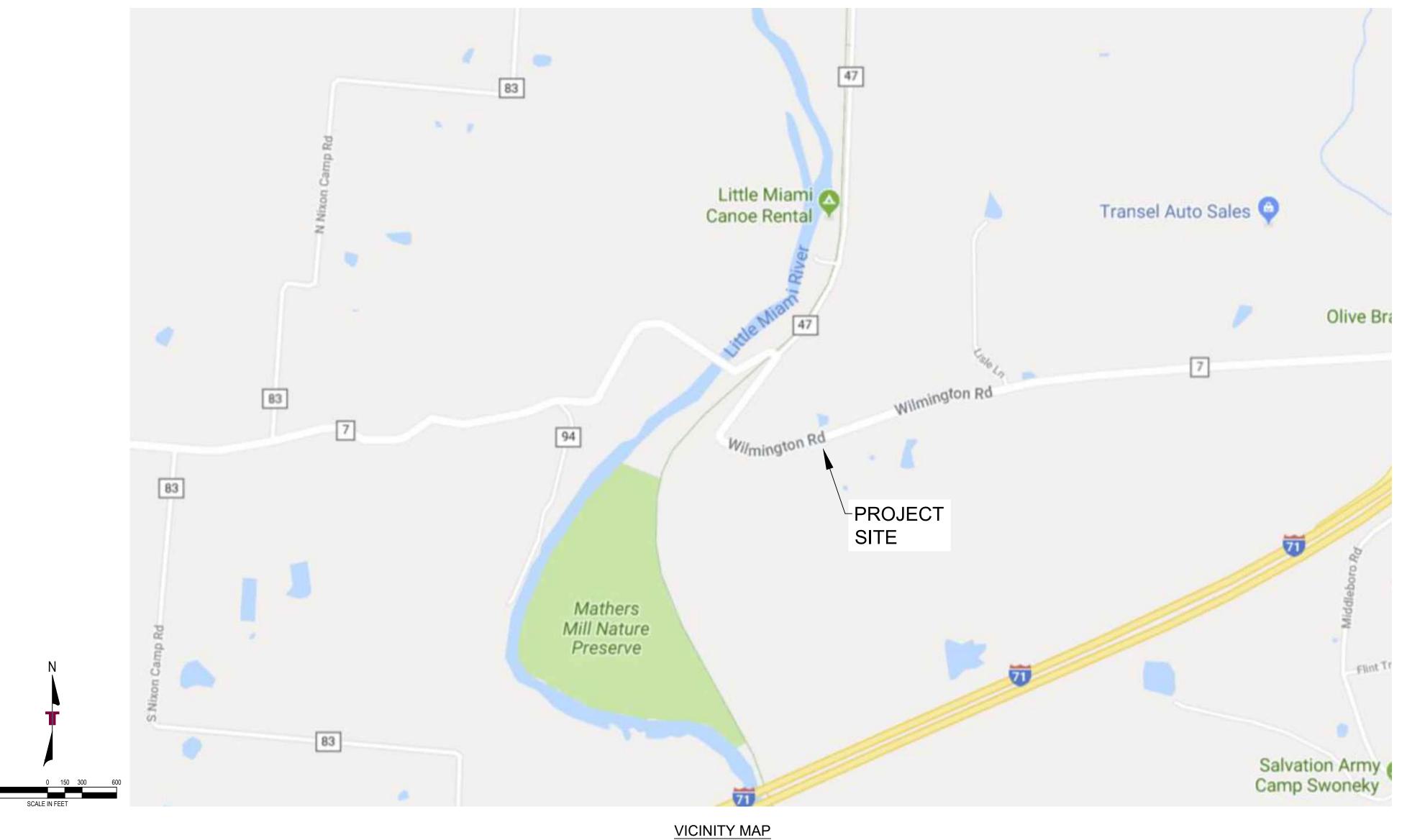
WARREN COUNTY ENGINEER'S OFFICE CR-7 LANDSLIDE 2 WILMINGTON ROAD, WARREN COUNTY, OHIO LANDSLIDE CORRECTION (PHASE II)



APPROVED

DATE

OFFICE

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SHEET 1

ESIGNED BY: ASK/DWW RAWN BY: BM

JDD

AS SHOWN 1/6/2025

N1245308

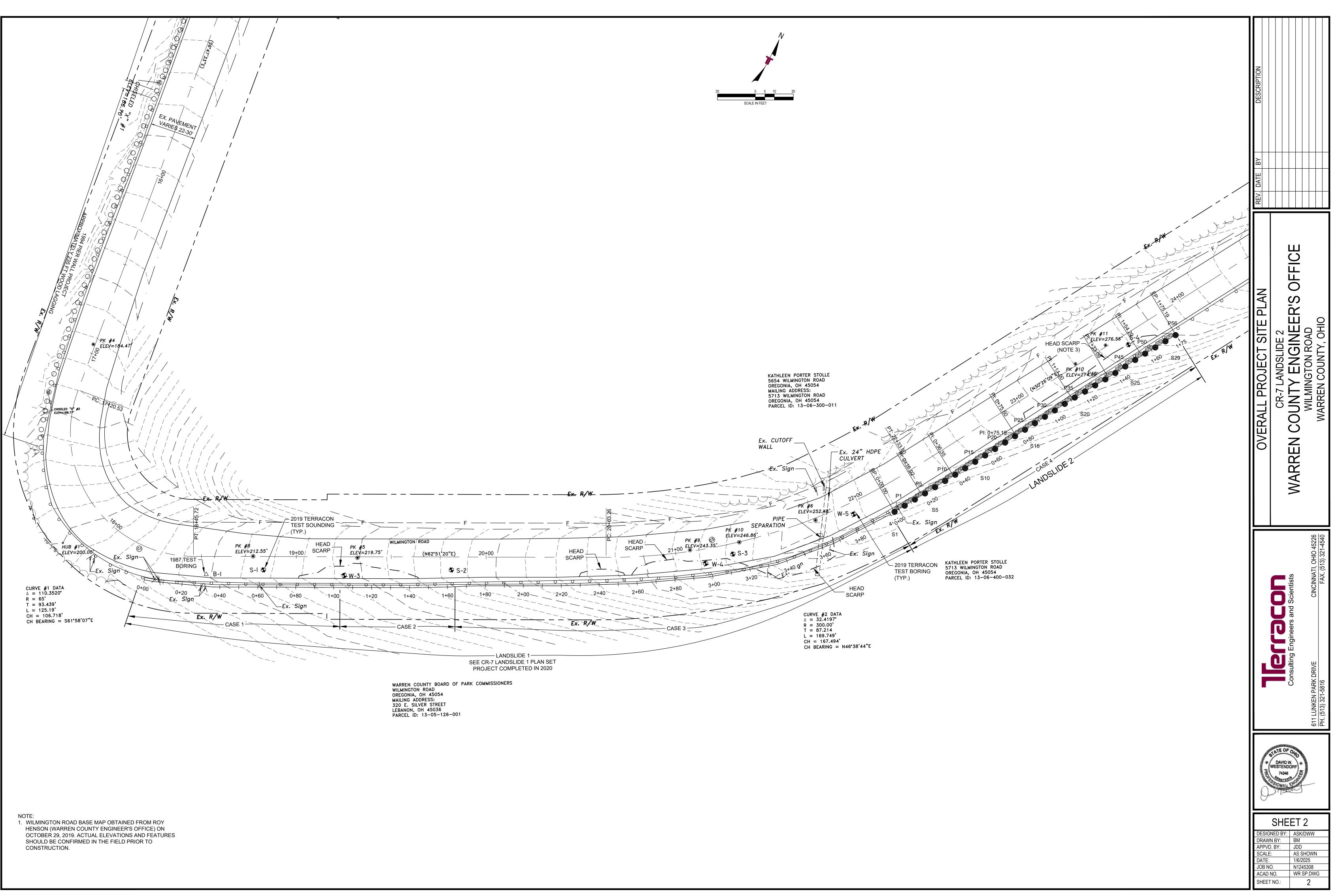
WR SP.DWG

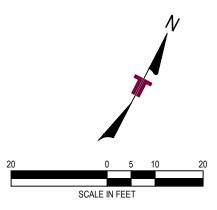
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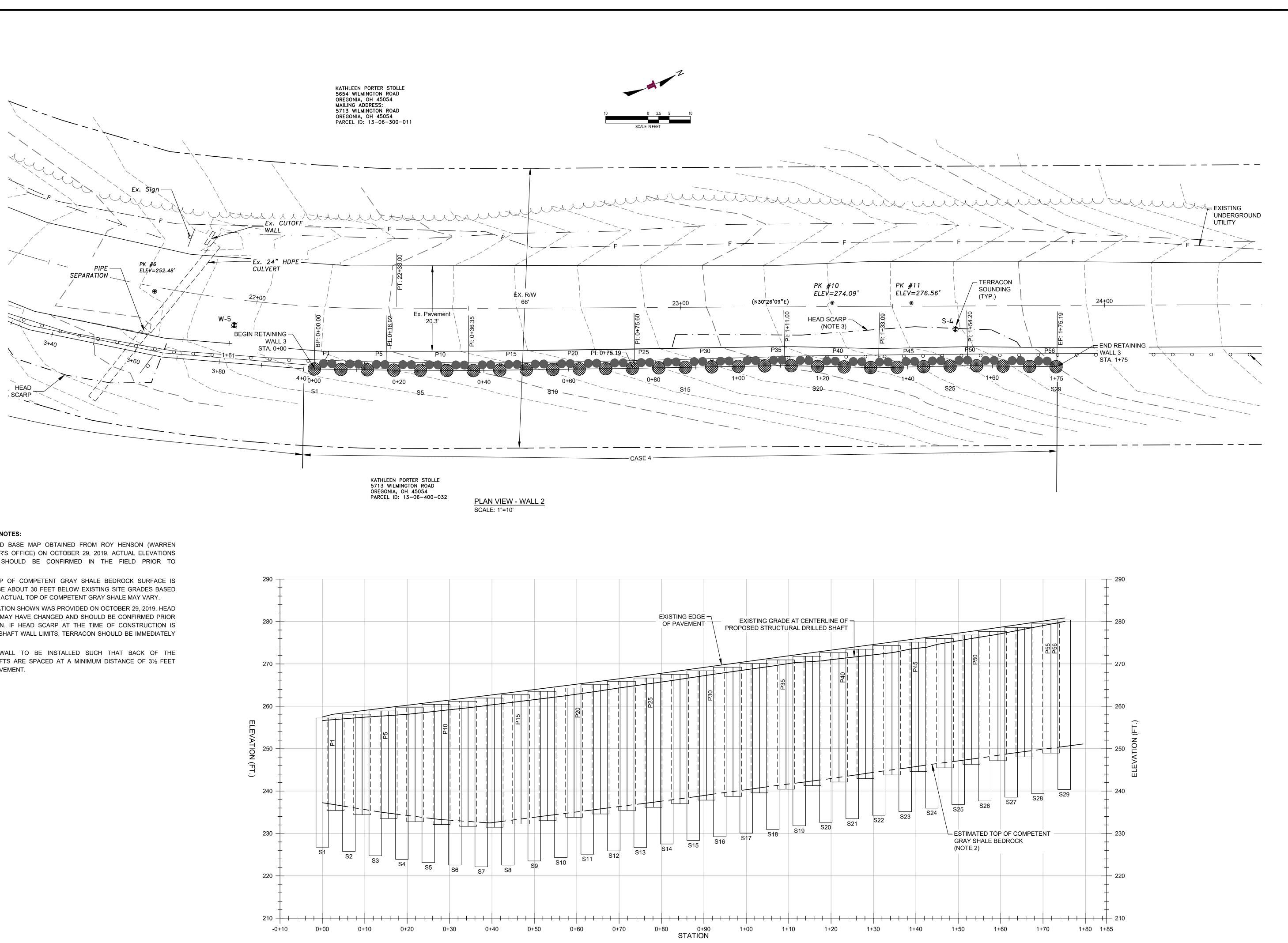
IOB NO. ACAD NO.

SHEET NO .:

KURT WEBER, P.E., P.S.

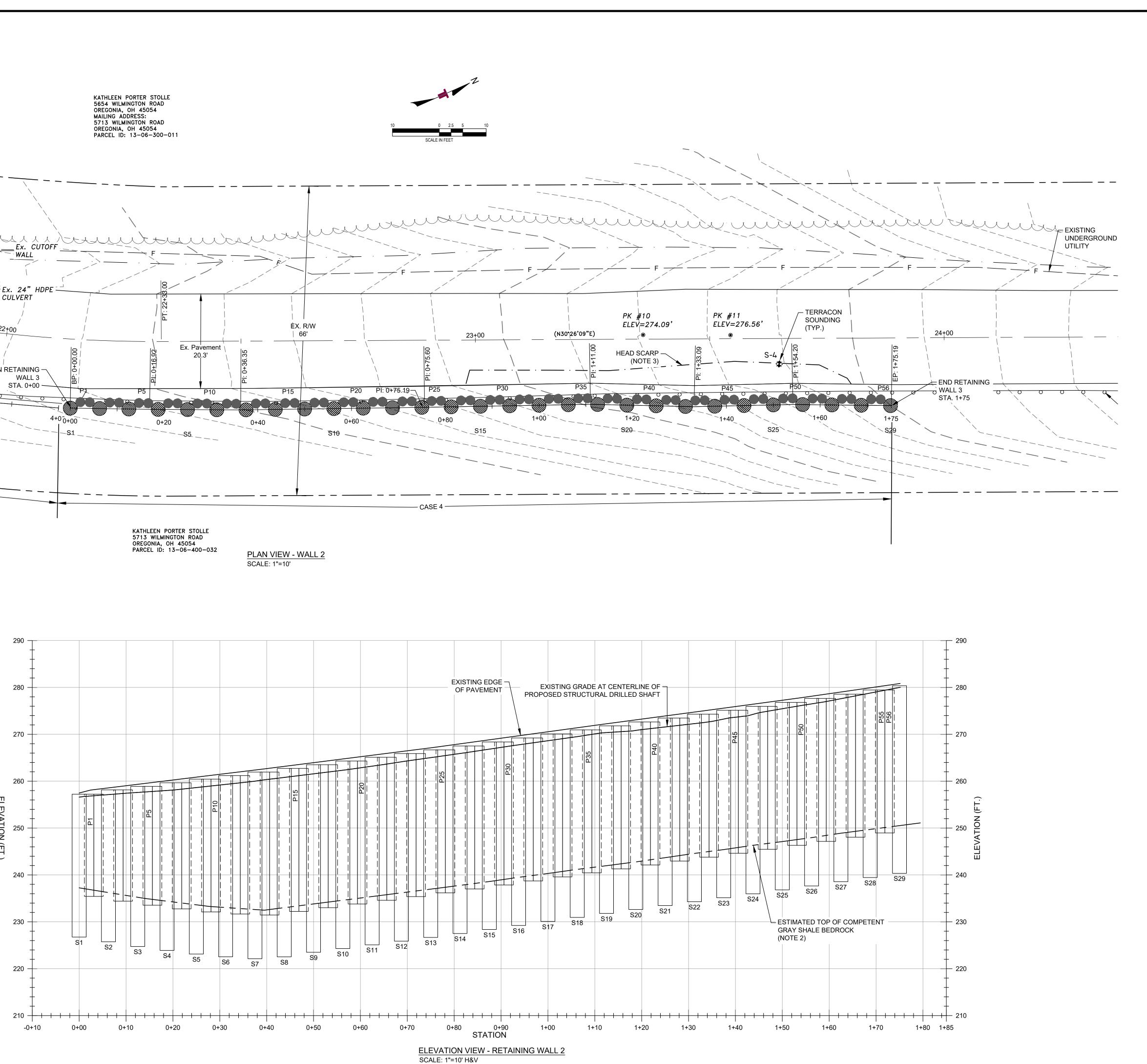




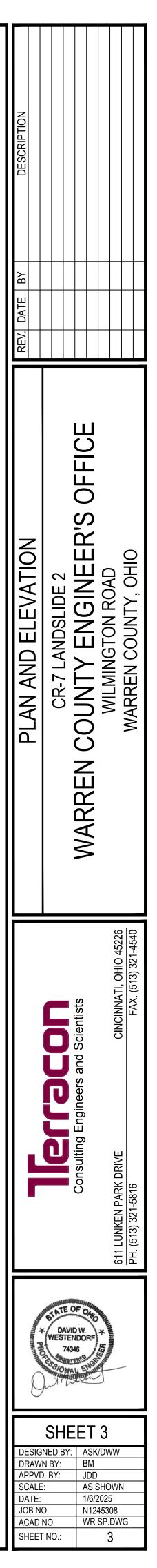


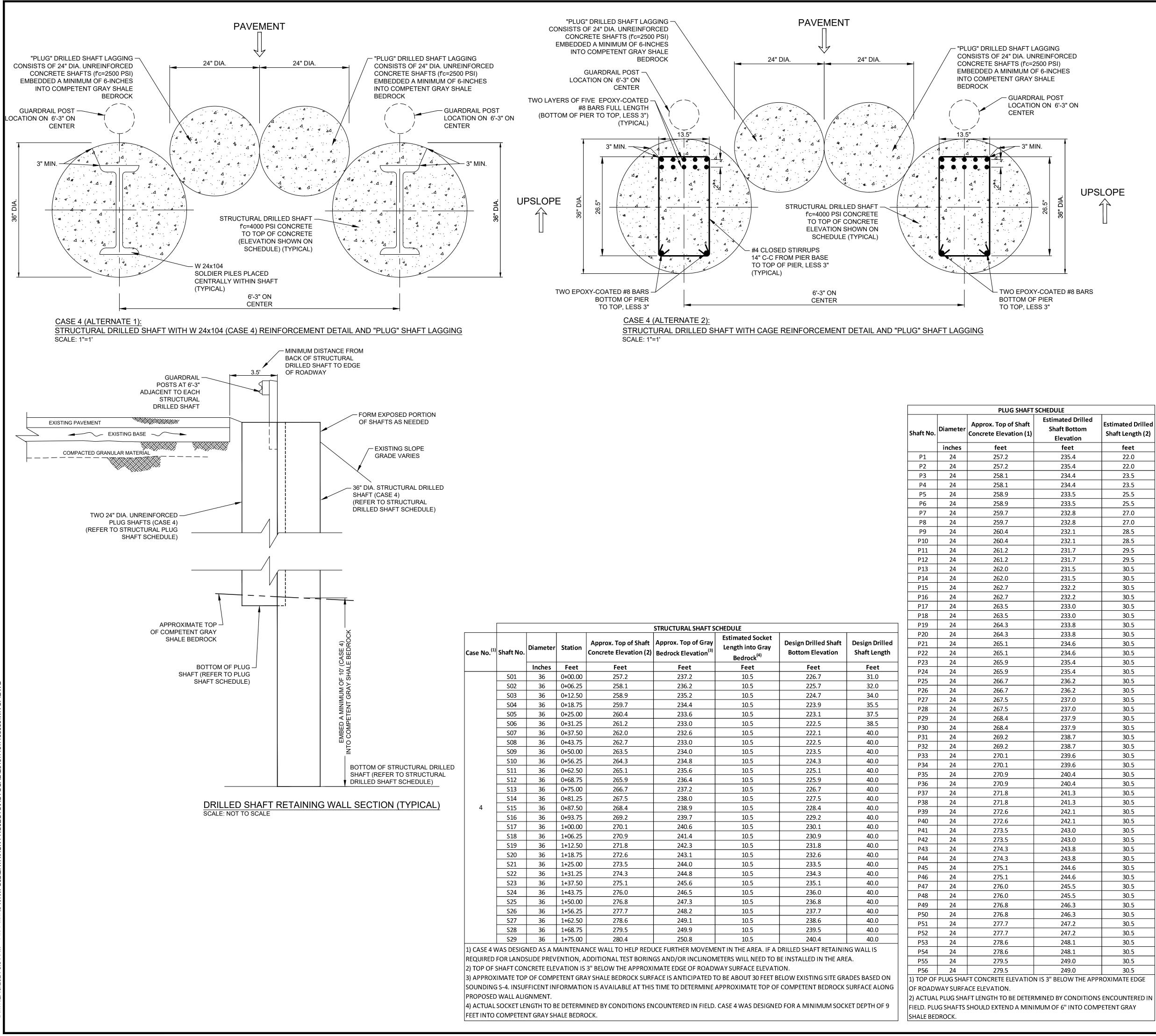
PLAN AND ELEVATION NOTES:

- 1. WILMINGTON ROAD BASE MAP OBTAINED FROM ROY HENSON (WARREN COUNTY ENGINEER'S OFFICE) ON OCTOBER 29, 2019. ACTUAL ELEVATIONS AND FEATURES SHOULD BE CONFIRMED IN THE FIELD PRIOR TO CONSTRUCTION.
- 2. APPROXIMATE TOP OF COMPETENT GRAY SHALE BEDROCK SURFACE IS ANTICIPATED TO BE ABOUT 30 FEET BELOW EXISTING SITE GRADES BASED ON SOUNDING S-4. ACTUAL TOP OF COMPETENT GRAY SHALE MAY VARY.
- 3. HEAD SCARP LOCATION SHOWN WAS PROVIDED ON OCTOBER 29, 2019. HEAD SCARP LOCATION MAY HAVE CHANGED AND SHOULD BE CONFIRMED PRIOR TO CONSTRUCTION. IF HEAD SCARP AT THE TIME OF CONSTRUCTION IS BEYOND DRILLED SHAFT WALL LIMITS, TERRACON SHOULD BE IMMEDIATELY NOTIFIED.
- 4. DRILLED SHAFT WALL TO BE INSTALLED SUCH THAT BACK OF THE STRUCTURAL SHAFTS ARE SPACED AT A MINIMUM DISTANCE OF 31/2 FEET FROM EDGE OF PAVEMENT.









| | | PLUG SHAFT S | |
|------------|----------|--|-----------------------------------|
| Shaft No. | Diameter | Approx. Top of Shaft Concrete Elevation (1) | Estimated Drilled Shaft Bottom |
| | <u></u> | | Elevation |
| | inches | feet | feet |
| P1 | 24 | 257.2 | 235.4 |
| P2 | 24 | 257.2 | 235.4 |
| P3 | 24 | 258.1 | 234.4 |
| P4 | 24 | 258.1 | 234.4 |
| P5 | 24 | 258.9 | 233.5 |
| P6 | 24 | 258.9 | 233.5 |
| P7 P8 | 24 24 | 259.7 259.7 | 232.8 232.8 |
| P9 | 24 | | |
| P9 P10 | 24 | 260.4 260.4 | 232.1 232.1 |
| P10 P11 | 24 | 261.2 | 232.1 |
| P11 P12 | 24 | 261.2 | 231.7 |
| P12 P13 | 24 | 262.0 | 231.7 |
| P13 P14 | | | 231.5 |
| P14 P15 | 24 24 | 262.0 262.7 | 231.5 |
| P15 P16 | 24 | 262.7 | 232.2 |
| P16 P17 | 24 | 263.5 | 232.2 |
| P17 P18 | 24 | 263.5 | 233.0 |
| P18 P19 | 24 | 264.3 | 233.8 |
| P19 P20 | 24 | 264.3 | 233.8 |
| | 24 | 265.1 | |
| P21 P22 | 24 | 265.1 | 234.6 |
| P22 P23 | 24 | 265.9 | 234.6 235.4 |
| P23 P24 | 24 | 265.9 | 235.4 |
| P24 P25 | 24 | | |
| P25 | 24 | 266.7 266.7 | 236.2 236.2 |
| P27 | 24 | 267.5 | 237.0 |
| P28 | 24 | 267.5 | 237.0 |
| P29 | 24 | 268.4 | 237.9 |
| P30 | 24 | 268.4 | 237.9 |
| P31 | 24 | 269.2 | 237.5 |
| P32 | 24 | 269.2 | 238.7 |
| P33 | 24 | 270.1 | 239.6 |
| P34 | 24 | 270.1 | 239.6 |
| P35 | 24 | 270.9 | 240.4 |
| P36 | 24 | 270.9 | 240.4 |
| P37 | 24 | 271.8 | 241.3 |
| P38 | 24 | 271.8 | 241.3 |
| P39 | 24 | 272.6 | 242.1 |
| P40 | 24 | 272.6 | 242.1 |
| P41 | 24 | 273.5 | 243.0 |
| P42 | 24 | 273.5 | 243.0 |
| P43 | 24 | 274.3 | 243.8 |
| P44 | 24 | 274.3 | 243.8 |
| P45 | 24 | 275.1 | 244.6 |
| P46 | 24 | 275.1 | 244.6 |
| P47 | 24 | 276.0 | 245.5 |
| P48 | 24 | 276.0 | 245.5 |
| P49 | 24 | 276.8 | 246.3 |
| P50 | 24 | 276.8 | 246.3 |
| P51 | 24 | 277.7 | 247.2 |
| P52 | 24 | 277.7 | 247.2 |
| P53 | 24 | 278.6 | 248.1 |
| P54 | 24 | 278.6 | 248.1 |
| P55 | 24 | 279.5 | 249.0 |
| | | 279.5 | 249.0 |

| meter | Station | Approx. Top of Shaft Concrete Elevation (2) | Approx. Top of Gray Bedrock Elevation ⁽³⁾ | Estimated Socket Length into Gray Bedrock ⁽⁴⁾ | Design Drilled Shaft Bottom Elevation | Design Drilled Shaft Length | |
|-------|---------|--|---|--|--|--------------------------------|--|
| ches | Feet | Feet | Feet | Feet | Feet | Feet | |
| 36 | 0+00.00 | 257.2 | 237.2 | 10.5 | 226.7 | 31.0 | |
| 36 | 0+06.25 | 258.1 | 236.2 | 10.5 | 225.7 | 32.0 | |
| 36 | 0+12.50 | 258.9 | 235.2 | 10.5 | 224.7 | 34.0 | |
| 36 | 0+18.75 | 259.7 | 234.4 | 10.5 | 223.9 | 35.5 | |
| 36 | 0+25.00 | 260.4 | 233.6 | 10.5 | 223.1 | 37.5 | |
| 36 | 0+31.25 | 261.2 | 233.0 | 10.5 | 222.5 | 38.5 | |
| 36 | 0+37.50 | 262.0 | 232.6 | 10.5 | 222.1 | 40.0 | |
| 36 | 0+43.75 | 262.7 | 233.0 | 10.5 | 222.5 | 40.0 | |
| 36 | 0+50.00 | 263.5 | 234.0 | 10.5 | 223.5 | 40.0 | |
| 36 | 0+56.25 | 264.3 | 234.8 | 10.5 | 224.3 | 40.0 | |
| 36 | 0+62.50 | 265.1 | 235.6 | 10.5 | 225.1 | 40.0 | |
| 36 | 0+68.75 | 265.9 | 236.4 | 10.5 | 225.9 | 40.0 | |
| 36 | 0+75.00 | 266.7 | 237.2 | 10.5 | 226.7 | 40.0 | |
| 36 | 0+81.25 | 267.5 | 238.0 | 10.5 | 227.5 | 40.0 | |
| 36 | 0+87.50 | 268.4 | 238.9 | 10.5 | 228.4 | 40.0 | |
| 36 | 0+93.75 | 269.2 | 239.7 | 10.5 | 229.2 | 40.0 | |
| 36 | 1+00.00 | 270.1 | 240.6 | 10.5 | 230.1 | 40.0 | |
| 36 | 1+06.25 | 270.9 | 241.4 | 10.5 | 230.9 | 40.0 | |
| 36 | 1+12.50 | 271.8 | 242.3 | 10.5 | 231.8 | 40.0 | |
| 36 | 1+18.75 | 272.6 | 243.1 | 10.5 | 232.6 | 40.0 | |
| 36 | 1+25.00 | 273.5 | 244.0 | 10.5 | 233.5 | 40.0 | |
| 36 | 1+31.25 | 274.3 | 244.8 | 10.5 | 234.3 | 40.0 | |
| 36 | 1+37.50 | 275.1 | 245.6 | 10.5 | 235.1 | 40.0 | |
| 36 | 1+43.75 | 276.0 | 246.5 | 10.5 | 236.0 | 40.0 | |
| 36 | 1+50.00 | 276.8 | 247.3 | 10.5 | 236.8 | 40.0 | |
| 36 | 1+56.25 | 277.7 | 248.2 | 10.5 | 237.7 | 40.0 | |
| 36 | 1+62.50 | 278.6 | 249.1 | 10.5 | 238.6 | 40.0 | |
| 36 | 1+68.75 | 279.5 | 249.9 | 10.5 | 239.5 | 40.0 | |
| 36 | 1+75.00 | 280.4 | 250.8 | 10.5 | 240.4 | 40.0 | |

- 1. CONSTRUCT THE 36-INCH DIAMETER DRILLED STRUCTURAL SHAFTS WITH PLUG SHAFT LAGGING RETAINING WALL USING ROLLED STEEL SECTIONS OR STEEL CAGE REINFORCEMENT AS SHOWN AND DESCRIBED ON PLANS. THE PURPOSE OF THIS WORK IS TO STOP LATERAL CREEP-TYPE MOVEMENT ON THE DOWNSLOPE (SOUTH) SIDE OF WILMINGTON ROAD. CONTRACTOR IS RESPONSIBLE FOR CLEARING OVERHEAD AND UNDERGROUND UTILITIES AND PROVIDING ACCESS FOR EQUIPMENT. THE SHAFT EXCAVATION SHALL BE UNCLASSIFIED.
- 2. THE REINFORCED DRILLED SHAFT RETAINING WALL WILL CONSIST OF DRILLED SHAFTS SPACED APPROXIMATELY 6 FEET -3 INCHES (6'-3") ON CENTER, AS SHOWN ON THE SITE PLAN DRAWING. ESTIMATED EMBEDMENT DEPTHS INTO SHALE BEDROCK ARE SHOWN ON THE DRILLED SHAFT SCHEDULE TABLE ON THIS SHEET; HOWEVER, ACTUAL EMBEDMENT DEPTHS WILL BE BASED ON ACTUAL FIELD CONDITIONS AS DETERMINED BY THE GEOTECHNICAL CONSULTANT.
- 3. THE SHAFTS SHALL BE LOCATED AS SHOWN ON PLAN WITHIN 6" OF PLAN LOCATION. THE SHAFTS SHALL MAINTAIN A PLUMBNESS DEVIATION OF A MAXIMUM OF 1" IN 12 FT. VERTICAL HEIGHT. A MINIMUM 3" CONCRETE COVER BETWEEN THE REINFORCING STEEL AND THE EXTERIOR (SIDES AND TOP) OF THE DRILLED SHAFT SHALL BE PROVIDED.
- 4. TWO ALTERNATIVES FOR REINFORCEMENT OF STRUCTURAL SHAFTS HAVE BEEN PROVIDED. REINFORCEMENT FOR THE STRUCTURAL SHAFTS SHALL CONSIST OF EITHER ROLLED STEEL SECTIONS HAVING YIELD STRENGTH OF 50 KSI OR CAGE REINFORCING STEEL HAVING A YIELD STRENGTH OF 60 KSI. ROLLED STEEL SECTIONS (ALTERNATIVE 1) SHOULD CONSIST OF W24x104 AS NOTED ON THESE PLANS. THE CONFIGURATION OF THE STEEL REINFORCING CAGE (ALTERNATIVE 2) FOR THE FOUR CASES HAS BEEN SHOWN ON THESE PLANS. ALL REBAR MUST BE EPOXY COATED.
- 5. THE PRE-DRILLED SHAFT WILL BE BACKFILLED WITH CONCRETE TO THE TOP OF CONCRETE ELEVATION. THE TOP OF SHAFT CONCRETE ELEVATION SHALL BE ABOUT 3 INCHES BELOW THE EDGE OF PAVEMENT ELEVATION, TO AVOID CONTACT BY SNOW PLOWS. STRUCTURE SHAFT CONCRETE SHALL BE CONCRETE (F'C = 4000 PSI, MAXIMUM SLUMP = 4 INCHES; 4% TO 6% AIR ENTRAINMENT) PLACED USING FREE FALL METHOD OF PLACEMENT. CONCRETE SHALL BE PLACED INTO EACH SHAFT EXCAVATION ON THE SAME DAY THAT THE DRILLING IS COMPLETED. SEE ITEM 9 BELOW.
- 6. TEMPORARY STEEL CASING SHOULD BE ON-SITE AND USED WHEREVER REQUIRED TO STABILIZE LOOSE OR CAVING MATERIALS, OR TO SEAL OFF WATER BEARING ZONES ENCOUNTERED DURING CONSTRUCTION.
- 7. THE WALL DESIGN IS BASED ON MAXIMUM DEPTH TO COMPETENT GRAY SHALE BEDROCK ABOUT 30 FEET BELOW GRADE, AS NOTED IN THE DRILLED SHAFT SCHEDULE. HOWEVER, IF BEDROCK IS ENCOUNTERED MORE THAN 1.0 FT. BELOW PLAN DESIGN ELEVATION, TERRACON SHALL BE NOTIFIED IMMEDIATELY TO REVIEW AND PROVIDE ADDITIONAL RECOMMENDATIONS. EACH SHAFT SHALL BE SOCKETED INTO SHALE BEDROCK WITH LIMESTONE LAYERS A MINIMUM OF 9 FEET, AS DESCRIBED ON THE PLANS.
- 8. THE CONTRACTOR SHALL MAINTAIN A RECORD OF EACH SHAFT DRILLED, WHICH WILL INCLUDE AS A MINIMUM: SHAFT NUMBER; GROUND ELEVATION; SHAFT TOP ELEVATION; TOP OF BROWN WEATHERED SHALE ELEVATIONS; TOP OF GRAY SHALE ELEVATIONS; AS-BUILT ROCK SOCKET DEPTH; ELEVATION OF THE TOP OF THE SHAFT CONCRETE; DATE DRILLED; DATE COMPLETED; AND WEATHER CONDITIONS.
- 9. IT IS ANTICIPATED THAT WATER MAY ENTER SOME OF THE SHAFT EXCAVATIONS. THE DEPTH OF PONDED WATER AT THE BOTTOM OF THE SHAFT EXCAVATIONS SHOULD NOT EXCEED 2 INCHES, PRIOR TO PLACING CONCRETE. IF THE WATER CANNOT BE PUMPED DOWN, TREMIE PLACEMENT METHODS WILL BE REQUIRED.
- 10. THE DRILLED SHAFT EXCAVATIONS SHOULD BE INSPECTED BY A QUALIFIED GEOTECHNICAL REPRESENTATIVE TO CONFIRM THAT THE DRILLED SHAFTS ARE SOCKETED INTO BEDROCK ACCORDING TO DESIGN, AND THAT THE DRILLED SHAFTS HAVE BEEN CONSTRUCTED PER SPECIFICATIONS.

11. SHAFT SPOILS SHALL BE TRUCKED FROM THE SITE (NOT WASTED ON THE HILLSIDE). NO FILL PLACEMENT SHOULD BE ALLOWED DOWNSLOPE OF THE SLOPE FACE.

PLUG SHAFT INSTALLATION

- 1. TWO 24-INCH DIAMETER PLUG SHAFTS CONSISTING OF UNREINFORCED CONCRETE (fr = 2500 PSI, MAXIMUM SLUMP = 4 INCHES; 4% TO 6% AIR ENTRAINMENT) AS NOTED ON THE CROSS-SECTION DETAILS WILL ACT AS LAGGING FOR THE SHAFT WALL
- 2. PLUG SHAFT INSTALLATION FOR THE DRILLED SHAFT RETAINING WALL SHALL BEGIN AFTER THE STRUCTURAL SHAFT ELEMENTS HAVE GAINED STRENGTH (AT LEAST 24 HOURS AFTER PLACEMENT OF STRUCTURAL SHAFT CONCRETE).
- 3. THE TOP OF THE PLUG SHAFT CONCRETE SHALL BE ABOUT 3 INCHES BELOW THE EDGE OF PAVEMENT.
- 4. THE BOTTOM OF ALL THE PLUG SHAFTS INSTALLED SHOULD EXTEND TO THE ELEVATIONS DETAILED IN THE DRILLED SHAFT SCHEDULE (A MINIMUM OF 6 INCHES BELOW TOP OF GRAY SHALE BEDROCK).

5. PLUG SHAFT SPOILS SHALL BE TRUCKED FROM THE SITE (NOT WASTED ON THE HILLSIDE). DRAINAGE AND OTHER CONSTRUCTION CONSIDERATIONS

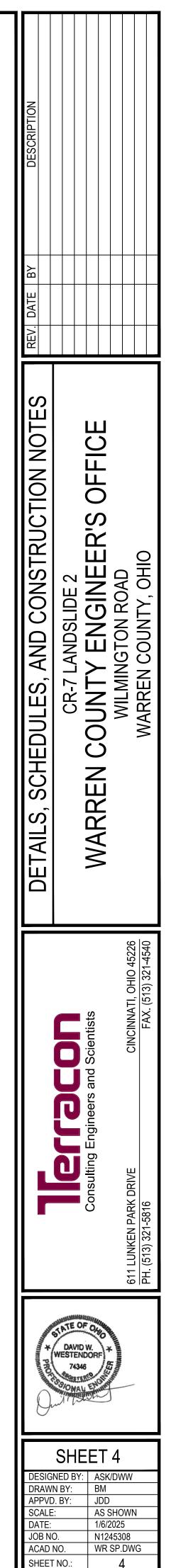
1. NEW STRUCTURAL FILL MAY BE PLACED ON UPSLOPE SIDE OF SHAFTS TO RETAIN GRADE NEXT TO THE EDGE OF PAVEMENT. SONOTUBES OR EQUIVALENT WILL BE REQUIRED IN SOME AREAS, DUE TO THE STEEPLY SLOPING HILLSIDE BELOW THE WALL. FILL SHOULD BE PLACED AND COMPACTED PER ODOT SPECIFICATIONS (ITEM 203). ONLY HAND-OPERATED EQUIPMENT SHOULD BE USED WITHIN 5 FEET OF THE FRONT OF THE SHAFTS.

FIELD QUALITY CONTROL

A. OWNER WILL COORDINATE FIELD CONSTRUCTION INSPECTION AND REPORTING THROUGH IN-HOUSE PERSONNEL OR EXTERNAL TESTING AGENCY.

DOCUMENTATION SHALL INCLUDE THE FOLLOWING AT EACH DRILLED SHAFT:

- 1. GROUND ELEVATION
- 2. AS-BUILT SHAFT DIAMETER AND TOP AND BOTTOM SHAFT ELEVATIONS.
- 3. TOP OF WEATHERED BROWN SHALE ELEVATION.
- 4. TOP OF GRAY SHALE ELEVATION.
- 5. DESCRIPTION OF ENCOUNTERED SOIL MATERIALS.
- 6. DESCRIPTION, LOCATION, AND DIMENSIONS OF OBSTRUCTIONS.
- 7. FINAL TOP CENTERLINE LOCATION AND DEVIATIONS FROM REQUIREMENTS.
- 8. VARIATION OF SHAFT FROM PLUMB.
- 9. DRILLED SHAFT EXCAVATING METHOD.
- 10. LENGTH OF ROCK SOCKET.
- 11. LEVELNESS OF SHAFT BOTTOM AND ADEQUACY OF CLEANOUT.
- 12. GROUND-WATER 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 MOVEMENT, SIDEWALL STABILITY, LOSS OF GROUND, AND MEANS OF CONTROL.
- 15. DATE AND TIME OF STARTING AND COMPLETING DRILLED SHAFT EXCAVATION.
- 16. POSITION OF REINFORCING STEEL.
- 17. CONCRETE PLACEMENT METHOD, INCLUDING DELAYS.
- 18. ELEVATION OF CONCRETE DURING REMOVAL OF CASINGS.
- 19. LOCATIONS OF CONSTRUCTION JOINTS, IF ANY.
- 20. REMARKS, UNUSUAL CONDITIONS ENCOUNTERED, AND DEVIATIONS FROM REQUIREMENTS.



| PF | ROJECT | : Wilmington Road Landslide R | SOUNDI Remediation | | | | | County OH | | | Page | 1 of ′ | 1 |
|--------------------|--------------------|--|---|--------------------|-----------------------------|-------------|--------------|-------------------------------------|------|-------------------------|---|----------------------|--------------------------|
| SI | TE: | Wilmington Road | | | l | _eb | anor | n, OH | | | | | |
| (7) | | Eagle Township, OH | | | <u>'</u> 0 | ш | | | | | ~ m € | | |
| GRAPHIC LOG | Latitude: 3 | 9.4278° Longitude: -84.1031° i24047.336 Easting: 1515697.08 | Surface Elev.: 867 (Ft.) +/ | DEPTH (Ft.) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE | RECOVERY (%) | FIELD TEST RESULTS | RQD% | LABORATORY HP (tsf) | UNCONFINED COMPRESSIVE STRENGTH (tsf) | WATER CONTENT (%) | DRY UNIT WFIGHT (pcf) |
| | Roc | ugered to 30 feet. No soil/rock samples v k sounding was terminated upon encour e bedrock. | ELEVATION (Ft. were collected. htering gray |) - | | | | | | | | | |
| | | | | 5- | - | | | | | | | | |
| | | | | - - 10- - | - | | | | | | | | |
| | | | | - - 15- - | - | | | | | | | | |
| | | | | - - 20- - | - | | | | | | | | |
| | | | | - 25- - | - | | | | | | | | |
| | | | | - | | | | | | | | | |
| | 30.0 Sou | nding Terminated at 30 Feet | 837+ | <u>./-</u> 30- | | | | | | | | | |
| | Stratificat | tion lines are approximate. In-situ, the transition m | nay be gradual. | | | | | | | | | | |
| | ncement Met | | See General Notes Rock Properties symbols and abbreviations. | | | | N | otes: | | | | | |
| | ring backfille | d with auger cuttings upon completion. | | | | | | | , | | | | |
| | No wate | ER LEVEL OBSERVATIONS or observed during drilling or observed after drilling | | | | n | | be Started: 02-27-20 Il Rig: D90 | | Probe Co Driller: Al | mpleted: VI | 02-27-2 | 2019 |
| | NU Wale | n uuserveu aner uriiling | 611 Lunke Cincinn | | _ | | Pro | ject No.: N1195052 | | | | | |



| ENERAL NO | TES BOLS AND ABBREVIATIONS | | Terracol GeoRepor | | |
|--|---|---|--|--|---|
| SAMPLING | WATER | | FIELD TESTS | | |
| SAMPLING | WAIER | N | Standard Penetration Test | | |
| - | Encountered | a (HF | Resistance (Blows/Ft.) P) Hand Penetrometer | | |
| Rock Core Standa Penetra Test | ration Specified Period of | f Time (T) | Torvane | | |
| | Water Level After a Specified Period | l of Time | | | |
| Split Spoon | Water levels indicated o the levels measured in t | n the soli boring logs are | CP) Dynamic Cone Penetrometer | | |
| | indicated. Groundwater over time. In low permea | evel variations will occur UC bility soils, accurate | Unconfined Compressive Strength | | |
| | determination of ground possible with short term | water levels is not | D) Photo-Ionization Detector | | |
| | observations. | | | | |
| | | | /A) Organic Vapor Analyzer | | |
| | | | | | |
| dry weight retained on a | sed on the Unified Soil Classificatic a #200 sieve; their principal descrip their dry weight retained on a #200 | tors are: boulders, cobbles, gr | avel or sand. Fine Grained Soils | | |
| and silts if they are sligh | htly plastic or non-plastic. Major co og to the relative proportions based | nstituents may be added as mo | odifiers and minor constituents | | |
| lefined on the basis of | their in-place relative density and f | ne-grained soils on the basis | of their consistency. | | |
| | LOCATION AND | ELEVATION NOTES | | | |
| accuracy of such device | l, Latitude and Longitude are appro es is variable. Surface elevation da | ta annotated with +/- indicates | that no actual topographical | | |
| survey was conducted to copographic maps of the | to confirm the surface elevation. In e area. | stead, the surface elevation wa | as approximately determined from | | |
| | STRE | NGTH TERMS | | | |
| | OF COARSE-GRAINED SOILS | CONSISTENCY OF F (50% or more passing | a the No. 200 sieve.) | | |
| Density determined by f | retained on No. 200 sieve.) Standard Penetration Resistance | nsistency determined by laboratory sh procedures or standard | lear strength testing, field visual-manual penetration resistance | | |
| Descriptive Term (Density) | | ptive Term Unconfined Compress sistency) Qu, (tsf) | ive Strength Standard Penetration o N-Value Blows/Ft. | | |
| Very Loose | | ry Soft less than 0.2 | | | |
| Loose | | Soft 0.25 to 0.50 | | | |
| Medium Dense Dense | | ium Stiff 0.50 to 1.00 Stiff 1.00 to 2.00 | | | |
| Very Dense | | ry Stiff 2.00 to 4.00 | | | |
| | | Hard > 4.00 | > 30 | | |
| | ORTIONS OF SAND AND GRAVEL | | ROPORTIONS OF FINES | | |
| Descriptive Term(s) o other constituents | Dry Weight | Descriptive Term(s) of other constituents | Percent of Dry Weight | | |
| Trace With | <15 15-29 | Trace With | <5 5-12 | | |
| Modifier | >30 | Modifier | >12 | | |
| Major Component of Sam | - | Term | CITY DESCRIPTION Plasticity Index | | |
| Boulders Cobbles | Over 12 in. (300 mm) 12 in. to 3 in. (300mm to 75mm) | | 0 1 - 10 | | |
| Gravel Sand | 3 in. to #4 sieve (75mm to 4.75 mm #4 to #200 sieve (4.75mm to 0.075m | | 11 - 30 > 30 | | |
| Silt or Clay | Passing #200 sieve (0.075mm) | | | | |
| | | | Terra | | |
| CRIPTION OF ROO | WE | ATHERING | Terra GeoRe | | |
| m Descrij veathered No visit | WE i ption ible sign of rock material weathering | , perhaps slight discoloration o | on major discontinuity surfaces. | | |
| m Descrip veathered No visit htly Discolo thered discolor | WE iption ble sign of rock material weathering pration indicates weathering of rock pred by weathering and may be son | , perhaps slight discoloration of material and discontinuity surf lewhat weaker externally than | on major discontinuity surfaces. aces. All the rock material may b in its fresh condition. | | |
| m Descrip veathered No visit htly Discolo thered discolor derately Less th thered present | WE iption ble sign of rock material weathering pration indicates weathering of rock bred by weathering and may be son han half of the rock material is deco the either as a continuous framework | I, perhaps slight discoloration of material and discontinuity surf lewhat weaker externally than mposed and/or disintegrated to or as corestones. | on major discontinuity surfaces. faces. All the rock material may b in its fresh condition. o a soil. Fresh or discolored rock | | |
| m Descrip veathered No visit htly Discolor thered discolor derately Less th thered present hly More th thered present | WE iption ble sign of rock material weathering pration indicates weathering of rock pred by weathering and may be son han half of the rock material is deco | I, perhaps slight discoloration of material and discontinuity surf lewhat weaker externally than mposed and/or disintegrated to or as corestones. mposed and/or disintegrated to | on major discontinuity surfaces. faces. All the rock material may b in its fresh condition. o a soil. Fresh or discolored rock | | |
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| GENERA | | ES | | | Terracon |
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| DESCRIPTION | | JLS AND ABBREVIATIONS | | | GeoReport |
| SAM | IPLING | | TER LEVEL | N Si | FIELD TESTS tandard Penetration Test |
| | | Water Initia Encounter | ed | R | and Penetrometer |
| Rock Core | Standard Penetratio | on Water Leve | Period of Time | | |
| | Test | Vater Leve a Specified | l After Period of Time | ., | orvane |
| Split Spoon | I | | ated on the soil boring logs ad in the borehole at the tim | nes | ynamic Cone Penetrometer |
| | | over time. In low p | water level variations will or ermeability soils, accurate roundwater levels is not | | nconfined Compressive trength |
| | | possible with shor observations. | | (PID) P | hoto-Ionization Detector |
| | | | | (OVA) O | rganic Vapor Analyzer |
| | | DESCRIPTI | VE SOIL CLASSIFICATION | | |
| dry weight reta have less than and silts if they may be added defined on the | ained on a #: n 50% of the y are slightly according to basis of the | 200 sieve; their principal c eir dry weight retained on a y plastic or non-plastic. Ma to the relative proportions l eir in-place relative density LOCATIO | escriptors are: boulders, c #200 sieve; they are princ or constituents may be ad based on grain size. In add and fine-grained soils on AND ELEVATION NOTES | cobbles, gravel o cipally described dded as modifiers dition to gradatio the basis of their | n, coarse-grained soils are r consistency. |
| accuracy of su | uch devices i onducted to c | atitude and Longitude are is variable. Surface elevat confirm the surface elevati area. | ion data annotated with +/- | /- indicates that n | eld GPS device. The no actual topographical proximately determined from |
| RELATIVE | E DENSITY OF | COARSE-GRAINED SOILS | STRENGTH TERMS | TENCY OF FINE-GR | |
| (More | e than 50% reta | ained on No. 200 sieve.) andard Penetration Resistance | (50% or r Consistency determined by I | more passing the No laboratory shear stre | o. 200 sieve.) ength testing, field visual-manual |
| Descriptive (Densi | ve Term | | Descriptive Term Unconfined (Consistency) | s or standard penetra d Compressive Stre | |
| Very Lo | | Blows/Ft. 0 - 3 | | Qu, (tsf) less than 0.25 | Blows/Ft. |
| Loose | e | 4 - 9 | Soft | 0.25 to 0.50 | 0 - 1 2 - 4 |
| Medium D Dens | | 10 - 29 30 - 50 | | 0.50 to 1.00 1.00 to 2.00 | 4 - 8 8 - 15 |
| Very De | ense | > 50 | | 2.00 to 4.00 | 15 - 30 |
| | | | Hard | > 4.00 | > 30 |
| Descriptiv | IVE PROPOR ve Term(s) of onstituents | TIONS OF SAND AND GRAVI | L RE Descriptive other cons | | TIONS OF FINES Percent of Dry Weight |
| Tr | race | Dry Weight <15 | Trac | ace | <5 |
| | Vith | 15-29 >30 | Wit | | 5-12 >12 |
| Major Compo | GRAIN SI | IZE TERMINOLOGY e Particle Size | Ter | PLASTICITY DE | |
| Bou | ulders obbles | Over 12 in. (300 m 12 in. to 3 in. (300mm to | m) Non-pl 75mm) Lov | vlastic w | 0 1 - 10 |
| S | ravel Sand or Clay | 3 in. to #4 sieve (75mm to #4 to #200 sieve (4.75mm Passing #200 sieve (0. | o 0.075mm Hig | | 11 - 30 > 30 |
| n | Descripti | K PROPERTIES | | | leriac |
| | | | WEATHERING | | GeoRep |
| lightly | No visible Discolorat | e sign of rock material wea tion indicates weathering o | hering, perhaps slight disc f rock material and discont | tinuity surfaces. | jor discontinuity surfaces. All the rock material may be |
| nweathered lightly eathered oderately eathered | No visible Discolorat discolored Less than | e sign of rock material wea tion indicates weathering o d by weathering and may b n half of the rock material is | hering, perhaps slight disc f rock material and discont e somewhat weaker extern decomposed and/or disin | tinuity surfaces. mally than in its f | GeoRep jor discontinuity surfaces. All the rock material may be resh condition. |
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| GENERAL NO DESCRIPTION OF SYME | TES BOLS AND ABBREVIATIO | IS | | |
|---|---|--|--|---|
| | | | | GeoReport |
| SAMPLING | Water In | | L N | FIELD TESTS Standard Penetration Test Resistance (Blows/Ft.) |
| | Encount | ered vel After a Period of Time | (HP) | Hand Penetrometer |
| Rock Core Standar Penetra Test | ation Water Le a Specifi | vel After ed Period of Time | | Torvane |
| Split Spoon | Water levels ind | | oil boring logs are shole at the times | Dynamic Cone Penetrometer |
| | indicated. Grour over time. In low | dwater level va permeability so | ariations will occur UC oils, accurate | Unconfined Compressive Strength |
| | determination of possible with sh observations. | groundwater le ort term water le | ovol | Photo-Ionization Detector |
| | | | (OVA) | Organic Vapor Analyzer |
| | DESCRIP | TIVE SOIL CLAS | SIFICATION | |
| dry weight retained on a have less than 50% of th and silts if they are sligh may be added according | a #200 sieve; their principal their dry weight retained on htly plastic or non-plastic. M g to the relative proportions their in-place relative densi | descriptors are a #200 sieve; ajor constituer based on grai | e: boulders, cobbles, grave they are principally describ nts may be added as modif in size. In addition to grada ined soils on the basis of th | have more than 50% of their el or sand. Fine Grained Soils bed as clays if they are plastic, iers and minor constituents ition, coarse-grained soils are heir consistency. |
| accuracy of such device | es is variable. Surface elev to confirm the surface eleva | ation data anno | ly determined using a hand otated with +/- indicates that the surface elevation was a | I-held GPS device. The at no actual topographical approximately determined from |
| RELATIVE DENSITY (| OF COARSE-GRAINED SOILS | STRENGTH T | ERMS CONSISTENCY OF FINE- | GRAINED SOILS |
| (More than 50% r | retained on No. 200 sieve.) Standard Penetration Resistance | Consistency | (50% or more passing the | e No. 200 sieve.) strenoth testino. field visual-manual |
| Descriptive Term (Density) | Standard Penetration or N-Value | Descriptive Ter (Consistency | rm Unconfined Compressive | |
| Very Loose | Blows/Ft. 0 - 3 | Very Soft | less than 0.25 | 0 - 1 |
| Loose Medium Dense | 4 - 9 10 - 29 | Soft Medium Stiff | 0.25 to 0.50 0.50 to 1.00 | 2 - 4 |
| Dense | 30 - 50 > 50 | Stiff Very Stiff | 1.00 to 2.00 2.00 to 4.00 | 8 - 15 15 - 30 |
| Very Dense | > 50 | Hard | > 4.00 | > 30 |
| | ORTIONS OF SAND AND GRA | | | PORTIONS OF FINES |
| Descriptive Term(s) o other constituents Trace | of Percent o Dry Weigh <15 | t | Descriptive Term(s) of other constituents Trace | Percent of Dry Weight <5 |
| With | 15-29 | | With | 5-12 |
| | >30 I SIZE TERMINOLOGY Polo Barticlo Siz | | | >12 ' DESCRIPTION Plasticity Index |
| Major Component of Sam Boulders Cobbles | nple Particle Siz Over 12 in. (300 12 in. to 3 in. (300mm) | mm) | Term Non-plastic Low | Plasticity Index 0 1 - 10 |
| Gravel Sand Silt or Clay | 3 in. to #4 sieve (75mm #4 to #200 sieve (4.75mi Passing #200 sieve (| to 4.75 mm) n to 0.075mm | Medium High | 11 - 30 > 30 |
| | ption ble sign of rock material we | | aps slight discoloration on n | GeoRep najor discontinuity surfaces. |
| veathered discolor | red by weathering and may | be somewhat | weaker externally than in it | |
| weathered present | t either as a continuous frai | nework or as c | corestones. | soil. Fresh or discolored rock is |
| veathered present | t either as a discontinuous | ramework or a | s corestones. | soil. Fresh or discolored rock is |
| veathered All rock | material is converted to so | il. The mass s | structure and material fabric | ass structure is still largely intact are destroyed. There is a large |
| | e in volume, but the soil has | | ificantly transported. | |
| Description Extremely weak | Field Identification | | | Uniaxial Compressive Strength, psi (MPa) 40-150 (0.3-1) |
| /ery weak | - | s with point of | f geological hammer, can be | · · · · · · · · · · · · · · · · · |
| Weak rock | Can be peeled by a pock made by firm blow with p | pint of geologic | | 700-4,000 (3-30) |
| Medium strong | fractured with single firm | blow of geolog | | 4,000-7,000 (30-50) |
| Strong rock | Specimen requires more fracture it | | | 7,000-15,000 (50-100) |
| /ery strong Extremely strong | Specimen can only be ch | ipped with geo | | 15,000-36,000 (100-250) >36,000 (>250) |
| | oints, Faults, Other Fract | | | y Include Foliation or Banding |
| Description Extremely close | Spacing < ¾ in (<19 r | | Description Laminated | Spacing < ½ in (<12 mm) |
| Very close Close | ³ ⁄₄ in – 2-1/2 in (19 2-1/2 in – 8 in (60 – | 200 mm) | Very thin Thin | ½ in – 2 in (12 – 50 mr 2 in – 1 ft. (50 – 300 mr |
| Moderate Wide | 8 in – 2 ft. (200 – 6 2 ft. – 6 ft. (600 mn | | Medium Thick | 1 ft. – 3 ft. (300 – 900 m 3 ft. – 10 ft. (900 mm – 3 |
| Very Wide Discontinuity Orientation (Ar | 6 ft. – 20 ft. (2.0 (ngle): Measure the angle o | – 6 m) f discontinuity r | Massive relative to a plane perpendi | > 10 ft. (3 m) icular to the longitudinal axis of t |
| ore. (For most cases, the | core axis is vertical; therefo ould have a 0-degree angle | ore, the plane p | | sis is horizontal.) For example, a |
| | Description Very Poor | | | D Value (%) 0 - 25 |
| | Poor Fair | | | 25 – 50 50 – 75 |
| | Good | | | 75 – 90 |
| 1. The combined leng | | ore segments | | 90 - 100 nches in length, expressed as a |
| percentage of the t | total core run length. artment of Transportation, Fede | | ninistration, Publication No FH | WA-NHI-10-034 December 2009 |
| | | intion of D - ··· | | |
| | Manual for Design and Constr | iction of Road Tu | | |
| | | <u>iction of Road Ti</u> | | |
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| | AL NOTES N OF SYMBOLS A | AND ABBREVIATIONS | 3 | | Terracon GeoReport |
|--|---|---|--|---|---|
| SAN | MPLING | WA | ATER LEVEL | | FIELD TESTS |
| | | Water Initia Encountere | | | tandard Penetration Test esistance (Blows/Ft.) |
| Rock Core | e Standard Penetration Test | Water Leve Specified P | el After a Period of Time | (HP) Ha | and Penetrometer |
| | Test | Water Leve a Specified | el After d Period of Time | | orvane |
| Split Spoon | n | Water levels indication the levels measure | | i boring logs are | ynamic Cone Penetrometer |
| | | indicated. Ground over time. In low p | lwater level varia permeability soils | ations will occur UC Ur ls, accurate St | nconfined Compressive trength |
| | | determination of g possible with short observations. | | vol | hoto-Ionization Detector |
| | | | | (OVA) Or | rganic Vapor Analyzer |
| | | DESCRIPTIV | IVE SOIL CLASSIF | IFICATION | |
| dry weight reta have less than and silts if the may be added | tained on a #200 s an 50% of their dry ey are slightly plas d according to the | sieve; their principal d / weight retained on a stic or non-plastic. Ma e relative proportions b | descriptors are: I a #200 sieve; the ajor constituents based on grain s | n. Coarse Grained Soils hav boulders, cobbles, gravel or ley are principally described s may be added as modifiers size. In addition to gradatior ed soils on the basis of their | r sand. Fine Grained Soils as clays if they are plastic, s and minor constituents n, coarse-grained soils are |
| accuracy of su | such devices is vai | de and Longitude are riable. Surface elevati | tion data annota | determined using a hand-he ated with +/- indicates that no | o actual topographical |
| survey was co | onducted to confir naps of the area. | rm the surface elevation | ion. Instead, the | e surface elevation was app | roximately determined from |
| RELATIV | /E DENSITY OF COAF | RSE-GRAINED SOILS | STRENGTH TER | CONSISTENCY OF FINE-GRA | |
| (More Density det | re than 50% retained o etermined by Standard | on No. 200 sieve.) I Penetration Resistance | Consistency de | (50% or more passing the No letermined by laboratory shear stre procedures or standard penetra | ength testing, field visual-manual |
| Descriptiv (Dens | ive Term Stand sity) | N-Value | Descriptive Term (Consistency) | Unconfined Compressive Stre Qu, (tsf) | N-Value |
| Very Lo | oose | Blows/Ft. 0 - 3 | Very Soft | less than 0.25 | Blows/Ft. 0 - 1 |
| Loos Medium I | | 4 - 9 10 - 29 | Soft Medium Stiff | 0.25 to 0.50 0.50 to 1.00 | <u>2 - 4</u> 4 - 8 |
| Dens | | 30 - 50 | Stiff | 1.00 to 2.00 | 8 - 15 |
| Very D | Dense | > 50 | Very Stiff Hard | 2.00 to 4.00 | 15 - 30 > 30 |
| RELAT | TIVE PROPORTIONS | S OF SAND AND GRAVE | EL | RELATIVE PROPOR | TIONS OF FINES |
| Descriptiv | ive Term(s) of constituents | Percent of Dry Weight | | Descriptive Term(s) of other constituents | Percent of Dry Weight |
| | Trace With | <15 15-29 | | Trace With | <5 5-12 |
| Mc | lodifier GRAIN SIZE TE | | | Modifier PLASTICITY DE | |
| | oulders | Particle Size Over 12 in. (300 mi | | Term Non-plastic | Plasticity Index 0 |
| | obbles Gravel | 12 in. to 3 in. (300mm to 3 in. to #4 sieve (75mm to | o 75mm) | Low Medium | 1 - 10 11 - 30 |
| | Sand t or Clay | #4 to #200 sieve (4.75mm to Passing #200 sieve (0.0 | | High | > 30 |
| CPIPTION | | | | | Terrac |
| erm | OF ROCK PF | | WEATHERIN | | GeoRep |
| erm nweathered ightly | Description No visible sign Discoloration in | n of rock material weat ndicates weathering o | thering, perhaps of rock material a | es slight discoloration on majo and discontinuity surfaces. | or discontinuity surfaces. All the rock material may be |
| erm nweathered ightly eathered oderately | Description No visible sign Discoloration in discolored by v Less than half | n of rock material weat ndicates weathering o weathering and may b of the rock material is | thering, perhaps of rock material a be somewhat we s decomposed a | es slight discoloration on majo and discontinuity surfaces. weaker externally than in its fr and/or disintegrated to a soil | or discontinuity surfaces. All the rock material may be |
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RIVER WORK COORDINATION

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THE SOUTHWEST OHIO SCENIC RIVERS REGIONAL MANAGER SHALL RECEIVE A FINAL SET OF PLANS FOR REVIEW AND BE INVITED TO THE PRECONSTRUCTION MEETING. THE CONTRACTOR SHALL NOTIFY THE OHIO DEPARTMENT OF NATURAL RESOURCES SOUTHWEST OHIO SCENIC RIVERS REGIONAL MANAGER SEVEN DAYS PRIOR TO PERFORMING ANY WORK NEAR THE LITTLE MIAMI RIVER. CONTACT INFORMATION IS:

SOUTHWEST OHIO SCENIC RIVERS REGIONAL MANAGER AARON ROURKE 1750 OSBORN ROAD WILMINGTON, OHIO 45177 937-382-1096 (OFFICE) 614-230-8534 (CELL)

THE SOUTHWEST OHIO SCENIC RIVERS REGIONAL MANAGER SHALL CONDUCT A FINAL INSPECTION BEFORE THE COMPLETION OF THE PROJECT.

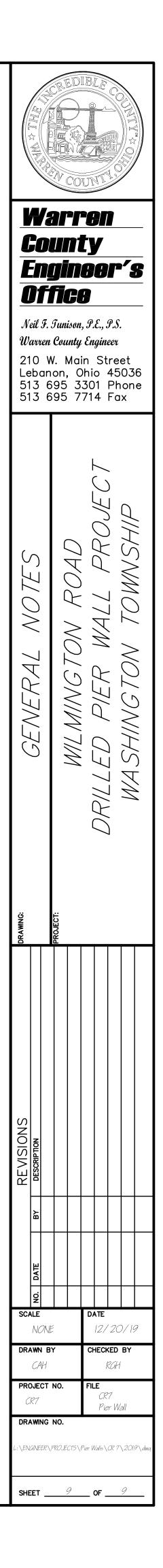
WHILE WORKING ADJACENT TO THE RIVER, THE CONTRACTOR SHALL NOT STORE ANY FUEL OR TOXIC/HAZARDOUS MATERIALS WITHIN THE 100 YEAR FLOODPLAIN OF THE LITTLE MIAMI RIVER. REFUELING OF EQUIPMENT SHALL NOT OCCUR IN THE FLOODPLAIN OR NEAR ANY DRAINAGE WAYS, DITCHES OR STREAMS. EQUIPMENT OPERATING ADJACENT TO THE RIVER SHALL BE INSPECTED DAILY FOR FUEL/LUBRICANT LEAKS AND PROMPTLY REPAIRED. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO CONTAIN ACCIDENTAL SPILLAGE OF HAZARDOUS MATERIALS DURING REFUELING OR EQUIPMENT SERVICING BY PREPOSITIONING ABSORBENT PADS, BOOMS, OR PREVENTATIVE MEASURES. PRIOR TO CONSTRUCTION, WARREN COUNTY ENGINEER'S OFFICE WILL INFORM THE CONTRACTOR REGARDING PROTOCOL FOR NOTIFYING EMERGENCY RESPONSE PERSONNEL IN THE EVENT OF A SIGNIFICANT SPILL.

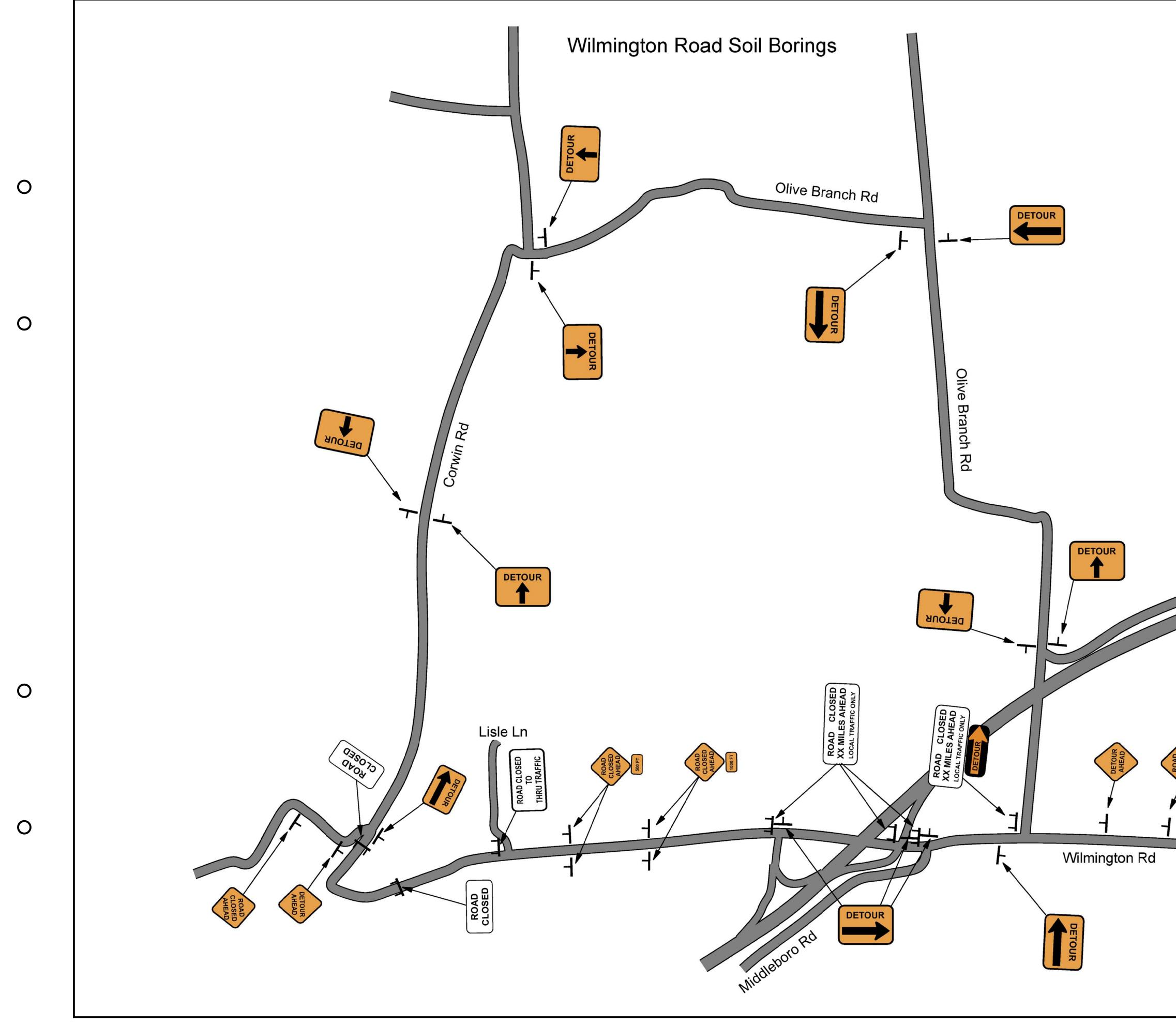
CARE SHALL BE TAKEN TO PREVENT MATERIAL FROM ENTERING THE RIVER. ANY MATERIAL WHICH ENTERS THE REIVER SHALL BE REMOVED BEFORE WORK COMMENCES TO ENSURE THAT ALL DEBRIS IS COMPLETELY REMOVED. ALL EXCESS CONSTRUCTION MATERIAL, EQUIPMENT AND OTHER DEBRIS SHALL BE REMOVED FROM THE PROJECT SITE UPON COMPLETION OF THE PROJECT AND DISPOSED OF AT A PROPER UPLAND FACILITY ABOVE THE 100 YEAR FLOOD ELEVATION. DISPOSAL WITHIN WETLANDS, FLOODPLAINS, OR WITHIN 1000 FEET OF THE LITTLE MIAMI RIVER IS PROHIBITED.

ALL STREAMBANK VEGETATION SHALL BE LEFT UNDISTURBED TO THE MAXIMUM EXTENT POSSIBLE. CUTTING OR CLEARING OF ANY RIPARIAN VEGETATION WITHIN 1000 FEET OF THE LITTLE MIAMI RIVER BEYOND THE EXISTING RIGHT-OF-WAY SHALL BE PROHIBITED. VERTICAL TREE TRIMMING IS PERMITTED WHERE NECESSARY INSIDE EXISTING RIGHT-OF-WAY, CARE SHALL BE TAKEN NOT TO GIRDLE OR SCUFF TREE TRUNKS OR DAMAGE ANY STANDING TREES.

IF DEWATERING IS NECESSARY FOR DRILLED PIER HOLES, ALL WASTE WATER SHALL BE PUMPED ONTO A VEGETATED AREA A SUFFICIENT DISTANCE FROM THE LITTLE MIAMI RIVER TO ALLOW FOR COMPLETE INFILTRATION. NO WASTEWATER OF ANY KIND SHALL BE DISCHARGED DIRECTLY INTO THE LITTLE MIAMI RIVER OR ANY OTHER DRAINAGE WAYS, DITCHES OR STREAMS. IF DISCHARGE TO A VEGETATED AREA IS NOT FEASIBLE, THEN WASTEWATER SHALL BE DISCHARGED INTO A SEDIMENT FILTER BAG. PRECONSTRUCTION MEETING

PRIOR TO COMMENCEMENT OF THE CONSTRUCTION ACTIVITIES, THE WARREN COUNTY ENGINEER WILL ARRANGE A MEETING BETWEEN THE CONTRACTOR, SOUTHWEST OHIO SCENIC RIVERS REGIONAL MANAGER, AND THE WARREN COUNTY ENGINEER. THE TIME, DATE AND LOCATION OF SAID MEETING WILL BE DETERMINED AFTER THE AWARDING OF THE CONTRACT, AND ALL PARTIES WILL BE NOTIFIED BY THE WARREN COUNTY ENGINEER. AT THE PRECONSTRUCTION MEETING THE CONTRACTOR SHALL SUBMIT TO THE PROJECT MANAGER A CONSTRUCTION SCHEDULE, LIST OF SUBCONTRACTORS, AND A LIST OF SUPPLIERS.





| | CO En Of Neil F. S Warren | Arren arren gineer's fice Junison, J.E., J.S. County Engineer Main Street |
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| | 513 6 513 6 | on, Ohio 45036 95 3301 Phone 95 7714 Fax |
| 7 | DETOUR SHEET | WILMINGTON ROAD DRILLED PIER WALL PROJECT WASHINGTON TOWNSHIP |
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| | NO. DATE BY DESCRIPTION | DATE 04/25/18 |
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