BID SET

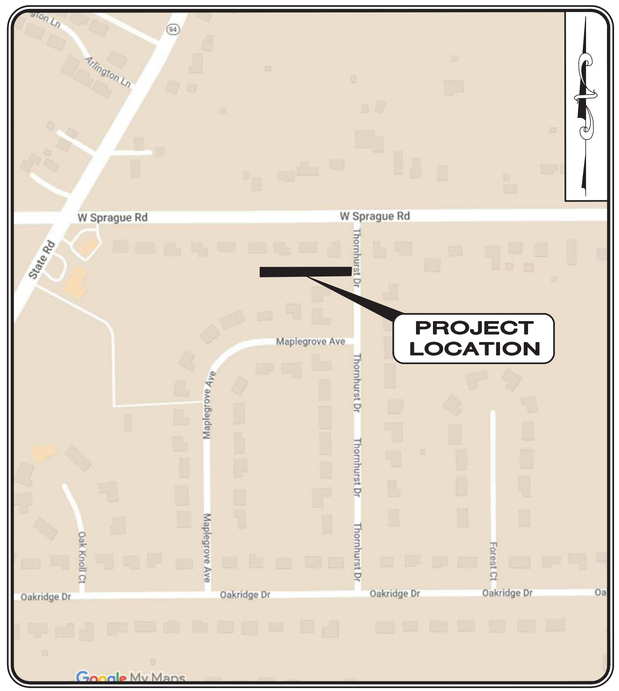
01/23/24

# CITY OF NORTH ROYALTON
# THORNHURST DRIVE
# STREAMBANK RESTORATION
# CUYAHOGA COUNTY, OHIO

JANUARY, 2025

| Sheet List Table | |
|---|---|
| **Sheet Number** | **Sheet Title** |
| 1 | COVER SHEET |
| 2 | GENERAL NOTES |
| 3 | SURVEY CONTROL PLAN |
| 4 | EXISTING CONDITIONS |
| 5 | PLAN & PROFILE |
| 6 | FENCING PLAN |
| 7 | GRADING PLAN |
| 8 | SECTIONS |
| 9 | DETAILS 1 |
| 10 | DETAILS 2 |
| 11 | DETAILS 3 |
| 12 | DETAILS 4 |
| 13 | SWPPP NOTES 1 |
| 14 | SWPPP NOTES 2 |
| 15 | SWPPP |
| 16 | LANDSCAPE PLAN 1 |
| 17 | LANDSCAPE PLAN 2 |

DEPARTMENT OF THE ARMY PERMIT NO. LRB-2023-00687,
NATIONWIDE PERMIT NO. 27




LOCATION MAP
NOT TO SCALE

## NORTH ROYALTON CITY OFFICIALS

LARRY ANTOSKIEWICZ — MAYOR
EDWARD HALLER — WASTEWATER SUPERINTENDENT

## NORTH ROYALTON CITY COUNCIL MEMBERS

| | |
|---|---|
| PAUL MARNECHECK | PRESIDENT OF COUNCIL |
| DANA A. SCHROEDER | DIRECTOR OF LEGISLATIVE SERVICES |
| JOHN NICKELL | WARD 1 |
| LINDA BARATH | WARD 2 |
| JOANNE KREJCI | WARD 3 |
| MARY GORJANC | WARD 4 |
| HEIDI WEBBER | WARD 5 |
| MIKE WOS | WARD 6 |

## UTILITIES

THE FOLLOWING IS THE LIST OF POTENTIAL UTILITY OWNERS WITHIN THE LIMITS OF CONSTRUCTION:

WATER
CITY OF CLEVELAND
DIVISION OF WATER
1201 LAKESIDE AVENUE,
CLEVELAND, OH. 4411
ATTN: FRED ROBERTS
PHONE: (216) 664-2444,
EXT. 75590
FAX: (216) 664-2838

ELECTRIC
CEI, FIRST ENERGY
6896 MILLER RD., STE 101
BRECKSVILLE, OH. 44141
ATTN: FRANK DIBBS
PHONE: (440) 546-8748
FAX (440) 546-8773

GAS
DOMINION EAST OHIO
320 SPRINGSIDE DR., STE 320
AKRON, OH. 44333
ATTN: BRYAN DAYTON
PHONE: (330) 664-2409
EMERGENCY DISPATCH NO.:
(216) 736-6651
FAX: (216) 736-6883

GAS
COLUMBIA GAS OF OHIO
7080 FRY ROAD
MIDDLEBURG HTS, OH 44130
ATTN: DAN SUREN
PHONE: (440) 891-2428
FAX: (440) 891-2497

TELECOMMUNICATIONS
VERIZON
120 RAVINE STREET
AKRON, OH 44303
ATTN: AL GUEST
PHONE: (330) 253-8267

TELECOMMUNICATIONS
SBC (AT&T)
13630 LORAIN AVENUE
2ND FLOOR
CLEVELAND, OHIO 44111
ATTN: JAMES JANIS
PHONE: (216) 476-6142
FAX: (216) 476-6013

CABLE
WOW (WIDE OPEN WEST OHIO, LLC)
105 BLAZE INDUSTRIAL PARKWAY
BEREA, OHIO 44017
ATTN: BOB HAMMOND
PHONE: (440) 602-6262

CABLE
SPECTRUM CABLE/
TIME WARNER CABLE
8179 DOW CIRCLE
STRONGSVILLE, OH. 44136
ATTN: MARK HOEFLE (EXT: 5034)
ATTN: GARY NAUMANN (EXT: 5033)
PHONE: (216) 854-0717
PHONE: (216) 555-5036
(FOR CONSTRUCTION)
FAX: (440) 826-2939

CITY OF NORTH ROYALTON
SERVICE DEPARTMENT
11545 ROYALTON ROAD
NORTH ROYALTON, OH. 44133
ATTN: NICK CINQUEPALMI,
SERVICE DIRECTOR
PHONE: (440) 582-3002

WASTE WATER TREATMENT PLANT
11675 ROYALTON ROAD
NORTH ROYALTON, OH. 44133
ATTN: EDWARD HALLER,
SUPERINTENDENT
PHONE: (440) 237-5010

NORTH ROYALTON POLICE DEPT.
14000 BENNETT ROAD
NORTH ROYALTON, OH. 44133
PHONE: (440) 237-8686

OHIO Utilities Protection SERVICE
*Call Before You Dig*
1-800-362-2764
CALL TWO WORKING DAYS BEFORE YOU DIG
(NON MEMBERS MUST BE CALLED DIRECTLY)


verdantas

ENGINEER'S PROJECT No. 220923

WILLIAM T. VASKO, P.E. — DESIGN ENGINEER — 1/23/25 DATE

MATTHEW D. GLASS, P.E. — CITY ENGINEER — 1/20/25 DATE

H:\2022\220923\DWG\SHEETS\C_220923 - COVER SHEET.DWG - 1/20/2025 10:19:06 AM - VASKO

## GENERAL:

1. ANY REVISIONS TO THE ACCEPTED CONSTRUCTION PLANS SHALL BE REVIEWED AND APPROVED BY THE OWNER PRIOR TO IMPLEMENTATION IN THE FIELD.
2. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH OSHA SAFETY REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF ALL VISITORS, EMPLOYEES AND WORKERS ON THE CONSTRUCTION SITE.
3. THE CONTRACTOR SHALL CONSTRUCT THIS PROJECT IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL BUILDING CODES.
4. ALL EXCAVATIONS ARE TO BE SECURED AND PROTECTED AT ALL TIMES.
5. ALL SEDIMENT AND EROSION CONTROL PRACTICES SHALL BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCE IN THEIR PROPER SEQUENCE AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
6. ANY DISTURBED AREAS WHICH ARE NOT SCHEDULED FOR CONSTRUCTION ACTIVITIES WITHIN FOURTEEN (14) DAYS OF DISTURBANCE SHALL BE TEMPORARILY STABILIZED.
7. ALL POLLUTANTS OTHER THAN SEDIMENT THAT OCCUR ON-SITE DURING CONSTRUCTION SHALL BE HANDLED AND LEGALLY DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORM OR SURFACE WATERS. POLLUTANTS OF CONCERN INCLUDE, BUT ARE NOT LIMITED TO, FUELS, LUBRICANTS, SOLVENTS, CONCRETE BI-PRODUCTS AND CONSTRUCTION MATERIALS.
8. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE SECURITY OF ALL STORED MATERIALS.
9. CONTRACTOR IS RESPONSIBLE FOR THE PRESERVATION OF ALL EXISTING BARNS, SHEDS, STRUCTURES, FENCES, RETAINING WALLS, STEPS, UTILITY POLES, MONUMENTS, UTILITY APPURTENANCES, SIGNAGE AND LANDSCAPE BEDS. IF DAMAGED, THE CONTRACTOR IS RESPONSIBLE FOR THE REPLACEMENT OF THESE ITEMS AT NO ADDITIONAL COST TO THE OWNER.
10. TREE CLEARING AS A PART OF CONSTRUCTION SHALL BE RESTRICTED TO THE PERIOD IN BETWEEN OCTOBER 1ST TO MARCH 31ST FOR THE PROTECTION OF OHIO'S STATE AND FEDERALLY LISTED ENDANGERED AND THREATENED BAT SPECIES. NO TREE CLEARING SHALL HAPPEN BETWEEN APRIL 1ST AND SEPTEMBER 30TH.
11. AS BUILT RECORDS - THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A SET OF PROJECT RECORD DOCUMENTS. THESE DOCUMENTS SHALL INCLUDE REVIEWED SHOP DRAWINGS, CHANGE ORDERS, EQUIPMENT OPERATING INSTRUCTIONS, FIELD TEST RECORDS, AND AS BUILT DRAWINGS. THE AS BUILT DRAWINGS SHALL BE MARKED LEGIBLY IN RED WITH THE ACTUAL LOCATION OF EQUIPMENT AND CONDUITS AS CONSTRUCTED. ALL EQUIPMENT AND UNDERGROUND CONDUITS INSTALLED SHALL HAVE LOCATIONS MARKED IN DISTANCE OFF A LANDMARK AT LEAST EVERY 25 FEET AND AS NECESSARY AT BENDS FOR LOCATING AT A LATER DATE. FINAL DOCUMENTS AND PLANS SHALL BE DELIVERED TO THE OWNER.

## UTILITIES:

1. THE LOCATIONS OF THE UNDERGROUND UTILITIES ARE PLOTTED ACCORDING TO THE INFORMATION FURNISHED BY THE UTILITIES CONCERNED AND THE OWNER DOES NOT GUARANTEE THE ACCURACY THEREOF. CONTRACTOR TO CALL OHIO811 (1-800-362-2764) "48 HOURS BEFORE YOU DIG" AND CALL OIL & GAS PRODUCERS PROTECTIVE (1-800-925-0988). CONTRACTOR ALSO TO COORDINATE HIS WORK WITH THE UTILITIES LISTED ON THIS SHEET.
2. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL PUBLIC AND PRIVATE UTILITIES WHICH MAY BE AFFECTED BY THE CONSTRUCTION. THE LOCATION OF UTILITIES AND STRUCTURES, BOTH SURFACE AND SUBSURFACE, ARE SHOWN ON THE DRAWINGS FROM DATA AVAILABLE AT THE TIMES OF SURVEY AND ARE NOT NECESSARILY COMPLETE OR CORRECT. THE EXACT LOCATION AND PROTECTION OF UTILITIES AND STRUCTURES ARE THE RESPONSIBILITY OF THE CONTRACTOR.
3. THE CONTRACTOR SHALL NOTIFY UTILITY COMPANIES AT LEAST THREE WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS AND LEGAL HOLIDAYS, PRIOR TO CONSTRUCTION TO HAVE UTILITIES STAKED, MARKED OR OTHERWISE DESIGNATED IN THE CONSTRUCTION AREA IN SUCH A MANNER OR LOCATING SHALL BE COORDINATED TO STAY 48 HOURS AHEAD OF THE PLANNED CONSTRUCTION.
4. THE CONTRACTOR SHALL EXPOSE ALL UTILITIES OR STRUCTURES PRIOR TO CONSTRUCTION TO VERIFY THE VERTICAL AND HORIZONTAL LOCATION OF THE UTILITY OR STRUCTURE AND ITS EFFECT ON THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE UTILITY OWNER AND PROPERTY OWNER.
5. OSHA STANDARDS PROHIBIT CRANE OR BACKHOE OPERATIONS WITHIN TEN (10) FEET OF ENERGIZED PRIMARY CONDUCTORS. TEMPORARY RELOCATION OF ELECTRICAL UTILITIES, INCLUDING RESTRAINT POLES, RELOCATION OF POLES AND RUBBER COVERING OF ENERGIZED CONDUCTORS MAY BE REQUIRED. THE COORDINATION AND COST OF THESE SERVICES IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR MAY RESTRAIN POLES IF THE METHOD OF SUPPORT HAS BEEN SUBMITTED TO AND APPROVED BY THE UTILITY OWNER.
6. IN THE EVENT OF DAMAGE TO EXISTING PUBLIC AND/OR PRIVATE UTILITIES, THE AGENCY CONCERNED SHALL BE NOTIFIED IMMEDIATELY AND ALL REPAIR WORK SHALL BE EXECUTED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE RESPECTIVE AGENCY AT NO ADDITIONAL EXPENSE TO THE OWNER INCLUDING ANY INSPECTION FEES OR MAINTENANCE CREWS. CABLE RELOCATION AND SUPPORT COST SHALL BE INCLUDED IN OTHER BID ITEMS.
7. WHERE EXISTING POWER OR TELEPHONE POLES ARE IN CLOSE PROXIMITY TO WORK, THE CONTRACTOR SHALL COORDINATE HIS WORK EFFORTS WITH THOSE OF THE UTILITY COMPANIES SUCH THAT THEIR EXISTING FACILITIES CAN BE MAINTAINED AND PROTECTED DURING THE TIME WORK IS GOING ON ADJACENT TO THE POLE. THE COST FOR ANY REQUIRED PROTECTION OR RELOCATION OF EXISTING POWER OR TELEPHONE POLES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND NOT BE THE RESPONSIBILITY OF THE OWNER.
8. SHOULD IT BECOME NECESSARY TO CHANGE THE POSITION OR TEMPORARILY REMOVE ANY STORM DRAIN, SANITARY SEWER, ELECTRIC CONDUITS, WATER PIPES, GAS PIPES, PROCESS OR OTHER PIPES OR WIRES IN ORDER TO PERMIT THE CONTRACTOR TO USE A PARTICULAR METHOD OF CONSTRUCTION OR IN ORDER TO CLEAR THE STRUCTURES BEING BUILT, THE CONTRACTOR SHALL NOTIFY THE OWNER OF THE LOCATION AND CIRCUMSTANCES AND SHALL CEASE WORK, IF NECESSARY, UNTIL SATISFACTORY ARRANGEMENTS HAVE BEEN MADE BY THE OWNERS OF SAID PIPES OR WIRES TO PROPERLY CARE FOR THE SAME. NO CLAIMS FOR DAMAGES WILL BE ALLOWED ON ACCOUNT OF ANY DELAY OCCASIONED THEREBY. THE ENTIRE COST OF THE CHANGES OR TEMPORARY REMOVAL MUST BE INCLUDED IN THE PRICES STIPULATED FOR THE VARIOUS ITEMS OF WORK TO BE DONE UNDER THIS CONTRACT.

## RESTORATION:

1. CONTRACTOR SHALL RESTORE ANY DISTURBED AREAS CAUSED FROM CONSTRUCTION TO PRE-CONSTRUCTION CONDITIONS OR BETTER; INCLUDING PAVEMENT, LAWN, LANDSCAPING, STRUCTURES, YARD APPURTENANCES, OR ANY OTHER AREAS DISTURBED BY CONSTRUCTION.
2. ALL GRASS AREAS ARE TO BE RESTORED UNLESS OTHERWISE SHOWN ON THE CONTRACT DRAWINGS.

## STREAM RESTORATION NOTES:

1. ROCK MATERIAL TO BE USED IN RIFFLE SHALL BE OF NATURAL ORIGIN. NO COMPOSITE STONE OR CONCRETE SHALL BE USED.
2. INSTREAM STRUCTURES SHALL BE INSTALLED AS THE CHANNEL IS BEING CONSTRUCTED, NOT POST CONSTRUCTION. FILTER FABRIC INSTALLED AS PART OF THE INSTREAM STRUCTURE SHALL BE A BIODEGRADABLE NONWOVEN GEOTEXTILE.
3. CONSTRUCTION WILL OCCUR FROM DOWNSTREAM TO UPSTREAM LIMITS.
4. ALL COCONUT FIBER MATTING WILL BE INSTALLED FROM DOWNSTREAM TO UPSTREAM WITH THE UPSTREAM PORTIONS OVERLAPPING THE DOWNSTREAM. ALL STAKES USED SHOULD BE WOOD OR OTHER BIODEGRADABLE MATERIALS.

## EROSION CONTROL:

1. ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY AFTER THE COMPLETION OF THE GRADING ACTIVITIES. AREAS REQUIRING COCONUT FIBER MATTING SHALL BE SEEDED AND MULCHED FOR STABILIZATION PRIOR TO MATTING INSTALLATION.
2. PERMANENT SEEDING FOR CHANNEL SLOPES SHALL BE A WETLAND MIX WITH BOTH NATIVE GRASSES AND FLOWERING FORBS.
3. OVERLAPPING OF THE MATTING EDGES SHOULD BE DONE SO THAT THE MATTING ON TOP IS ON THE UPSTREAM SIDE. OVERLAP EDGES APPROXIMATELY 1 FT.
4. TWO ROWS OF MATTING SHALL BE INSTALLED ON EACH STREAM BANK FOR A TOTAL OF FOUR ROWS OF MATTING COMMITTED TO THE CHANNEL.
5. USE WOODEN 1FT LONG BIOSTAKES AT A STAGGERED 2 FT SPACING TO SECURE MATTING. USE 2"X2", 2 FT LONG WOODEN STAKES AT 2 FT SPACING TO SECURE THE MATTING ALONG THE TOE OF THE BANKS.

## MATERIAL DISPOSAL AND TEMPORARY SURFACES:

1. THE REMOVAL AND DISPOSAL OF ALL SURPLUS EXCAVATED MATERIAL AND CONSTRUCTION DEBRIS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR FOR ULTIMATE DISPOSAL. THE DISPOSAL OF ALL CONSTRUCTION DEBRIS SHALL BE AT A LOCATION APPROVED BY THE OWNER. THE DISPOSAL OF ALL "CLEAN" WASTE MATERIAL SHALL BE AT APPROVED LANDFILLS, AND/OR OTHER SITES APPROVED BY THE OWNER. THE DISPOSAL OF EXISTING PIPELINE AND TANK SEDIMENTS AND WASTEWATER SLUDGE SHALL BE AT AN APPROVED LOCATION. THE CONTRACTOR SHALL OBTAIN ALL APPROVALS, PERMITS, LICENSES, ETC. FROM LOCAL, STATE AND FEDERAL AGENCIES AND/OR PRIVATE LANDOWNERS. THE CONTRACTOR SHALL FURNISH THE OWNER A COPY OF ALL APPROVALS OR WRITTEN PERMISSION PRIOR TO DISPOSING OF ANY WASTE AT SAID SITE.
2. TEMPORARY SURFACES WHERE EXCAVATION ARE LOCATED IN STREETS, DRIVES AND PARKING AREAS SHALL BE FURNISHED AND PLACED BY THE CONTRACTOR AND SHALL BE FULLY MAINTAINED TO MINIMIZE INCONVENIENCE TO THE PUBLIC AT NO ADDITIONAL COST TO THE OWNER.
3. THE ABOVE DESCRIBED WORK SHALL BE CONSIDERED INCIDENTAL TO THE COMPLETION OF ALL WORK AND INCLUDED IN THE RESPECTIVE PAY ITEMS AND SHALL NOT BE A SEPARATE PAY ITEM.

## PROHIBITED CONSTRUCTION ACTIVITIES:

1. THE USE OF EXPLOSIVES WITHIN MUNICIPAL LIMITS, UNLESS A PERMIT IS ISSUED BY THE OWNER.
2. PUMPING OF SEDIMENT-LADEN WATER FROM TRENCHES OR OTHER EXCAVATIONS DIRECTLY INTO ANY SURFACE WATERS, STREAM CORRIDORS, OR STORM SEWERS; ALL SUCH WATER WILL BE PROPERLY FILTERED OR SETTLED TO REMOVE SILT PRIOR TO RELEASE.
3. DISCHARGING POLLUTANTS SUCH AS CHEMICALS, FUELS, LUBRICANTS, BITUMINOUS MATERIALS, RAW SEWAGE, OR ANY OTHER HARMFUL WASTE INTO OR ALONGSIDE OF RIVERS, STREAMS, IMPOUNDMENTS OR INTO NATURAL OR MAN-MADE CHANNELS LEADING THERETO.
4. NO SURFACE, GROUND OR TRENCH WATER SHALL BE ALLOWED TO FLOW INTO EXISTING SANITARY SEWERS.
5. OPEN BURNING OF PROJECT DEBRIS WITHOUT A PERMIT.
6. STORING CONSTRUCTION EQUIPMENT AND VEHICLES AND/OR STOCKPILING CONSTRUCTION MATERIALS ON PROPERTY, PUBLIC OR PRIVATE, NOT PREVIOUSLY SPECIFIED ON THE PLANS BY THE ENGINEER FOR SUCH PURPOSES.
7. RUNNING WELL POINT OR PUMP DISCHARGE LINES THROUGH PRIVATE OR PUBLIC PROPERTY AND RIGHTS-OF-WAY WITHOUT PERMISSION OF THE PROPERTY OWNER AND THE CONSENT OF OWNER.
8. OPERATION ENTAILING THE USE OF VIBRATORY HAMMERS OR COMPACTORS OUTSIDE THE HOURS OF 8:00 AM TO 5:00 PM OR OUTSIDE THE HOURS ALLOWED BY LOCAL ORDINANCES OR REGULATIONS.
9. CLOSING OFF CLEAR ACCESS TO ANY PUBLIC ALLEY, STREET, ROAD, AVENUE OR BOULEVARD WITHOUT THE PRIOR CONSENT OF MUNICIPAL OFFICIALS AND THE OWNER AND CLOSING CLEAR ACCESS:
   - 9.1. BY FIRE PROTECTION EQUIPMENT AND EMERGENCY VEHICLES;
   - 9.2. BY THE PUBLIC TO ANY COMMERCIAL OR PROFESSIONAL PLACE OF BUSINESS, QUASI-PUBLIC OR PUBLIC ESTABLISHMENT, OR PLACE OF RESIDENCE; OR
   - 9.3. BY VEHICLES TO DRIVEWAYS WITHOUT THE PROVISION OF ALTERNATIVE MEANS OF BUILDING INGRESS AND EGRESS.

## STORMWATER SYSTEM NOTES:

1. CONTRACTOR SHALL RE-CONNECT ALL ENCOUNTERED DOWN SPOUT DRAINS AND OTHER STORM SEWER DRAIN LINES UNLESS DIRECTED OTHERWISE WITHIN.
2. ALL EXISTING UTILITY LINE ELEVATIONS SHOWN ARE ESTIMATED (EXCEPT FOR THE SANITARY SEWER) AND MUST BE FIELD DETERMINED BY THE CONTRACTOR. CONFLICTS MUST BE RESOLVED BY THE CONTRACTOR AND THE UTILITY OWNER.

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER

verdantas

| NO | REVISION | DATE |
|---|---|---|
| | | |

ISSUED FOR: BID
ISSUE DATE: 01/23/25
SCALE: AS SHOWN
DESIGNED BY: JRH/WTV
DRAWN BY: WTV
CHECKED BY: CR

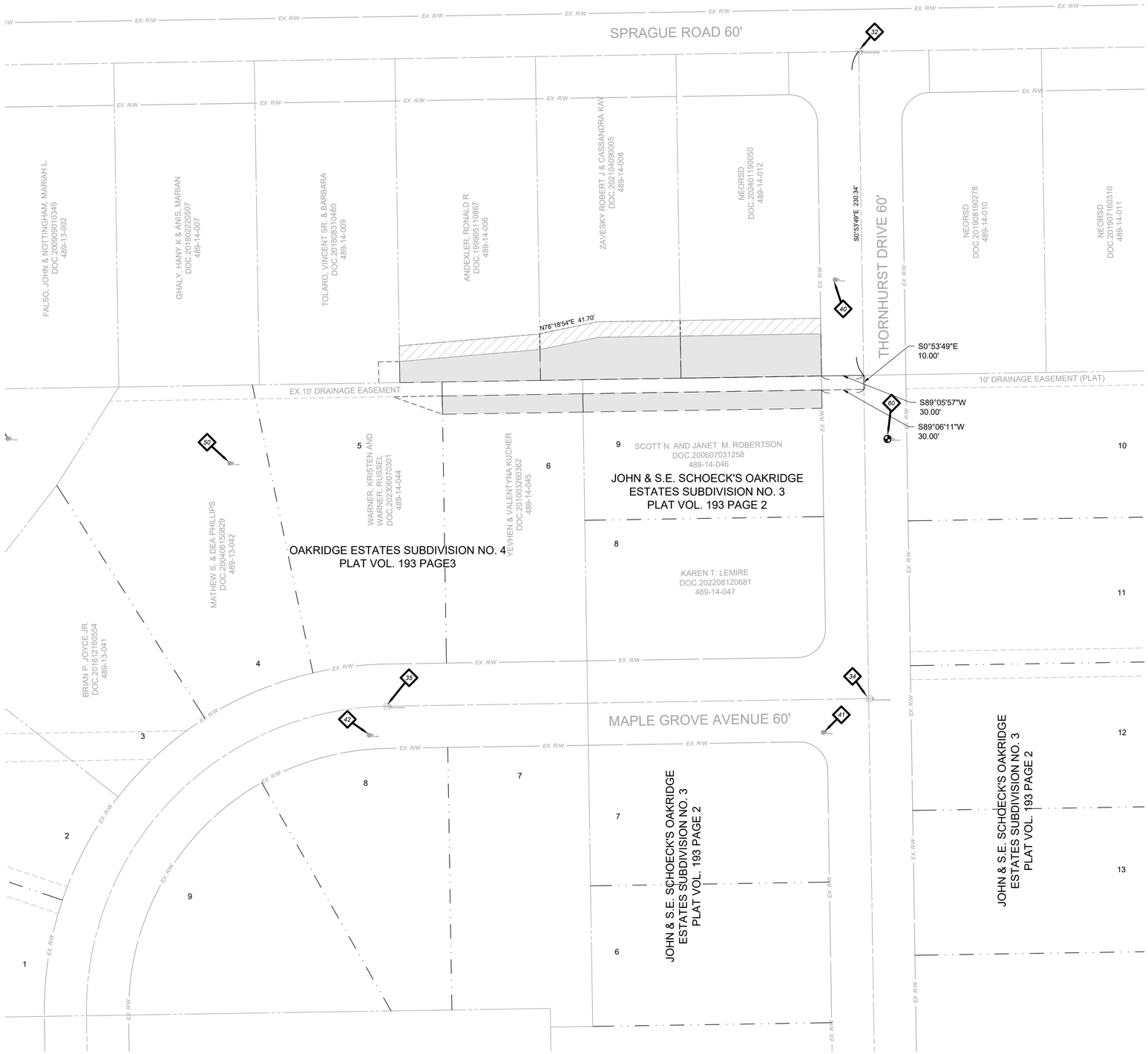
THORNHURST STREAMBANK RESTORATION
NORTH ROYALTON — CUYAHOGA COUNTY, OHIO

GENERAL NOTES

PROJECT NO. 220923
DISCIPLINE: CIVIL
SHEET NAME: GN-01
SHEET 2 OF 17

# CONTROL MAP

## STATE OF OHIO, COUNTY OF CUYAHOGA, CITY OF NORTH ROYALTON




BAR SCALE

40 20 0' 40'

SCALE: 1"= 40'

| POINT TABLE | | | | |
|---|---|---|---|---|
| POINT # | NORTHING | EASTING | ELEVATION | DESCRIPTION |
| 30 | 614559.5512 | 2182076.2823 | 0.00 | Monument Box (Fnd) |
| 31 | 614559.2725 | 2182094.1066 | 0.00 | Iron Pin (Fnd) |
| 32 | 614576.1455 | 2183167.2347 | 0.00 | Monument Box (Fnd) EMPTY MISC |
| 34 | 614115.8719 | 2183174.8607 | 0.00 | Monument Box (Fnd) EMPTY MISC |
| 35 | 614110.3394 | 2182831.5794 | 0.00 | Monument Box (Fnd) EMPTY |
| 36 | 613532.9642 | 2183183.5668 | 0.00 | Monument Box (Fnd) EMPTY MISC |
| 40 | 614413.8187 | 2183150.4678 | 0.00 | Iron Pin (Set) |
| 41 | 614091.8433 | 2183142.0928 | 0.00 | Iron Pin (Set) |
| 42 | 614089.8687 | 2182818.9941 | 0.00 | Iron Pin (Set) |
| 50 | 614283.2416 | 2182719.8182 | 0.00 | Iron Pin (Set) |
| 51 | 614300.8186 | 2182561.8778 | 0.00 | Iron Pin (Set) |
| 60 | 614300.5815 | 2183187.8126 | 1093.10 | Benchmark (Set) |

## NOTES:

1. THIS PLAN HAS BEEN PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND MAY BE SUBJECT TO EASEMENTS AND OTHER RESTRICTIONS, EITHER RECORDED OR UNRECORDED. THE SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RECORD ENCUMBRANCES, RESTRICTIVE COVENANTS OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE.
2. THESE PLANS MAY HAVE BEEN ALTERED IN SIZE BY REPRODUCTION. THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA.
3. THE PROJECT CONTROL COORDINATE SYSTEM IS BASED UPON THE FOLLOWING:
   - HORIZONTAL DATUM - PROJECT CONTROL COORDINATES FOR THIS PROJECT HAVE BEEN ESTABLISHED BY GPS/RTK OBSERVATIONS UTILIZING THE OHIO COORDINATE SYSTEM OF 1983 (ZONE 3401-OHIO NORTH). OHIO STATE PLANE GRID COORDINATE VALUES ARE EXPRESSED IN UNITS OF U.S. SURVEY FEET.
   - VERTICAL DATUM - NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
4. THE SURVEY AND STREET ALIGNMENTS SHOWN HEREON WERE OBSERVED IN THE FIELD FOR CONSTRUCTION PURPOSES ONLY AND MAY NOT BE SUITABLE FOR PROPERTY LINE SURVEYS OR OTHER PURPOSES. THE PROPERTY LINES SHOWN HEREON OUR SUBJECT TO AN ACCURATE BOUNDARY SURVEY AND ARE BASED ON FOUND MONUMENTS LOCATED IN THE FIELD BEST FIT TO THE RECORDS.
5. AN ALTA/ NSPS LAND TITLE SURVEY WAS NOT PERFORMED.
6. EASEMENTS, RECORD RESTRICTIONS AND SETBACKS WERE NOT ADDRESSED DURING THIS SURVEY.
7. ALL DIMENSIONS GIVEN ARE EXPRESSED IN US SURVEY FEET.
8. THE BENCHMARK ELEVATIONS SHOWN IN THE PROJECT CONTROL TABLE ARE AT THE TOP OF THE RED CAP OF THE IRON PIN SET.
9. IRON PINS SET ARE 5/8" IRON PINS SET WITH A RED CAP INSCRIBED WITH "CT REF"

## LEGEND:

- *CENTERLINE MONUMENT*
- *I.PIN SET*
- *I.PIN FOUND*
- *I.PIPE FOUND*
- EX. R/W — *LIMITS OF PUBLIC R/W*
- *CENTERLINE PUBLIC R/W*
- *PARCEL LINES*
- *SUBDIVISION LINES*
- *PROPOSED PERMANENT EASEMENT*
- *PROPOSED TEMPORARY EASEMENT*

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER

verdantas

| NO | REVISION | DATE |
|---|---|---|
| | | |

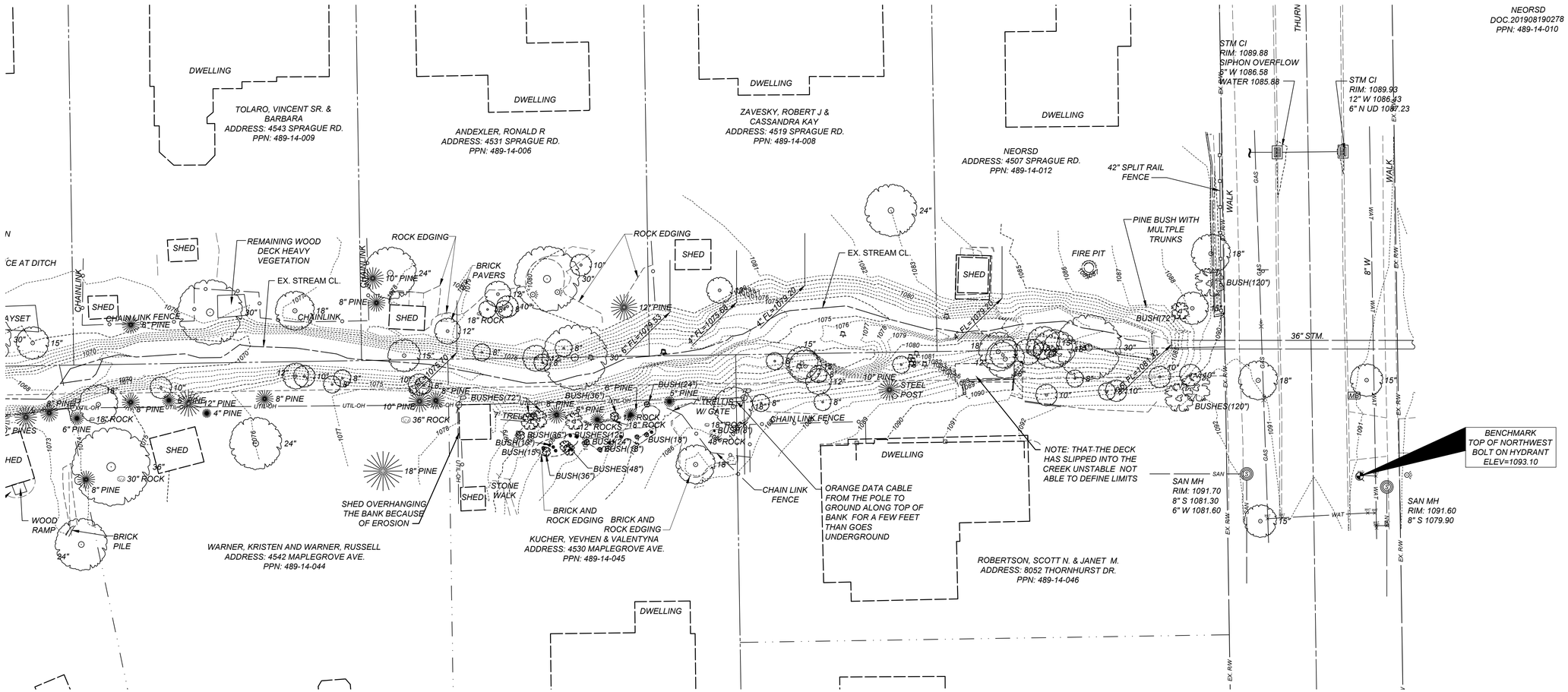
| | |
|---|---|
| ISSUED FOR: | BID |
| ISSUE DATE: | 01/23/25 |
| SCALE: | AS SHOWN |
| DESIGNED BY: | JRH/WTV |
| DRAWN BY: | WTV |
| CHECKED BY: | CR |

**THORNHURST STREAMBANK RESTORATION**

NORTH ROYALTON — CUYAHOGA COUNTY, OHIO

**SURVEY CONTROL PLAN**

| PROJECT NO. | |
|---|---|
| 220923 | |
| DISCIPLINE | |
| CIVIL | |
| SHEET NAME | |
| SC-01 | |
| SHEET | OF |
| 3 | 17 |




BAR SCALE
20' 10' 0' 20'
SCALE: 1"= 20'

## EXISTING CONDITIONS NOTES

1. THE EXISTING UNDERGROUND UTILITIES SHOWN ON THESE CONSTRUCTION PLANS WERE OBTAINED FROM VARIOUS SOURCES INCLUDING, BUT NOT LIMITED TO, FIELD OBSERVATIONS (E.G. ABOVE GROUND FEATURES, FLAGGED OR PAINTED MARKED UNDERGROUND UTILITIES) AND RECORDS MADE AVAILABLE (E.G. ORIGINAL CONSTRUCTION PLANS, AS-BUILT DRAWINGS, DISTRIBUTION AND SERVICE MAPS, GIS DATABASES, AERIAL PHOTOGRAPHY) TO CREATE A COMPOSITE DRAWING OF EXISTING CONDITIONS. ALTHOUGH GRAPHICALLY SHOWN AS ACCURATELY AS POSSIBLE FROM THE INFORMATION MADE AVAILABLE, THERE IS NO GUARANTEE OR WARRANTY, EXPRESSED OR IMPLIED, OF THE COMPLETENESS, CORRECTNESS OR ACCURACY OF SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED.
2. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE EXISTENCE AS WELL AS THE ACTUAL LOCATION, ALIGNMENT, AND ELEVATIONS OF ALL EXISTING UTILITIES WITHIN AND ADJACENT TO THE GENERAL LIMITS OF THESE IMPROVEMENTS INCLUDING WATERLINES, SANITARY AND STORM SEWERS, GAS LINES, COMMUNICATION LINES/BANKS, ELECTRIC LINES, ETC. THIS MAY REQUIRE EXPLORATORY EXCAVATIONS TO BE PERFORMED BY THE CONTRACTOR FOR WHICH HE WILL NOT BE REIMBURSED. THE CONTRACTOR SHALL NOT ASSUME EXISTING UTILITIES WERE INSTALLED AT TYPICAL OR STANDARD DEPTHS OR AT UNIFORM SLOPES, GRADES OR DEPTHS BETWEEN ACCESS POINTS (CATCH BASINS, MANHOLES, JUNCTION CHAMBERS, ETC.)
3. THE CONTRACTOR SHALL CONFIRM OR LOCATE ALL UNDERGROUND UTILITIES WITHIN EXCAVATION LIMITS, WHETHER OR NOT SHOWN ON THE CONSTRUCTION PLANS OR FIELD MARKED BY OUPS, OGPUPS OR OTHER UTILITY MARKING SERVICE. THE CONTRACTOR SHALL DOCUMENT ANY UTILITY NOT SHOWN OR DIFFERING FROM THE CONSTRUCTION PLANS, AND PROVIDE THE INFORMATION TO THE OWNER SHOWING LOCATIONS WITH MEASUREMENTS TO REFERENCE POINTS. ANY RESULTING UTILITY CONFLICTS WITH PROPOSED IMPROVEMENTS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE OWNER AND DESIGN ENGINEER.
4. THE LOCATION OF ALL ABANDONED IN-PLACE FACILITIES MAY NOT BE SHOWN ON THESE PLANS.
5. THE SURVEY AND STREET ALIGNMENTS SHOWN WERE OBSERVED IN THE FIELD FOR CONSTRUCTION PURPOSES ONLY, AND MAY NOT BE SUITABLE FOR PROPERTY LINE SURVEYS OR OTHER PURPOSES.
6. THE CONTRACTOR SHALL PRESERVE BENCHMARKS AND REFERENCE POINTS. IN CASE OF DISTURBANCE, THE CONTRACTOR SHALL REPLACE THEM AT THE CONTRACTOR'S EXPENSE, BE RESPONSIBLE FOR ANY ERRORS THAT MAY BE CAUSED BY THEIR LOSS OR DISTURBANCE, AND FURNISH A CERTIFICATION BY A REGISTERED SURVEYOR THAT THE LAND MONUMENTS HAVE BEEN RESTORED.

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER

verdantas

| NO | REVISION | DATE |
|---|---|---|
| | | |

| | |
|---|---|
| ISSUED FOR: | BID |
| ISSUE DATE: | 01/23/25 |
| SCALE: | AS SHOWN |
| DESIGNED BY: | JRH/WTV |
| DRAWN BY: | WTV |
| CHECKED BY: | CR |

# THORNHURST STREAMBANK RESTORATION

CUYAHOGA COUNTY, OHIO

NORTH ROYALTON

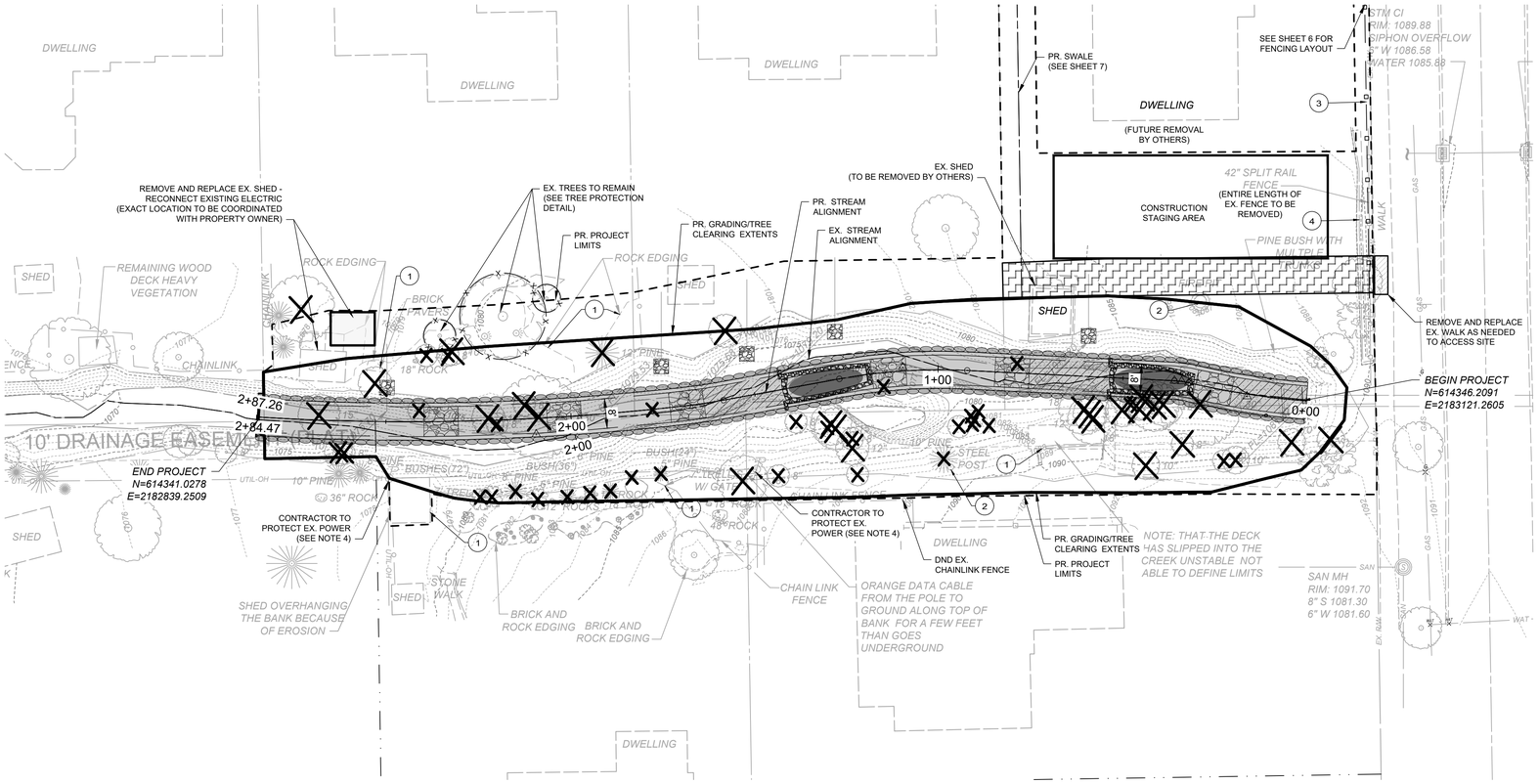
# EXISTING CONDITIONS

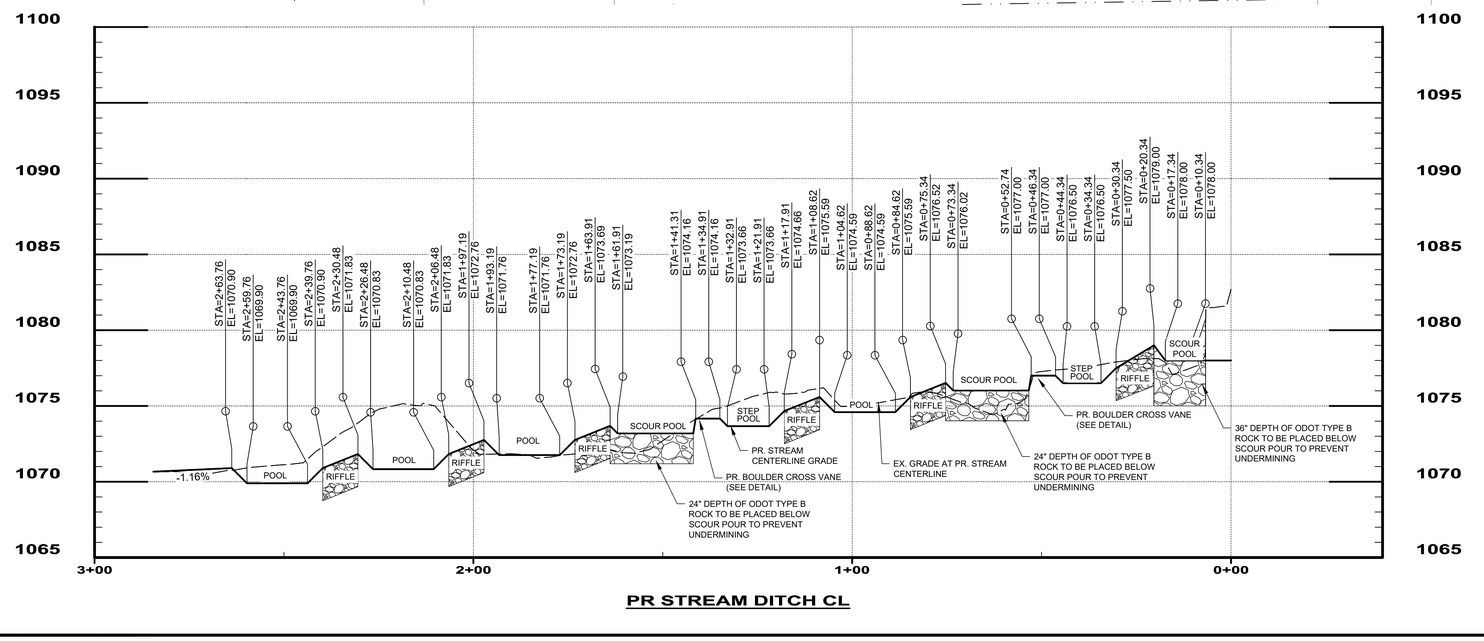
PROJECT NO.
220923

DISCIPLINE
CIVIL

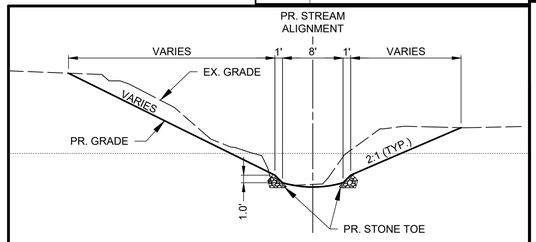
SHEET NAME
EC-01

SHEET 4 OF 17




**PR STREAM DITCH CL**




**TYPICAL STREAM BED SECTION**
(LOOKING DOWNSTREAM)

## NOTES

1. ANY EX. RESIDENTIAL STORM OUTLET PIPES FOUND SHALL BE EXTENDED TO MEET THE BANK OF THE NEW STREAM ALIGNMENT.
2. PROVIDE 4'L x 4'W x 1.5'D ODOT TYPE C RIP-RAP AT EACH RESIDENTIAL OUTLET.
3. IN AREAS OF CUT, STREAM CHANNEL FILL MATERIAL IS NOT NEEDED. IN AREAS OF FILL, FILL EXISTING STREAM CHANNEL WITH ODOT TYPE B STONE TO ELEVATION NECESSARY TO CONSTRUCT STRUCTURES AS SPECIFIED ON PROFILE.
4. CONTRACTOR TO COORDINATE WITH THE UTILITY COMPANY TO DETERMINE IF UTILITY POLES ARE TO BE RELOCATED.

## LEGEND

| | |
|---|---|
| | BOULDER |
| | PROPOSED BANKFULL CHANNEL |
| | LIVE SILTATION WITH STONE TOE |
| | SCOUR POOL |
| | STEP POOL |
| | WORK LIMITS |
| | TEMPORARY ACCESS ROAD |
| | REMOVE EX. TREE |
| 1 | CONTRACTOR TO COORDINATE WITH PROPERTY OWNER TO RELOCATE |
| 2 | TO BE REMOVED |
| 3 | PR. WOODEN SPLIT RAIL FENCE |
| 4 | REMOVE APPROX. 65 LF OF EX. RETAINING WALL AND RE-GRADE AT 3:1 SLOPE |
| | BOULDER CROSS VANE WITH STEP |

BAR SCALE
20' 10' 0' 20'
SCALE: 1"= 20'

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER

verdantas

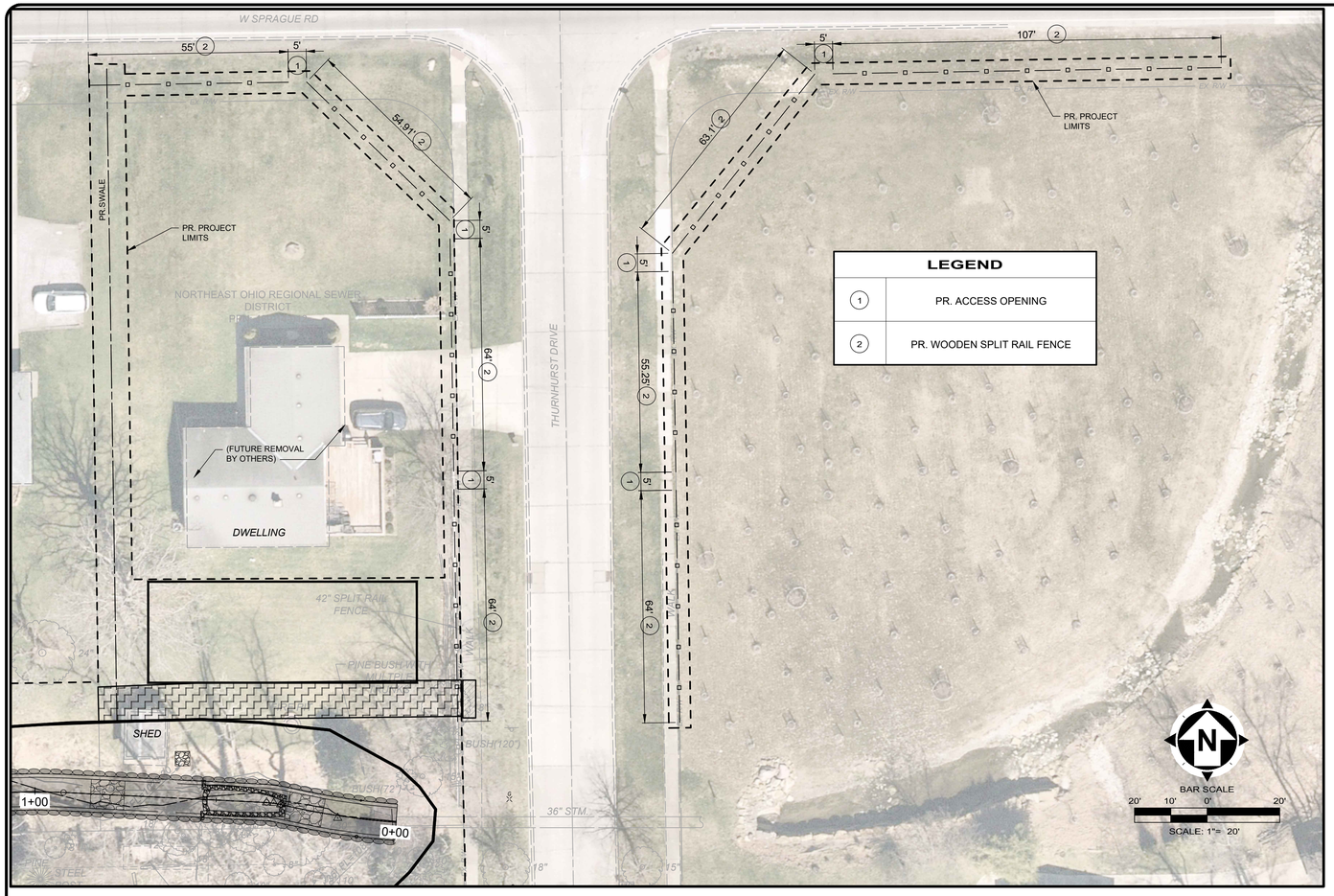
| NO | REVISION | DATE |
|---|---|---|
| | | |

| | |
|---|---|
| ISSUED FOR: | BID |
| ISSUE DATE: | 01/23/25 |
| SCALE: | AS SHOWN |
| DESIGNED BY: | JRH/WTV |
| DRAWN BY: | WTV |
| CHECKED BY: | CR |

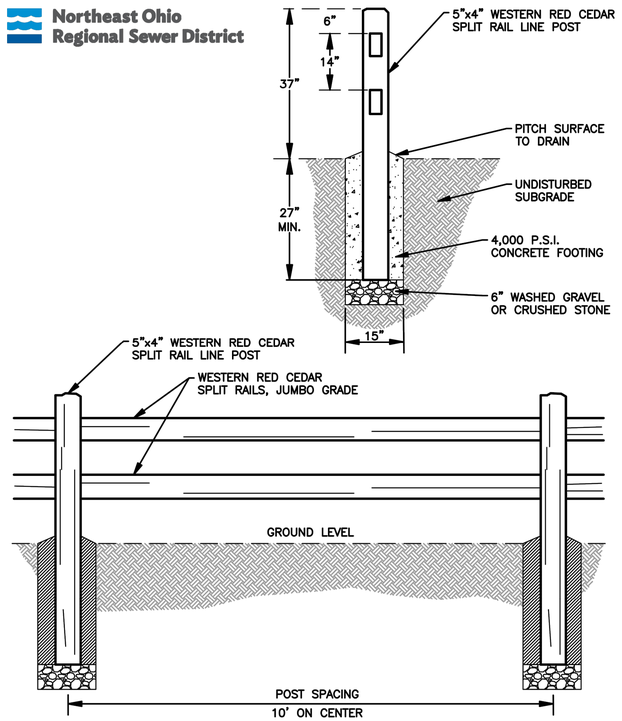
**THORNHURST STREAMBANK RESTORATION**
NORTH ROYALTON — CUYAHOGA COUNTY, OHIO

**PLAN AND PROFILE**

| | |
|---|---|
| PROJECT NO. | 220923 |
| DISCIPLINE | CIVIL |
| SHEET NAME | P&P |
| SHEET | 5 |
| OF | 17 |




Northeast Ohio Regional Sewer District




2–RAIL SPLIT RAIL FENCE
NOT TO SCALE

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER

verdantas

| NO | REVISION | DATE |
|---|---|---|

| ISSUED FOR: | BID |
|---|---|
| ISSUE DATE: | 01/23/25 |
| SCALE: | AS SHOWN |
| DESIGNED BY: | JRH/WTV |
| DRAWN BY: | WTV |
| CHECKED BY: | CR |

# THORNHURST STREAMBANK RESTORATION

NORTH ROYALTON CUYAHOGA COUNTY, OHIO

# FENCING PLAN

PROJECT NO.
220923

DISCIPLINE
CIVIL

SHEET NAME
FENCING

SHEET 6 OF 17

PR. SWALE, FIELD VERIFY SLOPE
(SEE DETAIL, THIS SHEET)

BAR SCALE
10' 5' 0' 10'
SCALE: 1"= 10'

**LEGEND**
PROPOSED PERMANENT EASEMENT

CONSTRUCTION LIMITS
GRADING/TREE CLEARING LIMITS
TEMPORARY EASEMENT LIMIT

PROVIDE 4'L x 4'W x 1.5'D ODOT TYPE C RIP-RAP AT OUTLET

PROVIDE 4'L x 4'W x 1.5'D ODOT TYPE C RIP-RAP AT OUTLET

PROVIDE 4'L x 4'W x 1.5'D ODOT TYPE C RIP-RAP AT OUTLET

6" FL=1075.70

6" FL=1073.53

6" FL=1075.68

6" FL=1079.20

6" FL=1079.20

6" FL=1081.12

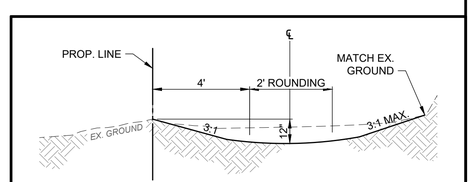
EX. 10' DRAINAGE EASEMENT

CONSTRUCTION LIMITS
GRADING/TREE CLEARING LIMITS
PERMANENT EASEMENT LIMIT

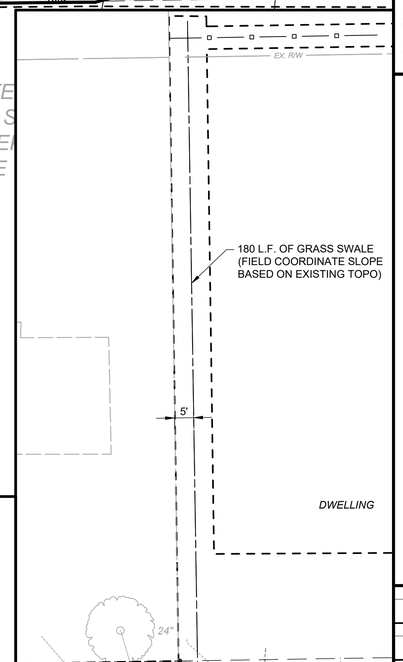
DWELLING
SHED
CHAINLINK
7' TRELLIS
CHAIN LINK FENCE
STONE WALK
SHED
CHAIN LINK FENCE
HED OVERHANGING
NOTE HAS S CREE ABLE

## GRADING NOTES

1. ALL EXCAVATION IS CONSIDERED UNCLASSIFIED AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEANS, METHODS AND MATERIALS OF CONSTRUCTION. THE DESIGN ENGINEER SHALL NOT BE RESPONSIBLE FOR THE SUITABILITY OF MATERIAL UNDERLYING THE PROJECT SITE. THE CONTRACTOR SHALL PERFORM INVESTIGATIONS OR TESTING NECESSARY TO ADEQUATELY DETERMINE OR ESTIMATE TO HIS SATISFACTION ANY EXISTING SITE CONDITION WHICH COULD AFFECT HIS BID OR THE PERFORMANCE OF THE PROPOSED IMPROVEMENTS. THIS COULD INCLUDE, BUT NOT BE LIMITED TO, UNSUITABLE OR UNSTABLE SOIL/SUBSURFACE CONDITIONS, ROCK, WATER (PERCHED OR FREE), SPRINGS, OBSTRUCTIONS, ETC.
2. THE CONTRACTOR SHALL PROTECT STRUCTURES, UTILITIES, PAVEMENTS AND OTHER FACILITIES TO REMAIN FROM DAMAGE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUT, AND OTHER HAZARDS CREATED BY EARTH MOVING OPERATIONS.
3. NO SLAG, RIVER GRAVEL, RECYCLED PORTLAND CEMENT CONCRETE (RPCC), RECLAIMED ASPHALT CONCRETE PAVEMENT (RACP) OR RECLAIMED BITUMINOUS AGGREGATE BASE (RBAB) SHALL BE USED AS FILL OR EMBANKMENT.
4. PROPOSED CONTOUR LINES ARE SHOWN NEAR EXISTING TREES. CONTRACTOR TO FIELD VERIFY BEST METHOD TO ACHIEVE PROPOSED GRADES WHILE PROTECTING TREES.
5. IF THE GRADE AROUND THE TREE WILL BE LOWERED, MOVE OUT FROM THE TRUNK AS FAR AS POSSIBLE (BEYOND THE DRIP LINE IS DESIRABLE), AND REMOVE THE SOIL WITH HAND TOOLS.
6. CONTRACTOR TO COORDINATE WITH EXISTING UTILITY POLE OWNERS TO SECURE POLES DURING EARTHMOVING ACTIVITIES.




**SWALE DETAIL**
SCALE: NONE




**ENLARGED SWALE DETAIL**
SCALE: NONE

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER

verdantas

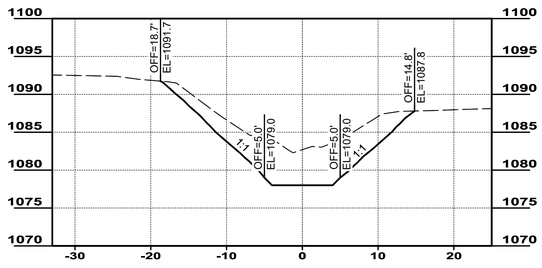
| NO | REVISION | DATE |
|---|---|---|
| | | |

| | |
|---|---|
| ISSUED FOR: | BID |
| ISSUE DATE: | 01/23/25 |
| SCALE: | AS SHOWN |
| DESIGNED BY: | JRH/WTV |
| DRAWN BY: | WTV |
| CHECKED BY: | CR |

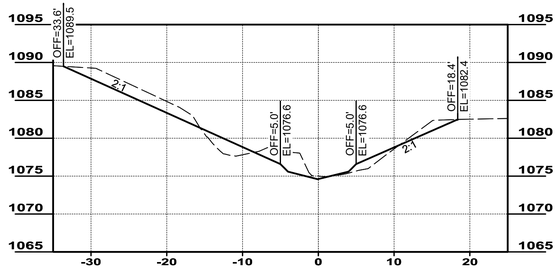
**THORNHURST STREAMBANK RESTORATION**
NORTH ROYALTON — CUYAHOGA COUNTY, OHIO

**PROPOSED GRADING & SECTION VIEWS**

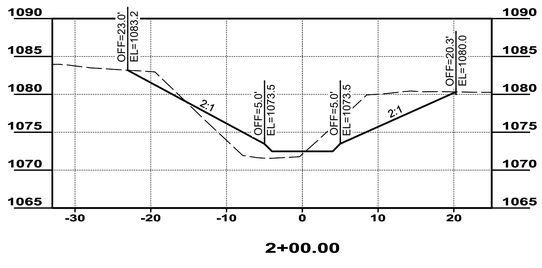
| PROJECT NO. | |
|---|---|
| 220923 | |
| DISCIPLINE | |
| CIVIL | |
| SHEET NAME | |
| GRDNG PLN | |
| SHEET | OF |
| 7 | 17 |



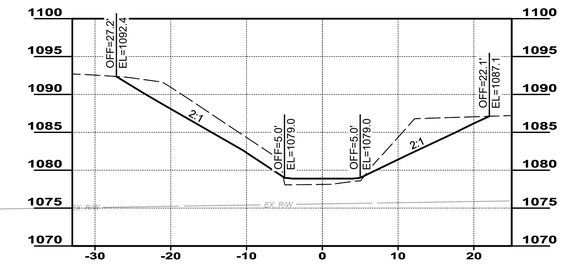

0+00.00



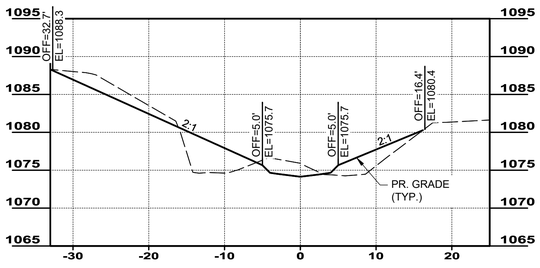

1+00.00



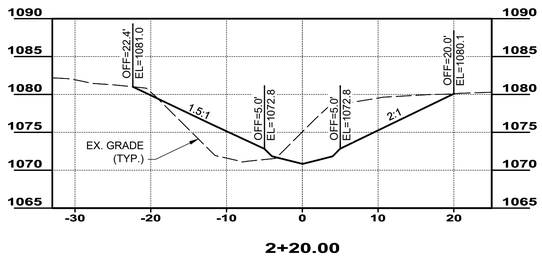

2+00.00



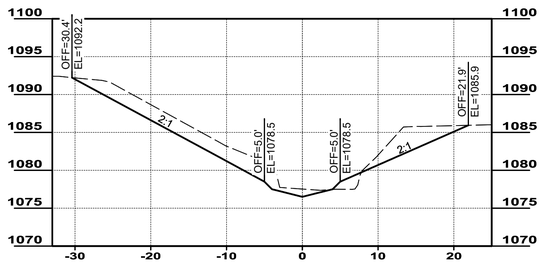

0+20.00



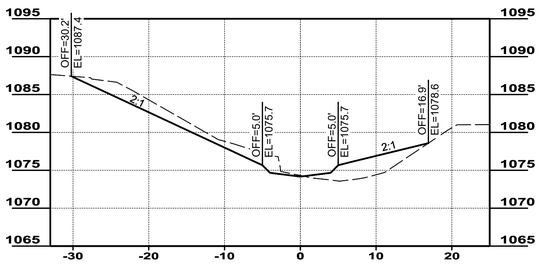

1+20.00



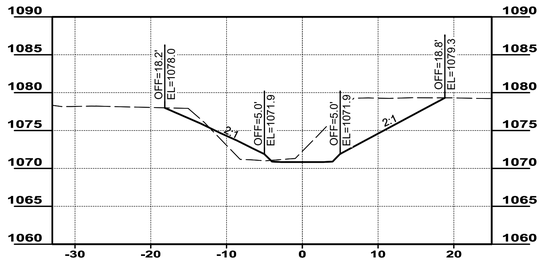

2+20.00



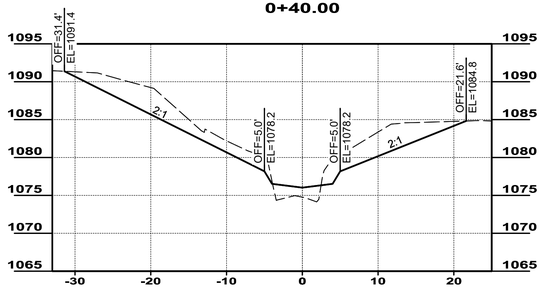

0+40.00



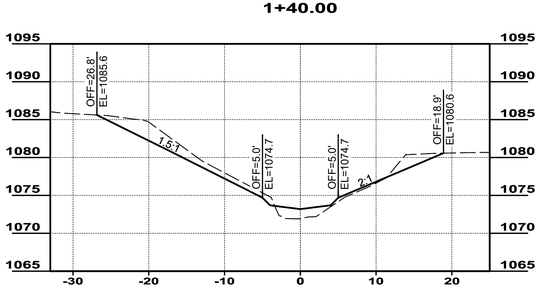

1+40.00



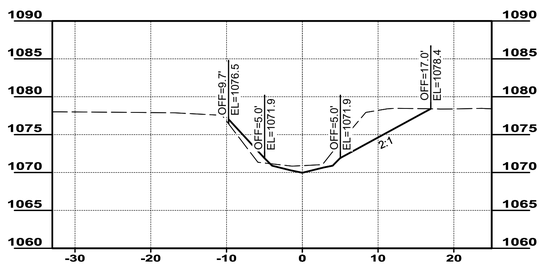

2+40.00



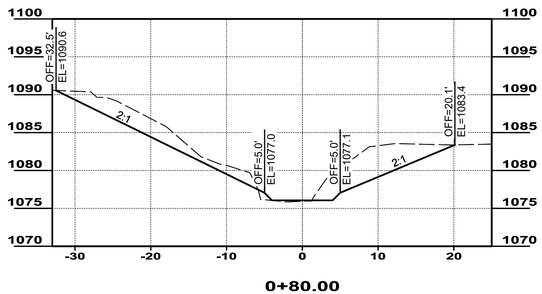

0+60.00



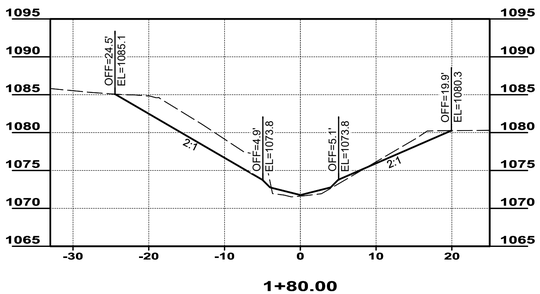

1+60.00




2+60.00




0+80.00




1+80.00

## STREAM CROSSING SECTIONS
## STA 0+00 TO 2+60

SCALE: 1" = 10' (H) / 1" = 5' (V)


STATE OF OHIO
WILLIAM
T. VASKO
E-86752
REGISTERED
PROFESSIONAL ENGINEER

verdantas


| NO | REVISION | DATE |
|---|---|---|

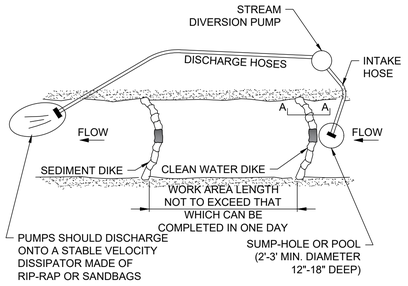
| | |
|---|---|
| ISSUED FOR: | BID |
| ISSUE DATE: | 01/23/25 |
| SCALE: | AS SHOWN |
| DESIGNED BY: | JRH/WTV |
| DRAWN BY: | WTV |
| CHECKED BY: | CR |

**THORNHURST STREAMBANK RESTORATION**

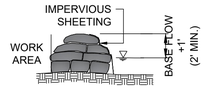
NORTH ROYALTON — CUYAHOGA COUNTY, OHIO

**STREAM CROSS SECTIONS**

| PROJECT NO. | |
|---|---|
| 220923 | |
| DISCIPLINE | |
| CIVIL | |
| SHEET NAME | |
| SECTIONS | |
| SHEET | OF |
| 8 | 17 |




PLAN VIEW



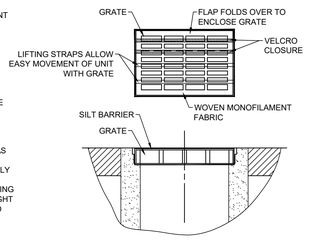

SECTION A-A

## PUMP AROUND DIVERSION

**NOT TO SCALE**

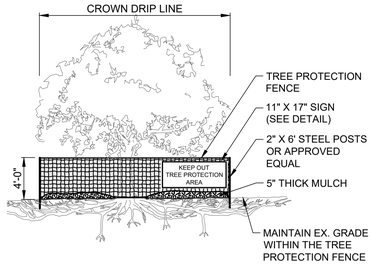
NOTES:

1. GEOTEXTILE SHALL HAVE AN EQUIVALENT OPENING OF 20-40 SIEVE AND BE RESISTANT TO SUNLIGHT.
2. MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM SURFACE AND VICINITY OF UNIT AFTER EACH STORM EVENT. REMOVE SEDIMENT THAT HAS ACCUMULATED WITHIN THE CONTAINMENT AREA OF THE SILT BARRIER AS NEEDED.
3. TO INSTALL CATCH BASIN INLET SILT BARRIER: THE EMPTY SILT BARRIER SHOULD BE PLACED OVER THE GRATE AS THE GRATE STANDS ON END. TUCK THE ENCLOSURE FLAP INSIDE TO COMPLETELY ENCLOSE THE GRATE. HOLDING THE LIFTING DEVICES (DO NOT RELY ON LIFTING DEVICES TO SUPPORT THE ENTIRE WEIGHT OF THE GRATE). PLACE THE GRATE INTO ITS FRAME.




## INLET PROTECTION FOR CATCH BASIN IN ROADWAY

SCALE: NONE




NOTES:

1) TREE PROTECTION FENCE MUST BE INSTALLED PRIOR TO BEGINNING CLEARING OPERATIONS.
2) FENCE TO REMAIN AROUND TREE PROTECTION AREAS UNTIL FINAL GRADING HAS BEEN COMPLETED.
3) FENCE MUST BE PLACED BEYOND THE DRIP LINE OR CANOPY OF TREES.
4) FENCE SHALL BE ORANGE COLOR, HIGH DENSITY POLYETHYLENE FENCING WITH 3.5" X 1.5" OPENINGS.
5) STEEL POSTS SHALL BE INSTALLED AT 8' O.C. MIN.
6) SIGN SHALL BE LAMINATED IN PLASTIC AND SPACED EVERY 50' ALONG THE FENCE.
7) NO EQUIPMENT SHALL OPERATE INSIDE THE PROTECTIVE FENCING, INCLUDING DURING FENCE INSTALLATION AND REMOVAL.
8) IF ANY CLEARING IS REQUIRED AROUND SPECIMEN TREES, CUT WITH HAND HELD TOOLS AND DO NOT GRUB OR PULL OUT. NO PRUNING SHALL BE PERFORMED EXCEPT BY AN APPROVED ARBORIST.

## TREE PROTECTION DETAIL

SCALE: NONE

NOTES:

1. THE SEED BED SHALL BE PULVERIZED AND LOOSE TO ENSURE THE SUCCESS OF ESTABLISHING VEGETATION.
2. SOIL AMENDMENTS MAY BE REQUIRED TO ESTABLISH VEGETATION. PERFORM SOIL TESTS TO PREDICT THE NEED FOR LIME OR FERTILIZER. IN LIEU OF A SOIL TEST, APPLY LIME AT 2 TONS/AC. OR FERTILIZER AT 500 LB/AC. OF 10-10-10 OR 12-12-12 ANALYSIS
3. APPLY SEED UNIFORMLY. COVER BROADCASTED SEED BY RAKING OR DRAGGING, AND LIGHTLY TAMPING INTO PLACE.
4. MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING.
5. INSPECT FOR SOIL EROSION OR VEGETATION LOSS AND REPAIR BARE OR SPARSE AREAS, FILL GULLIES, RE-FERTILIZE, RE-SEED AND RE-MULCH AS NEEDED.

| TEMPORARY SEEDING SPECIES SELECTION | | | |
|---|---|---|---|
| DATES | SPECIES | LB/1,000 SF | LB/AC. |
| MARCH 1 - AUGUST 15 | OATS<br>TALL FESCUE<br>PERENNIAL RYEGRASS | 3<br>1<br>1 | 128<br>40<br>40 |
| | PERENNIAL RYEGRASS<br>TALL FESCUE | 2<br>1 | 40<br>40 |
| AUGUST 16 - OCTOBER 31 | RYE<br>TALL FESCUE<br>PERENNIAL RYEGRASS | 3<br>1<br>1 | 112<br>40<br>40 |
| | WHEAT<br>TALL FESCUE<br>PERENNIAL RYEGRASS | 3<br>1<br>1 | 120<br>40<br>40 |
| | PERENNIAL RYEGRASS<br>TALL FESCUE | 2<br>1 | 40<br>40 |
| NOVEMBER 1 - FEBRUARY 28 | ONLY MULCH OR DORMANT SEEDING. | | |

## TEMPORARY SEEDING DETAIL

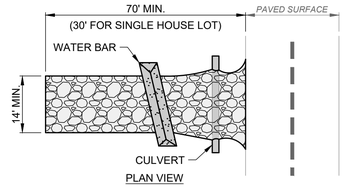
NOTES:

1. SUBSOILING SHALL OCCUR WHEN SOIL MOISTURE IS LOW ENOUGH TO ALLOW THE SOIL TO CRACK OR FRACTURE. SUBSOILING IS NOT PERMITTED ON SLIP-PRONE AREAS.
2. THE SEED BED SHALL BE PREPARED BY APPLYING AGRICULTURAL GROUND LIMESTONE OR FERTILIZER AS RECOMMENDED BY A SOIL TEST. IN LIEU OF A SOIL TEST, APPLY LIME AT 2 TONS/AC. OR FERTILIZER AT 500 LB/AC. OF 10-10-10 OR 12-12-12 ANALYSIS. LIME AND FERTILIZER SHALL BE WORKED INTO THE SOIL TO A DEPTH OF 3".
3. APPLY SEED UNIFORMLY ON FIRM, MOIST SEED BED BETWEEN MARCH 1 AND MAY 31 OR AUGUST 1 AND SEPTEMBER 30. TILLAGE FOR SEEDBED PREPARATION SHALL OCCUR WHEN THE SOIL IS DRY ENOUGH TO CRUMBLE AND NOT FORM RIBBONS WHEN COMPRESSED BY HAND. SEEDING SHOULD NOT BE APPLIED BETWEEN OCTOBER 1 AND NOVEMBER 20 BECAUSE SEEDS MAY GERMINATE, BUT WILL NOT SURVIVE THE WINTER. IF SEEDING MUST OCCUR, INCREASE THE SEEDING RATE BY 50% AND ANCHOR. APPLY ADDITIONAL MULCH AND IRRIGATION AS REQUIRED TO ENSURE GERMINATION.
4. COIR COCONUT MATTING SHALL BE USED ON SLOPES STEEPER THAN 3:1.
5. SEEDING SHALL INCLUDE IRRIGATION TO ESTABLISH VEGETATION DURING DRY OR HOT WEATHER OR ON ADVERSE SITE CONDITIONS.
6. SEEDING SHALL NOT BE CONSIDERED ESTABLISHED FOR AT LEAST 1 FULL YEAR FROM THE TIME OF SEEDING. DURING THIS PERIOD INSPECT FOR SOIL EROSION OR VEGETATION LOSS AND REPAIR BARE OR SPARSE AREAS, FILL GULLIES, RE-FERTILIZE, RE-SEED AND RE-MULCH AS NEEDED.
7. ADEQUATE PERMANENT VEGETATION SHALL BE GROUND COVER DENSE ENOUGH TO COVER 80% OF THE SOIL SURFACE BASED ON VISUAL INSPECTION.

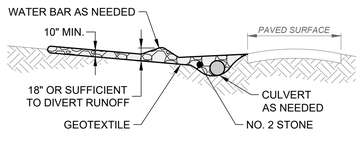
| PERMANENT SEEDING FERTILIZATION AND MOWING CHART | | | | |
|---|---|---|---|---|
| MIXTURE | FORMULA | LB/ AC. | TIME | MOW |
| CREEPING RED FESCUE<br>DOMESTIC RYEGRASS<br>KENTUCKY BLUEGRASS | 10-10-10 | 500 | FALL, YEARLY, OR AS NEEDED | ≥3" |
| TALL FESCUE | 10-10-10 | 500 | | ≥4" |
| TURF-TYPE FESCUE | 10-10-10 | 500 | | |
| CROWN VETCH FESCUE | 0-20-20 | 400 | SPRING, AND YEARLY AFTER ESTABLISHED | DO NOT MOW |
| FLAT PEA FESCUE | 0-20-20 | 400 | | |

| PERMANENT SEEDING SPECIES SELECTION | | |
|---|---|---|
| SEED MIX | SEED RATE LB/AC. | NOTES: |
| GENERAL USE | | |
| CREEPING RED FESCUE<br>DOMESTIC RYEGRASS<br>KENTUCKY BLUEGRASS | 20 - 40<br>10 - 20<br>20 - 40 | FOR CLOSE MOWING AND WATERWAYS WITH ≤2.0 FT./SEC. VELOCITY |
| TALL FESCUE | 40 - 50 | |
| TURF-TYPE FESCUE | 90 | |
| STEEP BANKS OR CUT SLOPES | | |
| TALL FESCUE | 40 - 50 | |
| CROWN VETCH<br>TALL FESCUE | 10 - 20<br>20 - 30 | DO NOT SEED LATER THAN AUGUST |
| FLAT PEA<br>TALL FESCUE | 20 - 25<br>20 - 30 | DO NOT SEED LATER THAN AUGUST |
| ROAD DITCHES AND SWALES | | |
| TALL FESCUE | 40 - 50 | |
| TURF-TYPE FESCUE<br>KENTUCKY BLUEGRASS | 90<br>5 | |
| LAWN | | |
| KENTUCKY BLUEGRASS<br>PERENNIAL RYEGRASS | 100 - 120<br>100 - 120 | |
| KENTUCKY BLUEGRASS<br>CREEPING RED FESCUE | 100 - 120<br>100 - 120 | FOR SHADED AREAS |

## PERMANENT SEEDING DETAIL




PLAN VIEW




PROFILE

NOTES:

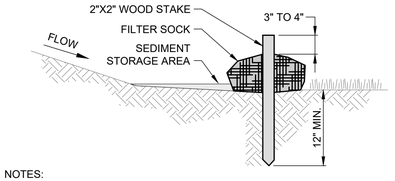
1. GEOTEXTILE SHALL BE COMPOSED OF STRONG ROT-PROOF POLYMERIC FIBERS MEETING THE FOLLOWING:

| | |
|---|---|
| TENSILE STRENGTH | 200 LB |
| PUNCTURE STRENGTH | 80 PSI |
| TEAR STRENGTH | 50 LB |
| BURST STRENGTH | 320 PSI |
| ELONGATION | 20% |
| EQUIVALENT OPENING SIZE | < 0.6 MM |
| PERMITTIVITY | 0.001 CM/SEC. |

2. INSTALL WATER BAR, AS NEEDED, TO PREVENT SURFACE RUNOFF FROM FLOWING OUT ONTO PAVEMENT.
3. APPLY ADDITIONAL STONE AS CONDITIONS DEMAND, REPLENISH STONE WHEN THE DEPTH IS LESS THAN 6", AND REPLACE IF STONES BECOMES MUD-LADEN.
4. IMMEDIATELY REMOVE MUD DROPPED, WASHED OR TRACKED ONTO ROADS OR ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS BY SCRAPING OR SWEEPING.
5. CONSTRUCTION ENTRANCE SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES OR PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE SITE SHALL BE RESTRICTED FROM MUDDY AREAS.
6. CONSTRUCTION ENTRANCE SHALL REMAIN UNTIL THE DISTURBED AREA IS STABILIZED OR REPLACED WITH A PERMANENT ROADWAY.

## CONSTRUCTION ENTRANCE DETAIL

SCALE: NONE




NOTES:

1. FILTER SOCKS SHALL BE 3 OR 5 MIL CONTINUOUS, TUBULAR, HDPE 3/8" KNITTED MESH NETTING MATERIAL, FILLED WITH COMPOST.
2. COMPOST SHALL BE WEED, PATHOGEN AND INSECT FREE, FREE OF ANY REFUSE, CONTAMINANTS OR OTHER MATERIALS TOXIC TO PLANT GROWTH, BE DERIVED FROM A WELL-DECOMPOSED SOURCE OF ORGANIC MATTER, AND CONSIST OF PARTICLES RANGING FROM 3/8" TO 2".
3. FILTER SOCKS SHALL BE PLACED ON A LEVEL LINE ACROSS SLOPES PARALLEL TO THE BASE OF THE SLOPE. ON SLOPES APPROACHING 2:1, ADDITIONAL SOCKS SHALL BE PROVIDED AT THE TOP AND MID-SLOPE.
4. FILTER SOCKS SHALL BE PLACED AT LEAST 5' FROM THE TOE OF SLOPE FOR SEDIMENT DEPOSIT.
5. BUILT UP SEDIMENT SHALL BE REMOVED WHEN IT HAS REACHED 1/3 THE FILTER SOCK HEIGHT.
6. WHEN A FILTER SOCK IS NO LONGER REQUIRED, IT SHALL BE DISPERSED ON-SITE.
7. THE MAXIMUM DRAINAGE AREA PER 100 FEET OF FILTER SOCK IS 1/2 ACRE AND IS DEPENDENT ON THE SLOPE FOLLOWING THE GUIDANCE CHART BELOW:

| MAX. SLOPE LENGTH ABOVE FILTER SOCK | | | | | |
|---|---|---|---|---|---|
| SLOPE | RATIO (H:V) | 8" | 12" | 18" | 24" |
| 0% - 2% | 0 - 50:1 | 125' | 250' | 300' | 350' |
| 2% - 10% | 50:1 - 10:1 | 100' | 125' | 200' | 250' |
| 10% - 20% | 10:1 - 5:1 | 75' | 100' | 150' | 200' |
| 20% - 50% | 5:1 - 2:1 | N/A | 50' | 75' | 100' |
| ≥ 50% | ≥ 2:1 | N/A | 25' | 50' | 75' |

## FILTER SOCK DETAIL

SCALE: NONE

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER

verdantas

| NO | REVISION | DATE |
|---|---|---|
| | | |

ISSUED FOR: BID
ISSUE DATE: 01/23/25
SCALE: AS SHOWN
DESIGNED BY: JRH/WTV
DRAWN BY: WTV
CHECKED BY: CR

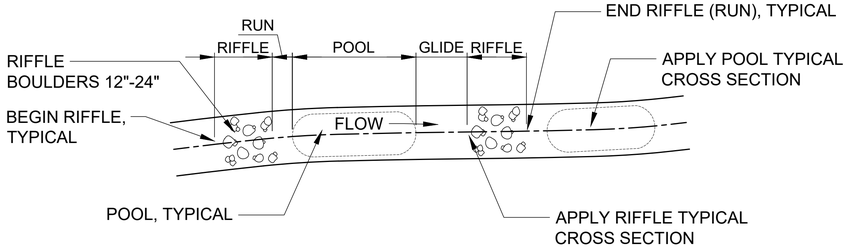
# THORNHURST STREAMBANK RESTORATION

NORTH ROYALTON — CUYAHOGA COUNTY, OHIO

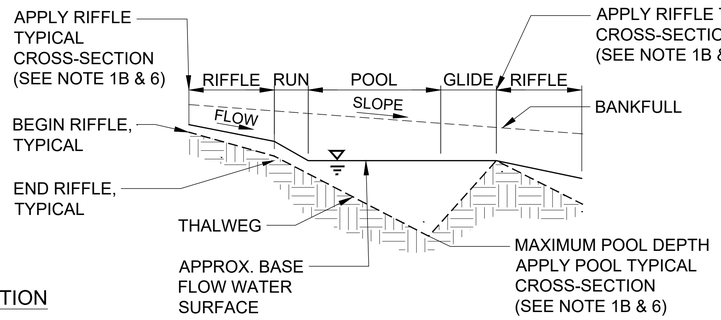
# CONSTRUCTION DETAILS

PROJECT NO. 220923
DISCIPLINE CIVIL
SHEET NAME D-01
SHEET 9 OF 17

HIGH GRADIENT STREAM TYPE




PLAN VIEW




SECTION

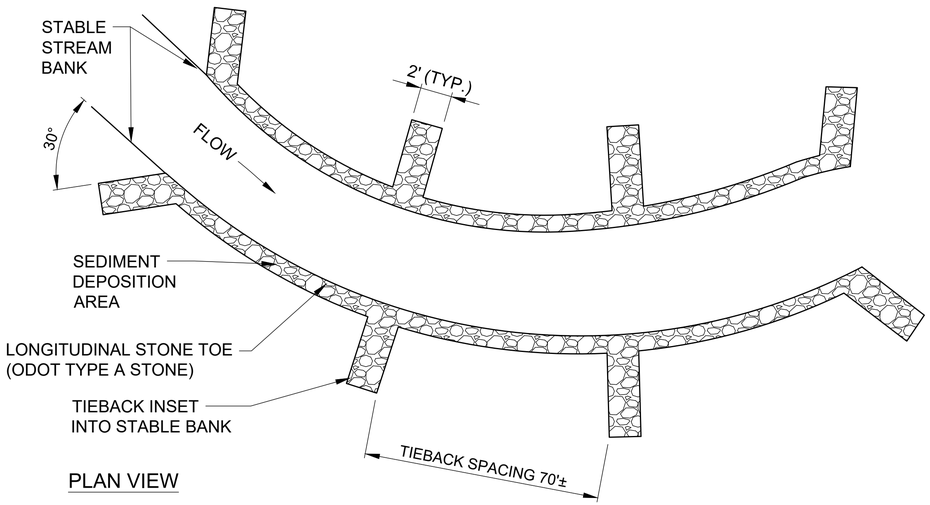
| ABBREVIATIONS (SEE NOTES 2 AND 3) | |
|---|---|
| ABBREVIATION | DESCRIPTION |
| R | RIFFLE CONTROL POINT |
| P | MAXIMUM POOL DEPTH |
| N | RUN CONTROL POINT |
| PC | POINT OF CURVATURE |
| PT | POINT OF TANGENCY |
| PI | POINT OF INTERSECTION |

NOTES:

1. THE RIFFLE–TO–POOL TRANSITION DETAIL IS A SCHEMATIC (GENERALIZED) DRAWING OF:
   A. THE RELATIONSHIP BETWEEN THE STREAM CHANNEL HORIZONTAL ALIGNMENT (MEANDER GEOMETRY) AND VERTICAL ALIGNMENT (PROFILE).
   B. THE PLACEMENT OF THE POOL AND RIFFLE TYPICAL CROSS SECTIONS WITH RESPECT TO THE STREAM CHANNEL HORIZONTAL ALIGNMENTS (MEANDER GEOMETRY) AND VERTICAL ALIGNMENT (PROFILE).
2. THE VERTICAL CONTROL POINTS SHOWN ARE THE ELEVATIONS USED TO ESTABLISH THE VERTICAL ALIGNMENT (PROFILE). THEY INCLUDE:
   A. R – RIFFLE CONTROL POINTS
      (1) HEAD OF (BEGIN) RIFFLE
      (2) TAIL OF (END) RIFFLE
   B. P – MAXIMUM POOL DEPTH
3. THE HORIZONTAL CONTROL POINTS SHOWN ARE THE BEGINNING AND ENDING LOCATIONS OF THE STRAIGHT SEGMENTS AND CURVES USED TO ESTABLISH THE HORIZONTAL ALIGNMENT (MEANDER GEOMETRY). THEY INCLUDE:
   A. HIGH–GRADIENT STREAM GEOMETRY (RELATIVELY STRAIGHT ROSGEN B–STREAM TYPES) INCLUDES PC'S AND PT'S AS DESCRIBED ABOVE AND ALSO:
      (1) PI – POINT OF INTERSECTION – TRANSITION BETWEEN STRAIGHT SEGMENTS WITH LITTLE CHANGE IN DIRECTION (BEARING)
4. CONSTRUCTION OF THE CHANNEL (ALIGNMENT, PROFILE AND CROSS SECTION) SHALL BE DONE IN A MANNER TO CREATE SMOOTH TRANSITIONS BETWEEN THE CONTROL POINTS AND TYPICAL RIFFLE AND POOL CROSS SECTIONS.
5. THE DESIGNER SHALL SPECIFY HORIZONTAL AND VERTICAL TOLERANCES FOR ALL CONTROL POINTS. REGARDLESS, THE DOWNSTREAM HEAD OF (BEGIN) RIFFLE ELEVATION SHALL NOT EXCEED THE UPSTREAM TAIL OF (END) RIFFLE ELEVATION (CREATING AN ADVERSE BANKFULL SLOPE).
6. THE RIFFLE TYPICAL CROSS SECTION SHALL BE APPLIED IN STRAIGHT (TANGENT) SEGMENTS. THE POOL TYPICAL CROSS SECTION SHALL BE APPLIED IN CURVES (MEANDER BENDS). THE STREAM CROSS SECTION SHALL SMOOTHLY TRANSITION DIMENSIONS FROM THE UPSTREAM RIFFLE TYPICAL CROSS SECTION TO THE NEXT (DOWNSTREAM) POOL TYPICAL CROSS SECTION TO THE NEXT (DOWNSTREAM) RIFFLE TYPICAL CROSS SECTION, ETC.
7. IF SITE CONDITIONS (E.G. – BEDROCK, LARGE TREES, ETC.) DO NOT ALLOW FOR CONSTRUCTION OF THE FULL RIFFLE OR POOL TYPICAL CROSS SECTION AND/OR SMOOTH TRANSITIONS BETWEEN TYPICAL SECTIONS, THE TYPICAL SECTION AND/OR TRANSITION SHALL BE ADJUSTED TO INCORPORATE THE NATURAL VARIATION. THE DESIGNER SHALL BE NOTIFIED OF SUCH SITE CONDITIONS AND DETERMINE THE APPROPRIATE MEANS OF ADJUSTMENT/INCORPORATION.

## RIFFLE TO POOL DETAIL

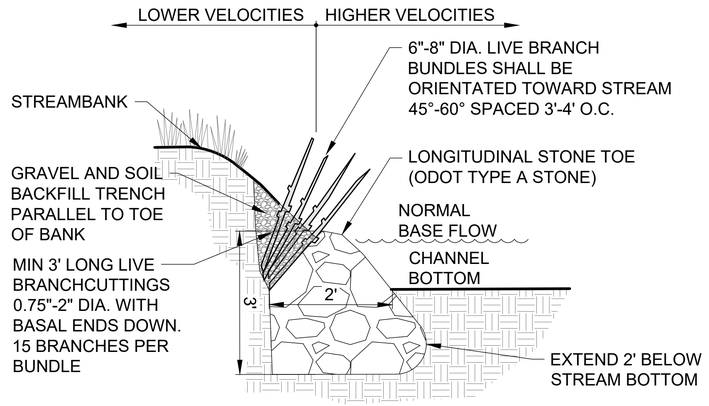
SCALE: NONE




PLAN VIEW

## LONGITUDINAL STONE TOE DETAIL

SCALE: NONE




NOTE: THE MATERIAL SHALL BE AT LEAST TWO YEARS OLD AND FREE OF DISEASE, ROT, OR INSECT INFESTATION. MATERIAL SHALL BE HARVESTED WHILE DORMANT AND SOAKED BEFORE INSTALLATION.
ENOUGH BRANCHES SHALL BE USED TO FORM A CONTINUOUS LINEAR BRANCH WALL PARALLEL TO STREAM WITH MINIMAL GAPS. LIVE BRANCH BUNDLES SHALL BE FAST GROWING SHRUBS AND TREES SUCH AS WILLOWS, DOGWOODS, BUTTONBUSH ETC..

## LIVE SILTATION WITH STONE TOE DETAIL

SCALE: NONE


STATE OF OHIO
WILLIAM T. VASKO
E–86752
REGISTERED PROFESSIONAL ENGINEER
verdantas

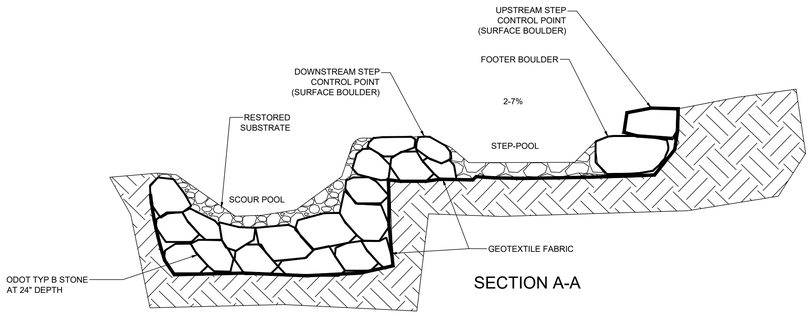

| NO | REVISION | DATE |
|---|---|---|

| | |
|---|---|
| ISSUED FOR: | BID |
| ISSUE DATE: | 01/23/25 |
| SCALE: | AS SHOWN |
| DESIGNED BY: | JRH/WTV |
| DRAWN BY: | WTV |
| CHECKED BY: | CR |

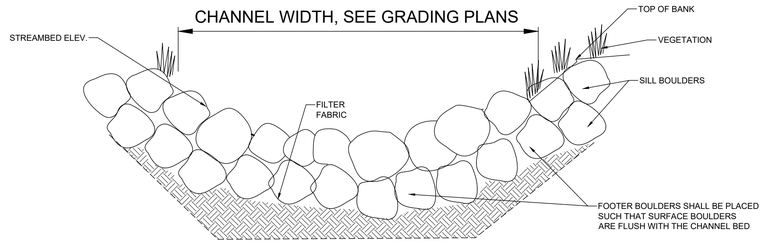
THORNHURST STREAMBANK RESTORATION
CUYAHOGA COUNTY, OHIO
NORTH ROYALTON

CONSTRUCTION DETAILS

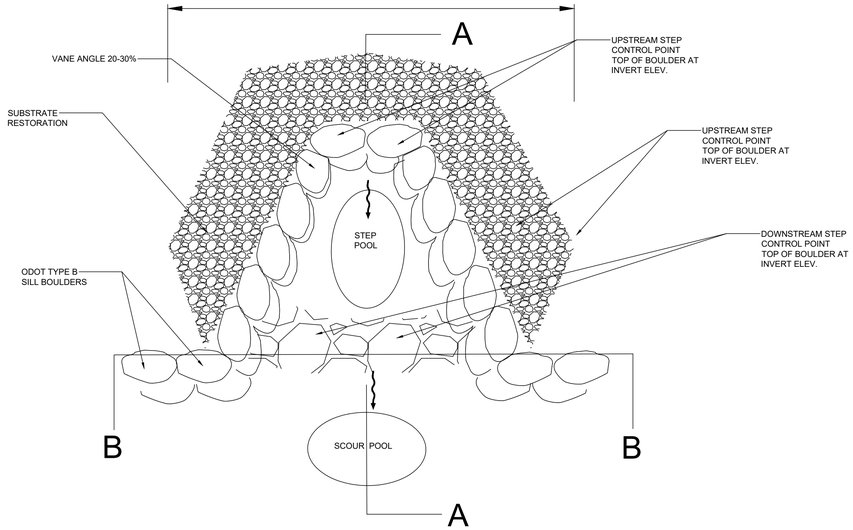
PROJECT NO. 220923
DISCIPLINE CIVIL
SHEET NAME D-02
SHEET 10 OF 17




SECTION A-A




SECTION B-B




## BOULDER CROSS VANE WITH STEP

SCALE: NONE

NOTES:

1. BOULDER CROSS VANES WITH STEPS ARE HYDRAULIC AND GRADE CONTROL MEASURES THAT ARE USED TO DIRECT FLOW AWAY FROM THE CHANNEL BANK, CONCENTRATE FLOWS INTO THE CENTER OF THE CHANNEL, AND ENHANCE HABITAT. THE ADDITION OF A STEP HELPS REDUCE THE ELEVATION DROP ACROSS THE STRUCTURE, THEREBY DISSIPATING ENERGY AND PROMOTING PASSAGE BY AQUATIC ORGANISMS.
2. BOULDERS PRESENT IN THE EXISTING STREAM MEETING THE SPECIFIED TYPE AND SIZE SHOULD BE USED IN THE RESTORED CHANNEL SEGMENT.
3. THE WEIR AND THE STEP OF THE BOULDER CROSS VANE WITH STEP ARE TYPICALLY LOCATED IN THE CENTER THIRD OF THE STREAM CHANNEL. UNLESS THE STRUCTURE IS DESIGNED WITH OFF-SET VANES TO CONFORM TO BENDS IN THE CHANNEL. THE SURFACE BOULDERS COMPRISING THE WEIR AND STEP ARE SET AT THE INVERT ELEVATIONS OF THE STRUCTURE. THE STEP INVERT SHOULD BE AT OR ABOVE THE TOP OF THE UPSTREAM FOOTER BOULDER .
4. A MIXTURE OF SELECT MATERIALS, AS SPECIFIED ON THE MATERIALS PLAN SHEETS, SHOULD BE USED FOR SUBSTRATE RESTORATION IN RIFFLE AND RUN HABITATS AND TO FILL GAPS IN THE VANE BOULDERS. COARSE ALLUVIUM EXCAVATED FROM THE EXISTING STREAM BED, WHICH MEETS THE SPECIFIED SIZE CLASSIFICATION, IS THE PREFERRED MATERIAL TO USE FOR SUBSTRATE RESTORATION.
5. CONSTRUCT BOULDER CROSS VANE WITH STEP STRUCTURES BY
   - 5.1. FIRST SHAPE THE CHANNEL AND FLOODPLAIN TO THE SPECIFIED GRADES.
   - 5.2. NEXT, EXCAVATE ENOUGH BED MATERIAL TO PLACE THE BOULDERS, NON-WOVEN GEOTEXTILE FABRIC (TYPE III) AND SELECT MATERIAL FOR BACKFILL AND SUBSTRATE REPLACEMENT.
   - 5.3. PLACE NON-WOVEN GEOTEXTILE FABRIC (TYPE III ) ALONG THE ENTIRE UPSTREAM FACE OF THE STRUCTURE, EXTENDING FROM THE BOTTOM OF THE FOOTER TO THE FINISHED GRADE ELEVATION. ONLY GEOTEXTILE FABRIC (TYPE III) LISTED ON THE QUALIFIED PRODUCTS LIST SHALL BE USED.
   - 5.4. PLACE FOOTER BOULDERS AND SURFACE BOULDERS AT THE CHANNEL INVERTS OF THE WEIR AND STEP, AND THEN USE SURVEY EQUIPMENT TO CHECK THE ELEVATIONS OF THE INVERTS IN ACCORDANCE WITH THE STREAM MITIGATION PLANS.
   - 5.5. ONCE THE INVERTS HAVE BEEN ESTABLISHED, THE REMAINDER OF THE FOOTER AND SURFACE BOULDERS SHALL BE PLACED, MINIMIZING VOIDS.
   - 5.6. FILL THE VOIDS BETWEEN BOULDERS ON THE UPSTREAM SIDE OF THE STRUCTURE.
   - 5.7. BACKFILL STRUCTURE AND NON-WOVEN GEOTEXTILE FABRIC (TYPE III) WITH EXCAVATED ON-SITE STREAM ALLUVIUM (IF AVAILABLE), OTHERWISE USE THE SPECIFIED SELECT MATERIAL. SOIL SHALL BE COMPACTED WELL AROUND BURIED PORTIONS OF THE STRUCTURE. TRIM ANY EXPOSED NON-WOVEN GEOTEXTILE FABRIC (TYPE III ).
   - 5.8. ONCE THE STRUCTURE IS INSTALLED, EXCAVATE SCOUR POOL AND PLACE SELECT MATERIAL AS REQUIRED.
   - 5.9. RE-DRESSING OF CHANNEL AND BANKFULL BENCH/FLOODPLAINWILL LIKELY BE REQUIRED FOLLOWING INSTALLATION OF IN-STREAM STRUCTURES AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.
6. THE SURFACE OF CROSS VANE WITH STEP STRUCTURE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN ACCORDANCE WITH THE LINES, GRADES AND CROSS SECTIONS OR ELEVATIONS SHOWN ON THE PLANS. THE DEGREE OF FINISH FOR INVERT ELEVATIONS SHALL BE WITHIN 0.10 FOOT OF THE GRADES AND ELEVATIONS INDICATED, OR AS DIRECTED BY THE ENGINEER. ALL GAPS OR VOIDS SHALL BE PLUGGED WITH SELECT MATERIAL TO FORM A TIGHT-FITTING SEAL.

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER
verdantas

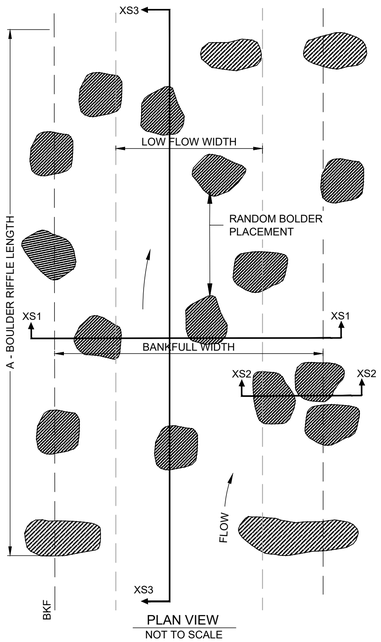
| NO | REVISION | DATE |
|---|---|---|
| | | |

| | |
|---|---|
| ISSUED FOR: | BID |
| ISSUE DATE: | 01/23/25 |
| SCALE: | AS SHOWN |
| DESIGNED BY: | JRH/WTV |
| DRAWN BY: | WTV |
| CHECKED BY: | CR |

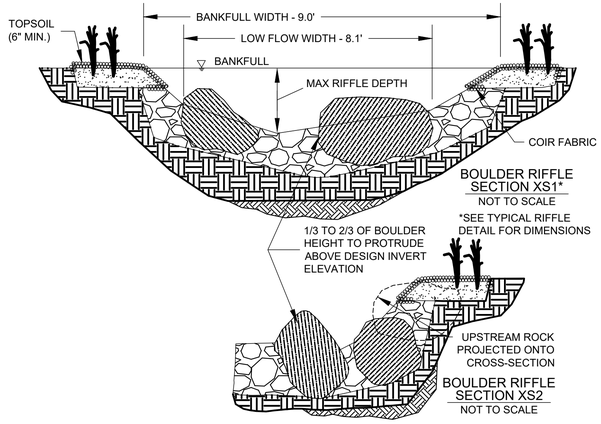
**THORNHURST STREAMBANK RESTORATION**
NORTH ROYALTON — CUYAHOGA COUNTY, OHIO

**CONSTRUCTION DETAILS**

PROJECT NO. 220923
DISCIPLINE: CIVIL
SHEET NAME: D-03
SHEET 11 OF 17

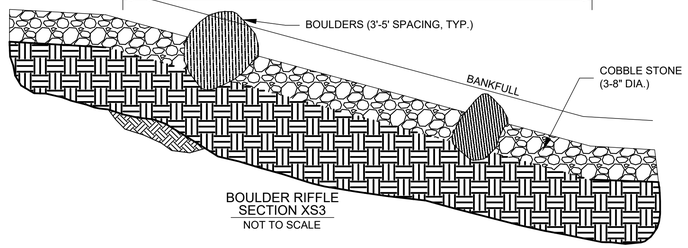



PLAN VIEW
NOT TO SCALE




BOULDER RIFFLE SECTION XS1*
NOT TO SCALE

BOULDER RIFFLE SECTION XS2
NOT TO SCALE




BOULDER RIFFLE SECTION XS3
NOT TO SCALE

BOULDER RIFFLE NOTES:

1. BOULDER RIFFLE SHALL BE CONSTRUCTED BETWEEN STATIONS IDENTIFIED ON THE PLAN.
2. THE GENERAL CHANNEL SHAPE WILL STILL CONFORM TO THE TYPICAL RIFFLE CROSS-SECTION OF THE REACH. BED MATERIAL SHALL BE PLACED (SIZE AND DEPTH) ACCORDING TO SPECIFICATIONS ON THE PROFILE. REFER TO REINFORCED BED MIX DETAIL FOR MATERIAL SPECIFICATIONS. PROTRUDING BOULDER ROCKS WILL BE ADDED TO REDIRECT FLOW TO DISSIPATE ENERGY IN ACCORDANCE WITH THIS DETAIL.
3. BOULDERS SHALL BE INSTALLED AT A SPACING THAT MEETS THE FOLLOWING RANGE DEPENDING ON THE STREAM SIZE:
   a. FOR STREAMS WITH BANKFULL WIDTH EQUAL TO OR LESS THAN 10 FEET WIDE, PLACE 1 BOULDER FOR EVERY 25-50 SF OF BED AREA (TOE OF BANK SLOPE TO TOE OF BANK SLOPE)
   b. FOR STREAMS WITH BANKFULL WIDTH GREATER THAN 10 FEET WIDE, PLACE 1 BOULDER FOR EVERY 50-100 SF OF BED AREA (TOE OF BANK SLOPE TO TOE OF BANK SLOPE)
4. WHILE CONFORMING TO THE SPACING REQUIREMENTS ABOVE, PLACEMENT OF BOULDERS WITHIN THE LIMITS OF THE BOULDER RIFFLE SHALL BE RANDOM TO CREATE VARYING FLOW PATTERN AND A MORE NATURAL APPEARANCE. CONTRACTOR SHALL AVOID PLACING BOULDERS DIRECTLY IN LINE WITH EACH OTHER EITHER PERPENDICULAR OR PARALLEL WITH ALIGNMENT.
5. BOULDERS SHALL BE PLACED PRIOR TO INSTALLING BED MATERIAL. APPROPRIATE BED MATERIAL SHALL BE INSTALLED AND BACKFILLED AROUND BOULDERS TO MEET SPECIFIED GRADE OF RIFFLE AND SPECIFICATIONS OF BOULDER PROTRUSION HEIGHT AND EMBEDDED DEPTH SPECIFIED BELOW.
6. BOULDERS SHALL BE ODOT TYPE A SIZED STONE.
7. BOULDERS SHALL PROTRUDE ABOVE THE TYPICAL BED INVERT SUCH THAT PROTRUSION HEIGHT FALLS BETWEEN 0.25 - 0.75 BANKFULL HEIGHT.
8. BOULDERS SHALL BE EMBEDDED BELOW STREAM INVERT AT LEAST 1/3 THE HEIGHT (Z-AXIS) OF THE ROCK USED. ROCK Z-AXIS DIMENSION MUST CONFORM TO RANGE SPECIFIED IN THE STRUCTURE ROCK SIZE TABLE.
9. CONTRACTOR SHALL AVOID PLACING A BOULDER WITHIN 2 FEET FROM THE TOE OF BANK SLOPE THAT WOULD DIRECT OR DEFLECT FLOW INTO THE BANK. BOULDER PLACEMENT WITHIN 2 FEET FROM THE TOE OF SLOPE SHALL BE INSPECTED BY ENGINEER FOR APPROVAL PRIOR TO ACCEPTANCE.

## BOULDER RIFFLE
NOT TO SCALE

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER

verdantas

| NO | REVISION | DATE |
|---|---|---|
| | | |

| ISSUED FOR: | BID |
|---|---|
| ISSUE DATE: | 01/23/25 |
| SCALE: | AS SHOWN |
| DESIGNED BY: | JRH/WTV |
| DRAWN BY: | WTV |
| CHECKED BY: | CR |

THORNHURST STREAMBANK RESTORATION
NORTH ROYALTON
CUYAHOGA COUNTY, OHIO

CONSTRUCTION DETAILS

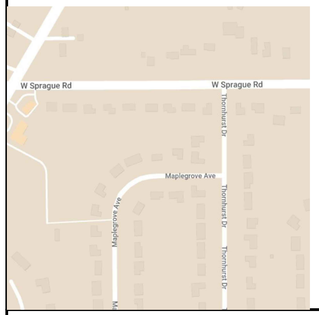
PROJECT NO.
220923

DISCIPLINE
CIVIL

SHEET NAME
D-04

SHEET 12 OF 17

## VICINITY MAP




NTS

## SITE INFORMATION

PROJECT INFORMATION:
THORNHURST DRIVE
CITY OF NORTH ROYALTON, CUYAHOGA COUNTY, OHIO 44133
LATITUDE: 41.3503 LONGITUDE: -81.7183

OWNER INFORMATION:
CITY OF NORTH ROYALTON
14600 STATE ROAD, NORTH ROYALTON, OHIO 44133
CONTACT: MATTHEW D. GLASS, P.E.
PHONE: 440-582-3001

SITE-CIVIL ENGINEER INFORMATION:
CT CONSULTANTS, INC.
1001 LAKESIDE AVE E, SUITE 1005
CLEVELAND, OHIO 44114
CONTACT: WILLIAM VASKO, P.E.
PHONE: 216-430-8503
EMAIL: WVASKO@CTCONSULTANTS.COM

TYPE OF CONSTRUCTION:
( ) NEW (X) MAINTENANCE ( ) REDEVELOPMENT

TYPE OF PROJECT:

| | | |
|---|---|---|
| ( ) RETAIL | ( ) COMMUNITY | ( ) MIXED USE |
| ( ) OFFICE | ( ) RECREATION | (X) RESIDENTIAL |
| ( ) MEDICAL | ( ) PUBLIC SAFETY | ( ) RESTAURANT |
| ( ) UTILITY | ( ) EDUCATION | ( ) APARTMENT |
| ( ) ROAD | ( ) INDUSTRIAL | ( ) MANUFACTURING |

DESCRIPTION OF PROJECT:
STREAM RESTORATION.

SOIL DISTURBING ACTIVITIES INCLUDE:
EROSION AND SEDIMENT CONTROL INSTALLATION; REMOVAL OF TREES, VEGETATION, TOPSOIL, EARTHWORK GRADING.

DESCRIPTION OF PRIOR LAND USE:
SMALL STREAM TRAVELING THROUGH A RESIDENTIAL AREA.

SITE AREA INFORMATION:

| | | |
|---|---|---|
| TOTAL PROPERTY AREA: | 0.5 | AC. |
| PROJECT LIMIT/CONSTRUCTION AREA: | 0.5 | AC. |
| AREA OF SOIL DISTURBANCE: | 0.5 | AC. |
| EXISTING IMPERVIOUS AREA: | 0.0 | AC. |
| PROPOSED IMPERVIOUS AREA: | 0.0 | AC. |
| INCREASE/DECREASE OF IMPERVIOUS AREA: | 0.0 | % |
| PRE-CONSTRUCTION RUNOFF COEFFICIENT: | 0.32 | |
| POST-CONSTRUCTION RUNOFF COEFFICIENT: | 0.32 | |

NAME OF RECEIVING STREAM, SURFACE WATER OR MS4:
UNNAMED TRIBUTARY WITHIN THE BIG CREEK SUBWATERSHED WITHIN THE CUYAHOGA RIVER WEST WATERSHED

QUALITY OF STORM WATER DISCHARGE FROM SITE:
UNKNOWN

ESTIMATED CONSTRUCTION START DATE: 03/01/2025
ESTIMATED CONSTRUCTION COMPLETION DATE: 06/01/2025

## EROSION CONTROL TIMETABLE

| | YEAR | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STABILIZATION TYPE | J | F | M | A | M | J | J | A | S | O | N | D |
| TEMPORARY SEEDING | | | O | O | ⊗ | ⊗ | ⊗ | ⊗ | O | O | | |
| PERMANENT SEEDING | | | | O | ⊗ | ⊗ | ⊗ | ⊗ | O | O | | |
| SODDING | | | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | | |
| MULCHING | O | O | O | O | O | O | O | O | O | O | O | O |
| PAVING | | | | | O | O | O | O | O | O | | |

⊗ IRRIGATION NEEDED

## SOIL TYPES

| NAME | DESCRIPTION | |
|---|---|---|
| EIC | ELLSWORTH SILT LOAM, 6 TO 12 PERCENT SLOPES | 100.0% |

## GENERAL NOTES

1. THE CONTRACTOR SHALL REVIEW AND FOLLOW THE PRACTICES AND REQUIREMENTS PROVIDED IN THE CURRENT, ACTIVE OHIO EPA NPDES PERMIT NO. 3IN00000*HD.
2. THIS SWP3 HAS BEEN PREPARED SHOWING THE ITEMS LISTED BELOW, BUT THE CONTRACTOR MAY NEED TO MOVE OR ADD ITEMS AS CONSTRUCTION PROGRESSES OR DURING THE VARIOUS STAGES OF CONSTRUCTION.
   - LIMITS OF EARTH DISTURBING ACTIVITY
   - CONSTRUCTION ENTRANCE(S)
   - EROSION AND SEDIMENT CONTROL MEASURES
   - INLET PROTECTIONS
   - CONCRETE WASHOUT PIT(S)
   - EQUIPMENT STAGING
   - FUEL STORAGE AND VEHICLE FUELING AREA
   - CONSTRUCTION TRAILER(S)
   - SANITATION FACILITY
   - MATERIAL STOCKPILE LOCATION(S)
   - CHEMICAL COMPOUND MIXING AND STORAGE AREA
   - ANY OTHER EROSION CONTROL REQUIRED
2. ALL WORK REQUIRED TO IMPLEMENT THE SW3P INCLUDING INSPECTION FEES, MAINTENANCE AND REPAIRS SHALL BE DONE BY AND AT THE EXPENSE OF THE CONTRACTOR.
3. THE CONTRACTOR SHALL AMEND THE SW3P WHEN THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION OR MAINTENANCE THAT REQUIRES INSTALLATION OF BMPS OR MODIFICATION TO EXISTING BMPS.
4. ADDITIONAL OR DIFFERENT BMPS MAY BE NEEDED AS CONSTRUCTION PROGRESSES OR AS REQUIRED BY THE OWNER, SWCD OR OHIO EPA.
5. PHASE CONSTRUCTION ACTIVITIES TO MINIMIZE LAND DISTURBED AT ANY ONE TIME AND LEAVE EXISTING VEGETATION IN PLACE AS LONG AS POSSIBLE.

## ADMINISTRATIVE NOTES

1. A NOI IS NOT REQUIRED FOR THIS PROJECT BECAUSE THE TOTAL LAND DISTURBANCE IS LESS THAN 1 ACRE AND IS NOT PART OF A LARGER COMMON DEVELOPMENT.
2. THE CONTRACTOR SHALL FOLLOW THE PRACTICES AND REQUIREMENTS PROVIDED IN THE OHIO EPA NPDES CONSTRUCTION SITE STORMWATER GENERAL PERMIT OHC000006 AND THE ODNR RAINWATER AND LAND DEVELOPMENT MANUAL, AND BE RESPONSIBLE FOR ALL NPDES TERMS AND CONDITIONS UNTIL A NOT IS FILED.
3. NO CONSTRUCTION ACTIVITIES MAY BEGIN UNTIL ALL OF THE FOLLOWING OCCUR:
   - OHIO EPA NPDES AUTHORIZATION LETTER RECEIVED
   - THE CONTRACTOR FILES A CO-PERMITTEE APPLICATION TO THE OHIO EPA
   - THE CONTRACTOR ATTENDS A PRE-CONSTRUCTION MEETING WITH THE SWCD TO DISCUSS OHIO EPA NPDES PERMIT REQUIREMENTS
4. OHIO EPA APPLICATION FORMS (I.E. NOI, NOT, CO-PERMITTEE NOI/NOT, INDIVIDUAL LOT NOI/NOT AND PERMIT TRANSFER) ARE ONLY ACCESSIBLE ELECTRONICALLY VIA THE OHIO EPA STREAMS APPLICATION SUBMITTAL SYSTEM USING AN INDIVIDUAL EBUSINESS CENTER ACCOUNT. VISIT THE OHIO EPA'S ELECTRONIC BUSINESS SERVICES WEBSITE FOR MORE INFORMATION, GUIDANCE AND REPORTING QUESTIONS.
5. THE CONTRACTOR SHALL SELECT INDIVIDUALS TO BE RESPONSIBLE FOR INSPECTIONS, MAINTENANCE AND REPAIR ACTIVITIES, AND COMPLETING INSPECTION AND MAINTENANCE REPORTS. THE CONTRACTOR SHALL COMPLETE A "DELEGATION OF AUTHORITY FOR STORMWATER POLLUTION PREVENTION PLAN" AND PROVIDE A COPY TO THE OWNER AND SWCD.
6. ALL PROCEDURES AND REQUIREMENTS CONTAINED IN THIS SW3P APPLY TO ALL GENERAL AND SUBCONTRACTORS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO IMPLEMENT, INFORM, REQUIRE AND ENFORCE ALL ASPECTS AND PROCEDURES OF THE SW3P. THE CONTRACTOR SHALL HAVE ALL SUBCONTRACTORS THAT ARE OR MAY BE ENGAGED IN ACTIVITIES THAT COULD IMPACT STORMWATER COMPLETE A "SUBCONTRACTOR AGREEMENT FOR EROSION AND SEDIMENT CONTROL", AND PROVIDE A COPY TO THE OWNER AND SWCD. EACH CONTRACTOR SHALL ACCEPT FULL RESPONSIBILITY FOR ALL FINES, DAMAGES AND LIABILITY RESULTING FROM FAILURE TO PROVIDE THE REQUIRED POLLUTION CONTROL.
7. THE CONTRACTOR SHALL KEEP ON-SITE COPIES OF THE NPDES, SW3P AND INSPECTION LOGS/REPORTS.
8. ALL EROSION AND SEDIMENT CONTROL WORK SHALL BE SUBJECT TO INSPECTION BY THE SWCD AND OHIO EPA.

## EROSION CONTROL NOTES

1. SPECIAL MEASURES SHALL BE TAKEN TO STABILIZE DRAINAGE CHANNELS AND STORM WATER OUTFALLS.
2. DIVERT SURFACE RUNOFF AWAY FROM DISTURBED AREAS AND STEEP SLOPES WHEREVER PRACTICABLE.
3. STABILIZATION OF DISTURBED AREAS SHALL BE INITIATED WITHIN THE TIME FRAMES IN THE FOLLOWING TABLES:

| AREA REQUIRING TEMPORARY STABILIZATION | TIME FRAME TO APPLY CONTROLS |
|---|---|
| AREA WITHIN 50 FEET OF A SURFACE WATER, NOT AT FINAL GRADE AND TO REMAIN IDLE MORE THAN 14 DAYS | WITHIN 2 DAYS OF MOST RECENT DISTURBANCE |
| ANY OTHER AREA TO BE DORMANT MORE THAN 14 DAYS, BUT LESS THAN 1 YEAR | WITHIN 7 DAYS OF MOST RECENT DISTURBANCE |
| AREA TO REMAIN IDLE OVER WINTER | PRIOR TO ONSET OF WINTER WEATHER |
| AREA TO BE PAVED | STABILIZE WITH STONE SUBBASE UNTIL PAVED |

| AREA REQUIRING PERMANENT STABILIZATION | TIME FRAME TO APPLY CONTROLS |
|---|---|
| AREA TO BE DORMANT FOR 1 YEAR OR MORE | WITHIN 7 DAYS OF MOST RECENT DISTURBANCE |
| AREA WITHIN 50 FEET OF A SURFACE WATER AND AT FINAL GRADE | WITHIN 2 DAYS OF REACHING FINAL GRADE |
| ANY OTHER AREA AT FINAL GRADE | WITHIN 7 DAYS OF REACHING FINAL GRADE |

## SEDIMENT CONTROL NOTES

1. INLET PROTECTION AND SEDIMENT BARRIERS MUST BE INSTALLED PRIOR TO CLEARING AND GRUBBING.
2. SEDIMENT PONDS, TEMPORARILY MODIFIED PERMANENT PONDS AND PERIMETER SEDIMENT BARRIERS MUST BE INSTALLED AS THE FIRST STEP OF GRADING AND WITHIN 7 DAYS FROM THE START OF CLEARING AND GRUBBING, AND CONTINUE TO FUNCTION UNTIL ALL DISTURBED UPLAND AREAS ARE STABILIZED.
3. SEDIMENT CONTROLS MUST POND RUNOFF TO BE CONSIDERED FUNCTIONAL.
4. SEDIMENT-LADEN TRENCH OR GROUND WATER MUST PASS THROUGH A SEDIMENT-SETTLING POND OR BE DEWATERED IN-PLACE USING A SUMP PIT, FILTER BAG OR OTHER COMPARABLE METHOD, PRIOR TO DISCHARGE FROM THE SITE.
5. TRENCH AND GROUND WATER FREE FROM SEDIMENT OR OTHER POLLUTANTS MAY BE DISCHARGED WITHOUT TREATMENT, PROVIDED THIS WATER DOES NOT BECOME POLLUTANT-LADEN BY TRAVERSING OVER DISTURBED SOILS OR OTHER POLLUTANT SOURCES.
6. SETTLED MATERIAL SHALL BE DISPOSED OF IN A STABILIZED LOCATION WHERE IT WILL NOT BE CARRIED OFF-SITE OR INTO A STORM SEWER BY RAINFALL.

## OTHER WASTE CONTROL NOTES

1. SOIL STOCKPILES SHALL BE RINGED WITH SILT FENCE ALONG THE BOTTOM FOOTPRINT. IF THE STOCKPILE WILL BE INACTIVE FOR 14 DAYS OR MORE, THE SURFACE SHALL BE SEEDED OR STABILIZED WITHIN 7 DAYS OF LAST DISTURBANCE.
2. CONCRETE TRUCKS ARE NOT PERMITTED TO WASH OUT OR DISCHARGE SURPLUS CONCRETE OR DRUM WASH WATER ONTO THE GROUND OR INTO STORM INLETS, DITCHES, STREAMS, WETLANDS OR ANY OTHER SURFACE WATERS. ALL EXCESS CONCRETE AND CONCRETE WASHOUT, INCLUDING FROM HAND MIXERS AND LIGHT EQUIPMENT, MUST BE DISPOSED OF IN A CONCRETE WASHOUT AREA TO COLLECT AND HARDEN.
3. OFF-SITE TRACKING OF SEDIMENT BY CONSTRUCTION VEHICLES MUST BE MINIMIZED. THE CONTRACTOR SHALL SWEEP ALL ADJACENT ROADS TO REMOVE MUD, DIRT OR ROCK TRACKED FROM THE SITE AT THE END OF EACH WORK DAY OR AS REQUIRED DURING THE DAY. DUMP TRUCKS HAULING MATERIAL FROM THE SITE SHALL BE COVERED WITH A TARPAULIN.
4. IT IS PROHIBITED TO BURN, BURY OR POUR ONTO THE GROUND OR INTO STORM INLETS, DITCHES, STREAMS, WETLANDS OR ANY OTHER SURFACE WATERS SOLID OR LIQUID WASTE INCLUDING TRASH, CONSTRUCTION DEBRIS, SOLVENTS, PAINT, DIESEL FUEL, GASOLINE, MOTOR OIL, HYDRAULIC FLUID, CEMENT CURING COMPOUND, ANTIFREEZE OR OTHER TOXIC OR HAZARDOUS WASTE. WASTE MATERIALS SHALL BE COLLECTED IN A SECURELY LIDDED DUMPSTER, DISPOSED OF IN AN APPROVED LANDFILL AND EMPTIED AS NECESSARY.
5. FUEL TANKS, DRUMS AND OTHER CONTAINERS HOLDING CHEMICALS MUST BE STORED WITHIN A DIKED AREA WITH A VOLUME OF AT LEAST 110% OF THE LARGEST TANK. A DIKED AREA IS NOT NECESSARY IF A SELF-CONTAINED SPILL PROOF TANK IS USED.
6. THE CONTRACTOR SHALL PROVIDE TEMPORARY SANITARY FACILITIES AT THE SITE. SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS 1 TIME PER WEEK, OR MORE OFTEN IF NECESSARY.
7. ANY TOXIC OR HAZARDOUS MATERIAL SPILL, REGARDLESS OF SIZE, MUST BE REPORTED WITHIN 30 MINUTES TO THE LOCAL FIRE DEPARTMENT AND OHIO EPA.
8. CONTAMINATED SOIL, SOIL WHERE CONSTRUCTION CHEMICALS HAVE BEEN SPILLED OR HAZARDOUS WASTE MATERIALS MUST BE REMOVED FROM THE SITE AND DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.
9. STORM WATER THAT COMES IN CONTACT WITH CONTAMINATED SOIL OR HAS A VISIBLE SHEEN MUST BE COLLECTED BY A VACUUM TRUCK AND DISPOSED OF AS A WASTE WATER.

## TMDLS AND BMPS SELECTED

1. APPLICABLE TMDLS FOR THE SITE:
   (X) PHOSPHORUS ( ) AMMONIA (X) HABITAT
   (X) NITROGEN (X) BACTERIA ( ) FLOW
   ( ) SEDIMENT/TOTAL SUSPEND SOLIDS
   (X) DISSOLVED OXYGEN/ORGANIC ENRICHMENT
2. THE FOLLOWING BMPS ARE SELECTED TO ADDRESS APPLICABLE TMDLS FOR THE PROJECT:

CONSTRUCTION SITE:
( ) DEMARCATE PROTECTED AREA BEFORE CONSTRUCTION
(X) MAINTAIN PORTABLE TOILET AND EMPTY W/OUT SPILL
(X) PROPER STORAGE OF LANDSCAPE FERTILIZER
(X) MS4 MONTHLY INSPECTIONS DURING CONSTRUCTION
(X) RESOLVE NON-COMPLIANCE SW3P INSPECTION ITEMS
( ) FINAL INSPECTION TO ENSURE BMP IMPLEMENTATION

TEMPORARY EROSION CONTROL:
( ) CHECK DAMS (X) TEMPORARY DIVERSION
( ) SLOPE DRAIN ( ) STREAM UTILITY CROSSING
( ) DEWATERING ( ) STREAM CROSSING

TEMPORARY SEDIMENT CONTROL:
( ) SEDIMENT BASIN ( ) SEDIMENT TRAP
(X) SILT FENCE (X) INLET PROTECTION
(X) FILTER SOCK ( ) FILTER BERM

SOIL STABILIZATION:
(X) DUST CONTROL (X) PHASED DISTURBANCE
(X) MULCHING (X) CLEARING AND GRUBBING
( ) SODDING (X) TEMPORARY SEEDING
(X) TOPSOILING (X) PERMANENT SEEDING
( ) GRADE TREATMENT (X) CONSTRUCTION ENTRANCE
( ) TEMPORARY ROLLED EROSION CONTROL PRODUCTS
(X) TURF REINFORCEMENT MATTING
(X) TREE AND NATURAL AREA PRESERVATION

PERMANENT EROSION CONTROL:
( ) GRASSED SWALE ( ) ROCK LINED CHANNEL
( ) LEVEL SPREADER ( ) ROCK OUTLET PROTECTION
( ) DIVERSION ( ) SUBSURFACE DRAIN

POLLUTION PREVENTION AND GOOD HOUSEKEEPING:
(X) ROUTINE FACILITY INSPECTIONS
(X) VISUAL ASSESSMENT OF STORM WATER DISCHARGE
( ) ANNUAL COMPREHENSIVE SITE INSPECTION
( ) SWEEP PARKING LOT AND DRIVE LANES
(X) CLEAN CATCH BASINS
( ) STORE WASTE IN LIDDED CONTAINERS
( ) LOCATE SNOW DISPOSAL AREAS AWAY FROM BMPS
( ) ESTABLISH "PICK-UP PET WASTE" STATION

POST-CONSTRUCTION:
( ) WETLAND SETBACK ( ) STREAM SETBACK
( ) WATER QUALITY POND ( ) PERMEABLE PAVEMENT
( ) GRASS FILTER STRIP ( ) INFILTRATION TRENCH
( ) TREE BOX FILTER ( ) SAND FILTER
( ) GREEN ROOF ( ) LTMA
( ) BIORETENTION AREA ( ) CISTERN
( ) BIORETENTION WITH INTERNAL WATER STORAGE
( ) OPEN CHANNEL SWALES
( ) AS-BUILT POST-BMPS
( ) SUBMIT LTMA ANNUAL MAINTENANCE REPORT TO MS4
( ) REDUCE IMPERVIOUS SURFACES
( ) LOW IMPACT DEVELOPMENT
( ) CONSERVATION DEVELOPMENT
( ) DISCONNECT DOWNSPOUT AND REDIRECT TO BMP
( ) VEGETATE MAINTENANCE/STORAGE YARD OPEN AREAS
(X) IMPLEMENT LOW-MOW OR NO-MOW PRACTICES

## PERMIT CLOSURE REQUIREMENTS

1. FINAL STABILIZATION REQUIRES THE CONTRACTOR TO REMOVE ALL TEMPORARY SEDIMENT AND EROSION CONTROLS FROM THE SITE AND ALL SEDIMENT TRAPPED BY THOSE CONTROLS BE PERMANENTLY STABILIZED.
2. THE CONTRACTOR SHALL COMPLETE A "FINAL CERTIFICATION AND NOTIFICATION FOR EROSION AND SEDIMENT CONTROL" UPON PROJECT COMPLETION AND PROVIDE A COPY TO THE OWNER AND SWCD.
3. ONCE CONSTRUCTION ACTIVITIES HAVE CEASED AND THE SITE REACHES FINAL STABILIZATION, THE CONTRACTOR MUST TERMINATE THE NPDES PERMIT COVERAGE BY FILING A NOT WITH THE OHIO EPA WITHIN 45 DAYS OF FINAL STABILIZATION. FINAL STABILIZATION IS DEFINED AS AN ESTABLISHED VEGETATIVE GROUND COVER OF AT LEAST 70% GROWTH DENSITY, OR OTHER MEANS OF PERMANENT STABILIZATION, OVER ALL AREAS DISTURBED DURING CONSTRUCTION.
4. THE CONTRACTOR MUST MAINTAIN ALL REPORTS FOR 3 YEARS AFTER THE NOT IS FILED, AND PROVIDE DIGITAL COPIES TO THE OWNER AND SWCD.

## MAINTENANCE REQUIREMENTS

1. BMPS SHALL BE MAINTAINED IN GOOD WORKING ORDER UNTIL UPSLOPE AREAS THEY CONTROL ARE STABILIZED.
2. THE CONTRACTOR SHALL PROVIDE A QUALIFIED PERSON KNOWLEDGEABLE IN THE PRINCIPLES AND PRACTICES OF EROSION AND SEDIMENT CONTROLS, POSSESS THE TECHNICAL SKILLS TO ASSESS SITE CONDITIONS THAT COULD IMPACT STORM WATER QUALITY, AND CAN ASSESS THE EFFECTIVENESS OF ANY BMP SELECTED.
3. A QUALIFIED PERSON MUST INSPECT BMPS AT LEAST ONCE EVERY 7 DAYS AND WITHIN 24 HOURS OF A 0.5" OR GREATER RAINFALL IN A 24-HOUR PERIOD TO DETERMINE IF THE SWP3 WAS PROPERLY IMPLEMENTED.
4. THE QUALIFIED PERSON MUST PREPARE A WRITTEN REPORT AFTER EACH INSPECTION SUMMARIZING INSPECTION RESULTS INCLUDING THE FOLLOWING:
   - DATE OF INSPECTION
   - NAME AND QUALIFICATION OF THE INSPECTOR
   - WEATHER CONDITIONS
   - LOCATIONS WHERE IN-STREAM OR OFF-SITE SEDIMENTATION OR OTHER POLLUTANTS WERE OBSERVED.
   - LOCATIONS OF BMPS NEEDING MAINTENANCE.
   - LOCATIONS OF BMPS FAILING TO OPERATE CORRECTLY OR PROVIDE ADEQUATE PROTECTION.
   - LOCATION OF AREAS IN NEED OF ADDITIONAL BMPS NOT IN PLACE AT THE TIME OF INSPECTION.
   - CORRECTIVE ACTIONS REQUIRED, CHANGES TO THE SW3P AND IMPLEMENTATION DATES.
   - GRADING AND STABILIZATION ACTIVITY LOG
   - EROSION AND SEDIMENT CONTROL AMENDMENT LOG
5. ALL INCIDENCES OF NON-COMPLIANCE MUST BE IDENTIFIED IN THE REPORT. IF A REPORT DOES NOT IDENTIFY INCIDENCES OF NON-COMPLIANCE, IT MUST CONTAIN A CERTIFICATION THE SITE IS IN COMPLIANCE AT THE TIME OF INSPECTION.
6. BMP MAINTENANCE OR REPAIR MUST BE COMPLETED WITHIN 3 DAYS, AND SEDIMENT POND MAINTENANCE OR REPAIR WITHIN 10 DAYS, OF THE INSPECTION THAT REVEALED A DEFICIENCY.
7. WHEN AN INSPECTION REVEALS A BMP IS NOT EFFECTIVE AND A MORE APPROPRIATE BMP IS REQUIRED, THE SW3P SHALL BE AMENDED, THE NEW BMP INSTALLED WITHIN 10 DAYS OF THE INSPECTION THAT REVEALED THE DEFICIENCY, AND THE "STORMWATER POLLUTION PREVENTION PLAN AMENDMENT LOG" FORM COMPLETED.
8. WHEN AN INSPECTION REVEALS A BMP HAS NOT BEEN INSTALLED, BUT IS REQUIRED TO PROVIDE ADEQUATE CONTROL, IT MUST BE INSTALLED PRIOR TO THE NEXT STORM EVENT WHICH PRODUCES RUNOFF, BUT IN NO CASE LATER THAN 10 DAYS FROM THE INSPECTION THAT REVEALED THE DEFICIENCY.
9. THE INSPECTION FREQUENCY MAY BE REDUCED TO 1 TIME PER MONTH IF THE ENTIRE SITE IS TEMPORARILY STABILIZED OR RUNOFF IS UNLIKELY DUE TO WINTER WEATHER (I.E. SUSTAINED SNOW COVER OR FROZEN GROUND CONDITIONS). A WAIVER OF INSPECTION REQUIREMENTS IS AVAILABLE UNTIL 1 MONTH BEFORE THAWING CONDITIONS ARE EXPECTED IF ALL THE FOLLOWING CONDITIONS ARE MET:
10. FROZEN CONDITIONS ARE ANTICIPATED TO CONTINUE FOR EXTENDED PERIODS OF TIME (I.E. MORE THAN 1 MONTH).
11. SOIL DISTURBANCE ACTIVITIES HAVE BEEN SUSPENDED.
12. THE BEGINNING AND ENDING DATES OF THE WAIVER PERIOD ARE DOCUMENTED IN THE SW3P.
13. ONCE A DEFINABLE AREA HAS BEEN FULLY STABILIZED, IT MAY BE MARKED ON THE SW3P AND NO FURTHER INSPECTION REQUIREMENTS ARE REQUIRED FOR THAT AREA OF THE SITE.
14. INSPECTIONS SHALL BE PERFORMED UNTIL A NOT IS FILED WITH THE OHIO EPA.

## SEQUENCE OF MAJOR CONSTRUCTION ACTIVITIES

1. HOLD A PRE-CONSTRUCTION MEETING TO DISCUSS OHIO EPA NPDES PERMIT REQUIREMENTS.
2. CONTRACTOR SUBMITS CONSTRUCTION SCHEDULE FOR CONSTRUCTION ACTIVITIES.
3. BEGIN INSPECTION, MAINTENANCE, RECORD KEEPING AND SITE POSTING OF BMPS.
4. ESTABLISH STAGING AREA AND NON-SEDIMENT BMPS.
5. INSTALL SILT FENCE, INLET PROTECTION AND CONSTRUCTION ENTRANCE.
6. INSTALL OTHER TEMPORARY EROSION AND SEDIMENT CONTROL ITEMS AS SOON AS POSSIBLE, BUT NO LATER THAN 7 DAYS AFTER FIRST SOIL DISTURBANCE. INSPECT AND MAINTAIN BMPS FOR THE PROJECT DURATION UNTIL UPSLOPE AREAS ARE PERMANENTLY STABILIZED.
7. BEGIN SITE DEMOLITION AND CONSTRUCTION.
8. BEGIN EARTHWORK OPERATIONS.
9. APPLY TEMPORARY SEED.
10. APPLY PERMANENT SEED.
11. INSTALL LANDSCAPING.
12. CONTINUE INSPECTIONS, MAINTENANCE, RECORD KEEPING, AND SITE POSTING UNTIL FINAL STABILIZATION ACHIEVED.
13. REMOVE TEMPORARY BMPS FROM STORM SEWER AND INLETS, AND OPEN GUTTERS AND DITCHES TO OBTAIN FREE DRAINAGE.
14. DISPOSE OF ALL DEBRIS AND WASTE MATERIAL.

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER

verdantas

| NO | REVISION | DATE |
|---|---|---|
| | | |

ISSUED FOR: BID
ISSUE DATE: 01/23/25
SCALE: AS SHOWN
DESIGNED BY: JRH/WTJ
DRAWN BY: WTJ
CHECKED BY: CR

# THORNHURST STREAMBANK RESTORATION

NORTH ROYALTON CUYAHOGA COUNTY, OHIO

# SWPPP NOTES

PROJECT NO. 220923
DISCIPLINE CIVIL
SHEET NAME SW3P-1
SHEET 13 OF 17

## DELEGATION OF AUTHORITY FOR EROSION AND SEDIMENT CONTROL

PROJECT NAME: _____

PROJECT ADDRESS: _____

I, _____, HEREBY DESIGNATE THE PERSON OR DESCRIBED POSITION BELOW TO BE A DULY AUTHORIZED REPRESENTATIVE FOR THE PURPOSE OF OVERSEEING COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS, INCLUDING THE OHIO EPA NPDES CONSTRUCTION GENERAL PERMIT, AT THE DESIGNATED PROJECT. THE DESIGNEE IS AUTHORIZED TO SIGN REPORTS, STORM WATER POLLUTION PREVENTION PLANS (SWP3) AND OTHER DOCUMENTS AS REQUIRED BY THE NPDES PERMIT.

_____
NAME OF QUALIFIED PERSON AND/OR POSITION

_____ _____
COMPANY NAME PHONE NO.

_____
STREET ADDRESS

BY SIGNING THIS AUTHORIZATION, I CERTIFY UNDER THE PENALTY OF LAW THAT ALL REQUIRED DOCUMENTS WILL BE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON(S) WHO MANAGES THE SYSTEM OR IS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION TO BE SUBMITTED WILL BE, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE AND COMPLETE. I AM AWARE THERE ARE SUBSTANTIAL PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

_____ _____
COMPANY NAME PHONE NO.

_____
STREET ADDRESS

_____
PRINT NAME AND TITLE

_____ _____
SIGNATURE DATE

## SUBCONTRACTOR AGREEMENT FOR EROSION AND SEDIMENT CONTROL

PROJECT NAME: _____

PROJECT ADDRESS: _____

BY SIGNING THIS AGREEMENT, I CERTIFY UNDER THE PENALTY OF LAW THAT I HAVE READ AND UNDERSTAND THE TERMS AND CONDITIONS OF THE STORM WATER POLLUTION PREVENTION PLAN (SWP3) FOR THE DESIGNATED PROJECT AND AGREE TO FOLLOW THE PRACTICES DESCRIBED. AS A SUBCONTRACTOR, I AM REQUIRED TO COMPLY WITH THE SWP3 FOR ANY WORK I PERFORM AT THE PROJECT. IT IS MY RESPONSIBILITY TO OBTAIN A COPY OF THE SWP3 FROM THE CONTRACTOR AND TO ADVISE MY EMPLOYEES WORKING ON THIS PROJECT OF THE REQUIREMENTS. I AM AWARE THERE ARE SUBSTANTIAL PENALTIES OR LOSS OF CONTRACT FOR VIOLATING ANY CONDITION OF THE SWP3, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

_____ _____
COMPANY NAME PHONE NO.

_____
STREET ADDRESS

_____
PRINT NAME AND TITLE

_____ _____
SIGNATURE DATE

DESCRIPTION OF CONSTRUCTION SERVICE(S) I AM TO PROVIDE:

_____

_____

_____

_____

_____

_____

_____

_____

## FINAL CERTIFICATION AND NOTIFICATION FOR EROSION AND SEDIMENT CONTROL

PROJECT NAME: _____

PROJECT ADDRESS: _____

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION SUBMITTED FOR THE DESIGNATED PROJECT. BASED ON MY INQUIRY OF THE PERSON(S) WHO MANAGED THE SYSTEM OR DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE AND COMPLETE. I AM AWARE THERE ARE SUBSTANTIAL PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

_____ _____
COMPANY NAME PHONE NO.

_____
STREET ADDRESS

_____
PRINT NAME AND TITLE

_____ _____
SIGNATURE DATE

## GRADING AND STABILIZATION ACTIVITY LOG

PROJECT NAME: _____ SHEET NO.: _____

PROJECT ADDRESS: _____

| DATE GRADING ACTIVITY INITIATED | DESCRIPTION OF GRADING ACTIVITY | DATE GRADING ACTIVITY CEASED | STABILIZATION MEASURE INITIATED | | DESCRIPTION OF STABILIZATION MEASURE AND LOCATION (ATTACH SKETCH IF NECESSARY) |
|---|---|---|---|---|---|
| | | | DATE | TYPE | |
| | | | | ☐ TEMP. ☐ PERM. | |
| | | | | ☐ TEMP. ☐ PERM. | |
| | | | | ☐ TEMP. ☐ PERM. | |
| | | | | ☐ TEMP. ☐ PERM. | |
| | | | | ☐ TEMP. ☐ PERM. | |
| | | | | ☐ TEMP. ☐ PERM. | |
| | | | | ☐ TEMP. ☐ PERM. | |
| | | | | ☐ TEMP. ☐ PERM. | |

## EROSION AND SEDIMENT CONTROL AMENDMENT LOG

PROJECT NAME: _____ SHEET NO.: _____

PROJECT ADDRESS: _____

| AMENDMENT NO. | DATE OF AMENDMENT | DESCRIPTION OF AMENDMENT | DESCRIPTION OF STABILIZATION MEASURE AND LOCATION (ATTACH SKETCH IF NECESSARY) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER

verdantas

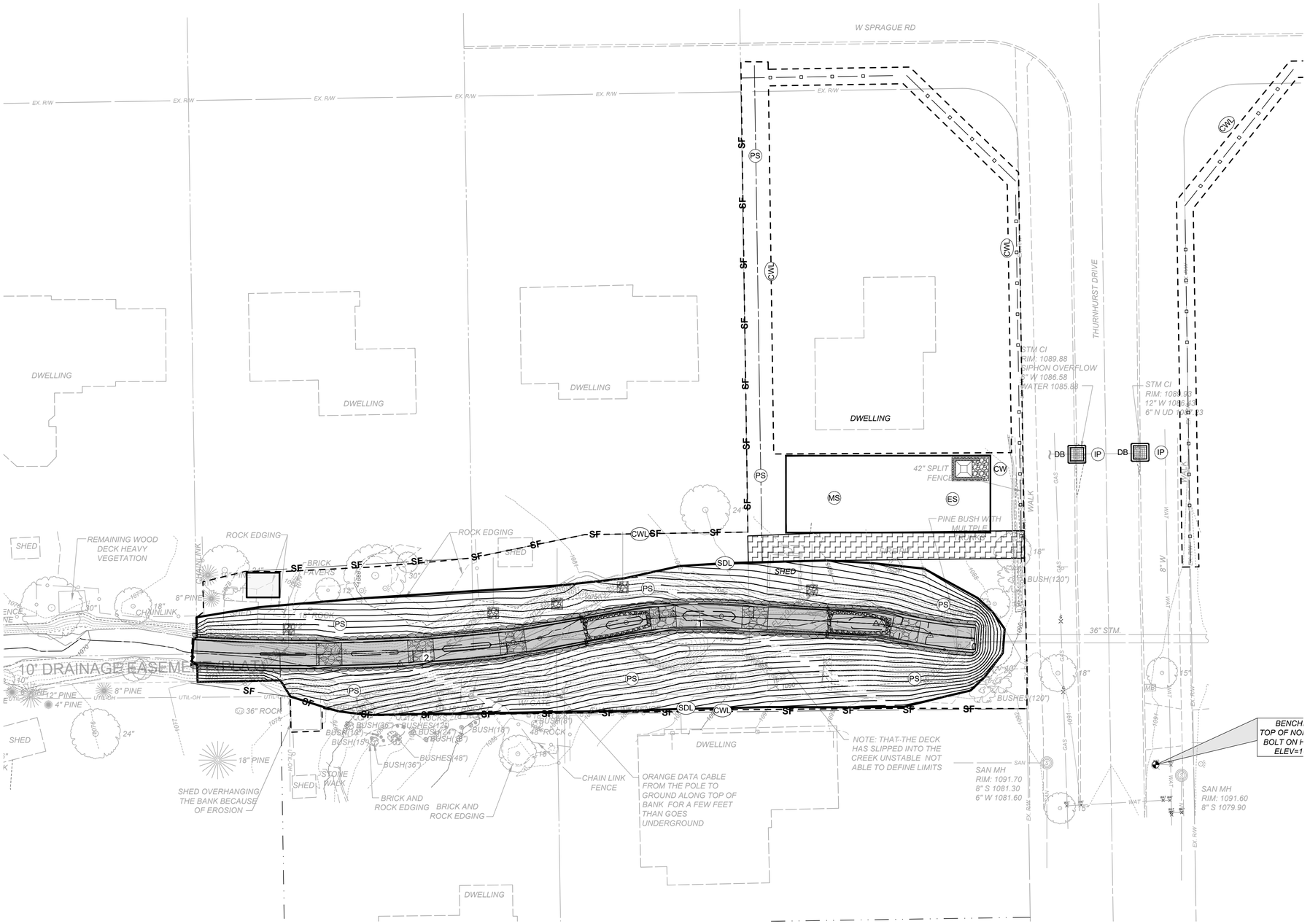
| NO | REVISION | DATE |
|---|---|---|
| | | |

ISSUED FOR: BID
ISSUE DATE: 01/23/25
SCALE: AS SHOWN
DESIGNED BY: JRH/WTV
DRAWN BY: WTV
CHECKED BY: CR

THORNHURST STREAMBANK RESTORATION
NORTH ROYALTON CUYAHOGA COUNTY, OHIO

SWPPP FORMS

PROJECT NO. 220923
DISCIPLINE CIVIL
SHEET NAME SW3P- 2
SHEET 14 OF 17




## LEGEND

| | |
|---|---|
| CWL | CONSTRUCTION WORK LIMIT |
| SDL | SOIL DISTURBANCE LIMIT |
| CW | CONCRETE WASHOUT |
| ES | EQUIPMENT STAGING |
| MS | MATERIAL STOCKPILE LOCATION |
| SF | SILT FENCE |
| DB IP | STORM INLET PROTECTION; DANDY BAG |
| PS | PERMANENT SEEDING |

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER

verdantas

| NO | REVISION | DATE |
|---|---|---|
| | | |

| | |
|---|---|
| ISSUED FOR: | BID |
| ISSUE DATE: | 01/23/25 |
| SCALE: | AS SHOWN |
| DESIGNED BY: | JRH/WTV |
| DRAWN BY: | WTV |
| CHECKED BY: | CR |

# THORNHURST STREAMBANK RESTORATION

NORTH ROYALTON — CUYAHOGA COUNTY, OHIO

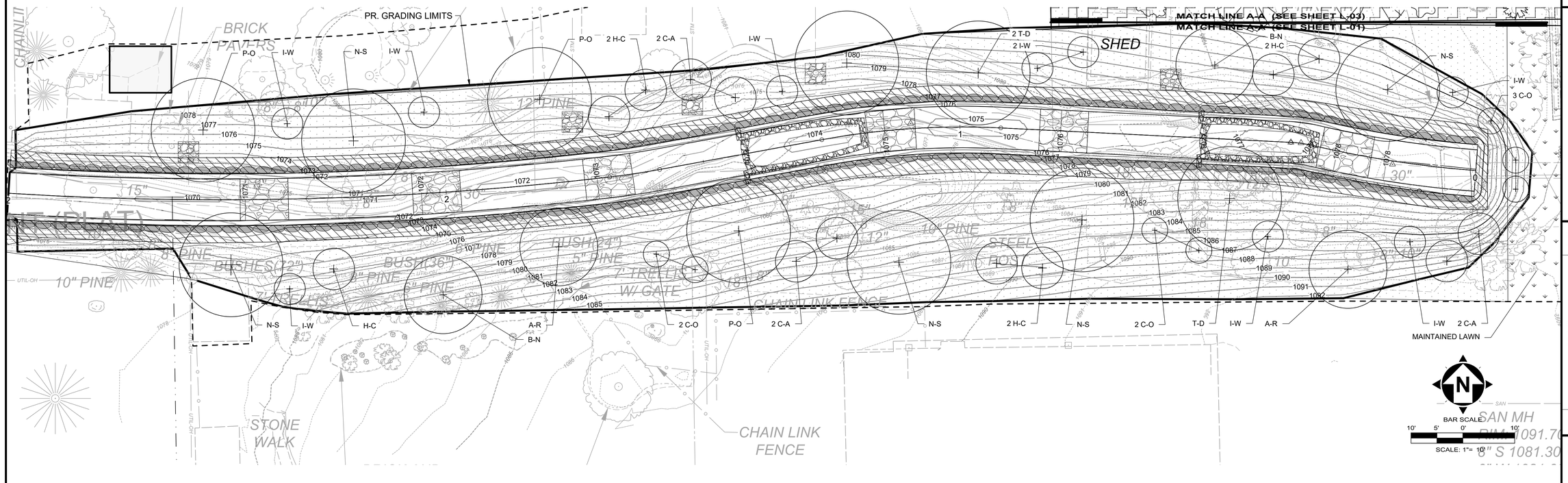
# SWPPP

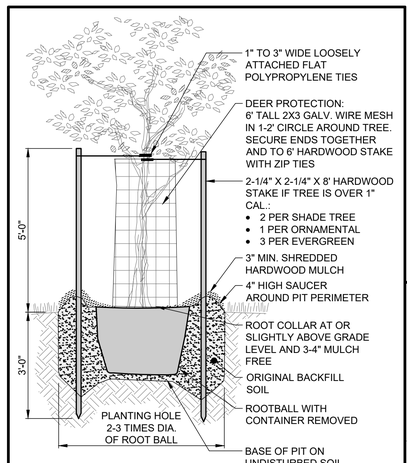
PROJECT NO.
220923

DISCIPLINE
CIVIL

SHEET NAME
SW3P- 3

SHEET 15 OF 17

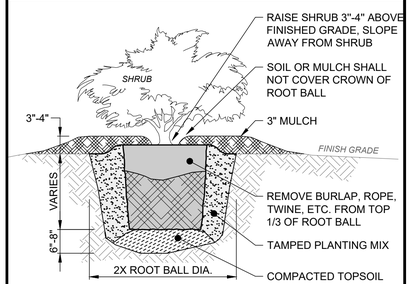



NOTES:
1. CROWN OF ROOT BALL TO BEAR THE SAME RELATION TO FINISH GRADE WHICH IT WAS GROWN AT THE NURSERY.
2. DO NOT DAMAGE ROOTS OR DESTROY ROOT BALL WHEN INSTALLING TREE STAKES.
3. REMOVE TREE STAKES 1 YEAR AFTER INSTALLATION. NOTIFY OWNER PRIOR TO REMOVAL.

## TREE PLANTING DETAIL

SCALE: NONE




## SHRUB PLANTING DETAIL

SCALE: NONE

## LANDSCAPE LEGEND

- CANOPY TREES
- SHRUBS
- RIPARIAN BUFFER SEED MIX 900. S.Y.
- FLOODPLAIN SEED MIX WITH LIVE BRUSH BUNDLES 220 S.Y. 580 L.F.
- LAWN SEED MIX 70 S.Y.

NOTES
1. LAWN AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED SMOOTH AND SEEDED WITH MAINTAINED LAWN SEED MIX.

## PLANT MATERIAL LIST

| QTY. | KEY | BOTANICAL NAME | COMMON NAME | SIZE | NOTES |
|---|---|---|---|---|---|
| 2 | A-R | ALNUS SERRULATA | HAZEL OR SMOOTH ALDER | 6' | #5 CONT. |
| 2 | B-N | BETULA N. HERITAGE | HERITAGE RIVER BIRCH | 6' | #5 CONT. |
| 6 | C-A | CORNUS AMOMUM | SILKY DOGWOOD | 3' | #3 CONT. |
| 7 | C-O | CEPHALANTHUS O. MAGICAL MOONLIGHT | MAGICAL MOONLIGHT BUTTONBUSH | 3' | #3 CONT. |
| 7 | H-C | HAMAMELIS VIRGINIANA | COMMON WITCHHAZEL | 3' | #5 CONT. |
| 9 | I-W | ILEX VERTICILLATA | WINTERBERRY | 3' | #5 CONT. |
| 5 | N-S | NYSSA SYLVATICA | BLACK OR SOUR GUM | 6' | #5 CONT. |
| 3 | P-O | PLATANUS OCCIDENTALIS | AMERICAN SYCAMORE | 6' | #5 CONT. |
| 3 | T-D | TAXODIUM DISTICHUM | BALD CYPRESS | 6' | #5 CONT. |

## LIVE BRUSH BUNDLE PLANT MATERIAL LIST

| QTY. | KEY | BOTANICAL NAME | COMMON NAME | SIZE | NOTES |
|---|---|---|---|---|---|
| 48 | C-A | CORNUS AMOMUM | SILKY DOGWOOD | 6"-8" BUNDLE | 3/4" DIA. X 3' |
| 48 | C-O | CEPHALANTHUS OCCIDENTALIS | BUTTONBUSH | 6"-8" BUNDLE | 3/4" DIA. X 3' |
| 48 | S-C | SAMBUCUS CANADENSIS | ELDERBERRY | 6"-8" BUNDLE | 3/4" DIA. X 3' |
| 48 | S-S | SALIX SERICEA | SILKY WILLOW | 6"-8" BUNDLE | 3/4" DIA. X 3' |

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER

verdantas

| NO | REVISION | DATE |
|---|---|---|

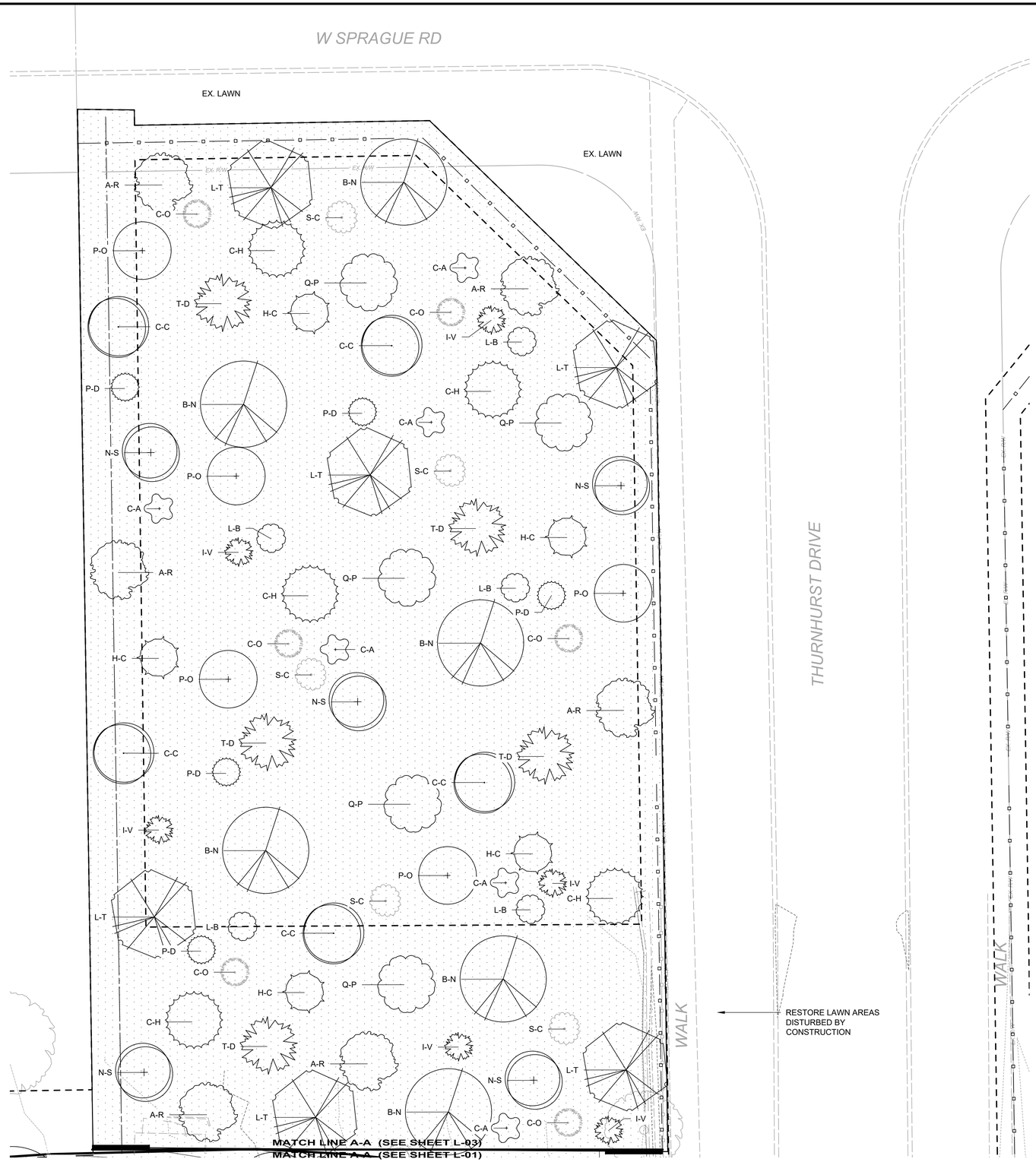
ISSUED FOR: BID
ISSUE DATE: 01/23/25
SCALE: AS SHOWN
DESIGNED BY: JRH/WTV
DRAWN BY: WTV
CHECKED BY: CR

# THORNHURST STREAMBANK RESTORATION

CUYAHOGA COUNTY, OHIO
NORTH ROYALTON

# LANDSCAPE PLAN

PROJECT NO. 220923
DISCIPLINE: CIVIL
SHEET NAME: L-01
SHEET 16 OF 17




## LANDSCAPE LEGEND

CANOPY TREES

SHRUBS

RIPARIAN BUFFER SEED MIX
1790 S.Y.

BAR SCALE
10' 5' 0' 10'
SCALE: 1"= 10'

## PLANT MATERIAL LIST

| QTY. | KEY | BOTANICAL NAME | COMMON NAME | SIZE | NOTES |
|---|---|---|---|---|---|
| 6 | A-R | ALNUS SERRULATA | HAZEL OR SMOOTH ALDER | 6' | #5 CONT. |
| 6 | B-N | BETULA N. HERITAGE | HERITAGE RIVER BIRCH | 6' | #5 CONT. |
| 6 | C-A | CORNUS AMOMUM | SILKY DOGWOOD | 3' | #5 CONT. |
| 5 | C-H | CELTIS OCCIDENTALIS | HACKBERRY | 1-1/2" CAL. | #5 CONT. |
| 6 | C-O | CEPHALANTHUS OCCIDENTALIS | BUTTONBUSH | 3' | #5 CONT. |
| 5 | C-C | CERCIS C. 'FOREST PANSY' | FOREST PANSY REDBUD | 1-1/2" CAL. | #5 CONT. |
| 5 | H-C | HAMAMELIS VIRGINIANA | COMMON WITCHHAZEL | 3' | #5 CONT. |
| 6 | I-V | ILEX VERTICILLATA | WINTERBERRY | 3' | #5 CONT. |
| 5 | L-B | LINDERA BENZOIN | SPICEBUSH | 3' | #5 CONT. |
| 6 | L-T | LIRIODENRON TULIPIFERA | TULIP TREE | 1-1/2" CAL. | #5 CONT. |
| 5 | N-S | NYSSA SYLVATICA | BLACK OR SOUR GUM | 6' | #5 CONT. |
| 5 | P-D | PHYSOCARPUS OPULIFOLIUS | COMMON NINEBARK | 3' | #5 CONT. |
| 5 | P-O | PLATANUS OCCIDENTALIS | AMERICAN SYCAMORE | 6' | #5 CONT. |
| 5 | S-C | SAMBUCUS CANADENSIS | ELDERBERRY | 3' | #5 CONT. |
| 5 | T-D | TAXODIUM DISTICHUM | BALD CYPRESS | 6' | #5 CONT. |
| 5 | Q-P | QUERCUS PALUSTRIS | PIN OAK | 1-1/2" CAL. | #5 CONT. |

STATE OF OHIO
WILLIAM T. VASKO
E-86752
REGISTERED PROFESSIONAL ENGINEER

verdantas

| NO | REVISION | DATE |
|---|---|---|
| | | |

| | |
|---|---|
| BID | |
| ISSUED FOR: | |
| ISSUE DATE: | 01/23/25 |
| SCALE: | AS SHOWN |
| DESIGNED BY: | JRH/WTV |
| DRAWN BY: | WTV |
| CHECKED BY: | CR |

# THORNHURST STREAMBANK RESTORATION

NORTH ROYALTON — CUYAHOGA COUNTY, OHIO

# LANDSCAPE PLAN

PROJECT NO.
220923

DISCIPLINE
CIVIL

SHEET NAME
L-02

SHEET 17 OF 17