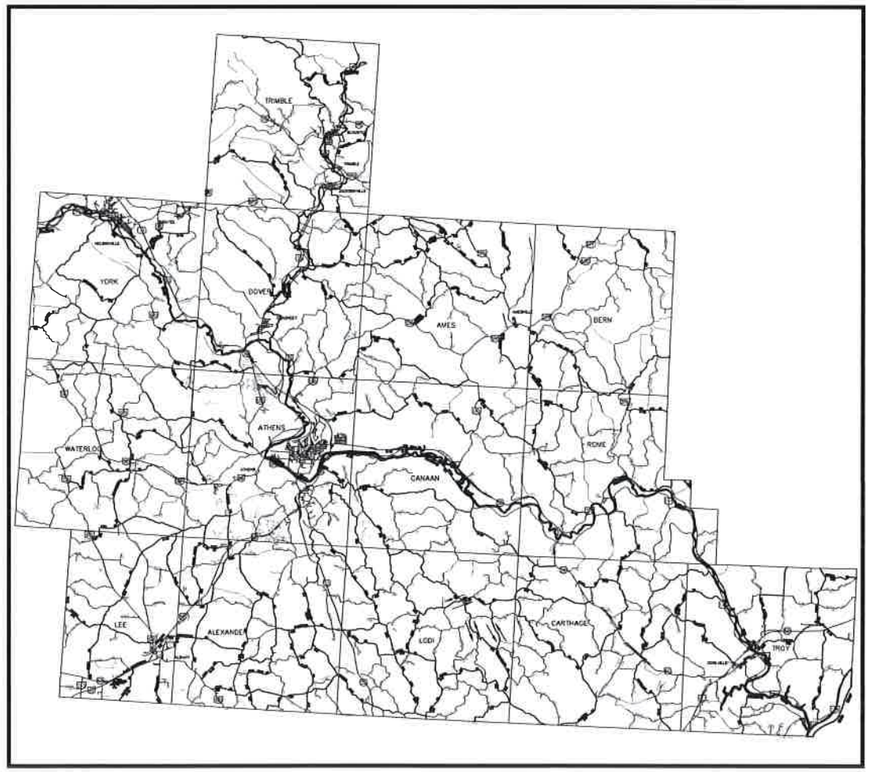

LOCATION MAP

COUNTY GARAGE - LATITUDE N39°19'27" LONGITUDE: W81°59'34"

ATHENS COUNTY ENGINEER

ATH-CR42-4.48 LANDSLIDE REPAIR

LODI TOWNSHIP
ATHENS COUNTY

PROJECT DESCRIPTION

CR42-4.48 CONSISTS OF THE CONSTRUCTION OF TWO DRILLED PIER WALLS, NAMELY WEST WALL (84 L.F.) AND EAST WALL (164 L.F.) ALONG MILL SCHOOL ROAD (CR42) LOCATED APPROXIMATELY 0.15 AND 0.10 MILES WEST OF THE INTERSECTION WITH T-47 HOGUE HOLLOW ROAD RESPECTIVELY.

INDEX OF SHEETS:

2016 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

UNDERGROUND UTILITIES

CONTACT BOTH SERVICES
CALL TWO WORKING DAYS
BEFORE YOU DIG

CALL
1-800-362-2764
(TOLL FREE)

OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

OIL & GAS PRODUCERS UNDERGROUND
PROTECTION SERVICE CALL: 1-800-925-0988

ENGINEER'S SEAL

STATE OF OHIO
KEVEN MICHAEL ERNST
E-56245
REGISTERED
PROFESSIONAL ENGINEER

SIGNED: K. M. Ernst
DATED: 2019-01-29

STANDARD CONSTRUCTION DRAWINGS						SUPPLEMENTAL SPECIFICATIONS	
DM-1.1	7/21/2017	MT-97.10	7/18/2014			SS-800	1/18/2019
BP-3.1	7/18/2014	MT-101.60	1/20/2017			SS-832	10/19/2018
		MT-101.70	7/20/2018				
		MT-105.10	7/19/2013				

ATHENS COUNTY ENGINEER

PLANS PREPARED FOR:
ATHENS COUNTY ENGINEER'S OFFICE
16000 CANAANVILLE RD
ATHENS, OHIO 45701

APPROVED
DATE 2/04/19 ATHENS COUNTY ENGINEER

APPROVED
DATE 2/5/19 ATHENS COUNTY COMMISSIONER

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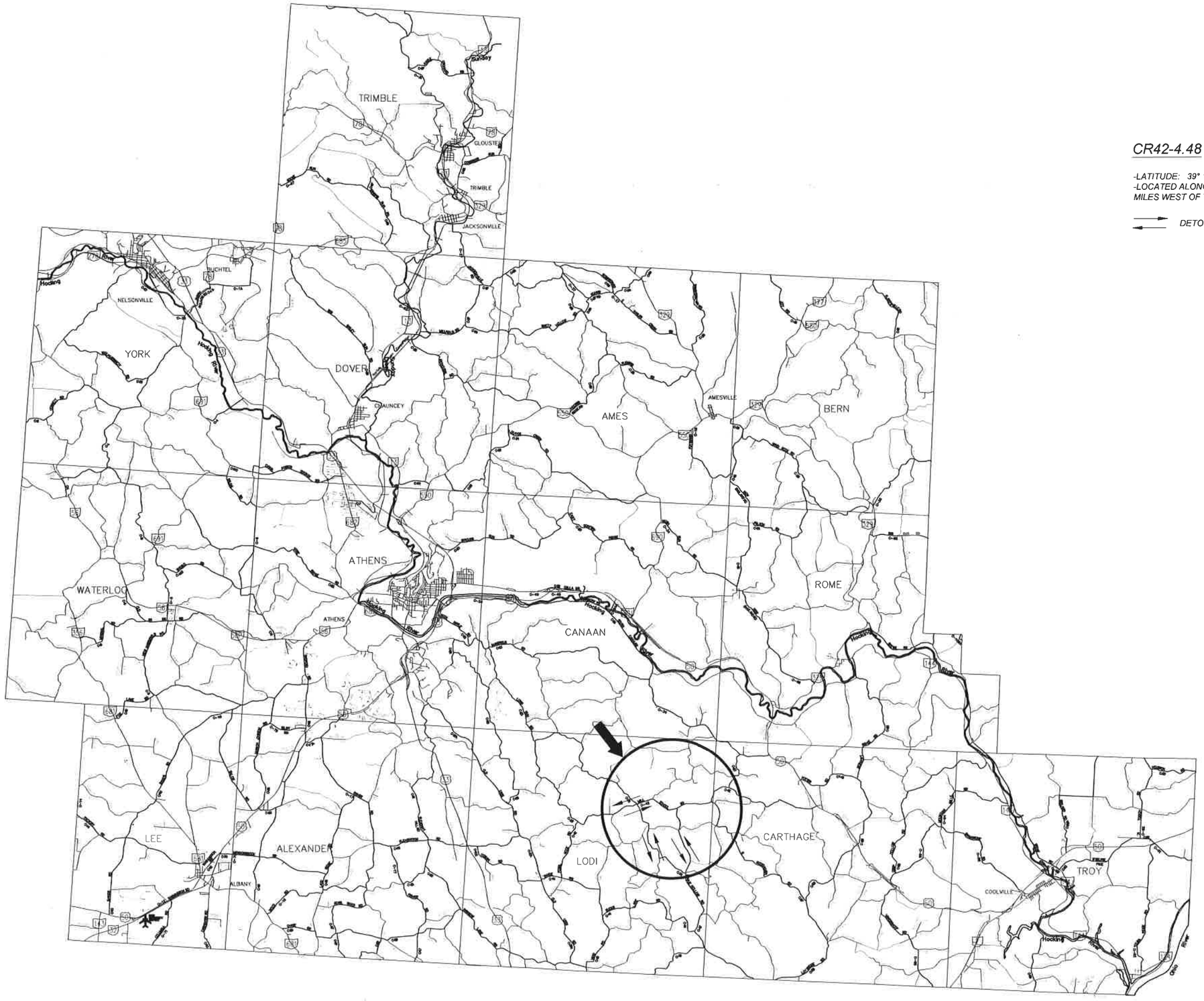
OH, IN, KY, MI, PA, WV
CO, MD, NC, NJ, NY, OR, VA, WA, WI

FHWA DISASTER NO.	PID NO.	CONSTRUCTION PROJECT NO.	RAILROAD INVOLVMENT
11-2018	108558	ATH-CR42-4.48	NONE



CR42-4.48

-LATITUDE: 39° 15' 06.98" LONGITUDE: 81° 58' 29.73"
-LOCATED ALONG MILL SCHOOL ROAD (CR42) APPROXIMATELY 0.11 MILES WEST OF THE INTERSECTION WITH T-47 HOGUE HOLLOW ROAD.

DETOUR ROUTE

Terracon
Consulting Engineers and Scientists
8664 MORRISON ROAD COLUMBUS, OHIO 43223
PH (614) 882-7510 FAX (614) 882-8475

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LANDSLIDE LOCATION MAP

ATH-CR42-4.48

CONTRACT SPECIFICATIONS
THE JANUARY 1, 2016 VERSION OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS AS PUBLISHED BY THE OHIO DEPARTMENT OF TRANSPORTATION SHALL GOVERN ALL ASPECTS OF THE CONTRACT WORK. THE CONTRACTOR SHOULD BE FAMILIAR WITH THESE SPECIFICATIONS AND THEIR PROCEDURAL REQUIREMENTS.

STANDARD DRAWINGS
REFERENCE SHOULD BE MADE TO THE STANDARD DRAWINGS SHOWN IN THE TABLE ON THE COVER SHEET.

O.U.P.S CALL:
THE CONTRACTOR IS RESPONSIBLE FOR CALLING THE OHIO UTILITIES PROTECTION SERVICE AT LEAST TWO DAYS BEFORE DIGGING. THE TOLL-FREE NUMBER IS (800) 362-2764.

UTILITIES
LISTED BELOW ARE ALL UTILITIES LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS TOGETHER WITH THEIR RESPECTIVE OWNERS:

(1) ELECTRIC — AMERICAN ELECTRIC POWER
9135 SR 682
ATHENS, OHIO 45701
CONTACT: CHRIS McDANIELS
PHONE: 740-532-9927

(2) TELEPHONE — FRONTIER COMMUNICATIONS
754 WEST UNION ST
ATHENS, OHIO 45701
PHONE: 740-331-9442

(3) WATER — SUNDAY CREEK VALLEY WATER
15945 2ND ST
MILLFIELD, OHIO 45761
PHONE: 740-797-2566

THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNER OF THE UTILITIES AS REQUIRED BY SECTION 153.64 O.R.C.

UTILITY LINES
ALL EXPENSES INVOLVED IN RELOCATING (INSTALLING) THE AFFECTED UTILITY LINES SHALL BE BORNE BY THE UTILITY(IES). THE CONTRACTOR AND UTILITY ARE TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE HELD TO A MINIMUM.

CONSTRUCTION NOTIFICATION
THE CONTRACTOR WILL ADVISE THE PROJECT ENGINEER A MINIMUM OF TWENTY ONE (21) DAYS PRIOR TO THE FOLLOWING: THE START OF THE CONSTRUCTION ACTIVITIES, LANE CLOSURES AND/OR ROAD CLOSURES.

WORK LIMITS
ALL PHYSICAL WORK SHALL BE COMPLETED WITHIN THE COUNTY RIGHT-OF-WAY ONLY. PROVIDE THE INSTALLATION AND OPERATION OF ALL WORK ZONE TRAFFIC CONTROL AND WORK ZONE TRAFFIC CONTROL DEVICES REQUIRED BY THESE PLANS WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.

ELEVATION DATUM
ALL ELEVATIONS ARE ORTHOMETRIC HEIGHTS USING THE NORTH AMERICAN VERTICAL DATUM OF 1988(NAVD 88) AND THE GEOID 12A. HORIZONTAL POSITIONS ARE BASED ON THE OHIO STATE PLANE SOUTH ZONE 3402.

ROUNDING
THE ROUNDING AT SLOPE BREAKPOINTS SHOWN ON THE TYPICAL SECTIONS APPLY TO ALL CROSS-SECTIONS EVEN THOUGH OTHER-WISE SHOWN.

CONTINGENCY QUANTITIES
THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER. THE ACTUAL WORK LOCATIONS AND QUANTITIES USED FOR SUCH ITEMS SHALL BE INCORPORATED INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

ITEM 614 - MAINTAINING TRAFFIC
COUNTY ROAD 42 WILL BE CLOSED FOR A MAXIMUM OF 60 DAYS. LOCAL TRAFFIC WILL BE DETOURED. SEE MAP ON SHEET 2 FOR DETOUR ROUTE.

THE CONTRACTOR SHALL SUBMIT A MAINTENANCE OF TRAFFIC PLAN WHICH COMPLIES WITH THE REQUIREMENTS OF THE STANDARD DRAWINGS, THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, THE CONSTRUCTION AND MATERIAL SPECIFICATIONS, THE DROP-OFFS IN WORK ZONES SHEET, AND VOLUME ONE OF THE LOCATION AND DESIGN MANUAL. THE PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

ITEM 614 - MAINTAINING TRAFFIC-CONTINUE
ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH CMS 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR ALL LABOR, EQUIPMENT, AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

ITEM 203 - SPECIAL EARTHWORK
PAYMENT FOR RECONSTRUCTION OF GRADED SHOULDER SHALL BE INCLUDED IN THE LUMPSUM CONTRACT PRICE FOR ITEM SPECIAL EARTHWORK (203).

ITEM 624 - PLUG PILES 30" DIAMETER
THESE SHAFTS ARE TO BE UNREINFORCED NON-STRUCTRAL "PLUG PILES" SERVING THE PURPOSE OF LAGGING.

THIS WORK SHALL BE AS PER ITEM 524 EXCEPT REINFORCING WILL NOT BE USED IN THE SHAFT, EACH PLUG PILE SHALL BE CENTERED BETWEEN EACH REINFORCED 24"DIAMETER DRILLED SHAFT AND SHALL HAVE A LENGTH OF 8 FEET AS SHOWN ON SHEET 7, AND BACKFILLED WITH UNREINFORCED CLASS QC1 CONCRETE.

PAYMENT FOR LABOR, EQUIPMENT, AND MATERIALS FOR THE ABOVE SHALL BE INCLUDED IN THE PER FOOT CONTRACT PRICE FOR ITEM 524, PLUG PILES, 30"DIAMETER.

ITEM 659 - SEEDING AND MULCHING
SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL BETWEEN THE EASEMENT LINES. QUANTITY CALCULATIONS FOR SEEDING AND MULCHING ARE BASED ON THESE LIMITS.

ITEM 201 - CLEARING AND GRUBBING
CONTRACTORS SHOULD INSPECT THE AREAS WHERE THE RETAINING WALLS ARE TO BE CONSTRUCTED TO FIND THE BULK OF THIS WORK. SPECIFIC TREES TO BE REMOVED HAVE NOT BEEN DENOTED ON THESE DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BECOME FAMILIAR WITH THE SCOPE OF WORK REQUIRED TO CLEAR THE AREAS NEEDED TO CONSTRUCT THE VARIOUS ELEMENTS OF THIS PROJECT.

ITEM 507 - STEEL PILES, MISC.: SOLDIER PILES HP14x89
THIS WORK CONSISTS OF FURNISHING AND PLACING STEEL SOLIDER PILES INTO DRILLED HOLES. FURNISH SOLDIER PILES CONSISTING OF STRUCTURAL STEEL MEMBER THAT MEET THE PLAN REQUIREMENTS AND CONFORM TO ASTM A572, GRADE 50.

MEASUREMENT FOR PAYMENT WILL BE LIMITED TO THE DISTANCE BETWEEN THE TOP OF WALL ELEVATION AND THE BOTTOM OF THE DRILLED SHAFT, AS DETERMINED BY THE ENGINEER. THE DEPARTMENT WILL PAY FOR SOLDIER PILES AT THE CONTRACT UNIT PRICE PER FOOT OF ITEM 507 - STEEL PILES, MISC.: SOLDIER PILES - HP14X89. ALL CUT PIECES SHALL BECOME PROPERTY OF ATHENS COUNTY.

ITEM 524 - DRILLED SHAFTS, 24" DIAMETER, ABOVE BEDROCK, AS PER PLAN
ITEM 524 - DRILLED SHAFTS, 24" DIAMETER, INTO BEDROCK, AS PER PLAN

THIS WORK CONSISTS OF FURNISHING AND INSTALLING DRILLED SHAFTS FOR SOLDIER PILE AND PLUG PILE WALLS. THE DRILLED SHAFTS ARE REINFORCED WITH SOLDIER PILES INSTEAD OF REINFORCING STEEL CAGES. THE SOLDIER PILES TERMINATES 3" BELOW THE TOP OF THE DRILLED SHAFT. FURNISH AND INSTALL DRILLED SHAFTS IN ACCORDANCE WITH CMS 524 EXCEPT AS MODIFIED AND SUPPLEMENTED BELOW.

EXCAVATE THE HOLE FOR THE DRILLED SHAFTS WITHIN 3 INCHES OF THE PLAN LOCATION IN THE HORIZONTAL PLANE. IF FIELD CONDITIONS INDICATE GREATER DEPTHS, NOTIFY THE ENGINEER FOR FURTHER EVALUATION.

PLACE THE SOLDIER PILE VERTICALLY WITHIN THE HOLE SO IT IS NOT INCLINED MORE THAN 1" BETWEEN THE TOP AND BOTTOM. PLACE THE SOLDIER PILE SO THAT THE FLANGES ARE PARALLEL TO THE CENTERLINE OF CONSTRUCTION. DO NOT ALLOW THE ORIENTATION OF THE FLANGES TO VARY BY MORE THAN 10 DEGREES. SUPPORT THE SOLDIER PILE SO THAT IT DOES NOT MOVE CONCRETE PLACEMENT.

USE CLASS QC1 CONCRETE ACCORDING TO CMS 511. THE CONTRACTOR MAY PLACE CONCRETE USING THE FREE FALL METHOD PROVIDED THE DEPTH OF WATER IS LESS THAN 6 INCHES AND THE CONCRETE FALLS WITHOUT STRIKING THE SIDES OF THE HOLE. POURING CONCRETE ALONG THE WEB OF THE SOLDIER PILE IS ACCEPTABLE.

CHECK THE POSITION, THE VERTICAL ALIGNMENT AND ORIENTATION OF THE SOLDIER PILE IMMEDIATELY AFTER CONCRETE PLACEMENT. MAKE CORRECTIONS AS NECESSARY TO MEET THE ABOVE TOLERANCES.

SEQUENCE OF INSTALLATION
THE INSTALLATION SEQUENCE SHALL BE SUCH THAT NO DRILLED SHAFT IS INSTALLED ADJACENT TO EITHER AN OPEN DRILLED SHAFT EXCAVATION OR A DRILLED SHAFT IN WHICH THE CONCRETE HAS LESS THAN A 48 HOUR CURE. INSTALLING THE SHAFTS IN A ALTERNATING SEQUENCE OR ANY OTHER SEQUENCE THAT MEETS THIS CRITERIA IS PERMISSIBLE.

PROTECTION OF UNATTENDED OPEN SHAFTS CARE SHALL BE EXERCISED AS TO COVER UNATTENDED OPEN SHAFTS. TEMPORARY COVERS SHALL BE OF ADEQUATE STRENGTH TO PREVENT A PERSON OR ANIMAL FROM FALLING IN. NO DRILLED SHAFT EXCAVATION SHALL BE LEFT UN-POURED OVERNIGHT

ACCESS
THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS AND METHODS USED TO CONSTRUCT THE DRILLED SHAFTS AND CONCRETE PLUG PILES. ANY TEMPORARY GRADING, AGGREGATE, DRAINAGE, SHEETING ETC. NEEDED FOR ACCESS TO THE WORK AREA SHALL BE INCLUDED IN THE BID PRICE FOR THE DRILLED SHAFTS. PAYMENT IS FULL COMPENSATION FOR CONSTRUCTING THE DRILLED SHAFTS, INCLUDING FURNISHING AND PLACING CONCRETE. PAYMENT FOR SOIL OVERBURDEN DRILLING, WHICH IS GROUND LEVEL TO THE TOP OF THE SHAFT, SHALL BE INCLUSIVE OF ITEM 524 DRILLED SHAFTS, 24" DIAMETER, ABOVE BEDROCK.

MEASUREMENT FOR PAYMENT FOR DRILLED SHAFTS ABOVE BEDROCK, AS PER PLAN, WILL BE MEASURED ALONG THE AXIS OF THE DRILLED SHAFT FROM THE TOP OF THE SHAFT TO THE TOP OF BEDROCK, AS DETERMINED BY THE ENGINEER. MEASUREMENT FOR PAYMENT FOR DRILLED SHAFTS INTO BEDROCK, AS PER PLAN, WILL BE LIMITED TO THE DISTANCE BETWEEN THE TOP OF BEDROCK AND THE BOTTOM OF THE DRILLED SHAFT, AS DETERMINED BY THE ENGINEER.

Terracon
Consulting Engineers and Scientists
8660 ANDERSON ROAD COLUMBUS, OHIO 43235
PH: (614) 883-3373 FAX: (614) 883-3375

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GENERAL NOTES

ATH-CR42-4.48

WEST WALL SCHEDULE FOR STEEL PILES, CONCRETE DRILLED SHAFTS AND PLUG PILES

SHAFT #	APPROXIMATE ELEVATIONS								BEAM LENGTH[4] (FT)
	DRILLED SHAFT			STEEL PILES		T/O ROCK[1]	PLUG PILES		
	BOTTOM[2]	T/O ROAD	TOP	BOTTOM[3]	TOP		BOTTOM	TOP	HP14x89
1	791.1	817.162	815.8	791.1	815.6	801.1	805.9	815.9	24.5
2	791.5	817.279	815.9	791.5	815.7	801.5	806.0	816.0	24.2
3	791.8	817.405	816.1	791.8	815.8	801.8	806.1	816.1	24.0
4	792.2	817.526	816.2	792.2	815.9	802.2	806.3	816.3	23.7
5	792.6	817.643	816.3	792.6	816.1	802.6	806.4	816.4	23.5
6	792.9	817.772	816.4	792.9	816.2	802.9	806.5	816.5	23.3
7	793.3	817.897	816.6	793.3	816.3	803.3	806.6	816.6	23.0
8	793.6	818.017	816.7	793.6	816.4	803.6	806.7	816.7	22.8
9	794.0	818.124	816.8	794.0	816.5	804.0	806.9	816.9	22.5
10	794.4	818.244	816.9	794.4	816.7	804.4	807.0	817.0	22.3
11	794.7	818.36	817.0	794.7	816.8	804.7	807.1	817.1	22.1
12	795.1	818.475	817.1	795.1	816.9	805.1	807.2	817.2	21.8
13	794.5	818.591	817.3	794.5	817.0	804.5	807.3	817.3	22.5
14	793.9	818.71	817.4	793.9	817.1	803.9	807.4	817.4	23.2
15	793.3	818.84	817.5	793.3	817.3	803.3	807.6	817.6	24.0
16	792.7	818.969	817.6	792.7	817.4	802.7	807.7	817.7	24.7
17	792.1	819.098	817.8	792.1	817.5	802.1	807.8	817.8	25.4
18	791.5	819.228	817.9	791.5	817.6	801.5	808.0	818.0	26.1
19	790.9	819.349	818.0	790.9	817.8	800.9	808.1	818.1	26.9
20	790.3	819.447	818.1	790.3	817.9	800.3	808.2	818.2	27.6
21	789.7	819.544	818.2	789.7	818.0	799.7	808.3	818.3	28.3
22	789.1	819.642	818.3	789.1	818.1	799.1			29.0

NOTES:

1. *TOP OF ROCK ELEVATIONS ARE INTERPOLATED FROM THE TOP OF ROCK ELEVATIONS OBSERVED IN THE ADJACENT BORINGS. HENCE, THESE ELEVATIONS ARE APPROXIMATE AND TO BE CONFIRMED IN THE FIELD DURING DRILLING OF THE SHAFTS BY A COMPETENT GEOTECHNICAL ENGINEER.*
2. *DRILED SHAFT BOTTOM SHALL BE AT LEAST 10 FEET BELOW THE TOP OF THE BEDROCK ENCOUNTERED DURING THE DRILLING OF THE SHAFT, AS CONFIRMED BY A COMPETENT GEOTECHNICAL ENGINEER IN THE FIELD DURING DRILLING.*
3. *BOTTOM OF STEEL PILES SHALL BE SAME AS THE BOTTOM OF THE DRILLED SHAFT ELEVATION AS PER THE NOTE 2 ABOVE, FOR EACH PILE.*
4. *BEAM LENGTHS SPECIFIED IN SCHEDULES ABOVE ARE APPROXIMATE FINISHED LENGTHS AND WILL BE THE LENGTHS BETWEEN TOP OF THE STEEL PILE AND BOTTOM OF STEEL PILE ELEVATION OBSERVED AS PER NOTE 3 ABOVE. ALL STEEL BEAMS (HP14X89) ARE TO BE OF 30 FEET SUPPLY LENGTH.*

EAST WALL SCHEDULE FOR STEEL PILES, CONCRETE DRILLED SHAFTS AND PLUG PILES

SHAFT #	APPROXIMATE ELEVATIONS								BEAM LENGTH[4] (FT)
	DRILLED SHAFT			STEEL PILES		T/O ROCK[1]	PLUG PILES		
	BOTTOM[2]	T/O ROAD	TOP	BOTTOM[3]	TOP		BOTTOM	TOP	HP14x89
1	792.8	820.796	819.5	792.8	819.2	802.8	809.5	819.5	26.4
2	792.8	820.809	819.5	792.8	819.2	802.8	809.5	819.5	26.4
3	792.7	820.822	819.5	792.7	819.2	802.7	809.5	819.5	26.5
4	792.7	820.834	819.5	792.7	819.3	802.7	809.5	819.5	26.6
5	792.7	820.847	819.5	792.7	819.3	802.7	809.5	819.5	26.6
6	792.6	820.832	819.5	792.6	819.2	802.6	809.5	819.5	26.6
7	792.6	820.786	819.5	792.6	819.2	802.6	809.4	819.4	26.6
8	792.6	820.741	819.4	792.6	819.2	802.6	809.4	819.4	26.6
9	792.5	820.695	819.4	792.5	819.1	802.5	809.3	819.3	26.6
10	792.5	820.649	819.3	792.5	819.1	802.5	809.3	819.3	26.6
11	792.5	820.604	819.3	792.5	819.0	802.5	809.2	819.2	26.5
12	792.4	820.558	819.2	792.4	819.0	802.4	809.2	819.2	26.6
13	792.4	820.522	819.2	792.4	818.9	802.4	809.2	819.2	26.5
14	792.3	820.511	819.2	792.3	818.9	802.3	809.2	819.2	26.6
15	792.3	820.499	819.2	792.3	818.9	802.3	809.2	819.2	26.6
16	792.3	820.488	819.2	792.3	818.9	802.3	809.1	819.1	26.6
17	792.2	820.476	819.1	792.2	818.9	802.2	809.1	819.1	26.7
18	792.2	820.465	819.1	792.2	818.9	802.2	809.1	819.1	26.7
19	792.2	820.46	819.1	792.2	818.9	802.2	809.1	819.1	26.7
20	792.1	820.442	819.1	792.1	818.9	802.1	809.1	819.1	26.8
21	792.1	820.43	819.1	792.1	818.8	802.1	809.1	819.1	26.7
22	792.0	820.419	819.1	792.0	818.8	802.0	809.1	819.1	26.8
23	791.9	820.407	819.1	791.9	818.8	801.9	809.1	819.1	26.9
24	791.7	820.395	819.1	791.7	818.8	801.7	809.1	819.1	27.1
25	791.6	820.384	819.1	791.6	818.8	801.6	809.0	819.0	27.2
26	791.5	820.372	819.0	791.5	818.8	801.5	809.0	819.0	27.3
27	791.4	820.368	819.0	791.4	818.8	801.4	809.0	819.0	27.4
28	791.3	820.363	819.0	791.3	818.8	801.3	809.0	819.0	27.5
29	791.2	820.338	819.0	791.2	818.8	801.2	809.0	819.0	27.6
30	791.0	820.326	819.0	791.0	818.7	801.0	809.0	819.0	27.7
31	790.9	820.321	819.0	790.9	818.7	800.9	809.0	819.0	27.8
32	790.8	820.303	819.0	790.8	818.7	800.8	809.0	819.0	27.9
33	791.1	820.292	819.0	791.1	818.7	801.1	809.0	819.0	27.6
34	791.4	820.28	818.9	791.4	818.7	801.4	808.9	818.9	27.3
35	791.7	820.269	818.9	791.7	818.7	801.7	808.9	818.9	27.0
36	792.0	820.257	818.9	792.0	818.7	802.0	808.9	818.9	26.7
37	792.3	820.245	818.9	792.3	818.7	802.3	808.9	818.9	26.4
38	792.6	820.222	818.9	792.6	818.6	802.6	808.9	818.9	26.0
39	792.9	820.27	818.9	792.9	818.7	802.9	809.0	819.0	25.8
40	793.2	820.316	819.0	793.2	818.7	803.2	809.0	819.0	25.5
41	793.5	820.362	819.0	793.5	818.8	803.5	809.1	819.1	25.3
42	793.8	820.408	819.1	793.8	818.8	803.8			25.0

CR42-4.48 : GENRAL SUMMARY

REF NO	ITEM No	ITEM DESCRIPTION	QTY	UNIT
1	201	CLEARING AND GRUBBING	1	LS
2	202	PIPE REMOVED, 24" AND UNDER	30	FT
3	203	SPECIAL EARTHWORK	1	LS
4	617	COMPACTED AGRREGATE	16	CY
5	659	SEEDING AND MULCHING, AS PER PLAN	217	SY
6	254	SUBGRADE COMPACTION	288	SY
7	301	ASPHALT CONCRETE BASE	32	CY
8	304	AGGREGATE BASE	64	CY
9	407	TACK COAT	46	GAL
10	441	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG64-22	27	CY
11	611	12" CONDUIT, TYPE B	30	FT
12	507	STEEL PILES MISC- SOLDIER PILE HP14X89	1920	FT
13	524	PLUG PILES, 30" DIAMETER	620	FT
14	524	DRILLED SHAFTS, 24" DIAMETER ABOVE BEDROCK, AS PER PLAN	1034	FT
15	524	DRILLED SHAFTS, 24" DIAMETER INTO BEDROCK, AS PER PLAN	640	FT
16	614	MAINTAINING TRAFFIC	1	LS
17	623	CONSTRUCTION LAYOUT STAKES AND SURVEYING	1	LS
18	624	MOBILIZATION	1	LS
19	103	PREMIUM FOR PERFORMANCE BOND AND FOR PAYMENT BOND	1	LS

Terracon
Consulting Engineers and Scientists
815 MORACON ROAD
PH (614) 882-3373
COLUMBUS, OHIO 43230
FAX (614) 882-3375

DRAWN DAB
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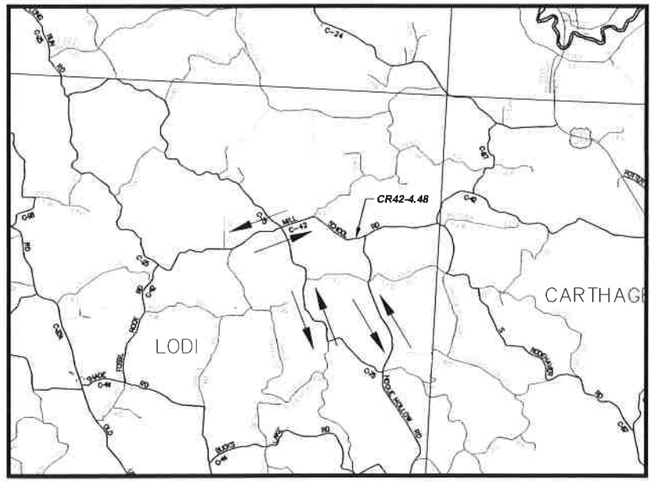
PILE SCHEDULES AND GENERAL SUMMARIES

ATH-CR42-4.48



LOCATION MAP

LATITUDE N39°15'06.98" LONGITUDE: W81°58'29.73"

SCALE IN MILES

0 1 2 3 4

2016 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

NOTES

1. THE ROAD WILL BE CLOSED DURING CONSTRUCTION SO THE CONTRACTOR SHALL SETUP AND MAINTAIN ROAD CLOSURE TRAFFIC CONTROL THROUGHOUT CONSTRUCTION
2. ORDER THE HP14x89 PILES AT 30 FEET LONG X 22 NOS = 660 FT.

CONTROL POINTS

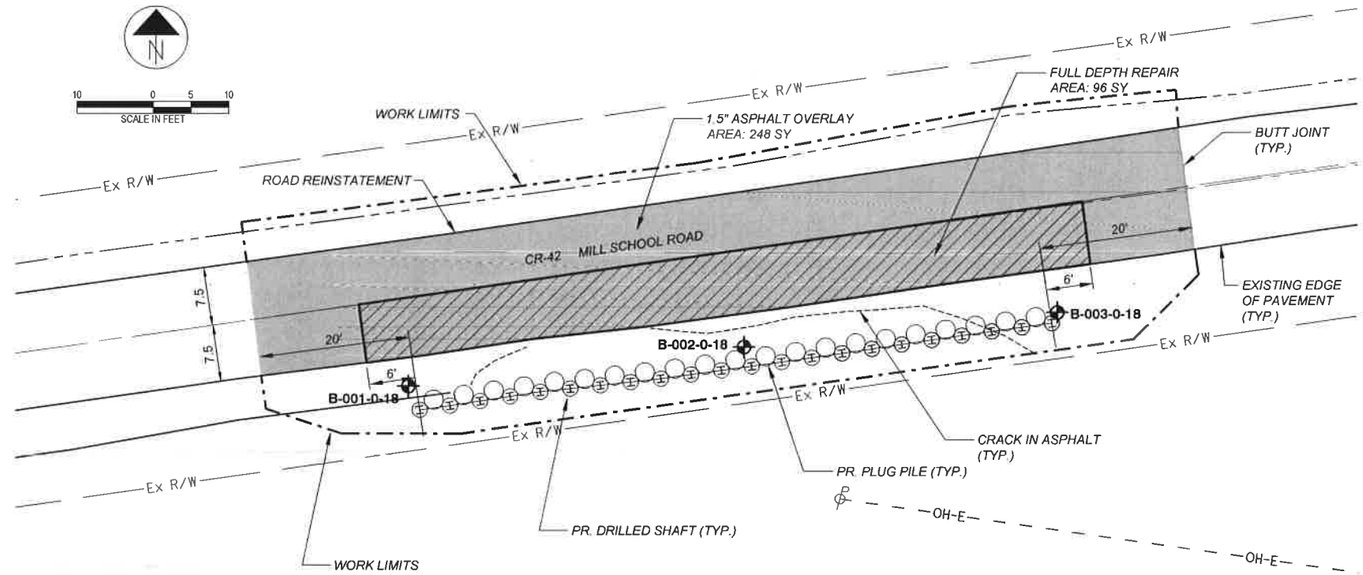
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
11	456459.9860	2117464.9310	817.93	CNPT
12	456402.8300	2117195.8490	820.77	CNPT
13	456362.0130	2116897.6220	813.87	CNPT

SOIL BORINGS

BORING	STATION	OFFSET	EX. GROUND SURFACE ELEV.	APPROX. TOP OF ROCK
B-1	-0+01.0	3.3' Lt	816.5	797.5
B-2	0+43.5	2.6' Lt	817.6	805.1
B-3	0+85.0	1.3' Lt	819.1	797.1

ESTIMATED QUANTITIES

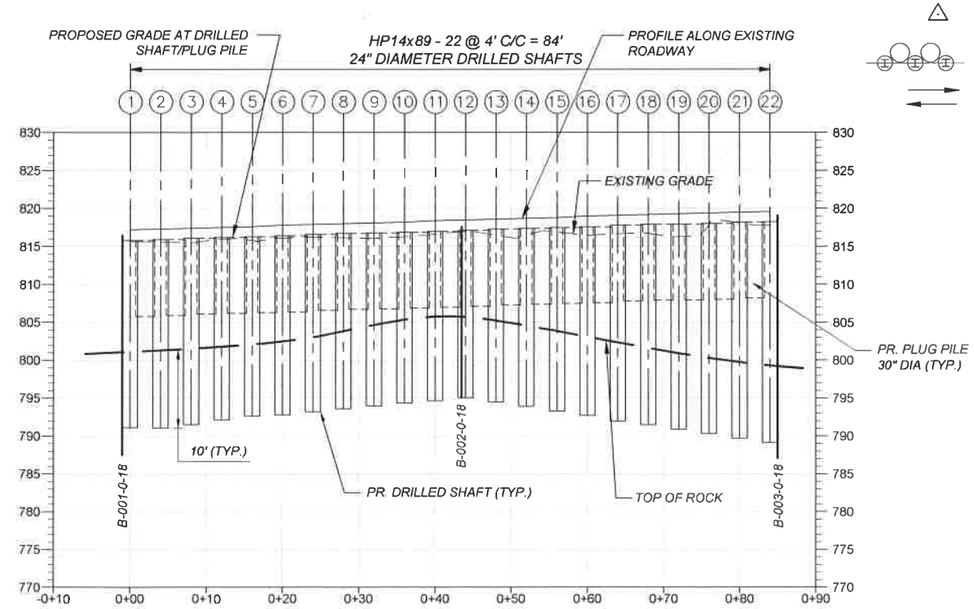
ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT
507	STEEL PILES, MISC.: SOLDIER PILE HP14X89	660	FT
524	DRILLED SHAFTS, 24" DIAMETER, ABOVE BEDROCK	321	FT
524	DRILLED SHAFTS, 24" DIAMETER, INTO BEDROCK	220	FT
524	PLUG PILES, 30" DIAMETER	210	FT



SITE PLAN

LEGEND

- BORING LOCATION
- CONTROL POINT
- DRILLED SHAFT AND PLUG PILE WALL
- DETOUR ROUTE



PIER WALL PROFILE

NOTE:

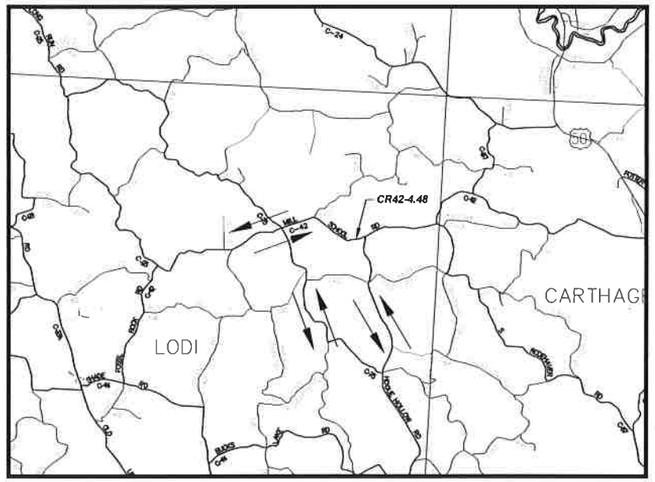
FOR STEEL PILES, CONCRETE SHAFTS AND PLUG PILES SCHEDULE - SEE SHEET 4

Terracon
Consulting Engineers and Scientists

DRAWN DAB
CHECKED NVP

WEST WALL SITE PLAN & WALL PROFILE

ATH-CR42-4.48

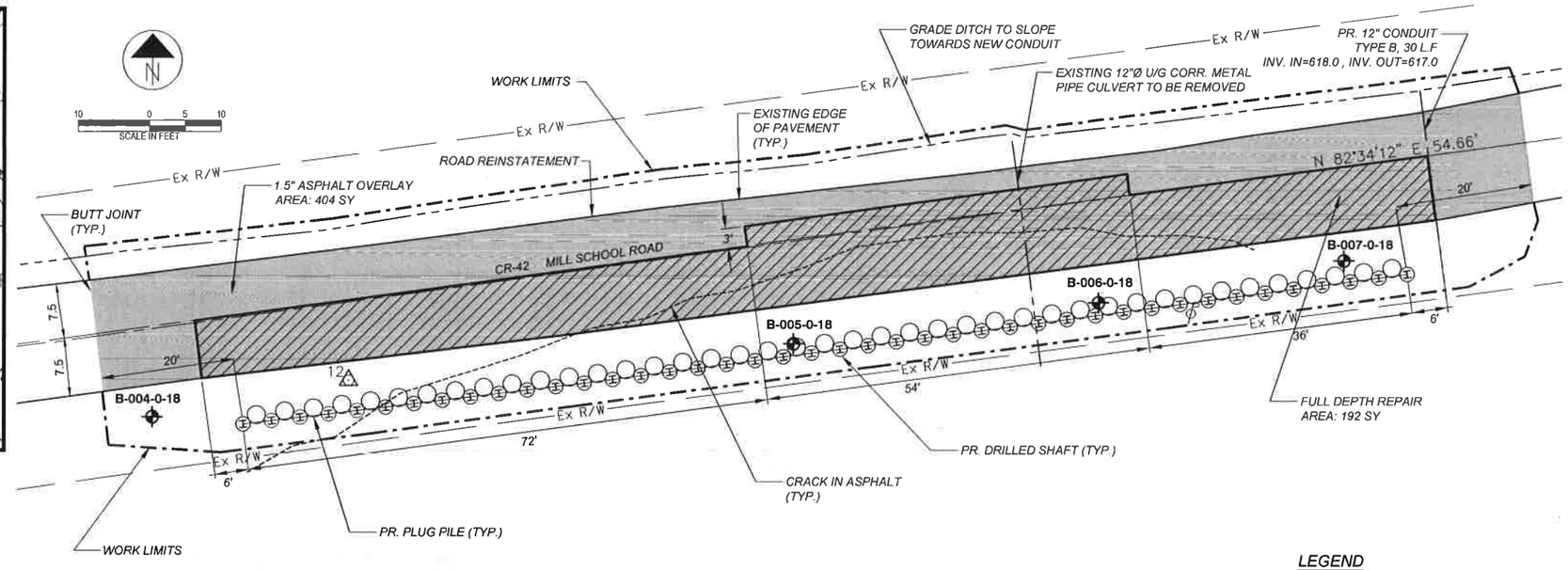


LOCATION MAP

LATITUDE N39°15'06.98" LONGITUDE: W81°58'29.73"

SCALE IN MILES

0 1 2 3 4



SITE PLAN

LEGEND

- BORING LOCATION
- CONTROL POINT
- DRILLED SHAFT AND PLUG PILE WALL
- DETOUR ROUTE

2016 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

NOTES

1. THE ROAD WILL BE CLOSED DURING CONSTRUCTION SO THE CONTRACTOR SHALL SETUP AND MAINTAIN ROAD CLOSURE TRAFFIC CONTROL THROUGHOUT CONSTRUCTION
2. ORDER THE HP14x89 PILES AT 30 FEET LONG X 42 NOS = 1260 FT.

CONTROL POINTS

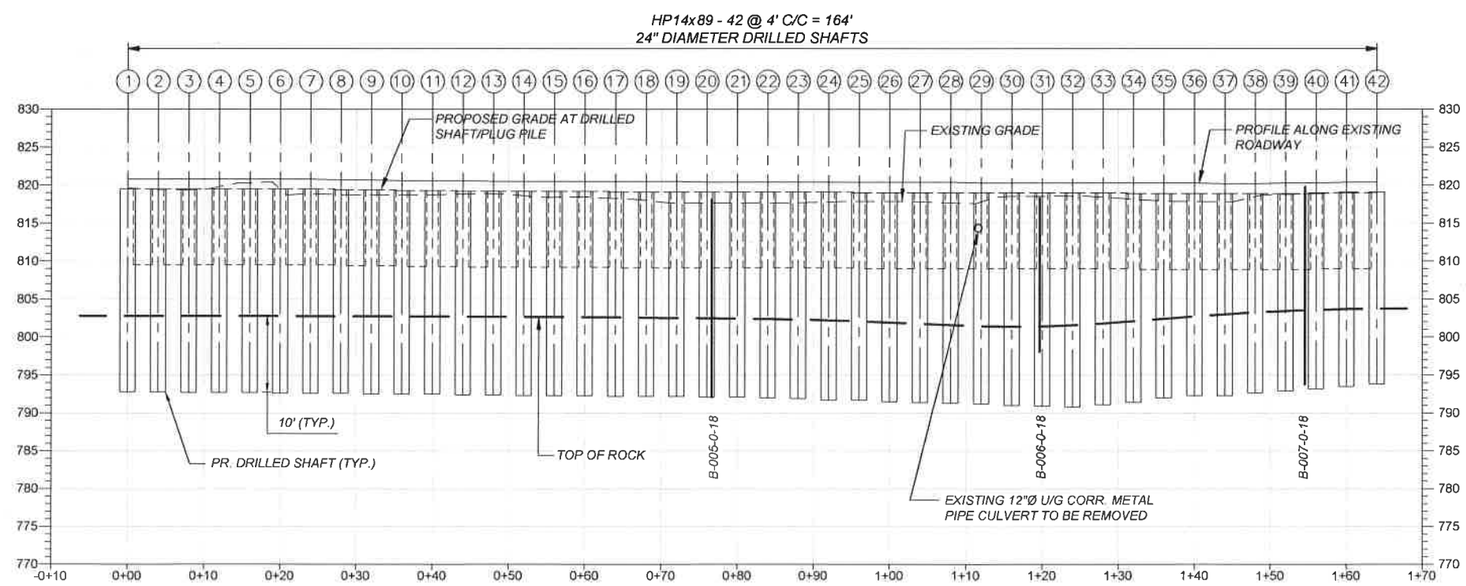
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
11	456459.9860	2117464.9310	817.93	CNPT
12	456402.8300	2117195.8490	820.77	CNPT
13	456362.0130	2116897.6220	813.87	CNPT

SOIL BORINGS

BORING	STATION	OFFSET	EX. GROUND SURFACE ELEV.	APPROX. TOP OF ROCK
B-4	-0+13.5	3.0' Lt	820.3	802.8
B-5	0+76.6	1.6' Lt	818.1	802.1
B-6	1+19.7	1.7' Lt	818.3	800.8
B-7	1+54.5	3.0' Lt	819.8	803.8

ESTIMATED QUANTITIES

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT
507	STEEL PILES, MISC.: SOLDIER PILE HP14X89	1260	FT
524	DRILLED SHAFTS, 24" DIAMETER, ABOVE BEDROCK	713	FT
524	DRILLED SHAFTS, 24" DIAMETER, INTO BEDROCK	420	FT
524	PLUG PILE, 30" DIAMETER	410	FT



PIER WALL PROFILE

NOTE:

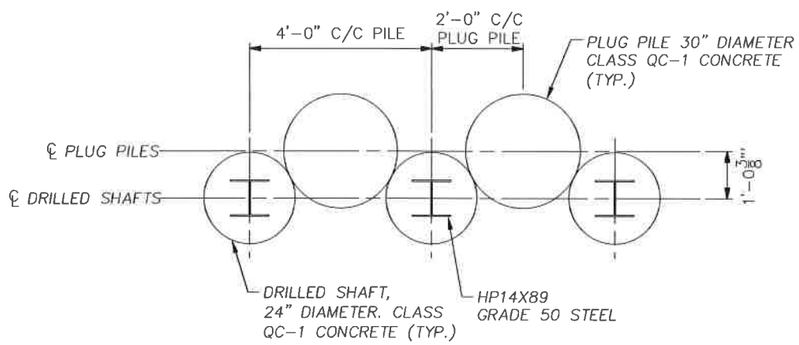
FOR STEEL PILES, CONCRETE SHAFTS AND PLUG PILES SCHEDULE - SEE SHEET 4

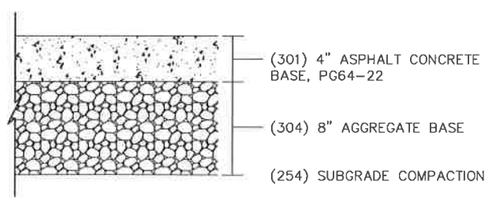
Terracon
Consulting Engineers and Scientists

DRAWN DAB
CHECKED NVP

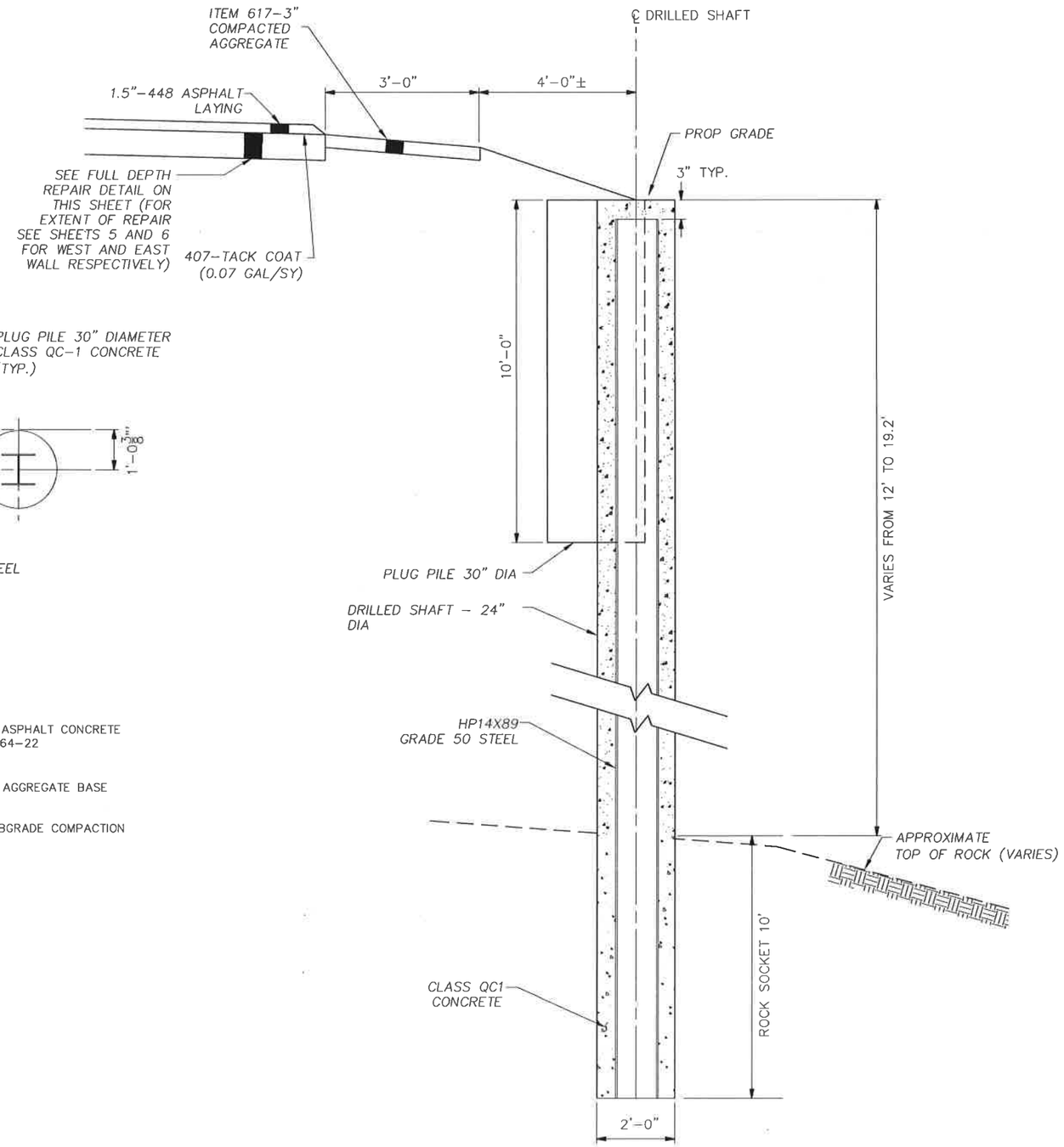
EAST WALL SITE PLAN & WALL PROFILE

ATH-CR42-4.48





FULL DEPTH REPAIR DETAIL



RETAINING WALL DETAIL
HP14x89

Terracon
Consulting Engineers and Scientists
10 LABUST, CHO 43206
FAX: (614) 863-8415
10 MORRISON ROAD
PH: (614) 863-3173

DRAWN DAB
CHECKED NVP

RETAINING WALL DETAILS

ATH-CR42-4.48

7/7

PROJECT DESCRIPTION

EXPLORATION OF A LANDSLIDE ON CR42 (MILL SCHOOL ROAD) IN ATHENS COUNTY, OHIO.

HISTORIC RECORDS

NO HISTORIC BORING RECORDS WERE FOUND FOR THIS PROJECT.

GEOLOGY

THE LANDSLIDE IS LOCATED IN THE UNGLACIATED AND DISSECTED MARIETTA PLATEAU OF THE APPALACHIAN PLATEAU PROVINCE. THIS AREA IS CHARACTERIZED BY HIGH RELIEF TOPOGRAPHY AND COLLUVIUM SOILS DERIVED FROM SURROUNDING BEDROCK. IN ADDITION TO THE COLLUVIUM SOILS, RESIDUUM SOILS ARE ALSO PRESENT IN SCATTERED AREAS. THE UNDERLY PENNSYLVANIAN AGED BEDROCK CONSIST PREDOMINATELY OF FINE GRAIN SEDIMENTARY ROCKS FROM THE CONEMAUGH AND MONONGAHELA GROUPS.

BEDROCK CONSISTING OF SILTSTONE AND SHALE WAS ENCOUNTERED AT EACH BORING AT DEPTHS RANGING FROM 12.5 FEET TO 20 FEET BELOW THE SURFACE, GENERALLY SLOPING NORTH.

RECONNAISSANCE

FIELD RECONNAISSANCE WAS PERFORMED ON JUNE 15, 2018 AT MILE MARKER 4.48 OF COUNTY ROAD 42 (MILL SCHOOL ROAD) IN LODI TOWNSHIP, ATHENS COUNTY, OHIO. THE SLIPPAGE HAS IMPACTED THE EAST BOUND LANE OF EAST-WEST TRENDING ROADWAY. THE ROADWAY SECTION IS GENERALLY SITUATED ALONG THE SOUTH FACING HILLSIDE SLOPE WITH A RELATIVELY LEVEL FIELD LOCATED DOWNSOPE OF THE ROADWAY. AN OPEN TRENCH WAS OBSERVED ALONG THE TOE OF THE SLOPE.

TWO SLIPS WERE NOTCED AT THE PROJECT SITE, SEPARATED BY A SECTION OF A SLOPE THAT HAS NOT FAILED. PREVIOUS REMEDITATION IN THE FORM OF ROCK FILL PLACEMENT BY UNDERCUTTING OF THE ROADWAY WAS DONE AS INFORMED BY THE ATHENS COUNTY ENGINEER DURING SITE VISIT. LARGE CRACKING AND SETTLING OF THE EXISTING PAVEMENT WAS OBSERVED ALONG THE SOUTHERN EDGE OF THE PAVEMENT AT THESE TWO LOCATIONS ON EITHER SIDE OF AN PREVIOUSLY REMEDIATED PORTION. APPROXIMATE LENGTH OF THE WESTERNMOST SLIP IS ABOUT 80 FEET, WHILE IT IS 162 FEET FOR THE EASTERN SLIP. AN EXISTING CULVERT IS NOTICED ALONG NORTH-SOUTH DIRECTION AT THE EASTERN SLIP. A TOTAL OF SEVEN (7) BORINGS WERE PROPOSED ALONG THE SOUTHERN SIDE OF THE ROAD, AND APPROXIMATELY AT 5 FEET ± SOUTH OF THE SOUTH EDGE OF THE ROAD PAVEMENT. THREE BORINGS B-001-0-18 THRU B-003-018 WERE PROPOSED FOR THE WESTERNMOST SLIPS, WHILE FOUR (4) BORINGS B-004-0-18 THRU B-007-0-18 FOR THE EASTERN SLIP AREA. NO GUARDRAILS WERE NOTICED ALONG THE SOUTHERN SIDE OF THE ROAD. A DEMOLISHED TRAILER SITE WAS NOTICED IN FRONT OF WESTERNMOST SLIP ZONE. EXTENTS OF THE LANDSLIDE FAILURE AREA WERE MARKED WITH A WHITE PAINT ON THE ROAD PAVEMENT. THE SURROUNDING LAND USAGE IS PRIMARILY WOODED RURAL LAND.

SUBSURFACE EXPLORATION

A TOTAL OF SEVEN (7) BORINGS WERE COMPLETED AS PART OF CURRENT EXPLORATION. BORINGS B-001-0-18 THROUGH B-007-0-18 WERE DRILLED AT APPROXIMATELY 5 FEET ± OFF THE SOUTHERN EDGE OF THE COUNTY ROAD CR42 (MILL SCHOOL ROAD). EACH OF THE PROPOSED BORINGS WERE DRILLED WITH A TRACK-MOUNTED ROTARY DRILL RIG UTILIZING 3 ¼ - INCH I.D. HOLLOW STEM AUGERS TO ADVANCE BORINGS BETWEEN THE SAMPLING ATTEMPTS. IN GENERAL STANDARD PENETRATION TESTING (SPT) AND SPLIT SPOON SAMPLING WERE PERFORMED IN THE BORINGS AT 2'-6" INTERVALS UNTILL THE TOP OF THE WEATHERED BEDROCK.

WHERE COMPETENT BEDROCK WAS ENCOUNTERED, AS DEFINED BY THE AUGER REFUSAL, A CHANGEOVER TO CORING TECHNIQUES WAS MADE AND THE BEDROCK WAS CORED USING AN NQ2-SIZED DOUBLE TUBE DIAMOND BIT CORE BARREL WITH WIRE LINE EQUIPMENT. WATER WAS USED AS A CIRCULATING FLUID DURING THE CORING PROCESS. THE HAMMER SYSTEM FOR THE DRILL RIG MODEL MOBIL B-57 (DRILL RIG NO. 613, SERIAL NO. 2016014) USED FOR THIS PROJECT WAS CALIBRATED ON SEPTEMBER 12, 2017 AND HAS A DRILL RIG ENERGY RATIO OF 89.2 + 3 PERCENT.

EXPLORATION RESULTS

AT THE EXISTING GROUND SURFACE, THE BORING GENERALLY ENCOUNTERED BETWEEN 8 TO 10 INCHES OF CRUSHED STONE OVERLAYING COHESIVE AND GRANULAR FILL (ODOT A-1a, A-2-6, or A-6b) EXTENDING TO DEPTHS OF THE ORDER OF ABOUT 4 FEET TO 10 FEET BELOW EXSISTING GROUND SURFACE.

UNDERLYING THE SURFICAL CRUSHED STONE AND EXSISITING FILL MATERIALS, THE BORINGS ENCOUNTERED PREDOMINANTLY COHESIVE SOILS WHICH WERE IDENTIFIED AS SILT AND CLAY (A-6b, A-7-6a) WITH CONSISTENCY RANGING FROM MEDIUM STIFF TO VERY STIFF BASED ON HAND PENTROMETER READINGS AND CORRECTED SPT BLOW COUNTS.

BEDROCK CONSISTING OF CLAYSTONE WAS ENCOUNTED AT THE BORING LOCATIONS AT DEPTHS OF 12.5 TO 20 FEET. THE UPPERMOST BEDROCK WAS AUGERABLE AND DESCRIBED AS RED SEVERELY WEATHERED CLAYSTONE. THE CORED BEDROCK ACROSS THE SITE CONSISTED OF RED, HIGHLY TO SEVERELY WEATHERED, THINLY LAMINATED AND HAVING A RELATIVE STRENGTH VARYING FROM WEAK TO SLIGHTLY STRONG CLAYSTONE.

GROUND WATER WAS NOT ENCOUNTERED DURING SAMPLING AND DRILLING; HOWEVER, WATER LEVELS RANGING FROM 3 TO 4.5 FEET BELOW SURFACE WERE RECORDED AT THE BORING LOCATIONS AT THE COMPLETION OF DRILLING

LEGEND

DESCRIPTION	ODOT CLASS	CLASSIFIED MECH./VISUAL	
SOD AND TOPSOIL			
CLAY	A-7-6	1	5
SILT AND CLAY	A-6a	1	3
SILTY CLAY	A-6b	3	15
GRAVEL AND/OR STONE FRAGMENTS WITH SAND, SILT AND CLAY	A-2-6	–	2
GRAVEL AND/OR STONE FRAGMENTS	A-1-a	–	1
	TOTAL	5	26
CLAYSTONE	VISUAL		
PAVEMENT OR AGGREGATE BASE	VISUAL		

BORING LOCATION – PLAN VIEW

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

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

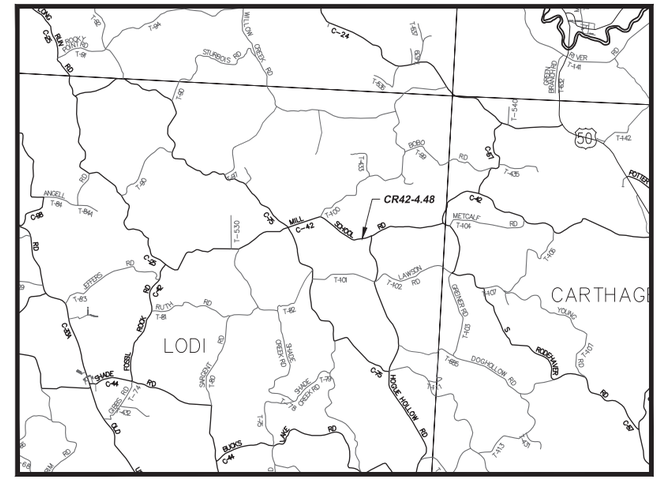
15/50/5" NUMBER OF BLOWS FOR STANDARD PENETRATION TEST (SPT): X= NUMBER OF BLOWS FOR 6 INCHES (UNCORRECTED). Y/D"= NUMBER OF BLOWS (UNCORRECTED) FOR D" OF PENETRATION AT REFUSAL.

W INDICATES STATIC WATER ELEVATION

WC INDICATES WATER CONTENT IN PERCENT.

SS INDICATES A SPLIT SPOON SAMPLE.

TR INDICATES TOP OF ROCK.



LOCATION MAP

LATITUDE N39°15'06.99" LONGITUDE: W81°58'30.15"

SCALE IN MILES

0 1 2 3 4

N

RECON. - KME 06/15/18
DRILLING - TMS 07/13/18
DRAWN - DAB 08/01/18
REVIEWED - NVP 08/01/18

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8004 MORRISON DRIVE OHIO 43230
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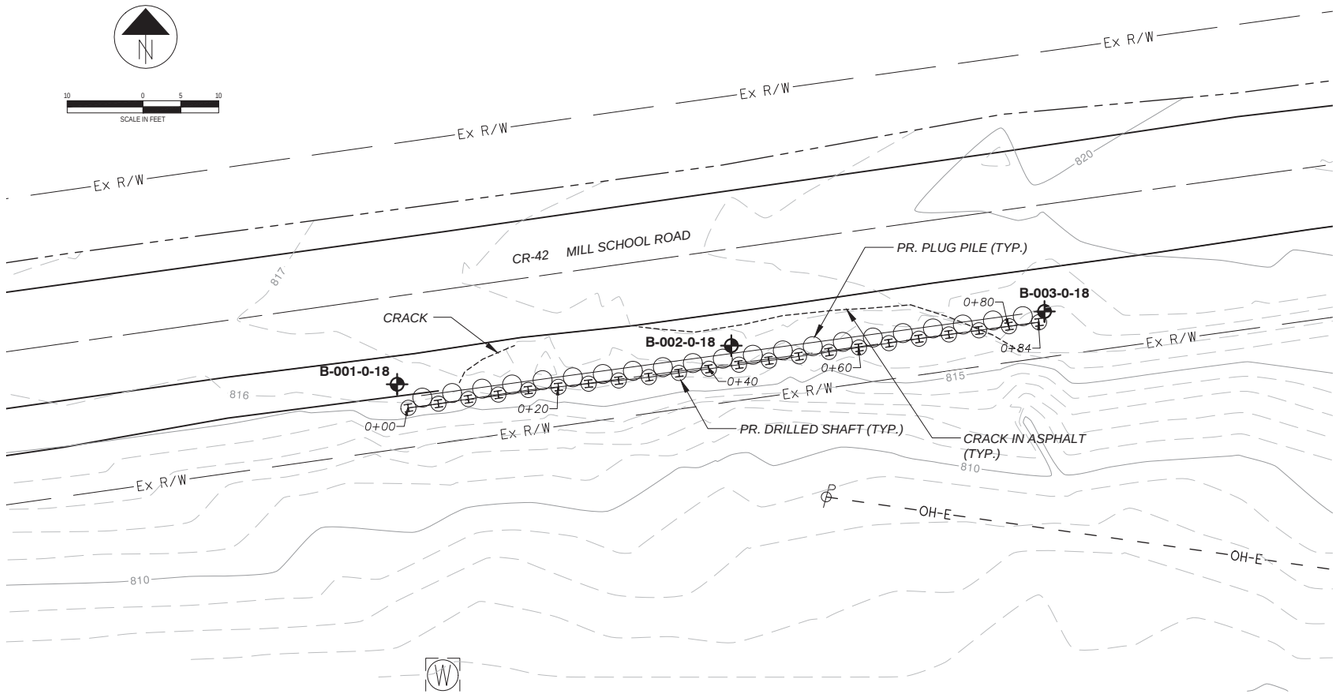
PID NO. 108558

GEOHAZARD EXPLORATION

FHWA-ATH-CR42-4.48

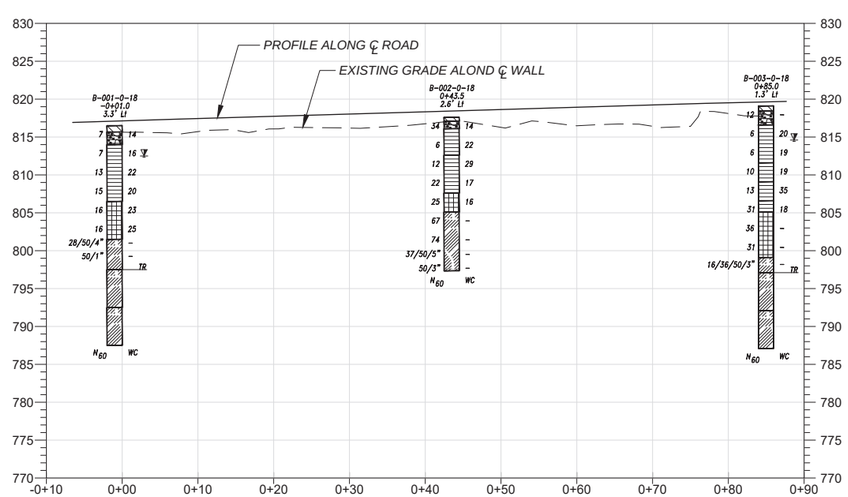


SITE PLAN

LEGEND

- BORING LOCATION
- CONTROL POINT
- DRILLED SHAFT AND PLUG PILE WALL

CONTROL POINTS				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
11	456459.9860	2117464.9310	817.93	CNPT
12	456402.8300	2117195.8490	820.77	CNPT
13	456362.0130	2116897.6220	813.87	CNPT



PROFILE

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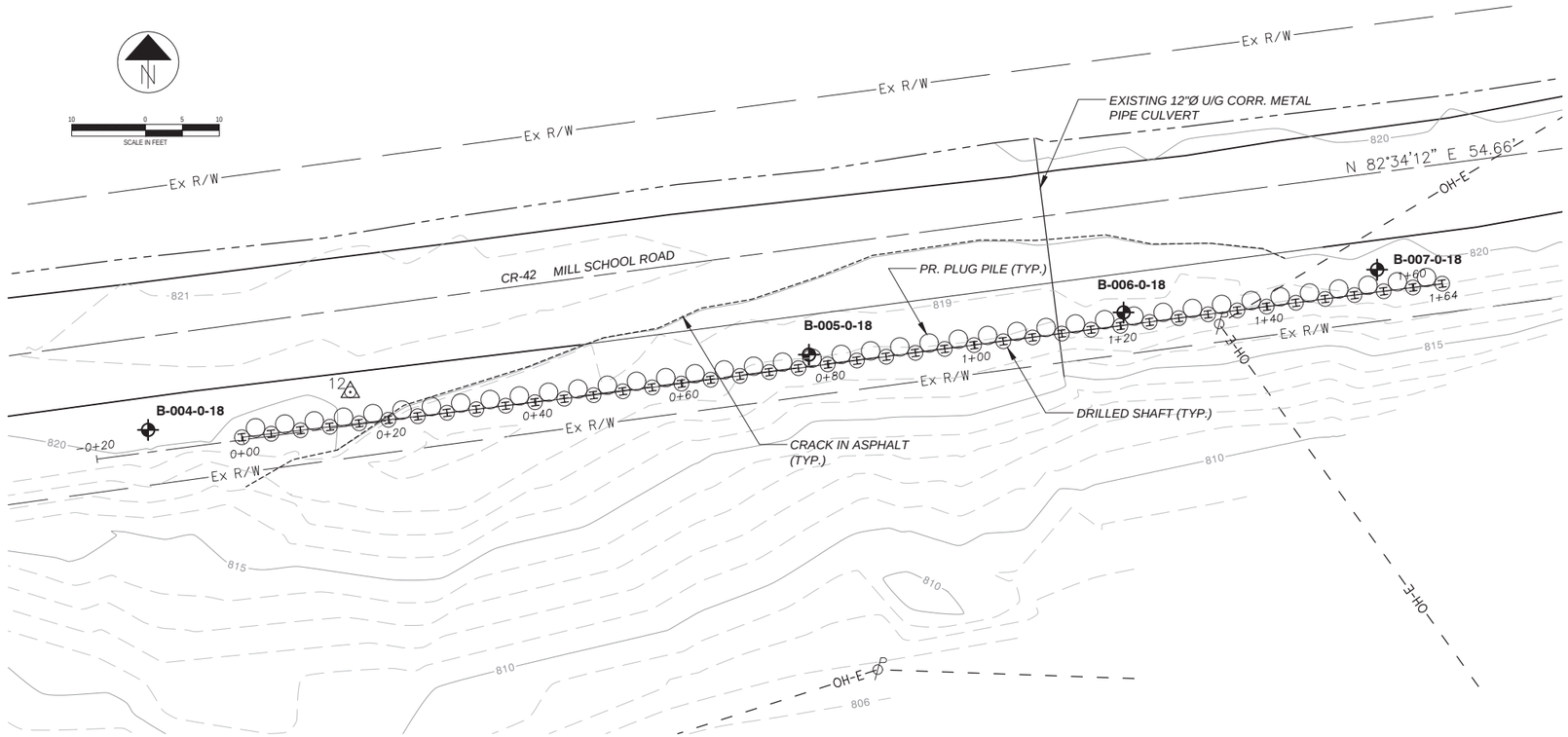
DRAWN DAB
CHECKED NVP

BORINGS AND WEST PIER WALL LOCATION PLAN

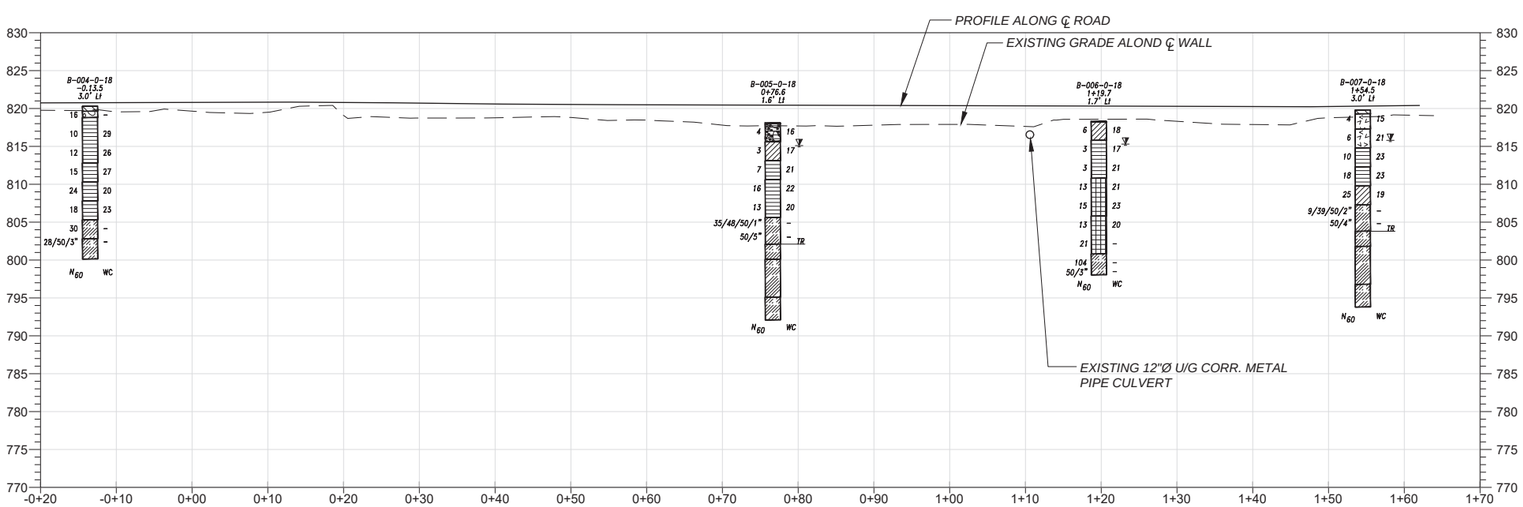
FHWA-ATH-CR42-4.48



SITE PLAN

LEGEND

- BORING LOCATION
- CONTROL POINT
- DRILLED SHAFT AND PLUG PILE WALL



PROFILE

CONTROL POINTS				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
11	456459.9860	2117464.9310	817.93	CNPT
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OHIO REG. OHO-4230
FAX: (614) 895-9575

DRAWN DAB
CHECKED NVP

BORINGS AND EAST PIER WALL LOCATION PLAN

FHWA-ATH-CR42-4.48

PROJECT: ATH-CR-42-4.48	DRILLING FIRM / OPERATOR: TERRACON / T.S	DRILL RIG: MOBILE B-57 #613	STATION / OFFSET:	EXPLORATION ID B-001-0-18
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TERRACON / T.M	HAMMER: AUTOMATIC HAMMER	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 9/12/17	ELEVATION: 816.5 (MSL) EOB: 29.0 ft.	PAGE 1 OF 1
START: 7/10/18 END: 7/10/18	SAMPLING METHOD: SPT / NQ2	ENERGY RATIO (%): 89.2	LAT / LONG: 39.251861, -81.975503	

MATERIAL DESCRIPTION AND NOTES	ELEV. 816.5	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
LOOSE DISPLACED STONE, TOPSOIL = 10"	815.7		5 3 2	7	56	SS-1	-	-	-	-	-	-	-	-	-	14	A-2-6 (V)	
LOOSE, DARK BROWN, **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP , **POSSIBLE FILL**	814.0																	
MEDIUM STIFF TO STIFF, LIGHT BROWN, **SILTY CLAY**, LITTLE SAND, DAMP , **POSSIBLE FILL**		▼ 812.5	3 2 3	7	100	SS-2	1.75	-	-	-	-	-	-	-	-	16	A-6b (V)	
			3 4 5	13	100	SS-3	3.00	-	-	-	-	-	-	-	-	22	A-6b (V)	
	806.5		3 4 6	15	100	SS-4	-	7	2	5	34	52	36	17	19	20	A-6b (12)	
STIFF, RED, **CLAY**, MOIST			5 5 6	16	100	SS-5	-	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
			4 5 6	16	100	SS-6	-	-	-	-	-	-	-	-	-	25	A-7-6 (V)	
	801.5																	
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK.			28 50/4"	-	100	SS-7	-	-	-	-	-	-	-	-	-	-	Rock (V)	
			50/1"	-	0	SS-8	-	-	-	-	-	-	-	-	-	-	Rock (V)	
	797.5	TR																
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK, THINLY LAMINATED, ARGILLACEOUS; RQD 78.3%, REC 100%. -Qu @ 22.0' - 22.4' = 20 psi			78		100	NQ2-R-1											CORE	
	792.5																	
CLAYSTONE, RED, HIGHLY WEATHERED, SLIGHTLY STRONG, THINLY LAMINATED, ARGILLACEOUS; RQD 70%, REC 100%. -Qu @ 28.5' - 28.9' = 683 psi			70		100	NQ2-R-2											CORE	
	787.5	EOB																

NOTES: FREE WATER WAS NOT OBSERVED WHILE DRILLING. AUGER REFUSAL AT 19.0 FT, CORING STARTED AT 19.0 FT. WATER WAS AT 4.0 FT UPON COMPLETION

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH BENTONITE GROUT

PROJECT: ATH-CR-42-4.48	DRILLING FIRM / OPERATOR: TERRACON / T.S	DRILL RIG: MOBILE B-57 #613	STATION / OFFSET:	EXPLORATION ID B-002-0-18
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TERRACON / T.M	HAMMER: AUTOMATIC HAMMER	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 9/12/17	ELEVATION: 817.6 (MSL) EOB: 20.25 ft.	PAGE 1 OF 1
START: 7/6/18 END: 7/6/18	SAMPLING METHOD: SPT	ENERGY RATIO (%): 89.2	LAT / LONG: 39.251874, -81.975347	

MATERIAL DESCRIPTION AND NOTES	ELEV. 817.6	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
Gravel = 6"	817.1																	
MEDIUM DENSE, BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, DAMP , **POSSIBLE FILL**	816.1	1	5 10 13	34	39	SS-1	-	-	-	-	-	-	-	-	-	14	A-6b (V)	
SOFT, REDDISH BROWN, **SILTY CLAY**, DAMP , **POSSIBLE FILL**	812.6	3	3 2 2	6	100	SS-2	-	-	-	-	-	-	-	-	-	22	A-6b (V)	
MEDIUM STIFF TO STIFF, REDDISH BROWN, **SILTY CLAY**, DAMP , **POSSIBLE FILL**	807.6	6	3 4 4	12	100	SS-3	0.75	-	-	-	-	-	-	-	-	29	A-6b (V)	
		8	5 6 9	22	100	SS-4	4.50	3	6	13	34	44	30	14	16	17	A-6b (10)	
VERY STIFF, RED, **CLAY**, DRY	805.1	11	6 7 10	25	100	SS-5	-	-	-	-	-	-	-	-	-	16	A-7-6 (V)	
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK.		13	12 17 28	67	100	SS-6	-	-	-	-	-	-	-	-	-	-	Rock (V)	
		16	15 20 30	74	100	SS-7	-	-	-	-	-	-	-	-	-	-	Rock (V)	
		18	37 50/5"	-	100	SS-8	-	-	-	-	-	-	-	-	-	-	Rock (V)	
	797.4	EOB 20	50/3"	-	100	SS-9	-	-	-	-	-	-	-	-	-	-	Rock (V)	

NOTES: FREE WATER WAS NOT OBSERVED WHILE DRILLING AND UPON COMPLETION

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH BENTONITE GROUT

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PROJECT: ATH-CR-42-4.48	DRILLING FIRM / OPERATOR: TERRACON / T.S	DRILL RIG: MOBILE B-57 #613	STATION / OFFSET:	EXPLORATION ID B-003-0-18
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TERRACON / T.M	HAMMER: AUTOMATIC HAMMER	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 9/12/17	ELEVATION: 819.1 (MSL) EOB: 32.0 ft.	PAGE 1 OF 2
START: 7/10/18 END: 7/10/18	SAMPLING METHOD: SPT / NQ2	ENERGY RATIO (%): 89.2	LAT / LONG: 39.251886, -81.975201	

MATERIAL DESCRIPTION AND NOTES	ELEV. 819.1	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
DISPLACED LOOSE CRUSHED STONE = 8"	818.4																	
VERY LOOSE, DARK BROWN, **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP , **POSSIBLE FILL**	816.6	1 2	5 4 4	12	56	SS-1	-	-	-	-	-	-	-	-	-	-	A-2-6 (V)	
SOFT, BROWN, **SILTY CLAY**, LITTLE SAND, DAMP , **POSSIBLE FILL**		3 4 ▼ 814.6	2 2 2	6	100	SS-2	1.75	-	-	-	-	-	-	-	-	20	A-6b (V)	
		5 6	2 2 2	6	100	SS-3	1.75	-	-	-	-	-	-	-	-	19	A-6b (V)	
	811.6	7																
MEDIUM STIFF, REDDISH BROWN, **SILTY CLAY**, DAMP	809.1	8 9	2 2 5	10	100	SS-4	3.00	-	-	-	-	-	-	-	-	19	A-6b (V)	
VERY STIFF, REDDISH BROWN, **SILTY CLAY**, TRACE SAND, DAMP	806.6	10 11 12	3 4 5	13	100	SS-5	2.25	-	-	-	-	-	-	-	-	35	A-6b (V)	
VERY STIFF, RED, **SILTY CLAY**, LITTLE SAND, DAMP	805.1	13 14	7 9 12	31	100	SS-6	4.50	4	5	7	38	46	32	16	16	18	A-6b (10)	
VERY STIFF, RED, **CLAY**, DAMP		15 16 17	8 11 13	36	100	SS-7	-	-	-	-	-	-	-	-	-	-	A-7-6 (V)	
	799.1	18 19	7 9 12	31	100	SS-8	-	-	-	-	-	-	-	-	-	-	A-7-6 (V)	
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK.	797.1	20 21 TR	16 36 50/3"	-	67	SS-9	-	-	-	-	-	-	-	-	-	-	Rock (V)	
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK, THINLY LAMINATED, ARGILLACEOUS; RQD 40%, REC 100%. -Qu @ 23.0' - 23.4' = 19 psi	792.1	22 23 24 25 26	40		100	NQ2-R-1											CORE	
CLAYSTONE, RED, HIGHLY WEATHERED, SLIGHTLY STRONG, THINLY LAMINATED, ARGILLACEOUS; RQD 75%, REC 100%.		27 28 29	75		100	NQ2-R-2											CORE	

PID:	SFN:	PROJECT: ATH-CR-42-4.48	STATION / OFFSET:	START: 7/10/18	END: 7/10/18	PG 2 OF 2	B-003-0-18

MATERIAL DESCRIPTION AND NOTES	ELEV. 789.1	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
CLAYSTONE, RED, HIGHLY WEATHERED, SLIGHTLY STRONG, THINLY LAMINATED, ARGILLACEOUS; RQD 75%, REC 100%. *(continued)* -Qu @ 30.0' - 30.4' = 1065 psi	787.1	31 EOB 32																

NOTES: FREE WATER WAS NOT OBSERVED WHILE DRILLING. AUGER REFUSAL AT 21.3 FT, CORING STARTED AT 22.0 FT. WATER WAS AT 4.5 FT UPON COMPLETION

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH BENTONITE GROUT

PROJECT: ATH-CR-42-4.48	DRILLING FIRM / OPERATOR: TERRACON / T.S	DRILL RIG: MOBILE B-57 #613	STATION / OFFSET:	EXPLORATION ID B-004-0-18
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TERRACON / T.M	HAMMER: AUTOMATIC HAMMER	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 9/12/17	ELEVATION: 820.3 (MSL) EOB: 20.16 ft.	PAGE 1 OF 1
START: 7/6/18 END: 7/6/18	SAMPLING METHOD: SPT	ENERGY RATIO (%): 89.2	LAT / LONG: 39.251909, -81.975014	

MATERIAL DESCRIPTION AND NOTES	ELEV. 820.3	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
GRAVEL AND WOOD = 8"	819.6																	
MEDIUM DENSE, GRAY, **GRAVEL**, LITTLE CLAY, DRY , **POSSIBLE FILL**	818.8	1	4 7 4	16	17	SS-1	-	-	-	-	-	-	-	-	-	-	A-1-a (V)	
MEDIUM STIFF, DARK BROWN, **SILTY CLAY**, DAMP , **POSSIBLE FILL**		2																
		3	2 3 4	10	22	SS-2	2.00	-	-	-	-	-	-	-	-	29	A-6b (V)	
		4																
		5	3 4 4	12	100	SS-3	1.75	-	-	-	-	-	-	-	-	26	A-6b (V)	
		6																
	812.8	7																
STIFF, LIGHT BROWN, **SILTY CLAY**, DAMP		8	4 4 6	15	56	SS-4	2.75	-	-	-	-	-	-	-	-	27	A-6b (V)	
		9																
	810.3	10																
VERY STIFF, LIGHT BROWN, **SILTY CLAY**, LITTLE SAND, DAMP		11	5 6 10	24	100	SS-5	3.50	5	2	4	35	54	33	17	16	20	A-6b (10)	
	807.8	12																
STIFF, REDDISH BROWN, **SILTY CLAY**, DAMP		13	5 6 6	18	100	SS-6	3.25	-	-	-	-	-	-	-	-	23	A-6b (V)	
		14																
	805.3	15																
CLAYSTONE, REDDISH BROWN, SEVERELY WEATHERED, VERY WEAK.		16	5 7 13	30	100	SS-7	-	-	-	-	-	-	-	-	-	-	Rock (V)	
	802.8	17																
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK.		18	28 50/3"	-	89	SS-8	-	-	-	-	-	-	-	-	-	-	Rock (V)	
		19																
	800.1	EOB 20	60/2"	-	100	SS-9	-	-	-	-	-	-	-	-	-	-	Rock (V)	

NOTES: FREE WATER WAS NOT OBSERVED WHILE DRILLING AND UPON COMPLETION

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH BENTONITE GROUT

FHWA-ATH-CR42-4.48

BORING LOG B-004-0-18

DRAWN DAB

CHECKED NVP

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PROJECT: ATH-CR-42-4.48	DRILLING FIRM / OPERATOR: TERRACON / T.S	DRILL RIG: MOBILE B-57 #613	STATION / OFFSET:	EXPLORATION ID B-005-0-18
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TERRACON / T.M	HAMMER: AUTOMATIC HAMMER	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 9/12/17	ELEVATION: 818.1 (MSL) EOB: 26.0 ft.	PAGE 1 OF 1
START: 7/9/18 END: 7/9/18	SAMPLING METHOD: SPT / NQ2	ENERGY RATIO (%): 89.2	LAT / LONG: 39.251936, -81.974697	

MATERIAL DESCRIPTION AND NOTES	ELEV. 818.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
GRAVEL AND ASPHALT = 1"	818.0																	
VERY LOOSE, DARK BROWN, **GRAVEL WITH SAND, SILT, AND CLAY**, DRY , **POSSIBLE FILL**	815.6	1	1 2 1	4	44	SS-1	-	-	-	-	-	-	-	-	-	16	A-2-6 (V)	
SOFT, REDDISH BROWN, **SILT AND CLAY**, LITTLE GRAVEL, DAMP , **POSSIBLE FILL**	813.1	▼ 815.1 2 3 4	1 1 1	3	56	SS-2	-	-	-	-	-	-	-	-	-	17	A-6a (V)	
MEDIUM STIFF, LIGHT BROWN, **SILTY CLAY**, DAMP	810.6	5 6 7	2 2 3	7	100	SS-3	1.75	-	-	-	-	-	-	-	-	21	A-6b (V)	
STIFF, LIGHT BROWN, **SILTY CLAY**, LITTLE SAND, DAMP	805.6	8 9 10 11 12	3 5 6	16	100	SS-4	3.00	4	5	4	24	63	36	17	19	22	A-6b (12)	
			3 4 5	13	100	SS-5	3.00	-	-	-	-	-	-	-	-	20	A-6b (V)	
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK.	802.1	13 14 15	35 48 50/1"	-	77	SS-6	-	-	-	-	-	-	-	-	-	-	Rock (V)	
			50/5"	-	100	SS-7	-	-	-	-	-	-	-	-	-	-	Rock (V)	
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK, THINLY LAMINATED, ARGILLACEOUS; RQD 33.33%, REC 100%. -Qu @ 17.0' - 17.4' = 43 psi	800.1	TR 16 17 18	33		100	NQ2-R-1											CORE	
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK, THINLY LAMINATED, ARGILLACEOUS; RQD 65%, REC 100%.	795.1	19 20 21 22	65		100	NQ2-R-2											CORE	
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK, THINLY LAMINATED, ARGILLACEOUS; RQD 66.6%, REC 100%.	792.1	23 24 25 EOB 26	67		100	NQ2-R-3											CORE	

NOTES: FREE WATER WAS NOT OBSERVED WHILE DRILLING. AUGER REFUSAL AT 15.5 FT, CORING STARTED AT 16.0 FT. WATER WAS AT 3.0 FT UPON COMPLETION

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH BENTONITE GROUT

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PROJECT: ATH-CR-42-4.48	DRILLING FIRM / OPERATOR: TERRACON / T.S	DRILL RIG: MOBILE B-57 #613	STATION / OFFSET:	EXPLORATION ID B-006-0-18
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TERRACON / T.M	HAMMER: AUTOMATIC HAMMER	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 9/12/17	ELEVATION: 818.3 (MSL) EOB: 20.25 ft.	PAGE 1 OF 1
START: 7/6/18 END: 7/6/18	SAMPLING METHOD: SPT	ENERGY RATIO (%): 89.2	LAT / LONG: 39.251951, -81.974547	

MATERIAL DESCRIPTION AND NOTES	ELEV. 818.3	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
GRAVEL = 1"	818.2																	
SOFT, DARK BROWN, **SILT AND CLAY**, SOME GRAVEL, DAMP **, POSSIBLE FILL**	815.8	1	2 2 2	6	56	SS-1	-	-	-	-	-	-	-	-	-	18	A-6a (V)	
SOFT, LIGHT BROWN, **SILTY CLAY**, SOME SAND, MOIST **, POSSIBLE FILL**		▼ 815.3 3	2 1 1	3	33	SS-2	1.00	-	-	-	-	-	-	-	-	17	A-6b (V)	
		5 6	1 1 1	3	56	SS-3	1.00	-	-	-	-	-	-	-	-	21	A-6b (V)	
STIFF, BROWN, **CLAY**, LITTLE SAND, TRACE GRAVEL, MOIST	810.8	8 9	2 4 5	13	100	SS-4	2.25	-	-	-	-	-	-	-	-	21	A-7-6 (V)	
		10 11	5 5 5	15	44	SS-5	3.00	13	6	5	24	52	49	19	30	23	A-7-6 (18)	
STIFF, REDDISH BROWN, **CLAY**, MOIST	805.8	13 14	4 4 5	13	100	SS-6	-	-	-	-	-	-	-	-	-	20	A-7-6 (V)	
		15 16	4 6 8	21	100	SS-7	-	-	-	-	-	-	-	-	-	-	A-7-6 (V)	
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK.	800.8	18 19	15 28 42	104	100	SS-8	-	-	-	-	-	-	-	-	-	-	Rock (V)	
	798.1	EOB 20	50/3"	-	100	SS-9	-	-	-	-	-	-	-	-	-	-	Rock (V)	

NOTES: FREE WATER WAS NOT OBSERVED WHILE DRILLING AND UPON COMPLETION

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH BENTONITE GROUT

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PROJECT: ATH-CR-42-4.48	DRILLING FIRM / OPERATOR: TERRACON / T.S	DRILL RIG: MOBILE B-57 #613	STATION / OFFSET:	EXPLORATION ID B-007-0-18
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TERRACON / T.M	HAMMER: AUTOMATIC HAMMER	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA / NQ2	CALIBRATION DATE: 9/12/17	ELEVATION: 819.8 (MSL) EOB: 26.0 ft.	PAGE 1 OF 1
START: 7/9/18 END: 7/9/18	SAMPLING METHOD: SPT / NQ2	ENERGY RATIO (%): 89.2	LAT / LONG: 39.251966, -81.974425	

MATERIAL DESCRIPTION AND NOTES	ELEV. 819.8	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GR	CS	FS	SI	CL	LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
GRAVEL = 6"	819.3																	
SOFT, DARK BROWN, **SILT AND CLAY**, SOME SAND, SOME GRAVEL, DAMP , **POSSIBLE FILL**	817.3	1	1 2	4	33	SS-1	-	-	-	-	-	-	-	-	-	15	A-6a (V)	
SOFT, BROWN, **SILTY CLAY**, DAMP , **POSSIBLE FILL**	814.8	2 3 4 ▼ 815.8	2 2 2	6	100	SS-2	1.25	-	-	-	-	-	-	-	-	21	A-6b (V)	
MEDIUM STIFF, REDDISH BROWN, **SILTY CLAY**, DAMP	812.3	5 6 7	3 3 4	10	100	SS-3	3.00	-	-	-	-	-	-	-	-	23	A-6b (V)	
STIFF, LIGHT BROWN, **SILTY CLAY**, DAMP	809.8	8 9	3 4 8	18	100	SS-4	3.00	-	-	-	-	-	-	-	-	23	A-6b (V)	
VERY STIFF, GRAY, **SILT AND CLAY**, SOME SAND, DAMP	807.3	10 11 12	5 6 11	25	100	SS-5	-	8	7	10	32	43	31	16	15	19	A-6a (10)	
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK.	803.8	13 14 15 TR 16	9 39 50/2"	-	71	SS-6	-	-	-	-	-	-	-	-	-	-	Rock (V)	
			50/4"	-	100	SS-7	-	-	-	-	-	-	-	-	-	-	Rock (V)	
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK, THINLY LAMINATED, ARGILLACEOUS; RQD 45.8%, REC 100%. -Qu @ 17.5' - 17.9' = 30 psi	801.8	17 18	46		100	NQ2-R-1											CORE	
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK, THINLY LAMINATED, ARGILLACEOUS; RQD 68.3%, REC 100%. -Qu @ 22.0' - 22.4' = 6 psi	796.8	19 20 21 22	68		100	NQ2-R-2											CORE	
CLAYSTONE, RED, SEVERELY WEATHERED, WEAK, THINLY LAMINATED, ARGILLACEOUS; RQD 69.4%, REC 100%.	793.8	23 24 25 EOB 26	69		100	NQ2-R-3											CORE	

NOTES: FREE WATER WAS NOT OBSERVED WHILE DRILLING. AUGER REFUSAL AT 15.4 FT, CORING STARTED AT 16.0 FT. WATER WAS AT 4.0 FT UPON COMPLETION

ABANDONMENT METHODS, MATERIALS, QUANTITIES: AUGER CUTTINGS MIXED WITH BENTONITE GROUT

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