:1

BEGIN APPROACH SLAB (SKEW)
748.39
5071+18.62
713.76

END AREA		VOLUME	
CUT	FILL	CUT	FILL
		22	<572>
AH 20	<0>		
BK 0	<0>		
0	<0>	0	<1258>
0	<2265>		
		22	<1830>

CALCULATED ATR

CHECKED CWL

CROSS SECTIONS - RAMP C5
STA. 5071+18.62 TO STA. 5074+10.30

FRA-70/71-12.68/14.86

485
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SEEDING	
END WIDTH	SQ. YDS.
	0
	0
	0
	0

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED HATCH LEGEND	CWL	11-5-2021

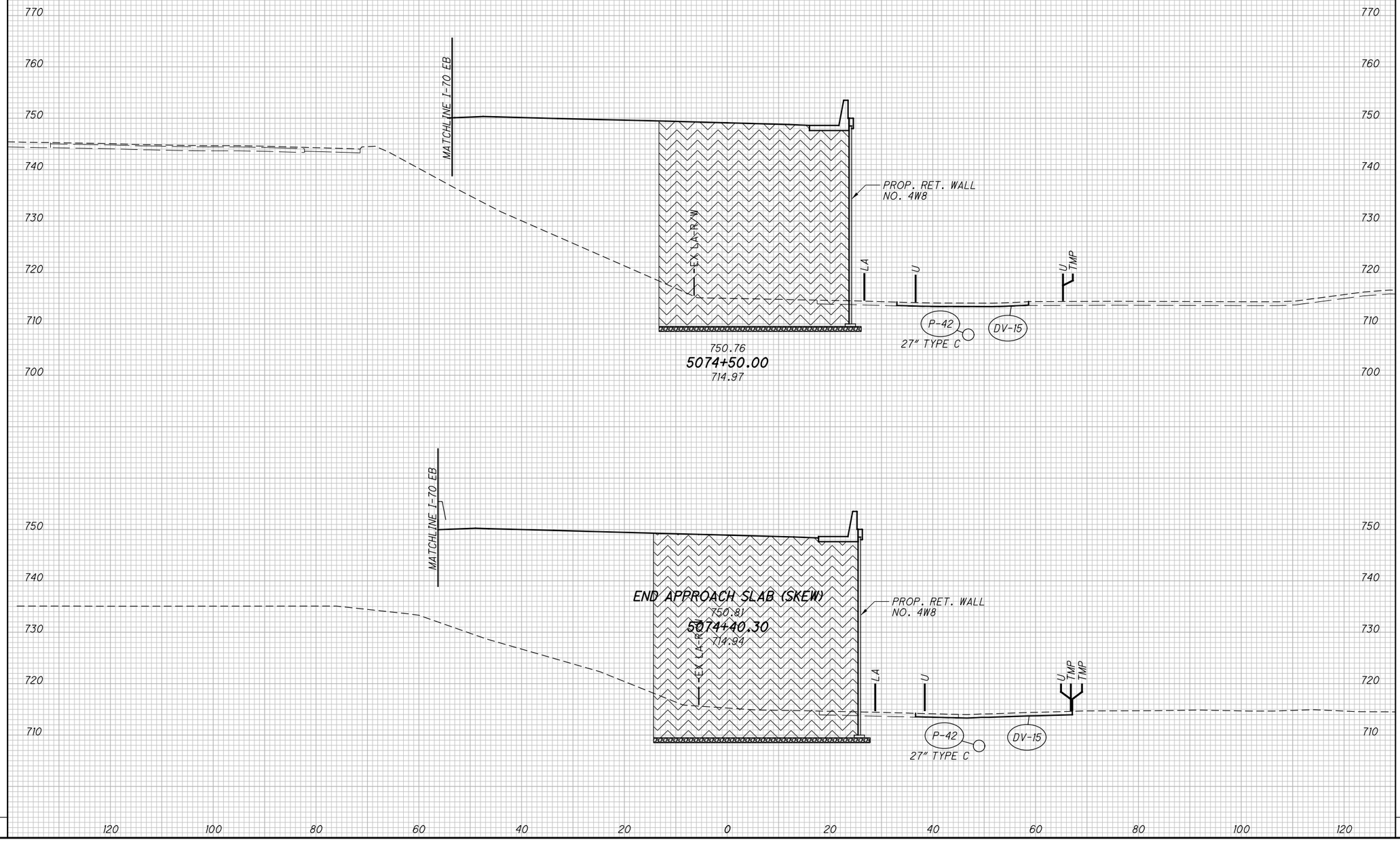
ITEM 202 - PAVEMENT REMOVED

ITEM 202 - PAVEMENT REMOVED, ASPHALT

<#> ITEM 203 - EMBANKMENT, AS PER PLAN "A"

SELECT GRANULAR BACKFILL PER SS840 (INCLUDED IN WALL QUANTITIES)

LOAD TRANSFER PLATFORM (INCLUDED WITH RETAINING WALL ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS) ⚠



END AREA		VOLUME	
CUT	FILL	CUT	FILL
		31	⟨1071⟩
17	⟨913⟩		
		7	⟨349⟩
20	⟨1029⟩		
		38	⟨1420⟩

CALCULATED ATR

CHECKED CWL

CROSS SECTIONS - RAMP C5
STA. 5074+40.30 TO STA. 5074+50.00

FRA-70/71-12.68/14.86

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SEEDING	
END WIDTH	SQ. YDS.
	56
5	
	28
5	
0	
	84

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED HATCH LEGEND	CWL	11-5-2021

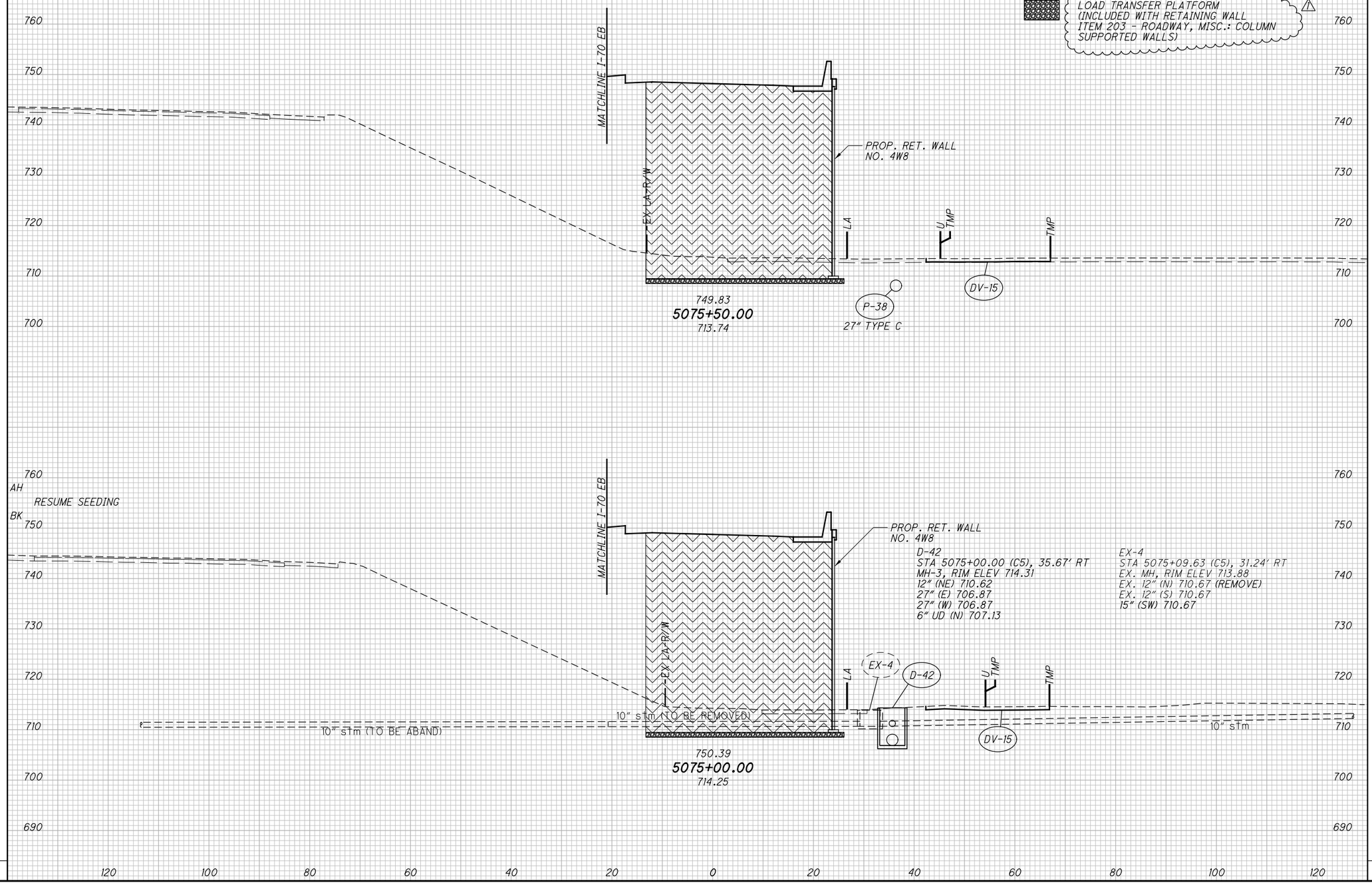
ITEM 202 - PAVEMENT REMOVED

ITEM 202 - PAVEMENT REMOVED, ASPHALT

<#> ITEM 203 - EMBANKMENT, AS PER PLAN "A"

SELECT GRANULAR BACKFILL PER SS840 (INCLUDED IN WALL QUANTITIES)

LOAD TRANSFER PLATFORM (INCLUDED WITH RETAINING WALL ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS) ⚠



AH
RESUME SEEDING
BK

END AREA		VOLUME	
CUT	FILL	CUT	FILL
		32	(487)
16	(260)		
		30	(467)
16	(244)		
		62	(954)

CALCULATED ATR
CHECKED CWL

CROSS SECTIONS - RAMP C5
STA. 5075+00.00 TO STA. 5075+50.00

FRA-70/71-12.68/14.86

487
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NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED HATCH LEGEND	CWL	11-5-2021

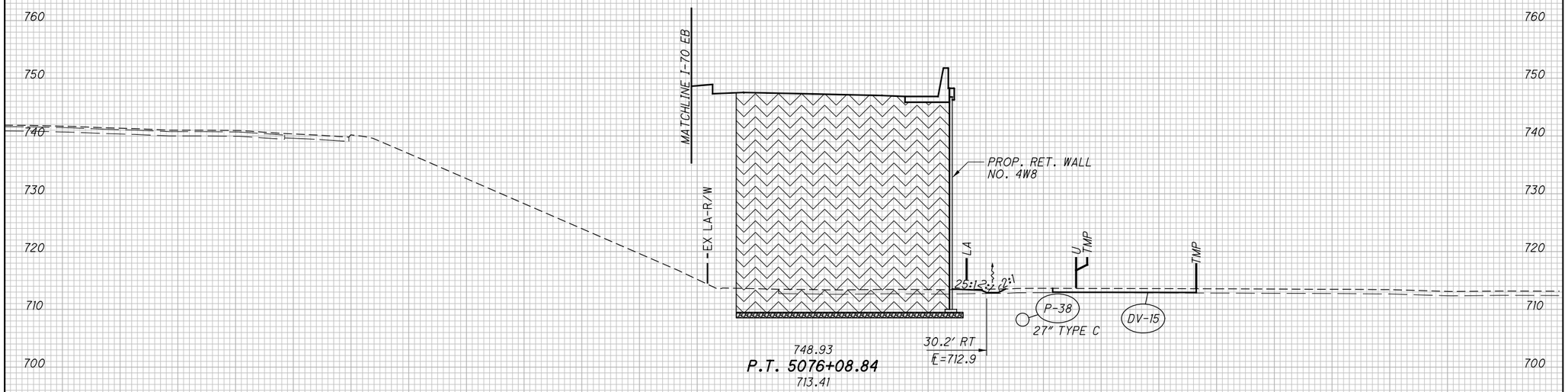
SELECT GRANULAR BACKFILL PER SS840 (INCLUDED IN WALL QUANTITIES)

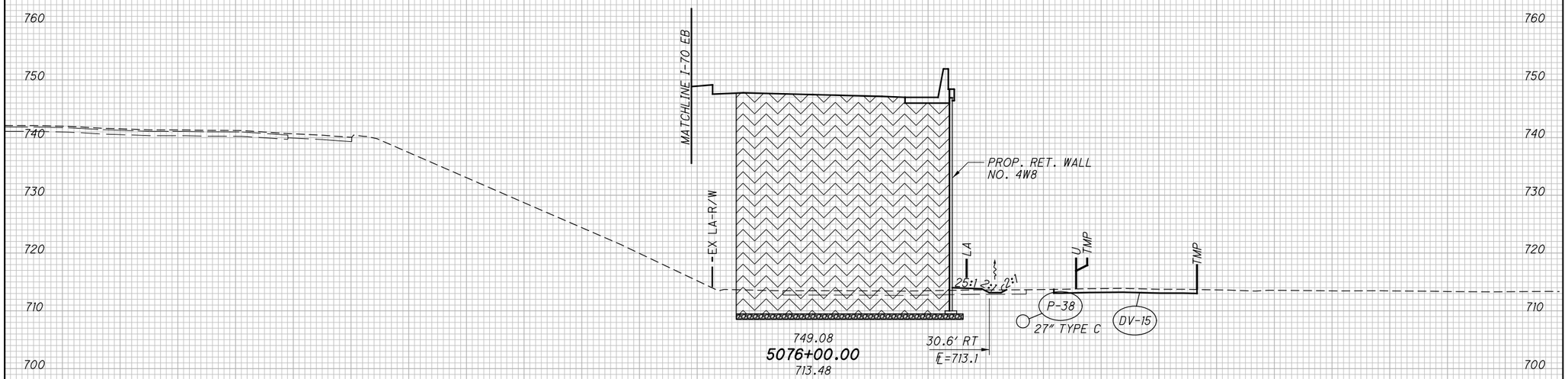
LOAD TRANSFER PLATFORM (INCLUDED WITH RETAINING WALL ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS)

ITEM 202 - PAVEMENT REMOVED

ITEM 202 - PAVEMENT REMOVED, ASPHALT

⟨#⟩ ITEM 203 - EMBANKMENT, AS PER PLAN "A"





SEEDING END WIDTH	SEEDING SQ. YDS.
	69
15	
	15
15	
	84

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL	
		30	378	
	AH 262			
	⟨262⟩			END ITEM 203 - EMBANKMENT, A.P.P. "A" BK STA. 5076+10.84
			⟨19⟩	
19	⟨262⟩			
		6	⟨86⟩	
18	⟨265⟩			
		36	⟨105⟩ 378	

CALCULATED ATR
CHECKED CWL

CROSS SECTIONS - RAMP C5
STA. 5076+00.00 TO STA. 5076+08.84

FRA-70/71-12.68/14.86

488
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NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED HATCH LEGEND	CWL	11-5-2021

ITEM 202 - PAVEMENT REMOVED

ITEM 202 - PAVEMENT REMOVED, ASPHALT

SELECT GRANULAR BACKFILL PER SS840 (INCLUDED IN WALL QUANTITIES)

LOAD TRANSFER PLATFORM (INCLUDED WITH RETAINING WALL ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS) ⚠1

D-259
STA 5077+00.00 (C5), 17.00' RT
MH-3, A.P.P., W/ DROP PIPE
SLAB ELEV 743.42
21" (E) 723.25
21" (S) 709.30
6" UD (W) 743.92
6" DS (S) 747.84

D-38
STA 5077+00.00 (C5), 35.67' RT
MH-3, RIM ELEV 713.95
21" (N) 709.13
27" (W) 707.26
12" (E) 708.84

P-259
19'-21" TYPE B, 706.02
WITH 706.11 JOINTS @ 0.91%

PROP. RET. WALL NO. 4W8

MATCHLINE I-70 EB

EX LA-R/W

LA

TMP

25:1

2:1

41.5' RT
℄=712.7

747.46
5077+00.00
712.65

MATCHLINE I-70 EB

EX LA-R/W

PROP. RET. WALL NO. 4W8

P-38
27" TYPE C

30.3' RT
℄=712.8

748.17
5076+50.00
713.31

SEEDING END WIDTH	SEEDING SQ. YDS.	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
	136			38	504
27		18	269		
	117			35	489
15		20	259		
	253			73	993

CALCULATED ATR
CHECKED CWL

CROSS SECTIONS - RAMP C5
STA. 5076+50.00 TO STA. 5077+00.00

FRA-70/71-12.68/14.86

489
1815

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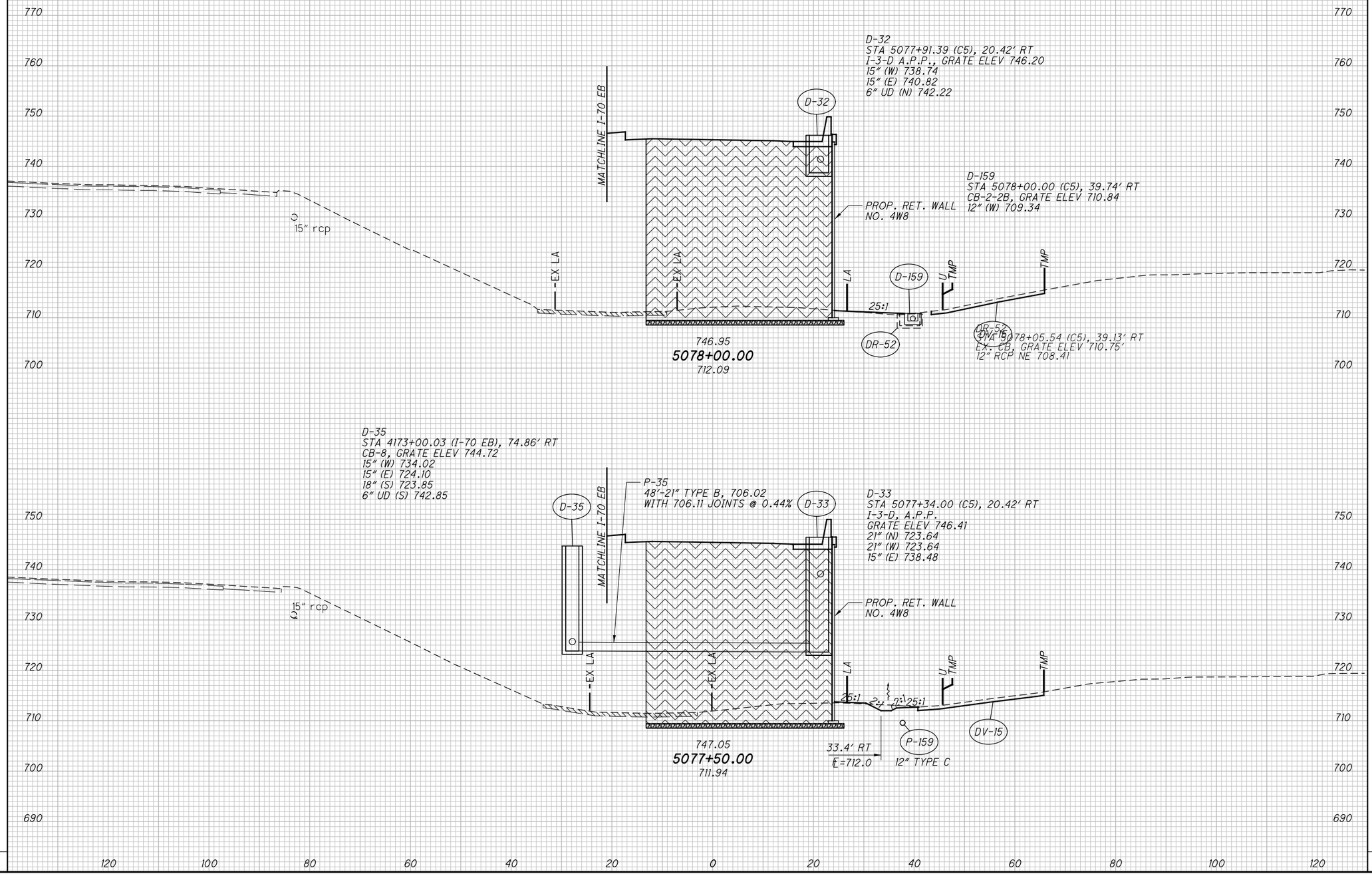
NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED HATCH LEGEND	CWL	11-5-2021

ITEM 202 - PAVEMENT REMOVED

ITEM 202 - PAVEMENT REMOVED, ASPHALT

SELECT GRANULAR BACKFILL PER SS840 (INCLUDED IN WALL QUANTITIES)

LOAD TRANSFER PLATFORM (INCLUDED WITH RETAINING WALL ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS) ⚠



SEEDING END WIDTH	SEEDING SQ. YDS.	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
	103			33	518
19		15	280		
	114			35	514
22		23	276		
	217			68	1032

CALCULATED ATR

CHECKED CWL

CROSS SECTIONS - RAMP C5
STA. 5077+50.00 TO STA. 5078+00.00

FRA-70/71-12.68/14.86

490
1815

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NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED HATCH LEGEND	CWL	11-5-2021

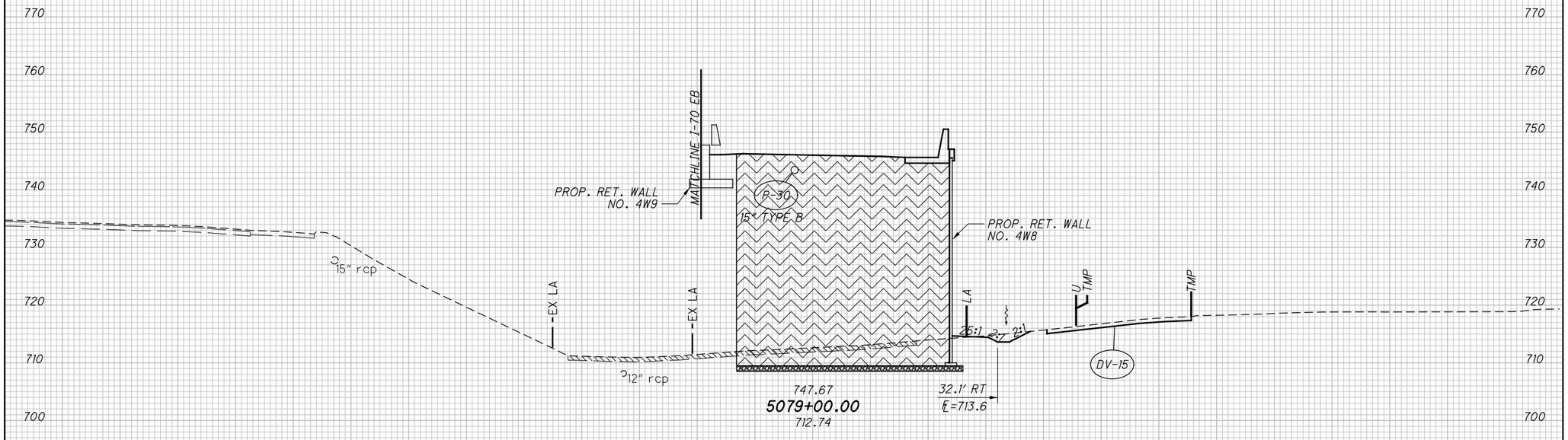
SEEDING END WIDTH	SEEDING SQ. YDS.
	22
17	
	97
18	
	119

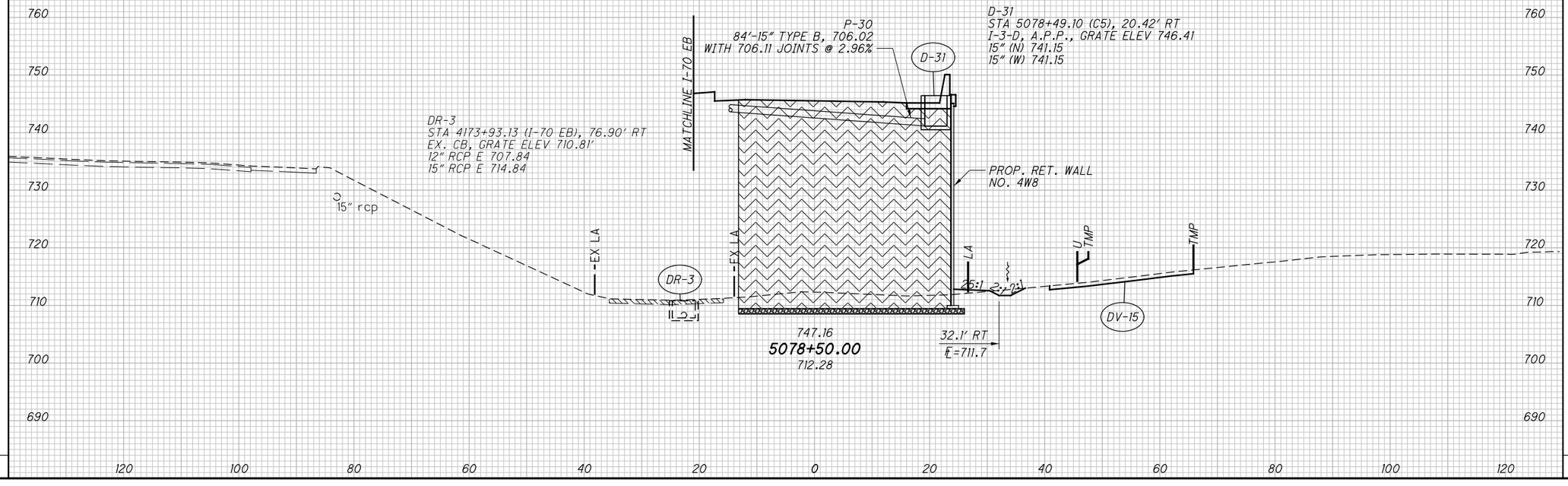
ITEM 202 - PAVEMENT REMOVED

ITEM 202 - PAVEMENT REMOVED, ASPHALT

SELECT GRANULAR BACKFILL PER SS840 (INCLUDED IN WALL QUANTITIES)

LOAD TRANSFER PLATFORM (INCLUDED WITH RETAINING WALL ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS) ⚠





END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
		11	99
24	207		
		42	451
21	280		
		53	550

CALCULATED ATR

CHECKED CWL

CROSS SECTIONS - RAMP C5
STA. 5078+50.00 TO STA. 5079+00.00

FRA-70/71-12.68/14.86

491
1815

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NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED HATCH LEGEND	CWL	11-5-2021

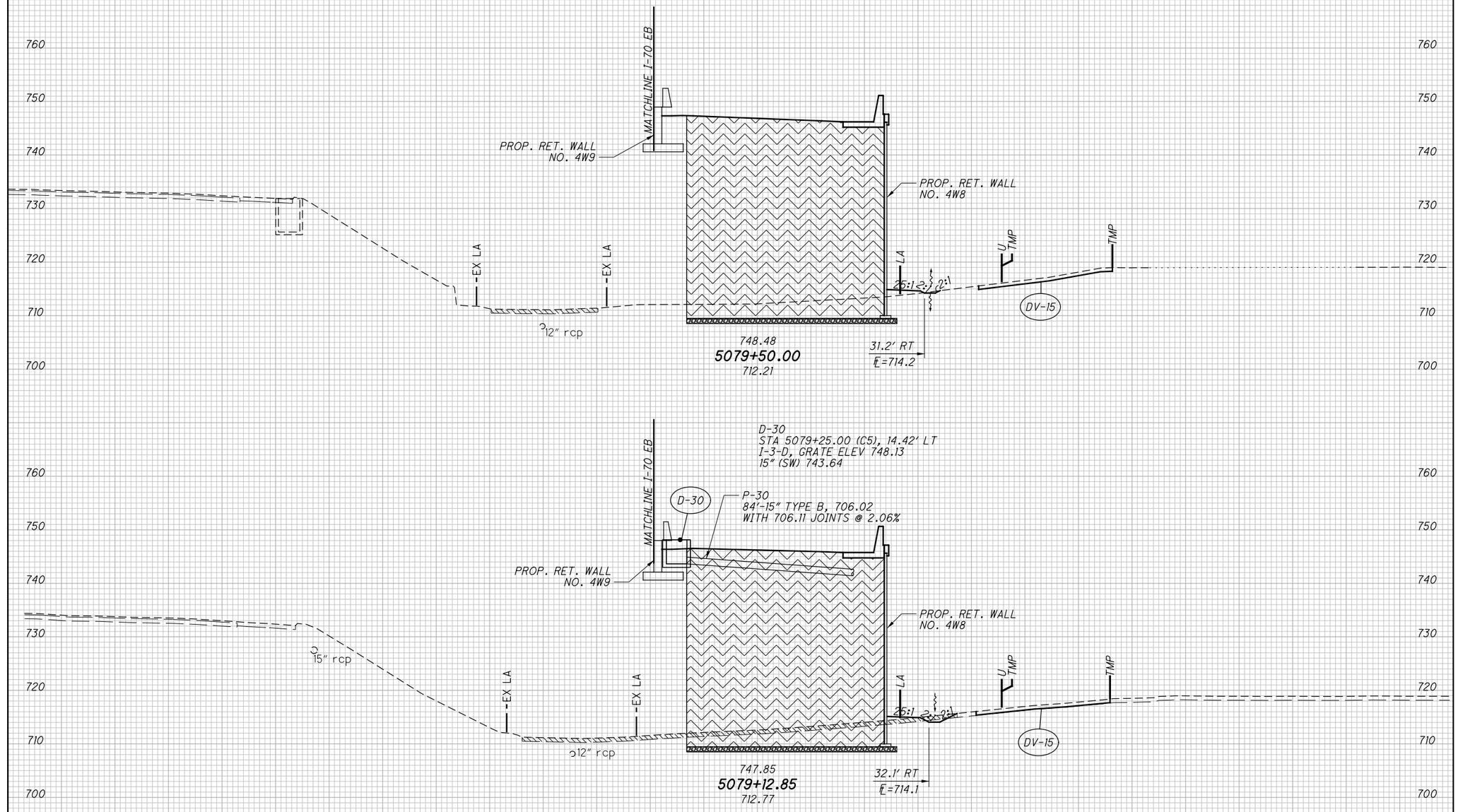
SELECT GRANULAR BACKFILL PER SS840 (INCLUDED IN WALL QUANTITIES)

LOAD TRANSFER PLATFORM (INCLUDED WITH RETAINING WALL ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS)

ITEM 202 - PAVEMENT REMOVED

ITEM 202 - PAVEMENT REMOVED, ASPHALT

<#> ITEM 203 - EMBANKMENT, AS PER PLAN "A"



SUSPEND ITEM 203 - EMBANKMENT AH
START ITEM 203 - EMBANKMENT, A.P.P. "A"
STA. 5079+95.31 BK

SEEDING END WIDTH	SEEDING SQ. YDS.	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
	57			32	⟨37⟩
			⟨206⟩		
			206		354
		17	206		
10					
				27	286
	50				
		22	209		
14					
	107			59	640
					⟨37⟩

CALCULATED ATR
CHECKED CWL

CROSS SECTIONS - RAMP C5
STA. 5079+12.85 TO STA. 5079+50.00

FRA-70/71-12.68/14.86

492
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SEEDING	
END WIDTH	SQ. YDS.
	63
28	
	34
11	
	97

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED HATCH LEGEND	CWL	11-5-2021

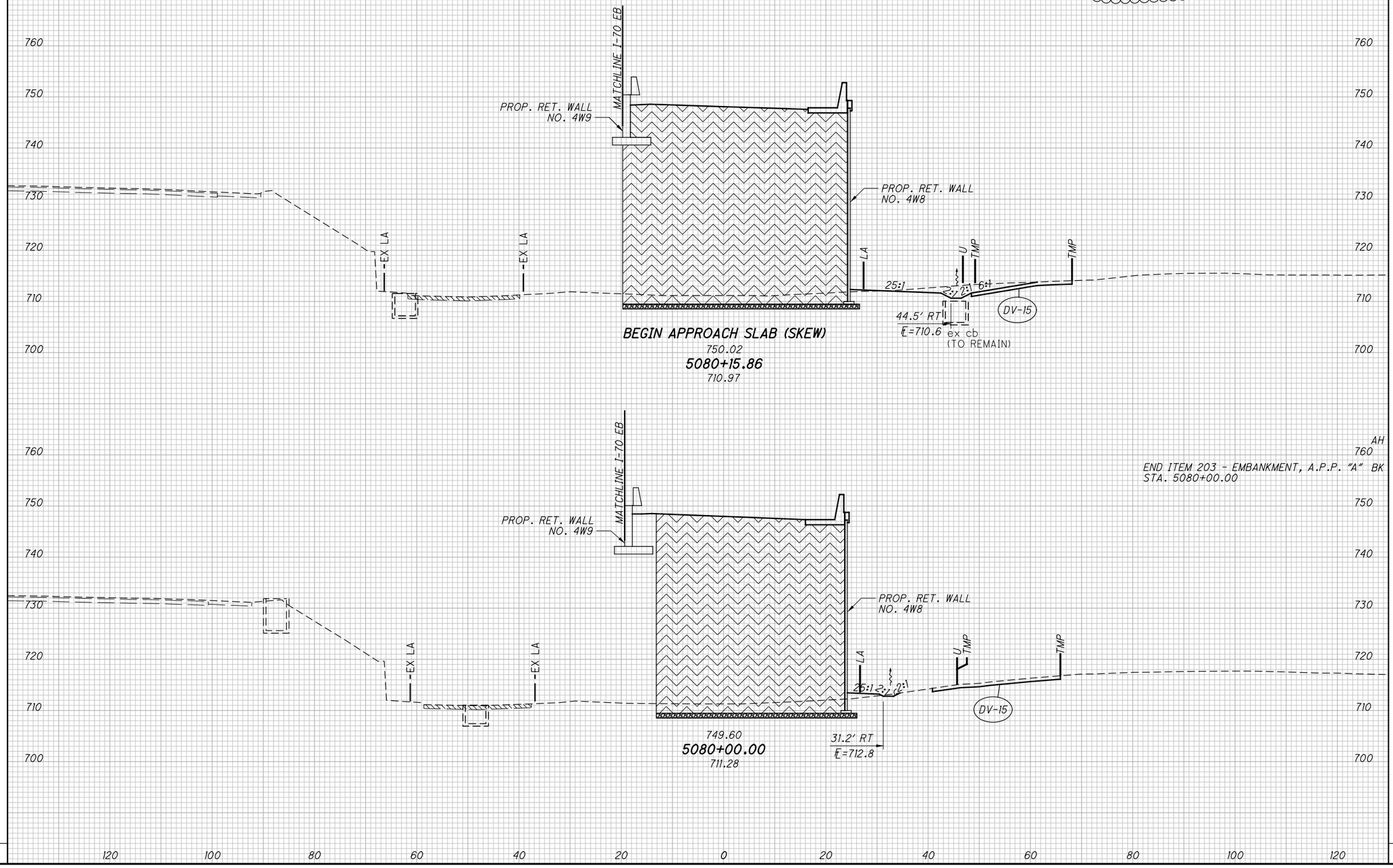
ITEM 202 - PAVEMENT REMOVED

ITEM 202 - PAVEMENT REMOVED, ASPHALT

<#> ITEM 203 - EMBANKMENT, AS PER PLAN "A"

SELECT GRANULAR BACKFILL PER SS840 (INCLUDED IN WALL QUANTITIES)

LOAD TRANSFER PLATFORM (INCLUDED WITH RETAINING WALL ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS) ⚠1



END AREA		VOLUME	
CUT	FILL	CUT	FILL
		34	2
42	1		
		18	2
AH		18	5
END ITEM 203 - EMBANKMENT, A.P.P. "A" BK STA. 5080+00.00		18	⟨215⟩
		52	4

CALCULATED ATR

CHECKED CWL

CROSS SECTIONS - RAMP C5
STA. 5080+00.00 TO STA. 5080+15.86

FRA-70/71-12.68/14.86

493
1815

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SEEDING	
END WIDTH	SQ. YDS.
	67

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED HATCH LEGEND	CWL	11-5-2021

CELLULAR CONCRETE FILL, CLASS III
(INCLUDED IN WALL QUANTITIES)

CELLULAR CONCRETE FILL, CLASS II
(INCLUDED IN WALL QUANTITIES)

LOAD TRANSFER PLATFORM
(INCLUDED WITH RETAINING WALL
ITEM 203 - ROADWAY, MISC.: COLUMN
SUPPORTED WALLS)

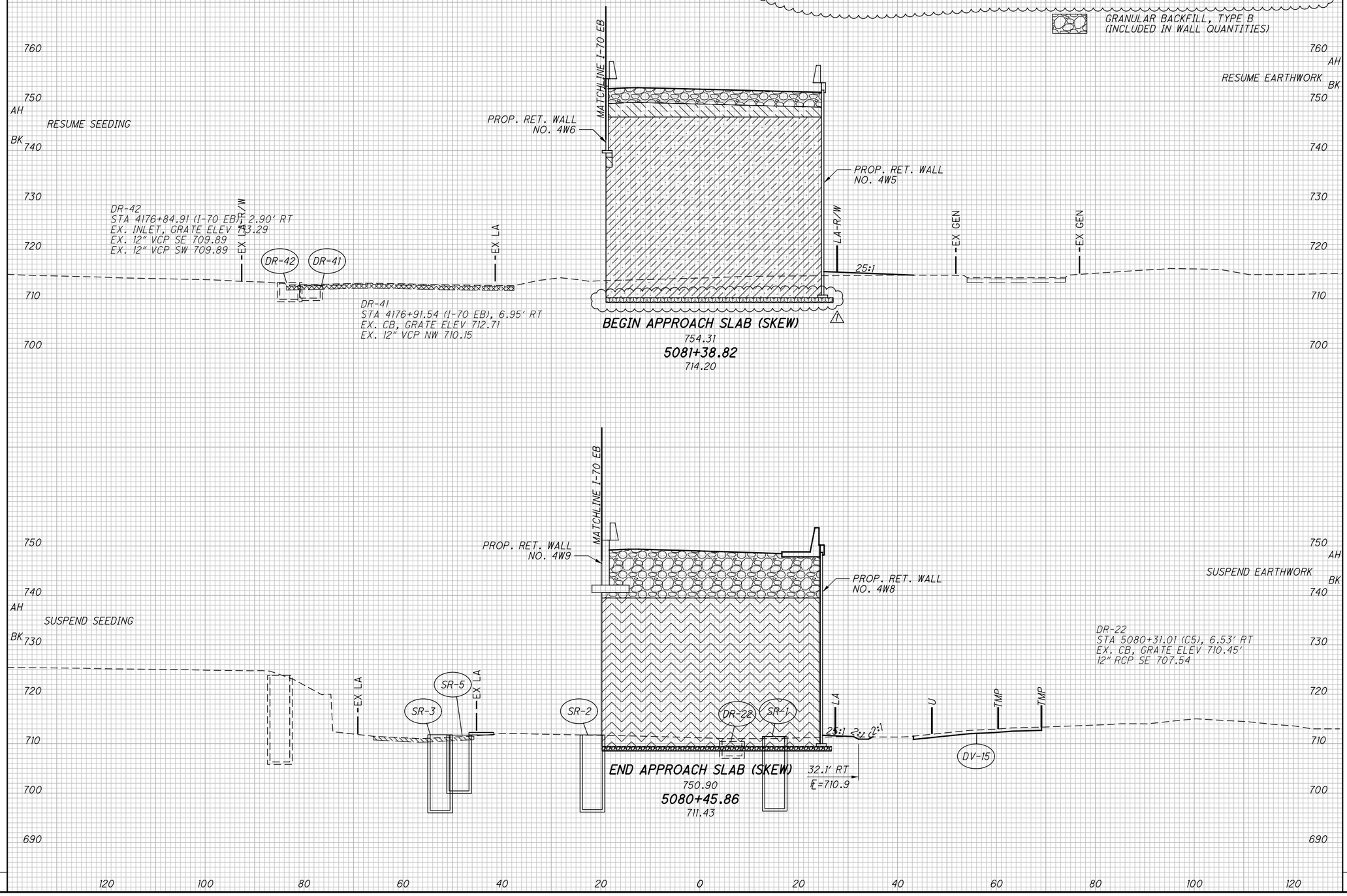
ITEM 202 - PAVEMENT REMOVED

ITEM 202 - PAVEMENT REMOVED, ASPHALT

SELECT GRANULAR BACKFILL PER SS840
(INCLUDED IN WALL QUANTITIES)

ITEM 203 - GRANULAR MATERIAL, TYPE C
(INCLUDED IN THE WALL QUANTITIES)

GRANULAR BACKFILL, TYPE B
(INCLUDED IN WALL QUANTITIES)



END AREA		VOLUME	
CUT	FILL	CUT	FILL
		0	11

CALCULATED ATR
CHECKED CWL

CROSS SECTIONS - RAMP C5
STA. 5080+45.86 TO STA. 5081+38.82

FRA-70/71-12.68/14.86

494
1815

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ESTIMATED QUANTITIES

CALCULATED: TJW DATE: 1-30-2019
CHECKED: RFV DATE: 1-30-2019

ITEM	EXT.	TOTAL	PARTICIPATION 01/IMS/PV	PARTICIPATION 02/NHS/PV	UNITS	DESCRIPTION	A.P.P. REFERENCE SHT. NO.
202	11200	LS	LS	LS		PORTIONS OF STRUCTURE REMOVED	
503	11100	LS	LS	LS		COFFERDAMS AND EXCAVATION BRACING	2
503	21101	562	247	315	CY	UNCLASSIFIED EXCAVATION, AS PER PLAN	
504	11101	7,145	3,144	4,001	SF	STEEL SHEET PILING LEFT IN PLACE, AS PER PLAN	2
511	53012	344	151	193	CY	CLASS QC2 CONCRETE, MISC.: FLOODWALL	2
512	10100	386	170	216	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	
SPECIAL	530E00200	LS	LS	LS		SPECIAL STRUCTURES - EMERGENCY CLOSURE	2
SPECIAL	690E98400	LS	LS	LS		SPECIAL - EMERGENCY ACTION PLAN COORDINATION	2
SPECIAL	690E98400	LS	LS	LS		SPECIAL - MONITORING OF EXISTING I-WALL	2
SPECIAL	690E98400	LS	LS	LS		SPECIAL - WCLPP R/W CONSTRUCTION CAMERA	2
SPECIAL	690E98400	LS	LS	LS		SPECIAL - USACE SURVEY AND AS-BUILTS	2

GENERAL NOTES

ITEM 503 - UNCLASSIFIED EXCAVATION, AS PER PLAN

ALL WORK UNDER THIS ITEM SHALL CONFORM TO CMS 503. HOWEVER, THE STABILITY OF THE EXISTING I-WALL STRUCTURE SHALL NOT BE COMPROMISED DURING EXECUTION OF THE WORK. EXCAVATION ALONG THE RIVER SIDE OF THE EXISTING I-WALL SHALL NOT CUT BELOW THE PAVEMENT ELEVATION ON THE ROADWAY SIDE OF THE WALL. THE MAXIMUM CUT SLOPE ORIGINATING AT THE EXISTING I-WALL SHALL NOT EXCEED 3:1 HORIZONTAL TO VERTICAL. ADDITIONALLY, DISTURBANCE TO THE EXISTING EARTHEN LEVEE WHICH ABUTS THE RIVER SIDE SOUTH END OF THE EXISTING I-WALL SHALL BE MINIMIZED AT ALL TIMES. AS SUCH, SUITABLE EXCAVATION BRACING DESIGNED BY THE CONTRACTOR IN ACCORDANCE WITH CMS 501.05, PAID SEPARATELY, SHALL BE INSTALLED AT ALL LOCATIONS REQUIRED TO LIMIT EXCAVATION DISTURBANCE NOTED HEREIN.

ITEM 504 - STEEL SHEET PILING LEFT IN PLACE, AS PER PLAN

ALL LABOR, MATERIALS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE SHEET PILE, AS SHOWN IN THESE PLANS AND AS SPECIFIED, INCLUDING WATERSTOPS, CLAMP BARS, SEALERS, SLURRY BACKFILL, STORM SEWER PIPE SLEEVES, NEOPRENE SEALS AND HARDWARE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 504 STEEL SHEET PILING LEFT IN PLACE, AS PER PLAN.

ITEM 511 - QC2 CONCRETE, MISC.: FLOODWALL

ALL WORK UNDER THIS ITEM SHALL CONFORM TO CMS 511, INCLUDING QC/QA. IN ADDITION TO THE REQUIREMENTS OF 511, THIS ITEM SHALL INCLUDE ALL WATERSTOPS EMBEDDED IN THE CONCRETE ABOVE THE STEEL SHEETING, ALL PREFORMED EXPANSION JOINT MATERIALS, JOINT SEALANTS AND OTHER INCIDENTALS NECESSARY TO COMPETE THE WORK.

FINAL DETAILS OF THE REINFORCING STEEL FOR THE I-WALL DEPEND ON THE ACTUAL SHEET PILE SECTION TO BE SUPPLIED BY THE CONTRACTOR SINCE PANEL LENGTHS ARE A FUNCTION OF THE SHEETING DIMENSIONS. THEREFORE, THIS ITEM SHALL ALSO INCLUDE THE FULL COST OF PROVIDING FINAL REBAR SCHEDULES AND FURNISHING AND INSTALLING ALL REINFORCING STEEL AND RELATED INCIDENTALS. REINFORCING SIZE, SHAPES AND SPACING REQUIREMENTS ARE INCLUDED IN THE PLANS.

PAYMENT SHALL BE MADE AT THE UNIT PRICE BID PER CUBIC YARD WHICH SHALL CONSTITUTE FULL PAYMENT FOR ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS TO COMPLETE THE WORK.

ITEM SPECIAL - EMERGENCY CLOSURE

IT IS THE INTENT OF THE PROJECT TO CONSTRUCT THE NEW I-WALL WHILE THE EXISTING I-WALL REMAINS IN PLACE. HOWEVER, AT THE NORTHERLY END OF THE PROPOSED WALL WHERE IT TIES INTO THE EXISTING I-WALL, THE EXISTING WALL MUST BE REMOVED TO INSTALL THE NEW WALL. BETWEEN THE TIME WHEN THE EXISTING I-WALL IS REMOVED AND THE NEW I-WALL IS COMPLETED AND TIED INTO THE EXISTING, THE CONTRACTOR SHALL HAVE ADEQUATE MATERIAL, EQUIPMENT AND MANPOWER AVAILABLE TO CONSTRUCT AN EMERGENCY CLOSURE FOR A LENGTH OF APPROXIMATLEY 100 FEET. THE ELEVATION OF THE TOP OF THE EMERGENCY CLOSURE SHALL EQUAL OR EXCEED THE ELEVATION OF THE THE EXISTING AND PROPOSED I-WALLS IMMEDIATELY ADJACENT TO IT. AT THE CONTRACTOR'S OPTION, THE EMERGENCY CLOSURE MAY BE CONSTRUCTED FROM HESCO BARRIERS, DUMPED LOW-PERMEABILITY FILL WITH GEOMEMBRANE OR PLASTIC SHEETING OR OTHER APPROVED METHOD, EXCLUDING SANDBAGS, TO CREATE A TEMPORARY IMPERMEABLE EMERGENCY CLOSURE. TEMPORARY MATERIALS FOR THIS EMERGENCY CLOSURE SHALL BE STORED ON SITE. SIDE SLOPES ON TEMPORARY EMBANKMENT SHALL NOT EXCEED 2:1 HORIZONTALTO VERTICAL.

THE CONTRACTOR SHALL BE CAPABLE OF CONSTRUCTING THE TEMPORARY CLOSURE WITHIN 4 HOURS NOTIFICATION. THIS WORK SHALL BE PERFORMED AS DIRECTED BY THE ENGINEER. UPON COMPLETION OF THE PROPOSED I-WALL, THE TEMPORARY CLOSURE MATERIAL SHALL BE REMOVED AND THE EMBANKMENT AREA FULLY RESTORED TO THE SATISFACTION OF THE ENGINEER.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE LUMP SUM PRICE BID WHICH SHALL CONSTITUTE FULL PAYMENT FOR ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS TO COMPLETE THE WORK.

ITEM SPECIAL - EMERGENCY ACTION PLAN COORDINATION

THIS ITEM INCLUDES ALL COSTS AND EXPENSES INCURRED BY THE CONTRACTOR TO COORDINATE WITH THE ARMY CORPS OF ENGINEERS, CITY OF COLUMBUS AND ODOT AS IT RELATES TO UPDATING THE EMERGENCY ACTION PLAN DURING CONSTRUCTION FOR THE CONTRACTOR'S ACTUAL MEANS AND METHODS FOR CONSTRUCTING THE NEW FLOODWALL AND MAINTAINING THE INTEGRITY OF THE FLOOD PROTECTION SYSTEM INCLUDING I-WALLS AND ADJACENT LEVEES. THIS ITEM IS ALSO TO INCLUDE ALL CONTRACTOR COSTS FOR ATTENDING WEEKLY PROGRESS MEETINGS AND PREPARING STATUS REPORTS RELATED TO THE WORK. CONTRACTOR SHALL SUBMIT A WORK PLAN TO ODOT, CITY OF COLUMBUS AND THE ARMY CORPS OF ENGINEERS OUTLINING THE PROPOSED SEQUENCE OF CONSTRUCTION WITHIN THE EXISTING FLOODWALL RIGHT-OF-WAY.

CONTRACTOR SHALL NOTIFY ODOT, THE CITY OF COLUMBUS INSPECTOR AND THE USACE A MINIMUM OF TWO DAYS PRIOR TO INITIATING CONSTRUCTION IN EACH OF THE FOUR IDENTIFIED IMPACT AREAS (AREA A, AREA B, AREA C, AND AREA D PER THE REVIEW PLAN DATED 14 NOVEMBER 2019 WITHIN THE 408 PERMIT DOCUMENATION).

PAYMENT FOR THIS WORK SHALL BE MADE AT THE LUMP SUM PRICE BID WHICH SHALL CONSTITUTE FULL PAYMENT FOR ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS TO COMPLETE THE WORK.

ITEM SPECIAL - MONITORING OF EXISTING I-WALL

THIS WORK SHALL INCLUDE MONITORING THE EXISTING I-WALL FOR POTENTIAL MOVEMENT DURING CONSTRUCTION. PLACE A TOTAL OF FIVE (5) SURVEY REFERENCE POINTS ALONG THE EXISTING I-WALL WITHIN THE LIMITS OF WALL WHICH WILL EVENTUALLY BE REMOVED. PLACE REFERENCE POINTS AT EACH END ALONG WITH THREE (3) INTERMEDIATE POINTS EQUALLY SPACED. THE CONTRACTOR SHALL OBSERVE EACH POINT ON A WEEKLY BASIS, OR AS DIRECTED BY THE ENGINEER, AND RECORD MEASUREMENTS AND RELATIVE MOVEMENTS. IF MOVEMENT IN EXCESS OF 0.25 INCH IN ANY DIRECTION IS OBSERVED RELATIVE TO THE PRE-CONSTRUCTION OBSERVATIONS, CEASE WORK ADJACENT TO THE WALL AND NOTIFY THE ENGINEER.

ESTABLISH A SET OF SURVEY CONTROL POINTS. THESE SAME POINTS SHALL BE USED THROUGHOUT THE PROJECT AND SHALL BE INDEPENDENT OF ALL STRUCTURES.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE LUMP SUM PRICE BID WHICH SHALL CONSTITUTE FULL PAYMENT FOR ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS TO COMPLETE THE WORK.

ITEM SPECIAL - WCLPP R/W CONSTRUCTION CAMERA

THIS ITEM INCLUDES ALL COSTS AND EXPENSES INCURRED BY THE CONTRACTOR TO INSTALL CAMERAS THAT COVER ALL CONSTRUCTION OCCURRING WITHIN 50 FEET OF THE WCLPP RIGHT OF WAY (EX FL LINES LABELED IN THE PLANS AS "APPROX. FLOODWALL R/W"). THE CAMERAS SHALL BE LIVE FEEDS AND VIEWABLE REMOTELY BY THE USACE, THE CITY OF COLUMBUS AND ODOT VIA THE INTERNET.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE LUMP SUM PRICE BID WHICH SHALL CONSTITUTE FULL PAYMENT FOR ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS TO COMPLETE THE WORK.

ITEM SPECIAL - USACE SURVEY AND AS-BUILTS

CONTRACTOR SHALL RECOVER THE USACE PRIMARY EXISTING CONTROL STATIONS NEAR THE PROJECT LIMITS AND REPORT THE CONDITION OF ALL MONUMENTS WITH CLOSE-UP AND HORIZONTAL PICTURES. CONTRACTOR SHALL LOCATE THESE STATIONS WITH REAL-TIME KINEMATIC POSITIONING FOR FIVE MINUTE OBSERVATIONS. CONTRACTOR SHALL UPDATE THE NEAREST CONTROL POINTS (215/16, 215/17, 215/18, 215/19, 215/20, 86/12-2, 86/13, 86/14, 86/14-1, OR THE NEXT NEAREST IF ONE MORE MORE OF THESE POINTS IS FOUND TO BE DESTROYED, FOR A MINIMUM OF THREE HORIZONTAL AND TWO VERTICAL CONTROL POINTS) TO NAD83/NAVD88 GEOID 18 OR THE CURRENT SURVEY DATUM AND SUBMIT TO ONLINE POSITIONING USER SERVICE SHAREPOINT (OPUS SHARE) AND PROVIDE THE UPDATED COORDINATES TO THE USACE. THE USACE CONTROL MUST BE UTILIZED FOR ALL AS-BUILT CONSTRUCTION DRAWINGS SUBMITTED TO THE CITY OF COLUMBUS AND THE USACE. EXISTING CONTROL SHOWN ON USACE PLAN INSERT SHEETS 694A - 694B.

CONTRACTOR SHALL PROVIDE TEMPORARY, HIGHLY-VISIBLE VISUAL MARKING OF THE WCLPP CENTERLINE OF PROTECTION AND OTHER FEATURES (E.G. GATEWELLS, CONDUIT OUTFALLS, ETC.) IN CONSTRUCTION AREAS AND IN AREAS IMMEDIATELY ADJACENT TO CONSTRUCTION AREAS WITHIN 50 FEET OF THE WCLPP RIGHT OF WAY. THIS SHALL SERVE TO INCREASE AWARENESS OF THE WCLPP TO THE CONSTRUCTION/FIELD PERSONNEL. THE PROPOSED MARKING METHOD SHALL BE SUBMITTED TO ODOT, THE CITY OF COLUMBUS AND THE USACE FOR CONCURRENCE.

CONTRACTOR SHALL SURVEY THE IMPACTED LEVEE/FLOODWALL FEATURES TO ENSURE THE REQUIRED TOP OF PROTECTION ELEVATION HAS BEEN SATISFACTORILY MET. SURVEYS OF LEVEE EMBANKMENT SECTIONS SHALL ALSO INCLUDE CROSS-SECTIONS AT 50 FOOT INTERVALS. THE SURVEY SHALL OCCUR PRIOR TO SUBMITTAL OF "AS-BUILT" CONSTRUCTION DRAWINGS TO ODOT, THE CITY OF COLUMBUS AND THE USACE. DATA FROM THE SURVEY SHALL BE INCLUDED THEREIN.

CONTRACTOR SHALL PROVIDE THE USACE, THE CITY OF COLUMBUS AND ODOT WITH PLANS AND SPECIFICATIONS WITH AMENDMENTS DURING CONSTRUCTION SHOWING ALTERATIONS AS FINALLY CONSTRUCTED (I.E. AS-BUILTS) WITHIN 180 DAYS OF CONSTRUCTION COMPLETION. THESE RECORD DRAWINGS WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE CITY OF COLUMBUS AND THE USACE TO DETERMINE WHETHER A SUFFICIENT AMOUNT OF INFORMATION HAS BEEN PROVIDED FOR THE CITY OF COLUMBUS' CONTINUED OPERATION AND MAINTENANCE OF THE WCLPP.

PAYMENT FOR THIS WORK SHALL BE MADE AT THE LUMP SUM PRICE BID WHICH SHALL CONSTITUTE FULL PAYMENT FOR ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS TO COMPLETE THE WORK.

EQUIPMENT AND MATERIAL STORAGE WITHIN WLCPP

CONTRACTOR SHALL NOT STORE ANY MATERIALS OR EQUIPMENT WITHIN THE WCLPP RIGHT OF WAY WITHOUT PRIOR WRITTEN CONSENT FROM THE CITY OF COLUMBUS.

⚠

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED USACE NOTES	CWL	11-5-2021

FOR ADDITIONAL FLOODWALL NOTES, SEE SHEET 5/5

DESIGN AGENCY
GPD GROUP.
Gdes, Pfb, Schorr, Burns & Davison, Inc.
8800 Lyra Drive, Suite 710, Columbus, Ohio 43240 614.410.0731
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DESIGNED TJW | DRAWN RPR | CHECKED DJC | REVIEWED DGN | DATE 9-6-19 | REVISED | STRUCTURE FILE NUMBER N/A

FLOODWALL ESTIMATED QUANTITIES & NOTES
RAMP A5 & I-71 NB

FRA-70/71-12.68/14.86
PID No. 105523

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COUNTRY	TYPE OF MARK	STATION
U.S.A.	MINE SPIKE	212/27
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARK(S))	ELEVATION (FT) (M)
FRANKLIN COUNTY	212/27		N/A
LATITUDE	LONGITUDE	DATUM	DATUM
		NAD 27	
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
707457.544	1857896.208	OHIO/SOUTH	C.O.E.
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	DATE 10/97 ORDER

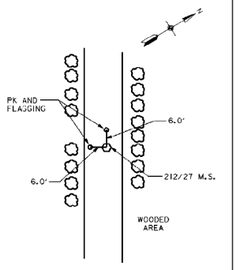
TO OBTAIN GRID AZIMUTH ADD ° ′ ″ TO THE GEODETIC AZIMUTH
TO OBTAIN GRID AZ. (ADD/SUB) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC/GRID) (MAGNETIC)	BACK AZIMUTH	GRID DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
212/28	271°54′03.0″	° ′ ″		766.872
212/26	106°53′59.1″	° ′ ″		344.197

W. COLUMBUS OHIO LPP REFERENCE TO HORIZ CONTROL PT. OCT. 7, 1997 JOB 41/7 CEN-S 212 JONES & CREW

212/27 MINE SPIKE

POINT IS LOCATED ON ACCESS ROAD WEST OF M.S. 212/26. POINT IS EAST OF ON-RAMP TO I-71.



COUNTRY	TYPE OF MARK	STATION
U.S.A.	MINE SPIKE	212/28
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARK(S))	ELEVATION (FT) (M)
FRANKLIN COUNTY	212/28		N/A
LATITUDE	LONGITUDE	DATUM	DATUM
		NAD 27	
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
707462.981	1857129.758	OHIO/SOUTH	C.O.E.
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	DATE 10/97 ORDER

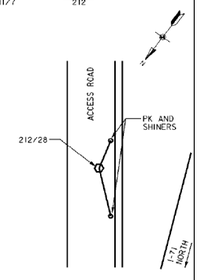
TO OBTAIN GRID AZIMUTH ADD ° ′ ″ TO THE GEODETIC AZIMUTH
TO OBTAIN GRID AZ. (ADD/SUB) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC/GRID) (MAGNETIC)	BACK AZIMUTH	GRID DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
212/29	239°37′11.4″	° ′ ″		275.117
212/27	91°54′03.0″	° ′ ″		766.872

W. COLUMBUS OHIO LPP REFERENCE TO HORIZ CONTROL PT. OCT. 7, 1997 JOB 41/7 CEN-S 212 JONES & CREW

212/28 MINE SPIKE

MINE SPIKE LOCATED FARTHER ALONG ACCESS ROAD



COUNTRY	TYPE OF MARK	STATION
U.S.A.	IP&C	212/29
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARK(S))	ELEVATION (FT) (M)
FRANKLIN COUNTY	212/29		N/A
LATITUDE	LONGITUDE	DATUM	DATUM
		NAD 27	
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
707331.614	1856900.025	OHIO/SOUTH	C.O.E.
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	DATE 10/97 ORDER

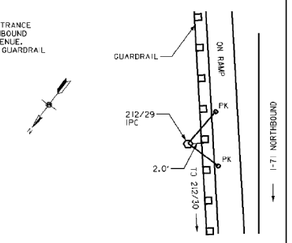
TO OBTAIN GRID AZIMUTH ADD ° ′ ″ TO THE GEODETIC AZIMUTH
TO OBTAIN GRID AZ. (ADD/SUB) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC/GRID) (MAGNETIC)	BACK AZIMUTH	GRID DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
212/30	330°03′10.8″	° ′ ″		522.099
212/28	56°37′11.4″	° ′ ″		275.117

W. COLUMBUS OHIO LPP REFERENCE TO HORIZ CONTROL PT. OCT. 8, 1997 JOB 41/7 CEN-S 212 JONES & CREW

212/29 IPC

POINT IS SET ON ENTRANCE RAMP TO I-71 NORTHBOUND FROM GREENLAWN AVENUE. POINT IS 2.0' FROM GUARDRAIL POST.



COUNTRY	TYPE OF MARK	STATION
U.S.A.	IP&C	212/30
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARK(S))	ELEVATION (FT) (M)
FRANKLIN COUNTY	212/30		N/A
LATITUDE	LONGITUDE	DATUM	DATUM
		NAD 27	
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
707784.006	1856639.394	OHIO/SOUTH	C.O.E.
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	DATE 10/97 ORDER

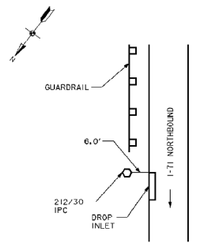
TO OBTAIN GRID AZIMUTH ADD ° ′ ″ TO THE GEODETIC AZIMUTH
TO OBTAIN GRID AZ. (ADD/SUB) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC/GRID) (MAGNETIC)	BACK AZIMUTH	GRID DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
215/16	333°29′02.6″	° ′ ″		941.613
212/29	150°03′10.8″	° ′ ″		522.099

W. COLUMBUS OHIO LPP REFERENCE TO HORIZ CONTROL PT. OCT. 8, 1997 JOB 41/7 CEN-S 212 JONES & CREW

212/30 IPC

POINT IS NEAR THE END OF THE ENTRANCE RAMP OF I-71 NORTH AT GREENLAWN AVENUE



COUNTRY	TYPE OF MARK	STATION
U.S.A.	IP&C	215/16
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARK(S))	ELEVATION (FT) (M)
FRANKLIN COUNTY	215/16		N/A
LATITUDE	LONGITUDE	DATUM	DATUM
		NAD 27	
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
708626.571	1856219.014	OHIO/SOUTH	C.O.E.
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	DATE 10/97 ORDER

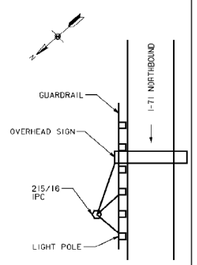
TO OBTAIN GRID AZIMUTH ADD ° ′ ″ TO THE GEODETIC AZIMUTH
TO OBTAIN GRID AZ. (ADD/SUB) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC/GRID) (MAGNETIC)	BACK AZIMUTH	GRID DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
215/17	333°21′36.6″	° ′ ″		942.684
212/30	153°29′02.6″	° ′ ″		941.613

W. COLUMBUS OHIO LPP REFERENCE TO HORIZ CONTROL PT. OCT. 7, 1997 JOB 41/7 CEN-S 215 JONES & CREW

215/16 IPC

POINT IS LOCATED ON I-71 NORTH AT SIGN SHOWING EXIT 106A 270 WEST, EXIT 106B AND THE I-70 AND I-71 SIGNS FOR CLEVELAND AND WHEELING



COUNTRY	TYPE OF MARK	STATION
U.S.A.	IP&C	215/17
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARK(S))	ELEVATION (FT) (M)
FRANKLIN COUNTY	215/17		N/A
LATITUDE	LONGITUDE	DATUM	DATUM
		NAD 27	
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
709469.182	1855796.333	OHIO/SOUTH	C.O.E.
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	DATE 10/97 ORDER

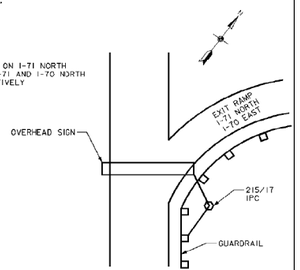
TO OBTAIN GRID AZIMUTH ADD ° ′ ″ TO THE GEODETIC AZIMUTH
TO OBTAIN GRID AZ. (ADD/SUB) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC/GRID) (MAGNETIC)	BACK AZIMUTH	GRID DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
215/18	348°56′06.6″	° ′ ″		385.787
215/16	153°21′36.6″	° ′ ″		942.684

W. COLUMBUS OHIO LPP REFERENCE TO HORIZ CONTROL PT. OCT. 8, 1997 JOB 41/7 CEN-S 215 JONES & CREW

215/17 IPC

POINT IS LOCATED ON I-71 NORTH AT THE EXIT OF I-71 AND I-70 NORTH AND EAST RESPECTIVELY



COUNTRY	TYPE OF MARK	STATION
U.S.A.	IP&C	215/18
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARK(S))	ELEVATION (FT) (M)
FRANKLIN COUNTY	215/18		N/A
LATITUDE	LONGITUDE	DATUM	DATUM
		NAD 27	
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
709847.797	1855722.293	OHIO/SOUTH	C.O.E.
(NORTHING) (EASTING) (FT) (M)	(EASTING) (NORTHING) (FT) (M)	GRID AND ZONE	DATE 10/97 ORDER

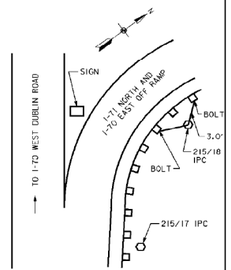
TO OBTAIN GRID AZIMUTH ADD ° ′ ″ TO THE GEODETIC AZIMUTH
TO OBTAIN GRID AZ. (ADD/SUB) ° ′ ″ TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC/GRID) (MAGNETIC)	BACK AZIMUTH	GRID DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
215/19	90°34′15.4″	° ′ ″		876.821
215/17	168°56′06.6″	° ′ ″		385.787

W. COLUMBUS OHIO LPP REFERENCE TO HORIZ CONTROL PT. OCT. 8, 1997 JOB 41/7 CEN-S 215 JONES & CREW

215/18 IPC

POINT IS LOCATED 380'± FARTHER DOWN THE OFF RAMP TO I-70 EAST AND I-71 NORTH



NOTES

1. FOR GENERAL SITE PLAN SEE DRAWING NO. 0/5.

Revisions			
Symbol	Descriptions	Date	Approved

BURGESS & NIPLE, LIMITED
COLUMBUS, OHIO

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
HUNTINGTON, WEST VIRGINIA

Designed by: COE
Drawn by: T.MULLINS
Checked by: P.CONROY
Reviewed by:
Approved by:

US Army Corps of Engineers

SCIOTO RIVER
COLUMBUS, OHIO
WEST COLUMBUS, L.P.P.
PHASE IIIA

SURVEY
REFERENCES (2 OF 3)

Scale: NONE
Date: OCTOBER 1999
Drawing Code: 16-PWC-12-
Sheet reference number: 11/2
FILENAME: 00susr02.dgn
PEN TABLE:
Sheet 2 of 3

WORK AS CONSTRUCTED

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED USACE CONTROL PTS	CWL	11-5-2021

DESIGNED TJW | DRAWN RPR | CHECKED DJC | REVIEWED DGN | REVISED

DATE 9-6-19
STRUCTURE FILE NUMBER N/A

DESIGN AGENCY
GPD GROUP.
Cities, Parks, Schools, Burns & Dickerson, Inc.
8000 Walton Parkway, Suite 260, Columbus, Ohio 43215 614.783.0733
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FLOODWALL PLAN INSERT SHEETS
RAMP A5 & I-71 NB

FRA-70/71-12.68/14.86
PID No. 105523

3A/5

694A
1815

D:\2012\2012848\FRA\105523\STRUCTURES\WALL_1\SHEETS\105523_INW001.DGN
11/6/2021
10:57:54 AM
ODOTWSTD_USER

COUNTRY	TYPE OF MARK	STATION
U.S.A.	IP&C	215/19
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT) (M)
FRANKLIN COUNTY	215/19		N/A
LATITUDE	LONGITUDE	DATUM	DATUM
		NAD 27	
NORTHING (EASTING) (FT) (M)	EASTING (NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
710726.574	1855731.050	OHIO/SOUTH	C.O.E.
NORTHING (EASTING) (FT) (M)	EASTING (NORTHING) (FT) (M)	GRID AND ZONE	DATE: 10/97 ORDER

TO OBTAIN	GRID AZIMUTH ADD	° ′ ″	TO THE GEODETIC AZIMUTH
TO OBTAIN	GRID AZ. SUBTRACT	° ′ ″	TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC/GRID) (MAGNETIC)	BACK AZIMUTH	GRID DISTANCE (METERS)	GRID DISTANCE (FEET)
215/20	154°48'58.9"	° ′ ″		665.045
	° ′ ″	° ′ ″		
215/18	180°34'15.4"	° ′ ″		878.821
	° ′ ″	° ′ ″		
	° ′ ″	° ′ ″		

W. COLUMBUS OHIO LPP REFERENCE TO HORIZ CONTROL PT.

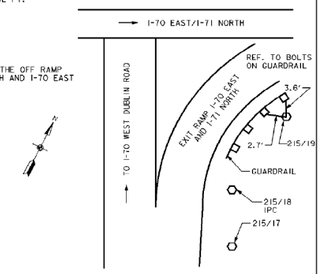
OCT. 8, 1997 JOB 41/7

CEN-S 215

JONES & CREW

215/19 IPC

POINT IS ON THE OFF RAMP OF I-71 NORTH AND I-70 EAST



COUNTRY	TYPE OF MARK	STATION
U.S.A.	IP&C	215/20
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT) (M)
FRANKLIN COUNTY	215/20		N/A
LATITUDE	LONGITUDE	DATUM	DATUM
		NAD 27	
NORTHING (EASTING) (FT) (M)	EASTING (NORTHING) (FT) (M)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
711366.442	1855912.305	OHIO/SOUTH	C.O.E.
NORTHING (EASTING) (FT) (M)	EASTING (NORTHING) (FT) (M)	GRID AND ZONE	DATE: 10/97 ORDER

TO OBTAIN	GRID AZIMUTH ADD	° ′ ″	TO THE GEODETIC AZIMUTH
TO OBTAIN	GRID AZ. SUBTRACT	° ′ ″	TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC/GRID) (MAGNETIC)	BACK AZIMUTH	GRID DISTANCE (METERS)	GRID DISTANCE (FEET)
215/19	154°48'58.9"	° ′ ″		665.045
	° ′ ″	° ′ ″		
17/12	32°08'06.4"	° ′ ″		735.471
	° ′ ″	° ′ ″		
	° ′ ″	° ′ ″		

W. COLUMBUS OHIO LPP REFERENCE TO HORIZ CONTROL PT.

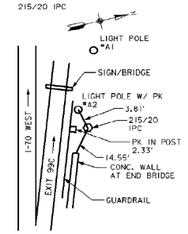
OCT. 8, 1997 JOB 41/7

CEN-S 215

JONES & CREW

215/20 IPC

POINT IS LOCATED TO THE RIGHT SIDE OF EXIT RAMP "B9C LEAVING I-70 WEST BOUND LANES. LOCATED AT THE EDGE OF DODGE PARK AND PUMP STATION.



LEVELMAN : PETRUCCI/STROLL (KENCO)	PROJECT NO. 59/9 MOD-1
DATE : OCT.-NOV. 1989	DESC. WEST COLUMBUS, OHIO - L.P.P.
BOOK NO. : CEN-S/AS SHOWN	SOUNDING/SECTIONS
COMPUTED BY : CONNELL	(VERTICAL BASE FOR FLOOD SURVEYS)
CHECKED BY : POPLIN	VERTICAL DATUM : 1929 NGS
T.B.M. : 11/19-1	LOCATION : DISK SET IN N. END OF GAS PUMP ISLAND OF CERTIFIED GAS STATION. AT POINT OF HARMON AVE. & ENIG ST. 400'± S. OF STIMMEL ROAD
ELEV. : 702.955	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :
T.B.M. : 11/19-2	LOCATION : DISK SET IN N.E.CORNER OF CONC. PAD OF STEEL LIGHT POLE 90°± S. OF CENTER LINE OF STIMMEL RD. 35'± W. OF DECKEDACH RD. EXTENDED 0'± W. OF W. EDGE PAVED PARKING LOT.
ELEV. : 701.575	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :
T.B.M. : 11/20-1	LOCATION : DISK SET IN CONC. WALK ON WEST SIDE OF FLAGPOLE. 100'± N. OF SCIOTO BLVD. & 12'± N. OF GREENLAWN AVE. AT BLDG. FOR CITY OF COLUMBUS RECREATION AND PARKS DEPT.
ELEV. : 720.482	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. : 12
T.B.M. : 11/20-2	LOCATION : DISK SET IN S.W. CORNER OF CONC. PAD OF "UPPER DECK SPORTSBAR AND GRILL" SIGN 60'± OF CENTERLINE OF DECKEBACH AVE. 12'± N. OF GREENLAWN AVE.
ELEV. : 709.128	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :
T.B.M. : 11/22-1	LOCATION : DISK SET IN CONC. PAD OF MANHOLE 12'± N. OF EDGE OF STIMMEL RD. 80'± W. OF "G" ST.
ELEV. : 702.313	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :

LEVELMAN : PETRUCCI/STROLL (KENCO)	PROJECT NO. 59/9 MOD-1
DATE : OCT.-NOV. 1989	DESC. WEST COLUMBUS, OHIO - L.P.P.
BOOK NO. : CEN-S/AS SHOWN	SOUNDING/SECTIONS
COMPUTED BY : CONNELL	(VERTICAL BASE FOR FLOOD SURVEYS)
CHECKED BY : POPLIN	VERTICAL DATUM : 1929 NGS
T.B.M. : 86/11	LOCATION : DISK SET AT NORTHWEST CORNER W. MOUND ST. & CYPRESS ST. AT ENT. TO 1082 MOUND ST. IN CONC. SIDEWALK AND S. OF BUILDING
ELEV. : 705.961	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :
T.B.M. : 86/12	LOCATION : DISK SET IN CONC. SIDEWALK AT S.E. CORNER W. MOUND ST. AND MT. CALVARY AVE. 7'± S. OF S. CURB OF MOUND ST. & 1'± E. OF E. CURB OF MT. CALVARY AVE.
ELEV. : 705.571	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :
T.B.M. : 86/12-1	LOCATION : DISK SET ON TOP OF N.E. CORNER OF CONC. PAD OF STEEL LIGHT POLE ON S.W. CORNER OF BUCHANAN DR. AND VAN BUREN DR.
ELEV. : 710.783	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :
T.B.M. : 86/12-2	LOCATION : DISK SET ON TOP OF S.W. CORNER OF CONC. PAD OF STEEL LIGHT POLE, 50'± E. OF INTERSECTION OF PIERCE DR. AND VAN BUREN DR. ON N. SIDE OF VAN BUREN DR.
ELEV. : 711.687	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :
T.B.M. : 86/13	LOCATION : DISK SET ON TOP OF S.W. CORNER OF CONC. PAD OF STEEL LIGHT POLE ON S.W. CORNER OF HARMON AVE. AND BUCHANAN DR.
ELEV. : 706.636	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :

LEVELMAN : PETRUCCI/STROLL (KENCO)	PROJECT NO. 59/9 MOD-1
DATE : OCT.-NOV. 1989	DESC. WEST COLUMBUS, OHIO - L.P.P.
BOOK NO. : CEN-S/AS SHOWN	SOUNDING/SECTIONS
COMPUTED BY : CONNELL	(VERTICAL BASE FOR FLOOD SURVEYS)
CHECKED BY : POPLIN	VERTICAL DATUM : 1929 NGS
T.B.M. : 86/14	LOCATION : DISK SET IN S. SIDE CONC. DR. 100'± S. OF CENTERLINE OF GRIGGS AVE. 10'± E. OF E. EDGE OF HARMON AVE. NEAR 754 HARMON AVE.
ELEV. : 714.266	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :
T.B.M. : 86/14-1	LOCATION : DISK SET IN TOP OF S.W. CORNER OF CONC. VALVE PIT BOX 20'± E. OF HARMON AVE. 6'± S. OF EDGE OF PAVED DR. ENT. TO "CLARK FORKLIFT OF COLUMBUS" ACROSS FROM 649 HARMON AVE.
ELEV. : 716.129	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :
T.B.M. : 86/14-2	LOCATION : DISK SET IN N. EDGE CONC. DR. AT 938 HARMON AVE. AT S. END CONC. BLOCK WALL 12'± E. OF EDGE OF HARMON AVE. AND 115'± N. OF CENTERLINE OF WHARTON AVE.
ELEV. : 708.916	
DESC. : DISK	
QUAD. :	
COOR. : N. = E. =	TOPO SHEET NO. :
T.B.M. : 86/17	LOCATION : DISK SET IN E. END OF CONC. CURB AT N.E. CORNER OF GREENLAWN AVE. AND GREENFIELD DR. 30'± E. OF CENTERLINE OF GREENFIELD DR. NEAR ST. RITA'S HOME AT 660 GREENLAWN AVE.
ELEV. : 704.188	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :
T.B.M. : 86/19	LOCATION : DISK SET IN TOP OF CONC. CURB INLET PAD ON N.W. CORNER OF GREENFIELD DR. AND PAVED DR. TO PARKING LOT FOR APTS. 200'± S. OF CANNON BK PLACE
ELEV. : 713.831	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :

LEVELMAN : PETRUCCI/STROLL (KENCO)	PROJECT NO. 59/9 MOD-1
DATE : OCT.-NOV. 1989	DESC. WEST COLUMBUS, OHIO - L.P.P.
BOOK NO. : CEN-S/AS SHOWN	SOUNDING/SECTIONS
COMPUTED BY : CONNELL	(VERTICAL BASE FOR FLOOD SURVEYS)
CHECKED BY : POPLIN	VERTICAL DATUM : 1929 NGS
T.B.M. : 11/22-2	LOCATION : DISK SET IN TOP OF N.W. CORNER OF CONC. CURB AT "RAM" BUSINESS AT 1101 STIMMEL RD. 33'± S. OF STIMMEL RD.
ELEV. : 713.098	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :
T.B.M. : 11/23	LOCATION : DISK SET IN N.E. CORNER OF CONC. BASE OF FLAGPOLE IN N. EDGE OF PARKING LOT TO "DALE CONTRACTING, INC." 1247 STIMMEL RD. 35'± S. OF STIMMEL RD.
ELEV. : 708.125	
DESC. : DISK	
QUAD. : S.W. COLUMBUS	
COOR. : N. = E. =	TOPO SHEET NO. :
T.B.M. :	LOCATION :
ELEV. :	
DESC. :	
QUAD. :	
COOR. : N. = E. =	TOPO SHEET NO. : 12
T.B.M. :	LOCATION :
ELEV. :	
DESC. :	
QUAD. :	
COOR. : N. = E. =	TOPO SHEET NO. : 12
T.B.M. :	LOCATION :
ELEV. :	
DESC. :	
QUAD. :	
COOR. : N. = E. =	TOPO SHEET NO. : 12

NOTES

1. FOR GENERAL SITE PLAN SEE DRAWING NO. 0/5.

Revisions			
Symbol	Descriptions	Date	Approved

BURGESS & NIPLE, LIMITED COLUMBUS, OHIO

U.S.ARMY ENGINEER DISTRICT CORPS OF ENGINEERS HUNTINGTON, WEST VIRGINIA

Designed by: COE

Drawn by: T.MULLINS

Checked by: P.CONROY

Reviewed by:

Approved by:

US Army Corps of Engineers

SCIOTO RIVER COLUMBUS, OHIO WEST COLUMBUS, L.P.P. PHASE IIIA

SURVEY REFERENCES (3 OF 3)

Scale: NONE

Date: OCTOBER 1999

Drawing Code: 16-PWC-12-

Sheet reference numbers: 11/3

FILENAME: 00surv03.dgn PDN TABLE:

Sheet 3 of 3

WORK AS CONSTRUCTED

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED USACE CONTROL PTS	CWL	11-5-2021

DESIGNED TJW | DRAWN RPR | CHECKED DJC | REVIEWED DGN | DATE 9-6-19 | STRUCTURE FILE NUMBER N/A | REVISED

DESIGN AGENCY
GPD GROUP.
Cities, Parks, Schools, Burns & Dickerson, Inc.
8000 Walton Parkway, Suite 260, Columbus, Ohio 43215 - 614.410.0701
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FLOODWALL PLAN INSERT SHEETS
RAMP A5 & I-71 NB

FRA-70/71-12.68/14.86
PID No. 105523

3B/5

694B
1815

D:\2012\2012846\FRA\105523\STRUCTURES\WALL_IVSHEETS\105523_IWW002.DGN
11/6/2021
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ODOTBISTD_USER

ITEM 203, SPECIAL - ENGINEERED FILL (LIGHTWEIGHT CELLULAR CONCRETE FILL): (4W1, 4W2, 4W5, 4W6)

A. DESCRIPTION.
THIS WORK CONSISTS OF FURNISHING AND PLACING A LOW DENSITY, LIGHTWEIGHT, FLOWABLE, CEMENTITIOUS FILL MATERIAL, HEREIN REFERRED TO AS CELLULAR CONCRETE FILL (CCF).

B. QUALIFICATIONS.
1. SUPPLIER/PRODUCER.
PROVIDE CCF FROM A SUPPLIER/PRODUCER REGULARLY ENGAGED IN THE PLACEMENT OF CCF MATERIAL, WHO HAS IN THE PAST THREE YEARS COMPLETED MASS FILLS HAVING A COMBINED QUANTITY OF AT LEAST 10,000 TOTAL CUBIC YARDS (7,650 CUBIC METERS).

DOCUMENTATION FOR THE ABOVE QUALIFICATIONS SHALL BE SUBMITTED AT OR BEFORE THE PRECONSTRUCTION CONFERENCE ACCORDING TO C&MS 108.02.

2. CCF MATERIAL.
PROVIDE CCF MATERIAL, MEETING THE REQUIREMENT OF SECTION C OF THIS SPECIFICATION, WHICH HAS BEEN SUCCESSFULLY PLACED ON AT LEAST 5 PROJECTS THAT HAVE PERFORMED SATISFACTORY FOR AT LEAST FIVE YEARS.

PREAPPROVAL OF THE CCF MATERIAL WILL BE BASED ON DOCUMENTATION FOR THE ABVE QUALIFICATIONS. THIS DOCUMENTATION SHALL BE SUBMITTED TO THE LABORATORY. PREAPPROVED CCF MATERIALS WILL BE LISTED ON THE DEPARTMENT'S QUALIFIED PROJECT LIST AND WILL NEED TO BE REAPPROVED YEARLY.

C. MATERIALS
1. FOAM.
USE A FOAMING AGENT CONFORMING TO ASTM C796. PERVIOUS CCF SHALL COMPLY WITH THE STANDARD SPECIFICATIONS OF ASTM C869 WHEN TESTED IN ACCORDANCE WITH ASTM C796.

2. CEMENT.
USE PORTLAND CEMENT CONFORMING TO C&MS 701.04 OR C&MS 701.05

3. WATER.
USE WATER ACCORDING TO C&MS 499.02. POTABLE WATER IS SATISFACTORY FOR USE IN CCF.

4. ADMIXTURES.
USE ADMIXTURES CONFORMING TO C&MS 499.02 FOR WATER REDUCING, RETARDING, ACCELERATING, IMPROVING THE BOND, OR FOR OTHER SPECIFIC PROPERTIES, WHEN SPECIFICALLY APPROVED BY THE SUPPLIER/PRODUCER OF THE CCF.

5. 701.10 MICRO-SILICA, 701.11 GGBF SLAG, OR FLY ASH SHALL BE CLASS C OR CLASS F AND COMPATIBLE WITH FOAMING AGENT. ⚠

D. MIX DESIGN.
DESIGN OF THE PROPOSED CCF MIX WILL BE PROVIDED BY THE SUPPLIER/PRODUCER. THE PROPOSED MIX DESIGN MUST MEET THE PROPERTIES OF TABLE A.

MIX DESIGNS MUST BE APPROVED BY THE LABORATORY PRIOR TO USE. A MINIMUM OF 30 DAYS PRIOR TO PLACING CCF, SUBMIT A PROPOSED MIX DESIGN, WITH CERTIFIED TEST DATA FROM THE SUPPLIER/PRODUCER, TO THE LABORATORY, WITH A COPY TO THE ENGINEER.

E. QUALITY CONTROL.
PERFORM CAST DENSITY MEASUREMENTS ON A MINIMUM OF 8 BATCHES PER PRODUCTION DAY. MAINTAIN A LOG OF THE CAST DENSITY MEASUREMENTS.

F. QUALITY ASSURANCE.
QUALITY ASSURANCE WILL BE BASED ON THE CAST DENSITY AND COMPRESSIVE STRENGTH AT THE POINT OF PLACEMENT. ANY MIXES NOT MEETING THE TABLE A PROPERTIES WILL BE REJECTED.

1. CAST DENSITY
AT A MINIMUM, THE DEPARTMENT WILL CHECK ONE OF THE BATCHES EACH DAY AS FOLLOWS:

A) WEIGH THE CONTAINER OF KNOWN VOLUME AND RECORD THE WEIGHT. A STANDARD CONCRETE CYLINDER MOLD MAY BE USED AS THE CONTAINER.

B) FILL THE CONTAINER WITH CCF, TAPPING THE CONTAINER SIDES BRISKLY WITH A RUBBER HAMMER DURING THE FILLING.

C) OVERFILL THE CONTAINER, STRIKING OFF THE EXCESS CCF. WIPE OFF THE OUTSIDE SURFACE OF THE CONTAINER.

D) WEIGH THE FULL CONTAINER.

E) SUBTRACT THE WEIGHT OF THE EMPTY CONTAINER FROM THE FULL CONTAINER.

F) CALCULATE THE CAST DENSITY AND COMPARE IT TO THE MAXIMUM DENSITY FOR THE CLASS OF CCF.

IF THE CCF MATERIAL EXCEEDS THE MAXIMUM DENSITY FOR THE CLASS OF CCF, ADJUST THE MIX AND RECHECK THE CAST DENSITY.

2. COMPRESSIVE STRENGTH.
TAKE AT LEAST FOUR (4) TEST SPECIMENS FOR EACH 300 CUBIC YARDS (230 CUBIC METERS) OF CCF PLACED OR FOR EACH DAY'S PRODUCTION, PREPARE, CURE, AND TEST THE SPECIMENS IN ACCORDANCE WITH ASTM C796 EXCEPT AS FOLLOWS:

A) FILL AN APPROPRIATE 3-INCH BY 6-INCH (75 MM BY 150 MM) CYLINDER MOLD ACCORDING TO ASTM C796, EXCEPT STRIKE OFF THE EXCESS CCF WITH A TROWEL.

B) CURE THE MOLDS IN A CURING BOX.

C) AFTER CURING, DO NOT OVEN DRY THE SPECIMENS THAT ARE TO BE LOAD TESTED. AIR DRY THE SPECIMENS FOR 1 TO 3 DAYS PRIOR TO TESTING.

D) WHILE SPECIMENS MAY BE TESTED AT ANY AGE TO MONITOR COMPRESSIVE STRENGTH OF THE CCF, TEST A MINIMUM OF TWO SPECIMENS AT 28 DAYS FOR ACCEPTANCE.

E) PROVIDE THE 28 DAY TEST RESULTS TO THE ENGINEER.

REVIEW THE STATUS OF THE CCF MATERIAL THAT FAILS TO MEET THE MINIMUM COMPRESSIVE STRENGTH FOR THE CLASS OF CCF TO DETERMINE IF IT IS ACCEPTABLE AT THAT LOCATION.

G. CONSTRUCTION METHODS.
PLACEMENT OF CCF SHALL BE ACCORDING TO PROCEDURES PROVIDED BY THE SUPPLIER/PRODUCER. PORTABLE PLANT SHALL COMPLY WITH CMS ITEM 107.11.C AND ALL APPLICABLE ENVIRONMENTAL PERMITS AND REGULATIONS. ⚠

1. PREPARATION.
THE ENGINEER WILL EXAMINE THE SUBSOIL CONDITIONS IN THE PLACEMENT AREAS. CORRECT UNSUITABLE SOIL CONDITIONS PRIOR TO PLACING THE CCF. PROPERTY FIX IN PLAN POSITION ITEMS TO BE ENCASED IN THE CCF. COAT ANY ALUMINUM TO PREVENT OXIDATION FROM THE FRESH CONCRETE.

2. WEATHER.
DO NOT PLACE CCF WHEN THE SUBSOIL IS FROZEN, WHEN THE AMBIENT TEMPERATURE IS LESS THAN 32°F (0°C), OR WHEN FREEZING CONDITIONS ARE EXPECTED IN LESS THAN 24 HOURS. IF THESE CONDITIONS CANNOT BE MET, FOLLOW THE MANUFACTURER'S RECOMMENDATIONS TO DETERMINE PRECAUTIONS NECESSARY TO ASSURE ACCEPTABLE INSTALLATION.

TAKE PRECAUTIONS TO AVOID DAMAGE TO THE CCF FROM FREEZING TEMPERATURES PER THE MANUFACTURER'S RECOMMENDATIONS.

3. MIXING AND CONVEYING.
USE JOB SITE MIXING AND CONVEYING EQUIPMENT FOR PROPORTIONING, MIXING AND PLACING THE CCF APPROVED BY THE SUPPLIER/PRODUCER. MIX THE MATERIALS ACCORDING TO THE SUPPLIER/PRODUCER MIX DESIGN PROCEDURES AND, PROMPTLY AFTER MIXING, CONVEY THE CCF TO ITS FINAL POSITION. AVOID EXCESSIVE HANDLING OF THE CCF.

4. PLACEMENT.
1) TOP OF THE CLASS III CCF SHALL NOT BE LESS THAN 2'-0" BELOW THE TOP OF PAVEMENT.

2) THE TOP OF THE CLASS II CCF SHALL NOT BE LESS THAN 4'-0" FROM THE TOP OF PAVEMENT.

3) THE TOP OF THE PERVIOUS CCF SHALL NOT BE LESS THAN 3'-0" FROM THE BOTTOM OF THE SIDEWALK.

DO NOT PLACE CCF IN LIFTS GREATER THAN 48" UNLESS RECOMMENDED BY THE MANUFACTURER.

DO NOT PLACE CCF INTO AN AREA OF STANDING WATER. PROVIDE AN INVERTED CROWN IN THE CLASS III CCF, AND PIPE UNDERDRAINS, AS SHOWN IN THE DETAILS.

CONTRACTOR SHALL PROVIDE WORKING DRAWINGS SHOWING THE FINAL WEIGHT TO BE USED IN THE FIELD, PLAN AND SECTIONS LOCATING THE CROWNS, AND LOCATIONS OF THE STEPS IN THE CLASS III CCF LIFT.

FINISHING THE CCF:
THE TOP SURFACE OF THE CCF SHALL BE FINISHED TO DRAIN AS SHOWN ON THE PLANS. THE FINISHING MAY BE EXECUTED DURING PLACEMENT, OR GRADED AFTERWARDS, AT THE CONTRACTOR'S DISCRETION. THE FINISHED SURFACE SHALL NOT EXHIBIT EXCESSIVE CRACKING SUBJECT TO THE APPROVAL OF THE ENGINEER.

5. LOADING.
DO NOT APPLY ANY LOAD ONTO THE CCF UNTIL IT HAS ATTAINED A COMPRESSIVE STRENGTH OF AT LEAST 20 PSI (0.14 MPA).

TABLE A - CELLULAR CONCRETE FILL PROPERTIES

PROPERTY	CLASS II	CLASS III	PERVIOUS
*-CAST DENSITY, MAX	30 LB/FT^3 (481 KG/M^3)	36 LB/FT^3 (577 KG/M^3)	35 LB/FT^3 (561 KG/M^3)
**-COMPRESSIVE STRENGTH, MIN. @ 28 DAYS	40 PSI (0.28 MPA)	80 PSI (0.55 MPA)	210 PSI (1.45 MPA)
***-WATER ABSORPTION, ASTM C796, MAX.	20 PERCENT	16 PERCENT	N/A
COEFFICIENT OF PERMEABILITY	N/A	N/A	247 FT/DAY (0.087 CM/SEC)

* - SPECIFIED IN SECTION F.1 OF THIS SPECIFICATION
** - SPECIFIED IN SECTION F.2 OF THIS CLASSIFICATION
*** - EXPRESSED AS PERCENT OF CAST DENSITY

H. METHOD OF MEASUREMENT.
THE DEPARTMENT WILL MEASURE EACH CLASS OF CCF BY THE NUMBER OF CUBIC YARDS COMPLETE IN PLACE.

I. BASIS OF PAYMENT.
THE DEPARTMENT WILL PAY FOR ACCEPTED QUANTITIES AT THE CONTRACT PRICE AS FOLLOWS:

ITEM	UNIT	DESCRIPTION
SPECIAL	CUBIC YARD	ENGINEERED FILL: LIGHTWEIGHT CELLULAR CONCRETE FILL, CLASS II (4W5, 4W6)
SPECIAL	CUBIC YARD	ENGINEERED FILL: LIGHTWEIGHT CELLULAR CONCRETE FILL, CLASS III (4W5, 4W6)
SPECIAL	CUBIC YARD	ENGINEERED FILL: LIGHTWEIGHT CELLULAR CONCRETE FILL, PERVIOUS (4W1, 4W2)

ALL QUANTITIES AND COSTS ASSOCIATED WITH THIS ITEM BETWEEN STA. 176+50 AND STA. 182+00 (℄ CONST. FUTURE I-70 EB) SHALL BE INCLUDED IN THE ESTIMATED QUANTITIES AND COST ESTIMATE FOR WALLS 4W5 AND 4W6.

NO.	DESCRIPTION	REV. BY	DATE
1	REVISED NOTE	MOJ	11-5-2021

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DESIGN AGENCY
GPD GROUP.
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DESIGNED DGN | DRAWN MOJ | REVIEWED T.JW | DATE 9-6-19
CHECKED RHC | REVISED | STRUCTURE FILE NUMBER

RETAINING WALL GENERAL NOTES

FRA-70/71-12.68/14.86
PID No. 105523

702
1815

ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS (4W8, 4W20)

PART 1 DESCRIPTION AND OBJECTIVES

1.1 PERFORMANCE CRITERIA

A. PROJECT DESCRIPTION: THE WORK SHALL CONSIST OF DESIGNING AND CONSTRUCTING COLUMN-SUPPORTED WALLS (CSW) IN THE INSTALLATION AREAS NOTED ON THE PLANS. THE CSW DESIGNER MUST DEMONSTRATE BY CALCULATIONS THAT THE CSW SYSTEMS SATISFY THE FOLLOWING REQUIREMENTS:

1. CSW MUST SATISFY THE FACTORED BEARING RESISTANCE REQUIREMENTS OF THE PLANNED EMBANKMENTS AND WALLS AT THE DESIGNATED BEARING LEVELS.

A. THE DESIGNATED BEARLING LEVEL FOR MSE WALLS IS THE TOP OF THE LEVELING PAD/BASE OF THE SGB.

B. THE DESIGNATED BEARING LEVEL FOR THE EMBANKMENTS IS EXISTING GRADE.

2. GLOBAL AND LOCAL STABILITY OF CSW SYSTEMS SUPPORTING EMBANKMENTS AND WALLS MUST EXCEED 1.3 FOR BOTH SHORT-TERM AND LONG-TERM CONDITIONS.

3. GLOBAL AND LOCAL STABILITY OF CSW SYSTEMS SUPPORTING BRIDGES MUST EXCEED 1.5 FOR BOTH SHORT-TERM AND LONG-TERM CONDITIONS.

4. LATERAL SQUEEZE CALCULATIONS MUST DEMONSTRATE A MINIMUM FACTOR OF SAFETY OF 2.0

5. A LOAD TRANSFER PLATFORM SHALL BE PROVIDED, AS NECESSARY, TO LIMIT PENETRATION (PUNCHING) OF GROUND IMPROVEMENT ELEMENTS AND DIFFERENTIAL SETTLEMENT OF MSE WALLS AND EMBANKMENTS BETWEEN CSW ELEMENTS. IF A LOAD TRANSFER PLATFORM IS NOT REQUIRED, PROVIDE A 1-FOOT LAYER OF ODOT CMS ITEM 703.16.C.3 COMPACTED PER ITEM 203 TO SUPPORT MSE LEVELING PADS AND SELECT GRANULAR EMBANKMENT MATERIALS.

6. TOTAL SETTLEMENT OF CSW SYSTEM IS TO BE LIMITED TO 3 INCHES OR LESS OCCURING WITHIN 30 DAYS AFTER THE SUPPORTED WALL REACHES FULL DESIGN HEIGHT (LESS COPING).

A. AN ADDITIONAL 1" OF SETTLEMENT AFTER THE 30 DAY WAITING PERIOD IS ACCEPTABLE. IN ADDITION, THE CONTRACTOR SHALL TAKE SURVEY SHOTS ALONG THE CENTERLINE OF CONSTRUCTION AT 50' INTERVALS ON THE EMBANKMENTS SUPPORTED BY CSW. THESE SHOTS SHALL BE TAKEN AT THE END OF THE 30 DAY WAITING PERIOD AND AGAIN 1 WEEK PRIOR TO BEGINNING PLACEMENT OF AGGREGATE BASE. THE SURVEY SHOTS SHALL BE PROVIDED TO THE DEPARTMENT AND WILL BE CONSIDERED INCIDENTAL TO THE CSW PAY ITEMS. THE SURVEY DATA WILL BE USED TO CALCULATE ANY ADDITIONAL EMBANKMENT OR AGGREGATE BASE NEEDED TO ACCOUNT FOR 1" OR LESS OF SETTLEMENT. PAYMENT FOR EMBANKMENT AND/OR AGGREGATE BASE NEEDED FOR SETTLEMENTS EXCEEDING 1" AT THE TIME OF PAVEMENT CONSTRUCTION WILL NOT BE MADE. THE CONTRACTOR WILL BE REQUIRED TO CONTINUE MONITORING THE SETTLEMENT UNTIL PROJECT CLOSE-OUT TO VERIFY THE MAXIMUM PERMISSIBLE SETTLEMENT IS NOT EXCEEDED. PAYMENT FOR CORRECTIVE REPAIRS NEEDED RESULTING FROM SETTLEMENT EXCEEDING 1" AFTER THE 30 DAY WAITING PERIOD WILL ALSO NOT BE MADE.

B. WICK DRAINS MAY BE UTILIZED TO ACCELERATE THE TIME RATE OF SETTLEMENT.

7. MAXIMUM DIFFERENTIAL SETTLEMENT FOR CSW'S IN THE LONGITUDINAL DIRECTION (ALONG THE WALL FACING) IS 0.5% FOR CONVENTIONAL MSE FACING PANELS AND 1.0% FOR SLIP-JOINTED PANELS. MAXIMUM DIFFERENTIAL SETTLEMENT FOR CSW'S IN THE TRANSVERSE DIRECTION (PERPENDICULAR TO THE WALL FACING) IS 1%.

8. AT A MINIMUM, THE CONTRACTOR SHALL PROVIDE TWO SURVEY POINTS FOR EVERY 50 FEET ALONG THE EMBANKMENT ALIGNEMENT, WITH ONE SURVEY POINT LOCATED ABOVE A COLUMN AND ONE SURVEY POINT LOCATED AT THE CENTROID OF A UNIT CELL FORMED BY THE CENTERS OF ADJACENT COLUMNS. DIFFERENTIAL SETTLEMENT BETWEEN UNIT CELL CONTROIDS AND ADJACENT CSW COLUMNS SHOULD NOT EXCEED *INCH.

9. THE CSW SYSTEM AND CONSTRUCTION PROCESSES SHALL NOT CAUSE ANY ADDITIONAL LOADING, DETRIMENTAL SETTLEMENT, OR DAMGE TO ADJACENT FACILITIES, UTILITIES, OR EMBANKMENTS.

B. THE DESIGN CONCEPT OF THE CSW INVOLVES CONSTRUCTING A PATTERN OF COLUMNS USING AN ACCEPTED SOIL IMPROVEMENT TECHNIQUE OF TRADITIONAL DEEP FOUNDATION ELEMENTS. DESIGN THE CSW SYSTEM TO EFFICIENTLY DISTRIBUTE EMBANKMENT AND WALL LOADS PLUS SURCHARGE LIVE AND DEAD LOADS. THE TYPE, NUMBER OF COLUMNS, SPACING, DIAMETER AND DEPTH SHALL BE DETERMINED BY THE CSW CONTRACTOR AND CSW DESIGNER. COLUMNS SHALL NOT BE LOCATED AT PROPOSED STRUCTURE PILE LOCATIONS.

1. THE CSW SYSTEM SHALL BE DESIGNED IN ACCORDANCE WITH FHWA RECOMMENDATIONS. THE FOLLOWING VARIABLES ARE USED IN THE CRITERIA BELOW:

S = COLUMN CENTER-TO-CENTER SPACING,
A = COLUMN WIDTH,
H = EMBANKMENT HEIGHT,
A(S) = AREA REPLACEMENT RATIO (COLUMN AREA DIVIDED BY COLUMN TRIBUTARY AREA),
T = COMPETENT LAYER THICKNESS.

NOTE THAT A COMPETENT LAYER IS DEFINED AS N ==10 BLOWS/FT FOR SANDS AND AN UNDRAINED SHEAR STRENGTH, SU ==500 PSF FOR CLAYS. A CONSERVATIVE, LOW AVERAGE, OF THE COMPETENT SOIL THICKNESS, T, SHOULD BE USED IN THE CRITERIA BELOW:

AT A MINIMUM, THE FOLLOWING CRITERIA SHALL BE SATISFIED:

A. THE MAXIMUM CENTER-TO-CENTER COLUMN SPACING, S, IS GIVEN BY THE RELATIONSHIP BELOW:

S =< MINIMUM OF (0.67H + α + 0.5) OR (1.23H - 1.20 α)

B. THE MINIMUM THICKNESS OF SELECT FILL FOR THE BRIDGING LAYER (LOAD TRANSFER PLATFORM) SHALL BE THE LARGER OF 2 FT OR 0.5(S - A).

C. THE CSW DESIGN CONCEPT SHALL INCLUDE THE DESIGN OF LOAD TRANSFER PLATFORMS, INCLUDING SELECT FILL AND GENERAL EMBANKMENT FILL MATERIALS, NUMBER OF REINFORCMENT LAYERS, TYPE OF REINFORCEMENT, AND PROPERTIES OF THE GEOSYNTHETIC REINFORCEMENT.

D. PRIOR TO SUBMITTING THE BID, THE CONTRACTOR AND CSW DESIGNER SHALL REVIEW THE AVAILABLE SUBSURFACE INFORMATION AND VISIT THE SITE TO ASSESS SITE GEOMETRY, CSW INSTALLATION METHOD VIABILITY, EQUIPMENT ACCESS CONDITIONS, AND LOCATION OF EXISTING STRUCTURES AND ABOVE GROUND UTLITIES AND FACILITIES.

1.2 GEOTECHNICAL ENGNIEER'S DESIGN CRITERIA FOR CSW

THE PURPOSE OF THE SUBGRADE IMPROVEMENT IS TO PROVIDE SUPPORT FOR MSE WALL 4W8 & 4W20 AND SUPPORT EMBANKMENTS. IT IS ANTICIPATED THAT THE CSW COLUMNS WILL EXTEND THROUGH THE VARIABLE FILL AND ALLUVIAL SOILS AND BEAR IN THE UNDERLYING GLACIAL TILL LAYERS.

SEE SHEET 11/14 FOR DESIGN CRITERIA TABLE.

1.3 CSW COLUMN TYPES AND MATERIALS

A. CSW COLUMN TYPES MAY INCLUDE, BUT ARE NOT LIMITED TO:

1. STEEL H PILES
2. STEEL PIPE PILES
3. PRE-CAST CONCRETE PILES
4. CONTINUOUS FLIGHT AUGER PILES (A.K.A. AUGERCAST PILES)
5. AGGREGATE COLUMNS (A.K.A. STONE COLUMNS)
6. RIGID INCLUSIONS
7. VIBRO-CONCRETE COLUMNS (VCC)
8. CONTROLLED MODULUS COLUMNS (CMC)

PART 2 MINIMUM CONTRACTOR QUALIFCATIONS

2.1 THE CONTRACTOR CONSTRUCTING THE CSW SYSTEM SHALL HAVE A MINIMUM 5+ YEARS EXPERIENCE INSTALLING GEOSYNTHETIC REINFORCEMENT AND THE COLUMN TYPE SUBMITTED IN THE CONTRACTOR'S BID PROPOSAL.

2.2 THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR THREE RECENT, SUCCESSFUL PROJECTS COMPLETED WITH SIMILAR SITE CONDITIONS AND IMPROVEMENT CRITERIA. THE CONTRACTOR SHALL PROVIDE NAMES AND CONTACT INFORMATION OF INDIVIDUALS WHO CAN ATTEST TO THE ADEQUACY OF THE WORK PERFORMED. THIS INFORMATION SHALL BE SUBMITTED IN THE CONTRACTOR'S BID PROPOSAL.

2.3 THE CONTRACTOR MUST A ASSIGN MANAGER WHO HAS BEEN RESPONSIBLE FOR THE CSW WORK ON AT LEAST THREE (3) PROJECTS. THE PROJECT MANAGER SHALL HAVE BEEN IN FULL-TIME EMPLOYMENT OF THE CONTRACTOR FOR AT LEAST TWO OF THOSE PROJECTS (PROVIDE A LIST OF PROJECTS AND DATES IN BID PROPOSAL). A DESIGNER THAT IS A CONSULTANT ON THIS PROJECT CANNOT BE THE PROJECT MANAGER.

2.4 THE CSW SYSTEM SHALL BE DESIGNED BY THE DESIGNER, A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF OHIO WITH EXPERIENCE IN THE DESIGN OF AT LEAST THREE SUCCESSFULLY COMPLETED CSW PROJECTS OVER THE PAST FIVE YEARS. THE DESIGNER MAY BE EITHER AN EMPLOYEE OF THE CONTRACTOR OR A SEPARATE CONSULTANT DESIGN ENGINEER MEETING THE STATED EXPERIENCE REQUIREMENTS.

2.5 THE CONTRACTOR MUST ASSIGN A FULL-TIME PROJECT SUPERINTENDENT WITH AT LEAST THREE (3) YEARS EXPERIENCE IN CSW CONSTRUCTION AND WHO HAS BEEN RESPONSIBLE FOR A MINIMUM OF THREE (3) CSW PROJECTS (PROVIDE A LIST OF PROJECTS AND DATES IN BID PROPOSAL).

2.6 WRITTEN REQUESTS FOR SUBSTITUTION OF THESE KEY PERSONNEL MUST BE SUBMITTED PRIOR TO PERSONNEL CHANGES. DOCUMENTATION MUST BE SUBMITTED TO THE ENGINEER THAT DEMONSTRATES THAT THE SUBSTITUTE MEETS THE REQUIREMENTS LISTED ABOVE.

REFERENCES:

A. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, 2020, AND CONSTRUCTION SPECIFICATIONS, 4TH EDITION, 2017, WITH 2020 INTERIMS.

B. FHWA NHI-16-027 AND 028, FHWA GEC 013 GROUND IMPROVEMENT METHODS: REFERENCE MANUAL VOLUMES I & II, APRIL 2017.

C. FHWA-NHI-16-009, FHWA GEC 012: DESIGN AND CONSTRUCTION OF DRIVEN PILE FOUNDATIONS VOLUMES I & II, 2016.

D. FHWA-RD-83-026 DESIGN AND CONSTRUCTION OF STONE COLUMNS, VOL. 1.

E. FHWA NHI-06-089 SOILS AND FOUNDATIONS REFERENCE MANUAL VOLUMES I & II, 2006.

F. FHWA GEC NO. 8 DESIGN AND CONSTRUCTION OF CONTINUOUS FLIGHT AUGER PILES, 2007.

G. ASTM D 6637 STANDARD TEST METHOD FOR DETERMINING TENSILE PROPERTIES OF GEOGRIDS BY THE SINGLE OR MULTI-RIB TENSILE METHOD.

H. ASTM D 4595 STANDARD TEXT METHOD FOR TENSILE PROPERTIES OF GEOTEXTILES BY THE WIDE-WIDTH STRIP METHOD

I. ASTM 5262 STANDARD TEST METHOD FOR EVALUATNG THE UNCONFINED TENSION CREEP AND RUPTURE BEHAVIOR OF GEOSYNTHETICS

NO.	DESCRIPTION	REV. BY	DATE
1	REVISED NOTE	MOJ	11-5-2021

DESIGN AGENCY
GPD GROUP.
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DESIGNED	DRAWN	REVIEWED	DATE
DGN	MOJ	T.JW	9-6-19
CHECKED	REVISED	STRUCTURE FILE NUMBER	
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RETAINING WALL GENERAL NOTES

FRA-70/71-12.68/14.86
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ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS (4W8, 4W20) (CONTINUED)

PART 3 - EQUIPMENT

3.1 THE EQUIPMENT REQUIRED FOR COLUMN INSTALLATION WILL VARY DEPENDING ON THE COLUMN TYPE. EQUIPMENT FOR COLUMN INSTALLATION SHOULD MEET FHWA CRITERIA FOR THE TYPE OF COLUMN SELECTED.

3.2 EQUIPMENT FOR FILL AND GEOSYNTHETIC PLACEMENT SHALL NOT CAUSE EXCESSIVE LOADS OR SETTLEMENT TO THE SOFT GROUND BETWEEN COLUMNS.

PART 4 - LOAD TRANSFER PLATFORM (LTP) MATERIALS

4.1 LTP SELECT FILL SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS:

SIZE	% PASSING
4-INCH	100
NO. 4	15 - 70
NO. 40	10 - 60
NO. 200	5 - 15

4.2 THE SELECT FILL SHALL ALSO HAVE:

$$CC = \frac{D(30)^2}{D(60) \times D(10)} = 1 \text{ TO } 3$$

$$CU = \frac{D(60)}{D(10)} > 4$$

WHERE: CC = COEFFICIENT OF CURVATURE
CU = COEFFICIENT OF UNIFORMITY
D(10) = DIAMETER SIZE AT 10% PASSING
D(30) = DIAMETER SIZE AT 30% PASSING
AND, D(60) = DIAMETER SIZE AT 60% PASSING

4.3 SELECT FILL PASSING THE NO. 40 SIEVE SHALL HAVE A LIQUID LIMIT LESS THAN 40 AND A PLASTICITY INDEX LESS THAN 20.

4.4 THE ALLOWABLE STRENGTH OF THE GEOSYNTHETIC T(A) MUST BE EQUAL OF GREATER THAN THE REQUIRED STRENGHT T(G). ALLOWABLE TENSILE STRENGTH T(A) OF THE GEOSYNTHETICSHALL BE DETERMINED USING A REDUCTION FACTOR APPROACH TO ACCOUND FOR CREEP RUPTURE STRENGHT AND DEGRADATION MECHANISMS OF THE REINFORCEMENT. THE ALLOWABLE LONG-TERM GEOSYNTHETIC DESIGN TENSILE STRENGTH T(A) IS:

$$T(G) <= T(A) = \frac{T(ULT)}{RF(D) \times RD(ID) \times RF(CR) \times FS(UNC)}$$

WHERE:

T(G) = REQUIRED STRENGTH OF GEOSYNTHETIC,
T(A) = ALLOWABLE TENSILE STRENGTH OF GEOSYNTHETIC,
T(ULT) = ULTIMATE TENSILE STRENGTH FROM SINGLE OR MULTI-RIB TENSILE STRENGTH TESTS (ASTM D6637) FOR GEOGRIDS OR WIDE WIDTH TENSILE STRENGTH TESTS (ASTM D4595) FOR GEOTEXTILES,
RD(D) = DURABILITY REDUCTION FACTOR IS DEPENDENT ON THE SUSCEPIBILITY OF THE GEOSYNTHETIC TO ATTACK BY MIRCOORGANISMS, CHEMICALS, THERMAL OXIDATION, HYDROLYSIS AND STRESS CRACKING. THE TYPICAL RANGE IS FROM 1.1 TO 2.0.
RF (ID) = INSTALLATION DAMAGE REDUCTION FACTOR CAN RANGE FROM 1.05 TO 3.0, DEPENDING ON BACKFILL GRADATION AND PRODUCT MASS PER UNIT WEIGHT.
RF(CR) = CREEP REDUCTION FACTOR IS THE RATION OF THE ULTIMATE STRENGTH T(ULT) TO THE CREEP LIMITED STRENGTH OBTAINED FROM LABORATORY CREEP TESTS FOR EACH PRODUCT, AND CAN VARY TYPICALLY FROM 1.65 TO 5.0.
FS(UNC) = OVERALL FACTOR OF SAFETY OR LOAD FACTOR REDUCTION TO ACCOUNT FOR UNCERTANTIES IN THE GEOMETRY OF THE STRUCTURE, FILL PROPERTIES, REINFORCEMENT PROPERTIES, AND EXTERNALLY APPLIED LOADS. FOR LOAD TRANSFER PLATFORMS, A MINIMUM OVERALL FACTOR OF SAFETY OF 1.5 IS TYPICAL.

THE SPECIFIC VALUES FOR THE REDUCTION FACTORS (RDF, RFID, RFCR) USED IN DESIGN SHALL BE THOSE ESTABLISHED BY THE NATIONAL TRANSPORTATION PRODUCT EVALUATION PROGRAM (NTPEP) AND CAN BE FOUND ONLINE AT:

HTTP://NTPEP.ORG/CONTENTMANAGEMENT/PAGEBOY.ASP?PAGE_ID=26

IF NTPEP REDUCTION FACTORS ARE NOT AVAILABLE FOR THE MANUFACTURER AND TYPE OF GEOSYNTHETIC PROPOSED BY THE DESIGNER, THEN THE VALUES USED SHALL BE THOSE RECOMMENDED BY THE GEOSYNTHETIC MANUFACTURER, SUPPORTED BY LABORATORY TESTING AND AS APPROVED BY THE ENGINEER.

4.5 IN ADDITION TO THE LONG TERM ALLOWABLE STRENGTH REQUIREMENT, THERE IS A SERVICEABILITY REQUIREMENT. FOR SERVICEABILITY, THE GEOSYNTHETIC MUST HAVE A CREEP LIMITED STRENGTH AT A STRAIN OF 5% ACCORDING TO ASTM D 5262 THAT IS EQUAL TO OR GREATER THAN THE REQUIRED STRENGTH T(G).

PART 5 - SUBMITTALS

5.1 FOLLOWING AWARD OF THE CONTRACT AND PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT DESIGNER-APPROVED DETAILS, SPECIFICATIONS, DRAWINGS, CONSTRUCTION SEQUENCES, DESIGN CALCULATIONS, QUALITY CONTROL PLAN, MONITORING PLAN, AND ANY OTHER REQUIRED INFORMATION FOR THE COLUMN-SUPPORTED WALL SYSTEM. THE ENGINEER SHALL REVIEW THE SUBMITTAL ITEMS FOR CONFORMANCE WITH THE PERFORMANCE SPECIFICATION. THE CONTRACTOR SHALL ALLOW A MINIMUM OF 30 DAYS FOR THE REVIEW OF THE INITIAL SUBMISSION AND SHALL ALSO ACCOUNT FOR THE SUBSEQUENT REVIEW AND ACCEPTANCE PROCESS WHICH WILL DEPEND ON THE ACCURACY AND QUALITY OF THE SUBMISSION DOCUMENTS.

5.2 THE FOLLOWING SHALL BE SUBMITTED TO THE ENGINEER AT LEAST 30 DAYS PRIOR TO BEGINNING WORK:

A. PROPOSED CSW CONSTRUCTION SEQUENCE AND SCHEDULE.

B. WORKING DRAWINGS AND DESIGN TO THE ENGINEER FOR REVIEW PRIOR TO STARTING THE WORK INDICATING THE EMBANKMENT DETAILS (MATERIAL TYPES, ELEVATIONS, GEOSYNTHETIC REINFORCEMENT, ETC.). COLUMN TYPE, COLUMN LAYOUT, COLUMN SIZE, SPACING OF COLUMNS, COLUMN TOP ELEVATIONS, AND THE DEPTH OF COLUMNS AS PROPOSED TO ACHIEVE THE CRITERIA OUTLINED IN THIS SPECIFICATION AND THE CONTRACT PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL LINES AND GRADES FOR COLUMNS, INCLUDING LOCATIONS OF ALL UTILITIES AND SURVEY MARKERS.

C. A CSW DEMONSTRATION COLUMN/LOAD TESTING PROGRAM TO DEMONSTRATE INSTALLATION TECHNIQUES AND COMPLIANCE WITH THE PERFORMANCE CRITERIA. THE LOAD TEST PROGRAM SHALL INCLUDE THE INSTALLATION OF TYPICAL UNIT CELLS OF THREE OR MORE COLUMNS OF THE SIZE, TYPE AND SPACING SPECIFIED BY THE CSW DESIGNER IN EACH STABILIZED ZONE IDENTIFIED IN DESIGN CRITERIA TABLE ON SHEET 708 AND PLAN SHEETS 810, 884, & 885. PERFORM LOAD TEST IN ACCORDANCE WITH IN ACCORDANCE WITH ASTM D1143 (PILE LOAD TEST), AND ASTM D1194 (PLATE LOAD TEST) PROCEDURES AS APPROPRIATE AND ELALUATE AS FOLLOWS:

1. MEASURE VERTICAL SURFACE DEFLECTIONS BOTH OVER THE TEST COLUMN AND BETWEEN TEST COLUMNS BY A SUITABLE METHOD.

2. MEASURE DEFLECTIONS WITHIN TEST COLUMNS AT MAXIMUM 10-FOOT INTERVALS.

3. MEASURE DEFLECTIONS AT THE BOTTOM OF THE TEST COLUMN. PERFORMANCE WILL BE DEEMED ACCEPTABLE WHEN, AT A LOAD EQUAL TO 117 PERCENT OF THE DESIGN STRESS, DEFLECTION AT THE BOTTOM OF THE COLUMN DOES NOT EXCEED 20% OF THE DELFECTION AT THE TOP OF THE COLUMN.

4. CONDUCT THE TEST BASED ON THE LOAD INCREMENTS, DECREMENTS, AND DURATIONS PROVIDED IN THE FOLLOWING TABLE. MAINTAIN THE LOAD AT EACH INCREMENT UNTIL THE RATE OF DEFLECTION IS LESS THAN 0.01 INCHES PER HOUR OR UNTIL THE MAXIMUM TIME DURATION IS REACHED, WHICHEVER OCCURS FIRST.

LOAD INCREMENT	APPROXIMATE STRESS ON COLUMN (% OF DESIGN)	MINIMUM DURATION (MINUTES)	MAXIMUM DURATION (MINUTES)
SEATING LOAD*	<9	N/A	N/A
1	17	15	60
2	33	15	60
3	50	15	60
4	67	15	60
5	83	15	60
6	100	15	60
7	117	15	60
8	133	15	60
9	150	N/A	N/A
10	100	N/A	N/A
11	66	N/A	N/A
12	33	N/A	N/A
FULLY UNLOADED	0	N/A	N/A

*COMPENSATE FOR SURFICIAL DISTRUBANCE BY APPLYING A SEATING LOAD EQUAL TO OR LESS THAN 9 PERCENT OF THE DESIGN LOAD BEFORE APPLYING LOAD INCREMENTS.

5. COLUMNS SHALL HAVE SUFFICIENT STRENGTH AND STIFFNESS TO SATISFY BEARING CAPACITY AT 150 PERCENT OF THE DESIGN STRESS AND TO SATISFY SETTLEMENT CRITERIA IN SECTION 1.1 (PERFORMANCE CRITERIA) AT 100 PERCENT OF THE DESIGN STRESS.

A. IN THE EVENT THAT TEST COLUMNS FAIL TO COMPLY WITH THE DESIGN REQUIREMENTS, CONTRACTOR SHALL INSTALL ADDITIONAL TEST COLUMNS AND CONDUCT ADDITIONAL TESTS AT NO COST TO THE DEPARTMENT.

6. ANY PLANNED DEVIATIONS FROM THE ABOVE DESCRIBED LOAD TEST PROCEDURE MUST BE DESCRIBED IN THE CONTRACTOR'S DESIGN SUBMITTAL, APPROVED BY THE DESIGNER, AND ACCEPTED BY THE ENGINEER.

7. CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS FOR THE LOAD TEST REACTION ELEMENTS INCLUDING DIAMETER, TYPE, REINFORCEMENT, DEPTH AS WELL AS THE REACTION FRAME AND BEAMS FOR REVIEW BY THE ENGINEER. THE CONTRACTOR SHALL DESIGN THE REACTION PILES AND FRAME FOR MINIMUM ONE AND HALF TIMES THE MAXIMUM TEST LOAD. ALL SHOP DRAWINGS AND SUPPORTING SHOP DRAWINGS CALCULATIONS SHALL BE SIGNED AND SEALED BY PROFESSIONAL ENGINEER.

8. SUBMIT CALIBATION RECORDS FOR LOAD CELLS, HYDRAULIC JACKS, PUMPS AND PRESSURE GAUGES AT LEAST 7 DAYS PRIOR TO PERFORMING THE LOAD TESTS.

9. SUBMIT THE FOLLOWING TO THE ENGINEER AFTER THE LOAD TESTS ARE COMPLETED:

A. A REPORT DOCUMENTING THE OBSERVATIONS AND RESULTS OF ALL TESTS. THE REPORT WILL CERTIFY THAT THE REQUIRED BEARING RESISTANCE HAS BEEN ACHIEVED WITHIN THE SETTLEMENT TOLERANCES AS DETAILED IN SECTION 1.1 (PERFORMANCE CRITERIA).

B. AS-BUILT DRAWINGS INDICATING THE LOCATION, DIAMETER, TOP AND BOTTOM ELEVATIONS, AND IDENTIFICATION NUMBER FOR EACH CSW COLUMN.

10. CSW COLUMN PRODUCTION SHALL ONLY START UPON COMPLETION OF TWO LOAD TESTS AND AFTER THE ENGINEER ACCEPTS THE CSW DESIGNER'S FINAL TIP ELEVATION, INSTALLATION CRITERIA, AND SPACING OF COLUMNS.

D. LOAD TRANSFER PLATFORM SUBMITTALS

1. GRADATION, ATTERBERG LIMITS, AND THE RESULTING ODOT/AASHTO CLASSIFICATION FOR ALL FILL MATERIALS USED.

2. THE CONTRACTOR SHALL SUBMIT A CERTIFCATE STATING THAT THE GEOSYNTHETIC REINFORCEMENT MEETS THE DESIGN REQUIREMENTS FOR ULTIMATE STRENGTH, CREEP, DURABILITY, INSTALLATION DAMAGE, AND COEFFIENT OF INTERACTION FOR SLIDING IN ACCORDANCE WITH THE DESIGN SUBMITTAL.

E. A DETAILED WRITTEN PROCEDURE OF PLANS TO PROTECT ADJACENT FACILITIES AND EMBANKMENTS FROM DAMAGE, INCLUDING DESIGN CALCULATIONS. ADJACENT EXISTING STRUCTURES AND PAVEMENT MUST REMAIN IN SERVICE AT ALL TIMES, EXCEPT WHEN CLOSED PER MOT REQUIREMENTS.

5.3 ACCEPTANCE OF THE PROPOSED DESIGN AND CONSTRUCTION METHODOLOGIES SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR THE SAFETY OF THE METHOD OR EQUIPMENT USED OR THE RESPONSIBILITY OF CARRYING OUT THE WORK IN FULL ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

5.4 THE CONTRACTOR SHALL SUBMIT AS-BUILT DRAWINGS TO THE ENGINEER NO-LATER-THAN 30 DAYS FOLLOWING COMPLETION OF CONSTRUCTION.

PART 6 SPOIL HANDLING REQUIREMENTS

6.1 THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY TO PROPERLY HANDLE, STORE, TRANSPORT AND DISPOSE OF REGULATED MATERIALS INCLUDING ANY REQUIRED PERMITS, APPROVALS OR FEES WITHIN THE PROJECT LIMITS. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.

6.2 MAINTAIN RECORDS (SUCH AS MANIFESTS, LANDFILL TICKETS, DAILY LOGS, ETC.) TO DOCUMENT THE SOURCE, MOVEMENT AND DESTINATION OF EACH TRUCKLOAD OF SOLID WASTE OR REQULATED MATERIAL. ALL TRANSPORT VEHICLES USED FOR THE MOVEMENT OF REGULATED MATERIALS SHALL MEET ALL APPLICABLE LOCAL, STATE AND FEDERAL REQUIREMENTS. ONE COPY OF EACH RECORD SHALL BE SUBMITTED TO THE ENGINEER.

PART 7 CSW CONSTRUCTION AND QC / QA REQUIREMENTS

7.1 PRE-CONSTRUCTION MEETING: A PRE-CONSTRUCTION MEETING SHALL BE HELD AMONG THE ENGINEER, CONTRACTOR, AND DESIGNER PRIOR TO MOBILIZING EQUIPMENT TO THE PROJECT SITE. AT THE MEETING, THE COLUMN INSTALLATION MEANS/METHODS, OBSERVATION, ACCEPTANCE/REJECTION PROCEDURES, TESTING AND CSW CONSTRUCTION PROCEDURES SHALL BE DISCUSSED AND FORMALIZED.

7.2 WORKING DRAWINGS

A. THE CONTRACTOR SHALL PROVIDE WORKING DRAWINGS WHICH SHALL SHOW THE LOCATION OF EACH COLUMN, AS WELL AS THE TOP AND BOTTOM ELEVATIONS. EACH COLUMN SHALL BE IDENTIFIED WITH A REFERENCE NUMBER.

B. THE WORKING DRAWINGS SHALL ALSO PROVIDE DETAIL ON THE SELECT FILL, GEOSYNTHETIC REINFORCEMENT, AND GENERAL EMBANKMENT FILL. A DESIGNER-APPROVED SET OF WORKING DRAWINGS AND CONTRACT SPECIFICATIONS SHALL BE ON-SITE AT ALL TIMES DURING CONSTRUCTION OF THE LOAD TRANSFER PLATFORM.

7.3 SITE PREPARATION

A. THE CONTRACTOR SHALL ENSURE A FIRM WORKING PLATFORM ON WHICH HEAVY EQUIPMENT CAN BE OPERATED SAFELY UNDER ITS OWN POWER. THE WORK PLATFORM MUST COMPLY WITH ITEM 203.

B. THE CONTRACTOR SHALL ACCURATELY LOCATE THE LIMITS OF COLUMN INSTALLATION AND EMBANKMENT EXTENTS IN ACCORDANCE WITH THE CONTRACT PLANS.

C. THE CONTRACTOR SHALL EXERCISE CAUTION TO AVOID SETTLEMENT OR DAMAGE TO EXISTING FACILITIES AND SETTLEMENT, UNDERMINING, OR INSTABILITY TO EXISTING EMBANKMENTS.

D. STABILITY OF ALL THE TEMPORARY SHEETING AND/OR TEMPORARY SLOPES, IF USED TO FACILITATE INSTALLATION OF THE COLUMNS IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE CAUSED BY HIS ACTIVITIES AT NO ADDITIONAL COST TO THE DEPARTMENT.

E. THE CONTRACTOR SHALL EXERCISE CAUTION AND ACCOUNT FOR THE TEMPORARY INSTABILITY THAT MAY BE CAUSED BY GROUND IMPROVEMENT (IF USED) UNTIL THE GROUND IMPROVEMENT FEATURES GAIN STRENGTH WITH TIME.

⚠ NO.	DESCRIPTION	REV. BY	DATE
1	REVISED NOTE	MOJ	11-5-2021

DESIGN AGENCY
GPD GROUP.
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DESIGNED	DRAWN	REVIEWED	DATE
DGN	MOJ	TJW	9-6-19
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RHC			

NOTES
RETAINING WALL GENERAL NOTES

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7.4 CSW COLUMN TOLERANCES

A. THE CSW DESIGNER SHALL SPECIFY IN THE CONTRACTOR'S SUBMITTAL THE ALLOWABLE TOLERANCES FOR:

1. COLUMN VERTICALITY
2. HORIZONTAL TOLERANCE FROM PLAN LOCATION.
3. VERTICAL TOLERANCE FROM COLUMN TOP.
4. ACCEPTABLE CONDITION OF COLUMN TOPS PRIOR TO INSTALLATION OF LOAD TRANSFER PLATFORM.
5. MINIMUM COLUMN DIMENSIONS.
6. COLUMN OVERLAP REQUIREMENTS, IF APPLICABLE.
7. MINIMUM STRENGTH REQUIREMENTS OF COLUMN MATERIALS.
8. MATERIAL PROPERTIES, AS INCORPORATED INTO THE COLUMNS.
9. OTHER ITEMS, AS REQUIRED PER ODOT CMS.

B. BEFORE BEGINNING INSTALLATION, THE CONTRACTOR SHOULD ACCURATELY STAKE THE LOCATION OF THE CSW COLUMNS USING A LICENSED SURVEYOR. THE CONTRACTOR SHOULD PROVIDE AN ADEQUATE METHOD FOR LOCATING ELEMENTS TO ALLOW THE ENGINEER TO VERIFY THE AS-BUILT LOCATION OF THE ELEMENTS DURING CONSTRUCTION. THE CONTRACTOR WILL NOT BE COMPENSATED FOR ELEMENTS THAT ARE LOCATED OUTSIDE OF THE SPECIFIED TOLERANCES. IF THE ENGINEER DETERMINES THAT MISALIGNED ELEMENTS WILL INTERFERE WITH CONSTRUCTION, A METHOD OF CORRECTION SHOULD BE PREPARED BY THE CSW DESIGNER AND SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW AND ACCEPTANCE.

C. COLUMN ELEMENTS INSTALLED BEYOND THE MAXIMUM ALLOWABLE TOLERANCES SHALL BE ABANDONED AND REPLACED WITH NEW COLUMNS, UNLESS THE DESIGNER APPROVES THE CONDITION OR PRESCRIBES OTHER REMEDIAL MEASURES TO BE COMPLETED BY CONTRACTOR AND CSW DESIGNER. ALL MATERIAL AND LABOR REQUIRED TO REPLACE OR REMEDY REJECTED COLUMNS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE DEPARTMENT. REMEDIAL MEASURES MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW AND ACCEPTANCE.

7.5 AS-BUILT COLUMN INSTALLATION RECORDS: THE CONTRACTOR MUST SUBMIT AS-BUILT FIELD MEASUREMENT DATA INDICATING SURVEYED AS-BUILT PLAN LOCATIONS OF EACH CSW ELEMENT, INCLUDING THE ELEMENT CENTER (PER SITE SPECIFIC COORDINATES), THE ELEMENT DIMENSION, THE COLUMN VERTICALITY, AND THE TOP AND BOTTOM ELEVATIONS OF EACH ELEMENT TO THE ACCURACY REQUIRED BY THE PROJECT SPECIFICATIONS. THE AS-BUILT DOCUMENTATION MUST BE APPROVED BY THE DESIGNER AND SUBMITTED TO THE ENGINEER NO LATER THAN 90 DAYS AFTER THE COMPLETION OF EACH CSW-STABILIZED ZONE. A DISINCENTIVE OF $300.00 PER DAY WILL BE ASSESSED FOR EACH DAY BEYOND 90 DAYS THAT THE COMPLETED AS-BUILT DRAWINGS ARE NOT SUBMITTED TO THE ENGINEER.

7.6 SELECT FILL PLACEMENT AND QA/QC REQUIREMENTS (LOAD TRANSFER PLATFORMS)

A. NO GEOSYNTHETIC REINFORCEMENT OR FILL MATERIALS SHALL BE PLACED PRIOR TO SATISFYING THE COLUMN PERFORMANCE CRITERIA, UNLESS THE FILL MATERIAL IS REQUIRED AS A WORKING PLATFORM FOR COLUMN INSTALLATION.

B. INSTRUMENTATION FOR PERFORMANCE MEASUREMENTS AND INSTRUMENTATON FOR MONITORING OF EXISTING STRUCTURES AND EMBANKMENTS SHALL BE INSTALLED PRIOR TO PLACEMENT OF ANY SELECT FILL OR GEOSYNTHETIC REINFORCEMENT.

C. PRIOR TO CONSTRUCTION OF THE LOAD TRANSFER PLATFORM, THE CONTRACTOR SHALL PREPARE SUBGRADE, AND REMOVE ANY DELETERIOUS MATERIALS SUCH AS TREE ROOTS. THE FOUNDATION SOIL SHALL BE OBSERVED AND APPROVED BY THE ENGINEER PRIOR TO PLACEMENT OF SELECT REINFORCED FILL.

D. IF CEMENTITIOUS GROUND IMPROVEMENT METHODS ARE USED, PLACEMENT OF FILL MATERIAL SHALL NOT START UNTIL THE COLUMNS HAVE GAINED ADEQUATE STRENGTH TO SUPPORT THE FILL MATERIALS AND FILL INSTALLATION AND CONSTRUCTION EQUIPMENT.

E. SELECT REINFORCED FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT EXCEEDING 10 IN. IN UNCOMPACTED THICKNESS FOR HEAVY COMPACTION EQUIPMENT. FOR ZONES WHERE COMPACTION IS ACCOMPLISHED WITH HAND-OPERATED COMPACTION EQUIPMENT, FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT EXCEEDING 6 IN. IN UNCOMPACTED THICKNESS.

F. SELECT REINFORCED FILL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH ITEM 203. THIS MAY NOT BE ACHIEVABLE FOR THE FIRST LIFT OF FILL BECAUSE OF THE WEAK SUBGRADE BETWEEN COLUMNS, HOWEVER, SUBSEQUENT LIFTS SHOULD MEET THE MINIMUM REQUIREMENTS.

G. TEST METHODS AND FREQUENCY, AND VERIFICATION OF MATERIAL SPECIFICATIONS AND COMPACTION, SHALL BE THE RESPONSIBILITY OF THE STATE.

7.7 GEOSYNTHETIC REINFORCEMENT PLACEMENT AND QA/QC REQUIREMENTS

A. PLACE REINFORCEMENT AT THE LOCATIONS AND ELEVATION SHOWN ON THE CONTRACTORS WORKING DRAWINGS. NO CHANGES TO THE GEOSYNTHETIC REINFORCEMENT LAYOUT, INCLUDING, BUT NOT LIMITED TO LENGTH, REINFORCEMENT TYPE (I.E., STRENGTH), DIRECTION OF REINFORCEMENT, OR ELEVATION SHALL BE MADE WITHOUT THE EXPLICIT WRITTEN APPROVAL OF THE DESIGNER. CONTRACTOR SHALL SUBMIT THE CHANGES TO THE ENGINEER FOR ACCEPTANCE.

B. CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOSYNTHETIC REINFORCEMENT. A MINIMUM FILL THICKNESS OF 150 MM (6 IN.) IS REQUIRED FOR OPERATION OF VEHICLES OVER THE REINFORCEMENT. TURNING OF VEHICLES SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS OR TIRES FROM DISPLACING THE FILL AND/OR GEOSYNTHETIC REINFORCEMENT.

C. MINIMUM OVERLAP OF ADJACENT ROLLS OF REINFORCEMENT SHALL BE AS INDICATED BY THE DESIGNER OF THE CONTRACTOR'S WORKING DRAWINGS.

D. EACH ROLE OF GEOSYNTHETIC REINFORCEMENT SHOULD BE INSPECTED BY THE CONTRACTOR TO ENSURE THAT IT IS UNDAMAGED PRIOR TO COVERING WITH FILL MATERIAL.

E. CARE SHALL BE TAKEN TO PREVENT EXCESSIVE MUD, WET CONCRETE, EPOXY, OR OTHER DELETERIOUS MATERIALS FROM COMING IN CONTACT WITH AND AFFIXING TO THE GEOGRID MATERIALS.

F. GEOSYNTHETIC REINFORCEMENT SHALL BE STORED AT TEMPERATURES ABOVE -20 DEGREES F (- 29 DEGREES C).

G. GEOSYNTHETIC REINFORCEMENT SHALL NOT BE LEFT DIRECTLY EXPOSED TO SUNLIGHT FOR A PERIOD LONGER THAN RECOMMENED BY THE MANUFACTURER OR ONE MONTH WHICHEVER IS SHORTER.

H. ANY ROLL OR PORTION OF A ROLL OF GEOSYNTHETIC DAMAGED BEFORE, DURING, AND/OR AFTER INSTALLATION SHALL BE REPLACED BY THE CONTRACTOR.

I. LARGE PILES OF FILL MATERIAL SHALL NOT BE PLACED ON THE GEOSYNTHETIC REINFORCEMENT.

J. IF GEOTEXTILE SEAMS ARE SPECIFIED, THE SEAMS SHOULD BE PLACED UP AND EVERY STITCH SHOULD BE INSPECTED.

K. THE CONTRACTOR SHALL REMOVE SLACK AND WRINKLES FROM THE GEOSYNTHETIC PRIOR TO PLACING FILL.

L. THE CONTRACTOR SHALL SUBMIT THE LOT NUMBERS AND ROLL NUMBERS ALONG WITH THEIR LOCATIONS WITHIN THE EMBANKMENT FOR ALL GEOSYNTHETIC REINFORCEMENT.

PART 8 POST-INSTALLATION PERFORMANCE MONITORING INSTRUMENTATION

8.1 POST-INSTALLATION PERFORMANCE MONITORING INSTRUMENTATION: TEN (10) SETS OF CSW PERFORMANCE MONITORING INSRUMENTATION SHALL BE INSTALLED. THIS INSTRUMENTATION WILL BE PLACED TO MONITOR THE PERFORMANCE OF THE CSW SYSTEM AFTER IT HAS BEEN SUCCESSFULLY CONSTRUCTED AND IS SUBJECTED TO THE CONSTRUCTION LOADING AND SUBSEQUENT SERVICE LOADING. THE INSTALLATION MAY BE PERFORMED BY THE PRIME CONTRACTOR, THE CONTRACTOR, OR AN INSTRUMENTATION SUBCONTRACTOR OR CONSULTANT (OR IN WHOLE OR IN PART BY COMBINATIONS THEREOF). IMPORTANT NOTE: IN THE EVENT THAT THIS QA MONITORING WORK IS NOT TO BE COORDINATED OR PERFORMED BY THE CSW CONTRACTOR, THE CSW CONTRACTOR SHALL BE REQUIRED TO SPECIFICALLY COORDINATE THIS WORK AND SUBMIT A WORK PLAN TO THE ENGINEER PRIOR TO INITIATING THE CSW WORK.

A. THE INSTRUMENT SHALL BE INSTALLED AS DESCRIBED IN THE FOLLOWING SUBSECTIONS, IN AREAS TO BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER SUCH THAT CONSTRUCTION INTERFERENCE AND THE POTENTIAL FOR DAMAGE IS MINIMIZED. THE INSTALLATIONS SHALL ALSO BE PLACED SUCH THAT DATA MAY CONTINUE TO BE ACQUIRED ONCE THE FACILITY HAS BEEN PLACED IN SERVICE. DETAILS OF THE EXACT INSTALLATION LOCATIONS WILL BE DETERMINED AT THE PRE-CONSTRUCTION MEETING.

B. MINIMUM INSTRUMENTATION PROVIDED BY THE CONTRACTOR IS TO CONSIST OF:

1. SETTLEMENT PLATES, TO BE INSTALLED ON TOP OF THE LOAD/TRANSFER PLATFORM.

2. PIEZOMETERS TO MONITOR PORE PRESSURES BENEATH THE MSE WALLS AND EMBANKMENTS IN THE STABILIZED ZONE.

C. CONTRACTOR SHALL INSTRUMENTATION DATA FROM THE TIME OF INSTALLATION (END OF CSW CONSTRUCTION) UNTIL 30 DAYS AFTER THE WALLS REACH THEIR FINAL PLAN ELEVATION (LESS COPING AND PAVEMENTS). READINGS SHALL BE TAKEN TWICE WEEKLY DURING WALL AND EMBANKMENT FILL PLACEMENT AND AT INTERVALS NOT TO EXCEED 15 CALENDAR DAYS AT OTHER TIMES. DATA FROM ALL SENSORS SHALL BE READ IN A UNIFORM MANNER, SUCH THAT ALL DATA IS TAKEN WITHIN A 2-DAY PERIOD AT THE 15 (OR 30) DAY INTERVALS TO AID IN THE EVALUATION OF THE DATA AND SUBSEQUENT PRESENTATION OF RESULTS.

D. IF THE WALLS SUPPORTED OVER THE CSW ELEMENTS HAVE COMPLETED SETTLEMENT IN ACCORDANCE WITH THE PERFORMANCE CRITERIA WITHIN 30 DAYS OF SUBSTANTIAL WALL COMPLETION AS DEFINED IN 7.1.C ABOVE, THE CONTRACTOR MAY TURN OVER FURTHER MONITORING OF THE DATA TO THE DEPARTMENT. IF THE WALLS HAVE NOT COMPLETED SETTLEMENT IN ACCORDANCE WITH THE DESIGN CRITERIA, THE CONTRACTOR SHALL CONTINUE MONITORING EFFORTS (AT NO ADDITIONAL COST TO THE DEPARTMENT) AS DIRECTED BY THE ENGINEER.

E. INSTRUMENTATION SHALL BE INSTALLED AFTER THE CONSTRUCTION OF THE CSW ELEMENTS WITHIN THE IN-SITU SOILS AND PRIOR TO MSE WALL CONSTRUCTION OR EMBANKMENT FILL PLACEMENT. A MINIMUM OF 2 SETS OF BASELINE READINGS SHALL BE TAKEN AND CONFIRMED PRIOR TO THE CONSTRUCTION OF ELEMENTS ABOVE THE INSTALLED CSW CONSTRUCTION.

F. INSTRUMENTATION SHALL BE ELECTRONIC AND SELF-RECORDING, WHERE PRACTICAL. READINGS FROM SENSORS SHALL BE TAKEN WITH AUTOMATED DATA COLLECTION SYSTEMS. ANY PARTICULAR INSTRUMENT TYPE SHALL BE OBTAINED FROM THE SAME MANUFACTURER TO MINIMIZE POTENTIAL INCOMPATIBILITIES AND ERRORS. DATA ACQUISITION DEVISES (DATA LOGGERS) SHALL BE OF A TYPE COMPATIBLE WITH EACH TYPE OF INSTRUMENTATION AND RECOMMENDED BY THE MANUFACTURER.

H. ALL INSTRUMENTATION AND ASSOCIATED MONITORING AND DATA COLLECTION DEVICES (PROBES, CABLES, DATA COLLECTORS, ETC.) BECOME THE PROPERTY OF THE DEPARTMENT AT THE END OF THE MONITORING PERIOD. ELECTRONIC FILES AND ALL DATA REPORTS SHALL BE PROVIDED TO THE DEPARTMENT AT THE END OF THE MONITORING PERIOD.

I. THE DEPARTMENT RESERVES THE RIGHT TO PUBLISH THE INFORMATION FROM THE MONITORING INVESTIGATION IN INTERNAL AND EXTERNAL TECHNICAL PUBLICATIONS.

J. THE PERFORMANCE MONITORING INSTRUMENTATION AND ASSOCIATED DATA COLLECTION AND ANALYSIS SHALL NEITHER BE USED AS A BASIS OF PAYMENT NOR AS A PERFORMANCE CRITERIA FOR THE DETERMINATION OF SUCCESSFUL INSTALLATION OF THE CSW APPLICATION.

K. INSTRUMENTS SHALL MEET ACCEPTED INDUSTRY STANDARDS AND HAVE AN ACCURACY OF +/- 0.5% WITH A MINIMUM PRECISION OF +/- 0.5% OF FULL SCALE (SPAN).

L. INSTRUMENTS SHALL HAVE APPROPRIATE RUGGEDNESS TO SURVIVE INSTALLATION AND CONSTRUCTION PROCESSES SUCH THAT THEY READ WITH THE MINIMUM PRECISION AND ACCURACY OVER THE DURATION OF CONSTRUCTION AND A MINIMUM OF EIGHTEEN (18) MONTHS OF SERVICE FOLLOWING CONSTRUCTION.

M. INSTRUMENTATION SHALL HAVE AN OPERATING TEMPERATURE RANGE AS APPROPRIATE FOR CONDITIONS ANTICIPATED WHERE INSTALLED (I.E. WITHIN OR ABOVE A CSW ELEMENT).

N. CABLING TO EACH SENSOR (REQUIRING CABLING) SHALL BE INCLUDED SUCH THAT DATA MAY BE OBTAINED AT ALL PHASES OF CONSTRUCTION AND WHEN THE NEW CONSTRUCTION IS IN SERVICE. THE DISTANCE FROM THE DATA ACQUISITION SYSTEM TO ANY GIVEN SENSOR SHALL BE A MINIMUM HORIZONTAL DISTANCE FROM THE SENSOR TO THE OUTSIDE OF THE NEAREST RETAINING WALL OR ABUTMENT FACE, PLUS A MINIMUM CABLING AMOUNT TO PROVIDE FOR ANY NECESSARY VERTICAL TRAVEL TO THE GROUND SURFACE, PLUS 6 FT.

O. THE INSTRUMENTATION INSTALLATIONS SHALL BE ADEQUATELY PROTECTED FROM CONSTRUCTION IMPACTS, DURING CONSTRUCTION, AS WELL AS WEATHER EFFECTS, AND VANDALISM. APPROPRIATE LOCKED CASINGS AND/OR REMOVABLE CABLING AND PLASTIC CONNECTOR CAPS AND RELATED PROTECTIVE DEVICES SHALL BE PROVIDED TO ENSURE THE INTEGRITY OF THE INSTRUMENTATION OVER THE PROPOSED MONITORING DURATION.

P. THE PLAN FOR INSTALLATION OF INSTRUMENTATION SHALL BE APPROVED BY THE DESIGNER AND SUBMITTED TO THE ENGINEER FOR ACCEPTANCE PRIOR TO PLACEMENT.

PART 9 ACCEPTANCE CRITERIA

9.1 ACCEPTANCE CRITERIA: THE COLUMN-SUPPORTED EMBANKMENT IS CONSIDERED ACCEPTABLE WHEN THE EMBANKMENT CONSTRUCTION AND QC/QA REQUIREMENTS ARE COMPLETED IN ACCORDANCE WITH SECTION 6, COMPLIANCE WITH THE PERFORMANCE CRITERIA FROM PARAGRAPH 1.1 IS DEMONSTRATED, AND NO DAMAGE TO ADJACENET FACILITIES IS FOUND OR COMPENSATION IS MADE FOR DAMAGED CAUSED OR DAMAGE IS REPAIRED AT CONTRACTOR'S EXPENSE.

PART 10 CSW PAYMENT

10.1 ALL COST IN CONNECTION WITH MOBILIZATION AND DEMOBILIZATION OF MATERIALS, EQUIPMENT AND LABOR FOR THE CONSTRUCTION OF COLUMN-SUPPORTED WALLS (CSW) AS REQUIRED IN THIS SPECIFICATION, SHALL BE PAID FOR UNDER ITEM 203 - ROADWAY MISC; COLUMN SUPPORTED WALLS.

10.2 ALL COST IN CONNECTION WITH DESIGN, EQUIPMENT, MATERIAL, AND LABOR FOR THE INSTALLATION OF COLUMN-SUPPORTED WALLS (CSW), INCLUDING COLUMN MATERIALS AND CONSTRUCTION, QC MONITORING, INSTRUMENTATION, WORKING AND LOAD TRANSFER PLATFORM MATERIALS, WICK DRAINS IF NECESSARY TO MEET SETTLEMENT REQUIREMENTS, AND THE GEOSYNTHETIC REINFORCEMENTS AS REQUIRED IN THIS SPECIFICATION, SHALL BE INCIDENTAL TO ITEM 203. SEPARATE PAYMENT WILL NOT BE MADE FOR SITE PREPARATION, DEWATERING, TEMPORARY WORKS TO FACILITATE CONSTRUCTION, ETC. INCLUDE ALL THE ANTICIPATED COSTS IN PRICE BID FOR ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS. GROUND IMPROVEMENT AREAS HAVE BEEN DEFINED IN THE PLANS FOR BIDDING PURPOSES. ADDITIONAL COLUMN SUPPORTS SHALL BE PROVIDED AS NECESSARY BEYOND THE DEFINED AREAS TO SATISFY GLOBAL STABILITY AND SHALL BE INCIDENTAL TO THIS ITEM.

10.3 ALL COSTS ASSOCIATED WITH THE INSTALLATION OF TEST COLUMNS, REACTION FRAMES, INSTRUMENTATION, PERFORMANCE, ANALYSIS, AND REPORTING OF TEST RESULTS TO ENGINEER SHALL BE INCLUDED IN UNIT BID FOR ITEM 203 - ROADWAY, MISC.: COLUMN SUPPOPRTED WALLS.

10.4 THE TERMS CSW AND COLUMN SUPPORTED WALLS SHALL BE USED INTERCHANGEABLY THROUGHOUT THE PLANS.

NO.	DESCRIPTION	REV. BY	DATE
1	REVISED NOTE	MOJ	11-5-2021

DESIGN AGENCY
GPD GROUP.
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DESIGNED DGN | DRAWN MOJ | REVIEWED TJW | DATE 9-6-19
CHECKED RHC | REVISED | STRUCTURE FILE NUMBER

RETAINING WALL GENERAL NOTES

FRA-70/71-12.68/14.86
PID No. 105523

6B / 14

703B
1815

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11/5/2021
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PROPRIETARY RETAINING WALL DATA (4W5, 4W8, 4W10, 4W11)

FOR ALL MSE WALL PORTIONS BELOW A BRIDGE ABUTMENT, THE PROPRIETARY WALL SUPPLIER SHALL DESIGN THE INTERNAL STABILITY OF A MECHANICALLY STABILIZED EARTH (MSE) WALL IN ACCORDANCE WITH SS840 TO SUPPORT THE ABUTMENT. THE DESIGN FOR INTERNAL STABILITY SHALL INCLUDE A NOMINAL (I.E. UNFACTORED) HORIZONTAL STRIP LOAD DUE TO FRICTION (FR) FROM THE SUPERSTRUCTURE APPLIED PERPENDICULAR TO THE FACE OF WALL AT THE BASE OF THE CONCRETE FOOTING. SEE BELOW FOR STRIP LOADS AT INDIVIDUAL WALLS/BRIDGES. THIS STRIP LOAD DOES NOT INCLUDE EARTH PRESSURE LOADS FROM THE ABUTMENT BACKFILL. HOWEVER, THE PROPRIETARY WALL SUPPLIER SHALL INCLUDE EARTH PRESSURE LOADS FROM THE ABUTMENT BACKFILL IN THE DESIGN CALCULATIONS.

MSE WALL	BRIDGE	NOMINAL HORIZONTAL STRIP LOAD DUE TO FRICTION
4W5	FRA-70-1373A	1.4 K/FT
	FRA-70-1373R	1.2 K/FT
4W8	FRA-70-1358A	1.7 K/FT
	FRA-70-1358R	1.8 K/FT
	FRA-70-1373A	1.4 K/FT
	FRA-70-1373R	1.2 K/FT
4W10	FRA-70-1358A	1.7 K/FT
	FRA-70-1358R	1.8 K/FT
4W11	FRA-71-1518A	2.1 K/FT

ITEM 840 - MECHANICALLY STABILIZED EARTH WALL (4W10, 4W11, 4W12)

CONSTRUCTION AND PAYMENT FOR THE MECHANICALLY STABILIZED EARTH (MSE) WALLS SHALL BE IN ACCORDANCE WITH SS840 EXCEPT AS MODIFIED BELOW.

FOR EACH WALL, PROVIDE MINIMUM SOIL REINFORCEMENT LENGTHS AS LISTED IN THE PLAN NOTES ON SHEET 11/14.

ITEM 840 - MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN: (4W8, 4W20)

THE CONTRACTOR AND MANUFACTURER SHALL COMPLY WITH THE REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION 840, EXCEPT REFERENCES, MATERIALS, AND PAY ITEMS ASSOCIATED WITH FOUNDATION PREPARATION SHALL BE REPLACED WITH ITEM 203 - ROADWAY, MSC.: COLUMN SUPPORTED WALLS. ⚠1

FOR EACH WALL, PROVIDE MINIMUM SOIL REINFORCEMENT LENGTHS AS LISTED IN THE PLAN NOTES ON SHEET 11/14.

ITEM 840 - MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN: (4W5, 4W6)

THE FOLLOWING COMPONENT ITEMS SHALL BE PROVIDED PER THE PROVISIONS OF ODOT SUPPLEMENTAL SPECIFICATION 840 - "MECHANICALLY STABILIZED EARTH WALL".

- PRECAST CONCRETE FACING PANELS
- SOIL REINFORCEMENT
- BEARING PADS
- FOUNDATION PREPARATION MATERIALS
- CONCRETE COPING
- LEVELING PAD
- CONCRETE SEALER
- PILE SLEEVES
- CAP UNIT ADHESIVE

FOR EACH WALL, PROVIDE MINIMUM SOIL REINFORCEMENT LENGTHS AS LISTED IN THE PLAN NOTES ON SHEET 11/14.

ITEM 840 - MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN: (4W5, 4W6) (CONTINUED)

THE CONTRACTOR AND MANUFACTURER SHALL COMPLY WITH THE REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION 840, EXCEPT REFERENCES & PAY ITEMS ASSOCIATED WITH SELECT GRANULAR BACKFILL (SGB) SHALL BE REPLACED WITH THE ENGINEERING FILL (LIGHTWEIGHT CCF) SPECIFICATIONS AND REFERENCES & PAY ITEMS ASSOCIATED WITH FACING PANEL JOINT COVER SHALL BE REPLACED WITH WATERPROOFING FABRIC PER CMS 711.24. SPECIFIC SECTIONS INCLUDE:

840.02A - REPLACE SGB WITH CCF
840.02B - REPLACE SGB WITH CCF
840.02C - REPLACE SGB WITH CCF
840.03D - FURNISH A WATERPROOFING FABRIC CONFORMING TO ODOT CMS 711.24. USE AN ADHESIVE THAT SECURES THE FABRIC TO THE WALL DURING THE PLACEMENT OF THE CCF. USE A MINIMUM WATERPROOFING FABRIC WIDTH OF 24 INCHES.
840.03E - CONFORM TO ITEM SPECIAL - ENGINEERED FILL (LIGHTWEIGHT CELLULAR CONCRETE FILL) REQUIREMENTS.
840.03F - NOT APPLICABLE
840.03K - NOT APPLICABLE
840.03L - NOT APPLICABLE
840.04A - REPLACE TABLE 840.04-1 PARAMETERS WITH CCF PROPERTIES AND OMIT NOTES 6 AND 7.
840.04B.12 - REPLACE SGB WITH CCF
840.06A - PROVIDE MIX DESIGN AT PRECONSTRUCTION MEETING IN LIEU OF SGB SAMPLE
840.06F - NOT APPLICABLE
840.06G - REPLACE SGB WITH CCF AND REPLACE FACING PANEL JOINT COVER WITH WATERPROOFING FABRIC
840.06H - REPLACE SGB WITH CCF
840.06I - CONFORM TO ITEM SPECIAL - ENGINEERED FILL (LIGHTWEIGHT CELLULAR CONCRETE FILL) REQUIREMENTS AND REPLACE FACING PANEL JOINT COVER WITH WATERPROOFING FABRIC
840.06J - NOT APPLICABLE
840.06M - NOT APPLICABLE
840.06N - NOT APPLICABLE
840.09 - AND REPLACE FACING PANEL JOINT COVER WITH WATERPROOFING FABRIC

THE SOIL REINFORCEMENT USED SHALL BE COMPATIBLE WITH THE CCF AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. THE CONTRACTOR SHALL SECURE THE SOIL REINFORCEMENT SO THAT IT DOES NOT MOVE WHILE PLACING THE WET CCF.

THE CONTRACTOR SHALL SUBMIT THE PROPOSED MATERIALS, DESIGN, AND PLANS TO THE ENGINEER FOR APPROVAL AT LEAST ONE MONTH PRIOR TO BEGINNING WORK.

ITEM 840 - 6" DRAINAGE PIPE, NON-PERFORATED (4W8, 4W10)

BECAUSE THERE IS NOT A VERY GOOD LOCATION TO CONNECT THE WALL 4W8 & 4W10 DRAINAGE THAT IS TO BE CONSTRUCTED IN PROJECT 4A & 6A TO EXISTING DRAINAGE INFRASTRUCTURE, 6" DRAINAGE PIPE, NON-PERFORATED SHALL STUB THROUGH THE TEMPORARY WALL AND BE CAPPED FOR FUTURE PROJECT 4A & 6A DRAINAGE CONNECTION.

ITEM 867 - TEMPORARY WIRE FACED MECHANICALLY STABILIZED EARTH WALL (T2, T3, T4, T5)

THE CONTRACTOR SHALL DESIGN, PREPARE ENGINEERING DRAWINGS FOR, FABRICATE, AND CONSTRUCT A TEMPORARY WIRE FACED MSE WALL IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION 867.

BASIS OF PAYMENT: ALL WORK UNDER SUPPLEMENTAL SPECIFICATION 867 SHALL BE PAID FOR AT THE LUMP SUM CONTRACT BID PRICE UNDER ITEM 867 - TEMPORARY WIRE FACED MECHANICALLY STABILIZED EARTH WALL.

ITEM 867, TEMPORARY WIRE FACED MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN: (T6, T7, 4W1 TWFMSE WALL, 4W2 TWFMSE WALL)

THE FOLLOWING COMPONENT ITEMS SHALL BE PROVIDED PER THE PROVISIONS OF ODOT SUPPLEMENTAL SPECIFICATION 867 - "TEMPORARY WIRE FACED MECHANICALLY STABILIZED EARTH WALL".

- FACING UNITS
- SOIL REINFORCEMENT
- PILE SLEEVES (IF NOT ALREADY INCLUDED IN ITEM 840)

ITEM 867, TEMPORARY WIRE FACED MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN: (T6, T7) (CONTINUED)

THE CONTRACTOR AND MANUFACTURER SHALL COMPLY WITH THE REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION 867, EXCEPT REFERENCES & PAY ITEMS ASSOCIATED WITH SELECT GRANULAR BACKFILL (SGB) SHALL BE REPLACED WITH THE ENGINEERING FILL (LIGHTWEIGHT CCF) SPECIFICATIONS AND REFERENCES & PAY ITEMS ASSOCIATED WITH SOIL RETENTION FABRIC SHALL BE REPLACED WITH A SUITABLE CCF CONTAINMENT SYSTEM DESIGNED AND FURNISHED BY THE CONTRACTOR (FROM THIS POINT FORWARD REFERRED TO AS "A CCF CONTAINMENT SYSTEM". SPECIFIC SECTIONS INCLUDE:

867.02A - REPLACE SGB WITH CCF
867.02B - REPLACE SGB WITH CCF
867.02C - REPLACE SGB WITH CCF
867.02D - REPLACE SGB WITH CCF
867.03B - REPLACE SOIL RETENTION FABRIC WITH A CCF CONTAINMENT SYSTEM
867.03D - CONFORM TO ITEM SPECIAL - ENGINEERED FILL (LIGHTWEIGHT CELLULAR CONCRETE FILL) REQUIREMENTS.
867.03E - NOT APPLICABLE
867.03F - NOT APPLICABLE
867.04A - REPLACE TABLE 867.04-1 PARAMETERS WITH CCF PROPERTIES AND OMIT NOTES 6 AND 7.
867.04B.4 - REPLACE SOIL RETENTION FABRIC WITH A CCF CONTAINMENT SYSTEM
867.04B.10 - REPLACE SGB WITH CCF
867.04B.12 - REPLACE SGB WITH CCF
867.06A - PROVIDE MIX DESIGN AT PRECONSTRUCTION MEETING IN LIEU OF SGB SAMPLE
867.06E - REPLACE SGB WITH CCF AND REPLACE SOIL RETENTION FABRIC WITH A CCF CONTAINMENT SYSTEM
867.06F - REPLACE SGB WITH CCF AND REPLACE SOIL RETENTION FABRIC WITH A CCF CONTAINMENT SYSTEM
867.06G - REPLACE SGB WITH CCF
867.06H - REPLACE SGB WITH CCF AND CONFORM TO ITEM SPECIAL - ENGINEERED FILL (LIGHTWEIGHT CELLULAR CONCRETE FILL) REQUIREMENTS. REPLACE SOIL RETENTION FABRIC WITH A CCF CONTAINMENT SYSTEM
867.06I - NOT APPLICABLE
867.06J - NOT APPLICABLE
867.06K - NOT APPLICABLE
867.09 - REPLACE SGB WITH CCF AND REPLACE SOIL RETENTION FABRIC WITH A CCF CONTAINMENT SYSTEM

TWFMSE WALLS T6 & T7 SHALL USE CLASS II & CLASS III CCF AS SHOWN IN THE DESIGN PLANS WHILE THE 4W1 & 4W2 TWFMSE WALLS SHALL USE PERVIOUS CCF.

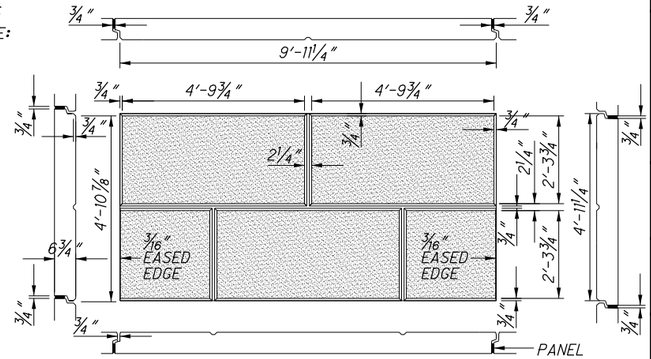
THE SOIL REINFORCEMENT USED SHALL BE COMPATIBLE WITH THE CCF AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. THE CONTRACTOR SHALL SECURE THE SOIL REINFORCEMENT SO THAT IT DOES NOT MOVE WHILE PLACING THE WET CCF.

THE CONTRACTOR SHALL SUBMIT THE PROPOSED MATERIALS, DESIGN, AND PLANS TO THE ENGINEER FOR APPROVAL AT LEAST ONE MONTH PRIOR TO BEGINNING WORK.

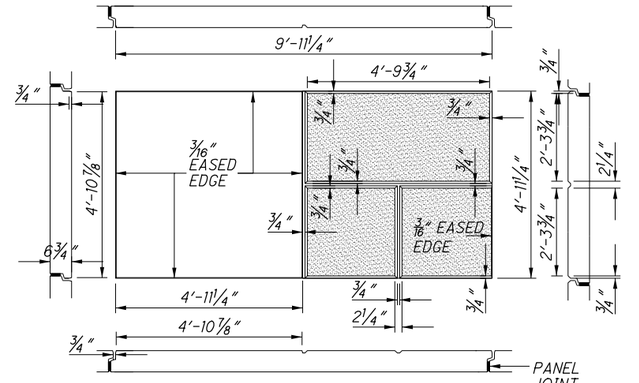
NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED ITEM	MOJ	11-5-2021

ITEM 840 AESTHETIC SURFACE TREATMENT: (4W5, 4W8, 4W10, 4W11, 4W12)

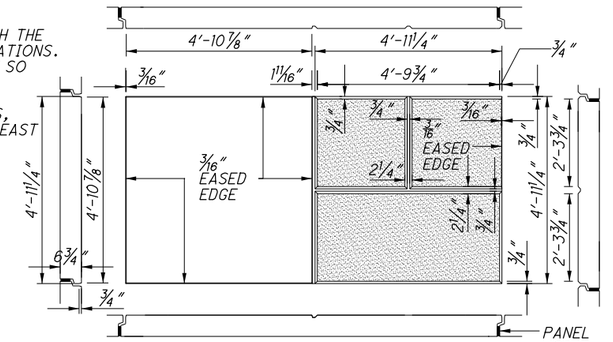
THE ITEM OF WORK SHALL CONSIST OF PROVIDING AESTHETIC TREATMENTS TO THE CONCRETE MSE WALL PANEL SURFACES. THE SURFACE FINISH SHALL BE EITHER A RUNNING BOND AESTHETIC PATTERN & TEXTURE OR A RUNNING BOND AESTHETIC PATTERN & TEXTURE WITH PILASTERS. SEE BELOW FOR DETAILS OF EACH, AND SEE INDIVIDUAL WALL PLANS FOR LOCATION OF VARIOUS SURFACE FINISHES.



RUNNING BOND ARCHITECTURAL PANEL



PILASTER ARCHITECTURAL PANEL - 1



PILASTER ARCHITECTURAL PANEL - 2

DESIGN AGENCY
GPD GROUP.
Cities, Parks, Schools, Buildings & Environments, Inc.
8800 Lyra Drive, Suite 350, Columbus, Ohio 43240 614.410.0733
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DESIGNED	DRAWN	REVIEWED	DATE
DGN	MOJ	T.JW	9-6-19
CHECKED	REVISED	STRUCTURE FILE NUMBER	
RHC			

RETAINING WALL GENERAL NOTES
MSE WALLS

FRA-70/71-12.68/14.86
PID No. 105523

10 / 14

707
1815

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CALCULATED: DK DATE: 3/12/15

CHECKED: RA DATE: 3/12/15

ESTIMATED QUANTITIES

ITEM	EXTENSION	TOTAL	PARTICIPATION 01/IMS/PV	PARTICIPATION 02/NHS/PV	UNIT	DESCRIPTION	REFERENCE SHEET NO.
203	35000	43300		43300	CY	GRANULAR EMBANKMENT	
203	35110	3285		3285	CY	GRANULAR MATERIAL, TYPE B	
203	98100	5582		5582	SY	ROADWAY MISC.: COLUMN SUPPORTED WALLS	703-703B
509	10000	79170		79170	LB	EPOXY COATED REINFORCING STEEL	
511	53012	352		352	CY	CLASS QC2 CONCRETE MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	700
512	10100	3680		3680	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	
516	13200	58		58	SF	1/2" PREFORMED EXPANSION JOINT FILLER	
516	13600	268		268	SF	1" PREFORMED EXPANSION JOINT FILLER	
516	13900	1753		1753	SF	2" PREFORMED EXPANSION JOINT FILLER	
840	20001	34590		34590	SF	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	707
840	21000	3368		3368	CY	WALL EXCAVATION	
840	23000	42100		42100	CY	SELECT GRANULAR BACKFILL	
840	25010	1620		1620	FT	6" DRAINAGE PIPE, PERFORATED	
840	25020	77		77	FT	6" DRAINAGE PIPE, NON-PERFORATED	812
840	26000	875		875	FT	CONCRETE COPING	
840	26050	34590		34590	SF	AESTHETIC SURFACE TREATMENT	707
840	27000	1		1	DAY	ON-SITE ASSISTANCE	
SPECIAL	20365000	7		7	EACH	SETTLEMENT PLATFORM	709

1

NO.	DESCRIPTION	REV. BY	DATE
1	REVISED ITEM	WCB	11/4/21

DESIGN AGENCY
DYNOTEC, INC.
2931 E. DUBLIN-GRANVILLE RD COLUMBUS, OH 43231
614.880.7320 T • WWW.DYNOTECINC.COM

REVIEWED EC DATE 3/11/2105 STRUCTURE FILE NUMBER
DRAWN DMK REVISED
DESIGNED RA CHECKED OHK

ESITMATED QUANTITIES
MSE WALL 4W8
SOUTH SIDE BETWEEN FRA-70-1358A AND FRA-70-1373A

PID No. 105523

804
1815

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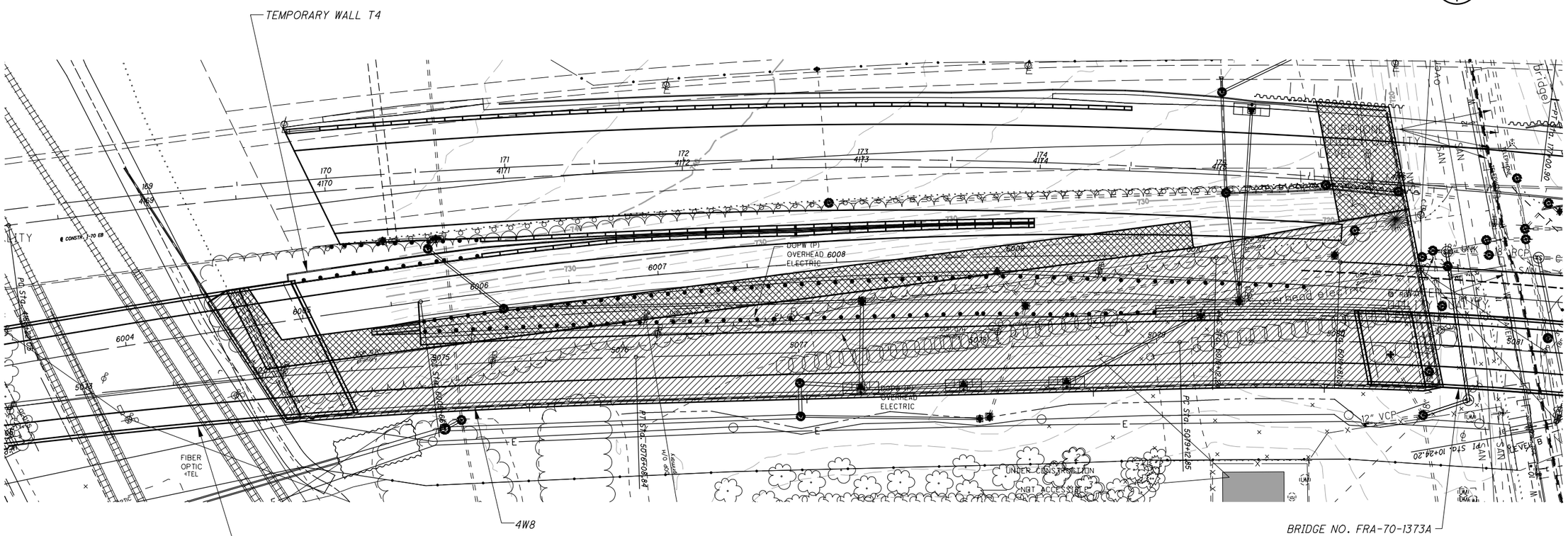

PLAN

LEGEND:

LIMIT OF GROUND IMPOVEMENT NEEDED:
39,434 SQ. FT.

LIMIT OF GROUND IMPOVEMENT NEEDED OVER EXIST. I-70 EMBANKMENT:
10,800 SQ. FT.

NO.	DESCRIPTION	REV. BY	DATE
1	REVISED NOTE	MOJ	11-5-2021

NOTES:

1. GROUND IMPROVEMENT SHALL BE IN THE FORM OF INTERMITTENTLY SPACED COLUMNS SUPPORTING A LOAD TRANSFER PLATFORM (LTP). FOR ADDITIONAL INFORMATION, SEE NOTES ON SHEET 703 - 703B OF 1815.
2. FOR SECTION VIEWS, SEE SHEET 8/15.

DESIGN AGENCY
GPD GROUP.
Glaus, Pyle, Schomer, Burns & Deweese, Inc.
8000 Walton Parkway, Suite 120, Columbus, Ohio 43215 614.210.0731
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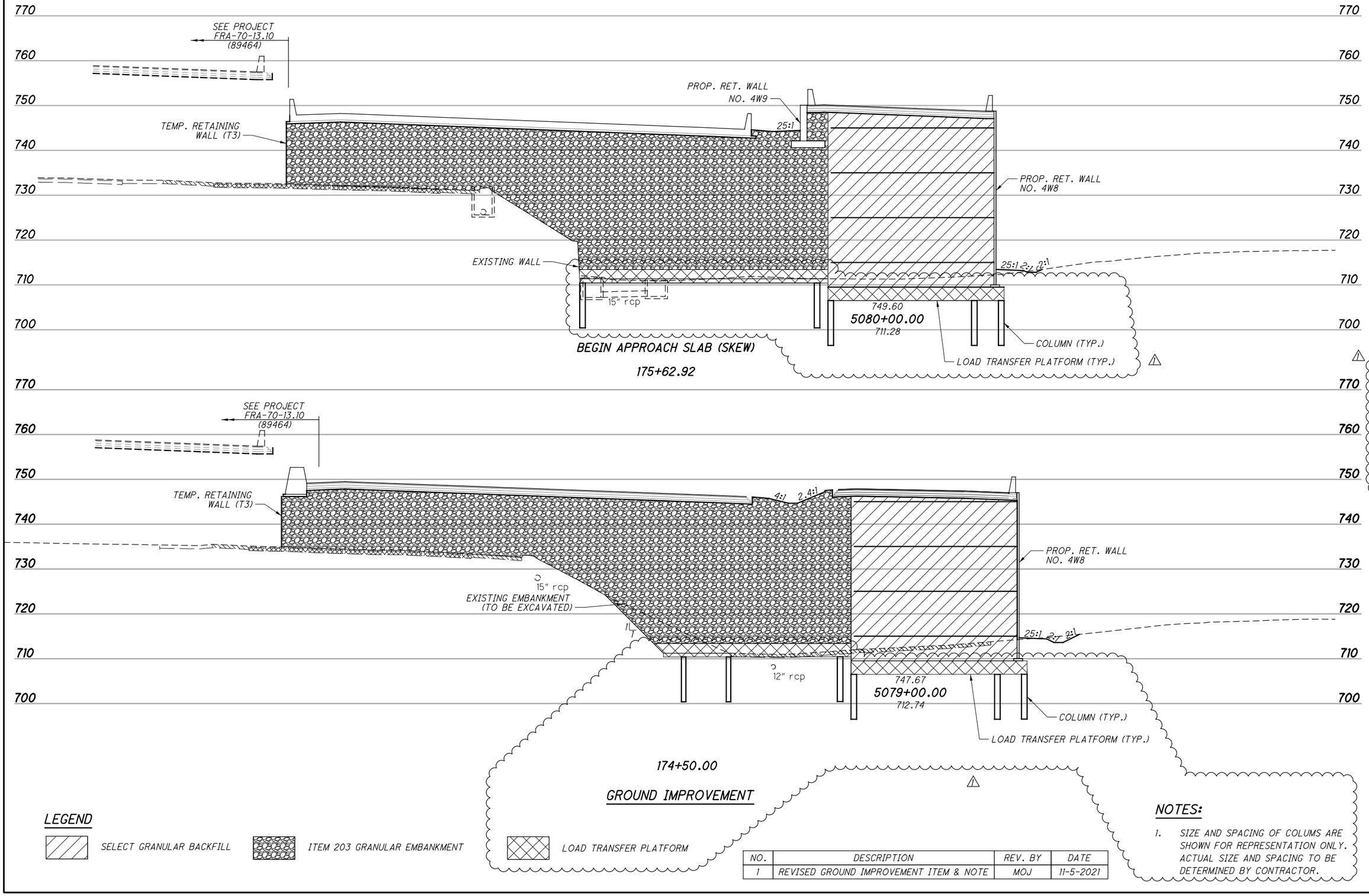
DESIGNED	DRAWN	REVIEWED	DATE
RSN	RPR	RHC	9-6-19
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DGN			

GROUND IMPROVEMENT LIMITS
MSE WALL 4W8
SOUTH SIDE BETWEEN FRA-70-1358A AND FRA-70-1373A

FRA-70/71-12.68/14.86
PID No. 105523

7 / 15

810
1815



NO.	DESCRIPTION	REV. BY	DATE
1	REVISED GROUND IMPROVEMENT ITEM & NOTE	MOJ	11-5-2021

DESIGN AGENCY
GPD GROUP.
Glaus, Pyle, Schomer, Burns & Deweese, Inc.
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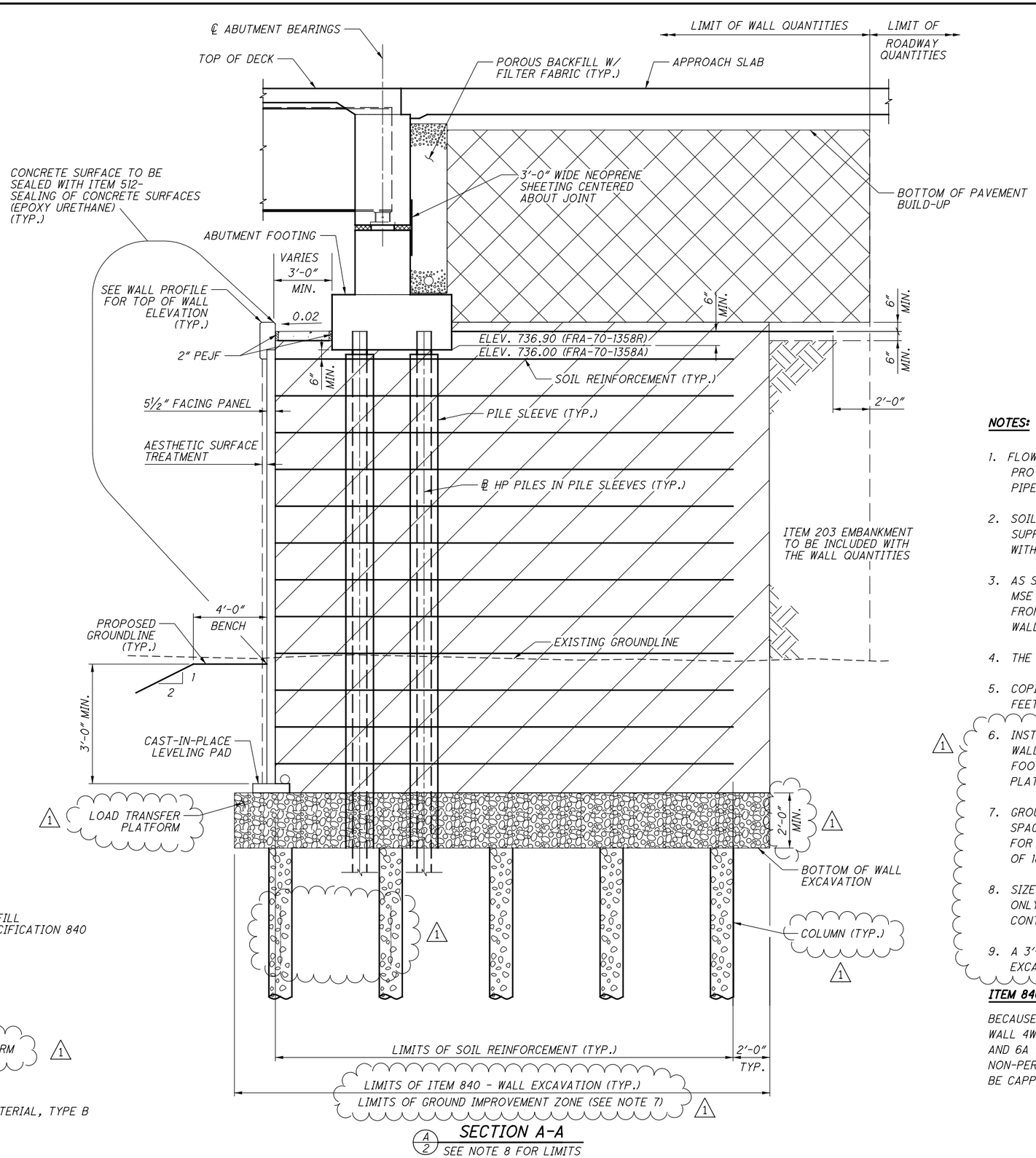
DESIGNED	DRAWN	REVIEWED	DATE
RSN	RSN	RHC	9-6-19
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DGN			

CROSS-SECTIONS OF GROUND IMPROVEMENT
MSE WALL 4W8
SOUTH SIDE BETWEEN FRA-70-1358A AND FRA-70-1373A

FRA-70/71-12.68/14.86
PID No. 105523

8 / 15

811
1815



A/2 **SECTION A-A**
SEE NOTE 8 FOR LIMITS

LEGEND:

- SELECT GRANULAR BACKFILL PER SUPPLEMENTAL SPECIFICATION 840
- ITEM 203, EMBANKMENT
- LOAD TRANSFER PLATFORM (1)
- ITEM 203 GRANULAR MATERIAL, TYPE B

NOTES:

1. FLOW LINE OF 6" DIA. PERFORATED PLASTIC PIPE WILL VARY TO PROVIDE POSITIVE DRAINAGE AT OUTLET. MINIMUM SLOPE OF PIPE SHALL BE ⅛" PER FOOT.
2. SOIL REINFORCEMENT LENGTH TO BE DETERMINED BY WALL SUPPLIER OF THE APPROVED WALL SYSTEM, AND SHALL COMPLY WITH THE REQUIREMENTS LISTED ON SHEET 708 OF 1815.
3. AS SHOWN IN THE PLANS, THE MAXIMUM DESIGN HEIGHT OF THE MSE WALL VARIES FROM 5'-1" TO 43'-4" (ACTUAL HEIGHT VARIES FROM 5'-1" TO 36'-4"), FINAL HEIGHTS TO BE DETERMINED BY WALL SUPPLIER.
4. THE THICKNESS OF MSE WALL PANELS IS ASSUMED AT 5½".
5. COPING EXPANSION JOINTS SHALL BE SPACED NO MORE THAN 20 FEET APART AND ALIGNED WITH JOINTS BETWEEN FACING PANELS.
6. INSTALL PILE SLEEVES DURING THE CONSTRUCTION OF THE MSE WALL. PILE SLEEVES SHALL EXTEND FROM BOTTOM OF ABUTMENT FOOTING TO BOTTOM OF WALL EXCAVATION/LOAD TRANSFER PLATFORM AND SHALL BE INSTALLED AS PER SS 840.06.J. (1)
7. GROUND IMPROVEMENT SHALL BE IN THE FORM OF INTERMITTENTLY SPACED COLUMNS SUPPORTING A LOAD TRANSFER PLATFORM (LTP). FOR ADDITIONAL INFORMATION, SEE NOTES ON SHEET 703-703B OF 1815.
8. SIZE AND SPACING OF COLUMNS ARE SHOWN FOR REPRESENTATION ONLY. ACTUAL SIZE AND SPACING TO BE DETERMINED BY CONTRACTOR.
9. A 3'-0" DEEP LOAD TRANSFER PLATFORM WAS ASSUMED FOR WALL EXCAVATION QUANTITIES.

ITEM 840 - 6" DRAINAGE PIPE, NON-PERFORATED

BECAUSE THERE IS NOT A VERY GOOD LOCATION TO CONNECT THE WALL 4W8 DRAINAGE THAT IS TO BE CONSTRUCTED IN PROJECT 4A AND 6A TO EXISTING DRAINAGE INFRASTRUCTURE, 6" DRAINAGE PIPE, NON-PERFORATED SHALL STUB THROUGH THE TEMPORARY WALL AND BE CAPPED FOR FUTURE PROJECT 4A AND 6A DRAINAGE CONNECTION.

NO.	DESCRIPTION	REV. BY	DATE
1	DETAILS REVISED	WCB	11/4/21

DESIGN AGENCY
DYNOTEC, INC.
2931 E. DUBLIN-GRANVILLE RD COLUMBUS, OH 43231
614.880.7320 T ▪ WWW.DYNOTECINC.COM

DESIGNED	DRAWN	REVIEWED	DATE
RA	DMK	EC	3/11/2105
CHECKED	REVISED	STRUCTURE FILE NUMBER	
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MISCELLANEOUS DETAILS
MSE WALL 4W8 SECTIONS
SOUTH SIDE BETWEEN FRA-70-1358A AND FRA-70-1373A

PID No. 105523

9 / 15

812
1815

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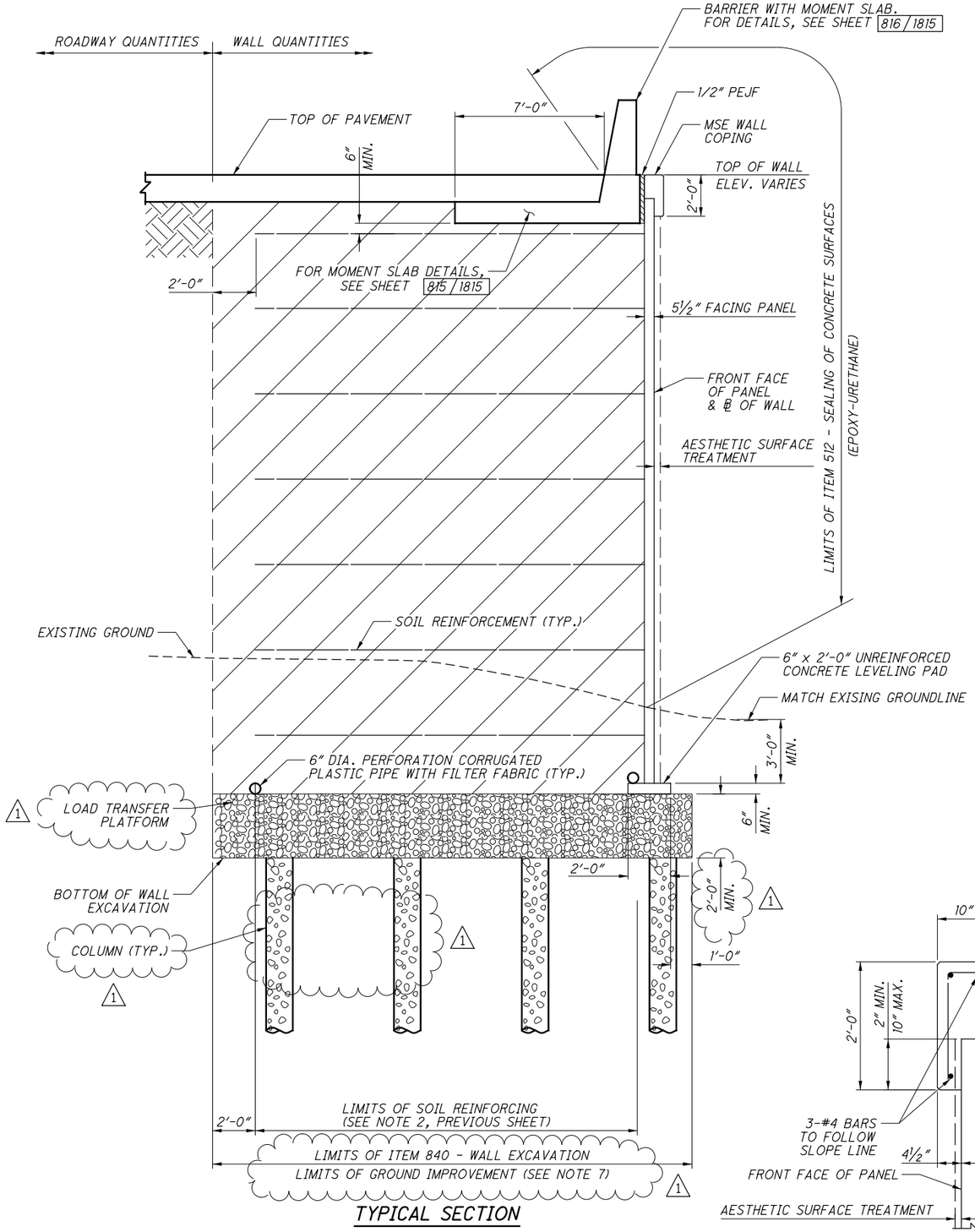
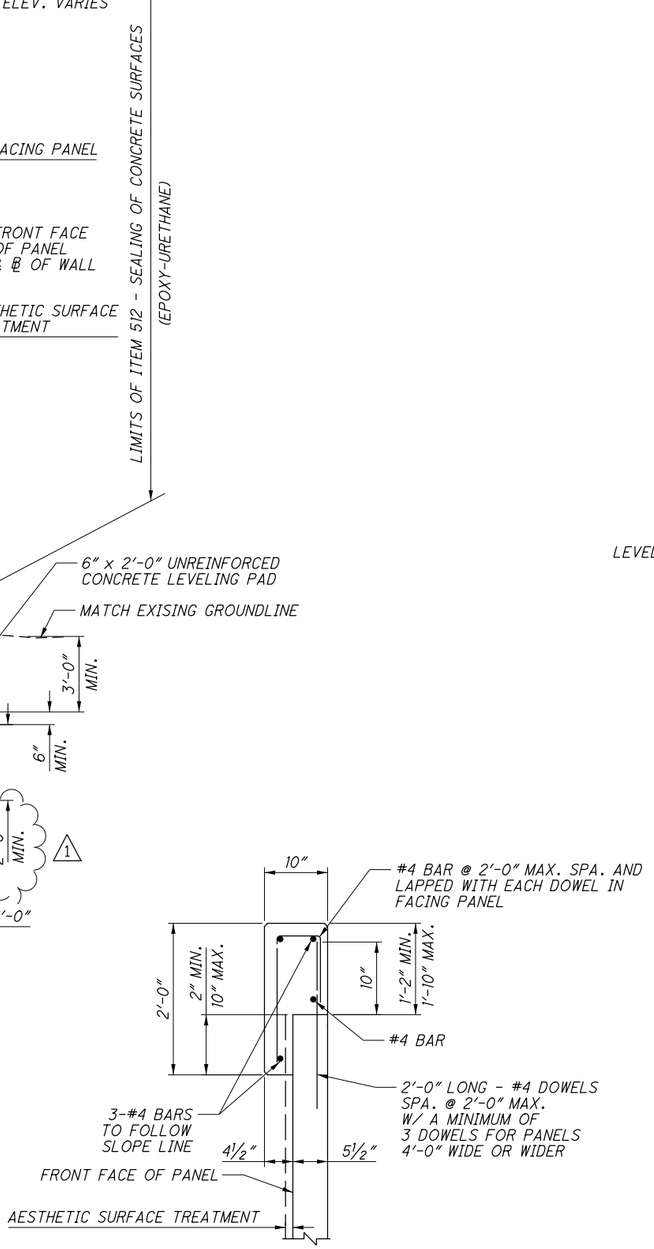
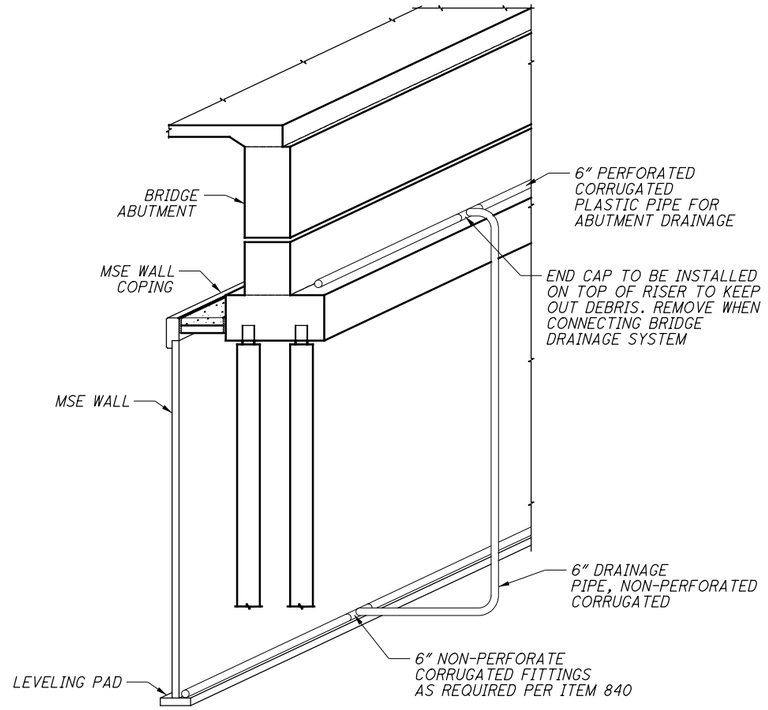


TYPICAL SECTION



MSE WALL COPING



TYPICAL DRAINAGE RISER DETAIL

(CONNECTION FROM BRIDGE DRAINAGE SYSTEM TO MSE WALL DRAINAGE)

LEGEND:

SELECT GRANULAR BACKFILL PER SUPPLEMENTAL SPECIFICATION 840

ITEM 203, EMBANKMENT

LOAD TRANSFER PLATFORM 1

NOTES:

1. FOR GROUND IMPROVEMENT AND MSE WALL NOTES, SEE SHEET 812 / 1815

1

NO.	DESCRIPTION	REV. BY	DATE
1	DETAILS REVISED	WCB	11/4/21

DESIGN AGENCY
DYNOTEC, INC.
2931 E. DUBLIN-GRANVILLE RD COLUMBUS, OH 43231
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DESIGNED	DRAWN	REVIEWED	DATE
RA	DMK	EC	3/11/2015
CHECKED	REVISED	STRUCTURE FILE NUMBER	
OHK			

MSE WALL SECTION
MSE WALL 4W8
SOUTH SIDE BETWEEN FRA-70-1358A AND FRA-70-1373A

PID No. 105523

10 / 15

813 / 1815

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ESTIMATED QUANTITIES

CALCULATED: MOJ DATE: 2-25-19
CHECKED: TJW DATE: 3-5-19

ITEM	EXT.	TOTAL 02/NHS/PV	UNIT	DESCRIPTION	AS PER PLAN SHEET __/1815
203	98100	504	SY	ROADWAY, MISC.: COLUMN SUPPORTED WALLS	703-703B
509	10000	20,943	LB	EPOXY COATED REINFORCING STEEL	
511	53012	130	CY	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	700
512	10100	614	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	
516	13900	405	SF	2" PREFORMED EXPANSION JOINT FILLER	
840	20001	4,486	SF	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	707
840	21000	1,251	CY	WALL EXCAVATION	
840	23000	2,043	CY	SELECT GRANULAR BACKFILL	
840	23050	72	CY	NATURAL SOIL	
840	25010	609	FT	6" DRAINAGE PIPE, PERFORATED	
840	25020	39	FT	6" DRAINAGE PIPE, NON-PERFORATED	
840	26000	289	FT	CONCRETE COPING	
840	27000	5	DAY	ON-SITE ASSISTANCE	

NO.	DESCRIPTION	REV. BY	DATE
1	REVISED ITEM	MOJ	11-5-2021

DESIGN AGENCY
GPD GROUP.
Cities, P.Vs, Schemes, Rivers, & Elevators, Inc.
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DESIGNED MOJ | DRAWN MOJ | REVIEWED DGN | DATE 6-9-19
CHECKED TJW | REVISED | STRUCTURE FILE NUMBER

ESTIMATED QUANTITIES
MSE WALL 4W20
RAMP C5 ADJACENT TO SUBSTATION

FRA-70/71-12.68/14.86
PID No. 105523

1 / 6

883
1815

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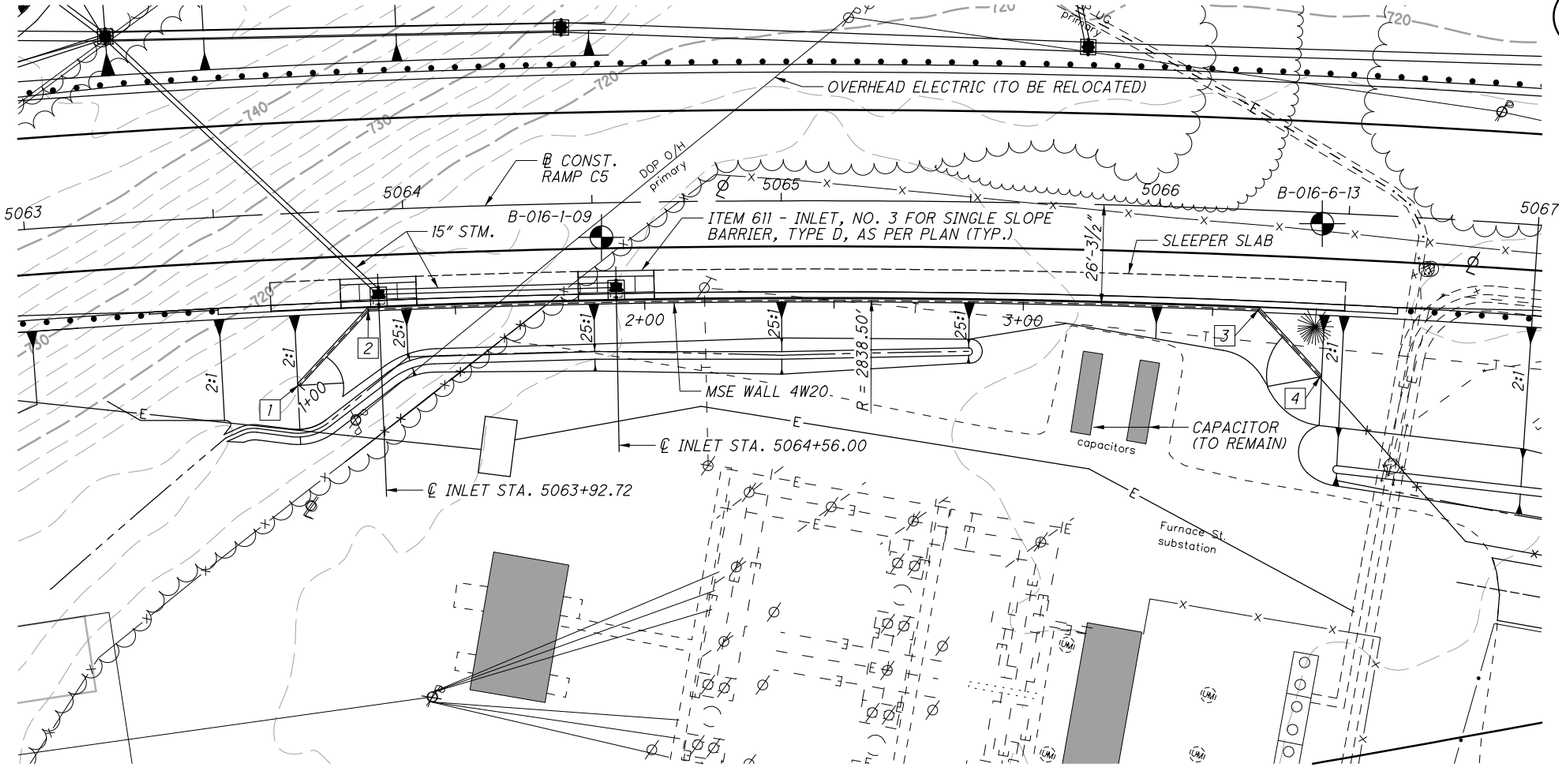
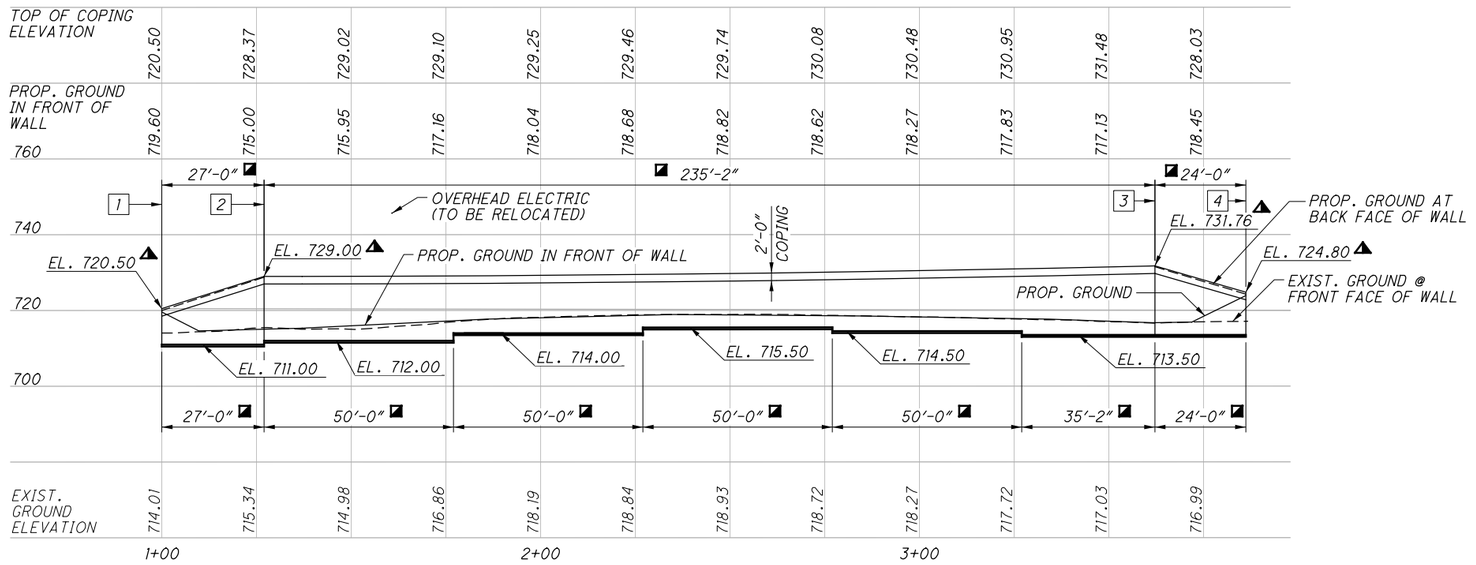


PLAN



ELEVATION ALONG ℄ CONST. WALL 4W20

LEGEND:

- [1] BEGIN WALL STA. 5063+70.43, 45.32' RT. STA. 1+00.00, 0.00' ◪
- [2] ANGLE PT. STA. 5063+89.83, 26.29' RT. STA. 1+27.00, 0.00' ◪
- [3] ANGLE PT. STA. 5066+27.17, 26.29' RT. STA. 3+62.16, 0.00' ◪
- [4] END WALL STA. 5066+44.40, 43.21' RT. STA. 3+86.16, 0.00' ◪
- ◪ MEASURED ALONG ℄ CONST. WALL 4W20 (FRONT FACE OF WALL)
- ▲ INDICATES TOP OF COPING
- PROJECT BORING LOCATION

NOTES:

1. ALL STATIONS AND OFFSETS ARE REFERENCED TO ℄ CONST. RAMP C5 UNLESS NOTED OTHERWISE.
2. FOR CURVE AND PROFILE DATA, SEE ROADWAY PLANS.
3. SEE GENERAL RETAINING WALL DETAILS (WHICH INCLUDES NOTES AND ITEM 611 INLET DETAILS), STARTING ON SHEET 698 OF 1815.

NO.	DESCRIPTION	REV. BY	DATE
1	REVISED REFERENCES	MOJ	11-5-2021

DESIGN AGENCY
GPD GROUP.
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.
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DESIGNED DGN | DRAWN RPR | CHECKED DJC | REVIEWED RHC | DATE 6-9-19 | REVISED | STRUCTURE FILE NUMBER

SITE PLAN
MSE WALL 4W20
RAMP C5 ADJACENT TO SUBSTATION

FRA-70/71-12.68/14.86
PID No. 105523

1A / 6

883A
1815

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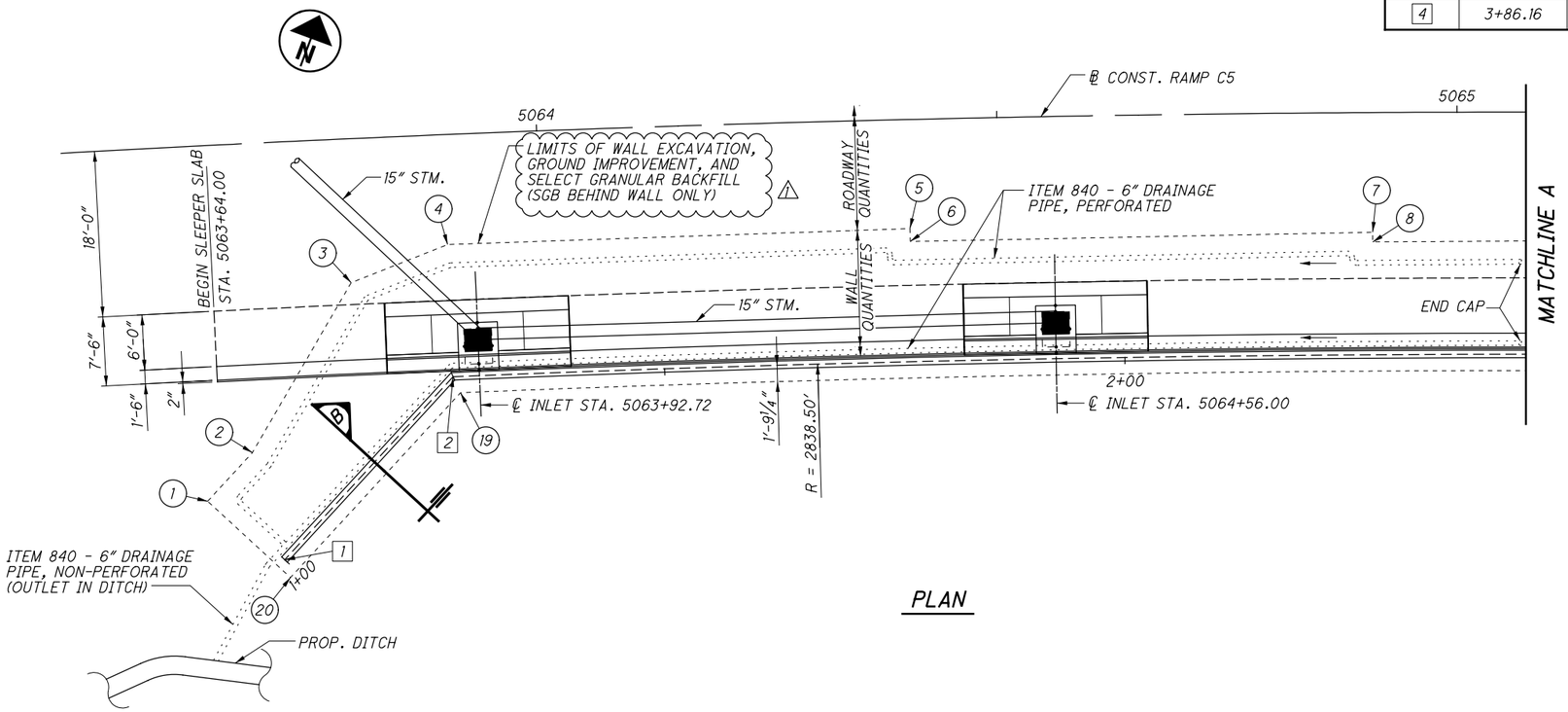
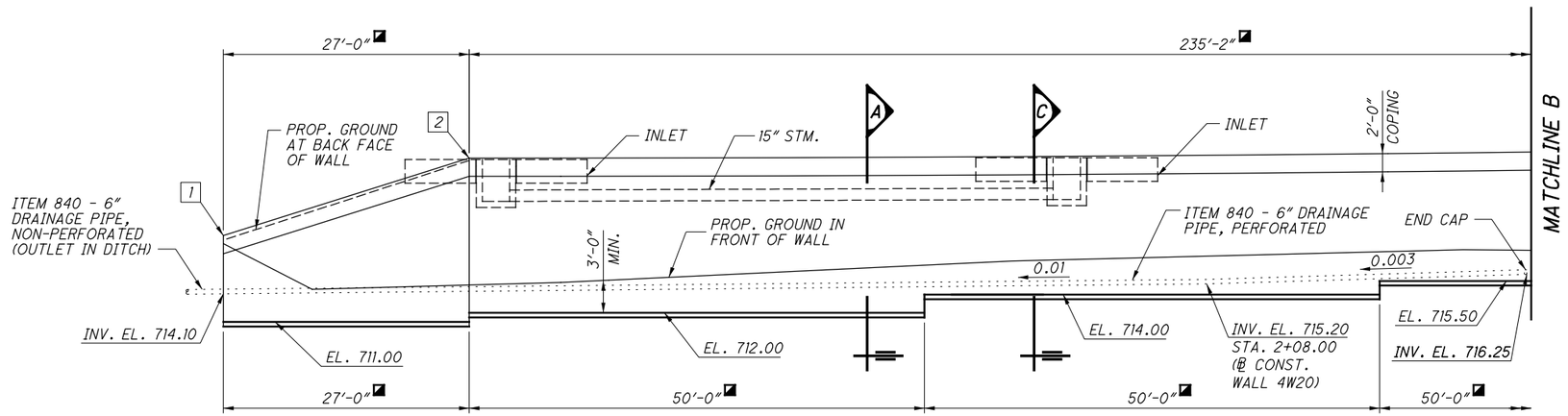
POINT	B/L CONST. WALL 4W20		B/L CONST. RAMP C5		TOP OF COPING ELEVATAION	PROPOSED ELEVATION "A"	PROPOSED ELEVATION "B"
	STATION	OFFSET	STATION	OFFSET			
1	1+00.00	0.00	5063+70.43	45.32' RT.	720.50	719.60	720.00
2	1+27.00	0.00	5063+89.83	26.29' RT.	729.00	715.05	728.75
3	3+62.16	0.00	5066+27.17	26.29' RT.	731.76	717.04	731.51
4	3+86.16	0.00	5066+44.40	43.21' RT.	724.80	723.90	724.30



PLAN

POINT	B/L CONST. WALL 4W20		B/L CONST. RAMP C5	
	STATION	OFFSET	STATION	OFFSET
1	0+99.00	10.46' LT.	5063+62.26	38.56' RT.
2	1+6.17	10.46' LT.	5063+67.44	33.54' RT.
3	1+27.00	15.06' LT.	5063+79.12	15.62' RT.
4	1+27.00	14.36' LT.	5063+89.83	11.93' RT.
5	1+77.00	14.45' LT.	5064+40.29	11.84' RT.
6	1+77.00	13.05' LT.	5064+40.29	13.24' RT.
7	2+27.00	13.30' LT.	5064+90.76	12.99' RT.
8	2+27.00	12.25' LT.	5064+90.76	14.04' RT.
9	2+77.00	12.69' LT.	5065+41.22	13.6' RT.
10	2+77.00	13.39' LT.	5065+41.22	12.9' RT.
11	3+27.00	14.01' LT.	5065+91.68	12.28' RT.
12	3+27.00	14.71' LT.	5065+91.68	11.58' RT.
13	3+62.16	15.24' LT.	5066+27.17	11.06' RT.
14	3+62.16	15.24' LT.	5066+38.00	15.50' RT.
15	3+85.72	10.46' LT.	5066+51.52	35.45' RT.
16	3+87.16	10.46' LT.	5066+52.57	36.46' RT.
17	3+87.16	1.77' RT.	5066+43.86	45.17' RT.
18	3+61.43	1.77' RT.	5066+26.43	28.06' RT.
19	1+26.27	1.77' RT.	5063+90.57	28.06' RT.
20	0+99.00	1.77' RT.	5063+70.97	47.28' RT.



DEVELOPED ELEVATION

SLEEPER SLAB NOT SHOWN

NO.	DESCRIPTION	REV. BY	DATE
1	REVISED CALLOUT	MOJ	11-5-2021

LEGEND:

◪ MEASURED ALONG ℄ CONST. WALL 4W20 (FRONT FACE OF WALL)

NOTES:

1. ALL STATIONS AND OFFSETS ARE REFERENCED TO ℄ CONST. RAMP C5 UNLESS NOTED OTHERWISE.
2. FOR MATCHLINES A AND B, SEE SHEET 3/6.
3. FOR PROPOSED ELEVATIONS "A" & "B" AND SECTIONS A, B, & C, SEE SHEET 4/6.

DESIGN AGENCY
GPD GROUP.
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.
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DESIGNED RPR/MOJ
DRAWN RPR/MOJ
CHECKED DGN
REVIEWED T.JW
DATE 6-9-19
REVISED
STRUCTURE FILE NUMBER

WALL PLAN & ELEVATION
MSE WALL 4W20
RAMP C5 ADJACENT TO SUBSTATION

FRA-70/71-12.68/14.86
PID No. 105523

2/6

884/1815

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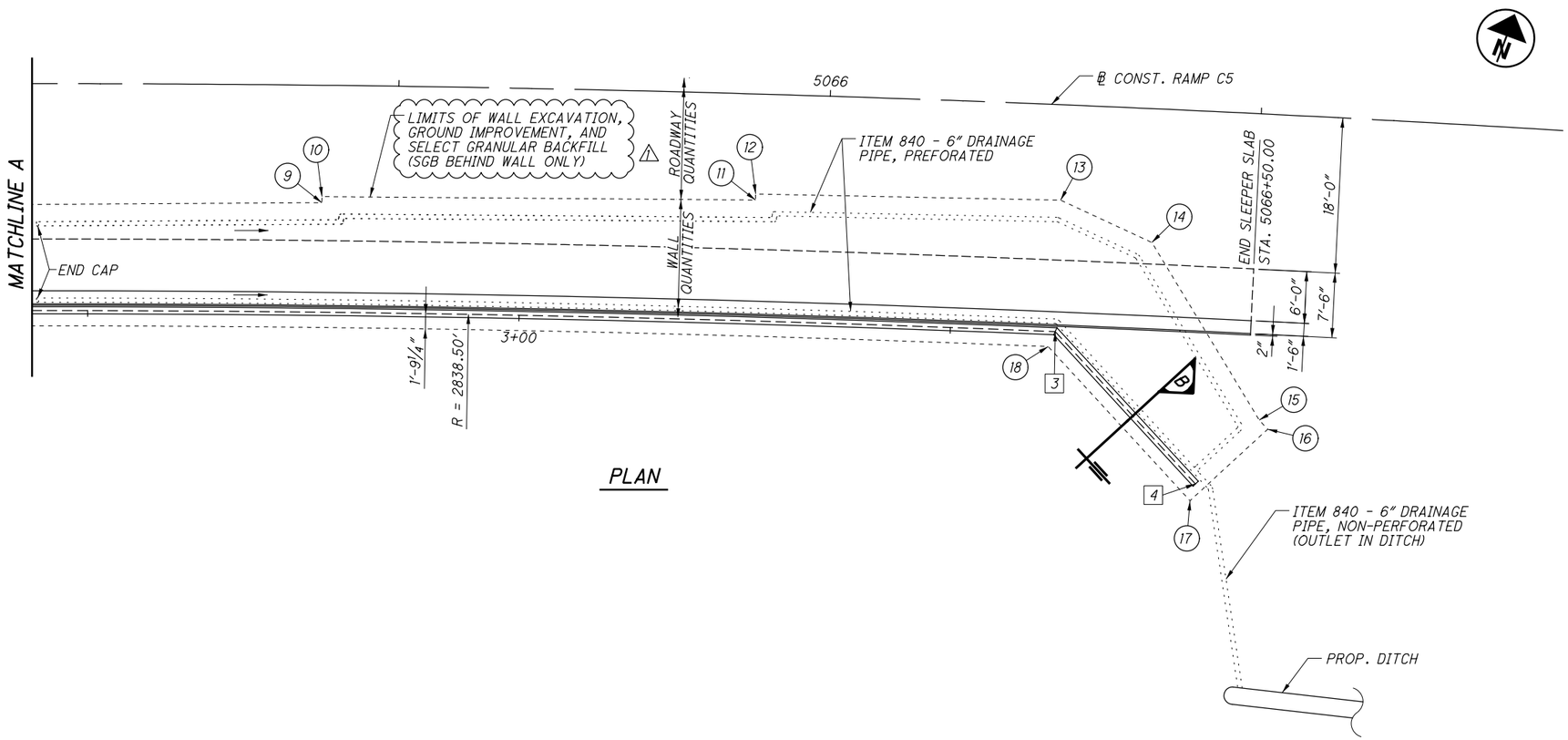
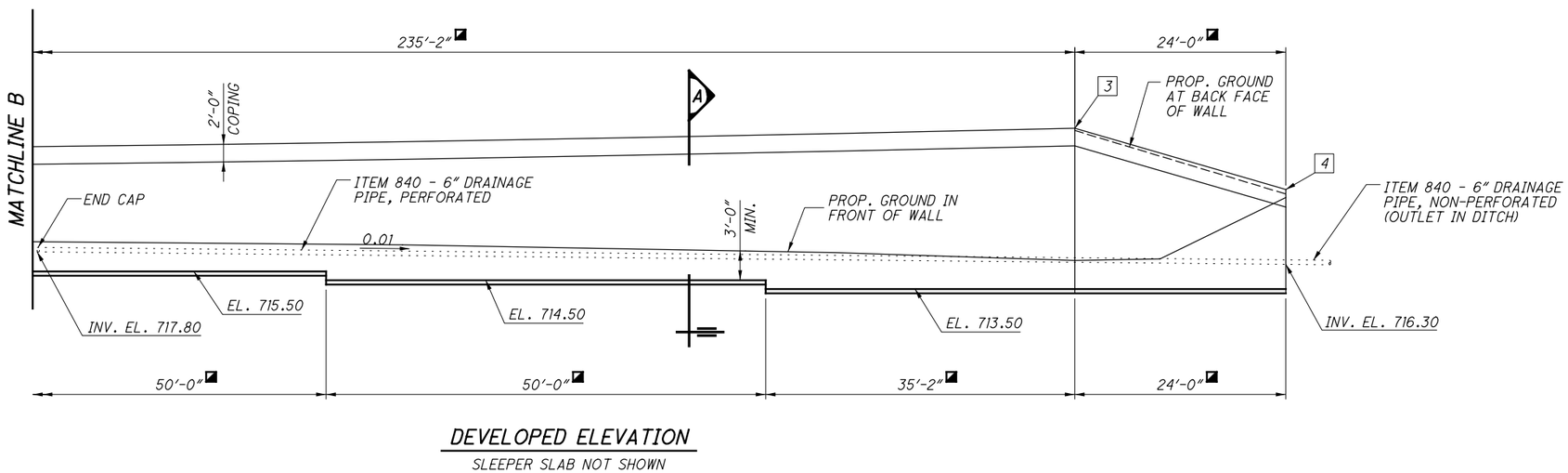


PLAN



DEVELOPED ELEVATION

SLEEPER SLAB NOT SHOWN

NO.	DESCRIPTION	REV. BY	DATE
1	REVISED CALLOUT	MOJ	11-5-2021

LEGEND:

▰ MEASURED ALONG ℄ CONST. WALL 4W20 (FRONT FACE OF WALL)

NOTES:

1. FOR ADDITIONAL NOTES, POINT LOCATIONS & ELEVATIONS, AND MATCHLINES A & B, SEE SHEET 2/6.
3. FOR SECTIONS A AND B, SEE SHEET 4/6.

DESIGN AGENCY
GPD GROUP.
Cities, P/Ts, Schools, Burns & Dickerson, Inc.
520 S. Main St., Suite 2531, Akron, Ohio 44311 - 330.572.2100
8800 Waterford Circle, Suite 150, Columbus, Ohio 43215 - 614.210.0731
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DESIGNED	DRAWN	REVIEWED	DATE
RPR/MOJ	RPR/MOJ	TJW	6-9-19
CHECKED	REVISED		
DGN			

STRUCTURE FILE NUMBER

WALL PLAN & ELEVATION
MSE WALL 4W20
RAMP C5 ADJACENT TO SUBSTATION

FRA-70/71-12.68/14.86
PID No. 105523

3 / 6

885
1815

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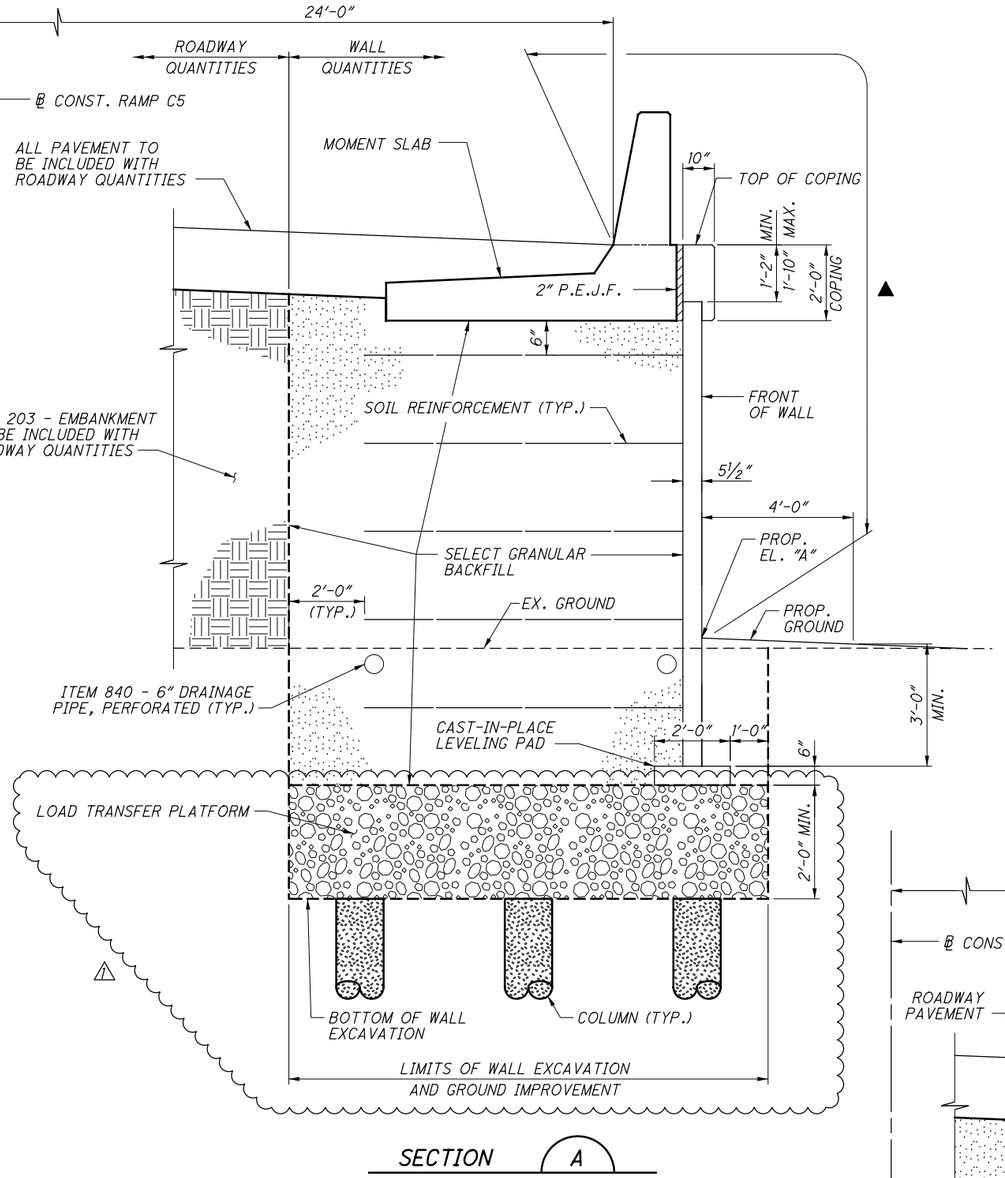
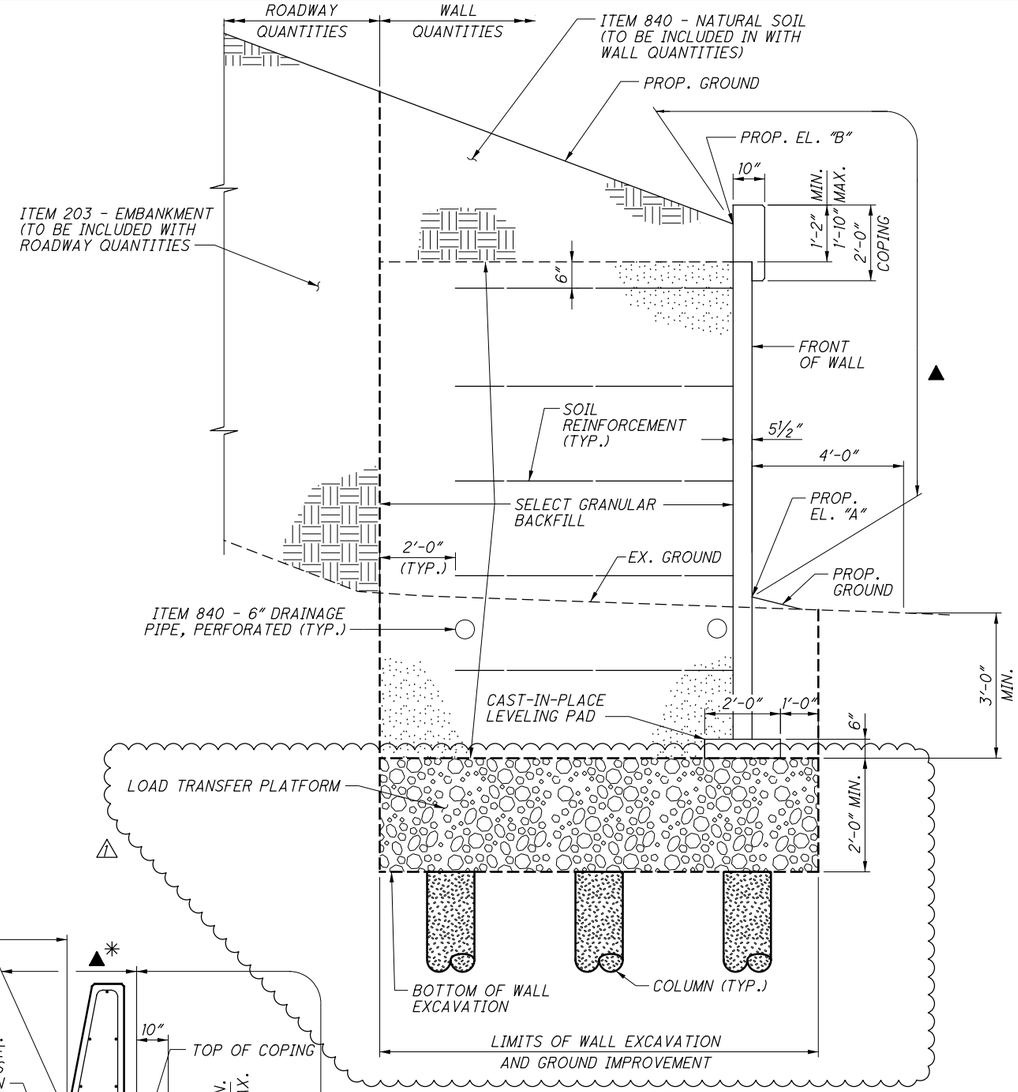
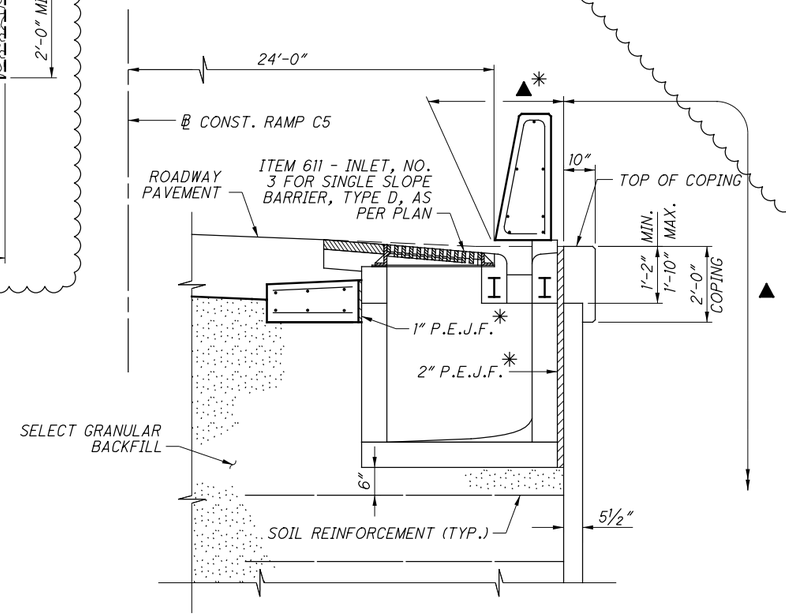


SECTION A



SECTION B



SECTION C

LEGEND:

▲ INDICATES LIMITS OF ITEM 512 - SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)

* TO BE INCLUDED WITH ITEM 611 - INLET, NO. 3 FOR SINGLE SLOPE BARRIER, TYPE D, AS PER PLAN IN THE ROADWAY QUANTITIES

NOTES:

1. FOR LOCATIONS OF SECTIONS A, B, AND C, SEE SHEETS 2/6 AND 3/6.
2. ⚠ GROUND IMPROVEMENT SHALL BE IN THE FORM OF INTERMITTENTLY SPACED COLUMNS SUPPORTING A LOAD TRANSFER PLATFORM (LTP). FOR ADDITIONAL INFORMATION, SEE NOTES ON SHEET 703-703B OF 1815.
3. A 3'-0" DEEP LOAD TRANSFER PLATFORM WAS ASSUMED FOR WALL EXCAVATION QUANTITIES.

NO.	DESCRIPTION	REV. BY	DATE
1	REVISED GROUND IMPROVEMENT ITEM & NOTE	MOJ	11-5-2021

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DESIGN AGENCY
GPD GROUP.
Glaus, Pyle, Schomer, Burns & Deweese, Inc.
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DESIGNED	DRAWN	REVIEWED	DATE
MOJ	RPR	TJW	6-9-19
CHECKED	REVISED	STRUCTURE FILE NUMBER	
DGN			

MSE WALL SECTION
MSE WALL 4W20
RAMP C5 ADJACENT TO SUBSTATION

FRA-70/71-12.68/14.86
PID No. 105523

4 / 6

886
1815

SHEET NUMBER											PARTICIPATION			ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
220	963		971	981	985	986	1049				01/IMS/PV	02/NHS/PV	10/IMS/OT/COL						
	550										242	308		621	00100	550	EACH	RPM	
	393										173	220		621	54000	393	EACH	RAISED PAVEMENT MARKER REMOVED	
						15					7	8		625	32000	15	EACH	GROUND ROD	
						4					2	2		625	32001	4	EACH	GROUND ROD, AS PER PLAN	959
240											106	134		626	00102	240	EACH	BARRIER REFLECTOR, TYPE 1, ONE-WAY	
135											59	76		626	00110	135	EACH	BARRIER REFLECTOR, TYPE 2, ONE-WAY	
					817.1						330.7	420.9	65.5	630	02100	817.1	FT	GROUND MOUNTED SUPPORT, NO. 2 POST	
					802.1						333.6	424.6	43.9	630	03100	802.1	FT	GROUND MOUNTED SUPPORT, NO. 3 POST	
					74.5						32.8	41.7		630	04101	74.5	FT	GROUND MOUNTED SUPPORT, NO. 4 POST, AS PER PLAN	959
						~~42.2~~					~~18.6~~	~~23.6~~		~~630~~	~~07600~~	~~42.2~~	~~FT~~	~~GROUND MOUNTED STRUCTURAL BEAM SUPPORT, W10X12~~	
					⚠	53.0					23.3	29.7		630	08000	53.0	FT	GROUND MOUNTED STRUCTURAL BEAM SUPPORT, W12X30	
					86.6						38.1	48.5		630	08004	86.6	FT	ONE WAY SUPPORT, NO. 3 POST	
					4						2	2		630	08200	4	EACH	GROUND MOUNTED SUPPORT, PIPE	
					1						0	1		630	08501	1	EACH	STREET NAME SIGN SUPPORT, AS PER PLAN	959
					42						~~18~~	~~24~~		~~630~~	~~08600~~	~~42~~	EACH	SIGN POST REFLECTOR	
					⚠	4					2	2		630	09000	4	EACH	BREAKAWAY STRUCTURAL BEAM CONNECTION	
						1					0	1		630	21000	1	EACH	OVERHEAD SIGN SUPPORT, TYPE TC-12.30, DESIGN 10	
						4					2	2		630	35500	4	EACH	OVERHEAD SIGN SUPPORT, TYPE TC-7.65, DESIGN 6	
						5					2	3		630	45500	5	EACH	OVERHEAD SIGN SUPPORT, TYPE TC-7.65, DESIGN 8	
						3					1	2		630	74500	3	EACH	OVERHEAD SIGN SUPPORT, MISC.: ANCHOR BOLT	959
						58					26	32		630	75000	58	EACH	SIGN ATTACHMENT ASSEMBLY	
					4						0	1	3	630	79001	4	EACH	SIGN HANGER ASSEMBLY, SPAN WIRE, AS PER PLAN	959
					17						7	8	2	630	79101	17	EACH	SIGN HANGER ASSEMBLY, MAST ARM, AS PER PLAN	959
					5						2	3		630	79500	5	EACH	SIGN SUPPORT ASSEMBLY, POLE MOUNTED	
					15						3	4	8	630	79501	15	EACH	SIGN SUPPORT ASSEMBLY, POLE MOUNTED, AS PER PLAN	959
					1184.9	268.3	⚠				603.8	768.5	80.9	630	80100	1453.2	SF	SIGN, FLAT SHEET	
					112.0	276.0					170.7	217.3		630	80200	388.0	SF	SIGN, GROUND MOUNTED EXTRUSHEET	
						~~6729.0~~					~~2960.8~~	~~3768.2~~		~~630~~	~~80224~~	~~6729.0~~	SF	SIGN, OVERHEAD EXTRUSHEET	
					9						1	1	7	630	80500	9	EACH	SIGN, DOUBLE FACED, STREET NAME	
					5						2	3		630	81020	5	EACH	CONCRETE MEDIAN BARRIER SIGN BRACKET	
						8					4	4		630	84000	8	EACH	CONCRETE BARRIER MEDIAN OVERHEAD SIGN SUPPORT FOUNDATION, TC-21.40	
						~~2~~					~~1~~	~~1~~		~~630~~	~~84010~~	~~2~~	EACH	CONCRETE BARRIER MEDIAN OVERHEAD SIGN SUPPORT FOUNDATION, TC-21.50	
					⚠	4					2	2		630	84500	4	EACH	GROUND MOUNTED STRUCTURAL BEAM SUPPORT FOUNDATION	
						~~19~~					~~8~~	~~11~~		~~630~~	~~84510~~	~~19~~	EACH	RIGID OVERHEAD SIGN SUPPORT FOUNDATION	
					4						2	2		630	84600	4	EACH	GROUND MOUNTED PIPE SUPPORT FOUNDATION	
				120							48	61	11	630	84900	120	EACH	REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL	
				2							0	1	1	630	85100	2	EACH	REMOVAL OF GROUND MOUNTED SIGN AND REERECTION	
				10							4	6		630	85400	10	EACH	REMOVAL OF GROUND MOUNTED MAJOR SIGN AND DISPOSAL	
				121							49	62	10	630	86002	121	EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL	
				15							7	8		630	86102	15	EACH	REMOVAL OF GROUND MOUNTED STRUCTURAL BEAM SUPPORT AND DISPOSAL	
				2							1	1		630	86272	2	EACH	REMOVAL OF GROUND MOUNTED PIPE SUPPORT AND DISPOSAL	
				3							1	2		630	87100	3	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND REERECTION	
				94							39	50	5	630	87400	94	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND DISPOSAL	
				66							23	30	13	630	87500	66	EACH	REMOVAL OF POLE MOUNTED SIGN AND DISPOSAL	
				6							3	3		630	89702	6	EACH	REMOVAL OF OVERHEAD SIGN SUPPORT AND DISPOSAL	
				8							4	4		630	89902	8	EACH	REMOVAL OF MISCELLANEOUS TRAFFIC CONTROL ITEM: REBOUNDABLE LONGITUDINAL CHANNELIZER TRAFFIC POST	959
							LS					1		630	95000	LS		SIGNING, MISC.: BIKE DETOUR ROUTE	1049
				1							0	1		631	94490	1	EACH	REMOVAL, MISC.: REMOVAL OF SIGN FLASHER ASSEMBLY	959
			86								38	48		644	00601	86	FT	CROSSWALK LINE, AS PER PLAN	959A
			529								233	296		644	00720	529	FT	CHEVRON MARKING	
			327								101	128	98	644	01200	327	FT	PARKING LOT STALL MARKING	
			19								8	11		644	01300	19	FT	LANE ARROW	
			3								1	2		644	01400	3	EACH	WORD ON PAVEMENT, 72"	

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED BEAM SIGN	AKF	10/22/21

CALCULATED SLB CHECKED AKF

TRAFFIC CONTROL GENERAL SUMMARY - SHEET 1 OF 2

FRA-70/71-12.68/14.86

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SIGNING SUBSUMMARY - SHEET 5 OF 5

FRA-70/71-12.68/14.86

CALCULATED SLB CHECKED AKF

SHEET NO.	REFERENCE NO.	LOCATION	STATION	SIDE	DETAIL PAGE	625 GROUND ROD EACH	625 GROUND ROD, AS PER PLAN EACH	630 GROUND MOUNTED STRUCTURAL BEAM SUPPORT, W10X12 ⚠1 FT	630 GROUND MOUNTED STRUCTURAL BEAM SUPPORT, W12X30 FT	630 BREAKAWAY STRUCTURAL BEAM CONNECTION EACH	630 OVERHEAD SIGN SUPPORT, TYPE TC-12.30, DESIGN 10 EACH	630 OVERHEAD SIGN SUPPORT, TYPE TC-7.65, DESIGN 6 EACH	630 OVERHEAD SIGN SUPPORT, TYPE TC-7.65, DESIGN 8 EACH	630 OVERHEAD SIGN SUPPORT, MISC.: ANCHOR BOLT EACH	630 SIGN ATTACHMENT ASSEMBLY EACH	630 SIGN, FLAT SHEET SF	630 SIGN, GROUND MOUNTED EXTRUSHEET SF	630 SIGN, OVERHEAD EXTRUSHEET SF	630 CONCRETE BARRIER MEDIAN OVERHEAD SIGN SUPPORT FOUNDATION, TC-21.40 EACH	630 CONCRETE BARRIER MEDIAN OVERHEAD SIGN SUPPORT FOUNDATION, TC-21.50 EACH	630 GROUND MOUNTED STRUCTURAL BEAM SUPPORT FOUNDATION EACH	630 RIGID OVERHEAD SIGN SUPPORT FOUNDATION EACH	
1029	OSS-200	I-70	385+00	RT	1056										5			200.5					
1029	OSS-201	I-70	420+50	RT	1057	2							1					495.5	2			2	
1029	OSS-202	I-70	452+00	RT	1058	2						1						465.5	2			2	
1030	S-1	I-70 EB	102+50	RT	1052			19.9/22.3		2							66.0				2		
1030	OSS-203	I-70 EB	112+00	LT/RT	1059	2							1			42.3		553.0	2			2	
1031	OSS-204	I-70 EB	121+33	LT/RT	1060										11	42.3		553.0					
1032	OSS-205	RAMP C5	5038+48	LT/RT	1061	2							1	1		42.3		153.0				4	
1033	OSS-300	RAMP C5	5057+76	LT/RT	1062		2					1		1		24.3		211.0					
1034	OSS-401	I-70 EB	4155+48	LT														49.5					
1034	OSS-301	I-70 EB	4161+25	RT	1063	1					1					6.3		121.0				1	
1034	OSS-302	RAMP C5	5069+54	LT/RT	1064	2						1				24.3		211.0				4	
1035	OSS-402	I-70 EB	4170+20	LT	1070	2							1					612.5	2			2	
1035	OSS-303	I-70 EB	4174+50	LT/RT	1065	2							1			12.5		537.0		2		2	
1036	OSS-403	I-70 EB	4182+33	LT														49.5					
1037	OSS-304	I-70 EB	4198+07	LT/RT	1066										8	6.3		416.0					
1037	OSS-404	I-70 EB	4200+29	LT														49.5					
1037	OSS-305	I-70 EB	4203+88	LT/RT	1067										9	12.5		537.0					
1037	OSS-405	I-70 EB	4205+38	LT														49.5					
1038	OSS-306	I-70 EB	218+75	LT/RT	1068										6	6.3		416.0					
1039	OSS-101	SR-315 NB	685+70	LT/RT	1053										3	6.3		182.0					
1040	OSS-102	SR-315 NB	700+50	LT/RT	1054										8	6.3		420.0					
1040	OSS-103	SR-315 NB	709+73	LT/RT	1055										8	6.3		447.0					
1041	S-28A	SR-315 NB	717+00	RT	1070A				25.8/27.2	2							210.0				2		⚠1
1042	OSS-307	RAMP C5	5087+82	LT/RT	1069		2					1		1		30.0							
TOTALS CARRIED TO TRAFFIC CONTROL GENERAL SUMMARY						15	4	42.2	⚠1 53.0	4	1	4	5	3	58	268.3	⚠1 276.0	6729.0	8	2	⚠1 4	19	

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED BEAM SIGN	AKF	10/22/21

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10/22/2021
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10/22/2021
2:09:42 PM
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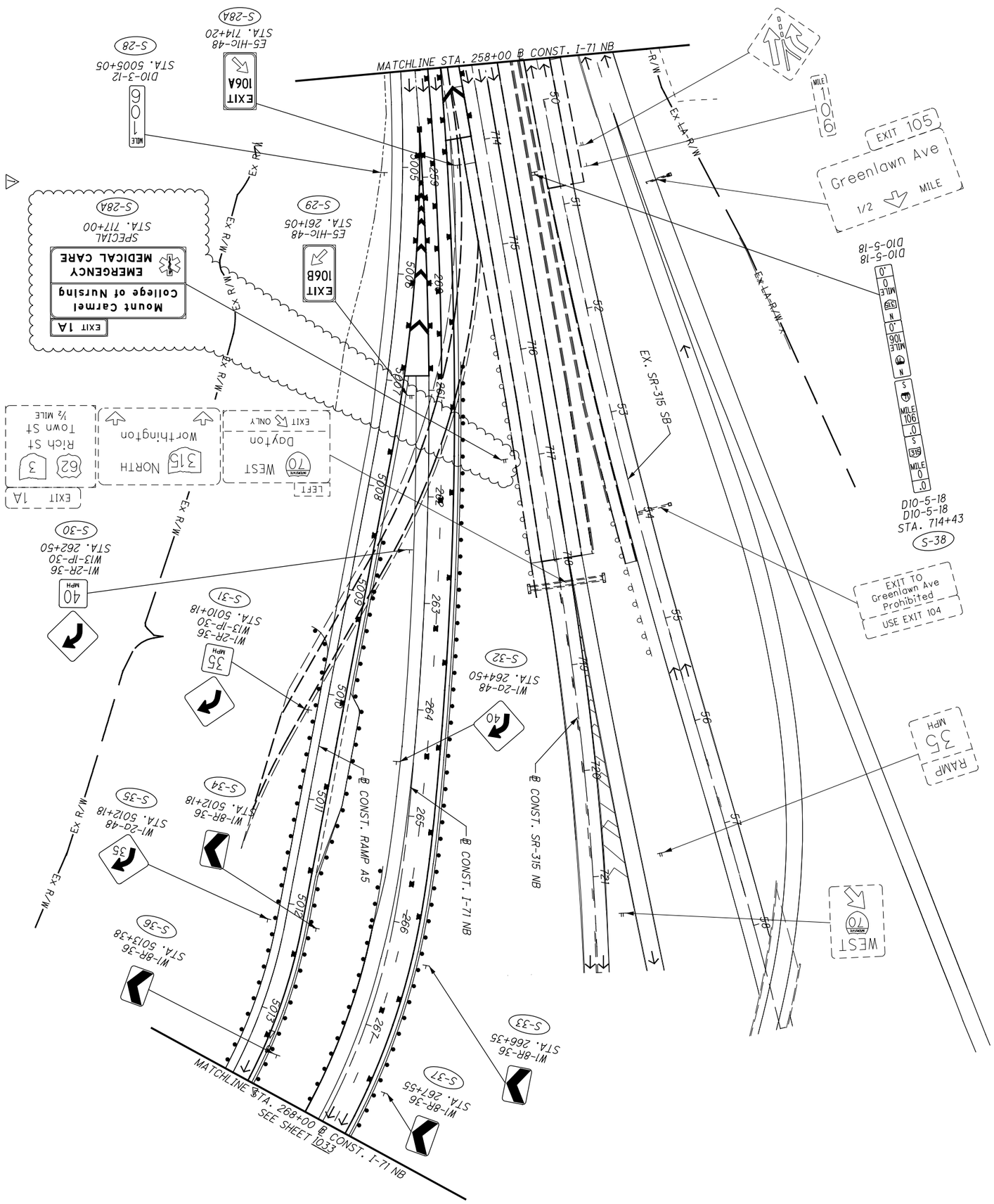
NO.	DESCRIPTION	REV. BY	DATE
1	ADDED BEAM SIGN	AKF	10/22/21

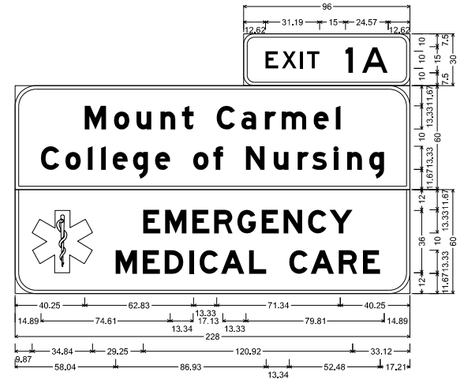


FOR PAVEMENT MARKING PLAN, SEE SHEET 1006.
FOR TRAFFIC CONTROL LEGEND, SEE SHEET 959.

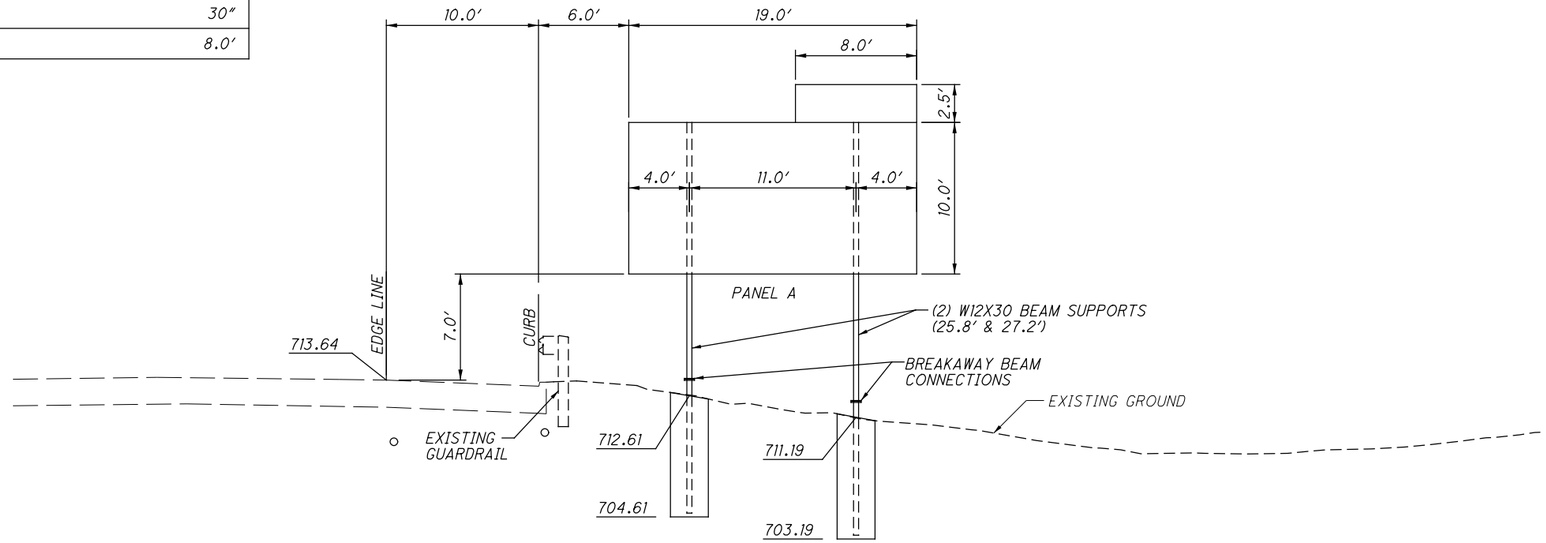
1815	1041	FRA-70/71-12.68/14.86	SIGNING PLAN - I-71 NORTHBOUND STA. 258+00 TO STA. 268+00	CALCULATED SLB	CHECKED AKF	0 50 25 100 HORIZONTAL SCALE IN FEET	N

SIGN INFORMATION	
PANEL A	
DESIGN LEVEL:	2
TEXT FONT:	E MOD
PANEL SIZE:	19′ X 5′
BACKGROUND:	GREEN
FILL COLOR:	WHITE
PANEL SIZE:	19′ X 5′
BACKGROUND:	BLUE
FILL COLOR:	WHITE
EXIT PANEL SIZE:	8′ X 2.5′
EXIT PANEL BACKGROUND:	GREEN
EXIT PANEL FILL COLOR:	WHITE
PROPOSED BEAM INFORMATION	
TOTAL SIGN AREA:	210.0 SQ. FT.
DESIGN TYPE:	W12X30
SIZE:	12-3/8″ X 6-1/2″
BEAM FOUNDATION INFORMATION	
DIAMETER:	30″
DEPTH:	8.0′

NOTES:
1. CONTRACTOR SHALL FIELD VERIFY EXISTING ELEVATIONS PRIOR TO THE ORDERING OF ANY MATERIALS.
2. ALL SIGNS ARE VIEWED IN THE DIRECTION OF TRAVEL.
3. CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN FIELD PRIOR TO ANY EXCAVATION.



PANEL A
N.T.S.



S-28A — BEAM MOUNTED SIGN SUPPORT TYPE W10X30
STA. 717+00, SR 315 NORTHBOUND

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED BEAM SIGN	AKF	10/22/21

SEE SHEET 1041 FOR PLAN VIEW.

HORIZONTAL SCALE IN FEET
0 2.5 5 10
CALCULATED SLB
CHECKED AKF

BEAM MOUNTED SIGN SUPPORT DETAILS
S-28A - STA. 717+00, SR 315 NORTHBOUND

FRA-70/71-12.68/14.86

1070A
1815

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10/22/2021
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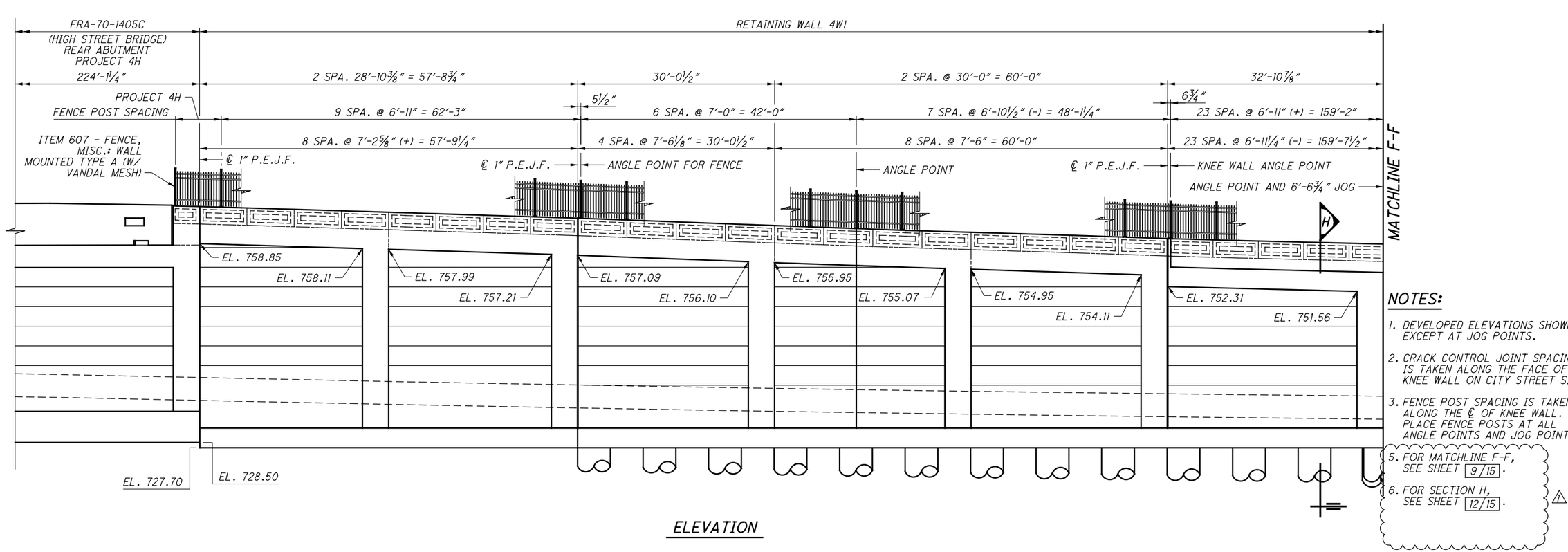
DOT\v81STD_USER

NO.	DESCRIPTION	REV. BY	DATE
1	REMOVE WALL 4W13	MOJ	11-5-2021



ELEVATION

NOTES:

1. DEVELOPED ELEVATIONS SHOWN EXCEPT AT JOG POINTS.
2. CRACK CONTROL JOINT SPACING IS TAKEN ALONG THE FACE OF KNEE WALL ON CITY STREET SIDE.
3. FENCE POST SPACING IS TAKEN ALONG THE ℄ OF KNEE WALL. PLACE FENCE POSTS AT ALL ANGLE POINTS AND JOG POINTS.
5. FOR MATCHLINE F-F, SEE SHEET 9/15.
6. FOR SECTION H, SEE SHEET 12/15.

DESIGN AGENCY
GPD GROUP.
Glaus, Pyle, Schomer, Burns & Deweese, Inc.
8000 Walton Parkway, Suite 120, Columbus, Ohio 43215 614.210.0731
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DESIGNED	DRAWN	REVIEWED	DATE
MOJ	MOJ	DGN	9-6-19
CHECKED	REVISED	STRUCTURE FILE NUMBER	
TJW			

SOUTH WALL ELEVATION - 2

STRUCTURE AESTHETIC DETAIL PLANS
I-70/I-71

FRA-70/71-12.68/14.86
PID No. 105523

1746H
1815

LEGEND

	DESCRIPTION	ODOT CLASS	CLASSIFIED MECH./VISUAL	
	GRAVEL AND/OR STONE FRAGMENTS	A-1-a	174	320
	GRAVEL AND/OR STONE FRAGMENTS WITH SAND	A-1-b	214	442
	GRAVEL AND/OR STONE FRAGS. WITH SAND & SILT	A-2-4	72	96
	GRAVEL AND/OR STONE FRAGS. WITH SAND & SILT	A-2-5	1	2
	GRAVEL AND/OR STONE FRAGS. WITH SAND, SILT & CLAY	A-2-6	23	45
	FINE SAND	A-3	2	7
	COARSE AND FINE SAND	A-3a	29	68
	SANDY SILT	A-4a	144	206
	SILT	A-4b	17	19
	SILT AND CLAY	A-6a	114	224
	SILTY CLAY	A-6b	121	166
	ELASTIC CLAY	A-7-5	2	3
	CLAY	A-7-6	76	97
	ORGANIC CLAY	A-8b	1	2
		TOTAL	990	1691
	BOULDER	VISUAL		
	CLAYSTONE / MUDSTONE	VISUAL		
	DOLOMITE	VISUAL		
	LIMESTONE	VISUAL		
	SHALE	VISUAL		

PAVEMENT OR BASE = X = APPROXIMATE THICKNESS *VISUAL*

SOD AND TOPSOIL = X = APPROXIMATE THICKNESS *VISUAL*

BORING LOCATION - PLAN VIEW.

HISTORIC BORING LOCATION - PLAN VIEW - FRA-3-14.69, 1956; FRA-40-12.30, 1957; FRA-40-12.82, 1959; FRA-70-12.21S, 1968; FRA-70-12.31S, 1968

DRIVE SAMPLE AND/OR 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.

N INDICATES STANDARD PENETRATION RESISTANCE.

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 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 A SAMPLE TAKEN WITHIN 3 FT OF PROPOSED GRADE.

W— INDICATES FREE WATER ELEVATION.

▼— INDICATES STATIC WATER ELEVATION.

#XX PROPOSED TRANSMISSION TOWER - PLAN VIEW.

2S/3S FOR INSTANCES OF NO RECOVERY FROM STANDARD SS INTERVAL, A 2.5 OR 3.0 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. BLOW COUNTS FROM 2S SAMPLING ARE NOT CORRELATED WITH N60 VALUES.

SS INDICATES A SPLIT SPOON SAMPLE.

ST INDICATES A SHELBY TUBE SAMPLE.

RC INDICATES A ROCK CORE SAMPLE.

NP INDICATES A NON-PLASTIC SAMPLE.

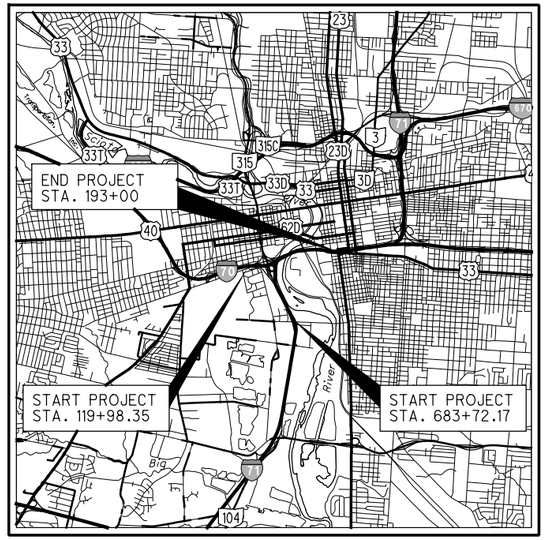
NQ INDICATES SERIES ROCK CORE BARREL.

TR INDICATES TOP OF ROCK.

WOH WEIGHT OF HAMMER AND DRILL RODS PUSHED SPLIT SPOON SAMPLER 6-INCHES.

	HISTORIC BORING DESCRIPTIONS	ODOT CLASS	CLASSIFIED MECH./VISUAL	
	GRAVEL AND/OR STONE FRAGMENTS	*A-1-a*	*88*	*9*
	GRAVEL AND/OR STONE FRAGMENTS WITH SAND	*A-1-b*	*75*	*0*
	GRAVEL AND/OR STONE FRAGS. WITH SAND & SILT	*A-2-4*	*27*	*0*
	FINE SAND	*A-3*	*1*	*1*
	COARSE AND FINE SAND	*A-3a*	*12*	*2*
	SANDY SILT	*A-4a*	*70*	*1*
	SILT	*A-4b*	*6*	*0*
	SILT AND CLAY	*A-6a*	*10*	*1*
	CLAY	*A-7-6*	*1*	*0*
		TOTAL	*290*	*14*
	BOULDER	VISUAL		
	LIMESTONE	VISUAL		
	SHALE	VISUAL		

D_{50} VALUES			
BORING NO.	SAMPLE NO.	ELEVATION	D_{50} VALUE
B-113-6-13	SS-1	691.5′ - 690.0′	0.905 mm
	SS-2	690.0′ - 688.5′	1.073 mm
	SS-3	688.5′ - 687.0′	0.902 mm
	SS-4	685.5′ - 685.0′	2.424 mm
	SS-6	680.7′ - 679.2′	9.630 mm
B-113-7-13	SS-1	690.3′ - 688.8′	0.253 mm
	SS-2	688.8′ - 687.3′	0.494 mm
	SS-3	687.3′ - 685.8′	0.466 mm
	SS-4	685.8′ - 684.3′	0.463 mm
	SS-5	684.3′ - 682.8′	0.121 mm
B-113-8-13	SS-1	691.0′ - 689.5′	1.471 mm
	SS-2	689.5′ - 688.0′	3.333 mm
	SS-3	688.0′ - 686.5′	3.264 mm
	SS-4	686.5′ - 685.0′	5.836 mm
	3S-5A	682.3′ - 681.8′	7.385 mm



LOCATION MAP

SCALE IN MILES

0 1 2 3 4

N

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	

D_{50} VALUES			
BORING NO.	SAMPLE NO.	ELEVATION	D_{50} VALUE
B-015-8-13	SS-1	692.5′ - 691.0′	3.594 mm
	SS-2	691.0′ - 689.5′	0.026 mm
	SS-3	689.5′ - 688.0′	0.136 mm
	SS-4	688.0′ - 686.5′	2.856 mm
	SS-6	682.3′ - 681.5′	5.218 mm
B-015-9-13	SS-1	691.2′ - 689.7′	0.355 mm
	SS-2	689.7′ - 688.2′	0.708 mm
	SS-3	688.2′ - 686.7′	0.602 mm
	SS-4	686.7′ - 685.2′	0.397 mm
	SS-5	684.7′ - 683.2′	1.530 mm
B-016-3-13	SS-1	685.0′ - 683.5′	5.839 mm
	SS-2	683.5′ - 682.0′	0.147 mm
	SS-3	682.0′ - 680.5′	0.139 mm
	SS-4	680.5′ - 679.0′	0.971 mm
	SS-5	679.0′ - 677.5′	5.202 mm

RECON. - RII RB/CS/VV/KR/BT/BS 05/31/13 TO 11/19/20

DRILLING - RII JB/JK/RB/SB/SM/TF/LH 06/03/13 TO 12/13/21
STOCK A/C/J/KR/TB 07/11/13 TO 04/17/15
DLZ J/K 06/30/08 TO 07/24/10

DRAWN - RRM 01/08/15 TO 07/16/18

REVIEWED - BRT 01/08/15 - 06/25/21

NO.	DESCRIPTION	REV. BY	DATE
1	REVISED SOIL PROFILE SHEETS	BRT	11/02/2021
.	.	.	.

⚠1 THE ENTIRE SOIL PROFILE HAS BEEN UPDATED.

DESIGN AGENCY
RESOURCE INTERNATIONAL
6350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43021

PID NO. 77372 89464

SOIL PROFILE

FRA-70-12.68
FRA-70-13.10

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INDEX OF SHEETS

SUMMARY OF SOIL TEST DATA, SHEETS 15 - 17.

SPECIALTY TESTING, SHEETS 18 - 64.

LOCATION FROM STA.	TO STA.	PLAN VIEW SHEET	PROFILE SHEET	CUT MAX.	FILL EMB. MAX.	STRUCTURES INCLUDED BRIDGE NO.	SFN
I-70 EB							
119+98.35	132+50	65	65	<1 FT	<1 FT		
132+50	145+50	66	66	- FT	<1 FT		
145+50	158+50	67	67	- FT	4 FT		
158+50	171+50	68	68	- FT	12 FT		
171+50	184+50	69	69	10 FT	15 FT		
184+50	192+59.19	70	70	5 FT	<1 FT		
TRANS. I-70 WB (WEST SIDE)							
542+39.13	548+79.18	71	71	- FT	8 FT		
I-70 WB							
148+79.18	161+50	72	72	- FT	9 FT		
161+50	174+50	73	73	- FT	23 FT		
174+50	187+50	74	74	<1 FT	25 FT		
187+50	193+00	75	75	- FT	2 FT		
I-71 NB							
252+86.40	265+50	76	76	4 FT	21 FT		
265+50	276+37.29	77	77	- FT	25 FT		
I-71 SB							
683+61.89	210+50	78	78	<1 FT	<1 FT		
210+50	223+50	79	79	- FT	7 FT		
223+50	231+00	80	80	- FT	35 FT		
RAMP A5							
5003+23.96	5012+00	81	81	5 FT	27 FT		
5012+00	5018+86.40	82	82	- FT	32 FT		
RAMP B3							
3000+23.82	3014+50	83	83	2 FT	7 FT		
RAMP C3							
3000+16.87	3009+00	84	84	- FT	24 FT		
3004+00	3017+00	85	85	<1 FT	41 FT		
RAMP C5							
5024+38.21	5037+50	86	86	<1 FT	17 FT		
5037+50	5050+50	87	87	- FT	15 FT		
5050+50	5063+50	88	88	12 FT	- FT		
5063+50	5076+50	89	89	2 FT	36 FT		
5076+50	5085+00	90	90	- FT	42 FT		
5085+00	5091+37.94	91	91	- FT	1 FT		
TRANS. RAMP D3 N							
831+90	842+03.33	92	92	2 FT	8 FT		
TRANS. RAMP D3 W							
3037+56.02	3041+94.28	93	93	<1 FT	7 FT		
RAMP D6							
6000+00	6005+61.78	94	94	2 FT	41 FT		
RAMP D7							
7000+00	7013+50	95	95	- FT	39 FT		
MOUND STREET							
10+00	23+00	96	96	<1 FT	2 FT		
23+00	19+00	97	97	<1 FT	<1 FT		
SHORT STREET							
8+00	15+21.73	98	98	<1 FT	<1 FT		
FRONT STREET							
147+75	156+03.49	99	99	<1 FT	<1 FT		
FULTON STREET							
18+95.96	28+00	100	100	<1 FT	<1 FT		
HIGH STREET							
147+95	152+36.07	101	101	<1 FT	<1 FT		

INDEX OF SHEETS

LOCATION FROM STA.	TO STA.	PLAN VIEW SHEET	PROFILE SHEET	CUT MAX.	FILL EMB. MAX.	STRUCTURES INCLUDED BRIDGE NO.	SFN
LIVINGSTON AVENUE							
200+04.24	209+55	102	102	<1 FT	<1 FT		
BIKE PATH							
8+02.41	21+28.97	103	103	<1 FT	<1 FT		
RAMP C5							
5030+00	5034+00	104	105	- FT	- FT	FRA-70-1282R	
RAMP C5							
5041+00	5046+50	106	107	- FT	- FT	FRA-70-1301A	
5046+50	5052+00	108	109	- FT	- FT	FRA-70-1301A	
I-70 EB							
130+00	135+00	109A	109A	- FT	- FT	FRA-70-1301R	
135+00	140+50	109B	109C	- FT	- FT	FRA-70-1301R	
140+50	143+50	109D	109E	- FT	- FT	FRA-70-1301R	
143+50	146+50	109F	109F	- FT	- FT	FRA-70-1301R	
I-70 EB							
147+00	152+00	110	111	- FT	- FT	FRA-70-1321R	
152+00	157+00	112	113	- FT	- FT	FRA-70-1321R	
157+00	162+00	114	115	- FT	- FT	FRA-70-1321R	
RAMP C5							
5050+00	5055+00	116	117	- FT	- FT	FRA-70-1321A	
5055+00	5060+00	118	119	- FT	- FT	FRA-70-1321A	
5060+00	5065+00	120	121	- FT	- FT	FRA-70-1321A	
I-70 WB							
148+00	153+00	122	123	- FT	- FT	FRA-70-1322L	
153+00	158+00	124	125	- FT	- FT	FRA-70-1322L	
158+00	161+00	126	127	- FT	- FT	FRA-70-1322L	
RAMP D3							
3041+00	3046+00	128	129	- FT	- FT	FRA-70-1323C	
3046+00	3051+00	130	131	- FT	- FT	FRA-70-1323C	
3051+00	3054+00	132	133	- FT	- FT	FRA-70-1323C	
I-70 WB							
165+00	170+00	134	135	- FT	- FT	FRA-70-1358L	
I-70-EB							
166+00	171+00	136	137	- FT	- FT	FRA-70-1358R	
RAMP C5							
5070+25	5075+75	138	139	- FT	- FT	FRA-70-1358A	
RAMP D7							
7006+00	7011+00	140	141	- FT	- FT	FRA-70-1373B	
I-70 WB							
173+50	178+50	142	143	- FT	- FT	FRA-70-1373L	
I-70 EB							
174+50	178+50	144	145	- FT	- FT	FRA-70-1373R	
RAMP C5							
5079+00	5083+00	146	147	- FT	- FT	FRA-70-1373A	
RAMP C5							
5084+00	5089+00	148	149	- FT	- FT	FRA-70-1390C	
5089+00	5091+37.94	150	151	- FT	- FT	FRA-70-1390C	
FRONT ST.							
148+00	152+00	152	153	- FT	- FT	FRA-70-1395C	
HIGH ST.							
148+00	152+00	154	155	- FT	- FT	FRA-70-1405C	
I-71 SB							
230+00	235+00	156	157	- FT	- FT	FRA-71-1503L	
235+00	240+00	158	159	- FT	- FT	FRA-71-1503L	
240+00	245+00	160	161	- FT	- FT	FRA-71-1503L	
245+00	250+00	162	163	- FT	- FT	FRA-71-1503L	
250+00	255+00	164	165	- FT	- FT	FRA-71-1503L	

DRAWN RRM
CHECKED BRT

SOIL PROFILE

FRA-70-12.68
FRA-70-13.10

INDEX OF SHEETS						
LOCATION FROM STA.	TO STA.	PLAN VIEW SHEET	PROFILE SHEET	CUT MAX.	FILL EMB. MAX.	STRUCTURES INCLUDED WALL NO.	SFN
I-71 SB							
255+00	260+00	166	167	- FT	- FT	FRA-71-1503L	
260+00	265+00	168	169	- FT	- FT	FRA-71-1503L	
265+00	270+00	170	171	- FT	- FT	FRA-71-1503L	
270+00	275+00	172	173	- FT	- FT	FRA-71-1503L	
275+00	279+00	174	175	- FT	- FT	FRA-71-1503L	
RAMP A5							
5013+00	5018+00	176	177	- FT	- FT	FRA-71-1518A	
I-70 EB							
187+00	192+00	178	179	- FT	- FT	4W1	
I-70 WB							
187+00	192+00	180	181	- FT	- FT	4W2	
I-70 EB							
187+00	192+00	182	183	- FT	- FT	4W3	
I-70 EB							
183+00	188+00	184	185	- FT	- FT	4W4	
RAMP C5							
5082+00	5085+00	186	187	- FT	- FT	4W5	
5085+00	5086+00	186	188	- FT	- FT	4W5	
I-70 EB							
176+00	181+00	189	190	- FT	- FT	4W6	
I-70 EB							
177+00	182+00	191	192	- FT	- FT	4W7	
WALL 4W8							
0+00	4+00	193	194	- FT	- FT	4W8	
4+00	9+77.37	195	196	- FT	- FT	4W8	
8+50	9+77.37	195	197	- FT	- FT	4W8	
RAMP C5							
5077+00	5082+00	198	199	- FT	- FT	4W9	
WALL 4W10							
0+00	3+00	200	200	- FT	- FT	4W10	
WALL 4W11							
0+00	3+00	201	202	- FT	- FT	4W11	
RAMP C5 TO RAMP C3							
5032+00	3003+00	203	204	- FT	- FT	4W12	
WALL 4W12							
0+00	5+50	203	204	- FT	- FT	4W12	
RAMP C3 TO RAMP C3							
3003+00	3008+50	205	206	- FT	- FT	4W12	
WALL 4W12							
5+50	10+00	205	206	- FT	- FT	4W12	
WALL 4W13							
193+26.21	198+77.78	206A	206B	- FT	- FT	4W13	
WALL 4W19							
0+00	0+80	206C	206C	- FT	- FT	4W19	
WALL 4W20							
5063+62.94	5066+49.53	206D	206E	- FT	- FT	4W20	
WALL E2							
200+00	202+00	207	208	- FT	- FT	E2	
WALL E3							
306+00	311+00	209	210	- FT	- FT	E3	
WALL E4							
402+00	407+00	211	212	- FT	- FT	E4	
407+00	412+00	213	214	- FT	- FT	E4	
WALL E5							
504+00	507+00	215	216	- FT	- FT	E5	

INDEX OF SHEETS						
LOCATION FROM STA.	TO STA.	PLAN VIEW SHEET	PROFILE SHEET	CUT MAX.	FILL EMB. MAX.	STRUCTURES INCLUDED WALL NO.	SFN
WALL E7							
700+00	705+00	217	218	- FT	- FT	E7	
705+00	708+00	219	220	- FT	- FT	E7	
WALL E9							
900+00	903+50	221	222	- FT	- FT	E9	
WALL W2							
199+00	204+00	223	224	- FT	- FT	W2	
204+00	209+00	225	226	- FT	- FT	W2	
209+00	214+00	227	228	- FT	- FT	W2	
214+00	219+50	229	230	- FT	- FT	W2	
WALL W3							
300+00	304+00	230A	230B	- FT	- FT	W3	
304+00	308+69.19	230C	230D	- FT	- FT	W3	
WALL W5							
499+00	504+00	231	232	- FT	- FT	W5	
504+00	509+00	233	234	- FT	- FT	W5	
509+00	603+00	235	236	- FT	- FT	W5	
603+00	608+00	237	238	- FT	- FT	W5	
TRANSMISSION TOWERS							
200+00	205+50	239	240	- FT	- FT		
205+50	211+00	241	242	- FT	- FT		
211+00	216+50	243	244	- FT	- FT		
216+50	222+00	245	246	- FT	- FT		
222+00	227+50	247	248	- FT	- FT		
227+50	233+00	249	250	- FT	- FT		
17+50	23+00	251	252	- FT	- FT		
BORING LOGS, SHEETS 253 - 496.							

DRAWN RRM
CHECKED BRT

SOIL PROFILE

FRA-70-12.68
FRA-70-13.10

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PROJECT DESCRIPTION

THE ROADWAY EXPLORATION PERFORMED FOR THE DESIGN AND CONSTRUCTION OF THE FRA-70-12.68, FRA-70-13.01 AND FRA-70-13.10 PROJECTS IN COLUMBUS, OHIO. THE PROJECTS ARE UNDERSTOOD TO CONSIST OF THE WIDENING AND RECONSTRUCTION OF I-70 EB MAINLINE BETWEEN STA. 119+91 AND STA. 192+59 AND I-70 WB MAINLINE BETWEEN STA. 148+ 79 AND STA. 193+00. THE PROFILE GRADE OF I-70 EB AND WB WILL BE RAISED APPROXIMATELY 2.0 TO 26.0 FEET ABOVE THE EXISTING PROFILE GRADE BETWEEN THE SCIOTO RIVER AND SHORT STREET, AND WILL BE CUT UP TO 5 FEET BELOW THE EXISTING PROFILE GRADE WHERE THE ALIGNMENT GOES INTO DOWNTOWN. THE IMPROVEMENTS WILL ALSO INCLUDE THE REALIGNMENT OF I-71 NB BETWEEN STA. 252+86 AND STA. 276+38 AND RECONSTRUCTION OF I-71 SB BETWEEN STA. 683+65 AND STA. 285+87. THERE WILL BE MINIMAL GRADE CHANGE ALONG THE BEGINNING PORTION OF I-71 NB, WHICH WILL BE REALIGNED TO THE WEST OF THE EXISTING RAMP AND RAISED ON GRADED EMBANKMENTS WITH FILL HEIGHTS UP TO APPROXIMATELY 27 FEET WHERE IT APPROACHES THE BRIDGE OVER THE SCIOTO RIVER, AND THERE WILL BE MINIMAL GRADE CHANGE ALONG I-71 SB BETWEEN GREENLAWN AVENUE AND THE PROPOSED FRA-71-1503L BRIDGE STRUCTURE OVER THE SCIOTO RIVER, WHICH BEGINS AT STA. 230+90. I-70 SB WILL SPLIT FROM I-70 WB ON THE NORTH SIDE OF THE ROADWAY, JUST WEST OF FRONT STREET, AND WILL CONTINUE WEST ON A NEW BRIDGE STRUCTURE THAT WILL SPAN OVER SHORT STREET, NORFOLK SOUTHERN AND CSX RAILROAD AND THE SCIOTO RIVER, WHERE IT WILL TURN SOUTH AND SPAN OVER 1-70 AND SR-315 AND CONNECT TO THE EXISTING I-71 SB ALIGNMENT.

THE PROJECT ALSO INCLUDES THE CONSTRUCTION OF A NEW COLLECTOR RAMP SYSTEM, WHICH WILL INCLUDE A NEW TWO TO FOUR-LANE RAMP ALIGNED PARALLEL ALONG THE SOUTH SIDE OF THE EXISTING I-70 ALIGNMENT THAT WILL COLLECT AND DIRECT TRAFFIC FROM I-71 NORTHBOUND (RAMP A5) AND SOUTHBOUND (RAMP B5) AS WELL AS I-70 EASTBOUND (RAMP C5) TO EXIT IN DOWNTOWN AT THE INTERSECTION OF FRONT STREET AND E. FULTON AVENUE. RAMP C5 WILL BE ELEVATED UP TO APPROXIMATELY 60.0 FEET ABOVE EXISTING GRADE WHERE IT CROSSES OVER SR-315, AND WILL BE ELEVATED UP TO APPROXIMATELY 50.0 FEET ABOVE EXISTING GRADE ON GRADED EMBANKMENTS BETWEEN THE SCIOTO RIVER AND WEST SIDE OF THE NORFOLK SOUTHERN AND CSX RAILROAD TRACKS AND MSE WALLS FROM THE EAST SIDE OF THE TRACKS TO JUST EAST OF SHORT STREET. THE IMPROVEMENTS WILL ALSO REQUIRE VERTICAL AND HORIZONTAL ALIGNMENT CHANGES OF THE RAMP FROM 1-70 EB TO 1-71 SB (RAMP C3), AND THE PROFILE WILL BE ELEVA TED APPROXIMATELY 1.0 TO 40.0 FEET ABOVE THE EXISTING GRADE. THE RAMP FROM MOUND STREET TO I-70 WB (RAMP D6), WHICH WILL CONNECT TO THE I-71 SB BRIDGE STRUCTURE, WILL BE SHIFTED TO THE NORTH SLIGHTLY AND ELEVATED APPROXIMATELY 1.0 TO 41.0 FEET ABOVE THE EXISTING GRADE . A NEW RAMP WILL BE CONSTRUCTED FROM MOUND STREET TO 1-70 WB (RAMP D7), WHICH WILL BE ELEVATED ALONG MOUND STREET, SPAN OVER SHORT STREET AND CROSS UNDER THE NEW I-71 SB BRIDGE STRUCTURE TO CONNECT WITH I-70 WB JUST EAST OF THE BRIDGE OVER NORFOLK SOUTHERN AND CSX RAILROAD. THERE WILL ALSO BE IMPROVEMENTS ALONG THE RAMP FROM I-71 SB TO GREENLAWN AVENUE (RAMP B3).

ADDITIONALLY, IMPROVEMENTS WILL ALSO BE PERFORMED ALONG SEVERAL OF THE SURROUNDING CITY STREETS NEAR THE EAST END OF THE PROJECT, INCLUDING FRONT STREET BETWEEN STA. 147+ 75 AND STA. 156+03, FULTON STREET BETWEEN STA. 18+ 75 AND STA. 26+50, HIGH STREET BETWEEN STA. 147+95 AND STA. 152+36, LIVINGSTON AVENUE BETWEEN STA. 200+04 AND STA. 209+55, MOUND STREET BETWEEN STA. 11+47 AND STA. 16+40 (EAST OF FRONT STREET) AND BETWEEN STA. 10+00 AND STA. 26+93 (WEST OF FRONT STREET), AND SHORT STREET BETWEEN STA. 10+24 AND STA. 15+21.73. MINIMAL GRADE CHANGES ARE ANTICIPATED ALONG THE SIDE STREETS.

THE PROJECT INCLUDES THE REPLACEMENT AND WIDENING OF EIGHT (8) EXISTING BRIDGE STRUCTURES WITH NINE (9) NEW BRIDGE STRUCTURES ALONG I-70, WHICH INCLUDES THE FRA-70-1282R OVER SOUDER AVENUE, FRA-70-1301R OVER SR-315, THE FRA-70-1321R, FRA-70-1322L AND FRA-70-1323C OVER THE SCIOTO RIVER, THE FRA-70-1358L AND FRA-70-1358R OVER NORFOLK SOUTHERN AND CSX RAILROAD, AND THE FRA-70-1373L ANDFRA-70-1373R OVER SHORT STREET STRUCTURES. I-71 SB WILL BE SUPPORTED ON A NEW BRIDGE STRUCTURE WHICH EXTENDS FROM JUST EAST OF SHORT STREET TO APPROXIMATELY 800 FEET SOUTH OF I-70, WHICH INCLUDES THE FRA-71-1503L OVER THE SCIOTO RIVER STRUCTURE. FIVE (5) NEW BRIDGE STRUCTURES WILL BE CONSTRUCTED TO ACCOMMODATE THE PROPOSED RAMP C5 ALIGNMENT, WHICH INCLUDE THE FRA-70-1301A OVER SR-315, FRA-70-1321A OVER THE SCIOTO RIVER, FRA-70-1358A OVER NORFOLK SOUTHERN AND CSX RAILROAD, FRA-70-1373A OVER SHORT STREET AND FRA-70-1390C OVER I-70 STRUCTURES. ONE (1) BRIDGE STRUCTURE WILL BE REQUIRED ALONG RAMP A5 WHERE THE ALIGNMENT CROSSES OVER THE EDGE OF THE EXISTING LEVEE EMBANKMENT AND CONNECTS TO RAMP C5, WHICH INCLUDES THE FRA-71-1518A OVER THE SCIOTO RIVER STRUCTURE, AND ONE (1) BRIDGE STRUCTURE WILL BE REQUIRED ALONG RAMP D7 WHERE THE ALIGNMENT CROSSES OVER A PORTION OF MOUND STREET AND SHORT STREET, WHICH INCLUDES THE FRA-70-1373B OVER SHORT STREET STRUCTURE. THE EXISTING BRIDGES CARRYING FRONT STREET (FRA-70-1395C) AND HIGH STREET (FRA-70-1405C) OVER I-70 WILL ALSO BE REPLACED.

A TOTAL OF TWENTY-THREE (23) NEW RETAINING WALLS WILL BE CONSTRUCTED TO ACCOMMODATE THE PROPOSED CONFIGURATIONS. RETAINING WALLS 4W1 AND 4W2 WILL BE CONSTRUCTED ALONG THE NORTH AND SOUTH SIDES OF I-70 WHERE THE WIDENED ALIGNMENTS WILL BE CUT INTO THE EXISTING TERRAIN BETWEEN FRONT STREET AND HIGH STREET, AND RETAINING WALL 4W4 WILL BE CONSTRUCTED ALONG THE SOUTH SIDE OF I-70 BETWEEN THE FORWARD ABUTMENT OF THE FRA-70-1390C STRUCTURE AND FRONT STREET. RETAINING WALLS 4W3 AND 4W7 WILL BE CONSTRUCTED IN THE PROPOSED MEDIAN BETWEEN I-70 EASTBOUND AND WESTBOUND TO SUPPORT THE GRADE SEPARATION BETWEEN THE TWO ALIGNMENTS IN THE FINAL CONFIGURATION. RETAINING WALLS 4W5 AND 4W6 WILL SUPPORT THE RAISED GRADE OF RAMP C5 BETWEEN SHORT STREET AND THE FRA-70-1390C STRUCTURE, AND RETAINING WALLS 4W8 AND 4W9 WILL SUPPORT THE RAISED GRADE OF RAMP C5 BETWEEN THE NORFOLK SOUTHERN RAILROAD AND SHORT STREET. RETAINING WALL 4W10 WILL BE CONSTRUCTED AT THE REAR ABUTMENT OF THE PROPOSED FRA-70-1358A AND FRA-70-1358R STRUCTURES AND RETAINING WALL 4W11 WILL BE CONSTRUCTED AT THE REAR ABUTMENT OF THE PROPOSED FRA-71-1518A STRUCTURE. RETAINING WALL 4W12 WILL BE CONSTRUCTED ALONG THE SOUTH SIDE OF RAMP C3 TO SUPPORT THE GRADE SEPARATION BETWEEN THE RAMP AND MOUND STREET. RETAINING WALL 4W13 BE CONSTRUCTED ALONG THE SOUTH SIDE OF I-70 EB EAST OF HIGH STREET TO SUPPORT THE REALIGNMENT AND WIDENING ALONG LIVINGSTON AVENUE. RETAINING WALLS 4W19 AND 4W20 WILL BE CONSTRUCTED ALONG THE SOUTH SIDE OF RAMP C5 TO PROVIDE GRADE SEPARATION AND ACCESS TO THE EXISTING POWER STATION JUST EAST OF THE SCIOTO RIVER.

PROJECT DESCRIPTION (CONTINUED)

RETAINING WALL E2 WILL BE CONSTRUCTED AT THE REAR ABUTMENT OF THE PROPOSED FRA-70-1358L STRUCTURE. RETAINING WALL E3 WILL BE CONSTRUCTED IN THE PROPOSED MEDIAN BETWEEN I-70 EB AND WB TO SUPPORT THE GRADE SEPARATION BETWEEN THE TWO ALIGNMENTS. RETAINING WALL E4 WILL BE CONSTRUCTED ALONG THE NORTH SIDE OF THE PROPOSED RAMP D7 AND WILL PROVIDE THE REQUIRED GRADE SEPARATION SUCH THAT GRADED EMBANKMENTS CAN BE UTILIZED BELOW THE WALL WITHIN THE REQUIRED RIGHT-OF-WAY, AND THE WALL WILL ALSO CROSS IN FRONT OF THE FORWARD ABUTMENT OF THE PROPOSED FRA-70-1358L STRUCTURE AT THE WEST END OF THE ALIGNMENT AND IN FRONT OF THE REAR ABUTMENT OF THE PROPOSED FRA-70-1373B STRUCTURE AT THE EAST END OF THE ALIGNMENT. RETAINING WALL E5 WILL SUPPORT RAMP D7 FROM JUST WEST OF THE INTERSECTION WITH RAMP D6 TO THE EAST END OF THE FRA-70-1373B BRIDGE STRUCTURE CARRYING RAMP D7 OVER SHORT STREET. RETAINING WALL E7 WILL BE CONSTRUCTED ALONG THE NORTH SIDE OF RAMP D6 TO SUPPORT THE GRADE SEPARATION BETWEEN THE RAMP AND AN EXISTING POWER SUBSTATION AND WILL WRAP AROUND THE FORWARD ABUTMENT OF THE PROPOSED FRA-70-1373L AND FRA-71-1503L STRUCTURES. RETAINING WALL E9 WILL BE CONSTRUCTED AT THE REAR ABUTMENT OF THE PROPOSED FRA-70-1373L STRUCTURE. RETAINING WALL W2 WILL BE LOCATED ALONG THE WEST SIDE OF RAMP C3 AND I-71 SB AND WILL PROVIDE THE REQUIRED GRADE SEPARTION BETWEEN THE EMBANKMENT AND ROADWAY AND THE ADJACENT COMMERCIAL PROPERTIES. RETAINING WALL W3 WILL BE LOCATED ALONG THE WEST SIDE OF RAMP C3 AND WILL PROVIDE THE REQUIRED GRADE SEPARATION BETWEEN THE PROPOSED RAMP AND THE ADJACENT MOT TRAFFIC LANES, WHICH WILL REMAIN AS A PERMANENT WALL. RETAINING WALL W5 WILL SUPPORT I-71 SB SOUTH OF THE REAR ABUTMENT OF THE PROPOSED FRA-71-1503L BRIDGE STRUCTURE, WILL WRAP AROUND THE REAR ABUTMENT OF THE BRIDGE STRUCTURE, AND WILL SUPPORT THE EMBANKMENT ALONG RAMP C3 NORTH OF THE BRIDGE ABUTMENT.

ALSO INCLUDED IN THE PROJECT IS THE DESIGN AND CONSTRUCTION OF THE PROPOSED OVERHEAD HIGH VOLTAGE TRANSMISSION TOWERS LOCATED ALONG THE WEST SIDE OF THE SCIOTO RIVER AND CROSSING THE RIVER JUST SOUTH OF THE I-70/I-71 BRIDGE STRUCTURES. IT IS UNDERSTOOD THAT ELEVEN (11) NEW OVERHEAD HIGH VOLTAGE TRANSMISSION TOWERS WILL BE CONSTRUCTED TO REPLACE THE EXISTING TRANSMISSION TOWERS WITHIN THE PROJECT LIMITS, AND THAT ADDITIONAL TOWERS WILL BE CONSTRUCTED SOUTH OF THE SOUTHERN PROJECT LIMITS ALONG I-71 SB AS PART OF A SEPARATE CONTRACT. BASED ON PLAN INFORMATION PROVIDED, THE TOWERS ARE UNDERSTOOD TO BE LOCATED ALONG THE WEST SIDE OF THE SCIOTO RIVER, JUST TO THE EAST OF THE EXISTING TRANSMISSION TOWERS, WITH TWO (2) NEW POLES TO BE LOCATED ALONG THE EAST SIDE OF THE SCIOTO RIVER, BETWEEN THE RIVER AND THE EXISTING POWER SUBSTATION. IT IS UNDERSTOOD THAT THE TOWERS WILL CONSIST OF 85 TO 150-FOOT TALL STEEL MONOPOLE STRUCTURES THAT WILL BE SUPPORTED ON A SINGLE DRILLED SHAFT FOUNDATION.

HISTORIC RECORDS

HISTORIC BORINGS ALONG EXISTING I-70 ALIGNMENT, FORMERLY US-40, FROM THE ORIGINAL CONSTRUCTION PLANS, FRA-40-12.30 (DATED 1957) AND FRA-40-12.82 (DATED 1959), ARE PRESENTED ON THIS SOIL PROFILE. FIVE (5) BORINGS FROM THE FRA-70-1230 STRUCTURES OVER THE SCIOTO RIVER, DESIGNATED AS B-001-S-57, B-005-S-57, B-009-S-57, B-013-S-57 AND B-020-S-57, TWO (2) BORINGS FROM THE FRA-40-1300 OVER FRONT STREET STRUCTURE, DESIGNATED AS B-002-F-59 AND B-005-F-59, THREE (3) BORINGS FROM THE FRA-40-1310 OVER HIGH STREET STRUCTURE, DESIGNATED AS B-001-0-59, B-007-0-59 AND B-011-0-59, AS WELL AS THREE BORINGS FROM ASSOCIATED RETAINING WALLS A AND B, DESIGNATED AS B-001-A-59, B-001-C-59 AND B-003-A-59, WERE OBTAINED FROM THESE HISTORIC EXPLORATIONS. HISTORIC BORINGS WERE ALSO OBTAINED FROM THE ORIGINAL CONSTRUCTION PLANS ASSOCIATED WITH THE CONSTRUCTION OF RETAINING WALL STRUCTURES IN THE VICINITY OF I-70, I-71, SR-315 AND HARMON AVENUE, FRA-3-14.69 (DATED 1956), AND ARE PRESENTED ON THIS SOIL PROFILE. THREE (3) BORINGS, DESIGNATED AS M-041-0-56 THROUGH M-043-0-56, WERE OBTAINED FROM THIS HISTORIC EXPLORATION. HISTORIC BORINGS WERE ALSO OBTAINED FROM THE ORIGINAL CONSTRUCTION PLANS ASSOCIATED WITH THE I-70 AND SR-315 INTERCHANGE, FRA-70-12.21S (DATED 1968) AND FRA-70-12.31S (DATED 1968), ARE ALSO PRESENT ON THE SOIL PROFILE. FOUR (4) BORINGS FROM THE FRA-70-1287 OVER SOUDER AVENUE STRUCTURE, DESIGNATED AS B-001-S-68 THROUGH B-004-S-68. ONE (1) BORING FROM THE FRA-70-1306 STRUCTURE OVER SR-315 AND VARIOUS RAMPS, DESIGNATED AS B-015-W-68, THREE (3) BORINGS FROM THE FRA-70-1307 STRUCTURE OVER SR-315 AND VARIOUS RAMPS, DESIGNATED AS B-006-D-68, B-009-D-68 AND B-015-D-68, AND FOUR (4) BORINGS FROM THE FRA-70-1309 STRUCTURE OVER SR-315 AND VARIOUS RAMPS, DESIGNATED AS B-001-B-68, B-003-E-68, B-012-E-68 AND B-018-E-68, WERE OBTAINED FROM THIS HISTORIC EXPLORATION.

GEOLOGY

THE PROJECT AREA LIES WITHIN THE COLUMBUS LOWLAND DISTRICT OF THE TILL PLAINS SECTION. THIS AREA IS CHARACTERIZED BY FLAT TO GENTLY ROLLING GROUND MORAINE DEPOSITS FROM THE LATE WISCONSINAN AGE. THE SITE TOPOGRAPHY EXHIBITS MODERATE TO HIGH RELIEF. THE GROUND MORAINE DEPOSITS ARE COMPOSED PRIMARILY OF SILTY LOAM TILL (DARBY, BELLEFONTAINE, CENTERBURG, GRAND LAKE, ARCANUM, KNIGHTSTOWN TILLS), WITH SMALLER ALLUVIUM AND OUTWASH DEPOSITS BORDERING THE SCIOTO RIVER, ITS TRIBUTARIES AND FLOODPLAIN AREAS. ACCORDING TO THE BEDROCK GEOLOGY AND TOPOGRAPHY MAPS OBTAINED FROM THE OHIO DEPARTMENT OF NATURAL RESOURCES (ODNR), THE UNDERLYING BEDROCK CONSISTS PREDOMINANTLY OF THE MIDDLE TO LOWER DEVONIAN-AGED COLUMBUS LIMESTONE. THIS FORMATION IS FURTHER SUBDIVIDED INTO TWO MEMBERS IN THE CENTRAL PORTION OF THE STATE, KNOWN AS THE DELHI AND BELLEPOINT MEMBERS. JUST EAST OF SCIOTO ROVER, THE UNDERLYING BEDROCK CONSISTS OF THE UPPER DEVONIAN-AGED OHIO SHALE FORMATION OVERLYING THE MIDDLE DEVONIAN-AGED DELAWARE LIMESTONE FORMATION.

RECONNAISSANCE

THE PROJECT ALIGNMENT IS ALONG THE I-70/71 SOUTH INNERBELT, PRIMARILY ALONG I-70 WB BETWEEN THE SCIOTO RIVER AND HIGH STREET. THE I-71, SR-315 AND I-70 INTERCHANGE IS A MAJOR INTERCHANGE WITH MANY ENTRANCE AND EXIT RAMPS THAT CONNECT THE VARIOUS ALIGNMENTS. I-70 CROSSES OVER THE SCIOTO RIVER JUST EAST OF THE I-71 AND SR-315 INTERCHANGE, WITH THREE EXISTING BRIDGES THAT CROSS THE RIVER AND CONVERGE AT THE EASTERN BANK INTO AN EIGHT-LANE ROADWAY. THE ROADWAY THEN REDUCES TO A SIX-LANE EXPRESSWAY WHICH CONTINUES INTO DOWNTOWN COLUMBUS AND CROSSES UNDER FRONT STREET AND HIGH STREET. THE EXISTING I-70 IS ELEVATED FROM THE SURROUNDING TERRAIN FROM THE BEGINNING OF THE PROJECT ALIGNMENT TO JUST WEST OF FRONT STREET AND THERE ARE EXISTING OVERPASS BRIDGES WHERE THE ROADWAY CROSSES THE SCIOTO RIVER, NORFOLK SOUTHERN AND CSX RAILROAD AND SHORT STREET. THE ROADWAY PROFILE IS LOWERED FROM THE SURROUNDING TERRAIN WHERE THE ALIGNMENT ENTERS INTO DOWNTOWN FROM JUST WEST OF FRONT STREET TO THE END OF THE PROJECT ALIGNMENT. THERE IS ALSO AN ENTRANCE RAMP FROM MOUND STREET TO I-70 WB AND EXIT RAMPS FROM I-70 EB TO FRONT STREET/LIVINGSTON AVENUE AND HIGH STREET/FOURTH STREET, WHICH IS WHERE THE EXISTING EIGHT-LANE ALIGNMENT TRANSITIONS TO SIX LANES. THE EXISTING ALIGNMENT OF I-71 SB DIVERGES FROM I-70 WB AT THE WEST SIDE OF THE STRUCTURE OVER THE SCIOTO RIVER, AND CONVERGES WITH THE RAMP FROM I-70 EB TO I-71/SR-315 SB. THE EXISTING ROADWAY AND BRIDGE STRUCTURES APPEAR TO BE IN FAIR CONDITION, AND THE EXISTING EMBANKMENTS SUPPORTING I-70 ARE COVERED WITH GRASS WITH BRUSH AND SMALL TREES, WITH NO INSTABILITY OBSERVED ALONG THE PROJECT CORRIDOR. THE SURROUNDING TERRAIN ACROSS THE SITE IS RELATIVELY FLAT-LYING, WITH A GENERAL SLOPE TOWARD THE SCIOTO RIVER.

SUBSURFACE EXPLORATION

BETWEEN JUNE 3, 2013, AND MARCH 22, 2015, A TOTAL OF FORTY-TWO (42) BORINGS, DESIGNATED AS B-013-1-15, B-013-2-15, B-015-1-13, B-015-2-13, B-015-4-13 THROUGH B-015-9-13, B-016-3-13 THROUGH B-016-6-13, B-017-3-13 THROUGH B-017-7-13, B-019-1-13, B-020-1-13 THROUGH B-020-3-13, B-020-9-15, B-021-2-13, B-021-4-14, B-023-1-13, B-024-1-13, B-024-2-14, B026-1-13 THROUGH B-026-3-13, B-027-1-13, B-102-1-13, B-105-1-13, B-106-1-13, B-108-1-13 THROUGH B-108-3-13, B-108-9-15, B-109-1-15 AND B-110-1-15, WERE EXTENDED TO DEPTHS RANGING FROM 25.0 TO 96.7 FEET BELOW THE GROUND SURFACE AT VARIOUS STRUCTURE LOCATIONS AS PART OF THE FRA-70-12.68 EXPLORATION. DUE TO SCHEDULE CONFLICTS, BORINGS B-019-1-13 AND B-020-1-13 WERE DRILLED BY STOCK DRILLING. THE REMAINING BORINGS WERE PERFORMED BY RII DRILLING PERSONNEL.

BETWEEN JANUARY 14, 2014, AND APRIL 28, 2015, A TOTAL OF SEVENTY-SEVEN (77) BORINGS, DESIGNATED AS B-016-7-13, B-017-9-13, B-018-1-13, B-018-2-13, B-018-4-13, B-018-5-13, B-019-2-13, B-019-5-19, B-019-6-19, B-020-4-13 THROUGH B-020-8-13, B-021-1-13, B-021-3-13, B-021-5-14, B-023-2-13, B-023-3-14, B-026-4-19, B-027-2-19, B-029-1-19, B-097-1-13, B-098-2-13, B-098-3-14, B-099-2-13 THROUGH B-099-5-14, B-100-1-14 THROUGH B-100-4-14, B-102-2-14 THROUGH B-102-6-14, B-103-1-14, B-104-1-13, B-105-2-13 THROUGH B-105-6-14, B-107-1-13 THROUGH B-107-4-14, B-108-4-13 THROUGH B-108-8-14, B-113-2-13 THROUGH B-113-9-13, B-114-1-13 THROUGH B-114-5-13, B-114-7-13 THROUGH B-114-9-13, B-115-1-13, B-115-1A-19, B-115-2-13 AND B-115-3-19 THROUGH B-115-7-19 WERE EXTENDED TO DEPTHS RANGING FROM 7.9 TO 102.0 FEET BELOW THE GROUND SURF ACE AT VARIOUS STRUCTURE LOCATIONS AS PART OF THE FRA-70-13.10 EXPLORATION. DUE TO SCHEDULE CONFLICTS AND ACCESS CHALLENGES, BORINGS B-020-7-13, B-099-4-14, B-100-2-14, B-100-4-14, B-105-5-14 AND B-107-2-14 WERE DRILLED BY STOCK DRILLING. THE REMAINING BORINGS WERE PERFORMED BY RII DRILLING PERSONNEL.

BETWEEN OCTOBER 6 AND DECEMBER 3, 2015, THREE (3) STRUCTURAL BORINGS, DESIGNATED AS B-030-1-15, B-032-2-15, AND B-032-3-15, WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 59.4 TO 75.0 FEET BELOW THE EXISTING GROUND SURFACE ALONG THE PROPOSED ALIGNMENT OF RETAINING WALL 4W13 AS PART OF THE FRA-70-14.05 PROJECT 4B EXPLORATION.

BETWEEN APRIL 22 AND 29, 2020, FIVE (5) SOIL BORINGS, DESIGNATED AS B-014-1-19 THROUGH B-014-5-19, WERE DRILLED ALONG THE PROJECT ALIGNMENT. BORINGS B-014-1-19 AND B-014-5-19 WERE ADVANCED TO COMPLETION DEPTHS RANGING FROM 7.3 TO 7.5 FEET BELOW THE EXITING GROUND SURFACE FOR THE ROADWAY APPROACH WORK, AND BORINGS B-014-2-19 THROUGH B-014-4-19 WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 49.7 TO 94.6 FEET BELOW THE EXISTING GROUND SURFACE FOR THE PROPOSED FRA-70-1301R STRUCTURE REPLACEMENT.

THE BORINGS WERE DRILLED USING A CME 55 TRUCK OR CME 750X ALL-TERRAIN VEHICLE (ATV) MOUNTED ROTARY DRILLING MACHINE, UTILIZING EITHER A 3.25-INCH INSIDE DIAMETER HOLLOW-STEM OR 4.5 INCH OUTSIDE DIAMETER SOLID FLIGHT AUGER TO ADVANCE THE HOLES. THE HAMMERS FOR THE CME 55 AND CME 750X DRILL RIGS USED WERE CALIBRATED ON SEPTEMBER 4, 2018, AND HAVE DRILL ROD ENERGY RATIOS OF 91.2 AND 79.5 PERCENT, RESPECTIVELY. WHERE BORINGS WERE 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.

IN ADDITION TO THE BORINGS PERFORMED FOR THE CURRENT EXPLORATION, BETWEEN JUNE 30, 2008, AND SEPTEMBER 24, 2009, A TOTAL OF FORTY-NINE (49) BORINGS, DESIGNATED AS B-012-0-08 THROUGH B-032-0-08, INCLUDING B-016-1-09, B-016-2-09, B-017-1-09 AND B-017-2-09, B-091-0-09, B-092-0-09 AND B-094-0-09 THROUGH B-112-0-09, INCLUDING B-096-1-09, B-098-1-09 AND B-099-1-09, WERE DRILLED TO DEPTHS RANGING FROM 7.0 TO 136.5 FEET BELOW THE GROUND SURF ACE ALONG THE VARIOUS PROJECT ALIGNMENTS AS PART OF THE PRELIMINARY ROADWAY AND STRUCTURE FOUNDATION EXPLORATIONS PERFORMED BY DLZ FOR THE FRA-70-8.93 PROJECT. ON JULY 24, 2010, A TOTAL OF FOUR (4) BORINGS, DESIGNATED AS B-278-0-10 THROUGH B-280-0-10 AND B-292-0-10, WERE DRILLED TO DEPTHS RANGING FROM 7.5 TO 15.0 FEET BELOW THE GROUND SURFACE ALONG FULTON STREET AND MOUND STREET AS PART OF THE FRA-70-14 .48 PROJECT PERFORMED BY DLZ.

DRAWN RRM
CHECKED BRT

SOIL PROFILE

FRA-70-12.68
FRA-70-13.10

SUBSURFACE EXPLORATION (CONTINUED)

THE BORINGS WERE DRILLED USING EITHER A TRUCK OR AN ALL-TERRAIN VEHICLE (ATV) MOUNTED ROTARY DRILLING MACHINES, UTILIZING EITHER A 3.25, 3.75 OR 4.25-INCH INSIDE DIAMETER, HOLLOW STEM AUGER, OR A 4.0-INCH OUTSIDE DIAMETER, SOLID FLIGHT AUGER TO ADVANCE THE HOLES. THE HAMMERS FOR THE MOBILE B-53, CME 750 AND CME 705X DRILL RIGS OPERATED BY RII WERE CALIBRATED ON APRIL 26, 2013, AND HAVE DRILL ROD ENERGY RATIOS OF 77.7, 82.6 AND 86.8 PERCENT, RESPECTIVELY. THE HAMMERS FOR THE CME 750, CME 750X AND CME 55 DRILL RIGS OPERATED BY RII WERE CALIBRATED AGAIN ON OCTOBER 20, 2014, AND HAVE DRILL ROD ENERGY RATIOS OF 92.9, 85.7 AND 92.0 PERCENT, RESPECTIVELY. THE HAMMERS FOR THE CME 750X, CME 55 AND MOBILE B-53 DRILL RIGS OPERATED BY RII WERE CALIBRATED AGAIN ON SEPTEMBER 18, 2018 AND HAVE A DRILL ROD ENERGY RATIOS OF 79.5, 91.2 AND 80.7 PERCENT. THE HAMMERS FOR THE CME 750X, CME 55 AND MOBILE B-53 DRILL RIGS OPERATED BY RII WERE CALIBRATED AGAIN ON SEPTEMBER 14, 2020, AND HAVE DRILL ROD ENERGY RATIOS OF 86.2, 84.2 AND 83.6 PERCENT.

THE UPDATED ENERGY RATIOS WERE UTILIZED FOR BORINGS PERFORMED AFTER THE RECALIBRATION DATE. THE HAMMER FOR THE CME 45, CME 750X AND BK 81 HD DRILL RIGS OPERATED BY STOCK DRILLING WERE CALIBRATED ON MARCH 28, 2013, AND HAVE DRILL ROD ENERGY RATIOS OF 73.5, 78.6 AND 72.3 PERCENT, RESPECTIVELY. THE HAMMERS FOR THE THREE CME 75, CME 450 AND CME 750X DRILL RIGS OPERATED BY DLZ HAVE DRILL ROD ENERGY RATIOS OF 61.2, 62.0, 79.0, 85.9 AND 63.1 PERCENT, RESPECTIVELY. NO CALIBRATION DATE IS AVAILABLE FOR THESE RIG CALIBRATIONS. WHERE THE BORINGS WERE EXTENDED INTO THE UNDERLYING BEDROCK, AN NQ OR HQ-SIZED DOUBLE-TUBE DIAMOND BIT CORE BARREL (UTILIZING WIRE LINE EQUIPMENT) WAS USED TO CORE THE BEDROCK.

EXPLORATION FINDINGS

I-70 EB AND RAMP C5 (START TO STA. 5033+00):
TWENTY (20) BORINGS WERE DRILLED WITHIN THE EXISTING PAVEMENT OF I-70 EB AND WB ALONG THE PROJECT ALIGNMENT AND ENCOUNTERED VARIOUS COMBINATIONS OF ASPHALT, CONCRETE AND AGGREGATE BASE AT THE GROUND SURFACE. ALL NINETEEN (19) OF THE BORINGS ENCOUNTERED 3.0 TO 12.0 INCHES OF ASPHALT, AND NINE (9) OF THESE LOCATIONS ENCOUNTERED 8.0 TO 13.0 INCHES OF CONCRETE UNDERLYING THE EXISTING ASPHALT. SIXTEEN (16) BORINGS ENCOUNTERED 2.0 TO 11.0 INCHES OF AGGREGATE BASE BENEATH THE ASPHALT OR CONCRETE. IN ADDITION, BORING B-013-2-15 WAS DRILLED AT THE NORTHWEST CORNER OF THE INTERSECTION OF SOUDER AVENUE AND MOUND STREET AND ENCOUNTERED 6.0 INCHES OF TOPSOIL AT THE GROUND SURFACE. BORINGS B-032-2-15 AND B-032-3-15 WERE DRILLED THROUGH THE GRADED EMBANKMENT SOUTH OF I-70 EB, BETWEEN HIGH STREET AND THIRD STREET, AND ENCOUNTERED 3.0 INCHES OF TOPSOIL.

BENEATH THE SURFACE MATERIALS, EXISTING EMBANKMENT FILL WAS ENCOUNTERED IN FOURTEEN (14) OF THE BORINGS EXTENDING TO ELEVATIONS RANGING FROM 707.6 TO 721.2 FEET MSL WEST OF THE SR-315 OVERPASS AND 704.1 TO 710.7 FEET MSL FROM THE SCIOTO RIVER TO JUST EAST OF SHORT STREET. THE EMBANKMENT FILL IS COMPRISED OF MEDIUM DENSE TO VERY DENSE A-1-a, A-1-b, A-2-4, A-3a AND A-4a SOILS, AND MEDIUM STIFF TO HARD A-4a, A-6a, A-6b AND A-7-6 SOILS. EXISTING FILL CONSISTING OF LOOSE TO MEDIUM DENSE A-1-a, A-1-b and A-2-6 SOILS WERE ENCOUNTERED IN BORINGS B-013-2-15, B-028-0-08, B-029-0-08 AND B-026-2-13 EXTENDING AN ELEVATION OF 725.7, 736.3 AND 731.3 FEET MSL, RESPECTIVELY.

UNDERLYING THE EXISTING FILL MATERIALS, THE NATURAL SOILS ENCOUNTERED WEST OF THE SCIOTO RIVER WERE PREDOMINANTLY GRANULAR WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL, AND THE NATURAL SOILS ENCOUNTERED EAST OF THE SCIOTO RIVER CONSISTED GENERALLY OF GRANULAR OVERLYING COHESIVE SOILS. THE GRANULAR SOILS WERE COMPRISED OF MEDIUM DENSE TO VERY DENSE A-1-a, A-1-b, A-2-4, A-2-6, A-3a, A-4a AND A-4b MATERIAL, AND THE COHESIVE SOILS WERE COMPRISED OF STIFF TO HARD A-4a, A-4b, A-6a, A-6b AND A-7-6 MATERIAL. SHALE BEDROCK WAS ENCOUNTERED IN BORINGS B-029-0-08, B-017-3-13 AND B-017-4-13 AT AN ELEVATION OF 628.8, 656.8 AND 653.1 FEET MSL, RESPECTIVELY, AND LIMESTONE BEDROCK WAS ENCOUNTERED BELOW THE SHALE IN BORING B-029-0-08 AT AN ELEVATION OF 621.7 FEET MSL. LIMESTONE BEDROCK WAS ALSO ENCOUNTERED IN BORING B-013-2-15 BELOW THE OVERBURDEN SOILS AT AN ELEVATION OF 647.0 FEET MSL. GROUNDWATER WAS ENCOUNTERED DURING DRILLING IN EIGHT (8) OF THE BORINGS AT ELEVATIONS RANGING FROM 678.2 TO 718.3 FEET MSL, AND AT THE COMPLETION OF DRILLING IN TWO (2) OF THE BORINGS AT ELEVATIONS RANGING FROM 702.5 TO 712.9 FEET MSL.

I-70 WB:
EIGHTEEN (18) BORINGS WERE DRILLED ALONG THE PROPOSED ALIGNMENT OF I-70 WB. TWELVE (12) OF THE BORINGS WERE DRILLED WITHIN THE EXISTING PAVEMENT OF I-70 EB AND WB ALONG THE PROJECT ALIGNMENT AND ENCOUNTERED VARIOUS COMBINATIONS OF ASPHALT, CONCRETE AND AGGREGATE BASE AT THE GROUND SURFACE. ALL TWELVE (12) OF THE BORINGS ENCOUNTERED 6.0 TO 14.0 INCHES OF ASPHALT, AND EIGHT (8) OF THESE LOCATIONS ENCOUNTERED 6.0 TO 12.0 INCHES OF CONCRETE UNDERLYING THE EXISTING ASPHALT. SEVEN (7) BORINGS ENCOUNTERED 4.0 TO 11.0 INCHES OF AGGREGATE BASE BENEATH THE ASPHALT OR CONCRETE. BORINGS B-016-2-09 AND B-017-2-09 WERE DRILLED THROUGH THE EXISTING PAVEMENT OF THE ABANDONED AND CURRENT MOUND STREET ROADWAYS AND ENCOUNTERED 3.0 AND 2.0 INCHES OF ASPHALT, RESPECTIVELY, OVERLYING 9.0 INCHES OF CONCRETE AT BOTH LOCATIONS, FOLLOWED BY 3.0 INCHES OF AGGREGATE BASE IN BORING B-017-2-09. BORINGS B-017-9-13, B-018-1-13 AND B-018-2-13 WERE DRILLED ALONG THE NORTH SIDE OF THE EXISTING I-70 BRIDGE OVER NORFOLK SOUTHERN AND CSX RAILROAD AND ENCOUNTERED 2.0 TO 12.0 INCHES OF TOPSOIL AT THE GROUND SURFACE. BORING B-020-7-13 WAS DRILLED THROUGH THE EXISTING SIDWALK ADJACENT TO SHORT STREET, BENEATH THE EXISTING I-70 BRIDGE STRUCTURE, AND ENCOUNTERED 8.0 INCHES OF CONCRETE AT THE GROUND SURFACE.

BENEATH THE SURFACE MATERIALS, EXISTING EMBANKMENT FILL WAS ENCOUNTERED IN TEN (10) OF THE BORINGS EXTENDING TO ELEVATIONS RANGING FROM 710.3 TO 714.5 FEET MSL. THE EMBANKMENT FILL IS COMPRISED OF LOOSE TO DENSE A-1-a, A-1-b, A-2-4, A-2-6, A-3a AND A-4a SOILS, AND MEDIUM STIFF TO HARD A-4a, A-6a, A-6b AND A-7-6 SOILS. EXISTING FILL CONSISTING OF VERY LOOSE TO VERY DENSE A-1-a, A-1-b A-2-4, A-3a and A-4a SOILS, AND MEDIUM STIFF TO HARD A-4a, A-6a, A-6b AND A-7-6 SOILS WERE ENCOUNTERED IN ELEVEN (11) OF THE

EXPLORATION FINDINGS (CONTINUED)

I-70 WB (CONTINUED):
BORINGS EXTENDING TO ELEVATIONS RANGING FROM 692.1 TO 705.8 BETWEEN THE SCIOTO RIVER AND JUST EAST OF SHORT STREE, AND 721.7 TO 736.9 FEET MSL FROM JUST EAST OF SHORT STREET TO THE END OF THE PROJECT LIMITS.

UNDERLYING THE EMBANKMENT FILL AND EXISTING FILL MATERIALS, THE NATURAL SOILS ENCOUNTERED CONSISTED GENERALLY OF GRANULAR OVERLYING COHESIVE MATERIALS. THE GRANULAR SOILS WERE COMPRISED OF MEDIUM DENSE TO VERY DENSE A-1-a, A-1-b, A-2-4, A-2-6, A-3a AND A-4a MATERIAL, AND THE COHESIVE SOILS WERE COMPRISED OF SOFT TO HARD A-4a, A-6a, A-6b AND A-7-6 MATERIAL.

SHALE BEDROCK WAS ENCOUNTERED IN BORINGS B-017-9-13, B-018-1-13, B-018-2-13, B-020-5-13 AND B-020-7-13 AT ELEVATIONS RANGING FROM 648.1 TO 657.7 FEET MSL. LIMESTONE BEDROCK WAS ENCOUNTERED BELOW THE SHALE IN BORINGS B-017-9-13, B-018-1-13 AND B-018-2-13 AT ELEVATIONS RANGING FROM 641.2 TO 643.5 FEET MSL. GROUNDWATER WAS ENCOUNTERED DURING DRILLING IN TEN (10) OF THE BORINGS AT ELEVATIONS RANGING FROM 689.9 TO 714.4 FEET MSL, AND AT THE COMPLETION OF DRILLING IN SIX (6) OF THE BORINGS AT ELEVATIONS RANGING FROM 693.5 TO 701.4 FEET MSL.

I-71 NB AND RAMP A5:
ELEVEN (11) BORINGS WERE DRILLED ALONG THE PROPOSED ALIGNMENTS OF I-71 NB AND RAMP A5. BORINGS B-099-0-09, B-100-0-09, B-102-0-09 AND B-108-9-15 WERE DRILLED WITHIN THE EXISTING PAVEMENT OF I-71 AND ENCOUNTERED 3.0 TO 7.0 INCHES OF ASPHALT, OVERLYING 8.0 AND 9.0 INCHES OF CONCRETE IN BORING B-102-0-09 AND B-108-9-15, AND 5.0 AND 4.0 INCHES OF AGGREGATE BASE IN BORINGS B-100-0-09 AND B-108-9-15, RESPECTIVELY. THE REMAINING BORINGS WERE DRILLED WITHIN THE GRASS INFIELD BETWEEN THE I-71 NB, SR-315 AND I-70 EB INTERCHANGE RAMPS AND ENCOUNTERED 2.0 TO 7.0 INCHES OF TOPSOIL AT THE GROUND SURFACE.

BENEATH THE SURFACE MATERIALS, EXISTING FILL WAS ENCOUNTERED IN ALL OF THE BORINGS EXTENDING TO ELEVATIONS RANGING FROM 701.7 TO 716.6 FEET MSL. THE FILL MATERIAL CONSISTED OF LOOSE TO MEDIUM DENSE A-1-a, A-1-b, A-2-4 AND A-4a SOILS, AND MEDIUM STIFF TO HARD A-4a, A-6a AND A-6b SOILS.

UNDERLYING THE EXISTING FILL, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS CONSISTED OF LOOSE TO VERY DENSE A-1-a, A-1-a, A-2-4, A-2-6, A-3, A-3a AND A-4a MATERIAL, AND THE COHESIVE SOILS CONSISTED OF SOFT TO HARD A-4a, A-6a, A-6b AND A-7-6 MATERIAL. LIMESTONE BEDROCK WAS ALSO ENCOUNTERED IN BORING B-108-9-15 BELOW THE OVERBURDEN SOILS AT AN ELEVATION OF 655.4 FEET MSL.GROUNDWATER WAS ENCOUNTERED DURING DRILLING IN SIX (6) OF THE BORINGS AT ELEVATIONS RANGING FROM 685.1 TO 688.9 FEET MSL, WITH BORING B-100-0-09 NOTING GROUNDWATER INITIALLY DURING DRILLING AT ELEVATION 713.6 FEET MSL AND AT THE COMPLETION OF DRILLING AT AN ELEVATION OF 703.3 FEET MSL.

I-71 SB (START TO STA. 230+90):
TWENTY-SEVEN (27) BORINGS WERE DRILLED ALONG THE PROPOSED ALIGNMENT OF I-71 SB FROM THE START OF THE PROJECT LIMITS TO STA. 230+90, WHICH INCLUDES PORTIONS OF RETAINING WALLS W2 AND W5. NINE (9) BORINGS WERE DRILLED WITHIN THE EXISTING PAVEMENT OF I-71 AND ENCOUNTERED 2.0 TO 8.0 INCHES OF ASPHALT, AND SEVEN (7) BORINGS ENCOUNTERED 9.0 TO 12.0 INCHES OF CONCRETE UNDERLYING THE ASPHALT OR AT THE GROUND SURFACE. SIX (6) BORINGS ENCOUNTERED 5.0 TO 13.0 INCHES OF AGGREGATE BASE BENEATH THE ASPHALT OR CONCRETE. FOUR (4) BORINGS WERE PERFORMED WITHIN THE EXISTING PAVEMENT OF PRIVATE DRIVEWAYS OR PARKING LOTS FOR THE PROPERTIES ALONG THE WEST SIDE OF I-71 AND ENCOUNTERED 1.0 TO 4.0 INCHES OF ASPHALT OVERLYING 12.0 INCHES OF CONCRETE IN BORING B-102-2-14, FOLLOWED BY 3.0 TO 4.0 INCHES OF AGGREGATE BASE AT TWO OF THE LOCATIONS. THE REMAINING BORINGS WERE DRILLED WITHIN THE GRASS AREAS ALONG THE WEST SIDE OF I-71 OR WITHIN THE GRASS MEDIAN BETWEEN I-71 SB AND SR-315 SB AND ENCOUNTERED 2.0 TO 10.0 INCHES OF TOPSOIL AT THE GROUND SURFACE.

BENEATH THE SURFACE MATERIALS, EXISTING FILL WAS ENCOUNTERED IN TWELVE (12) OF THE BORINGS EXTENDING TO ELEVATIONS RANGING FROM 696.9 TO 712.0 FEET MSL. THE FILL MATERIAL CONSISTED OF LOOSE TO VERY DENSE A-1-a, A-1-b, A-2-6 AND A-4a SOILS, AND MEDIUM STIFF TO HARD A-4a, A-6a, A-6b AND A-7-6 SOILS. UNDERLYING THE EXISTING FILL, NATURAL GRANULAR AND COHESIVE SOILS WERE ENCOUNTERED. THE GRANULAR SOILS CONSISTED OF LOOSE TO VERY DENSE A-1-a, A-1-b, A-2-4, A-2-6, A-3a AND A-4a MATERIAL, AND THE COHESIVE SOILS CONSISTED OF MEDIUM STIFF TO HARD A-4a, A-6a, A-6b AND A-7-6 MATERIAL. BEDROCK WAS NOT ENCOUNTERED IN ANY OF THE BORINGS PERFORMED ALONG THIS PORTION OF THE I-71 ALIGNMENT. GROUNDWATER WAS ENCOUNTERED DURING DRILLING IN TWELVE (12) OF THE BORINGS AT ELEVATIONS RANGING FROM 686.4 TO 691.6 FEET MSL, AND AT THE COMPLETION OF DRILLING IN SIX (6) OF THE BORINGS AT ELEVATIONS RANGING FROM 679.9 TO 703.2 FEET MSL.

I-71 SB (STA. 230+90 TO END, FRA-71-1503L):
TWENTY-FOUR (24) BORINGS WERE DRILLED ALONG THE PROPOSED ALIGNMENT OF I-71 SB FROM STA. 230+90 TO THE END OF THE PROJECT ALIGNMENT, WHICH ENCOMPASSES THE FRA-71-1503L STRUCTURE. BORINGS B-113-2-13 AND B-113-3-13 WERE PERFORMED WITHIN THE EXISTING PAVEMENT OF I-70 WESTBOUND AND ENCOUNTERED 8.0 AND 6.0 INCHES OF ASPHALT OVERLYING 6.0 AND 12.0 INCHES OF AGGREGATE BASE MATERIAL, RESPECTIVELY. BORING B-114-2-13 WAS EXTENDED THROUGH THE PAVEMENT OF THE EXISTING LOWER SCIOTO GREENWAY BIKE TRAIL AND ENCOUNTERED 6.0 INCHES OF ASPHALT AT THE GROUND SURFACE. EIGHTEEN (18) OF THE BORINGS WERE DRILLED WITHIN EXISTING GRASS AREAS WITHIN THE INFIELDS OF THE I-70 AND SR-315 INTERCHANGE AREA OR ALONG THE NORTH SIDE OF I-70 AND ENCOUNTERED 1.0 TO 9.0 INCHES OF TOPSOIL AT THE GROUND SURFACE. BORINGS B-113-6-13 THROUGH B-113-8-13 WERE DRILLED WITHIN THE SCIOTO RIVER WITH THE USE OF A BARGE.

EXPLORATION FINDINGS (CONTINUED)

I-71 SB (STA. 230+90 TO END, FRA-71-1503) (CONTINUED):
BENEATH THE SURFACE MATERIALS, EXISTING FILL WAS ENCOUNTERED IN EIGHT (8) OF THE BORINGS PERFORMED WEST OF THE SCIOTO RIVER EXTENDING TO ELEVATIONS RANGING FROM 677.5 TO 719.7 FEET MSL, AND IN TEN (10) OF THE BORINGS PERFORMED EAST OF THE SCIOTO RIVER EXTENDING TO ELEVATIONS RANGING FROM 685.8 TO 708.5 FEET MSL. THE EXISTING FILL ENCOUNTERED WEST OF THE SCIOTO RIVER IS COMPRISED OF LOOSE TO VERY DENSE A-1-a, A-1-b, A-2-4, A-2-6 AND A-3a SOILS, AND MEDIUM STIFF TO HARD A-4a, A-6a AND A-6b SOILS. THE EXISTING FILL ENCOUNTERED EAST OF THE SCIOTO RIVER IS COMPRISED OF VERY LOOSE TO VERY DENSE A-1-a, A-1-b, A-2-4, A-2-6, A-3a, A-4a AND A-4b SOILS, AND MEDIUM STIFF TO HARD A-4a, A-6a AND A-6b SOILS. ASPHALT, BRICK, CINDER, COAL, CONCRETE, ROCK, SLAG, AND WOOD FRAGMENTS WERE OBSERVED TO BE PRESENT WITHIN THE MAJORITY OF THE FILL MATERIAL EAST OF THE SCIOTO RIVER IN ADDITION TO ORGANIC MATERIAL INCLUDING GRASS AND ROOT FIBERS. THE FILL MATERIAL ENCOUNTERED IN THE VICINITY OF SHORT STREET WAS PLACED WITHIN AN OLD CANAL

UNDERLYING THE EXISTING FILL MATERIALS, THE NATURAL SOILS ENCOUNTERED WEST OF THE SCIOTO RIVER WERE PREDOMINANTLY GRANULAR WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL, AND THE NATURAL SOILS ENCOUNTERED EAST OF THE SCIOTO RIVER CONSISTED GENERALLY OF GRANULAR OVERLYING COHESIVE SOILS. THE GRANULAR SOILS WERE COMPRISED OF VERY LOOSE TO VERY DENSE A-1-a, A-1-b, A-2-4, A-2-6, A-3a AND A-4a MATERIAL, AND THE COHESIVE SOILS WERE COMPRISED OF VERY SOFT TO HARD A-4a, A-4b, A-6a, A-6b AND A-7-6 MATERIAL. GROUNDWATER WAS ENCOUNTERED DURING DRILLING IN TWENTY (20) OF THE BORINGS AT ELEVATIONS RANGING FROM 675.3 TO 707.6 FEET MSL. THE ELEVTION OF THE RIVER SURFACE AT THE TIME THE BORINGS WERE PERFORMED WITHIN THE SCIOTO RIVER RANGED FROM 699.2 TO 700.7 FEET MSL.

BEDROCK WAS ENCOUNTERED IN ALL TWENTY-FOUR (24) BORINGS ALONG THIS PORITON OF THE I-71 SB ALIGNMENT. SEVEN (7) BORINGS PERFOMED ALONG THE WEST END OF THE ALIGNMENT TO JUST WEST OF THE SCIOTO RIVER ENCOUNTERED LIMESTONE AT THE BEDROCK SURFACE, AND SIXTEEN (16) BORINGS PERFORMED FROM JUST WEST OF THE SCIOTO RIVER TO THE END OF THE I-71 SB PROJECT ALIGNMENT ENCOUNTERED SHALE AT THE BEDROCK SURFACE OVERLYING LIMESTONE THAT WAS ENCOUNTERED IN SIXTEEN (16) OF THE BORINGS. THE SHALE BEDROCK WAS ENCOUNTERED AT ELEVATIONS RANGING FROM 648.4 TO 661.1 FEET MSL, AND THE LIMESTONE BEDROCK WAS ENCOUNTERED AT ELEVATIONS RANGING FROM 629.0 TO 657.0 FEET MSL.

RAMP B3:
TWO (2) BORINGS WERE DRILLED ALONG THE PROPOSED ALIGNMENT OF RAMP B3. BORINGS B-091-0-09 AND B-094-0-09 WERE PERFORMED WITHIN THE EXISTING PAVEMENT OF THE RAMP FROM I-71/SR-315 SB TO GREENLAWN AVENUE AND ENCOUNTERED 4.0 INCHES OF ASPHALT OVERLYING 8.0 INCHES OF CONCRETE AND 9.0 INCHES OF CONCRETE OVERLYING 6.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE, RESPECTIVELY. BENEATH THE SURFACE MATERIALS, EXISTING FILL CONSISTING OF LOOSE A-1-b SOIL AND STIFF TO HARD A-6a SOILS WAS ENCOUNTERED EXTENDING TO AN ELEVATION OF 701.2 AND 709.9 FEET MSL, RESPECTIVELY. UNDERLYING THE EXISTING FILL MATERIALS, NATURAL COHESIVE SOILS WERE ENCOUNTERED CONSISTING OF STIFF TO VERY STIFF A-6b MATERIAL. GROUNDWATER WAS NOT ENCOUNTERED IN EITHER OF THE BORINGS.

RAMP C3:
EIGHTEEN (18) BORINGS WERE DRILLED ALONG THE PROPOSED ALIGNMENT OF RAMP C3, WHICH INCLUDES WALL 4W12 AND THE NORTHERN PORTIONS OF WALLS W2 AND W5. BORINGS B-103-0-09, B-109-1-15, B-110-1-15 AND B-111-0-09 WERE PERFORMED ALONG THE EXISTING I-70 EB TO I-71 SB RAMP AND ENCOUNTERED 6.0 TO 8.0 INCHES OF ASPHALT OVERLYING 14.5 INCHES OF CONCRETE IN BORING B-110-1-15 FOLLOWED BY 5.0 TO 12.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE. BORINGS B-105-5-14 AND B-107-2-14 WERE PERFORMED ALONG THE EXISTING I-70 WB TO I-71 SB RAMP AND ENCOUNTERED 3.0 INCHES OF ASPHALT OVERLYING 6.0 AND 9.0 INCHES OF CONCRETE, RESPECTIVELY, FOLLOWED BY 6.0 INCHES OF AGGREGATE BASE IN BORING B105-2-14. BORINGS B-109-0-09 AND B-110-0-09 WERE PERFORMED ALONG MOUND STREET, AT THE BASE OF THE EXISTING EMBANKMENT SUPPORTING THE I-70 EB TO I-71 SB RAMP, AND ENCOUNTERED 5.0 INCHES OF TOPSOIL IN BORING B-109-0-09 AND 5.0 INCHES OF ASPHALT OVERLYING 7.0 INCHES OF CONCRETE IN BORING B-110-0-09 AT THE GROUND SURFACE. BORING B-105-6-14 WAS PERFORMED WITHIN AN EXISTING PARKING LOT AND ENCOUTNERED 3.0 INCHES OF ASPHALT AT THE GROUND SURFACE. THE REMAINING BORINGS ENCOUNTERED 1.0 TO 7.0 TOPSOIL AT THE GROUND SURFACE.

BENEATH THE SURFACE MATERIALS IN BORINGS B-109-0-09 AND B-110-0-09, EXISTING FILL CONSISTING OF LOOSE TO VERY DENSE A-1-b, A-3a AND A-4a SOILS AND VERY STIFF TO HARD A-4a AND A-6a SOILS WERE ENCOUNTERED EXTENDING TO AN ELEVATION OF 698.9 AND 695.3 FEET MSL. THE FILL MATERIAL ENCOUNTERED IN BORING B-110-0-09 CONTAINED CONSTRUCTION DEBRIS AND ORGANICS TO AN ELEVATION OF 699.8 FEET MSL. BENEATH THE SURFACE MATERIALS IN BORINGS B-107-3-14 AND B-108-7-14, EXISTING FILL CONSISTING OF DENSE TO VERY DENSE A-1-a SOILS AND HARD A-7-6 SOILS WERE ENCOUNTERED EXTENDING TO AN ELEVATION OF 701.3 AND 698.1 FEET MSL, RESPECTIVELY. EXISTING EMBANKMENT SOILS WERE ENCOUNTERED BELOW THE PAVEMENT IN BORINGS B-103-0-09, B-106-0-09, B1110-09, B-105-5-14, B-107-2-14, B-107-3-14, B-109-1-15 AND B-110-1-15, WHICH EXTENDED TO ELEVATIONS RANGING FROM 701.1 TO 710.9 FEET MSL. THE EMBANKMENT FILL CONSISTED OF MEDIUM DENSE TO VERY DENSE A-1-b, A-2-4, A-2-6, A-3a AND A-4a SOILS AND STIFF TO HARD A-4a, A-6a, A-6b AND A-7-5 SOILS.

UNDERLYING THE EXISTING FILL MATERIALS, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS CONSISTED OF LOOSE TO VERY DENSE A-1-a, A-1-b, A-2-4, A-2-6, A-3a AND A-4a MATERIAL, AND THE COHESIVE SOILS CONSISTED OF STIFF TO HARD A-4a, A-4b, A-6b AND A-7-6 MATERIAL. GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN TWELVE (12) OF THE BORINGS AT ELEVATIONS RANGING FROM 686.8 TO 695.3 FEET MSL, AND AT THE COMPLETION OF DRILLING IN BORINGS B-109-0-09, B-110-0-09 AND B-107-4-14 AT AN ELEVATION OF 692.4, 695.2 AND 689.1 FEET MSL, RESPECTIVELY.

DRAWN RRM CHECKED BRT

SOIL PROFILE

FRA-70-12.68
FRA-70-13.10

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ICO05.dgn 6/25/2021 10:48:16 AM rachelm

EXPLORATION FINDINGS (CONTINUED)

RAMP C5 (STA. 5033+00 TO END):
THIRTY-TWO (32) BORINGS WERE DRILLED ALONG THE PROPOSED ALIGNMENT OF RAMP C5. ELEVEN (11) OF THE BORINGS ENCOUNTERED EXISTING PAVEMENT COMPRISED OF 2.0 TO 14.0 INCHES OF ASPHALT OVERLYING 3.0 TO 12.0 INCHES OF AGGREGATE BASE. BORINGS B-016-5-13 AND B-024-2-14 ENCOUNTERED 6.0 AND 13.0 INCHES OF CONCRETE, RESPECTIVELY BETWEEN THE ASPHALT AND AGGREGATE BASE, AND BORINGS B-020-1-13, B-020-3-13 AND B-020-9-15 ENCOUNTERED 4.0 INCHES OF BRICK BETWEEN THE ASPHALT AND AGGREGATE BASE. IN ADDITION, BORING B-026-3-13 WAS DRILLED WITHIN THE EXISTING SIDWALK AT THE INTERSECTION OF FRONT STREET AND FULTON STREET AND ENCOUNTERED 6.0 INCHES OF CONCRETE AT THE GROUND SURFACE. TWELVE (12) OF THE BORINGS WERE DRILLED WITHIN EXISTING GRASS AREAS WITHIN THE INFIELDS OF THE I-70 AND SR-315 INTERCHANGE AREA OR ALONG THE SOUTH SIDE OF I-70 AND ENCOUNTERED 2.0 TO 12.0 INCHES OF TOPSOIL AT THE GROUND SURFACE. BORINGS B-015-8-13, B-015-9-13 AND B-016-3-13 WERE DRILLED WITHIN THE SCIOTO RIVER WITH THE USE OF A BARGE.

BENEATH THE SURFACE MATERIALS, EXISTING FILL WAS ENCOUNTERED IN FOUR (4) OF THE BORINGS PERFORMED WEST OF THE SCIOTO RIVER EXTENDING TO ELEVATIONS RANGING FROM 686.6 TO 707.5 FEET MSL, AND IN SIXTEEN (16) OF THE BORINGS PERFORMED EAST OF THE SCIOTO RIVER EXTENDING TO ELEVATIONS RANGING FROM 690.9 TO 736.9 FEET MSL. THE EXISTING FILL ENCOUNTERED WEST OF THE SCIOTO RIVER IS COMPRISED OF LOOSE TO VERY DENSE A-1-a, A-1-b, A-2-4 AND A-2-6 SOILS, AND MEDIUM STIFF TO VERY STIFF A-4a, A-6a AND A-6b SOILS. THE EXISTING FILL ENCOUNTERED EAST OF THE SCIOTO RIVER IS COMPRISED OF VERY LOOSE TO DENSE A-1-a, A-1-b, A-2-4, A-2-6, AND A-4a SOILS, AND VERY SOFT TO VERY STIFF A-4a, A-6a, A-6b AND A-7-6 SOILS. FILL MATERIAL CLASSIFIED AS ORGANIC CLAY (A-8a) WAS ENCOUNTERED IN BORING B-019-0-08 AT AN ELEVATION OF 705.5 FEET MSL AND EXTENDED TO ELEVATION 698.0 FEET MSL. ADDITIONALLY, THE FILL MATERIAL ENCOUNTERED IN THE VICINITY OF THE INTERSECTION OF SHORT STREET AND FULTON STREET WAS PLACED WITHIN AN OLD CANAL.

UNDERLYING THE EXISTING FILL MATERIALS, THE NATURAL SOILS ENCOUNTERED WEST OF THE SCIOTO RIVER WERE PREDOMINANTLY GRANULAR WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL, AND THE NATURAL SOILS ENCOUNTERED EAST OF THE SCIOTO RIVER CONSISTED GENERALLY OF GRANULAR OVERLYING COHESIVE SOILS. THE GRANULAR SOILS WERE COMPRISED OF VERY LOOSE TO VERY DENSE A-1-a, A-1-b, A-2-4, A-2-6, A-3, A-3a, A-4a AND A-4b MATERIAL, AND THE COHESIVE SOILS WERE COMPRISED OF VERY SOFT TO HARD A-4a, A-4b, A-6a, A-6b AND A-7-6 MATERIAL. GROUNDWATER WAS ENCOUNTERED DURING DRILLING IN TWENTY-NINE (29) OF THE BORINGS AT ELEVATIONS RANGING FROM 678.2 TO 720.9 FEET MSL, AND AT THE COMPLETION OF DRILLING IN EIGHT (8) OF THE BORINGS AT ELEVATIONS RANGING FROM 680.0 TO 726.9 FEET MSL. THE ELEVTION OF THE RIVER SURFACE AT THE TIME THE BORINGS WERE PERFORMED WITHIN THE SCIOTO RIVER RANGED FROM 697.3 TO 700.8 FEET MSL.

BEDROCK WAS ENCOUNTERED IN TWENTY-ONE (21) BORINGS ALONG THE ALIGNMENT OF RAMP C5. EIGHT (8) BORINGS PERFOMED ALONG THE WEST END OF THE ALIGNMENT TO THE SCIOTO RIVER ENCOUNTERED LIMESTONE AT THE BEDROCK SURFACE, AND THIRTEEN (13) BORINGS PERFORMED EAST OF THE SCIOTO RIVER ENCOUNTERED SHALE AT THE BEDROCK SURFACE OVERLYING LIMESTONE THAT WAS ENCOUNTERED IN SEVEN (7) OF THE BORINGS. THE SHALE BEDROCK WAS ENCOUNTERED AT ELEVATIONS RANGING FROM 647.3 TO 664.0 FEET MSL, AND THE LIMESTONE BEDROCK WAS ENCOUNTERED AT ELEVATIONS RANGING FROM 631.9 TO 657.6 FEET MSL.

RAMP D6:
FOUR (4) BORINGS WERE DRILLED ALONG THE PROPOSED ALIGNMENT OF RAMP D6, INCLUDING WALL E7 WHICH EXTENDS FROM THE STA. 6003+50 TO THE END OF THE RAMP ALIGNMENT. BORINGS B-021-1-13, B-021-5-14, B-023-3-14 AND B-115-2-13 WERE PERFORMED AT THE BASE OF THE EXISTING EMBANKMENT SUPPORTING THE MOUND STREET TO I-70 WB RAMP AND ENCOUNTERED 5.0 TO 12.0 INCHES OF TOPSOIL AT THE GROUND SURFACE.

BENEATH THE SURFACE MATERIALS IN BORINGS B-021-1-13, B-023-3-14 AND B-115-2-13, EXISTING FILL CONSISTING OF VERY LOOSE TO DENSE A-1-b, A-2-4, A-3a AND A-4b SOILS, AND MEDIUM STIFF TO VERY STIFF A-6a SOIL, WAS ENCOUNTERED EXTENDING TO ELEVATIONS RANGING FROM 693.1 TO 727.7 FEET MSL. THE FILL MATERIAL ENCOUNTERED CONSTRUCTION DEBRIS AND ORGANICS THROUGHOUT. UNDERLYING THE EXISTING FILL MATERIALS, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS CONSISTED OF LOOSE TO VERY DENSE A-1-a, A-1-b, A-2-4, A-2-6 AND A-3a MATERIAL, AND THE COHESIVE SOILS CONSISTED OF STIFF TO HARD A-4a, A-6a AND A-6b MATERIAL. GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN ALL FOUR BORINGS AT ELEVATIONS RANGING FROM 693.1 TO 707.6 FEET MSL. SHALE BEDROCK WAS ENCOUNTERED IN BORING B-115-2-13 AT AN ELEVATION OF 652.6 FEET MSL, AND LIMESTONE BEDROCK WAS ENCOUNTERED BELOW THE SHALE BEDROCK AT AN ELEVATION OF 632.9 FEET MSL.

RAMP D7 (STA. 7007+60 TO END) AND MOUND STREET (STA. 16+50 TO 26+92.75, FRA-70-13.10):
FIVE (5) BORINGS WERE DRILLED ALONG THE PROPOSED ALIGNMENT OF RAMP D7 FROM STA. 7007+60 TO THE END OF THE ALIGNMENT, WHICH INCLUDES BRIDGE STRUCTURE FRA-70-1373B AND RETAINING WALL E5. THIS SEGMENT IS ALSO REPRESENTATIVE OF MOUND STREET BETWEEN STA. 16+50 AND 26+92.75 ALONG THE FRA-70-13.10 PORTION OF THE ALIGNMENT. BORINGS B-020-6-13 AND B-020-8-13 WERE PERFORMED WITHIN THE EXISTING SIDEWALK ALONG THE SOUTH SIDE OF MOUND STREET AND ENCOUNTERED 2.0 AND 8.0 INCHES OF CONCRETE OVERLYING 7.0 AND 6.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE, RESPECTIVELY. BORING B-021-3-13 WAS PERFORMED WITHIN THE EXISTING PAVEMENT OF MOUND STREET AND ENCOUNTERED 3.0 INCHES OF ASPHALT OVERLYING 8.0 INCHES OF CONCRETE. BORINGS B-020-4-13 AND B-023-2-13 WERE DRILLED IN THE GRASS AREAS ALONG THE SOUTH SIDE OF MOUND STREET AND ENCOUNTERED 2.0 AND 11.0 INCHES OF TOPSOIL AT THE GROUND SURFACE, RESPECTIVELY.

EXPLORATION FINDINGS (CONTINUED)

BENEATH THE SURFACE MATERIALS IN ALL FIVE (5) BORINGS, EXISTING FILL CONSISTING OF LOOSE TO MEDIUM DENSE A-1-a, A-1-b AND A-2-4 SOILS AND STIFF A-6a SOILS WAS ENCOUNTERED EXTENDING TO ELEVATIONS RANGING FROM 703.6 TO 727.6 FEET MSL. THE FILL MATERIAL CONTAINED CONSTRUCTION DEBRIS AND ORGANICS. UNDERLYING THE EXISTING FILL MATERIALS, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS CONSISTED OF LOOSE TO VERY DENSE A-1-a, A-1-b, A-2-4 and A-3a MATERIAL, AND THE COHESIVE SOILS CONSISTED OF MEDIUM STIFF TO HARD A-4a, A-6a, A-6b AND A-7-6 MATERIAL. GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN ALL FIVE (5) BORINGS AT ELEVATIONS RANGING FROM 688.1 TO 719.6 FEET MSL. SHALE BEDROCK WAS ENCOUNTERED IN BORINGS B-020-4-13, B-020-6-13 AND B-020-8-13 AT ELEVATIONS RANGING FROM 649.6 TO 656.0 FEET MSL, AND LIMESTONE BEDROCK WAS ENCOUNTERED BELOW THE SHALE BEDROCK IN ALL THREE BORINGS AT ELEVATIONS RANGING FROM 628.6 TO 630.3 FEET MSL.

FULTON STREET:
THREE (3) BORINGS WERE DRILLED WITHIN THE EXISTING PAVEMENT OF FULTON STREET ALONG THE PROJECT ALIGNMENT. BORINGS B-278-0-10, B-279-0-10 AND B-280-0-10 ENCOUNTERED 4.0 TO 6.0 INCHES OF ASPHALT, OVERLYING 8.0 AND 9.0 INCHES OF CONCRETE IN BORINGS B-278-0-10 AND B-280-0-10, RESPECTIVELY, AND 6.0 INCHES OF GRANITE PAVERS IN BORING B-279-0-10, FOLLOWED BY 5.0 TO 8.0 INCHES OF AGGREGATE BASE. BENEATH THE PAVEMENT MATERIALS, EXISTING FILL CONSISTING OF MEDIUM STIFF TO HARD A-6a AND A-7-6 WAS ENCOUNTERED EXTENDING TO ELEVATIONS RANGING FROM 756.7 TO 763.8 FEET MSL, RESPECTIVELY. UNDERLYING THE EXISTING FILL MATERIAL, NATURAL COHESIVE AND GRANULAR SOILS WERE ENCOUNTERED. THE COHESIVE SOILS CONSISTED OF MEDIUM STIFF TO VERY STIFF A-4a, A-6a AND A-6b MATERIAL, AND THE GRANULAR SOILS CONSISTED OF LOOSE TO DENSE A-1-b AND A-4a MATERIAL.

LIVINGSTON AVENUE:
TWO (2) BORINGS WERE DRILLED WITHIN THE EXISTING PAVEMENT OF FULTON STREET AND LIVINGSTON AVENUE ALONG THE PROPOSED LIVINGSTON AVENUE ALIGNMENT. BORINGS B-026-1-13 AND B-027-1-13 ENCOUNTERED 4.0 AND 2.0 INCHES OF ASPHALT, RESPECTIVELY, OVERLYING 8.0 INCHES OF AGGREGATE BASE IN BORING B-026-1-13 AND 8.0 INCHES OF CONCRETE IN BORING B-027-1-13. BENEATH THE PAVEMENT MATERIALS IN BORING B-026-1-13, EXISTING FILL CONSISTING OF MEDIUM DENSE TO VERY DENSE A-1-a AND A-2-4 SOIL WAS ENCOUNTERED EXTENDING TO AN ELEVATION OF 731.5 FEET MSL. UNDERLYING THE EXISTING FILL AND PAVEMENT MATERIAL, NATURAL GRANULAR SOILS WERE ENCOUNTERED CONSITING OF MEDIUM DENSE TO VERY DENSE A-1-b, A-2-4 AND A-4a SOILS. A SEAM OF COHESIVE SOIL CONSISTING OF MEDIUM STIFF TO STIFF A-6a SOIL WAS ENCOUNTERED IN BORING B-027-1-13 NEAR THE PROPOSED SUBGRADE ELEVATION.

MOUND STREET (STA. 11+50.81 TO 19+00, FRA-70-12.68):
ONE (1) BORING WAS DRILLED WITHIN THE EXISTING PAVEMENT OF MOUND STREET ALONG THE FRA-70-12.68 PORTION OF THE PROJECT ALIGNMENT. BORING B-292-0-10 ENCOUNTERED 3.0 INCHES OF ASPHALT, OVERLYING 5.0 INCHES OF BRICK PAVERS FOLLOWED BY 4.0 INCHES OF AGGREGATE BASE. BENEATH THE PAVEMENT MATERIAL, NATURAL GRANULAR SOILS WERE ENCOUNTERED CONSISTING OF MEDIUM DENSE A-1-b MATERIAL.

SHORT STREET:
SIX (6) BORINGS WERE DRILLED ALONG THE PROPOSED ALIGNMENT OF SHORT STREET. BORINGS B-020-2-13, B-020-3-13 AND B-020-9-15 WERE DRILLED WITHIN THE EXISTING PAVEMENT OF SHORT STREET AND ENCOUNTERED 4.0 INCHES OF ASPHALT, OVERLYING 4.0 INCHES OF BRICK PAVERS IN BORINGS B-020-3-13 AND B-020-9-13, FOLLOWED BY 3.0 TO 6.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE.BORING B-020-7-13 WAS DRILLED THROUGH THE EXISTING SIDEWALK ADJACENT TO SHORT STREET, BENEATH THE EXISTING I70 BRIDGE STRUCTURE, AND ENCOUNTERED 8.0 INCHES OF CONCRETE AT THE GROUND SURFACE. BORINGS B-020-4-13 AND B-115-1-13 WERE DRILLED IN THE GRASS AREAS ADJACENT TO SHORT STREET AND ENCOUNTERED 2.0 AND 9.0 INCHES OF TOPSOIL, RESPECTIVELY.

BENEATH THE SURFACE MATERIALS IN ALL SIX (6) BORINGS, EXISTING FILL CONSISTING OF MEDIUM STIFF TO HARD A-4a, A-6a, A-6b AND A-7-6 SOILS AND VERY LOOSE TO MEDIUM DENSE A-1-a, A-1-b AND A-2-4 SOILS WAS ENCOUNTERED EXTENDING TO ELEVATIONS RANGING FROM 690.9 TO 706.0 FEET MSL. THE FILL MATERIAL CONTAINED CONSTRUCTION DEBRIS AND ORGANICS. UNDERLYING THE EXISTING FILL MATERIALS, NATURAL GRANULAR SOILS WERE ENCOUNTERED OVERLYING COHESIVE SOILS AT ELEVATIONS RANGING FROM 657.0 TO 666.9 FEET MSL. THE GRANULAR SOILS CONSISTED OF LOOSE TO VERY DENSE A-1-a, A-1-b, A-2-4, A2-6 and A-4a MATERIAL, AND THE COHESIVE SOILS CONSISTED OF VERY STIFF TO HARD A4a, A-6a, A-6b AND A-7-6 MATERIAL. WITH THE EXCEPTION OF BORING B-020-3-13, SHALE OR MUDSTON BEDROCK WAS ENCOUNTERED IN THE REMAINING BORINGS AT ELEVATIONS RANGING FROM 647.1 TO 652.5 FEET MSL, AND LIMESTONE BEDROCK WAS ENCOUNTERED BELOW THE SHALE BEDROCK IN IN BORINGS B-020-2-13 AND B-020-4-13 AT AN ELEVATION OF 631.9 AND 630.3 FEET MSL, RESPECTIVELY. WITH THE EXCEPTION OF BORING B-020-7-13, GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN THE REMAINING BORINGS AT ELEVATIONS RANGING FROM 685.6 TO 697.3 FEET MSL.

BIKE PATH:
SEVEN (7) BORINGS WERE DRILLED ALONG THE PROPOSED ALIGNMENT OF THE LOWER SCIOTO GREENWAY BIKE PATH. BORING B-114-2-13 WAS DRILLED WITHIN THE EXISTING PAVEMENT OF THE BIKE PATH AND ENCOUNTERED 6.0 INCHES OF ASPHALT AT THE GROUND SURFACE. THE REMAINING BORINGS WERE DRILLED IN THE GRASS AREAS ADJACENT TO THE EXISTING BIKE PATH AND ENCOUNTERED 3.0 TO 12.0 INCHES OF TOPSOIL AT THE GROUND SURFACE.

EXPLORATION FINDINGS (CONTINUED)

BENEATH THE SURFACE MATERIALS IN ALL SEVEN (7) BORINGS, EXISTING FILL CONSISTING OF MEDIUM STIFF TO VERY STIFF A-6a AND A-6b SOILS AND VERY LOOSE TO DENSE A-1-b, A24, A-2-6 AND A-4a SOILS WAS ENCOUNTERED EXTENDING TO ELEVATIONS RANGING FROM 685.8 TO 708.0 FEET MSL. UNDERLYING THE EXISTING FILL MATERIALS, NATURAL GRANULAR AND COHESIVE SOILS WERE ENCOUNTERED. THE GRANULAR SOILS CONSISTED OF VERY LOOSE TO VERY DENSE A-1-a, A-1-b, A-2-4, A2-6 and A-4a MATERIAL, AND THE COHESIVE SOILS CONSISTED OF VERY SOFT TO HARD A4a, A-6a, A-6b AND A-7-6 MATERIAL. WITH THE EXCEPTION OF BORING B-016-7-13, SHALE OR MUDSTON BEDROCK WAS ENCOUNTERED IN THE REMAINING BORINGS AT ELEVATIONS RANGING FROM 655.3 TO 661.1 FEET MSL, AND LIMESTONE BEDROCK WAS ENCOUNTERED BELOW THE SHALE BEDROCK IN EACH OF THESE BORINGS AT ELEVATIONS RANGING FROM 634.8 TO 645.6 FEET MSL. GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN ALL SEVEN (7) BORINGS AT ELEVATIONS RANGING FROM 681.3 TO 695.9 FEET MSL.

FRA-70-1282R:
BETWEEN JANUARY 29 AND FEBRUARY 27, 2015, TWO (2) STRUCTURAL BORINGS, DESIGNATED AS B-013-1-15 AND B-013-2-15, WERE ADVANCED TO A COMPLETION DEPTH OF 35.0 TO 66.5 FEET, RESPECTIVELY, BELOW THE EXISTING GROUND SURFACE. IN ADDITION TO THE BORINGS PERFORMED BY RII AS PART OF THE CURRENT EXPLORATION, TWO (2) BORINGS, DESIGNATED AS B-109-0-09 AND B-122-0-09, WERE ADVANCED TO A COMPLETION DEPTH OF 50.0 AND 79.1 FEET BELOW THE EXISTING GROUND SURFACE, RESPECTIVELY BY DLZ AS PART OF THE FRA-70-8.93 PRELIMINARY EXPLORATION.

BORING B-013-1-15 WAS PERFORMED IN THE PAVED MEDIAN BETWEEN I-70 EASTBOUND AND WESTBOUND, JUST WEST OF THE EXISTING BRIDGE STRUCTURE, AND ENCOUNTERED 7.0 INCHES OF ASPHALT OVERLYING 5.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE. BORINGS B-013-2-15 AND B-109-0-09 WERE PERFORMED IN THE GRASS JUST SOUTH OF THE I-70 EMBANKMENT AND ENCOUNTERED 6.0 AND 5.0 INCHES OF TOPSOIL, RESPECTIVELY, AT THE GROUND SURFACE, AS IDENTIFIED BY THE SIGNIFICANT PRESENCE OF VEGETATION AND ORGANIC MATERIAL. BORING B-122-0-09 WAS PERFORMED IN THE GRASS JUST NORTH OF THE I-70 EMBANKMENT AND ENCOUNTERED 2.0 INCHES OF TOPSOIL AT THE GROUND SURFACE.

BENEATH THE PAVEMENT MATERIALS IN BORING B-013-1-15, EXISTING EMBANKMENT FILL CONSISTING OF BROWN GRAVEL AND SAND (ODOT A-1-b) AND BROWN TO GRAY SILT AND CLAY (ODOT A-6A) WERE ENCOUNTERED EXTENDING TO A DEPTH OF 18.0 FEET BELOW EXISTING GRADE. BENEATH THE TOPSOIL IN BORINGS B-013-2-15, B-109-0-09 AND B-122-0-09, MATERIAL IDENTIFIED AS EXISTING FILL OR POSSIBLE FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 3.5 TO 8.0 FEET BELOW EXISTING GRADE. THE FILL MATERIALS CONSISTED OF BROWN AND GRAY GRAVEL AND SAND, GRAVEL WITH SAND, SILT AND CLAY, SANDY SILT, SILT AND CLAY AND CLAY (ODOT A-1-b, A-2-6, A-4a, A-6a, A-7-6). THE FILL MATERIAL ENCOUNTERED AT BORING B-013-2-15 CONTAINED CINDERS AND ROOT FIBERS THROUGHOUT.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, NATURAL GRANULAR SOILS WERE ENCOUNTERED IN THE UPPER 25 TO 37 FEET OF THE SOIL PROFILE OVERLYING COHESIVE SOILS. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY AND BLACK GRAVEL, GRAVEL AND SAND, FINE SAND, COARSE AND FINE SAND AND SANDY SILT (ODOT A-1-a, A-1-b, A-3, A-3a, A-4a). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS GRAY AND BROWNISH GRAY SANDY SILT AND SILT AND CLAY (ODOT A-4a, A-6a). IT SHOULD BE NOTED THAT COBBLES AND BOULDERS WERE ENCOUNTERED WITHIN THE DENSE GRANULAR SOIL DEPOSITS AT DEPTHS RANGING FROM 20.0 TO 50.0 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM APPROXIMATELY 655 TO 685 FEET MSL.

TOP OF BEDROCK WAS ENCOUNTERED IN BORINGS B-013-2-15 AND B-122-0-09 AT AN ELEVATION OF 647.0 AND 642.1 FEET MSL, RESPECTIVELY. THE UPPER PORTION OF THE BEDROCK CONSISTS OF WEATHERED LIMESTONE WHICH WAS ABLE TO BE AUGERED TO COMPETENT (CORED) LIMESTONE BEDROCK, WHICH WAS ENCOUNTERED AT AN ELEVATION OF 646.0 AND 632.0 FEET MSL, RESPECTIVELY.

IN ADDITION TO THE BORINGS PERFORMED AS PART OF THE PRELIMINARY ENGINEERING AND CURRENT EXPLORATIONS, FOUR (4) HISTORIC BORINGS PERFORMED IN 1968 BY THE DEPARTMENT OF HIGHWAYS AS PART OF THE ORIGINAL FRA7012.31S PROJECT FOR THE EXISTING STRUCTURE, DESIGNATED AS B-001-S-68 THROUGH B-004-S-68, WERE EXTENDED TO DEPTHS RANGING FROM 45 TO 50.8 FEET BELOW THE EXISTING GRADE OF SOUDER AVENUE. IN GENERAL, THE HISTORIC BORINGS ENCOUNTERED MEDIUM DENSE TO VERY DENSE GRANULAR SOILS OVERLYING HARD COHESIVE SOILS. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, SANDY SILT AND SILT (ODOT A-1-a, A-1-b, A-2-4, A-4a, A-4b), AND THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS GRAY SANDY SILT AND SILT (ODOT A-4a, A-4b). BEDROCK WAS NOT ENCOUNTERED IN THE HISTORIC BORINGS PRIOR TO THE TERMINATION DEPTHS.

GROUNDWATER WAS NOT ENCOUNTERED DURING OR AT THE COMPLETION OF DRILLING IN BORING B-013-1-15. GROUNDWATER WAS ENCOUNTERED INITIALLY DURING THE DRILLING PROCESS IN BORINGS B-013-2-15, B-109-0-09 AND B-122-0-09 AT DEPTHS RANGING FROM 13.5 18.5 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 687.0 TO 692.1 FEET MSL. THE GROUNDWATER LEVELS AT THE COMPLETION OF DRILLING IN BORINGS B-013-2-15 AND B-109-0-09 COULD NOT BE MEASURED DUE TO THE ADDITION OF MUD TO COUNTERACT HEAVING SANDS AS WELL AS WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING IN BORING B-122-0-09 WAS 15.7 FEET BELOW EXISTING GRADE PRIOR TO ADDING WATER FOR THE ROCK CORING PROCESS.

SOIL PROFILE

FRA-70-12.68
FRA-70-13.10

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ICO06.dgn 6/25/2021 10:29:57 AM rachelm

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EXPLORATION FINDINGS (CONTINUED)

ERA-70-1301A:
BETWEEN JUNE 10 AND JULY 30, 2013, SIX (6) BORINGS, DESIGNATED AS B-015-1-13, B-015-2-13 AND B-015-4-13 THROUGH B-015-7-13, WERE DRILLED ALONG THE PROPOSED BRIDGE ALIGNMENT AT THE LOCATIONS SHOWN ON THE BORING PLAN PROVIDED IN APPENDIX I OF THE FULL REPORT. THE BORINGS WERE ADVANCED TO COMPLETION DEPTHS RANGING FROM 68.5 TO 95.7 FEET BELOW THE EXISTING GROUND SURFACE AT THE RESPECTIVE BORING LOCATION. BORING B-015-3-13 WAS ALSO PLANNED NEAR THE PROPOSED FOOTPRINT OF PIER 4, BUT DUE TO THE PRESENCE OF DENSE UNDERGROUND UTILITIES IN THE VICINITY OF THE PROPOSED BORING LOCATION, THIS BORING WAS ELIMINATED FROM THE PROGRAM.

BORINGS B-015-1-13 AND B-015-4-13 WERE DRILLED THROUGH THE EXISTING SHOULDER OF I-70 EASTBOUND AND THE I-70 EASTBOUND RAMP TO SR-315 NORTHBOUND, RESPECTIVELY, AND ENCOUNTERED 9.0 AND 4.0 INCHES OF ASPHALT OVERLYING 6.0 AND 12.0 INCHES OF AGGREGATE BASE, RESPECTIVELY. BORING B015613 WAS PERFORMED IN THE EXISTING ACCESS DRIVE TO THE PUMP STATION LOCATED WITHIN THE INFIELD OF THE I-70 EASTBOUND TO SR-315 NORTHBOUND LOOP RAMP AND ENCOUNTERED 2.0 INCHES OF ASPHALT AT THE GROUND SURFACE. THE REMAINING BORINGS WERE DRILLED IN THE GRASS INFIELD AREAS BETWEEN THE VARIOUS ROADWAYS AND INTERCHANGE RAMPS AND ENCOUNTERED 4.0 TO 8.0 INCHES OF TOPSOIL AT THE GROUND SURFACE.

BENEATH THE SURFACE MATERIALS IN BORINGS B-015-1-13, B-015-4-13, B-015-5-13 AND B-015-6-13, MATERIAL IDENTIFIED AS EXISTING FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 15.5 TO 37.0 FEET BELOW THE GROUND SURFACE. THE FILL MATERIAL CONSISTED OF DARK BROWN, DARK GRAY, GRAY, BROWN AND BROWNISH GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY, SANDY SILT, SILT AND CLAY AND SILTY CLAY (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-4a, A-6a, A-6b) AND CONTAINED BRICK, CONCRETE OR COAL FRAGMENTS AND ROOT FIBERS THROUGHOUT.

UNDERLYING THE EXISTING FILL AND SURFICIAL MATERIALS IN BORINGS B-015-2-13 AND B-015-7-13, NATURAL SOILS WERE ENCOUNTERED CONSISTING OF BOTH GRANULAR AND COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY, BROWNISH GRAY AND DARK GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY, COARSE AND FINE SAND AND SANDY SILT (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a, A-4a). THE COHESIVE SOILS WERE DESCRIBED AS GRAY, BROWN, DARK GRAY AND DARK BROWN SANDY SILT, SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-4a, A-4b, A-6a, A-6b, A-7-6).

WITH THE EXCEPTION OF BORING B-015-1-13, BEDROCK WAS ENCOUNTERED IN THE REMAINING BORINGS AT DEPTHS RANGING FROM 58.5 TO 70.5 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 641.9 TO 657.6 FEET MSL. THE CORED BEDROCK CONSISTED OF LIMESTONE IN ALL OF THE BORINGS WHERE BEDROCK WAS ENCOUNTERED WITH THE EXCEPTION OF BORING B-015-7-13, WHICH ENCOUNTERED DOLOMITE.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN ALL SIX BORINGS PERFORMED FOR THE CURRENT EXPLORATION AT DEPTHS RANGING FROM 11.0 TO 68.5 FEET BELOW THE EXISTING GROUND SURFACE. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING COULD NOT BE MEASURED DUE TO THE ADDITION OF MUD IN BORING B-015-1-13 TO COUNTERACT HEAVING SANDS OR WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS IN THE REMAINING BORINGS.

ERA-70-1301R:
BORINGS B-014-1-19, B-019-5-19 AND B-019-8-19 WERE DRILLED WITHIN THE EXISTING PAVEMENT OF EASTBOUND LANES OF I-70 AND ENCOUNTERED 4.5 TO 5.5 INCHES OF ASPHALT OVERLYING 11.5 TO 13.5 INCHES OF AGGREGATE BASE. BORINGS B-015-1-13 WAS DRILLED THROUGH THE EXISTING SHOULDER OF I-70 EASTBOUND AND ENCOUNTERED 9.0 INCHES OF ASPHALT OVERLYING 6.0 INCHES OF AGGREGATE BASE. THE REMAINING BORINGS WERE DRILLED IN THE GRASS INFIELD AREAS BETWEEN THE VARIOUS ROADWAYS AND INTERCHANGE RAMPS AND ENCOUNTERED 2.0 TO 6.0 INCHES OF TOPSOIL AT THE GROUND SURFACE.

BENEATH THE SURFACE MATERIALS IN BORINGS B-015-1-13, B-019-5-19 AND B-108-6-13 MATERIAL IDENTIFIED AS EXISTING FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 25.5 TO 37.0 FEET BELOW THE GROUND SURFACE. THE FILL MATERIAL CONSISTED OF GRAYISH BROWN TO GRAY, MEDIUM STIFF TO HARD SANDY SILT AND SILT AND CLAY (ODOT A-4a, A-6a) AND BROWN, MEDIUM DENSE TO DENSE GRAVEL AND GRAVEL WITH SAND AND SILT (ODOT A-1-a, A-2-4).

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, WHERE ENCOUNTERED, NATURAL SOILS WERE ENCOUNTERED CONSISTING OF BOTH GRANULAR AND COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY, GRAYISH BROWN, DARK BROWN AND BLACK, LOOSE TO VERY DENSE GRAVEL, GRAVEL WITH SAND, GRAVEL WITH SAND AND SILT AND GRAVEL WITH SAND, SILT AND CLAY (ODOT A-1-a, A-1-b, A-2-4, A-2-6). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS BROWN, DARK BROWN, DARK GRAY AND GRAY, STIFF TO HARD SANDY SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-4a, A-6a, A-6b, A-7-6).

THE NATURAL SOILS ENCOUNTERED IN HISTORIC BORINGS B-012-E-68 AND B-003-E-68 CONSISTED OF BOTH GRANULAR AND COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, SANDY GRAVEL, SILTY SANDY GRAVEL AND GRAVELLY SANDY SILT (ODOT A-1-a, A-1-b, A-2-4, A-4a). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS BROWNISH GRAY, GRAY GRAVELLY SANDY SILT, SANDY SILT, SILT AND CLAY (ODOT A-4a, A-7-6). IN GENERAL, THE SUBSURFACE CONDITIONS ENCOUNTERED IN THE HISTORIC BORINGS MATCHED RELATIVELY CLOSELY WITH THE SUBSURFACE CONDITIONS ENCOUNTERED IN THE PROJECT BORINGS.

WITH THE EXCEPTION OF BORINGS B-014-1-19, B-015-1-13, B-019-5-19 AND B-019-8-19, BEDROCK WAS ENCOUNTERED IN THE REMAINING BORINGS AT DEPTHS RANGING FROM 42.0 TO 70.0 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 641.9 TO 657.0 FEET MSL.

EXPLORATION FINDINGS (CONTINUED)

ERA-70-1301R (CONTINUED):
THE CORED BEDROCK CONSISTED OF LIMESTONE IN ALL OF THE BORINGS WHERE BEDROCK WAS ENCOUNTERED, WHICH WAS DESCRIBED AS BROWN, DARK BROWN, GRAY AND DARK GROWN, SLIGHTLY WEATHERED TO UNWEATHERED, SLIGHTLY STRONG TO VERY STRONG AND SLIGHTLY TO HIGHLY FRACTURED. BOULDERS AND COBBLES CONSISTING OF LIMESTONE, DOLOMITE, GRANITE AND SILTSTONE FRAGMENTS WAS ENCOUNTERED IN BORING B-019-5-19 AT A DEPTH OF 82.0 TO 94.6 FEET, CORRESPONDING TO ELEVATIONS RANGING FROM 649.9 TO 662.5 FEET MSL.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN ALL OF THE PROJECT STRUCTURE BORINGS AT DEPTHS RANGING FROM 8.0 TO 68.5 FEET BELOW THE EXISTING GROUND SURFACE, CORRESPONDING TO ELEVATIONS RANGING FROM 676.0 TO 690.8 FEET MSL. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING COULD NOT BE MEASURED IN ANY OF THE BORINGS DUE TO THE ADDITION OF MUD OR WATER TO COUNTERACT HEAVING SANDS OR WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS. GROUNDWATER LEVELS WERE NOT NOTED IN BORINGS B-003-E-68 AND B-012-E-68, WHICH WERE PERFORMED DURING THE 1968 INVESTIGATION.

ERA-70-1321A/R:
BETWEEN JUNE 10, 2013, AND MAY 3, 2014, SIX (6) STRUCTURAL BORINGS, DESIGNATED AS B-015-7-13 THROUGH B-015-9-13 AND B-016-3-13 THROUGH B-016-5-13, WERE ADVANCED TO COMPLETION DEPTHS RANGING FROM 56.0 TO 94.9 FEET BELOW THE EXISTING GROUND SURFACE. IN ADDITION TO THE BORINGS PERFORMED AS PART OF THE CURRENT EXPLORATION, FIVE (5) HISTORIC BORINGS, DESIGNATED AS B-001-S-57, B-005-S-57, B-009-S-57, B-013-S-57 AND B-020-S-57, WERE REFERENCED ALONG THE EXISTING BRIDGE ALIGNMENTS CARRYING I-70 EASTBOUND AND WESTBOUND OVER THE SCIOTO RIVER. THE HISTORIC BORINGS WERE ADVANCED TO DEPTHS RANGING FROM 36.0 TO 63.0 FEET BELOW THE EXISTING GRADE AT THE TIME OF THE EXPLORATION.

BORINGS B-015-7-13 AND B-016-4-13 ENCOUNTERED 5.0 AND 12.0 INCHES OF TOPSOIL AT THE GROUND SURFACE, RESPECTIVELY. BORING B-016-5-13 ENCOUNTERED 4.0 INCHES OF ASPHALT OVERLYING 6.0 INCHES OF CONCRETE FOLLOWED BY 2.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE. NO DISTINCTIVE SURFACE MATERIALS WERE NOTED IN BORINGS B-015-8-13, B-015-9-13 AND B-016-3-13, WHICH WERE DRILLED WITHIN THE SCIOTO RIVER CHANNEL. HOWEVER, THE DEPTH OF WATER WITHIN THE RIVER CHANNEL RANGED FROM 8.3 TO 12.3 FEET AT THE BORING LOCATIONS.

BENEATH THE SURFACE MATERIALS IN BORINGS B-016-4-13 AND B-016-5-13, MATERIAL IDENTIFIED AS EXISTING FILL WAS ENCOUNTERED EXTENDING TO A DEPTH OF 8.0 AND 28.0 FEET BELOW THE GROUND SURFACE, RESPECTIVELY. THE FILL MATERIAL CONSISTED OF BROWN, DARK BROWN, GRAY AND BROWNISH GRAY GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY, SANDY SILT, SILT AND CLAY AND SILTY CLAY (ODOT A-2-4, A-2-6, A-4a, A-6a, A-6b) AND CONTAINED BRICK, CONCRETE OR COAL FRAGMENTS.

UNDERLYING THE EXISTING FILL AND THE SURFICIAL MATERIALS IN THE REMAINING BORINGS, NATURAL SOILS WERE ENCOUNTERED CONSISTING OF BOTH GRANULAR AND COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY, COARSE AND FINE SAND AND SANDY SILT (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a, A-4a). THE COHESIVE SOILS WERE DESCRIBED AS GRAY, BROWN, BROWNISH GRAY AND DARK BROWN SANDY SILT, SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-4a, A-4b, A-6a, A-6b, A-7-6). A BOULDER ZONE WAS ENCOUNTERED IN BORING B-015-9-13 BETWEEN ELEVATIONS 652.2 TO 654.7 FEET MSL AND IN BORING B-016-4-13 BETWEEN ELEVATIONS 667.0 TO 669.5 FEET MSL. COBBLES AND BOULDERS WERE GENERALLY ENCOUNTERED ABOVE THE BEDROCK IN BORINGS B-015-7-13 THROUGH B-016-4-13 STARTING AT AN ELEVATION OF APPROXIMATELY 670 FEET MSL.

TOP OF BEDROCK WAS ENCOUNTERED AT ELEVATIONS RANGING FROM 643.8 TO 660.3 FEET MSL. THE UPPER PORTION OF THE BEDROCK ENCOUNTERED IN THE MAJORITY OF THE BORINGS ALONG THE EASTERN HALF OF THE BRIDGE ALIGNMENT CONSISTS OF GRAY AND BLACK SHALE OVERLYING COMPETENT LIMESTONE AND/OR DOLOMITE BEDROCK. SHALE BEDROCK WAS ENCOUNTERED IN BORINGS B-009-S-57, B-013-S-57, B-015-9-13, B-016-4-13 AND B-016-5-13 AT ELEVATIONS RANGING FROM 650.8 TO 660.8 FEET MSL. WITH THE EXCEPTION OF BORINGS B-001-S-57, B-020-S-57 AND B-016-5-13, LIMESTONE/DOLOMITE BEDROCK WAS ENCOUNTERED IN THE REMAINING BORINGS AT ELEVATIONS RANGING FROM 643.8 TO 654.2 FEET MSL.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN BORING B-015-7-13 AT THE WEST BANK OF THE RIVER WAS AT A DEPTH OF 30.0 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO AN ELEVATION OF 682.8 FEET MSL, AND GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN BORINGS B-016-4-13 AND B-016-5-13 AT THE EAST BANK OF THE RIVER WAS AT A DEPTH OF 15.5 AND 48.5 FEET, WHICH CORRESPONDS TO AN ELEVATION OF 689.5 AND 691.6 FEET MSL, RESPECTIVELY. AS PREVIOUSLY NOTED, BORINGS B-015-8-13, B-015-9-13 AND B-016-3-13 WERE DRILLED WITHIN THE SCIOTO RIVER. WATER WAS ENCOUNTERED AT THE EXISTING SCIOTO RIVER SURFACE, WHICH WAS DETERMINED TO BE AT AN ELEVATION RANGING FROM 697.3 TO 700.8 FEET MSL AT THE TIME OF THE DRILLING. THE GROUNDWATER LEVELS AT THE COMPLETION OF DRILLING COULD NOT BE MEASURED DUE TO THE ADDITION OF MUD TO COUNTERACT HEAVING SANDS AND WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS.

ERA-70-1322L & ERA-70-1323C:
BETWEEN JANUARY 14 AND DECEMBER 7, 2020, NINE (9) BORINGS, DESIGNATED AS B-016-7-13, B-019-5-19 AND B-113-4-13 THROUGH B-114-1-13, WERE DRILLED ALONG THE PROPOSED BRIDGE ALIGNMENTS. THE BORINGS WERE ADVANCED TO COMPLETION DEPTHS RANGING FROM 48.7 TO 88.3 FEET BELOW THE EXISTING GROUND SURFACE AT THE RESPECTIVE BORING LOCATION. IN ADDITION TO THE BORINGS PERFORMED AS PART OF THE CURRENT EXPLORATION, FIVE (5) HISTORIC BORINGS, DESIGNATED AS B-001-S-57, B-005-S-57, B-009-S-57, B-013-S-57 AND B-020-S-57, WERE OBTAINED ALONG THE ENTIRE LENGTH OF THE EXISTING BRIDGE ALIGNMENTS CARRYING I-70 EASTBOUND AND WESTBOUND OVER THE SCIOTO RIVER. THE BORINGS WERE EXTENDED TO DEPTHS RANGING FROM 36.0 TO 63.0 FEET BELOW THE EXISTING GRADE AT THE TIME OF THE EXPLORATION.

EXPLORATION FINDINGS (CONTINUED)

ERA-70-1322L & ERA-70-1323C (CONTINUED):
BORINGS B-113-4-13 AND B-113-5-13 WERE DRILLED IN THE GRASS AREA ALONG THE SOUTH SIDE OF MCDOWELL STREET, JUST WEST OF THE EXISTING PUMP STATION, AND ENCOUNTERED 6.0 INCHES OF TOPSOIL AT THE GROUND SURFACE. BORINGS B-016-7-13, B-113-9-13 AND B-114-1-13 WERE DRILLED ADJACENT TO THE EXISTING BIKE PATH THE RUNS ALONG THE EAST BANK OF THE SCIOTO RIVER, AND ENCOUNTERED 3.0 TO 5.0 INCHES OF TOPSOIL AT THE GROUND SURFACE. BORING B-019-5-19 WAS DRILLED WITHIN THE EXISTING EMBANKMENT SUPPORTING THE ABANDONED MOUND STREET AND ENCOUNTERED 3.0 INCHES OF ASPHALT OVERLYING 11.0 INCHES OF CONCRETE AT THE GROUND SURFACE.

BENEATH THE SURFACE MATERIALS IN BORINGS B-016-7-13, B-113-4-13, B-113-5-13, B-113-9-13 AND B-114-1-13, MATERIAL IDENTIFIED AS EXISTING FILL OR POSSIBLE FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 5.5 TO 20.5 FEET BELOW THE GROUND SURFACE. THE FILL MATERIAL CONSISTED OF BROWN, DARK BROWN, GRAY AND BLACK GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY, SILT AND CLAY AND SILTY CLAY (ODOT A-1-b, A-2-4, A-2-6, A-6a, A-6b) AND CONTAINED BRICK, CONCRETE AND SLAG FRAGMENTS AS WELL AS ROOT FIBERS THROUGHOUT.

BENEATH THE PAVEMENT IN BORING B-019-5-13, EXISTING EMBANKMENT FILL CONSISTING OF GRAY, DARK GRAY AND BROWN GRAVEL WITH SAND, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-1-b, A-6a, A-6b, A-7-6) WAS ENCOUNTERED EXTENDING TO A DEPTH OF 37.0 FEET, OVERLYING EXISTING FILL MATERIAL COMPROMISED OF BLACK, RED AND BROWN GRAVEL WITH SAND, SILT AND CLAY (ODOT A-2-6) EXTENDING TO A DEPTH OF 47.0 FEET.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, WHERE ENCOUNTERED, AND FROM THE EXISTING GROUND SURFACE IN BORINGS B-113-6-13 THROUGH B-113-8-13, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY, GRAYISH BROWN, BROWNISH GRAY, DARK BROWN AND BLACK GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND SILT AND CLAY, COARSE AND FINE SAND AND SANDY SILT (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a, A-4a). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS GRAY, BROWN DARK BROWN, DARK GRAY AND LIGHT BROWN SANDY SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-4a, A-6a, A-6b, A-7-6). A BOULDER ZONE WAS ENCOUNTERED IN BORING B-113-5-13 BETWEEN ELEVATIONS 668.7 AND 674.7 FEET MSL AND IN BORING B-113-8-13 BETWEEN ELEVATIONS 646.8 AND 663.6 FEET MSL. COBBLES AND BOULDERS WERE GENERALLY ENCOUNTERED ABOVE THE BEDROCK IN BORINGS B-113-4-13 THROUGH B-113-8-13 STARTING AT ELEVATIONS OF APPROXIMATELY 700 FEET MSL IN BORINGS B-113-4-13 AND B-113-5-13 AND APPROXIMATELY 675 FEET MSL IN BORINGS B113613 THROUGH B-113-8-13 .

TOP OF BEDROCK IN THE BORINGS WAS ENCOUNTERED AT ELEVATIONS RANGING FROM 644.0 TO 660.9 FEET MSL. THE UPPER PORTION OF THE BEDROCK ENCOUNTERED IN THE MAJORITY OF THE BORINGS CONSISTS OF GRAY SHALE AND MUDSTONE OVERLYING COMPETENT LIMESTONE AND DOLOMITE BEDROCK. WITH THE EXCEPTION OF BORING B-113-8-13, SHALE/MUDSTONE BEDROCK WAS ENCOUNTERED IN THE REMAINING BORINGS AT ELEVATIONS RANGING FROM 651.4 TO 660.9 FEET MSL. WITH THE EXCEPTION OF BORINGS B-001-S-57, B-013-S-57 AND B-020-S-57, LIMESTONE/DOLOMITE BEDROCK WAS ENCOUNTERED IN THE REMAINING BORINGS AT ELEVATIONS RANGING FROM 634.8 TO 650.8 FEET MSL.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN BORINGS B-016-7-13, B-019-5-19, B-113-4-13, B-113-5-13, B-113-9-13 AND B-114-1-13 AT DEPTHS RANGING FROM 19.0 TO 48.5 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS ELEVATIONS RANGING FROM 681.3 TO 702.5 FEET MSL. AS PREVIOUSLY NOTED, BORINGS B-113-6-13 THROUGH B-113-8-13 WERE PERFORMED WITHIN THE SCIOTO RIVER. THE ELEVATION OF THE SCIOTO RIVER SURFACE RANGED FROM 699.2 TO 700.7 FEET MSL AT THE TIME OF THE DRILLING. AT THE COMPLETION OF THE DRILLING AND PRIOR TO REMOVING THE AUGER IN BORING B-019-5-19, GROUNDWATER ACCUMULATED IN THE AUGER STEMS TO A DEPTH OF 57.0 FEET BELOW GRADE, WHICH CORRESPONDS TO AN ELEVATION OF 694.0 FEET MSL. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING COULD NOT BE MEASURED DUE TO THE ADDITION OF MUD TO COUNTERACT HEAVING SANDS OR WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS IN THE REMAINING BORINGS.

ERA-70-1358L/R/A:
BETWEEN JULY 18, 2013, AND DECEMBER 2, 2020, NINE (9) STRUCTURAL BORINGS, DESIGNATED AS B-017-3-13 THROUGH B-017-7-13, B-017-9-13, B-018-1-13, B-018-2-13 AND B-019-6-19 WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 40.0 TO 96.7 FEET BELOW THE EXISTING GROUND SURFACE. BORINGS B-017-3-13 AND B-017-7-13 WERE PERFORMED IN THE SOUTH SHOULDER OF I-70 EASTBOUND AND ENCOUNTERED 6.0 AND 11.0 INCHES OF ASPHALT OVERLYING 4.0 AND 6.0 INCHES OF AGGREGATE BASE, RESPECTIVELY, AT THE GROUND SURFACE. BORING B-017-4-13 AND B-017-5-13 WERE PERFORMED IN GRASS AREAS SOUTH OF I-70 AND WEST OF THE EXISTING RAILROAD TRACKS, JUST OFF OF AN ACCESS ROAD THAT RUNS ADJACENT TO THE RAILROAD TRACKS, AND ENCOUNTERED 6.0 AND 2.0 INCHES OF TOPSOIL AT THE GROUND SURFACE, RESPECTIVELY. BORING B-017-6-13 WAS PERFORMED WITHIN THE DIRT PACKED ACCESS ROAD THAT RUNS FROM SHORT STREET TO THE RAILROAD TRACKS JUST SOUTH OF I-70. BORINGS B-017-9-13, B-018-1-13 AND B-018-2-13 WERE ADVANCED WITHIN THE GRASSY AREA JUST NORTH OF THE EXISTING BRIDGE STRUCTURES AND ENCOUNTERED 2.0 TO 12.0 INCHES OF TOPSOIL AT THE EXISTING GROUND SURFACE. BORING B-019-6-19 WAS ADVANCED AT THE WEST END OF THE EXISTING EMBANKMENT SUPPORTING THE ABANDONED MOUND STREET AND ENCOUNTERED 4.0 INCHES OF TOPSOIL AT THE GROUND SURFACE.

BENEATH THE EXISTING PAVEMENT, EXISTING EMBANKMENT FILL WAS ENCOUNTERED IN BORINGS B-017-3-13 AND B-017-7-13 EXTENDING TO A DEPTH OF 32.0 AND 39.0 FEET BELOW THE EXISTING GROUND SURFACE, RESPECTIVELY. THE FILL CONSISTED OF BROWN, GRAY, BROWNISH GRAY AND BLACK GRAVEL, GRAVEL AND SAND, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-1-a, A-1-b, A-6a, A-6b, A-7-6) AND DID NOT CONTAIN ANY DELETERIOUS MATERIAL.

(CONTINUED ON NEXT SHEET)

DRAWN RRM
CHECKED BRT

SOIL PROFILE

FRA-70-12.68
FRA-70-13.10

EXPLORATION FINDINGS (CONTINUED)

ERA-70-1358L/R/A: (CONTINUED)
BENEATH THE SURFACE MATERIALS IN BORINGS B-017-5-13, B-017-6-13, B-017-9-13, B-018-1-13 AND B-018-2-13, MATERIAL IDENTIFIED AS EXISTING FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 5.0 TO 14.3 FEET BELOW THE GROUND SURFACE. IN GENERAL, THE FILL MATERIALS CONSISTED OF GRANULAR SOILS COMPRISED OF BLACK AND BROWN GRAVEL AND SAND, GRAVEL WITH SAND AND SILT AND COARSE AND FINE SAND (ODOT A-1-b, A-2-4, A-3a) OVERLYING COHESIVE SOILS COMPRISED OF BROWN AND GRAY SANDY SILT AND SILTY CLAY (ODOT A-4a, A-6b). THE FILL MATERIALS CONTAINED TRASH AND DEBRIS, INCLUDING ORGANIC MATERIAL, ROOT FIBERS, CINDERS, PLASTIC, COAL, BRICK AND SLAG FRAGMENTS THROUGHOUT. WOOD FRAGMENTS WERE RECOVERED AT THE BOTTOM OF THE EXISTING FILL IN BORING B-017-7-13. BENEATH THE TOPSOIL IN BORING B-019-6-13, EXISTING EMBANKMENT FILL CONSISTING OF GRAY, DARK GRAY, BROWN AND DARK BROWN GRAVEL WITH SAND, GRAVEL WITH SAND AND SILT, SILT AND CLAY AND SILTY CLAY (ODOT A-1-b, A-2-4, A-6a, A-6b) WAS ENCOUNTERED EXTENDING TO A DEPTH OF 27.0 FEET, OVERLYING EXISTING FILL MATERIAL COMPRISED OF BROWN GRAVEL WITH SAND AND SILT (ODOT A-2-4) EXTENDING TO A DEPTH OF 32.0 FEET.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL MATERIAL, NATURAL GRANULAR SOILS WERE PREDOMINANTLY PRESENT IN THE UPPER 25 TO 52 FEET OF THE SOIL PROFILE OVERLYING COHESIVE SOILS. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY AND BLACK GRAVEL, GRAVEL AND SAND AND GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY AND COARSE AND FINE SAND (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY, DARK BROWN, REDDISH BROWN AND BLACK SANDY SILT, SILT AND CLAY, SILTY CLAY, ELASTIC CLAY AND CLAY (ODOT A-4a, A-6a, A-6b, A-7-5, A-7-6). IT SHOULD BE NOTED THAT COBBLES AND ROCK FRAGMENTS WERE PRESENT WITHIN THE DENSE GRANULAR SOILS AT THE REAR AND FORWARD ABUTMENTS. THESE OBSTRUCTIONS WERE ENCOUNTERED AT DEPTHS RANGING FROM 22.0 TO 31.0 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM APPROXIMATELY 684 TO 696 FEET MSL.

TOP OF BEDROCK WAS ENCOUNTERED ACROSS THE SITE AT ELEVATIONS RANGING FROM 650.0 TO 659.3 FEET MSL. THE UPPER PORTION OF THE BEDROCK CONSISTS OF WEATHERED SHALE WHICH WAS ABLE TO BE AUGERED TO COMPETENT SHALE AND MUDSTONE BEDROCK IN BORINGS B-017-4-13 AND B-017-9-13, AND COMPETENT LIMESTONE BEDROCK IN BORINGS B-017-5-13, B-017-6-13, B-018-1-13 AND B-018-2-13. THE CORED BEDROCK CONSISTS OF SHALE AND MUDSTONE, WHICH WAS ENCOUNTERED IN BORINGS B-017-3-13, B-017-4-13, B-017-7-13, B-017-9-13 AT ELEVATIONS RANGING FROM 646.6 TO 656.8 FEET MSL, AND LIMESTONE BEDROCK, WHICH WAS ENCOUNTERED ELEVATIONS RANGING FROM 640.0 TO 643.5 FEET MSL.

GROUNDWATER SEEPAGE WAS INITIALLY ENCOUNTERED IN BORING B-018-1-13 AT A DEPTH OF 7.0 FEET BENEATH THE GROUND SURFACE. MORE SIGNIFICANT GROUNDWATER FLOW WAS ENCOUNTERED DURING DRILLING IN THE REMAINING BORINGS AT DEPTHS RANGING FROM 18.0 TO 58.5 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 681.8 TO 697.6 FEET MSL. THE GROUNDWATER LEVELS AT THE COMPLETION OF DRILLING COULD NOT BE MEASURED DUE TO THE ADDITION OF MUD TO COUNTERACT HEAVING SANDS AS WELL AS WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS. BORING B-019-6-19 WAS OBSERVED TO BE DRY DURING AND AT THE COMPLETION OF DRILLING.

ERA-70-1373B:
BETWEEN MARCH 5, 2014, AND JANUARY 12, 2015, THREE (3) BORINGS, DESIGNATED AS B-020-4-13, B-020-6-13, AND B-020-2-13, WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 94.7 TO 102.0 FEET BELOW THE EXISTING GROUND SURFACE AT THE LOCATIONS SHOWN ON THE BORING PLAN PROVIDED IN APPENDIX I OF THE FULL REPORT.

BORING B-020-4-13 WAS PERFORMED IN A GRASS AREA BETWEEN THE SIDEWALK AND PINE TREES AT THE SOUTHWEST CORNER OF THE INTERSECTION OF MOUND STREET AND SHORT STREET AND ENCOUNTERED 2.0 INCHES OF TOPSOIL AT THE GROUND SURFACE. BORINGS B-020-6-13 AND B-020-8-13 WERE DRILLED THROUGH THE EXISTING SIDEWALK THAT RUNS ALONG THE SOUTH SIDE OF MOUND STREET, EAST OF SHORT STREET, AND ENCOUNTERED 2.0 AND 8.0 INCHES OF CONCRETE OVERLYING 7.0 AND 4.0 INCHES OF AGGREGATE BASE, RESPECTIVELY, AT THE GROUND SURFACE.

BENEATH THE SURFACE MATERIALS IN BORINGS B-020-4-13, B-020-6-13 AND B-020-8-13, MATERIAL IDENTIFIED AS EXISTING FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 5.5 TO 10.5 FEET BELOW THE EXISTING GROUND SURFACE. THE FILL MATERIAL CONSISTED OF DARK BROWN AND BROWN GRAVEL, GRAVEL WITH SAND AND SILT AND SILT AND CLAY (ODOT A-1-a, A-2-4, A-6a) AND CONTAINED ORGANICS, WOOD FIBERS AND SLAG.

UNDERLYING THE EXISTING FILL, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT AND COARSE AND FINE SAND (ODOT A-1-a, A-1-b, A-2-4, A-3a). THE COHESIVE SOILS WERE DESCRIBED AS BROWN AND GRAY SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-6a, A-6b, A-7-6). COBBLES AND BOULDERS WERE GENERALLY ENCOUNTERED ABOVE THE BEDROCK IN BORINGS B-020-4-13, B-020-6-13 AND B-020-8-13 STARTING AT ELEVATIONS RANGING FROM 686 TO 696 FEET MSL. DUE TO THE SIGNIFICANT PRESENCE OF LARGE BOULDERS IN BORINGS B-020-4-13 AND B-020-8-13 AT 55.5 AND 37.0 FEET BELOW EXISTING GRADE, RESPECTIVELY, MUD ROTARY DRILLING TECHNIQUES WITH CASING ADVANCER OR TRICONE BIT WERE UTILIZED UNTIL BEDROCK WAS ENCOUNTERED.

TOP OF BEDROCK IN THE BORINGS WAS ENCOUNTERED AT ELEVATIONS RANGING FROM 649.6 TO 656.0 FEET MSL. THE UPPER PORTION OF THE BEDROCK ENCOUNTERED CONSISTS OF SHALE WITH INTERBEDDED SEAMS OF MUDSTONE AND CLAYSTONE OVERLYING COMPETENT LIMESTONE BEDROCK. SHALE BEDROCK WAS ENCOUNTERED IN THE BORINGS AT ELEVATIONS RANGING FROM 649.6 TO 656.0 FEET MSL, AND LIMESTONE BEDROCK WAS ENCOUNTERED AT ELEVATIONS RANGING FROM 628.6 TO 630.3 FEET MSL.

EXPLORATION FINDINGS (CONTINUED)

ERA-70-1373B (CONTINUED):
GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN THE BORINGS AT DEPTHS RANGING FROM 18.5 TO 56.0 FEET BELOW EXISTING GRADE. THE GROUNDWATER LEVELS AT THE COMPLETION OF DRILLING COULD NOT BE MEASURED DUE TO THE ADDITION OF MUD TO COUNTERACT HEAVING SANDS AS WELL AS WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS. PLEASE NOTE THAT SHORT-TERM WATER LEVEL READINGS, ESPECIALLY IN COHESIVE SOILS, ARE NOT NECESSARILY AN ACCURATE INDICATION OF THE ACTUAL GROUNDWATER LEVEL.

ERA-70-1373L/R/A:
BETWEEN JULY 1 AND MARCH 17, 2015, SIX (6) STRUCTURAL BORINGS, DESIGNATED AS B-020-1-13 THROUGH B-020-3-13, B-020-5-13, B-020-7-13 AND B-020-9-15, WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 49.8 TO 90.0 FEET BELOW THE EXISTING GROUND SURFACE. BORING B-020-1-13 WAS PERFORMED IN A GRASS YARD BETWEEN A NEW BUILDING AND AN ASPHALT ACCESS DRIVE BETWEEN SHORT STREET AND THE RAILROAD TRACKS TO THE WEST AND ENCOUNTERED 6.0 INCHES OF TOPSOIL OVERLYING 4.0 INCHES OF BRICK PAVERS. BORING B-020-2-13 WAS PERFORMED ALONG THE ASPHALT ACCESS DRIVE FROM SHORT STREET TO THE RAILROAD TRACKS AND ENCOUNTERED 4.0 INCHES OF ASPHALT OVERLYING 6.0 INCHES OF AGGREGATE BASE. BORINGS B-020-3-13 AND B-020-9-15 WERE PERFORMED IN THE SOUTHBOUND LANE OF SHORT STREET AND ENCOUNTERED 4.0 INCHES OF ASPHALT IN EACH BORING OVERLYING 4.0 INCHES OF BRICK PAVERS IN BORING B-020-9-15 FOLLOWED BY 9.0 AND 3.0 INCHES OF AGGREGATE BASE, RESPECTIVELY. BORING B-020-5-13 WAS DRILLED IN THE MEDIAN SHOULDER OF I-70 WESTBOUND AND ENCOUNTERED 6.0 INCHES OF CONCRETE OVERLYING 6.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE. BORING B-020-7-13 WAS DRILLED THROUGH THE EXISTING SIDEWALK ALONG THE EAST SIDE OF SHORT STREET, BELOW THE EXISTING STRUCTURE AND BETWEEN THE CURB AND PIER COLUMNS, AND ENCOUNTERED 8.0 INCHES OF CONCRETE AT THE GROUND SURFACE.

BENEATH THE PAVEMENT MATERIALS IN BORING B-020-5-13 EXISTING EMBANKMENT FILL CONSISTING OF BROWN SILT AND CLAY (ODOT A-6a) WAS ENCOUNTERED EXTENDING TO A DEPTH OF 25.5 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO ELEVATION 707.9 FEET MSL. THE EMBANKMENT FILL CONTAINED WOOD AND BRICK FRAGMENTS AT VARIOUS DEPTHS. BENEATH THE SURFACE MATERIALS IN BORINGS B-020-1-13, B-020-2-13, B-020-7-13 AND B-020-9-15, MATERIAL IDENTIFIED AS EXISTING OR POSSIBLE FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 10.5 TO 20.5 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 690.5 TO 702.5 FEET MSL. THE FILL MATERIAL CONSISTED OF DARK BROWN, BROWN, BLACK AND GRAY GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, SANDY SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-1-b, A-2-4, A-4a, A-6a, A-6b, A-7-6).

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL MATERIAL, NATURAL GRANULAR SOILS WERE PREDOMINANTLY PRESENT IN THE UPPER 45 TO 57 FEET OF THE SOIL PROFILE OVERLYING COHESIVE SOILS. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, DARK BROWN BLACK AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY AND SANDY SILT (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-4a). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS GRAY, BROWN AND BROWNISH GRAY SANDY SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-4a, A-6a, A-6b, A-7-6).

IT SHOULD BE NOTED THAT COBBLES AND ROCK FRAGMENTS WERE PRESENT WITHIN THE DENSE GRANULAR SOILS ENCOUNTERED IN THE MAJORITY OF THE BORINGS. AUGER REFUSAL WAS ENCOUNTERED AT A DEPTH OF 26.0 FEET BELOW THE GROUND SURFACE IN BORING B-020-3-13, AND A 5.0-FOOT ROCK CORE RUN RECOVERED A 1.5-FOOT THICK GRANITE BOULDER AT THIS DEPTH OVERLYING NATURAL SOILS. THE BORING WAS CONTINUED BELOW THIS DEPTH FOLLOWING THE ROCK CORE THROUGH THE BOULDER, AND ANOTHER BOULDER WAS ENCOUNTERED AT A DEPTH OF 49.8 FEET BELOW EXISTING GRADE. THE BORING COULD NOT BE ADVANCED BEYOND THIS DEPTH USING THE HOLLOW-STEM AUGERS OR A CASING ADVANCER WITH A TRI-CONE BIT AND WAS TERMINATED. GRANITE BOULDERS WERE ENCOUNTERED IN BORINGS B-020-5-13 AND B-020-7-13 AT AN APPROXIMATE ELEVATION OF 657 FEET MSL. AUGER REFUSAL WAS ENCOUNTERED AT THIS ELEVATION IN BOTH BORINGS. ROCK CORING WAS PERFORMED BELOW THIS ELEVATION IN BORING B-020-5-13 AND THE 1.1-FOOT ROCK CORE RUN RECOVERED 9.0-INCHES OF GRANITE FROM A BOULDER. THE BORING COULD NOT BE ADVANCED BEYOND THIS DEPTH USING THE HOLLOW-STEM AUGERS, AND WAS EXTENDED TO BEDROCK AND CORED TO THE TERMINATION DEPTH AT A LATER DATE. ROCK CORING WAS ALSO PERFORMED BELOW THIS ELEVATION IN BORING B-020-7-13. BASED ON THE LACK OF RECOVERY AND OBSERVATION OF THE SOIL WASHOUT IN THE CIRCULATION FLUID, IT IS ANTICIPATED THAT THIS MATERIAL IS A HARD COHESIVE SOIL THAT EXTENDED TO THE TOP OF BEDROCK ENCOUNTERED AT ELEVATION 648.1 FEET MSL.

WEATHERED SHALE BEDROCK WAS ENCOUNTERED IN BORINGS B-020-1-13, B-020-2-13 AND B-020-5-13 AT A DEPTHS RANGING FROM 64.2 TO 76.6 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 647.1 TO 656.8 FEET MSL. MORE COMPETENT SHALE AND MUDSTONE BEDROCK THAT REQUIRED ROCK CORING TECHNIQUES TO ADVANCE THE BORINGS WAS ENCOUNTERED IN BORINGS B-020-2-13, B-020-5-13, B-020-7-13 AND B-020-9-15 AT DEPTHS RANGING FROM 60.5 TO 80.0 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 641.9 TO 653.4 FEET MSL. COMPETENT LIMESTONE BEDROCK WAS ENCOUNTERED IN BORINGS B-020-1-13 AND B-020-2-13 AT A DEPTH OF 80.5 AND 79.5 FEET BELOW THE GROUND SURFACE, RESPECTIVELY, WHICH CORRESPONDS TO AN ELEVATION OF 632.3 AND 631.9 FEET MSL. THE REMAINDER OF THE BORINGS WERE TERMINATED AT PRIOR TO ENCOUNTERING THE UNDERLYING LIMESTONE BEDROCK.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN BORINGS B-020-1-13, B-020-2-13 AND B-020-5-13 AT DEPTHS RANGING FROM 23.0 TO 43.5 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 689.8 TO 692.9 FEET MSL. GROUNDWATER WAS NOT ENCOUNTERED IN BORINGS B-020-3-13 OR B-020-7-13 PRIOR TO INTRODUCING WATER TO THE BOREHOLE. THE GROUNDWATER LEVELS AT THE COMPLETION OF DRILLING COULD NOT BE MEASURED DUE TO THE ADDITION OF MUD TO COUNTERACT HEAVING SANDS AS WELL AS WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS.

EXPLORATION FINDINGS (CONTINUED)

ERA-70-1390C:
BETWEEN AUGUST 6, 2013, AND FEBRUARY 14, 2015, SIX (6) STRUCTURAL BORINGS, DESIGNATED AS B-023-1-13, B-024-1-13, B-024-2-14, B-026-1-13, B-026-2-13 AND B-026-3-13, WERE ADVANCED TO COMPLETION DEPTHS RANGING FROM 48.1 TO 90.0 FEET BELOW THE EXISTING GROUND SURFACE. IN ADDITION TO THE BORINGS PERFORMED BY RII AS PART OF THE CURRENT EXPLORATION, THREE (3) BORINGS, DESIGNATED AS B-024-0-08, B-025-0-08 AND B-026-0-08, WERE DRILLED TO A COMPLETION DEPTH OF 111.5, 59.3 AND 115.0 FEET BELOW THE EXISTING GROUND SURFACE, RESPECTIVELY, BY DLZ AS PART OF THE FRA-70-8.93 PRELIMINARY EXPLORATION (PID 77369). IN ADDITION TO THE PROJECT BORINGS, FOUR (4) BORINGS, DESIGNATED AS B-001-C-59, B-002-F-59, B-003-A-59 AND B-005-F-59, WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 55.0 TO 73.0 FEET BELOW THE EXISTING GRADE AT THE RESPECTIVE BORING LOCATION AT THE TIME OF THE EXPLORATION BY THE DEPARTMENT OF HIGHWAYS AS PART OF THE FRA-40-12.89 PROJECT.

BORINGS B-023-1-13 AND B-024-0-08 WERE PERFORMED ALONG THE SOUTH SIDE OF W. FULTON STREET, AND NO DISCERNABLE SURFACE MATERIAL WAS PRESENT AT THE GROUND SURFACE. BORINGS B-024-1-13 AND B-024-2-14 WERE DRILLED IN THE EXISTING I-70 EASTBOUND RAMP TO FRONT STREET AND ENCOUNTERED 14.0 AND 5.0 INCHES OF ASPHALT, RESPECTIVELY, OVERLYING 6.0 INCHES OF AGGREGATE BASE IN BORING B-024-1-13 AND 13.0 INCHES OF CONCRETE IN BORING B-024-2-14 AT THE GROUN SURFACE. BORINGS B-025-0-08 AND B-026-2-13 WERE DRILLED IN THE EXISTING SHOULDERS OF I-70 EASTBOUND AND WESTBOUND AND ENCOUNTERED 7.0 AND 9.0 INCHES OF ASPHALT OVERLYING 7.0 AND 6.0 INCHES OF AGGREGATE BASE, RESPECTIVELY. BORING B-026-0-08 WAS PERFORMED AT THE TOP OF THE SLOPE ALONG THE NORTH SIDE OF I-70/I-71 AND ENCOUNTERED 4.0 INCHES OF TOPSOIL AT THE GROUND SURFACE. BORING B-026-1-13 WAS PERFORMED IN THE EXISTING PAVEMENT ALONG S. LUDLOW STREET AND ENCOUNTERED 4.0 INCHES OF ASPHALT OVERLYING 8.0 INCHES OF AGGREGATE BASE. BORING B-026-3-13 WAS PERFORMED WITHIN THE EXISTING SIDEWALK ALONG THE WEST SIDE OF S. FRONT STREET, AT THE INTERSECTION WITH W. FULTON STREET ON THE NORTH SIDE OF I-70/I-71 AND ENCOUNTERED 6.0 INCHES OF CONCRETE OVERLYING 6.0 INCHES OF AGGREGATE BASE.

BENEATH THE PAVEMENT MATERIALS IN BORINGS B-025-0-08, B-026-1-13 AND B-026-2-13, MATERIAL IDENTIFIED AS EXISTING FILL OR POSSIBLE FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 3.5 TO 15.5 FEET BELOW EXITING GRADE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 731.3 TO 736.9 FEET MSL. THE FILL MATERIAL WAS DESCRIBED AS MEDIUM DENSE TO VERY DENSE, BROWN AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT (ODOT A-1-a, A-1-b, A-2-4), AND HARD, BROWN SILT AND CLAY (ODOT A-6a) AND CONTAINED BRICK FRAGMENTS THROUGHOUT.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, WHERE ENCOUNTERED, NATURAL SOILS WERE ENCOUNTERED CONSISTING OF BOTH GRANULAR AND COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS LOOSE TO VERY DENSE BROWN, GRAY, BROWNISH GRAY AND DARK GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, FINE SAND, COARSE AND FINE SAND, SANDY SILT AND SILT (ODOT A-1-a, A-1-b, A-2-4, A-3, A-3a, A-4a, A-4b). THE COHESIVE MATERIALS WERE GENERALLY DESCRIBED AS SOFT TO HARD, BROWN, BROWNISH GRAY AND DARK GRAY SANDY SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-4a, A-6a, A-6b, A-7-6).

COBBLES AND BOULDERS WERE ENCOUNTERED IN THE MAJORITY OF THE BORINGS AT AND BELOW ELEVATIONS RANGING FROM 700 TO 710 FEET MSL. AT DEPTHS BELOW THIS ELEVATIONS RANGE, DRILLING CONDITIONS WERE TYPICALLY MORE CHALLENGING AND HIGH BLOW COUNTS, INCLUDING SPLIT SPOON SAMPLER REFUSAL, WERE OBTAINED THROUGHOUT THESE DEPOSITS. SPLIT SPOON SAMPLER REFUSAL IS DEFINED AS EXCEEDING 50 BLOWS FROM THE HAMMER WITH LESS THAN 6.0 INCHES OF PENETRATION BY THE SPLIT SPOON SAMPLER. ADDITIONALLY, HEAVING SANDS WERE ENCOUNTERED IN THE MAJORITY OF THE BORINGS AT ELEVATIONS RANGING FROM 685 TO 700 FEET MSL. THE HEIGHT OF SAND HEAVE WITHIN THE AUGERS WAS APPROXIMATELY 1.0 TO 3.0 FEET AND WAS ABLE TO BE CONTROLLED THROUGH THE ADDITION OF WATER OR MUD TO THE BOREHOLES DURING DRILLING.

TOP OF BEDROCK WAS ENCOUNTERED IN BORINGS B-024-0-08 AND B-026-0-08 AT A DEPTH OF 91.8 AND 90.0 FEET BELOW EXISTING GRADE, RESPECTIVELY, WHICH CORRESPONDS TO AN ELEVATION OF 651.6 AND 664.0 FEET MSL. THE UPPER PORTION OF THE BEDROCK IN BORING B-026-0-08 CONSISTED OF BROWN, SEVERELY WEATHERED CLAYSTONE THAT EXTENDED TO A DEPTH OF 97.8 FEET (EL. 656.2 FEET MSL) OVERLYING BLUEISH GRAY TO DARK GRAY, MODERATELY TO HIGHLY WEATHERED SHALE.

IN GENERAL, THE HISTORIC BORINGS, DESIGNATED B-001-C-59, B-002-F-59, B-003-A-59 AND B-005-F-59, ENCOUNTERED LOOSE TO VERY DENSE GRANULAR SOILS WITH INTERMITTENT SEAMS OF MEDIUM STIFF TO HARD COHESIVE SOILS. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, COARSE AND FINE SAND AND SANDY SILT (ODOT A-1-a, A-1-b, A-2-4, A-3a, A-4a), AND THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY AND BROWNISH GRAY SANDY SILT, SILT AND SILT AND CLAY (ODOT A-4a, A-4b, A-6a). IN GENERAL, THE SUBSURFACE CONDITIONS ENCOUNTERED IN THE HISTORIC BORINGS MATCHED RELATIVELY CLOSELY WITH THE SUBSURFACE CONDITIONS ENCOUNTERED IN THE PRELIMINARY ENGINEERING OR CURRENT EXPLORATION BORINGS.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING THE DRILLING PROCESS IN ALL OF THE BORINGS PERFORMED AS PART OF THE CURRENT OR PRELIMINARY EXPLORATIONS AT DEPTHS RANGING FROM 18.5 TO 41.0 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 700.4 TO 720.9 FEET MSL. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING IN BORINGS B-023-1-13, B-024-0-08, B-026-0-08 AND B-026-0-08 RANGED FROM 18.0 TO 39.0 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 701.4 TO 726.9 FEET MSL. THE GROUNDWATER LEVELS AT THE COMPLETION OF DRILLING COULD NOT BE MEASURED IN THE REMAINDER OF THE BORINGS DUE TO THE ADDITION OF MUD OR WATER TO COUNTERACT HEAVING SANDS.

DRAWN RRM
CHECKED BRT

SOIL PROFILE

FRA-70-12.68
FRA-70-13.10

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-8\9464iC008.dgn 6/25/2021 11:21:43 AM racheim

EXPLORATION FINDINGS (CONTINUED)

FRA-70-1395C:
BETWEEN AUGUST 21 AND 22, 2013, ONE (1) STRUCTURAL BORING, DESIGNATED AS B-026-3-13, WAS DRILLED TO A COMPLETION DEPTH OF 90.0 FEET BELOW THE EXISTING GROUND SURFACE AT THE LOCATION SHOWN ON THE BORING PLAN PROVIDED IN APPENDIX II OF THIS REPORT. IN ADDITION TO THE BORING PERFORMED AS PART OF THE CURRENT EXPLORATION, TWO (2) HISTORIC BORINGS, DESIGNATED AS B-002-F-59 AND B-005-F-59, WERE OBTAINED AT THE SOUTHWEST AND NORTHEAST CORNERS OF THE EXISTING BRIDGE ALIGNMENT, RESPECTIVELY. THE HISTORIC BORINGS WERE EXTENDED TO A DEPTH OF 73.0 AND 66.0 FEET, RESPECTIVELY, BELOW THE GROUND SURFACE AT THE TIME THE BORINGS WERE OBTAINED.

BORING B-026-3-13 WAS PERFORMED WITHIN THE EXISTING SIDEWALK ALONG THE WEST SIDE OF S. FRONT STREET, AT THE INTERSECTION WITH W. FULTON STREET ON THE NORTH SIDE OF THE EXISTING STRUCTURE AND ENCOUNTERED 6.0 INCHES OF CONCRETE OVERLYING 6.0 INCHES OF AGGREGATE BASE AT THE EXISTING GROUND SURFACE. BENEATH THE SURFACE MATERIALS, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT LAYERS OF COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY AND BROWNISH GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT AND COARSE AND FINE SAND (ODOT A-1-a, A-1-b, A-2-4, A-3a). THE COHESIVE SOIL SEAMS ENCOUNTERED WERE GENERALLY DESCRIBED AS BROWN, GRAY AND BROWNISH GRAY SANDY SILT, SILT AND CLAY AND SILTY CLAY (ODOT A-4a, A-6a, A-6b).

BEDROCK WAS NOT ENCOUNTERED IN ANY OF THE BORINGS PERFORMED DURING THE HISTORIC OR CURRENT EXPLORATIONS IN THE IMMEDIATE VICINITY OF THE S. FRONT STREET STRUCTURE. HOWEVER, BASED ON THE SUBSURFACE CONDITIONS ENCOUNTERED IN BORINGS PERFORMED WITHIN THE AREA OF THE ADJACENT FRA-70-1390C STRUCTURE, SHALE BEDROCK IS PRESENT AT AN APPROXIMATE ELEVATION OF 630 FEET MSL.

IN GENERAL, THE HISTORIC BORINGS ENCOUNTERED MEDIUM DENSE TO VERY DENSE GRANULAR SOILS WITH INTERMITTENT LAYERS OF HARD COHESIVE SOILS. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT AND COARSE AND FINE SAND (ODOT A-1-a, A-1-b, A-2-4, A-4a, A-4b), AND THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS GRAY SANDY SILT AND SILT AND CLAY (ODOT A-4a, A-6a). BEDROCK WAS NOT ENCOUNTERED IN THE HISTORIC BORINGS PRIOR TO THE TERMINATION DEPTHS. IN GENERAL, THE SUBSURFACE CONDITIONS ENCOUNTERED IN THE HISTORIC BORINGS MATCHED RELATIVELY CLOSELY WITH THE SUBSURFACE CONDITIONS ENCOUNTERED IN THE CURRENT EXPLORATION BORING.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING THE DRILLING PROCESS IN BORING B-026-3-13 AT A DEPTH OF 36.0 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO AN ELEVATION OF 720.9 FEET MSL. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING WAS NOT OBTAINED PRIOR TO BACKFILLING THE BOREHOLE.

FRA-70-1405C:
BETWEEN JULY 9 AND 24, 2008, TWO (2) BORINGS, DESIGNATED AS B-027-0-08 AND B-029-0-08, WERE DRILLED TO A COMPLETION DEPTH OF 10.0 AND 136.5 FEET BELOW THE EXISTING GROUND SURFACE, RESPECTIVELY, AT THE LOCATIONS PROVIDED BY DLZ AS PART OF THE FRA-70-8.93 PRELIMINARY EXPLORATION. IN ADDITION TO THE BORINGS PERFORMED AS PART OF THE PRELIMINARY ENGINEERING EXPLORATION, THREE (3) BORINGS, DESIGNATED AS B-001-0-59, B-007-0-59 AND B-011-0-59, WERE OBTAINED ALONG THE EAST SIDE OF THE EXISTING BRIDGE ALIGNMENT. THE BORINGS WERE EXTENDED TO A DEPTH OF 56.0, 65.2 AND 71.0 FEET, RESPECTIVELY, BELOW THE GROUND SURFACE AT THE TIME THE BORINGS WERE OBTAINED.

BORINGS B-028-0-08 WAS DRILLED IN THE EXISTING SHOULDER OF I-70 WESTBOUND AND ENCOUNTERED 12.0 INCHES OF CONCRETE OVERLYING 6.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE. BORING B-029-0-08 WAS PERFORMED IN THE EXISTING I-70 EASTBOUND RAMP TO FOURTH STREET AND ENCOUNTERED 7.0 INCHES OF ASPHALT OVERLYING 9.0 INCHES OF CONCRETE AND 11.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE. BENEATH THE PAVEMENT MATERIALS IN BORINGS B-028-0-08 AND B-029-0-08, MATERIAL IDENTIFIED AS EXISTING FILL OR POSSIBLE FILL WAS ENCOUNTERED EXTENDING TO A DEPTH OF 10.0 (BOTTOM OF BORING) AND 6.0 FEET, RESPECTIVELY, BELOW EXITING GRADE, WHICH CORRESPONDS TO AN ELEVATION OF 721.7 AND 736.3 FEET MSL. THE FILL MATERIAL WAS DESCRIBED AS BROWN AND GRAY GRAVEL AND GRAVEL WITH SAND (ODOT A-1-a, A-1-b) AND CONTAINED BRICK FRAGMENTS IN ONE OF THE SAMPLES, AS NOTED ON THE VISUAL DESCRIPTIONS PROVIDED ON THE BORING LOGS.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, NATURAL GRANULAR SOILS WERE ENCOUNTERED IN BORING B-029-0-08, WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, FINE SAND, COARSE AND FINE SAND, SANDY SILT AND SILT (ODOT A-1-a, A-1-b, A-2-4, A-3, A-3a, A-4a, A-4 b). THE COHESIVE MATERIALS WERE DESCRIBED AS GRAY SANDY SILT, SILT, SILT AND CLAY AND SILTY CLAY (ODOT A-4a, A-4b, A-6a, A-6b).

TOP OF BEDROCK WAS ENCOUNTERED IN BORING B-029-0-08 AT A DEPTH OF 113.5 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO AN ELEVATION OF 628.8 FEET MSL. THE UPPER PORTION OF THE BEDROCK CONSISTED OF GRAY, SEVERELY WEATHERED SHALE OVERLYING DARK GRAY, MODERATELY TO HIGHLY WEATHERED SHALE OVERLYING COMPETENT LIMESTONE BEDROCK, WHICH WAS ENCOUNTERED AT AN ELEVATION OF 621.7 FEET MSL.

IN GENERAL, THE HISTORIC BORINGS, DESIGNATED B-001-0-59, B-007-0-59 AND B-011-0-59, ENCOUNTERED MEDIUM DENSE TO VERY DENSE GRANULAR SOILS WITH INTERMITTENT SEAMS OF VERY STIFF TO HARD COHESIVE SOILS. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, SANDY SILT AND SILT (ODOT A-1-a, A-1-b, A-2-4, A-4 a, A-4b), AND THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS GRAY AND BROWN SANDY SILT AND SILT AND CLAY (ODOT A-4a, A-6a).

EXPLORATION FINDINGS (CONTINUED)

FRA-70-1405C (CONTINUED):
A BOULDER ZONE WAS ENCOUNTERED IN BORING B-001-0-59 BETWEEN ELEVATIONS 740.2 AND 750.2 FEET MSL, AND BOULDERS WERE ENCOUNTERED FOR THE ENTIRE DEPTH OF BORING B-007-0-59, TO ELEVATION 703.1 FEET MSL. BOULDERS WERE NOT NOTED ON THE LOG FOR BORING B-011-0-59. IN GENERAL, THE SUBSURFACE CONDITIONS ENCOUNTERED IN THE HISTORIC BORINGS MATCHED RELATIVELY CLOSELY WITH THE SUBSURFACE CONDITIONS ENCOUNTERED IN THE CURRENT EXPLORATION BORING.

GROUNDWATER WAS NOT ENCOUNTERED DURING OR AT THE COMPLETION OF DRILLING IN BORING B-028-0-08. GROUNDWATER WAS ENCOUNTERED INITIALLY DURING THE DRILLING PROCESS IN BORING B-029-0-08 AT A DEPTH OF 21.0 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO AN ELEVATION OF 721.3 FEET MSL. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING IN BORING B-029-0-08 WAS 20.5 FEET BELOW EXISTING GRADE FOLLOWING THE ROCK CORING PROCESS. ADDITIONALLY, DLZ NOTED THAT THEY FREQUENTLY ADDED WATER TO THE BOREHOLE TO CLEAN OUT THE AUGERS AFTER ENCOUNTERING SAND HEAVE OF VARYING AMOUNTS AT VARIOUS DEPTHS.

FRA-70-1503L:
BETWEEN FEBRUARY 4, 2014, AND JANUARY 22, 2015, A TOTAL OF TWENTY FOUR (24) BORINGS, DESIGNATED AS B-104-1-13, B-105-2-13, B-107-1-13, B-108-4-13 THROUGH B-108-6-13, B-113-2-13 THROUGH B-113-9-13, B-114-1-13 THROUGH B-114-9-13, B-115-1-13 AND B-115-2-13 WERE DRILLED. IN ADDITION TO THE BORINGS PERFORMED AS PART OF THE CURRENT EXPLORATION, FIVE (5) HISTORIC BORINGS PERFORMED IN 1957 BY THE DEPARTMENT OF HIGHWAYS AS PART OF THE FRA-40-12.30 PROJECT, AND SEVEN (7) HISTORIC BORINGS PERFORMED IN 1968 BY THE DEPARTMENT OF HIGHWAYS AS PART OF THE FRA-70-12.30S PROJECT WERE OBTAINED FROM THE CONSTRUCTION DOCUMENTS ON RECORD. THE HISTORIC BORINGS WERE EXTENDED TO DEPTHS RANGING FROM 36.0 TO 75.0 FEET BELOW EXISTING GRADES AT THE TIME OF THE EXPLORATION.

BORINGS B-113-2-13 AND B-113-3-13 WERE PERFORMED WITHIN THE EXISTING PAVEMENT OF I-70 WESTBOUND AND ENCOUNTERED 8.0 AND 6.0 INCHES OF ASPHALT OVERLYING 6.0 AND 12.0 INCHES OF AGGREGATE BASE MATERIAL, RESPECTIVELY. BORING B-114-2-13 WAS EXTENDED THROUGH THE PAVEMENT OF THE EXISTING LOWER SCIOTO GREENWAY BIKE TRAIL AND ENCOUNTERED 6.0 INCHES OF ASPHALT AT THE GROUND SURFACE. WITH THE EXCEPTION OF BORINGS B-113-6-13 THROUGH B-113-8-13, WHICH WERE PERFORMED WITHIN THE SCIOTO RIVER, THE REMAINING BORINGS ENCOUNTERED 1.0 TO 9.0 INCHES OF TOPSOIL AT THE GROUND SURFACE, AS IDENTIFIED BY THE SIGNIFICANT PRESENCE OF ORGANICS AND VEGETATION. SURFICIAL MATERIALS WERE NOT NOTED ON THE HISTORIC BORING LOGS.

BENEATH THE SURFACE MATERIALS, EXISTING FILL WAS ENCOUNTERED IN EIGHT (8) OF THE BORINGS PERFORMED WEST OF THE SCIOTO RIVER EXTENDING TO ELEVATIONS RANGING FROM 677.5 TO 719.7 FEET MSL, AND IN TEN (10) OF THE BORINGS PERFORMED EAST OF THE SCIOTO RIVER EXTENDING TO ELEVATIONS RANGING FROM 685.8 TO 708.5 FEET MSL. THE EXISTING FILL MATERIAL ENCOUNTERED WEST OF THE SCIOTO RIVER CONSISTED OF BROWN, DARK BROWN, GRAY, DARK GRAY AND BLACK GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY, COARSE
AND FINE SAND, SANDY SILT, SILT AND CLAY AND SILTY CLAY (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a, A-4a, A-6a, A-6b). THE EXISTING FILL MATERIAL ENCOUNTERED EAST OF THE SCIOTO RIVER IS COMPRISED OF DARK BROWN, BROWN, GRAY, DARK GRAY AND BLACK GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY, COARSE AND FINE SAND, SANDY SILT, SILT, SILT AND CLAY AND SILTY CLAY (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a, A-4a, A-4b, A-6a, A-6b). ASPHALT, BRICK, CINDER, COAL, CONCRETE, ROCK, SLAG, AND WOOD FRAGMENTS WERE OBSERVED TO BE PRESENT WITHIN THE MAJORITY OF THE FILL MATERIAL EAST OF THE SCIOTO RIVER IN ADDITION TO ORGANIC MATERIAL INCLUDING GRASS AND ROOT FIBERS. BASED ON AVAILABLE HISTORIC RECORDS, THE FILL MATERIAL ENCOUNTERED IN THE VICINITY OF SHORT STREET WAS LIKELY PLACED WITHIN AN OLD CANAL.

UNDERLYING THE SURFACE MATERIALS AND EXISTING FILL, WHERE ENCOUNTERED, THE NATURAL SOILS ENCOUNTERED WEST OF THE SCIOTO RIVER WERE PREDOMINANTLY GRANULAR WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL, AND THE NATURAL SOILS ENCOUNTERED EAST OF THE SCIOTO RIVER CONSISTED GENERALLY OF GRANULAR OVERLYING COHESIVE SOILS. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BLACK, BROWN, DARK BROWN, GRAY, AND DARK GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY, COARSE AND FINE SAND AND SANDY SILT (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a, A-4a). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS BROWN, LIGHT BROWN, DARK BROWN, REDDISH BROWN, GRAY AND DARK GRAY SANDY SILT, SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-4a, A-4b, A-6a, A-6b, A-7-6).

COBBLES AND BOULDERS WERE ENCOUNTERED IN A TOTAL OF SIXTEEN (16) OF THE BORINGS PERFORMED FOR THIS STRUCTURE. THE COBBLES AND BOULDERS, WHICH GENERALLY INCREASED IN INTENSITY WITH DEPTH AND NEAR THE BEDROCK SURFACE, WERE INITIALLY ENCOUNTERED AT ELEVATIONS RANGING FROM 663.6 TO 743.3 FEET MSL. ADDITIONALLY, A BOULDER ZONE WAS ALSO ENCOUNTERED IN HISTORIC BORING B-001-S-57 BETWEEN ELEVATIONS 661.0 AND 667.0 FEET MSL.

THE BEDROCK SURFACE WAS ENCOUNTERED IN THE HISTORIC BORINGS AT DEPTHS RANGING FROM 29.0 TO 86.7 FEET BELOW THE GROUND SURFACE, CORRESPONDING TO ELEVATIONS RANGING FROM 646.4 TO 660.8 FEET MSL. WITHIN THE BORINGS PERFORMED AS PART OF THE CURRENT EXPLORATION, THE BEDROCK SURFACE WAS ENCOUNTERED AT DEPTHS RANGING FROM 30.9 TO 89.2 FEET BENEATH THE GROUND SURFACE, CORRESPONDING TO ELEVATIONS RANGING FROM 644.0 TO 661.1 FEET MSL. AUGERABLE BEDROCK WAS ENCOUNTERED IN SEVERAL OF THE BORINGS PERFORMED ALONG THE EAST SIDE OF THE PROJECT. THE CORED BEDROCK ENCOUNTERED ACROSS THE PROPOSED ALIGNMENT GENERALLY CONSISTS OF SHALE, MUDSTONE, CLAYSTONE, LIMESTONE AND DOLOMITE.

EXPLORATION FINDINGS (CONTINUED)

FRA-70-1503L(CONTINUED):
SEVEN (7) BORINGS PERFORMED ALONG THE WEST END OF THE STRUCTURE ALIGNMENT TO JUST WEST OF THE SCIOTO RIVER ENCOUNTERED LIMESTONE AT THE BEDROCK SURFACE. SIXTEEN (16) BORINGS PERFORMED FROM JUST WEST OF THE SCIOTO RIVER TO THE END OF THE STRUCTURE ALIGNMENT ENCOUNTERED SHALE, CLAYSTONE OR MUDSTONE AT THE BEDROCK SURFACE OVERLYING LIMESTONE. IN THIRTEEN (13) OF THE BORINGS WHERE SHALE, MUDSTONE AND CLAYSTONE BEDROCK WERE ENCOUNTERED, THE UPPER PORTION OF THE BEDROCK WAS ABLE TO BE AUGERED AND SAMPLED USING THE SPT AND SPLIT SPOON SAMPLER. IN GENERAL, THE SHALE, MUDSTONE AND CLAYSTONE BEDROCK OVERLYING THE LIMESTONE INCREASED IN THICKNESS ALONG THE PROPOSED ALIGNMENT STARTING JUST WEST OF THE SCIOTO RIVER TO THE END OF THE STRUCTURE ALIGNMENT. LIMESTONE BEDROCK WAS ENCOUNTERED IN EIGHT (8) OF THE BORINGS AT THE BEDROCK SURFACE, AND, WITH THE EXCEPTION OF BORING B-115-1-13, WAS ENCOUNTERED IN THE REMAINING BORINGS BELOW THE SHALE, MUDSTONE AND CLAYSTONE BEDROCK. THE SHALE BEDROCK WAS ENCOUNTERED AT ELEVATIONS RANGING FROM 648.4 TO 661.1 FEET MSL, AND THE LIMESTONE BEDROCK WAS ENCOUNTERED AT ELEVATIONS RANGING FROM 629.0 TO 657.0 FEET MSL.

GROUNDWATER SEEPAGE WAS INITIALLY ENCOUNTERED IN EIGHT (8) BORINGS AT DEPTHS RANGING FROM 11.5 TO 44.5 FEET BELOW THE GROUND SURFACE, CORRESPONDING TO ELEVATIONS RANGING FROM 690.5 TO 702.0 FEET MSL. MORE SIGNIFICANT GROUNDWATER FLOW WAS ENCOUNTERED IN TWENTY-ONE (21) OF THE BORINGS PERFORMED, AT DEPTHS RANGING FROM 8.5 TO 60.0 FEET BELOW THE GROUND SURFACE, CORRESPONDING TO ELEVATIONS RANGING FROM 675.3 TO 707.6 FEET MSL. AS STATED PREVIOUSLY, BORINGS B-113-6-13 THROUGH B-113-8-13 WERE PERFORMED WITHIN THE SCIOTO RIVER, WHICH RANGED IN ELEVATION FROM 699.2 TO 700.7 FEET MSL AT THE TIME OF DRILLING. AT THE COMPLETION OF DRILLING, ACCURATE GROUNDWATER LEVELS COULD NOT BE OBTAINED DUE TO THE ADDITION OF MUD TO COUNTERACT HEAVING SANDS IN SEVERAL OF THE BORINGS, AS WELL AS THE ADDITION OF WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS.

FRA-71-1518A & WALL 4W11:
BETWEEN JUNE 6, 2013, AND MARCH 8, 2015, A TOTAL OF FOUR (4) BORINGS, DESIGNATED AS B-015-7-13, B-108-2-13, B-108-3-13 AND B-108-9-15, WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 50.0 TO 80.5 FEET BELOW THE EXISTING GROUND SURFACE ALONG THE PROPOSED BRIDGE ALIGNMENT.

BORING B-108-2-13 WAS PERFORMED IN THE GRASS INFIELD ALONG THE WEST SIDE OF THE EXISTING I-71 NORTHBOUND RAMP AND BORINGS B-015-7-13 AND B-108-3-13 WERE PERFORMED AT THE TOP OF THE GRASS COVERED BANK OF THE SCIOTO RIVER AND ENCOUNTERED 5.0 TO 6.0 INCHES OF TOPSOIL AT THE GROUND SURFACE. BORING B-108-9-15 WAS PERFORMED WITHIN THE EXISTING RAMP FROM I-71 NORTHBOUND TO I-70 EASTBOUND AND ENCOUNTERED 3.0 INCHES OF ASPHALT OVERLYING 9.0 INCHES OF CONCRETE FOLLOWED BY 4.0 INCHES OF AGGREGATE BASE.

BENEATH THE SURFACE MATERIALS IN BORINGS B-108-2-13, B-108-3-13 AND B-108-9-15, MATERIAL IDENTIFIED AS EXISTING FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 5.0 TO 8.0 FEET BELOW EXISTING GRADE. THE FILL MATERIAL CONSISTED OF BROWN, GRAY, DARK BROWN AND BROWNISH GRAY GRAVEL WITH SAND AND SILT, AND SILTY CLAY (ODOT A-2-4, A-6b) AND CONTAINED TRACE AMOUNTS OF CINDERS, BRICK AND STONE FRAGMENTS IN SEVERAL OF THE SAMPLES RECOVERED.

UNDERLYING THE TOPSOIL IN BORING B-015-7-13 AND EXISTING FILL IN THE REMAINING BORINGS, NATURAL COHESIVE SOILS WERE ENCOUNTERED EXTENDING TO AN APPROXIMATE ELEVATION OF 700 FEET MSL OVERLYING GRANULAR SOILS. THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS GRAY, BROWN, BROWNISH GRAY, DARK BROWN AND DARK GRAY SANDY SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-4 a, A-6a, A-6b, A-7-6). THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY, BROWNISH GRAY AND DARK BROWN GRAVEL, GRAVEL AND SAND GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY, COARSE AND FINE SAND AND SANDY SILT (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a, A-4a).

BEDROCK WAS ENCOUNTERED IN BORINGS B-015-7-13 AND B-108-9-15 AT A DEPTH OF 70.5 AND 67.0 FEET BELOW THE GROUND SURFACE, RESPECTIVELY, WHICH CORRESPONDS TO AND ELEVATION OF 651.3 AND 655.4 FEET MSL. THE CORED BEDROCK IN BORING B-015-7-13 CONSISTED OF DOLOMITE, AND THE CORED BEDROCK IN BORING B-108-9-15 CONSISTED OF LIMESTONE.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN THE BORINGS AT DEPTHS RANGING FROM 30.0 TO 37.0 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 685.1 TO 691.8 FEET MSL. AT THE COMPLETION OF DRILLING AND AFTER REMOVING THE AUGERS, GROUNDWATER ACCUMULATED IN THE BOREHOLE OF BORING B-108-3-13 TO A DEPTH OF 37.0 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO AN ELEVATION OF 685.9 FEET MSL. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING IN THE REMAINING BORINGS COULD NOT BE MEASURED DUE TO THE ADDITION OF EITHER MUD TO COUNTERACT HEAVING SANDS THAT WERE ENCOUNTERED DURING DRILLING OR WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS.

DRAWN RRM
CHECKED BRT

SOIL PROFILE

FRA-70-12.68
FRA-70-13.10

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ICO09.dgn 6/25/2021 11:31:16 AM rachelm

EXPLORATION FINDINGS (CONTINUED)

WALL 4W1
BORINGS B-027-0-08, B-027-1-13 AND B-029-0-08 WERE ADVANCED TO DEPTHS RANGING FROM 14.0 TO 136.5 FEET BELOW EXISTING GRADE ALONG OR IN THE VICINITY OF RETAINING WALL 4W1. IN ADDITION, HISTORIC BORING B-002-F-59 WAS ALSO PERFORMED IN THE VICINITY OF THE PROPOSED WALL AND WAS EXTENDED TO A DEPTH OF 73.0 FEET BELOW THE GROUND SURFACE AT THE TIME THE BORING WAS OBTAINED.

BORING B-027-1-13 WAS PERFORMED WITHIN THE EXISTING ROADWAY OF W. FULTON STREET ON THE SOUTH SIDE OF THE PROPOSED RETAINING WALL LOCATION, AND ENCOUNTERED 2.0 INCHES OF ASPHALT OVERLYING 8.0 INCHES OF CONCRETE AT THE EXISTING GROUND SURFACE. BORING B-028-0-08 WAS PERFORMED WITHIN THE EXISTING PAVEMENT OF I-70/71 AND ENCOUNTERED 7.0 INCHES OF ASPHALT OVERLYING 9.0 INCHES OF CONCRETE AND 11.0 INCHES OF AGGREGATE BASE. SURFACE MATERIALS WERE NOT NOTED ON THE 1959 HISTORIC BORING LOGS.

MATERIAL IDENTIFIED AS POSSIBLE FILL CONSISTING OF BROWN GRAVEL WITH SAND (ODOT A-1-b) WAS ENCOUNTERED IN BORING B-029-0-08 EXTENDING TO A DEPTH OF 6.0 FEET BELOW THE GROUND SURFACE. BENEATH THE SURFICIAL MATERIALS AND/OR FILL, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, FINE SAND, COARSE AND FINE SAND, SANDY SILT AND SILT (ODOT A-1-a, A-1-b, A-2-4, A-3, A-3 a, A-4a, A-4b). THE COHESIVE MATERIALS WERE DESCRIBED AS BROWN AND GRAY SANDY SILT, SILT AND CLAY, SILTY CLAY (ODOT A-4a, A-4b, A-6a, A-6b). COBBLES WERE NOTED AS PRESENT IN BORING B-027-1-13 AT DEPTHS OF 8.0 AND 41.0 FEET BELOW THE GROUND SURFACE AND LIMESTONE FRAGMENTS WERE NOTED IN SAMPLE SS-4. COBBLES OR DIFFICULT DRILLING WERE NOTED IN B-029-0-08 BETWEEN 11.5 FEET AND 21.0 FEET AS WELL AS 31.0 FEET AND 43.5 FEET BELOW THE GROUND SURFACE. HEAVING SANDS WERE ALSO NOTED IN THIS BORING AT 33.5 FEET, 48.5 FEET, 53.5 FEET, 58.5 FEET TO 68.5 FEET, 98.5 FEET, 103.5 FEET, AND 113.5 FEET.

TOP OF BEDROCK WAS ENCOUNTERED IN BORING B-029-0-08 AT A DEPTH OF 113.5 FEET BELOW THE GROUND SURFACE. THE BEDROCK CONSISTED OF DARK GRAY, SEVERELY WEATHERED SHALE WHICH EXTENDED TO A DEPTH OF 120.6 FEET BELOW EXISTING GRADE (EL. 621.7 FEET MSL) OVERLYING BROWNISH-GRAY, SLIGHTLY TO MODERATELY WEATHERED LIMESTONE.
GROUNDWATER SEEPAGE WAS ENCOUNTERED DURING DRILLING AT DEPTHS OF 21.0, 30.0, AND 40.0 FEET BELOW THE EXISTING GROUND SURFACE IN BORING B-029-0-08.

GROUNDWATER WAS INITIALLY ENCOUNTERED IN BORING B-029-0-08 AT A DEPTH OF 29.4 FEET, AND IN BORING B-027-1-13 AT A DEPTH OF 37.0 FEET. WATER LEVEL READINGS AT THE COMPLETION OF DRILLING WERE NOT ABLE TO BE MEASURED IN BORING B-029-0-08 DUE TO THE ADDITION OF WATER DURING THE ROCK CORING PROCESS AND BORING B-027-1-13 WAS OBSERVED TO BE DRY AT THE COMPLETION OF DRILLING, MEANING THAT NO MEASURABLE AMOUNT OF WATER ACCUMULATED IN THE BOREHOLE DURING OR AT THE COMPLETION OF DRILLING PRIOR TO BACKFILLING THE BOREHOLES. GROUNDWATER LEVELS WERE NOT NOTED IN THE BORINGS PERFORMED DURING THE 1959 INVESTIGATION.

WALL 4W2
BORINGS B-001-C-59, B-005-F-59, AND B-011-0-59 WERE PERFORMED IN THE VICINITY OF RETAINING WALL 4W2 AND WERE EXTENDED TO DEPTHS RANGING FROM 66.0 TO 71.0 FEET BELOW THE GROUND SURFACE AT THE TIME THE BORINGS WERE OBTAINED.

SURFACE MATERIALS WERE NOT NOTED IN THE HISTORIC 1959 BORING LOGS. NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, BROWNISH GRAY OR GRAY GRAVEL, SILTY SANDY GRAVEL, SANDY GRAVEL, SAND, GRAVELLY SAND, SILTY GRAVELLY SAND, SILTY SAND, SANDY GRAVELLY SILT, GRAVELLY SANDY SILT, AND SANDY SILT. THE COHESIVE SOILS WERE DESCRIBED AS BROWN OR BROWNISH GRAY SANDY GRAVELLY CLAY AND SANDY CLAY. BOULDERY GRAY SANDY GRAVEL WAS ENCOUNTERED IN BORING B-005-F-59 AT AN APPROXIMATE DEPTH OF 46.0 FEET BELOW THE GROUND SURFACE, AND AUGER REFUSAL ON APPARENT BOULDERS WAS ENCOUNTERED AT ELEVATION 692.3 FEET MSL IN BORING B-005-F-59. BEDROCK WAS NOT ENCOUNTERED IN ANY OF THE BORINGS PERFORMED FOR THIS STRUCTURE.

GROUNDWATER LEVELS WERE NOT NOTED IN THE BORINGS PERFORMED DURING THE 1959 INVESTIGATION.

EXPLORATION FINDINGS (CONTINUED)

WALL 4W3 & WALL 4W7:
BETWEEN FEBRUARY 11 AND 14, 2015, THREE (3) STRUCTURAL BORINGS, DESIGNATED AS B-021-2-13, B-021-4-14, AND B-024-2-14, WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 25.0 TO 59.2 FEET BELOW THE EXISTING GROUND SURFACE ALONG THE PROPOSED ALIGNMENT OF RETAINING WALL 4W7. IN ADDITION TO THE BORINGS PERFORMED BY RII AS PART OF THE CURRENT EXPLORATION, FOUR (4) BORINGS, DESIGNATED AS B-023-0-08, B-027-0-08, B-028-0-08, AND B-029-0-08, WERE ADVANCED TO COMPLETION DEPTHS RANGING FROM 10.0 AND 136.5 FEET BELOW EXISTING GRADE AS PART OF THE PRELIMINARY ENGINEERING EXPLORATION PERFORMED BY DLZ. HISTORIC BORINGS B-001-A-59 AND B-003-A-59 WERE ALSO OBTAINED FROM THE CONSTRUCTION DOCUMENTS ON RECORD FOR THE FRA-40-12.89 PROJECT. THE HISTORIC BORINGS WERE EXTENDED TO A DEPTH OF 51.0 FEET EACH BELOW THE EXISTING GRADE AT THE RESPECTIVE BORING LOCATION AT THE TIME OF THE EXPLORATION.

BORING B-021-2-13 WAS DRILLED THROUGH THE I-71 NORTHBOUND TO I-70 EASTBOUND PAVEMENT, AND ENCOUNTERED 8.0 INCHES OF ASPHALT FOLLOWED BY 4.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE. BORINGS B-021-4-14 AND B-024-2-14, DRILLED THROUGH THE I-70 EASTBOUND PAVEMENT, ENCOUNTERED 4.0 TO 5.0 INCHES OF ASPHALT OVER 12.0 TO 13.0 INCHES OF CONCRETE BASE. BORING B-021-4-14 ALSO EXHIBITED 6.0 INCHES OF AGGREGATE BASE BENEATH THE CONCRETE BASE. BORING B-023-0-08, DRILLED ALONG THE NORTHERN EDGE OF WEST FULTON STREET, EXHIBITED 4.0 INCHES OF ASPHALT OVER 8.0 INCHES OF CONCRETE BASE, FOLLOWED BY 6.0 INCHES OF AGGREGATE SUB-BASE. BORINGS B-027-0-08 AND B-029-0-08 WERE DRILLED THROUGH THE EXISTING PAVEMENT OF THE RAMP FROM I-70 EASTBOUND TO FOURTH STREET AND LIVINGSTON AVENUE AND ENCOUNTERED 7.0 INCHES OF ASPHALT OVERLYING 11.0 AND 8.0 INCHES OF CONCRETE FOLLOWED BY 11.0 INCHES OF AGGREGATE BASE, RESPECTIVELY, AT THE GROUND SURFACE. BORING B-028-0-08 WAS PERFORMED IN THE SHOULDER OF I-70 WESTBOUND AND ENCOUNTERED 12.0 INCHES OF ASPHALT OVERLYING 6.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE.

BENEATH THE SURFACE MATERIALS IN BORINGS B-027-0-08 THROUGH B-029-0-08 AND THE VICINITY OF PROPOSED RETAINING WALL 4W3, MATERIAL IDENTIFIED AS EXISTING FILL OR POSSIBLE FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 3.0 TO 10.0 FEET BELOW THE GROUND SURFACE. THE FILL MATERIAL CONSISTED OF BROWN AND GRAY GRAVEL AND GRAVEL AND SAND (ODOT A-1-a, A-1-b) AND CONTAINED BRICK FRAGMENTS THROUGHOUT.

UNDERLYING THE EXISTING FILL AND SURFICIAL MATERIALS, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS LOOSE TO VERY DENSE, BROWN AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, COARSE AND FINE SAND, SANDY SILT AND SILT (ODOT A-1-a, A-1-b, A-2-4, A-3a, A-4a, A-4b). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS STIFF TO HARD, GRAY SANDY SILT, SILT AND SILT AND CLAY (ODOT A-4a, A-4b, A-6a).

ALONG THE PROPOSED RETAINING WALL 4W7 ALIGNMENT, BORINGS B-021-2-13, B-023-0-08, AND B-021-4-14 ENCOUNTERED MATERIAL DESCRIBED AS FILL OR POSSIBLE FILL EXTENDING TO DEPTHS RANGING FROM 18.0 TO 22.0 FEET BELOW THE GROUND SURFACE. THIS FILL MATERIAL CONSISTED OF LENSES OF BROWN SAND AND GRAVEL WITH SAND AND SILT (ODOT A-2-4, A-3a). OTHER FILL LAYERS WERE DESCRIBED AS BROWN AND BROWN TO MOTTLED BROWN SILTY CLAY, SILT AND CLAY, AND SANDY SILT (ODOT A-4a, A-6a, A-6b).BORING B-021-2-13 CONTAINED ROOT FIBERS, BRICK FRAGMENTS, AND FRACTURED ROCK FRAGMENTS THROUGHOUT THE FILL, WHILE DLZ BORING B-023-0-08 WAS NOTED TO SIMILARLY CONTAIN BRICK FRAGMENTS THROUGHOUT BUT ALSO RECOVERED SAMPLES HAVING ORGANIC OR TURPENTINE ODORS.

UNDERLYING THE EXISTING FILL AND SURFACE MATERIALS IN THE BORINGS JUST MENTIONED, AND IN BORING B-024-2-14 WHICH DID NOT ENCOUNTER FILL, NATURAL GRANULAR AND COHESIVE SOILS WERE ENCOUNTERED. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS MEDIUM DENSE TO VERY DENSE BROWN OR GRAY GRAVEL AND SAND, AND SAND (ODOT A-1-b, A-3a). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS STIFF TO HARD BROWN, ORANGISH-BROWN, BROWN TO GRAY, AND GRAY SILTY CLAY, SANDY SILT, SILT (ODOT A-4a, A-4b, A-6b). SIMILAR TO THE FILL MATERIAL, BORING B-023-0-08 NOTED A TURPENTINE ODOR WITHIN SAMPLES COLLECTED IN THE NATURAL SOILS.

WEATHERED SHALE BEDROCK WAS ENCOUNTERED IN BORING B-029-0-08 AT A DEPTH OF 113.5 FEET BELOW THE GROUND SURFACE (EL. 628.8 FEET MSL). IN GENERAL, THIS MATERIAL WAS ABLE TO BE AUGERED AND SAMPLED TO THE TOP OF COMPETENT SHALE BEDROCK, ENCOUNTERED AT A DEPTH OF 116.5 FEET BELOW THE GROUND SURFACE (EL. 625.8 FEET MSL). COMPETENT LIMESTONE BEDROCK WAS ENCOUNTERED BELOW THE SHALE BEDROCK AT A DEPTH OF 120.6 FEET BELOW THE GROUND SURFACE (EL. 621.7 FEET MSL) AND CONTINUED TO THE BORING TERMINATION DEPTH OF 136.5 FEET (EL. 605.8 FEET MSL).

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING THE DRILLING PROCESS IN BORINGS B-023-0-08, B-024-2-14, B-027-0-08 AND B-029-0-08 AT DEPTHS RANGING FROM 5.0 TO 26.0 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 697.0 TO 721.3 FEET MSL, RESPECTIVELY. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING IN BORINGS B-023-0-08 WAS 19.1 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO AN ELEVATION OF 702.9 FEET MSL. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING IN BORING B-029-0-08 WAS 20.5 FEET BELOW EXISTING GRADE FOLLOWING THE ROCK CORING PROCESS. ADDITIONALLY, DLZ NOTED THAT THEY FREQUENTLY ADDED WATER TO THE BOREHOLE TO CLEAN OUT THE AUGERS AFTER ENCOUNTERING SAND HEAVE OF VARYING AMOUNTS AT VARIOUS DEPTHS. GROUNDWATER OBSERVATIONS WERE NOT PROVIDED ON THE HISTORIC BORING LOGS.

EXPLORATION FINDINGS (CONTINUED)

WALL 4W4:
BORINGS B-024-1-13 AND B-027-1-13 WERE ADVANCED TO A DEPTH OF 64.3 AND 50.0 FEET BELOW EXISTING GRADE ALONG OR IN THE VICINITY OF RETAINING WALL 4W4. IN ADDITION, HISTORIC BORING B-002-F-59 WAS ALSO PERFORMED IN THE VICINITY OF THE PROPOSED WALL AND WAS EXTENDED TO A DEPTH OF 73.0 FEET BELOW THE GROUND SURFACE AT THE TIME THE BORING WAS OBTAINED.

BORING B-024-1-13 WAS DRILLED IN THE EXISTING I-70 EASTBOUND RAMP TO FRONT STREET AND ENCOUNTERED 14.0 OF ASPHALT OVERLYING 6.0 INCHES OF AGGREGATE BASE. BORING B-026-1-13 WAS PERFORMED IN THE EXISTING PAVEMENT ALONG S. LUDLOW STREET AND ENCOUNTERED 4.0 INCHES OF ASPHALT OVERLYING 8.0 INCHES OF AGGREGATE BASE. SURFACE MATERIALS WERE NOT NOTED IN THE HISTORIC 1959 BORING LOGS.

MATERIAL IDENTIFIED AS EXISTING OR POSSIBLE FILL CONSISTING OF BROWN AND GRAY GRAVEL AND GRAVEL WITH SAND AND SILT (ODOT A-1-a, A-2-4) WAS ENCOUNTERED IN BORING B-026-1-13 EXTENDING TO A DEPTH OF 15.5 FEET BELOW THE GROUND SURFACE. BENEATH THE SURFICIAL MATERIALS AND/OR FILL, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, GRAVEL AND SAND, AND COARSE AND FINE SAND (ODOT A-1-a, A-1-b, A-3a). THE COHESIVE MATERIALS WERE DESCRIBED AS BROWN AND GRAY SANDY SILT, AND SILT AND CLAY (ODOT A-4a, A-6a). WHILE THE PRESENCE OF COBBLES WAS NOT SPECIFICALLY NOTED ON THE BORING LOGS, BELOW APPROXIMATE ELEVATIONS OF 710 TO 730 FEET MSL, DRILLING CONDITIONS WERE TYPICALLY MORE CHALLENGING AND HIGH BLOW COUNTS, INCLUDING SPLIT SPOON SAMPLER REFUSAL, WERE OBTAINED THROUGHOUT THESE DEPOSITS. ADDITIONALLY, HEAVING SANDS WERE ALSO NOTED IN BORING B-024-1-13 AT AN ELEVATION OF 592.9 FEET MSL.

BEDROCK WAS NOT ENCOUNTERED IN ANY OF THE BORINGS PERFORMED IN THE VICINITY OF THIS STRUCTURE.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN BORINGS B-024-1-13 AND B-026-1-13 AT A DEPTH OF 34.0 AND 28.5 FEET BELOW THE GROUND SURFACE, RESPECTIVELY. WATER LEVEL READINGS AT THE COMPLETION OF DRILLING WERE NOT ABLE TO BE MEASURED IN BORINGS B-024-1-13 OR B-026-1-13 DUE TO THE ADDITION OF MUD TO COUNTERACT THE HEAVING SANDS THAT WERE ENCOUNTERED BENEATH THE INITIAL GROUNDWATER LEVEL DURING DRILLING. GROUNDWATER LEVELS WERE NOT NOTED IN THE BORINGS PERFORMED DURING THE 1959 INVESTIGATION.

WALL 4W5 & WALL 4W6:
BETWEEN JULY 1, 2013 AND JANUARY 22, 2015, SIX (6) STRUCTURAL BORINGS, DESIGNATED AS B-020-1-13, B-020-2-13, B-020-3-13, B-020-7-13, B-020-9-15 AND B-023-1-13, WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 48.1 TO 86.0 FEET BELOW THE EXISTING GROUND SURFACE. IN ADDITION TO THE BORINGS PERFORMED BY RII FOR THE CURRENT EXPLORATION, THREE (3) BORINGS, DESIGNATED AS B-021-0-08, B-023-0-08 AND B-024-0-08, WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 35.0 TO 111.5 FEET BELOW THE EXISTING GROUND SURFACE BY DLZ AS PART OF THE FRA-70-8.93 PRELIMINARY EXPLORATION. IN ADDITION TO THE PROJECT BORINGS, TWO (2) BORINGS, DESIGNATED AS B-001-A-59 AND B-003-A-59, WERE DRILLED TO A COMPLETION DEPTH OF 51.0 FEET EACH BELOW THE EXISTING GRADE AT THE RESPECTIVE BORING LOCATION AT THE TIME OF THE EXPLORATION BY THE DEPARTMENT OF HIGHWAYS AS PART OF THE FRA4012.89 PROJECT.

BORING B-020-1-13 WAS ON THE PROPERTY LOCATED AT THE SOUTHWEST CORNER OF SHORT STREET AND AN ACCESS DRIVE THAT EXTENDS WEST OF SHORT STREET ALONG THE SOUTH SIDE OF I-70 TO THE EXISTING RAILROAD TRACKS AND ENCOUNTERED 6.0 INCHES OF TOPSOIL OVERLYING 4.0 INCHES OF BRICK PAVERS AT THE GROUND SURFACE. BORING B-020-2-13 WAS DRILLED THROUGH EXISTING PAVEMENT AT THE ENTRY OF THE ACCESS DRIVE AND ENCOUNTERED 4.0 INCHES OF ASPHALT OVERLYING 6.0 INCHES OF AGGREGATE BASE. BORINGS B-020-3-13 AND B-020-9-13 WERE DRILLED THROUGH THE EXISTING PAVEMENT OF SHORT STREET AND ENCOUNTERED 4.0 INCHES OF ASPHALT OVERLAYING 4.0 INCHES OF BRICK PAVERS IN EACH BORING FOLLOWED BY 9.0 AND 3.0 INCHES OF AGGREGATE BASE, RESPECTIVELY, AT THE GROUND SURFACE. BORING B-020-7-13 WAS DRILLED THROUGH THE EXISTING SIDEWALK ALONG THE EAST SIDE OF SHORT STREET, BELOW THE EXISTING STRUCTURE AND BETWEEN THE CURB AND PIER COLUMNS, AND ENCOUNTERED 8.0 INCHES OF CONCRETE AT THE GROUND SURFACE. BORING B-023-0-08 WAS PERFORMED WITHIN THE PAVEMENT OF W. FULTON STREET AND ENCOUNTERED 4.0 INCHES OF ASPHALT, OVERLYING 8.0 INCHES OF CONCRETE FOLLOWED BY 6.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE. BORINGS B-021-0-08, B-023-1-13 AND B-024-0-08 WERE DRILLED ON THE PROPERTY LOCATED AT THE SOUTHEAST CORNER OF W. FULTON STREET AND SHORT STREET. BORING B-021-0-08 ENCOUNTERED 3.0 INCHES OF GRAVEL AT THE GROUND SURFACE AND NATURAL SOILS WERE ENCOUNTERED AT THE SURFACE IN BORINGS B-023-1-13 AND B-024-0-08.

BENEATH THE SURFACE MATERIALS IN BORINGS B-020-1-13, B-020-2-13, B-020-3-13, B-020-7-13, B-020-9-15, B-021-0-08 AND B-023-0-08, MATERIAL IDENTIFIED AS EXISTING FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 10.5 TO 21.5 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 690.9 TO 702.5 FEET MSL. THE FILL MATERIAL CONSISTED OF DARK BROWN, BROWN, BLACK AND GRAY GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, SANDY SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-1-b, A-2-4, A-4a, A-6a, A-6b, A-7-6). THE FILL MATERIAL WAS PLACED WITHIN THE LIMITS OF THE ABANDONED CANAL AND CONTAINS CONSTRUCTION DEBRIS AND ORGANICS THROUGHOUT. ADDITIONALLY, THE SPT BLOW COUNTS WERE SIGNIFICANTLY LOWER AND MORE VARIABLE WITHIN THE FILL DEPTH OF THE BORINGS WHERE FILL WAS ENCOUNTERED.

(CONTINUED ON NEXT SHEET.)

DRAWN RRM
CHECKED BRT

SOIL PROFILE

FRA-70-12.68
FRA-70-13.10

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-8946\IC010.dgn 6/25/2021 11:34:04 AM rachelm

EXPLORATION FINDINGS (CONTINUED)

WALL 4W5 & WALL 4W6 (CONTINUED):
UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, NATURAL GRANULAR AND COHESIVE SOILS WERE ENCOUNTERED. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY, BROWNISH GRAY, DARK BROWN AND BLACK GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY, FINE SAND, COARSE AND FINE SAND, SANDY SILT AND SILT (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3, A-3a, A-4a, A-4b). THE COHESIVE SOILS WERE DESCRIBED AS GRAY, BROWN, BROWNISH GRAY AND DARK GRAY SANDY SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-4a, A-6a, A-6b, A-7-6). COBBLES AND BOULDERS WERE ENCOUNTERED IN BORING B-021-0-08 AT DEPTHS OF 33.5 FEET TO 43.0 FEET BELOW GRADE.

TOP OF BEDROCK WAS ENCOUNTERED IN BORINGS B-020-1-13, B-020-2-13, B-020-7-13, B-020-9-13, B-021-0-08 AND B-024-0-08 AT ELEVATIONS RANGING FROM 647.1 TO 660.9 FEET MSL. THE UPPER PORTION OF THE BEDROCK CONSISTS OF WEAK SHALE WHICH WAS ABLE TO BE AUGERED TO COMPETENT SHALE OR MUDSTONE BEDROCK IN BORINGS B-020-2-13 AND B021008 AND COMPETENT LIMESTONE BEDROCK IN BORING B-020-1-13. THE CORED BEDROCK CONSISTS OF SHALE AND MUDSTONE, WHICH WAS ENCOUNTERED IN BORINGS B-020-2-13, B-020-7-13, B-020-9-13, B-021-0-08 AND B-024-0-08 AT ELEVATIONS RANGING FROM 641.9 TO 657.9 FEET MSL, AND LIMESTONE BEDROCK, WHICH WAS ENCOUNTERED IN BORINGS B-020-1-13 AND B-020-2-13 AN ELEVATION OF 632.3 AND 631.9 FEET MSL, RESPECTIVELY.

IN GENERAL, THE SUBSURFACE CONDITIONS ENCOUNTERED IN THE HISTORIC BORINGS MATCHED RELATIVELY CLOSELY WITH THE SUBSURFACE CONDITIONS ENCOUNTERED IN THE CURRENT AND PRELIMINARY ENGINEERING EXPLORATION BORINGS.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN ALL OF THE BORINGS, WITH THE EXCEPTION OF BORING B-020-7-13, AT DEPTHS RANGING FROM 15.0 TO 32.0 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 689.8 TO 714.9 FEET MSL. GROUNDWATER WAS NOT ENCOUNTERED IN BORING B-020-7-13 PRIOR TO INTRODUCING WATER TO THE BOREHOLE. AT THE COMPLETION OF DRILLING AND PRIOR TO BEGINNING ROCK CORING OPERATIONS IN BORINGS B-021-0-08, B-023-0-08, B-023-1-13 AND B-024-0-08, GROUNDWATER ACCUMULATED IN THE AUGER STEMS TO DEPTHS RANGING FROM 16.5 TO 26.9 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 701.0 TO 726.9 FEET MSL. THE GROUNDWATER LEVELS AT THE COMPLETION OF DRILLING COULD NOT BE MEASURED IN THE REMAINDER OF THE BORINGS DUE TO THE ADDITION OF MUD TO COUNTERACT HEAVING SANDS AS WELL AS WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS.

WALL 4W8 & WALL 4W9:
BETWEEN JULY 3 AND 11, 2013, THREE (3) STRUCTURAL BORINGS, DESIGNATED AS B-017-6-13, B-019-1-13 AND B-020-1-13, WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 50.0 TO 86.0 FEET BELOW THE EXISTING GROUND SURFACE ALONG THE PROPOSED ALIGNMENT OF RETAINING WALL 4W8. IN ADDITION TO THE BORINGS PERFORMED BY RII AND STOCK AS PART OF THE CURRENT EXPLORATION, ONE (1) BORING, DESIGNATED AS B-019-0-09, WAS ADVANCED TO A COMPLETION DEPTH OF 75.8 FEET BELOW THE EXISTING GROUND SURFACE BY DLZ AS PART OF THE FRA-70-8.93 PRELIMINARY EXPLORATION.

BORING B-019-0-09 WAS DRILLED THROUGH AN ACCESS DRIVE THAT EXTENDS SOUTH OFF OF THE ASPHALT ACCESS ROAD BETWEEN SHORT STREET AND THE RAILROAD TRACKS TO THE WEST AND ENCOUNTERED 12.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE. BORING B-019-1-13 WAS PERFORMED IN THE GRASS AREA JUST SOUTH OF THE ASPHALT ACCESS ROAD AND ENCOUNTERED 12.0 INCHES OF TOPSOIL AT THE GROUND SURFACE. BORING B-020-1-13 WAS PERFORMED IN A GRASS YARD BETWEEN A NEW BUILDING AND THE ASPHALT ACCESS DRIVE AND ENCOUNTERED 6.0 INCHES OF TOPSOIL OVERLYING 4.0 INCHES OF BRICK PAVERS.

BENEATH THE SURFACE MATERIALS IN ALL FOUR BORINGS, MATERIAL IDENTIFIED AS EXISTING FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 10.5 FEET BELOW THE EXISTING GROUND SURFACE IN BORING B-017-6-13 TO 18.0 FEET BELOW THE GROUND SURFACE IN BORINGS B-019-0-08 AND B-020-1-13, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 694.8 TO 704.4 FEET MSL. THE FILL MATERIAL CONSISTED OF BROWN, DARK BROWN, GRAY AND BLACK GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, SANDY SILT, SILT AND CLAY AND SILTY CLAY (ODOT A-1-b, A-2-4, A-4a, A-6a, A-6b). MATERIAL IDENTIFIED AS ORGANIC CLAY (A-8b) WAS ENCOUNTERED IN BORING B-019-0-08 AT A DEPTH OF 8.0 FEET AND EXTENDED TO A DEPTH OF 15.5 FEET BELOW EXISTING GRADE. THE ORGANIC CONTENT IN THIS LAYER RANGED FROM 7 TO 9 PERCENT, AND LARGE WOOD FRAGMENTS WERE ENCOUNTERED THROUGHOUT THIS LAYER AS WELL.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY AND DARK BROWN GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY AND COARSE AND FINE SAND (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a). THE COHESIVE SOILS WERE DESCRIBED AS GRAY, BROWN AND BROWNISH GRAY SANDY SILT, SILT AND CLAY, SILTY CLAY, ELASTIC CLAY AND CLAY (ODOT A-4a, A-6a, A-6b, A-7-5, A-7-6).

SHALE BEDROCK WAS ENCOUNTERED ALONG THE PROPOSED WALL ALIGNMENT AT A DEPTHS RANGING FROM 54.0 TO 64.3 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 648.6 FEET MSL IN BORING B-020-1-13 TO 659.5 FEET MSL IN BORING B-019-008. COMPETENT LIMESTONE BEDROCK WAS ENCOUNTERED IN BORINGS B017613 AND B-020-1-13 AT A DEPTH OF 74.5 AND 80.5 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS OF 640.4 AND 632.3 FEET MSL, RESPECTIVELY.

EXPLORATION FINDINGS (CONTINUED)

WALL 4W8 & WALL 4W9 (CONTINUED):
GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN ALL FOUR BORINGS AT DEPTHS RANGING FROM 12.5 TO 28.0 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 696.9 TO 701.0 FEET MSL. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING IN BORING B-019-0-08 WAS 12.5 FEET BELOW EXISTING GRADE PRIOR TO ADDING WATER FOR THE ROCK CORING PROCESS, WHICH CORRESPONDS TO AN ELEVATION OF 701.5 FEET MSL. THE GROUNDWATER LEVELS AT THE COMPLETION OF DRILLING IN THE REMAINING BORINGS COULD NOT BE MEASURED DUE TO THE ADDITION OF WATER OR MUD TO COUNTERACT HEAVING SANDS AS WELL AS WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS.

WALL 4W10:
SEE FRA-70-1358A&R

WALL 4W12:
ON MARCH 21 AND 22, 2015, TWO (2) STRUCTURE BORINGS, DESIGNATED AS BORINGS B-109-1-15 AND B-110-1-15, WERE ADVANCED TO COMPLETION DEPTHS OF 85.0 AND 75.0 FEET, RESPECTIVELY, BELOW THE EXISTING GROUND SURFACE. IN ADDITION TO THE BORINGS PERFORMED BY RII AS PART OF THE CURRENT EXPLORATION, THREE (3) BORINGS, DESIGNATED AS B-109-0-09, B-110-0-09, AND B-111-0-09, WERE ADVANCED TO DEPTHS OF 50.0, 49.4 AND 30.0 FEET BELOW THE EXISTING GROUND SURFACE, RESPECTIVELY, BY DLZ AS PART OF THE FRA-70-8.93 PRELIMINARY EXPLORATION.

AT THE EXISTING GROUND SURFACE, BORING B-109-1-15 ENCOUNTERED 6.0 INCHES OF ASPHALT OVERLYING 12.0 INCHES OF AGGREGATE BASE, WHILE BORING B-110-1-15 ENCOUNTERED 8.0 INCHES OF ASPHALT UNDERLAIN BY 14.5 INCHES OF CONCRETE AND 5.0 INCHES OF AGGREGATE BASE. BORING B-109-0-09 WAS LOCATED WITHIN THE GRASS JUST SOUTH OF THE I-70 EMBANKMENT AND ENCOUNTERED 5.0 INCHES OF TOPSOIL AT THE GROUND SURFACE. BORING B-110-0-09 WAS PERFORMED WITHIN THE EXISTING PAVEMENT OF MOUND STREET/HARMON AVENUE, ENCOUNTERING 5.0 INCHES OF ASPHALT OVERLYING 7.0 INCHES OF CONCRETE AT THE GROUND SURFACE. BORING B-111-0-09 WAS PERFORMED WITHIN THE RAMP PAVEMENT CONNECTING I-70 EASTBOUND TO I-71 SOUTHBOUND, AND ENCOUNTERED 6.0 INCHES OF CONCRETE OVERLYING 6.0 INCHES OF AGGREGATE BASE.

BENEATH THE SURFICIAL PAVEMENT MATERIALS ENCOUNTERED IN BORINGS B-109-1-15 AND B-110-1-15, EXISTING EMBANKMENT FILL CONSISTING OF GRAY GRAVEL WITH SAND AND SILT (ODOT A-2-4) AND BROWN TO GRAY SILT AND CLAY, AND ELASTIC CLAY (ODOT A-6a AND A-7-5) WERE ENCOUNTERED EXTENDING TO DEPTHS OF 32.0 AND 27.0 FEET BELOW EXISTING GRADE, RESPECTIVELY. BRICK, CLAY TILE, AND ROCK FRAGMENTS WERE NOTED WITHIN THE FILL MATERIALS IN BORING B-109-1-15. BENEATH THE SURFICIAL TOPSOIL AND PAVEMENT MATERIALS ENCOUNTERED IN BORINGS B-109-0-09, B-110-0-09 AND B-111-0-09, MATERIAL IDENTIFIED AS EXISTING OR POSSIBLE EXISTING FILL WAS ENCOUNTERED EXTENDING TO DEPTHS OF 6.0, 10.5, AND 3.5 FEET BELOW EXISTING GRADES, RESPECTIVELY. THE FILL MATERIALS CONSISTED OF BROWN AND DARK BROWN GRAVEL AND SAND, GRAVEL WITH SAND, SILT AND CLAY, COARSE AND FINE SAND, SANDY SILT, AND SILT AND CLAY (ODOT A-1-b, A-2-6, A-4a, AND A-6a). THE UPPERMOST FILL MATERIAL ENCOUNTERED AT BORING B-110-0-09 CONTAINED BRICK FRAGMENTS AND ORGANIC MATERIAL TO A DEPTH OF 8.0 FEET BELOW THE GROUND SURFACE; HOWEVER, BASED ON INFORMATION PROVIDED BY ODOT, IT IS ANTICIPATED THAT THE BRICK FRAGMENTS ARE LIKELY FROM THE DEMOLITION OF AN OUTBUILDING ASSOCIATED WITH THE FORMER SLAUGHTER YARDS, AND IT IS NOT UNCOMMON FOR SOILS PRESENT DURING SLAUGHTER YARD ACTIVITIES TO BE HIGH IN ORGANIC CONTENT.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, THE SUBSURFACE PROFILE ENCOUNTERED IN BOTH THE CURRENT AND PRELIMINARY EXPLORATIONS PRIMARILY CONSISTED OF NATURAL GRANULAR SOILS OVERLYING DEEP, INTERMITTENT COHESIVE DEPOSITS. THE NATURAL GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, COARSE AND FINE SAND, AND SANDY SILT (ODOT A-1-a, A-1-b, A-2-4, A-3a, AND A-4a). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS BROWN, DARK BROWN AND GRAY SANDY SILT, SILT AND CLAY, AND SILTY CLAY (ODOT A-4a, A-6a, AND A-6b).

GROUNDWATER WAS ENCOUNTERED IN BORING B-109-0-09, B-110-0-09 AND B-110-1-15 AT DEPTHS RANGING FROM 10.5 TO 53.5 FEET BENEATH THE GROUND SURFACE, CORRESPONDING TO ELEVATIONS RANGING FROM 686.8 TO 695.3 FEET MSL. AT THE COMPLETION OF DRILLING, AND PRIOR TO REMOVING THE AUGERS, GROUNDWATER HAD ACCUMULATED IN BORING B-110-0-09 TO A DEPTH OF 10.6 FEET BELOW THE GROUND SURFACE, CORRESPONDING TO AN ELEVATION OF 695.2 FEET MSL. GROUNDWATER WAS NOT ENCOUNTERED DURING, OR AT THE COMPLETION OF, DRILLING IN BORING B-111-0-09. GROUNDWATER WAS ALSO NOT ENCOUNTERED IN BORING B-109-1-15 PRIOR TO THE INTRODUCTION OF DRILLING FLUID AT A DEPTH OF 45.0 FEET BENEATH THE GROUND SURFACE. AS STATED, DRILLING FLUID WAS INTRODUCED TO BORINGS B-109-0-09, B-109-1-15, AND B-110-1-15 TO COUNTERACT THE WATER PRESSURE CAUSING SANDS TO HEAVE INTO THE AUGERS. THE INTRODUCTION OF DRILLING FLUID TO THE BORINGS PREVENTS ACCURATE MEASUREMENTS OF THE GROUNDWATER LEVELS WITHIN THE BOREHOLES AT THE COMPLETION OF DRILLING.

EXPLORATION FINDINGS (CONTINUED)

WALL 4W13:
ON MARCH 21 AND 22, 2015, TWO (2) STRUCTURE BORINGS, DESIGNATED AS BORINGS B-109-1-15 AND B-110-1-15, WERE ADVANCED TO COMPLETION DEPTHS OF 85.0 AND 75.0 FEET, RESPECTIVELY, BELOW THE EXISTING GROUND SURFACE. IN ADDITION TO THE BORINGS PERFORMED BY RII AS PART OF THE CURRENT EXPLORATION, THREE (3) BORINGS, DESIGNATED AS B-109-0-09, B-110-0-09, AND B-111-0-09, WERE ADVANCED TO DEPTHS OF 50.0, 49.4 AND 30.0 FEET BELOW THE EXISTING GROUND SURFACE, RESPECTIVELY, BY DLZ AS PART OF THE FRA-70-8.93 PRELIMINARY EXPLORATION.

AT THE EXISTING GROUND SURFACE, BORING B-109-1-15 ENCOUNTERED 6.0 INCHES OF ASPHALT OVERLYING 12.0 INCHES OF AGGREGATE BASE, WHILE BORING B-110-1-15 ENCOUNTERED 8.0 INCHES OF ASPHALT UNDERLAIN BY 14.5 INCHES OF CONCRETE AND 5.0 INCHES OF AGGREGATE BASE. BORING B-109-0-09 WAS LOCATED WITHIN THE GRASS JUST SOUTH OF THE I-70 EMBANKMENT AND ENCOUNTERED 5.0 INCHES OF TOPSOIL AT THE GROUND SURFACE. BORING B-110-0-09 WAS PERFORMED WITHIN THE EXISTING PAVEMENT OF MOUND STREET/HARMON AVENUE, ENCOUNTERING 5.0 INCHES OF ASPHALT OVERLYING 7.0 INCHES OF CONCRETE AT THE GROUND SURFACE. BORING B-111-0-09 WAS PERFORMED WITHIN THE RAMP PAVEMENT CONNECTING I-70 EASTBOUND TO I-71 SOUTHBOUND, AND ENCOUNTERED 6.0 INCHES OF CONCRETE OVERLYING 6.0 INCHES OF AGGREGATE BASE.

BENEATH THE SURFICIAL PAVEMENT MATERIALS ENCOUNTERED IN BORINGS B-109-1-15 AND B-110-1-15, EXISTING EMBANKMENT FILL CONSISTING OF GRAY GRAVEL WITH SAND AND SILT (ODOT A-2-4) AND BROWN TO GRAY SILT AND CLAY, AND ELASTIC CLAY (ODOT A-6a AND A-7-5) WERE ENCOUNTERED EXTENDING TO DEPTHS OF 32.0 AND 27.0 FEET BELOW EXISTING GRADE, RESPECTIVELY. BRICK, CLAY TILE, AND ROCK FRAGMENTS WERE NOTED WITHIN THE FILL MATERIALS IN BORING B-109-1-15. BENEATH THE SURFICIAL TOPSOIL AND PAVEMENT MATERIALS ENCOUNTERED IN BORINGS B-109-0-09, B-110-0-09 AND B-111-0-09, MATERIAL IDENTIFIED AS EXISTING OR POSSIBLE EXISTING FILL WAS ENCOUNTERED EXTENDING TO DEPTHS OF 6.0, 10.5, AND 3.5 FEET BELOW EXISTING GRADES, RESPECTIVELY. THE FILL MATERIALS CONSISTED OF BROWN AND DARK BROWN GRAVEL AND SAND, GRAVEL WITH SAND, SILT AND CLAY, COARSE AND FINE SAND, SANDY SILT, AND SILT AND CLAY (ODOT A-1-b, A-2-6, A-4a, AND A-6a). THE UPPERMOST FILL MATERIAL ENCOUNTERED AT BORING B-110-0-09 CONTAINED BRICK FRAGMENTS AND ORGANIC MATERIAL TO A DEPTH OF 8.0 FEET BELOW THE GROUND SURFACE; HOWEVER, BASED ON INFORMATION PROVIDED BY ODOT, IT IS ANTICIPATED THAT THE BRICK FRAGMENTS ARE LIKELY FROM THE DEMOLITION OF AN OUTBUILDING ASSOCIATED WITH THE FORMER SLAUGHTER YARDS, AND IT IS NOT UNCOMMON FOR SOILS PRESENT DURING SLAUGHTER YARD ACTIVITIES TO BE HIGH IN ORGANIC CONTENT.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, THE SUBSURFACE PROFILE ENCOUNTERED IN BOTH THE CURRENT AND PRELIMINARY EXPLORATIONS PRIMARILY CONSISTED OF NATURAL GRANULAR SOILS OVERLYING DEEP, INTERMITTENT COHESIVE DEPOSITS. THE NATURAL GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, COARSE AND FINE SAND, AND SANDY SILT (ODOT A-1-a, A-1-b, A-2-4, A-3a, AND A-4a). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS BROWN, DARK BROWN AND GRAY SANDY SILT, SILT AND CLAY, AND SILTY CLAY (ODOT A-4a, A-6a, AND A-6b).

GROUNDWATER WAS ENCOUNTERED IN BORING B-109-0-09, B-110-0-09 AND B-110-1-15 AT DEPTHS RANGING FROM 10.5 TO 53.5 FEET BENEATH THE GROUND SURFACE, CORRESPONDING TO ELEVATIONS RANGING FROM 686.8 TO 695.3 FEET MSL. AT THE COMPLETION OF DRILLING, AND PRIOR TO REMOVING THE AUGERS, GROUNDWATER HAD ACCUMULATED IN BORING B-110-0-09 TO A DEPTH OF 10.6 FEET BELOW THE GROUND SURFACE, CORRESPONDING TO AN ELEVATION OF 695.2 FEET MSL. GROUNDWATER WAS NOT ENCOUNTERED DURING, OR AT THE COMPLETION OF, DRILLING IN BORING B-111-0-09. GROUNDWATER WAS ALSO NOT ENCOUNTERED IN BORING B-109-1-15 PRIOR TO THE INTRODUCTION OF DRILLING FLUID AT A DEPTH OF 45.0 FEET BENEATH THE GROUND SURFACE. AS STATED, DRILLING FLUID WAS INTRODUCED TO BORINGS B-109-0-09, B-109-1-15, AND B-110-1-15 TO COUNTERACT THE WATER PRESSURE CAUSING SANDS TO HEAVE INTO THE AUGERS. THE INTRODUCTION OF DRILLING FLUID TO THE BORINGS PREVENTS ACCURATE MEASUREMENTS OF THE GROUNDWATER LEVELS WITHIN THE BOREHOLES AT THE COMPLETION OF DRILLING.

DRAWN RRM
CHECKED BRT

SOIL PROFILE

FRA-70-12.68
FRA-70-13.10

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464\C011.dgn 6/25/2021 11:39:51 AM rachelm

EXPLORATION FINDINGS (CONTINUED)

CULVERT (VAULT) 4W19:
ON SEPTEMBER 23, 2009, ONE (1) BORING, DESIGNATED AS B-017-1-09, WAS ADVANCED TO A DEPTH OF 53.8 FEET BELOW THE EXISTING GROUND SURFACE BY DLZ AS PART OF THE FRA-70-8.93 PRELIMINARY EXPLORATION.

BORING B-017-1-09 WAS DRILLED ON THE SOUTH OF I-70/71 BY TOE OF THE EXISTING I-70/71 EASTBOUND EMBANKMENT AND ENCOUNTERED 8.0 INCHES OF TOPSOIL AT THE GROUND SURFACE.

BENEATH THE TOPSOIL, MATERIAL IDENTIFIED AS EXISTING FILL CONSISTING OF MEDIUM STIFF, DARK BROWN SANDY SILT (ODOT A-4a) WAS ENCOUNTERED EXTENDING TO A DEPTH OF 6.0 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO AN ELEVATION OF 707.7 FEET MSL.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, NATURAL GRANULAR SOILS WERE ENCOUNTERED UP TO A DEPTH OF 32 FEET BELOW EXISTING GRADE, WHICH WERE GENERALLY DESCRIBED AS DENSE TO VERY DENSE, BROWN GRAVEL WITH SAND (ODOT A-1-b). COHESIVE SOILS WERE ENCOUNTERED BELOW THIS DEPTH, WHICH WERE DESCRIBED AS VERY STIFF TO HARD, BROWN AND GRAY SILT AND CLAY AND CLAY (ODOT A-6a, A-7-6).

BEDROCK WAS NOT NOTED TO HAVE BEEN ENCOUNTERED IN BORING B-017-1-09. HOWEVER, THE BORING WAS TERMINATED AT A DEPTH OF 53.8 FEET, CORRESPONDING TO AN ELEVATION OF 659.9 FEEL MSL, WHERE SPLIT SPOON SAMPLER REFUSAL WAS ENCOUNTERED. BASED ON THE DEPTH OF BEDROCK ENCOUNTERED IN OTHER BORINGS WITHIN THE VICINITY OF THIS STRUCTURE, THIS MAY REPRESENT THE TOP OF SHALE BEDROCK.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING THE DRILLING PROCESS IN AT A DEPTH OF 16.0 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO AN ELEVATION OF 697.7 FEET MSL. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING WAS 16.4 FEET BELOW EXISTING GRADE FOLLOWING, WHICH INCLUDES WATER THAT WAS ADDED DURING THE DRILLING PROCESS AS NOTED BY DLZ.

WALL 4W20:
ON JULY 18, 2013, ONE (1) STRUCTURAL BORING, DESIGNATED AS B-016-6-09 WAS DRILLED TO A COMPLETION DEPTH OF 50.0 FEET BELOW THE EXISTING GROUND SURFACE ALONG THE PROPOSED ALIGNMENT OF MSE RETAINING WALL 4W20. IN ADDITION TO THE BORING PERFORMED BY RII AS PART OF THE CURRENT EXPLORATION, ONE (1) BORING, DESIGNATED AS B-016-1-09, WAS ADVANCED TO A DEPTH OF 45.0 FEET BELOW THE EXISTING GROUND SURFACE BY DLZ AS PART OF THE FRA-70-8.93 PRELIMINARY EXPLORATION.

BORINGS B-016-1-09 AND B-016-6-13 WERE PERFORMED ON THE SOUTH SIDE OF THE I-70 EASTBOUND, JUST NORTH OF THE EXISTING ELECTRICAL SUBSTATION, AND ENCOUNTERED 3.0 INCHES OF TOPSOIL AND 3.0 FEET OF FILL MATERIAL CONSISTING OF SANDY SILT WITH STONE FRAGMENTS, RESPECTIVELY, AT THE GROUND SURFACE.

BENEATH THE SURFACE MATERIALS, EXISTING FILL WAS ENCOUNTERED IN BORINGS B-016-1-09 AND B-016-6-13 EXTENDING TO A DEPTH OF 8.0 AND 18.5 FEET BELOW THE EXISTING GROUND SURFACE, RESPECTIVELY. THE FILL MATERIAL CONSISTED OF BROWN AND BLACK GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, COARSE AND FINE SAND, SANDY SILT AND SILT AND CLAY (ODOT A-1-a, A-1-b, A-2-4, A-3a, A-4a, A-6b) AND CONTAINED BRICK FRAGMENTS AND WOOD PIECES UP TO A DEPTH OF 18.5 FEET BELOW THE EXISTING GRADE AS INDICATED IN BORING B-016-1-09.

UNDERLYING THE SURFICIAL MATERIALS AND FILL MATERIAL, NATURAL GRANULAR SOILS WERE PREDOMINANTLY PRESENT IN THE UPPER 37 FEET OF THE SOIL PROFILE OVERLYING COHESIVE SOILS AS INDICATED IN BORING B-016-1-09 AND COHESIVE SOILS WERE PREDOMINANT IN THE ENTIRE BORING WITH SEAM OF GRANULAR MATERIAL INDICATED IN BORING B-016-6-13. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAVEL, GRAVEL AND SAND, AND SILT (ODOT A-1-a, A-1-b, A-4b). THE COHESIVE SOILS WERE DESCRIBED AS REDDISH BROWN, BROWN, AND GRAY SILTY CLAY AND SANDY SILT (ODOT A-4a, A-6b).

BEDROCK WAS NOT ENCOUNTERED IN EITHER OF THE BORINGS WITHIN THE TERMINATION DEPTS.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN BOTH THE BORINGS AT DEPTHS RANGING FROM 21.0 TO 23.5 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 693.5 TO 696.2 FEET MSL. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING WAS MEASURED AT DEPTHS RANGING FROM 34.8 TO 24.0 FEET BELOW THE EXISTING GROUND SURFACE, CORRESPONDING TO ELEVATIONS RANGING FROM 682.4 TO 693.0 FEET MSL.

EXPLORATION FINDINGS (CONTINUED)

WALL E2:
SEE FRA-70-1358L.

WALL E3:
BETWEEN FEBRUARY 18, 2014, AND JANUARY 29, 2015, FOUR (4) STRUCTURAL BORINGS, DESIGNATED AS B-018-4-13, B-018-5-13, B-019-2-13, AND B-020-5-13, WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 50.0 TO 90.0 FEET BELOW THE EXISTING GROUND SURFACE.

ALL OF THE BORINGS FOR THIS EXPLORATION WERE DRILLED WITHIN THE EXISTING SHOULDER OF I-70 WESTBOUND, JUST WEST OF SHORT STREET. BORINGS B-018-4-13, B-018-5-13 AND B-019-2-13 ENCOUNTERED 11.0 TO 14.0 INCHES OF ASPHALT OVERLYING 8.0 TO 12.0 INCHES OF CONCRETE AT THE EXISTING GROUND SURFACE. BORING B-020-5-13 ENCOUNTERED 6.0 INCHES OF CONCRETE OVERLYING 6.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE.

BENEATH THE SURFACE MATERIALS IN ALL FOUR BORINGS, MATERIAL IDENTIFIED AS EXISTING EMBANKMENT FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 22.0 FEET TO 32.0 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 707.9 TO 714.0 FEET MSL. THE EMBANKMENT FILL MATERIAL GENERALLY CONSISTED OF COHESIVE SOILS COMPRISED OF BROWN, DARK BROWN AND DARK GRAY SILT AND CLAY AND SILTY CLAY (ODOT A-6a, A-6b) WITH ISOLATED SEAMS OF GRANULAR SOILS COMPRISED OF BROWN GRAVEL, GRAVEL AND SAND AND GRAVEL WITH SAND, SILT AND CLAY (ODOT A-1-a, A-1-b, A-2-6). UNDERLYING THE EMBANKMENT FILL, MATERIAL IDENTIFIED AS EXISTING FILL WAS ENCOUNTERED IN BORINGS B-018-4-13, B-018-5-13 AND B-019-2-13 EXTENDING TO DEPTHS RANGING FROM 37.0 TO 47.0 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 692.1 TO 699.0 FEET MSL. THE EXISTING FILL MATERIAL CONSISTED OF BOTH COHESIVE AND GRANULAR SOILS DESCRIBED AS GRAY, BLACK AND BROWN GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, SANDY SILT, SILT AND CLAY AND CLAY. THE FILL CONTAINED DEBRIS CONSISTING OF BRICK AND SLAG FRAGMENTS, CINDERS AND ORGANICS.

A LAYER OF BLACK CLAY (ODOT A-7-6) WAS ENCOUNTERED IN BORING B-018-4-13 AT A DEPTH OF 37.0 FEET AND EXTENDING TO 45.0 FEET BELOW EXISTING GRADE, WHICH WAS DESCRIBED AS HIGHLY ORGANIC. THE ORGANIC CONTENT IN THIS LAYER WAS 18.9 PERCENT AT DEPTH OF 38.5 FEET BELOW EXISTING GRADE. A PETROLEUM ODOR WAS NOTED WITHIN THIS LAYER.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, NATURAL SOILS WERE ENCOUNTERED CONSISTING PRIMARILY OF GRANULAR SOILS WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL IN BORING B-020-5-13. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, GRAVEL AND SAND AND GRAVEL WITH SAND AND SILT (ODOT A-1-a, A-1-b, A-2-4). THE COHESIVE SOILS ENCOUNTERED IN BORING B-020-5-13 WERE GENERALLY DESCRIBED AS BROWN AND GRAY SANDY SILT, SILT AND CLAY AND SILTY CLAY (ODOT A-4a, A-6a, A-6b).

TOP OF BEDROCK IN BORING B-020-5-13 WAS ENCOUNTERED AT A DEPTH OF 76.6 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO AN ELEVATION OF 656.8 FEET MSL. THE UPPER 3.4 FEET OF BEDROCK WAS DESCRIBED AS WEATHERED, AUGERABLE SHALE. MORE COMPETENT BEDROCK CONSISTING OF MUDSTONE AND SHALE WAS ENCOUNTERED AT A DEPTH OF 80.0 FEET, WHICH REQUIRED ROCK CORING TECHNIQUES TO ADVANCE THE BORINGS.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN ALL FOUR BORINGS AT DEPTHS RANGING FROM 43.5 TO 48.5 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 689.9 TO 699.1 FEET MSL. AT THE COMPLETION OF DRILLING AND PRIOR TO REMOVING THE AUGERS, GROUNDWATER ACCUMULATED IN THE AUGER STEMS IN BORINGS B-018-4-13, B-018-5-13 AND B-019-2-13 RANGED TO DEPTHS RANGING FROM 40.0 TO 45.0 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 694.0 TO 698.1 FEET MSL. THE GROUNDWATER LEVEL IN BORING B-020-5-13 COULD NOT BE MEASURED DUE TO THE ADDITION OF MUD DURING TO COUNTERACT HEAVING SANDS DURING DRILLING AS WELL AS WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS.

EXPLORATION FINDINGS (CONTINUED)

WALL E4:
BETWEEN JANUARY 16, 2014 AND JANUARY 2, 2015, SIX (6) STRUCTURAL BORINGS, DESIGNATED AS B-018-4-13, B-018-5-13, B-019-2-13, AND B-020-5-13 WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 50.0 TO 90.0 FEET BELOW THE EXISTING GROUND SURFACE ALONG THE PROPOSED ALIGNMENT OF RETAINING WALL E5.

ALL OF THE BORINGS FOR THIS INVESTIGATION WERE DRILLED ALONG INTERSTATE I-70, JUST WEST OF SHORT STREET. BORINGS B-018-4-13, B-018-5-13 AND B-019-2-13 ENCOUNTERED 11.0 TO 14.0 INCHES OF ASPHALT AT THE EXISTING GROUND SURFACE OVERLYING 8.0 TO 12.0 INCHES OF CONCRETE. BORING B-020-5-13 ENCOUNTERED 6.0 INCHES OF CONCRETE OVERLYING 6 INCHES OF AGGREGATE BASE.

BENEATH THE SURFACE MATERIALS IN ALL FOUR BORINGS, MATERIAL IDENTIFIED AS EXISTING FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 25.5 FEET TO 47.0 FEET BELOW THE GROUND SURFACE. GENERALLY, THE FILL MATERIAL CONSISTED OF BOTH COHESIVE AND GRANULAR MATERIALS, DESCRIBED AS BROWN, DARK BROWN, GRAY AND DARK GRAY GRAVEL AND SAND, GRAVEL WITH SAND, SILT AND CLAY, GRAVEL WITH SAND AND SILT, SILT, SANDY SILT, SILT AND CLAY, AND SILTY CLAY (ODOT A-1-b, A-2-4, A-4a, A-6a, AND A-6b). THE FILL CONTAINED DEBRIS CONSISTING OF ASPHALT, BRICK AND WOOD FRAGMENTS AND CINDERS.

BORING B-018-4-13 ENCOUNTERED A LAYER OF BLACK CLAY AND SILT (ODOT A-7-6) FROM A DEPTH OF 37.0 FEET TO 45.0 FEET BELOW THE EXISTING GROUND SURFACE, DESCRIBED AS HIGHLY ORGANIC. THE ORGANIC CONTENT IN THIS LAYER WAS 18.9 PERCENT AT DEPTH OF 38.5 FEET BELOW THE GROUND SURFACE. A PETROLEUM ODOR WAS NOTED WITHIN THIS LAYER.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, NATURAL SOILS WERE ENCOUNTERED CONSISTING PRIMARILY OF GRANULAR SOILS IN BORINGS B-018-4-13, B-018-5-13 AND B-019-2-13, AND GRANULAR WITH COHESIVE SEAMS AND LAYERS IN BORING B-020-5-13. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND BROWN TO GRAY, GRAVEL, GRAVEL AND SAND, AND GRAVEL WITH SAND AND SILT (ODOT A-1-a, A-1-b, A-2-4). THE COHESIVE SOILS IN B-020-5-13 WERE GENERALLY DESCRIBED AS BROWN AND GRAY SANDY SILT, SILT AND CLAY, AND SILTY CLAY (ODOT A-4a, A-6a AND A-6b).

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, NATURAL COHESIVE AND GRANULAR SOILS WERE ENCOUNTERED. THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS BROWN, SILTY CLAY, SILT AND CLAY (ODOT A-6b, AND A-4a), WHERE THE GRANULAR SOIL WERE GENERALLY DESCRIBED AS BROWN GRAVEL AND SAND, GRAVEL WITH SAND AND SILT (ODOT A-1-b, A-2-4, AND A-1-b).

SHALE BEDROCK WAS ENCOUNTERED IN BORING B-020-5-13 AT A DEPTHS RANGING FROM 78.5 TO 90.0 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 656.8 FEET MSL TO 643.4 FEET MSL. GRANITE BOULDER WAS ENCOUNTERED IN THE SAME BORING AT 75.5 AND 80.0 FEET BELOW THE GROUND SURFACE.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN ALL SIX BORINGS AT DEPTHS RANGING FROM 16.0 TO 25.0 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 697.3 TO 689.7 FEET MSL. THE GROUNDWATER LEVELS AT THE COMPLETION OF DRILLING IN BORINGS B-018-2-13, AND B-114-9-13 COULD NOT BE MEASURED DUE TO THE ADDITION OF WATER OR MUD TO COUNTERACT HEAVING SANDS AS WELL AS WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS.

DRAWN RRM
CHECKED BRT

SOIL PROFILE

FRA-70-12.68
FRA-70-13.10

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464IC012.dgn 6/25/2021 1:32:43 PM rachelm

WALL E5:
BETWEEN MARCH 20 AND DECEMBER 19, 2014, THREE (3) STRUCTURE BORINGS, DESIGNATED AS B-020-8-13, B-021-3-13 AND B-023-2-13, WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 25.0 TO 102.0 FEET BELOW THE EXISTING GROUND SURFACE.

BORING B-020-8-13 WAS DRILLED THROUGH THE EXISTING SIDEWALK THAT RUNS ALONG THE SOUTH SIDE OF MOUND STREET AND ENCOUNTERED 8.0 INCHES OF CONCRETE OVERLYING 4.0 INCHES OF AGGREGATE BASE AT THE GROUND SURFACE. BORING B-021-3-13 WAS DRILLED ALONG THE SOUTH SIDE OF MOUND STREET AND ENCOUNTERED 3.0 INCHES OF ASPHALT OVERLYING 8.0 INCHES OF CONCRETE AT THE GROUND SURFACE. BORING B-023-2-13 WAS DRILLED IN GRASS AREA ALONG THE SOUTH SIDE OF MOUND STREET, BETWEEN THE ENTRANCE RAMP TO I-70 WESTBOUND AND THE AEP POWER SUBSTATION, AND ENCOUNTERED 11.0 INCHES OF TOPSOIL AT THE GROUND SURFACE.

BENEATH THE SURFACE MATERIALS IN ALL THREE BORINGS, MATERIAL IDENTIFIED AS EXISTING FILL WAS ENCOUNTERED EXTENDING TO DEPTHS RANGING FROM 3.0 TO 5.5 FEET BELOW THE EXISTING GROUND SURFACE. THE FILL MATERIAL WAS GENERALLY DESCRIBED AS BROWN AND DARK BROWN GRAVEL AND SAND, GRAVEL WITH SAND AND SILT AND SILT AND CLAY (ODOT A-1-b, A-2-4, A-6a). POTENTIAL BURIED CONSTRUCTION DEBRIS WAS ENCOUNTERED AT A DEPTH OF 1.0 FEET IN BORING B-023-2-13, WHICH PREVENTED THE POSSIBILITY OF OBTAINING THE FIRST SPLIT SPOON SAMPLE AT THIS DEPTH. ADDITIONALLY, A PETROLEUM ODOR WAS NOTED IN SAMPLE SS-1 AT A DEPTH OF 3.5 FEET IN BORING B-023-2-13.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT SEAMS OF COHESIVE SOIL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT AND COARSE AND FINE SAND (ODOT A-1-a, A-1-b, A-2-4, A-3a). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS GRAY AND BROWN SANDY SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-4a, A-6a, A-6b , A-7-6). COBBLES AND BOULDERS WERE ENCOUNTERED ABOVE THE BEDROCK IN BORING B-020-8-13 STARTING AT AN ELEVATION OF 689 FEET MSL. DUE TO THE SIGNIFICANT PRESENCE OF LARGE BOULDERS IN BORING B-020-8-13 AT ELEVATION 682 FEET MSL, MUD ROTARY DRILLING TECHNIQUES WITH A TRICONE BIT WAS UTILIZED TO ADVANCE THE BORING TO BEDROCK.

TOP OF BEDROCK IN BORING B-020-8-13 WAS ENCOUNTERED AT A DEPTH OF 65.0 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO AN ELEVATION OF 656.0 FEET MSL. THE UPPER 27.0 FEET OF THE BEDROCK ENCOUNTERED CONSISTS OF SHALE AND MUDSTONE OVERLYING LIMESTONE BEDROCK AT AN ELEVATION OF 629.0 FEET MSL.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN ALL THREE BORINGS AT DEPTHS RANGING FROM 13.5 TO 21.0 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 702.5 TO 719.6 FEET MSL. THE GROUNDWATER LEVELS AT THE COMPLETION OF DRILLING COULD NOT BE MEASURED DUE TO THE ADDITION OF WATER OR MUD TO COUNTERACT HEAVING SANDS. PLEASE NOTE THAT SHORT-TERM WATER LEVEL READINGS, ESPECIALLY IN COHESIVE SOILS, ARE NOT NECESSARILY AN ACCURATE INDICATION OF THE ACTUAL GROUNDWATER LEVEL.

WALL E7:
BETWEEN MAY 13, 2014, AND APRIL 17, 2015, FOUR (4) STRUCTURAL BORINGS, DESIGNATED AS B-021-1-13, B-021-5-14, B-023-3-14, AND B-115-2-13, WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 35.0 TO 90.7 FEET BELOW THE EXISTING GROUND SURFACE.

ALL OF THE BORINGS FOR THIS EXPLORATION WERE DRILLED IN THE GRASS AREA AT THE TOE OF THE EXISTING EMBANKMENT SUPPORTING THE RAMP FROM MOUND STREET TO I-70 WESTBOUND AND ENCOUNTERED 5.0 TO 12.0 INCHES OF TOPSOIL AT THE EXISTING GROUND SURFACE, AS IDENTIFIED BY THE SIGNIFICANT PRESENCE OF VEGETATION AND ORGANIC MATERIAL.

BENEATH THE SURFACE MATERIALS IN BORINGS B-021-1-13, B-023-3-14 AND B-115-2-13, MATERIAL IDENTIFIED AS EXISTING FILL WAS ENCOUNTERED EXTENDING TO A DEPTH OF 3.0, 5.5 AND 23.0 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO AN ELEVATION OF 716.7, 727.7 AND 693.1 FEET MSL. THE EXISTING FILL MATERIAL WAS GENERALLY DESCRIBED AS DARK BROWN, BROWN, BLACK AND GRAY GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, COARSE AND FINE SAND, SILT, AND SILT AND CLAY. THE FILL CONTAINED DEBRIS CONSISTING OF BRICK AND SLAG FRAGMENTS, CINDERS AND ORGANICS. ASPHALT, BRICK, CINDER, COAL, CONCRETE, ROCK, SLAG, AND WOOD FRAGMENTS WERE OBSERVED TO BE PRESENT WITHIN THE FILL MATERIALS IN ADDITION TO ORGANIC MATERIAL. IT SHOULD ALSO BE NOTED THAT A PETROLEUM ODOR WAS NOTED WITHIN THE FILL MATERIAL ENCOUNTERED IN BORING B-115-2-13 AT A DEPTH OF 16.0 FEET BENEATH THE GROUND SURFACE.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, NATURAL SOILS WERE ENCOUNTERED CONSISTING PRIMARILY OF GRANULAR SOILS WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY, BROWNISH GRAY AND DARK BROWN GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY AND COARSE AND FINE SAND (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS GRAY AND BROWN SANDY SILT, SILT AND CLAY AND SILTY CLAY (ODOT A-4a, A-6a, A-6b).

TOP OF BEDROCK IN BORING B-115-2-13 WAS ENCOUNTERED AT A DEPTH OF 63.5 FEET BELOW THE EXISTING GROUND SURFACE, WHICH CORRESPONDS TO AN ELEVATION OF 652.6 FEET MSL. THE UPPER 19.7 FEET OF THE BEDROCK ENCOUNTERED CONSISTS OF CLAYSTONE AND SHALE OVERLYING LIMESTONE BEDROCK AT AN ELEVATION OF 632.9 FEET MSL.

EXPLORATION FINDINGS (CONTINUED)

WALL E7 (CONTINUED):
GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN ALL FOUR BORINGS AT DEPTHS RANGING FROM 8.0 TO 28.5 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 697.7 TO 708.1 FEET MSL. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING COULD NOT BE MEASURED DUE TO THE ADDITION OF MUD DURING TO COUNTERACT HEAVING SANDS DURING DRILLING AS WELL AS WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS. PLEASE NOTE THAT SHORT-TERM WATER LEVEL READINGS, ESPECIALLY IN COHESIVE SOILS, ARE NOT NECESSARILY AN ACCURATE INDICATION OF THE ACTUAL GROUNDWATER LEVEL.

WALL E9:
SEE FRA-70-1373L.

WALL E10:
BETWEEN JANUARY 20, AND FEBRUARY 18, 2020, FIVE (5) STRUCTURAL BORINGS, DESIGNATED AS B115-3-19 THROUGH B-115-7-19, WERE DRILLED TO COMPLETION DEPTHS RANGING FROM 20.0 TO 45.0 FEET BELOW THE EXISTING GROUND SURFACE.

BORINGS B-115-3-19, B-115-6-19 AND B-115-7-19 WERE DRILLED THROUGH THE EXISTING MAINLINE PAVEMENT ALONG THE I-70 WESTBOUND AND ENCOUNTERED A COMPOSITE PAVEMENT SECTION CONSISTING OF 8.0 TO 9.0 INCHES OF ASPHALT OVERLYING 10.0 INCHES OF CONCRETE. BORINGS B-115-4-19 AND B-115-5-19, WHICH WERE PERFORMED IN THE EXISTING OUTSIDE SHOULDER ENCOUNTERED FULL DEPTH ASPHALT SECTION WITH 8.0 TO 9.0 INCHES OF ASPHALT. AGGREGATE BASE WAS ENCOUNTERED IN ALL OF THE BORINGS WITH THICKNESSES VARYING FROM 6.0 TO 12.0 INCHES.

BENEATH THE SURFACE MATERIALS IN BORINGS B-115-3-19, B-115-4-19 AND B-115-5-19, MATERIAL IDENTIFIED AS EXISTING FILL OR POSSIBLE FILL WAS ENCOUNTERED EXTENDING TO A DEPTH OF 32.0, 18.0 AND 15.5 FEET, RESPECTIVELY, BELOW EXISTING GRADE, WHICH CORRESPONDS TO AN ELEVATION OF 701.9, 718.7 AND 723.3 FEET MSL. THE EXISTING FILL MATERIAL WAS GENERALLY DESCRIBED AS DARK BROWN, BROWN, BLACK AND GRAY GRAVEL WITH SAND, GRAVEL WITH SAND, SILT AND CLAY, SANDY SILT, SILT AND CLAY AND SILTY CLAY (ODOT A-1-b, A-2-6, A-4a, A-6a, A-6b). THE FILL CONTAINED DEBRIS CONSISTING OF CINDERS, RED TILE/BRICK FRAGMENTS, BROKEN ROCK FRAGMENTS AND POSSIBLE CONCRETE FRAGMENTS IN BORING B-115-3-19 BETWEEN THE DEPTHS OF 18.0 AND 32.0 FEET BELOW THE EXISTING GROUND SURFACE. BASED ON THE SITE TOPOGRAPHY, THE FILL MATERIAL IS LIKELY EMBANKMENT FILL THAT WAS PLACED DURING THE ORIGINAL CONSTRUCTION OF THE ROADWAY.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL, NATURAL SOILS WERE ENCOUNTERED CONSISTING OF BOTH GRANULAR AND COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY AND BROWNISH GRAY GRAVEL, GRAVEL WITH SAND, GRAVEL WITH SAND AND SILT AND COARSE AND FINE SAND (ODOT A-1-a, A1-b, A-2-4, A-3a). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS GRAY AND BROWN SANDY SILT, SILTY CLAY AND CLAY (ODOT A4a, A6b, A-7-6).

BEDROCK WAS NOT ENCOUNTERED IN ANY OF THE BORINGS PERFORMED FOR THIS STRUCTURE.

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN ALL OF THE BORINGS WITH THE EXCEPTION OF BORING B-115-7-19, AT DEPTHS RANGING FROM 13.5 TO 43.5 FEET BELOW THE GROUND SURFACE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 690.4 TO 727.4 FEET MSL. AT THE COMPLETION OF DRILLING IN BORINGS B-115-3-19 AND B-115-6-19, GROUNDWATER WAS MEASURED AT A DEPTH OF 40.0 AND 16.0 FEET BELOW GRADE, RESPECTIVELY, CORRESPONDING TO ELEVATIONS OF 693.9 AND 724.9 FEET MSL. THE GROUNDWATER LEVEL AT COMPLETION IN BORINGS B-115-4-19 AND B-115-5-19 WAS NOT OBTAINED PRIOR TO GROUTING THE BOREHOLES. BORING B-115-7-19 WAS OBSERVED TO BE DRY, MEANING THAT NO MEASURABLE AMOUNT OF GROUNDWATER WAS OBSERVED IN THE BOREHOLE DURING OR AT THE COMPLETION OF DRILLING.

WALL W2:
BETWEEN JANUARY 16, 2014, AND MARCH 27, 2015, FIFTEEN (15) STRUCTURAL BORINGS, DESIGNATED AS B-098-2-13 THROUGH B-107-4-14, WERE ADVANCED TO COMPLETION DEPTHS RANGING FROM 15.0 TO 54.3 FEET BELOW THE EXISTING GROUND SURFACE. IN ADDITION TO THE BORINGS PERFORMED BY RII AS PART OF THE CURRENT EXPLORATION, TWO (2) BORINGS, DESIGNATED AS B-099-1-09 AND B-101-0-09, WERE ADVANCED TO A COMPLETION DEPTH OF 12.5 AND 10.0 FEET BELOW THE EXISTING GROUND SURFACE, RESPECTIVELY, BY DLZ AS PART OF THE FRA-70-8.93 PRELIMINARY EXPLORATION.

BORINGS B-099-2-13, B-099-3-13 AND B-099-5-14 WERE PERFORMED IN THE EXISTING MJS CARRIERS PARKING LOT. BORINGS B-099-2-13 AND B-099-3-13 ENCOUNTERED 2.0 INCHES OF ASPHALT EACH AT THE GROUND SURFACE OVERLYING 4.0 INCHES OF AGGREGATE BASE IN BORING B-099-2-13, AND BORING B-099-5-14 ENCOUNTERED 8.0 INCHES OF CRUSHED GRAVEL AND ASPHALT AT THE GROUND SURFACE. BORING B-102-2-14 WAS PERFORMED WITHIN THE EXISTING PAVEMENT BEHIND THE LOADING DOCK FOR LIFECARE ALLIANCE AND ENCOUNTERED 4.0 INCHES OF ASPHALT OVERLYING 12.0 INCHES OF CONCRETE FOLLOWED BY 3.0 INCHES OF AGGREGATE BASE. BORING B-105-6-14 WAS PERFORMED WITHIN THE EXISTING PARKING LOT OF R.W. SETTERLIN BUILDING COMPANY AND ENCOUNTERED 4.0 INCHES OF ASPHALT OVERLYING 8.0 INCHES OF FILL MATERIAL. THE REMAINING BORINGS WERE PERFORMED WITHIN THE GRASS AREAS ADJACENT TO THE PARKING LOTS OR ALONG THE EMBANKMENT SUPPORTING I-71/SR-315 SOUTHBOUND AND ENCOUNTERED 1.0 TO 10.0 INCHES OF TOPSOIL AT THE GROUND SURFACE, AS IDENTIFIED BY THE SIGNIFICANT PRESENCE OF VEGETATION AND ORGANIC MATERIAL.

EXPLORATION FINDINGS (CONTINUED)

WALL W2 (CONTINUED):
BENEATH THE TOPSOIL IN BORINGS B-098-2-13, B-102-4-14 AND B-107-3-14, MATERIAL IDENTIFIED AS EXISTING FILL WAS ENCOUNTERED EXTENDING TO A DEPTH OF 3.0 FEET BELOW THE GROUND SURFACE AT THE RESPECTIVE BORING LOCATIONS, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 701.3 TO 712.0 FEET MSL. THE FILL MATERIAL CONSISTED OF DARK BROWN AND BROWN GRAVEL WITH SAND, SILT AND CLAY AND CLAY (ODOT A-2-6, A-7-6) AND CONTAINED ROOT FIBERS AND BRICK FRAGMENTS THROUGHOUT.

UNDERLYING THE SURFICIAL MATERIALS AND EXISTING FILL IN BORINGS B-098-2-13, B-102-4-14 AND B-107-3-14, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT SEAMS OF COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY, BROWNISH GRAY AND BLACK GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY AND SANDY SILT (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-4a). THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS BROWN, DARK BROWN, GRAY, BROWNISH GRAY, DARK GRAY AND REDDISH BROWN SANDY SILT, SILT AND CLAY, SILTY CLAY AND CLAY (ODOT A-4a, A-6a, A-6b, A-7-6).

WITH THE EXCEPTION OF BORINGS B-098-3-14, B-099-1-09 AND B-101-0-09, GROUNDWATER WAS ENCOUNTERED INITIALLY DURING THE DRILLING PROCESS IN THE REMAINING BORINGS AT DEPTHS RANGING FROM 11.0 TO 24.0 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 686.7 TO 691.6 FEET MSL. AT THE COMPLETION OF DRILLING AND PRIOR TO REMOVING THE AUGERS IN BORINGS B-099-3-13, B-099-5-14, B-100-3-14 AND B-107-4-14, GROUNDWATER ACCUMULATED IN THE AUGER STEMS TO DEPTHS RANGING FROM 15.0 TO 24.3 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 679.9 TO 690.1 FEET MSL. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING COULD NOT BE OBTAINED IN SEVERAL OF THE BORINGS DUE TO THE ADDITION OF WATER OR MUD TO THE BOREHOLES TO COUNTERACT HEAVING SANDS.

WALL W3:
BETWEEN JUNE 4, 2014, AND APRIL 28, 2015 A TOTAL OF NINE (9) STRUCTURE BORINGS, DESIGNATED AS B-103-1-14, B-104-1-13, B-105-3-14 THROUGH B-105-6-14 AND B-107-2-14 THROUGH B-107-4-14, WERE ADVANCED TO COMPLETION DEPTHS RANGING FROM 20.0 TO 70.5 FEET BELOW THE EXISTING GROUND SURFACE. IN ADDITION TO THE BORINGS PERFORMED BY RII AS PART OF THE CURRENT EXPLORATION, TWO (2) BORINGS, DESIGNATED AS B-106-0-09 AND B-111-0-09, WERE PERFORMED BY DLZ IN THE VICINITY OF THE PROPOSED STRUCTURE AS PART OF THE FRA-70-8.93 PRELIMINARY EXPLORATION. ADDITIONALLY, BORINGS B-105-5-14 AND B-107-2-14 WERE PERFORMED BY A SUBCONTRACT DRILLING COMPANY, STOCK DRILLING, TO ENSURE THAT ALL OF THE SUBJECT BORINGS WERE COMPLETED IN A TIMELY AND EFFICIENT MANNER.

BORINGS B-105-3-14, B-105-5-14 AND B-107-2-14 WERE LOCATED WITHIN THE EXISTING I-71 SOUTHBOUND RAMP AND ENCOUNTERED 3.0 TO 4.0 INCHES OF ASPHALT OVERLYING 6.0 TO 9.5 INCHES OF CONCRETE FOLLOWED BY 6.0 INCHES OF AGGREGATE BASE IN BORINGS B-105-3-14 AND B-105-5-14. BORING B-111-0-09 WAS LOCATED WITHIN THE EXISTING I-70 EASTBOUND TO I71/SR-315 SOUTHBOUND RAMP AND ENCOUNTERED 6.0 INCHES OF ASPHALT OVERLYING 6.0 INCHES OF AGGREGATE BASE. BORING B-105-6-14 WAS PERFORMED WITHIN THE EXISTING PARKING LOT OF R.W. SETTERLIN BUILDING COMPANY AND ENCOUNTERED 4.0 INCHES OF ASPHALT OVERLYING 8.0 INCHES OF FILL MATERIAL. BORINGS LOCATED OUTSIDE THE LIMITS OF THE EXISTING PAVEMENT ENCOUNTERED 1.0 TO 5.0 INCHES OF TOPSOIL AT THE EXISTING GROUND SURFACE, AS IDENTIFIED BY THE SIGNIFICANT PRESENCE OF ORGANICS AND VEGETATION.

BENEATH THE SURFICIAL MATERIALS, EXISTING FILL AND/OR POSSIBLE FILL MATERIALS WERE ENCOUNTERED IN A TOTAL OF SEVEN (7) OF THE ELEVEN (11) BORINGS ANALYZED AS PART OF THIS EXPLORATION. WITH THE EXCEPTION OF BORING B-107-3-14, THE EXISTING FILL ENCOUNTERED IN THE REMAINING BORINGS CONSISTED OF EXISTING EMBANKMENT FILL COMPRISED BROWN, DARK BROWN, GRAY AND BROWNISH GRAY SANDY SILT, SILT AND CLAY AND CLAY (ODOT A-4a, A-6a, A-6b) WITH INTERMITTENT SEAMS OF GRANULAR SOILS COMPRISED OF GRAVEL WITH SAND, GRAVEL WITH SAND AND SILT, AND GRAVEL WITH SAND, SILT AND CLAY (ODOT A-1-b, A-2-4, A-2-6) WHICH EXTENDED TO DEPTHS RANGING FROM 10.5 TO 25.5 FEET BELOW THE EXISTING GRADE AT ALONG THE I-70 EASTBOUND TO I-71/SR-315 SOUTHBOUND RAMP. THE PRESENCE OF ORGANIC AND CHEMICAL ODORS WAS ALSO NOTED WITHIN THE EMBANKMENT FILL MATERIAL ENCOUNTERED IN BORING B-104-1-13 BETWEEN EL. 703.5 AND 701.5 FEET MSL. THE EXISTING FILL ENCOUNTERED IN BORING B-107-3-14 CONSISTED OF BROWN CLAY (ODOT A-7-6), WHICH EXTENDED TO A DEPTH OF 3.0 FEET BELOW GRADE.

BENEATH THE SURFICIAL AND FILL MATERIALS, WHERE ENCOUNTERED, NATURAL COHESIVE AND GRANULAR SOILS WERE ENCOUNTERED EXTENDING TO THE BORING TERMINATION DEPTHS OR TOP OF BEDROCK. IN GENERAL, THE BORINGS PRIMARILY ENCOUNTERED NATURAL COHESIVE SOILS OVERLYING DEEP GRANULAR DEPOSITS. THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS GRAY, BROWN, DARK BROWN, DARK GRAY, AND BLACK SANDY SILT, SILT, SILT AND CLAY, SILTY CLAY, AND CLAY (ODOT A-4a, A-4b, A-6a, A-6b, A-7-6). THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY, BROWNISH GRAY AND DARK GRAY GRAVEL, GRAVEL WITH SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT, SILT AND CLAY, COARSE AND FINE SAND AND SANDY SILT (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a, A-4a).

IT SHOULD BE NOTED THAT AUGER REFUSAL WAS INITIALLY ENCOUNTERED IN BORING B-104-1-13 AT A DEPTH OF 51.0 FEET BENEATH THE GROUND SURFACE. UPON ENCOUNTERING AUGER REFUSAL, A CHANGEOVER TO ROCK CORING TECHNIQUES WAS MADE, AND 3.0 FEET OF ROCK CORING WAS PERFORMED. UPON INSPECTION OF THE RECOVERED SAMPLE, IT WAS DETERMINED THAT AUGER REFUSAL HAD BEEN ENCOUNTERED ON GRANITE AND LIMESTONE BOULDERS. AS A RESULT, THE BORING WAS OFFSET 5.0 FEET NORTH OF ITS ORIGINAL LOCATION, AND SOIL SAMPLING WAS CONTINUED UNTIL COMPETENT BEDROCK WAS ENCOUNTERED.

DRAWN RRM
CHECKED BRT

SOIL PROFILE

FRA-70-12.68
FRA-70-13.10

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464IC013.dgn 6/25/2021 1:26:11 PM rachelm

EXPLORATION FINDINGS (CONTINUED)

WALL W3 (CONTINUED):
BEDROCK WAS ENCOUNTERED IN BORING B-104-1-13 AT A DEPTH OF 60.5 FEET BENEATH THE GROUND SURFACE, CORRESPONDING TO AN ELEVATION OF 654.0 FEET MSL. UPON ENCOUNTERING COMPETENT BEDROCK, AS DEFINED BY AUGER REFUSAL, A CHANGEOVER TO ROCK CORING TECHNIQUES WAS MADE AND 10.0 FEET OF ROCK CORE WAS OBTAINED. THE CORED BEDROCK CONSISTED OF GRAY LIMESTONE, DESCRIBED AS BEING UNWEATHERED, VERY STRONG, VERY THICKLY BEDDED, CALCAREOUS, SILICEOUS, CHERTY, DOLOMITIC, CRYSTALLINE, AND SLIGHTLY TO MODERATELY FRACTURED, WITH OPEN APERTURES AND A SLIGHTLY ROUGH TO VERY ROUGH SURFACE.

GROUNDWATER WAS ENCOUNTERED IN A TOTAL OF NINE (9) OF THE ELEVEN (11) BORINGS ANALYZED AS PART OF THIS INVESTIGATION. GROUNDWATER WAS NOT ENCOUNTERED DURING OR AT THE COMPLETION OF DRILLING IN BORINGS B-106-0-09 AND B-111-0-09. GROUNDWATER WAS ENCOUNTERED IN THE REMAINING BORINGS INITIALLY DURING DRILLING AT DEPTHS RANGING FROM 11.0 TO 35.0 FEET BENEATH THE GROUND SURFACE, CORRESPONDING TO ELEVATIONS RANGING FROM 687.8 TO 693.5 FEET MSL. WITH THE EXCEPTION OF BORING B-107-4-14, THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING COULD NOT BE OBTAINED IN THESE BORINGS DUE TO THE ADDITION OF WATER OR MUD TO THE BOREHOLES TO COUNTERACT HEAVING SANDS. AT THE COMPLETION OF DRILLING IN BORING B-107-4-14, GROUNDWATER WAS ENCOUNTERED AT A DEPTH OF 15.0 FEET BELOW GRADE, CORRESPONDING TO AN ELEVATION OF 690.1 FEET MSL.

WALL W5:
BETWEEN JUNE 4, 2014, AND APRIL 28, 2015 A TOTAL OF ELEVEN (11) STRUCTURAL BORINGS, DESIGNATED AS B-099-4-14, B-100-2-14, B-100-4-14, B-102-3-14, B-102-5-14, B-104-1-13, B-105-3-14, B-105-5-14, B-107-2-14, B-108-7-14 AND B-108-8-14, WERE ADVANCED TO COMPLETION DEPTHS RANGING FROM 15.0 TO 70.5 FEET BELOW THE EXISTING GROUND SURFACE. THE BORINGS WERE DRILLED IN THE SHOULDER OF SR-315 SOUTHBOUND AND ALONG THE TOE OF THE EXISTING EMBANKMENT SUPPORTING I-71 SOUTHBOUND AND THE RAMP FROM I-70 EASTBOUND TO I-71 SOUTHBOUND ALONG THE WEST SIDE OF SR-315 SOUTHBOUND. IN ADDITION TO THE BORINGS PERFORMED BY RII AS PART OF THE CURRENT EXPLORATION, TWO (2) HISTORIC BORINGS, DESIGNATED AS B-100-0-09 AND B1040-09, WERE PERFORMED BY DLZ IN THE VICINITY OF THE PROPOSED STRUCTURE AS PART OF THE FRA-70-8.93 PRELIMINARY ENGINEERING PROJECT (PID NO. 77369) WITH THEIR FINDINGS PUBLISHED IN A REPORT DATED MARCH 18, 2010. THE HISTORIC BORINGS WERE ADVANCED TO COMPLETION DEPTHS OF 15.0 AND 30.0 FEET BELOW THE EXISTING GROUND SURFACE, RESPECTIVELY.

ALL BORINGS PERFORMED AS PART OF THE CURRENT EXPLORATION WERE LOCATED WITHIN THE EXISTING PAVEMENT OF I-71 SOUTHBOUND, THE EXISTING SHOULDER PAVEMENT OF SR-315 SOUTHBOUND, OR ALONG THE TOE OF THE SUPPORTING EMBANKMENT OF I-71 SOUTHBOUND. BORINGS LOCATED WITHIN THE EXISTING PAVEMENT GENERALLY ENCOUNTERED EITHER 2.0 TO 5.0 INCHES OF ASPHALT OVERLYING 6.0 TO 10.0 INCHES OF CONCRETE, OR 9.0 TO 12.0 INCHES OF CONCRETE AT THE GROUND SURFACE. AGGREGATE BASE MATERIAL WAS ENCOUNTERED UNDERLYING THE SURFICIAL PAVEMENT MATERIALS IN THREE (3) OF THE BORINGS, RANGING IN THICKNESS FROM 5.0 TO 6.0 INCHES. BORINGS LOCATED OUTSIDE THE LIMITS OF THE EXISTING PAVEMENT GENERALLY ENCOUNTERED 4.0 TO 8.0 INCHES OF TOPSOIL AT THE EXISTING GROUND SURFACE, AS IDENTIFIED BY THE SIGNIFICANT PRESENCE OF ORGANICS AND VEGETATION.

BENEATH THE SURFICIAL MATERIALS DETAILED IN THE PREVIOUS SECTION, EXISTING FILL AND/OR POSSIBLE FILL MATERIALS WERE ENCOUNTERED IN A TOTAL OF SIX (6) OF THE THIRTEEN (13) BORINGS ANALYZED AS PART OF THIS EXPLORATION. THE FILL MATERIALS EXTENDED TO DEPTHS RANGING FROM AS SHALLOW AS 5.5 FEET TO AS DEEP AS 25.5 FEET BENEATH THE EXISTING GROUND SURFACE. IN GENERAL, THE EXISTING AND POSSIBLE FILL MATERIALS CONSISTED OF BROWN, DARK BROWN, GRAY AND DARK GRAY GRAVEL, GRAVEL WITH SAND, GRAVEL WITH SAND AND SILT, SANDY SILT, SILT AND CLAY, AND SILTY CLAY (ODOT A-1-a, A-1-b, A-2-4, A-4a, A-6a, AND A-6b). WHILE A MAJORITY OF THE FILL MATERIALS THAT WERE ENCOUNTERED IN THE BORINGS IS CONSIDERED TO BE EXISTING EMBANKMENT FILL AND SUITABLE FOR FOUNDATION SUPPORT, IT SHOULD BE NOTED THAT ASPHALT AND COAL FRAGMENTS WERE NOTED WITHIN THE FILL MATERIALS ENCOUNTERED IN BORINGS B-105-5-14, B-107-2-14, AND B-108-7-14. THE PRESENCE OF ORGANIC AND CHEMICAL ODORS WAS ALSO NOTED WITHIN THE FILL MATERIALS ENCOUNTERED AT THESE LOCATIONS, WHERE THE FILL MATERIALS ARE CONSIDERED TO BE UNCONTROLLED, AND NOT SUITABLE FOR FOUNDATION SUPPORT.

BENEATH THE SURFICIAL AND FILL MATERIALS, NATURAL SOILS WERE ENCOUNTERED CONSISTING OF BOTH COHESIVE AND GRANULAR SOILS. IN GENERAL, THE BORINGS PRIMARILY ENCOUNTERED COHESIVE NATURAL SOILS OVERLYING DEEP GRANULAR DEPOSITS. THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS BLACK, BROWN, DARK BROWN, GRAY, AND DARK 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 WERE GENERALLY DESCRIBED AS BLACK, BROWN, GRAY AND DARK GRAY GRAVEL, GRAVEL WITH SAND, GRAVEL WITH SAND AND SILT, GRAVEL WITH SAND, SILT AND CLAY, COARSE AND FINE SAND, SANDY SILT, AND SILT (ODOT A-1-a, A-1-b, A-2-4, A-2-6, A-3a, A-4a, A-4b).

BEDROCK WAS ENCOUNTERED IN BORING B-104-1-13 AT A DEPTH OF 60.5 FEET BENEATH THE GROUND SURFACE. UPON ENCOUNTERING COMPETENT BEDROCK, AS DEFINED BY AUGER REFUSAL, A CHANGEOVER TO ROCK CORING TECHNIQUES WAS MADE AND 10.0 FEET OF ROCK CORE WAS ATTEMPTED. THE CORED BEDROCK CONSISTED OF GRAY LIMESTONE, DESCRIBED AS BEING UNWEATHERED, VERY STRONG, VERY THICKLY BEDDED, CALCAREOUS, SILICEOUS, CHERTY, DOLOMITIC, CRYSTALLINE, AND SLIGHTLY TO MODERATELY FRACTURED, WITH OPEN APERTURES AND A SLIGHTLY ROUGH TO VERY ROUGH SURFACE.

EXPLORATION FINDINGS (CONTINUED)

WALL W5 (CONTINUED):
GROUNDWATER WAS ENCOUNTERED IN A TOTAL OF TEN (10) OF THE THIRTEEN (13) BORINGS ANALYZED AS PART OF THIS INVESTIGATION. GROUNDWATER WAS INITIALLY ENCOUNTERED IN THE BORINGS AT DEPTHS RANGING FROM 3.0 TO 35.0 FEET BENEATH THE GROUND SURFACE, CORRESPONDING TO ELEVATIONS RANGING FROM 685.1 TO 713.6 FEET MSL. AT THE COMPLETION OF DRILLING, GROUNDWATER HAD ACCUMULATED WITHIN THE HISTORIC BORINGS B-100-0-09 AND B-104-0-09 TO DEPTHS OF 13.4 AND 19.4 FEET BENEATH THE GROUND SURFACE, CORRESPONDING TO ELEVATIONS OF 703.2 AND 690.8 FEET MSL, RESPECTIVELY. THE BORINGS PERFORMED BY RII AS PART OF THE CURRENT INVESTIGATION WERE EITHER DRY AT THE COMPLETION OF DRILLING, OR ACCURATE GROUNDWATER LEVELS COULD NOT BE OBTAINED DUE TO THE ADDITION OF DRILLING FLUIDS DURING THE DRILLING PROCESS TO COUNTERACT THE WATER PRESSURE CAUSING SANDS TO HEAVE INTO THE AUGERS.

HIGH VOLTAGE TRANSMISSION TOWERS:

BETWEEN AUGUST 21 AND 22, 2013, ONE (1) STRUCTURAL BORING, DESIGNATED AS B-026-3-13, WAS DRILLED TO A COMPLETION DEPTH OF 90.0 FEET BELOW THE EXISTING GROUND SURFACE. IN ADDITION TO THE BORING PERFORMED AS PART OF THE CURRENT EXPLORATION, TWO (2) HISTORIC BORINGS, DESIGNATED AS B-002-F-59 AND B-005-F-59, WERE OBTAINED AT THE SOUTHWEST AND NORTHEAST CORNERS OF THE EXISTING BRIDGE ALIGNMENT, RESPECTIVELY. THE HISTORIC BORINGS WERE EXTENDED TO A DEPTH OF 73.0 AND 66.0 FEET, RESPECTIVELY, BELOW THE GROUND SURFACE AT THE TIME THE BORINGS WERE OBTAINED.

BORING B-026-3-13 WAS PERFORMED WITHIN THE EXISTING SIDEWALK ALONG THE WEST SIDE OF S. FRONT STREET, AT THE INTERSECTION WITH W. FULTON STREET ON THE NORTH SIDE OF THE EXISTING STRUCTURE AND ENCOUNTERED 6.0 INCHES OF CONCRETE OVERLYING 6.0 INCHES OF AGGREGATE BASE AT THE EXISTING GROUND SURFACE. BENEATH THE SURFACE MATERIALS, NATURAL GRANULAR SOILS WERE ENCOUNTERED WITH INTERMITTENT LAYERS OF COHESIVE MATERIAL. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN, GRAY AND BROWNISH GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT AND COARSE AND FINE SAND (ODOT A-1-a, A-1-b, A-2-4, A-3a). THE COHESIVE SOIL SEAMS ENCOUNTERED WERE GENERALLY DESCRIBED AS BROWN, GRAY AND BROWNISH GRAY SANDY SILT, SILT AND CLAY AND SILTY CLAY (ODOT A-4a, A-6a, A-6b).

BEDROCK WAS NOT ENCOUNTERED IN ANY OF THE BORINGS PERFORMED DURING THE HISTORIC OR CURRENT EXPLORATIONS IN THE IMMEDIATE VICINITY OF THE S. FRONT STREET STRUCTURE. HOWEVER, BASED ON THE SUBSURFACE CONDITIONS ENCOUNTERED IN BORINGS PERFORMED WITHIN THE AREA OF THE ADJACENT FRA-70-1390C STRUCTURE, SHALE BEDROCK IS PRESENT AT AN APPROXIMATE ELEVATION OF 630 FEET MSL.

IN GENERAL, THE HISTORIC BORINGS ENCOUNTERED MEDIUM DENSE TO VERY DENSE GRANULAR SOILS WITH INTERMITTENT LAYERS OF HARD COHESIVE SOILS. THE GRANULAR SOILS WERE GENERALLY DESCRIBED AS BROWN AND GRAY GRAVEL, GRAVEL AND SAND, GRAVEL WITH SAND AND SILT AND COARSE AND FINE SAND (ODOT A-1-a, A-1-b, A-2-4, A-4a, A-4b), AND THE COHESIVE SOILS WERE GENERALLY DESCRIBED AS GRAY SANDY SILT AND SILT AND CLAY (ODOT A-4a, A-6a).

BEDROCK WAS NOT ENCOUNTERED IN THE HISTORIC BORINGS PRIOR TO THE TERMINATION DEPTHS. IN GENERAL, THE SUBSURFACE CONDITIONS ENCOUNTERED IN THE HISTORIC BORINGS MATCHED RELATIVELY CLOSELY WITH THE SUBSURFACE CONDITIONS ENCOUNTERED IN THE CURRENT EXPLORATION BORING

GROUNDWATER WAS ENCOUNTERED INITIALLY DURING DRILLING IN ALL BORINGS AT DEPTHS RANGING FROM 16.0 TO 38.5 FEET BELOW EXISTING GRADE AT THE RESPECTIVE BORING LOCATION, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 683.1 TO 692.9 FEET MSL. AT THE COMPLETION OF DRILLING IN BORINGS B-018-6-15, B-100-5-15, B-102-5-15 AND B-106-2-15 AND FOLLOWING REMOVAL OF THE AUGERS, GROUNDWATER ACCUMULATED IN THE BOREHOLES TO DEPTHS RANGING FROM 30.0 TO 33.0 FEET BELOW EXISTING GRADE, WHICH CORRESPONDS TO ELEVATIONS RANGING FROM 683.9 TO 691.6 FEET MSL. BORING B-018-7-15 WAS OBSERVED TO BE DRY AT THE COMPLETION OF DRILLING. THE GROUNDWATER LEVEL AT THE COMPLETION OF DRILLING IN THE REMAINING BORINGS COULD NOT BE MEASURED DUE TO THE ADDITION OF MUD TO COUNTERACT HEAVING SANDS OR WATER AS A CIRCULATING FLUID DURING THE ROCK CORING PROCESS.

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.

SEVERAL BORINGS APPEAR IN SOME PLAN VIEWS IN THIS SOIL PROFILE, WHICH ARE NOT WITHIN THE WORK LIMITS OF THE PROJECT, THEREFORE NO SUBSURFACE INFORMATION HAS BEEN INCLUDED IN THE SOIL PROFILE FOR THESE BORINGS. BORING DATA FOR THESE BORINGS MAY BE FOUND ONLINE IN THE ODOT GEOMS GIS DATA MANAGEMENT SYSTEM DATABASE AT http://gis.dot.state.oh.us/tims/map/geotech. THE FOLLOWING TABLE DESCRIBES WHERE DATA FOR THESE BORINGS MAY BE FOUND:

EXPLORATION IDENTIFICATION NUMBER	PLAN SHEETS IN THIS SOIL PROFILE	HISTORIC BORING NUMBER	GEOMS SUB BATCH NUMBER
B-093-0-09	78, 83	N/A	18955
B-107-0-09	76, 156, 237	N/A	18955
B-113-0-09	66, 87	N/A	18955
B-113-1-09	66, 87, 160	N/A	18955
B-117-0-09	72, 128, 162	N/A	18955
B-118-0-09	162	N/A	18955
B-121-0-09	65	N/A	18955
B-122-0-09	65	N/A	18955
B-123-0-09	65, 86	N/A	18955
B-001-A-68	66	B-1	59
B-003-W-68	66	B-3	62
B-010-W-68	66	B-10	62
B-015-W-68	66, 86, 92, 87, 160, 161	B-15	62
M-019-0-55	66	MS-19	489
M-021-0-55	66, 87,106, 160	MS-21	488
M-022-0-55	87,106, 158	MS-22	488
M-035-0-55	78, 83	MS-35	444
M-041-0-56	76, 80, 85,156,157, 227, 235, 236	M-41	494
M-042-0-56	76, 85, 156,157, 235	M-42	494
M-043-0-56	76, 85, 156,157, 235	M-43	494

DRAWN RRM
CHECKED BRT

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464IC014.dgn 6/25/2021 1:31:18 PM rachelm

SUMMARY OF SOIL TEST DATA
℄ I-70 EB

EXPLORATION NO., STATION & OFFSET	FROM	TO	SAMPLE ID	% REC	HP tsf	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	SO4 ppm
B-012-0-09	01.50	03.00	SS-1	61	2.50	15	14	18	28	25	25	14	11	13	A-6a (4)*	
STA. 122+40.71, 14.8′ LT	03.00	04.50	SS-2	89	-	42	20	15	11	12	NP	NP	NP	8	A-1-b (0)*	
LATITUDE = 39.950046	04.50	06.00	SS-3	100	4.00	19	20	15	27	19	23	15	8	10	A-4a (2)	
LONGITUDE = -83.022975	06.00	07.50	SS-4	100	4.5+	V. ST. TO HD., BR. SILT AND CLAY, LI. F-C SA., TR. TO LI. GR.								14	A-6a (VISUAL)	
	08.50	10.00	SS-5	94	3.50	SAME AS SS-4								13	A-6a (VISUAL)	
	11.00	12.50	SS-6	100	-	MD. DE., BROWN GRAVEL AND SAND, LI. SILT								8	A-1-b (VISUAL)	
	13.50	15.00	SS-7	100	-	SAME AS SS-6								9	A-1-b (VISUAL)	
B-013-0-09	01.50	03.00	SS-1	72	-	42	28	16	--14--		NP	NP	NP	6	A-1-b (0)*	73
STA. 126+80.23, 26.2′ RT	03.00	04.50	SS-2	56	-	35	29	20	--15--		NP	NP	NP	7	A-1-b (0)	
LATITUDE = 39.94993	04.50	06.00	SS-3	89	-	39	31	18	--12--		NP	NP	NP	6	A-1-b (0)	
LONGITUDE = -83.021526	06.00	07.50	SS-4	83	-	26	22	30	--21--		NP	NP	NP	7	A-3a (0)	
	08.50	10.00	SS-5	33	-	SAME AS SS-4								11	A-1-b (VISUAL)	
B-014-0-09	01.50	03.00	SS-1	100	-	46	26	12	--16--		NP	NP	NP	6	A-1-b (0)*	
STA. 130+08.62, 157.1′ LT	03.50	05.00	SS-2	100	-	SAME AS SS-1								6	A-1-b (VISUAL)*	
LATITUDE = 39.950574	06.00	07.50	SS-3	100	-	45	24	14	--16--		NP	NP	NP	7	A-1-b (0)	
LONGITUDE = -83.020229	07.50	09.00	SS-4	67	-	30	28	16	--27--		NP	NP	NP	7	A-2-4 (0)	
	09.00	10.50	SS-5	50	-	34	25	15	--26--		NP	NP	NP	9	A-2-4 (0)	
	10.50	12.00	SS-6	28	-	34	27	13	15	11	20	15	5	9	A-2-4 (0)	
	12.00	13.50	SS-7	78	-	SAME AS SS-6								10	A-2-4 (VISUAL)	
	13.50	15.00	SS-8	100	-	SAME AS SS-6								11	A-2-4 (VISUAL)	
	16.00	17.50	SS-9	100	-	SAME AS SS-6								9	A-2-4 (VISUAL)	
B-014-1-19	01.50	03.00	SS-1	72	-	39	26	12	18	5	19	14	5	8	A-1-b (0)*	1900
STA. 130+97.17, 21′ LT	03.00	04.50	SS-2	67	3.50	26	16	22	26	10	21	17	4	13	A-4a (0)*	
LATITUDE = 39.950225	04.50	06.00	SS-3	92	3.50	SAME AS SS-2								13	A-4a (VISUAL)	
LONGITUDE = -83.019864	06.00	07.50	SS-4	72	4.5+H.	GRAY SILT & CLAY, L. COARSE TO F. SAND, L. F. GRAV., DAMP								11	A-6a (VISUAL)	
B-014-5-19	01.50	02.30	SS-1A	92	3.25	V. ST., D. GRAY, SANDY SILT, L. CLAY, TR. F. GRAV., DAMP								9	A-4a (VISUAL)*	640
STA. 145+09.20, 10′ LT	02.30	03.00	SS-1B		3.50	13	21	15	33	18	36	21	15	13	A-6a (5)*	
LATITUDE = 39.950903	03.00	04.50	SS-2	72	3.50	21	18	17	26	18	33	23	10	20	A-4a (2)*	
LONGITUDE = -83.014979	04.50	06.00	SS-3	100	3.00	SAME AS SS-2								21	A-4a (VISUAL)	
	06.00	07.30	SS-4	100	4.25	SAME AS SS-2								14	A-4a (VISUAL)	
B-015-0-09	01.50	03.00	SS-1	100	-	MD. DE. TO V. DE., BR. GRAVEL WITH SAND AND SILT, LI. CL.								9	A-2-4 (VISUAL)	
STA. 133+74.39, 123.0′ LT	03.50	05.00	SS-2	56	-	SAME AS SS-2								14	A-2-4 (VISUAL)	
LATITUDE = 39.950557	06.00	07.50	SS-3	100	-	26	26	18	18	12	NP	NP	NP	8	A-2-4 (0)	
LONGITUDE = -83.018898	07.50	09.00	SS-4	83	4.5+	19	14	19	27	21	21	13	8	8	A-4a (3)	
	09.00	10.50	SS-5	100	-	27	26	18	16	13	20	13	7	9	A-2-4 (0)	
	10.50	12.00	SS-6	61	1.50	26	29	16	16	14	22	15	7	11	A-2-4 (0)	
	12.00	13.50	SS-7	100	2.75	SAME AS SS-5								10	A-2-4 (VISUAL)	
	13.50	15.00	SS-8	100	4.5+	SAME AS SS-5								9	A-2-4 (VISUAL)	
	16.00	17.50	SS-9	100	-	V. DE., BR. COARSE AND FINE SAND, SM. SI., TR. TO LI. GR.								7	A-3a (VISUAL)	
B-016-0-08	01.50	02.20	SS-1A	83	-	FILL: MD. DE., BR. COARSE AND FINE SAND, SM. SI., TR. GR.								7	A-3a (VISUAL)	
STA. 160+54.70, 106.6′ RT.	02.20	03.00	SS-1B	0	4.5+	FILL: HD., BROWN SANDY SILT, SM. F-C SA., TR. GR.								14	A-4a (VISUAL)	
LATITUDE = 39.952684	03.50	05.00	SS-2	72	-	FILL: DE., BROWN GRAVEL WITH SAND AND SILT, SM. CL.								6	A-2-4 (VISUAL)	
LONGITUDE = -83.009926	06.00	07.50	SS-3	67	3.00	FILL: ST. TO V. ST., BR. & GY. SILT & CLAY, SM. F-C SA., TR. TO LI. GR.								12	A-6a (VISUAL)	
	08.50	10.00	SS-4	0	1.50	SAME AS SS-3								14	A-6a (VISUAL)	
	11.00	12.50	SS-5	50	1.50	SAME AS SS-3								14	A-6a (VISUAL)	
	13.50	15.00	SS-6	44	-	SAME AS SS-7								27	A-2-4 (VISUAL)	
	15.00	16.50	SS-7	44	-	18	33	21	5	23	28	19	9	25	A-2-4 (0)	
	16.50	18.00	SS-8	11	-						39	34	5	31	A-2-4 (VISUAL)	
	18.00	19.50	SS-9	72	1.25	0	5	20	46	29	31	20	11	28	A-6a (8)	
	19.50	21.00	SS-10	78	2.50	SAME AS SS-9								31	A-6a (VISUAL)	
	21.00	22.50	SS-11	61	3.50	SAME AS SS-9								25	A-6a (VISUAL)	
	23.50	25.00	SS-12	94	2.00	SAME AS SS-9								23	A-6a (VISUAL)	
B-017-0-08	01.50	03.00	SS-1	50	2.50	V. ST., BROWN SILT & CLAY, LI. F-C SAND, LI. GRAVEL								16	A-6a (VISUAL)	
STA. 164+60.87, 4.9′ LT	03.50	05.00	SS-2	78	-	40	47	6	--7--					5	A-1-b (VISUAL)	
LATITUDE = 39.953279	05.00	06.50	SS-3	67	-	44	43	5	--8--					6	A-1-b (VISUAL)	
LONGITUDE = -83.008662	06.50	08.00	SS-4	83	1.50	3	9	10	33	45	36	18	18	22	A-6b (11)	
	08.00	09.50	SS-5	78	0.50	SAME AS SS-4								21	A-6b (VISUAL)	
	09.50	11.00	SS-6	78	3.00	ST. TO V. ST., GRAY CLAY, TR. F-C SAND, TR. GRAVEL								-	A-7-6 (VISUAL)	
	11.00	12.50	SS-7	89	1.50	SAME AS SS-6								28	A-7-6 (VISUAL)	
	13.50	15.00	SS-8	89	1.50	ST., BROWN & GRAY SILTY CLAY, LI. F-C SAND, LI. GRAVEL								-	A-6b (VISUAL)	

SUMMARY OF SOIL TEST DATA
℄ I-70 EB

EXPLORATION NO., STATION & OFFSET	FROM	TO	SAMPLE ID	% REC	HP tsf	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	SO4 ppm
B-018-0-08	01.50	03.00	SS-1	50	2.50	SAME AS SS-2								9	A-6b (VISUAL)	
STA. 171+75.76, 109.1′ RT	03.50	05.00	SS-2	61	2.75	14	16	11	30	29	33	16	17	19	A-6b (8)	
LATITUDE = 39.953211	06.00	07.50	SS-3	89	4.00	SAME AS SS-2								10	A-6b (VISUAL)	
LONGITUDE = -83.006121	08.50	10.00	SS-4	6	-	FILL: ST., GRAY SANDY SILT, SM. F-C SA., TR. GR.								15	A-4a (VISUAL)	
	11.00	12.50	SS-5	44	3.00	ST. TO V. ST., GRAY SANDY SILT, SM. F-C SA., TR. GR.								20	A-4a (VISUAL)	
	13.50	15.00	SS-6	67	1.50	SAME AS SS-5								39	A-4a (VISUAL)	
	16.00	17.50	SS-7	67	2.75	SAME AS SS-5								74	A-4a (VISUAL)	
B-020-0-08	01.50	03.00	SS-1	67	3.00	V. ST., BROWN SILT & CLAY, SM. F-C SA., LI. GR.								13	A-6a (VISUAL)	
STA. 175+26.83, 34.7′ LT	03.50	05.00	SS-2	50	2.25	SAME AS SS-1								-	A-6a (VISUAL)	
LATITUDE = 39.953585	06.00	07.50	SS-3	100	2.00	6	12	22	37	23	23	15	8	11	A-4a (5)	
LONGITUDE = -83.004872	08.50	10.00	SS-4	72	2.25	SAME AS SS-3								12	A-4a (VISUAL)	
	11.00	12.50	SS-5	50	2.00	SAME AS SS-3								-	A-4a (VISUAL)	
	13.50	15.00	SS-6	6	-	SAME AS SS-3								-	A-4a (VISUAL)	
	16.00	17.50	SS-7	61	2.25	V. ST., GY/BR SILT & CLAY, LI. F-C SA., LI. GR.								-	A-6a (VISUAL)	
	18.50	20.00	SS-8	100	3.75	SAME AS SS-7								-	A-6a (VISUAL)	
B-023-0-08	01.00	02.50	SS-1	22	3.00	FILL: V. SO. TO SO., BR. SILT AND CLAY, SM. F-C SA., TR. TO LI. GR.								-	A-6a (VISUAL)	
STA. 179+52.56, 1.9′ LT	03.50	05.00	SS-2	67	0.25	9	16	20	32	23	28	18	10	19	A-4a (4)	
LATITUDE = 39.953152	06.00	07.50	SS-3	11	0.25	9	16	20	32	24	28	18	10	19	A-4a (4)	
LONGITUDE = -83.003324	08.50	10.00	SS-4	100	0.25	SAME AS SS-3								21	A-4a (VISUAL)	
	11.00	12.50	SS-5	100	-	SAME AS SS-3								16	A-4a (VISUAL)	
	13.50	15.00	SS-6	100	-	SAME AS SS-7								-	A-2-4 (VISUAL)	
	16.00	17.50	SS-7	56	-	40	15	14	24	7	25	18	7	11	A-2-4 (0)	
	18.50	20.00	SS-8	44	-	SAME AS SS-7								13	A-2-4 (VISUAL)	
	21.00	21.90	SS-9	91	-	SAME AS SS-7								-	A-2-4 (VISUAL)	
	23.50	24.90	SS-10	82	-	V. DE., BROWN SANDY SILT, SM. F-C SA., SM. GR.								-	A-4a (VISUAL)	
	26.00	27.50	SS-11	100	-	V. DE., BR. COARSE AND FINE SAND, SM. SI., SM. GR.								-	A-3a (VISUAL)	
	28.50	30.00	SS-12	83	-	SAME AS SS-11								-	A-3a (VISUAL)	
	31.00	32.50	SS-13	94	-	SAME AS SS-11								-	A-3a (VISUAL)	
	33.50	35.00	SS-14	83	-	SAME AS SS-11								-	A-3a (VISUAL)	
B-027-0-08	01.50	03.00	SS-1	100	-	AGGREGATE BASE								10	Fill (VISUAL)	
STA. 187+87.61, 91.1′ RT	03.00	04.50	SS-2	100	-	19	34	25	17	5	27	21	6	16	A-1-b (0)	
LATITUDE = 39.952864	04.50	06.00	SS-3	100	-	39	32	10	--19--		NP	NP	NP	9	A-1-b (0)*	
LONGITUDE = -83.000428	06.00	07.50	SS-4	78	-	SAME AS SS-2								8	A-1-b (VISUAL)*	207
	07.50	09.00	SS-5	83	-	28	34	15	--23--		NP	NP	NP	14	A-1-b (0)	
	10.00	11.50	SS-6	72	-	17	20	25	--38--		NP	NP	NP	9	A-4a (1)	
	12.50	14.00	SS-7	67	-						NP	NP	NP	9	A-4a (VISUAL)	
B-028-0-08	01.50	03.00	SS-1	44	-	64	16	6	--13--					6	A-1-a (VISUAL)	53
STA. 191+29.95, 16.1′ LT	03.50	05.00	SS-2	39	-	70	13	5	--11--					7	A-1-a (VISUAL)	
LATITUDE = 39.953161	06.00	07.50	SS-3	89	-	34	35	14	--17--		NP	NP	NP	8	A-1-b (0)	
LONGITUDE = -82.999193	08.50	10.00	SS-4	67	-	84	5	3	--8--		NP	NP	NP	3	A-1-a (0)	

SUMMARY OF SOIL TEST DATA
℄ I-70 WB

EXPLORATION NO., STATION & OFFSET	FROM	TO	SAMPLE ID	% REC	HP tsf	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	SO4 ppm
B-022-0-08	01.50	03.00	SS-1	67	1.50	15	17	17	29	22	29	15	14	13	A-6a (5)	
STA. 179+85.96, 51.6′ LT	03.00	04.50	SS-2	39	-	34	23	16	18	9	21	18	3	11	A-2-4 (0)	
LATITUDE = 39.953496	04.50	06.00	SS-3	83	2.00	11	23	18	30	18	28	18	10	13	A-4a (3)	
LONGITUDE = -83.003230	06.00	07.50	SS-4	89	-	FILL: DE., GRAY GRAVEL								-	A-1-a (VISUAL)	
	07.50	09.00	SS-5	61	3.00	FILL: V. ST., DARK BROWN SILTY CLAY, SM. F-C SA., TR. GR.								17	A-6b (VISUAL)	
	09.00	10.50	SS-6	78	3.00	SAME AS SS-5								17	A-6b (VISUAL)	
	11.00	12.50	SS-7	61	-	FILL: DE., DARK GRAY SANDY SILT, SM. GRAVEL								-	A-4a (VISUAL)	
	13.50	15.00	SS-8	6	-	SAME AS SS-7								-	A-4a (VISUAL)	
	16.00	17.50	SS-9	72	-	MD. DE., BR. COARSE AND FINE SAND, LI. SI., TR. GR.								-	A-3a (VISUAL)	
	18.50	20.00	SS-10	78	2.25	V. ST., GRAY SILTY CLAY, TR. F-C SAND								-	A-6b (VISUAL)	
B-026-4-19	02.20	02.70	SS-1A	61	2.00	-	-	-	-	-	-	-	-	11	A-6b (VISUAL)	
STA. 184+64.16, 3.7′ RT	02.70	03.70	SS-1B		-	50	17	9	19	5	21	17	4	9	A-1-b (0)	310
LATITUDE = 39.953161	03.70	05.20	SS-2	61	-	52	15	10	19	4	21	18	3	7	A-1-b (0)	
LONGITUDE = -83.001205	05.20	06.70	SS-3	67	-	SAME AS SS-2								7	A-1-b (VISUAL)	
	06.70	08.20	SS-4	61	-	SAME AS SS-2								7	A-1-b (VISUAL)	

DRAWN RRM
CHECKED BRT

SOIL PROFILE
SUMMARY OF SOIL TEST DATA

FRA-70-12.68
FRA-70-13.10

15 / 496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ID001.dgn 6/25/2021 12:41:50 PM rachelm

SUMMARY OF SOIL TEST DATA
℄ I-70 WB

EXPLORATION NO., STATION & OFFSET	FROM	TO	SAMPLE ID	% REC	HP tsf	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	SO4 ppm
B-027-2-19	01.90	03.40	SS-1	39	-	45	24	12	15	4	NP	NP	NP	4	A-1-b (0)	3800
STA. 189+00.00, 10.0′ LT	03.40	04.90	SS-2	78	-	8	25	53	13	1	NP	NP	NP	5	A-3a (0)	
LATITUDE = 39.953130	04.90	06.40	SS-3	67	-				SAME AS SS-2					7	A-3a (VISUAL)	
LONGITUDE = -83.000009	06.40	07.90	SS-4	67	-				SAME AS SS-2					14	A-3a (VISUAL)	
B-029-1-19	01.90	03.40	SS-1	50	4.5+	15	8	14	40	23	23	14	9	10	A-4a (6)	540
STA. 193+00.00, 10.0′ LT	03.40	04.90	SS-2	89	4.5+	34	23	16	18	9	21	18	3	10	A-4a (6)	
LATITUDE = 39.953187	04.90	06.40	SS-3	78	4.5+				SAME AS SS-2					10	A-4a (VISUAL)	
LONGITUDE = -82.998590	06.40	07.90	SS-4	100	4.5+				SAME AS SS-2					11	A-4a (VISUAL)	

SUMMARY OF SOIL TEST DATA
℄ I-71 NB

EXPLORATION NO., STATION & OFFSET	FROM	TO	SAMPLE ID	% REC	HP tsf	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	SO4 ppm
B-102-0-09	01.50	03.00	SS-1	56	1.75	15	15	21	26	23	33	16	17	14	A-6b (5)*	47
STA. 257+18.33, 3.8′ LT	03.00	04.50	SS-2	100	1.50				SAME AS SS-1					18	A-6b (VISUAL)*	
LATITUDE = 39.94694	04.50	06.00	SS-3	100	1.00				SAME AS SS-1					24	A-6b (VISUAL)	
LONGITUDE = -83.014331	06.00	07.50	SS-4	72	1.00				SAME AS SS-1					22	A-6b (VISUAL)	
	08.50	10.00	SS-5	67	1.00	19	16	26	22	18	29	20	9	22	A-4a (1)	
	11.00	12.50	SS-6	17	-				SAME AS SS-5					14	A-4a (VISUAL)	
B-105-0-09	01.00	02.50	SS-1	100	1.75	9	5	12	38	36	37	18	19	21	A-6b (11)*	80
STA. 261+46.34, 15.7′ RT	03.50	05.00	SS-2	56	1.50	SAME AS SS-1 (CONTAINS BRICK FRAGMENTS)								18	A-6b (VISUAL)	
LATITUDE = 39.948065	06.00	07.50	SS-3	100	1.00	18	20	19	25	18	30	18	12	18	A-6a (2)	
LONGITUDE = -83.014768	08.50	10.00	SS-4	100	1.00				SAME AS SS-3					21	A-6a (VISUAL)	
B-108-0-09	01.00	02.50	SS-1	17	-	49	20	13	--18--		NP	NP	NP	9	A-1-b (0)	
STA. 265+72.67, 9.3′ LT.	03.50	05.00	SS-2	6	-				SAME AS SS-1					8	A-1-b (VISUAL)	
LATITUDE = 39.94919	06.00	07.50	SS-3	100	1.00	MD. ST. TO ST., DK. BR. SILT AND CLAY, LI. F-C SA.								31	A-6a (VISUAL)	
LONGITUDE = -83.01519	08.50	10.00	SS-4	100	2.25	1	4	26	33	36	35	16	19	23	A-6b (10)	
	11.00	12.50	SS-5	17	3.00				SAME AS SS-4					26	A-6b (VISUAL)	
	13.50	15.00	SS-6	17	-	73	13	5	--9--		NP	NP	NP	5	A-1-a (0)	
	16.00	17.50	SS-7	72	-				SAME AS SS-6					-	A-1-a (VISUAL)	
	18.50	20.00	SS-8	44	-				SAME AS SS-6					-	A-1-a (VISUAL)	
	21.00	21.92	SS-9	45	-				SAME AS SS-6					-	A-1-a (VISUAL)	
	23.50	25.00	SS-10	100	-				SAME AS SS-6					-	A-1-a (VISUAL)	

SUMMARY OF SOIL TEST DATA
℄ I-71 SB

EXPLORATION NO., STATION & OFFSET	FROM	TO	SAMPLE ID	% REC	HP tsf	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	SO4 ppm
B-095-0-09	01.50	03.00	SS-1	83	2.00	13	6	7	39	35	38	19	19	20	A-6b (11)	
STA. 203+05.61, 121.3′ RT.	03.50	05.00	SS-2	39	-	POS. FILL: MD. DE., BR. SANDY SILT, SM. F-C SA., LI. GR.								7	A-4a (VISUAL)	
LATITUDE = 39.941330	06.00	07.50	SS-3	100	1.00	13	7	8	38	34	35	20	15	21	A-6a (9)	
LONGITUDE = -83.010689	08.50	10.00	SS-4	100	2.00				SAME AS SS-3					22	A-6a (VISUAL)	
B-096-1-09	01.50	03.00	SS-1	72	-	20	48	19	--13--		NP	NP	NP	7	A-1-b (0)*	
STA. 206+96.35, 14.0′ RT.	03.50	05.00	SS-2	44	1.75				SAME AS SS-3					26	A-6a (VISUAL)	
LATITUDE = 39.942134	06.00	07.50	SS-3	56	1.00	16	9	15	38	22	28	17	11	18	A-6a (5)	
LONGITUDE = -83.011688	08.50	10.00	SS-4	17	-	MD. DE., BROWN GRAVEL WITH SAND, SILT AND CLAY								12	A-2-6 (VISUAL)	
B-097-0-09	01.50	03.00	SS-1	67	-	10	17	22	31	20	31	21	10	20	A-4a (3)*	
STA. 210+75.17, 143.2′ RT.	03.00	04.50	SS-2	67	-	40	25	13	13	9	NP	NP	NP	9	A-1-b (0)*	
LATITUDE = 39.943216	04.50	06.00	SS-3	56	-	70	15	6	--9--		NP	NP	NP	5	A-1-a (0)	
LONGITUDE = -83.011905	06.00	07.50	SS-4	56	0.75	8	8	34	24	26	31	15	16	25	A-6b (5)	
	08.50	10.00	SS-5	100	0.50	MD. ST., BROWN SILT & CLAY, LI. TO SM. F-C SA., TR. GR.								16	A-6a (VISUAL)	
	11.00	12.50	SS-6	100	0.75	SAME AS SS-5								23	A-6a (VISUAL)	
	13.50	15.00	SS-7	83	-	V. DE., BROWN GRAVEL AND SAND, LI. SILT								4	A-1-b (VISUAL)	

SUMMARY OF SOIL TEST DATA
℄ I-71 SB

EXPLORATION NO., STATION & OFFSET	FROM	TO	SAMPLE ID	% REC	HP tsf	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	SO4 ppm
B-100-0-09	01.50	03.00	SS-1	56	-				SAME AS SS-3					4	A-1-a (VISUAL)	
STA. 222+98.38, 5.9′ RT.	03.00	04.50	SS-2	22	-	68	18	6	--9--		NP	NP	NP	12	A-1-a (0)	
LATITUDE = 39.946029	04.50	06.00	SS-3	11	-	63	12	8	--18--		NP	NP	NP	14	A-1-b (0)	
LONGITUDE = -83.014338	06.00	07.50	SS-4	67	1.00	21	11	15	30	23	24	15	9	15	A-4a (4)	
	07.50	09.00	SS-5	67	-	45	25	14	--16--		NP	NP	NP	6	A-1-b (0)	
	09.00	10.50	SS-6	33	2.00	19	15	9	27	30	33	15	18	17	A-6b (8)	
	11.00	12.50	SS-7	56	1.00				SAME AS SS-6					18	A-6b (VISUAL)	
	13.50	15.00	SS-8	28	1.00				SAME AS SS-6					14	A-6b (VISUAL)	
B-101-0-09	01.00	02.50	SS-1	61	4.5+	5	6	13	43	34	30	18	12	12	A-6a (9)	
STA. 226+52.84, 34.1′ LT.	03.50	05.00	SS-2	50	-				SAME AS SS-3					4	A-1-a (VISUAL)	
LATITUDE = 39.946822	06.00	07.50	SS-3	61	-	75	9	6	--10--		NP	NP	NP	3	A-1-a (0)	
LONGITUDE = -83.015077	08.50	10.00	SS-4	67	-				SAME AS SS-3					7	A-1-a (VISUAL)	
B-104-0-09	01.00	02.50	SS-1	100	-	MD. DE., GRAY SANDY SILT, SM. F-C SA., LI. GR.								9	A-4a (VISUAL)	
STA. 230+19.87, 52.9′ RT.	03.50	05.00	SS-2	67	3.00	20	15	13	25	27	31	17	14	13	A-6a (5)	
LATITUDE = 39.947804	06.00	07.50	SS-3	67	2.00				SAME AS SS-2					23	A-6a (VISUAL)	
LONGITUDE = -83.015489	08.50	10.00	SS-4	17	1.50				SAME AS SS-2					10	A-6a (VISUAL)	
	11.00	12.50	SS-5	72	4.00	0	2	18	37	43	38	20	18	21	A-6b (11)	
	13.50	15.00	SS-6	67	-				SAME AS SS-8					7	A-1-a (VISUAL)	
	16.00	17.50	SS-7	67	-				SAME AS SS-8					10	A-1-a (VISUAL)	
	18.50	20.00	SS-8	67	-	57	18	11	--15--		NP	NP	NP	8	A-1-a (0)	
	21.00	22.50	SS-9	56	-	MD. DE., BROWN COARSE AND FINE SAND, LI. SI., LI. GR.								-	A-3a (VISUAL)	
	23.50	25.00	SS-10	50	-	MD. DE. TO DE., BROWN GRAVEL, LI. F-C SA., TR. SI.								-	A-1-a (VISUAL)	
	26.00	27.50	SS-11	33	-				SAME AS SS-10					-	A-1-a (VISUAL)	
	28.50	30.00	SS-12	44	-				SAME AS SS-10					-	A-1-a (VISUAL)	
B-098-0-09	01.00	01.50	SS-1A	78	-	42	31	12	--15--		NP	NP	NP	6	A-1-b (0)	
STA. 214+98.46, 68.4′ LT.	01.50	02.50	SS-1B	0	4.00	16	14	11	24	35	44	21	23	21	A-7-6 (10)	
LATITUDE = 39.943984	02.50	04.00	SS-2	83	-	70	12	5	--12--		NP	NP	NP	6	A-1-a (0)	
LONGITUDE = -83.013267	04.00	05.50	SS-3	100	-				SAME AS SS-2					4	A-1-a (VISUAL)	
	06.00	07.50	SS-4	89	-				SAME AS SS-2					4	A-1-a (VISUAL)	
	08.50	10.00	SS-5	78	-				SAME AS SS-2					3	A-1-a (VISUAL)	
B-098-1-09	01.00	02.50	SS-1	83	2.00	35	11	8	23	23	33	17	16	16	A-6b (4)	
STA. 214+88.38, 15.1′ RT.	03.50	05.00	SS-2	100	3.50	FILL: ST. TO V. ST., BROWN SANDY SILT, LI. GR.								15	A-4a (VISUAL)	
LATITUDE = 39.944064	06.00	07.50	SS-3	39	-	73	10	5	--12--		NP	NP	NP	4	A-1-a (0)	
LONGITUDE = -83.012986	08.50	10.00	SS-4	22	-				SAME AS SS-3					3	A-1-a (VISUAL)	
B-099-0-09	01.50	03.00	SS-1	56	-	11	13	37	20	19	25	17	8	19	A-4a (1)*	60
STA. 218+98.88, 143.2′ RT.	03.00	04.50	SS-2	56	-	44	19	20	--17--		NP	NP	NP	8	A-1-b (0)*	
LATITUDE = 39.945227	04.50	06.00	SS-3	100	1.00	15	15	28	25	17	27	16	11	18	A-6a (2)	
LONGITUDE = -83.013250	06.00	07.50	SS-4	44	0.75	21	26	21	17	15	25	18	7	13	A-4a (0)	
	08.50	10.00	SS-5	83	0.75	MD. ST., BROWN SANDY SILT, TR. TO LI. GRAVEL								24	A-4a (VISUAL)	
	11.00	12.50	SS-6	33	0.50	6	6	31	33	25	29	16	13	24	A-6a (6)	
	13.50	15.00	SS-7	50	0.50				SAME AS SS-6					23	A-6a (VISUAL)	
	16.00	17.50	SS-8	50	0.75				SAME AS SS-6					18	A-6a (VISUAL)	
	18.50	20.00	SS-9	0	0.75				SAME AS SS-6					34	A-6a (VISUAL)	
B-099-1-09	01.00	02.50	SS-1	61	-	19	21	15	26	19	23	16	7	10	A-4a (2)	
STA. 221+80.40, 63.9′ LT.	03.50	05.00	SS-2	61	-				SAME AS SS-3					9	A-1-a (VISUAL)	
LATITUDE = 39.945653	06.00	07.50	SS-3	67	-	74	15	5	--6--		NP	NP	NP	7	A-1-a (0)	
LONGITUDE = -83.014366	08.50	10.00	SS-4	50	-				SAME AS SS-3					6	A-1-a (VISUAL)	
	11.00	12.50	SS-5	89	-				SAME AS SS-3					5	A-1-a (VISUAL)	

DRAWN RRM
CHECKED BRT

SOIL PROFILE
SUMMARY OF SOIL TEST DATA

FRA-70-12.68
FRA-70-13.10

16 / 496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ID002.dgn 6/25/2021 12:48:07 PM rachelm

SUMMARY OF SOIL TEST DATA
℄ RAMP B3

EXPLORATION NO., STATION & OFFSET	FROM	TO	SAMPLE ID	% REC	HP tsf	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	SO4 ppm
B-091-0-09	01.00	02.50	SS-1	100	-	21	14	12	31	22	31	17	14	13	A-6a (5)*	
STA. 3000+68.95, 10.2' LT	02.50	04.00	SS-2	67	-	48	41	5	--7--		NP	NP	NP	4	A-1-b (0)*	
LATITUDE = 39.939735	04.00	05.50	SS-3	100	2.25	0	0	15	44	40	38	19	19	23	A-6b (12)	
LONGITUDE = -83.010418	05.50	07.00	SS-4	100	1.75	0	1	14	45	40	37	18	19	26	A-6b (12)	
B-094-0-09	01.00	02.50	SS-1	56	2.00	12	21	18	30	20	28	17	11	14	A-6a (3)*	
STA. 3003+86.72, 8.6' LT	03.50	05.00	SS-2	100	1.25	SAME AS SS-2								26	A-6b (VISUAL)*	
LATITUDE = 39.940541	06.00	07.50	SS-3	28	1.00	3	4	11	44	37	38	18	20	26	A-6b (12)	
LONGITUDE = -83.010842	08.50	10.00	SS-4	22	1.50	SAME AS SS-2								25	A-6b (VISUAL)	
	11.00	12.50	SS-5	100	1.50	SAME AS SS-2								24	A-6b (VISUAL)	
B-096-0-09	01.00	02.50	SS-1	67	3.25	1	5	16	52	26	26	18	8	18	A-4b (8)	
STA. 3010+06.29, 23.5' LT.	03.50	05.00	SS-2	89	4.00	SAME AS SS-2								18	A-4b (VISUAL)	
LATITUDE = 39.942030	06.00	07.50	SS-3	83	4.5+	0	0	1	25	74	49	23	26	21	A-7-6 (16)	
LONGITUDE = -83.011915	08.50	10.00	SS-4	61	-	MD. DE., BROWN GRAVEL AND SAND, LI. SILT								8	A-1-b (VISUAL)	

SUMMARY OF SOIL TEST DATA
℄ RAMP C3

EXPLORATION NO., STATION & OFFSET	FROM	TO	SAMPLE ID	% REC	HP tsf	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	SO4 ppm
B-103-0-09	01.50	03.00	SS-1	83	3.00	SAME AS SS-2								14	A-6a (VISUAL)	
STA. 3015+76.62, 4.9' RT	03.00	04.50	SS-2	100	3.75	3	7	15	38	37	30	15	15	15	A-6a (10)	
LATITUDE = 39.947737117	04.50	06.00	SS-3	100	3.25	6	7	15	40	32	32	16	16	14	A-6b (10)	
LONGITUDE = -83.015811136	06.00	07.50	SS-4	100	4.5+	12	14	19	33	21	23	16	7	11	A-4a (4)	
	07.50	09.00	SS-5	56	-	32	20	10	23	13	24	19	5	10	A-4a (0)	
	09.00	10.50	SS-6	100	2.75	SAME AS SS-5								19	A-4a (VISUAL)	
	11.00	12.50	SS-7	100	4.25	SAME AS SS-5								14	A-4a (VISUAL)	
	13.50	15.00	SS-8	100	-	SAME AS SS-5								6	A-4a (VISUAL)	
B-106-0-09	01.00	02.50	SS-1	50	3.00	FILL: V. ST., BROWN SANDY SILT, SM. F-C SA., TR. GR.								16	A-4a (VISUAL)	
STA. 3011+71.87, 16.7' LT	03.50	05.00	SS-2	100	4.5+	SAME AS SS-3								15	A-6a (VISUAL)	
LATITUDE = 39.94869578	06.00	07.50	SS-3	100	3.50	5	10	16	35	34	28	15	13	14	A-6a (8)	
LONGITUDE = -83.016539172	08.50	10.00	SS-4	100	4.25	SAME AS SS-3								16	A-6a (VISUAL)	
	11.00	12.50	SS-5	94	3.50	SAME AS SS-6								18	A-6b (VISUAL)	
	12.50	14.00	SS-6	17	2.50	10	9	16	34	31	37	21	16	22	A-6b (8)	
	14.00	15.50	SS-7	67	4.5+	4	7	15	36	38	30	15	15	14	A-6a (10)	
	15.50	16.30	SS-8	100	2.75	22	18	19	22	19	23	14	9	10	A-4a (1)	
	17.00	17.80	SS-9	78	-	38	41	15	--6--		NP	NP	NP	13	A-1-b (0)	
	18.50	18.80	SS-10	100	-	SAME AS SS-9								14	A-1-b (VISUAL)	
	21.00	21.80	SS-11	89	-	SAME AS SS-9								18	A-1-b (VISUAL)	
B-111-0-09	01.50	03.00	SS-1	44	-	MD. DE., BR. GRAVEL WITH SAND, SILT, AND CLAY								6	A-2-6 (VISUAL)	2,067
STA. 3008+21.22, 56.8' RT	03.50	05.00	SS-2	67	4.5+	SAME AS SS-3								14	A-4a (VISUAL)	
LATITUDE = 39.949346000	06.00	07.50	SS-3	100	1.50	13	10	17	33	27	26	16	10	13	A-4a (5)	
LONGITUDE = -83.017438000	08.50	10.00	SS-4	100	3.00	SAME AS SS-3								18	A-4a (VISUAL)	
	11.00	12.50	SS-5	100	4.5+	SAME AS SS-3								20	A-4a (VISUAL)	
	13.50	15.00	SS-6	100	-	11	13	19	40	17	20	14	6	9	A-4a (4)	
	16.00	17.42	SS-7	53	-	V. DE., BROWN GRAVEL AND SAND, LI. SILT								8	A-1-b (VISUAL)	
	18.50	19.42	SS-8	45	-	V. DE., BROWN SANDY SILT, LI. TO SM. GRAVEL								9	A-4a (VISUAL)	
	21.00	22.50	SS-9	67	3.00	8	8	26	27	31	31	16	15	18	A-6a (7)	
	22.50	23.42	SS-10	91	-	50	22	12	--16--		NP	NP	NP	4	A-1-b (0)	
	24.00	25.50	SS-11	56	3.75	27	19	18	20	17	22	12	10	8	A-4a (0)	
	25.50	27.00	SS-12	67	3.75	13	12	17	30	28	26	13	13	11	A-6a (6)	
	27.00	28.50	SS-13	17	1.50	SAME AS SS-12								13	A-6a (VISUAL)	
	28.50	30.00	SS-14	100	1.50	SAME AS SS-12								6	A-4a (VISUAL)	
B-112-0-09	01.00	02.50	SS-1	56	-	SAME AS SS-2								11	A-1-a (VISUAL)	
STA. 3007+78.35, 169.3' LT	02.50	04.00	SS-2	56	-	71	16	7	--6--		NP	NP	NP	8	A-1-a (0)	
LATITUDE = 39.949716006	04.00	05.50	SS-3	22	-	67	16	9	--9--		NP	NP	NP	6	A-1-a (0)	
LONGITUDE = -83.017025676	05.50	07.00	SS-4	56	-	52	22	13	--14--		NP	NP	NP	7	A-1-a (0)	
	07.00	08.50	SS-5	83	-	71	12	6	--11--		NP	NP	NP	4	A-1-a (0)	
	08.50	10.00	SS-6	44	-	SAME AS SS-5								6	A-1-a (VISUAL)	
	11.00	12.50	SS-7	44	-	SAME AS SS-5								-	A-1-a (VISUAL)	

SUMMARY OF SOIL TEST DATA
℄ TRANS RAMP D3 N

EXPLORATION NO., STATION & OFFSET	FROM	TO	SAMPLE ID	% REC	HP tsf	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	SO4 ppm
B-115-0-09	01.50	03.00	SS-1	6	1.50	SAME AS SS-2								11	A-6b (VISUAL)	
STA. 833+32.42, 17.8' RT	03.50	05.00	SS-2	18	3.00	16	16	8	31	29	34	13	21	18	A-6b (9)	
LATITUDE = 39.952059781	06.00	07.50	SS-3	18	1.50	SAME AS SS-2								14	A-6b (VISUAL)	
LONGITUDE = -83.016849643	08.50	10.00	SS-4	10	2.00	SAME AS SS-5								29	A-6a (VISUAL)	
	11.00	12.50	SS-5	18	2.75	0	1	13	46	40	32	18	14	21	A-6a (10)	
	13.50	15.00	SS-6	18	1.50	ST. BROWN SILTY CLAY, LI. TO SM. F-C SA., LI. GRAVEL								31	A-6b (VISUAL)	
	16.00	17.50	SS-7	0	-	SAME AS SS-8								9	A-1-b (VISUAL)	
	18.50	20.00	SS-8	6	-	48	16	11	--25--		NP	NP	NP	7	A-1-b (0)	
	21.00	22.50	SS-9	1	-	SAME AS SS-8								4	A-1-b (VISUAL)	
	23.50	25.00	SS-10	13	1.75	ST. BROWN SANDY SILT, TR. GRAVEL								21	A-4a (VISUAL)	

SUMMARY OF SOIL TEST DATA
℄ FULTON STREET

EXPLORATION NO., STATION & OFFSET	FROM	TO	SAMPLE ID	% REC	HP tsf	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	SO4 ppm
B-278-0-10	01.50	03.00	SS-1	89	-	9	11	14	27	39	27	16	11	23	A-6a (7)*	760
STA. 19+58.43, 10.3' RT	03.00	04.50	SS-2	17	-	19	21	14	26	20	22	16	6	15	A-4a (2)*	
LATITUDE = 39.95327	04.50	06.00	SS-3	100	1.25	18	15	17	31	19	23	16	7	13	A-4a (3)	
LONGITUDE = -83.000492	06.00	07.50	SS-4	83	1.50	13	18	19	31	19	23	16	7	16	A-4a (3)	
	07.50	09.00	SS-5	22	0.50	SAME AS SS-4								15	A-4a (VISUAL)	
	09.00	10.50	SS-6	39	-	LO., BR. SANDY SILT, SM. F-C SAND, LI. GR.								13	A-4a (VISUAL)	
	11.00	12.50	SS-7	61	-	DE., BR. GRAVEL AND SA., "AND" F-C SA., TR. SILT								8	A-1-b (VISUAL)	
	13.50	15.00	SS-8	89	-	SAME AS SS-7								7	A-1-b (VISUAL)	
B-279-0-10	01.00	01.25	SS-1	100	-	41	32	14	--13--		NP	NP	NP	14	A-1-b (0)*	227
STA. 22+94.43, 2.4' RT	02.50	04.00	SS-2	100	1.00	10	10	16	25	39	41	18	23	24	A-7-6 (11)*	
LATITUDE = 39.953408	04.00	05.50	SS-3	78	0.75	9	14	17	33	27	29	16	13	18	A-6a (6)	
LONGITUDE = -82.999307	05.50	07.00	SS-4	100	1.50	20	14	17	30	19	25	15	10	13	A-4a (3)	
	07.00	08.50	SS-5	100	1.25	SAME AS SS-4								19	A-4a (VISUAL)	
	08.50	10.00	SS-6	89	1.25	SAME AS SS-4								12	A-4a (VISUAL)	
	10.00	11.50	SS-7	78	1.00	SAME AS SS-4								15	A-4a (VISUAL)	
B-280-0-10	01.50	03.00	SS-1	78	4.00	11	13	17	32	27	29	18	11	15	A-6a (5)*	587
STA. 27+21.57, 9.3' RT	03.00	04.50	SS-2	100	2.00	0	2	6	55	37	29	18	11	22	A-6a (8)*	
LATITUDE = 39.953559717	04.50	06.00	SS-3	100	3.00	3	9	14	32	42	37	17	20	21	A-6b (12)	
LONGITUDE = -82.997795443	06.00	07.50	SS-4	100	2.00	20	12	16	31	21	24	16	8	13	A-4a (3)	

SUMMARY OF SOIL TEST DATA
℄ MOUND STREET

EXPLORATION NO., STATION & OFFSET	FROM	TO	SAMPLE ID	% REC	HP tsf	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	SO4 ppm
B-292-0-10	01.00	02.50	SS-1	67	-	45	23	15	--17--		NP	NP	NP	6	A-1-b (VISUAL)*	
STA. 18+33.66, 23.0' LT	02.50	04.00	SS-2	89	-	52	21	11	--16--		NP	NP	NP	8	A-1-b (VISUAL)*	
LATITUDE = 39.954915764	04.00	05.50	SS-3	78	-	44	25	14	--17--		NP	NP	NP	7	A-1-b (VISUAL)	
LONGITUDE = -82.998751833	05.50	07.00	SS-4	89	-	36	39	11	--14--		NP	NP	NP	6	A-1-b (VISUAL)	

DRAWN RRM
CHECKED BRT

SOIL PROFILE
SUMMARY OF SOIL TEST DATA

FRA-70-12.68
FRA-70-13.10

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464D003.dgn 4/6/2020 11:10:36 AM rachelm

6350 Presidential Gateway
Columbus, Ohio 43231
Telephone: (614) 823-4949
Fax Number: (614) 823-4990

UNCONFINED COMPRESSION
ASTM D -2166

PROJECT FRA-70-12.68
JOB No. W-13-045

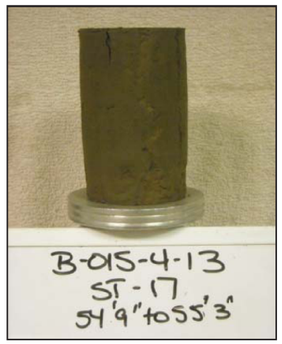
BORING B-015-4-13
STATION / OFFSET 5048+23.41, 12.5' Rt.
SAMPLE No. / DEPTH ST-17 / 54.8 ft
DATE OF TESTING 6/14/2013
TESTED BY JJH

Soil Description: Gray CLAY, "and" silt.
Soil Classification: ODOT A-7-6

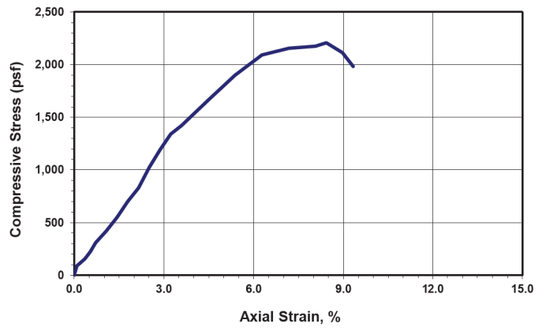
Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	46	24	22	0	0	0	61	39

DIAMETER, D_0	2.87 in	72.796 mm	STRAIN RATE	1.00	%/min
AREA, A_0	6.45 in^2	41.6 cm^2	WET SOIL + PAN MASS	1247.4	g
HEIGHT, L_0	5.58 in	141.71 mm	PAN MASS	90.1	g
VOLUME, V_0	35.99 in^3	589.79 cm^3	DRY SOIL + PAN MASS	973.6	g
MACH. RATE	0.558	in/min	WET DENSITY	122.49	lb/ft^3
WATER CONT.	30.99	%	DRY DENSITY	93.51	lb/ft^3
UNCONFINED COMPRESSION STRESS, q_u		**2,208 psf**		1.10	tsf
AXIAL STRAIN @ FAILURE				8.43	%
HAND PENETROMETER				1.00	tsf

Failure Sketch



Unconfined Compression Test



6350 Presidential Gateway
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UNCONFINED COMPRESSION
ASTM D -2166

PROJECT FRA-70-13.10
JOB No. W-13-072

BORING B-016-7-13
STATION / OFFSET 3052+85.29, 31.4' Lt.
SAMPLE No. / DEPTH ST-8 / 17.9 ft.
DATE OF TESTING 1/30/2014
TESTED BY JJH

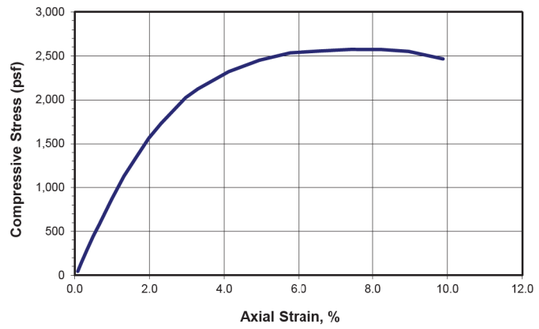
Soil Description: Dark brown SILTY CLAY, little coarse to fine sand, trace fine gravel.
Soil Classification: ODOT A-6b

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	40	23	19	1	2	18	40	39

DIAMETER, D_0	2.860 in	72.6 mm	STRAIN RATE	1.00	%/min
AREA, A_0	6.424 in^2	41.4 cm^2	WET SOIL + PAN MASS	1300.4	g
HEIGHT, L_0	6.073 in	154.3 mm	PAN MASS	77.9	g
VOLUME, V_0	39.015 in^3	639.3 cm^3	DRY SOIL + PAN MASS	1026.8	g
MACH. RATE	0.607	in/min	WET DENSITY	119.37	lb/ft^3
WATER CONT.	28.83	%	DRY DENSITY	92.65	lb/ft^3
UNCONFINED COMPRESSION STRESS, q_u		**2,574 psf**		1.29	tsf
AXIAL STRAIN @ FAILURE				7.41	%
HAND PENETROMETER				2.00	tsf

Failure Sketch

Unconfined Compression Test



DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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6350 Presidential Gateway
Columbus, Ohio 43231
Telephone: (614) 823-4949
Fax Number: (614) 823-4990

UNCONFINED COMPRESSION

ASTM D -2166

PROJECT	FRA-70-12.68
JOB No.	W-13-045
BORING	B-019-3-15
STATION / OFFSET	156+26.06, 325.9' Rt.
SAMPLE No. / DEPTH	ST-9 / 20.0 ft
DATE OF TESTING	11/2/2015
TESTED BY	CS

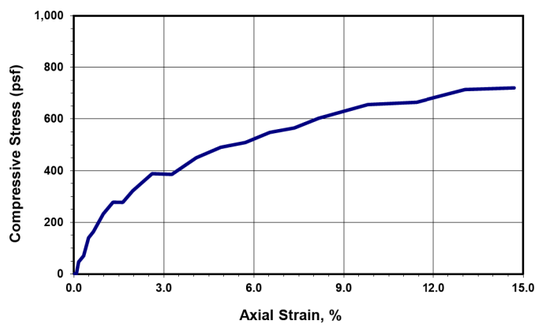
Soil Description: Brown SILT AND CLAY, some coarse to fine sand.
Soil Classification: ODOT A-6a

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	32	18	14	0	4	27	35	34

DIAMETER, D_0	2.80 in	71.0 mm	STRAIN RATE	1.00	%/min
AREA, A_0	6.14 in^2	39.6 cm^2	WET SOIL + PAN MASS	1355	g
HEIGHT, L_0	6.12 in	155.55 mm	PAN MASS	104.8	g
VOLUME, V_0	37.60 in^3	616.17 cm^3	DRY SOIL + PAN MASS	1106.5	g
MACH. RATE	0.612	in/min	WET DENSITY	126.66	lb/ft^3
WATER CONT.	24.81 %		DRY DENSITY	101.49	lb/ft^3
UNCONFINED COMPRESSION STRESS, q_u		**720** psf		0.36	tsf
AXIAL STRAIN @ FAILURE				14.70	%
HAND PENETROMETER				0.25	tsf

Failure Sketch

Unconfined Compression Test



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UNCONFINED COMPRESSION

ASTM D -2166

PROJECT	FRA-70-12.68
JOB No.	W-13-045
BORING	B-023-1-13
STATION / OFFSET	5084+74.16 / 15.0' Rt.
SAMPLE No. / DEPTH	ST-4 / 8.3 ft
DATE OF TESTING	8/14/2013
TESTED BY	JJH

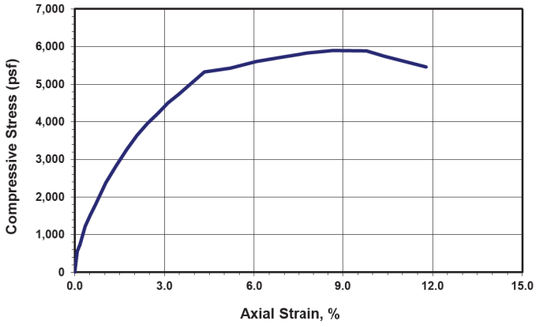
Soil Description: Brown SILT AND CLAY, some coarse to fine sand, little fine gravel.
Soil Classification: ODOT A-6a

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	29	18	11	16	11	15	34	24

DIAMETER, D_0	2.87 in	72.898 mm	STRAIN RATE	1.00	%/min
AREA, A_0	6.47 in^2	41.7 cm^2	WET SOIL + PAN MASS	1384.2	g
HEIGHT, L_0	5.77 in	146.58 mm	PAN MASS	90.2	g
VOLUME, V_0	37.33 in^3	611.8 cm^3	DRY SOIL + PAN MASS	1197.9	g
MACH. RATE	0.577	in/min	WET DENSITY	132.04	lb/ft^3
WATER CONT.	16.82 %		DRY DENSITY	113.03	lb/ft^3
UNCONFINED COMPRESSION STRESS, q_u		**5,896** psf		2.95	tsf
AXIAL STRAIN @ FAILURE				8.66	%
HAND PENETROMETER				4.5+	tsf

Failure Sketch

Unconfined Compression Test



DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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Fax Number: (614) 823-4990

UNCONFINED COMPRESSION

ASTM D -2166

PROJECT FRA-70-12.68
JOB No. W-13-045

BORING B-108-2-13
STATION / OFFSET 5014+11.97 / 28.9' Rt.
SAMPLE No. / DEPTH ST-6 / 13.7 ft
DATE OF TESTING 6/14/2013
TESTED BY JJH

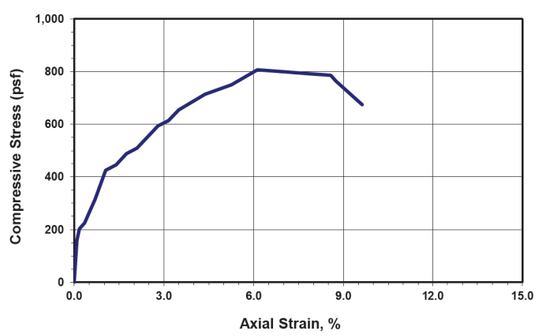
Soil Description: Gray GRAVEL WITH SAND, SILT AND CLAY.
Soil Classification: ODOT A-2-4

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	31	19	12	55	10	8	15	12

DIAMETER, D_0	2.85 in	72.3 mm	STRAIN RATE	1.00	%/min
AREA, A_0	6.37 in^2	41.1 cm^2	WET SOIL + PAN MASS	1281.5	g
HEIGHT, L_0	5.72 in	145.16 mm	PAN MASS	77.9	g
VOLUME, V_0	36.38 in^3	596.19 cm^3	DRY SOIL + PAN MASS	1062.4	g
MACH. RATE	0.572	in/min	WET DENSITY	126.03	lb/ft^3
WATER CONT.	22.25	%	DRY DENSITY	103.09	lb/ft^3
UNCONFINED COMPRESSION STRESS, q_u	**807**	**psf**		0.40	tsf
AXIAL STRAIN @ FAILURE				6.12	%
HAND PENETROMETER				N/A	tsf

Failure Sketch

Unconfined Compression Test



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Fax Number: (614) 823-4990

UNCONFINED COMPRESSION

ASTM D -2166

PROJECT FRA-70-13.10
JOB No. W-13-072

BORING B-113-9-13
STATION / OFFSET 258+77.50, 36.0' Rt.
SAMPLE No. / DEPTH ST-7 / 16.4 ft
DATE OF TESTING 4/15/2014
TESTED BY T.P.

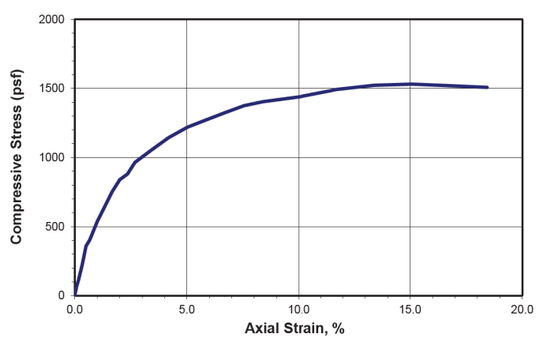
Soil Description: Dark brown SILT AND CLAY, little coarse to fine sand, little fine gravel.
Soil Classification: ODOT A-6a

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	32	18	14	19	10	13	31	27

DIAMETER, D_0	2.852 in	72.4 mm	STRAIN RATE	1.00	%/min
AREA, A_0	6.388 in^2	41.2 cm^2	WET SOIL + PAN MASS	1367.7	g
HEIGHT, L_0	5.969 in	151.61 mm	PAN MASS	89	g
VOLUME, V_0	38.132 in^3	624.87 cm^3	DRY SOIL + PAN MASS	1149.7	g
MACH. RATE	0.597	in/min	WET DENSITY	127.75	lb/ft^3
WATER CONT.	20.55	%	DRY DENSITY	105.97	lb/ft^3
UNCONFINED COMPRESSION STRESS, q_u	**1,531**	**psf**		0.77	tsf
AXIAL STRAIN @ FAILURE				15.08	%
HAND PENETROMETER				1.50	tsf

Failure Sketch

Unconfined Compression Test



DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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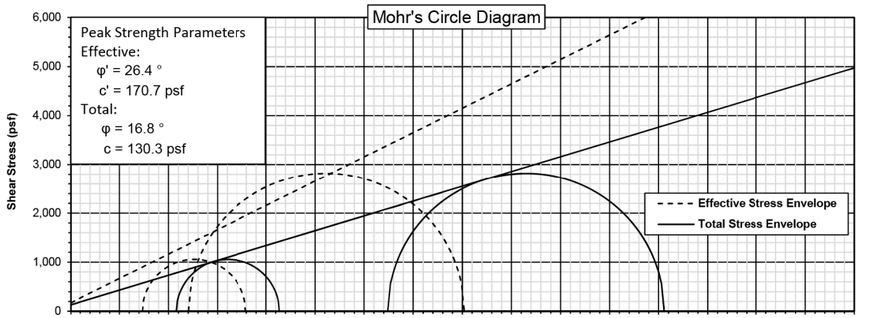
Consolidated, Undrained Triaxial Compression Test Report (ASTM D4767)

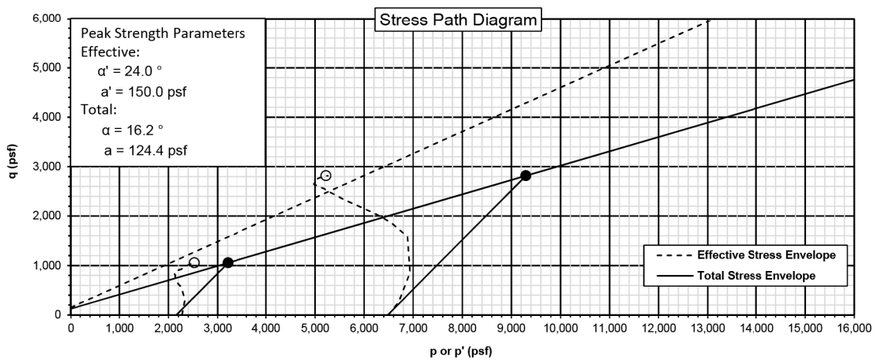
Project Number:	W-13-045	Boring Number:	B-020-2-13
Project Name:	FRA-70-12.68	Station / Offset:	176+13.92, 34.0' Rt.
Project Location:	Columbus, Ohio	Sample No. / Depth:	ST-6 / 13.5 ft to 14.0 ft
Client:	GPD GROUP	Date of Testing:	08/14/2013 to 08/21/2013

Soil Description: Brown CLAY, "and" coarse to fine sand, some silt, little fine gravel.
Soil Classification: ODOT A-7-6

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	41	16	25	17	31	13	24	15

Stage	Boring No.	Sample No.	Depth (ft)	$(\sigma_3)_f$ (psf)	$(\sigma_1)_f$ (psf)	$(\sigma_3')_f$ (psf)	$(\sigma_1')_f$ (psf)	p'_f (psf)	q_f (psf)
1	B-020-2-13	ST-6	13.5	2,160.0	4,271.8	1,468.8	3,580.6	2,524.7	1,055.9
2	B-020-2-13	ST-6	14	6,480.0	12,114.6	2,404.8	8,039.4	5,222.1	2,817.3
3									





Notes: _____

Consolidated, Undrained Triaxial Compression Test (ASTM D4767)

Project Number:	W-13-045	Boring Number:	B-020-2-13
Project Name:	FRA-70-12.68	Station / Offset:	176+13.92, 34.0' Rt.
Project Location:	Columbus, Ohio	Sample No. / Depth:	ST-6 / 13.5 ft
Client:	GPD GROUP	Date of Testing:	6/21/2013

Data for Specimen No. 1

Soil Description: Brown CLAY, "and" coarse to fine sand, some silt, little fine gravel.
Soil Classification: ODOT A-7-6

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	41	16	25	17	31	13	24	15

Diameter, D_0	2.854	in	Volume of Solids , V_s :	21.813	in^3
Area, A_0	6.396	in^2	Initial Volume of Voids, V_v :	14.805	in^3
Height, L_0	5.725	in	Initial Void Ratio, e_o :	0.679	
Volume, V_0	36.618	in^3	Initial Degree of Saturation, S_0 :	88.2	%

Water Content BEFORE Test

Tin No.:	M-74	g
Wet Soil + Tin :	146.25	g
Dry Soil + Tin :	124.58	g
Tin Weight :	27.9	g
Dry Mass :	96.68	g
Weight of water :	21.67	g
Moisture :	22.41	%

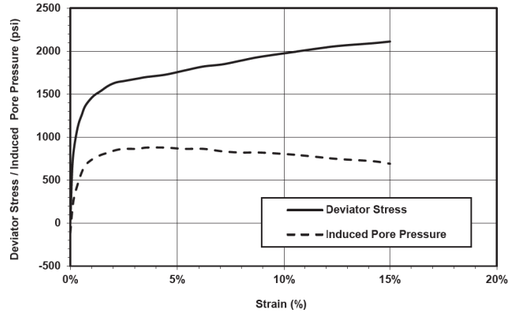
Water Content AFTER Test (Total Specimen)

Tin No.:	KDW	g
Wet Soil + Tin :	1262.80	g
Dry Soil + Tin :	1032.30	g
Tin Weight :	77.90	g
Dry Mass :	954.40	g
Weight of water :	230.50	g
Moisture :	24.15	%
Wet Density :	123.27	pcf
Dry Density :	99.29	pcf

Consolidation Cell Pressure:	140.0	psi	Deviator Stress @ Failure, Ds:	2,112	psf
Consolidation Back Pressure:	125.0	psi	Axial Strain @ Failure:	15.0	%
Effective Confining Stress, σ_3:	15.0	psi	Major Principal Stress @ Failure, σ_1:	4,272	psf
	2,160	psf	Induced Pore Pressure @ Failure:	691	psf
Strain Rate:	0.0030	in/min	Effective Minor Principal Stress,σ'_3:	1,469	psf
			Effective Major Principal Stress, σ'_1:	3,581	psf

Failure Sketch

CU Compressive Strength and Induced Pore Pressure



Notes: _____

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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Consolidated, Undrained Triaxial Compression Test (ASTM D4767)

Project Number:	W-13-045	Boring Number:	B-020-2-13
Project Name:	FRA-70-12.68	Station / Offset:	176+13.92, 34.0' Rt.
Project Location:	Columbus, Ohio	Sample No. / Depth:	ST-6 / 14.0 ft
Client:	GPD GROUP	Date of Testing:	8/21/2013

Data for Specimen No. 2

Soil Description: Brown CLAY, "and" coarse to fine sand, some silt, little fine gravel.
Soil Classification: ODOT A-7-6

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	41	16	25	17	31	13	24	15

Diameter, D_0	2.849	in	Volume of Solids , V_s :	23.322	in^3
Area, A_0	6.376	in^2	Initial Volume of Voids, V_v :	13.698	in^3
Height, L_0	5.806	in	Initial Void Ratio, e_o :	0.587	
Volume, V_0	37.019	in^3	Initial Degree of Saturation, S_0 :	101.89	%

Water Content BEFORE Test

Tin No.:	M-74	g
Wet Soil + Tin :	146.25	g
Dry Soil + Tin :	124.58	g
Tin Weight :	27.9	g
Dry Mass :	96.68	g
Weight of water :	21.67	g
Moisture :	22.41	%

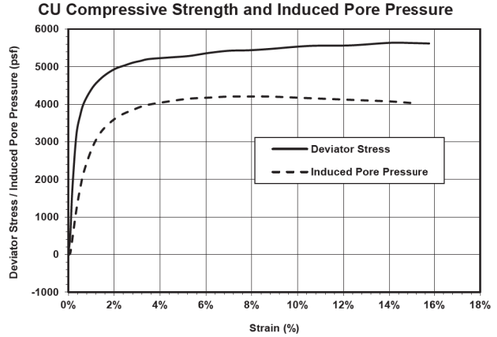
Water Content AFTER Test (Total Specimen)

Tin No.:	BC	g
Wet Soil + Tin :	1307.40	g
Dry Soil + Tin :	1110.10	g
Tin Weight :	89.70	g
Dry Mass :	1020.40	g
Weight of water :	197.30	g
Moisture :	19.34	%
Wet Density :	125.31	pcf
Dry Density :	105.01	pcf

Consolidation Cell Pressure:	133.0	psi	Deviator Stress @ Failure, Ds:	5,635	psf
Consolidation Back Pressure:	88.0	psi	Axial Strain @ Failure:	14.0	%
Effective Confining Stress, σ_3:	45.0	psi	Major Principal Stress @ Failure, σ_1:	12,115	psf
	6,480	psf	Induced Pore Pressure @ Failure:	4,075	psf
Strain Rate:	0.0030	in/min	Effective Minor Principal Stress,σ'_3:	2,405	psf
			Effective Major Principal Stress, σ'_1:	8,039	psf

Failure Sketch

CU Compressive Strength and Induced Pore Pressure



Notes:

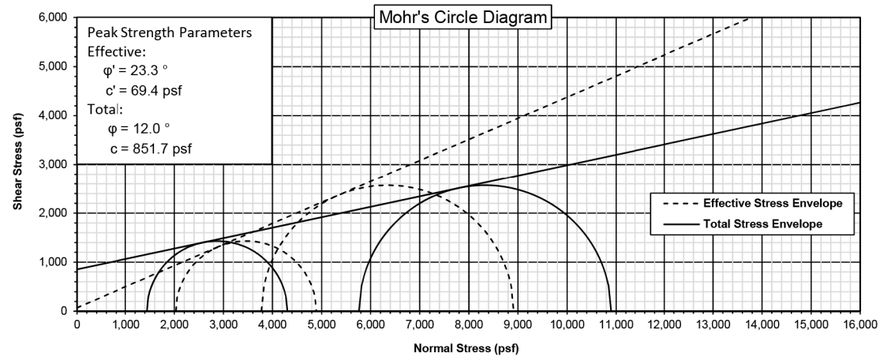
Consolidated, Undrained Triaxial Compression Test Report (ASTM D4767)

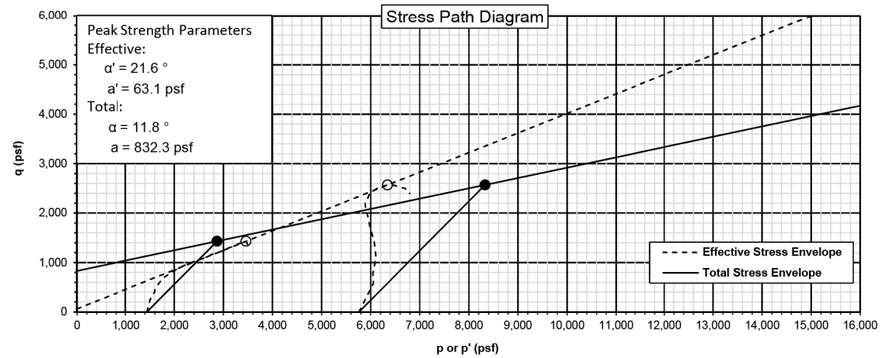
Project Number:	W-13-072	Boring Number:	B-020-7-13
Project Name:	FRA-70-13.10	Station / Offset:	176+68.64, 1.8' Rt.
Project Location:	Franklin County, Ohio	Sample No. / Depth:	ST-4 / 12.0 ft to 13.0 ft
Client:	ms consultants	Date of Testing:	01/28/2015 to 02/10/2015

Soil Description: Dark brown CLAY, "and" silt, trace coarse to fine sand
Soil Classification: ODOT A-7-6

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	43	19	24	0	2	7	45	46

Stage	Boring No.	Sample No.	Depth (ft)	$(\sigma_3)_f$ (psf)	$(\sigma_1)_f$ (psf)	$(\sigma_3')_f$ (psf)	$(\sigma_1')_f$ (psf)	p'_f (psf)	q_f (psf)
1	B-020-7-13	ST-4	12.0-12.5	1,440.0	4,302.7	2,030.4	4,893.1	3,461.8	1,431.4
2	B-020-7-13	ST-4	12.5-13.0	5,760.0	10,900.3	3,772.8	8,913.1	6,343.0	2,570.2
3									





Notes:

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DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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Consolidated, Undrained Triaxial Compression Test (ASTM D4767)

Project Number:	W-13-072	Boring Number:	B-020-7-13
Project Name:	FRA-70-13.10	Station / Offset:	176+68.64, 1.8' Rt.
Project Location:	Franklin County, Ohio	Sample No. / Depth:	ST-4 / 12.0-12.5 ft
Client:	ms consultants	Date of Testing:	2/10/2015

Data for Specimen No. 1

Soil Description: Dark brown CLAY, "and" silt, trace coarse to fine sand
Soil Classification: ODOT A-7-6

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	43	19	24	0	2	7	45	46

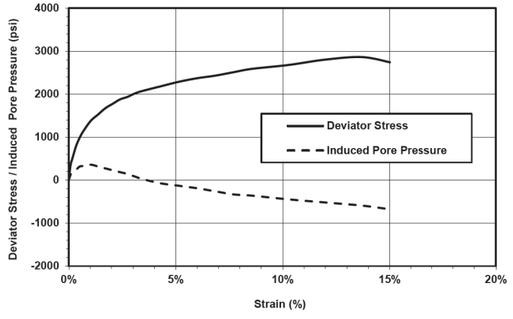
Diameter, D_0	2.872	in	Volume of Solids , V_s :	23.242	in^3
Area, A_0	6.478	in^2	Initial Volume of Voids, V_v :	15.246	in^3
Height, L_0	5.941	in	Initial Void Ratio, e_o :	0.656	
Volume, V_0	38.487	in^3	Initial Degree of Saturation, S_0 :	94.7	%

Water Content BEFORE Test			Water Content AFTER Test (Total Specimen)		
Tin No.:	X-16	g	Tin No.:	FUNKY	g
Wet Soil + Tin :	113.18	g	Wet Soil + Tin :	1316.50	g
Dry Soil + Tin :	97.47	g	Dry Soil + Tin :	1073.70	g
Tin Weight :	29.97	g	Tin Weight :	56.80	g
Dry Mass :	67.5	g	Dry Mass :	1016.90	g
Weight of water :	15.71	g	Weight of water :	242.80	g
Moisture :	23.27	%	Moisture :	23.88	%
			Wet Density :	124.69	pcf
			Dry Density :	100.65	pcf

Consolidation Cell Pressure:	140.0	psi	Deviator Stress @ Failure, Ds:	2,863	psf
Consolidation Back Pressure:	130.0	psi	Axial Strain @ Failure:	13.7	%
Effective Confining Stress, σ_3:	10.0	psi	Major Principal Stress @ Failure, σ_1:	4,303	psf
	1,440	psf	Induced Pore Pressure @ Failure:	-590	psf
Strain Rate:	0.0030	in/min	Effective Minor Principal Stress,σ'_3:	2,030	psf
			Effective Major Principal Stress, σ'_1:	4,893	psf

Failure Sketch

CU Compressive Strength and Induced Pore Pressure



Notes:

Consolidated, Undrained Triaxial Compression Test (ASTM D4767)

Project Number:	W-13-072	Boring Number:	B-020-7-13
Project Name:	FRA-70-13.10	Station / Offset:	176+68.64, 1.8' Rt.
Project Location:	Franklin County, Ohio	Sample No. / Depth:	ST-4 / 12.5-13.0 ft
Client:	ms consultants	Date of Testing:	10/11/2014

Data for Specimen No. 2

Soil Description: Dark brown CLAY, "and" silt, trace coarse to fine sand
Soil Classification: ODOT A-7-6

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	43	19	24	0	2	7	45	46

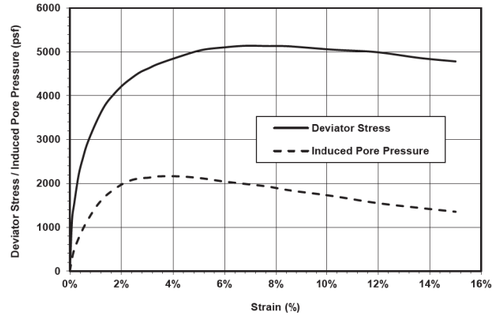
Diameter, D_0	2.875	in	Volume of Solids , V_s :	23.795	in^3
Area, A_0	6.492	in^2	Initial Volume of Voids, V_v :	14.946	in^3
Height, L_0	5.968	in	Initial Void Ratio, e_o :	0.628	
Volume, V_0	38.741	in^3	Initial Degree of Saturation, S_0 :	98.93	%

Water Content BEFORE Test			Water Content AFTER Test (Total Specimen)		
Tin No.:	X-16	g	Tin No.:	FUNKY	g
Wet Soil + Tin :	113.18	g	Wet Soil + Tin :	1325.30	g
Dry Soil + Tin :	97.47	g	Dry Soil + Tin :	1097.20	g
Tin Weight :	29.97	g	Tin Weight :	56.10	g
Dry Mass :	67.5	g	Dry Mass :	1041.10	g
Weight of water :	15.71	g	Weight of water :	228.10	g
Moisture :	23.27	%	Moisture :	21.91	%
			Wet Density :	124.80	pcf
			Dry Density :	102.37	pcf

Consolidation Cell Pressure:	143.0	psi	Deviator Stress @ Failure, Ds:	5,140	psf
Consolidation Back Pressure:	103.0	psi	Axial Strain @ Failure:	6.8	%
Effective Confining Stress, σ_3:	40.0	psi	Major Principal Stress @ Failure, σ_1:	10,900	psf
	5,760	psf	Induced Pore Pressure @ Failure:	1,987	psf
Strain Rate:	0.0030	in/min	Effective Minor Principal Stress,σ'_3:	3,773	psf
			Effective Major Principal Stress, σ'_1:	8,913	psf

Failure Sketch

CU Compressive Strength and Induced Pore Pressure



Notes:

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STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

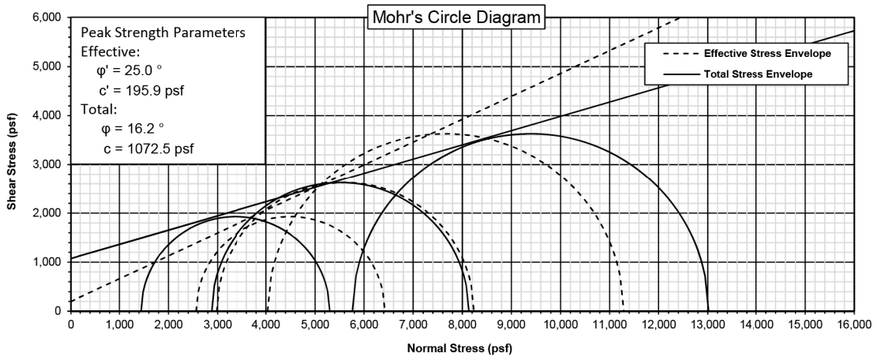
Consolidated, Undrained Triaxial Compression Test Report (ASTM D4767)

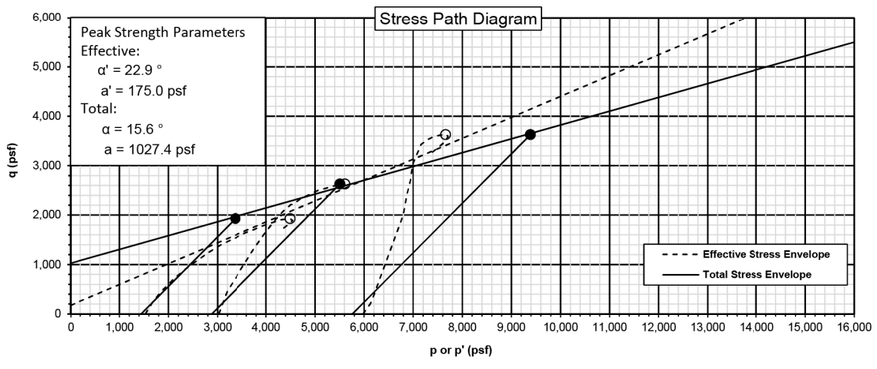
Project Number:	W-13-045	Boring Number:	B-105-1-13
Project Name:	FRA-70-12.68	Station / Offset:	5008+89.52, 6.5' Lt.
Project Location:	Columbus, Ohio	Sample No. / Depth:	ST-7 / 16.5 ft to 17.5 ft
Client:	GPD GROUP	Date of Testing:	06/19/2013 to 06/28/2013

Soil Description: Brownish gray CLAY, "and" silt, trace coarse to fine sand.
Soil Classification: ODOT A-7-6

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	48	22	26	0	1	8	46	45

Stage	Boring No.	Sample No.	Depth (ft)	$(\sigma_3)_f$ (psf)	$(\sigma_1)_f$ (psf)	$(\sigma_3')_f$ (psf)	$(\sigma_1')_f$ (psf)	p'_f (psf)	q_f (psf)
1	B-105-1-13	ST-7	17.0	1,440.0	5,299.0	2,563.2	6,422.2	4,492.7	1,929.5
2	B-105-1-13	ST-7	16.5	2,880.0	8,134.8	2,980.8	8,235.6	5,608.2	2,627.4
3	B-105-1-13	ST-7	17.5	5,760.0	13,018.3	4,032.0	11,290.3	7,661.2	3,629.2





Notes:

Consolidated, Undrained Triaxial Compression Test (ASTM D4767)

Project Number:	W-13-045	Boring Number:	B-105-1-13
Project Name:	FRA-70-12.68	Station / Offset:	5008+89.52, 6.5' Lt.
Project Location:	Columbus, Ohio	Sample No. / Depth:	ST-7 / 17.0 ft
Client:	GPD GROUP	Date of Testing:	6/21/2013

Data for Specimen No. 1

Soil Description: Brownish gray CLAY, "and" silt, trace coarse to fine sand.
Soil Classification: ODOT A-7-6

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	48	22	26	0	1	8	46	45

Diameter, D_0	2.869 in	Volume of Solids , V_s :	24.691 in^3
Area, A_0	6.466 in^2	Initial Volume of Voids, V_v :	13.380 in^3
Height, L_0	5.888 in	Initial Void Ratio, e_o :	0.542
Volume, V_0	38.071 in^3	Initial Degree of Saturation, S_0 :	96.7 %

Water Content BEFORE Test

Tin No.:	T-9	g
Wet Soil + Tin :	170.53	g
Dry Soil + Tin :	147.08	g
Tin Weight :	27.59	g
Dry Mass :	119.49	g
Weight of water :	23.45	g
Moisture :	19.63	%

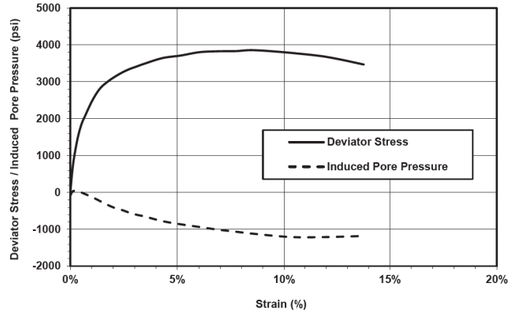
Water Content AFTER Test (Total Specimen)

Tin No.:	BC	g
Wet Soil + Tin :	1394.80	g
Dry Soil + Tin :	1169.40	g
Tin Weight :	89.10	g
Dry Mass :	1080.30	g
Weight of water :	225.40	g
Moisture :	20.86	%
Wet Density :	130.65	pcf
Dry Density :	108.10	pcf

Consolidation Cell Pressure:	95.0 psi	Deviator Stress @ Failure, Ds:	3,859 psf
Consolidation Back Pressure:	85.0 psi	Axial Strain @ Failure:	8.6 %
Effective Confining Stress, σ_3:	10.0 psi	Major Principal Stress @ Failure, σ_1:	5,299 psf
	1,440 psf	Induced Pore Pressure @ Failure:	-1,123 psf
Strain Rate:	0.0030 in/min	Effective Minor Principal Stress,σ'_3:	2,563 psf
		Effective Major Principal Stress, σ'_1:	6,422 psf

Failure Sketch

CU Compressive Strength and Induced Pore Pressure



Notes:

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CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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Consolidated, Undrained Triaxial Compression Test (ASTM D4767)

Project Number:	W-13-045	Boring Number:	B-105-1-13
Project Name:	FRA-70-12.68	Station / Offset:	5008+89.52, 6.5' Lt.
Project Location:	Columbus, Ohio	Sample No. / Depth:	ST-7 / 16.5 ft
Client:	GPD GROUP	Date of Testing:	6/25/2013

Data for Specimen No. 2

Soil Description: Brownish gray CLAY, "and" silt, trace coarse to fine sand.
Soil Classification: ODOT A-7-6

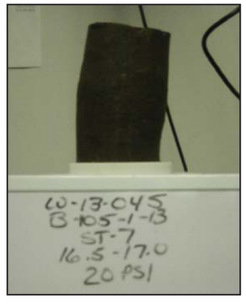
Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	48	22	26	0	1	8	46	45

Diameter, D_0	2.863	in	Volume of Solids , V_s :	23.102	in^3
Area, A_0	6.436	in^2	Initial Volume of Voids, V_v :	14.672	in^3
Height, L_0	5.869	in	Initial Void Ratio, e_o :	0.635	
Volume, V_0	37.774	in^3	Initial Degree of Saturation, S_0 :	96.07	%

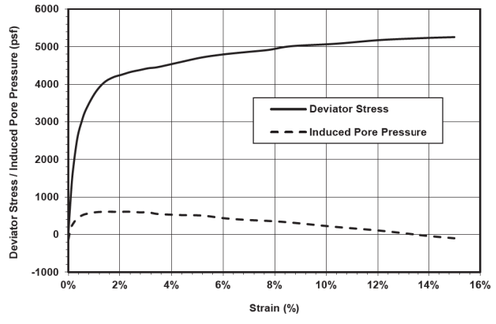
Water Content BEFORE Test			Water Content AFTER Test (Total Specimen)		
Tin No.:	B-96	g	Tin No.:	AA	g
Wet Soil + Tin :	173.95	g	Wet Soil + Tin :	1323.00	g
Dry Soil + Tin :	146.55	g	Dry Soil + Tin :	1092.40	g
Tin Weight :	26.65	g	Tin Weight :	81.60	g
Dry Mass :	119.9	g	Dry Mass :	1010.80	g
Weight of water :	27.4	g	Weight of water :	230.60	g
Moisture :	22.85	%	Moisture :	22.81	%
			Wet Density :	125.19	pcf
			Dry Density :	101.94	pcf

Consolidation Cell Pressure:	105.0	psi	Deviator Stress @ Failure, Ds:	5,255	psf
Consolidation Back Pressure:	85.0	psi	Axial Strain @ Failure:	15.0	%
Effective Confining Stress, σ_3:	20.0	psi	Major Principal Stress @ Failure, σ_1:	8,135	psf
	2,880	psf	Induced Pore Pressure @ Failure:	-101	psf
Strain Rate:	0.0030	in/min	Effective Minor Principal Stress,σ'_3:	2,981	psf
			Effective Major Principal Stress, σ'_1:	8,236	psf

Failure Sketch



CU Compressive Strength and Induced Pore Pressure



Notes:

Consolidated, Undrained Triaxial Compression Test (ASTM D4767)

Project Number:	W-13-045	Boring Number:	B-105-1-13
Project Name:	FRA-70-12.68	Station / Offset:	5008+89.52, 6.5' Lt.
Project Location:	Columbus, Ohio	Sample No. / Depth:	ST-7 / 17.5 ft
Client:	GPD GROUP	Date of Testing:	6/28/2013

Data for Specimen No. 3

Soil Description: Brownish gray CLAY, "and" silt, trace coarse to fine sand.
Soil Classification: ODOT A-7-6

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	48	22	26	0	1	8	46	45

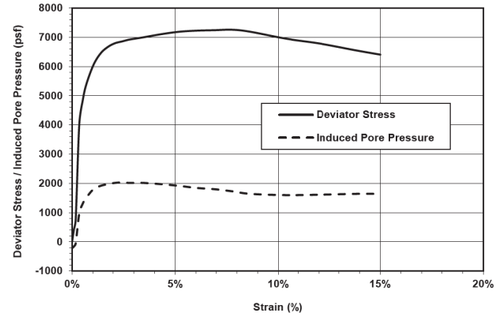
Diameter, D_0	2.869	in	Volume of Solids , V_s :	25.559	in^3
Area, A_0	6.465	in^2	Initial Volume of Voids, V_v :	12.324	in^3
Height, L_0	5.860	in	Initial Void Ratio, e_o :	0.482	
Volume, V_0	37.883	in^3	Initial Degree of Saturation, S_0 :	98.1	%

Water Content BEFORE Test			Water Content AFTER Test (Total Specimen)		
Tin No.:	R-46	g	Tin No.:	Ohio	g
Wet Soil + Tin :	140.96	g	Wet Soil + Tin :	1443.10	g
Dry Soil + Tin :	123.97	g	Dry Soil + Tin :	1245.40	g
Tin Weight :	28.09	g	Tin Weight :	127.10	g
Dry Mass :	95.88	g	Dry Mass :	1118.30	g
Weight of water :	16.99	g	Weight of water :	197.70	g
Moisture :	17.72	%	Moisture :	17.68	%
			Wet Density :	132.34	pcf
			Dry Density :	112.46	pcf

Consolidation Cell Pressure:	130.0	psi	Deviator Stress @ Failure, Ds:	7,258	psf
Consolidation Back Pressure:	90.0	psi	Axial Strain @ Failure:	7.8	%
Effective Confining Stress, σ_3:	40.0	psi	Major Principal Stress @ Failure, σ_1:	13,018	psf
	5,760	psf	Induced Pore Pressure @ Failure:	1,728	psf
Strain Rate:	0.0030	in/min	Effective Minor Principal Stress,σ'_3:	4,032	psf
			Effective Major Principal Stress, σ'_1:	11,290	psf

Failure Sketch

CU Compressive Strength and Induced Pore Pressure



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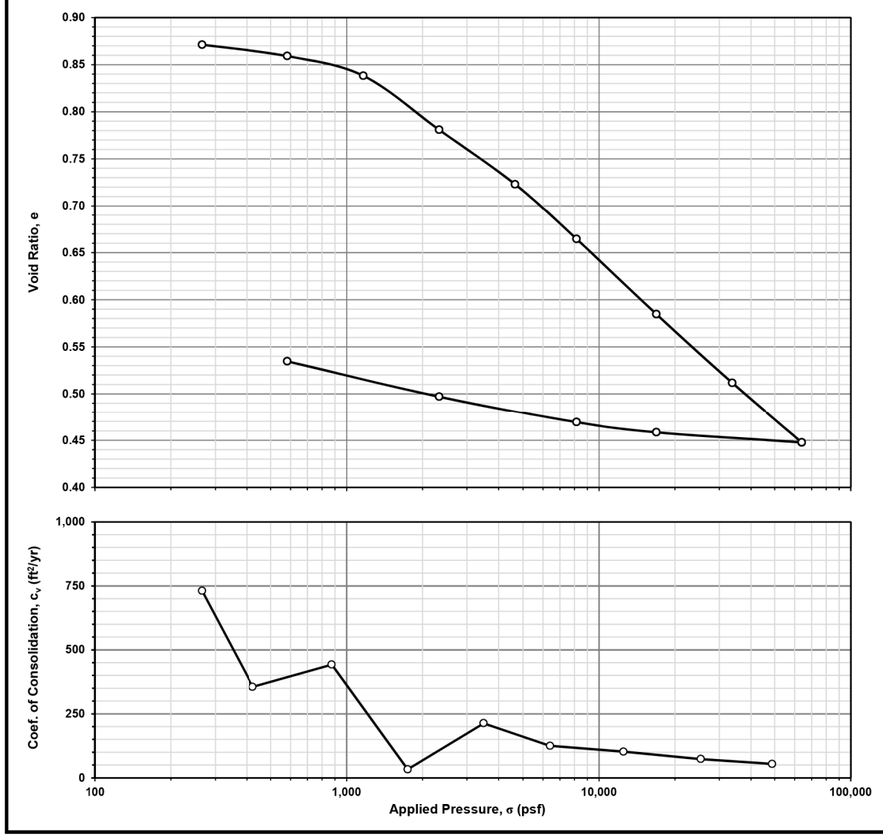
One-Dimensional Consolidation Test Report (ASTM D2435)

Project Number:	W-13-072	Boring Number:	B-018-1-13
Project Name:	FRA-70-13.10	Station / Offset:	167+31.32, 54.6' Lt.
Project Location:	Columbus, Ohio	Sample No. / Depth:	ST-4 / 10.1 ft
Client:	ms consultants, inc.	Date of Testing:	02/11/2014 to 02/27/2014

Soil Description: Gray SANDY SILT, some clay, trace fine gravel.
Soil Classification: ODOT A-4a

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	34	25	9	6	6	18	41	29

Natural S_o	Natural w_o	γ_d (pcf)	γ_{sat} (pcf)	σ_{vo}' (psf)	S_G	e_o	σ_p' (psf)	c_c	c_r
96.7%	31.4%	88.7	116.9	1,212	2.67	0.879	1,851	0.271	0.043



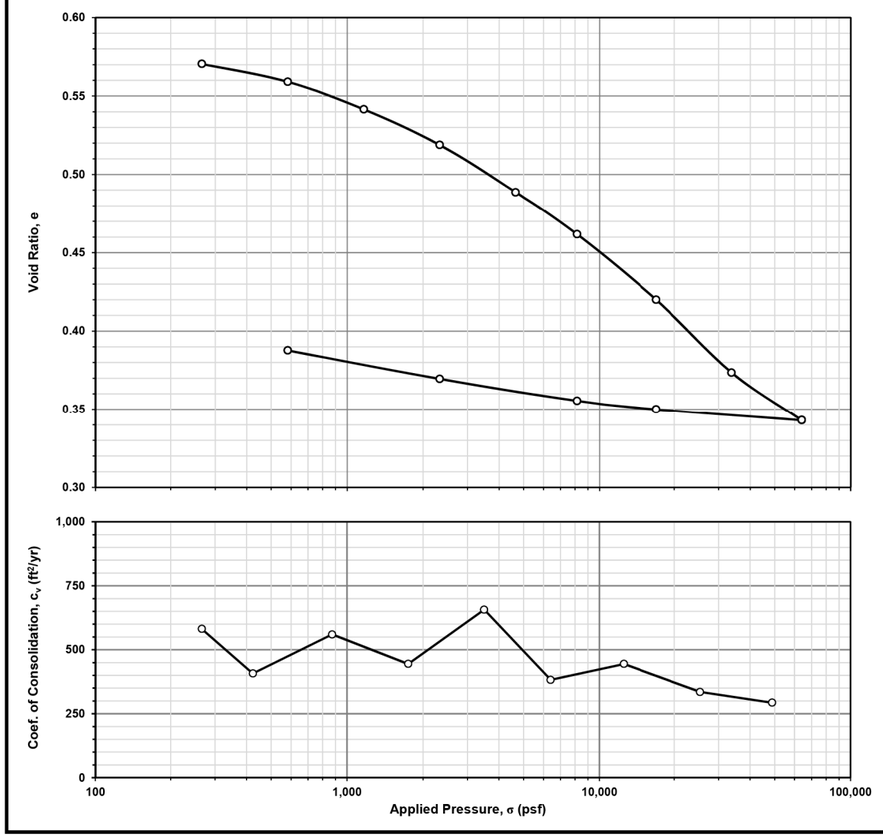
One-Dimensional Consolidation Test Report (ASTM D2435)

Project Number:	W-13-045	Boring Number:	B-020-2-13
Project Name:	FRA-70-12.68	Station / Offset:	176+13.62, 34.0' Rt.
Project Location:	Columbus, Ohio	Sample No. / Depth:	ST-6 / 14.7 ft
Client:	GPD GROUP	Date of Testing:	08/13/2013 to 08/30/2013

Soil Description: Brown CLAY, and coarse to fine sand, some silt, little fine gravel.
Soil Classification: ODOT A-7-6

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	41	16	25	17	31	13	24	15

Natural S_o	Natural w_o	γ_d (pcf)	γ_{sat} (pcf)	σ_{vo}' (psf)	S_G	e_o	σ_p' (psf)	c_c	c_r
101.6%	19.9%	105.6	128.9	1,617	2.67	0.578	2,470	0.154	0.022



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STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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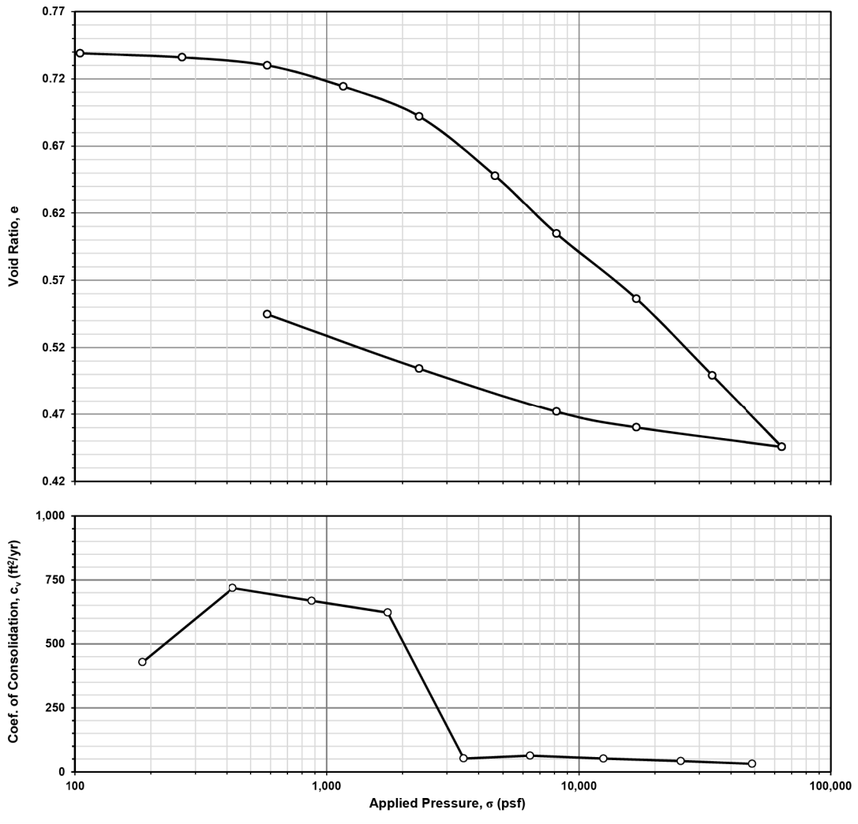
One-Dimensional Consolidation Test Report (ASTM D2435)

Project Number:	W-13-072	Boring Number:	B-020-7-13
Project Name:	FRA-70-13.10	Station / Offset:	176+68.64, 1.8' Rt.
Project Location:	Columbus, Ohio	Sample No. / Depth:	ST-4 / 11.8 ft
Client:	ms consultants, inc.	Date of Testing:	01/27/2015 to 02/12/2015

Soil Description: Dark brown CLAY, "and" silt, trace coarse to fine sand
Soil Classification: ODOT A-7-6

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	43	19	24	0	2	7	45	46

Natural S_o	Natural w_o	γ_d (pcf)	γ_{sat} (pcf)	σ_{vo}' (psf)	S_G	e_o	σ_p' (psf)	c_c	c_r
99.6%	23.3%	95.5	122.0	1,357	2.67	0.745	3,449	0.210	0.049



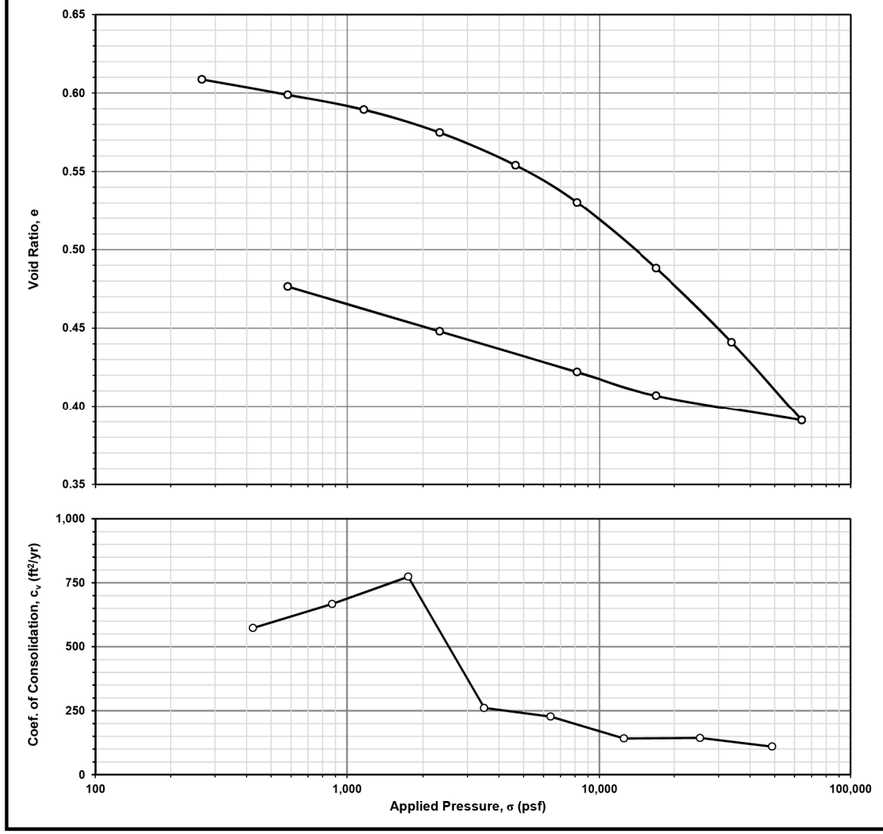
One-Dimensional Consolidation Test Report (ASTM D2435)

Project Number:	W-13-045	Boring Number:	B-023-1-13
Project Name:	FRA-70-12.68	Station / Offset:	5084+74.16, 15.0' Rt.
Project Location:	Columbus, Ohio	Sample No. / Depth:	ST-4 / 8.9 ft
Client:	GPD GROUP	Date of Testing:	08/21/2013 to 09/11/2013

Soil Description: Reddish brown SILT AND CLAY, some coarse to fine sand, little fine gravel.
Soil Classification: ODOT A-6a

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	29	18	11	16	11	15	34	24

Natural S_o	Natural w_o	γ_d (pcf)	γ_{sat} (pcf)	σ_{vo}' (psf)	S_G	e_o	σ_p' (psf)	c_c	c_r
89.5%	22.1%	102.6	124.1	1,068	2.67	0.624	7,680	0.191	0.043



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STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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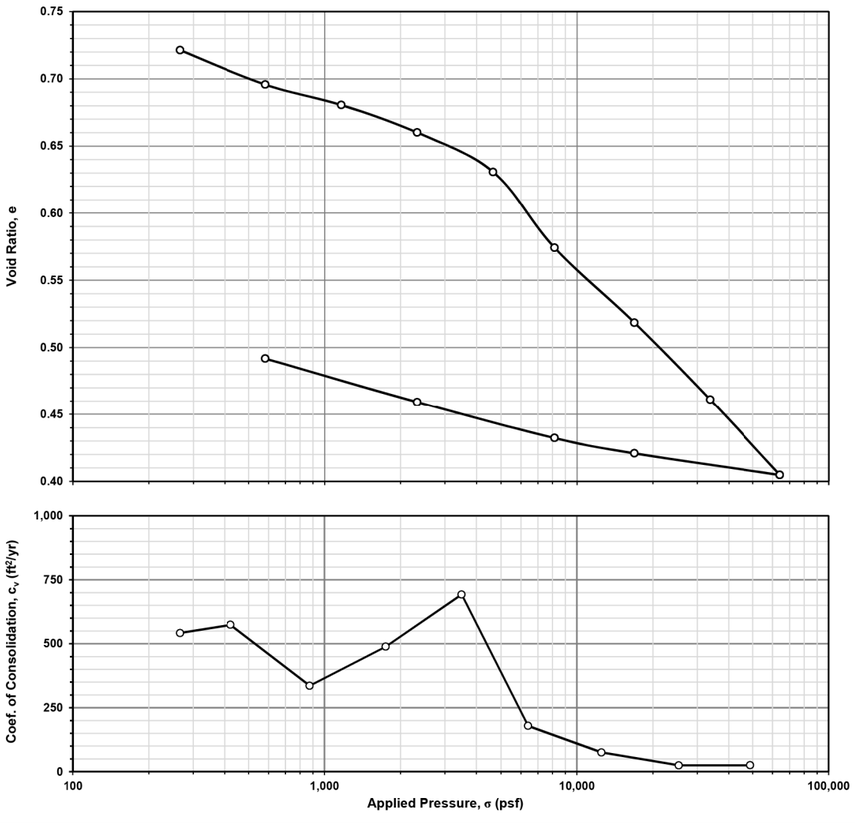
One-Dimensional Consolidation Test Report (ASTM D2435)

Project Number:	W-13-045	Boring Number:	B-105-1-13
Project Name:	FRA-70-12.68	Station / Offset:	5008+89.52, 6.5' Lt.
Project Location:	Columbus, Ohio	Sample No. / Depth:	ST-7 / 16.3 ft
Client:	GPD GROUP	Date of Testing:	06/13/2013 to 07/03/2013

Soil Description: Brownish gray CLAY, "and" silt, trace coarse to fine sand.
Soil Classification: ODOT A-7-6

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	48	22	26	0	1	8	46	45

Natural S_o	Natural w_o	γ_d (pcf)	γ_{sat} (pcf)	σ_{vo}' (psf)	S_G	e_o	σ_p' (psf)	c_c	c_r
92.9%	25.8%	96.1	120.6	1,875	2.67	0.735	4,522	0.249	0.043



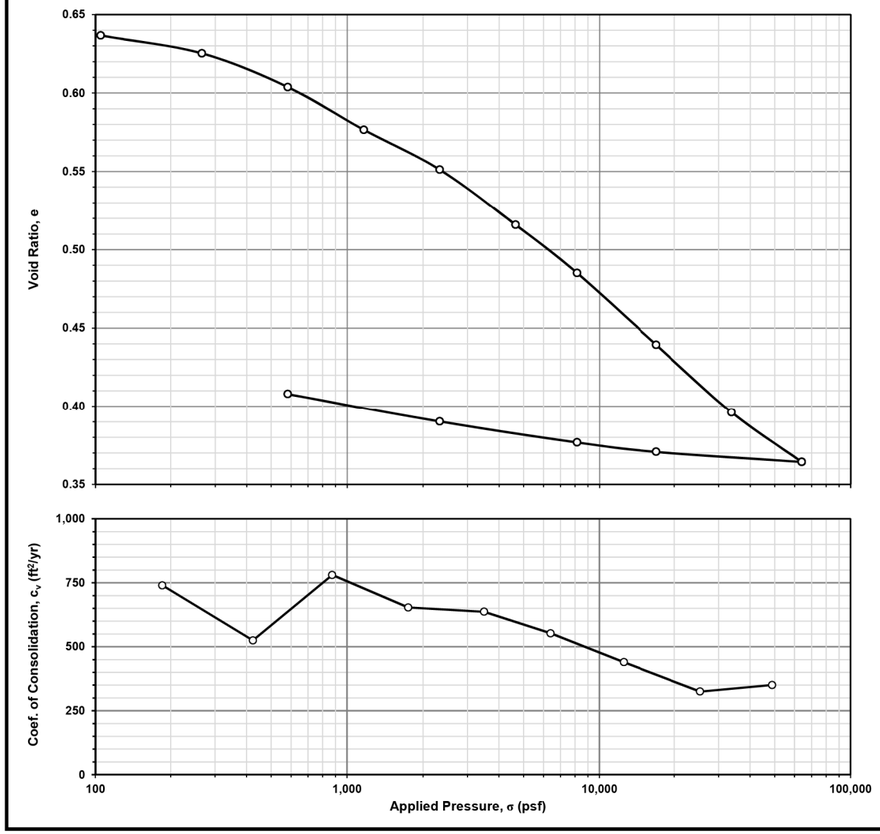
One-Dimensional Consolidation Test Report (ASTM D2435)

Project Number:	W-13-072	Boring Number:	B-113-9-13
Project Name:	FRA-70-13.10	Station / Offset:	258+77.50, 36.0' Rt.
Project Location:	Columbus, Ohio	Sample No. / Depth:	ST-7 / 16.3
Client:	ms consultants, inc.	Date of Testing:	04/07/2014 to 04/25/2014

Soil Description: Dark brown SILT AND CLAY, little coarse to fine sand, little fine gravel.
Soil Classification: ODOT A-6a

Physical Characteristics	L.L.	P.L.	P.I.	Gravel%	C. Sand%	F. Sand%	Silt%	Clay%
	32	18	14	19	10	13	31	27

Natural S_o	Natural w_o	γ_d (pcf)	γ_{sat} (pcf)	σ_{vo}' (psf)	S_G	e_o	σ_p' (psf)	c_c	c_r
91.2%	18.3%	101.7	123.9	1,793	2.67	0.638	1,973	0.165	0.022



STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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RESOURCE INTERNATIONAL, INC.
Engineering Consultants

6350 Presidential Gatew. | 9885 Rockside Road | 4480 Lake Forest Drive
Columbus, OH 43231 | Cleveland, OH 44125 | Cincinnati, Ohio 45242
Phone (614) 823-4949 | Phone (216) 573-0955 | Phone (513) 769-6998

Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

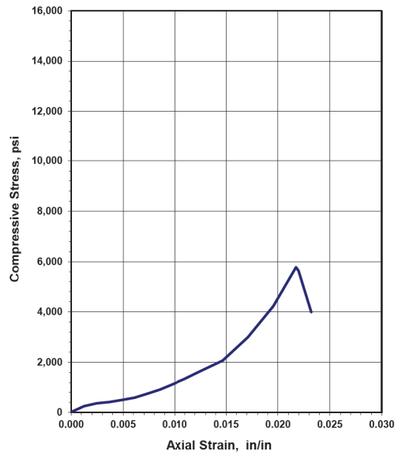
Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 7/12/2013
Test Performed by: JJH/TK

Rock Description: LIMESTONE: Light gray, slightly weathered, strong.

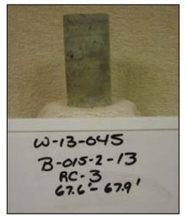
Boring No.:	B-015-2-13	Average Length:	4.094 in
Station / Offset:	5042+88.86, 2.6' Rt.	Average Diameter:	1.872 in
Sample No. / Depth:	RC-3 / 67.6 ft.	Length to diameter ratio:	2.187
Moisture condition:	As received	Cross Sectional Area:	2.751 in^2
		Failure Load:	15,880 lbs
Rate of Loading:	79.4 lbs/sec	Axial Strain at Failure:	0.0217 in/in
Testing Time:	200 sec	Stress:	5,771 psi

(Rate 2-15 minutes to failure)

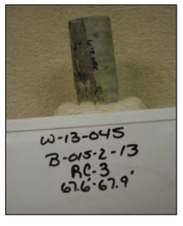
Unconfined Compression Test



Before Testing



After Failure



REMARKS:

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Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

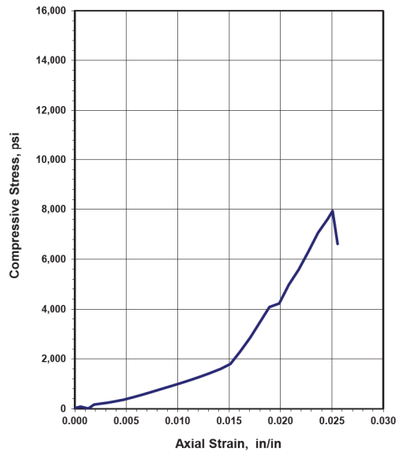
Project: FRA-70-12.63
Project No.: W-13-045
Date of Testing: 8/2/2013
Test Performed by: JH/TK

Rock Description: LIMESTONE: Gray, unweathered, moderately strong to strong.

Boring No.:	B-015-4-13	Average Length:	5.284 in
Station / Offset:	5048+23.41, 12.5' Rt.	Average Diameter:	2.389 in
Sample No. / Depth:	RC-1 / 87.1 ft.	Length to diameter ratio:	2.212
Moisture condition:	As received	Cross Sectional Area:	4.480 in^2
		Failure Load:	35,560 lbs
Rate of Loading:	70.7 lbs/sec	Axial Strain at Failure:	0.0251 in/in
Testing Time:	503 sec	Stress:	7,935 psi

(Rate 2-15 minutes to failure)

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

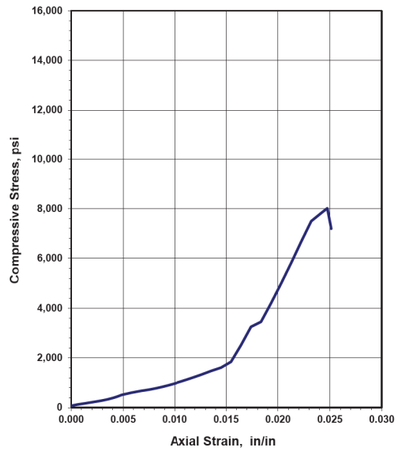
Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 8/2/2013
Test Performed by: JH/TK

Rock Description: LIMESTONE: Gray, unweathered, moderately strong to strong.

Boring No.:	B-015-4-13	Average Length:	5.173 in
Station / Offset:	5048+23.41, 12.5' Rt.	Average Diameter:	2.386 in
Sample No. / Depth:	RC-2 / 92.4 ft.	Length to diameter ratio:	2.168
Moisture condition:	As received	Cross Sectional Area:	4.469 in^2
		Failure Load:	35,870 lbs
Rate of Loading:	84.0 lbs/sec	Axial Strain at Failure:	0.0247 in/in
Testing Time:	427 sec	Stress:	8,024 psi

(Rate 2-15 minutes to failure)

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

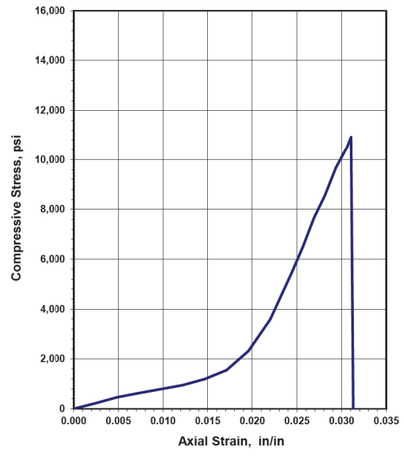
Project: FRA-70-12.63
Project No.: W-13-045
Date of Testing: 7/12/2013
Test Performed by: JJH/TK

Rock Description: LIMESTONE: Brown and gray, unweathered, strong to very strong.

Boring No.:	B-015-5-13	Average Length:	4.09 in
Station / Offset:	5049+08.12, 37.6' Rt.	Average Diameter:	1.868 in
Sample No. / Depth:	RC-1 / 66.8 ft.	Length to diameter ratio:	2.190
Moisture condition:	As received	Cross Sectional Area:	2.739 in^2
		Failure Load:	29,940 lbs
Rate of Loading:	80.2 lbs/sec	Axial Strain at Failure:	0.0311 in/in
Testing Time:	373 sec	Stress:	10,927 psi

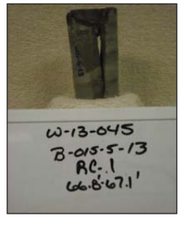
(Rate 2-15 minutes to failure)

Unconfined Compression Test



Before Testing

After Failure



REMARKS:

DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

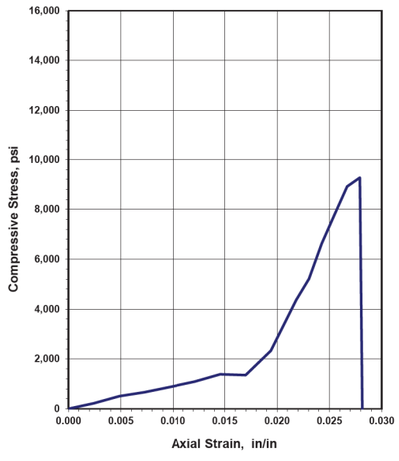
Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 7/12/2013
Test Performed by: JJH/TK

Rock Description: LIMESTONE: Gray and brown, slightly weathered to unweathered, strong to very strong.

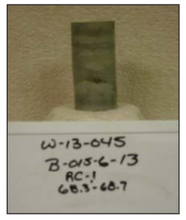
Boring No.:	B-015-6-13	Average Length:	4.122 in
Station / Offset:	5050+28.85, 20.8' Lt.	Average Diameter:	1.872 in
Sample No. / Depth:	RC-1 / 68.3 ft.	Length to diameter ratio:	2.202
Moisture condition:	As received	Cross Sectional Area:	2.751 in^2
		Failure Load:	25,520 lbs
Rate of Loading:	74.6 lbs/sec	Axial Strain at Failure:	0.0279 in/in
Testing Time:	342 sec	Stress:	9,274 psi

(Rate 2-15 minutes to failure)

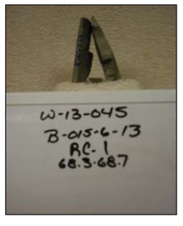
Unconfined Compression Test



Before Testing



After Failure



REMARKS:

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Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

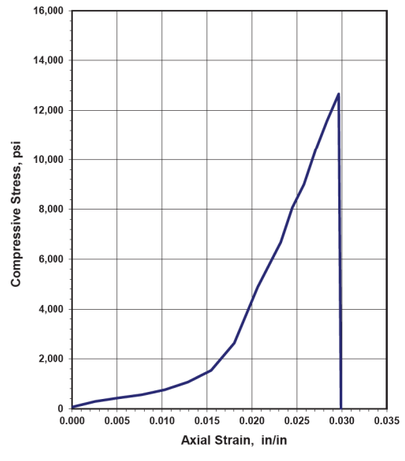
Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 7/12/2013
Test Performed by: JJH/TK

Rock Description: LIMESTONE: Gray and brown, slightly weathered to unweathered, strong to very strong.

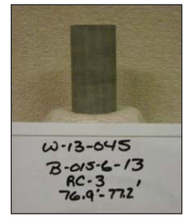
Boring No.:	B-015-6-13	Average Length:	3.88 in
Station / Offset:	5050+28.85, 20.8' Lt.	Average Diameter:	1.872 in
Sample No. / Depth:	RC-3 / 76.9 ft.	Length to diameter ratio:	2.073
Moisture condition:	As received	Cross Sectional Area:	2.751 in^2
		Failure Load:	34,840 lbs
Rate of Loading:	75.9 lbs/sec	Axial Strain at Failure:	0.0296 in/in
Testing Time:	459 sec	Stress:	12,661 psi

(Rate 2-15 minutes to failure)

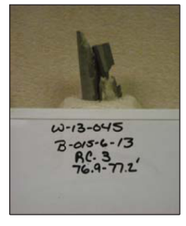
Unconfined Compression Test



Before Testing



After Failure



REMARKS:

DRAWN RRM | CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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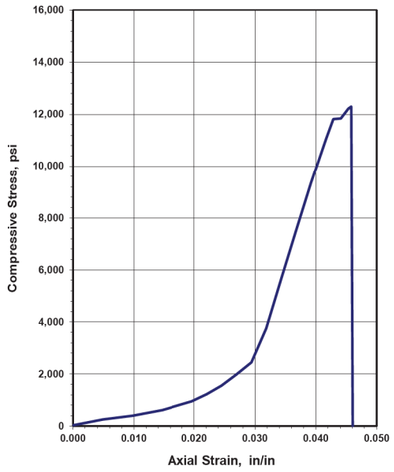
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 7/12/2013
Test Performed by: JJH/TK

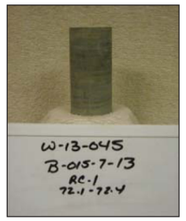
Rock Description: DOLOMITE: Gray and brown, slightly weathered, strong.

Boring No.:	B-015-7-13	Average Length:	4.081 in
Station / Offset:	5051+29.66, 9.8' Rt.	Average Diameter:	1.855 in
Sample No. / Depth:	RC-1 / 72.1 ft.	Length to diameter ratio:	2.200
Moisture condition:	As received	Cross Sectional Area:	2.701 in^2
Rate of Loading:	63.9 lbs/sec	Failure Load:	33,240 lbs
Testing Time:	520 sec	Axial Strain at Failure:	0.0458 in/in
	(Rate 2-15 minutes to failure)	Stress:	12,300 psi

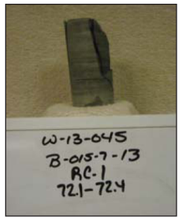
Unconfined Compression Test



Before Testing



After Failure



REMARKS:

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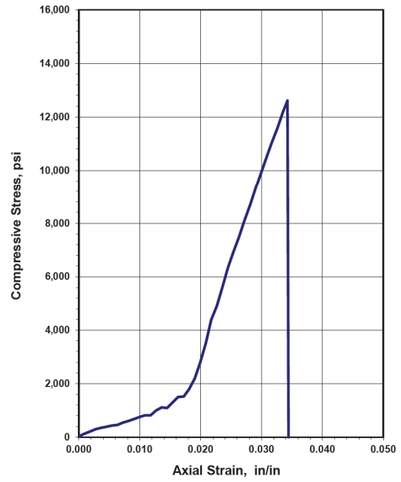
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 6/27/2014
Test Performed by: K.R./T.K.

Rock Description: LIMESTONE: Gray, unweathered to slightly weathered, very strong.

Boring No.:	B-015-8-13	Average Length:	5.518 in
Station / Offset:	5053+52.86, 39.9' Lt.	Average Diameter:	2.484 in
Sample No. / Depth:	RC-2 / 45.2 ft.	Length to diameter ratio:	2.221
Moisture condition:	Dry	Cross Sectional Area:	4.844 in^2
Rate of Loading:	86.4 lbs/sec	Failure Load:	61,100 lbs
Testing Time:	707 sec	Axial Strain at Failure:	0.0343 in/in
	(Rate 2-15 minutes to failure)	Stress:	12,610 psi

Unconfined Compression Test



Before Testing

Not Available

After Failure

Not Available

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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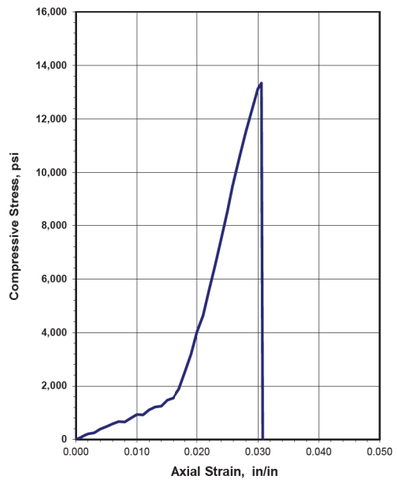
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 6/27/2014
Test Performed by: K.R./T.K.

Rock Description: LIMESTONE: Gray, unweathered to slightly weathered, very strong.

Boring No.:	B-015-8-13	Average Length:	5.003 in
Station / Offset:	5053+52.86, 39.9' Lt.	Average Diameter:	2.483 in
Sample No. / Depth:	RC-3 / 48 ft.	Length to diameter ratio:	2.015
Moisture condition:	Dry	Cross Sectional Area:	4.840 in^2
Rate of Loading:	97.7 lbs/sec	Failure Load:	64,580 lbs
Testing Time:	661 sec	Axial Strain at Failure:	0.0306 in/in
	(Rate 2-15 minutes to failure)	Stress:	13,340 psi

Unconfined Compression Test



Before Testing

Not Available

After Failure

Not Available

REMARKS:

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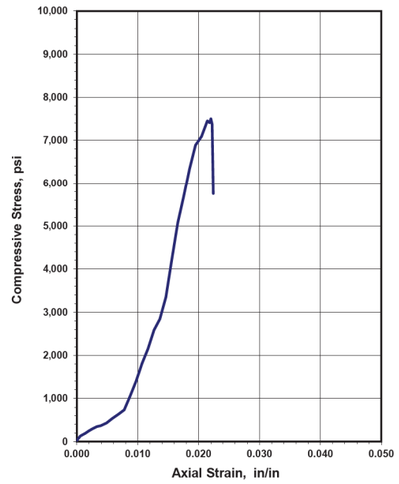
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 5/15/2014
Test Performed by: CS/TK

Rock Description: LIMESTONE: Gray, unweathered to slightly weathered, very strong.

Boring No.:	B-015-8-13	Average Length:	5.132 in
Station / Offset:	5053+52.86, 39.9' Lt.	Average Diameter:	2.489 in
Sample No. / Depth:	RC-4 / 53.4 ft.	Length to diameter ratio:	2.062
Moisture condition:	Dry	Cross Sectional Area:	4.863 in^2
Rate of Loading:	63.8 lbs/sec	Failure Load:	36,490 lbs
Testing Time:	572 sec	Axial Strain at Failure:	0.0220 in/in
	(Rate 2-15 minutes to failure)	Stress:	7,502 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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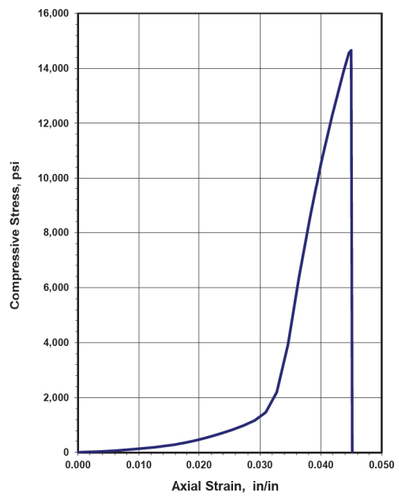
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 6/19/2014
Test Performed by: CS/TK

Rock Description: LIMESTONE: Brown, unweathered, strong, dolomitic.

Boring No.:	B-015-9-13	Average Length:	5.492 in
Station / Offset:	5055+67.30, 34.3' Lt.	Average Diameter:	2.493 in
Sample No. / Depth:	RC-3 / 43.8 ft.	Length to diameter ratio:	2.203
Moisture condition:	Dry	Cross Sectional Area:	4.879 in^2
Rate of Loading:	90.5 lbs/sec	Failure Load:	71,530 lbs
Testing Time:	790 sec	Axial Strain at Failure:	0.0450 in/in
	(Rate 2-15 minutes to failure)	Stress:	14,655 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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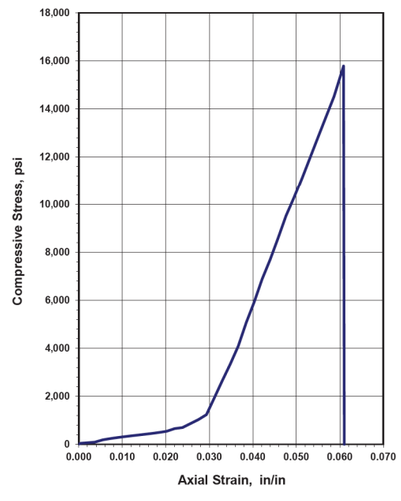
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 6/19/2014
Test Performed by: CS/TK

Rock Description: LIMESTONE: Brown, unweathered, strong, dolomitic.

Boring No.:	B-015-9-13	Average Length:	5.457 in
Station / Offset:	5055+67.30, 34.3' Lt.	Average Diameter:	2.491 in
Sample No. / Depth:	RC-4 / 45.2 ft.	Length to diameter ratio:	2.191
Moisture condition:	Dry	Cross Sectional Area:	4.871 in^2
Rate of Loading:	83.7 lbs/sec	Failure Load:	76,960 lbs
Testing Time:	919 sec	Axial Strain at Failure:	0.0608 in/in
	(Rate 2-15 minutes to failure)	Stress:	15,790 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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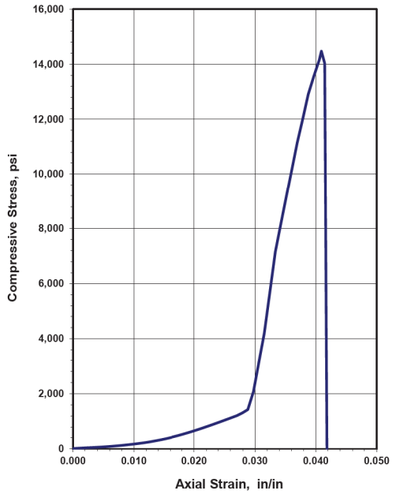
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 6/19/2014
Test Performed by: CS/TK

Rock Description: LIMESTONE: Gray, unweathered, strong, conglomeritic.

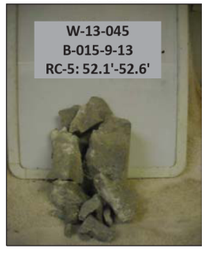
Boring No.:	B-015-9-13	Average Length:	5.548 in
Station / Offset:	5055+67.30, 34.3' Lt.	Average Diameter:	2.491 in
Sample No. / Depth:	RC-5 / 52.1 ft.	Length to diameter ratio:	2.227
Moisture condition:	Dry	Cross Sectional Area:	4.871 in^2
Rate of Loading:	98.4 lbs/sec	Failure Load:	70,520 lbs
Testing Time:	717 sec	Axial Strain at Failure:	0.0409 in/in
	(Rate 2-15 minutes to failure)	Stress:	14,472 psi

Unconfined Compression Test



Before Testing

After Failure



REMARKS:

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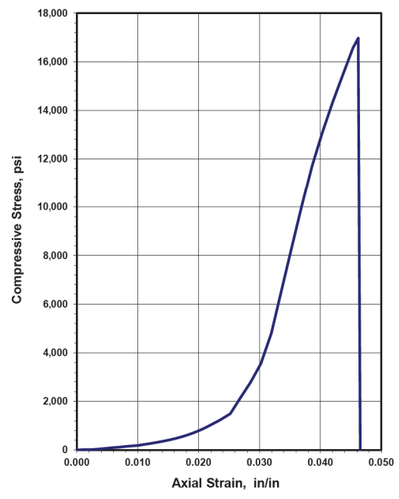
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 6/19/2014
Test Performed by: CS/TK

Rock Description: Brown Dolomitic Limestone

Boring No.:	B-015-9-13	Average Length:	5.952 in
Station / Offset:	5055+67.30, 34.3' Lt.	Average Diameter:	2.494 in
Sample No. / Depth:	RC-6 / 57.2 ft.	Length to diameter ratio:	2.387
Moisture condition:	Dry	Cross Sectional Area:	4.883 in^2
Rate of Loading:	106.7 lbs/sec	Failure Load:	82,900 lbs
Testing Time:	777 sec	Axial Strain at Failure:	0.0462 in/in
	(Rate 2-15 minutes to failure)	Stress:	16,970 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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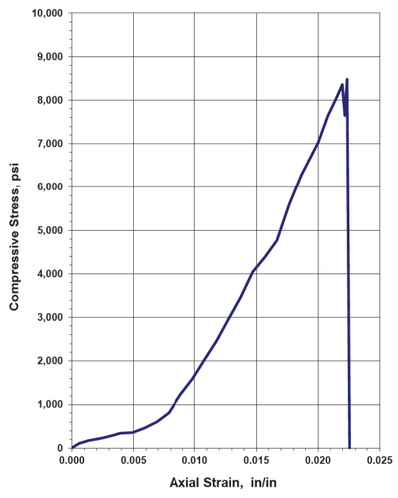
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 5/15/2014
Test Performed by: CS/TK

Rock Description: LIMESTONE: Gray, unweathered, very strong, dolomitic.

Boring No.:	B-016-3-13	Average Length:	5.099 in
Station / Offset:	5058+05.01, 33.7' Lt.	Average Diameter:	2.485 in
Sample Nc	RC-1 / 42.6 ft.	Length to diameter ratio:	2.052
Moisture condition:	Dry	Cross Sectional Area:	4.848 in^2
Rate of Loading:	73.2 lbs/sec	Failure Load:	41,120 lbs
Testing Time:	562 sec	Axial Strain at Failure:	0.0224 in/in
	(Rate 2-15 minutes to failure)	Stress:	8,481 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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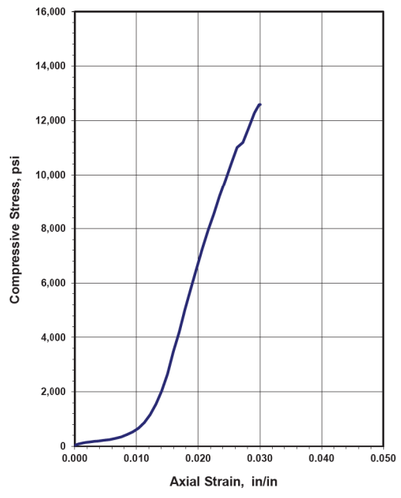
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 5/15/2014
Test Performed by: CS/TK

Rock Description: LIMESTONE: Gray, unweathered, very strong, dolomitic.

Boring No.:	B-016-3-13	Average Length:	5.324 in
Station / Offset:	5058+05.01, 33.7' Lt.	Average Diameter:	2.487 in
Sample Nc	RC-2 / 45.5 ft.	Length to diameter ratio:	2.141
Moisture condition:	Dry	Cross Sectional Area:	4.855 in^2
Rate of Loading:	82.9 lbs/sec	Failure Load:	61,120 lbs
Testing Time:	737 sec	Axial Strain at Failure:	0.0301 in/in
	(Rate 2-15 minutes to failure)	Stress:	12,584 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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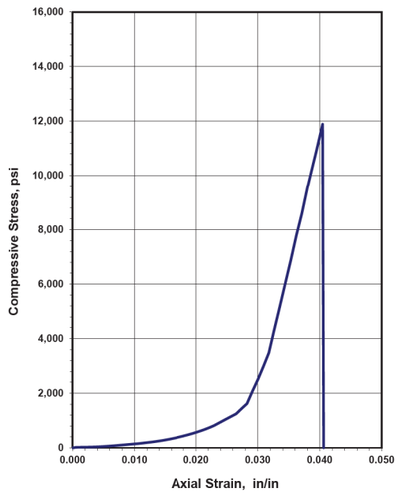
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 6/19/2014
Test Performed by: CS/TK

Rock Description: LIMESTONE: Gray, unweathered, very strong, dolomitic.

Boring No.:	B-016-3-13	Average Length:	5.662 in
Station / Offset:	5058+05.01, 33.7' Lt.	Average Diameter:	2.489 in
Sample Nc	RC-3 / 48.6 ft.	Length to diameter ratio:	2.275
Moisture condition:	Dry	Cross Sectional Area:	4.863 in^2
Rate of Loading:	93.9 lbs/sec	Failure Load:	57,840 lbs
Testing Time:	616 sec	Axial Strain at Failure:	0.0404 in/in
	(Rate 2-15 minutes to failure)	Stress:	11,889 psi

Unconfined Compression Test



Before Testing

After Failure

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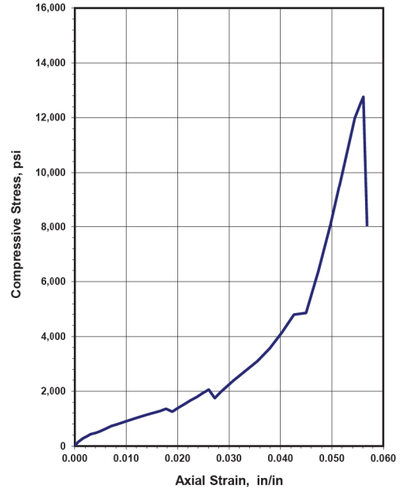
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 8/29/2013
Test Performed by: KR/TK

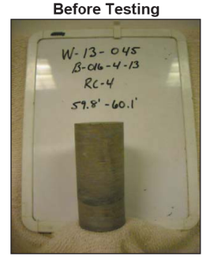
Rock Description: LIMESTONE: Gray, slightly weathered, strong.

Boring No.:	B-016-4-13	Average Length:	4.223 in
Station / Offset:	5059+89.96, 2.4' Rt.	Average Diameter:	1.869 in
Sample Nc	RC-4 / 59.8 ft.	Length to diameter ratio:	2.259
Moisture condition:	As received	Cross Sectional Area:	2.742 in^2
Rate of Loading:	61.9 lbs/sec	Failure Load:	35,010 lbs
Testing Time:	566 sec	Axial Strain at Failure:	0.0561 in/in
	(Rate 2-15 minutes to failure)	Stress:	12,760 psi

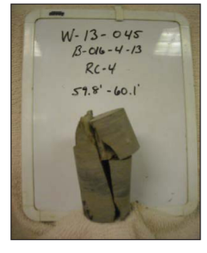
Unconfined Compression Test



Before Testing



After Failure



REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

37 / 496

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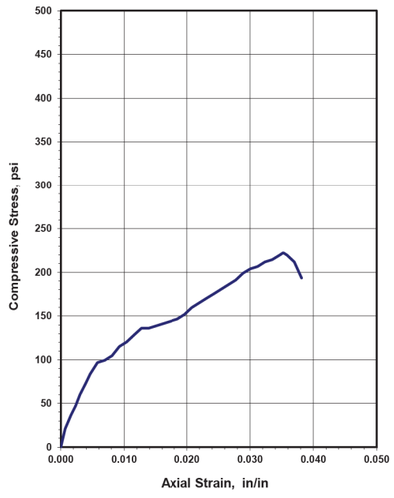
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 8/8/2013
Test Performed by: KR/TK

Rock Description: SHALE: Black, highly weathered, very weak.

Boring No.:	B-017-3-13	Average Length:	4.328 in
Station / Offset:	166+20.53, 31.8' Rt.	Average Diameter:	2.206 in
Sample No. / Depth:	RC-2 / 86 ft.	Length to diameter ratio:	1.962
Moisture condition:	As received	Cross Sectional Area:	3.820 in^2
Rate of Loading:	2.7 lbs/sec	Failure Load:	850 lbs
Testing Time:	310 sec	Axial Strain at Failure:	0.0352 in/in
	(Rate 2-15 minutes to failure)	Stress:	222 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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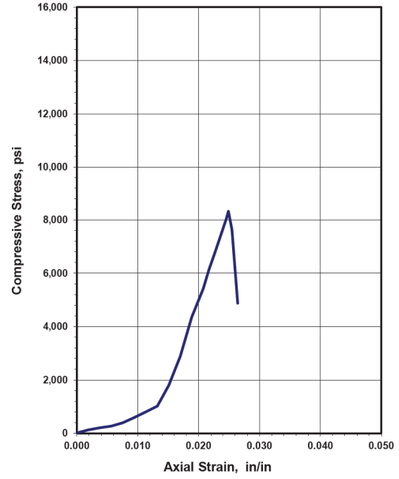
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 7/26/2013
Test Performed by: KR/TK

Rock Description: LIMESTONE: Gray, unweathered, strong.

Boring No.:	B-017-4-13	Average Length:	5.3 in
Station / Offset:	5071+46.22, 58.4' Rt.	Average Diameter:	2.396 in
Sample No. / Depth:	RC-3 / 74.1 ft.	Length to diameter ratio:	2.212
Moisture condition:	As received	Cross Sectional Area:	4.507 in^2
Rate of Loading:	64.1 lbs/sec	Failure Load:	37,520 lbs
Testing Time:	585 sec	Axial Strain at Failure:	0.0249 in/in
	(Rate 2-15 minutes to failure)	Stress:	8,324 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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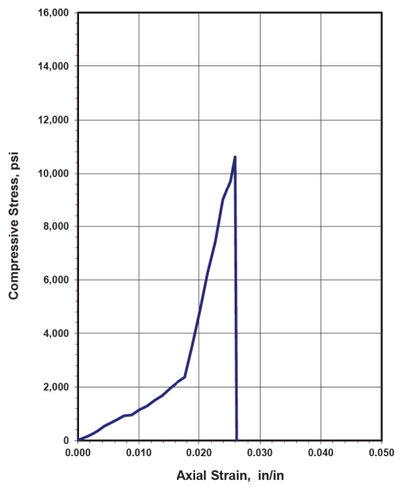
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 2/10/2014
Test Performed by: K.R./T.K.

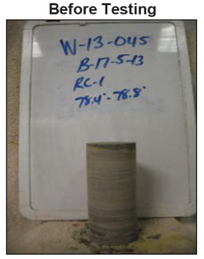
Rock Description: LIMESTONE: Gray, unweathered, strong.

Boring No.:	B-017-5-13	Average Length:	3.973 in
Station / Offset:	167+93.97, 62.9' Rt.	Average Diameter:	1.864 in
Sample No. / Depth:	RC-1 / 78.4 ft.	Length to diameter ratio:	2.131
Moisture condition:	As received	Cross Sectional Area:	2.727 in^2
Rate of Loading:	90.2 lbs/sec	Failure Load:	28,960 lbs
Testing Time:	321 sec	Axial Strain at Failure:	0.0259 in/in
	(Rate 2-15 minutes to failure)	Stress:	10,615 psi

Unconfined Compression Test



Before Testing



After Failure

REMARKS:

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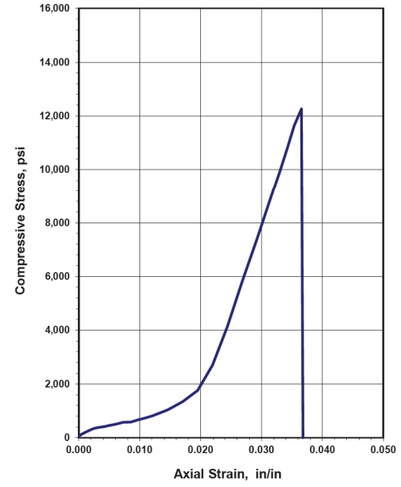
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 2/13/2014
Test Performed by: J.H./T.K.

Rock Description: LIMESTONE: Light brown, unweathered, very strong.

Boring No.:	B-017-6-13	Average Length:	4.102 in
Station / Offset:	5074+21.50, 19.1' Rt.	Average Diameter:	1.87 in
Sample No. / Depth:	RC-1 / 75.6 ft.	Length to diameter ratio:	2.194
Moisture condition:	As received	Cross Sectional Area:	2.745 in^2
Rate of Loading:	62.1 lbs/sec	Failure Load:	33,670 lbs
Testing Time:	542 sec	Axial Strain at Failure:	0.0366 in/in
	(Rate 2-15 minutes to failure)	Stress:	12,261 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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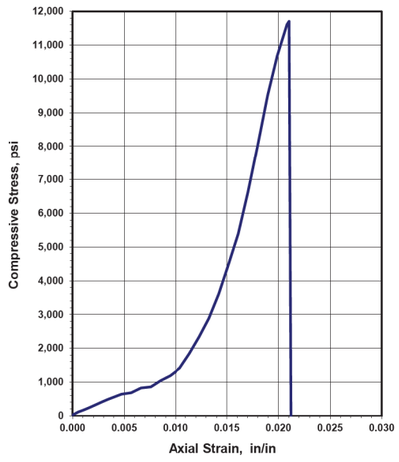
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 3/7/2014
Test Performed by: K.R./T.K.

Rock Description: Gray Limestone

Boring No.:	B-017-9-13	Average Length:	5.28 in
Station / Offset:	166+64.96, 18.3' Lt.	Average Diameter:	2.399 in
Sample No. / Depth:	RC-2 / 74.2 ft	Length to diameter ratio:	2.201
Moisture condition:	As received	Cross Sectional Area:	4.518 in^2
Rate of Loading:	96.0 lbs/sec	Failure Load:	52,900 lbs
Testing Time:	551 sec	Axial Strain at Failure:	0.0210 in/in
(Rate 2-15 minutes to failure)		Stress:	11,707 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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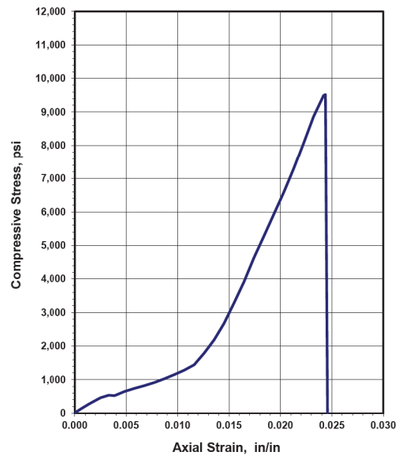
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 2/10/2014
Test Performed by: K.R./T.K.

Rock Description: Gray Limestone

Boring No.:	B-018-1-13	Average Length:	5.168 in
Station / Offset:	167+31.32, 54.6' Lt.	Average Diameter:	2.385 in
Sample No. / Depth:	RC-1 / 75.6 ft	Length to diameter ratio:	2.167
Moisture condition:	As received	Cross Sectional Area:	4.465 in^2
Rate of Loading:	85.8 lbs/sec	Failure Load:	42,540 lbs
Testing Time:	496 sec	Axial Strain at Failure:	0.0244 in/in
(Rate 2-15 minutes to failure)		Stress:	9,525 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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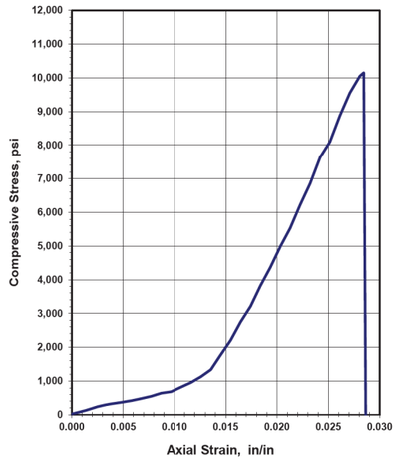
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 2/13/2014
Test Performed by: J.H./T.K.

Rock Description: Gray Limestone

Boring No.:	B-018-2-13	Average Length:	5.169 in
Station / Offset:	168+63.72, 22.9' Lt.	Average Diameter:	2.4 in
Sample No. / Depth:	RC-1 / 78.5 ft	Length to diameter ratio:	2.154
Moisture condition:	As received	Cross Sectional Area:	4.522 in^2
Rate of Loading:	78.5 lbs/sec	Failure Load:	45,920 lbs
Testing Time:	585 sec	Axial Strain at Failure:	0.0284 in/in
(Rate 2-15 minutes to failure)		Stress:	10,153 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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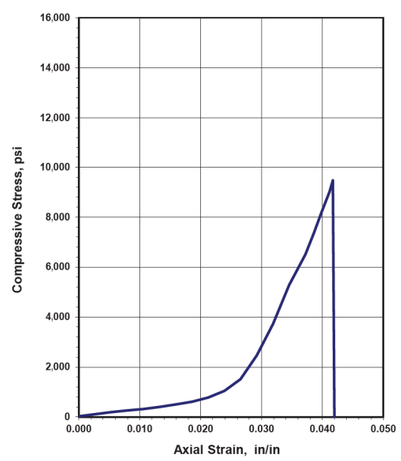
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.63
Project No.: W-13-045
Date of Testing: 7/26/2013
Test Performed by: KR/TK

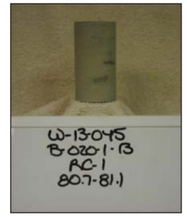
Rock Description: LIMESTONE: Light gray, unweathered, strong.

Boring No.:	B-020-1-13	Average Length:	3.765 in
Station / Offset:	5080+09.80, 30.9' Rt.	Average Diameter:	1.863 in
Sample No. / Depth:	RC-1 / 80.7 ft.	Length to diameter ratio:	2.021
Moisture condition:	As received	Cross Sectional Area:	2.725 in^2
		Failure Load:	25,800 lbs
Rate of Loading:	55.0 lbs/sec	Axial Strain at Failure:	0.0417 in/in
Testing Time:	469 sec	Stress:	9,465 psi
(Rate 2-15 minutes to failure)			

Unconfined Compression Test



Before Testing



After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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Phone (513) 769-6998

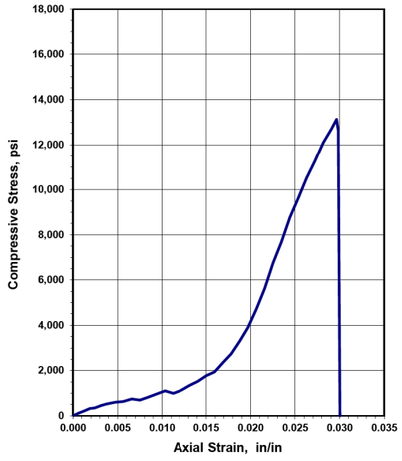
Unconfined Compressive Strength
of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 4/1/2014
Test Performed by: K.R./T.K.

Rock Description: Limestone

Boring No.:	B-020-4-13	Average Length:	5.329 in
Station / Offset:	7007+77.61, 12.0' Rt.	Average Diameter:	2.477 in
Sample No. / Depth:	RC-3 / 86.5 ft	Length to diameter ratio:	2.151
Moisture condition:	As received	Cross Sectional Area:	4.816 in^2
Rate of Loading:	114.2 lbs/sec	Failure Load:	63,240 lbs
Testing Time:	554 sec	Axial Strain at Failure:	0.0296 in/in
	(Rate 2-15 minutes to failure)	Stress:	13,126 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS: _____

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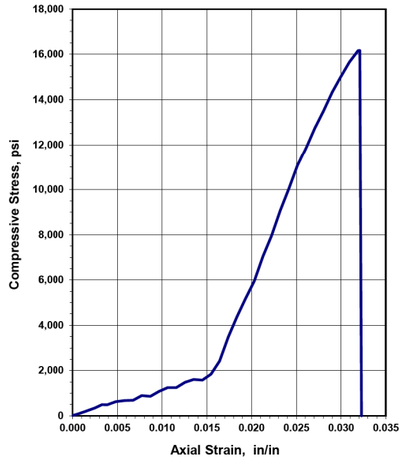
Unconfined Compressive Strength
of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 4/1/2014
Test Performed by: K.R./T.K.

Rock Description: Limestone

Boring No.:	B-020-4-13	Average Length:	5.173 in
Station / Offset:	7007+77.61, 12.0' Rt.	Average Diameter:	2.47 in
Sample No. / Depth:	RC-4 / 90.7 ft	Length to diameter ratio:	2.094
Moisture condition:	As received	Cross Sectional Area:	4.789 in^2
Rate of Loading:	124.0 lbs/sec	Failure Load:	77,480 lbs
Testing Time:	625 sec	Axial Strain at Failure:	0.0321 in/in
	(Rate 2-15 minutes to failure)	Stress:	16,173 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS: _____

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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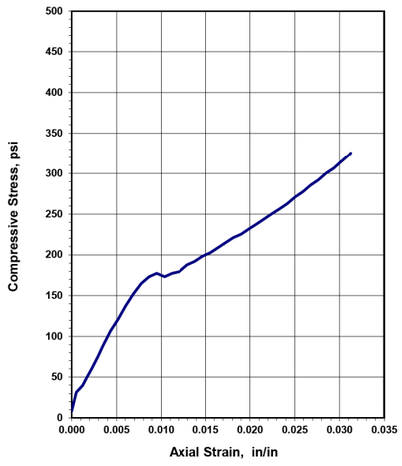
Unconfined Compressive Strength
of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 1/19/2015
Test Performed by: C.S./T.K.

Rock Description: Shale

Boring No.:	B-020-6-13	Average Length:	5.792 in
Station / Offset:	7008+36.29, 24.1' Rt.	Average Diameter:	2.471 in
Sample No. / Depth:	RC-4 / 77.4 ft	Length to diameter ratio:	2.344
Moisture condition:	As received	Cross Sectional Area:	4.793 in^2
Rate of Loading:	2.1 lbs/sec	Failure Load:	850 lbs
Testing Time:	413 sec	Axial Strain at Failure:	0.0095 in/in
	(Rate 2-15 minutes to failure)	Stress:	177 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS: _____

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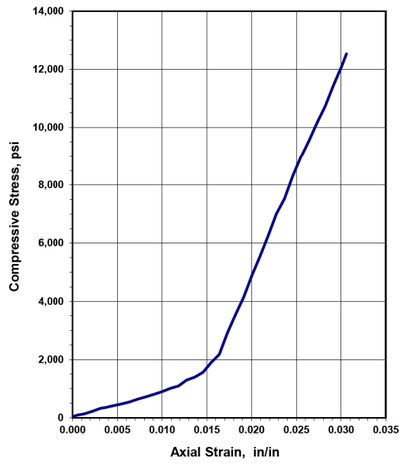
Unconfined Compressive Strength
of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 1/19/2015
Test Performed by: C.S./T.K.

Rock Description: Limestone with Chert nodules

Boring No.:	B-020-6-13	Average Length:	5.49 in
Station / Offset:	7008+36.29, 24.1' Rt.	Average Diameter:	2.488 in
Sample No. / Depth:	RC-7 / 91.5 ft	Length to diameter ratio:	2.207
Moisture condition:	As received	Cross Sectional Area:	4.859 in^2
Rate of Loading:	82.5 lbs/sec	Failure Load:	60,910 lbs
Testing Time:	738 sec	Axial Strain at Failure:	0.0306 in/in
	(Rate 2-15 minutes to failure)	Stress:	12,531 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS: _____

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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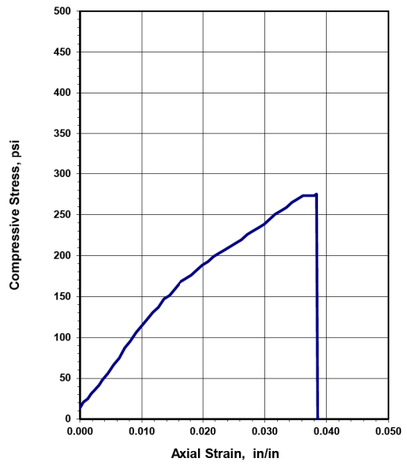
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 12/30/2014
Test Performed by: K.R./T.K.

Rock Description: Shale

Boring No.:	B-020-8-13	Average Length:	5.523 in
Station / Offset:	7010+15.89, 30.7' Rt.	Average Diameter:	2.48 in
Sample No. / Depth:	RC-2 / 71.2 ft	Length to diameter ratio:	2.227
Moisture condition:	As received	Cross Sectional Area:	4.828 in^2
Rate of Loading:	2.9 lbs/sec	Failure Load:	1,330 lbs
Testing Time:	454 sec	Axial Strain at Failure:	0.0384 in/in
	(Rate 2-15 minutes to failure)	Stress:	275 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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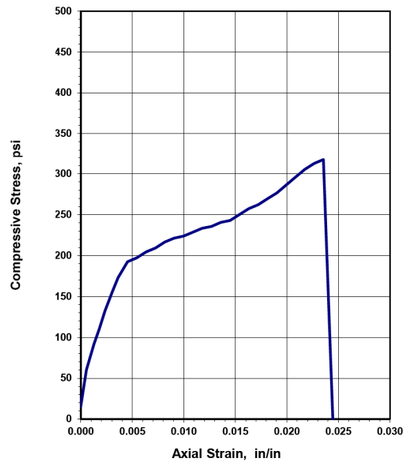
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 12/30/2014
Test Performed by: K.R./T.K.

Rock Description: Shale

Boring No.:	B-020-8-13	Average Length:	5.52 in
Station / Offset:	7010+15.89, 30.7' Rt.	Average Diameter:	2.301 in
Sample No. / Depth:	RC-5 / 85.9 ft	Length to diameter ratio:	2.399
Moisture condition:	As received	Cross Sectional Area:	4.156 in^2
Rate of Loading:	4.1 lbs/sec	Failure Load:	1,320 lbs
Testing Time:	322 sec	Axial Strain at Failure:	0.0236 in/in
	(Rate 2-15 minutes to failure)	Stress:	318 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 12/30/2014
Test Performed by: K.R./T.K.

Rock Description: Limestone

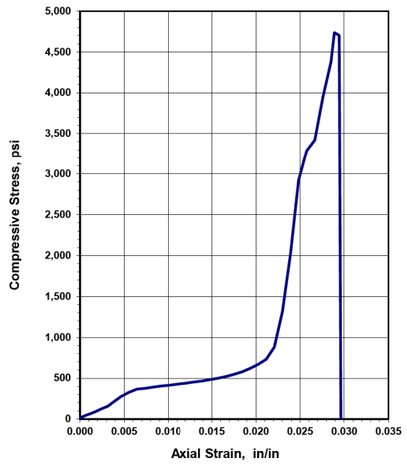
Boring No.: B-020-8-13
Station / Offset: 7010+15.89, 30.7' Rt.
Sample No. / Depth: RC-8 / 97.1 ft
Moisture condition: As received

Rate of Loading: 65.4 lbs/sec
Testing Time: 353 sec
(Rate 2-15 minutes to failure)

Average Length: 5.435 in
Average Diameter: 2.491 in
Length to diameter ratio: 2.182
Cross Sectional Area: 4.871 in^2

Failure Load: 23,080 lbs
Axial Strain at Failure: 0.0289 in/in
Stress: 4,737 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 7/3/2014
Test Performed by: K.R./T.K.

Rock Description: Dolomitic Limestone

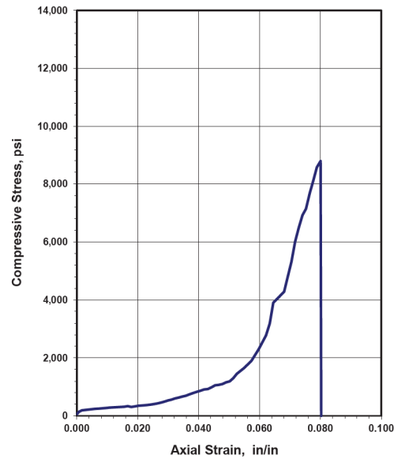
Boring No.: B-104-1-13
Station / Offset: 230+95.90, 17.5' Rt.
Sample No. / Depth: RC-2 / 65.5 ft
Moisture condition: As received

Rate of Loading: 55.1 lbs/sec
Testing Time: 432 sec
(Rate 2-15 minutes to failure)

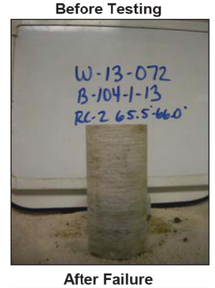
Average Length: 4.185 in
Average Diameter: 1.858 in
Length to diameter ratio: 2.252
Cross Sectional Area: 2.710 in^2

Failure Load: 23,820 lbs
Axial Strain at Failure: 0.0800 in/in
Stress: 8,783 psi

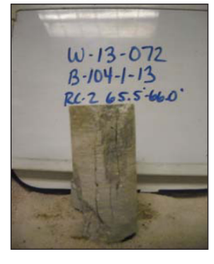
Unconfined Compression Test



Before Testing



After Failure



REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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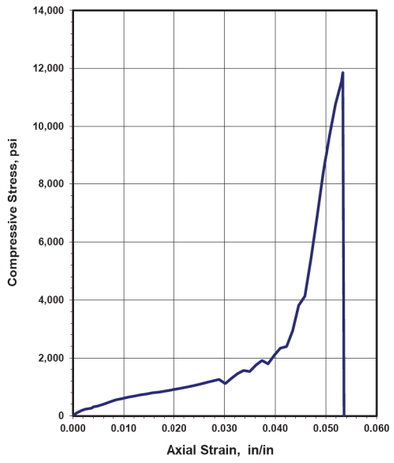
Unconfined Compressive Strength
of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 7/9/2014
Test Performed by: K.R./T.K.

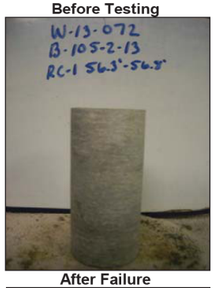
Rock Description: Dolomitic Limestone

Boring No.:	B-105-2-13	Average Length:	4.146 in
Station / Offset:	232+68.59, 24.4' Rt.	Average Diameter:	1.864 in
Sample No. / Depth:	RC-1 / 56.3 ft	Length to diameter ratio:	2.224
Moisture condition:	As received	Cross Sectional Area:	2.727 in^2
Rate of Loading:	55.6 lbs/sec	Failure Load:	32,350 lbs
Testing Time:	582 sec	Axial Strain at Failure:	0.0533 in/in
(Rate 2-15 minutes to failure)		Stress:	11,854 psi

Unconfined Compression Test



Before Testing



After Failure

REMARKS: _____

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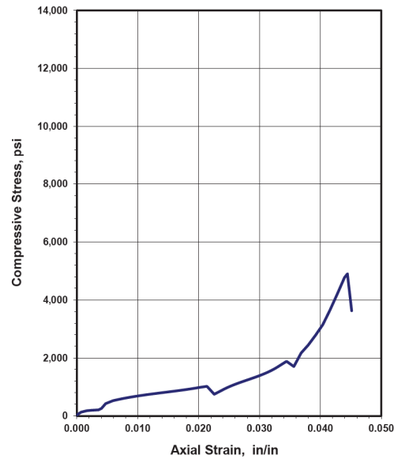
Unconfined Compressive Strength
of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 1/6/2015
Test Performed by: C.S./T.K.

Rock Description: Limestone

Boring No.:	B-107-1	Average Length:	4.21 in
Station / Offset:	#N/A	Average Diameter:	1.856 in
Sample No. / Depth:	RC-2 / 59.6-60.0' ft	Length to diameter ratio:	2.268
Moisture condition:	As received	Cross Sectional Area:	2.704 in^2
Rate of Loading:	37.9 lbs/sec	Failure Load:	13,250 lbs
Testing Time:	350 sec	Axial Strain at Failure:	0.0444 in/in
(Rate 2-15 minutes to failure)		Stress:	4,898 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS: _____

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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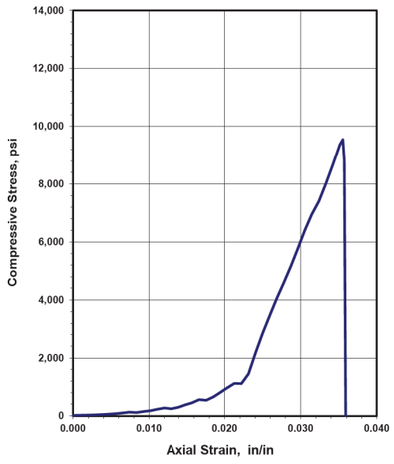
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 7/3/2014
Test Performed by: K.R./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-108-4-13	Average Length:	5.402 in
Station / Offset:	237+31.12, 23.7' Rt.	Average Diameter:	2.481 in
Sample No. / Depth:	RC-2 / 52.5 ft	Length to diameter ratio:	2.177
Moisture condition:	As received	Cross Sectional Area:	4.832 in^2
Rate of Loading:	68.2 lbs/sec	Failure Load:	46,120 lbs
Testing Time:	676 sec	Axial Strain at Failure:	0.0355 in/in
(Rate 2-15 minutes to failure)		Stress:	9,541 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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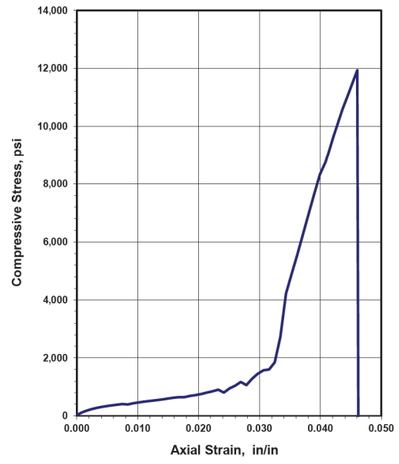
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 7/3/2014
Test Performed by: K.R./T.K.

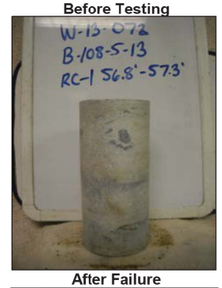
Rock Description: Dolomitic Limestone

Boring No.:	B-108-5-13	Average Length:	5.386 in
Station / Offset:	239+69.30, 18.7' Rt.	Average Diameter:	2.408 in
Sample No. / Depth:	RC-1 / 56.8 ft	Length to diameter ratio:	2.237
Moisture condition:	As received	Cross Sectional Area:	4.552 in^2
Rate of Loading:	72.6 lbs/sec	Failure Load:	54,340 lbs
Testing Time:	749 sec	Axial Strain at Failure:	0.0460 in/in
(Rate 2-15 minutes to failure)		Stress:	11,933 psi

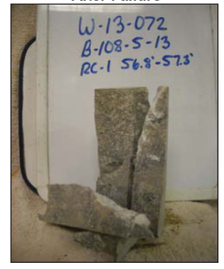
Unconfined Compression Test



Before Testing



After Failure



REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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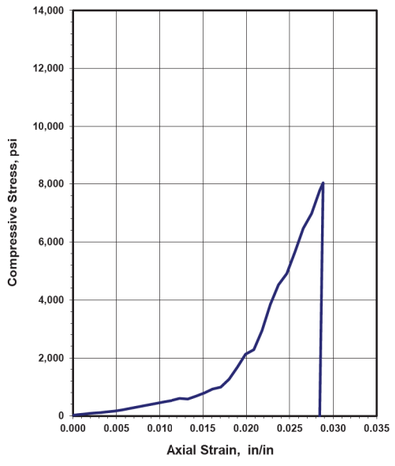
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 7/9/2014
Test Performed by: K.R./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-108-6-13	Average Length:	5.272 in
Station / Offset:	242+23.02, 20.7' Rt.	Average Diameter:	2.398 in
Sample No. / Depth:	RC-1 / 59.6 ft	Length to diameter ratio:	2.198
Moisture condition:	As received	Cross Sectional Area:	4.514 in^2
Rate of Loading:	63.5 lbs/sec	Failure Load:	36,270 lbs
Testing Time:	571 sec	Axial Strain at Failure:	0.0288 in/in
	(Rate 2-15 minutes to failure)	Stress:	8,033 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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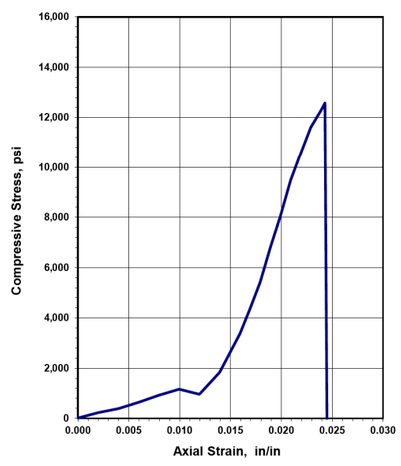
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 3/27/2015
Test Performed by: JH/TK

Rock Description: LIMESTONE: Brown and gray, moderately weathered, strong.

Boring No.:	B-108-9-15	Average Length:	5.023 in
Station / Offset:	5015+96.50, 15.7' Rt.	Average Diameter:	1.862 in
Sample No. / Depth:	RC-1 / 68.6 ft.	Length to diameter ratio:	2.698
Moisture condition:	As received	Cross Sectional Area:	2.722 in^2
		Failure Load:	34,230 lbs
Rate of Loading:	72.7 lbs/sec	Axial Strain at Failure:	0.0243 in/in
Testing Time:	471 sec	Stress:	12,574 psi
	(Rate 2-15 minutes to failure)		

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

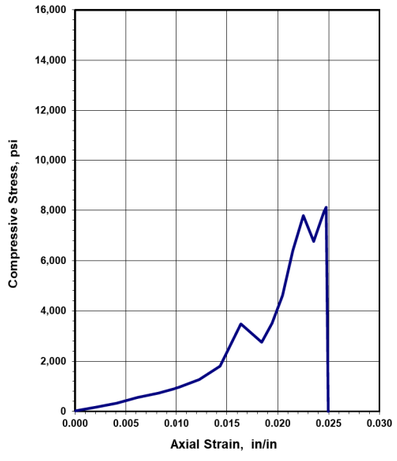
Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 3/27/2015
Test Performed by: JH/TK

Rock Description: LIMESTONE: Brown and gray, moderately weathered, strong.

Boring No.:	B-108-9-15	Average Length:	4.887 in
Station / Offset:	5015+96.50, 15.7' Rt.	Average Diameter:	1.862 in
Sample No. / Depth:	RC-3 / 75.4 ft.	Length to diameter ratio:	2.625
Moisture condition:	As received	Cross Sectional Area:	2.722 in^2
		Failure Load:	21,200 lbs
Rate of Loading:	38.7 lbs/sec	Axial Strain at Failure:	0.0225 in/in
Testing Time:	571 sec	Stress:	7,788 psi

(Rate 2-15 minutes to failure)

Unconfined Compression Test



Before Testing

After Failure

REMARKS: Upper corner of sample sheared off at 3,500 psi. Based on nature of shear, this is not considered failure.

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Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

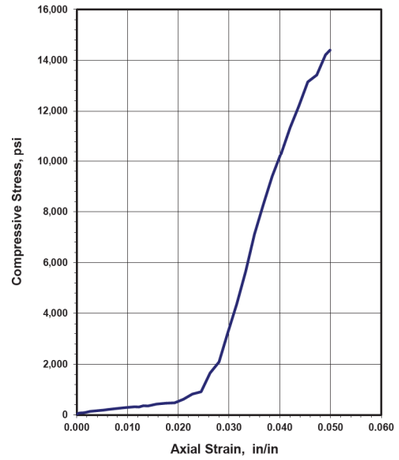
Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 1/22/2015
Test Performed by: C.S./T.K.

Rock Description: Limestone, dolomitic

Boring No.:	B-113-2-13	Average Length:	5.713 in
Station / Offset:	245+03.67, 17.9' Lt.	Average Diameter:	2.484 in
Sample No. / Depth:	RC-1 / 91.5 ft	Length to diameter ratio:	2.300
Moisture condition:	As received	Cross Sectional Area:	4.844 in^2
		Failure Load:	69,760 lbs
Rate of Loading:	90.0 lbs/sec	Axial Strain at Failure:	0.0499 in/in
Testing Time:	775 sec	Stress:	14,395 psi

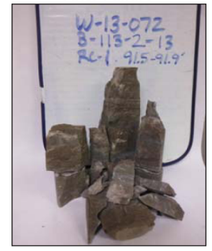
(Rate 2-15 minutes to failure)

Unconfined Compression Test



Before Testing

After Failure



REMARKS:

DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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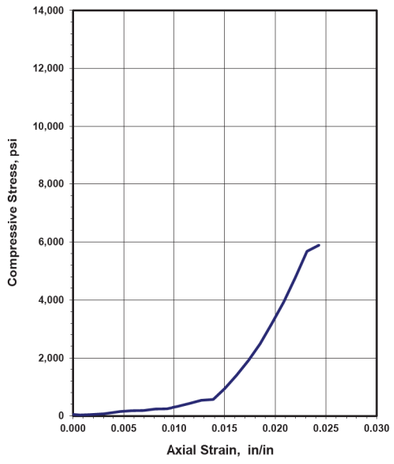
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 1/22/2015
Test Performed by: C.S./T.K.

Rock Description: Limestone with chert nodules

Boring No.:	B-113-3-13	Average Length:	4.323 in
Station / Offset:	247+30.17, 35.7' Rt.	Average Diameter:	1.856 in
Sample No. / Depth:	RC-2 / 87.8 ft	Length to diameter ratio:	2.329
Moisture condition:	As received	Cross Sectional Area:	2.704 in^2
Rate of Loading:	55.8 lbs/sec	Failure Load:	15,910 lbs
Testing Time:	285 sec	Axial Strain at Failure:	0.0243 in/in
(Rate 2-15 minutes to failure)		Stress:	5,882 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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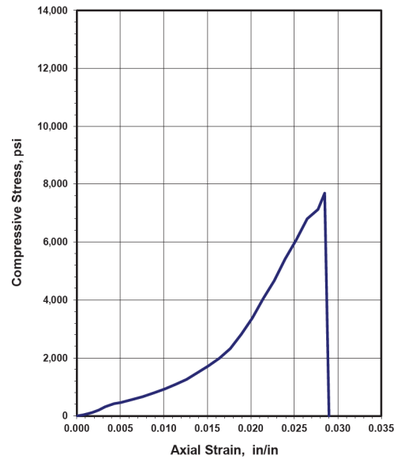
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 6/23/2014
Test Performed by: K.R./T.K.

Rock Description: Dolomitic Limestone

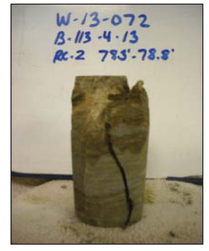
Boring No.:	B-113-4-13	Average Length:	3.967 in
Station / Offset:	249+37.84, 28.1' Rt.	Average Diameter:	1.859 in
Sample No. / Depth:	RC-2 / 78.3 ft	Length to diameter ratio:	2.134
Moisture condition:	As received	Cross Sectional Area:	2.713 in^2
Rate of Loading:	56.3 lbs/sec	Failure Load:	20,830 lbs
Testing Time:	370 sec	Axial Strain at Failure:	0.0285 in/in
(Rate 2-15 minutes to failure)		Stress:	7,676 psi

Unconfined Compression Test



Before Testing

After Failure



REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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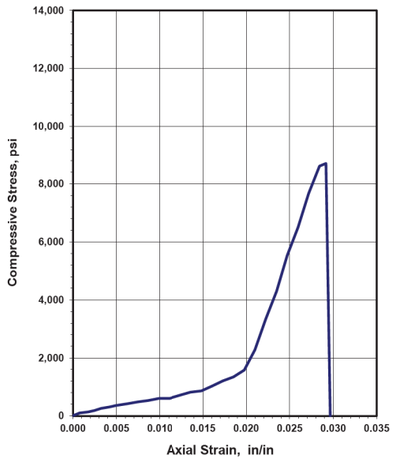
Unconfined Compressive Strength
of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 6/20/2014
Test Performed by: K.R./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-113-5-13	Average Length:	4.047 in
Station / Offset:	250+13.44, 36.0' Rt.	Average Diameter:	1.849 in
Sample No. / Depth:	RC-4 / 75.7 ft	Length to diameter ratio:	2.189
Moisture condition:	As received	Cross Sectional Area:	2.684 in^2
Rate of Loading:	49.5 lbs/sec	Failure Load:	23,360 lbs
Testing Time:	472 sec	Axial Strain at Failure:	0.0292 in/in
	(Rate 2-15 minutes to failure)	Stress:	8,702 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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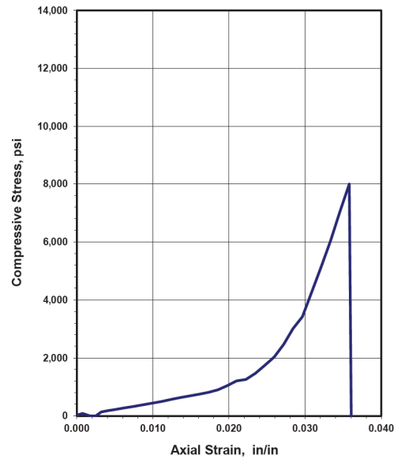
Unconfined Compressive Strength
of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 6/20/2014
Test Performed by: K.R./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-113-5-13	Average Length:	4.05 in
Station / Offset:	250+13.44, 36.0' Rt.	Average Diameter:	1.862 in
Sample No. / Depth:	RC-5 / 80.7 ft	Length to diameter ratio:	2.175
Moisture condition:	As received	Cross Sectional Area:	2.722 in^2
Rate of Loading:	49.1 lbs/sec	Failure Load:	21,760 lbs
Testing Time:	443 sec	Axial Strain at Failure:	0.0358 in/in
	(Rate 2-15 minutes to failure)	Stress:	7,992 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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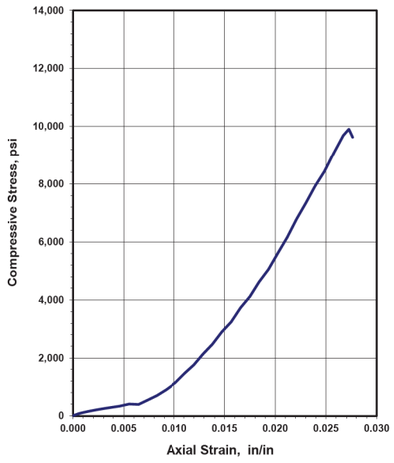
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 5/7/2014
Test Performed by: K.R./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-113-6-13	Average Length:	5.431 in
Station / Offset:	251+93.56, 37.3' Rt.	Average Diameter:	2.468 in
Sample No. / Depth:	RC-1 / 45.9 ft	Length to diameter ratio:	2.201
Moisture condition:	As received	Cross Sectional Area:	4.781 in^2
Rate of Loading:	76.1 lbs/sec	Failure Load:	47,380 lbs
Testing Time:	623 sec	Axial Strain at Failure:	0.0273 in/in
	(Rate 2-15 minutes to failure)	Stress:	9,906 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS: _____

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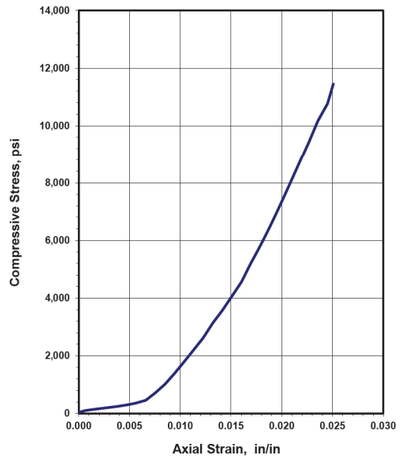
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 5/7/2014
Test Performed by: K.R./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-113-6-13	Average Length:	5.305 in
Station / Offset:	251+93.56, 37.3' Rt.	Average Diameter:	2.485 in
Sample No. / Depth:	RC-2 / 50.7 ft	Length to diameter ratio:	2.135
Moisture condition:	As received	Cross Sectional Area:	4.848 in^2
Rate of Loading:	79.3 lbs/sec	Failure Load:	55,510 lbs
Testing Time:	700 sec	Axial Strain at Failure:	0.0251 in/in
	(Rate 2-15 minutes to failure)	Stress:	11,448 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS: _____

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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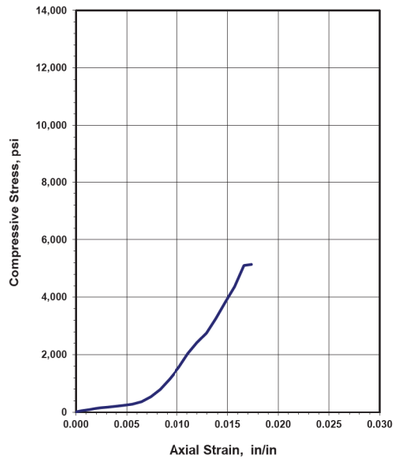
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 5/7/2014
Test Performed by: K.R./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-113-6-13	Average Length:	5.417 in
Station / Offset:	251+93.56, 37.3' Rt.	Average Diameter:	2.493 in
Sample No. / Depth:	RC-3 / 54.8 ft	Length to diameter ratio:	2.173
Moisture condition:	As received	Cross Sectional Area:	4.879 in^2
Rate of Loading:	69.7 lbs/sec	Failure Load:	25,080 lbs
Testing Time:	360 sec	Axial Strain at Failure:	0.0174 in/in
	(Rate 2-15 minutes to failure)	Stress:	5,140 psi

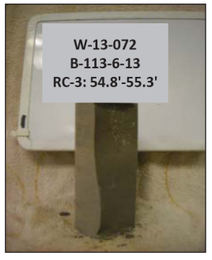
Unconfined Compression Test



Before Testing

Photo Not Available

After Failure



REMARKS:

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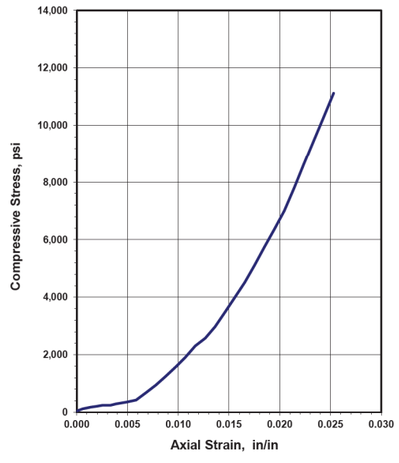
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 5/7/2014
Test Performed by: K.R./T.K.

Rock Description: Limestone

Boring No.:	B-113-7-13	Average Length:	5.139 in
Station / Offset:	254+41.19, 36.0' Rt.	Average Diameter:	2.478 in
Sample No. / Depth:	RC-5 / 42.2 ft	Length to diameter ratio:	2.074
Moisture condition:	As received	Cross Sectional Area:	4.820 in^2
Rate of Loading:	82.5 lbs/sec	Failure Load:	53,610 lbs
Testing Time:	650 sec	Axial Strain at Failure:	0.0253 in/in
	(Rate 2-15 minutes to failure)	Stress:	11,119 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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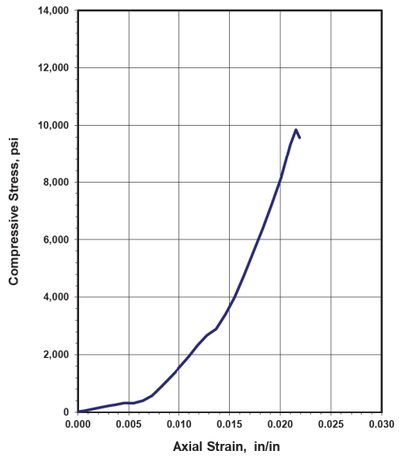
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 5/7/2014
Test Performed by: K.R./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-113-7-13	Average Length:	5.478 in
Station / Offset:	254+41.19, 36.0' Rt.	Average Diameter:	2.483 in
Sample No. / Depth:	RC-6 / 50.2 ft	Length to diameter ratio:	2.206
Moisture condition:	As received	Cross Sectional Area:	4.840 in^2
Rate of Loading:	72.5 lbs/sec	Failure Load:	47,680 lbs
Testing Time:	658 sec	Axial Strain at Failure:	0.0215 in/in
(Rate 2-15 minutes to failure)		Stress:	9,850 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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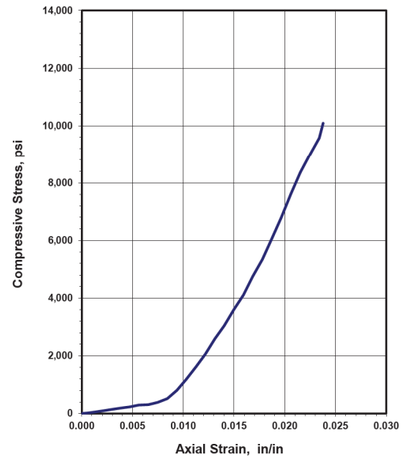
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 5/7/2014
Test Performed by: K.R./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-113-7-13	Average Length:	5.342 in
Station / Offset:	254+41.19, 36.0' Rt.	Average Diameter:	2.483 in
Sample No. / Depth:	RC-7 / 51.2 ft	Length to diameter ratio:	2.151
Moisture condition:	As received	Cross Sectional Area:	4.840 in^2
Rate of Loading:	73.5 lbs/sec	Failure Load:	48,830 lbs
Testing Time:	664 sec	Axial Strain at Failure:	0.0238 in/in
(Rate 2-15 minutes to failure)		Stress:	10,087 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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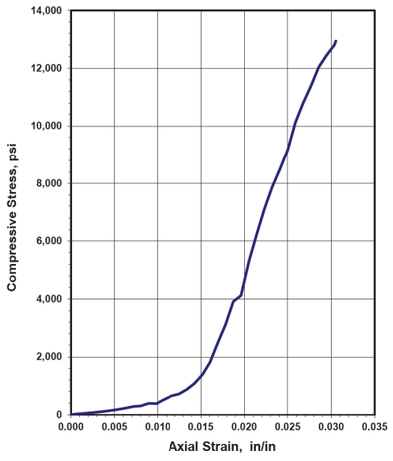
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 5/15/2014
Test Performed by: C.S./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-113-8-13	Average Length:	5.602 in
Station / Offset:	256+62.64, 36.0' Rt.	Average Diameter:	2.475 in
Sample No. / Depth:	RC-4 / 47.1 ft	Length to diameter ratio:	2.263
Moisture condition:	Dry	Cross Sectional Area:	4.809 in^2
Rate of Loading:	75.2 lbs/sec	Failure Load:	62,250 lbs
Testing Time:	828 sec	Axial Strain at Failure:	0.0305 in/in
(Rate 2-15 minutes to failure)		Stress:	12,942 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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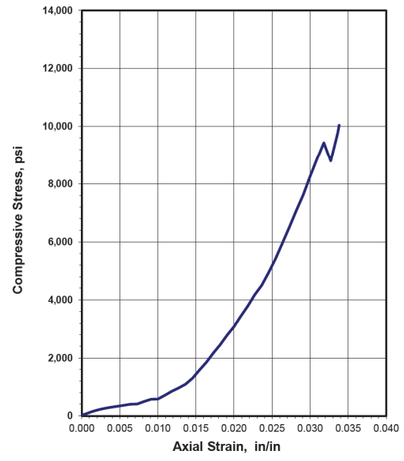
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 5/15/2014
Test Performed by: C.S./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-113-8-13	Average Length:	5.503 in
Station / Offset:	256+62.64, 36.0' Rt.	Average Diameter:	2.481 in
Sample No. / Depth:	RC-5 / 52.3 ft	Length to diameter ratio:	2.218
Moisture condition:	Dry	Cross Sectional Area:	4.832 in^2
Rate of Loading:	60.3 lbs/sec	Failure Load:	45,620 lbs
Testing Time:	757 sec	Axial Strain at Failure:	0.0318 in/in
(Rate 2-15 minutes to failure)		Stress:	9,438 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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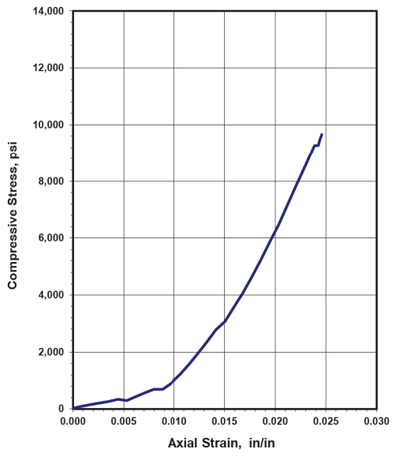
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 5/15/2014
Test Performed by: C.S./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-113-8-13	Average Length:	5.655 in
Station / Offset:	256+62.64, 36.0' Rt.	Average Diameter:	2.486 in
Sample No. / Depth:	RC-6 / 56.8 ft	Length to diameter ratio:	2.275
Moisture condition:	Dry	Cross Sectional Area:	4.851 in^2
Rate of Loading:	73.6 lbs/sec	Failure Load:	46,860 lbs
Testing Time:	637 sec	Axial Strain at Failure:	0.0246 in/in
(Rate 2-15 minutes to failure)		Stress:	9,657 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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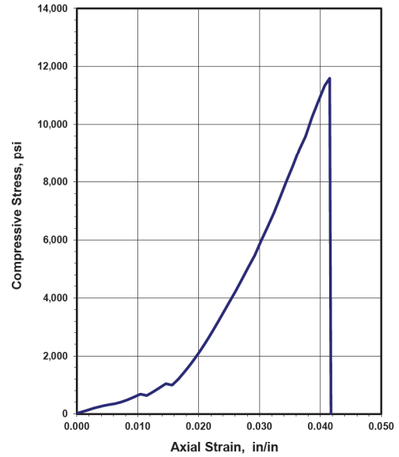
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 4/7/2014
Test Performed by: K.R./T.K.

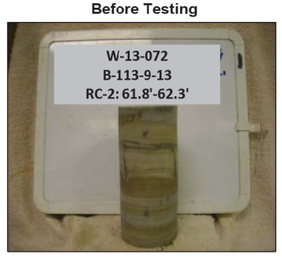
Rock Description: Dolomitic Limestone

Boring No.:	B-113-9-13	Average Length:	4.792 in
Station / Offset:	258+77.50, 36.0' Rt.	Average Diameter:	2.396 in
Sample No. / Depth:	RC-2 / 61.8 ft	Length to diameter ratio:	2.000
Moisture condition:	As received	Cross Sectional Area:	4.507 in^2
Rate of Loading:	106.7 lbs/sec	Failure Load:	52,270 lbs
Testing Time:	490 sec	Axial Strain at Failure:	0.0415 in/in
(Rate 2-15 minutes to failure)		Stress:	11,594 psi

Unconfined Compression Test



Before Testing



After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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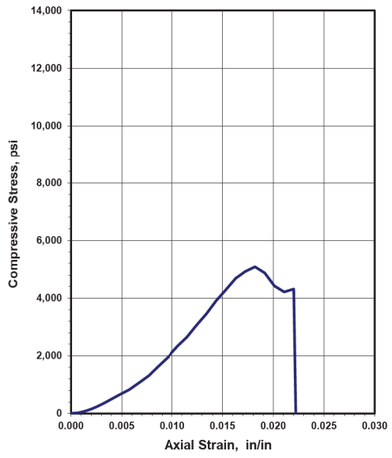
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 4/7/2014
Test Performed by: K.R./T.K.

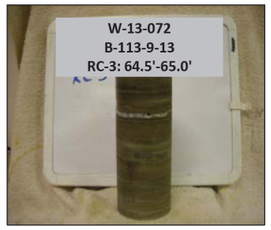
Rock Description: Dolomitic Limestone

Boring No.:	B-113-9-13	Average Length:	5.221 in
Station / Offset:	258+77.50, 36.0' Rt.	Average Diameter:	2.399 in
Sample No. / Depth:	RC-3 / 64.5 ft	Length to diameter ratio:	2.176
Moisture condition:	As received	Cross Sectional Area:	4.518 in^2
Rate of Loading:	70.5 lbs/sec	Failure Load:	22,980 lbs
Testing Time:	326 sec	Axial Strain at Failure:	0.0182 in/in
	(Rate 2-15 minutes to failure)	Stress:	5,086 psi

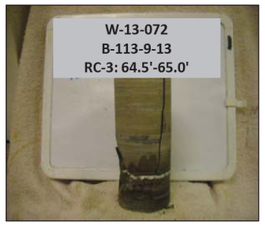
Unconfined Compression Test



Before Testing



After Failure



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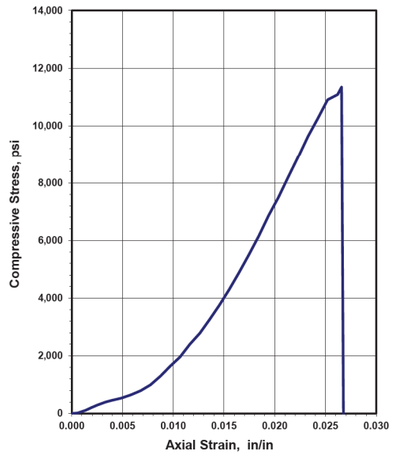
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 6/20/2014
Test Performed by: K.R./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-114-1-13	Average Length:	5.157 in
Station / Offset:	260+75.33, 40.2' Rt.	Average Diameter:	2.4 in
Sample No. / Depth:	RC-4 / 76 ft	Length to diameter ratio:	2.149
Moisture condition:	As received	Cross Sectional Area:	4.522 in^2
Rate of Loading:	88.3 lbs/sec	Failure Load:	51,290 lbs
Testing Time:	581 sec	Axial Strain at Failure:	0.0266 in/in
	(Rate 2-15 minutes to failure)	Stress:	11,340 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM | CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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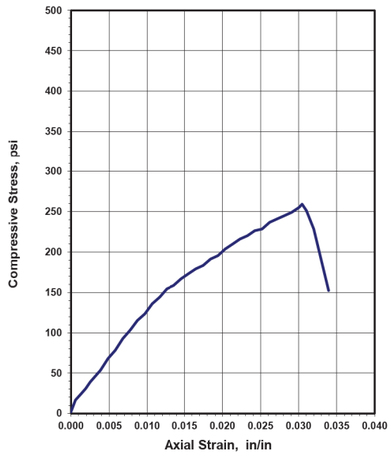
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 6/19/2014
Test Performed by: C.S./T.K.

Rock Description: Shale

Boring No.:	B-114-3-13	Average Length:	5.157 in
Station / Offset:	264+64.99, 20.3' Lt.	Average Diameter:	2.488 in
Sample No. / Depth:	RC-2 / 77.5 ft	Length to diameter ratio:	2.073
Moisture condition:	Dry	Cross Sectional Area:	4.859 in^2
Rate of Loading:	3.0 lbs/sec	Failure Load:	1,260 lbs
Testing Time:	424 sec	Axial Strain at Failure:	0.0304 in/in
(Rate 2-15 minutes to failure)		Stress:	259 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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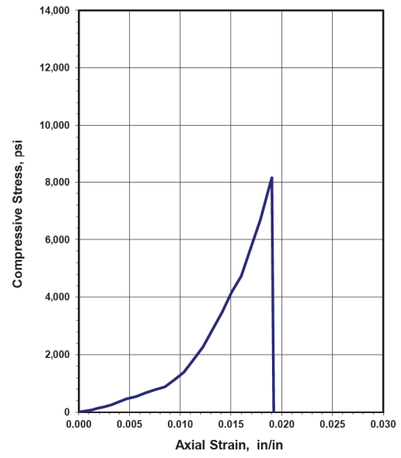
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 3/7/2014
Test Performed by: K.R./T.K.

Rock Description: Gray Limestone

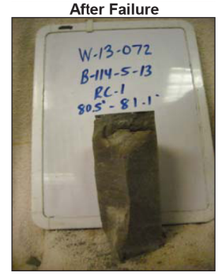
Boring No.:	B-114-5-13	Average Length:	5.312 in
Station / Offset:	268+86.79, 10.9' Lt.	Average Diameter:	2.493 in
Sample No. / Depth:	RC-1 / 80.5 ft	Length to diameter ratio:	2.131
Moisture condition:	As received	Cross Sectional Area:	4.879 in^2
Rate of Loading:	99.7 lbs/sec	Failure Load:	39,790 lbs
Testing Time:	399 sec	Axial Strain at Failure:	0.0190 in/in
(Rate 2-15 minutes to failure)		Stress:	8,154 psi

Unconfined Compression Test



Before Testing

After Failure



REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

58/496

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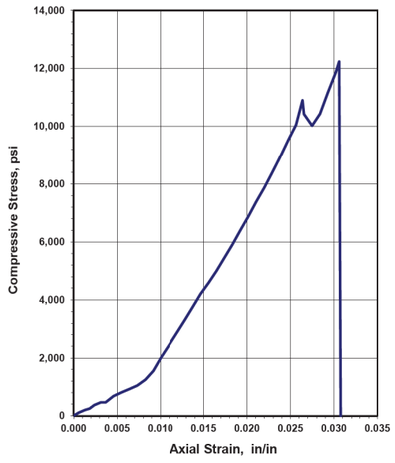
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 3/7/2014
Test Performed by: K.R./T.K.

Rock Description: Gray Limestone

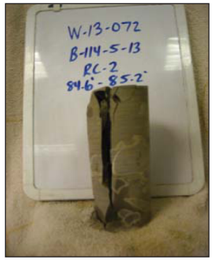
Boring No.:	B-114-5-13	Average Length:	5.459 in
Station / Offset:	268+86.79, 10.9' Lt.	Average Diameter:	2.499 in
Sample No. / Depth:	RC-2 / 84.6 ft	Length to diameter ratio:	2.184
Moisture condition:	As received	Cross Sectional Area:	4.902 in^2
Rate of Loading:	78.7 lbs/sec	Failure Load:	53,450 lbs
Testing Time:	679 sec	Axial Strain at Failure:	0.0264 in/in
(Rate 2-15 minutes to failure)		Stress:	10,900 psi

Unconfined Compression Test



Before Testing

After Failure



REMARKS:

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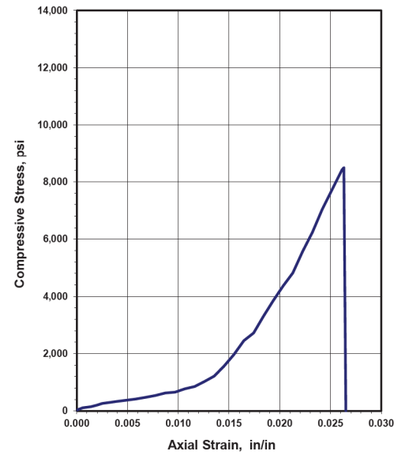
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 2/20/2014
Test Performed by: K.R./T.K.

Rock Description: Gray Limestone

Boring No.:	B-114-7-13	Average Length:	5.169 in
Station / Offset:	271+12.84, 28.4' Rt.	Average Diameter:	2.4 in
Sample No. / Depth:	RC-1 / 75.1 ft	Length to diameter ratio:	2.154
Moisture condition:	As received	Cross Sectional Area:	4.522 in^2
Rate of Loading:	67.1 lbs/sec	Failure Load:	38,390 lbs
Testing Time:	572 sec	Axial Strain at Failure:	0.0263 in/in
(Rate 2-15 minutes to failure)		Stress:	8,488 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

59/496

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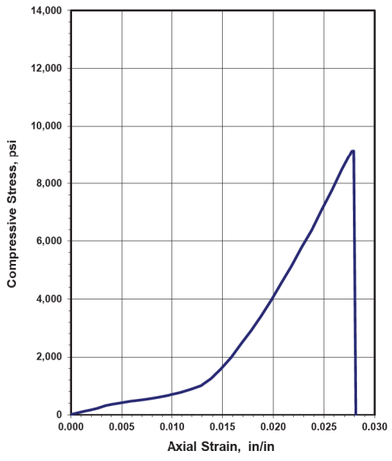
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 2/20/2014
Test Performed by: K.R./T.K.

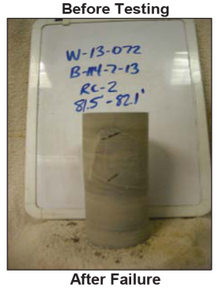
Rock Description: Gray Limestone

Boring No.:	B-114-7-13	Average Length:	5.047 in
Station / Offset:	271+12.84, 28.4' Rt.	Average Diameter:	2.397 in
Sample No. / Depth:	RC-2 / 81.5 ft	Length to diameter ratio:	2.106
Moisture condition:	As received	Cross Sectional Area:	4.510 in^2
Rate of Loading:	59.8 lbs/sec	Failure Load:	41,240 lbs
Testing Time:	690 sec	Axial Strain at Failure:	0.0279 in/in
(Rate 2-15 minutes to failure)		Stress:	9,141 psi

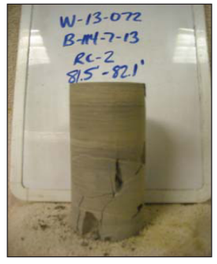
Unconfined Compression Test



Before Testing



After Failure



REMARKS:

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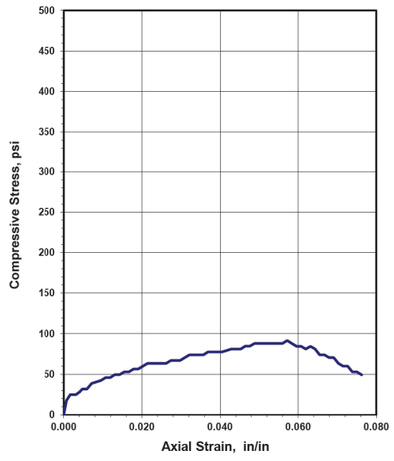
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 3/17/2014
Test Performed by: K.R./T.K.

Rock Description: Gray Claystone

Boring No.:	B-114-8-13	Average Length:	4.197 in
Station / Offset:	273+13.25, 16.5' Lt.	Average Diameter:	1.901 in
Sample No. / Depth:	RC-2 / 74.8 ft	Length to diameter ratio:	2.208
Moisture condition:	As received	Cross Sectional Area:	2.837 in^2
Rate of Loading:	0.3 lbs/sec	Failure Load:	260 lbs
Testing Time:	821 sec	Axial Strain at Failure:	0.0572 in/in
(Rate 2-15 minutes to failure)		Stress:	92 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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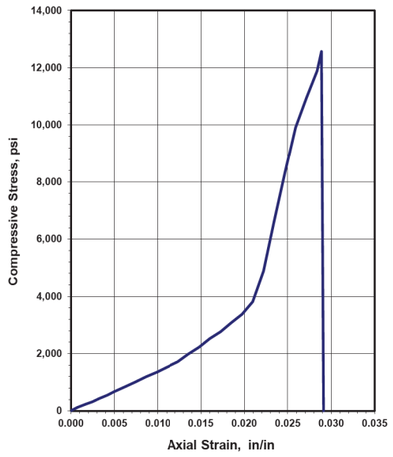
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 4/1/2014
Test Performed by: K.R./T.K.

Rock Description: Limestone

Boring No.:	B-114-8-13	Average Length:	4.053 in
Station / Offset:	273+13.25, 16.5' Lt.	Average Diameter:	1.869 in
Sample No. / Depth:	RC-3 / 78.4 ft	Length to diameter ratio:	2.169
Moisture condition:	As received	Cross Sectional Area:	2.742 in^2
Rate of Loading:	127.7 lbs/sec	Failure Load:	34,470 lbs
Testing Time:	270 sec	Axial Strain at Failure:	0.0289 in/in
(Rate 2-15 minutes to failure)		Stress:	12,567 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

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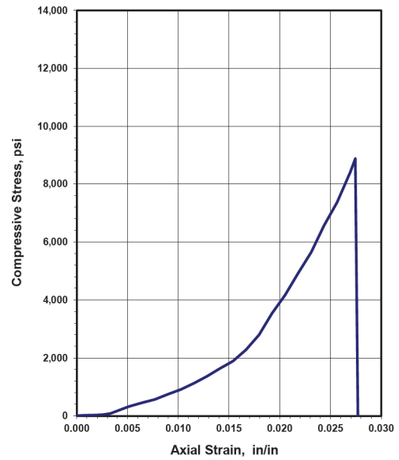
Unconfined Compressive Strength of Intact Rock Core Specimens (ASTM D 7012-04)

Project: FRA-70-13.10 - Project 6A
Project No.: W-13-072
Date of Testing: 6/23/2014
Test Performed by: K.R./T.K.

Rock Description: Dolomitic Limestone

Boring No.:	B-115-2-13	Average Length:	3.9 in
Station / Offset:	277+71.50, 20.2' Lt.	Average Diameter:	1.778 in
Sample No. / Depth:	RC-5 / 83.2 ft	Length to diameter ratio:	2.193
Moisture condition:	As received	Cross Sectional Area:	2.482 in^2
Rate of Loading:	56.9 lbs/sec	Failure Load:	22,010 lbs
Testing Time:	387 sec	Axial Strain at Failure:	0.0274 in/in
(Rate 2-15 minutes to failure)		Stress:	8,867 psi

Unconfined Compression Test



Before Testing

After Failure

REMARKS:

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
LABORATORY TEST DATA

FRA-70-12.68
FRA-70-13.10

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Point Load Strength Index of Rock Specimens
(ASTM D 5731-08)

Project: FRA-70-12.68
Project No.: W-13-045
Date of Testing: 8/27/2013
Test Performed by: E.M.

Rock Description: Black Shale

Boring No.: B-016-4-13
Station / Offset: 5059+89.96, 2.4' Rt.
Sample No. / Depth: RC-3 / 52.5' to 56.0'

Test Apparatus: Forney-LA 0080
Serial Number: A125/AZ/0014
Date of Calibration: 8/11/2012

Sample No.	Test Type	Depth (ft)	Width (mm)	Diameter (mm)	Load (N)	D_e^2 (mm^2)	D_e (mm)	F	Is (MPa)	$Is_{(50)}$ (MPa)	σ_c (MPa)
1	a ⊥	52.5	31.9	46.9	170	1,903	43.6	0.94	0.09	0.08	1.07
2	a ⊥	54.7	25.5	46.4	190	1,509	38.8	0.89	0.13	0.11	1.51
3	a ⊥	54.8	28.1	47.2	195	1,691	41.1	0.92	0.12	0.11	1.38
4	a ⊥	56.0	27.7	47.9	165	1,689	41.1	0.92	0.10	0.09	1.17

STATISTICS	
Mean $Is_{(50)}$ ⊥	0.10 MPa (14 psi)
Mean $Is_{(50)}$ ∥	
$Ia_{(50)}$	

Specific Specimen Shape:
d = diametrical
a = axial
b = block
i = irregular lump
⊥ = perpendicular to bedding plane
∥ = parallel to bedding plane

Estimated Unaxial Compression, $\sigma_c = K*Is$
K = 12
*Per Section 206.1.3 of 2011 ODOT Rock Slope Design Guide
Mean σ_c = 1.28 MPa (186 psi)

Remarks:

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Point Load Strength Index of Rock Specimens
(ASTM D 5731-08)

Project: FRA-70-13.10
Project No.: W-13-072
Date of Testing: 2/2/2015
Test Performed by: E.M.

Rock Description: Gray Mudstone

Boring No.: B-020-7-13
Station / Offset: 176+68.64, 1.8' Rt.
Sample No. / Depth: RC-4 / 69.4' to 74.8'

Test Apparatus: Forney-LA 0080
Serial Number: A125/AZ/0014
Date of Calibration: 8/9/2014

Sample No.	Test Type	Depth (ft)	Width (mm)	Diameter (mm)	Load (N)	D_e^2 (mm^2)	D_e (mm)	F	Is (MPa)	$Is_{(50)}$ (MPa)	σ_c (MPa)
1	a ⊥	69.4	37.0	46.5	70	2,192	46.8	0.97	0.03	0.03	0.38
2	a ⊥	70.6	37.1	46.0	185	2,174	46.6	0.97	0.09	0.08	1.02
3	a ⊥	70.9	35.8	45.5	195	2,078	45.6	0.96	0.09	0.09	1.13
4	a ⊥	73.8	36.7	45.9	105	2,143	46.3	0.97	0.05	0.05	0.59
5	a ⊥	74.8	34.2	45.6	110	1,983	44.5	0.95	0.06	0.05	0.67
6											
7											
8											
9											
10											

STATISTICS	
Mean $Is_{(50)}$ ⊥	0.06 MPa (9 psi)
Mean $Is_{(50)}$ ∥	
$Ia_{(50)}$	

Specific Specimen Shape:
d = diametrical
a = axial
b = block
i = irregular lump
⊥ = perpendicular to bedding plane
∥ = parallel to bedding plane

Estimated Unaxial Compression, $\sigma_c = K*Is$
K = 12
*Per Section 206.1.3 of 2011 ODOT Rock Slope Design Guide
Mean σ_c = 0.76 MPa (110 psi)

Remarks:

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Point Load Strength Index of Rock Specimens
(ASTM D 5731-08)

Project: FRA-70-13.10
Project No.: W-13-072
Date of Testing: 5/2/2014
Test Performed by: E.M.

Rock Description: Gray Shale

Boring No.: B-113-7-13
Station / Offset: 254+41.19, 36.0' Rt.
Sample No. / Depth: RC-3 / 30.9' to 35.7'

Test Apparatus: Forney-LA 0080
Serial Number: A125/AZ/0014
Date of Calibration: 8/10/2013

Sample No.	Test Type	Depth (ft)	Width (mm)	Diameter (mm)	Load (N)	D_e^2 (mm^2)	D_e (mm)	F	Is (MPa)	$Is_{(50)}$ (MPa)	σ_c (MPa)
1	a ⊥	30.9-35.7	35.4	57.3	50	2,583	50.8	1.01	0.02	0.02	0.23
2	a ⊥	30.9-35.7	42.5	63.0	50	3,409	58.4	1.07	0.01	0.02	0.18
3	a ⊥	30.9-35.7	46.4	62.8	70	3,711	60.9	1.09	0.02	0.02	0.23
4	a ⊥	30.9-35.7	48.0	64.9	90	3,967	63.0	1.11	0.02	0.03	0.27
5	a ⊥	30.9-35.7	46.6	63.1	100	3,747	61.2	1.10	0.03	0.03	0.32
6											
7											
8											
9											
10											

STATISTICS	
Mean $Is_{(50)}$ ⊥	0.02 MPa (3 psi)
Mean $Is_{(50)}$ ‖	
$Ia_{(50)}$	

Specific Specimen Shape:
d = diametrical
a = axial
b = block
i = irregular lump
⊥ = perpendicular to bedding plane
‖ = parallel to bedding plane

Estimated Unaxial Compression, σ_c = K*Is
K = 12
*Per Section 206.1.3 of 2011 ODOT Rock Slope Design Guide
Mean σ_c = 0.25 MPa (36 psi)

Remarks:

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Point Load Strength Index of Rock Specimens
(ASTM D 5731-08)

Project: FRA-70-13.10
Project No.: W-13-072
Date of Testing: 6/19/2014
Test Performed by: E.M.

Rock Description: Gray Shale

Boring No.: B-114-1-13
Station / Offset: 260+75.33, 40.2' Rt.
Sample No. / Depth: RC-3 / 73.0' to 74.0'

Test Apparatus: Forney-LA 0080
Serial Number: A125/AZ/0014
Date of Calibration: 8/10/2013

Sample No.	Test Type	Depth (ft)	Width (mm)	Diameter (mm)	Load (N)	D_e^2 (mm^2)	D_e (mm)	F	Is (MPa)	$Is_{(50)}$ (MPa)	σ_c (MPa)
1	a ⊥	73.0-74.0	26.6	61.0	350	2,066	45.5	0.96	0.17	0.16	2.03
2	a ⊥	73.0-74.0	28.0	61.0	290	2,177	46.7	0.97	0.13	0.13	1.60
3	a ⊥	73.0-74.0	25.0	61.0	275	1,941	44.1	0.94	0.14	0.13	1.70
4	a ⊥	73.0-74.0	27.0	60.7	295	2,086	45.7	0.96	0.14	0.14	1.70
6											
7											
8											
9											
10											

STATISTICS	
Mean $Is_{(50)}$ ⊥	0.14 MPa (20 psi)
Mean $Is_{(50)}$ ‖	
$Ia_{(50)}$	

Specific Specimen Shape:
d = diametrical
a = axial
b = block
i = irregular lump
⊥ = perpendicular to bedding plane
‖ = parallel to bedding plane

Estimated Unaxial Compression, σ_c = K*Is
K = 12
*Per Section 206.1.3 of 2011 ODOT Rock Slope Design Guide
Mean σ_c = 1.76 MPa (255 psi)

Remarks:

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Point Load Strength Index of Rock Specimens
(ASTM D 5731-08)

Project: FRA-70-13.10
Project No.: W-13-072
Date of Testing: 6/19/2014
Test Performed by: E.M.

Rock Description: SHALE

Boring No.: B-114-9-13
Station / Offset: 275+07.50, 4.7' Rt.
Sample No. / Depth: RC-3/4 / 78.8' to 81.3'

Test Apparatus: Forney-LA 0080
Serial Number: A125/AZ/0014
Date of Calibration: 8/12/2013

Sample No.	Test Type	Depth (ft)	Width (mm)	Diameter (mm)	Load (N)	D_e^2 (mm^2)	D_e (mm)	F	Is (MPa)	$Is_{(50)}$ (MPa)	σ_c (MPa)
1	a ⊥	78.8'-81.3'	36.1	46.9	330	2,159	46.5	0.97	0.15	0.15	1.83
2	a ⊥	78.8'-81.3'	33.5	50.5	35	2,157	46.4	0.97	0.02	0.02	0.19
3	a ⊥	78.8'-81.3'	33.4	47.8	25	2,032	45.1	0.95	0.01	0.01	0.15
4	a ⊥	78.8'-81.3'	35.1	47.9	330	2,143	46.3	0.97	0.15	0.15	1.85
5	a ⊥	78.8'-81.3'	35.1	47.9	310	1,808	42.5	0.93	0.17	0.16	2.06

STATISTICS	
Mean $Is_{(50)}$ ⊥	0.10 MPa (14 psi)
Mean $Is_{(50)}$ ‖	
$Ia_{(50)}$	

Specific Specimen Shape:
d = diametrical
a = axial
b = block
i = irregular lump
⊥ = perpendicular to bedding plane
‖ = parallel to bedding plane

Estimated Unaxial Compression, $\sigma_c = K^*Is$

K = 12
*Per Section 206.1.3 of 2011 ODOT Rock Slope Design Guide

Mean σ_c = 1.22 MPa (176 psi)

Remarks:

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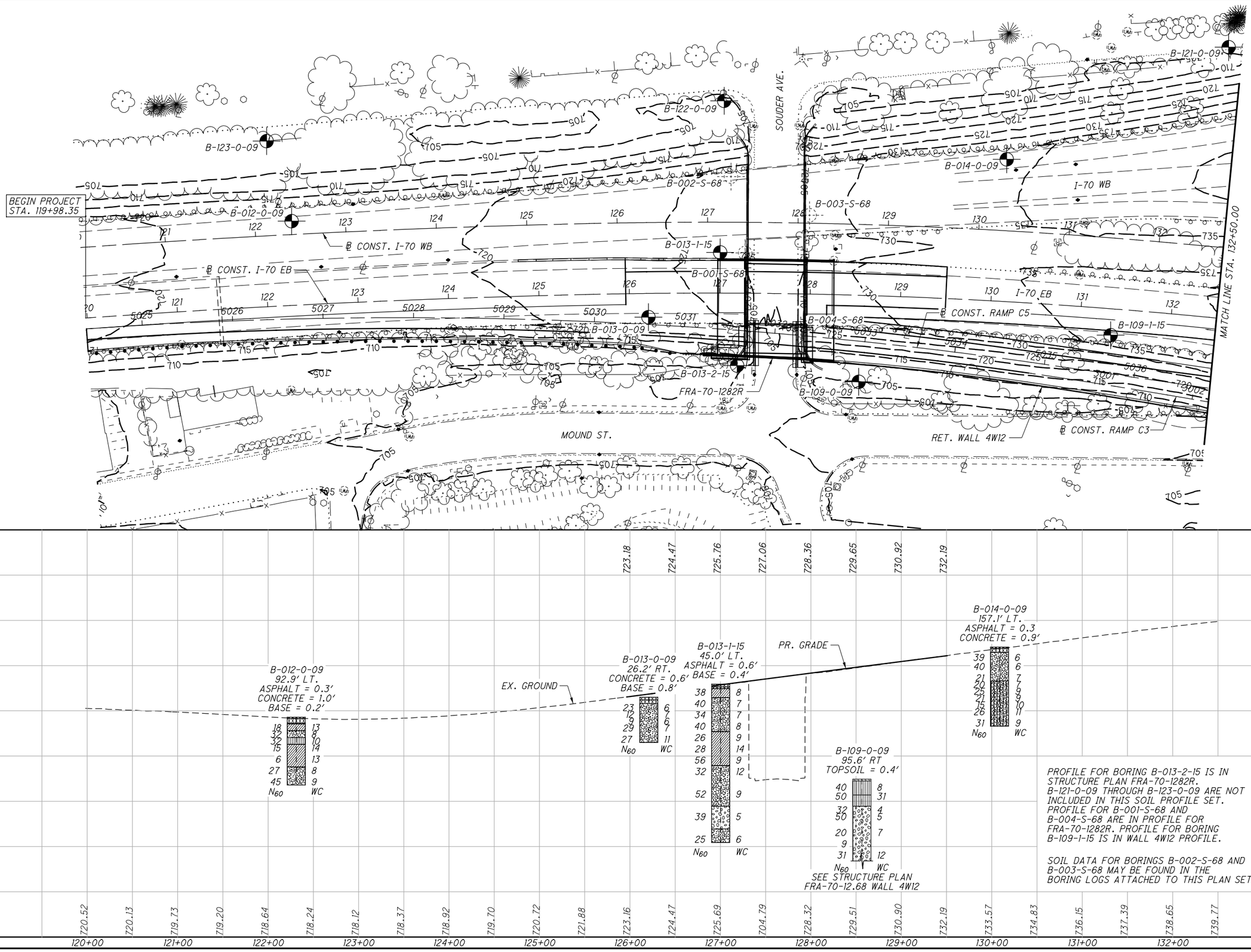

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 119+98.35 TO STA. 132+50.00 I-70 EB
FRA-70-12.68

SOIL PROFILE
STA. 132+50 TO STA. 145+50 I-70 EB

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

FRA-70-12.68

66/496

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PROFILE FOR BORING B-015-4-13 IS IN STRUCTURE PLAN FRA-70-1301A.
PROFILES FOR BORINGS B-015-W-68, B-018-E-68, B-108-5-13, B-108-6-13, B-113-1-09 AND B-113-2-13 ARE IN STRUCTURE PLAN FRA-71-1503L.
PROFILES FOR BORINGS B-110-0-09 AND B-110-1-15 ARE IN WALL PLAN 4W12.
PROFILES FOR BORINGS B-108-3-13 AND B-108-9-15 ARE IN STRUCTURE PLAN FRA-71-1518A.
BORINGS B-001-A-68, B-003-W-68, B-010-W-68, B-113-0-09, M-021-0-55 AND M-019-0-55 ARE NOT INCLUDED IN PLAN SET.

EX. GROUND

PR. GRADE

B-015-0-09
123.0′ LT.
ASPHALT = 0.3′
CONCRETE = 0.8′
BASE = 0.5′

B-015-1-13
26.1′ RT.
ASPHALT = 0.8′
BASE = 0.5′

B-003-E-68
30.3′ LT.

B-015-2-13
107.5′ RT.
TOPSOIL = 0.4′

B-001-B-68
149.1′ RT.

B-012-E-68
48.9′ RT.

B-018-E-68
23.5′ RT.

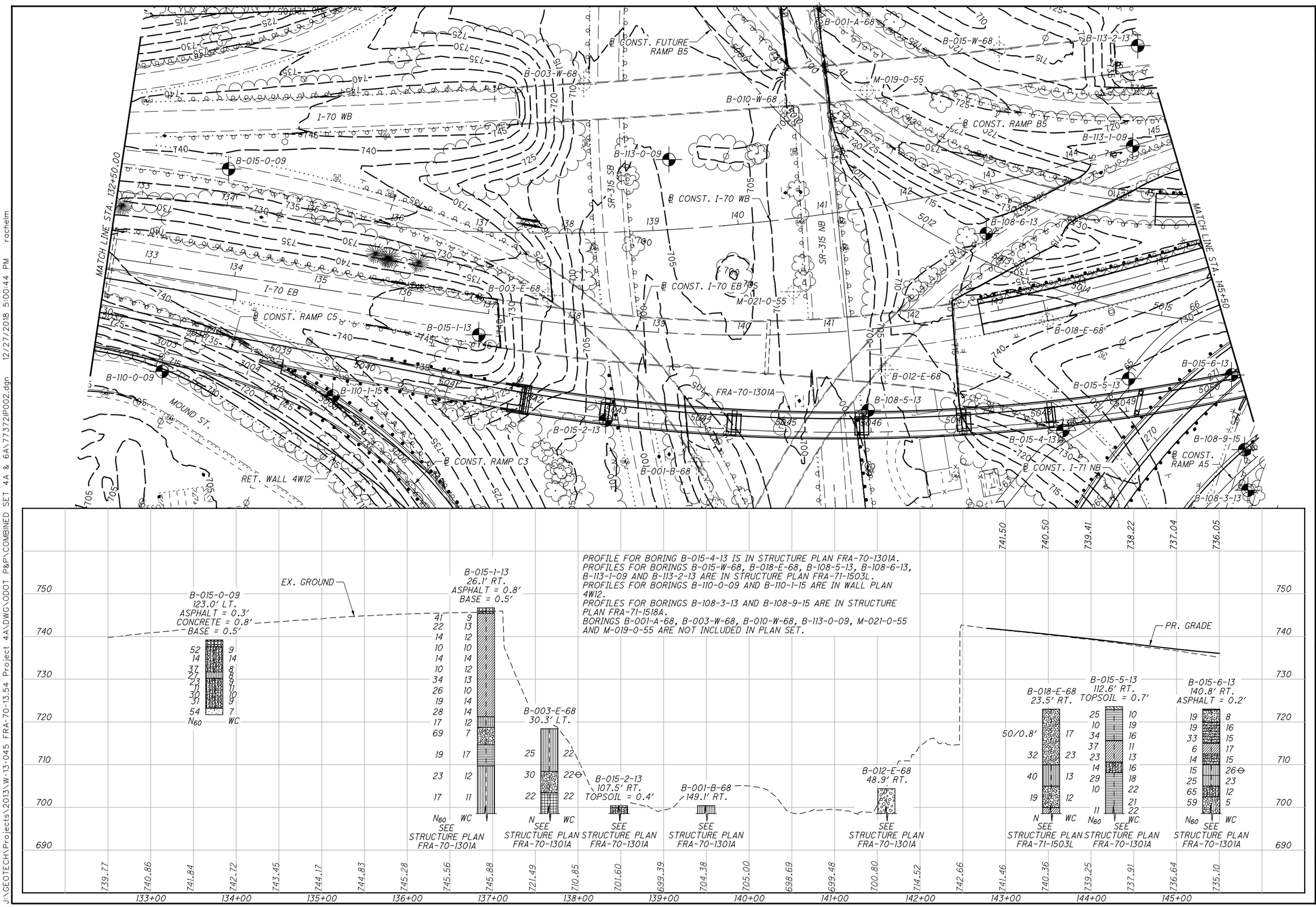
B-015-5-13
112.6′ RT.
TOPSOIL = 0.7′

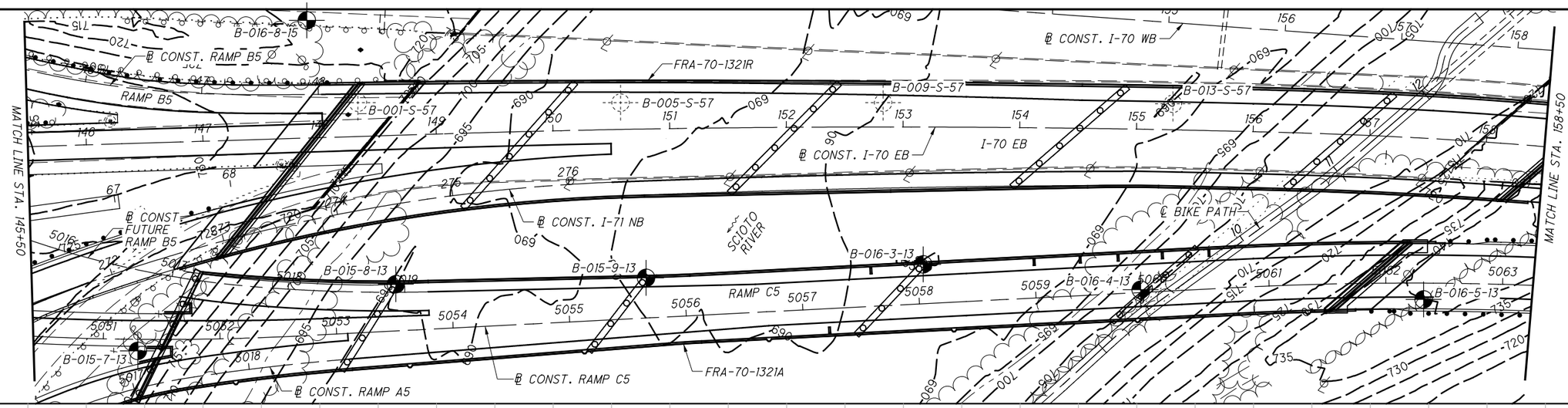
B-015-6-13
140.8′ RT.
ASPHALT = 0.2′

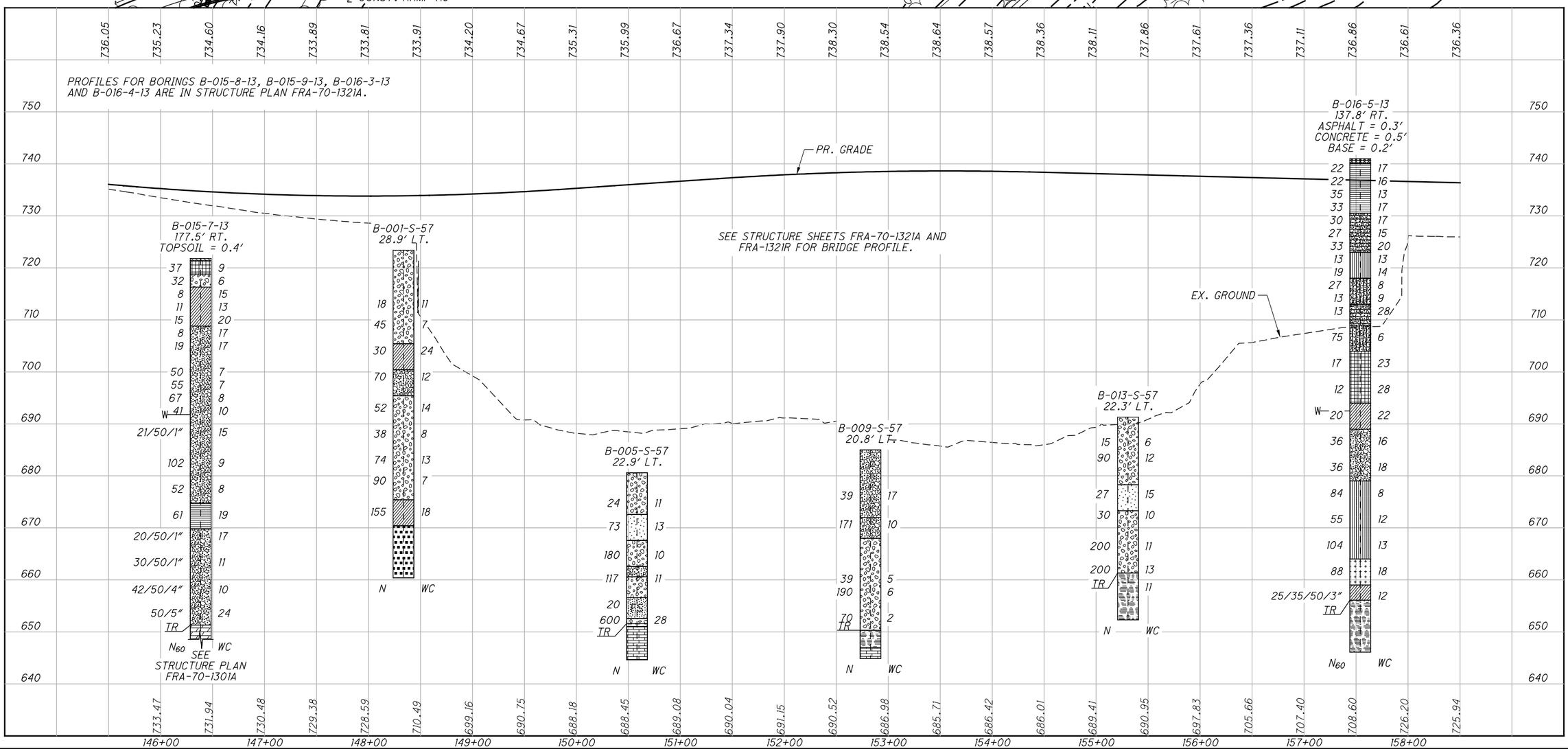
SEE STRUCTURE PLAN FRA-70-1301A

SEE STRUCTURE PLAN FRA-71-1503L

SEE STRUCTURE PLAN FRA-70-1301A







SOIL PROFILE
STA. 145+50 TO STA. 158+50 I-70 EB
FRA-70-12.68
DRAWN RRM
CHECKED BRT
HORIZONTAL SCALE IN FEET
0 25 50 100
67 / 496

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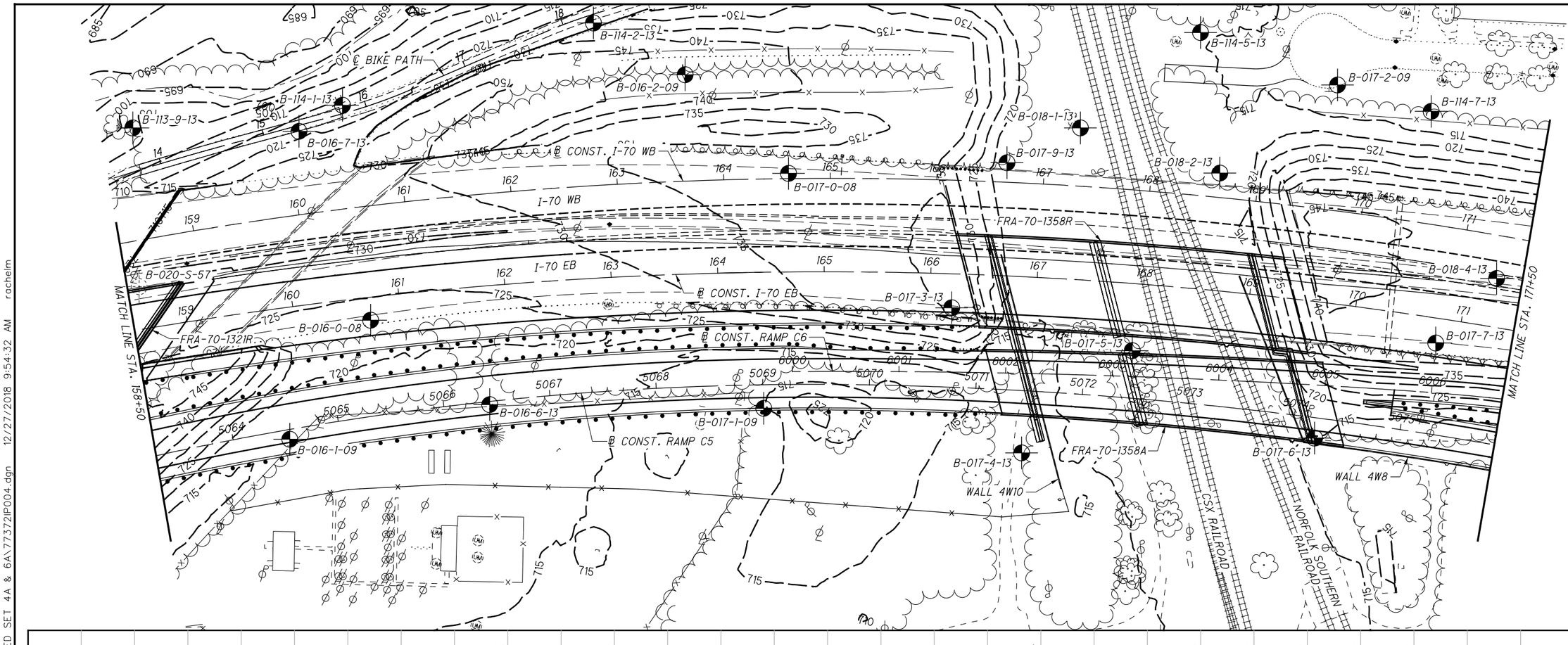

PROFILE FOR BORING B-017-1-09 IS IN SOIL PLAN RAMP C5.
PROFILE FOR BORING B-017-4-13 IS IN STRUCTURE PLAN FRA-70-1358A.
PROFILE FOR BORINGS B-016-2-09, B-017-2-09, B-113-9-13, B-114-1-13, B-114-2-13, B-114-5-13 AND B-114-7-13 ARE IN STRUCTURE PLAN FRA-71-1503L.
PROFILE FOR BORING B-016-7-13 IS IN STRUCTURE PLAN FRA-70-1323C.
PROFILE FOR BORINGS B-017-9-13, B-018-1-13 AND B-018-2-13 ARE IN STRUCTURE PLAN FRA-70-1358L.
PROFILE FOR BORING B-018-4-13 IS IN WALL PLAN E3.

PR. GRADE
EX. GROUND

B-020-S-57
40.0′ LT.
SEE STRUCTURE PLAN FRA-70-1321A

B-016-1-09
123.0′ RT.
TOPSOIL = 0.3′
SEE STRUCTURE PLAN FRA-70-1321A

B-016-0-08
21.5′ RT.
ASPHALT = 0.7′
BASE = 0.3′

B-016-6-13
111.3′ RT
SEE SOIL PLAN RAMP C5

B-017-0-08
92.5′ LT
ASPHALT = 0.5′
CONCRETE = 0.9′
BASE = 0.3′

B-017-3-13
31.8′ RT
ASPHALT = 0.5′
BASE = 0.3′
SEE STRUCTURE PLAN FRA-70-1358A

SEE STRUCTURE PLANS FRA-70-1358A AND FRA-70-1358R FOR BRIDGE PROFILES.

B-017-5-13
62.9′ RT
TOPSOIL = 0.2′
SEE STRUCTURE PLAN FRA-70-1358A

B-017-6-13
127.3′ RT.
SEE STRUCTURE PLAN HAM-75-1539L/R

B-017-7-13
23.3′ RT
ASPHALT = 0.9′
BASE = 0.5′
SEE STRUCTURE PLAN FRA-70-1358A

159+00 160+00 161+00 162+00 163+00 164+00 165+00 166+00 167+00 168+00 169+00 170+00 171+00

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 158+50 TO STA. 171+50 I-70 EB

FRA-70-12.68

68/496

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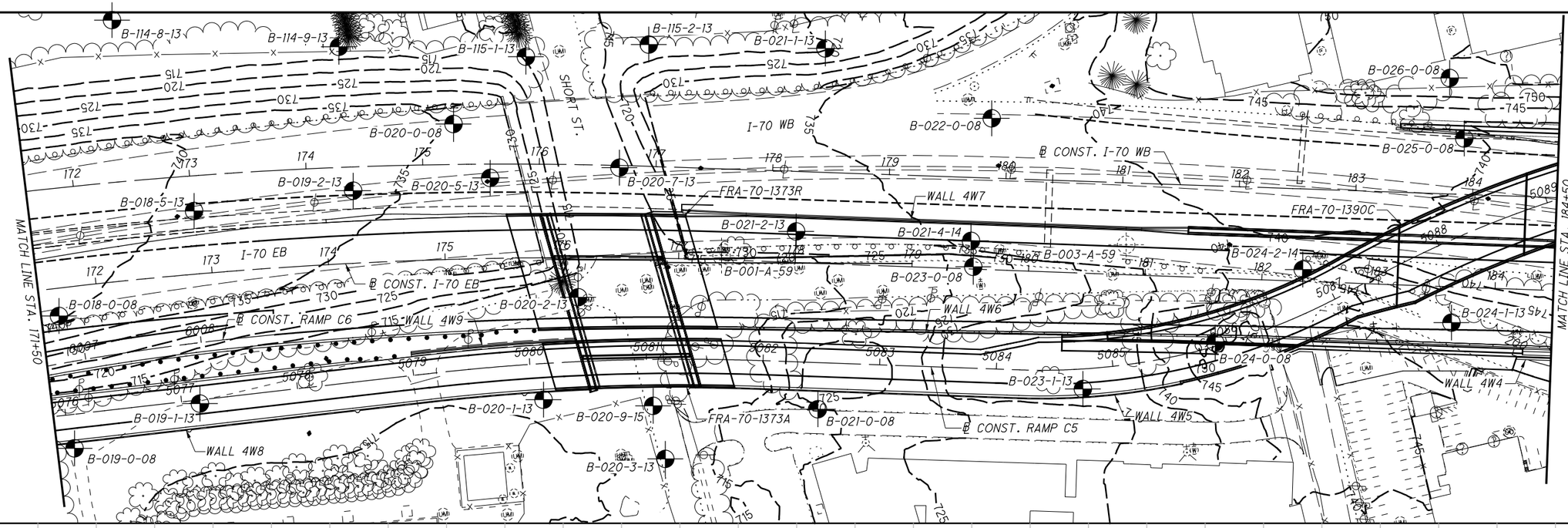
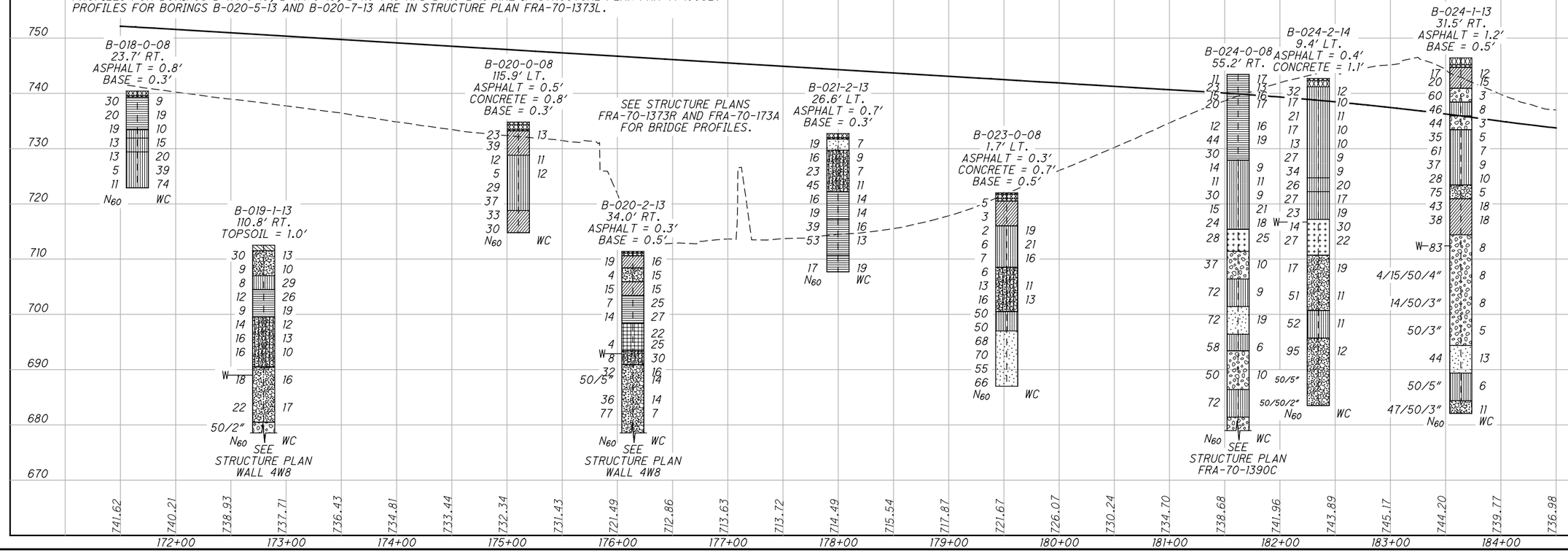


PROFILES FOR BORINGS B-019-0-08 AND B-020-1-13 ARE IN STRUCTURE PLAN WALL 4W8.
PROFILES FOR BORINGS B-021-0-08 AND B-023-1-13 ARE IN STRUCTURE PLAN WALL 4W5.
PROFILE FOR BORING B-020-9-15 IS IN STRUCTURE PLAN FRA-70-1373A.
PROFILES FOR BORINGS B-021-4-14, B-001-A-59, AND B-003-A-59 ARE IN STRUCTURE PLAN WALL 4W7.
PROFILES FOR BORINGS B-018-5-13 AND B-019-2-13 ARE IN STRUCTURE PLAN WALL E3.
PROFILES FOR BORINGS B-114-8-13, B-114-9-13, B-115-1-13 AND B-115-2-13 ARE IN STRUCTURE PLAN FRA-71-1503L.
PROFILES FOR BORINGS B-020-5-13 AND B-020-7-13 ARE IN STRUCTURE PLAN FRA-70-1373L.

PROFILE FOR BORING B-021-1-13 IS IN STRUCTURE PLAN WALL E7.
PROFILES FOR BORINGS B-022-0-08 AND B-025-0-08 ARE IN SOIL PLAN I-70 WB.
PROFILE FOR BORING B-020-3-13 IS IN SOIL PLAN SHORT STREET.
PROFILE FOR BORING B-026-0-08 IS IN STRUCTURE PLAN FRA-70-1390C.



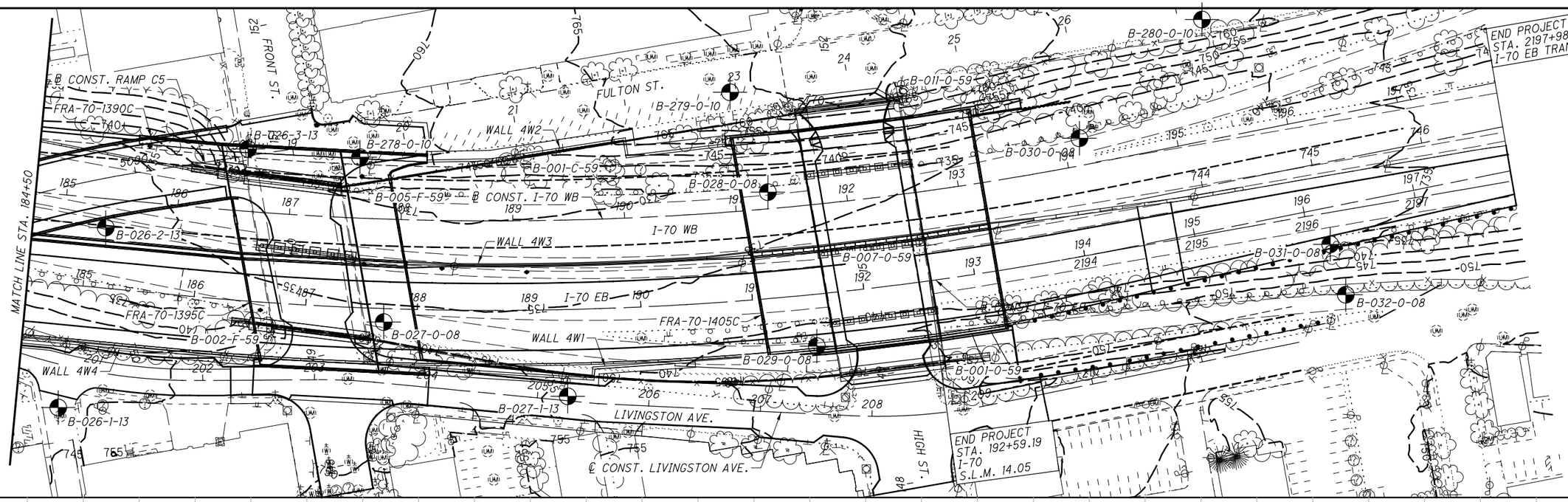
SOIL PROFILE
STA. 171+50 TO STA. 184+50 I-70 EB

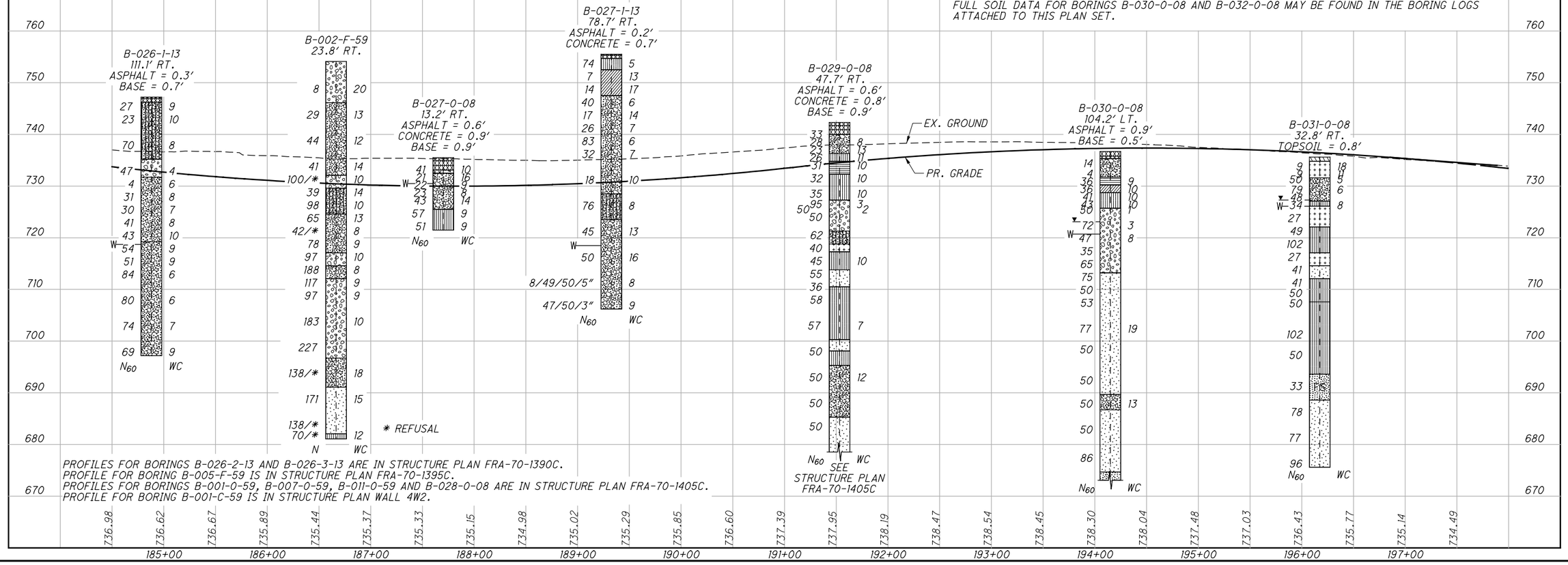
HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

FRA-70-12.68

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372IP005.dgn 1/30/2019 7:57:47 PM rachelm





SOIL PROFILE
STA. 184+50 TO STA. 2197+98.92 I-70 EB TRANS.

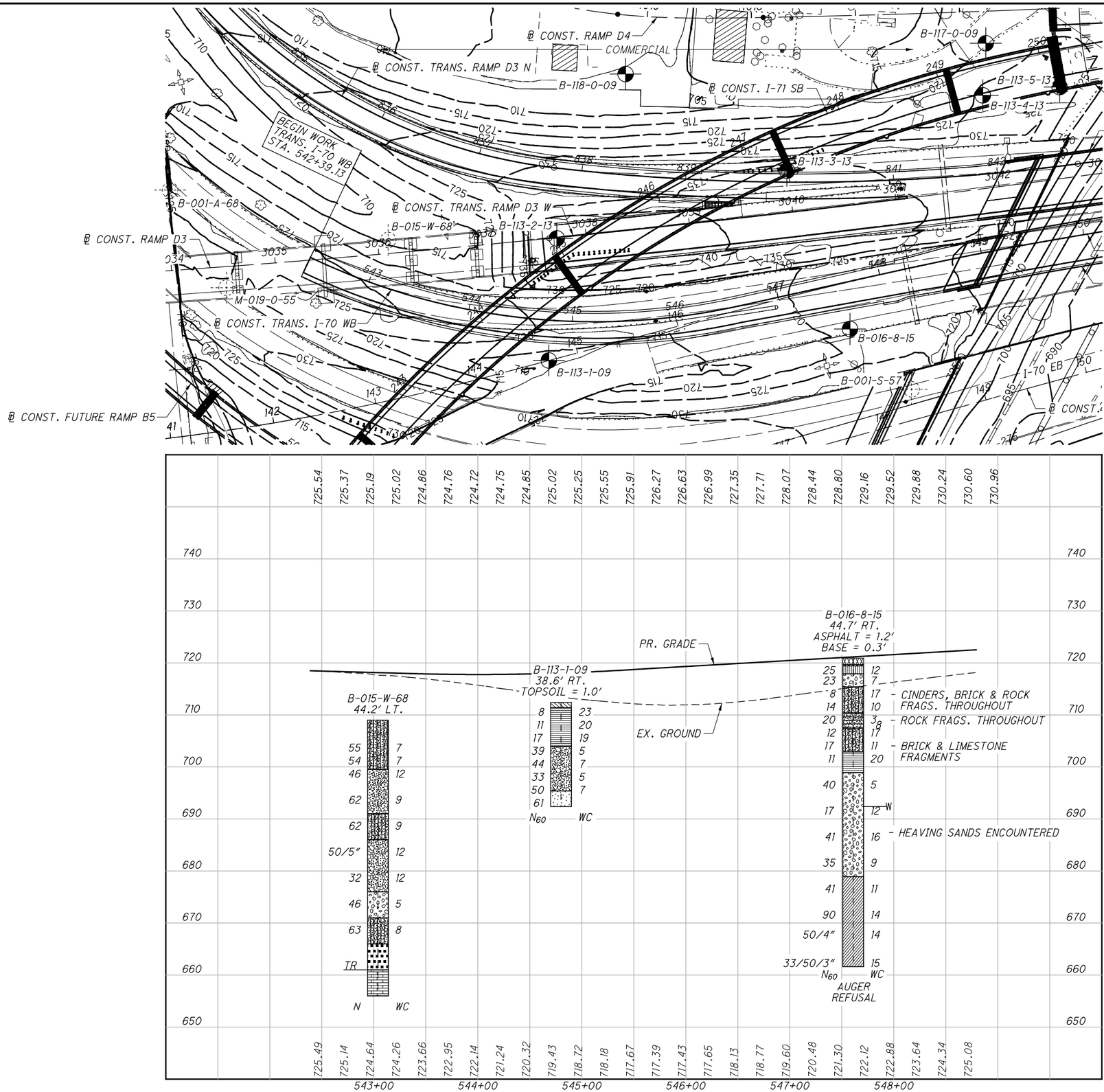
HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

FRA-70-12.68

70 / 496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372IP006.dgn 12/28/2018 10:25:49 AM rachelm



HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 542+39.13 TO STA. 548+79.18
TRANS. I-70 WB (WEST SIDE)

FRA-70-13.10

71 / 496

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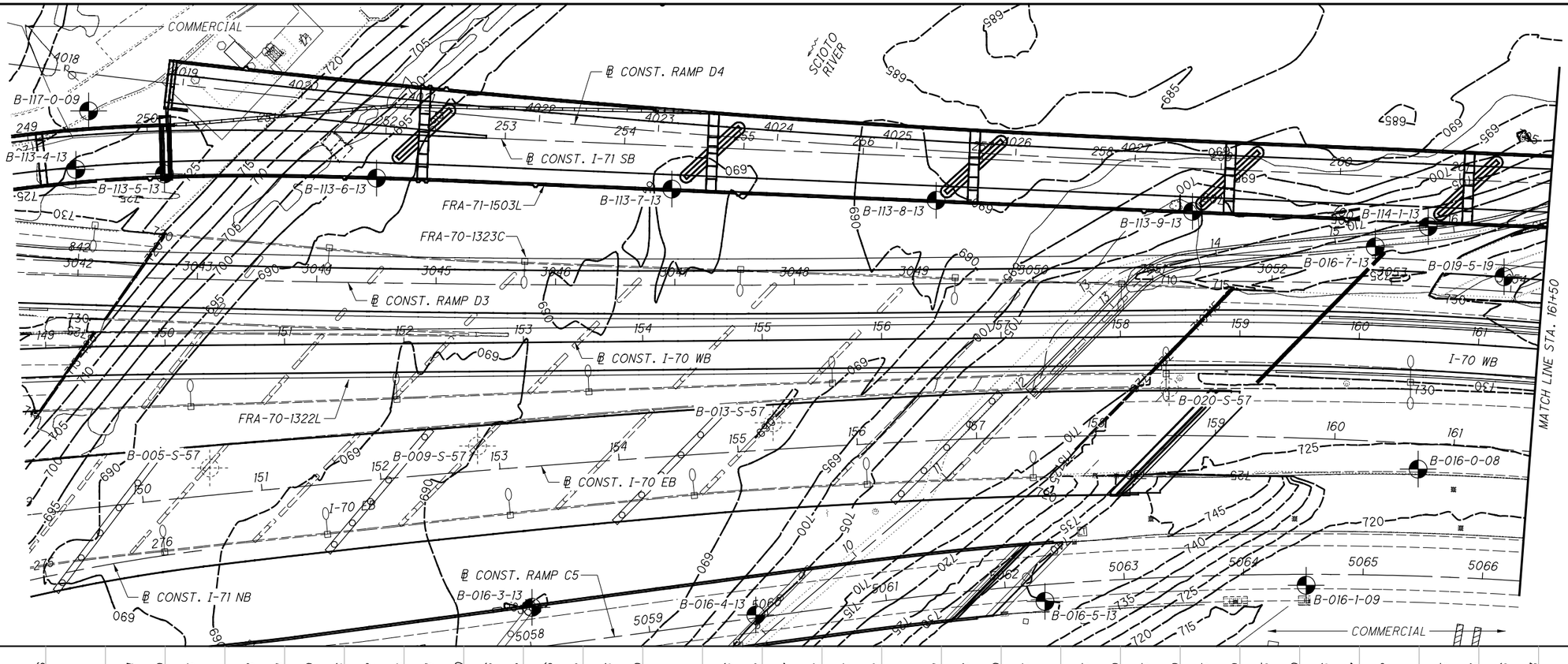


PROFILES FOR BORINGS B-113-4-13 THROUGH B-113-9-13 AND B-114-1-13 ARE IN STRUCTURE PLAN FRA-71-1503L.
PROFILES FOR BORINGS B-016-3-13 THROUGH B-016-5-13 AND B-016-1-09 ARE IN STRUCTURE PLAN FRA-70-1321A.
PROFILES FOR B-016-7-13 AND B-019-5-19 ARE IN STRUCTURE PLAN FRA-70-1323C.
BORING B-117-0-09 IS NOT INCLUDED IN THIS PLAN SET.

PR. GRADE

SEE FRA-70-1322L PROFILE SHEETS FOR BRIDGE PROFILE.

SEE FRA-70-1323C PROFILE SHEETS FOR BRIDGE PROFILE.

EX. GROUND

B-005-S-57
SEE STRUCTURE PLAN FRA-70-1322L

B-009-S-57
SEE STRUCTURE PLAN FRA-70-1322L

B-013-S-57
15 90 6 12
N WC
SEE STRUCTURE PLAN FRA-70-1322L

B-020-S-57
10 17 25 15 23 25 75
11 24 25 26 7 10
N WC

B-016-0-08
106.6' RT.
ASPHALT = 0.7'
BASE = 0.3'
31 43 15 15 3 6 9 8 8 14 13
7 6 12 14 14 27 25 31 28 31 25 23
N_{60} WC

740 730 720 710 700 690 680 670

730.96 731.32 731.68 732.04 732.40 732.76 733.12 733.48 733.84 734.20 734.56 734.92 735.28 735.64 736.00 736.36 736.72 737.06 737.38 737.66 737.90 738.12 738.31 738.46 738.58 738.67 738.73 738.75 738.74 738.71 738.64 738.53 738.40 738.25 738.10 737.95 737.80 737.65 737.50 737.35 737.20 737.05 736.90 736.76 736.67 736.62 736.61 736.65 736.73 736.86 737.03

725.73 710.88 696.68 688.41 687.41 688.50 690.01 689.78 690.00 689.17 688.12 686.36 686.70 687.76 689.36 693.32 704.29 707.28 707.92 707.91 726.64 726.94 727.24 727.96 728.78 729.78

149+00 150+00 151+00 152+00 153+00 154+00 155+00 156+00 157+00 158+00 159+00 160+00 161+00

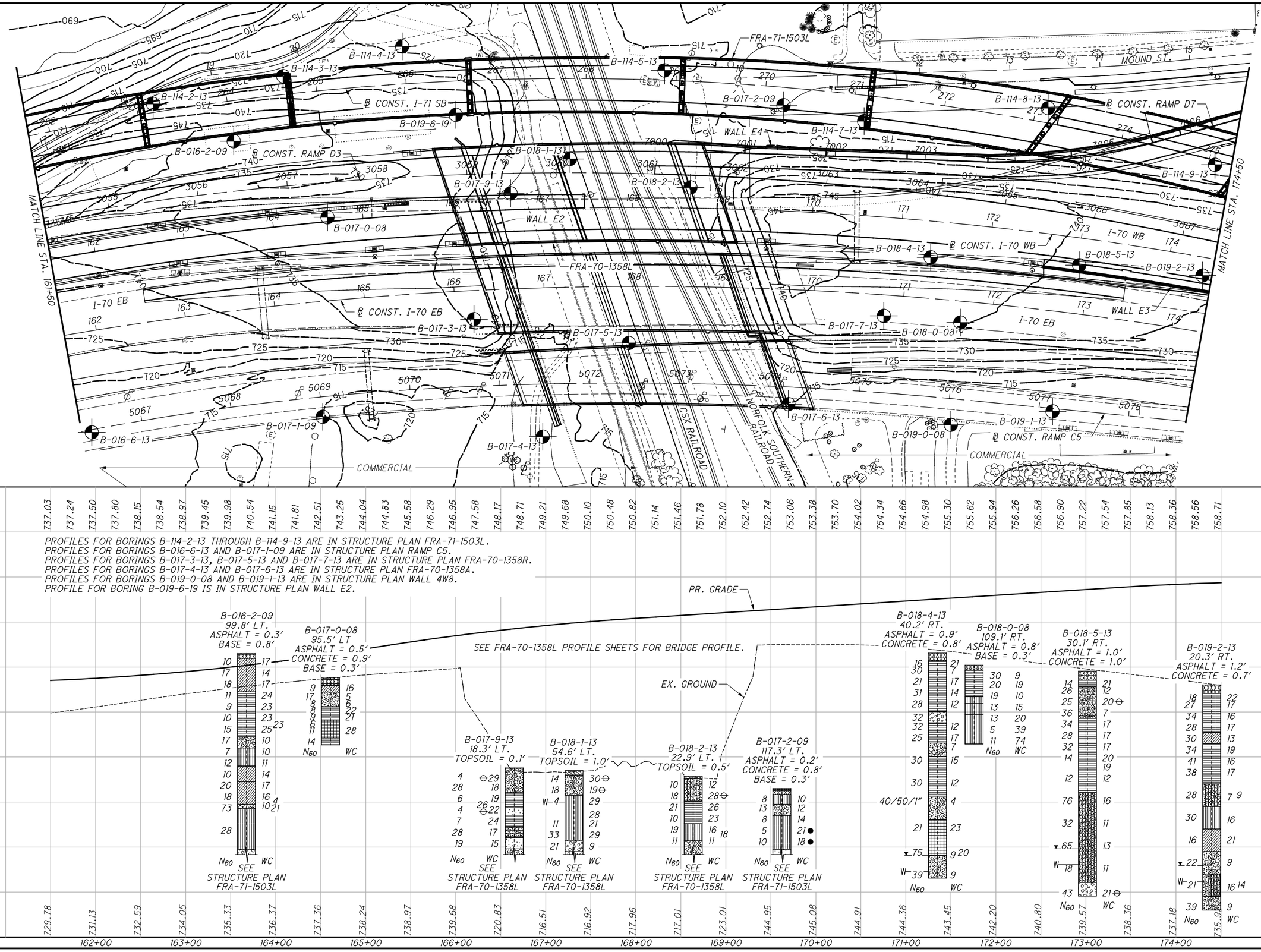
HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM CHECKED BRT

SOIL PROFILE
STA. 148+79.18 TO STA. 161+50 I-70 WB
FRA-70-13.10

72/496

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464IP001.dgn 3/10/2021 10:06:33 AM rachelm



HORIZONTAL SCALE IN FEET
0 25 50 100

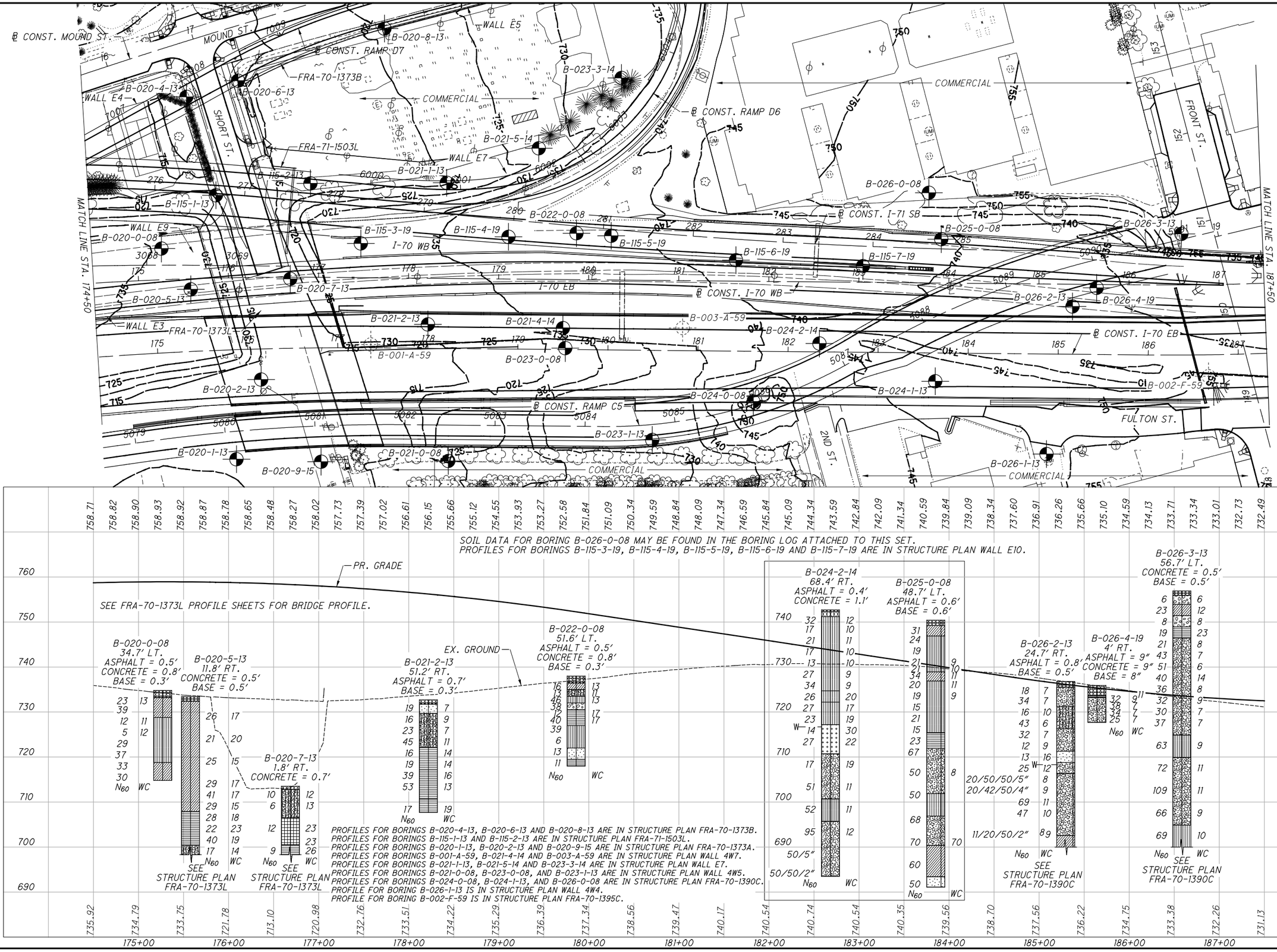
DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 161+50 TO STA. 174+50 I-70 WB

FRA-70-13.10

73 / 496

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464IP002.dgn 3/10/2021 10:25:31 AM rachelm



SOIL DATA FOR BORING B-026-0-08 MAY BE FOUND IN THE BORING LOG ATTACHED TO THIS SET.
PROFILES FOR BORINGS B-115-3-19, B-115-4-19, B-115-5-19, B-115-6-19 AND B-115-7-19 ARE IN STRUCTURE PLAN WALL E10.

PR. GRADE

SEE FRA-70-1373L PROFILE SHEETS FOR BRIDGE PROFILE.

EX. GROUND

B-020-0-08
34.7' LT.
ASPHALT = 0.5'
CONCRETE = 0.8'
BASE = 0.3'

B-020-5-13
11.8' RT.
CONCRETE = 0.5'
BASE = 0.5'

SEE STRUCTURE PLAN FRA-70-1373L

B-020-7-13
1.8' RT.
CONCRETE = 0.7'

SEE STRUCTURE PLAN FRA-70-1373L

B-021-2-13
51.2' RT.
ASPHALT = 0.7'
BASE = 0.3'

B-022-0-08
51.6' LT.
ASPHALT = 0.5'
CONCRETE = 0.8'
BASE = 0.3'

B-024-2-14
68.4' RT.
ASPHALT = 0.4'
CONCRETE = 1.1'

B-025-0-08
48.7' LT.
ASPHALT = 0.6'
BASE = 0.6'

B-026-2-13
24.7' RT.
ASPHALT = 0.8'
BASE = 0.5'

SEE STRUCTURE PLAN FRA-70-1390C

B-026-4-19
4' RT.
ASPHALT = 9"
CONCRETE = 9"
BASE = 8"

B-026-3-13
56.7' LT.
CONCRETE = 0.5'
BASE = 0.5'

SEE STRUCTURE PLAN FRA-70-1390C

PROFILES FOR BORINGS B-020-4-13, B-020-6-13 AND B-020-8-13 ARE IN STRUCTURE PLAN FRA-70-1373B.
PROFILES FOR BORINGS B-115-1-13 AND B-115-2-13 ARE IN STRUCTURE PLAN FRA-71-1503L.
PROFILES FOR BORINGS B-020-1-13, B-020-2-13 AND B-020-9-15 ARE IN STRUCTURE PLAN FRA-70-1373A.
PROFILES FOR BORINGS B-001-A-59, B-021-4-14 AND B-003-A-59 ARE IN STRUCTURE PLAN WALL 4W7.
PROFILES FOR BORINGS B-021-1-13, B-021-5-14 AND B-023-3-14 ARE IN STRUCTURE PLAN WALL E7.
PROFILES FOR BORINGS B-021-0-08, B-023-0-08, AND B-023-1-13 ARE IN STRUCTURE PLAN WALL 4W5.
PROFILES FOR BORINGS B-024-0-08, B-024-1-13, AND B-026-0-08 ARE IN STRUCTURE PLAN FRA-70-1390C.
PROFILE FOR BORING B-026-1-13 IS IN STRUCTURE PLAN WALL 4W4.
PROFILE FOR BORING B-002-F-59 IS IN STRUCTURE PLAN FRA-70-1395C.

DRAWN RPM
CHECKED BRT

SOIL PROFILE
STA. 174+50 TO STA. 187+50 I-70 WB

FRA-70-13.10

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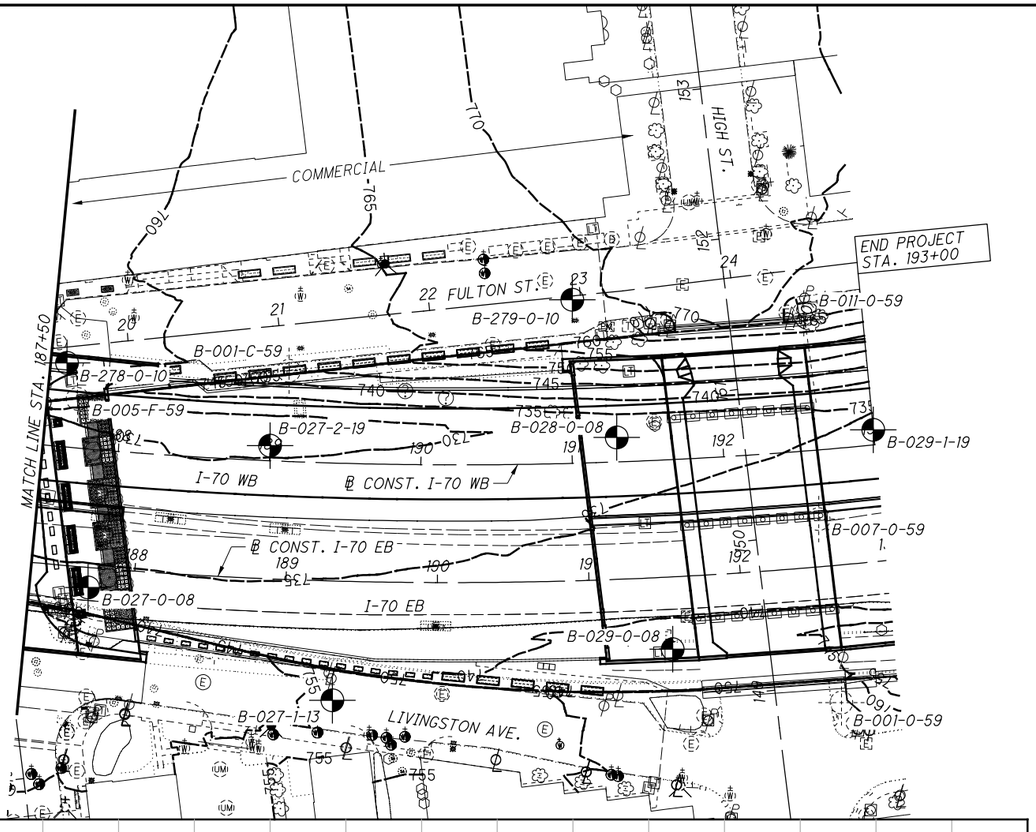

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 187+50 TO STA. 193+00 I-70 WB

FRA-70-13.10

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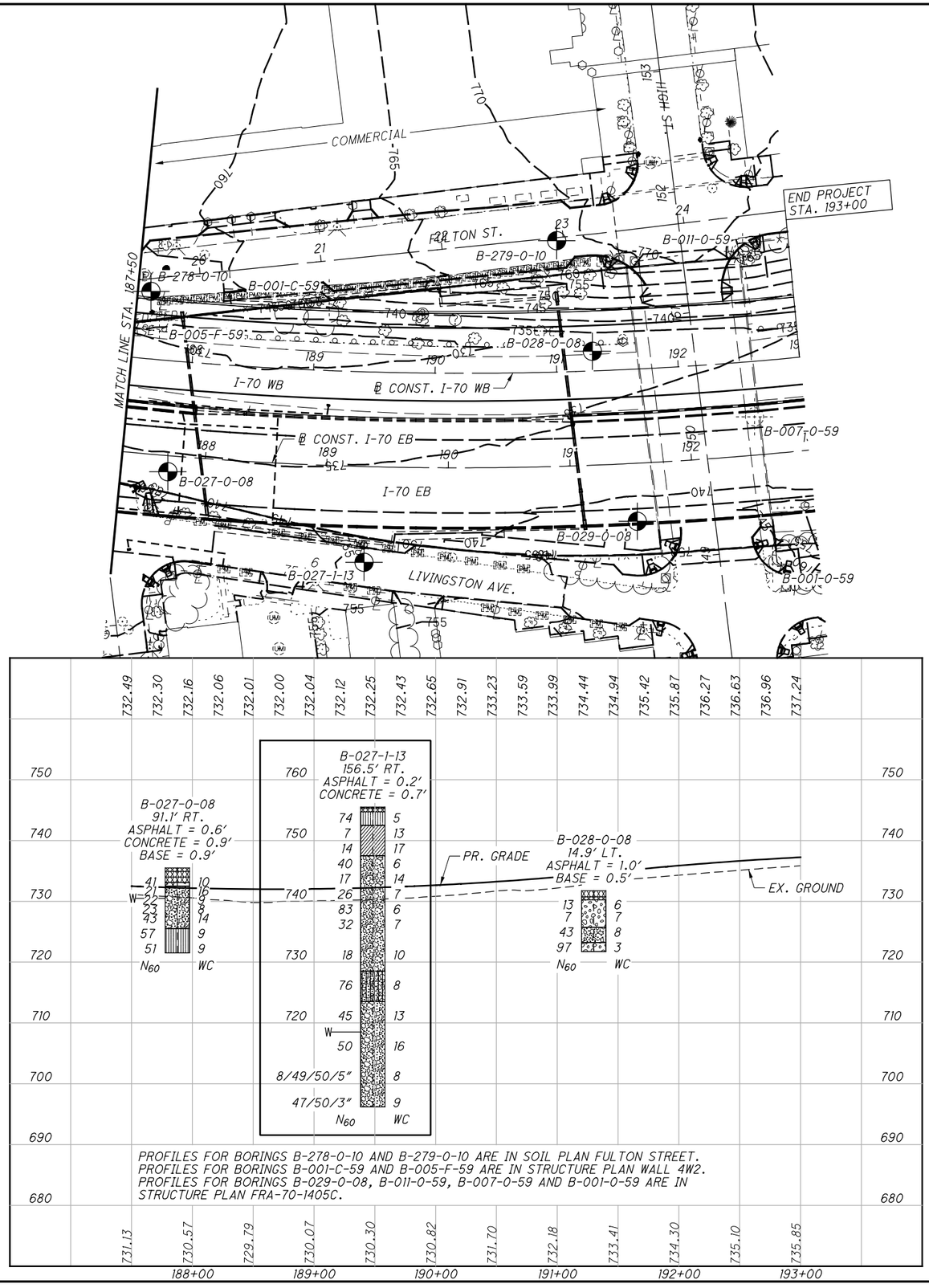

PROFILES FOR BORINGS B-278-0-10 AND B-279-0-10 ARE IN SOIL PLAN FULTON STREET.
PROFILES FOR BORINGS B-001-C-59 AND B-005-F-59 ARE IN STRUCTURE PLAN WALL 4W2.
PROFILES FOR BORINGS B-029-0-08, B-011-0-59, B-007-0-59 AND B-001-0-59 ARE IN STRUCTURE PLAN FRA-70-1405C.

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 187+50 TO STA. 193+00 I-70 WB

FRA-70-13.10

75/496

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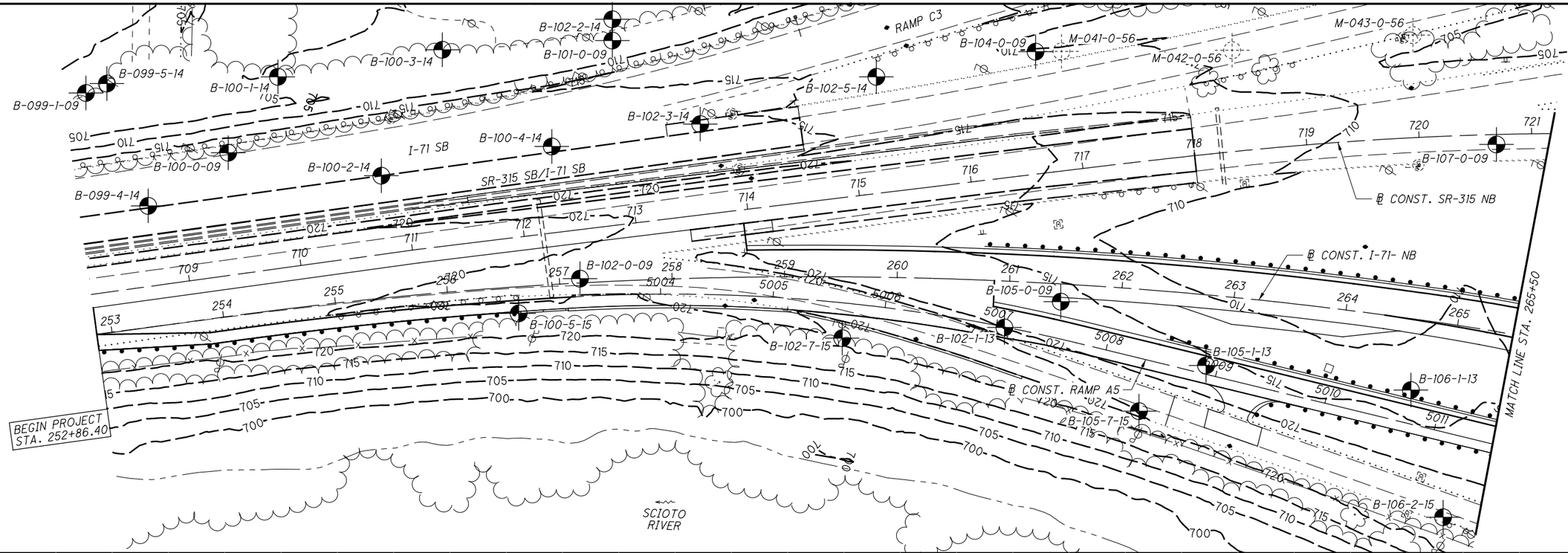

PROFILE FOR BORING B-102-1-13 IS IN SOIL PLAN RAMP A5.
PROFILES FOR BORINGS B-099-1-09, B-099-5-14, B-100-1-14, B-100-3-14 AND B-102-2-14 ARE IN STRUCTURE PLAN WALL W2.
PROFILES FOR BORINGS B-099-4-14, B-100-2-14, B-100-4-14, B-102-3-14 AND B-102-5-14 ARE IN STRUCTURE PLAN WALL W5.
PROFILES FOR BORINGS B-100-0-09, B-101-0-09 AND B-104-0-09 ARE IN SOIL PLAN I-71 SB.
PROFILES FOR BORINGS M-041-0-56, M-042-0-56 AND M-043-0-56 ARE IN STRUCTURE PLAN FRA-71-1503L.
PROFILE FOR BORING B-107-0-09 IS NOT INCLUDED IN THIS SOIL SET.

B-102-0-09
3.8' LT.
ASPHALT = 0.6'
CONCRETE = 0.7'

B-105-0-09
15.7' RT.
TOPSOIL = 0.3'

B-105-1-13
62.4' RT.
TOPSOIL = 0.6'

B-106-1-13
62.9' RT.
TOPSOIL = 0.2'

N_{60} WC

253+00 254+00 255+00 256+00 257+00 258+00 259+00 260+00 261+00 262+00 263+00 264+00 265+00

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 252+86.40 TO STA. 265+50 I-71 NB

FRA-70-12.68

76/496

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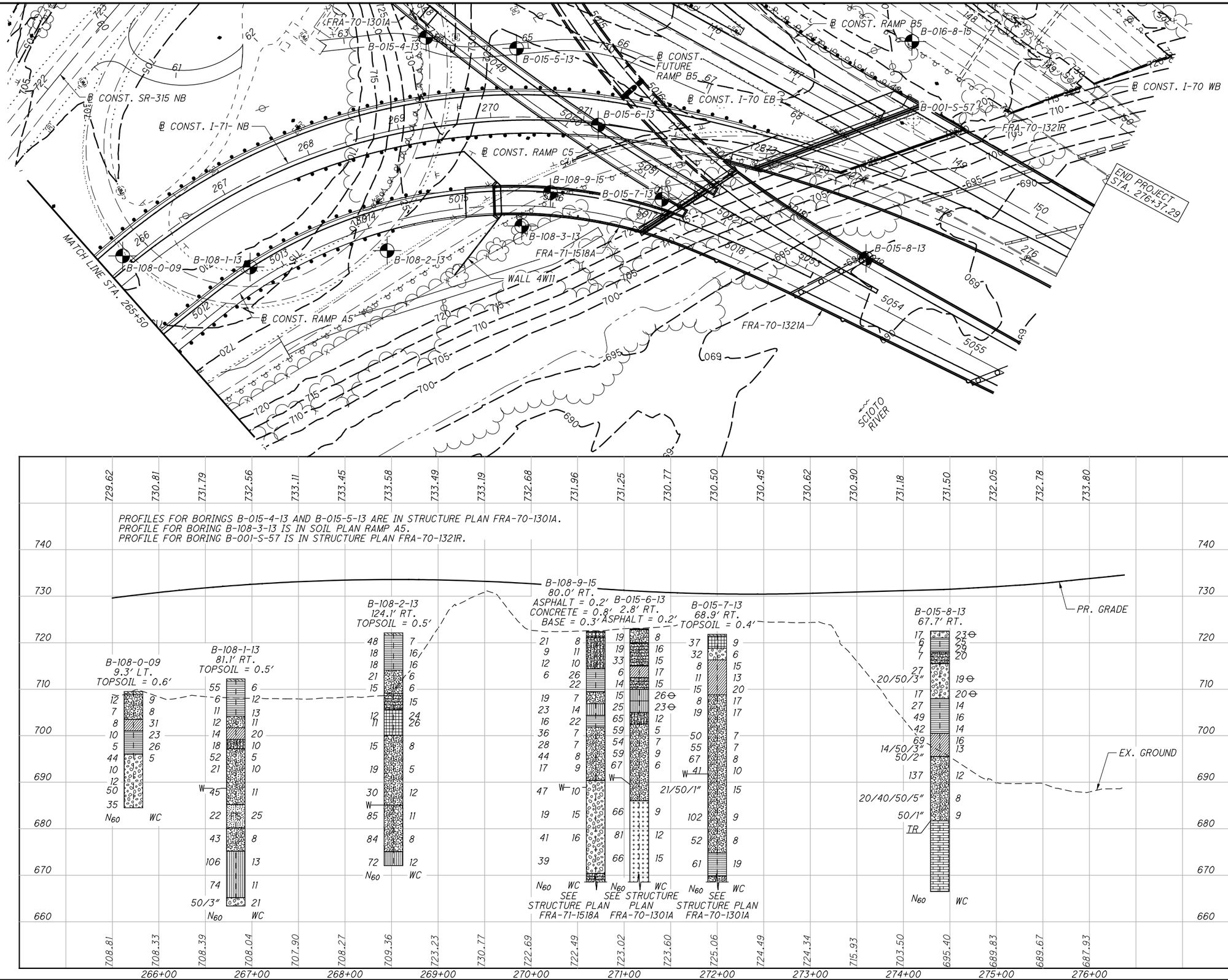

HORIZONTAL SCALE IN FEET

DRAWN RPM CHECKED BRT

SOIL PROFILE

STA. 265+50 TO STA. 276+37.29 I-71 NB

FRA-70-12.68

77/496

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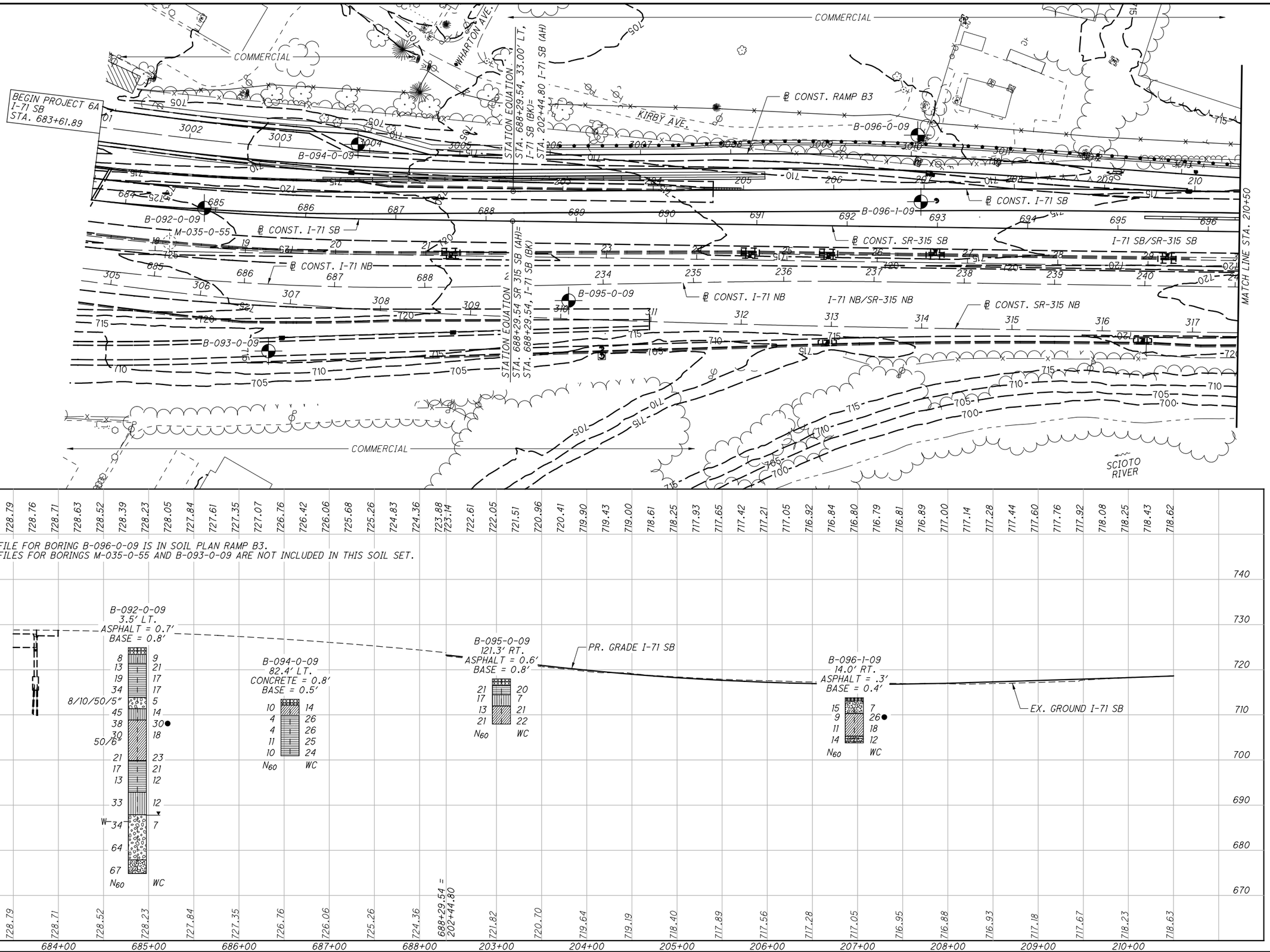
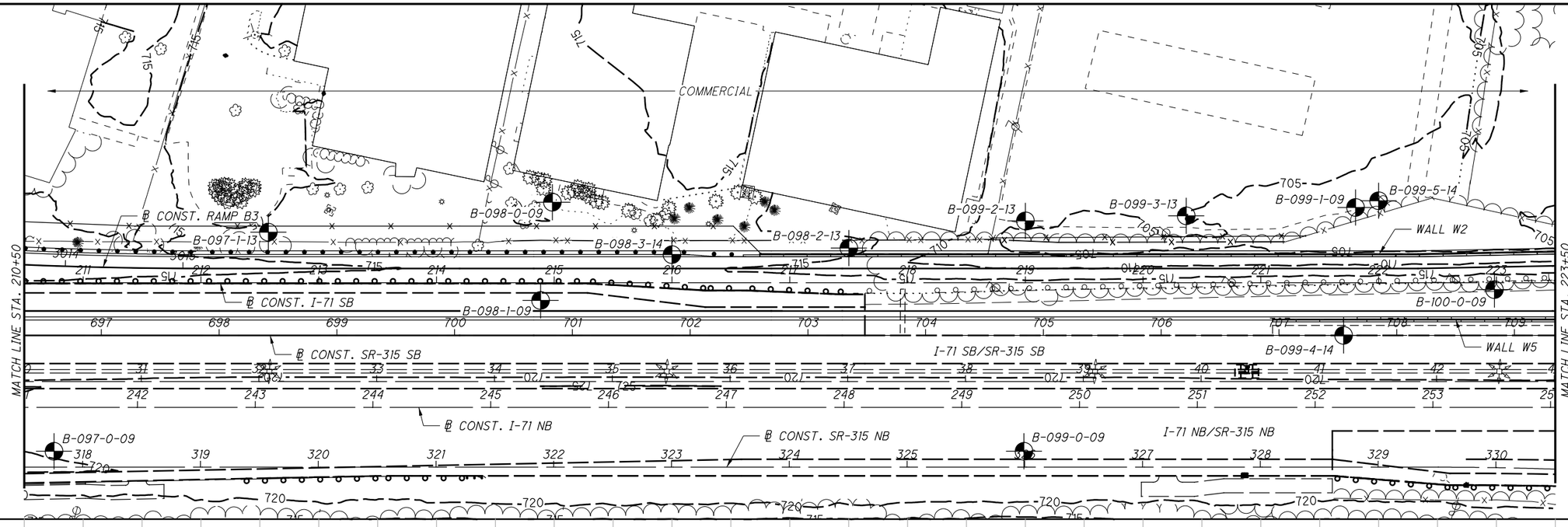


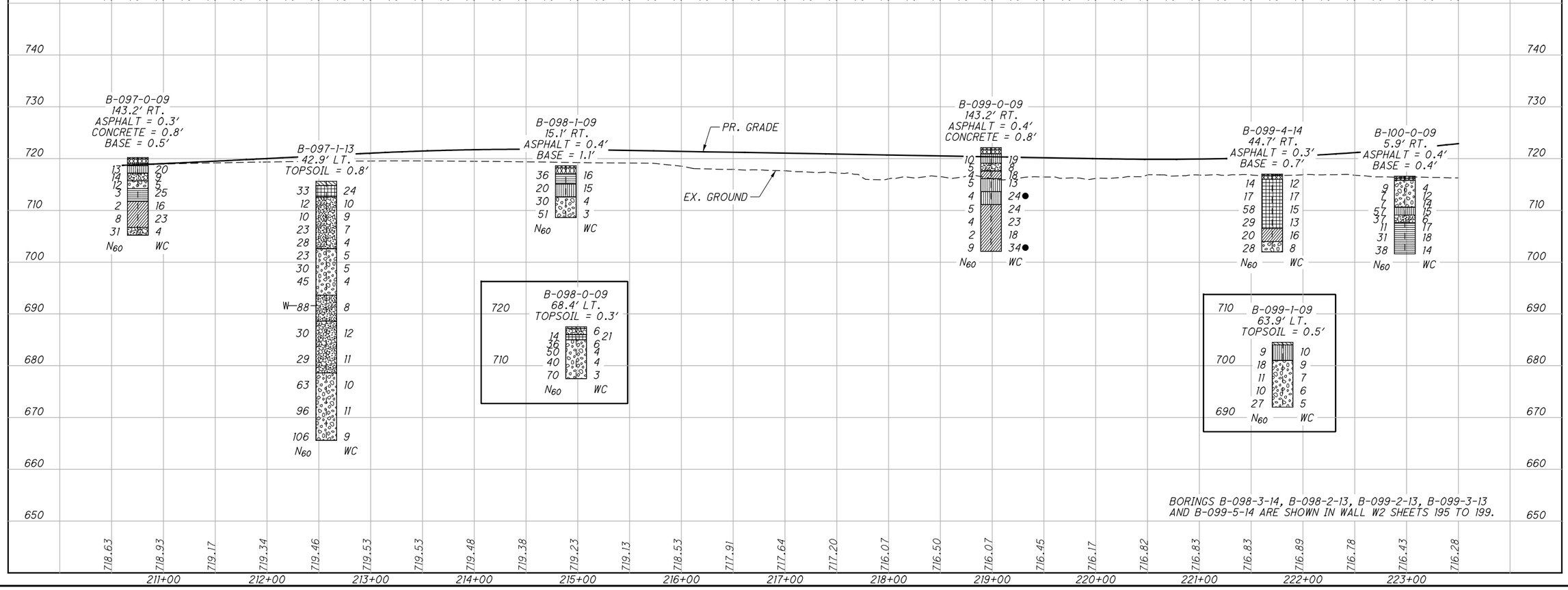
HORIZONTAL SCALE IN FEET

DRAWN RRM CHECKED BRT

SOIL PROFILE
STA. 683+61.89 TO STA. 210+50 I-71 SB

FRA-70-13.10





HORIZONTAL SCALE IN FEET

DRAWN RRM CHECKED BRT

SOIL PROFILE
STA. 210+50 TO STA. 223+50 I-71 SB

FRA-70-13.10

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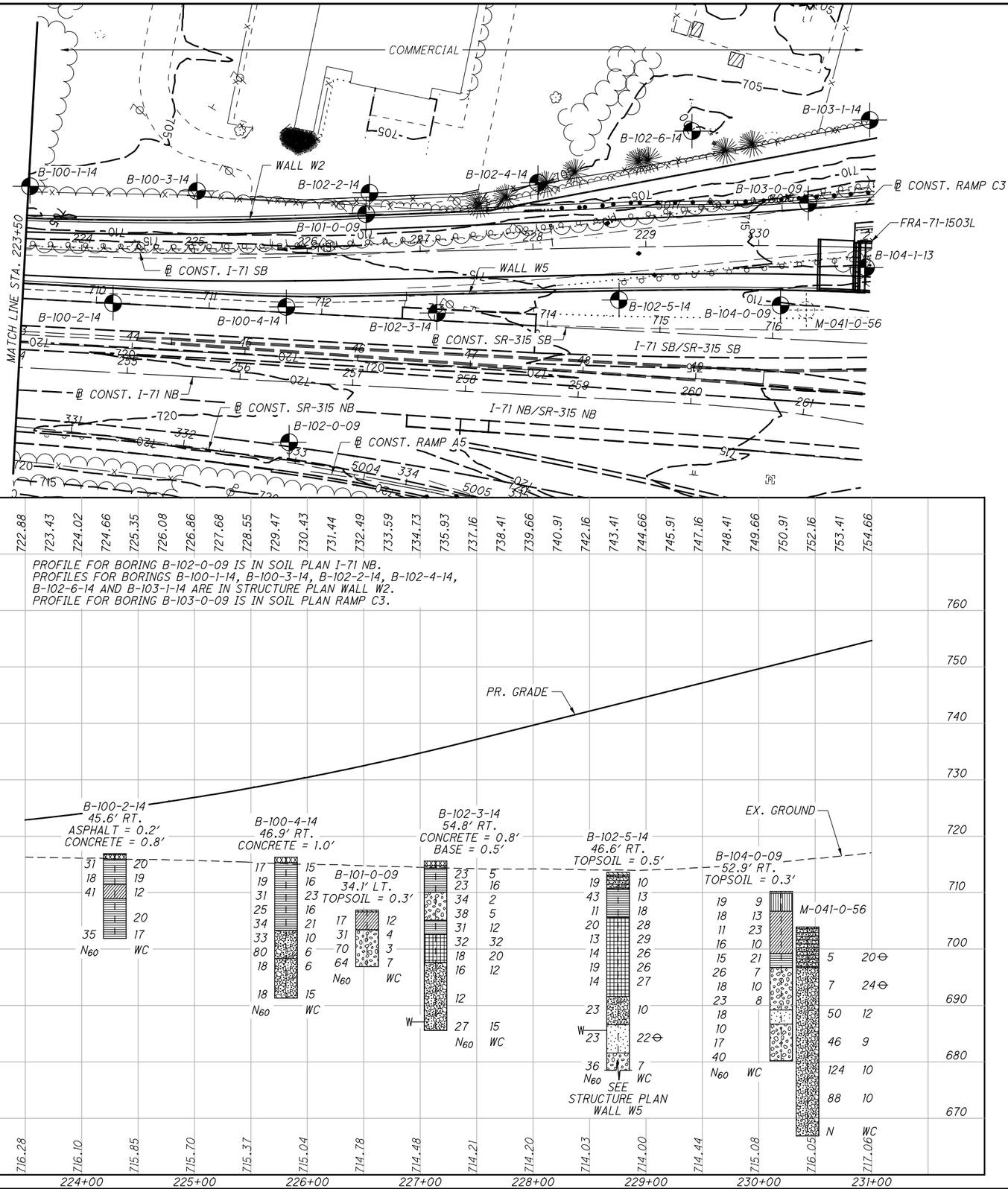

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 223+50 TO STA. 231+00 I-71 SB

FRA-70-13.10

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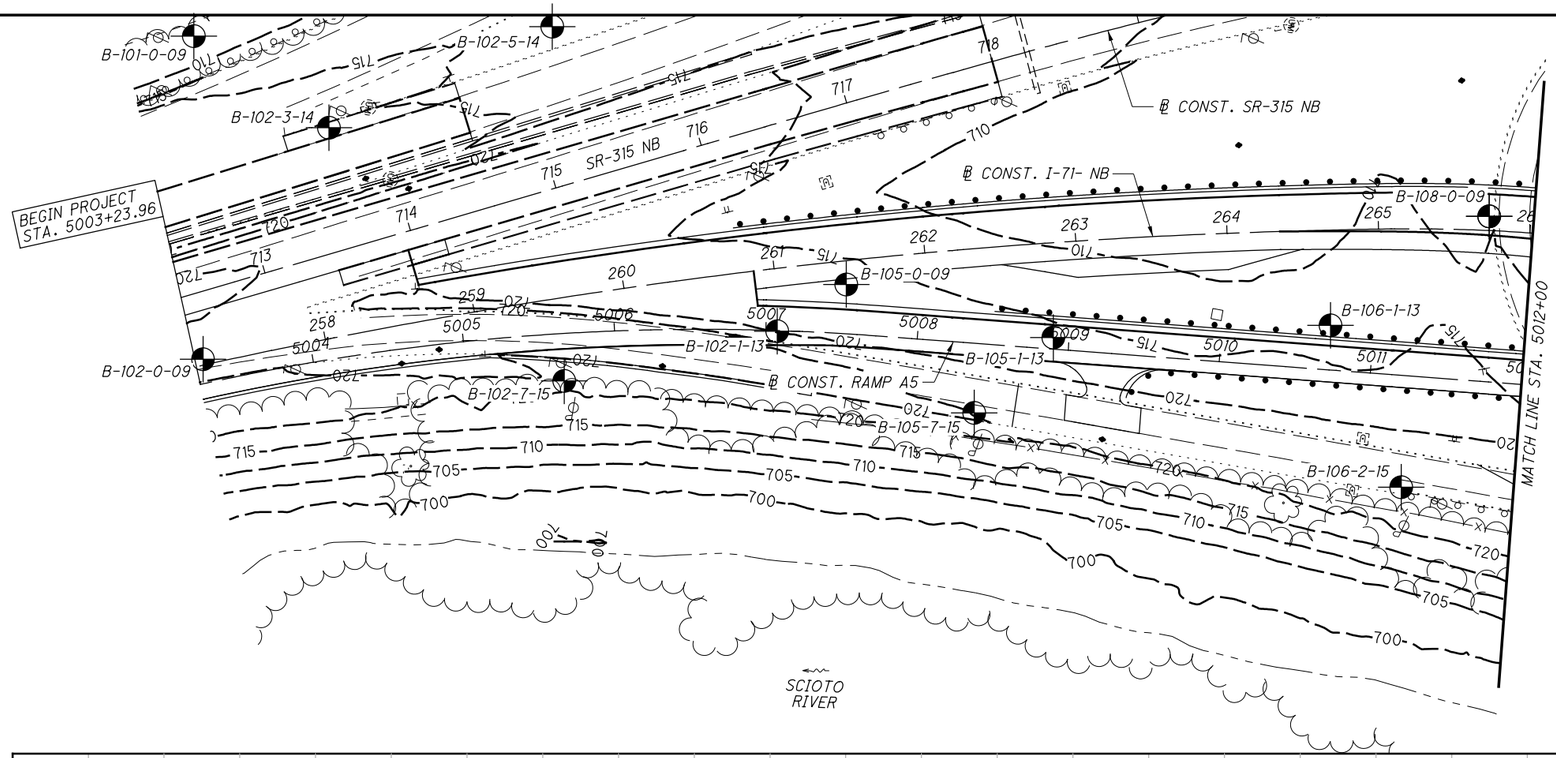

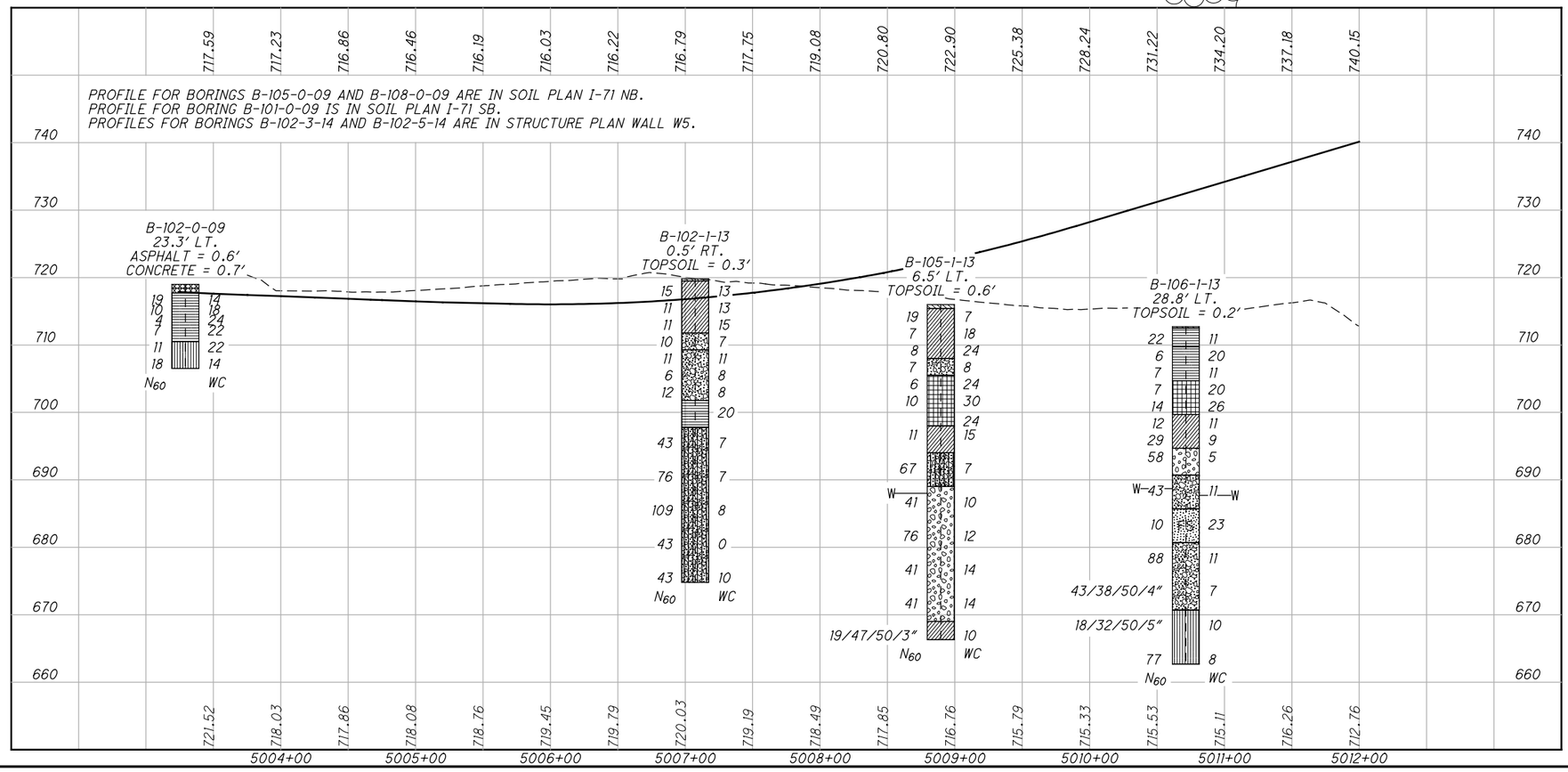

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 5003+23.96 TO STA. 5012+00 RAMP A5

FRA-70-12.68

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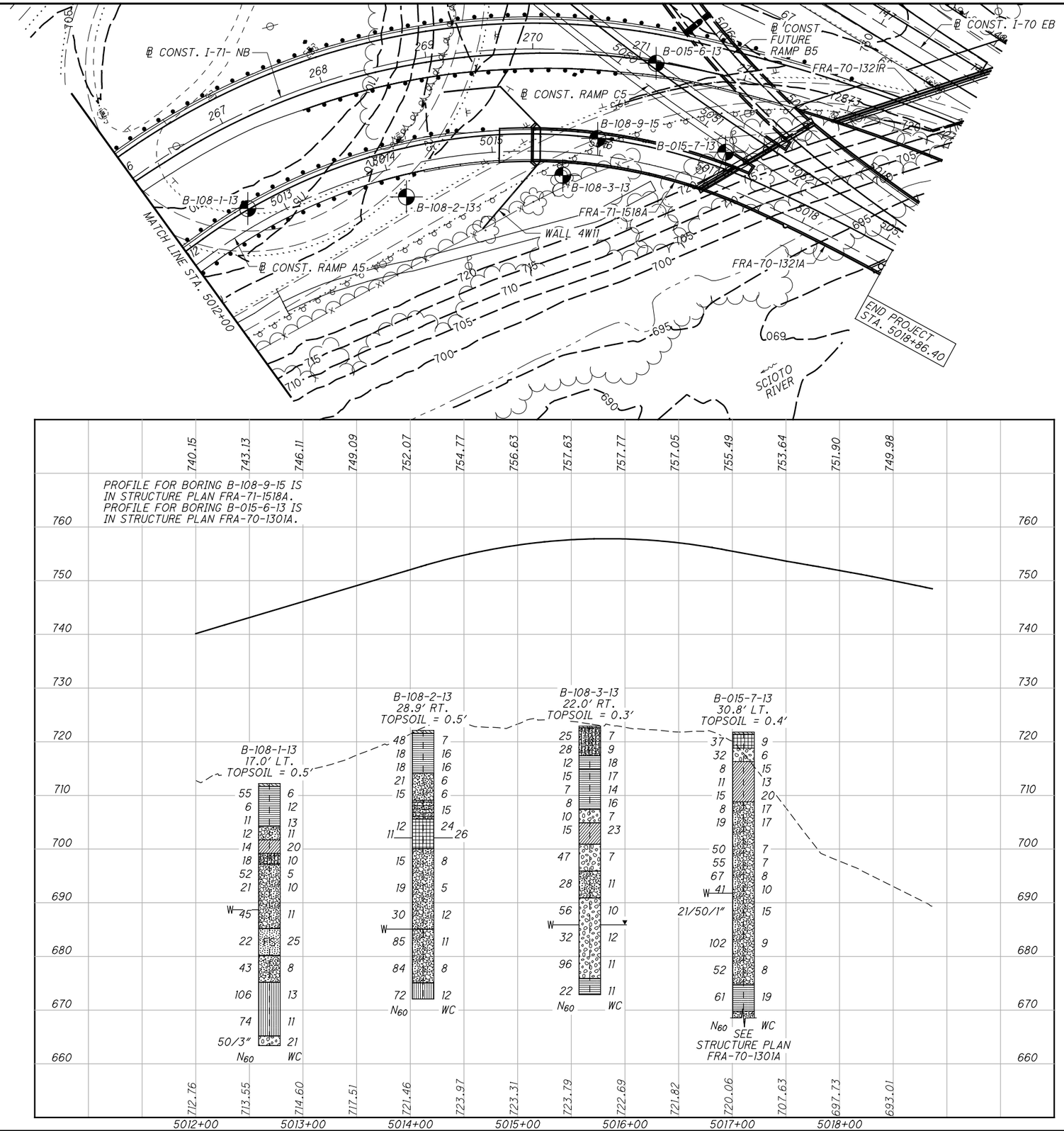

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RPM
CHECKED BRT

SOIL PROFILE
STA. 5012+00 TO STA. 5018+86.40 RAMP A5

FRA-70-12.68

82/496

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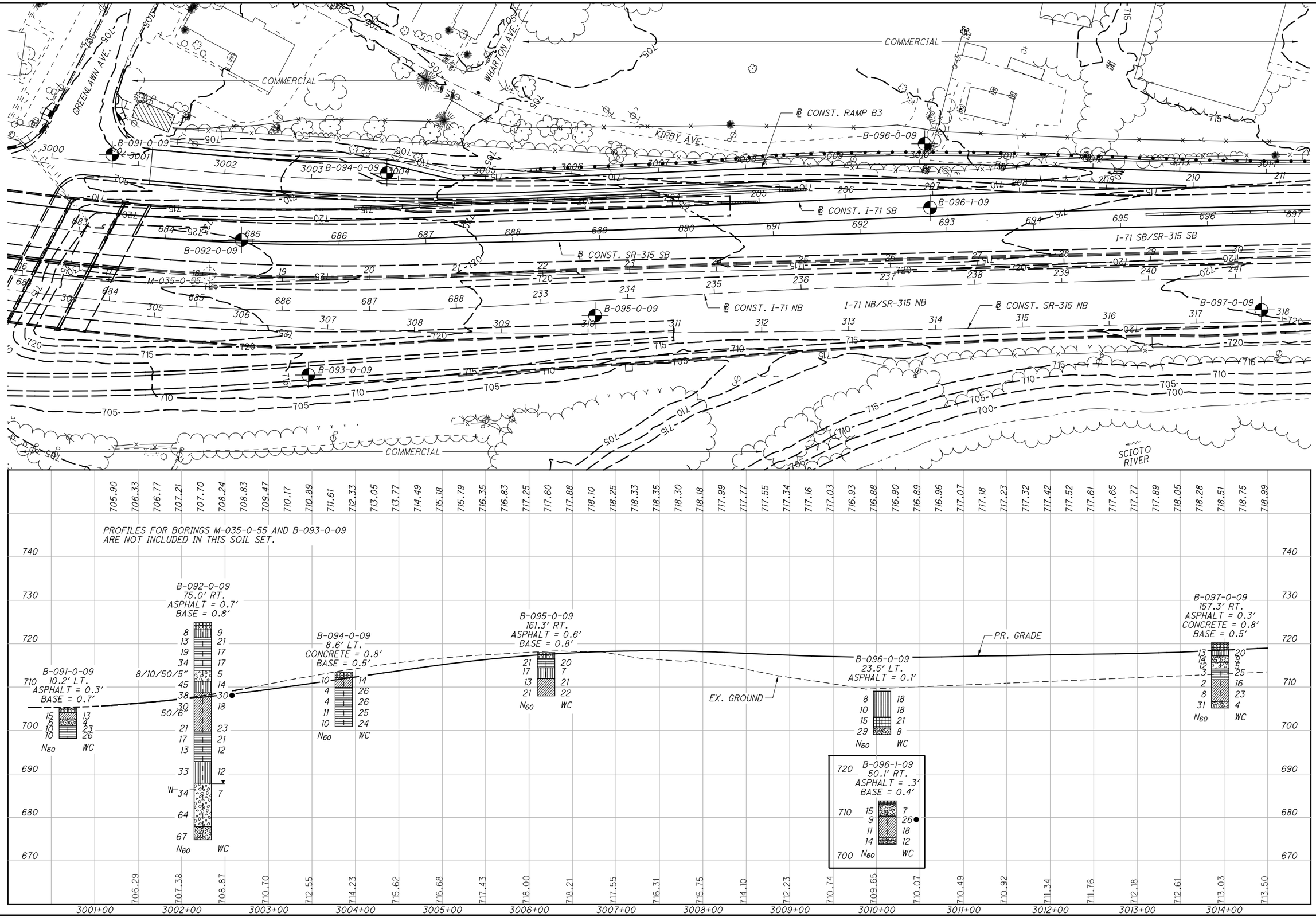


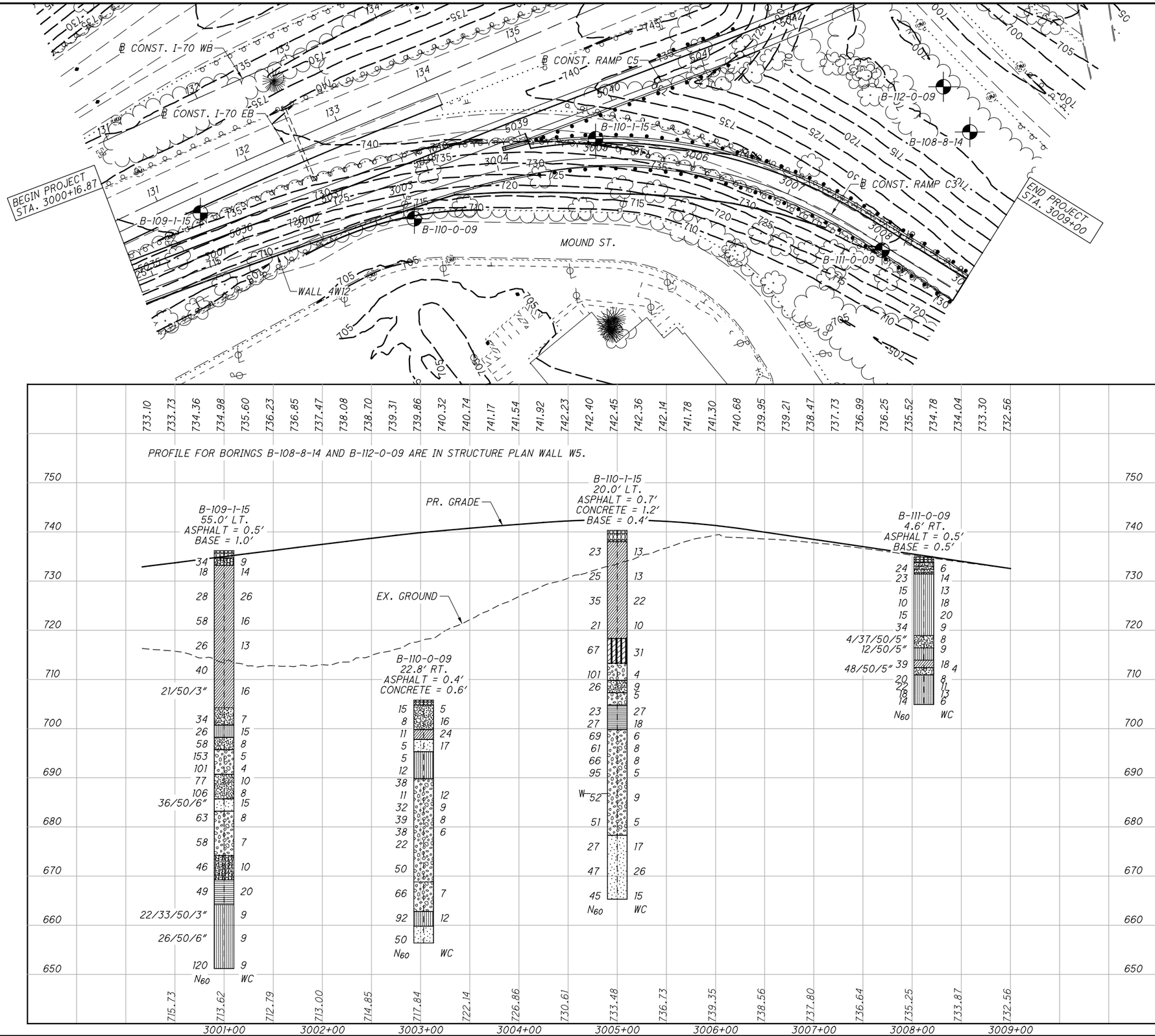
HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM CHECKED BRT

SOIL PROFILE

STA. 3000+23.82 TO STA. 3014+50 RAMP B3

FRA-70-13.10



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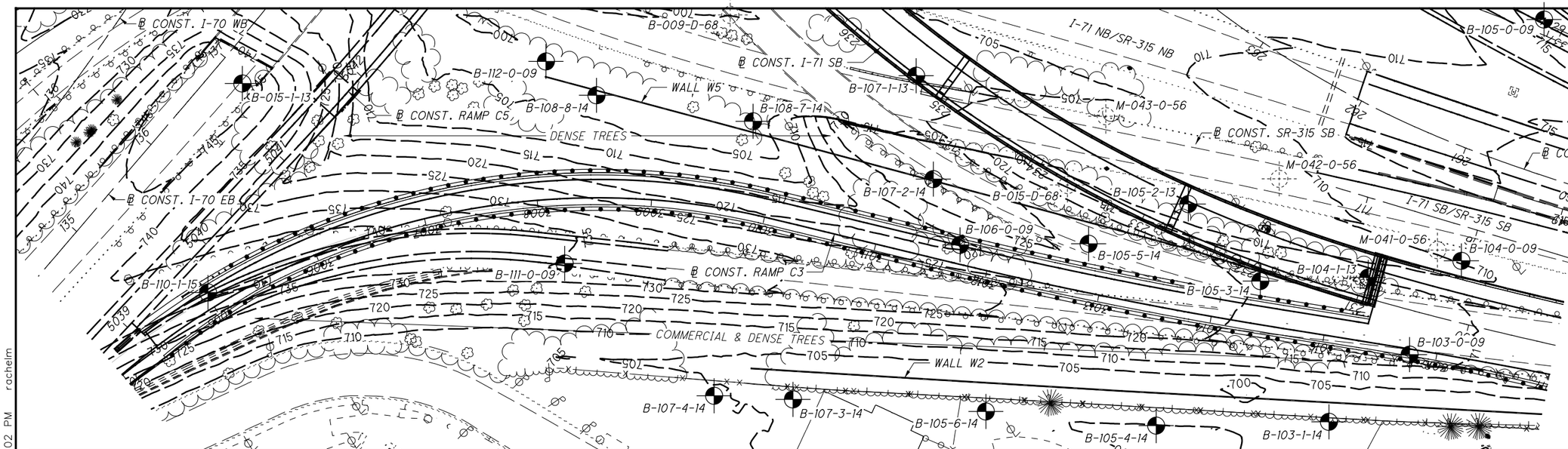
HORIZONTAL SCALE IN FEET

DRAWN RRM CHECKED BRT

SOIL PROFILE
STA. 3000+16.87 TO STA. 3009+00 RAMP C3
FRA-70-12.68



741.59 742.02 742.43 742.89 743.41 743.99 744.64 745.35 746.13 746.97 747.88 748.85 749.89 750.95 752.01 753.07 754.13 755.19 756.25 757.31 758.36 759.36 760.25 761.05 761.75 762.36 762.86 763.27 763.59 763.80 763.92 763.95 763.87 763.70 763.43 763.07 762.61 762.05 761.39 760.64 759.79 758.84 757.80 756.66 755.42 754.16 752.88 751.62 750.38 749.23 748.07 746.77 745.58

PROFILE FOR BORING B-015-1-13 IS IN STRUCTURE PLAN FRA-70-1301A.
PROFILES FOR BORINGS B-009-D-68, B-107-1-13, B-015-D-68, M-043-0-56, B-105-2-13, M-042-0-56, M-041-0-56 AND B-104-1-13 ARE IN STRUCTURE PLAN FRA-71-1503L.
PROFILE FOR BORING B-105-0-09 IS IN SOIL PLAN I-71 NB.
PROFILE FOR BORING B-104-0-09 IS IN SOIL PLAN I-71 SB.
PROFILES FOR BORINGS B-107-3-14, B-107-4-13, B-105-6-14, B-105-4-13 AND B-103-1-14 ARE IN STRUCTURE PLAN WALL W2.
PROFILE FOR BORING B-112-0-09 IS IN STRUCTURE PLAN WALL W5.
PROFILE FOR BORING B-102-1-13 IS IN SOIL PLAN RAMP A5.

760 750 740 730 720 710 700 690 680 670 660

PR. GRADE

EX. GROUND

B-110-1-15
13.6′ LT.
ASPHALT = 0.7′
CONCRETE = 1.2′
BASE = 0.4′

23	13	
25	13	
35	22	
21	10	
67	31	
101	4	
26	9	
10/50/2″	5	
23	27	
27	18	
69	6	
61	8	
66	8	
95	5	
W–52	9	
51	5	
27	17	
47	26	
45	15	
N_{60}	WC	

B-111-0-09
56.8′ RT.
ASPHALT = 0.5′
BASE = 0.5′

24	6	
23	14	
15	13	
10	18	
15	20	
34	9	
4/37/50/5″	8	
12/50/5″	9	
48/50/5″	39	18 4
20	8	
22	11	
18	13	
14	6	
N_{60}	WC	

B-108-8-14
89.6′ RT.
TOPSOIL = 0.5′

26	12	
33	8	
43	6	
56	6	
W–27	12	
N_{60}	WC	

B-108-7-14
79.9′ LT.
TOPSOIL = 0.7′

39	15	
54	10	
49	6	
73	8	
40/50/0″	10	
31/50/3″	6	
21	14	
13	13	
107	12	
61	15	
N_{60}	WC	

B-106-0-09
16.7′ LT.
TOPSOIL = 0.3′

14	16	
15	15	
16	14	
22	16	
18	18	
15	22	
19/50/3″	26	14 10
49/50/3″	13	
50/4″	14	
44/50/3″	18	
N_{60}	WC	

B-105-5-14
42.1′ LT.
ASPHALT = 0.3′
CONCRETE = 0.5′
BASE = 0.5′

16	13	
20	20	
18	14	
25	7	
50/3″	88	7
23	23	6
20	19	
18	20	
28	10	
W–67	7	
84	10	
70	10	
37	8	
N_{60}	WC	

B-105-3-14
37.7′ LT.
ASPHALT = 0.3′
CONCRETE = 0.8′
BASE = 0.5′

21	12	
29	13	
21	13	
17	15	
67	5	
81	8	
83	5	
28	22	
31	167	
W–25	13	
71	12	
38	10	
40	13	
113	7	
72	5	
N_{60}	WC	

B-103-0-09
4.9′ RT.
ASPHALT = 0.6′
BASE = 0.9′

7	14	
17	15	
10	14	
20	11	
22	10	
22	19	
22	14	
60	6	
N_{60}	WC	

741.59 742.40 742.83 742.81 742.32 741.07 737.54 732.65 728.51 724.61 721.39 720.61 720.58 721.81 723.04 723.23 723.78 724.50 722.80 721.51 720.35 719.17 717.99 716.73 715.61 714.58 713.77

3004+00 3005+00 3006+00 3007+00 3008+00 3009+00 3010+00 3011+00 3012+00 3013+00 3014+00 3015+00 3016+00 3017+00

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 3004+00 TO STA. 3017+00 RAMP C3

FRA-70-13.10

85 / 496

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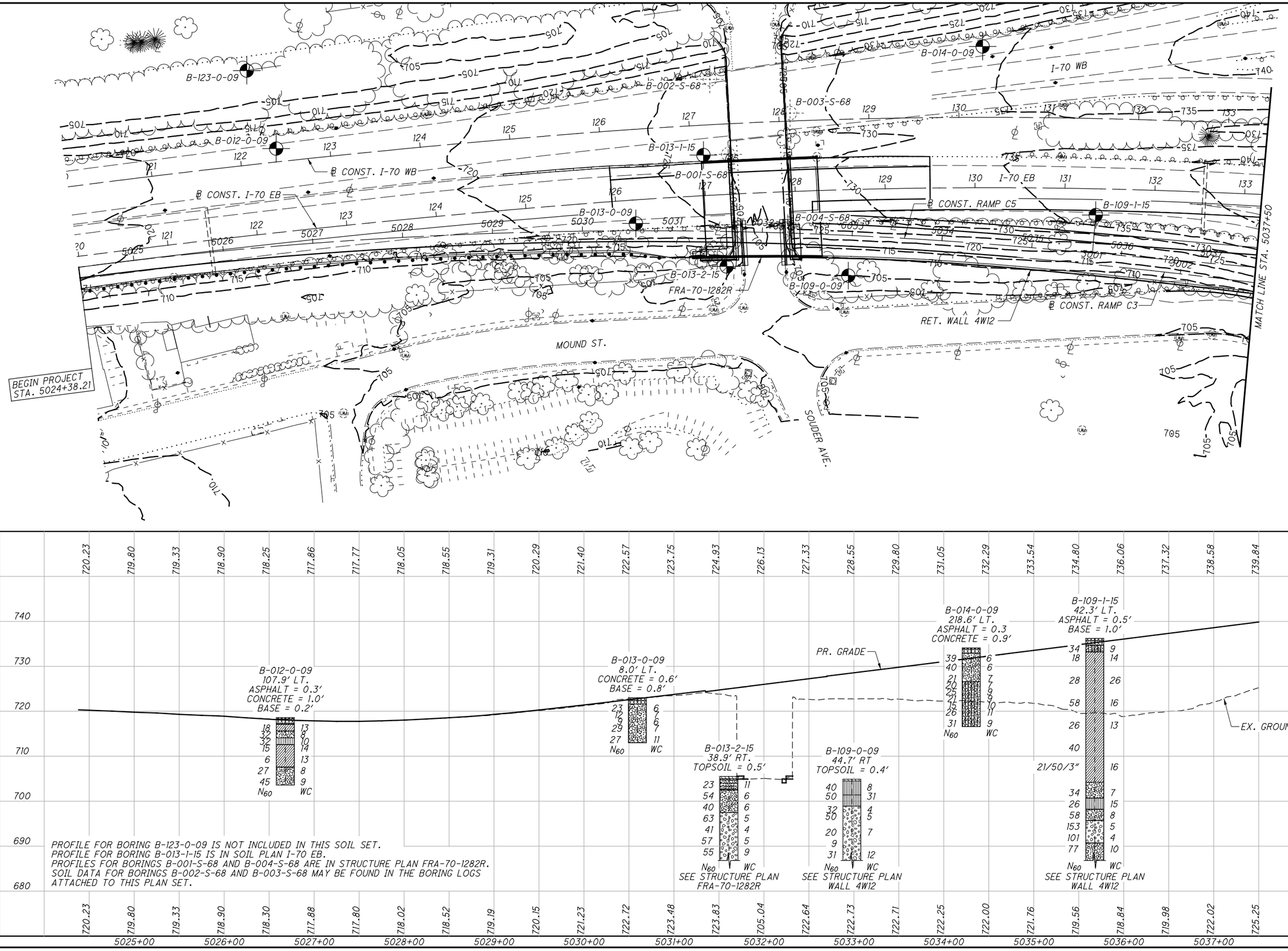

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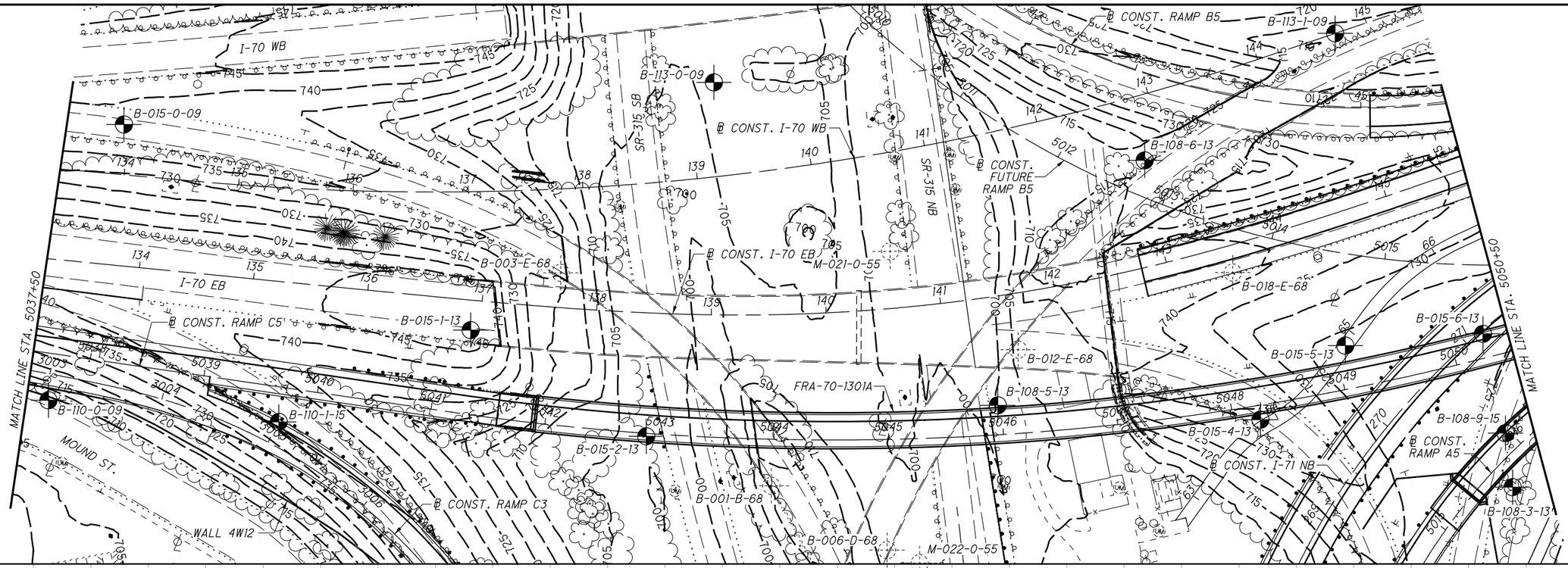
HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 5024+38.21 TO STA. 5037+50 RAMP C5

FRA-70-12.68

86/496



739.84 741.10 742.36 743.62 744.88 746.14 747.40 748.66 749.93 751.27 752.69 754.18 755.68 757.18 758.68 760.18 761.51 762.57 763.35 763.86 764.09 764.04 763.72 763.13 762.25 761.11 759.68

PROFILES FOR BORINGS B-003-E-68 AND B-012-E-68 ARE IN STRUCTURE PLAN FRA-70-1301A.
PROFILE FOR BORING B-015-0-09 IS IN SOIL PLAN I-70 EB.
PROFILES FOR BORINGS B-113-0-09, M-021-0-55 AND M-022-0-55 ARE NOT INCLUDED IN THIS SOIL SET.
PROFILES FOR BORINGS B-006-D-68, B-018-E-68, B-108-6-13 AND B-113-1-09 ARE IN STRUCTURE PLAN FRA-71-1503L.
PROFILE FOR BORING B-108-9-15 IS IN STRUCTURE PLAN FRA-71-1518A.
PROFILE FOR BORING B-108-3-13 IS IN SOIL PLAN A5.

PR. GRADE
EX. GROUND

B-110-0-09
40.8′ RT.
ASPHALT = 0.4′
CONCRETE = 0.6′
15 5
8 16
N_{60} WC
SEE STRUCTURE PLAN WALL 4W12

B-110-1-15
30.3′ RT.
ASPHALT = 0.7′
CONCRETE = 1.2′
BASE = 0.4′
23 13
25 13
35 22
21 10
67 31
101 4
26 9
23 5
27
27 18
N_{60} WC
SEE STRUCTURE PLAN WALL 4W12

B-015-1-13
73.2′ LT.
ASPHALT = 0.8′
BASE = 0.5′
41 9
22 13
14 12
10 10
14 14
10 12
34 13
26 10
19 14
28 14
17 12
69 7
19 17
23 12
17 11
N_{60} WC
SEE STRUCTURE PLAN FRA-70-1301A

B-015-2-13
2.6′ RT.
TOPSOIL = 0.4′
SEE STRUCTURE PLAN FRA-70-1301A

B-001-B-68
40.6′ RT.
SEE STRUCTURE PLAN FRA-70-1301A

B-108-5-13
25.7′ LT.
TOPSOIL = 0.5′
SEE STRUCTURE PLAN FRA-70-1301A

B-015-4-13
12.5′ RT.
ASPHALT = 0.5′
BASE = 1.0′
26 17
17 17
28 13
17 16
16 15
18 18
19 17
58 7
50/4″ 5
17 13
8 10
10 16
14 8
N_{60} WC
SEE STRUCTURE PLAN FRA-70-1301A

B-015-5-13
37.6′ RT.
TOPSOIL = 0.7′
25 10
10 19
34 16
37 11
23 13
14 16
29 18
10 22
11 21
N_{60} WC 22
SEE STRUCTURE PLAN FRA-70-1301A

B-015-6-13
20.8′ LT.
ASPHALT = 0.2′
19 8
19 16
33 15
6 17
14 15
15 26
25 23
65 12
59 5
N_{60} WC
SEE STRUCTURE PLAN FRA-70-1301A

770 760 750 740 730 720 710 700 690

725.25 729.81 735.64 740.32 741.66 736.58 729.61 727.75 723.88 711.57 706.04 700.91 698.93 716.38 703.37 699.98 700.53 705.34 708.83 729.18 735.08 735.45 724.31 722.63 722.65 724.80

5038+00 5039+00 5040+00 5041+00 5042+00 5043+00 5044+00 5045+00 5046+00 5047+00 5048+00 5049+00 5050+00

HORIZONTAL SCALE IN FEET
0 25 50 100
DRAWN RRM CHECKED BRT

SOIL PROFILE
STA. 5037+50 TO STA. 5050+50 RAMP C5
FRA-70-12.68

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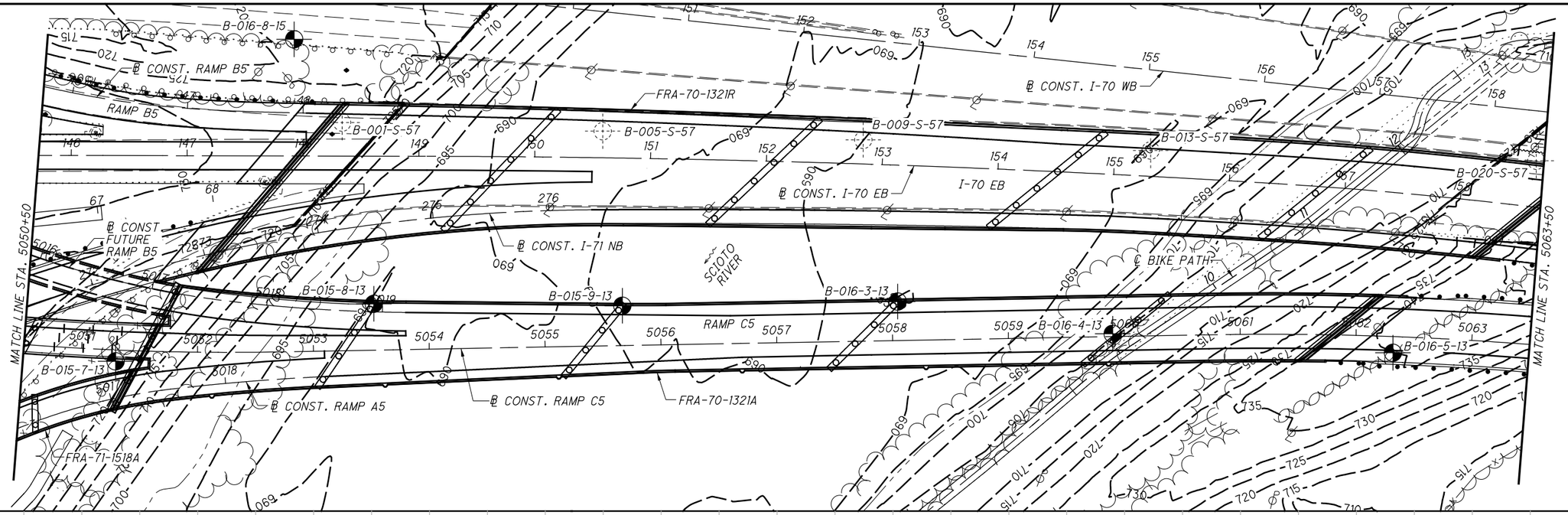

759.68 757.98 756.01 753.79 751.54 749.28 747.03 744.78 742.53 740.37 738.47 736.83 735.45 734.32 733.46 732.86 732.51 732.26 732.01 731.75 731.50 731.25 731.00 730.74 730.49 730.24 729.99

PROFILES FOR BORINGS B-001-S-57, B-005-S-57, B-009-S-57, B-013-S-57 AND B-020-S-57 ARE IN STRUCTURE PLAN FRA-70-1321R.

770 760 750 740 730 720 710 700 690 680

PR. GRADE

EX. GROUND

B-015-7-13
9.8′ RT.
TOPSOIL = 0.4′
37 32 8 11 15 8 19 50 55 67 W 41
9 6 15 13 20 17 17 7 7 8 10
N_{60} WC
SEE STRUCTURE PLAN FRA-70-1301A

B-015-8-13
39.9′ LT.
17 6
23 25
N_{60} WC
SEE STRUCTURE PLAN FRA-70-1321A

B-015-9-13
34.3′ LT.
4
22
N_{60} WC
SEE STRUCTURE PLAN FRA-70-1321A

B-016-3-13
33.7′ LT.
SEE STRUCTURE PLAN FRA-70-1321A

B-016-4-13
2.4′ RT.
TOPSOIL = 1.0′
10 17 11 7 3 W
16 10 14 29 30 27 34
N_{60} WC
SEE STRUCTURE PLAN FRA-70-1321A

B-016-5-13
14.0′ RT.
ASPHALT = 0.3′
CONCRETE = 0.5′
BASE = 0.2′
22 22 35 33 30 27 33 13 19 27 13 13 75 17 12 W 20
17 16 13 17 17 15 20 13 14 8 9 28 6 23 28 22
N_{60} WC
SEE SOIL PROFILE PLAN FRA-70-1321A

724.80 723.01 721.61 708.02 697.41 692.00 689.43 690.71 688.92 689.55 689.81 690.45 690.87 690.96 689.10 686.92 688.54 689.62 695.71 705.76 706.55 718.79 725.60 738.73 741.03 740.92 731.72

5051+00 5052+00 5053+00 5054+00 5055+00 5056+00 5057+00 5058+00 5059+00 5060+00 5061+00 5062+00 5063+00

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 5050+50 TO STA. 5063+50 RAMP C5
FRA-70-12.68

88/496

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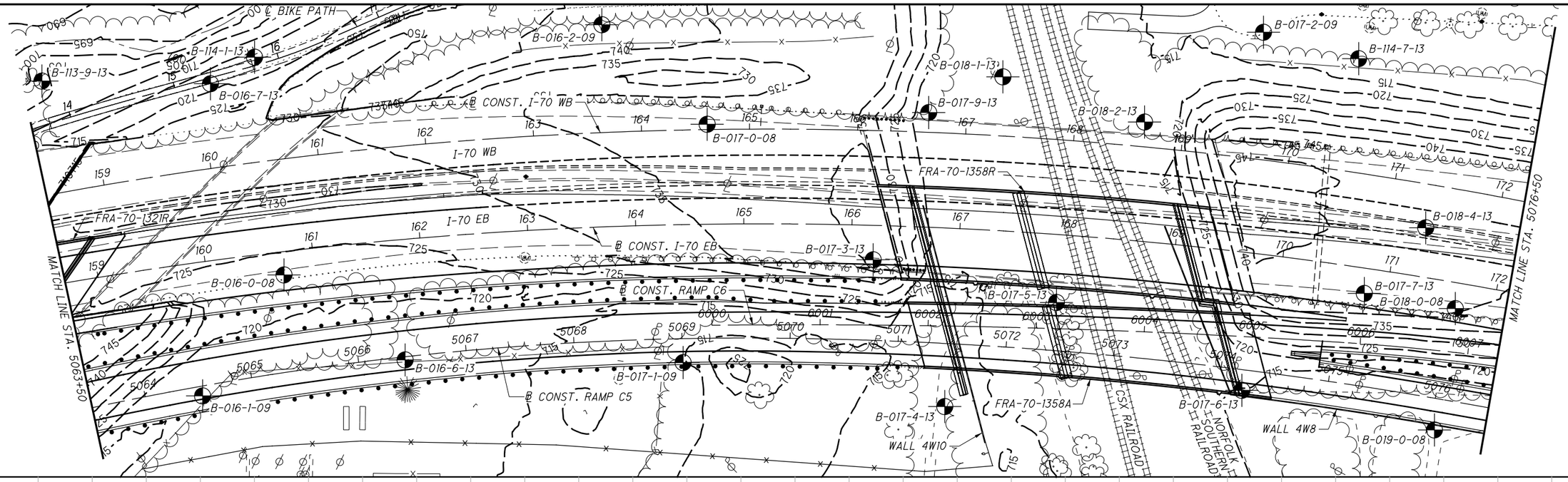
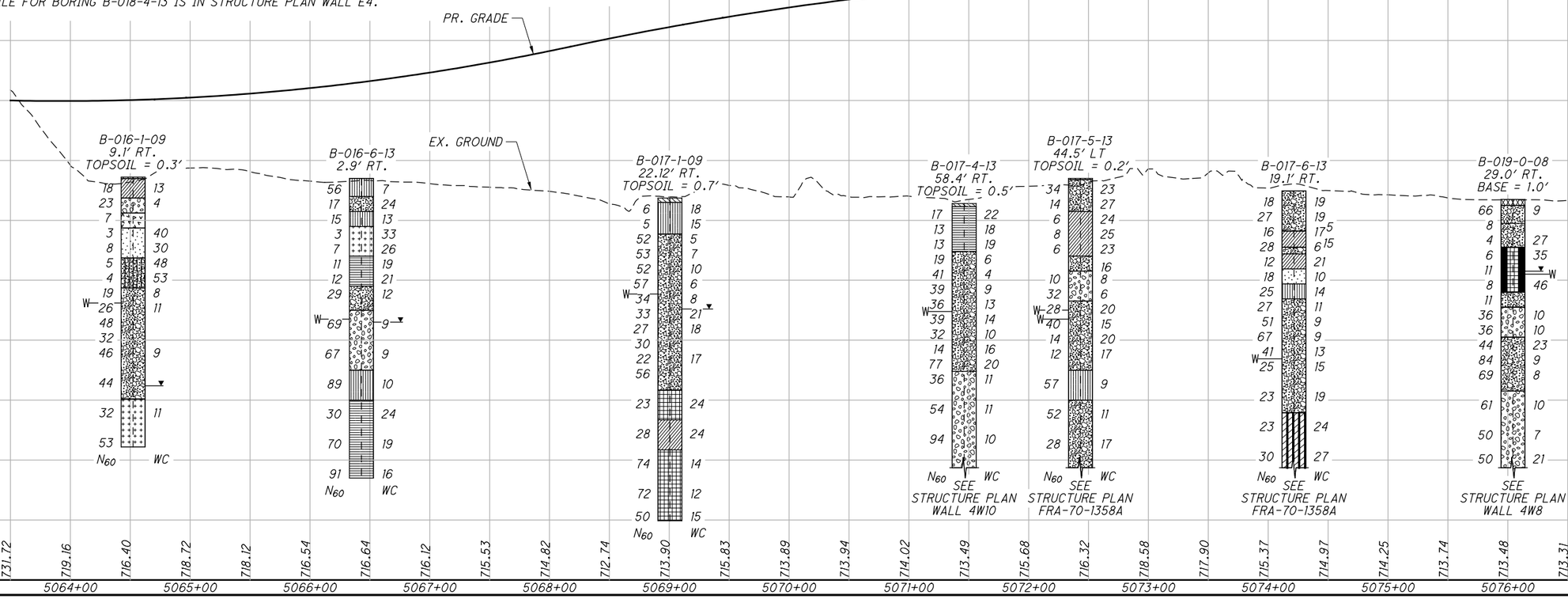


PROFILES FOR BORINGS B-016-2-09, B-017-2-09, B-113-9-13, B114-1-13 AND B-114-7-13 ARE IN STRUCTURE PLAN FRA-71-1503L.
PROFILE FOR BORING B-016-7-13 IS IN STRUCTURE PLAN FRA-70-1328C.
PROFILES FOR BORINGS B-016-0-08, B-017-0-08 AND B-018-0-08 ARE IN SOIL PLAN I-70 EB.
PROFILES FOR BORINGS B-017-3-13 AND B-017-7-13 ARE IN STRUCTURE PLAN FRA-70-1358R.
PROFILES FOR BORINGS B-017-9-13, B-018-1-13 AND B-018-2-13 ARE IN STRUCTURE PLAN FRA-70-1358L.
PROFILE FOR BORING B-018-4-13 IS IN STRUCTURE PLAN WALL E4.



SOIL PROFILE
STA. 5063+50 TO STA. 5076+50 RAMP C5

FRA-70-12.68

89/496

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM CHECKED BRT

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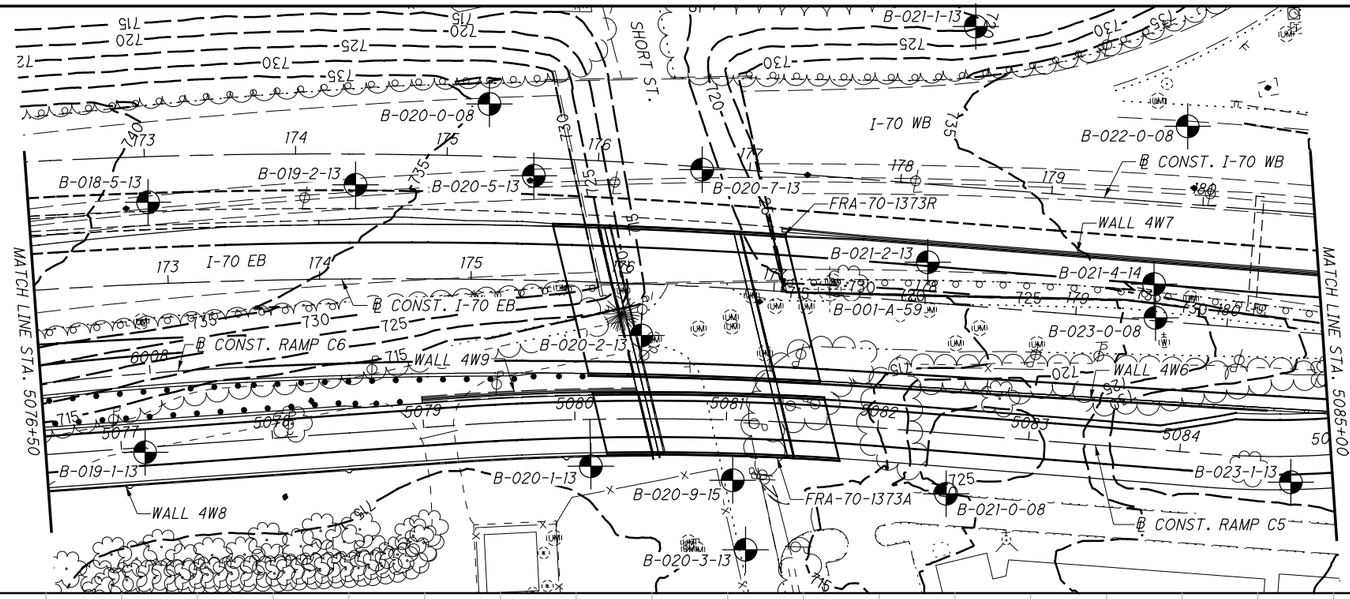

748.17 747.46 747.05 746.95 747.16 747.67 748.48 749.60 751.03 752.76 754.79 756.84 758.68 760.29 761.69 762.87 763.84 764.58

PROFILE FOR BORING B-020-2-13 IS IN STRUCTURE PLAN WALL 4W8.
PROFILES FOR BORINGS B-018-5-13 AND B-019-2-13 ARE IN STRUCTURE PLAN WALL E3.
PROFILES FOR BORINGS B-020-0-08 AND B-022-0-08 ARE IN SOIL PLAN I-70 WB.
PROFILES FOR BORINGS B-020-5-13 AND B-020-7-13 ARE IN STRUCTURE PLAN FRA-70-1373L.
PROFILE FOR BORING B-020-3-13 IS IN SOIL PLAN SHORT STREET.
PROFILES FOR BORINGS B-001-A-59 AND B-023-0-08 ARE IN STRUCTURE PLAN WALL 4W6.
PROFILES FOR BORINGS B-021-2-13 AND B-021-4-14 ARE IN STRUCTURE PLAN WALL 4W7.
PROFILE FOR BORING B-021-1-13 IS IN STRUCTURE PLAN WALL E7.

770 760 750 740 730 720 710 700 690 680 670

PR. GRADE

EX. GROUND

B-019-1-13
3.2′ RT.
TOPSOIL = 1.0′
30 9 8 12 9 14 16 16 W 18 22 50/2″
13 10 29 26 19 12 13 10 16 17 WC
N_{60}
SEE STRUCTURE PLAN WALL 4W8

B-020-1-13
30.9′ RT.
TOPSOIL = 0.5′
BRICK = 0.3′
21 4 10 8 8 4 20 16 W 18 16 42 6/50/0.4′
12 20 12 23 19 21 15 17 15 15 14 11
N_{60} WC
SEE STRUCTURE PLAN WALL 4W8

B-020-9-15
39.8′ RT.
ASPHALT = 0.3′
BRICK = 0.4′
BASE = 0.3′
11 12 9 15 35 28 58 28 92 W 18 23/25/50/4″ 51
22 18 37 21 5 14 6 10 10 16 11 8
N_{60} WC
SEE STRUCTURE PLAN FRA-70-1373A

B-021-0-08
39.8′ RT.
GRAVEL = 0.3′
9 11 12 6 16 9 24 30 43 8 10 21 50
11 26 21 12 25
N_{60} WC
SEE STRUCTURE PLAN WALL 4W5

B-023-1-13
15.0′ RT.
28 14 25 15 17 W 33 51 22/50/5″ W 55 40 91 50/1″
14 16 16 22 18 16 21 18 13 12 9 11 6
N_{60} WC

713.31 712.65 711.94 712.09 712.28 712.74 712.21 711.28 711.83 712.65 714.29 715.02 726.41 726.28 728.32 731.97 732.35 732.31

5077+00 5078+00 5079+00 5080+00 5081+00 5082+00 5083+00 5084+00 5085+00

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 5076+50 TO STA. 5085+00 RAMP C5

FRA-70-12.68

90 / 496

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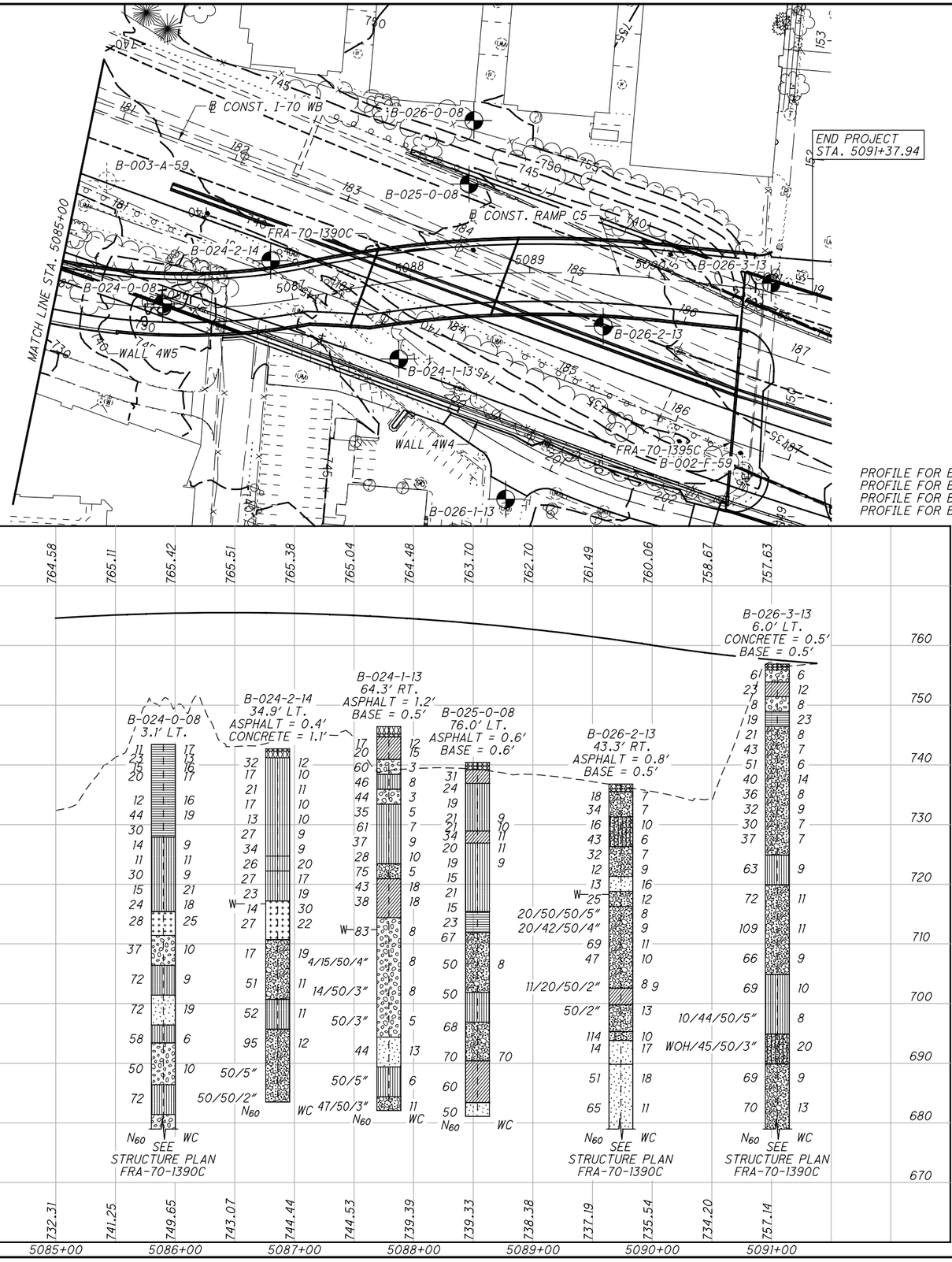

SOIL PROFILE
STA. 5085+00 TO STA. 5091+37.94 RAMP C5

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

FRA-70-12.68

91 / 496

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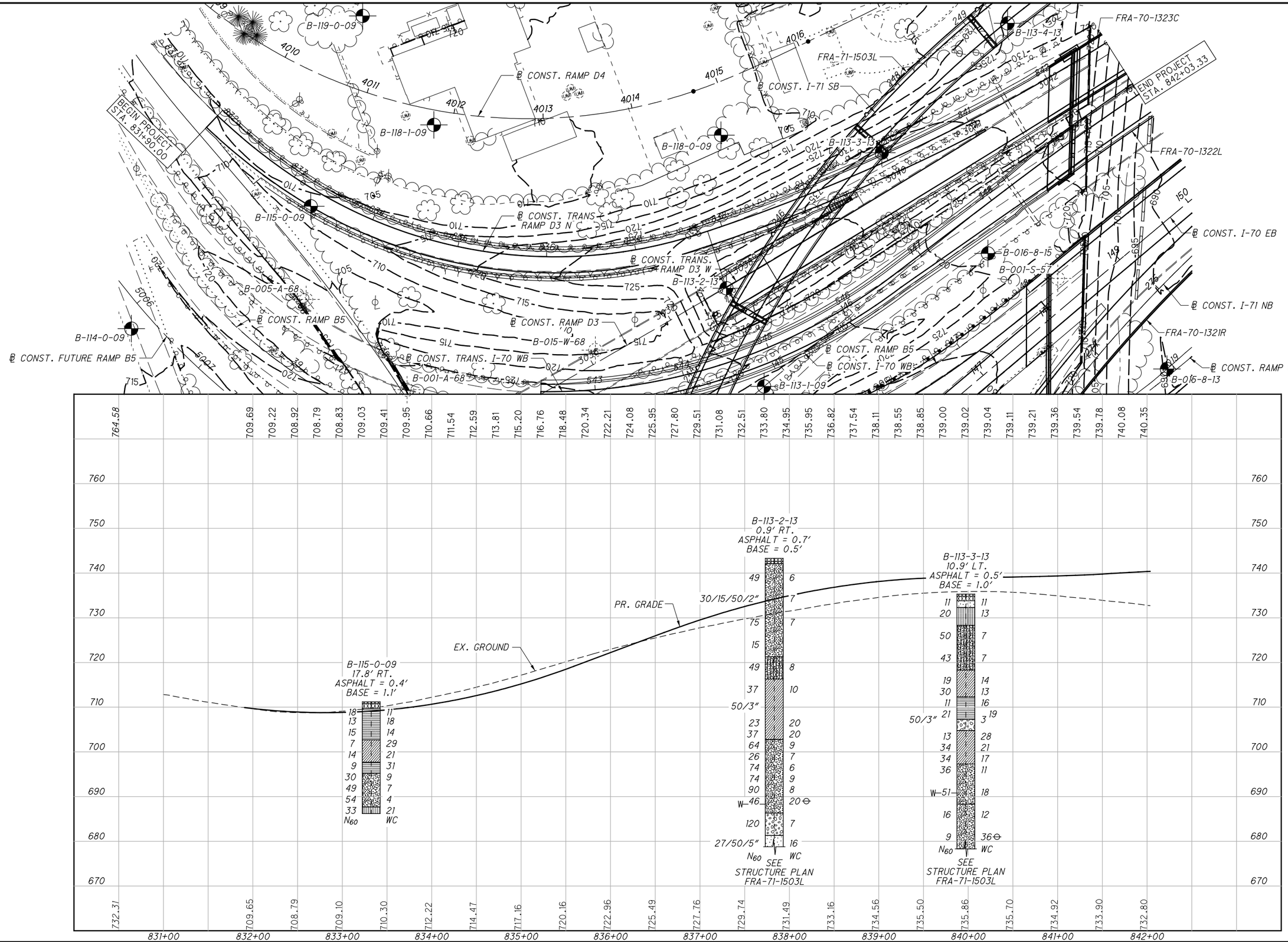

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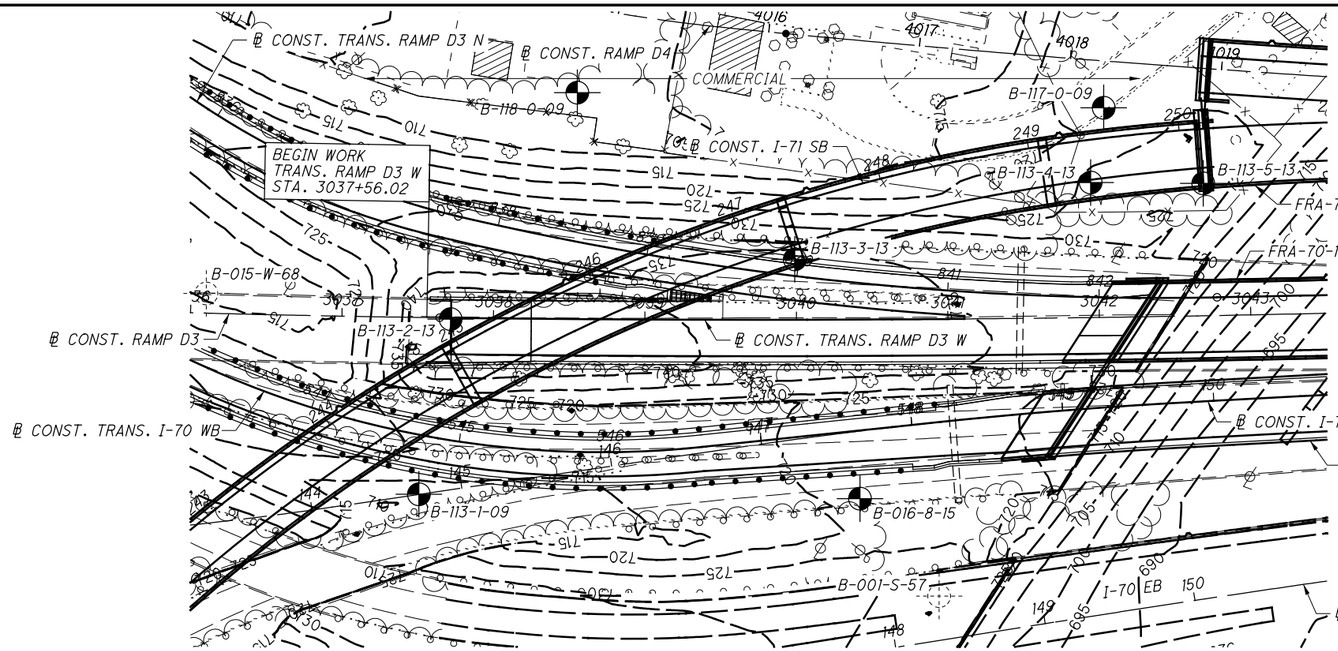
HORIZONTAL SCALE IN FEET
0 25 50 100

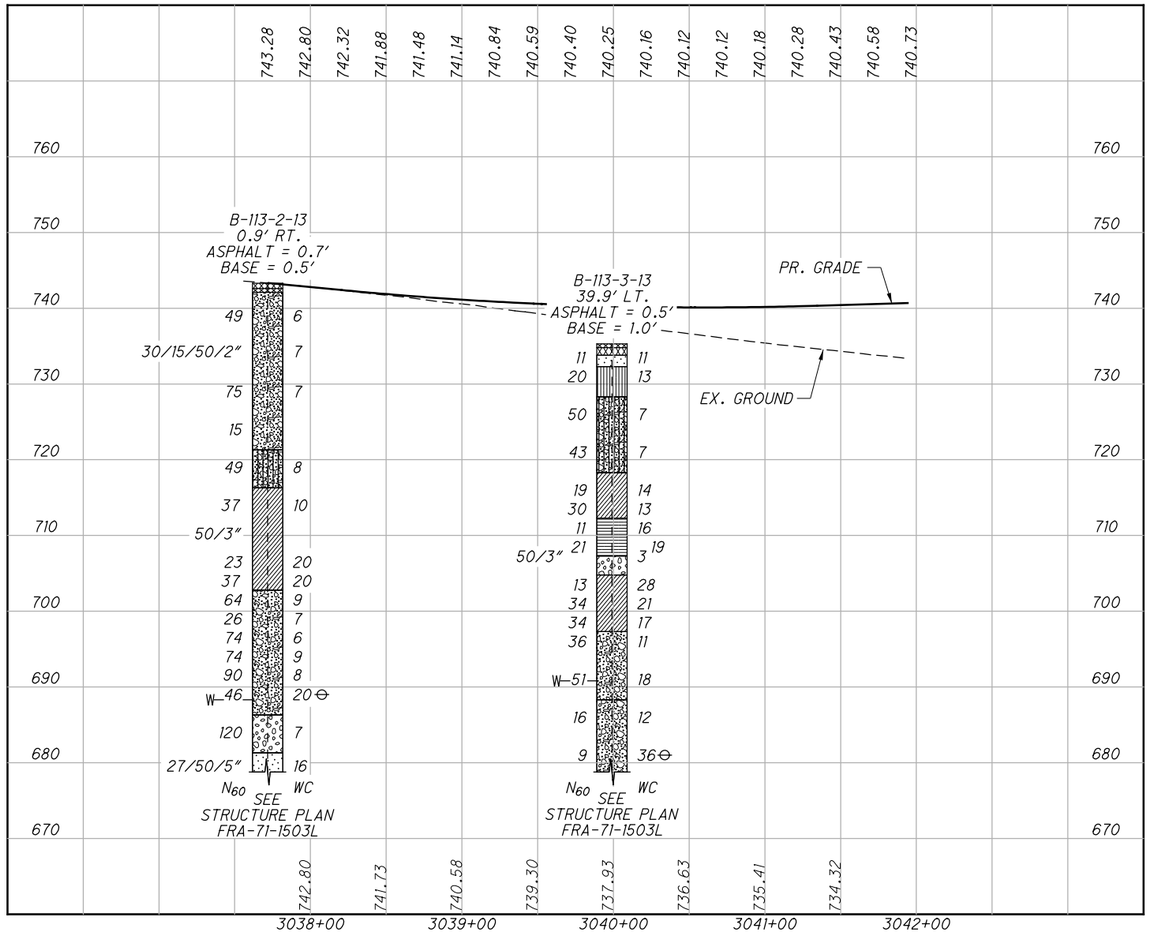
DRAWN RPM
CHECKED BRT

SOIL PROFILE
STA. 831+90.00 TO STA. 842+03.33
TRANS RAMP D3 N

FRA-70-13.10

92 / 496





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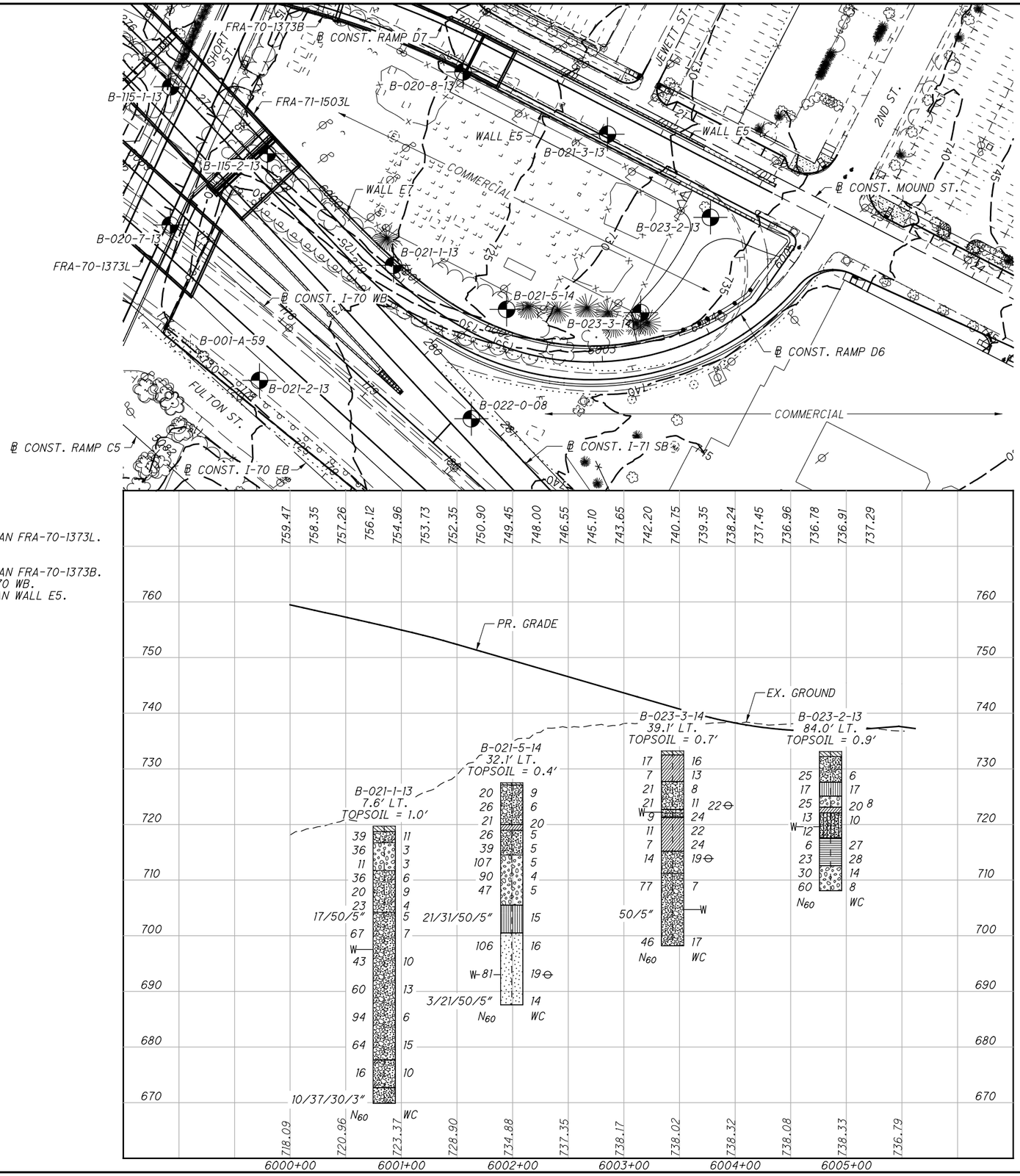
HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 3037+56.02 TO STA. 3041+94.28
TRANS. RAMP D3 W

FRA-70-13.10



PROFILES FOR BORINGS B-115-1-13 AND B-115-2-13 ARE IN STRUCTURE PLAN FRA-71-1503L.
PROFILE FOR BORING B-020-7-13 IS IN STRUCTURE PLAN FRA-70-1373L.
PROFILES FOR BORINGS B-001-A-59 AND B-021-2-13 ARE IN STRUCTURE PLAN WALL 4W7.
PROFILE FOR BORING B-020-8-13 IS IN STRUCTURE PLAN FRA-70-1373B.
PROFILE FOR BORING B-022-0-08 IS IN SOIL PLAN I-70 WB.
PROFILE FOR BORING B-021-3-13 IS IN STRUCTURE PLAN WALL E5.

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RPM
CHECKED BRT

SOIL PROFILE
STA. 6000+00 TO STA. 6005+61.78 RAMP D6

FRA-70-13.10

94/496

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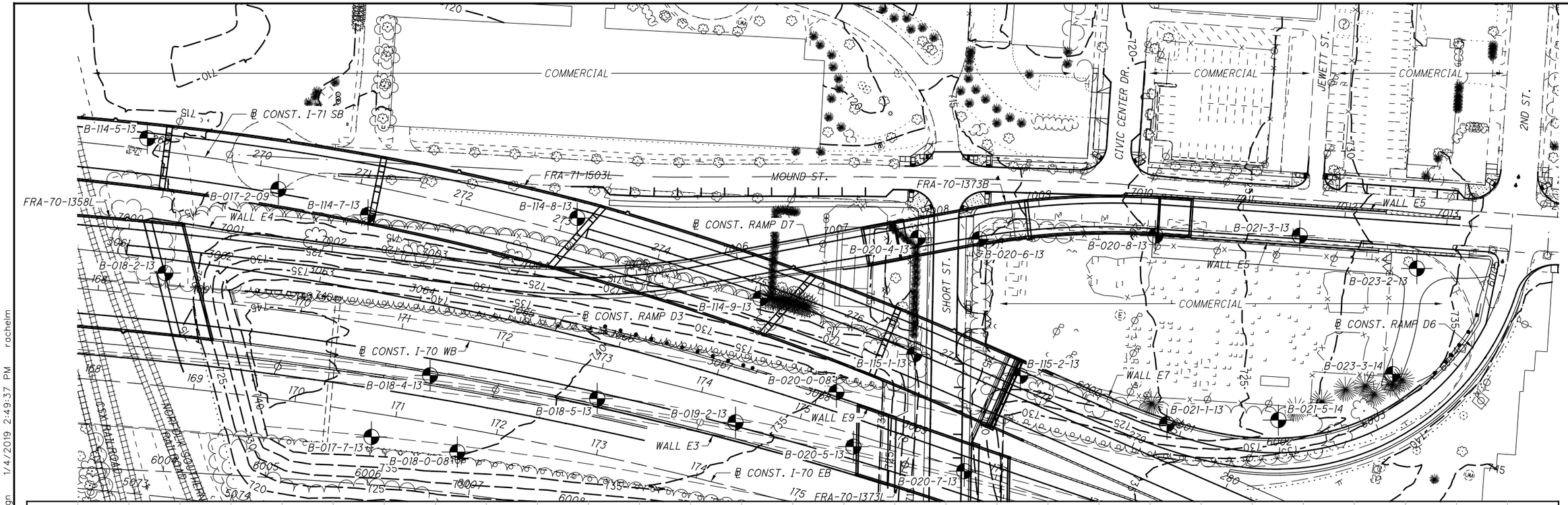

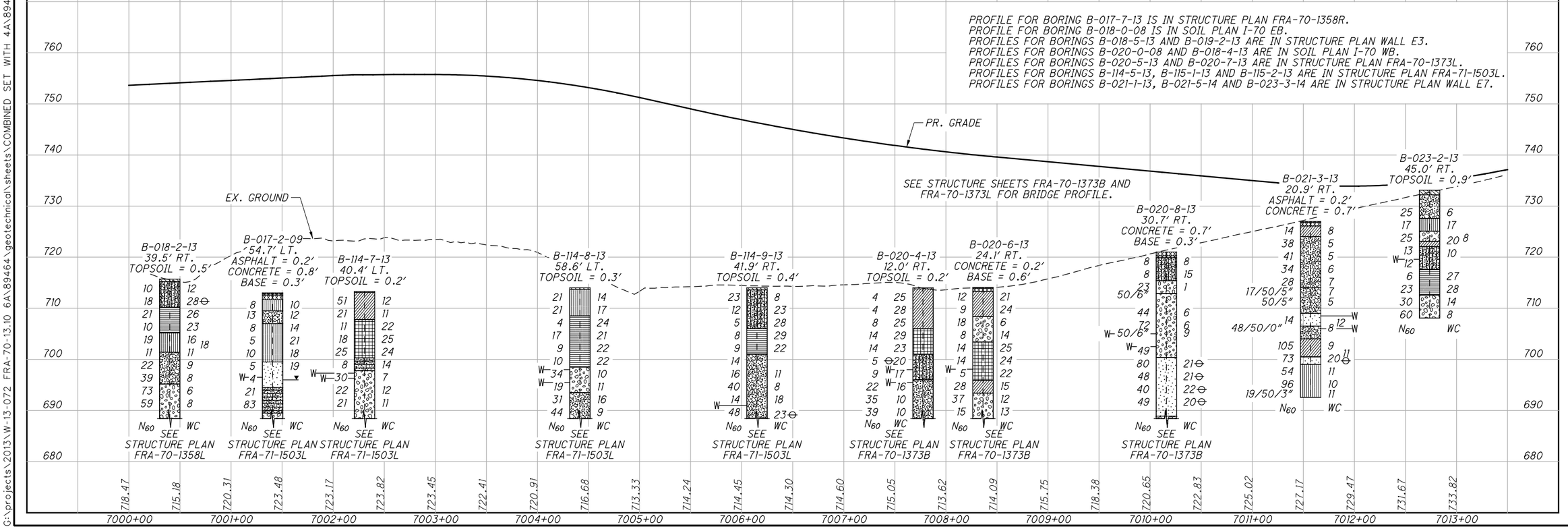

HORIZONTAL SCALE IN FEET
0 25 50 100
DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 7000+00 TO STA. 7013+50 RAMP D7
FRA-70-13.10

95/496

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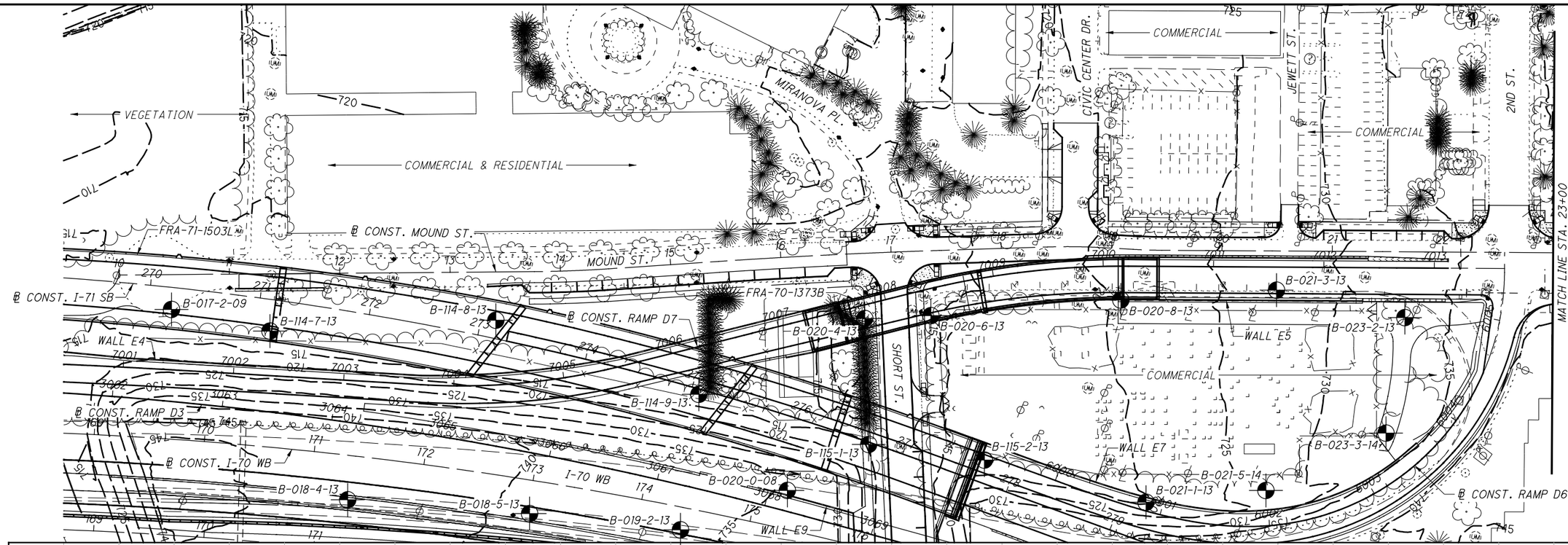
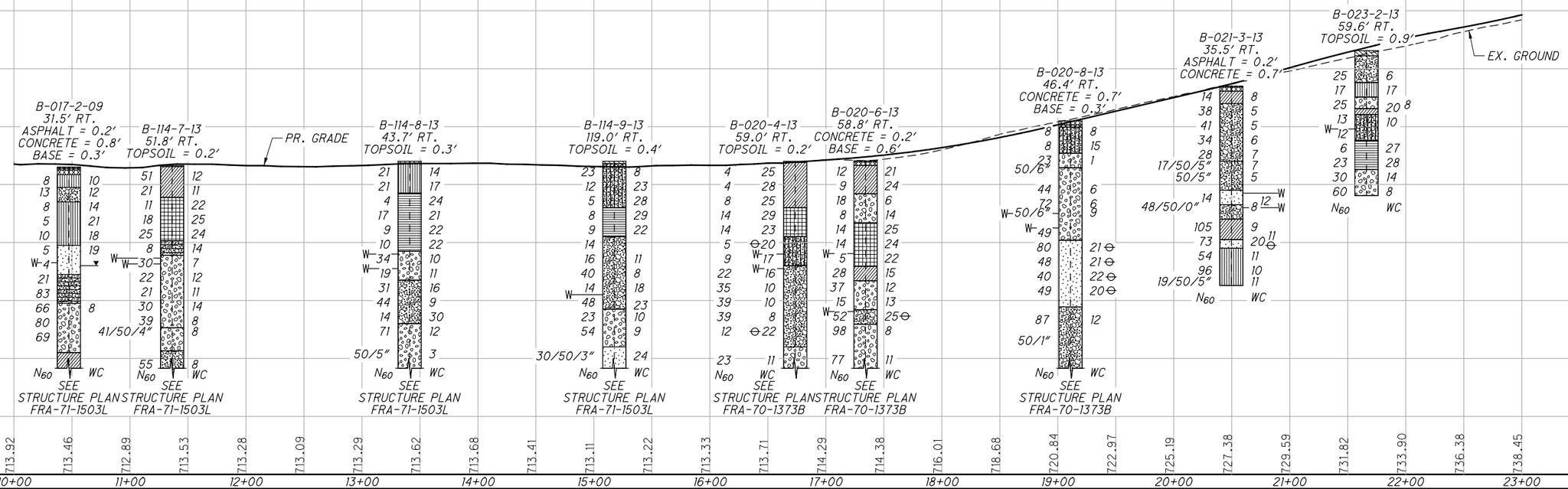


PROFILES FOR BORINGS B-018-5-13 AND B-019-2-13 ARE IN STRUCTURE PLAN WALL E3.
PROFILES FOR BORINGS B-020-0-08 AND B-018-4-13 ARE IN SOIL PLAN I-70 WB.
PROFILES FOR BORINGS B-115-1-13 AND B-115-2-13 ARE IN STRUCTURE PLAN FRA-71-1503L.
PROFILES FOR BORINGS B-021-1-13, B-021-5-14 AND B-023-3-14 ARE IN STRUCTURE PALN WALL E7.



10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00

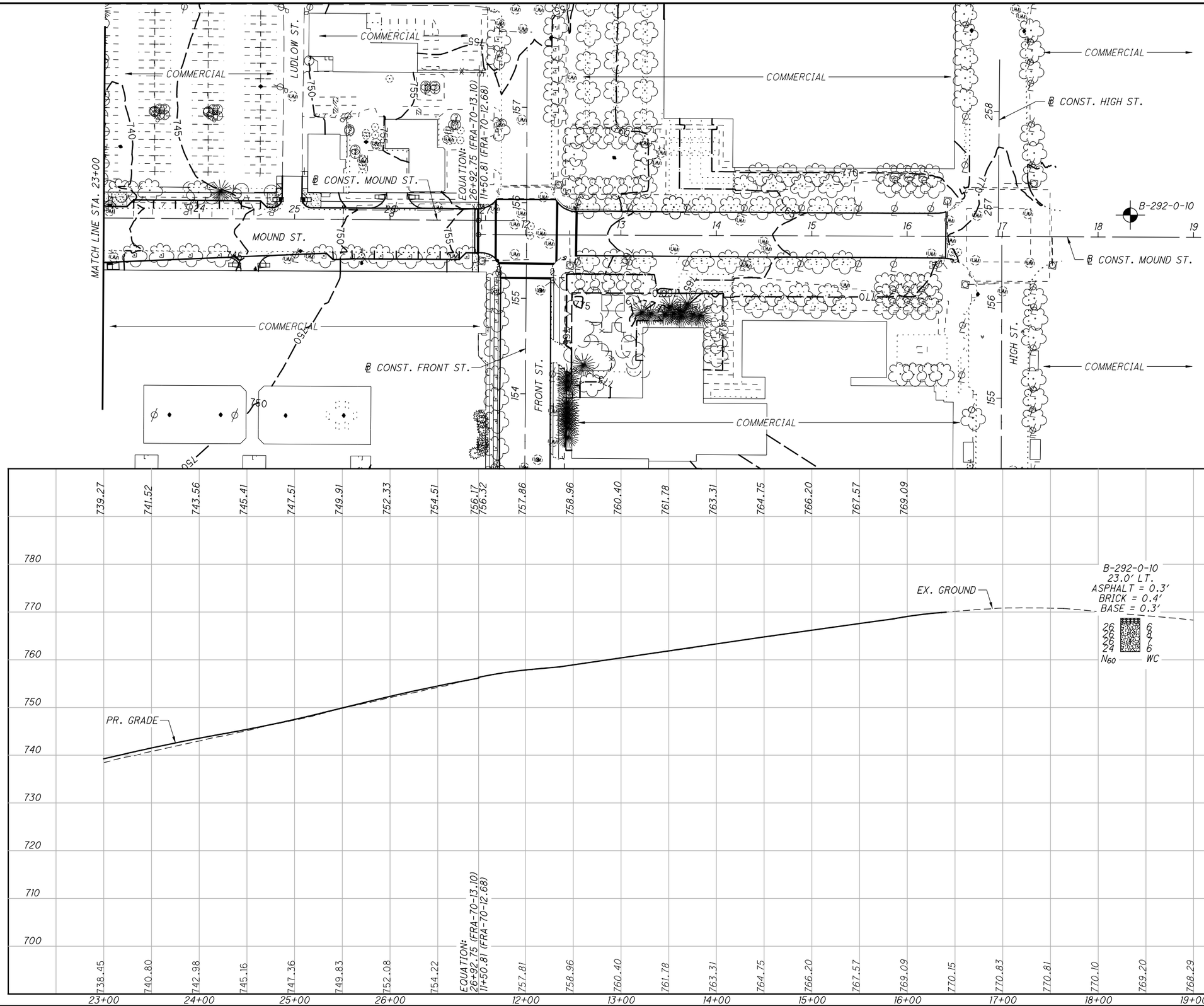
HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 10+00.00 TO STA. 23+00.00 MOUND ST.

FRA-70-12.68
FRA-70-13.10

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372IP022.dgn 1/4/2019 10:03:00 AM rochelm



HORIZONTAL SCALE IN FEET
0 25 50 100

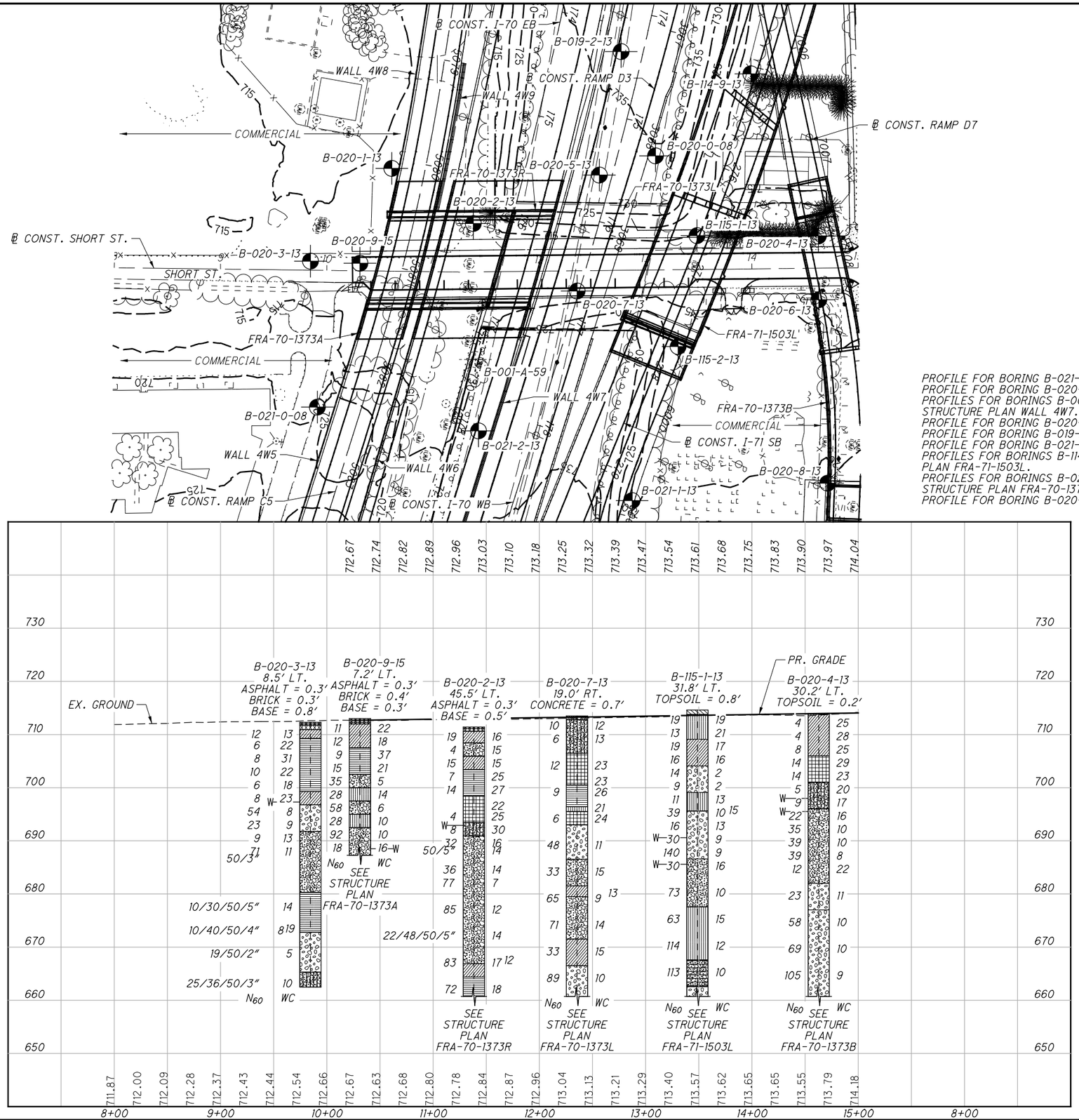
DRAWN RRM CHECKED BRT

SOIL PROFILE
STA. 23+00.00 TO STA. 19+00.00 MOUND ST.

FRA-70-12.68
FRA-70-13.10

97 / 496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372IP023.dgn 12/27/2018 10:03:46 AM rachelm



PROFILE FOR BORING B-021-0-08 IS IN STRUCTURE PLAN WALL 4W5.
PROFILE FOR BORING B-020-1-13 IS IN STRUCTURE PLAN FRA-70-1373A.
PROFILES FOR BORINGS B-001-A-59 AND B-021-2-13 ARE IN STRUCTURE PLAN WALL 4W7.
PROFILE FOR BORING B-020-5-13 IS IN STRUCTURE PLAN FRA-70-1373L.
PROFILE FOR BORING B-019-2-13 IS IN STRUCTURE PLAN WALL E3.
PROFILE FOR BORING B-021-1-13 IS IN STRUCTURE PLAN WALL E7.
PROFILES FOR BORINGS B-114-9-13 AND B-115-2-13 ARE IN STRUCTURE PLAN FRA-71-1503L.
PROFILES FOR BORINGS B-020-6-13 AND B-020-8-13 ARE IN STRUCTURE PLAN FRA-70-1373B.
PROFILE FOR BORING B-020-0-08 IS IN SOIL PLAN I-70 WB.

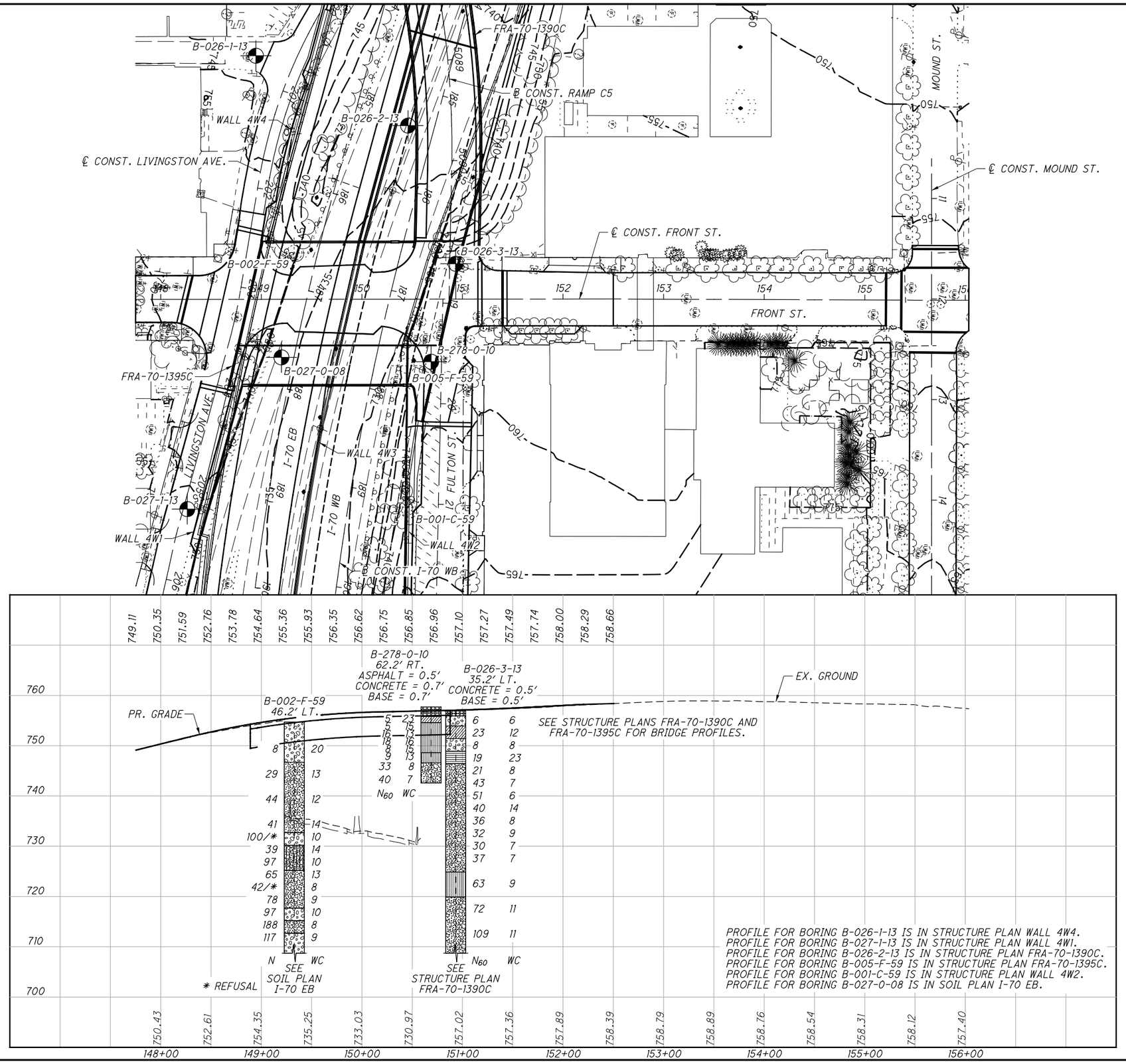
HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 15+21.73 SHORT STREET
STA. 8+00.00 TO STA. 15+21.73
FRA-70-12.68
FRA-70-13.10

98 / 496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372IP024.dgn 12/27/2018 10:03:47 AM rachelm



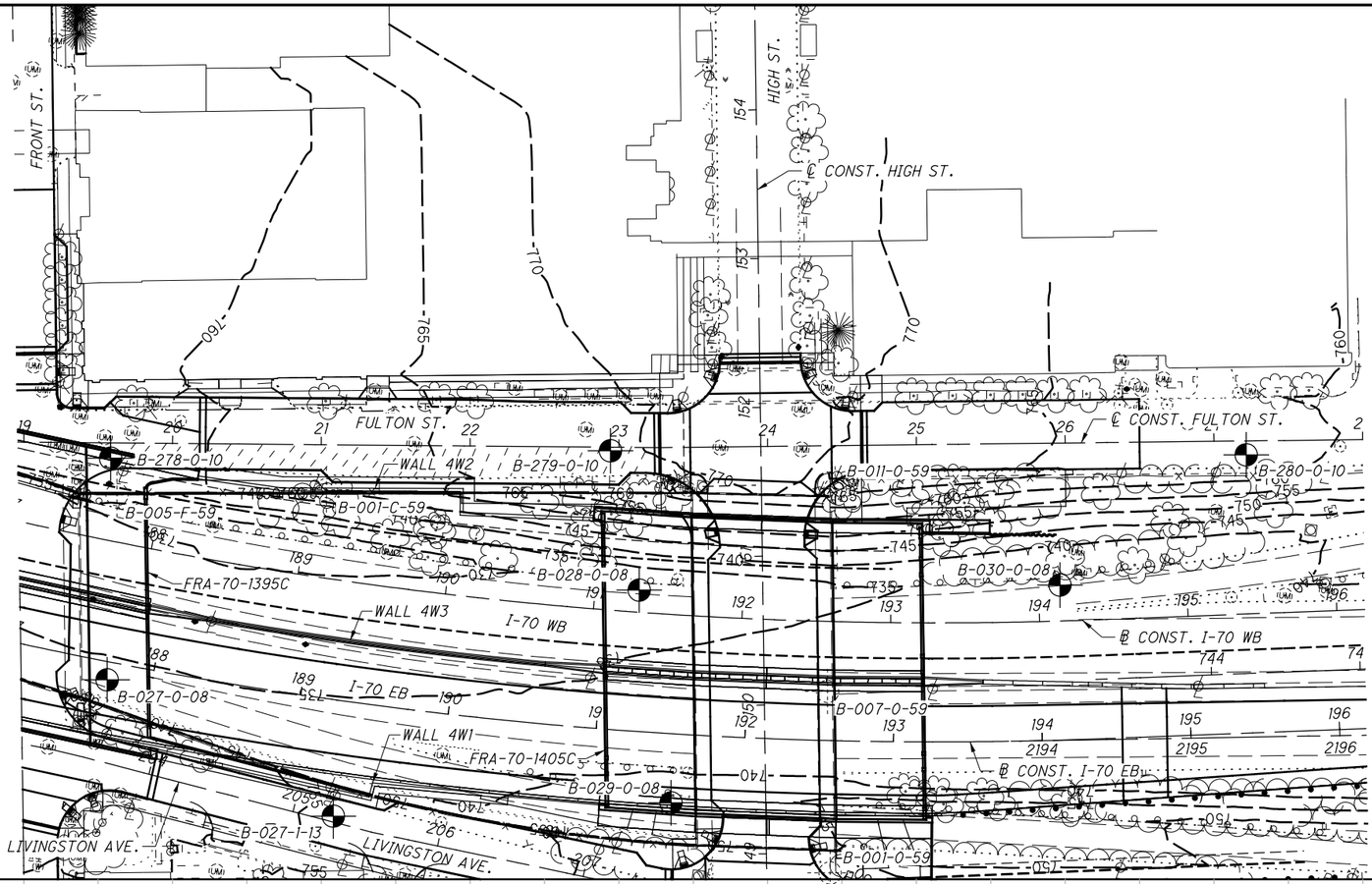
HORIZONTAL SCALE IN FEET
0 25 50 100

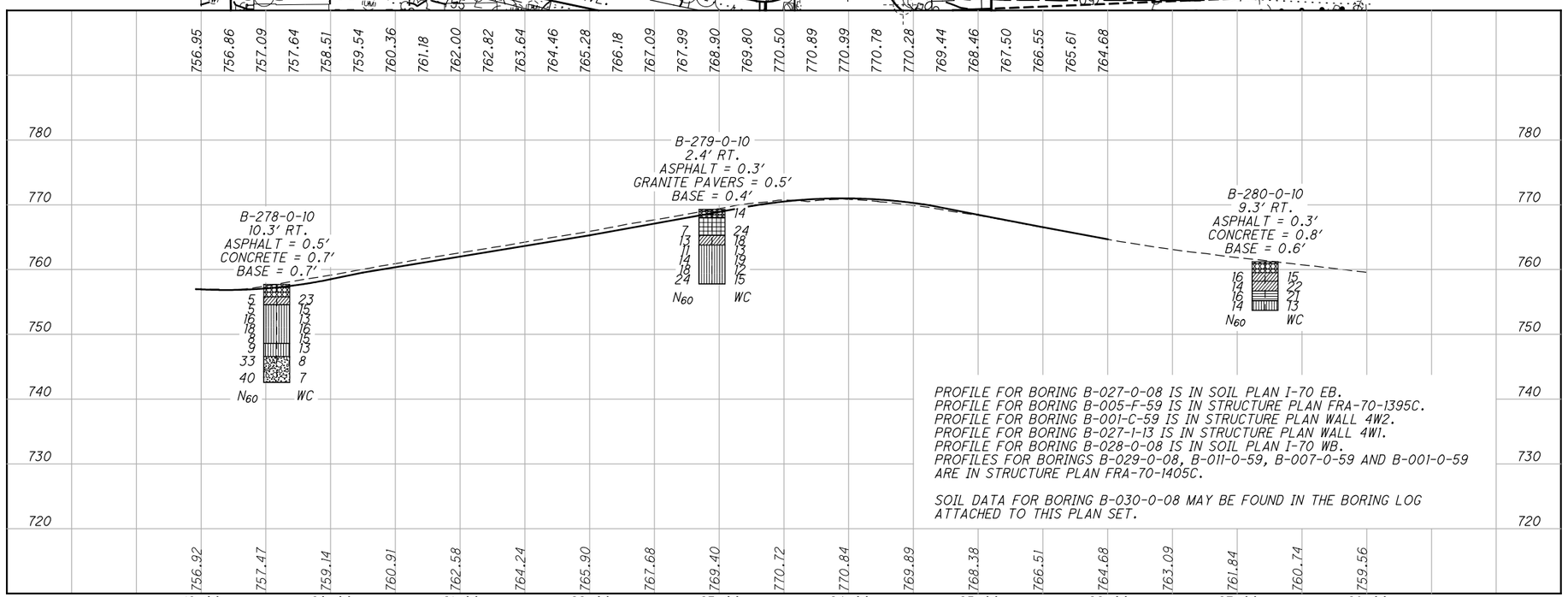
DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 147+75 TO STA. 156+03.49 FRONT ST.

FRA-70-12.68

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372IP018.dgn 1/31/2019 8:01:39 AM rachelm





HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 18+95.96 TO STA. 28+00 FULTON ST.

FRA-70-12.68

100/496

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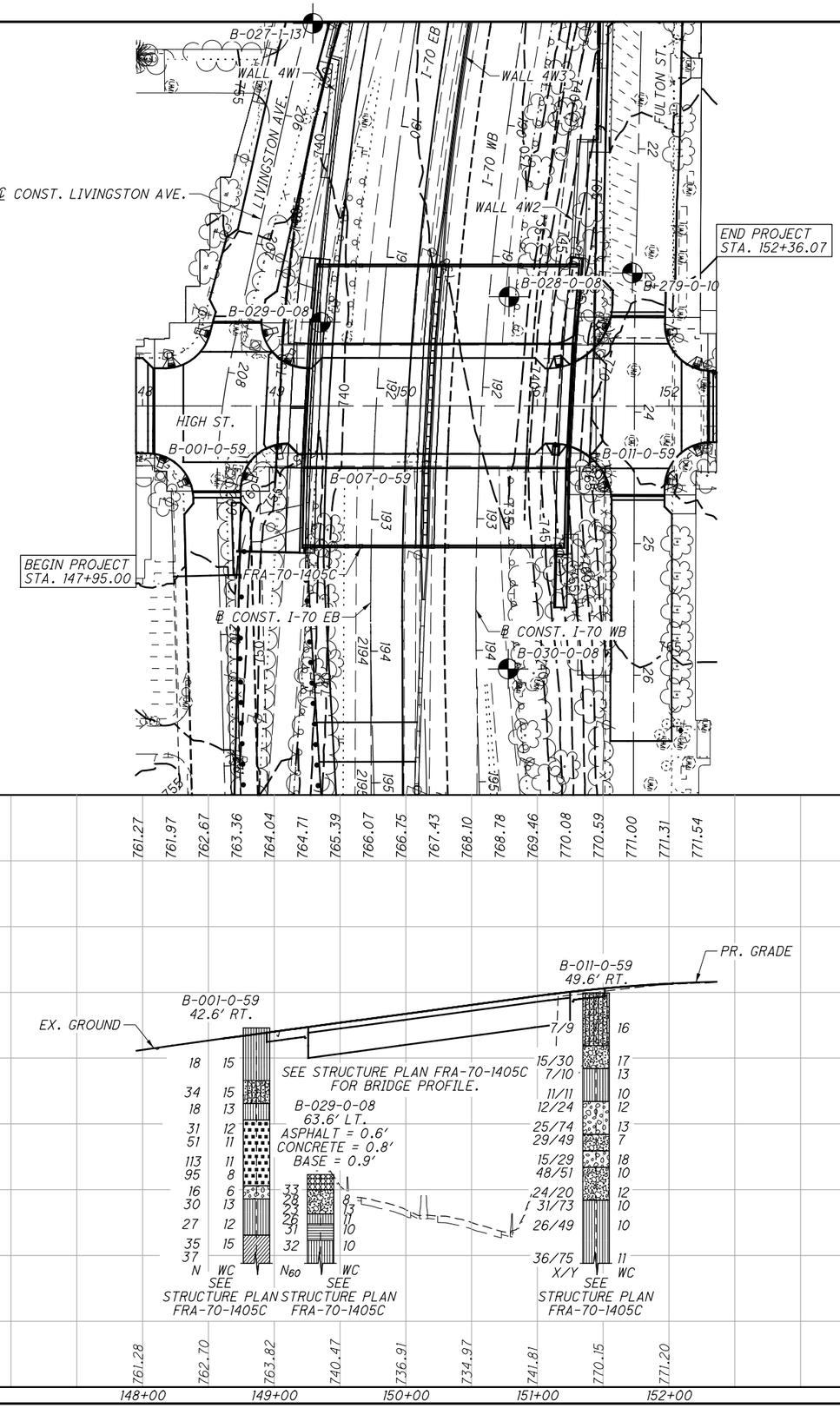

PROFILE FOR BORING B-007-0-59 IS IN STRUCTURE PLAN FRA-70-1405C.
PROFILE FOR BORING B-027-1-13 IS IN STRUCTURE PLAN WALL 4W1.
PROFILE FOR BORING B-028-0-08 IS IN SOIL PLAN I-70 WB.
PROFILE FOR BORING B-279-0-10 IS IN SOIL PLAN FULTON STREET.

SOIL DATA FOR BORING B-030-0-08 MAY BE FOUND IN THE BORING LOG ATTACHED TO THIS PLAN SET.

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 147+95.00 TO STA. 152+36.07 HIGH ST.

FRA-70-12.68

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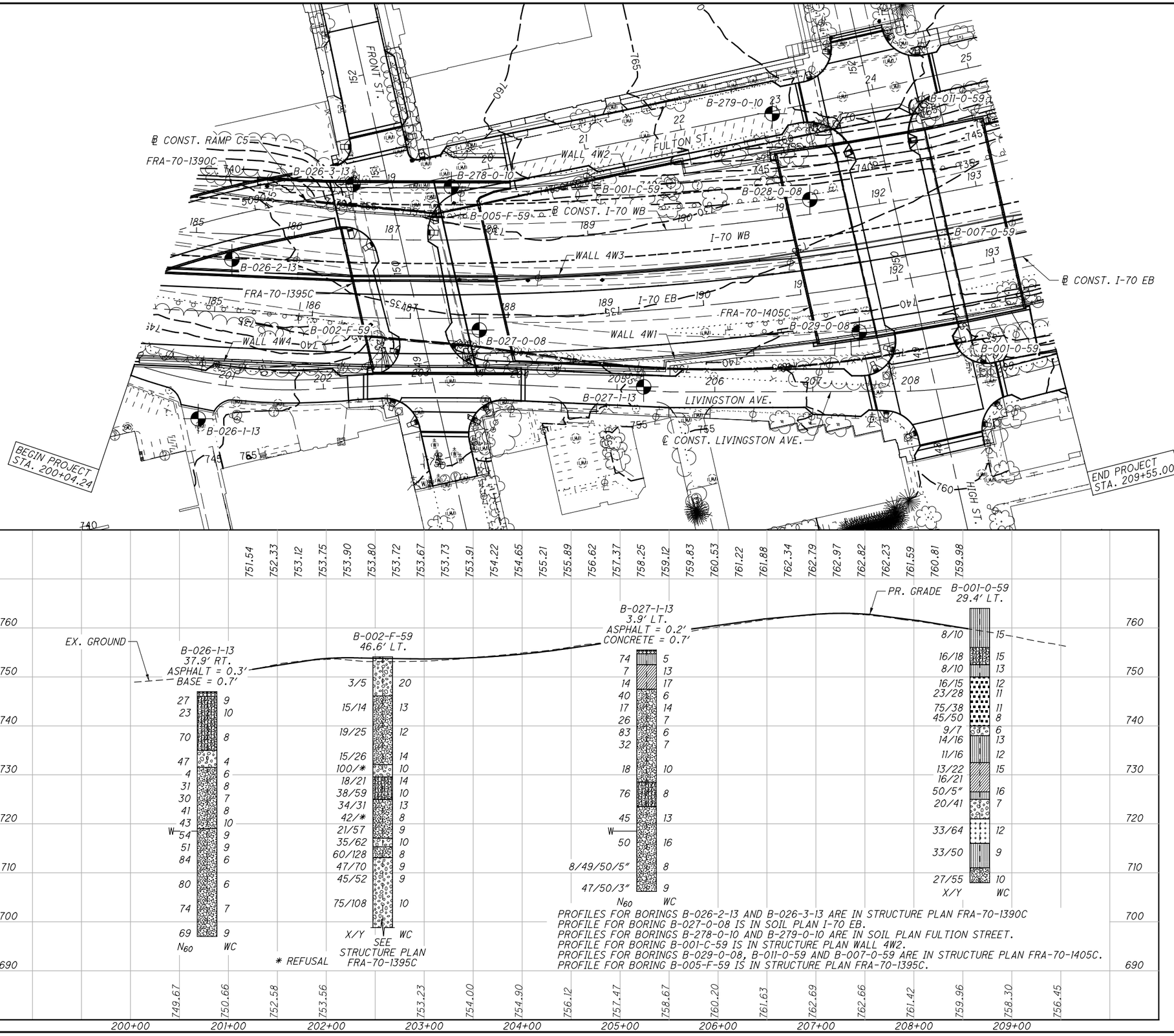

HORIZONTAL SCALE IN FEET
0 25 50 100

DRAWN RRM
CHECKED BRT

SOIL PROFILE
STA. 200+04.24 TO STA. 209+55.00
LIVINGSTON AVE.

FRA-70-12.68

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372IP021.dgn 1/31/2019 10:49:06 AM rachelm

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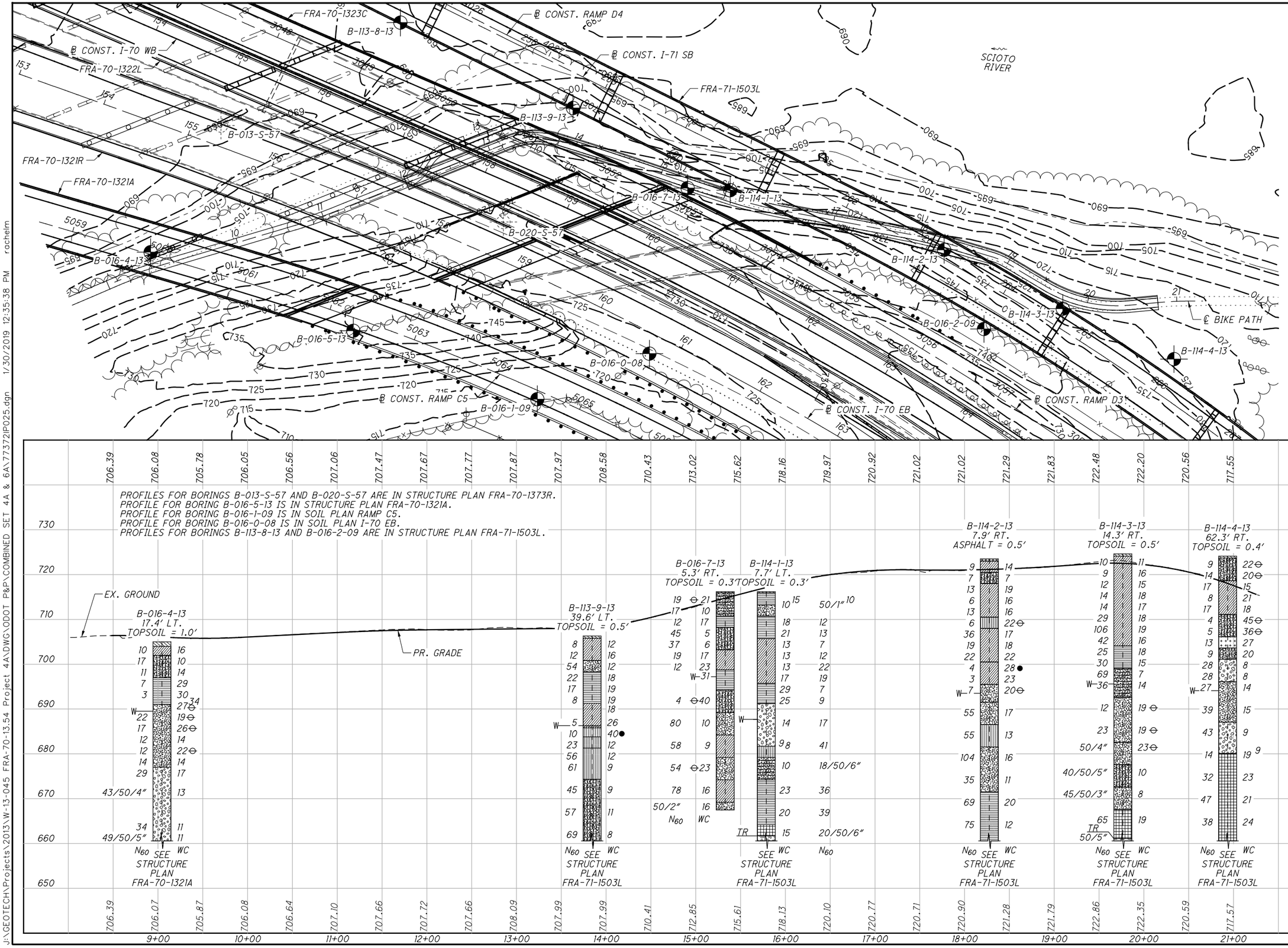


HORIZONTAL SCALE IN FEET
0 25 50 100

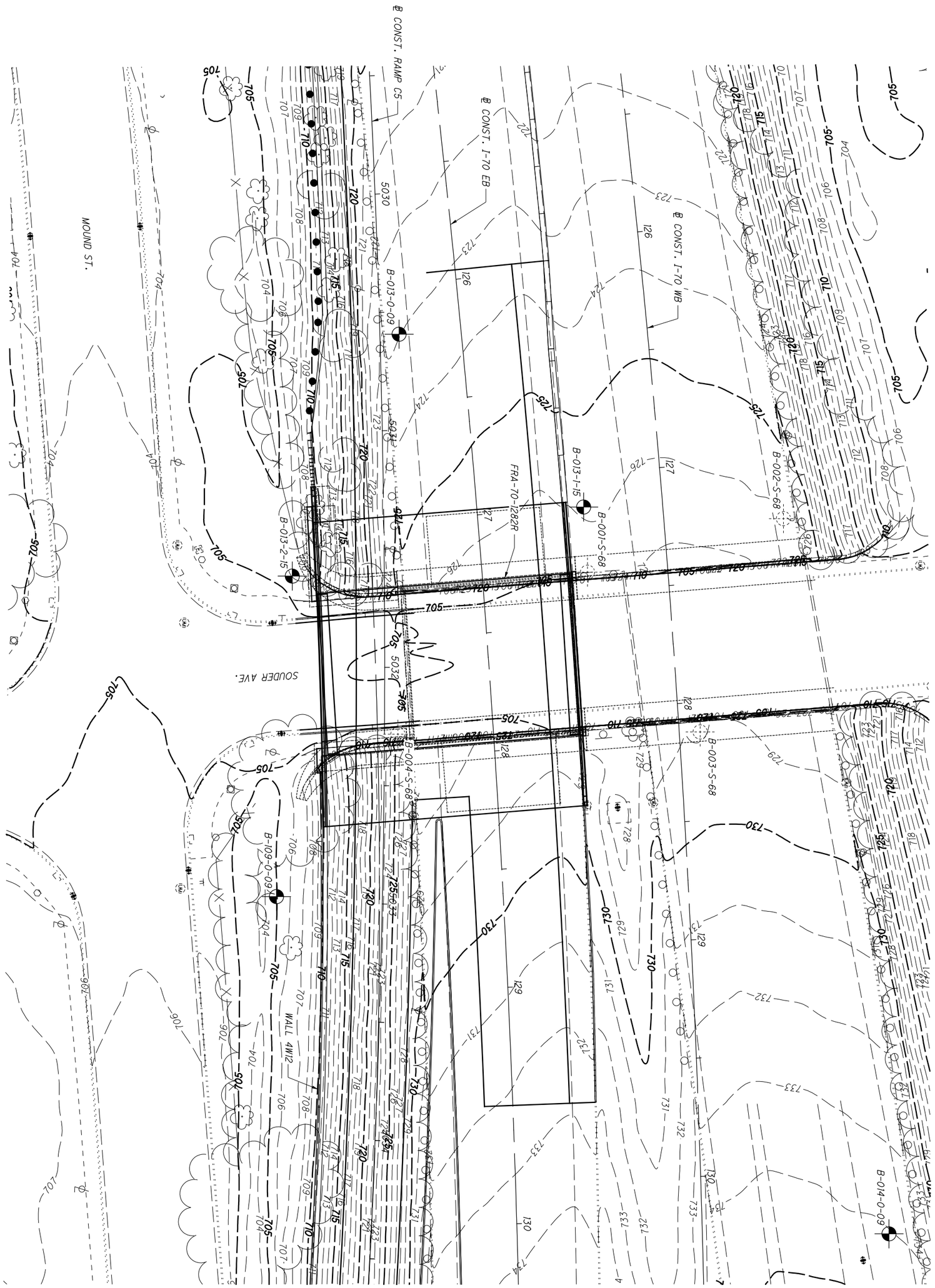
DRAWN RPM
CHECKED BRT

SOIL PROFILE

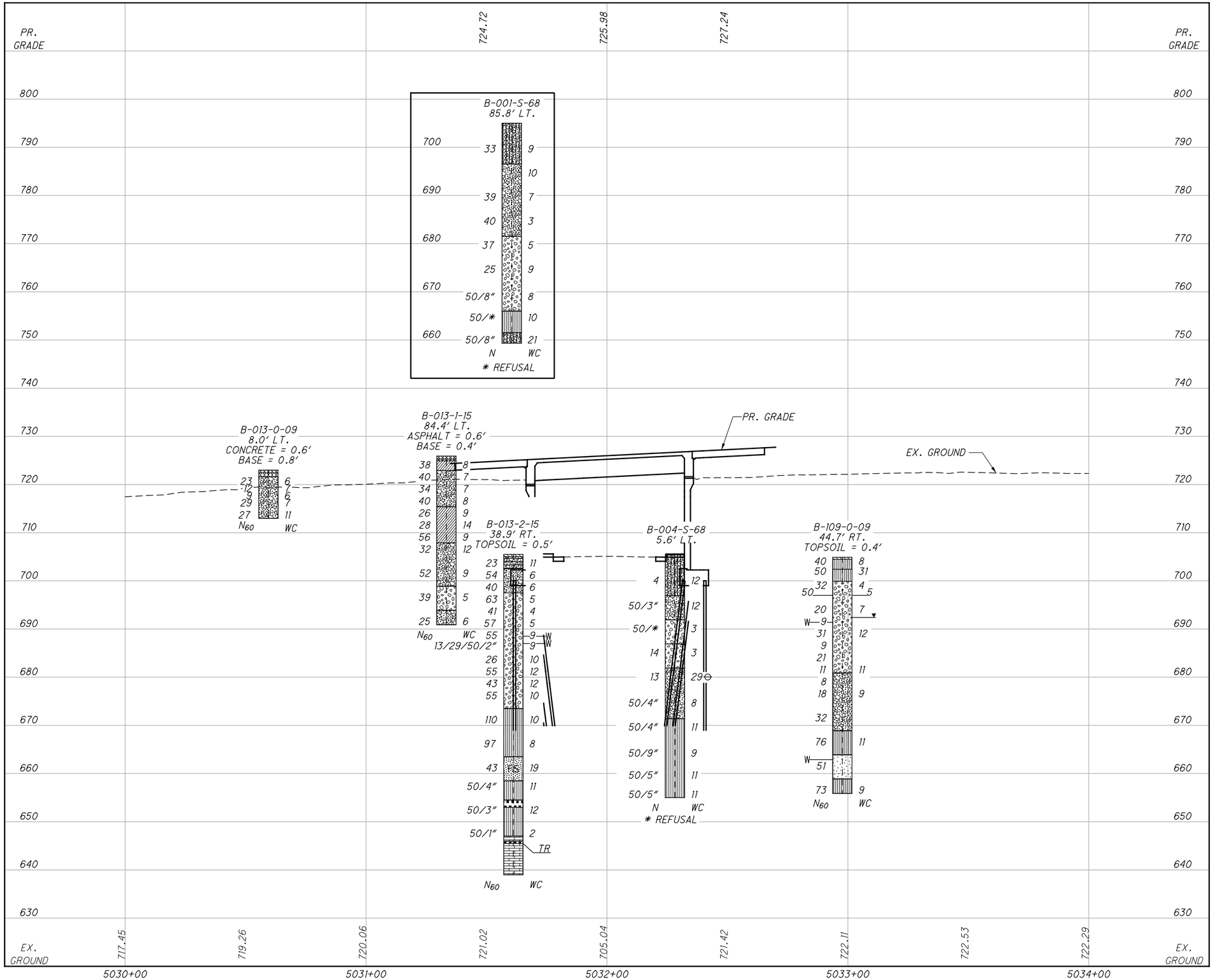
FRA-70-12.68
FRA-70-13.10

STA. 8+02.41 TO STA. 21+28.97 BIKE PATH

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP001.dgn 12/27/2018 10:04:04 AM rachelm



	104/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION FRA-70-1282R I-70 EB OVER SOUDER AVE.	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



PROFILE ALONG ℄ RAMP C5

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1282R I-70 EB OVER SOUDER AVE.

FRA-70-12.68

105 496

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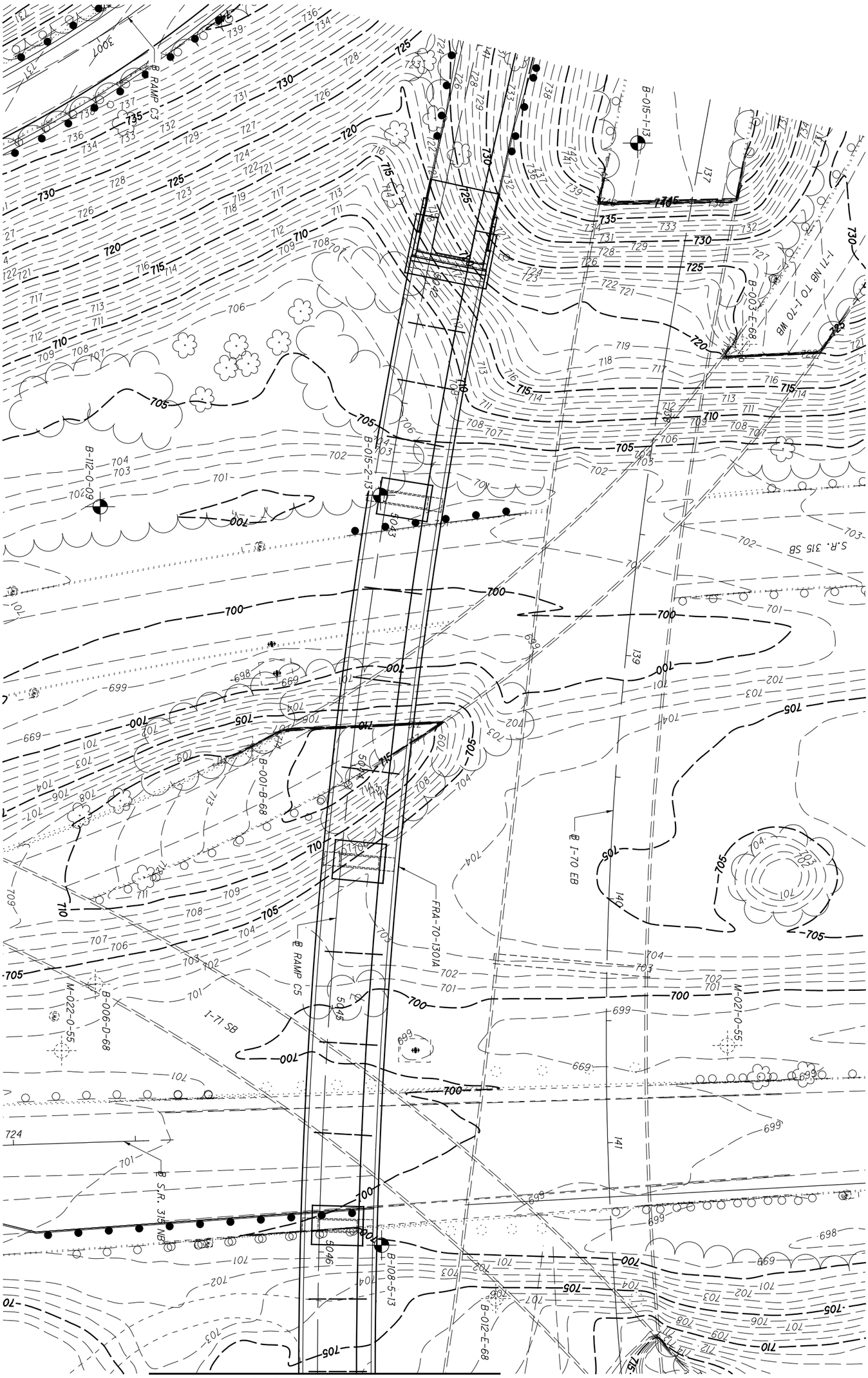
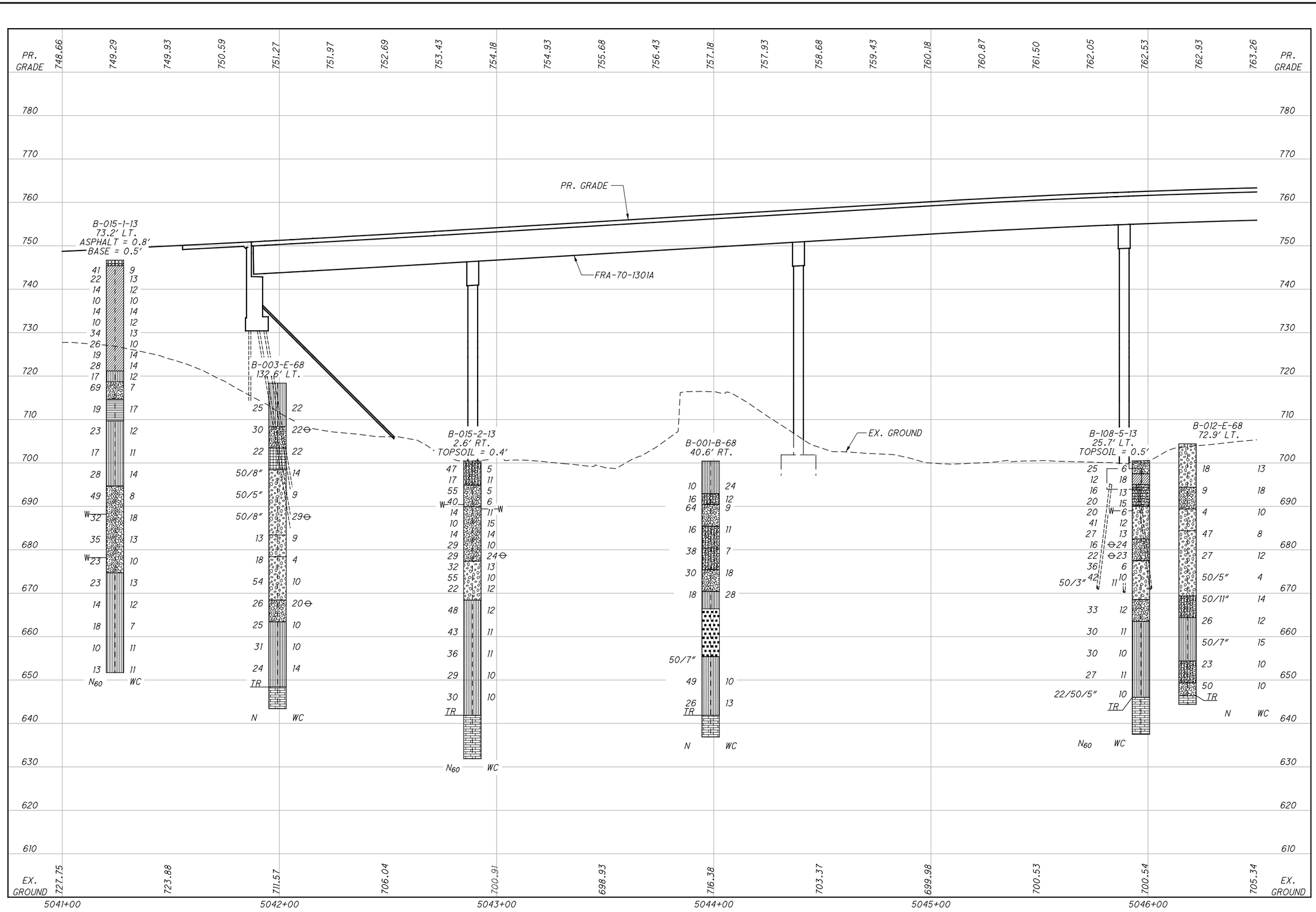


106/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION FRA-70-1301A RAMP C5 OVER SR 315 STA. 5041+00 TO STA. 5046+50	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N



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HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1301A RAMP C5 OVER SR 315
STA. 5041+00 TO STA. 5046+50

FRA-70-12.68

107/496

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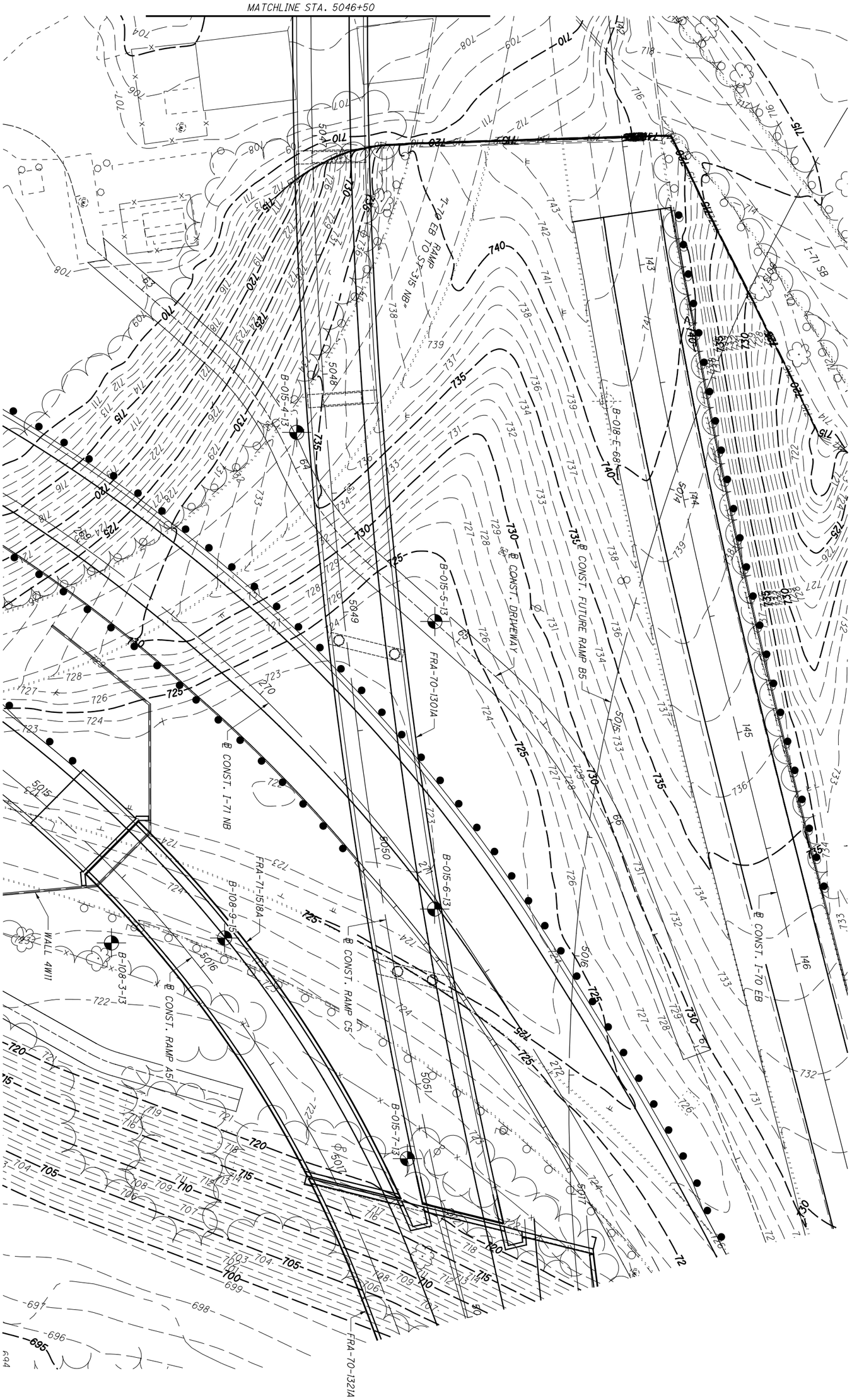

	108/496	**FRA-70-12.68**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-70-1301A RAMP C5 OVER SR 315** **STA. 5046+50 TO STA. 5052+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET

PR. GRADE 763.26 763.52 763.70 763.82 763.85 763.82 763.70 763.52 763.26 762.93 762.53 762.05 761.50 760.87 760.18 759.40 758.56 757.64 756.65 755.58 754.44 753.23 751.98 PR. GRADE

780 770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610

PR. GRADE

FRA-70-1301A

FRA-70-1321A

EX. GROUND

TO BE BUILT WITH BRIDGE FRA-70-1321A

B-015-4-13
12.5' RT.
ASPHALT = 0.5'
BASE = 1.0'

26	17
17	17
28	13
17	16
16	15
18	18
19	17
58	7
50/4"	5
17	13
8	10
10	16
14	8
W-31	12
10	15
5	28
W	31
14	29⊖
12	24⊖
39	21
10	10
12	11
13	11
TR	

N_{60} WC

B-015-5-13
37.6' LT.
TOPSOIL = 0.7'

25	10
10	19
34	16
37	11
23	13
14	16
29	18
10	22
11	22
15	20
8	25
7	28
W-6	19⊖
73	9
23	12
28	28⊖
19	12
32	13
TR	

N_{60} WC

B-015-6-13
20.8' LT.
ASPHALT = 0.2'

19	8
19	16
33	15
6	17
14	15
15	26⊖
25	23
65	12
59	5
54	7
59	9
67	6
15/50/5"	6-W
66	9
81	12
66	15
72	16
117	18
25/47/50/1"	21⊖
50/5"	15
TR	

N_{60} WC

B-015-7-13
9.8' RT.
TOPSOIL = 0.4'

37	9
32	6
8	15
11	13
15	20
8	17
19	17
50	7
55	7
67	8
W-41	10
21/50/1"	15
102	9
52	8
61	19
20/50/1"	17
30/50/1"	11
42/50/4"	10
50/5"	24⊖
TR	

N_{60} WC

EX. GROUND 705.34 708.83 729.18 735.08 735.45 724.31 722.63 722.65 724.80 723.01 721.61 708.02 EX. GROUND

5047+00 5048+00 5049+00 5050+00 5051+00 5052+00

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1301A RAMP C5 OVER SR 315
STA. 5046+50 TO STA. 5052+00

FRA-70-12.68

109/496

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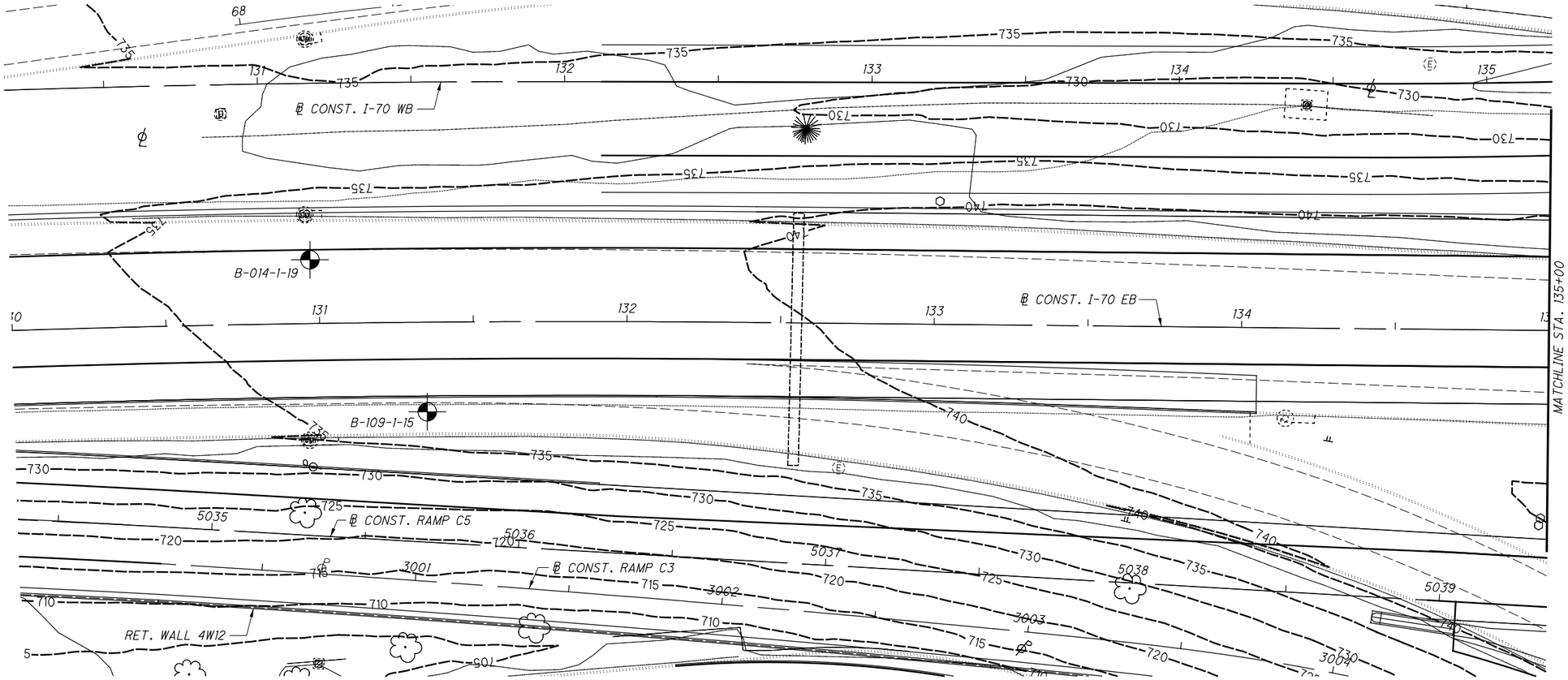

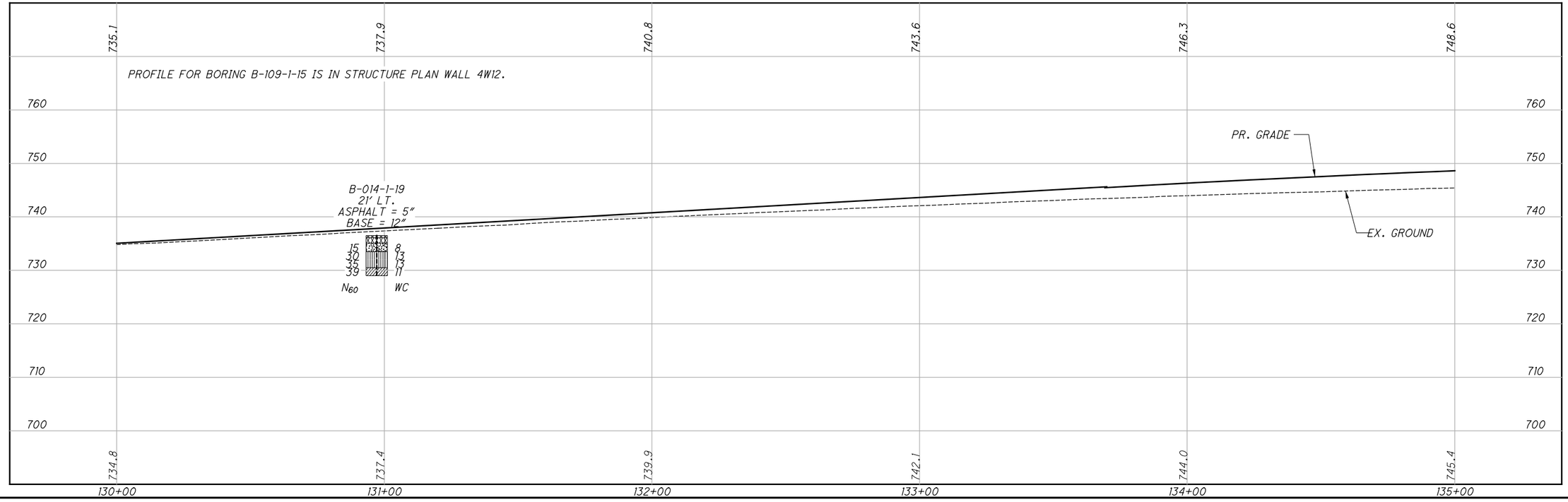

N

0 10 20 40 HORIZONTAL SCALE IN FEET

DRAWN RRM CHECKED BRT

SOIL PROFILE
I-70 EB STA. 130+00 TO STA. 135+00

FRA-70-13.01

109A496

1

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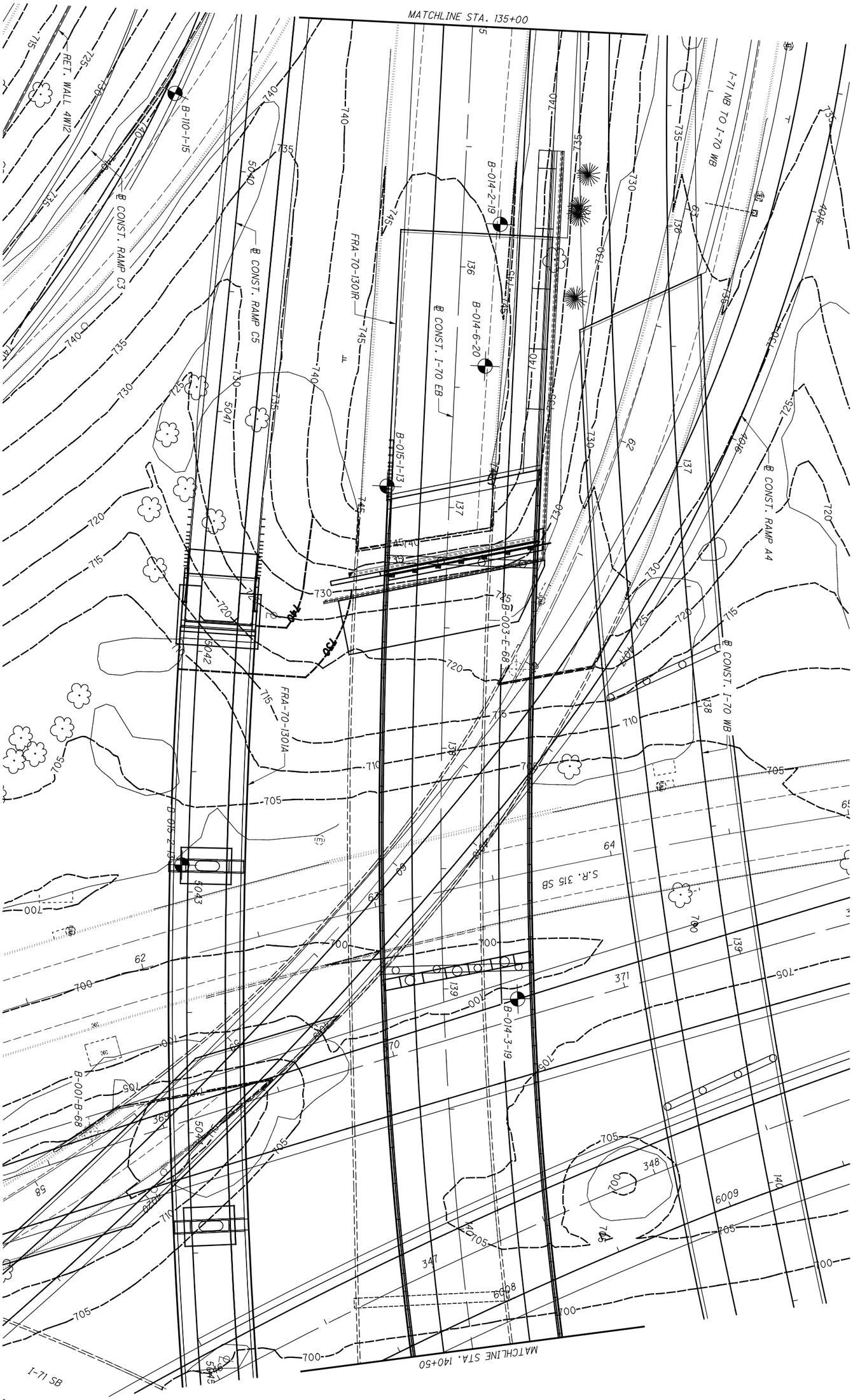

105469	FRA-70-13.01	STRUCTURE FOUNDATION EXPLORATION FRA-70-1301R I-70 EB OVER SR 315 STA. 135+00 TO STA. 140+50	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N

PROFILE FOR BORING B-110-1-15 IS IN STRUCTURE PLAN 4W12.
PROFILE FOR BORING B-001-13-68 IS ON FRA-70-1301A.
PROFILE FOR BORING B-014-6-20 SEE BORING LOG.

PR. GRADE
EX. GROUND

B-014-2-19
16' LT.
ASPHALT = 5"
BASE = 14"

B-015-1-13
26' RT.
ASPHALT = 0.8'
BASE = 0.5'

B-003-E-68
30' LT.

B-015-2-13
108" RT.
TOPSOIL = 0.4'

B-014-3-19
31' LT.
TOPSOIL = 4"

PR. GRADE	747.98	748.42	748.83	749.20	749.53	749.83	750.09	750.31	750.49	750.64	750.74	750.82	750.85	750.85	750.81	750.73	750.61	750.46	750.27	750.04	749.78	749.48	PR. GRADE
780																							780
770																							770
760																							760
750																							750
740																							740
730																							730
720																							720
710																							710
700																							700
690																							690
680																							680
670																							670
660																							660
650																							650
640																							640
630																							630
620																							620
610																							610
EX. GROUND	745.80	746.06	746.30	746.52	746.67	746.79	746.89	747.12	747.43	747.57	747.67	747.73	747.76	747.77	747.73	747.68	747.57	747.43	747.12	746.98	746.83	746.62	EX. GROUND
	135+00				136+00			137+00				138+00				139+00					140+00		

B-014-2-19: 21 29 21 15 15 23 27 17 33 23 4/12/50/4" 68 38/50/2" 23 42 9 23 96 8 71 11 W 30 15 27 16 44 9 39 10 TR — N_{60} WC

B-015-1-13: 41 22 14 10 14 10 34 26 19 28 17 69 19 23 17 28 49 W 32 35 W 23 23 14 18 10 13 — N_{60} WC

B-003-E-68: 25 30 22 17 50/8" 50/5" 50/8" 13 18 54 26 25 31 24 TR — N WC

B-015-2-13: 47 17 55 W 40 14 10 14 29 29 32 55 22 48 43 36 29 30 TR — N_{60} WC

B-014-3-19: 85 42 70 72 34 38 37 15 17 46 14/25/50/5" 82 27 27 56 TR — N_{60} WC

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HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1301R I-70 EB OVER SR 315
STA. 135+00 TO STA. 140+50

FRA-70-13.01

1090496

1

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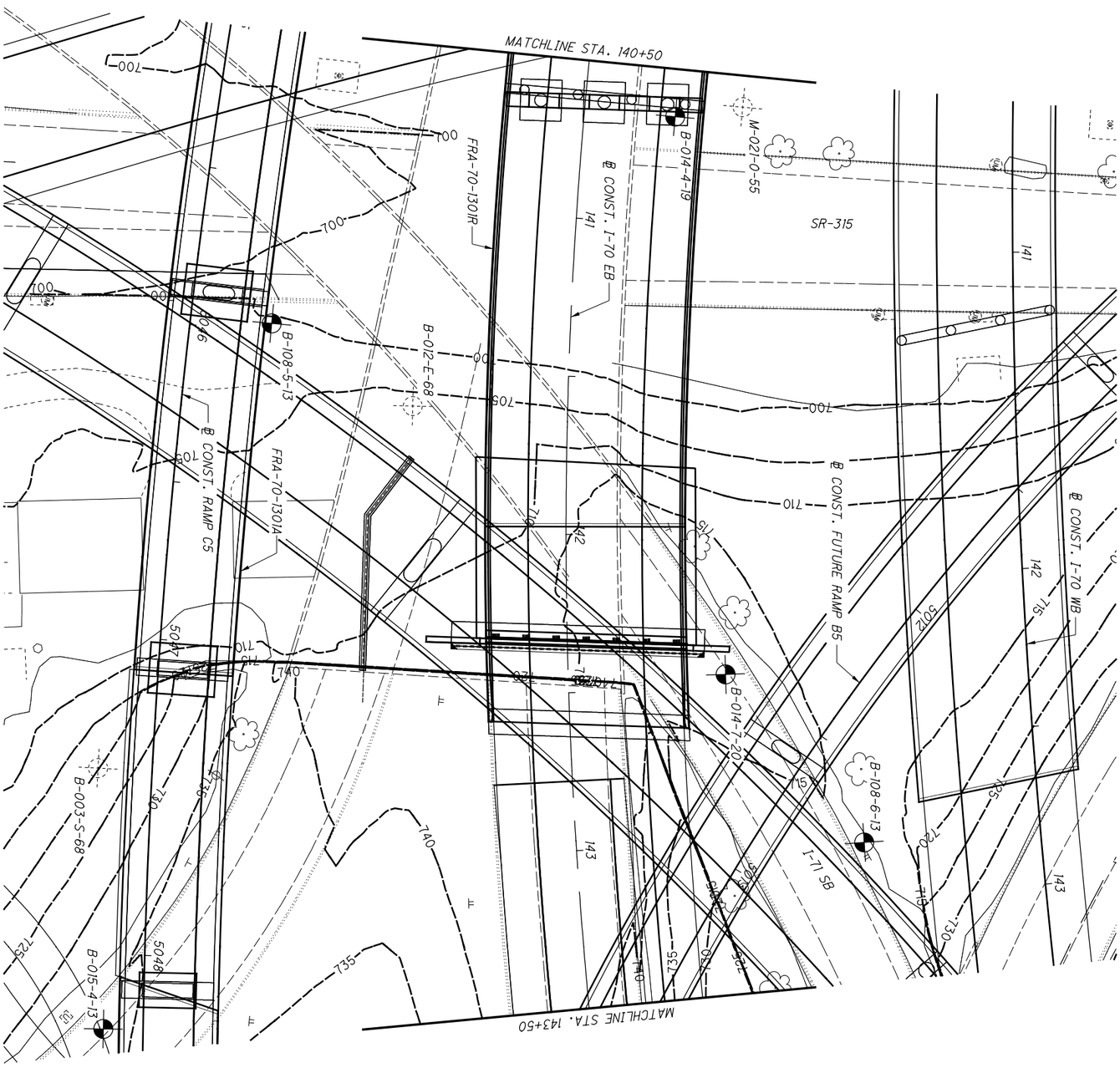

1 of 1	FRA-70-13.01	STRUCTURE FOUNDATION EXPLORATION FRA-70-1301 I-70 EB OVER SR 315 STA. 140+50 TO STA. 143+50	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N

PROFILE FOR BORING B-015-4-13 IS IN STRUCTURE PLAN FRA-70-1301A.
B-003-S-68 MAY BE FOUND IN THE BORING LOGS ATTACHED TO THIS PLAN SET.
BORING M-021-0-55 IS NOT INCLUDED IN THIS PLAN SET.

PR. GRADE — 749.48 — 749.14 — 748.76 — 748.35 — 747.89 — 747.41 — 746.88 — 746.32 — 745.72 — 745.08 — 744.40 — 743.69 — 742.99 — PR. GRADE

780 770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610

PR. GRADE
EX. GROUND

B-014-4-19
29' LT.
TOPSOIL = 5"

37	25	10	16	
	32	8		
	40	8		
	30	W 11		
	44	8		
	28	14		
	24	12		
	15	9		
	73	9		
	73	9		
	34	11		
	27	11		
	25	10		
	50/4"	8		
	50/1"	TR		
	N_{60}	WC		

B-108-5-13
94' RT.
TOPSOIL = 0.5'

25	6	18	13
12	18		
16	13	9	18
20	15		
20	W 6	4	10
41	12		
27	13	47	8
16	⊖24		
22	⊖23	27	12
36	6		
50/3"	42 11 10	50/5"	4
33	12	50/11"	14
30	11	26	12
30	10	50/7"	15
27	11	23	10
22/50/5"	10	50	10
TR		TR	
N_{60}	WC	N	WC

B-012-E-68
49' RT.

B-014-7-20
50' LT.
TOPSOIL = 0.2'

15/6"22	14		
ST 53	15		
ST			
23	23		
ST			
50/5"128	W 10	15	
68	9		
43	9		
40	11		
23	10		
ST			
45	11		
11/50/5"	9		
50/1"	8		
N_{60}	WC		

B-108-6-13
91' LT.
TOPSOIL = 0.2'

33	7		
19	6		
7	19		
16	9	5	
W 9	12		
12	21		
7	24		
7	21		
46	24		
12	20		
12	15		
9	17		
9	18		
W 26	11		
54	9		
84	10		
50/5"	9		
TR	8		
N_{60}	WC		

EX. GROUND — 746.62 — 746.38 — 746.10 — 745.76 — 745.44 — 745.12 — 744.73 — 744.35 — 743.61 — 743.22 — 742.68 — 742.14 — 741.58 — EX. GROUND

141+00 142+00 143+00

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1301R I-70 EB OVER SR 315
STA. 140+50 TO STA. 143+50

FRA-70-13.01

109E496

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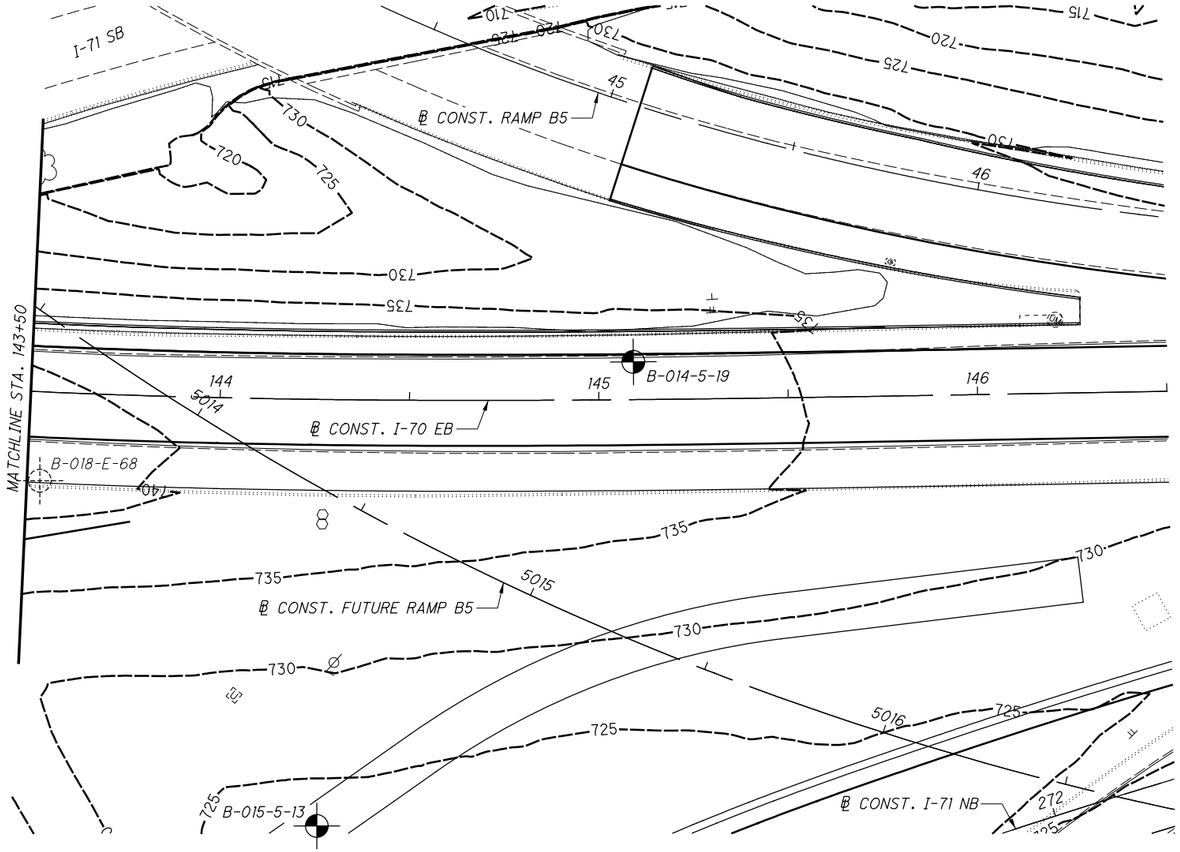

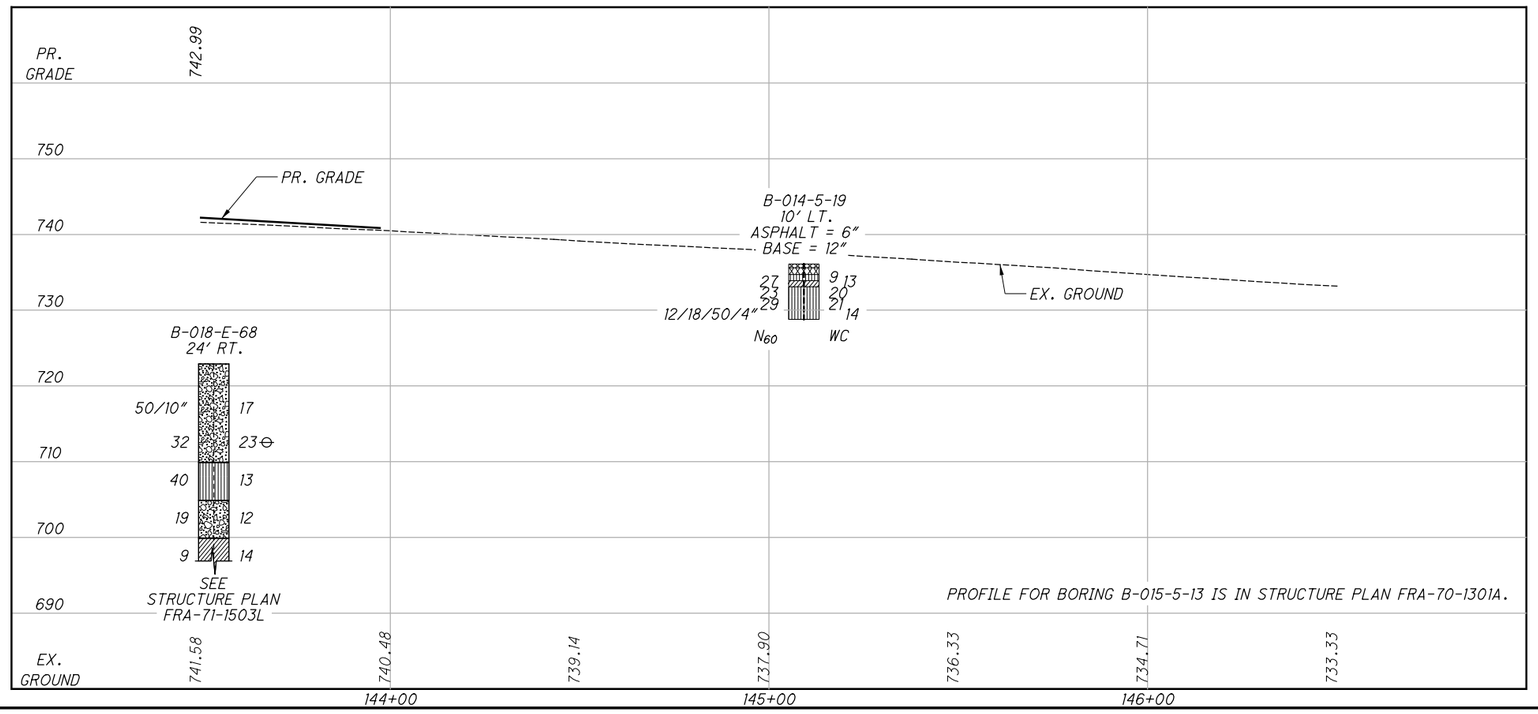

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HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

SOIL PROFILE
I-70 EB STA. 143+50 TO STA. 146+50

FRA-70-13.01

109F496

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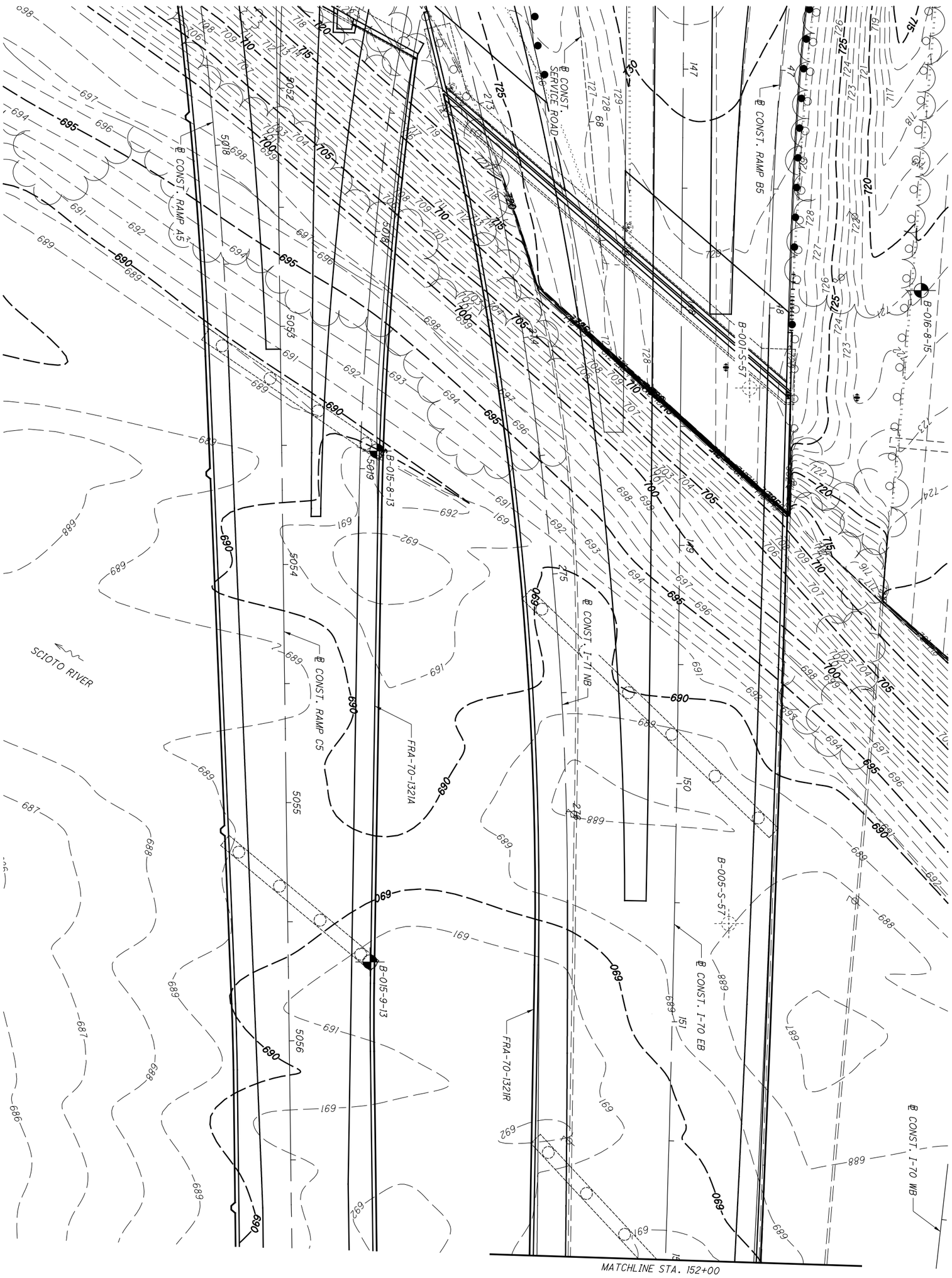

110/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION FRA-70-1321R OVER - SCIOTO RIVER STA. 147+00 TO STA. 152+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N

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PR. GRADE — 734.16 — 734.00 — 733.89 — 733.83 — 733.81 — 733.84 — 733.91 — 734.04 — 934.20 — 734.42 — 734.67 — 734.98 — 735.31 — 735.66 — 735.99 — 736.34 — 736.67 — 737.00 — 737.34 — 737.63 — 737.90 — PR. GRADE

780 770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610

PR. GRADE

FRA-70-1321R

B-001-S-57
28.9' LT.

EX. GROUND

NORMAL WATER
ELEV. = 696.2

B-015-8-13
127.4' RT.

18	11			
45	7			
30	24			
70	12			
52	14	17	23	
38	8	6	25	
74	13	7	29	
90	7	27	20	
155	18	20/50/3"	19	
		17	20	
		27	14	
		49	16	
		42	14	
		69	16	
		14/50/3"	13	
		50/2"		
		137	12	
		20/40/50/5"	8	
		50/1"	9	
N	WC	N_{60}	WC	

TR

B-005-S-57
22.9' LT.

24	11		
73	13		
180	10		
117	11		
20			
600	28		
N	WC		

TR

B-015-9-13
127.4' RT.

4		22	
5		16	
7		18	
12		20	
3		15	
7		19	33 ●
7		53 ●	
10		25 ⊖	
13		45 ⊖	
27		42 ⊖	
42	50/1"	51 ●	
		72 ●	
		20	
37/50/3"	14		
50/1"			
20/50/3"	13		
TR			
N_{60}	WC		

EX. GROUND — 730.48 — 729.38 — 728.59 — 710.49 — 699.16 — 690.75 — 688.18 — 688.45 — 689.08 — 690.04 — 691.15 — EX. GROUND

147+00 148+00 149+00 150+00 151+00 152+00

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1321R OVER SCIOTI RIVER
STA. 147+00 TO STA. 152+00

FRA-70-12.68

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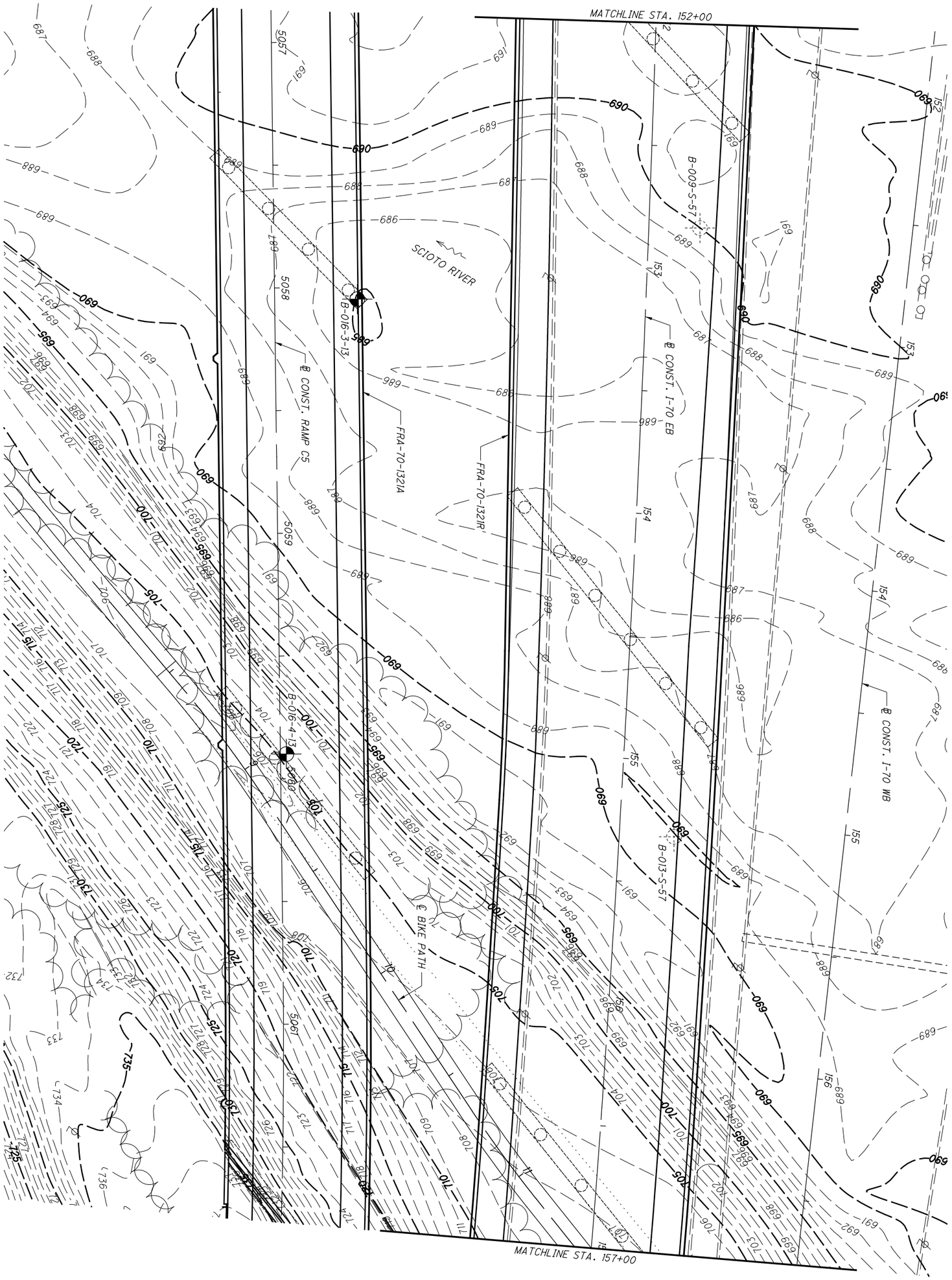

	112/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION FRA-70-1321R OVER SCIOTO RIVER STA. 152+00 TO STA. 157+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET

PR. GRADE: 737.90 | 738.11 | 738.30 | 738.44 | 738.54 | 738.60 | 738.64 | 738.62 | 738.57 | 738.48 | 738.36 | 738.23 | 738.11 | 737.98 | 737.86 | 737.73 | 737.61 | 737.48 | 737.36 | 737.23 | 737.11

780 770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610

PR. GRADE

FRA-70-1321R

NORMAL WATER ELEV. = 696.2

B-009-S-57
20.8' LT.

39 17
171 10
39 5
190 6
70 2
TR
N WC

B-016-3-13
117.5' RT.

4 19
4 19
12 14
7 18
16 21
19 22
26 11
12 29
72 12 9
50/5" 9
41 11
50/1" 22 10 5
101 9
20/20/50/4" 13
TR
N_{60} WC

B-016-4-13
137.3' RT.
TOPSOIL = 1.0'

10 16
17 10
11 14
7 29
3 30 34
W 22 27
17 19
12 26 15 6
12 14 90 12
12 22
14 14
29 17 27 15
43/50/4" 13 30 10
200 11
34 11
49/50/5" 11 200 13
TR 200 11
TR
N_{60} WC

B-013-S-57
22.3' LT.

N WC

EX. GROUND

EX. GROUND: 691.15 | 690.98 | 686.98 | 685.71 | 686.42 | 686.01 | 689.41 | 690.95 | 697.83 | 705.66 | 707.40

152+00 153+00 154+00 155+00 156+00 157+00

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1321R OVER SCIOTI RIVER
STA. 152+00 TO STA. 157+00

FRA-70-12.68

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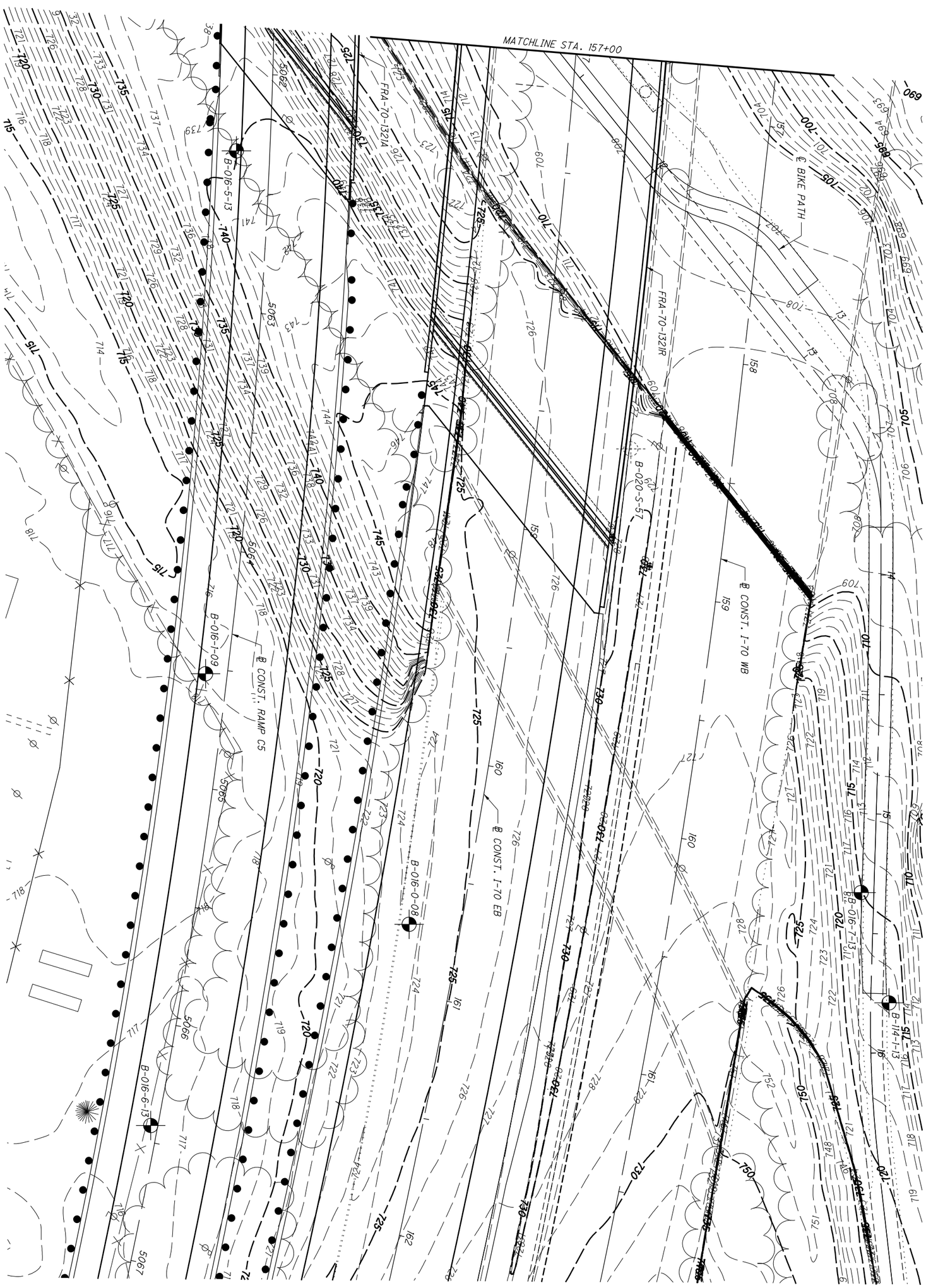
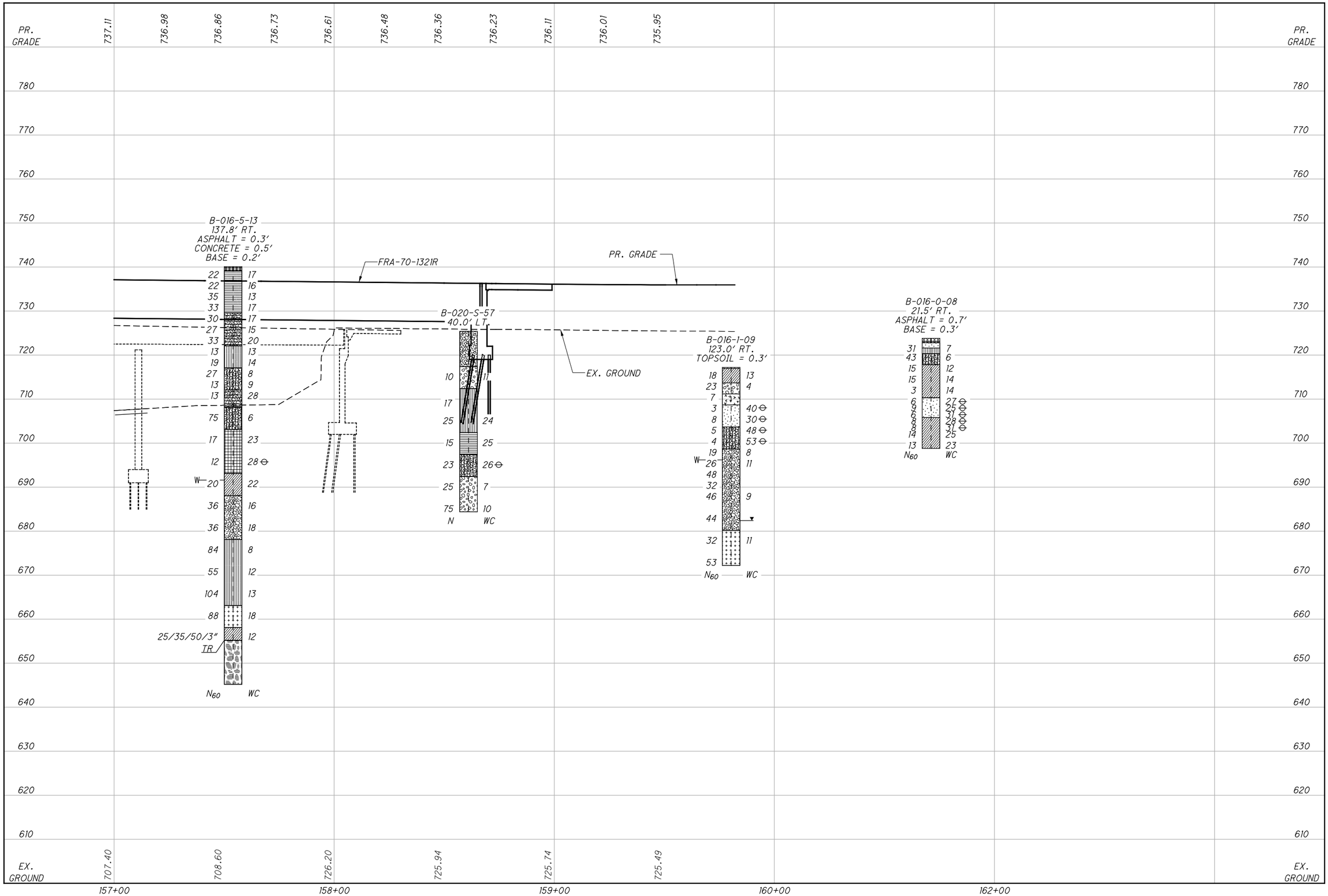


	114/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION FRA-70-1321R OVER SCIOTO RIVER STA. 157+00 TO STA. 162+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



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0 10 20 40
HORIZONTAL SCALE IN FEET

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1321R OVER SCIOTI RIVER
STA. 157+00 TO STA. 162+00

FRA-70-12.68

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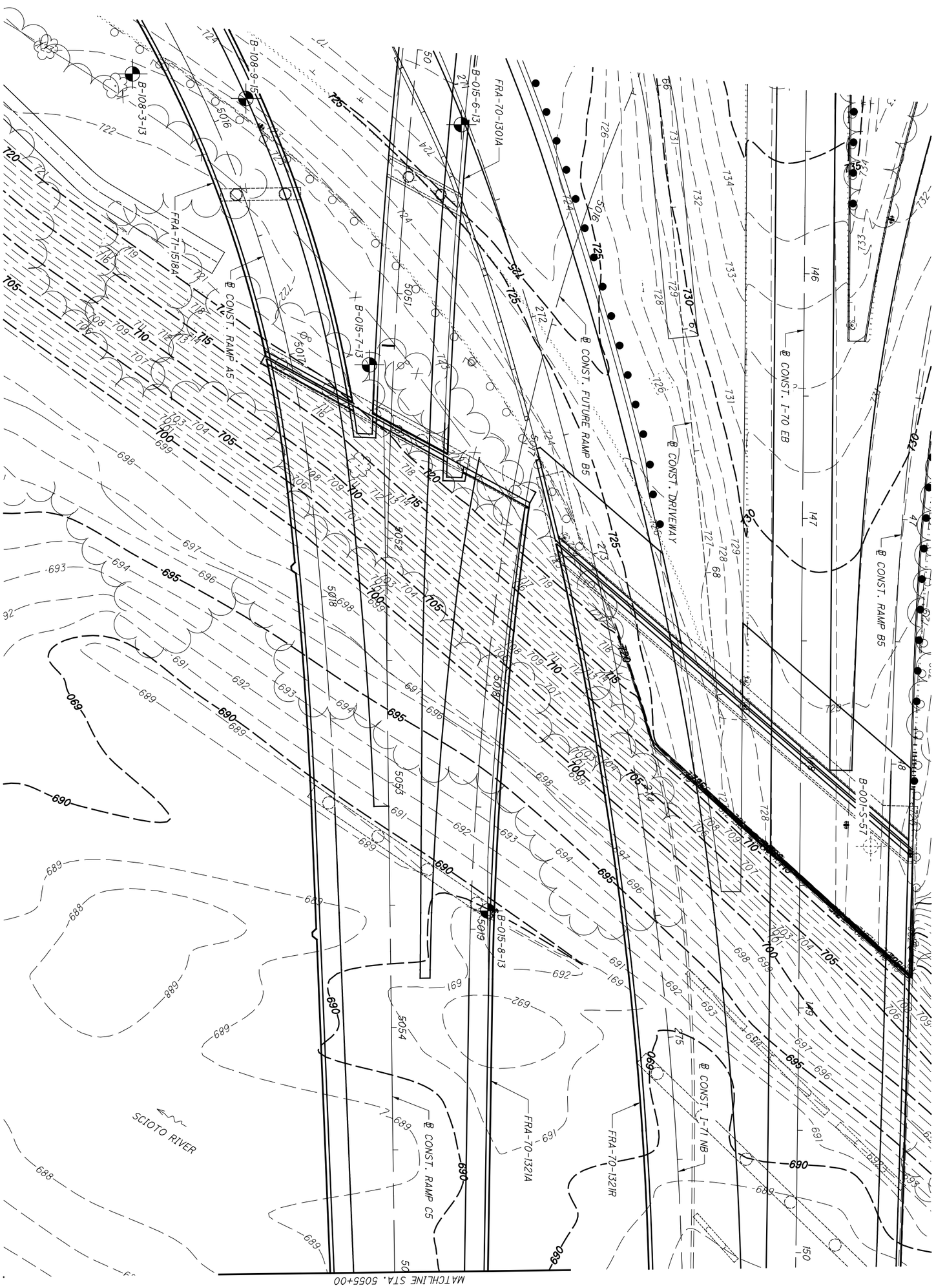

	116/496	**FRA-70-12.68**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-70-1321A OVER - SCIOTO RIVER** **STA. 5050+00 TO STA. 5055+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET

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PR. GRADE: 761.11 | 760.43 | 759.68 | 758.87 | 757.98 | 757.03 | 756.01 | 754.91 | 753.79 | 752.66 | 751.54 | 750.41 | 749.28 | 748.16 | 747.03 | 745.91 | 744.78 | 743.66 | 742.53 | 741.42 | 740.37

EX. GROUND: 722.65 | 723.06 | 724.80 | 723.59 | 723.01 | 722.34 | 721.61 | 715.26 | 708.02 | 700.75 | 697.41 | 694.50 | 692.00 | 689.42 | 689.43 | 690.00 | 690.71 | 689.57 | 688.92 | 689.31 | 689.55

780 770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610

FRA-70-1301A

PR. GRADE

FRA-70-1321A

NORMAL WATER ELEV. = 696.2

EX. GROUND

B-015-6-13
20.8' LT.
ASPHALT = 0.2'

19	8
19	16
33	15
6	17
14	15
15	26⊖
25	23⊖
65	12
59	5
54	7
59	9
67	6
15/50/5"	6–W
66	9
81	12
66	15
72	16
117	18
25/47/50/1"	21⊖
50/5"	15
TR	
N_{60}	WC

B-015-7-13
9.8' RT.
TOPSOIL = 0.4'

37	9
32	6
8	15
11	13
15	20
8	17
19	17
50	7
55	7
67	8
W 41	10
21/50/1"	15
102	9
52	8
61	19
20/50/1"	17
30/50/1"	11
42/50/4"	10
50/5"	24⊖
TR	
N_{60}	WC

B-001-S-57
196.8' LT.

18	11
45	7
30	24
70	12
52	14
38	8
74	13
90	7
155	18
N	WC

B-015-8-13
39.9' LT.

17	23⊖
6	25⊖
7	29⊖
7	20
27	
20/50/3"	19⊖
17	20⊖
27	14
49	16
42	14
69	16
14/50/3"	13
50/2"	
137	12
20/40/50/5"	8
50/1"	9
TR	
N_{60}	WC

5050+00 5051+00 5052+00 5053+00 5054+00 5055+00

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1321A OVER SCIOTI RIVER
STA. 5050+00 TO STA. 5055+00

FRA-70-12.68

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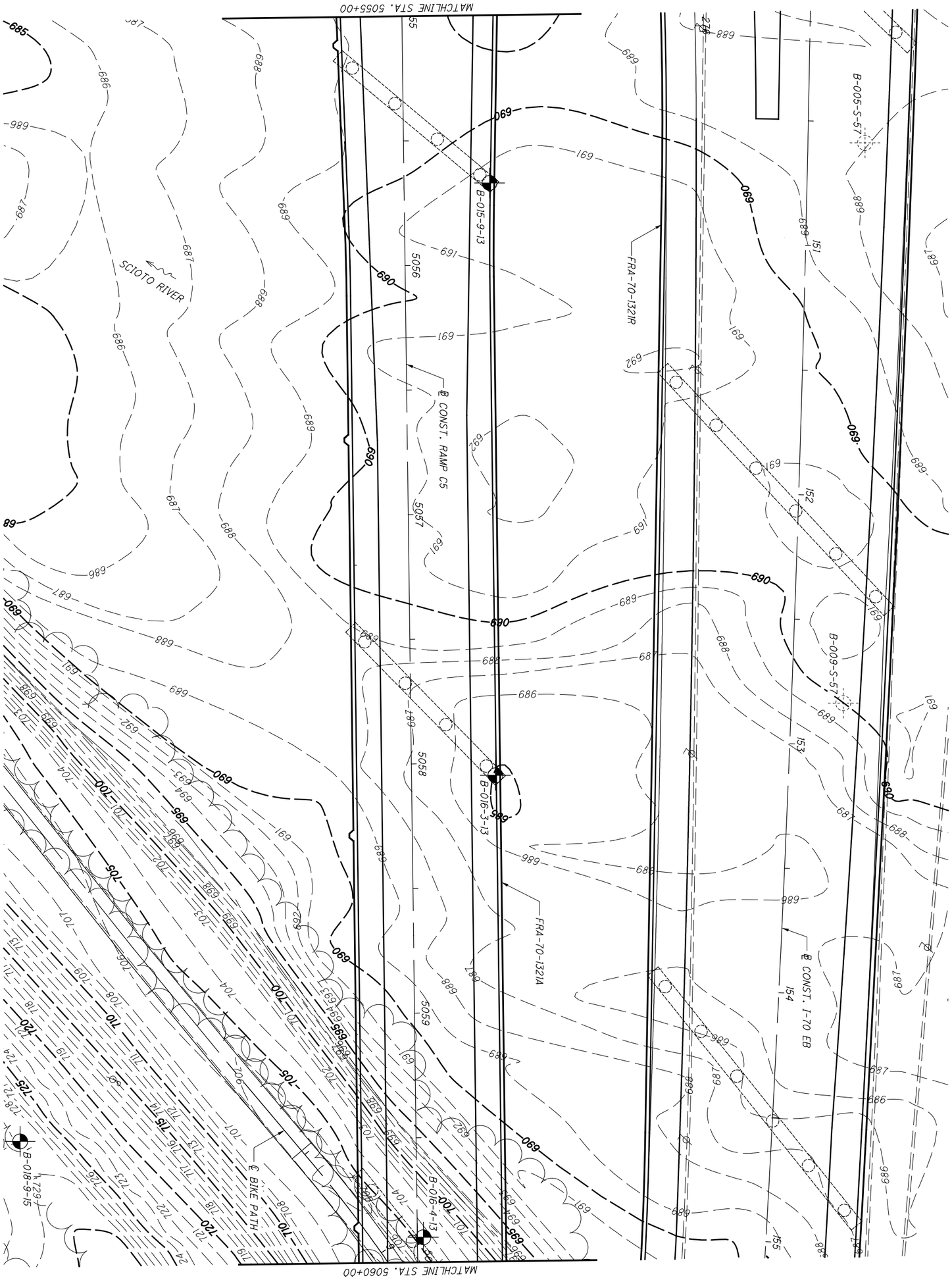

	118/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION FRA-70-1321A OVER SCIOTO RIVER STA. 5055+00 TO STA. 5060+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET

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PR. GRADE 740.37 739.39 738.47 737.62 736.83 736.10 735.45 734.85 734.32 733.86 733.46 733.13 732.86 732.65 732.51 732.39 732.26 732.13 732.01 731.88 731.75 PR. GRADE

780 770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610

PR. GRADE

FRA-70-1321A

NORMAL WATER ELEV. = 696.2

EX. GROUND

B-005-S-57
185.2' LT.

B-015-9-13
34.3' LT.

B-009-S-57
173.6' LT.

B-016-3-13
33.7' LT.

B-016-4-13
2.4' RT.
TOPSOIL = 1.0'

| | | |

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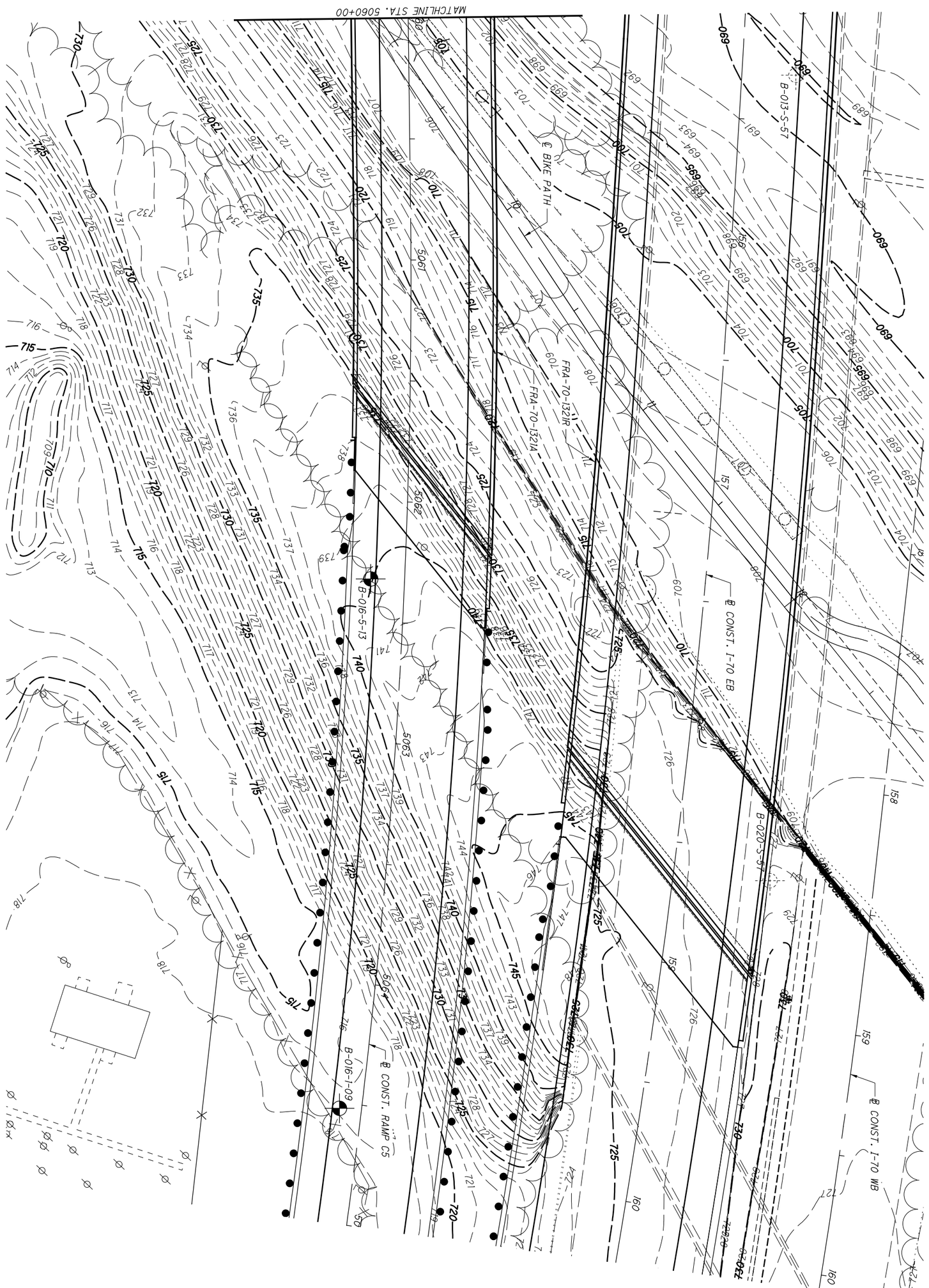
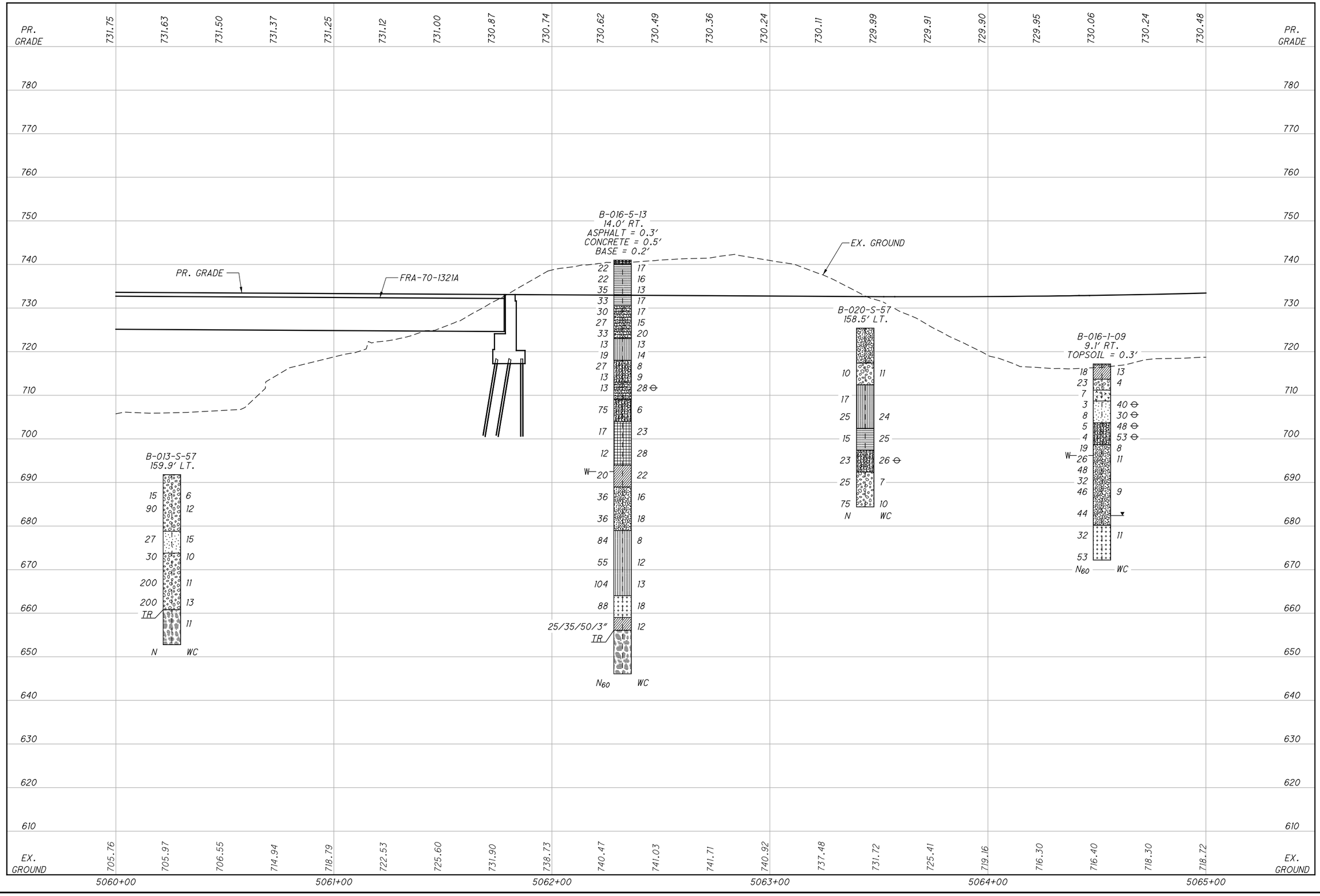


	120/496	**FRA-70-12.68**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-70-1321A OVER SCIOTO RIVER** **STA. 5060+00 TO STA. 5065+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



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0 10 20 40
HORIZONTAL SCALE IN FEET

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1321A OVER SCIOTI RIVER
STA. 5060+00 TO STA. 5065+00

FRA-70-12.68

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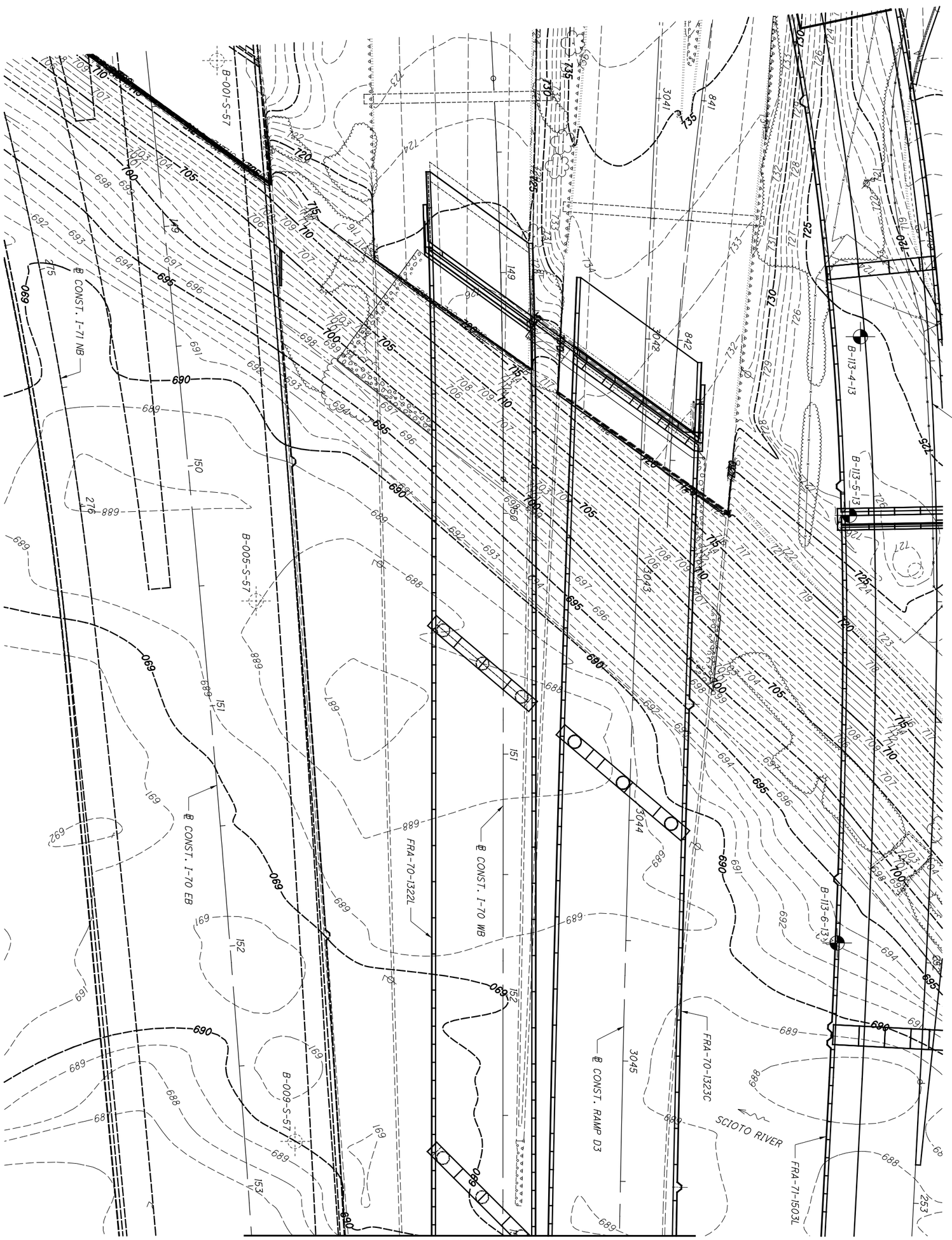
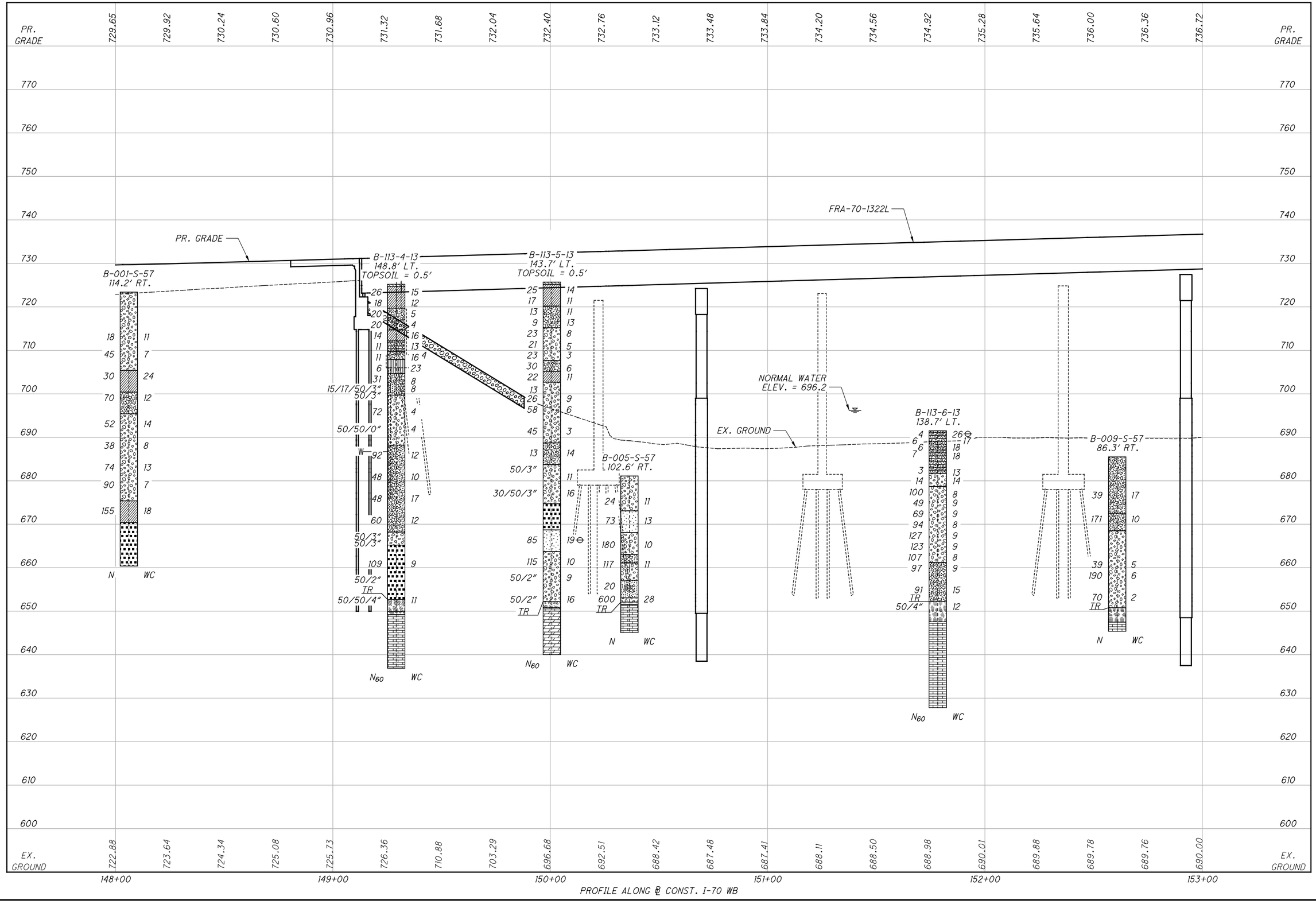


	122/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION FRA-70-1322L OVER SCIOTO RIVER STA. 148+00 TO STA. 153+00 I-70 WB	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



0 10 20 40
HORIZONTAL SCALE IN FEET

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1322L OVER SCIOTO RIVER
STA. 148+00 TO STA. 153+00 I-70 WB

FRA-70-13.10

123/496

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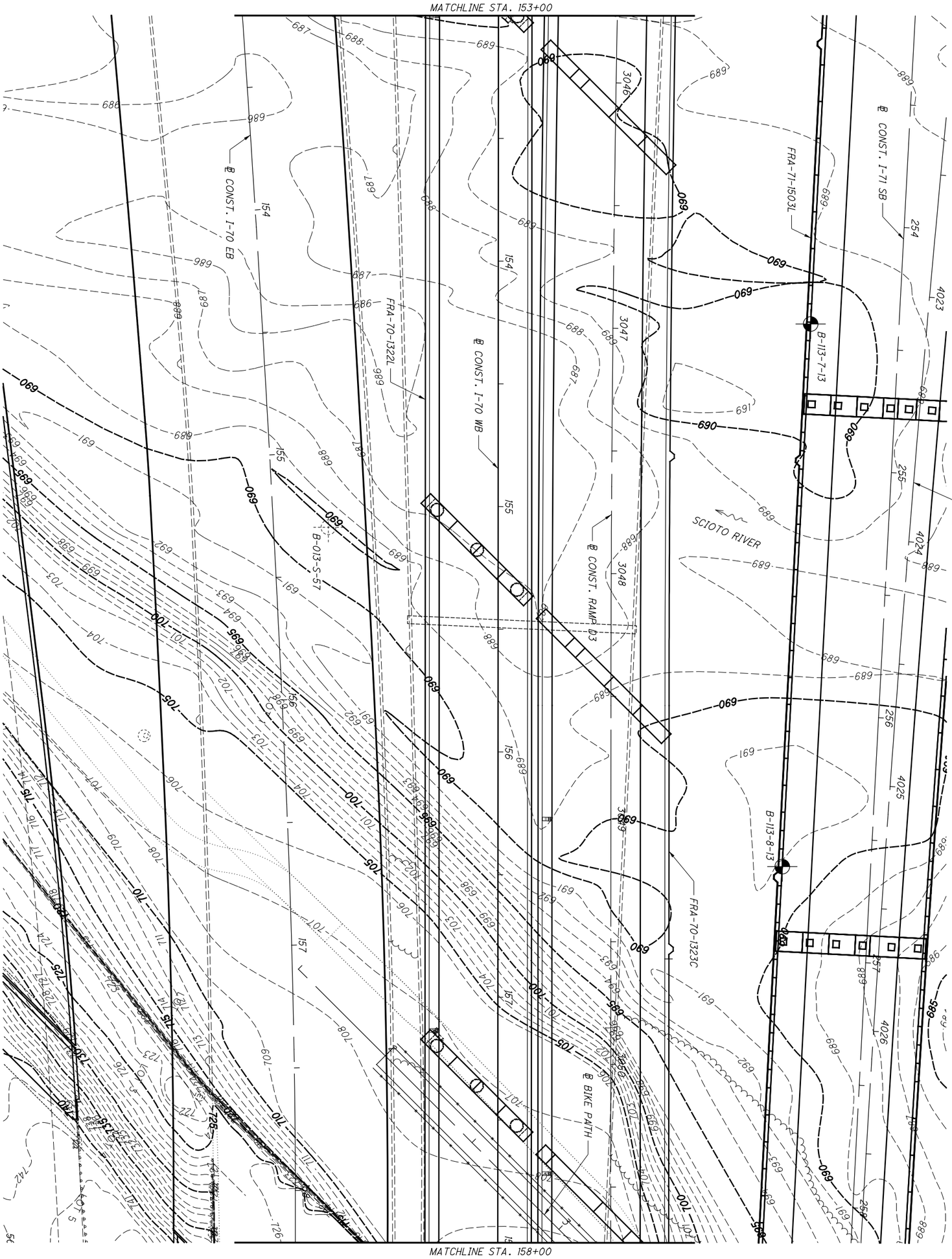
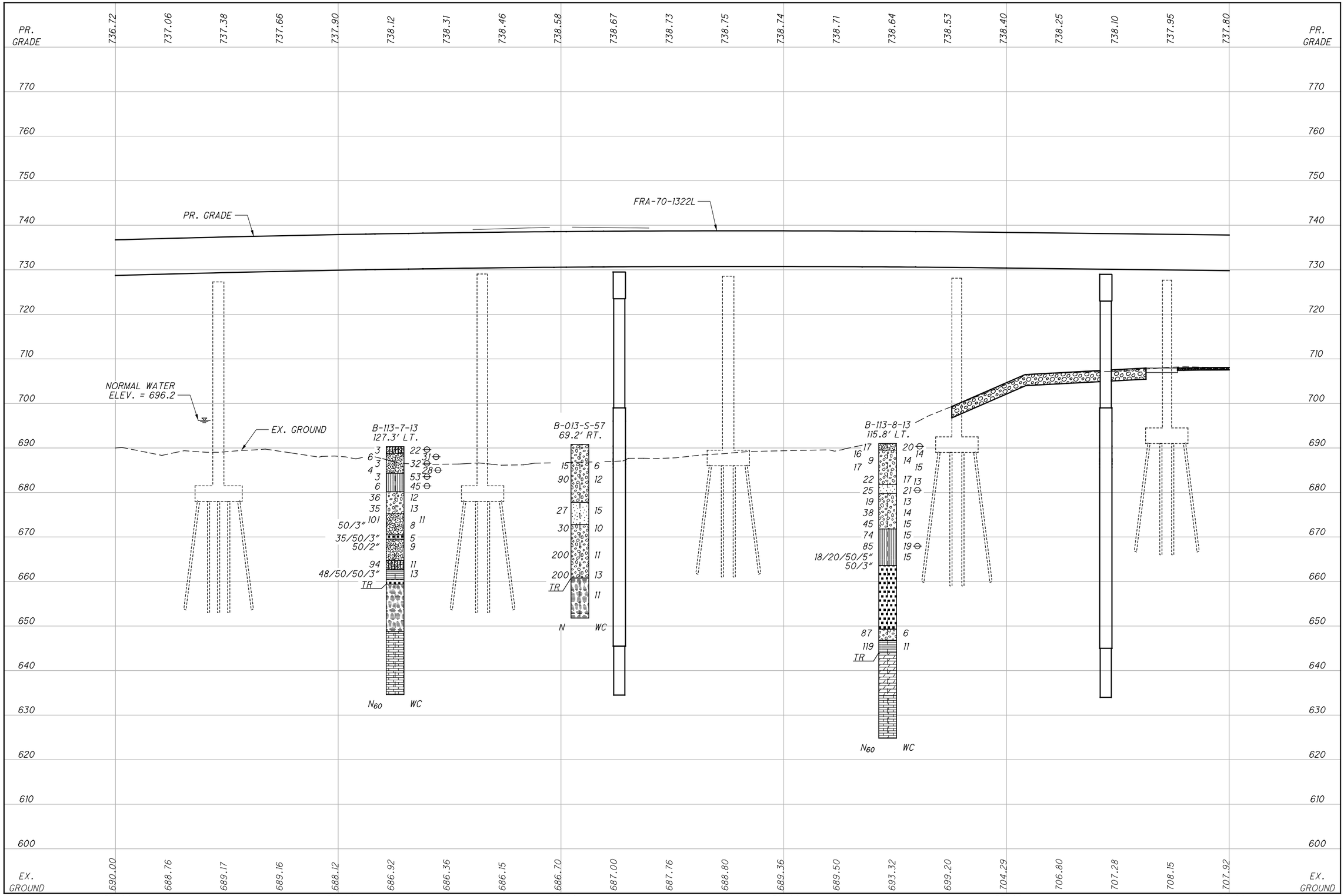


	124/496	**FRA-70-13.10**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-70-1322L OVER SCIOTO RIVER** **STA. 153+00 TO STA. 158+00 I-70 WB**	DRAWN RRM CHECKED BRT	0 10 20 40 HORIZONTAL SCALE IN FEET



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1322L OVER SCIOTO RIVER
STA. 153+00 TO STA. 158+00 I-70 WB

FRA-70-13.10

125/496

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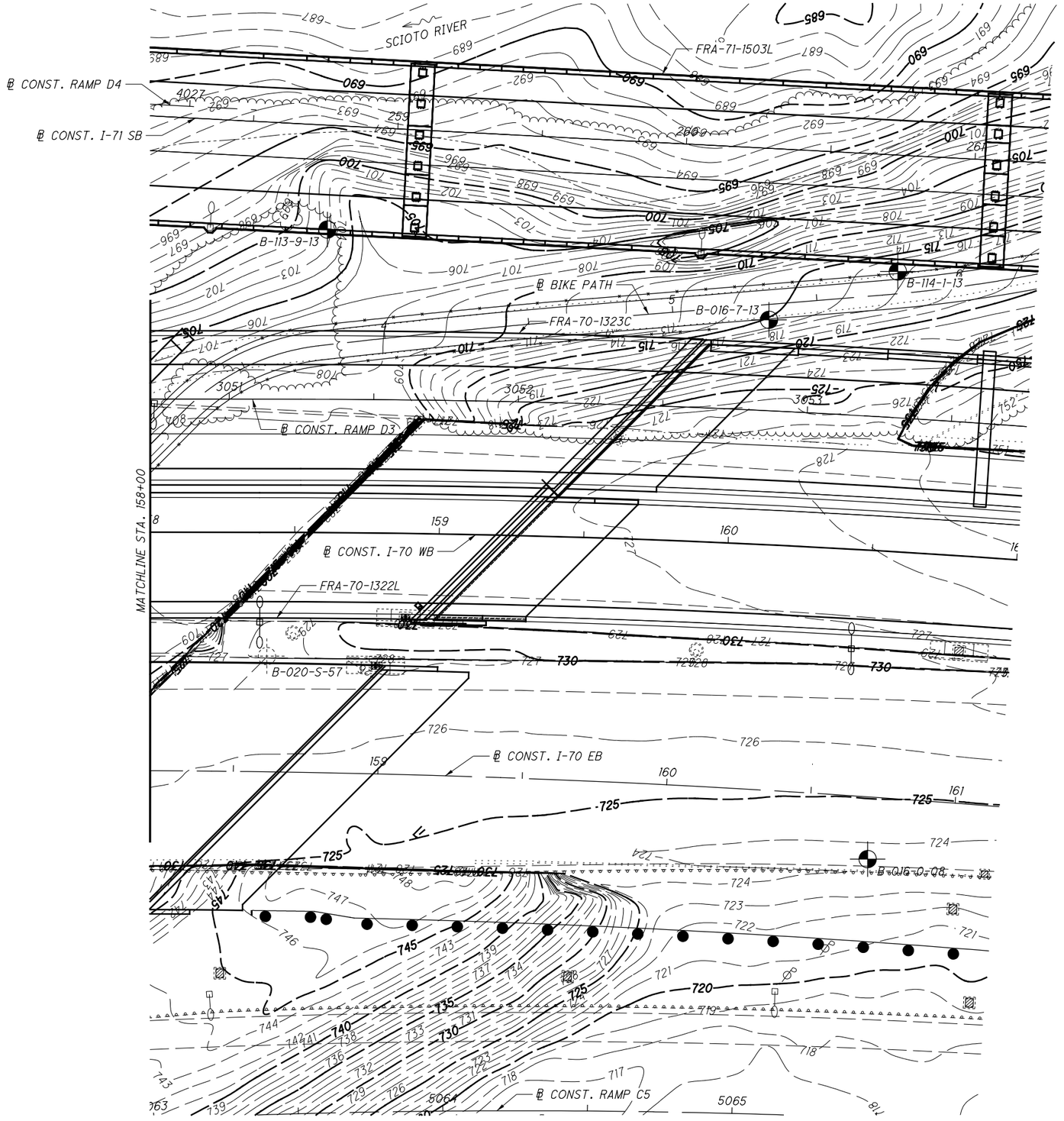

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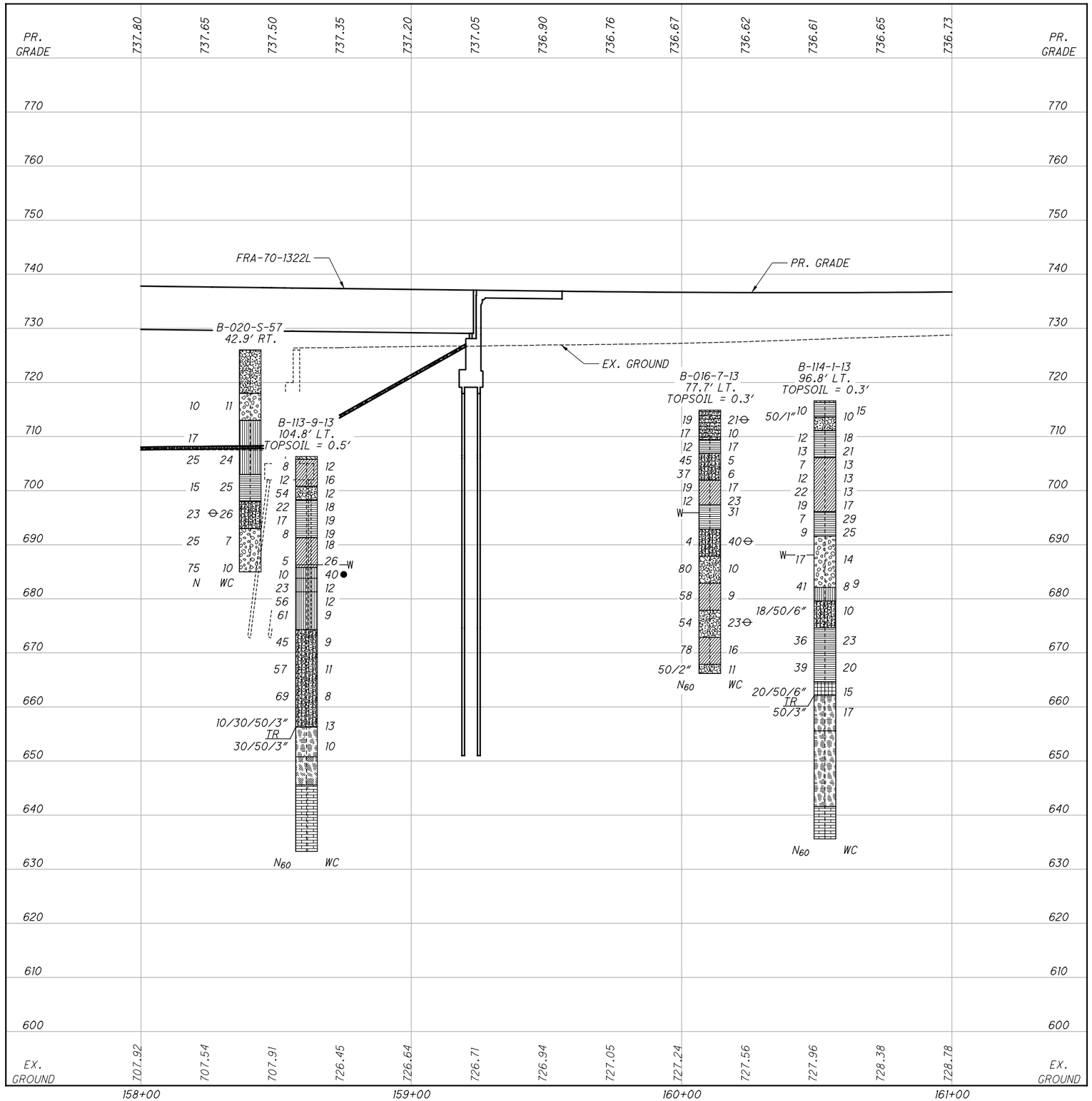
HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1322L OVER SCIOTO RIVER
STA. 158+00 TO STA. 161+00 I-70 WB

FRA-70-13.10

126/496



0 10 20 40
HORIZONTAL SCALE IN FEET

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1322L OVER SCIOTO RIVER
STA. 158+00 TO STA. 161+00 I-70 WB

FRA-70-13.10

127/496

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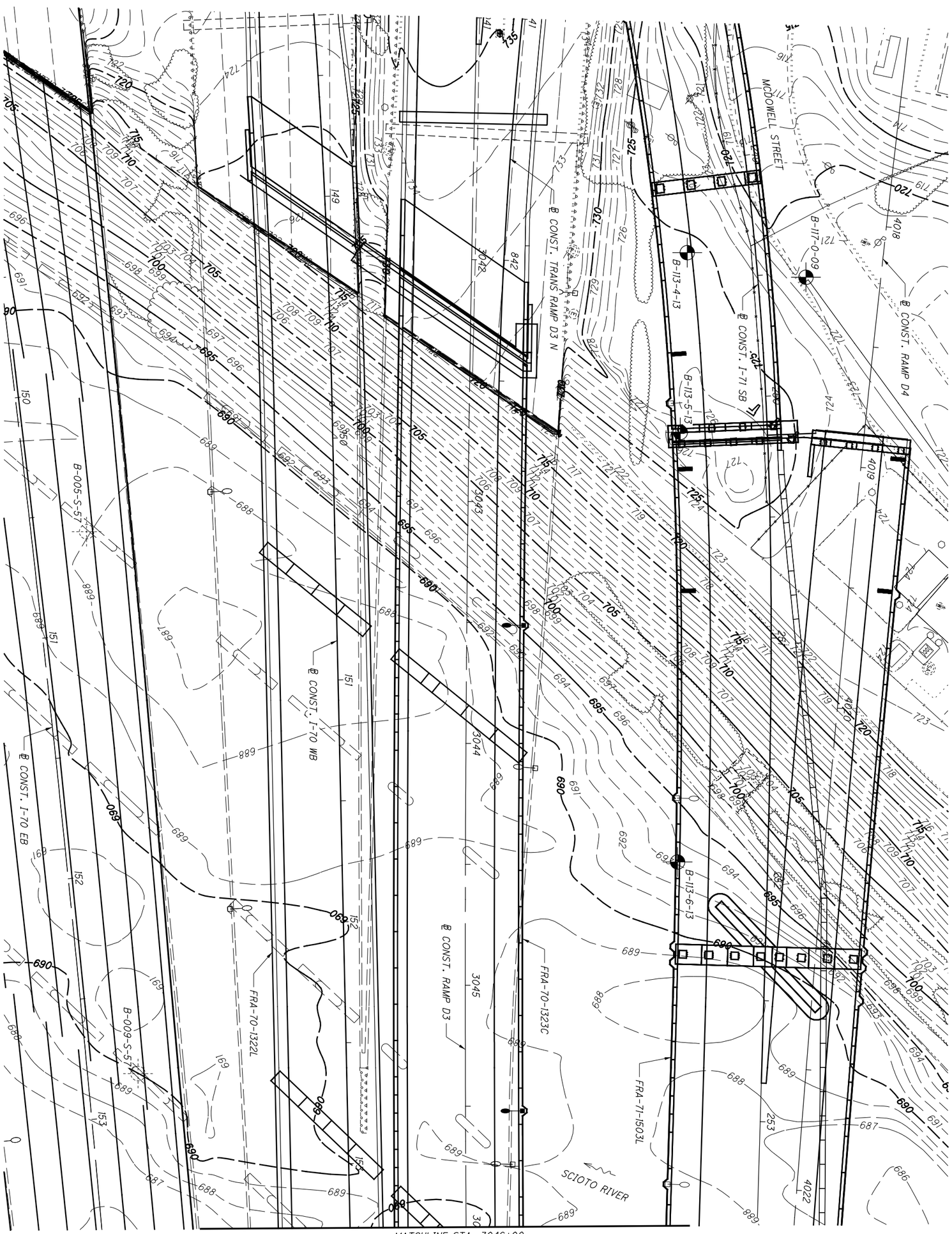

	128/496	**FRA-70-13.10**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-70-1323C OVER SCIOTO RIVER** **STA. 3041+00 TO STA. 3046+00 RAMP D3**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET

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PR. GRADE | 740.13 | 740.28 | 740.43 | 740.58 | 740.73 | 740.88 | 741.03 | 741.18 | 741.33 | 741.48 | 741.63 | 741.78 | 741.93 | 742.08 | 742.23 | 742.38 | 742.53 | 742.67 | 742.79 | 742.89 | 742.98 | PR. GRADE

770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610 600

PR. GRADE

FRA-70-1323C

EX. GROUND

B-113-4-13
89.1' LT.
TOPSOIL = 0.5'

26	15
18	12
20	5
20	4
14	16
11	13
11	16
6	23
31	8
15/17/50/3"	8
50/3"	
72	4
50/50/0"	4
W 92	12
48	10
48	17
60	12
50/3"	
50/3"	
109	9
50/2"	
TR	
50/50/4"	11

N_{60} WC

B-113-5-13
87.4' LT.
TOPSOIL = 0.5'

25	14
17	11
13	11
9	13
23	8
21	5
23	3
30	6
22	11
13	9
26	6
58	
45	3
13	14
50/3"	11
30/50/3"	16
85	19
115	10
50/2"	9
50/2"	16
TR	

N_{60} WC

B-005-S-57
157.6' RT.

24	11
73	13
180	10
117	11
20	
600	28
TR	

N WC

NORMAL WATER
ELEV. = 696.2

B-113-6-13
87.7' LT.

4	26
6	17
6	18
7	18
3	13
14	14
100	8
49	9
69	9
94	8
127	9
123	9
107	8
97	9
91	15
TR	
50/4"	12

N_{60} WC

B-009-S-57
135.4' RT.

39	17
171	10
39	5
190	6
70	2
TR	

N WC

EX. GROUND | 735.41 | 734.85 | 734.32 | 733.77 | 733.21 | 732.64 | 717.16 | 709.39 | 702.47 | 696.43 | 689.76 | 688.87 | 688.73 | 688.94 | 689.15 | 689.33 | 689.27 | 689.24 | 689.16 | 689.09 | 690.44 | EX. GROUND

3041+00 3042+00 3043+00 3044+00 3045+00 3046+00

PROFILE ALONG ℄ RAMP D3

0 10 20 40 HORIZONTAL SCALE IN FEET

DRAWN RRM | CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1323C OVER SCIOTO RIVER
STA. 3041+00 TO STA. 3046+00 RAMP D3

FRA-70-13.10

1

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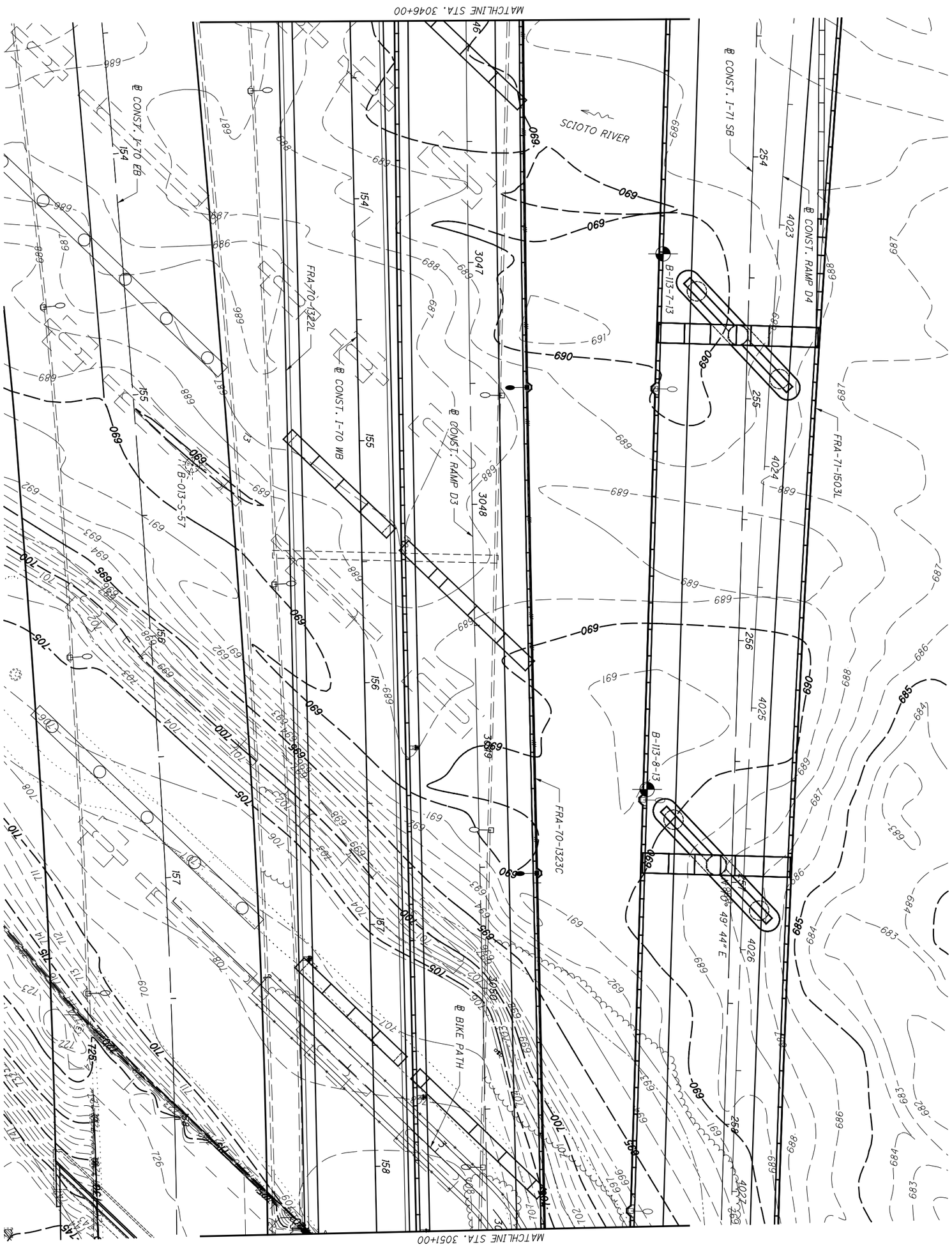

	130/496	**FRA-70-13.10**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-70-1323C OVER SCIOTO RIVER** **STA. 3046+00 TO STA. 3051+00 RAMP D3**	DRAWN RRM CHECKED BRT	0 10 20 40 HORIZONTAL SCALE IN FEET

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PR. GRADE — 742.98 — 743.04 — 743.09 — 743.12 — 743.13 — 743.12 — 743.09 — 743.04 — 742.98 — 742.89 — 742.79 — 742.67 — 742.53 — 742.38 — 742.23 — 742.08 — 741.93 — 741.78 — 741.63 — 741.48 — 741.33 — PR. GRADE

770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610 600

PR. GRADE

FRA-70-1323C

EX. GROUND

NORMAL WATER ELEV. = 696.2

B-113-7-13
80.5' LT.

3	22
6	31
3	32
4	28
3	53
6	45
36	12
35	13
101	11
50/3"	8
35/50/3"	5
50/2"	9
94	11
48/50/50/3"	13
TR	

N_{60} WC

B-013-S-57
115.3' RT.

15	6
90	12
27	15
30	10
200	11
200	13
TR	11

N WC

B-113-8-13
69.8' LT.

17	20
16	14
9	14
17	15
22	17
25	13
19	21
13	
38	14
45	15
74	15
85	19
18/20/50/5"	15
50/3"	
87	6
119	11
TR	

N_{60} WC

EX. GROUND — 690.44 — 690.49 — 690.10 — 689.63 — 689.47 — 688.75 — 687.51 — 687.41 — 688.11 — 687.89 — 689.11 — 688.97 — 690.07 — 689.72 — 691.63 — 695.03 — 702.83 — 706.79 — 707.65 — 708.14 — 708.13 — EX. GROUND

3046+00 3047+00 3048+00 3049+00 3050+00 3051+00

PROFILE ALONG ℄ RAMP D3

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1323C OVER SCIOTO RIVER
STA. 3046+00 TO STA. 3051+00 RAMP D3

FRA-70-13.10

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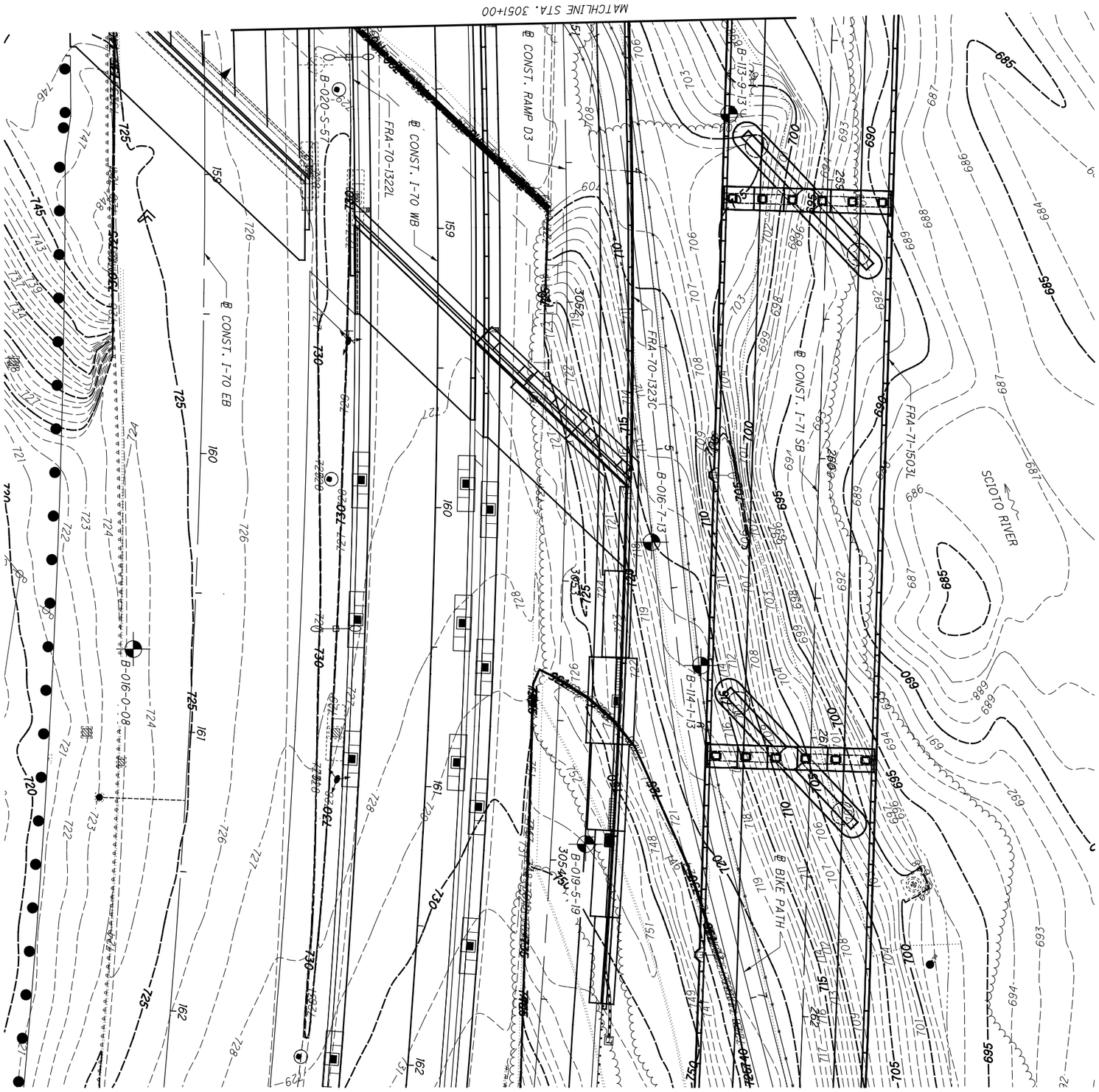
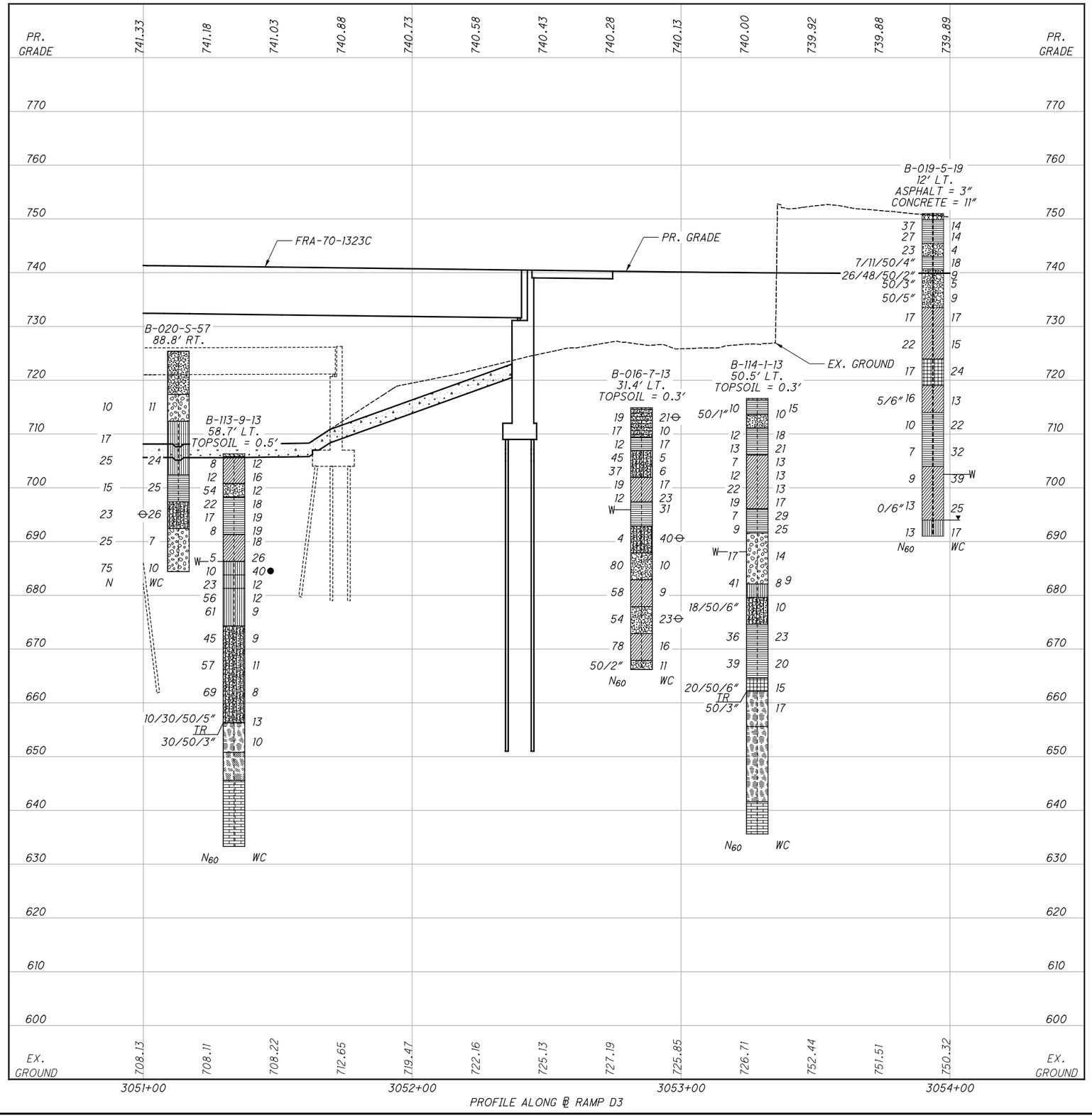


	132/496	**FRA-70-13.10**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-70-1323C OVER SCIOTO RIVER** **STA. 3051+00 TO STA. 3054+00 RAMP D3**	DRAWN RRM CHECKED BRT	0 10 20 40 HORIZONTAL SCALE IN FEET



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1323C OVER SCIOTO RIVER
STA. 3051+00 TO STA. 3054+00 RAMP D3

FRA-70-13.10

133/496

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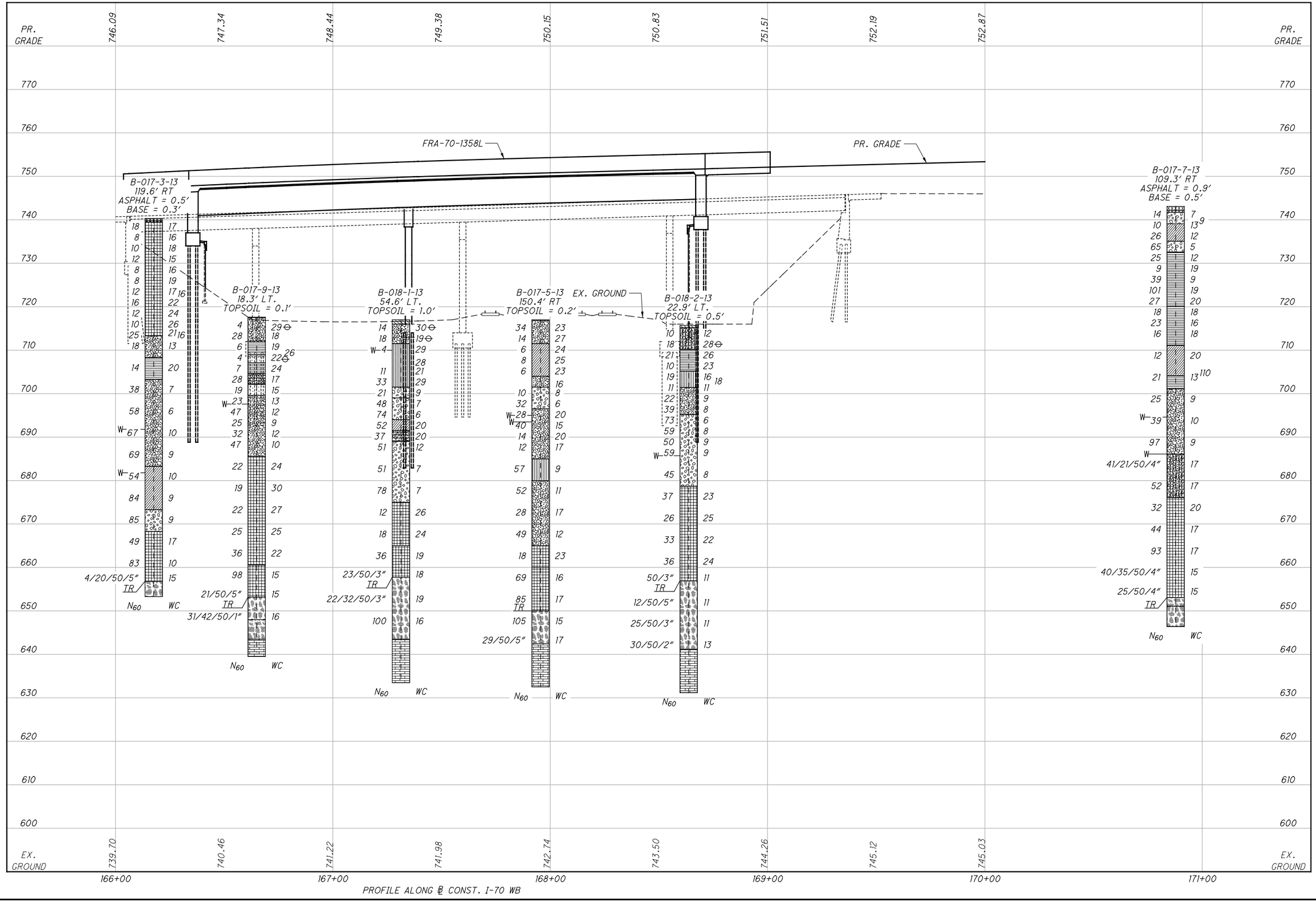
	134/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION FRA-70-1358L I-70 WB OVER CSX & NS RR	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



PROFILE ALONG ℄ CONST. I-70 WB

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1358L I-70 WB OVER CSX & NS RR

FRA-70-13.10

135/496

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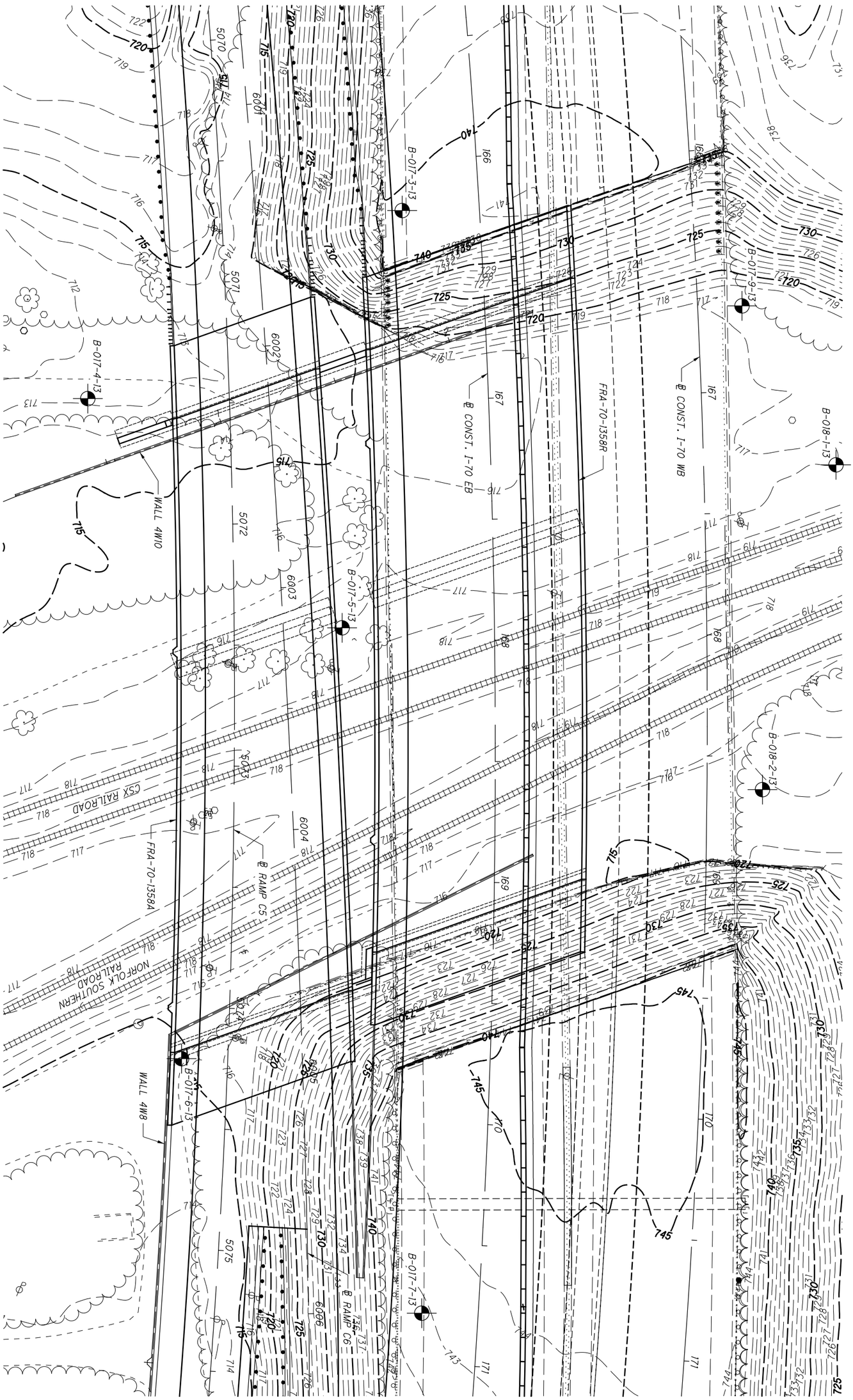

	136/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION FRA-70-1358R I-70 EB OVER CSX AND NS RR	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET

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PR. GRADE

748.86 749.30 749.72 750.11 750.47 750.81 751.13 751.42 751.68 751.68 751.92 751.14 752.33 752.50 752.64 752.75 752.85 752.92 752.96 752.98 752.97

780 770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610

FRA-70-1358R

PR. GRADE

EX. GROUND

B-017-3-13
31.8' RT
ASPHALT = 0.5'
BASE = 0.3'

B-017-9-13
106.1' LT.
TOPSOIL = 0.1'

B-018-1-13
142.4' LT.
TOPSOIL = 1.0'

B-017-5-13
62.9' RT
TOPSOIL = 0.2'

B-018-2-13
110.2' LT.
TOPSOIL = 0.5'

B-017-6-13
127.3' RT.

B-017-7-13
23.3' RT
ASPHALT = 0.9'
BASE = 0.5'

4/20/50/5" TR — N_{60} WC

21/50/5" / 31/42/50/1" TR — N_{60} WC

23/50/3" TR / 22/32/50/3" — N_{60} WC

29/50/5" — N_{60} WC

50/3" TR / 12/50/5" / 25/50/3" / 30/50/2" — N_{60} WC

32/50/3" TR / 33/50/3" / 50/3" — N_{60} WC

41/21/50/4" / 25/50/4" TR / 40/35/50/4" / 93 / 44 / 52 / 97 — N_{60} WC

EX. GROUND: 740.33 | 725.83 | 715.55 | 716.55 | 718.16 | 718.10 | 715.44 | 732.95 | 744.89 | 744.23 | 743.10

166+00 167+00 168+00 169+00 170+00 171+00

0 10 20 40 HORIZONTAL SCALE IN FEET

DRAWN RRM | CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1358R I-70 EB OVER CSX AND NS RAILROAD

FRA-70-12.68

137 | 496

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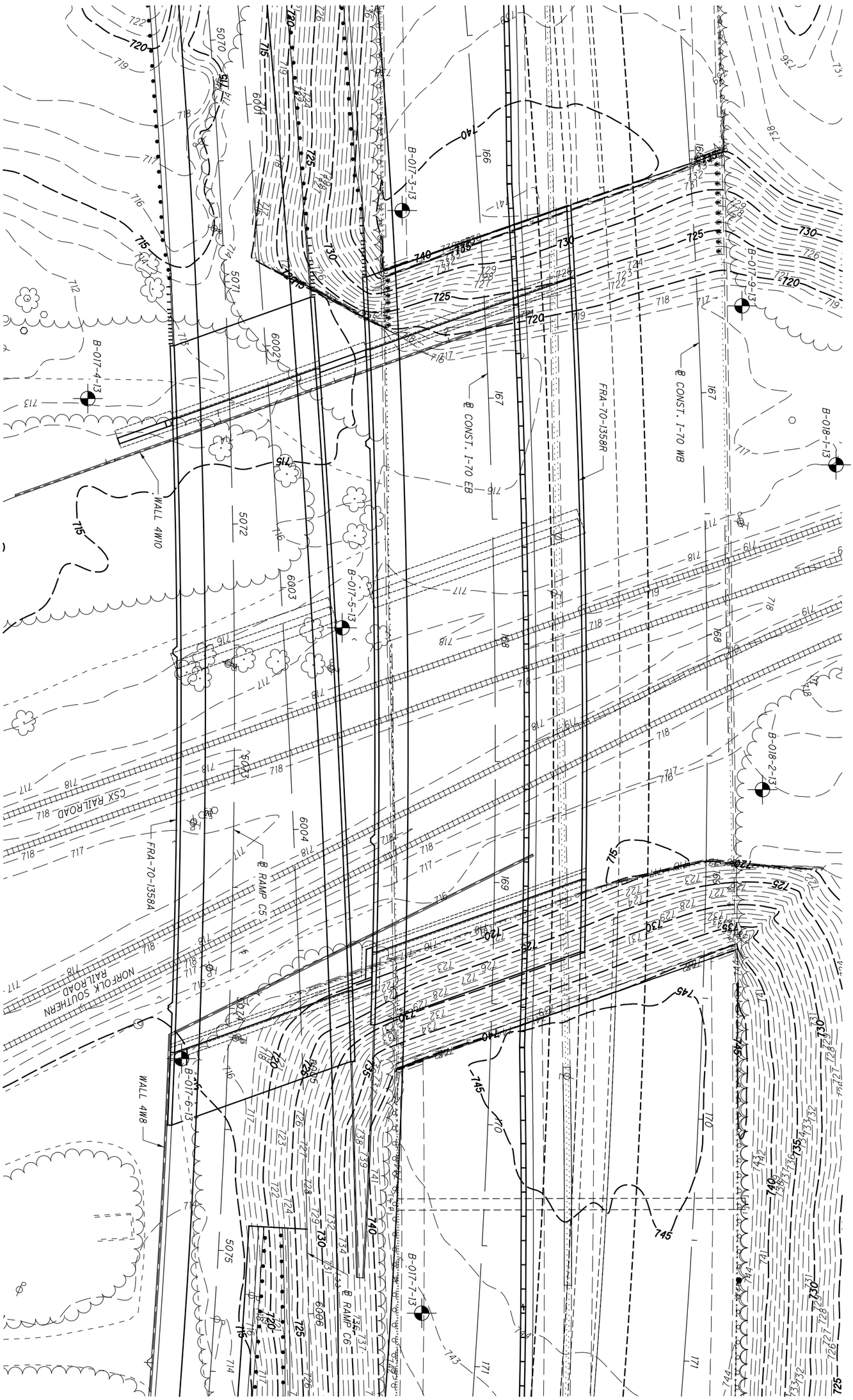

138/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION FRA-70-1358A RAMP C5 OVER CSX AND NS RR	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N

PR. GRADE: 746.78 | 747.45 | 748.07 | 748.62 | 749.11 | 749.53 | 749.88 | 750.17 | 750.38 | 750.53 | 750.62 | 750.64 | 750.59 | 750.47 | 750.33 | 750.20 | 750.06 | 749.92 | 749.79 | 749.69 | 749.63

EX. GROUND: 713.94 | 714.02 | 713.49 | 715.69 | 716.32 | 717.86 | 717.60 | 715.16 | 715.33 | 714.25 | 713.74

PR. GRADE

FRA-70-1358A

EX. GROUND

B-017-3-13
74.6′ LT.
ASPHALT = 0.5′
BASE = 0.3′

18	17	
8	16	
10	18	
12	15	
8	16	
8	19	
12	17	16
16	22	
12	24	
10	26	
25	21	16
18	13	
14	20	
38	7	
58	6	
W 67	10	
69	9	
W 54	10	
84	9	
85	9	
49	17	
83	10	
4/20/50/5″ TR	15	

N_{60} WC

B-017-4-13
58.4′ RT.
TOPSOIL = 0.5′

17	22	
13	18	
13	19	
19	6	
41	4	
39	9	
36	13	
W 39	14	
32	10	
14	16	
77	20	
36	11	
54	11	
94	10	
42	8	
67	16	
50/5″ TR	10	
50/5″	10	
50/5″	11	

N_{60} WC

B-017-5-13
44.5′ LT.
TOPSOIL = 0.2′

34	23	
14	27	
6	24	
8	25	
6	23	
	16	
10	8	
32	6	
W 28	20	
W 40	15	
14	20	
12	17	
57	9	
52	11	
28	17	
49	12	
18	23	
69	16	
85	17	
TR		
105	15	
29/50/5″	17	

N_{60} WC

B-017-6-13
19.1′ RT.

18	19	
27	19	
16	17	5
28	6	15
12	21	
18	10	
25	14	
27	11	
51	9	
67	9	
W 41	13	
25	15	
23	19	
23	24	
30	27	
28	27	
65	25	
50/4″	8	
32/50/3″ TR	10	
33/50/3″	12	
50/3″	16	

N_{60} WC

B-017-7-13
85.3′ LT.
ASPHALT = 0.9′
BASE = 0.5′

14	7	
10	13	9
26	12	
65	5	
25	12	
9	19	
39	9	
101	19	
27	20	
18	18	
23	16	
16	18	
12	20	
21	13	110
25	9	
W 39	10	
97	9	
W 41/21/50/4″	17	
52	17	
32	20	
44	17	
93	17	
40/35/50/4″	15	
25/50/4″ TR	15	

N_{60} WC

5071+00 | 5072+00 | 5073+00 | 5074+00 | 5075+00

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM | CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1358A RAMP C5 OVER CSX AND NS RAILROAD

FRA-70-12.68

139/496

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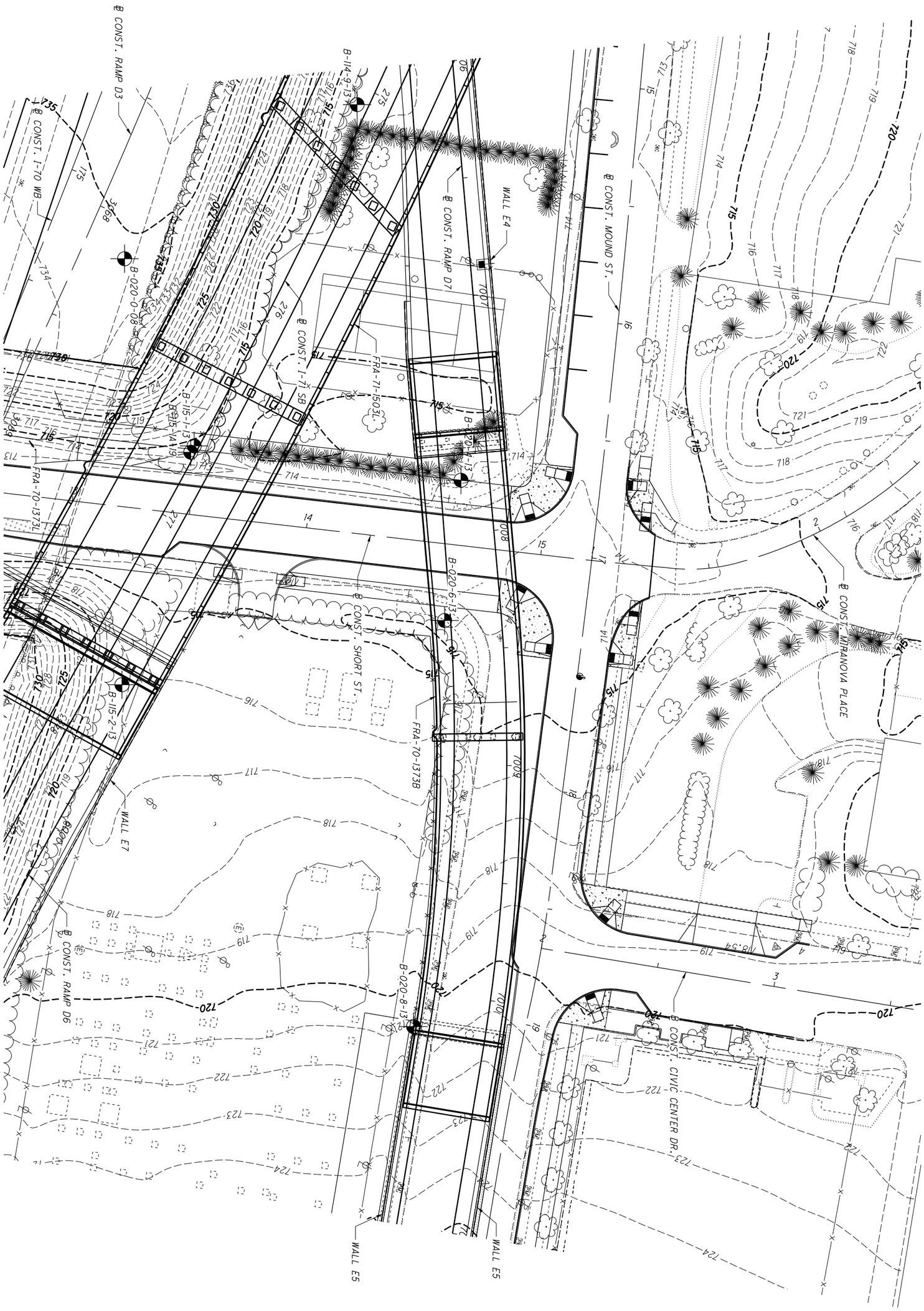
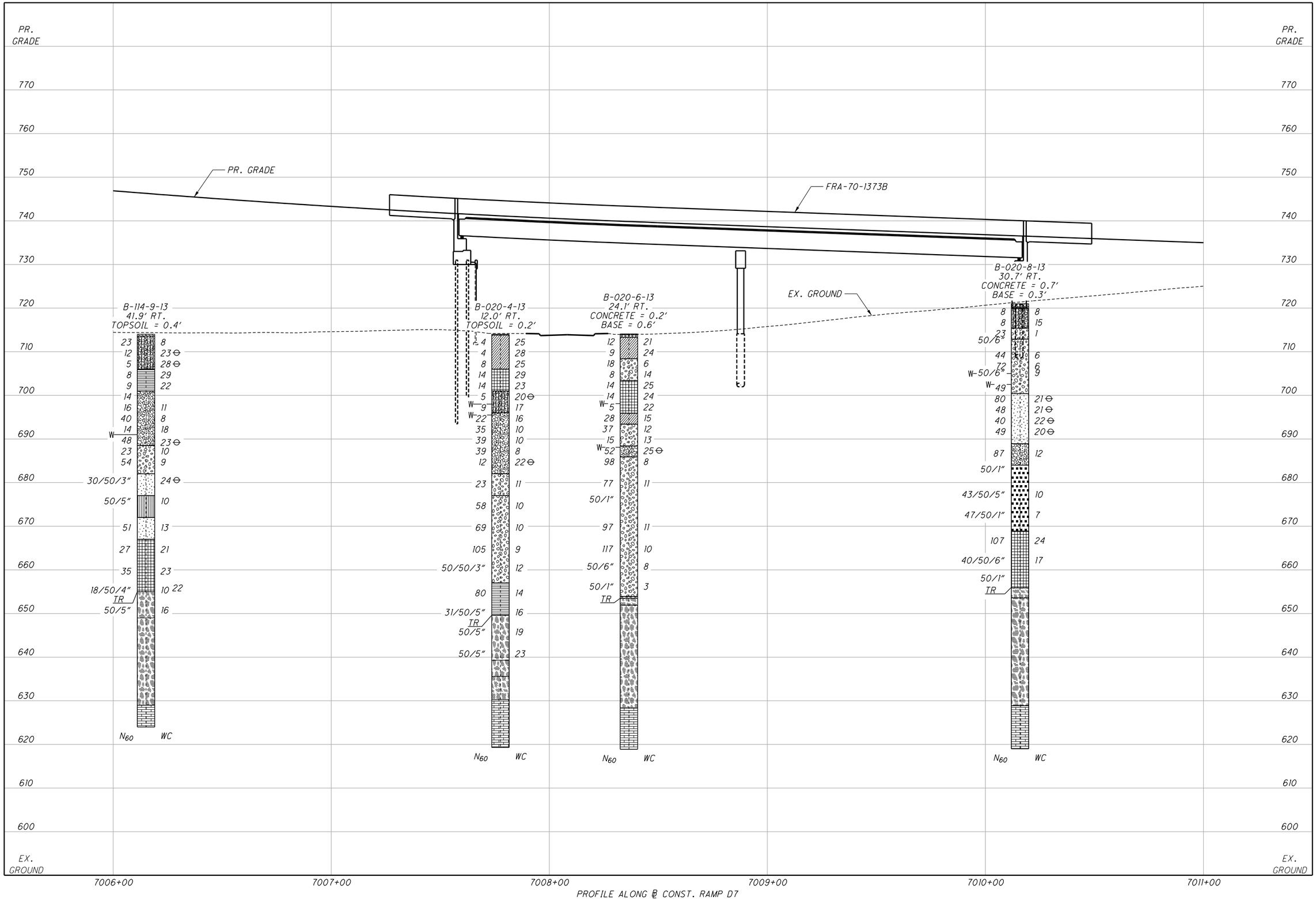


	140/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION FRA-70-1373B RAMP D7 OVER SHORT ST.	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



PROFILE ALONG ℄ CONST. RAMP D7

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1373B RAMP D7 OVER SHORT ST.

FRA-70-13.10

141/496

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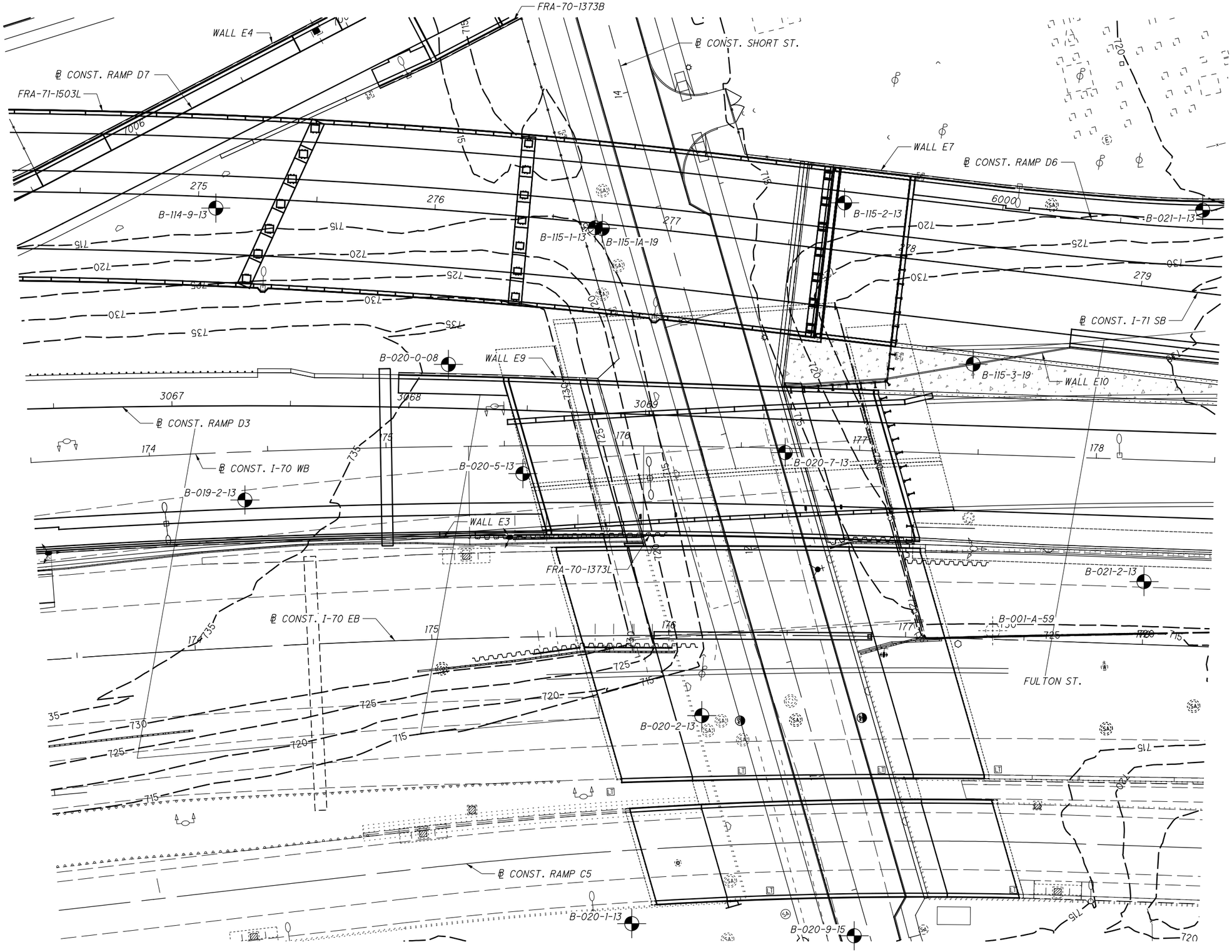

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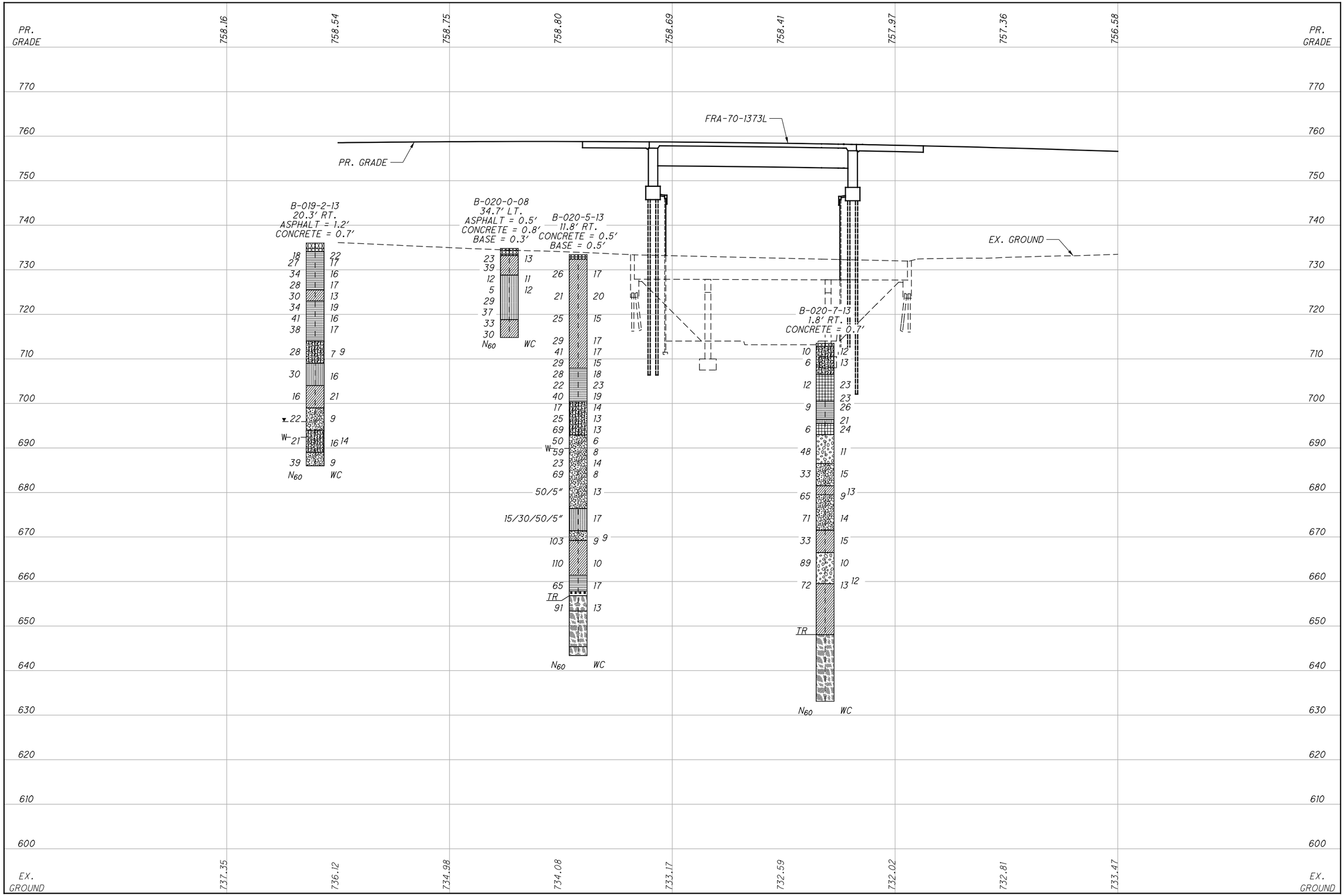
HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1373L I-70 WB OVER SHORT ST.

FRA-70-13.10

142/496



0 10 20 40 HORIZONTAL SCALE IN FEET

DRAWN RRM | CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1373L I-70 WB OVER SHORT ST.

FRA-70-13.10

143/496

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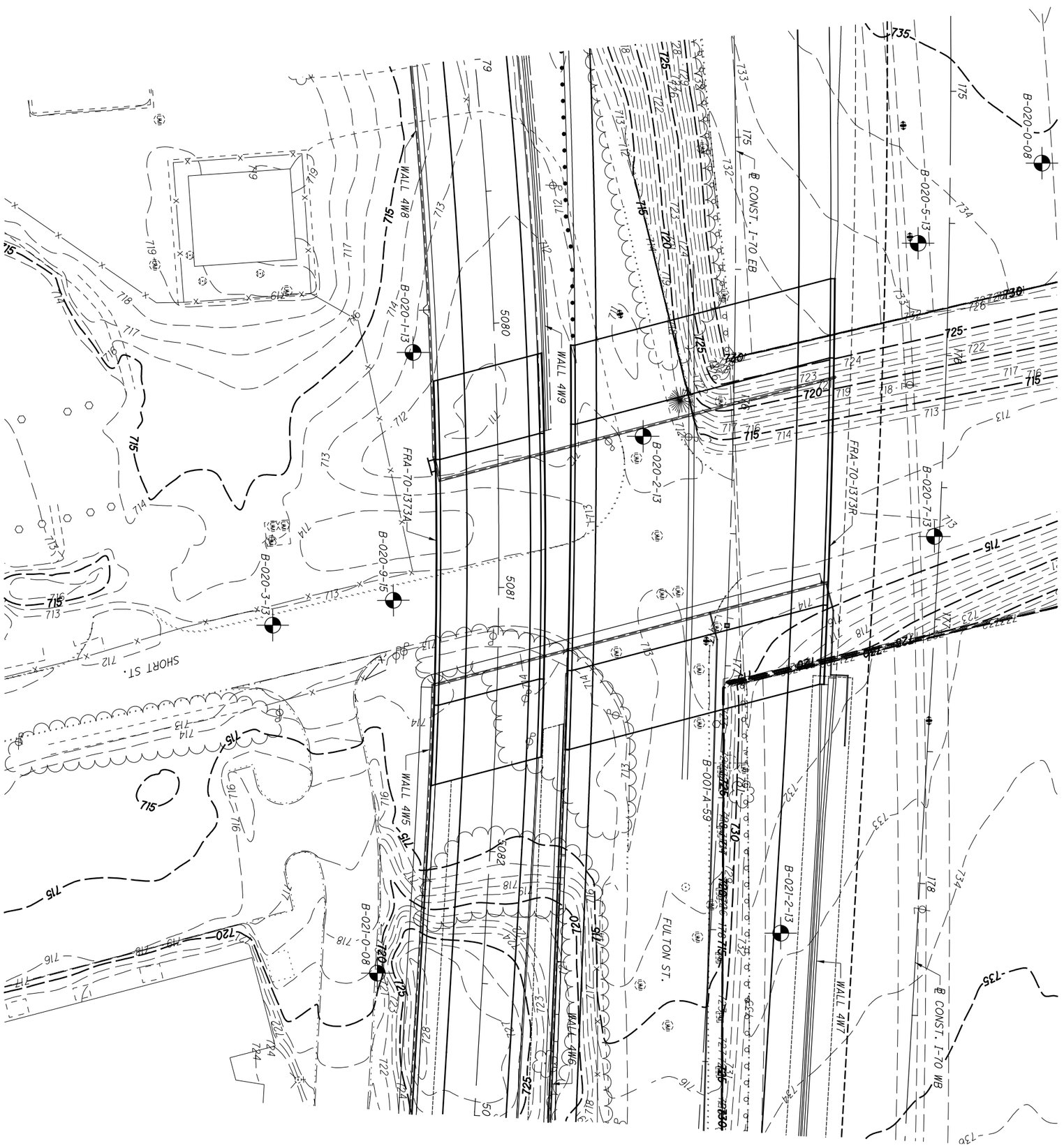
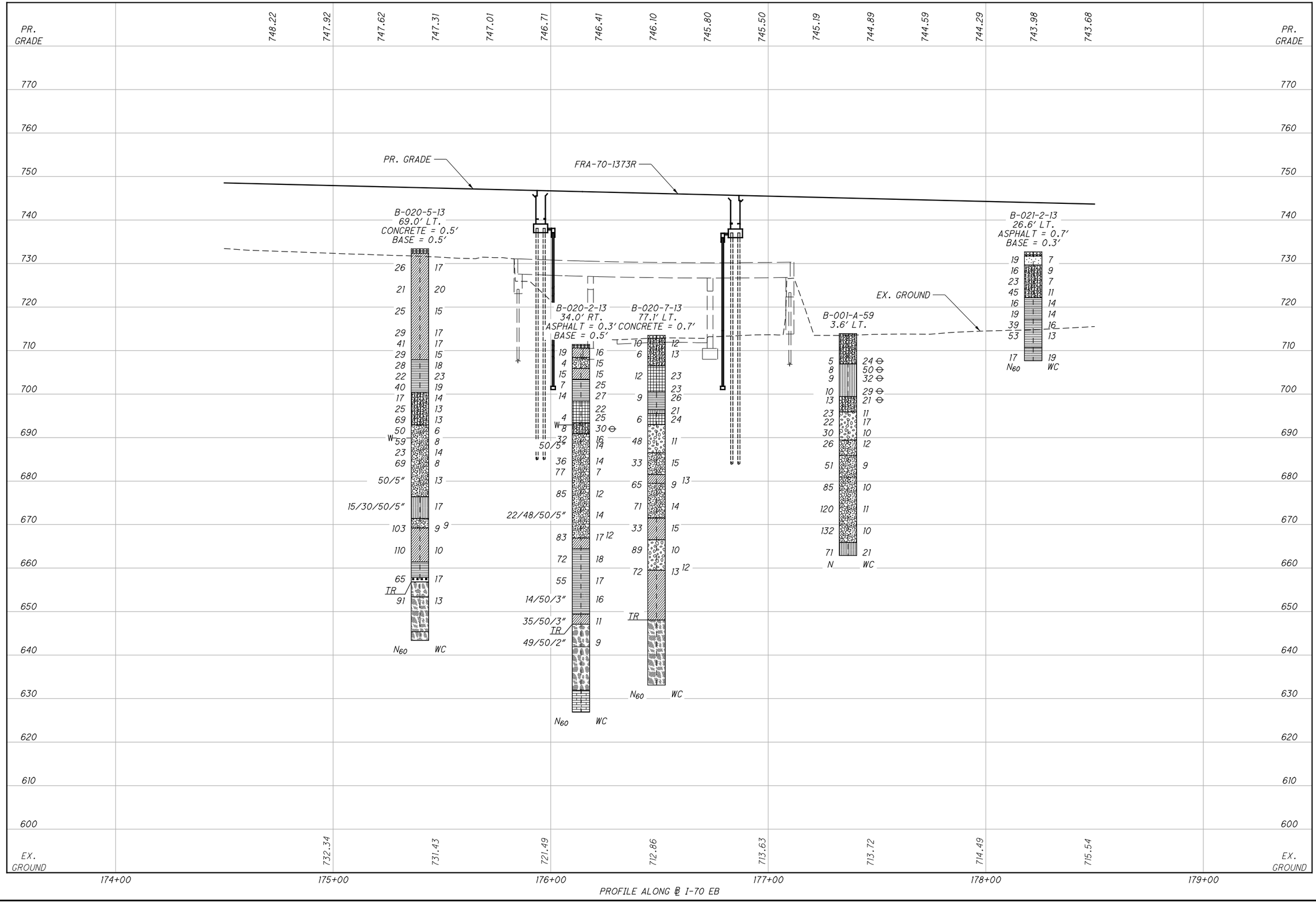


	144/496	**FRA-70-12.68**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-70-1373R I-70 EB OVER SHORT ST.** **STA. 175+00 TO STA. 179+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



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HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1373R I-70 EB OVER SHORT ST.

FRA-70-12.68

145/496

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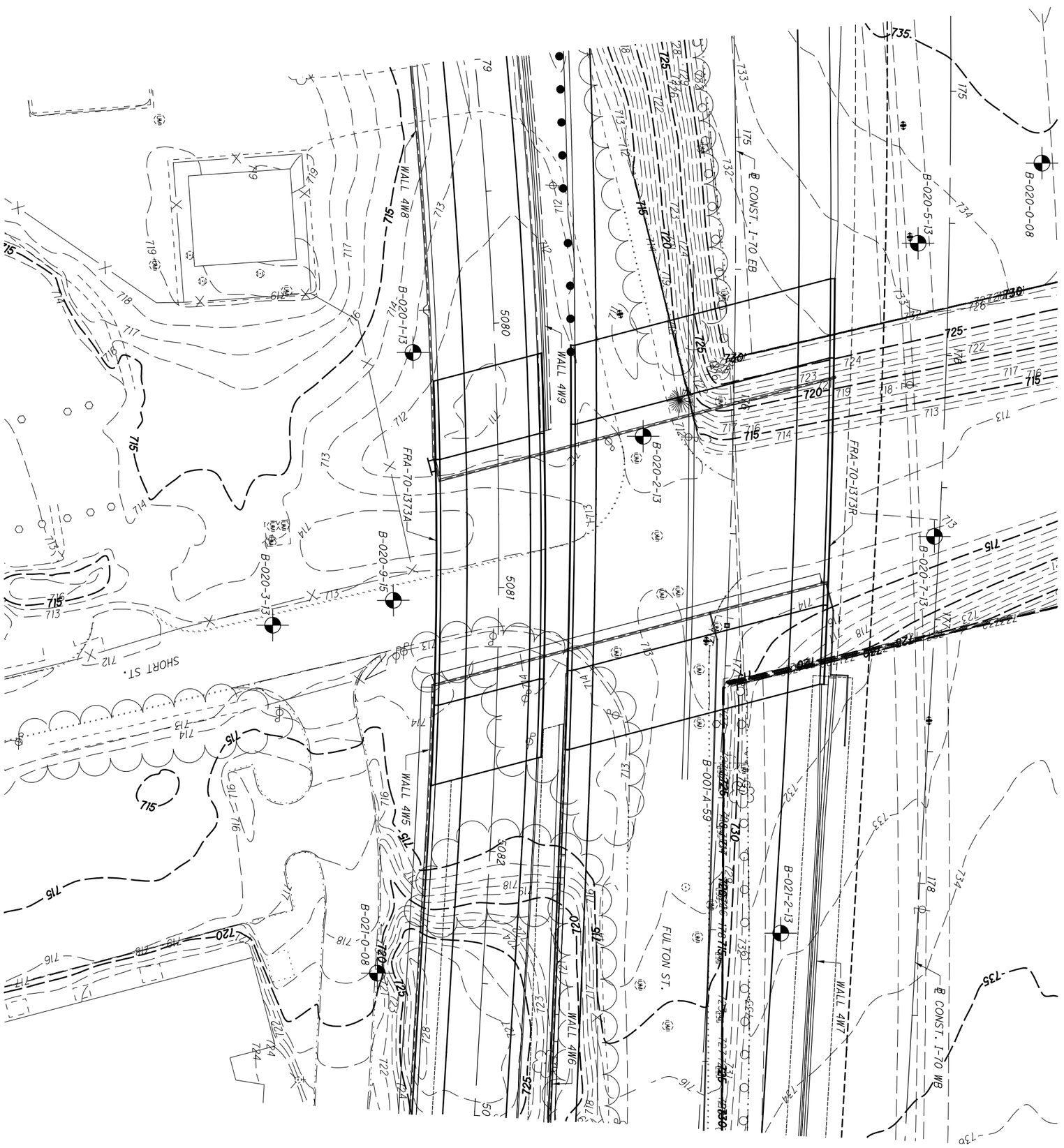
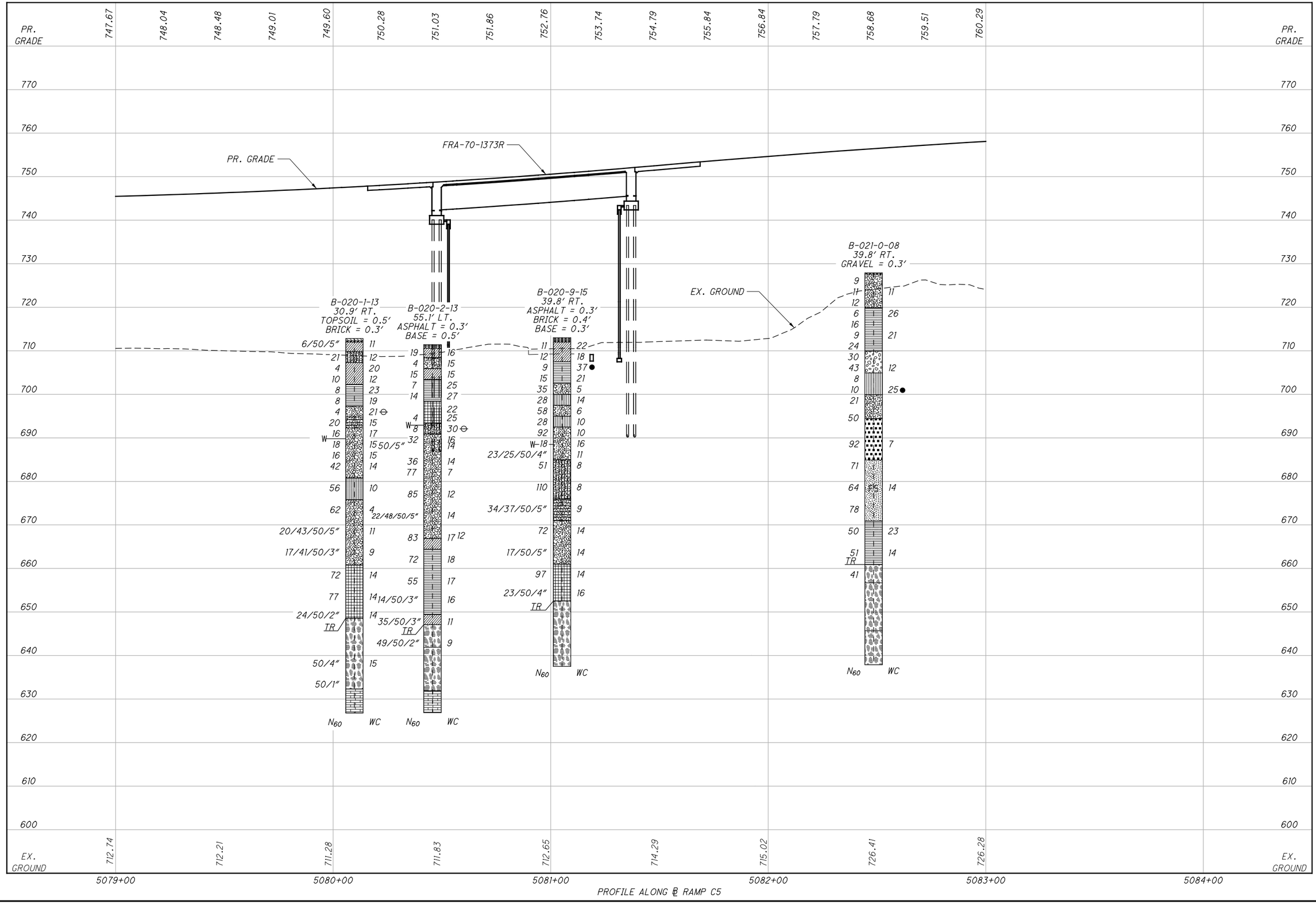


	146/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION FRA-70-1373A RAMP C5 OVER SHORT STREET STA. 5079+00 TO STA. 5083+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1373A RAMP C5 OVER SHORT ST.

FRA-70-12.68

147/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP024.dgn 1/31/2019 8:55:25 AM rachelm

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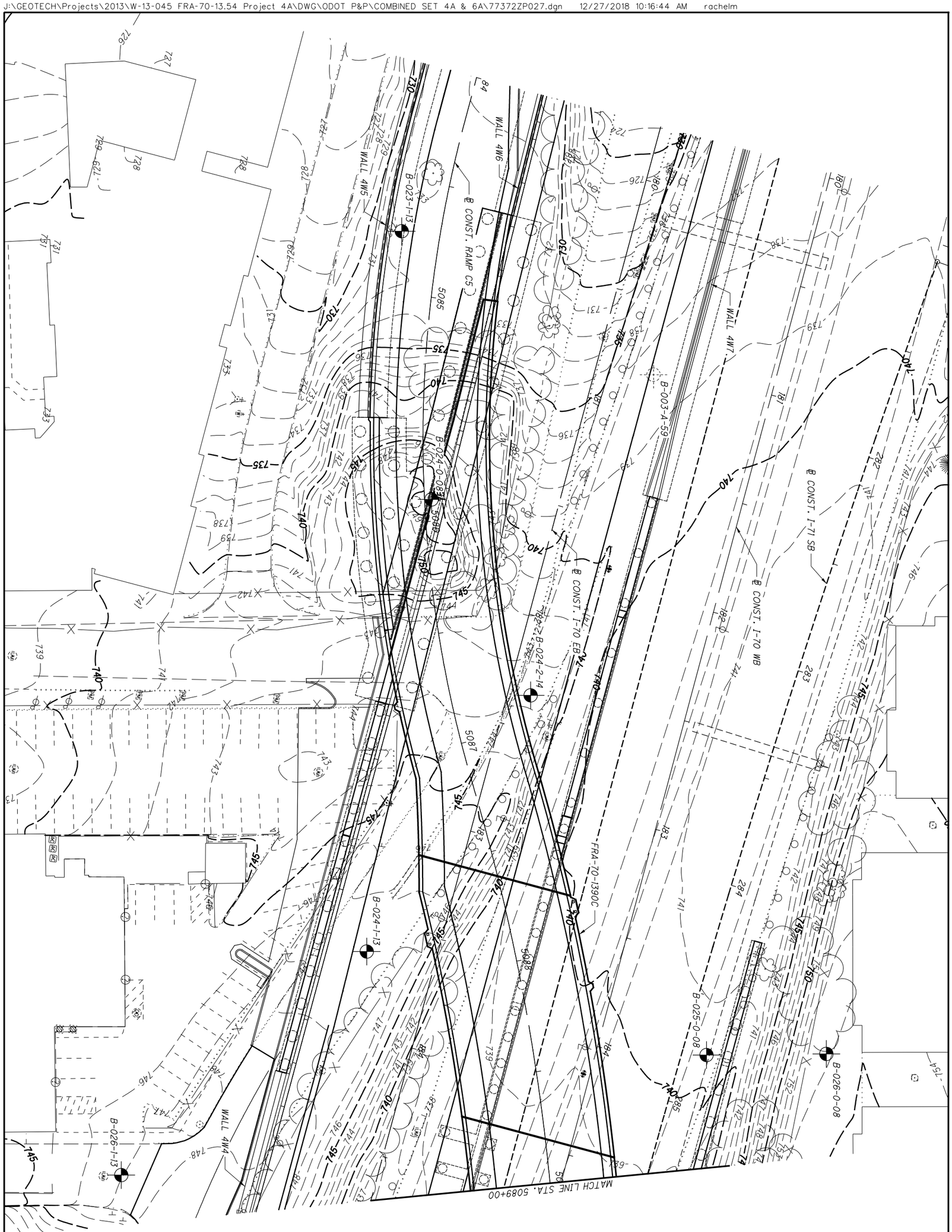

	148/496	**FRA-70-12.68**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-70-1390C RAMP C5 OVER I-70 EB/WB** **STA. 5084+00 TO STA. 5089+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP028.dgn 1/30/2019 5:24:49 PM rachelm

PR. GRADE 762.87 763.38 763.84 764.24 764.58 764.87 765.11 765.29 765.42 765.49 765.51 765.47 765.38 765.24 765.04 764.79 764.48 764.12 763.70 763.23 762.70 PR. GRADE

770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610 600

PR. GRADE

FRA-70-1390C

EX. GROUND

B-023-1-13
17.1′ LT.

28	14
14	16
25	16
	22
15	18
17	16
W 33	21
	18
51	13
22/50/5″	12
W 55	9
40	11
91	6
50/1″	WC
N_{60}	

B-003-A-59
101.6′ LT.

33	15
17	10
18	12
17	24
19	20
28	22
38	22
78	11
50	5
66	11
115	10
75/*	14
72	12
69	12
62	14
75/*	
N	WC

* REFUSAL

B-024-0-08
3.1′ LT.

11	17
22	13
15	16
20	17
12	16
44	19
30	
14	9
11	11
30	9
15	21 ●
24	18 ●
28	25
37	10
72	9
72	19
58	6
15/40/50/4″	10
72	13
11/50/4″	9
50/3″	13
50/3″	9
39/50/3″	7
50/0″	
50/0″	TR
N_{60}	WC

B-024-2-14
34.9′ LT.
ASPHALT = 0.4′
CONCRETE = 1.1′

32	12
17	10
21	11
17	10
13	10
27	9
34	9
26	20
27	17
23	19
W 14	30
27	22
17	19
51	11
52	11
95	12
50/5″	
50/50/2″	WC
N_{60}	

B-024-1-13
64.3′ RT.
ASPHALT = 1.2′
BASE = 0.5′

17	12
20	15
60	3
46	8
44	3
35	5
61	7
37	9
28	10
75	5
43	18
38	18
W 83	8
4/15/50/4″	8
14/50/3″	8
50/3″	5
44	13
50/5″	6
47/50/3″	11
N_{60}	WC

B-025-0-08
76.0′ LT.
ASPHALT = 0.6′
BASE = 0.6′

20	
9	21
20	
17	12
32	
31	32
24	47
19	23
21	23 12
21	9
34	10
20	11
19	9
15	
21	
15	
23	
67	
29/50/5″	8
23/50/6″	
68	
70	5
60	
48/50/3″	WC
N_{60}	

B-026-0-08
128.9′ LT
TOPSOIL = 0.3′

19	23
46	
23	12
14	
19	
23	
46	
20	11
16	
28	11
69	8
70	
50	9
78	11
50	
45	
50	10
50	
50	11
55	25
TR	
N_{60}	WC

EX. GROUND 731.97 732.09 732.35 732.23 732.31 735.76 741.25 749.83 749.65 749.22 743.07 743.52 744.44 744.85 744.53 738.92 739.39 739.51 739.33 738.65 738.38 EX. GROUND

5084+00 5085+00 5086+00 5087+00 5088+00 5089+00

PROFILE ALONG ℄ RAMP C5

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1390C RAMP C5 OVER I-70 EB/WB
STA. 5084+00 TO STA. 5089+00

FRA-70-12.68

149/496

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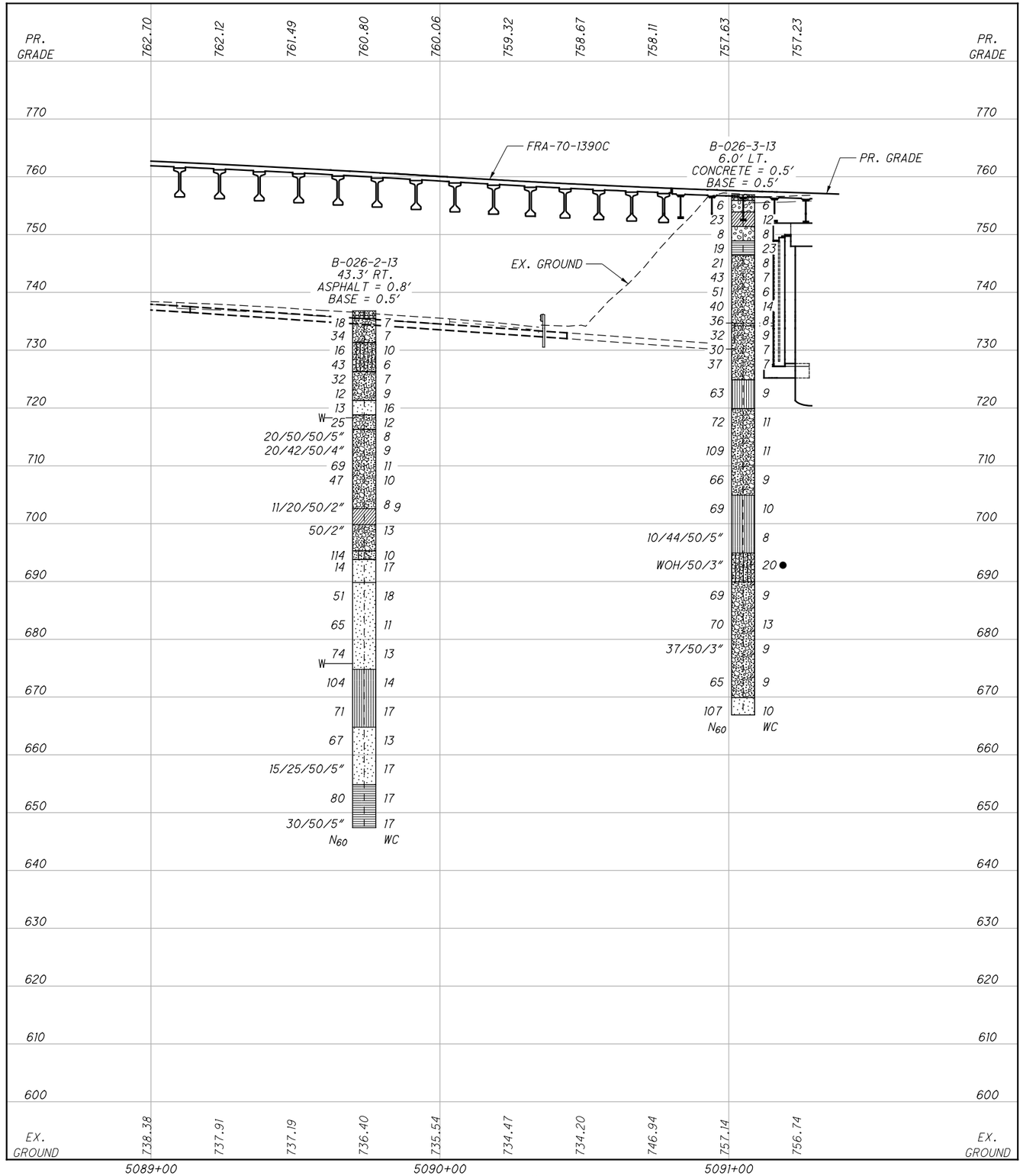
150/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION FRA-70-1390C RAMP C5 OVER I-70 EB/WB STA. 5089+00 TO STA. 5091+37.94	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

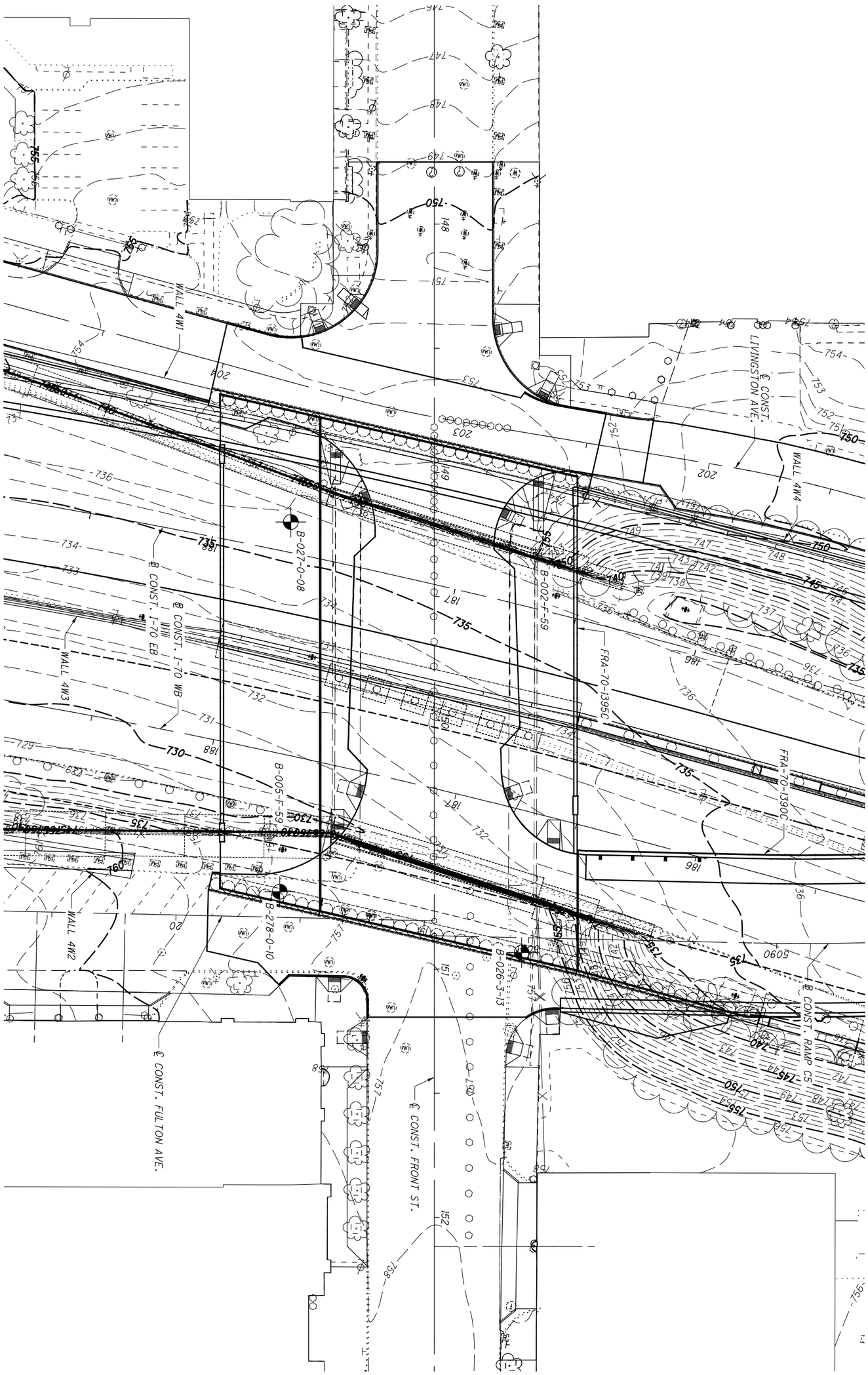
STRUCTURE FOUNDATION EXPLORATION
FRA-70-1390C RAMP C5 OVER I-70 EB/WB
STA. 5089+00 TO STA. 5091+37.94

FRA-70-12.68

151/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP030.dgn 12/27/2018 10:16:47 AM rachelm

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP031.dgn 12/27/2018 10:17:20 AM rachelm



	152/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION FRA-70-1395C FRONT ST. OVER I-70 EB/WB	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP032.dgn 12/27/2018 10:17:21 AM rachelm

PR. GRADE 750.35 751.59 752.76 753.78 754.64 755.36 755.93 756.35 756.62 756.75 756.85 756.96 757.09 757.26 757.46 757.69 757.94 PR. GRADE

830 820 810 800 790 780 770 760 750 740 730 720 710 700 690 680 670 660

B-027-0-08
57.8' RT.
ASPHALT = 0.6'
CONCRETE = 0.9'
BASE = 0.9'

N_{60}	WC
41	10
21	16
22	9
23	8
43	14
57	9
51	9

PR. GRADE

FRA-70-1395C

B-002-F-59
46' LT.

N	WC
8	20 ⊖
29	13
44	12
31	14
100/*	10
39	14
97	10
65	13
42/*	8
78	9
97	10
188	8
117	9
97	9
183	10
227	
138/*	18
171	15
138/*	
70/*	12

* REFUSAL

EX. GROUND

B-005-F-59
67' RT.

N	WC
10	24
17	15
137	14
104	12
102	15"
88	12
57	10
95	14
91/*	11
153	11
100/*	10
100/*	
206	13
238	10
127	11
156	9
100/*	9

* REFUSAL

B-026-3-13
35.2' LT.
CONCRETE = 0.5'
BASE = 0.5'

N_{60}	WC
6	6
23	12
8	8
19	23
21	8
43	7
51	6
40	14
36	8
32	9
30	7
37	7
63	9 W
72	11
109	11
66	9
69	10
10/44/50/5"	8
WOH/50/3"	20 ⊖
69	9
70	13
37/50/3"	9
65	9
107	10

EX. GROUND 750.43 752.81 754.29 735.25 733.03 730.97 757.02 757.37 757.97 EX. GROUND

148+00 149+00 150+00 151+00 152+00 153+00

PROFILE ALONG ℄ FRONT ST.

0 10 20 40 HORIZONTAL SCALE IN FEET

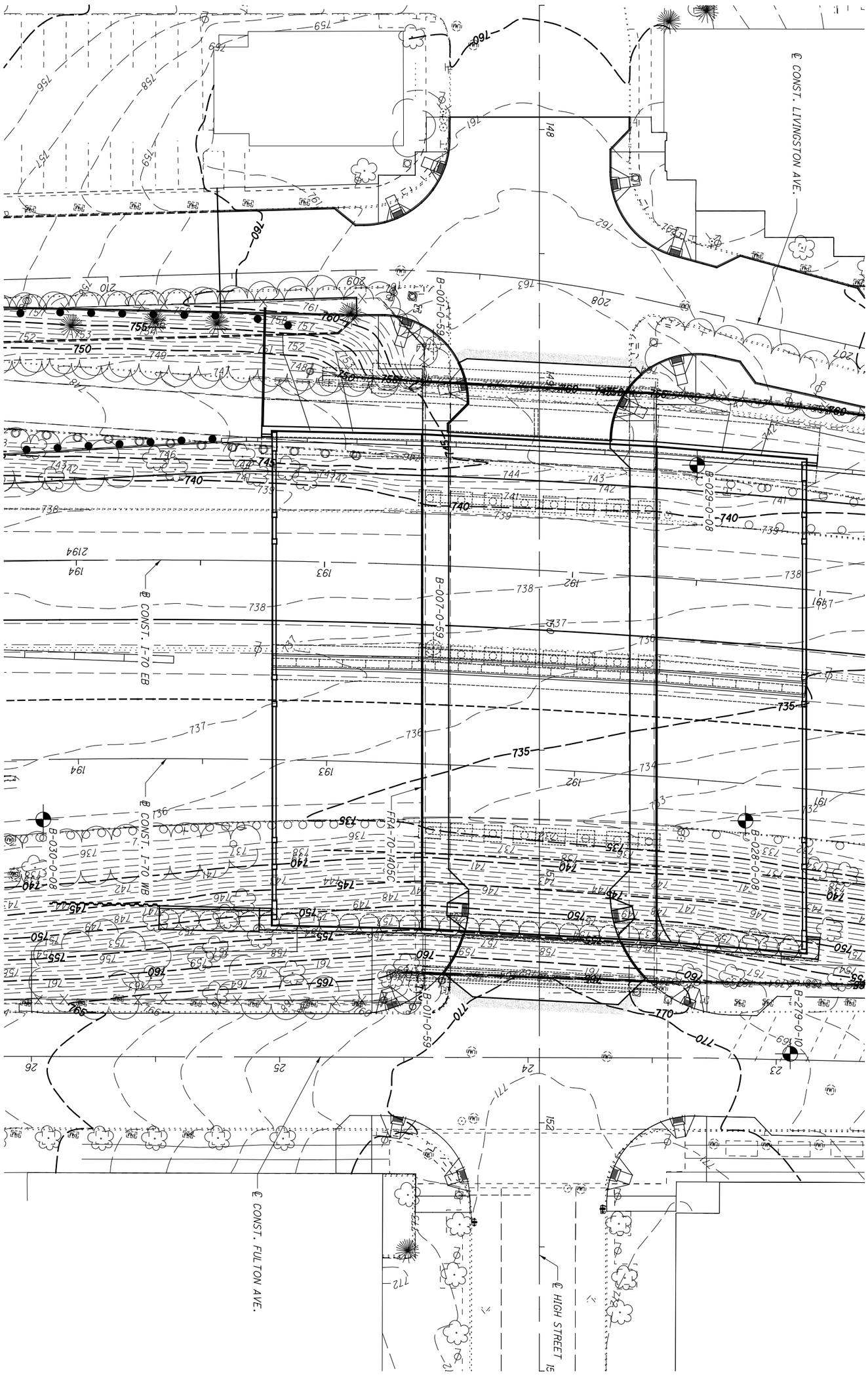
DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1395C FRONT ST. OVER I-70 EB/WB

FRA-70-12.68

153/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP033.dgn 1/30/2019 5:30:05 PM rachelm



	154/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION FRA-70-1405C OVER I-70	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP034.dgn 1/31/2019 11:02:36 AM rachelm

PR. GRADE

763.36 764.04 764.71 765.39 766.07 766.75 767.43 768.10 768.78 769.46 770.08 770.59 771.00 771.31 771.56

PR. GRADE

770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610 600

B-001-0-59
42.6′ RT.

B-029-0-08
63.6′ LT.
ASPHALT = 0.6′
CONCRETE = 0.8′
BASE = 0.9′

B-007-0-59
42.6′ RT.

FRA-70-1405C

B-030-0-08
199.8′ RT.
ASPHALT = 0.9′
BASE = 0.5′

B-011-0-59
49.6′ RT.

B-279-0-10
101.1′ LT.
ASPHALT = 0.3′
PAVERS = 0.5′
BASE = 0.4′

EX. GROUND

B-028-0-08
83.0′ LT.
ASPHALT = 1.0′
BASE = 0.5′

N WC
N60 WC
TR
W
* REFUSAL

EX. GROUND

762.69 764.00 740.47 736.91 734.97 741.82 770.32 771.39 771.82 772.08

148+00 149+00 150+00 151+00 152+00 153+00

PROFILE ALONG ℄ HIGH STREET

0 10 20 40
HORIZONTAL SCALE IN FEET

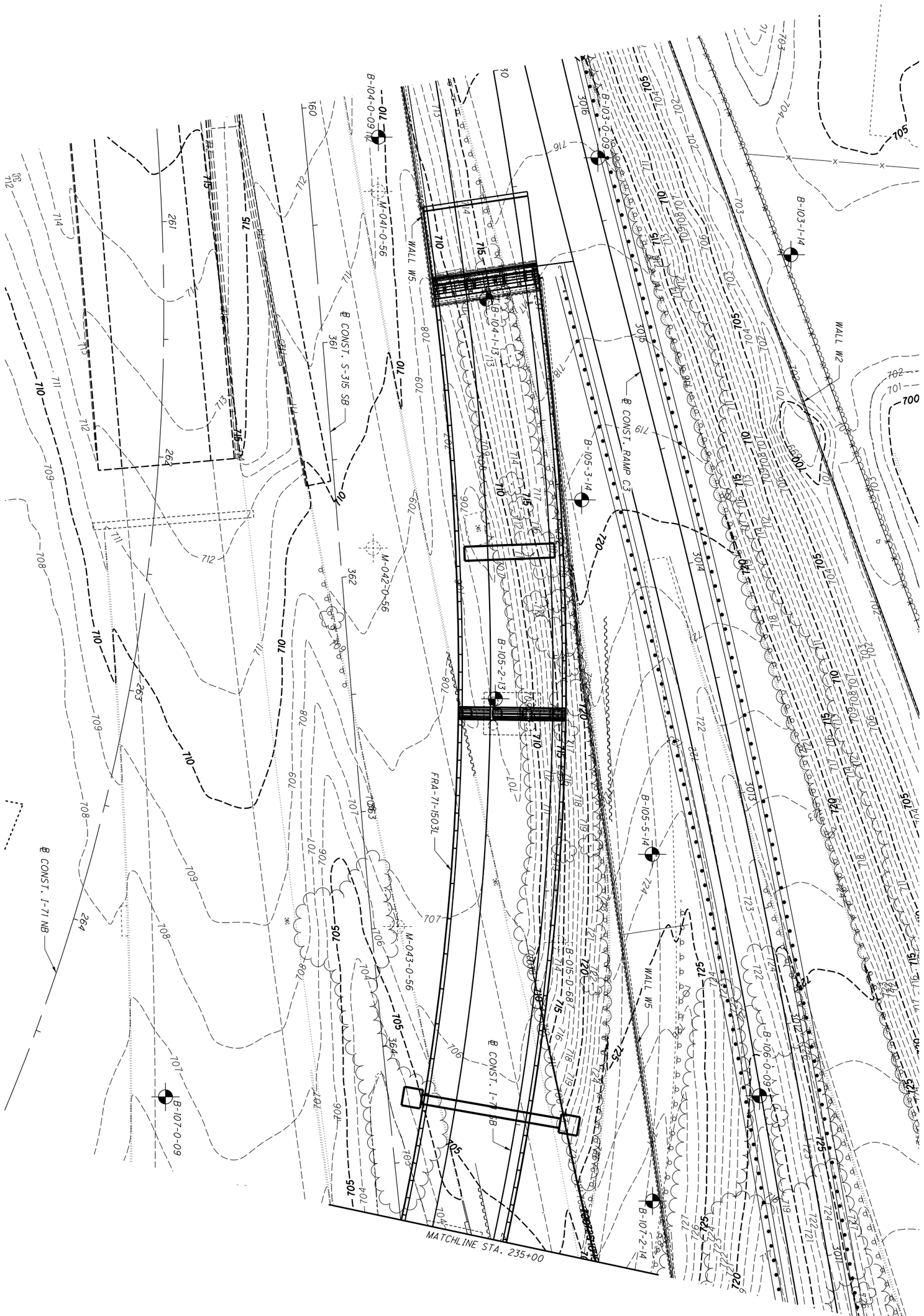
DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-70-1405C OVER I-70

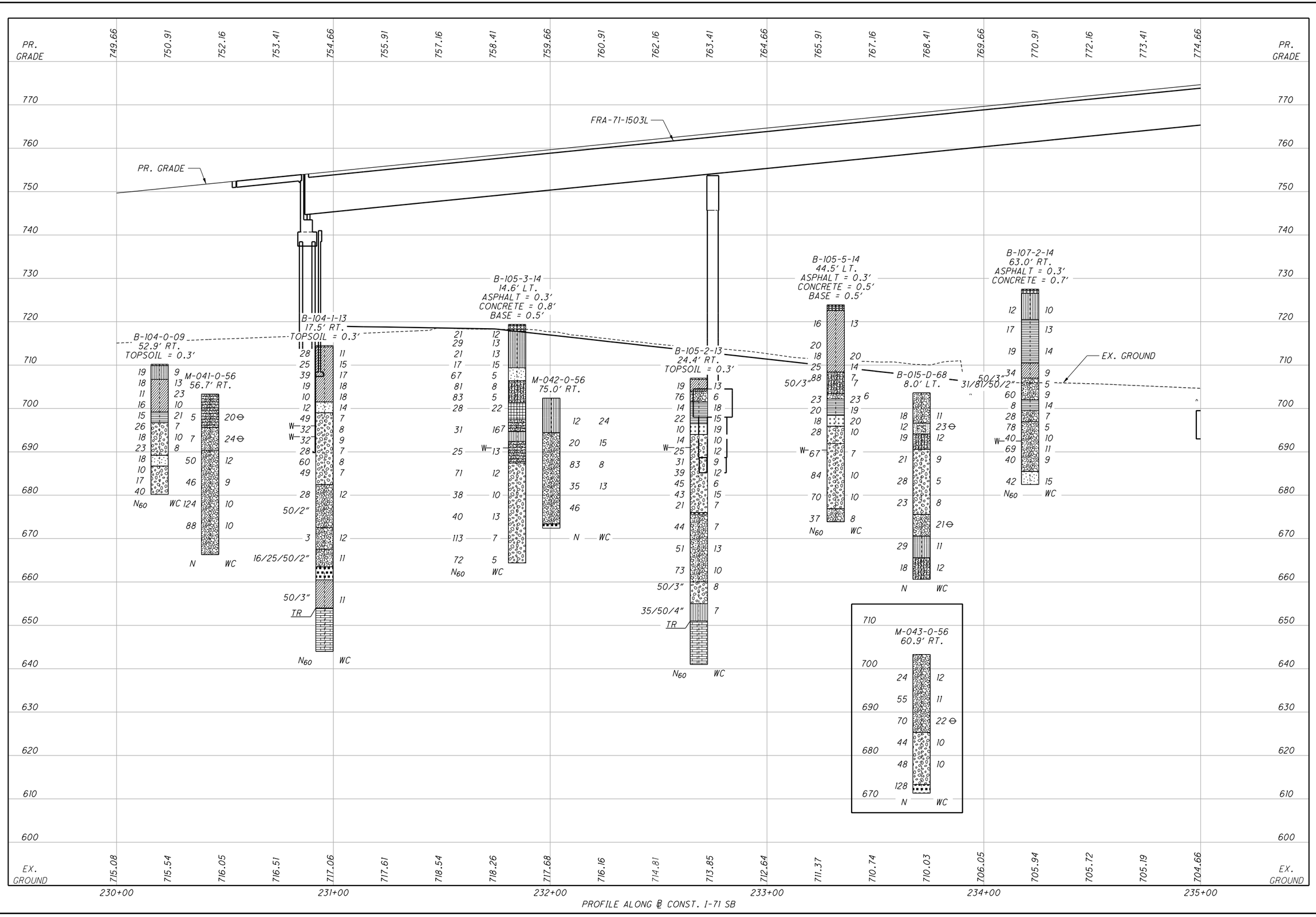
FRA-70-12.68

155/496

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP019.dgn 4/6/2020 4:27:52 PM rachelm



156/496	**FRA-70-13.10**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER** **STA. 230+00 TO STA. 235+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N



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HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER
STA. 230+00 TO STA. 235+00

FRA-70-13.10

157 496

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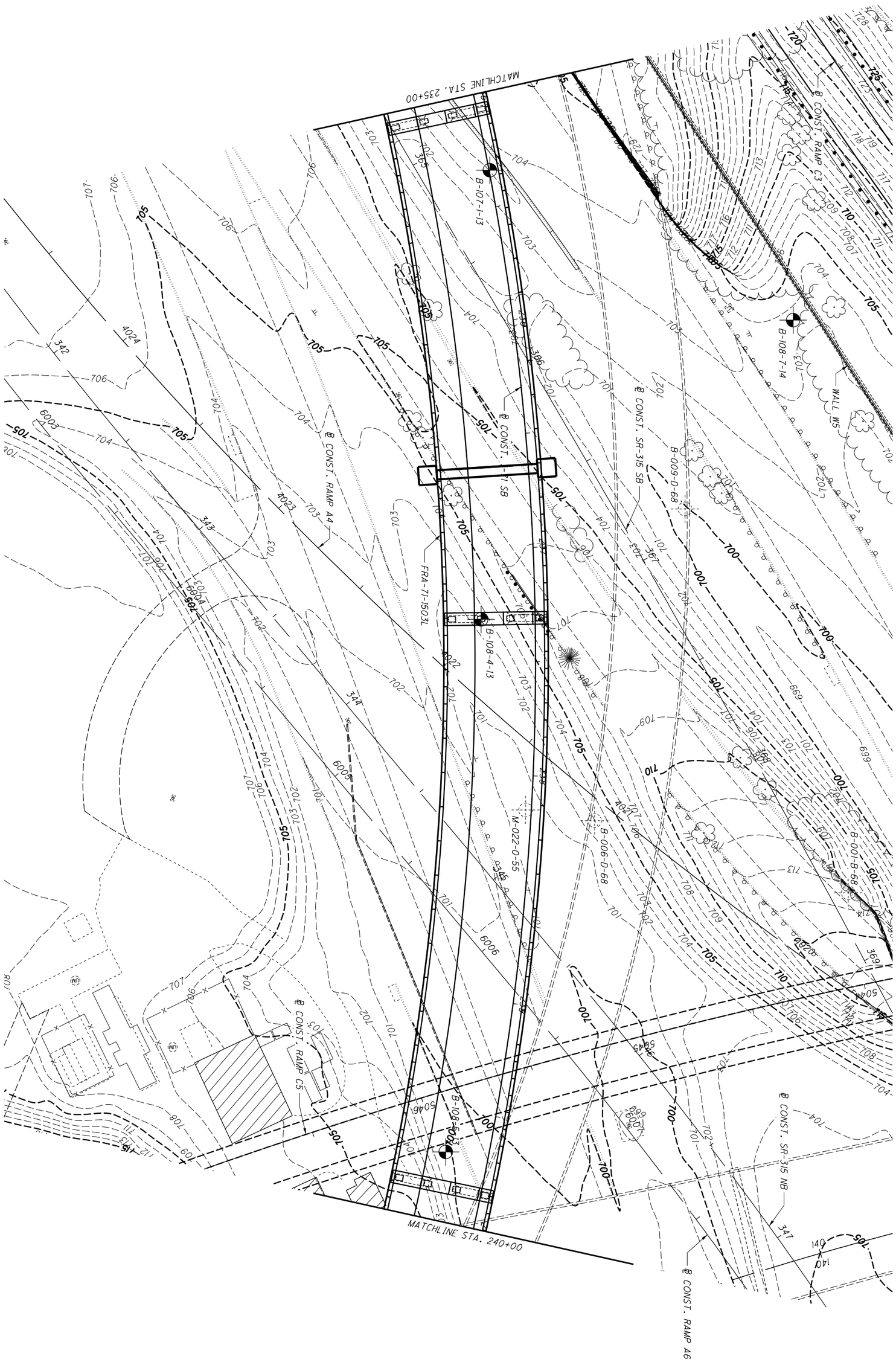


158/496	**FRA-70-13.10**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER** **STA. 235+00 TO STA. 240+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP022.dgn 4/6/2020 4:18:52 PM rachelm

PR. GRADE

774.66 775.91 777.16 778.41 779.66 780.91 782.16 783.41 784.66 785.88 787.05 788.17 789.23 790.24 791.19 792.09 792.93 793.73 794.46 795.15 795.78

PR. GRADE

790 780 770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620

PR. GRADE

FRA-71-1503L

EX. GROUND

B-107-1-13
- 0.3' LT.
TOPSOIL = 0.6'

10	18	
9	14	
9	10	
39	6	
51	5	
W 53	9	
W 52	9	
34	13	
67	12	
39	10	
32	17	
32	21	⊖
17	21	⊖
50/3"	11	
30/50/4"	10	9
50/5"	8	
50/1" TR		

N_{60} WC

B-009-D-68
67.2' LT.

15	10	
50/7"	20	⊖
50	9	
34	23	⊖
22	2	
13	6	
50/7"	24	●
28	8	
50/7" TR	17	
	5	

N WC

B-108-4-13
23.7' LT.
TOPSOIL = 0.3'

30	9	
6	15	
30	9	
22	9	
W 49	10	
W 27	8	
27	12	
17	20	⊖
23	18	
13	19	⊖
10	22	⊖
9	25	⊖
28/50/6"	9	27 ●
80	12	
12	15	
15/50/3" TR	16	

N_{60} WC

B-006-D-68
27.9' LT.

24	12	
28	25	⊖
37	12	
21	13	
20	20	⊖
50	5	
23	11	
18	12	
18 TR	15	

N WC

B-108-5-13
18.7' RT.
TOPSOIL = 0.5'

25	6	
12	18	
16	13	
20	15	
W 20	6	
41	12	
27	13	
16	24	⊖
22	23	⊖
36	6	
50/3"	42	10 11
33	12	
30	11	
30	10	
27	11	
22/50/5" TR	10	

N_{60} WC

EX. GROUND

704.66 704.34 702.91 701.76 702.61 703.20 704.39 705.32 706.03 706.55 704.88 702.29 701.16 700.60 701.15 700.72 700.70 700.40 700.09 699.63 699.66

EX. GROUND

235+00 236+00 237+00 238+00 239+00 240+00

PROFILE ALONG ℄ CONST. I-71 SB

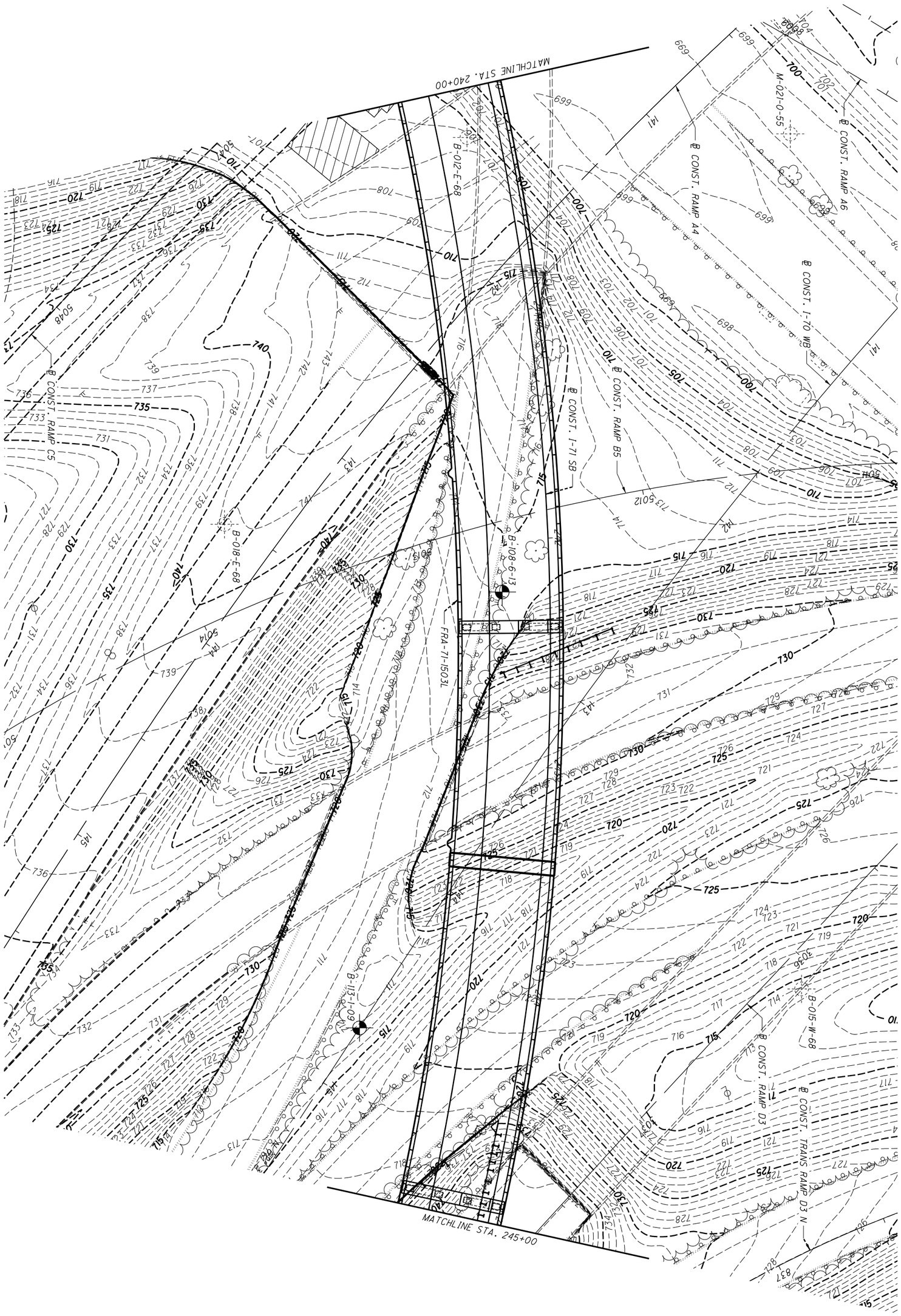
HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER
STA. 235+00 TO STA. 240+00

FRA-70-13.10

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP023.dgn 4/6/2020 4:33:12 PM rachelm



160/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER STA. 240+00 TO STA. 245+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\894642P024.dgn 4/6/2020 4:17:38 PM rachelm

PR. GRADE: 795.78 | 796.35 | 796.87 | 797.34 | 797.76 | 798.12 | 798.42 | 798.67 | 798.87 | 799.02 | 799.11 | 799.14 | 799.12 | 799.05 | 798.93 | 798.75 | 798.51 | 798.23 | 797.88 | 797.49 | 797.04

PR. GROUND

FRA-71-1503L

EX. GROUND: 699.66 | 702.85 | 708.06 | 711.05 | 718.91 | 718.17 | 716.43 | 714.79 | 714.64 | 715.60 | 726.99 | 732.57 | 730.97 | 725.76 | 716.38 | 721.47 | 722.00 | 720.39 | 732.61 | 743.77 | 743.60

B-012-E-68
13.9' RT.

	N	WC
	18	13
	9	18
	4	10
	47	8
	27	12
	50/5"	4
	50/11"	14
	26	12
	50/7"	15
	23	10
TR	50	10

B-018-E-68
140.2' RT.

	N	WC
	50/10"	17
	32	23
	40	13
	19	12
	9	14
	8	16
	10	16
	15	18
	50/7"	
	50/5"	10
	50/7"	11
	50/7"	11
	50/0	10
TR		

B-108-6-13
20.7' RT.
TOPSOIL = 0.2'

	N_{60}	WC
	33	7
	19	6
	7	19
	16	9 5
W	9	12
	12	21
	7	24
	7	21
	46	24
	12	20
	12	15
	9	17
	9	18
W	26	11
	54	9
	84	10
	50/5"	
TR		

B-015-W-68
117.7' LT.

	N	WC
	55	7
	54	7
	46	12
	62	9
	62	9
	50/5"	12
	32	12
	46	5
	63	8
TR		

B-113-1-09
70.6' RT.
TOPSOIL = 1.0'

	N_{60}	WC
	8	23
	11	20
	17	19
	39	5
	44	7
	33	5
	50	7
	61	

240+00 | 241+00 | 242+00 | 243+00 | 244+00 | 245+00

PROFILE ALONG ℄ CONST. I-71 SB

HORIZONTAL SCALE IN FEET
0 10 20 40

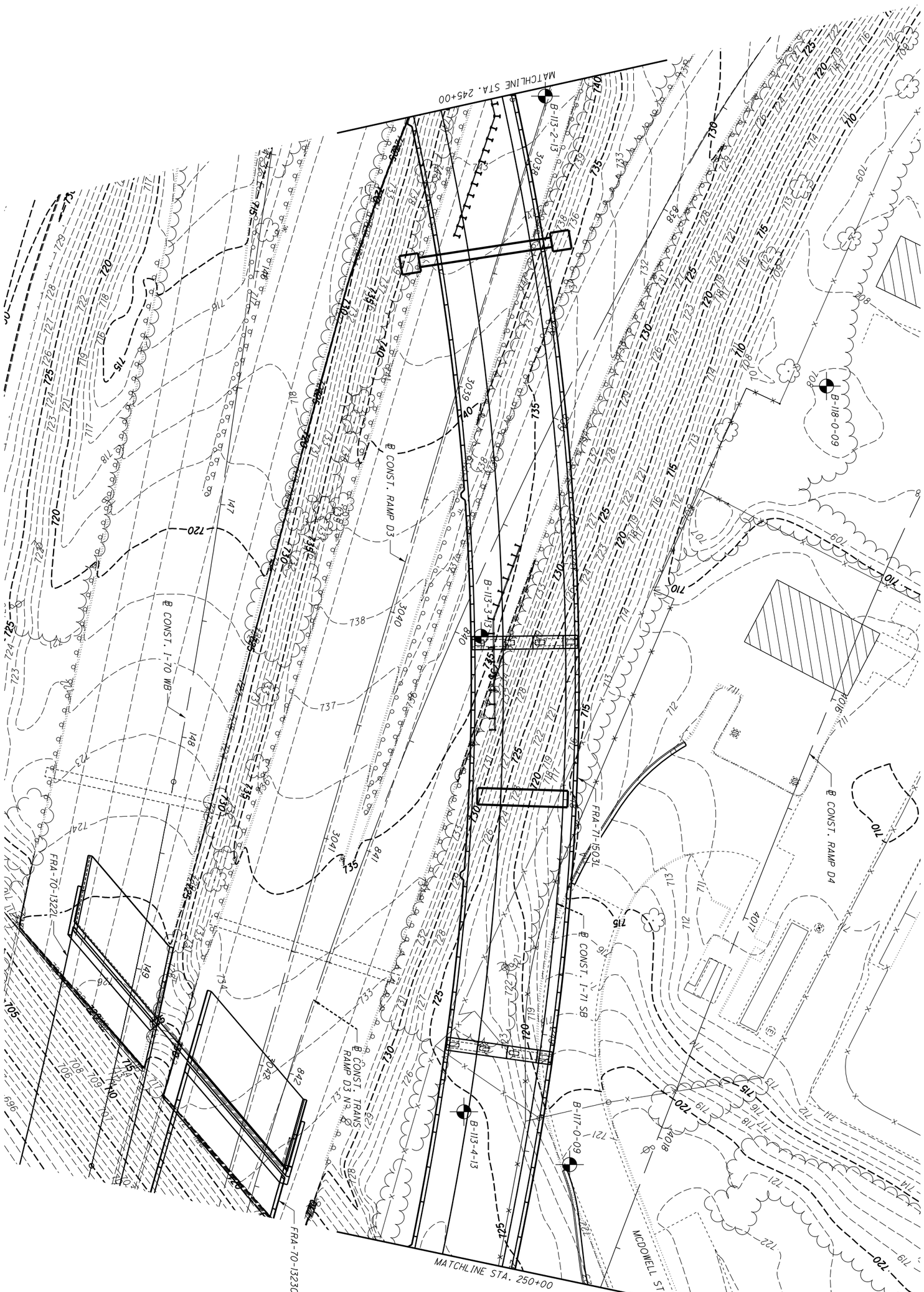
DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER
STA. 240+00 TO STA. 245+00

FRA-70-13.10

161 / 496

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP025.dgn 4/6/2020 4:35:19 PM rachelm



162/496	**FRA-70-13.10**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER** **STA. 245+00 TO STA. 250+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	

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PR. GRADE: 797.04 | 796.54 | 795.98 | 795.37 | 794.70 | 793.98 | 793.21 | 792.44 | 791.72 | 791.05 | 790.43 | 789.87 | 789.36 | 788.90 | 788.50 | 788.15 | 787.85 | 787.60 | 787.41 | 787.27 | 787.18

PR. GRADE

FRA-71-1503L

EX. GROUND

B-113-2-13
17.9' LT.
ASPHALT = 0.7'
BASE = 0.5'

49	6	
30/15/50/2"	7	
75	7	
15		
49	8	
37	10	
50/3"		
23	20	
37	20	
64	9	
26	7	
74	6	
74	9	
90	8	
W—46	20	⊖
120	7	
27/50/5"	16	
136	9	
57	10	
103	11	
30/50/3"	8	
35/50/2"	9	
TR		

N_{60} WC

B-113-3-13
35.7' RT.
ASPHALT = 0.5'
BASE = 1.0'

11	11	
20	13	
50	7	
43	7	
19	14	
30	13	
11	16	
50/3"	21	19
	3	
13	28	
34	21	
34	17	
36	11	
W—51	18	
16	12	
9	36	⊖
W—23	12	
60	13	
50/5"	15	
27/50/2"	12	
TR		
28/29/50/3"	13	

N_{60} WC

B-113-4-13
28.1' RT.
TOPSOIL = 0.5'

26	15	
18	12	
20	5	
20	4	
14	16	
11	13	
11	16	4
6	23	
31	8	
15/17/50/3"	8	
50/3"		
72	4	
50/50/0"	4	
W—92	12	
48	10	
48	17	
60	12	
50/3"		
50/3"		
109	9	
50/2"		
TR		
50/50/4"	11	

N_{60} WC

EX. GROUND: 743.60 | 742.97 | 742.11 | 739.90 | 735.34 | 734.68 | 734.48 | 734.31 | 729.49 | 724.74 | 720.27 | 717.15 | 715.49 | 716.09 | 716.08 | 716.95 | 718.27 | 720.81 | 723.83 | 724.66 | 725.42

245+00 246+00 247+00 248+00 249+00 250+00

PROFILE ALONG ℄ CONST. I-71 SB

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER
STA. 245+00 TO STA. 250+00

FRA-70-13.10

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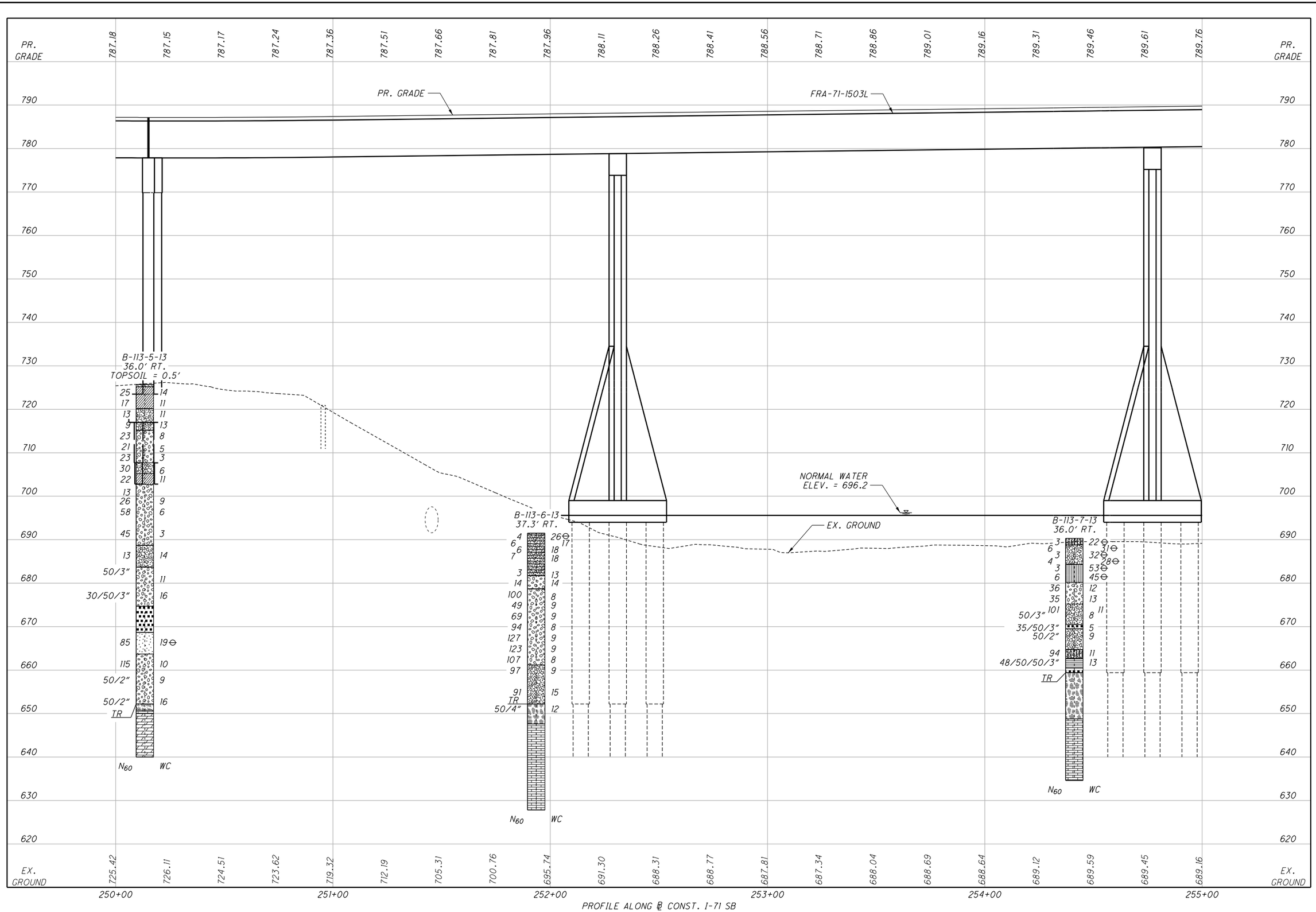
	164/496	**FRA-70-13.10**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER** **STA. 250+00 TO STA. 255+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



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0 10 20 40
HORIZONTAL SCALE IN FEET

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER
STA. 250+00 TO STA. 255+00

FRA-70-13.10

165 496

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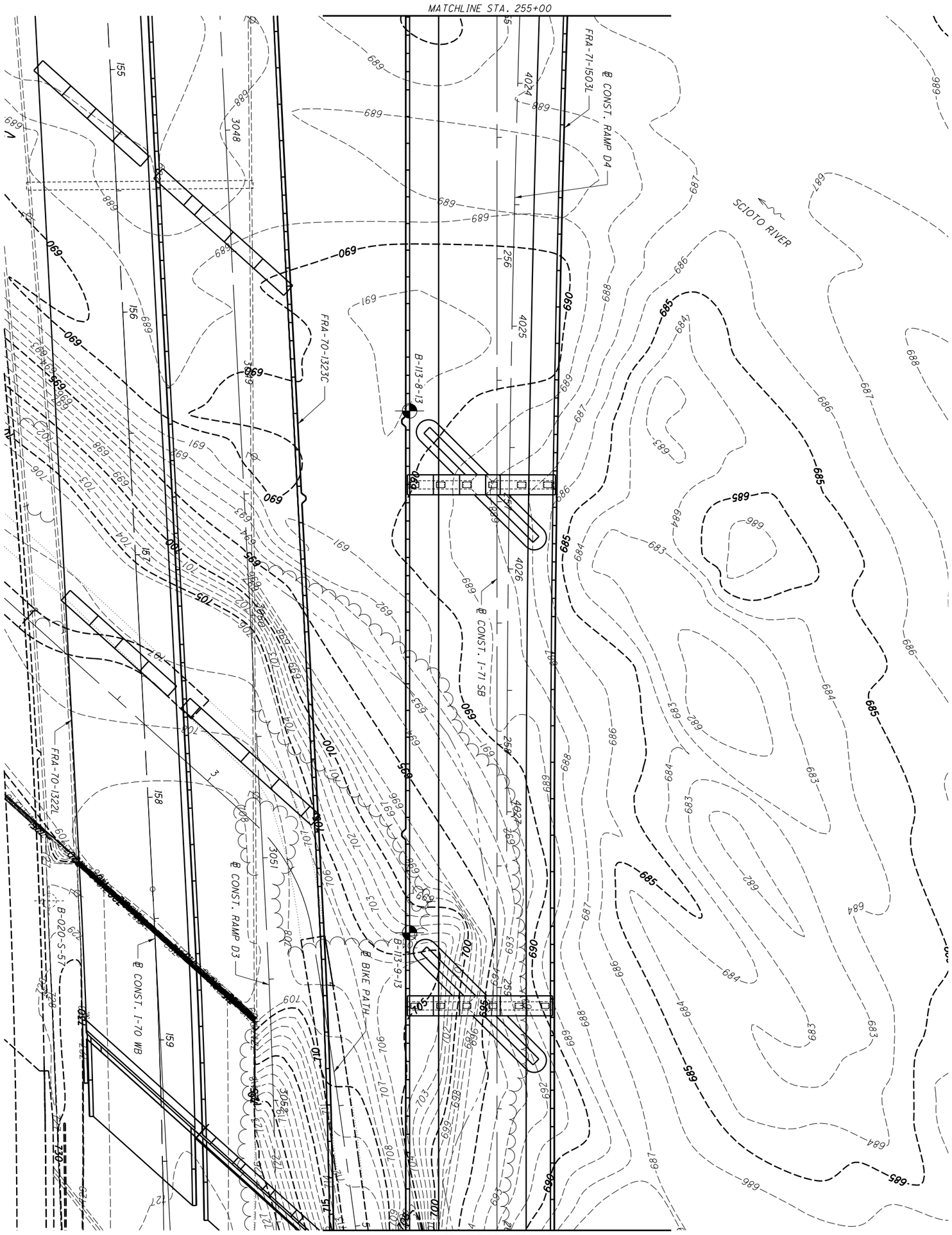

166/496	**FRA-70-13.10**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER** **STA. 255+00 TO STA. 260+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP030.dgn 4/6/2020 4:10:10 PM rachelm

PR. GRADE | 789.76 | 789.91 | 790.06 | 790.21 | 790.36 | 790.52 | 790.67 | 790.82 | 790.97 | 791.12 | 791.27 | 791.42 | 791.57 | 791.72 | 791.87 | 792.02 | 792.17 | 792.32 | 792.47 | 792.62 | 792.77 | PR. GRADE

PR. GRADE

FRA-71-1503L

790 780 770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620

NORMAL WATER ELEV. = 696.2

EX. GROUND

B-113-8-13
36.0' RT.

17		20
16		14
17	9	14
		15
22		17
		13
25		21
19		13
38		14
45		15
74		15
85		19
18/20/50/5"		15
50/3"		
87		6
119		11
TR		

N_{60} WC

B-113-9-13
36.0' RT.
TOPSOIL = 0.5'

8	12
12	16
54	12
22	18
17	19
8	19
	18
W 5	26
10	40
23	12
56	12
61	9
45	9
57	11
69	8
10/30/50/5"	13
TR	
30/50/3"	10

N_{60} WC

EX. GROUND | 689.16 | 688.71 | 689.14 | 689.07 | 690.25 | 690.71 | 690.32 | 688.87 | 687.89 | 688.20 | 688.83 | 688.78 | 690.04 | 691.89 | 693.36 | 694.83 | 693.73 | 693.93 | 693.94 | 693.42 | 692.03 | EX. GROUND

255+00 256+00 257+00 258+00 259+00 260+00

PROFILE ALONG ℄ CONST. I-71 SB

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER
STA. 255+00 TO STA. 260+00

FRA-70-13.10

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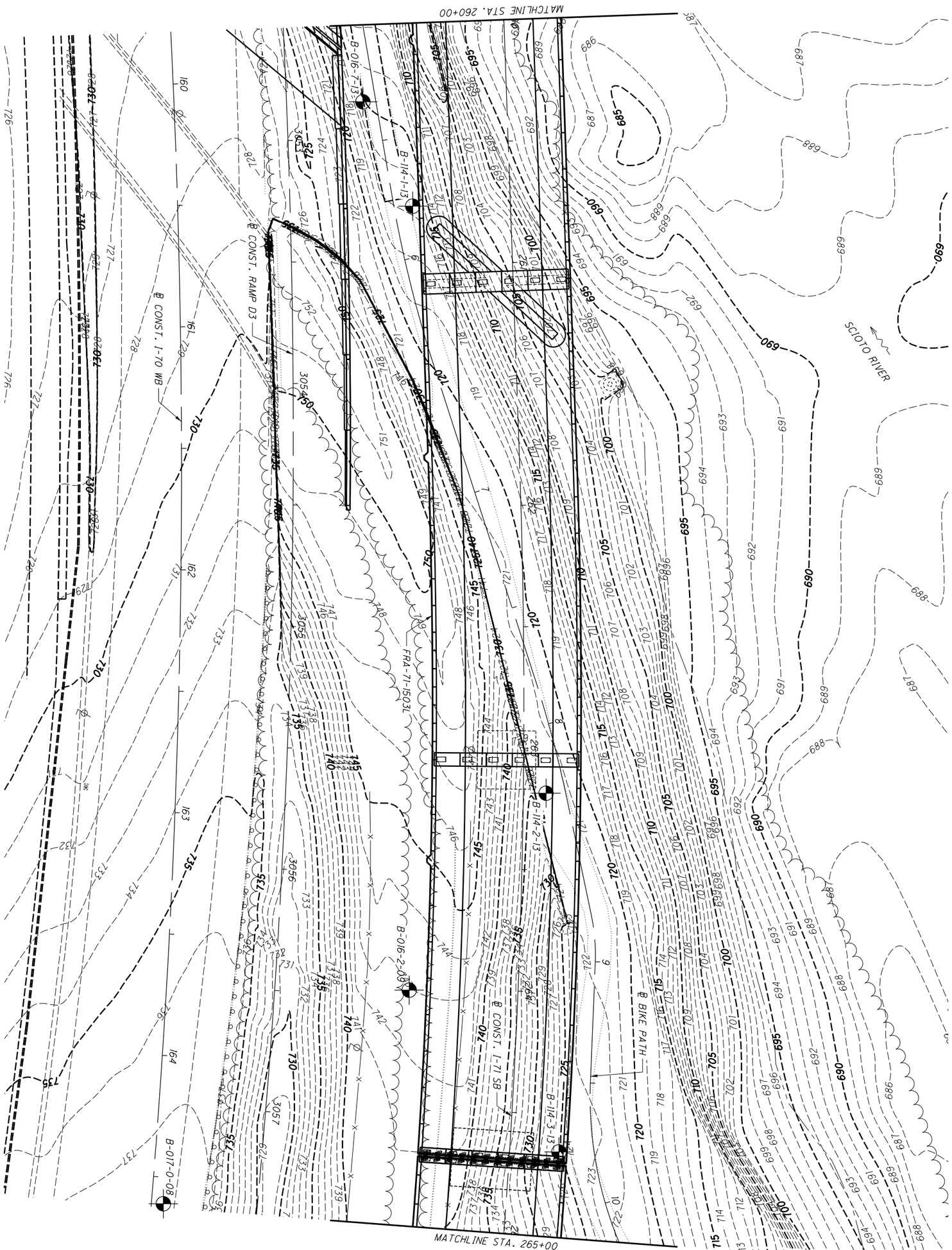

	168/496	**FRA-70-13.10**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER** **STA. 260+00 TO STA. 265+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET

PR. GRADE | 792.77 | 792.92 | 793.07 | 793.22 | 793.37 | 793.52 | 793.67 | 793.80 | 793.91 | 793.99 | 794.06 | 794.10 | 794.12 | 794.12 | 794.10 | 794.05 | 793.99 | 793.90 | 793.79 | 793.66 | 793.50 | PR. GRADE

800 790 780 770 760 750 740 730 720 710 700 690 680 670 660 650 640 630

PR. GRADE

FRA-71-1503L

EX. GROUND

NORMAL WATER ELEV. = 696.2

B-016-7-13
59.2' RT.
TOPSOIL = 0.3'

19	17	12	45	37	19	12	W	4	80	58	54	78	50/2"		21	10	23	31	40	10	9	23	16	11
													N_{60}	WC										

B-114-1-13
40.2' RT.
TOPSOIL = 0.3'

50/1"	12	13	7	12	22	19	7	W	17	41	18/50/6"	36	39	20/50/6"	TR	50/3"							
10	18	21	13	13	13	13	29		14	8 9	10	23	20	15		17							
																	N_{60}	WC					

B-114-2-13
9.4' LT.
ASPHALT = 0.5'

9	7	13	6	13	6	36	19	22	4	3	W	7	55	55	104	35	69	75	TR	21/50/4"	50/2"		
14	7	19	16	16	22	17	18	22	28	23		20	17	13	16	11	20	12		12			
																					N_{60}	WC	

B-016-2-09
44.7' RT.
ASPHALT = 0.3'
CONCRETE = 0.8'

10	17	18	11	9	10	15	17	7	12	10	20	18	73	28	55	W	31						
17	14	17	24	23	23	25	10	10	11	14	17	16	4		7								
						23							10 21				N_{60}	WC					

B-114-3-13
20.3' LT.
TOPSOIL = 0.5'

10	9	12	14	14	29	106	42	25	30	69	W	36	12	23	50/4"	40/50/5"	45/50/3"	65	50/5"	TR	35/50/5"		
11	16	15	18	17	18	19	16	18	15	7		14	19	19	23	10	8	19					
																					N_{60}	WC	

692.03 | 692.77 | 694.95 | 699.83 | 704.08 | 706.47 | 710.82 | 716.12 | 719.08 | 720.10 | 720.53 | 721.20 | 725.48 | 736.11 | 735.49 | 734.70 | 733.59 | 733.80 | 733.69 | 732.51 | 733.65

EX. GROUND | EX. GROUND

260+00 | 261+00 | 262+00 | 263+00 | 264+00 | 265+00

PROFILE ALONG ℄ CONST. I-71 SB

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM | CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER
STA. 260+00 TO STA. 265+00

FRA-70-13.10

169 / 496

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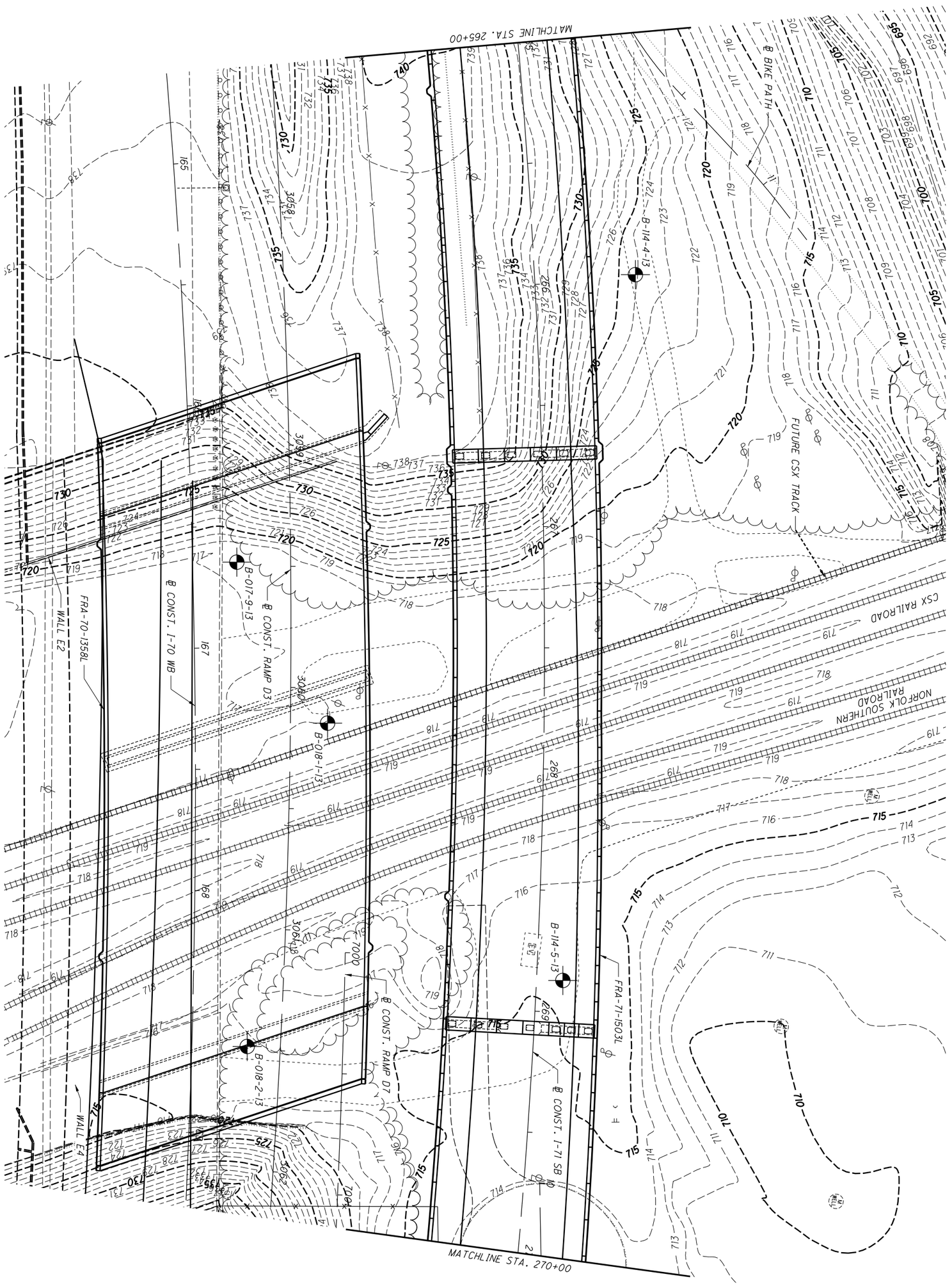

170/496	**FRA-70-13.10**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER** **STA. 265+00 TO STA. 270+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N

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PR. GRADE | 793.50 | 793.33 | 793.13 | 792.93 | 792.73 | 792.53 | 792.33 | 792.13 | 791.93 | 791.74 | 791.54 | 791.34 | 791.14 | 790.94 | 790.74 | 790.52 | 790.26 | 789.96 | 789.62 | 789.24 | 788.82 | PR. GRADE

PR. GRADE

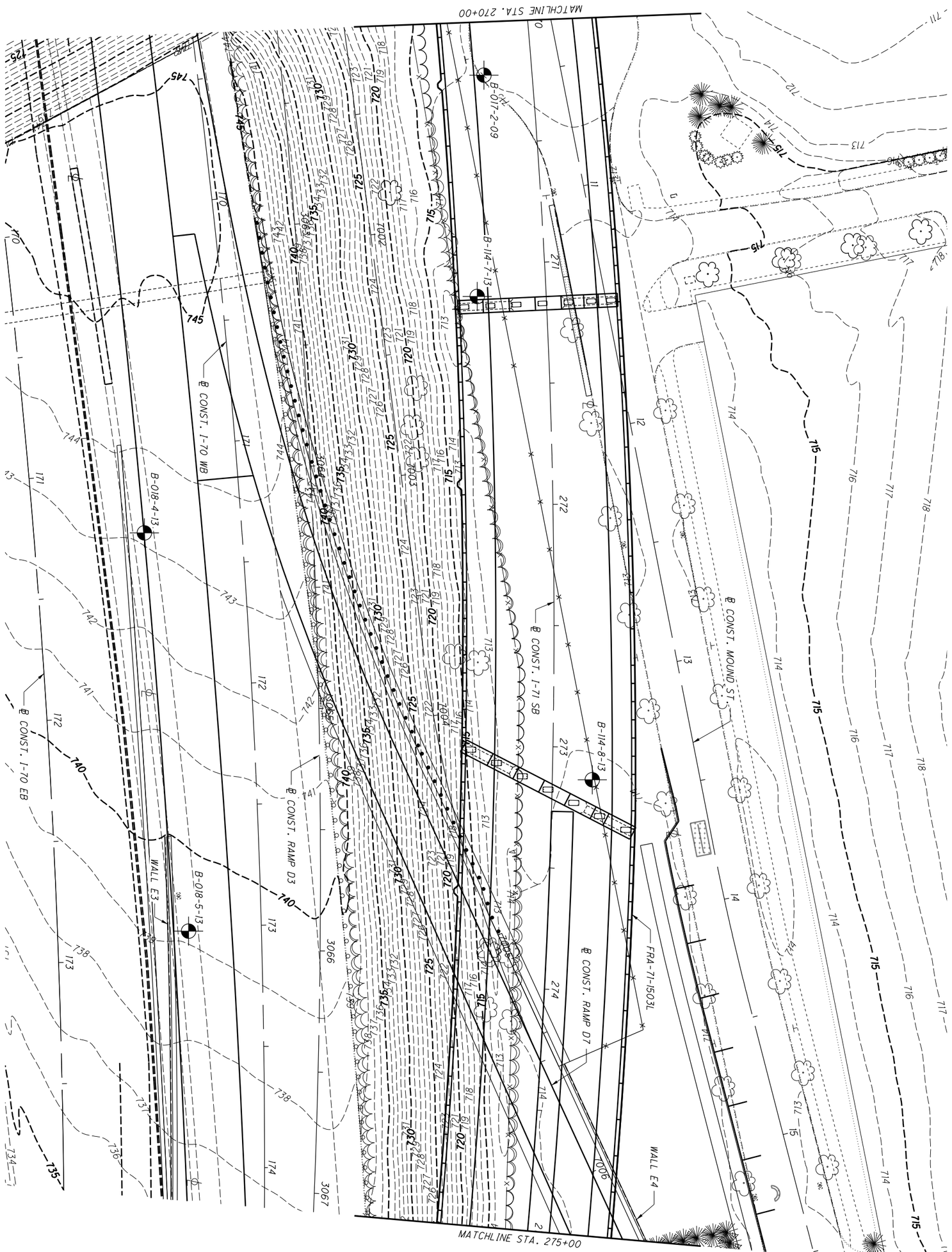
FRA-71-1503L

EX. GROUND

B-114-4-13
41.6' LT.
TOPSOIL = 0.4'

| | | |

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP035.dgn 4/6/2020 4:51:14 PM rachelm



	172/496	**FRA-70-13.10**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER** **STA. 270+00 TO STA. 275+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET

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PR. GRADE | 786.74 | 786.12 | 785.46 | 784.76 | 784.02 | 783.24 | 782.42 | 781.56 | 780.66 | 779.72 | 778.74 | 777.74 | 776.74 | 775.74 | 774.74 | 773.74 | 772.74 | 771.74 | 770.74 | 769.74 | 768.74 | PR. GRADE

PR. GRADE

FRA-71-1503L

PR. GROUND

EX. GROUND

B-017-2-09
19.8' RT.
ASPHALT = 0.2'
CONCRETE = 0.8'
BASE = 0.3'

8	10	
13	12	
8	14	
5	21	●
10	18	●
5	19	⊖
W-4		▼
21		
83		
66	8	
80		
69		
27	28	
33	25	
24	24	
79	16	
50	18	
N_{60}	WC	

B-114-7-13
28.4' RT.
TOPSOIL = 0.2'

51	12	
21	11	
11	22	
18	25	
25	24	
8	14	
W	7	
W-30		
22	12	
21	11	
30	14	
39	8	
41/50/4"	8	
55	8	
21	14	
41	20	
30	19	
21/32/50/3"	14	
31/50/5"	15	
21/21/50/5"	17	
TR		
18/24/50/3"	12	
N_{60}	WC	

B-114-8-13
16.5' LT.
TOPSOIL = 0.3'

21	14	
21	17	
4	24	
17	21	
9	22	
10	22	
W-34	10	
W-19	11	
31	16	
44	9	
14	30	⊖
71	12	
50/5"	3	
18	21	
18	14	18
30	18	
6/42/50/5"	12	
10/49/50/3"	15	
TR		
37/50/4"	15	
N_{60}	WC	

790 | 780 | 770 | 760 | 750 | 740 | 730 | 720 | 710 | 700 | 690 | 680 | 670 | 660 | 650 | 640 | 630 | 620

EX. GROUND | 713.95 | 713.87 | 713.73 | 713.58 | 713.27 | 713.51 | 713.69 | 713.71 | 713.87 | 713.99 | 714.02 | 714.29 | 714.26 | 714.18 | 713.91 | 713.88 | 713.62 | 713.94 | 713.89 | 714.58 | 714.65 | EX. GROUND

270+00 | 271+00 | 272+00 | 273+00 | 274+00 | 275+00

PROFILE ALONG ℄ CONST. I-71 SB

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER
STA. 270+00 TO STA. 275+00

FRA-70-13.10

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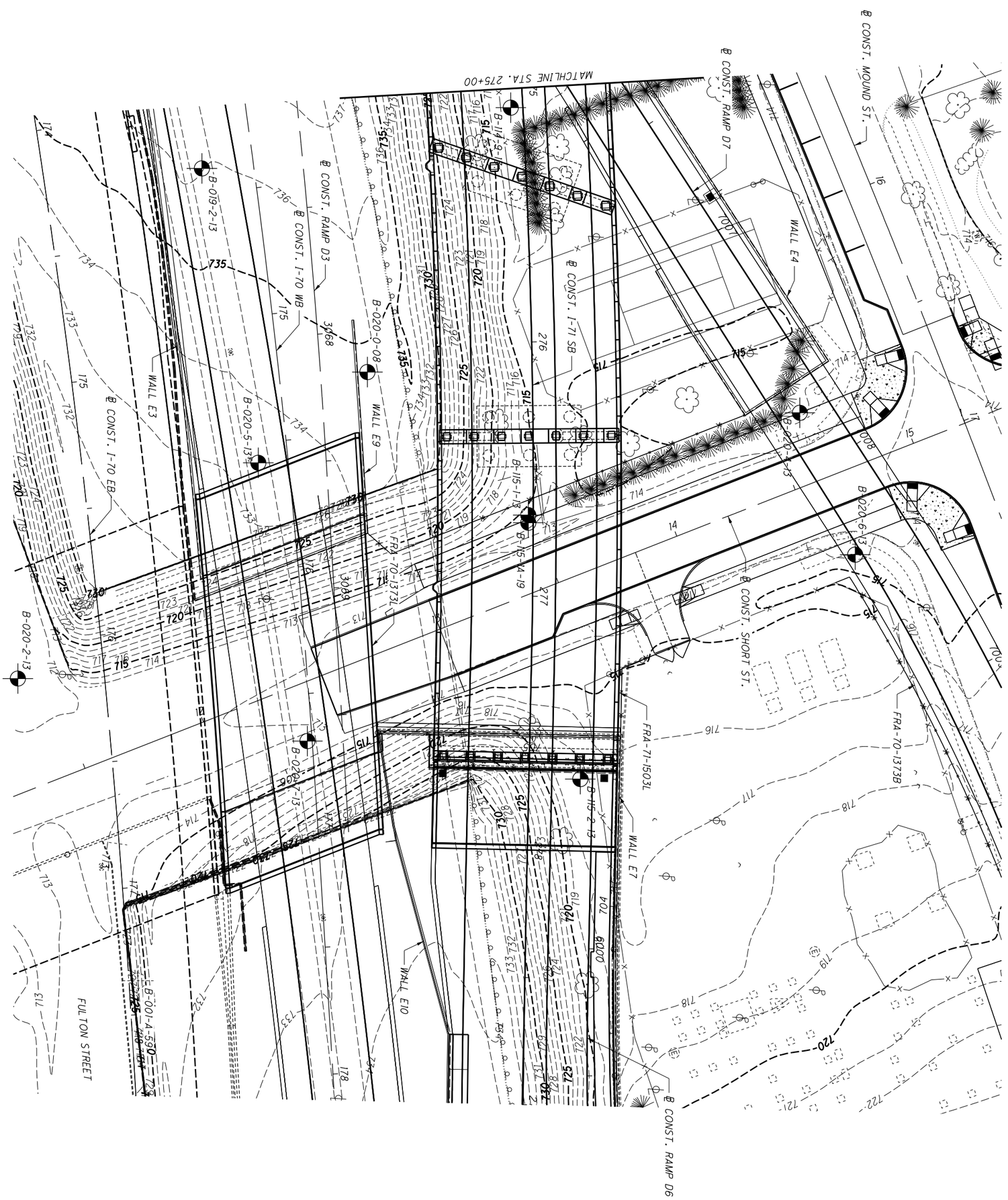
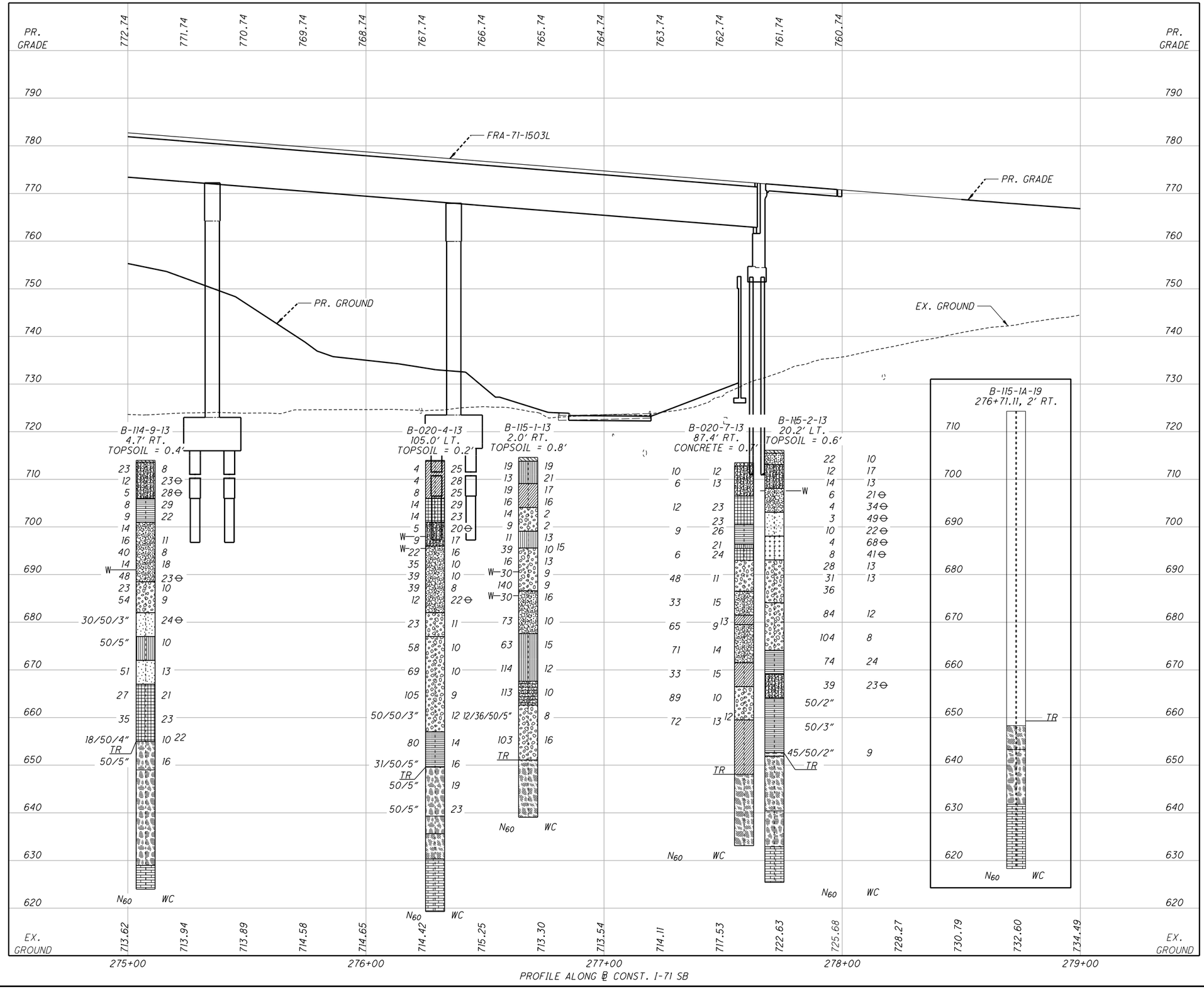


	174/496	**FRA-70-13.10**	**STRUCTURE FOUNDATION EXPLORATION** **FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER** **STA. 275+00 TO STA. 279+00**	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



PROFILE ALONG ℄ CONST. I-71 SB

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-71-1503L I-71 SB OVER SR 315 & SCIOTO RIVER
STA. 275+00 TO STA. 279+00

FRA-70-13.10

175/496

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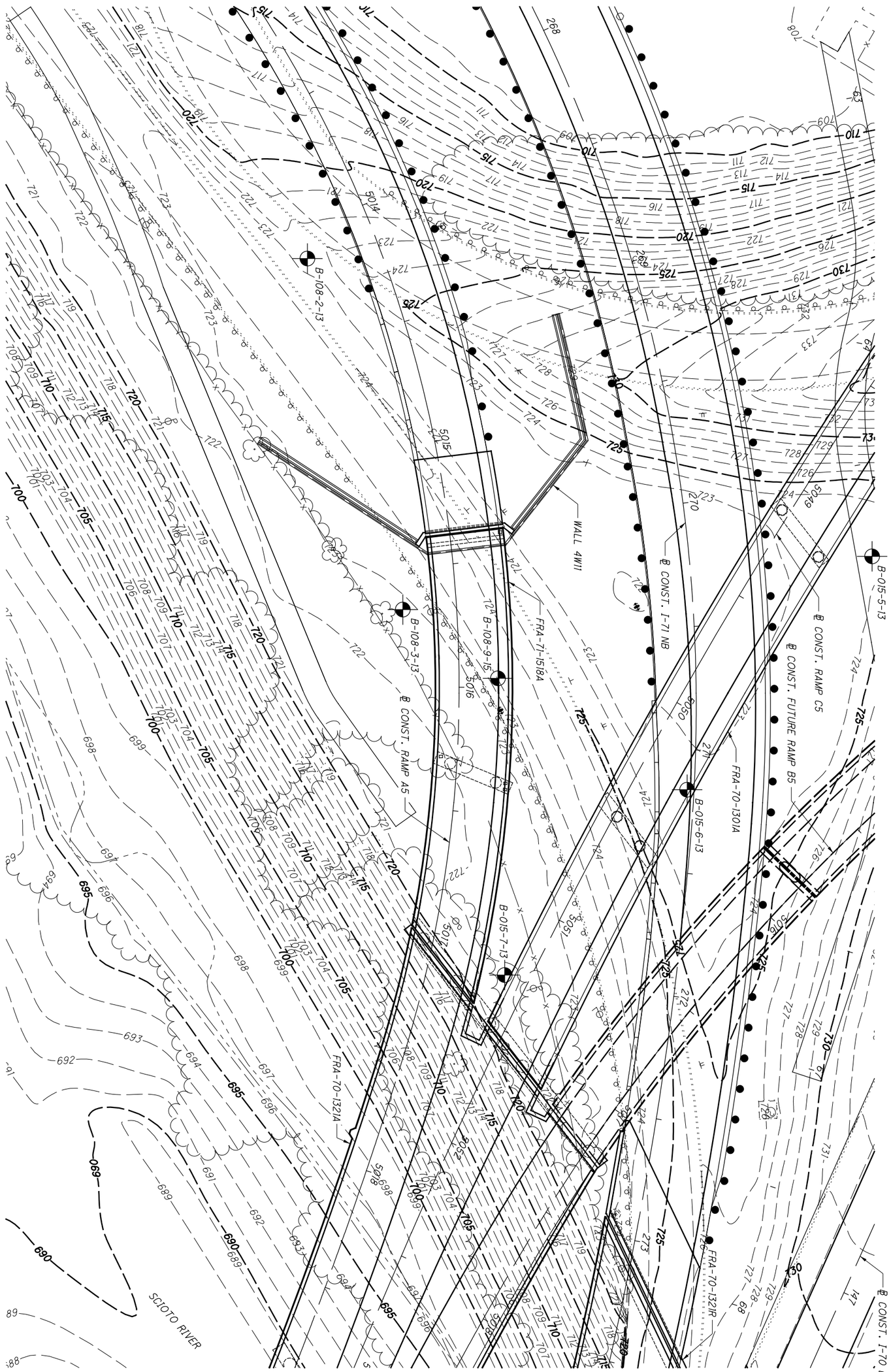
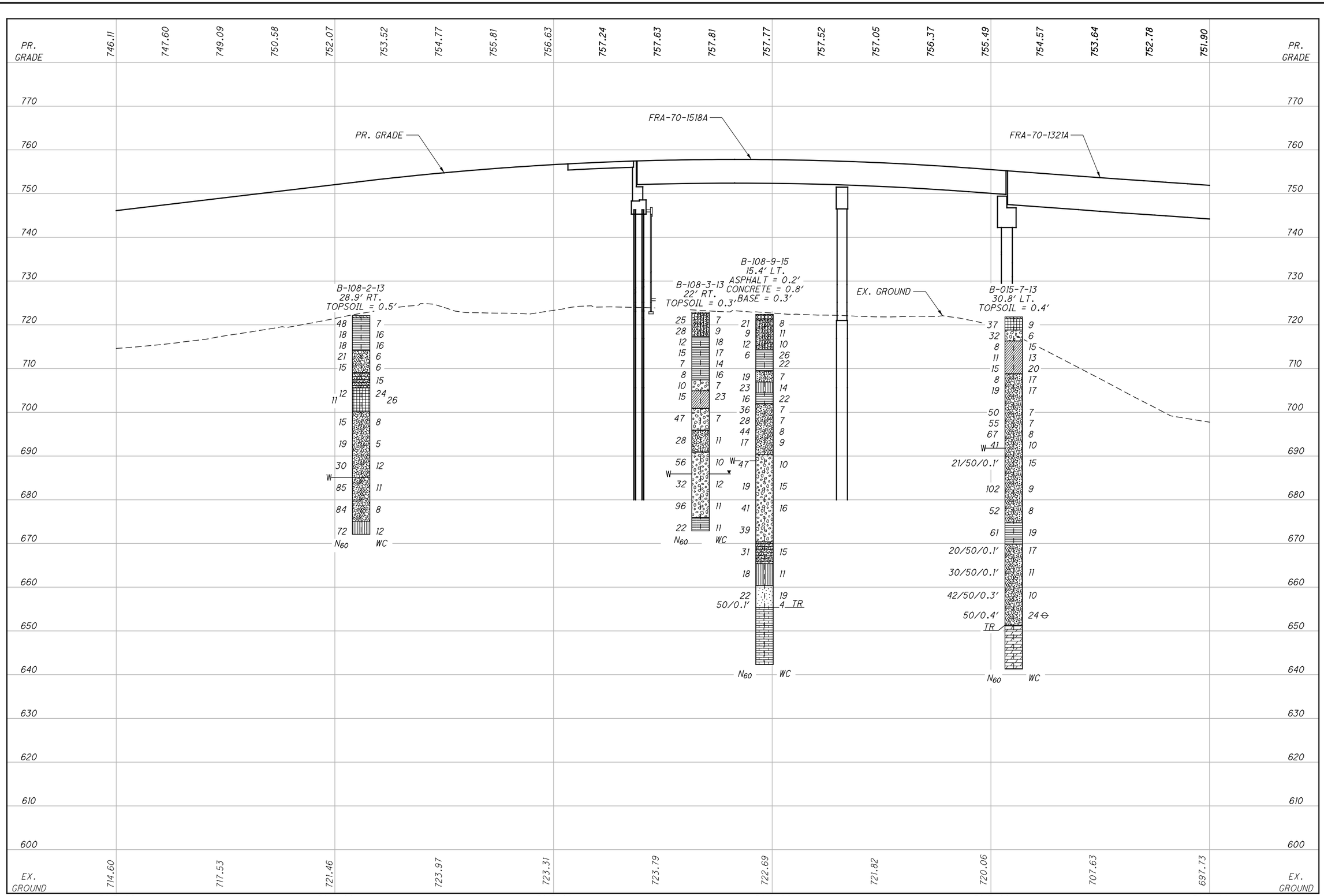


	176/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION FRA-71-1518A RAMP A5 OVER THE SCIOTO RIVER	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



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HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
FRA-71-1518A RAMP A5 OVER THE SCIOTO RIVER

FRA-70-12.68

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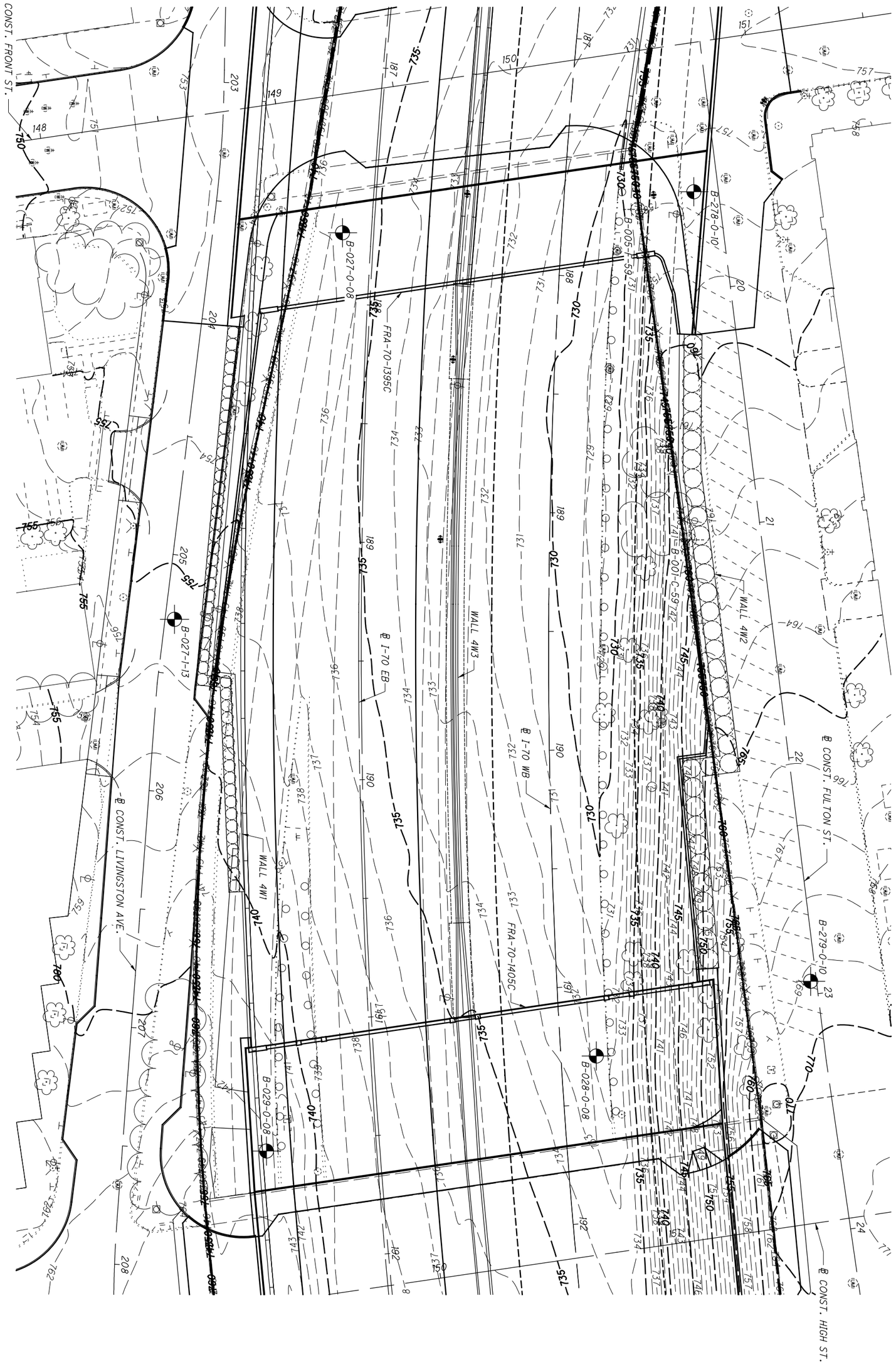
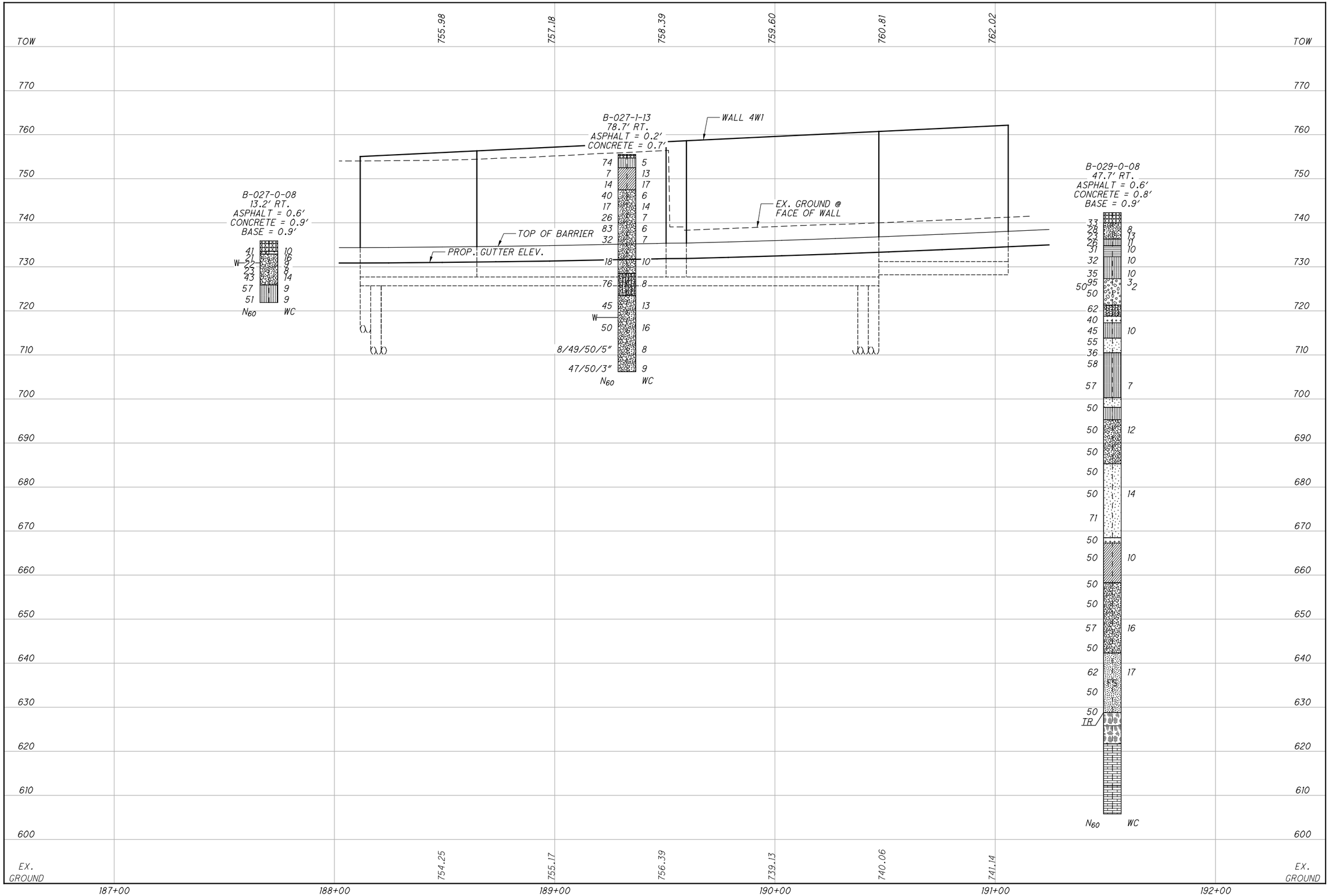


	178/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W1	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



PROFILE ALONG ℄ I-70 EB

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

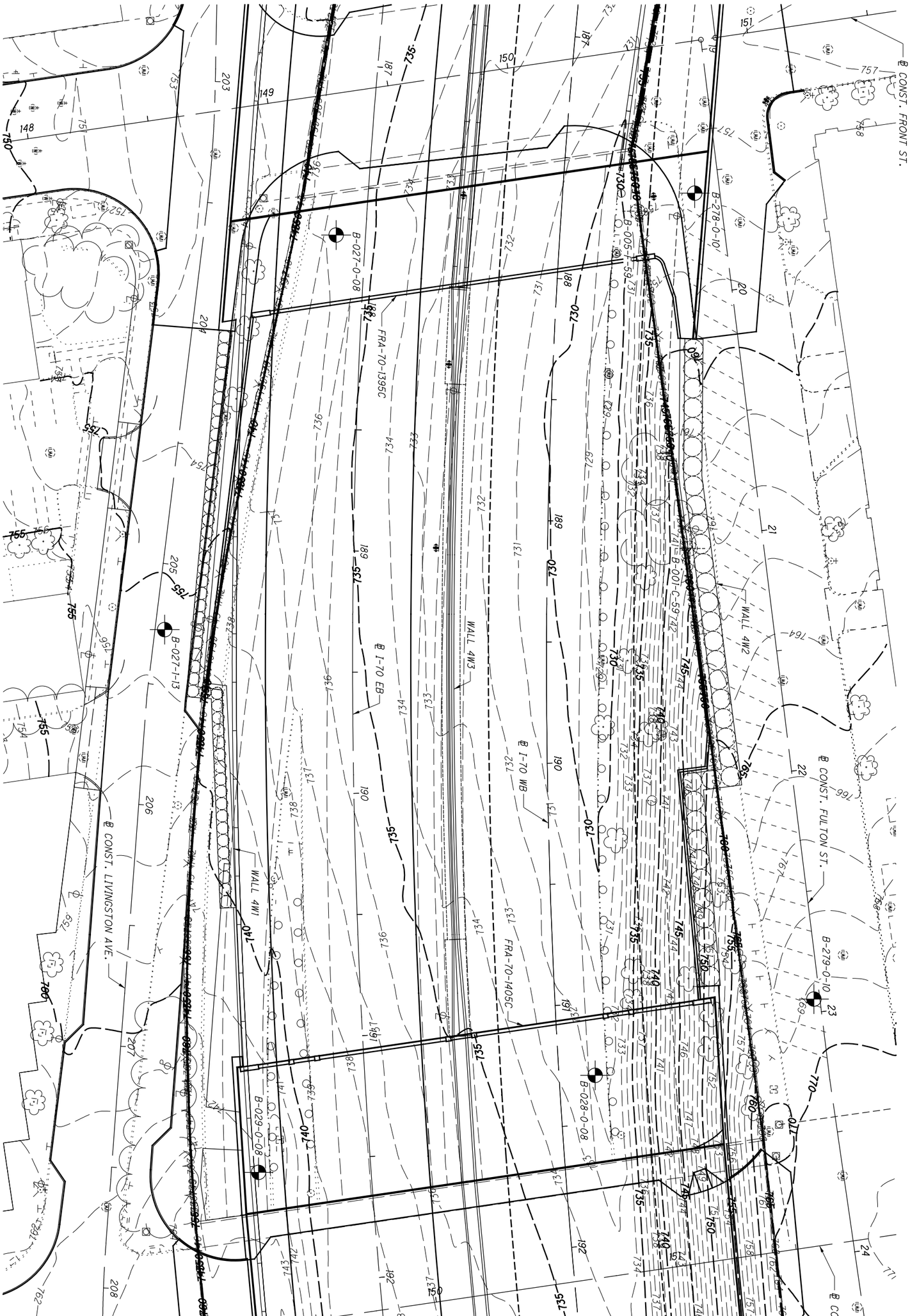
STRUCTURE FOUNDATION EXPLORATION
WALL 4W1

FRA-70-12.68

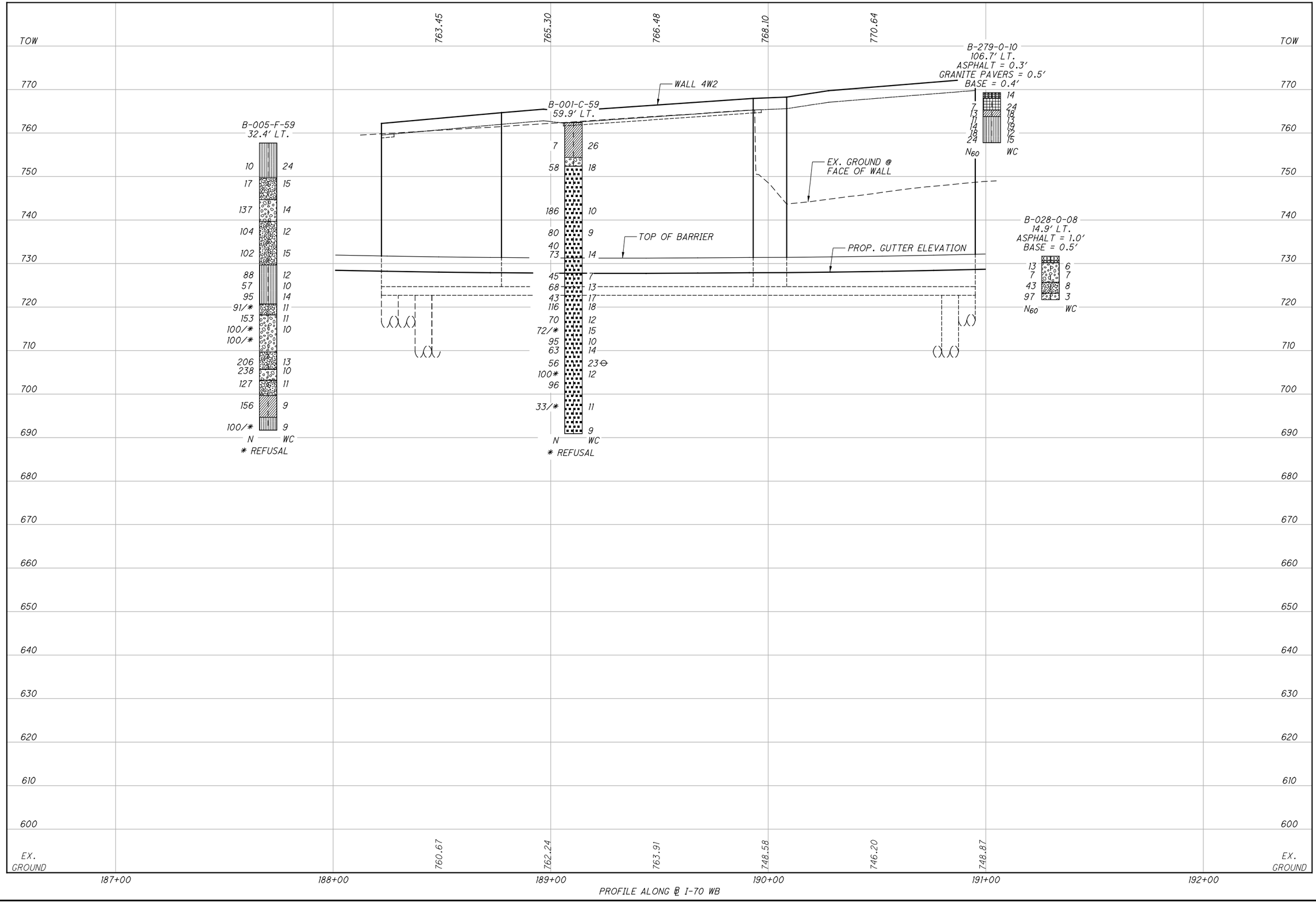
179/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP038.dgn 1/30/2019 6:10:43 PM rachelm

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP039.dgn 12/27/2018 10:19:58 AM rachelm



	180/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W2	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP040.dgn 1/31/2019 10:26:25 AM rachelm

0 10 20 40
HORIZONTAL
SCALE IN FEET

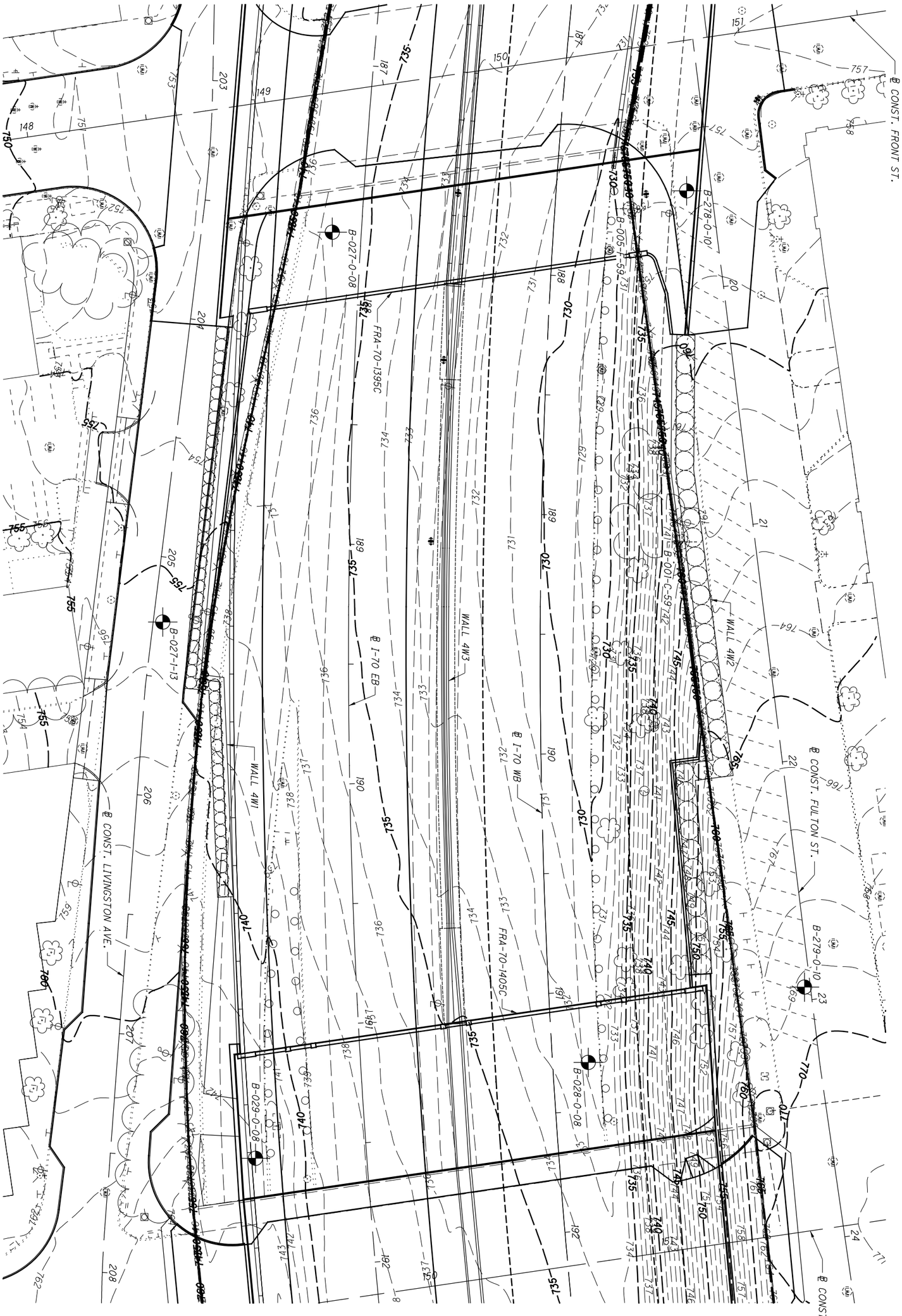
DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL 4W2

FRA-70-12.68

181/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP041.dgn 12/27/2018 10:20:00 AM rachelm



	182/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W3	DRAWN RRM CHECKED BRT	0 10 20 40 HORIZONTAL SCALE IN FEET

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP042.dgn 1/31/2019 10:39:57 AM rachelm

TOW 770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610 600 EX. GROUND

737.59 737.45 737.54 737.83 738.23 738.71 739.66

187+00 188+00 189+00 190+00 191+00 192+00

732.28 732.19 732.36 732.77 733.33 734.08 734.99

PROFILE ALONG ℄ I-70 EB

B-005-F-59
110.3′ LT.

10	24
17	15
137	14
104	12
102	15
88	12
57	10
95	14
91/*	11
153	11
100/*	10
100/*	
206	13
238	10
127	11
156	9
100/*	9
N	WC

* REFUSAL

B-001-C-59
59.9′ LT.

7	26
58	18
186	10
80	9
40	
73	14
45	7
68	13
43	17
116	18
70	12
72/*	15
95	10
63	14
56	23
100*	12
96	
33/*	11
N	WC

* REFUSAL

WALL 4W3
EX. GROUND
TOE/BARRIER (EB-4A)

B-027-1-13
78.7′ RT.
ASPHALT = 0.2′
CONCRETE = 0.7′

74	5
7	13
14	17
40	6
17	14
26	7
83	6
32	7
18	10
76	8
W 45	13
50	16
8/49/50/5″	8
47/50/3″	9
N_{60}	WC

TOP OF MEDIAN BARRIER
FUTURE TOE/BARRIER (WB-6A)

B-028-0-08
93.6′ LT.
ASPHALT = 1.0′
BASE = 0.5′

13	6
7	7
43	8
97	3
N_{60}	WC

B-029-0-08
47.7′ RT.
ASPHALT = 0.6′
CONCRETE = 0.8′
BASE = 0.9′

33	
28	8
23	13
26	11
31	10
32	10
35	10
95	3
50	2
50	
62	
40	
45	10
55	
36	
58	
57	7
50	
50	12
50	
50	14
71	
50	
50	10
50	
50	
57	16
50	
62	17
50	
50	
IR	
N_{60}	WC

B-027-0-08
13.2′ RT.
ASPHALT = 0.6′
CONCRETE = 0.9′
BASE = 0.9′

41	10
21	6
W 52	6
22	8
43	14
57	9
51	9
N_{60}	WC

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

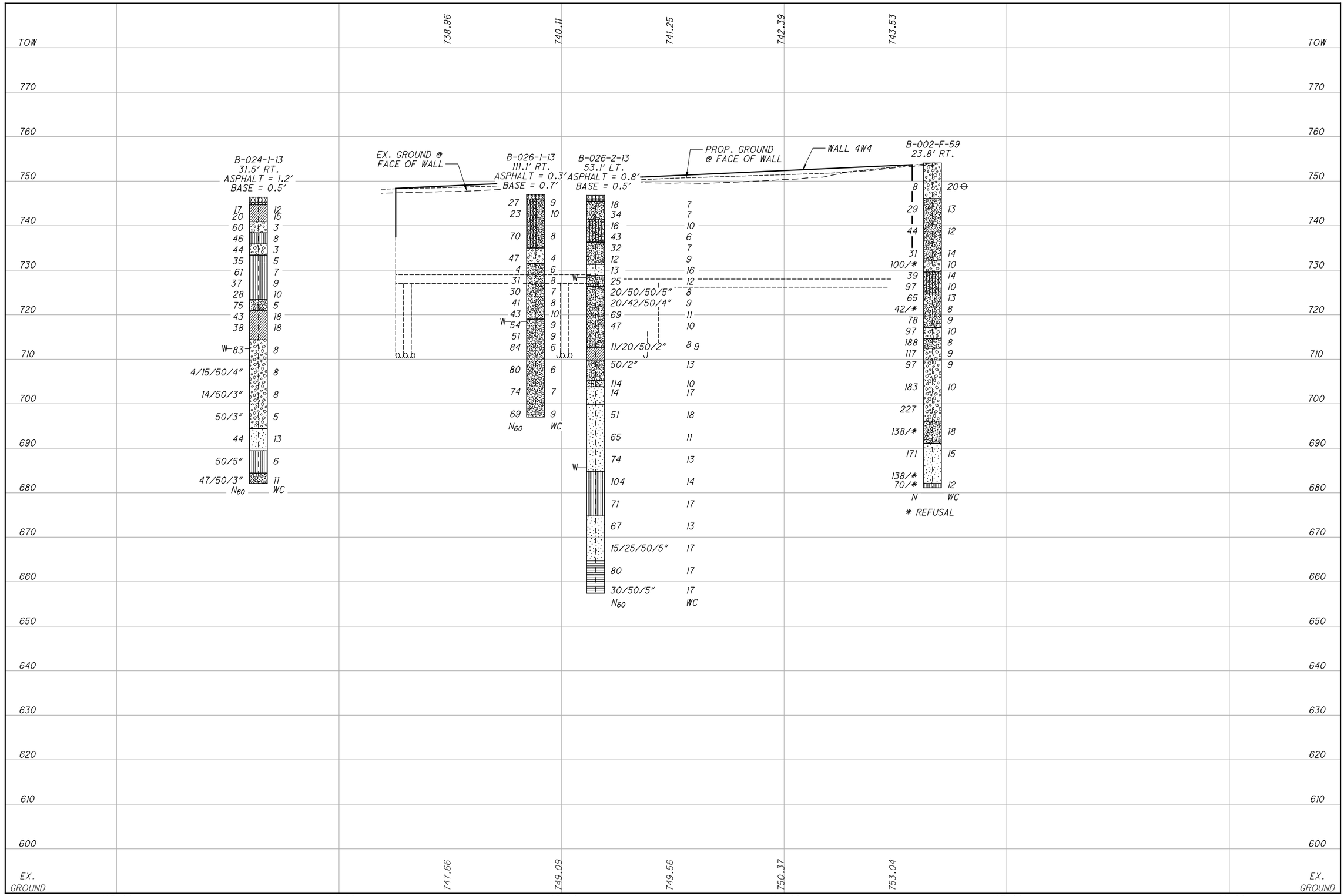
STRUCTURE FOUNDATION EXPLORATION
WALL 4W3

FRA-70-12.68

183 496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP043.dgn 12/27/2018 10:20:03 AM rachelm

	184/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W4	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL 4W4

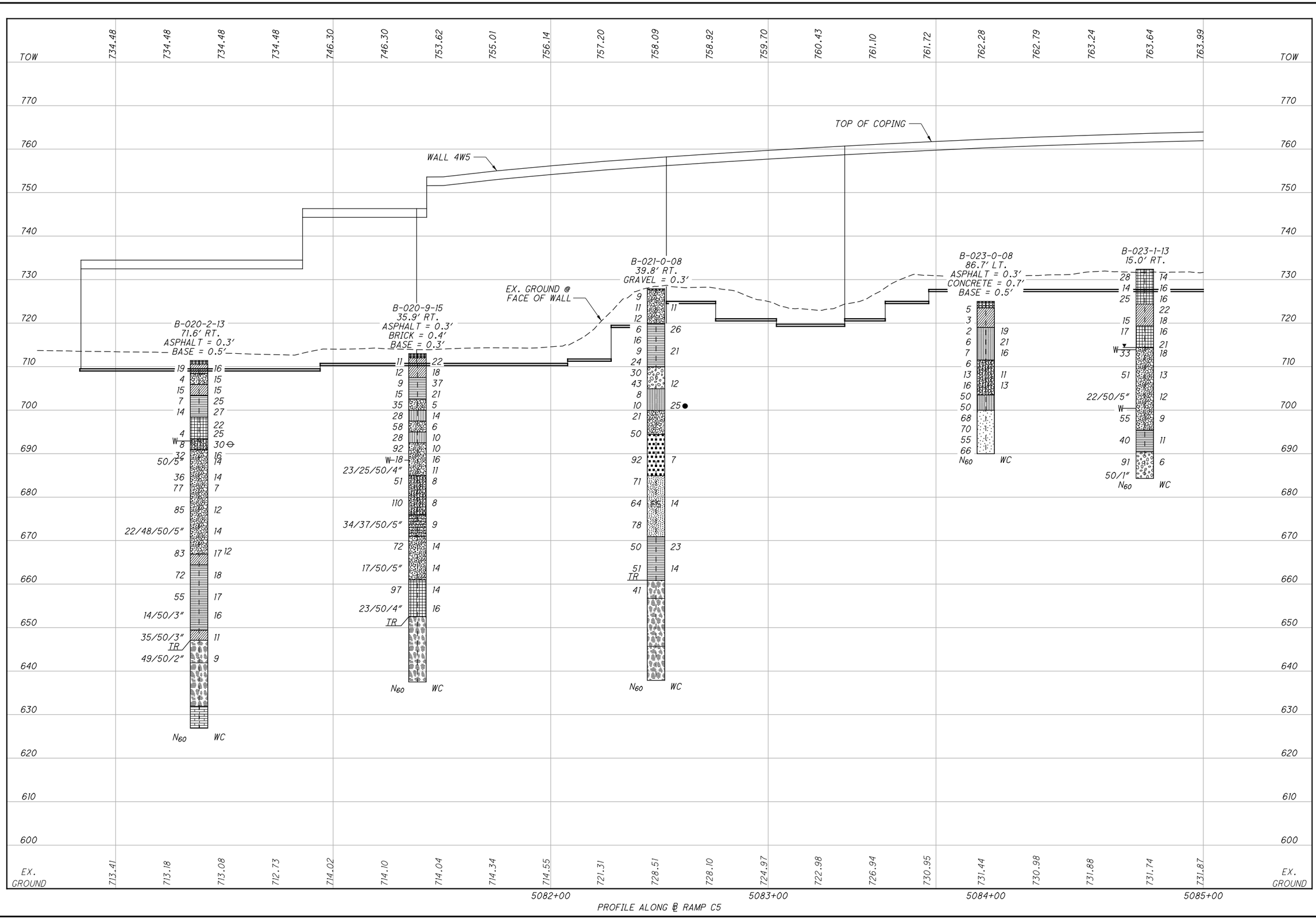
FRA-70-12.68

185/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP044.dgn 12/27/2018 10:20:03 AM rachelm

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP045.dgn 12/27/2018 10:20:05 AM rachelm

186/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W5	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N



0 10 20 40
HORIZONTAL SCALE IN FEET

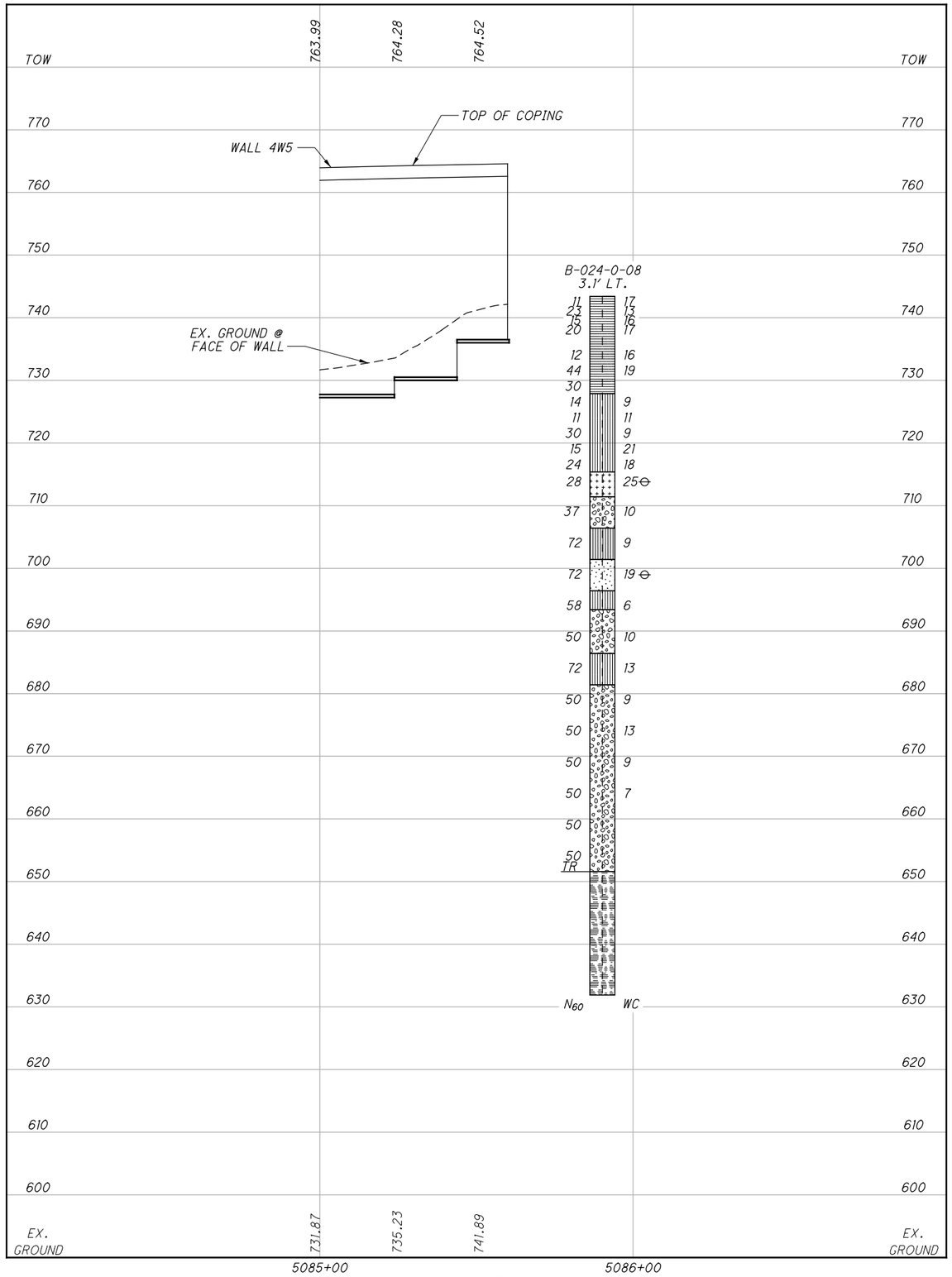
DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL 4W5
C5 STA. 5082+00 TO STA. 5085+00
RAMP C5

FRA-70-12.68

187 / 496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP046.dgn 1/31/2019 8:59:25 AM rachelm



PROFILE ALONG ℄ RAMP C5

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL 4W5
STA. 5085+00 TO STA. 5086+00

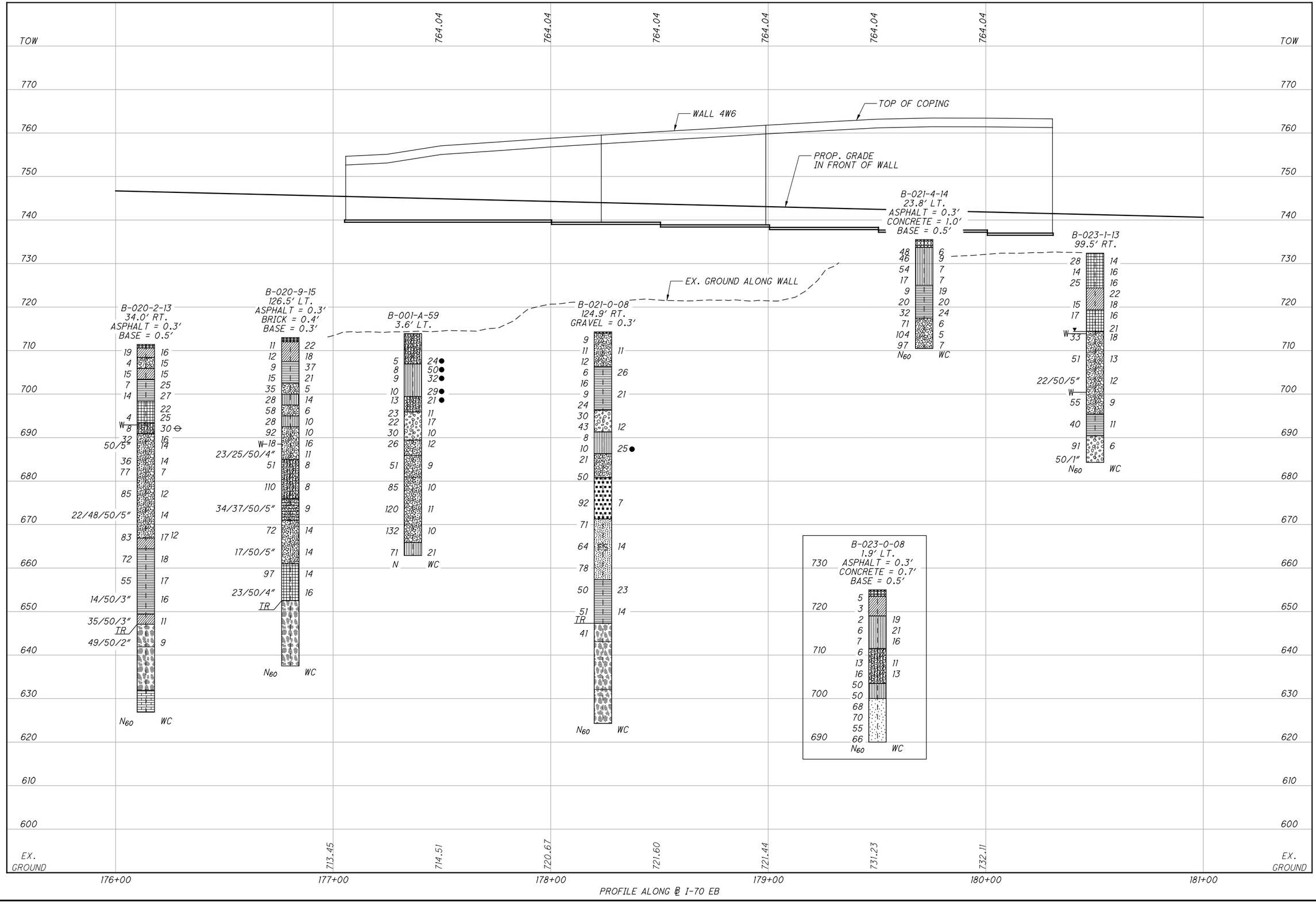
FRA-70-12.68

188/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP047.dgn 12/27/2018 10:20:06 AM rachelm

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP049.dgn 12/27/2018 10:20:07 AM rachelm

	189/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W6	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



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HORIZONTAL SCALE IN FEET
0 10 20 40

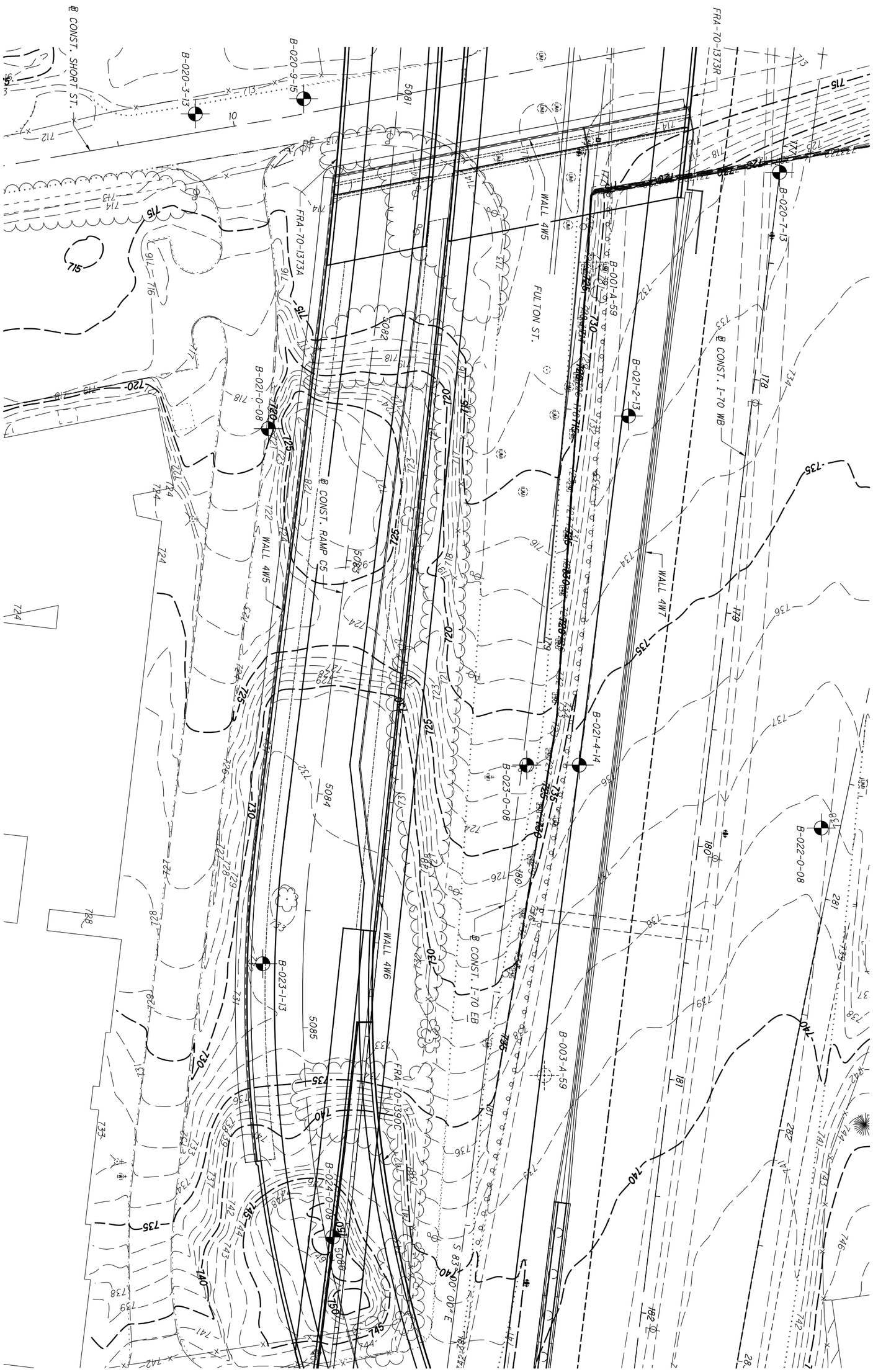
DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL 4W6

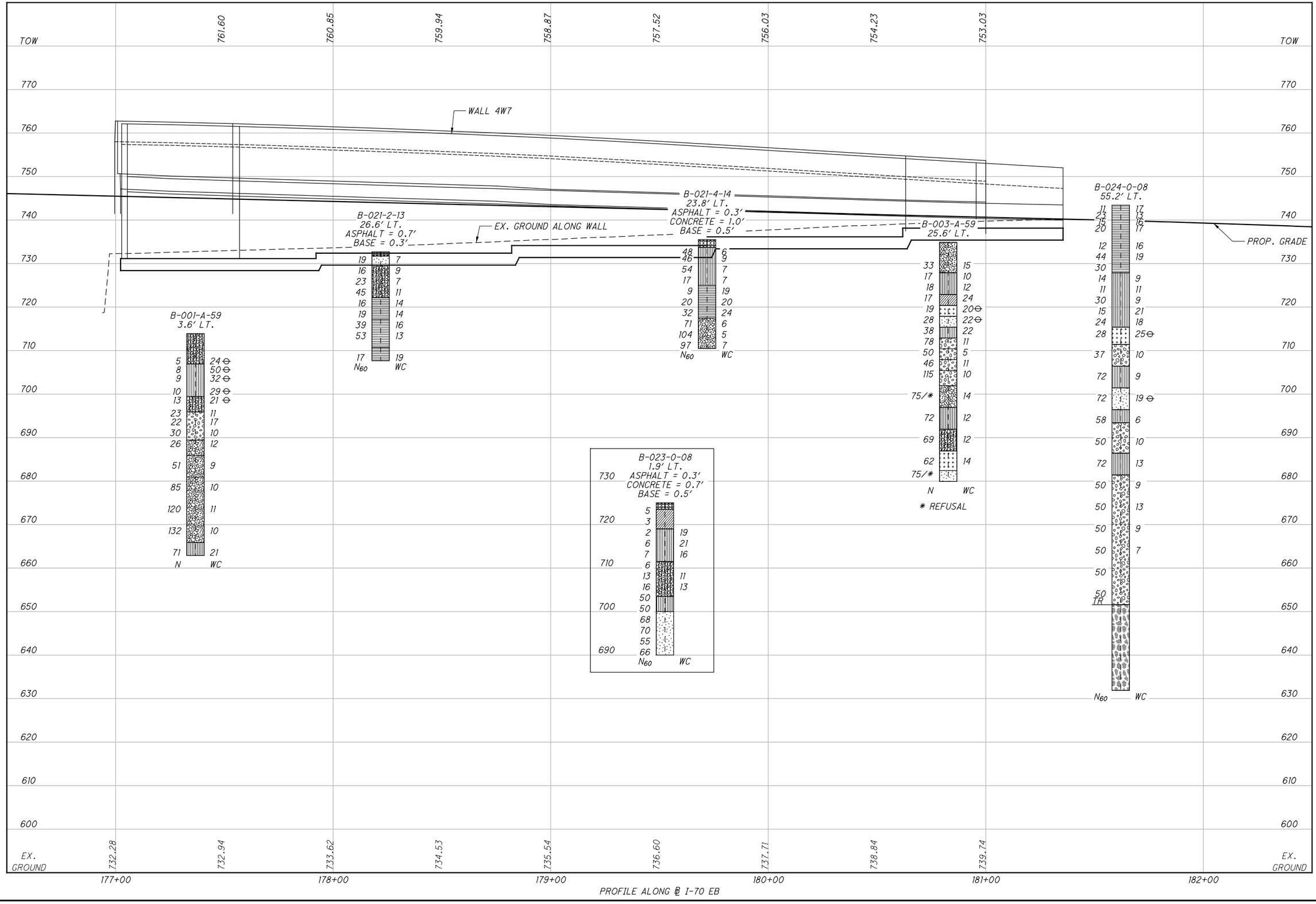
FRA-70-12.68

190/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP051.dgn 12/27/2018 10:21:44 AM rachelm



	191/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W7	DRAWN RRM CHECKED BRT	0 10 20 40 HORIZONTAL SCALE IN FEET



0 10 20 40
HORIZONTAL SCALE IN FEET

DRAWN RRM
CHECKED BRT

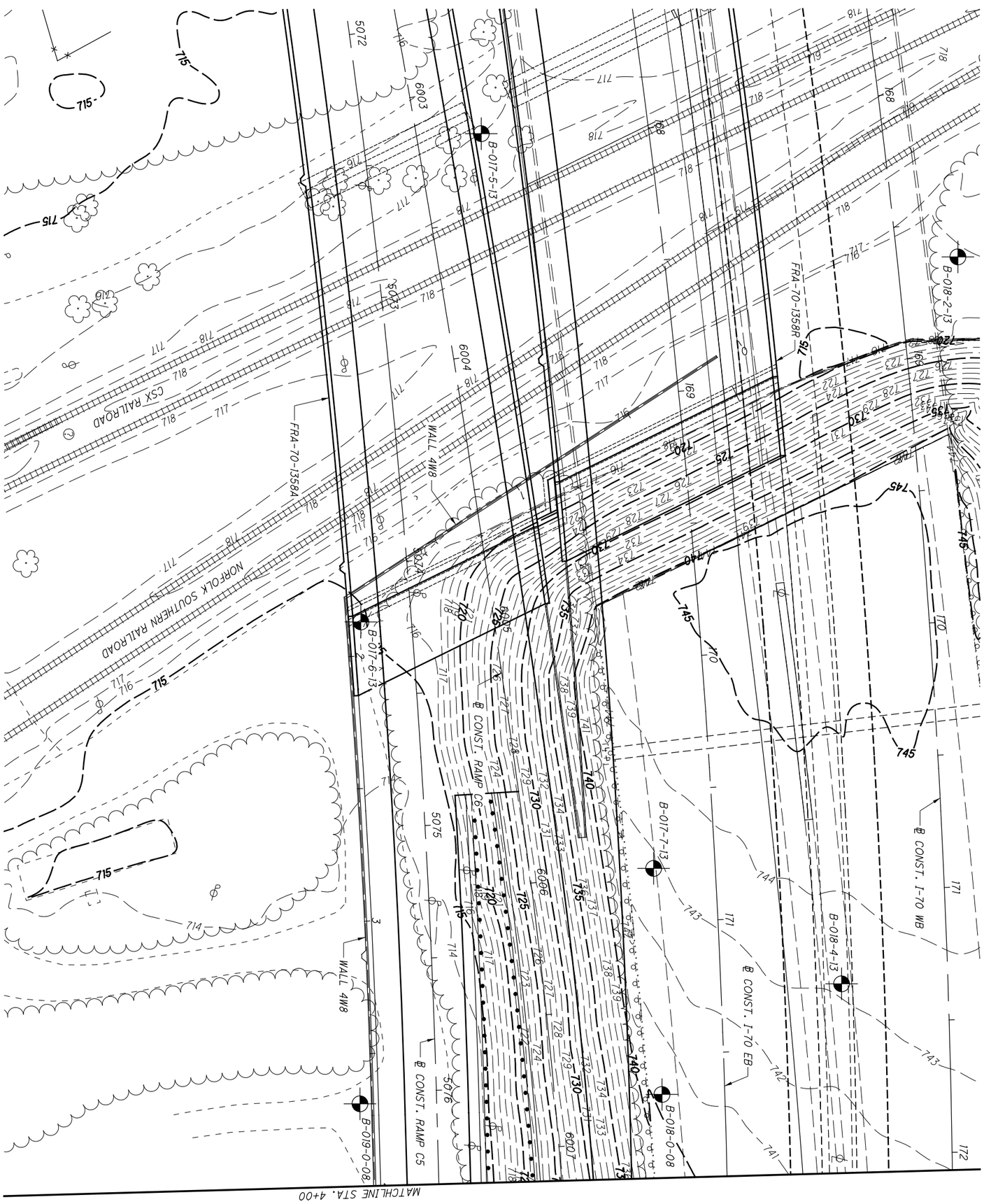
STRUCTURE FOUNDATION EXPLORATION
WALL 4W7

FRA-70-12.68

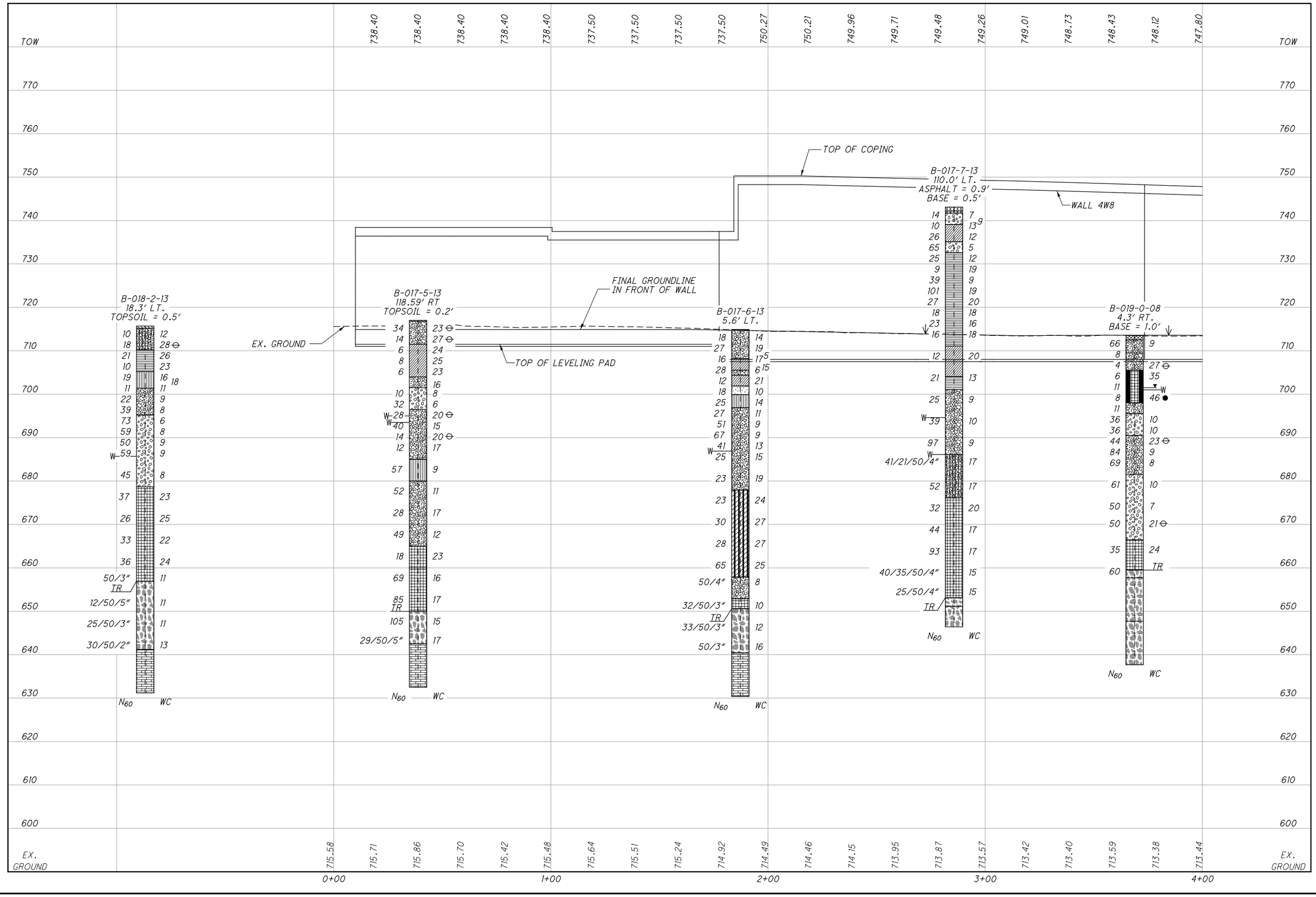
192/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP052.dgn 12/27/2018 10:21:45 AM rachelm

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP053.dgn 12/27/2018 10:21:46 AM rachelm



193/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W8 STA. 0+00 TO STA. 4+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N



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HORIZONTAL SCALE IN FEET
0 10 20 40

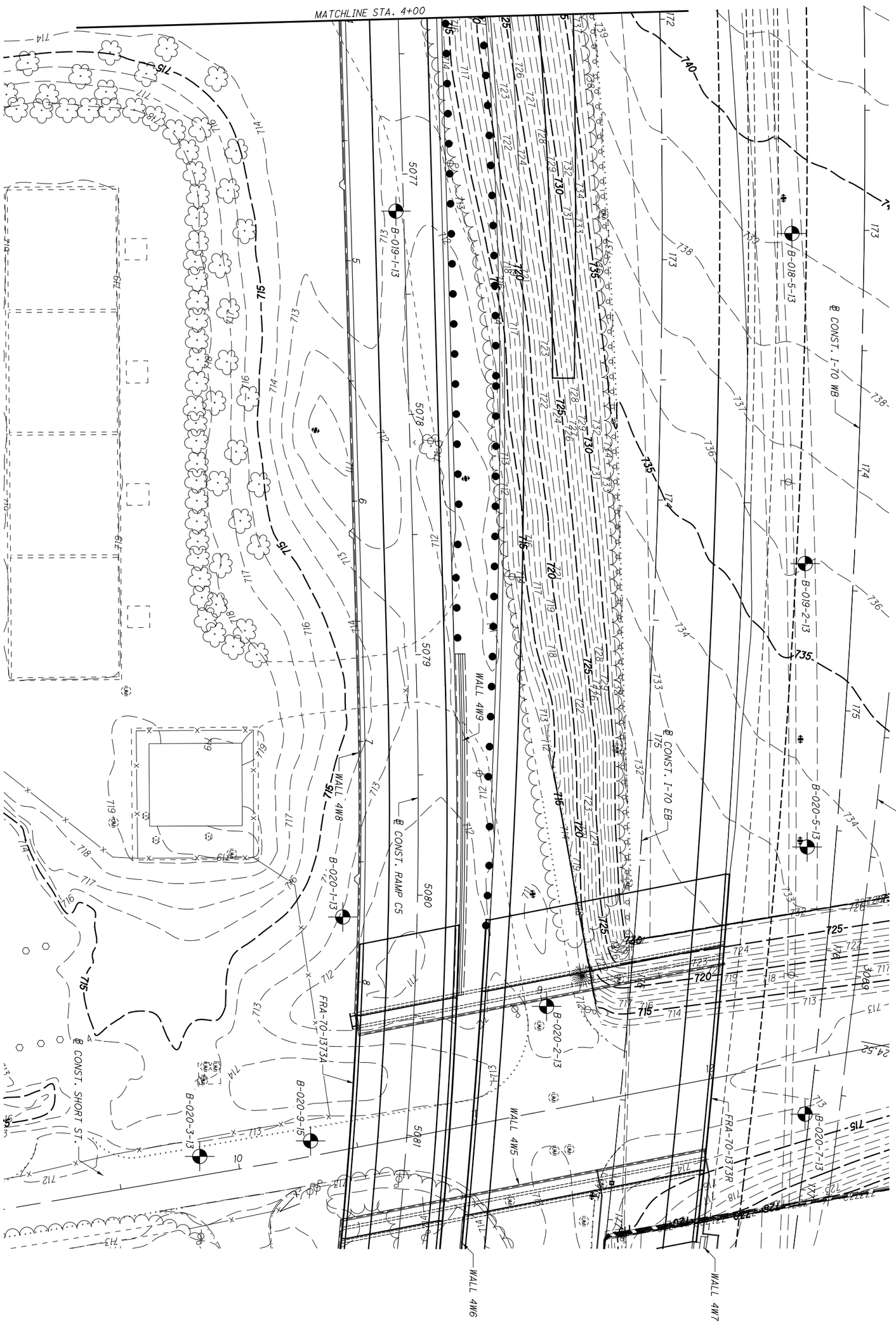
DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL 4W8 STA. 0+00 TO STA. 4+00

FRA-70-12.68

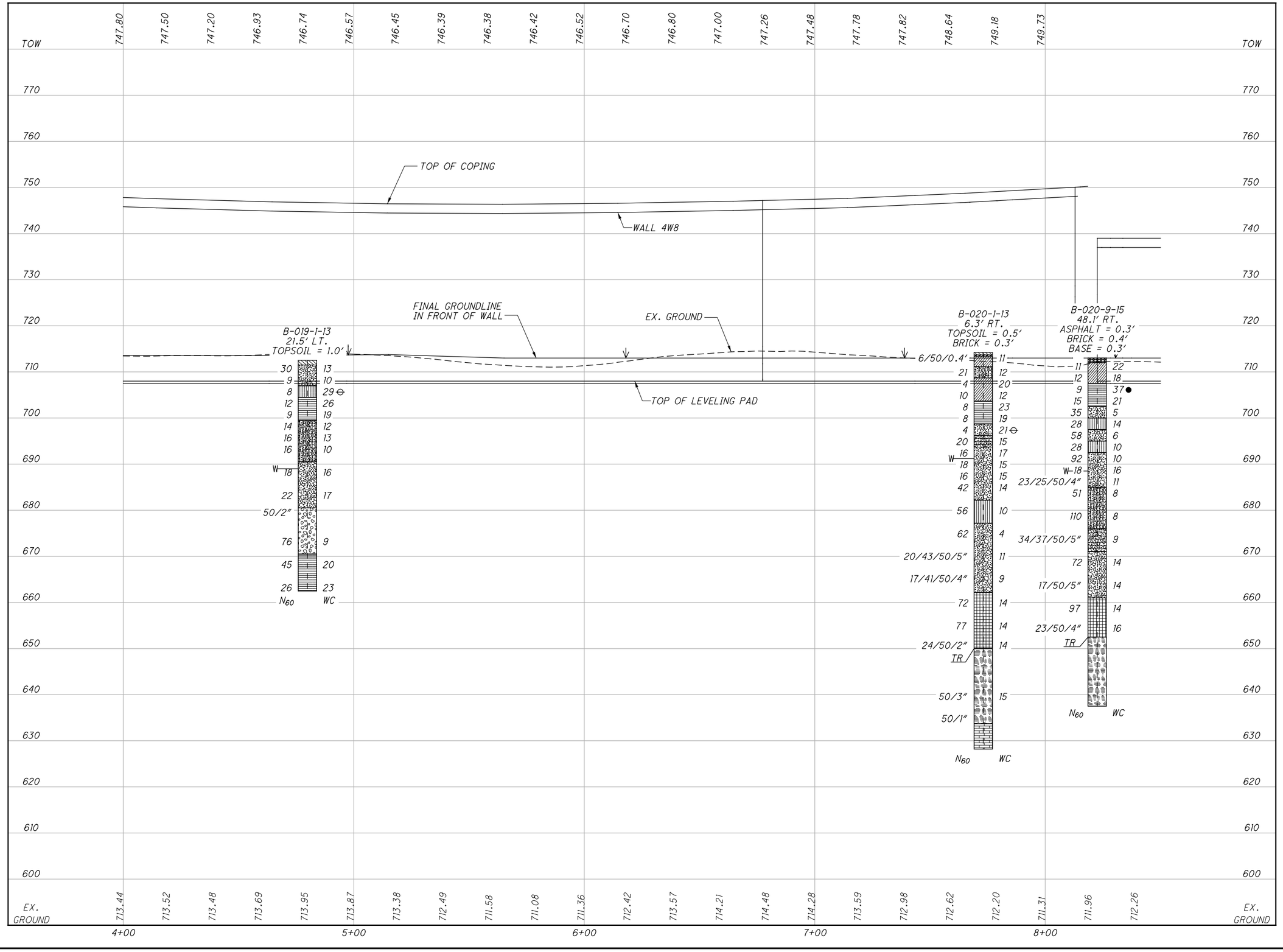
194/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP055.dgn 12/27/2018 10:21:48 AM rachelm



	195/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W8 STA. 6+00 TO STA. 9+27.37	DRAWN RRM CHECKED BRT	0 10 20 40 HORIZONTAL SCALE IN FEET

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP056.dgn 1/30/2019 6:22:09 PM rachelm



0 10 20 40
HORIZONTAL SCALE IN FEET

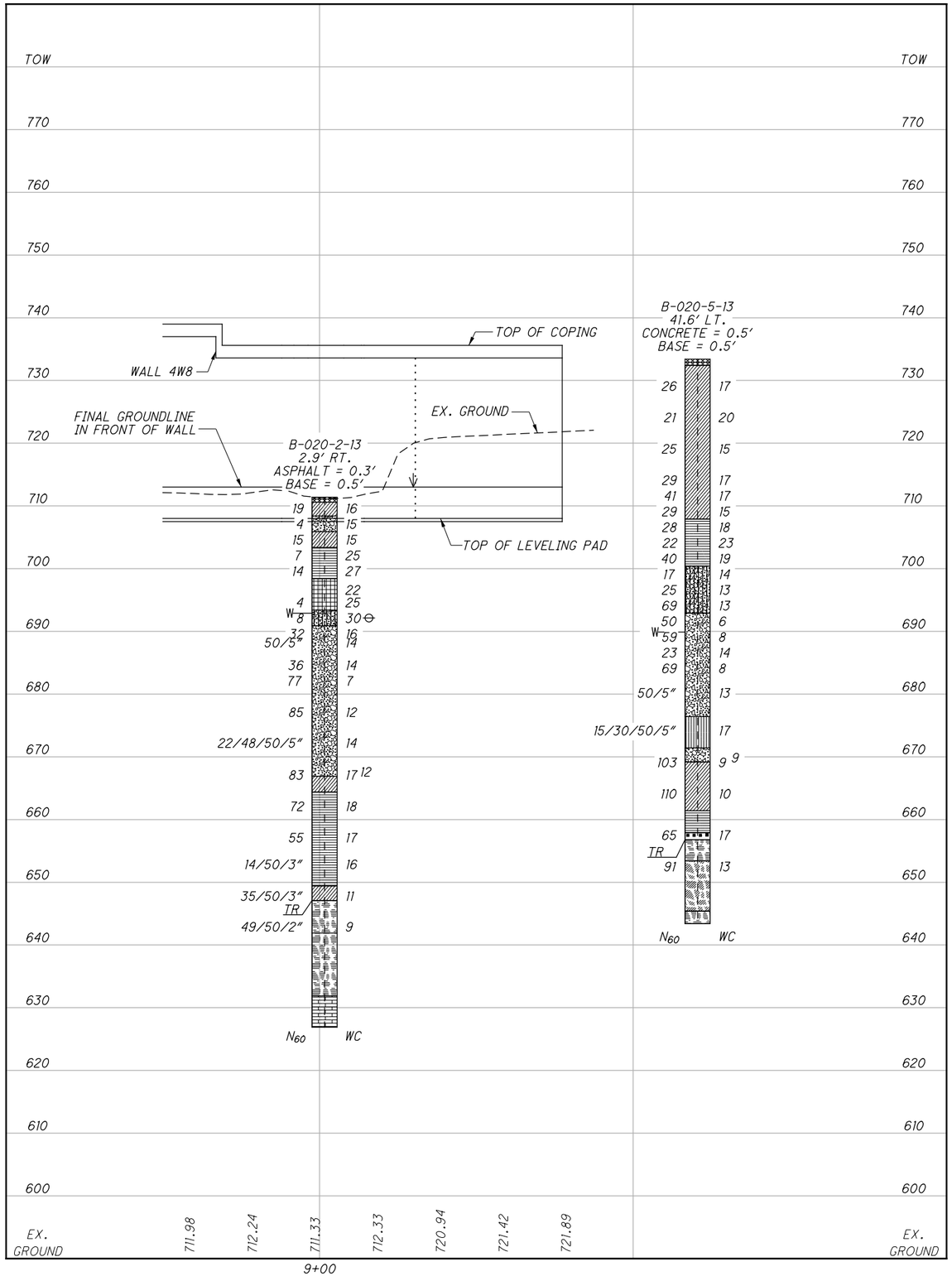
DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL 4W8 STA. 4+00 TO STA. 8+50

FRA-70-12.68

196/496

1



0 10 20 40
HORIZONTAL SCALE IN FEET

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL 4W8 STA. 8+50 TO STA. 9+77.37

FRA-70-12.68

197/496

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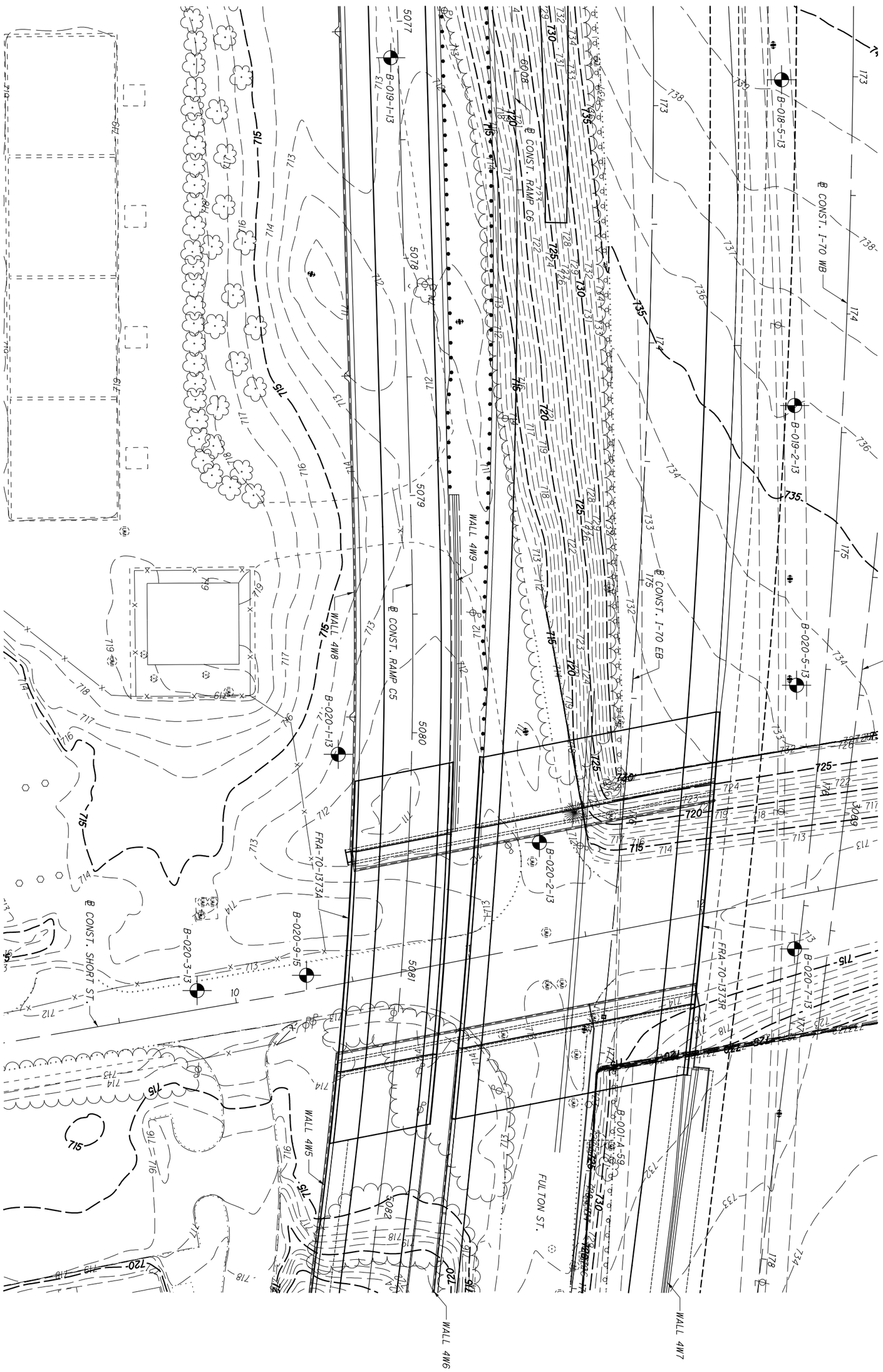
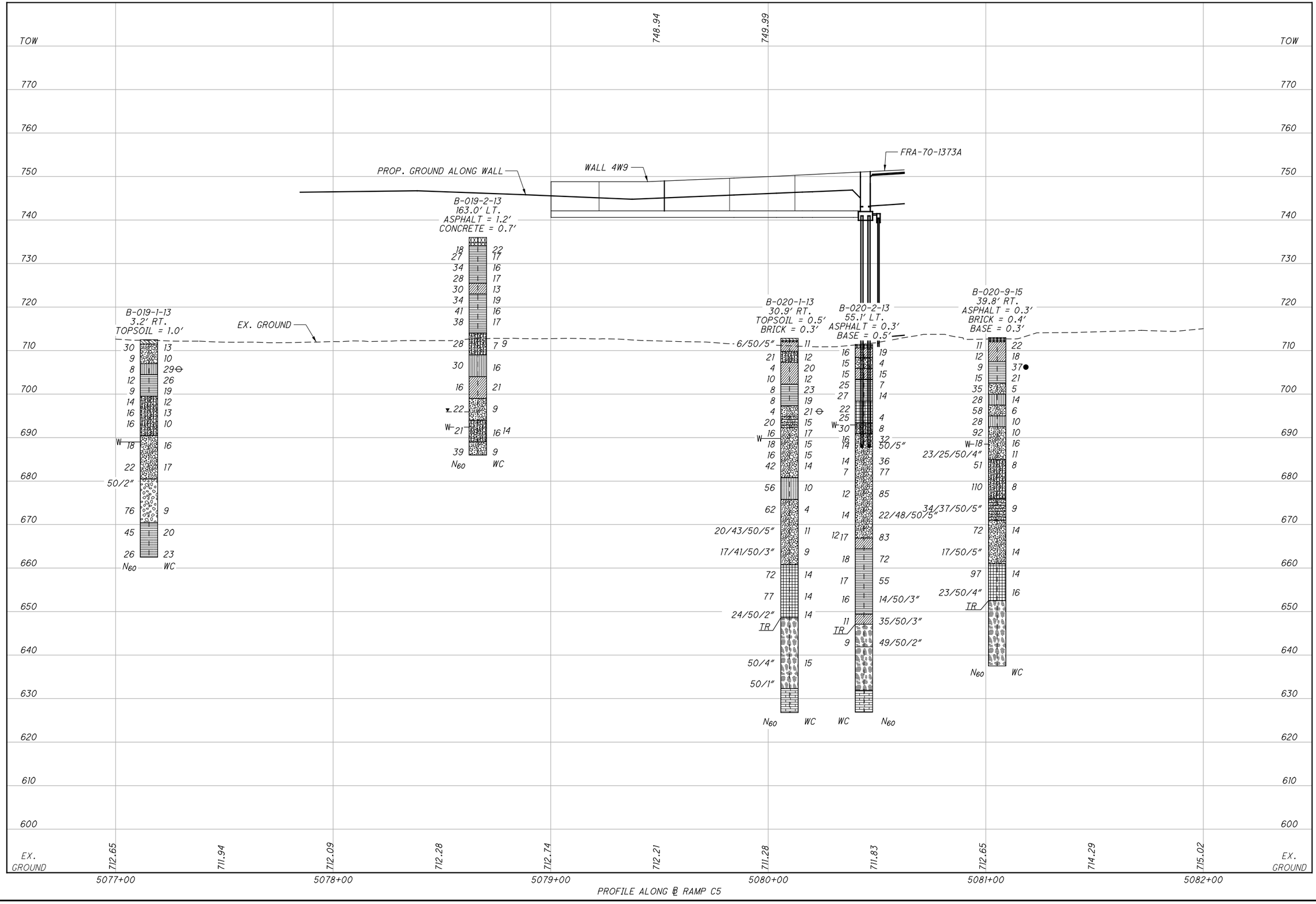


	198/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W9	DRAWN RRM CHECKED BRT	0 10 20 40 HORIZONTAL SCALE IN FEET



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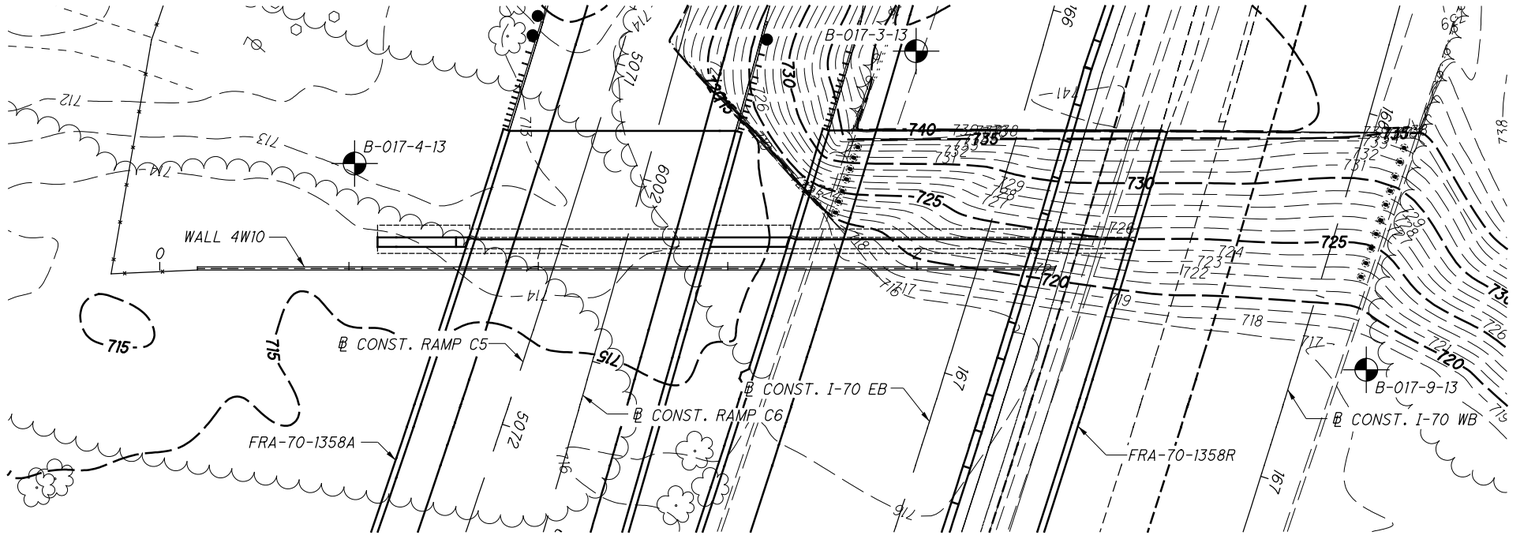
HORIZONTAL SCALE IN FEET
0 10 20 40

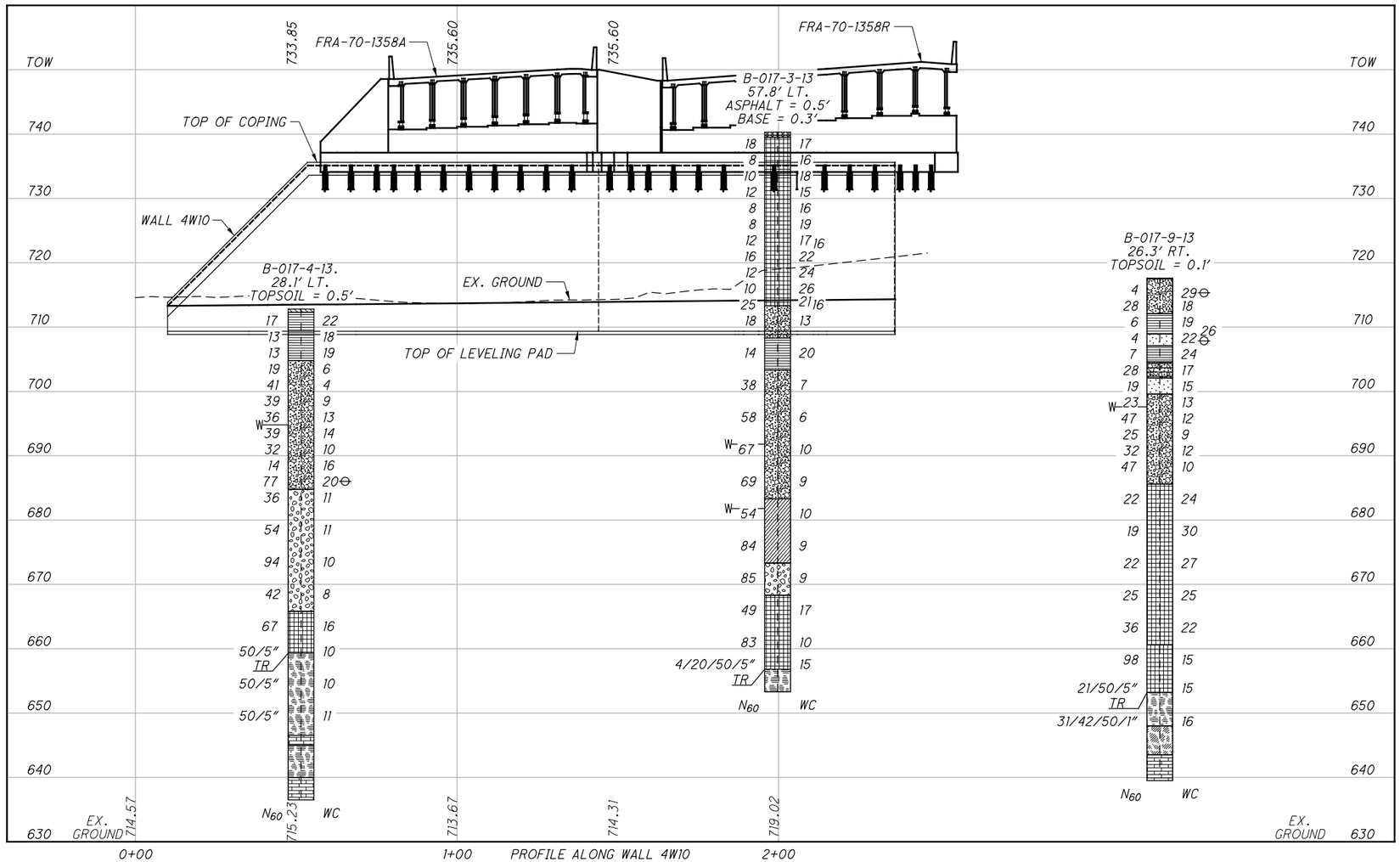
DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL 4W9

FRA-70-12.68

199/496





HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL 4W10

FRA-70-12.68

200496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP059.dgn 1/30/2019 6:29:29 PM rachelm

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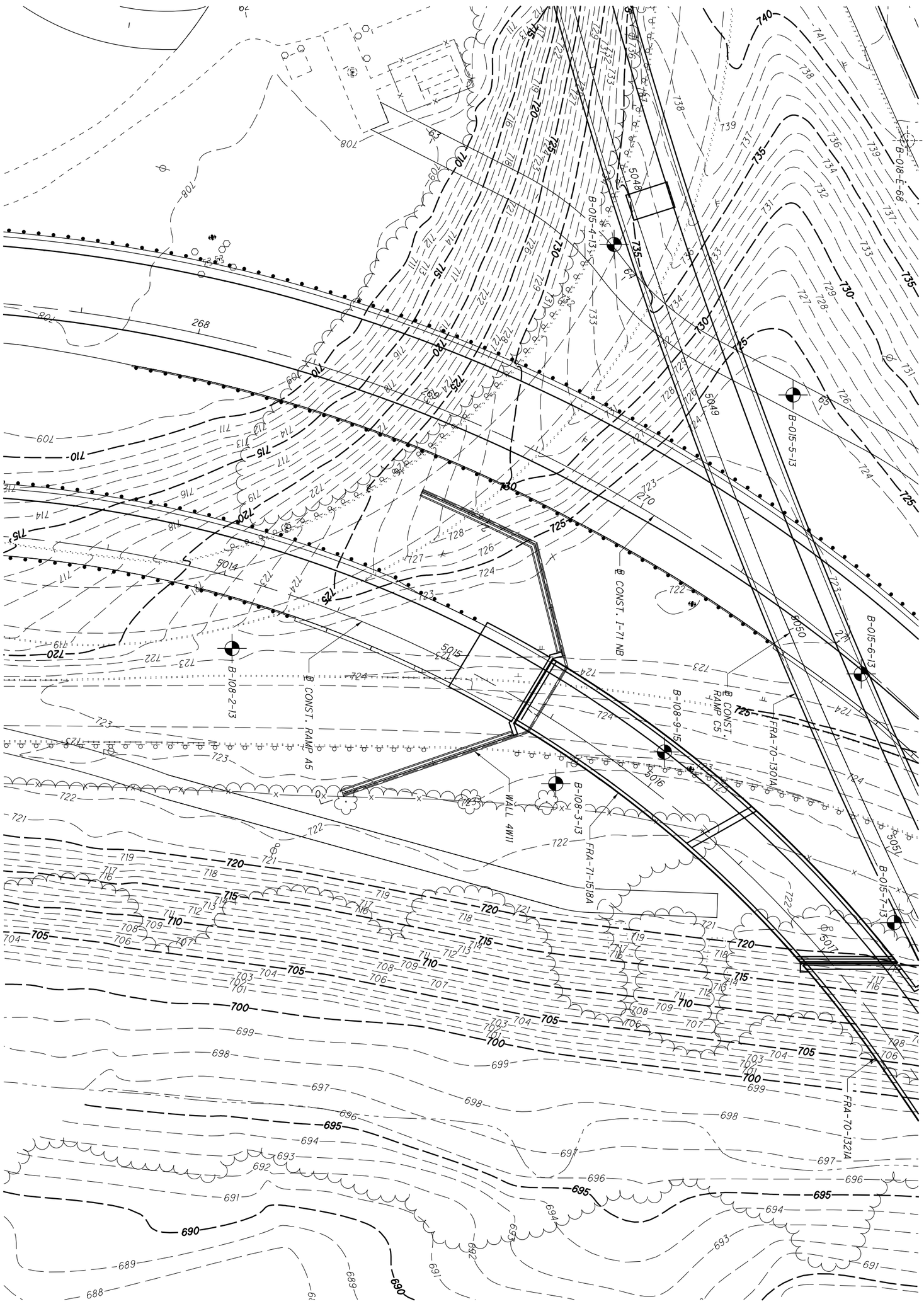
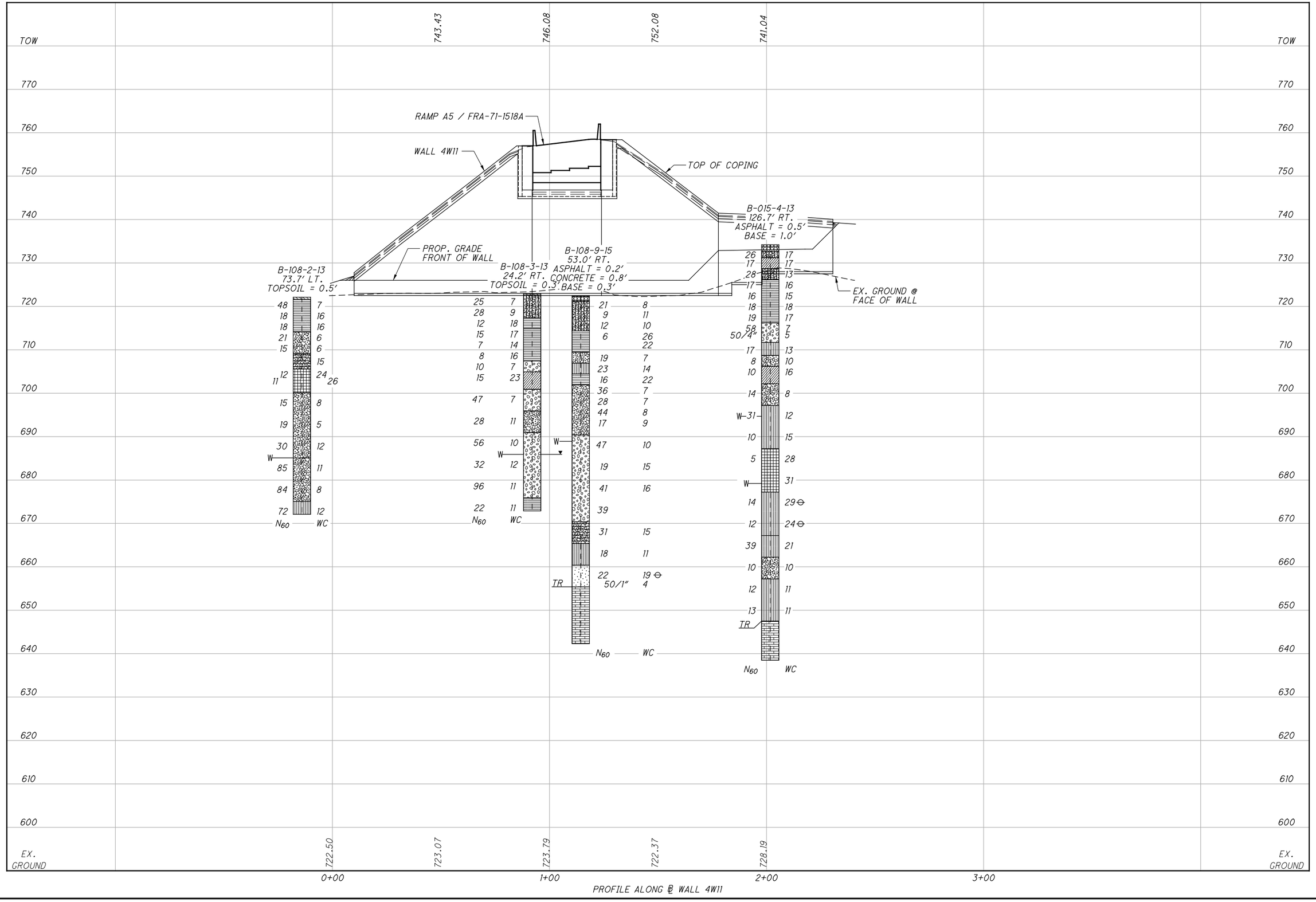


	201/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W11	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



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0 10 20 40
HORIZONTAL SCALE IN FEET

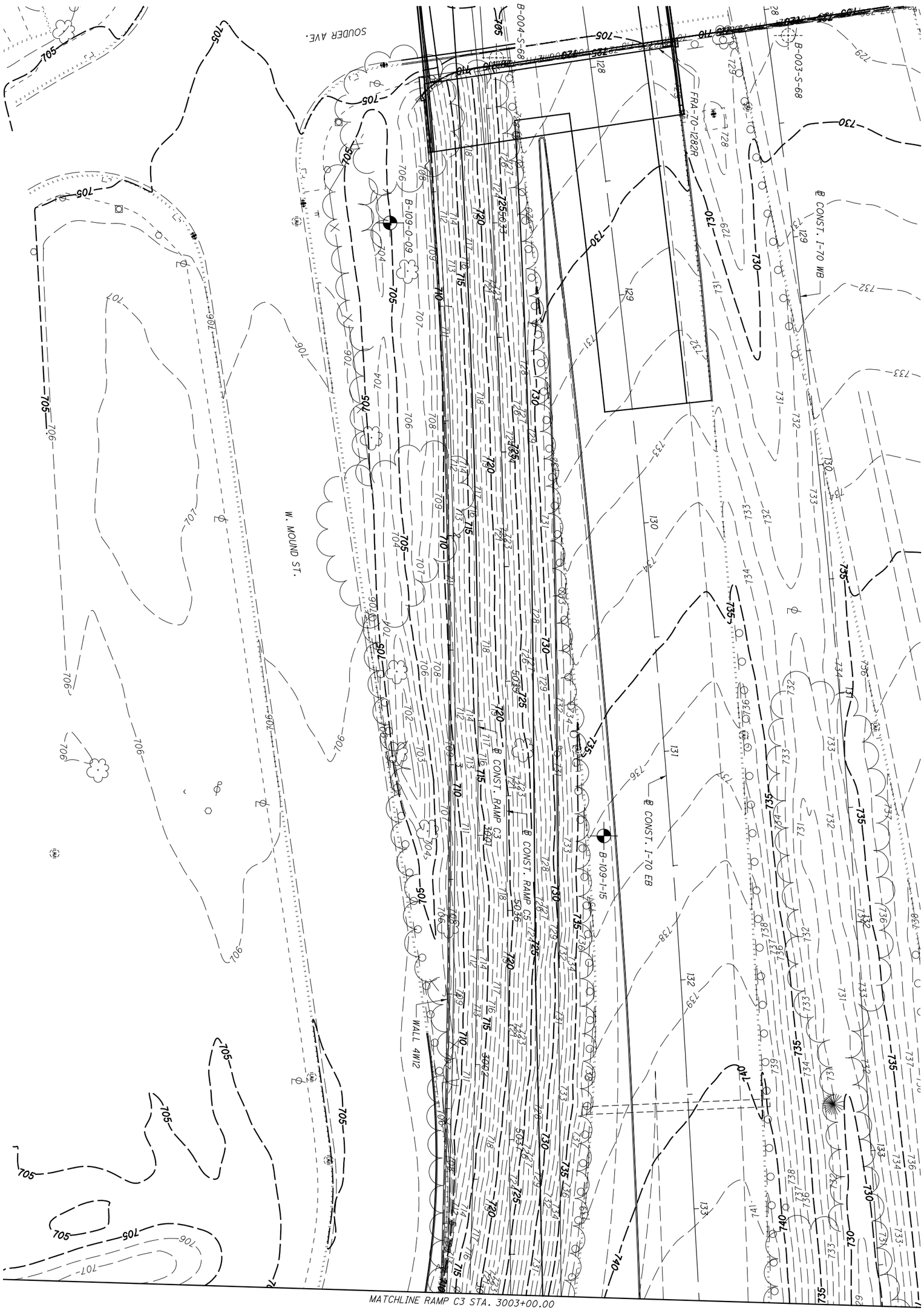
DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL 4W11

FRA-70-12.68

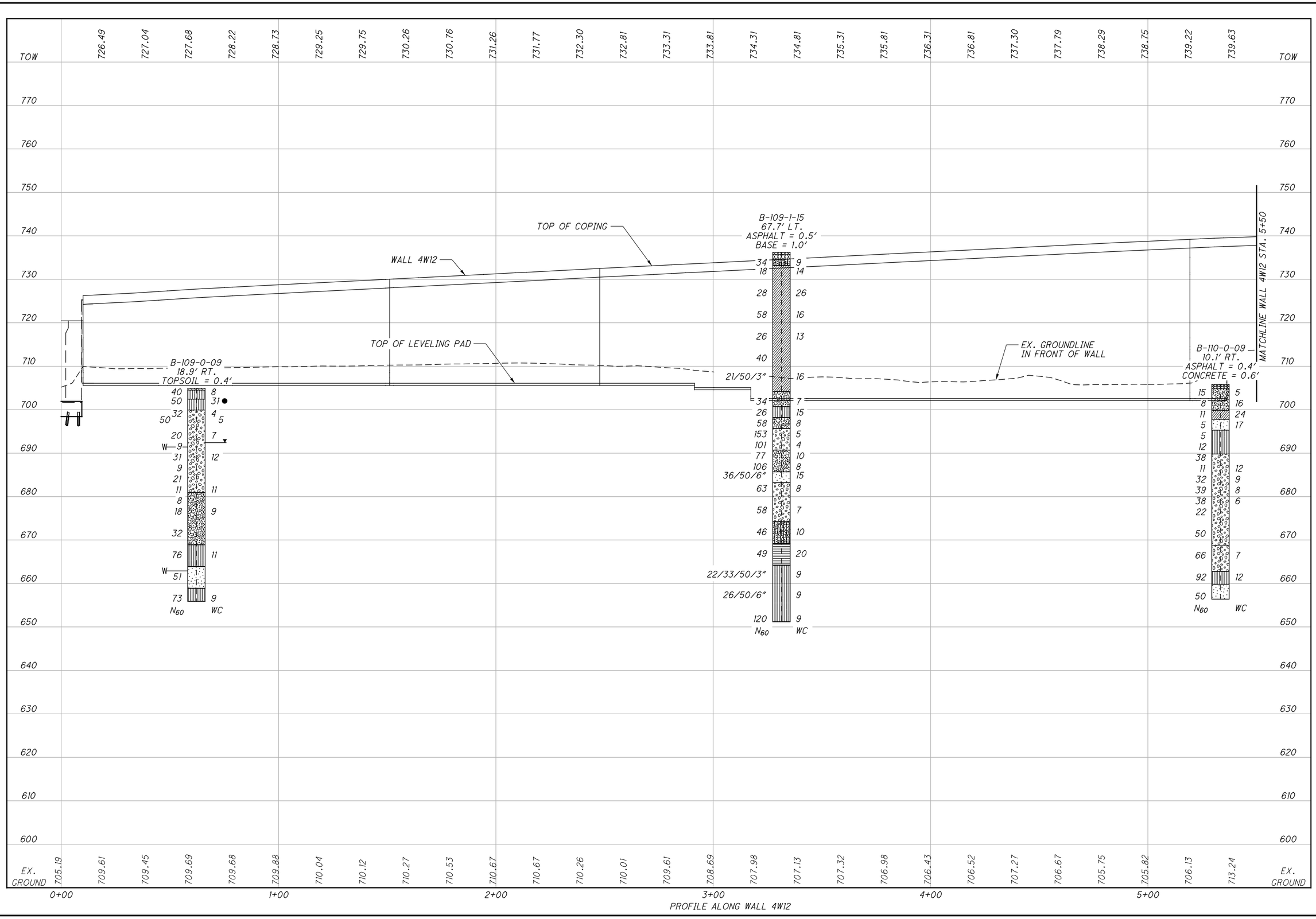
202/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP062.dgn 12/27/2018 10:22:11 AM rachelm



203496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W12 RAMP C5 STA. 5032+00 TO RAMP C3 STA. 3003+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP063.dgn 12/27/2018 10:22:12 AM rachelm



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

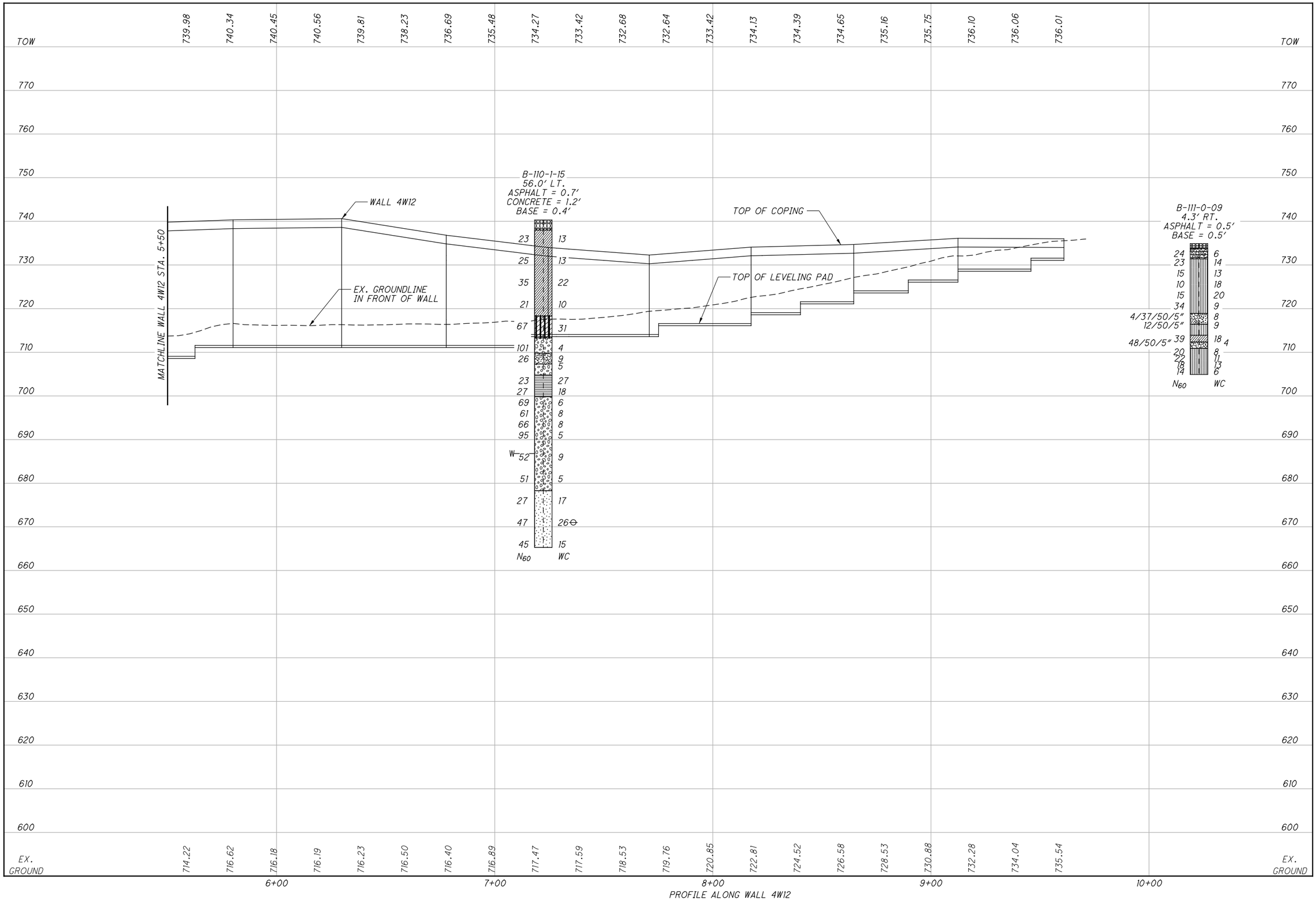
STRUCTURE FOUNDATION EXPLORATION
WALL 4W12
STA. 0+00.00 TO STA. 5+50.00

FRA-70-12.68

204496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP064.dgn 12/27/2018 10:22:13 AM rachelm

	20549	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W12 RAMP C3 STA. 3003+00 TO RAMP C3 STA. 3008+50	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



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0 10 20 40
HORIZONTAL SCALE IN FEET

DRAWN RRM
CHECKED BRT

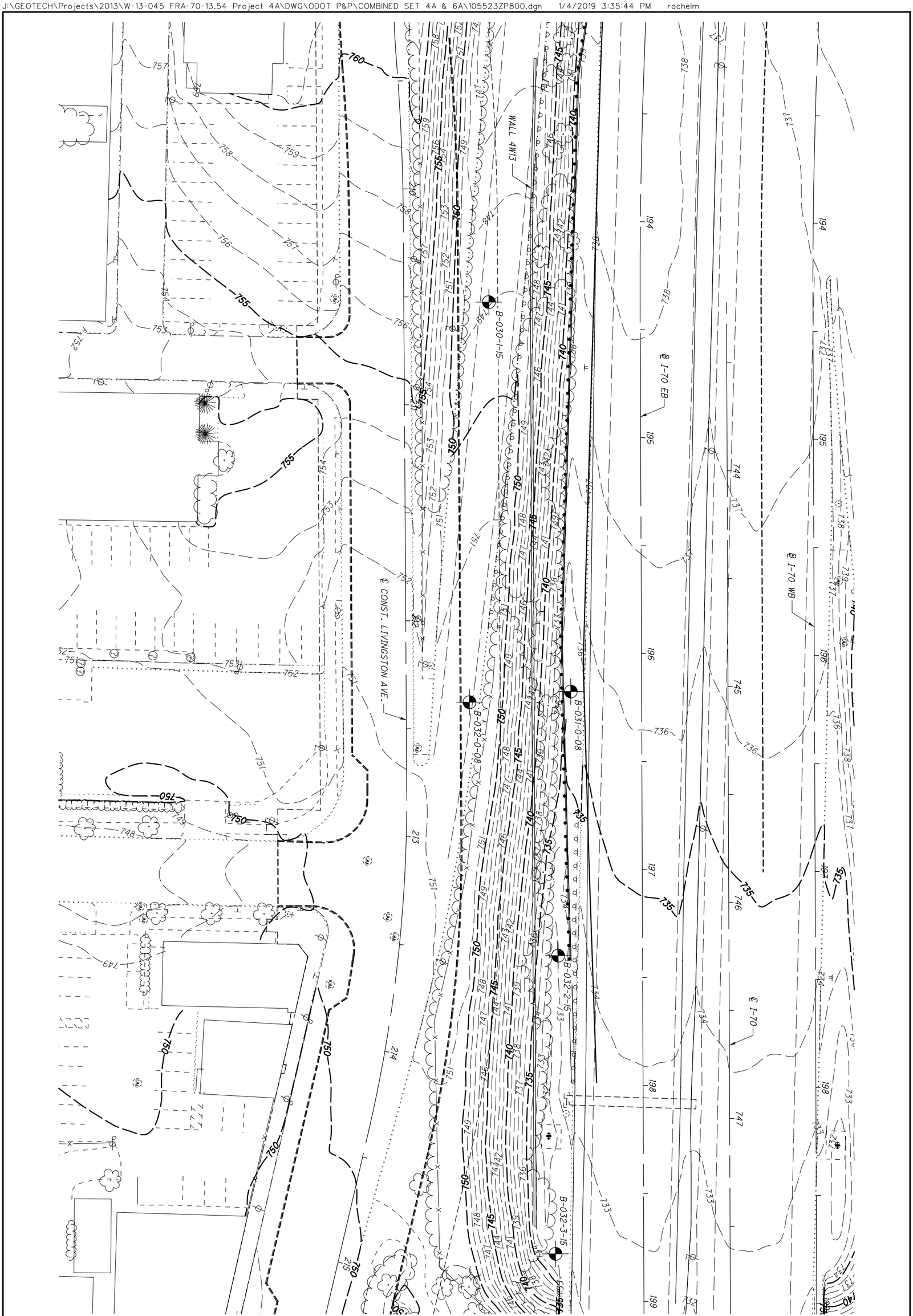
STRUCTURE FOUNDATION EXPLORATION
WALL 4W12
STA. 5+50.00 TO STA. 10+00.00

FRA-70-12.68

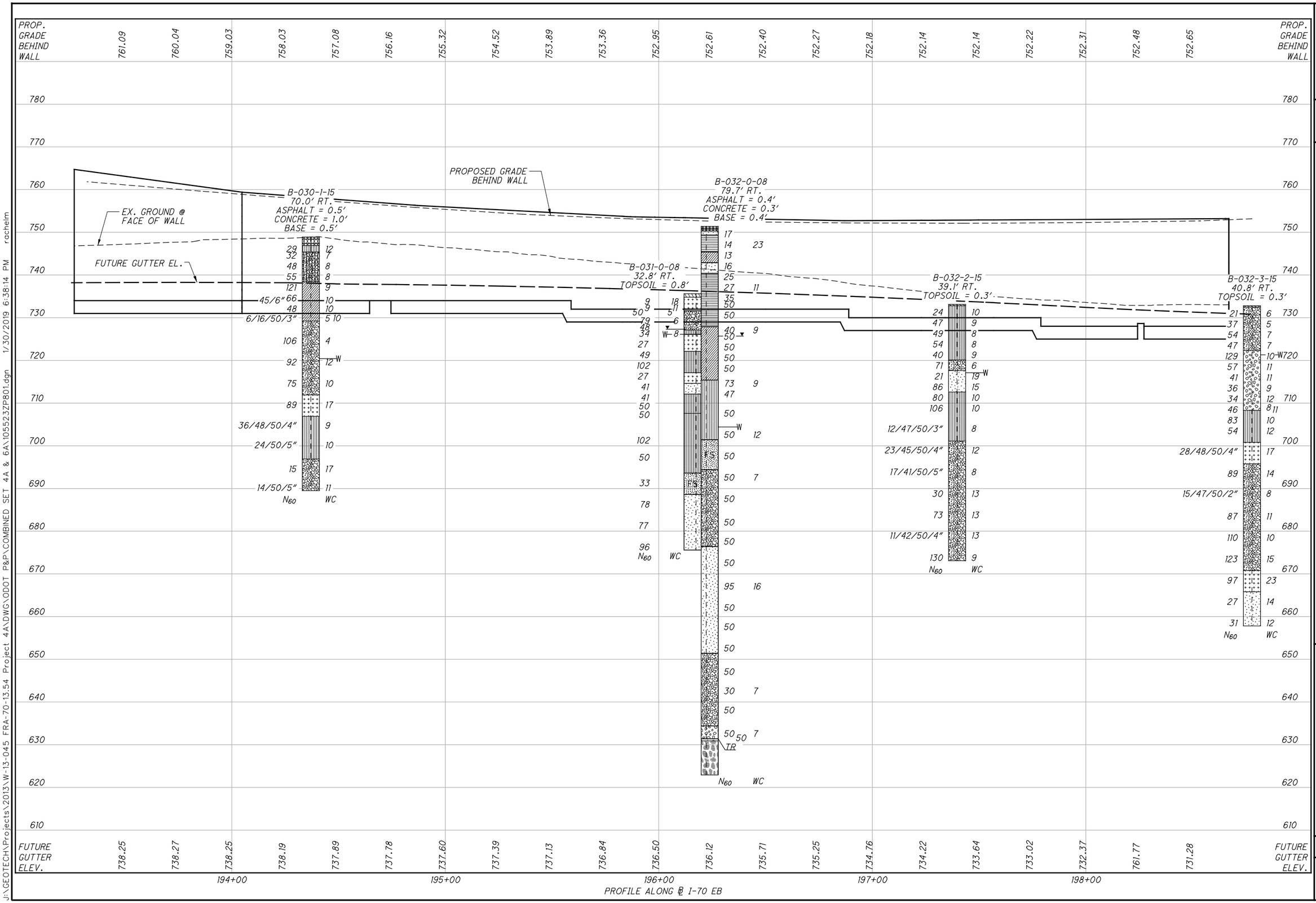
206/496

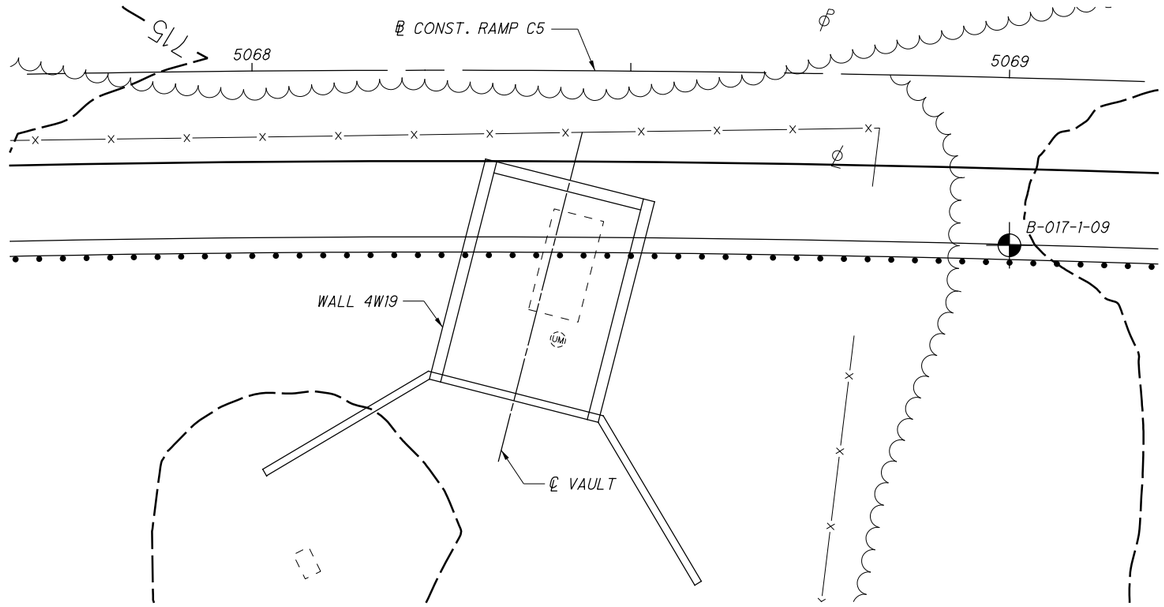
1

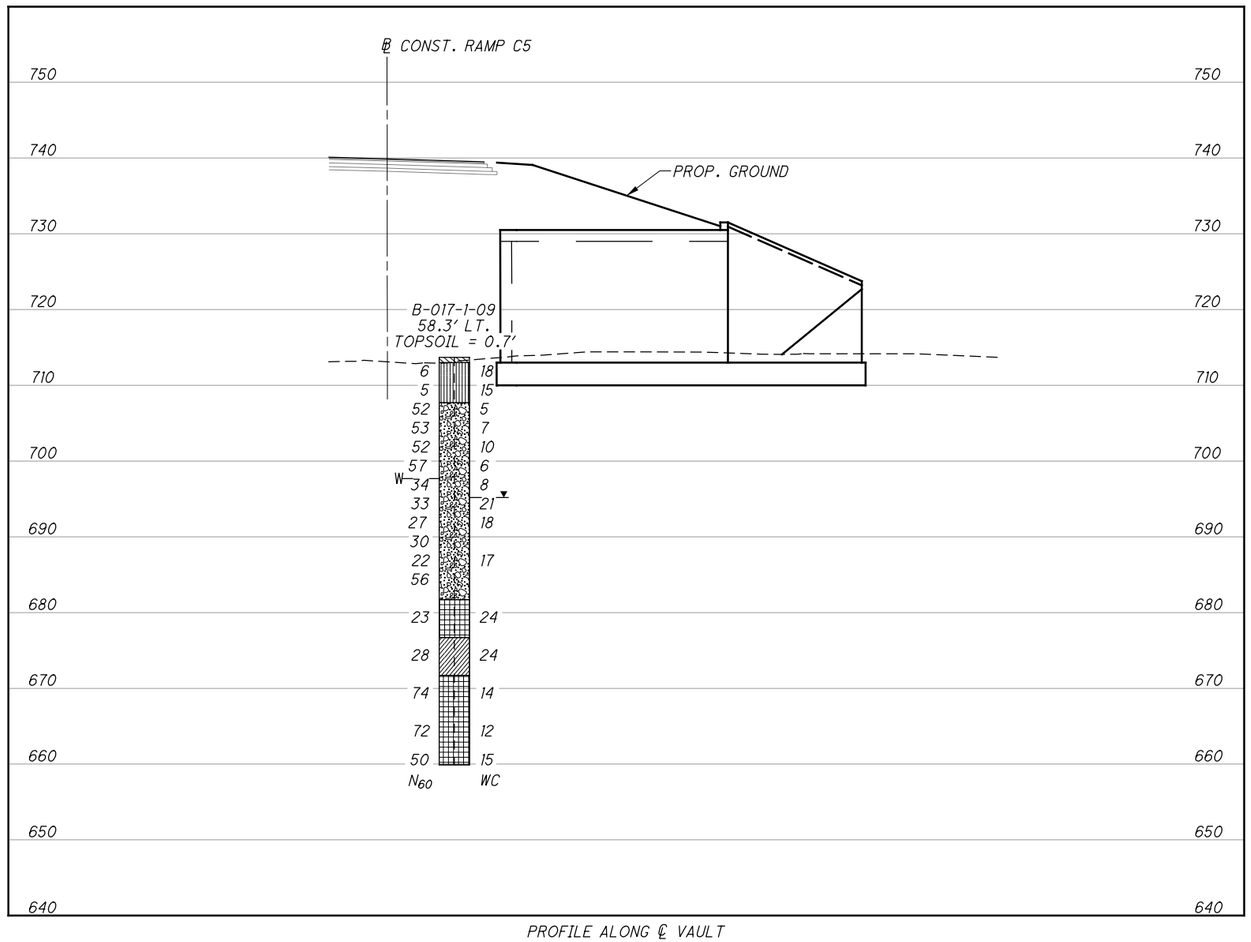
J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\105523ZP800.dgn 1/4/2019 3:35:44 PM rachelm



	206/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION WALL 4W13	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET


PROP. GRADE BEHIND WALL
761.09
760.04
759.03
758.03
757.08
756.16
755.32
754.52
753.89
753.36
752.95
752.61
752.40
752.27
752.18
752.14
752.14
752.22
752.31
752.48
752.65
PROP. GRADE BEHIND WALL
780
770
760
750
740
730
720
710
700
690
680
670
660
650
640
630
620
610
PROPOSED GRADE BEHIND WALL
EX. GROUND @ FACE OF WALL
FUTURE GUTTER EL.
B-030-1-15
70.0' RT.
ASPHALT = 0.5'
CONCRETE = 1.0'
BASE = 0.5'
B-031-0-08
32.8' RT.
TOPSOIL = 0.8'
B-032-0-08
79.7' RT.
ASPHALT = 0.4'
CONCRETE = 0.3'
BASE = 0.4'
B-032-2-15
39.1' RT.
TOPSOIL = 0.3'
B-032-3-15
40.8' RT.
TOPSOIL = 0.3'
45/6"
6/16/50/3"
36/48/50/4"
24/50/5"
14/50/5"
12/47/50/3"
23/45/50/4"
17/41/50/5"
11/42/50/4"
28/48/50/4"
15/47/50/2"
TR
N60
WC
W
FUTURE GUTTER ELEV.
738.25
738.27
738.25
738.19
737.89
737.78
737.60
737.39
737.13
736.84
736.50
736.12
735.71
735.25
734.76
734.22
733.64
733.02
732.37
761.77
731.28
194+00
195+00
196+00
197+00
198+00
PROFILE ALONG ℄ I-70 EB
HORIZONTAL SCALE IN FEET
0
10
20
40
DRAWN RRM
CHECKED BRT
STRUCTURE FOUNDATION EXPLORATION
WALL 4W13
FRA-70-12.68
206B/496
J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\105523ZP801.dgn 1/30/2019 6:38:14 PM rachelm





PROFILE ALONG ℄ VAULT

HORIZONTAL SCALE IN FEET
0 5 10 20

DRAWN RRM
CHECKED BRT

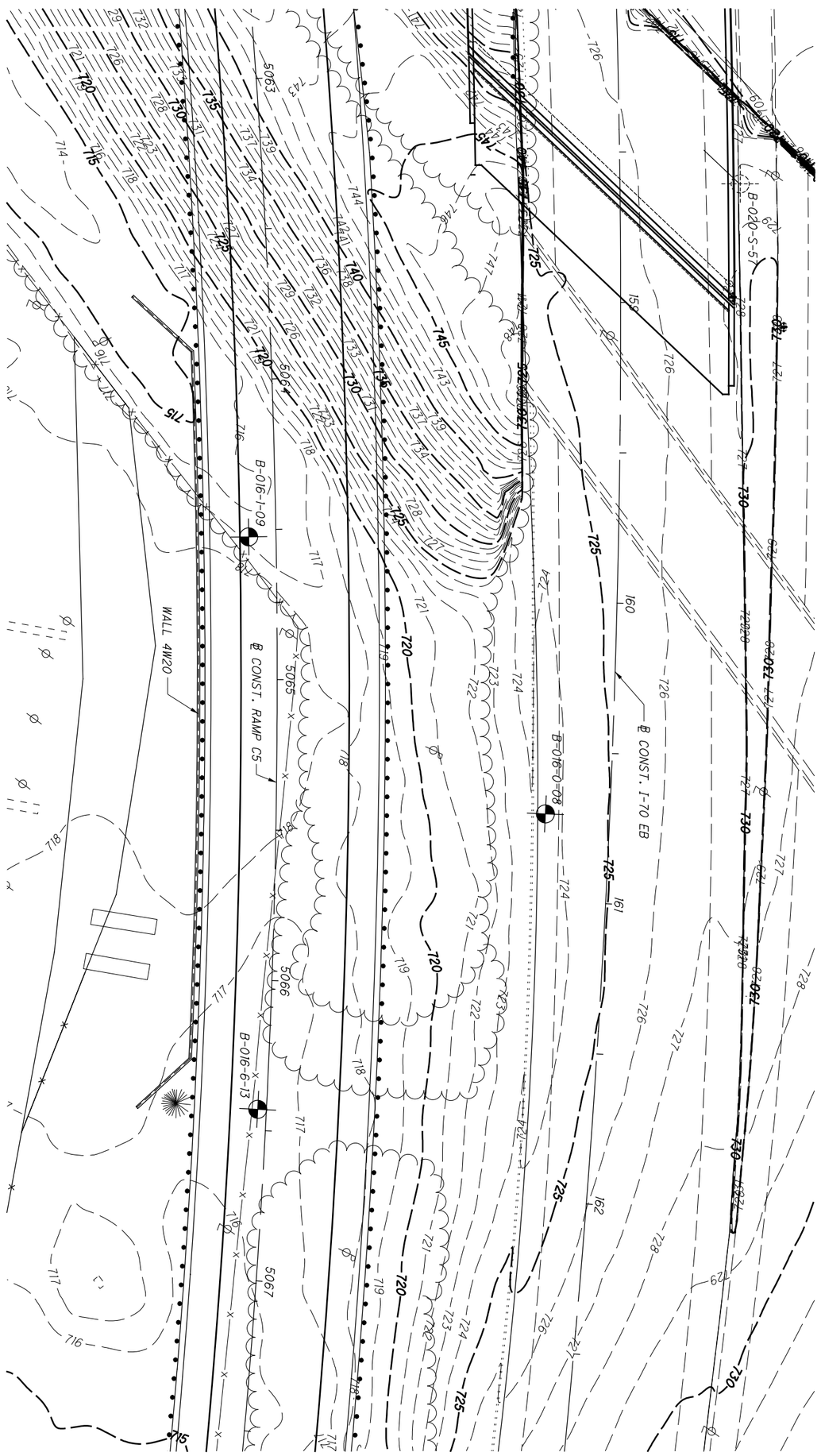
STRUCTURE FOUNDATION EXPLORATION
WALL 4W19

FRA-70-12.68

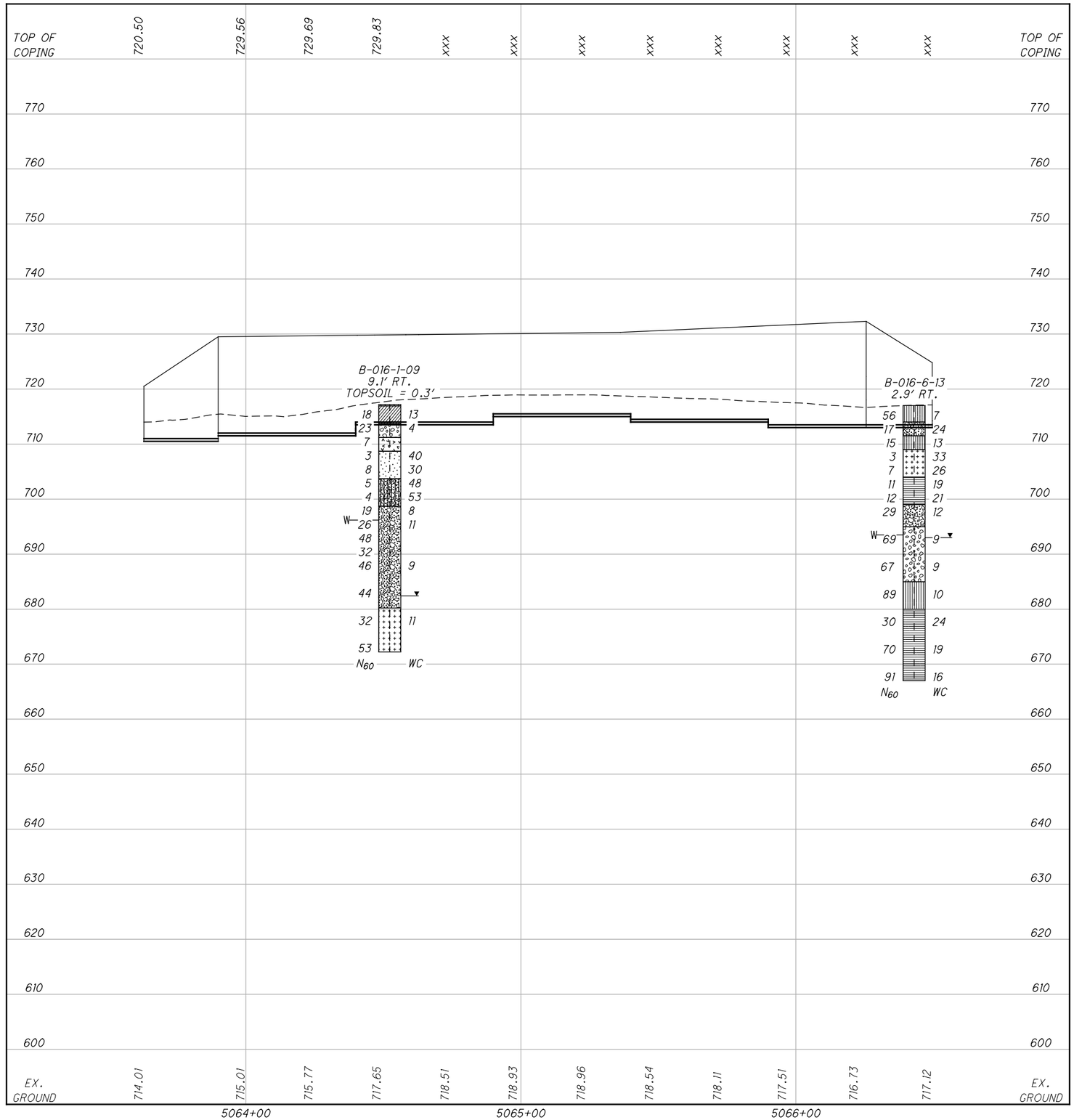
206C/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\105523ZP802.dgn 1/4/2019 3:37:17 PM rocheim

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\105523ZP803.dgn 1/4/2019 3:37:52 PM rachelm



	206/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION RETAINING WALL 4W20	DRAWN RRM CHECKED BRT	0 10 20 40 HORIZONTAL SCALE IN FEET



PROFILE ALONG ℄ CONST. RAMP C5

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

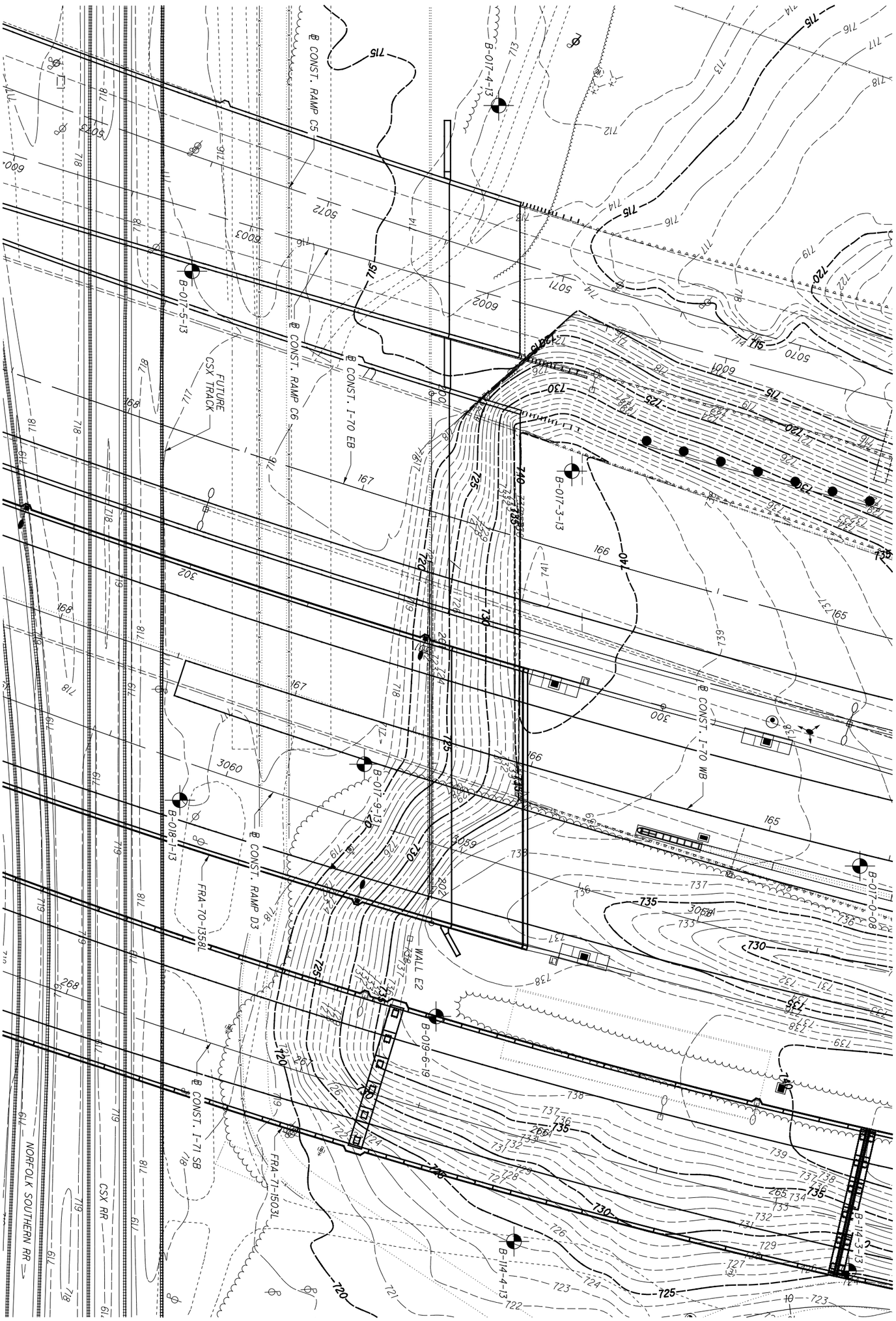
STRUCTURE FOUNDATION EXPLORATION
RETAINING WALL 4W20

FRA-70-12.68

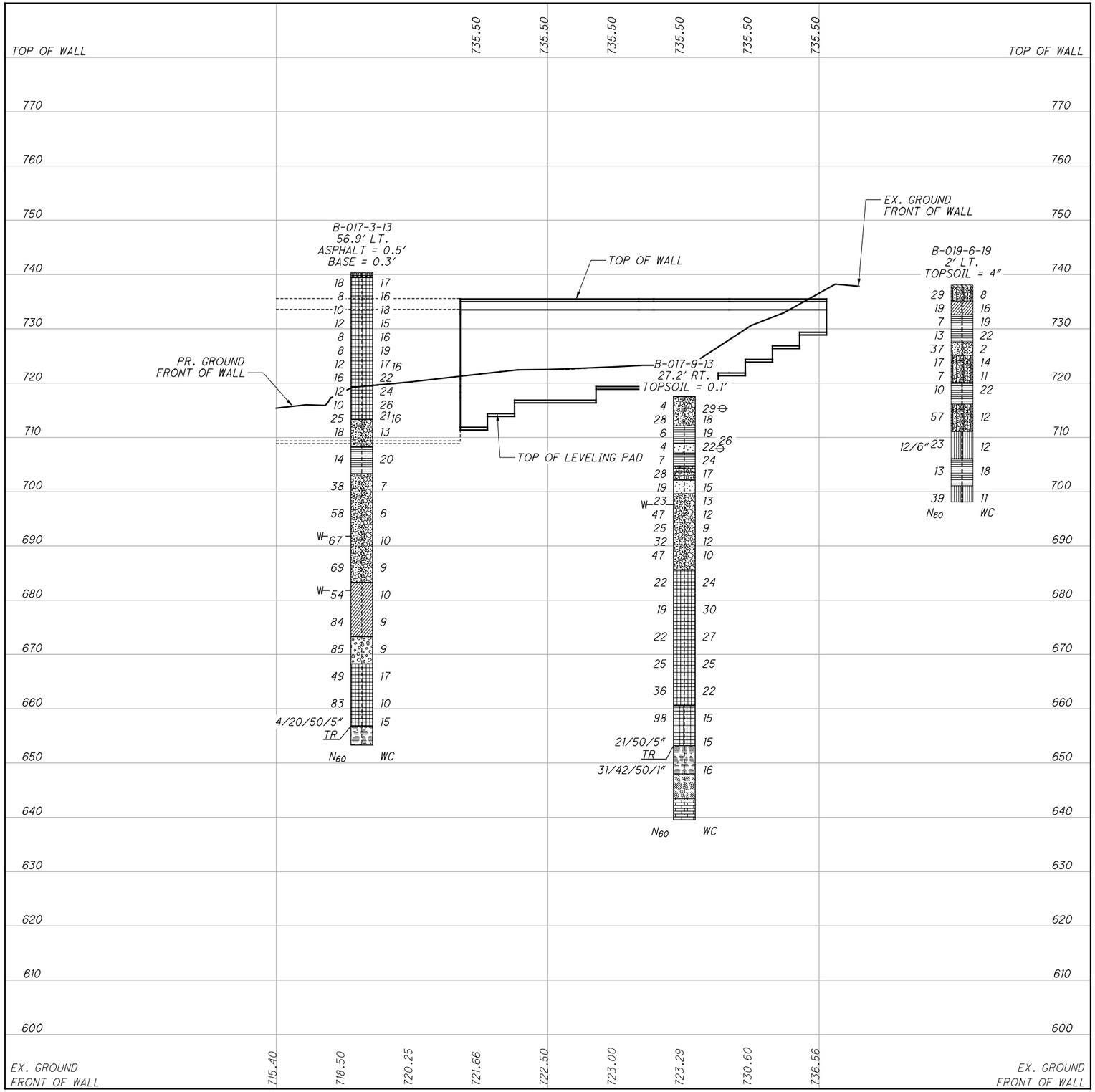
206E/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\105523ZP804.dgn 1/4/2019 3:38:26 PM rachelm

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP039.dgn 4/8/2021 4:50:51 PM rachelm



	207/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL E2	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



PROFILE ALONG WALL E2

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL E2

FRA-70-13.10

208/496

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP040.dgn 4/8/2021 5:07:14 PM rachelm

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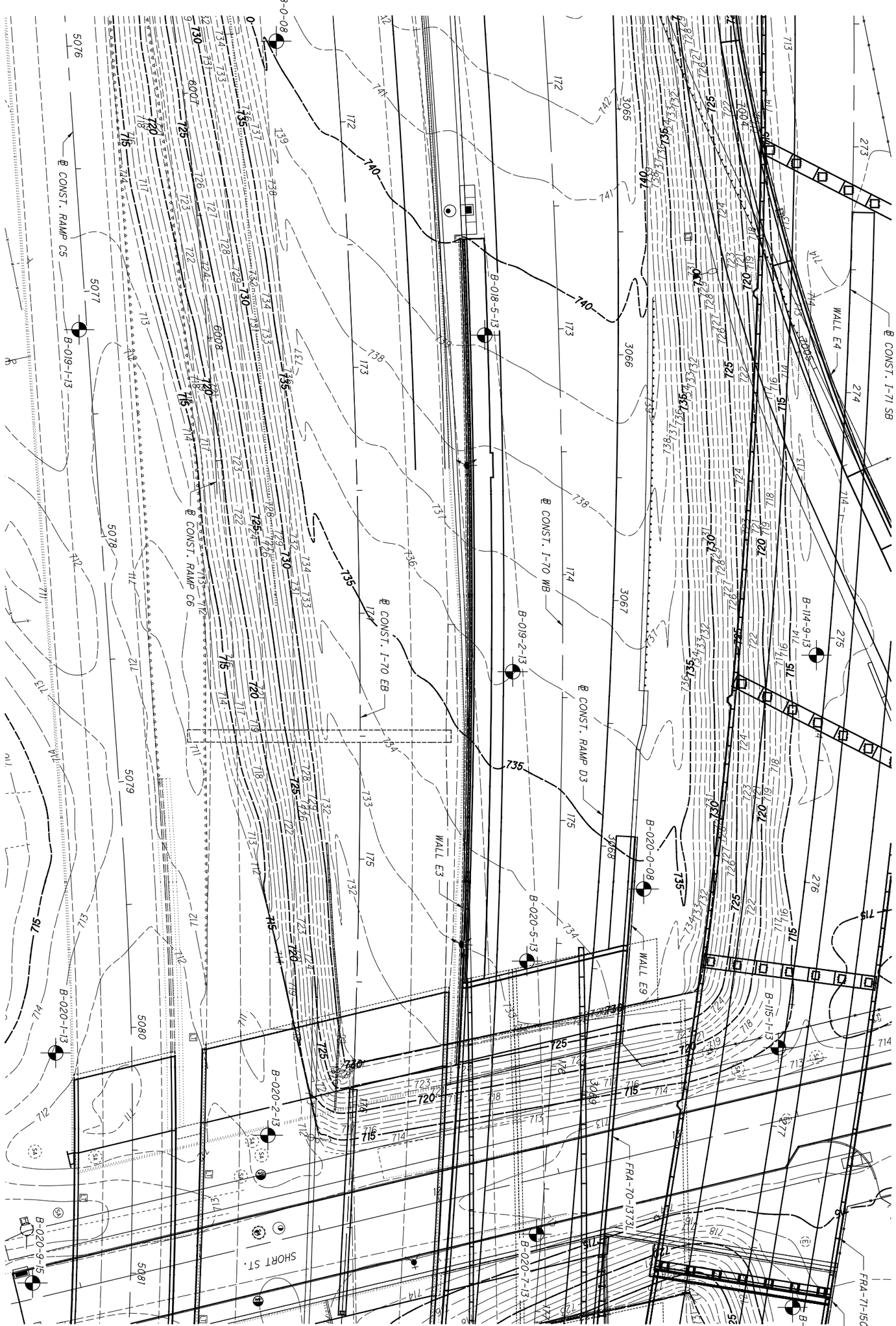
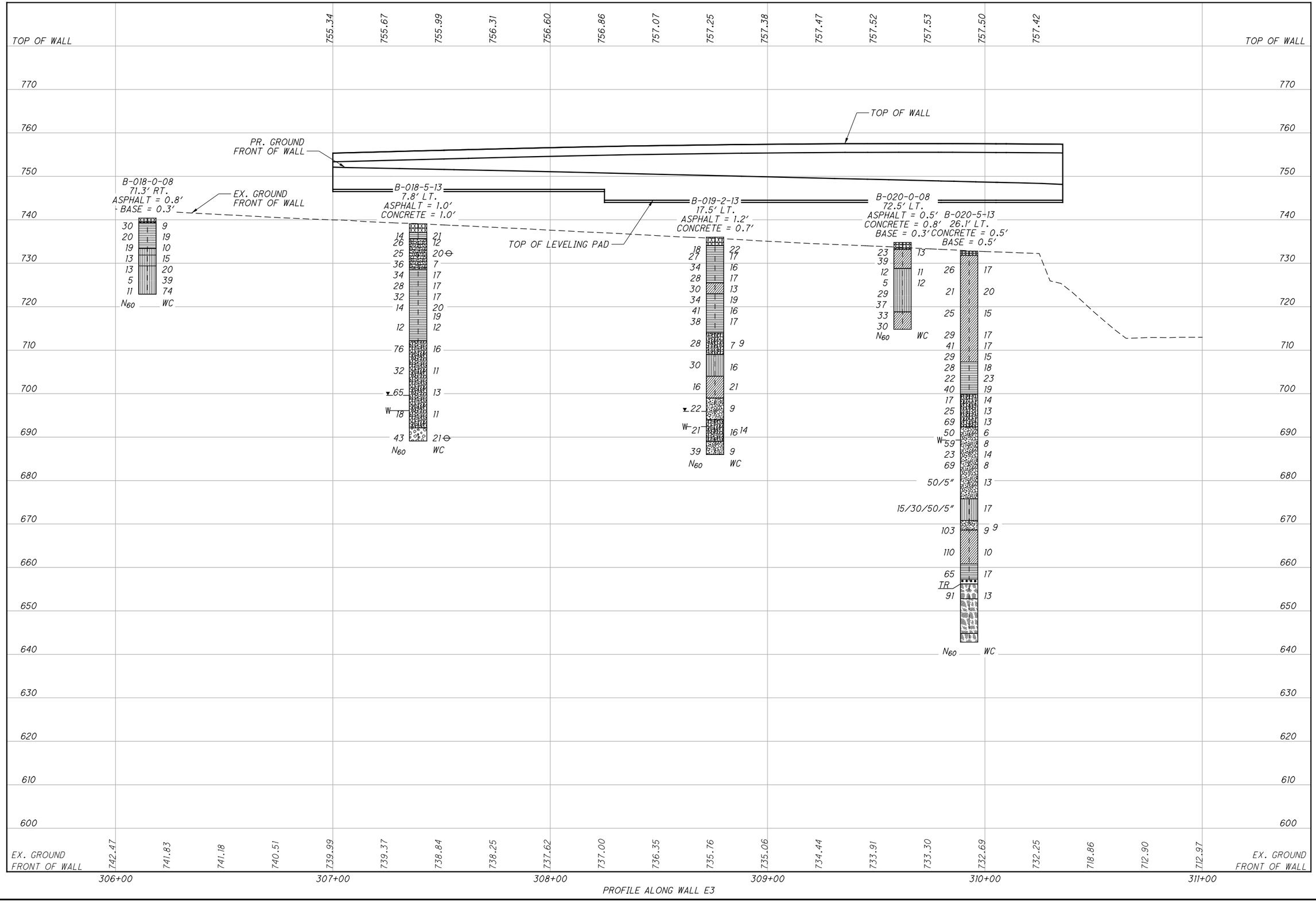


	209/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL E3	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL E3

FRA-70-13.10

210/496

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP042.dgn 3/8/2021 2:40:31 PM rachelm

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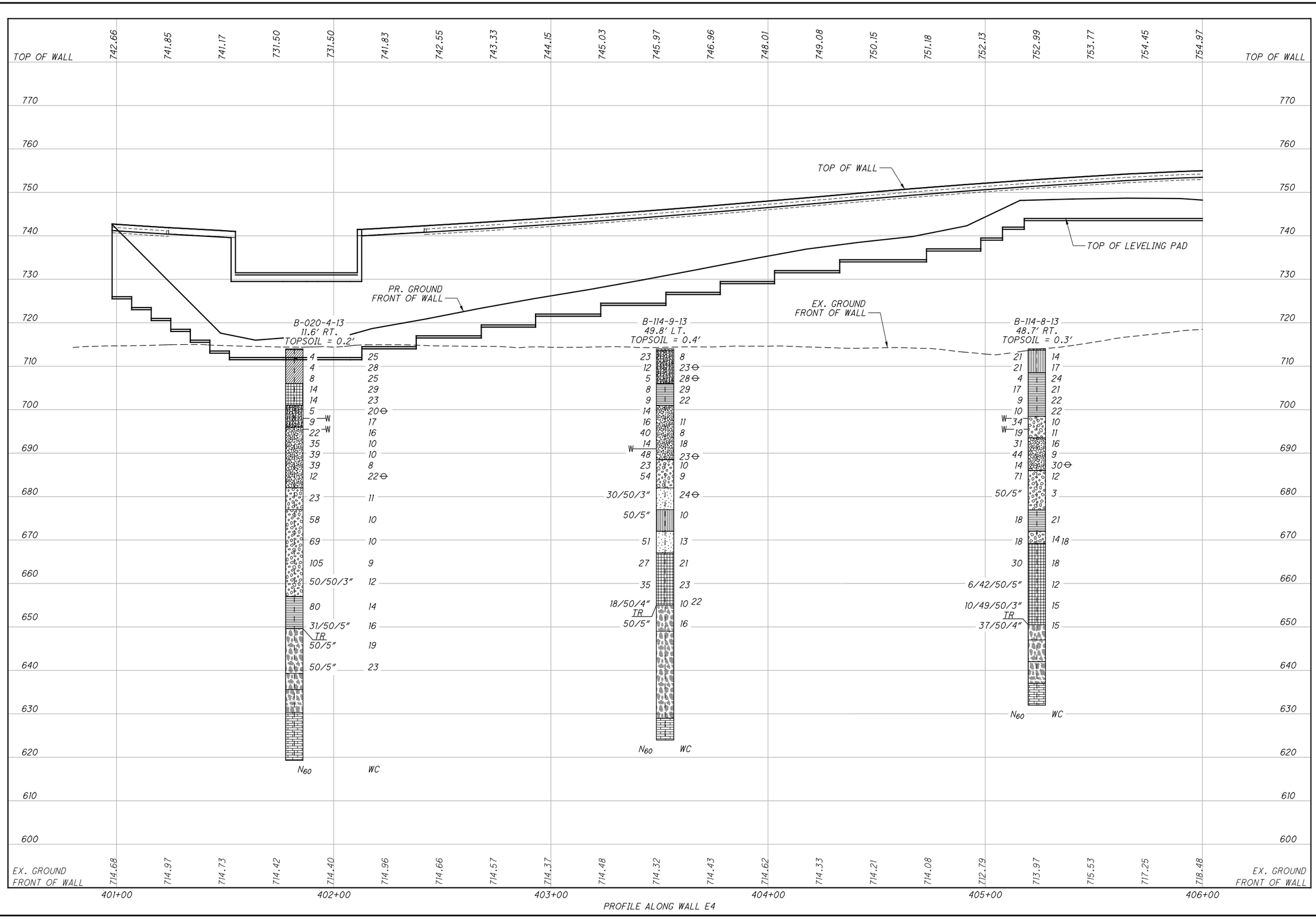
	211/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL E4 STA. 400+80 TO 406+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



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0 10 20 40
HORIZONTAL SCALE IN FEET

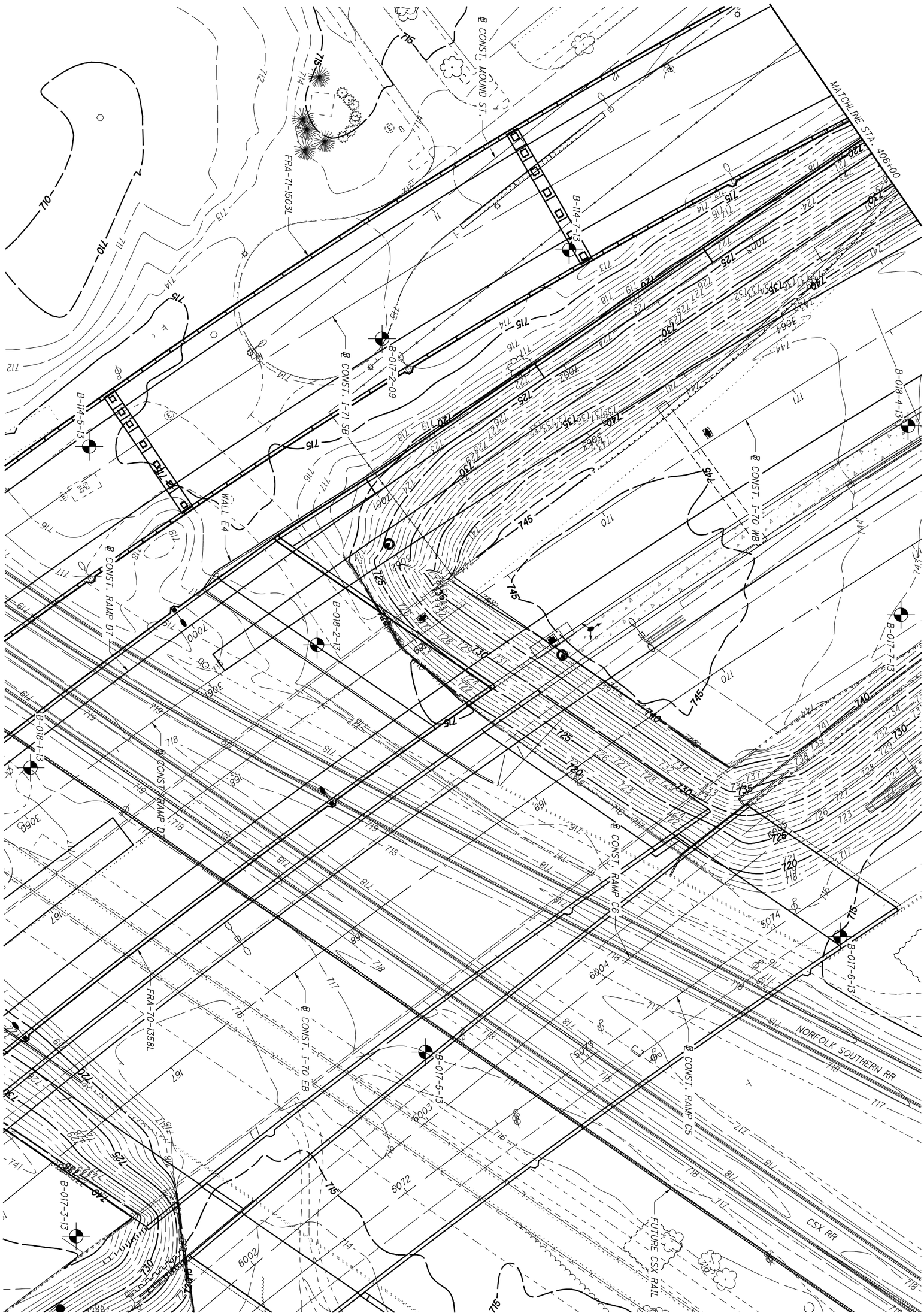
DRAWN RRM | CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL E4 STA. 400+80 TO STA. 406+00

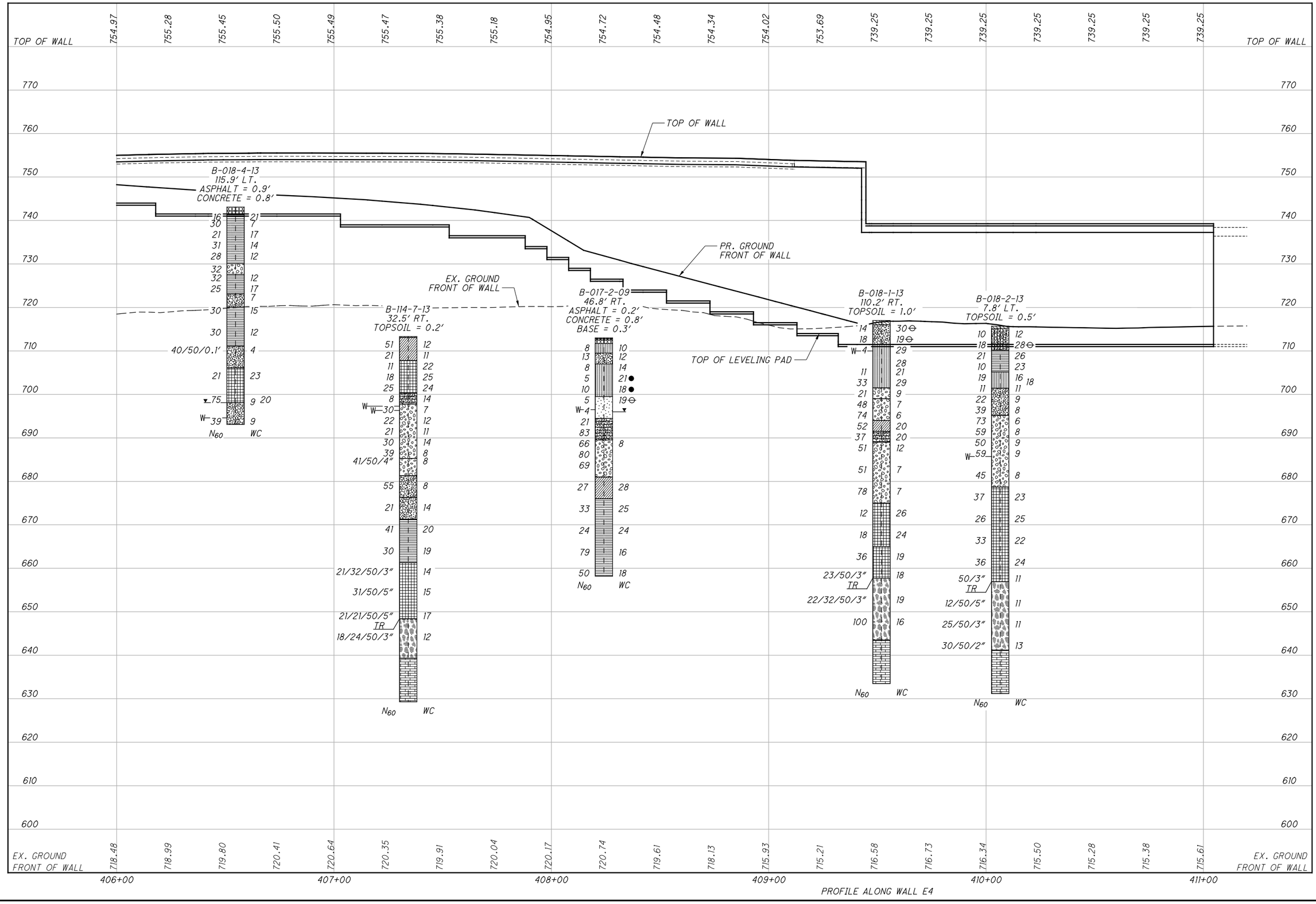
FRA-70-13.10

212/496

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP045.dgn 3/8/2021 2:40:38 PM rachelm



	213/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL E4 STA. 406+00 TO STA. 411+20	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL E4 STA. 406+00 TO STA. 411+20

FRA-70-13.10

214/496

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP046.dgn 3/8/2021 2:40:40 PM rachelm

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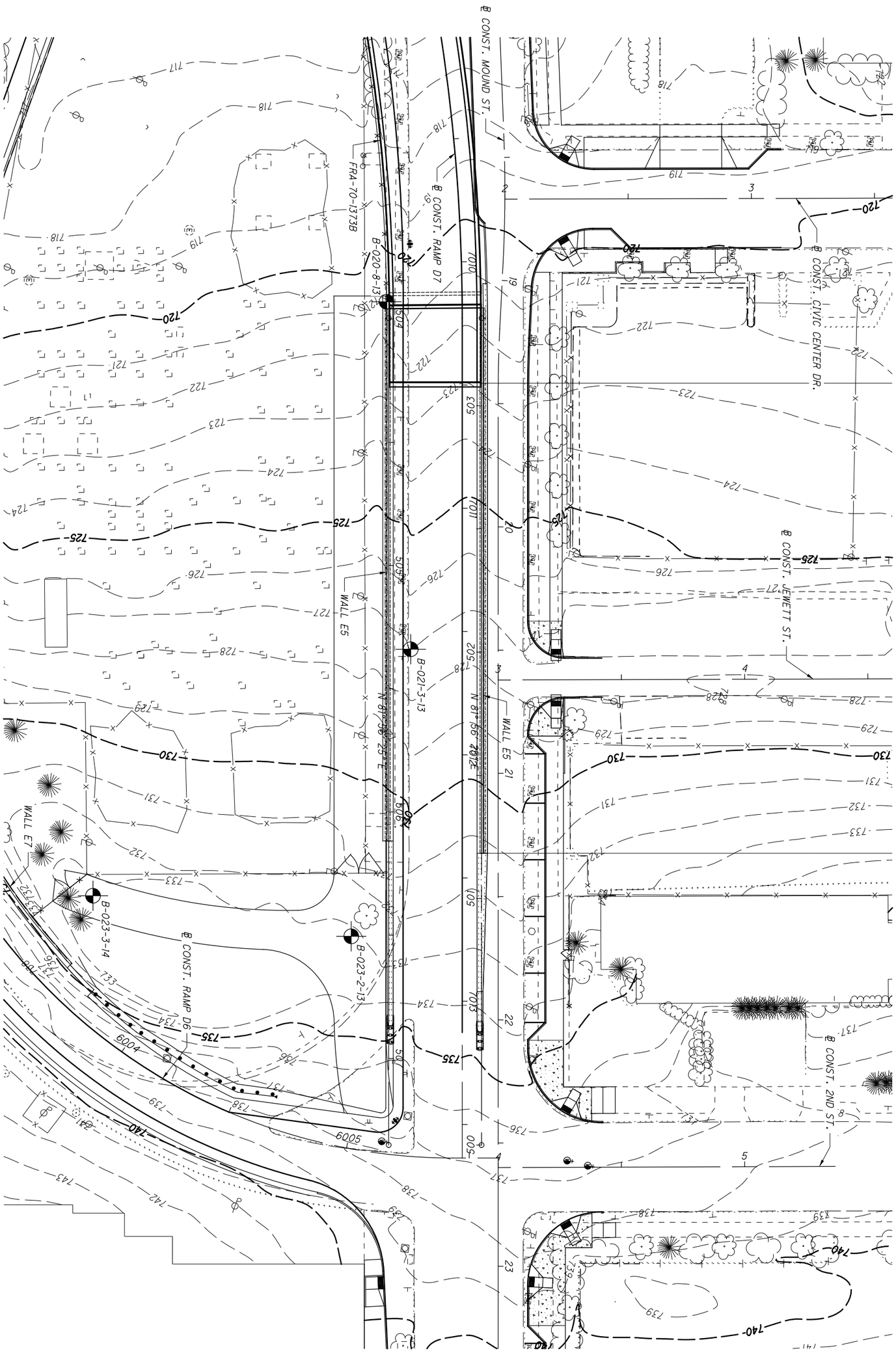
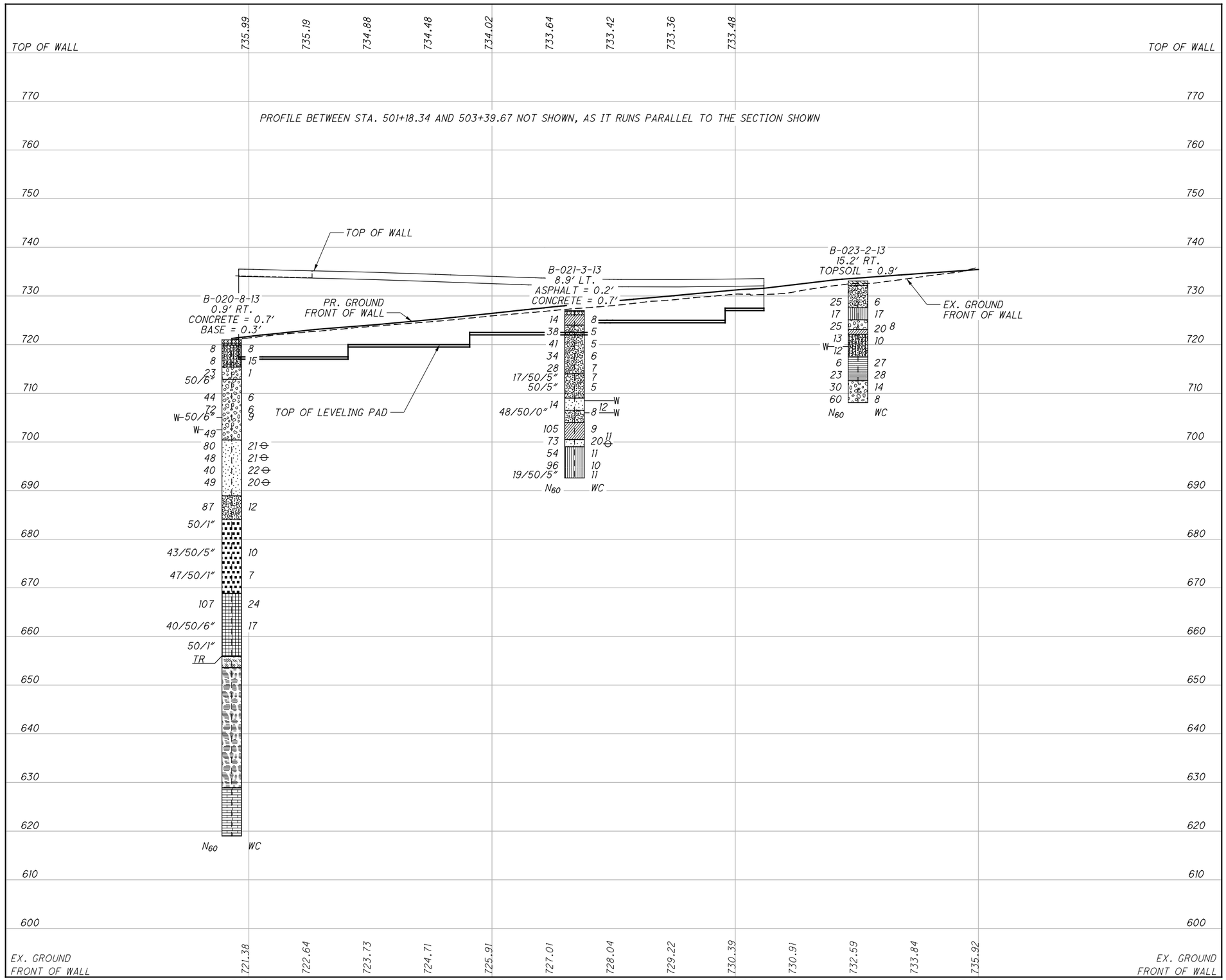


	215/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL E5	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL E5

FRA-70-13.10

216/496

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP048.dgn 1/31/2019 8:24:18 AM rachelm

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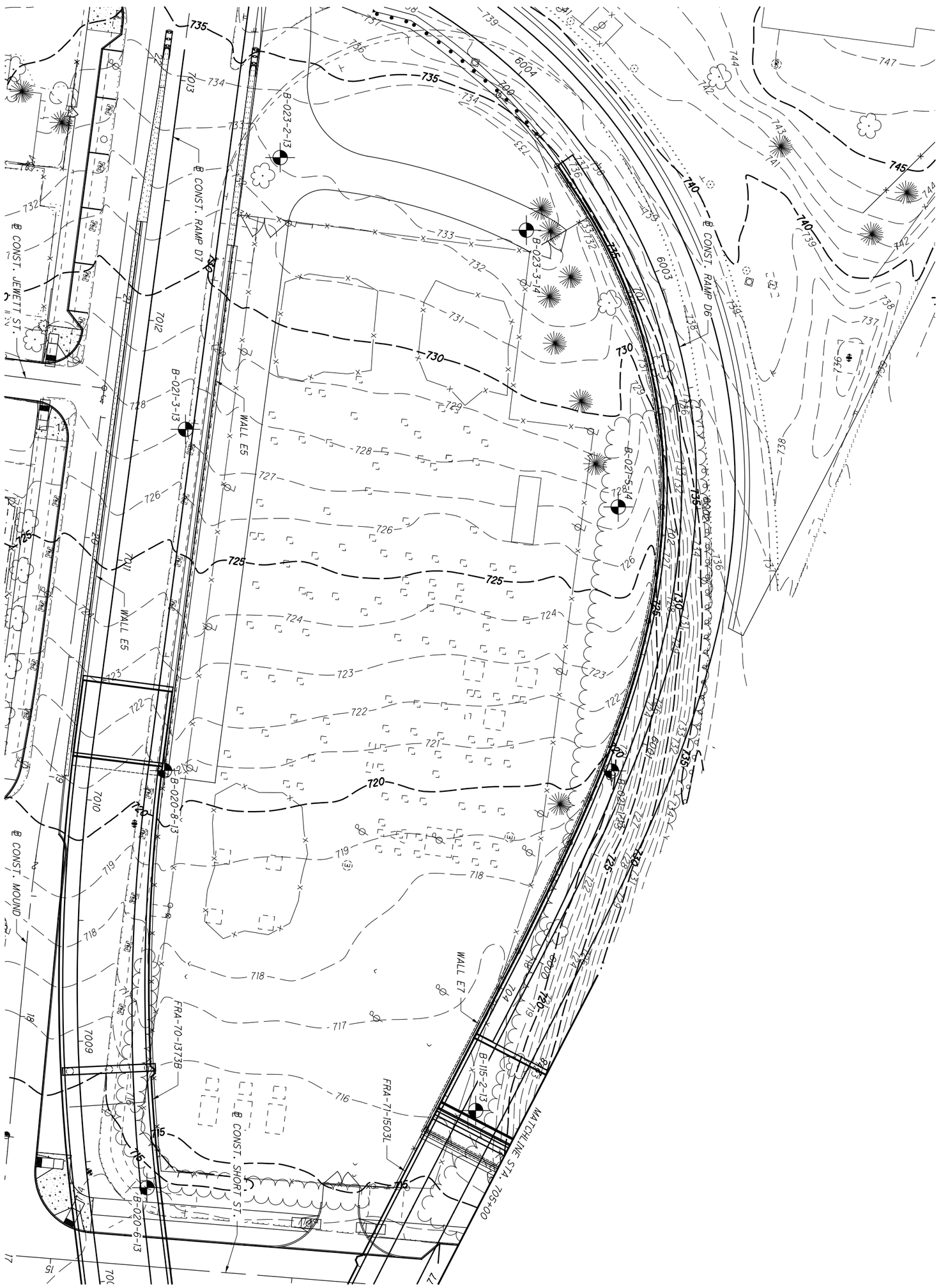
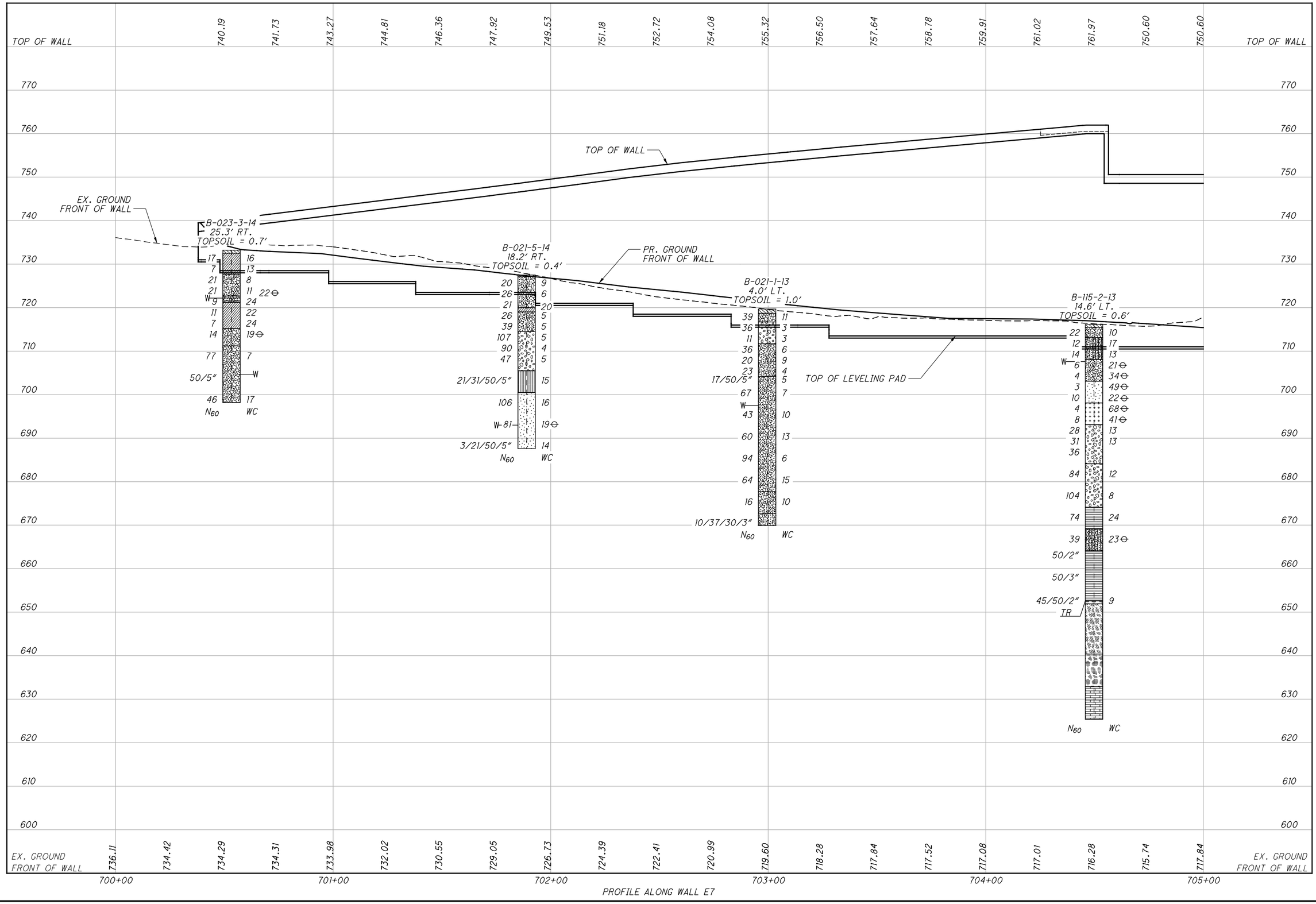


	217/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL E7 STA. 700+00 TO STA. 705+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL E7 STA. 700+00 TO STA. 705+00

FRA-70-13.10

218/496

1

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP050.dgn 1/30/2019 7:26:15 PM rachelm

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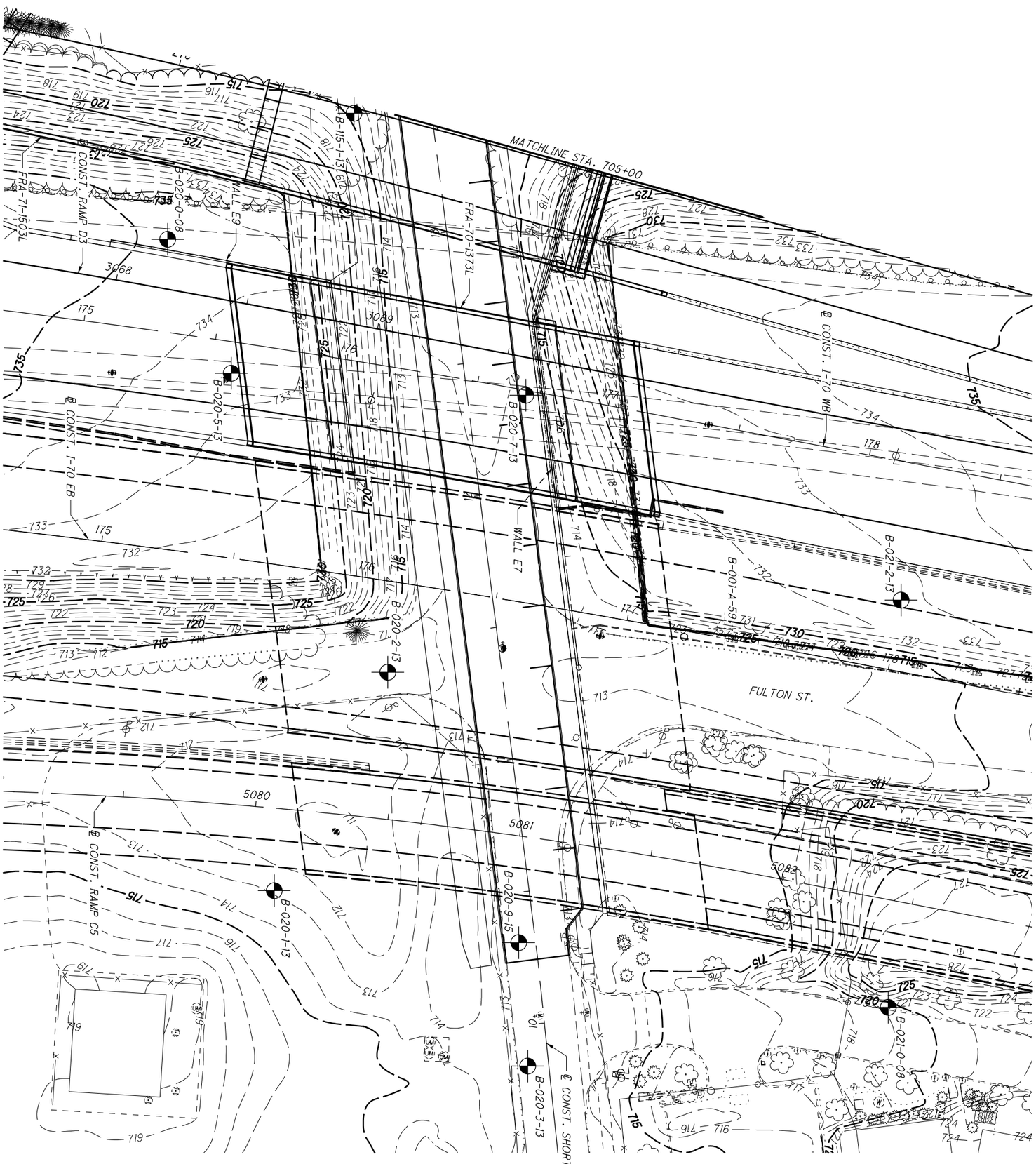
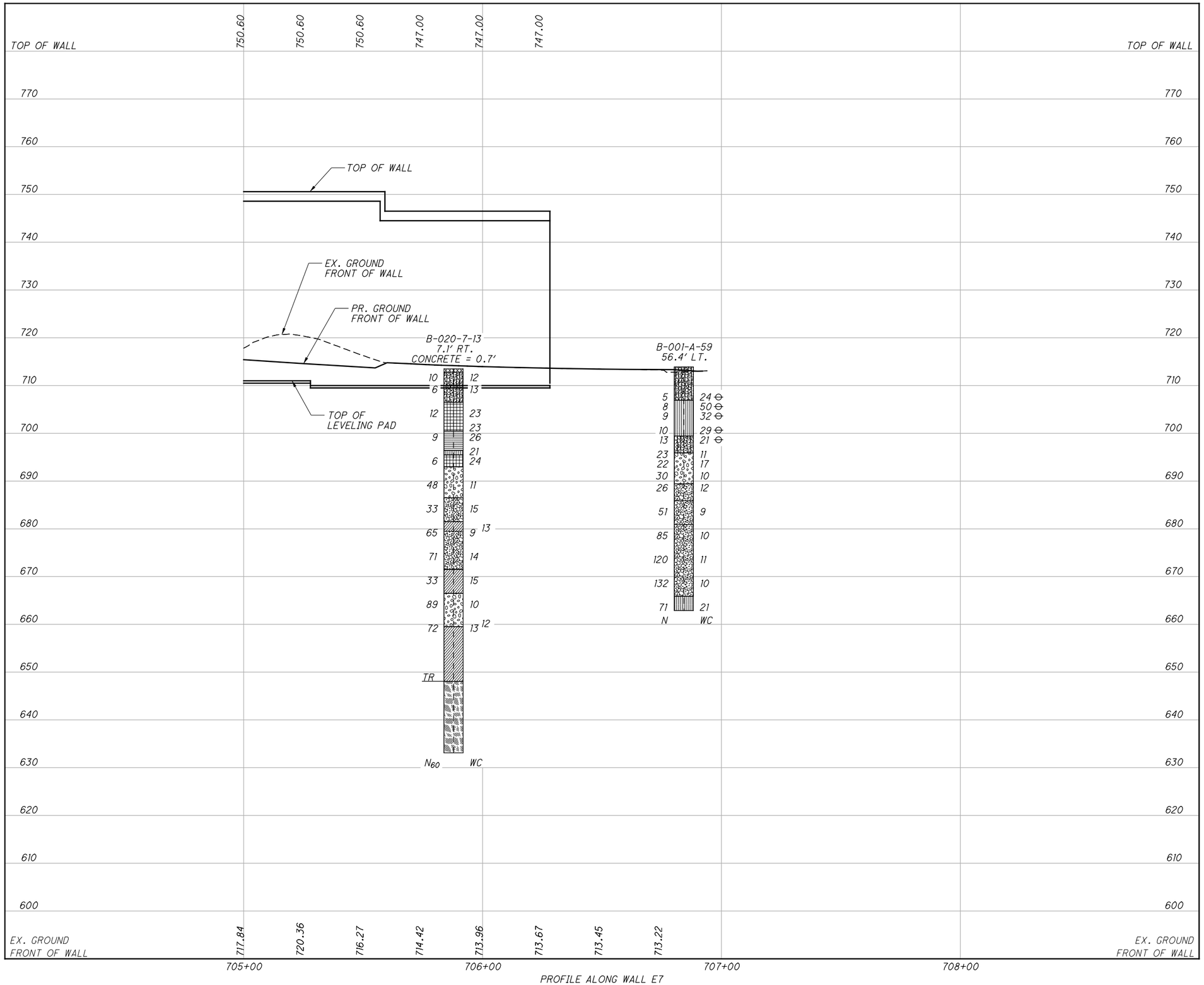


	219/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL E7 STA. 705+00 TO STA. 708+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

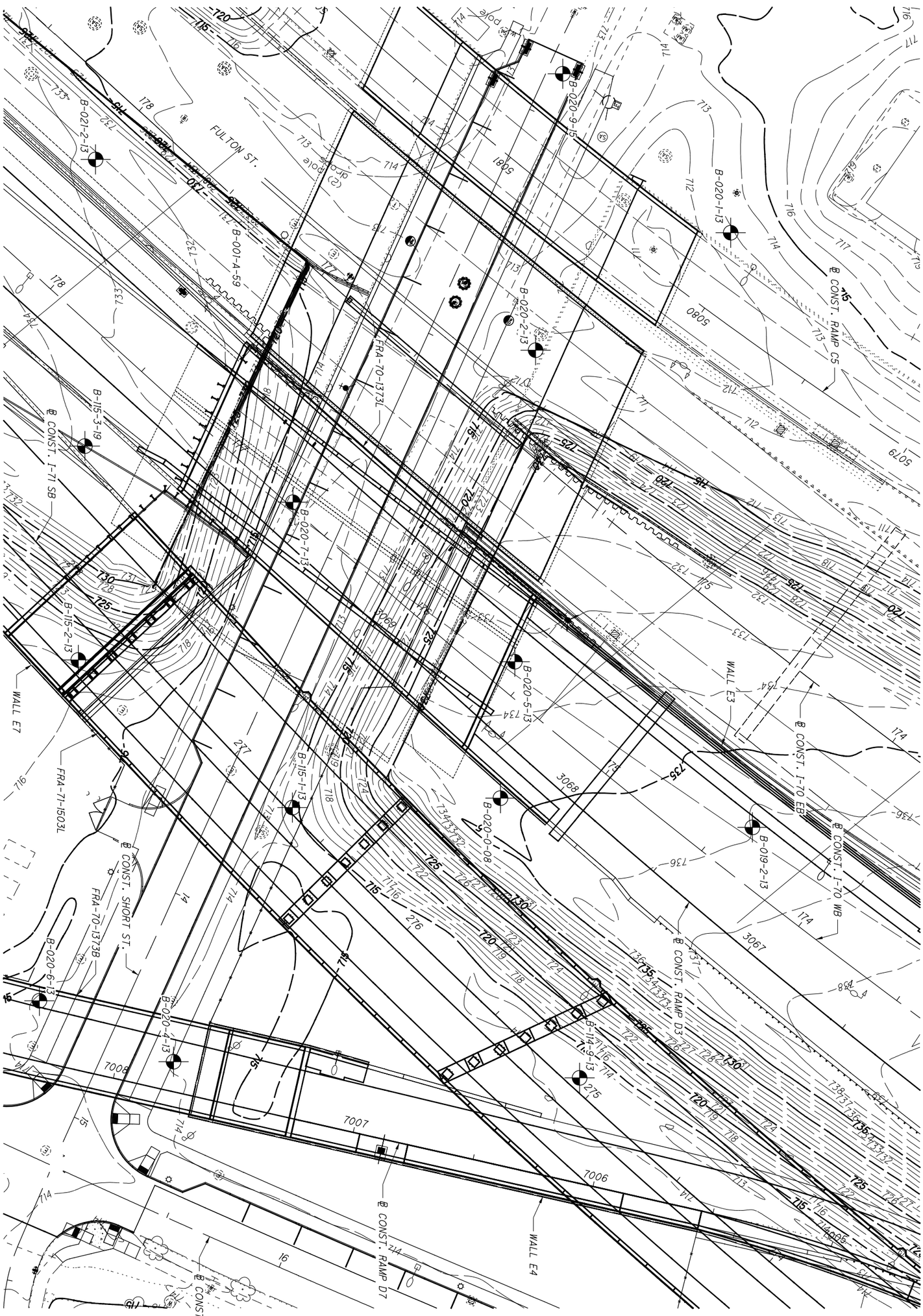
STRUCTURE FOUNDATION EXPLORATION
WALL E7 STA. 705+00 TO STA. 708+00

FRA-70-13.10

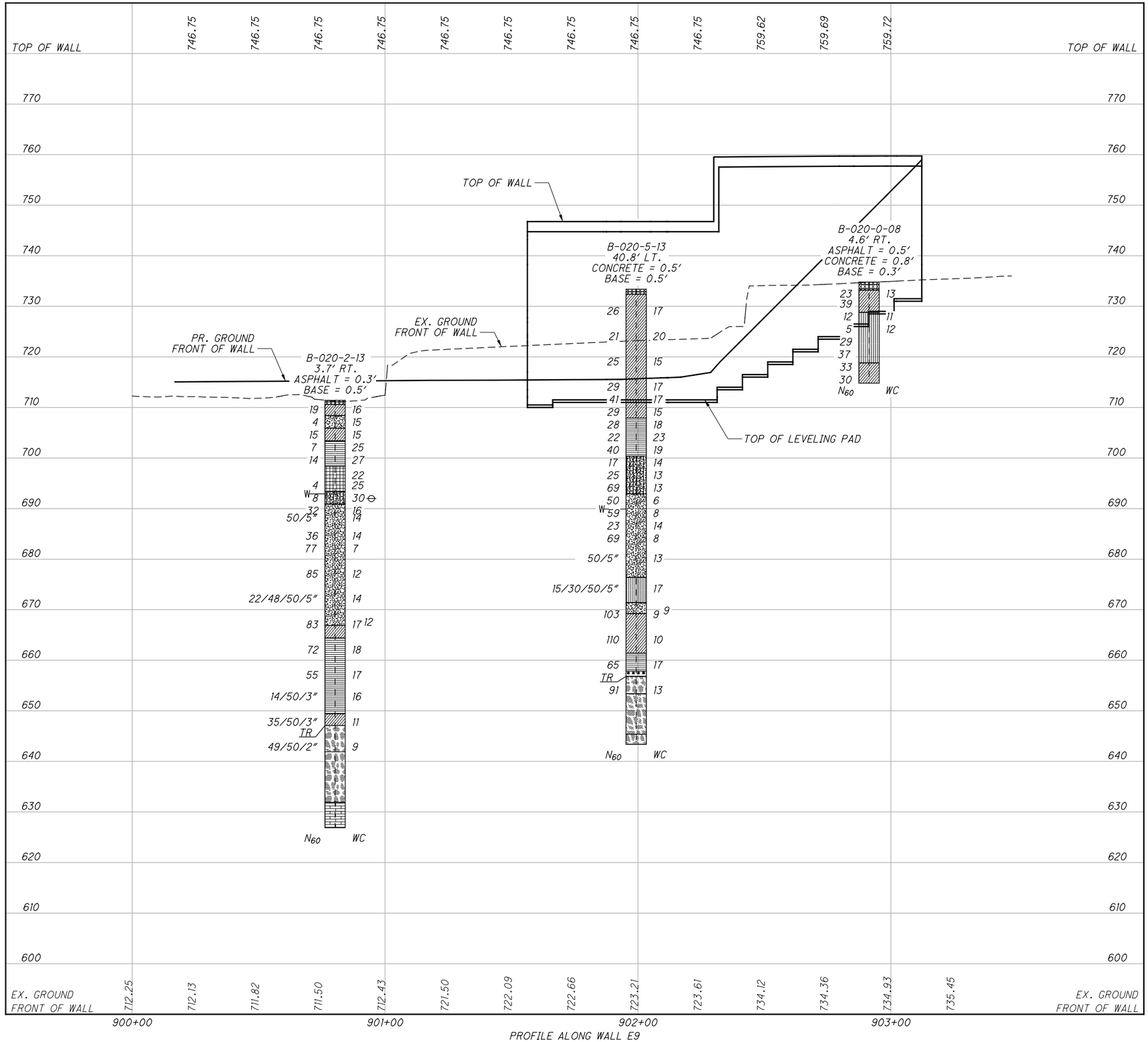
220496

1

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP052.dgn 12/27/2018 10:22:49 AM rachelm



	22/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL E9	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



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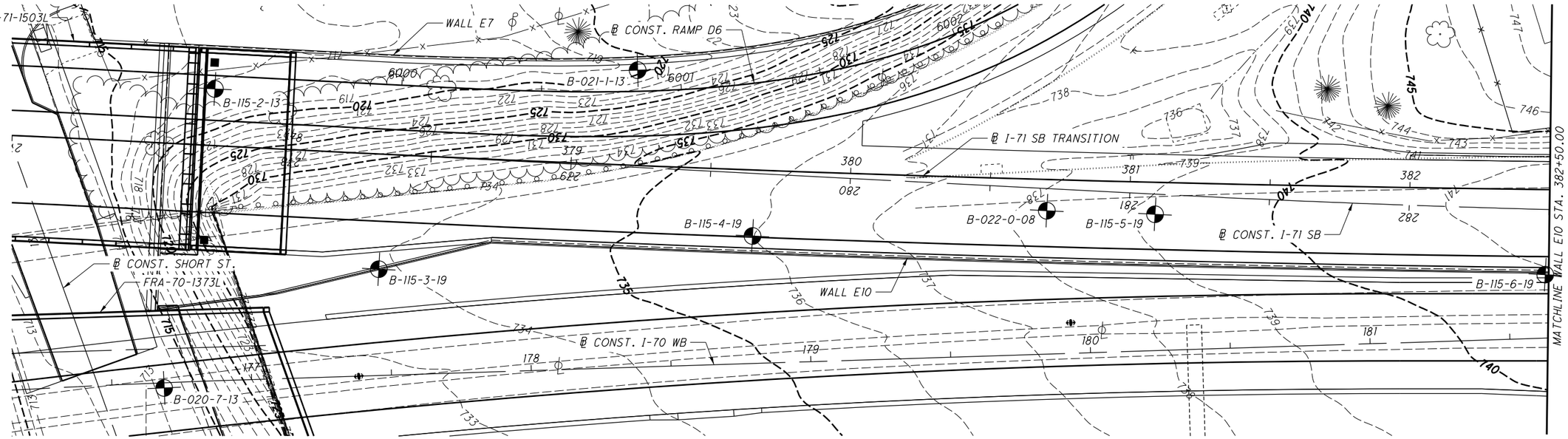
HORIZONTAL SCALE IN FEET
0 10 20 40

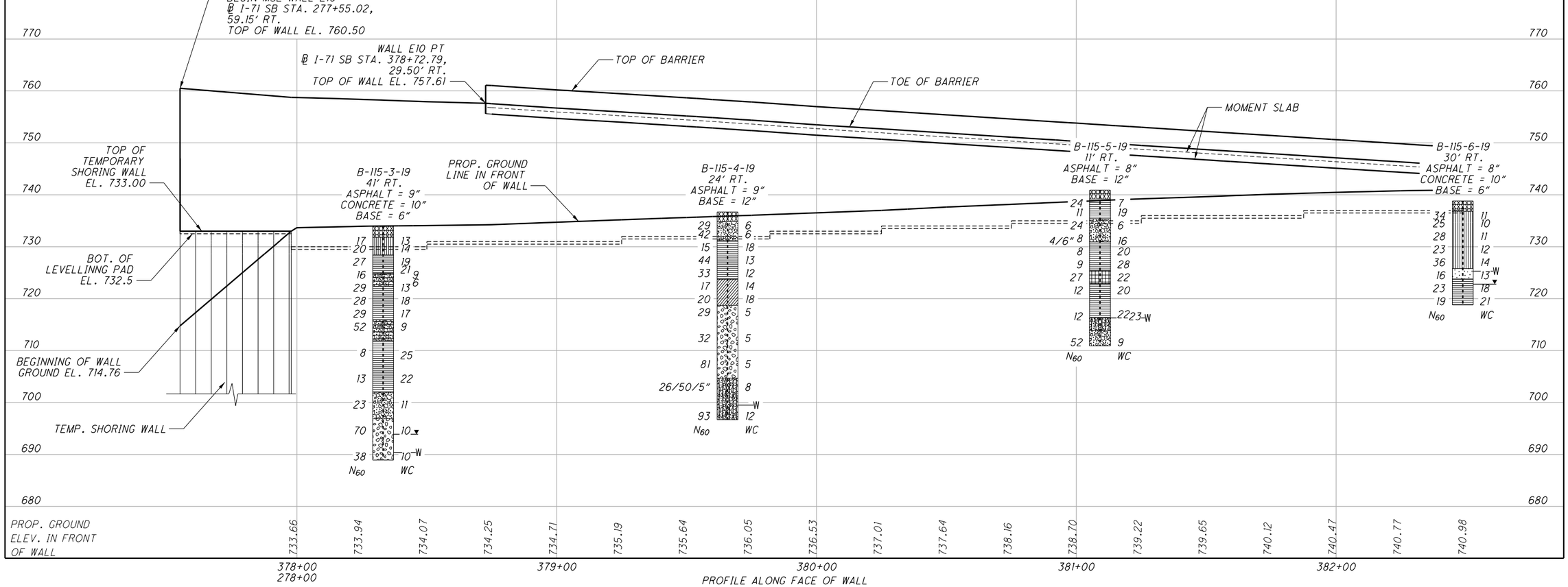
DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL E9

FRA-70-13.10

222/496





HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

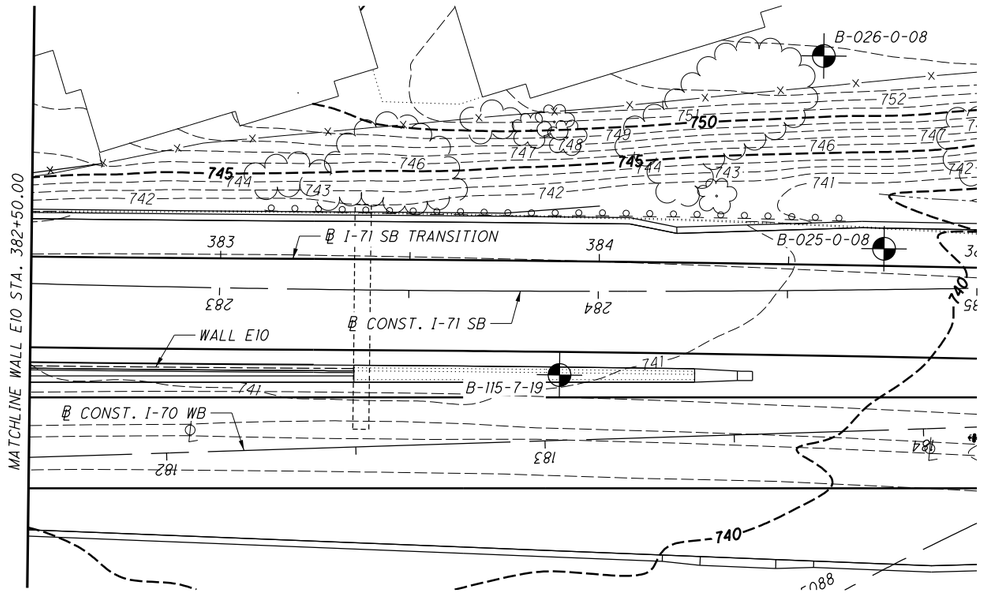
STRUCTURE FOUNDATION EXPLORATION WALL E10

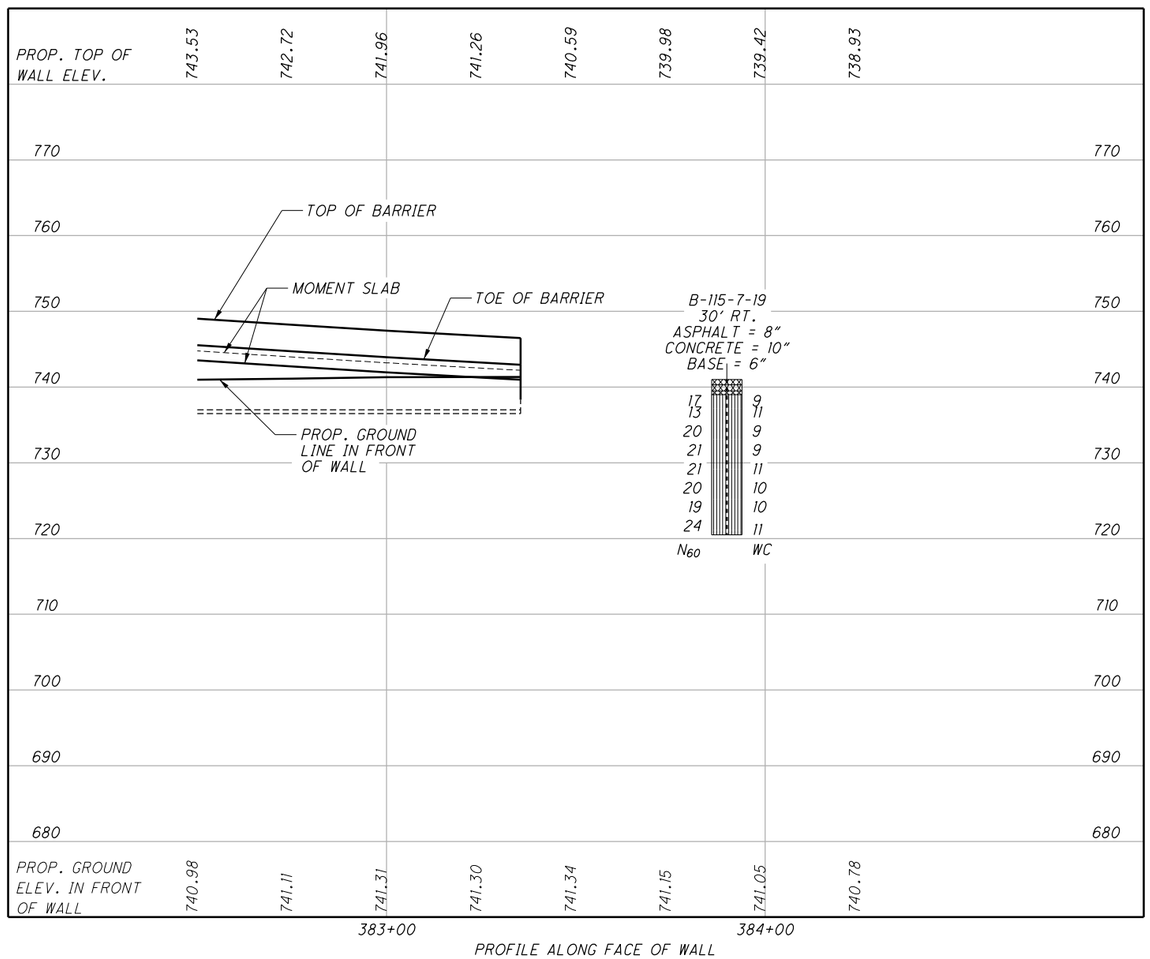
FRA-70-13.10

22224496

1

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP071.dgn 4/6/2020 8:07:30 AM rachelm





PROFILE ALONG FACE OF WALL

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION WALL E10

FRA-70-13.10

222B496

1

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP072.dgn 4/6/2020 9:42:31 AM rachelm

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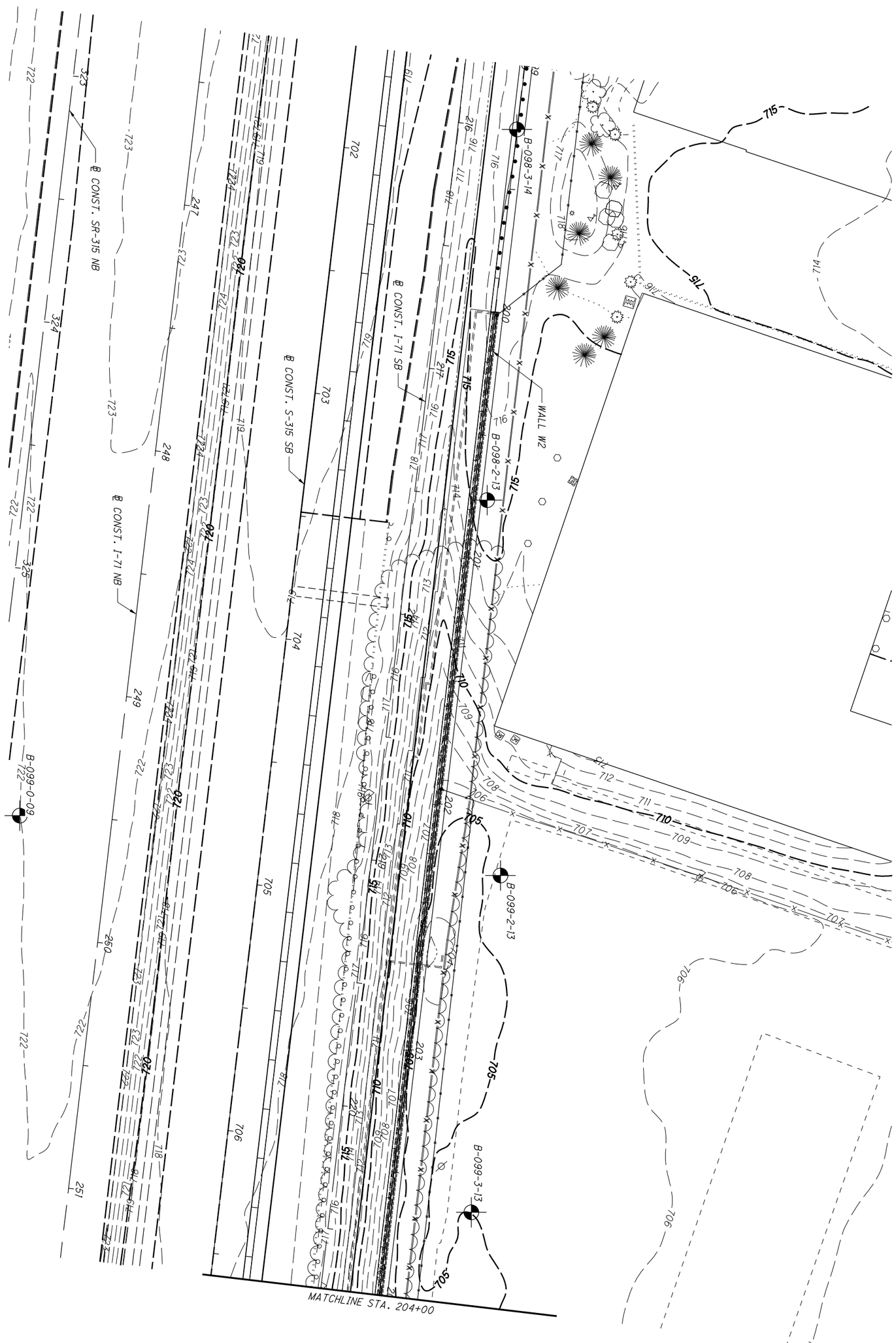
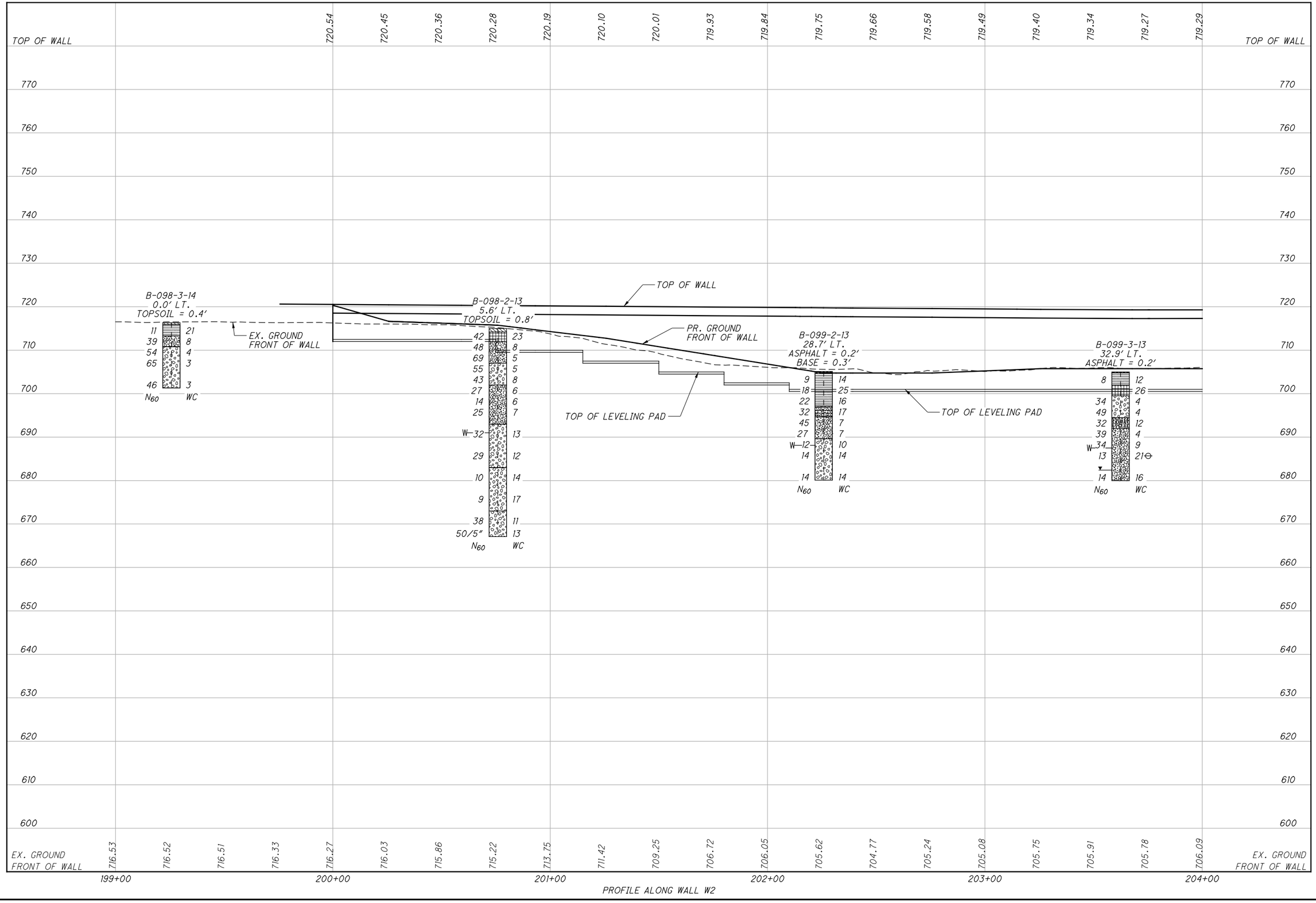


	223/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL W2 STA. 199+00 TO STA. 204+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



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HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL W2 STA. 199+00 TO STA. 204+00

FRA-70-13.10

224/496

	225/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL W2 STA. 204+00 TO STA. 209+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\89464ZP058.dgn 12/27/2018 10:24:33 AM rachelm

TOP OF WALL 719.29 719.31 719.42 719.54 719.74 719.95 720.24 720.53 720.91 721.29 721.70 722.11 722.60 723.09 723.72 724.35 725.09 725.83 726.67 727.51 728.50 TOP OF WALL

770 760 750 740 730 720 710 700 690 680 670 660 650 640 630 620 610 600

TOP OF WALL

TOP OF LEVELING PAD

PR. GROUND FRONT OF WALL

EX. GROUND FRONT OF WALL

B-099-1-09
40.1' LT
TOPSOIL = 0.5'

9	10
18	9
11	7
10	6
27	5
N_{60}	WC

B-099-5-14
45.8' LT.
GRAVEL AND ASPHALT = 0.7'

19	15
17	16
25	13
23	8
13	7
19	12
W 32	9
14	8
▼ 17	14
35	13
N_{60}	WC

B-100-1-14
28.7' LT.
TOPSOIL = 0.2'

16	23
31	5
22	6
28	5
19	2
48	6
70	4
W 41	7
62	9
19	19 ⊖
21	17
23	13
97	11 21 ⊖
N_{60}	WC

B-100-3-14
26.4' LT.
TOPSOIL = 0.3'

16	16
58	3
47	5
36	3
50/2" 63	3 3
37/50/5"	3
42/50/5"	6 W
▼ 21	11
21	22 ⊖
N_{60}	WC

EX. GROUND FRONT OF WALL 706.09 706.18 705.48 705.90 705.86 706.05 705.96 706.02 705.71 706.08 705.83 706.18 705.88 705.64 705.62 705.99 705.99 706.03 706.28 706.66 706.63 EX. GROUND FRONT OF WALL

204+00 205+00 206+00 207+00 208+00 209+00

PROFILE ALONG WALL W2

0 10 20 40 HORIZONTAL SCALE IN FEET

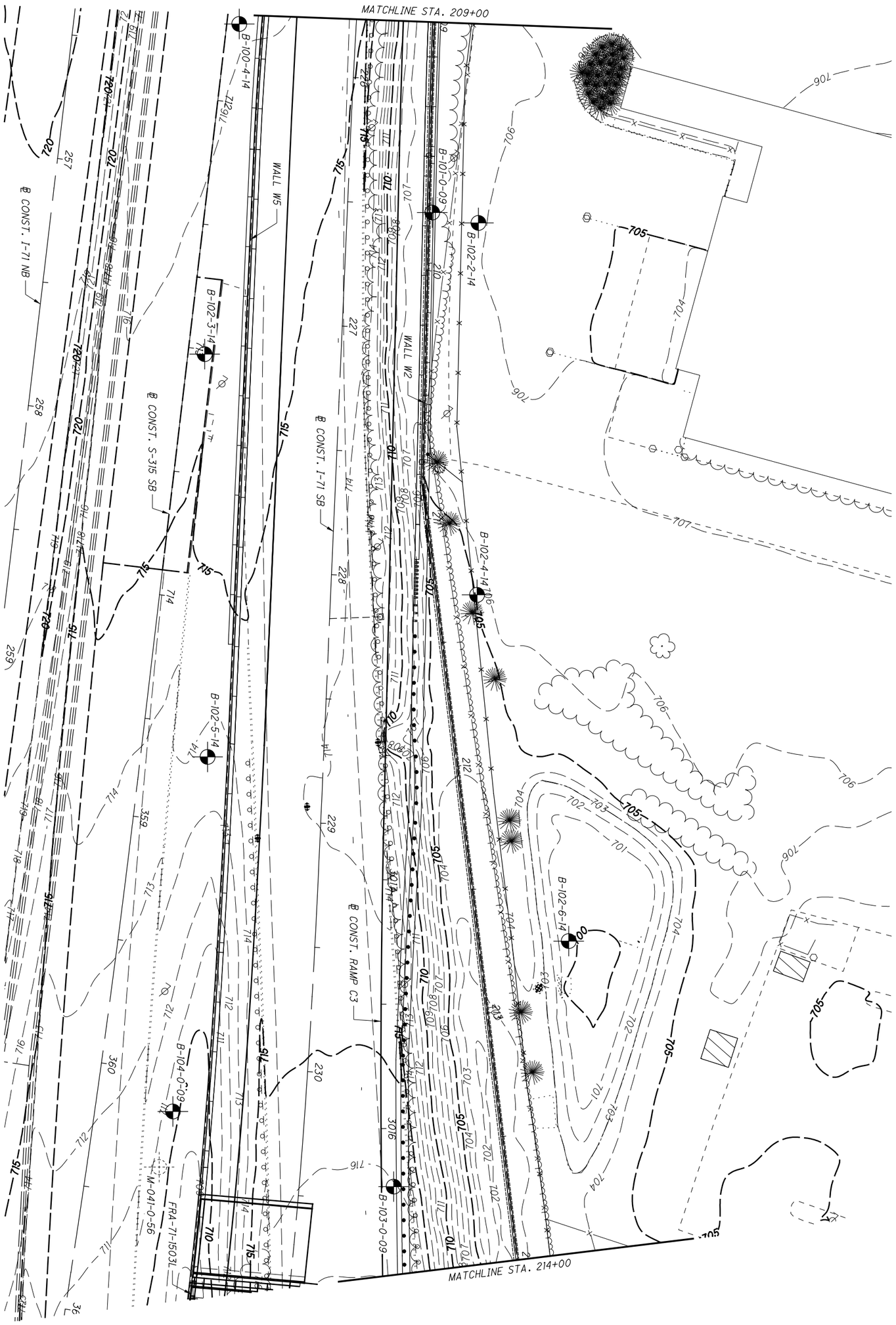
DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL W2 STA. 204+00 TO STA. 209+00

FRA-70-13.10

226/496

1

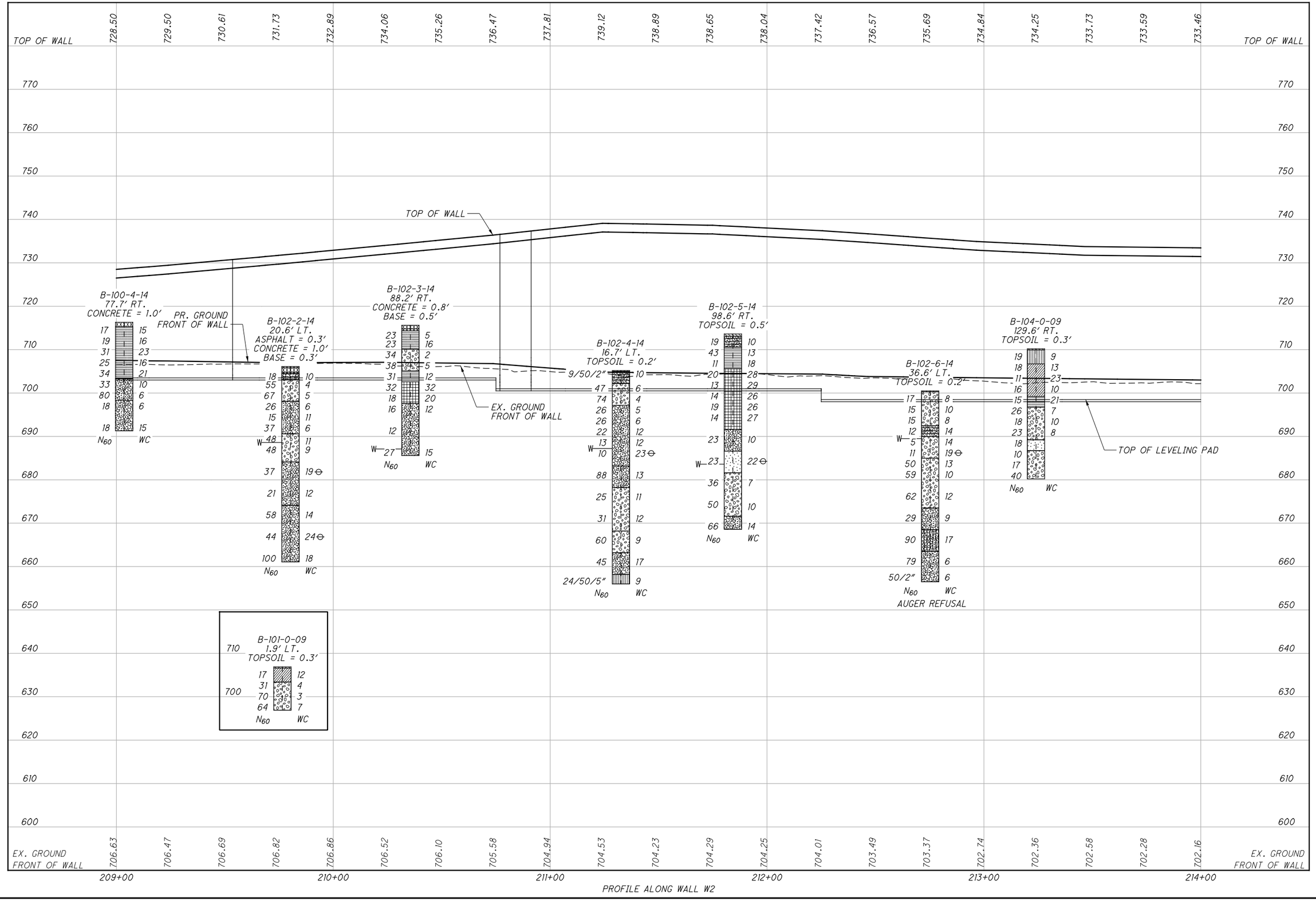


FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
WALL W2 STA. 209+00 TO STA. 214+00

DRAWN RRM
CHECKED BRT

0 10 20 40
HORIZONTAL SCALE IN FEET



0 10 20 40
HORIZONTAL SCALE IN FEET

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL W2 STA. 209+00 TO STA. 214+00

FRA-70-13.10

228/496

1

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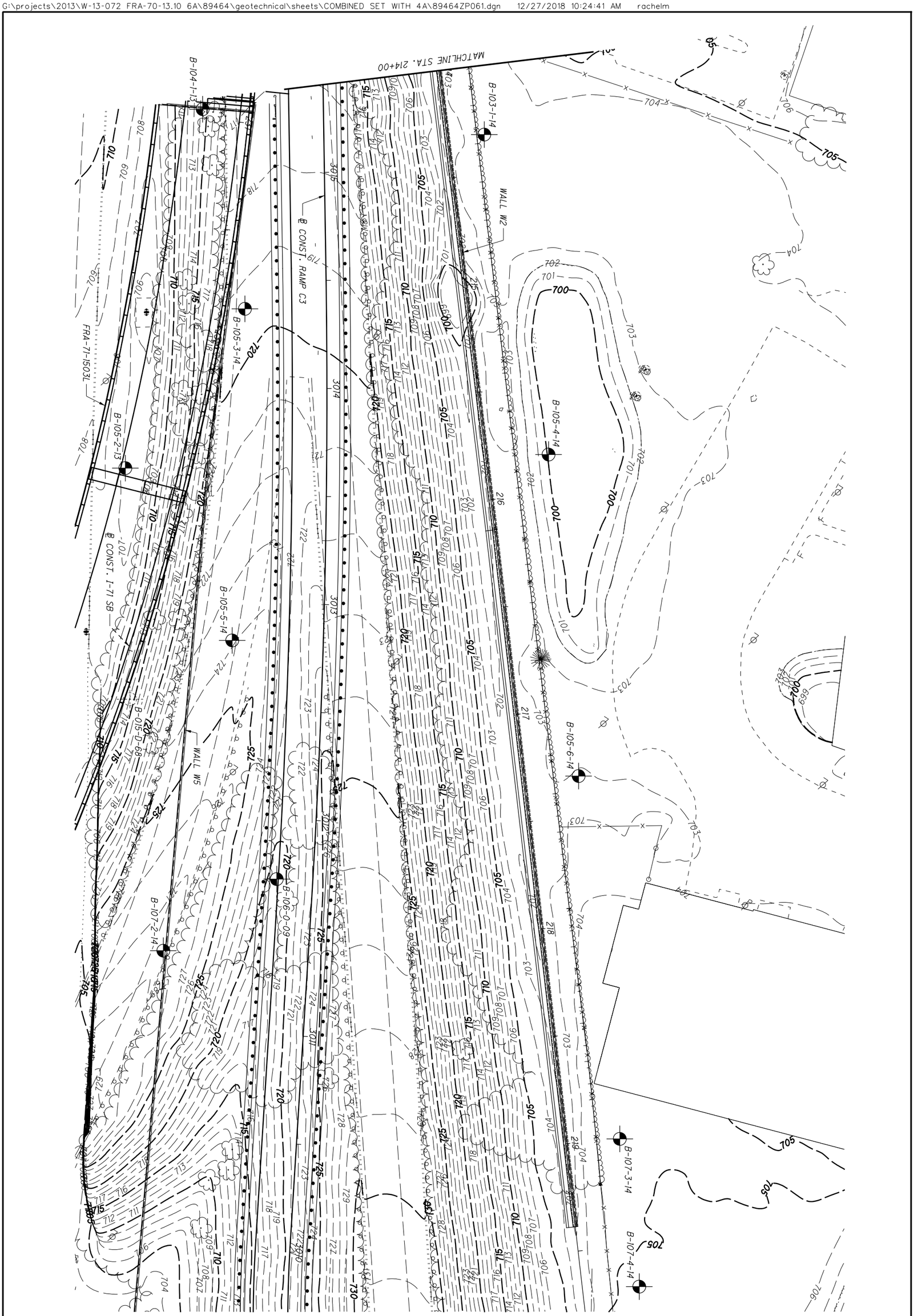
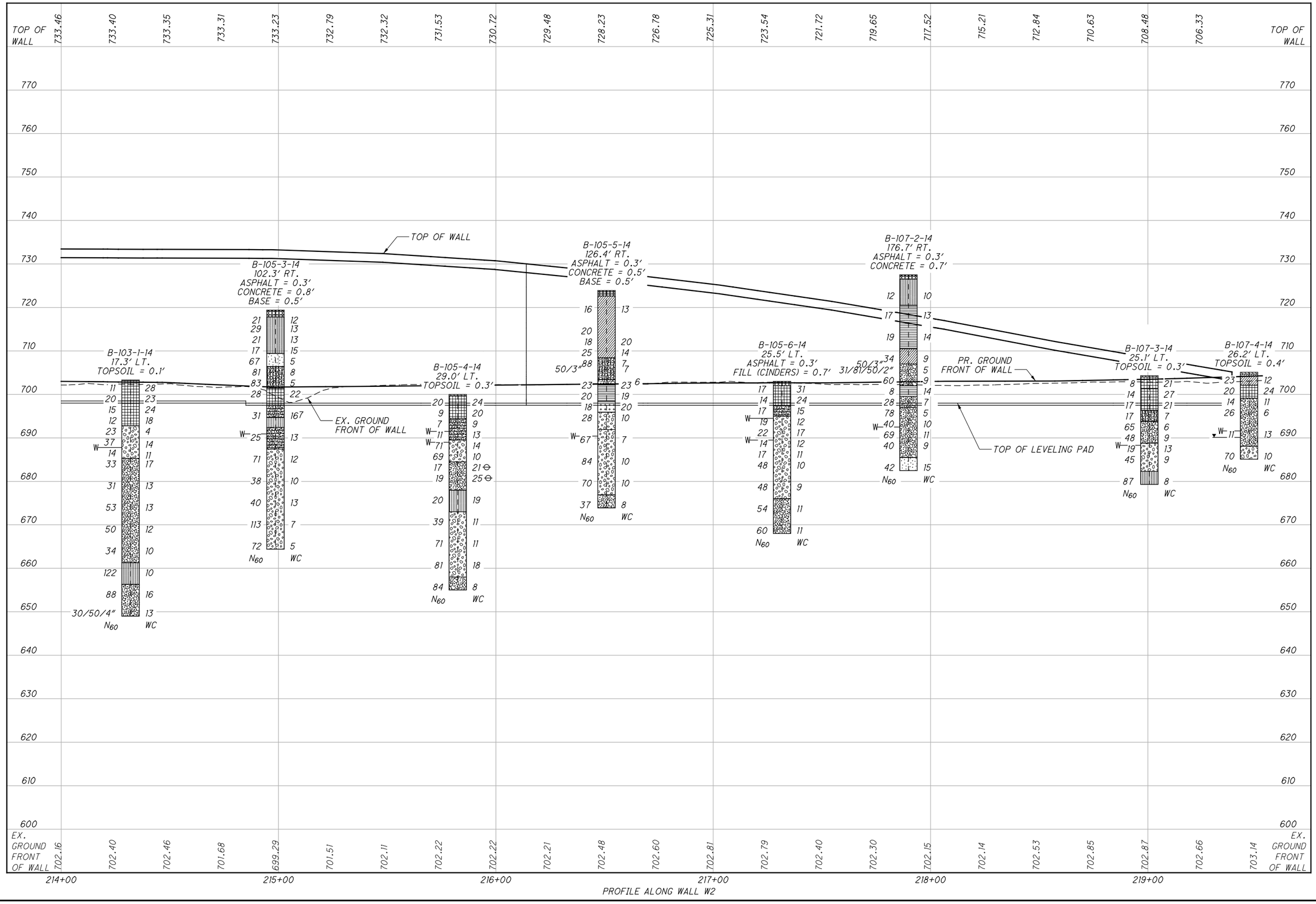


	223496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL W2 STA. 214+00 TO STA. 219+50	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



0 10 20 40
HORIZONTAL SCALE IN FEET

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL W2 STA. 214+00 TO STA. 219+50

FRA-70-13.10

230496

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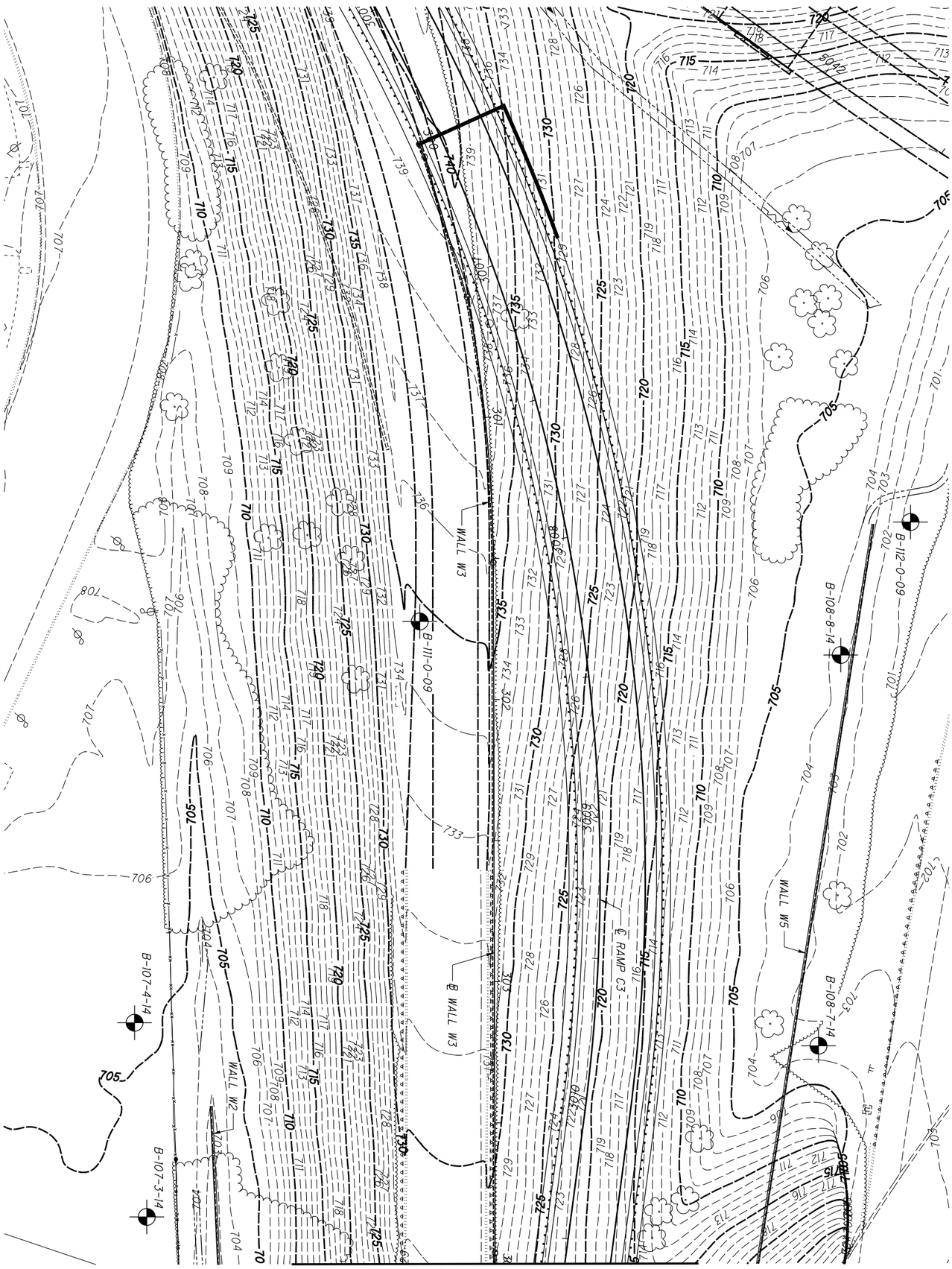
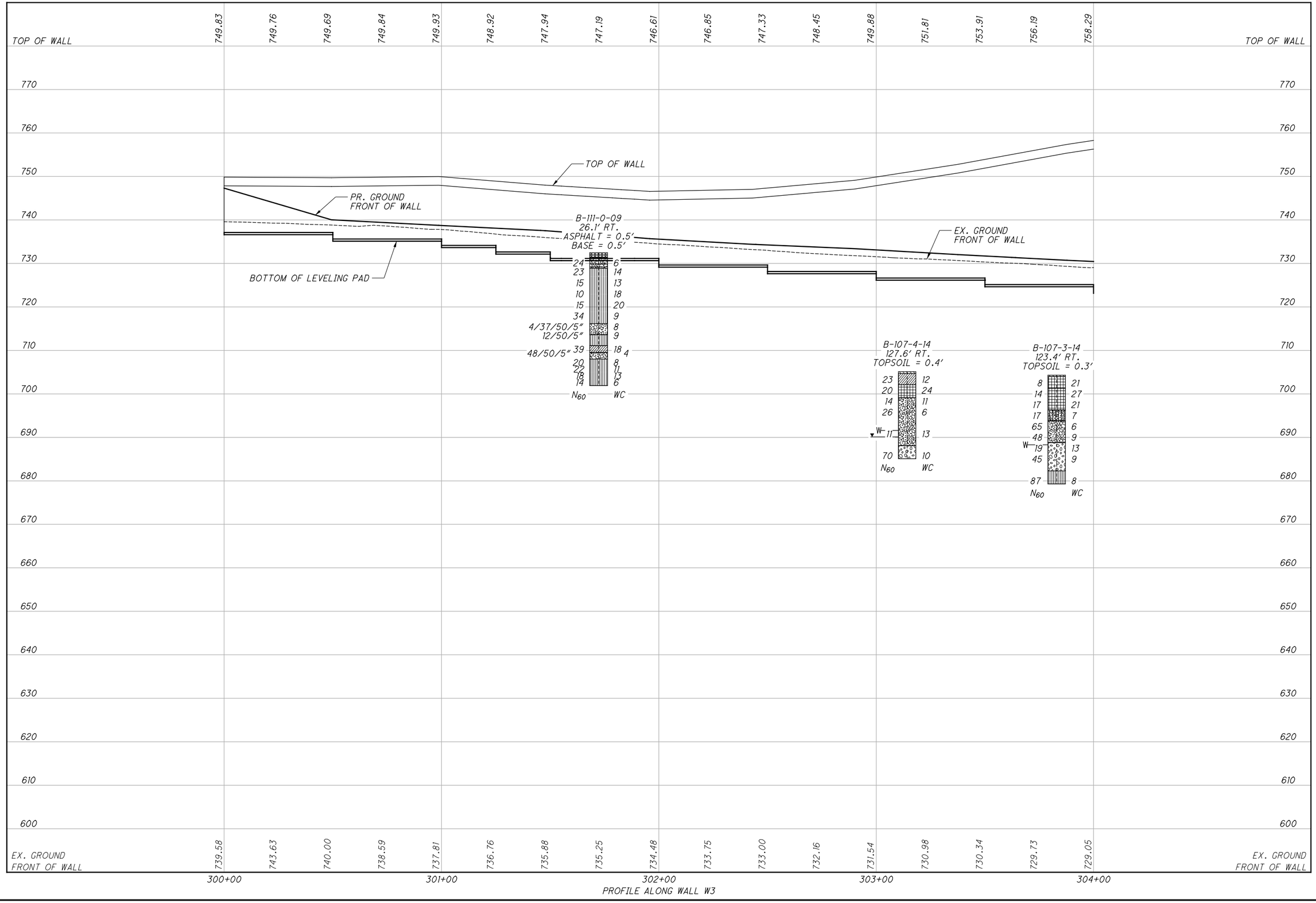


230/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL W3 STA. 300+00 TO STA. 304+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	



PROFILE ALONG WALL W3

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL W3 STA. 300+00 TO STA. 304+00

FRA-70-13.10

2308496

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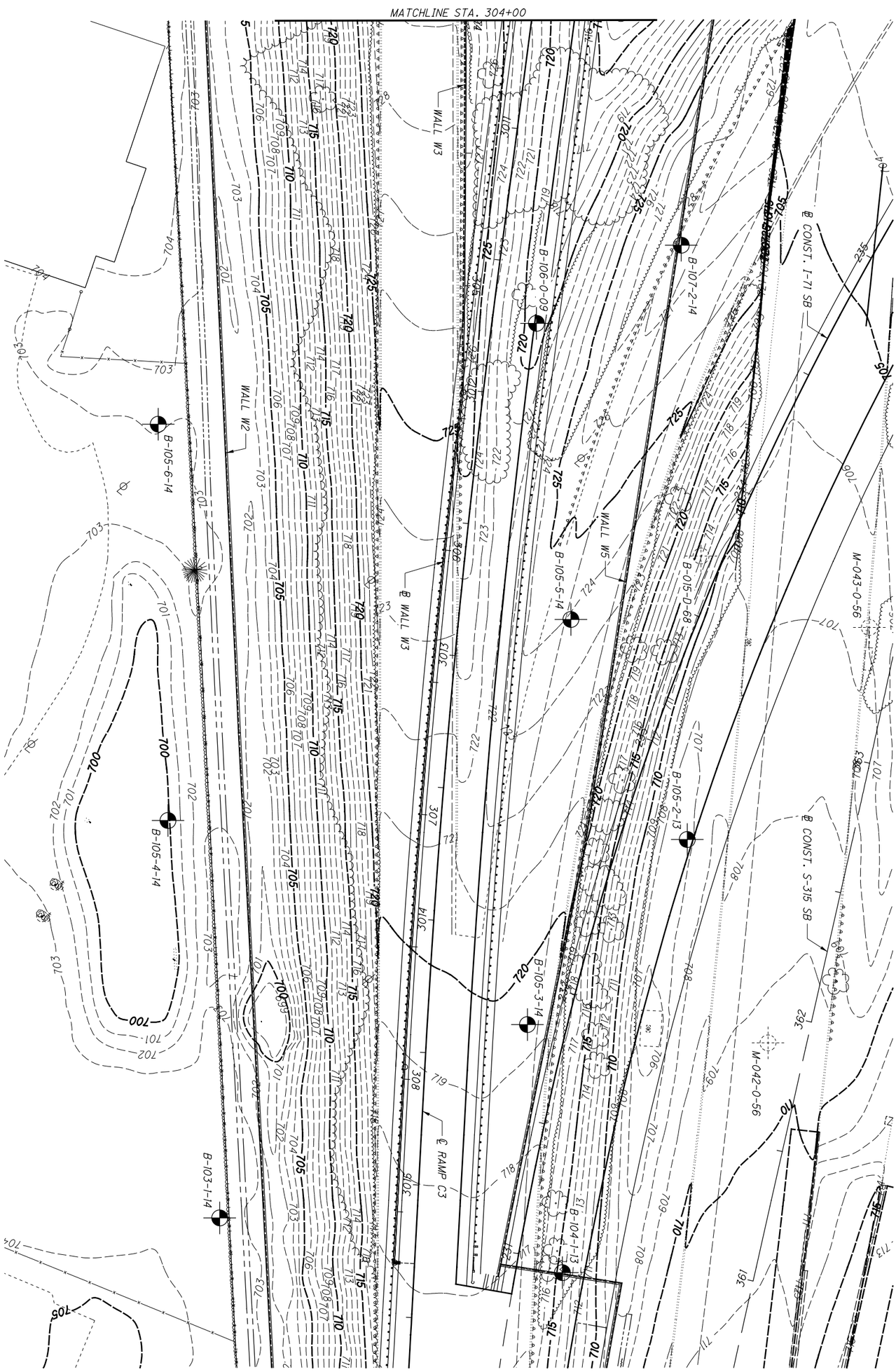
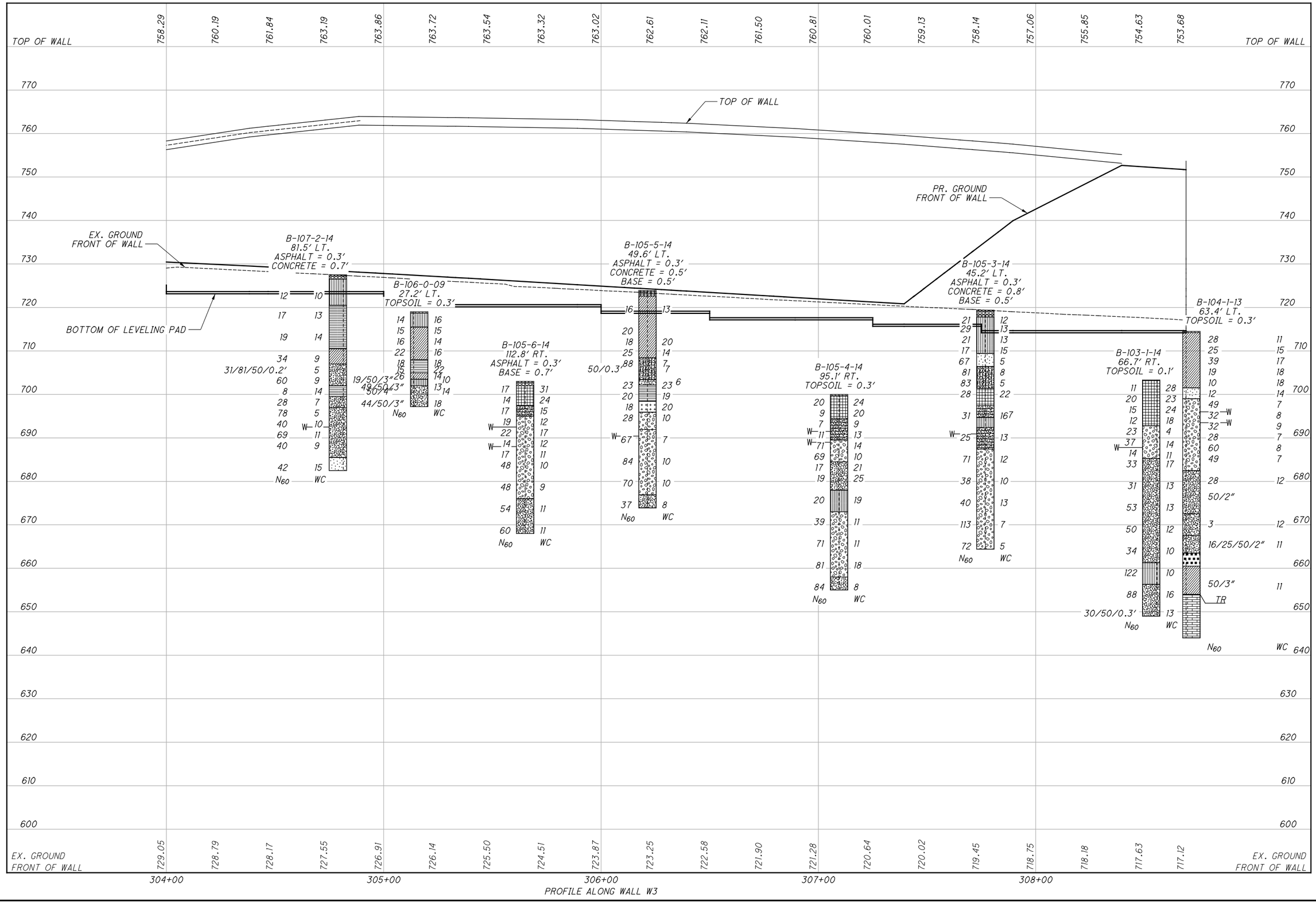


23049 6	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL W3 STA. 304+00 TO STA. 308+69.19	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL W3 STA. 304+00 TO STA. 308+69.19

FRA-70-13.10

230D496

1

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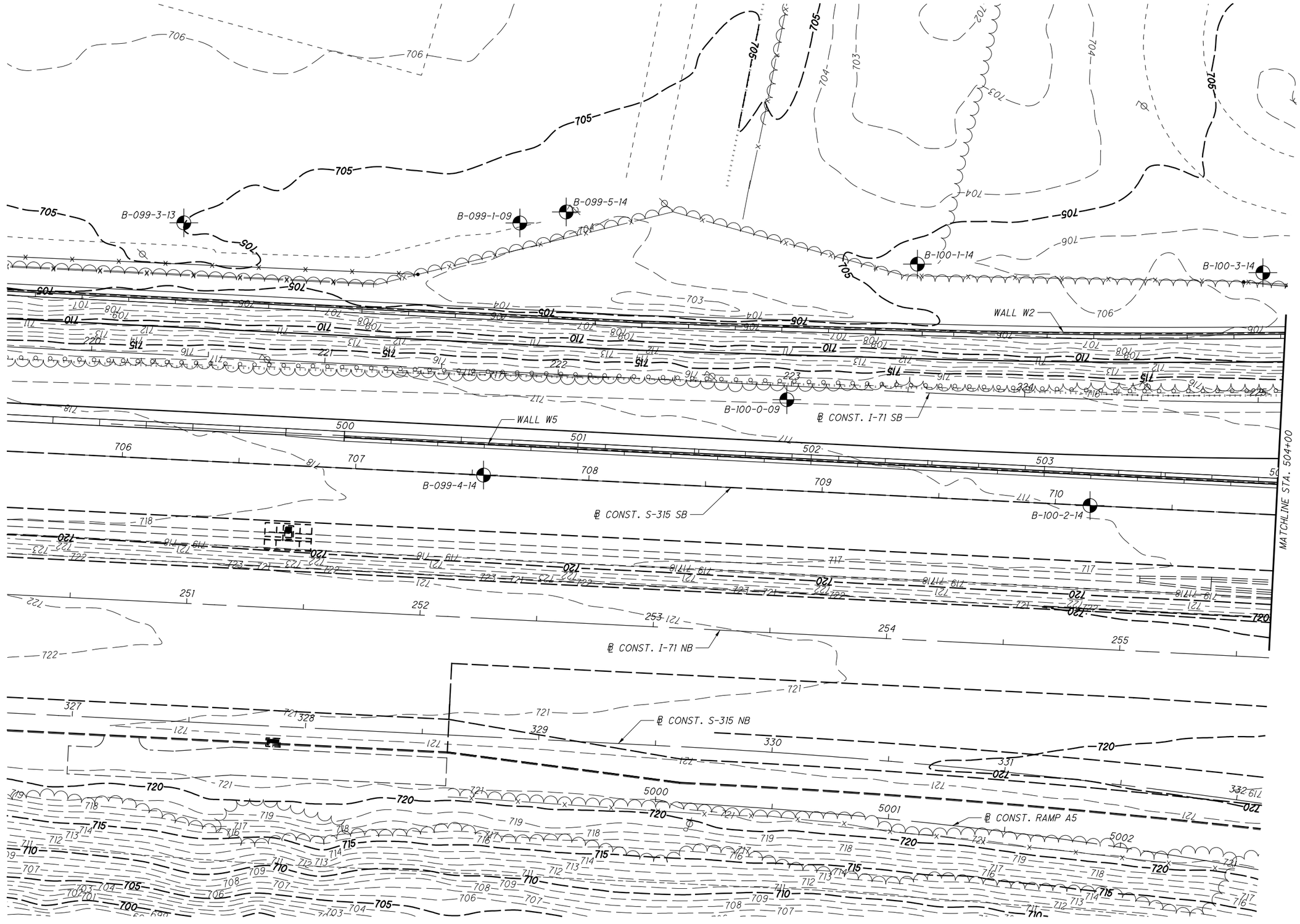

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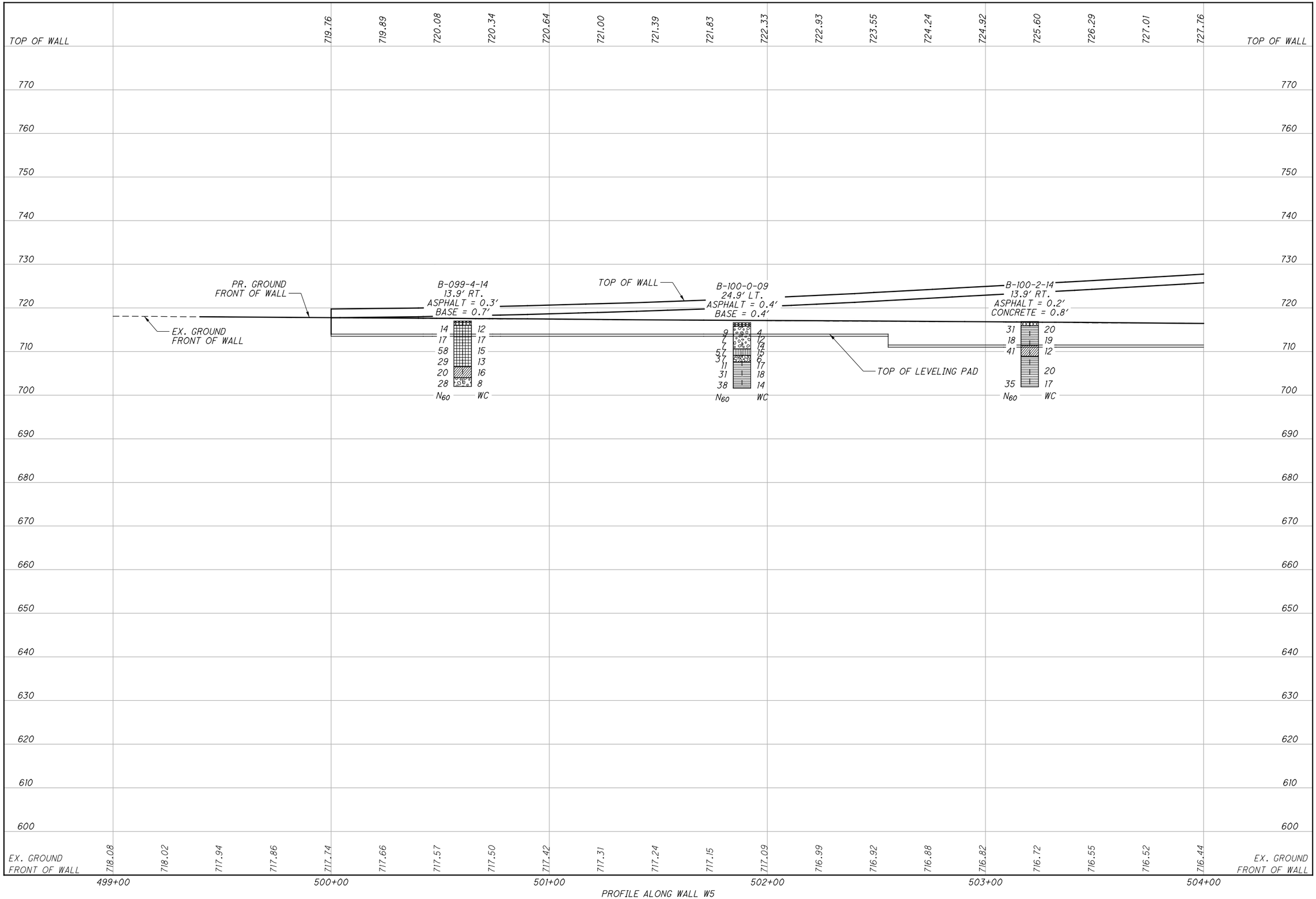
HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL W5 STA. 499+00 TO STA. 504+00

FRA-70-13.10

231 496



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HORIZONTAL SCALE IN FEET
0 10 20 40

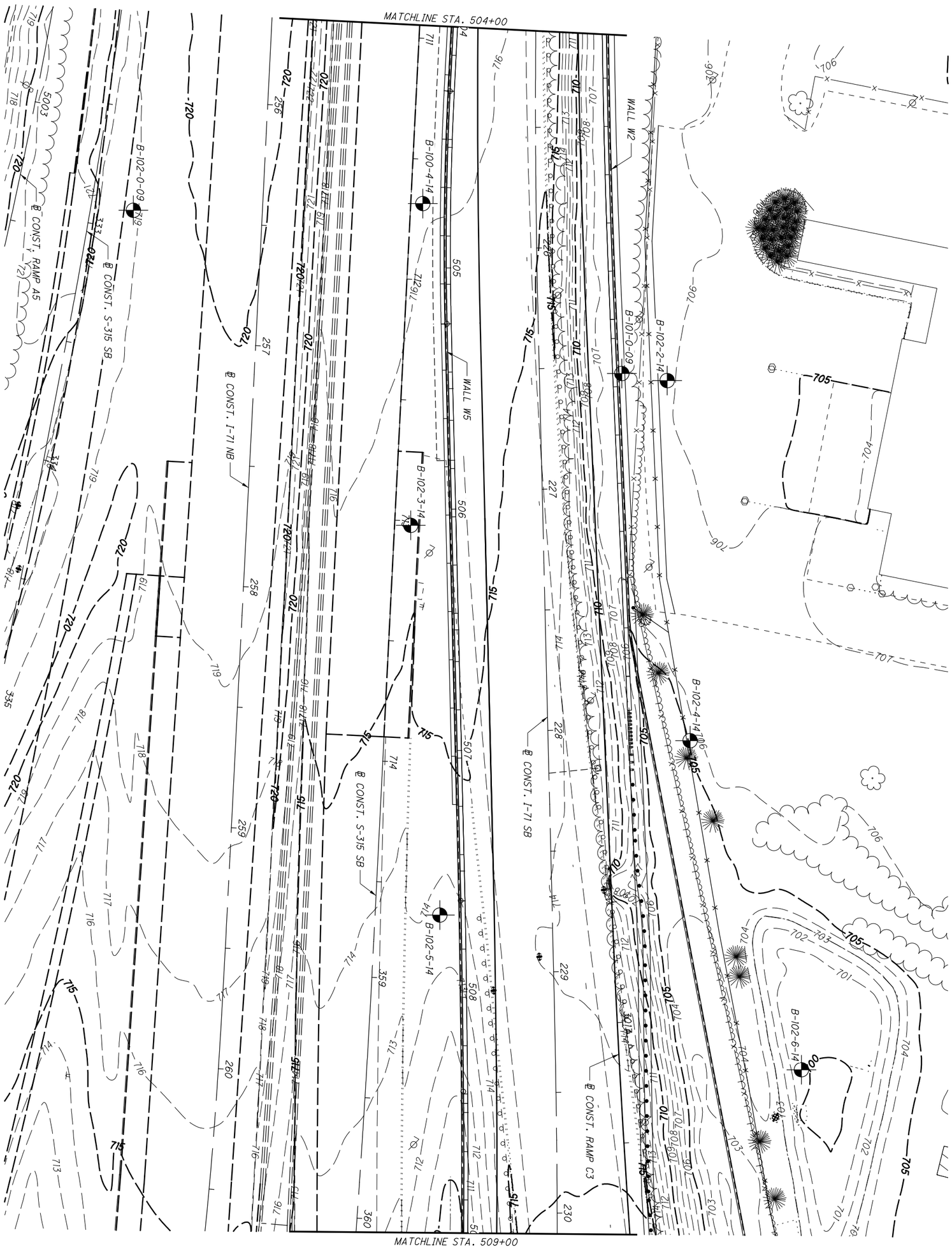
DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL W5 STA. 499+00 TO STA. 504+00

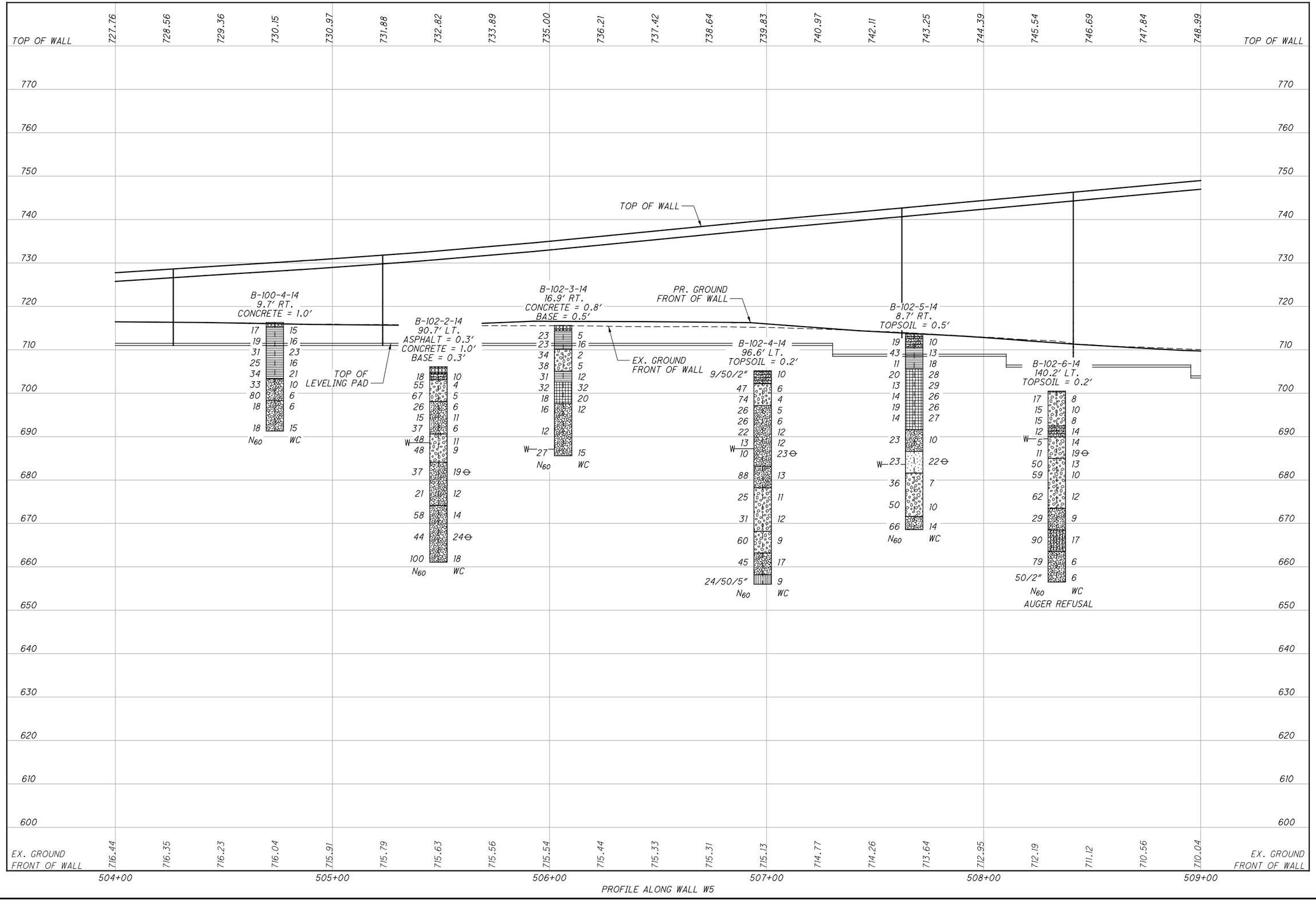
FRA-70-13.10

232/496

1



	233/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL W5 STA. 504+00 TO STA. 509+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL W5 STA. 504+00 TO STA. 509+00

FRA-70-13.10

234/496

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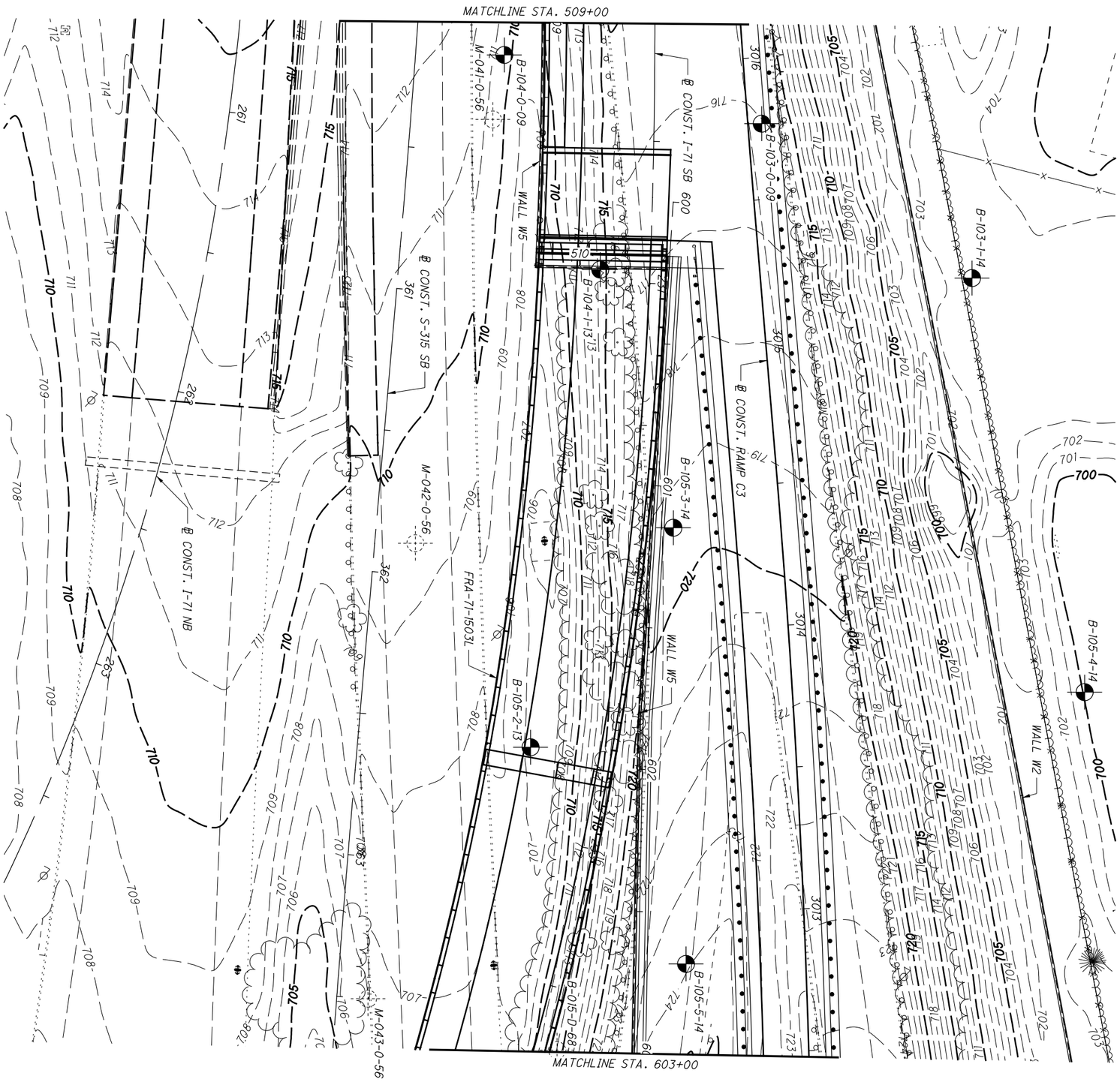
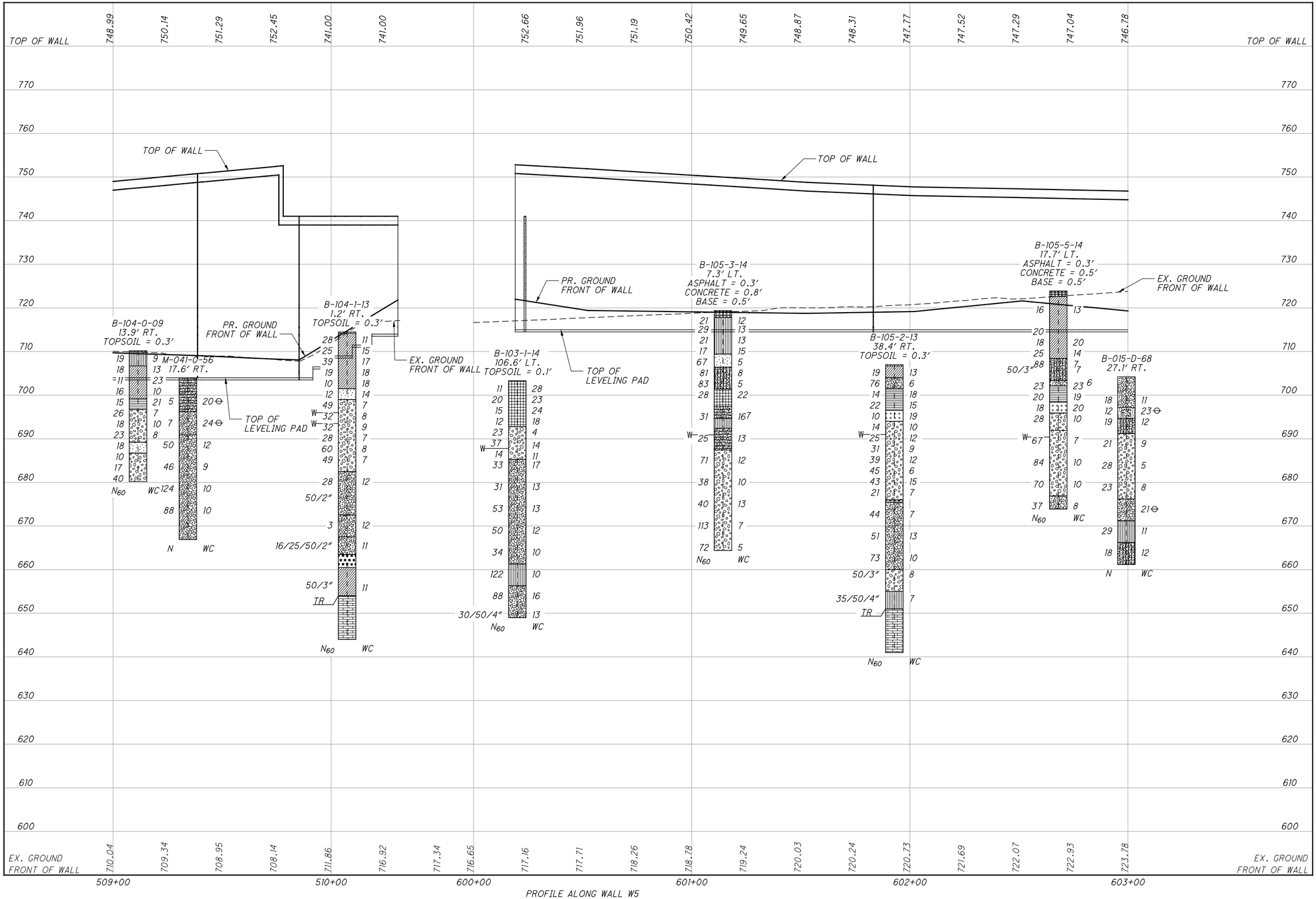


	235/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL W5 STA. 509+00 TO STA. 603+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



PROFILE ALONG WALL W5

0 10 20 40
HORIZONTAL SCALE IN FEET

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL W5 STA. 509+00 TO STA. 603+00

FRA-70-13.10

236/496

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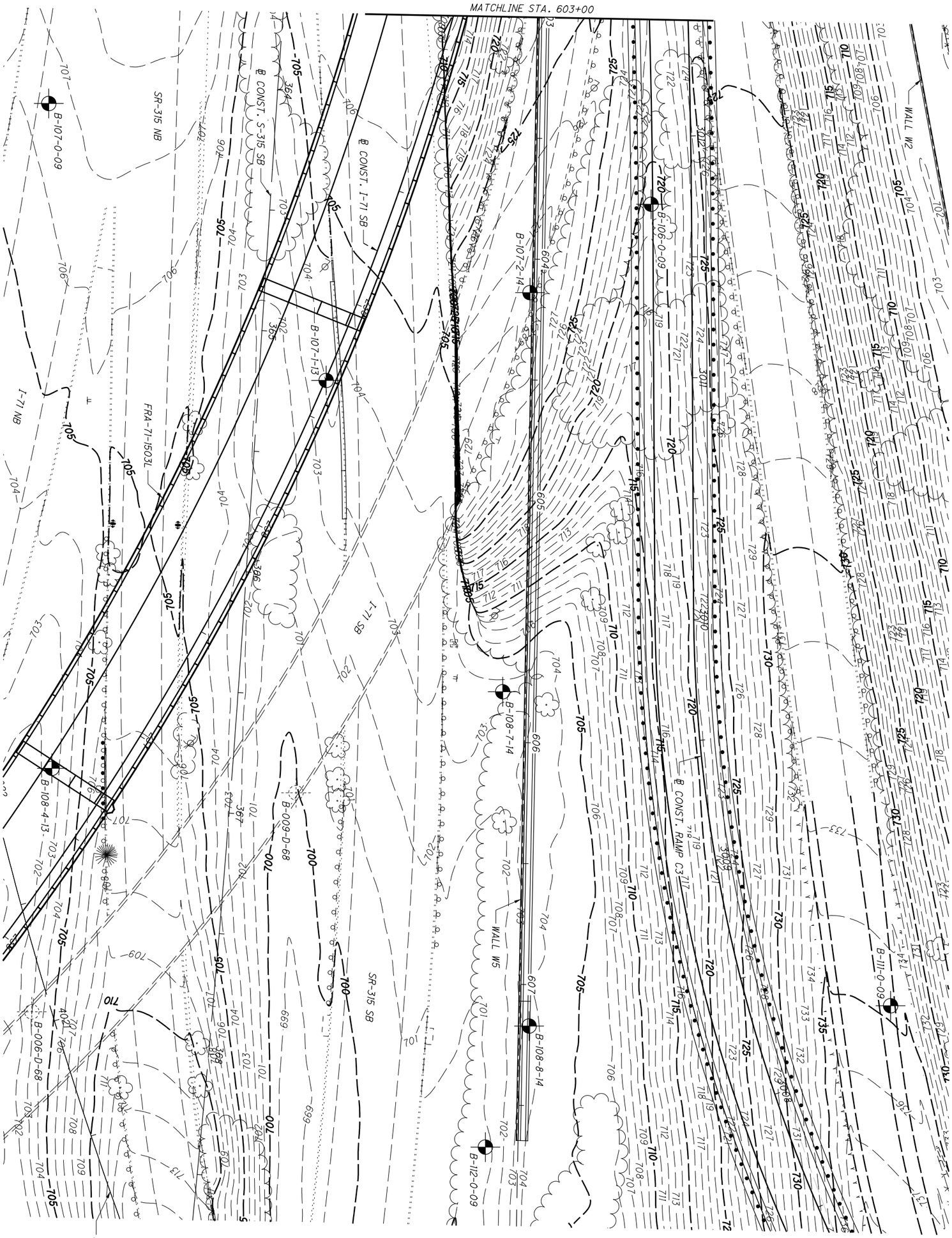
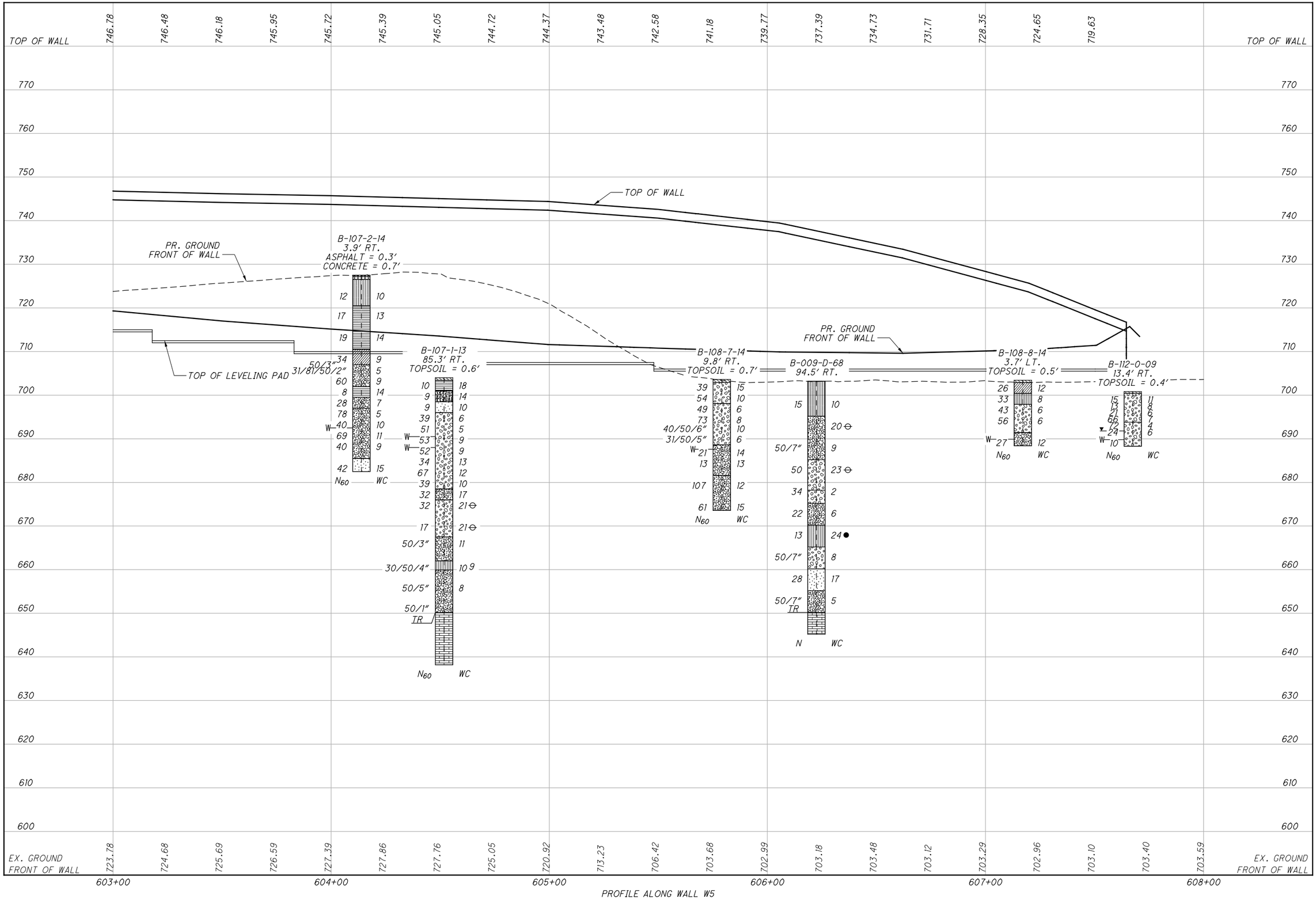


	237/496	FRA-70-13.10	STRUCTURE FOUNDATION EXPLORATION WALL W5 STA. 603+00 TO STA. 608+00	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
WALL W5 STA. 603+00 TO STA. 608+00

FRA-70-13.10

238/496

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23/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION ELECTRICAL RELOCATION	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP401.dgn 12/27/2018 10:49:44 AM rachelm

820 810 800 790 780 770 760 750 740 730 720 710 700 690 680 670 660 650 640

#20 #19 #17

PR. TRANSMISSION TOWER (TYP.)

B-018-8-15
29.8' RT.
TOPSOIL = 6"

17	17
46	5
46	5
40	2
20/25/50/5"	2
46	3
W 33	12
24	11
61	16
57	10 13
59	10
54	16
59	16
50	16
39	11
50/3"	TR
N_{60}	WC

- HEAVING SANDS ENCOUNTERED

AUGER REFUSAL

EX. GRADE

B-018-7-15
39.7' RT.
TOPSOIL = 3"

50/3" 26	2 17
14	8
15	21
20	11
94	20
W 11	16
43	12
49	11
34	18
32	16
38	15
49	17
58	13
50/1"	TR
N_{60}	2 WC

- VOID AT 690.8 TO 692.3
- COBBLES ENCOUNTERED
- HEAVING SANDS ENCOUNTERED

AUGER REFUSAL

EX. GROUND 707.34 707.04 707.43 707.48 708.13 709.12 708.29 708.61 708.86 709.10 709.28 708.92 708.53 708.31 708.40 708.86 709.23 709.27 710.09 709.51 709.73 710.31 711.96 EX. GROUND

200+00 201+00 202+00 203+00 204+00 205+00

PROFILE ALONG ℄ PR. TRANSMISSION TOWERS

0 10 20 40 HORIZONTAL SCALE IN FEET

DRAWN RRM | CHECKED BRT

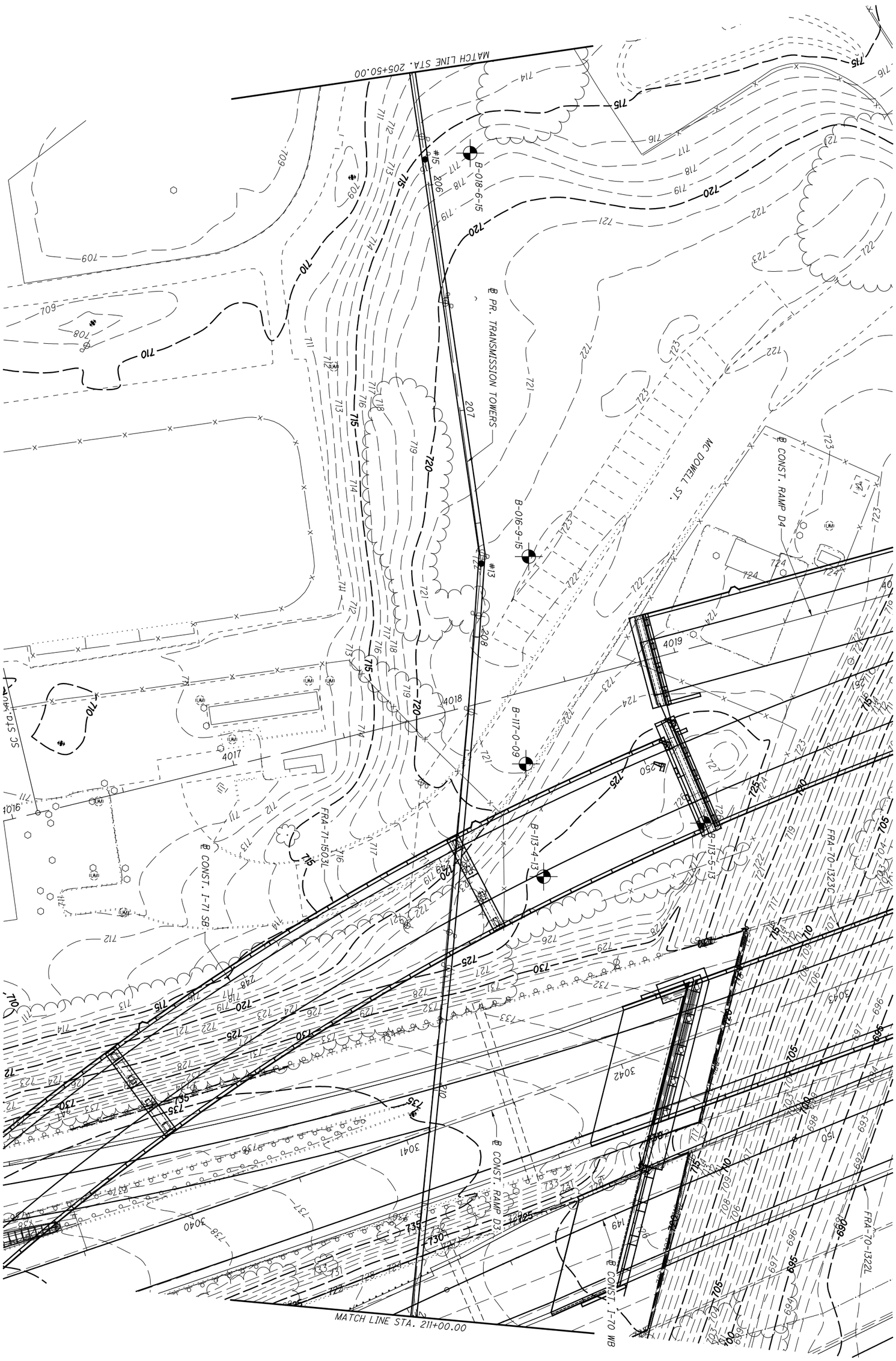
STRUCTURE FOUNDATION EXPLORATION
ELECTRICAL RELOCATION

FRA-70-12.68

240/496

1

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP402.dgn 12/27/2018 10:49:46 AM rachelm



	241/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION ELECTRICAL RELOCATION	DRAWN RRM CHECKED BRT	0 10 20 40 HORIZONTAL SCALE IN FEET

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP403.dgn 12/27/2018 10:49:47 AM rochelm

820
810
800
790
780
770
760
750
740
730
720
710
700
690
680
670
660
650
640

PR. TRANSMISSION TOWER (TYP.)

#15

#13

B-018-6-15
20.0' LT.
TOPSOIL = 0.3'

26	9
20	21
20	10
17	10
8	13
11	20
32	28
35	6
37	5
W-31	9
29	9
28	11
80	13
72	12
34	10
23	17
21/50/1"	16
50/1"	

- COBBLES ENCOUNTERED
- COBBLES ENCOUNTERED
- HEAVING SANDS ENCOUNTERED

N_{60} WC

AUGER REFUSAL

B-016-9-15
21.0' LT.
TOPSOIL = 0.2'

54	6
34	10
54	3
27	8
93	6
73	8
36	8
6	21
39	18
W-49	11
69	8
27	13
31	11
80	17
106	18
71	9
10/25/50/4"	17
30	12
50/1"	6

- COBBLES ENCOUNTERED
- HEAVING SANDS ENCOUNTERED
- HEAVING SANDS ENCOUNTERED
- COBBLES ENCOUNTERED
- HEAVING SANDS ENCOUNTERED

N_{60} WC

AUGER REFUSAL

EX. GRADE

EX. GROUND	711.96	714.17	717.05	719.36	720.16	720.26	720.24	720.54	721.48	722.00	722.10	721.57	721.14	719.81	719.85	723.17	725.91	733.54	734.54	735.37	735.55	723.13	722.91	EX. GROUND

206+00 207+00 208+00 209+00 210+00 211+00

PROFILE ALONG ℄ PR. TRANSMISSION TOWERS

0 10 20 40
HORIZONTAL SCALE IN FEET

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
ELECTRICAL RELOCATION

FRA-70-12.68

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820
810
800
790
780
770
760
750
740
730
720
710
700
690
680
670
660
650
640

PR. TRANSMISSION TOWER (TYP.)

#9

#7

B-016-8-15
14.0' RT.
ASPHALT = 1.2'
BASE = 0.3'

25	12
23	7
8	17
14	10
20	3 8
W- 12	17
17	11
11	20
40	5
W- 17	12
41	16
35	9
41	11
90	14
50/4"	14
33/50/3"	15
N_{60}	WC

- HEAVING SANDS ENCOUNTERED

AUGER REFUSAL

EX. GRADE

B-108-9-15
38.1' RT.
ASPHALT = 0.2'
CONCRETE = 0.8'
BASE = 0.3'

21	8
9	11
12	10
6	26
	22
19	7
23	14
16	22
36	7
28	7
44	8
17	9
W- 47	10
19	15
41	16
39	
31	15
18	11
22	19
50/1"	4
	TR
N_{60}	WC

- BOULDER ENCOUNTERED

EX. GROUND																			EX. GROUND
	722.91	722.51	721.28	721.14	727.30	728.92	729.46	729.64	729.03	726.43	725.78	724.92	723.92	723.64	723.03	722.71	722.52	722.25	721.90	721.87	722.07	722.42	722.74	
211+00					212+00				213+00				214+00				215+00				216+00			

PROFILE ALONG ℄ PR. TRANSMISSION TOWERS

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
ELECTRICAL RELOCATION

FRA-70-12.68

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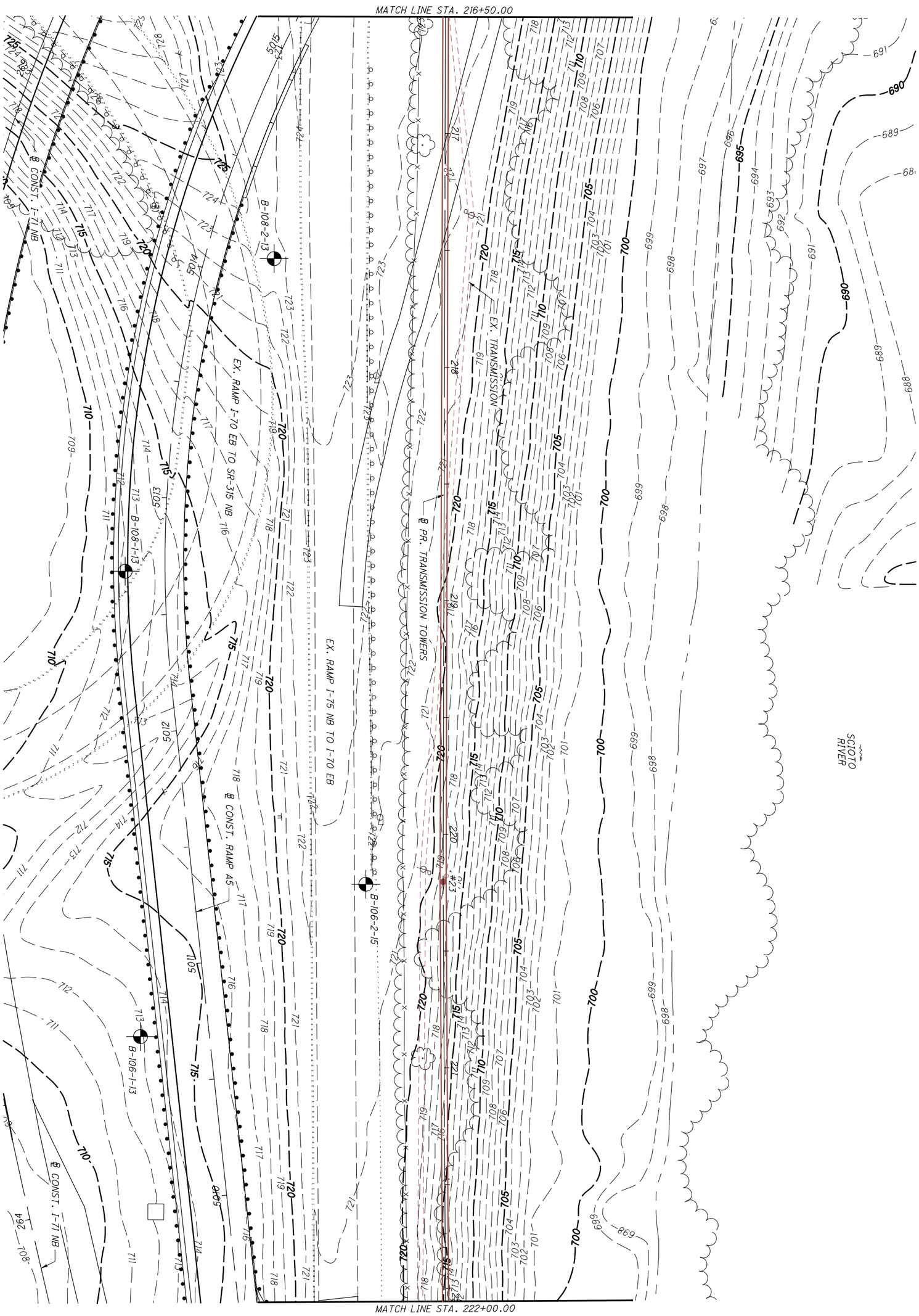
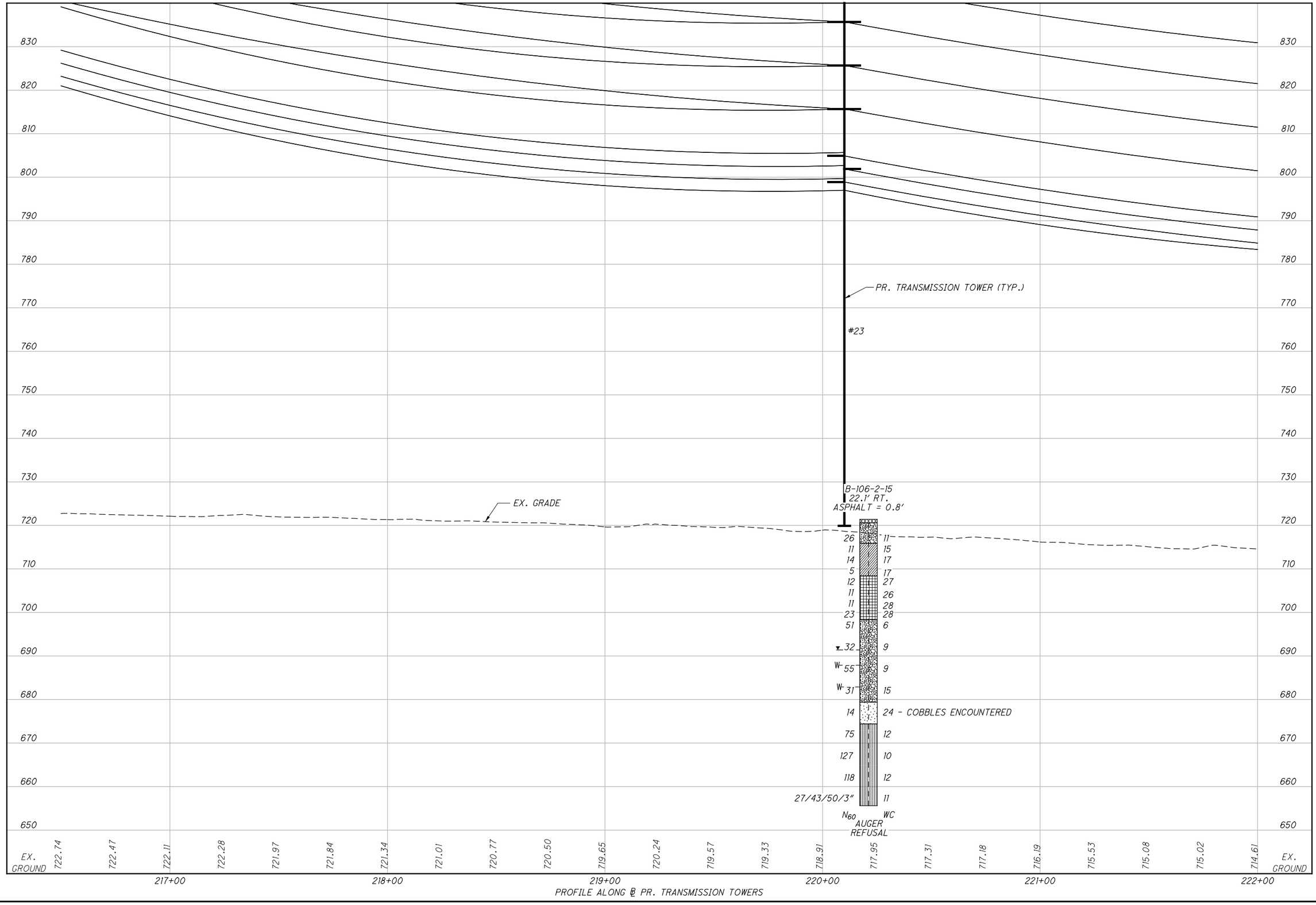


	245/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION ELECTRICAL RELOCATION	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET



PROFILE ALONG ℄ PR. TRANSMISSION TOWERS

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
ELECTRICAL RELOCATION

FRA-70-12.68

246/496

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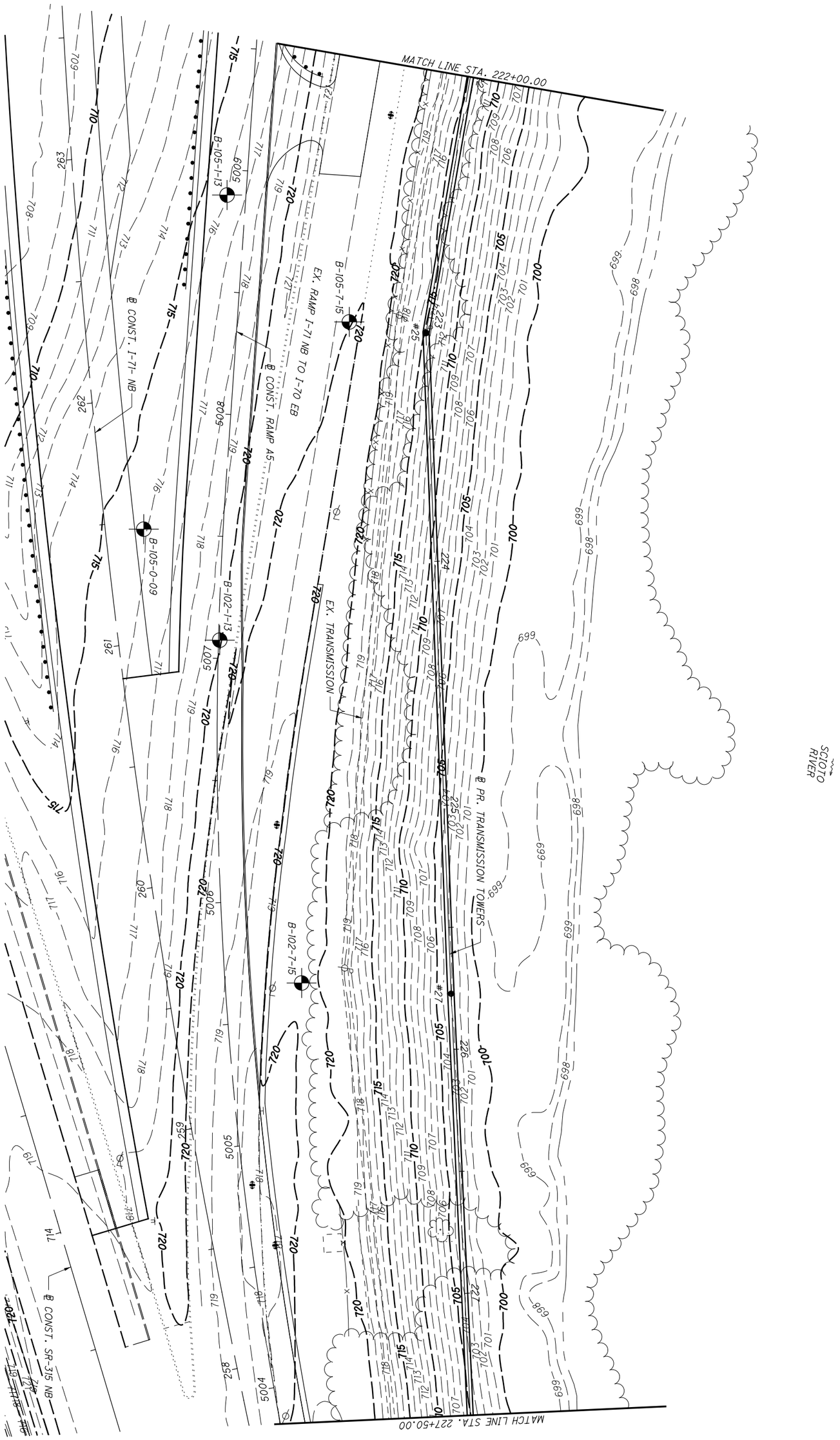
J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZP408.dgn 12/27/2018 10:49:53 AM rachelm



	247/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION ELECTRICAL RELOCATION	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N

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PR. TRANSMISSION TOWER (TYP.)

#25

#27

EX. GRADE

B-105-7-15
19.7' RT.
ASPHALT = 0.8'
BASE = 0.4'

18	8	
12	13	
17	16	
6	28	- LARGE CHUNK OF WOOD IN SAMPLE
46	92	
6	33	
6	36	- MODERATELY ORGANIC (LOI=7.3%)
25	34	
15	31	
75	8	
W- 51	64	
34	17	
35	17	
133	7	
50/6"	9	- COBBLES ENCOUNTERED
37/50/5"	9	
140	8	
50/4"	10	
N_{60}	WC	

AUGER REFUSAL

B-102-7-15
60.9' RT.
TOPSOIL = 0.2'

17	13	
21	13	
6		- COBBLES ENCOUNTERED
6	44	
17	14	
17	9	
17	27	
8	21	
12	13	
W- 8	12	
25	10	
64	12	
46	8	
50/6"	10	- COBBLES THROUGHOUT
121	8	
40/50/3"	10	
135	9	- COBBLES ENCOUNTERED
46	11	
N_{60}	WC	

AUGER REFUSAL

EX. GROUND	714.61	713.87	714.07	714.78	714.85	713.35	711.87	710.54	709.20	707.64	706.37	705.18	704.13	703.41	703.13	703.11	703.07	702.98	703.25	703.03	703.96	704.35	705.08	EX. GROUND

222+00 223+00 224+00 225+00 226+00 227+00

PROFILE ALONG ℄ PR. TRANSMISSION TOWERS

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
ELECTRICAL RELOCATION

FRA-70-12.68

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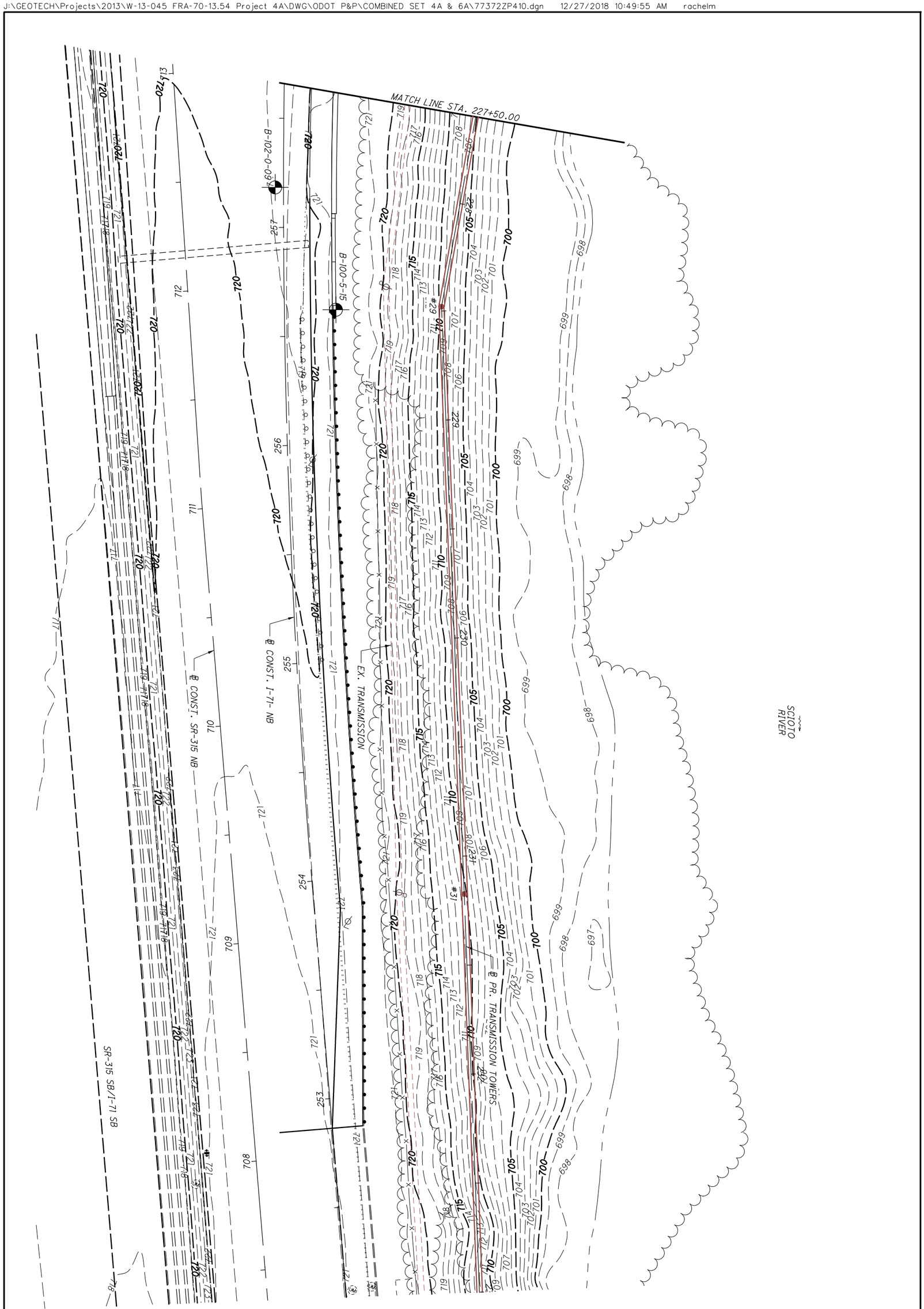

249/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION ELECTRICAL RELOCATION	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET	N

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820
810
800
790
780
770
760
750
740
730
720
710
700
690
680
670
660
650
640

#29

B-100-5-15
48.4' RT.
TOPSOIL = 0.1'

18	13
21	15
17	15
41	11
17	10
25	26
20	28
15	23
23	25
17	21
15	27
W 37	11
20	21
20	20
95	12
47/50/4"	7
112	9
150	7
N_{60}	WC

- COBBLES ENCOUNTERED
- COBBLES ENCOUNTERED
AUGER REFUSAL

EX. GRADE

#31

PR. TRANSMISSION TOWER (TYP.)

EX. GROUND	705.08	705.70	706.93	708.18	709.61	708.76	708.34	708.17	708.29	708.14	708.16	707.94	708.09	708.64	709.57	710.55	710.69	710.42	710.27	710.43	711.11	713.40	712.36	EX. GROUND
	228+00				229+00						230+00				231+00				232+00				233+00	

PROFILE ALONG ℄ PR. TRANSMISSION TOWERS

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
ELECTRICAL RELOCATION

FRA-70-12.68

250/496

1

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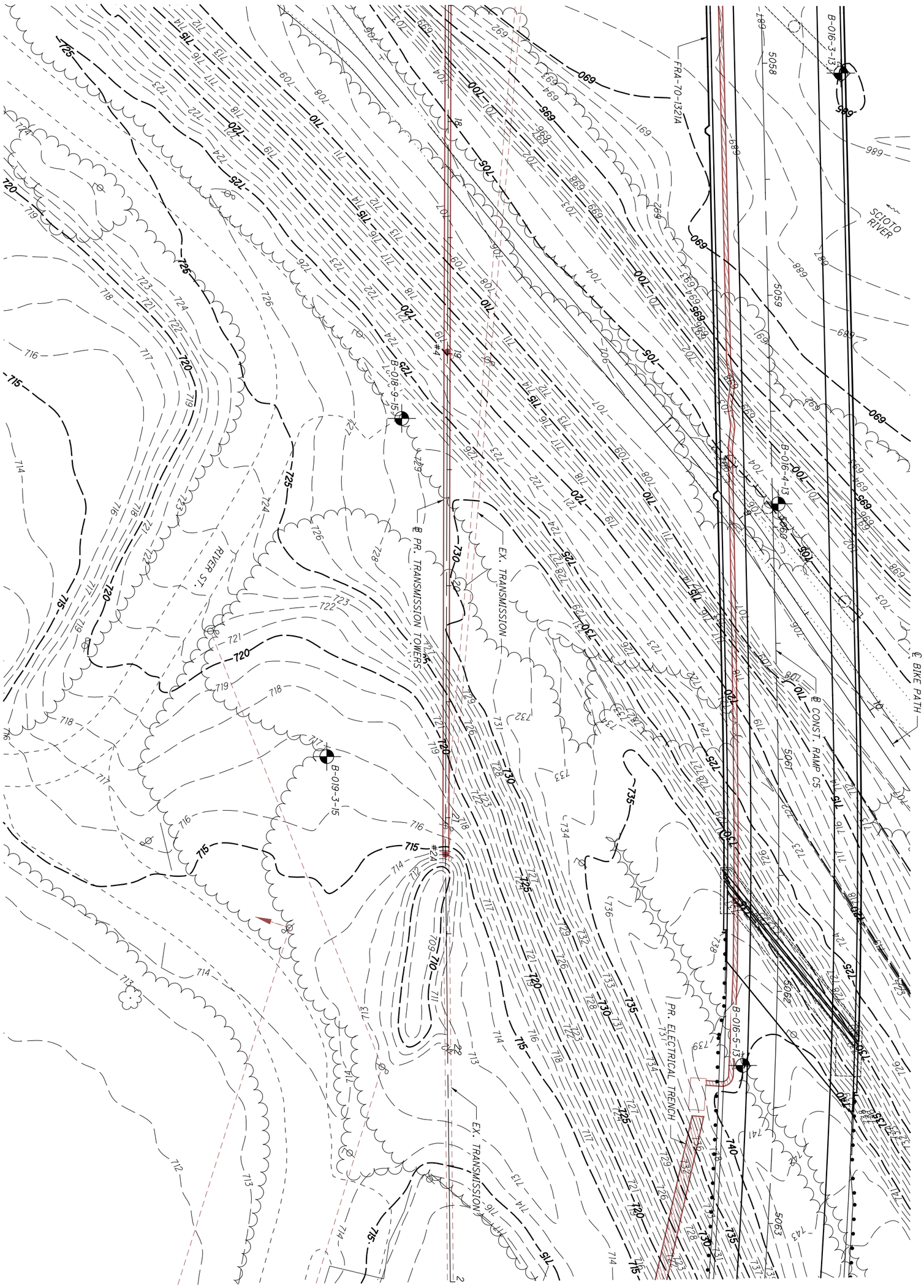

	251/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION ELECTRICAL RELOCATION	DRAWN RRM CHECKED BRT	0 20 10 40 HORIZONTAL SCALE IN FEET

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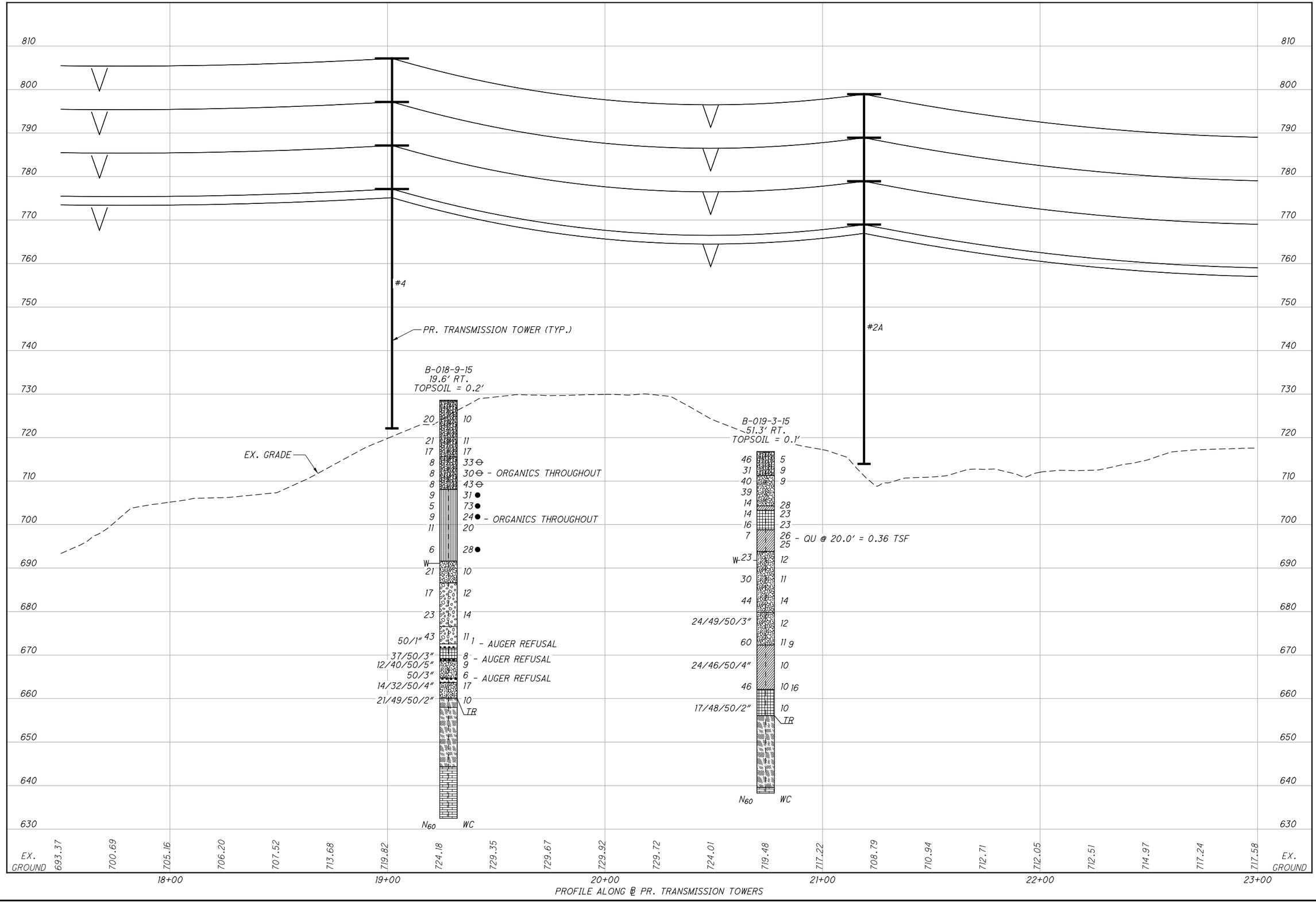

PROFILE ALONG ℄ PR. TRANSMISSION TOWERS

HORIZONTAL SCALE IN FEET
0 10 20 40

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
ELECTRICAL RELOCATION

FRA-70-12.68

1

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / J.K./S.B.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 127+00.32 / 45.0' LT	EXPLORATION ID B-013-1-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D./N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-70 EB	
PID: 77372 BR ID: FRA-70-1282R	DRILLING METHOD: 4.5" CFA / 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 725.9 (MSL) EOB: 35.0 ft.	PAGE 1 OF 1
START: 2/26/15 END: 2/27/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.950158148, -83.021287305	

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)	BACK FILL
0.6' - ASPHALT (7.0")	725.3																	
0.4' - AGGREGATE BASE (5.0")	724.9																	
FILL: HARD, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.	722.9	1	40 16 13	38	67	SS-1	4.5+	-	-	-	-	-	-	-	-	8	A-6a (V)	
FILL: DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.	715.4	4	11 15 16	40	100	SS-2	-	34	30	17	12	7	NP	NP	NP	7	A-1-b (0)	
		7	14 12 14	34	100	SS-3	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
		9	19 17 14	40	100	SS-4	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
FILL: HARD, BROWN TO GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DRY TO DAMP.	707.9	12	15 9 11	26	100	SS-5	4.5+	-	-	-	-	-	-	-	-	9	A-6a (V)	
		14	8 8 14	28	100	SS-6	4.5+	20	13	11	36	20	28	17	11	14	A-6a (5)	
		17	14 22 21	56	100	SS-7	4.5+	-	-	-	-	-	-	-	-	9	A-6a (V)	
DENSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.	698.9	19	8 11 14	32	100	SS-8	-	52	19	7	14	8	NP	NP	NP	12	A-1-b (0)	
		24	17 15 25	52	100	SS-9	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, DAMP. -ROCK FRAGMENTS PRESENT IN SS-10	693.9	29	12 12 18	39	100	SS-10	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP. -ROCK FRAGMENTS PRESENT IN SS-11	690.9	34	9 9 10	25	100	SS-11	-	61	14	5	13	7	NP	NP	NP	6	A-1-b (0)	
	EOB	35																

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

PROJECT: FRA-70-12.68 - PHASE 4A
TYPE: STRUCTURE
PID: 77372 BR ID: FRA-70-1282R
START: 1/29/15 END: 2/25/15

DRILLING FIRM / OPERATOR: RII / J.K.
SAMPLING FIRM / LOGGER: RII / C.D.
DRILLING METHOD: 4.25" HSA / HQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME 55 (SN 386345)
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 10/20/14
ENERGY RATIO (%): 92

STATION / OFFSET: 127+19.67 / 80.0' RT
ALIGNMENT: BL I-70 EB
ELEVATION: 705.5 (MSL) EOB: 66.5 ft.
LAT / LONG: 39.949827, -83.021151

EXPLORATION ID B-013-2-15

MATERIAL DESCRIPTION AND NOTES	ELEV. 705.5	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
0.5' - TOPSOIL (6.0")	705.0																	
FILL: MEDIUM DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST. -CINDERS AND STONE FRAGMENTS PRESENT IN SS-1	702.5		5 6 9	23	100	SS-1	-	-	-	-	-	-	-	-	-	11	A-2-6 (V)	
POSSIBLE FILL: DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP. -ROOT FIBERS PRESENT IN SS-2	697.5		24 20 15	53	56	SS-2	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			10 14 12	39	67	SS-3	-	63	12	8	13	4	NP	NP	NP	6	A-1-b (0)	
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL**, LITTLE TO SOME COARSE TO FINE SAND, TRACE TO LITTLE SILT, TRACE CLAY, DAMP TO MOIST. -COBBLES ENCOUNTERED @ 11.0'			16 18 23	62	100	SS-4	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
			14 13 14	41	50	SS-5	-	-	-	-	-	-	-	-	-	4	A-1-a (V)	
			16 20 17	56	72	SS-6	-	71	12	5	9	3	NP	NP	NP	5	A-1-a (0)	
		W	7 15 21	54	89	SS-7	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
		W	13 29 50/2"	-	93	SS-8	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
			7 8 9	26	94	SS-9	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
-ROCK FRAGMENTS PRESENT IN SS-10			6 25 11	54	100	SS-10	-	53	25	7	12	3	NP	NP	NP	12	A-1-a (0)	
-HEAVING SANDS ENCOUNTERED @ 26.0'			5 12 16	42	100	SS-11	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
-INTRODUCED MUD @ 28.5'	673.5		19 16 20	54	100	SS-12	-	61	24	7	7	1	NP	NP	NP	10	A-1-a (0)	
HARD, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.			10 28 44	108	100	SS-13	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
			7 27 36	95	72	SS-14	4.5+	24	11	17	34	14	20	14	6	8	A-4a (3)	
DENSE, BLACK **FINE SAND**, TRACE SILT, WET.	663.5		14 10 18	42	100	SS-15	-	-	-	-	-	-	-	-	-	19	A-3 (V)	
HARD, DARK GRAY **SANDY SILT**, SOME CLAY, SOME FINE GRAVEL, DAMP. -ROCK FRAGMENTS PRESENT IN SS-16	658.5		50/4"	-	25	SS-16	-	-	-	-	-	-	-	-	-	11	A-4a (V)	
-BOULDER ENCOUNTERED @ 51.0-52.5'	654.5																	
HARD, DARK GRAY **SANDY SILT**, SOME CLAY, SOME FINE GRAVEL, DAMP. -ROCK FRAGMENTS PRESENT IN SS-17	653.0		50/3"	-	33	SS-17	-	-	-	-	-	-	-	-	-	12	A-4a (V)	
LIMESTONE FRAGMENTS AUGER REFUSAL @ 59.5'	647.0 646.0	TR	50/1"	-	100	SS-18	-	-	-	-	-	-	-	-	-	2	Rock (V)	

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PID: 77372	BR ID: FRA-70-1282R	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 127+19.67 / 80.0 RT	START: 1/29/15	END: 2/25/15	PG 2 OF 2	B-013-2-15

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)	BACK FILL
GRANITE BOULDER	645.5																	
LIMESTONE : GRAY AND WHITE, MODERATELY WEATHERED TO UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM TO THICK BEDDED, CHERTY, DOLOMITIC, FOSSILIFEROUS, PYRITIC, SLIGHTLY TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH.; RQD 58%, REC 98%.	645.5	61	25		92	RC-1											CORE	
-STYLOLITES PRESENT IN RC-2		62																
		63																
		64	71		100	RC-2											CORE	
		65																
	639.0	66 EOB																

NOTES: SEEPAGE ENCOUNTERED @ 17.0'; GROUNDWATER ENCOUNTERED INITIALLY @ 18.5'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 100 LBS BENTONITE CHIPS AND SOIL CUTTINGS

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PROJECT: FRA-70-13.01	DRILLING FIRM / OPERATOR: RII / LH	DRILL RIG: CME 55 (386345)	STATION / OFFSET: 135+81.56 / 15.6' LT	EXPLORATION ID B-014-2-19
TYPE: BRIDGE REPLACEMENT	SAMPLING FIRM / LOGGER: RII / TG	HAMMER: AUTOMATIC	ALIGNMENT: BL CONST. I-70 EB	
PID: 105430 SFN: NA	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 9/4/18	ELEVATION: 744.5 (MSL) EOB: 94.6 ft.	PAGE 1 OF 2
START: 4/27/20 END: 4/29/20	SAMPLING METHOD: SPT/RC	ENERGY RATIO (%): 91.2	LAT / LONG: 39.950298, -83.018137	

MATERIAL DESCRIPTION AND NOTES	ELEV. 744.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	HOLE SEALED
0.4' - ASPHALT (4.5")	744.1	1																	
1.1' - CONCRETE (13.5")	743.0																		
FILL: VERY STIFF TO HARD, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP TO MOIST.		2	8 6 8	21	50	SS-1	3.50	32	23	9	24	12	19	16	3	16	A-4a (0)	1500	
		3																	
		4	11 8 11	29	33	SS-2	3.75	-	-	-	-	-	-	-	-	11	A-4a (V)	-	
		5																	
		6																	
		7	9 8 6	21	14	SS-3	4.50	-	-	-	-	-	-	-	-	8	A-4a (V)	-	
	736.3	8	10	-	50	SS-3A	3.00	-	-	-	-	-	-	-	-	13	A-4a (V)	-	
FILL: VERY STIFF, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP TO MOIST.		9	8 3 7	15	69	SS-4	3.00	21	12	15	32	20	26	15	11	13	A-6a (4)	-	
		10																	
		11	3 4 6	15	72	SS-5	3.75	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
		12																	
		13																	
		14	4 3 7	15	75	SS-6	3.50	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
		15																	
		16																	
		17	3 7 8	23	67	SS-7	3.75	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
		18																	
		19	5 9 9	27	78	SS-8	2.75	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
		20																	
		21																	
		22	4 4 7	17	75	SS-9	3.25	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
	721.5	23																	
FILL: VERY STIFF, GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DAMP TO MOIST.		24	8 10 12	33	94	SS-10	3.50	12	13	19	38	18	25	16	9	13	A-4a (4)	-	
		25																	
		26																	
		27	4 6 9	23	100	SS-11	4.00	-	-	-	-	-	-	-	-	18	A-4a (V)	-	
	716.5	28																	
VERY STIFF TO HARD, GRAY **SANDY SILT**, LITTLE CLAY, SOME FINE GRAVEL, DAMP.		29	4 12 50/4"	-	100	SS-12	4.00	-	-	-	-	-	-	-	-	9	A-4a (V)	-	
		30																	
		31																	
		32																	
-COBBLES @ 30.0'-31.5'		33																	
		34	27 26 19	68	42	SS-13	4.25	27	11	16	29	17	25	15	10	10	A-4a (2)	-	
		35																	
		36																	
		37																	
		38																	
		39	38 50/2"	-	75	SS-14	4.5+	-	-	-	-	-	-	-	-	9	A-4a (V)	-	
	702.5	40																	
VERY STIFF, BROWN AND DARK BROWN **CLAY**, "AND" SILT, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		41																	
		42																	
		43																	
		44	4 6 9	23	92	SS-15	3.75	1	1	9	45	44	47	22	25	24	A-7-6 (15)	-	
		45																	
		46																	
		47																	
		48																	
	695.3	49	4 11 17	42	81	SS-16A	3.50	-	-	-	-	-	-	-	-	23	A-7-6 (V)	-	
VERY STIFF, BROWN **SANDY SILT**, LITTLE CLAY, TRACE FINE GRAVEL, DAMP.						SS-16B	3.50	-	-	-	-	-	-	-	-	9	A-4a (V)	-	
	692.5	50																	
MEDIUM DENSE TO VERY DENSE, BROWN AND DARK BROWN **GRAVEL WITH SAND**, SOME SILT, TRACE CLAY, MOIST TO WET.		51																	
		52																	
		53																	
		54	8 31 33	96	78	SS-17	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	-	
-WATER ADDED @ 55.0'		55																	
		56																	
		57																	
		58																	
		59	15 30 17	71	33	SS-18	-	47	24	8	14	7	21	15	6	11	A-1-b (0)	-	

00-2021 RII STAND ODOT LOG SUL (11 X 17) - OH DOT GDT - 6/28/21 11:16 - U:\GIR\PROJECTS\2020\W-20-025.GPJ

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PID: 105430	SFN: NA	PROJECT: FRA-70-13.01	STATION / OFFSET: 13581.56, 16' LT.	START: 4/27/20	END: 4/29/20	PG 2 OF 2	B-014-2-19

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)	SO4 ppm	HOLE SEALED
MEDIUM DENSE TO VERY DENSE, BROWN AND DARK BROWN **GRAVEL WITH SAND**, SOME SILT, TRACE CLAY, MOIST TO WET. *(continued)*	684.5																		
-COBBLES @ 61.5'		W 682.5																	
		61																	
		62																	
		63																	
		64	15 10 10	30	58	SS-19	-	-	-	-	-	-	-	-	-	15	A-1-b (V)	-	
		65																	
		66																	
		67																	
		68																	
		69	9 7 11	27	89	SS-20	-	-	-	-	-	-	-	-	-	16	A-1-b (V)	-	
		70																	
		71																	
		72																	
		73																	
		74	15 13 16	44	94	SS-21	-	47	29	13	9	2	NP	NP	NP	9	A-1-b (0)	-	
		75																	
		76																	
		77																	
		78																	
-WATER ADDED @ 78.3'		79	21 14 12	39	89	SS-22	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	-	
-HEAVING SAND @ 78.5'		80																	
AUGER REFUSAL @ 82.0'	662.5	81																	
BOULDERS/COBBLES: LIMESTONE, DOLOMITE, GRANITE, SILTSTONE FRAGMENTS.		82																	
		83	0		0	NQ-1											CORE		
		84																	
		85																	
		86																	
		87	0		25	NQ-2											CORE		
		88																	
		89																	
		90																	
		91																	
		92	0		4	NQ-3											CORE		
		93																	
	649.9	94 EOB																	

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 62.0'; CAVE-IN DEPTH @ 72.3'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 94 LBS CEMENT / 50 LBS BENTONITE POWDER / 20 GAL WATER. PAVEMENT PATCHED WITH ASPHALT COLD PATCH. .

00-2021 RII STAND ODOT LOG SUL (11 X 17) - OH DOT.GDT - 6/28/21 11:16 - U:\CI\$\PROJECTS\2020\W-20-025.GPJ

2554496	FRA-70-13.01	STRUCTURE FOUNDATION EXPLORATION BRIDGE NO. FRA-70-1301R OVER SR-315 BORING LOG B-014-2-19	DRAWN RRM CHECKED BRT

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PROJECT: FRA-70-13.01	DRILLING FIRM / OPERATOR: RII / SB	DRILL RIG: CME 750X (310218)	STATION / OFFSET: 139+05.23 / 30.7' LT	EXPLORATION ID B-014-3-19
TYPE: BRIDGE REPLACEMENT	SAMPLING FIRM / LOGGER: RII / TG	HAMMER: AUTOMATIC	ALIGNMENT: BL CONST. I-70 EB	
PID: 105430 SFN: NA	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 9/4/18	ELEVATION: 700.9 (MSL) EOB: 54.8 ft.	PAGE 1 OF 1
START: 4/24/20 END: 4/24/20	SAMPLING METHOD: SPT/RC	ENERGY RATIO (%): 79.5	LAT / LONG: 39.950416, -83.017000	

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)	SO4 ppm	HOLE SEALED
0.4' - TOPSOIL (4.0")	700.5	700.9				SS-1A	-	-	-	-	-	-	-	-	-	-		-	
DENSE, DARK BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.	699.4	1	5 11 14	33	56	SS-1B	-	73	8	5	9	5	26	19	7	9	A-2-4 (0)	-	
DENSE TO VERY DENSE, DARK BROWN TO BROWNISH GRAY **GRAVEL**, LITTLE FINE TO COARSE SAND, LITTLE SILT, TRACE CLAY, MOIST.		2 3	11 39 25	85	56	SS-2	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	-	
		4 5	12 14 18	42	69	SS-3	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	-	
-COBBLES @ 5.0'		6 7	24 23 30	70	72	SS-4	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	-	
		8 9	24 30 24	72	89	SS-5	-	66	13	6	11	4	NP	NP	NP	7	A-1-a (0)	-	
-COBBLES @ 10.0'		10 11 W 688.9 12	19 14 12	34	75	SS-6	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	-	
		13 14	16 16 13	38	39	SS-7	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	-	
-MUD ADDED @ 16.0'		15 16 17	18 17 11	37	69	SS-8	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	-	
	682.9	18																	
MEDIUM DENSE, GRAY **GRAVEL WITH SAND**, TRACE SILT, TRACE CLAY, WET.		19 3 5 6 20		15	36	SS-9	-	-	-	-	-	-	-	-	-	17	A-1-b (V)	-	
		21 6 7 6 22		17	81	SS-10	-	22	51	14	10	3	NP	NP	NP	16	A-1-b (0)	-	
	677.9	23																	
STIFF, GRAY **SANDY SILT**, LITTLE CLAY, TRACE FINE GRAVEL, MOIST.		24 5 15 20 25		46	92	SS-11	1.25	-	-	-	-	-	-	-	-	19	A-4a (V)	-	
	675.4																		
VERY DENSE, GRAY **GRAVEL WITH SAND**, TRACE SILT, TRACE CLAY, MOIST.		26 14																	
-HEAVING SAND @ 26.0'		27 25 50/5"		-	85	SS-12	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	-	
		28 29 41	22 40	82	47	SS-13	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	-	
-COBBLES @ 29.0'		30 31 32																	
	668.9																		
VERY STIFF, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE SILT, DAMP TO MOIST.		33 34 10 8 12		27	0	SS-14	-	-	-	-	-	-	-	-	-	-		-	
		35 11		-	100	2S-14A	2.50	26	13	14	30	17	21	14	7	18	A-4a (2)	-	
		36 37 38																	
		39 6 9 11		27	56	SS-15	4.00	-	-	-	-	-	-	-	-	11	A-4a (V)	-	
		40 41 42 43																	
		44 28 31 11 45		56	39	SS-16	3.50	-	-	-	-	-	-	-	-	13	A-4a (V)	-	
AUGER REFUSAL @ 46.0'	654.9	TR																	
LIMESTONE : DARK GRAY, DARK BROWN TO LIGHT GRAY, SLIGHTLY WEATHERED, SLIGHTLY STRONG TO STRONG, THICK TO VERY THICK BEDDED, CHERTY, CRYSTALLINE, FOSSILIFEROUS, SLIGHTLY TO MODERATELY FRACTURED, NARROW, SLIGHTLY ROUGH, INTACT, GOOD SURFACE CONDITIONS; RQD 32%, REC 93%.		46 47 48	24		93	NQ-1											CORE		
-VERTICAL FRACTURE @ 48.2'-48.7'		49 50 51 52	40		93	NQ-2											CORE		
	646.1	EOB 53 54																	

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 12.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 94 LBS CEMENT / 50 LBS BENTONITE POWDER / 20 GAL WATER. .

00-2021 RII STAND ODOT LOG SUL (11 X 17) - OH DOT.GDT - 6/28/21 11:16 - U:\CI8\PROJECTS\2020\W-20-025.GPJ

2554496	FRA-70-13.01	STRUCTURE FOUNDATION EXPLORATION BRIDGE NO. FRA-70-1301R OVER SR-315 BORING LOG B-014-3-19	DRAWN RRM	CHECKED BRT

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PROJECT: FRA-70-13.01	DRILLING FIRM / OPERATOR: RII / SB	DRILL RIG: CME 750X (310218)	STATION / OFFSET: 140+65.30 / 28.7' LT	EXPLORATION ID B-014-4-19	
TYPE: BRIDGE REPLACEMENT	SAMPLING FIRM / LOGGER: RII / TG	HAMMER: AUTOMATIC	ALIGNMENT: BL CONST. I-70 EB		
PID: 105430 SFN: NA	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 9/4/18	ELEVATION: 698.8 (MSL) EOB: 49.7 ft.	PAGE 1 OF 1	
START: 4/22/20 END: 4/22/20	SAMPLING METHOD: SPT/RC	ENERGY RATIO (%): 79.5	LAT / LONG: 39.950496, -83.016450		

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)	SO4 ppm	HOLE SEALED
0.4' - TOPSOIL (5.0")	698.4					SS-1A	-	-	-	-	-	-	-	-	-	-		-	
STIFF TO VERY STIFF, DARK GRAY TO DARK BROWN **SILT AND CLAY**, "AND" FINE GRAVEL, LITTLE FINE TO COARSE SAND, DAMP.			3 10 9	25	50	SS-1B	2.75	-	-	-	-	-	-	-	-	10	A-6a (V)	-	
-COBBLES @ 3.0'	695.6		9 11 17	37	50	SS-2	1.50	44	13	7	23	13	33	19	14	16	A-6a (1)	-	
MEDIUM DENSE TO VERY DENSE, BROWNISH GRAY TO GRAY **GRAVEL**, SOME FINE TO COARSE SAND, TRACE SILT, TRACE CLAY, MOIST TO WET.			8 12 12	32	61	SS-3	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	-	
-COBBLES @ 7.5'		W 690.8	8 22 8	40	44	SS-4	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	-	
			10 11 12	30	56	SS-5	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	-	
			12 17 16	44	83	SS-6	-	64	15	6	11	4	20	18	2	8	A-1-a (0)	-	
-COBBLES @ 14.0'			5 8 13	28	61	SS-7	-	-	-	-	-	-	-	-	-	14	A-1-a (V)	-	
			3 9 9	24	72	SS-8	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	-	
-MUD ADDED @ 20.0'			8 7 4	15	78	SS-9	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	-	
-COBBLES @ 20.0'																			
			18 30 25	73	86	SS-10	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	-	
-COBBLES @ 23.0'			15 29 26	73	81	SS-11	-	69	18	5	7	1	NP	NP	NP	9	A-1-a (0)	-	
	672.3		22			SS-12A	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	-	
HARD, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.			15 11	34	94	SS-12B	4.5+	-	-	-	-	-	-	-	-	11	A-4a (V)	-	
			5 9 11	27	81	SS-13	4.5+	25	11	14	32	18	20	14	6	11	A-4a (3)	-	
	666.8																		
MEDIUM DENSE, GRAY **GRAVEL WITH SAND**, TRACE SILT, TRACE CLAY, MOIST.			6 8 11	25	50	SS-14	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	-	
	662.3																		
HARD, GRAY **SANDY SILT**, TRACE CLAY, TRACE FINE GRAVEL, DAMP.																			
			50/4"	-	88	SS-15	4.5+	-	-	-	-	-	-	-	-	8	A-4a (V)	-	
	658.3	TR																	
GRAY **LIMESTONE FRAGMENTS**																			
AUGER REFUSAL @ 42.0'	656.7		50/1"	-	100	SS-16	-	-	-	-	-	-	-	-	-	-	A-1-a (V)	-	
LIMESTONE : DARK GRAY AND DARK BROWN, SLIGHTLY WEATHERED, STRONG, THICK TO VERY THICK BEDDED, CHERTY, FOSSILIFEROUS, CRYSTALLINE, INTACT, NARROW, SLIGHTLY ROUGH; RQD 71.5%, REC 96.5%. -LOST WATER RETURNED @ 44.5'			54		97	NQ-1											CORE		
			89		96	NQ-2											CORE		
	649.1	EOB																	

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 8.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 70 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER .

00-2021 RII STAND ODOT LOG SUL (11 X 17) - OH DOT GDT - 6/28/21 11:16 - U:\GIB\PROJECTS\2020\W-20-025.GPJ

2552496

FRA-70-13.01

STRUCTURE FOUNDATION EXPLORATION
BRIDGE NO. FRA-70-1301R OVER SR-315
BORING LOG B-014-4-19

DRAWN RRM
CHECKED BRT

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PROJECT: FRA-70-13.01	DRILLING FIRM / OPERATOR: RII / LH	DRILL RIG: CME 55 - 386345	STATION / OFFSET: 136+40.68 / 12.2' LT	EXPLORATION ID B-014-6-20	
TYPE: BRIDGE REPLACEMENT	SAMPLING FIRM / LOGGER: RII / JP	HAMMER: AUTOMATIC	ALIGNMENT: BL CONST. I-70 EB		
PID: 105430 SFN: NA	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 9/14/20	ELEVATION: 745.4 (MSL) EOB: 88.1 ft.	PAGE 1 OF 2	
START: 12/10/20 END: 12/10/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 84.2	LAT / LONG: 39.950299, -83.017926		

MATERIAL DESCRIPTION AND NOTES	ELEV. 745.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	HOLE SEALED
0.4' - ASPHALT (4.5")	745.0																		
1.1' - CONCRETE (13.5")	743.9																		
FILL:: HARD, DARK GRAY TO GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.		1																	
		2																	
		3	3 4 5	13	33	SS-1	4.5+	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
		4																	
		5																	
		6																	
		7																	
		8																	
		9																	
		10																	
		11																	
		12	6 6 7	18	78	SS-2	4.5+	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
		13																	
		14			71	ST-3	4.5+	8	9	16	31	36	27	15	12	13	A-6a (7)	-	
		15																	
		16																	
		17																	
		18																	
		19																	
		20																	
		21																	
		22																	
		23																	
		24	12 9 9	25	83	SS-4	4.5+	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
		25																	
-COBBLES @ 25.5'	719.4	26																	
VERY STIFF TO HARD, BROWN TO GRAY **SILT AND CLAY**, LITTLE TO SOME COARSE TO FINE SAND, TRACE TO LITTLE FINE GRAVEL, DRY TO MOIST.		27			0	ST-5	-	-	-	-	-	-	-	-	-	-		-	
-ATTEMPTED SHELBY TUBE @ 26.0'. MAXED OUT DOWN PRESSURE AND CRUSHED TUBE.		28			100	ST-6	4.5+	1	5	10	45	39	34	20	14	20	A-6a (10)	-	
		29																	
		30																	
		31	33 12 20	45	44	SS-7	3.50	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
		32																	
-ATTEMPTED SHELBY TUBE @ 32.5'. MAXED OUT DOWN PRESSURE AND CRUSHED TUBE.		33			0	ST-8	-	-	-	-	-	-	-	-	-	-		-	
		34																	
		35																	
		36																	
		37																	
		38																	
		39																	
		40																	
-LIMESTONE FRAGMENTS IN SS-9		41	16 10 50/4"	-	63	SS-9	3.00	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
		42																	
		43																	
		44			67	ST-10	4.00	19	18	14	27	22	34	21	13	13	A-6a (4)	-	
		45																	
	695.4	46																	
VERY DENSE, BROWN **GRAVEL WITH SAND**, SOME SILT, TRACE CLAY, MOIST.		47																	
		48																	
		49																	
		50																	
		51																	
		52																	
		53																	
		54	24 23 31	76	100	SS-11	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	-	
		55																	
		56																	
		57																	
		58																	
	685.4	59																	

00 2021 RII STAND ODOT LOG SUL (11 X 17) - OH DOT.GDT 6/28/21 11:16 - U:\GIB\PROJECTS\2020\W-20-025.GPJ

255496	FRA-70-13.01	STRUCTURE FOUNDATION EXPLORATION BRIDGE NO. FRA-70-1301R OVER SR-315 BORING LOG B-014-6-20	DRAWN RRM	CHECKED BRT

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PID: 105430	SFN: NA	PROJECT: FRA-70-13.01	STATION / OFFSET: 13640.68, 12' LT.	START: 12/10/20	END: 12/10/20	PG 2 OF 2	B-014-6-20

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)	SO4 ppm	HOLE SEALED
STIFF, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	685.4																		
		W 681.9																	
-WATER ADDED TO THE AUGERS @ 63.5'			45 35 42	108	33	SS-12	2.00	-	-	-	-	-	-	-	-	18	A-6a (V)	-	
	675.4																		
DENSE, BROWN **GRAVEL WITH SAND**, TRACE SILT, TRACE CLAY, MOIST TO WET.			11 8 17	35	17	SS-13	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	-	
-ATTEMPTED SHELBY TUBE @ 74.0'. MAXED OUT DOWN PRESSURE AND CRUSHED TUBE.					0	ST-14	-	-	-	-	-	-	-	-	-	-		-	
-DUE TO TIME RESTRICTIONS, SPLIT SPOON NOT ATTEMPTED AT 88.0'. ATTEMPTED SHELBY TUBE @ 88.0'. MAXED OUT DOWN PRESSURE AND CRUSHED TUBE.	657.3	EOB			0	ST-15	-	-	-	-	-	-	-	-	-	-		-	

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 63.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 94 LBS CEMENT / 25 LBS BENTONITE POWDER / 26 GAL WATER. PAVEMENT PATCHED WITH CONCRETE .

00.2021 RII STAND ODOT LOG SUL (11 X 17) - OH DOT.GDT 6/28/21 11:16 - U:\GI8\PROJECTS\2020\W-20-025.GPJ

255496	FRA-70-13.01	STRUCTURE FOUNDATION EXPLORATION BRIDGE NO. FRA-70-1301R OVER SR-315 BORING LOG B-014-6-20	DRAWN RRM CHECKED BRT

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PROJECT: FRA-70-13.01 | DRILLING FIRM / OPERATOR: RII / SB | DRILL RIG: CME 750X - 310218 | STATION / OFFSET: 142+45.72 / 49.7' LT | EXPLORATION ID: B-014-7-20
TYPE: BRIDGE REPLACEMENT | SAMPLING FIRM / LOGGER: RII / KS | HAMMER: AUTOMATIC | ALIGNMENT: BL CONST. I-70 EB
PID: 105430 SFN: NA | DRILLING METHOD: 3.25" HSA | CALIBRATION DATE: 9/14/20 | ELEVATION: 715.5 (MSL) EOB: 56.6 ft. | PAGE: 1 OF 1
START: 12/15/20 END: 12/15/20 | SAMPLING METHOD: SPT | ENERGY RATIO (%): 86.2 | LAT / LONG: 39.950698, -83.015876

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)	SO4 ppm	BACK FILL
0.2' - TOPSOIL (2.0")	715.3																	
FILL: HARD, GRAY **SILT AND CLAY**, SOME FINE TO COARSE SAND, SOME FINE GRAVEL, DAMP.		4 5 10	22	0	SS-1	-	-	-	-	-	-	-	-	-	-		-	
-LIMESTONE FRAGMENTS PRESENT THROUGHOUT		15	-	67	2S-1A	4.50	26	16	14	20	24	32	21	11	14	A-6a (2)	-	
		7 9 28	53	83	SS-2	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
-ATTEMPTED SHELBY TUBES @ 8.0' AND 9.0'. MAXED OUT DOWN PRESSURE AND CRUSHED TUBES.				0	ST-3	-	-	-	-	-	-	-	-	-	-		-	
				0	ST-4	-	-	-	-	-	-	-	-	-	-		-	
	704.0																	
HARD, DARK GRAY **CLAY**, "AND" SILT, LITTLE COARSE TO FINE SAND, MOIST.		6 7 9	23	44	SS-5	4.50	0	5	7	41	47	46	25	21	23	A-7-6 (14)	-	
				85	ST-6	4.50	32	10	7	32	19	42	27	15	23	A-7-6 (5)	-	
	690.5	W 690.5																
VERY DENSE, BROWN **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, WET.																		
-HEAVING SANDS @ 26.5'		21 40 49	128	94	SS-7	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	-	
		50/5"	-	80	SS-8	-	-	-	-	-	-	-	-	-	15	A-1-b (V)	-	
		36 24 23	68	83	SS-9	-	62	15	6	14	3	NP	NP	NP	9	A-1-b (0)	-	
	683.5																	
DENSE, BROWN **GRAVEL**, "AND" FINE TO COARSE SAND, TRACE SILT, WET. -COBBLES @ 33.0'		13 15 15	43	72	SS-10	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	-	
		12 14 14	40	78	SS-11	-	54	30	7	9	0	NP	NP	NP	11	A-1-a (0)	-	
	673.5																	
HARD, DARK GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.																		
-LIMESTONE FRAGMENTS IN SS-12		3 6 10	23	67	SS-12	4.50	23	17	17	31	12	19	14	5	10	A-4a (2)	-	
				0	ST-13	-	-	-	-	-	-	-	-	-	-		-	
	667.5																	
DENSE TO VERY DENSE, GRAY **GRAVEL**, SOME FINE TO COARSE SAND, TRACE SILT, WET.		9 13 18	45	61	SS-14	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	-	
-LIMESTONE FRAGMENTS PRESENT THROUGHOUT		11 50/5"	-	55	SS-15	-	64	23	6	7	0	NP	NP	NP	9	A-1-a (0)	-	
-COBBLES @ 55.0'																		
AUGER REFUSAL @ 56.6'	658.9 EOB	50/1"	-	100	SS-16	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	-	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 25.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 100 LBS BENTONITE CHIPS AND SOIL CUTTINGS. .

00 2021 RII STAND ODOT LOG SUL (11 X 17) - OH DOT.GDT 6/28/21 11:16 - U:\GI8\PROJECTS\2020\W-20-025.GPJ

255496	FRA-70-13.01	STRUCTURE FOUNDATION EXPLORATION BRIDGE NO. FRA-70-1301R OVER SR-315 BORING LOG B-014-7-20	DRAWN RRM CHECKED BRT

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL004.dgn 12/27/2018 10:25:34 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / J.B.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 5041+24.30 / 73.2' LT	EXPLORATION ID B-015-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / A.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1301A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 746.7 (MSL) EOB: 95.0 ft.	PAGE 1 OF 2
START: 7/25/13 END: 7/30/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.949844277, -83.017516074	

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)	BACK FILL
0.8' - ASPHALT (9.0")	746.7																	
0.5' - AGGREGATE BASE (6.0")	745.9																	
FILL: VERY STIFF, GRAYISH BROWN TO GRAY **SILT AND CLAY**, LITTLE TO SOME COARSE TO FINE SAND, TRACE TO LITTLE FINE GRAVEL, DAMP. -STONE FRAGMENTS PRESENT IN SS-1	745.4	1																
		2	6 13 19	41	67	SS-1	4.00	-	-	-	-	-	-	-	-	9	A-6a (V)	
		3																
		4	3 6 11	22	67	SS-2	3.50	-	-	-	-	-	-	-	-	13	A-6a (V)	
		5																
		6																
		7	3 4 7	14	83	SS-3	4.00	-	-	-	-	-	-	-	-	12	A-6a (V)	
		8																
		9	4 4 4	10	33	SS-4	3.50	13	6	14	41	26	29	16	13	10	A-6a (8)	
		10																
		11																
		12	4 4 7	14	67	SS-5	4.00	-	-	-	-	-	-	-	-	14	A-6a (V)	
		13																
		14	2 2 6	10	67	SS-6	4.00	-	-	-	-	-	-	-	-	12	A-6a (V)	
		15																
		16																
		17	3 13 13	34	33	SS-7	4.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
		18																
		19	5 7 13	26	61	SS-8	3.25	3	8	16	46	27	27	16	11	10	A-6a (8)	
		20																
		21																
		22	3 6 9	19	78	SS-9	3.50	-	-	-	-	-	-	-	-	14	A-6a (V)	
		23																
		24	6 13 9	28	61	SS-10	4.00	-	-	-	-	-	-	-	-	14	A-6a (V)	
		25																
	721.2																	
STIFF, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.		26																
		27	2 6 7	17	78	SS-11	-	23	24	16	25	12	29	19	10	12	A-4a (0)	
	718.7	28																
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		29																
		30	21 28 25	69	83	SS-12	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
		31																
	714.7	32																
VERY STIFF, DARK BROWN **SILTY CLAY**, SOME FINE GRAVEL, LITTLE COARSE TO FINE SAND, DAMP.		33																
		34	10 6 9	19	83	SS-13	2.50	30	13	7	28	22	37	18	19	17	A-6b (6)	
		35																
	709.7	36																
STIFF TO HARD, DARK GRAY TO BROWN **SANDY SILT**, "AND" GRAVEL, TRACE CLAY, DAMP.		37																
		38																
		39	8 11 7	23	33	SS-14	4.50	-	-	-	-	-	-	-	-	12	A-4a (V)	
		40																
		41																
		42																
		43																
		44	7 6 7	17	33	SS-15	4.50	-	-	-	-	-	-	-	-	11	A-4a (V)	
		45																
		46																
		47																
		48																
		49	8 9 13	28	61	SS-16	2.00	44	9	9	29	9	26	20	6	14	A-4a (1)	
		50																
		51																
	694.7	52																
MEDIUM DENSE TO DENSE, BROWNISH GRAY TO GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -COBBLES PRESENT @ 52.0'		53																
		54	6 16 22	49	78	SS-17	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
		55																
		56																
		57																
		58																
		W																
		59	2 20 5	32	50	SS-18	-	-	-	-	-	-	-	-	-	18	A-1-b (V)	

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL005.dgn 12/27/2018 10:25:37 AM rachelm

PID: 77372	BR ID: FRA-70-1301A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5041+24.30 / 73.2 LT	START: 7/25/13	END: 7/30/13	PG 2 OF 2	B-015-1-13

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)	BACK FILL
MEDIUM DENSE TO DENSE, BROWNISH GRAY TO GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. *(continued)*	686.7	61																
		62																
		63																
-HEAVING SANDS ENCOUNTERED @ 63.5'		64	1 1 26	35	33	SS-19	-	47	29	10	11	3	22	19	3	13	A-1-b (0)	
		65																
		66																
		67																
		68																
		W 69	5 10 8	23	100	SS-20	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
		70																
		71																
	674.7	72																
STIFF TO VERY STIFF, GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DAMP.		73																
		74	8 10 8	23	100	SS-21	2.50	-	-	-	-	-	-	-	-	13	A-4a (V)	
		75																
		76																
		77																
		78																
-SWITCHED TO ROTARY DRILLING TECHNIQUES WITH MUD @ 76.0'		79	9 5 6	14	50	SS-22	2.00	-	-	-	-	-	-	-	-	12	A-4a (V)	
		80																
		81																
		82																
		83																
		84	WOH 5 9	18	100	SS-23	2.00	17	13	17	35	18	21	15	6	7	A-4a (4)	
		85																
		86																
		87																
		88																
		89	2 4 4	10	100	SS-24	1.25	-	-	-	-	-	-	-	-	11	A-4a (V)	
		90																
		91																
		92																
		93																
		94	2 4 6	13	72	SS-25	1.50	-	-	-	-	-	-	-	-	11	A-4a (V)	
	651.7	EOB 95																

NOTES: SEEPAGE ENCOUNTERED @ 58.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 68.5'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 100 LBS BENTONITE CHIPS AND SOIL CUTTINGS

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL006.dgn 12/27/2018 10:25:41 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 5042+88.86 / 2.6' RT	EXPLORATION ID B-015-2-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1301A	DRILLING METHOD: 3.75" HSA / RC	CALIBRATION DATE: 4/26/13	ELEVATION: 700.4 (MSL) EOB: 68.5 ft.	PAGE 1 OF 2
START: 6/27/13 END: 6/28/13	SAMPLING METHOD: SPT / NQ	ENERGY RATIO (%): 82.6	LAT / LONG: 39.950018890, -83.017141752	

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)	BACK FILL
0.4' - TOPSOIL (4.0")	700.0																	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP TO MOIST. -TRACE ROOT FIBERS PRESENT IN SS-1 -COBBLES PRESENT @ 5.0'	694.9		10 17 17	47	72	SS-1	-	-	-	-	-	-	-	-	-	5	A-2-4 (V)	
			6 6 6	17	56	SS-2	-	40	18	12	22	8	25	18	7	11	A-2-4 (0)	
DENSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP.	689.9	W	6 18 22	55	56	SS-3	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
			18 19 10	40	56	SS-4	-	59	15	7	16	3	18	17	1	6	A-1-b (0)	
LOOSE TO MEDIUM DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET. -HEAVING SANDS ENCOUNTERED @ 20.0' -INTRODUCED MUD @ 20.0'	677.4	W	8 4 6	14	33	SS-5	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
			2 3 4	10	33	SS-6	-	-	-	-	-	-	-	-	-	15	A-1-b (V)	
			3 6 4	14	33	SS-7	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
			17 12 9	29	33	SS-8	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
			16 13 8	29	33	SS-9	-	-	-	-	-	-	-	-	-	24	A-1-b (V)	
MEDIUM DENSE TO VERY DENSE, GRAY **GRAVEL**, SOME FINE TO COARSE SAND, TRACE SILT, TRACE CLAY, MOIST.	668.4		2 7 16	32	33	SS-10	-	-	-	-	-	-	-	-	-	13	A-1-a (V)	
			11 19 21	55	50	SS-11	-	72	18	4	5	1	NP	NP	NP	10	A-1-a (0)	
			6 6 10	22	28	SS-12	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
VERY STIFF TO HARD, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP TO MOIST.			3 14 21	48	50	SS-13	4.50	-	-	-	-	-	-	-	-	12	A-4a (V)	
			11 15 16	43	72	SS-14	4.50	-	-	-	-	-	-	-	-	11	A-4a (V)	
			8 10 16	36	89	SS-15	4.50	23	13	15	32	17	20	12	8	11	A-4a (3)	
			4 9 12	29	89	SS-16	4.50	-	-	-	-	-	-	-	-	10	A-4a (V)	
			4 10 12	30	72	SS-17	4.00	-	-	-	-	-	-	-	-	10	A-4a (V)	
AUGER REFUSAL @ 58.5'	641.9	TR	54		100	RC-1											CORE	

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL007.dgn 12/27/2018 10:25:45 AM rachelm

PID: 77372	BR ID: FRA-70-1301A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5042+88.86 / 2.6 RT	START: 6/27/13	END: 6/28/13	PG 2 OF 2	B-015-2-13

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)	BACK FILL
LIMESTONE : DARK AND LIGHT GRAY, SLIGHTLY WEATHERED, STRONG, VERY THIN TO THIN BEDDED, CHERTY, DOLOMITIC, FOSSILIFEROUS, STYOLITIC, HIGHLY FRACTURED, OPEN APERTURE, VERY ROUGH; RQD 68%, REC 92%. *(continued)*	640.4	61																
		62	63		87	RC-2											CORE	
		63																
		64																
-RC-3: VUGGY, TRACE PETROLEUM RESIDUE PRESENT		65																
		66	78		96	RC-3											CORE	
-QU @ 67.6' = 5,771 PSI		67																
	631.9	68 EOB																

NOTES: SEEPAGE ENCOUNTERED @ 10.0'; GROUNDWATER INITIALLY ENCOUNTERED @ 11.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 141 LBS PORTLAND CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / J.B.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 5048+23.41 / 12.5' RT	EXPLORATION ID B-015-4-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / R.B.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1301A	DRILLING METHOD: 4.25" HSA / RC	CALIBRATION DATE: 4/26/13	ELEVATION: 734.2 (MSL) EOB: 95.7 ft.	PAGE 1 OF 2
START: 7/22/13 END: 7/24/13	SAMPLING METHOD: SPT / HQ	ENERGY RATIO (%): 77.7	LAT / LONG: 39.950291772, -83.015266056	

MATERIAL DESCRIPTION AND NOTES	ELEV. 734.2	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
0.5' - ASPHALT (6.0")	733.7																	
1.0' - AGGREGATE BASE (12.0")	732.7																	
FILL: MEDIUM DENSE, DARK BROWNISH GRAY **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST. -ASPHALT AND CONCRETE FRAGMENTS PRESENT IN SS-1	731.2		3 10 10	26	78	SS-1	-	-	-	-	-	-	-	-	-	13	A-2-4 (V)	
FILL: VERY STIFF, DARK BROWN **SILT AND CLAY**, LITTLE TO SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -BRICK FRAGMENTS, ROOT AND GRASS FIBERS PRESENT IN SS-2	728.7		4 6 7	17	67	SS-2	2.50	-	-	-	-	-	-	-	-	17	A-6a (V)	
FILL: MEDIUM DENSE, DARK BROWNISH GRAY AND BLACK **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST. -COAL, CINDERS AND STONE FRAGMENTS PRESENT IN SS-3	726.2		13 9 13	28	67	SS-3	-	-	-	-	-	-	-	-	-	13	A-2-4 (V)	
FILL: VERY STIFF, GRAY TO DARK BROWNISH GRAY **SILTY CLAY**, SOME FINE TO COARSE SAND, SOME FINE GRAVEL, DAMP.			7 7 6	17	56	SS-4	2.50	-	-	-	-	-	-	-	-	16	A-6b (V)	
			6 5 7	16	67	SS-5	2.50	27	15	8	28	22	37	21	16	15	A-6b (5)	
			5 7 7	18	61	SS-6	2.75	-	-	-	-	-	-	-	-	18	A-6b (V)	
-STONE FRAGMENTS PRESENT IN SS-7	716.2		6 7 8	19	50	SS-7	3.00	-	-	-	-	-	-	-	-	17	A-6b (V)	
FILL: VERY DENSE, BROWN **GRAVEL**, SOME FINE TO COARSE SAND, TRACE SILT, TRACE CLAY, DAMP. -COBBLES PRESENT FROM 19.0' TO 22.0'	711.7		27 25 20	58	67	SS-8	-	64	18	6	10	2	25	23	2	7	A-1-a (0)	
			50/4"	-	50	SS-9	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
FILL: VERY STIFF, BROWN **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.	708.7		13 8 5	17	67	SS-10	-	26	18	16	26	14	30	20	10	13	A-4a (1)	
FILL: LOOSE, DARK BROWNISH GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -CONCRETE FRAGMENTS PRESENT IN SS-11	706.2		6 3 3	8	67	SS-11	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
FILL: STIFF, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. -CLAY TILE AND BRICK FRAGMENTS PRESENT IN SS-12	702.2		2 3 5	10	50	SS-12	1.25	-	-	-	-	-	-	-	-	16	A-6a (V)	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, MOIST.	697.2		10 6 5	14	56	SS-13	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
STIFF TO VERY STIFF, DARK BROWN **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, MOIST.		W	12 12 12	31	33	SS-14	3.00	-	-	-	-	-	-	-	-	12	A-4a (V)	
			3 4 4	10	61	SS-15	-	29	20	14	23	14	25	18	7	15	A-4a (0)	
SOFT TO MEDIUM STIFF, GRAY **CLAY**, "AND" SILT, MOIST.	687.2		1 2 2	5	61	SS-16	0.50	-	-	-	-	-	-	-	-	28	A-7-6 (V)	
-QU @ 54.8' = 2,207 PSF		W			88	ST-17	1.00	0	0	0	61	39	46	24	22	31	A-7-6 (14)	
MEDIUM DENSE, BROWNISH GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, WET.	677.2		1 5 6	14	33	SS-18	-	-	-	-	-	-	-	-	-	29	A-4a (V)	

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PID: 77372	BR ID: FRA-70-1301A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5048+23.41 / 12.5 RT	START: 7/22/13	END: 7/24/13	PG 2 OF 2	B-015-4-13

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)	BACK FILL
MEDIUM DENSE, BROWNISH GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, WET. *(continued)*	674.2	61																
		62																
		63																
		64	3 4 5	12	33	SS-19	-	-	-	-	-	-	-	-	-	24	A-4a (V)	
		65																
		66																
	667.2	67																
HARD, DARK GRAYISH BROWN **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, MOIST.		68																
		69	14 22 8	39	67	SS-20	-	31	12	9	30	18	28	19	9	21	A-4a (3)	
		70																
		71																
	662.2	72																
LOOSE, DARK GRAY **GRAVEL AND SAND**, TRACE SILT, MOIST. -COBBLES PRESENT @ 72.0'		73																
		74	7 4 4	10	44	SS-21	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
		75																
		76																
	657.2	77																
MEDIUM STIFF TO STIFF, DARK GRAY **SANDY SILT**, LITTLE CLAY, TRACE FINE GRAVEL, DAMP.		78																
		79	3 3 6	12	61	SS-22	1.00	-	-	-	-	-	-	-	-	11	A-4a (V)	
		80																
		81																
		82																
		83																
		84	2 4 6	13	67	SS-23	1.50	10	13	18	39	20	20	14	6	11	A-4a (5)	
		85																
AUGER REFUSAL @ 86.7'	647.5	86 TR																
LIMESTONE : GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, THIN BEDDED TO LAMINATED, CALCAREOUS, FOSSILIFEROUS, SLIGHTLY TO MODERATELY FRACTURED, NARROW TO OPEN APERTURE, SLIGHTLY ROUGH; RQD 87%, REC 98%.		87																
		88	87		98	RC-1											CORE	
-QU @ 87.1' = 7,935 PSI		89																
		90																
		91																
-QU @ 92.4' = 8,024 PSI		92																
-CHERT NODULES PRESENT IN RC-2		93																
		94	88		98	RC-2											CORE	
	638.5	95 EOB																

NOTES: SEEPAGE ENCOUNTERED @ 39.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 55.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 100 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 5049+08.12 / 37.6' RT	EXPLORATION ID B-015-5-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / K.S.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1301A	DRILLING METHOD: 3.25" HSA / RC	CALIBRATION DATE: 4/26/13	ELEVATION: 723.6 (MSL) EOB: 76.0 ft.	PAGE 1 OF 2
START: 6/25/13 END: 6/26/13	SAMPLING METHOD: SPT / NQ	ENERGY RATIO (%): 82.6	LAT / LONG: 39.950498754, -83.015042527	

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)	BACK FILL
0.7' - TOPSOIL (8.0")	722.9																	
FILL: VERY STIFF, BROWN **SILTY CLAY**, SOME FINE TO COARSE SAND, SOME FINE GRAVEL, DAMP TO MOIST.		1	5 9 9	25	44	SS-1	3.50	30	13	12	29	16	35	15	20	10	A-6b (5)	
-ROOT FIBERS PRESENT IN SS-1 AND SS-2		4	3 4 3	10	33	SS-2	3.50	-	-	-	-	-	-	-	-	19	A-6b (V)	
-COBBLES PRESENT THROUGHOUT		7	9 9 16	34	39	SS-3	2.50	-	-	-	-	-	-	-	-	16	A-6b (V)	
	715.6																	
FILL: VERY STIFF, DARK GRAY **SILT AND CLAY**, SOME FINE TO COARSE SAND, SOME FINE GRAVEL, DAMP. -CLAY TILE AND BRICK FRAGMENTS PRESENT IN SS-4		10	9 13 14	37	78	SS-4	4.00	26	16	14	30	14	30	16	14	11	A-6a (3)	
		12	7 9 8	23	56	SS-5	4.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
	710.6																	
FILL: MEDIUM DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.		15	7 6 4	14	44	SS-6	-	-	-	-	-	-	-	-	-	16	A-2-4 (V)	
	708.1																	
FILL: MEDIUM STIFF TO VERY STIFF, BROWNISH GRAY TO DARK GRAY **SILTY CLAY**, SOME COARSE TO FINE SAND, TRACE TO LITTLE FINE GRAVEL, MOIST.		17	WOH 13 8	29	50	SS-7	3.50	-	-	-	-	-	-	-	-	18	A-6b (V)	
-WOOD FRAGMENTS PRESENT IN SS-8		20	3 3 4	10	61	SS-8	1.50	14	8	13	38	27	37	16	21	22	A-6b (10)	
-COBBLES PRESENT @ 22.0'		22			58	ST-9	2.75	-	-	-	-	-	-	-	-	21	A-6b (V)	
		25	2 4 4	11	72	SS-10	2.00	-	-	-	-	-	-	-	-	22	A-6b (V)	
		27	6 5 6	15	89	SS-11	1.75	-	-	-	-	-	-	-	-	20	A-6b (V)	
-WOOD FRAGMENTS PRESENT IN SS-12		30	WOH 3 3	8	67	SS-12	0.50	7	8	13	40	32	38	16	22	25	A-6b (12)	
-COBBLES PRESENT @ 35.0'		35	1 2 3	7	78	SS-13	0.50	-	-	-	-	-	-	-	-	28	A-6b (V)	
	686.6																	
LOOSE, DARK GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, WET.		W 40	1 1 3	6	33	SS-14	-	-	-	-	-	-	-	-	-	19	A-2-6 (V)	
	681.6																	
HARD, DARK GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP TO MOIST.		45	5 15 38	73	67	SS-15	4.5+	26	12	15	30	17	21	11	10	9	A-4a (2)	
		50	3 6 11	23	67	SS-16	4.50	-	-	-	-	-	-	-	-	12	A-4a (V)	
	671.6																	
MEDIUM DENSE, DARK GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, WET. -COBBLES PRESENT @ 53.0'		55	7 10 10	28	33	SS-17	-	-	-	-	-	-	-	-	-	28	A-2-6 (V)	
	666.6																	
STIFF TO VERY STIFF, DARK GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DAMP TO MOIST.		60	2 6 8	19	61	SS-18	2.00	15	14	17	38	16	20	13	7	12	A-4a (4)	

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL011.dgn 12/27/2018 10:26:12 AM rachelm

PID: 77372 | BR ID: FRA-70-1301A | PROJECT: FRA-70-12.68 - PHASE 4A | STATION / OFFSET: 5049+08.12 / 37.6 RT | START: 6/25/13 | END: 6/26/13 | PG 2 OF 2 | B-015-5-13

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)	BACK FILL
STIFF TO VERY STIFF, DARK GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DAMP TO MOIST. *(continued)*	663.6	61																
		62																
		63																
		64	WOH 7 16	32	44	SS-19	2.75	-	-	-	-	-	-	-	-	13	A-4a (V)	
		65																
AUGER REFUSAL @ 66.0'	657.6	TR 66																
LIMESTONE : VARIGATED GRAY AND BROWN, UNWEATHERED, STRONG TO VERY STRONG, VERY THIN TO THIN BEDDED, CHERTY, DOLOMITIC, FOSSILIFEROUS, PYRITIC, FRACTURED TO MODERATELY FRACTURED, NARROW TO OPEN APERTURE, SLIGHTLY TO VERY ROUGH; RQD 75%, REC 94%. -QU @ 66.8' = 10,927 PSI		67																
		68	63		88	RC-1											CORE	
		69																
		70																
		71																
		72																
		73	88		100	RC-2											CORE	
		74																
		75																
	647.6	EOB 76																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 40.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 141 LBS PORTLAND CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-12.68 - PHASE 4A
TYPE: STRUCTURE
PID: 77372 BR ID: FRA-70-1301A
START: 6/13/13 END: 6/24/13

DRILLING FIRM / OPERATOR: RII / S.M.
SAMPLING FIRM / LOGGER: RII / A.D.
DRILLING METHOD: 3.25" HSA / RC
SAMPLING METHOD: SPT / NQ

DRILL RIG: CME-750 (SN 98048)
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 82.6

STATION / OFFSET: 5050+28.85 / 20.8' LT
ALIGNMENT: BL RAMP C5
ELEVATION: 723.0 (MSL) EOB: 77.5 ft.
LAT / LONG: 39.950578918, -83.014626080

EXPLORATION ID: B-015-6-13
PAGE: 1 OF 2

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)	BACK FILL
0.2' - ASPHALT (2.0")	723.0																	
FILL: MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP.	722.8		6 8 6	19	78	SS-1	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
FILL: MEDIUM DENSE TO DENSE, DARK BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.	720.0		3 5 9	19	39	SS-2	-	57	9	8	7	19	33	17	16	16	A-2-6 (1)	
-PETROLEUM ODOR PRESENT IN SS-3			6 11 13	33	22	SS-3	-	-	-	-	-	-	-	-	-	15	A-2-6 (V)	
FILL: STIFF, BROWN **SILT AND CLAY**, "AND" COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	715.0		2 2 2	6	33	SS-4	1.50	4	17	36	16	27	29	16	13	17	A-6a (2)	
FILL: MEDIUM DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.	712.5		3 5 5	14	28	SS-5	-	-	-	-	-	-	-	-	-	15	A-2-6 (V)	
FILL: MEDIUM DENSE, BLACK **SANDY SILT**, SOME FINE GRAVEL, TRACE CLAY, WET. -COBBLES PRESENT @ 13.0'	710.0		9 6 5	15	56	SS-6	-	26	17	18	36	3	NP	NP	NP	26	A-4a (1)	
MEDIUM DENSE, BROWN **SANDY SILT**, SOME FINE GRAVEL, TRACE CLAY, WET.	707.5		5 6 12	25	39	SS-7	-	-	-	-	-	-	-	-	-	23	A-4a (V)	
VERY DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.	705.0		13 25 22	65	17	SS-8	-	-	-	-	-	-	-	-	-	12	A-2-4 (V)	
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP. -INTRODUCED WATER @ 22.5'	702.5		14 21 22	59	67	SS-9	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
			8 18 21	54	72	SS-10	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
			16 19 24	59	78	SS-11	-	51	15	17	15	2	NP	NP	NP	9	A-1-b (0)	
			8 30 19	67	67	SS-12	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
		W	15 50/5"	-	73	SS-13	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
HARD, BROWNISH GRAY TO GRAY **SILT**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DRY TO MOIST.	686.0		21 22 26	66	67	SS-14	4.50	-	-	-	-	-	-	-	-	9	A-4b (V)	
			16 29 30	81	72	SS-15	4.50	12	9	14	53	12	20	14	6	12	A-4b (6)	
			16 22 26	66	72	SS-16	4.50	-	-	-	-	-	-	-	-	15	A-4b (V)	
			17 24 28	72	78	SS-17	4.50	-	-	-	-	-	-	-	-	16	A-4b (V)	
VERY DENSE, GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST TO WET.	666.0		27 35 50	117	83	SS-18	-	-	-	-	-	-	-	-	-	18	A-2-4 (V)	

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PID: 77372	BR ID: FRA-70-1301A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5050+28.85 / 20.8 LT	START: 6/13/13	END: 6/24/13	PG 2 OF 2	B-015-6-13

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)	BACK FILL
VERY DENSE, GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST TO WET. *(continued)*	663.0	61																
		62																
		63																
		64	25 47 50/1"	-	100	SS-19	-	33	21	15	23	8	NP	NP	NP	21	A-2-4 (0)	
		65																
		66																
AUGER REFUSAL @ 67.5'	655.5	67	50/5"	-	10	SS-20	-	-	-	-	-	-	-	-	-	15	A-2-4 (V)	
		TR																
LIMESTONE : VARIGATED GRAY AND BROWN, SLIGHTLY WEATHERED TO UNWEATHERED, STRONG TO VERY STRONG, VERY THIN TO THIN BEDDED, CHERTY, DOLOMITIC, PYRITIC, HIGHLY TO MODERATELY FRACTURED, OPEN TO NARROW APERTURE, VERY ROUGH TO SLIGHTLY ROUGH; RQD 71%, REC 87%. -QU @ 68.3' = 9,274 PSI		68																
		69																
		70	51		51	RC-1											CORE	
		71																
		72																
		73																
		74	88		98	RC-2											CORE	
		75																
-QU @ 76.9' = 12,661 PSI		76																
	645.5	77	67		100	RC-3											CORE	
		EOB																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 33.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 141 LBS PORTLAND CEMENT / 25 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 5051+29.66 / 9.8' RT	EXPLORATION ID B-015-7-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / A.D.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1301A	DRILLING METHOD: 3.25" HSA / RC	CALIBRATION DATE: 4/26/13	ELEVATION: 721.8 (MSL) EOB: 80.5 ft.	PAGE 1 OF 2
START: 6/10/13 END: 6/13/13	SAMPLING METHOD: SPT / NQ	ENERGY RATIO (%): 82.6	LAT / LONG: 39.950618516, -83.014254653	

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)	BACK FILL
0.4' - TOPSOIL (5.0")	721.8																	
HARD, BROWN **CLAY**, SOME FINE GRAVEL, SOME FINE TO COARSE SAND, LITTLE SILT, DRY.	721.4	1	4 15 12	37	50	SS-1	4.5+	24	14	13	15	34	43	19	24	9	A-7-6 (8)	
DENSE, GRAY **GRAVEL**, LITTLE FINE TO COARSE SAND, TRACE SILT, TRACE CLAY, DAMP.	718.8	4	9 11 12	32	17	SS-2	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
STIFF TO VERY STIFF, DARK BROWN TO BROWNISH GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP TO MOIST.	716.3	7	3 4 2	8	61	SS-3	2.00	-	-	-	-	-	-	-	-	15	A-6a (V)	
		9	2 4 4	11	67	SS-4	2.50	26	15	15	16	28	32	17	15	13	A-6a (3)	
		12	3 6 5	15	56	SS-5	2.00	-	-	-	-	-	-	-	-	20	A-6a (V)	
LOOSE TO DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP.	708.8	14	2 3 3	8	72	SS-6	-	-	-	-	-	-	-	-	-	17	A-2-6 (V)	
		17	3 9 5	19	44	SS-7	-	30	20	15	11	24	30	18	12	17	A-2-6 (0)	
DENSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE TO SOME SILT, TRACE CLAY, DAMP TO MOIST.	703.8			0	ST-8	-	-	-	-	-	-	-	-	-	-	-		
		22	5 18 18	50	72	SS-9	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
		24	11 21 19	55	67	SS-10	-	49	18	9	23	1	NP	NP	NP	7	A-1-b (0)	
		27	12 27 22	67	83	SS-11	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
	W	29	8 13 17	41	11	SS-12	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
-HEAVING SANDS ENCOUNTERED @ 33.5'		34	21 50/1"	-	100	SS-13	-	34	30	16	19	1	NP	NP	NP	15	A-1-b (0)	
-INTRODUCED MUD @ 33.5'																		
		39	20 36 38	102	56	SS-14	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		44	13 14 24	52	72	SS-15	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
HARD, GRAY **SILTY CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	674.8	49	16 19 25	61	83	SS-16	4.50	7	7	15	46	25	30	14	16	19	A-6b (10)	
VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET.	669.8	54	20 50/1"	-	171	SS-17	-	-	-	-	-	-	-	-	-	17	A-1-b (V)	
		59	30 50/1"	-	100	SS-18	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	

PID: 77372	BR ID: FRA-70-1301A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5051+29.66 / 9.8 RT	START: 6/10/13	END: 6/13/13	PG 2 OF 2	B-015-7-13

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)	BACK FILL
VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET. *(continued)*	661.8	61																
		62																
		63																
		64	42 50/4"	-	100	SS-19	-	54	17	10	16	3	22	17	5	10	A-1-b (0)	
		65																
		66																
		67																
		68																
		69	50/5"	-	20	SS-20	-	-	-	-	-	-	-	-	-	24	A-1-b (V)	
	651.3	70																
DOLOMITE : BROWN AND GRAY, SLIGHTLY WEATHERED, STRONG, VERY THIN TO MEDIUM BEDDED, CHERTY, CRYSTALLINE,, SILICEOUS, CALCITE/PYRITE DEPOSITS, CHERT NODULES AND LENSES, MODERATELY FRACTURED TO FRACTURED, OPEN APERTURE, SLIGHTLY ROUGH TO ROUGH; RQD 58%, REC 96%. -CHERT NODULE @ 71.1' -QU @ 72.1' = 12,300 PSI	TR	71																
		72																
		73	58		97	RC-1											CORE	
		74																
		75																
		76																
		77																
		78	58		95	RC-2											CORE	
		79																
	641.3	80																
	EOB																	

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 30.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BNTONITE POWDER / 50 GAL WATER

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: CME-750X (SN 310218)	STATION / OFFSET: 5053+52.86 / 39.9' LT	EXPLORATION ID B-015-8-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	PAGE 1 OF 1
PID: 77372 BR ID: FRA-70-1321A	DRILLING METHOD: 4.25" HSA / HQ	CALIBRATION DATE: 4/26/13	ELEVATION: 692.5 (MSL) EOB: 56.0 ft.	
START: 5/3/14 END: 5/3/14	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 86.8	LAT / LONG: 39.951030, -83.013641	

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
MEDIUM DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, WET.	692.5		12 10 2	17	33	SS-1	-	62	19	8	6	5	-	-	-	23	A-1-a (V)	
	691.0	1																
MEDIUM STIFF, BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, MOIST.		2	WOH WOH 4	6	33	SS-2	1.00	20	10	11	26	33	38	19	19	25	A-6b (8)	
		3																
	688.0	4	1 2 3	7	33	SS-3	1.00	30	12	12	23	23	-	-	-	29	A-6b (V)	
LOOSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.		5	1 2 3	7	33	SS-4	-	54	12	9	14	11	33	20	13	20	A-2-6 (0)	
	685.5	6																
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, WET.		7																
		8																
		9	1 9 10	27	0	SS-5	-	-	-	-	-	-	-	-	-	-		
-LARGE ROCK RECOVERED IN 3S-5A		10	13	-	50	3S-5A	-	-	-	-	-	-	-	-	-	-	A-1-a (V)	
		11	20 50/3"	-	100	SS-6	-	66	16	8	7	3	NP	NP	NP	19	A-1-a (0)	
-ROCK FRAGMENTS PRESENT IN SS-6 AND SS-7		12																
		13	1 5 7	17	33	SS-7	-	-	-	-	-	-	-	-	-	20	A-1-a (V)	
	678.0	14																
HARD, DARK BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.		15																
		16	5 7 12	27	72	SS-8	4.5+	3	7	16	40	34	32	15	17	14	A-6b (11)	
		17																
		18	15 17 17	49	44	SS-9	4.5+	-	-	-	-	-	-	-	-	16	A-6b (V)	
		19																
		20																
		21	10 15 14	42	94	SS-10	4.5+	-	-	-	-	-	-	-	-	14	A-6b (V)	
	670.5	22																
HARD, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.		23																
		24	23 23 25	69	56	SS-11	4.5+	7	8	21	34	30	28	15	13	16	A-6a (7)	
		25																
		26	14 50/3"	-	100	SS-12	4.5+	-	-	-	-	-	-	-	-	13	A-6a (V)	
	665.5	27																
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		28	50/2"	-	0	SS-13	-	-	-	-	-	-	-	-	-	-		
		29																
		30																
-COBBLES PRESENT @ 30.2'		31	25 45 50	137	83	SS-14	-	53	19	9	13	6	24	19	5	12	A-1-b (0)	
		32																
		33																
		34																
		35																
		36	20 40 50/5"	-	82	SS-15	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
		37																
		38																
		39																
-SHALE FRAGMENTS PRESENT IN SS-16 AUGER REFUSAL @ 40.3'		40																
-TOP 0.5' OF RC-1 CONSISTED OF GRANITE AND SHALE FRAGMENTS	651.7	TR	50/1"	-	100	SS-16	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
LIMESTONE : GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, VERY STRONG, THICK TO VERY THICK BEDDED, DOLOMITIC, CALCAREOUS, CRYSTALLINE, PYRITIC, CHERTY, MODERATELY FRACTURED TO FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 94%, REC 97%.		41	70		88	RC-1											CORE	
		42																
		43																
		44																
-QU @ 45.2' = 12,610 PSI		45	100		100	SS-2											CORE	
		46																
		47																
		48																
-QU @ 48.0' = 13,340 PSI		49	100		100	RC-3											CORE	
		50																
		51																
		52																
		53																
-CHANGING TO CONGLOMERITIC @ 53.5'		54																
-QU @ 53.4' = 7,502 PSI		55	85		93	RC-4											CORE	
	636.5	EOB 56																

NOTES: ELEVATION OF SCIOTO RIVER SURFACE @ 700.8

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: CME-750X (SN 310218)	STATION / OFFSET: 5055+67.30 / 34.3' LT	EXPLORATION ID B-015-9-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1321A	DRILLING METHOD: 4.25" HSA / HQ	CALIBRATION DATE: 4/26/13	ELEVATION: 691.2 (MSL) EOB: 65.2 ft.	PAGE 1 OF 2
START: 5/1/14 END: 5/3/14	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 86.8	LAT / LONG: 39.951307, -83.012966	

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
SOFT, BROWN AND BLACK **SILT AND CLAY**, LITTLE FINE GRAVEL, LITTLE COARSE TO FINE SAND, MOIST. -ROOT FIBERS PRESENT IN SS-1	691.2		WOH 1 2	4	33	SS-1	0.50	28	21	13	22	16	-	-	-	23	A-6a (V)	
LOOSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.	689.7		6 4 2	9	56	SS-2	-	39	15	11	20	15	34	19	15	19	A-2-6 (1)	
-BRICK FRAGMENTS PRESENT IN SS-3			1 3 3	9	39	SS-3	-	34	21	11	19	15	-	-	-	18	A-2-6 (V)	
VERY SOFT, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, MOIST.	686.7		1 3 2	7	44	SS-4	0.25	31	18	12	23	16	34	19	15	20	A-6a (2)	
MEDIUM DENSE, BROWN TO GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.	684.7		5 4 4	12	44	SS-5	-	47	16	9	17	11	-	-	-	15	A-2-6 (V)	
					83	ST-6	-	-	-	-	-	-	-	-	-	19	A-2-6 (V)	
VERY SOFT TO SOFT, DARK BROWN TO BLACK **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	681.0						0.50	-	-	-	-	-	-	-	-	33	A-6b (V)	
			1 1 1	3	100	SS-7	0.25	-	-	-	-	-	-	-	-	53	A-6b (V)	
LOOSE, DARK BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, WET. -INTRODUCED MUD @ 14.0'	677.7		1 2 3	7	44	SS-8	-	20	6	42	17	15	27	21	6	26	A-2-4 (0)	
			2 2 3	7	89	SS-9	-	-	-	-	-	-	-	-	-	46	A-2-4 (V)	
LOOSE, BROWN **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, TRACE SILT, TRACE CLAY, WET. -WOOD FRAGMENTS PRESENT IN SS-10 -HEAVING SAND ENCOUNTERED @ 20.5'	672.7		2 3 4	10	67	SS-10	-	20	25	38	10	7	NP	NP	NP	42	A-3a (0)	
STIFF TO VERY STIFF, GRAY AND BLACK **SILT AND CLAY**, SOME COARSE TO FINE SAND, WET.	670.2		6 5 4	13	33	SS-11	-	-	-	-	-	-	-	-	-	51	A-6a (V)	
-WOOD FRAGMENTS AND ORGANICS PRESENT THROUGHOUT			7 10 9	27	33	SS-12	-	-	-	-	-	-	-	-	-	72	A-6a (V)	
HARD, GRAY **SILT**, LITTLE CLAY, LITTLE COARSE TO FINE SAND, WET.	665.2		9 11 18	42	67	SS-13	4.5+	0	1	21	56	22	20	15	5	20	A-4b (8)	
VERY DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.	662.7		50/1"	-	0	SS-14	-	-	-	-	-	-	-	-	-	-		
			37 50/3"	-	67	SS-15	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
-LARGE PIECE OF WOOD RECOVERED IN RC-1	655.7				75	RC-1	-	-	-	-	-	-	-	-	-	-		
GRANITE BOULDERS	654.7		50/1"	-	0	SS-16	-	-	-	-	-	-	-	-	-	-		
	652.2	TR	19		29	RC-2											CORE	
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK. AUGER REFUSAL @ 40.2'			20 50/3"	-	100	SS-17	-	-	-	-	-	-	-	-	-	13	Rock (V)	
-SHALE WASHED OUT DURING CORING PROCESS IN RC-3	647.4		26		28	RC-3											CORE	
LIMESTONE : GRAY AND BROWN, UNWEATHERED, STRONG, THICK TO VERY THICK BEDDED, DOLOMITIC, CALCAREOUS, CHERTY, PYRITIC, FOSSILIFEROUS, STYOLITIC, SLIGHTLY TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 78%, REC 84%. -QU @ 43.8' = 14,655 PSI -QU @ 45.2' = 15,790 PSI			97		97	RC-4											CORE	
-CONGLOMERITIC FROM 50.2' TO 51.0'			77		97	RC-5											CORE	
-QU @ 52.1' = 14,472 PSI -CONGLOMERITIC FROM 52.0' TO 54.6'																		
-QU @ 57.2' = 16,970 PSI			96		100	RC-6											CORE	

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL018.dgn 1/31/2019 11:49:16 AM rachelm

PID: 77372	BR ID: FRA-70-1321A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5055+67.30 / 34.3 LT	START: 5/1/14	END: 5/3/14	PG 2 OF 2	B-015-9-13

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
LIMESTONE : GRAY AND BROWN, UNWEATHERED, STRONG, THICK TO VERY THICK BEDDED, DOLOMITIC, CALCAREOUS, CHERTY, PYRITIC, FOSSILIFEROUS, STYOLITIC, SLIGHTLY TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 78%, REC 84%. *(continued)*	631.2	61	93		100	RC-7											CORE	
		62																
		63																
		64																
	626.0	65 EOB																

NOTES: ELEVATION OF SCIOTO RIVER SURFACE @ 700.7

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-016-1-09 | *Location:* Sta. 5064+52.34, 9.1' RT., BL RAMP C5 | *Date Drilled:* 9/24/2009

WATER OBSERVATIONS: Water seepage at: 21.0' Water level at completion: 34.8'

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	717.2														
0.3	716.9						Topsoil - 3"								
		4 6 11	8	1		2.0	FILL: Stiff brown SILT AND CLAY (A-6a), little to some fine to coarse sand, trace to little fine to coarse gravel; contains few brick fragments; damp.								
3.5	713.7														
		2 8 14	3	2			FILL: Loose to medium dense brown GRAVEL (A-1-a), little to some fine to coarse sand, trace to little silt; damp.		64	18	---	7	--11--		INP
6.0	711.2														
		2 4 3	2	3			FILL: Brick Fragments								
8.5	708.7														
		1 2 1	6	4			FILL: Very loose to loose brown COARSE AND FINE SAND (A-3a), little silt, little gravel; contains brick fragments and wood pieces; damp to moist.								
		2 4 4	2	5											
13.5	703.7														
		2 2 3	4	6			FILL: Loose brown GRAVEL WITH SAND AND SILT (A-2-4), trace to little clay; contains brick fragments and wood pieces; wet.		33	23	---	17	17	10	
		2 2 2	2	7											52.66099
18.5	698.7														
		8 10 8	4	8			Medium dense to dense brown GRAVEL (A-1-b), some fine to coarse sand, trace to little silt; wet.								
		10 10 15	5	9											
		27 25 21	10	10											
25	692.2														

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-016-1-09 | *Location:* Sta. 5064+52.34, 9.1' RT., BL RAMP C5 | *Date Drilled:* 9/24/2009

WATER OBSERVATIONS: Water seepage at: 21.0' Water level at completion: 34.8'

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	692.2														
		20 18 13	10	11			Medium dense to very dense brown GRAVEL (A-1-b), some fine to coarse sand, trace to little silt; wet.								
		32 31 14	12	12											INP
30									38	29	---	16	--17--		
		36 25 18	3	13											
35															
37.0	680.2														
		8 15 16	8	14		4.5+	Hard gray SILT (A-4b), some fine to coarse sand, trace to little clay, trace gravel; damp.		7	8	---	22	53	10	
40															
		15 23 28	14	15		4.5+	@ 43.5'-45.0', little to some gravel.								53
45.0	672.2														
							Bottom of Boring - 45.0'								
50															

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-016-2-09 | *Location:* Sta. 163+67.46, 99.8' LT., BL I-70 WB | *Date Drilled:* 9/25/2009

WATER OBSERVATIONS: Water seepage at: 48.5' Water level at completion: 49.5'

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	743.0													
1.0	742.0						Asphalt Concrete - 3" Portland Cement Concrete - 9"							
		4 5 5	16	1		4.5+	FILL: Very stiff to hard brownish gray SILT AND CLAY (A-6a), trace gravel, trace to little fine to coarse sand; damp.		9	6	---	3	48	34
5		9 8 8	14	2		3.5	@ 3.5'-5.0', some fine to coarse sand.		21	19	---	13	26	21
		5 5 12	17	3		3.0	@ 6.0'-7.5', brown.							
8.5	734.5													
10		4 4 7	17	4		1.5	FILL: Stiff to very stiff brownish gray SILTY CLAY (A-6b), trace fine to coarse sand, trace gravel; damp to moist.							
		4 4 5	14	5		1.5								
15		2 5 5	17	6		2.5			6	5	---	4	36	49
		3 5 10	18	7A 7B		4.0	@ 16.0'-16.5', dark brown, contains brick fragments.							
18.5	724.5													
20		3 10 6	10	8			FILL: Medium dense black GRAVEL WITH SAND (A-1-b); contains brick and asphalt fragments; damp.							
21.0	722.0													
		3 4 3	18	9		4.5+	FILL: Very stiff to hard brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.		18	13	---	19	32	18
25	718.0	14 6 6	9	10		3.5								

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-016-2-09 | *Location:* Sta. 163+67.46, 99.8' LT., BL I-70 WB | *Date Drilled:* 9/25/2009

WATER OBSERVATIONS: Water seepage at: 48.5' Water level at completion: 49.5'

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	718.0													
		7 6 4	7	11		1.0	FILL: Medium stiff to stiff brown SILT AND CLAY (A-6a), trace to little fine to coarse sand; trace gravel; contains brick fragments and possible cobbles; damp.							
28.5	714.5													
30		4 11 8	14	12		1.5	Stiff brown SILT AND CLAY (A-6a), some gravel, trace to little fine to coase sand; damp.							
		4 10 7	6	13		1.0			33	9	---	10	29	19
33.5	709.5													
34.5	708.5	20 46 25	18	14A 14B 14C		2.75	Very dense brown GRAVEL WITH SAND (A-1-b), little silt; damp. @ 34.0'-34.5', possible cobbles.							
35							Very stiff brown SANDY SILT (A-4a), trace gravel; damp to moist.							
		8 10 17	1	15		-								
40														
43.5	699.5													
45		33 29 24	18	16			Dense to very dense brown GRAVEL (A-1-a), some fine to coarse sand, trace to little silt; damp.		61	15	---	10	--14--	
50	693.0	12 13 17	12	17			@ 48.5'-50.0', wet.							

STANDARD PENETRATION (N60) Natural Moisture Content, % - ●

PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP

10 20 30 40

INP 73 55

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-016-2-09 | *Location:* Sta. 163+67.46, 99.8' LT., BL I-70 WB | *Date Drilled:* 9/25/2009

WATER OBSERVATIONS:
Water seepage at: 48.5'
Water level at completion: 49.5'
FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ ○ / ⊣ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	693.0						Dense brown COARSE AND FINE SAND (A-3a), trace gravel, trace to little silt; wet.								
55.0 55	688.0	8 13 17	30	18											
							Bottom of Boring - 55.0'								
60															
65															
70															
75															

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL020.dgn 12/27/2018 10:27:05 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: CME-750X (SN 310218)	STATION / OFFSET: 5058+05.01 / 33.7' LT	EXPLORATION ID B-016-3-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1321A	DRILLING METHOD: 4.25" HSA / RC	CALIBRATION DATE: 4/26/13	ELEVATION: 685.0 (MSL) EOB: 58.6 ft.	PAGE 1 OF 1
START: 4/30/14 END: 5/1/14	SAMPLING METHOD: SPT / HQ	ENERGY RATIO (%): 86.8	LAT / LONG: 39.951627935, -83.012227140	

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 LOOSE, BROWNISH GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, WET.	685.0		3 2 1	4	67	SS-1	-	66	16	8	7	3	NP	NP	NP	19	A-1-a (0)	
-BRICK FRAGMENTS PRESENT IN SS-1	683.5		1 2 1	4	50	SS-2	0.50	24	13	21	27	15	-	-	-	19	A-4a (V)	
SOFT, BROWNISH GRAY AND BLACK **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, MOIST TO WET. -ORGANIC ODOR PRESENT IN SS-3			3 5 3	12	50	SS-3	0.50	24	13	20	28	15	27	18	9	24	A-4a (2)	
-INTRODUCED MUD @ 4.2'	680.5		1 2 3	7	33	SS-4	-	42	16	17	16	9	-	-	-	18	A-1-b (V)	
LOOSE TO MEDIUM DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET. -ORGANIC ODOR PRESENT IN SS-5			14 5 6	16	44	SS-5	-	56	9	11	16	8	31	25	6	21	A-1-b (0)	
	674.5		5 6 7	19	56	SS-6	-	-	-	-	-	-	-	-	-	22	A-1-b (V)	
MEDIUM DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, MOIST.	672.0		22 9 9	26	100	SS-7	-	69	11	6	10	4	NP	NP	NP	11	A-1-a (0)	
MEDIUM DENSE, GRAYISH BROWN **SANDY SILT**, LITTLE FINE GRAVEL, LITTLE CLAY, WET.	669.5		5 2 6	12	100	SS-8	-	12	19	20	38	11	NP	NP	NP	29	A-4a (3)	
VERY DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, WET.	668.3		7				-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
VERY STIFF, GRAY **SANDY SILT**, LITTLE CLAY, TRACE FINE GRAVEL, DAMP.	666.5		13 37	72	61	SS-9	4.00	-	-	-	-	-	-	-	-	12	A-4a (V)	
VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, MOIST. -COBBLES ENCOUNTERED @ 18.7'	664.5		50/5"	-	100	SS-10	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
MEDIUM DENSE TO DENSE, GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST. -HEAVING SAND ENCOUNTERED @ 23.7'			10 12 16	41	33	SS-11	-	-	-	-	-	-	21	15	6	11	A-2-4 (V)	
			14 8 7	22	33	SS-12	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	
	659.0		50/1"	-	100	SS-13	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
VERY DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-13			34 34 36	101	44	SS-14	-	69	11	7	8	5	NP	NP	NP	9	A-1-a (0)	
	650.0		20 20 50/4"	-	94	SS-15	4.50	27	3	6	32	32	42	22	20	13	A-7-6 (10)	
HARD, GRAY **CLAY**, "AND" SILT, SOME FINE GRAVEL, TRACE COARSE TO FINE SAND, DRY. -ROCK FRAGMENTS PRESENT IN SS-15 AUGER REFUSAL @ 41.2'	643.8	TR																
LIMESTONE : GRAY, UNWEATHERED, VERY STRONG, THICK TO VERY THICK BEDDED, DOLOMITIC, CALCAREOUS, CHERTY, PYRITIC, CRYSTALLINE, SLIGHTLY TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 96%, REC 98%. -QU @ 42.6' = 8,481 PSI			83		92	RC-1											CORE	
-QU @ 45.5' = 12,584 PSI			96		97	RC-2											CORE	
-QU @ 48.6' = 11,889 PSI			100		100	RC-3											CORE	
-CHANGING TO CONGLOMERITIC @ 54.6'			98		98	RC-4											CORE	
	626.4	EOB																

NOTES: ELEVATION OF SCIOTO RIVER SURFACE @ 697.3

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

FRA-70-12.68

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-016-3-13

DRAWN RRM
CHECKED BRT

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M./J.B.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 5059+89.96 / 2.4' RT	EXPLORATION ID B-016-4-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / K.R./A.D.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1321A	DRILLING METHOD: 3.25" HSA / RC	CALIBRATION DATE: 4/26/13	ELEVATION: 705.0 (MSL) EOB: 61.5 ft.	PAGE 1 OF 2
START: 8/7/13 END: 8/22/13	SAMPLING METHOD: SPT / NQ	ENERGY RATIO (%): 82.6	LAT / LONG: 39.951803928, -83.011598406	

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)	BACK FILL
1.0' - TOPSOIL (12.0")	705.0																	
	704.0																	
FILL: STIFF, BROWN AND DARK BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST. -BRICK AND COAL FRAGMENTS PRESENT IN SS-1	702.0	1	4 3 4	10	58	SS-1	1.75	-	-	-	-	-	-	-	-	16	A-6a (V)	
FILL: MEDIUM DENSE, BROWN AND GRAY **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, DAMP TO MOIST.		2																
		3																
		4	3 5 7	17	78	SS-2	-	25	20	23	14	18	19	12	7	10	A-2-4 (0)	
		5																
		6																
-TRACE ROOT FIBERS AND BRICK FRAGMENTS PRESENT IN SS-3	697.0	7	4 4 4	11	89	SS-3	-	-	-	-	-	-	-	-	-	14	A-2-4 (V)	
VERY SOFT TO MEDIUM STIFF, BROWN **SILTY CLAY**, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. -TRACE ORGANICS PRESENT IN SS-4		8																
		9	2 2 3	7	83	SS-4	0.75	1	1	7	45	46	40	18	22	29	A-6b (13)	
		10																
		11																
		12	WOH 1 1	3	100	SS-5	0.75	-	-	-	-	-	-	-	-	30	A-6b (V)	
		13																
	691.0	14			96	ST-6	0.25	-	-	-	-	-	-	-	-	34	A-6b (V)	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET.		15	W				-	-	-	-	-	-	-	-	-	27	A-1-b (V)	
		16																
		17	7 8 8	22	33	SS-7	-	-	-	-	-	-	-	-	-	19	A-1-b (V)	
-INTRODUCED MUD @ 18.5'		18																
		19	6 6 6	17	33	SS-8	-	-	-	-	-	-	-	-	-	26	A-1-b (V)	
-COBBLES ENCOUNTERED @ 20.0'		20																
		21																
		22	4 5 4	12	61	SS-9	-	64	12	6	12	6	22	22	NP	14	A-1-b (0)	
		23																
		24	4 5 4	12	33	SS-10	-	-	-	-	-	-	-	-	-	22	A-1-b (V)	
		25																
		26																
		27	4 4 6	14	39	SS-11	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
	677.0	28																
MEDIUM DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -COBBLES ENCOUNTERED @ 30.0'		29	13 13 8	29	100	SS-12	-	55	23	9	3	10	23	18	5	17	A-1-a (0)	
	673.0	30																
DENSE TO VERY DENSE, BROWN TO GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		31																
		32																
		33																
		34	43 50/4"	-	100	SS-13	-	-	-	-	-	-	-	-	-	13	A-1-a (V)	
		35																
		36																
		37																
-AUGER REFUSAL ENCOUNTERED @ 35.5'. ATTEMPTED 5.0' CORE RUN. GRANITE BOULDER PIECE RECOVERED IN CORE RUN. REMAINING SOIL WAS WASHED OUT DURING CORING OPERATION. CONTINUED SPT SAMPLING @ 40.5'.		38	0		28	RC-1											CORE	
		39																
		40																
		41	22 12 13	34	83	SS-14	0.00	-	-	-	-	-	-	-	-	11	A-1-a (V)	
		42																
		43																
		44	49 50/5"	-	100	SS-15	4.25	67	17	5	5	6	20	16	4	11	A-1-a (0)	
AUGER REFUSAL @ 45.5'	659.5	45																
SHALE : BLACK AND GRAY, MODERATELY WEATHERED TO UNWEATHERED, WEAK TO SLIGHTLY STRONG, VERY THIN BEDDED TO LAMINATED, FISSILE, FRIABLE, HIGHLY FRACTURED TO FRACTURED, OPEN APERTURE, SLIGHTLY ROUGH TO ROUGH; RQD 23%, REC 65%.		46	TR 0		98	RC-2											CORE	
		47																
		48																
		49	0		40	RC-3											CORE	
-SLIGHTLY PYRITIC IN RC-3		50																
		51																
		52																
-POINT LOAD STRENGTH @ 52.5' TO 56.0' -MEAN QU = 186 PSI		53																
		54	45		100	RC-4											CORE	
		55																
		56																
		57																
		58																
	645.3	59	33		63	RC-5											CORE	

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL022.dgn 12/27/2018 10:27:15 AM rachelm

PID: 77372	BR ID: FRA-70-1321A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5059+89.96 / 2.4 RT	START: 8/7/13	END: 8/22/13	PG 2 OF 2	B-016-4-13

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)	BACK FILL
	645.0																	
LIMESTONE : GRAY AND DARK GRAY, SLIGHTLY WEATHERED, STONG, CRYSTALLINE, THIN BEDDED, DOLOMITIC, PYRITIC, CHERTY, SLIGHTLY FRACTURED, OPEN APPERTURE, ROUGH; RQD 91%, REC 100%. *(continued)* -QU @ 59.8' = 12,760 PSI	643.5	EOB 61																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 15.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: TREMIED 188 LBS CEMENT / 50 LBS BNTONITE POWDER / 50 GAL WATER

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL023.dgn 12/27/2018 10:27:17 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: CME-750X (SN 310218)	STATION / OFFSET: 5062+32.40 / 14' RT	EXPLORATION ID B-016-5-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / A.D.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1321A	DRILLING METHOD: 4.25" HSA / RC	CALIBRATION DATE: 4/26/13	ELEVATION: 740.1 (MSL) EOB: 94.9 ft.	PAGE 1 OF 2
START: 8/9/13 END: 8/13/13	SAMPLING METHOD: SPT / HQ	ENERGY RATIO (%): 86.8	LAT / LONG: 39.952081479, -83.010812274	

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)	BACK FILL
0.3' - ASPHALT (4.0")	740.1																	
0.5' - CONCRETE (6.0")	739.8																	
0.2' - AGGREGATE BASE (2.0")	739.3																	
FILL: VERY STIFF, DARK BROWNISH GRAY TO DARK GRAYISH BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.	739.1	1	4 7 8	22	56	SS-1	2.75	-	-	-	-	-	-	-	-	17	A-6b (V)	
		2																
		3																
		4	4 6 9	22	61	SS-2	2.50	19	8	13	36	24	33	17	16	16	A-6b (7)	
		5																
		6																
		7	11 12 12	35	61	SS-3	3.00	-	-	-	-	-	-	-	-	13	A-6b (V)	
		8																
		9	8 10 13	33	72	SS-4	2.50	-	-	-	-	-	-	-	-	17	A-6b (V)	
		10																
	729.6																	
FILL: MEDIUM DENSE TO DENSE, DARK BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.		11	8 10 11	30	78	SS-5	-	28	16	24	4	28	40	19	21	17	A-2-6 (2)	
		12																
		13																
		14	5 8 11	27	83	SS-6	-	-	-	-	-	-	-	-	-	15	A-2-6 (V)	
		15																
		16																
		17	9 9 14	33	78	SS-7	-	-	-	-	-	-	-	-	-	20	A-2-6 (V)	
	722.1	18																
FILL: STIFF, DARK BROWN **SANDY SILT**, SOME FINE GRAVEL, LITTLE SILT, DAMP. -COBBLES ENCOUNTERED @ 18.5'		19	4 6 3	13	56	SS-8	1.50	27	18	19	22	14	28	18	10	13	A-4a (0)	
-SLAG FRAGMENTS PRESENT IN SS-8		20																
-BRICK AND CONCRETE FRAGMENTS PRESENT IN SS-9		21																
		22	2 4 9	19	61	SS-9	-	-	-	-	-	-	-	-	-	14	A-4a (V)	
	717.1	23																
FILL: MEDIUM DENSE, BROWNISH GRAY TO BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.		24	18 9 10	27	39	SS-10	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	
		25																
-BRICK, COAL, CONCRETE AND CINDER FRAGMENTS PRESENT THROUGHOUT		26																
		27	7 4 5	13	72	SS-11	-	40	20	13	18	9	26	19	7	9	A-2-4 (0)	
	712.1	28																
MEDIUM DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, WET.		29	7 4 5	13	72	SS-12	-	-	-	-	-	-	-	-	-	28	A-2-6 (V)	
		30																
		31																
	708.1	32																
VERY DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.		33																
		34	2 35 17	75	56	SS-13	-	-	-	-	-	-	-	-	-	6	A-2-4 (V)	
		35																
	703.1	36																
STIFF TO VERY STIFF, BROWN **CLAY**, "AND" SILT, TRACE FINE SAND, MOIST.		37																
		38																
		39	3 5 7	17	78	SS-14	2.50	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
		40																
		41																
		42																
		43																
		44	3 3 5	12	83	SS-15	2.00	0	0	4	54	42	45	22	23	28	A-7-6 (14)	
		45																
		46																
	693.1	47																
STIFF, DARK BROWNISH GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.		48																
W		49	6 8 6	20	56	SS-16	1.50	-	-	-	-	-	-	-	-	22	A-6a (V)	
		50																
		51																
	688.1	52																
DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		53																
		54	10 16 9	36	56	SS-17	-	45	29	12	12	2	18	15	3	16	A-1-b (0)	
		55																
		56																
		57																
		58																
		59	10 12 13	36	83	SS-18	-	-	-	-	-	-	-	-	-	18	A-1-b (V)	

PID: 77372	BR ID: FRA-70-1321A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5062+32.40 / 14 RT	START: 8/9/13	END: 8/13/13	PG 2 OF 2	B-016-5-13

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)	BACK FILL
DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. *(continued)*	680.1	61																
	678.1	62																
VERY STIFF TO HARD, GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DAMP TO MOIST.		63																
		64	12 28 30	84	56	SS-19	4.5+	-	-	-	-	-	-	-	-	8	A-4a (V)	
		65																
		66																
		67																
		68																
		69	11 13 25	55	50	SS-20	4.5+	11	8	22	41	18	21	13	8	12	A-4a (5)	
		70																
		71																
		72																
		73																
		74	17 24 48	104	56	SS-21	4.00	-	-	-	-	-	-	-	-	13	A-4a (V)	
	663.1	75																
VERY STIFF, GRAY **SILT**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, TRACE CLAY, WET.		76																
		77																
		78																
		79	10 22 39	88	61	SS-22	3.50	5	6	20	64	5	17	12	5	18	A-4b (7)	
		80																
		81																
	658.1	82																
HARD, GRAY **SILT AND CLAY**, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -SHALE FRAGMENTS PRESENT IN SS-23		83																
AUGER REFUSAL @ 84.9'	655.2	84	25 35 50/3"	-	67	SS-23	4.5+	-	-	-	-	-	-	-	-	12	A-6a (V)	
		TR 85	0		42	RC-1											CORE	
SHALE : GRAY AND BLACK, MODERATELY TO HIGHLY WEATHERED, VERY WEAK TO SLIGHTLY STRONG, LAMINATED TO THINLY LAMINATED, FISSILE, FRIABLE, HIGHLY FRACTURED, OPEN APERTURE, ROUGH; RQD 0%, REC 32%.		86																
		87																
		88	0		30	RC-2											CORE	
		89																
		90																
-0.2' SILTSTONE LENS @ 90.9'		91																
		92																
		93	0		31	RC-3											CORE	
	645.2	94 EOB																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 48.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: TREMIED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 50 GAL WATER

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL025.dgn 12/27/2018 10:27:32 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 5066+43.00 / 2.9' RT	EXPLORATION ID B-016-6-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.H.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1321A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 717.0 (MSL) EOB: 50.0 ft.	PAGE 1 OF 1
START: 7/18/13 END: 7/18/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 82.6	LAT / LONG: 39.952535194, -83.009477109	

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)	BACK FILL
FILL: HARD, DARK BROWN **SANDY SILT**, SOME FINE GRAVEL, DRY. -STONE FRAGMENTS PRESENT IN SS-1	717.0	1	8 13 28	56	22	SS-1	-	-	-	-	-	-	-	-	-	7	A-4a (V)	
	714.0	2																
FILL: MEDIUM DENSE, BLACK **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, WET. -CINDERS PRESENT IN SS-2		3																
	711.5	4	8 8 4	17	44	SS-2	-	-	-	-	-	-	-	-	-	24	A-1-b (V)	
FILL: STIFF, BROWN **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP. -CINDERS AND ROOT FIBERS PRESENT IN SS-3		5																
	709.0	6	3 5 6	15	67	SS-3	-	24	18	17	28	13	27	19	8	13	A-4a (1)	
VERY LOOSE TO LOOSE, BROWN **SILT**, LITTLE COARSE TO FINE SAND, LITTLE CLAY, TRACE FINE GRAVEL, WET.		7																
		8																
		9	3 1 1	3	28	SS-4	-	-	-	-	-	-	-	-	-	33	A-4b (V)	
		10																
		11																
		12	3 2 3	7	44	SS-5	-	-	-	-	-	-	-	-	-	26	A-4b (V)	
	704.0	13																
MEDIUM STIFF TO STIFF, REDDISH BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		14	3 4 4	11	83	SS-6	1.50	1	5	28	43	23	33	17	16	19	A-6b (9)	
		15																
		16																
		17	3 4 5	12	61	SS-7	1.00	-	-	-	-	-	-	-	-	21	A-6b (V)	
	699.0	18																
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		19	10 10 11	29	56	SS-8	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
		20																
	695.0	21																
VERY DENSE, BROWN TO GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -HEAVING SAND ENCOUNTERED @ 23.5'		22																
		23																
		24	11 27 23	69	67	SS-9	-	54	22	12	10	2	17	17	NP	9	A-1-a (0)	
-COBBLES PRESENT @ 26.0'		25																
		26																
		27																
		28																
		29	11 27 22	67	39	SS-10	4.50	-	-	-	-	-	-	-	-	9	A-1-a (V)	
		30																
	685.0	31																
HARD, GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DAMP.		32																
		33																
		34	19 31 34	89	39	SS-11	4.50	17	15	21	28	19	22	13	9	10	A-4a (2)	
		35																
	680.0	36																
HARD, GRAY **SILTY CLAY**, TRACE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.		37																
		38																
		39	6 9 13	30	39	SS-12	4.50	-	-	-	-	-	-	-	-	24	A-6b (V)	
		40																
		41																
		42																
		43																
		44	18 23 28	70	44	SS-13	4.5+	1	1	1	31	66	38	19	19	19	A-6b (12)	
		45																
		46																
		47																
		48																
		49	20 31 35	91	50	SS-14	4.5+	-	-	-	-	-	-	-	-	16	A-6b (V)	
	667.0	50																
		EOB																

W

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 23.5' AND AT COMPLETION @ 24.0'; CAVE-IN DEPTH @ 32.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 50 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.B.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 3052+85.29 / 31.4' LT	EXPLORATION ID B-016-7-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.V.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP D3	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 714.9 (MSL) EOB: 48.7 ft.	PAGE 1 OF 1
START: 1/14/14 END: 1/15/14	SAMPLING METHOD: SPT	ENERGY RATIO (%): 82.6	LAT / LONG: 39.953120632, -83.010292838	

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)	BACK FILL
0.3' - TOPSOIL (3.0")	714.6																	
FILL: MEDIUM DENSE, DARK BROWN AND BLACK **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST TO WET. -ROOT FIBERS PRESENT IN SS-1 -COBBLES ENCOUNTERED @ 2.5' -CONCRETE AND LIMESTONE FRAGMENTS PRESENT THROUGHOUT	709.4		8 6 8	19	33	SS-1	-	-	-	-	-	-	-	-	-	21	A-2-6 (V)	
			6 7 5	17	50	SS-2	-	55	9	7	15	14	35	19	16	10	A-2-6 (1)	
FILL: VERY STIFF, BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. -STONE FRAGMENTS PRESENT IN SS-3	706.9		4 4 5	12	56	SS-3	2.75	-	-	-	-	-	-	-	-	17	A-6b (V)	
FILL: DENSE, GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP. -COBBLES ENCOUNTERED @ 8.0' -LIMESTONE FRAGMENTS PRESENT THROUGHOUT -ROOT FIBERS PRESENT IN SS-5	701.9		8 18 15	45	33	SS-4	-	-	-	-	-	-	-	-	-	5	A-2-4 (V)	
			18 17 10	37	44	SS-5	-	64	14	7	10	5	30	22	8	6	A-2-4 (0)	
FILL: STIFF TO VERY STIFF, DARK BROWN TO DARK BROWNISH GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. -ROOT FIBERS AND BRICK FRAGMENTS PRESENT IN SS-6	697.4		5 7 7	19	61	SS-6	2.50	-	-	-	-	-	-	-	-	17	A-6a (V)	
			4 5 4	12	78	SS-7	1.75	-	-	-	-	-	-	-	-	23	A-6a (V)	
STIFF, DARK BROWN AND BLACK **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. -QU @ 17.9' = 1.29 TSF	692.9	W			88	ST-8	2.00	1	2	18	40	39	40	21	19	31	A-6b (12)	
VERY LOOSE, DARK GRAY **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, WET.	687.9		WOH 2 1	4	100	SS-9	-	3	24	39	20	14	29	21	8	40	A-2-4 (0)	
VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST. -COBBLES ENCOUNTERED @ 27.0' -ROCK FRAGMENTS PRESENT IN SS-10	682.9		11 37 21	80	36	SS-10	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
HARD, GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DRY. -ROCK FRAGMENTS PRESENT IN SS-11	677.9		20 21 21	58	94	SS-11	4.5+	-	-	-	-	-	-	-	-	9	A-6a (V)	
VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, WET. -INTORDUCED MUD @ 37.0' -ROCK FRAGMENTS PRESENT IN SS-12 -COBBLES ENCOUNTERED @ 41.0'	672.9		7 14 25	54	61	SS-12	-	26	31	25	10	8	NP	NP	NP	23	A-1-b (0)	
HARD, GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -ROCK FRAGMENTS PRESENT IN SS-13	667.9		3 35 22	78	89	SS-13	4.5+	-	-	-	-	-	-	-	-	16	A-6a (V)	
VERY DENSE, GRAYISH BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.	666.2	EOB	50/2"	-	100	SS-14	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 19.0'; CAVE-IN DEPTH @ 35.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 50 LBS BENTONITE CHIPS AND SOIL CUTTINGS

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZL401.dgn 12/27/2018 10:47:28 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / M.W.	DRILL RIG: CME 55 (SN 386345)	STATION / OFFSET: 147+92.16 / 100.7' LT	EXPLORATION ID B-016-8-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-70 EB	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 720.9 (MSL) EOB: 59.3 ft.	PAGE 1 OF 1
START: 11/2/15 END: 11/2/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92	LAT / LONG: 39.951490699, -83.014244767	

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)	BACK FILL
1.2' - ASPHALT (14.0")	720.9																	
0.3' - AGGREGATE BASE (4.0")	719.7																	
FILL: VERY STIFF, DARK BROWN **SANDY SILT**, SOME CLAY, LITTLE FINE GRAVEL, DAMP. -CINDERS, BRICK AND ROCK FRAGMENTS PRESENT IN SS-1	719.4		7 9 7	25	78	SS-1	3.25	-	-	-	-	-	-	-	-	12	A-4a (V)	
FILL: MEDIUM DENSE, DARK BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.	717.9		5 7 8	23	94	SS-2	-	77	7	4	7	5	NP	NP	NP	7	A-1-a (0)	
FILL: LOOSE TO MEDIUM DENSE, DARK BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST. -CINDERS, BRICK AND ROCK FRAGMENTS PRESENT THROUGHOUT	715.4		3 3 2	8	89	SS-3	-	-	-	-	-	-	-	-	-	17	A-2-4 (V)	
			2 4 5	14	39	SS-4	-	83	4	3	7	3	29	20	9	10	A-2-4 (0)	
FILL: MEDIUM DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, DRY TO DAMP. -ROCK FRAGMENTS PRESENT THROUGHOUT	710.4		2 8 5	20	6	SS-5	-	-	-	-	-	-	-	-	-	3	A-2-6 (V)	
			9	-	100	3S-5A	-	93	2	1	3	1	30	17	13	8	A-2-6 (0)	
FILL: MEDIUM DENSE, DARK BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST. -BRICK AND LIMESTONE FRAGMENTS PRESENT IN SS-7	707.4	W	3 3 5	12	61	SS-6	-	-	-	-	-	-	-	-	-	17	A-2-4 (V)	
			8 7 4	17	33	SS-7	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	
VERY STIFF, BROWN **SILTY CLAY**, "AND" COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	702.9		2 3 4	11	100	SS-8	2.75	4	11	36	22	27	34	17	17	20	A-6b (5)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, TRACE TO SOME COARSE TO FINE SAND, TRACE TO LITTLE SILT, TRACE CLAY, DAMP TO MOIST.	698.9		14 13 13	40	56	SS-9	-	87	5	2	4	2	22	19	3	5	A-1-a (0)	
		W	5 5 6	17	61	SS-10	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
-HEAVING SANDS ENCOUNTERED @ 33.5' -INTRODUCED MUD @ 33.5'			11 11 16	41	100	SS-11	-	-	-	-	-	-	-	-	-	16	A-1-a (V)	
			18 10 13	35	44	SS-12	-	63	15	7	12	3	NP	NP	NP	9	A-1-a (0)	
HARD, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.	678.9		7 9 18	41	39	SS-13	4.5+	-	-	-	-	-	-	-	-	11	A-6a (V)	
			11 21 38	90	100	SS-14	4.5+	5	8	18	38	31	29	15	14	14	A-6a (8)	
			50/4"	-	100	SS-15	4.5+	-	-	-	-	-	-	-	-	14	A-6a (V)	
AUGER REFUSAL @ 59.3'	661.6	EOB	33 50/3"	-	100	SS-16	4.5+	-	-	-	-	-	-	-	-	15	A-6a (V)	

NOTES: SEEPAGE ENCOUNTERED @ 13.5', GROUNDWATER ENCOUNTERED INITIALLY @ 28.5'. CAVE-IN DEPTH @ 30.0'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:46 - U:\GI\PROJECTS\2013\W-13-045.GPJ

281/496

FRA-70-12.68

STRUCTURE FOUNDATION EXPLORATION
ELECTRICAL RELOCATION
BORING LOG B-016-8-15

DRAWN RRM
CHECKED BRT

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750X (SN 310218)	STATION / OFFSET: 150+30.99 / 410.8' LT	EXPLORATION ID B-016-9-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-70 EB	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 722.9 (MSL) EOB: 73.1 ft.	PAGE 1 OF 2
START: 11/7/15 END: 11/7/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 85.7	LAT / LONG: 39.952555351, -83.014007320	

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)	BACK FILL
0.2' - TOPSOIL (2.0")	722.7																	
FILL: HARD, BROWN TO DARK BROWN **SILTY CLAY**, "AND" FINE GRAVEL, LITTLE COARSE TO FINE SAND, DRY.		2	11 12 26	54	67	SS-1	4.50	38	10	8	22	22	35	19	16	6	A-6b (4)	
		4	12 12 12	34	100	SS-2	4.5+	-	-	-	-	-	-	-	-	10	A-6b (V)	
	717.4																	
FILL: DENSE, BROWNISH GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP. -ASPHALT AND BRICK FRAGMENTS PRESENT THROUGHOUT	714.9	7	16 19 19	54	56	SS-3	-	68	12	5	10	5	23	18	5	3	A-1-a (0)	
FILL: MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, DAMP. -ASPHALT AND BRICK FRAGMENTS PRESENT THROUGHOUT		9	8 10 9	27	100	SS-4	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	
		12	9 17 48	93	100	SS-5	-	46	17	8	18	11	26	17	9	6	A-2-4 (0)	
	709.9																	
FILL: DENSE TO VERY DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -ASPHALT AND BRICK FRAGMENTS PRESENT THROUGHOUT		14	14 16 35	73	50	SS-6	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
	705.4	17	20 14 11	36	0	SS-7	-	-	-	-	-	-	-	-	-	-		
FILL: STIFF, BROWN **SANDY SILT**, LITTLE FINE GRAVEL, LITTLE CLAY, DRY TO DAMP. -ASPHALT, BRICK AND GLASS FRAGMENTS PRESENT THROUGHOUT			10	-	67	3S-7A	-	-	-	-	-	-	-	-	-	8	A-4a (V)	
	700.9	19	2 2 2	6	100	SS-8	1.50	16	18	21	31	14	31	25	6	21	A-4a (2)	
DENSE TO VERY DENSE, BROWN **GRAVEL**, TRACE SILT, TRACE FINE SAND, TRACE CLAY, MOIST.		24	2 5 22	39	33	SS-9	-	-	-	-	-	-	-	-	-	18	A-1-a (V)	
-COBBLES ENCOUNTERED @ 29.0'		29	19 24 10	49	0	SS-10	-	-	-	-	-	-	-	-	-	-		
W		30	8	-	100	3S-10A	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
-HEAVING SANDS ENCOUNTERED FROM 33.5' TO 43.5'		34	6 27 21	69	100	SS-11	-	90	0	3	5	2	21	17	4	8	A-1-a (0)	
	685.9																	
MEDIUM DENSE TO DENSE, BROWN TO BROWNISH GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		39	4 7 12	27	100	SS-12	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
		44	4 9 13	31	100	SS-13	-	42	46	5	4	3	22	17	5	11	A-1-b (0)	
	675.9																	
VERY DENSE, GRAY **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, TRACE SILT, TRACE CLAY, MOIST.		49	27 23 33	80	100	SS-14	-	-	-	-	-	-	-	-	-	17	A-3a (V)	
-HEAVING SANDS ENCOUNTERED @ 53.5'		54	7 31 43	106	100	SS-15	-	-	-	-	-	-	-	-	-	18	A-3a (V)	
	665.9																	
HARD, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.		59	7 25 25	71	100	SS-16	4.5+	-	-	-	-	-	-	-	-	9	A-6a (V)	

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:46 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZL403.dgn 12/27/2018 10:47:36 AM rachelm

PID: 77372	BR ID: N/A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 150+30.99 / 410.8 LT	START: 11/7/15	END: 11/7/15	PG 2 OF 2	B-016-9-15

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)	BACK FILL
HARD, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST. *(continued)*	662.9	61																
	660.9	62																
MEDIUM DENSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		63																
		64	10 25 50/4"	-	88	SS-17	-	32	28	16	15	9	24	19	5	17	A-1-b (0)	
-COBBLES ENCOUNTERED @ 65.0'		65																
		66																
		67																
		68																
-HEAVING SAND ENCOUNTERED @ 68.5' -WATER ADDED @ 68.5'		69	7 10 11	30	100	SS-18	-	52	18	11	13	6	NP	NP	NP	12	A-1-b (0)	
		70																
		71																
		72																
AUGER REFUSAL @ 73.0'	649.8	EOB 73	50/1"	-	100	SS-19	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 30.0'; CAVE-IN DEPTH @ 41.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 200 LBS BENTONITE CHIPS AND SOIL CUTTINGS

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:46 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-017-1-09 | *Location:* Sta. 5069+00.59, 22.12' RT., BL RAMP C5 | *Date Drilled:* 9/23/2009

WATER OBSERVATIONS: Water seepage at: 16.0' | Water level at completion: 18.5' (prior to adding water), 16.4' (includes drilling water)

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	713.7														
0.7	713.0						Topsoil - 8"								
		9 4 2	18	1		1.0	FILL: Medium stiff dark brown to brown SANDY SILT (A-4a), trace to little gravel; damp to moist.								
		3 2 3	9	2		0.5									
6.0	707.7														
		7 27 23	13	3			Dense to very dense brown GRAVEL WITH SAND (A-1-b), trace to little silt; damp.		58	14	---	11	--17--		INP 52
		16 27 24	14	4											53
		7 27 23	13	5											52
		10 30 25	13	6											57
		7 17 16	14	7			@ 16.0', becomes wet.								
		9 16 16	4	8											
		2 8 18	12	9			@ 21.0'-22.5', medium dense.		33	45	---	15	--7--		INP
		10 20 9	11	10											
25	688.7														

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-017-1-09 | *Location:* Sta. 5069+00.59, 22.12' RT., BL RAMP C5 | *Date Drilled:* 9/23/2009

WATER OBSERVATIONS: Water seepage at: 16.0' | Water level at completion: 18.5' (prior to adding water), 16.4' (includes drilling water)

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	688.7														
		11 10 11	12	11			Medium dense brown GRAVEL WITH SAND (A-1-b), little silt; wet.		25	47	---	17	--11--		INP
30		8 14 40	9	12											56
32.0	681.7														
		4 9 13	18	13		2.5	Very stiff gray CLAY (A-7-6), little silt, moist.		0	0	---	0	16	84	
35															
37.0	676.7														
		11 12 15	18	14		2.5	Very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, trace to little gravel; moist.								
40															
42.0	671.7														
		13 34 38	18	15		3.5	Very stiff to hard gray CLAY (A-7-6), little gravel, trace fine to coarse sand; possible decomposed shale; damp.		11	2	---	2	38	46	74
45															
50	663.7	26 34 36	18	16		4.5+									72

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-017-1-09 | *Location:* Sta. 5069+00.59, 22.12' RT., BL RAMP C5 | *Date Drilled:* 9/23/2009

WATER OBSERVATIONS:
Water seepage at: 16.0'
Water level at completion: 18.5' (prior to adding water)
16.4' (includes drilling water)
FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ ○ / ⊣ LL Blows per foot - Non-Plastic - NP (10 20 30 40)
	663.7						Very stiff to hard gray CLAY (A-7-6), little gravel, trace fine to coarse sand; possible decomposed shale; damp.								
53.8	659.9	50/4	4	17		--	@ 53.5'; gray.								50+
							Bottom of Boring - 53.8'								
55															
60															
65															
70															
75															

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-017-2-09 | *Location:* Sta. 169+62.3, 117.3' LT., BL I-70 WB | *Date Drilled:* 9/23/2009

WATER OBSERVATIONS: Water seepage at: 16.5' | Water level at completion: 17.0' (prior to adding water), 45.5' (includes drilling water)

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL; Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	713.0														
1.2	711.8						Asphalt Concrete - 2" Portland Cement Concrete - 9" Aggregate Base - 3"								
		3 4 4	10	1		1.0	FILL: Stiff brown SANDY SILT (A-4a), little gravel; moist.								
3.5	709.5														
5		3 6 7	5	2		-	FILL: Medium dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, trace to little silt; damp.								
6.0	707.0														
		4 3 5	13	3		2.0	FILL: Stiff brown SANDY SILT (A-4a), trace to little gravel; damp to moist. @ 6.0'-7.5', contains few brick fragments.		10	12	---	19	40	19	
10		3 2 3	13	4		1.0									
		2 3 7	13	5		1.0	@ 11.0'-12.5', little to some gravel;								
13.5	699.5														
15		3 3 2	12	6			Loose brown COARSE TO FINE SAND (A-3a), some silt, little gravel; moist to wet.		15	17	---	42	--26--		INP
		1 2 2	18	7											
18.5	694.5														
20		7 9 11	18	8			Medium dense brown GRAVEL WITH SAND, SILT, AND CLAY (A-2-6); wet.								
		18 36 44	14	9			@ 21.0'-22.5', very dense.								83
23.5	689.5														
25	688.0	16 24 40	18	10			Very dense brown GRAVEL (A-1-a), some fine to coarse sand, trace silt; wet.		65	18	---	8	--9--		INP 66

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-017-2-09 | *Location:* Sta. 169+62.3, 117.3' LT., BL I-70 WB | *Date Drilled:* 9/23/2009

WATER OBSERVATIONS: Water seepage at: 16.5' | Water level at completion: 17.0' (prior to adding water), 45.5' (includes drilling water)

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	% Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL; Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	688.0														
		38 44 33	11	11			Very dense brown GRAVEL (A-1-a), some fine to coarse sand, trace silt; wet.								80
30		19 34 33	11	12											69
32.0	681.0														
35		8 12 14	12	13		0.5	Soft to medium stiff gray SILT AND CLAY (A-6a), trace to little fine to coarse sand, trace gravel; moist.		7	1	---	1	41	50	
37.0	676.0														
40		11 8 24	14	14		2.75	Very stiff gray SILTY CLAY (A-6b); trace to little fine to coarse sand; damp to moist.								
45		8 9 14	18	15		2.75			9	7	---	6	34	44	
							@ 48.5'-50.0', possible decomposed shale.								
50	663.0	24 36 40	18	16		3.75									79

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-017-2-09 | *Location:* Sta. 169+62.3, 117.3' LT., BL I-70 WB | *Date Drilled:* 9/23/2009

WATER OBSERVATIONS:
Water seepage at: 16.5'
Water level at completion: 17.0' (prior to adding water)
45.5' (includes drilling water)
FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ ○ / Non-Plastic - NP ⊣ LL Blows per foot - 10 20 30 40
	663.0						Very stiff gray SILTY CLAY (A-6b); trace to little fine to coarse sand; damp to moist.								
54.8	658.2	22 39 50/4	16	17		2.5	@ 53.5'-54.8', possible decomposed shale.								● 50+ ○
55							Bottom of Boring - 54.8'								
60															
65															
70															
75															

PROJECT: FRA-70-12.68 - PHASE 4A
TYPE: STRUCTURE
PID: 77372 BR ID: FRA-70-1358R
START: 7/30/13 END: 8/2/13

DRILLING FIRM / OPERATOR: RII / J.B.
SAMPLING FIRM / LOGGER: RII / S.B.
DRILLING METHOD: 4.25" HSA / RC
SAMPLING METHOD: SPT / HQ

DRILL RIG: MOBILE B-53 (SN 624400)
HAMMER: AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 77.7

STATION / OFFSET: 166+20.53 / 31.8' RT
ALIGNMENT: BL I-70 EB
ELEVATION: 740.3 (MSL) EOB: 87.0 ft.
LAT / LONG: 39.953028358, -83.008033736

EXPLORATION ID: B-017-3-13

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)	BACK FILL
0.5'- ASPHALT (6.0")	739.8																	
0.3'- AGGREGATE BASE (4.0")	739.5																	
FILL: STIFF TO VERY STIFF, BROWN **CLAY**, "AND" SILT, TRACE TO LITTLE FINE TO COARSE SAND, TRACE TO SOME FINE GRAVEL, DAMP TO MOIST.		1	4 4 10	18	78	SS-1	3.25	-	-	-	-	-	-	-	-	17	A-7-6 (V)	
		2																
		3																
		4	5 2 4	8	50	SS-2	1.50	26	13	6	36	19	43	16	27	16	A-7-6 (11)	
		5																
		6																
		7	2 3 5	10	33	SS-3	2.25	-	-	-	-	-	-	-	-	18	A-7-6 (V)	
		8																
		9	3 4 5	12	44	SS-4	2.75	-	-	-	-	-	-	-	-	15	A-7-6 (V)	
		10																
		11																
		12	2 3 3	8	50	SS-5	2.00	-	-	-	-	-	-	-	-	16	A-7-6 (V)	
		13																
		14	1 3 3	8	56	SS-6	1.25	21	9	5	36	29	43	17	26	19	A-7-6 (13)	
		15																
		16																
		17	3 4 5	12	17	SS-7	1.25	-	-	-	-	-	-	-	-	17	A-7-6 (V)	
		18	4	-	67	3S-7A	1.25	-	-	-	-	-	-	-	-	16	A-7-6 (V)	
		19	2 7 5	16	50	SS-8	3.00	5	3	3	35	54	50	18	32	22	A-7-6 (18)	
		20																
		21																
		22	3 4 5	12	83	SS-9	3.00	-	-	-	-	-	-	-	-	24	A-7-6 (V)	
		23																
		24	3 3 5	10	89	SS-10	2.00	-	-	-	-	-	-	-	-	26	A-7-6 (V)	
		25																
		26																
	713.3	27	3 9 10	25	83	SS-11	3.75	-	-	-	-	-	-	-	-	21	A-7-6 (V)	
FILL: MEDIUM DENSE, BLACK **GRAVEL AND SAND**, TRACE SILT, MOIST.							-	-	-	-	-	-	-	-	-	16	A-1-b (V)	
		28																
		29	3 5 9	18	33	SS-12	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
	708.3	30																
		31																
		32																
		33																
STIFF, BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		34	1 4 7	14	67	SS-13	1.50	5	7	12	41	35	37	17	20	20	A-6b (12)	
		35																
		36																
	703.3	37																
DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST.		38																
		39	5 13 16	38	61	SS-14	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
		40																
		41																
		42																
		43																
		44	20 25 20	58	94	SS-15	-	59	16	8	14	3	NP	NP	NP	6	A-1-b (0)	
		45																
		46																
		47																
		48																
	W	49	13 26 26	67	56	SS-16	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
		50																
		51																
		52																
		53																
		54	30 25 28	69	78	SS-17	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		55																
		56																
	683.3	57																
VERY STIFF TO HARD, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP.		58																
	W	59	15 22 20	54	67	SS-18	3.50	28	13	18	30	11	22	11	11	10	A-6a (1)	

FRA-70-12.68

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-017-3-13

DRAWN RRM
CHECKED BRT

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL030.dgn 12/27/2018 10:28:04 AM rachelm

PID: 77372	BR ID: FRA-70-1358R	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 166+20.53 / 31.8 RT	START: 7/30/13	END: 8/2/13	PG 2 OF 2	B-017-3-13

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)	BACK FILL
VERY STIFF TO HARD, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP. *(continued)*	680.3	61																
		62																
		63																
		64	20 25 40	84	67	SS-19	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
		65																
		66																
	673.3	67																
VERY DENSE, BROWN AND GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, MOIST.		68																
		69	3 30 36	85	67	SS-20	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
	668.3	70																
HARD, BROWN TO GRAY **CLAY**, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.		71																
		72																
		73																
		74	4 19 19	49	72	SS-21	4.50	-	-	-	-	-	-	-	-	17	A-7-6 (V)	
		75																
		76																
		77																
		78																
		79	10 24 40	83	72	SS-22	4.5+	8	2	3	41	46	41	19	22	10	A-7-6 (13)	
		80																
		81																
		82																
AUGER REFUSAL @ 83.5'	656.8	83	4 20 50/5"	-	59	SS-23	4.5+	-	-	-	-	-	-	-	-	15	A-7-6 (V)	
		TR																
SHALE : BLACK AND GRAY, SLIGHTLY TO HIGHLY WEATHERED, VERY WEAK TO SLIGHTLY STRONG, THINLY LAMINATED TO THIN BEDDED, FISSILE, HIGHLY TO MODERATELY FRACTURED, OPEN APERTURE, SLIGHTLY ROUGH; RQD 26%, REC 81%. -QU @ 86.0' = 222 PSI		84	0		56	RC-1											CORE	
		85																
		86	46		100	RC-2											CORE	
	653.3	EOB 87																

NOTES: SEEPAGE ENCOUNTERED @ 48.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 58.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 100 LBS BENTONITE CHIPS AND SOIL CUTTINGS

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL031.dgn 1/31/2019 11:51:22 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: CME-750X (SN 310218)	STATION / OFFSET: 5071+46.22 / 58.4' RT	EXPLORATION ID B-017-4-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / A.D.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1358A	DRILLING METHOD: 4.25" HSA / HQ	CALIBRATION DATE: 4/26/13	ELEVATION: 712.8 (MSL) EOB: 76.3 ft.	PAGE 1 OF 2
START: 7/18/13 END: 7/19/13	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 86.8	LAT / LONG: 39.952700, -83.007703	

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)	BACK FILL
0.5' - TOPSOIL (6.0")	712.3																	
STIFF, BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP TO MOIST.			5 8 4	17	72	SS-1	2.00	-	-	-	-	-	-	-	-	22	A-6b (V)	
			4 4 5	13	72	SS-2	2.00	29	10	14	28	19	36	20	16	18	A-6b (4)	
			4 4 5	13	50	SS-3	2.00	-	-	-	-	-	-	-	-	19	A-6b (V)	
	704.8																	
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE TO SOME SILT, TRACE CLAY, DAMP TO MOIST.			5 7 6	19	17	SS-4	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			11 13 15	41	67	SS-5	-	-	-	-	-	-	-	-	-	4	A-1-b (V)	
			21 12 15	39	56	SS-6	-	59	16	7	14	4	24	19	5	9	A-1-b (0)	
-COBBLES PRESENT THROUGHOUT			16 15 10	36	56	SS-7	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
		W																
			9 12 15	39	44	SS-8	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
			10 10 12	32	78	SS-9	-	39	23	13	21	4	23	22	1	10	A-1-b (0)	
			5 6 4	14	72	SS-10	-	-	-	-	-	-	-	-	-	16	A-1-b (V)	
			4 25 28	77	89	SS-11	-	-	-	-	-	-	-	-	-	20	A-1-b (V)	
	684.8																	
DENSE TO VERY DENSE, BROWN **GRAVEL**, SOME FINE TO COARSE SAND, TRACE SILT, TRACE CLAY, MOIST.			24 13 12	36	83	SS-12	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
-HEAVING SANDS ENCOUNTERED @ 33.5'			10 17 20	54	56	SS-13	-	69	19	4	5	3	21	16	5	11	A-1-a (0)	
			15 24 41	94	83	SS-14	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
			17 18 11	42	89	SS-15	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
	665.8																	
HARD, GRAY **CLAY**, SOME SILT, SOME FINE GRAVEL, TRACE FINE SAND, DRY TO DAMP.			11 16 30	67	50	SS-16	3.50	-	-	-	-	-	-	-	-	16	A-7-6 (V)	
	659.3	TR																
SHALE: GRAY, HIGHLY WEATHERED, VERY WEAK.			50/5"	-	100	SS-17	-	-	-	-	-	-	-	-	-	10	Rock (V)	
			50/5"	-	80	SS-18	-	-	-	-	-	-	-	-	-	10	Rock (V)	

PID: 77372 | BR ID: FRA-70-1358A | PROJECT: FRA-70-12.68 - PHASE 4A | STATION / OFFSET: 5071+46.22 / 58.4 RT | START: 7/18/13 | END: 7/19/13 | PG 2 OF 2 | B-017-4-13

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)	BACK FILL
SHALE: GRAY, HIGHLY WEATHERED, VERY WEAK. *(continued)*	652.8	61																
		62																
		63																
		64	50/5"	-	100	SS-19	-	-	-	-	-	-	-	-	-	11	Rock (V)	
		65																
AUGER REFUSAL @ 66.3'	646.5	66																
LIMESTONE : GRAY, MODERATELY WEATHERED, MODERATELY STRONG, VERY THIN TO THIN BEDDED, CALCAREOUS, FRACTURED, OPEN APERTURE, SLIGHTLY ROUGH; RQD 0%, REC 56%. -CLAY SEAM FROM 66.3' TO 66.9'	645.0	67	0		56	RC-1											CORE	
SHALE : GRAY, SLIGHTLY WEATHERED, WEAK, LAMINATED TO THIN BEDDED, CALCAREOUS, FISSILE, FRACTURED TO HIGHLY FRACTURED, OPEN APERTURE, ROUGH; RQD 7%, REC 13%.	640.0	68	7		13	RC-2											CORE	
LIMESTONE : GRAY, UNWEATHERED, STRONG, LAMINATED TO THIN BEDDED, CALCAREOUS, CHERT NODULS, PYRITIC, SLIGHTLY FRACTURED, TIGHT APERTURE, SMOOTH; RQD 100%, REC 100%. -QU @ 74.1' = 8,324 PSI	636.5	73	100		100	RC-3											CORE	
		76 EOB																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 18.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: TREMIED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 50 GAL WATER

PROJECT: FRA-70-12.68 - PHASE 4A
TYPE: STRUCTURE
PID: 77372 BR ID: FRA-70-1358R
START: 2/6/14 END: 2/7/14

DRILLING FIRM / OPERATOR: RII / J.K.
SAMPLING FIRM / LOGGER: RII / S.B.
DRILLING METHOD: 3.25" HSA / NQ
SAMPLING METHOD: SPT / RC

DRILL RIG: MOBILE B-53 (SN 624400)
HAMMER: AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 77.7

STATION / OFFSET: 167+93.97 / 62.9' RT
ALIGNMENT: BL I-70 EB
ELEVATION: 717.0 (MSL) EOB: 84.5 ft.
LAT / LONG: 39.953018, -83.007413

EXPLORATION ID: B-017-5-13

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
0.2' - TOPSOIL (2.0")	716.8																	
FILL: MEDIUM DENSE TO DENSE, BLACK **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, WET. -COAL FRAGMENTS PRESENT IN SS-1		1–2	10 12 14	34	67	SS-1	-	35	23	17	17	8	NP	NP	NP	23	A-1-b (0)	
		3–4	8 5 6	14	67	SS-2	-	-	-	-	-	-	-	-	-	27	A-1-b (V)	
	711.5	5–6																
MEDIUM STIFF TO STIFF, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.		6–7	1 2 3	6	72	SS-3	1.00	-	-	-	-	-	-	-	-	24	A-6a (V)	
		8–9	2 2 4	8	72	SS-4	1.00	12	11	8	31	38	33	20	13	25	A-6a (8)	
		10–11	2 2 3	6	78	SS-5	1.50	-	-	-	-	-	-	-	-	23	A-6a (V)	
	704.0	12–13																
BROWN **GRAVEL AND SAND**, TRACE CLAY, TRACE SILT, MOIST.		13–14			50	ST-6	-	45	30	6	9	10	NP	NP	NP	16	A-1-b (0)	
	701.5	14–15																
LOOSE TO DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		15–16	5 4 4	10	89	SS-7	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
		18–19	10 12 13	32	72	SS-8	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
	696.5	20–21																
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST TO WET.		W 21–22	8 10 12	28	56	SS-9	-	36	41	10	7	6	NP	NP	NP	20	A-1-b (0)	
		W 22–23																
		23–24	8 14 17	40	67	SS-10	-	-	-	-	-	-	-	-	-	15	A-1-b (V)	
		26–27	5 5 6	14	89	SS-11	-	-	-	-	-	-	-	-	-	20	A-1-b (V)	
-INTRODUCED MUD @ 30.0'		28–29	3 3 6	12	72	SS-12	-	-	-	-	-	-	-	-	-	17	A-1-b (V)	
	685.0	30–31																
HARD, BROWN **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DRY.		33–34	40 20 24	57	83	SS-13	4.5+	20	18	13	32	17	21	16	5	9	A-4a (3)	
	680.0	35–36																
MEDIUM DENSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST. -COBBLES PRESENT FROM 32.0' TO 47.0'		38–39	17 20 20	52	89	SS-14	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
		43–44	7 10 12	28	94	SS-15	-	4	66	17	8	5	NP	NP	NP	17	A-1-b (0)	
		48–49	8 10 28	49	94	SS-16	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
	665.0	52–53																
VERY STIFF, GRAY **CLAY**, LITTLE SILT, TRACE COARSE AND FINE SAND, TRACE FINE GRAVEL, DAMP.		53–54	3 6 8	18	56	SS-17	2.50	2	1	0	20	77	43	27	16	23	A-7-6 (11)	
	660.0	57–58																
HARD, GRAY **CLAY**, SOME SILT, LITTLE FINE GRAVEL, TRACE COARSE TO FINE SAND, DAMP.		58–59	16 26 27	69	72	SS-18	4.5+	-	-	-	-	-	-	-	-	16	A-7-6 (V)	

PID: 77372 | BR ID: FRA-70-1358R | PROJECT: FRA-70-12.68 - PHASE 4A | STATION / OFFSET: 167+93.97 / 62.9 RT | START: 2/6/14 | END: 2/7/14 | PG 2 OF 2 | B-017-5-13

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
HARD, GRAY **CLAY**, SOME SILT, LITTLE FINE GRAVEL, TRACE COARSE TO FINE SAND, DAMP. *(continued)*	657.0	61																
		62																
		63																
		64	17 26 40	85	83	SS-19	4.5+	12	4	3	32	49	41	24	17	17	A-7-6 (11)	
		65																
		66																
	650.0	67 TR																
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.		68																
		69	20 36 45	105	78	SS-20	4.5+	-	-	-	-	-	-	-	-	15	Rock (V)	
		70																
		71																
		72																
		73																
AUGER REFUSAL @ 74.5'	642.5	74	29 50/5"	-	91	SS-21	4.5+	-	-	-	-	-	-	-	-	17	Rock (V)	
LIMESTONE : GRAY, UNWEATHERED, STRONG, VERY THICK BEDDED, CALCAREOUS, DOLOMITIC, FOSSILIFEROUS, CHERTY, PYRITIC, SLIGHTLY TO HIGHLY FRACTURED, NARROW TO OPEN APERTURES, SLIGHTLY ROUGH TO ROUGH; RQD 82%, REC 91%.		75																
		76																
		77	83		89	RC-1											CORE	
-QU @ 78.4' = 10,615 PSI		78																
		79																
		80																
		81																
		82	82		93	RC-2											CORE	
		83																
	632.5	84 EOB																

NOTES: SEEPAGE ENCOUNTERED @ 22.0'; GROUNDWATER ENCOUNTERED INITIALLY @ 23.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: TREMIED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 50 GAL WATER

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 5074+21.50 / 19.1' RT	EXPLORATION ID B-017-6-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / K.S.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1358A	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 4/26/13	ELEVATION: 714.9 (MSL) EOB: 84.5 ft.	PAGE 1 OF 2
START: 12/31/13 END: 1/7/14	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 77.7	LAT / LONG: 39.952896, -83.006755	

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
FILL: MEDIUM DENSE, BLACK **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST.	714.9		5 6 8	18	44	SS-1	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
-SLAG, CINDERS AND ROCK FRAGMENTS PRESENT THROUGHOUT			9 10 11	27	100	SS-2	-	34	25	20	18	3	NP	NP	NP	19	A-1-b (0)	
	708.2		13 8 4	16	78	SS-3	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
FILL: STIFF, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.							2.00	13	4	13	42	28	33	18	15	17	A-6a (9)	
-ORGANICS PRESENT THROUGHOUT	705.5		22 13 9	28	89	SS-4	1.75	-	-	-	-	-	-	-	-	15	A-6a (V)	
							-	52	15	13	15	5	NP	NP	NP	6	A-1-b (0)	
FILL: MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP.	704.4																	
-SLAG, CINDERS AND ORGANICS PRESENT THROUGHOUT																		
STIFF, REDDISH BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	701.9		4 4 5	12	33	SS-5	1.50	-	-	-	-	-	-	-	-	21	A-6a (V)	
MEDIUM DENSE, BLACK AND BROWN **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE FINE GRAVEL, MOIST.	699.4		5 6 8	18	100	SS-6	-	4	28	47	16	5	NP	NP	NP	10	A-3a (0)	
VERY STIFF, BROWN **SANDY SILT**, SOME FINE GRAVEL, TRACE CLAY, DAMP.	696.9		7 9 10	25	89	SS-7	-	27	15	14	35	9	24	19	5	14	A-4a (2)	
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, TRACE TO LITTLE SILT, TRACE CLAY, DAMP TO MOIST.			14 10 11	27	83	SS-8	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
			11 14 25	51	89	SS-9	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
			29 26 26	67	78	SS-10	-	57	17	9	12	5	22	17	5	9	A-1-b (0)	
			18 16 16	41	67	SS-11	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
		W																
			8 9 10	25	83	SS-12	-	-	-	-	-	-	-	-	-	15	A-1-b (V)	
			2 6 12	23	67	SS-13	-	10	47	33	8	2	NP	NP	NP	19	A-1-b (0)	
	677.9																	
VERY STIFF TO HARD, GRAY **ELASTIC CLAY**, TRACE SILT, TRACE COARSE SAND, DAMP.			2 6 12	23	67	SS-14	3.00	-	-	-	-	-	-	-	-	24	A-7-5 (V)	
			7 10 13	30	83	SS-15	3.75	-	-	-	-	-	-	-	-	27	A-7-5 (V)	
			8 10 12	28	100	SS-16	3.75	0	1	0	10	89	57	34	23	27	A-7-5 (17)	
			12 18 32	65	100	SS-17	4.50	-	-	-	-	-	-	-	-	25	A-7-5 (V)	
	657.9																	
VERY DENSE, GRAY AND BLACK **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP.			50/4"	-	75	SS-18	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	

PID: 77372 | BR ID: FRA-70-1358A | PROJECT: FRA-70-12.68 - PHASE 4A | STATION / OFFSET: 5074+21.50 / 19.1 RT | START: 12/31/13 | END: 1/7/14 | PG 2 OF 2 | B-017-6-13

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 DENSE, GRAY AND BLACK **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP. *(continued)*	654.9																	
HARD, GRAY **CLAY**, "AND" FINE GRAVEL, LITTLE SILT, TRACE COARSE TO FINE SAND, DRY.	652.9																	
	650.6	TR	32 50/3"	-	22	SS-19	4.5+	56	1	1	15	27	51	23	28	10	A-7-6 (7)	
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.			33 50/3"	-	56	SS-20	-	-	-	-	-	-	-	-	-	12	Rock (V)	
			50/3"	-	100	SS-21	-	-	-	-	-	-	-	-	-	16	Rock (V)	
AUGER REFUSAL @ 74.5'	640.4																	
LIMESTONE : LIGHT BROWN AND GRAY, UNWEATHERED, VERY STRONG, VERY THICK BEDDED, DOLOMITIC, CALCAREOUS, CHERTY, MICACEOUS, SLIGHTLY TO HIGHLY FRACTURED, OPEN APERTURES, ROUGH; RQD 92%, REC 97%. -QU @ 75.6' = 12,261 PSI			83		93	RC-1											CORE	
			100		100	RC-2											CORE	
	630.4	EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 28.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: TREMIED 282 LBS CEMENT / 50 LBS BENTONITE POWDER / 50 GAL WATER

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL037.dgn 12/27/2018 10:29:53 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / J.B.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 170+79.36 / 23.3' RT	EXPLORATION ID B-017-7-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-70 EB	
PID: 77372 BR ID: FRA-70-1358R	DRILLING METHOD: 4.25" HSA / RC	CALIBRATION DATE: 4/26/13	ELEVATION: 743.1 (MSL) EOB: 96.7 ft.	PAGE 1 OF 2
START: 8/4/13 END: 8/7/13	SAMPLING METHOD: SPT / HQ	ENERGY RATIO (%): 77.7	LAT / LONG: 39.953200568, -83.006425064	

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)	BACK FILL
0.9' - ASPHALT (11.0")	743.1																	
0.5' - AGGREGATE BASE (6.0")	742.2																	
FILL: MEDIUM DENSE, GRAY **GRAVEL**, LITTLE FINE TO COARSE SAND, TRACE SILT, TRACE CLAY, MOIST.	741.7	1	4 5 6	14	67	SS-1	-	69	13	5	10	3	NP	NP	NP	7	A-1-a (0)	
	739.1	2																
FILL: STIFF TO VERY STIFF, BROWNISH GRAY TO BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.		3																
		4	3 3 5	10	50	SS-2	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
		5					3.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
		6	6 8 12	26	50	SS-3	2.00	-	-	-	-	-	-	-	-	12	A-6a (V)	
	735.1	7																
FILL: VERY DENSE, BROWN **GRAVEL**, TRACE SILT, DAMP.		8																
		9	18 25 25	65	44	SS-4	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
	732.6	10																
FILL: STIFF TO HARD, BROWN TO DARK BROWNISH GRAY **SILTY CLAY**, SOME FINE GRAVEL, LITTLE COARSE TO FINE SAND, DRY TO MOIST.		11																
		12	3 9 10	25	50	SS-5	2.00	-	-	-	-	-	-	-	-	12	A-6b (V)	
		13																
		14	1 2 5	9	56	SS-6	1.50	31	11	8	30	20	37	18	19	19	A-6b (6)	
		15																
		16	5 15 15	39	39	SS-7	2.00	-	-	-	-	-	-	-	-	9	A-6b (V)	
		17																
		18	15 50 28	101	39	SS-8	2.00	-	-	-	-	-	-	-	-	19	A-6b (V)	
		19																
		20	6 12 9	27	56	SS-9	1.75	-	-	-	-	-	-	-	-	20	A-6b (V)	
		21																
		22	21 6 8	18	56	SS-10	4.50	24	10	9	33	24	40	20	20	18	A-6b (8)	
		23																
		24	7 8 10	23	83	SS-11	2.50	-	-	-	-	-	-	-	-	16	A-6b (V)	
		25																
		26																
		27	WOH 2 10	16	72	SS-12	2.75	-	-	-	-	-	-	-	-	18	A-6b (V)	
	711.1	28																
FILL: STIFF, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP.		29																
		30																
		31																
		32																
		33																
		34	4 4 5	12	50	SS-13	1.75	24	14	12	31	19	33	18	15	20	A-6a (5)	
		35																
		36																
		37																
		38																
-WOOD FRAGMENTS RECOVERED FROM 38.5' TO 39.0'	704.1	39	10 8 8	21	33	SS-14	-	-	-	-	-	-	-	-	-	110		
HARD, DARK BROWN **SILTY CLAY**, SOME FINE TO COARSE SAND, SOME FINE GRAVEL, MOIST.		40					4.50	-	-	-	-	-	-	-	-	13	A-6b (V)	
	701.1	41																
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, MOIST.		42																
		43																
		44	2 8 11	25	78	SS-15	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		45																
		46																
		47																
		48																
		49	10 14 16	39	61	SS-16	-	52	18	10	16	4	21	18	3	10	A-1-b (0)	
		50																
		51																
		52																
		53																
		54	20 30 45	97	72	SS-17	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		55																
		56																
	686.1	57																
VERY DENSE, GRAY **GRAVEL WITH SAND AND SILT**, TRACE SILT, MOIST.		58																
		59	41 21 50/4"	-	100	SS-18	-	-	-	-	-	-	-	-	-	17	A-2-4 (V)	

W

W

PID: 77372	BR ID: FRA-70-1358R	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 170+79.36 / 23.3 RT	START: 8/4/13	END: 8/7/13	PG 2 OF 2	B-017-7-13

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)	BACK FILL
VERY DENSE, GRAY **GRAVEL WITH SAND AND SILT**, TRACE SILT, MOIST. *(continued)* -COBBLES PRESENT @ 60.0'	683.1	61																
		62																
		63																
		64	8 20 20	52	83	SS-19	-	-	-	-	-	-	-	-	-	17	A-2-4 (V)	
		65																
		66																
	676.1	67																
HARD, GRAY **CLAY**, SOME SILT, TRACE COARSE TO FINE SAND, DAMP.		68																
		69	8 9 16	32	78	SS-20	4.5+	-	-	-	-	-	-	-	-	20	A-7-6 (V)	
		70																
		71																
		72																
		73																
		74	12 14 20	44	89	SS-21	4.5+	-	-	-	-	-	-	-	-	17	A-7-6 (V)	
		75																
		76																
		77																
		78																
		79	12 22 50	93	44	SS-22	4.5+	-	-	-	-	-	-	-	-	17	A-7-6 (V)	
		80																
		81																
		82																
		83																
		84	40 35 50/4"	-	81	SS-23	4.5+	0	2	5	34	59	54	25	29	15	A-7-6 (18)	
		85																
		86																
		87																
		88																
		89	25 50/4"	-	100	SS-24	4.5+	-	-	-	-	-	-	-	-	15	A-7-6 (V)	
AUGER REFUSAL @ 90.0'	653.1	TR 90																
MUDSTONE : GRAY, SLIGHTLY WEATHERED, VERY WEAK, THINLY LAMINATED TO LAMINATED, FRIABLE, FISSILE, HIGHLY FRACTURED TO FRACTURED, OPEN APERTURE, ROUGH; RQD 73%, REC 100%.		91	79		100	RC-1											CORE	
	651.1	92	66		100	RC-2											CORE	
SHALE : GRAY TO BLACK, HIGHLY WEATHERED, VERY WEAK, THINLY LAMINATED TO LAMINATED, FRIABLE, MODERATELY TO HIGHLY FRACTURED, OPEN APERTURE, SLIGHTLY ROUGH TO ROUGH; RQD 15%, REC 74%.		93																
		94	15		74	RC-3											CORE	
		95																
	646.4	96 EOB																

NOTES: SEEPAGE ENCOUNTERED @ 48.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 57.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS PORTLAND CEMENT / 50 LBS BENTONITE POWDER / 50 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-70-1358L
START: 2/25/14 END: 2/26/14

DRILLING FIRM / OPERATOR: RII / J.K.
SAMPLING FIRM / LOGGER: RII / R.B.
DRILLING METHOD: 4.25" HSA / HQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME-750 (SN 98048)
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 82.6

STATION / OFFSET: 166+64.96 / 18.3' LT
ALIGNMENT: BL I-70 WB
ELEVATION: 717.6 (MSL) EOB: 78.1 ft.
LAT / LONG: 39.953423, -83.007954

EXPLORATION ID B-017-9-13

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
0.1' - TOPSOIL (2.0")	717.5																	
FILL: VERY LOOSE TO MEDIUM DENSE, BLACK TO BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET. -ORGANICS, ROOT FIBERS AND CINDERS PRESENT IN 3S-1A -CINDERS AND SLAG PRESENT IN SS-2	712.1	1	2 2 1	4	0	SS-1	-	-	-	-	-	-	-	-	-	-		
		2	3	-	67	3S-1A	-	40	20	17	16	7	35	29	6	29	A-1-b (0)	
		3	6 8 12	28	56	SS-2	-	-	-	-	-	-	-	-	-	18	A-1-b (V)	
FILL: MEDIUM STIFF, BROWN TO GRAY **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.	708.9	4																
		5	2 2 2	6	50	SS-3	1.00	11	10	12	35	32	40	18	22	19	A-6b (11)	
		6					1.00	-	-	-	-	-	-	-	-	26	A-6b (V)	
FILL: VERY LOOSE, BROWN AND BLACK **COARSE AND FINE SAND**, SOME CLAY, LITTLE FINE GRAVEL, TRACE SILT, WET. -TRACE COAL FRAGMENTS PRESENT IN SS-4B	707.1	7	1 1 2	4	33	SS-4	-	-	-	-	-	-	-	-	-	22	A-3a (V)	
STIFF, DARK BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	704.6	8																
		9	WOH 1 4	7	44	SS-5	1.50	-	-	-	-	-	-	-	-	24	A-6b (V)	
MEDIUM DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.	702.1	10																
		11	6 8 12	28	33	SS-6	-	51	11	10	14	14	-	-	-	17	A-2-6 (V)	
MEDIUM DENSE, BROWN **COARSE AND FINE SAND**, LITTLE SILT, LITTLE FINE GRAVEL, TRACE CLAY, MOIST.	699.6	12																
		13	6 6 8	19	44	SS-7	-	18	19	37	19	7	NP	NP	NP	15	A-3a (0)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -INTRODUCED MUD @ 20.0' -ROCK FRAGMENTS PRESENT THROUGHOUT -COBBLES PRESENT FROM 22.0' TO 31.0'	685.6	14																
		15	4 6 11	23	56	SS-8	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
		16																
		17	10 13 21	47	67	SS-9	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
		18																
		19	3 7 11	25	50	SS-10	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		20																
		21	9 10 13	32	56	SS-11	-	54	17	8	15	6	24	19	5	12	A-1-b (0)	
		22																
		23	17 15 19	47	50	SS-12	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
VERY STIFF, GRAY **CLAY**, LITTLE SILT, TRACE COARSE SAND, TRACE FINE GRAVEL, MOIST.	660.6	24																
		25	3 7 9	22	50	SS-13	3.50	-	-	-	-	-	-	-	-	24	A-7-6 (V)	
		26																
		27																
		28																
		29	3 6 8	19	56	SS-14	2.25	0	1	0	12	87	58	23	35	30	A-7-6 (20)	
		30																
		31																
		32																
		33																
		34	5 6 10	22	72	SS-15	2.75	-	-	-	-	-	-	-	-	27	A-7-6 (V)	
		35																
		36																
		37																
		38																
		39	4 7 11	25	78	SS-16	4.00	-	-	-	-	-	-	-	-	25	A-7-6 (V)	
		40																
		41																
		42																
		43																
		44	6 10 16	36	78	SS-17	4.00	1	0	0	15	84	53	21	32	22	A-7-6 (19)	
HARD, GRAY **CLAY**, SOME SILT, TRACE FINE GRAVEL, TRACE FINE SAND, DRY.		45																
		46																
		47																
		48																
		49																
		50																
		51																
		52																
		53																
		54	11 21 50	98	56	SS-18	4.5+	-	-	-	-	-	-	-	-	15	A-7-6 (V)	
		55																
		56																
		57																
		58																
		59																

W

PID: 89464 | BR ID: FRA-70-1358L | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 166+64.96 / 18.3 LT | START: 2/25/14 | END: 2/26/14 | PG 2 OF 2 | B-017-9-13

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
HARD, GRAY **CLAY**, SOME SILT, TRACE FINE GRAVEL, TRACE FINE SAND, DRY. *(continued)* -BECOMING SHALE @ 60.0'	657.6	61 62 63																
	653.2	TR 64	21 50/5"	-	73	SS-19	4.5+	10	0	1	34	55	53	24	29	15	A-7-6 (18)	
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.		65 66 67 68																
AUGER REFUSAL @ 69.6'	648.0	69	31 42 50/1"	-	69	SS-20	-	-	-	-	-	-	-	-	-	16	Rock (V)	
MUDSTONE : BROWN, HIGHLY TO SEVERLY WEATHERED, VERY WEAK TO WEAK, MEDIUM BEDDED, ARENACEOUS, CALCAREOUS, FRIABLE, PYRITIC, FISSILE, FRACTURED TO HIGHLY FRACTURED, OPEN APERTURES, ROUGH; RQD 0%, REC 62%.		70 71 72 73	0		50	RC-1											CORE	
	643.5	74																
LIMESTONE : GRAY, SLIGHTLY WEATHERED, VERY STRONG, THICK BEDDED, ARENACEOUS, CALCAREOUS, ARGILLACEOUS, CHERT INCLUSIONS, PYRITIC, JOINTED, MODERATELY TO HIGHLY FRACTURED, OPEN APERTURES, ROUGH; RQD 57%, REC 100%. -QU @ 74.2' = 11,707 PSI		75 76 77	38		77	RC-2											CORE	
	639.5	EOB 78																

NOTES: GROUNDWATER ENCOUNTERED INTIALLY @ 20.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 376 LBS CEMENT / 50 LBS BENTONITE POWDER / 80 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-70-1358L
START: 2/6/14 END: 2/7/14

DRILLING FIRM / OPERATOR: RII / J.B.
SAMPLING FIRM / LOGGER: RII / TF
DRILLING METHOD: 4.25" HSA / HQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME-750 (SN 98048)
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 82.6

STATION / OFFSET: 167+31.32 / 54.6' LT
ALIGNMENT: BL I-70 WB
ELEVATION: 717.0 (MSL) EOB: 83.5 ft.
LAT / LONG: 39.953551, -83.007739

EXPLORATION ID B-018-1-13
PAGE 1 OF 2

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
1.0' - TOPSOIL (12.0")	717.0																	
	716.0																	
FILL: MEDIUM DENSE, BLACK AND BROWN **GRAVEL AND SAND**, SOME SILT, TRACE CLAY, WET. -SLAG AND ORGANICS PRESENT IN SS-1		1	3 2 8	14	61	SS-1	-	31	28	19	20	2	NP	NP	NP	30	A-1-b (0)	
-BRICK AND COAL FRAGMENTS PRESENT IN SS-2		4	9 7 6	18	56	SS-2	-	-	-	-	-	-	-	-	-	19	A-1-b (V)	
	711.5	5																
MEDIUM STIFF TO VERY STIFF, GRAY TO BROWN **SANDY SILT**, SOME CLAY, TRACE FINE GRAVEL, MOIST.		7 W	2 1 2	4	61	SS-3	1.00	-	-	-	-	-	-	-	-	29	A-4a (V)	
-CONSOLIDATION TEST PERFORMED @ 10.1'		10			75	ST-4	2.00	6	6	18	41	29	34	25	9	28	A-4a (7)	
		12	3 2 6	11	39	SS-5	1.00	-	-	-	-	-	-	-	-	21	A-4a (V)	
		14	2 11 13	33	44	SS-6	2.50	-	-	-	-	-	-	-	-	29	A-4a (V)	
	701.5																	
MEDIUM DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		17	10 9 6	21	89	SS-7	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
	699.0																	
DENSE TO VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		19	11 14 21	48	67	SS-8	-	68	14	7	7	4	NP	NP	NP	7	A-1-a (0)	
		22	21 26 28	74	83	SS-9	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
	694.0																	
STIFF, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.		24	26 21 17	52	33	SS-10	2.00	16	19	14	31	20	33	21	12	20	A-6a (4)	
	691.5																	
DENSE, GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.		27	16 14 13	37	33	SS-11	-	-	-	-	-	-	-	-	-	20	A-2-6 (V)	
	689.0																	
VERY DENSE, BROWN TO GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		29	17 17 20	51	61	SS-12	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
		34	17 17 20	51	61	SS-13	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	
		39	21 21 36	78	89	SS-14	-	61	23	7	6	3	NP	NP	NP	7	A-1-a (0)	
	675.0																	
STIFF TO VERY STIFF, GRAY **CLAY**, SOME SILT, TRACE FINE GRAVEL, TRACE COARSE TO FINE SAND, DAMP TO MOIST.		44	4 4 5	12	39	SS-15	1.75	-	-	-	-	-	-	-	-	26	A-7-6 (V)	
		49	3 5 8	18	78	SS-16	2.75	-	-	-	-	-	-	-	-	24	A-7-6 (V)	
	665.0																	
VERY STIFF TO HARD, BROWN TO GRAY **CLAY**, SOME SILT, TRACE FINE GRAVEL, TRACE COARSE TO FINE SAND, DAMP.		54	12 10 16	36	50	SS-17	4.00	7	4	2	31	56	41	25	16	19	A-7-6 (11)	
	657.7	59 TR	23 50/3"	-	89	SS-18	4.5+	-	-	-	-	-	-	-	-	18	A-7-6 (V)	
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.																		

PID: 89464 | BR ID: FRA-70-1358L | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 167+31.32 / 54.6 LT | START: 2/6/14 | END: 2/7/14 | PG 2 OF 2 | B-018-1-13

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 : GRAY, HIGHLY WEATHERED, VERY WEAK. *(continued)*	657.0	61																
		62																
		63																
		64	22 32 50/5"	-	82	SS-19	-	-	-	-	-	-	-	-	-	19	Rock (V)	
		65																
		66																
		67																
		68																
		69	6 23 50	100	67	SS-20	-	-	-	-	-	-	-	-	-	16	Rock (V)	
		70																
		71																
		72																
AUGER REFUSAL @ 73.5'	643.5	73																
LIMESTONE : GRAY AND TAN, UNWEATHERED TO SLIGHTLY WEATHERED, STRONG, VERY THICK BEDDED, CALCAREOUS, SLIGHTLY CARBONACEOUS, CHERTY, CALCITE GROWTHS, DOLOMITIC, JOINTED, MODERATELY TO HIGHLY FRACTURED, OPEN APERTURES, ROUGH; RQD 60%, REC 93%. -QU @ 75.6' = 9,525 PSI -LOSS OF CIRCULATION @ 76.8'		74																
		75																
		76	97		98	RC-1											CORE	
		77																
		78																
-CHERT INCLUSIONS FROM 79.5' TO 80.0'		79																
		80																
		81	24		88	RC-2											CORE	
		82																
	633.5	83 EOB																

NOTES: SEEPAGE ENCOUNTERED @ 7.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-70-1358L
START: 2/10/14 END: 2/13/14

DRILLING FIRM / OPERATOR: RII / J.B.
SAMPLING FIRM / LOGGER: RII / K.S.
DRILLING METHOD: 4.25" HSA / HQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME-750 (SN 98048)
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 82.6

STATION / OFFSET: 168+63.72 / 22.9' LT
ALIGNMENT: BL I-70 WB
ELEVATION: 715.7 (MSL) EOB: 84.5 ft.
LAT / LONG: 39.953512, -83.007251

EXPLORATION ID B-018-2-13

MATERIAL DESCRIPTION AND NOTES	ELEV. 715.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
0.5' - TOPSOIL (6.0")	715.2																	
FILL: LOOSE TO MEDIUM DENSE, BROWN TO BLACK **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST TO WET. -TRASH, DEBRIS, PLASTIC, CINDERS AND ROOT FIBERS PRESENT THROUGHOUT			6 4 3	10	67	SS-1	-	-	-	-	-	-	-	-	-	12	A-2-4 (V)	
			3 5 8	18	72	SS-2	-	26	25	17	22	10	NP	NP	NP	28	A-2-4 (0)	
	710.2																	
FILL: STIFF TO VERY STIFF, BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST. -TRACE CINDERS AND BRICK FRAGMENTS PRESENT THROUGHOUT			7 7 8	21	83	SS-3	2.25	-	-	-	-	-	-	-	-	26	A-6b (V)	
			4 4 3	10	61	SS-4	1.75	-	-	-	-	-	-	-	-	23	A-6b (V)	
	705.2																	
FILL: STIFF TO VERY STIFF, BROWN TO DARK BROWN **SANDY SILT**, SOME CLAY, TRACE FINE GRAVEL, DAMP. -TRACE CINDERS PRESENT IN SS-5			6 6 8	19	78	SS-5	2.75	9	16	8	39	28	28	19	9	16	A-4a (6)	
	701.4																	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, TRACE CLAY, TRACE SILT, DAMP TO MOIST. -TRACE ROCK FRAGMENTS PRESENT IN SS-6B			3 3 5	11	11	SS-6	1.50	-	-	-	-	-	-	-	-	18	A-4a (V)	
							-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
			5 9 7	22	72	SS-7	-	42	37	13	1	7	NP	NP	NP	9	A-1-b (0)	
			7 9 19	39	78	SS-8	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
	695.2																	
DENSE TO VERY DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP TO MOIST.			21 25 28	73	56	SS-9	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
		W	15 20 23	59	83	SS-10	-	54	29	6	6	5	NP	NP	NP	8	A-1-a (0)	
-IRON STAINING PRESENT IN SS-11			25 21 15	50	78	SS-11	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
-LIMESTONE FRAGMENTS PRESENT THROUGHOUT			23 20 23	59	83	SS-12	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
-COBBLES PRESENT @ 31.0'																		
			48 15 18	45	56	SS-13	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
-HEAVING SAND ENCOUNTERED @ 35.0' -INTRODUCED MUD @ 35.0'	678.7																	
VERY STIFF TO HARD, GRAY **CLAY**, SOME SILT, TRACE FINE GRAVEL, TRACE COARSE SAND, DRY TO DAMP.			7 9 18	37	39	SS-14	3.50	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
			5 8 11	26	78	SS-15	3.50	-	-	-	-	-	-	-	-	25	A-7-6 (V)	
			8 11 13	33	72	SS-16	4.00	1	1	0	20	78	45	26	19	22	A-7-6 (13)	
			8 11 15	36	83	SS-17	4.50	-	-	-	-	-	-	-	-	24	A-7-6 (V)	
	656.9	TR	50/3"	-	100	SS-18	4.5+	-	-	-	-	-	-	-	-	11	A-7-6 (V)	
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.																		

FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-018-2-13

DRAWN RRM
CHECKED BRT

PID: 89464	BR ID: FRA-70-1358L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 168+63.72 / 22.9 LT	START: 2/10/14	END: 2/13/14	PG 2 OF 2	B-018-2-13

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 : GRAY, HIGHLY WEATHERED, VERY WEAK. *(continued)*	655.7	61																
		62																
		63																
		64	12 50/5"	-	91	SS-19	-	-	-	-	-	-	-	-	-	11	Rock (V)	
		65																
		66																
		67																
		68																
		69	25 50/3"	-	100	SS-20	-	-	-	-	-	-	-	-	-	11	Rock (V)	
		70																
		71																
		72																
		73																
AUGER REFUSAL @ 74.5'	641.2	74	30 50/2"	-	100	SS-21	-	-	-	-	-	-	-	-	-	13	Rock (V)	
LIMESTONE : GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, STRONG, VERY THICK BEDDED, CALCAREOUS, ARGILLACEOUS, FOSSILIFEROUS, CHERTY, DOLOMITIC, JOINTED, SLIGHTLY TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 80%, REC 100%. -0.1' TO 0.2' CLAY SEAMS PRESENT FROM 74.5' TO 75.5' -QU @ 78.5' = 10,153 PSI		75																
		76																
		77	72		100	RC-1											CORE	
		78																
		79																
		80																
		81																
		82	87		100	RC-2											CORE	
		83																
	631.2	84 EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 25.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER; COMPACTED WITH THE AUGER 300 LB. BENTONITE CHIPS AND SOIL CUTTINGS

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL045.dgn 12/27/2018 10:30:45 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 171+35.06 / 40.2' RT	EXPLORATION ID B-018-4-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-70 WB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 743.1 (MSL) EOB: 50.0 ft.	PAGE 1 OF 1
START: 3/26/14 END: 3/27/14	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.953396027, -83.006271115	

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
0.9' - ASPHALT (11.0")	743.1																	
0.8' - CONCRETE (9.0")	742.2																	
FILL: VERY STIFF TO HARD, DARK GRAY AND BROWN **SILTY CLAY**, LITTLE TO SOME FINE GRAVEL, LITTLE TO SOME COARSE TO FINE SAND, DAMP TO MOIST.	741.4		5 5 7	16	67	SS-1	4.25	-	-	-	-	-	-	-	-	21	A-6b (V)	
			11 11 12	30	67	SS-2	4.00	27	15	8	26	24	38	18	20	7	A-6b (7)	
-ROCK FRAGMENTS PRESENT THROUGHOUT			8 8 8	21	44	SS-3	2.25	-	-	-	-	-	-	-	-	17	A-6b (V)	
			15 14 10	31	67	SS-4	4.5+	12	6	10	41	31	34	17	17	14	A-6b (10)	
			15 12 10	28	44	SS-5	3.00	-	-	-	-	-	-	-	-	12	A-6b (V)	
LIMESTONE FRAGMENTS.	730.1		8 11 14	32	6	SS-6	-	-	-	-	-	-	-	-	-	-	A-1-a (V)	
	727.6		15	-	0	2S-6A	-	-	-	-	-	-	-	-	-	-		
FILL: VERY STIFF TO HARD, DARK GRAY AND BROWN **SILTY CLAY**, SOME FINE GRAVEL, LITTLE COARSE TO FINE SAND, DAMP.			10 15 10	32	56	SS-7	-	-	-	-	-	-	-	-	-	12	A-6b (V)	
-ROCK FRAGMENTS PRESENT THROUGHOUT			8 11 8	25	67	SS-8	3.00	21	10	6	29	34	38	18	20	17	A-6b (10)	
FILL: DARK BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.	723.1				29	ST-9	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
	720.1		7 11 12	30	33	SS-10	4.00	-	-	-	-	-	-	-	-	15	A-6b (V)	
FILL: VERY STIFF TO HARD, DARK GRAY AND BROWN **SILTY CLAY**, SOME FINE GRAVEL, LITTLE COARSE TO FINE SAND, DAMP.			10 8 15	30	67	SS-11	4.5+	29	10	9	20	32	38	18	20	12	A-6b (7)	
-ROCK FRAGMENTS PRESENT THROUGHOUT	711.1		40 50/1"	-	100	SS-12	-	-	-	-	-	-	-	-	-	4	A-1-b (V)	
FILL: VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP.																		
-LIMESTONE FRAGMENTS PRESENT IN SS-12	706.1		7 7 9	21	78	SS-13	4.50	0	4	11	48	37	41	23	18	23	A-7-6 (11)	
FILL: HARD, BLACK **CLAY**, "AND" SILT, LITTLE COARSE TO FINE SAND, DAMP TO MOIST, HIGHLY ORGANIC.																		
-LLo @ 38.5' = 37% -LOI @ 38.5' = 18.9% -ASPHALT FRAGMENTS PRESENT IN SS-13																		
-PETROLEUM ODOR PRESENT IN SS-13 AND SS-14																		
	698.1	▼	17 33 25	75	11	SS-14	4.50	-	-	-	-	-	-	-	-	20	A-7-6 (V)	
DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.			11	-	50	SS-14A	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		W																
	693.1	EOB	7 16 14	39	72	2S-15	-	62	9	11	14	4	NP	NP	NP	9	A-1-b (0)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 48.5' AND AT COMPLETION @ 45.0'; CAVE-IN DEPTH @ 20.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL046.dgn 12/27/2018 10:30:50 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 173+01.62 / 30.1' RT	EXPLORATION ID B-018-5-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-70 WB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 739.1 (MSL) EOB: 50.0 ft.	PAGE 1 OF 1
START: 3/25/14 END: 3/26/14	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.953431007, -83.005683369	

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
1.0' - ASPHALT (12.0")	739.1																	
1.0' - CONCRETE (12.0")	738.1																	
FILL: VERY STIFF, DARK BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.	737.1		6 6 5	14	83	SS-1	3.75	-	-	-	-	-	-	-	-	21	A-6b (V)	
FILL: MEDIUM DENSE TO DENSE, BROWN TO DARK GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP TO WET. -CONCRETE FRAGMENTS PRESENT IN SS-2	735.6		6 8 12	26	33	SS-2	-	36	20	9	22	13	30	17	13	12	A-2-6 (1)	
-ROCK FRAGMENTS PRESENT THROUGHOUT			13 8 11	25	78	SS-3	-	-	-	-	-	-	-	-	-	20	A-2-6 (V)	
-COBBLES ENCOUNTERED @ 8.5'			20 15 13	36	67	SS-4	-	45	11	9	21	14	30	17	13	7	A-2-6 (1)	
FILL: STIFF TO HARD, BROWN **SILTY CLAY**, LITTLE TO SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP TO MOIST. -BRICK FRAGMENTS PRESENT IN SS-5	728.6		10 12 14	34	89	SS-5	4.5+	-	-	-	-	-	-	-	-	17	A-6b (V)	
			6 8 14	28	44	SS-6	4.5+	-	-	-	-	-	-	-	-	17	A-6b (V)	
			7 11 14	32	56	SS-7	4.00	14	9	15	31	31	36	16	20	17	A-6b (9)	
-ROCK FRAGMENTS PRESENT THROUGHOUT			5 6 5	14	67	SS-8	1.75	-	-	-	-	-	-	-	-	20	A-6b (V)	
					38	ST-9	2.00	19	8	6	35	32	38	19	19	19	A-6b (10)	
			6 5 4	12	50	SS-10	-	-	-	-	-	-	-	-	-	12	A-6b (V)	
FILL: MEDIUM DENSE TO VERY DENSE, BLACK AND BROWN TO BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.	712.1		43 35 24	76	100	SS-11	-	32	19	18	21	10	NP	NP	NP	16	A-2-4 (0)	
-BRICK, CINDER, AND LIMESTONE FRAGMENTS PRESENT THROUGHOUT			7 14 11	32	33	SS-12	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	
		▼	4 30 20	65	56	SS-13	-	46	19	11	16	8	32	25	7	13	A-2-4 (0)	
		W	5 7 7	18	61	SS-14	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	
DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, WET.	692.1		10 16 17	43	100	SS-15	-	63	16	7	11	3	23	19	4	21	A-1-a (0)	
	689.1	EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 43.5' AND AT COMPLETION @ 40.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GALLONS WATER

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / M.W.	DRILL RIG: CME 55 (SN 386345)	STATION / OFFSET: 150+86.72 / 580.3' LT	EXPLORATION ID B-018-6-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-70 EB	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 716.9 (MSL) EOB: 70.6 ft.	PAGE 1 OF 2
START: 11/9/15 END: 11/9/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92	LAT / LONG: 39.953041261, -83.014105029	

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)	BACK FILL
0.3' - TOPSOIL (4.0")	716.6																	
FILL: VERY STIFF, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DRY TO DAMP.			4 7 10	26	33	SS-1	-	-	-	-	-	-	-	-	-	9	A-6a (V)	
			3 6 7	20	89	SS-2	4.00	4	5	19	38	34	38	23	15	21	A-6a (9)	
-COBBLES ENCOUNTERED @ 7.0'	709.4		6 6 7	20	39	SS-3	-	-	-	-	-	-	-	-	-	10	A-6a (V)	
FILL: LOOSE TO MEDIUM DENSE, DARK BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.			5 -	0		3S-3A	-	-	-	-	-	-	-	-	-	-		
			5 5 6	17	33	SS-4	-	-	-	-	-	-	-	-	-	10	A-2-6 (V)	
-BRICK FRAGMENTS AND CINDERS PRESENT THROUGHOUT			2 2 3	8	56	SS-5	-	50	15	9	14	12	33	22	11	13	A-2-6 (0)	
	703.9																	
FILL: MEDIUM DENSE TO DENSE, DARK BROWN AND BLACK **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST TO WET.			3 2 5	11	89	SS-6	-	-	-	-	-	-	-	-	-	20	A-2-4 (V)	
-BRICK FRAGMENTS AND CINDERS PRESENT THROUGHOUT			3 10 11	32	67	SS-7	-	26	21	20	25	8	NP	NP	NP	28	A-2-4 (0)	
-WOOD FRAGMENTS PRESENT IN SS-7	698.9																	
DENSE, BROWNISH GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP.			3 8 15	35	94	SS-8	-	-	-	-	-	-	-	-	-	6	A-2-6 (V)	
-COBBLES ENCOUNTERED FROM 20.5' TO 22.0'			15 12 12	37	100	SS-9	-	60	13	7	11	9	30	18	12	5	A-2-6 (0)	
	689.9																	
MEDIUM DENSE TO DENSE, GRAY TO BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.		W	14 11 9	31	89	SS-10	-	-	-	-	-	-	-	-	-	9	A-2-4 (V)	
		▼	5 7 12	29	61	SS-11	-	67	15	5	10	3	23	16	7	9	A-2-4 (0)	
	679.9																	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.			5 8 10	28	100	SS-12	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
	674.9																	
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.			24 25 27	80	67	SS-13	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
-HEAVING SANDS ENCOUNTERED @ 48.5'			12 22 25	72	83	SS-14	-	43	27	10	15	5	21	15	6	12	A-1-b (0)	
	664.9																	
HARD, GRAY **SILTY CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DRY.			6 9 13	34	100	SS-15	4.5+	-	-	-	-	-	-	-	-	10	A-6b (V)	
	659.9																	
VERY STIFF TO HARD, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, MOIST.			4 5 10	23	56	SS-16	-	30	13	10	29	18	25	15	10	17	A-4a (2)	

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:46 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZL405.dgn 12/27/2018 10:47:44 AM rachelm

PID: 77372	BR ID: N/A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 150+86.72 / 580.3 LT	START: 11/9/15	END: 11/9/15	PG 2 OF 2	B-018-6-15

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)	BACK FILL
VERY STIFF TO HARD, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, MOIST. *(continued)*	656.9	61																
		62																
		63																
		64	21 50/1"	-	71	SS-17	-	-	-	-	-	-	-	-	-	16	A-4a (V)	
		65																
		66																
		67																
		68																
		69	50/1"	-	0	SS-18	-	-	-	-	-	-	-	-	-	-		
AUGER REFUSAL @ 70.6'	646.3	70 EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 29.0' AND AT COMPLETION @ 33.0'; CAVE-IN DEPTH @ 41.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 100 LBS BENTONITE CHIPS AND SOIL CUTTINGS

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:46 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

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PROJECT: FRA-70-12.68 - PHASE 4A
TYPE: STRUCTURE
PID: 77372 BR ID: N/A
START: 11/7/15 END: 11/7/15

DRILLING FIRM / OPERATOR: RII / M.W.
SAMPLING FIRM / LOGGER: RII / N.A.
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: CME 55 (SN 386345)
HAMMER: AUTOMATIC
CALIBRATION DATE: 10/20/14
ENERGY RATIO (%): 92

STATION / OFFSET: 150+93.26 / 787.4' LT
ALIGNMENT: BL I-70 EB
ELEVATION: 708.3 (MSL) EOB: 58.8 ft.
LAT / LONG: 39.953554055, -83.014424669

EXPLORATION ID B-018-7-15
PAGE 1 OF 1

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)	BACK FILL
0.3' - TOPSOIL (3.0")	708.0																	
FILL: HARD, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.	705.3		5 9 8	26	67	SS-1	4.5+	15	11	17	29	28	33	22	11	17	A-6a (5)	
FILL: VERY DENSE, BROWN AND GRAY **GRAVEL**, DAMP. -STONE FRAGMENTS PRESENT IN SS-2	702.8		50/3"	-	33	SS-2	-	-	-	-	-	-	-	-	-	2	A-1-a (V)	
FILL: MEDIUM DENSE, DARK BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST. -BRICK AND ROCK FRAGMENTS PRESENT THROUGHOUT	695.3		10 5 4	14	33	SS-3	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	
			3 5 5	15	39	SS-4	-	58	10	8	14	10	35	25	10	21	A-2-4 (0)	
			2 4 9	20	56	SS-5	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	
FILL: MEDIUM DENSE TO VERY DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -VOID PRESENT @ 16.0' TO 17.5'. DRILLING RODS AND CENTER PLUG WERE AT A DEPTH OF 17.5' AFTER AUGERING TO THE TOP OF THE 16.0' SAMPLE INTERVAL. COULD NOT ATTEMPT SAMPLE @ 16.0'. -BRICK FRAGMENTS PRESENT THROUGHOUT -COBBLES ENCOUNTERED @ 20.5'	686.3	W	20 30 31	94	78	SS-6	-	53	26	9	10	2	NP	NP	NP	20	A-1-a (0)	
			8 3 4	11	50	SS-7	-	-	-	-	-	-	-	-	-	16	A-1-a (V)	
DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -HEAVING SANDS ENCOUNTERED @ 23.5'	681.3		13 16 12	43	100	SS-8	-	55	21	6	12	6	22	18	4	12	A-1-b (0)	
HARD, GRAY **SILTY CLAY**, TRACE COARSE TO FINE SAND, DAMP.	671.3		12 15 17	49	67	SS-9	4.5+	-	-	-	-	-	-	-	-	11	A-6b (V)	
			3 9 13	34	100	SS-10	4.5+	0	2	6	37	55	35	19	16	18	A-6b (10)	
HARD, GRAY **SILT AND CLAY**, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.	649.8		5 8 13	32	100	SS-11	4.5+	-	-	-	-	-	-	-	-	16	A-6a (V)	
			7 9 16	38	100	SS-12	4.5+	-	-	-	-	-	-	-	-	15	A-6a (V)	
			5 13 19	49	100	SS-13	4.5+	1	1	7	54	37	27	16	11	17	A-6a (8)	
			13 19 19	58	100	SS-14	4.5+	-	-	-	-	-	-	-	-	13	A-6a (V)	
LIMESTONE : GRAY. AUGER REFUSAL @ 58.8'	649.5	TR EOB	50/1"	-	100	SS-15	-	-	-	-	-	-	-	-	-	2	Rock (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 18.5'; CAVE-IN DEPTH @ 13.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:46 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

FRA-70-12.68

STRUCTURE FOUNDATION EXPLORATION
ELECTRICAL RELOCATION
BORING LOG B-018-7-15

DRAWN RRM
CHECKED BRT

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZL407.dgn 12/27/2018 10:47:51 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / B.S.	DRILL RIG: CME 750X (SN 310218)	STATION / OFFSET: 151+60.13 / 968.5' LT	EXPLORATION ID B-018-8-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-70 EB	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 708.9 (MSL) EOB: 59.0 ft.	PAGE 1 OF 1
START: 10/30/15 END: 10/30/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 85.7	LAT / LONG: 39.954086075, -83.014494697	

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)	BACK FILL
0.5' - TOPSOIL (6.0")	708.4																	
FILL: HARD, DARK BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. -BRICK FRAGMENTS PRESENT IN SS-1	705.9		3 5 7	17	56	SS-1	4.5+	-	-	-	-	-	-	-	-	17	A-6a (V)	
DENSE TO VERY DENSE, GRAY TO BROWNISH GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE TO LITTLE SILT, TRACE CLAY, DAMP TO MOIST.			15 15 17	46	94	SS-2	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
			11 15 17	46	100	SS-3	-	63	14	9	10	4	NP	NP	NP	5	A-1-a (0)	
			32 16 12	40	100	SS-4	-	-	-	-	-	-	-	-	-	2	A-1-a (V)	
-ROCK FRAGMENTS PRESENT IN SS-4 THROUGH SS-6			20 25 50/5"	-	59	SS-5	-	-	-	-	-	-	-	-	-	2	A-1-a (V)	
	693.4		40 20 12	46	44	SS-6	-	64	14	7	11	4	NP	NP	NP	3	A-1-a (0)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		W	10 11 12	33	0	SS-7	-	-	-	-	-	-	-	-	-	-		
			16	-	100	3S-7A	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
-HEAVING SANDS ENCOUNTERED @ 18.5'	686.9		3 5 12	24	100	SS-8	-	75	18	2	4	1	NP	NP	NP	11	A-1-a (0)	
HARD, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP TO MOIST.			9 18 25	61	100	SS-9	4.5+	-	-	-	-	-	-	-	-	16	A-4a (V)	
	679.4		10 18 22	57	100	SS-10	4.5+	26	15	15	31	13	20	15	5	10	A-4a (2)	
							-	-	-	-	-	-	-	-	-	13	A-3a (V)	
VERY DENSE, GRAY **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, TRACE SILT, MOIST. -INTRODUCED MUD @ 30.0'	676.9																	
HARD, GRAY **SILT AND CLAY**, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.			6 16 25	59	50	SS-11	4.5+	-	-	-	-	-	-	-	-	10	A-6a (V)	
			9 18 20	54	100	SS-12	4.5+	1	1	5	54	39	28	16	12	16	A-6a (9)	
			6 19 22	59	100	SS-13	4.5+	-	-	-	-	-	-	-	-	16	A-6a (V)	
	661.9																	
HARD, GRAY **SILT**, SOME CLAY, TRACE COARSE TO FINE SAND, DAMP TO MOIST.			7 18 17	50	100	SS-14	4.5+	0	1	3	61	35	26	16	10	16	A-4b (8)	
			7 12 15	39	100	SS-15	4.5+	-	-	-	-	-	-	-	-	11	A-4b (V)	
	650.9	TR																
LIMESTONE : GRAY. AUGER REFUSAL @ 59.0'	649.9	EOB	50/3"	-	100	SS-16	-	-	-	-	-	-	-	-	-	-	Rock (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 16.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 200 LBS BENTONITE CHIPS AND SOIL CUTTINGS

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:46 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

FRA-70-12.68

STRUCTURE FOUNDATION EXPLORATION
ELECTRICAL RELOCATION
BORING LOG B-018-8-15

DRAWN RRM
CHECKED BRT

PROJECT: FRA-70-12.68 - PHASE 4A
TYPE: STRUCTURE
PID: 77372 BR ID: N/A
START: 11/4/15 END: 11/6/15

DRILLING FIRM / OPERATOR: RII / M.W.
SAMPLING FIRM / LOGGER: RII / N.A.
DRILLING METHOD: 3.25" HSA / NQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME 55 (SN 386345)
HAMMER: AUTOMATIC
CALIBRATION DATE: 10/20/14
ENERGY RATIO (%): 92

STATION / OFFSET: 154+76.09 / 301.0' RT
ALIGNMENT: BL I-70 EB
ELEVATION: 728.6 (MSL) EOB: 96.1 ft.
LAT / LONG: 39.951364, -83.011440

EXPLORATION ID B-018-9-15
PAGE 1 OF 2

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
0.2' - TOPSOIL (2.0")	728.4																	
FILL: MEDIUM DENSE, BLACK AND BROWN **GRAVEL WITH SAND AND SILT**, DAMP TO MOIST.			2 5 8	20	56	SS-1	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	
-ASPHALT, GLASS, BRICK AND ROCK FRAGMENTS PRESENT THROUGHOUT			11 6 8	21	61	SS-2	-	45	15	12	18	10	39	32	7	11	A-2-4 (0)	
			3 5 6	17	50	SS-3	-	-	-	-	-	-	-	-	-	17	A-2-4 (V)	
	715.6																	
FILL: LOOSE, BLACK, BROWN AND WHITE **GRAVEL WITH SAND AND SILT**, TRACE CLAY, WET.			2 2 3	8	72	SS-4	-	44	12	13	22	9	42	33	9	33	A-2-5 (0)	
-BRICK, GLASS AND CLAY TILE FRAGMENTS PRESENT THROUGHOUT -ORGANICS PRESENT THROUGHOUT			2 2 3	8	89	SS-5	-	-	-	-	-	-	-	-	-	30	A-2-5 (V)	
			1 2 3	8	44	SS-6	-	-	-	-	-	-	-	-	-	43	A-2-5 (V)	
	708.1																	
MEDIUM STIFF TO STIFF, BLACK, BROWN AND WHITE TO DARK GRAY **SANDY SILT**, LITTLE CLAY, TRACE TO SOME FINE GRAVEL, MOIST TO WET.			1 2 4	9	94	SS-7	-	1	19	38	26	16	27	18	9	31	A-4a (1)	
			1 1 2	5	100	SS-8	-	-	-	-	-	-	-	-	-	73	A-4a (V)	
			2 2 4	9	100	SS-9	2.00	-	-	-	-	-	-	-	-	24	A-4a (V)	
-WOOD FRAGMENTS AND ORGANICS PRESENT THROUGHOUT			3 3 4	11	100	SS-10	1.50	26	20	15	22	17	25	17	8	20	A-4a (1)	
			1 2 2	6	100	SS-11	1.50	-	-	-	-	-	-	-	-	28	A-4a (V)	
	691.6																	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		W																
-INTRODUCED MUD @ 38.5'			4 7 7	21	33	SS-12	-	63	13	5	12	7	21	16	5	10	A-1-b (0)	
	686.6																	
MEDIUM DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.			2 5 6	17	78	SS-13	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
			7 7 8	23	50	SS-14	-	80	7	4	6	3	20	14	6	14	A-1-a (0)	
	676.6																	
DENSE TO VERY DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DRY TO MOIST.			10 11 17	42	61	SS-15	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
-AUGER REFUSAL @ 56.0', SWITCHED TO ROCK CORING	672.6																	
LIMESTONE BOULDER	671.6		50/1" 0	-	100/ 58	SS-16 RC-1	-	-	-	-	-	-	-	-	-	1	A-1-a (V) CORE	
HARD, BROWN **CLAY**, SOME SILT, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DRY.																		
-AUGER REFUSAL @ 59.5', SWITCHED TO ROCK CORING	669.1		37 50/3"	-	100	SS-17	-	4	4	6	24	62	53	22	31	8	A-7-6 (19)	
GRANITE BOULDER			0		100	RC-2											CORE	

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 1/30/19 11:02 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZL409.dgn 1/31/2019 12:06:39 PM rachelm

PID: 77372	BR ID: N/A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 154+76.09 / 301.0 RT	START: 11/4/15	END: 11/6/15	PG 2 OF 2	B-018-9-15

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 DENSE, BROWNISH GRAY **GRAVEL AND SAND**, TRACE SILT, MOIST. *(continued)*	668.7	61	12 40 50	135	50	SS-18	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
-AUGER REFUSAL @ 63.9', SWITCHED TO ROCK CORING	664.7	63	50/3"	-	100	SS-19	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
MARBLE BOULDER	663.7	64	0		33	RC-3											CORE	
VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE FINE TO COARSE SAND, TRACE SILT, TRACE CLAY, DAMP TO MOIST.	660.1	66	14 32 50/4"	-	100	SS-20	-	65	13	6	15	1	21	16	5	17	A-1-b (0)	
CLAYSTONE : GRAY, HIGHLY WEATHERED, HIGHLY FRACTURED. -0.5' CLAY SEAM RECOVERED AT TOP OF CORE RUN RC-4	658.0	TR 69	21 49 50/2"	-	100	SS-21	-	-	-	-	-	-	-	-	-	10	Rock (V)	
CLAYSTONE : GRAY, SLIGHTLY WEATHERED, VERY WEAK TO WEAK, THIN BEDDED, PYRITIC, CALCAREOUS, FRIABLE, FRACTURED TO MODERATELY FRACTURED, NARROW TO OPEN, SLIGHTLY ROUGH; RQD 24%, REC 46%. -CORE BARREL WAS LIKELY BLOCKED OFF BY CLAY SEAM AT TOP OF CORE RUN RC-4		70	0		14	RC-4											CORE	
		75	50		80	RC-5											CORE	
-LIMESTONE SEAMS PRESENT FROM 81.1' TO 84.3'	644.3	80	53		80	RC-6											CORE	
LIMESTONE : BROWN AND GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG TO STRONG, THIN TO MEDIUM BEDDED, DOLOMITIC, PYRITIC, CHERTY, MODERATELY TO SLIGHTLY FRACTURED, NARROW TO OPEN, SLIGHTLY ROUGH; RQD 99%, REC 100%. -QU @ 87.8' = 13,689 PSI -CALCITE SEAMS PRESENT THROUGHOUT		85	100		100	RC-7											CORE	
		90	99		100	RC-8											CORE	
	632.5	EOB 96																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 37.5'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 1/30/19 11:02 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-019-0-08 | *Location:* Sta. 5076+04.30, 29.0' RT., RAMP C5 | *Date Drilled:* 6/30/2008

WATER OBSERVATIONS: Water seepage at: 12.5'-50.0' | Water level at completion: 12.0' (prior to coring), 11.0' (24 hours after completion)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP
	713.5														
1.0	712.5						Aggregate road base - 12"								
		9 28 37	16	1			FILL: Very dense black GRAVEL WITH SAND (A-1-b), little silt; contains coal particles and cinders; damp.		21	30	---	35	--14--		INP ● 66
4.0	709.5	9 5 3	2	2			POSSIBLE FILL: Loose black GRAVEL WITH SAND (A-1-b), little silty clay; damp.								
5		2 2 2	11	3					37	27	---	26	--10--		INP ●
8.0	705.5						POSSIBLE FILL: Stiff dark brown to black ORGANIC CLAY (A-8b), trace fine sand; moderately organic; damp.								
		2 2 4	11	4		1.5	@ 8.5', LOI @ 440 deg = 7.2%, LOI @ 750 deg = 9.1 %.		0	4	---	11	57	28	●
10		10 6 5	8	5		--	@ 11.0', encountered large, decomposing wood fragment.								
		5 4 4	3	6		--									●
15.5	698.0						POSSIBLE FILL: Medium dense brown GRAVEL WITH SAND (A-1-b), trace silty clay; wet.								
		8 7 4	8	7			@ 16.0', encountered large, decomposing wood fragment.								
18.0	695.5						Dense brown and gray GRAVEL (A-1-a), some fine to coarse sand, little silty clay; wet.								
		10 17 18	12	8					64	12	---	11	--13--		INP ●
20		11 15 20	12	9											●
23.0	690.5						Dense dark brown and gray GRAVEL WITH SAND (A-1-b), trace silty clay; wet.								
		21 22 21	7	10					26	39	---	30	--5--		INP ●
25	688.5														

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-019-0-08 | *Location:* Sta. 5076+04.30, 29.0' RT., RAMP C5 | *Date Drilled:* 6/30/2008

WATER OBSERVATIONS: Water seepage at: 12.5'-50.0' | Water level at completion: 12.0' (prior to coring), 11.0' (24 hours after completion)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP
	688.5														
		14 36 46	12	11			Very dense brown and gray GRAVEL WITH SAND (A-1-b), trace silty clay; wet. @ 26.0', encountered 1.8 feet sand heave.								● 84
30		25 32 36	10	12											● 69
32.0	681.5						Very dense brownish gray GRAVEL (A-1-a), some fine to coarse sand, trace silty clay; wet. @ 33.5', 38.5', encountered 2 feet sand heave.								
		22 28 32	9	13					66	22	---	8	--4--		INP ● 61
35		32 30 50/5	15	14											● 50+
40		50/3	3	15			@ 43.5', possible cobbles.								● 50+
45															
47.0	666.5						Very stiff brownish gray CLAY (A-7-6), trace to little silt, trace fine sand; damp to moist.								
		8 12 22	10	16		3.5			0	0	---	0	9	91	●
50	663.5														

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-019-0-08 | *Location:* Sta. 5076+04.30, 29.0' RT., RAMP C5 | *Date Drilled:* 6/30/2008

WATER OBSERVATIONS: Water seepage at: 12.5'-50.0' | Water level at completion: 12.0' (prior to coring), 11.0' (24 hours after completion)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	663.5														
54.0	659.5	8					Very stiff brownish gray CLAY (A-7-6), trace to little silt, trace fine sand; damp to moist.								
55		23 36 Core 10"	17 Rec 0"	17 RQD 0%	R1	4.5+	Shale, blue-gray, severely weathered, weak to very weak. @ 55.0'-55.8', core loss.								
55.8	657.7														
		Core 60"	Rec 28"	RQD 23%	R2		Interbedded Shale (90%) and Limestone (10%) RQD 19% Loss 60%. Shale, light gray to blue-gray, highly to severely weathered, very weak to weak, slightly calcareous, laminated, fissile, fractured to highly fractured; Limestone, light gray, moderately weathered, moderately strong to strong, fractured. @ 55.8'-60.8', core barrel damaged while coring.								
60															
		Core 60"	Rec 23"	RQD 17%	R3		@ 62.3'-62.5', encountered large pyritic inclusion. @ 62.5'-65.8', core loss. Pyrite lodged in core barrel, eroded sample.								
65.8	647.7														
		Core 60"	Rec 60"	RQD 67%	R4		Shale dark gray highly weathered, weak, laminated, slighly calcareous, contains abundant pyritic inclusions, fissile, moderately fractured to fractured, RQD 45%, Loss 25%.								
70															
		Core 60"	Rec 30"	RQD 22%	R5		@ 71.0'-71.3', encountered large pyritic inclusion.								
75	638.5														

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-019-0-08 | *Location:* Sta. 5076+04.30, 29.0' RT., RAMP C5 | *Date Drilled:* 6/30/2008

WATER OBSERVATIONS: Water seepage at: 12.5'-50.0' | Water level at completion: 12.0' (prior to coring), 11.0' (24 hours after completion)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	638.5														
75.8	637.7	Core 60"	Rec 30"	RQD 22%			Bottom of Boring - 75.8'								
80															
85															
90															
95															
100															

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL049.dgn 12/27/2018 10:31:00 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: STOCK / A/J	DRILL RIG: CME-750X (SN 375128)	STATION / OFFSET: 5077+15.33 / 3.2' RT	EXPLORATION ID B-019-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / K.R.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 3/28/13	ELEVATION: 712.5 (MSL) EOB: 50.0 ft.	PAGE 1 OF 1
START: 7/8/13 END: 7/11/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.6	LAT / LONG: 39.952978442, -83.005713188	

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)	BACK FILL
1.0' - TOPSOIL (12.0")	712.5																	
	711.5																	
FILL: LOOSE TO MEDIUM DENSE, DARK BROWN TO BLACK AND GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -BRICK AND ASPHALT FRAGMENTS PRESENT THROUGHOUT		1	20 13 10	30	94	SS-1	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
		2																
		3																
		4	3 3 4	9	44	SS-2	-	35	24	17	16	8	21	16	5	10	A-1-b (0)	
	707.0	5																
FILL: LOOSE, BROWN **SANDY SILT**, SOME FINE GRAVEL, TRACE CLAY, WET. -STONE AND CONCRETE FRAGMENTS PRESENT IN SS-3		6	6 4 2	8	83	SS-3	-	-	-	-	-	-	-	-	-	29	A-4a (V)	
	704.5	7																
POSSIBLE FILL: SOFT TO MEDIUM STIFF, DARK BROWNISH GRAY **SILTY CLAY**, "AND" COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.		8																
		9	2 3 6	12	94	SS-4	0.75	-	-	-	-	-	-	-	-	26	A-6b (V)	
		10																
		11																
		12	3 4 3	9	83	SS-5	0.50	16	25	20	15	24	40	16	24	19	A-6b (4)	
	699.5	13																
MEDIUM DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST. -STONE FRAGMENTS PRESENT IN SS-6		14	4 5 6	14	69	SS-6	-	-	-	-	-	-	-	-	-	12	A-2-4 (V)	
		15																
		16																
		17	5 5 7	16	67	SS-7	-	43	19	11	21	6	NP	NP	NP	13	A-2-4 (0)	
		18																
		19	6 6 6	16	86	SS-8	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	
	690.5	20																
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -COBBLES PRESENT THROUGHOUT		21																
		22																
	W	23																
		24	7 6 8	18	78	SS-9	-	55	17	7	17	4	NP	NP	NP	16	A-1-b (0)	
		25																
		26																
		27																
		28																
-HEAVING SANDS ENCOUNTERED @ 28.5'		29	5 3 14	22	100	SS-10	-	-	-	-	-	-	-	-	-	17	A-1-b (V)	
	680.5	30																
VERY DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, MOIST. -DROVE SPOON ON COBBLE @ 33.5'		31																
		32																
		33																
		34	50/2"	-	0	SS-11	-	-	-	-	-	-	-	-	-	-		
-INTRODUCED MUD @ 35.0'		35																
		36																
		37																
		38																
		39	7 30 28	76	67	SS-12	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
	670.5	40																
HARD, GRAY TO MOTTLED BROWN AND GRAY **SILTY CLAY**, TRACE COARSE AND FINE SAND, TRACE FINE GRAVEL, MOIST.		41																
		42																
		43																
		44	3 8 26	45	89	SS-13	4.5+	1	2	2	32	63	33	16	17	20	A-6b (11)	
		45																
		46																
		47																
		48																
		49	5 9 11	26	100	SS-14	4.5+	-	-	-	-	-	-	-	-	23	A-6b (V)	
	662.5	50	EOB															

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 23.5'; CAVE-IN DEPTH @ 32.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 94 LBS PORTLAND CEMENT / 100 LBS BENTONITE POWDER / 50 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 174+39.64 / 20.3' RT	EXPLORATION ID B-019-2-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-70 WB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 736.0 (MSL) EOB: 50.0 ft.	PAGE 1 OF 1
START: 3/24/14 END: 3/24/14	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.953448237, -83.005193743	

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
1.2' - ASPHALT (14.0")	736.0																	
0.7' - CONCRETE (8.0")	734.8																	
FILL: VERY STIFF TO HARD, BROWN TO DARK BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP TO MOIST.	734.1		6 7 7	18	83	SS-1	2.50	-	-	-	-	-	-	-	-	22	A-6b (V)	
			8 8 13	27	83	SS-2	3.75	22	20	7	25	26	38	18	20	17	A-6b (7)	
-ROCK FRAGMENTS AND ORGANICS PRESENT THROUGHOUT			13 13 13	34	33	SS-3	4.25	-	-	-	-	-	-	-	-	16	A-6b (V)	
			6 10 12	28	44	SS-4	3.50	-	-	-	-	-	-	-	-	17	A-6b (V)	
FILL: VERY STIFF, BROWN **SILT AND CLAY**, SOME FINE GRAVEL, SOME COARSE TO FINE SAND, DAMP.	725.5		15 11 12	30	78	SS-5	4.00	33	11	12	23	21	30	17	13	13	A-6a (3)	
-ROCK FRAGMENTS PRESENT IN SS-5	723.0																	
FILL: HARD, DARK BROWN TO BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP TO MOIST.			16 14 12	34	72	SS-6	4.25	-	-	-	-	-	-	-	-	19	A-6b (V)	
-ORGANICS PRESENT IN SS-6			8 12 20	41	72	SS-7	4.50	-	-	-	-	-	-	-	-	16	A-6b (V)	
-ROCK FRAGMENTS PRESENT THROUGHOUT			9 12 17	38	67	SS-8	4.50	14	7	8	35	36	37	18	19	17	A-6b (11)	
	714.0																	
FILL: MEDIUM DENSE, LIGHT BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.			12 13 9	28	17	SS-9	-	-	-	-	-	-	-	-	-	9	A-2-4 (V)	
-ROCK FRAGMENTS PRESENT IN 2S-9A			7	-	100	2S-9A	-	-	-	-	-	-	-	-	-	7	A-2-4 (V)	
	709.0																	
FILL: MEDIUM DENSE, BLACK **SANDY SILT**, LITTLE FINE GRAVEL, LITTLE CLAY, MOIST.			17 13 10	30	0	SS-10	-	-	-	-	-	-	-	-	-	-		
-CHLORINE ODOR, ORGANICS, AND BRICK, CINDER, AND SLAG FRAGMENTS PRESENT IN 2S-10A			8	-	67	2S-10A	-	17	21	24	22	16	27	24	3	16	A-4a (1)	
	704.0																	
FILL: HARD, DARK BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.			3 6 6	16	89	SS-11	4.25	-	-	-	-	-	-	-	-	21	A-6a (V)	
-BRICK FRAGMENTS PRESENT IN SS-11	699.0																	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.			8 9 8	22	72	SS-12	-	50	14	13	18	5	NP	NP	NP	9	A-1-b (0)	
-ROCK FRAGMENTS PRESENT IN SS-12	694.0	▼																
MEDIUM DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.		W	7 10 6	21	6	SS-13	-	-	-	-	-	-	-	-	-	14	A-2-4 (V)	
-ROCK FRAGMENTS PRESENT THROUGHOUT			11	-	100	2S-13A	-	39	14	20	19	8	NP	NP	NP	16	A-2-4 (0)	
	689.0																	
DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.			27 20 10	39	33	SS-14	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
-ROCK FRAGMENTS PRESENT IN SS-14	686.0	EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 43.5' AND AT COMPLETION @ 40.0'; CAVE-IN DEPTH @ 20.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750X (SN 310218)	STATION / OFFSET: 156+26.06 / 325.9' RT	EXPLORATION ID B-019-3-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-70 EB	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 10/20/14	ELEVATION: 716.8 (MSL) EOB: 78.5 ft.	PAGE 1 OF 2
START: 10/28/15 END: 10/29/15	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 85.7	LAT / LONG: 39.951475147, -83.010927880	

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
0.1' - TOPSOIL (1.0")	716.8																	
FILL: DENSE, BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, DAMP.	716.7		8 18 14	46	100	SS-1	-	-	-	-	-	-	-	-	-	5	A-2-4 (V)	
-BRICK AND CLAY TILE FRAGMENTS PRESENT IN SS-2			9 9 13	31	100	SS-2	-	-	-	-	-	-	-	-	-	9	A-2-4 (V)	
FILL: MEDIUM DENSE TO DENSE, DARK BROWN AND GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -BRICK AND LIMESTONE FRAGMENTS PRESENT IN SS-3	711.3		6 14 14	40	56	SS-3	-	44	16	15	16	9	NP	NP	NP	9	A-1-b (0)	
			16 14 13	39	0	SS-4	-	-	-	-	-	-	-	-	-	-		
			15	-	0	3S-4A	-	-	-	-	-	-	-	-	-	-		
			4 6 4	14	0	SS-5	-	-	-	-	-	-	-	-	-	-		
DARK GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	704.3		6	-	100	3S-5A	-	7	4	16	41	32	37	24	13	28	A-6a (9)	
VERY STIFF, DARK BROWN **CLAY**, "AND" SILT, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	703.3		2 5 5	14	100	SS-6	3.75	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
			3 5 6	16	100	SS-7	3.50	1	0	8	41	50	44	20	24	23	A-7-6 (14)	
SOFT TO MEDIUM STIFF, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, MOIST. -QU @ 20.0' = 0.36 TSF (720 PSF)	698.8		1 2 3	7	100	SS-8	0.75	-	-	-	-	-	-	-	-	26	A-6a (V)	
					65	ST-9	-	0	4	27	35	34	32	18	14	25	A-6a (8)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.	693.8		7 7 9	23	0	SS-10	-	-	-	-	-	-	-	-	-	-		
		W	9	-	33	3S-10A	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
			11 10 11	30	100	SS-11	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
			16 17 14	44	72	SS-12	-	60	14	9	10	7	21	15	6	14	A-1-b (0)	
VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.	679.8		24 49 50/3"	-	0	SS-13	-	-	-	-	-	-	-	-	-	-		
			50/2"	-	100	3S-13A	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
			17 20 22	60	100	SS-14	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
HARD, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.	672.3						4.5+	14	12	17	33	24	24	13	11	9	A-6a (5)	
			24 46 50/4"	-	100	SS-15	4.5+	-	-	-	-	-	-	-	-	10	A-6a (V)	
			8 17 15	46	100	SS-16	4.5+	-	-	-	-	-	-	-	-	10	A-6a (V)	
VERY STIFF, GRAY **CLAY**, "AND" SILT, TRACE COARSE TO FINE SAND, DRY.	662.1						4.00	-	-	-	-	-	-	-	-	16	A-7-6 (V)	
			17 48 50/2"	-	100	SS-17	4.00	0	1	3	44	52	48	26	22	10	A-7-6 (14)	

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 11/28/16 16:36 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

PID: 77372	BR ID: N/A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 156+26.06 / 325.9 RT	START: 10/28/15	END: 10/29/15	PG 2 OF 2	B-019-3-15

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
-0.7' CLAY SEAM RECOVERED AT TOP OF CORE RUN RC-1	656.8 / 656.1	TR																
CLAYSTONE : GRAY, SLIGHTLY WEATHERED, WEAK, THIN TO MEDIUM BEDDED, CALCAREOUS, PYRITIC (NODULES), FRACTURED TO MODERATELY FRACTURED, NARROW TO OPEN APERTURE, SLIGHTLY ROUGH; RQD 44%, REC 70%.		61–63	36		57	RC-1											CORE	
-QU @ 65.5' = 281 PSI		64–68	48		73	RC-2											CORE	
		69–73	54		93	RC-3											CORE	
	639.6	74–77	43		65	RC-4											CORE	
LIMESTONE : BROWN AND GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG, FINELY CRYSTALLINE, MEDIUM BEDDED, DOLOMITIC, PYRITIC, MODERATELY FRACTURED, OPEN APERTURE, SLIGHTLY ROUGH; RQD 100%, REC 100%.	638.3	EOB 78																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 25.0'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 11/28/16 16:36 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

PROJECT: FRA-70-12.68 - PHASE 4A
TYPE: STRUCTURE
PID: 77372 BR ID: FRA-70-1373A
START: 7/1/13 END: 7/3/13

DRILLING FIRM / OPERATOR: STOCK / A/M
SAMPLING FIRM / LOGGER: RII / K.R.
DRILLING METHOD: 4.25" HSA / NQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME 750X (SN 375128)
HAMMER: AUTOMATIC
CALIBRATION DATE: 3/28/13
ENERGY RATIO (%): 78.6

STATION / OFFSET: 5080+09.80 / 30.9' RT
ALIGNMENT: BL RAMP C5
ELEVATION: 712.8 (MSL) EOB: 86.0 ft.
LAT / LONG: 39.952922, -83.004666

EXPLORATION ID B-020-1-13

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)	BACK FILL
0.5' - TOPSOIL (6.0")	712.8																	
0.3' - BRICK (4.0")	712.0																	
FILL: HARD, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -ROOT AND GRASS FIBERS PRESENT IN SS-1	709.8		6 50/5"	-	55	SS-1	-	-	-	-	-	-	-	-	-	11	A-6a (V)	
POSSIBLE FILL: MEDIUM DENSE, GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.	707.3		15 11 5	21	81	SS-2	-	-	-	-	-	-	-	-	-	12	A-2-4 (V)	
POSSIBLE FILL: SOFT TO STIFF, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP TO MOIST. -STONE FRAGMENTS PRESENT IN SS-4	702.3		2 1 2	4	64	SS-3	0.50	20	13	13	22	32	35	20	15	20	A-6a (6)	
			2 5 3	10	33	SS-4	-	-	-	-	-	-	-	-	-	12	A-6a (V)	
POSSIBLE FILL: STIFF TO VERY STIFF, DARK BROWNISH GRAY TO BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	697.3		1 2 4	8	56	SS-5	2.75	-	-	-	-	-	-	-	-	23	A-6b (V)	
			2 3 3	8	78	SS-6	2.00	6	9	12	23	50	40	17	23	19	A-6b (13)	
POSSIBLE FILL: VERY LOOSE, DARK BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, WET.	694.8		1 1 2	4	67	SS-7	-	-	-	-	-	-	-	-	-	21	A-1-b (V)	
MEDIUM DENSE, DARK BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST. -STONE FRAGMENTS PRESENT IN SS-8	692.3		5 9 6	20	39	SS-8	-	-	-	-	-	-	-	-	-	15	A-2-6 (V)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, LITTLE CLAY, TRACE SILT, MOIST. -COBBLES PRESENT @ 22.0'		W	10 7 5	16	39	SS-9	-	-	-	-	-	-	-	-	-	17	A-1-b (V)	
			3 6 8	18	53	SS-10	-	-	-	-	-	-	-	-	-	15	A-1-b (V)	
			5 4 8	16	56	SS-11	-	36	30	12	9	13	NP	NP	NP	15	A-1-b (0)	
	680.8		8 16 16	42	83	SS-12	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
HARD, GRAY **SANDY SILT**, SOME CLAY, LITTLE FINE GRAVEL, DAMP. -HEAVING SANDS ENCOUNTERED @ 35.0'	675.8		15 18 25	56	100	SS-13	4.5+	20	13	17	21	29	22	13	9	10	A-4a (3)	
VERY DENSE, GRAY TO BROWNISH GRAY **GRAVEL AND SAND**, TRACE SILT, DAMP TO MOIST. -INTRODUCED WATER @ 40.0'			7 13 34	62	100	SS-14	-	-	-	-	-	-	-	-	-	4	A-1-b (V)	
			20 43 50/5"	-	100	SS-15	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
			17 41 50/3"	-	100	SS-16	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
	660.8																	
HARD, GRAY **CLAY**, LITTLE SILT, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -SHALE FRAGMENTS PRESENT IN SS-17			18 30 25	72	100	SS-17	-	-	-	-	-	-	-	-	-	14	A-7-6 (V)	
			30 26 33	77	78	SS-18	4.5+	6	1	8	18	67	44	21	23	14	A-7-6 (14)	

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PID: 77372 | BR ID: FRA-70-1373A | PROJECT: FRA-70-12.68 - PHASE 4A | STATION / OFFSET: 5080+09.80 / 30.9 RT | START: 7/1/13 | END: 7/3/13 | PG 2 OF 2 | B-020-1-13

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)	BACK FILL
HARD, GRAY **CLAY**, LITTLE SILT, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. *(continued)*	652.8	61 62 63																
	648.6	TR 64	24 50/2"	-	100	SS-19	4.50	-	-	-	-	-	-	-	-	14	A-7-6 (V)	
SHALE: GRAY, VERY WEAK, HIGHLY WEATHERED. -AUGER REFUSAL @ 65.0'. ATTEMPTED 10.0' ROCK CORE RUN. NO RECOVERY FROM CORE RUN. MAY HAVE WASHED OUT HIGHLY WEATHERED SHALE MATERIAL DURING THE CORING OPERATION. CONTINUED SPT SAMPLING @ 75.0'.		65 66 67 68 69 70	0		0	RC-1											CORE	
		75	50/4"	-	100	SS-20	-	-	-	-	-	-	-	-	-	15	Rock (V)	
AUGER REFUSAL @ 80.5'	632.3	80	50/1"	-	0	SS-21	-	-	-	-	-	-	-	-	-	-		
LIMESTONE : LIGHT AND DARK GRAY, UNWEATHERED, STRONG, VERY THIN TO THIN BEDDED, CRYSTALLINE, DOLOMITIC, MODERATELY FRACTURED TO FRACTURED, OPEN APERTURE, VERY ROUGH; RQD 49%, REC 99%. -QU @ 80.7' = 9,465 PSI -CHERT NODULES PRESENT THROUGHOUT		81 82 83 84 85	49		99	RC-2											CORE	
	626.8	EOB 86																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 23.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 376 PORTLAND CEMENT / 200 LBS BENTONITE POWDER / 150 GAL WATER

PROJECT: FRA-70-12.68 - PHASE 4A
TYPE: STRUCTURE
PID: 77372 BR ID: FRA-70-1373R
START: 7/16/13 END: 7/17/13

DRILLING FIRM / OPERATOR: RII / S.M.
SAMPLING FIRM / LOGGER: RII / C.H.
DRILLING METHOD: 3.25" HSA / NQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME-750 (SN 98048)
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 82.6

STATION / OFFSET: 176+13.92 / 34' RT
ALIGNMENT: BL I-70 EB
ELEVATION: 711.4 (MSL) EOB: 84.5 ft.
LAT / LONG: 39.953156, -83.004535

EXPLORATION ID: B-020-2-13

MATERIAL DESCRIPTION AND NOTES	ELEV. 711.4	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
0.3' - ASPHALT (4.0")	711.1																	
0.5' - AGGREGATE BASE (6.0")	710.6																	
FILL: STIFF, BLACK AND BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -ROCK FRAGMENTS PRESENT	708.4	1–2	4 8 6	19	72	SS-1	1.75	-	-	-	-	-	-	-	-	16	A-6a (V)	
FILL: VERY LOOSE, BLACK AND BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.	705.9	3–4	2 2 1	4	33	SS-2	-	47	16	12	19	6	26	23	3	15	A-1-b (0)	
POSSIBLE FILL: STIFF, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.	703.4	5–6	3 4 7	15	33	SS-3	2.00	-	-	-	-	-	-	-	-	15	A-6a (V)	
POSSIBLE FILL: MEDIUM STIFF TO STIFF, BROWN **SILTY CLAY**, TRACE COARSE TO FINE SAND, MOIST.	698.4	7–8	2 2 3	7	83	SS-4	1.00	0	1	8	54	37	39	20	19	25	A-6b (12)	
		9–10	3 4 6	14	83	SS-5	1.75	-	-	-	-	-	-	-	-	27	A-6b (V)	
POSSIBLE FILL: MEDIUM STIFF, BROWN **CLAY**, SOME SILT, AND FINE TO COARSE SAND, LITTLE FINE GRAVEL, MOIST. -CONSOLIDATION TEST PERFORMED @ 14.7'	693.4	11–12			83	ST-6	0.75	17	31	13	24	15	41	16	25	22	A-7-6 (4)	
		13–14	1 1 2	4	33	SS-7	0.75	-	-	-	-	-	-	-	-	25	A-7-6 (V)	
POSSIBLE FILL: LOOSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, WET. -HEAVING SANDS ENCOUNTERED @ 18.5' -COBBLES PRESENT @ 19.5'	690.9	W 15–16	WOH 2 4	8	33	SS-8	-	33	21	13	26	7	31	25	6	30	A-2-4 (0)	
DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		17–18	4 13 10	32	67	SS-9	-	-	-	-	-	-	-	-	-	16	A-1-b (V)	
		19–20	50/5"	-	80	SS-10	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
		21–22	9 12 14	36	33	SS-11	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
		23–24	9 24 32	77	39	SS-12	-	47	27	10	12	4	21	18	3	7	A-1-b (0)	
		25–26	14 29 33	85	61	SS-13	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
		27–28	22 48 50/5"	-	71	SS-14	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
	666.9	29–30	15 31 29	83	94	SS-15	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
HARD, BROWN **SILT AND CLAY**, LITTLE FINE GRAVEL, TRACE COARSE TO FINE SAND, DAMP.	664.4						4.5+	11	1	4	46	38	32	18	14	17	A-6a (10)	
HARD, BROWN **SILTY CLAY**, LITTLE FINE GRAVEL, TRACE COARSE TO FINE SAND, DAMP.		31–32	29 27 25	72	22	SS-16	-	-	-	-	-	-	-	-	-	18	A-6b (V)	
		35–36	11 20 20	55	56	SS-17	4.50	-	-	-	-	-	-	-	-	17	A-6b (V)	
		39–40	14 50/3"	-	89	SS-18	-	19	3	4	36	38	38	20	18	16	A-6b (11)	

FRA-70-12.68

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-020-2-13

DRAWN RRM
CHECKED BRT

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PID: 77372 | BR ID: FRA-70-1373R | PROJECT: FRA-70-12.68 - PHASE 4A | STATION / OFFSET: 176+13.92 / 34 RT | START: 7/16/13 | END: 7/17/13 | PG 2 OF 2 | B-020-2-13

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)	BACK FILL
HARD, BROWN **SILTY CLAY**, LITTLE FINE GRAVEL, TRACE COARSE TO FINE SAND, DAMP. *(continued)*	651.4	61																
	649.4	62																
HARD, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.		63																
	647.1	64	35 50/3"	-	100	SS-19	-	-	-	-	-	-	-	-	-	11	A-6a (V)	
SHALE: GRAY, VERY WEAK, HIGHLY WEATHERED.		TR 65																
		66																
		67																
		68																
	641.9	69	49 50/2"	-	100	SS-20	-	-	-	-	-	-	-	-	-	9	Rock (V)	
SHALE : GRAY AND BLACK, SLIGHTLY TO MODERATELY WEATHERED, WEAK AND STRONG, THINLY LAMINATED TO MEDIUM BEDDED, CALCAREOUS, PYRITIC, FISSILE, FRACTURED TO HIGHLY FRACTURED, NARROW TO OPEN APERTURE, SMOOTH TO SLIGHTLY ROUGH; RQD 4%, REC 30%.		70																
		71																
		72	8		40	RC-1											CORE	
		73																
		74																
		75																
		76																
		77	0		20	RC-2											CORE	
		78																
	631.9	79																
LIMESTONE : GRAY AND TAN, SLIGHTLY WEATHERED, MODERATELY STRONG, VERY THIN TO MEDIUM BEDDED, CALCAREOUS, PYRITIC, DOLOMITIC, CHERT NODULES, FRACTURED TO SLIGHTLY FRACTURED, NARROW APERTURE, SMOOTH; RQD 97%, REC 97%.		80																
		81																
		82	97		97	RC-3											CORE	
		83																
	626.9	EOB 84																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 18.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 94 LBS PORTLAND CEMENT / 100 LBS BENTONITE POWDER / 50 GAL WATER

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL055.dgn 12/27/2018 10:31:27 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / J.B.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 5081+15.55 / 85.3' RT	EXPLORATION ID B-020-3-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1373A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 712.3 (MSL) EOB: 49.8 ft.	PAGE 1 OF 1
START: 8/15/13 END: 8/21/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.952760425, -83.004309070	

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)	BACK FILL
0.3' - ASPHALT (4.0")	712.0																	
0.3' - BRICK (4.0")	711.7																	
0.8' - AGGREGSTE BASE (9.0")	710.9																	
POSSIBLE FILL: STIFF, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -TRACE ORGANICS IN SS-1	709.3		3 3 6	12	72	SS-1	2.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
POSSIBLE FILL: STIFF TO VERY STIFF, GRAY TO BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.			3 2 3	6	61	SS-2	1.25	4	4	8	47	37	38	18	20	22	A-6b (12)	
			1 2 4	8	83	SS-3	2.25	-	-	-	-	-	-	-	-	31	A-6b (V)	
			4 3 5	10	78	SS-4	2.50	0	0	14	54	32	35	15	20	22	A-6b (12)	
			1 2 3	6	44	SS-5	1.75	-	-	-	-	-	-	-	-	18	A-6b (V)	
	699.3																	
POSSIBLE FILL: MEDIUM STIFF, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		W	WOH 2 4	8	44	SS-6	1.00	-	-	-	-	-	-	-	-	23	A-6a (V)	
	696.8																	
MEDIUM DENSE TO VERY DENSE, BROWN AND GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.			14 22 20	54	39	SS-7	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
-COBBLES PRESENT THROUGHOUT			WOH 8 10	23	50	SS-8	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
	691.8																	
LOOSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, MOIST.			2 3 4	9	50	SS-9	1.75	50	21	9	17	3	24	18	6	13	A-1-b (0)	
-COBBLES PRESENT THROUGHOUT			5 15 40	71	67	SS-10	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
-AUGER REFUSAL ENCOUNTERED @ 26.0'. ATTEMPTED 5.0' CORE RUN. GRANITE BOULDER PIECE RECOVERED IN CORE RUN. REMAINING SOIL WAS WASHED OUT DURING CORING OPERATION. CONTINUED SPT SAMPLING @ 31.3'.			50/3"	-	0	SS-11	-	-	-	-	-	-	-	-	-	-		
			7		17	RC-1											CORE	
	680.3																	
VERY STIFF TO HARD, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP TO MOIST.			10 30 50/5"	-	100	SS-12	4.5+	20	8	11	29	32	34	16	18	14	A-6b (8)	
			10 40 50/4"	-	100	SS-13	4.00	-	-	-	-	-	-	-	-	19	A-6b (V)	
	672.8							-	-	-	-	-	-	-	-	8	A-1-a (V)	
VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP TO MOIST.			19 50/2"	-	38	SS-14	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
	665.3																	
VERY DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP. -AUGER REFUSAL ENCOUNTERED @ 49.8'. ATTEMPTED ROCK CORE RUN AT 49.8' AND RECOVERED GRANITE BOULDER PIECE. SOIL WAS OBSERVED TO BE WASHING OUT WITH THE CIRCULATION FUILD BELOW THE BOULDER. BORING TERMINATED AT 49.8' PRIOR TO ENCOUNTERING BEDROCK.	662.5	EOB	25 36 50/3"	-	60	SS-15	-	47	20	12	14	7	22	14	8	10	A-2-4 (0)	

NOTES: SEEPAGE ENCOUNTERED @ 15.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 50 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.B./T.F.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 7007+77.61 / 12.0' RT	EXPLORATION ID B-020-4-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B./S.M.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP D7	
PID: 89464 BR ID: FRA-70-1373B	DRILLING METHOD: 3.25" HSA / HQ	CALIBRATION DATE: 4/26/13	ELEVATION: 714.0 (MSL) EOB: 94.7 ft.	PAGE 1 OF 2
START: 3/5/14 END: 3/11/14	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 77.7	LAT / LONG: 39.954037, -83.004709	

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
0.2' - TOPSOIL (2.0")	713.8																	
FILL: STIFF, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.	714.0	1	3 2 1	4	44	SS-1	1.25	-	-	-	-	-	-	-	-	25	A-6a (V)	
-TRACE ORGANICS AND WOOD FIBERS PRESENT IN SS-2		4	1 1 2	4	72	SS-2	1.25	14	14	16	31	25	32	18	14	28	A-6a (6)	
		7	3 3 3	8	72	SS-3	2.50	-	-	-	-	-	-	-	-	25	A-6a (V)	
	706.0																	
VERY STIFF TO HARD, BROWN **CLAY**, AND SILT, TRACE FINE SAND, TRACE FINE GRAVEL, MOIST.		9	3 5 6	14	72	SS-4	3.50	1	0	5	53	41	48	20	28	29	A-7-6 (17)	
		12	4 5 6	14	100	SS-5	3.75	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
	701.0																	
LOOSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST TO WET.		14	WOH 2 2	5	56	SS-6	-	-	-	-	-	-	-	-	-	20	A-2-4 (V)	
W		17	2 2 5	9	44	SS-7	-	33	17	16	25	9	NP	NP	NP	17	A-2-4 (0)	
	696.0																	
MEDIUM DENSE TO DENSE, BROWN TO GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET.		W 19	4 6 11	22	33	SS-8	-	-	-	-	-	-	-	-	-	16	A-1-b (V)	
-INTRODUCED MUD @ 21.0'		22	6 12 15	35	100	SS-9	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
		24	8 12 18	39	78	SS-10	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
-COBBLES PRESENT THROUGHOUT		27	21 18 12	39	33	SS-11	-	61	15	8	10	6	NP	NP	NP	8	A-1-b (0)	
		29	4 4 5	12	33	SS-12	-	-	-	-	-	-	-	-	-	22	A-1-b (V)	
	682.0																	
MEDIUM DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		34	1 1 17	23	44	SS-13	-	62	22	5	7	4	NP	NP	NP	11	A-1-a (0)	
	677.0																	
VERY DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		39	8 20 25	58	67	SS-14	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
		44	18 26 27	69	83	SS-15	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
		49	8 31 50	105	72	SS-16	-	83	10	3	3	1	NP	NP	NP	9	A-1-a (0)	
		54	50 50/3"	-	100	SS-17	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
-AUGER REFUSAL ON BOULDER @ 55.5'; SWITCHED TO MUD ROTARY DRILLING WITH CASING ADVANCER.	657.0																	
HARD, GRAY **SILTY CLAY**, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.		59	10 27 35	80	42	SS-18	4.5+	7	4	4	41	44	40	19	21	14	A-6b (12)	

PID: 89464 | BR ID: FRA-70-1373B | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 7007+77.61 / 12.0 RT | START: 3/5/14 | END: 3/11/14 | PG 2 OF 2 | B-020-4-13

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
HARD, GRAY **SILTY CLAY**, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. *(continued)*	654.0																	
		61																
		62																
		63																
		64	31 50/5"	-	91	SS-19	4.5+	-	-	-	-	-	-	-	-	16	A-6b (V)	
	649.6	TR																
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.		65																
		66																
		67																
		68																
		69	50/5"	-	100	SS-20	-	-	-	-	-	-	-	-	-	19	Rock (V)	
		70																
		71																
		72																
		73																
		74	50/5"	-	20	SS-21	-	-	-	-	-	-	-	-	-	23	Rock (V)	
	639.3																	
SHALE : DARK GRAY, SLIGHTLY WEATHERED, WEAK, VERY THIN TO THIN BEDDED, ARGILLACEOUS, MODERATELY FRACTURED, NARROW APERTURES, SLICKENSIDED TO SLIGHTLY ROUGH; RQD 66%, REC 89%.		75																
		76																
		77	75		92	RC-1											CORE	
	635.6	78																
CLAYSTONE : DARK GRAY, SLIGHTLY WEATHERED, VERY WEAK, THIN BEDDED, CALCAREOUS, FRACTURED, TIGHT APERTURES, SLICKENSIDED TO SLIGHTLY ROUGH; RQD 100%, REC 100%. -SHALE SEAM PRESENT FROM 79.7' TO 80.7' -PYRITIC FROM 80.7' TO 83.7'		79																
		80																
		81																
		82	100		100	RC-2											CORE	
	630.3	83																
LIMESTONE : DARK BROWNISH GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, THIN TO MEDIUM BEDDED, CHERTY, DOLOMITIC, MODERATELY TO SLIGHTLY FRACTURED, NARROW TO OPEN APERTURES, SLIGHTLY ROUGH; RQD 87%, REC 95%. -QU @ 86.5' = 13,130 PSI -QU @ 90.7' = 16,178 PSI		84																
		85																
		86																
		87	90		95	RC-3											CORE	
		88																
		89																
		90																
		91																
		92	85		95	RC-4											CORE	
		93																
	619.3	94																
		EOB																

NOTES: SEEPAGE ENCOUNTERED @ 16.0'; GROUNDWATER ENCOUNTERED INITIALLY @ 18.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.B./J.K.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 175+57.74 / 11.8' RT	EXPLORATION ID B-020-5-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B./N.A.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL I-70 WB	
PID: 89464 BR ID: FRA-70-1373L	DRILLING METHOD: 4.25" HSA / HQ	CALIBRATION DATE: 4/26/13	ELEVATION: 733.4 (MSL) EOB: 90.0 ft.	PAGE 1 OF 2
START: 2/18/14 END: 1/29/15	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 82.6	LAT / LONG: 39.953452, -83.004773	

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
0.5' - CONCRETE (6.0")	732.9																	
0.5' - AGGREGATE BASE (6.0")	732.4																	
FILL: VERY STIFF TO HARD, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP TO MOIST.	733.4																	
-WOOD FRAGMENTS PRESENT IN SS-1			8 9 10	26	50	SS-1	3.50	-	-	-	-	-	-	-	-	17	A-6a (V)	
-IRON STAINING PRESENT IN SS-2			4 7 8	21	44	SS-2	3.75	-	-	-	-	-	-	-	-	20	A-6a (V)	
-ROCK FRAGMENTS PRESENT THROUGHOUT			5 7 11	25	67	SS-3	4.25	11	8	16	36	29	32	17	15	15	A-6a (8)	
-IRON STAINING PRESENT IN SS-4			4 9 12	29	78	SS-4	4.00	-	-	-	-	-	-	-	-	17	A-6a (V)	
-BRICK FRAGMENTS PRESENT IN SS-5			12 15 15	41	89	SS-5	4.50	-	-	-	-	-	-	-	-	17	A-6a (V)	
-LIMESTONE FRAGMENTS PRESENT IN SS-6	707.9		15 8 13	29	44	SS-6	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	
HARD, BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST. -IRON STAINING PRESENT IN SS-7			6 8 12	28	56	SS-7	4.50	13	13	15	29	30	33	16	17	18	A-6b (8)	
			4 6 10	22	89	SS-8	4.50	-	-	-	-	-	-	-	-	23	A-6b (V)	
			9 14 15	40	72	SS-9	4.50	-	-	-	-	-	-	-	-	19	A-6b (V)	
MEDIUM DENSE TO VERY DENSE, BROWN TO REDDISH BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST.	700.4		5 6 6	17	56	SS-10	-	-	-	-	-	-	-	-	-	14	A-2-4 (V)	
			10 8 10	25	100	SS-11	-	33	21	12	25	9	24	19	5	13	A-2-4 (0)	
			15 20 30	69	83	SS-12	-	-	-	-	-	-	-	-	-	13	A-2-4 (V)	
MEDIUM DENSE TO VERY DENSE, BROWN TO GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP TO MOIST.	692.9		19 19 17	50	78	SS-13	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
-INTRODUCED MUD @ 43.0'		W	18 19 24	59	56	SS-14	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
			11 7 10	23	100	SS-15	-	23	46	18	9	4	NP	NP	NP	14	A-1-b (0)	
-ROCK FRAGMENTS PRESENT THROUGHOUT			15 23 27	69	56	SS-16	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
-STRONG PETROLEUM ODOR PRESENT IN SS-17	676.4		50/5"	-	100	SS-17	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
HARD, GRAY **SANDY SILT**, SOME CLAY, TRACE FINE GRAVEL, MOIST.			15 30 50/5"	-	59	SS-18	4.50	5	9	18	45	23	25	15	10	17	A-4a (7)	

PID: 89464 | BR ID: FRA-70-1373L | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 175+57.74 / 11.8 RT | START: 2/18/14 | END: 1/29/15 | PG 2 OF 2 | B-020-5-13

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
HARD, GRAY **SANDY SILT**, SOME CLAY, TRACE FINE GRAVEL, MOIST. *(continued)*	673.4																	
	671.4																	
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP.	669.2		8 30 45	103	61	SS-19	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
HARD, BROWN **SILT AND CLAY**, "AND" COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.							4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
-ROCK FRAGMENTS PRESENT IN SS-20	661.4		25 30 50	110	78	SS-20	4.50	20	13	23	24	20	25	12	13	10	A-6a (3)	
HARD, BROWN **SILTY CLAY**, LITTLE FINE GRAVEL, TRACE COARSE TO FINE SAND, DAMP.																		
AUGER REFUSAL @ 75.5'	657.9		24 17 30	65	89	SS-21	4.50	-	-	-	-	-	-	-	-	17	A-6b (V)	
GRANITE BOULDER -BORING TERMINATED @ 76.6' ON 2-23-14. RESUMED DRILLING ON 1-22-15 AND CONTINUED SAMPLING @ 78.5'.	656.8	TR			62	RC-1	-	-	-	-	-	-	-	-	-	-		
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.	653.4		49 29 37	91	17	SS-22	-	-	-	-	-	-	-	-	-	13	Rock (V)	
MUDSTONE : GRAY, SLIGHTLY WEATHERED, VERY WEAK TO WEAK, VERY THIN TO THICK BEDDED, ARENACEOUS, CALCAREOUS, FRIABLE, FISSILE, PYRITIC, SLIGHTLY TO HIGHLY FRACTURED, TIGHT TO OPEN APERTURES, ROUGH TO VERY ROUGH; RQD 73%, REC 88%. -0.3' GRANITE BOULDER @ 80.0' -0.3' LIMESTONE SEAM @ 82.6'			63		80	RC-2											CORE	
	645.4		72		100	RC-3											CORE	
SHALE : BLACK AND GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, VERY WEAK TO SLIGHTLY STRONG, LAMINATED TO THICK BEDDED, ARENACEOUS, CALCAREOUS, FRIABLE, FISSILE, MODERATELY TO HIGHLY FRACTURED, TIGHT TO OPEN APERTURES, ROUGH TO VERY ROUGH; RQD 46%, REC 100%.	643.4	EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 43.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL060.dgn 12/27/2018 10:32:07 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: CME-55 (SN 386345)	STATION / OFFSET: 7008+36.29 / 24.1' RT	EXPLORATION ID B-020-6-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP D7	
PID: 89464 BR ID: FRA-70-1373B	DRILLING METHOD: 4.25" HSA / HQ	CALIBRATION DATE: 10/20/14	ELEVATION: 714.1 (MSL) EOB: 95.0 ft.	PAGE 1 OF 2
START: 1/5/15 END: 1/12/15	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 92	LAT / LONG: 39.954069154, -83.004498924	

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
0.2' - CONCRETE (2.0")	713.9																	
0.6' - AGGREGATE BASE (7.0")	713.5																	
FILL: STIFF, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.			3 4 4	12	50	SS-1	1.50	14	15	16	32	23	33	20	13	21	A-6a (5)	
			2 3 3	9	33	SS-2	1.25	-	-	-	-	-	-	-	-	24	A-6a (V)	
	708.6																	
FILL: LOOSE TO MEDIUM DENSE, BROWN **GRAVEL**, TRACE COARSE SAND, TRACE SILT, DAMP TO MOIST. -CINDERS PRESENT IN SS-3			7 7 5	18	44	SS-3	-	98	1	0	1	0	NP	NP	NP	6	A-1-a (0)	
-SLAG PRESENT IN SS-3 AND SS-4			2 2 3	8	39	SS-4	-	-	-	-	-	-	-	-	-	14	A-1-a (V)	
	703.6																	
STIFF, GRAY **CLAY**, AND SILT, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.			4 4 5	14	100	SS-5	1.75	-	-	-	-	-	-	-	-	25	A-7-6 (V)	
-IRON STAINING PRESENT IN SS-5 THROUGH SS-7			4 4 5	14	100	SS-6	2.00	1	1	9	46	43	43	19	24	24	A-7-6 (14)	
		W	2 1 2	5	44	SS-7	2.00	-	-	-	-	-	-	-	-	22	A-7-6 (V)	
	696.1																	
VERY STIFF, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP.			9 8 10	28	100	SS-8	-	-	-	-	-	-	-	-	-	15	A-6a (V)	
	693.6																	
MEDIUM DENSE TO DENSE, GRAY AND BLACK **GRAVEL**, TRACE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.			10 13 11	37	39	SS-9	-	91	3	3	2	1	NP	NP	NP	12	A-1-a (0)	
			5 5 5	15	50	SS-10	-	-	-	-	-	-	-	-	-	13	A-1-a (V)	
	688.6																	
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, WET. -ROCK FRAGMENTS PRESENT IN SS-11 -INTRODUCED MUD @26.0'		W	13 16 18	52	67	SS-11	-	59	18	6	11	6	29	23	6	25	A-1-b (0)	
	686.1																	
VERY DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.			35 34 30	98	100	SS-12	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
-ROCK FRAGMENTS PRESENT IN SS-13			44 23 27	77	100	SS-13	-	66	15	6	9	4	NP	NP	NP	11	A-1-a (0)	
			50/1"	-	0	SS-14	-	-	-	-	-	-	-	-	-	-		
-COBBLES AND BOULDERS PRESENT THROUGHOUT			38 23 40	97	100	SS-15	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
			40 38 38	117	100	SS-16	-	70	16	6	5	3	20	15	5	10	A-1-a (0)	
			50/6"	-	100	SS-17	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
			50/1"	-	100	SS-18	-	-	-	-	-	-	-	-	-	3	A-1-a (V)	
	654.1																	

PID: 89464	BR ID: FRA-70-1373B	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 7008+36.29 / 24.1 RT	START: 1/5/15	END: 1/12/15	PG 2 OF 2	B-020-6-13

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
PINK AND BLACK GRANITE BOULDER	654.1	TR																
	653.7	61																
MUDSTONE : GRAY, UNWEATHERED, VERY WEAK, THICK BEDDED, CALCAREOUS, FRIABLE, FISSILE, INTACT, TIGHT APERTURES, SLICKENSIDED; RQD 46%, REC 100%.	652.1	62	60		90	RC-1											CORE	
SHALE : GRAY, SLIGHTLY WEATHERED TO UNWEATHERED, VERY WEAK TO STRONG, LAMINATED TO THICK BEDDED, ARENACEOUS, CALCAREOUS, PYRITIC, CRYSTALLINE, FISSILE, SLIGHTLY TO HIGHLY FRACTURED, TIGHT TO OPEN APERTURES, SLIGHTLY TO VERY ROUGH; RQD 49%, REC 81%.		63																
-0.5' MUDSTONE SEAM @ 65.0'		64																
-1.1' LIMESTONE SEAM @ 66.0'		65																
		66																
		67	0		33	RC-2											CORE	
		68																
		69																
		70																
-0.4' MUDSTONE SEAM @ 71.0'		71																
-0.4' LIMESTONE SEAM @ 71.4'		72																
-0.8' MUDSTONE SEAM @ 71.8'		73	64		100	RC-3											CORE	
		74																
-0.5' MUDSTONE SEAM @ 74.5'		75																
		76																
		77																
-QU @ 77.4' = 177 PSI		78	63		97	RC-4											CORE	
-0.3' CLAY SEAM @ 78.6'		79																
		80																
-0.2' CLAY SEAM @ 80.9'		81																
		82																
		83	57		83	RC-5											CORE	
		84																
	628.6	85																
LIMESTONE : GRAY AND BROWN, UNWEATHERED, MODERATELY STRONG TO STRONG, MEDIUM TO THICK BEDDED, CHERTY, CRYSTALLINE, PYRITIC, DOLOMITIC, SLIGHTLY FRACTURED, NARROW TO OPEN APERTURES, SLIGHTLY TO VERY ROUGH; RQD 94%, REC 100%.		86																
		87																
		88	89		100	RC-6											CORE	
		89																
		90																
		91																
-QU @ 91.5' = 12,531 PSI		92																
		93	100		100	RC-7											CORE	
		94																
	619.1	EOB 95																

NOTES: SEEPAGE ENCOUNTERED @ 16.0'; GROUNDWATER ENCOUNTERED INITIALLY @ 26.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 150 LBS BENTONITE CHIPS AND SOIL CUTTINGS; PUMPED 47 LBS CEMENT / 100 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: STOCK / J/M	DRILL RIG: CME 55-LC (SN 360485)	STATION / OFFSET: 176+68.64 / 1.8' RT	EXPLORATION ID B-020-7-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / K.R.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-70 WB	
PID: 89464 BR ID: FRA-70-1373L	DRILLING METHOD: 4.25" HSA / NQ	CALIBRATION DATE: 3/28/13	ELEVATION: 713.5 (MSL) EOB: 80.4 ft.	PAGE 1 OF 2
START: 1/19/15 END: 1/22/15	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 73.2	LAT / LONG: 39.953451540, -83.004376859	

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)	BACK FILL
0.7' - CONCRETE (8.0")	713.5 712.8																	
POSSIBBLE FILL: LOOSE TO MEDIUM DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.		1–2	5 4 4	10	83	SS-1	-	-	-	-	-	-	-	-	-	12	A-2-4 (V)	
		3–4	WOH 2 3	6	67	SS-2	-	25	31	17	19	8	NP	NP	NP	13	A-2-4 (0)	
	706.5	5–6																
POSSIBBLE FILL: STIFF, DARK BROWN **CLAY**, "AND" SILT, TRACE COARSE TO FINE SAND, MOIST.		7–8																
-SWITCHED TO ROTARY DRILLING TECHNIQUES WITH WATER AND CASING ADVANCER @ 10.0'		9–10	2 4 6	12	11	SS-3	-	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
-CONSOLIDATION TEST PERFORMED @ 11.8' -CU TRIAXIAL COMPRESSION TEST PERFORMED @ 12.0'	700.5	11–12			71	ST-4	1.50	0	2	7	45	46	43	19	24	23	A-7-6 (14)	
POSSIBBLE FILL: MEDIUM STIFF TO STIFF, BROWN **SILTY CLAY**, TRACE FINE SAND, TRACE FINE GRAVEL, MOIST.		13–14	2 3 4	9	81	S-5	1.25	1	0	8	49	42	38	19	19	26	A-6b (12)	
	696.4	15–16																
		17–18			63	ST-6	0.75	-	-	-	-	-	-	-	-	-	A-6b (V)	
POSSIBBLE FILL: HARD, REDDISH BROWN **SANDY SILT**, LITTLE FINE GRAVEL, LITTLE CLAY, MOIST.	695.5						4.50	19	14	12	40	15	26	21	5	21	A-4a (4)	
POSSIBBLE FILL: MEDIUM STIFF, BROWN **CLAY**, "AND" SILT, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	693.0	19–20	1 2 3	6	33	SS-7	-	-	-	-	-	-	-	-	-	24	A-7-6 (V)	
VERY DENSE, BLACK **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		21–22			0	ST-8	-	-	-	-	-	-	-	-	-	-		
-COBBLES PRESENT @ 24.0'		23–24	7 19 20	48	61	SS-9	-	78	11	5	4	2	NP	NP	NP	11	A-1-a (0)	
	686.5	25–26																
DENSE, BROWN AND BLACK **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		27–28																
-HEAVING SANDS ENCOUNTERED @ 28.5'		29–30	5 13 14	33	100	SS-10	-	-	-	-	-	-	-	-	-	15	A-1-b (V)	
	681.5	31–32																
HARD, BROWNISH GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.	679.5						4.5+	11	11	19	33	26	27	15	12	13	A-6a (6)	
VERY DENSE, BLACK **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		33–34	11 20 33	65	72	SS-11	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		35–36																
		37–38																
		39–40	6 20 38	71	94	SS-12	-	54	14	22	7	3	NP	NP	NP	14	A-1-b (0)	
-COBBLES PRESENT @ 40.0'	671.5	41–42																
HARD, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.		43–44	4 6 21	33	44	SS-13	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	
	666.5	45–46																
VERY DENSE, GRAY AND BLACK **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		47–48																
		49–50	9 32 41	89	100	SS-14	-	70	13	9	5	3	NP	NP	NP	10	A-1-a (0)	
	659.5	51–52																
HARD, GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		53–54	5 20 39	72	78	SS-15	- 4.5+	-	-	-	-	-	-	-	-	12 13	A-1-a (V) A-6a (V)	
AUGER REFUSAL @ 55.0'		55–56			25	RC-1	-	-	-	-	-	-	-	-	-	-	A-6a (V)	
-0.8' GRANITE BOULDER @ 56.5'		57–58																
		59			33	RC-2	-	-	-	-	-	-	-	-	-	-	A-6a (V)	

PID: 89464	BR ID: FRA-70-1373L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 176+68.64 / 1.8 RT	START: 1/19/15	END: 1/22/15	PG 2 OF 2	B-020-7-13

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)	BACK FILL
HARD, GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. *(continued)* -0.8' MUDSTONE SEAM @ 60.7' -0.1' THICK PIECE OF GRANITE RECOVERED IN RC-3. REMAINING SOIL WASHED OUT DURING CORING.	653.5	61 62 63 64 65			2	RC-3	-	-	-	-	-	-	-	-	-	-	A-6a (V)	
MUDSTONE : GRAY, HIGHLY WEATHERED, VERY WEAK, THINLY LAMINATED TO THIN BEDDED, ARENACEOUS, CALCAREOUS, FRIABLE, FISSILE, SLIGHTLY TO HIGHLY FRACTURED, THIGHT APERTURES, SLIGHTLY ROUGH; RQD 74%, REC 98%. -POINT LOAD STRENGTH @ 69.4' to 74.8' -MEAN QU = 110 PSI	648.1 TR	66 67 68 69 70 71 72 73 74 75	89		97	RC-4											CORE	
	633.1 EOB	76 77 78 79 80	45		100	RC-5											CORE	

NOTES: GROUNDWATER NOT ENCOUNTERED PRIOR TO INTORDUCTION OF WATER AS A DRILLING FLUID

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 150 LBS BENTONITE CHIPS AND SOIL CUTTINGS

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL064.dgn 1/31/2019 11:25:36 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-70-1373B
START: 12/15/14 END: 12/19/14

DRILLING FIRM / OPERATOR: RII / J.K.
SAMPLING FIRM / LOGGER: RII / N.A.
DRILLING METHOD: 4.25" HSA / HQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME-55 (SN 386345)
HAMMER: AUTOMATIC
CALIBRATION DATE: 10/20/14
ENERGY RATIO (%): 92

STATION / OFFSET: 7010+15.89 / 30.7' RT
ALIGNMENT: BL RAMP D7
ELEVATION: 721.0 (MSL) EOB: 102.0 ft.
LAT / LONG: 39.954179, -83.003900

EXPLORATION ID B-020-8-13

PAGE 1 OF 2

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
0.7' - CONCRETE (8.0")	720.3																	
0.3' - AGGREGATE BASE (4.0")	720.0																	
FILL: LOOSE, BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, DAMP TO MOIST.		1	2 3 2	8	56	SS-1	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	
-ROCK FRAGMENTS PRESENT THROUGHOUT		4	2 2 3	8	56	SS-2	-	40	19	12	13	16	28	18	10	15	A-2-4 (0)	
	715.5																	
MEDIUM DENSE, GRAY **GRAVEL**, DRY.		6	5 7 8	23	33	SS-3	-	-	-	-	-	-	-	-	-	1	A-1-a (V)	
-LIMESTONE FRAGMENTS PRESENT IN SS-3	713.0																	
DENSE TO VERY DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP TO MOIST.		9	50/6"	-	0	SS-4	-	-	-	-	-	-	-	-	-	-		
		12	26 16 13	44	67	SS-5	-	77	12	4	3	4	20	19	1	6	A-1-a (0)	
		14	13 24 23	71	33	SS-6	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
		W 16	50/6"	-	100	SS-7	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
		W 18																
-INTRODUCED MUD @ 20.0'		19	15 16 16	48	0	SS-8	-	-	-	-	-	-	-	-	-	-		
	700.5																	
DENSE TO VERY DENSE, BROWN **COARSE AND FINE SAND**, TRACE TO LITTLE CLAY, TRACE SILT, TRACE FINE GRAVEL, WET.		22	25 26 26	78	100	SS-9	-	1	10	70	9	10	NP	NP	NP	21	A-3a (0)	
		24	10 13 18	47	100	SS-10	-	-	-	-	-	-	-	-	-	21	A-3a (V)	
		27	8 11 15	39	100	SS-11	-	1	14	61	10	14	NP	NP	NP	22	A-3a (0)	
		29	11 16 16	48	100	SS-12	-	-	-	-	-	-	-	-	-	20	A-3a (V)	
	689.0																	
VERY DENSE, GRAY TO BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		34	27 20 37	86	100	SS-13	-	36	38	13	6	7	NP	NP	NP	12	A-1-b (0)	
	684.0																	
-GRANITE BOULDER ENCOUNTERED @ 37.0'		39	50/1"	-	0	SS-14	-	-	-	-	-	-	-	-	-	-		
-SWITCHED TO MUD ROTARY DRILLING WITH TRICONE BIT @ 39.0'																		
-COBBLES AND BOULDERS PRESENT THROUGHOUT		44	43 50/5"	-	73	SS-15	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
		49	47 50/1"	-	71	SS-16	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
	669.0																	
HARD, GRAY **CLAY**, SOME SILT, TRACE COARSE TO FINE SAND, DAMP TO MOIST.		54	8 30 40	105	100	SS-17	4.5+	-	-	-	-	-	-	-	-	24	A-7-6 (V)	
		59	40 50/6"	-	100	SS-18	4.5+	0	1	2	32	65	43	21	22	17	A-7-6 (13)	

PID: 89464	BR ID: FRA-70-1373B	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 7010+15.89 / 30.7 RT	START: 12/15/14	END: 12/19/14	PG 2 OF 2	B-020-8-13

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)	BACK FILL
HARD, GRAY **CLAY**, SOME SILT, TRACE COARSE TO FINE SAND, DAMP TO MOIST. *(continued)*	661.0	61																
		62																
		63																
		64	50/1"	-	0	SS-19	-	-	-	-	-	-	-	-	-	-		
	656.0	TR 65																
MUDSTONE : GRAY, HIGHLY WEATHERED, VERY WEAK TO WEAK, MEDIUM BEDDED, CALCAREOUS, FISSILE, ARGILLACEOUS, MODERATELY FRACTURED, TIGHT TO OPEN APERTURES, VERY ROUGH; RQD 29%, REC 58%.		66	33		52	RC-1											CORE	
	653.7	67																
SHALE : GRAY, SLIGHTLY WEATHERED TO UNWEATHERED, VERY WEAK TO STRONG, LAMINATED TO VERY THICK BEDDED, ARENACEOUS, ARGILLACEOUS, FISSILE, SLIGHTLY FRACTURED TO FRACTURED, TIGHT TO OPEN APERTURES, VERY ROUGH; RQD 63%, REC 86%.		68																
-QU @ 71.2' = 275 PSI		69																
		70	72		97	RC-2											CORE	
-0.4' LIMESTONE SEAM @ 72.0'		71																
		72																
		73																
		74																
		75	83		100	RC-3											CORE	
		76																
-CALCAREOUS FROM 77.0' TO 82.0'		77																
		78																
		79																
		80	68		90	RC-4											CORE	
		81																
		82																
		83																
		84																
		85	78		95	RC-5											CORE	
-QU @ 85.9' = 318 PSI		86																
		87																
		88																
		89																
		90	8		52	RC-6											CORE	
		91																
	629.0	92																
LIMESTONE : GRAY, UNWEATHERED, VERY STRONG, VERY THICK BEDDED, ARENACEOUS, FERRIFEROUS, SILICEOUS, PYRITIC, INTACT, NARROW APERTURES, SLIGHTLY ROUGH; RQD 100%, REC 100%.		93																
		94																
		95	100		100	RC-7											CORE	
		96																
-QU @ 97.1' = 4,737 PSI		97																
		98																
		99																
		100	100		100	RC-8											CORE	
		101																
	619.0	EOB 102																

NOTES: SEEPAGGE ENCOUNTERED @ 16.0'; GROUNDWATER INITIALLY ENCOUNTERED @ 18.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 50 LBS BENTONITE CHIPS AND SOIL CUTTINGS

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL066.dgn 12/27/2018 10:32:28 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: CME 55 (SN 386345)	STATION / OFFSET: 5081+05.25 / 39.8' RT	EXPLORATION ID B-020-9-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1373A	DRILLING METHOD: 4.25" HSA / RC	CALIBRATION DATE: 10/20/14	ELEVATION: 713.0 (MSL) EOB: 75.5 ft.	PAGE 1 OF 2
START: 3/16/15 END: 3/17/15	SAMPLING METHOD: SPT / HQ	ENERGY RATIO (%): 92	LAT / LONG: 39.952886963, -83.004333117	

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
0.3'- ASPHALT (4.0")	713.0																	
0.4' - BRICK (4.0")	712.7																	
0.3' - AGGREGATE BASE (3.0")	712.3																	
POSSIBLE FILL: STIFF, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.	712.0		5 4 3	11	56	SS-1	1.25	-	-	-	-	-	-	-	-	22	A-6a (V)	
			4 4 4	12	100	SS-2	1.50	10	10	14	37	29	35	20	15	18	A-6a (8)	
POSSIBLE FILL: STIFF, DARK BROWN AND BLACK TO BROWNISH GRAY **SILTY CLAY**, LITTLE COARSE TO FINE SAND, MOIST.	707.5		3 2 4	9	61	SS-3	2.00	-	-	-	-	-	-	-	-	37	A-6b (V)	
			4 4 6	15	100	SS-4	2.00	0	1	13	50	36	34	18	16	21	A-6b (10)	
DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP. -ROCK FRAGMENTS PRESENT IN SS-5	702.5		7 11 12	35	39	SS-5	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
MEDIUM DENSE, BROWN **SANDY SILT**, "AND" FINE GRAVEL, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-6	700.0		6 5 13	28	100	SS-6	-	38	15	10	29	8	22	19	3	14	A-4a (0)	
VERY DENSE, BROWNISH GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-7	697.5		20 14 24	58	89	SS-7	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
MEDIUM DENSE, BROWNISH GRAY **SANDY SILT**, SOME FINE GRAVEL, TRACE CLAY, MOIST.	695.0		13 9 9	28	100	SS-8	-	34	18	12	26	10	NP	NP	NP	10	A-4a (0)	
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.	692.5		14 43 17	92	50	SS-9	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
-ROCK FRAGMENTS PRESENT THROUGHOUT		W	13 4 8	18	33	SS-10	-	33	38	9	13	7	NP	NP	NP	16	A-1-b (0)	
-PETROLEUM ODOR PRESENT IN SS-11	685.0		23 25 50/4"	-	88	SS-11	-	47	21	14	12	6	NP	NP	NP	11	A-1-b (0)	
VERY DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST. -INTRODUCED MUD @ 30.0'			7 14 19	51	100	SS-12	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	
			5 30 42	110	100	SS-13	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	
VERY DENSE, GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.	676.0		34 37 50/5"	-	82	SS-14	-	35	18	14	15	18	26	13	13	9	A-2-6 (1)	
VERY DENSE, BROWNISH GRAY TO GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.	671.0		17 32 15	72	100	SS-15	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
-ROCK FRAGMENTS PRESENT IN SS-16			17 50/5"	-	73	SS-16	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
VERY STIFF TO HARD, GRAY **CLAY**, SOME SILT, LITTLE FINE GRAVEL, TRACE COARSE TO FINE SAND, DAMP.	661.0		12 24 39	97	100	SS-17	4.5+	11	3	3	34	49	42	19	23	14	A-7-6 (14)	
-BECOMING SHALE WITH DEPTH			23 50/4"	-	100	SS-18	3.75	-	-	-	-	-	-	-	-	16	A-7-6 (V)	

PID: 77372	BR ID: FRA-70-1373A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5081+05.25 / 39.8 RT	START: 3/16/15	END: 3/17/15	PG 2 OF 2	B-020-9-15

MATERIAL DESCRIPTION AND NOTES	ELEV. 653.0	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
	652.5	TR																
SHALE : DARK GRAY TO BLACK, HIGHLY WEATHERED, VERY WEAK TO WEAK, THINLY LAMINATED TO MEDIUM BEDDED, ARENACEOUS, CALCAREOUS, FRIABLE, FISSILE, JOINTED, MODERATELY TO HIGHLY FRACTURED, THIGHT TO OPEN APERTURES, SLIGHTLY TO VERY ROUGH; RQD 48%, REC 75%. -0.4' GRANITE BOULDER @ 60.5' -0.2' CLAY SEAM @ 60.9' -0.4' LIMESTONE SEAM @ 61.5' -0.5' LIMESTONE SEAM @ 64.5'		61 62 63	17		52	RC-1											CORE	
		64 65 66 67 68	48		75	RC-2											CORE	
-SLIGHTLY WEATHERED AND SLIGHTLY FRACTURED IN RC-3		69 70 71 72 73	80		100	RC-3											CORE	
	637.5	74 75 EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 24.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-021-0-08 | *Location:* Sta. 5082+48.43, 39.8' RT., BL RAMP C5 | *Date Drilled:* 7/29/2008 to 7/31/2008

WATER OBSERVATIONS:
Water seepage at: 0.0-8.0, 18.0-23.0, 28.0-57.0
Water level at completion: 26.9' (beginning of shift, 7/30/08) 25.3' (includes drilling water)
FIELD NOTES:
Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	727.9													
0.3	727.6						Gravel - 3"							
		5 5 4	1	1			FILL: Loose to medium dense brown and gray GRAVEL WITH SAND (A-1-b), little silt; wet. @ 1.0', drove splitspoon on gravel particle.							
5		6 5 6	6	2					63	13	---	8	--16--	
		10 6 6	3	3										
8.0	719.9													
		6 3 3	10	4		1.0	POSSIBLE FILL: Medium stiff to stiff brown SILTY CLAY (A-6b), trace to little fine to coarse sand, trace gravel; moist.							
10		5 7 9	1	5		--	@ 11.0'-12.0', drove gravel in spoon.							
		2 3 6	18	6		2.5	@ 13.0', very stiff.		1	7	---	10	39	43
15		3 10 14	6	7		2.75								
18.0	709.9													
		11 13 16	5	8			Medium dense to dense gray GRAVEL (A-1-a), trace to little silty clay, trace fine sand; wet.							
20		11 19 23	18	9			@ 21.0'-22.5', light brown, some fine to coarse sand.		50	20	---	15	--15--	
23.0	704.9													
		9 5 3	18	10		2.0	Stiff to very stiff brown SANDY SILT (A-4a), some clay, little gravel; moist.							
25	702.9													

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LOG OF: Boring B-021-0-08 | *Location:* Sta. 5082+48.43, 39.8' RT., BL RAMP C5 | *Date Drilled:* 7/29/2008 to 7/31/2008

WATER OBSERVATIONS:
Water seepage at: 0.0-8.0, 18.0-23.0, 28.0-57.0
Water level at completion: 26.9' (beginning of shift, 7/30/08) 25.3' (includes drilling water)
FIELD NOTES:
Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	702.9													
		5 5 5	18	11		1.5	Stiff to very stiff brown SANDY SILT (A-4a), some clay, little gravel; moist. @ 25.0'-35.0', set piezometer screen.		11	12	---	32	19	26
28.0	699.9													
		5 8 13	18	12			Medium dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little to some silty clay; wet.							
30							@ 33.5'-35.0', drove spoon on boulder. No sample was recovered.							
		50/1	0	13			@ 33.5'-43.0', very dense; boulders and cobble caused difficult drilling and poor sample recovery.							
35							@ 37.0', gray.							
		43 48 42	18	14					53	17	---	14	--15--	
40														
42.0	685.9													
		25 32 38	10	15			Very dense brown FINE SAND (A-3), some coarse sand, little gravel, trace silty clay; wet.							
45														
		22 28 35	16	16					14	35	---	42	--8--	
50	677.9													

STANDARD PENETRATION (N60)
Natural Moisture Content, % -
PL ⟷ LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-021-0-08 | *Location:* Sta. 5082+48.43, 39.8' RT., BL RAMP C5 | *Date Drilled:* 7/29/2008 to 7/31/2008

WATER OBSERVATIONS:
Water seepage at: 0.0-8.0, 18.0-23.0, 28.0-57.0
Water level at completion: 26.9' (beginning of shift, 7/30/08) 25.3' (includes drilling water)
FIELD NOTES:
Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - PL / LL, Blows per foot - Non-Plastic - NP
	677.9														
55		25 30 46	18	17			Very dense brown FINE SAND (A-3), some coarse sand, little gravel, trace silty clay; wet.								78
57.0	670.9														
60		11 21 50/5	14	18		4.5+	Hard gray SILTY CLAY (A-6b), trace to little gravel, trace fine to coarse sand; damp to moist.		0	1	---	1	31	67	50+
65		23 25 25	18	19		4.5+	@ 63.5'-65.0', brown, "and" fine to coarse sand; encountered sandstone fragments.		12	20	---	18	23	27	51
67.0	660.9														
70		13 14 26	8	20			Shale, blue-gray, severely weathered, weak, laminated, pyritic.								
71.2	656.7														
75		Core 60"	Rec 60"	RQD 82%	R1		Shale, blue-gray, highly weathered, weak, thinly laminated, friable, fissile, pyritic, slightly calcareous, jointed, moderately fractured, tight, slightly rough; RQD 83%, Loss 0%. @ 73.1' - 73.3', high angle fracture.								
	652.9														

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-021-0-08 | *Location:* Sta. 5082+48.43, 39.8' RT., BL RAMP C5 | *Date Drilled:* 7/29/2008 to 7/31/2008

WATER OBSERVATIONS:
Water seepage at: 0.0-8.0, 18.0-23.0, 28.0-57.0
Water level at completion: 26.9' (beginning of shift, 7/30/08) 25.3' (includes drilling water)
FIELD NOTES:
Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - PL / LL, Blows per foot - Non-Plastic - NP
	652.9														
80		Core 60"	Rec 60"	RQD 90%	R2		Shale, blue-gray, highly weathered, weak, thinly laminated, friable, fissile, pyritic, slightly calcareous, jointed, moderately fractured, tight, slightly rough; RQD 83%, Loss 0%. @ 75.8', encountered large pyritic inclusions. @ 76.4'-76.8' and 78.8'-78.9', high angle fracture.								
82.2	645.7	Core 60"	Rec 60"	RQD 75%	R3		Interbedded Shale (91%) and Limestone (9%) RQD 82%, LOSS 0%; Shale, dark gray, weak, moderately to highly weathered, laminated, calcareous, fissile, jointed, moderately fractured, tight, slightly rough; Limestone, light gray, slightly weathered, slightly strong to strong, thinly bedded, pyritic. @ 82.8' - 83.3', qu = 1536 psi.								
85															
90.0	90 637.9	Core 60"	Rec 60"	RQD 87%	R4										
							Bottom of Boring - 90.0'								
95															
100															

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: CME 750X (SN 310218)	STATION / OFFSET: 6000+84.54 / 7.6' LT	EXPLORATION ID B-021-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / J.P.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP D6	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 719.7 (MSL) EOB: 49.8 ft.	PAGE 1 OF 1
START: 1/23/15 END: 1/23/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 85.7	LAT / LONG: 39.953691691, -83.003720238	

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)	BACK FILL
1.0' - TOPSOIL (12.0")	719.7																	
	718.7																	
FILL: DENSE, DARK BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -BRICK FRAGMENTS AND CINDERS PRESENT IN SS-1	716.7	1 2 3	5 11 16	39	44	SS-1	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
MEDIUM DENSE TO DENSE, GRAYISH BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP.	711.7	4 5 6 7 8	15 14 11	36	67	SS-2	-	63	25	4	6	2	NP	NP	NP	3	A-1-a (0)	
			5 4 4	11	33	SS-3	-	-	-	-	-	-	-	-	-	3	A-1-a (V)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP TO MOIST.		9 10 11 12 13	11 14 11	36	56	SS-4	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			5 6 8	20	67	SS-5	-	46	39	5	7	3	NP	NP	NP	9	A-1-b (0)	
	704.2	14 15	6 8 8	23	83	SS-6	-	-	-	-	-	-	-	-	-	4	A-1-b (V)	
DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, TRACE TO LITTLE SILT, TRACE CLAY, DAMP TO MOIST.		16 17	17 50/5"	-	91	SS-7	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
		19 20 21	17 21 26	67	100	SS-8	-	21	51	13	8	7	NP	NP	NP	7	A-1-b (0)	
		W 22 23																
		24 25 26 27 28	5 14 16	43	100	SS-9	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
		29 30 31 32 33	8 16 26	60	33	SS-10	-	42	26	12	11	9	NP	NP	NP	13	A-1-b (0)	
		34 35 36 37 38	42 34 32	94	22	SS-11	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
		39 40 41 42 43	13 12 33	64	83	SS-12	-	-	-	-	-	-	-	-	-	15	A-1-b (V)	
	677.7																	
MEDIUM DENSE, BROWNISH GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		44 45 46 47 48	5 5 6	16	100	SS-13	-	38	34	19	6	3	NP	NP	NP	10	A-1-b (0)	
	672.7																	
VERY DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP. -WC NOT PERFORMED ON SS-14 DUE TO BROKEN JAR	669.9	49 EOB	10 37 50/3"	-	100	SS-14	-	-	-	-	-	-	-	-	-	-	A-1-b (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 22.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL071.dgn 12/27/2018 10:33:01 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 178+21.83 / 51.4' RT	EXPLORATION ID B-021-2-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-70 EB	
PID: 77372 BR ID: N/A	DRILLING METHOD: 4.5" CFA	CALIBRATION DATE: 4/26/13	ELEVATION: 732.7 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 2/14/15 END: 2/14/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.953268429, -83.003854397	

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)	BACK FILL
0.7' - ASPHALT (8.0")	732.0																	
0.3' - AGGREGATE BASE (4.0")	731.7																	
FILL: MEDIUM DENSE, BROWN **COARSE AND FINE SAND**, SOME FINE GRAVEL, LITTLE SILT, LITTLE CLAY, DAMP.	729.7	1	3 7 8	19	67	SS-1	-	-	-	-	-	-	-	-	-	7	A-3a (V)	
FILL: MEDIUM DENSE TO DENSE, BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST.		2																
		3																
		4	4 6 6	16	89	SS-2	-	41	20	12	16	11	22	16	6	9	A-2-4 (0)	
		5																
		6																
-ROCK FRAGMENTS PRESENT THROUGHOUT		7	3 9 9	23	100	SS-3	-	-	-	-	-	-	-	-	-	7	A-2-4 (V)	
		8																
		9	7 11 24	45	100	SS-4	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	
	722.2	10																
FILL: STIFF, BROWN **SILTY CLAY**, "AND" FINE GRAVEL, SOME COARSE TO FINE SAND, DAMP.		11																
		12	3 6 6	16	100	SS-5	1.75	-	-	-	-	-	-	-	-	14	A-6b (V)	
-ROOT FIBERS AND BRICK FRAGMENTS PRESENT THROUGHOUT		13																
		14	12 8 7	19	100	SS-6	1.50	36	13	9	20	22	40	18	22	14	A-6b (5)	
	717.2	15																
FILL: VERY STIFF TO HARD, BROWN **SILTY CLAY**, SOME FINE GRAVEL, LITTLE COARSE TO FINE SAND, DAMP.		16																
		17	7 14 16	39	56	SS-7	3.00	-	-	-	-	-	-	-	-	16	A-6b (V)	
-ROOT FIBERS AND BRICK FRAGMENTS PRESENT THROUGHOUT		18																
		19	13 17 24	53	67	SS-8	4.5+	-	-	-	-	-	-	-	-	13	A-6b (V)	
	710.7	20																
STIFF, BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.		21																
		22																
		23																
		24	7 6 7	17	100	SS-9	2.00	3	4	9	52	32	39	20	19	19	A-6b (12)	
	707.7	25	EOB															

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 25 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: N/A
START: 3/20/14 END: 3/20/14

DRILLING FIRM / OPERATOR: RII / J.B.
SAMPLING FIRM / LOGGER: RII / S.B.
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: MOBILE B-53 (SN 624400)
HAMMER: AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 77.7

STATION / OFFSET: 7011+57.17 / 20.9' RT
ALIGNMENT: BL RAMP D7
ELEVATION: 727.0 (MSL) EOB: 34.4 ft.
LAT / LONG: 39.954262476, -83.003407384

EXPLORATION ID B-021-3-13
PAGE 1 OF 1

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)	BACK FILL
0.2' - ASPHALT (3.0")	727.0																	
0.7' - CONCRETE (8.0")	726.8																	
FILL: STIFF, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DRY. -BRICK AND ROCK FRAGMENTS PRESENT IN SS-1	726.1	1	12 6 5	14	67	SS-1	1.75	19	15	13	30	23	28	16	12	8	A-6a (4)	
	724.0	2																
MEDIUM DENSE TO DENSE, GRAY TO BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP. -PETROLEUM ODOR PRESENT IN SS-2		3																
		4	8 14 15	38	56	SS-2	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
		5																
		6																
-ROCK FRAGMENTS PRESENT THROUGHOUT		7	17 17 15	41	44	SS-3	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
		8																
		9	11 12 14	34	100	SS-4	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
		10																
		11																
		12	24 12 10	28	78	SS-5	-	18	46	17	11	8	NP	NP	NP	7	A-1-b (0)	
	714.0	13																
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP.		14	17 50/5"	-	73	SS-6	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
		15																
-ROCK FRAGMENTS PRESENT THROUGHOUT		16	50/5"	-	100	SS-7	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
	709.0	17																
		18																
MEDIUM DENSE, BROWN **COARSE AND FINE SAND**, SOME CLAY, LITTLE SILT, MOIST.		W 19	6 6 5	14	0	SS-8	-	-	-	-	-	-	-	-	-	-		
-ROCK FRAGMENTS PRESENT 2S-8A	706.5	20	36	-	67	2S-8A	-	-	-	-	-	-	-	-	-	12	A-3a (V)	
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT SS-9		W 21	48 50/0"	-	83	SS-9	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
	704.0	22																
HARD, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP. -ROCK FRAGMENTS PRESENT IN SS-10		23																
		24	24 40 41	105	56	SS-10	4.5+	23	14	15	27	21	25	14	11	9	A-6a (3)	
	700.5	25																
		26					4.5+	-	-	-	-	-	-	-	-	11	A-6a (V)	
VERY DENSE, BROWN **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE FINE GRAVEL, WET.	699.0	27	29 26 30	73	83	SS-11	-	1	24	54	14	7	NP	NP	NP	20	A-3a (0)	
HARD, BROWN TO GRAY **SANDY SILT**, SOME CLAY, LITTLE FINE GRAVEL, DAMP.		28																
		29	16 18 24	54	94	SS-12	4.5+	-	-	-	-	-	-	-	-	11	A-4a (V)	
-INTRODUCED WATER @ 30.0'		30																
		31																
		32	18 24 50	96	94	SS-13	4.5+	12	12	19	30	27	24	14	10	10	A-4a (4)	
		33																
-GRANITE FRAGMENTS PRESENT IN SS-14	692.6	EOB 34	19 50/5"	-	45	SS-14	4.5+	-	-	-	-	-	-	-	-	11	A-4a (V)	

NOTES: SEEPAGE ENCOUNTERED @ 18.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 21.0'; CAVE-IN DEPTH @ 25.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 50 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: CME 55 (SN 386345)	STATION / OFFSET: 179+71.86 / 54.3' RT	**EXPLORATION ID B-021-4-14**
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL I-70 EB	
PID: 77372 BR ID: N/A	DRILLING METHOD: 4.5" CFA	CALIBRATION DATE: 10/20/14	ELEVATION: 735.5 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 2/14/15 END: 2/14/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92	LAT / LONG: 39.953213152, -83.003323990	

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
0.3' - ASPHALT (4.0")	735.2																	
1.0' - CONCRETE (12.0")	734.2																	
0.5' - AGGREGATE BASE (6.0")	733.7																	
FILL: MEDIUM DENSE TO VERY DENSE, BROWN **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DRY.			3 15 16	48	78	SS-1	-	-	-	-	-	-	-	-	-	6	A-4a (V)	
			10 14 16	46	100	SS-2	-	33	19	12	24	12	24	17	7	9	A-4a (0)	
			11 16 19	54	83	SS-3	-	-	-	-	-	-	-	-	-	7	A-4a (V)	
			8 5 6	17	72	SS-4	-	-	-	-	-	-	-	-	-	7	A-4a (V)	
	725.0																	
FILL: STIFF TO VERY STIFF, BROWN TO MOTTLED BROWN AND GRAY **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.			3 3 3	9	39	SS-5	1.50	-	-	-	-	-	-	-	-	19	A-6b (V)	
			4 6 7	20	100	SS-6	3.00	12	11	14	34	29	37	18	19	20	A-6b (9)	
			8 9 12	32	100	SS-7	4.00	-	-	-	-	-	-	-	-	24	A-6b (V)	
	717.5																	
DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP.			16 23 23	71	44	SS-8	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			19 33 35	104	100	SS-9	-	55	15	11	15	4	NP	NP	NP	5	A-1-b (0)	
			21 32 31	97	100	SS-10	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
	710.5	EOB																

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING; CAVE-IN DEPTH @ 17.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 25 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / T.F./S.B.	DRILL RIG: CME 750X (SN 310218)	STATION / OFFSET: 6001+99.15 / 32.1' LT	EXPLORATION ID B-021-5-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / J.P./C.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP D6	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 727.5 (MSL) EOB: 39.9 ft.	PAGE 1 OF 1
START: 1/22/15 END: 4/9/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 85.7	LAT / LONG: 39.953766206, -83.003343013	

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)	BACK FILL
0.4' - TOPSOIL (5.0")	727.5																	
MEDIUM DENSE, BROWN TO REDDISH BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST. -ROOT FIBERS PRESENT IN SS-1	727.1	1	3 7 7	20	44	SS-1	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		2																
		3																
		4	6 11 7	26	22	SS-2	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
		5																
		6																
		7	5 7 8	21	0	SS-3	-	-	-	-	-	-	-	-	-	-		
HARD, BROWN **SILT AND CLAY**, TRACE COARSE TO FINE SAND, MOIST.	720.0	8	19	-	100	2S-3A	4.5+	0	1	6	49	44	28	17	11	20	A-6a (8)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP.	719.0	9	7 9 9	26	67	SS-4	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
		10																
		11																
		12	7 12 15	39	67	SS-5	-	41	47	5	4	3	NP	NP	NP	5	A-1-b (0)	
	714.5	13																
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP.		14	16 36 39	107	83	SS-6	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
		15																
		16																
		17	7 30 33	90	100	SS-7	-	-	-	-	-	-	-	-	-	4	A-1-a (V)	
-ROCK FRAGMENTS PRESENT THROUGHOUT		18																
		19	9 22 11	47	83	SS-8	-	55	28	7	7	3	NP	NP	NP	5	A-1-a (0)	
		20																
	705.5	21																
VERY STIFF, BROWN **SANDY SILT**, LITTLE FINE GRAVEL, TRACE CLAY, DAMP.		22																
		23																
		24	21 31 50/5"	-	106	SS-9	2.50	-	-	-	-	-	-	-	-	15	A-4a (V)	
-BORING TERMINATED @ 24.9' ON 1-22-15 PRIOR TO PLANNED TERMINATION DEPTH. ON 4-9-15, CONTINUED SAMPLING @ 28.5' TO PLANNNED TERMINATION DEPTH.	700.5	25																
		26																
		27																
VERY DENSE, BROWN **COARSE AND FINE SAND**, TRACE SILT, TRACE CLAY, TRACE FINE GRAVEL, MOIST TO WET.		28																
		29	18 31 43	106	100	SS-10	-	-	-	-	-	-	-	-	-	16	A-3a (V)	
		30																
		31																
		32																
		33																
		34	9 19 38	81	100	SS-11	-	1	9	79	9	2	NP	NP	NP	19	A-3a (0)	
		35	W															
		36																
		37																
		38																
	687.6	39	3 21 50/5"	-	106	SS-12	-	-	-	-	-	-	-	-	-	14	A-3a (V)	
		EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 34.5'; CAVE-IN DEPTH @ 37.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 100 LBS BENTONITE CHIPS AND SOIL CUTTINGS

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL076.dgn 12/27/2018 10:33:15 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 5084+74.16 / 15.0' RT	EXPLORATION ID B-023-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / K.R.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 732.4 (MSL) EOB: 48.1 ft.	PAGE 1 OF 1
START: 8/6/13 END: 8/6/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 82.6	LAT / LONG: 39.952844807, -83.003019835	

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)	BACK FILL
VERY STIFF TO HARD, BROWN **CLAY**, "AND" SILT, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.	732.4		5 7 13	28	53	SS-1	4.5+	-	-	-	-	-	-	-	-	14	A-7-6 (V)	
			4 4 6	14	58	SS-2	3.50	10	5	11	37	37	42	21	21	16	A-7-6 (13)	
			6 8 10	25	53	SS-3	4.5+	-	-	-	-	-	-	-	-	16	A-7-6 (V)	
VERY STIFF TO HARD, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST. -COBBLES PRESENT @ 9.0' -QU @ 8.3' = 2.95 TSF -CONSOLIDATION TEST PERFORMED @ 8.9'	724.4				60	ST-4	4.5+	16	11	15	34	24	29	18	11	22	A-6a (5)	
			4 5 6	15	78	SS-5	3.00	-	-	-	-	-	-	-	-	18	A-6a (V)	
STIFF TO VERY STIFF, BROWN **CLAY**, SOME SILT, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP TO MOIST.	719.4		4 6 6	17	81	SS-6	2.00	25	13	12	25	25	48	19	29	16	A-7-6 (10)	
					98	ST-7	3.00	-	-	-	-	-	-	-	-	21	A-7-6 (V)	
DENSE TO VERY DENSE, BROWN TO GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET.	714.4	W	4 8 16	33	100	SS-8	-	-	-	-	-	-	-	-	-	18	A-1-b (V)	
-COBBLES PRESENT THROUGHOUT			4 17 20	51	100	SS-9	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
			22 50/5"	-	0	SS-10	-	-	-	-	-	-	-	-	-	-		
			45	-	100	3S-10A	-	54	18	10	14	4	25	22	3	12	A-1-b (0)	
-HEAVING SAND ENCOUNTERED @ 32.0'		W																
-COBBLES PRESENT THROUGHOUT	695.4		17 18 22	55	100	SS-11	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
VERY STIFF, DARK GRAY **SILTY CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.	690.4		9 6 23	40	100	SS-12	3.50	4	8	20	46	22	36	16	20	11	A-6b (11)	
VERY DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, DAMP.			12 30 36	91	78	SS-13	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
-COBBLES PRESENT @ 46.0'	684.3	EOB	50/1"	-	0	SS-14	-	-	-	-	-	-	-	-	-	-		

NOTES: SEEPAGE ENCOUNTERED @ 18.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 32.0' AND AT COMPLETION @ 18.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 100 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.B.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 7012+73.67 / 45.0' RT	EXPLORATION ID B-023-2-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP D7	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 733.1 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 3/20/14 END: 3/20/14	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.954243564, -83.002983734	

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
0.9' - TOPSOIL (11.0")	733.1																	
FILL: MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP. -COULD NOT ADVANCE AUGERS OR ATTEMPT SPLIT SPOON SAMPLE @ 1.0' DUE TO SIGNIFICANT PRESENCE OF CONSTRUCTION DEBRIS. OBTAINED REPRESENTATIVE SAMPLE FROM AUGER CUTTINGS. -PETROLEUM ODOR PRESENT IN SS-1	732.2		8 9 10	25	33	SS-1	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
VERY STIFF, BROWN **SANDY SILT**, SOME CLAY, TRACE FINE GRAVEL, MOIST. -IRON STAINING PRESENT IN SS-2	727.6		5 5 8	17	56	SS-2	2.50	4	11	11	44	30	25	16	9	17	A-4a (8)	
MEDIUM DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-3	725.1		4 8 11	25	6	SS-3	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
STIFF, BROWN **SILT AND CLAY**, LITTLE TO SOME COARSE TO FINE SAND, MOIST.	723.1		13	-	100	2S-3A	2.00	-	-	-	-	-	-	-	-	20	A-6a (V)	
MEDIUM DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.	722.1		6 5 5	13	0	SS-4	-	-	-	-	-	-	-	-	-	-		
			6	-	100	2S-4A	-	42	23	9	18	8	21	16	5	10	A-2-4 (0)	
		W	5 5 4	12	0	SS-5	-	-	-	-	-	-	-	-	-	-		
	717.6		8	-	0	2S-5A	-	-	-	-	-	-	-	-	-	-		
MEDIUM STIFF TO STIFF, GRAY **SILT AND CLAY**, TRACE FINE GRAVEL, MOIST. -INTORODUCED WATER @ 18.5'			2 2 3	6	61	SS-6	0.75	1	0	0	44	55	33	17	16	27	A-6b (10)	
			4 7 11	23	89	SS-7	2.00	-	-	-	-	-	-	-	-	28	A-6b (V)	
MEDIUM DENSE TO VERY DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.	712.6		3 9 14	30	100	SS-8	-	-	-	-	-	-	-	-	-	14	A-1-a (V)	
	708.1	EOB	19 22 24	60	100	SS-9	-	55	21	10	9	5	NP	NP	NP	8	A-1-a (0)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 13.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE CHIPS / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / T.F./S.B.	DRILL RIG: CME 750X (SN 310218)	STATION / OFFSET: 6003+43.74 / 39.1' LT	EXPLORATION ID B-023-3-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / J.P./C.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP D6	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 733.2 (MSL) EOB: 35.0 ft.	PAGE 1 OF 1
START: 1/22/15 END: 4/17/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 85.7	LAT / LONG: 39.953952398, -83.002987438	

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)	BACK FILL
0.7' - TOPSOIL (8.0")	732.5																	
FILL: MEDIUM STIFF TO VERY STIFF, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -BRICK FRAGMENTS AND ROOT FIBERS PRESENT IN SS-1 -ROOT FIBERS PRESENT IN SS-2	727.7	1–5	4 6 6	17	39	SS-1	4.00	-	-	-	-	-	-	-	-	16	A-6a (V)	
			2 3 2	7	44	SS-2	-	4	12	15	47	22	34	22	12	13	A-6a (8)	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-3	722.7	6–10	6 7 8	21	33	SS-3	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
			7 8 7	21	33	SS-4	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
LOOSE TO MEDIUM DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, WET.	721.2	W 11–12	4 3 3	9	67	SS-5	-	-	-	-	-	-	-	-	-	22	A-2-6 (V)	
STIFF TO VERY STIFF, GRAY **SILT AND CLAY**, TRACE FINE GRAVEL, MOIST.	715.2						1.25	-	-	-	-	-	-	-	-	24	A-6a (V)	
		14–17	2 3 5	11	100	SS-6	2.50	2	0	0	44	54	34	20	14	22	A-6a (10)	
			1 2 3	7	89	SS-7	1.50	-	-	-	-	-	-	-	-	24	A-6a (V)	
MEDIUM DENSE, BLACK AND GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, WET.	711.2	19–20	2 5 5	14	33	SS-8	-	16	37	36	8	3	NP	NP	NP	19	A-1-b (0)	
DENSE TO VERY DENSE, BLACK AND GRAY TO GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-9 -BORING TERMINATED @ 25.0' ON 1-22-15. ON 4-17-15 OFFSET BORING 5.0' NORTH AND CONTINUED SAMPLING @ 28.5'. -COBBLES AND BOULDERS PRESENT FROM 26.0' TO 30.0'		24–25	33 27 27	77	67	SS-9	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
		W 29	50/5"	-	0	SS-10	-	-	-	-	-	-	-	-	-	-		
	698.2	EOB 35	7 12 20	46	56	SS-11	-	44	22	18	10	6	NP	NP	NP	17	A-1-b (0)	

NOTES: SEEPAGE ENCOUNTERED @ 11.0'; GROUNDWATER ENCOUNTERED INITIALLY @ 28.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-024-0-08 | *Location:* Sta. 5085+90.21, 3.1' LT., BL RAMP C5 | *Date Drilled:* 7/1/2008 to 7/2/2008

WATER OBSERVATIONS:
Water seepage at: 28.5'-80.0'
Water level at completion: 16.5' (prior to coring), 10.7' (includes drilling water)
FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - PL / LL, Blows per foot - Non-Plastic - NP
	743.4	3 4 7	11	1		--	Stiff to very stiff brown SILTY CLAY (A-6b), trace to little fine to coarse sand, little gravel; damp to moist. @ 0.0 - 3.0', contains roots.		11	9	---	11	32	37	
		7 12 11	12	2		4.5+	@ 1.5', hard.		15	8	---	10	32	35	
		5 7 8	16	3		4.0	@ 3.0', very stiff to hard.		11	8	---	12	33	36	
5		4 6 14	13	4		3.75			12	10	---	13	31	34	
		4 4 8	15	5		4.5									
10															
		14 21 22	9	6		--	@ 11.0', encountered rock fragments.								
		17 14 15	1	7		--									
15.5	727.9														
		4 7 7	18	8		3.5	Very stiff brownish gray SANDY SILT (A-4a), little to some fine to coarse sand, trace gravel; damp to moist.								
		2 4 7	18	9		3.0			9	15	---	19	35	22	
20															
		7 13 16	12	10		--	@ 21.5', encountered possible large rock fragments, cobbles.								
		3 7 8	18	11		3.25									
25	718.4														

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-024-0-08 | *Location:* Sta. 5085+90.21, 3.1' LT., BL RAMP C5 | *Date Drilled:* 7/1/2008 to 7/2/2008

WATER OBSERVATIONS:
Water seepage at: 28.5'-80.0'
Water level at completion: 16.5' (prior to coring), 10.7' (includes drilling water)
FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - PL / LL, Blows per foot - Non-Plastic - NP
	718.4														
		8 10 14	18	12		--	Very stiff brownish gray SANDY SILT (A-4a), little to some fine to coarse sand, trace gravel; damp to moist.								
28.0	715.4														
		3 12 15	16	13			Medium dense brownish gray SILT (A-4b), little fine sand; wet.		0	0	---	17	--83--		INP
30															
32.0	711.4														
		7 18 18	11	14			Dense brown GRAVEL (A-1-a), some fine to coarse sand, trace to little silty clay; wet.		60	22	---	8	--10--		INP
35															
37.0	706.4														
		13 26 45	15	15		--	Hard brownish gray SANDY SILT (A-4a), little gravel, trace clay; damp.		12	14	---	27	33	14	72
40															
42.0	701.4														
		17 26 45	18	16			Very dense brownish gray COARSE AND FINE SAND (A-3a), little silty clay, little gravel; wet. @ 43.5', 2.0 feet sand heave.		16	25	---	47	--12--		INP 72
45															
47.0	696.4														
		26 30 27	13	17			Very dense brownish gray SANDY SILT (A-4a), little gravel; wet.								53
50	693.4														

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | Project: FRA-70-8.93 | Job No. 0221-1004.01

LOG OF: Boring B-024-0-08 | Location: Sta. 5085+90.21, 3.1' LT., BL RAMP C5 | Date Drilled: 7/1/2008 to 7/2/2008

WATER OBSERVATIONS: Water seepage at: 28.5'-80.0' | Water level at completion: 16.5' (prior to coring), 10.7' (includes drilling water)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - PL / LL, Blows per foot - Non-Plastic NP
	693.4						Very dense brownish gray GRAVEL WITH SAND (A-1-b), some silty clay; wet.								
55		15 40 50/4	13	18			@ 50.0'-60.0', difficulty advancing boring due to obstruction inside augers blocking rods; possible boulder zone.		30	31	---	16	15	8	50+
57.0	686.4														
							Very dense brownish gray SANDY SILT (A-4a), some gravel, some fine to coarse sand; damp.								
60		37 21 50	13	19					30	19	---	10	28	13	72
62.0	681.4														
							Very dense brown and gray GRAVEL (A-1-a), some fine to coarse sand, trace silt; wet.								
		11 50/4	10	20			@ 63.5', one foot sand heave; encountered black shale fragments.		73	17	---	5	--5--		NP 50+
65															
		50/3	0	21			@ 68.5', possible cobbles or boulders.								50+
70															
		50 50/3	6	22			@ 73.5', 6.0 feet sand heave; washed out with tricone.								50+
75	668.4														

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Client: ms consultants | Project: FRA-70-8.93 | Job No. 0221-1004.01

LOG OF: Boring B-024-0-08 | Location: Sta. 5085+90.21, 3.1' LT., BL RAMP C5 | Date Drilled: 7/1/2008 to 7/2/2008

WATER OBSERVATIONS: Water seepage at: 28.5'-80.0' | Water level at completion: 16.5' (prior to coring), 10.7' (includes drilling water)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - PL / LL, Blows per foot - Non-Plastic NP
	668.4						Very dense brown and gray GRAVEL (A-1-a), some fine to coarse sand, trace silt; wet.								
		39 50/3	9	23			@ 78.5', 3.0 feet sand heave.		55	36	---	5	--4--		NP 50+
80							@ 80.0'-90.0', difficult drilling; possible cobbles.								
		50/0	0	24											50+
85															
		50/0	0	25			@ 88.5', 1.0 foot sand heave.								50+
90							@ 90.0' - 91.5', core loss.								
		Core 18"	Rec 0"	RQD 0%	R1		@ 91.5' - 91.8', encountered igneous-plutonic cobble/boulder; likely peridotite or gabbro.								
91.8	651.6														
							Interbedded Shale (90%) and Limestone (10%) RQD 60%, LOSS 26%; Shale, blue-gray, highly weathered, weak, laminated, slightly calcareous, contains abundant pyritic inclusions, moderately to highly fractured; Limestone, light gray, moderately weathered, moderately strong to strong, fractured.								
95															
		Core 120"	Rec 116"	RQD 81%	R2		@ 97.7' - 98.1', qu = 1650 psi								
100	643.4														

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-024-0-08 | *Location:* Sta. 5085+90.21, 3.1' LT., BL RAMP C5 | *Date Drilled:* 7/1/2008 to 7/2/2008

WATER OBSERVATIONS:
Water seepage at: 28.5'-80.0'
Water level at completion: 16.5' (prior to coring), 10.7' (includes drilling water)
FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ ○ / Non-Plastic - NP ⊣ LL Blows per foot - 10 20 30 40
	643.4														
105		Core 120"	Rec 76"	RQD 48%	R3		Interbedded Shale (90%) and Limestone (10%) RQD 60%, LOSS 26%; Shale, blue-gray, highly weathered, weak, laminated, slightly calcareous, contains abundant pyritic inclusions, moderately to highly fractured; Limestone, light gray, moderately weathered, moderately strong to strong, fractured. @ 101.2', dark gray (shale). @ 107.8' - 111.5', core loss due to pyritic inclusion lodged in core barrel.								
110															
111.5	631.9						Bottom of Boring - 111.5'								
115															
120															
125															

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: CME 55 (SN 386345)	STATION / OFFSET: 5087+81.22 / 64.3' RT	EXPLORATION ID B-024-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1390	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 746.4 (MSL) EOB: 64.3 ft.	PAGE 1 OF 2
START: 2/11/15 END: 2/14/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92	LAT / LONG: 39.952930262, -83.001880690	

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
1.2' - ASPHALT (14.0")	746.4																	
0.5' - AGGREGATE BASE (6.0")	745.2																	
VERY STIFF TO HARD, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE TO LITTLE FINE GRAVEL, DAMP.	744.7		8 6 5	17	33	SS-1	4.50	-	-	-	-	-	-	-	-	12	A-6a (V)	
			2 6 7	20	100	SS-2	3.50	-	-	-	-	-	-	-	-	15	A-6a (V)	
VERY DENSE, GRAY **GRAVEL**, TRACE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP.	740.9		9 19 20	60	33	SS-3	-	83	7	3	5	2	NP	NP	NP	3	A-1-a (0)	
HARD, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.	738.4		12 17 13	46	89	SS-4	4.5+	23	13	14	31	19	23	13	10	8	A-4a (3)	
DENSE, GRAY **GRAVEL**, TRACE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP.	735.9		19 16 13	44	39	SS-5	-	-	-	-	-	-	-	-	-	3	A-1-a (V)	
HARD, GRAY TO DARK GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DRY TO DAMP. -SS-6: SULFATE CONCENTRATION = 1,447 PPM	733.4		9 10 13	35	100	SS-6	4.5+	-	-	-	-	-	-	-	-	5	A-4a (V)	
			16 22 18	61	39	SS-7	-	-	-	-	-	-	-	-	-	7	A-4a (V)	
			6 13 11	37	67	SS-8	4.5+	18	14	17	32	19	22	13	9	9	A-4a (3)	
			9 8 10	28	100	SS-9	4.50	-	-	-	-	-	-	-	-	10	A-4a (V)	
VERY DENSE, DARK GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP.	723.4		14 30 19	75	100	SS-10	-	31	28	27	9	5	NP	NP	NP	5	A-1-b (0)	
HARD, GRAY **SILT AND CLAY**, TRACE FINE SAND, MOIST.	720.9		7 10 18	43	100	SS-11	4.5+	-	-	-	-	-	-	-	-	18	A-6a (V)	
			6 10 15	38	100	SS-12	4.5+	0	0	3	49	48	30	15	15	18	A-6a (10)	
VERY DENSE, DARK GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.	714.4	W	21 30 24	83	89	SS-13	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
			4 15 50/4"	-	81	SS-14	-	72	16	5	4	3	17	13	4	8	A-1-a (0)	
			14 50/3"	-	44	SS-15	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
			50/3"	-	100	SS-16	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
DENSE, GRAY **COARSE AND FINE SAND**, SOME FINE GRAVEL, TRACE SILT, TRACE CLAY, MOIST. -HEAVING SANDS ENCOUNTERED @ 53.5' -INTRODUCED WATER @ 53.5' -PETROLEUM ODOR PRESENT IN SS-17	694.4		12 14 15	44	89	SS-17	-	-	-	-	-	-	-	-	-	13	A-3a (V)	
HARD, GRAY **SILT AND CLAY**, SOME FINE GRAVEL, SOME COARSE TO FINE SAND, DAMP.	689.4		50/5"	-	80	SS-18	4.5+	34	14	13	25	14	23	13	10	6	A-4a (1)	

PID: 77372	BR ID: FRA-70-1390	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5087+81.22 / 64.3 RT	START: 2/11/15	END: 2/14/15	PG 2 OF 2	B-024-1-13

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
HARD, GRAY **SILT AND CLAY**, SOME FINE GRAVEL, SOME COARSE TO FINE SAND, DAMP. *(continued)*	686.4	61																
	684.4	62																
VERY DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		63																
	682.1	64 EOB	47 50/3"	-	100	SS-19	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 34.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LABS BENTONITE POWDER / 40 GAL WATER

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL084.dgn 12/27/2018 10:33:57 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 5086+86.08 / 34.9' LT	EXPLORATION ID B-024-2-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1390	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 742.7 (MSL) EOB: 59.2 ft.	PAGE 1 OF 1
START: 2/11/15 END: 2/13/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.953082824, -83.002320685	

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
0.4' - ASPHALT (5.0")	742.7																	
1.1' - CONCRETE (13.0")	741.2																	
VERY STIFF TO HARD, BROWN TO GRAY **SANDY SILT**, SOME CLAY, LITTLE FINE GRAVEL, DAMP.			8 12 13	32	78	SS-1	4.00	-	-	-	-	-	-	-	-	12	A-4a (V)	
			5 6 7	17	100	SS-2	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
			3 7 9	21	100	SS-3	2.75	16	17	17	30	20	22	13	9	11	A-4a (3)	
			3 5 8	17	100	SS-4	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
			5 5 5	13	100	SS-5	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
			5 9 12	27	100	SS-6	4.5+	14	15	18	30	23	21	13	8	9	A-4a (4)	
			8 12 14	34	100	SS-7	4.5+	-	-	-	-	-	-	-	-	9	A-4a (V)	
	724.7																	
MEDIUM DENSE, GRAY **SANDY SILT**, TRACE CLAY, MOIST.			9 10 10	26	100	SS-8	-	0	0	47	48	5	NP	NP	NP	20	A-4a (4)	
	722.2																	
VERY STIFF, DARK GRAY **SANDY SILT**, SOME CLAY, MOIST.			5 10 11	27	100	SS-9	4.00	-	-	-	-	-	-	-	-	17	A-4a (V)	
			5 9 9	23	100	SS-10	3.00	0	0	18	48	34	22	14	8	19	A-4a (8)	
	717.2																	
MEDIUM DENSE, GRAY **SILT**, LITTLE FINE SAND, LITTLE CLAY, TRACE FINE GRAVEL, WET.		W	2 5 6	14	100	SS-11	-	-	-	-	-	-	-	-	-	30	A-4b (V)	
			9 10 11	27	100	SS-12	-	1	0	17	67	15	NP	NP	NP	22	A-4b (8)	
	710.7																	
MEDIUM DENSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST TO WET.			3 4 9	17	100	SS-13	-	-	-	-	-	-	-	-	-	19	A-1-b (V)	
			12 18 21	51	100	SS-14	-	40	23	27	6	4	NP	NP	NP	11	A-1-b (0)	
	700.7																	
HARD, GRAY **SANDY SILT**, TRACE CLAY, TRACE FINE GRAVEL, DAMP.			15 19 21	52	100	SS-15	4.5+	-	-	-	-	-	-	-	-	11	A-4a (V)	
	695.7																	
VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST. -HEAVING SANDS ENCOUNTERED @ 48.5'			25 32 41	95	100	SS-16	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
			50/5"	-	0	SS-17	-	-	-	-	-	-	-	-	-	-		
-NO RECOVERY IN SS-17 AND SS-18. SOIL TYPE DETERMINED BASED ON VISUAL DESCRIPTION OF SOIL CUTTINGS ON FIELD LOG.	683.5	EOB	50 50/2"	-	0	SS-18	-	-	-	-	-	-	-	-	-	-		

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 26.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE CHIPS / 40 GAL WATER

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-025-0-08 | *Location:* Sta. 5088+53.62, 76.0' LT., BL RAMP C5 | *Date Drilled:* 7/24/2008

WATER OBSERVATIONS: Water seepage at: 26.0' Water level at completion: 39.0'

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	740.4														
1.2	739.2						Asphalt Concrete - 7" Aggregate Base - 7"								
		14 13 17	15	1		4.5+	FILL: Hard brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; contains few brick fragments; damp.								
3.5	736.9														
5		11 10 14	14	2		4.5+	Hard gray SANDY SILT (A-4a), some to "and" fine to coarse sand, trace to little gravel; damp.								
		6 8 11	14	3		4.5+									
10		7 10 11	18	4		4.5+			18	12	---	16	32	22	
		6 10 11	18	5		4.5+			8	15	---	20	36	21	
11.5	728.9														
		14 16 17	4	6		4.5+	Hard gray SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp to moist.		12	16	---	18	34	20	
13.5	726.9														
15		5 8 12	18	7		4.5+	Very stiff to hard gray SANDY SILT (A-4a), some to "and" fine to coarse sand, trace to little gravel; damp.								
		5 7 12	18	8		4.5+			15	14	---	19	31	21	
20		4 6 9	18	9		2.75									
		5 9 12	18	10		4.5									
25	715.4	5 6 9	18	11		2.5									

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-025-0-08 | *Location:* Sta. 5088+53.62, 76.0' LT., BL RAMP C5 | *Date Drilled:* 7/24/2008

WATER OBSERVATIONS: Water seepage at: 26.0' Water level at completion: 39.0'

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	715.4														
		3 6 17	13	12		3.5	Very stiff gray SILTY CLAY (A-6b), little fine sand; moist.								
28.5	711.9														
30		17 29 37	10	13			Very dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little silty clay; wet. @ 30.0'-38.5', encountered cobbles while augering.								67
35		29 50/5	6	14					50	21	---	10	14	5	INP ● 50+
38.5	701.9														
40		23 50/6	10	15		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.								50+
43.5	696.9														
45		9 30 37	12	16			Very dense gray GRAVEL WITH SAND (A-1-b), "and" fine to coarse sand, little silt; wet.								68
50	690.4	22 39 30	15	17					39	26	---	22	--13--		INP ● 70

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-025-0-08 | *Location:* Sta. 5088+53.62, 76.0' LT., BL RAMP C5 | *Date Drilled:* 7/24/2008

WATER OBSERVATIONS:
Water seepage at: 26.0'
Water level at completion: 39.0'

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ ○ / Non-Plastic - NP ⊣ LL Blows per foot - 10 20 30 40
	690.4														
55		22 33 26	13	18		2.5	Very stiff gray SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; moist.								60 ○
57.0	683.4														
59.3	681.1	48 50/3	9	19			Very dense brown COARSE AND FINE SAND (A-3a), some silt, little gravel; wet.								50+ ○
60							Bottom of Boring - 59.3'								
65															
70															
75															

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-026-0-08 | *Location:* Sta. 5088+59.96, 128.9' LT., BL RAMP C5 | *Date Drilled:* 8/1/2008 to 8/6/2008

WATER OBSERVATIONS: Water seepage at: 41.0', 58.0', 77.0' | Water level at completion: 29.1' (beginning of shift, 8/5/08) 30.7' (includes drilling water)

FIELD NOTES: Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	754.0													
0.3	753.7						Topsoil - 4"							
2.0	752.0	8 11 8	18	1A		1.5	Stiff brown SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; moist.							
				1B		0.5								
3.5	750.5						Soft brown SANDY SILT (A-4a), some fine to coarse sand, little gravel; wet.							
		5 4 5	18	2		2.75	Very stiff to hard brown CLAY (A-7-6), little to some fine to coarse sand, trace to little gravel; moist.		5	6	---	13	37	39
5														
		5 8 11	18	3		4.25								
		11 8 8	18	4		0.5	@ 8.5'-10.0', soft, wet.							
10														
		8 10 20	4	5		2.5								
		5 10 20	2	6		1.5	@ 13.5', becomes gray. @ 13.5'-15.0', stiff.							
15														
		19 23 22	0	7		--								
18.5	735.5													
		11 8 14	18	8		3.0	Very stiff to hard gray SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp to moist.							
20														
		11 12 10	18	9		2.5			9	14	---	16	35	26
		7 5 8	18	10		4.5+								
25	729.0													

STANDARD PENETRATION (N60) Natural Moisture Content, % - ●
PL ⊢ LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-026-0-08 | *Location:* Sta. 5088+59.96, 128.9' LT., BL RAMP C5 | *Date Drilled:* 8/1/2008 to 8/6/2008

WATER OBSERVATIONS: Water seepage at: 41.0', 58.0', 77.0' | Water level at completion: 29.1' (beginning of shift, 8/5/08) 30.7' (includes drilling water)

FIELD NOTES: Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay
	729.0													
		9 10 8	18	11		3.5	Very stiff gray SILT AND CLAY (A-6a), little to some fine to coarse sand, trace gravel; moist.							
30														
		8 12 10	10	12		2.25								
31.0	723.0													
		21 21 23	18	13		1.5	Stiff to very stiff gray SANDY SILT (A-4a), little to some fine to coarse sand, trace to little gravel; damp to moist.							
35														
		4 8 11	18	14		3.0			10	13	---	18	36	23
		12 8 7	18	15		3.25								
38.5	715.5													
		6 9 18	16	16		1.75	Stiff gray SILTY CLAY (A-6b), trace fine sand; damp.		0	0	---	1	39	60
40														
42.0	712.0													
		29 34 32	18	17			Very dense gray GRAVEL WITH SAND AND SILT (A-2-4), some fine to coarse sand, some silty clay; wet.							
45														
		19 35 32	18	18										
50	704.0													

STANDARD PENETRATION (N60) Natural Moisture Content, % - ●
PL ⊢ LL
Blows per foot - ○ / Non-Plastic - NP
10 20 30 40

69

70

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-026-0-08 | *Location:* Sta. 5088+59.96, 128.9' LT., BL RAMP C5 | *Date Drilled:* 8/1/2008 to 8/6/2008

WATER OBSERVATIONS: Water seepage at: 41.0', 58.0', 77.0' | Water level at completion: 29.1' (beginning of shift, 8/5/08) 30.7' (includes drilling water)

FIELD NOTES: Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	704.0														
		21 23 50/5	17	19		4.5+	Hard gray SILT AND CLAY (A-6a), some fine to coarse sand, trace to little gravel; contains sand seams; damp.		10	13	---	22	35	20	50+
57.0	697.0														
		19 30 44	18	20			Very dense gray GRAVEL WITH SAND (A-1-b), trace to little silt; wet.		30	41	---	21	--8--		NP 78
		29 50/4	2	21											50+
67.0	687.0														
		8 20 23	2	22		4.5	Hard gray SILT AND CLAY (A-6a), some fine to coarse sand, trace to little gravel; damp to moist.								
		13 50/5	10	23		4.5+			9	10	---	19	40	22	50+
75	679.0														

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-026-0-08 | *Location:* Sta. 5088+59.96, 128.9' LT., BL RAMP C5 | *Date Drilled:* 8/1/2008 to 8/6/2008

WATER OBSERVATIONS: Water seepage at: 41.0', 58.0', 77.0' | Water level at completion: 29.1' (beginning of shift, 8/5/08) 30.7' (includes drilling water)

FIELD NOTES: Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	679.0														
		50/5	2	24			Very dense gray GRAVEL (A-1-a); possible cobbles and boulders; wet.								50+
82.0	672.0														
		35 50/5	7	25		1.75	Stiff gray SANDY SILT (A-4a), "and" fine to coarse sand, trace gravel; damp.		9	13	---	27	33	18	50+
87.0	667.0														
		13 19 33	7	26		1.5	Stiff gray CLAY (A-7-6), trace fine to coarse sand, trace gravel; moist.		6	3	---	2	30	59	55
90.0	664.0						Claystone, brown, severely weathered, very weak, fractured, RQD 14%, Loss 67%. @ 90.0'-97.8' lost recovery.								
97.8	656.2														
100	654.0						Shale, blue-gray, highly weathered, weak, laminated, friable, fissile, jointed, fractured to moderately fractured, tight, slightly rough, RQD 87%, Loss 0%.								

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-026-0-08 | *Location:* Sta. 5088+59.96, 128.9' LT., BL RAMP C5 | *Date Drilled:* 8/1/2008 to 8/6/2008

WATER OBSERVATIONS:
Water seepage at: 41.0', 58.0', 77.0'
Water level at completion: 29.1' (beginning of shift, 8/5/08) 30.7' (includes drilling water)
FIELD NOTES: Advanced boring using 4.0" diameter flush joint casing.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ ○ / Non-Plastic - NP ⊣ LL Blows per foot - 10 20 30 40
	654.0														
105		Core 60"	Rec 60"	RQD 85%	R3		Shale, blue-gray, highly weathered, weak, laminated, friable, fissile, jointed, fractured to moderately fractured, tight, slightly rough, RQD 87%, Loss 0%. Contains dark gray, well cemented shale zones [thin, dark bands]. Dark shale zones are typically 1-2 inches thick, spaced at intervals of 12 to 18 inches.									
		Core 60"	Rec 60"	RQD 90%	R4		@ 100.5' - 101.0', qu = 2391 psi								
108.9	645.1														
110		Core 60"	Rec 60"	RQD 83%	R5		Interbedded Shale (90%) and Limestone (10%), RQD 88%, Loss 0%; Shale, dark gray, moderately weathered, weak, thinly laminated, calcareous, fissile, pyritic, jointed, moderately fractured, tight, slightly rough; Limestone, light gray, slightly weathered, strong, thinly bedded, pyritic. @ 110.2'-110.5', 113.9'-114.2', high angle fractures.									
115.0 115	639.0						Bottom of Boring - 115.0'								
120															
125															

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL090.dgn 12/27/2018 10:34:13 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 184+88.08 / 111.1' RT	EXPLORATION ID B-026-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.M.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-70 EB	
PID: 77372 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 747.0 (MSL) EOB: 50.0 ft.	PAGE 1 OF 1
START: 9/19/13 END: 9/19/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.952673289, -83.001473185	

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)	BACK FILL
0.3' - ASPHALT (4.0")	747.0																	
0.7' - AGGREGATE BASE (8.0")	746.7																	
FILL: MEDIUM DENSE TO VERY DENSE, GRAY TO BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.	746.0		23 14 7	27	50	SS-1	-	-	-	-	-	-	-	-	-	9	A-2-4 (V)	
			4 9 9	23	50	SS-2	-	17	34	14	26	9	27	22	5	10	A-2-4 (0)	
			12 27 27	70	61	SS-3	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	
FILL: DENSE, GRAY AND BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP.	735.0		12 17 19	47	33	SS-4	-	63	16	6	10	5	22	18	4	4	A-1-a (0)	
MEDIUM DENSE TO DENSE, BROWN TO GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST.	731.5		11 14 20	44	50	SS-5	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			9 12 12	31	44	SS-6	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
			7 9 14	30	56	SS-7	-	31	32	14	19	4	21	18	3	7	A-1-b (0)	
			13 15 17	41	61	SS-8	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
	719.0		9 16 17	43	50	SS-9	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST.		W	15 17 25	54	33	SS-10	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
			16 16 23	51	33	SS-11	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
			30 32 33	84	39	SS-12	-	70	10	0	18	2	20	16	4	6	A-1-b (0)	
			27 29 33	80	50	SS-13	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			27 25 32	74	67	SS-14	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
	697.0	EOB	25 26 27	69	72	SS-15	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 28.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 50 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-12.68 - PHASE 4A
TYPE: STRUCTURE
PID: 77372 BR ID: FRA-70-1390
START: 8/8/13 END: 8/14/13

DRILLING FIRM / OPERATOR: RII / J.B.
SAMPLING FIRM / LOGGER: RII / S.B.
DRILLING METHOD: 4.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: MOBILE B-53 (SN 624400)
HAMMER: AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 77.7

STATION / OFFSET: 5089+73.78 / 16.5' RT
ALIGNMENT: BL RAMP C5
ELEVATION: 736.8 (MSL) EOB: 89.5 ft.
LAT / LONG: 39.953112248, -83.001308349

EXPLORATION ID B-026-2-13
PAGE 1 OF 2

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)	BACK FILL
0.8' - ASPHALT (9.0")	736.0																	
0.5' - AGGREGATE BASE (6.0")	735.5																	
POSSIBLE FILL: MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP. -STONE FRAGMENTS PRESENT IN SS-1		2	5 6 8	18	50	SS-1	-	40	28	11	15	6	20	16	4	7	A-1-b (0)	
		4	2 12 14	34	72	SS-2	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
	731.3																	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP. -COBBLES PRESENT THROUGHOUT		7	3 4 8	16	67	SS-3	-	40	24	11	18	7	26	17	9	10	A-2-4 (0)	
		9	7 10 23	43	33	SS-4	-	-	-	-	-	-	-	-	-	6	A-2-4 (V)	
	726.3																	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST.		12	14 18 7	32	44	SS-5	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
		14	6 5 4	12	50	SS-6	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
	721.3																	
MEDIUM DENSE, BROWN **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, TRACE SILT, MOIST.		W 16	8 6 4	13	33	SS-7	-	-	-	-	-	-	-	-	-	16	A-3a (V)	
	718.8																	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST. -INTRODUCED MUD @ 20.0'		W 19	6 8 11	25	83	SS-8	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
	716.3																	
DENSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET.		22	20 50 50/5"	-	82	SS-9	-	51	19	12	14	4	18	16	2	8	A-1-b (0)	
		24	20 42 50/4"	-	81	SS-10	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		27	10 20 33	69	56	SS-11	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
		29	3 13 23	47	56	SS-12	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
	702.6	34	11 20 50/2"	-	79	SS-13	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
HARD, GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DRY.							4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
	699.8																	
VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, MOIST. -ENCOUNTERED LIMESTONE BOULDER @ 40.0'. SWITCHED TO ROCK CORING TECHNIQUES TO CORE BOULDER		39	50/2"	-	100	SS-14	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
		41	0		94	RC-1											CORE	
	695.3																	
VERY DENSE, GRAY **FINE SAND**, TRACE FINE GRAVEL, TRACE SILT, TRACE CLAY, DAMP. -HEAVING SAND ENCOUNTERED @ 41.5'	693.8	42	24 40 48	114	100	SS-15	-	-	-	-	-	-	-	-	-	10	A-3 (V)	
MEDIUM DENSE, GRAY **COARSE AND FINE SAND**, SOME FINE GRAVEL, LITTLE SILT, TRACE CLAY, MOIST.		44	4 3 8	14	50	SS-16	-	24	24	29	17	6	15	11	4	17	A-3a (0)	
	689.8																	
VERY DENSE, GRAY **COARSE AND FINE SAND**, LITTLE SILT, LITTLE FINE GRAVEL, TRACE CLAY, MOIST.		49	5 16 23	51	33	SS-17	-	-	-	-	-	-	-	-	-	18	A-3a (V)	
		54	9 12 38	65	100	SS-18	-	16	29	33	18	4	15	13	2	11	A-3a (V)	
		59	17 20 37	74	100	SS-19	-	-	-	-	-	-	-	-	-	13	A-3a (V)	

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PID: 77372	BR ID: FRA-70-1390	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5089+73.78 / 16.5 RT	START: 8/8/13	END: 8/14/13	PG 2 OF 2	B-026-2-13

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)	BACK FILL
VERY DENSE, GRAY **COARSE AND FINE SAND**, LITTLE SILT, LITTLE FINE GRAVEL, TRACE CLAY, MOIST. *(continued)*	676.8	61																
	674.8	62																
VERY STIFF, GRAY **SANDY SILT**, LITTLE FINE GRAVEL, TRACE CLAY, MOIST.		63																
		64	42 42 38	104	89	SS-20	2.00	-	-	-	-	-	-	-	-	14	A-4a (V)	
		65																
		66																
		67																
		68																
		69	12 18 37	71	100	SS-21	3.00	13	23	21	33	10	18	14	4	17	A-4a (2)	
		70																
	664.8	71																
VERY DENSE, GRAY **COARSE AND FINE SAND**, TRACE SILT, TRACE CLAY, TRACE FINE GRAVEL, MOIST.		72																
		73																
		74	15 22 30	67	83	SS-22	-	-	-	-	-	-	-	-	-	13	A-3a (V)	
		75																
		76																
		77																
		78																
		79	15 25 50/5"	-	100	SS-23	-	8	28	50	7	7	NP	NP	NP	17	A-3a (0)	
	654.8	80																
HARD, BROWNISH GRAY **SILTY CLAY**, TRACE TO LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.		81																
		82																
		83																
		84	18 22 40	80	89	SS-24	4.5+	-	-	-	-	-	-	-	-	17	A-6b (V)	
		85																
		86																
		87																
		88																
	647.4	89	30 50/5"	-	100	SS-25	4.50	7	5	5	42	41	39	20	19	17	A-6b (12)	
		EOB																

NOTES: SEEPAGE ENCOUNTERED @ 61.0'; GROUNDWATER INITIALLY ENCOUNTERED @ 18.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 150 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 5091+04.93 / 11.5' LT	EXPLORATION ID B-026-3-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / K.S.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C5	
PID: 77372 BR ID: FRA-70-1390	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 756.9 (MSL) EOB: 90.0 ft.	PAGE 1 OF 2
START: 8/21/13 END: 8/22/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 82.6	LAT / LONG: 39.953296762, -83.000848553	

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)	BACK FILL
0.5' - CONCRETE (6.0")	756.4																	
0.5' - AGGREGATE BASE (6.0")	755.9																	
LOOSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, DAMP.	753.9		3 2 2	6	33	SS-1	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
STIFF, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.			4 9 8	23	39	SS-2	1.50	-	-	-	-	-	-	-	-	12	A-6a (V)	
-COBBLES PRESENT @ 5.0'	751.4																	
LOOSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, MOIST.	748.9		5 3 3	8	33	SS-3	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
SOFT, BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	746.4		WOH 7 7	19	72	SS-4	0.50	8	7	10	46	29	36	19	17	23	A-6b (11)	
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST.			5 7 8	21	67	SS-5	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
			8 16 15	43	61	SS-6	-	32	39	11	15	3	19	17	2	7	A-1-b (0)	
			8 17 20	51	61	SS-7	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			18 16 13	40	72	SS-8	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
			18 12 14	36	83	SS-9	-	42	30	10	13	5	NP	NP	NP	8	A-1-b (0)	
			6 10 13	32	72	SS-10	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
			5 10 12	30	78	SS-11	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
-STONE FRAGMENTS PRESENT THROUGHOUT			8 11 16	37	67	SS-12	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
	724.9																	
HARD, GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DAMP.		W	10 22 24	63	83	SS-13	4.5+	15	11	17	38	19	21	14	7	9	A-4a (4)	
	719.9																	
VERY DENSE, BROWN TO BROWNISH GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.			11 26 26	72	83	SS-14	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
			8 29 50	109	83	SS-15	-	52	14	17	14	3	17	14	3	11	A-1-b (0)	
			10 20 28	66	56	SS-16	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
	704.9																	
HARD, GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DAMP.			3 22 28	69	78	SS-17	4.5+	12	11	19	40	18	24	14	10	10	A-4a (5)	
			10 44 50/5"	-	88	SS-18	4.5+	-	-	-	-	-	-	-	-	8	A-4a (V)	

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PID: 77372	BR ID: FRA-70-1390	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5091+04.93 / 11.5 LT	START: 8/21/13	END: 8/22/13	PG 2 OF 2	B-026-3-13

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)	BACK FILL
HARD, GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DAMP. *(continued)*	696.9																	
	694.9	61																
VERY DENSE, GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, WET.		62																
		63																
		64	WOH 45 50/3"	-	40	SS-19	-	-	-	-	-	-	-	-	-	20	A-2-4 (V)	
		65																
		66																
	689.9	67																
VERY DENSE, GRAY TO DARK GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		68																
		69	8 22 28	69	44	SS-20	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		70																
		71																
		72																
		73																
		74	12 23 28	70	67	SS-21	-	38	28	23	10	1	13	10	3	13	A-1-b (0)	
		75																
		76																
		77																
		78																
		79	37 50/3"	-	33	SS-22	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		80																
		81																
		82																
		83																
		84	10 19 28	65	56	SS-23	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		85																
		86																
	669.9	87																
VERY DENSE, GRAY **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, LITTLE SILT, TRACE CLAY, WET.		88																
		89	12 28 50	107	67	SS-24	-	11	30	39	18	2	NP	NP	NP	10	A-3a (0)	
	666.9 EOB	90																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 36.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 376 LBS PORTLAND CEMENT / 100 LBS BENTONITE POWDER / 100 GAL WATER

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL095.dgn 12/27/2018 10:34:52 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 189+32.64 / 78.7' RT	EXPLORATION ID B-027-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / K.S.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL I-70 EB	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 755.5 (MSL) EOB: 49.3 ft.	PAGE 1 OF 1
START: 8/7/13 END: 8/7/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 82.6	LAT / LONG: 39.952671524, -82.999846757	

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)	BACK FILL
0.2' - ASPHALT (2.0")	755.5																	
0.7' - CONCRETE (8.0")	754.7																	
VERY DENSE, BROWN **SANDY SILT**, SOME FINE GRAVEL, TRACE CLAY, DAMP.	752.5	1	12 36 18	74	33	SS-1	-	-	-	-	-	-	-	-	-	5	A-4a (V)	
MEDIUM STIFF TO STIFF, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP TO MOIST.		4	4 2 3	7	72	SS-2	1.75	18	19	15	19	29	33	18	15	13	A-6a (4)	
-COBBLES PRESENT @ 8.0'	747.5	7	4 4 6	14	44	SS-3	1.50	-	-	-	-	-	-	-	-	17	A-6a (V)	
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP TO MOIST. -LIMESTONE FRAGMENTS PRESENT IN SS-4		9	15 11 18	40	44	SS-4	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
		12	8 7 5	17	69	SS-5	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
		14	8 9 10	26	72	SS-6	-	52	23	9	8	8	21	18	3	7	A-1-b (0)	
		17	8 32 28	83	44	SS-7	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
		19	14 13 10	32	72	SS-8	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
		24	5 5 8	18	67	SS-9	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
VERY DENSE, GRAY **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, DAMP.	728.5	29	6 23 32	76	100	SS-10	-	24	25	16	16	19	20	13	7	8	A-2-4 (0)	
DENSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE CLAY, TRACE SILT, MOIST.	723.5	34	7 18 15	45	100	SS-11	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
	W	37																
		39	7 18 18	50	100	SS-12	-	15	35	37	6	7	NP	NP	NP	16	A-1-b (0)	
-COBBLES PRESENT @ 41.0'		44	8 49 50/5"	-	88	SS-13	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
	706.2 EOB	49	47 50/3"	-	100	SS-14	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 37.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 100 LBS BENTONITE CHIPS AND SOIL CUTTINGS

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-029-0-08 | *Location:* Sta. 191+53.21, 46.3' RT., BL I-70 EB | *Date Drilled:* 7/9/2008 to 7/14/2008

WATER OBSERVATIONS:
Water seepage at: 21.0'-25.0',30.0'-32.0',40.0'-110.0'
Water level at completion: 29.4' (beginning of shift, 7/10/08) 20.5' (includes drilling water)
FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	742.3														
2.3	740.0	5 15 17	7	1			Asphalt Concrete Pavement - 7" Portland Cement Concrete - 9" Aggregate Base - 11"								
		13 15 12	10	2			POSSIBLE FILL: Medium dense to dense brown GRAVEL WITH SAND (A-1-b), little to some silt; damp.								
6.0	736.3	11 13 10	6	3					55	17	---	9	--19--		INP
7.5	734.8	4 10 15	14	4		4.5	Hard gray SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.		12	11	---	16	35	26	
10.0	732.3	12 15 15	12	5		4.5	Hard gray SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; damp to moist.		9	9	---	15	41	26	
		10 14 17	18	6		4.5	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp. @ 11.5'-21.0', difficult drilling.		8	8	---	15	40	29	
15.0	727.3	8 15 19	18	7		4.5									
		15 48 45	12	8			Very dense gray GRAVEL (A-1-a), some fine to coarse sand, trace to little silt; damp.		55	24	---	10	--11--		INP 95
		29 50/3	8	9					61	16	---	12	--11--		INP 50+
		50/5	1	10			@ 18.5'-18.9', rock fragments; possible cobble blocking shoe.								50+
21.0	721.3	21 28 33	6	11			Very dense gray GRAVEL WITH SAND AND SILT (A-2-4), some silt; wet.								62
23.5	718.8	11 18 21	16	12			Dense gray SILT (A-4b), little fine sand; contains interbedded sand seams; wet.								
25	717.3														

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-029-0-08 | *Location:* Sta. 191+53.21, 46.3' RT., BL I-70 EB | *Date Drilled:* 7/9/2008 to 7/14/2008

WATER OBSERVATIONS:
Water seepage at: 21.0'-25.0',30.0'-32.0',40.0'-110.0'
Water level at completion: 29.4' (beginning of shift, 7/10/08) 20.5' (includes drilling water)
FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	717.3														
28.5	713.8	10 19 25	15	13		4.5+	Hard gray SANDY SILT (A-4a), "and" fine to coarse sand, trace gravel; contains interbedded sand seams; damp.		9	8	---	33	34	16	
30		13 23 31	13	14			Dense to very dense gray COARSE AND FINE SAND (A-3a), some silt; moist.								55
31.8	710.5	3 6		15A											
		29	14	15B		4.5+	Hard gray SANDY SILT (A-4a), some gravel, little to some fine to coarse sand; damp. @ 31.0'-43.5', difficult drilling.								
35		13 26 31	9	16		--	@ 33.5', 5 inches sand heave.								53
40		14 23 33	14	17		4.5+			28	15	---	19	25	13	57
42.0	700.3														
44.2	698.1	10 20		18A			Dense gray COARSE AND FINE SAND (A-3a), little silt; contains silty clay seams; wet.								
45		29	18	18B			Dense gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; moist.								
47.0	695.3														
		19 37 50/3	15	19			Very dense gray GRAVEL WITH SAND (A-1-b), trace silt; wet. @ 48.5', 6 inches sand heave.		21	48	---	27	--4--		INP 50+
50	692.3														

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LOG OF: Boring B-029-0-08 | *Location:* Sta. 191+53.21, 46.3' RT., BL I-70 EB | *Date Drilled:* 7/9/2008 to 7/14/2008

WATER OBSERVATIONS:
Water seepage at: 21.0'-25.0',30.0'-32.0',40.0'-110.0'
Water level at completion: 29.4' (beginning of shift, 7/10/08) 20.5' (includes drilling water)
FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	692.3						Very dense gray GRAVEL WITH SAND (A-1-b), trace silt; wet.								
55		10 16 50/5	13	20			@ 53.5', 1.7 feet sand heave; washed out.								50+
57.0	685.3						Very dense gray COARSE AND FINE SAND (A-3a), little to some silt, trace to little gravel; wet.								
60		31 50/5	11	21			@ 58.5'-68.5', three to six inches sand heave.								50+
65		21 50/5	11	22					18	13	---	52	--17--	NP	50+
70		13 29 41	14	23											71
73.8	668.5	25		24A		3.75									
75	667.3	38 50/6	18	24B			Very stiff gray SILT (A-4b), little fine sand; moist.								50+

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WATER OBSERVATIONS:
Water seepage at: 21.0'-25.0',30.0'-32.0',40.0'-110.0'
Water level at completion: 29.4' (beginning of shift, 7/10/08) 20.5' (includes drilling water)
FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	667.3						Stiff gray SILT AND CLAY (A-6a), some to "and" fine to coarse sand, trace to little gravel; damp to moist.								
80		50/4	4	25		1.5			25	20	---	18	26	11	50+
84.0	658.3	31		26A		4.5+									
85		31 50/3	15	26B			Very dense gray GRAVEL WITH SAND (A-1-b), trace silt; wet.								50+
90		15 50/4	10	27											50+
95		13 26 30	18	28					31	48	---	18	--3--	NP	57
100	642.3	41 50/2	8	29			@ 98.5', 1.2 feet sand heave.								50+

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-029-0-08 | *Location:* Sta. 191+53.21, 46.3' RT., BL I-70 EB | *Date Drilled:* 7/9/2008 to 7/14/2008

WATER OBSERVATIONS:
Water seepage at: 21.0'-25.0',30.0'-32.0',40.0'-110.0'
Water level at completion: 29.4' (beginning of shift, 7/10/08) 20.5' (includes drilling water)
FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	642.3						Very dense gray FINE SAND (A-3), little coarse sand, trace gravel; wet.								
105		2 12 49	18	30			@ 103.5', 2.3 feet sand heave.		3	13	---	76	--8--		INP ● 62
110		41 50/0	6	31											50+
113.5	628.8						@ 113.5', 22 feet sand heave; washed out.								
115		50/2	2	32			Severely weathered gray SHALE.								50+
116.5	625.8														
120		Core 42"	Rec 38"	RQD 0%	R-1		Shale, dark gray, moderately to highly weathered, weak, thinly laminated, calcareous, pyritic, fissile, friable, jointed, fractured, tight, slightly rough; RQD 0%, Loss 10%.								
120.6	621.7														
125	617.3	Core 60"	Rec 60"	RQD 88%	R-2		Limestone, brownish-gray, moderately weathered, moderately strong to strong, very thinly bedded, pyritic, cherty, moderately fractured, tight, slightly rough, RQD 86%, Loss 0%. [Delaware Limestone] @ 121.2' - 121.5', qu = 14,137 psi								

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LOG OF: Boring B-029-0-08 | *Location:* Sta. 191+53.21, 46.3' RT., BL I-70 EB | *Date Drilled:* 7/9/2008 to 7/14/2008

WATER OBSERVATIONS:
Water seepage at: 21.0'-25.0',30.0'-32.0',40.0'-110.0'
Water level at completion: 29.4' (beginning of shift, 7/10/08) 20.5' (includes drilling water)
FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	617.3														
130		Core 60"	Rec 60"	RQD 85%	R-3		Limestone, brownish-gray, moderately weathered, moderately strong to strong, very thinly bedded, pyritic, cherty, moderately fractured, tight, slightly rough, RQD 86%, Loss 0%. [Delaware Limestone]								
130.2	612.1														
135		Core 60"	Rec 54"	RQD 76%	R-4		Limestone, light gray, slightly weathered, strong, thinly bedded, slightly fossiliferous, stylolitic, slightly fractured, tight to narrow, slightly rough, RQD 82%, Loss 8%. [Columbus Limestone]								
136.5	605.8	Core 18"	Rec 18"	RQD 100%	R-5										
							Bottom of Boring - 136.5'								
140															
145															
150															

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-030-0-08 | *Location:* Sta. 194+15.01, 104.2' LT., BL I-70 EB | *Date Drilled:* 7/20/2008 to 7/23/2008

WATER OBSERVATIONS: Water seepage at: 16.0' | Water level at completion: 13.6' (includes drilling water)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP
	736.7														
1.4	735.3						Asphalt Concrete - 11" Aggregate Base - 6"								
		4 6 8	11	1			Loose to medium dense brown GRAVEL WITH SAND (A-1-b), some fine to coarse sand, little silt; damp.								
5.0	731.7	3 3 1	8	2											
6.5	730.2	4 14 21	18	3		4.5+	Hard gray SILTY CLAY (A-6b), some fine to coarse sand, trace gravel; contains few rock fragments; damp to moist.		9	9	---	14	40	28	
8.0	728.7	10 16 19	18	4		4.5+	Hard gray SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.		6	10	---	15	40	29	
		13 19 21	18	5		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.		5	11	---	18	41	25	
11.0	725.7	11 15 27	18	6		4.5+									
		16 50/5	8	7			Dense to very dense gray GRAVEL (A-1-a), little to some fine to coarse sand, trace to little silty clay; damp.		71	12	---	5	--12--	NP	50+
		11 33 38	13	8					59	21	---	8	--12--	NP	72
		18 23 23	13	9			@ 16.0', becomes wet.		61	20	---	8	--11--		
		12 13 21	12	10											
		13 28 36	12	11											65
23.5	713.2														
25	711.7	17 34 40	14	12			Very dense gray COARSE AND FINE SAND (A-3a), some silty clay; wet.								75

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-030-0-08 | *Location:* Sta. 194+15.01, 104.2' LT., BL I-70 EB | *Date Drilled:* 7/20/2008 to 7/23/2008

WATER OBSERVATIONS: Water seepage at: 16.0' | Water level at completion: 13.6' (includes drilling water)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP
	711.7														
		23 45 50/4	15	13			Very dense gray COARSE AND FINE SAND (A-3a), some silty clay; wet.								50+
							@ 26.0', 0.4 feet sand heave.								
30		9 21 31	16	14											53
35		14 30 45	16	15					0	8	---	69	--23--		77
		50/4	4	16			@ 38.5'-38.8', contains sandy silt seams.								50+
40							@ 38.5'-43.5', difficult drilling.								
45		11 32 50/5	17	17			@ 43.5', 1.9 feet sand heave.								50+
47.0	689.7														
50	686.7	12 50/5	10	18			Very dense gray GRAVEL WITH SAND (A-1-b), trace silt; wet.		15	54	---	23	--8--		50+

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-030-0-08 | *Location:* Sta. 194+15.01, 104.2' LT., BL I-70 EB | *Date Drilled:* 7/20/2008 to 7/23/2008

WATER OBSERVATIONS: Water seepage at: 16.0' | Water level at completion: 13.6' (includes drilling water)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	686.7														
		41 50/6	10	19			Very dense gray COARSE AND FINE SAND (A-3a), little gravel, little to some silty clay; wet.								50+
55							@ 53.5', 0.7 feet sand heave.								
		24 39 45	13	20											86
60															
62.0	674.7														
		16 31 41	15	21			Very dense gray FINE SAND (A-3), trace silt, trace gravel; wet.								73
65															
67.0	669.7														
		33 50/5	9	22			Very dense gray GRAVEL WITH SAND (A-1-b), trace to little silty clay; wet.		49	29	---	13	--9--		50+
70															
		43 50/3	9	23											50+
75	661.7														

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-030-0-08 | *Location:* Sta. 194+15.01, 104.2' LT., BL I-70 EB | *Date Drilled:* 7/20/2008 to 7/23/2008

WATER OBSERVATIONS: Water seepage at: 16.0' | Water level at completion: 13.6' (includes drilling water)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	661.7														
		35 50/5	10	24			Very dense gray GRAVEL WITH SAND (A-1-b), trace to little silty clay; wet.								50+
80							@ 78.5', 1.0 foot sand heave.								
		21 47 47	13	25			@ 83.5', 4.6 feet sand heave.		15	39	---	33	--13--		96
85															
		15 23 46	9	26											70
90															
		37 50/3	9	27											50+
95															
		38 50/5	7	28											50+
100	636.7														

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-030-0-08 | *Location:* Sta. 194+15.01, 104.2' LT., BL I-70 EB | *Date Drilled:* 7/20/2008 to 7/23/2008

WATER OBSERVATIONS:
Water seepage at: 16.0'
Water level at completion: 13.6' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ ○ / Non-Plastic - NP ⊣ LL; Blows per foot - 10 20 30 40
	636.7														
103.5	633.2	50/3	3	29			Very dense gray GRAVEL WITH SAND (A-1-b), trace to little silty clay; wet. @ 100.0'-103.5', 25.0 to 27.3 feet sand heave; washed out twice.								
105.0	631.7						Severely weathered gray SHALE.								50+
105		Core 60"	Rec 57"	RQD 37%	R1		Shale, dark gray, highly weathered, weak, laminated, slightly calcareous, contains abundant pyritic inclusions, fissile, laminated, fractured to highly fractured, RQD 38%, Loss 4%. @ 107.7'-107.8', encounterd large pyritic inclusion. @ 108.1'-109.1', moderately weathered, moderately strong.								
110															
111.0	625.7	Core 12"	Rec 12"	RQD 42%	R2		@ 111.0', core steel damaged. Abandoned boring at 111.0'.								
							Bottom of Boring - 111.0'								
115															
120															
125															

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\105523ZL801.dgn 1/4/2019 3:53:51 PM rachelm

PROJECT: FRA-70-14.05 PROJECT 4B	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 55 (SN 386345)	STATION / OFFSET: 194+37.05 / 70' RT	EXPLORATION ID B-030-1-15
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: CME AUTOMATIC	ALIGNMENT: I-70 EB	
PID: 96053 BR ID: NA	DRILLING METHOD: 3.25" - HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 748.9 (MSL) EOB: 59.4 ft.	PAGE 1 OF 1
START: 12/2/15 END: 12/3/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92	COORD: 39.952814, -82.998014	

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)	BACK FILL
0.5' - ASPHALT (6.0")	748.4																	
1.0' - CONCRETE (12.0")	747.4																	
0.5' - AGGREGATE BASE (6.0")	746.9																	
VERY STIFF, BROWN **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.	745.4		7 8 11	29	100	SS-1	4.00	25	16	12	27	20	24	15	9	12	A-4a (2)	
DENSE TO VERY DENSE, BROWN TO BROWNISH GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.			8 12 9	32	67	SS-2	-	-	-	-	-	-	-	-	-	7	A-2-4 (V)	
-COBBLES PRESENT THROUGHOUT			9 15 16	48	100	SS-3	-	49	21	9	14	7	24	17	7	8	A-2-4 (0)	
			19 20 16	55	100	SS-4	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	
	738.4																	
HARD, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE TO SOME FINE GRAVEL, DAMP.			26 42 37	121	33	SS-5	4.5+	22	9	12	31	26	26	13	13	9	A-6a (6)	
			10 19 24	66	0	SS-6	-	-	-	-	-	-	-	-	-	-	A-6a (V)	
			45	-	100	3S-6A	4.5+	-	-	-	-	-	-	-	-	10	A-6a (V)	
			11 14 17	48	100	SS-7	4.5+	-	-	-	-	-	-	-	-	10	A-6a (V)	
	729.2		6 16 50/3"	-	100	SS-8	4.5+	12	9	13	38	28	25	13	12	10	A-6a (7)	
VERY DENSE, GRAY TO BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP TO MOIST.							-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
-COBBLES PRESENT @ 22.0'			22 32 37	106	100	SS-9	-	23	34	29	9	5	NP	NP	NP	4	A-1-b (0)	
-WATER ADDED TO AUGERS @ 28.5'		W	24 31 29	92	100	SS-10	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
			5 19 30	75	100	SS-11	-	43	26	17	10	4	NP	NP	NP	10	A-1-b (0)	
	711.9																	
VERY DENSE, GRAY **SILT**, "AND" COARSE TO FINE SAND, TRACE CLAY, TRACE FINE GRAVEL, MOIST.			5 25 33	89	100	SS-12	-	1	0	38	54	7	NP	NP	NP	17	A-4b (5)	
	706.9																	
HARD, GRAY **SANDY SILT**, LITTLE FINE GRAVEL, LITTLE CLAY, MOIST.			36 48 50/4"	-	100	SS-13	4.5+	-	-	-	-	-	-	-	-	9	A-4a (V)	
			24 50/5"	-	100	SS-14	4.5+	16	13	23	37	11	18	13	5	10	A-4a (3)	
	696.9																	
MEDIUM DENSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST TO WET.			1 2 8	15	78	SS-15	-	-	-	-	-	-	-	-	-	17	A-1-b (V)	
-HEAVING SANDS ENCOUNTERED @ 53.5'																		
	689.5	EOB	14 50/5"	-	100	SS-16	-	33	47	12	6	2	NP	NP	NP	11	A-1-b (0)	

NOTES: GROUNDWATER INITIALLY ENCOUNTERED 28.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 200 LBS BENTONITE CHIPS AND SOIL CUTTINGS

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 7/16/18 10:08 - U:\GI6\PROJECTS\2015\W-15-126.GPJ

367/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION BORING LOG B-030-1-15	DRAWN RRM	CHECKED BRT

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-031-0-08 | *Location:* Sta. 196+17.42, 32.8' RT., BL I-70 EB | *Date Drilled:* 7/7/2008 to 8/7/2008

WATER OBSERVATIONS: Water seepage at: 9.5' | Water level at completion: 8.3' (includes drilling water)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP
	735.6														
0.7	734.9						Topsoil - 8"								
		2 4 5	18	1		3.75	FILL: Very stiff to hard brown SILT (A-4b), some clay, little fine to coarse sand, trace to little gravel; contains few brick and coal fragments; damp.								
4.0	731.6	3 4 5	18	2		4.5+			12	5	---	6	52	25	
		16 50/5	5	3			Dense to very dense brownish gray GRAVEL WITH SAND (A-1-b), little silt; damp.		50	20	---	13	--17--		NP 50+
5		42 44 31	1	4			@ 5.0', encountered refusal; offset boring approx. three feet west.								79
8.5	727.1	18 21 25	1	5			@ 5.5'-8.5', rock fragments; possible cobble blocking shoe.								
9.5	726.1	9 15 17	18	6A 6B		4.5	Hard gray SANDY SILT (A-4a), little gravel; damp.		15	12	---	25	32	16	
10		4 12 14	18	7			Medium dense to dense gray SILT (A-4b), some fine sand; wet.								
13.5	722.1	18 22 25	12	8		4.5+	Very stiff to hard gray SANDY SILT (A-4a), some fine to coarse sand, little gravel; damp.								
15		14 48 49	18	9		3.5									102
18.5	717.1	11 13 13	18	10			Medium dense gray SILT (A-4b), trace fine sand; moist.								
20															
21.0	714.6	7 18 21	18	11			Dense gray COARSE AND FINE SAND (A-3a), some silt; wet.								
23.5	712.1	12 18 21	18	12		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace gravel; damp.								
25	710.6														

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LOG OF: Boring B-031-0-08 | *Location:* Sta. 196+17.42, 32.8' RT., BL I-70 EB | *Date Drilled:* 7/7/2008 to 8/7/2008

WATER OBSERVATIONS: Water seepage at: 9.5' | Water level at completion: 8.3' (includes drilling water)

FIELD NOTES: Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP
	710.6														
		20 50/5	10	13		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; damp.								50+
28.0	707.6	50/5	5	14			Very dense gray SANDY SILT (A-4a), some fine to coarse sand, trace to little gravel; wet.								50+
30															
							@ 28.5'-38.9', possible cobbles.								
		24 49 48	18	15											102
35															
		50/5	5	16											50+
40															
42.0	693.6						Dense gray FINE SAND (A-3), trace silt; wet.								
		11 13 18	18	17											
45															
47.0	688.6						Very dense gray COARSE AND FINE SAND (A-3a), little silt, little gravel; wet.								
50	685.6	16 33 41	18	18			@ 48.5', ten feet sand heave; triconed and washed out.								78

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LOG OF: Boring B-031-0-08 | *Location:* Sta. 196+17.42, 32.8' RT., BL I-70 EB | *Date Drilled:* 7/7/2008 to 7/8/2008

WATER OBSERVATIONS:
Water seepage at: 9.5'
Water level at completion: 8.3' (includes drilling water)

FIELD NOTES:
Advanced boring using 3.25" diameter hollowstem augers.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ ○ / ⊣ LL Blows per foot - Non-Plastic - NP (10 20 30 40)
	685.6						Very dense gray COARSE AND FINE SAND (A-3a), trace to little gravel, trace silt; wet.								
55		25 33 40	18	19											77 ○
60.0 60	675.6	38 42 49	18	20											96 ○
							Bottom of Boring - 60.0'								
65															
70															
75															

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Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-032-0-08 | *Location:* Sta. 196+22.20, 79.7' RT., BL I-70 EB | *Date Drilled:* 7/8/2008 to 7/15/2008

WATER OBSERVATIONS: Water seepage at: 47.0' | Water level at completion: 25.7' (includes drilling water)

FIELD NOTES: 3.25" diameter hollowstem augers to 120.5'; 4.0" diameter flush joint casing from 120.5' to 128.5'.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL — LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	751.4														
1.1	750.3						Asphalt Concrete - 5"								
		5					Portland Cement Concrete - 3"								
2.0	749.4	10 6 9		1		4.5+	Aggregate Base - 5"								
							FILL: Medium dense brown COARSE AND FINE SAND (A-3a), little silt, little gravel; moist.								
		5 7 6 18		2		2.0	FILL: Very stiff to hard brown SILTY CLAY (A-6b), little to some fine to coarse sand, trace gravel; contains few brick fragments; damp to moist.		8	7	---	13	29	43
5															
6.0	745.4														
		3 4 8 3		3		2.5	Very stiff brown SILT AND CLAY (A-6a), little fine to coarse sand, trace gravel; moist.								
8.5	742.9														
		4 7 8 3		4			Medium dense gray COARSE AND FINE SAND (A-3a), little silt, little gravel; damp. (POSSIBLE FOUNDRY SAND)								
10															
11.0	740.4														
		5 8 16 18		5		4.5+	Hard gray SILTY CLAY (A-6b), little to some fine to coarse sand, trace to little gravel; damp. @ 11.0'-12.5', brown and gray.								
		12 12 14 18		6		4.5+			12	8	---	15	38	27	
15							@ 13.0'-35.0', difficult drilling; possible cobbles and boulders.								
		5 16 17 1		7		--									
		50/1 0		8		--	@ 18.5'-20.0', only gravel recovered in auger cuttings sample.								
20															
		50/3 0		9		--									
23.5	727.9														
		34 17 21 18		10		4.5+	Hard gray SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.		7	14	---	20	37	22	
25	726.4														

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LOG OF: Boring B-032-0-08 | *Location:* Sta. 196+22.20, 79.7' RT., BL I-70 EB | *Date Drilled:* 7/8/2008 to 7/15/2008

WATER OBSERVATIONS: Water seepage at: 47.0' | Water level at completion: 25.7' (includes drilling water)

FIELD NOTES: 3.25" diameter hollowstem augers to 120.5'; 4.0" diameter flush joint casing from 120.5' to 128.5'.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL — LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	726.4														
		50/1 1		11		--	Hard gray SILT AND CLAY (A-6a), some fine to coarse sand, trace gravel; damp.								
		50/4 0		12		--									
30															
		50/1 0		13		--									
		50/3 1		14		--									
35															
36.0	715.4														
		10 24 45 18		15		4.5+	Hard gray SANDY SILT (A-4a), some to "and" fine to coarse sand, little gravel; damp.		16	20	---	23	26	15	
		11 17 28 18		16		4.5+									
40															
		11 50/4 10		17		4.5+									
45															
		32 50/3 9		18		4.5+	@ 48.5'-49.3', contains occasional thin sand seams.								
50	701.4														

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LOG OF: Boring B-032-0-08 | Location: Sta. 196+22.20, 79.7' RT., BL I-70 EB | Date Drilled: 7/8/2008 to 7/15/2008

WATER OBSERVATIONS:
Water seepage at: 47.0'
Water level at completion: 25.7' (includes drilling water)

FIELD NOTES:
3.25" diameter hollowstem augers to 120.5';
4.0" diameter flush joint casing from 120.5' to 128.5'.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL — LL; Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	701.4						Very dense gray FINE SAND (A-3); contains silty clay seams; wet.								
		26 50/3	9	19			@ 53.5', 1.5 feet sand heave; used tricone bit to wash out.								50+
55															
57.0	694.4														
							Very dense gray GRAVEL WITH SAND (A-1-b), trace silt; contains silty clay seams; wet.								
		18 50/4	10	20					42	30	---	20	--8--		NP ● 50+
60															
		28 50/3	9	21											50+
65															
		16 42 50/3	15	22											50+
70															
		33 50/5	11	23											50+
75	676.4														

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LOG OF: Boring B-032-0-08 | Location: Sta. 196+22.20, 79.7' RT., BL I-70 EB | Date Drilled: 7/8/2008 to 7/15/2008

WATER OBSERVATIONS:
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Water level at completion: 25.7' (includes drilling water)

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3.25" diameter hollowstem augers to 120.5';
4.0" diameter flush joint casing from 120.5' to 128.5'.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL — LL; Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	676.4						Very dense gray COARSE AND FINE SAND (A-3a), trace to little silt, trace to little gravel; wet.								
		17 50/4	10	24											50+
80															
		17 41 49	18	25					10	15	---	62	--13--		NP ● 95
85															
		17 49 50/3	15	26			@ 88.5'-90.0', few limestone fragments.								50+
90															
		20 50/4	8	27											50+
95															
		17 50/4	10	28											50+
100	651.4														

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LOG OF: Boring B-032-0-08 | *Location:* Sta. 196+22.20, 79.7' RT., BL I-70 EB | *Date Drilled:* 7/8/2008 to 7/15/2008

WATER OBSERVATIONS:
Water seepage at: 47.0'
Water level at completion: 25.7' (includes drilling water)

FIELD NOTES:
3.25" diameter hollowstem augers to 120.5';
4.0" diameter flush joint casing from 120.5' to 128.5'.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ ○ / Non-Plastic - NP Blows per foot - 10 20 30 40
	651.4						Very dense gray GRAVEL WITH SAND (A-1-b), trace silt; wet.								
105		5 37 50/3	15	29											50+
		27 50/4	10	30					38	43	---	13	--6--		NP ● 50+
110															
		50/5	5	31			@ 113.5'-113.9', possible cobbles.								50+
115															
117.0	634.4														
							Very dense gray GRAVEL (A-1-a), "and" fine to coarse sand, trace silt; wet.								
		22 50/4	10	32					55	24	---	14	--7--		NP ● 50+
120.0 120	631.4														
120.5	630.9	50/3	3	33			Severely weathered gray SHALE.								50+
		Core 60"	Rec 22"	RQD 8%	R1		Shale, dark gray, highly to severely weathered, very weak to weak, laminated, calcareous, friable, fissile, pyritic, jointed, fractured to highly fractured, tight, slightly rough; RQD 5% Loss 53%.								
125	626.4														

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WATER OBSERVATIONS:
Water seepage at: 47.0'
Water level at completion: 25.7' (includes drilling water)

FIELD NOTES:
3.25" diameter hollowstem augers to 120.5';
4.0" diameter flush joint casing from 120.5' to 128.5'.

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ ○ / Non-Plastic - NP Blows per foot - 10 20 30 40
	626.4														
		Core 36"	Rec 23"	RQD 0%	R2		Shale, dark gray, highly to severely weathered, very weak to weak, laminated, calcareous, friable, fissile, pyritic, jointed, fractured to highly fractured, tight, slightly rough; RQD 5% Loss 53%.								
128.5	622.9						@ 125.2' - 125.5', encountered thin limestone layer.								
130							@ 128.5', boring terminated due to difficult coring conditions (core steel broke off during both core runs).								
							Bottom of Boring - 128.5'								
135															
140															
145															
150															

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\105523ZL802.dgn 1/4/2019 3:54:29 PM rachelm

PROJECT: FRA-70-14.05 PROJECT 4B	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750X (SN 310218)	STATION / OFFSET: 197+39.71 / 39.1' RT	EXPLORATION ID B-032-2-15
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: RII / CD/BW	HAMMER: CME AUTOMATIC	ALIGNMENT: I-70 EB	
PID: 96053 BR ID: NA	DRILLING METHOD: 3.25" - HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 733.1 (MSL) EOB: 60.0 ft.	PAGE 1 OF 1
START: 10/6/15 END: 10/6/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 85.7	COORD: 39.953042, -82.996969	

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)	BACK FILL
0.3' - TOPSOIL (3.0")	733.1																	
HARD, BROWN TO GRAY **SANDY SILT**, SOME CLAY, LITTLE FINE GRAVEL, DAMP.	732.8		5 6 11	24	100	SS-1	4.5+	11	12	20	34	23	25	15	10	10	A-4a (4)	
			8 14 19	47	100	SS-2	4.5+	-	-	-	-	-	-	-	-	9	A-4a (V)	
-SS-3: SULFATE CONTENT = 907 PPM			9 15 19	49	100	SS-3	4.5+	-	-	-	-	-	-	-	-	8	A-4a (V)	
			10 17 21	54	100	SS-4	4.5+	-	-	-	-	-	-	-	-	8	A-4a (V)	
			9 10 18	40	100	SS-5	4.5+	-	-	-	-	-	-	-	-	9	A-4a (V)	
VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.	720.1		7 18 32	71	100	SS-6	-	36	25	17	14	8	17	11	6	6	A-1-b (0)	
MEDIUM DENSE TO VERY DENSE, GRAY **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE FINE GRAVEL, MOIST TO WET.	717.6	W	2 3 12	21	100	SS-7	-	5	10	70	12	3	NP	NP	NP	19	A-3a (0)	
			9 22 38	86	100	SS-8	-	-	-	-	-	-	-	-	-	15	A-3a (V)	
HARD, GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DAMP.	712.6		6 21 35	80	100	SS-9	-	12	16	24	35	13	18	12	6	10	A-4a (3)	
			11 26 48	106	100	SS-10	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
			12 47 50/3"	-	100	SS-11	4.5+	13	11	22	38	16	20	11	9	8	A-4a (4)	
MEDIUM DENSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST TO WET.	701.1		23 45 50/4"	-	100	SS-12	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
-HEAVING SANDS ENCOUNTERED @ 38.5' -WATER ADDED TO AUGERS @ 38.5'			17 41 50/5"	-	88	SS-13	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
			4 8 13	30	100	SS-14	-	21	55	17	5	2	NP	NP	NP	13	A-1-b (0)	
			9 18 33	73	100	SS-15	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
			11 42 50/4"	-	100	SS-16	-	11	47	30	8	4	NP	NP	NP	13	A-1-b (0)	
	673.1	EOB	16 44 47	130	67	SS-17	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 16.0'; CAVE-IN DEPTH @ 17.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 100 LBS BENTONITE CHIPS AND SOIL CUTTINGS

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 7/16/18 10:08 - U:\GI6\PROJECTS\2015\W-15-126.GPJ

372/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION BORING LOG B-032-2-15	DRAWN RRM	CHECKED BRT

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\105523ZL803.dgn 1/4/2019 3:55:06 PM rachelm

PROJECT: FRA-70-14.05 PROJECT 4B	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750X (SN 310218)	STATION / OFFSET: 198+77.78 / 40.8' RT	EXPLORATION ID B-032-3-15
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: CME AUTOMATIC	ALIGNMENT: I-70 EB	
PID: 96053 BR ID: FRA-33-1747	DRILLING METHOD: 3.25" - HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 732.8 (MSL) EOB: 75.0 ft.	PAGE 1 OF 2
START: 10/7/15 END: 10/8/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 85.7	COORD: 39.953103, -82.996483	

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)	BACK FILL
0.3' - TOPSOIL (3.0")	732.8																	
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.	732.5		4 7 8	21	100	SS-1	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			8 13 13	37	100	SS-2	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
-ROCK FRAGMENTS PRESENT THROUGHOUT			11 14 24	54	78	SS-3	-	57	21	6	13	3	NP	NP	NP	7	A-1-b (0)	
-COBBLES PRESENT @ 8.0'			14 18 15	47	100	SS-4	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
DENSE TO VERY DENSE, BROWNISH GRAY TO GRAY **GRAVEL**, AND COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, WET.	722.3	W	9 12 78	129	83	SS-5	-	99	1	0	0	0	NP	NP	NP	10	A-1-a (0)	
-MUD ADDED TO AUGERS @ 11.0'			26 20 20	57	89	SS-6	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
			7 13 16	41	100	SS-7	-	61	21	8	7	3	NP	NP	NP	11	A-1-a (0)	
-ROCK FRAGMENTS PRESENT THROUGHOUT																		
-HEAVING SANDS ENCOUNTERED @ 18.5'			6 11 14	36	100	SS-8	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
-COBBLES PRESENT FROM 18.5' TO 21.0'			9 10 14	34	100	SS-9	-	55	27	9	7	2	NP	NP	NP	12	A-1-a (0)	
			17 11 21	46	100	SS-10	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
HARD, GRAY **SANDY SILT**, LITTLE FINE GRAVEL, LITTLE CLAY, DAMP.	708.3						4.5+	-	-	-	-	-	-	-	-	11	A-4a (V)	
			16 23 35	83	100	SS-11	4.5+	19	11	18	37	15	21	14	7	10	A-4a (3)	
			8 15 23	54	100	SS-12	4.5+	-	-	-	-	-	-	-	-	12	A-4a (V)	
VERY DENSE, GRAY **SILT**, SOME COARSE TO FINE SAND, TRACE CLAY, TRACE FINE GRAVEL, MOIST.	700.8		28 48 50/4"	-	100	SS-13	1.50	5	5	22	61	7	NP	NP	NP	17	A-4b (7)	
VERY DENSE, DARK GRAY TO GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, WET.	695.8		26 26 36	89	100	SS-14	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
-COBBLES PRESENT @ 41.0'																		
-HEAVING SANDS ENCOUNTERED @ 43.5'			15 47 50/2"	-	100	SS-15	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
-HEAVING SANDS ENCOUNTERED @ 48.5'			8 23 38	87	100	SS-16	-	36	28	26	9	1	NP	NP	NP	11	A-1-b (0)	
-COBBLES PRESENT @ 50.5'																		
			32 30 47	110	100	SS-17	-	44	27	18	9	2	NP	NP	NP	10	A-1-b (0)	
			10 40 46	123	100	SS-18	-	-	-	-	-	-	-	-	-	15	A-1-b (V)	

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 7/16/18 10:08 - U:\GI6\PROJECTS\2015\W-15-126.GPJ

3726/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION BORING LOG B-032-3-15	DRAWN RRM CHECKED BRT

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PID: 96053 | BR ID: FRA-33-1747 | PROJECT: FRA-70-14.05 PROJECT 4B | STATION / OFFSET: 198+77.78 / 40.8 RT | START: 10/7/15 | END: 10/8/15 | PG 2 OF 2 | B-032-3-15

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)	BACK FILL
VERY DENSE, DARK GRAY TO GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, WET. *(continued)*	672.8	61																
	670.8	62																
VERY DENSE, GRAY **SILT**, SOME COARSE TO FINE SAND, TRACE CLAY, WET.		63																
		64	9 20 48	97	100	SS-19	-	0	1	20	74	5	NP	NP	NP	23	A-4b (8)	
-COBBLES PRESENT @ 66.0'	665.8	65																
MEDIUM DENSE TO DENSE, GRAY **COARSE AND FINE SAND**, TRACE SILT, TRACE FINE GRAVEL, TRACE CLAY, MOIST.		66																
-HEAVING SANDS ENCOUNTERED @ 68.5'		67																
		68																
		69	6 9 10	27	100	SS-20	-	5	40	42	10	3	NP	NP	NP	14	A-3a (0)	
		70																
		71																
		72																
		73																
		74	7 11 11	31	100	SS-21	-	-	-	-	-	-	-	-	-	12	A-3a (V)	
	657.8	EOB 75																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED 11.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 200 LBS BENTONITE CHIPS AND SOIL CUTTINGS

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 7/16/18 10:08 - U:\GI6\PROJECTS\2015\W-15-126.GPJ

3720/496	FRA-70-12.68	STRUCTURE FOUNDATION EXPLORATION BORING LOG B-032-3-15	DRAWN RRM CHECKED BRT

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-092-0-09 | *Location:* Sta. 685+49.50, 79.6' LT., BL I-71 SB | *Date Drilled:* 9/1/2009 to 9/9/2009

WATER OBSERVATIONS: Water seepage at: 38.5' Water level at completion: 37.1'

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	724.9														
1.5	723.4						Asphalt Concrete - 8" Aggregate Base - 10"								
		7 4 4	5	1		--	FILL: Very stiff brown SANDY SILT (A-4a), "and" gravel, some fine to coarse sand; damp.		36	17	---	11	20	16	
3.5	721.4														
5		8 7 6	12	2		2.0	FILL: Very stiff brown SILTY CLAY (A-6b), some fine to coarse sand, some gravel; moist.		22	9	---	14	24	31	
		11 8 11	13	3		2.0									
10		11 17 16	14	4		2.5	@ 8.5'-10.0', contains numerous gravel fragments.								
11.0	713.9														
		8 10 50/5	6	5			FILL: Very dense brown and gray GRAVEL (A-1-a), some fine to coarse sand, little silt; damp.		60	17	---	11	--12--		INP 50+
13.5	711.4														
15		12 22 22	15	6		--	FILL: Hard brown SANDY SILT (A-4a), some fine to coarse sand, some gravel; contains numerous gravel fragments; damp.								
16.0	708.9														
		18 20 17	17	7		3.5	Very stiff to hard dark brown SILT AND CLAY (A-6a), some fine to coarse sand, trace to little gravel; damp to moist.								
20		15 13 16	18	8		4.5			10	13	---	11	37	29	
		50/6	0	9		--									50+
		9 10 11	13	10		3.25									
25	699.9														

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-092-0-09 | *Location:* Sta. 685+49.50, 79.6' LT., BL I-71 SB | *Date Drilled:* 9/1/2009 to 9/9/2009

WATER OBSERVATIONS: Water seepage at: 38.5' Water level at completion: 37.1'

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	699.9														
		10 8 9	12	11		3.25	Very stiff brown SILTY CLAY (A-6b), little fine to coarse sand, trace gravel; damp to moist.		0	0	---	13	45	42	
30		6 7 6	1	12		--									
32.0	692.9						Note: terminated sampling on 9/2/09 @ 30.0 feet. Resumed sampling on 9/9/09.								
		3 14 18	11	13		3.75	Very stiff brown SANDY SILT (A-4a), "and" gravel; damp.								
35															
37.0	687.9														
		13 13 20	10	14			Dense to very dense brown GRAVEL (A-1-a), trace fine to coarse sand, trace silt; wet.		87	6	---	3	--4--		INP
40															
		18 32 31	8	15											64
45															
47.0	677.9														
		36 33 33	12	16			Very dense gray GRAVEL WITH SAND (A-1-b), little silt; wet.								67
50.0	674.9						Bottom of Boring - 50.0'								

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.B.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 212+57.18 / 42.9' LT	EXPLORATION ID B-097-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.V.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 715.6 (MSL) EOB: 50.0 ft.	PAGE 1 OF 1
START: 1/17/14 END: 1/17/14	SAMPLING METHOD: SPT	ENERGY RATIO (%): 82.6	LAT / LONG: 39.943426678, -83.012792384	

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)	BACK FILL
0.8' - TOPSOIL (10.0")	715.6 / 714.8																	
FILL: HARD, BROWN **CLAY**, "AND" SILT, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. -ORGANICS AND ROOT FIBERS IN SS-1	712.6		4 7 17	33	44	SS-1	4.25	4	10	6	39	41	48	22	26	24	A-7-6 (16)	
POSSIBLE FILL: LOOSE TO MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP. -ORGANICS PRESENT IN SS-2			4 5 4	12	44	SS-2	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
-ROOT FIBERS AND ROCK FRAGMENTS PRESENT THROUGHOUT			4 3 4	10	50	SS-3	-	7	51	20	18	4	NP	NP	NP	9	A-1-b (0)	
			7 10 7	23	28	SS-4	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
			5 10 10	28	50	SS-5	-	-	-	-	-	-	-	-	-	4	A-1-b (V)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, DAMP.	702.6		6 8 9	23	56	SS-6	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
-ROCK FRAGMENTS PRESENT THROUGHOUT			12 11 11	30	50	SS-7	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
			13 16 17	45	56	SS-8	-	69	13	4	12	2	21	17	4	4	A-1-a (0)	
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-9	693.6	W	48 35 29	88	61	SS-9	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT THROUGHOUT	688.6		21 11 11	30	17	SS-10	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
			38 13 8	29	56	SS-11	-	40	33	8	14	5	22	17	5	11	A-1-b (0)	
VERY DENSE, BROWN TO GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE TO LITTLE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT THROUGHOUT	678.6		16 21 25	63	61	SS-12	-	55	25	7	11	2	23	19	4	10	A-1-a (0)	
			35 40 30	96	50	SS-13	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
	665.6	EOB	33 37 40	106	28	SS-14	-	63	10	14	10	3	NP	NP	NP	9	A-1-a (0)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 24.0'; CAVE-IN DEPTH @ 22.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 50 LBS BENTONITE CHIPS AND SOIL CUTTINGS

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL103.dgn 12/27/2018 10:36:03 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.B.	DRILL RIG: CME-750X (SN 310218)	STATION / OFFSET: 217+50.17 / 29.4' LT	EXPLORATION ID B-098-2-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / J.S.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 715.0 (MSL) EOB: 47.9 ft.	PAGE 1 OF 1
START: 1/16/14 END: 1/16/14	SAMPLING METHOD: SPT	ENERGY RATIO (%): 86.8	LAT / LONG: 39.944646825, -83.013554525	

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)	BACK FILL
0.8' - TOPSOIL (10.0")	715.0																	
	714.2																	
FILL: HARD, DARK BROWN **CLAY**, 'AND" SILT, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. -ROOT FIBERS PRESENT IN SS-1		1 2	4 9 20	42	28	SS-1	4.25	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
	712.0	3																
DENSE TO VERY DENSE, BROWNISH GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT THROUGHOUT		4 5 6 7	7 19 14	48	67	SS-2	-	60	13	7	14	6	24	18	6	8	A-1-b (0)	
			16 19 29	69	67	SS-3	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
	707.0	8																
DENSE TO VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -LIMESTONE FRAGMENTS PRESENT THROUGHOUT		9 10 11 12	17 18 20	55	67	SS-4	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
			24 15 15	43	72	SS-5	-	55	24	8	10	3	NP	NP	NP	8	A-1-a (0)	
	702.0	13																
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		14 15 16 17	3 10 9	27	33	SS-6	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			5 3 7	14	50	SS-7	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
		18 19 20 21 22 23	4 6 11	25	67	SS-8	-	31	44	8	14	3	NP	NP	NP	7	A-1-b (0)	
	693.0																	
MEDIUM DENSE TO DENSE, BROWN TO GRAY **GRAVEL**, SOME FINE TO COARSE SAND, LITTLE SILT, TRACE CLAY, MOIST. -INTRODUCED MUD @ 23.5'		W 24 25 26 27 28	5 14 8	32	61	SS-9	-	65	16	5	11	3	NP	NP	NP	13	A-1-a (0)	
		29 30 31 32 33	26 12 8	29	39	SS-10	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
	683.0																	
LOOSE, GRAY **GRAVEL**, LITTLE TO SOME COARSE TO FINE SAND, TRACE TO LITTLE SILT, TRACE CLAY, MOIST.		34 35 36 37 38	14 4 3	10	50	SS-11	-	-	-	-	-	-	-	-	-	14	A-1-a (V)	
		39 40 41 42 43	3 3 3	9	22	SS-12	-	-	-	-	-	-	-	-	-	17	A-1-a (V)	
	673.0																	
DENSE TO VERY DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		44 45 46 47	12 12 14	38	50	SS-13	-	76	10	4	7	3	NP	NP	NP	11	A-1-a (0)	
	667.1	EOB	50/5"	-	100	SS-14	-	-	-	-	-	-	-	-	-	13	A-1-a (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 24.0'; CAVE-IN DEPTH @ 25.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 50 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750 (SN 98048)	STATION / OFFSET: 216+00.00 / 23.8' LT	EXPLORATION ID B-098-3-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.5" CFA	CALIBRATION DATE: 10/20/14	ELEVATION: 716.3 (MSL) EOB: 15.0 ft.	PAGE 1 OF 1
START: 2/4/15 END: 2/4/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92.9	LAT / LONG: 39.944287341, -83.013291632	

MATERIAL DESCRIPTION AND NOTES	ELEV. 716.3	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
0.4' - TOPSOIL (5.0")	715.9																	
VERY STIFF, DARK BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.	713.3	1	3 3 4	11	50	SS-1	3.00	-	-	-	-	-	-	-	-	21	A-6b (V)	
DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, DAMP.	710.8	4	15 13 12	39	100	SS-2	-	62	13	6	19	0	23	20	3	8	A-1-b (0)	
DENSE TO VERY DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP. -ROCK FRAGMENTS PRESENT IN SS-3		7	1 20 15	54	72	SS-3	-	-	-	-	-	-	-	-	-	4	A-1-a (V)	
		9	16 24 18	65	89	SS-4	-	78	9	4	6	3	18	15	3	3	A-1-a (0)	
	701.3	EOB 15	16 16 14	46	56	SS-5	-	-	-	-	-	-	-	-	-	3	A-1-a (V)	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 219+00.12 / 52.5' LT	EXPLORATION ID B-099-2-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.5" CFA	CALIBRATION DATE: 4/26/13	ELEVATION: 705.1 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 2/5/15 END: 2/5/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.944983752, -83.013872625	

MATERIAL DESCRIPTION AND NOTES	ELEV. 705.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
0.2' - ASPHALT (2.0")	704.9																	
0.3' - AGGREGATE BASE (4.0")	704.6																	
STIFF TO HARD, BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE TO SOME FINE GRAVEL, DAMP TO MOIST. -ORGANICS PRESENT IN SS-1 -ROOT FIBERS PRESENT IN SS-2 -ROCK FRAGMENTS PRESENT IN SS-3	697.1	1	8 3 4	9	100	SS-1	1.50	7	5	13	46	29	39	21	18	14	A-6b (11)	
		4	3 6 8	18	72	SS-2	4.50	-	-	-	-	-	-	-	-	25	A-6b (V)	
		7	5 8 9	22	67	SS-3	2.25	34	6	11	28	21	40	19	21	16	A-6b (7)	
DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.	694.6	10	12 11 14	32	61	SS-4	-	-	-	-	-	-	-	-	-	17	A-2-6 (V)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -LIMESTONE AND CHERT FRAGMENTS PRESENT IN SS-5	689.6	12	11 15 20	45	50	SS-5	-	64	15	4	12	5	NP	NP	NP	7	A-1-b (0)	
		14	13 9 12	27	89	SS-6	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
MEDIUM DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT THROUGHOUT		W 17	6 5 4	12	39	SS-7	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
		19	6 5 6	14	33	SS-8	-	-	-	-	-	-	-	-	-	14	A-1-a (V)	
	680.1	EOB 25	4 5 6	14	100	SS-9	-	54	26	5	12	3	23	18	5	14	A-1-a (0)	

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 17.0'; CAVE-IN DEPTH @ 17.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 150 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 220+36.69 / 56.8' LT	EXPLORATION ID B-099-3-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 705.0 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 2/5/15 END: 2/5/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.945311743, -83.014109060	

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)	BACK FILL
0.2' - ASPHALT (2.0")	704.8																	
STIFF, REDDISH BROWN **SILTY CLAY**, "AND" COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.	702.0	1	4 3 3	8	39	SS-1	2.00	18	17	27	20	18	32	15	17	12	A-6b (2)	
VERY STIFF, REDDISH BROWN **CLAY**, SOME SILT, SOME COARSE TO FINE SAND, LITTLE FINE GRVAEL, MOIST.	699.5	5		46		ST-2	3.00	14	12	15	28	31	46	19	27	26	A-7-6 (12)	
DENSE, GRAY **GRAVEL**, TRACE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP.	694.5	7	7 14 12	34	39	SS-3	-	-	-	-	-	-	-	-	-	4	A-1-a (V)	
		9	20 19 19	49	33	SS-4	-	-	-	-	-	-	-	-	-	4	A-1-a (V)	
DENSE, BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-5	692.0	12	15 12 13	32	89	SS-5	-	65	5	3	7	20	NP	NP	NP	12	A-2-4 (0)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO WET.		14	17 14 16	39	56	SS-6	-	-	-	-	-	-	-	-	-	4	A-1-b (V)	
		17	14 15 11	34	44	SS-7	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		W																
		19	5 4 6	13	50	SS-8	-	60	17	6	12	5	26	20	6	21	A-1-b (0)	
		22	▼															
-ROCK FRAGMENTS PRESENT IN SS-9	680.0	24	11 5 6	14	89	SS-9	-	-	-	-	-	-	-	-	-	16	A-1-b (V)	
		EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 17.5' AND AT COMPLETION @ 22.6'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 150 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: STOCK / T.B./B.Z.	DRILL RIG: BK 81 HD (SN 810792.111)	STATION / OFFSET: 221+70.29 / 44.7' RT	**EXPLORATION ID B-099-4-14**
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / D.M.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 3/28/13	ELEVATION: 717.0 (MSL) EOB: 15.0 ft.	PAGE 1 OF 1
START: 4/14/15 END: 4/14/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 72.3	LAT / LONG: 39.945765348, -83.014005413	

MATERIAL DESCRIPTION AND NOTES	ELEV. 717.0	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
0.3' - ASPHALT (3.0")	716.7																	
0.7' - CONCRETE (9.0")	716.0																	
VERY STIFF, BROWN **CLAY**, SOME SILT, SOME FINE GRAVEL, LITTLE COARSE TO FINE SAND, DAMP.		1	9 7 5	14	44	SS-1	2.50	-	-	-	-	-	-	-	-	12	A-7-6 (V)	
		2																
		3																
		4	5 8 6	17	78	SS-2	2.50	36	12	6	25	21	43	18	25	17	A-7-6 (7)	
		5																
		6																
-ROCK FRAGMENTS PRESENT THROUGHOUT		7	20 24 24	58	78	SS-3	2.50	-	-	-	-	-	-	-	-	15	A-7-6 (V)	
		8																
		9	9 9 15	29	94	SS-4	3.00	-	-	-	-	-	-	-	-	13	A-7-6 (V)	
	706.5	10																
VERY STIFF, BROWN AND BLACK **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP.		11	7 8 9	20	50	SS-5	3.00	33	11	14	26	16	34	19	15	16	A-6a (3)	
	704.0	12																
MEDIUM DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-6		13																
	702.0	14	4 6 17	28	11	SS-6	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
	EOB	15																

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

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PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 222+00.00 / 69.6' LT	EXPLORATION ID B-099-5-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 704.2 (MSL) EOB: 30.0 ft.	PAGE 1 OF 1
START: 2/5/15 END: 2/5/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.945694161, -83.014416489	

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)	BACK FILL
0.7' - GRAVEL AND ASPHALT (8.0")	704.2																	
	703.5																	
VERY STIFF, GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP. -ROCK FRAGMENTS PRESENT IN SS-1		1	10 5 10	19	67	SS-1	3.50	-	-	-	-	-	-	-	-	15	A-6a (V)	
	701.2	2																
VERY STIFF, DARK BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP. -IRON STAINING PRESENT IN SS-2		3																
	698.7	4	4 5 8	17	89	SS-2	3.75	24	12	12	26	26	37	19	18	16	A-6b (6)	
MEDIUM DENSE, BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, DAMP TO MOIST.		5																
		6	7 8 11	25	39	SS-3	-	-	-	-	-	-	-	-	-	13	A-2-4 (V)	
-ROCK FRAGMENTS PRESENT THROUGHOUT		7																
	693.7	8	7 9 9	23	50	SS-4	-	56	9	7	17	11	27	17	10	8	A-2-4 (0)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST.		9																
		10	6 5 5	13	39	SS-5	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
-ROCK FRAGMENTS PRESENT THROUGHOUT		11																
		12	10 7 8	19	39	SS-6	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
		13																
		14	14 12 13	32	61	SS-7	-	58	17	9	12	4	NP	NP	NP	9	A-1-b (0)	
	686.2	15	W															
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		16																
		17	3 4 7	14	33	SS-8	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
		18																
		19																
		20																
		21																
		22																
		23																
		24	4 5 8	17	33	SS-9	-	-	-	-	-	-	-	-	-	14	A-1-a (V)	
		25																
		26																
		27																
		28																
-ROCK FRAGMENTS PRESENT IN SS-10	674.2	29	9 14 13	35	44	SS-10	-	63	19	6	7	5	NP	NP	NP	13	A-1-a (0)	
		EOB 30																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 17.5' AND AT COMPLETION @ 24.3'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 150 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 223+51.27 / 54.9' LT	EXPLORATION ID B-100-1-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 705.6 (MSL) EOB: 45.0 ft.	PAGE 1 OF 1
START: 2/6/15 END: 2/6/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.946081913, -83.014616606	

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)	BACK FILL
0.2' - TOPSOIL (2.0")	705.6																	
VERY STIFF, BROWN **CLAY**, SOME FINE GRAVEL, SOME COARSE TO FINE SAND, LITTLE SILT, MOIST. -ROCK FRAGMENTS PRESENT IN SS-1	705.4	1	3 5 7	16	100	SS-1	2.75	25	13	9	18	35	42	20	22	23	A-7-6 (8)	
	702.6	2																
MEDIUM DENSE TO DENSE, GRAYISH BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP. -ROCK FRAGMENTS PRESENT IN SS-3		3																
		4	12 13 11	31	50	SS-2	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
		5																
		6																
		7	6 8 9	22	50	SS-3	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
		8																
		9	10 11 11	28	56	SS-4	-	71	9	5	9	6	NP	NP	NP	5	A-1-a (0)	
		10																
		11																
		12	7 8 7	19	33	SS-5	-	-	-	-	-	-	-	-	-	2	A-1-a (V)	
	692.6	13																
DENSE TO VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP.		14	17 19 18	48	100	SS-6	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
		15																
		16																
		17	15 33 21	70	100	SS-7	-	66	14	6	9	5	NP	NP	NP	4	A-1-a (0)	
		18																
W		19	33 19 13	41	44	SS-8	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	
		20																
		21																
	683.6	22																
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -HEAVING SANDS ENCOUNTERED @ 23.5' -INTRODUCED MUD @ 23.5'		23																
		24	33 25 23	62	100	SS-9	-	55	23	6	11	5	20	16	4	9	A-1-b (0)	
		25																
		26																
	678.6	27																
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST TO WET.		28																
		29	6 8 7	19	100	SS-10	-	-	-	-	-	-	-	-	-	19	A-1-b (V)	
		30																
		31																
		32																
		33																
		34	5 6 10	21	44	SS-11	-	29	44	14	9	4	NP	NP	NP	17	A-1-b (0)	
		35																
		36																
		37																
		38																
		39	4 9 9	23	83	SS-12	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
		40																
		41																
	663.6	42																
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, WET.		43																
	661.2	44	23 43 32	97	94	SS-13	-	-	-	-	-	-	-	-	-	21	A-1-b (V)	
HARD, GRAY **SILT AND CLAY**, SOME FINE GRAVEL, LITTLE COARSE TO FINE SAND, DAMP. -ROCK FRAGMENTS PRESENT IN SS-13B	660.6	EOB 45					4.5+	-	-	-	-	-	-	-	-	11	A-6a (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 18.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 300 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: N/A
START: 4/13/15 END: 4/13/15

DRILLING FIRM / OPERATOR: STOCK / T.B./B.Z.
SAMPLING FIRM / LOGGER: RII / D.M.
DRILLING METHOD: 4.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: BK 81 HD (SN 810792.111)
HAMMER: AUTOMATIC
CALIBRATION DATE: 3/28/13
ENERGY RATIO (%): 72.3

STATION / OFFSET: 224+29.33 / 45.6' RT
ALIGNMENT: BL I-71 SB
ELEVATION: 716.9 (MSL) EOB: 15.0 ft.
LAT / LONG: 39.946399914, -83.014429916

EXPLORATION ID B-100-2-14
PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 716.9	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
0.2' - ASPHALT (2.0")	716.7																	
0.8' - CONCRETE (10.0")	715.9																	
VERY STIFF, BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST. -ROCK FRAGMENTS PRESENT IN SS-1		1	6 9 17	31	67	SS-1	2.50	-	-	-	-	-	-	-	-	20	A-6b (V)	
		2																
		3																
		4	5 5 10	18	78	SS-2	2.25	12	11	8	34	35	40	18	22	19	A-6b (12)	
	711.4	5																
VERY STIFF, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -ROCK FRAGMENTS PRESENT IN SS-3		6	7 15 19	41	78	SS-3	2.50	-	-	-	-	-	-	-	-	12	A-6a (V)	
	708.9	7																
VERY STIFF, BROWN **SILTY CLAY**, SOME FINE GRAVEL, LITTLE COARSE TO FINE SAND, MOIST. -ROCK FRAGMENTS PRESENT THROUGHOUT		8																
		9																
		10																
		11			67	ST-4	3.25	25	9	6	30	30	35	17	18	20	A-6b (8)	
		12																
		13																
		14	5 11 18	35	83	SS-5	2.75	-	-	-	-	-	-	-	-	17	A-6b (V)	
	701.9	EOB 15																

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 225+01.50 / 55.6' LT	EXPLORATION ID B-100-3-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 706.0 (MSL) EOB: 30.0 ft.	PAGE 1 OF 1
START: 2/6/15 END: 2/6/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.946438290, -83.014870081	

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)	BACK FILL
0.3' - TOPSOIL (3.0")	706.0																	
HARD, REDDISH BROWN **CLAY**, SOME SILT, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP. -ROOT FIBERS PRESENT IN SS-1	705.7 / 703.0	1	7 5 7	16	67	SS-1	4.5+	15	7	10	31	37	43	20	23	16	A-7-6 (12)	
DENSE TO VERY DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP.	703.0	4	31 24 21	58	39	SS-2	-	-	-	-	-	-	-	-	-	3	A-1-a (V)	
		7	18 21 15	47	100	SS-3	-	71	10	5	10	4	20	17	3	5	A-1-a (0)	
DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP.	698.0	9	12 15 13	36	100	SS-4	-	-	-	-	-	-	-	-	-	3	A-1-b (V)	
		12	17 20 29	63	100	SS-5	-	62	15	7	14	2	NP	NP	NP	3	A-1-b (0)	
VERY DENSE, GRAY **GRAVEL**, TRACE COARSE TO FINE SAND, TRACE SILT, DAMP.	693.0	14	50/2"	-	50	SS-6	-	-	-	-	-	-	-	-	-	3	A-1-a (V)	
		17	37 50/5"	-	36	SS-7	-	-	-	-	-	-	-	-	-	3	A-1-a (V)	
-ROCK FRAGMENTS PRESENT IN SS-6		W 19	42 50/5"	-	18	SS-8	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
MEDIUM DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, MOIST TO WET.	684.0	23 ▼	7 7 9	21	100	SS-9	-	58	22	6	12	2	NP	NP	NP	11	A-1-a (0)	
-ROCK FRAGMENTS PRESENT IN SS-10	676.0	EOB 30	8 8 8	21	100	SS-10	-	-	-	-	-	-	-	-	-	22	A-1-a (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 19.0' AND AT COMPLETION @ 23.4'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 200 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: STOCK / T.B./B.Z.	DRILL RIG: BK 81 HD (SN 810792.111)	STATION / OFFSET: 225+81.07 / 46.9' RT	EXPLORATION ID B-100-4-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / D.M.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 3/28/13	ELEVATION: 716.3 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 4/14/15 END: 4/14/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 72.3	LAT / LONG: 39.946768298, -83.014696343	

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)	BACK FILL
1.0' - CONCRETE (12.0")	716.3																	
	715.3																	
VERY STIFF, BROWN AND BLACK **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE TO SOME FINE GRAVEL, DAMP TO MOIST.		1	3 6 8	17	56	SS-1	2.50	-	-	-	-	-	-	-	-	15	A-6b (V)	
		2																
		3																
		4	3 6 10	19	56	SS-2	2.50	20	12	8	31	29	39	18	21	16	A-6b (9)	
		5																
		6																
		7	4 16 10	31	78	SS-3	3.00	-	-	-	-	-	-	-	-	23	A-6b (V)	
		8																
		9	5 6 15	25	72	SS-4	3.00	28	14	8	29	21	38	19	19	16	A-6b (6)	
		10																
		11																
		12	9 9 19	34	89	SS-5	3.00	-	-	-	-	-	-	-	-	21	A-6b (V)	
	703.3	13																
DENSE TO VERY DENSE, GRAY TO BROWNISH GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		14	11 12 15	33	94	SS-6	-	65	11	7	12	5	NP	NP	NP	10	A-1-b (0)	
-ROCK FRAGMENTS PRESENT THROUGHOUT		15																
		16																
		17	25 32 34	80	67	SS-7	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
	698.3	18																
MEDIUM DENSE, BROWNISH GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		19	21 11 4	18	44	SS-8	-	37	34	9	16	4	NP	NP	NP	6	A-1-b (0)	
-ROCK FRAGMENTS PRESENT THROUGHOUT		20																
		21																
		22																
		23																
		24	6 6 9	18	50	SS-9	-	-	-	-	-	-	-	-	-	15	A-1-b (V)	
	691.3	25 EOB																

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372ZL412.dgn 12/27/2018 10:48:54 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / M.W.	DRILL RIG: CME 55 (SN 386345)	STATION / OFFSET: 255+88.39 / 76.6' RT	EXPLORATION ID B-100-5-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 NB	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 721.0 (MSL) EOB: 66.7 ft.	PAGE 1 OF 2
START: 11/11/15 END: 11/12/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92	LAT / LONG: 39.946827325, -83.014163023	

MATERIAL DESCRIPTION AND NOTES	ELEV. 721.0	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
0.1' - TOPSOIL (1.0")	720.9																	
FILL: VERY STIFF TO HARD, DARK BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP.			4 4 8	18	61	SS-1	2.50	-	-	-	-	-	-	-	-	13	A-6b (V)	
			4 5 9	21	100	SS-2	4.5+	24	5	17	27	27	40	22	18	15	A-6b (7)	
-BRICK FRAGMENTS AND CINDERS PRESENT THROUGHOUT			5 5 6	17	83	SS-3	3.00	-	-	-	-	-	-	-	-	15	A-6b (V)	
	710.5																	
FILL: MEDIUM DENSE TO DENSE, DARK BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP.			20 16 11	41	0	SS-4	-	-	-	-	-	-	-	-	-	-		
			16	-	100	3S-4A	-	45	12	11	20	12	35	23	12	11	A-2-6 (0)	
-BRICK AND ROCK FRAGMENTS PRESENT THROUGHOUT			7 5 6	17	0	SS-5	-	-	-	-	-	-	-	-	-	-		
	705.5		20	-	67	3S-5A	-	-	-	-	-	-	-	-	-	10	A-2-6 (V)	
VERY STIFF, DARK BROWN **CLAY**, "AND" SILT, TRACE TO LITTLE COARSE TO FINE SAND, DAMP TO MOIST.			4 7 9	25	100	SS-6	3.50	0	2	14	46	38	46	27	19	26	A-7-6 (13)	
			2 6 7	20	100	SS-7	2.50	-	-	-	-	-	-	-	-	28	A-7-6 (V)	
			1 3 7	15	100	SS-8	3.00	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
			3 6 9	23	100	SS-9	3.00	0	1	5	38	56	53	23	30	25	A-7-6 (19)	
-COBBLES PRESENT @ 25.0'			5 5 6	17	56	SS-10	2.50	-	-	-	-	-	-	-	-	21	A-7-6 (V)	
			9 7 3	15	44	SS-11	3.00	-	-	-	-	-	-	-	-	27	A-7-6 (V)	
	689.0	▼																
DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.		W	5 11 13	37	83	SS-12	-	70	10	4	11	5	24	15	9	11	A-2-4 (0)	
	684.0																	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, WET.			6 5 8	20	56	SS-13	-	-	-	-	-	-	-	-	-	21	A-1-b (V)	
			4 6 7	20	39	SS-14	-	-	-	-	-	-	-	-	-	20	A-1-b (V)	
	674.0																	
HARD, GRAY **SILT**, SOME CLAY, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. -COBBLES PRESENT @ 47.0'			40 27 35	95	67	SS-15	4.5+	8	9	13	50	20	22	15	7	12	A-4b (7)	
	669.0																	
VERY DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE CLAY, MOIST.			47 50/4"	-	100	SS-16	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	
			7 31 42	112	100	SS-17	-	84	8	3	0	5	20	15	5	9	A-1-a (0)	

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:47 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

FRA-70-12.68

STRUCTURE FOUNDATION EXPLORATION
ELECTRICAL RELOCATION
BORING LOG B-100-5-15

DRAWN RRM
CHECKED BRT

PID: 77372	BR ID: N/A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 255+88.39 / 76.6 RT	START: 11/11/15	END: 11/12/15	PG 2 OF 2	B-100-5-15

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)	BACK FILL
VERY DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE CLAY, MOIST. *(continued)*	661.0	61																
		62																
		63																
		64	21 48 50	150	100	SS-18	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	
		65																
AUGER REFUSAL @ 66.7'	654.3	66 EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 33.5' AND AT COMPLETION @ 31.0'; CAVE-IN DEPTH @ 50.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 100 LBS BENTONITE CHIPS AND SOIL CUTTINGS

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:47 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL113.dgn 12/27/2018 10:36:50 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 5007+07.46 / 0.5' RT	EXPLORATION ID B-102-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP A5	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 719.8 (MSL) EOB: 45.0 ft.	PAGE 1 OF 1
START: 6/4/13 END: 6/4/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 82.6	LAT / LONG: 39.947956011, -83.014631636	

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)	BACK FILL
0.3' - TOPSOIL (4.0")	719.8																	
FILL: STIFF TO VERY STIFF, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -SULFATE CONCENTRATION AT 1.0' = 33 PPM	719.5	1	4 5 6	15	67	SS-1	4.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
		2																
		3																
		4	2 3 5	11	44	SS-2	1.50	8	14	19	40	19	33	21	12	13	A-6a (6)	
		5																
		6																
		7	9 4 4	11	50	SS-3	-	-	-	-	-	-	-	-	-	15	A-6a (V)	
	711.8	8																
FILL: LOOSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -PETROLEUM ODOR AND ROOT FIBERS PRESENT IN SS-4		9	3 4 3	10	44	SS-4	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
	709.3	10																
LOOSE TO MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		11																
		12	3 4 4	11	44	SS-5	-	50	19	9	16	6	NP	NP	NP	11	A-1-b (0)	
		13																
		14	3 2 2	6	50	SS-6	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
		15																
		16	2 4 5	12	33	SS-7	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
	701.8	17																
VERY STIFF, DARK GRAY **SILTY CLAY**, SOME COARSE TO FINE SAND, MOIST.		18																
		19			63	ST-8	2.50	0	1	22	44	33	40	17	23	20	A-6b (13)	
	697.8	20																
DENSE TO VERY DENSE, BROWNISH GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST TO WET.		21																
		22																
		23																
		24	9 15 16	43	67	SS-9	-	-	-	-	-	-	-	-	-	7	A-2-4 (V)	
-INTRODUCED WATER @ 26.0'		25																
		26																
		27																
		28																
		29	15 26 29	76	33	SS-10	-	40	18	12	20	10	NP	NP	NP	7	A-2-4 (0)	
		30																
		31																
		32																
		33																
		34	35 44 35	109	72	SS-11	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	
-COBBLES PRESENT THROUGHOUT		35																
		36																
		37																
		38																
-ONE ROCK RECOVERED FROM BOTTOM OF SHOE IN SS-12		39	9 16 15	43	6	SS-12	-	-	-	-	-	-	-	-	-	0	A-2-4 (V)	
		40	19	-	0	3S-12A	-	-	-	-	-	-	-	-	-	-		
		41																
		42																
		43																
		44	7 14 17	43	61	SS-13	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	
	674.8	45	EOB															

NOTES: GROUNDWATER NOT ENCOUNTERED PRIOR TO INTRODUCTION OF WATER

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BNTONITE POWDER / 50 GAL WATER

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL114.dgn 12/27/2018 10:36:54 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME-55 (SN 386345)	STATION / OFFSET: 226+56.20 / 52.9' LT	EXPLORATION ID B-102-2-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 706.1 (MSL) EOB: 45.0 ft.	PAGE 1 OF 1
START: 2/26/15 END: 2/26/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92	LAT / LONG: 39.946802907, -83.015140045	

MATERIAL DESCRIPTION AND NOTES	ELEV. 706.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
0.3' - ASPHALT (4.0")	705.8																	
1.0' - CONCRETE (12.0")	704.8																	
0.3' - AGGREGATE BASE (3.0")	704.5																	
MEDIUM DENSE, BROWNISH GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP.	703.1		5 5 7	18	56	SS-1	-	-	-	-	-	-	-	-	-	10	A-2-6 (V)	
VERY DENSE, BROWNISH GRAY **GRAVEL**, "AND" COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT THROUGHOUT	698.1		6 17 19	55	100	SS-2	-	53	18	15	10	4	NP	NP	NP	4	A-1-a (0)	
			14 24 20	67	100	SS-3	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
MEDIUM DENSE TO DENSE, BROWNISH GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.	690.6		10 10 7	26	100	SS-4	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			4 7 3	15	56	SS-5	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
			11 13 11	37	78	SS-6	-	66	13	4	12	5	23	19	4	6	A-1-b (0)	
DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-8	684.1	W	11 14 17	48	0	SS-7	-	-	-	-	-	-	-	-	-	-		
			14	-	100	2S-7A	-	73	12	4	7	4	NP	NP	NP	11	A-1-a (0)	
			11 17 14	48	44	SS-8	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
MEDIUM DENSE TO DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET. -ROCK FRAGMENTS PRESENT THROUGHOUT	674.1		6 11 13	37	100	SS-9	-	-	-	-	-	-	-	-	-	19	A-1-b (V)	
			4 7 7	21	100	SS-10	-	59	15	6	14	6	24	19	5	12	A-1-b (0)	
DENSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET. -ROCK FRAGMENTS PRESENT THROUGHOUT	661.1	EOB	16 27 11	58	100	SS-11	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
			8 14 15	44	100	SS-12	-	32	36	13	13	6	NP	NP	NP	24	A-1-b (0)	
			14 28 37	100	100	SS-13	-	-	-	-	-	-	-	-	-	18	A-1-b (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 17.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 275 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 227+13.65 / 54.8' RT	EXPLORATION ID B-102-3-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 715.6 (MSL) EOB: 30.0 ft.	PAGE 1 OF 1
START: 2/26/15 END: 2/26/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.947091789, -83.014919601	

MATERIAL DESCRIPTION AND NOTES	ELEV. 715.6	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' - CONCRETE (9.0")	714.8																	
0.5' - AGGREGATE BASE (6.0")	714.3																	
STIFF TO VERY STIFF, BROWNISH GRAY **SILTY CLAY**, SOME FINE GRAVEL, SOME COARSE TO FINE SAND, DRY TO DAMP.			11 9 9	23	67	SS-1	3.00	-	-	-	-	-	-	-	-	5	A-6b (V)	
-ROCK FRAGMENTS PRESENT IN SS-2			10 12 6	23	72	SS-2	1.50	27	14	9	46	4	34	17	17	16	A-6b (5)	
	710.1																	
DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP TO MOIST.			32 15 11	34	33	SS-3	-	-	-	-	-	-	-	-	-	2	A-1-a (V)	
			8 15 14	38	56	SS-4	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
	705.1																	
VERY STIFF, DARK BROWNISH GRAY **SILTY CLAY**, SOME FINE GRAVEL, LITTLE COARSE TO FINE SAND, DAMP. -ROCK FRAGMENTS PRESENT IN SS-5			8 12 12	31	50	SS-5	3.50	34	14	6	24	22	40	18	22	12	A-6b (6)	
	702.6																	
VERY STIFF TO HARD, DARK GRAYISH BROWN **CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, LITTLE SILT, DAMP TO MOIST.			5 11 14	32	100	SS-6	4.50	-	-	-	-	-	-	-	-	32	A-7-6 (V)	
			6 8 6	18	89	SS-7	4.00	23	15	9	19	34	56	23	33	20	A-7-6 (13)	
	697.6																	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.			5 8 4	16	50	SS-8	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
			3 3 6	12	0	SS-9	-	-	-	-	-	-	-	-	-	-		
			24	-	0	3S-9A	-	-	-	-	-	-	-	-	-	-		
		W																
			7 10 11	27	100	SS-10	-	64	12	5	17	2	NP	NP	NP	15	A-1-b (0)	
	685.6	EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 28.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL116.dgn 12/27/2018 10:37:03 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 228+05.59 / 58.8' LT	EXPLORATION ID B-102-4-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 705.2 (MSL) EOB: 49.4 ft.	PAGE 1 OF 1
START: 2/4/15 END: 2/4/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.947144182, -83.015436296	

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)	BACK FILL
0.2' - TOPSOIL (2.0")	705.0																	
FILL: VERY DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST. -ROOT FIBERS AND IRON STAINING PRESENT IN SS-1	702.2	1	9 50/2"	-	88	SS-1	-	-	-	-	-	-	-	-	-	10	A-2-6 (V)	
DENSE TO VERY DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, DAMP.		4	15 13 23	47	100	SS-2	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
		7	8 32 25	74	78	SS-3	-	71	10	5	11	3	NP	NP	NP	4	A-1-a (0)	
LOOSE TO MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO WET.	697.2	9	18 11 9	26	83	SS-4	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
		12	20 11 9	26	94	SS-5	-	56	14	7	17	6	20	17	3	6	A-1-b (0)	
		14	6 7 10	22	50	SS-6	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
		17	4 5 5	13	39	SS-7	-	64	9	6	16	5	25	19	6	12	A-1-b (0)	
-ROCK FRAGMENTS PRESENT IN SS-7 AND SS-8	683.2	W 18																
		19	6 5 3	10	67	SS-8	-	-	-	-	-	-	-	-	-	23	A-1-b (V)	
VERY DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		24	19 28 40	88	100	SS-9	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.	678.2	29	7 8 11	25	100	SS-10	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
-HEAVING SANDS ENCOUNTERED @ 32.0'		34	14 12 12	31	100	SS-11	-	69	20	4	5	2	NP	NP	NP	12	A-1-a (0)	
-INTRODUCED WATER @ 35.0'	668.2																	
VERY DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		39	17 21 25	60	100	SS-12	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
DENSE, BROWN AND BLACK **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.	663.2	44	12 21 14	45	94	SS-13	-	-	-	-	-	-	-	-	-	17	A-1-b (V)	
HARD, GRAY **SANDY SILT**, "AND" FINE GRAVEL, LITTLE CLAY, DAMP.	658.2																	
	655.8	EOB 49	24 50/5"	-	100	SS-14	4.5+	37	10	13	24	16	22	13	9	9	A-4a (1)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 18.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 200 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750X (SN 310218)	STATION / OFFSET: 228+75.36 / 46.6' RT	EXPLORATION ID B-102-5-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 713.6 (MSL) EOB: 45.0 ft.	PAGE 1 OF 1
START: 2/2/15 END: 2/3/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 85.7	LAT / LONG: 39.947458593, -83.015245752	

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)	BACK FILL
0.5' - TOPSOIL (6.0")	713.1																	
MEDIUM DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST. -ROCK FRAGMENTS AND ROOT FIBERS PRESENT IN SS-1	710.6		3 8 5	19	28	SS-1	-	-	-	-	-	-	-	-	-	10	A-2-6 (V)	
VERY STIFF TO HARD, BROWNISH GRAY **SILTY CLAY**, SOME FINE GRAVEL, LITTLE COARSE TO FINE SAND, DRY TO DAMP. -ROCK FRAGMENTS PRESENT IN SS-2			5 21 9	43	56	SS-2	4.5+	26	9	6	29	30	39	21	18	13	A-6b (8)	
			3 3 5	11	56	SS-3	3.00	-	-	-	-	-	-	-	-	18	A-6b (V)	
	705.6																	
VERY STIFF TO HARD, BROWN AND BLACK TO BROWNISH GRAY **CLAY**, "AND" SILT, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. -ROCK FRAGMENTS IN SS-4			9 9 5	20	33	SS-4	2.50	-	-	-	-	-	-	-	-	28	A-7-6 (V)	
-ORGANICS PRESENT IN SS-5			4 4 5	13	67	SS-5	4.5+	0	1	4	47	48	46	26	20	29	A-7-6 (13)	
			3 3 7	14	89	SS-6	3.50	-	-	-	-	-	-	-	-	26	A-7-6 (V)	
			5 6 7	19	100	SS-7	3.00	-	-	-	-	-	-	-	-	26	A-7-6 (V)	
			2 5 5	14	100	SS-8	2.50	1	3	4	38	54	52	21	31	27	A-7-6 (18)	
	691.6																	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.			5 7 9	23	78	SS-9	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
	686.6																	
MEDIUM DENSE, BLACK **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, TRACE SILT, TRACE CLAY, WET.		W																
			4 4 12	23	100	SS-10	-	15	28	44	8	5	NP	NP	NP	22	A-3a (0)	
-COBBLES PRESENT @ 31.0'	681.6																	
DENSE, BROWN AND BLACK **GRAVEL**, "AND" COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -HEAVING SANDS ENCOUNTERED @ 33.5' -INTRODUCED WATER @ 33.5'			17 12 13	36	39	SS-11	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	
			19 20 15	50	0	SS-12	-	-	-	-	-	-	-	-	-	-		
			39	-	100	3S-12A	-	50	30	9	8	3	NP	NP	NP	10	A-1-a (0)	
	671.6																	
VERY DENSE, BLACK AND GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.			21 17 29	66	100	SS-13	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
	668.6	EOB																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 28.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750 (SN 98048)	STATION / OFFSET: 3016+76.27 / 75.2' RT	EXPLORATION ID B-102-6-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C3	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 700.5 (MSL) EOB: 44.0 ft.	PAGE 1 OF 1
START: 2/6/15 END: 2/6/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92.9	LAT / LONG: 39.947404459, -83.015822670	

MATERIAL DESCRIPTION AND NOTES	ELEV. 700.5	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
0.2' - TOPSOIL (2.0")	700.3																	
MEDIUM DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, MOIST.			10 8 3	17	39	SS-1	-	76	7	3	11	3	NP	NP	NP	8	A-1-a (0)	
-COBBLES PRESENT @ 4.0'			10 5 5	15	33	SS-2	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
			6 6 4	15	22	SS-3	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
	692.5																	
LOOSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP.			2 3 5	12	33	SS-4	-	64	6	5	17	8	30	19	11	14	A-2-6 (0)	
	690.0																	
LOOSE TO MEDIUM DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, MOIST TO WET.		W	1 1 2	5	44	SS-5	-	-	-	-	-	-	-	-	-	14	A-1-a (V)	
			2 3 4	11	33	SS-6	-	-	-	-	-	-	-	-	-	19	A-1-a (V)	
-INTRODUCED MUD @ 15.0'	685.0																	
DENSE TO VERY DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, MOIST.			13 15 17	50	100	SS-7	-	68	12	5	13	2	NP	NP	NP	13	A-1-a (0)	
-ROCK FRAGMENTS PRESENT IN SS-7			13 15 23	59	50	SS-8	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
			15 17 23	62	56	SS-9	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
	673.5																	
MEDIUM DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.			18 10 9	29	50	SS-10	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
	668.5																	
VERY DENSE, GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.			19 13 45	90	100	SS-11	-	21	3	45	29	2	NP	NP	NP	17	A-2-4 (0)	
-ROCK FRAGMENTS PRESENT IN SS-11	663.5																	
VERY DENSE, GRAY AND BLACK **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.			25 25 26	79	100	SS-12	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
-HEAVING SANDS ENCOUNTERED @ 38.5'																		
-ROCK FRAGMENTS PRESENT IN SS-13																		
AUGER REFUSAL @ 44.0'	656.5	EOB	50/2"	-	100	SS-13	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 11.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / M.W.	DRILL RIG: CME 55 (SN 386345)	STATION / OFFSET: 5005+64.39 / 28.4' RT	EXPLORATION ID B-102-7-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP A5	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 720.0 (MSL) EOB: 67.5 ft.	PAGE 1 OF 2
START: 11/11/15 END: 11/11/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92	LAT / LONG: 39.947591682, -83.014429305	

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)	BACK FILL
0.2' - TOPSOIL (1.5")	720.0																	
FILL: VERY STIFF, DARK BROWN **SILTY CLAY**, SOME FINE GRAVEL, SOME COARSE TO FINE SAND, DAMP.	719.8		3 5 6	17	94	SS-1	4.00	31	13	12	23	21	39	23	16	13	A-6b (4)	
-BRICK AND ROCK FRAGMENTS PRESENT THROUGHOUT			4 6 8	21	61	SS-2	-	-	-	-	-	-	-	-	-	13	A-6b (V)	
FILL: STIFF, DARK BROWN **CLAY**, "AND" SILT, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	713.0		4 2 2	6	0	SS-3	-	-	-	-	-	-	-	-	-	-		
-COBBLES PRESENT @ 10.8'			2	-	0	3S-3A	-	-	-	-	-	-	-	-	-	-		
-WOOD AND CLAY TILE FRAGMENTS PRESENT IN SS-4			3 2 2	6	100	SS-4	1.25	9	8	9	37	37	48	23	25	44	A-7-6 (15)	
VERY STIFF, BROWNISH GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.	704.5		3 4 7	17	0	SS-5	-	-	-	-	-	-	-	-	-	-		
-ROCK FRAGMENTS PRESENT IN 3S-5A	702.0		6	-	100	3S-5A	-	-	-	-	-	-	-	-	-	14	A-6a (V)	
MEDIUM DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.	699.5		5 5 6	17	0	SS-6	-	-	-	-	-	-	-	-	-	-		
VERY STIFF, DARK BROWNISH GRAY **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.			7	-	100	3S-6A	-	62	12	5	12	9	25	15	10	9	A-2-4 (0)	
	694.5		4 5 6	17	100	SS-7	3.00	-	-	-	-	-	-	-	-	27	A-6b (V)	
			2 2 3	8	89	SS-8	2.75	12	14	17	26	31	39	18	21	21	A-6b (9)	
MEDIUM DENSE, BROWNISH GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.	692.0		3 4 4	12	39	SS-9	-	-	-	-	-	-	-	-	-	13	A-2-6 (V)	
LOOSE TO MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.	687.0	W	2 2 3	8	44	SS-10	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
			5 7 9	25	72	SS-11	-	65	12	6	12	5	NP	NP	NP	10	A-1-b (0)	
DENSE TO VERY DENSE, BROWN TO GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.			6 9 33	64	100	SS-12	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
-COBBLE PRESENT THROUGHOUT			10 15 15	46	100	SS-13	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
			50/6"	-	100	SS-14	-	46	30	11	10	3	NP	NP	NP	10	A-1-b (0)	
	668.0		26 36 43	121	61	SS-15	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
HARD, GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.			40 50/3"	-	100	SS-16	4.5+	-	-	-	-	-	-	-	-	10	A-6a (V)	
-COBBLES PRESENT @ 59.5'			29 41 47	135	44	SS-17	4.5+	18	10	9	36	27	28	16	12	9	A-6a (6)	

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:47 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

PID: 77372	BR ID: N/A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5005+64.39 / 28.4 RT	START: 11/11/15	END: 11/11/15	PG 2 OF 2	B-102-7-15

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)	BACK FILL
HARD, GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP. *(continued)*	660.0	61																
		62																
		63																
		64	12 13 17	46	100	SS-18	4.5+	-	-	-	-	-	-	-	-	11	A-6a (V)	
		65																
		66																
AUGER REFUSAL @ 67.5'	652.5	67 EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 28.5' AND AT COMPLETION @ 30.0'; CAVE-IN DEPTH @ 51.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 150 LBS BENTONITE CHIPS AND SOIL CUTTINGS

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:47 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL119.dgn 12/27/2018 10:37:21 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750 (SN 98048)	STATION / OFFSET: 3015+16.32 / 74.2' RT	EXPLORATION ID B-103-1-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C3	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 703.3 (MSL) EOB: 54.3 ft.	PAGE 1 OF 1
START: 3/26/15 END: 3/27/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92.9	LAT / LONG: 39.947764221, -83.016136629	

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)	BACK FILL
0.1' - TOPSOIL (1.0")	703.2																	
STIFF TO VERY STIFF, DARK GRAY TO DARK GRAYISH BROWN **CLAY**, LITTLE TO "AND" SILT, TRACE TO SOME COARSE TO FINE SAND, TRACE TO SOME FINE GRAVEL, DAMP TO MOIST.		1	5 4 3	11	33	SS-1	1.50	-	-	-	-	-	-	-	-	28	A-7-6 (V)	
		2																
		3																
		4	1 6 7	20	100	SS-2	3.50	5	3	3	58	31	54	25	29	23	A-7-6 (18)	
		5																
		6	2 4 6	15	100	SS-3	3.50	-	-	-	-	-	-	-	-	24	A-7-6 (V)	
		7																
		8																
-ROCK FRAGMENTS PRESENT IN SS-4		9	1 4 4	12	78	SS-4	1.50	33	21	7	15	24	43	21	22	18	A-7-6 (4)	
	692.8	10																
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		11																
		12	5 8 7	23	33	SS-5	-	-	-	-	-	-	-	-	-	4	A-1-a (V)	
-COBBLES PRESENT @ 13.0'		13																
		14	7 14 10	37	0	SS-6	-	-	-	-	-	-	-	-	-	-		
		15	W 4	-	100	3S-6A	-	69	19	5	6	1	NP	NP	NP	14	A-1-a (0)	
		16																
		17	7 4 5	14	0	SS-7	-	-	-	-	-	-	-	-	-	-		
	685.3	18	6	-	100	3S-7A	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
DENSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		19	8 9 12	33	100	SS-8	-	-	-	-	-	-	-	-	-	17	A-1-b (V)	
-HEAVING SANDS ENCOUNTERED @ 18.5'		20																
-INTRODUCED MUD @ 20.0'		21																
		22																
		23																
		24	7 10 10	31	100	SS-9	-	37	51	4	5	3	NP	NP	NP	13	A-1-b (0)	
		25																
		26																
		27																
		28																
		29	6 18 16	53	100	SS-10	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
		30																
		31																
		32																
		33																
		34	7 16 16	50	100	SS-11	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
		35																
		36																
		37																
		38																
		39	21 10 12	34	67	SS-12	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
	661.3	40																
HARD, GRAY **SANDY SILT**, SOME CLAY, SOME FINE GRAVEL, DAMP.		41																
		42																
		43																
		44	10 34 45	122	100	SS-13	4.5+	23	13	17	25	22	22	12	10	10	A-4a (2)	
	656.3	45																
VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		46																
		47																
		48																
		49	17 27 30	88	100	SS-14	-	-	-	-	-	-	-	-	-	16	A-1-b (V)	
		50																
		51																
		52																
		53																
-ROCK FRAGMENTS PRESENT IN SS-15	649.0	54	30 50/4"	-	100	SS-15	-	34	39	13	8	6	NP	NP	NP	13	A-1-b (0)	
		EOB																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 15.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 250 LBS BENTONITE CHIPS AND SOIL CUTTINGS

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL120.dgn 12/27/2018 10:37:25 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 230+95.90 / 17.5' RT	EXPLORATION ID B-104-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B./J.P.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: FRA-71-1503L	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 4/26/13	ELEVATION: 714.5 (MSL) EOB: 70.5 ft.	PAGE 1 OF 2
START: 6/4/14 END: 6/26/14	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 77.7	LAT / LONG: 39.947937268, -83.015727886	

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
0.3' - TOPSOIL (4.0")	714.2																	
FILL: VERY STIFF TO HARD, DARK BROWN TO GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE TO SOME FINE GRAVEL, DAMP TO MOIST.		1	5 9 13	28	67	SS-1	4.25	-	-	-	-	-	-	-	-	11	A-6a (V)	
		2																
		3																
		4	11 9 10	25	67	SS-2	4.25	16	12	14	29	29	25	14	11	15	A-6a (5)	
		5																
		6																
		7	3 5 25	39	78	SS-3	4.50	-	-	-	-	-	-	-	-	17	A-6a (V)	
		8																
-ROCK FRAGMENTS PRESENT IN SS-4		9	6 6 9	19	33	SS-4	3.00	-	-	-	-	-	-	-	-	18	A-6a (V)	
		10																
-ORGANIC ODOR PRESENT IN SS-5		11																
		12	4 3 5	10	44	SS-5	3.50	32	18	10	19	21	31	16	15	18	A-6a (2)	
	701.5	13																
MEDIUM DENSE, BROWN **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, MOIST.		14	3 4 5	12	67	SS-6	-	0	10	59	21	10	NP	NP	NP	14	A-3a (0)	
	699.0	15																
MEDIUM DENSE TO VERY DENSE, BROWN TO BROWNISH GRAY **GRAVEL**, TRACE TO SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		16																
		17	14 21 17	49	67	SS-7	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	
		18																
W		19	9 11 14	32	100	SS-8	-	97	1	1	1	0	NP	NP	NP	8	A-1-a (0)	
		20																
W		21																
		22	5 12 13	32	89	SS-9	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
		23																
		24	10 11 11	28	100	SS-10	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	
		25																
		26																
		27	15 25 21	60	78	SS-11	-	68	12	10	6	4	NP	NP	NP	8	A-1-a (0)	
		28																
		29	13 17 21	49	100	SS-12	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	
		30																
	682.5	31																
MEDIUM DENSE TO VERY DENSE, DARK BROWNISH GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		32																
		33																
		34	10 11 11	28	100	SS-13	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
		35																
		36																
-COBBLES PRESENT FROM 35.0' TO 38.5'		37																
		38																
		39	50/2"	-	0	SS-14	-	-	-	-	-	-	-	-	-	-		
		40																
		41																
	672.5	42																
VERY LOOSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		43																
		44	3 1 1	3	100	SS-15	-	39	43	6	2	10	NP	NP	NP	12	A-1-b (0)	
		45																
		46																
	667.5	47																
VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		48																
-HEAVING SANDS ENCOUNTERED @ 48.5' -INTRODUCED MUD @ 48.5'		49	16 25 50/2"	-	100	SS-16	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
		50																
AUGER REFUSAL @ 51.0'	663.5	51																
GRANITE AND LIMESTONE BOULDERS.		52																
-BORING TERMINATED @ 54.0' ON 6-5-14. OFFSET BORING 5.0' NORTH AND CONTINUED SAMPLING @ 58.5' ON 6-26-14.		53	0		25	RC-1											CORE	
	660.5	54																
HARD, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.		55																
		56																
		57																
-COBBLES PRESENT THROUGHOUT		58																
		59	50/3"	-	33	SS-17	-	-	-	-	-	-	-	-	-	-	A-6a (V)	
			50/4"	-	50	3S-17A	-	-	-	-	-	-	-	-	-	11	A-6a (V)	

FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-104-1-13

DRAWN RRM
CHECKED BRT

PID: 89464	BR ID: FRA-71-1503L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 230+95.90 / 17.5 RT	START: 6/4/14	END: 6/26/14	PG 2 OF 2	B-104-1-13

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
	654.5																	
LIMESTONE : GRAY, UNWEATHERED, VERY STRONG, VERY THICK BEDDED, CALCAREOUS, SILICEOUS, CHERTY, DOLOMITIC, CRYSTALLINE, SLIGHTLY TO MODERATELY FRACTURED, OPEN APERTURES, SLIGHTLY TO VERY ROUGH; RQD 73%, REC 95%.	654.0	TR																
		61																
		62																
		63	75		100	RC-2											CORE	
-QU @ 65.5' = 8,783 PSI		64																
		65																
		66																
		67																
		68	70		90	RC-3											CORE	
		69																
	644.0	70 EOB																

NOTES: SEEPAGE ENCOUNTERED @ 18.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 21.0'; CAVE-IN DEPTH @ 45.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL122.dgn 12/27/2018 10:37:33 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 5008+89.52 / 6.5' LT	EXPLORATION ID B-105-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP A5	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 716.0 (MSL) EOB: 49.8 ft.	PAGE 1 OF 1
START: 6/4/13 END: 6/4/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 82.6	LAT / LONG: 39.948450631, -83.014730556	

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)	BACK FILL
0.6' - TOPSOIL (7.0")	716.0 / 715.4																	
FILL: STIFF TO HARD, BROWN TO DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DRY TO MOIST.		1–2	7 8 6	19	50	SS-1	4.50	-	-	-	-	-	-	-	-	7	A-6a (V)	
-ASPHALT FRAGMENTS PRESENT IN SS-2		3–5	3 2 3	7	56	SS-2	2.75	15	11	16	39	19	36	21	15	18	A-6a (7)	
		6–7	2 3 3	8	56	SS-3	1.75	-	-	-	-	-	-	-	-	24	A-6a (V)	
	708.0	8																
FILL: LOOSE, BROWN **GRAVEL AND SAND**, TRACE SILT, MOIST.	705.5	9–10	3 3 2	7	33	SS-4	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
STIFF, DARK GRAY TO BROWNISH GRAY **CLAY**, "AND" SILT, TRACE COARSE TO FINE SAND, MOIST.		11–12	2 2 2	6	50	SS-5	1.25	-	-	-	-	-	-	-	-	24	A-7-6 (V)	
-ROOT FIBERS PRESENT IN SS-6		14–15	1 3 4	10	61	SS-6	2.00	-	-	-	-	-	-	-	-	30	A-7-6 (V)	
-CONSOLIDATION TEST PERFORMED @ 16.3' -TRIAXIAL COMPRESSION TEST PERFORMED @ 16.5'	698.0	17			96	ST-7	2.00	0	1	8	46	45	48	22	26	24	A-7-6 (16)	
STIFF, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.		19–20	2 4 4	11	61	SS-8	1.25	-	-	-	-	-	-	-	-	15	A-6a (V)	
-COBBLES PRESENT @ 22.0'	694.0																	
VERY DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.	689.0	24–25	6 24 25	67	78	SS-9	-	34	29	10	19	8	NP	NP	NP	7	A-2-4 (0)	
DENSE TO VERY DENSE, BROWN TO GRAY **GRAVEL**, SOME COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, MOIST. -HEAVING SANDS ENCOUNTERED @ 28.0' -INTRODUCED MUD @ 28.0'	W	29–30	13 16 14	41	61	SS-10	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
		34–35	22 25 30	76	50	SS-11	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
		39–40	14 12 18	41	50	SS-12	-	51	23	12	11	3	NP	NP	NP	14	A-1-a (0)	
		44–45	15 16 14	41	50	SS-13	-	-	-	-	-	-	-	-	-	14	A-1-a (V)	
	669.0																	
HARD, GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.	666.3	49	19 47 50/3"	-	80	SS-14	4.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
	EOB																	

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 28.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BNTONITE POWDER / 50 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-71-1503L
START: 6/30/14 END: 7/2/14

DRILLING FIRM / OPERATOR: RII / J.K.
SAMPLING FIRM / LOGGER: RII / J.P.
DRILLING METHOD: 3.25" HSA / NQ
SAMPLING METHOD: SPT / RC

DRILL RIG: MOBILE B-53 (SN 624400)
HAMMER: AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 77.7

STATION / OFFSET: 232+68.59 / 24.4' RT
ALIGNMENT: BL I-71 SB
ELEVATION: 707.0 (MSL) EOB: 66.0 ft.
LAT / LONG: 39.948370122, -83.015953098

EXPLORATION ID: B-105-2-13

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
0.3' - TOPSOIL (4.0")	706.7																	
FILL: VERY STIFF, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -BRICK FRAGMENTS PRESENT IN SS-1	704.0		3 5 10	19	100	SS-1	3.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
FILL: VERY DENSE, BLACK **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP. -ASPHALT FRAGMENTS PRESENT IN SS-2	701.5		23 42 17	76	89	SS-2	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
STIFF TO VERY STIFF, BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.	696.5		5 5 6	14	89	SS-3	2.00	3	11	24	30	32	36	17	19	18	A-6b (9)	
			6 8 9	22	83	SS-4	3.00	-	-	-	-	-	-	-	-	15	A-6b (V)	
STIFF, LIGHT BROWN **SILT**, SOME CLAY, LITTLE COARSE TO FINE SAND, MOIST.	694.0		3 3 5	10	67	SS-5	1.50	0	1	10	68	21	23	18	5	19	A-4b (8)	
MEDIUM DENSE TO DENSE, BROWN TO MOTTLED BROWN AND GRAY **GRAVEL**, TRACE TO SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-6		W	6 6 5	14	61	SS-6	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
			6 9 10	25	67	SS-7	-	91	4	2	3	0	NP	NP	NP	12	A-1-a (0)	
			10 10 14	31	100	SS-8	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
			10 10 20	39	83	SS-9	-	67	16	7	7	3	NP	NP	NP	12	A-1-a (0)	
			15 15 20	45	78	SS-10	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
-ROCK FRAGMENTS PRESENT IN SS-11			20 19 14	43	89	SS-11	-	-	-	-	-	-	-	-	-	15	A-1-a (V)	
			15 9 7	21	100	SS-12	-	63	21	7	7	2	NP	NP	NP	7	A-1-a (0)	
	676.0																	
-GRANITE BOULDER.	675.5		0		50	RC-1												CORE
DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -ENCOUNTERED GRANITE BOULDER @ 31.0' ON 6-30-14. CORED THROUGH BOULDER TO 31.5' ON 7-1-14 AND TERMINATED BORING. OFFSET HOLE 5.0' NORTH AND RESUMED SAMPLING @ 33.5' ON 7-2-14.			8 19 15	44	100	SS-13	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
			18 19 20	51	89	SS-14	-	47	23	11	14	5	NP	NP	NP	13	A-1-b (0)	
			9 16 40	73	67	SS-15	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
	660.0																	
VERY DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, MOIST.			50/3"	-	100	SS-16	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
	655.0																	
HARD, BROWN **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.			35 50/4"	-	100	SS-17	4.5+	23	20	15	22	20	23	14	9	7	A-4a (1)	
AUGER REFUSAL @ 56.0'	651.0	TR																
LIMESTONE : GRAY, UNWEATHERED, VERY STRONG, VERY THICK BEDDED, CALCAREOUS, CRYSTALLINE, SILICEOUS, MODERATELY TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 56%, REC 95%. -QU @ 56.3' = 11,854 PSI			36		90	RC-2												CORE

FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-105-2-13

DRAWN RRM
CHECKED BRT

PID: 89464	BR ID: FRA-71-1503L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 232+68.59 / 24.4 RT	START: 6/30/14	END: 7/2/14	PG 2 OF 2	B-105-2-13

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
LIMESTONE : GRAY, UNWEATHERED, VERY STRONG, VERY THICK BEDDED, CALCAREOUS, CRYSTALLINE, SILICEOUS, MODERATELY TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 56%, REC 95%. *(continued)*	647.0	61	77		100	RC-3											CORE	
	641.0	EOB 66																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 16.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL125.dgn 12/27/2018 10:37:45 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME-55 (SN 386345)	STATION / OFFSET: 3014+37.27 / 37.7' LT	EXPLORATION ID B-105-3-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C3	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 719.4 (MSL) EOB: 55.0 ft.	PAGE 1 OF 1
START: 4/27/15 END: 4/28/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92	LAT / LONG: 39.948117531, -83.015969846	

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)	BACK FILL
0.3' - ASPHALT (4.0")	719.4																	
0.8' - CONCRETE (9.5")	719.1																	
0.5' - AGGREGATE BASE (6.0")	718.3																	
FILL: VERY STIFF TO HARD, GRAYISH BROWN **SANDY SILT**, LITTLE TO SOME CLAY, LITTLE TO SOME FINE GRAVEL, DAMP. -ROCK FRAGMENTS PRESENT IN SS-2	717.8	1	3 6 8	21	33	SS-1	4.5+	-	-	-	-	-	-	-	-	12	A-4a (V)	
		2	3 5 14	29	89	SS-2	4.5+	20	10	15	33	22	26	16	10	13	A-4a (4)	
		3	4 7 7	21	100	SS-3	3.25	34	13	12	27	14	26	16	10	13	A-4a (1)	
		4	2 5 6	17	100	SS-4	2.25	-	-	-	-	-	-	-	-	15	A-4a (V)	
VERY DENSE, DARK GRAY **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, LITTLE SILT, DAMP. -ROCK FRAGMENTS PRESENT IN SS-5	708.9	5	13 23 21	67	100	SS-5	-	-	-	-	-	-	-	-	-	5	A-3a (V)	
VERY DENSE, DARK BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.	706.4	6	4 24 29	81	100	SS-6	-	44	16	12	19	9	25	16	9	8	A-2-4 (0)	
		7	13 33 21	83	100	SS-7	-	-	-	-	-	-	-	-	-	5	A-2-4 (V)	
HARD, BROWN **CLAY**, "AND" SILT, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	701.4	8	4 8 10	28	89	SS-8	4.5+	3	4	9	36	48	43	22	21	22	A-7-6 (13)	
DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP.	697.4	9	7 9 11	31	100	SS-9	-	-	-	-	-	-	-	-	-	7	A-2-6 (V)	
HARD, BROWN **SANDY SILT**, SOME CLAY, LITTLE FINE GRAVEL, MOIST.	694.7	10					-	11	5	24	33	27	23	14	9	16	A-4a (5)	
MEDIUM DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST. -INTRODUCED MUD @ 28.5'	692.4	W 11	3 11 5	25	67	SS-10	-	-	-	-	-	-	-	-	-	13	A-2-6 (V)	
DENSE TO VERY DENSE, BROWN TO GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.	687.4	12	14 19 27	71	72	SS-11	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
		13	9 17 8	38	100	SS-12	-	55	25	6	10	4	22	18	4	10	A-1-a (0)	
		14	3 13 13	40	72	SS-13	-	-	-	-	-	-	-	-	-	13	A-1-a (V)	
-HEAVING SANDS ENCOUNTERED @ 48.5'		15	23 30 44	113	100	SS-14	-	63	21	9	5	2	NP	NP	NP	7	A-1-a (0)	
	664.4	EOB 16	7 25 22	72	100	SS-15	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 28.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL126.dgn 12/27/2018 10:37:49 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750X (SN 310218)	STATION / OFFSET: 3013+70.11 / 102.6' RT	EXPLORATION ID B-105-4-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C3	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 700.0 (MSL) EOB: 45.0 ft.	PAGE 1 OF 1
START: 2/17/15 END: 2/18/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 85.7	LAT / LONG: 39.948055710, -83.016519556	

MATERIAL DESCRIPTION AND NOTES	ELEV. 700.0	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
0.3' - TOPSOIL (4.0")	699.7																	
VERY STIFF TO HARD, BROWN **CLAY**, "AND" SILT, TRACE COARSE TO FINE SAND, DAMP TO MOIST. -ROOT FIBERS PRESENT IN SS-1		1 2 3 4 5	4 7 7	20	100	SS-1	4.25	0	1	5	40	54	54	22	32	24	A-7-6 (19)	
			2 3 3	9	33	SS-2	2.75	-	-	-	-	-	-	-	-	20	A-7-6 (V)	
	694.5																	
LOOSE TO MEDIUM DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP TO MOIST. -IRON STAINING PRESENT IN SS-3		6 7 8	2 3 2	7	39	SS-3	-	-	-	-	-	-	-	-	-	9	A-2-6 (V)	
		W 9 10	2 3 5	11	44	SS-4	-	-	-	-	-	-	-	-	-	13	A-2-6 (V)	
	689.5																	
VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		W 11 12 13	9 20 30	71	100	SS-5	-	66	12	10	9	3	NP	NP	NP	14	A-1-a (0)	
-ROCK FRAGMENTS AND PETROLEUM ODOR PRESENT IN SS-6 -COBBLES ENCOUNTERED @ 14.0'		14 15	22 23 25	69	100	SS-6	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
	684.5																	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, WET. -HEAVING SANDS ENCOUNTERED @ 16.0' -INTRODUCED MUD @ 16.0'		16 17 18	3 5 7	17	100	SS-7	-	22	37	25	12	4	NP	NP	NP	21	A-1-b (0)	
		19 20 21	5 6 7	19	100	SS-8	-	-	-	-	-	-	-	-	-	25	A-1-b (V)	
	678.0																	
MEDIUM DENSE, BROWN **SANDY SILT**, LITTLE FINE GRAVEL, TRACE CLAY, MOIST. -IRON STAINING PRESENT IN SS-9		22 23 24 25	3 7 7	20	100	SS-9	-	20	11	30	33	6	NP	NP	NP	19	A-4a (1)	
	673.0																	
DENSE TO VERY DENSE, GRAY **GRAVEL**, "AND" COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		26 27 28 29	13 15 12	39	100	SS-10	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
		30 31 32 33 34	21 19 31	71	100	SS-11	-	55	29	7	6	3	NP	NP	NP	11	A-1-a (0)	
		35 36 37 38 39	19 28 29	81	78	SS-12	-	-	-	-	-	-	-	-	-	18	A-1-a (V)	
	658.0																	
VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-13	655.0	40 41 42 43 44 EOB 45	20 28 31	84	100	SS-13	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	

NOTES: SEEPAGE ENCOUNTERED @ 8.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 11.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 200 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: STOCK / C/T	DRILL RIG: BK 81 HD (SN 810792.111)	STATION / OFFSET: 3012+82.16 / 42.1' LT	EXPLORATION ID B-105-5-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C3	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 3/28/13	ELEVATION: 723.9 (MSL) EOB: 50.0 ft.	PAGE 1 OF 1
START: 4/17/15 END: 4/17/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 72.3	LAT / LONG: 39.948475867, -83.016258220	

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)	BACK FILL
0.3' - ASPHALT (3.0")	723.6																	
0.5' - CONCRETE (6.0")	723.1																	
0.5' - AGGREGATE BASE (6.0")	722.6																	
FILL: VERY STIFF TO HARD, BROWNISH GRAY TO GRAY **SILT AND CLAY**, LITTLE TO SOME COARSE TO FINE SAND, LITTLE TO SOME FINE GRAVEL, DAMP TO MOIST. -ROCK FRAGMENTS PRESENT IN SS-1	723.9	1–4	3 6 7	16	50	SS-1	2.25	27	12	13	26	22	29	16	13	13	A-6a (4)	
		9–10	4 7 10	20	0	SS-2	-	-	-	-	-	-	-	-	-	-	-	
		11–12	3 6 9	18	89	SS-3	4.50	-	-	-	-	-	-	-	-	20	A-6a (V)	
		14–15	4 9 12	25	100	SS-4	4.00	14	6	13	40	27	27	16	11	14	A-6a (7)	
	708.4																	
FILL: VERY DENSE, DARK GRAY TO BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, DAMP. -ROCK FRAGMENTS PRESENT THROUGHOUT	703.4	16–17	9 29 44	88	100	SS-5	-	25	22	25	17	11	NP	NP	NP	7	A-2-4 (0)	
		19	50/3"	-	100	SS-6	-	-	-	-	-	-	-	-	-	7	A-2-4 (V)	
FILL: MEDIUM DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP. -CHEMICAL ODOR PRESENT IN SS-7A	702.2	21–22	33 9 10	23	100	SS-7	- 4.5+	-	-	-	-	-	-	-	-	6 23	A-1-b (V) A-6b (V)	
HARD, DARK GRAY AND BLACK TO BROWN **SILTY CLAY**, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. -ORGANICS PRESENT THROUGHOUT	698.4	24–25	6 7 10	20	100	SS-8	4.5+	-	-	-	-	-	-	-	-	19	A-6b (V)	
VERY STIFF, BROWN **SILT**, LITTLE COARSE TO FINE SAND, LITTLE CLAY, LITTLE FINE GRAVEL, MOIST. -ROCK FRAGMENTS PRESENT IN SS-9	695.9	26–27	4 5 10	18	100	SS-9	2.50	11	3	13	56	17	22	17	5	20	A-4b (8)	
MEDIUM DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-10	691.9	29–30	4 11 12	28	67	SS-10	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -HEAVING SANDS ENCOUNTERED @ 33.5' -INTRODUCED WATER @ 33.5'		W 33–34	23 29 27	67	100	SS-11	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	
-COBBLES AND BOULDERS ENCOUNTERED @ 38.0'		39	3 33 37	84	100	SS-12	-	60	18	7	9	6	20	17	3	10	A-1-a (0)	
-ROCK FRAGMENTS PRESENT THROUGHOUT	676.9	44	29 26 32	70	100	SS-13	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.	673.9	EOB 49–50	2 14 17	37	100	SS-14	-	66	16	2	11	5	21	17	4	8	A-1-b (0)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 33.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL128.dgn 12/27/2018 10:38:19 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750 (SN 98048)	STATION / OFFSET: 3012+25.98 / 120.3' RT	EXPLORATION ID B-105-6-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C3	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 703.0 (MSL) EOB: 35.0 ft.	PAGE 1 OF 1
START: 3/25/15 END: 3/25/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92.9	LAT / LONG: 39.948372985, -83.016857114	

MATERIAL DESCRIPTION AND NOTES	ELEV. 703.0	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
0.3' - ASPHALT (4.0")	702.7																	
0.7' - FILL MATERIAL (8.0")	702.0																	
VERY STIFF, DARK GRAY TO DARK BROWNISH GRAY **CLAY**, "AND" SILT, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.			3 5 6	17	89	SS-1	2.75	2	7	3	62	26	43	26	17	31	A-7-6 (11)	
			3 3 6	14	50	SS-2	-	-	-	-	-	-	-	-	-	24	A-7-6 (V)	
MEDIUM DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.	697.5		1 5 6	17	33	SS-3	-	-	-	-	-	-	-	-	-	15	A-2-6 (V)	
MEDIUM DENSE TO DENSE, BROWN TO GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.	695.0	W	2 6 6	19	39	SS-4	-	60	25	7	5	3	NP	NP	NP	12	A-1-a (0)	
			2 6 8	22	44	SS-5	-	-	-	-	-	-	-	-	-	17	A-1-a (V)	
-PETROLEUM ODOR PRESENT IN SS-6 AND SS-7		W	4 5 4	14	56	SS-6	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
			6 7 4	17	100	SS-7	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
-HEAVING SANDS ENCOUNTERED @ 20.0'			11 17 14	48	100	SS-8	-	65	26	0	7	2	NP	NP	NP	10	A-1-a (0)	
			10 17 14	48	56	SS-9	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.	676.0		7 14 21	54	100	SS-10	-	38	32	7	13	10	NP	NP	NP	11	A-1-b (0)	
-ROCK FRAGMENTS PRESENT IN SS-11	668.0	EOB	12 22 17	60	56	SS-11	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	

NOTES: SEEPAGE ENCOUNTERED @ 8.5'; GROUNDWATER INITIALLY ENCOUNTERED @ 13.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 200 LBS BENTONITE CHIPS AND SOIL CUTTINGS

FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-105-6-14

DRAWN RRM
CHECKED BRT

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / M.W.	DRILL RIG: CME 55 (SN 386345)	STATION / OFFSET: 5008+41.36 / 47.3' RT	EXPLORATION ID B-105-7-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP A5	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 720.1 (MSL) EOB: 68.9 ft.	PAGE 1 OF 2
START: 10/28/15 END: 10/28/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92	LAT / LONG: 39.948333180, -83.014523361	

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)	BACK FILL
0.8' - ASPHALT (9.0")	720.1																	
0.4' - AGGREGATE BASE (4.0")	719.3																	
FILL: MEDIUM DENSE, GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.	718.9		11 6 6	18	39	SS-1	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	
FILL: MEDIUM DENSE, GRAYISH BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.	717.1		3 3 5	12	0	SS-2	-	-	-	-	-	-	-	-	-	-		
			7	-	100	3S-2A	-	76	8	4	8	4	-	-	-	13	A-1-a (V)	
			3 5 6	17	0	SS-3	-	-	-	-	-	-	-	-	-	-		
	712.1		8	-	100	3S-3A	-	-	-	-	-	-	-	-	-	16	A-1-a (V)	
FILL: LOOSE, DARK GRAY AND BLACK **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, WET.	709.6		3 2 2	6	33	SS-4	-	24	32	12	20	12	39	35	4	28	A-2-4 (0)	
FILL: LOOSE TO DENSE, DARK GRAY AND BLACK **GRAVEL**, WET. -LARGE CHUNK OF WOOD RECOVERED IN SS-5			11 15 15	46	17	SS-5	-	-	-	-	-	-	-	-	-	92	A-1-a (V)	
			3 1 3	6	0	SS-6	-	-	-	-	-	-	-	-	-	-		
	705.1		6	-	100	3S-6A	1.25	5	5	11	45	34	43	23	20	33	A-7-6 (13)	
FILL: SOFT TO STIFF, DARK GRAY AND BLACK **CLAY**, "AND" SILT, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST, MODERATELY ORGANIC. -ORGANIC ODOR PRESENT IN SS-6A -WOOD FRAGMENTS PRESENT IN SS-7 -LOI @ 16.0' (SS-7) = 7.27 % -TILE FRAGMENTS PRESENT IN SS-8			1 2 2	6	44	SS-7	0.50	-	-	-	-	-	-	-	-	36	A-7-6 (V)	
			5 7 9	25	50	SS-8	1.00	-	-	-	-	-	-	-	-	34	A-7-6 (V)	
	698.1																	
STIFF, DARK BROWNISH GRAY **CLAY**, SOME SILT, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.	693.1		2 4 6	15	100	SS-9	1.25	16	8	9	33	34	47	22	25	31	A-7-6 (14)	
VERY DENSE, BROWNISH GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET. -ROCK FRAGMENTS PRESENT THROUGHOUT		W	19 24 25	75	100	SS-10	-	57	17	8	12	6	NP	NP	NP	8	A-1-b (0)	
			11 16 17	51	61	SS-11	-	-	-	-	-	-	-	-	-	64	A-1-b (V)	
	683.1																	
DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST. -INTRODUCED MUD @ 38.5'			7 9 13	34	44	SS-12	-	-	-	-	-	-	-	-	-	17	A-1-b (V)	
			6 11 12	35	67	SS-13	-	30	48	12	6	4	NP	NP	NP	17	A-1-b (0)	
	673.1																	
VERY DENSE, GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.	668.1		23 49 38	133	94	SS-14	-	-	-	-	-	-	-	-	-	7	A-2-4 (V)	
VERY DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -COBBLES PRESENT FROM 55.0' TO 58.0'			50/6"	-	100	SS-15	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
			37 50/5"	-	100	SS-16	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:47 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

PID: 77372	BR ID: N/A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5008+41.36 / 47.3 RT	START: 10/28/15	END: 10/28/15	PG 2 OF 2	B-105-7-15

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)	BACK FILL
VERY DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. *(continued)*	660.1	61 62 63 64 65 66 67 68	30 48 43	140	67	SS-17	-	57	18	10	9	6	NP	NP	NP	8	A-1-a (0)	
HARD, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.	653.1																	
AUGER REFUSAL @ 68.9'	651.2	EOB	50/4"	-	100	SS-18	-	-	-	-	-	-	-	-	-	10	A-6a (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 33.5'; CAVE-IN DEPTH @ 33.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:47 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL129.dgn 12/27/2018 10:38:23 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 5010+71.36 / 28.8' LT	EXPLORATION ID B-106-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP A5	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 712.7 (MSL) EOB: 50.0 ft.	PAGE 1 OF 1
START: 6/3/13 END: 6/3/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 82.6	LAT / LONG: 39.948941600, -83.014872189	

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)	BACK FILL
0.2' - TOPSOIL (2.0")	712.5																	
FILL: VERY STIFF, BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP. -STONE FRAGMENTS PRESENT IN SS-1	709.7		7 8 8	22	67	SS-1	2.50	-	-	-	-	-	-	-	-	11	A-6b (V)	
VERY STIFF TO HARD, BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP TO MOIST. -ROOT FIBERS PRESENT IN SS-2			3 2 2	6	44	SS-2	3.25	20	11	16	32	21	36	19	17	20	A-6b (6)	
	704.7		2 2 3	7	33	SS-3	4.5+	-	-	-	-	-	-	-	-	11	A-6b (V)	
STIFF, DARK BROWN **CLAY**, "AND" SILT, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.			3 2 3	7	56	SS-4	1.50	-	-	-	-	-	-	-	-	20	A-7-6 (V)	
	699.7		3 4 6	14	61	SS-5	2.00	1	1	8	56	34	42	23	19	26	A-7-6 (12)	
STIFF TO VERY STIFF, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.			2 4 5	12	61	SS-6	2.00	-	-	-	-	-	-	-	-	11	A-6a (V)	
-STONE FRAGMENTS PRESENT IN SS-7	694.7		8 8 13	29	53	SS-7	-	-	-	-	-	-	-	-	-	9	A-6a (V)	
VERY DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, DAMP.	690.7		10 15 27	58	53	SS-8	-	70	11	5	11	3	NP	NP	NP	5	A-1-a (0)	
DENSE, GRAYISH BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -COBBLES PRESENT @ 23.0'		W	9 14 17	43	50	SS-9	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
	685.7	W																
LOOSE, GRAY **FINE SAND**, LITTLE COARSE SAND, TRACE SILT, WET. -HEAVING SANDS ENCOUNTERED @ 30.0'	680.7		2 1 6	10	100	SS-10	-	-	-	-	-	-	-	-	-	23	A-3 (V)	
VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST. -INTRODUCED MUD @ 35.0'			18 30 34	88	39	SS-11	-	23	46	14	13	4	NP	NP	NP	11	A-1-b (0)	
	670.7		43 38 50/4"	-	81	SS-12	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
HARD, GRAY **SANDY SILT**, SOME CLAY, TRACE FINE GRAVEL, DRY TO DAMP. -STONE FRAGMENTS PRESENT IN SS-13			18 32 50/5"	-	65	SS-13	4.50	1	4	27	43	25	20	13	7	10	A-4a (7)	
	662.7	EOB	12 24 32	77	67	SS-14	4.50	-	-	-	-	-	-	-	-	8	A-4a (V)	

NOTES: SEEPAGE ENCOUNTERED @ 24.0'; GROUNDWATER INITIALLY ENCOUNTERED @ 25.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BNTONITE POWDER / 50 GAL WATER

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / M.W.	DRILL RIG: CME 55 (SN 386345)	STATION / OFFSET: 5011+26.22 / 74.0' RT	EXPLORATION ID B-106-2-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP A5	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 721.6 (MSL) EOB: 65.8 ft.	PAGE 1 OF 2
START: 10/29/15 END: 10/29/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92	LAT / LONG: 39.949118611, -83.014526096	

MATERIAL DESCRIPTION AND NOTES	ELEV. 721.6	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")	720.8																	
FILL: MEDIUM DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, MOIST.	716.1		4 10 7	26	33	SS-1	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
FILL: MEDIUM STIFF TO STIFF, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP.			4 3 4	11	56	SS-2	-	32	19	12	24	13	31	18	13	15	A-6a (1)	
-WOOD FIBERS, BRICK, GLASS AND COAL FRAGMENTS PRESENT THROUGHOUT			2 5 4	14	44	SS-3	1.25	-	-	-	-	-	-	-	-	17	A-6a (V)	
			3 2 1	5	0	SS-4	-	-	-	-	-	-	-	-	-	-		
	708.6		5	-	100	3S-4A	1.00	-	-	-	-	-	-	-	-	17	A-6a (V)	
MEDIUM STIFF TO STIFF, DARK BROWNISH GRAY **CLAY**, "AND" SILT, TRACE TO LITTLE COARSE TO FINE SAND, TRACE TO LITTLE FINE GRAVEL, MOIST.			3 4 4	12	89	SS-5	2.00	13	6	9	38	34	42	21	21	27	A-7-6 (12)	
			5 4 3	11	0	SS-6	-	-	-	-	-	-	-	-	-	-		
			6	-	100	3S-6A	1.00	-	-	-	-	-	-	-	-	26	A-7-6 (V)	
			6 3 4	11	0	SS-7	-	-	-	-	-	-	-	-	-	-		
			10	-	100	3S-7A	2.00	-	-	-	-	-	-	-	-	28	A-7-6 (V)	
			5 6 9	23	100	SS-8	3.00	6	2	6	42	44	46	23	23	28	A-7-6 (14)	
DENSE TO VERY DENSE, BROWNISH GRAY TO BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.			11 15 18	51	83	SS-9	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
		▼	13 13 8	32	89	SS-10	-	62	12	7	13	6	21	17	4	9	A-1-b (0)	
		W	15 17 19	55	100	SS-11	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		W	6 11 9	31	100	SS-12	-	26	42	15	11	6	NP	NP	NP	15	A-1-b (0)	
	679.6																	
MEDIUM DENSE, GRAY **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, WET.			5 4 5	14	78	SS-13	-	-	-	-	-	-	-	-	-	24	A-3a (V)	
-COBBLES PRESENT THROUGHOUT	674.6																	
HARD, GRAY **SANDY SILT**, SOME CLAY, LITTLE FINE GRAVEL, DAMP.			19 22 27	75	100	SS-14	4.5+	-	-	-	-	-	-	-	-	12	A-4a (V)	
			13 33 50	127	100	SS-15	4.5+	18	13	15	34	20	22	14	8	10	A-4a (4)	
			12 34 43	118	100	SS-16	4.5+	-	-	-	-	-	-	-	-	12	A-4a (V)	

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:47 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

PID: 77372	BR ID: N/A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5011+26.22 / 74.0 RT	START: 10/29/15	END: 10/29/15	PG 2 OF 2	B-106-2-15

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)	BACK FILL
HARD, GRAY **SANDY SILT**, SOME CLAY, LITTLE FINE GRAVEL, DAMP. *(continued)*	661.6	61																
		62																
		63																
-ROCK FRAGMENTS PRESENT IN SS-17		64	27 43 50/3"	-	100	SS-17	4.5+	-	-	-	-	-	-	-	-	11	A-4a (V)	
AUGER REFUSAL @ 65.8'	655.8	65 EOB																

NOTES: SEEPAGE ENCOUNTERED @ 33.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 38.5' AND AT COMPLETION @ 30.0'; CAVE-IN DEPTH @ 40.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

2014 STD ODOT BOR LOG (11X17) BRIDGE ID - OH DOT.GDT - 9/22/16 16:47 - U:\GI8\PROJECTS\2013\W-13-045.GPJ

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 235+33.88 / 0.3' LT	EXPLORATION ID B-107-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: FRA-71-1503L	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 4/26/13	ELEVATION: 704.0 (MSL) EOB: 65.8 ft.	PAGE 1 OF 2
START: 12/22/14 END: 1/2/15	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 77.7	LAT / LONG: 39.949053857, -83.016255140	

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
0.6' - TOPSOIL (7.0")	704.0 / 703.4																	
FILL: VERY STIFF, DARK GRAY AND BLACK **SILTY CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.	701.0	1	4 3 5	10	50	SS-1	2.50	-	-	-	-	-	-	-	-	18	A-6b (V)	
LOOSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST. -ROOT FIBERS PRESENT IN SS-2	698.5	4	2 4 3	9	44	SS-2	-	-	-	-	-	-	-	-	-	14	A-2-4 (V)	
LOOSE, DARK BROWN **COARSE AND FINE SAND**, LITTLE CLAY, LITTLE SILT, MOIST.	696.0	7	6 4 3	9	78	SS-3	-	2	28	39	14	17	NP	NP	NP	10	A-3a (0)	
DENSE TO VERY DENSE, GRAY TO BROWN **GRAVEL**, TRACE TO SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		9	8 14 16	39	106	SS-4	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
		12	16 19 20	51	100	SS-5	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
		W 14	7 20 21	53	100	SS-6	-	94	3	1	1	1	19	17	2	9	A-1-a (0)	
-ROCK FRAGMENTS PRESENT IN SS-7		W 17	16 20 20	52	100	SS-7	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
		19	9 15 11	34	100	SS-8	-	-	-	-	-	-	-	-	-	13	A-1-a (V)	
		22	17 26 26	67	100	SS-9	-	57	29	6	7	1	NP	NP	NP	12	A-1-a (0)	
	678.5	24	12 14 16	39	100	SS-10	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST. -BORING TERMINATED @ 27.5' ON 12-22-14. OFFSET 5.0' NORTH AND CONTINUED SAMPLING @ 28.5' ON 12-30-14.	676.0	27	13 11 14	32	100	SS-11	-	43	43	7	6	1	NP	NP	NP	17	A-1-b (0)	
MEDIUM DENSE TO DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, WET.		29	15 13 12	32	100	SS-12	-	-	-	-	-	-	-	-	-	21	A-1-a (V)	
	667.5	34	5 6 7	17	83	SS-13	-	69	22	7	2	0	NP	NP	NP	21	A-1-a (0)	
VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		39	50/3"	-	100	SS-14	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
	662.0																	
HARD, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.	659.9	44	30 50/4"	-	100	SS-15	4.5+	20	14	16	32	18	20	13	7	9	A-4a (3)	
VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.							-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
		48	50/5"	-	100	SS-16	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
	650.2	53	50/1"	-	0	SS-17	-	-	-	-	-	-	-	-	-	-		
LIMESTONE : LIGHT GRAY TO BLUISH GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, THIN TO THICK BEDDED, CRYSTALLINE, FOSSILIFEROUS, STYOLITIC, SLIGHTLY TO MODERATELY FRACTURED, NARROW APERTURES, SLIGHTLY ROUGH; RQD 83%, REC 100%.	TR	54	100		100	RC-1											CORE	
-QU @ 59.6' = 4,898 PSI		58	80		100	RC-2											CORE	

PID: 89464	BR ID: FRA-71-1503L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 235+33.88 / 0.3 LT	START: 12/22/14	END: 1/2/15	PG 2 OF 2	B-107-1-13

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
LIMESTONE : LIGHT GRAY TO BLUISH GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, THIN TO THICK BEDDED, CRYSTALLINE, FOSSILIFEROUS, STYOLITIC, SLIGHTLY TO MODERATELY FRACTURED, NARROW APERTURES, SLIGHTLY ROUGH; RQD 83%, REC 100%. *(continued)*	644.0	61 62 63 64 65	80		100	RC-3											CORE	
	638.2	EOB																

NOTES: SEEPAGE ENCOUNTERED @ 13.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 16.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL132.dgn 12/27/2018 10:38:35 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: STOCK / T.B./B.Z.	DRILL RIG: BK 81 HD (SN 810792.111)	STATION / OFFSET: 3011+35.50 / 67.0' LT	EXPLORATION ID B-107-2-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / D.M.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C3	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 3/28/13	ELEVATION: 727.5 (MSL) EOB: 45.0 ft.	PAGE 1 OF 1
START: 4/13/15 END: 4/14/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 72.3	LAT / LONG: 39.948851596, -83.016450128	

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)	BACK FILL
0.3' - ASPHALT (3.0")	727.5																	
0.7' - CONCRETE (9.0")	726.5																	
FILL: STIFF, GRAY **SANDY SILT**, LITTLE FINE GRAVEL, TRACE CLAY, DAMP.																		
-ROCK FRAGMENTS PRESENT IN SS-1			4 5 5	12	72	SS-1	1.50	-	-	-	-	-	-	-	-	10	A-4a (V)	
	720.5																	
FILL: VERY STIFF, GRAY **SILTY CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.																		
-ASPHALT FRAGMENTS PRESENT IN SS-2			5 6 8	17	78	SS-2	3.50	-	-	-	-	-	-	-	-	13	A-6b (V)	
			7 7 9	19	94	SS-3	3.00	10	12	15	33	30	33	16	17	14	A-6b (8)	
	710.5																	
FILL: VERY STIFF, GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.																		
-ROCK FRAGMENTS PRESENT IN SS-4			7 11 17	34	83	SS-4	3.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
	707.0																	
FILL: VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST.			50/3"	-	0	SS-5	-	-	-	-	-	-	-	-	-	-		
			31 81 50/2"	-	100	SS-6	-	42	20	18	14	6	NP	NP	NP	5	A-1-b (0)	
-ASPHALT FRAGMENTS PRESENT IN SS-7			29 46 4	60	50	SS-7	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
	702.0																	
VERY STIFF, DARK BROWN **SILTY CLAY**, "AND" COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.			3 4 3	8	61	SS-8	3.00	18	21	22	21	18	37	18	19	14	A-6b (3)	
	699.5																	
MEDIUM DENSE, BROWNISH GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.			15 14 9	28	83	SS-9	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
	697.0																	
DENSE TO VERY DENSE, BROWNISH GRAY TO BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST.			11 30 35	78	89	SS-10	-	45	21	14	13	7	NP	NP	NP	5	A-1-b (0)	
-HEAVING SANDS ENCOUNTERED @ 35.0'		W	5 13 20	40	67	SS-11	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
-INTRODUCED MUD @ 35.0'																		
-ROCK FRAGMENTS PRESENT THROUGHOUT			8 21 36	69	61	SS-12	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
			4 13 20	40	44	SS-13	-	45	27	13	13	2	NP	NP	NP	9	A-1-b (0)	
	685.5																	
DENSE, BROWN **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, TRACE SILT, MOIST.			8 14 21	42	100	SS-14	-	-	-	-	-	-	-	-	-	15	A-3a (V)	
	682.5	EOB																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 35.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750 (SN 98048)	STATION / OFFSET: 3010+61.70 / 149.1' RT	EXPLORATION ID B-107-3-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C3	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 704.3 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 2/4/15 END: 2/4/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92.9	LAT / LONG: 39.948726068, -83.017248056	

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)	BACK FILL
0.3' - TOPSOIL (3.0")	704.0																	
FILL: HARD, BROWN **CLAY**, "AND" SILT, TRACE COARSE TO FINE SAND, DAMP. -BRICK AND ROCK FRAGMENTS PRESENT IN SS-1	701.3		2 2 3	8	6	SS-1	4.5+	-	-	-	-	-	-	-	-	21	A-7-6 (V)	
VERY STIFF, BROWN **CLAY**, "AND" SILT, TRACE COARSE TO FINE SAND, DAMP TO MOIST. -ROOT FIBERS PRESENT IN SS-2 AND SS-3	696.3		2 4 5	14	100	SS-2	3.75	0	1	3	48	48	55	24	31	27	A-7-6 (19)	
			3 3 8	17	100	SS-3	4.00	-	-	-	-	-	-	-	-	21	A-7-6 (V)	
MEDIUM DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.	693.8		4 5 6	17	44	SS-4	-	44	14	9	24	9	26	18	8	7	A-2-4 (0)	
DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST. -ROCK FRAGMENTS PRESENT THROUGHOUT			14 19 23	65	67	SS-5	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
-COBBLES PRESENT @ 15.0'	688.8		6 15 16	48	67	SS-6	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-7		W	4 5 7	19	56	SS-7	-	72	16	4	6	2	NP	NP	NP	13	A-1-a (0)	
-HEAVING SANDS ENCOUNTERED @ 20.0'	682.3		14 13 16	45	100	SS-8	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
HARD, GRAY **SANDY SILT**, LITTLE FINE GRAVEL, LITTLE CLAY, DAMP.	679.3	EOB	21 27 29	87	39	SS-9	4.5+	16	15	21	34	14	20	13	7	8	A-4a (3)	

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 16.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750 (SN 98048)	STATION / OFFSET: 3009+90.45 / 162.2' RT	EXPLORATION ID B-107-4-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C3	
PID: 89464 BR ID: N/A	DRILLING METHOD: 4.5" CFA	CALIBRATION DATE: 10/20/14	ELEVATION: 705.1 (MSL) EOB: 20.0 ft.	PAGE 1 OF 1
START: 2/4/15 END: 2/4/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92.9	LAT / LONG: 39.948867841, -83.017410893	

MATERIAL DESCRIPTION AND NOTES	ELEV. 705.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
0.4' - TOPSOIL (5.0")	704.7																	
VERY STIFF, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -ROOT FIBERS PRESENT IN SS-1	702.1		3 7 8	23	33	SS-1	-	-	-	-	-	-	-	-	-	12	A-6a (V)	
VERY STIFF, DARK BROWN **CLAY**, "AND" SILT, TRACE FINE SAND, TRACE FINE GRAVEL, MOIST. -ROOT FIBERS PRESENT IN SS-2	699.6		5 6 7	20	100	SS-2	3.50	1	0	10	45	44	47	22	25	24	A-7-6 (15)	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST.			2 4 5	14	67	SS-3	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
-WOOD FRAGMENTS PRESENT IN SS-4			3 6 11	26	100	SS-4	-	37	21	18	19	5	NP	NP	NP	6	A-1-b (0)	
-ROCK FRAGMENTS PRESENT IN SS-5	688.1	W	7 4 3	11	50	SS-5	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-6	685.1	EOB	12 21 24	70	100	SS-6	-	66	16	6	10	2	NP	NP	NP	10	A-1-a (0)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 13.5' AND AT COMPLETION @ 15.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 100 LBS BENTONITE CHIPS AND SOIL CUTTINGS

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL135.dgn 12/27/2018 10:38:45 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 5012+68.65 / 17' LT	EXPLORATION ID B-108-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / K.S.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP A5	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 712.2 (MSL) EOB: 48.8 ft.	PAGE 1 OF 1
START: 6/5/13 END: 6/5/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 82.6	LAT / LONG: 39.949488655, -83.014890028	

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)	BACK FILL
0.5' - TOPSOIL (6.0")	712.2																	
FILL: HARD, BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DRY. -ROOT FIBERS PRESENT IN SS-1	711.7	1	14 18 22	55	56	SS-1	4.5+	-	-	-	-	-	-	-	-	6	A-6b (V)	
		2																
		3																
		4	6 2 2	6	33	SS-2	4.5+	16	13	14	31	26	36	20	16	12	A-6b (7)	
		5																
		6																
		7	3 4 4	11	0	SS-3	-	-	-	-	-	-	-	-	-	-		
	704.2	8	9	-	100	3S-3A	4.5+	-	-	-	-	-	-	-	-	13	A-6b (V)	
FILL: MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, MOIST. -ROOT FIBERS AND GLASS FRAGMENTS PRESENT IN SS-4 -COBBLES PRESENT @ 10.0'		9	6 5 4	12	44	SS-4	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
	701.7	10																
HARD, DARK BROWNISH GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		11																
		12	6 4 6	14	33	SS-5	4.5+	-	-	-	-	-	-	-	-	20	A-6a (V)	
	699.2	13																
MEDIUM DENSE, BROWNISH GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.		14	3 8 5	18	33	SS-6	-	33	29	11	20	7	NP	NP	NP	10	A-2-4 (0)	
	697.2	15																
MEDIUM DENSE TO VERY DENSE, BROWN AND GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST. -COBBLES PRESENT @ 17.0'		16																
		17	24 24 14	52	56	SS-7	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
		18																
		19	6 9 6	21	89	SS-8	-	26	28	27	12	7	NP	NP	NP	10	A-1-b (0)	
		20																
		21																
		22																
		23																
-HEAVING SANDS ENCOUNTERED @ 23.5' -INTRODUCED MUD @ 23.5'	W	24	3 17 16	45	67	SS-9	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
	685.2	25																
MEDIUM DENSE, GRAY **FINE SAND**, LITTLE COARSE SAND, TRACE SILT, WET.		26																
		27																
		28																
		29	7 7 9	22	67	SS-10	-	-	-	-	-	-	-	-	-	25	A-3 (V)	
FS		30																
		31																
	680.2	32																
DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, MOIST. -COBBLES PRESENT @ 33.0'		33																
		34	14 16 15	43	33	SS-11	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
		35																
		36																
	675.2	37																
HARD, GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, MOIST.		38																
		39	46 47 30	106	56	SS-12	4.5+	12	7	20	43	18	17	15	2	13	A-4a (5)	
		40																
		41																
		42																
		43																
		44	25 27 27	74	78	SS-13	4.5+	-	-	-	-	-	-	-	-	11	A-4a (V)	
-COBBLES PRESENT @ 47.0'		45																
		46																
	665.2	47																
VERY DENSE, GRAY **GRAVEL**, TRACE SILT, WET.		48																
	663.4	EOB	50/3"	-	67	SS-14	-	-	-	-	-	-	-	-	-	21	A-1-a (V)	

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 23.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BNTONITE POWDER / 50 GAL WATER

FRA-70-12.68

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-108-1-13

DRAWN RRM
CHECKED BRT

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL136.dgn 12/27/2018 10:38:50 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 5014+11.97 / 28.9' RT	EXPLORATION ID B-108-2-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / K.S.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP A5	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 722.1 (MSL) EOB: 50.0 ft.	PAGE 1 OF 1
START: 6/6/13 END: 6/6/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 82.6	LAT / LONG: 39.949854823, -83.014658823	

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)	BACK FILL
0.5' - TOPSOIL (6.0")	722.1																	
FILL: STIFF TO HARD, BROWNISH GRAY TO DARK GRAY **SILTY CLAY**, SOME TO SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DRY TO DAMP. -STONE AND CINDER FRAGMENTS PRESENT THROUGHOUT	721.6		4 20 15	48	33	SS-1	4.5+	-	-	-	-	-	-	-	-	7	A-6b (V)	
			5 7 6	18	67	SS-2	2.00	19	16	12	27	26	36	17	19	16	A-6b (7)	
STIFF, DARK GRAY **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -COBBLES PRESENT THROUGHOUT	716.6		6 6 7	18	78	SS-3	2.00	-	-	-	-	-	-	-	-	16	A-6b (V)	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.	714.1		7 9 6	21	39	SS-4	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			9 6 5	15	44	SS-5	-	46	25	8	12	9	24	18	6	6	A-1-b (0)	
MEDIUM DENSE, GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST. -QU @ 13.7' = 0.40 TSF -ATTEMPTED SHELBY TUBE @ 15.5', TUBE CRUSHED @ 17.0'	709.1				54	ST-6	-	55	10	8	15	12	31	19	12	15	A-2-6 (0)	
SOFT TO STIFF, GRAY **CLAY**, "AND" SILT, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST. -COBBLES PRESENT @ 18.0'	705.6		3 4 5	12	56	SS-7	0.50	-	-	-	-	-	-	-	-	24	A-7-6 (V)	
			2 3 5	11	72	SS-8	1.50	9	10	13	38	30	41	25	16	26	A-7-6 (9)	
MEDIUM DENSE, DARK GRAY TO BROWNISH GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST.	700.1		4 6 5	15	78	SS-9	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
-COBBLES PRESENT @ 30.0'			8 9 5	19	33	SS-10	-	62	13	8	11	6	NP	NP	NP	5	A-1-b (0)	
			15 11 11	30	33	SS-11	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
VERY DENSE, BROWNISH GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -HEAVING SANDS ENCOUNTERED @ 38.5' -INTRODUCED MUD @ 38.5' -COBBLES PRESENT @ 40.0'	685.1 W		10 37 25	85	56	SS-12	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
			15 30 31	84	72	SS-13	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
HARD, GRAY **SANDY SILT**, SOME CLAY, LITTLE FINE GRAVEL, DAMP.	675.1		26 30 22	72	78	SS-14	4.5+	12	9	15	44	20	21	13	8	12	A-4a (6)	
	672.1	EOB																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 37.0"

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BNTONITE POWDER / 50 GAL WATER

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL137.dgn 12/27/2018 10:38:56 AM rachelm

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.M.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 5015+67.23 / 22' RT	EXPLORATION ID B-108-3-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / K.S.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP A5	
PID: 77372 BR ID: FRA-71-1518A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 722.9 (MSL) EOB: 50.0 ft.	PAGE 1 OF 1
START: 6/7/13 END: 6/7/13	SAMPLING METHOD: SPT	ENERGY RATIO (%): 82.6	LAT / LONG: 39.950228123, -83.014459410	

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)	BACK FILL
0.3' - TOPSOIL (4.0")	722.9																	
FILL: MEDIUM DENSE, GRAY TO BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.	722.6		10 8 10	25	44	SS-1	-	-	-	-	-	-	-	-	-	7	A-2-4 (V)	
-CINDERS PRESENT IN SS-2 -COBBLES PRESENT @ 4.0'	717.4		20 12 8	28	56	SS-2	-	-	-	-	-	-	-	-	-	9	A-2-4 (V)	
FILL: STIFF, BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, MOIST. -BRICK FRAGMENTS PRESENT IN SS-3	714.9		4 4 5	12	61	SS-3	1.75	30	15	14	20	21	34	18	16	18	A-6b (3)	
SOFT TO STIFF, BROWN **SILTY CLAY**, LITTLE TO SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP.			1 5 6	15	67	SS-4	1.50	-	-	-	-	-	-	-	-	17	A-6b (V)	
			7 3 2	7	44	SS-5	1.50	-	-	-	-	-	-	-	-	14	A-6b (V)	
	707.4		2 3 3	8	44	SS-6	0.50	-	-	-	-	-	-	-	-	16	A-6b (V)	
LOOSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.	704.9		3 4 3	10	33	SS-7	-	67	13	8	8	4	NP	NP	NP	7	A-1-a (0)	
STIFF, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	700.9		3 4 7	15	44	SS-8	1.75	-	-	-	-	-	-	-	-	23	A-6a (V)	
DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -COBBLES PRESENT @ 24.0'	695.9		11 15 19	47	61	SS-9	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -COBBLES PRESENT @ 31.0'	690.9		7 11 9	28	56	SS-10	-	31	34	18	14	3	NP	NP	NP	11	A-1-b (0)	
DENSE TO VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, MOIST.			14 17 24	56	67	SS-11	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
-HEAVING SANDS ENCOUNTERED @ 38.5' -COBBLES PRESENT @ 39.0'			5 9 14	32	39	SS-12	-	63	16	7	12	2	NP	NP	NP	12	A-1-a (0)	
			11 31 39	96	17	SS-13	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
VERY STIFF, GRAY **SILTY CLAY**, SOME FINE GRAVEL, DAMP.	675.9		5 7 9	22	33	SS-14	3.50	24	21	15	31	9	30	13	17	11	A-6b (3)	
	672.9	EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 37.0' AND AT COMPLETION @ 37.0';

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BNTONITE POWDER / 50 GAL WATER

FRA-70-12.68

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-108-3-13

DRAWN RRM
CHECKED BRT

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-71-1503L
START: 6/29/14 END: 6/30/14

DRILLING FIRM / OPERATOR: RII / R.B.
SAMPLING FIRM / LOGGER: RII / S.B.
DRILLING METHOD: 4.25" HSA / HQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME-750X (SN 310218)
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 86.8

STATION / OFFSET: 237+31.12 / 23.7' RT
ALIGNMENT: BL I-71 SB
ELEVATION: 702.7 (MSL) EOB: 62.5 ft.
LAT / LONG: 39.949590983, -83.016192327

EXPLORATION ID B-108-4-13
PAGE 1 OF 2

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
0.3' - TOPSOIL (4.0")	702.4																	
FILL: MEDIUM DENSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP. -BRICK FRAMENTS PRESENT IN IN SS-1	699.7		7 13 8	30	44	SS-1	-	-	-	-	-	-	-	-	-	9	A-2-6 (V)	
FILL: VERY STIFF, DARK BROWN **SANDY SILT**, SOME CLAY, LITTLE FINE GRAVEL, DRY. -BRICK FRAGMENTS PRESENT IN SS-2	697.2		3 2 2	6	44	SS-2	3.00	19	16	17	27	21	35	26	9	15	A-4a (3)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, TRACE TO LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.			7 10 11	30	39	SS-3	-	67	13	7	9	4	22	17	5	9	A-1-a (0)	
			13 12 3	22	33	SS-4	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
-COBBLES PRESENT @ 12.0'		W	13 15 19	49	67	SS-5	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
		W	7 10 9	27	72	SS-6	-	97	1	1	1	0	21	16	5	8	A-1-a (0)	
			8 9 10	27	50	SS-7	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
LOOSE TO MEDIUM DENSE, BROWN AND GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST TO WET. -INTRODUCED MUD @ 20.0'	684.7		5 5 7	17	67	SS-8	-	33	50	9	5	3	NP	NP	NP	20	A-1-b (0)	
			6 6 10	23	67	SS-9	-	-	-	-	-	-	-	-	-	18	A-1-b (V)	
			3 4 5	13	83	SS-10	-	-	-	-	-	-	-	-	-	19	A-1-b (V)	
			2 3 4	10	67	SS-11	-	24	53	14	6	3	NP	NP	NP	22	A-1-b (0)	
			1 2 4	9	50	SS-12	-	-	-	-	-	-	-	-	-	25	A-1-b (V)	
STIFF, BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, WET.	670.7																	
VERY DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -COBBLES PRESENT THROUGHOUT	668.9		28 50/6"	-	25	SS-13	1.50 -	- 65	- 17	- 7	- 7	- 4	- NP	- NP	- NP	27 9	A-6a (V) A-1-a (0)	
			12 24 31	80	0	SS-14	-	-	-	-	-	-	-	-	-	-		
STIFF TO VERY STIFF, BROWNISH GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DAMP TO MOIST.	662.7		15	-	100	3S-14A	3.50	-	-	-	-	-	-	-	-	12	A-4a (V)	
			WOH 3 5	12	67	SS-15	1.50	11	14	17	38	20	20	13	7	15	A-4a (5)	
AUGER REFUSAL @ 49.5'	653.2	TR	15 50/3"	-	100	SS-16	2.75	-	-	-	-	-	-	-	-	16	A-4a (V)	
LIMESTONE : GRAY, SLIGHTLY WEATHERED TO UNWEATHERED, VERY STRONG, THICK BEDDED, CALCAREOUS, SILICEOUS, CHERTY, DOLOMITIC, SLIGHTLY TO MODERATELY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 81%, REC 92%. -QU @ 52.5' = 9,541 PSI			43		78	RC-1											CORE	
			93		100	RC-2											CORE	

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL139.dgn 12/27/2018 10:39:05 AM rachelm

PID: 89464	BR ID: FRA-71-1503L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 237+31.12 / 23.7 RT	START: 6/29/14	END: 6/30/14	PG 2 OF 2	B-108-4-13

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
	642.7		93		93	RC-3											CORE	
	640.2	61 62 EOB																

NOTES: SEEPAGE ENCOUNTERED @ 11.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 13.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL140.dgn 12/27/2018 10:39:08 AM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: CME-750X (SN 310218)	STATION / OFFSET: 239+69.30 / 18.7' RT	EXPLORATION ID B-108-5-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: FRA-71-1503L	DRILLING METHOD: 4.25" HSA / HQ	CALIBRATION DATE: 4/26/13	ELEVATION: 700.3 (MSL) EOB: 63.0 ft.	PAGE 1 OF 2
START: 6/30/14 END: 7/1/14	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 86.8	COORD: 39.950225755, -83.016078990	

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
0.5' - TOPSOIL (6.0")	699.8																	
MEDIUM DENSE, BROWN AND GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP.	697.3		3 5 12	25	33	SS-1	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
STIFF, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST. -ROCK FRAGMENTS AND ORGANICS PRESENT IN SS-2	694.8		6 4 4	12	33	SS-2	2.00	20	16	15	30	19	30	17	13	18	A-6a (4)	
MEDIUM DENSE, BROWN TO DARK BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST. -COBBLES PRESENT THROUGHOUT			2 5 6	16	0	SS-3	-	-	-	-	-	-	-	-	-	-		
			5	-	100	3S-3A	-	-	-	-	-	-	-	-	-	13	A-2-6 (V)	
			3 5 9	20	0	SS-4	-	-	-	-	-	-	-	-	-	-		
-ROCK FRAGMENTS PRESENT IN 3S-4A	689.8		9	-	100	3S-4A	-	43	17	10	17	13	30	18	12	15	A-2-6 (0)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -COBBLES PRESENT THROUGHOUT		W	8 7 7	20	39	SS-5	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
			20 20 8	41	33	SS-6	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
			11 9 10	27	100	SS-7	-	67	17	7	6	3	NP	NP	NP	13	A-1-a (0)	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, WET. -ROCK FRAGMENTS PRESENT IN SS-9	682.3		3 5 6	16	100	SS-8	-	3	61	20	11	5	NP	NP	NP	24	A-1-b (0)	
	677.3		3 6 9	22	78	SS-9	-	-	-	-	-	-	-	-	-	23	A-1-b (V)	
DENSE TO VERY DENSE, GRAY TO BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP TO MOIST. -COBBLES PRESENT THROUGHOUT			9 12 13	36	67	SS-10	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
			11 14 15	42	89	SS-11	-	67	15	7	8	3	17	14	3	10	A-1-a (0)	
			50/3"	-	100	SS-12	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
DENSE, BROWN AND BLACK **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-13	668.3		7 10 13	33	61	SS-13	-	43	43	8	4	2	NP	NP	NP	12	A-1-b (0)	
VERY STIFF TO HARD, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.	663.3		19 9 12	30	67	SS-14	4.00	-	-	-	-	-	-	-	-	11	A-4a (V)	
			11 9 12	30	83	SS-15	4.50	-	-	-	-	-	-	-	-	10	A-4a (V)	
			8 9 10	27	67	SS-16	4.00	21	12	16	32	19	20	12	8	11	A-4a (3)	
-ROCK FRAGMENTS PRESENT IN SS-17 AUGER REFUSAL @ 54.5 FEET	645.8	TR	22 50/5"	-	100	SS-17	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
LIMESTONE : BLUISH GRAY TO LIGHT BROWN AND GRAY, UNWEATHERED, VERY STRONG, VERY THICK BEDDED, CALCAREOUS, SILICEOUS, FOSSILIFEROUS, VUGGY, SLIGHTLY FRACTURED TO FRACTURED, TIGHT TO OPEN APERTURES, SLIGHTLY TO VERY ROUGH; RQD 79%, REC 95%. -QU @ 56.8' = 11,933 PSI -DOLOMITIC AND SLIGHTLY TO HIGHLY FRACTURED			79		100	RC-1											CORE	

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL141.dgn 12/27/2018 10:39:34 AM rachelm

PID: 89464	BR ID:	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 239+69.30 / 18.7 RT	START: 6/30/14	END: 7/1/14	PG 2 OF 2	B-108-5-13

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
FROM 59.5' TO 63.0'	640.3	61	79		87	RC-2											CORE	
	637.3	EOB 63																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 11.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-71-1503L
START: 7/7/14 END: 7/8/14

DRILLING FIRM / OPERATOR: RII / R.B.
SAMPLING FIRM / LOGGER: RII / S.B.
DRILLING METHOD: 4.25" HSA / NQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME-750X (SN 310218)
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 86.8

STATION / OFFSET: 242+23.02 / 20.7' RT
ALIGNMENT: BL I-71 SB
ELEVATION: 714.5 (MSL) EOB: 67.1 ft.
LAT / LONG: 39.950860104, -83.015749519

EXPLORATION ID: B-108-6-13
PAGE: 1 OF 2

MATERIAL DESCRIPTION AND NOTES	ELEV. 714.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
0.2' - TOPSOIL (2.0")	714.3																	
FILL: MEDIUM DENSE TO DENSE, BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, DAMP.			9 13 10	33	67	SS-1	-	-	-	-	-	-	-	-	-	7	A-2-4 (V)	
-BRICK AND CONCRETE FRAGMENTS PRESENT THROUGHOUT			5 6 7	19	72	SS-2	-	50	16	5	15	14	NP	NP	NP	6	A-2-4 (0)	
	709.0																	
FILL: MEDIUM STIFF, BLACK **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.			3 2 3	7	78	SS-3	-	-	-	-	-	-	-	-	-	19	A-6a (V)	
	706.5																	
FILL: MEDIUM DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP TO MOIST.			7 7 4	16	11	SS-4	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
	704.0		5	-	100	3S-4A	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
FILL: MEDIUM STIFF TO STIFF, GRAY TO BROWNISH GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE TO SOME FINE GRAVEL, DAMP TO MOIST.		W	2 3 3	9	44	SS-5	1.50	22	24	11	25	18	26	15	11	12	A-6a (2)	
-ASPHALT AND COAL FRAGMENTS PRESENT IN SS-6			4 3 5	12	33	SS-6	1.75	-	-	-	-	-	-	-	-	21	A-6a (V)	
			1 2 3	7	94	SS-7	1.00	16	12	11	28	33	31	19	12	24	A-6a (6)	
-BRICK FRAGMENTS PRESENT THROUGHOUT			2 2 3	7	67	SS-8	0.75	-	-	-	-	-	-	-	-	21	A-6a (V)	
			1 10 22	46	72	SS-9	1.75	-	-	-	-	-	-	-	-	24	A-6a (V)	
			12 5 3	12	61	SS-10	1.50	12	16	12	30	30	31	20	11	20	A-6a (5)	
	689.0																	
FILL: MEDIUM STIFF TO STIFF, BROWNISH GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.			4 5 3	12	67	SS-11	1.75	-	-	-	-	-	-	-	-	15	A-4a (V)	
			4 2 4	9	44	SS-12	1.25	33	20	10	18	19	25	19	6	17	A-4a (0)	
-BRICK, ASPHALT AND COAL FRAGMENTS PRESENT THROUGHOUT			3 3 3	9	44	SS-13	1.00	-	-	-	-	-	-	-	-	18	A-4a (V)	
	677.5																	
MEDIUM DENSE TO VERY DENSE, BROWN TO GRAYISH BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		W	1 11 7	26	83	SS-14	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
-HEAVING SANDS ENCOUNTERED @ 40.0'																		
-INTRODUCED MUD @ 40.0'																		
-ROCK FRAGMENTS PRESENT THROUGHOUT			13 15 22	54	100	SS-15	-	81	9	3	4	3	NP	NP	NP	9	A-1-a (0)	
	667.5																	
HARD, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.			15 23 35	84	50	SS-16	4.50	26	14	10	29	21	20	15	5	10	A-4a (3)	
			50/5"	-	0	SS-17	-	-	-	-	-	-	-	-	-	-		
AUGER REFUSAL @ 57.5'	657.0	TR																
LIMESTONE : GRAY, UNWEATHERED, VERY STRONG, VERY THICK BEDDED, CALCAREOUS, SILICEOUS, CHERTY, DOLOMITIC, PYRITIC, MODERATELY TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 73%, REC 99%.			55		100	RC-1											CORE	

PID: 89464	BR ID: FRA-71-1503L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 242+23.02 / 20.7 RT	START: 7/7/14	END: 7/8/14	PG 2 OF 2	B-108-6-13

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
LIMESTONE : GRAY, UNWEATHERED, VERY STRONG, VERY THICK BEDDED, CALCAREOUS, SILICEOUS, CHERTY, DOLOMITIC, PYRITIC, MODERATELY TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 73%, REC 99%. *(continued)* -QU @ 59.6' = 8,033 PSI	654.5	61 62 63 64 65 66 67	90		98	RC-2											CORE	
	647.4	EOB																

NOTES: SEEPAGE ENCOUNTERED @ 12.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 38.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750X (SN 310218)	STATION / OFFSET: 3009+74.31 / 79.9' LT	EXPLORATION ID B-108-7-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C3	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 703.6 (MSL) EOB: 30.0 ft.	PAGE 1 OF 1
START: 1/30/15 END: 1/30/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 85.7	LAT / LONG: 39.949258997, -83.016710746	

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)	BACK FILL
0.7' - TOPSOIL (8.0")	703.6 / 702.9																	
FILL: DENSE TO VERY DENSE, BROWNISH GRAY TO BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -COAL FRAGMENTS PRESENT IN SS-1 -COBBLES ENCOUNTERED THROUGHOUT		1	3 13 14	39	61	SS-1	-	-	-	-	-	-	-	-	-	15	A-1-a (V)	
		2																
		3																
		4	7 19 19	54	78	SS-2	-	81	7	4	6	2	NP	NP	NP	10	A-1-a (0)	
	698.1	5																
DENSE TO VERY DENSE, BROWNISH GRAY **GRAVEL**, TRACE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		6	10 12 22	49	89	SS-3	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
		7																
		8																
		9	19 30 21	73	67	SS-4	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
-COBBLES ENCOUNTERED THROUGHOUT		10																
		11																
		12	40 50/6"	-	83	SS-5	-	87	5	3	4	1	NP	NP	NP	10	A-1-a (0)	
		13																
		14	31 50/5"	-	100	SS-6	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
-ROCK FRAGMENTS PRESENT IN SS-6	688.6	15																
MEDIUM DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		W 16	33 10 5	21	100	SS-7	-	52	22	7	14	5	NP	NP	NP	14	A-1-b (0)	
		17																
		18																
		19	3 4 5	13	100	SS-8	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
		20																
	681.6	21																
VERY DENSE, BROWNISH GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -HEAVING SANDS ENCOUNTERED @ 23.5'		22																
		23																
		24	22 34 41	107	100	SS-9	-	33	32	20	11	4	NP	NP	NP	12	A-1-b (0)	
		25																
		26																
		27																
		28																
		29	17 19 24	61	100	SS-10	-	-	-	-	-	-	-	-	-	15	A-1-b (V)	
	673.6	EOB 30																

NOTES: SEEPAGE ENCOUNTERED @ 11.0'; GROUNDWATER ENCOUNTERED INITIALLY @ 16.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750X (SN 310218)	STATION / OFFSET: 3008+52.04 / 89.6' LT	EXPLORATION ID B-108-8-14
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C3	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 703.4 (MSL) EOB: 15.0 ft.	PAGE 1 OF 1
START: 1/30/15 END: 1/30/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 85.7	LAT / LONG: 39.949572208, -83.016991873	

MATERIAL DESCRIPTION AND NOTES	ELEV. 703.4	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
0.5' - TOPSOIL (6.0")	702.9																	
HARD, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -ROCK FRAGMENTS PRESENT IN SS-1 -COBBLES PRESENT @ 1.0'	700.4	1	9 12 6	26	50	SS-1	4.25	-	-	-	-	-	-	-	-	12	A-6a (V)	
DENSE, BROWNISH GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.	697.9	4	4 11 12	33	44	SS-2	-	32	16	11	30	11	NP	NP	NP	8	A-4a (1)	
DENSE TO VERY DENSE, BROWN **GRAVEL**, TRACE COARSE TO FINE SAND, TRACE SILT, MOIST.	691.4	7	3 13 17	43	56	SS-3	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
		9	11 19 20	56	100	SS-4	-	96	2	1	1	0	NP	NP	NP	6	A-1-a (0)	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		W																
-ROCK FRAGMENTS PRESENT IN SS-5	688.4	14	10 9 10	27	39	SS-5	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
		EOB 15																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 13.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 5015+96.50 / 15.7' LT	EXPLORATION ID B-108-9-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP A5	
PID: 77372 BR ID: FRA-71-1518A	DRILLING METHOD: 3.25" HSA / RC	CALIBRATION DATE: 4/26/13	ELEVATION: 722.4 (MSL) EOB: 80.1 ft.	PAGE 1 OF 2
START: 3/7/15 END: 3/8/15	SAMPLING METHOD: SPT / NQ	ENERGY RATIO (%): 77.7	LAT / LONG: 39.950352963, -83.014507695	

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)	BACK FILL
0.2' - ASPHALT (3.0")	722.2																	
0.8' - CONCRETE (9.0")	721.4																	
0.3' - AGGREGATE BASE (4.0")	721.1																	
FILL: LOOSE TO MEDIUM DENSE, DARK BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST.		1																
		2	11 8 8	21	100	SS-1	-	48	18	9	17	8	25	16	9	8	A-2-4 (0)	
		3																
		4	6 4 3	9	100	SS-2	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	
		5																
-LOI = 1.9%		6																
		7	4 5 4	12	100	SS-3	-	43	20	11	20	6	25	19	6	10	A-2-4 (0)	
	714.4	8																
MEDIUM STIFF TO STIFF, DARK GRAY TO BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.		9	3 3 2	6	33	SS-4	1.00	-	-	-	-	-	-	-	-	26	A-6b (V)	
		10																
		11			67	ST-5	1.25	14	13	17	32	24	37	19	18	22	A-6b (7)	
		12																
	709.4	13																
MEDIUM DENSE, BROWNISH GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		14	8 7 8	19	50	SS-6	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
	706.9	15																
MEDIUM DENSE, GRAY **SANDY SILT**, SOME FINE GRAVEL, TRACE CLAY, MOIST.		16																
		17	5 8 10	23	78	SS-7	-	30	16	15	34	5	NP	NP	NP	14	A-4a (1)	
	704.4	18																
VERY STIFF, BROWNISH GRAY **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.		19	4 5 7	16	100	SS-8	2.25	-	-	-	-	-	-	-	-	22	A-6b (V)	
	701.9	20																
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		21																
		22	8 14 14	36	100	SS-9	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
		23																
		24	15 12 10	28	67	SS-10	-	51	14	18	14	3	NP	NP	NP	7	A-1-b (0)	
		25																
		26																
		27	15 16 18	44	100	SS-11	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
		28																
		29	9 6 7	17	100	SS-12	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
		30																
	690.4	31																
MEDIUM DENSE TO DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, MOIST.		32																
W		33																
		34	19 18 18	47	100	SS-13	-	61	17	7	12	3	NP	NP	NP	10	A-1-a (0)	
		35																
		36																
		37																
		38																
		39	5 8 7	19	56	SS-14	-	-	-	-	-	-	-	-	-	15	A-1-a (V)	
		40																
		41																
		42																
		43																
		44	15 21 11	41	39	SS-15	-	-	-	-	-	-	-	-	-	16	A-1-a (V)	
-BOULDER PRESENT @ 45.0'		45																
		46																
		47																
		48																
		49	24 15 15	39	0	SS-16	-	-	-	-	-	-	-	-	-	-		
		50	30	-	0	2S-16A	-	-	-	-	-	-	-	-	-	-		
	670.4	51																
DENSE, GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.		52																
		53																
		54	14 11 13	31	56	SS-17	-	-	-	-	-	-	-	-	-	15	A-2-6 (V)	
		55																
		56																
	665.4	57																
VERY STIFF, GRAY **SANDY SILT**, LITTLE FINE GRAVEL, LITTLE CLAY, DAMP.		58																
		59	6 6 8	18	100	SS-18	2.50	19	12	19	36	14	18	13	5	11	A-4a (3)	

PID: 77372	BR ID: FRA-71-1518A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 5015+96.50 / 15.7 LT	START: 3/7/15	END: 3/8/15	PG 2 OF 2	B-108-9-15

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)	BACK FILL
VERY STIFF, GRAY **SANDY SILT**, LITTLE FINE GRAVEL, LITTLE CLAY, DAMP. *(continued)*	662.4	61																
	660.4	62																
MEDIUM DENSE, BROWN **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE FINE GRAVEL, WET. -HEAVING SAND ENCOUNTERED @ 63.5' -INTORDUCED WATER @ 63.5'		63																
		64	6 8 9	22	100	SS-19	-	4	43	32	15	6	NP	NP	NP	19	A-3a (0)	
		65																
		66																
AUGER REFUSAL @ 67.0'	655.4	67 TR	50/1"	-	100	SS-20	-	-	-	-	-	-	-	-	-	4	Rock (V)	
LIMESTONE : BROWN AND GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG TO STRONG, MEDIUM TO THIN BEDDED, CHERTY, DOLOMITIC, CRYSTALLINE, SLIGHTLY FRACTURED, NARROW APPERTURES, SLIGHTLY ROUGH; RQD 86%, REC 96%. -QU @ 68.6' = 12,574 PSI		68	69		85	RC-1												CORE
		69																
		70																
		71																
		72	86		100	RC-2												CORE
-0.1' CLAY SEAM PRESENT @ 73.7' AND 74.1' -LOSS OF CIRCULATION @ 73.9'		73																
		74																
		75																
-IRON STAINING PRESENT @ 75.5' -QU @ 75.4' = 7,788 PSI		76																
		77																
		78	95		100	RC-3												CORE
-INCREASINGLY DOLOMITIC FROM 78.5' TO 80.1'		79																
	642.3	80 EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 33.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER 400 LBS BENTONITE CHIPS AND SOIL CUTTINGS

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-109-0-09 | *Location:* Sta. 5032+97.77, 44.7' RT., BL RAMP C5 | *Date Drilled:* 9/11/2009

WATER OBSERVATIONS: Water seepage at: 13.5', 42.0' | Water level at completion: 12.5' (includes drilling water)

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP
	704.9														10 20 30 40
1.0	703.9						Topsoil - 5"								
		6 18 21	6	1			FILL: Very dense brown SANDY SILT (A-4a), some fine to coarse sand, some gravel; damp.								
3.5	701.4														
5		10 50/1	2	2		-	POSSIBLE FILL: Hard brown SANDY SILT (A-4a), little clay, trace to little fine to coarse gravel; damp.								50+
6.0	698.9														
		15 15 16	12	3			Dense to very dense brown GRAVEL (A-1-a), little to some fine to coarse sand, trace silt; damp.		75	13	---	4	--8--	INP
		50/5	5	4											50+
10															
		26 10 9	2	5			@ 11.0'-12.5'; contains sandstone fragments. @ 11.0'-15.0', loose to medium dense.								
		6 6 3	3	6			@ 13.5', becomes wet.								
15															
		8 12 18	6	7					68	18	---	6	--8--	INP	
		2 5 4	5	8			@ 18.5'-25.0', loose to medium dense.								
20															
		5 8 12	2	9											
		5 5 6	6	10			@ 23.5'-25.0', trace fine to coarse sand.		83	6	---	2	--9--	INP	
25	679.9														

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-109-0-09 | *Location:* Sta. 5032+97.77, 44.7' RT., BL RAMP C5 | *Date Drilled:* 9/11/2009

WATER OBSERVATIONS: Water seepage at: 13.5', 42.0' | Water level at completion: 12.5' (includes drilling water)

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP
	679.9														10 20 30 40
		3 3 5	3	11			Loose to medium dense brown GRAVEL WITH SAND (A-1-b), little fine to coarse sand, trace silt; damp.								
		5 8 9	7	12					83	9	---	2	--6--	INP	
30															
		15 14 17	1	13			@ 33.5'-35.0', dense.								
35															
37.0	667.9														
		27 36 38	18	14		4.5+	Hard gray SANDY SILT (A-4a), some fine to coarse sand, some gravel; damp.		21	16	---	17	31	15	76
40															
42.0	662.9														
		25 26 23	18	15			Very dense gray COARSE AND FINE SAND (A-3a), little fine to coarse gravel, trace silt; wet.								51
45															
47.0	657.9														
		24 36 35	12	16		4.5+	Hard brown SANDY SILT (A-4a), trace to little gravel; moist.								73
50.0	654.9						Bottom of Boring - 50.0'								
50															

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: CME 55 (SN 386345)	STATION / OFFSET: 3001+00.00 / 55.0' LT	EXPLORATION ID B-109-1-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / M.M.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL RAMP C3	
PID: 77372 BR ID: N/A	DRILLING METHOD: 4.25" HSA	CALIBRATION DATE: 10/20/14	ELEVATION: 736.2 (MSL) EOB: 85.0 ft.	PAGE 1 OF 2
START: 3/21/15 END: 3/22/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 92	LAT / LONG: 39.950097038, -83.019715408	

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
0.5' - ASPHALT (6.0")	736.2																	
1.0' - AGGREGATE BASE (12.0")	735.7																	
FILL: DENSE, GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.	734.7	1																
	733.2	2	10 10 12	34	89	SS-1	-	18	31	17	24	10	NP	NP	NP	9	A-2-4 (0)	
FILL: VERY STIFF TO HARD, GRAY **SILT AND CLAY**, "AND" FINE GRAVEL, LITTLE COARSE TO FINE SAND, DAMP TO WET.		3																
		4	6 5 7	18	67	SS-2	3.50	-	-	-	-	-	-	-	-	14	A-6a (V)	
		5																
		6																
		7																
		8																
		9	7 7 11	28	89	SS-3	4.00	-	-	-	-	-	-	-	-	26	A-6a (V)	
		10																
		11																
		12																
		13																
-ROCK FRAGMENTS PRESENT IN SS-4		14	18 20 18	58	89	SS-4	4.50	37	10	10	23	20	29	17	12	16	A-6a (2)	
		15																
		16																
		17																
		18																
		19	7 9 8	26	89	SS-5	3.50	-	-	-	-	-	-	-	-	13	A-6a (V)	
		20																
		21																
		22																
		23																
		24	18 13 13	40	0	SS-6	-	-	-	-	-	-	-	-	-	-		
		25																
		26																
		27																
		28																
-BRICK AND CLAY TILE FRAGMENTS PRESENT IN SS-7		29	21 50/3"	-	100	SS-7	4.50	-	-	-	-	-	-	-	-	16	A-6a (V)	
		30																
		31																
	704.2	32																
DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		33																
		34	37 12 10	34	67	SS-8	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
	700.7	35																
HARD, BROWN **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DRY.		36																
		37	7 8 9	26	89	SS-9	4.5+	27	25	12	19	17	36	29	7	15	A-4a (0)	
	698.2	38																
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		39	8 10 28	58	89	SS-10	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
	695.7	40																
VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		41																
		42	33 50 50	153	89	SS-11	-	60	17	9	10	4	NP	NP	NP	5	A-1-a (0)	
-ROCK FRAGMENTS PRESENT THROUGHOUT		43																
-INTORDUCED WATER @ 45.0'		44	18 44 22	101	67	SS-12	-	-	-	-	-	-	-	-	-	4	A-1-a (V)	
	690.7	45																
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		46																
		47	34 25 25	77	67	SS-13	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
-COBBLES PRESENT THROUGHOUT		48																
		49	18 32 37	106	67	SS-14	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
	685.7	50																
VERY DENSE, GRAY **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, TRACE SILT, MOIST. -ROCK FRAGMENTS PRESENT IN SS-16 -COBBLES PRESENT THROUGHOUT		51	36 50/6"	-	25	SS-15	-	-	-	-	-	-	-	-	-	15	A-3a (V)	
	683.2	52																
VERY DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		53																
		54	22 23 18	63	89	SS-16	-	70	14	5	7	4	NP	NP	NP	8	A-1-a (0)	
		55																
		56																
		57																
-COBBLES PRESENT THROUGHOUT		58																
		59	18 19 19	58	44	SS-17	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL150.dgn 12/27/2018 10:40:05 AM rachelm

PID: 77372	BR ID: N/A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 3001+00.00 / 55.0 LT	START: 3/21/15	END: 3/22/15	PG 2 OF 2	B-109-1-15

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 DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. *(continued)*	676.2	61																
	674.2	62																
DENSE, GRAY **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, DAMP.		63																
		64	10 13 17	46	89	SS-18	-	30	22	13	16	19	21	14	7	10	A-2-4 (0)	
		65																
		66																
	669.2	67																
HARD, GRAY **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		68																
		69	23 14 18	49	89	SS-19	4.5+	-	-	-	-	-	-	-	-	20	A-6b (V)	
		70																
		71																
	664.2	72																
HARD, GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DAMP.		73																
		74	22 33 50/3"	-	100	SS-20	4.5+	17	22	15	27	19	22	14	8	9	A-4a (2)	
		75																
		76																
		77																
		78																
		79	26 50/6"	-	100	SS-21	4.5+	-	-	-	-	-	-	-	-	9	A-4a (V)	
		80																
		81																
		82																
		83																
		84	22 35 43	120	89	SS-22	4.5+	-	-	-	-	-	-	-	-	9	A-4a (V)	
	651.2	EOB 85																

NOTES: GROUNDWATER NOT ENCOUNTERED PRIOR TO INTRODUCTION OF WATER TO THE BOREHOLE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 376 LBS CEMENT / 100 LBS BENTONITE CHIPS / 80 GAL WATER

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-110-0-09 | *Location:* Sta. 3003+02.96, 22.8' RT., BL RAMP C3 | *Date Drilled:* 9/11/2009

WATER OBSERVATIONS: Water seepage at: 10.5', 46.0' | Water level at completion: 10.6'

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	705.8														
1.0	704.8						Asphalt Concrete - 5" / Portland Cement Concrete - 7"								
		5 9 6	6	1			FILL: Loose to medium dense dark brown GRAVEL WITH SAND (A-1-b), trace clay, trace silt; damp to moist.								
5		2 4 4	18	2		1.5	@ 1.0'-2.5', contains trace brick fragments. @ 3.5'-5.0', organic; LOI @ 440 deg. C = 11.0%		47	32	---	7	9	5	INP
6.0	699.8														
		4 5 6	12	3		3.0	FILL: Very stiff dark brown SILT AND CLAY (A-6a), little fine to coarse sand, slightly organic; damp.								
8.0	697.8														
		4 3 2	12	4			FILL: Loose brown COARSE AND FINE SAND (A-3a), little to some gravel, little silt; moist.		20	45	---	18	--17--	INP
10															
10.5	695.3														
		1 1 4	7	5			Loose to medium dense brown SANDY SILT (A-4a), some fine to coarse sand, some gravel; wet.								
		2 8 4	3	6											
15															
16.0	689.8														
		8 19 18	1	7			Medium dense to dense brown GRAVEL (A-1-a), little to some fine to coarse sand, trace silt; wet.								
		1 5 6	3	8					80	10	---	2	--8--		INP
20															
		1 11 20	3	9											
		7 22 16	8	10											
25	680.8														

DLZ Ohio, Inc. * 6121 Huntley Road, Columbus, Ohio 43229 * (614) 888-0040

Client: ms consultants | *Project:* FRA-70-8.93 | *Job No.* 0221-1004.01

LOG OF: Boring B-110-0-09 | *Location:* Sta. 3003+02.96, 22.8' RT., BL RAMP C3 | *Date Drilled:* 9/11/2009

WATER OBSERVATIONS: Water seepage at: 10.5', 46.0' | Water level at completion: 10.6'

FIELD NOTES:

Depth (ft)	Elev. (ft)	Blows per 6"	Recovery	Sample No. Drive	Sample No. Press / Core	Hand Penetrometer (tsf)	DESCRIPTION	Graphic Log	GRADATION % Aggregate	% C. Sand	% M. Sand	% F. Sand	% Silt	% Clay	STANDARD PENETRATION (N60) Natural Moisture Content, % - ● PL ⊢ LL Blows per foot - ○ / Non-Plastic - NP (10 20 30 40)
	680.8														
		10 18 19	6	11			Medium dense to dense brown GRAVEL (A-1-a), little to some fine to coarse sand, trace silt; wet.		82	11	---	4	--3--		INP
		12 11 10	4	12											
30															
		3 50/5	3	13			@ 33.5'-34.4', very dense.								50+
35															
37.0	668.8														
		30 34 30	12	14			Very dense gray GRAVEL WITH SAND (A-1-b), little silt; moist to wet.		49	20	---	13	--18--		INP 66
40															
43.0	662.8														
		35 41 48	18	15		4.5+	Hard gray SANDY SILT (A-4a), little fine to coarse gravel; damp to moist.								92
45															
46.0	659.8														
							Very dense gray COARSE AND FINE SAND (A-3a), some silt, some gravel; wet.								
49.4	656.4	30 50/5	11	16											50+
50							Bottom of Boring - 49.4'								

PROJECT: FRA-70-12.68 - PHASE 4A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 3005+00.00 / 20.0' LT	EXPLORATION ID B-110-1-15
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL RAMP C3	
PID: 77372 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 4/26/13	ELEVATION: 740.3 (MSL) EOB: 75.0 ft.	PAGE 1 OF 2
START: 3/21/15 END: 3/22/15	SAMPLING METHOD: SPT	ENERGY RATIO (%): 77.7	LAT / LONG: 39.949913094, -83.018276075	

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
0.7' - ASPHALT (8.0")	740.3																	
1.2' - CONCRETE (14.5")	739.6																	
0.4' - AGGREGATE BASE (5.0")	738.4																	
FILL: HARD, BROWNISH GRAY TO GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.	738.0	4	6 9 9	23	100	SS-1	4.5+	-	-	-	-	-	-	-	-	13	A-6a (V)	
		9	4 9 10	25	50	SS-2	4.5+	8	12	9	36	35	30	17	13	13	A-6a (8)	
		14	2 10 17	35	100	SS-3	4.5+	-	-	-	-	-	-	-	-	22	A-6a (V)	
		19	4 5 11	21	100	SS-4	4.5+	-	-	-	-	-	-	-	-	10	A-6a (V)	
	718.3																	
FILL: HARD, GRAY **ELASTIC CLAY**, SOME COARSE TO FINE SAND, SOME SILT, TRACE FINE GRAVEL, MOIST.		24	21 34 18	67	0	SS-5	-	-	-	-	-	-	-	-	-	-		
		25	17	-	100	2S-5A	4.5+	5	19	10	40	26	41	30	11	31	A-7-5 (7)	
	713.3																	
VERY DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-6		29	9 40 38	101	100	SS-6	-	-	-	-	-	-	-	-	-	4	A-1-a (V)	
	709.8																	
MEDIUM DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		32	7 8 12	26	100	SS-7	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
	707.3																	
VERY DENSE, GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-8		34	10 50/2"	-	75	SS-8	-	67	14	4	9	6	NP	NP	NP	5	A-1-a (0)	
	704.8																	
HARD, DARK BROWNISH GRAY TO BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.		37	3 6 12	23	100	SS-9	4.00	-	-	-	-	-	-	-	-	27	A-6b (V)	
		39	5 9 12	27	100	SS-10	4.25	4	12	18	42	24	39	23	16	18	A-6b (9)	
	699.8																	
VERY DENSE, BROWN TO GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		42	13 19 34	69	100	SS-11	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
		44	9 24 23	61	100	SS-12	-	56	22	7	10	5	NP	NP	NP	8	A-1-a (0)	
		47	9 22 29	66	100	SS-13	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
		49	17 32 41	95	39	SS-14	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
		W																
		54	15 16 24	52	100	SS-15	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
		59	17 18 21	51	100	SS-16	-	65	21	6	5	3	NP	NP	NP	5	A-1-a (0)	

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL153.dgn 12/27/2018 10:40:16 AM rachelm

PID: 77372	BR ID: N/A	PROJECT: FRA-70-12.68 - PHASE 4A	STATION / OFFSET: 3005+00.00 / 20.0 LT	START: 3/21/15	END: 3/22/15	PG 2 OF 2	B-110-1-15

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 DENSE, BROWN TO GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. *(continued)*	680.3	61																
	678.3	62																
MEDIUM DENSE TO DENSE, GRAY **COARSE AND FINE SAND**, LITTLE SILT, TRACE FINE GRAVEL, TRACE CLAY, MOIST TO WET.		63																
		64	7 8 13	27	100	SS-17	-	-	-	-	-	-	-	-	-	17	A-3a (V)	
		65																
		66																
		67																
		68																
		69	16 17 19	47	56	SS-18	-	-	-	-	-	-	-	-	-	26	A-3a (V)	
		70																
		71																
		72																
		73																
		74	13 17 18	45	100	SS-19	-	8	40	30	16	6	NP	NP	NP	15	A-3a (0)	
	665.3	EOB 75																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 53.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE CHIPS / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: CME-55 (SN 386345)	STATION / OFFSET: 245+03.67 / 17.9' LT	EXPLORATION ID B-113-2-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / N.A.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: FRA-71-1503L	DRILLING METHOD: 4.25" HSA / HQ	CALIBRATION DATE: 10/20/14	ELEVATION: 743.3 (MSL) EOB: 99.2 ft.	PAGE 1 OF 2
START: 1/15/15 END: 1/22/15	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 92	LAT / LONG: 39.951551161, -83.015294380	

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
0.7' - ASPHALT (8.0")	742.6																	
0.5' - AGGREGATE BASE (6.0")	742.1																	
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.			4 19 13	49	83	SS-1	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			30 15 50/2"	-	57	SS-2	-	54	17	10	11	8	21	15	6	7	A-1-b (0)	
			24 26 23	75	100	SS-3	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
			14 4 6	15	0	SS-4	-	-	-	-	-	-	-	-	-	-		
	721.3																	
DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.			31 15 17	49	50	SS-5	-	40	22	14	14	10	22	15	7	8	A-2-4 (0)	
	716.3																	
VERY STIFF TO HARD, BROWN AND GRAY TO REDDISH BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DRY TO MOIST. -ROCK FRAGMENTS PRESENT IN SS-6			9 9 15	37	100	SS-6	4.5+	-	-	-	-	-	-	-	-	10	A-6a (V)	
			50/3"	-	0	SS-7	-	-	-	-	-	-	-	-	-	-		
			34 7 8	23	67	SS-8	2.50	6	16	14	32	32	30	18	12	20	A-6a (7)	
			34 17 7	37	56	SS-9	3.25	-	-	-	-	-	-	-	-	20	A-6a (V)	
	702.8																	
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO WET. -ROCK FRAGMENTS PRESENT IN SS-10			14 19 23	64	89	SS-10	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
			17 7 10	26	100	SS-11	-	33	27	18	14	8	NP	NP	NP	7	A-1-b (0)	
-ROCK FRAGMENTS PRESENT IN SS-12			28 26 22	74	100	SS-12	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			17 19 29	74	100	SS-13	-	46	20	10	19	5	22	19	3	9	A-1-b (0)	
			27 28 31	90	100	SS-14	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
			8 9 21	46	100	SS-15	-	-	-	-	-	-	-	-	-	20	A-1-b (V)	
		W																
	686.3																	
VERY DENSE, GRAYISH BROWN **GRAVEL**, SOME COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, MOIST.			26 41 37	120	100	SS-16	-	60	19	8	11	2	17	15	2	7	A-1-a (0)	

PID: 89464	BR ID: FRA-71-1503L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 245+03.67 / 17.9 LT	START: 1/15/15	END: 1/22/15	PG 2 OF 2	B-113-2-13

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 DENSE, GRAYISH BROWN **GRAVEL**, SOME COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, MOIST. *(continued)*	683.3	61																
VERY DENSE, GRAYISH BROWN **COARSE AND FINE SAND**, SOME SILT, LITTLE CLAY, MOIST.	681.3	62																
		63																
		64	27 50/5"	-	100	SS-17	-	-	-	-	-	-	-	-	-	16	A-3a (V)	
		65																
		66																
	676.3	67																
HARD, BROWNISH GRAY **SANDY SILT**, LITTLE CLAY, LITTLE FINE GRAVEL, DAMP.		68																
		69	29 41 48	136	100	SS-18	4.5+	-	-	-	-	-	-	-	-	9	A-4a (V)	
		70																
		71																
		72																
		73																
		74	13 14 23	57	100	SS-19	4.5+	-	-	-	-	-	-	-	-	10	A-4a (V)	
		75																
		76																
		77																
-ROCK FRAGMENTS PRESENT THROUGHOUT		78																
		79	17 23 44	103	50	SS-20	4.5+	13	13	17	40	17	20	13	7	11	A-4a (4)	
		80																
		81																
		82																
		83																
		84	30 50/3"	-	78	SS-21	4.5+	-	-	-	-	-	-	-	-	8	A-4a (V)	
		85																
		86																
		87																
		88																
	654.1	89	35 50/2"	-	88	SS-22	4.5+	-	-	-	-	-	-	-	-	9	A-4a (V)	
LIMESTONE : BROWNISH GRAY, UNWEATHERED, SLIGHTLY STRONG TO STRONG, MEDIUM TO THICK BEDDED, CHERTY, DOLOMITIC, CRYSTALLINE, SLIGHTLY FRACTURED, NARROW APERTURES, SLIGHTLY ROUGH; RQD 90%, REC 91%.	TR	90																
		91																
-QU @ 91.5' = 14,395 PSI		92	84		85	RC-1											CORE	
		93																
		94																
		95																
-CHERTY FROM @ 95.5' TO 99.2'		96																
		97	97		97	RC-2											CORE	
		98																
	644.1	99	EOB															

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 55.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 376 LBS CEMENT / 100 LBS BENTONITE CHIPS / 80 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-71-1503L
START: 1/15/15 END: 1/16/15

DRILLING FIRM / OPERATOR: RII / T.F.
SAMPLING FIRM / LOGGER: RII / C.D.
DRILLING METHOD: 3.25" HSA / NQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME 750X (SN 310218)
HAMMER: AUTOMATIC
CALIBRATION DATE: 10/20/14
ENERGY RATIO (%): 85.7

STATION / OFFSET: 247+30.17 / 35.7' RT
ALIGNMENT: BL I-71 SB
ELEVATION: 735.3 (MSL) EOB: 91.0 ft.
LAT / LONG: 39.951860, -83.014577

EXPLORATION ID B-113-3-13
PAGE 1 OF 2

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
0.5' - ASPHALT (6.0")	735.3																	
1.0' - AGGREGATE BASE (12.0")	734.8																	
FILL: MEDIUM DENSE, BROWN **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, LITTLE SILT, TRACE CLAY, MOIST.	733.8		9 4 4	11	78	SS-1	-	-	-	-	-	-	-	-	-	11	A-3a (V)	
FILL: VERY STIFF, GRAY **SANDY SILT**, SOME FINE GRVEL, LITTLE CLAY, DAMP.	732.3		2 5 9	20	72	SS-2	2.50	27	15	15	25	18	26	17	9	13	A-4a (2)	
FILL: DENSE TO VERY DENSE, BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, DAMP.	728.3		12 19 16	50	89	SS-3	-	-	-	-	-	-	-	-	-	7	A-2-4 (V)	
			14 16 14	43	83	SS-4	-	43	21	10	13	13	24	15	9	7	A-2-4 (0)	
FILL: VERY STIFF, BROWN AND GRAY **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.	718.3		4 5 8	19	67	SS-5	2.50	-	-	-	-	-	-	-	-	14	A-6a (V)	
-CINDERS AND ORGANICS PRESENT IN SS-6			10 10 11	30	78	SS-6	4.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
FILL: STIFF TO VERY STIFF, BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP. -SLAG AND COAL FRAGMENTS PRESENT IN SS-7	712.3		3 3 5	11	67	SS-7	2.00	9	4	24	29	34	36	20	16	16	A-6b (8)	
-SHELLS PRESENT IN SS-8			5 6 9	21	67	SS-8	3.00	-	-	-	-	-	-	-	-	19	A-6b (V)	
VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, DRY.	707.3		50/3"	-	67	SS-9	-	-	-	-	-	-	-	-	-	3	A-1-a (V)	
STIFF TO HARD, DARK BROWNISH GRAY TO BROWN **SILT AND CLAY**, LITTLE COARSE TO FINE SAND, MOIST.	704.8		2 2 7	13	89	SS-10	2.00	-	-	-	-	-	-	-	-	28	A-6a (V)	
			8 11 13	34	89	SS-11	4.5+	0	2	18	37	43	34	19	15	21	A-6a (10)	
			9 12 12	34	67	SS-12	4.5+	-	-	-	-	-	-	-	-	17	A-6a (V)	
DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.	697.3		11 16 9	36	28	SS-13	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
		W	10 16 20	51	44	SS-14	-	29	47	13	6	5	NP	NP	NP	18	A-1-b (0)	
LOOSE TO MEDIUM DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST TO WET.	688.3		2 5 6	16	56	SS-15	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
			WOH 1 5	9	89	SS-16	-	23	52	15	6	4	NP	NP	NP	36	A-1-b (0)	
STIFF TO HARD, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, MOIST.	678.3	W	5 7 9	23	0	SS-17	-	-	-	-	-	-	-	-	-	-		

PID: 89464 | BR ID: FRA-71-1503L | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 247+30.17 / 35.7 RT | START: 1/15/15 | END: 1/16/15 | PG 2 OF 2 | B-113-3-13

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
STIFF TO HARD, GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, MOIST. *(continued)*	675.3	61	14	-	100	3S-17A	1.50	-	-	-	-	-	-	-	-	12	A-4a (V)	
		62																
		63																
		64	14 23 19	60	0	SS-18	-	-	-	-	-	-	-	-	-	-		
		65	37	-	100	3S-18A	2.00	-	-	-	-	-	-	-	-	13	A-4a (V)	
		66																
		67																
		68																
		69	50/5"	-	100	SS-19	-	29	15	19	21	16	19	12	7	15	A-4a (0)	
	663.3	70																
		71																
		72																
VERY DENSE, GRAY **COARSE AND FINE SAND**, SOME FINE GRAVEL, LITTLE SILT, TRACE CLAY, MOIST.		73																
		74	27 50/2"	-	100	SS-20	-	-	-	-	-	-	-	-	-	12	A-3a (V)	
	658.3	75																
		76																
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.		TR 77																
		78																
		79	28 29 50/3"	-	80	SS-21	-	-	-	-	-	-	-	-	-	13	Rock (V)	
	653.3	80																
		81																
LIMESTONE : BROWNISH GRAY, UNWEATHERED, MODERATELY STRONG TO STRONG, THICK TO VERY THICK BEDDED, CHERTY, DOLOMITIC, PYRITIC, CRYSTALLINE, SLIGHTLY FRACTURED, NARROW APERTURES, SLIGHTLY ROUGH; RQD 93%, REC 95%.		82																
		83																
		84	98		98	RC-1											CORE	
		85																
		86																
-QU @ 87.8' = 5,882 PSI		87																
		88	87		92	RC-2											CORE	
		89																
		90																
	644.3	EOB 91																

NOTES: SEEPAGE ENCOUNTERED @ 44.5'; GROUNDWATER ENCOUNTERED INITIALLY @ 60.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER; PLACED CONCRETE

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-71-1503L
START: 5/29/14 END: 6/3/14

DRILLING FIRM / OPERATOR: RII / J.K.
SAMPLING FIRM / LOGGER: RII / S.B.
DRILLING METHOD: 3.25" HSA / NQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME-55 (SN 386345)
HAMMER: AUTOMATIC
CALIBRATION DATE: 10/20/14
ENERGY RATIO (%): 92

STATION / OFFSET: 249+37.84 / 28.1' RT
ALIGNMENT: BL I-71 SB
ELEVATION: 725.2 (MSL) EOB: 88.3 ft.
LAT / LONG: 39.952170, -83.013979

EXPLORATION ID B-113-4-13

MATERIAL DESCRIPTION AND NOTES	ELEV. 725.2	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
0.5' - TOPSOIL (6.0")	724.7																	
POSSIBLE FILL: VERY STIFF TO HARD, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP. -ROCK, COAL AND BRICK FRAGMENTS PRESENT TROUGHOUT	719.7	1 2 3 4 5	6 11 6	26	78	SS-1	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	
			2 6 6	18	61	SS-2	2.75	32	14	13	21	20	35	20	15	12	A-6a (3)	
DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP. -ROCK FRAGMENTS PRESENT THROUGHOUT	714.7	6 7 8 9 10	11 6 7	20	44	SS-3	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	
			6 6 7	20	33	SS-4	-	-	-	-	-	-	-	-	-	4	A-1-b (V)	
VERY STIFF, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP.	712.2	11 12 13	3 3 6	14	67	SS-5	2.50	25	14	14	27	20	28	17	11	16	A-6a (3)	
LOOSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.	709.7	14 15	5 4 3	11	83	SS-6	-	54	13	7	15	11	30	18	12	13	A-2-6 (0)	
LOOSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP.	707.9	16 17	8 4 3	11	56	SS-7	-	-	-	-	-	-	-	-	-	4	A-1-b (V)	
MEDIUM STIFF TO STIFF, DARK BROWN **SANDY SILT**, LITTLE CLAY, TRACE FINE GRAVEL, MOIST. -TRACE ORGANICS PRESENT THROUGHOUT	704.7	18 19 20	2 2 2	6	72	SS-8	1.00	6	13	20	41	20	32	24	8	23	A-4a (5)	
							1.50	-	-	-	-	-	-	-	-	16	A-4a (V)	
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -COBBLES PRESENT THROUGHOUT -BOULDER PRESENT FROM 25.0' TO 25.5'	699.7	21 22 23 24 25	11 8 12	30	0	SS-9	-	-	-	-	-	-	-	-	-	-		
			12	-	67	2S-9A	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
			15 17 50/3"	-	80	SS-10	-	57	18	6	13	6	23	18	5	8	A-1-b (0)	
VERY DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP. -COBBLES PRESENT THROUGHOUT	688.2	26 27 28 29 30 31 32 33 34 35 36 37	50/3"	-	100	SS-11	-	-	-	-	-	-	-	-	-	-	A-1-a (V)	
			33 25 22	71	100	SS-12	-	63	17	7	9	4	NP	NP	NP	4	A-1-a (0)	
			50 50/0"	-	100	SS-13	-	-	-	-	-	-	-	-	-	4	A-1-a (V)	
DENSE TO VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST. -BOULDER PRESENT FROM 37.0' TO 38.0' -COBBLES PRESENT THROUGHOUT	668.2	W 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57	50 25 35	90	56	SS-14	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
			19 19 12	47	83	SS-15	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
			10 18 13	47	100	SS-16	-	32	43	10	10	5	NP	NP	NP	17	A-1-b (0)	
			18 19 20	59	67	SS-17	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
VERY DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.	665.2	58 59	50/3"	-	0	SS-18	-	-	-	-	-	-	-	-	-	-		

PID: 89464 | BR ID: FRA-71-1503L | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 249+37.84 / 28.1 RT | START: 5/29/14 | END: 6/3/14 | PG 2 OF 2 | B-113-4-13

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
-COBBLES AND BOULDERS PRESENT THROUGHOUT	665.2	61	50/3"	-	0	2S-18A	-	-	-	-	-	-	-	-	-	-		
		62																
		63																
		64	10 24 47	107	78	SS-19	-	56	18	13	9	4	NP	NP	NP	9	A-1-a (0)	
		65																
		66																
		67																
		68																
		69	60/2"	-	0	SS-20	-	-	-	-	-	-	-	-	-	-		
		70																
		71																
AUGER REFUSAL @ 72.5'	652.7	72																
MUDSTONE : GRAY, HIGHLY WEATHERED; RQD 0%, REC 96%.		TR 73	50 50/4"	-	100	SS-21	-	-	-	-	-	-	-	-	-	11	Rock (V)	
	649.9	74																
SHALE : GRAY, HIGHLY WEATHERED; RQD 0%, REC 100%.	649.2	75																
LIMESTONE : GRAY TO BROWN, UNWEATHERED, STRONG TO VERY STRONG, THICK BEDDED, DOLOMITIC, CALCAREOUS, SILICEOUS, CHERTY, HIGHLY TO SLIGHTLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 77%, REC 99%. -QU @ 78.3' = 7,676 PSI		76	34		98	RC-1											CORE	
		77																
		78																
		79																
		80																
		81	97		100	RC-2											CORE	
		82																
		83																
		84																
		85																
		86	100		100	RC-3											CORE	
		87																
	636.9	88 EOB																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 38.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.K.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 250+13.44 / 36.0' RT	EXPLORATION ID B-113-5-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: FRA-71-1503L	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 4/26/13	ELEVATION: 725.7 (MSL) EOB: 85.7 ft.	PAGE 1 OF 2
START: 5/27/14 END: 5/28/14	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 77.7	LAT / LONG: 39.952235986, -83.013728661	

MATERIAL DESCRIPTION AND NOTES	ELEV. 725.7	DEPTHS	SPT/RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
0.5' - TOPSOIL (6.0")	725.2																	
FILL: HARD, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DRY TO DAMP. -BRICK FRAGMENTS PRESENT THROUGHOUT	720.2	1	8 9 10	25	44	SS-1	4.25	20	13	14	30	23	33	19	14	14	A-6a (5)	
		4	8 7 6	17	67	SS-2	4.25	-	-	-	-	-	-	-	-	11	A-6a (V)	
FILL: LOOSE TO MEDIUM DENSE, BROWN TO DARK BROWN **GRAVEL AND SAND**, LITTLE SILT, LITTLE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-3	715.2	6	7 3 7	13	44	SS-3	-	39	12	24	13	12	22	16	6	11	A-1-b (0)	
		9	3 3 4	9	39	SS-4	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	
MEDIUM DENSE, DARK BROWN TO GRAY **GRAVEL**, TRACE COARSE TO FINE SAND, TRACE SILT, DAMP TO MOIST.	707.7	11	7 9 9	23	33	SS-5	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
		14	9 8 8	21	0	SS-6	-	-	-	-	-	-	-	-	-	-		
			5	-	83	2S-6A	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
		16	14 11 7	23	33	SS-7	-	-	-	-	-	-	-	-	-	3	A-1-a (V)	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP. -ROCK FRAGMENTS PRESENT IN 2S-8A	705.2	19	10 11 12	30	0	SS-8	-	-	-	-	-	-	-	-	-	-		
			9	-	100	2S-8A	-	63	15	6	9	7	23	17	6	6	A-1-b (0)	
VERY STIFF, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP.	702.7	22	7 8 9	22	94	SS-9	3.00	-	-	-	-	-	-	-	-	11	A-6a (V)	
MEDIUM DENSE TO VERY DENSE, BROWNISH GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP TO MOIST.		24	6 5 5	13	0	SS-10	-	-	-	-	-	-	-	-	-	-		
			6	-	0	2S-10A	-	-	-	-	-	-	-	-	-	-		
		27	6 8 12	26	44	SS-11	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
-COBBLES PRESENT THROUGHOUT -ROCK FRAGMENTS PRESENT THROUGHOUT	688.7	29	9 15 30	58	89	SS-12	-	64	16	5	10	5	22	16	6	6	A-1-a (0)	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -HEAVING SANDS ENCOUNTERED @ 38.5' -INTRODUCED MUD @ 38.5'	683.7	W 34	20 17 18	45	33	SS-13	-	-	-	-	-	-	-	-	-	3	A-1-a (V)	
		39	4 4 6	13	100	SS-14	-	14	50	12	17	7	NP	NP	NP	14	A-1-b (0)	
VERY DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, MOIST TO WET.		44	50/3"	-	0	SS-15	-	-	-	-	-	-	-	-	-	-		
		45	35	-	100	2S-15A	-	73	12	4	7	4	NP	NP	NP	11	A-1-a (0)	
-COBBLES AND BOULDERS PRESENT THROUGHOUT		49	30 50/3"	-	67	SS-16	-	-	-	-	-	-	-	-	-	16	A-1-a (V)	
	674.7																	
LIMESTONE AND DOLOMITE BOULDERS		51	0		50	RC-1											CORE	
-SWITCHED TO MUD ROTARY DRILLING WITH TRICONE BIT @ 57.0'	668.7	54	0		20	RC-2											CORE	
VERY DENSE, BROWN **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE FINE GRAVEL, WET.		59	25 32 34	85	100	SS-17	-	1	31	44	19	5	NP	NP	NP	19	A-3a (0)	

PID: 89464	BR ID: FRA-71-1503L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 250+13.44 / 36.0 RT	START: 5/27/14	END: 5/28/14	PG 2 OF 2	B-113-5-13

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)	BACK FILL
VERY DENSE, BROWN **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE FINE GRAVEL, WET. *(continued)*	665.7																	
VERY DENSE, BROWN **GRAVEL**, TRACE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.	663.7		43 44 45	115	100	SS-18	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
-COBBLES AND BOULDERS PRESENT THROUGHOUT			50/2"	-	50	SS-19	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
AUGER REFUSAL @ 73.7'	652.2	TR	50/2"	-	100	SS-20	-	-	-	-	-	-	-	-	-	16	Rock (V)	
MUDSTONE : GRAY, WEATHERED; RQD 0%, REC 86%. -0.2' LIMESTONE SEAM FROM 74.2' TO 74.4'	650.8		21		92	RC-3											CORE	
LIMESTONE : GRAY, UNWEATHERED, STRONG, THIN BEDDED, CALCAREOUS, CHERTY, MODERATELY TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY TO VERY ROUGH; RQD 100%, REC 100%.	650.0																	
DOLOMITE : BROWN TO GRAY, UNWEATHERED, VERY STRONG, VERY THICK BEDDED, CALCAREOUS, CRYSTALLINE, CHERTY, PYRITIC, SILICEOUS, SLIGHTLY TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 77%, REC 89%. -QU @ 75.7' = 8,702 PSI			94		100	RC-4											CORE	
-QU @ 80.7' = 7,992 PSI			60		78	RC-5											CORE	
	640.0	EOB																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 38.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: CME-750X (SN 310218)	STATION / OFFSET: 251+93.56 / 37.3' RT	EXPLORATION ID B-113-6-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: FRA-71-1503L	DRILLING METHOD: 4.25" HSA / HQ	CALIBRATION DATE: 4/26/13	ELEVATION: 691.5 (MSL) EOB: 63.7 ft.	PAGE 1 OF 2
START: 4/23/14 END: 4/23/14	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 86.8	LAT / LONG: 39.952409438, -83.013136525	

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 LOOSE TO LOOSE, BLACK TO BROWN AND GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST. -ORGANICS AND PLANT MATERIAL PRESENT IN SS-1	691.5		1 1 2	4	33	SS-1	-	42	17	18	14	9	-	-	-	26	A-2-6 (V)	
			1 2 2	6	56	SS-2	1.50	45	12	11	19	13	31	19	12	17	A-2-6 (0)	
			2 2 2	6	61	SS-3	1.50	43	14	11	19	13	32	19	13	18	A-2-6 (1)	
			1 2 3	7	0	SS-4	-	-	-	-	-	-	-	-	-	-		
			6	-	100	3S-4A	2.00	53	17	9	13	8	-	-	-	18	A-2-6 (V)	
			2 1 1	3	0	SS-5	-	-	-	-	-	-	-	-	-	-		
LOOSE TO MEDIUM DENSE, BLACK AND GRAY **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -INTRODUCED MUD @ 12.0'	681.7		6	-	50	3S-5A	-	-	-	-	-	-	-	-	-	13	A-1-a (V)	
			8 6 4	14	33	SS-6	-	72	13	6	5	4	NP	NP	NP	14	A-1-a (0)	
DENSE TO VERY DENSE, BROWN AND GRAY TO BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.	678.7		13 32 37	100	0	SS-7	-	-	-	-	-	-	-	-	-	-		
			50	-	100	3S-7A	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
			10 17 17	49	78	SS-8	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
			18 24 24	69	89	SS-9	-	66	17	6	7	4	NP	NP	NP	9	A-1-a (0)	
			20 40 25	94	67	SS-10	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
			45 47 41	127	100	SS-11	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
			6 37 48	123	89	SS-12	-	64	16	6	10	4	NP	NP	NP	9	A-1-a (0)	
			20 36 38	107	61	SS-13	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
VERY DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST.	661.2		8 28 39	97	100	SS-14	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
			6 36 27	91	100	SS-15	-	26	32	22	13	7	NP	NP	NP	15	A-1-b (0)	
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK. AUGER REFUSAL @ 43.9 FEET	652.2	TR	50/4"	-	100	SS-16	4.5+	-	-	-	-	-	-	-	-	12	Rock (V)	
LIMESTONE : GRAY TO BROWN, UNWEATHERED, MODERATELY STRONG TO STRONG, VERY THICK BEDDED, CALCAREOUS, DOLOMITIC, PYRITIC, SLIGHTLY TO HIGHLY FRACTURED, TIGHT TO OPEN APERTURES, SLIGHTLY TO VERY ROUGH; RQD 88%, REC 95%. -QU @ 45.9' = 9,906 PSI	647.6		79		79	RC-1											CORE	
-QU @ 50.7' = 11,448 PSI			88		100	RC-2											CORE	
-QU @ 54.8' = 5,140 PSI			93		100	RC-3											CORE	

PID: 89464	BR ID: FRA-71-1503L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 251+93.56 / 37.3 RT	START: 4/23/14	END: 4/23/14	PG 2 OF 2	B-113-6-13

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
LIMESTONE : GRAY TO BROWN, UNWEATHERED, MODERATELY STRONG TO STRONG, VERY THICK BEDDED, CALCAREOUS, DOLOMITIC, PYRITIC, SLIGHTLY TO HIGHLY FRACTURED, TIGHT TO OPEN APERTURES, SLIGHTLY TO VERY ROUGH; RQD 88%, REC 95%. *(continued)* -RC-4 IS ARENACEOUS, FOSSILIFEROUS, STYLOLITIC, AND CONTAINS THINLY LAMINATED BLACK LENSES.	631.5	61 62 63	90		100	RC-4											CORE	
	627.8	EOB																

NOTES: ELEVATION OF SCIOTO RIVER SURFACE @ 699.2

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-71-1503L
START: 4/24/14 END: 4/25/14

DRILLING FIRM / OPERATOR: RII / T.F.
SAMPLING FIRM / LOGGER: RII / S.B.
DRILLING METHOD: 4.25" HSA / HQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME-750X (SN 310218)
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 86.8

STATION / OFFSET: 254+41.19 / 36.0' RT
ALIGNMENT: BL I-71 SB
ELEVATION: 690.3 (MSL) EOB: 55.7 ft.
LAT / LONG: 39.952639679, -83.012306009

EXPLORATION ID B-113-7-13
PAGE 1 OF 1

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 LOOSE, GRAYISH BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, WET.	690.3		WOH WOH 2	3	33	SS-1	-	24	17	29	20	10	NP	NP	NP	22	A-2-4 (0)	
	688.8																	
VERY LOOSE TO LOOSE, DARK GRAYISH BROWN TO BLACK **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, WET.			2 2 2	6	44	SS-2	-	8	47	34	8	3	-	-	-	31	A-1-b (V)	
			1 1 1	3	44	SS-3	-	12	40	37	8	3	NP	NP	NP	32	A-1-b (0)	
	684.3		1 2 1	4	100	SS-4	-	5	47	36	10	2	-	-	-	28	A-1-b (V)	
VERY LOOSE TO LOOSE, DARK GRAY **SANDY SILT**, LITTLE CLAY, TRACE FINE GRAVEL, WET. -INTRODUCED MUD @ 6.4'			1 1 1	3	67	SS-5	-	6	9	48	26	11	NP	NP	NP	53	A-4a (0)	
			2 1 3	6	33	SS-6	-	-	-	-	-	-	-	-	-	45	A-4a (V)	
	680.2																	
DENSE, GRAYISH BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -COBBLES PRESENT @ 10.6'			8 10 15	36	89	SS-7	-	56	24	7	10	3	NP	NP	NP	12	A-1-a (0)	
			5 8 16	35	100	SS-8	-	-	-	-	-	-	-	-	-	13	A-1-a (V)	
	675.2																	
VERY DENSE, GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, DAMP TO MOIST.			4 35 35	101	89	SS-9	-	38	38	12	8	4	NP	NP	NP	11	A-1-b (0)	
-AUGER REFUSAL @ 19.8', SWITCHED TO ROCK CORING AND CORED THROUGH 0.8' THICK LIMESTONE BOULDER, CONTINUTED SAMPLING @ 20.8'.	670.5		50/3"	-	100	SS-10	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
LIMESTONE BOULDER	669.5		0		75	RC-1											CORE	
VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP TO MOIST.			35 50/3"	-	100	SS-11	-	60	13	11	12	4	NP	NP	NP	5	A-1-b (0)	
			50/2"	-	100	SS-12	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
	664.7																	
VERY DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.			28 30 35	94	67	SS-13	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	
	662.7																	
HARD, BROWN AND GRAY **SILTY CLAY**, SOME FINE GRAVEL, LITTLE COARSE TO FINE SAND, DAMP.			48 50 50/3"	-	80	SS-14	4.50	25	8	11	20	36	36	17	19	13	A-6b (8)	
AUGER REFUSAL @ 29.8 FEET	660.5																	
GRANITE, LIMESTONE AND DOLOMITE BOULDERS	659.4		0		93	RC-2											CORE	
		TR																
SHALE : DARK GRAY, HIGHLY WEATHERED, WEAK, THIN BEDDED, MODERATELY FRACTURED, OPEN APERTURES, ROUGH; RQD 21%, REC 31%. -POINT LOAD STRENGTH @ 30.9' TO 35.7' -MEAN QU = 36 PSI			45		53	RC-3											CORE	
-RC-4: COBBLE STUCK IN CORE BARREL PREVENTED CORE FROM ENTERING INNER BARREL. SHALE WASHED OUT DURING CORING PROCESS.			0		0	RC-4											CORE	
	648.8																	
LIMESTONE : BROWN, SLIGHTLY WEATHERED, STRONG, THICK BEDDED, DOLOMITIC, SILICEOUS, CHERTY, PYRITIC, SLIGHTLY FRACTURED, NARROW APERTURES, SLIGHTLY ROUGH; RQD 81%, REC 91%. -QU @ 42.2' = 11,119 PSI			58		76	RC-5											CORE	
-CALCITE LENS PRESENT @ 47.6'			90		100	RC-6											CORE	
-RC-6 AND RC-7 CONTAIN CHERT NODULES AND LENSES THROUGHOUT -QU @ 50.2' = 9,850 PSI -QU @ 51.2' = 10,087 PSI			100		100	RC-7											CORE	
	634.6	EOB																

NOTES: ELEVATION OF SCIOTO RIVER SURFACE @ 700.7

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: CME-750X (SN 310218)	STATION / OFFSET: 256+62.64 / 36.0' RT	EXPLORATION ID B-113-8-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: FRA-71-1503L	DRILLING METHOD: 4.25" HSA / HQ	CALIBRATION DATE: 4/26/13	ELEVATION: 691.0 (MSL) EOB: 66.2 ft.	PAGE 1 OF 2
START: 4/28/14 END: 4/29/14	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 86.8	LAT / LONG: 39.952842559, -83.011561408	

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
MEDIUM DENSE, BROWNISH GRAY **GRAVEL AND SAND**, TRACE CLAY, TRACE SILT, WET.	691.0		4 6 6	17	33	SS-1	-	43	33	19	2	3	-	-	-	20	A-1-b (V)	
	689.5	1																
LOOSE TO MEDIUM DENSE, BROWNISH GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		2	5 6 5	16	33	SS-2	-	57	19	11	8	5	NP	NP	NP	14	A-1-a (0)	
		3																
		4	5 4 2	9	44	SS-3	3.00	56	18	11	9	6	-	-	-	14	A-1-a (V)	
		5	3 6 6	17	44	SS-4	-	60	17	10	8	5	NP	NP	NP	15	A-1-a (0)	
		6																
-INTRODUCED MUD @ 7.2'		7																
		8	7 7 8	22	11	SS-5	-	-	-	-	-	-	-	-	-	17	A-1-a (V)	
	681.8	9	10	-	100	3S-5A	-	70	16	6	6	2	NP	NP	NP	13	A-1-a (0)	
MEDIUM DENSE, BROWN **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, TRACE SILT, WET.	679.8	10	2 7 10	25	100	SS-6	-	-	-	-	-	-	-	-	-	21	A-3a (V)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		11																
		12																
		13	9 6 7	19	44	SS-7	-	-	-	-	-	-	-	-	-	13	A-1-a (V)	
		14																
		15	7 9 17	38	67	SS-8	-	79	11	3	5	2	NP	NP	NP	14	A-1-a (0)	
		16																
		17																
		18	11 15 16	45	50	SS-9	-	-	-	-	-	-	-	-	-	15	A-1-a (V)	
	671.8	19																
VERY DENSE, BROWN AND GRAY **SANDY SILT**, LITTLE CLAY, TRACE TO LITTLE FINE GRAVEL, MOIST TO WET.		20	22 22 29	74	94	SS-10	-	6	3	27	47	17	NP	NP	NP	15	A-4a (6)	
		21																
		22																
		23	19 20 39	85	56	SS-11	-	-	-	-	-	-	-	-	-	19	A-4a (V)	
		24																
		25	18 20 50/5"	-	100	SS-12	-	16	10	25	34	15	NP	NP	NP	15	A-4a (3)	
AUGER REFUSAL @ 27.4 FEET	663.6	26																
		27	50/3"	-	0	SS-13	-	-	-	-	-	-	-	-	-	-		
GRANITE, LIMESTONE AND DOLOMITE BOULDERS		28	0		14	RC-1											CORE	
		29																
		30																
		31																
		32	0		13	RC-2											CORE	
		33																
		34																
		35																
		36																
		37	0		3	RC-3											CORE	
		38																
		39																
		40																
		41																
-SWITCHED TO MUD ROTARY DRILLING WITH TRICONE BIT @ 41.7'.	649.3	42																
VERY DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, DAMP.		43	7 40 20	87	89	SS-14	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
	646.8	44																
HARD, GRAY **SILTY CLAY**, SOME FINE GRAVEL, LITTLE COARSE TO FINE SAND, DAMP.		45	29 32 50	119	67	SS-15	-	34	7	8	23	28	35	19	16	11	A-6b (5)	
	644.0	46																
DOLOMITE : BROWN, SLIGHTLY WEATHERED, STRONG, MEDIUM BEDDED, LIMY, SILICEOUS, PYRITIC, CHERTY, SLIGHTLY FRACTURED, TIGHT TO NARROW APERTURES, SLIGHTLY ROUGH; RQD 40%, REC 48%. -QU @ 47.1' = 12,942 PSI		TR 47	30		46	RC-4											CORE	
		48																
		49																
		50																
-QU @ 52.3' = 9,438 PSI		51																
		52	99		100	RC-5											CORE	
		53																
		54																
		55																
	634.4	56																
LIMESTONE : BROWN, SLIGHTLY WEATHERED, MODERATELY STRONG, THIN TO MEDIUM BEDDED, DOLOMITIC, SILICEOUS, CHERTY, MODERATELY TO SLIGHTLY FRACTURED, TIGHT TO NARROW APERTURES, ROUGH; RQD 90%, REC 92%. -QU @ 56.8' = 9,657 PSI		57																
		58	97		100	RC-6											CORE	
		59																

PID: 89464	BR ID: FRA-71-1503L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 256+62.64 / 36.0 RT	START: 4/28/14	END: 4/29/14	PG 2 OF 2	B-113-8-13

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
LIMESTONE : BROWN, SLIGHTLY WEATHERED, MODERATELY STRONG, THIN TO MEDIUM BEDDED, DOLOMITIC, SILICEOUS, CHERTY, MODERATELY TO SLIGHTLY FRACTURED, TIGHT TO NARROW APERTURES, ROUGH; RQD 90%, REC 92%. *(continued)*	631.0	61																
		62																
		63																
		64	83		97	RC-7											CORE	
		65																
	624.8	66 EOB																

NOTES: ELEVATION OF SCIOTO RIVER SURFACE @ 699.8

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-71-1503L
START: 4/1/14 END: 4/3/14

DRILLING FIRM / OPERATOR: RII / T.F.
SAMPLING FIRM / LOGGER: RII / S.B.
DRILLING METHOD: 4.25" HSA / HQ
SAMPLING METHOD: SPT / RC

DRILL RIG: MOBILE B-53 (SN 624400)
HAMMER: AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 77.7

STATION / OFFSET: 258+77.50 / 36.0' RT
ALIGNMENT: BL I-71 SB
ELEVATION: 706.3 (MSL) EOB: 73.0 ft.
LAT / LONG: 39.953039, -83.010839

EXPLORATION ID: B-113-9-13

MATERIAL DESCRIPTION AND NOTES	ELEV. 706.3	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
0.5' - TOPSOIL (6.0")	705.8																	
FILL: VERY STIFF, DARK BROWN **SILT AND CLAY**, SOME FINE GRAVEL, SOME COARSE TO FINE SAND, DAMP. -ROOT FIBER AND WOOD FRAGMENTS PRESENT IN SS-1 -ROCK FRAGMENTS PRESENT THROUGHOUT -SLAG FRAGMENTS PRESENT IN SS-2		1	5 3 3	8	61	SS-1	3.50	-	-	-	-	-	-	-	-	12	A-6a (V)	
		2																
		3																
		4	5 4 5	12	44	SS-2	3.25	33	14	13	23	17	34	21	13	16	A-6a (2)	
	700.8	5																
FILL: VERY DENSE, BROWN AND GRAY **GRAVEL AND SAND**, TRACE SILT, MOIST. -ROCK AND SLAG FRAGMENTS PRESENT IN SS-3		6	18 34 8	54	67	SS-3	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
	698.3	7																
FILL: MEDIUM STIFF TO STIFF, GRAY **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST. -BRICK AND CONCRETE FRAGMENTS PRESENT IN SS-4		8																
		9	5 8 9	22	50	SS-4	1.25	-	-	-	-	-	-	-	-	18	A-6b (V)	
-TRACE ROCK FRAGMENTS PRESENT THROUGHOUT		10																
		11																
		12	4 4 9	17	67	SS-5	0.75	19	12	14	31	24	34	18	16	19	A-6b (6)	
		13																
	691.3	14	6 3 3	8	67	SS-6	1.00	-	-	-	-	-	-	-	-	19	A-6b (V)	
FILL: MEDIUM STIFF TO STIFF, DARK BROWN TO GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST TO WET. -CONSOLIDATION TEST PERFORMED @ 16.3' -QU @ 16.4' = 1,531 PSF (0.77 TSF)		15																
		16			69	ST-7	1.50	19	10	13	31	27	32	18	14	18	A-6a (6)	
		17																
		18																
-CONCRETE AND SLAG FRAGMENTS PRESENT IN SS-8		19	3 2 2	5	39	SS-8	0.75	-	-	-	-	-	-	-	-	26	A-6a (V)	
	685.8	20	W															
STIFF, BROWN AND BLACK **SANDY SILT**, SOME CLAY, LITTLE FINE GRAVEL, MOIST TO WET. -SS-9: LL (OVEN DRIED) = 23%; LOI = 5.6%		21																
		22	2 4 4	10	100	SS-9	-	10	4	19	46	21	32	22	10	40	A-4a (6)	
	683.3	23																
MEDIUM DENSE, BROWN **SANDY SILT**, LITTLE FINE GRAVEL, TRACE CLAY, MOIST. -ORGANICS PRESENT THROUGHOUT -ROCK FRAGMENTS PRESENT IN SS-10		24	7 8 10	23	56	SS-10	-	-	-	-	-	-	-	-	-	12	A-4a (V)	
	680.8	25																
VERY DENSE, GRAY **SANDY SILT**, LITTLE FINE GRAVEL, TRACE CLAY, DAMP TO MOIST.		26	10 17 26	56	61	SS-11	-	13	15	30	32	10	NP	NP	NP	12	A-4a (1)	
		27																
		28																
		29	8 22 25	61	78	SS-12	-	-	-	-	-	-	-	-	-	9	A-4a (V)	
	674.3	30																
DENSE TO VERY DENSE, GRAY TO BROWN **GRAVEL WITH SAND AND SILT**, TRACE TO LITTLE CLAY, DAMP TO MOIST. -ROCK FRAGMENTS PRESENT IN SS-13		31																
		32																
		33																
		34	10 15 20	45	56	SS-13	-	59	15	8	11	7	21	14	7	9	A-2-4 (0)	
		35																
		36																
		37																
		38																
-INTRODUCED MUD @ 38.5'		39	6 22 22	57	83	SS-14	4.50	-	-	-	-	-	-	-	-	11	A-2-4 (V)	
		40																
		41																
		42																
		43																
		44	9 23 30	69	67	SS-15	4.50	35	17	16	18	14	22	12	10	8	A-2-4 (0)	
		45																
		46																
		47																
		48																
	656.3	49	10 30 50/5"	-	0	SS-16	-	-	-	-	-	-	-	-	-	-		
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.		50	TR 30	-	100	2S-16A	-	-	-	-	-	-	-	-	-	13	Rock (V)	
		51																
		52																
		53																
		54	30 50/3"	-	100	SS-17	4.5+	-	-	-	-	-	-	-	-	10	Rock (V)	
AUGER REFUSAL @ 55.5 FEET	650.8	55																
MUDSTONE : GRAY, HIGHLY WEATHERED, VERY WEAK, MEDIUM BEDDED, FRIABLE, PYRITIC, HIGHLY FRACTURED, VERY ROUGH; RQD 0%, REC 23%. -RC-1: 0.2' LIMESTONE PIECE RECOVERED; MUDSTONE WASHED OUT DURING CORING PROCESS		56	0		7	RC-1											CORE	
		57																
		58																
		59																

FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-113-9-13

DRAWN RRM
CHECKED BRT

PID: 89464 | BR ID: FRA-71-1503L | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 258+77.50 / 36.0 RT | START: 4/1/14 | END: 4/3/14 | PG 2 OF 2 | B-113-9-13

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
	646.3																	
	645.6	61	40		70	RC-2											CORE	
LIMESTONE : GRAY TO BLACK, UNWEATHERED, VERY STRONG, THICK TO VERY THICK BEDDED, CALCAREOUS, CRYSTALLINE, CHERTY, ARENACEOUS, DOLOMITIC, PYRITIC, CALCITE DEPOSITS, STYLOLITIC, JOINTED, FRACTURED TO INTACT, OPEN APERTURES, SLIGHTLY ROUGH TO ROUGH; RQD 95%, REC 100%. -QU @ 61.8' = 11,594 PSI -QU @ 64.5' = 5,086 PSI		62 63 64 65 66 67	100		100	RC-3											CORE	
		68 69 70 71 72	94		100	RC-4											CORE	
	633.3	EOB 73																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 21.0'; CAVE-IN DEPTH @ 20.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-71-1503L
START: 5/13/14 END: 5/14/14

DRILLING FIRM / OPERATOR: RII / J.K.
SAMPLING FIRM / LOGGER: RII / J.P.
DRILLING METHOD: 4.25" HSA / NQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME-750X (SN 310218)
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 86.8

STATION / OFFSET: 260+75.33 / 40.2' RT
ALIGNMENT: BL I-71 SB
ELEVATION: 716.6 (MSL) EOB: 81.0 ft.
LAT / LONG: 39.953210, -83.010169

EXPLORATION ID B-114-1-13

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
0.3' - TOPSOIL (4.0")	716.6																	
FILL: STIFF, BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST. -ROOT FIBERS PRESENT IN SS-1	716.3		3 4 3	10	61	SS	2.00	-	-	-	-	-	-	-	-	15	A-6b (V)	
FILL: VERY DENSE, BROWN **GRAVEL WITH SAND**, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-2	713.6		50/1"	-	100	SS	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
FILL: STIFF, BROWN TO DARK BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP TO MOIST. -ROOT FIBERS AND ROCK FRAGMENTS PRESENT IN SS-3	711.1		8 4 4	12	22	SS	1.50	14	10	12	39	25	35	19	16	18	A-6b (8)	
			4 6 3	13	56	SS	1.50	-	-	-	-	-	-	-	-	21	A-6b (V)	
FILL: STIFF TO VERY STIFF, DARK BROWN TO BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME TO AND FINE GRAVEL, DAMP. -CONCRETE FRAGMENTS PRESENT IN SS-5	706.1		5 3 2	7	33	SS	1.50	33	15	13	24	15	33	20	13	13	A-6a (2)	
			4 3 5	12	56	SS	4.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
-BRICK FRAGMENTS AND ROOT FIBERS PRESENT IN SS-8			5 7 8	22	39	SS	2.00	38	11	13	24	14	33	20	13	13	A-6a (1)	
	696.1		6 7 6	19	56	SS	2.75	-	-	-	-	-	-	-	-	17	A-6a (V)	
VERY SOFT TO MEDIUM STIFF, BROWN TO DARK BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, MOIST.	691.6		3 2 3	7	89	SS	1.00	0	1	10	60	29	37	21	16	29	A-6b (10)	
			4 3 3	9	89	SS	0.25	-	-	-	-	-	-	-	-	25	A-6b (V)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, LITTLE SILT, TRACE CLAY, MOIST.		W 688.1			0	ST	-	-	-	-	-	-	-	-	-	-		
			3 4 8	17	67	SS	-	55	23	9	10	3	22	18	4	14	A-1-a (0)	
	682.1		8 16 12	41	50	SS	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
HARD, DARK GRAY **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP. -COBBLES PRESENT FROM 36.5' TO 38.5'	679.6						4.5+	31	13	13	26	17	23	14	9	8	A-4a (2)	
VERY DENSE, GRAY **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST. -BOULDER PRESENT FROM 39.5' TO 41.0'	674.6		18 50/6"	-	75	SS	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	
VERY STIFF TO HARD, GRAY TO LIGHT BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.	664.6		14 17 8	36	50	SS	3.00	19	12	9	18	42	35	16	19	23	A-6b (9)	
			4 12 15	39	83	SS	4.5+	-	-	-	-	-	-	-	-	20	A-6b (V)	
HARD, LIGHT BROWN **CLAY**, SOME SILT, TRACE FINE SAND, TRACE FINE GRAVEL, DAMP.	662.1	TR	20 50/6"	-	83	SS	4.5+	5	0	1	32	62	46	22	24	15	A-7-6 (15)	
SHALE : GRAY, WEATHERED.			50/3"	-	100	SS	-	-	-	-	-	-	-	-	-	17	Rock (V)	

PID: 89464 | BR ID: FRA-71-1503L | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 260+75.33 / 40.2 RT | START: 5/13/14 | END: 5/14/14 | PG 2 OF 2 | B-114-1-13

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 : GRAY, WEATHERED. *(continued)* AUGER REFUSAL @ 61.0'	649.8 / 648.8	61																
SHALE : GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, VERY WEAK TO WEAK, VERY THICK BEDDED, CALCAREOUS, ARGILLACEOUS, FRIABLE, MICACEOUS, FISSILE, MODERATELY TO HIGHLY FRACTURED, TIGHT TO OPEN APERTURES, SLICKENSIDED TO SLIGHTLY ROUGH; RQD 37%, REC 89%.		62–66	76		95	RC-1											CORE	
		66–71	23		100	RC-2											CORE	
-POINT LOAD STRENGTH @ 73.0' TO 74.0' -MEAN QU = 255 PSI	634.8	71–76	23		75	RC-3											CORE	
LIMESTONE : GRAY AND BROWN, UNWEATHERED TO SLIGHTLY WEATHERED, VERY STRONG, VERY THICK BEDDED, DOLOMITIC, CALCAREOUS, CRYSTALLINE, CHERTY, PYRITIC, SILICEOUS, SLIGHTLY TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 95%, REC 96%. -QU @ 76.0' = 11,340 PSI		76–81	94		96	RC-4											CORE	
	628.8	EOB 81																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 28.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL171.dgn 1/31/2019 12:38:32 PM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: CME-750X (SN 310218)	STATION / OFFSET: 263+18.38 / 9.4' LT	EXPLORATION ID B-114-2-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / J.P.	HAMMER: CME AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: FRA-71-1503L	DRILLING METHOD: 4.25" HSA / NQ	CALIBRATION DATE: 4/26/13	ELEVATION: 723.5 (MSL) EOB: 82.0 ft.	PAGE 1 OF 2
START: 6/4/14 END: 6/5/14	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 86.8	LAT / LONG: 39.953552, -83.009405	

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
0.5' - ASPHALT (6.0")	723.5																	
FILL: MEDIUM STIFF, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP. -ROOT FIBERS AND ORGANIC ODOR PREENT IN SS-1	723.0		2 3 3	9	33	SS-1	1.00	-	-	-	-	-	-	-	-	14	A-6a (V)	
FILL: LOOSE, BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST. -ROOT FIBERS PRESENT IN SS-2	720.5		3 2 3	7	33	SS-2	-	-	-	-	-	-	-	-	-	7	A-2-4 (V)	
FILL: STIFF TO VERY STIFF, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP TO MOIST. -ROOT FIBERS AND SHALE FRAGMENTS PRESENT IN SS-3	718.0		2 4 5	13	50	SS-3	1.75	24	18	11	27	20	30	19	11	19	A-6a (3)	
			2 3 1	6	50	SS-4	1.50	-	-	-	-	-	-	-	-	16	A-6a (V)	
			2 4 5	13	67	SS-5	2.50	-	-	-	-	-	-	-	-	16	A-6a (V)	
FILL: LOOSE, DARK BROWN **SANDY SILT**, LITTLE FINE GRAVEL, LITTLE CLAY, WET. -BRICK AND CLAY TILE FRAGMENTS PRESENT IN SS-6	710.5		2 2 2	6	89	SS-6	-	17	33	13	22	15	NP	NP	NP	22	A-4a (0)	
VERY STIFF TO HARD, BROWN **SILT AND CLAY**, LITTLE FINE SAND, DAMP TO MOIST.	708.0		8 12 13	36	83	SS-7	4.5+	-	-	-	-	-	-	-	-	17	A-6a (V)	
			5 6 7	19	100	SS-8	2.50	-	-	-	-	-	-	-	-	18	A-6a (V)	
			5 8 7	22	100	SS-9	2.75	0	0	13	51	36	33	18	15	22	A-6a (10)	
SOFT, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, MOIST TO WET.	700.5		1 2 1	4	100	SS-10	0.50	-	-	-	-	-	-	-	-	28	A-6a (V)	
			WOH 1 1	3	100	SS-11	0.50	0	5	28	37	30	29	17	12	23	A-6a (7)	
LOOSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, WET.	695.5	W	2 2 3	7	78	SS-12	-	38	29	12	13	8	25	20	5	20	A-1-b (0)	
VERY DENSE, BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.	691.5		6 20 18	55	100	SS-13	-	-	-	-	-	-	-	-	-	17	A-1-b (V)	
HARD, GRAY **SANDY SILT**, SOME CLAY, LITTLE FINE GRAVEL, DAMP. -COBBLES PRESENT @ 38.0'	686.5		20 18 20	55	39	SS-14	4.5+	11	19	12	23	35	25	16	9	13	A-4a (5)	
DENSE TO VERY DENSE, BROWNISH GRAY TO GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.	681.5		12 30 42	104	100	SS-15	-	-	-	-	-	-	-	-	-	16	A-1-b (V)	
			4 15 9	35	100	SS-16	-	36	36	15	6	7	NP	NP	NP	11	A-1-b (0)	
HARD, BROWN TO GRAY **SILTY CLAY**, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.	671.5		10 18 30	69	50	SS-17	4.5+	-	-	-	-	-	-	-	-	20	A-6b (V)	
			18 33 19	75	78	SS-18	4.5+	9	6	4	39	42	38	20	18	12	A-6b (11)	

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL172.dgn 1/31/2019 12:39:13 PM rachelm

PID: 89464 | BR ID: FRA-71-1503L | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 263+18.38 / 9.4 LT | START: 6/4/14 | END: 6/5/14 | PG 2 OF 2 | B-114-2-13

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
HARD, BROWN TO GRAY **SILTY CLAY**, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST. *(continued)*	663.5	61 62 63																
	660.0	TR																
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.		64	21 50/4"	-	90	SS-19	-	-	-	-	-	-	-	-	-	12	Rock (V)	
		65 66 67 68																
		69	60/2"	-	0	SS-20	-	-	-	-	-	-	-	-	-	-		
-0.2' CLAY SEAM @ 70.0'		70																
-LIMESTONE FRAGMENTS RECOVERED IN RC-1	651.5	71	0		33	RC-1											CORE	
SHALE : GRAY, MODERATELY WEATHERED TO UNWEATHERED, VERY WEAK TO WEAK, VERY THICK BEDDED, CALCAREOUS, FRIABLE, FISSILE, PYRITIC, MODERATELY TO HIGHLY FRACTURED, THIGHT TO OPEN APERTURES, SLIGHTLY TO VERY ROUGH; RQD 35%, REC 58%.		72 73 74 75 76	50		85	RC-2											CORE	
		77 78 79 80	43		50	RC-3											CORE	
	643.0																	
LIMESTONE : GRAY, UNWEATHERED, VERY STRONG, THICK BEDDED, CALCAREOUS, SILICEOUS, CHERTY, DOLOMITIC, PYRITIC, MODERATELY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 100%, REC 100%.	641.5	81 82 EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 30.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-71-1503L
START: 5/28/14 END: 5/29/14

DRILLING FIRM / OPERATOR: RII / T.F.
SAMPLING FIRM / LOGGER: RII / J.P.
DRILLING METHOD: 4.25" HSA / HQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME-750X (SN 310218)
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 86.8

STATION / OFFSET: 264+64.99 / 20.3' LT
ALIGNMENT: BL I-71 SB
ELEVATION: 724.6 (MSL) EOB: 84.0 ft.
LAT / LONG: 39.953688, -83.008908

EXPLORATION ID B-114-3-13

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)	BACK FILL
0.5' - TOPSOIL (6.0")	724.6																	
FILL: STIFF TO VERY STIFF, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP. -BRICK FRAGMENTS PRESENT IN SS-1	724.1		4 4 3	10	44	SS-1	2.00	-	-	-	-	-	-	-	-	11	A-6a (V)	
-ROOT FIBERS PRESENT IN SS-2			2 3 3	9	39	SS-2	2.25	23	13	14	26	24	34	20	14	16	A-6a (4)	
			3 4 4	12	44	SS-3	1.50	-	-	-	-	-	-	-	-	15	A-6a (V)	
			6 6 4	14	56	SS-4	2.25	-	-	-	-	-	-	-	-	18	A-6a (V)	
			3 7 3	14	78	SS-5	1.50	21	13	15	26	25	34	20	14	17	A-6a (5)	
			3 7 13	29	72	SS-6	1.50	-	-	-	-	-	-	-	-	18	A-6a (V)	
-BRICK AND COAL FRAGMENTS PRESENT IN SS-7			30 45 28	106	33	SS-7	2.00	-	-	-	-	-	-	-	-	19	A-6a (V)	
-ROOT FIBERS PRESENT IN SS-8			12 12 17	42	33	SS-8	4.00	-	-	-	-	-	-	-	-	16	A-6a (V)	
VERY STIFF, DARK BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, SOME FINE GRAVEL, DAMP.	704.1		7 7 10	25	67	SS-9	3.50	-	-	-	-	-	-	-	-	18	A-6b (V)	
			12 10 11	30	56	SS-10	3.00	22	12	14	26	26	35	19	16	15	A-6b (6)	
DENSE TO VERY DENSE, BROWNISH GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP TO MOIST.	699.1		20 22 26	69	78	SS-11	-	-	-	-	-	-	-	-	-	7	A-2-6 (V)	
		W	6 8 17	36	67	SS-12	1.00	45	14	11	17	13	28	17	11	14	A-2-6 (0)	
MEDIUM DENSE, BROWN TO DARK BROWNISH GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, WET.	692.6		4 4 4	12	33	SS-13	-	-	-	-	-	-	-	-	-	19	A-1-b (V)	
			5 5 11	23	89	SS-14	-	31	37	21	6	5	NP	NP	NP	19	A-1-b (0)	
VERY DENSE, BROWNISH GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, WET.	682.6		50/4"	-	100	SS-15	-	-	-	-	-	-	-	-	-	23	A-1-b (V)	
VERY DENSE, BROWNISH GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, MOIST.	677.6		40 50/5"	-	100	SS-16	-	20	31	15	25	9	NP	NP	NP	10	A-2-4 (0)	
VERY DENSE, BROWNISH GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.	672.6		45 50/3"	-	100	SS-17	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
HARD, BROWN **CLAY**, AND SILT, LITTLE COARSE TO FINE SAND, DAMP.	667.6		5 15 30	65	67	SS-18	4.5+	0	3	10	38	49	41	21	20	19	A-7-6 (12)	

PID: 89464 | BR ID: FRA-71-1503L | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 264+64.99 / 20.3 LT | START: 5/28/14 | END: 5/29/14 | PG 2 OF 2 | B-114-3-13

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)	BACK FILL
HARD, BROWN **CLAY**, AND SILT, LITTLE COARSE TO FINE SAND, DAMP. *(continued)*	664.6	61 62 63																
	661.1	TR																
SHALE : BROWN TO GRAY, HIGHLY WEATHERED, VERY WEAK.		64	50/5"	-	100	SS-19	-	-	-	-	-	-	-	-	-	-	Rock (V)	
		65 66 67 68																
AUGER REFUSAL @ 69.0'	655.2	69	35 50/5"	-	100	SS-20	-	-	-	-	-	-	-	-	-	-	Rock (V)	
SHALE : GRAY, SLIGHTLY TO HIGHLY WEATHERED, VERY WEAK TO WEAK, MEDIUM BEDDED, CALCAREOUS, FRIABLE, MICACEOUS, FISSILE, FRACTURED TO HIGHLY FRACTURED, TIGHT TO OPEN APERTURES, SLIGHTLY TO VERY ROUGH; RQD 19%, REC 62%. -0.5' LIMESTONE SEAM @ 69.4'		70 71 72 73 74	10		44	RC-1	-	-	-	-	-	-	-	-	-	-	CORE	
-QU @ 77.5' = 259 PSI		75 76 77 78 79	27		80	RC-2											CORE	
LIMESTONE : GRAY, UNWEATHERED, VERY STRONG, VERY THICK BEDDED, DOLOMITIC, CALCAREOUS, SILICEOUS, CRYSTALLINE, PYRITIC, SLIGHTLY FRACTURED TO FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 91%, REC 100%.	645.2	80 81 82 83	83		92	RC-3											CORE	
	640.6	EOB 84																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 29.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-71-1503L
START: 5/5/14 END: 5/20/14

DRILLING FIRM / OPERATOR: RII / J.K.
SAMPLING FIRM / LOGGER: RII / T.P.
DRILLING METHOD: 4.25" HSA / HQ
SAMPLING METHOD: SPT / RC

DRILL RIG: MOBILE B-53 (SN 624400)
HAMMER: AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 77.7

STATION / OFFSET: 265+98.19 / 41.6' LT
ALIGNMENT: BL I-71 SB
ELEVATION: 724.1 (MSL) EOB: 86.2 ft.
LAT / LONG: 39.953825, -83.008456

EXPLORATION ID: B-114-4-13
PAGE 1 OF 2

MATERIAL DESCRIPTION AND NOTES	ELEV. 724.1	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
0.4' - TOPSOIL (5.0")	723.7																	
FILL: LOOSE TO MEDIUM DENSE, BROWN TO DARK BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST TO WET. -BRICK FRAGMENTS, WOOD AND ROOT FIBERS PRESENT THROUGHOUT		1	3 3 4	9	50	SS-1	-	-	-	-	-	-	-	-	-	22	A-2-4 (V)	
		2																
		3																
		4	4 5 6	14	39	SS-2	-	43	19	9	15	14	NP	NP	NP	20	A-2-4 (0)	
	718.6	5																
FILL: STIFF TO VERY STIFF, BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP TO MOIST.		6																
		7	3 4 9	17	61	SS-3	2.50	-	-	-	-	-	-	-	-	15	A-6a (V)	
		8																
-ORGANICS PRESENT IN SS-4		9	2 3 3	8	72	SS-4	2.00	12	14	7	27	40	32	20	12	21	A-6a (7)	
		10																
-BRICK FRAGMENTS PRESENT IN SS-5		11	5 9 4	17	28	SS-5	1.25	-	-	-	-	-	-	-	-	18	A-6a (V)	
	711.1	12																
FILL: VERY LOOSE TO LOOSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, WET.		13																
		14	2 2 1	4	33	SS-6	-	42	17	13	19	9	NP	NP	NP	45	A-2-4 (0)	
-BRICK FRAGMENTS, CINDERS AND WOOD FIBERS PRESENT THROUGHOUT		15																
		16																
		17	1 1 3	5	33	SS-7	-	-	-	-	-	-	-	-	-	36	A-2-4 (V)	
	706.1	18																
STIFF, DARK BROWN **SILT**, AND CLAY, LITTLE COARSE TO FINE SAND, MOIST.		19	2 4 6	13	67	SS-8	1.50	0	5	8	50	37	32	24	8	27	A-4b (8)	
	703.6	20																
LOOSE, DARK BROWN AND BLACK **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST.		21																
		22	4 3 4	9	56	SS-9	-	-	-	-	-	-	-	-	-	20	A-2-4 (V)	
	701.1	23																
MEDIUM DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP.		24	10 12 10	28	67	SS-10	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
		25																
		26																
		27	10 13 9	28	67	SS-11	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
	696.1	28																
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST.		29	8 11 10	27	67	SS-12	-	52	19	7	15	7	NP	NP	NP	14	A-1-b (0)	
W		30																
		31																
		32																
		33																
		34	8 10 20	39	28	SS-13	-	-	-	-	-	-	-	-	-	15	A-1-b (V)	
		35																
	687.1	36																
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		37																
		38																
		39	15 19 14	43	28	SS-14	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
-COBBLES PRESENT THROUGHOUT		40																
		41																
		42																
		43																
	680.1	44	5 6 5	14	44	SS-15	-	64	17	6	8	5	NP	NP	NP	9	A-1-a (0)	
VERY STIFF TO HARD, BROWN TO GRAY **CLAY**, LITTLE SILT, LITTLE FINE GRAVEL, TRACE COARSE TO FINE SAND, DAMP TO MOIST.		45					3.00	-	-	-	-	-	-	-	-	19	A-7-6 (V)	
		46																
		47																
		48																
		49	6 9 16	32	56	SS-16	3.75	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
		50																
		51																
		52																
		53																
		54	9 16 20	47	72	SS-17	4.5+	14	5	2	16	63	52	21	31	21	A-7-6 (18)	
		55																
		56																
		57																
		58																
		59	10 13 16	38	67	SS-18	4.5+	-	-	-	-	-	-	-	-	24	A-7-6 (V)	

PID: 89464 | BR ID: FRA-71-1503L | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 265+98.19 / 41.6 LT | START: 5/5/14 | END: 5/20/14 | PG 2 OF 2 | B-114-4-13

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 STIFF TO HARD, BROWN TO GRAY **CLAY**, LITTLE SILT, LITTLE FINE GRAVEL, TRACE COARSE TO FINE SAND, DAMP TO MOIST. *(continued)*	664.1	61																
AUGER REFUSAL @ 63.8'	660.6	TR 63	50/3"	-	100	SS-19	-	-	-	-	-	-	-	-	-	8	Rock (V)	
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK. -0.3' LIMESTONE PIECE RECOVERED IN RC-1; REMAINDER OF ROCK IN CORE RUN WASHED OUT DUE TO BARREL BEING BLOCKED BY LIMESTONE.		64	0		5	RC-1											CORE	
		65																
		66																
		67																
		68																
		69																
		70																
		71	0		0	RC-2											CORE	
		72																
	650.6	73																
SHALE : GRAY, SLIGHTLY WEATHERED, WEAK, THIN BEDDED, CALCAREOUS, FISSILE, FRACTURED, NARROW TO OPEN APERTURES, SLIGHTLY ROUGH; RQD 26%, REC 73%.		74																
		75	25		43	RC-3											CORE	
		76																
		77																
		78																
-0.2' LIMESTONE SEAM @ 78.1'		79	63		98	RC-4											CORE	
	644.3	80																
LIMESTONE : GRAY, SLIGHTLY WEATHERED, MODERATELY STRONG, THIN TO THICK BEDDED, CHERTY, PYRITIC, DOLOMITIC, SLIGHTLY FRACTURED, OPEN APERTURES, VERY ROUGH; RQD 87%, REC 99%.		81																
		82																
		83																
		84	83		100	RC-5											CORE	
-0.1' CHERT SEAM @ 84.4'		85																
	637.9	EOB 86																

NOTES: GROUNDWATER INITIALLY ENCOUNTERED @ 30.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE CHIPS / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-71-1503L
START: 3/4/14 END: 3/5/14

DRILLING FIRM / OPERATOR: RII / T.F.
SAMPLING FIRM / LOGGER: RII / S.M.
DRILLING METHOD: 4.25" HSA / HQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME-750X (SN 310218)
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 86.8

STATION / OFFSET: 268+86.79 / 10.9' LT
ALIGNMENT: BL I-71 SB
ELEVATION: 715.3 (MSL) EOB: 89.6 ft.
LAT / LONG: 39.953856, -83.007412

EXPLORATION ID B-114-5-13

MATERIAL DESCRIPTION AND NOTES	ELEV. 715.3	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
0.1' - TOPSOIL (1.0")	715.2																	
FILL: MEDIUM DENSE, DARK BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-1	712.3		7 6 5	16	78	SS-1	-	36	17	13	20	14	30	19	11	11	A-2-6 (0)	
FILL: STIFF, DARK BROWN TO BROWNISH GRAY **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST. -BRICK FRAGMENTS AND CINDERS PRESENT IN SS-2			3 3 3	9	33	SS-2	2.00	-	-	-	-	-	-	-	-	14	A-6b (V)	
			2 3 4	10	44	SS-3	1.75	-	-	-	-	-	-	-	-	21	A-6b (V)	
			2 3 4	10	50	SS-4	1.75	7	7	13	39	34	38	18	20	21	A-6b (12)	
-BRICK FRAGMENTS AND ROOT FIBERS PRESENT IN SS-5	702.3		3 3 4	10	33	SS-5	2.00	-	-	-	-	-	-	-	-	13	A-6b (V)	
MEDIUM DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT IN SS-6	699.8		5 4 7	16	33	SS-6	-	-	-	-	-	-	-	-	-	18	A-1-b (V)	
MEDIUM DENSE, BROWN **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE FINE GRAVEL, DAMP. -ROCK FRAGMENTS PRESENT IN SS-7	697.3	W	4 6 8	20	39	SS-7	-	10	29	33	19	9	NP	NP	NP	9	A-3a (0)	
DENSE TO VERY DENSE, BROWN **GRAVEL**, LITTLE TO SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.			7 34 28	90	33	SS-8	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
-ROCK FRAGMENTS PRESENT IN SS-9			14 28 32	87	33	SS-9	-	67	13	6	10	4	NP	NP	NP	9	A-1-a (0)	
			9 13 14	39	61	SS-10	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	
			12 14 14	41	50	SS-11	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
-INTRODUCED MUD @ 30.0'			22 13 15	41	39	SS-12	-	65	18	7	8	2	NP	NP	NP	10	A-1-a (0)	
	683.3																	
DENSE, GRAY **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, TRACE SILT, TRACE CLAY, MOIST.	678.3		10 16 16	46	44	SS-13	-	-	-	-	-	-	-	-	-	11	A-3a (V)	
VERY STIFF, BROWN **CLAY**, SOME SILT, TRACE COARSE TO FINE SAND, DRY.	673.3		6 7 9	23	50	SS-14	3.00	0	2	1	28	69	44	20	24	10	A-7-6 (14)	
HARD, BROWN **SILT**, "AND" CLAY, TRACE COARSE TO FINE SAND, MOIST TO WET.			18 23 19	61	67	SS-15	4.5+	-	-	-	-	-	-	-	-	24	A-4b (V)	
			14 18 20	55	44	SS-16	4.5+	0	1	1	59	39	25	15	10	17	A-4b (8)	
	661.7																	
HARD, GRAY **CLAY**, SOME SILT, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DRY TO DAMP. -SHALE AND LIMESTONE FRAGMENTS PRESENT THROUGHOUT			48 50/5"	-	73	SS-17	4.5+ 4.5+	- -	- -	- -	- -	- -	- -	- -	- -	16 9	A-4b (V) A-7-6 (V)	
			20 22 26	69	61	SS-18	4.5+	1	1	1	31	66	53	22	31	17	A-7-6 (19)	

FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-114-5-13

DRAWN RRM
CHECKED BRT

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL178.dgn 1/31/2019 12:45:40 PM rachelm

PID: 89464 | BR ID: FRA-71-1503L | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 268+86.79 / 10.9 LT | START: 3/4/14 | END: 3/5/14 | PG 2 OF 2 | B-114-5-13

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)	BACK FILL
HARD, GRAY **CLAY**, SOME SILT, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DRY TO DAMP. *(continued)*	655.3	61 62 63																
	651.8	TR																
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.		64	50/5"	-	100	SS-19	-	-	-	-	-	-	-	-	-	20	Rock (V)	
		65 66 67 68																
		69	50/3"	-	100	SS-20	-	-	-	-	-	-	-	-	-	10	Rock (V)	
		70 71 72 73																
		74	48 50/5"	-	64	SS-21	-	-	-	-	-	-	-	-	-	10	Rock (V)	
		75 76 77 78																
AUGER REFUSAL @ 79.6	635.7	79	50/1"	-	0	SS-22	-	-	-	-	-	-	-	-	-	-		
LIMESTONE : GRAY, UNWEATHERED, VERY STRONG, VERY THICK BEDDED, CALCAREOUS, SILICEOUS, CRYSTALLINE, CHERT INCLUSIONS, SLIGHTLY DOLOMITIC, JOINTED, INTACT TO FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH TO ROUGH; RQD 91%, REC 98%. -QU @ 80.5' = 8,154 PSI -0.1' CALCITE DEPOSIT @ 83.1'		80 81 82	98		100	RC-1											CORE	
-QU @ 84.6' = 12,237 PSI		83 84 85 86 87	83		97	RC-2											CORE	
	625.7	EOB 88 89																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 18.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: COMPACTED WITH THE AUGER SOIL CUTTINGS

FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-114-5-13

DRAWN RRM
CHECKED BRT

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / J.B.	DRILL RIG: CME-750 (SN 98048)	STATION / OFFSET: 271+12.84 / 28.4' RT	EXPLORATION ID B-114-7-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / T.F./K.S	HAMMER: CME AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: FRA-71-1503L	DRILLING METHOD: 4.25" HSA / HQ	CALIBRATION DATE: 4/26/13	ELEVATION: 713.3 (MSL) EOB: 84.0 ft.	PAGE 1 OF 2
START: 2/4/14 END: 2/14/14	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 82.6	LAT / LONG: 39.953782, -83.006602	

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
0.2' - TOPSOIL (2.0")	713.1																	
VERY STIFF, BROWN **SILT AND CLAY**, SOME FINE GRAVEL, SOME COARSE TO FINE SAND, DAMP. -ROCK FRAGMENTS PRESENT THROUGHOUT -IRON STAINING PRESENT IN SS-2	707.8	1–5	5 7 30	51	83	SS-1	3.25	32	14	13	22	19	33	19	14	12	A-6a (2)	
			9 11 4	21	61	SS-2	3.00	-	-	-	-	-	-	-	-	11	A-6a (V)	
VERY STIFF, BROWN **CLAY**, AND SILT, TRACE FINE SAND, TRACE FINE GRAVEL, MOIST. -IRON STAINING PRESENT THROUGHOUT	700.3	6–12	1 4 4	11	44	SS-3	3.00	2	0	8	43	47	41	20	21	22	A-7-6 (13)	
			3 5 8	18	67	SS-4	3.25	-	-	-	-	-	-	-	-	25	A-7-6 (V)	
			8 9 9	25	89	SS-5	2.75	-	-	-	-	-	-	-	-	24	A-7-6 (V)	
LOOSE, BROWN **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST. -COBBLES PRESENT @ 15.0'	697.8	13–15	3 3 3	8	94	SS-6	-	30	19	21	12	18	34	17	17	14	A-2-6 (1)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS PRESENT THROUGHOUT	685.3	16–28	5 9 13	30	56	SS-7	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	
			6 8 8	22	67	SS-8	-	-	-	-	-	-	-	-	-	12	A-1-a (V)	
			7 8 7	21	78	SS-9	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
			8 10 12	30	72	SS-10	-	69	12	6	8	5	NP	NP	NP	14	A-1-a (0)	
			7 10 18	39	83	SS-11	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
VERY DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.	681.3	29–33	41 50/4"	-	60	SS-12	-	-	-	-	-	-	-	-	-	8	A-1a (V)	
VERY DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, DAMP.	676.3	34–38	33 21 19	55	56	SS-13	-	58	17	8	10	7	18	14	4	8	A-1-b (0)	
MEDIUM DENSE, GRAY **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -COBBLES PRESENT @ 40.0'	671.3	39–43	6 6 9	21	33	SS-14	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
HARD, BROWN TO GRAY **SILTY CLAY**, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST. -INTRODUCED MUD @ 43.5'	661.3	44–48	14 14 16	41	72	SS-15	4.50	4	1	3	46	46	31	15	16	20	A-6b (10)	
		49–53	11 11 11	30	83	SS-16	4.25	-	-	-	-	-	-	-	-	19	A-6b (V)	
HARD, GRAY **CLAY**, SOME TO "AND" SILT, TRACE TO LITTLE FINE GRAVEL, TRACE COARSE TO FINE SAND, DAMP. -ROCK FRAGMENTS PRESENT IN SS-17		54–58	21 32 50/3"	-	100	SS-17	-	9	3	3	38	47	41	18	23	14	A-7-6 (13)	
		59	31 50/5"	-	100	SS-18	-	-	-	-	-	-	-	-	-	15	A-7-6 (V)	

PID: 89464 | BR ID: FRA-71-1503L | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 271+12.84 / 28.4 RT | START: 2/4/14 | END: 2/14/14 | PG 2 OF 2 | B-114-7-13

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
HARD, GRAY **CLAY**, SOME TO "AND" SILT, TRACE TO LITTLE FINE GRAVEL, TRACE COARSE TO FINE SAND, DAMP. *(continued)*	653.3	61 62 63 64	21 21 50/5"	-	59	SS-19	-	15	0	1	32	52	50	24	26	17	A-7-6 (16)	
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.	648.4	TR 65 66 67 68	18 24 50/3"	-	67	SS-20	-	-	-	-	-	-	-	-	-	12	Rock (V)	
AUGER REFUSAL @ 74.0'	639.3	69 70 71 72 73 74																
LIMESTONE : DARK GRAY, UNWEATHERED TO SLIGHTLY WEATHERED, STRONG TO VERY STRONG, VERY THICK BEDDED, CALCAREOUS, DOLOMITIC, ARGILLACEOUS, CALCITE VEINS, CHERT INCLUSIONS, JOINTED, MODERATELY TO HIGHLY FRACTURED, OPEN APERATURES, ROUGH; RQD 50%, REC 87%. -QU @ 75.1' = 8,488 PSI		75 76 77 78 79	48		92	RC-1											CORE	
-QU @ 81.5' = 9,141 PSI		80 81 82 83	52		83	RC-2											CORE	
	629.3	EOB 84																

NOTES: SEEPAGE ENCOUNTERED @ 16.0'; GROUNDWATER ENCOUNTERED INITIALLY @ 17.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT 100 LBS BENTONITE 70 GALLONS WATER; COMPACTED WITH *THE AUGER* 300 LBS BENTONITE CHIPS AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: FRA-71-1503L
START: 3/11/14 END: 3/13/14

DRILLING FIRM / OPERATOR: RII / J.K.
SAMPLING FIRM / LOGGER: RII / S.B.
DRILLING METHOD: 3.25" HSA / NQ
SAMPLING METHOD: SPT / RC

DRILL RIG: MOBILE B-53 (SN 624400)
HAMMER: AUTOMATIC
CALIBRATION DATE: 4/26/13
ENERGY RATIO (%): 77.7

STATION / OFFSET: 273+13.25 / 16.5' LT
ALIGNMENT: BL I-71 SB
ELEVATION: 714.0 (MSL) EOB: 82.0 ft.
LAT / LONG: 39.953894, -83.005886

EXPLORATION ID B-114-8-13

MATERIAL DESCRIPTION AND NOTES	ELEV. 714.0	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
0.3' - TOPSOIL (3.0")	713.7																	
FILL: VERY STIFF TO HARD, DARK BROWN **SANDY SILT**, SOME FINE GRAVEL, LITTLE CLAY, DAMP.			7 8 8	21	50	SS-1	4.50	-	-	-	-	-	-	-	-	14	A-4a (V)	
			6 7 9	21	61	SS-2	3.00	21	22	14	25	18	32	22	10	17	A-4a (2)	
	708.5																	
STIFF TO VERY STIFF, BROWN TO DARK BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.			3 2 1	4	33	SS-3	1.75	-	-	-	-	-	-	-	-	24	A-6b (V)	
			5 5 8	17	50	SS-4	2.25	-	-	-	-	-	-	-	-	21	A-6b (V)	
			2 3 4	9	89	SS-5	1.25	1	2	12	36	49	38	16	22	22	A-6b (13)	
			4 4 4	10	72	SS-6	1.25	-	-	-	-	-	-	-	-	22	A-6b (V)	
	698.5																	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		W	14 16 10	34	72	SS-7	-	64	13	9	10	4	20	19	1	10	A-1-a (0)	
		W	8 7 8	19	83	SS-8	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	
	693.5																	
MEDIUM DENSE TO DENSE, DARK BROWN TO BROWN **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.			4 8 16	31	56	SS-9	-	35	42	9	10	4	NP	NP	NP	16	A-1-b (0)	
-COBBLES PRESENT THROUGHOUT			12 16 18	44	72	SS-10	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
-INTRODUCED MUD @ 25.0'			5 3 8	14	33	SS-11	-	-	-	-	-	-	-	-	-	30	A-1-b (V)	
	686.0																	
VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DRY TO MOIST.			19 27 28	71	72	SS-12	-	63	18	7	9	3	NP	NP	NP	12	A-1-a (0)	
-COBBLES PRESENT THROUGHOUT			50/5"	-	20	SS-13	-	-	-	-	-	-	-	-	-	3	A-1-a (V)	
	677.0																	
HARD, GRAY **SILTY CLAY**, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.			5 6 8	18	33	SS-14	4.25	3	2	2	38	55	36	18	18	21	A-6b (11)	
	672.0																	
MEDIUM DENSE, GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, MOIST.			4 8 6	18	100	SS-15	-	-	-	-	-	-	-	-	-	14	A-1-a (V)	
	669.2																	
VERY STIFF TO HARD, BROWN **CLAY**, SOME SILT, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.							3.50	-	-	-	-	-	-	-	-	18	A-7-6 (V)	
			8 10 13	30	67	SS-16	3.50	15	11	10	30	34	42	20	22	18	A-7-6 (11)	
			6 42 50/5"	-	65	SS-17	4.5+	-	-	-	-	-	-	-	-	12	A-7-6 (V)	
			10 49 50/3"	-	100	SS-18	4.5+	-	-	-	-	-	-	-	-	15	A-7-6 (V)	

PID: 89464	BR ID: FRA-71-1503L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 273+13.25 / 16.5 LT	START: 3/11/14	END: 3/13/14	PG 2 OF 2	B-114-8-13

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 STIFF TO HARD, BROWN **CLAY**, SOME SILT, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP. *(continued)*	654.0																	
	650.5	TR																
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.			37 50/4"	-	100	SS-19	-	-	-	-	-	-	-	-	-	15	Rock (V)	
AUGER REFUSAL @ 67.0'	647.0																	
SHALE : DARK GRAY, SLIGHTLY WEATHERED, VERY WEAK TO WEAK, THINLY LAMINATED TO LAMINATED, ARGILLACEOUS, FRACTURED TO HIGHLY FRACTURED, NARROW TO OPEN APERTURES, SLICKENSIDED TO SLIGHTLY ROUGH; RQD 19%, REC 82%. -0.5' CLAYSTONE SEAM @ 67.7' -CLAYSTONE SEAMS PRESENT FROM 69.5' TO 72.0'	642.0		19		82	RC-1											CORE	
CLAYSTONE : DARK GRAY, SLIGHTLY WEATHERED, VERY WEAK TO WEAK, THINLY LAMINATED BEDDING TO VERY THIN BEDDED, FRACTURED TO HIGHLY FRACTURED, OPEN APERTURES, ROUGH; RQD 12%, REC 97%. -QU @ 74.8' = 92 PSI	637.0		12		97	RC-2											CORE	
LIMESTONE : GRAY, UNWEATHERED, STRONG, VERY THICK BEDDED, CALCAREOUS, CHERTY, PYRITIC, JOINTED, SLIGHTLY FRACTURED TO FRACTURED, NARROW TO OPEN APERTURES, SLIGHTLY ROUGH; RQD 92%, REC 98%. -QU @ 78.4' = 12,567 PSI	632.0	EOB	92		98	RC-3											CORE	

NOTES: SEEPAGE ENCOUNTERED @ 16.0'; GROUNDWATER ENCOUNTERED INITIALLY @ 18.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT 50 LBS BENTONITE 40 GALLONS WATER AND SOIL CUTTINGS

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 275+07.50 / 4.7' RT	EXPLORATION ID B-114-9-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / B.Z.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: FRA-71-1503L	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 4/26/13	ELEVATION: 714.0 (MSL) EOB: 90.0 ft.	PAGE 1 OF 2
START: 5/9/14 END: 5/13/14	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 77.7	LAT / LONG: 39.953788, -83.005201	

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
0.4' - TOPSOIL (4.5")	714.0																	
FILL: LOOSE TO MEDIUM DENSE, BROWN AND BLACK **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP TO MOIST. -ROOT FIBERS PRESENT IN SS-1	713.6		2 9 9	23	33	SS-1	-	56	15	10	13	6	-	-	-	8	A-2-4 (V)	
-BRICK FRAGMENTS PRESENT IN SS-2 AND SS-3			3 4 5	12	33	SS-2	-	60	10	7	15	8	33	23	10	23	A-2-4 (0)	
-CINDERS PRESENT IN SS-3	706.0		2 2 2	5	67	SS-3	-	-	-	-	-	-	-	-	-	28	A-2-4 (V)	
STIFF, DARK BROWN **SILTY CLAY**, TRACE COARSE TO FINE SAND, MOIST.			1 2 4	8	67	SS-4	1.75	-	-	-	-	-	-	-	-	29	A-6b (V)	
-COBBLE PRESENT @ 13.5'	701.0		2 3 4	9	89	SS-5	2.00	0	1	7	53	39	37	20	17	22	A-6b (11)	
MEDIUM DENSE TO DENSE, BROWN **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET. -LARGE PIECE OF ROCK RECOVERED IN SS-6			3 4 7	14	44	SS-6	-	-	-	-	-	-	-	-	-	-		
			3 5 7	16	61	SS-7	-	49	11	17	19	4	NP	NP	NP	11	A-1-b (0)	
-COBBLES PRESENT THROUGHOUT			16 14 17	40	67	SS-8	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
			3 4 7	14	61	SS-9	-	33	31	16	14	6	26	20	6	18	A-1-b (0)	
		W																
			21 17 20	48	0	SS-10	-	-	-	-	-	-	-	-	-	-		
	688.5		15	-	100	3S-10A	-	-	-	-	-	-	-	-	-	23	A-1-b (V)	
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.			12 9 9	23	44	SS-11	-	82	10	3	4	1	NP	NP	NP	10	A-1-a (V)	
-INTRODUCED MUD @ 30.0'	682.0		16 21 21	54	39	SS-12	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
VERY DENSE, BROWN **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, LITTLE SILT, TRACE CLAY, WET.			30 50/3"	-	100	SS-13	-	11	18	51	15	5	NP	NP	NP	24	A-3a (0)	
	677.0		50/5"	-	100	SS-14	4.50	-	-	-	-	-	-	-	-	10	A-4a (V)	
HARD, BROWN **SANDY SILT**, LITTLE CLAY, TRACE FINE GRAVEL, DAMP.	672.0																	
VERY DENSE, GRAY **COARSE AND FINE SAND**, LITTLE SILT, TRACE FINE GRAVEL, MOIST.			17 19 20	51	67	SS-15	-	-	-	-	-	-	-	-	-	13	A-3a (V)	
	667.0																	
VERY STIFF TO HARD, GRAY **CLAY**, SOME SILT, TRACE COARSE TO FINE SAND, MOIST.			2 9 12	27	72	SS-16	3.50	0	1	2	28	69	42	19	23	21	A-7-6 (14)	
			9 11 16	35	78	SS-17	4.50	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
	655.0	TR	18 50/4"	-	100	SS-18	4.5+	-	-	-	-	-	-	-	-	22	A-7-6 (V)	
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK.							-	-	-	-	-	-	-	-	-	10	Rock (V)	

PID: 89464	BR ID: FRA-71-1503L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 275+07.50 / 4.7 RT	START: 5/9/14	END: 5/13/14	PG 2 OF 2	B-114-9-13

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 : GRAY, HIGHLY WEATHERED, VERY WEAK. *(continued)*	654.0	61 62 63 64	50/5"	-	100	SS-19	-	-	-	-	-	-	-	-	-	16	Rock (V)	
AUGER REFUSAL @ 65.0'	649.0	65																
SHALE : DARK GRAY, SLIGHTLY WEATHERED, VERY WEAK TO WEAK, VERY THIN TO THIN BEDDED, CALCAREOUS, FISSILE, PYRITIC, MODERATELY FRACTURED TO FRACTURED, NARROW TO OPEN APERTURES, SLIGHTLY ROUGH; RQD 64%, REC 79%. -ARGILLACEOUS FROM 65.6' TO 75.0'		66 67 68 69 70	26		33	RC-1											CORE	
-0.3' LIMESTONE SEAM @ 71.5'		71 72 73 74 75	58		88	RC-2											CORE	
-ARGILLACEOUS FROM 78.6' TO 85.0' -POINT LOAD STRENGTH @ 78.8' TO 81.3' -MEAN QU = 176 PSI		76 77 78 79 80	83		100	RC-3											CORE	
	629.0	81 82 83 84 85	90		93	RC-4											CORE	
LIMESTONE : GRAY, UNWEATHERED, VERY STRONG, MEDIUM TO THICK BEDDED, CALCAREOUS, DOLOMITIC, PYRITIC, MODERATELY FRACTURED TO FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 89%, REC 93%.		86 87 88 89	89		93	RC-5											CORE	
	624.0 EOB	90																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 23.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: CME 750X (SN 310218)	STATION / OFFSET: 276+68.11 / 2.0' RT	EXPLORATION ID B-115-1-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / C.D.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: FRA-71-1503L	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 10/20/14	ELEVATION: 714.6 (MSL) EOB: 75.5 ft.	PAGE 1 OF 2
START: 1/13/15 END: 1/14/15	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 85.7	LAT / LONG: 39.953729246, -83.004634304	

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
0.8' - TOPSOIL (9.0")	714.6																	
	713.8																	
FILL: VERY STIFF, DARK BROWN **SANDY SILT**, SOME CLAY, LITTLE FINE GRAVEL, DAMP.		1	2															
-ORGANICS PRESENT IN SS-1		2	7	19	61	SS-1	4.00	-	-	-	-	-	-	-	-	19	A-4a (V)	
		3	6															
		4	3															
-BRICK AND ROCK FRAGMENTS PRESENT IN SS-2		5	4	13	67	SS-2	3.50	13	14	10	42	21	32	22	10	21	A-4a (6)	
	709.1		5															
FILL: HARD, DARK BROWN **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP.		6																
		7	4															
		8	6	19	50	SS-3	4.5+	-	-	-	-	-	-	-	-	17	A-6a (V)	
-ROCK FRAGMENTS PRESENT THROUGHOUT		9	7															
		10	6															
		11	5															
		12	6	16	61	SS-4	4.5+	14	10	15	33	28	33	22	11	16	A-6a (6)	
	704.1																	
FILL: LOOSE TO MEDIUM DENSE, BROWN **GRAVEL**, LITTLE COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, DAMP.		13																
		14	5															
		15	5	14	61	SS-5	-	-	-	-	-	-	-	-	-	2	A-1-a (V)	
		16	5															
		17	2															
		18	3	9	56	SS-6	-	73	12	5	7	3	NP	NP	NP	2	A-1-a (0)	
	699.1		3															
FILL: STIFF TO VERY STIFF, BROWN **SANDY SILT**, LITTLE FINE GRAVEL, LITTLE CLAY, DAMP.		19																
		20	2															
		21	4	11	78	SS-7	2.00	14	13	31	29	13	25	18	7	13	A-4a (1)	
-IRON STAINING PRESENT IN SS-8		22	4															
	695.6																	
		23	11				4.00	-	-	-	-	-	-	-	-	15	A-4a (V)	
MEDIUM DENSE TO VERY DENSE, BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.		24	14	39	83	SS-8	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	
		25	13															
		26	3															
		27	7	16	33	SS-9	-	-	-	-	-	-	-	-	-	13	A-1-a (V)	
		28	4															
	W	29	4															
-ROCK FRAGMENTS PRESENT THROUGHOUT		30	10	30	78	SS-10	-	64	11	15	7	3	NP	NP	NP	9	A-1-a (0)	
		31	11															
		32	10															
-COBBLES PRESENT @ 26.0'		33	49	140	50	SS-11	-	-	-	-	-	-	-	-	-	9	A-1-a (V)	
		34	49															
	686.6																	
DENSE TO VERY DENSE, BROWN TO DARK GRAY **GRAVEL AND SAND**, TRACE SILT, TRACE CLAY, MOIST.		35																
	W	36	11															
		37	10	30	100	SS-12	-	58	5	28	5	4	23	18	5	16	A-1-b (0)	
-ROCK FRAGMENTS PRESENT THROUGHOUT		38	11															
		39																
		40																
		41																
		42																
		43	7															
		44	24	73	78	SS-13	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
		45	27															
	677.6																	
VERY STIFF, GRAY **SANDY SILT**, SOME CLAY, TRACE FINE GRAVEL, DAMP.		46																
		47																
		48	15															
		49	16	63	78	SS-14	4.00	2	6	12	47	33	26	16	10	15	A-4a (8)	
		50	28															
		51																
		52																
		53																
		54																
-ROCK FRAGMENTS PRESENT IN SS-15		55	18															
		56	32	114	89	SS-15	3.50	-	-	-	-	-	-	-	-	12	A-4a (V)	
		57	48															
	667.6																	
VERY DENSE, GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.		58																
		59																
		60	6															
		61	35	113	78	SS-16	-	-	-	-	-	-	-	-	-	10	A-2-6 (V)	
		62	44															
	662.6																	
VERY DENSE, GRAY **GRAVEL**, TRACE COARSE TO FINE SAND, TRACE SILT, MOIST.		63																
		64																
		65																
		66																
		67																
		68																
		69																
		70																
		71																
		72	12															
		73	36	-	71	SS-17	-	89	1	9	1	0	NP	NP	NP	8	A-1-a (0)	
		74	50/5"															
		75																
		76																
		77																

PID: 89464	BR ID: FRA-71-1503L	PROJECT: FRA-70-13.10 - PHASE 6A	STATION / OFFSET: 276+68.11 / 2.0 RT	START: 1/13/15	END: 1/14/15	PG 2 OF 2	B-115-1-13

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 DENSE, GRAY **GRAVEL**, TRACE COARSE TO FINE SAND, TRACE SILT, MOIST. *(continued)*	654.6	61 62 63																
	651.1	TR																
MUDSTONE : GRAY, HIGHLY WEATHERED TO UNWEATHERED, VERY WEAK TO WEAK, LAMINATED TO THICK BEDDED, FRIABLE, FISSILE, CALCAREOUS, SLIGHTLY TO HIGHLY WEATHERED, MODERATELY TO HIGHLY FRACTURED, THIGHT APERTURES, SLIGHTLY TO VERY ROUGH; RQD 69%, REC 97%.		64 65	100		100	RC-1											CORE	
-0.3' LIMESTONE SEAM @ 68.5'		66 67 68 69 70	40		95	RC-2											CORE	
-0.3' LIMESTONE SEAM @ 70.1"		71 72 73 74	87		96	RC-3											CORE	
-0.3' LIMESTONE SEAM @ 73.5'	639.1	75 EOB																

NOTES: SEEPAGE ENCOUNTERED @ 24.0'; GROUNDWATER INITIALLY ENCOUNTERED @ 29.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

PROJECT: FRA-70-13.10 PHASE 6A
TYPE: STRUCTURE
PID: 89464 SFN: NA
START: 1/9/20 END: 1/10/20

DRILLING FIRM / OPERATOR: RII / S.B.
SAMPLING FIRM / LOGGER: RII / J.P.
DRILLING METHOD: 3.25" HSA / NQ
SAMPLING METHOD: SPT / RC

DRILL RIG: CME 55-LC (SN 360485)
HAMMER: AUTOMATIC
CALIBRATION DATE: 3/28/13
ENERGY RATIO (%): 73.2

STATION / OFFSET: 276+71.11 / 2' RT
ALIGNMENT: BL I-71 SB
ELEVATION: 714.3 (MSL) EOB: 96.0 ft.
LAT / LONG: 39.953728, -83.004624

EXPLORATION ID
B-115-1A-19

MATERIAL DESCRIPTION AND NOTES	ELEV. 714.3	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
NO SAMPLING DOWN TO 66.0'		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59																

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / T.F.	DRILL RIG: MOBILE B-53 (SN 624400)	STATION / OFFSET: 277+71.50 / 20.2' LT	EXPLORATION ID B-115-2-13
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / S.B.	HAMMER: AUTOMATIC	ALIGNMENT: BL I-71 SB	
PID: 89464 BR ID: FRA-71-1503L	DRILLING METHOD: 3.25" HSA / NQ	CALIBRATION DATE: 4/26/13	ELEVATION: 716.1 (MSL) EOB: 90.7 ft.	PAGE 1 OF 2
START: 5/13/14 END: 5/16/14	SAMPLING METHOD: SPT / RC	ENERGY RATIO (%): 77.7	LAT / LONG: 39.953734, -83.004257	

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
0.6' - TOPSOIL (7.0")	715.5																	
FILL: MEDIUM DENSE, BROWN AND BLACK **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, MOIST. -ROCK FRAGMENTS AND ROOT FIBERS PRESENT IN SS-1	713.1	1	7 8 9	22	67	SS-1	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
FILL: MEDIUM DENSE, BROWN TO DARK BROWN **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST. -CINDERS, BRICK AND SLAG FRAGMENTS PRESENT THROUGHOUT	708.1	4	4 5 4	12	72	SS-2	-	29	26	11	18	16	NP	NP	NP	17	A-2-4 (0)	
		7	4 5 6	14	56	SS-3	-	-	-	-	-	-	-	-	-	13	A-2-4 (V)	
FILL: VERY LOOSE TO LOOSE, GRAY AND BLACK **GRAVEL AND SAND**, LITTLE SILT, TRACE CLAY, WET. -ORGANICS PRESENT THROUGHOUT	703.1	W 9	2 2 3	6	100	SS-4	-	30	33	13	15	9	NP	NP	NP	21	A-1-b (0)	
		12	3 1 2	4	56	SS-5	-	-	-	-	-	-	-	-	-	34	A-1-b (V)	
FILL: VERY LOOSE TO LOOSE, GRAY AND BLACK **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE FINE GRAVEL, WET. -ROCK FRAGMENTS AND ORGANICS PRESENT IN SS-6 -PETROLEUM ODOR AND WOOD FRAGMENTS PRESENT IN SS-7	698.1	14	WOH 1 1	3	100	SS-6	-	4	33	29	24	10	NP	NP	NP	49	A-3a (0)	
		17	2 2 6	10	78	SS-7	-	-	-	-	-	-	-	-	-	22	A-3a (V)	
FILL: VERY LOOSE TO LOOSE, BLACK **SILT**, SOME COARSE TO FINE SAND, SOME CLAY, TRACE FINE GRAVEL, WET. -ORGANICS PRESENT THROUGHOUT	693.1	19	3 2 1	4	56	SS-8	-	1	11	14	53	21	NP	NP	NP	68	A-4b (8)	
		22	2 3 3	8	83	SS-9	-	-	-	-	-	-	-	-	-	41	A-4b (V)	
MEDIUM DENSE TO DENSE, BROWNISH GRAY TO BROWN **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -CERAMIC TILE FRAGMENTS PRESENT IN SS-10 -ROCK FRAGMENTS PRESENT IN SS-11	684.1	24	6 9 13	28	44	SS-10	-	-	-	-	-	-	-	-	-	13	A-1-a (V)	
		27	11 11 13	31	44	SS-11	-	61	21	6	7	5	NP	NP	NP	13	A-1-a (0)	
		29	10 13 15	36	11	SS-12	-	-	-	-	-	-	-	-	-	-	A-1-a (V)	
		30	25	-	0	3S-12A	-	-	-	-	-	-	-	-	-	-		
VERY DENSE, DARK BROWN TO GRAY **GRAVEL**, "AND" COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST. -COBBLES PRESENT @ 33.5' -ROCK FRAGMENTS PRESENT THROUGHOUT -HEAVING SANDS ENCOUNTERED @ 38.5' -INTRODUCED MUD @ 38.5'	674.1	34	10 30 35	84	72	SS-13	-	50	32	5	7	6	NP	NP	NP	12	A-1-a (0)	
		39	22 32 48	104	94	SS-14	-	-	-	-	-	-	-	-	-	8	A-1-a (V)	
HARD, GRAY **SILTY CLAY**, LITTLE COARSE TO FINE SAND, MOIST.	669.1	44	10 12 45	74	78	SS-15	4.50	0	5	5	32	58	40	19	21	24	A-6b (12)	
DENSE, GRAY **GRAVEL WITH SAND AND SILT**, TRACE CLAY, WET.	664.1	49	12 12 18	39	94	SS-16	-	-	-	-	-	-	-	-	-	23	A-2-4 (V)	
GRAY **SILTY CLAY.** -BOULDER ENCOUNTERED @ 55.0' -SOIL TYPE DETERMINED FROM FIELD OBSERVATION OF AUGER CUTTINGS		54	60/2"	-	0	SS-17	-	-	-	-	-	-	-	-	-	-		
		59	50/3"	-	0	SS-18	-	-	-	-	-	-	-	-	-	-		

PID: 89464 | BR ID: FRA-71-1503L | PROJECT: FRA-70-13.10 - PHASE 6A | STATION / OFFSET: 277+71.50 / 20.2 LT | START: 5/13/14 | END: 5/16/14 | PG 2 OF 2 | B-115-2-13

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
GRAY **SILTY CLAY.** *(continued)*	656.1																	
	652.6	TR																
SHALE : GRAY, HIGHLY WEATHERED, VERY WEAK. AUGER REFUSAL @ 64.2'	651.9		45 50/2"	-	100	SS-19	-	-	-	-	-	-	-	-	-	9	Rock (V)	
CLAYSTONE : GRAY, UNWEATHERED, VERY WEAK TO SLIGHTLY STRONG, MEDIUM BEDDED, MODERATELY TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 45%, REC 95%.			58		100	RC-1											CORE	
			0		88	RC-2											CORE	
			86		100	RC-3											CORE	
	640.4																	
SHALE : GRAY, HIGHLY WEATHERED, WEAK, MEDIUM BEDDED, CALCAREOUS, FISSILE, FRACTURED TO HIGHLY FRACTURED, OPEN APERTURES, SLIGHTLY ROUGH; RQD 0%, REC 37%.			0		30	RC-4											CORE	
	632.9																	
LIMESTONE : GRAYISH BROWN, SLIGHTLY WEATHERED, MODERATELY STRONG, THIN TO MEDIUM BEDDED, CHERTY, PYRITIC,, MODERATELY FRACTURED, OPEN APERTURES, SLIGHTLY TO VERY ROUGH; RQD 91%, REC 100%. -QU @ 83.2' = 8,867 PSI			45		75	RC-5											CORE	
			92		100	RC-6											CORE	
	625.4	EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 8.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 188 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER

G:\projects\2013\W-13-072 FRA-70-13.10 6A\89464\geotechnical\sheets\COMBINED SET WITH 4A\77372-89464ZL189.dgn 6/28/2021 1:10:43 PM rachelm

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750X (310218)	STATION / OFFSET: 278+33.33 / 41.1' RT	EXPLORATION ID B-115-3-19
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / E.T.	HAMMER: AUTOMATIC	ALIGNMENT: I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 9/3/18	ELEVATION: 733.9 (MSL) EOB: 45.0 ft.	PAGE 1 OF 1
START: 1/20/20 END: 1/20/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79.5	COORD: 39.953536, -83.004084	

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
0.8' - ASPHALT (9.0")	733.1																	
0.8' - CONCRETE (10.0")	732.3																	
0.5' - AGGREGATE BASE (6.0")	731.8																	
FILL: VERY STIFF, BROWN AND DARK BROWN **SANDY SILT**, SOME TO LITTLE FINE GRAVEL, LITTLE TO SOME CLAY, MOIST.	728.4		5 7 6	17	50	SS-1	3.00	35	18	11	22	14	26	18	8	13	A-4a (0)	
			8 7 8	20	56	SS-2	3.00	-	-	-	-	-	-	-	-	14	A-4a (V)	
FILL: VERY STIFF, DARK BROWN AND BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, VERY MOIST.	724.9		4 10 10	27	56	SS-3	3.00	-	-	-	-	-	-	-	-	19	A-6b (V)	
			8 5 7	16	67	SS-4A	3.50	-	-	-	-	-	-	-	-	21	A-6b (V)	
FILL: MEDIUM DENSE, DARK BROWN, BROWN AND GRAY **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.						SS-4B	-	-	-	-	-	-	-	-	-	9	A-2-6 (V)	
-PULVERIZED ROCK FRAGMENTS FROM 11.0-11.5'	722.4		10 14 8	29	72	SS-5A	-	-	-	-	-	-	-	-	-	6	A-2-6 (V)	
						SS-5B	3.00	-	-	-	-	-	-	-	-	13	A-6b (V)	
FILL: VERY STIFF TO HARD, DARK BROWN AND DARK GRAYISH BROWN **SILTY CLAY**, LITTLE COARSE TO FINE SAND, LITTLE FINE GRAVEL, DAMP TO MOIST.			6 7 14	28	78	SS-6	4.50	15	9	9	32	35	34	18	16	18	A-6b (9)	
	715.9		9 10 12	29	61	SS-7	3.00	-	-	-	-	-	-	-	-	17	A-6b (V)	
FILL: VERY DENSE, DARK BROWN, BLACK, RED **GRAVEL WITH SAND, SILT, AND CLAY**, MOIST.			19 19 20	52	67	SS-8	3.00	-	-	-	-	-	-	-	-	9	A-2-6 (V)	
-CINDERS, RED TILE/BRICK FRAGMENTS, BROKEN ROCK FRAGMENTS, POSSIBLE CONCRETE FRAGMENTS THROUGHOUT			5 3 3	8	0	SS-9	-	-	-	-	-	-	-	-	-	-		
			6	-	100	2S-9A	1.50	-	-	-	-	-	-	-	-	25	A-2-6 (V)	
			4 5 5	13	78	SS-10	1.50	-	-	-	-	-	-	-	-	22	A-2-6 (V)	
	701.9																	
MEDIUM DENSE, BROWN AND GRAY **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, MOIST.			4 7 10	23	44	SS-11	-	57	10	12	13	8	NP	NP	NP	11	A-1-b (0)	
	696.9																	
MEDIUM DENSE TO DENSE, BROWN AND GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST TO WET.			8 20 33	70	89	SS-12	-	57	22	11	6	4	NP	NP	NP	10	A-1-a (0)	
		W 690.4																
	688.9	EOB	12 15 14	38	89	SS-13	-	-	-	-	-	-	-	-	-	10	A-1-a (V)	

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 43.5' AND AT COMPLETION @ 40.0'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 94 LBS CEMENT / 50 LBS BENTONITE POWDER / 40 GAL WATER; PAVEMENT PATCHED WITH CONCRETE.

89464

FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-115-3-19

DRAWN RRM
CHECKED BRT

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: N/A
START: 2/18/20 END: 2/18/20

DRILLING FIRM / OPERATOR: RII / S.B.
SAMPLING FIRM / LOGGER: RII / J.K.
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: CME 750X (310218)
HAMMER: AUTOMATIC
CALIBRATION DATE: 9/3/18
ENERGY RATIO (%): 79.5

STATION / OFFSET: 279+95.95 / 19.2' RT
ALIGNMENT: I-71 SB
ELEVATION: 736.7 (MSL) EOB: 40.0 ft.
COORD: 39.953507, -83.003500

EXPLORATION ID B-115-4-19
PAGE 1 OF 1

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
0.8' - ASPHALT (9.0")	736.7																	
1.0' - AGGREGATE BASE (12.0")	735.9																	
POSSIBLE FILL: DENSE, BROWNISH GRAY **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, DAMP.	734.9		7 11 11	29	72	SS-1	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			5 6 26	42	39	SS-2	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
-COBBLES PRESENT @ 4.5'	731.2																	
POSSIBLE FILL: VERY STIFF, DARK GRAY **SILTY CLAY**, "AND" FINE GRAVEL, LITTLE COARSE TO FINE SAND, MOIST.			3 6 5	15	58	SS-3	3.50	47	9	6	21	17	37	17	20	18	A-6b (3)	
			8 16 17	44	50	SS-4	3.50	-	-	-	-	-	-	-	-	13	A-6b (V)	
			8 10 15	33	33	SS-5	2.50	-	-	-	-	-	-	-	-	12	A-6b (V)	
	723.7																	
POSSIBLE FILL: VERY STIFF, DARK GRAY **SILT AND CLAY**, SOME COARSE TO FINE SAND, LITTLE FINE GRAVEL, MOIST.			6 7 6	17	83	SS-6	3.00	-	-	-	-	-	-	-	-	14	A-6a (V)	
			5 8 7	20	72	SS-7	3.50	18	13	9	35	25	34	21	13	18	A-6a (6)	
	718.7																	
DENSE TO VERY DENSE, BROWNISH GRAY TO GRAY **GRAVEL**, SOME COARSE TO FINE SAND, TRACE SILT, TRACE CLAY, MOIST.			6 10 12	29	67	SS-8	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
			8 10 14	32	61	SS-9	-	59	20	9	9	3	NP	NP	NP	5	A-1-a (0)	
			14 27 34	81	69	SS-10	-	-	-	-	-	-	-	-	-	5	A-1-a (V)	
	704.7																	
VERY DENSE, BROWN **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP.			26 50/5"	-	100	SS-11	-	35	30	11	15	9	24	14	10	8	A-2-4 (0)	
		W 699.5																
			21 35 35	93	89	SS-12	-	-	-	-	-	-	-	-	-	12	A-2-4 (V)	
	696.7	EOB																

NOTES: GROUNDWATER ENCOUNTERED INITIALLY @ 37.2'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 47 LBS CEMENT / 25 LBS BENTONITE POWDER / 20 GAL WATER; PAVEMENT PATCHED WITH CONCRETE.

89464

FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-115-4-19

DRAWN RRM
CHECKED BRT

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: N/A
START: 2/17/20 END: 2/17/20

DRILLING FIRM / OPERATOR: RII / S.B.
SAMPLING FIRM / LOGGER: RII / J.K.
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: CME 750X (310218)
HAMMER: AUTOMATIC
CALIBRATION DATE: 9/3/18
ENERGY RATIO (%): 79.5

STATION / OFFSET: 281+08.27 / 4.6' RT
ALIGNMENT: I-71 SB
ELEVATION: 738.8 (MSL) EOB: 30.0 ft.
COORD: 39.953510, -83.003090

EXPLORATION ID B-115-5-19
PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
0.7' - ASPHALT (8.0")	738.8																	
1.0' - AGGREGATE BASE (12.0")	738.1																	
FILL: VERY STIFF, BROWN AND DARK BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.	737.1	1	8 10 8	24	39	SS-1	3.50	-	-	-	-	-	-	-	-	7	A-6b (V)	
		2																
		3	4 4 4	11	64	SS-2	2.50	4	11	16	35	34	35	17	18	19	A-6b (10)	
	733.3	4																
POSSIBLE FILL: LOOSE TO MEDIUM DENSE, GRAY **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, MOIST.		5																
		6	16 9 9	24	44	SS-3	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
		7																
		8																
		9	3 3 3	8	0	SS-4	-	-	-	-	-	-	-	-	-	-		
	728.8	10	4	-	67	2S-4A	2.00	-	-	-	-	-	-	-	-	16	A-6b (V)	
POSSIBLE FILL: STIFF TO VERY STIFF, DARK BROWN AND BROWN **SILTY CLAY**, SOME COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.		11	2 3 3	8	75	SS-5	2.00	8	15	15	33	29	37	17	20	20	A-6b (9)	
		12																
		13																
		14	3 3 4	9	83	SS-6	2.50	-	-	-	-	-	-	-	-	28	A-6b (V)	
	723.3	15																
VERY STIFF, GRAY **CLAY**, SOME SILT, MOIST.		16																
		17	6 8 12	27	83	SS-7	4.00	0	0	0	35	65	44	22	22	22	A-7-6 (14)	
	720.8	18																
VERY STIFF, GRAY **SILTY CLAY**, LITTLE COARSE TO FINE SAND, TRACE FINE GRAVEL, MOIST.		19	3 4 5	12	100	SS-8	2.50	-	-	-	-	-	-	-	-	20	A-6b (V)	
		20																
		21																
		22																
		23																
	W	24	3 3 6	12	67	SS-9A	2.50	-	-	-	-	-	-	-	-	22	A-6b (V)	
	714.2 W 714.2					SS-9B	-	-	-	-	-	-	-	-	-	23	A-2-4 (V)	
MEDIUM DENSE, GRAY **GRAVEL WITH SAND AND SILT**, MOIST.	711.8	25																
		26																
		27																
VERY DENSE, DARK BROWNISH GRAY **GRAVEL WITH SAND**, TRACE SILT, TRACE CLAY, MOIST.		28																
		29	11 21 18	52	83	SS-10	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
	708.8 EOB	30																

PROJECT: FRA-70-13.10 - PHASE 6A
TYPE: STRUCTURE
PID: 89464 BR ID: N/A
START: 1/23/20 END: 1/23/20

DRILLING FIRM / OPERATOR: RII / S.B.
SAMPLING FIRM / LOGGER: RII / E.T.
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: CME 750X (310218)
HAMMER: AUTOMATIC
CALIBRATION DATE: 9/3/18
ENERGY RATIO (%): 79.5

STATION / OFFSET: 282+49.27 / 23.3' RT
ALIGNMENT: I-71 SB
ELEVATION: 740.9 (MSL) EOB: 20.0 ft.
COORD: 39.953362, -83.002614

EXPLORATION ID B-115-6-19
PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
0.7' - ASPHALT (8.0")	740.9																	
0.8' - CONCRETE (10.0")	740.2																	
0.5' - AGGREGATE BASE (6.0")	739.4																	
VERY STIFF, BROWN TO GRAYISH BROWN **SANDY SILT**, SOME CLAY, SOME TO LITTLE FINE GRAVEL, MOIST.	738.9	1																
		2	6 15 11	34	83	SS-1	3.00	26	15	15	22	22	23	16	7	11	A-4a (2)	
		3																
		4	4 10 9	25	33	SS-2	2.50	-	-	-	-	-	-	-	-	10	A-4a (V)	
		5																
		6	10 10 11	28	100	SS-3	3.00	15	13	16	32	24	24	15	9	11	A-4a (4)	
		7																
		8																
		9	5 7 10	23	67	SS-4	2.50	-	-	-	-	-	-	-	-	12	A-4a (V)	
		10																
		11	4 11 16	36	33	SS-5	2.50	-	-	-	-	-	-	-	-	14	A-4a (V)	
	727.9	12																
LOOSE, GRAY **COARSE AND FINE SAND**, LITTLE FINE GRAVEL, LITTLE SILT, VERY MOIST.	W 727.4	13																
		14	4 6 6	16	56	SS-6	-	-	-	-	-	-	-	-	-	13	A-3a (V)	
	725.9	15																
VERY STIFF TO HARD, GRAY **SILTY CLAY**, TRACE COARSE TO FINE SAND, TRACE FINE GRAVEL, DAMP TO MOIST.		16																
		17	7 9 8	23	100	SS-7	4.50	2	2	2	34	60	36	18	18	18	A-6b (11)	
		18																
		19	4 6 8	19	89	SS-8	3.00	-	-	-	-	-	-	-	-	21	A-6b (V)	
	720.9	20 EOB																

PROJECT: FRA-70-13.10 - PHASE 6A	DRILLING FIRM / OPERATOR: RII / S.B.	DRILL RIG: CME 750X (310218)	STATION / OFFSET: 283+89.84 / 22.1' RT	EXPLORATION ID B-115-7-19
TYPE: STRUCTURE	SAMPLING FIRM / LOGGER: RII / E.T.	HAMMER: AUTOMATIC	ALIGNMENT: I-71 SB	
PID: 89464 BR ID: N/A	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 9/3/18	ELEVATION: 741.0 (MSL) EOB: 20.5 ft.	PAGE 1 OF 1
START: 1/23/20 END: 1/23/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 79.5	COORD: 39.953303, -83.002116	

MATERIAL DESCRIPTION AND NOTES	ELEV. 741.0	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
0.7' - ASPHALT (8.0")	740.3																	
0.8' - CONCRETE (10.0")	739.5																	
0.5' - AGGREGATE BASE (6.0")	739.0																	
VERY STIFF TO HARD, GRAYISH BROWN TO GRAY **SANDY SILT**, SOME CLAY, LITTLE TO SOME FINE GRAVEL, MOIST.		1																
		2	10 6 7	17	89	SS-1	3.00	-	-	-	-	-	-	-	-	9	A-4a (V)	
		3	3 5 5	13	83	SS-2	3.00	17	10	13	32	28	23	14	9	11	A-4a (V)	
		4																
		5																
		6	6 7 8	20	100	SS-3	3.00	-	-	-	-	-	-	-	-	9	A-4a (V)	
		7																
		8																
		9	6 8 8	21	100	SS-4	3.50	23	13	14	26	24	21	14	7	9	A-4a (3)	
		10																
		11																
		12	6 7 9	21	100	SS-5	4.50	-	-	-	-	-	-	-	-	11	A-4a (V)	
		13																
		14	6 7 8	20	100	SS-6	3.50	-	-	-	-	-	-	-	-	10	A-4a (V)	
		15																
		16																
		17	4 7 7	19	100	SS-7	3.50	20	14	16	27	23	21	13	8	10	A-4a (3)	
		18																
		19	7 8 10	24	0	SS-8	-	-	-	-	-	-	-	-	-	-		
		20																
	720.5	EOB	15	-	100	2S-8A	3.00	-	-	-	-	-	-	-	-	11	A-4a (V)	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PUMPED 47 LBS CEMENT / 25 LBS BENTONITE POWDER / 20 GAL WATER; PAVEMENT PATCHED WITH CONCRETE.

©2019 STA ODOT LOG (11X17) BR ID - OH DOT.GDT - 6/28/21 11:12 - U:\GB\PROJECTS\2013\W-13-072.GPJ

B-001-0-59

SHEET 4

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

LOG OF BORING

CO., RT. NO., SEC. FRA-40-12.82 SECOND PIER — BRIDGE NO. FRA-40-1310 SOUTH INNERBELT UNDER HIGH STREET

LOCATION: T.H. 1 STA. 48+87 OFFSET 43' Rt. FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
764.6	0			
	2			
	4			
759.6	6	8/10	20655	Brown Silty Sandy Gravel
	8			
754.6	10	16/18	20656	Brown Silty Sandy Gravel
752.1	12	8/10	20657	Brown Gravelly Sandy Silt
749.6	14			
	16	16/15	20658	Brown Silty Gravelly Sand W/Boulders
747.1	18	23/28	20659	Brown Silty Sandy Gravel
744.6	20	75/3*	20660	Brown Silty Sandy Gravel W/Boulders
	22			
742.1	24	45/50	20661	Brown Silty Sandy Gravel W/Boulders
739.6	26	9/7	20662	Gray Gravel
737.1	28	14/16	20663	Gray Gravelly Sandy Silt
734.6	30			
	32	11/16	20664	Gray Gravelly Sandy Silt
732.1	34	13/23	20665	Gray Clayey Gravelly Sand
729.6	36	16/21	-----	Gray Clayey Gravelly Sand

BM
6-25-59

B-001-0-59

SHEET 5

LOG OF BORING (CONTINUED)

BRIDGE NO. FRA-40-1310 T.H. 1

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
727.1	38	50/*	20666	Gray Silty Gravelly Sand
724.6	40	20/41	20667	Gray Sandy Gravel W/Boulders
	42			
	44			
719.6	46	33/64	20668	Gray Sandy Silt
	48			
714.6	50	33/50	20669	Gray Silty Gravelly Sand
	52			
	54			
709.6				
708.6	56	27/55	20670	Gray Silty Sandy Gravel
	58			BOTTOM OF BORING
	60			
	62			* Refusal
	64			
	66			
	68			
	70			
	72			
	74			
	76			
	78			
	80			
	82			

DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-001-0-59

FRA-70-12.68
FRA-70-13.10

469/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL201.dgn 12/27/2018 10:44:03 AM rocheim

B-001-A-59

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

SHEET 4

LOG OF BORING

CO., RT. NO., SEC. FRA-40-12.82 BRIDGE NO.
RETAINING WALL-A SOUTH-EAST INNERBELT

LOCATION: T.H. 1-A&B STA. 51+16 OFFSET 72'RT FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
714.5	0			
	2			
	4			
709.5	6	2/3	19687	Brown Silty Gravelly Sand
707.0	8	3/5	19688	Dk.Gr.Gravelly Sand Silt W/Coal Fragments
704.5	10	3/6	19689	Dk.Gr.Gravelly Sandy Silt
702.0	12	3/7	19690	Gr.Gravelly Sandy Silt Trace of Organic
699.5	14	4/9	19691	Dk.Gray Silty Sandy Gravel
697.0	16	10/13	19692	Brown Gravel W/Limestone Fragments
694.5	18	8/14	19693	Brown Sandy Gravel
692.0	20	12/18	19694	Brown Silty Sandy Gravel
689.5	22	10/16	19695	Brown Silty Sandy Gravel
	24			
	26			
	28			
684.5	30	19/32	19696	Gray Silty Gravelly Sand
	32			
	34			
679.5	36	30/55	19697	Gray Sandy Gravel

Boulders

MB
8.26.59

B-001-A-59

LOG OF BORING (CONTINUED) SHEET 5

BRIDGE NO. T.H. 1-A B

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
	38			
674.5	40	45/75	19698	Gray Silty Sandy Gravel
	42			
	44			
669.5	46	37/95	19699	Gray Silty Sandy Gravel
	48			
664.5	50			
663.5		31/40	19700	Gray Sandy Silt
	52			BOTTOM OF BORING
	54			
	56			
	58			
	60			
	62			
	64			
	66			
	68			
	70			
	72			
	74			
	76			
	78			
	80			
	82			

Boulders

DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-001-A-59

FRA-70-12.68
FRA-70-13.10

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B-001-B-68

LOG OF BORING

Date Started 7-23-68 | Sampler Type SS | Dia 1 3/8" | Water Elev ____
Date Completed 7-25-68 | Casing Length 40' | Dia 3 1/2"
Boring No B-1 | Station & Offset 58+39, 06' Lt. (Rear Abutment) | Surface Elev 701.0'

Elev	Depth	Std Pen (N)	Rec ft.	Loss ft.	Description	Sample No	Physical Characteristics % Agg	% C S	% F S	% Silt	% Clay	L L	P I	W C	SHTL Class.
701.0	0														
	2														
	4														
696.0	6	5/5			Brown Gravelly Sandy Silt	1	16	26	18	15	25	27	9	24	A-4a
693.5	8														
	10	4/12			Brown Silty Sandy Gravel and Boulders	2	35	15	15	19	16	NP	NP	12	A-2-4
691.0	12	30/34			Brown Silty Sandy Gravel	3	48	20	11	10	11	NP	NP	9	A-1-b
	14														
686.0	16	6/10			Brown Silty Gravelly Sand	4	27	29	13	15	16	NP	NP	11	A-3a
	18														
681.0	20	16/22			Brownish-Gray Silty Sandy Gravel	5	44	13	14	17	12	NP	NP	7	A-2-4
	22														
676.0	24	12/18			Gray Silty Sand	6	6	52	27	-15	-	NP	NP	18	A-1-b
	28														
671.0	30	8/10			Brownish-Gray Clayey Silt	7	0	2	7	39	52	27	9	28	A-4a
	32														
666.0	34				No Sample Recovered - Boulders (Driller's Des.)		V	I	S	U	A	L			
	36														
661.0	38				No Sample Recovered - Boulders(Driller's Des.)		V	I	S	U	A	L			
	40														
656.0	42														
	44														
	46	50" (0.6')			Gray Silty Gravelly Sand	10	29	17	15	20	19	14	PL	7	-
651.0	48														
	50	20/29			Gray Sandy Gravelly Silt	11	29	12	13	24	22	20	5	10	A-4a
	52														
646.0	54														
	56	12/14			Gray Sandy Silt	12	7	8	16	40	29	19	5	13	A-4a
642.5	58				TOP OF ROCK										
	60														
	62		4.7	0.3	Limestone, gray, hard, dense, badly broken in part, jointed. Core Loss 6%.										
637.5	64				BOTTOM OF BORING										

*Refusal

DRAWN RRM | CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-001-B-68

FRA-70-12.68
FRA-70-13.10

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B-001-C-59

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

SHEET 3

LOG OF BORING

CO., RT. NO., SEC. FRA-40-12.82 BRIDGE NO. RETAINING WALL C
RETAINING WALL C

LOCATION: T.H. 1B STA. 62+75 OFFSET 102'LT FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
763.0	0			
	2			
	4			
758.0	6	3/4	29107	Brown Sandy Gravelly Clay
	8			
753.0	10			
	12	26/32	29108	Brown Silty Sandy Gravel
	14			
748.0	16	-----		Brown Silty Sandy Gravel
	18			
743.0	20			
	22	96/90	29109	Brown Silty Sandy Gravel
	24			
738.0	26	33/47	29110	Gray Gravel
735.5	28			
		24/16		
733.0	30			
	32	37/36	29111	Brown Silty Sandy Gravel
	34			
728.0	36	27/18	29112	Brown Sandy Gravel

(Glacial Boulders (igneous and limestone))

BM
8.24.59

B-001-C-59

LOG OF BORING (CONTINUED)

SHEET 4

BRIDGE NO. RETAINING WALL C T.H. 1B

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
725.5	38	34/34	29113	Brown Sandy Gravel
723.0	40			
	42	21/22	29114	Gray Silty Sand
720.5	44	40/76	29115	Gray Silty Sand
718.0	46	28/42	29116	Gray Silty Gravelly Sand
716.5	48	72/*	29117	Gray Silty Sand
713.0	50	59/36	29118	Gray Silty Sandy Gravel
711.5	52	24/39	29119	Gray Sandy Gravel
708.0	54	27/29	29120	Gray Sand
706.5	56	100*	29121	Brown Silty Sandy Gravel
703.0	58	43/53	-----	Gray Silty Sandy Gravel
	60			
	62			
	64			
698.0	66	33/*	29122	Gray Silty Gravelly Sand
	68			
693.0	70			
692.0		------	29123	Gray Sandy Gravelly Silt
	72			
	74			
	76			
	78			
	80			
	82			

(Glacial Boulders (igneous and limestone))

BOTTOM OF BORING

*Refusal

DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-001-C-59

FRA-70-12.68
FRA-70-13.10

472/496

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B-001-S-57

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

LOG OF BORING

CO., RT. NO., SEC. FRA-40-12.30 BRIDGE NO. FRA-40-1230
REAR ABUTMENT OVER SCIOTO RIVER
LOCATION: T.H. 1 STA. 21+75 OFFSET C.L. FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
724.0	0			
	2			
	4			
	6			
	8			
714.0	10	18	67403	GRAY AND BROWN SILTY GRAVEL
	12			
	14			
709.0	16	45	67404	GRAVEL
	18			
704.0	20	30	67405	BROWN CLAY
	22			
	24			
699.0	26	70	67406	GRAY AND BROWN SILTY SANDY GRAVEL
	28			
694.0	30			
	32	52	67407	GRAVEL
	34			
689.0	36	38	67408	GRAVEL

B-001-S-57

LOG OF BORING (CONTINUED)
BRIDGE NO. FRA-40-1230 T.H. 1

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
	38			
684.0	40	74	67409	SANDY GRAVEL
	42			
680.0	44	90	67410	SILTY SANDY GRAVEL
	46			
	48			
674.0	50	155	67411	GRAY GRAVELLY SANDY CLAY
	52			
	54			
	56			
667.0	58			BOULDERS
	60			
	62			
661.0	64			LARGE BOULDERS BOTTOM OF HOLE
	66			
	68			
	70			
	72			
	74			
	76			
	78			
	80			
	82			

DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-001-S-57

FRA-70-12.68
FRA-70-13.10

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL205.dgn 12/27/2018 10:44:31 AM rachelm

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B-001-S-68

LOG OF BORING

Date Started 6-26-68 Sampler Type SS Dia 1 3/8" Water Elev. ____

Date Completed 6-27-68 Casing: Length 40' Dia 3 1/2"

Boring No. B-1 Station & Offset 484+26, 35' Lt. (Rear Abutment) Surface Elev. 705.6'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics % Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
705.6	0														
	2														
	4														
700.6	6	15/18			Brown Silty Sandy Gravel	1	49	13	9	21	8	19	2	9	A-2-4
	8														
695.6	10				Brown Silty Gravelly Sand (Wash Sample)-(Sand Heaved 5.0' in Casing)	2	25	42	16	-17	-	NP	NP	10	A-1-b
	12														
	14														
690.6	16	18/21			Brown Silty Sandy Gravel	3	57	14	8	14	7	NP	NP	7	A-1-b
	18														
685.6	20	19/21			Brown Silty Sandy Gravel	4	61	12	10	-17	-	NP	NP	3	A-1-b
	22														
	24														
680.6	26	18/19			Brown Silty Sandy Gravel	5	64	13	9	-14	-	NP	NP	5	A-1-a
	28														
675.6	30	12/13			Brown Silty Sandy Gravel	6	61	16	9	-14	-	NP	NP	9	A-1-a
	32														
	34														
670.6	36	50* (0.7')			Brown Gravel	7	79	7	6	- 8	-	NP	NP	8	A-1-a
	38														
665.6	40	50/*			Gray Sandy Gravelly Silt	8	25	9	14	28	24	20	5	10	A-4a
	42														
	44														
660.6															
659.9	46	50* (0.7')			Gray Silty Gravelly Sand	9	20	3	44	-31	-	NP	NP	21	A-2-4
					BOTTOM OF BORING										
					*Refusal										

FRA-70-12.68
FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-001-S-68

DRAWN RRM
CHECKED BRT

B-002-F-59

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

SHEET 4

LOG OF BORING

CO., RT. NO., SEC. FRA-40-12.82 BRIDGE NO. FRA-40-1300
REAR ABUTMENT SOUTH INNERBELT UNDER FRONT STREET

LOCATION: T.H. 2B STA. 49+33 OFFSET 46'LT FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
754.7	0			
	2			
	4			
749.7	6	3/5	19858	Brown Silty Sandy Gravel
	8			
744.7	10			
	12	15/14	19859	Brown Silty Sandy Gravel
	14			
739.7	16	19/25	19860	Brown Silty Sandy Gravel
	18			
734.7	20			
	22	15/26	19861	Brown Silty Sandy Gravel
732.2	24	100/*	19862	Brown Sandy Gravel
729.7	26	18/21	19863	Brown Silty Sandy Gravel
727.2	28	38/59	19864	Brown Silty Sandy Gravel
724.7	30			
	32	34/31	19865	Brown Silty Sandy Gravel
722.2	34	42/*	19866	Brown Silty Sandy Gravel
719.7	36	21/57	19867	Gray Silty Sandy Gravel

*Refusal

BM
6.26.59

B-002-F-59

LOG OF BORING (CONTINUED) SHEET 5

BRIDGE NO. FRA-40-1300 T.H. 2B

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
717.2	38			
	40	35/62	19868	Gray Sandy Gravel
714.7	42	60/128	19869	Gray Silty Sandy Gravel
712.2	44	47/70	19870	Gray Silty Sandy Gravel
709.7	46	45/52	19871	Gray Silty Sandy Gravel
	48			
704.7	50			
	52	75/108	19872	Gray Sandy Gravel
	54			
699.7	56	77/150	-----	Gray Silty Sandy Gravel
	58			
694.7	60			
	62	138/*	19873	Gray Silty Sandy Gravel
	64			
689.7	66	62/109	19874	Gray Silty Gravelly Sand
	68			
684.7	70			
	72	138/*	-----	Gray Silty Gravelly Sand
682.2				
681.7	74	70/*	19875	Gray Silty Sandy Gravel
	76			BOTTOM OF BORING
	78			
	80			*Refusal
	82			

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-002-F-59

FRA-70-12.68
FRA-70-13.10

DRAWN RRM
CHECKED BRT

475/496

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B-002-S-68

LOG OF BORING

Date Started 6-24-68 | Sampler Type SS | Dia 1 3/8" | Water Elev. ____
Date Completed 6-26-68 | Casing: Length 30' | Dia 3 1/2"
Boring No. B-2 | Station & Offset 484+18, 48' Lt. (Rear Abutment) | Surface Elev 704.7'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
704.7	0														
	2														
	4														
699.7	6	32/45			Brown Silty Sandy Gravel	1	57	13	11	20		NP	NP	9	A-1-b
	8														
694.7	10	40/25			Brown Silty Sandy Gravel	2	48	19	12	21		NP	NP	10	A-1-b
	12														
689.7	14														
	16	10/21			Brown Sandy Gravel	3	82	12	3	3		NP	NP	6	A-1-a
	18														
684.7	20	13/13			Brown Silty Sandy Gravel	4	55	13	13	19		NP	NP	4	A-1-b
	22														
679.7	24														
	26	21/25			Brown Gravelly Silt	5	48	5	7	29	11	NP	NP	11	A-4a
	28														
674.7	30														
	32	50* (0.8')			Gray Sandy Gravelly Silt	6	40	7	13	21	19	NP	NP	10	A-4a
	34														
669.7	36	50/*			Gray Silty Sand	7	7	20	40	8	25	NP	NP	10	A-3a
	38														
664.7	40														
	42	50* (0.6')			Gray Gravelly Sandy Silt	8	17	9	18	30	26	19	4	9	A-4a
	44														
659.7					Gray Silt	9	6	4	9	52	29	20	3	15	A-4b

BOTTOM OF BORING
*Refusal

FRA-70-12.68
FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-002-S-68

DRAWN RRM
CHECKED BRT

B-003-A-59

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

SHEET 6

LOG OF BORING

CO., RT. NO., SEC. FRA-40-12.82 BRIDGE NO.
RETAINING WALL-A SOUTH-EAST INNERBELT

LOCATION: T.H. 3-A STA. 54+68 OFFSET 60'RT FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
735.5	0			
	2			
	4			
730.5	6	19/14	19701	Gray Silty Sandy Gravel
728.0	8	8/9	19702	Gray Sandy Gravelly Silt
725.5	10			
	12	9/9	19703	Gray Gravelly Sandy Silt
723.0	14	7/10	19704	Gray Silt and Clay
720.5	16	9/10	19705	Gray Silt
718.0	18	13/15	19706	Gray Silty Sand
715.5	20	16/22	19707	Gray Sandy Silt
713.0	22			
	24	42/36	19708	Gray Silty Sandy Gravel W/Boulders
710.5	26	25/25	19709	Gray Gravel W/Boulders
708.0	28	20/46	19710	Brown Sandy Gravel W/Boulders
705.5	30			
	32	10/75	19711	Brown Sandy Gravel W/Boulders
	34			
700.5	36	75/*	19712	Gray Silty Sand W/Boulders

*Refusal

MB
8.24.59

B-003-A-59

LOG OF BORING (CONTINUED)

SHEET 7

BRIDGE NO. T.H. 3-A B

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
	38			
695.5	40	38/34	19713	Gray Sandy Silt
	42			
	44			
690.5	46	27/42	19714	Gray Silty Sandy Gravel
	48			
685.5	50	25/37	19715	Gray Silt W/Boulders
683.0	52			
	54	75/*	-----	Bouldery Gray Sand
680.5	56			BOTTOM OF BORING
	58			
	60			*Refusal
	62			
	64			
	66			
	68			
	70			
	72			
	74			
	76			
	78			
	80			
	82			

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-003-A-59

FRA-70-12.68
FRA-70-13.10

477/496

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B-003-E-68

LOG OF BORING

Date Started 7-15-68 | Sampler Typ. SS | Dia 1 3/8" | Wat. Elev ____
Date Completed 7-17-68 | Casing Length 55' | Dia 3 1/2"
Boring No B-3 | Station & Offset 494+81, 19' Lt. (First Pier) | Surface Elev 719.0'

Elev.	Depth	Std Pen (N)	Rec ft.	Loss ft.	Description	Sample No	Physical Characteristics: % Agg	% C S	% F S	% Silt	% Clay	L L	P I	W C	SHTL Class.
719.0	0														
	2														
714.0	4														
	6	11/14			Brownish-Gray Sandy Gravelly Silt	1	40	9	8	18	25	28	9	22	A-4a
	8														
709.0	10														
	12	14/16			Brown Gravelly Sand (Wash Sample)	2	37	53	4	- 6 -		NP	NP	22	A-1-b
	14														
704.0	16	10/12			Gray Silt and Clay, Slightly Organic	3	0	5	11	36	48	44	16	22	A-7-6
	18														
699.0	20														
	22	50* (0.7')			Brown Silty Sandy Gravel	4	66	12	7	-15 -		NP	NP	14	A-1-a
	24														
694.0	26	50*/ (0.4')			Brown Silty Sandy Gravel	5	65	16	7	-12 -		NP	NP	9	A-1-a
	28														
689.0	30														
	32	50* (0.7')			Gray Gravel	6	90	6	2	- 2 -		NP	NP	29	A-1-a
	34														
684.0	36	9/4			Brown Gravel	7	81	7	4	- 8 -		NP	NP	9	A-1-a
	38														
679.0	40	11/17			Brown Silty Sandy Gravel	8	72	9	7	-12 -		NP	NP	4	A-1-a
	42														
674.0	44														
	46	27/27			Gray Sandy Gravel	9	72	14	6	- 8 -		NP	NP	10	A-1-a
	48														
669.0	50	12/14			Gray Silty Sand	10	12	56	19	-13 -		NP	NP	20	A-1-b
	52														
664.0	54														
	56	10/15			Brown Gravelly Sandy Silt	11	24	13	16	24	23	19	6	10	A-4a
	58														
659.0	60	15/16			Gray Gravelly Sandy Silt	12	22	16	17	24	21	20	7	10	A-4a
	62														
654.0	64														
	66	11/13			Gray Gravelly Sandy Silt	13	16	13	17	23	31	21	9	14	A-4a
	68														
649.0	70														
	72	50/*	4.5	0.0	TOP OF ROCK Limestone, light-gray, hard, dense, crystalline, few fossils, few chert seams. No Core Loss.										
644.0	74				BOTTOM OF BORING *Refusal										

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DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-003-E-68

FRA-70-12.68
FRA-70-13.10

478/496

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B-003-S-68

LOG OF BORING

Date Started 6-27-68 Sampler Type SS Dia 1 3/8" Water Elev. ———

Date Completed 6-28-68 Casing: Length 32' Dia 3 1/2"

Boring No. B-3 Station & Offset 485+02, CL. (Forward Abutment) Surface Elev 705.0'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
705.0	0														
	2														
	4														
700.0	6	24/30			Brown Silty Sandy Gravel	1	42	14	10	14	20	20	7	9	A-2-4
	8														
695.0	10	14/17			Brown Silty Sandy Gravel	2	65	17	7	11	-	NP	NP	7	A-1-a
	12														
690.0	14														
	16	50* (0.8')			Brown Silty Gravel	3	66	4	5	15	10	NP	NP	9	A-1-b
	18														
685.0	20	14/15			Brown Silty Gravelly Sand	4	26	20	15	21	18	NP	NP	13	A-4a
	22														
680.0	24														
	26	16/17			Gray Silty Sandy Gravel	5	52	21	12	15	-	NP	NP	11	A-1-a
	28														
675.0	30	13/14			Gray Silty Sandy Gravel	6	V	I	S	U	A	L	17	4	9	-
	32														
670.0	34														
	36	50* (0.6')			Gray Gravelly Sandy Silt	7	15	14	19	39	13	18	5	11	A-4a
	38														
665.0	40	50* (0.4')			Gray Sandy Silt	8	0	1	28	55	16	NP	NP	18	A-4b
	42														
	44														
660.0	46	50/*			Gray Sandy Silt	9	13	10	23	30	24	17	4	29	A-4a
	48														
655.0	50	50*			Gray Gravelly Sandy Silt	10	16	11	19	30	24	22	7	9	A-4a
654.2		(0.8')			BOTTOM OF BORING										
					*Refusal										

FRA-70-12.68
FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-003-S-68

DRAWN RRM
CHECKED BRT

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B-004-S-68

LOG OF BORING

Date Started 7-1-68 | Sampler Type SS | Dia 1 3/8" | Water Elev. ____
Date Completed 7-3-68 | Casing: Length 40' | Dia 3 1/2"
Boring No. B-4 | Station & Offset 484+95, 46' Rt. (Forward Abutment) | Surface Elev 706.0'

Elev.	Depth	Std. Pen. (ft)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics % Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
706.0	0														
	2														
	4														
701.0	6	5/6			Brown Silty Sandy Gravel	1	39	7	23	17	14	NP	NP	12	A-2-4
	8														
696.0	10														
	12	50* (0.3')			Gray Silty Sand	2	9	53	16	22	-	NP	NP	12	A-1-b
	14														
691.0	16	50/*			Gray Gravel with Boulders	3	-	-	-	-	-	-	-	3	Visual
	18														
686.0	20	7/7			Gray Gravel with Boulders	4	88	3	2	7	-	NP	NP	3	A-1-a
	22														
681.0	24														
	26	8/5			Gray Silty Sand (Wash Sample)	5	0	62	18	20	-	NP	NP	29	A-1-b
	28														
676.0	30														
	32	50* (0.4')			Brown Silty Sandy Gravel	6	67	14	3	16	-	NP	NP	8	A-1-b
	34														
671.0	36	50* (0.4')			Gray Sandy Silt	7	9	14	32	22	23	17	4	11	A-4a
	38														
666.0	40														
	42	50* (0.8')			Gray Sandy Silt	8	11	10	19	25	35	24	9	9	A-4a
	44														
661.0	46	50* (0.4')			Gray Sandy Silt	9	7	7	23	47	16	NP	NP	11	A-4a
	48														
656.0	50	50*			Gray Sandy Silt	10	0	3	26	46	25	18	4	11	A-4a
655.6		(0.4')			BOTTOM OF BORING										

*Refusal

FRA-70-12.68
FRA-70-13.10

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-004-S-68

DRAWN RRM
CHECKED BRT

B-005-F-59

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

SHEET 6

LOG OF BORING

CO., RT. NO., SEC. FRA-40-12.82 FORWARD ABUTMENT BRIDGE NO. FRA-40-1300 SOUTH INNERBELT UNDER FRONT STREET

LOCATION: T.H. 5B STA. 50+44 OFFSET 67'RT FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
758.3	0			
	2			
	4			
753.3	6	4/6	20608	Brown Sandy Silt
	8			
748.3	10	7/10	20609	Brown Silty Sandy Gravel
	12			
	14			
743.3	16	54/83	20610	Brown Sandy Gravel
	18			
738.3	20			
	22	58/46	20611	Brown Silty Sandy Gravel
	24			
733.3	26	44/58	20612	Brown and Gray Silty Sandy Gravel
	28			
728.3	30			
	32	48/40	20613	Gray Gravelly Sandy Silt
725.8	34	21/36	20614	Gray Sandy Silt
723.3	36	38/57	20615	Gray Sandy Silt

RM
6.26.59

B-005-F-59

SHEET 7

LOG OF BORING (CONTINUED)

BRIDGE NO. FRA-40-1300 T.H. 5B

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
720.8	38			
	40	91/*	20616	Gray Silty Gravelly Sand
718.3	42	59/94	20617	Gray Sandy Gravel
715.8	44	100/*	20618	Gray Sandy Gravel
713.3	46	100/*	-----	Bouldery Gray Sandy Gravel
	48			
708.3	50			
	52	64/142	20619	Brown Silty Sandy Gravel
706.3	54	100/138	20620	Brown Silty Sandy Gravel
703.3	56	49/78	20621	Brown Silty Gravelly Sand
	58			
698.3	60			
	62	52/104	20622	Brownish-Gray Sandy Clay
	64			
693.3				
692.3	66	100/*	20623	Brown Gravelly Sandy Silt
				BOTTOM OF BORING
	68			
	70			
	72			*Refusal
	74			
	76			
	78			
	80			
	82			

DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-005-F-59

FRA-70-12.68
FRA-70-13.10

481/496

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B-005-S-57

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

LOG OF BORING

CO., RT. NO., SEC. FRA-40-12.30 BRIDGE NO. FRA-40-1230
SECOND PIER OVER SCIOTO RIVER

LOCATION: T.H. 5 STA. 24+00 OFFSET C.L. FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
681.7	0			
	2			
	4			
676.4	6	24	66517	GRAY SANDY GRAVEL
	8			
671.4	10			
	12	73	66518	GRAY SILTY GRAVELLY SAND
	14			
666.4	16	180	66519	GRAY SILTY SANDY GRAVEL
	18			
663.4		--	---	COARSE SAND
661.4	20			
	22	117	66520	GRAY SILTY GRAVEL
	24			
656.4	26	20	----	FINE SAND, SILT AND SMALL GRAVEL
	28			
652.7	30	600	66521	WEATHERED SHALE
652.1				TOP OF ROCK
	32			
	34			HARD DENSE GRAY LIMESTONE
645.7	36			BOTTOM OF HOLE

AB
7-24-57

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-005-S-57

FRA-70-12.68
FRA-70-13.10

482/496

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B-006-D-68

LOG OF BORING

Date Started 7-17-68 | Sampler Type SS | Dia 1 3/8" | Water Elev. ____
Date Completed 7-18-68 | Casing: Length 48' | Dia. 3 1/2"
Boring No. B-6 | Station & Offset 523+90, 04' Lt. (2nd Pier) | Surface Elev. 702.0'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics: % Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
702.0	0														
	2														
	4														
697.0	6	10/14			Brown Silty Sandy Gravel	1	70	11	6	-13	-	NP	NP	12	A-1-a
694.5	8				No Sample Recovered (Hole Caved in)		V	I		S		U	A	L	
692.0	10	15/18			Gray Silty Gravel	2	78	6	6	-13	-	NP	NP	25	A-1-a
	12														
	14														
687.0	16	13/19			Brown Silty Sandy Gravel	3	55	23	8	-14	-	NP	NP	12	A-1-a
	18														
682.0	20	12/9			Gray Silty Gravelly Sand	4	37	35	18	-10	-	NP	NP	13	A-1-b
	22														
	24														
677.0	26	10/10			Gray Silty Sand	5	14	25	42	-13	-	NP	NP	20	A-3a
	28														
672.0	30	50/*			Gray Sandy Gravel	6	53	39	5	- 3	-	NP	NP	5	A-1-a
	32														
	34														
667.0	36	10/13			Gray Gravelly Sandy Silt	7	24	14	16	21	25	19	7	11	A-4a
	38														
662.0	40	8/10			Gray Gravelly Sandy Silt	8	23	12	14	27	24	19	6	12	A-4a
	42														
	44														
657.0	46	9/9			Gray Gravelly Sandy Silt	9	21	11	14	30	24	19	7	15	A-4a
654.0	48														
	50		1.9	0.1	TOP OF ROCK										
	52		5.0	0.0	Limestone, light-gray, hard, dense, chert seams, crystalline, few fossils. Core Loss 1%.										
647.0	54				BOTTOM OF BORING										

*Refusal

DRAWN RRM | CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-006-D-68

FRA-70-12.68
FRA-70-13.10

483/496

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL215.dgn 12/27/2018 10:45:37 AM rachelm

B-007-0-59

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

LOG OF BORING

CO., RT. NO., SEC. FRA-40-12.82 BRIDGE NO. FRA-40-1310
THIRD PIER SOUTH INNERBELT UNDER HIGH STREET

LOCATION: T.H. 7 STA. 50+09 OFFSET 43'RT FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
767.7	0			
	2			
	4			
762.7	6	11/6	20624	Brown Sandy Gravelly Silt
	8			
757.7	10			
	12	9/14	20625	Brown Sandy Gravel
	14			
752.7	16	12/12	20626	Brown Sandy Gravel W/Boulders
	18			
747.7	20			
	22	21/26	20627	Brown Silty Sandy Gravel W/Boulders
	24			
742.7	26	23/30	20628	Brownish-Gray Gravel W/Boulders
	28			
737.7	30			
	32	32/37	20629	Gray Silty Gravel W/Boulders
	34			
732.7	36	30/50	20630	Gray Sandy Silt

BM
6.25-59

B-007-0-59

LOG OF BORING (CONTINUED)

BRIDGE NO. FRA-40-1310 T.H. 7

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
730.2	38			
	40	23/37	20631	Gray Gravelly Sandy Silt
727.7	42	33/*	20632	Gray Silty Sandy Gravel W/Boulders
725.2	44	75/*	20633	Brownish-Gray Sandy Gravel W/Boulders
722.7	46	125/*	20634	Gray Gravel W/Boulders
720.2	48	23/35	20635	Gray Sandy Silt W/Boulders
717.7	50	50/85	20636	Gray Sandy Silt W/Boulders
715.2	52	35/50	20637	Gray Gravelly Sandy Silt W/Boulders
712.7	54	40/60	20638	Gray Gravelly Sandy Silt W/Boulders
	56			
	58			
707.7	60	20/45	20639	Gray Silty Sandy Gravel W/Boulders
	62			
	64			
702.7	66	100/*	20640	Gray Gravel W/Boulders
702.5				BOTTOM OF BORING
	68			
	70			*Refusal
	72			
	74			
	76			
	78			
	80			
	82			

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-007-0-59

FRA-70-12.68
FRA-70-13.10

484/496

DRAWN RRM
CHECKED BRT

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL216.dgn 12/27/2018 10:45:41 AM rocheim

B-009-D-68

LOG OF BORING

Date Started 7-23-68 | Sampler Type SS | Dia 1 3/8" | Water Elev. ____
Date Completed 7-25-68 | Casing: Length 50' | Dia. 3 1/2" | Surface Elev. 703.8'
Boring No. B-9 | Station & Offset 525+26, 24' Rt. (4th Pier)

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics: % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
703.8	0														
701.3	2				No Sample Recovered		V	I		S		U	A	L	
698.8	4														
	6	7/8			Brown Silty Gravelly Sand	1	24	20	19	22	15	NP	NP	10	A-4a
696.3	8				No Sample Recovered		V	I		S		U	A	L	
693.8	10														
	12				Brownish-Gray Gravelly Sand (Wash Sample) (Heaved in Casing 0.3')	2	37	44	9	-10	-	NP	NP	20	A-1-b
691.3	14				No Sample Recovered		V	I		S		U	A	L	
688.8	16	50* (0.6')			Brownish-Gray Silty Sandy Gravel	3	61	14	8	8	9	NP	NP	9	A-1-b
	18														
683.8	20	22/28			Brownish-Gray Silty Sandy Gravel	4	68	13	6	7	6	NP	NP	23	A-4a
	22														
678.8	24														
	26	16/18			Brownish-Gray Gravel	5	V	I	S	U	A	L	NP	NP	2	-
	28														
673.8	30	11/11			Gray Gravelly Sand	6	44	46	6	-	4	-	NP	NP	6	A-1-b
	32														
668.8	34														
	36	4/9			Brown and Gray Clayey Silt	7	13	2	4	34	47	26	8	24	A-4a
	38														
663.8	40														
	42	50* (0.6')			Gray Sandy Gravel	8	67	16	7	5	5	-	-	8	-
	44														
658.8	46	13/15			Gray Silty Sand	9	0	3	72	-	25	-	NP	NP	17	A-3a
	48														
653.8	50														
	52	50* (0.7')			Brown Sandy Gravel	10	V	I	S		U	A	L	5	
650.8					TOP OF ROCK										
	54														
	56		4.7	0.3	Limestone, gray, hard, dense. Core Loss 6%.										
645.8	58				BOTTOM OF BORING										

*Refusal

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-009-D-68

FRA-70-12.68
FRA-70-13.10

485/496

DRAWN RRM
CHECKED BRT

J:\GEOTECH\Projects\2013\W-13-045 FRA-70-13.54 Project 4A\DWG\ODOT P&P\COMBINED SET 4A & 6A\77372-89464ZL217.dgn 12/27/2018 10:45:49 AM rachelm

B-009-S-57

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

LOG OF BORING

CO., RT. NO., SEC. FRA-40-12.30 BRIDGE NO. FRA-40-1230
FOURTH PIER OVER SCIOTO RIVER
LOCATION: T.H. 9 STA. 26+25 OFFSET C.L. FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
686.1	0			
	2			
	4			
	6			
	8			
677.4	10	39	67412	GRAY SILTY GRAVELLY SAND
	12			
672.4	14			
	16	171	67413	GRAY AND BROWN SILTY GRAVELLY SAND
669.4	18		67414	GRAVEL AND STONE FRAGMENTS
	20			
	22			
	24			
662.4	26	39	67415	SANDY GRAVEL
660.4	28	190	67416	SANDY GRAVEL
	30			
654.4	32			
	34	70	67417	GRAVEL
651.4				TOP OF ROCK
	36			FIRM GRAY CLAY SHALE

AS 7-24-57

B-009-S-57

LOG OF BORING (CONTINUED)
BRIDGE NO. FRA-45-1230 T.H. 9

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
648.7	38			FIRM GRAY CLAY SHALE
646.0	40			DENSE GRAY LIMESTONE WITH DARK WAVY PARTINGS
	42			BOTTOM OF HOLE
	44			
	46			
	48			
	50			
	52			
	54			
	56			
	58			
	60			
	62			
	64			
	66			
	68			
	70			
	72			
	74			
	76			
	78			
	80			
	82			

AS 7-24-57

DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-009-S-57

FRA-70-12.68
FRA-70-13.10

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B-011-0-59

SHEET 8

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

LOG OF BORING

CO., RT. NO., SEC. FRA-40-12.82 BRIDGE NO. FRA-40-1310
FORWARD ABUTMENT SOUTH INNERBELT UNDER HIGH STREET
LOCATION: T.H. 11 STA. 51+45 OFFSET 50'RT FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
770.5	0			
	2			
	4			
765.5	6	7/9	20971	Brown Silty Sandy Gravel
	8			
760.5	10	15/30	20972	Brown Silty Gravelly Sand
758.5	12	7/10	20973	Brown Silty Sandy Gravel
	14			
755.5	16	11/11	20974	Gray Sandy Gravelly Silt
753.5	18	12/24	20975	Brown Silty Sandy Gravel
750.5	20	25/74	20976	Gray Sandy Gravel
748.5	22	29/49	20977	Brown Silty Sandy Gravel
	24			
745.5	26	15/29	20978	Brown Sandy Gravel
743.5	28	48/51	20979	Brown Silty Sandy Gravel
740.5	30	24/20	20980	Brown Gravelly Sand
738.5	32	31/73	20981	Gray Gravelly Sandy Silt
	34			
735.5	36	26/49	20982	Gray Gravelly Sandy Silt

ZM
6-25-59

B-011-0-59

LOG OF BORING (CONTINUED) SHEET 9

BRIDGE NO. FRA-40-1310 T.H. 11

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
	38			
730.5	40	36/75	20983	Gray Sandy Silt
	42			
	44			
725.5	46	38/76	20984	Gray Gravelly Sandy Silt
	48			
720.5	50	7/60	20985	Gray Sandy Gravel
	52			
	54			
715.5	56	88/122	20986	Gray Gravel
	58			
710.5	60	60/80	20987	Gray Gravelly Sand
	62			
	64			
705.5	66	75/159	20988	Gray Silty Sandy Gravel
	68			
700.5	70			
699.5	72	80/*	20989	Gray Silty Sandy Gravel
				BOTTOM OF BORING
	74			
	76			*Refusal
	78			
	80			
	82			

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-011-0-59

FRA-70-12.68
FRA-70-13.10

DRAWN RRM
CHECKED BRT

487/496

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B-012-E-68

LOG OF BORING

Date Started 7-11-68 | Sampler Type SS | Dia 1 3/8" | Water Elev —
Date Completed 7-17-68 | Casing Length 58' | Dia 3 1/2"
Boring No B-12 | Station & Offset 498+62, 65' Rt. (5th Pier) | Surface Elev 705.0'

Elev.	Depth	Std Pen (N)	Rec ft.	Loss ft.	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
705.0	0														
702.5	2														
	4				No Sample Recovered (Hole Caved in)		V	I	S		U	A	L		
700.0	6	9/9			Brown Sandy Gravel	1	51	43	3	- 3	-	NP	NP	13	A-1-a
697.5	8				No Sample Recovered (Hole Caved in)		V	I	S		U	A	L		
695.0	10														
	12	6/3			Brown Silty Sandy Gravel	2	49	27	9	-15	-	NP	NP	18	A-1-b
690.0	14														
	16	3/1			Brown Sandy Gravel	3	67	24	3	- 6	-	NP	NP	10	A-1-a
685.0	18														
	20	23/24			Brown Silty Sandy Gravel	4	68	12	8	-12	-	NP	NP	8	A-1-a
	22														
680.0	24														
	26	15/12			Brown Sandy Gravel	5	70	16	6	- 8	-	NP	NP	12	A-1-a
	28														
675.0	30														
	32	50"/ (0.4')			Gray Gravel	6	90	8	1	- 1	-	NP	NP	4	A-1-a
	34														
670.0	36	50" (0.9')			Gray Silty Sandy Gravel	7	38	23	11	17	11	16	4	14	A-2-4
	38														
665.0	40														
	42	11/15			Gray Sandy Gravelly Silt	8	35	9	13	23	20	NP	NP	12	A-4a
	44														
660.0	46	50" (0.6')			Gray Gravelly Sandy Silt	9	25	17	16	19	23	19	6	15	A-4a
	48														
655.0	50	11/12			Gray Silty Sandy Gravel	10	44	11	12	15	18	-	-	10	A-2-4
	52														
650.0	54														
	56	23/27			Gray Silty Sandy Gravel	11	52	15	13	-20	-	NP	NP	10	A-1-b
647.0	58				TOP OF ROCK										
645.0	60		2.0	0.0	Limestone, light-gray, hard, dense, crystalline, few small fossils. No Core Loss.										
					BOTTOM OF BORING										
					*Refusal										

DRAWN RRM | CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-012-E-68

FRA-70-12.68
FRA-70-13.10

488/496

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B-013-S-57

SHEET 8

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

LOG OF BORING

CO., RT. NO. SEC. FRA -40-12.30 BRIDGE NO. FRA-40-1230
SIXTH PIER OVER SCIOTO RIVER

LOCATION: T.H. 13 STA. 28+73 OFFSET C.L. FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
693.4	0			
	2			
	4			
686.9	6	15	66522	GRAVEL
682.9	8	90	66523	BROWN SANDY GRAVEL
	10			
	12			
	14			
676.9	16	27	66524	GRAY AND BROWN GRAVELLY SAND
	18			
672.9	20	30	66525	BROWN AND GRAY SANDY GRAVEL
	22			
	24			
666.9				
665.9	26	200	66526	BROWN AND GRAY SANDY GRAVEL
	28		66527	STONE FRAGMENTS
	30			
661.4		200	66528	GRAY SOFT SHALE ← TOP OF ROCK
660.9	32		66529	SHALE
	34			
	36			

AB
7-24-57

B-013-S-57

SHEET 9

LOG OF BORING (CONTINUED)

BRIDGE NO. FRA-40-1230 T.H. 13

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
	38			SHALE
652.4	40			← BOTTOM OF HOLE
	42			
	44			
	46			
	48			
	50			
	52			
	54			
	56			
	58			
	60			
	62			
	64			
	66			
	68			
	70			
	72			
	74			
	76			
	78			
	80			
	82			

AB
7-24-57

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-013-S-57

FRA-70-12.68
FRA-70-13.10

489/496

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B-015-D-68

LOG OF BORING

Date Started 7-19-68 — Sampler Type SS — Dia 1 3/8" — Water Elev ———
Date Completed 7-23-68 — Casing: Length 43' — Dia 3 1/2"
Boring No B-15 — Station & Offset 528+57, 28' Lt. (Wingwall) — Surface Elev 704.2'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics: % Agg	% C.S	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
704.2	0														
	2														
	4														
699.2	6	12/6			Brown Silty Gravelly Sand	1	37	26	15	10	12	NP	NP	11	A-1-b
696.7	8	5/7			Brown Sand (Wash Sample)	2	0	4	86	-10	-	NP	NP	23	A-3
694.2	10	9/10			Brown Silty Sandy Gravel	3	42	15	11	25	7	NP	NP	12	A-2-4
	12														
	14														
689.2	16	13/8			Brown Sandy Gravel	4	78	14	4	- 4	-	NP	NP	9	A-1-a
	18														
684.2	20	16/12			Gray Gravel	5	85	10	2	- 3	-	NP	NP	5	A-1-a
	22														
	24														
679.2	26	11/12			Gray Sandy Gravel	6	80	10	5	- 5	-	NP	NP	8	A-1-a
	28														
674.2	30				Gray Sand with Boulders (Wash Sample)	7	0	76	15	- 9	-	NP	NP	21	A-1-b
	32														
	34														
669.2	36	13/16			Gray Sandy Gravelly Silt	8	32	11	14	19	24	18	6	11	A-4a
	38														
664.2	40														
	42	9/9			Brownish-Gray Silty Gravelly Sand	9	29	19	20	10	22	17	3	12	A-2-4
661.2					BOTTOM OF BORING										

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-015-D-68

FRA-70-12.68
FRA-70-13.10

490/496

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B-015-W-68

LOG OF BORING

Date Started 7-30-68 | Sampler Type SS | Dia 1 3/8" | Water Elev. —
Date Completed 7-30-68 | Casing: Length 42' | Dia. 3 1/2"
Boring No. B-15 | Station & Offset 499+97, 36' Lt. (7th Pier) | Surface Elev. 709.0'

Elev.	Depth	Std. Pen (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics: % Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
709.0	0														
	2														
	4														
704.0	6	24/31			Brown Silty Sandy Gravel	1	35	14	16	19	16	NP	NP	7	A-2-4
701.5	8														
	10	19/35			Brownish-Gray Silty Sandy Gravel	2	42	17	9	21	11	NP	NP	7	A-2-4
699.0	12	24/22			Brownish-Gray Silty Sandy Gravel	3	48	15	16	13	8	NP	NP	12	A-1-b
	14														
694.0	16	28/34			Brownish-Gray Silty Sandy Gravel	4	47	17	11	12	13	NP	NP	9	A-1-b
	18														
689.0	20	26/36			Brownish-Gray Silty Sandy Gravel with Boulders	5	39	21	13	15	12	NP	NP	9	A-2-4
	22														
	24														
684.0	26	50*/ (0.4')			Brownish-Gray Gravelly Sand with Boulders	6	V	I	S	U	A	L		12	-
	28														
679.0	30	14/18			Brown Silty Sandy Gravel	7	61	12	9	10	8	NP	NP	12	A-1-b
	32														
	34														
674.0	36	24/22			Brown Sandy Gravel with Boulders	8	72	15	8	2	3	NP	NP	5	A-1-a
	38														
669.0	40	26/37			Gray Silty Gravel with Boulders	9	60	8	6	13	13	NP	NP	8	A-2-4
	42														
666.0	44		3.7	1.3	Limestone Boulders and Clay with Pebbles										
	46														
661.0	48				← TOP OF ROCK										
	50		5.0	0.0	Limestone, gray, thinly-bedded, hard, dense, few cherty zones, pyritiferous. No Core Loss.										
656.0	52				← BOTTOM OF BORING										

*Refusal

DRAWN RRM | CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-015-W-68

FRA-70-12.68
FRA-70-13.10

491/496

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B-018-E-68

LOG OF BORING

Date Started 7-10-68 | Sampler Type SS | Dia 1 3/8" | Water Elev ____
Date Completed 7-12-68 | Casing Length 55' | Dia 3 1/2"
Boring No B-18 | Station & Offset 500+61, 35' Rt. (Forward Abutment) | Surface Elev 723.5'

Elev.	Depth	Std. Pen. (ft.)	Rec. ft.	Loss ft.	Description	Sample No	Physical Characteristics: % Agg	% C S	% F S	% Silt	% Clay	L L	P I	W C	AASHO Class
723.5	0														
	2														
	4														
718.5	6	50" (0.8')			Brown Gravel and Sand	1	-	-	-	-	-	-	-	17	Visual
	8														
713.5	10	19/14			Brown Sand (Wash Sample)	2	0	72	12	~16	-	NP	NP	23	A-1-b
	12														
	14														
708.5	16	12/28			Brown Silty Sandy Gravel	3	40	8	13	23	16	NP	NP	13	A-4a
	18														
703.5	20	7/12			Brown Gravel and Sand	4	-	-	-	-	-	-	-	12	Visual
	22														
	24														
698.5	26	4/5			Brown Sandy Gravelly Clay	5	29	11	14	22	24	24	11	14	A-6a
	28														
693.5	30	3/5			Brown Gravelly Sandy Silt	6	19	14	19	23	25	24	7	16	A-4a
	32														
	34														
688.5	36	6/4			Brown Sandy Clay	7	10	12	18	28	32	26	11	16	A-6a
	38														
683.5	40	8/7			Brown Sandy Clay	8	11	14	15	29	31	26	11	18	A-6a
	42														
	44														
678.5	46	50" (0.6')			No Sample Recovered - Boulders(Driller's Des.)		V	I	S	U	A	L			
	48														
673.5	50	50"/ (0.4')			Gray Sandy Gravelly Silt	9	24	8	13	30	25	22	9	10	A-4a
	52														
	54														
668.5	56	50" (0.6')			Gray Sandy Silt	10	9	6	12	46	27	21	6	11	A-4a
	58														
663.5	60	50" (0.6')			Brownish-Gray Sandy Gravelly Silt	11	23	9	14	29	25	23	9	11	A-4a
	62														
	64														
658.5	66	50/*			Gray Silty Sandy Gravel	12	42	5	11	25	17	NP	NP	10	A-4a
657.0	68		3.5	0.0	TOP OF ROCK										
	70				Limestone, medium-gray, hard, dense, cherty. Core Loss 2%.										
	72		4.8	0.2											
648.5	74				BOTTOM OF BORING										

*Refusal

CONSTRUCTION 6 1978

DRAWN RRM | CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-018-E-68

FRA-70-12.68
FRA-70-13.10

492/496

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B-020-S-57

SHEET 10

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

LOG OF BORING

CO., RT. NO., SEC. FRA-40-12.30 BRIDGE NO. FRA-40-1230
FORWARD ABUTMENT OVER SCIOTO RIVER

LOCATION: T.H. 20 STA. 32+05 OFFSET 19' LT FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
726.0	0			
	2			
	4			
721.0	6	----	-----	SAND & SMALL GRAVEL
	8			
	10			
715.0	12	10	67937	SANDY GRAVEL
	14			
	16			
709.0	18	17	-----	SANDY GRAVELLY SILT
	20			
705.0	22	25	67938	SANDY GRAVELLY SILT
	24			
700.0	26			
	28	15	67939	BROWN CLAY
	30			
695.0	32	23	67940	BROWN SILTY GRAVEL
	34			
690.0	36	25	67941	GRAVEL

B-020-S-57

SHEET 11

LOG OF BORING (CONTINUED)

BRIDGE NO. FRA-40-1230 T.H. 20

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
	38			
	40			
658.5		75	67942	SILTY GRAVEL
	42			BOTTOM OF HOLE
	44			
	46			
	48			
	50			
	52			
	54			
	56			
	58			
	60			
	62			
	64			
	66			
	68			
	70			
	72			
	74			
	76			
	78			
	80			
	82			

DRAWN RRM CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG B-020-S-57

FRA-70-12.68
FRA-70-13.10

493/496

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M-041-0-56

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

LOG OF BORING

CO.,RT.NO.,SEC. FRA-3-14.33 BRIDGE NO. FRA-3-
RETAINING WALL MOUND-SANDUSKY EXPWY.
LOCATION: T.H. MS41 STA. 50+00 OFFSET 70' LT. FED.NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
703.9	0			
	2			
	4			
698.9	6	5	54234	GR. CLAYEY SANDY GRAVEL
	8			
693.9	10	7	54235	GRAY SANDY GRAVEL
	12			
	14			
688.9	16	50	54236	BROWN & GRAY SANDY GRAVEL
	18			
683.9	20	46	54237	GRAY SANDY GRAVEL
	22			
	24			
678.9	26	124	54238	GRAY SANDY GRAVEL
	28			
673.9	30	88	54239	GRAY SANDY GRAVEL
	32			
	34			
688.9	36	-----	-----	BOTTOM OF HOLE

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG M-041-0-56

FRA-70-12.68
FRA-70-13.10

M-042-0-56

SHEET 1

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

LOG OF BORING

CO., RT. NO., SEC. FRA-3-14.33 BRIDGE NO. FRA-3-
RETAINING WALL MOUND-SANDUSKY EXPWY.
LOCATION: T.H. MS42 STA. 51+50 OFFSET 48' LT. FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
703.0	0			
	2			
	4			
698.0	6	12	54223	BROWN GRAVELLY SILT
	8			
693.0	10	20	54224	BROWN SANDY GRAVEL
	12			
	14			
688.0	16	83	54225	BROWN SANDY GRAVEL
	18			
683.0	20	35	54226	INDICATION OF SAND, GRAVEL, BOULDERS
	22			
	24			
678.0	26	46	54226	GRAY SANDY GRAVEL
	28			
673.0	30	----	-----	INDICATION OF BOULDERS
	32			BOTTOM OF HOLE
	34			
	36			

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG M-042-0-56

FRA-70-12.68
FRA-70-13.10

495/496

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M-043-0-56

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
TESTING LABORATORY

LOG OF BORING

CO., RT. NO. SEC. FRA-3-14.33 BRIDGE NO. FRA-3-
RETAINING WALL MOUND-SANDUSKY EXPWY.
LOCATION: T.H. MS4.3 STA. 53+00 OFFSET 50' LT. FED. NO.

ELEV.	DEPTH	NO. BLOWS	SAMPLE NO.	DESCRIPTION
703.9	0			
	2			
	4			
698.9	6	24	54218	BROWN SANDY GRAVEL
	8			
693.9	10	55	54219	BROWN SANDY GRAVEL
	12			
	14			
688.9	16	70	54220	BROWN SANDY GRAVEL
	18			
683.9	20	44	54221	GRAY GRAVEL
	22			
	24			
678.9	26	48	54222	GRAY GRAVEL
	28			
673.9	30	128	-----	INDICATION OF BOULDER
671.9	32			BOTTOM OF HOLE
	34			
	36			

DRAWN RRM
CHECKED BRT

STRUCTURE FOUNDATION EXPLORATION
BORING LOG M-043-0-56

FRA-70-12.68
FRA-70-13.10

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NO.	DESCRIPTION	REV. BY	DATE
1	Move soil profile sheets to Part 1	TAZ	11-02-2021
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PLAN SHEET INDEX

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LEGEND
(DND) = DO NOT DISTURB

CATEGORY	GROUP	RESPONSIBLE ENTITY	PLAN SPLIT CODE	DESCRIPTION
INTERSTATE	PAVEMENT	STATE	13/IMS/PV	IR 70 EXISTING PAVEMENT RECONSTRUCTION FROM RAILROAD BRIDGE TO FRONT ST. (50%), RESURFACING AND RESTRIPING IR 70 FROM FRONT ST. TO GRANT AVE, RAMP D7, AND LOCAL STREETS (MOUND, SHORT, CIVIC CENTER, SECOND)
NHS	PAVEMENT	STATE	14/NHS/PV	IR 70 WIDENED PAVEMENT FROM RAILROAD TO FRONT ST. (50%) AND RETAINING WALLS
INTERSTATE	BRIDGE	STATE	15/IMS/BR	BEIDGE REPLACEMENT - EXISTING WIDTH - FRA-71-1503L (171 SB OVER RAILROADS, SCIOTO RIVER, AND SR 315 (50%)
NHS	BRIDGE	STATE	16/NHS/BR	BRIDGE REPLACEMENT - WIDENING - FRA-71-1503L (50%)
NHS	BRIDGE	STATE	17/NHS/BR	NEW BRIDGE - FRA-70-13.73B (RAMP D7 OVER SHORT ST.)
NHS	OTHER	STATE	18/NHS/OT	ELIGIBLE UTILITY ITEMS (WATERWORKS, SANITARY, ELECTRIC, ETC)
NHS	OTHER	NON-STATE	19/NHS/OT	MORPC / COLUMBUS FUNDED ENHANCEMENTS
NHS	OTHER	NON-STATE	20/NHS/OT	100% CITY OF COLUMBUS ITEMS
NHS	PAVEMENT	NON-STATE	21/NHS/PV	INCREMENTAL ITEMS - COLUMBUS TO PAY COSTS ABOVE STANDARD ITEMS
INTERSTATE	BRIDGE	STATE	22/IMS/BR	REHIBILITATE BRIDGE BY CLOSING GAP BETWEEN BRIDGES FOR MOT

BEGIN PROJECT
I-71 SB
STA. 209+44.97

E190 (122)

BEGIN WORK
RAMP B3
STA. 695+53.47

BEGIN WORK
RAMP C3
STA.3002+45.00

HARMON AVE.

℄ CONST. RAMP C3

℄ CONST. RAMP B3

℄ CONST. I-71 SB

℄ CONST. SR 315 SB

GREENLAWN AVE.

500 YR.
FLOOD PLAIN

100 YR.
FLOOD PLAIN

BEGIN WORK
I-71 SB
STA. 683+80.02

GATEWELL #8
TO REMAIN (DND)

GATEWELL #7
TO REMAIN (DND)

GATEWELL #6
TO REMAIN (DND)

GATEWELL #5
TO REMAIN (DND)

LINE OF
PROTECTION

FLOODWAY

SCIOTO RIVER

SCPZ = 505'

LOWER SCIOTO BIKEWAY

I-71 NB TO I-70 WB
I-71 NB TO 315 NB

TO I-70 EB

315 SB

I-70 EB

I-70 WB

3-HO

FRA-71-1503L

MATCH LINE SEE SHEET 7

ST-1 & ST-1A
PUMP STATIONS
TO REMAIN (DND)
EXISTING STORM
SEWER PIPE COMING
INTO AND OUT OF
THE PUMP STATIONS
ARE TO REMAIN (DND)

NO.	DESCRIPTION	REV. BY	DATE
1	REVISE PLAN SPLITS	TAZ	09/30/21
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HORIZONTAL
SCALE IN FEET

CALCULATED ACW
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SCHEMATIC PLAN

FRA-71-14.36

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CSXT RAILROAD NOTES

A. CSXT FLAGGING WILL BE REQUIRED FOR ALL WORK ON AND OVER CSXT PROPERTY AND RIGHT-OF-WAY WITH THE POTENTIAL TO OBSTRUCT OR DELAY RAIL OPERATIONS.

B. THE CONTRACTOR SHALL CONDUCT HIS WORK SO AS TO PROTECT RAILROAD FACILITIES, RIGHT-OF-WAY AND PROPERTY FROM DAMAGE AND TAKE ANY MEASURES NECESSARY TO PREVENT CONSTRUCTION DEBRIS FROM FALLING ONTO CSXT PROPERTY AND TRACKS.

C. CONSTRUCTION MATERIAL SHALL NOT BE STAGED ON CSXT PROPERTY WITHOUT WRITTEN PERMISSION FROM CSXT OR THEIR ENGINEERING DESIGNATE.

D. NO TEMPORARY CONSTRUCTION AT-GRADE CROSSING OVER CSXT TRACKS SHALL BE ALLOWED.

E. CERTAIN CONTRACTOR WORK SHALL BE DONE IN ACCORDANCE WITH SPECIFICATIONS AND REGULATIONS STIPULATED BY CSXT OR THEIR ENGINEERING DESIGNATE.

F. CONTRACTOR(S) SHALL BE REQUIRED TO SUBMIT DETAILED AND COMPREHENSIVE PLANS AND PROCEDURE FOR REVIEW AND ACCEPTANCE BY THE CSXT DIRECTOR OF CONSTRUCTION ENGINEERING OF HIS ENGINEERING DESIGNATE:

I. THE CONTRACTOR SHALL INSTALL A GEOTEXTILE FABRIC BALLAST PROTECTION SYSTEM AND ROBUST EROSION CONTROL DEVICES TO PREVENT CONSTRUCTION DEBRIS AND EMBANKMENT FINES FROM FOULING TRACK DITCHES AND ROADBED BALLAST. THE GEOTEXTILE BALLAST PROTECTION SYSTEM SHALL BE INSTALLED AND MAINTAINED BY THE CONTRACTOR TO THE SATISFACTION OF THE CSXT REPRESENTATIVES.

II. SUPERSTRUCTURE BEAM ERECTION AND STABILIZATION OVER RAILROAD RIGHT-OF-WAY AND ADJACENT SPANS.

III. PAINT PREPARATION, PAINTING, OR TEXTURE COAT SEALING OF SUBSTRUCTURE AND SUPERSTRUCTURE COMPONENTS IN THE RAILROAD SPAN.

G. TEMPORARY CONSTRUCTION CLEARANCES PROPOSED SHALL BE SUBJECT TO THE APPROVAL OF CSXT. TYPICALLY, REDUCTIONS IN CLEARANCE FOR CONSTRUCTION ARE NOT PERMITTED.

H. CSXT ENGINEERING SHALL BE FURNISHED AS-BUILT DRAWING SHOWING ACTUAL CLEARANCES AS CONSTRUCTED, PRIOR TO PROJECT COMPLETION AND CLOSEOUT.

I. CONTRACTOR SHOULD VERIFY THE EXISTING TOP OF RAIL ELEVATIONS RELATIVE TO PLAN BENCHMARKS TO ENSURE DESIGNED RAILROAD MINIMUM VERTICAL CLEARANCE SHALL BE MAINTAINED.

J. DURING AND AT COMPLETION OF CONSTRUCTION, THE CONTRACTOR MUST CLEAR CSXT's DRAINAGE DITCHES OF ALL DEBRIS TO THE SATISFACTION OF CSXT's CONSTRUCTION ENGINEERING AND INSPECTION REPRESENTATIVE.

K. A WORKSITE SAFETY ACTION PLAN THAT INCLUDES RECOGNITION TO KEEP ALL PERSONNEL AWAY FROM THE TRACKS FOR PASSING OF TRAINS, A FALL PROTECTION PLAN DESCRIBING THE MEASURES TO BE TAKEN WHEN REQUIRED, AND A FIRE PREVENTION PLAN SHALL BE PRESENTED AND ACCEPETED BY CSXT FOR WORK ON CSXT PROPERTY.

NORFOLK SOUTHERN RAILROAD NOTES

ALL WORK OVER, UNDER, ON, OR ADJACENT TO NORFOLK SOUTHERN RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH THE NORFOLK SOUTHERN 'SPECIAL PROVISIONS FOR THE PROTECTION OF RAILWAY INTERESTS' (NS SPECIAL PROVISIONS).

'ONE CALL' SERVICES DO NOT LOCATE BURIED RAILROAD SIGNAL AND COMMUNICATIONS LINES. THE CONTRACTOR SHALL CONTACT THE RAILROAD'S REPRESENTATIVE 2 DAYS IN ADVANCE OF WORK AT THOSE PLACES WHERE EXCAVATION, PILE DRIVING, OR HEAVY LOADS MAY DAMAGE RAILROAD UNDERGROUND LINES ON RAILROAD PROPERTY. UPON REQUEST FROM THE CONTRACTOR OR AGENCY, RAILROAD SIGNAL FORCES WILL LOCATE AND PAINT MARK OR FLAG RAILROAD UNDERGROUND SIGNAL, COMMUNICATION, AND POWER LINES IN THE AREA TO BE DISTURBED FOR THE CONTRACTOR. THE CONTRACTOR SHALL AVOID EXCAVATION OR OTHER DISTURBANCE OF THESE LINES WHICH ARE CRITICAL TO THE SAFETY OF THE RAILROAD AND THE PUBLIC. IF DISTURBANCE OR EXCAVATION IS REQUIRED NEAR A BURIED RAILROAD SIGNAL, COMMUNICATION, OR POWER LINE, THE CONTRACTOR SHALL COORDINATE WITH THE RAILROAD TO HAVE THE LINE POTHOLED MANUALLY WITH CAREFUL HAND EXCAVATION. THE LINE SHALL BE PROTECTED BY THE CONTRACTOR DURING THE COURSE OF THE DISTURBANCE UNDER THE SUPERVISION AND DIRECTION OF A RAILROAD SIGNAL REPRESENTATIVE."

ALL UTILITY INSTALLATIONS OR RELOCATIONS THAT ARE REQUIRED IN CONJUNCTION WITH THIS PROJECT CAN BE INSTALLED OR RELOCATED AS PART OF THE PROJECT PROVIDED THE CONSTRUCTION IS PERFORMED BY THE PROJECT CONTRACTOR OR PROJECT CONTRACTOR'S SUB-CONTRACTOR. HOWEVER, THE UTILITY MUST SUBMIT AN APPLICATION FOR THE INSTALLATION OR RELOCATION TO AECOM FOR APPROPRIATE HANDLING FOR LICENSE AGREEMENT AND APPLICABLE FEES. FOR UTILITY APPLICATIONS GO TO: WWW.NSCORP.COM > REAL ESTATE > NS SERVICES > WIRE, PIPELINE, & FIBER OPTIC PROJECTS> AECOM. **NOTE: LICENSE AGREEMENT MUST BE EXECUTED PRIOR TO UTILITY BEING INSTALLED OR RELOCATED.**

NORFOLK SOUTHERN WILL BE PROVIDED AS-BUILT DRAWINGS SHOWING THE ACTUAL CLEARANCES AS CONSTRUCTED. DEPTH, SIZE, AND LOCATION OF ALL FOUNDATION COMPONENTS SHALL BE SHOWN ON THE DRAWINGS

ITEM 202 - WALK REMOVED, AS PER PLAN

PRIOR TO REMOVING THE BRICK SIDEWALK PAVERS ON PARCEL 39, THE CONTRACTOR SHALL CONTACT THE OWNER TO DETERMINE IF THE OWNER WANTS THE BRICK PAVERS THAT ARE TO BE REMOVED. IF THE OWNER WANTS THEM, THE CONTRACTOR SHALL CAREFULLY REMOVE THE PAVERS AND SET THEM ASIDE AT AN AGREED TO LOCATION ON SAME SITE. IF THE OWNER DOES NOT WANT THE PAVERS, THE CONTRACTOR SHALL TAKE POSITION OF THEM AND DISPOSE OF THEM PER ITEM 202. WHERE THE PROPOSED WALK TIES INTO THE EXISTING BRICK PAVERS, THE CONTRACTOR WILL NEED TO CREATE A FLUSH FACE ALONG THE BRICK PAVERS TO ABUT THE PROPOSED WALK UP TO. THIS CAN BE ARCHIVED BY CUTTING THE BRICK PAVERS.

ALL WORK ASSOCIATED WITH THE REMOVAL, RELOCATING, AND SAW CUTTING OF THE BRICK PAVERS WILL BE PER ODOT C&MS SPECIFICATION 202, AND PAID FOR AS FOLLOWS: ITEM 202 - WALK REMOVED, AS PER PLAN, PER (SF).

DODGE PARK PUMP STATION ACCESS

THROUGHOUT THE CONSTRUCTION OF PROJECT 6, THE CONTRACTOR SHALL MAINTAIN ACCESS AT ALL TIMES TO BOTH THE DODGE PARK SANITARY SEWER FORCE MAIN PUMP STATION AND THE STORM SEWER PUMP STATION.

CROSS SECTIONS

THE CROSS SECTIONS CONTAIN WITHIN THIS PLAN SET WILL SHOW THE ITEM 203 EXCAVATION AND EMBANKMENT QUANTITIES ON EACH SHEET AND THE TOTAL WILL BE CARRIED TO THE GENERAL SUMMARY. EACH APPLICABLE CROSS SECTIONS WILL ALSO SHOW THE UNDERCUT FOR THE SUBGRADE STABILIZATION, BUT ALL ITEM 204 QUANTITIES ASSOCIATED WITH THE UNDERCUT WILL BE ACCOUNTED FOR IN THE OFFICE CALCULATIONS, AND CARRIED FORWARD TO THE GENERAL SUMMARY.

ITEM 607 - VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC, AS PER PLAN

ALL ASPECTS OF THE VANDAL PROTECTION FENCE THAT IS TO BE PVC COATED PER STANDARD DRAWING VPF-1-90, THE PVC COATING SHALL BE BLACK.

THE MOUNTING BASE PLATE AND SLEEVE SHALL BE BP-5 PER STANDARD DRAWING VPF-1-90. FOR THE ROADWAY PLANS WHERE THE VANDAL PROTECTION FENCE IS MOUNTED ON THE BARRIER, THE POST SPACING SHALL BE 5 FOOT. SEE THE STRUCTURES PLANS FOR POST SPACING ON BRIDGES AND WALLS.

ITEM 202 - GATE REMOVED FOR REUSE, AS PER PLAN

THE CONTRACTOR SHALL TAKE CARE IN REMOVING THE EXISTING GATE FOR STORAGE (ON SITE AT THE PUMP STATION IT WAS REMOVED FROM) UNTIL THE SITE IS READY FOR THE GATE TO BE REBUILT. IF THE GATE IS DAMAGED DURING THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL REPLACE THE DAMAGED SECTION OR GATE AT THE COST TO THE CONTRACTOR. THE CONTRACTOR SHALL MAINTAIN ACCESS TO PUMP STATION BY CITY OFFICIALS AT ALL TIMES.

THE COST FOR ALL OF THE ABOVE LABOR AND MATERIAL FOR THE REMOVAL AND STORAGE OF EXISTING GATES SHALL BE INCLUDED IN THE COST FOR:
ITEM 202 GATE REMOVED FOR REUSE, AS PER PLAN

ITEM 607 - FENCE, TYPE CLT, AS PER PLAN

ALL REQUIREMENTS OF SECTION 607 OF THE ODOT CMS AND ODOT SCD F-1.1. SHALL APPLY WITH THE ADDITION THAT THE FENCE SHALL BE 8 FEET TALL WITH MESH FENCE SCREENING. ALL LABOR, TOOLS, EQUIPMENT, MATERIALS AND INCIDENTALS INCLUDING THE MESH SCREENING SHALL BE INCLUDED IN THE CONTRACT PRICE BID FOR ITEM 607 - FENCE, TYPE CLT, AS PER PLAN

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ITEM 607-SPECIAL-VANDAL PROTECTION FENCE

THE CONTRACTOR SHALL CONSTRUCT A TEMPORARY VANDAL PROTECTION FENCE TO ENCLOSE BOTH PUMP STATIONS WHERE THE EXISTING FENCE HAS BEEN REMOVED DUE TO CONSTRUCTION OF A CONSTRUCTION ACCESS ROAD AND THE CONSTRUCTION OF FRA-71-1503L BRIDGE PIERS. THE EXISTING FENCE THAT PROTECTS THE PUMP STATIONS, AND HAS BEEN REMOVED DUE TO CONSTRUCTION SHALL BE REPLACED IN-KIND. THE FENCE DESIGN IS SIMILAR AT BOTH PUMP STATIONS, BUT THE FENCE COATING IS DIFFERENT. SEE MISC. DETAIL SHEETS FOR DETAIL OF FENCING.

THE COST FOR ALL OF THE ABOVE LABOR AND MATERIALS FOR THE CONSTRUCTION OF THE TEMPORARY VANDAL PROTECTION FENCE SHALL BE INCLUDED IN THE COST PER LF FOR:
ITEM SPECIAL - VANDAL PROTECTION FENCE

ITEM 607-GATE TYPE CL, AS PER PLAN

THE CONTRACTOR SHALL CONSTRUCT A TEMPORARY GATE TO THE SANITARY PUMP STATION. THE GATE DESIGN AND COATING COLOR SHALL REPLACE THE EXISTING GATE IN-KIND. SEE THE GATE DETAIL IN MISC. DETAIL SHEETS.

THE COST FOR ALL THE ABOVE LABOR AND MATERIALS FOR THE CONSTRUCTION OF THE TEMPORARY CHAIN LINK GATE SHALL BE INCLUDED IN THE COST PER EACH FOR:
ITEM 607 - GATE, TYPE CL, AS PER PLAN

ITEM 622 - PORTABLE BARRIER, ANCHORED, AS PER PLAN

THIS ITEM SHALL CONSIST OF PORTABLE BARRIER PER ODOT SCD'S RM-4.2 AND PCB-91. PORTABLE BARRIER SHALL BE NEW SEGMENTS WITH NO VISIBLE GRAFFITI NOR MARKINGS AND SHALL BE LEFT IN PLACE UPON COMPLETION OF PROJECT CONSTRUCTION AND BECOME THE PROPERTY OF THE OHIO DEPARTMENT OF TRANSPORTATION. GLARE SCREENS SHALL BE PROVIDED FOR THOSE PLACED ADJACENT TO OPPOSING TRAFFIC.

IF ANCHORING CANNOT BE DONE AS PER ODOT SCD PCB-91.

1) USE THE PCB AS DETAILED ON PCB-91 (NJ SHAPE SEGMENTS WITH ANCHORING HOLES)
2)ANCHOR THE PCB ON AT LEAST 2 INCHES OF ASPHALT WITH 4 ANCHORING BOLTS PER BARRIER SEGMENT, ONE LOCATED AT EACH CORNER OF THE PCB.
3) EACH ANCHORING BOLT SHALL BE 1 INCH DIAMETER HIGH-STRENGTH STEEL WITH A NUT AND WASHER AS SPECIFIED IN PCB-91.
4) ANCHORING BOLTS WILL BE A MINIMUM OF 36 INCHES LONG.

ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY INCLUDING THE GLARE SCREENS SHALL BE INCLUDED IN THE CONTRACT PRICE BID FOR ITEM 622 - PORTABLE BARRIER, ANCHORED, AS PER PLAN.

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GENERAL NOTES

NO.	DESCRIPTION	REV. BY	DATE
1	NOTES FOR BIKE PATH QTY.	TAZ	10-13-21
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FRA-71-14.36

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Printed: 10/14/2021

NO.	DESCRIPTION	REV. BY	DATE
1	Move item from sheet 266	TAZ	10-14-21

SHEET NUM.											PART.			ITEM	ITEM EXT	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
48	67	170	276	278	279	284*	285	286	OFFICE		13/IMS/PV	14/NHS/PV	20/NHS/PV/Cols						
																		ROADWAY	
											LUMP			201	11001	LS		CLEARING AND GRUBBING, AS PER PLAN	50
				LUMP							LUMP			202	11200	LS		PORTIONS OF STRUCTURE REMOVED	
		2	8		1						6	5		202	20010	11	EACH	HEADWALL REMOVED	
			11,962	4,725	9,288	7,593	511				16,672	16,672	735	202	23000	34,079	SY	PAVEMENT REMOVED	
						11,624	9,997				9,628	9,627	2,366	202	30000	21,621	SF	WALK REMOVED	
						15					8	7		202	30001	15	SF	WALK REMOVED, AS PER PLAN	58
						74					37	37		202	30001	74	SF	WALK REMOVED, AS PER PLAN "A"	58
					62						31	31		202	30600	62	SY	CONCRETE MEDIAN REMOVED	
			19	476	1,452						974	973		202	30700	1,947	FT	CONCRETE BARRIER REMOVED	
			2,313	1,957	3,301	1,928	1,127				5,102	5,102	422	202	32000	10,626	FT	CURB REMOVED	
						12					6	6		202	32300	12	FT	STONE CURB REMOVED FOR REUSE	
		113	373	170	1,355	833	378				1,611	1,611		202	35100	3,222	FT	PIPE REMOVED, 24" AND UNDER	
			6								3	3		202	35200	6	FT	PIPE REMOVED, OVER 24"	
			4,935	1,802	2,686						4,712	4,711		202	38000	9,423	FT	GUARDRAIL REMOVED	
			1								1			202	47800	1	EACH	IMPACT ATTENUATOR REMOVED	
				2	4	7	7				10	10		202	58000	20	EACH	MANHOLE REMOVED	
						4					2	2		202	58001	4	EACH	MANHOLE REMOVED, AS PER PLAN	49
		2	9	1	3	8	2				13	12		202	58100	25	EACH	CATCH BASIN REMOVED	
			4	3	15	4					13	13		202	58200	26	EACH	INLET REMOVED	
						7					4	3		202	58700	7	EACH	MANHOLE ABANDONED	
						1					1			202	58701	1	EACH	MANHOLE ABANDONED, AS PER PLAN	51
						1,077					539	538		SPECIAL	20270000	1,077	FT	FILL AND PLUG EXISTING CONDUIT, DIAMETER VARIES	51
			422								211	211		SPECIAL	20270110	422	FT	PIPE CLEANOUT, 24" AND UNDER	324
			2,670	1,314	168		422				2,287	2,287		202	75000	4,574	FT	FENCE REMOVED	
							410				205	205		202	75001	410	FT	FENCE REMOVED, AS PER PLAN	52
						42					21	21		202	75001	42	FT	FENCE REMOVED, AS PER PLAN "A"	52
						202					101	101		202	75001	202	FT	FENCE REMOVED, AS PER PLAN "B"	49
							2				1	1		202	75250	2	EACH	GATE REMOVED	
							2				1	1		202	75251	2	EACH	GATE REMOVED, AS PER PLAN	52
						1					1			202	75251	1	EACH	GATE REMOVED, AS PER PLAN"A"	52
				2							1	1		202	75255	2	EACH	GATE REMOVED FOR REUSE, AS PER PLAN	58
						2					1	1		202	98100	2	EACH	REMOVAL MISC.: STEPS REMOVED, AS PER PLAN	52
						1	2				2	1		202	98100	3	EACH	REMOVAL MISC.: TRASH RECEPTACLES REMOVED, AS PER PLAN	52
							1				1			202	98100	1	EACH	REMOVAL MISC.: WOOD POLE WITH CONCRETE BASE, REMOVED	
							1				1			202	98100	1	EACH	REMOVAL MISC.:BENCH REMOVED, AS PER PLAN	52
							2				1	1		202	98100	2	EACH	REMOVAL MISC.:METAL POSTS REMOVED, AS PER PLAN	52
							4				2	2		202	98100	4	EACH	REMOVAL MISC.:PRIVATE LIGHT REMOVED, AS PER PLAN	52
							2				1	1		202	98100	2	EACH	REMOVAL MISC.:PRIVATE SIGN REMOVED	
						4	6				5	5		202	98100	10	EACH	REMOVAL MISC.:TREE GRATES REMOVED, AS PER PLAN	52
							51						51	202	98200	51	FT	REMOVAL MISC.: RAILROAD TIE RETAINING WALL REMOVED	
2											1	1		202	98200	2	FT	REMOVAL MISC.: INSPECTION WELL	48
100											50	50		202	98200	100	FT	REMOVAL MISC.: CONDUIT	48
							42				21	21		202	98200	42	FT	REMOVAL MISC.:TENNIS NET REMOVED, AS PER PLAN	52
			138								69	69		202	98700	138	FT	ABANDON MISC.:24" CONDUIT, BULKHEADED AND FILLED IN-PLACE	
	4,767									14,694	9,731	9,730		203	10000	19,461	CY	EXCAVATION	
	7,858									84,973	46,416	46,415		203	20000	92,831	CY	EMBANKMENT	
50											25	25		203	20001	50	CY	EMBANKMENT, AS PER PLAN	48
										23,497	11,726	11,725	46	204	10000	23,497	SY	SUBGRADE COMPACTION	
										123			123	204	13000	123	CY	EXCAVATION OF SUBGRADE	
										1,319	655	654	10	204	13001	1,319	CY	EXCAVATION OF SUBGRADE, AS PER PLAN	50A
									4		2	2		204	30010	4	CY	GRANULAR MATERIAL, TYPE B	
										5	3	2		204	45000	5	HOUR	PROOF ROLLING	
										4	2	2		204	45001	4	HOUR	PROOF ROLLING, AS PER PLAN	50A
										8,652	3,887	3,886	879	204	50001	8,652	SY	GEOTEXTILE FABRIC, AS PER PLAN	50A
									1	276	138	138		206	10500	276	TON	CEMENT	
										7,796	3,898	3,898		206	11000	7,796	SY	CURING COAT	
										7,796	3,898	3,898		206	15010	7,796	SY	CEMENT STABILIZED SUBGRADE, 12 INCHES DEEP	
																		** INCLUDES QUANTITIES FROM SHEET 285A	

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GENERAL SUMMARY

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NO.	DESCRIPTION	REV. BY	DATE
1	New Qty additions	TAZ	10-14-21
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SHEET NUM.										PART.				ITEM	ITEM EXT	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
44	277	280	281	286	287	944	OFFICE			13/IMS/PV	14/NHS/PV	20/NHS/PV/Cols	21/NHS/PV/INC						
																		ROADWAY (CONT.)	
							4			2	2			206	20000	4	HOUR	TEST ROLLING	
							LUMP			LUMP	LUMP			206	30000	LS		MIXTURE DESIGN FOR CHEMICALLY STABILIZED SOILS	
		100								50	50			606	13000	100	FT	GUARDRAIL, TYPE 5	547-552
	2,532	450	475							1,729	1,728			606	15050	3,457	FT	GUARDRAIL, TYPE MGS	
	2		2							2	2			606	26150	4	EACH	ANCHOR ASSEMBLY, MGS TYPE E, (MASH 2016)	49
	1									1				606	26550	1	EACH	ANCHOR ASSEMBLY, MGS TYPE T	
	3	2	3							4	4			606	35002	8	EACH	MGS BRIDGE TERMINAL ASSEMBLY, TYPE 1	
	4	2	1							4	3			606	35102	7	EACH	MGS BRIDGE TERMINAL ASSEMBLY, TYPE 2	
			1							1				606	60022	1	EACH	IMPACT ATTENUATOR, TYPE 2 (UNIDIRECTIONAL), 44MPH, 24" HAZ. WIDTH	49
			1							1				606	60022	1	EACH	IMPACT ATTENUATOR, TYPE 2 (UNIDIRECTIONAL), 44MPH, 28" HAZ. WIDTH	49
			1							1				606	60040	1	EACH	IMPACT ATTENUATOR, TYPE 3 UNIDIRECTIONAL, 62MPH, 29" HAZ. WIDTH	49
	1,646	563	489							1,349	1,349			607	20000	2,698	FT	FENCE, TYPE CL	
		345		135						240	240			607	23000	480	FT	FENCE, TYPE CLT	
	/1\	20								10	10			607	23001	20	FT	FENCE, TYPE CLT, AS PER PLAN	58
			15							8	7			607	39901	15	FT	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC, AS PER PLAN	58
	/1\	41								21	20			607	39994	41	FT	TEMPORARY VANDAL FENCE, TYPE B	
		326								163	163			SPECIAL	60740000	326	FT	VANDAL PROTECTION FENCE	58/545
		1								1				607	50901	1	EACH	GATE, TYPE CL, AS PER PLAN	58/545
				469						235	234			607	98000	469	FT	FENCE, MISC.:AEP FENCE, AS PER PLAN	561-563
				254						127	127			607	98000	254	FT	FENCE, MISC.:IRON FENCE CURB MOUNTED, AS PER PLAN	557
				1						1				607	98100	1	EACH	FENCE, MISC.:5.5' GATE, AS PER PLAN	558
				1						1				607	98100	1	EACH	FENCE, MISC.:AEP FENCE DRIVE-IN GATE, AS PER PLAN	556-557
					17,209					7,567	7,567	2,075		608	10000	17,209	SF	4" CONCRETE WALK	
					235					25	25	185		608	15000	235	SF	8" CONCRETE WALK	
					128					60	60	8		608	53021	128	SF	DETECTABLE WARNING, AS PER PLAN	47
					3,373							1,252	2,121	608	98000	3,373	SF	WALKWAY, MISC.: BRICK PAVER WALK, AS PER PLAN	47
							5,600						5,600	608	98000	5,600	SF	WALKWAY, MISC.:BRICK PAVER CROSS WALK, AS PER PLAN	47
					74							74		608	98000	74	SF	WALKWAY, MISC.:BRICK PAVER WALK, AS PER PLAN "A"	58
					1,661								1,661	608	98000	1,661	SF	WALKWAY, MISC.:GRANITE COBBLES, AS PER PLAN	825A
					1					1				608	98200	1	EACH	WALKWAY, MISC.:COLUMBUS CURB RAMP, TYPE C, AS PER PLAN	47
					5					2	2	1		608	98200	5	EACH	WALKWAY, MISC.:COLUMBUS CURB RAMP, TYPE D, AS PER PLAN	47
					5					3	2			608	98200	5	EACH	WALKWAY, MISC.:COLUMBUS CURB RAMP, TYPE G, AS PER PLAN	47
					3					2	1			608	98200	3	EACH	WALKWAY, MISC.:COLUMBUS CURB RAMP, TYPE H, AS PER PLAN	47
					4					2	2			608	98200	4	EACH	WALKWAY, MISC.:COLUMBUS CURB RAMP, TYPE J, AS PER PLAN	47
					1					1				608	98200	1	EACH	WALKWAY, MISC.:COLUMBUS CURB RAMP, TYPE P-7, AS PER PLAN	47
					7					4	3			608	98200	7	EACH	WALKWAY, MISC.:COLUMBUS CURB RAMP, TYPE A, AS PER PLAN	47
				20						10	10			622	10060	20	FT	CONCRETE BARRIER, SINGLE SLOPE, TYPE B	
	899		30							465	464			622	10120	929	FT	CONCRETE BARRIER, SINGLE SLOPE, TYPE C	
	970	452	2,258	269						1,975	1,974			622	10160	3,949	FT	CONCRETE BARRIER, SINGLE SLOPE, TYPE D	
		2								1	1			622	10200	2	EACH	BARRIER TRANSITION	553
			2							1	1			622	10201	2	EACH	BARRIER TRANSITION, AS PER PLAN	553A
			1							1				622	24841	1	EACH	CONCRETE BARRIER END SECTION, TYPE B, AS PER PLAN	554A
		4	3							4	3			622	25000	7	EACH	CONCRETE BARRIER END SECTION, TYPE D	
	10		1							6	5			622	25008	11	EACH	CONCRETE BARRIER, END ANCHORAGE, REINFORCED, TYPE C	
	6									3	3			622	25010	6	EACH	CONCRETE BARRIER END SECTION, TYPE D, REINFORCED	
	6	8	23	4						21	20			622	25050	41	EACH	CONCRETE BARRIER, END ANCHORAGE, REINFORCED, TYPE D	
		1								1				622	25051	1	EACH	CONCRETE BARRIER, END ANCHORAGE, REINFORCED, TYPE D, AS PER PLAN "A"	552A
			6							3	3			622	25051	6	EACH	CONCRETE BARRIER, END ANCHORAGE, REINFORCED, TYPE D, AS PER PLAN "B"	552A
	/1\	41								21	20			622	41111	41	FT	PORTABLE BARRIER, ANCHORED, AS PER PLAN	58
			86							43	43			622	90000	86	FT	BARRIER, MISC.:CONCRETE BARRIER, END ANCHORAGE, REINFORCED, TYPE C, AS PER PLAN "B"	555
			73							37	36			622	90000	73	FT	BARRIER, MISC.:CONCRETE BARRIER, END ANNCHORAGE, REINFORCED, TYPE C, AS PER PLAN "A"	554
				2						1	1			622	90200	2	EACH	BARRIER, MISC.: CONCRETE BARRIER, TAPERED END SECION, AS PER PLAN	552
		2								1	1			625	32000	2	EACH	GROUND ROD	
						LUMP				LUMP	LUMP			SPECIAL	69098400	LS		EMERGENCY ACTION PLAN COORDINATION	43, 941
LUMP										LUMP	LUMP			SPECIAL	69098400	LS		SURVEY CONTROL VERIFICATION	44
										LUMP	LUMP			878	25000	LS		INSPECTION AND COMPACTION TESTING OF UNBOUND MATERIALS	

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GENERAL SUMMARY

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By: tzongmester

34" x 22"

SHEET NUM.											PART.					ITEM	ITEM EXT	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
276^	284*	285	286	287	295	297	298	680	OFFICE		13/IMS/PV	14/NHS/PV	18/NHS/OT	20/NHS/PV/Cols	21/NHS/PV/INC						
																				PAVEMENT	
									40		20	20				252	01000	40	SY	FULL DEPTH RIGID PAVEMENT REMOVAL AND FLEXIBLE REPLACEMENT	
8,554	860	568		1,900	340	160					5,911	5,911	163	136		252	01500	12,121	FT	FULL DEPTH PAVEMENT SAWING	
332	53			511	83	35	10	22	1,542	1	1,252	1,251	63	22		253	01000	2,588	SY	PAVEMENT REPAIR	
1									5,689		2,845	2,844				254	01000	5,689	SY	PAVEMENT PLANING, ASPHALT CONCRETE, VARIABLE DEPTH	
									3,741		1,871	1,870				302	46000	3,741	CY	ASPHALT CONCRETE BASE, PG64-22	
									4,682		2,341	2,341				302	46000	4,682	CY	ASPHALT CONCRETE BASE, PG64-22, 10.5"	
									4,769		2,385	2,384				304	20000	4,769	CY	AGGREGATE BASE, 6"	
									31		16	15				304	20000	31	CY	AGGREGATE BASE, 8"	
									2,830		1,269	1,268		293		304	20001	2,830	CY	AGGREGATE BASE, AS PER PLAN, 12"	50A
									3,106		1,214	1,213		679		305	12010	3,106	SY	8" CONCRETE BASE, CLASS QC 1P	
									2,700		1,350	1,350				305	13010	2,700	SY	9" CONCRETE BASE, CLASS QC 1P	
									464		205	205		54		407	13900	464	GAL	TACK COAT, 702.13	
									6,200		3,080	3,079		41		407	20000	6,200	GAL	NON-TRACKING TACK COAT	
									271		124	123		24		441	50000	271	CY	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG64-22	
									276		122	121		33		441	50300	276	CY	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448) PG64-22	
									4,105		2,053	2,052				442	00100	4,105	CY	ANTI-SEGREGATION EQUIPMENT	49
									998		499	499				442	10001	998	CY	ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (446), AS PER PLAN, A	49
									388		194	194				442	10001	388	CY	ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE A (446), AS PER PLAN, B	17, 49
									1,571		786	785				442	10100	1,571	CY	ASPHALT CONCRETE INTERMEDIATE COURSE, 19 MM, TYPE A (446)	
				825							413	412				452	10011	825	SY	6" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC 1P, AS PER PLAN	49
									276		117	117		42		452	12010	276	SY	8" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC 1P	
									68		34	34				452	13010	68	SY	9" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC 1P	
									251		126	125				452	15010	251	SY	12" NON-REINFORCED CONCRETE PAVEMENT, CLASS QC 1P	
200			196								198	198				609	24510	396	FT	CURB, TYPE 4-C	
			51											51		609	30001	51	FT	CURB, TYPE 8, AS PER PLAN "B"	41
			254								127	127				609	30001	254	FT	CURB, TYPE 8, AS PER PLAN "A"	557
18			88												88	609	98000	88	FT	CURB, MISC.: STRAIGHT 16" GRANITE CURB, AS PER PLAN	47, 564
			129												1 129	609	98000	129	FT	CURB, MISC.: STRAIGHT 17" GRANITE CURB, AS PER PLAN	47, 564
			2,154	1										330	1,824	609	98000	2,154	FT	CURB, MISC.: STRAIGHT 18" GRANITE CURB, AS PER PLAN	47, 564
			12								6	6				609	98000	12	FT	CURB, MISC.:INSTALL GRANITE CURB FROM STORAGE, AS PER PLAN	58
			31								1 16	15				609	98000	31	FT	CURB, MISC.:STRAIGHT 16" CONCRETE CURB, AS PER PLAN	573
			783	1							322	322		139		609	98000	783	FT	CURB, MISC.:STRAIGHT 18" CONCRETE CURB, AS PER PLAN	573
									24,616		12,308	12,308				872	10000	24,616	FT	VOID REDUCING ASPHALT MEMBRANE (VRAM)	17

NO.	DESCRIPTION	REV. BY	DATE
1	REVISE QUANTITIES	TAZ	10-28-21
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"^" INCLUDES QUANTITIES FROM SHEET 276, 277, 279, 280, 281

"*" INCLUDES QUANTITIES FROM SHEET 285A

CALCULATED HRB
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GENERAL SUMMARY

FRA-71-14.36

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SHEET NUM.														PART.	ITEM	ITEM	GRAND	UNIT	DESCRIPTION	SEE
857	864													14/NHS/PV		EXT	TOTAL			SHEET NO.
																			RETAINING WALLS (E5)	
438														438	203	20000	438	CY	EMBANKMENT	
LUMP														LUMP	503	11100	LS		COFFERDAMS AND EXCAVATION BRACING	
24,388														24,388	509	10000	24,388	LB	EPOXY COATED REINFORCING STEEL	
150														150	511	53012	150	CY	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	838
449														449	512	10001	449	SY	SEALING OF CONCRETE SURFACES, AS PER PLAN, (PERMANENT GRAFFITI PROTECTION)	838
698														698	512	10100	698	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	
875														875	516	13900	875	SF	2" PREFORMED EXPANSION JOINT FILLER	
179														179	607	39901	179	FT	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC, AS PER PLAN	838
5,533														5,533	840	20001	5,533	SF	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	843
1,162														1,162	840	21000	1,162	CY	WALL EXCAVATION	
691														691	840	22000	691	SY	FOUNDATION PREPARATION	
2,164														2,164	840	23000	2,164	CY	SELECT GRANULAR BACKFILL	
997														997	840	25010	997	FT	6" DRAINAGE PIPE, PERFORATED	
438														438	840	26000	438	FT	CONCRETE COPING	
4,658														4,658	840	26050	4,658	SF	AESTHETIC SURFACE TREATMENT	
5														5	840	27000	5	DAY	ON-SITE ASSISTANCE	
LUMP														LUMP	840	28000	LS		SGB INSPECTION AND COMPACTION TESTING	
																			RETAINING WALLS (E7)	
	9,684													9,684	SPECIAL	20302000	9,684	CY	ENGINEERED FILL: LIGHTWEIGHT CELLULAR CONCRETE FILL, CLASS II	841
	451													451	SPECIAL	20302000	451	CY	ENGINEERED FILL: LIGHTWEIGHT CELLULAR CONCRETE FILL, CLASS III	841
	436													436	203	20000	436	CY	EMBANKMENT	
	935													935	203	35110	935	CY	GRANULAR MATERIAL, TYPE B	
	2													2	SPECIAL	20365000	2	EACH	SETTLEMENT PLATFORM	844
	4,687													4,687	203	98000	4,687	CY	ROADWAY, MISC.:EPS GEOFOAM FILL	840
	LUMP													LUMP	503	11101	LS		COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN	838
	31,202													31,202	509	10000	31,202	LB	EPOXY COATED REINFORCING STEEL	
	199													199	511	53012	199	CY	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	838
	110													110	511	53012	110	CY	CLASS QC2 CONCRETE, MISC.: LOAD DISTRIBUTION SLAB	838
	5,058													5,058	511	71200	5,058	SF	CONCRETE, MISC.: PRECAST WALL PANELS	838
	121													121	511	81100	121	FT	CONCRETE, MISC.: PRECAST FOOTING	838
	2,080													2,080	512	10100	2,080	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	
	76													76	516	13200	76	SF	1/2" PREFORMED EXPANSION JOINT FILLER	
	857													857	516	13900	857	SF	2" PREFORMED EXPANSION JOINT FILLER	
	363													363	607	39901	363	FT	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC, AS PER PLAN	838
	17,809													17,809	840	20001	17,809	SF	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	839843
	4,995													4,995	840	21000	4,995	CY	WALL EXCAVATION	
	1,485													1,485	840	22000	1,485	SY	FOUNDATION PREPARATION	
	2,660													2,660	840	23000	2,660	CY	SELECT GRANULAR BACKFILL	
	506													506	840	25010	506	FT	6" DRAINAGE PIPE, PERFORATED	
	523													523	840	26000	523	FT	CONCRETE COPING	
	16,763													16,763	840	26050	16,763	SF	AESTHETIC SURFACE TREATMENT	
	5													5	840	27000	5	DAY	ON-SITE ASSISTANCE	
	LUMP													LUMP	840	28000	LS		SGB INSPECTION AND COMPACTION TESTING	

NO.	DESCRIPTION	REV. BY	DATE
1	Removal of Item 203E35120	TAZ	11-05-2021
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GENERAL SUMMARY

FRA-71-14.36

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SHEET NUM.														PART.	ITEM	ITEM	GRAND	UNIT	DESCRIPTION	SEE
874	884													14/NHS/PV		EXT	TOTAL			SHEET NO.
																			RETAINING WALLS (E10)	
1,346														1,346	SPECIAL	20302000	1,346	CY	ENGINEERED FILL: LIGHTWEIGHT CELLULAR CONCRETE FILL, CLASS II	841
122														122	SPECIAL	20302000	122	CY	ENGINEERED FILL: LIGHTWEIGHT CELLULAR CONCRETE FILL, CLASS III	841
678														678	203	20000	678	CY	EMBANKMENT	
827														827	203	35110	827	CY	GRANULAR MATERIAL, TYPE B	
6,138														6,138	203	98000	6,138	CY	ROADWAY, MISC.:EPS GEOFOAM FILL	840
LUMP														LUMP	503	11101	LS		COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN	838
39,409														39,409	509	10000	39,409	LB	EPOXY COATED REINFORCING STEEL	
247														247	511	53012	247	CY	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	838
4,628														4,628	511	71200	4,628	SF	CONCRETE, MISC.: PRECAST WALL PANELS	838
152														152	511	81100	152	FT	CONCRETE, MISC.: PRECAST FOOTING	838
1,240														1,240	512	10100	1,240	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	
10,345														10,345	840	20001	10,345	SF	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	839
4,104														4,104	840	21000	4,104	CY	WALL EXCAVATION	
743														743	840	22000	743	SY	FOUNDATION PREPARATION	
1,748														1,748	840	23000	1,748	CY	SELECT GRANULAR BACKFILL	
455														455	840	25010	455	FT	6" DRAINAGE PIPE, PERFORATED	
5														5	840	27000	5	DAY	ON-SITE ASSISTANCE	
LUMP														LUMP	840	28000	LS		SGB INSPECTION AND COMPACTION TESTING	
																			RETAINING WALLS (W2)	
	2,649													2,649	203	20000	2,649	CY	EMBANKMENT	
	LUMP													LUMP	503	11100	LS		COFFERDAMS AND EXCAVATION BRACING	
	87,095													87,095	509	10000	87,095	LB	EPOXY COATED REINFORCING STEEL	
	560													560	511	53012	560	CY	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	838
	1,627													1,627	512	10001	1,627	SY	SEALING OF CONCRETE SURFACES, AS PER PLAN, (PERMANENT GRAFFITI PROTECTION)	838
	4,459													4,459	512	10100	4,459	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	
	216													216	516	13200	216	SF	1/2" PREFORMED EXPANSION JOINT FILLER	
	2,217													2,217	516	13900	2,217	SF	2" PREFORMED EXPANSION JOINT FILLER	
	431													431	601	37500	431	FT	PAVED GUTTER, TYPE 1-2	
	36,756													36,756	840	20001	36,756	SF	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	843
	6,905													6,905	840	21000	6,905	CY	WALL EXCAVATION	
	3,332													3,332	840	22000	3,332	SY	FOUNDATION PREPARATION	
	27,781													27,781	840	23000	27,781	CY	SELECT GRANULAR BACKFILL	
	924													924	840	23050	924	CY	NATURAL SOIL	
	3,135													3,135	840	25010	3,135	FT	6" DRAINAGE PIPE, PERFORATED	
	1,555													1,555	840	26000	1,555	FT	CONCRETE COPING	
	33,647													33,647	840	26050	33,647	SF	AESTHETIC SURFACE TREATMENT	
	5													5	840	27000	5	DAY	ON-SITE ASSISTANCE	
	LUMP													LUMP	840	28000	LS		SGB INSPECTION AND COMPACTION TESTING	

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GENERAL SUMMARY

FRA-71-14.36

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NO.	DESCRIPTION	REV. BY	DATE
1	Removal of Item 203E35120	TAZ	11-05-2021
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SHEET NUM.												PART.		ITEM	ITEM EXT	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
170	277	278@	894	909A								13/IMS/PV	14/NHS/PV						
																		RETAINING WALLS (W5)	
			3,578										3,578	203	20000	3,578	CY	EMBANKMENT	
			278										278	203	35110	278	CY	GRANULAR MATERIAL, TYPE B	
																		/1	
			2										2	SPECIAL	20365000	2	EACH	SETTLEMENT PLATFORM	844
			1,912										1,912	203	98100	1,912	SY	ROADWAY, MISC.: CONTROLLED MODULUS COLUMNS	901
			LUMP										LUMP	503	11100	LS		COFFERDAMS AND EXCAVATION BRACING	
			31,723										31,723	509	10000	31,723	LB	EPOXY COATED REINFORCING STEEL	
			524										524	511	53012	524	CY	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	838
			5,418										5,418	512	10100	5,418	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	
			419										419	516	13200	419	SF	1/2" PREFORMED EXPANSION JOINT FILLER	
			1,962										1,962	516	13900	1,962	SF	2" PREFORMED EXPANSION JOINT FILLER	
			746										746	601	37500	746	FT	PAVED GUTTER, TYPE 1-2	
			47,388										47,388	840	20001	47,388	SF	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	843
			12,124										12,124	840	21000	12,124	CY	WALL EXCAVATION	
			6,296										6,296	840	22000	6,296	SY	FOUNDATION PREPARATION	
			62,184										62,184	840	23000	62,184	CY	SELECT GRANULAR BACKFILL	
			9,690										9,690	840	23050	9,690	CY	NATURAL SOIL	
			4,033										4,033	840	25010	4,033	FT	6" DRAINAGE PIPE, PERFORATED	
			1,777										1,777	840	26000	1,777	FT	CONCRETE COPING	
			43,836										43,836	840	26050	43,836	SF	AESTHETIC SURFACE TREATMENT	
			5										5	840	27000	5	DAY	ON-SITE ASSISTANCE	
			LUMP										LUMP	840	28000	LS		SGB INSPECTION AND COMPACTION TESTING	
				1,393									1,393	203	20000	1,393	CY	**RETAINING WALLS (W3)** EMBANKMENT	
																		/1	
				LUMP									LUMP	503	11100	LS		COFFERDAMS AND EXCAVATION BRACING	
				30,007									30,007	509	10000	30,007	LB	EPOXY COATED REINFORCING STEEL	
				192									192	511	53012	192	CY	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	838
				2,629									2,629	512	10100	2,629	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	838
				196									196	516	13200	196	SF	1/2" PREFORMED EXPANSION JOINT FILLER	
				720									720	516	13900	720	SF	2" PREFORMED EXPANSION JOINT FILLER	
				392									392	601	37500	392	FT	PAVED GUTTER, TYPE 1-2	
				27,132									27,132	840	20001	27,132	SF	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	843
				3,256									3,256	840	21000	3,256	CY	WALL EXCAVATION	
				1,835									1,835	840	22000	1,835	SY	FOUNDATION PREPARATION	
				18,250									18,250	840	23000	18,250	CY	SELECT GRANULAR BACKFILL	
				701									701	840	23050	701	CY	NATURAL SOIL	
				1,090									1,090	840	25010	1,090	FT	6" DRAINAGE PIPE, PERFORATED	
				25									25	840	25020	25	FT	6" DRAINAGE PIPE, NON-PERFORATED	
				871									871	840	26000	871	FT	CONCRETE COPING	
				25,394									25,394	840	26050	25,394	SF	AESTHETIC SURFACE TREATMENT	
				5									5	840	27000	5	DAY	ON-SITE ASSISTANCE	
				LUMP									LUMP	840	28000	LS		SGB INSPECTION AND COMPACTION TESTING	
				LUMP									LUMP	867	00101	LS		TEMPORARY WIRE FACED MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	839
																		MISCELLANEOUS STRUCTURE	
		LUMP										LUMP	LUMP	202	11200	LS		PORTIONS OF STRUCTURE REMOVED	
												1		202	11500	1	EACH	PORTIONS OF STRUCTURE REMOVED	46
		78										64	64	202	22900	128	SY	APPROACH SLAB REMOVED	
LUMP												LUMP	LUMP	503	11100	LS		COFFERDAMS AND EXCAVATION BRACING	
		LUMP										LUMP	LUMP	503	11101	LS		COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN	47
	2,096	3,869										2,983	2,982	512	10000	5,965	SY	SEALING OF CONCRETE SURFACES	
		LUMP										LUMP	LUMP	867	00100	LS		TEMPORARY WIRE FACED MECHANICALLY STABILIZED EARTH WALL	199E
																		"@" INCLUDES QUANTITIES FROM SHEET 199e, 279, 280, 281, 282, 286	

NO.	DESCRIPTION	REV. BY	DATE
1	Removal of Item 203E35120	TAZ	11-05-2021

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GENERAL SUMMARY

FRA-71-14.36

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NO.	DESCRIPTION	REV. BY	DATE
1	QUANTITY REVISION	TAZ	10-13-21
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CALCULATED TAZ
CHECKED DLT

REF NO.	SHEET NO.	STATION TO STATION			512 SEALING OF CONCRETE SURFACES SY	606 GUARDRAIL, TYPE MGS FT	606 GUARDRAIL, TYPE 5 FT	606 MGS BRIDGE TERMINAL ASSEMBLY, TYPE 1 EACH	606 MGS BRIDGE TERMINAL ASSEMBLY, TYPE 2 EACH	SPECIAL VANDAL PROTECTION FENCE FT	607 FENCE, TYPE CL FT	607 GATE, TYPE CL, AS PER PLAN EACH	625 GROUND ROD EACH	607 FENCE, TYPE CLT FT	622 PORTABLE BARRIER, ANCHORED, AS PER PLAN FT	609 CURB, TYPE 4-C FT	622 CONCRETE BARRIER, SINGLE SLOPE, TYPE D FT	622 BARRIER TRANSITION EA	622 CONCRETE BARRIER, END ANCHORAGE, REINFORCED, TYPE D EACH	622 CONCRETE BARRIER END SECTION, TYPE D EACH	622 CONCRETE BARRIER, END ANCHORAGE, REINFORCED, TYPE D, AS PER PLAN "A" EACH	253 PAVEMENT REPAIR SY	626 BARRIER REFLECTOR, TYPE 1, BI-DIRECTIONAL EA	626 BARRIER REFLECTOR, TYPE 2, BI-DIRECTIONAL EA	607 FENCE, TYPE CLT, AS PER PLAN FT	607 TEMPORARY VANDAL FENCE, TYPE B FT
B100	327-328	57+60.68 RT (315SB)	TO	58+59.44 RT (315SB)												63	1	1				1			
B101	329	501+41.24 RT (D)	TO	502+10.24 RT (D)												20	1	1	1			2			
B102	330	839+74.53 LT (TD3)	TO	840+38.06 LT (TD3)												35			2			2			
B103	335	527+48.97 LT (C.)	TO	528+88.80 RT (C.)												110		1		1		2			
B104	335	529+08.81 RT (C.)	TO	530+88.86 RT (C.)												150		2				2			
B105	335	17004+95.00 LT (TD7)	TO	17005+54.68 LT (TD7)												31		1	1			1			
B106	335-336	7006+27.05 RT (D7)	TO	7007+00.10 RT (D7)												43		2				2			
B130	334	267+05.55 RT (I-71SB)	TO	267+18.21 RT (I-71SB)	/1										41										
BR100	327-336	230+87.74 LT (I-71SB)	TO	277+64.00 LT (I-71SB)																		68			
BR101	327-336	230+87.74 RT (I-71SB)	TO	277+64.00 RT (I-71SB)																		68			
BR102	335-336, 348,350	7005+54.64 LT (D7)	TO	7012+40.00 LT (D7)																		14			
BR103	336, 348, 350	7007+00.13 RT (D7)	TO	7012+35.00 RT (D7)																		11			
C100	327	57+45.00 RT (315SB)	TO	57+60.68 RT (315SB)												16									
C101	328	56+15.50 RT (315SB)	TO	56+73.00 RT (315SB)												58									
C102	329-330	502+10.24 RT (D)	TO	502+26.55 RT (D)												16									
C103	330	839+53.23 LT (TD3)	TO	839+74.53 LT (TD3)												21									
C106	334-335	17001+79.65 LT (TD7)	TO	17001+89.69 LT (TD7)												10									
P1	334	265+65.17 LT (I-71SB)	TO	265+84.74 LT (I-71SB)	/1																		17				
P2	333	262+80.25 LT (I-71SB)	TO	263+73.45 LT (I-71SB)																			131				
P3	333	264+72.97 LT (I-71SB)	TO	264+80.35 LT (I-71SB)																			14				
P4	333	264+82.84 LT (I-71SB)	TO	264+91.85 LT (I-71SB)																			15				
P6	334	265+88.52 LT (I-71SB)	TO	266+19.98 LT (I-71SB)																			19				
P7	334	267+04.59 RT (I-71SB)	TO	267+17.24 RT (I-71SB)	/1																		34				
P8	334	269+59.13 RT (I-71SB)	TO	269+90.80 RT (I-71SB)																			34				
GR100	328	56+13.36 RT (315SB)	TO	56+75.12 RT (315SB)			62.5																				
GR101	329	501+41.61 RT (D)	TO	501+78.95 RT (D)			37.5																				
GR102	329-330	502+10.24 RT (D)	TO	502+84.59 RT (D)		50		1																1			
GR103	330	839+13.63 LT (TD3)	TO	839+74.53 LT (TD3)		50			1															1			
GR104	330	840+38.06 LT (TD3)	TO	841+13.27 LT (TD3)		50		1																1			
GR105	334-335	17001+80.09 LT (TD7)	TO	17004+95.00 LT (TD7)		300			1															6			
S100	327	57+60.68 RT (315SB)	TO	58+59.44 RT (315SB)	88																						
S101	329	501+41.24 RT (D)	TO	502+10.24 RT (D)	62																						
S102	330	839+74.53 LT (TD3)	TO	840+38.06 LT (TD3)	56																						
S103	335-336	527+48.97 LT (C.)	TO	532+12.12 RT (C.)	414																						
S104	335	17004+95.00 LT (TD3)	TO	17005+54.68 LT (TD3)	53																						
S105	335-336	7006+27.05 RT (D7)	TO	7007+00.10 RT (D7)	66																						
F100	330	893+00.22 LT (TD3)	TO	4+74.42 LT (SC)						128																	
F101	330	4+62.65 RT (SC)	TO	4+74.42 LT (SC)								1															
F102	330	3+34.60 RT (SC)	TO	4+62.65 RT (SC)						122			1														
F103	330-331	2+18.15 LT (SC)	TO	2+32.95 LT (SC)						76																	
F104	330-331	0+52.70 RT (SC)	TO	3+34.60 RT (SC)									1	304													
F105	331	0+54.14 LT (SC)	TO	0+63.19 LT (SC)										41													
F108	334-335	17000+99.33 LT (TD)	TO	17005+54.70 LT (TD7)							563																
F113	334	267+05.55 RT (I-71SB)	TO	267+18.21 RT (I-71SB)	/1																						41
F114	334	267+07.54 RT (I-71SB)	TO	267+13.77 RT (I-71SB)																						20	
TOTALS CARRIED TO SUBSUMMARY					739	450	100	2	2	326	563	1	2	345	41	121	452	2	8	4	1	264	173	9	20	41

ROADWAY SUBSUMMARY - ODOT

FRA-71-14.36

280
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NO.	DESCRIPTION	REV. BY	DATE
1	REVISE CURB QUANTITIES	TAZ	10-28-21
.	.	.	.

STATION TO STATION
FRONT ST. = (F)
MOUND ST. = (M)
JEWETT ST. = (J)
LUDLOW ST. = (L)
SHORT ST. = (SS)
CIVIC CENTER DR. = (CC)
SECOND ST. = (2ND)
RAMP D6 = (D6) RAMP D7 = (D7)

REF NO.	SHEET NO.				512 SEALING OF CONCRETE SURFACES SY	622 CONCRETE BARRIER, SINGLE SLOPE, TYPE B FT	622 CONCRETE BARRIER, SINGLE SLOPE, TYPE D FT	622 BARRIER, MISC.: CONCRETE BARRIER, TAPERED END SECION, AS PER PLAN EACH	622 CONCRETE BARRIER, END ANCHORAGE, REINFORCED, TYPE D EACH	626 BARRIER REFLECTOR, TYPE 1, BI-DIRECTIONAL EA	204 GRANULAR MATERIAL, TYPE B CY	609 CURB, MISC.: STRAIGHT 16" CONCRETE CURB, AS PER PLAN FT	609 CURB, TYPE 4-C FT	609 CURB, MISC.: INSTALL GRANITE CURB FROM STORAGE, AS PER PLAN FT	609 CURB, TYPE 8, AS PER PLAN "B" FT	609 CURB, MISC.: STRAIGHT 18" CONCRETE CURB, AS PER PLAN FT	609 CURB, MISC.: STRAIGHT 18" GRANITE CURB, AS PER PLAN FT	609 CURB, MISC.: STRAIGHT 16" GRANITE CURB, AS PER PLAN FT	609 CURB, MISC.: STRAIGHT 17" GRANITE CURB, AS PER PLAN FT	607 FENCE, TYPE CLT FT	607 FENCE, MISC.: AEP FENCE, AS PER PLAN FT	607 FENCE, MISC.: AEP FENCE DRIVE-IN GATE, AS PER PLAN EACH	607 FENCE, MISC.: 5.5' GATE, AS PER PLAN EACH	607 FENCE, MISC.: IRON FENCE CURB MOUNTED, AS PER PLAN FT	609 CURB, TYPE 8, AS PER PLAN "A" FT
B200	346	11+05.42 RT (M)	TO	11+85.42 RT (M)		20		2																	
B201	350	19+01.57 RT (M)	TO	21+32.46 RT (M)			201		2	4															
B202	356,358	12+63.11 RT (SS)	TO	13+51.74 RT (SS)			68		2		4														
S200	350	19+01.57 RT (M)	TO	21+32.46 RT (M)	206																				
C200	346,348	13+33.80 RT (M)	TO	16+89.21 RT (M)												10	366								
C201	348	16+56.84 LT (M)	TO	16+87.38 LT (M)												5	52								
C202	348,350	14+84.44 RT (SS)	TO	19+01.53 RT (M)													177								
C203	348	2+35.66 RT (CC)	TO	3+33.27 LT (J)													162								
C204	348,350	18+77.97 LT (M)	TO	3+38.27 LT (J)												5	204								
C205	350	3+38.27 RT (J)	TO	22+38.60 LT (M)								5						68	129						
C208	350, 353	22+69.98 RT (M)	TO	24+44.34 RT (M)													195								
C209	350,353	22+77.91 LT (M)	TO	5+45.00 LT (L)								13					238	10							
C210	353	24+58.00 LT (M)	TO	24+80.98 LT (M)									27												
C211	353	24+62.09 RT (M)	TO	26+92.75 RT (M)													244								
C212	353	5+45.00 RT (L)	TO	25+96.51 LT (M)								13					103	10							
C213	353	25+56.50 LT (M)	TO	25+96.51 LT (M)									40												
C214	353	26+17.75 LT (M)	TO	26+92.75 LT (M)													83								
C215	353	26+17.75 LT (M)	TO	26+92.75 LT (M)									75												
C216	356, 358	12+50.00 RT (SS)	TO	14+84.44 RT (SS)												238	0								
C217	356, 358	12+50.00 LT (SS)	TO	14+83.44 LT (SS)												235	0								
C218	360	2+23.20 RT (CC)	TO	2+65.09 RT (CC)									54												
C219	360	2+35.66 RT (CC)	TO	2+85.30 RT (CC)												53									
C220	360	2+36.27 LT (CC)	TO	3+12.00 LT (CC)												79									
C221	362	4+41.83 RT (2ND)	TO	6+06.65 RT (2ND)													165								
C222	362	4+42.17 LT (2ND)	TO	6+06.65 LT (2ND)													165								
C223	362	4+65.00 RT (2ND)	TO	6+04.26 RT (2ND)												139									
C224	362	5+66.78 LT (2ND)	TO	6+06.57 LT (2ND)											51										
C225	353	156+00.81 LT (F)	TO	156+10.83 LT (F)										12											
C226	346	10+02.40 LT (M)	TO	10+05.09 LT (M)												7									
C227	346	10+78.89 LT (M)	TO	10+91.06 LT (M)												12									
F200	358	13+17.50 LT (SS)	TO	14+42.48 LT (SS)																	135				
F201	351, 348 358	13+94.67 RT (SS)	TO	7010+17.58 RT (D7)																		230			
F202	351,358	13+70.33 RT (SS)		13+94.67 RT (SS)																			1		
F203	351,358	13+50.44 RT (SS)		13+70.33 RT (SS)																		37			
F204	351,358	13+82.11 RT (SS)		6000+85.05 LT (D6)																		202			
F205	348	14+56.97 RT (SS)		17+77.54 RT (M)																				82	82
F206	348	17+80.86 RT (M)		17+88.01 RT (M)																				7	7
F207	348	17+88.01 RT (M)		17+99.32 RT (M)																			1		
F208	348,350	17+99.32 RT (M)		19+06.48 RT (M)																				106	106
F209	348,358	13+94.67 RT (SS)		14+53.74 RT (SS)																				59	59
TOTALS CARRIED TO SUBSUMMARY					206	20	269	2	4	4	4	31	196	12	51	783	2154	88	129	135	469	1	1	254	254

CALCULATED TAZ
CHECKED DLT

ROADWAY SUBSUMMARY - COC

FRA-71-14.36

286
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1" 0.5" 0

34" x 22"

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By: tzeigmeister
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View: SHEET
By: tzangmeister

34" x 22"

C11

P.I.Sta. 269+71.54
Δ= 30° 53' 23" (RT)
Dc = 2° 00' 00"
R = 2,864.79'
T = 791.51'
L = 1,544.48'
E = 107.33'
PC Sta. 261+80.04
PT Sta. 277+24.52
V (des) = 60 MPH
e (max) = 0.045
WIDENING = N/A

C19

P.I.Sta. 167+89.88
Δ = 29° 03' 49" (RT)
Dc = 1° 33' 36"
R = 3,672.81'
T = 952.03'
L = 1,863.05'
E = 121.38'
PC Sta. 158+37.85
PT Sta. 177+00.90

C23

P.I.Sta. 3060+07.07
Δ = 29° 08' 02" (RT)
Dc = 1° 41' 15"
R = 3,395.31'
T = 882.32'
L = 1,726.45'
E = 112.77'
PC Sta. 3051+24.75
PT Sta. 3068+51.20

C64

P.I. STA.520+69.64
Ls = 250.00'
θs = 3° 45' 00" (RT)
LT = 166.70'
ST = 83.37'
x = 249.89'
y = 5.45'
k = 124.98'
p = 1.36'
CS STA. 519+86.28
ST STA. 522+36.28

C65

P.I.Sta. 533+75.53
Δ = 20° 05' 49" (RT)
Dc = 1° 20' 00"
R = 4,297.19'
T = 761.46'
L = 1,507.27'
E = 66.94'
PC STA. 526+14.07
PT STA. 541+21.34

C69

P.I. STA. 17002+15.49
Ls = 200.00'
θs = 6° 30' 00" (LT)
LT = 133.42'
ST = 66.75'
x = 199.74'
y = 7.56'
k = 99.96'
p = 1.89'
TS STA. 17000+82.07
SC STA. 17002+82.07

C82

P.I.Sta. 628+47.60
Δ = 10° 41' 45" (RT)
Dc = 1° 00' 00"
R = 5,729.58'
T = 536.35'
L = 1,069.59'
E = 25.05'
PC Sta. 623+11.25
PCC Sta. 633+80.84

C60

P.I. STA.521+58.82
Ls = 250.00'
θs = 3° 45' 00" (RT)
LT = 166.70'
ST = 83.37'
x = 249.89'
y = 5.45'
k = 124.98'
p = 1.36'
CS STA. 520+75.45
ST STA. 523+25.45

C60

P.I. STA.521+58.82
Ls = 250.00'
θs = 3° 45' 00" (RT)
LT = 166.70'
ST = 83.37'
x = 249.89'
y = 5.45'
k = 124.98'
p = 1.36'
CS STA. 520+75.45
ST STA. 523+25.45

Ⓐ STA. 522+78.27 ℄ ROAD D=
STA. 622+78.27 ℄ TRANS I-70 WB (EAST)

Ⓑ STA. 523+28.93 ℄ ROAD C =
STA. 522+78.27, 22.00' RT ℄ ROAD C-D

Ⓒ STA. 16998+00.00 ℄ TRANS RAMP D7 =
STA. 166+30.83, 1.07' LT ℄ I-70 WB

CROSS REFERENCES	
SHEET NO	DESCRIPTION
379-380	I-71 SB PROFILE
390	TRANS RAMP D7 PROFILE
363	TRANS I-70 PROFILE
345	MOUND ST. PLAN/PROFILE
644-645	WATERLINE PLAN/PROFILE
516	RR FIELD DRIVE PLAN
621	STORM PROFILES
529-530	GRADING DETAILS
539	GORE DETAILS

CSX RR
FUTURE CSX RR
EX. SUP
100 YR. FLOOD PLAIN
25' DIA. BORING/ JACKING PIT
NORFOLK SOUTHERN
EX. PROJECT 4R BIKE PATH DETOUR (TO REMAIN)
500 YR. FLOOD PLAIN
CSX R/W
NS R/W
INSTALL PIPE MARKER SIGN AT PROPERTY LINE
CONST. LIMITS
FRA-71-1503L
PROP. 36" WATER LINE
BEGIN WORK MOUND ST. STA. 10+00.00
EX. AT&T 4-4" DUCT (DND)
℄ CONST. MOUND ST.
STA. 10+00.00 ℄ MOUND ST. =
STA. 269+70.63, 6.53' LT ℄ I-71 SB
Ex R/W
4"G (ABAND.)
18" in 36" CASING PIPE
TH-102-2020
TH-101-2020
TH-100-2020
TH-01-2020
TH-20-2015
50:1 TAPER
MOUND ST. N 81° 06' 25" E
MATCH LINE STA. 265+50 SEE SHEET 333
MATCH LINE STA. 270+50 SEE SHEET 335
I-71 SB
℄ CONST. I-71 SB
BEGIN PVMNT. TAPER +76.63, 12.00' LT
VAR. 8.0'
24.0'
12.0'
CSX MILEPOST CK-1.76
SAWCUT
PT Sta. 14+87.73
PC Sta. 15+30.15
RR FIELD DRIVE RELOCATED IN PART I
PT Sta. 24+69.31
PC Sta. 14+20.04
PC Sta. 24+07.46 = POT Sta. 14+07.46
+99.41 102.00' LT
CAP PROP. 15" FOR FUTURE PROJECT 6A TIE-IN
500 YR. FLOOD PLAIN
DENSE TREES
BEGIN FENCE +99.83 11.79' LT
+99.66 10.79' LT
℄ CONST. TRANS RAMP D7
+09.73 20.09' RT
TWO (2) SEPARATE DIRECTIONAL BORES 236'± I-4" 'C' PLAS DUCT W/ COPPER CABLE
EX. PROJECT 4R BIKE PATH DETOUR (TO REMAIN)
B-018-1-13
B-017-9-13
B-018-2-13
B-017-2
℄ CONST. RAMP D3
℄ CONST. I-70 WB
I-70 WB
EX. ℄ ROAD 'D'
N 82° 24' 12" E
PC Sta. 623+11.25
POT Sta. 522+78.27
4:1 TAPER
+28.27 12.00' RT ST Sta. 522+36.28
POT Sta. 523+28.93
EX. ℄ ROAD 'C-D'
EX. ℄ ROAD 'C'
ST Sta. 523+25.45
100 YR. FLOOD PLAIN
500 YR. FLOOD PLAIN
CONST. LIMITS
FRA-70-1379S
I-70 EB
℄ CONST. TRANS I-70 WB
EX. BRIDGE (DND)
PC Sta. 526+14.07
MATCH LINE STA. 3057+90 SEE SHEET 333
MATCH LINE STA. 165+09 SEE SHEET 333
MATCH LINE STA. 3063+00 SEE SHEET 335

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATE PVMT. REPAIR	TAZ	10-13-21

HORIZONTAL SCALE IN FEET
0 10 20 40
CALCULATED
CHECKED

PLAN - I-71 SB STA. 265+50 TO STA. 270+50

FRA-71-14.36

334
1228

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0 0.5" 1"

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View: FENCE_VIEW1
By: tzongmeister

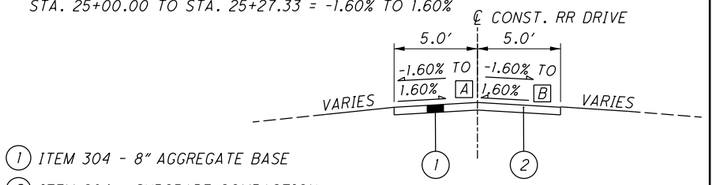
34" x 22"

I-71 SB
100 YR FLOODPLAIN
℄ CONST. I-71 SB
℄ CONST. EX RR FIELD DRIVE
PR. I-71 SB BRIDGE PIER #18
1-4" HDPE SDR-11 CASING W/COPPER CABLE, (2 SEPARATE DIRECTIONAL BORES) ATT U.G. LINE
℄ CONST. RR DRIVE
NORFOLK SOUTHERN RAILROAD
DOP ELEC. VAULT #055
DOP MH 135
AEP 117
AEP 118
TH-20-2015
TH-21-2015
PR. 36" WATERLINE
END WORK RR ACCESS DR.
BEGIN WORK RR ACCESS DR.
PC Sta. 15+30.15
PT Sta. 14+97.73
PC Sta. 25+27.33 = POT Sta. 15+41.66
POT Sta. 15+60.40
POT Sta. 24+69.37
PC Sta. 14+20.04
PC Sta. 24+07.46 = POT Sta. 14+07.46
N 69° 14' 53" E
N 81° 11' 46" E
N 52° 18' 41" E
Ex R/W
Ex LA-R/W
℄ CONST MOUND ST.
MOUND ST
2-4" 'C' PLAS DUCT W/COPPER CABLE
CAUTION: AEP ELEC. MH (DND)
FRA-70-12.68 RAILROAD CONCRETE DRIVE APRON (DND)
500 YR. FLOODPLAIN
3061

P.I. Sta. 24+50.19
Δ = 101° 21' 15" (RT)
Dc = 163° 42' 08"
R = 35.00'
T = 42.73'
L = 61.91'

A STA. 24+07.46 TO STA. 24+25.00 = -1.60% TO 1.60%
STA. 24+25.00 TO STA. 24+75.00 = 1.60%
STA. 24+75.00 TO STA. 25+00.00 = 1.60% TO -1.60%
STA. 25+00.00 TO STA. 25+27.33 = -1.60%

B STA. 24+07.46 TO STA. 25+00.00 = -1.60%
STA. 25+00.00 TO STA. 25+27.33 = -1.60% TO 1.60%



(1) ITEM 304 - 8" AGGREGATE BASE
(2) ITEM 204 - SUBGRADE COMPACTION

STA. 24+07.46 TO STA. 25+27.33

718.78 718.60 717.43 716.87 714.87 714.57 714.59

40.00' VC
P.V.I. STA 24+27.46
ELEV = 718.88'

EX. DRIVE GRADE FOR FRA-70-12.68

TIE INTO DRIVE FROM FRA-70-12.68 STA 24+07.46 ELEV 718.78

STA 24+47.46 ELEV 716.59

+0.53 % -6.44 %

EX. GRADE

PROP. GRADE

STA 24+66.00 ELEV 716.40

-6.44 % +0.36 %

TIE INTO DRIVE FROM FRA-70-12.68 STA 25+27.33 ELEV 714.59

ATT

CAUTION U.G.AEP ELEC VERIFY LOCATION 12-3.5" FIBER DUCTS

ATT 1-4" HDPE SDR-11 CASING W/ COPPER CABLE

CAUTION U.G.AEP ELEC VERIFY LOCATION 12-3.5" FIBER DUCTS

MCI F.O.

2-4" 'C" TELE DUCT W/ COPPER CABLE

STA 25+26.00 ELEV 714.58

EX. DRIVE GRADE FOR FRA-70-12.68

60.00' VC
P.V.I. STA 24+96.00
ELEV = 714.47'

718.70 718.65 718.63 717.44 715.57 714.70

725 720 715 710 705

24 25

NO.	DESCRIPTION	REV. BY	DATE
1	Detail not needed, see 4R	TAZ	10-14-21

HORIZONTAL SCALE IN FEET
0 5 10 20

CALCULATED
CHECKED

DRIVE DETAIL
REALIGNED RR ACCESS FROM FRA-70-12.68

FRA-71-14.36

1

516
1228

ms consultants, inc.

GENERAL NOTES

PROPOSED WORK:

THE PROPOSED WORK CONSISTS OF BUILDING RETAINING WALLS W2, W3, W5, E4, E5, E7 & E10 WITHIN THE I-70/I-71 WEST INTERCHANGE.

STANDARD DRAWING AND SUPPLEMENTAL SPECIFICATIONS:

REFER TO THE FOLLOWING SUPPLEMENTAL SPECIFICATONS:

840 DATED 4-16-21
867 DATED 1-15-21

DESIGN SPECIFICATIONS:

THESE STRUCTURES CONFORM TO THE "LRFD BRIDGE DESIGN SPECIFICATIONS" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 9TH EDITION, 2020, AND THE ODOT BRIDGE DESIGN MANUAL, 2021 EDITION, INCLUDING REVISIONS THROUGH JANUARY 2021.

DESIGN LOADING:

HL-93 AND
250 PSF LIVE LOAD SURCHARGE

DESIGN DATA:

CONCRETE CLASS QC1 - COMPRESSIVE STRENGTH 4.0 KSI (COPING & LEVELING PAD)

CONCRETE CLASS QC2 - COMPRESSIVE STRENGTH 4.5 KSI (PARAPET & MOMENT SLAB)

REINFORCING STEEL - ASTM A615 OR A996 GRADE 60, MINIMUM YIELD STRENGTH 60 KSI

MAINTENANCE OF TRAFFIC:

FOR MAINTENANCE OF TRAFFIC DETAILS, SEE THE ROADWAY PLANS.

UTILITIES:

THE LOCATION OF UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE OBTAINED THROUGH UTILITY OWNERS AS REQUIRED BY SECTION 153.64 O.R.C.

PROPRIETARY RETAINING WALL DATA:

FOR ALL MSE WALL PORTIONS BELOW A BRIDGE ABUTMENT, THE PROPRIETARY WALL SUPPLIER SHALL DESIGN THE INTERNAL STABILITY OF A MECHANICALLY STABILIZED EARTH (MSE) WALL IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION 840 TO SUPPORT THE ABUTMENT. THE DESIGN FOR INTERNAL STABILITY SHALL INCLUDE A NOMINAL (I.E. UNFACTORED) HORIZONTAL STRIP LOAD DUE TO FRICTION (FR) FROM THE SUPERSTRUCTURE APPLIED PERPENDICULAR TO THE FACE OF WALL AT THE BASE OF THE CONCRETE FOOTING. SEE BELOW FOR STRIP LOADS AT INDIVIDUAL WALLS/BRIDGES. THIS STRIP LOAD DOES NOT INCLUDE EARTH PRESSURE LOADS FROM THE ABUTMENT BACKFILL. HOWEVER, THE PROPRIETARY WALL SUPPLIER SHALL INCLUDE EARTH PRESSURE LOADS FROM THE ABUTMENT BACKFILL IN THE DESIGN CALCULATIONS.

MSE WALL	BRIDGE	NOMINAL HORIZONTAL STRIP LOAD DUE TO FRICTION
E4	FRA-70-1373B	2.4 K/FT
E7	FRA-71-1503L	1.0 K/FT
W5	FRA-71-1503L	1.2 K/FT

CONSTRUCTION SEQUENCING:

WHERE WALL CONSTRUCTION IS PHASED AND A TEMPORARY RETAINING SYSTEM IS REQUIRED, SHOP DRAWINGS OF BOTH PERMANENT AND TEMPORARY WALLS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. THE COST OF THESE SUBMITTALS SHALL BE INCLUDED FOR PAYMENT WITH THE COST OF THE TEMPORARY WALLS.

EXCAVATION, SHEETING AND BRACING

EXCAVATION ENVELOPES AS DETAILED IN THE PLANS SHALL BE PROTECTED FROM CAVING AND SLOUGHING. WHERE CLEARANCES AND CONSTRUCTION SEQUENCING WILL NOT ALLOW FOR SLOPED EXCAVATIONS, APPROPRIATE SHEETING OR BRACING METHODS SHALL BE EMPLOYED BY THE CONTRACTOR. THIS TEMPORARY SHEETING OR BRACING IS CONSIDERED INCIDENTAL TO ITEM 503 - COFFERDAMS AND EXCAVATION BRACING.

ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN (WALLS E4, E7 & E10)

THE DESIGN SHOWN ON THE PLANS FOR TEMPORARY SUPPORT OF EXCAVATION IS ONE REPRESENTATIVE DESIGN THAT MAY BE USED TO CONSTRUCT THE PROJECT. THE CONTRACTOR MAY CONSTRUCT THE DESIGN SHOWN ON THE PLANS OR PREPARE AN ALTERNATE DESIGN TO SUPPORT THE SIDES OF EXCAVATIONS. IF CONSTRUCTING AN ALTERNATE DESIGN FOR TEMPORARY SUPPORT OF EXCAVATION, PREPARE AND PROVIDE PLANS IN ACCORDANCE WITH C&MS 501.05. THE DEPARTMENT WILL PAY FOR THE TEMPORARY SUPPORT OF EXCAVATION AT THE CONTRACT LUMP SUM PRICE FOR COFFERDAMS AND EXCAVATION BRACING. NO ADDITIONAL PAYMENT WILL BE MADE FOR PROVIDING AN ALTERNATE DESIGN.

ITEM 511 CONCRETE MISC.: PRECAST WALL PANELS (WALLS E7 & E10)

THIS ITEM SHALL INCLUDE THE FABRICATION AND ERECTION OF THE PRECAST WALL PANELS AS DETAILED IN THE PLANS. CONCRETE FOR THE PRECAST PANELS SHALL BE CLASS QC1 AS PER CMS 511. PRECAST WALL PANELS SHALL BE USED ADJACENT TO WHERE EPS GEOFOAM FILL IS USED. THE FABRICATION OF THE PANELS, TESTING OF THE CONCRETE AND ERECTION OF THE PANELS SHALL MEET THE REQUIREMENTS OF SS 840.05. FORMLINERS SHALL BE USED TO PROVIDE AN AESTHETIC TREATMENT. THE AESTHETIC TREATMENT SHALL BE AN ASHLAR STONE FINISH WITH A MINIMUM OF 1" AND A MAXIMUM OF 1½" RELIEF. THIS WORK ALSO INCLUDES THE PLACEMENT OF THE UNISTRUT P3754 (OR EQUIVALENT) CHANNELS AND THE F1554 GRADE 36 ANCHOR BOLTS. THE ANCHOR BOLTS SHALL BE GALVANIZED AS PER CMS 711.02.

METHOD OF MEASUREMENT: THE DEPARTMENT WILL MEASURE THE PRECAST PANELS BY THE NUMBER OF SQUARE FEET.

PAYMENT: ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE WORK SHALL BE INCLUDED IN THE CONTRACT BID PRICE FOR ITEM 511 CONCRETE MISC.: PRECAST WALL PANELS.

ITEM 511 CONCRETE MISC.: PRECAST FOOTING (WALLS E7 & E10)

THIS ITEM SHALL INCLUDE THE FABRICATION AND PLACEMENT OF THE PRECAST FOOTINGS AS DETAILED IN THE PLANS. INCLUDING THE REINFORCING STEEL. CONCRETE FOR THE PRECAST FOOTING SHALL BE CLASS QC1 AS PER CMS 511.

PRECAST FOOTING SHALL BE FOUNDED ON EITHER A GRANULAR EMBANKMENT TYPE C OR A CAST-IN-PLACE LEVELING PAD OR A LEVEL SURFACE OF LOW STRENGTH MORTAR BACKFILL (LSM) OR CLASSIC QC MISC CONCRETE. PRECAST FOOTING SHALL BE LEVEL.

METHOD OF MEASUREMENT: THE DEPARTMENT WILL MEASURE THE PRECAST FOOTINGS BY THE NUMBER OF FEET.

PAYMENT: ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE WORK SHALL BE INCLUDED IN THE CONTRACT BID PRICE FOR ITEM 511 CONCRETE MISC.: PRECAST FOOTING.

ITEM 511 CLASS QC2 CONCRETE MISC.: LOAD DISTRIBUTION SLAB (WALLS E7 & E10)

THIS ITEM SHALL INCLUDE THE CONCRETE CONSTRUCTION AS DETAILED IN THE PLANS INCLUDING THE WORK NECESSARY TO FURNISH & PLACE THE REINFORCING STEEL. CONCRETE FOR THE PROPOSED WORK SHALL BE CLASS QC2 AS PER CMS 511.

METHOD OF MEASUREMENT: THE DEPARTMENT WILL MEASURE THE CONCRETE CONSTRUCTION BY THE NUMBER OF CUBIC YARDS.

PAYMENT: ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE WORK SHALL BE INCLUDED WITH WALL E7 IN THE CONTRACT BID PRICE FOR ITEM 511 CLASS QC2 CONCRETE MISC.: LOAD DISTRIBUTION SLAB.

ITEM 512 - SEALING OF CONCRETE SURFACES, AS PER PLAN, (PERMANENT GRAFFITI PROTECTIN) (WALLS E4, E5 & W2):

APPLY A PERMANENT GRAFFITI COATING QUALIFIED ACCORDING TO SUPPLEMENT 1083 THAT IS COMPATIBLE WITH THE CONCRETE SEALER OVER WHICH IT IS APPLIED. APPLY THE GRAFFITI COATING IN ACCORDNACE WITH MANUFACTURER'S PRINTED INSTRUCTIONS. APPLY PERMANENT GRAFFITI COATING TO THE WALLS E4 TO THE RAILROAD, E5 NORTH FACING, AND W2.

ITEM 517 - RAILING MISC.: TRAFFIC BARRIER ON MSE WALL:

THIS ITEM SHALL INCLUDE, BUT IS NOT LIMITED TO THE CONCRETE, REINFORCING STEEL, DOWELS, SLEEVES, PEJF, AND JOINT SEAL NECESSARY TO FORM AND PLACE THE CONCRETE RAILING AND BARRIER MOMENT SLAB. PAYMENT FOR THIS ITEM SHALL ALSO INCLUDE ALL OTHER NECESSARY MATERIAL, LABOR, AND EQUIPMENT AND SHALL BE INCLUDED IN THE UNIT PRICE BID PER LINEAR FOOT FOR ITEM 517-RAILING, CONCRETE, AS PER PLAN.

ITEM 607 - VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC, AS PER PLAN:

ALL FENCE POSTS, RAILS, FABRIC, BASE PLATES, POST SLEEVES, TENSION BANDS, TRUSS RODS, FABRIC TIES AND ALL OTHER VISIBLE PORTIONS OF FENCE NOT LISTED SHALL BE BLACK PVC COATED.

THE MOUNTING BASE PLATE AND SLEEVE SHALL BE BP-5 PER STANDARD DRAWING VPF-1-90. FOR THE ROADWAY PLANS WHERE VANDAL PROTECTION FENCE IS MOUNTED ON THE BARRIER, THE POST SPACING SHALL BE 5 FOOT. SEE THE STRUCTURES PLANS FOR POST SPACING ON BRIDGE AND WALLS.

ITEM 840 - DRAINAGE PIPE:

PROVIDE A MINIMUM SLOPE OF 1.00% ON ALL MSE WALL DRAINS UNLESS NOTED OTHERWISE.

PIPE LOCATED OUTSIDE THE FACE OF THE MSE WALL PANEL SHALL BE INCLUDED WITH THE ROADWAY QUANTITIES FOR PAYMENT.

LOCATE THE PIPE AS CLOSE AS POSSIBLE TO THE TOP OF THE LEVELING PAD. IT MAY BE LOCATED ABOVE THE BOTTOM ROW OF REINFORCING STRAPS. HOWEVER, AT NO TIME SHALL THE PIPE BE LOCATED WITHIN 1 FOOT OF THE PROPOSED GROUND LINE.

ABBREVIATIONS:

CCF - CELLULAR CONCRETE FILL
CJ - CONSTRUCTION JOINT
C/C - CENTER TO CENTER
CLR - CLEAR
CONST - CONSTRUCTION
CSW - COLUMN SUPPORTED WALLS
DIA - DIAMETER
EF - EACH FACE
ELEV - ELEVATION
EOP - EDGE OF PAVEMENT
EPS- EXPANDED POLYSTYRENE
EX - EXISTING
FF - FAR FACE
I.R. 75 - INTERSTATE ROUTE 75
INC - INCREMENT
LT - LEFT
LDS - LOAD DISTRIBUTION SLAB
MAX - MAXIMUM
MIN - MINIMUM
MISC - MISCELLANEOUS
NF - NEAR FACE
PEJF - PREFORMED EXPANSION JOINT FILLER
PERF CPP - PERFORATED CORRUGATED PLASTIC PIPE
PROP - PROPOSED
RT - RIGHT
SB - SOUTHBOUND
SER - SERIES
SGB - SELECT GRANULAR BACKFILL
SPA - SPACING
STA - STATION
ST - STRAIGHT
TBA - TO BE ABANDONED
TBR - TO BE REMOVED
TBRL - TO BE RELOCATED
TYP - TYPICAL
VPF - VANDAL PROTECTION FENCE

NO.	DESCRIPTION	REV. BY	DATE
1	CHANGED CMC- CONTROLLED MODULUS COLUMNS TO CSW -COLUMN SUPPORTED WALLS	MMS	11/5/21
1	UPDATED SHEET TITLE	MMS	11/5/21

RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

DESIGNED MMS | DRAWN MMS | CHECKED JGM | REVIEWED NCK | DATE 6/23/2021 | REVISED | STRUCTURE FILE NUMBER

RETAINING WALL NOTES 1 OF 9
RETAINING WALLS
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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GENERAL NOTES

ITEM 840 - MECHANICALLY STABLIZED EARTH WALL, AS PER PLAN: (WALL E4, WALL E5 & PORTIONS OF WALL W5)

THE CONTRACTOR AND MANUFACTURER SHALL COMPLY WITH THE REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION 840, EXCEPT REFERENCES, MATERIALS, AND PAY ITEMS ASSOCIATED WITH FOUNDATION PREPARATION SHALL BE REPLACED WITH ITEM 203 - ROADWAY, MISC.: CONTROLLED MODULUS COLUMNS.

FOR EACH WALL, PROVIDE MINIMUM SOIL REINFORCEMENT LENGTHS AS LISTED IN THE PLAN NOTES ON SHEET 6/9.

138KV ELECTRIC LINE- THERMAL BACKFILL MATERIAL PER SHEET 58A SHALL BE INCIDENTAL TO THIS ITEM.

ITEM 840 - MECHANICALLY STABLIZED EARTH WALL, AS PER PLAN: (PORTIONS OF WALL E7)

THE FOLLOWING COMPONENT ITEMS SHALL BE PROVIDED PER THE PROVISIONS OF ODOT SUPLPEMENTAL SPECIFICATION 840 - MECHANICALLY STABILIZED EARTH WALL.

- PRECAST CONCRETE FACING PANELS
- SOIL REINFORCEMENTS
- FOUNDATON PREPARATION MATERIALS
- CONCRETE COPING
- LEVELING PAD
- CONCRETE SEALER
- PILE SLEEVES
- CAP UNIT ADHESIVE

FOR EACH WALL, PROVIDE MINIMUM SOIL REINFORCEMENT LENGTHS AS LISTED IN THE PLAN NOTES ON SHEET 6/9.

THE CONTRTACTOR AND MANUFACTURER SHALL COMPLY WITH THE REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION 840, EXCEPT REFERENCES & PAY ITEMS ASSOCIATED WITH SELECT GRANULAR BACKFILL (SGB) SHALL BE REPLACED WITH THE ENGINEERING FILL (LIGHTWEIGHT CELLULAR CONCRETE FILL (CCF)) SPECIFICATIONS AND REFERENCES & PAY ITEMS ASSOCIATED WITH FACING PANEL JOINT COVER SHALL BE REPLACED WITH WATERPROOFING FABRIC PER CMS 711.24. SPECIFIC SECTIONS INCLUDE:

840.02A - REPLACE SGB WITH CCF
840.02B - REPLACE SGB WITH CCF
840.02C - REPLACE SGB WITH CCF
840.03D - FURNISH A WATERPROOFING FABRIC CONFORMING TO ODOT CMS 711.24. USE AN ADHESIVE THAT SECURES THE FABRIC TO THE WALL DURING THE PLACEMENT OF THE CCF. USE A MINIMUM WATERPROOFING FABRIC WIDTH OF 18 INCHES.
840.03E - CONFORM TO ITEM SPECIAL - ENGINEERED FILL (LIGHTWEIGHT CELLULAR CONCRETE FILL) REQUIREMENTS.
840.03F - NOT APPLICABLE
840.03K - NOT APPLICABLE
840.03L - NOT APPLICABLE
840.04A - REPLACE TABLE 840.04-1 PARAMETERS WITH CCF PROPERTIES AND OMIT NOTES 6 AND 7.
840.04B.12 - REPLACE SGB WITH CCF
840.06A - PROVIDE MIX DESIGN AT PRECONSTRUCTION MEETING IN LIEU OF SGB SAMPLE
840.06F - NOT APPLICABLE
840.06G - REPLACE SGB WITH CCF AND REPLACE FACING PANEL JOINT COVER WITH WATERPROOFING FABRIC
840.06H - REPLACE SGB WITH CCF
840.06I - CONFORM TO ITEM SPECIAL - ENGINEERED FILL (LIGHTWEIGHT CELLULAR CONCRETE FILL) REQUIREMENTS AND REPLACE FACING PANEL JOINT COVER WITH WATERPROOFING FABRIC
840.06J - NOT APPLICABLE
840.06M - NOT APPLICABLE
840.06N - NOT APPLICABLE
840.09 - AND REPLACE FACING PANEL JOINT COVER WITH WATERPROOFING FABRIC

ITEM 840 - MECHANICALLY STABLIZED EARTH WALL, AS PER PLAN: (PORTIONS OF WALL E10)

THE FOLLOWING COMPONENT ITEMS SHALL BE PROVIDED PER THE PROVISIONS OF ODOT SUPLPEMENTAL SPECIFICATION 840 - MECHANICALLY STABILIZED EARTH WALL.

- PRECAST CONCRETE FACING PANELS
- SOIL REINFORCEMENTS
- FOUNDATON PREPARATION MATERIALS
- LEVELING PAD

FOR EACH WALL, PROVIDE MINIMUM SOIL REINFORCEMENT LENGTHS AS LISTED IN THE PLAN NOTES ON SHEET 6/9.

THE CONTRTACTOR AND MANUFACTURER SHALL COMPLY WITH THE REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION 840, EXCEPT REFERENCES & PAY ITEMS ASSOCIATED WITH SELECT GRANULAR BACKFILL (SGB) SHALL BE REPLACED WITH THE ENGINEERING FILL (LIGHTWEIGHT CELLULAR CONCRETE FILL (CCF)) SPECIFICATIONS AND REFERENCES & PAY ITEMS ASSOCIATED WITH FACING PANEL JOINT COVER SHALL BE REPLACED WITH WATERPROOFING FABRIC PER CMS 711.24. SPECIFIC SECTIONS INCLUDE:

840.02A - REPLACE SGB WITH CCF
840.02B - REPLACE SGB WITH CCF
840.02C - REPLACE SGB WITH CCF
840.03D - FURNISH A WATERPROOFING FABRIC CONFORMING TO ODOT CMS 711.24. USE AN ADHESIVE THAT SECURES THE FABRIC TO THE WALL DURING THE PLACEMENT OF THE CCF. USE A MINIMUM WATERPROOFING FABRIC WIDTH OF 18 INCHES.
840.03E - CONFORM TO ITEM SPECIAL - ENGINEERED FILL (LIGHTWEIGHT CELLULAR CONCRETE FILL) REQUIREMENTS.
840.03F - NOT APPLICABLE
840.03K - NOT APPLICABLE
840.03L - NOT APPLICABLE
840.04A - REPLACE TABLE 840.04-1 PARAMETERS WITH CCF PROPERTIES AND OMIT NOTES 6 AND 7.
840.04B.12 - REPLACE SGB WITH CCF
840.06A - PROVIDE MIX DESIGN AT PRECONSTRUCTION MEETING IN LIEU OF SGB SAMPLE
840.06F - NOT APPLICABLE
840.06G - REPLACE SGB WITH CCF AND REPLACE FACING PANEL JOINT COVER WITH WATERPROOFING FABRIC
840.06H - REPLACE SGB WITH CCF
840.06I - CONFORM TO ITEM SPECIAL - ENGINEERED FILL (LIGHTWEIGHT CELLULAR CONCRETE FILL) REQUIREMENTS AND REPLACE FACING PANEL JOINT COVER WITH WATERPROOFING FABRIC
840.06J - NOT APPLICABLE
840.06M - NOT APPLICABLE
840.06N - NOT APPLICABLE
840.09 - AND REPLACE FACING PANEL JOINT COVER WITH WATERPROOFING FABRIC

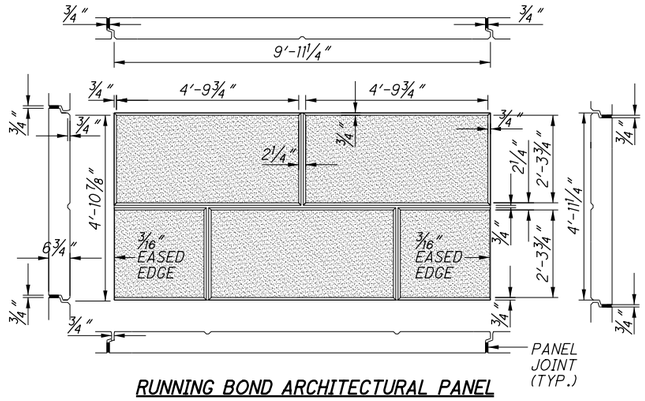
ITEM 867 - TEMPORARY WIRE FACED MECHANICALLY STABILIZED EARTH WALL: (WALL T1 & T2)

THE CONTRACTOR SHALL DESIGN, PREPARE ENGINEERING DRAWINGS FOR, FABRICATE, AND CONSTRUCT A TEMPORARY WIRE FACED MSE WALL IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION 867.

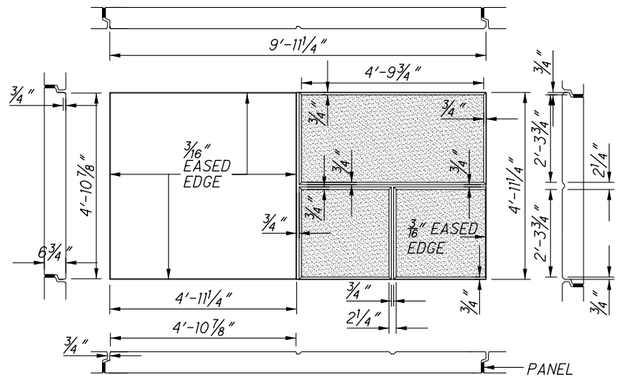
BASIS OF PAYMENT: ALL WORK UNDER SUPPLEMENTAL SPECIFICATION 867 SHALL BE PAID FOR AT THE LUMP SUM CONTRACT BID PRICE UNDER ITEM 867 - TEMPORARY WIRE FACED MECHANICALLY STABILIZED EARTH WALL, SEPARATELY ITEMIZED.

ITEM 840 - AESTHETIC SURFACE TREATMENT:

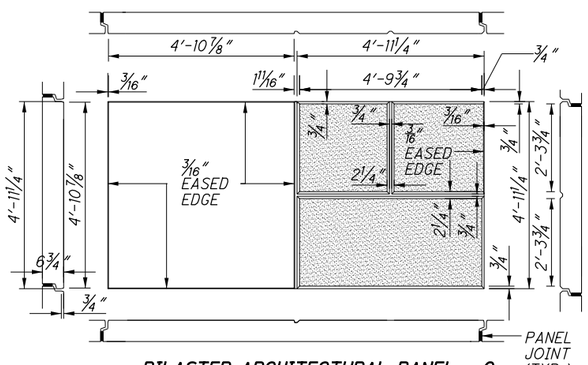
THE ITEM OF WORK SHALL CONSIST OF PROVIDING AESTHETIC TREATMENTS TO THE CONCRETE MSE WALL PANEL SURFACES. THE SURFACE FINISH SHALL BE EITHER A RUNNING BOND AESTHETIC PATTERN & TEXTURE OR A RUNNING BOND AESTHETIC PSTTERN & TEXTURE WITH PILASTERS. SEE BELOW FOR DETAILS OF EACH, AND SEE INDIVIDUAL WALL PLANS FOR LOCATION OF VARIOUS SURFACE FINISHES.



RUNNING BOND ARCHITECTURAL PANEL



PILASTER ARCHITECTURAL PANEL - 1



PILASTER ARCHITECTURAL PANEL - 2

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED SHEET TITLE	MMS	11/5/21

RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

DESIGNED MMS | DRAWN MMS | REVIEWED NCK | DATE 6/23/2021
CHECKED JGM | REVISED | STRUCTURE FILE NUMBER

RETAINING WALL NOTES 2 OF 9
RETAINING WALLS
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

2 / 9

839
1228

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ITEM 203 ROADWAY MISC.: EPS GEOFOAM FILL (PORTIONS OF WALL E7 AND WALL E10)

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND PLACING EPS GEOFOAM CONFORMING TO ASTM D6817 TYPE 19 EPS GEOFOAM. THE MATERIAL SHALL HAVE A MINIMUM DENSITY OF 1.15 POUNDS PER CUBIC FEET, AND A MINIMUM COMPRESSIVE RESISTANCE OF 5.8 PSI AT 1% STRAIN DEFORMATION. FOR DESIGN CALCULATIONS, THE AVERAGE DENSITY OF THE EPS GEOFOAM WAS ASSUMED TO BE 1.5 POUNDS PER CUBIC FEET.

ALL EPS GEOFOAM BLOCKS SHALL BE TREATED BY THE MANUFACTURER WITH A TESTED AND PROVEN TERMITE TREATMENT FOR BELOW GRADE APPLICATIONS. THE TREATMENT SHALL BE EPA REGISTERED, MEET REQUIREMENTS OF ICC ES AC239, AND BE RECOGNIZED IN AN ICC ES REPORT.

PRIOR TO ORDERING THE MATERIAL FOR THIS ITEM OF WORK, THE CONTRACTOR SHALL FURNISH THE ENGINEER WITH THE FOLLOWING ITEMS:

- -EPS GEOFOAM MANUFACTURERS PRODUCT LITERATURE AND TECH DATA INCLUDING PHYSICAL PROPERTIES IN COMPLIANCE WITH THE ASTM D6817 TYPE SPECIFIED.
- -SUMMARY OF TEST COMPLIANCE WITH SPECIFIED PERFORMANCE CHARACTERISTICS AND PHYSICAL PROPERTIES.
- -PRODUCT CERTIFICATE SHOWING EVIDENCE OF THIRD PARTY QUALITY CONTROL.
- -A SIGNED/NOTARIZED CERTIFICATION FROM THE MANUFACTURER THAT THEIR EPS GEOFOAM MATERIAL MEETS THE PLAN REQUIREMENTS.
- -SHOP DRAWINGS SHOWING BLOCK THICKNESS, WIDTH, LENGTH, AND LAYING PATTERN OR SCHEDULE.

A GEOMEMBRANE SHALL BE PLACED ON THE TOP AND SIDES OF THE GEOFOAM FILL. THE CONTRACTOR SHALL NOT PLACE THE CELLULAR CONCRETE FILL DIRECTLY AGAINST THE GEOFOAM. THE GEOMEMBRANE MATERIAL SHALL BE TRI-POLYMER CONSISTENT WITH POLYVINYL CHLORIDE, ETHYLENE INTERPOLYMER ALLOY, AND A POLYURETHANE, OR A COMPARABLE POLYMER COMBINATION. THE MATERIAL SHALL MEET THE FOLLOWING PHYSICAL AND CHEMICAL REQUIREMENTS.

- -THICKNESS: MIN. 28 MILS (ATSM D751)
- -UNLEADED GASOLINE VAPOR MAXIMUM 0.40 TRANSMISSION RATE, OZ. PER SQUARE PER 24 HOURS (ASTM D814)
- -GRAB TENSILE STRENGTH: MIN. 600 LBS. BOTH MACHINE AND CROSS DIRECTION (1" GRIP 4' x 8' SAMPLE ASTM D751)
- -ELONGATION AT BREAK: 20% MIN. (ASTM D751)
- -TOUGHNESS: 14,000 MIN. (GRAB TENSILE STRENGTH x PERCENT ELONGATION)
- -PUNCTURE RESISTANCE: 800 LB. MIN. (ASTM D751 BALL TIP)
- -COLD CRACK: PASS -30° FAHRENHEIT (ASTM D2136 1" MANDREL, 4 HR)
- -FACTORY SEAMS: 2 INCH MIN. BONDED WIDTH
- -SHEAR: 320 LBS. MIN. (ASTM D751)

A SIGNED/NOTARIZED CERTIFICATION OF COMPLIANCE SHALL BE FURNISHED BY THE MANUFACTURER STATING THE SELECTED GEOMEMBRANE HAS BEEN TESTED AND MEETS THE ABOVE REQUIREMENTS. JOINTS IN THE GEOMEMBRANE WRAP SHALL BE LAPPED A MINIMUM OF 18 INCHES.

AT WALL E7 STA. 703+00.00 TO STA. 704+21.44, THE GEOFOAM SHALL BE PLACED ON A BASE OF CELLULAR CONCRETE FILL, CLASS II. AT WALL E10 STA. 277+91.69 TO STA. 379+50.59, THE GEOFOAM FILL SHALL BE PLACED ON A BASE OF GRANULAR MATERIAL CONFORMING TO SIZE NO. 9 OF TABLE 703.01-1 OF THE CMS. THE GRANULAR BASE SHALL ALSO BE PLACED ALONG THE SIDES OF THE GEOFOAM FILL THAT ARE IN CONTACT WITH SOIL (NORTH AND EAST SIDES OF THE GEOFOAM).

CARE SHALL BE TAKEN TO PROTECT THE GEOFOAM BLOCKS FROM EXPOSURE TO GASOLINE, SOLVENT NAPHTHA, FUEL OIL, MINERAL OIL, TURPENTINE, OR ANY OTHER SOLVENT. THE BLOCKS SHALL ALSO BE PROTECTED FROM EXPOSURE TO ANY HEAT SOURCE WHICH WOULD REACH 175 DEGREES (F). GEOFOAM SHALL BE STORED ABOVE GROUND, AND PROTECTED FROM MOISTURE AND SUNLIGHT PRIOR TO INSTALLATION.

DAMAGE TO GEOFOAM SHALL BE CORRECTED AS FOLLOWS:

- -SLIGHT DAMAGE (< 0.12 CU FT) WITH NO LINEAR DIMENSION GREATER THAN 1 FOOT MAY BE LEFT IN PLACE AS IS.
- -MODERATE DAMAGE (< 0.35 CU FEET) WITH NO LINEAR DIMENSION GREATER THAN 1 FOOT SHALL BE FILLED IN WITH SAND.
- -GEOFOAM BLOCKS WITH EXCESSIVE DAMAGE (I.E. EXCEEDING THE MODERATE CATEGORY) SHALL BE REPLACED WITH GEOFOAM BLOCKS WHICH MEET THE DAMAGE CRITERIA. GEOFOAM BLOCKS NOT MEETING THE CRITERIA MAY BE CUT TO ELIMINATE THE EXCESSIVE DAMAGE AND THE REMAINING UNDAMAGEDPORTION OF THE BLOCK MAY BE USED WITHIN THE FILL, PROVIDED THE UNDAMAGED PORTION OF THE BLOCK MEETS ALL OTHER REQUIREMENTS. SEE SHEETS 865 & 866 FOR SITE PREPARATION, AREA OF APPLICATION, AND EMBANKMENT TO BE PLACED ON TOP OF THE GEOFOAM BLOCK LOAD DISTRIBUTION SLAB.

PLACEMENT:

THE SURFACE OF A LAYER OF GEOFOAM BLOCKS TO RECEIVE ADDITIONAL GEOFOAM BLOCKS SHALL BE CONSTRUCTED WITH A VARIATION IN SURFACE TOLERANCE OF NO MORE THAN ½" IN ANY 10 FOOT INTERVAL. ALL BLOCKS SHALL BE ACCURATELY FIT RELATIVE TO ADJACENT BLOCKS. NO GAPS GREATER THAN 1" WILL BE ALLOWED ON VERTICAL JOINTS. THE FINISHED SURFACE OF THE GEOFOAM FILL BENEATH PAVEMENT SECTIONS SHALL BE CONSTRUCTED TO WITHIN THE TOLERANCE OF ZERO MINUS 2.5" OF THE INDICATED GRADE.

BLOCKS PLACED IN A ROW IN A PARTICULAR LAYER SHALL BE OFFSET 2 FEET RELATIVE TO BLOCKS PLACED IN ADJACENT ROWS OF THE SAME LAYER. IN ORDER TO AVOID CONTINUOUS JOINTS, EACH SUBSEQUENT LAYER OF BLOCKS SHALL BE ROTATED ON THE HORIZONTAL PLANE 90 DEGREES FROM THE DIRECTION OF PLACEMENT OF THE PREVIOUS LAYER.

THE LONGITUDINAL AXES OF THE UPPERMOST LAYER OF BLOCKS MUST BE PERPENDICULAR TO THE LONGITUDINAL AXIS OF THE ROAD ALIGNMENT.

CONNECTOR PLATES SHALL BE PLACED BETWEEN HORIZONTAL LAYERS OF BLOCK. A MINIMUM OF TWO CONNECTOR PLATES SHALL BE USED BETWEEN BLOCKS.

CONNECTORS SHALL BE GALVANIZED STEEL OR STAINLESS STEEL TWO SIDED MULTI-BARBED CONNECTORS. EACH CONNECTOR SHALL HAVE A LATERAL HOLDING STRENGTH OF AT LEAST 60 LBS. PROVIDE A SIGNED/NOTARIZED CERTIFICATION FROM THE MANUFACTURER THAT THE CONNECTOR PLATES MEET MATERIAL, DESIGN AND STRENGTH REQUIREMENTS OF THESE PLANS.

BLOCKS SHALL BE CUT USING A SAW OR HOT WIRE.

TO PREVENT THE COMPLETED GEOFOAM STRUCTURE FROM DISLODGING OR SHIFTING, CONSTRUCTION OF EMBANKMENT ADJACENT TO THE GEOFOAM SHALL BE DONE SO THAT THE LATERAL EARTH PRESSURES FROM OPPOSITE SIDES REMAIN APPROXIMATELY EQUAL.

NO VEHICLE OR CONSTRUCTION EQUIPMENT SHALL TRAVERSE DIRECTLY ON THE EPS BLOCKS OR ON ANY SEPARATION MATERIAL PLACED BETWEEN THE EPS BLOCKS AND THE PAVEMENT SYSTEM. SOIL FOR THE PAVEMENT SYSTEM SHALL BE PUSHED ONTO THE EPS BLOCKS OR SEPARATION LAYER USING APPROPRIATE EQUIPMENT. A MINIMUM OF 12 INCHES OF FILL SHALL COVER THE TOP OF THE GEOFOAM BLOCK OR SEPARATION LAYER BEFORE COMPACTION COMMENCES. THE CONTRACTOR'S EQUIPMENT USED DURING COMPACTION SHALL NOT PLACE A PRESSURE GREATER THAN 18 PSI ON THE GEOFOAM BLOCKS AT ANY TIME DURING CONSTRUCTION. ANY DAMAGE TO THE GEOFOAM BLOCKS RESULTING FROM THE CONTRACTOR'S VEHICLES, EQUIPMENT, OR OPERATIONS SHALL BE REPLACED BY THE CONTRACTOR.

PAYMENT FOR THIS ITEM OF WORK SHALL BE PAID FOR BY THE UNIT PRICE BID PER CUBIC YARD OF ITEM SPECIAL ROADWAY MISC.: EPS GEOFOAM FILL, WHICH PRICE AND PAYMENT INCLUDES ALL MATERIALS, SITE PREPARATION (EXCLUDING EXCAVATION), GRANULAR BASE, GEOMEMBRANE WRAP, TOOLS, EQUIPMENT, AND LABOR TO COMPLETE THIS ITEM OF WORK IN PLACE.

ALL QUANTITIES AND COSTS ASSOCIATED WITH THIS ITEM SHALL BE INCLUDED IN THE ESTIMATED QUANTITIES AND COST ESTIMATE FOR WALL E7 ONLY.

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED SHEET TITLE	MMS	11/5/21

RESOURCE INTERNATIONAL INC.
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COLUMBUS, OHIO 43231
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DESIGNED	DRAWN	REVIEWED	DATE
MMS	MMS	NCK	6/23/2021
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JGM			

RETAINING WALL NOTES 3 OF 9
RETAINING WALLS E7 & E10
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

3 / 9

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ITEM 203, SPECIAL - ENGINEERED FILL (LIGHTWEIGHT CELLULAR CONCRETE FILL): (WALL E7)

A. DESCRIPTION.
THIS WORK CONSISTS OF FURNISHING AND PLACING A LOW DENSITY, LIGHTWEIGHT, FLOWABLE, LOW ABSORBABILITY, CEMENTITIOUS FILL MATERIAL, HEREIN REFERRED TO AS CELLULAR CONCRETE FILL (CCF).

B. QUALIFICATIONS.
1. SUPPLIER/PRODUCER.
PROVIDE CCF FROM A SUPPLIER/PRODUCER REGULARLY ENGAGED IN THE PLACEMENT OF CCF MATERIAL, WHO HAS IN THE PAST THREE YEARS COMPLETED MASS FILLS HAVING A COMBINED QUANTITY OF AT LEAST 10,000 TOTAL CUBIC YARDS (7650 CUBIC METERS).

DOCUMENTATION FOR THE ABOVE QUALIFICATIONS SHALL BE SUBMITTED AT OR BEFORE THE PRECONSTRUCTION CONFERENCE ACCORDING TO C&MS 108.02.

2. CCF MATERIAL.
PROVIDE CCF MATERIAL, MEETING THE REQUIREMENT OF SECTION C OF THIS SPECIFICATION, WHICH HAS BEEN SUCCESSFULLY PLACED ON AT LEAST 5 PROJECTS THAT HAVE PERFORMED SATISFACTORY FOR AT LEAST FIVE YEARS.

PREAPPROVAL OF THE CCF MATERIAL WILL BE BASED ON DOCUMENTATION FOR THE ABVE QUALIFICATIONS. THIS DOCUMENTATION SHALL BE SUBMITTED TO THE LABORATORY. PREAPPROVED CCF MATERIALS WILL BE LISTED ON THE DEPARTMENT'S QUALIFIED PROJECT LIST AND WILL NEED TO BE REAPPROVED YEARLY.

C. MATERIALS
1. FOAM.
USE A FOAMING AGENT CONFORMING TO ASTM C796.

2. CEMENT.
USE PORTLAND CEMENT COMPLYING WITH ASTM C150 (TYPE I, II OR III).

3. WATER.
USE WATER ACCORDING TO C&MS 499.02. POTABLE WATER IS SATISFACTORY FOR USE IN CCF. WATER SHALL BE FREE FROM DELETERIOUS SUBSTANCES.

4. ADMIXTURES.
USE ADMIXTURES CONFORMING TO C&MS 499.02 FOR WATER REDUCING, RETARDING, ACCELERATING, ANTI-WASHOUT, IMPROVING THE BOND, OR FOR OTHER SPECIFIC PROPERTIES, WHEN SPECIFICALLY APPROVED BY THE MANUFACTURER OF THE PRE-FORMED FOAM.

701.10 MICRO-SILICA, 701.11 GGBF SLAG, OR FLY ASH SHALL BE CLASS C OR CLASS F AND COMPATIBLE WITH FOAMING AGENT.

D. MIX DESIGN.
DESIGN OF THE PROPOSED CCF MIX WILL BE PROVIDED BY THE SUPPLIER/PRODUCER. THE PROPOSED MIX DESIGN MUST MEET THE PROPERTIES OF TABLE A.

MIX DESIGNS MUST BE APPROVED BY THE LABORATORY PRIOR TO USE. A MINIMUM OF 30 DAYS PRIOR TO PLACING CCF, SUBMIT A PROPOSED MIX DESIGN, WITH CERTIFIED TEST DATA FROM THE SUPPLIER/PRODUCER, TO THE LABORATORY, WITH A COPY TO THE ENGINEER.

E. QUALITY CONTROL.
PERFORM CAST DENSITY MEASUREMENTS ON A MINIMUM OF 8 BATCHES PER PRODUCTION DAY. MAINTAIN A LOG OF THE CAST DENSITY MEASUREMENTS.

F. QUALITY ASSURANCE.
QUALITY ASSURANCE WILL BE BASED ON THE CAST DENSITY AND COMPRESSIVE STRENGTH AT THE POINT OF PLACEMENT. ANY MIXES NOT MEETING THE TABLE A PROPERTIES WILL BE REJECTED.

1. CAST DENSITY
AT A MINIMUM, THE DEPARTMENT WILL CHECK ONE OF THE BATCHES EACH DAY AS FOLLOWS:

A) WEIGH THE CONTAINER OF KNOWN VOLUME AND RECORD THE WEIGHT. A STANDARD CONCRETE CYLINDER MOLD MAY BE USED AS THE CONTAINER.

B) FILL THE CONTAINER WITH CCF, TAPPING THE CONTAINER SIDES BRISKLY WITH A RUBBER HAMMER DURING THE FILLING.

C) OVERFILL THE CONTAINER, STRIKING OFF THE EXCESS CCF. WIPE OFF THE OUTSIDE SURFACE OF THE CONTAINER.

D) WEIGH THE FULL CONTAINER.

E) SUBTRACT THE WEIGHT OF THE EMPTY CONTAINER FROM THE FULL CONTAINER.

F) CALCULATE THE CAST DENSITY AND COMPARE IT TO THE MAXIMUM DENSITY FOR THE CLASS OF CCF.

IF THE CCF MATERIAL EXCEEDS THE MAXIMUM DENSITY FOR THE CLASS OF CCF, ADJUST THE MIX AND RECHECK THE CAST DENSITY.

2. COMPRESSIVE STRENGTH.
TAKE AT LEAST FOUR (4) TEST SPECIMENS FOR EACH 300 CUBIC YARDS (230 CUBIC METERS) OF CCF PLACED OR FOR EACH DAY'S PRODUCTION, PREPARE, CURE, AND TEST THE SPECIMENS IN ACCORDANCE WITH ASTM C796 EXCEPT AS FOLLOWS:

A) FILL AN APPROPRIATE 3-INCH BY 6-INCH (75 MM BY 150 MM) CYLINDER MOLD ACCORDING TO ASTM C796, EXCEPT STRIKE OFF THE EXCESS CCF WITH A TROWEL.

B) CURE THE MOLDS IN A CURING BOX.

C) AFTER CURING, DO NOT OVEN DRY THE SPECIMENS THAT ARE TO BE LOAD TESTED. AIR DRY THE SPECIMENS FOR 1 TO 3 DAYS PRIOR TO TESTING.

D) WHILE SPECIMENS MAY BE TESTED AT ANY AGE TO MONITOR COMPRESSIVE STRENGTH OF THE CCF, TEST A MINIMUM OF TWO SPECIMENS AT 28 DAYS FOR ACCEPTANCE.

E) PROVIDE THE 28 DAY TEST RESULTS TO THE ENGINEER.

REVIEW THE STATUS OF THE CCF MATERIAL THAT FAILS TO MEET THE MINIMUM COMPRESSIVE STRENGTH FOR THE CLASS OF CCF TO DETERMINE IF IT IS ACCEPTABLE AT THAT LOCATION.

G. CONSTRUCTION METHODS.
PORTABLE PLANT SHALL COMPLY WITH C&MS ITEM 107.11.C AND ALL APPLICABLE ENVIORNMENTAL PERMITS AND REGULATIONS.

PLACEMENT OF CCF SHALL BE ACCORDING TO PROCEDURES PROVIDED BY THE SUPPLIER/PRODUCER.

1. PREPARATION.
THE ENGINEER WILL EXAMINE THE SUBSOIL CONDITIONS IN THE PLACEMENT AREAS. CORRECT UNSUITABLE SOIL CONDITIONS PRIOR TO PLACING THE CCF. PROPERTY FIX IN PLAN POSITION ITEMS TO BE ENCASED IN THE CCF. COAT ANY ALUMINUM TO PREVENT OXIDATION FROM THE FRESH CONCRETE.

2. WEATHER.
DO NOT PLACE CCF IF THE SUBSOIL IS FROZEN. WHEN THE AMBIENT TEMPERATURE IS LESS THAN 32°F (0°C), FOLLOW THE MANUFACTURER'S RECOMMENDATIONS SUCH AS HEATED MIX WATER OR TYP III CEMENT.

TAKE PRECAUTIONS TO AVOID DAMAGE TO THE CCF FROM FREEZING TEMPERATURES PER THE MANUFACTURER'S RECOMMENDATIONS.

3. MIXING AND CONVEYING.
USE JOB SITE MIXING AND CONVEYING EQUIPMENT FOR PROPORTIONING, MIXING AND PLACING THE CCF APPROVED BY THE SUPPLIER/PRODUCER. MIX THE MATERIALS ACCORDING TO THE SUPPLIER/PRODUCER MIX DESIGN PROCEDURES AND, PROMPTLY AFTER MIXING, CONVEY THE CCF TO ITS FINAL POSITION. AVOID EXCESSIVE HANDLING OF THE CCF.

4. PLACEMENT.
1) TOP OF THE CLASS III CCF SHALL NOT BE LESS THAN 2'-0" BELOW THE TOP OF PAVEMENT.

2) THE TOP OF THE CLASS II CCF SHALL NOT BE LESS THAN 4'-0" FROM THE TOP OF PAVEMENT.

DO NOT PLACE CCF INTO AN AREA OF STANDING WATER. PROVIDE AN INVERTED CROWN IN THE CLASS III CCF, AND PIPE UNDERDRAINS, AS SHOWN IN THE DETAILS.

CONTRACTOR SHALL PROVIDE WORKING DRAWINGS SHOWING THE FINAL WEIGHT TO BE USED IN THE FIELD, PLAN AND SECTIONS LOCATING THE CROWNS, AND LOCATIONS OF THE STEPS IN THE CLASS III CCF LIFT.

DO NOT PLACE REINFORCEMENTS AT COLD JOINTS. SUPPORT REINFORCEMENTS IN A LEVEL POSITION THROUGHOUT THEIR LENGTH AND KEEP THEM AT LEAST 6 INCHES ABOVE THE PREVIOUS DAY'S COLD JOINT.

FINISHING THE CCF:
THE TOP SURFACE OF THE CCF SHALL BE FINISHED TO DRAIN AS SHOWN ON THE PLANS. THE FINISHING MAY BE EXECUTED DURING PLACEMENT, OR GRADED AFTERWARDS, AT THE CONTRACTOR'S DISCRETION. THE FINISHED SURFACE SHALL NOT EXHIBIT EXCESSIVE CRACKING SUBJECT TO THE APPROVAL OF THE ENGINEER.

5. LOADING.
DO NOT APPLY ANY LOAD ONTO THE CCF UNTIL IT HAS ATTAINED A COMPRESSIVE STRENGTH OF AT LEAST 20 PSI (0.14 MPA).

TABLE A - CELLULAR CONCRETE FILL PROPERTIES

PROPERTY	CLASS II	CLASS III
*-CAST DENSITY, MAX	30 LB/FT^3 (481 KG/M^3)	36 LB/FT^3 (577 KG/M^3)
**-COMPRESSIVE STRENGTH, MIN. @ 28 DAYS	40 PSI (0.28 MPA)	80 PSI (0.55 MPA)
***-WATER ABSORPTION, ASTM C796, MAX.	20 PERCENT	16 PERCENT

* - SPECIFIED IN SECTION F.1 OF THIS SPECIFICATION
** - SPECIFIED IN SECTION F.2 OF THIS CLASSIFICATION
*** - EXPRESSED AS PERCENT OF CAST DENSITY

H. METHOD OF MEASUREMENT.
THE DEPARTMENT WILL MEASURE EACH CLASS OF CCF BY THE NUMBER OF CUBIC YARDS COMPLETE IN PLACE.

I. BASIS OF PAYMENT.
THE DEPARTMENT WILL PAY FOR ACCEPTED QUANTITIES AT THE CONTRACT PRICE AS FOLLOWS:

ITEM	UNIT	DESCRIPTION
SPECIAL	CUBIC YARD	ENGINEERED FILL: LIGHTWEIGHT CELLULAR CONCRETE FILL, CLASS II
SPECIAL	CUBIC YARD	ENGINEERED FILL: LIGHTWEIGHT CELLULAR CONCRETE FILL, CLASS III

ALL QUANTITIES AND COSTS ASSOCIATED WITH THIS ITEM BETWEEN STA. 705+50.00 AND STA. 705+60.87 (@ WALL E7) SHALL BE INCLUDED IN THE ESTIMATED QUANTITIES AND COST ESTIMATE FOR WALL E7.

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED SHEET TITLE	MMS	11/5/21
1	MODIFIED NOTES	MMS	11/5/21

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DESIGNED MMS | DRAWN MMS | REVIEWED NCK | DATE 6/23/2021
CHECKED JGM | REVISED | STRUCTURE FILE NUMBER

RETAINING WALL NOTES 4 OF 9
RETAINING WALLS
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS (WALL E4, W5)

PART 1 DESCRIPTION AND OBJECTIVES

1.1 PERFORMANCE CRITERIA

A. PROJECT DESCRIPTION: THE WORK SHALL CONSIST OF DESIGNING AND CONSTRUCTING COLUMN-SUPPORTED WALLS (CSW) IN THE INSTALLATION AREAS NOTED ON THE PLANS. THE CSW DESIGNER MUST DEMONSTRATE BY CALCULATIONS THAT THE CSW SYSTEMS SATISFY THE FOLLOWING REQUIREMENTS:

1. CSW MUST SATISFY THE FACTORED BEARING RESISTANCE REQUIREMENTS OF THE PLANNED EMBANKMENTS AND WALLS AT THE DESIGNATED BEARING LEVELS.

A. THE DESIGNATED BEARLING LEVEL FOR MSE WALLS IS THE TOP OF THE LEVELING PAD/BASE OF THE SGB.

B. THE DESIGNATED BEARING LEVEL FOR THE EMBANKMENTS IS EXISTING GRADE.

2. GLOBAL AND LOCAL STABILITY OF CSW SYSTEMS SUPPORTING EMBANKMENTS AND WALLS MUST EXCEED 1.3 FOR BOTH SHORT-TERM AND LONG-TERM CONDITIONS.

3. GLOBAL AND LOCAL STABILITY OF CSW SYSTEMS SUPPORTING BRIDGES MUST EXCEED 1.5 FOR BOTH SHORT-TERM AND LONG-TERM CONDITIONS.

4. LATERAL SQUEEZE CALCULATIONS MUST DEMONSTRATE A MINIMUM FACTOR OF SAFETY OF 2.0

5. A LOAD TRANSFER PLATFORM SHALL BE PROVIDED, AS NECESSARY, TO LIMIT PENETRATION (PUNCHING) OF GROUND IMPROVEMENT ELEMENTS AND DIFFERENTIAL SETTLEMENT OF MSE WALLS AND EMBANKMENTS BETWEEN CSW ELEMENTS. IF A LOAD TRANSFER PLATFORM IS NOT REQUIRED, PROVIDE A 1-FOOT LAYER OF ODOT CMS ITEM 703.16.C.3 COMPACTED PER ITEM 203 TO SUPPORT MSE LEVELING PADS AND SELECT GRANULAR EMBANKMENT MATERIALS.

6. TOTAL SETTLEMENT OF CSW SYSTEM IS TO BE LIMITED TO 3 INCHES OR LESS OCCURING WITHIN 30 DAYS AFTER THE SUPPORTED WALL REACHES FULL DESIGN HEIGHT (LESS COPING).

A. AN ADDITIONAL 1" OF SETTLEMENT AFTER THE 30 DAY WAITING PERIOD IS ACCEPTABLE. IN ADDITION, THE CONTRACTOR SHALL TAKE SURVEY SHOTS ALONG THE CENTERLINE OF CONSTRUCTION AT 50' INTERVALS ON THE EMBANKMENTS SUPPORTED BY CSW. THESE SHOTS SHALL BE TAKEN AT THE END OF THE 30 DAY WAITING PERIOD AND AGAIN 1 WEEK PRIOR TO BEGINNING PLACEMENT OF AGGREGATE BASE. THE SURVEY SHOTS SHALL BE PROVIDED TO THE DEPARTMENT AND WILL BE CONSIDERED INCIDENTAL TO THE CSW PAY ITEMS. THE SURVEY DATA WILL BE USED TO CALCULATE ANY ADDITIONAL EMBANKMENT OR AGGREGATE BASE NEEDED TO ACCOUNT FOR 1" OR LESS OF SETTLEMENT. PAYMENT FOR EMBANKMENT AND/OR AGGREGATE BASE NEEDED FOR SETTLEMENTS EXCEEDING 1" AT THE TIME OF PAVEMENT CONSTRUCTION WILL NOT BE MADE. THE CONTRACTOR WILL BE REQUIRED TO CONTINUE MONITORING THE SETTLEMENT UNTIL PROJECT CLOSE-OUT TO VERIFY THE MAXIMUM PERMISSIBLE SETTLEMENT IS NOT EXCEEDED. PAYMENT FOR CORRECTIVE REPAIRS NEEDED RESULTING FROM SETTLEMENT EXCEEDING 1" AFTER THE 30 DAY WAITING PERIOD WILL ALSO NOT BE MADE.

B. WICK DRAINS MAY BE UTILIZED TO ACCELERATE THE TIME RATE OF SETTLEMENT.

7. MAXIMUM DIFFERENTIAL SETTLEMENT FOR CSW'S IN THE LONGITUDINAL DIRECTION (ALONG THE WALL FACING) IS 0.5% FOR CONVENTIONAL MSE FACING PANELS AND 1.0% FOR SLIP-JOINTED PANELS. MAXIMUM DIFFERENTIAL SETTLEMENT FOR CSW'S IN THE TRANSVERSE DIRECTION (PERPENDICULAR TO THE WALL FACING) IS 1%.

8. AT A MINIMUM, THE CONTRACTOR SHALL PROVIDE TWO SURVEY POINTS FOR EVERY 50 FEET ALONG THE EMBANKMENT ALIGNEMENT, WITH ONE SURVEY POINT LOCATED ABOVE A COLUMN AND ONE SURVEY POINT LOCATED AT THE CENTROID OF A UNIT CELL FORMED BY THE CENTERS OF ADJACENT COLUMNS. DIFFERENTIAL SETTLEMENT BETWEEN UNIT CELL CONTROIDS AND ADJACENT CSW COLUMNS SHOULD NOT EXCEED *INCH.

9. THE CSW SYSTEM AND CONSTRUCTION PROCESSES SHALL NOT CAUSE ANY ADDITIONAL LOADING, DETRIMENTAL SETTLEMENT, OR DAMGE TO ADJACENT FACILITIES, UTILITIES, OR EMBANKMENTS.

B. THE DESIGN CONCEPT OF THE CSW INVOLVES CONSTRUCTING A PATTERN OF COLUMNS USING AN ACCEPTED SOIL IMPROVEMENT TECHNIQUE OF TRADITIONAL DEEP FOUNDATION ELEMENTS. DESIGN THE CSW SYSTEM TO EFFICIENTLY DISTRIBUTE EMBANKMENT AND WALL LOADS PLUS SURCHARGE LIVE AND DEAD LOADS. THE TYPE, NUMBER OF COLUMNS, SPACING, DIAMETER AND DEPTH SHALL BE DETERMINED BY THE CSW CONTRACTOR AND CSW DESIGNER. COLUMNS SHALL NOT BE LOCATED AT PROPOSED STRUCTURE PILE LOCATIONS.

1. THE CSW SYSTEM SHALL BE DESIGNED IN ACCORDANCE WITH FHWA RECOMMENDATIONS. THE FOLLOWING VARIABLES ARE USED IN THE CRITERIA BELOW:

S = COLUMN CENTER-TO-CENTER SPACING,
A = COLUMN WIDTH,
H = EMBANKMENT HEIGHT,
A(S) = AREA REPLACEMENT RATIO (COLUMN AREA DIVIDED BY COLUMN TRIBUTARY AREA),
T = COMPETENT LAYER THICKNESS.

NOTE THAT A COMPETENT LAYER IS DEFINED AS N ==10 BLOWS/FT FOR SANDS AND AN UNDRAINED SHEAR STRENGTH, SU ==500 PSF FOR CLAYS. A CONSERVATIVE, LOW AVERAGE, OF THE COMPETENT SOIL THICKNESS, T, SHOULD BE USED IN THE CRITERIA BELOW:

AT A MINIMUM, THE FOLLOWING CRITERIA SHALL BE SATISFIED:

A. THE MAXIMUM CENTER-TO-CENTER COLUMN SPACING, S, IS GIVEN BY THE RELATIONSHIP BELOW:

S =< MINIMUM OF (0.67H + α + 0.5) OR (1.23H - 1.20 α)

B. THE MINIMUM THICKNESS OF SELECT FILL FOR THE BRIDGING LAYER (LOAD TRANSFER PLATFORM) SHALL BE THE LARGER OF 2 FT OR 0.5(S - A).

C. THE CSW DESIGN CONCEPT SHALL INCLUDE THE DESIGN OF LOAD TRANSFER PLATFORMS, INCLUDING SELECT FILL AND GENERAL EMBANKMENT FILL MATERIALS, NUMBER OF REINFORCMENT LAYERS, TYPE OF REINFORCEMENT, AND PROPERTIES OF THE GEOSYNTHETIC REINFORCEMENT.

D. PRIOR TO SUBMITTING THE BID, THE CONTRACTOR AND CSW DESIGNER SHALL REVIEW THE AVAILABLE SUBSURFACE INFORMATION AND VISIT THE SITE TO ASSESS SITE GEOMETRY, CSW INSTALLATION METHOD VIABILITY, EQUIPMENT ACCESS CONDITIONS, AND LOCATION OF EXISTING STRUCTURES AND ABOVE GROUND UTLITIES AND FACILITIES.

1.2 GEOTECHNICAL ENGNIEER'S DESIGN CRITERIA FOR CSW

THE PURPOSE OF THE SUBGRADE IMPROVEMENT IS TO PROVIDE SUPPORT FOR MSE WALL E2 & E4 AND SUPPORT EMBANKMENTS. IT IS ANTICIPATED THAT THE CSW COLUMNS WILL EXTEND THROUGH THE VARIABLE FILL AND ALLUVIAL SOILS AND BEAR IN THE UNDERLYING GLACIAL TILL LAYERS.

SEE SHEET 843 FOR DESIGN CRITERIA TABLE.

1.3 CSW COLUMN TYPES AND MATERIALS

A. CSW COLUMN TYPES MAY INCLUDE, BUT ARE NOT LIMITED TO:

1. STEEL H PILES
2. STEEL PIPE PILES
3. PRE-CAST CONCRETE PILES
4. CONTINUOUS FLIGHT AUGER PILES (A.K.A. AUGERCAST PILES)
5. AGGREGATE COLUMNS (A.K.A. STONE COLUMNS)
6. RIGID INCLUSIONS
7. VIBRO-CONCRETE COLUMNS (VCC)
8. CONTROLLED MODULUS COLUMNS (CMC)

PART 2 MINIMUM CONTRACTOR QUALIFCATIONS

2.1 THE CONTRACTOR CONSTRUCTING THE CSW SYSTEM SHALL HAVE A MINIMUM 5+ YEARS EXPERIENCE INSTALLING GEOSYNTHETIC REINFORCEMENT AND THE COLUMN TYPE SUBMITTED IN THE CONTRACTOR'S BID PROPOSAL.

2.2 THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR THREE RECENT, SUCCESSFUL PROJECTS COMPLETED WITH SIMILAR SITE CONDITIONS AND IMPROVEMENT CRITERIA. THE CONTRACTOR SHALL PROVIDE NAMES AND CONTACT INFORMATION OF INDIVIDUALS WHO CAN ATTEST TO THE ADEQUACY OF THE WORK PERFORMED. THIS INFORMATION SHALL BE SUBMITTED IN THE CONTRACTOR'S BID PROPOSAL.

2.3 THE CONTRACTOR MUST A ASSIGN MANAGER WHO HAS BEEN RESPONSIBLE FOR THE CSW WORK ON AT LEAST THREE (3) PROJECTS. THE PROJECT MANAGER SHALL HAVE BEEN IN FULL-TIME EMPLOYMENT OF THE CONTRACTOR FOR AT LEAST TWO OF THOSE PROJECTS (PROVIDE A LIST OF PROJECTS AND DATES IN BID PROPOSAL). A DESIGNER THAT IS A CONSULTANT ON THIS PROJECT CANNOT BE THE PROJECT MANAGER.

2.4 THE CSW SYSTEM SHALL BE DESIGNED BY THE DESIGNER, A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF OHIO WITH EXPERIENCE IN THE DESIGN OF AT LEAST THREE SUCCESSFULLY COMPLETED CSW PROJECTS OVER THE PAST FIVE YEARS. THE DESIGNER MAY BE EITHER AN EMPLOYEE OF THE CONTRACTOR OR A SEPARATE CONSULTANT DESIGN ENGINEER MEETING THE STATED EXPERIENCE REQUIREMENTS.

2.5 THE CONTRACTOR MUST ASSIGN A FULL-TIME PROJECT SUPERINTENDENT WITH AT LEAST THREE (3) YEARS EXPERIENCE IN CSW CONSTRUCTION AND WHO HAS BEEN RESPONSIBLE FOR A MINIMUM OF THREE (3) CSW PROJECTS (PROVIDE A LIST OF PROJECTS AND DATES IN BID PROPOSAL).

2.6 WRITTEN REQUESTS FOR SUBSTITUTION OF THESE KEY PERSONNEL MUST BE SUBMITTED PRIOR TO PERSONNEL CHANGES. DOCUMENTATION MUST BE SUBMITTED TO THE ENGINEER THAT DEMONSTRATES THAT THE SUBSTITUTE MEETS THE REQUIREMENTS LISTED ABOVE.

REFERENCES:

A. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, 2020, AND CONSTRUCTION SPECIFICATIONS, 4TH EDITION, 2017, WITH 2020 INTERIMS.

B. FHWA NHI-16-027 AND 028, FHWA GEC 013 GROUND IMPROVEMENT METHODS: REFERENCE MANUAL VOLUMES I & II, APRIL 2017.

C. FHWA-NHI-16-009, FHWA GEC 012: DESIGN AND CONSTRUCTION OF DRIVEN PILE FOUNDATIONS VOLUMES I & II, 2016.

D. FHWA-RD-83-026 DESIGN AND CONSTRUCTION OF STONE COLUMNS, VOL. 1.

E. FHWA NHI-06-089 SOILS AND FOUNDATIONS REFERENCE MANUAL VOLUMES I & II, 2006.

F. FHWA GEC NO. 8 DESIGN AND CONSTRUCTION OF CONTINUOUS FLIGHT AUGER PILES, 2007.

G. ASTM D 6637 STANDARD TEST METHOD FOR DETERMINING TENSILE PROPERTIES OF GEOGRIDS BY THE SINGLE OR MULTI-RIB TENSILE METHOD.

H. ASTM D 4595 STANDARD TEXT METHOD FOR TENSILE PROPERTIES OF GEOTEXTILES BY THE WIDE-WIDTH STRIP METHOD

I. ASTM 5262 STANDARD TEST METHOD FOR EVALUATNG THE UNCONFINED TENSION CREEP AND RUPTURE BEHAVIOR OF GEOSYNTHETICS

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED CONTROLLED MODULUS COLUMNS NOTES TO COLUMN SUPPORTED WALLS	MMS	11/5/21
1	UPDATED SHEET TITLE	MMS	11/5/21

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DESIGNED	DRAWN	REVIEWED	DATE
MMS	MMS	NCK	6/23/2021
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JGM			

RETAINING WALL NOTES 5 OF 9 /1

RETAINING WALLS

I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS (WALL E4, W5)

PART 3 - EQUIPMENT

3.1 THE EQUIPMENT REQUIRED FOR COLUMN INSTALLATION WILL VARY DEPENDING ON THE COLUMN TYPE. EQUIPMENT FOR COLUMN INSTALLATION SHOULD MEET FHWA CRITERIA FOR THE TYPE OF COLUMN SELECTED.

3.2 EQUIPMENT FOR FILL AND GEOSYNTHETIC PLACEMENT SHALL NOT CAUSE EXCESSIVE LOADS OR SETTLEMENT TO THE SOFT GROUND BETWEEN COLUMNS.

PART 4 - LOAD TRANSFER PLATFORM (LTP) MATERIALS

4.1 LTP SELECT FILL SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS:

SIZE	% PASSING
4-INCH	100
NO. 4	15 - 70
NO. 40	10 - 60
NO. 200	5 - 15

4.2 THE SELECT FILL SHALL ALSO HAVE:

$$CC = \frac{D(30)^2}{D(60) \times D(10)} = 1 \text{ TO } 3$$

$$CU = \frac{D(60)}{D(10)} > 4$$

WHERE: CC = COEFFICIENT OF CURVATURE
CU = COEFFICIENT OF UNIFORMITY
D(10) = DIAMETER SIZE AT 10% PASSING
D(30) = DIAMETER SIZE AT 30% PASSING
AND, D(60) = DIAMETER SIZE AT 60% PASSING

4.3 SELECT FILL PASSING THE NO. 40 SIEVE SHALL HAVE A LIQUID LIMIT LESS THAN 40 AND A PLASTICITY INDEX LESS THAN 20.

4.4 THE ALLOWABLE STRENGTH OF THE GEOSYNTHETIC T(A) MUST BE EQUAL OF GREATER THAN THE REQUIRED STRENGHT T(G). ALLOWABLE TENSILE STRENGTH T(A) OF THE GEOSYNTHETICSHALL BE DETERMINED USING A REDUCTION FACTOR APPROACH TO ACCOUND FOR CREEP RUPTURE STRENGHT AND DEGRADATION MECHANISMS OF THE REINFORCEMENT. THE ALLOWABLE LONG-TERM GEOSYNTHETIC DESIGN TENSILE STRENGTH T(A) IS:

$$T(G) <= T(A) = \frac{T(ULT)}{RF(D)XRD(ID)XRF(CR)XFS(UNC)}$$

WHERE:

T(G) = REQUIRED STRENGTH OF GEOSYNTHETIC,
T(A) = ALLOWABLE TENSILE STRENGTH OF GEOSYNTHETIC,
T(ULT) = ULTIMATE TENSILE STRENGTH FROM SINGLE OR MULTI-RIB TENSILE STRENGTH TESTS (ASTM D6637) FOR GEOGRIDS OR WIDE WIDTH TENSILE STRENGTH TESTS (ASTM D4595) FOR GEOTEXTILES,
RD(D) = DURABILITY REDUCTION FACTOR IS DEPENDENT ON THE SUSCEPIBILITY OF THE GEOSYNTHETIC TO ATTACK BY MIRCOORGANISMS, CHEMICALS, THERMAL OXIDATION, HYDROLYSIS AND STRESS CRACKING. THE TYPICAL RANGE IS FROM 1.1 TO 2.0.
RF (ID) = INSTALLATION DAMAGE REDUCTION FACTOR CAN RANGE FROM 1.05 TO 3.0, DEPENDING ON BACKFILL GRADATION AND PRODUCT MASS PER UNIT WEIGHT.
RF(CR) = CREEP REDUCTION FACTOR IS THE RATION OF THE ULTIMATE STRENGTH T(ULT) TO THE CREEP LIMITED STRENGTH OBTAINED FROM LABORATORY CREEP TESTS FOR EACH PRODUCT, AND CAN VARY TYPICALLY FROM 1.65 TO 5.0.
FS(UNC) = OVERALL FACTOR OF SAFETY OR LOAD FACTOR REDUCTION TO ACCOUNT FOR UNCERTANTIES IN THE GEOMETRY OF THE STRUCTURE, FILL PROPERTIES, REINFORCEMENT PROPERTIES, AND EXTERNALLY APPLIED LOADS. FOR LOAD TRANSFER PLATFORMS, A MINIMUM OVERALL FACTOR OF SAFETY OF 1.5 IS TYPICAL.

THE SPECIFIC VALUES FOR THE REDUCTION FACTORS (RDF, RFID, RFCR) USED IN DESIGN SHALL BE THOSE ESTABLISHED BY THE NATIONAL TRANSPORTATION PRODUCT EVALUATION PROGRAM (NTPEP) AND CAN BE FOUND ONLINE AT:

HTTP://NTPEP.ORG/CONTENTMANAGEMENT/PAGEBOY.ASP?PAGE_ID=26

IF NTPEP REDUCTION FACTORS ARE NOT AVAILABLE FOR THE MANUFACTURER AND TYPE OF GEOSYNTHETIC PROPOSED BY THE DESIGNER, THEN THE VALUES USED SHALL BE THOSE RECOMMENDED BY THE GEOSYNTHETIC MANUFACTURER, SUPPORTED BY LABORATORY TESTING AND AS APPROVED BY THE ENGINEER.

4.5 IN ADDITION TO THE LONG TERM ALLOWABLE STRENGTH REQUIREMENT, THERE IS A SERVICEABILITY REQUIREMENT. FOR SERVICEABILITY, THE GEOSYNTHETIC MUST HAVE A CREEP LIMITED STRENGTH AT A STRAIN OF 5% ACCORDING TO ASTM D 5262 THAT IS EQUAL TO OR GREATER THAN THE REQUIRED STRENGTH T(G).

PART 5 - SUBMITTALS

5.1 FOLLOWING AWARD OF THE CONTRACT AND PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT DESIGNER-APPROVED DETAILS, SPECIFICATIONS, DRAWINGS, CONSTRUCTION SEQUENCES, DESIGN CALCULATIONS, QUALITY CONTROL PLAN, MONITORING PLAN, AND ANY OTHER REQUIRED INFORMATION FOR THE COLUMN-SUPPORTED WALL SYSTEM. THE ENGINEER SHALL REVIEW THE SUBMITTAL ITEMS FOR CONFORMANCE WITH THE PERFORMANCE SPECIFICATION. THE CONTRACTOR SHALL ALLOW A MINIMUM OF 30 DAYS FOR THE REVIEW OF THE INITIAL SUBMISSION AND SHALL ALSO ACCOUNT FOR THE SUBSEQUENT REVIEW AND ACCEPTANCE PROCESS WHICH WILL DEPEND ON THE ACCURACY AND QUALITY OF THE SUBMISSION DOCUMENTS.

5.2 THE FOLLOWING SHALL BE SUBMITTED TO THE ENGINEER AT LEAST 30 DAYS PRIOR TO BEGINNING WORK:

A. PROPOSED CSW CONSTRUCTION SEQUENCE AND SCHEDULE.

B. WORKING DRAWINGS AND DESIGN TO THE ENGINEER FOR REVIEW PRIOR TO STARTING THE WORK INDICATING THE EMBANKMENT DETAILS (MATERIAL TYPES, ELEVATIONS, GEOSYNTHETIC REINFORCEMENT, ETC.). COLUMN TYPE, COLUMN LAYOUT, COLUMN SIZE, SPACING OF COLUMNS, COLUMN TOP ELEVATIONS, AND THE DEPTH OF COLUMNS AS PROPOSED TO ACHIEVE THE CRITERIA OUTLINED IN THIS SPECIFICATION AND THE CONTRACT PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL LINES AND GRADES FOR COLUMNS, INCLUDING LOCATIONS OF ALL UTILITIES AND SURVEY MARKERS.

C. A CSW DEMONSTRATION COLUMN/LOAD TESTING PROGRAM TO DEMONSTRATE INSTALLATION TECHNIQUES AND COMPLIANCE WITH THE PERFORMANCE CRITERIA. THE LOAD TEST PROGRAM SHALL INCLUDE THE INSTALLATION OF TYPICAL UNIT CELLS OF THREE OR MORE COLUMNS OF THE SIZE, TYPE AND SPACING SPECIFIED BY THE CSW DESIGNER IN EACH STABILIZED ZONE IDENTIFIED IN DESIGN CRITERIA TABLE ON SHEET 843& PLAN SHEET 909K. PERFORM LOAD TEST IN ACCORDANCE WITH IN ACCORDANCE WITH ASTM D1143 (PILE LOAD TEST), AND ASTM D1194 (PLATE LOAD TEST) PROCEDURES AS APPROPRIATE AND ELALUATE AS FOLLOWS:

1. MEASURE VERTICAL SURFACE DEFLECTIONS BOTH OVER THE TEST COLUMN AND BETWEEN TEST COLUMNS BY A SUITABLE METHOD.

2. MEASURE DEFLECTIONS WITHIN TEST COLUMNS AT MAXIMUM 10-FOOT INTERVALS.

3. MEASURE DEFLECTIONS AT THE BOTTOM OF THE TEST COLUMN. PERFORMANCE WILL BE DEEMED ACCEPTABLE WHEN, AT A LOAD EQUAL TO 117 PERCENT OF THE DESIGN STRESS, DEFLECTION AT THE BOTTOM OF THE COLUMN DOES NOT EXCEED 20% OF THE DELFECTION AT THE TOP OF THE COLUMN.

4. CONDUCT THE TEST BASED ON THE LOAD INCREMENTS, DECREMENTS, AND DURATIONS PROVIDED IN THE FOLLOWING TABLE. MAINTAIN THE LOAD AT EACH INCREMENT UNTIL THE RATE OF DEFLECTION IS LESS THAN 0.01 INCHES PER HOUR OR UNTIL THE MAXIMUM TIME DURATION IS REACHED, WHICHEVER OCCURS FIRST.

LOAD INCREMENT	APPROXIMATE STRESS ON COLUMN (% OF DESIGN)	MINIMUM DURATION (MINUTES)	MAXIMUM DURATION (MINUTES)
SEATING LOAD*	<9	N/A	N/A
1	17	15	60
2	33	15	60
3	50	15	60
4	67	15	60
5	83	15	60
6	100	15	60
7	117	15	60
8	133	15	60
9	150	N/A	N/A
10	100	N/A	N/A
11	66	N/A	N/A
12	33	N/A	N/A
FULLY UNLOADED	0	N/A	N/A

*COMPENSATE FOR SURFICIAL DISTRUBANCE BY APPLYING A SEATING LOAD EQUAL TO OR LESS THAN 9 PERCENT OF THE DESIGN LOAD BEFORE APPLYING LOAD INCREMENTS.

5. COLUMNS SHALL HAVE SUFFICIENT STRENGTH AND STIFFNESS TO SATISFY BEARING CAPACITY AT 150 PERCENT OF THE DESIGN STRESS AND TO SATISFY SETTLEMENT CRITERIA IN SECTION 1.1 (PERFORMANCE CRITERIA) AT 100 PERCENT OF THE DESIGN STRESS.

A. IN THE EVENT THAT TEST COLUMNS FAIL TO COMPLY WITH THE DESIGN REQUIREMENTS, CONTRACTOR SHALL INSTALL ADDITIONAL TEST COLUMNS AND CONDUCT ADDITIONAL TESTS AT NO COST TO THE DEPARTMENT.

6. ANY PLANNED DEVIATIONS FROM THE ABOVE DESCRIBED LOAD TEST PROCEDURE MUST BE DESCRIBED IN THE CONTRACTOR'S DESIGN SUBMITTAL, APPROVED BY THE DESIGNER, AND ACCEPTED BY THE ENGINEER.

7. CONTRACTOR SHALL SUBMIT DESIGN CALCULATIONS FOR THE LOAD TEST REACTION ELEMENTS INCLUDING DIAMETER, TYPE, REINFORCEMENT, DEPTH AS WELL AS THE REACTION FRAME AND BEAMS FOR REVIEW BY THE ENGINEER. THE CONTRACTOR SHALL DESIGN THE REACTION PILES AND FRAME FOR MINIMUM ONE AND HALF TIMES THE MAXIMUM TEST LOAD. ALL SHOP DRAWINGS AND SUPPORTING SHOP DRAWINGS CALCULATIONS SHALL BE SIGNED AND SEALED BY PROFESSIONAL ENGINEER.

8. SUBMIT CALIBATION RECORDS FOR LOAD CELLS, HYDRAULIC JACKS, PUMPS AND PRESSURE GAUGES AT LEAST 7 DAYS PRIOR TO PERFORMING THE LOAD TESTS.

9. SUBMIT THE FOLLOWING TO THE ENGINEER AFTER THE LOAD TESTS ARE COMPLETED:

A. A REPORT DOCUMENTING THE OBSERVATIONS AND RESULTS OF ALL TESTS. THE REPORT WILL CERTIFY THAT THE REQUIRED BEARING RESISTANCE HAS BEEN ACHIEVED WITHIN THE SETTLEMENT TOLERANCES AS DETAILED IN SECTION 1.1 (PERFORMANCE CRITERIA).

B. AS-BUILT DRAWINGS INDICATING THE LOCATION, DIAMETER, TOP AND BOTTOM ELEVATIONS, AND IDENTIFICATION NUMBER FOR EACH CSW COLUMN.

10. CSW COLUMN PRODUCTION SHALL ONLY START UPON COMPLETION OF TWO LOAD TESTS AND AFTER THE ENGINEER ACCEPTS THE CSW DESIGNER'S FINAL TIP ELEVATION, INSTALLATION CRITERIA, AND SPACING OF COLUMNS.

D. LOAD TRANSFER PLATFORM SUBMITTALS

1. GRADATION, ATTERBERG LIMITS, AND THE RESULTING ODOT/AASHTO CLASSIFICATION FOR ALL FILL MATERIALS USED.

2. THE CONTRACTOR SHALL SUBMIT A CERTIFCATE STATING THAT THE GEOSYNTHETIC REINFORCEMENT MEETS THE DESIGN REQUIREMENTS FOR ULTIMATE STRENGTH, CREEP, DURABILITY, INSTALLATION DAMAGE, AND COEFFIENT OF INTERACTION FOR SLIDING IN ACCORDANCE WITH THE DESIGN SUBMITTAL.

E. A DETAILED WRITTEN PROCEDURE OF PLANS TO PROTECT ADJACENT FACILITIES AND EMBANKMENTS FROM DAMAGE, INCLUDING DESIGN CALCULATIONS. ADJACENT EXISTING STRUCTURES AND PAVEMENT MUST REMAIN IN SERVICE AT ALL TIMES, EXCEPT WHEN CLOSED PER MOT REQUIREMENTS.

5.3 ACCEPTANCE OF THE PROPOSED DESIGN AND CONSTRUCTION METHODOLOGIES SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR THE SAFETY OF THE METHOD OR EQUIPMENT USED OR THE RESPONSIBILITY OF CARRYING OUT THE WORK IN FULL ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

5.4 THE CONTRACTOR SHALL SUBMIT AS-BUILT DRAWINGS TO THE ENGINEER NO-LATER-THAN 30 DAYS FOLLOWING COMPLETION OF CONSTRUCTION.

PART 6 SPOIL HANDLING REQUIREMENTS

6.1 THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY TO PROPERLY HANDLE, STORE, TRANSPORT AND DISPOSE OF REGULATED MATERIALS INCLUDING ANY REQUIRED PERMITS, APPROVALS OR FEES WITHIN THE PROJECT LIMITS. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.

6.2 MAINTAIN RECORDS (SUCH AS MANIFESTS, LANDFILL TICKETS, DAILY LOGS, ETC.) TO DOCUMENT THE SOURCE, MOVEMENT AND DESTINATION OF EACH TRUCKLOAD OF SOLID WASTE OR REQULATED MATERIAL. ALL TRANSPORT VEHICLES USED FOR THE MOVEMENT OF REGULATED MATERIALS SHALL MEET ALL APPLICABLE LOCAL, STATE AND FEDERAL REQUIREMENTS. ONE COPY OF EACH RECORD SHALL BE SUBMITTED TO THE ENGINEER.

PART 7 CSW CONSTRUCTION AND QC / QA REQUIREMENTS

7.1 PRE-CONSTRUCTION MEETING: A PRE-CONSTRUCTION MEETING SHALL BE HELD AMONG THE ENGINEER, CONTRACTOR, AND DESIGNER PRIOR TO MOBILIZING EQUIPMENT TO THE PROJECT SITE. AT THE MEETING, THE COLUMN INSTALLATION MEANS/METHODS, OBSERVATION, ACCEPTANCE/REJECTION PROCEDURES, TESTING AND CSW CONSTRUCTION PROCEDURES SHALL BE DISCUSSED AND FORMALIZED.

7.2 WORKING DRAWINGS

A. THE CONTRACTOR SHALL PROVIDE WORKING DRAWINGS WHICH SHALL SHOW THE LOCATION OF EACH COLUMN, AS WELL AS THE TOP AND BOTTOM ELEVATIONS. EACH COLUMN SHALL BE IDENTIFIED WITH A REFERENCE NUMBER.

B. THE WORKING DRAWINGS SHALL ALSO PROVIDE DETAIL ON THE SELECT FILL, GEOSYNTHETIC REINFORCEMENT, AND GENERAL EMBANKMENT FILL. A DESIGNER-APPROVED SET OF WORKING DRAWINGS AND CONTRACT SPECIFICATIONS SHALL BE ON-SITE AT ALL TIMES DURING CONSTRUCTION OF THE LOAD TRANSFER PLATFORM.

7.3 SITE PREPARATION

A. THE CONTRACTOR SHALL ENSURE A FIRM WORKING PLATFORM ON WHICH HEAVY EQUIPMENT CAN BE OPERATED SAFELY UNDER ITS OWN POWER. THE WORK PLATFORM MUST COMPLY WITH ITEM 203.

B. THE CONTRACTOR SHALL ACCURATELY LOCATE THE LIMITS OF COLUMN INSTALLATION AND EMBANKMENT EXTENTS IN ACCORDANCE WITH THE CONTRACT PLANS.

C. THE CONTRACTOR SHALL EXERCISE CAUTION TO AVOID SETTLEMENT OR DAMAGE TO EXISTING FACILITIES AND SETTLEMENT, UNDERMINING, OR INSTABILITY TO EXISTING EMBANKMENTS.

D. STABILITY OF ALL THE TEMPORARY SHEETING AND/OR TEMPORARY SLOPES, IF USED TO FACILITATE INSTALLATION OF THE COLUMNS IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE CAUSED BY HIS ACTIVITIES AT NO ADDITIONAL COST TO THE DEPARTMENT.

E. THE CONTRACTOR SHALL EXERCISE CAUTION AND ACCOUNT FOR THE TEMPORARY INSTABILITY THAT MAY BE CAUSED BY GROUND IMPROVEMENT (IF USED) UNTIL THE GROUND IMPROVEMENT FEATURES GAIN STRENGTH WITH TIME.

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED CONTROLLED MODULUS COLUMNS NOTES TO COLUMN SUPPORTED WALLS	MMS	11/5/21
1	UPDATED SHEET TITLE	MMS	11/5/21

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DESIGNED MMS | DRAWN MMS | REVIEWED NCK 6/23/2021 | DATE | CHECKED JGM | REVISED | STRUCTURE FILE NUMBER

RETAINING WALL NOTES 6 OF 9
RETAINING WALLS
I-70/I-71 WEST INTERCHANGE PROJECT

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PID No. 105588

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7.4 CSW COLUMN TOLERANCES

A. THE CSW DESIGNER SHALL SPECIFY IN THE CONTRACTOR'S SUBMITTAL THE ALLOWABLE TOLERANCES FOR:

1. COLUMN VERTICALITY
2. HORIZONTAL TOLERANCE FROM PLAN LOCATION.
3. VERTICAL TOLERANCE FROM COLUMN TOP.
4. ACCEPTABLE CONDITION OF COLUMN TOPS PRIOR TO INSTALLATION OF LOAD TRANSFER PLATFORM.
5. MINIMUM COLUMN DIMENSIONS.
6. COLUMN OVERLAP REQUIREMENTS, IF APPLICABLE.
7. MINIMUM STRENGTH REQUIREMENTS OF COLUMN MATERIALS.
8. MATERIAL PROPERTIES, AS INCORPORATED INTO THE COLUMNS.
9. OTHER ITEMS, AS REQUIRED PER ODOT CMS.

B. BEFORE BEGINNING INSTALLATION, THE CONTRACTOR SHOULD ACCURATELY STAKE THE LOCATION OF THE CSW COLUMNS USING A LICENSED SURVEYOR. THE CONTRACTOR SHOULD PROVIDE AN ADEQUATE METHOD FOR LOCATING ELEMENTS TO ALLOW THE ENGINEER TO VERIFY THE AS-BUILT LOCATION OF THE ELEMENTS DURING CONSTRUCTION. THE CONTRACTOR WILL NOT BE COMPENSATED FOR ELEMENTS THAT ARE LOCATED OUTSIDE OF THE SPECIFIED TOLERANCES. IF THE ENGINEER DETERMINES THAT MISALIGNED ELEMENTS WILL INTERFERE WITH CONSTRUCTION, A METHOD OF CORRECTION SHOULD BE PREPARED BY THE CSW DESIGNER AND SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW AND ACCEPTANCE.

C. COLUMN ELEMENTS INSTALLED BEYOND THE MAXIMUM ALLOWABLE TOLERANCES SHALL BE ABANDONED AND REPLACED WITH NEW COLUMNS, UNLESS THE DESIGNER APPROVES THE CONDITION OR PRESCRIBES OTHER REMEDIAL MEASURES TO BE COMPLETED BY CONTRACTOR AND CSW DESIGNER. ALL MATERIAL AND LABOR REQUIRED TO REPLACE OR REMEDY REJECTED COLUMNS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE DEPARTMENT. REMEDIAL MEASURES MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW AND ACCEPTANCE.

7.5 AS-BUILT COLUMN INSTALLATION RECORDS: THE CONTRACTOR MUST SUBMIT AS-BUILT FIELD MEASUREMENT DATA INDICATING SURVEYED AS-BUILT PLAN LOCATIONS OF EACH CSW ELEMENT, INCLUDING THE ELEMENT CENTER (PER SITE SPECIFIC COORDINATES), THE ELEMENT DIMENSION, THE COLUMN VERTICALITY, AND THE TOP AND BOTTOM ELEVATIONS OF EACH ELEMENT TO THE ACCURACY REQUIRED BY THE PROJECT SPECIFICATIONS. THE AS-BUILT DOCUMENTATION MUST BE APPROVED BY THE DESIGNER AND SUBMITTED TO THE ENGINEER NO LATER THAN 90 DAYS AFTER THE COMPLETION OF EACH CSW-STABILIZED ZONE. A DISINCETIVE OF $300.00 PER DAY WILL BE ASSESSED FOR EACH DAY BEYOND 90 DAYS THAT THE COMPLETED AS-BUILT DRAWINGS ARE NOT SUBMITTED TO THE ENGINEER.

7.6 SELECT FILL PLACEMENT AND QA/QC REQUIREMENTS (LOAD TRANSFER PLATFORMS)

A. NO GEOSYNTHETIC REINFORCEMENT OR FILL MATERIALS SHALL BE PLACED PRIOR TO SATISFYING THE COLUMN PERFORMANCE CRITERIA, UNLESS THE FILL MATERIAL IS REQUIRED AS A WORKING PLATFORM FOR COLUMN INSTALLATION.

B. INSTRUMENTATION FOR PERFORMANCE MEASUREMENTS AND INSTRUMENTATON FOR MONITORING OF EXISTING STRUCTURES AND EMBANKMENTS SHALL BE INSTALLED PRIOR TO PLACEMENT OF ANY SELECT FILL OR GEOSYNTHETIC REINFORCEMENT.

C. PRIOR TO CONSTRUCTION OF THE LOAD TRANSFER PLATFORM, THE CONTRACTOR SHALL PREPARE SUBGRADE, AND REMOVE ANY DELETERIOUS MATERIALS SUCH AS TREE ROOTS. THE FOUNDATION SOIL SHALL BE OBSERVED AND APPROVED BY THE ENGINEER PRIOR TO PLACEMENT OF SELECT REINFORCED FILL.

D. IF CEMENTITIOUS GROUND IMPROVEMENT METHODS ARE USED, PLACEMENT OF FILL MATERIAL SHALL NOT START UNTIL THE COLUMNS HAVE GAINED ADEQUATE STRENGTH TO SUPPORT THE FILL MATERIALS AND FILL INSTALLATION AND CONSTRUCTION EQUIPMENT.

E. SELECT REINFORCED FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT EXCEEDING 10 IN. IN UNCOMPACTED THICKNESS FOR HEAVY COMPACTION EQUIPMENT. FOR ZONES WHERE COMPACTION IS ACCOMPLISHED WITH HAND-OPERATED COMPACTION EQUIPMENT, FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT EXCEEDING 6 IN. IN UNCOMPACTED THICKNESS.

F. SELECT REINFORCED FILL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH ITEM 203. THIS MAY NOT BE ACHIEVABLE FOR THE FIRST LIFT OF FILL BECAUSE OF THE WEAK SUBGRADE BETWEEN COLUMNS, HOWEVER, SUBSEQUENT LIFTS SHOULD MEET THE MINIMUM REQUIREMENTS.

G. TEST METHODS AND FREQUENCY, AND VERIFICATION OF MATERIAL SPECIFICATIONS AND COMPACTION, SHALL BE THE RESPONSIBILITY OF THE STATE.

7.7 GEOSYNTHETIC REINFORCEMENT PLACEMENT AND QA/QC REQUIREMENTS

A. PLACE REINFORCEMENT AT THE LOCATIONS AND ELEVATION SHOWN ON THE CONTRACTORS WORKING DRAWINGS. NO CHANGES TO THE GEOSYNTHETIC REINFORCEMENT LAYOUT, INCLUDING, BUT NOT LIMITED TO LENGTH, REINFORCEMENT TYPE (I.E., STRENGTH), DIRECTION OF REINFORCEMENT, OR ELEVATION SHALL BE MADE WITHOUT THE EXPLICIT WRITTEN APPROVAL OF THE DESIGNER. CONTRACTOR SHALL SUBMIT THE CHANGES TO THE ENGINEER FOR ACCEPTANCE.

B. CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOSYNTHETIC REINFORCEMENT. A MINIMUM FILL THICKNESS OF 150 MM (6 IN.) IS REQUIRED FOR OPERATION OF VEHICLES OVER THE REINFORCEMENT. TURNING OF VEHICLES SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS OR TIRES FROM DISPLACING THE FILL AND/OR GEOSYNTHETIC REINFORCEMENT.

C. MINIMUM OVERLAP OF ADJACENT ROLLS OF REINFORCEMENT SHALL BE AS INDICATED BY THE DESIGNER OF THE CONTRACTOR'S WORKING DRAWINGS.

D. EACH ROLE OF GEOSYNTHETIC REINFORCEMENT SHOULD BE INSPECTED BY THE CONTRACTOR TO ENSURE THAT IT IS UNDAMAGED PRIOR TO COVERING WITH FILL MATERIAL.

E. CARE SHALL BE TAKEN TO PREVENT EXCESSIVE MUD, WET CONCRETE, EPOXY, OR OTHER DELETERIOUS MATERIALS FROM COMING IN CONTACT WITH AND AFFIXING TO THE GEOGRID MATERIALS.

F. GEOSYNTHETIC REINFORCEMENT SHALL BE STORED AT TEMPERATURES ABOVE -20 DEGREES F (- 29 DEGREES C).

G. GEOSYNTHETIC REINFORCEMENT SHALL NOT BE LEFT DIRECTLY EXPOSED TO SUNLIGHT FOR A PERIOD LONGER THAN RECOMMENED BY THE MANUFACTURER OR ONE MONTH WHICHEVER IS SHORTER.

H. ANY ROLL OR PORTION OF A ROLL OF GEOSYNTHETIC DAMAGED BEFORE, DURING, AND/OR AFTER INSTALLATION SHALL BE REPLACED BY THE CONTRACTOR.

I. LARGE PILES OF FILL MATERIAL SHALL NOT BE PLACED ON THE GEOSYNTHETIC REINFORCEMENT.

J. IF GEOTEXTILE SEAMS ARE SPECIFIED, THE SEAMS SHOULD BE PLACED UP AND EVERY STITCH SHOULD BE INSPECTED.

K. THE CONTRACTOR SHALL REMOVE SLACK AND WRINKLES FROM THE GEOSYNTHETIC PRIOR TO PLACING FILL.

L. THE CONTRACTOR SHALL SUBMIT THE LOT NUMBERS AND ROLL NUMBERS ALONG WITH THEIR LOCATIONS WITHIN THE EMBANKMENT FOR ALL GEOSYNTHETIC REINFORCEMENT.

PART 8 POST-INSTALLATION PERFORMANCE MONITORING INSTRUMENTATION

8.1 POST-INSTALLATION PERFORMANCE MONITORING INSTRUMENTATION: TEN (10) SETS OF CSW PERFORMANCE MONITORING INSRUMENTATION SHALL BE INSTALLED. THIS INSTRUMENTATION WILL BE PLACED TO MONITOR THE PERFORMANCE OF THE CSW SYSTEM AFTER IT HAS BEEN SUCCESSFULLY CONSTRUCTED AND IS SUBJECTED TO THE CONSTRUCTION LOADING AND SUBSEQUENT SERVICE LOADING. THE INSTALLATION MAY BE PERFORMED BY THE PRIME CONTRACTOR, THE CONTRACTOR, OR AN INSTRUMENTATION SUBCONTRACTOR OR CONSULTANT (OR IN WHOLE OF IN PART BY COMBINATIONS THEREOF). IMPORTANT NOT: IN THE EVENT THAT THIS QA MONITORING WORK IS NOT TO BE COORDINATED OR PERFORMED BY THE CSW CONTRACTOR, THE CSW CONTRACTOR SHALL BE REQUIRED TO SPECIFICALLY COORDINATE THIS WORK AND SUBMIT A WORK PLAN TO THE ENGINEER PRIOR TO INITIATING THE CSW WORK.

A. THE INSTRUMENT SHALL BE INSTALLED AS DESCRIBED IN THE FOLLOWING SUBSECTIONS, IN AREAS TOP BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER SUCH THAT CONSTRUCTION INTERFERENCE AND THE POTENTIAL FOR DAMAGE IS MINIMIZED. THE INSTALLATIONS SHALL ALSO BE PLACED SUCH THAT DATA MAY CONTINUE TO BE ACQUIRED ONCE THE FACILITY HAS BEEN PLACED IN SERVICE. DETAILS OF THE EXACT INSTALLATION LOCATIONS WILL BE DETERMINED AT THE PRE-CONSTRUCTION MEETING.

B. MINIMUM INSTRUMENTATION PROVIDED BY THE CONTRACTOR IS TO CONSIST OF:

1. SETTLEMENT PLATES, TO BE INSTALLED ON TOP OF THE LOAD/TRANSFER PLATFORM.

2. PIEZOMETERS TO MONITOR PORE PRESSURES BENEATH THE MSE WALLS AND EMBANKMENTS IN THE STABILIZED ZONE.

C. CONTRACTOR SHALL INSTRUMENTATION DATA FROM THE TIME OF INSTALLATION (END OF CSW CONSTRUCTION) UNTIL 30 DAYS AFTER THE WALLS REACH THEIR FINAL PLAN ELEVATION (LESS COPING AND PAVEMENTS). READINGS SHALL BE TAKEN TWICE WEEKLY DURING WALL AND EMBANKMENT FILL PLACEMENT AND AT INTERVALS NOT TO EXCEED 15 CALENDAR DAYS AT OTHER TIMES. DATA FROM ALL SENSORS SHALL BE READ IN A UNIFORM MANNER, SUCH THAT ALL DATA IS TAKEN WITHIN A 2-DAY PERIOD AT THE 15 (OR 30) DAY INTERVALS TO AID IN THE EVALUATION OF THE DATA AND SUBSEQUENT PRESENTATION OF RESULTS.

D. IF THE WALLS SUPPORTED OVER THE CSW ELEMENTS HAVE COMPLETED SETTLEMENT IN ACCORDANCE WITH THE PERFORMANCE CRITERIA WITHIN 30 DAYS OF SUBSTANTIAL WALL COMPLETION AS DEFINED IN 7.1.C ABOVE, THE CONTRACTOR MAY TURN OVER FURTHER MONITORING OF THE DATA TO THE DEPARTMENT. IF THE WALLS HAVE NOT COMPLETED SETTLEMENT IN ACCORDANCE WITH THE DESIGN CRITERIA, THE CONTRACTOR SHALL CONTINUE MONITORING EFFORTS (AT NO ADDITIONAL COST TO THE DEPARTMENT) AS DIRECTED BY THE ENGINEER.

E. INSTRUMENTATION SHALL BE INSTALLED AFTER THE CONSTRUCTION OF THE CSW ELEMENTS WITHIN THE IN-SITU SOILS AND PRIOR TO MSE WALL CONSTRUCTION OR EMBANKMENT FILL PLACEMENT. A MINIMUM OF 2 SETS OF BASELINE READINGS SHALL BE TAKEN AND CONFIRMED PRIOR TO THE CONSTRUCTION OF ELEMENTS ABOVE THE INSTALLED CSW CONSTRUCTION.

F. INSTRUMENTATION SHALL BE ELECTRONIC AND SELF-RECORDING, WHERE PRACTICAL. READINGS FROM SENSORS SHALL BE TAKEN WITH AUTOMATED DATA COLLECTION SYSTEMS. ANY PARTICULAR INSTRUMENT TYPE SHALL BE OBTAINED FROM THE SAME MANUFACTURER TO MINIMIZE POTENTIAL INCOMPATIBILITIES AND ERRORS. DATA ACQUISITION DEVISES (DATA LOGGERS) SHALL BE OF A TYPE COMPATIBLE WITH EACH TYPE OF INSTRUMENTATION AND RECOMMENDED BY THE MANUFACTURER.

H. ALL INSTRUMENTATION AND ASSOCIATED MONITORING AND DATA COLLECTION DEVICES (PROBES, CABLES, DATA COLLECTORS, ETC.) BECOME THE PROPERTY OF THE DEPARTMENT AT THE END OF THE MONITORING PERIOD. ELECTRONIC FILES AND ALL DATA REPORTS SHALL BE PROVIDED TO THE DEPARTMENT AT THE END OF THE MONITORING PERIOD.

I. THE DEPARTMENT RESERVES THE RIGHT TO PUBLISH THE INFORMATION FROM THE MONITORING INVESTIGATION IN INTERNAL AND EXTERNAL TECHNICAL PUBLICATIONS.

J. THE PERFORMANCE MONITORING INSTRUMENTATION AND ASSOCIATED DATA COLLECTION AND ANALYSIS SHALL NEITHER BE USED AS A BASIS OF PAYMENT NOR AS A PERFORMANCE CRITERIA FOR THE DETERMINATION OF SUCCESSFUL INSTALLATION OF THE CSW APPLICATION.

K. INSTRUMENTS SHALL MEET ACCEPTED INDUSTRY STANDARDS AND HAVE AN ACCURACY OF +/- 0.5% WITH A MINIMUM PRECISION OF +/- 0.5% OF FULL SCALL (SPAN).

L. INSTRUMENTS SHALL HAVE APPROPRIATE RUGGEDNESS TO SURVIVE INSTALLATION AND CONSTRUCTION PROCESSES SUCH THAT THEY READ WITH THE MINIMUM PRECISION AND ACCURACY OVER THE DURATION OF CONSTRUCTION AND A MINIMUM OF EIGHTEEN (18) MONTHS OF SERVICE FOLLOWING CONSTRUCTION.

M. INSTRUMENTATION SHALL HAVE AN OPERATING TEMPERATURE RANGE AS APPROPRIATE FOR CONDITIONS ANTICIPATED WHERE INSTALLED (I.E. WITHIN OR ABOVE A CSW ELEMENT).

N. CABLING TO EACH SENSOR (REQUIRING CABLING) SHALL BE INCLUDED SUCH THAT DATA MAY BE OBTAINED AT ALL PHASES OF CONSTRUCTION AND WHEN THE NEW CONSTRUCTION IS IN SERVICE. THE DISTANCE FROM THE DATA ACQUISITION SYSTEM TO ANY GIVEN SENSOR SHALL BE A MINIMUM HORIZONTAL DISTANCE FROM THE SENSOR TO THE OUTSIDE OF THE NEAREST RETAINING WALL OR ABUTMENT FACE, PLUS A MINIMUM CABLING AMOUNT TO PROVIDE FOR ANY NECESSARY VERTICAL TRAVEL TO THE GROUND SURFACE, PLUS 6 FT.

O. THE INSTRUMENTATION INSTALLATIONS SHALL BE ADEQUATELY PROTECTED FROM CONSTRUCTION IMPACTS, DURING CONSTRUCTION, AS WELL AS WEATHER EFFECTS, AND VANDALISM. APPROPRIATE LOCKED CASINGS AND/OR REMOVABLE CABLING AND PLASTIC CONNECTOR CAPS AND RELATED PROTECTIVE DEVICES SHALL BE PROVIDED TO ENSURE THE INTEGRITY OF THE INSTRUMENTATION OVER THE PROPOSED MONITORING DURATION.

P. THE PLAN FOR INSTALLATION OF INSTRUMENTATION SHALL BE APPROVED BY THE DESIGNER AND SUBMITTED TO THE ENGINEER FOR ACCEPTANCE PRIOR TO PLACEMENT.

PART 9 ACCEPTANCE CRITERIA

9.1 ACCEPTANCE CRITERIA: THE COLUMN-SUPPORTED EMBANKMENT IS CONSIDERED ACCEPTABLE WHEN THE EMBANKMENT CONSTRUCTION AND QC/QA REQUIREMENTS ARE COMPLETED IN ACCORDANCE WITH SECTION 6, COMPLIANCE WITH THE PERFORMANCE CRITERIA FROM PARAGRAPH 1.1 IS DEMONSTRATED, AND NO DAMAGE TO ADJACENET FACILITIES IS FOUND OR COMPENSATION IS MADE FOR DAMAGED CAUSED OR DAMAGE IS REPAIRED AT CONTRACTOR'S EXPENSE.

PART 10 CSW PAYMENT

10.1 ALL COST IN CONNECTION WITH MOBILIZATION AND DEMOBILIZATION OF MATERIALS, EQUIPMENT AND LABOR FOR THE CONSTRUCTION OF COLUMN-SUPPORTED WALLS (CSW) AS REQUIRED IN THIS SPECIFICATION, SHALL BE IN PAID FOR UNDER ITEM 203 - ROADWAY MISC; COLUMN SUPPORTED WALLS.

10.2 ALL COST IN CONNECTION WITH DESIGN, EQUIPMENT, MATERIAL, AND LABOR FOR THE INSTALLATION OF COLUMN-SUPPORTED WALLS (CSW), INCLUDING COLUMN MATERIALS AND CONSTRUCTION, QC MONITORING, INSTRUMENTATION, WORKING AND LOAD TRANSFER PLATFORM MATERIALS, WICK DRAINS IF NECESSARY TO MEET SETTLEMENT REQUIREMENTS, AND THE GEOSYNTHETIC REINFORCEMENTS AS REQUIRED IN THIS SPECIFICATION, SHALL BE INCIDENTAL TO ITEM-203. SEPARATE PAYMENT WILL NOT BE MADE FOR SITE PREPARATION, DEWATERING, TEMPORARY WORKS TO FACILITATE CONSTRUCTION, ETC. INCLUDE ALL THE ANTICIPATED COSTS IN PRICE BID FOR ITEM 203 - ROADWAY, MISC.: COLUMN SUPPORTED WALLS. GROUND IMPROVEMENT AREAS HAVE BEEN DEFINED IN THE PLANS FOR BIDDING PURPOSES. ADDITIONAL COLUMN SUPPORTS SHALL BE PROVIDED AS NECESSARY BEYOND THE DEFINED AREAS TO SATISFY GLOBAL STABILITY AND SHALL BE INCIDENTAL TO THIS ITEM.

10.3 ALL COSTS ASSOCIATED WITH THE INSTALLATION OF TEST COLUMNS, REACTION FRAMES, INSTRUMENTATION, PERFORMANCE, ANALYSIS, AND REPORTING OF TEST RESULTS TO ENGINEER SHALL BE INCLUDED IN UNIT BID FOR ITEM - 203, ROADWAY, MISC.: COLUMN SUPPOPRTED WALLS.

10.4 THE TERMS CSW AND COLUMN SUPPORTED WALLS SHALL BE USED INTERCHANGEABLY THROUGHOUT THE PLANS.

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED CONTROLLED MODULUS COLUMNS NOTES TO COLUMN SUPPORTED WALLS	MMS	11/5/21
1	UPDATED SHEET TITLE	MMS	11/5/21

RESOURCE INTERNATIONAL INC.
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(614) 823-4949

DESIGNED MMS | DRAWN MMS | REVIEWED NCK | DATE 6/23/2021
CHECKED JGM | REVISED | STRUCTURE FILE NUMBER

RETAINING WALL NOTES 7 OF 9
RETAINING WALLS
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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MSE WALL DESIGN CRITERIA:

THE FACTORED BEARING RESISTANCE FOR EACH MSE WALL IS LISTED IN THE TABLE BELOW:

RETAINING WALL DESIGN CRITERIA										
WALL LOCATION	DESCRIPTION	WALL LIMITS			WALL TYPE	BACKFILL TYPE	FOUNDATION TREATMENT 1	BEFORE GROUND IMPROVEMENT	REQUIRED AFTER GROUND IMPROVEMENT	MIN. REINF. LENGTH
		ALIGNMENT	FROM STA.	TO STA.						
E4	WALL SECTION SUPPORTING RAMP D7 ROADWAY WEST OF SHORT STREET	B/L WALL E4	400+97.98	401+63.98	MSE	SGE	CSW	2.26	6.63	0.70 X H
	WALL SECTION SUPPORTING FORWARD ABUTMENT OF BRIDGE NO. FRA-70-1373B (RAMP D7 OVER SHORT STREET)		401+63.98	402+01.65	MSE	SGE	CSW	2.41	7.00	0.70 X H
	WALL SECTION SUPPORTING RAMP D7 ROADWAY WEST OF SHORT STREET		402+01.65	404+12.96	MSE	SGE	CSW	2.26	6.63	0.70 X H
E5	WALL SECTION SUPPORTING RAMP D7 ROADWAY EAST OF SHORT STREET	B/L WALL E5	501+18.34	503+39.67	MSE	SGE	NONE	31.08	N/A	0.70 X H
	WALL SECTION SUPPORTING RAMP D7 ROADWAY EAST OF SHORT STREET		503+95.83	506+11.80	MSE	SGE	NONE	31.08	N/A	0.70 X H
E7	WALL SECTION SUPPORTING RAMP D6 ROADWAY EAST OF SHORT STREET (STANDARD MSE WALL)	B/L WALL E7	700+37.95	702+20.00	MSE	SGE	NONE	42.48	N/A	0.70 X H
	WALL SECTION SUPPORTING RAMP D6 ROADWAY EAST OF SHORT STREET (CELLULAR CONCRETE MSE WALL)		702+20.00	703+00.00	MSE	CCF	NONE	37.92	N/A	0.70 X H
	WALL SECTION SUPPORTING RAMP D6 ROADWAY EAST OF SHORT STREET (GEOFOAM/CELLULAR CONCRETE MSE WALL)		703+00.00	704+21.44	MSE	CCF & GEOFOAM	NONE	37.92	N/A	0.70 X H
	WALL SECTION SUPPORTING RAMP D6 ROADWAY EAST OF SHORT STREET (CELLULAR CONCRETE MSE WALL)		704+21.44	704+66.26	MSE	CCF	NONE	4.23	N/A	0.70 X H
	WALL SECTION SUPPORTING FORWARD ABUTMENT OF BRIDGE NO. FRA-71-1503L (I-71 SOUTHBOUND BRIDGE)		704+66.26	705+60.87	MSE	CCF	NONE	4.23	N/A	0.70 X H
E10	WALL SECTION SUPPORTING SOUTH SIDE OF I-71 SOUTHBOUND (CELLULAR CONCRETE MSE WALL)	B/L I-71 SB	277+55.02	377+97.84	MSE	CCF	NONE	4.49	N/A	0.70 X H
	WALL SECTION SUPPORTING SOUTH SIDE OF I-71 SOUTHBOUND (GEOFOAM/CELLULAR CONCRETE MSE WALL)		377+97.84	379+50.82	MSE	CCF & GEOFOAM	NONE	4.49	N/A	0.70 X H
	WALL SECTION SUPPORTING SOUTH SIDE OF I-71 SOUTHBOUND (CELLULAR CONCRETE MSE WALL)		379+50.82	380+20.00	MSE	CCF	NONE	4.49	N/A	0.70 X H
	WALL SECTION SUPPORTING SOUTH SIDE OF I-71 SOUTHBOUND (STANDARD MSE WALL)		380+20.00	383+35.41	MSE	SGE	NONE	5.36	N/A	0.70 X H
W2	WALL SUPPORTING ROADWAY EMBANKMENT ALONG WEST SIDE OF RAMP C3 AND I-71 SOUTHBOUND	B/L WALL W2	200+00.00	203+00.00	MSE	SGE	NONE	8.51	N/A	0.70 X H
			203+00.00	219+38.65	MSE	SGE	NONE	17.88	N/A	0.70 X H
W3	WALL SUPPORTING RAMP C3	B/L WALL W3	300+00.00	307+75.00	MSE	SGE	NONE	8.39	N/A	0.95 X H
			307+75.00	308+69.19	MSE	SGE	CSW	7.90	8.31	1.1 X H
W5	WALL SUPPORTING ROADWAY EMBANKMENT ALONG EAST SIDE OF I-71 SOUTHBOUND	B/L WALL W5	500+00.00	507+00.00	MSE	SGE	NONE	8.70	N/A	0.70 X H
			507+00.00	508+50.00	MSE	SGE	CSW	8.72	N/A*	0.80 X H
			508+50.00	509+85.33	MSE	SGE	CSW	10.39	N/A*	0.80 X H
	WALL SECTION SUPPORTING REAR ABUTMENT OF BRIDGE NO. FRA-71-1503L (I-71 SOUTHBOUND BRIDGE)		509+85.33	510+30.62	MSE	SGE	CSW	11.52	N/A*	0.88 X H
	WALL SUPPORTING ROADWAY EMBANKMENT ALONG EAST SIDE OF RAMP C3		600+19.08	601+17.17	MSE	SGE	CSW	7.90	8.31	1.1 X H
			601+17.17	607+00.00	MSE	SGE	NONE	7.81	N/A	1.4 X H
			607+00.00	607+64.59	MSE	SGE	NONE	4.39	N/A	1.30 X H

THE FOUNDATION SOIL SHALL BE EVALUATED BY THE GEOTECHNICAL ENGINEER OF RECORD DURING CONSTRUCTION TO DETERMINE SUITABILITY FOR SUPPORT OF THE APPLIED BEARING STRESSES.

PROVIDE MINIMUM SOIL REINFORCEMNT LENGTH EQUAL TO THE GREATER OF 8 FEET OR THE VALUE SPECIFIED IN THE ABOVE TABLE, ACCORDING TO SUPPLEMENTAL SPECIFICATION 840.04.

H = WALL HEIGHT AS DEFINED ACCORDING TO SUPPLEMENTAL SPECIFICATION 840.04.

* - GROUND IMPROVEMENT PROVIDED FOR LIMITING THE GROUND SETTLEMENT WITHIN TOLERANCE LIMITS.

NO.	DESCRIPTION	REV. BY	DATE
1	CHANGED CMC TO CSW	MMS	11/5/21
1	UPDATED SHEET TITLE	MMS	11/5/21

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DESIGNED MMS | DRAWN MMS | REVIEWED NCK | DATE 6/23/2021
CHECKED JGM | REVISED | STRUCTURE FILE NUMBER

1 RETAINING WALL NOTES 8 OF 9

RETAINING WALLS
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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GENERAL NOTES

ITEM SPECIAL - SETTLEMENT PLATFORMS:

SETTLEMENT PLATFORMS SHALL BE PLACED AT THE BOTTOM OF THE MSE WALL AT THE LOCATIONS INDICATED BELOW, UNLESS OTHERWISE DIRECTED BY ODOT.

CONTRACTOR HAS THE OPTION OF USING EITHER STEEL OR PLYWOOD PLATFORM BASE.

CONTRACTOR SHALL FURNISH MATERIALS AND LABOR TO EXTEND PIPE THROUGH ENTIRE FILL.

SETTLEMENT PLATFORMS SHALL BE ANCHORED BY STAKES DRIVEN AT EACH CORNER TO PREVENT OVERTURNING.

SPECIFICATIONS:

DESCRIPTION:
THIS ITEM CONSISTS OF FURNISHING, CONSTRUCTING, AND MAINTAINING SETTLEMENT PLATFORMS AND OBTAINING SETTLEMENT READINGS AS REQUIRED BY THE PLANS OR AS DIRECTED BY THE ENGINEER. AT THE OPTION AND EXPENSE OF THE CONTRACTOR, ADDITIONAL SETTLEMENT PLATFORMS MAY BE INSTALLED AT ADDITIONAL LOCATIONS.

SETTLEMENT READINGS SHALL BE TAKEN WEEKLY DURING CONSTRUCTION AND DURING ANY SPECIFIED WAITING PERIOD. THE READINGS SHALL BE PLOTTED UTILIZING THE SETTLEMENT PLATFORM READINGS EXCEL SPREADSHEET AS DEVELOPED BY ODOT'S OFFICE OF GEOTECHNICAL ENGINEERING. A COPY OF EACH CUMULATIVE PLOT SHALL BE SENT TO ODOT, AFTER EACH SETTLEMENT READING IS RECORDED.

VIBRATING WIRE SETTLEMENT MONITORING PLATFORMS MAY BE CONSIDERED IN LIEU OF THE CONVENTIONAL SETTLEMENT PLATFORMS. THE CONTRACTOR SHOULD PROVIDE DETAILS OF THE PROPOSED VIBRATING WIRE SETTLEMENT PLATFORMS AS WELL AS DESIGN DRAWINGS OF THE PROPOSED PLATFORM AND CABLING LAYOUT TO ODOT AT LEAST 14 DAYS PRIOR TO CONSTRUCTION.

THE DESIGN DRAWINGS SHOULD ILLUSTRATE THE PROPOSED SETTLEMENT VIBRATING WIRE SETTLEMENT PLATFORM LOCATIONS WITH ALL EXISTING AND PROPOSED SITE FEATURES TO VERIFY THE PROPOSED CABLING WILL NOT CONFLICT WITH EXISTING FACILITIES, PROPOSED FACILITIES OR UTILITIES.

THE CONTRACTOR SHALL IDENTIFY, SET AND MAINTAIN AN APPROPRIATE NUMBER OF FIXED BENCHMARKS, REFERENCE POINTS, ETC. TO FACILITATE THE SURVEYING OF THE SETTLEMENT PLATFORMS.

MATERIALS:
SOUND LUMBER SUCH AS ¾" EXTERIOR GRADE PLYWOOD SHALL BE USED FOR THE BASE. THE PIPE SHALL BE 2-½" STANDARD BLACK PIPE WITH THREADED FITTINGS AS SHOWN ON THE PLANS. A STEEL PLATE 3'-0"x 3'-0"x⅛" MAY BE SUBSTITUTED FOR THE LUMBER, AT THE CONTRACTOR'S OPTION.

CONSTRUCTION METHODS: THE PLATFORM SHALL CONFORM TO THE DETAILS SHOWN ON THE PLANS. IF EXISTING PAVEMENT IS ENCOUNTERED AT THE SPECIFIED LOCATIONS, THE PAVEMENT (INCLUDING ANY BASE MATERIAL) SHALL BE REMOVED AND THE SETTLEMENT PLATFORM SHALL BE SET ON THE EXPOSED SUBGRADE. THE PLATFORM SHALL BE SET ON A LEVEL SURFACE. THE PIPE SHALL BE FIRMLY SECURED TO THE PLATFORM AND SHALL BE MAINTAINED IN A PLUMB POSITION DURING CONSTRUCTION OF THE MSE WALL. THE PIPE SHALL BE MARKED AT INTERVALS TO FACILITATE MEASUREMENT OF THE DEPTH OF FILL.

THE CONTRACTOR SHALL PROTECT SETTLEMENT PLATFORMS FROM CONSTRUCTION TRAFFIC/ACTIVITIES USING APPROPRIATE METHODS SUCH AS BARRICADES, CONES, GUARD-STAKES WITH HIGH VISIBILITY RIBBON, ETC. THE CONTRACTOR SHALL STOP WORK IN ANY LOCATION WHERE THE SETTLEMENT PLATFORM HAS BEEN DISTURBED OR DAMAGED. PLATFORMS OR PIPES DAMAGED OR DISPLACED DURING CONSTRUCTION SHALL BE RESTORED TO THEIR PROPER CONDITION.

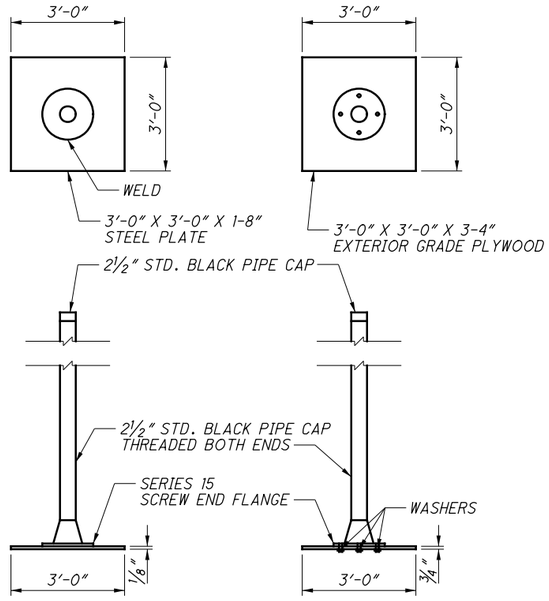
PRIOR TO PAVING: THE TOP OF THE SETTLEMENT PLATFORM PIPE SHALL BE CUT OFF TWO FEET BELOW THE FINISHED SURFACE OF THE SUBGRADE OR FINISHED GROUND SURFACE. WHICHEVER IS APPLICABLE.

ITEM SPECIAL - SETTLEMENT PLATFORMS (CONTINUED):

WAITING PERIOD:
SEE PILE DRIVING CONSTRAINTS NOTES FROM STRUCTURE GENERAL NOTES SHEET FOR MORE INFORMATION REGARDING WAITING PERIOD.

METHOD OF MEASUREMENT:
THE DEPARTMENT WILL MEASURE SETTLEMENT PLATFORMS BY THE NUMBER EACH, COMPLETE IN PLACE.

BASIS OF PAYMENT:
THE UNIT PRICE BID FOR ITEM SPECIAL - SETTLEMENT PLATFORM SHALL INCLUDE FURNISHING, CONSTRUCTING, AND MAINTAINING SETTLEMENT PLATFORMS AND OBTAINING SETTLEMENT READINGS AS REQUIRED BY THE PLANS OR AS DIRECTED BY THE ENGINEER.



SETTLEMENT PLATFORM
NOT TO SCALE

SETTLEMENT PLATFORMS SHALL BE PLACED AT THE BOTTOM OF THE MSE WALL FILL AT THE LOCATION INDICATED BELOW, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

SETTLEMENT PLATFORM TABLE

WALL	ALIGNMENT	SETTLEMENT PLATE DESIGNATION	STATION	OFFSET
E4	WALL E4	S.P. 1	401+52.32	3.65 L
	WALL E4	S.P. 2	402+13.63	3.46 L
E7	WALL E7	S.P. 1	704+50.35	5.19 L
	WALL E7	S.P. 2	705+34.97	15.43 L
W5	WALL W5	S.P. 1	600+08.94	3.59 L
	WALL W5	S.P. 2	600+11.05	42.66 L

ITEM SPECIAL STRUCTURE MISC.: PRECONSTRUCTION CONDITION SURVEY: WALL E4, W5

BEFORE GROUND IMPROVEMENT WORK BEGINS, CONDUCT A CONDITION SURVEY OF ANY EXISTING BUILDINGS, STRUCTURES, OR UTILITIES WITHIN 400 FEET OF THE WORK. THE PURPOSE OF THE SURVEY IS TO DOCUMENT THE CONDITION OF THE BUILDINGS, STRUCTURES, OR UTILITIES PRIOR TO STONE COLUMN INSTALLATION, SO THAT ANY CLAIMS OF DAMAGE CAUSED BY THE GROUND IMPROVEMENT WORK CAN BE VERIFIED.

RETAIN AN EXPERIENCED VIBRATION SPECIALIST TO PERFORM OR SUPERVISE THE CONDITION SURVEY. USE A VIBRATION SPECIALIST THAT MEETS THE QUALIFICATION REQUIREMENTS LISTED BELOW FOR VIBRATION MONITORING.

RECORD THE CONDITION OF EXISTING STRUCTURES AND BUILDING MATERIALS, USING WRITTEN TEXT, PHOTOGRAPHS, AND VIDEO RECORDINGS. INSPECT INTERIOR WALLS, CEILINGS, AND FLOORS THAT ARE ACCESSIBLE. INSPECT THE EXTERIOR OF THE BUILDING THAT IS VISIBLE FROM GROUND LEVEL. ALSO RECORD THE LOCATION, SIZE, AND TYPE OF ALL CRACKS AND OTHER STRUCTURAL DEFICIENCIES.

IF OWNERS OR OCCUPANTS FAIL TO ALLOW ACCESS TO THE PROPERTY FOR THE PRECONSTRUCTION CONDITION SURVEY, SEND A CERTIFIED LETTER TO THE OWNER OR OCCUPANT. DOCUMENT THE NOTIFICATION EFFORT AND THE CERTIFIED LETTER IN THE REPORT.

SUBMIT A REPORT TO THE ENGINEER THAT SUMMARIZES THE PRECONSTRUCTION CONDITION OF THE BUILDINGS, STRUCTURES, AND UTILITIES, AND THAT IDENTIFIES AREAS OF CONCERN. SUBMIT THREE COPIES OF THE REPORT.

THE DEPARTMENT WILL PAY FOR THIS ITEM AT THE CONTRACT LUMP SUM PRICE FOR ITEM SPECIAL STRUCTURE MISC.: PRECONSTRUCTION CONDITION SURVEY.

ITEM SPECIAL STRUCTURE MISC.: VIBRATION MONITORING: WALL E4, W5

MONITOR GROUND VIBRATIONS CAUSED DURING CONTROLLED MODULUS COLUMN INSTALLATION SO THAT THE PILE DRIVING WORK CAN BE CONTROLLED IN ORDER TO MINIMIZE THE POTENTIAL DAMAGE TO EXISTING STRUCTURES.

RETAIN AN EXPERIENCED VIBRATION SPECIALIST TO ESTABLISH THE ACCEPTABLE VIBRATION LIMITS AND TO PERFORM THE VIBRATION MONITORING. USE A VIBRATION SPECIALIST THAT IS AN EXPERT IN THE INTERPRETATION OF VIBRATION DATA AND WHO MEETS ONE OF THE FOLLOWING CRITERIA:

1) IS A REGISTERED ENGINEER WITH AT LEAST TWO YEARS OF PROVEN EXPERIENCE IN MONITORING VIBRATIONS ON SIMILAR CONSTRUCTION PROJECTS, OR
2) HAS AT LEAST FIVE YEARS OF PROVEN EXPERIENCE IN MONITORING VIBRATIONS ON SIMILAR CONSTRUCTION PROJECTS.
DO NOT USE A VIBRATION SPECIALIST THAT IS AN EMPLOYEE OF THE CONTRACTOR.

SUBMIT A RESUME OF THE CREDENTIALS OF THE PROPOSED VIBRATION SPECIALIST AT OR BEFORE THE PRECONSTRUCTION CONFERENCE. INCLUDE IN THE RESUME A LIST OF CONSTRUCTION PROJECTS ON WHICH THE VIBRATION SPECIALIST WAS RESPONSIBLY IN CHARGE OF MONITORING THE VIBRATIONS. LIST A DESCRIPTION OF THE PROJECTS, WITH DETAILS OF THE VIBRATION INTERPRETATIONS MADE ON THE PROJECT. LIST THE NAMES AND TELEPHONE NUMBERS OF PROJECT OWNERS WITH SUFFICIENT KNOWLEDGE OF THE PROJECTS TO VERIFY THE SUBMITTED INFORMATION. OBTAIN APPROVAL OF THE VIBRATION SPECIALIST BEFORE BEGINNING ANY GROUND IMPROVEMENT WORK. ALLOW 30 DAYS FOR THE REVIEW OF THIS DOCUMENTATION.

USE SEISMOGRAPHS CAPABLE OF CONTINUOUSLY RECORDING THE PEAK PARTICLE VELOCITY FOR THREE MUTUALLY PERPENDICULAR COMPONENTS OF VIBRATION, AND PROVIDING A PERMANENT RECORD OF THE ENTIRE VIBRATION EVENT. USE A SUFFICIENT NUMBER OF SEISMOGRAPHS TO PROVIDE REDUNDANCY IN CASE ONE DEVICE SHOULD FAIL. SUBMIT A PLAN OF THE PROPOSED SEISMOGRAPH LOCATIONS TO THE ENGINEER FOR REVIEW.

THE VIBRATION SPECIALIST SHALL PERFORM THE FOLLOWING:

1. MEASURE THE AMBIENT GROUND VIBRATIONS NEAR EXISTING STRUCTURES BEFORE GROUND IMPROVEMENT WORK BEGINS.
2. ESTABLISH VIBRATION LIMITS TO MINIMIZE POTENTIAL DAMAGE TO EXISTING STRUCTURES AND EXPLAIN WHY THEY ARE BEING USED TO THE ENGINEER BEFORE INSTALLING STONE COLUMNS NEAR EXISTING STRUCTURES.
3. MONITOR GROUND VIBRATIONS DURING STONE COLUMN INSTALLATION.
4. IMMEDIATELY INFORM THE CONTRACTOR AND ENGINEER IF THE VIBRATION LIMITS ARE REACHED OR EXCEEDED.
5. FURNISH THE DATA RECORDED AND INCLUDE THE FOLLOWING:
   A. IDENTIFICATION OF SEISMOGRAPH.
   B. DISTANCE AND DIRECTION OF SEISMOGRAPH FROM STONE COLUMN INSTALLATION.
   C. START TIME AND DURATION OF GROUND IMPROVEMENT WORK.
   D. LIST OF STONE COLUMNS INSTALLED DURING EACH MONITORING INTERVAL.

THE CONTRACTOR SHALL IMMEDIATELY SUSPEND ALL GROUND IMPROVEMENT WORK IF THE VIBRATION LIMITS ARE REACHED OR EXCEEDED. EVALUATE ALTERNATIVE CONSTRUCTION PROCEDURES TO REDUCE THE VIBRATIONS.

SUBMIT A FINAL REPORT WHICH CONTAINS ALL MEASUREMENTS, INTERPRETATIONS, AND RECOMMENDATIONS TO THE ENGINEER. SUBMIT THREE COPIES OF THE REPORT.

THE DEPARTMENT WILL PAY FOR THIS ITEM AT THE CONTRACT LUMP SUM PRICE FOR ITEM SPECIAL, STRUCTURE MISC.: VIBRATION MONITORING. THE DEPARTMENT WILL PAY THE FINAL TWENTY PERCENT AFTER THE ENGINEER RECEIVES THE FINAL REPORT.

THE DEPARTMENT WILL PAY ACCORDING TO CMS 109.05 FOR ALTERNATIVE CONSTRUCTION PROCEDURES THAT THE ENGINEER DETERMINES ARE NECESSARY TO REDUCE VIBRATIONS.

NO.	DESCRIPTION	REV. BY	DATE
1	UPDATED SHEET TITLE	MMS	11/5/21

RESOURCE INTERNATIONAL INC.
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(614) 823-4949

DESIGNED MMS | DRAWN MMS | REVIEWED NCK 6/23/2021 | CHECKED JGM | REVISED | STRUCTURE FILE NUMBER

RETAINING WALL NOTES 9 OF 9
RETAINING WALLS
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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CALCULATED BY: KSJ DATE: 03/04/2020
CHECKED BY: MMS DATE: 03/04/2020

ESTIMATED QUANTITIES					AS PER PLAN REFERENCE SHEET
ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	
203	20000	961	CU YD	EMBANKMENT	
203	35000	2085	CU YD	GRANULAR EMBANKMENT	
203	35110	246	CU YD	GRANULAR MATERIAL, TYPE B	
203	65000	2	EACH	~~SPECIAL - SETTLEMENT PLATFORM~~	
203	98100	5260	SQ YD	ROADWAY MISC.: COLUMN SUPPORTED WALLS * 1	
503	11101	LS	LS	COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN	838
509	10000	14932	LB	EPOXY COATED REINFORCING STEEL	
511	53012	93	CU YD	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	
512	10001	348	SQ YD	SEALING OF CONCRETE SURFACES, AS PER PLAN (PERMANENT GRAFFITI PROTECTION)	838
512	10100	703	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY URETHANE)	
516	13200	56	SQ FT	1/2" PREFORMED EXPANSION JOINT FILLER	
516	13900	518	SQ FT	2" PREFORMED EXPANSION JOINT FILLER	
840	20001	6894	SQ FT	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	839 & 843
840	21000	630	CU YD	WALL EXCAVATION	
840	22000	547	SQ YD	FOUNDATION PREPARATION	
840	23000	3908	CU YD	SELECT GRANULAR BACKFILL	
840	25010	608	FT	6" DRAINAGE PIPE, PERFORATED	
840	26000	315	FT	CONCRETE COPING	
840	26050	6264	SQ FT	AESTHETIC SURFACE TREATMENT	
840	27000	5	DAY	ON-SITE ASSISTANCE	
840	28000	LS	LS	SGB INSPECTION AND COMPACTION TESTING	
867	00101	LS	LS	TEMPORARY WIRE FACED MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN (WALL T1)	839

1 * - QUANTITY FOR COLUMN SUPPORTED WALLS
INCLUDE GROUND IMPROVEMENT UP TO RAMP D7
STA. 7002+25.00

NO.	DESCRIPTION	REV. BY	DATE
1	CHANGED CONTROLLED MODULUS COLUMNS TO COLUMN SUPPORTED WALLS	MMS	11/5/21

RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

DESIGNED	DRAWN	REVIEWED	DATE
KSJ	MMS	NCK	6/23/2021
CHECKED	REVISED	STRUCTURE FILE NUMBER	
MMS			

ESTIMATED QUANTITIES
RETAINING WALL E4
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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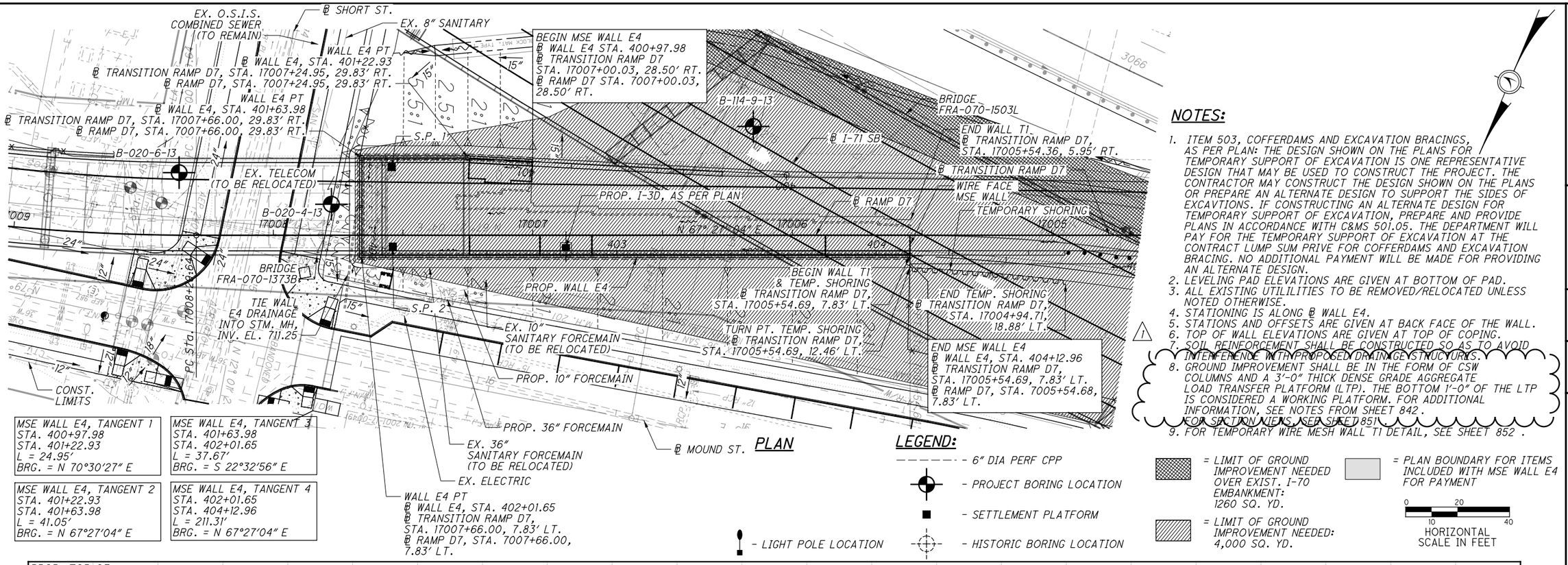


PLAN

MSE WALL E4, TANGENT 1	MSE WALL E4, TANGENT 3
STA. 400+97.98	STA. 401+63.98
STA. 401+22.93	STA. 402+01.65
L = 24.95'	L = 37.67'
BRG. = N 70°30'27" E	BRG. = S 22°32'56" E
MSE WALL E4, TANGENT 2	**MSE WALL E4, TANGENT 4**
STA. 401+22.93	STA. 402+01.65
STA. 401+63.98	STA. 404+12.96
L = 41.05'	L = 211.31'
BRG. = N 67°27'04" E	BRG. = N 67°27'04" E

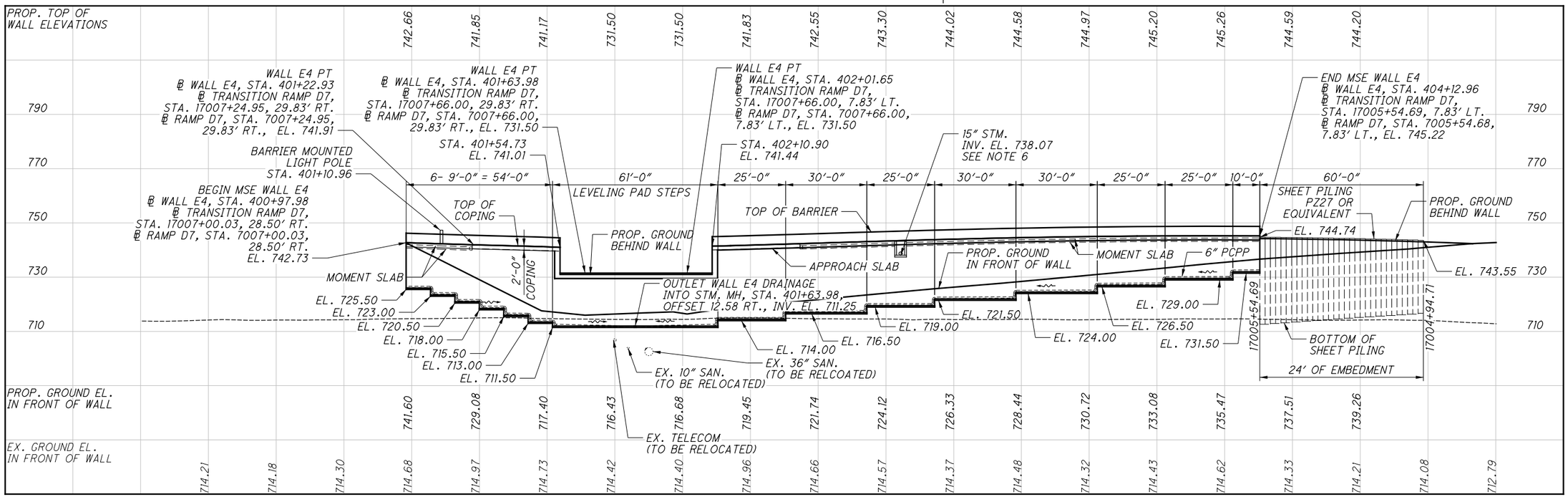
NOTES:

1. ITEM 503, COFFERDAMS AND EXCAVATION BRACINGS, AS PER PLAN: THE DESIGN SHOWN ON THE PLANS FOR TEMPORARY SUPPORT OF EXCAVATION IS ONE REPRESENTATIVE DESIGN THAT MAY BE USED TO CONSTRUCT THE PROJECT. THE CONTRACTOR MAY CONSTRUCT THE DESIGN SHOWN ON THE PLANS OR PREPARE AN ALTERNATE DESIGN TO SUPPORT THE SIDES OF EXCAVTIONS. IF CONSTRUCTING AN ALTERNATE DESIGN FOR TEMPORARY SUPPORT OF EXCAVATION, PREPARE AND PROVIDE PLANS IN ACCORDANCE WITH C&MS 501.05. THE DEPARTMENT WILL PAY FOR THE TEMPORARY SUPPORT OF EXCAVATION AT THE CONTRACT LUMP SUM PRIVE FOR COFFERDAMS AND EXCAVATION BRACING. NO ADDITIONAL PAYMENT WILL BE MADE FOR PROVIDING AN ALTERNATE DESIGN.
2. LEVELING PAD ELEVATIONS ARE GIVEN AT BOTTOM OF PAD.
3. ALL EXISTING UTILILITIES TO BE REMOVED/RELOCATED UNLESS NOTED OTHERWISE.
4. STATIONING IS ALONG ℄ WALL E4.
5. STATIONS AND OFFSETS ARE GIVEN AT BACK FACE OF THE WALL.
6. TOP OF WALL ELEVATIONS ARE GIVEN AT TOP OF COPING.
7. SOIL REINFORCEMENT SHALL BE CONSTRUCTED SO AS TO AVOID INTERFERENCE WITH PROPOSED DRAINAGE STRUCTURES.
8. GROUND IMPROVEMENT SHALL BE IN THE FORM OF CSW COLUMNS AND A 3'-0" THICK DENSE GRADE AGGREGATE LOAD TRANSFER PLATFORM (LTP). THE BOTTOM 1'-0" OF THE LTP IS CONSIDERED A WORKING PLATFORM. FOR ADDITIONAL INFORMATION, SEE NOTES FROM SHEET 842. FOR SECTION VIEWS, SEE SHEET 851.
9. FOR TEMPORARY WIRE MESH WALL T1 DETAIL, SEE SHEET 852 .

LEGEND:

- 6" DIA PERF CPP
- PROJECT BORING LOCATION
- SETTLEMENT PLATFORM
- HISTORIC BORING LOCATION
- LIGHT POLE LOCATION
- = LIMIT OF GROUND IMPROVEMENT NEEDED OVER EXIST. I-70 EMBANKMENT: 1260 SQ. YD.
- = LIMIT OF GROUND IMPROVEMENT NEEDED: 4,000 SQ. YD.
- = PLAN BOUNDARY FOR ITEMS INCLUDED WITH MSE WALL E4 FOR PAYMENT

HORIZONTAL SCALE IN FEET: 0, 10, 20, 40



ELEVATION ALONG BACK OF WALL

NO.	DESCRIPTION	REV. BY	DATE
1	CHANGED CONTROLLED MODULUS COLUMNS TO COLUMN SUPPORTED WALLS (CSW)	MMS	11/5/21

RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
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DESIGNED	DRAWN	REVIEWED	DATE
JGM	JGM	NCK	6/23/202
CHECKED	REVISED	STRUCTURE FILE NUMBER	
MMS			

PLAN AND ELEVATION 1 OF 1
RETAINING WALL E4 (RAMP D7, SHORT ST., MOUND ST.)
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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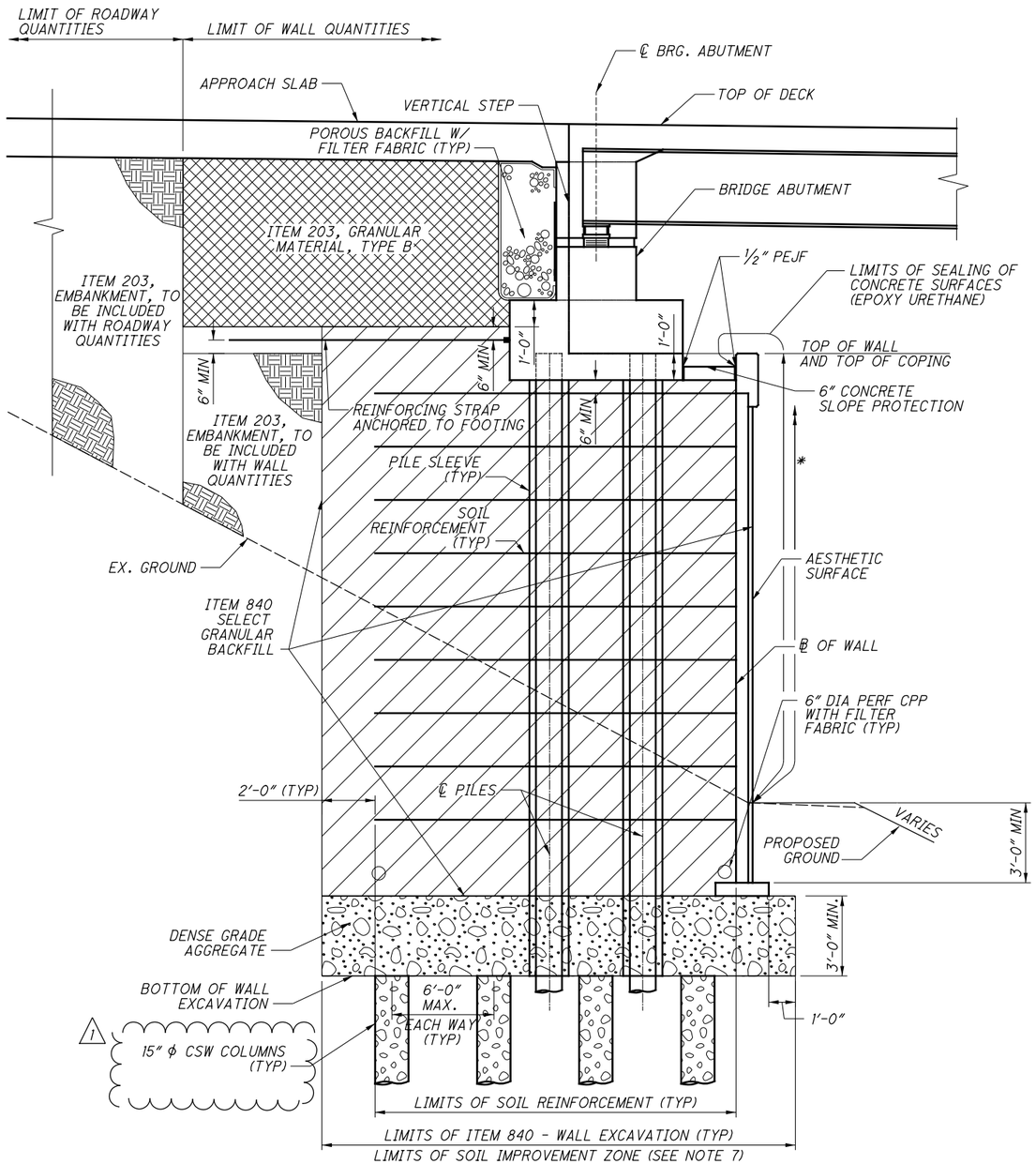
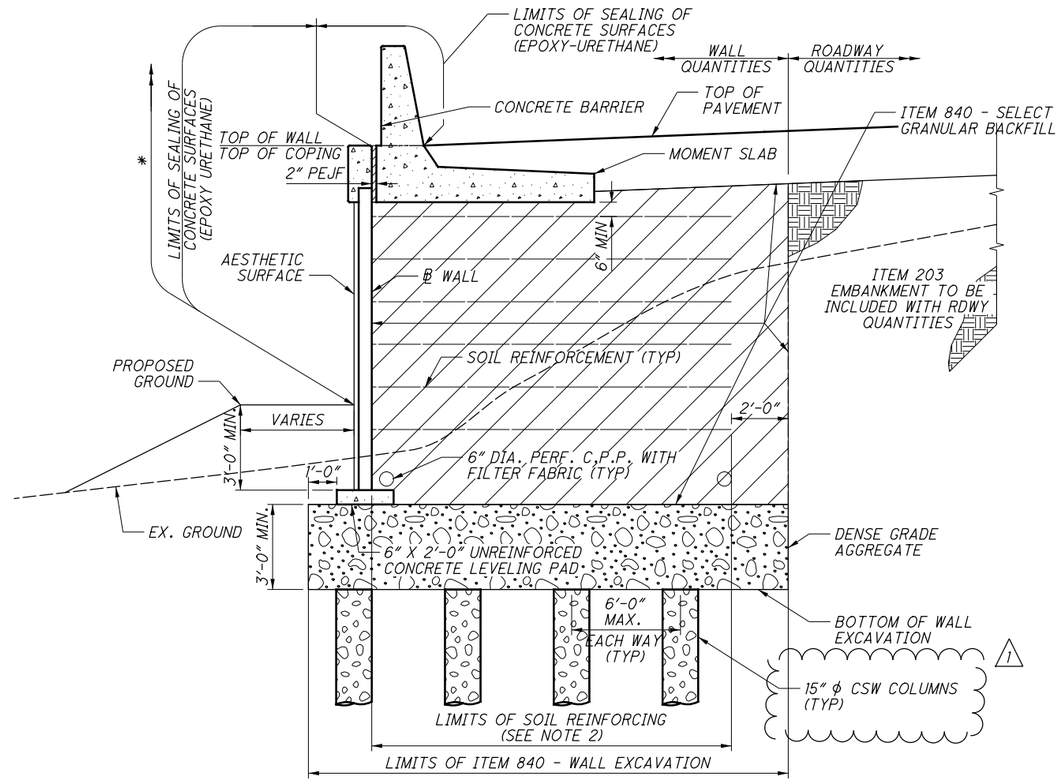


NO.	DESCRIPTION	REV. BY	DATE
1	CHANGED CONTROLLED MODULUS COLUMNS TO COLUMN SUPPORTED WALLS (CSW)	MMS	11/5/21

TYPICAL SECTION
MSE WALL AT BRIDGE ABUTMENTS
WALL E4



TYPICAL SECTION: WALL E4

LEGEND:

* LIMITS OF ITEM 512 - SEALING OF CONCRETE SURFACES, AS PER PLAN (PERMANENT GRAFFITI PROTECTION) SEAL ALL EXPOSED SURFACES EXTENDING 10'-0" VERTICAL FROM GROUND LINE

\# GRADING SLOPES AWAY FROM BARRIER. SEE WALL PLAN SHEETS AND ROADWAY CROSS SECTIONS FOR MORE INFORMATION.

DENSE GRADE AGGREGATE LOAD TRANSFER PLATFORM

ITEM 203, EMBANKMENT

SELECT GRANULAR BACKFILL PER SUPPLEMENTAL SPECIFICATION 840

ITEM 203, GRANULAR MATERIAL, TYPE B

NOTES:

1. FLOW LINE OF 6" DIA. PERFORATED PLASTIC PIPE WILL VARY TO PROVIDE POSITIVE DRAINAGE AT OUTLET. MINIMUM SLOPE OF PIPE SHALL BE 1/8" PER FOOT.
2. SOIL REINFORCEMENT LENGTH TO BE DETERMINED BY WALL SUPPLIER OF THE APPROVED WALL SYSTEM, AND SHALL COMPLY WITH THE REQUIREMENTS LISTED ON SHEET 843 .
3. AS SHOWN IN THE PLANS, THE MAXIMUM DESIGN HEIGHT OF THE MSE WALL VARIES FROM 16'-9" TO 29'-6" (ACTUAL HEIGHT VARIES FROM 16'-9" TO 29'-6"), FINAL HEIGHTS TO BE DETERMINED BY WALL SUPPLIER.
4. THE THICKNESS OF MSE WALL PANELS IS ASSUMED AT 5½".
5. COPING EXPANSION JOINTS SHALL BE SPACED NO MORE THAN 20 FEET APART AND ALIGNED WITH JOINTS BETWEEN FACING PANELS.

1

6. INSTALL PILE SLEEVES DURING THE CONSTRUCTION OF THE MSE WALL. PILE SLEEVES SHALL EXTEND FROM BOTTOM OF ABUTMENT FOOTING TO BOTTOM OF WALL EXCAVATION/ITEM 203, ROADWAY MISC.: COLUMN SUPPORTED WALLS AND SHALL BE INSTALLED AS PER SS 840.06.J.
7. CSW COLUMNS SHALL BE INSTALLED TO IMPROVE THE SOIL IN THE AREAS AS SHOWN ON SHEET 909K
8. SIZE AND SPACING OF CSW COLUMNS ARE SHOWN FOR REPRESENTATION ONLY. ACTUAL SIZE AND SPACING TO BE DETERMINED BY CONTRACTOR.

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(614) 823-4949

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CHECKED JGM | REVISED | STRUCTURE FILE NUMBER

TYPICAL RETAINING WALL DETAILS 1 OF 2
RETAINING WALL E4
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

3 / 10

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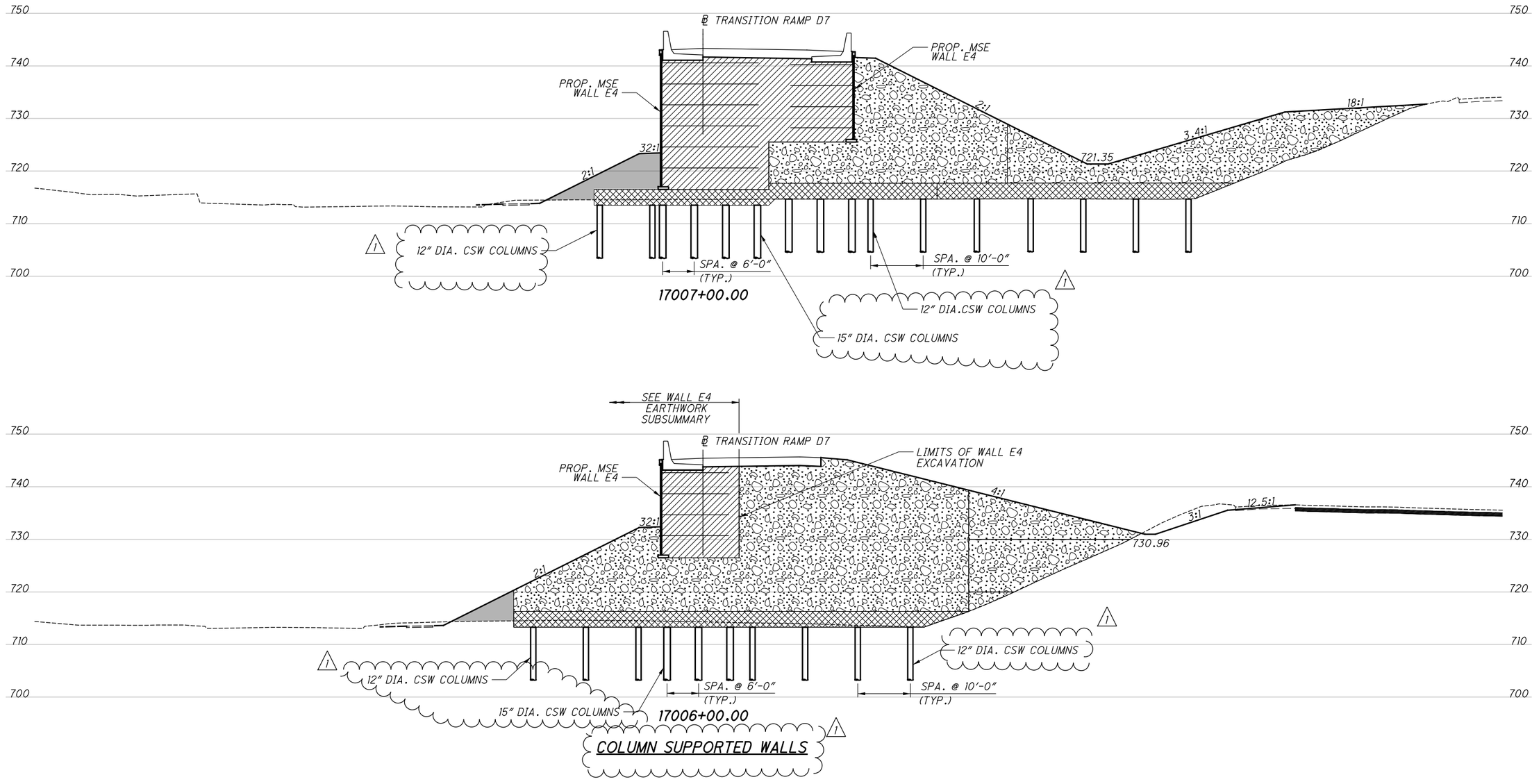

LEGEND:

- SELECT GRANULAR BACKFILL
- DENSE GRADE AGGREGATE LOAD TRANSFER PLATFORM
- ITEM 203 GRANULAR EMBANKMENT
- ITEM 203 EMBANKMENT

NO.	DESCRIPTION	REV. BY	DATE
1	CHANGED CONTROLLED MODULUS COLUMNS TO COLUMN SUPPORTED WALLS (CSW)	MMS	11/5/21

1 NOTES:

1. SIZE AND SPACING OF CSW COLUMNS ARE SHOWN FOR REPRESENTATION ONLY. ACTUAL SIZE AND SPACING TO BE DETERMINED BY CONTRACTOR.

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CHECKED	REVISED	STRUCTURE FILE NUMBER	
NCK			

CROSS SECTIONS OF CONTROLLED MODULUS COLUMNS

RETAINING WALL E4
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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CALCULATED BY: KSJ DATE: 03/04/2020
CHECKED BY: MMS DATE: 03/04/2020

ESTIMATED QUANTITIES					AS PER PLAN REFERENCE SHEET
ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	
203	20000	438	CU YD	EMBANKMENT	
503	11100	LS	LS	COFFERDAMS AND EXCAVATION BRACING	
509	10000	24388	LB	EPOXY COATED REINFORDING STEEL	
511	53012	150	CU YD	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	
512	10001	449	SQ YD	SEALING OF CONCRETE SURFACES, AS PER PLAN (PERMANENT GRAFFITI PROTECTION)	838
512	10100	698	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY URETHANE)	
516	13900	875	SQ FT	2" PREFOEMED EXPANSION JOINT FILLER	
607	39901	179	FT	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC, AS PER PLAN	838
840	20001	5533	SQ FT	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	843
840	21000	1162	CU YD	WALL EXCAVATION	
840	22000	691	SQ YD	FOUNDATION PREPARATION	
840	23000	2164	CU YD	SELECT GRANULAR BACKFILL	
840	25010	997	FT	6" DRAINAGE PIPE, PERFORATED	
840	26000	438	FT	CONCRETE COPING	
840	26050	4658	SQ FT	AESTHETIC SURFACE TREATMENT	
840	27000	5	DAY	ON-SITE ASSISTANCE	
840	28000	LS	LS	SGB INSPECTION AND COMPACTION TESTING	

1

NO.	DESCRIPTION	REV. BY	DATE
1	REMOVED ITEM 203 - GRANULAR MATERIAL, TYPE C QUANTITY	KSJ	11/5/21
.	.	.	.

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DESIGNED KSJ | CHECKED MMS
DRAWN MMS | REVISED
REVIEWED NCK | DATE 6/23/2021
STRUCTURE FILE NUMBER

ESTIMATED QUANTITIES

RETAINING WALL E5
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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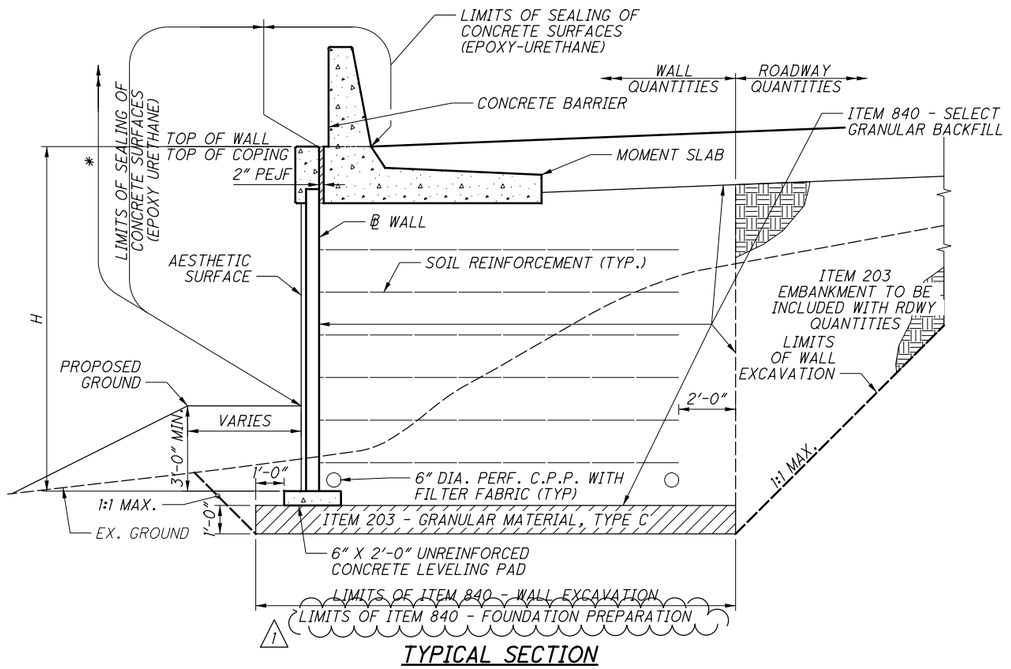
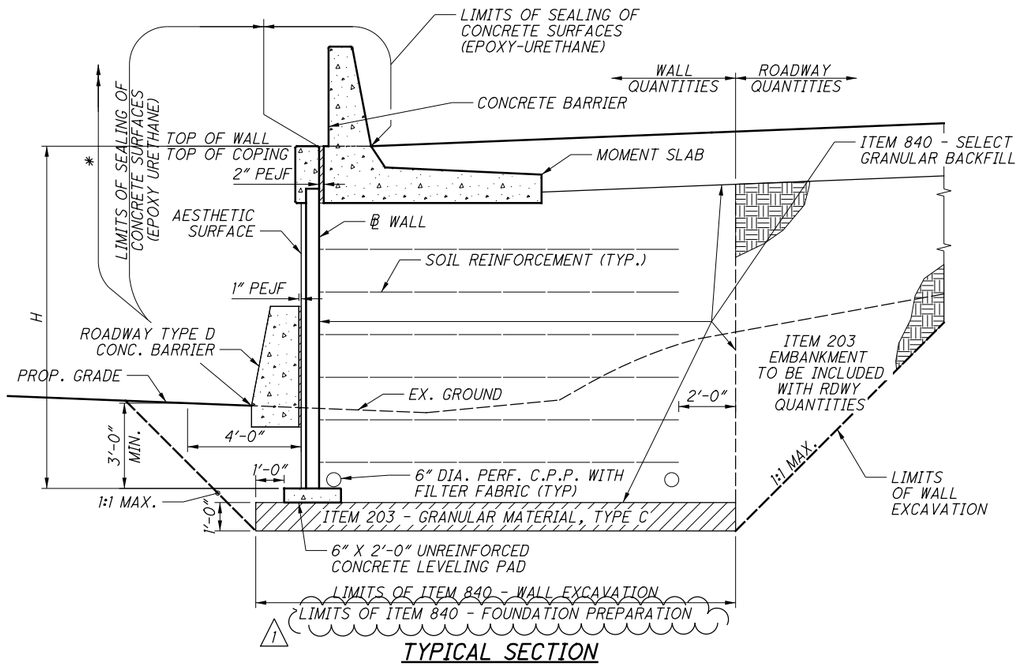


TYPICAL SECTION

WALL E5 STA. 503+95.83 TO STA. 506+11.80



TYPICAL SECTION

WALL E5 STA. 501+18.34 TO STA. 503+39.67

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED ITEM 840 - FOUNDATION PREPARATION	KSJ	11/5/21
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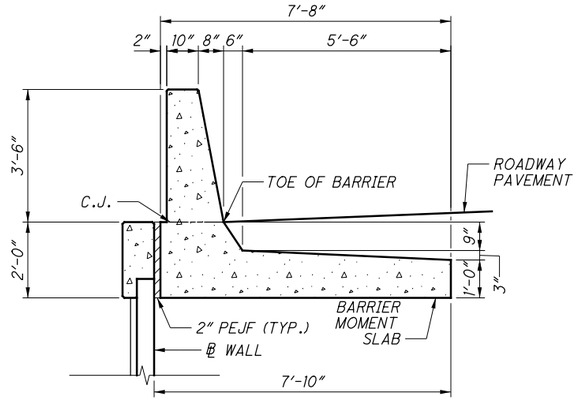
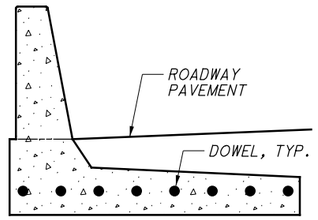
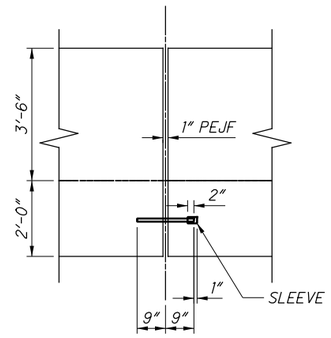


MOMENT SLAB DETAIL

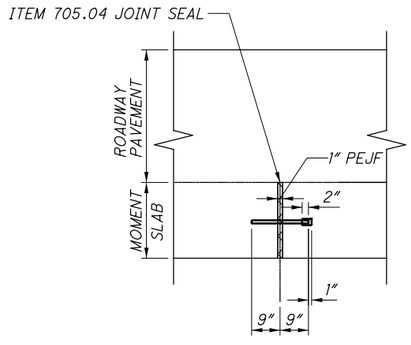


EXPANSION JOINT SECTION



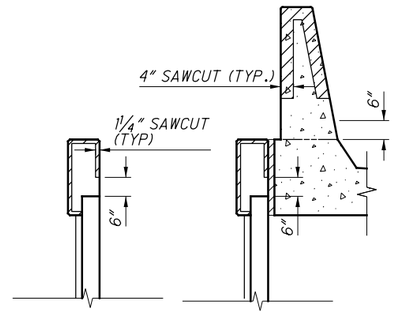
EXPANSION JOINT DETAIL

(AT PARAPET)



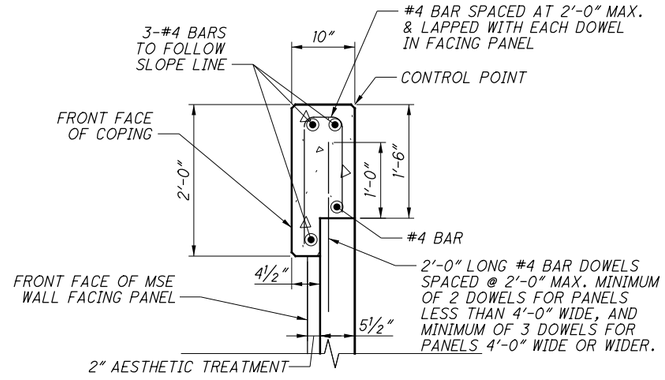
EXPANSION JOINT DETAIL

(AT PAVEMENT)



SAWCUT DETAILS

SEE SBR-1-13 FOR ADDITIONAL DETAILS



COPING DETAIL

LEGEND:

* LIMITS OF ITEM 512 - SEALING OF CONCRETE SURFACES, AS PER PLAN (PERMANENT GRAFFITI PROTECTION) SEAL ALL EXPOSED SURFACES EXTENDING 10'-0" VERTICAL FROM GROUND LINE

GRADING SLOPES AWAY FROM BARRIER. SEE WALL PLAN SHEETS AND ROADWAY CROSS SECTIONS FOR MORE INFORMATION.

MINIMUM LAP LENGTHS:
#5 LAP LENGTH = 2'-5"
#6 LAP LENGTH = 2'-11"

NOTES:

1. TRAFFIC BARRIER & MOMENT SLAB ARE INCIDENTAL TO RAILING MISC: TRAFFIC BARRIER ON MSE WALL.
2. CONTROL JOINT: SAWCUT 1¼" DEEP CONTROL JOINTS ALONG THE PERIMETER AS SHOWN ON THIS SHEET AS SOON AS THE SAW CAN BE OPERATED WITHOUT DAMAGING THE CONCRETE.

   USE AN EDGE GUIDE, FENCE, OR JIG TO ENSURE THAT THE CUT JOINT IS STRAIGHT, TRUE AND ALIGNED ON ALL FACES OF THE BARRIER. THE JOINT WIDTH SHALL BE THE WIDTH OF THE SAW BLADE, A NOMINAL WIDTH OF ¼".

   SEAL THE PERIMETER OF THE CONTROL JOINT TO A MINIMUM DEPTH OF 1" WITH A POLYURETHANE OR POLYMERIC MATERIAL CONFORMING TO C920, TYPE S. LEAVE THE BOTTOM ½" OF BOTH THE INSIDE AND OUTSIDE FACES OF THE BARRIER UNSEALED TO ALLOW ANY WATER WHICH MAY ENTER THE JOINT TO ESCAPE.
3. SAWCUT CONTROL JOINTS SHALL HAVE A MINIMUM SPACING OF 6' AND A MAXIMUM SPACING OF 15'. SEE PLANS FOR BARRIER CONTROL JOINT LOCATIONS.
4. FOR ABBREVIATIONS LEGEND, SEE SHEET 838
5. FOR LOCATIONS OF CIP BARRIER TO RECEIVE 2" LIGHTING CONDUIT, SEE HIGHWAY LIGHTING PLANS. FOR ADDITIONAL CIP BARRIER CONDUIT DETAILS AND NOTES, SEE STD. DWG. HL-20.14.
6. FOR LOCATIONS OF JUNCTION BOXES AND TRAFFIC CONDUIT IN CIP BARRIER, SEE TRAFFIC CONTROL PLANS.

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CHECKED	REVISED	STRUCTURE FILE NUMBER	
JGM			

TYPICAL RETAINING WALL DETAILS 1 OF 2

RETAINING WALL E5
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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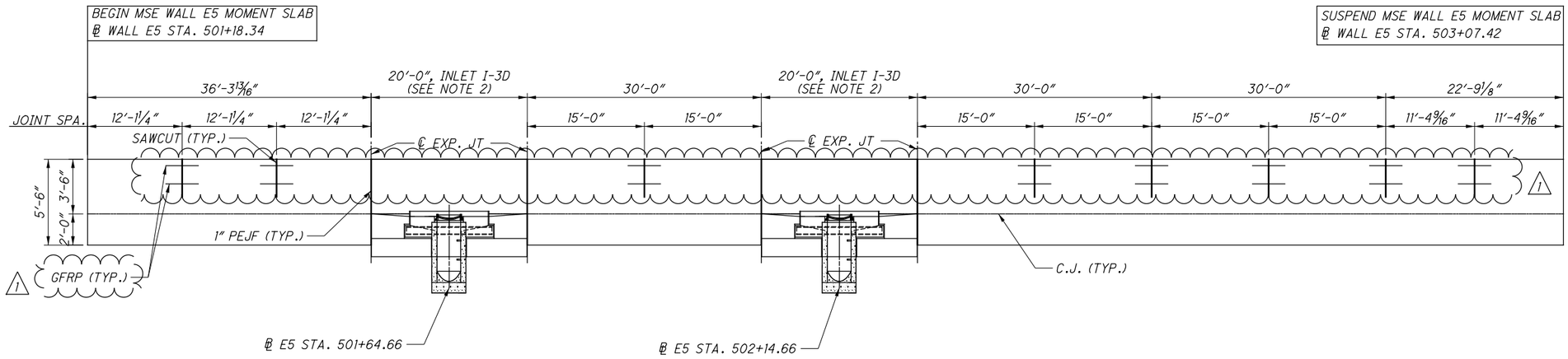
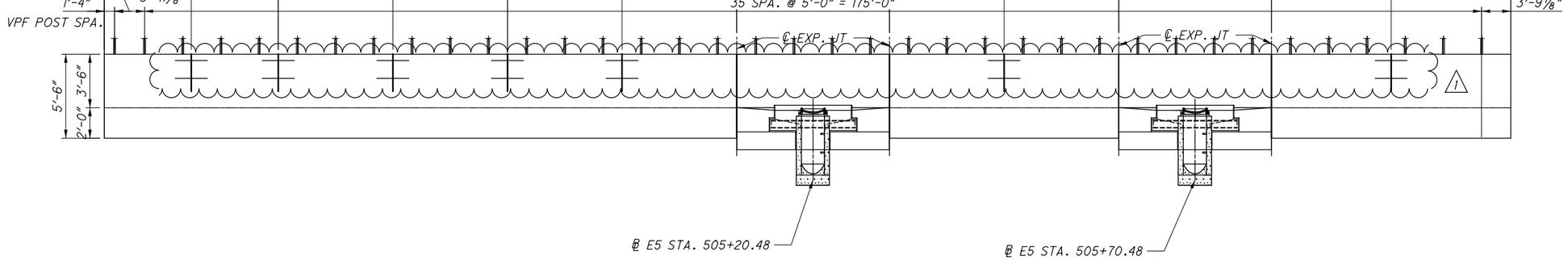


DEVELOPED ELEVATION

REAR FACE



DEVELOPED ELEVATION

REAR FACE

NOTES:

1. ALL DIMENSIONS MEASURED ALONG BACK FACE OF MOMENT SLAB.

2. SEE SHEETS 845 & 846 FOR ADDITIONAL INLET I-3D, AS PER PLAN DETAILS.

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED GFRP BARS	JGM	9/29/21
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RESOURCE INTERNATIONAL INC.
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CHECKED	REVISED	STRUCTURE FILE NUMBER	
MMS	JGM		

BARRIER AND MOMENT SLAB DETAILS 1 OF 3

RETAINING WALL E5
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

5 / 8

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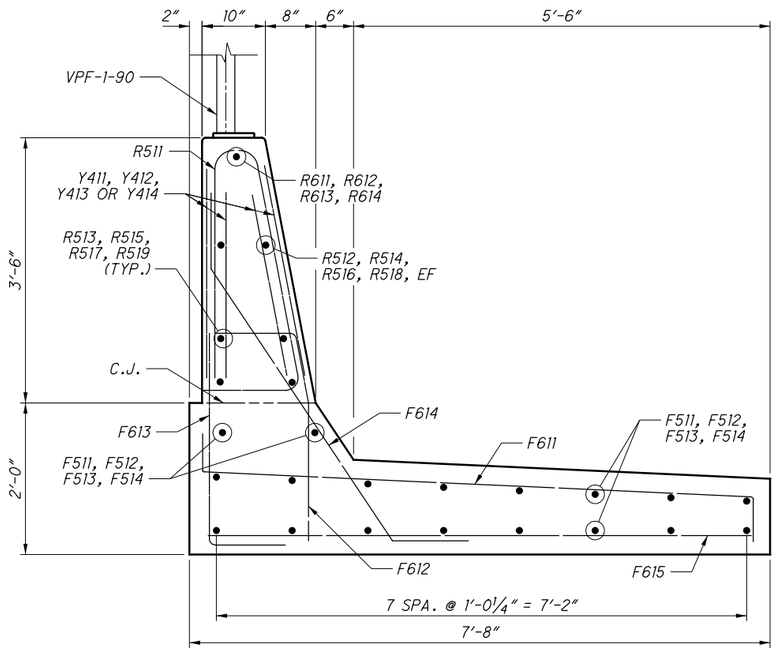
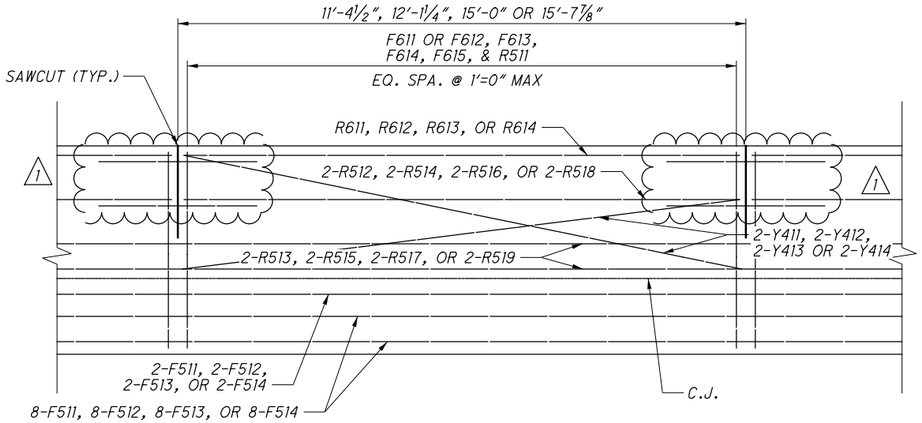
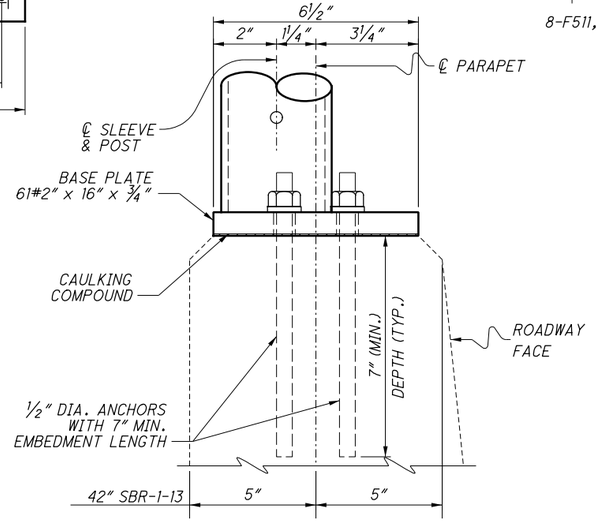


MOMENT SLAB SECTION DETAIL



TYPICAL PANEL ELEVATION



END VIEW BP-5

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED GFRP BARS	JGM	9/29/21
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1 NOTE:

1. A TOTAL OF 30 GFRP STIFFENING REINFORCEMENT BARS, ½″ DIA. X 4′-6″ LONG, ARE REQUIRED FOR THE WALL E5 MOMENT SLAB.

RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
COLUMBUS, OHIO 43231
(614) 823-4949

DESIGNED	DRAWN	REVIEWED	DATE
MMS	MMS	NCK	6/23/2021
CHECKED	REVISED	STRUCTURE FILE NUMBER	
JGM	JGM		

BARRIER AND MOMENT SLAB DETAILS 3 OF 3
RETAINING WALL E5
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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CALCULATED BY: KSJ DATE: 06/08/2020
CHECKED BY: MMS DATE: 06/08/2020

ESTIMATED QUANTITIES					AS PER PLAN REFERENCE SHEET
ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	
203	02000	9684	CU YD	SPECIAL - ENGINEERED FILL: LIGHTWEIGHT CELLULAR CONCRETE FILL, CLASS II	
203	02000	451	CU YD	SPECIAL - ENGINEERED FILL: LIGHTWEIGHT CELLULAR CONCRETE FILL, CLASS III	
203	20000	436	CU YD	EMBANKMENT	
203	35110	935	CU YD	GRANULAR MATERIAL, TYPE B	
203	65000	2	EACH	SPECIAL - SETTLEMENT PLATFORM	
203	98000	4687	CU YD	ROADWAY MISC.: EPS GEOFOAM FILL	
503	11101	LS	LS	COFFERDAMS AND EXCAVATION, AS PER PLAN	838
509	10000	31202	LB	EPOXY COATED REINFORCING STEEL	
511	53012	199	CU YD	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	
511	53012	110	CU YD	CLASS QC2 CONCRETE, MISC.: LOAD DISTRIBUTION SLAB	
511	71200	5058	SQ FT	CONCRETE MISC.: PRECAST WALL PANELS	
511	81100	121	FT	CONCRETE MISC.: PRECAST FOOTING	
512	10100	2080	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY URETHANE)	
516	13200	76	SQ FT	1/2" PREFORMED EXPANSION JOINT FILLER	
516	13900	857	SQ FT	2" PREFORMED EXPANSION JOINT FILLER	
607	39901	363	FT	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC, AS PER PLAN	838
840	20001	17809	SQ FT	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	839 & 843
840	21000	4995	CU YD	WALL EXCAVATION	
840	22000	1485	SQ YD	FOUNDATION PREPARATION	
840	23000	2660	CU YD	SELECT GRANULAR BACKFILL	
840	25010	506	FT	6" DRAINAGE PIPE, PERFORATED	
840	26000	523	FT	CONCRETE COPING	
840	26050	16763	SQ FT	AESTHETIC SURFACE TREATMENT	
840	27000	5	DAY	ON-SITE ASSISTANCE	
840	28000	LS	LS	SGB INSPECTION AND COMPACTION TESTING	

NO.	DESCRIPTION	REV. BY	DATE
1	REMOVED ITEM 203 - GRANULAR MATERIAL, TYPE C QUANTITY	KSJ	11/5/21
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RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
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ESTIMATED QUANTITIES
RETAINING WALL E7
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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CALCULATED BY: KSJ DATE: 03/04/2020
CHECKED BY: MMS DATE: 03/04/2020

ESTIMATED QUANTITIES					AS PER PLAN REFERENCE SHEET
ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	
203	02000	1346	CU YD	SPECIAL - ENGINEERED FILL: LIGHTWEIGHT CELLULAR CONCRETE FILL, CLASS II	
203	02000	122	CU YD	SPECIAL - ENGINEERED FILL: LIGHTWEIGHT CELLULAR CONCRETE FILL, CLASS III	
203	20000	678	CU YD	EMBANKMENT	
203	35110	827	CU YD	GRANULAR MATERIAL, TYPE B	
1 203	98000	6138	CU YD	ROADWAY MISC.: EPS GEOFOAM FILL	
503	11101	LS	LS	COFFERDAMS AND EXCAVATION, AS PER PLAN	838
509	10000	39409	LB	EPOXY COATED REINFORCING STEEL	
511	53012	247	CU YD	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	
511	71200	4628	SQ FT	CONCRETE MISC.: PRECAST WALL PANELS	
511	81100	152	FT	CONCRETE MISC.: PRECAST FOOTING	
512	10100	1240	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY URETHANE)	
840	20001	10345	SQ FT	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	839
840	21000	4104	CU YD	WALL EXCAVATION	
840	22000	743	SQ YD	FOUNDATION PREPARATION	
840	23000	1748	CU YD	SELECT GRANULAR BACKFILL	
840	25010	455	FT	6" DRAINAGE PIPE, PERFORATED	
840	27000	5	DAY	ON-SITE ASSISTANCE	
840	28000	LS	LS	SGB INSPECTION AND COMPACTION TESTING	

NO.	DESCRIPTION	REV. BY	DATE
1	REMOVED ITEM 203 - GRANULAR MATERIAL, TYPE C QUANTITY	KSJ	11/5/21
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DESIGNED	DRAWN	REVIEWED	DATE
KSJ	MMS	NCK	6/23/2021
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MMS			

ESTIMATED QUANTITIES
RETAINING WALL E10
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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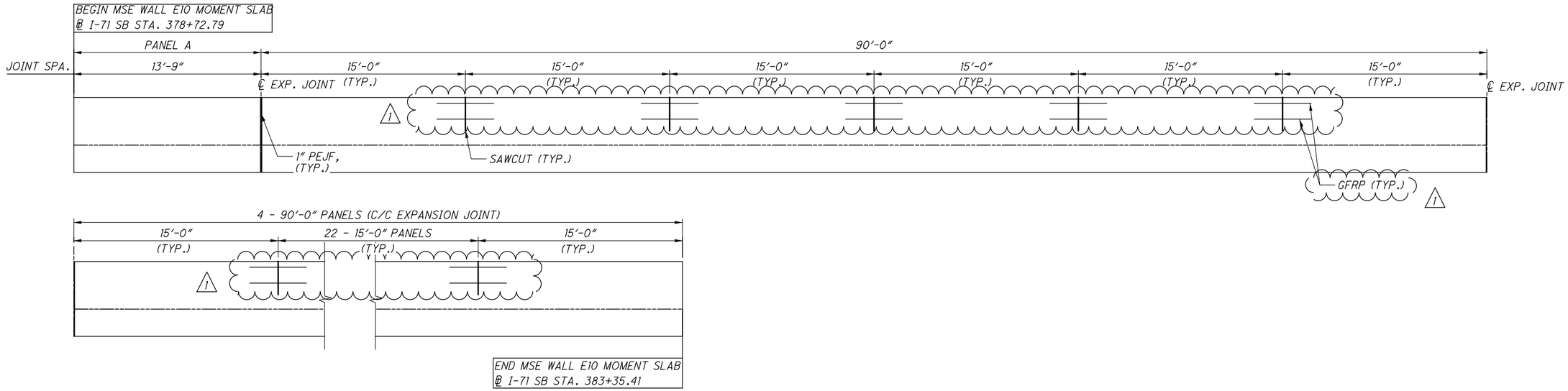
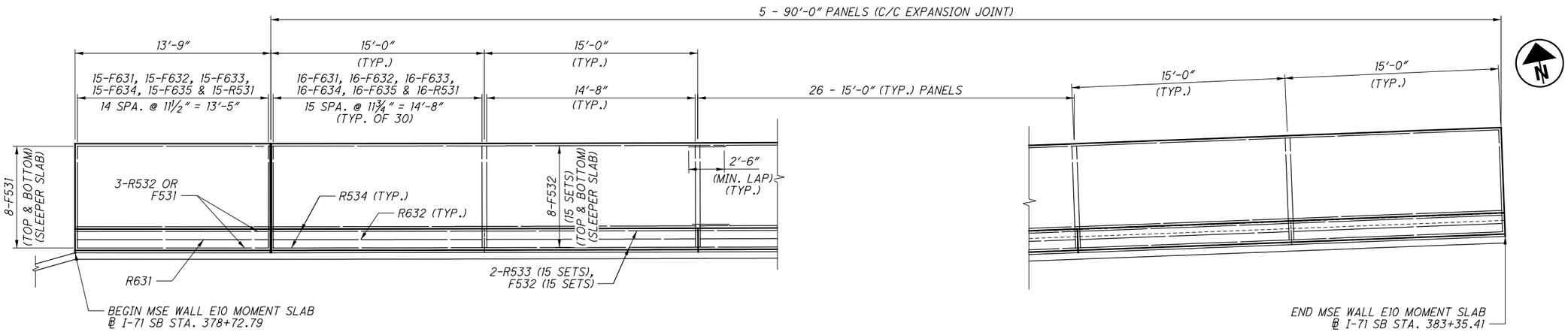


DEVELOPED ELEVATION

REAR FACE



DEVELOPED PLAN

NOTES:

1. ALL DIMENSIONS MEASURED ALONG REAR FACE OF MOMENT SLAB.

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED GFRP BARS	JGM	9/29/21
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CHECKED	REVISED	STRUCTURE FILE NUMBER	
JGM	JGM		

BARRIER AND MOMENT SLAB DETAILS 1 OF 2
RETAINING WALL E10
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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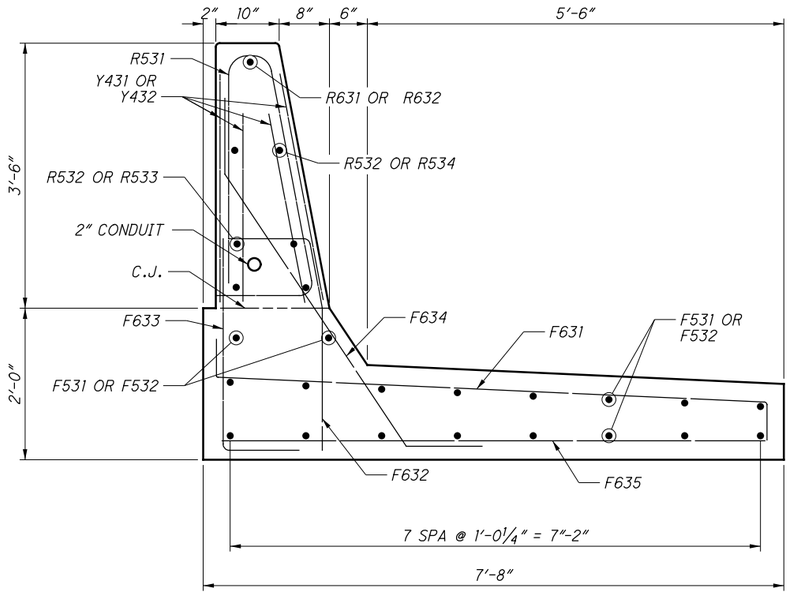
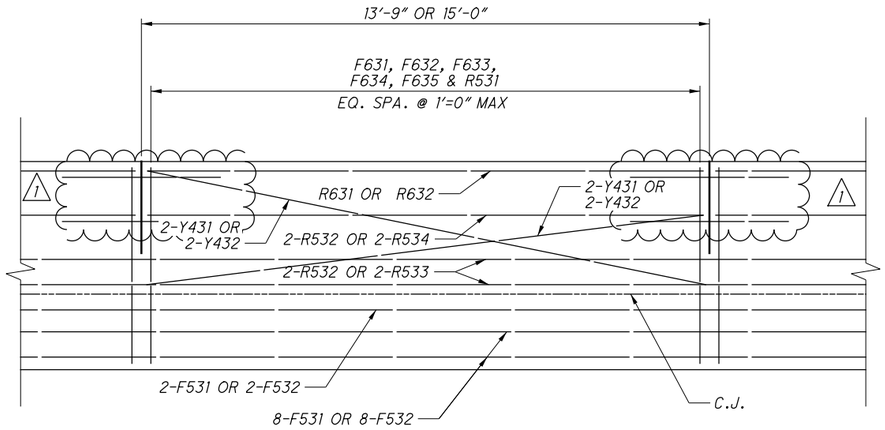


MOMENT SLAB SECTION DETAIL



TYPICAL PANEL ELEVATION

NO.	DESCRIPTION	REV. BY	DATE
1	ADDED GFRP BARS	JGM	9/29/21
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⚠1 **NOTE:**

1. A TOTAL OF 50 GFRP STIFFENING REINFORCEMENT BARS, ½″ DIA. X 4′-6″ LONG, ARE REQUIRED FOR THE WALL E10 MOMENT SLAB.

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CHECKED	REVISED	STRUCTURE FILE NUMBER	
JGM	JGM		

BARRIER AND MOMENT SLAB DETAILS 2 OF 2
RETAINING WALL E10
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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CALCULATED BY: MMS DATE: 06/08/2020
CHECKED BY: NCK DATE: 06/08/2020

ESTIMATED QUANTITIES					AS PER PLAN REFERENCE SHEET
ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	
203	20000	2649	CU YD	EMBANKMENT	
503	11100	LS	LS	COFFERDAMS AND EXCAVATION BRACING	
509	10000	87095	LB	EPOXY COATED REINFORCING STEEL	
511	53012	560	CU YD	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	
512	10001	1627	SQ YD	SEALING OF CONCRETE SURFACES, AS PER PLAN (PERMANENT GRAFFITI PROTECTION)	838
512	10100	4459	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY URETHANE)	
516	13200	216	SQ FT	1/2" PREFORMED EXPANSION JOINT FILLER	
516	13900	2217	SQ FT	2" PREFORMED EXPANSION JOINT FILLER	
601	37500	431	FT	PAVED GUTTER, TYPE 1-2	
840	20001	36756	SQ FT	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	843
840	21000	6905	CU YD	WALL EXCAVATION	
840	22000	3332	SQ YD	FOUNDATION PREPARATION	
840	23000	27781	CU YD	SELECT GRANULAR BACKFILL	
840	23050	924	CU YD	NATURAL SOIL	
840	25010	3135	FT	6" DRAINAGE PIPE, PERFORATED	
840	26000	1555	FT	CONCRETE COPING	
840	26050	33647	SQ FT	AESTHETIC SURFACE TREATMENT	
840	27000	5	DAY	ON-SITE ASSISTANCE	
840	28000	LS	LS	SGB INSPETION AND COMPACTION TESTING	

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NO.	DESCRIPTION	REV. BY	DATE
1	REMOVED ITEM 203 - GRANULAR MATERIAL, TYPE C QUANTITY	KSJ	11/5/21
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DESIGNED MMS | CHECKED JGM
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REVIEWED NCK | DATE 6/23/2021
STRUCTURE FILE NUMBER

ESTIMATED QUANTITIES
RETAINING WALL W2
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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CALCULATED BY: KSJ DATE: 03/04/2020
CHECKED BY: MMS DATE: 03/04/2020

ESTIMATED QUANTITIES

ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	AS PER PLAN REFERENCE SHEET
203	20000	3578	CU YD	EMBANKMENT	
203	35110	278	CU YD	GRANULAR MATERIAL, TYPE B	
203	65000	2	EACH	~~SPECIAL - SETTLEMENT PLATFORM~~	
203	98100	1912	SQ YD	ROADWAY, MISC: COLUMN SUPPORTED WALLS *	
503	11100	LS	LS	COFFERDAMS AND EXCAVATION BRACING	
509	10000	31723	LB	EPOXY COATED REINFORCING STEEL	
511	53012	524	CU YD	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	
512	10100	5418	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY URETHANE)	
516	13200	419	SQ FT	1/2" PREFORMED EXPANSION JOINT FILLER	
516	13900	1962	SQ FT	2" PREFORMED EXPANSION JOINT FILLER	
601	37500	746	FT	PAVED GUTTER, TYPE 1-2	
840	20001	47388	SQ FT	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	843
840	21000	12124	CU YD	WALL EXCAVATION	
840	22000	6296	SQ YD	FOUNDATION PREPARATION	
840	23000	62184	CU YD	SELECT GRANULAR BACKFILL	
840	23050	9690	CU YD	NATURAL SOIL	
840	25010	4033	FT	6" DRAINAGE PIPE, PERFORATED	
840	26000	1777	FT	CONCRETE COPING	
840	26050	43836	SQ FT	AESTHETIC SURFACE TREATMENT	
840	27000	5	DAY	ON-SITE ASSISTANCE	
840	28000	LS	LS	SGB INSPECTION AND COMPACTION TESTING	

1 * - QUANTITY FOR COLUMN SUPPORTED WALLS INCLUDES GROUND IMPROVEMENTS PERFORMED UNDER THIS SET OF PLANS. SEE SHEET 909K FOR LIMITS.

NO.	DESCRIPTION	REV. BY	DATE
1	REMOVED ITEM 203 - GRANULAR MATERIAL, TYPE C QUANTITY	KSJ	11/5/21
1	CHANGED CONTROLLED MODULUS COLUMNS TO COLUMN SUPPORTED WALLS	KSJ	11/5/21
1	NOTE ADDED	KSJ	11/5/21

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6350 PRESIDENTIAL GATEWAY
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CHECKED	REVISED	STRUCTURE FILE NUMBER	
MMS			

ESTIMATED QUANTITIES
RETAINING WALL W5
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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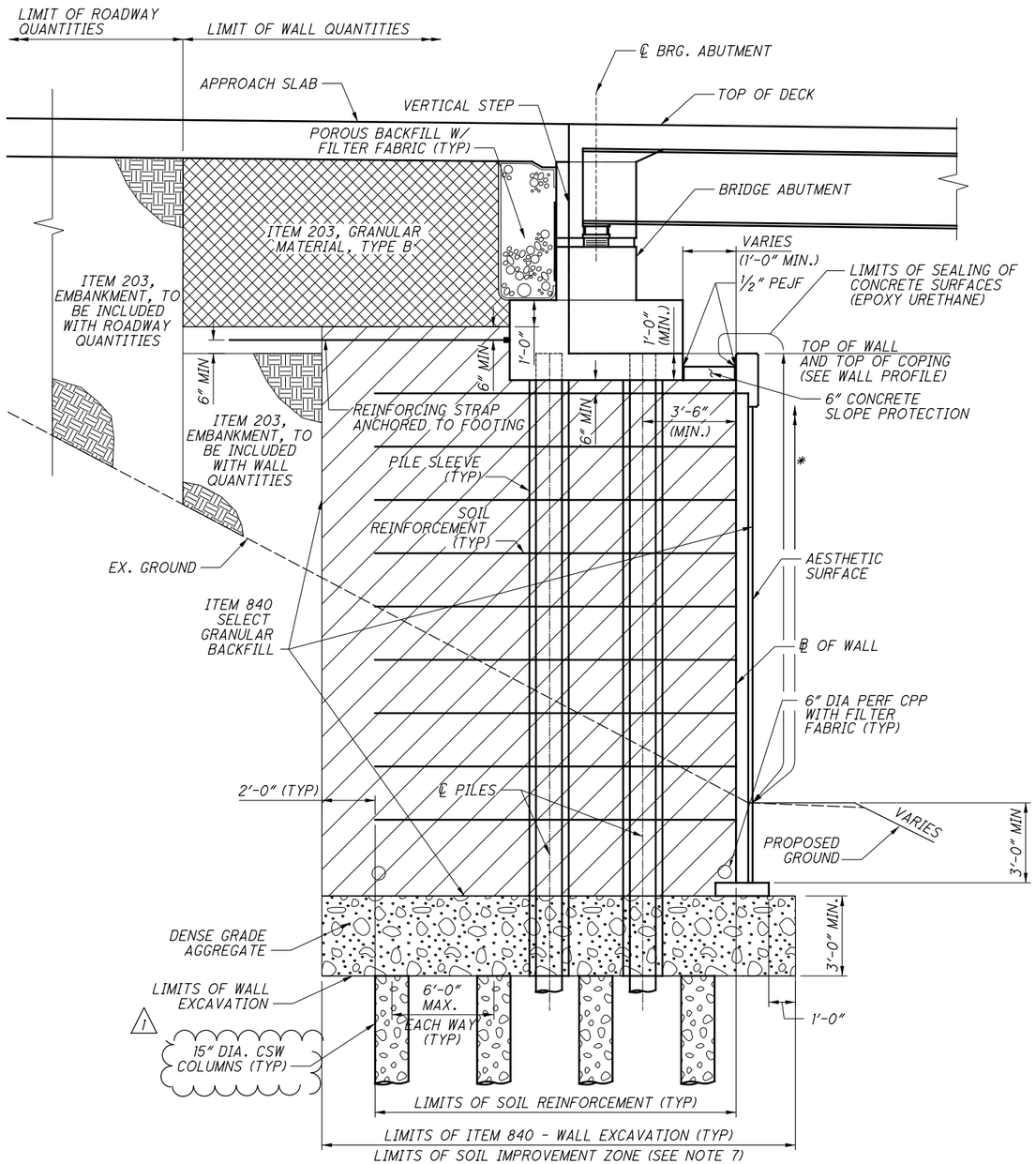
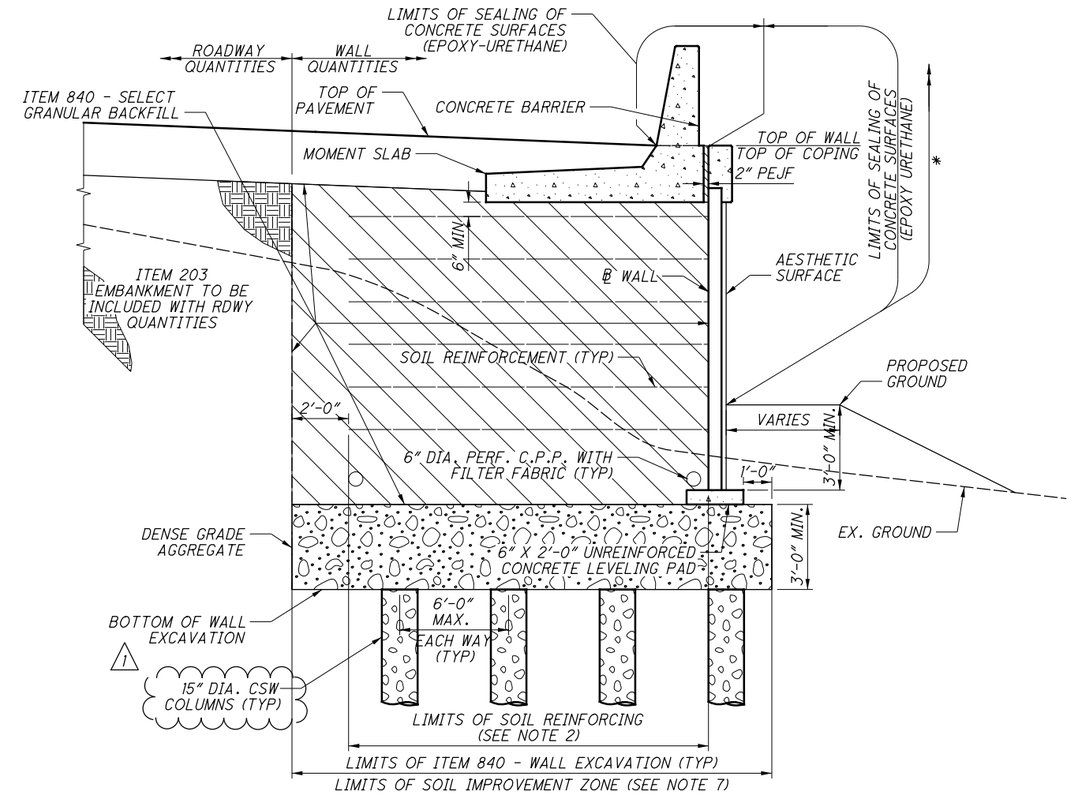


NO.	DESCRIPTION	REV. BY	DATE
1	CHANGED CONTROLLED MODULUS COLUMNS TO COLUMN SUPPORTED WALLS (CSW)	KSJ	11/5/21

TYPICAL SECTION
MSE WALL AT BRIDGE ABUTMENTS
WALL W5



TYPICAL SECTION: WALL W5

WALL W5 STA. 507+00.00 TO STA. 509+43.60
& STA. 600+19.08 TO STA 601+17.17

LEGEND:

* LIMITS OF ITEM 512 - SEALING OF CONCRETE SURFACES, AS PER PLAN (PERMANENT GRAFFITI PROTECTION) SEAL ALL EXPOSED SURFACES EXTENDING 10'-0" VERTICAL FROM GROUND LINE

- DENSE GRADE AGGREGATE LOAD TRANSFER PLATFORM
- ITEM 203, EMBANKMENT
- SELECT GRANULAR BACKFILL PER SUPPLEMENTAL SPECIFICATION 840
- ITEM 203, GRANULAR MATERIAL, TYPE B

NOTES:

1. FLOW LINE OF 6" DIA. PERFORATED PLASTIC PIPE WILL VARY TO PROVIDE POSITIVE DRAINAGE AT OUTLET. MINIMUM SLOPE OF PIPE SHALL BE 1/8" PER FOOT.
2. SOIL REINFORCEMENT LENGTH TO BE DETERMINED BY WALL SUPPLIER OF THE APPROVED WALL SYSTEM, AND SHALL COMPLY WITH THE REQUIREMENTS LISTED ON SHEET 843 .
3. AS SHOWN IN THE PLANS, THE MAXIMUM DESIGN HEIGHT OF THE MSE WALL VARIES FROM 10'-9" TO 48'-9" (ACTUAL HEIGHT VARIES FROM 10'-9" TO 48'-9"), FINAL HEIGHTS TO BE DETERMINED BY WALL SUPPLIER.
4. THE THICKNESS OF MSE WALL PANELS IS ASSUMED AT 5 1/2".
5. COPING EXPANSION JOINTS SHALL BE SPACED NO MORE THAN 20 FEET APART AND ALIGNED WITH JOINTS BETWEEN FACING PANELS.

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6. INSTALL PILE SLEEVES DURING THE CONSTRUCTION OF THE MSE WALL. PILE SLEEVES SHALL EXTEND FROM BOTTOM OF ABUTMENT FOOTING TO BOTTOM OF WALL EXCAVATION/ITEM 203, ROADWAY MISC.: COLUMN SUPPORTED WALLS AND SHALL BE INSTALLED AS PER SS 840.06.J.
7. CSW COLUMNS SHALL BE INSTALLED TO IMPROVE THE SOIL IN THE AREAS AS SHOWN ON SHEET 909K
8. SIZE AND SPACING OF CSW COLUMNS ARE SHOWN FOR REPRESENTATION ONLY. ACTUAL SIZE AND SPACING TO BE DETERMINED BY CONTRACTOR.

RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
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(614) 823-4949

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TYPICAL RETAINING WALL DETAILS 3 OF 3
RETAINING WALL W5
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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CALCULATED BY: MMS DATE: 06/01/2020
CHECKED BY: JGM DATE: 06/01/2020

ESTIMATED QUANTITIES

ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	AS PER PLAN REFERENCE SHEET
203	20000	1393	CU YD	EMBANKMENT	
503	11100	LS	LS	COFFERDAMS AND EXCAVATION BRACING	
509	10000	30007	LB	EPOXY COATED REINFORCING STEEL	
511	53012	192	CU YD	CLASS QC2 CONCRETE, MISC.: PARAPET INCLUDING SLEEPER SLAB WITH QC/QA	
512	10100	2629	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY URETHANE)	
516	13200	196	SQ FT	1/2" PREFORMED EXPANSION JOINT FILLER	
516	13900	720	SQ FT	2" PREFORMED EXPANSION JOINT FILLER	
601	37500	392	FT	PAVED GUTTER, TYPE 1-2	
840	20001	27132	SQ FT	MECHANICALLY STABILIZED EARTH WALL, AS PER PLAN	843
840	21000	3256	CU YD	WALL EXCAVATION	
840	22000	1835	SQ YD	FOUNDATION PREPARATION	
840	23000	18250	CU YD	SELECT GRANULAR BACKFILL	
840	23050	701	CU YD	NATURAL SOIL	
840	25010	1090	FT	6" DRAINAGE PIPE, PERFORATED	
840	25020	25	FT	6" DRAINAGE PIPE, NON-PERFORATED	
840	26000	871	FT	CONCRETE COPING	
840	26050	25394	SQ FT	AESTHETIC SURFACE TREATMENT	
840	27000	5	DAY	ON-SITE ASSISTANCE	
840	28000	LS	LS	SGB INSPETION AND COMPACTION TESTING	
867	00101	LS	LS	TEMPORARY WIRE FACED MECHANICALLY STABLIZED EARTH WALL (WALL T2), AS PER PLAN	839

NO.	DESCRIPTION	REV. BY	DATE
1	REMOVED ITEM 203 - GRANULAR MATERIAL, TYPE C QUANTITY	KSJ	11/5/21
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RESOURCE INTERNATIONAL INC.
6350 PRESIDENTIAL GATEWAY
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CHECKED	REVISED	STRUCTURE FILE NUMBER	
MMS			

ESTIMATED QUANTITIES
RETAINING WALL W3
I-70/I-71 WEST INTERCHANGE PROJECT

FRA-71-14.36
PID No. 105588

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