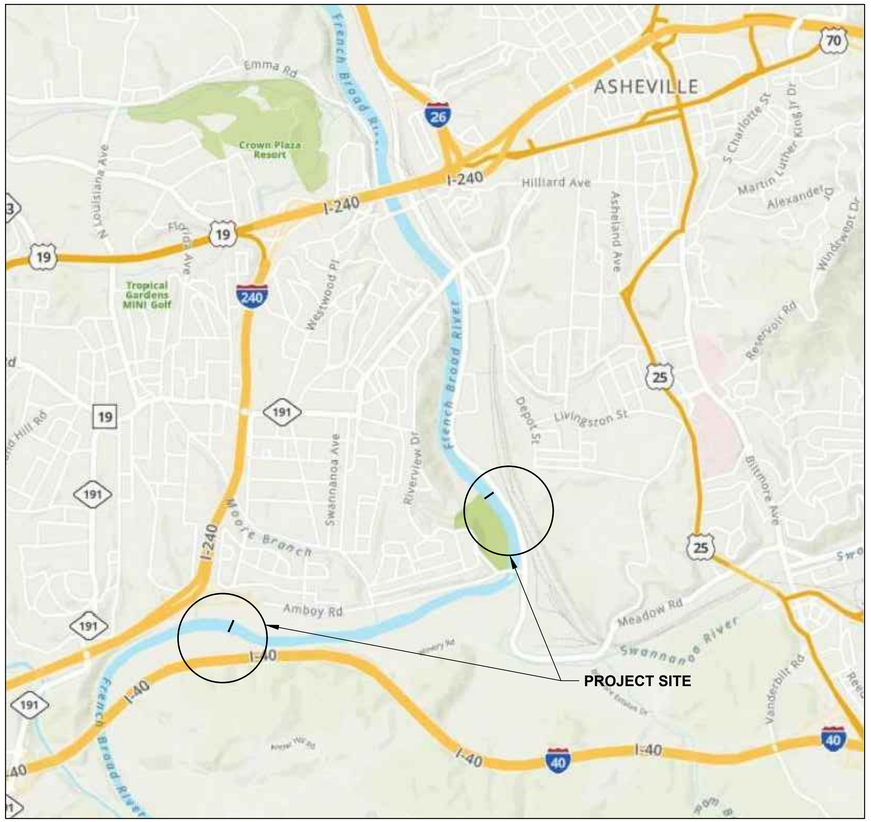
HDR Engineering, Inc. of the Carolinas

440 S. Church Street, Suite 1200
Charlotte NC 28202
704.338.6700

N.C.B.E.L.S. License Number F-0116



LOCATION MAP

Contract Drawings For

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

Carrier Bridge Pump Station (Pipeline River Crossings)

508 Riverview Drive
Asheville, NC 28806

Issued For Bids

MSD Project No. 2019045

HDR Project No. 10194380

Date: January 2025

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27599 MATTHEW A. SHULTZ 1.22.25

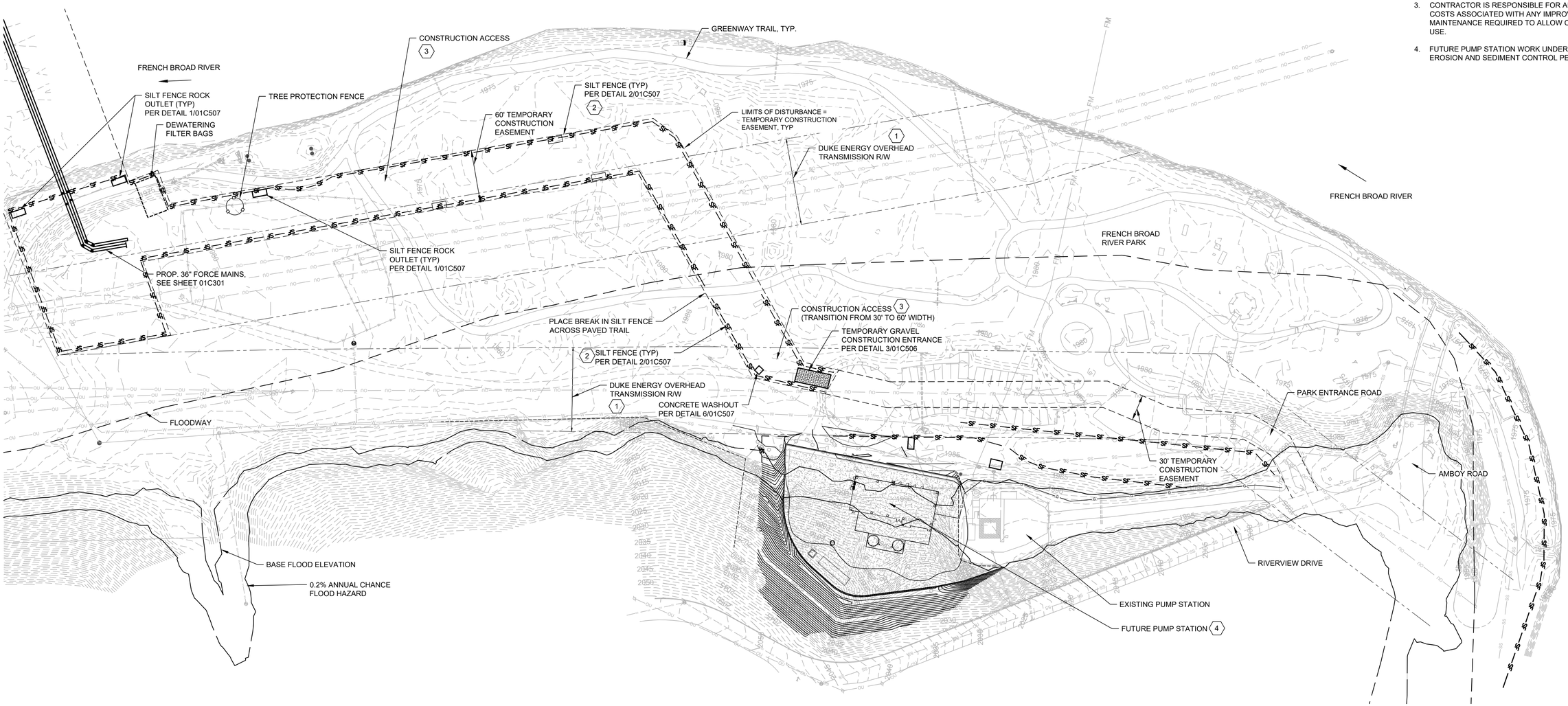
INDEX OF DRAWINGS

GENERAL NOTES:

1. SURVEY COMPLETED BY ED HOLMES & ASSOCIATES LAND SURVEYORS, PA; ASHEVILLE, NC. SURVEY HAS NOT BEEN UPDATED FOLLOWING HURRICANE HELENE. CONTRACTOR SHALL REVIEW CURRENT SITE CONDITIONS.
2. TREES AND VEGETATION NOT SHOWN. TREES WITHIN EASEMENT WILL BE CUT DOWN BY MSD TO 5-FEET ABOVE GRADE, CONTRACTOR SHALL REMOVE STUMPS.

KEYNOTES: (#)

1. COMPLY WITH ALL OSHA, DUKE ENERGY AND OTHER APPLICABLE GUIDELINES AND SAFETY STANDARDS FOR WORKING NEAR AND UNDER HIGH VOLTAGE ELECTRICAL LINES. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK WITH DUKE ENERGY.
2. INSTALL SILT FENCE ALONG BOTH SIDES OF TEMPORARY CONSTRUCTION EASEMENT FROM END OF ASPHALT ROAD TO THE CONSTRUCTION SITE.
3. CONTRACTOR IS RESPONSIBLE FOR ALL WORK AND COSTS ASSOCIATED WITH ANY IMPROVEMENTS AND MAINTENANCE REQUIRED TO ALLOW CONTINUED USE.
4. FUTURE PUMP STATION WORK UNDER SEPARATE EROSION AND SEDIMENT CONTROL PERMIT.



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ISSUE	DATE	DESCRIPTION
A	01/2025	ISSUED FOR BIDS

PROJECT MANAGER	MATTHEW A. SHULTZ, P.E.
DESIGNED BY	M. SHULTZ, P.E.
CHECKED BY	C. SMITH, P.E.
DRAWN BY	J. KROOSWYK
PROJECT NUMBER	10194380

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27599 MATTHEW A. SHULTZ 1.22.25

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY, NORTH CAROLINA

CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

ACCESS ROAD TO WEST SIDE OF CARRIER BRIDGE FORCE MAINS

0 1" 2"

FILENAME 01C101.dwg
SCALE 1" = 60'

SHEET 01C101

1	2	3	4	5	6	7	8

D
C
A

GENERAL NOTES

1. ALL WORK MUST BE COMPLETED BETWEEN NOVEMBER 1, 2025, AND APRIL 20, 2026. NO ACCESS WILL BE GRANTED BEFORE OR AFTER THESE DATES WITHOUT PRE-APPROVAL FROM BOTH MSD AND BILTMORE.
2. ALL CONTRACTOR AND SUBCONTRACTOR EMPLOYEES MUST COMPLY WITH THE CODE OF CONDUCT INCLUDED IN SPECIFICATION SECTION 01 13 00.

EROSION CONTROL NOTES

1. NO EXCAVATIONS OR GRADING IS PLANNED ALONG THE ACCESS ROADS THAT WOULD WARRANT INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES. IF UNPLANNED DISTURBANCES OCCUR, CONTRACTOR SHALL IMMEDIATELY INSTALL APPROPRIATE MEASURES IN COORDINATION WITH MSD.

KEYNOTES #

1. UNLESS SPECIFICALLY NOTED, ALL MATERIALS AND EMPLOYEES MUST ENTER AND EXIT THE SITE THROUGH THE GATE AT THE JONES FARM ROAD ACCESS POINT OFF BREVARD ROAD.
2. ALL EMPLOYEE PERSONAL VEHICLES MUST PARK AT THE SPORTING CLAYS PARKING LOT. CONTRACTOR IS RESPONSIBLE FOR SHUTTLING ALL EMPLOYEES FROM THE PARKING LOT TO THE CONSTRUCTION SITE. COMPANY VEHICLES ARE PERMITTED TO DRIVE TO CONSTRUCTION SITE.
3. ACCESS ROAD IS DIRT, HAS SECTIONS WITH STEP GRADES, IS NARROW AND LIMITED TO ONE-WAY TRAFFIC, HAS SHARP TURNS, AND HAS OVERHANGING TREE LIMBS. CONTRACTOR IS RESPONSIBLE FOR ALL WORK, COSTS AND ADDITIONAL PERMITTING ASSOCIATED WITH ANY IMPROVEMENTS AND MAINTENANCE REQUIRED TO ALLOW CONTINUED USE FOR BOTH CONTRACTOR AND PROPERTY OWNER. FOLLOWING CONSTRUCTION, ACCESS ROAD MUST MEET OR EXCEED PRECONSTRUCTION CONDITIONS.
4. CONTRACTOR SHALL CONTROL ONE-WAY TRAFFIC BETWEEN THE PARKING LOT AND THE BRIDGE CROSSING OVER FRENCH BROAD RIVER THROUGH THE USE OF FLAGGERS, TEMPORARY TRAFFIC SIGNALS, OR OTHER APPROVED METHODS DURING ALL TIMES OF MATERIAL DELIVERY. PROPERTY OWNER HAS RIGHT TO USE THE ACCESS ROAD AT ALL TIMES.
5. EXISTING STEEL BRIDGE WITH WOOD DECK OVER STREAM. WEIGHT CAPACITY IS UNKNOWN. PLACE TEMPORARY BRIDGE OVER EXISTING TO SPAN FULL LIMITS WITHOUT PLACING WEIGHT ON EXISTING BRIDGE.
6. CONCRETE BRIDGE OVER FRENCH BROAD RIVER. RUBBER TIRE VEHICLES THAT MEET HS-25 LOADING CAN CROSS BRIDGE. CONTRACTOR RESPONSIBLE FOR MAINTAINING CLEAN SURFACE.
7. EXISTING CONCRETE ARCH CULVERT, DO NOT DRIVE OVERTOP. INSTALL TEMPORARY DRIVE AROUND END OF CULVERT.
8. A TEMPORARY TRAIL, APPROX. 1,800 LF, MUST BE CONSTRUCTED ALONG THE EAST SIDE OF FARM TRAIL TO MAINTAIN A CONTINUOUS TRAIL FOR WALKING, BIKING, AND HORSE BACK RIDING. THE TRAIL SHALL BE 6-FOOT WIDE, PLACED ON A COMPACTED SUBBASE AND GEOTEXTILE FABRIC, CONSTRUCTED USING ABC STONE TO A COMPACTED THICKNESS OF 6-INCHES. A PHYSICAL SEPARATION BETWEEN THE WALKING TRAIL AND CONSTRUCTION ACCESS ROAD SHALL BE MADE USING BLACK ROPE STRUNG BETWEEN WOODEN STAKES. FOLLOWING CONSTRUCTION, TEMPORARY TRAIL MUST BE REMOVED, NO STONE SHALL REMAIN, AND AREA RETURNED TO PRECONSTRUCTION CONDITIONS. IF TOPSOIL IS REMOVED DURING REMOVAL OF STONE, REPLACEMENT TOPSOIL MUST BE PLACED.
9. EXISTING CONCRETE ARCH CULVERT, DO NOT DRIVE OVERTOP. INSTALL TEMPORARY DRIVE AROUND END OF CULVERT.
10. EXISTING CONCRETE ARCH CULVERT AND 36" PLASTIC CULVERT PIPE. PLACE TEMPORARY BRIDGE OVER EXISTING CULVERT TO SPAN FULL LIMITS WITHOUT PLACING WEIGHT ON EXISTING CULVERT.
11. MOBILIZATION OF CONSTRUCTION EQUIPMENT THAT MUST BE TRANSPORTED ON LONG TRAILERS, SUCH AS EXCAVATORS, AND ONLY DELIVERY OF THE PIPE AND THE MANHOLE CAN ENTER THE PROPERTY THROUGH THE MAIN GATE. USE THE ROADS IDENTIFIED ON THE FIGURE, AND UNLOAD IN THE LOWER PARKING LOT AT ANTLER VILLAGE. NO EQUIPMENT OR TRAILERS CAN REMAIN PARKED AT THIS LOT. ALL EQUIPMENT DELIVERY MUST ENTER AND EXIT THE PROPERTY BETWEEN 7:00 AM AND 9:00 AM. EQUIPMENT AND MATERIAL OFFLOADED AT THIS LOT MUST BE IMMEDIATELY MOVED TO THE CONSTRUCTION SITE.

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DESIGNED BY	M. SHULTZ, P.E.
CHECKED BY	C. SMITH, P.E.
DRAWN BY	J. KROOSWYK
PROJECT NUMBER	10194380

NORTH CAROLINA PROFESSIONAL ENGINEER 27599 MATTHEW A. SHULTZ 1.22.25

METROPOLITAN SEWERAGE DISTRICT BUNCOMBE COUNTY, NORTH CAROLINA

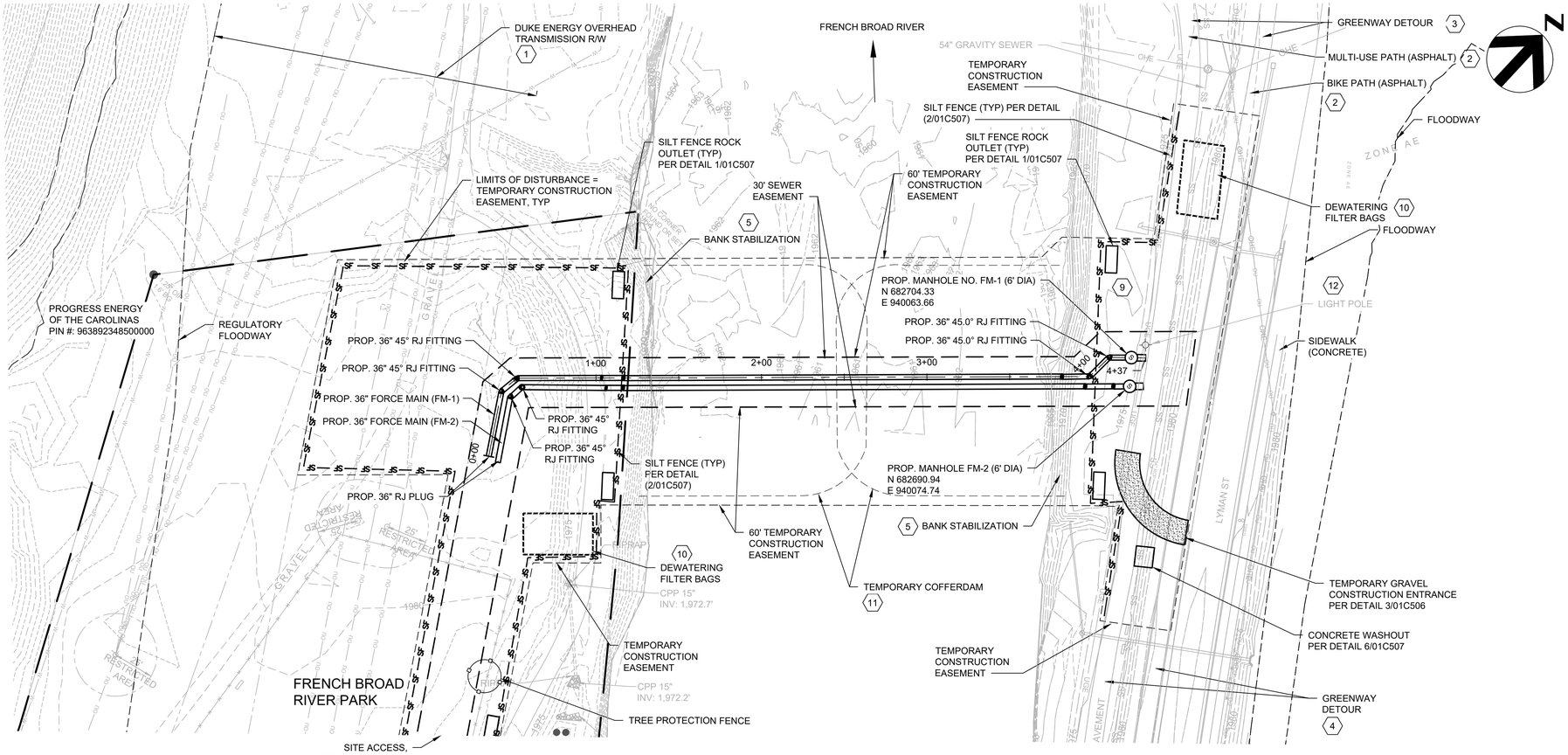
CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

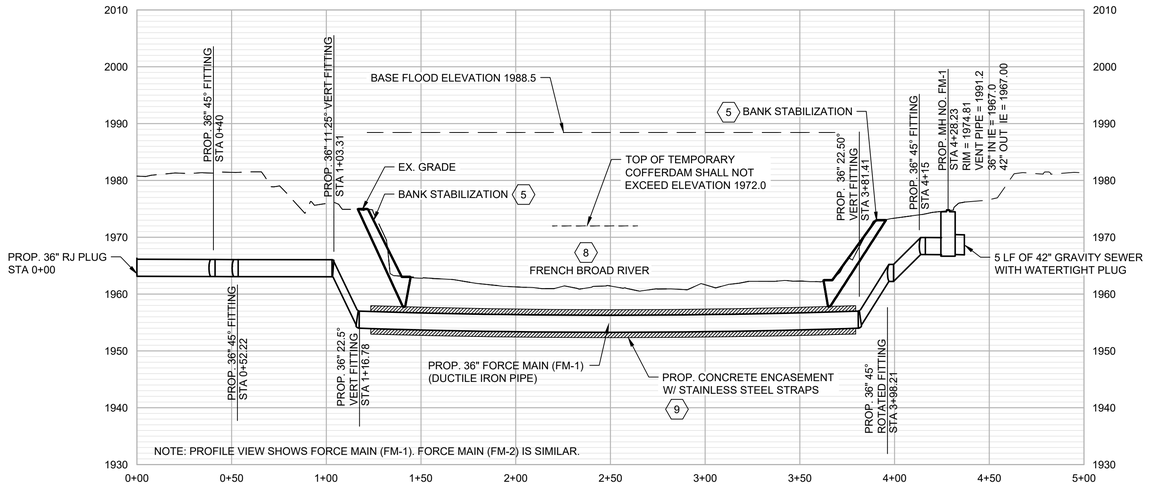
METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

ACCESS ROAD TO SOUTH SIDE OF SOUTH FRENCH BROAD RELIEF INTERCEPTOR

0 1" 2"

FILENAME	01C102.dwg
SCALE	1" = 600'
SHEET	01C102





GENERAL NOTES:

1. SURVEY COMPLETED BY ED HOLMES & ASSOCIATES LAND SURVEYORS, PA; ASHEVILLE, NC. SURVEY HAS NOT BEEN UPDATED FOLLOWING HURRICANE HELENE. CONTRACTOR SHALL REVIEW CURRENT SITE CONDITIONS.
2. TREES AND VEGETATION NOT SHOWN. TREES WITHIN EASEMENT WILL BE CUT DOWN BY MSD TO 5-FEET ABOVE GRADE, CONTRACTOR SHALL REMOVE STUMPS.
3. ALL PIPE JOINTS NOT WITHIN CONCRETE ENCASEMENT SHALL BE RESTRAINED JOINT.

KEYNOTES: (#)

1. COMPLY WITH ALL OSHA, DUKE ENERGY AND OTHER APPLICABLE GUIDELINES AND SAFETY STANDARDS FOR WORKING NEAR AND UNDER HIGH VOLTAGE ELECTRICAL LINES. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK WITH DUKE ENERGY.
2. IF TRAILS/PATHS ARE DAMAGED DURING CONSTRUCTION. FULL WIDTH OVERLAY AND END MILLING WILL BE REQUIRED FOR MINOR SURFACE DAMAGE. FOR MORE EXTENSIVE DAMAGE, REPLACE PER DETAIL 3/01C508.
3. GREENWAY DETOUR. 10-FEET SOUTH OF EXISTING CROSSWALK (LOCATED 700-FEET NORTH), INSTALL SIX NCDOT DRUMS ACROSS THE BIKE PATH AND MULTI-USE PATH AND A SIGN IN THE CENTER OF EACH PATH THAT STATES "PATH CLOSED. DETOUR ACROSS THE STREET."
4. GREENWAY DETOUR. 10-FEET NORTH OF EXISTING CROSSWALK (LOCATED NW OF INTERSECTION OF LYMAN ST AND AMBOY RD), INSTALL THREE NCDOT DRUMS ACROSS THE PAVED PATH AND A SIGN IN THE CENTER THAT STATES "PATH CLOSED. DETOUR ACROSS THE STREET."
5. RESTORE ALL RIVERBANK AREAS DISTURBED PER DETAIL 2/01C504. FURNISH AND INSTALL TURBIDITY CURTAIN TO CONTAIN SEDIMENT.
6. MANHOLE SHALL BE SEALED AND WATERTIGHT. INSTALL VENT PIPE. SEE DETAILS ON SHEET 01C502. COORDINATE LOCATION OF VENT PIPE WITH MSD.
7. ELEVATIONS OF PROP. MH NO. FM-2 SHALL MATCH MH NO. FM-1.
8. INSTALL PIPE UNDER THE RIVER BY OPEN CUT METHOD. SEE SHEET 01C504.
9. EXTEND CONCRETE ENCASEMENT A MINIMUM DISTANCE OF 10' BEYOND RIVER BANK TOE OF SLOPE. SEE DETAIL ON SHEET 01C504.
10. SEE DETAIL 3/01C507.
11. TEMPORARY COFFERDAM TO BE DESIGNED BY CONTRACTOR. TEMPORARY COFFERDAM SHALL NOT EXTEND BEYOND TEMPORARY EASEMENTS OR MORE THAN 55% ACROSS THE WIDTH OF THE RIVER. FURNISH AND INSTALL TURBIDITY CURTAIN TO CONTAIN SEDIMENT.
12. CONTRACTOR SHALL RELOCATE LIGHT POLE 40 FEET NORTH OF ITS CURRENT LOCATION. REUSE EXISTING POLE. SEE DETAIL 1/01C508 FOR CONCRETE FOOTING. RELOCATE EXISTING UNDERGROUND ELECTRIC AS REQUIRED TO CONSTRUCT MANHOLES AND GRAVITY SEWER.

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DESIGNED BY	M. SHULTZ, P.E.
CHECKED BY	C. SMITH, P.E.
DRAWN BY	J. KROOSWYK
PROJECT NUMBER	10194380

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27599 MATTHEW A. SHULTZ 12.22.25

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY, NORTH CAROLINA

CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

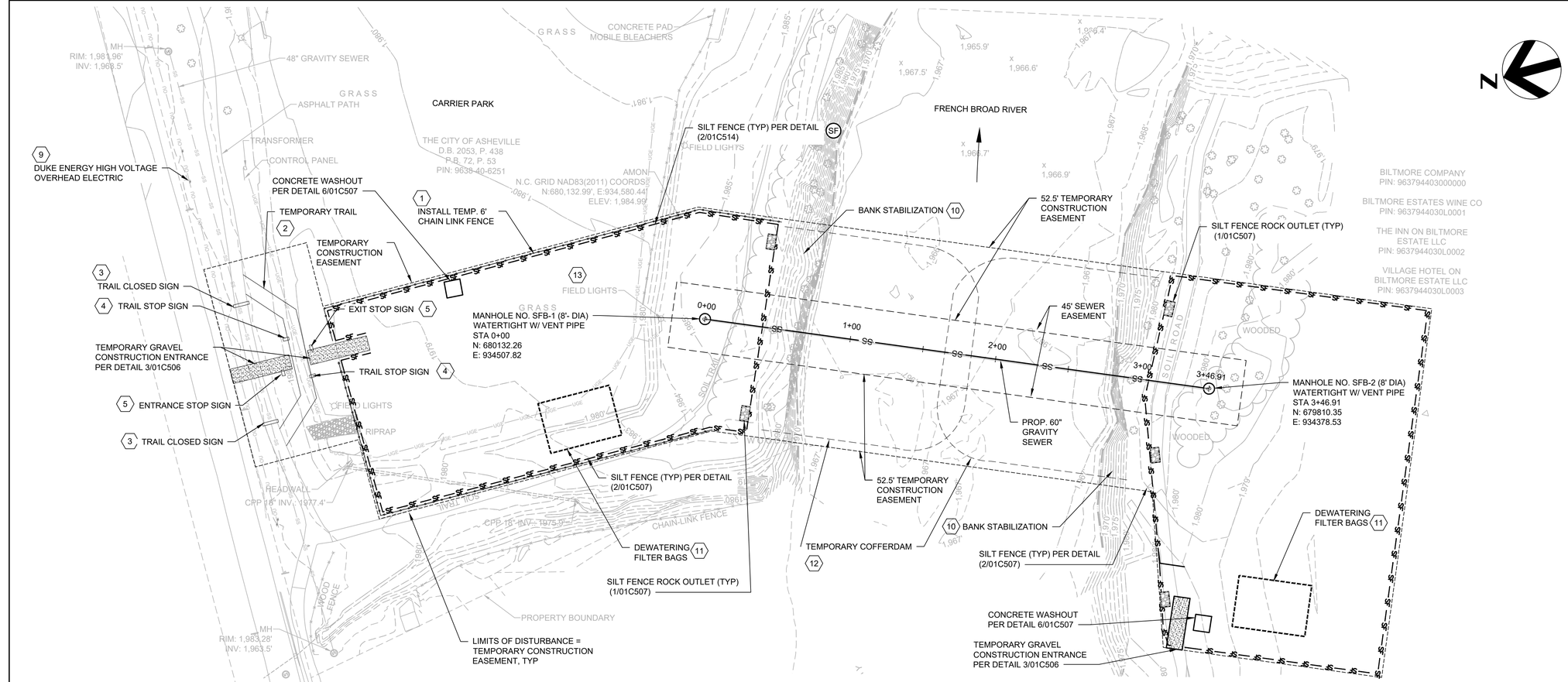
METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

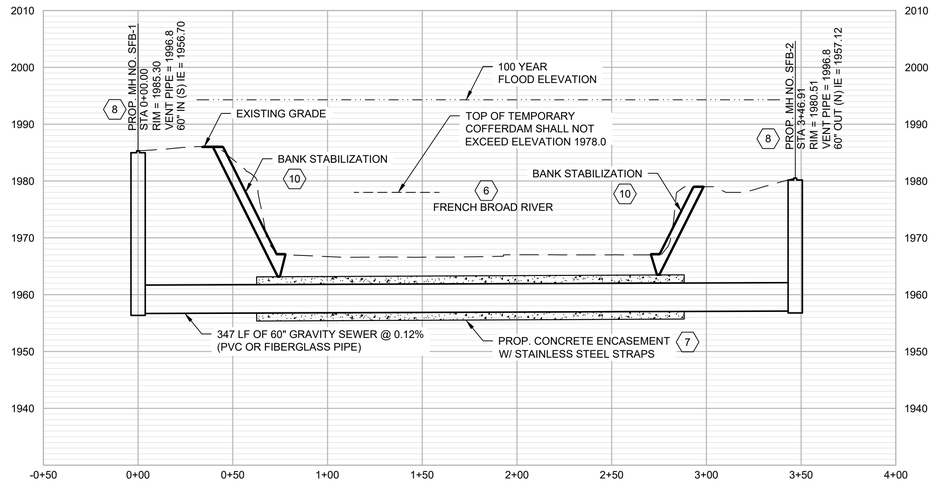
36" PARALLEL FORCE MAINS PLAN AND PROFILE

0 1" 2"

FILENAME 01C301.dwg
SCALE 1" = 40'

SHEET 01C301





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1. SURVEY COMPLETED BY ED HOLMES & ASSOCIATES LAND SURVEYORS, PA; ASHEVILLE, NC. SURVEY HAS NOT BEEN UPDATED FOLLOWING HURRICANE HELENE. CONTRACTOR SHALL REVIEW CURRENT SITE CONDITIONS.
2. TREES AND VEGETATION NOT SHOWN. ON CARRIER PARK SIDE OF THE RIVER, TREES WITHIN EASEMENT WILL BE CUT DOWN BY MSD TO 5-FEET ABOVE GRADE, CONTRACTOR SHALL REMOVE STUMPS. ON BILTMORE SIDE OF THE RIVER, CONTRACTOR SHALL CUT DOWN TREES WITHIN EASEMENT AND REMOVE STUMPS.

KEYNOTES: (#)

1. INSTALL A TEMPORARY 6' CHAIN LINK FENCE TO PROVIDE A SAFETY BARRIER BETWEEN THE PARK AND THE CONSTRUCTION ZONE.
2. CONSTRUCT TEMPORARY 10' WIDE TRAIL WITH 6" AGGREGATE BASE COURSE. FOLLOWING CONSTRUCTION OF GRAVITY SEWER, TRAIL SHALL BE REMOVED AND AREA RESEEDED.
3. INSTALL FOUR NCDOT DRUMS ACROSS THE TRAIL AND A SIGN IN THE CENTER THAT STATES "TRAIL CLOSED, USE TEMPORARY TRAIL". INCLUDE ARROW POINTING TOWARD TEMPORARY TRAIL.
4. INSTALL SIGN ON RIGHT EDGE OF TEMPORARY TRAIL THAT STATES "STOP FOR CONSTRUCTION TRUCKS". AT SIGN, SPRAY PAINT AND MAINTAIN A SOLID 2-FOOT WIDE BRIGHT WHITE LINE ACROSS FULL WIDTH OF TEMPORARY TRAIL.
5. INSTALL SIGN ON RIGHT EDGE OF ENTRANCE AND EXIT ACCESS ROAD THAT STATES "STOP FOR PEDESTRIANS". AT SIGN, SPRAY PAINT AND MAINTAIN A SOLID 2-FOOT WIDE BRIGHT WHITE LINE ACROSS FULL WIDTH OF ACCESS ROAD.
6. INSTALL PIPE UNDER THE RIVER BY OPEN CUT METHOD. SEE SHEET 01C504.
7. EXTEND CONCRETE ENCASEMENT A MINIMUM DISTANCE OF 10' BEYOND RIVER BANK TOE OF SLOPE. SEE DETAIL ON SHEET 01C504.
8. MANHOLE RIM SHALL BE SEALED AND WATERTIGHT. INSTALL VENT PIPE. SEE DETAILS ON SHEET 01C502.
9. COMPLY WITH ALL OSHA, DUKE ENERGY AND OTHER APPLICABLE GUIDELINES AND SAFETY STANDARDS FOR WORKING NEAR AND UNDER HIGH VOLTAGE ELECTRICAL LINES. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK WITH DUKE ENERGY.
10. RESTORE ALL RIVERBANK AREAS DISTURBED PER DETAIL 2/01C504. FURNISH AND INSTALL TURBIDITY CURTAIN TO CONTAIN SEDIMENT.
11. SEE DETAIL 3/01C507.
12. TEMPORARY COFFERDAM TO BE DESIGNED BY CONTRACTOR. TEMPORARY COFFERDAM SHALL NOT EXTEND BEYOND TEMPORARY EASEMENTS OR MORE THAN 55% ACROSS THE WIDTH OF THE RIVER. FURNISH AND INSTALL TURBIDITY CURTAIN TO CONTAIN SEDIMENT.
13. DO NOT DISTURB LIGHT POLE.

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27599 MATTHEW A. SHULTZ 1.22.25

METROPOLITAN SEWERAGE DISTRICT • BUNCOMBE COUNTY, NORTH CAROLINA • 1996

CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

60" SOUTH FRENCH BROAD RELIEF INTERCEPTOR PLAN & PROFILE

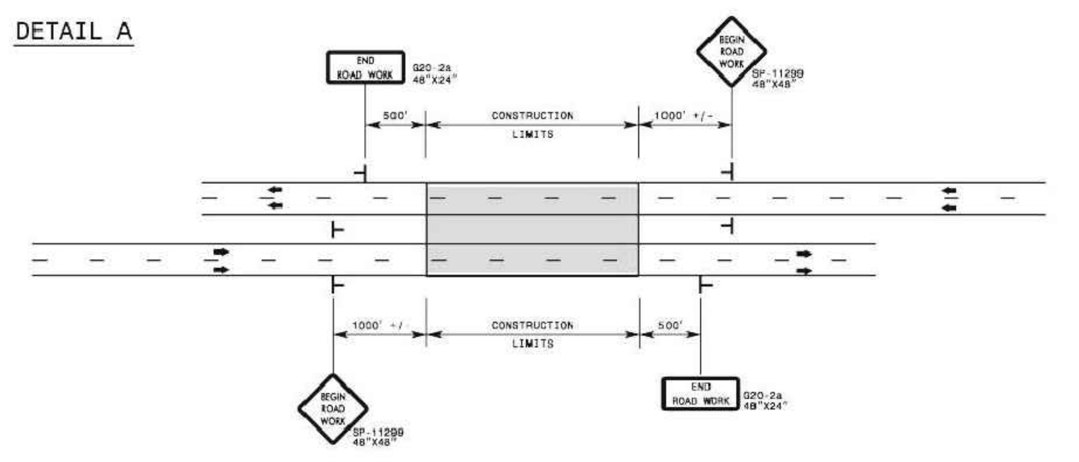
0 1" 2"

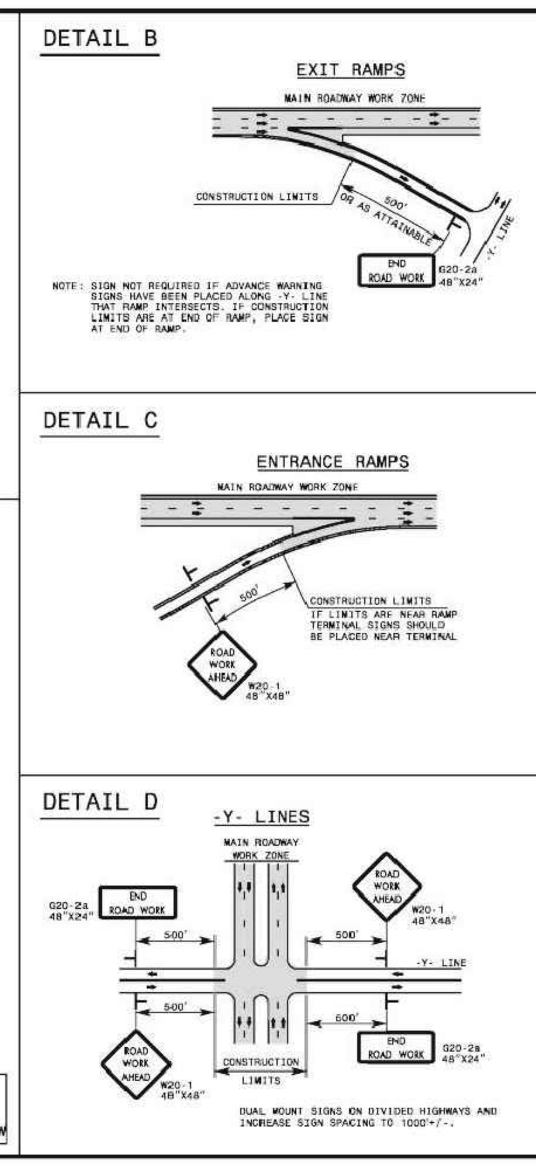
FILENAME 01C302.dwg
SCALE 1" = 40'

SHEET 01C302

1101.01 — ENGLISH STANDARD DRAWING FOR WORK ZONE ADVANCE WARNING SIGNS FOR FACILITIES ≤ 55 MPH

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — 1-12 — SHEET 2 OF 3





GENERAL NOTES

1- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS.

2- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK UNLESS COVERED.

3- SIGNS SHOWN ARE REQUIRED FOR WORK ZONES THAT WILL REMAIN IN EFFECT OVERNIGHT. FOR SHORT-TERM DAILY MAINTENANCE TYPE OPERATIONS, THIS SIGNING APPLICATION IS OPTIONAL; MAY USE ONLY APPLICABLE ROADWAY STANDARD DRAWINGS INSTEAD. HOWEVER, IF THIS SIGNING APPLICATION IS USED, SIGNS MAY BE PORTABLE MOUNTED.

4- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.

5- USE 3LB STEEL U-CHANNEL POST OR 4" X 4" WOOD POST FOR ALL WORK ZONE SIGNS. 3LB STEEL U-CHANNEL POSTS MUST MEET THE REQUIREMENTS OF STANDARD SPECIFICATION SECTION 1094-1(B), MAY BE GALVANIZED STEEL, OR MAY BE PAINTED GREEN BY THE POST MANUFACTURER. SQUARE STEEL TUBING POSTS HAVING EQUIVALENT STRENGTH OF THE 3 LB STEEL U-CHANNEL POST ARE ALSO ACCEPTABLE FOR USE. ERECT SIGNS PER ROADWAY STANDARD DRAWING 1110.01. PAYMENT FOR WOOD POSTS, 3LB STEEL U-CHANNEL AND SQUARE STEEL TUBING POSTS WITH SIGNS WILL BE MADE ACCORDING TO STANDARD SPECIFICATION "WORK ZONE SIGNS" SECTION 1110.

6- WHEN NECESSARY, USE SPLICING IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1110.01.

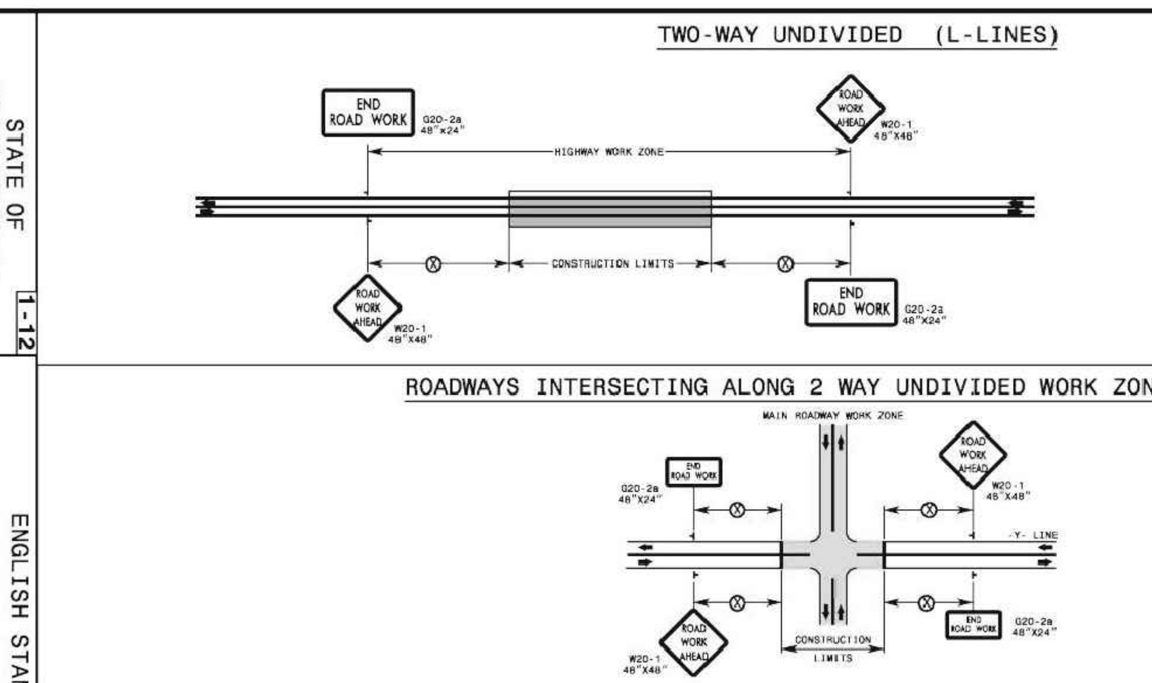
7- DO NOT BACK BRACE SIGN SUPPORTS.

8- TWO-WAY UNDIVIDED ADVANCE WARNING SIGN CONFIGURATION MAY BE USED ON URBAN MULTI-LANE FACILITIES WHERE CONDITIONS LIMIT THE USE OF DUAL MOUNTED SIGNS AS DETERMINED BY THE ENGINEER.

LEGEND
- ⊢ STATIONARY SIGN
- ← DIRECTION OF TRAFFIC FLOW

1101.01 — ENGLISH STANDARD DRAWING FOR DETAIL DRAWING FOR TWO-WAY UNDIVIDED WORK ZONE WARNING SIGNS

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — 1-12 — SHEET 3 OF 3



POSTED SPEED LIMIT (MPH)	RECOMMENDED MINIMUM SIGN SPACING ⊗
≤ 60	500'
55	1000'

GENERAL NOTES

1- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS.

2- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK, UNLESS COVERED.

3- SIGNS SHOWN ARE REQUIRED FOR WORK ZONES THAT WILL REMAIN IN EFFECT OVERNIGHT. FOR SHORT-TERM DAILY MAINTENANCE TYPE OPERATIONS, THIS SIGNING APPLICATION IS OPTIONAL; MAY USE ONLY APPLICABLE ROADWAY STANDARD DRAWINGS INSTEAD. HOWEVER, IF THIS SIGNING APPLICATION IS USED, SIGNS MAY BE PORTABLE MOUNTED.

4- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.

5- USE 3LB STEEL U-CHANNEL POST OR 4" X 4" WOOD POST FOR ALL WORK ZONE SIGNS. 3LB STEEL U-CHANNEL POSTS MUST MEET THE REQUIREMENTS OF STANDARD SPECIFICATION SECTION 1094-1(B), MAY BE GALVANIZED STEEL, OR MAY BE PAINTED GREEN BY THE POST MANUFACTURER. SQUARE STEEL TUBING POSTS HAVING EQUIVALENT STRENGTH OF THE 3 LB STEEL U-CHANNEL POST ARE ALSO ACCEPTABLE FOR USE. ERECT SIGNS PER ROADWAY STANDARD DRAWING 1110.01. PAYMENT FOR WOOD POSTS, 3LB STEEL U-CHANNEL AND SQUARE STEEL TUBING POSTS WITH SIGNS WILL BE MADE ACCORDING TO STANDARD SPECIFICATION "WORK ZONE SIGNS" SECTION 1110.

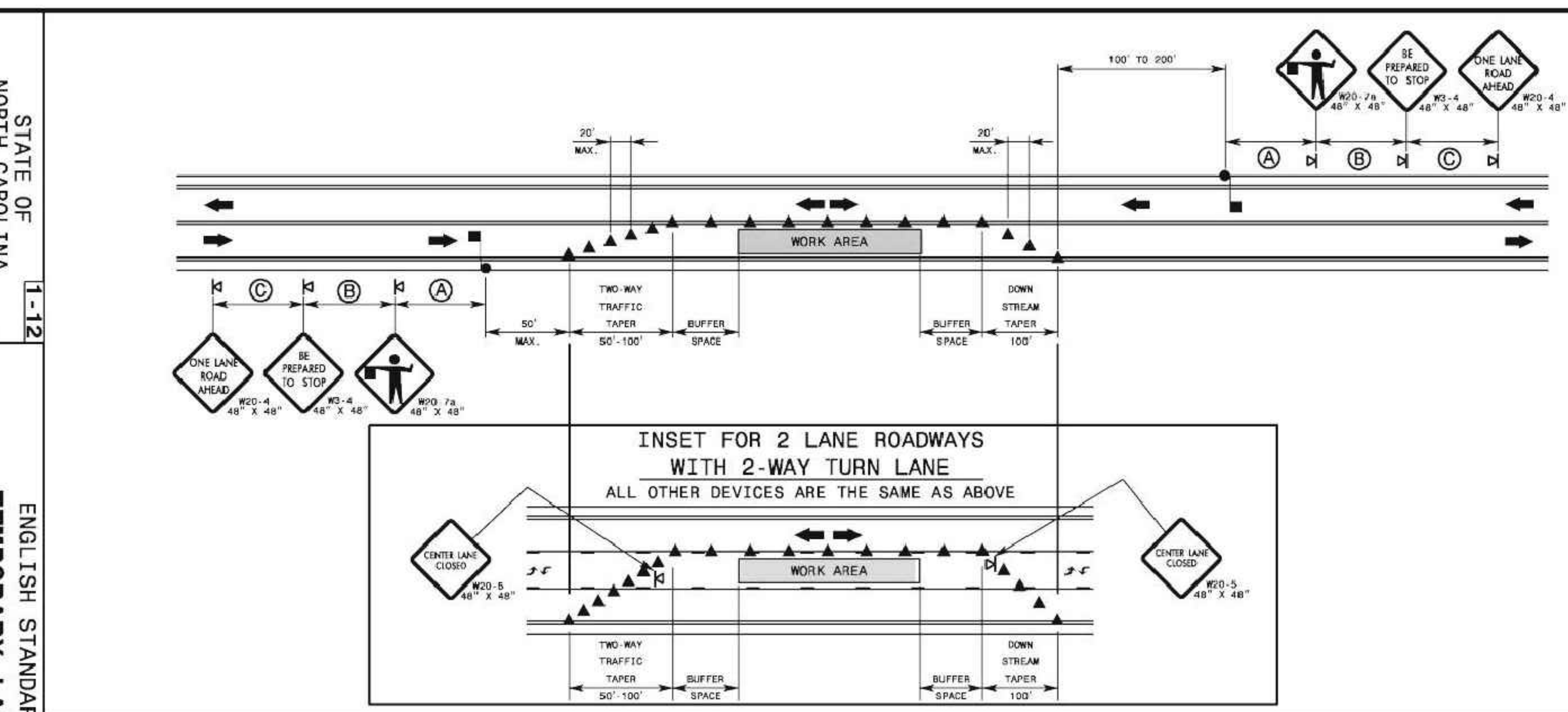
6- WHEN NECESSARY, USE SPLICING IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1110.01.

7- DO NOT BACK BRACE SIGN SUPPORTS.

LEGEND
- ⊢ STATIONARY SIGN
- ← DIRECTION OF TRAFFIC FLOW

1101.02 — ENGLISH STANDARD DRAWING FOR TEMPORARY LANE CLOSURES 2-LANE, 2-WAY ROADWAY-1 LANE CLOSED

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — 1-12 — SHEET 1 OF 15



GENERAL NOTES FOR FLAGGER OPERATIONS

1- REFER TO STD. 1101.11 SHEET 4 FOR SIGN SPACING.

2- INSTALL LANE CLOSURES WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC.

3- REMOVE LANE CLOSURES AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.

4- PLACE CONES THRU THE WORK AREA AT THE MAXIMUM SPACING EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.

5- EXTEND LANE CLOSURES AT THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE IS PROVIDED TO THE FLAGGER (REFER TO STD. 1101.11 SHEET 2).

6- DO NOT STOP TRAFFIC IN ANY ONE DIRECTION FOR MORE THAN 5 MINUTES AT A TIME.

7- DRUMS OR SKINNY-DRUMS MAY BE USED IN LIEU OF CONES. REFER TO ROADWAY STANDARD DRAWING 1180.01 FOR SKINNY-DRUM REQUIREMENTS.

8- USE FLAGGERS TO CONTROL TRAFFIC AT INTERSECTIONS AFFECTED BY THE LANE CLOSURE. SUPPLEMENT FLAGGERS LOCATED AT INTERSECTIONS WITH FLAGGER AHEAD SIGNS (W20-7a) PLACED APPROXIMATELY 250 FT. IN ADVANCE OF THE FLAGGER. FOR SIGNALIZED INTERSECTIONS PLACE SIGNALS IN THE FLASH MODE AND RECOMMEND THE USE OF LAW ENFORCEMENT.

9- REFER TO 2009 MUTCD, CHAPTER 6, FOR FLAGGER CONTROL, REQUIREMENTS, AND PROCEDURES.

10- DO NOT EXCEED A 1 MILE LANE CLOSURE LENGTH UNLESS OTHERWISE SHOWN IN THE TMP OR AS DIRECTED BY THE ENGINEER.

GENERAL NOTES FOR PILOT CAR OPERATIONS

1- USE PILOT CARS WHEN DIRECTED BY THE ENGINEER.

2- IF ROADWAY WIDTH IS LESS THAN 22 FEET (EOP TO EOP), CONES MAY NOT BE REQUIRED ALONG WORK AREA, AND AT THE DISCRETION OF THE ENGINEER, CONES MAY BE OMITTED ALONG THE WORK AREA IF USING A PILOT CAR.

3- CONES ARE ALWAYS REQUIRED IN THE UPSTREAM AND DOWNSTREAM TAPERS.

4- MOUNT SIGN G20-4 "PILOT CAR FOLLOW ME" AT A CONSPICUOUS POSITION ON THE REAR OF THE PILOT VEHICLE.

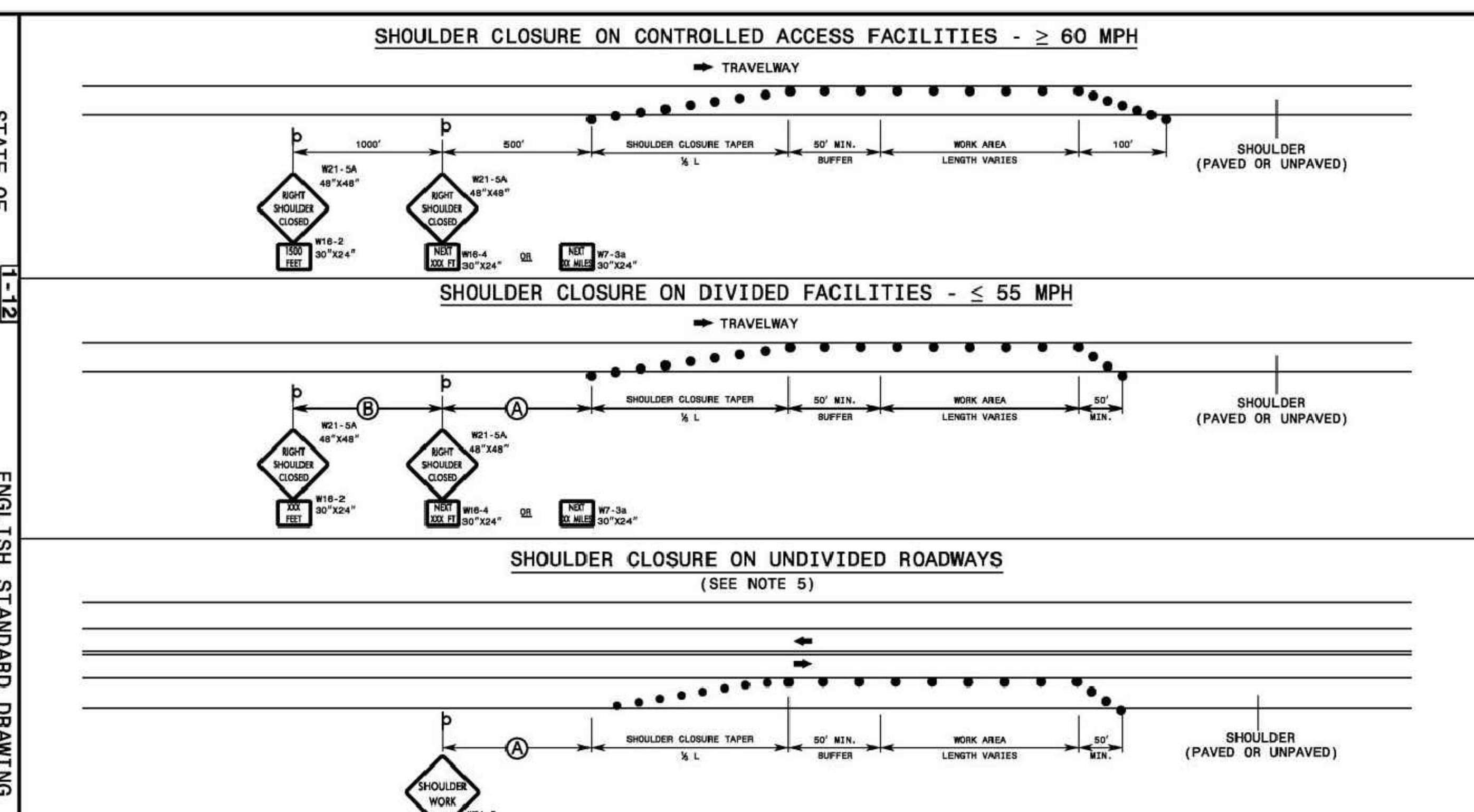
5- DO NOT INSTALL MORE THAN ONE (1) MILE OF LANE CLOSURE, MEASURED FROM THE BEGINNING OF THE MERGE TAPER TO THE END OF THE LANE CLOSURE.

6- ADVISE RESIDENTS AND BUSINESSES WITHIN THE LANE CLOSURE LIMITS ABOUT METHODS OF SAFE EGRESS AND INGRESS FROM DRIVEWAYS DURING FLAGGING AND PILOT CAR OPERATIONS.

LEGEND
- FLAGGER
- ▲ CONE
- PORTABLE SIGN
- ← DIRECTION OF TRAFFIC FLOW

1101.04 — ENGLISH STANDARD DRAWING FOR TEMPORARY SHOULDER CLOSURES

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — 1-12 — SHEET 1 OF 1



GENERAL NOTES

1- PLACE SHOULDER CLOSURE SIGNS ON THE SAME SIDE AS THE SHOULDER THAT IS CLOSED.

2- PLACE DRUMS IN THE SHOULDER TAPER AT THE MAXIMUM SPACING EQUAL IN FEET TO THE POSTED SPEED LIMIT. THE MAXIMUM SPACING OF DRUMS ALONG THE WORK AREA IS EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.

3- USE STATIONARY SIGNS FOR LONG TERM OPERATIONS (LONGER THAN 3 DAYS).

4- REFER TO STD. 1101.11 FOR "L" DISTANCE AND SIGN SPACING.

5- THE TWO-LANE, TWO-WAY DRAWING MAY BE APPLIED TO UNDIVIDED, MULTI-LANE FACILITIES.

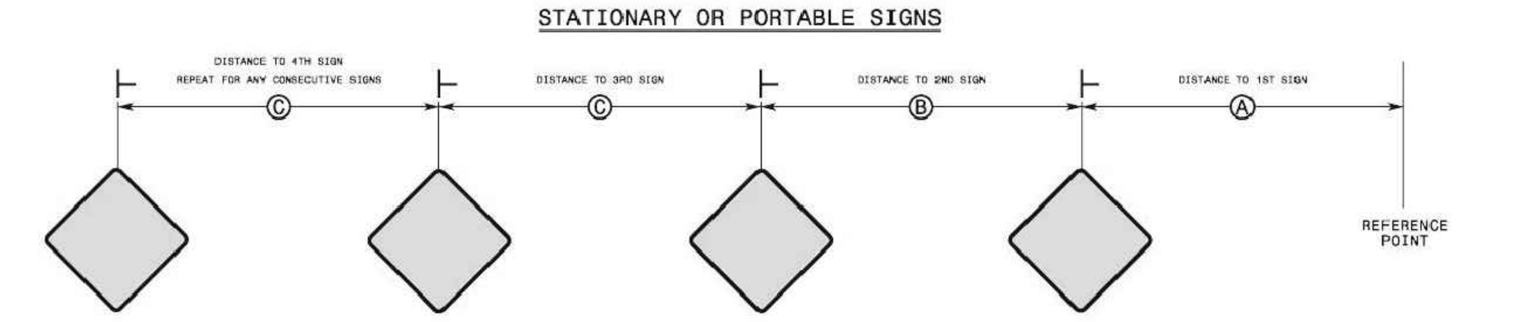
LEGEND
- ● DRUM
- STATIONARY OR PORTABLE SIGN
- → DIRECTION OF TRAFFIC FLOW

1101.11 — ENGLISH STANDARD DRAWING FOR TRAFFIC CONTROL DESIGN TABLES SPACING OF TEMPORARY SIGNS IN SERIES

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — 1-12 — SHEET 4 OF 4

ADVANCE WARNING SIGN SPACING CHART

POSTED SPEED LIMIT (MPH)	RECOMMENDED DISTANCE BETWEEN SIGNS (FEET)± Ⓐ	Ⓑ	Ⓒ
≤ 35	200	200	200
40-50	350	350	350
55	500	500	500
CONTROLLED ACCESS ROADS (≥ 55)	1000	1500	2700



GENERAL NOTES

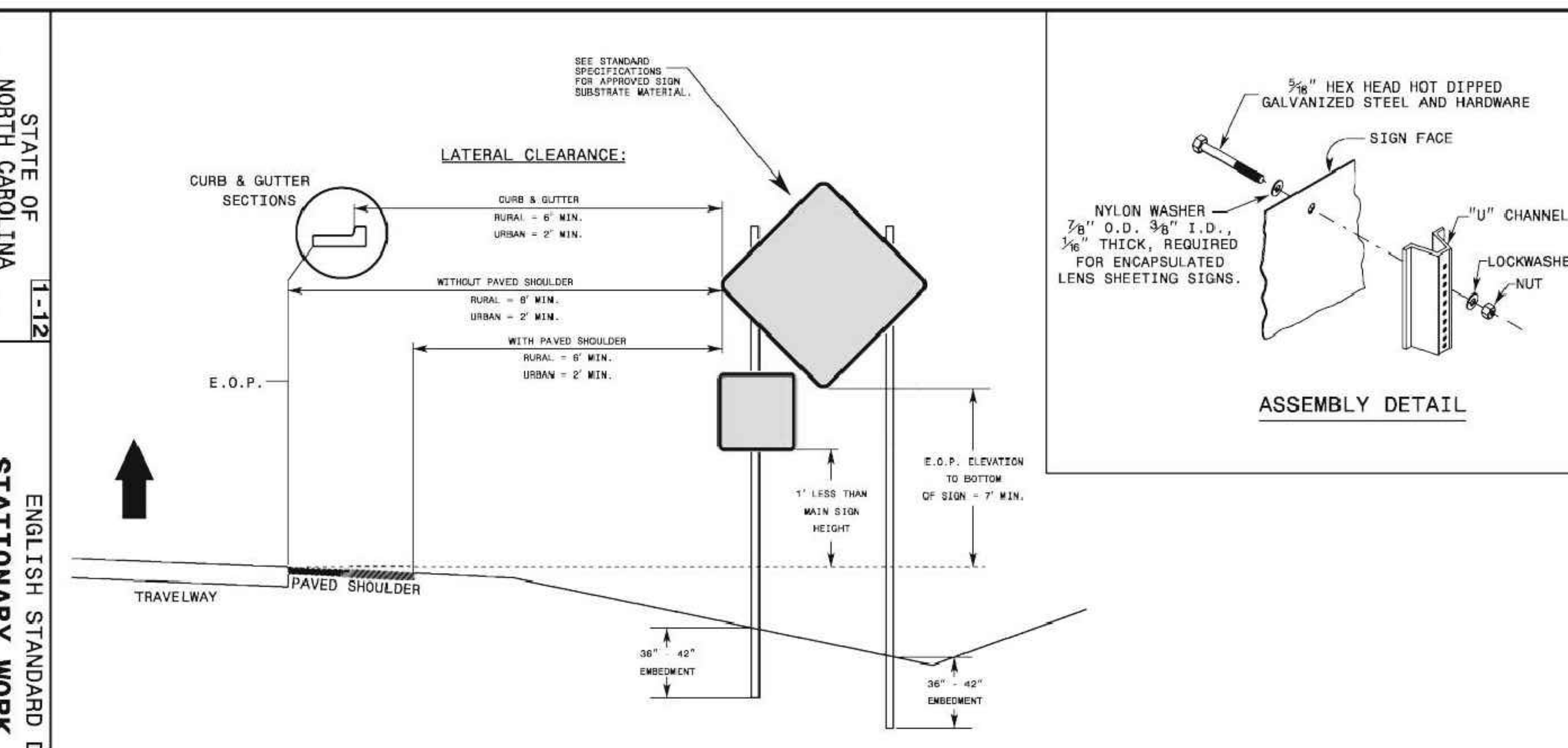
1- REFER TO 2009 MUTCD.

2- USE THIS STANDARD DRAWING IN CONJUNCTION WITH OTHER TRAFFIC CONTROL ROADWAY STANDARD DRAWINGS WHERE SIGN SPACING DISTANCES A, B, C, ARE SPECIFIED.

3- APPLY THE ADVANCE WARNING SIGN SPACING CHART WHERE A SERIES OF 2 OR MORE SIGNS ARE USED. ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE. FIELD ADJUST AS VARIOUS CONDITIONS OCCUR, SUCH AS LIMITED SIGHT DISTANCE, OBSTRUCTION INTERFERENCE, ETC.

1110.01 — ENGLISH STANDARD DRAWING FOR STATIONARY WORK ZONE SIGNS MOUNTING HEIGHT & LATERAL CLEARANCE

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — 1-12 — SHEET 1 OF 3



GENERAL NOTES

1- DIMENSIONS SHOWN ARE MINIMUM VALUES. WHEN SIGNS ARE MOUNTED BEHIND TRAFFIC CONTROL DEVICES SUCH AS DRUMS, BARRIER, OR OTHER OBJECTS THAT DETRACT FROM THEIR VISIBILITY, MOUNT THE SIGNS AT AN APPROPRIATE HEIGHT SUCH THAT THEY ARE CLEARLY VISIBLE TO APPROACHING TRAFFIC.

2- MOUNT SIGNS THAT ARE LARGER THAN 10 SQUARE FEET IN AREA ON TWO OR MORE WOOD OR U-CHANNEL SUPPORTS. PERFORATED SQUARE TUBING SUPPORT SYSTEMS MAY SUPPORT LARGER AREAS ON A SINGLE SUPPORT. FOLLOW MANUFACTURER'S RECOMMENDATIONS. THESE SYSTEMS SHALL BE NCHRP 350 COMPLIANT AND NCDOT APPROVED.

3- SEE STANDARD SPECIFICATION 1089-1 FOR WORK ZONE SIGNS.

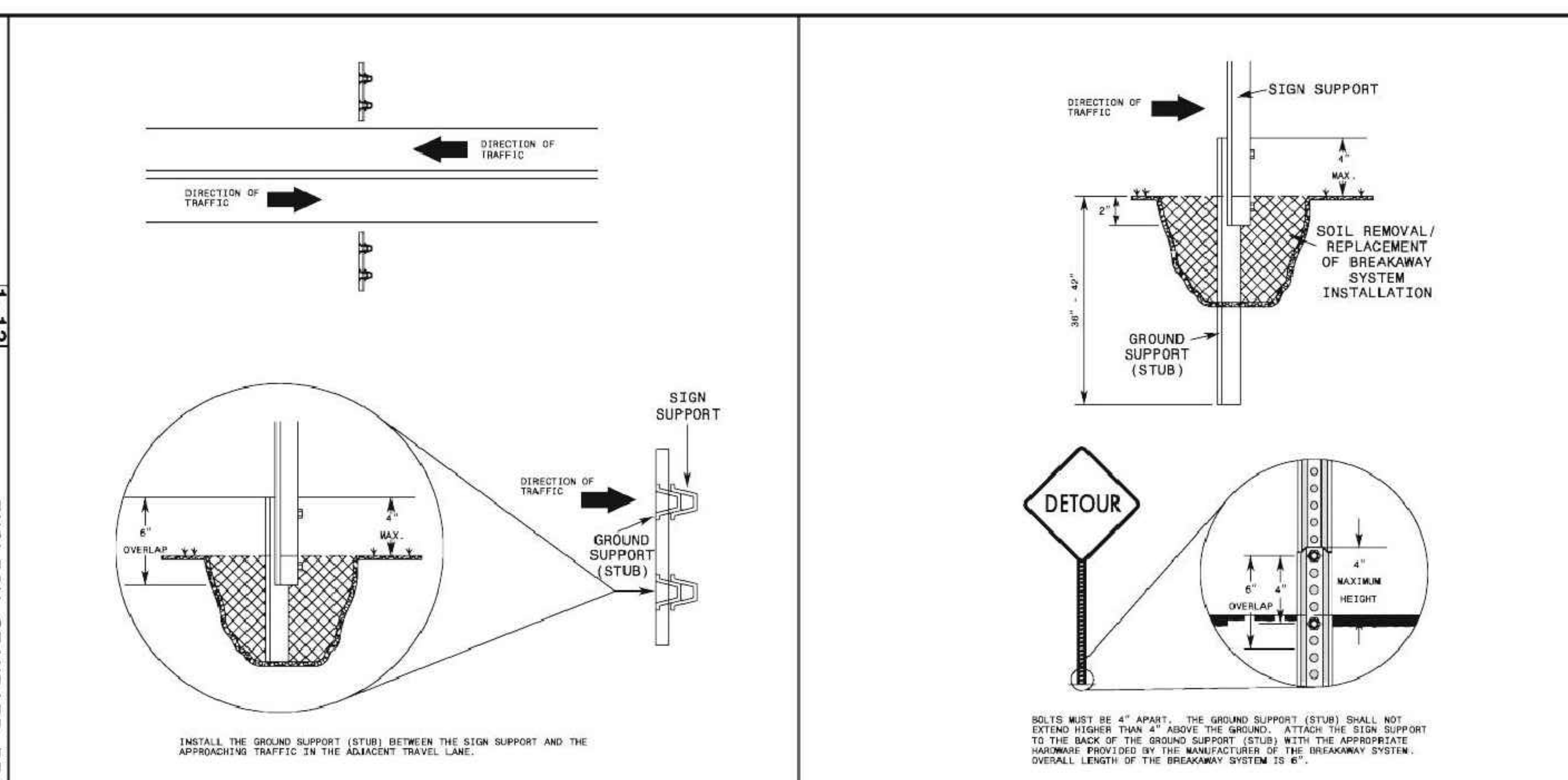
4- SEE STANDARD SPECIFICATION 1089-2 FOR WORK ZONE SIGN SUPPORTS.

5- SEE ROADWAY STANDARD DRAWING 903.20 FOR WOOD POSTS.

6- SEE STANDARD SPECIFICATION 903-1 FOR WOOD SUPPORTS.

1110.01 — ENGLISH STANDARD DRAWING FOR STATIONARY WORK ZONE SIGNS SPLICING DETAIL

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — 1-12 — SHEET 2 OF 3



GENERAL NOTES

1- ALL TRAFFIC CONTROL DEVICES, INCLUDING BREAKAWAY SYSTEMS FOR GROUND MOUNTED SIGN SUPPORTS, COMPLY WITH ALL NCHRP REPORT 350 REQUIREMENTS AND SHALL BE APPROVED BY THE DEPARTMENT. ALL APPROVED TRAFFIC CONTROL DEVICES ARE ON THE DEPARTMENT'S WEB SITE AT: https://apps.dot.state.nc.us/vendor/approvedproducts.

2- INSTALL THE BREAKAWAY SYSTEM TO FUNCTION PROPERLY IN ACCORDANCE WITH THE DIRECTION OF TRAFFIC ADJACENT TO THE SIGN.

3- FOR PERFORATED SQUARE TUBING BREAKAWAY SYSTEMS, FOLLOW THE MANUFACTURER'S RECOMMENDATIONS FOR ANCHOR EMBEDMENT DEPTHS AND POST ATTACHMENT REQUIREMENTS.

3 LB. U-CHANNEL SPLICING REQUIREMENTS

1- WHEN SIGN IS REMOVED AT THE END OF PROJECT, REMOVE THE GROUND SUPPORT (STUB).

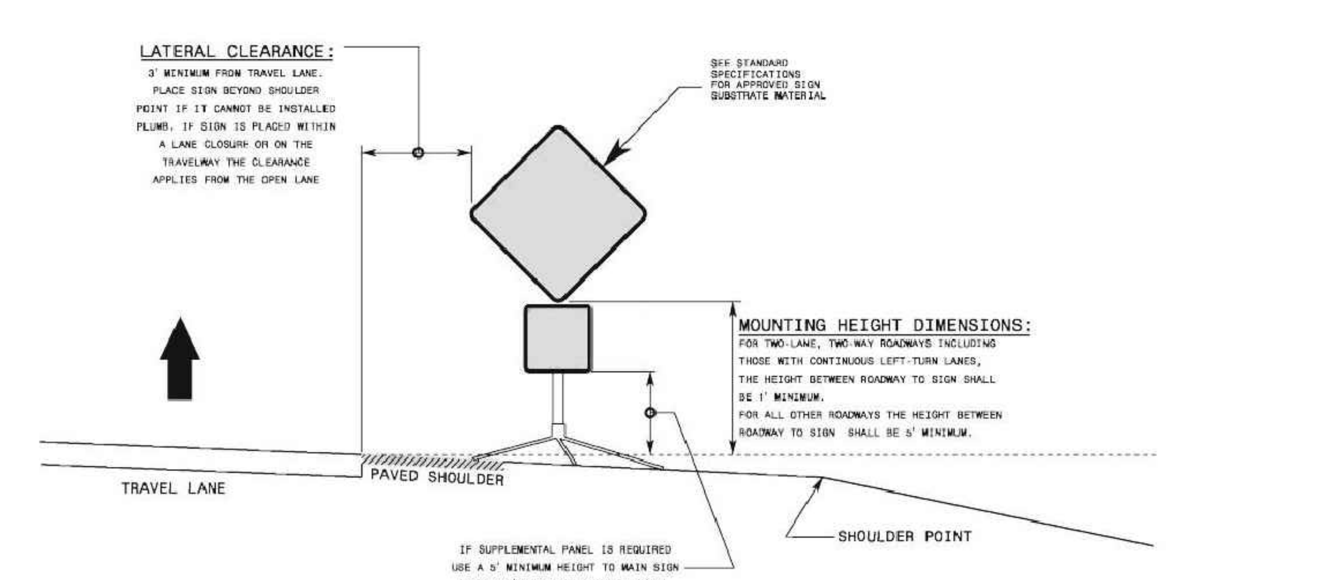
2- WHEN SPLICING A U-CHANNEL SUPPORT, INSTALL THE GROUND SUPPORT (STUB) APPROXIMATELY 36" TO 42" INTO THE GROUND WHILE LEAVING NO MORE THAN 4" ABOVE THE EXISTING GROUND ELEVATION. REMOVE ENOUGH SOIL FROM AROUND THE GROUND SUPPORT (STUB) TO PERMIT ACCESS TO THE HOLES FOR THE BREAKAWAY SYSTEM. ONCE THE BREAKAWAY SYSTEM IS TIGHTENED, REPLACE THE SOIL AND TAMP.

3- OVERALL LENGTH OF THE BREAKAWAY SYSTEM IS 6". BOLTS MUST BE 4" APART. ATTACH THE SIGN SUPPORT TO THE BACK OF THE GROUND SUPPORT (STUB) WITH THE APPROPRIATE HARDWARE SUPPLIED BY THE MANUFACTURER OF THE BREAKAWAY SYSTEM.

4- INSTALL U-CHANNEL BREAKAWAY SYSTEMS SO THE GROUND SUPPORT (STUB) IS INSTALLED ON THE APPROACH SIDE OF TRAFFIC WHILE THE SIGN SUPPORT IS ATTACHED/SPLICED BEHIND THE GROUND SUPPORT (STUB).

1110.02 — ENGLISH STANDARD DRAWING FOR PORTABLE WORK ZONE SIGNS MOUNTING HEIGHT & LATERAL CLEARANCE

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — 1-12 — SHEET 1 OF 1



GENERAL NOTES

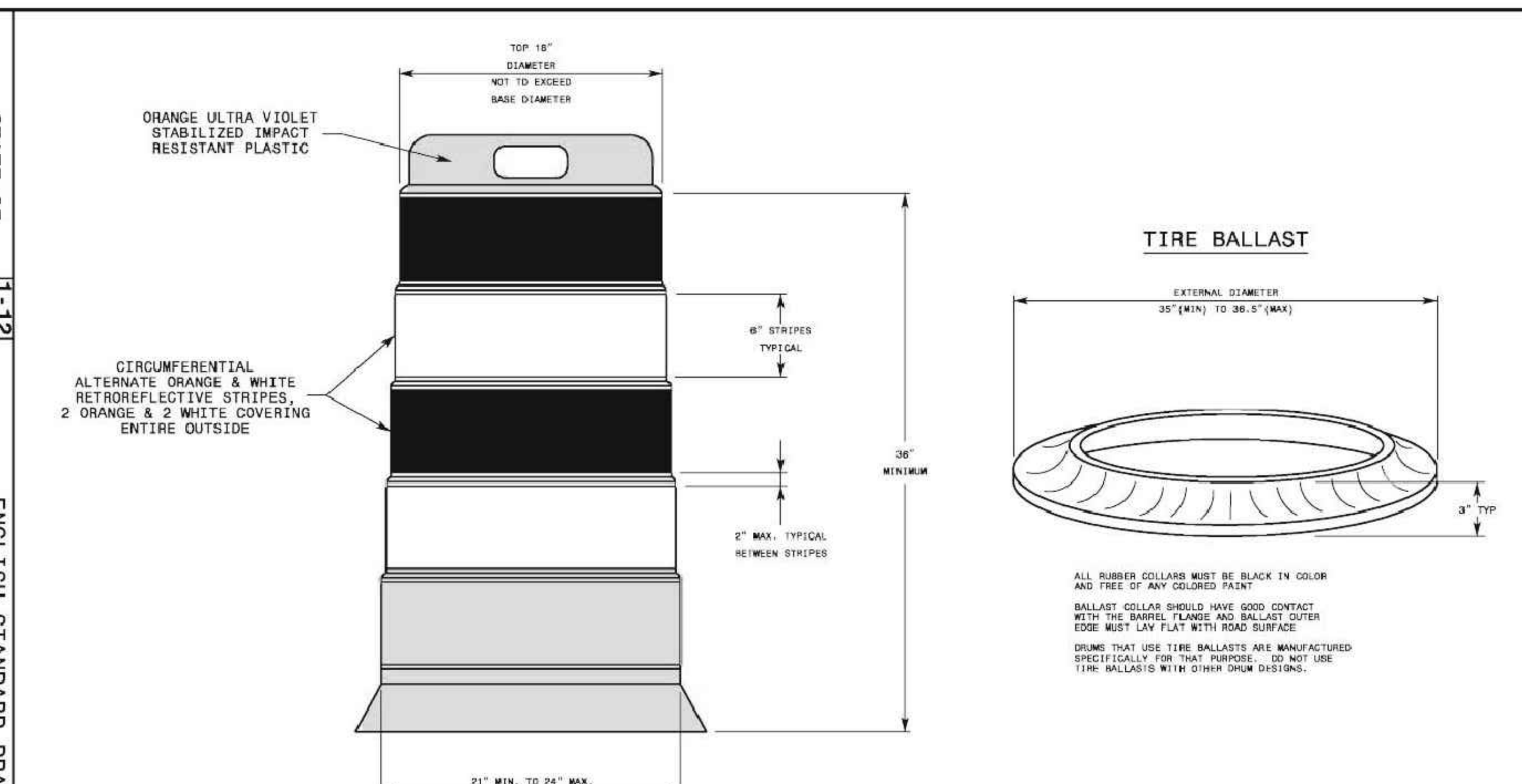
1- DIMENSIONS SHOWN ARE MINIMUM VALUES. MOUNT SIGNS SO THEY WILL BE CLEARLY VISIBLE TO APPROACHING TRAFFIC EVEN WHEN SIGNS ARE MOUNTED BEHIND TRAFFIC CONTROL DEVICES SUCH AS DRUMS, BARRIER, OR OTHER OBJECTS.

2- ALL PORTABLE SIGNS AND STANDS MUST MEET OR EXCEED THE REQUIREMENTS OF NCHRP 350 FOR CATEGORY II DEVICES. USE PORTABLE WORK ZONE SIGNS AND STANDS SPECIFICALLY DESIGNED FOR ONE ANOTHER.

3- ALL PORTABLE WORK ZONE SIGNS AND STANDS MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST AT https://apps.dot.state.nc.us/vendor/approvedproducts.

1130.01 — ENGLISH STANDARD DRAWING FOR DRUM

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. — 1-12 — SHEET 1 OF 1



GENERAL NOTES

1- BALLASTING SHALL BE ACHIEVED BY THE SAND BAG, TIRE-SIDEWALL, OR PREFORMED WEIGHTED BASE METHODS. USE THE TIRE BALLAST AS SPECIFIED BY THE MANUFACTURER. DO NOT PLACE BALLAST ON TOP OF THE DRUM.

2- IF NECESSARY PLACE THE NAME OF THE AGENCY, CONTRACTOR, OR SUPPLIER ON NON-RETROREFLECTIVE DRUM SURFACES. SHOW THE LETTERS AND NUMBERS USING A NON-RETROREFLECTIVE COLOR AND NOT OVER 2" IN HEIGHT.

3- USE TYPE 3 OR HIGHER HIGH INTENSITY PRISMATIC SHEETING.

4- SEE THE DEPARTMENT'S APPROVED PRODUCT LIST AT https://apps.dot.state.nc.us/vendor/approvedproducts.

5- REFER THE STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES FOR ADDITIONAL INFORMATION.

HDR Engineering Inc.
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Charlotte, NC 28202
704.338.6700
N.C.B.E.L.S. License Number: F-0116

ISSUE	DATE	DESCRIPTION
	01/2025	ISSUED FOR BIDS

PROJECT MANAGER MATTHEW A. SHULTZ, P.E.
DESIGNED BY M. SHULTZ, P.E.
CHECKED BY C. SMITH, P.E.
DRAWN BY J. KROOSWYK
PROJECT NUMBER 10194380

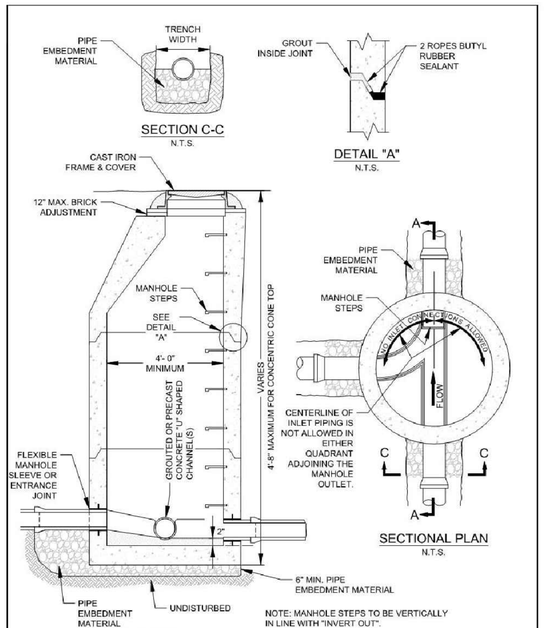
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27599 MATTHEW A. SHULTZ 1.22.25

CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

CIVIL DETAILS 1

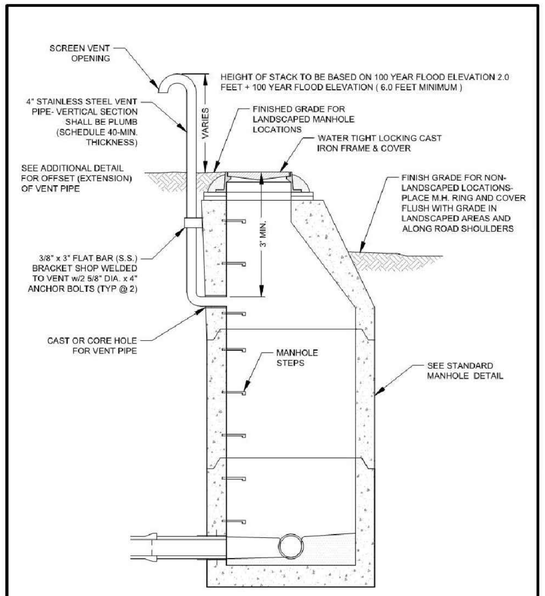
FILENAME 01C501.DWG
SCALE NOT TO SCALE
SHEET 01C501



MANHOLE NOTES:

1. FOR MANHOLES LARGER THAN 4 FT. DIA., MAINTAIN FULL MANHOLE DIA. TO 6 FT. ABOVE INVERT BENCH.
2. FOR 5 FT. AND 6 FT. DIA. MANHOLES, USE A TRANSITION CONE TO REDUCE TO 4 FT. DIA. FOR 7 FT. TO 10 FT. DIA. MANHOLES, USE A TRANSITION TOP TO REDUCE TO 4 FT. DIA.

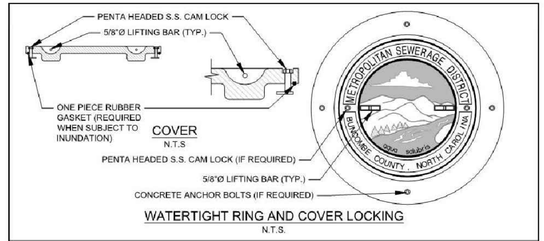
STANDARD DETAIL	
Metropolitan Sewerage District of Buncombe County, North Carolina	
STANDARD MANHOLE	
DATE APPROVED: MARCH 2017	2.11 - 01

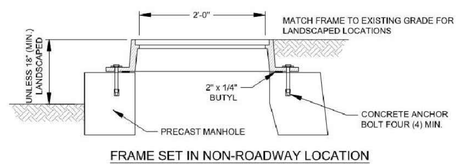


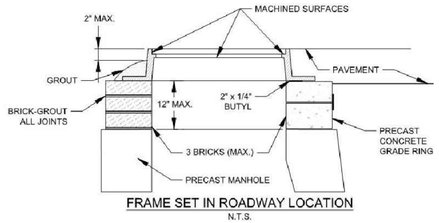
NOTES:

1. 4" VENT PIPE, STRAPS AND ANCHOR BOLTS SHALL BE STAINLESS STEEL
2. MANHOLE STEPS TO BE VERTICALLY IN LINE WITH "INVERT OUT" FOR PIPE 18" AND LESS. OVER 18" TO BE LOCATED IN LINE WITH BENCH.

STANDARD DETAIL	
Metropolitan Sewerage District of Buncombe County, North Carolina	
STANDARD MANHOLE WITH VENT STACK	
DATE APPROVED: MARCH 2017	2.11 - 04



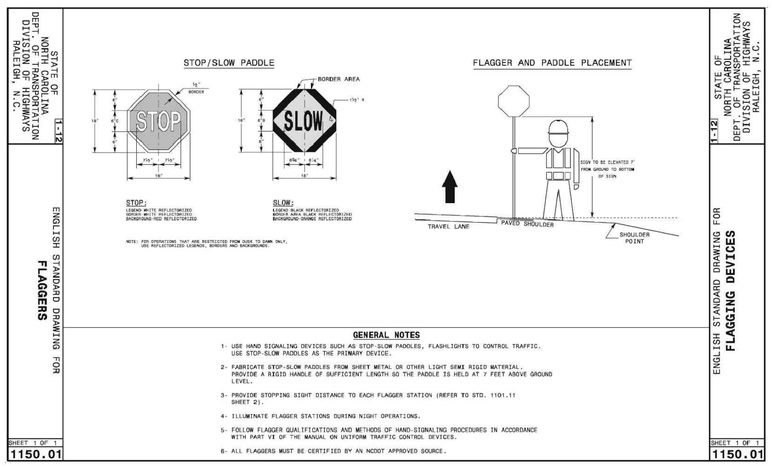




NOTE:

1. WATERTIGHT FRAME & COVER REQUIRED IN FLOODPLAIN OR WHEN SPECIFIED ON PLANS
2. "MSD OF BUNCOMBE COUNTY" TO APPEAR ON COVERS ONLY WHEN THE SEWER SYSTEM IS TO BE MAINTAINED BY MSD

STANDARD DETAIL	
Metropolitan Sewerage District of Buncombe County, North Carolina	
WATERTIGHT MANHOLE FRAME & COVER	
DATE APPROVED: MARCH 2017	2.11 - 08.2



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N.C.B.E.L.S. License Number: F-0116

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CHECKED BY	C. SMITH, P.E.
DRAWN BY	J. KROOSWYK
PROJECT NUMBER	10194380

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27599 MATTHEW A. SHULTZ 1.22.25

CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

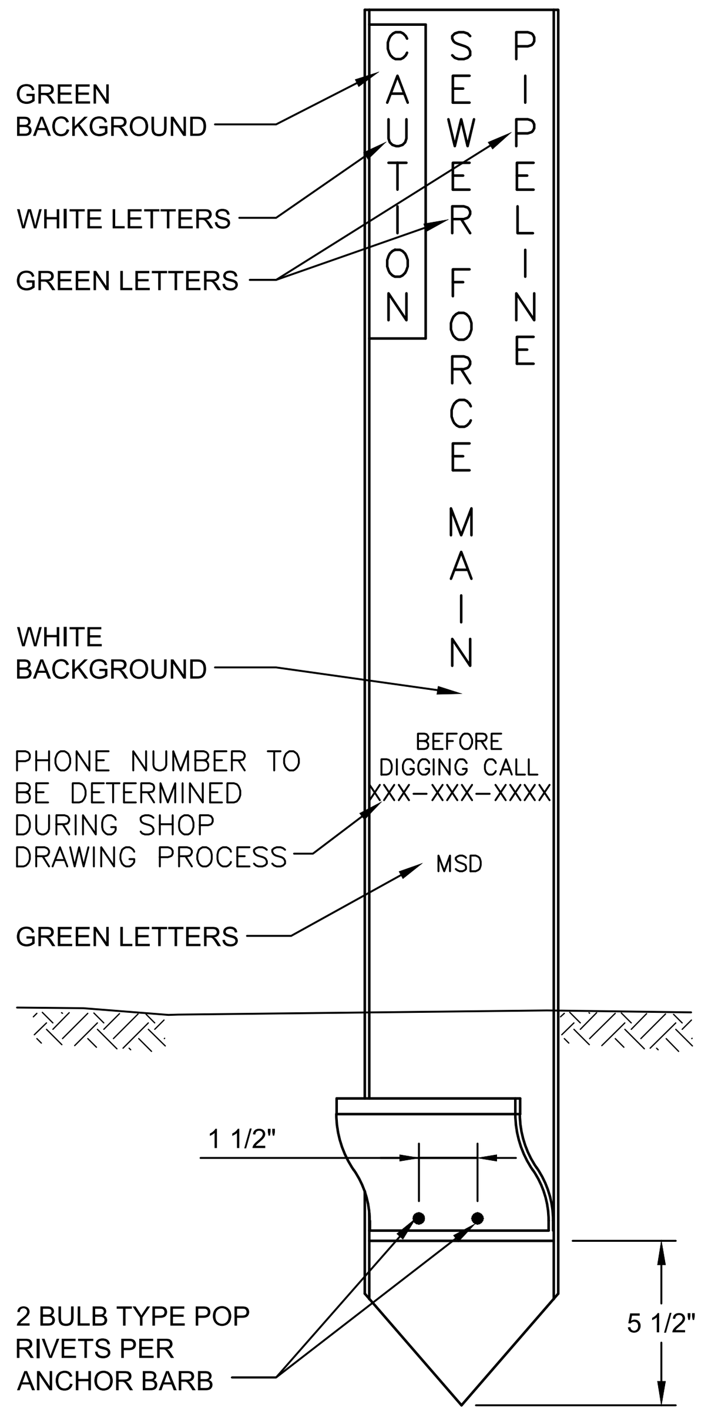
METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

CIVIL DETAILS 2

0 1" 2"

FILENAME	01C502.DWG
SCALE	NOT TO SCALE

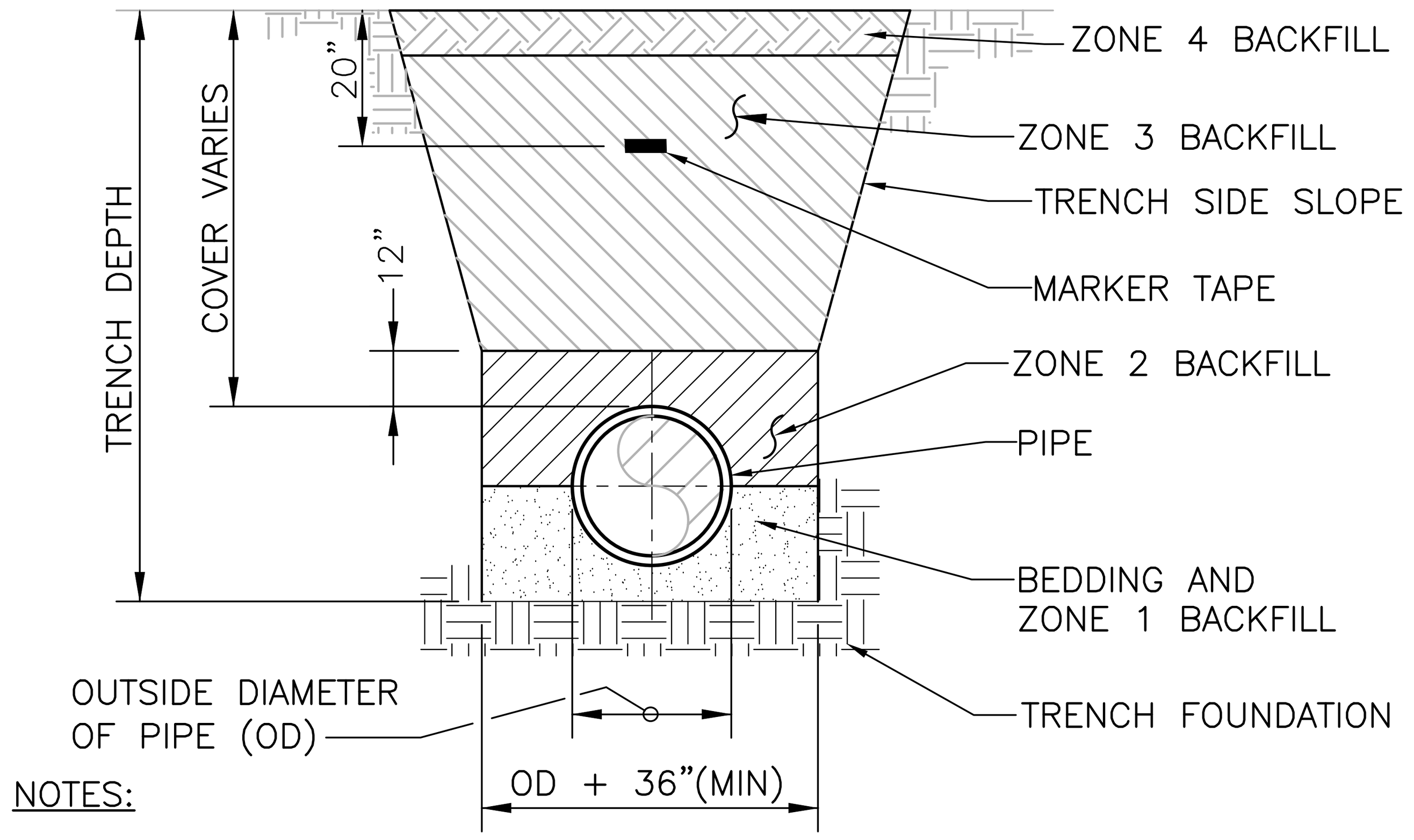
SHEET **01C502**



NOTES:

1. MARKERS SHALL BE CARSONITE TYPE CUM-375 OR APPROVED EQUAL. MARKERS SHALL BE PIGMENTED WITH U.V. RESISTANT RESINS OR COATED WITH CLEAR UV RESISTANT COATING.
2. DECALS SHALL BE AS SHOWN AND PROVIDED ON U.V. RESISTANT BACKING WITH TEXT CONFORMING TO THE FEDERAL OFFICE OF PIPELINE SAFETY STANDARDS AND DENOTING THE STANDARD NO-DIG SYMBOL.
3. MARKERS SHALL EXTEND 4-FEET ABOVE GRADE.
4. MARKERS SHALL BE INSTALLED WITH MANUFACTURER'S APPROVED MARKER DRIVER. BURIED DEPTH SHALL BE 24" MINIMUM FOR LOOSE, SANDY, OR MARSHY SOILS AND 18" MINIMUM FOR HARD OR ROCKY SURFACES.
5. MARKERS SHALL BE INSTALLED AT LOCATIONS INDICATED ON THE DRAWINGS, OR AS DIRECTED BY THE OWNER.

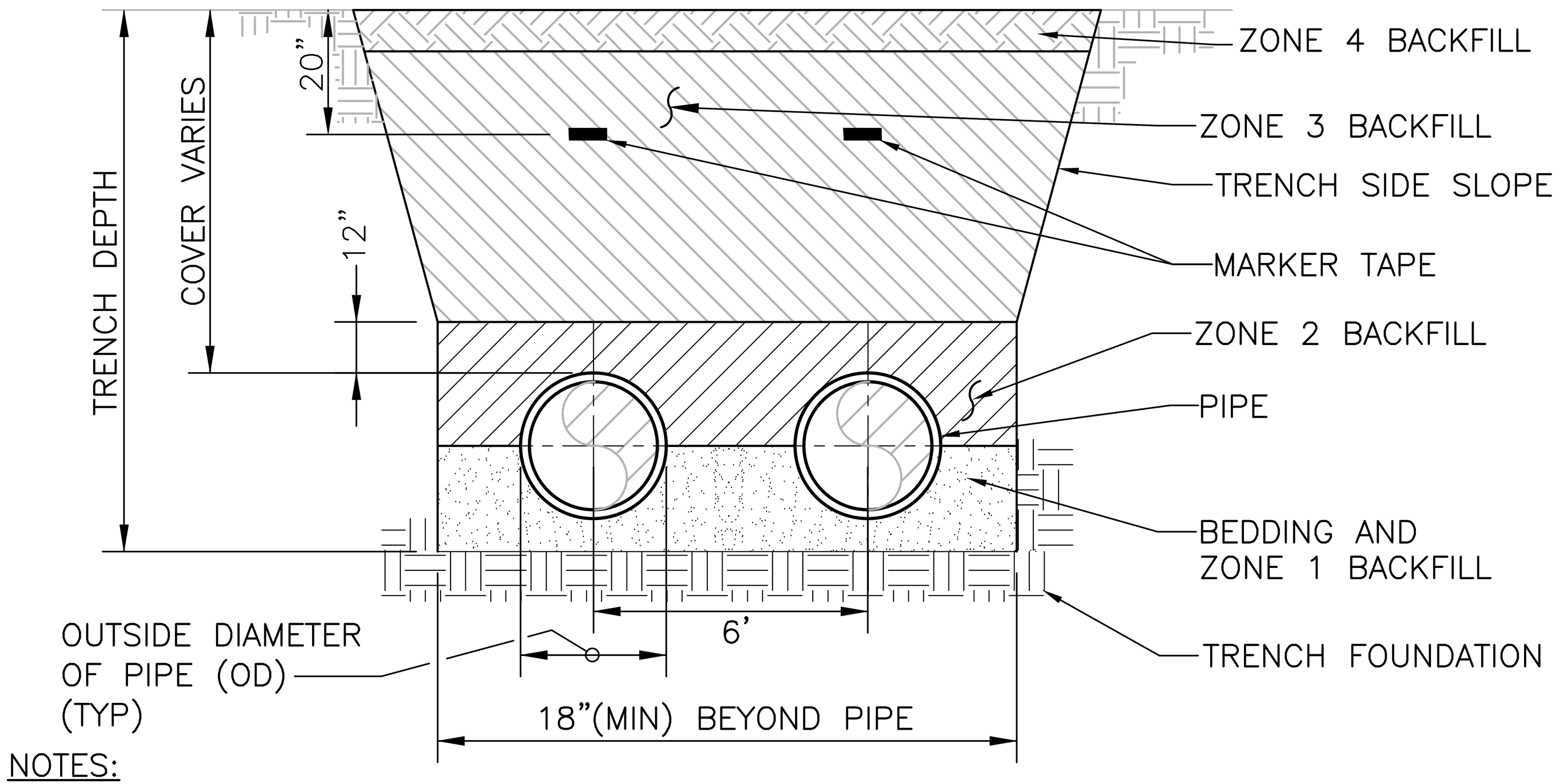
1 / - UTILITY MARKER DETAIL
NOT TO SCALE



NOTES:

1. ZONE 1 BEDDING AND BACKFILL: NO. 67 (OR NO. 57) STONE PER ASTM C33 COMPACTED TO 95%. ZONE 1 BACKFILL SHALL EXTEND FROM 6–INCHES BELOW PIPE BOTTOM UP TO PIPE CENTERLINE.
2. ZONE 2 BACKFILL: SUITABLE SOIL, MAXIMUM PARTICLE SIZE IS 1.5–INCH, COMPACTED TO 95%.
3. ZONE 3 BACKFILL: SUITABLE SOIL, MAXIMUM PARTICLE SIZE IS 3–INCHES, COMPACTED TO 90%.
4. ZONE 4 BACKFILL: IN GRASSED AREA, TOPSOIL, 4–INCH MINIMUM DEPTH. IN PAVED AREAS, PER PROJECT REQUIREMENTS.
5. FOR WET OR SOFT TRENCH FOUNDATION SOILS, UNDERCUT AND STABILIZE.
6. INSTALL GEOTECH FABRIC TO REDUCE MIGRATION OF NATIVE FINE SOILS. WHERE PIPE CENTERLINE IS IN ROCK, PLACE FABRIC AT SPRINGLINE OVER STONE IN ZONE 1. WHERE PIPE CENTERLINE IS ABOVE ROCK, PLACE FABRIC BELOW, ABOVE AND AROUND ALL SIDES OF THE STONE IN ZONE 1.

2 / - PVC GRAVITY SEWER PIPE EMBEDMENT
NOT TO SCALE



NOTES:

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2. ZONE 2 BACKFILL: SUITABLE SOIL, MAXIMUM PARTICLE SIZE IS 1.5–INCH, COMPACTED TO 95%.
3. ZONE 3 BACKFILL: SUITABLE SOIL, MAXIMUM PARTICLE SIZE IS 3–INCHES, COMPACTED TO 90%.
4. ZONE 4 BACKFILL: IN GRASSED AREA, TOPSOIL, 4–INCH MINIMUM DEPTH. IN PAVED AREAS, PER PROJECT REQUIREMENTS.
5. FOR WET OR SOFT TRENCH FOUNDATION SOILS, UNDERCUT AND STABILIZE.
6. INSTALL GEOTECH FABRIC TO REDUCE MIGRATION OF NATIVE FINE SOILS. WHERE PIPE CENTERLINE IS IN ROCK, PLACE FABRIC AT SPRINGLINE OVER STONE IN ZONE 1. WHERE PIPE CENTERLINE IS ABOVE ROCK, PLACE FABRIC BELOW, ABOVE AND AROUND ALL SIDES OF THE STONE IN ZONE 1.

4 / - DIP FORCE MAIN PIPE EMBEDMENT
NOT TO SCALE

STANDARD ABBREVIATIONS

E	ELECTRICAL CABLE OR CONDUIT
EX	EXISTING
FM	FORCE MAIN PIPE
FO	FIBER OPTIC CABLE OR CONDUIT
G	GAS PIPE
IE	INVERT
LF	LINEAR FEET
MH	MANHOLE
OHE	OVERHEAD ELECTRIC
OU	OVERHEAD UTILITY
PROP	PROPOSED
RJ	RESTRAINED JOINT
SD	STORM DRAIN PIPE
SS	SANITARY SEWER PIPE
UGE	UNDERGROUND ELECTRIC
T	TELEPHONE CABLE OR CONDUIT
UK (UNK)	UNKNOWN
W	WATER PIPE

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CHECKED BY	C. SMITH, P.E.
DRAWN BY	J. KROOSWYK
PROJECT NUMBER	10194380

NORTH CAROLINA PROFESSIONAL ENGINEER 27599 MATTHEW A. SHULTZ 1.22.25

METROPOLITAN SEWERAGE DISTRICT • BUNCOMBE COUNTY, NORTH CAROLINA

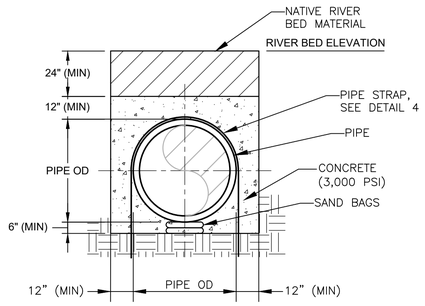
CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

CIVIL DETAILS 3

0 1" 2"

FILENAME	01C503.DWG
SCALE	NOT TO SCALE
SHEET	01C503

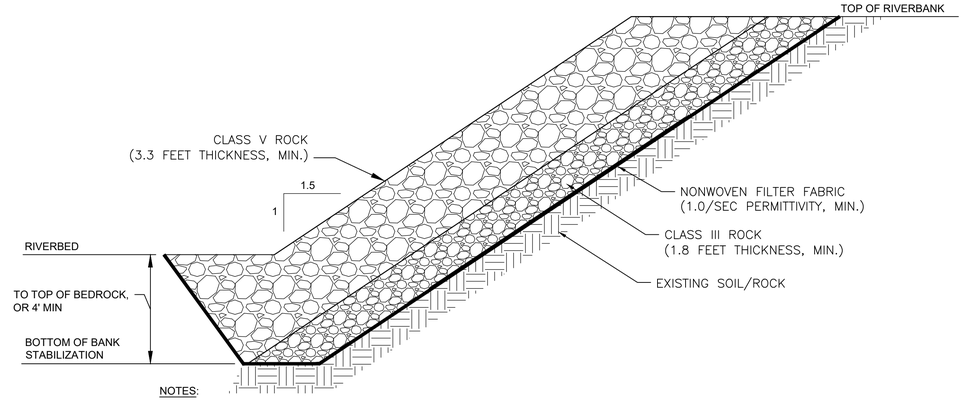


NOTES:

1. CONCRETE MIX TO INCLUDE SYNTHETIC MACRO FIBER AT A MINIMUM DOSAGE OF 3 LBS/CY, COMPLY WITH ASTM C1116.

1 - 60" GRAVITY CONCRETE ENCASEMENT

NOT TO SCALE

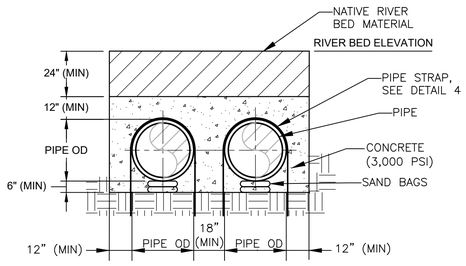


NOTES:

1. SEE SPECIFICATION SECTIONS 31 37 00 AND 31 32 19.
2. CLASS V RIPRAP PER NCHRP SHALL HAVE NOMINAL DIAMETER OF 18" (500 LBS.), MIN. DIAMETER OF 11" (110 LBS.) AND MAX. DIAMETER OF 36" (3,600 LBS.).
3. CLASS III RIPRAP PER NCHRP SHALL HAVE NOMINAL DIAMETER OF 12" (150 LBS.), MIN. DIAMETER OF 7.3" (32 LBS.) AND MAX. DIAMETER OF 24" (1,100 LBS.).

2 - STREAM BANK STABILIZATION

NOT TO SCALE

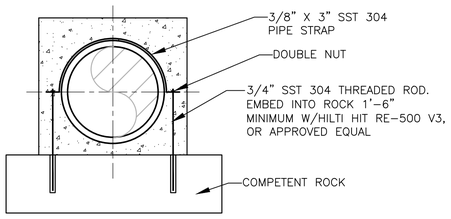


NOTES:

1. CONCRETE MIX TO INCLUDE SYNTHETIC MACRO FIBER AT A MINIMUM DOSAGE OF 3 LBS/CY, COMPLY WITH ASTM C1116.

3 - 36" FORCE MAIN CONCRETE ENCASEMENT

NOT TO SCALE



NOTES:

1. SPACE PIPE STRAPS @ 10 FT OC MAX, MINIMUM 2 STRAPS PER SEGMENT OF PIPE.

4 - PIPE STRAP

NOT TO SCALE

PERMIT NOTES FOR FRENCH BROAD RIVER CROSSINGS:

1. CONTRACTOR IS FULLY RESPONSIBLE FOR THE DESIGN OF THE TEMPORARY COFFERDAMS AND ALL OTHER TEMPORARY WORKS REQUIRED TO COMPLETE ALL ASPECTS OF THE PROJECT. SEE SPECIFICATION SECTION 01 71 23.
2. LIMITS OF COFFERDAM SHALL NOT EXTEND BEYOND TEMPORARY EASEMENTS, SHALL NOT EXTEND MORE THAN 55% ACROSS THE WIDTH OF THE RIVER, AND TOP SHALL NOT EXCEED ELEVATION PROVIDED IN PIPE PROFILE VIEWS.
3. ALL TREE CLEARING AND TREE TRIMMING CAN ONLY BE PERFORMED BETWEEN NOVEMBER 15TH AND FEBRUARY 28TH.
4. SUBMIT COFFERDAM DESIGN A MINIMUM OF 60 DAYS IN ADVANCE OF INITIATING IN-WATER WORK FOR PERMIT AGENCY REVIEW.
5. CONDUCT A PRE-CONSTRUCTION MEETING A MINIMUM OF 30 DAYS IN ADVANCE OF INITIATING IN-WATER WORK WITH USACE AND NCDEQ TO DISCUSS FINAL DESIGN OF COFFERDAM.
6. WITHIN 14 DAYS OF INITIATING IN-WATER WORK AT EACH RIVER CROSSING LOCATION, OWNER AND USFWS SHALL PERFORM A MUSSEL SURVEY. CONTRACTOR SHALL PROVIDE 45 DAYS NOTICE OF STARTING IN-WATER WORK AT EACH CROSSING.
7. A RIVER SAFETY PLAN MUST BE IMPLEMENTED PRIOR TO ANY WORK OCCURRING IN AND/OR ABOVE THE FRENCH BROAD RIVER.
8. COMPLY WITH ALL SWPPP REQUIREMENTS, INCLUDING TREATMENT OF WATER FROM TRENCH AND COFFERDAM DEWATERING PRIOR TO DISCHARGE TO PRECLUDE VIOLATION OF WATER QUALITY STANDARDS.
9. VEGETATION REMOVAL ALONG STREAM BANKS (INCLUDING THE FRENCH BROAD RIVER) SHALL BE CLEARED BY HAND WITH VEGETATION CUT AT THE BASE TO RETAIN BANK STABILIZING ROOT MASSES.
10. ENSURE ALL APPROPRIATE SOIL EROSION AND SEDIMENT CONTROLS AND BMPS ARE IMPLEMENTED/USED, ROUTINELY INSPECTED, AND MAINTAINED IN EFFECTIVE OPERATING CONDITION THROUGHOUT CONSTRUCTION AT ALL RIVER AND STREAM CROSSINGS AND DEWATERING DISCHARGE LOCATIONS SO THAT NO VIOLATIONS OF STATE WATER QUALITY STANDARDS, STATUTES, OR RULES OCCUR.
11. ANY RIPRAP REQUIRED FOR STREAM STABILIZATION SHALL BE RESTRICTED TO THE AREA DIRECTLY IMPACTED BY THE APPROVED CONSTRUCTION ACTIVITY. ANY RIPRAP USED FOR STREAM OR SHORELINE STABILIZATION SHALL BE OF A SIZE AND DENSITY TO PREVENT MOVEMENT BY WAVE, CURRENT ACTION, OR STREAM FLOWS, AND SHALL CONSIST OF CLEAN ROCK OR MASONRY MATERIAL FREE OF DEBRIS OR TOXIC POLLUTANTS.
12. IMPULSIVE NOISE AND VIBRATION SHALL BE REDUCED WITH THE USE OF NOISE-ABSORPTION PADDING OR MATTING TO DAMPEN NOISE AND VIBRATIONS GENERATED FROM CONSTRUCTION ACTIVITIES AND/OR EQUIPMENT. DURATION OF EQUIPMENT USE THAT GENERATES IMPULSIVE/IMPACT SOUNDS SHOULD BE REDUCED TO THE GREATEST EXTENT FEASIBLE AND NO MORE THAN FOUR (4) HOURS PER DAY BETWEEN THE MONTHS OF MARCH AND OCTOBER WHEN MIGRATORY BIRDS MAY BE PRESENT.
13. IF BLASTING IS REQUIRED FOR EXCAVATION WITHIN THE RIVERBED, BLASTING MATS SHALL BE USED TO REDUCE THE EFFECTS OF NOISE AND VIBRATION.
14. ALL MECHANIZED EQUIPMENT OPERATED NEAR SURFACE WATERS SHALL BE INSPECTED AND MAINTAINED REGULARLY TO PREVENT CONTAMINATION OF SURFACE WATERS FROM FUELS, LUBRICANTS, HYDRAULIC FLUIDS, OR OTHER TOXIC MATERIALS. CONDUCT ALL FUELING, LUBRICATION AND GENERAL EQUIPMENT MAINTENANCE IN UPLAND AREAS OR OTHERWISE IN A MANNER THAT PREVENTS CONTAMINATION OF SURFACE WATERS BY FUELS AND OILS. CONSTRUCTION SHALL BE STAGED TO MINIMIZE EXPOSURE TO SURFACE WATERS.
15. IF CONCRETE IS USED DURING CONSTRUCTION, THEN ALL NECESSARY MEASURES SHALL BE TAKEN TO PREVENT DIRECT CONTACT BETWEEN UNCURED OR CURING CONCRETE AND WATERS OF THE STATE. WATER THAT INADVERTENTLY CONTACTS UNCURED CONCRETE SHALL NOT BE DISCHARGED TO WATERS OF THE STATE.
16. COFFERDAMS SHALL REMAIN IN THE FRENCH BROAD RIVER FOR THE SHORTEST FEASIBLE DURATION AND REMOVED AS SOON AS THE NEW PIPE SEGMENTS ARE INSTALLED TO PREVENT UNNECESSARY EROSIVE FORCES AND SHEAR STRESSES TO STREAM BED AND STREAM BANK HABITATS. COFFERDAMS SHALL BE REMOVED AND THE IMPACTED AREA SHALL BE RETURNED TO NATURAL CONDITIONS WITHIN 60 CALENDAR DAYS AFTER THE TEMPORARY IMPACT IS NO LONGER NECESSARY. THE IMPACTED AREAS SHALL BE RESTORED TO ORIGINAL GRADE, INCLUDING EACH STREAM'S ORIGINAL CROSS-SECTIONAL DIMENSIONS, PLANFORM PATTERN, AND LONGITUDINAL BED PROFILE.
17. DEWATERING INLET HOSES SHALL BE SCREENED AND EQUIPPED WITH A FLOAT TO PREVENT INADVERTENT AQUATIC LIFE ENTRAPMENT OR UNNECESSARY REMOVAL OF STREAMBED SUBSTRATES.
18. HEAVY EQUIPMENT WORKING IN WETLANDS OR MUDFLATS, INCLUDING DEWATERED RIVERBED AREAS, MUST BE PLACED ON MATS OR OTHER MEASURES MUST BE TAKEN TO MINIMIZE SOIL DISTURBANCE AND/OR COMPACTION FROM HEAVY EQUIPMENT USAGE.
19. SUBSTRATES EXCAVATED FROM WETLANDS AND/OR THE FRENCH BROAD RIVER RIVERBED SHALL BE RETAINED IN ISOLATED UPLAND AREAS ON FABRIC UNDER LININGS (I.E., A TARP NOT TO CO-MIX WITH OTHER SUBSTRATES) AND RETURNED TO MATCH PRE-EXISTING/PRE-CONSTRUCTION WETLAND AND STREAM BED CONTOUR ELEVATIONS AND HABITAT CONDITIONS. CONTRACTOR SHALL NOTIFY THE OWNER IF STAINED SOIL OR SOILS WITH ODORS ARE OBSERVED DURING CONSTRUCTION.
20. MONITOR FOR INCOMING RAIN EVENTS AND DETERMINE IF HIGH WATER LEVELS ARE EXPECTED IN THE FRENCH BROAD RIVER. IF HIGH WATER LEVELS ARE EXPECTED, REMOVE ANY EQUIPMENT THAT IS ON THE COFFERDAMS (OR BEHIND) PRIOR TO EXPECTED HIGH WATER LEVELS. ENSURE EQUIPMENT IS REMOVED AT THE END OF THE WORKDAY IF HIGH WATER LEVELS ARE EXPECTED OVERNIGHT OR PRIOR TO THE NEXT WORK-DAY SHIFT. CONTRACTOR SHALL INSPECT COFFERDAMS AND RIVERBANKS FOR SIGNS OF EROSION OR UNSTABLE CONDITIONS AFTER EACH STORM EVENT THAT IS EQUAL TO OR GREATER THAN A BANK-FULL WATER LEVEL EVENT.
21. IF HISTORIC, CULTURAL, OR ARCHAEOLOGICAL REMAINS AND/OR ARTIFACTS ARE DISCOVERED DURING CONSTRUCTION, ALL CONSTRUCTION ACTIVITIES THAT MAY AFFECT THE REMAINS/ARTIFACTS MUST BE HALTED AND THE USACE MUST BE NOTIFIED IMMEDIATELY OF THE DISCOVERY.
22. IN THE EVENT OF A HAZARDOUS MATERIAL SPILL, REPORT ANY PETROLEUM SPILL OF 25 GALLONS OR MORE. REPORT ANY SPILL REGARDLESS OF AMOUNT THAT CAUSES A SHEEN ON SURFACE WATERS. REPORT ANY PETROLEUM SPILL REGARDLESS OF AMOUNT OCCURRING WITHIN 100 FEET OF SURFACE WATERS. REPORT ANY PETROLEUM SPILL LESS THAN 25 GALLONS THAT CANNOT BE CLEANED UP WITHIN 24 HOURS.
23. ALL HAZARDOUS MATERIALS USED FOR CONSTRUCTION SHALL BE STORED UNDER COVER AND IN AN UPLAND AREA AT LEAST 100 FEET FROM ANY WATERBODY.
24. ALL CONSTRUCTION LIGHTING SHALL BE SHIELDED AND DIRECTED AWAY FROM SUITABLE BAT HABITATS.
25. A COPY OF THE WATER QUALITY CERTIFICATION SHALL BE AVAILABLE AT THE PROJECT SITE THROUGHOUT CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ALL OPERATORS, EMPLOYEES, SUBCONTRACTORS AND VISITORS ARE AWARE OF THE ENVIRONMENTAL COMMITMENTS ASSOCIATED WITH THE PROJECT.
26. CONTRACTOR SHALL NOTIFY THE NCDEQ ASHEVILLE REGIONAL OFFICE WITHIN 24 HOURS IF, AT ANY TIME, THE PROJECT IS UNABLE TO COMPLY WITH THE PERMIT CONDITIONS.
27. RIVER SAFETY. INSTALL FLOATING NAVIGATION AIDES TO MARK THE SAFE PASSAGE LANE AROUND THE COFFERDAM STRUCTURES. INSTALL STEADY-STATE SOLAR POWERED RED LIGHTS ON TOP OF THE COFFERDAM TO ALERT RIVER USERS TO ITS LOCATION. FOR ANY CONSTRUCTION ACTIVITY OUTSIDE THE LIMITS OF THE WARNING DEVICES, HAVE DEDICATED STAFF PROVIDE LOOKOUT AND ADVANCE WARNING TO RIVER USERS TO STOP RIVER USE. CONTRACTOR IS FULLY RESPONSIBLE FOR SITE SAFETY; CONSIDER MEASURES SUCH AS PROVIDING APPROPRIATE SAFETY TRAINING FOR ALL CONTRACTOR AND SUBCONTRACTOR EMPLOYEES THAT WILL BE WORKING NEAR THE RIVER INCLUDING HOW TO AIDE AN EMPLOYEE OR DISTURBED RIVER USER. CONSIDER USE OF LIFE VESTS. CONSIDER HAVING ON-SITE A THROWABLE FLOATATION TUBE AND/OR BOAT.

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ISSUE	DATE	DESCRIPTION
	01/2025	ISSUED FOR BIDS

PROJECT MANAGER	MATTHEW A. SHULTZ, P.E.
DESIGNED BY	M. SHULTZ, P.E.
CHECKED BY	C. SMITH, P.E.
DRAWN BY	J. KROOSWYK
PROJECT NUMBER	10194380

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27599 MATTHEW A. SHULTZ 1.22.25

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY, NORTH CAROLINA

CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

CIVIL DETAILS 4

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FILENAME	01C504.DWG
SCALE	NOT TO SCALE

SHEET 01C504

GENERAL EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL INSTALL ALL EROSION AND SEDIMENTATION CONTROL MEASURES AND DEVICES NECESSARY TO COMPLY WITH THE STANDARDS AND SPECIFICATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY (NC DEQ) AND APPLICABLE STATE AND LOCAL LAWS AND ORDINANCES, AND PREVENT STANDING WATER WITHIN PROJECT LIMITS, UNLESS OTHERWISE DIRECTED.
2. INSTALL CONSTRUCTION ENTRANCES AND ACCESS ROADS IN LOCATIONS SHOWN, IN ACCORDANCE WITH STATE STANDARDS AND WITH MINIMAL DISTURBANCE TO SURROUNDING VEGETATION AND TREES. CONTRACTOR SHALL RECEIVE PRIOR APPROVAL FROM ENGINEER BEFORE TREE REMOVAL FOR ACCESS ROAD CONSTRUCTION. WITHIN 30 DAYS AFTER CONSTRUCTION IS COMPLETED FOR WHICH ACCESS ROAD IS USED, AND UNLESS OTHERWISE APPROVED, CONTRACTOR SHALL REMOVE ALL REMNANTS OF THE ACCESS ROADS AND RETURN AREA TO AS GOOD AS OR BETTER CONDITION. ADDITIONAL MEASURES TO CONTROL EROSION AND SEDIMENT MAY BE REQUIRED BASED ON CONTRACTOR'S PRACTICES OR BY THE CONTRACTING OFFICER AND WILL BE EMPLOYED WHERE DETERMINED NECESSARY BY ACTUAL SITE CONDITIONS.
3. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLE OR SITE ONTO PUBLIC ROADWAY OR INTO STORM DRAIN MUST BE REMOVED.
4. ALL DITCH LINES DISTURBED DURING CONSTRUCTION SHALL BE STABILIZED BY THE CONTRACTOR. ON ALL NEW OR UNDISTURBED, UNPAVED DITCHES INSTALL EROSION CONTROL MATTING (NAG SC150, SC150BN OR APPROVED EQUAL) A TEMPORARY DITCH LINER OF FIBERGLASS ROVING ON THE DITCH BOTTOM AND SIDE SLOPES.
5. PROVIDE SILT FENCE ADJACENT TO DITCHES AND AT THE TOE OF FILL SLOPES. ALSO, PROVIDE ADEQUATE MEASURES IN AREAS WHERE NATURAL VEGETATION DOES NOT PROVIDE A SUFFICIENT BUFFER AND AS DIRECTED BY THE ENGINEER. WHERE SILT FENCE AND TREE PROTECTION CONFLICT, STOP SILT FENCE AT TREE PROTECTION.
6. PROVIDE INLET SEDIMENT FILTER AT ALL NEW STORM INLETS. INLET PROTECTION MAY BE REQUIRED AT EXISTING INLETS IN THE EVENT SEDIMENT WILL RUN DOWNSTREAM TO AN EXISTING INLET.
7. PRIOR TO COMMENCING LAND DISTURBANCE ACTIVITY:
   a. THE LIMITS OF LAND DISTURBANCE SHALL BE CLEARLY AND ACCURATELY DEMARCATED WITH STAKES, FENCING, OR OTHER APPROPRIATE MEANS. THE LOCATION AND EXTENT OF ALL AUTHORIZED LAND DISTURBANCE ACTIVITY SHALL BE DEMARCATED FOR THE DURATION OF THE CONSTRUCTION ACTIVITY. NO LAND DISTURBANCE SHALL OCCUR OUTSIDE THE APPROVED LIMITS INDICATED ON THE APPROVED PLANS.
   b. ALL TREE PROTECTION FENCING SHALL BE INSTALLED, INSPECTED AND APPROVED BY THE INSPECTOR. TREES WITHIN THE PROTECTION AREAS MAY ONLY BE REMOVED WITH APPROVAL BY THE INSPECTOR.
8. COMPLY WITH THE FOLLOWING CONSTRUCTION SEQUENCE FOR EACH CONSTRUCTION PHASE:
   a. GRUBBING SHALL BE PERFORMED DURING PREDICTED PERIODS OF DRY WEATHER.
   b. EROSION CONTROL DEVICES AND STORMWATER MANAGEMENT DEVICES SHALL BE INSTALLED PRIOR TO ANY OTHER CONSTRUCTION AND WITHIN 24 HOURS OF GRUBBING. THIS MAY REQUIRE GRUBBING IN STAGES TO ENSURE EROSION CONTROL MEASURES ARE PUT IN PLACE PRIOR TO RAIN EVENT. THE LOCATION OF SOME OF THE EROSION CONTROL DEVICES MAY HAVE TO BE ALTERED FROM THAT SHOWN ON THE APPROVED PLANS IF DRAINAGE PATTERNS DURING CONSTRUCTION ARE DIFFERENT FROM THE FINAL PROPOSED DRAINAGE PATTERNS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCOMPLISH EROSION CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES DURING CONSTRUCTION. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF CONSTRUCTION SHALL IMMEDIATELY BE REPORTED TO THE ENGINEER.
   c. SILT FENCE SHALL BE INSTALLED WITHIN 24 HOURS OF GRUBBING ALL PERIMETERS. THE CONTRACTOR SHALL REMOVE ACCUMULATED SILT WHEN THE SILT IS WITHIN 12" OF THE TOP OF THE SILT FENCE UTILIZED FOR EROSION CONTROL.
9. THE CONSTRUCTION OF THE SITE WILL COMMENCE WITH INSTALLATION OF EROSION CONTROL MEASURES SUFFICIENT TO CONTROL SEDIMENT DEPOSITS AND EROSION. ALL SEDIMENT CONTROL WILL BE MAINTAINED UNTIL ALL UPSTREAM GROUND WITHIN THE CONSTRUCTION AREA HAS BEEN COMPLETELY STABILIZED WITH PERMANENT VEGETATION.
10. FAILURE TO INSTALL, OPERATE OR MAINTAIN ALL EROSION CONTROL MEASURES WILL RESULT IN ALL CONSTRUCTION BEING STOPPED ON THE JOB SITE UNTIL SUCH MEASURES ARE CORRECTED TO NORTH CAROLINA EROSION AND SEDIMENT CONTROL REGULATIONS.
11. A COPY OF THE APPROVED LAND DISTURBANCE PLAN AND PERMIT SHALL BE PRESENT ON THE SITE WHENEVER LAND DISTURBANCE ACTIVITY IS IN PROGRESS.
12. ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND ANY DEFICIENCIES NOTED WILL BE CORRECTED BY THE END OF EACH DAY. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED IF DEEMED NECESSARY BY ON-SITE INSPECTION.
13. ON-SITE STOCKPILING OF SOIL IS ALLOWED WITHIN THE LIMITS OF DISTURBANCE SUBJECT TO PLACING APPROPRIATE EROSION CONTROL DEVICES TO PREVENT SOIL LOSS DURING RAIN EVENTS. LOCATIONS SHALL BE PRE-APPROVED BY THE INSPECTOR.
14. GROUND STABILIZATION SHALL BE ACHIEVED CONSISTENT WITH NCDEQ GENERAL PERMIT NCG01000 EFFECTIVE AS OF AUGUST 2, 2011. WHERE LAND DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, ALL DISTURBED AREAS SHALL BE PROVIDED WITH TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER WITHIN 7 CALENDAR DAYS FROM THE LAST LAND DISTURBING ACTIVITY EXCEPT FOR ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3:1 (H:V), WHICH SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER WITHIN 7 CALENDAR DAYS FROM THE LAND DISTURBING ACTIVITY. THE CONTRACTOR SHALL REFER TO GENERAL PERMIT NCG01000 FOR SPECIFIC CONDITIONS, EXEMPTIONS, AND DEFINITIONS FOR MEETING THESE STABILIZATION REQUIREMENTS. SEE TABLE 1.
15. SITE DISTURBED AREA = 6.5 ACRES.
16. PROVIDE NOTIFICATION TO ALL AFFECTED PROPERTY OWNERS PRIOR TO CONSTRUCTION, AS APPLICABLE.
17. EFFECTIVE OCTOBER 1, 2010, PERSONS RESPONSIBLE FOR LAND DISTURBING ACTIVITIES MUST INSPECT THE SEDIMENT AND EROSION CONTROL MEASURES ON A PROJECT AFTER EACH PHASE OF THE PROJECT TO MAKE SURE THAT THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN IS BEING FOLLOWED. SELF-INSPECTION REPORTS ARE REQUIRED. A SAMPLE SELF-INSPECTION REPORT AS WELL AS DETAILS OF THE SELF-INSPECTION PROGRAM CAN BE FOUND ON THE LAND QUALITY WEB SITE: http://deq.nc.gov/about/divisions/energy-mineral-lan-resources/erosion-sediment-control/forms.
18. ANY OFF-SITE BORROW OR WASTE REQUIRED FOR THIS PROJECT MUST COME FROM AN APPROVED EROSION CONTROL SITE PLAN REGULATED UNDER THE MINING ACT OF 1971 OR A LANDFILL REGULATED BY THE DIVISION OF SOLID WASTE MANAGEMENT. DEBRIS FROM DEMOLITION ACTIVITIES SHOULD BE DISPOSED OF AT AN APPROVED FACILITY.

EROSION MAINTENANCE REQUIREMENTS

1. SEDIMENT FENCE (SILT FENCE):
   a. INSPECT SEDIMENT FENCES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
   b. SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.
   c. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE.
   d. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEAN OUT.
   e. REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE. STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
2. SEDIMENT TUBES:
   a. INSPECT CHANNELS FOR DAMAGE AFTER EACH RUNOFF EVENT.
   b. ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE THE WATTLE AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE WATTLE. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN WATTLES, INSTALL A PROTECTIVE RIPRAP LINER IN THAT PORTION OF THE CHANNEL.
   c. REMOVE SEDIMENT ACCUMULATED BEHIND THE WATTLES AS NEEDED TO PREVENT DAMAGE TO CHANNEL VEGETATION, ALLOW THE CHANNEL TO DRAIN THROUGH THE STRAW WATTLE AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE WATTLE.
3. TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT:
   a. INSPECT ON LEAVING THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH 2-INCH STONE. AFTER EACH RAINFALL, INSPECT ANY STRUCTURE USED TO TRAP SEDIMENT AND CLEAN IT OUT AS NECESSARY. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS.
4. ROCK OUTLET PROTECTION:
   a. INSPECT STONE ARRANGEMENT WEEKLY AND AFTER EVERY RAINFALL EVENT.
   b. MAINTAIN SPECIFIED DIMENSIONS AND REMOVE SEDIMENT BUILDUP WHEN THE SEDIMENT LEVEL IS ½ THE HEIGHT OF THE ROCKS.
5. INLET PROTECTION:
   a. INSPECT STONE ARRANGEMENT WEEKLY AND AFTER EVERY RAINFALL EVENT.
   b. REPLACE STONE AS NEEDED TO MAINTAIN SPECIFIED DIMENSIONS
   c. REMOVE SEDIMENT BUILDUP WHEN THE SEDIMENT LEVEL IS ½ THE HEIGHT OF THE ROCKS. TAKE ARE NOT TO DAMAGE OR UNDERCUT THE WIRE MESH DURING SEDIMENT REMOVAL.
6. TEMPORARY DIVERSIONS:
   a. INSPECT WEEKLY AND, AFTER EVERY RAINFALL, REMOVE SEDIMENT FROM THE FLOW AREA AND REPAIR THE DIVERSION RIDGES. ALSO CHECK AND MAINTAIN OUTLETS.
   b. WHEN THE PROTECTED AREA IS PERMANENTLY STABILIZED, REMOVE THE RIDGES AND THE CHANNEL TO BLEND WITH THE NATURAL GROUND LEVEL AND APPROPRIATELY STABILIZE SITE.
7. CHECK DAM:
   a. INSPECT CHECK DAMS AND CHANNELS FOR DAMAGE AFTER EACH RUNOFF EVENT.
   b. ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE THE CHECK DAM AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE DAM. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN DAMS, INSTALL A PROTECTIVE RIPRAP LINER IN THAT PORTION OF THE CHANNEL.
   c. REMOVE SEDIMENT ACCUMULATED BEHIND THE DAMS AS NEEDED TO PREVENT DAMAGE TO CHANNEL VEGETATION, ALLOW THE CHANNEL TO DRAIN THROUGH THE STONE CHECK DAM AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE DAM. ADD STONES TO DAMS AS NEEDED TO MAINTAIN DESIGN HEIGHT AND CROSS SECTION.

TEMPORARY AND PERMANENT SEEDING MEASURES

A. GENERAL:

1. AFTER CONSTRUCTION IS COMPLETE IN ANY AREA OR PHASE OF THE PROJECT, THE DISTURBED AREAS SHALL RECEIVE A PERMANENT GROUND COVER. SEEDING AND MULCHING SHALL BE PERFORMED IMMEDIATELY BEHIND CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE PERMANENT SEEDING IN ALL DISTURBED AREAS AS INDICATED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL ADAPT PERMANENT SEEDING OPERATIONS TO PROTECT AND TO ACCOMMODATE ANY TEMPORARY SEEDING AND SOIL AND EROSION CONTROL MEASURES THAT MAY ALREADY BE IN PLACE DURING THE WORK PERIOD.
2. WHEN SEEDING MUST TAKE PLACE OUT OF SEASON FOR PERMANENT GRASS THE APPROPRIATE TEMPORARY SEEDING SHALL BE DONE AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERMANENT SEEDING AS SPECIFIED IN SEASON AT NO ADDITIONAL COST TO OWNER.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR TURF MAINTENANCE THROUGH SUBSTANTIAL COMPLETION. SLOPES MUST BE AT 90% COVERAGE AT SUBSTANTIAL COMPLETION REVIEW TO BE ACCEPTED. IF NOT AT 90% COVERAGE, SUBSTANTIAL COMPLETION WILL BE DELAYED UNTIL 90% COVERAGE IS ACHIEVED AND/OR UNTIL THE FOLLOWING GROWING SEASON.

B. SITE PREPARATION AND INSTALLATION:

1. GROUND COVER: ALL DISTURBED AREAS SHALL BE DRESSED TO A DEPTH OF SIX (6) INCHES. THE TOP THREE (3) INCHES SHALL BE PULVERIZED TO PROVIDE A UNIFORM SEEDBED. RAKE OR HARROW THE SITE TO ESTABLISH A SMOOTH AND LEVEL FINAL GRADE. SOIL PARTICLES SHOULD BE NO LARGER THAN MARBLE SIZE, AND PEA GRAVEL SIZE IS EVEN BETTER. AGRICULTURAL LIME SHALL BE APPLIED AT THE RATE OF 1 TONS/ACRE IMMEDIATELY BEFORE PLOWING. GRASS SEED SHALL BE APPLIED AT THE RATES OUTLINED IN TABLES 2A AND 2B.
2. 10-10-10 FERTILIZER SHALL BE APPLIED TO ALL DISTURBED AREAS AT A RATE OF 750 LBS./ACRE. MULCHING SHALL CONSIST OF SMALL GRAIN STRAW APPLIED AT A RATE OF 2 TONS/ACRE. MULCHED AREAS SHALL BE TACKED WITH ASPHALT OR OTHER APPROVED METHOD SUFFICIENT TO HOLD THE STRAW IN PLACE, AT A RATE OF 150 TO 200 GALLONS PER TON OF STRAW.
3. SOME AREAS MAY REQUIRE TEMPORARY SEEDING DUE TO AN INTERRUPTION OF WORK OR SEASONAL RESTRICTIONS AS SPECIFIED IN THE PERMANENT SEEDING SCHEDULE, OR A COMBINATION THEREOF. THESE AREAS SHALL BE RE-SEEDED IN ACCORDANCE WITH THE PERMANENT SEEDING SCHEDULE. IF TEMPORARY SEEDING IS REQUIRED DUE TO CONTRACTOR DELAYS, THERE WILL BE NO COMPENSATION FOR THE TEMPORARY SEEDING. TEMPORARY SEEDING SHALL BE PERFORMED ONLY AT THE DIRECTION OF THE ENGINEER OR INSPECTOR.

C. CLEANUP AND INSPECTION:

1. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REMOVE FROM THE SITE ALL EQUIPMENT AND OTHER ARTICLES USED. ALL EXCESS SOIL, STONE, AND DEBRIS SHALL BE REMOVED AND LEGALLY DISPOSED OF AT NO ADDITIONAL COST TO THE OWNER. ALL WORK AREAS SHALL BE LEFT IN A CLEAN AND NEAT CONDITION. ALL DAMAGE TO EXISTING CONSTRUCTION CAUSED BY LANDSCAPING OPERATIONS SHALL BE REPAIRED TO THE SATISFACTION OF THE TOWN AT THE CONTRACTOR'S EXPENSE.
2. SEEDED AREAS SHALL BE PROTECTED AND REPLANTED AS NECESSARY TO ESTABLISH A UNIFORM STAND OF SPECIFIED GRASS. SCATTERED BARE SPOTS, NONE OF WHICH SHALL BE LARGER THAT ONE (1) SQUARE FOOT, WILL BE ALLOWED UP TO A MAXIMUM OF 3% OF THE SEEDED AREA FOR EACH PROPERTY. WHEN SEEDED AREAS ARE READY FOR INSPECTION, THE MAINTAINED TURF AREAS SHALL BE NEATLY MOWED TO THE UNIFORM HEIGHT OF APPROXIMATELY TWO AND ONE-HALF (2.5) INCHES. THE LAWNS SHALL BE CONSIDERED ESTABLISHED ONLY WHEN THE SPECIFIED GRASS IS VIGOROUS AND GROWING WELL IN ADDITION TO MEETING THE OTHER REQUIREMENTS SPECIFIED.
3. AN INSPECTION OF THE COMPLETED SEEDING SHALL BE MADE AT THE CONCLUSION OF THE LANDSCAPE WORK UPON WRITTEN NOTICE REQUESTING SUCH INSPECTION SUBMITTED BY THE CONTRACTOR TO THE ENGINEER, AT LEAST TEN (10) DAYS PRIOR TO THE ANTICIPATED DATE OF INSPECTION.
4. A FINAL INSPECTION SHALL BE PERFORMED WHEN A SATISFACTORY STAND OF SEEDED TURF GRASS HAS BEEN PRODUCED, UPON WRITTEN NOTICE REQUESTING SUCH INSPECTION SUBMITTED BY THE CONTRACTOR TO THE ENGINEER, AT LEAST TEN (10) DAYS PRIOR TO THE ANTICIPATED DATE OF INSPECTION. IF A SATISFACTORY STAND OF TURF HAS NOT BEEN PRODUCED AT THE TIME OF FINAL INSPECTION, NECESSARY REPAIRS SHALL BE PERFORMED IN CONFORMANCE WITH THE REQUIREMENTS OF THIS SECTION. UPON COMPLETION OF THESE REPAIRS, THE SEEDED GRASS SHALL BE REINSPECTED UPON WRITTEN NOTICE AS ABOVE.

TABLE 2A
SHOULDERS, SIDE DITCHES, SLOPES
(For Slopes Between 2:1 and 3:1)

Date	Type	Planting Rate
Mar 1 - June 1	Sericea Lespedeza (scarified) and	50 lbs./acre
Mar 1 - Apr 15	Add Tall Fescue or	120 lbs./acre
Mar 1 - June 30	Add Hulled Common Bermudagrass	25 lbs./acre
June 1 - Sept 1	***Tall Fescue and ***Browntop Millet or ***Sorghum-Sudan Hybrids	120 lbs./acre 35 lbs./acre 30 lbs./acre
Sept 1 - Mar 1	Sericea Lespedeza (unhulled/unscarified) and Tall Fescue	70 lbs./acre 120 lbs./acre
Nov 1 - Mar 1	Add Abruzzi Rye	25 lbs./acre

TABLE 2B
SHOULDERS, SIDE DITCHES, SLOPES
(For Slopes 3:1 and Flatter)

Date	Type	Planting Rate
Aug 15 - Nov 1	Tall Fescue	300 lbs./acre
Nov 1 - Mar 1	Tall Fescue and Abruzzi Rye	300 lbs./acre
Mar 1 - Apr 15	Tall Fescue	300 lbs./acre
Apr 15 - June 30	Hulled Common Bermudagrass	25 lbs./acre
July 15 - Aug 15	Tall Fescue and ***Browntop Millet or ***Sorghum-Sudan Hybrids	35 lbs./acre

Fertilizer - Base application rates on soil tests. When these are not possible, apply a 10-10-10 grade fertilizer at 700-1,000 lb/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.

EROSION CONTROL CONSTRUCTION SEQUENCE

1. OBTAIN AND MAINTAIN ON SITE THE LAND-DISTURBING PERMIT FROM NCDEQ.
2. CALL NCDEQ ASHEVILLE REGIONAL OFFICE AT 828-296-4500 TO SCHEDULE A PRE-CONSTRUCTION MEETING AT LEAST 48 HOURS PRIOR TO PROJECT ACTIVATION.
3. PRIOR TO COMMENCING ANY LAND DISTURBANCE ACTIVITY, CLEARLY AND ACCURATELY DEMARCATE THE LIMITS OF THE LAND DISTURBANCE WITH STAKES, RIBBONS, OR OTHER APPROPRIATE MEANS.
4. INSTALL STABILIZED CONSTRUCTION ENTRANCE AND SILT FENCE PRIOR TO ANY LAND DISTURBANCE ACTIVITIES (CLEARING, GRADING, GRUBBING, OR EXCAVATION). CLEAR ONLY AS NECESSARY TO INSTALL THE SKIMMER BASIN AS SHOWN ON THE PHASE I EROSION CONTROL PLANS.
5. CONTACT THE INSPECTOR (828-296-4500) FOR AN ON-SITE INSPECTION OF THE INSTALLED MEASURES. WHEN APPROVED, INSTALL REMAINING EROSION CONTROL DEVICES (TEMPORARY DIVERSION DITCHES, STRAW WATTLES, ETC.).
6. INSPECT ALL EROSION CONTROL DEVICES AT WEEKLY INTERVALS AND AFTER EVERY RAINFALL EVENT EXCEEDING 1" TO VERIFY THAT THEY ARE FUNCTIONING PROPERLY. ANY ACCUMULATED SEDIMENT SHALL BE REMOVED AND PLACED IN A DESIGNATED SPOIL DISPOSAL AREA APPROVED BY THE INSPECTOR. CONDUCT PERIODIC INSPECTIONS OF ALL EROSION AND SEDIMENTATION CONTROLS AND MAKE ANY REPAIRS OR MODIFICATIONS NECESSARY TO ASSURE CONTINUED EFFECTIVE OPERATION OF EACH DEVICE.
7. BEGIN REMAINDER OF CLEARING, GRUBBING, AND GRADING OF SITE.
8. STABILIZE SITE PER EROSION CONTROL NOTES AND SEEDING SCHEDULE AS AREAS ARE BROUGHT TO FINISHED GRADE WITH VEGETATION, PAVING, DITCH LININGS, ETC. PER GENERAL PERMIT NCG010000. ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3:1 SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND DISTURBING ACTIVITY. ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND DISTURBING ACTIVITY.
9. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION.
10. ALL DENUDED AREA NOT PAVED SHALL BE SODDED.
11. CONTACT THE INSPECTOR (828-296-4500) FOR AN INSPECTION WHEN CONSTRUCTION IS COMPLETE AND ALL AREAS ARE FULLY PLANTED/SODDED AND STABILIZED.
12. WHEN FINAL SITE STABILIZATION IS APPROVED, REMOVE ALL EROSION CONTROL DEVICES AND STABILIZE THESE AND ANY RESULTING BARE AREAS.
13. CONTACT THE INSPECTOR (828-296-4500) FOR A FINAL SITE INSPECTION WHEN VEGETATION HAS BECOME ESTABLISHED.

HDR Engineering Inc.
of the Carolinas

440 S. Church Street, Suite 1200
Charlotte, NC 28202
704.338.6700

N.C.B.E.L.S. License Number: F-0116

ISSUE	DATE	DESCRIPTION
	01/2025	ISSUED FOR BIDS

PROJECT MANAGER	MATTHEW A. SHULTZ, P.E.
DESIGNED BY	M. SHULTZ, P.E.
CHECKED BY	C. SMITH, P.E.
DRAWN BY	J. KROOSWYK
PROJECT NUMBER	10194380

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27599 MATTHEW A. SHULTZ 1.22.25

METROPOLITAN SEWERAGE DISTRICT • BUNCOMBE COUNTY, NORTH CAROLINA • 1996 • ESTABLISHED

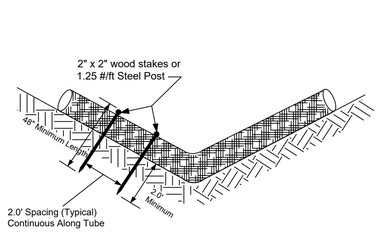
CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

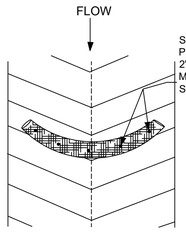
EROSION CONTROL DETAILS 1

0 1" 2"

FILENAME	01C505.DWG
SCALE	NOT TO SCALE
SHEET	01C505



END VIEW OF DITCH



TOP VIEW OF DITCH

SEDIMENT TUBE SPACING

SLOPE	MAXIMUM SEDIMENT TUB SPACING
LESS THAN 2%	150-FEET
2%	100-FEET
3%	75-FEET
4%	50-FEET
5%	40-FEET
6%	30-FEET
GREATER THAN 6%	25-FEET

SEDIMENT TUBE

DESCRIPTION
SEDIMENT TUBES ARE ELONGATED TUBES OF COMPACTED GEOTEXTILES, CURLED EXCELSIOR WOOD, NATURAL COCONUT FIBER OR HARDWOOD MULCH. STRAW, PINE NEEDLE AND LEAF MULCH-FILLED
SEDIMENT TUBES ARE NOT PERMITTED UNDER THIS SPECIFICATION.

WHEN AND WHERE TO USE IT:
INSTALL SEDIMENT TUBES ALONG CONTOURS, IN DRAINAGE CONVEYANCE SWALES, AND AROUND INLETS TO HELP REDUCE THE EFFECTS OF SOIL EROSION BY ENERGY DISSIPATION AND RETAIN SEDIMENT.

MATERIALS
SEDIMENT TUBES FOR DITCH CHECKS AND TYPE A INLET STRUCTURE FILTERS EXHIBIT THE FOLLOWING PROPERTIES:

- PRODUCED BY A MANUFACTURER EXPERIENCED IN SEDIMENT TUBE MANUFACTURING.
- COMPOSED OF COMPACTED GEOTEXTILES, CURLED EXCELSIOR WOOD, NATURAL COCONUT FIBERS, HARDWOOD MULCH OR A MIX OF THESE MATERIALS ENCLOSED BY A FLEXIBLE NETTING MATERIAL.
- STRAW, STRAW FIBER, STRAW BALES, PINE NEEDLES AND LEAF MULCH ARE NOT ALLOWED UNDER THIS SPECIFICATION.
- UTILIZES OUTER NETTING THAT CONSISTS OF SEAMLESS, HIGH-DENSITY POLYETHYLENE PHOTODEGRADABLE MATERIALS TREATED WITH ULTRAVIOLET STABILIZERS OR A SEAMLESS, HIGH-DENSITY
- POLYETHYLENE NON-DEGRADABLE MATERIALS. DIAMETER RANGING FROM 18-INCHES TO 24-INCHES.
- CURLED EXCELSIOR WOOD, OR NATURAL COCONUT ROLLED EROSION CONTROL PRODUCTS (RECPS) THAT ARE ROLLED UP TO CREATE A SEDIMENT TUBE ARE NOT ALLOWED UNDER THIS SPECIFICATION.

INSTALLATION:
INSTALL OVER BARE SOIL, MULCHED AREAS OR EROSION CONTROL BLANKETS.
BE COMPOSED OF GEOTEXTILES, CURLED EXCELSIOR WOOD, NATURAL COCONUT FIBER OR HARDWOOD MULCH ENCLOSED BY A FLEXIBLE NETTING MATERIAL. STRAW, STRAW FIBER, STRAW BALES, PINE NEEDLES AND LEAF MULCH ARE NOT ALLOWED.

THE MINIMUM DIAMETER SHOULD BE 18 INCHES.
SEDIMENT TUBES SHOULD BE STAKED USING WOODEN STAKES (2-INCH X 2-INCH) OR STEEL POSTS (STANDARD "U" OR "T" SECTIONS WITH A MINIMUM WEIGHT OF 1.25 POUNDS PER FOOT) A MINIMUM OF 48-INCHES IN LENGTH PLACED ON 2-FOOT CENTERS.

STAKES SHOULD BE INTERTWINED WITH THE OUTER MESH ON THE DOWNSTREAM SIDE AND DRIVEN IN THE GROUND TO A MINIMUM DEPTH OF 1.5 FEET LEAVING LESS THAN 1 FOOT OF STAKE EXPOSED ABOVE THE SEDIMENT TUBE. ALWAYS REFER TO THE MANUFACTURER'S RECOMMENDATIONS FOR THE STAKING DETAIL. INSTALL ALL SEDIMENT TUBES INSURING THAT NO GAPS EXIST BETWEEN THE SOIL AND THE BOTTOM OF THE SEDIMENT TUBE. THE ENDS OF ADJACENT SEDIMENT TUBES SHOULD BE LAPPED 6-INCH TO PREVENT FLOW AND SEDIMENT FROM PASSING THROUGH THE FIELD JOINT. IN NO SITUATIONS SHOULD SEDIMENT TUBES BE STACKED ON TOP OF ONE ANOTHER.

CONSTRUCT A TRENCH THAT IS 20% OF THE TUBE DIAMETER TO INSTALL THE TUBE IN.
AVOID DAMAGE TO SEDIMENT TUBES WHILE INSTALLING THEM. IF THE SEDIMENT TUBE BECOMES DAMAGED DURING INSTALLATION, A STAKE SHOULD BE PLACED ON BOTH SIDES OF THE DAMAGED AREA TERMINATING THE TUBE SEGMENT AND A NEW TUBE SEGMENT SHOULD BE INSTALLED. SHOULD BE INSTALLED IN SWALES OR DRAINAGE DITCHES PERPENDICULAR TO THE FLOW OF WATER. SEDIMENT TUBES SHOULD CONTINUE UP THE SIDE SLOPES A MINIMUM OF 1 FOOT ABOVE THE DESIGN FLOW DEPTH. SEDIMENT TUBES SHOULD BE SPACED ACCORDING TO THE FOLLOWING TABLE.

SEDIMENT TUBE

SEDIMENT TUBE LENGTH SELECTED SHOULD MINIMIZE THE NUMBER OF SEDIMENT TUBES NEEDED TO SPAN THE WIDTH OF THE DRAINAGE CONVEYANCE.

IF THE DITCH CHECK LENGTH (PERPENDICULAR TO THE WATER FLOW) IS 15 FEET, THEN ONE 15 FOOT SEDIMENT TUBE IS PREFERRED COMPARED TO TWO OVERLAPPING 10 FOOT SEDIMENT TUBES.

SEDIMENT TUBES FOR DITCH CHECKS SHOULD REMAIN IN PLACE UNTIL FULLY ESTABLISHED VEGETATION AND ROOT SYSTEMS HAVE COMPLETELY DEVELOPED AND CAN SURVIVE ON THEIR OWN.

INSPECTION AND MAINTENANCE:

CHECK DAMS SHOULD BE INSPECTED EVERY 7 CALENDAR DAYS AND WITHIN 24-HOURS AFTER EACH STORM THAT PRODUCES ½-INCHES OR MORE OF RAIN TO ENSURE CONTINUED
EFFECTIVENESS.

LARGE DEBRIS, TRASH, AND LEAVES SHOULD BE REMOVED.

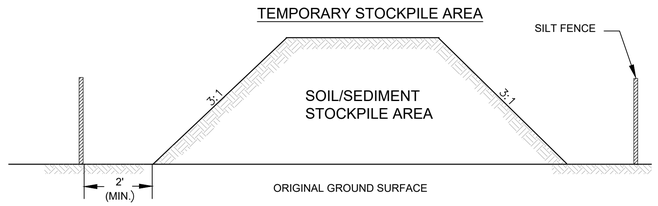
IF EROSION CAUSES THE EDGES TO FALL TO A HEIGHT EQUAL TO OR BELOW THE HEIGHT OF THE CENTER, REPAIRS SHOULD BE MADE IMMEDIATELY.

REMOVE ACCUMULATED SEDIMENT FROM THE UPSTREAM SIDE OF THE SEDIMENT TUBE WHEN
THE SEDIMENT HAS REACHED A HEIGHT OF APPROXIMATELY ONE-THIRD OF THE EXPOSED HEIGHT OF THE TUBE (MEASURED AT THE CENTER).

ACCUMULATED SEDIMENT SHOULD BE REMOVED PRIOR TO REMOVING SEDIMENT TUBES.

SEDIMENT TUBE REMOVAL SHOULD BE COMPLETED ONLY AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN COMPLETELY STABILIZED. PERMANENT VEGETATION SHOULD REPLACE AREAS FROM WHICH GRAVEL, STONE, SEDIMENT TUBES, OR OTHER MATERIALS HAVE BEEN REMOVED.

SEDIMENT TUBE DETAIL (1 / -)
NOT TO SCALE

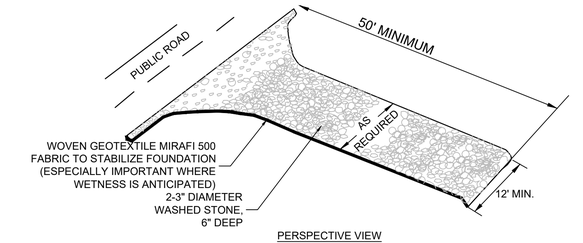


NOTES:

1. SILT FENCE TO EXTEND AROUND ENTIRE PERIMETER OF STOCKPILE, OR IF STOCKPILE AREA IS LOCATED ON/NEAR A SLOPE THE SILT FENCE IS TO EXTEND ALONG CONTOURS OF THE DOWN-GRADIENT AREA.
2. IF STOCKPILE IS TO REMAIN FOR MORE THAN 7 DAYS, TEMPORARY STABILIZATION MEASURES MUST BE IMPLEMENTED.
3. SILT FENCE SHALL BE MAINTAINED UNTIL STOCKPILE AREA HAS EITHER BEEN REMOVED OR PERMANENTLY STABILIZED.
4. THE KEY TO FUNCTIONAL TEMPORARY STOCKPILE AREAS IS WEEKLY INSPECTIONS, ROUTINE MAINTENANCE, AND REGULAR SEDIMENT REMOVAL.

STOCKPILE (2 / -)
NOT TO SCALE

DESIGN CRITERIA:
1. AGGREGATE SIZE: 2-3" DIAMETER WASHED STONE
2. PAD THICKNESS: 6" MINIMUM
3. PAD WIDTH: 12' MINIMUM
4. PAD LENGTH: 50' MINIMUM
5. PAD LOCATION: LOCATE CONSTRUCTION ENTRANCES AND EXITS TO LIMIT SEDIMENT FROM LEAVING THE SITE AND TO PROVIDE MAXIMUM UTILITY BY ALL CONSTRUCTION VEHICLES. AVOID STEEP GRADES AND ENTRANCES AT CURVES IN PUBLIC ROADS.
6. WASHING: IF CONDITIONS AT THE SITE ARE SUCH THAT MOST OF THE MUD AND SEDIMENT ARE NOT REMOVED BY VEHICLES TRAVELING OVER THE GRAVEL, THE TIRES SHOULD BE WASHED. WASHING SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO A SEDIMENT TRAP OR OTHER SUITABLE DISPOSAL AREA. A WASH RACK MAY ALSO BE USED TO MAKE WASHING MORE CONVENIENT AND EFFECTIVE.



PERSPECTIVE VIEW

MAINTENANCE:
- ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE.
- ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY.
- IF EXCESSIVE AMOUNTS OF SEDIMENT ARE BEING DEPOSITED ON ROADWAY, EXTEND LENGTH OF ROCK CONSTRUCTION ENTRANCE BY 50 FOOT INCREMENTS UNTIL CONDITION IS ALLEVIATED OR INSTALL WASH RACK.
- WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

PLAN SYMBOL

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE DETAIL (3 / -)
NOT TO SCALE

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N.C.B.E.L.S. License Number: F-0116

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	01/2025	ISSUED FOR BIDS

PROJECT MANAGER	MATTHEW A. SHULTZ, P.E.
DESIGNED BY	M. SHULTZ, P.E.
CHECKED BY	C. SMITH, P.E.
DRAWN BY	J. KROOSWYK
PROJECT NUMBER	10194380

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27599 MATTHEW A. SHULTZ 1.22.25

METROPOLITAN SEWERAGE DISTRICT • BUNCOMBE COUNTY, NORTH CAROLINA • 1936

CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

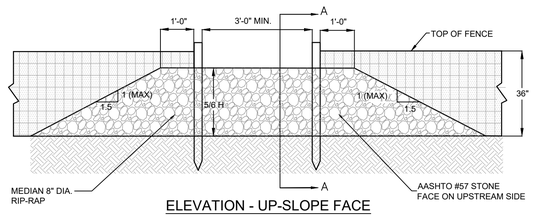
METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

EROSION CONTROL DETAILS 2

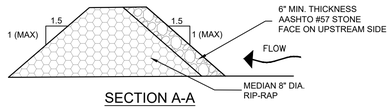
0 1" 2"

FILENAME	01C506.DWG
SCALE	NOT TO SCALE

SHEET 01C506



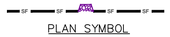
ELEVATION - UP-SLOPE FACE



SECTION A-A

NOTES:
1. WASHED STONE (#57) TO BE REMOVED AND REPLACED ONCE IT BECOMES CLOGGED WITH SEDIMENT.
2. SEDIMENT TO BE REMOVED WHEN ACCUMULATIONS REACH 1/3 HEIGHT OF SILT FENCE
3. THE KEY TO FUNCTIONAL ROCK OUTLETS IS WEEKLY INSPECTIONS, ROUTINE MAINTENANCE, AND REGULAR SEDIMENT REMOVAL.

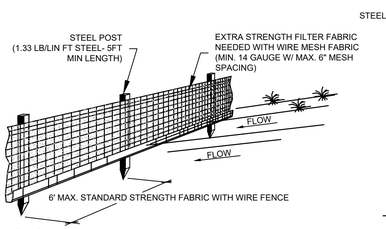
MAINTENANCE:
- A ROCK FILTER OUTLET SHALL BE INSTALLED WHERE FAILURE OF A SILT FENCE OR STRAW BALE BARRIER HAS OCCURRED DUE TO CONCENTRATED FLOW.
- SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE HEIGHT OF THE OUTLET.

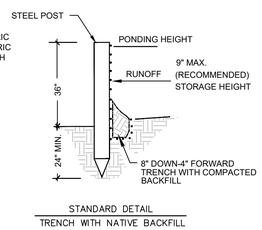


PLAN SYMBOL

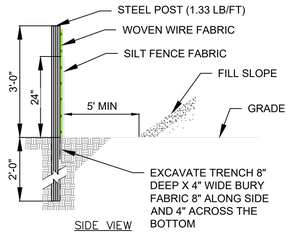
SILT FENCE / ROCK OUTLET

1 / - NOT TO SCALE





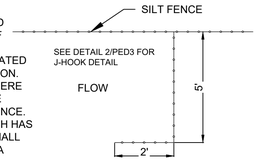
STANDARD DETAIL
TRENCH WITH NATIVE BACKFILL



SIDE VIEW

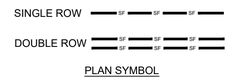
NOTES:
1. A DOUBLE ROW OF SILT FENCE (MINIMUM 5' APART) MUST BE INSTALLED IN AREAS WHERE A 50' UNDISTURBED BUFFER CANNOT BE MAINTAINED BETWEEN THE DISTURBED AREA AND THE WATERS OF THE STATE.
2. A MINIMUM 10' MAINTENANCE BUFFER SHALL BE PROVIDED BETWEEN LAST ROW OF SILT FENCE AND THE WATERS OF THE STATE.
3. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN DEPOSITS REACH 30% OF FENCE HEIGHT.
4. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
5. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
6. DRAINAGE AREA OF 1/4 ACRE OR LESS PER 100 LF.
7. USE FILTRATION GEOTEXTILE A MINIMUM OF 36" IN WIDTH AND FASTEN ADEQUATELY TO THE POSTS AND WIRE AS DIRECTED.
8. USE WIRE A MINIMUM OF 32" IN WIDTH AND WITH A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
9. PROVIDE 5'-0" STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.
10. FOR MECHANICAL SLICING METHOD INSTALLATION, GEOTEXTILE SHALL BE A MAXIMUM OF 18" ABOVE GROUND SURFACE.

MAINTENANCE:
- SILT FENCE SHOULD BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT.
- NEEDED REPAIRS SHOULD BE INITIATED IMMEDIATELY AFTER THE INSPECTION.
- SEDIMENT SHALL BE REMOVED WHERE ACCUMULATIONS REACH HALF THE ABOVEGROUND HEIGHT OF THE FENCE.
- ANY SECTION OF SILT FENCE WHICH HAS BEEN UNDERMINED OR TOPPED SHALL BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET (STANDARD CONSTRUCTION DETAIL #4).



PLAN VIEW

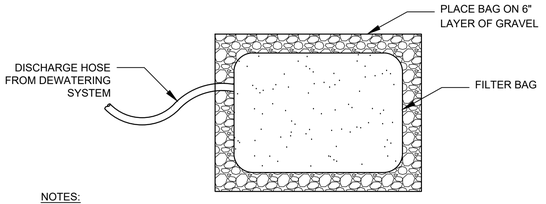
SLOPE STEEPNESS	MAXIMUM SPACE BETWEEN SILT FENCE ROWS OR J-HOOKS (FT.)
2:1 (50%)	25
3:1 (33%)	50
4:1 (25%)	75
5:1 OR FLATTER (20%)	100



PLAN SYMBOL

TEMPORARY SILT FENCE

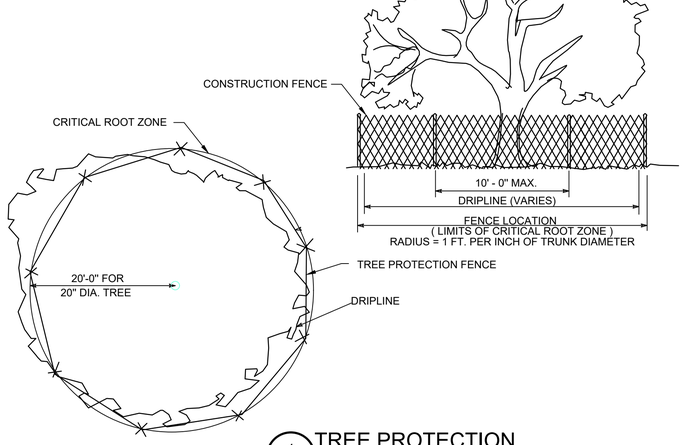
2 / - NOT TO SCALE



NOTES:
1. WATER DISCHARGED FROM THE CONSTRUCTION SITE SHALL NOT EXCEED 50 NTU.
2. CONTRACTOR TO SIZE FILTER BAG BASED UPON FLOW RATE OF DEWATERING SYSTEM. USE MULTIPLE BAGS AS NEEDED.
3. MONITOR DISCHARGE FROM BAG TO ENSURE NO DOWNSTREAM EROSION OCCURS.
4. FABRIC: 8 OZ NON-WOVEN GEOTEX. MIN. TENSILE STRENGTH OF 200 LB., AND MIN. PUNCTURE STRENGTH OF 130 LB. SEEMS SHALL HAVE MIN. STRENGTH OF 60 LB/IN.
5. REPLACE BAG AS NEEDED TO MEET REQUIRED DISCHARGE AND TURBIDITY LEVEL.
6. TAKE IMMEDIATE CORRECTIVE ACTION IF LEVELS EXCEED DISCHARGE LIMIT.

DEWATERING FILTER BAG

3 / - NOT TO SCALE



TREE PROTECTION

4 / - NOT TO SCALE

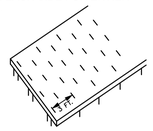
EROSION CONTROL MATTING DETAIL FOR STEEP SLOPES

INSTALLATION:
BLANKET IS DESIGNED TO PROTECT SEED ON SLOPES AND REDUCE OR PREVENT EROSION. PROPERLY PREPARE, FERTILIZE AND SEED AREA TO BE COVERED BEFORE BLANKET IS APPLIED. OVERCUT CHANNELS 2" TO ALLOW BULKING DURING SEEDBED PREPARATION. WHEN THE BLANKET IS UNROLLED, NETTING SHOULD BE ON TOP AND FIBERS IN CONTACT WITH THE SOIL OVER THE ENTIRE AREA. IN DITCHES, APPLY BLANKETS IN THE DIRECTION THE WATER FLOWS, BUTTING THEM AT THE ENDS AND SIDES AND THEN STAPLING. ON SLOPES, APPLY BLANKETS HORIZONTAL TO SLOPE, OVERLAP ENDS AND SIDES 6" AND THEN STAPLE. VERTICAL INSTALLATION MAY USED UPON ENGINEERS APPROVAL. INSTALL 6" LONGITUDINAL ANCHOR TRENCHES AT TOP OF SLOPE, AND ANCHOR. LONGITUDINAL ANCHOR TRENCHES SHOULD BE LOCATED ABOVE THE DESIGN DEPTH OF DITCHES.

STAPLING INSTRUCTIONS:
USE WIRE STAPLES, .091" DIAMETER OR GREATER, "U" SHAPED WITH LEGS 6" LONG OR LONGER AND 1" CROWN. SIZE AND GAUGE OF STAPLES USED WILL VARY WITH SOIL CONDITIONS. DRIVE STAPLES VERTICALLY INTO THE GROUND. USE FOUR STAPLES ACROSS AT THE START OF EACH ROLL. FOR SLOPE INSTALLATION, CONTINUE TO STAPLE ALONG THE LENGTH OF THE ROLL AT 3' TO 5' INTERVALS. FOR DITCH LINER, STAPLE ALONG THE LENGTH OF THE ROLL AT 3' FT. INTERVALS. ANOTHER ROW OF STAPLES IN THE CENTER OF EACH BLANKET SHOULD BE ALTERNATELY SPACED BETWEEN EACH SIDE FOR EITHER SLOPE FOR DITCH. USE A COMMON ROW OF STAPLES ON ADJOINING BLANKETS.

TYPICAL STAPLING PATTERN FOR HIGH-VELOCITY DITCHES AND SLOPES.

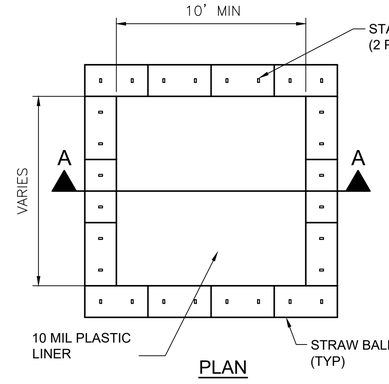
USE 4 STAPLES ACROSS AT THE START OF EACH ROLL AND CONTINUE TO STAPLE THROUGHOUT THE LENGTH OF THE ROLL AT 1.5 FT. INTERVALS.



MATTING MATERIALS: NORTH AMERICAN GREEN
SLOPES 2:1 OR GREATER, OR ON SENSITIVE AREAS- TYPE S75 OR APPROVED EQUAL
SWALES OR HIGH VELOCITY AREAS- TYPE S150 OR APPROVED EQUAL

MATTING STEEP SLOPES

5 / - NOT TO SCALE



PLAN

SECTION A-A

TEMPORARY CONCRETE WASHOUT DETAIL

6 / - NOT TO SCALE

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of the Carolinas

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N.C.B.E.L.S. License Number: F-0116

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PROJECT NUMBER	10194380

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27599 MATTHEW A. SHULTZ 12.2.25

METROPOLITAN SEWERAGE DISTRICT • BUNCOMBE COUNTY, NORTH CAROLINA •

CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

EROSION CONTROL DETAILS 3

0 1" 2"

FILENAME 01C507.DWG
SCALE NOT TO SCALE

SHEET 01C507

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those un-attended days (and this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication of whether the measures were operating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDOs)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the discharge outfalls inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5. Indication of visible sediment leaving the site, 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits, 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item (2)(a) of this permit.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be kept on site and available for inspection at all times during normal business hours.

Item to Document	Documentation Requirements
(a) Each E&SC measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&SC plan.	Initial and date each E&SC measure on a copy of the approved E&SC plan or complete, date and sign an inspection report that lists each E&SC measure shown on the approved E&SC plan. This documentation is required upon the initial installation of the E&SC measures or if the E&SC measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&SC plan.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&SC measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&SC measures.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

2. Additional Documentation to be Kept on Site

In addition to the E&SC plan documents above, the following items shall be kept on the site and available for inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

(a) This General Permit as well as the Certificate of Coverage, after it is received.

(b) Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years

All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.

(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(c) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.

(d) Anticipated bypasses and unanticipated bypasses.

(e) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Department's Environmental Emergency Center personnel at (800) 858-0368.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	• ***Within 24 hours***, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible***. The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment[40 CFR 122.41(l)(7)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

PART II, SECTION G, ITEM (4)
DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT

Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is infeasible. The circumstances in which it is not feasible to withdraw water from the surface shall be rare (for example, times with extended cold weather). Non-surface withdrawals from sediment basins shall be allowed only when all of the following criteria have been met:

(a) The E&SC plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur. The non-surface withdrawal shall not commence until the E&SC plan authority has approved these items,
(b) The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit,
(c) Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin. Examples of appropriate controls include properly sited, designed and maintained dewatering tanks, weir tanks, and filtration systems,
(d) Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above,
(e) Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and
(f) Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

HDR Engineering Inc.
of the Carolinas

440 S. Church Street, Suite 1200
Charlotte, NC 28202
704.338.6700

N.C.B.E.L.S. License Number: F-0116

ISSUE	DATE	DESCRIPTION
	01/2025	ISSUED FOR BIDS

PROJECT MANAGER	MATTHEW A. SHULTZ, P.E.
DESIGNED BY	M. SHULTZ, P.E.
CHECKED BY	C. SMITH, P.E.
DRAWN BY	J. KROOSWYK
PROJECT NUMBER	10194380

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27599 MATTHEW A. SHULTZ 12.2.25

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY, NORTH CAROLINA

CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

EROSION CONTROL DETAILS 4

0 1" 2"

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SCALE NOT TO SCALE

SHEET 01C508

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
(d) Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plastic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
2. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
3. Apply flocculants at the concentrations specified in the *NC DWR List of Approved PAMS/Flocculants* and in accordance with the manufacturer's instructions.
4. Provide ponding area for containment of treated Stormwater before discharging offsite.
5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

EQUIPMENT AND VEHICLE MAINTENANCE

1. Maintain vehicles and equipment to prevent discharge of fluids.
2. Provide drip pans under any stored equipment.
3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
5. Remove leaking vehicles and construction equipment from service until the problem has been corrected.
6. Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

1. Never bury or burn waste. Place litter and debris in approved waste containers.
2. Provide a sufficient number and size of waste containers (e.g dumpster, trash receptacle) on site to contain construction and domestic wastes.
3. Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
4. Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
5. Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
6. Anchor all lightweight items in waste containers during times of high winds.
7. Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
8. Dispose waste off-site at an approved disposal facility.
9. On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE

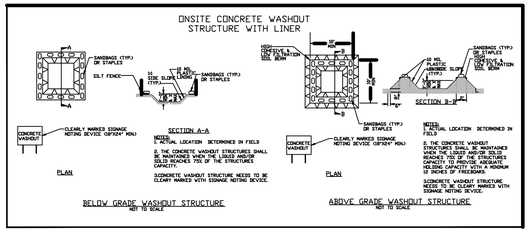
1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled, sized and placed appropriately for the needs of site.
5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

PORTABLE TOILETS

1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
3. Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

EARTHEN STOCKPILE MANAGEMENT

1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
3. Provide stable stone access point when feasible.
4. Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.



CONCRETE WASHOUTS

1. Do not discharge concrete or cement slurry from the site.
2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
3. Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
4. Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
5. Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
6. Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
7. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
8. Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
9. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
10. At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

HERBICIDES, PESTICIDES AND RODENTICIDES

1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
2. Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
3. Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
4. Do not stockpile these materials onsite.

HAZARDOUS AND TOXIC WASTE

1. Create designated hazardous waste collection areas on-site.
2. Place hazardous waste containers under cover or in secondary containment.
3. Do not store hazardous chemicals, drums or bagged materials directly on the ground.

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

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CHECKED BY	C. SMITH, P.E.
DRAWN BY	J. KROOSWYK
PROJECT NUMBER	10194380

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27599 MATTHEW A. SHULTZ 1.22.25

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

EROSION CONTROL DETAILS 5

0 1" 2"

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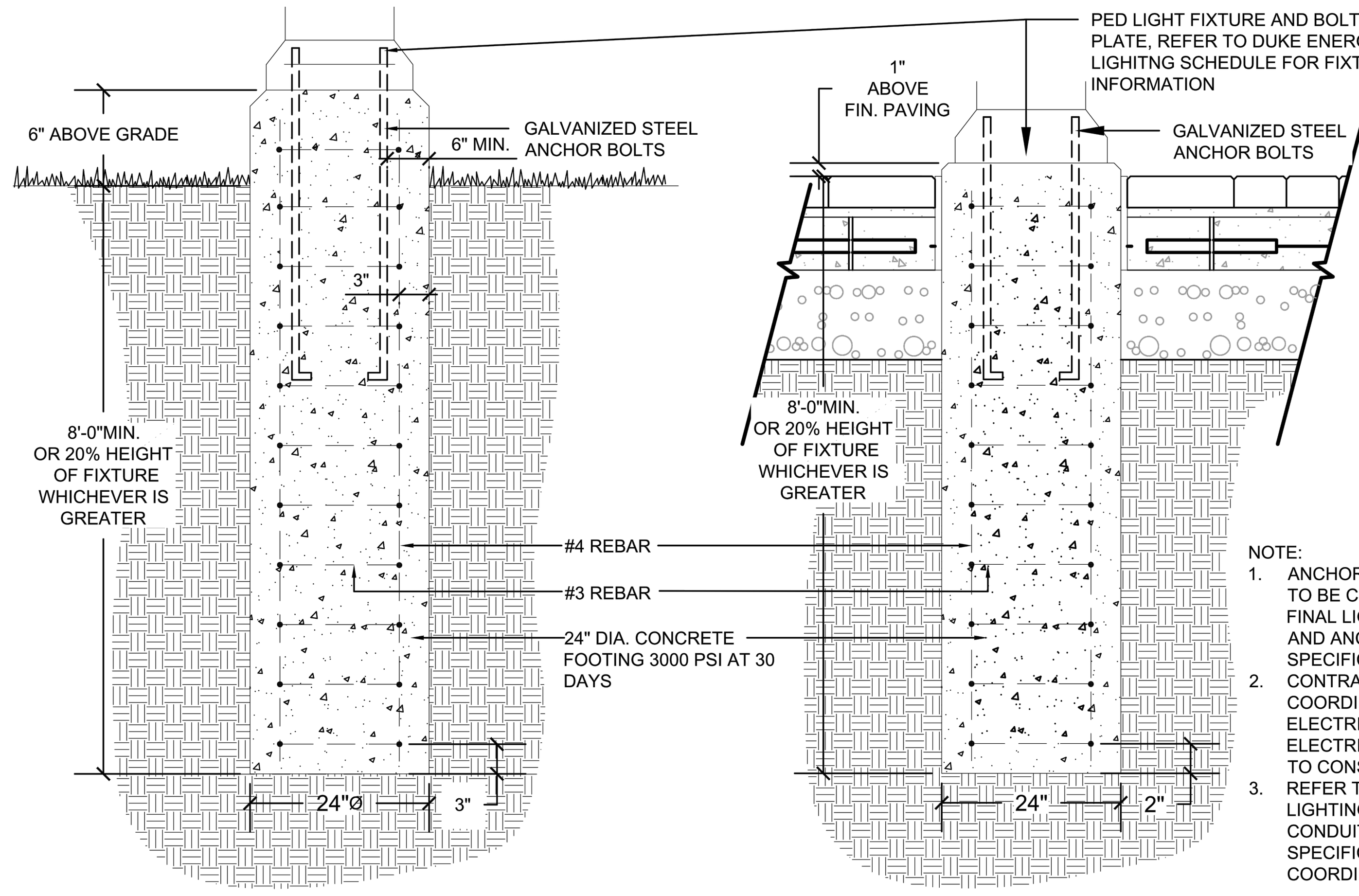
SCALE NOT TO SCALE

SHEET 01C509



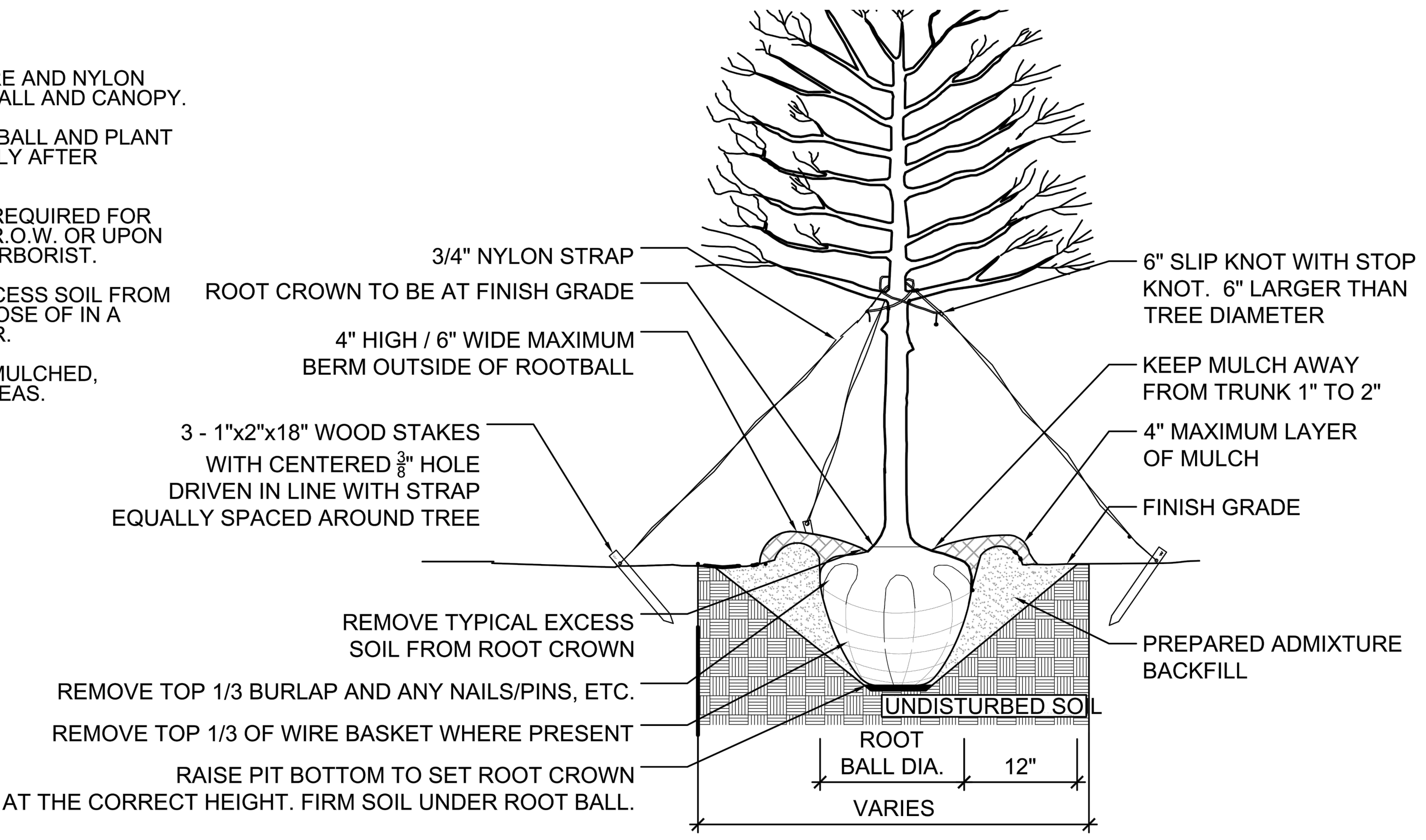
NOTE:
1. ANCHOR BOLTS AND COVER TO BE COORDINATED WITH FINAL LIGHT POLE SELECTION AND ANCHOR PLATE SPECIFICATION.
2. CONTRACTOR TO COORDINATE WITH LOCAL ELECTRIC COMPANY AND ELECTRICAL ENGINEER PRIOR TO CONSTRUCTION.
3. REFER TO DUKE ENERGY LIGHTING PLAN FOR FINAL CONDUIT DESIGN SPECIFICATIONS AND COORDINATION.

1 PED LIGHT POLE FOOTING

NOT TO SCALE

NOTES:

1. REMOVE WIRE AND NYLON TWINE FROM BALL AND CANOPY.
2. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.
3. STAKING IS REQUIRED FOR ALL TREES IN R.O.W. OR UPON REQUEST OF ARBORIST.
4. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
5. RESEED UNMULCHED, DISTURBED AREAS.



ALL TREES SHALL MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2004)

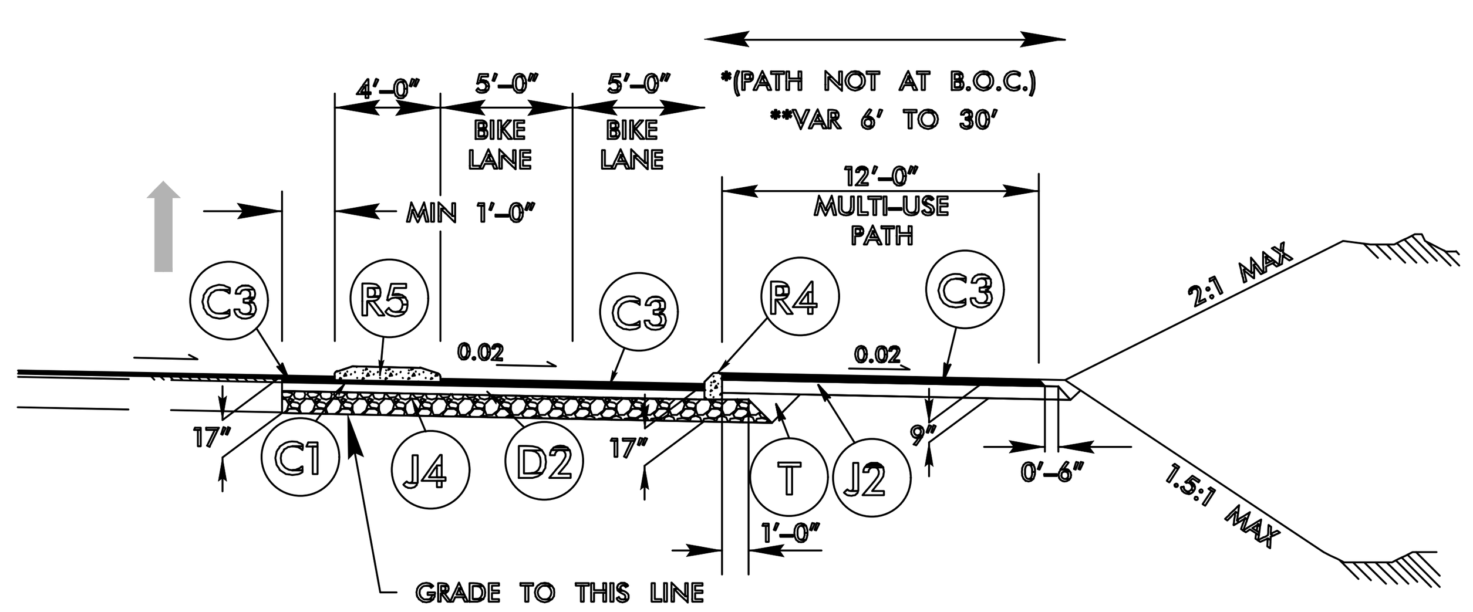
FOR EXAMPLE:	CALIPER	HEIGHT (RANGE)	MAX. HEIGHT	MIN. ROOT BALL DIA.	MIN. ROOT BALL DEPTH
	2"	12-14'	16'	24"	16"
	3"	14-16'	18'	32"	21"

2 TREE PLANTING FOR SINGLE STEM TREES

NOT TO SCALE

NOTES:

1. SHOWN DETAILS ARE FROM THE FOLLOWING REFERENCES:
   A) PLANS BY CDM SMITH, TITLED: CITY OF ASHEVILLE - BUNCOMBE COUNTY - RIVER ARTS DISTRICT - IMPROVEMENT PROJECT (RADTIP).
   B) PLANS BY LAND DESIGN, TITLED: RIVER ARTS DISTRICT - TRANSPORTATION IMPROVEMENT PROJECT - STREETSCAPE & BMP.



PAVEMENT SCHEDULE (FINAL PAVEMENT DIESGN)

C1: PROP. APPROX. 1-1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168LBS PER SQ. YD.
C3: PROP. APPROX 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS PER SQ. YD. IN EACH OF TWO LAYERS.
D2: PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS PER SQ YD.
J2 : PROP. 6" AGGREGATE BASE COURSE
J4: PROP. 10" AGGREGATE BASE COURSE
R4: 8"x12" CONCRETE CURB
R5: 5" MONOLITHIC CONCRETE CURB (KEYED IN)
T: EARTH MATERIAL

3 TYPICAL SECTION NO. 13

NOT TO SCALE

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METROPOLITAN SEWERAGE DISTRICT BUNCOMBE COUNTY, NORTH CAROLINA

CARRIER BRIDGE PUMP STATION (PIPELINE RIVER CROSSINGS)

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

GREENWAY RESTORATION DETAILS 1

0 1" 2"

FILENAME 01C510.dwg

SCALE NOT TO SCALE

SHEET 01C510