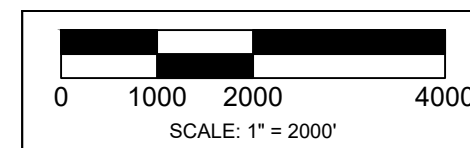
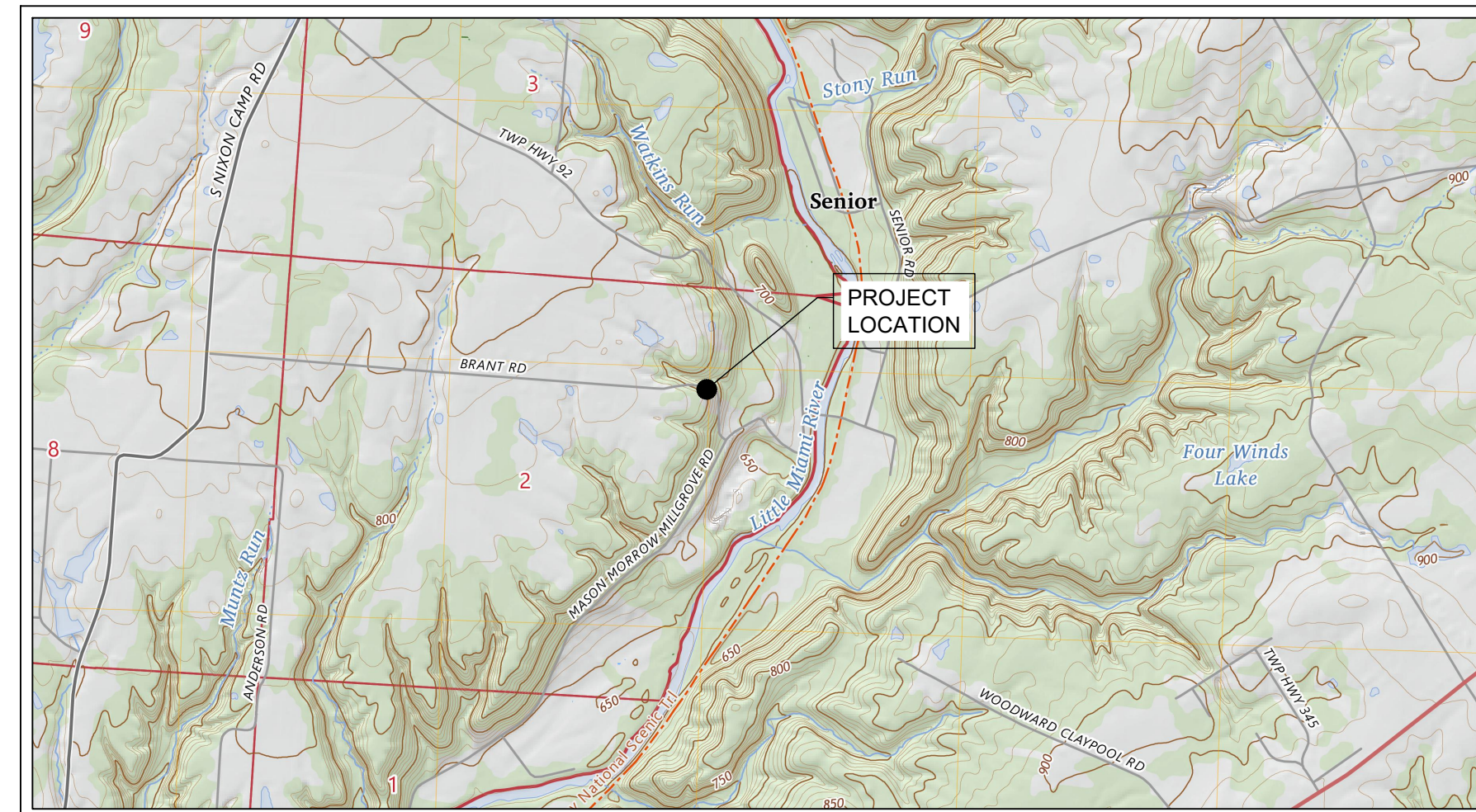


DRILLED SHAFT RETAINING WALL BRANT ROAD LANDSLIDES

WARREN COUNTY ENGINEER'S OFFICE
210 W MAIN STREET
LEBANON, OHIO 45036

SITE VICINITY MAP



SHEET INDEX

- SHEET 1 - COVER AND TITLE SHEET
- SHEET 2 - SITE PLAN
- SHEET 3 - CROSS-SECTIONS
- SHEET 4 - WALL PLAN AND PROFILE
- SHEET 5 - DETAILS AND SCHEDULES
- SHEET 6 - DETAILS AND SCHEDULES
- SHEET 7 - BORING LOGS AND ROCK CORE PHOTOS
- SHEET 8 - DRILLED SHAFT CONSTRUCTION NOTES
- SHEET 9 - DETOUR (PREPARED BY WARREN COUNTY ENGINEER'S OFFICE)

GENERAL DRAWING NOTES

1. THESE PLANS ARE SIZED FOR 34 INCHES BY 22 INCHES PAPER.
2. THESE PLANS ARE INTENDED TO BE PRINTED IN COLOR.
3. THE BID DRAWINGS ARE TO AN APPROXIMATE SCALE BASED ON SITE TOPOGRAPHIC MAPPING. WHILE REASONABLE ATTEMPTS WERE MADE TO PROVIDE THE BIDDERS WITH ACCURATE SCALED PLANS THAT REFLECT CURRENT CONDITIONS, MINOR ERRORS ARE EVIDENT. THE BIDDERS SHOULD VERIFY QUANTITIES BY PERFORMING A THOROUGH SITE VISIT AND OBTAINING HIS OWN TAKE OFF OF REQUIRED QUANTITIES FOR THE WORK ON THE PROJECT. TERRACON WILL NOT BE RESPONSIBLE FOR ADDITIONAL COSTS RESULTING FROM THE BIDDER NOT PERFORMING A THOROUGH SITE VISIT.

REV. DATE BY DESCRIPTION

COVER AND TITLE SHEET
BRANT ROAD LANDSLIDES
WARREN COUNTY ENGINEER'S OFFICE
210 W MAIN STREET
LEBANON, OHIO 45036

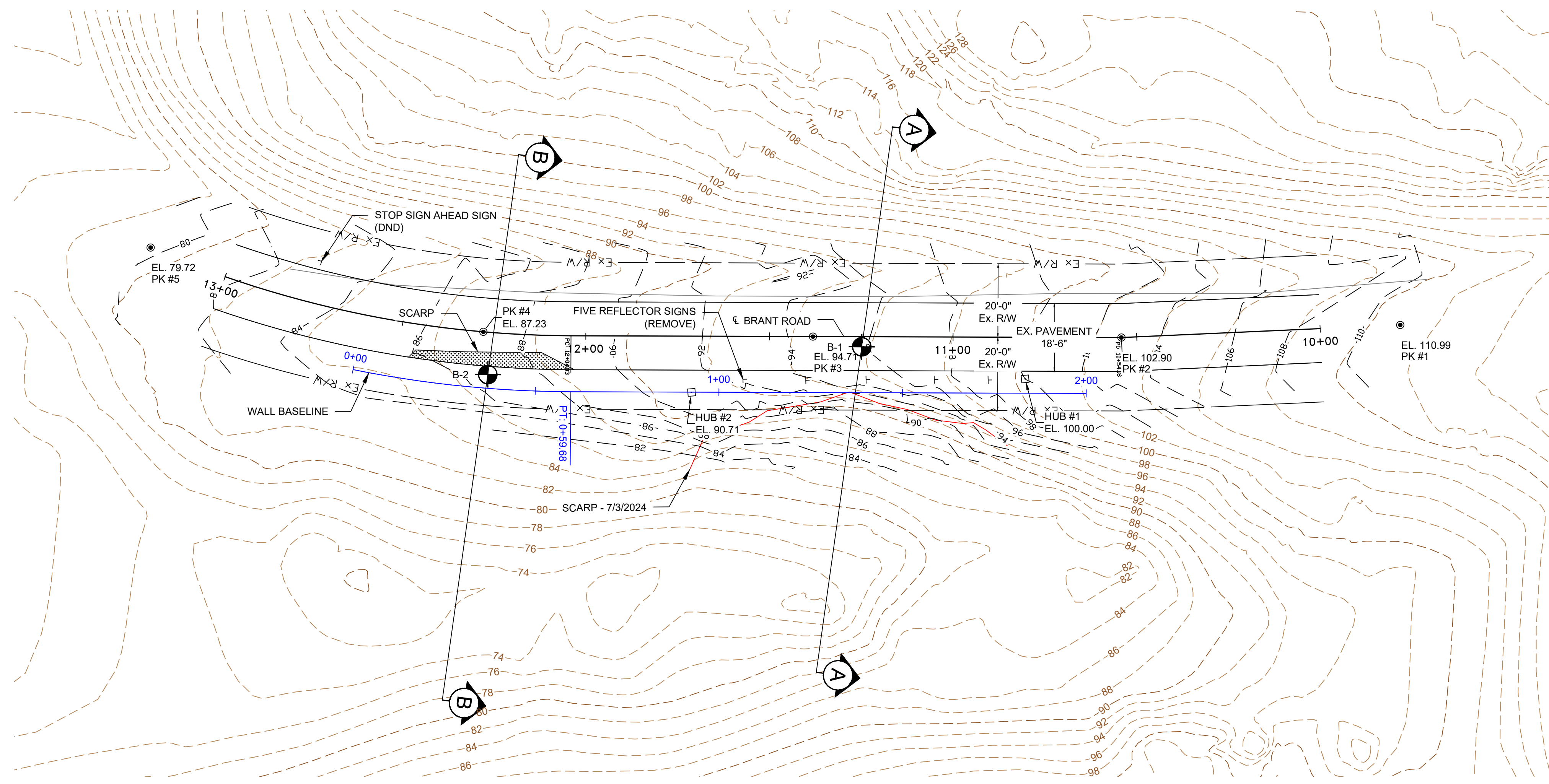
611 LUNKEN PARK DRIVE
PH. (513) 321-5816

CINCINNATI, OHIO 45226
FAX. (513) 321-4540



SHEET 1	
DESIGNED BY:	RLB
DRAWN BY:	BCM
APPVD. BY:	DWW
SCALE:	AS NOTED
DATE:	10/23/24
JOB NO.	N1245183
SHEET NO.:	1 OF 9

Date: 10/22/2024 5:08 PM File Path: \\P:\1\WF502\DATA\PROJECTS\2024\1245183\WORKING FILES\DIAGRAMS-DRAWINGS-FIGURES\1245183 - DRILLED SHAFT WALL PLANS.DWG



PLAN VIEW
SCALE: 1" = 20'

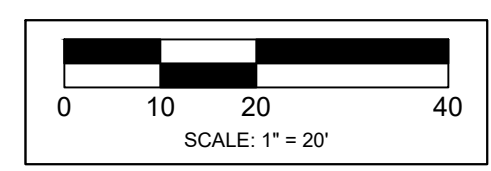
- LEGEND**
- INDICATES TEST BORING LOCATIONS
 - LIDAR CONTOURS
 - WCEO CONTOURS

NOTE:
BASEMAP AND CONTROL POINTS PROVIDED BY WARREN COUNTY ENGINEER'S OFFICE (WCEO) ON 8/23/2024. LIDAR GROUND SURFACE DERIVED FROM LIDAR SCAN OF THE PROJECT SITE PERFORMED BY TERRACON ON 7/3/2024. LIDAR SCAN UTILIZED A ROCK R360 RUNNING IN SLAM MODE AND WAS PROCESSED INTO TOPOGRAPHY USING ROCK CLOUD.

Control Point	Northing (ft.)	Easting (ft.)	Elevation (ft.)
HUB #1	5000.00	5000.00	100.00
HUB #2	5023.05	5087.94	90.71
PK #1	4963.77	4903.40	110.99
PK #2	4983.38	4976.82	102.90
PK #3	5001.13	5058.91	94.71
PK #4	5019.08	5146.84	87.23
PK #5	5016.07	5240.26	79.72

Control points established and provided by WCEO.

WALL BASELINE CURVE DATA
LENGTH OF ARC = 59.68 FT
RADIUS = 304.69
CENTRAL ANGLE = 11.22 DEGREES
TANGENT LENGTH = 29.93 FT



REV.	DATE	BY	DESCRIPTION

SITE PLAN
BRANT ROAD LANDSLIDES
WARREN COUNTY ENGINEER'S OFFICE
210 W MAIN STREET
LEBANON, OHIO 45036

611 LUNKEN PARK DRIVE
PH. (513) 321-5816

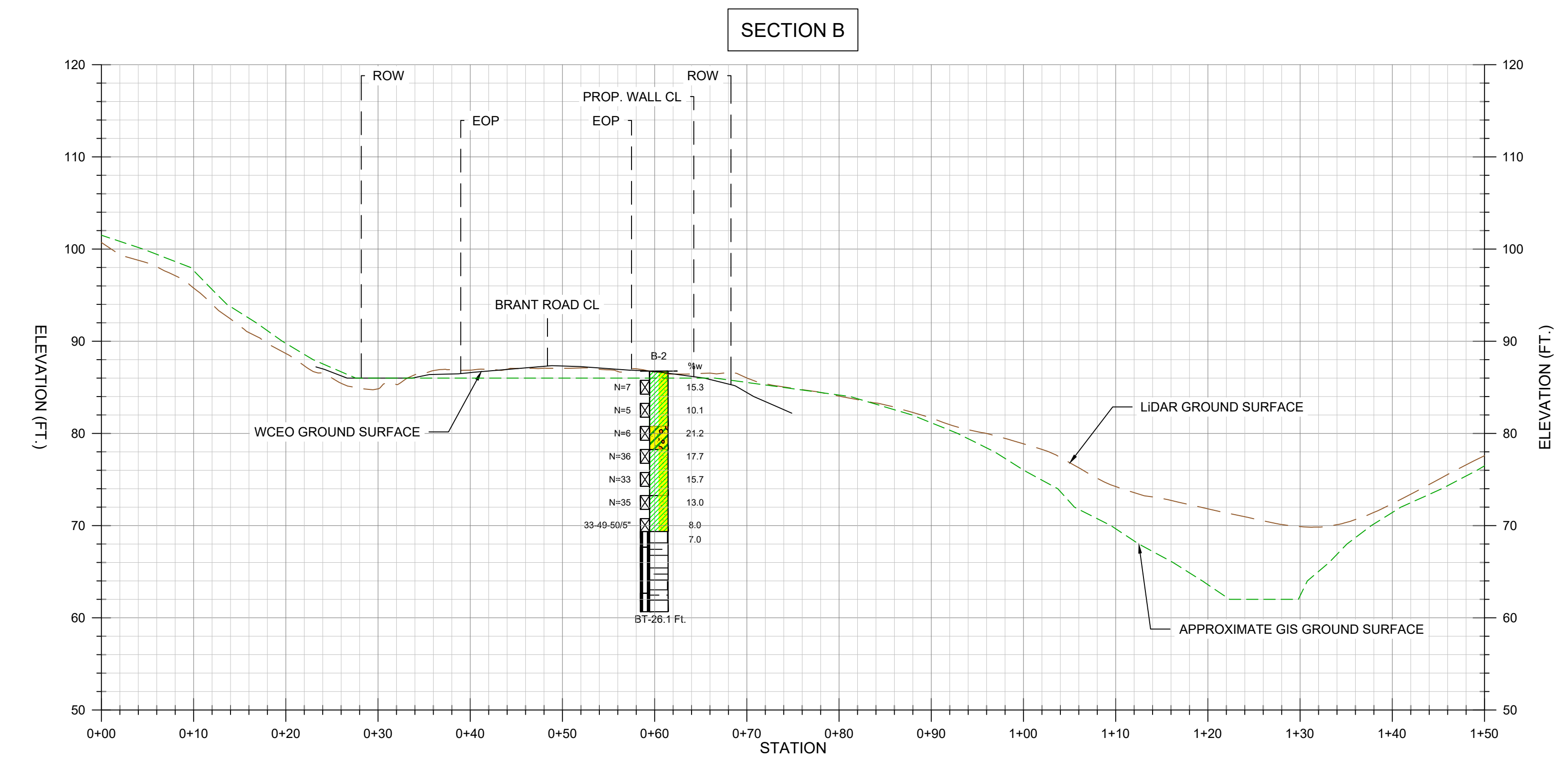
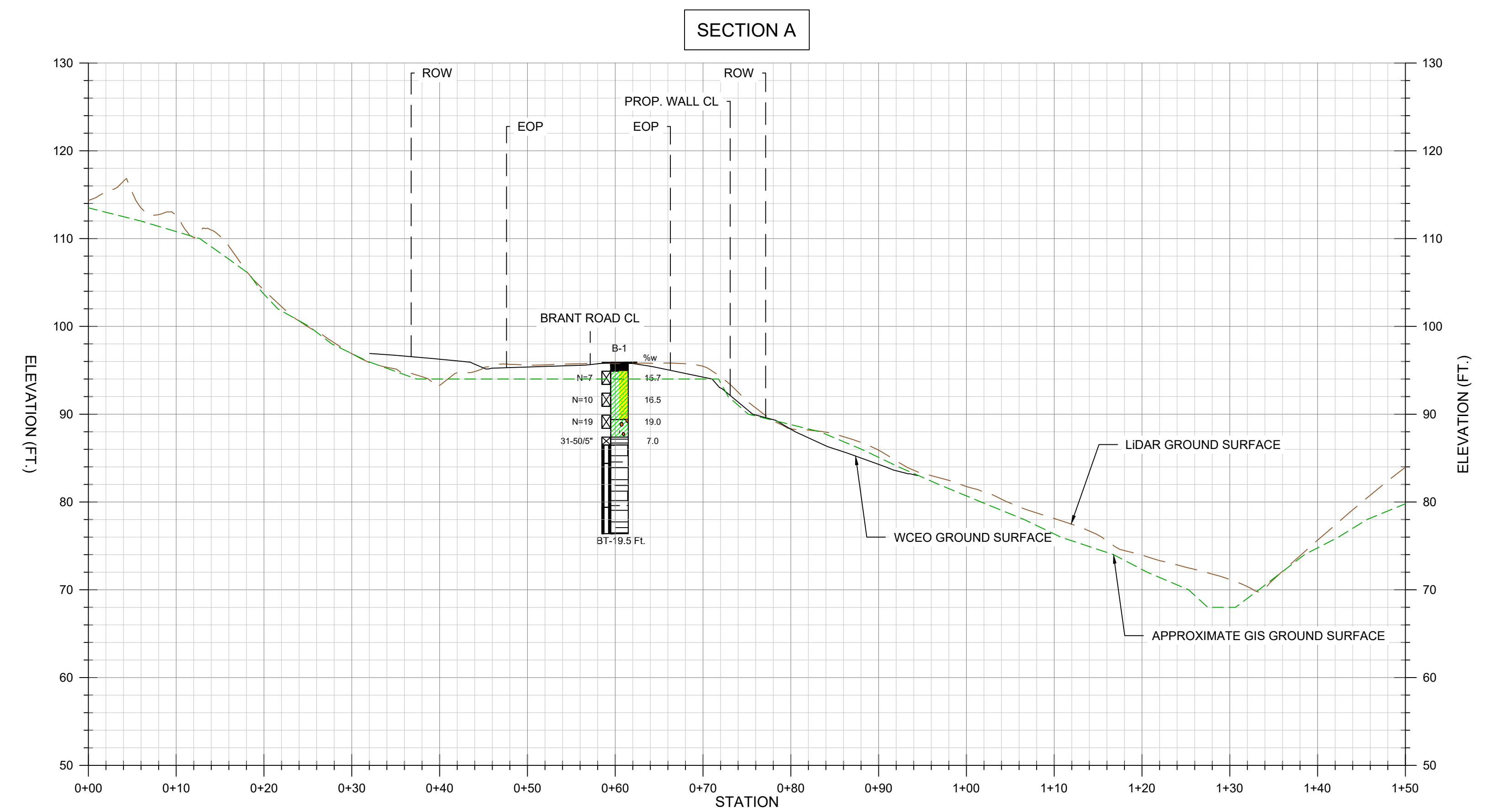
CINCINNATI, OHIO 45226
FAX. (513) 321-4540

10/23/2024

SHEET 2

DESIGNED BY:	RLB
DRAWN BY:	BCM
APPVD. BY:	DWW
SCALE:	1" = 20'
DATE:	10/23/24
JOB NO.	N1245183
SHEET NO.:	2 OF 9

Date: 10/22/2024 5:08 PM File Path: \\P:\1\WFS02\DATA\PROJECTS\2024\1245183\WORKING FILES\DIAGRAMS-DRAWINGS-FIGURES\FIGURES\1245183 - DRILLED SHAFT WALL PLANS.DWG



Sampling/Testing Notes	Explanation	Water Level Observations	Material Symbols
<ul style="list-style-type: none"> Shallow Standard Penetration Test N Standard Penetration Test Resistance (Blows/ft) HP Hand Penetrometer UC Unconfined Compressive Strength UU Unconsolidated Undrained Compressive Strength 	<ul style="list-style-type: none"> NA-1 - Borehole ID LL, PL - Liquid and Plastic Limits Moisture Content Sampling AR - Auger Refusal BT - Boring Termination 	<ul style="list-style-type: none"> Water Level Reading at time of drilling Water Level Reading at completion of drilling Water Level Reading after specified period of time 	<ul style="list-style-type: none"> Topsoil Asphalt Lean Clay with Sand Lean Clay with Gravel Clayey Sand with Gravel Interbedded Shale and Limestone

Note: Subsurface profile provided for illustration purposes only based on the data obtained from the subsurface exploration. The field exploration and laboratory test methods used indicate subsurface conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Consequently, subsurface conditions may vary gradually, abruptly, and/or nonlinearly between sample locations and/or intervals.

REV.	DATE	BY	DESCRIPTION

CROSS-SECTIONS
BRANT ROAD LANDSLIDES
WARREN COUNTY ENGINEER'S OFFICE
 210 W MAIN STREET
 LEBANON, OHIO 45036

terracon
 Explore with us

611 LUNKEN PARK DRIVE
 PH. (513) 321-5816

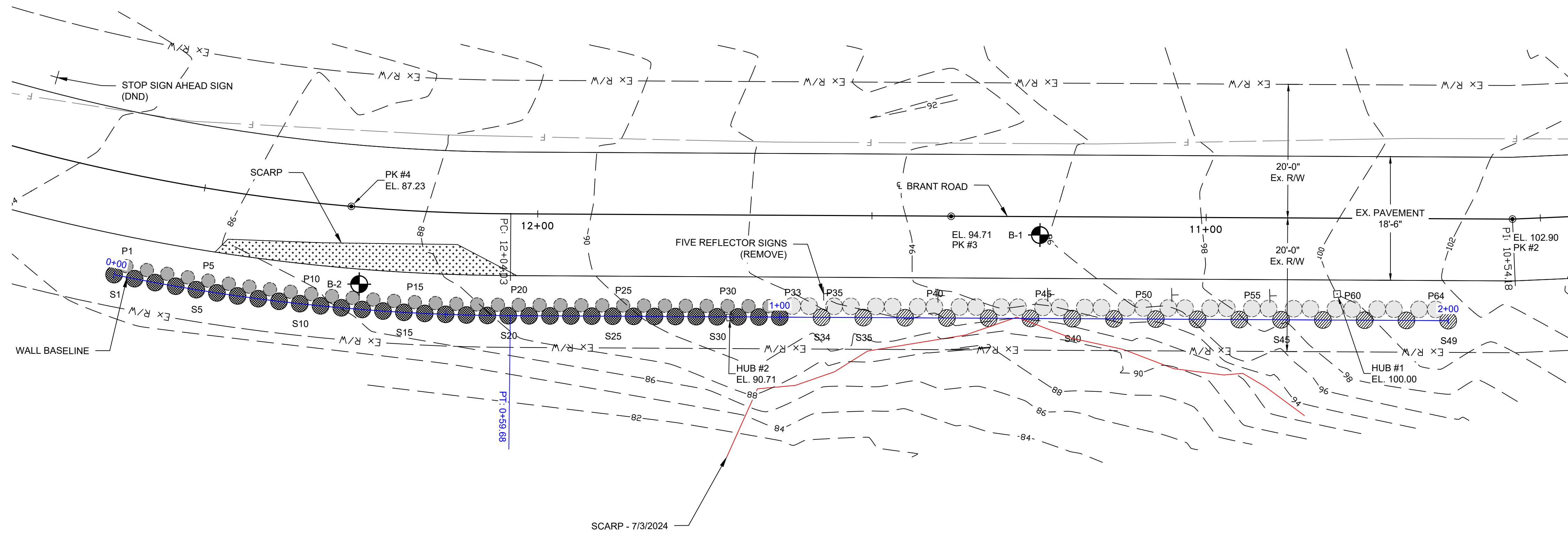
CINCINNATI, OHIO 45226
 FAX. (513) 321-4540

STATE OF OHIO
 RICHARD BACH
 86025
 REGISTERED PROFESSIONAL ENGINEER
 10/23/2024

SHEET 3

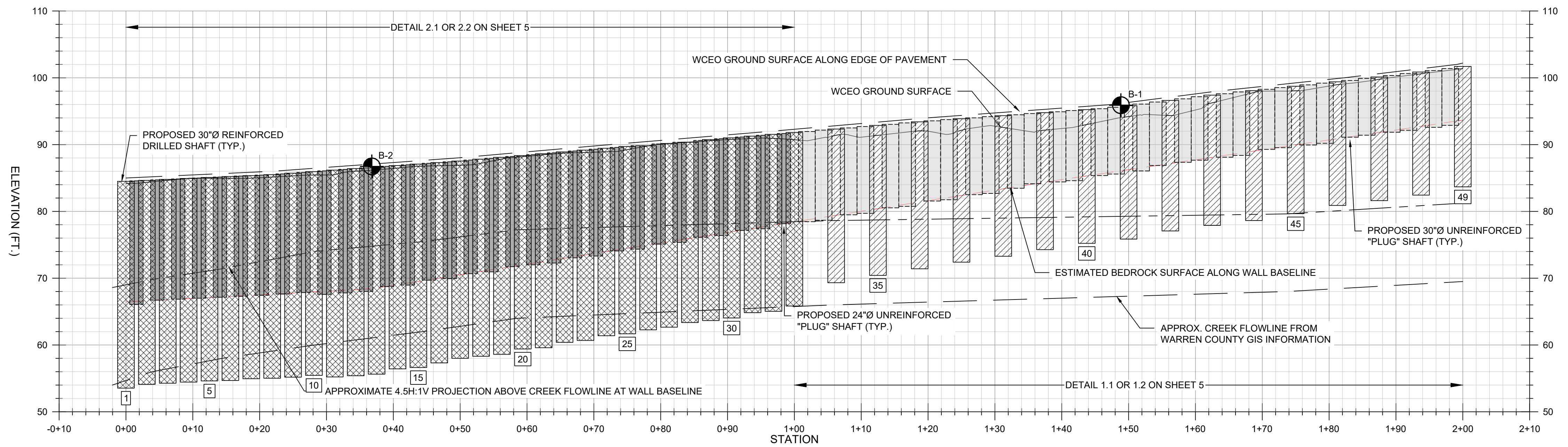
DESIGNED BY:	RLB
DRAWN BY:	BCM
APPVD. BY:	DWW
SCALE:	1" = 10'
DATE:	10/23/24
JOB NO.	N1245183
SHEET NO.:	3 OF 9

Date: 10/22/2024 5:08 PM File Path: \\P:\WF\S02\DATA\PROJECTS\2024\1245183\WORKING FILES\DIAGRAMS-DRAWINGS-FIGURES\1245183 - DRILLED SHAFT WALL PLANS.DWG



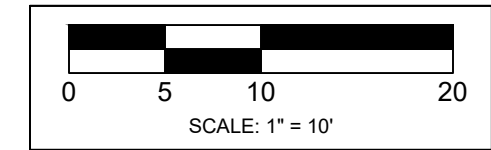
NOTE:
BASEMAP AND CONTROL POINTS
PROVIDED BY WARREN COUNTY
ENGINEER'S OFFICE (WCEO) ON
8/23/2024.

PLAN VIEW
SCALE: 1" = 10'



PROFILE VIEW
SCALE: 1" = 10'

- LEGEND**
- INDICATES TEST BORING LOCATIONS
 - 30-IN-DIA REINFORCED SHAFT - DETAIL 1.1 OR 1.2 ON SHEET 5
 - 30-IN-DIA PLUG SHAFT - DETAIL 1.1 OR 1.2 ON SHEET 5
 - 30-IN-DIA REINFORCED SHAFT - DETAIL 2.1 OR 2.2 ON SHEET 5
 - 24-IN-DIA PLUG SHAFT - DETAIL 2.1 OR 2.2 ON SHEET 5



REV.	DATE	BY	DESCRIPTION

PLAN AND PROFILE
BRANT ROAD LANDSLIDES
WARREN COUNTY ENGINEER'S OFFICE
210 W MAIN STREET
LEBANON, OHIO 45036

terracon
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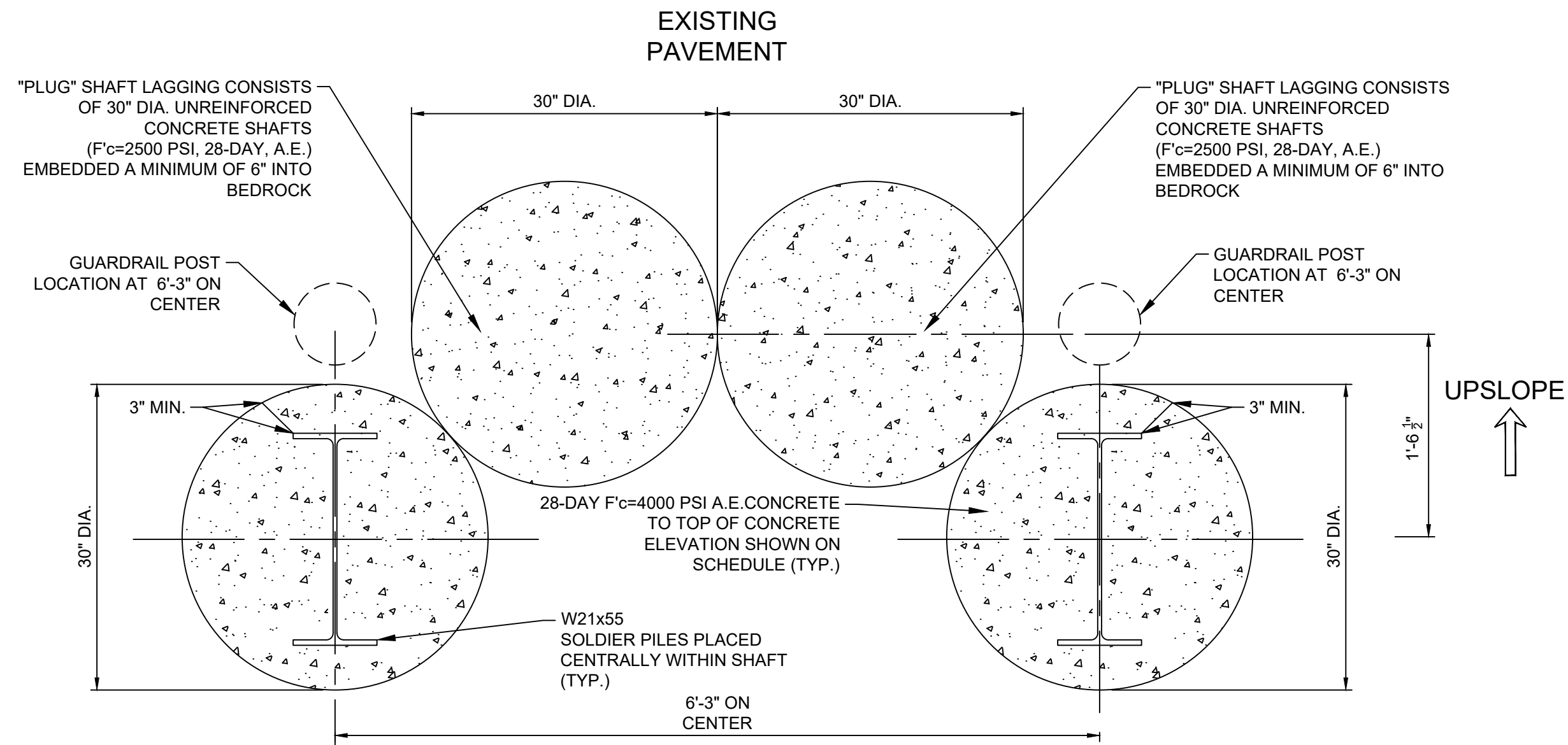
611 LUNKEN PARK DRIVE
PH. (513) 321-5816

CINCINNATI, OHIO 45226
FAX. (513) 321-4540

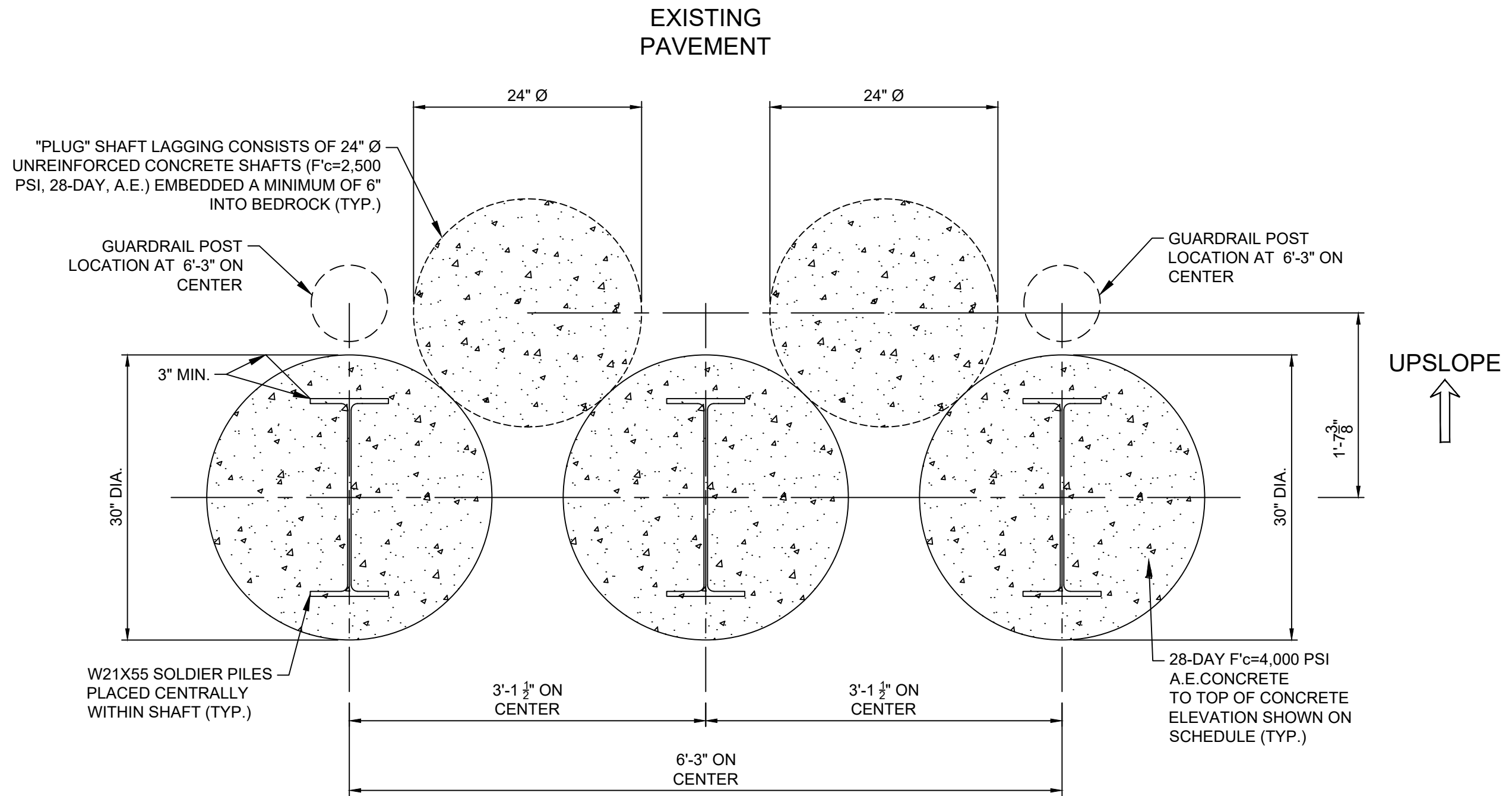
STATE OF OHIO
REGISTERED PROFESSIONAL ENGINEER
RICHARD BACH
66025
10/23/2024

SHEET 4

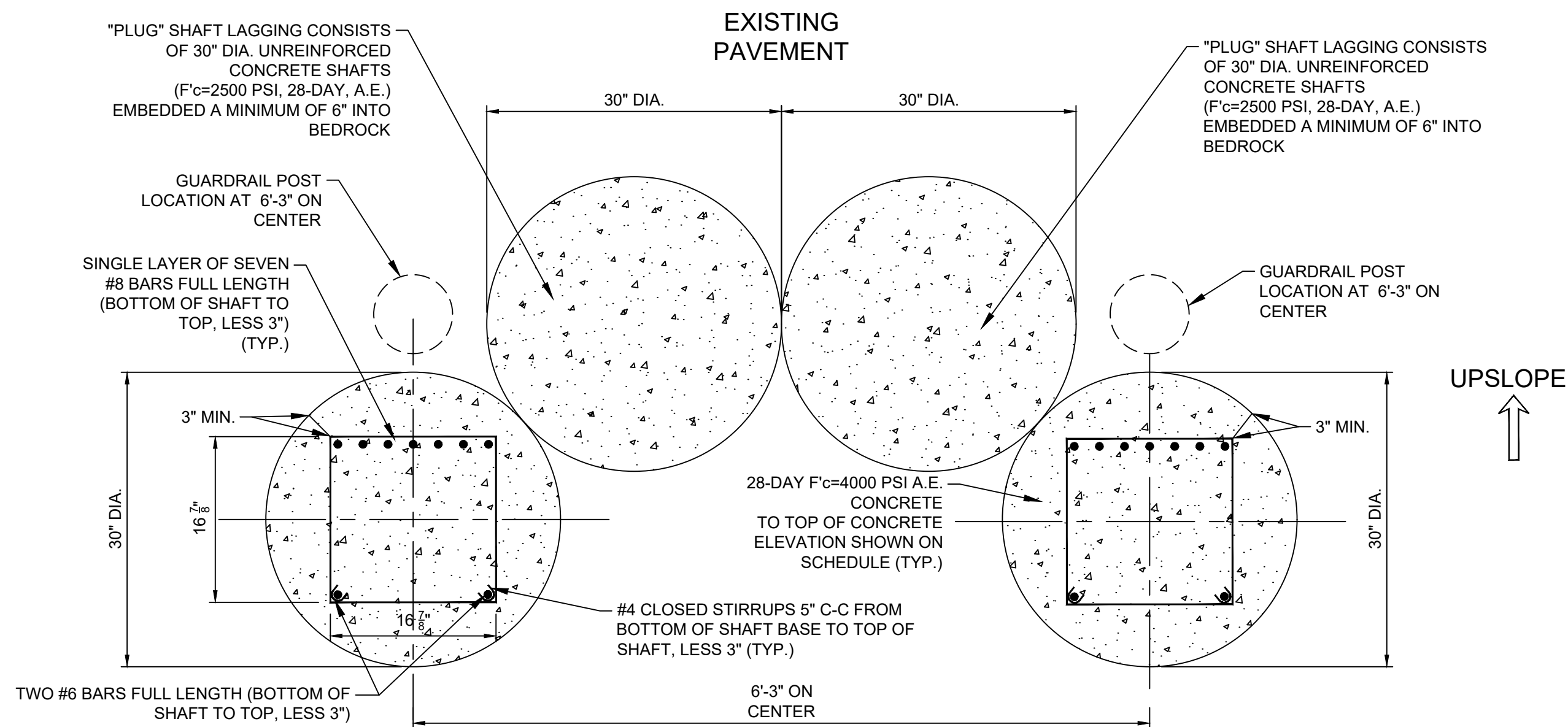
DESIGNED BY: RLB
DRAWN BY: BCM
APPVD. BY: DWV
SCALE: 1" = 10'
DATE: 10/23/24
JOB NO. N1245183
SHEET NO. 4 OF 9



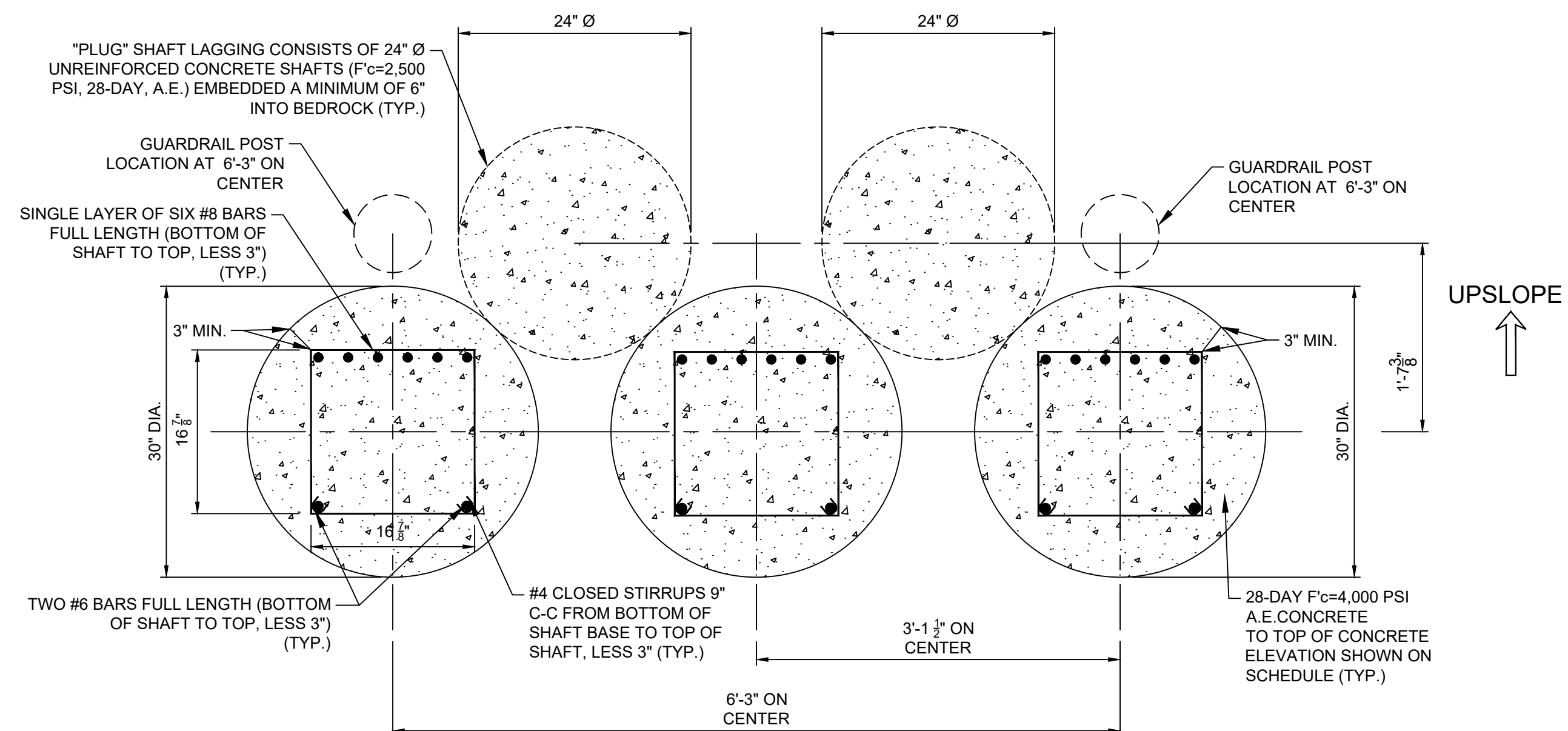
1.1
5
ALTERNATE 1: STRUCTURAL DRILLED SHAFT WITH W21x55 REINFORCEMENT DETAIL AND "PLUG" SHAFT LAGGING
SCALE: 1"=1'



2.1
5
ALTERNATE 1: STRUCTURAL DRILLED SHAFT WITH W21x55 REINFORCEMENT DETAIL AND "PLUG" SHAFT LAGGING
SCALE: 1"=1'



1.2
5
ALTERNATE 2: STRUCTURAL DRILLED SHAFT WITH STEEL REINFORCEMENT CAGE DETAIL AND "PLUG" SHAFT
SCALE: 1"=1'



2.2
5
ALTERNATE 2: STRUCTURAL DRILLED SHAFT WITH STEEL REINFORCEMENT CAGE DETAIL AND "PLUG" SHAFT
SCALE: 1"=1'

REV.	DATE	BY	DESCRIPTION

DETAILS AND SCHEDULES
BRANT ROAD LANDSLIDES
WARREN COUNTY ENGINEER'S OFFICE
210 W MAIN STREET
LEBANON, OHIO 45036

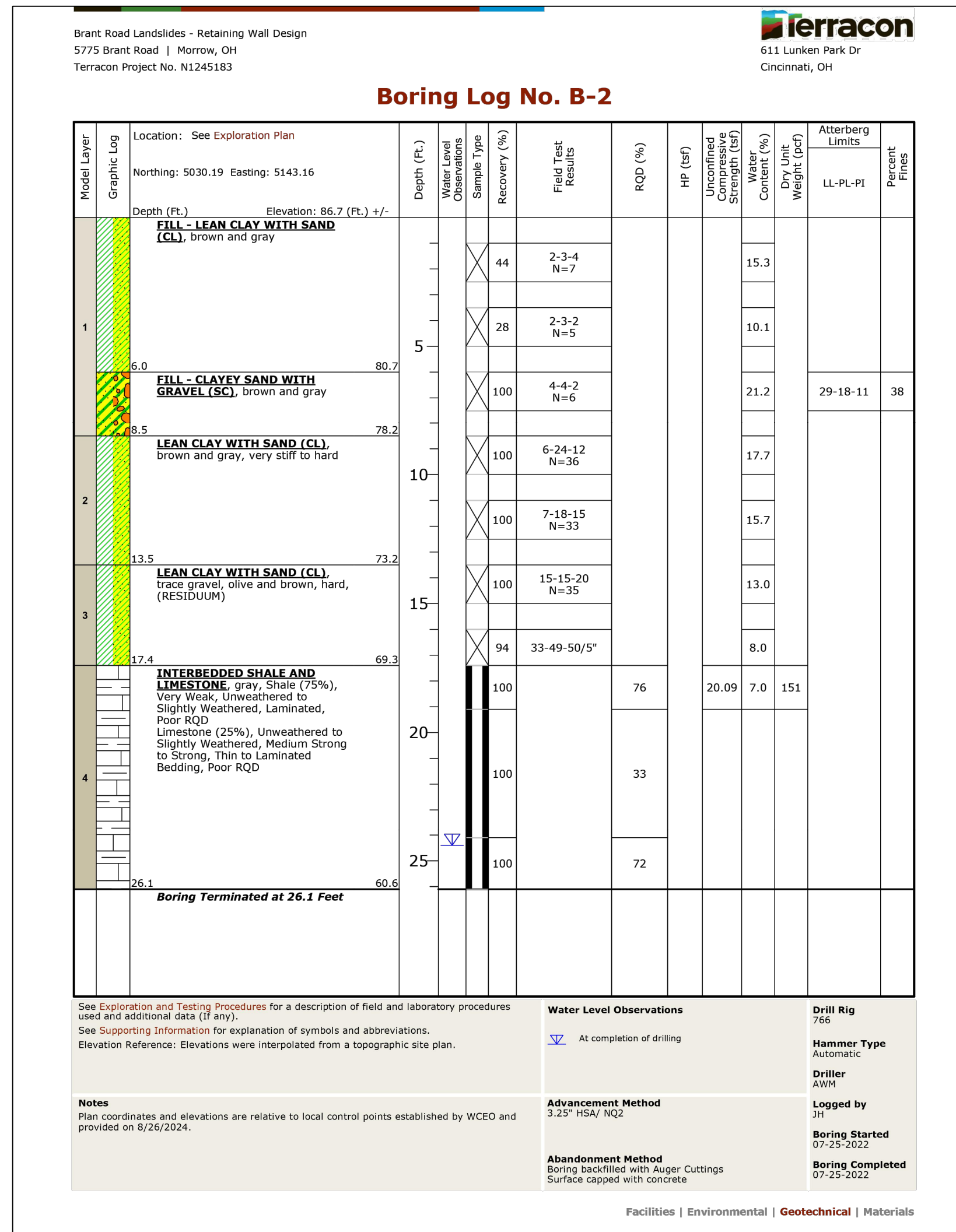
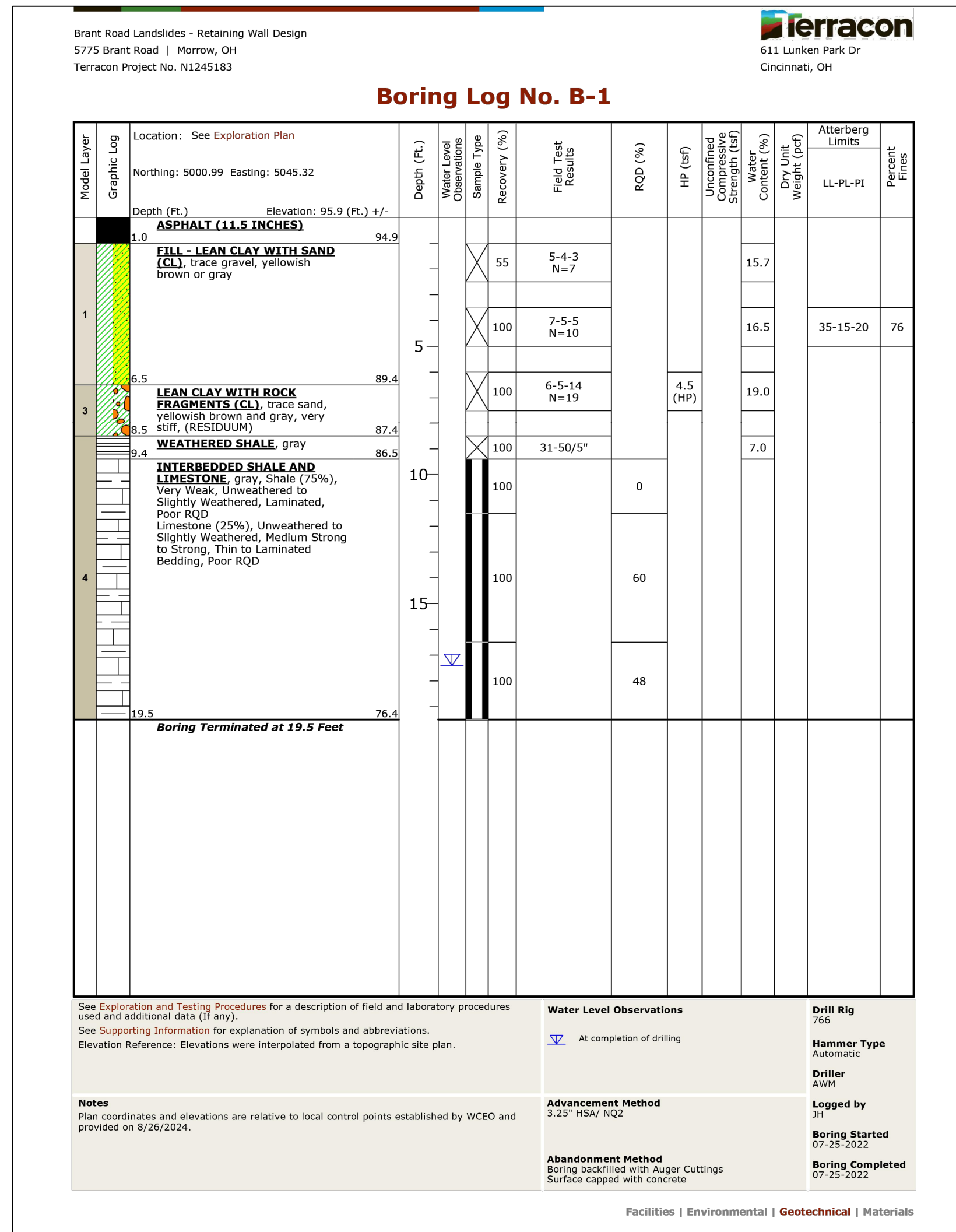
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RICHARD BACH
66025
REGISTERED PROFESSIONAL ENGINEER
10/23/2024

SHEET 5

DESIGNED BY:	RLB
DRAWN BY:	BCM
APPVD. BY:	DWW
SCALE:	AS NOTED
DATE:	10/23/24
JOB NO.	N1245183
SHEET NO.:	5 OF 9

Date: 10/22/2024 5:08 PM File Path: \\P:\WF\S02\DATA\PROJECTS\2024\N1245183\WORKING FILES\DIAGRAMS-DRAWINGS-FIGURES\FIGURES\N1245183 - DRILLED SHAFT WALL PLANS.DWG



Brant Road Landslides - Retaining Wall Design
 5775 Brant Road | Morrow, OH
 Terracon Project No. N1245183

General Notes

Sampling	Water Level	Field Tests
<ul style="list-style-type: none"> Rock Core Standard Penetration Test 	<ul style="list-style-type: none"> Water Initially Encountered Water Level After a Specified Period of Time Water Level After a Specified Period of Time Cave In Encountered 	<ul style="list-style-type: none"> N Standard Penetration Test Resistance (Blows/Ft.) (HP) Hand Penetrometer (T) Torvane (DCP) Dynamic Cone Penetrometer UC Unconfined Compressive Strength (PID) Photo-Ionization Detector (OVA) Organic Vapor Analyzer

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

Descriptive Soil Classification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location and Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density	Standard Penetration or N-Value (Blows/Ft.)	Consistency	Unconfined Compressive Strength Qu (tsf)	Standard Penetration or N-Value (Blows/Ft.)
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

Facilities | Environmental | Geotechnical | Materials



ROCK CORE B-1



ROCK CORE B-2

REV.	DATE	BY	DESCRIPTION

BORING LOGS AND ROCK CORE PHOTOS
 BRANT ROAD LANDSLIDES
WARREN COUNTY ENGINEER'S OFFICE
 210 W MAIN STREET
 LEBANON, OHIO 45036

Terracon
 Explore with us

611 LUNKEN PARK DRIVE
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 PH. (513) 321-5816
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RICHARD BACH
 86025
 REGISTERED PROFESSIONAL ENGINEER

10/23/2024

SHEET 7

DESIGNED BY:	RLB
DRAWN BY:	BCM
APPVD. BY:	DWW
SCALE:	AS NOTED
DATE:	10/23/24
JOB NO.	N1245183
SHEET NO.:	7 OF 9

DRILLED SHAFT CONSTRUCTION NOTES

IN THE FOLLOWING NOTES, THE ENGINEER SHALL BE HELD TO MEAN THE DESIGN ENGINEER FROM TERRACON CONSULTANTS, INC. (TERRACON). THE OWNER SHALL BE HELD TO MEAN WARREN COUNTY, OHIO. THE PROJECT PLANS SHALL BE HELD TO MEAN THESE PLANS PREPARED BY TERRACON. ODOT CMS SHALL BE HELD TO MEAN THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIALS SPECIFICATIONS, CURRENT EDITION.

THE PURPOSE OF THIS WORK IS TO REMEDIATE LATERAL MOVEMENT ON THE DOWNSLOPE SIDE OF BRANT ROAD; HOWEVER, PLEASE NOTE THAT CONTINUED MOVEMENT OF THE HILLSIDE DOWNSLOPE OF THIS WALL SHOULD BE EXPECTED. OWNER SHALL MONITOR THE WALL AND PROJECT AREA FOR FUTURE MOVEMENT THAT MAY COMPROMISE THE WALL. THE ENGINEER SHOULD BE CONTACTED IN SUCH CASE TO REVIEW.

1. THE CONTRACTOR SHALL REFER TO THE PROJECT PLANS AND THESE CONSTRUCTION NOTES, AND SHALL SATISFY THE REQUIREMENTS OF BOTH. ANY DISCREPANCIES BETWEEN THE PROJECT PLANS AND THESE CONSTRUCTION NOTES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING. THE RESOLUTION OF ANY DISCREPANCY SHALL BE AT THE SOLE DISCRETION OF THE ENGINEER.
2. THE CONTRACTOR SHALL OBTAIN ANY NECESSARY PERMITS THAT ARE REQUIRED FOR THIS WORK PRIOR TO PERFORMANCE OF THIS WORK.
3. THE CONTRACTOR SHALL COORDINATE A STAGING AREA, ACCEPTABLE TO THE ENGINEER AND OWNER, FOR STOCKPILING MATERIALS, INCLUDING DRILLING AND EXCAVATION SPOILS.
4. THE CONTRACTOR SHALL DEVELOP A MAINTENANCE OF TRAFFIC CONTROL (MOT) PLAN AND ESTABLISH THE WORK ZONE WITHIN THE LIMITS OF THE ROADWAY IN ACCORDANCE WITH THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD). THESE SHALL BE COORDINATED WITH THE OWNER PRIOR TO CONSTRUCTION.
5. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER, OH 811 (FORMERLY OHIO UTILITY PROTECTION SERVICES), AND ALL UTILITY COMPANIES TO CHECK FOR UNDERGROUND UTILITIES WITHIN THE WORK AREA BEFORE THE SHAFTS ARE DRILLED. THE ENGINEER SHALL BE NOTIFIED OF ANY EXISTING UTILITIES, STRUCTURES, OR OTHER INFRASTRUCTURE WITHIN THE PROPOSED DRILLED SHAFT LOCATIONS THAT DEVIATE FROM THE LOCATIONS SHOWN ON THE PROJECT PLANS OR ARE NOT SHOWN ON THE PROJECT PLANS BEFORE WORK BEGINS. SHOULD THE PRESENCE OF UNDERGROUND FEATURES NEGATIVELY IMPACT THE DESIGN OF THE DRILLED SHAFT WALL, A REASONABLE ALLOTMENT OF TIME SHALL BE PROVIDED IN THE CONSTRUCTION SCHEDULE TO MAKE DESIGN REVISIONS WHERE APPROPRIATE.
6. OVERHEAD UTILITIES SHALL BE PROTECTED AND/OR RELOCATED AS NECESSARY FOR CONSTRUCTION.
7. THE CONTRACTOR SHALL COORDINATE THE PROJECT PLANS AND THE FIELD CONDITIONS. THE ENGINEER SHALL APPROVE OF ADJUSTMENTS AND ADJUST THE REINFORCING STEEL DESIGN AND/OR BEDROCK SOCKET LENGTH, IF NECESSARY.
8. STAKING OF THE DRILLED SHAFTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE SHAFTS SHALL BE LOCATED WITHIN 3 INCHES OF THE PLANNED LOCATION.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ACCESS FOR EQUIPMENT AND PERSONNEL.
10. ALL DRILLED SHAFT EXCAVATIONS SHALL BE REVIEWED BY THE ENGINEER, OR A REPRESENTATIVE THEREOF, AT THE EXPENSE OF THE OWNER DURING DRILLING AND PRIOR TO PLACING REINFORCING STEEL AND CONCRETE. FINAL INTERPRETATION OF THE DRILLED SHAFT WALL PLANS AND THESE DRILLED SHAFT WALL CONSTRUCTION NOTES SHALL BE AT THE DISCRETION OF THE ENGINEER. THE CONTRACTOR SHALL BE FAMILIAR WITH THE REQUIRED SPECIAL INSPECTIONS AND THEIR FREQUENCY, SHALL SCHEDULE THE ENGINEER, OR A REPRESENTATIVE THEREOF, AND SHALL PROVIDE SAFE ACCESS FOR THE REQUIRED TESTING AND REVIEWS.
11. THE DRILLED SHAFTS SHALL BE DRILLED WITH DRY DRILLING METHODS AND SHALL BE DRILLED SO THAT THEY DO NOT COLLAPSE DURING DRILLING, PLACEMENT OF REINFORCING STEEL, AND/OR CONCRETING. CASING OF THE DRILLED SHAFTS SHALL BE PROVIDED, AS NECESSARY, TO CONTROL CAVING SOILS AND/OR EXCESSIVE GROUNDWATER SEEPAGE.
12. THE DRILLED SHAFTS SHALL BE EXCAVATED PLUMB, AND THE BOTTOMS SHALL BE RELATIVELY LEVEL AND REASONABLY FREE OF LOOSE AND DISTURBED MATERIAL PRIOR TO PLACING CONCRETE. THE OUT-OF-PLUMB TOLERANCE SHALL BE 1.5 PERCENT OF THE SHAFT LENGTH. THE DRILLED SHAFT EXCAVATIONS WILL EXTEND INTO THE INTERBEDDED SHALE AND LIMESTONE BEDROCK, AND THE CONTRACTOR SHALL BE PREPARED TO DRILL THROUGH THE BEDROCK WITH THE PROPER EQUIPMENT.
13. DRILLED SHAFTS SHALL BE EXTENDED TO THE MINIMUM EMBEDMENT INTO BEDROCK INDICATED IN THE STRUCTURAL DRILLED SHAFT AND PLUG SHAFT SCHEDULES. IF BEDROCK IS ENCOUNTERED MORE THAN 1.0 FT. BELOW THE ANTICIPATED BEDROCK SURFACE ELEVATIONS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY TO REVIEW AND PROVIDE ADDITIONAL RECOMENTAIONS. LONGER OR ADDITIONAL REINFORCING MAY BE REQUIRED IN THIS CASE.
14. THE DRILLED SHAFTS SHALL BE REINFORCED AND FILLED WITH CONCRETE THE SAME DAY THAT THE ENTIRE BEDROCK SOCKET (TOP TO BOTTOM) IS DRILLED. IF CONCRETE CANNOT BE PLACED THE SAME DAY AS THE BEDROCK SOCKET IS DRILLED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER FOR DIRECTION, WHICH MAY INVOLVE EXTENDING THE DRILLED SHAFT DEEPER AND/OR REDRILLING THE SHAFT WITH A LARGER DIAMETER AUGER, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ADDITIONAL COSTS ASSOCIATED WITH NOT FILLING THE DRILLED SHAFT WITH CONCRETE THE SAME DAY THAT THE BEDROCK SOCKET IS DRILLED.
15. SPOILS FROM THE DRILLED SHAFT EXCAVATIONS SHALL BE SPREAD AND COMPACTED ALONG THE DOWNSLOPE EDGE OF THE ROAD WITHIN THE WORK AREA TO RECONSTRUCT THE

SHOULDER. THE FILL SOILS PLACED ALONG THE SHOULDER SHALL BE PLACED IN LEVEL, LOOSE LIFTS (8 TO 10 INCHES THICK) AND COMPACTED TO AT LEAST 95 PERCENT OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D698). EXCESS SPOILS SHALL BE WASTED OFF SITE. DISTURBED AREAS SHALL BE RESTORED WITH SEED AND STRAW AND SHALL BE COVERED WITH A TEMPORARY EROSION CONTROL BLANKET/MAT THAT IS INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS, FOLLOWING WALL INSTALLATION AND FINAL GRADING. EXCESS SHAFT SPOILS SHALL BE REMOVED FROM THE SITE (NOT WASTED ON THE HILLSIDE BELOW THE WALL). NO FILL PLACEMENT SHOULD BE ALLOWED DOWNSLOPE OF THE WALL FACE.

16. CONCRETE:
 - A. CONCRETE FOR THE DRILLED SHAFTS SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH (F'/C) OF 4,000 PSI. SHALL HAVE A MAXIMUM AGGREGATE SIZE OF 1.5 INCHES, AIR ENTRAINED BETWEEN 5% AND 8%, AND SHALL BE PLACED AT A SLUMP OF 5 TO 7 INCHES, EXCEPT 2,500 PSI CONCRETE MAY BE USED FOR THE UNREINFORCED PLUG SHAFTS.
 - B. CONCRETE SHALL NOT BE PLACED THROUGH MORE THAN 3 INCHES OF STANDING WATER THAT MAY ACCUMULATE AT THE BOTTOM OF ANY DRILLED SHAFT EXCAVATION. DURING CONCRETE PLACEMENT FOR THE DRILLED SHAFTS, THE CONCRETE SHALL BE DIRECTED SO AS NOT TO STRIKE THE REINFORCEMENT DURING FREEFALL AND TO AVOID CAUSING SEGREGATION OF THE CONCRETE. CONCRETE PLACEMENT FOR ANY GIVEN DRILLED SHAFT SHALL BE CONTINUOUS.
 - C. IF TEMPORARY CASING IS REQUIRED DURING THE DRILLED SHAFT EXCAVATIONS, THE TEMPORARY CASING SHALL BE EXTRACTED AT SUCH A RATE AND IN SUCH A MANNER THAT THE OVERBURDEN SOILS DO NOT CAVE INTO THE SHAFT DURING CONCRETE PLACEMENT AND THAT POCKETS OF AIR AND SOIL ARE NOT INTRODUCED INTO THE CONCRETE.
 - D. THE TOP 6 FEET OF CONCRETE IN THE DRILLED SHAFTS SHALL BE VIBRATED WITH A CONCRETE VIBRATOR.
 - E. WHERE NECESSARY, TEMPORARY CYLINDRICAL FORMS SHALL BE USED FOR FORMING THE CONCRETE ABOVE EXISTING GRADES.
 - F. COLD JOINTS SHALL NOT BE USED IN THE DRILLED SHAFTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER. IF COLD JOINTS ARE USED, THEY SHALL BE CLEANED AND PREPARED PER ACI 301 SPECIFICATIONS.
 - G. THE CONTRACTOR SHALL FOLLOW THE GUIDELINES WITHIN ACI 301, "STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE," AND, WHEN NECESSARY, SHALL IMPLEMENT THE PRACTICES OUTLINED WITHIN ACI 305, "HOT WEATHER CONCRETING," OR ACI 306, "COLD WEATHER CONCRETING."
17. REINFORCEMENT:
 - A. REINFORCEMENT FOR THE STRUCTURAL SHAFTS SHALL CONSIST OF EITHER: (A) ROLLED STEEL SECTIONS CONFORMING TO ASTM A992, GRADE 50 (F/Y = 50 KSI), OR (B) A CAGE OF REINFORCING STEEL BARS CONFORMING TO ASTM A615, GRADE 60 (F/Y = 60 KSI) AND EPOXY COATED IN ACCORDANCE WITH ASTM A775.
 - B. PROVIDE PILES FREE OF CAMBER OR TWIST THAT WOULD AFFECT THEIR STRUCTURAL CAPACITY. SPLICING OF THE SOLDIER PILES SHALL NOT BE PERMITTED WITHOUT REVIEW AND WRITTEN PERMISSION BY THE ENGINEER.
 - C. ALL REINFORCING STEEL CONSTRUCTION AND PLACEMENT SHALL BE IN CONFORMANCE WITH ACI 318-19. ALL REINFORCING STEEL SHALL BE RELATIVELY CLEAN OF RUST, SOIL, AND OTHER DEBRIS IMMEDIATELY PRIOR TO THE PLACEMENT OF CONCRETE.
 - D. UNLESS NOTED OTHERWISE, ALL REINFORCING STEEL SHALL HAVE MINIMUM CLEAR COVER OF 3 INCHES WHERE THE CONCRETE IS CAST AGAINST SOIL OR BEDROCK PLASTIC BOTTOM BOLSTERS AND SPACERS SHALL BE PROVIDED TO MAINTAIN THE PROPER CLEAR COVER IN THE DRILLED SHAFTS.
 - E. LAP SPLICES SHALL NOT BE USED TO SPLICE NO. 11 OR LARGER STEEL BARS. IF SPLICING IS NECESSARY, MECHANICAL COUPLERS SHALL BE PROVIDED THAT ARE CAPABLE OF DEVELOPING AT LEAST 1.25F/Y. THE LOCATIONS OF THE COUPLERS SHALL BE COORDINATED WITH PROJECT GEOTECHNICAL ENGINEER. LAP SPLICES MAY BE USED FOR THE NO. 10 AND SMALLER BARS.
18. DISTURBED AREAS SHALL BE SEEDED AND COVERED WITH A TEMPORARY EROSION CONTROL MAT, CONFORMING TO ODOT CMS ITEM 712.11.
19. IF DIRECTED BY OWNER, CONSTRUCTION OF A GUARDRAIL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE GUARDRAIL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH ODOT CMS ITEMS 606 AND 710.15. GUIDANCE ON THE LOCATION AND EXTENT OF NEW GUARDRAIL TO BE PROVIDED BY OWNER.
20. PAVEMENTS DAMAGED DUE TO CONSTRUCTION OF THE WALL SHALL BE RESTORED IN KIND. PAVEMENT RESTORATION, INCLUDING SUBGRADE PREPARATION, SHALL BE COMPLETED IN ACCORDANCE WITH ODOT CMS ITEMS 204 (SUBGRADE COMPACTION AND PROOF ROLLING), 301 (ASPHALT CONCRETE BASE), 407 (TACK COAT), AND 441 (ASPHALT CONCRETE SURFACE & INTERMEDIATE COURSES).
21. REFER TO THE BORING LOGS ON SHEET 7 OF THESE PROJECT PLANS FOR SUBSURFACE INFORMATION.
22. TERRACON HAS DESIGNED THE DRILLED SHAFTS TO SUPPORT THE LATERAL EARTH PRESSURES FOR THE PROPOSED GRADES SHOWN ON THE PLANS INCLUDING A TRAFFIC SURCHARGE OF 250 PSF. TERRACON ASSUMES NO RESPONSIBILITY FOR, BUT NOT LIMITED TO, THE FOLLOWING ITEMS:
 - A. LOCATION PROTECTION OF EXISTING UNDERGROUND OR ABOVE GROUND UTILITIES.
 - B. COORDINATION AND VERIFICATION OF DIMENSIONS AND DETAILS WITH EXISTING ON-SITE

CONDITIONS.

- C. CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF PERSONS AND PROPERTY DURING CONSTRUCTION.
- D. TRAFFIC CONTROL.
- E. SLOPE MOVEMENT DOWNSLOPE AND BEYOND THE LIMITS OF THE PROPOSED RETAINING WALL

FIELD QUALITY CONTROL

OWNER WILL COORDINATE FIELD CONSTRUCTION INSPECTION AND REPORTING THROUGH IN-HOUSE PERSONNEL OR TERRACON. DOCUMENTATION SHALL INCLUDE THE FOLLOWING AT EACH SHAFT:

1. GROUND ELEVATION
2. AS-BUILT SHAFT DIAMETER
3. TOP AND BOTTOM OF SHAFT ELEVATIONS
4. TOP OF BEDROCK ELEVATION
5. DESCRIPTION OF ENCOUNTERED SOIL AND BEDROCK MATERIALS
6. DESCRIPTION, LOCATION, AND DIMENSION OF ANY OBSTRUCTIONS
7. FINAL TOP CENTERLINE LOCATION AND DEVIATION FROM REQUIREMENTS
8. VARIATION OF SHAFT FROM PLUMB
9. DRILLED SHAFT EXCAVATING METHOD
10. LENGTH OF ROCK SOCKET INTO BEDROCK
11. LEVELNESS OF SHAFT BOTTOM AND ADEQUACY OF CLEANOUT
12. GROUNDWATER CONDITIONS AND WATER INFILTRATION RATE, DEPTH, AND PUMPING
13. DESCRIPTION, DIAMETER, AND TOP AND BOTTOM ELEVATIONS OF TEMPORARY OR PERMANENT CASINGS
14. DESCRIPTION OF SOIL OR WATER MOVEMENTS, SIDEWALL STABILITY, LOSS OF GROUND, AND MEANS OF CONTROL
15. DATE AND TIME OF STARTING AND COMPLETING DRILLED SHAFT EXCAVATION
16. TYPE, NUMBER, AND POSITION OF REINFORCING STEEL
17. CONCRETE PLACEMENT METHOD, INCLUDING DELAYS
18. ELEVATION OF CONCRETE DURING REMOVAL OF CASINGS
19. LOCATION OF CONSTRUCTION JOINTS, IF ANY
20. REMARKS, UNUSUAL CONDITIONS ENCOUNTERED, AND DEVIATIONS FROM REQUIREMENTS

CONCRETE: SAMPLING AND TESTING OF CONCRETE FOR QUALITY CONTROL SHALL INCLUDE THE FOLLOWING:

1. SAMPLING FRESH CONCRETE: ASTM c172, EXCEPT MODIFIED FOR SLUMP TO COMPLY WITH ASTM C 94/ C94M.
 - a. SLUMP: ASTM C143/C143M; ONE TEST AT POINT OF PLACEMENT FOR EACH SET OF COMPRESSIVE STRENGTH TEST SPECIMENS
 - b. CONCRETE TEMPERATURE: ASTM C1064; ONE TEST HOURLY WHEN AIR TEMPERATURE IS 40 F (4.4 C) AND BELOW AND WHEN 80 F (27 C) AND ABOVE, AND ONE TEST FOR EACH SET OF COMPRESSIVE STRENGTH SPECIMENS.
 - c. COMPRESSION TEST SPECIMENS: ASTM C31/C31M; ONE SET OF FIVE STANDARD CYLINDERS FOR EACH COMPRESSIVE STRENGTH TEST, UNLESS OTHERWISE INDICATED. MOLD AND STORE CYLINDERS FOR LABORATORY CURED TEST SPECIMENS.
 - d. COMPRESIVE STRENGTH TESTS: ASTM C39; ONE SET OF FIVE CYLINDERS FOR EACH 100 CY OF CONCRETE PLACED, OR A MINIMUM OF ONE SET PER DAY. ONE SPECIMEN WILL BE TESTED AT 7 DAYS, TWO SPECIMENS WILL BE TESTED AT 28 DAYS, AND TWO SPECIMENS WILL BE RETAINED IN RESERVE FOR LATER TESTING IF REQUIRED. THE LOCATION OF THE CONCRETE TEST SPECIMEN SHALL BE NOTED (SHAFT NUMBER).
 - e. CONCRETE AIR CONTENT: ASTM C231: ONE TEST FOR EACH SET OF COMPRESSIVE STRENGTH TEST SPECIMENS.
2. STRENGTH LEVEL OF CONCRETE WILL BE CONSIDERED SATISFACTORY IF AVERAGES OF THREE SETS OF CONSECUTIVE STRENGTH TEST RESULTS EQUAL OR EXCEED SPECIFIED COMPRESIVE STRENGTH AND NO INDIVIDUAL STRENGTH TEST RESULT FALLS BELOW SPECIFIED COMPRESSIVE STRENGTH BY MORE THAN 500 PSI AND SLUMP OF 6±1 INCHES.

REV	DATE	BY	DESCRIPTION

DRILLED SHAFT CONSTRUCTION NOTES

BRANT ROAD LANDSLIDES
WARREN COUNTY ENGINEER'S OFFICE
 210 W MAIN STREET
 LEBANON, OHIO 45036



611 LUNKEN PARK DRIVE
 PH: (513) 321-5816

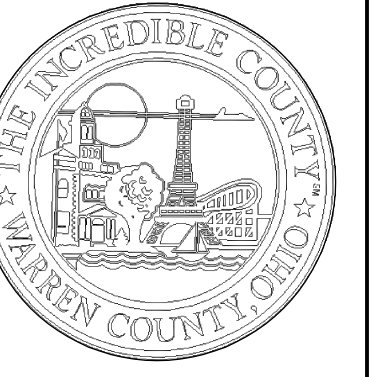
CINCINNATI, OHIO 45226
 FAX: (513) 321-4540



10/23/2024

SHEET 8	
DESIGNED BY:	RLB
DRAWN BY:	BCM
APPVD. BY:	DWW
SCALE:	NO SCALE
DATE:	10/23/24
JOB NO.	N1245183
SHEET NO.:	8 OF 9

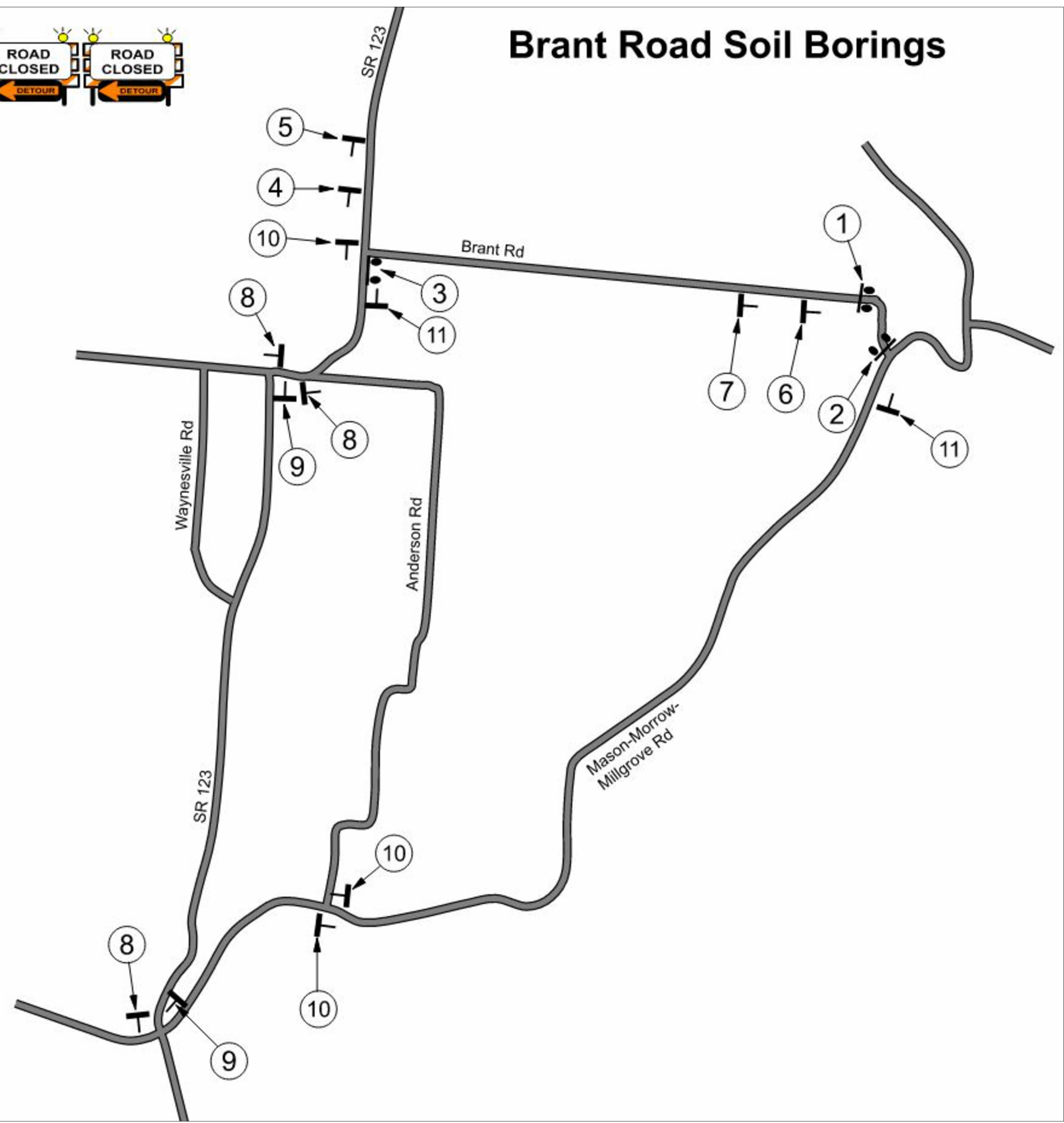
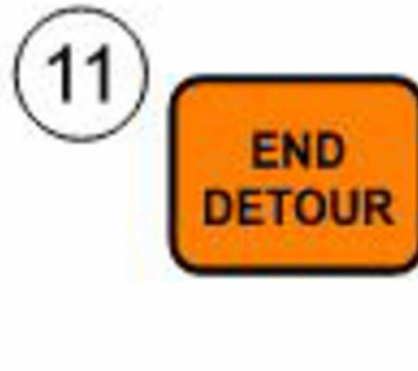
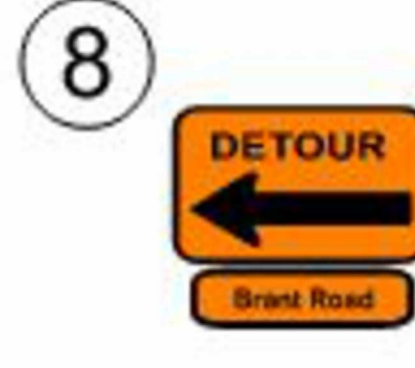
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Warren County Engineer's Office

Neil S. Junison, P.E., P.S.
 Warren County Engineer
 210 W. Main Street
 Lebanon, Ohio 45036
 513 695 3301 Phone
 513 695 7714 Fax

Brant Road Soil Borings



DETOUR SHEET
 BRANT ROAD
 DRILLED PIER WALL
 SALEM TOWNSHIP

NO.	DATE	BY	DESCRIPTION

SCALE	DATE
NONE	10/11/2024
DRAWN BY	CHECKED BY
LKS	DMB
PROJECT NO.	FILE
91-1.1B	CR 91
DRAWING NO.	Drilled Pier Wall

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