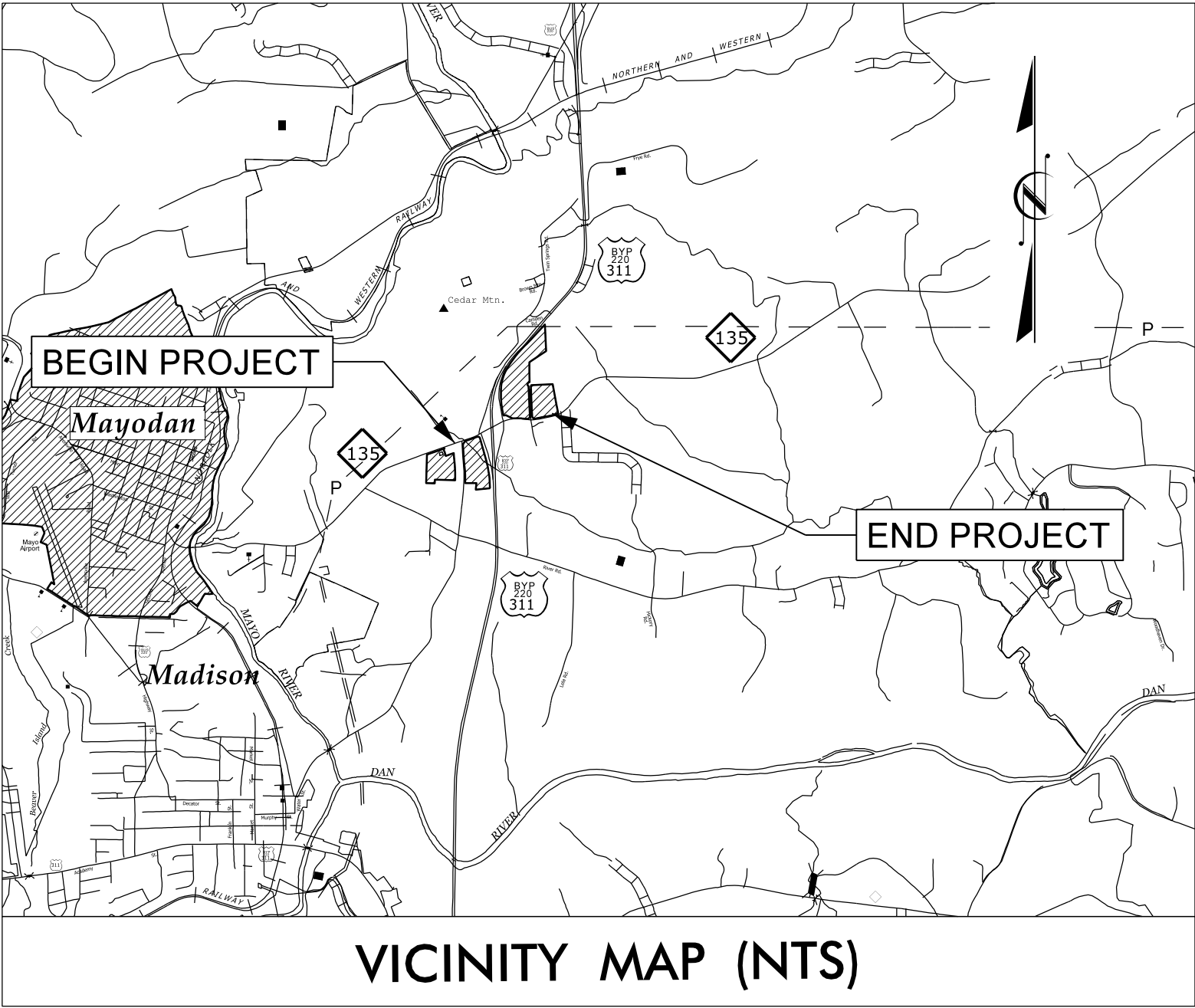


09/08/2025

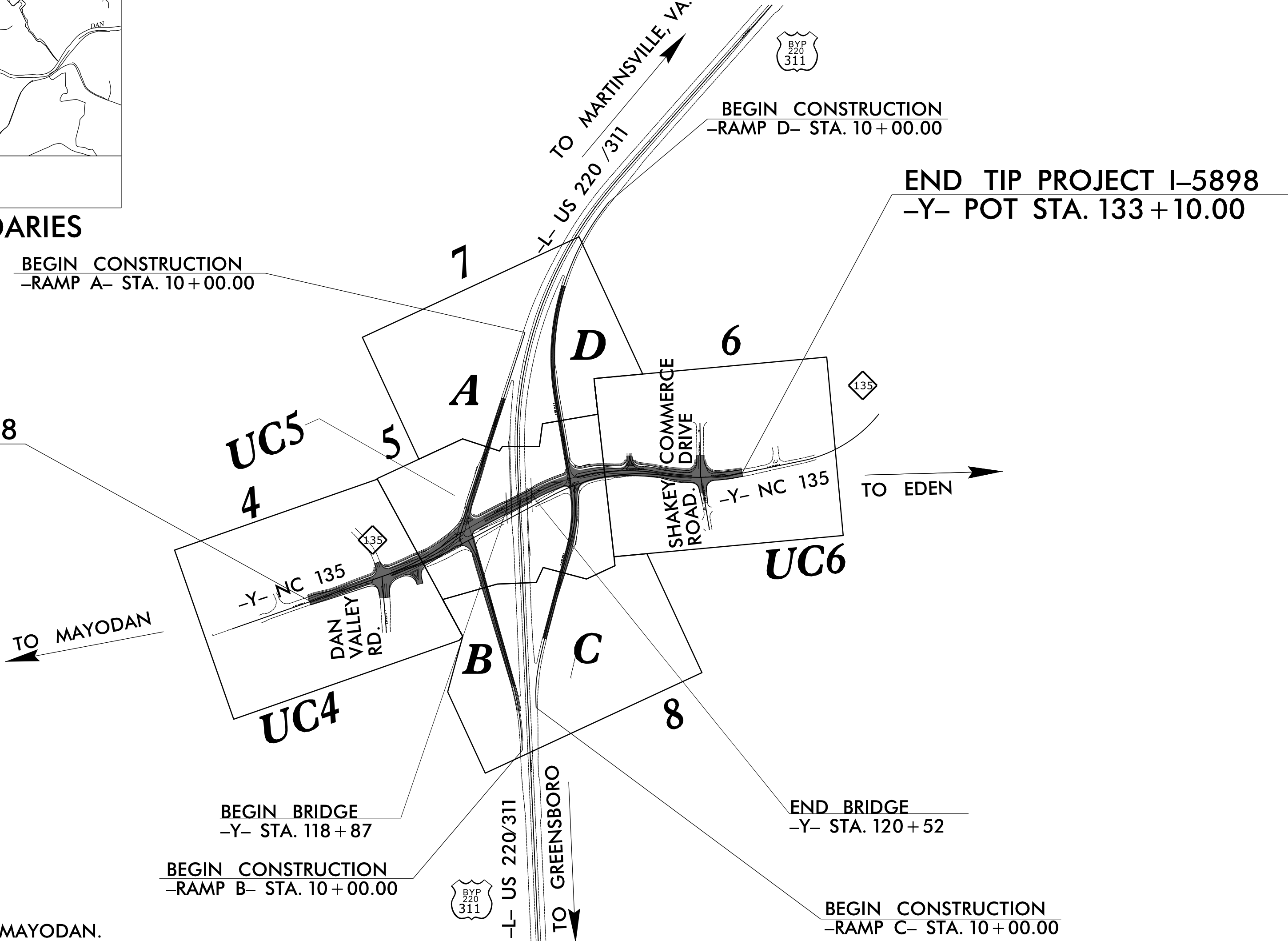
TIP PROJECT: I-5898



MAYODAN MUNICIPAL BOUNDARIES

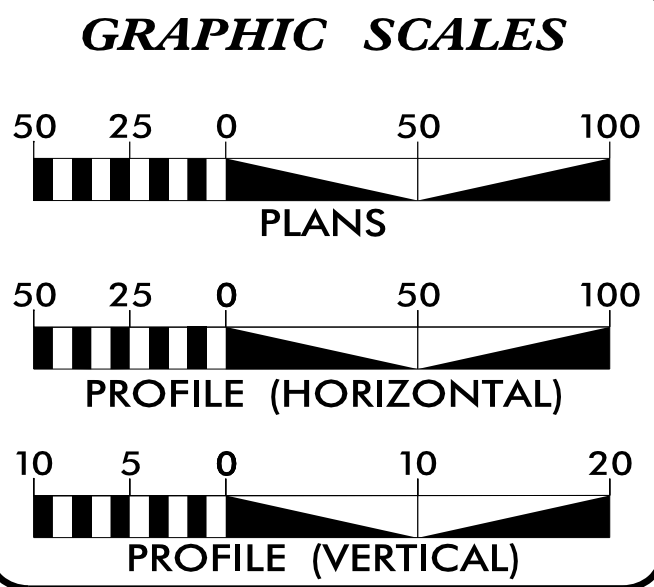
BEGIN TIP PROJECT I-5898
-Y- POT STA. 106+00.00

BEGIN CONSTRUCTION
-RAMP A- STA. 10+00.00



- THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF MAYODAN.
- CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
- THIS IS A FULL & PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

DOCUMENT NOT CONSIDERED FINAL
UNTIL ALL SIGNATURES ARE COMPLETED



INDEX OF SHEETS	
SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3A	NOTES
UC-3B THRU UC-3E	DETAILS
UC-4 THRU UC-6	UTILITY CONSTRUCTION SHEETS
UC-7 THRU UC-9	PROFILE SHEETS

**WATER AND SEWER
OWNERS ON PROJECT**

(A) WATER & SANITARY SEWER -
TOWN OF MAYODAN

PREPARED IN THE OFFICE OF

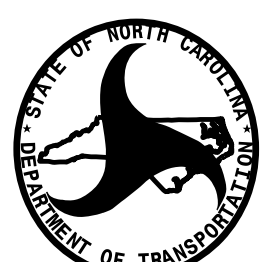
Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

BEN W. KOSKI, PE CONSULTANT CONTACT #1
LEIGH-ANN B. DUDLEY, PE CONSULTANT CONTACT #2
TRAVIS KNECHT CONSULTANT CONTACT #3

SEAL

NORTH CAROLINA
PROFESSIONAL
ENGINEER
45146
BENJAMIN W. KOSKI
11/7/2025

 **DIVISION OF HIGHWAYS
UTILITIES UNIT**
1555 MAIL SERVICES CENTER
RALEIGH, NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

ALI KOUCHEKI, PE UTILITIES REGIONAL ENGINEER
JAMES YATES, PE UTILITIES ENGINEER
DAYTON MARTIN UTILITIES AREA COORDINATOR
CODY LUNGRIN UTILITIES COORDINATOR

UTILITIES PLAN SHEET SYMBOLS

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Telephone Pedestal	
Utility Line by Others (Type as Shown)	
Trenchless Installation	
Encasement by Open Cut	
Encasement	

Thrust Block		
Air Release Valve		
Utility Vault		
Concrete Pier		
Steel Pier		
Plan Note		NOTE
Pay Item Note		PAY ITEM

Underground Power Line	12" TL INSTALL
*Underground Telephone Cable	12" TL INSTALL
*Underground Telephone Conduit	12" TL INSTALL
*Underground Fiber Optics Telephone Cable	12" TL INSTALL
*Underground TV Cable	12" TL INSTALL
*Underground Fiber Optics TV Cable	12" TL INSTALL
*Underground Gas Pipeline	12" TL INSTALL
Aboveground Gas Pipeline	A/G Gas
*Underground Water Line	12" TL INSTALL
Aboveground Water Line	A/G Water
*Underground Gravity Sanitary Sewer Line	SS
Aboveground Gravity Sanitary Sewer Line	A/G Sanitary Sewer
*Underground SS Forced Main Line	12" TL INSTALL
Underground Unknown Utility Line	12" TL INSTALL
SUE Test Hole	●
Water Meter	⊠
Water Valve	⊕
Fire Hydrant	⊕
Sanitary Sewer Cleanout	⊕

Gravity Sewer Line 12" SS
(Sized as Shown)

Force Main Sewer Line 12" FSS
(Sized as Shown)

Manhole
(Sized per Note) •

Sewer Pump Station PS(SS)

Power Pole	
Telephone Pole	
Joint Use Pole	
Utility Pole	
Utility Pole with Base	
H-Frame Pole	
Power Transmission Line Tower	
Water Manhole	
Power Manhole	
Telephone Manhole	
Sanitary Sewer Manhole	
Hand Hole for Cable	
Power Transformer	
Telephone Pedestal	
CATV Pedestal	
Gas Valve	
Gas Meter	
Located Miscellaneous Utility Object	
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

For Existing Utilities

Utility Line Drawn from Record 12" TL INSTALL

(Type as Shown)

Designated Utility Line

(Type as Shown)

5/14/25

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S (THE DEPARTMENT) "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024.
2. THE EXISTING WATER AND SEWER UTILITIES BELONG TO THE TOWN OF MAYODAN.
3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.
4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.
7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.
9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.
10. MAINTAIN 18" MIN. VERTICAL SEPARATION AT ALL WATERMAIN & RCP STORM DRAIN CROSSINGS.
11. ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER WITH 18" MIN. VERTICAL SEPARATION REQUIRED.
12. ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW & APPROVAL OF AN AMENDED PLAN &/OR PROFILE BY THE TOWN OF MAYODAN PRIOR TO CONSTRUCTION.

13. CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER & SEWER SERVICE TO EXISTING RESIDENCES & BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE PRECEDED BY A 24 HOUR ADVANCE NOTICE TO THE TOWN OF MAYODAN.

14. 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS. 4.0' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS.

PROJECT SPECIFIC NOTES:

1. PROPOSED WATER LINE SHALL BE MJ DIP OF THE SAME PRESSURE CLASS AND THICKNESS AS THE EXISTING WATER LINE UNLESS OTHERWISE SHOWN ON THE CONTRACT DOCUMENTS.
2. ALL PIPE JOINTS AND FITTINGS SHALL BE RESTRAINED WITH RESTRAINED JOINTS. UNLESS OTHERWISE SHOWN ON THE CONTRACT DOCUMENTS.
3. CONTRACTOR SHALL ENSURE THAT THE CONNECTION BETWEEN EXISTING AND PROPOSED WATER LINE SHALL BE AT TIMES MOST CONVENIENT TO THE PUBLIC AND UTILITY OWNER.
4. CONTRACTOR SHALL COORDINATE WITH THE TOWN OF MAYODAN 72 HOURS PRIOR TO THE SHUTDOWN OF THE EXISTING WATER LINE.
5. CONTRACTOR SHALL REMOVE EXISTING 16" & 12" WATER LINE AS NECESSARY TO MAKE CONNECTION WITH THE NEW WATER LINE.
6. CONTRACTOR SHALL PLACE FOUNDATION CONDITIONING MATERIALS AND GEOTEXTILE IN ALL PROPOSED WATERLINE TRENCHES.
7. CONTRACTOR AND THE TOWN OF MAYODAN WILL EXCHANGE ALL NECESSARY CONTACTS / PHONE NUMBERS AT THE PRE CONSTRUCTION CONFERENCE.



2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: (919) 881-8899
NC CON. NO. F-0629

PROJECT REFERENCE NO.		SHEET NO.	
I-5898		UC-3A	
DESIGNED BY:	EPH	SEALED BY 45146 Dewberry 11/7/2025 11/7/2025 11/7/2025 11/7/2025 UTILITY CONSTRUCTION PLANS ONLY	
DRAWN BY:	TLK		
CHECKED BY:	EPH		
APPROVED BY:	BWK		
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION			
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151			

UTILITY CONSTRUCTION

8. UPON EXPOSING ANY OF THE TOWN OF MAYODAN'S ASSETS, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE TOWN OF MAYODAN TO PERFORM CONDITION ASSESSMENT OF THE ASSET WHILE EXPOSED.
9. CONTRACTOR SHALL PROVIDE A 2-DAY NOTIFICATION TO THE TOWN OF MAYODAN PRIOR TO ANYTIME CONTRACTOR WILL EXCAVATE WITHIN 10 FEET OF ANY TOWN OF MAYODAN WATER MAIN.
10. ALL NEW WATER INFRASTRUCTURE SHALL BE IN COMPLIANCE WITH FEDERAL, STATE, AND LOCAL STANDARDS.
11. WATER LINE ASSUMED TO BE 3' BELOW GRADE, CONTRACTOR TO VERIFY DEPTH OF WATER MAIN FOR SERVICE CONNECTIONS.
12. CONTRACTOR TO VERIFY SERVICE LINE SIZES FOR CONNECTION.

6/6/17/18

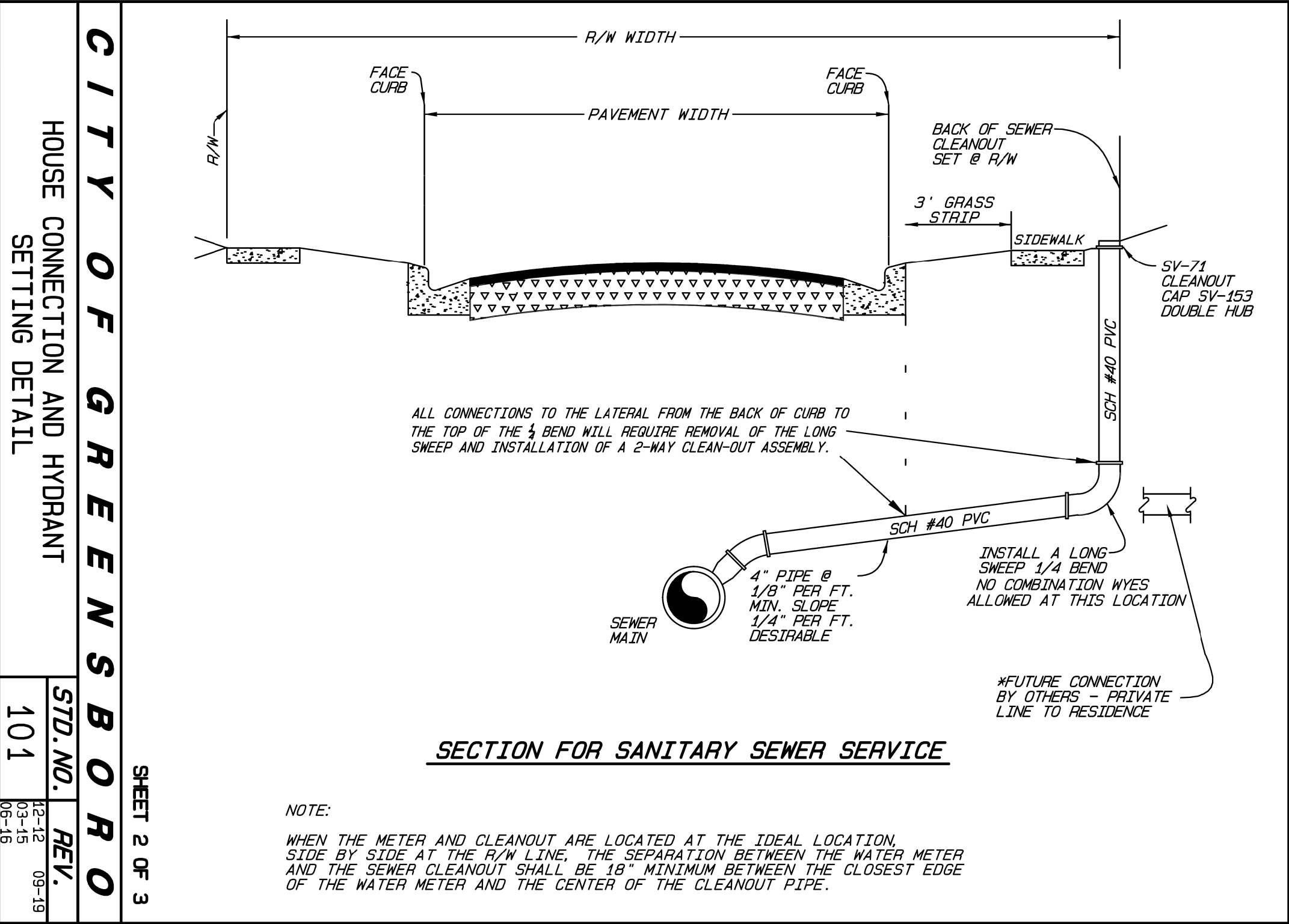
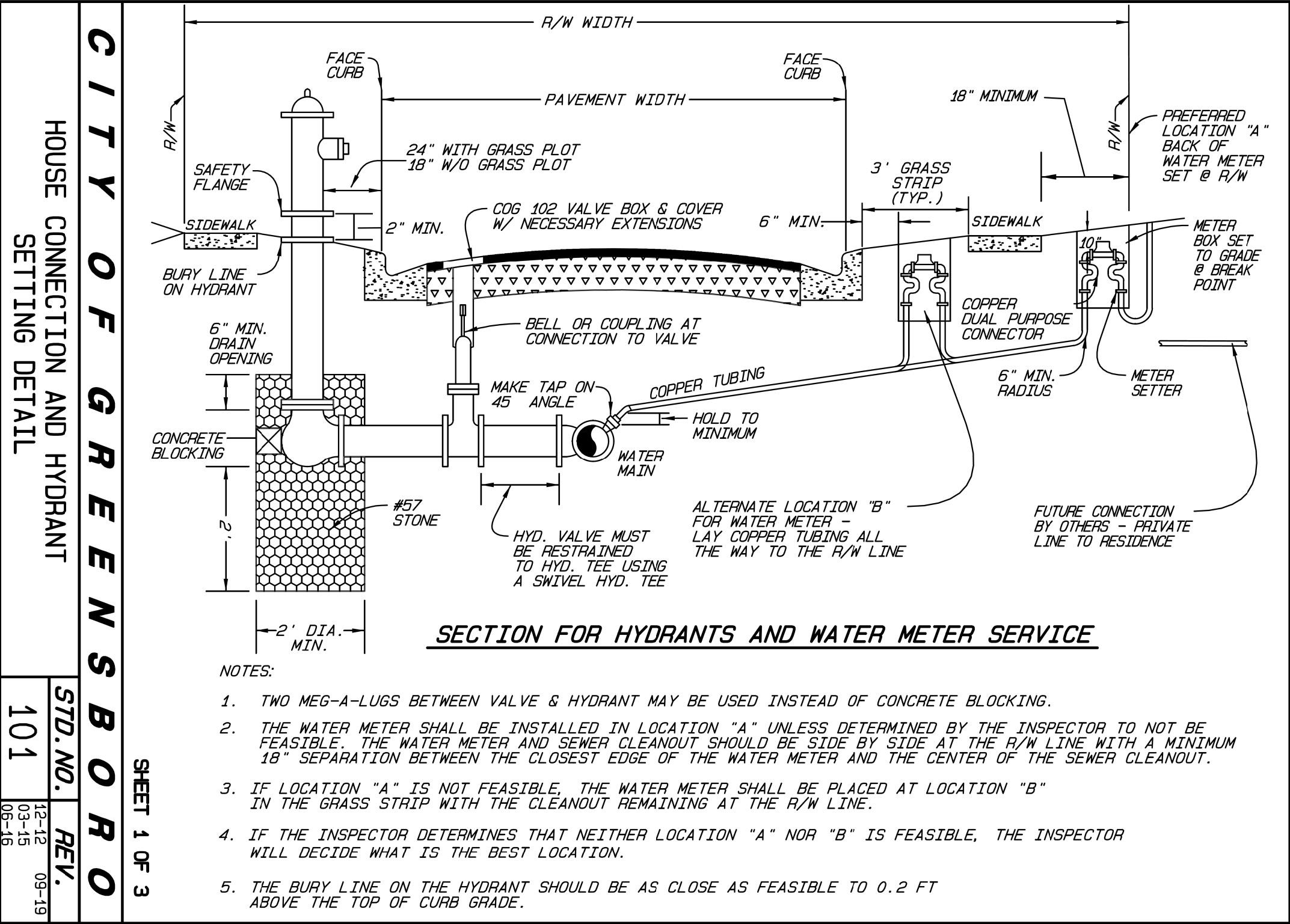
REVISIONS

PROJECT TYPICAL DETAILS

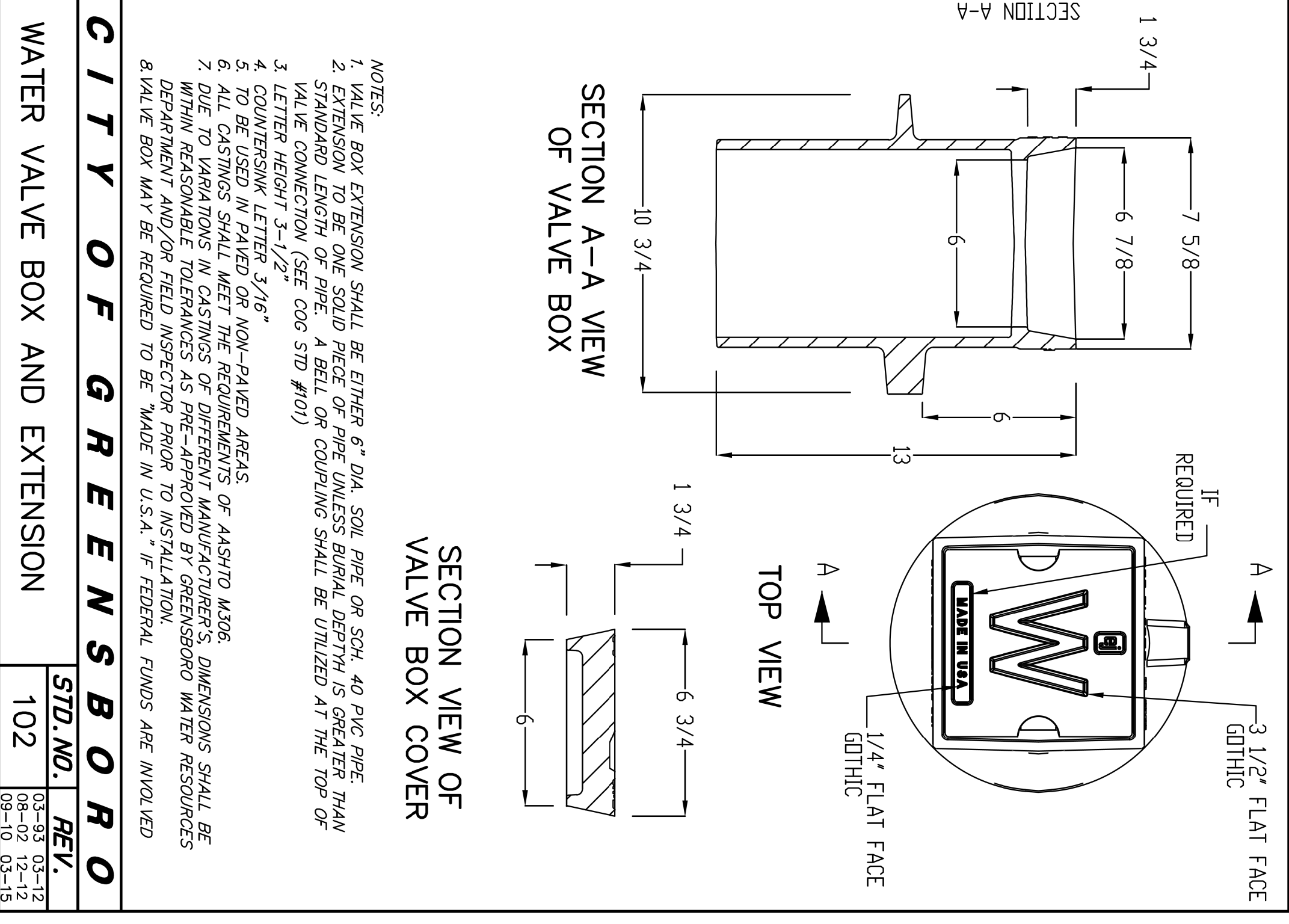
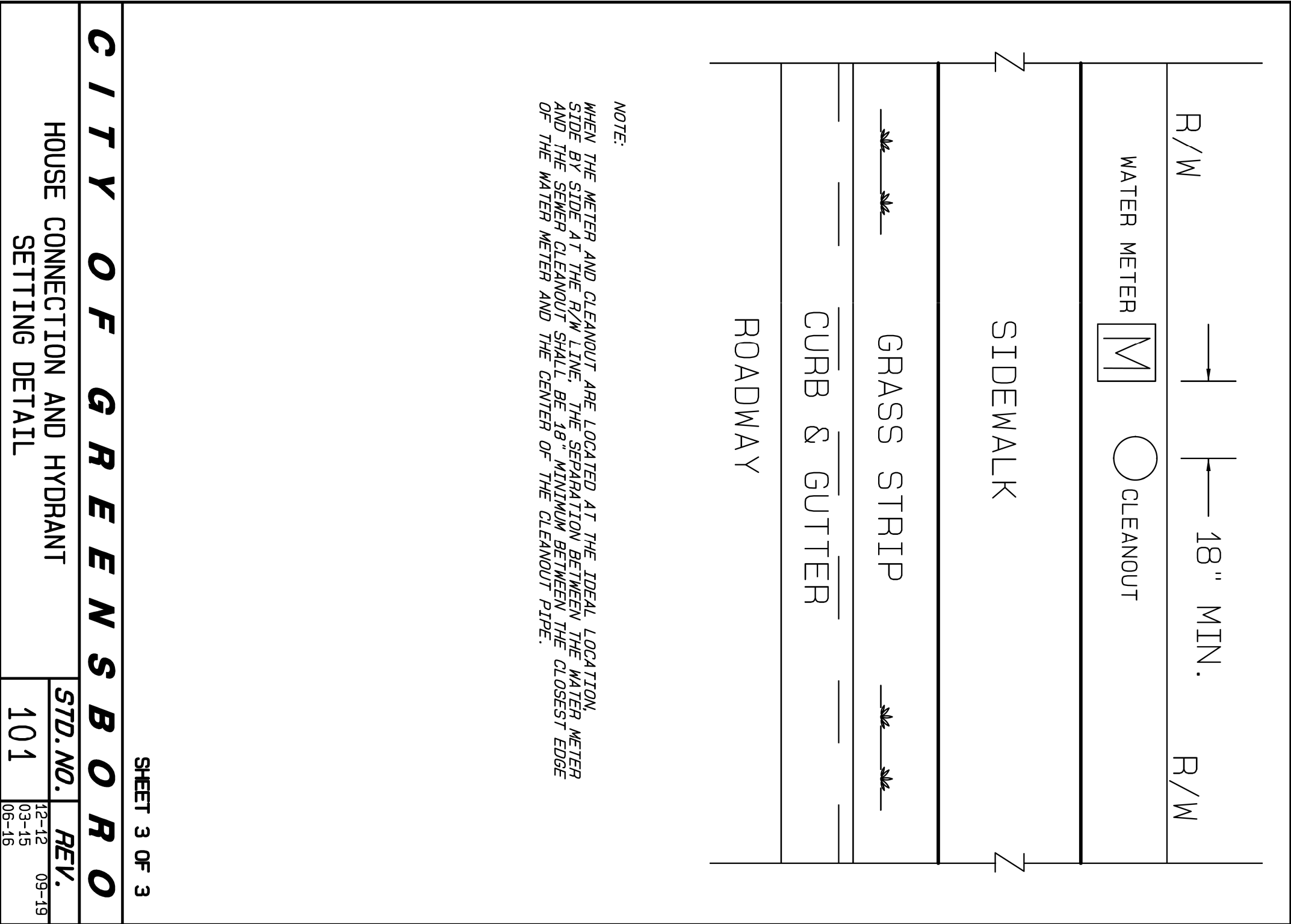


2610 WYOLFEE ROAD
RALEIGH, NC 27603
PHONE: (919) 251-5519
NC CORP. NO. P-0057

PROJECT REFERENCE NO.		SHEET NO.
I-5898		UC-3B
DESIGNED BY:	EPH	SEALED BY: 65148 Benjamin W. Cook Professional Engineer No. 65148 Exp. 12/31/2025 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION 11/7/2025 UTILITY CONSTRUCTION PLANS ONLY
DRAWN BY:	TLK	
CHECKED BY:	EPH	
APPROVED BY:	BWK	
REVISED:		
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		



UTILITY CONSTRUCTION



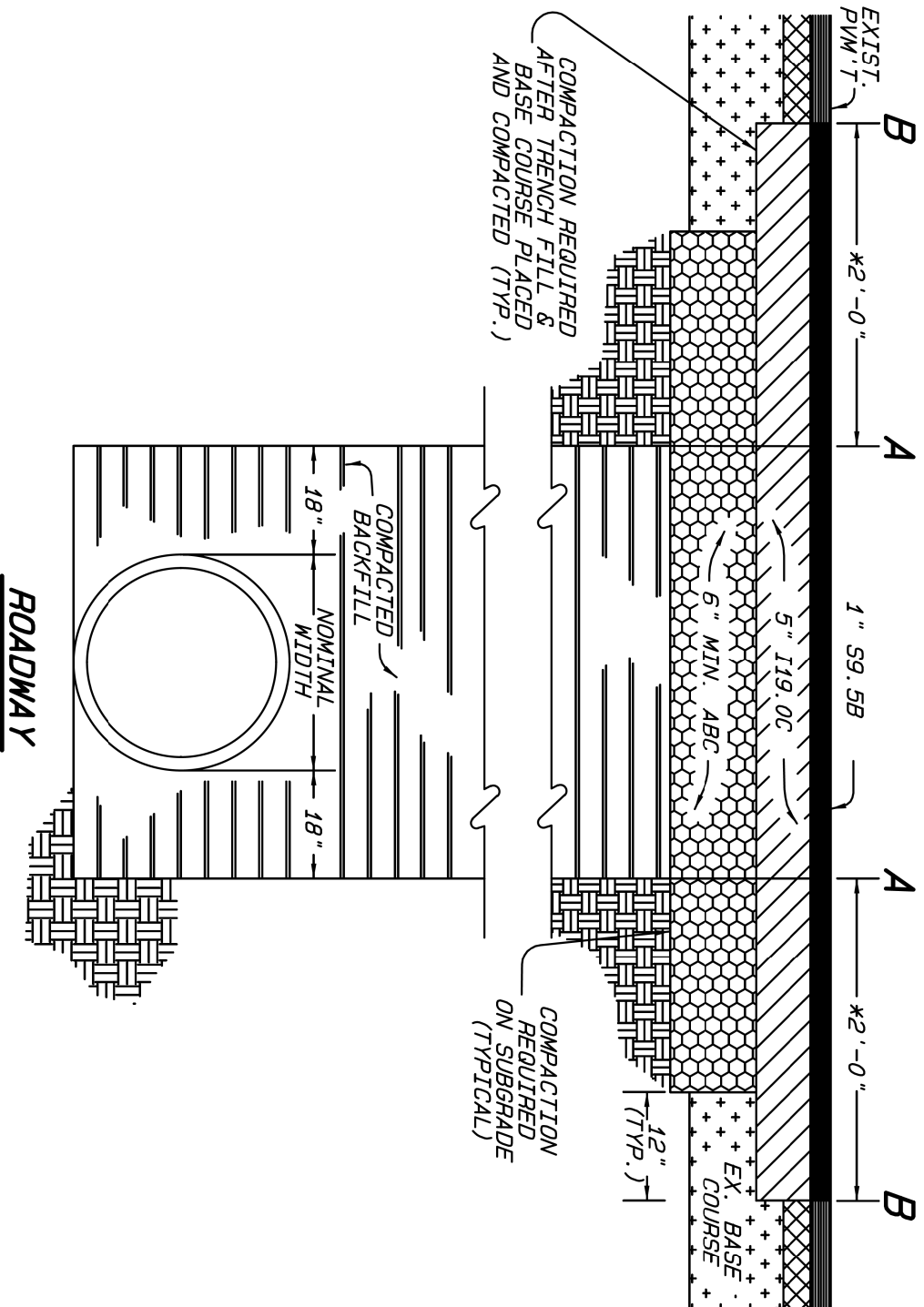
Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.593
NC COA No. F-0529

UTILITY CONSTRUCTION

* 2'-0" OR TO LIP OF GUTTER, CURB, PAVEMENT PATCH OR
EDGE OF PAVEMENT WITHIN 5'-0" OF SECOND SAW CUT
NOTE: 1) FULL LANE RESURFACING AND/OR MILLING MAY BE REQ
2) 3'-0" MAY BE REQUIRED AT THE DISCRETION OF THE
CITY ENGINEER OR DESIGNER.

A-A = INITIAL CUT
B-B = SECOND SAW CUT



INSTALLATION NOTES:

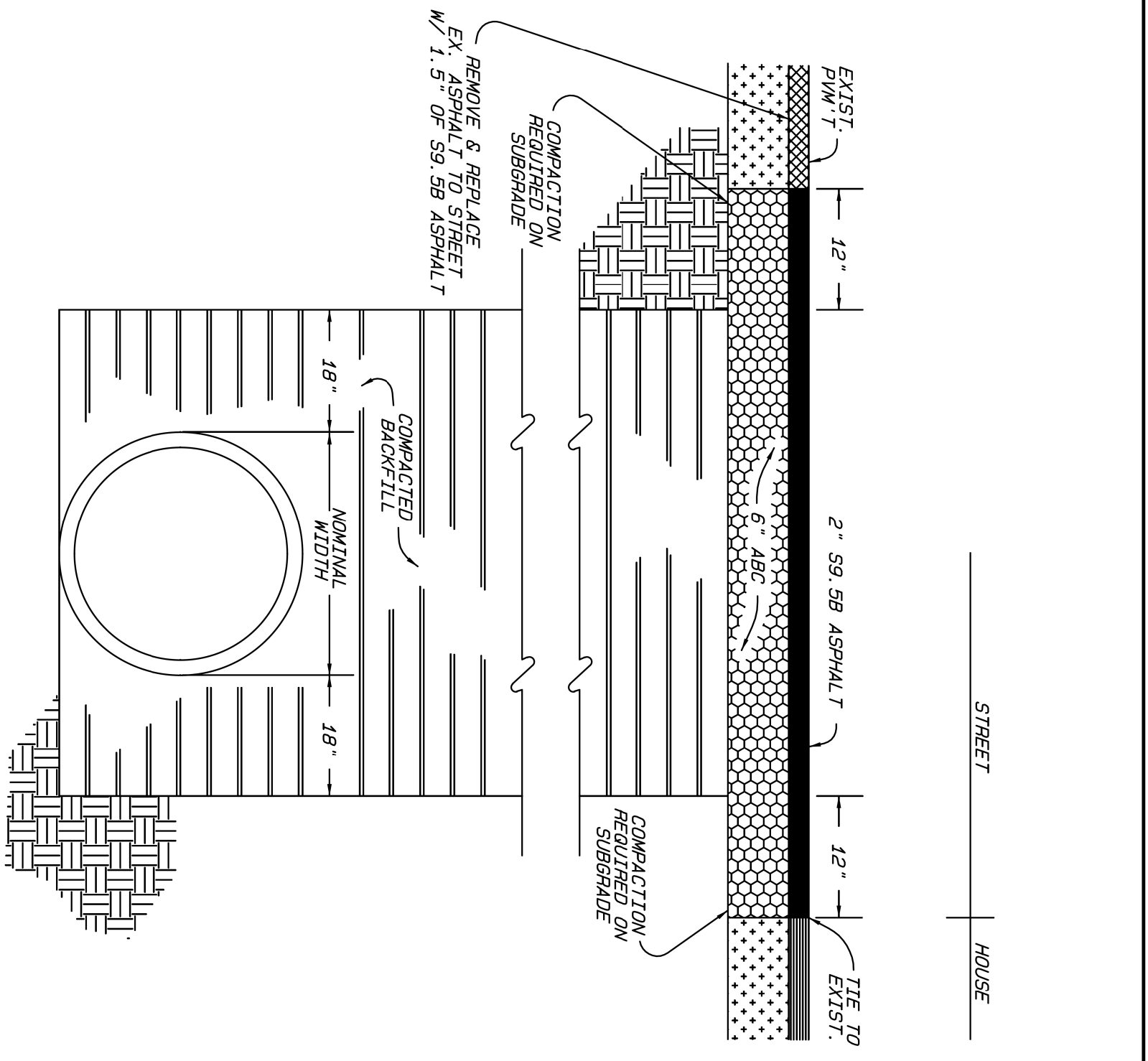
1119.0C INSTALLED IN TWO LIFTS OF 2'-1/2".
FILLER MATERIAL DEPTHS SHOULD EQUAL EXISTING, PLUS 1", OR MINIMUMS SHOWN (WHICH EVER IS GREATER).
FILLER MATERIAL COMPACTED TO 95% STANDARD PROCTOR. LIFTS NOT TO EXCEED 8 INCHES.
PROVIDE TACK COAT TO ALL VERTICAL PAYMENT SURFACES.
SECOND PAYMENT REMOVAL LINE B-B TO BE SAME CUT ONLY.
VARY BASED ON FIELD CONDITIONS AT DISCRETION OF FIELD INSPECTOR.

ADDITIONAL NOTES:

1. TEMPORARY STEEL PLATES ARE ALLOWED TO BE INSTALLED OVER A TYPICAL OPENING
2. EDGES OF STEEL PLATE MUST BE WELDED TO ALLOW THE PLATE TO STAY FLUSH WITH THE
3. EDGES OF THE PLATE
4. ANCHORS ARE REQUIRED TO TEMPORARILY FASTEN THE STEEL PLATE TO THE ASPHALT
5. TO PREVENT SLIDING OF THE PLATE
6. STEEL PLATE ARE NOT TO BE USED DURING THE WINTER MONTHS
7. ADVANCE WARNING SIGNS INDICATING "BUMP AHEAD" OR "UNEVEN PAVEMENT AHEAD" SHALL BE UTILIZED WHEN STEEL PLATING ARE USED.

CITY OF GREENSBORO

STANDARD NO.	REV.
107	03-12 03-15 06-15



ASPHALT DRIVEWAYS

CITY OF GREENSBORO

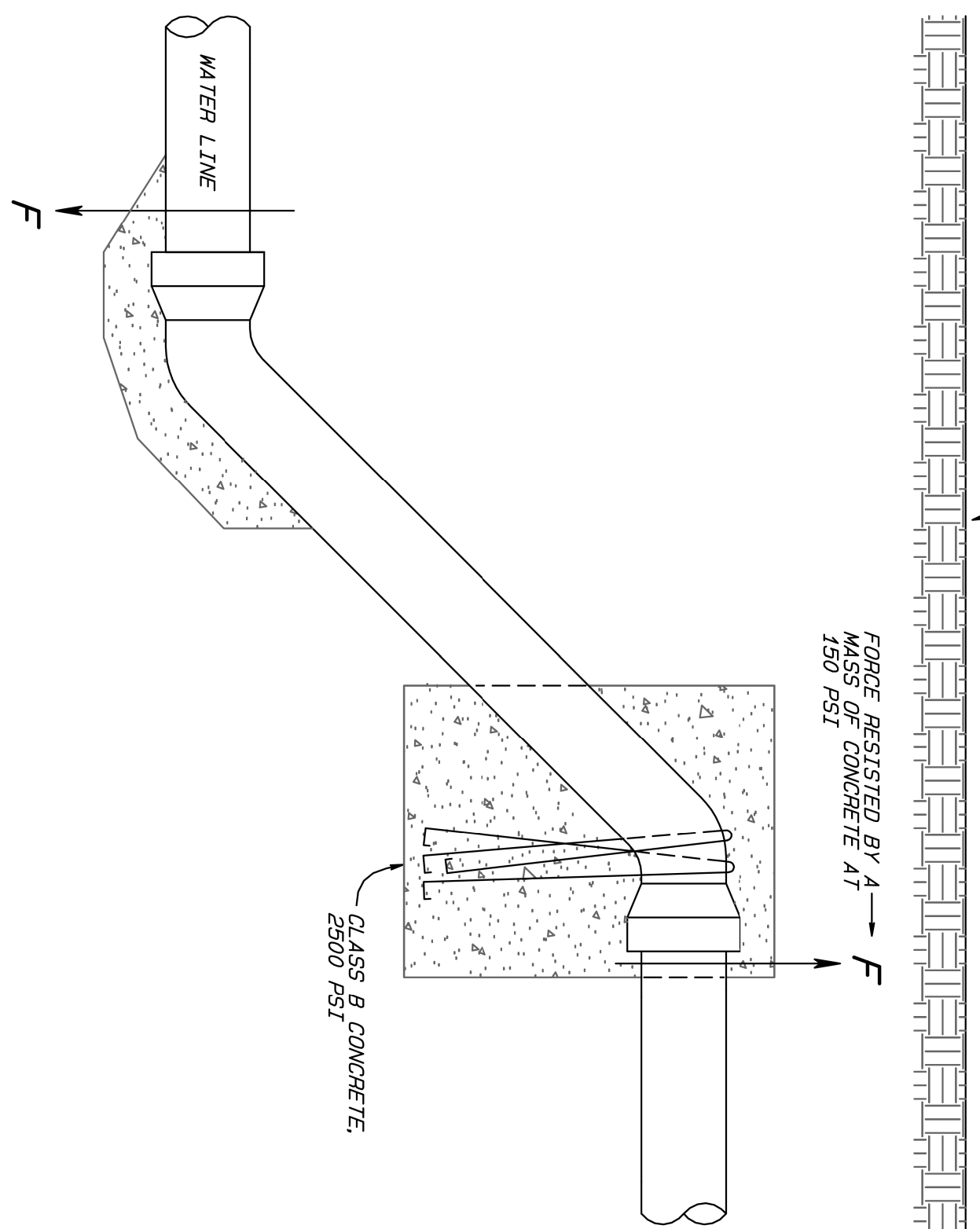
PAVEMENT REPAIR FOR PIPE/UTILITY PLACED UNDER EXISTING PAVEMENT (ASPHALT DRIVEWAYS)	STD.NO.	REV.
	03-03	03
	09-03	
	03-15	

PIES DATA	6" DROP	12" DROP	18" DROP	24" DROP	30" DROP	36" DROP
	FORCE	CONC.	FORCE	CONC.	FORCE	CONC.
6"	908#	1/4 CY 1466#	1/2 CY 1661#	1/2 CY 2481#	3/4 CY 3102#	3/4 CY 3722#
8"	1559	1/2 CY 2958#	3/4 CY 3175#	1/2 CY 2481#	3/4 CY 3102#	1.0 CY
10"	2395	3/4 CY 3718#	1.0 CY 4604#	1/4 CY 6143#	1/2 CY 9591#	1/2 CY
12"	2992	3/4 CY 4582#	1-1/4 CY 5450#	1-1/2 CY 7567#	1-3/4 CY	
16"	4306	1-1/4 CY 7235#	1-3/4 CY 9355#	2-1/2 CY 12473#	3-1/4 CY	

NOTE: THE TABLE ABOVE SHOWS WEIGHT AND VOLUME OF CONCRETE NECESSARY TO HOLD DOWN OFFSET WEIGHT OF OFFSET, WEIGHT OF PIPE, AND TRENCH LOADS ARE IGNORED IN CALCULATIONS.

CITY OF GREENSBORO

STANDARD VERTICAL OFFSET ANCHORS	
STD. NO.	REV.
111	08-02



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

CLASS A
CONCRETE ARCH

CLASS B
GRANULAR FOUNDATION

CLASS C
GRANULAR FOUNDATION

CLASS D
FLAT SUBGRADE

Dimensions shown in the diagrams include:

- Foundation width: d
- Arch height: $\frac{1}{8} H$ MIN.
- Foundation thickness: $\frac{1}{6} B_c$, $\frac{1}{4} D$ MIN., $1'-0"$
- Foundation materials: #67 STONE, 2000 PSI CONCRETE, DENSELY COMPACTED BACKFILL
- Arch material: CONCRETE ARCH

DEPTH OF BEDDING MATERIAL BELOW PIPE	
<i>D</i>	<i>d</i> (MIN.)
27" & SMALLER	3"
30" TO 60"	4"
66" & LARGER	6"

B_C = OUTSIDE DIAMETER
 H = BACKFILL COVER ABOVE
TOP OF PIPE
 D = INSIDE DIAMETER
 d = DEPTH OF BEDDING MATERIAL
BELOW PIPE

NOTE:

USE 467M OR A.R.E.A. (AMERICAN RAILWAY ENGINEERING ASSOCIATION) #4 STONE FOR 21" AND LARGER PIPE.

CITY OF GREENSBORO	
STANDARD TRENCH BEDDINGS FOR CIRCULAR PIPE	REV.
207	03-97

STANDARD TRENCH BEDDINGS FOR CIRCULAR PIPE	
STD. NO.	REV.
207	03-97

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.581.5938
NC COA No. F-0929

SHEET NO.
UC-3D

DRAWN BY: *TIK*

APPROVED BY: *BWK*

REVISÉ:

NORTH CAROLINA

DEPARTMENT OF
TRANSPORTATIONTRANSPORTATION
UTILITIES ENGINEERING SE

PHONE: (919) 707-6690



2025

ILITY CONSTRUCT
PLANE ONLY

PLANS ONLY

ELEVATION

SPIDERS SUPPORT CARRIER PIPE IN CASING
 CENTER LINE CARRIER PIPE
 3'-0"
 2" BEVEL
 ENCLOSE ENDS WITH PIPE SEAL
 STEEL CASING PIPE
 SLOPE TO DRAIN
 2" WEEP HOLE
 GRAVEL

SECTION "A"

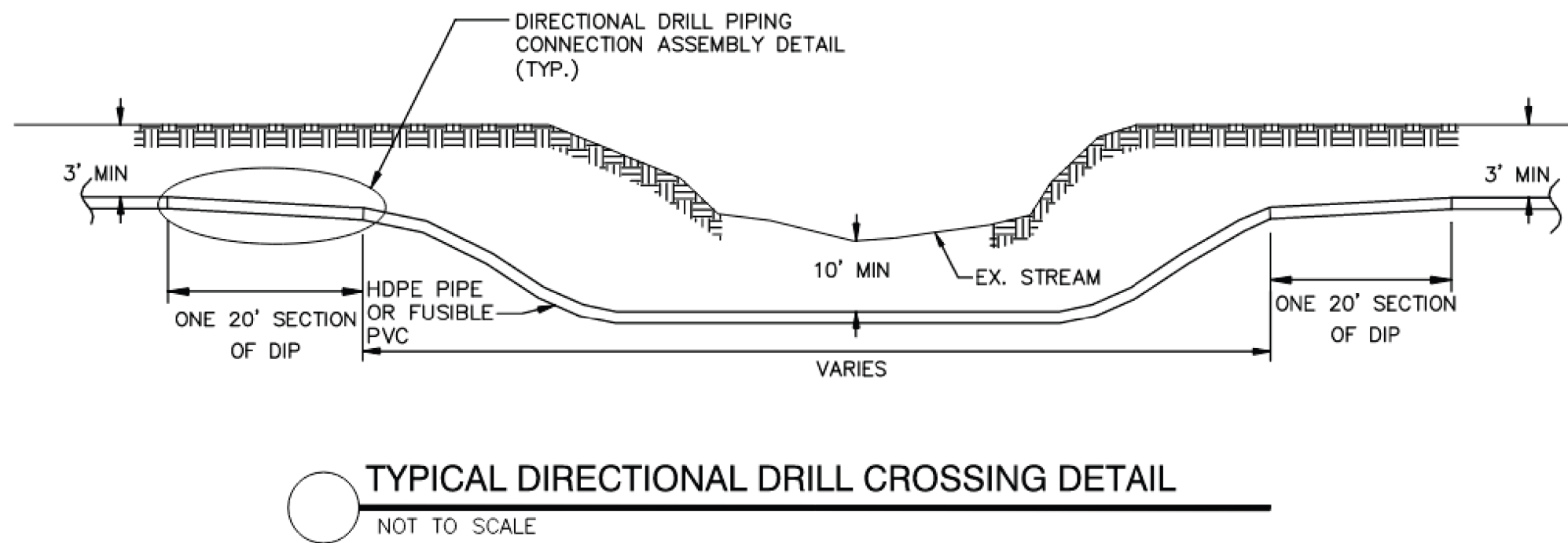
BOLTS TO PIPE
 HEAVY DUTY STEEL SKIDS (4)
 12" RESTRAINED JOINT CARRIER PIPE (SPIDER SIZE DETERMINED BY SIZE OF STEEL CASING AND INNER PIPE.)

PROFILE

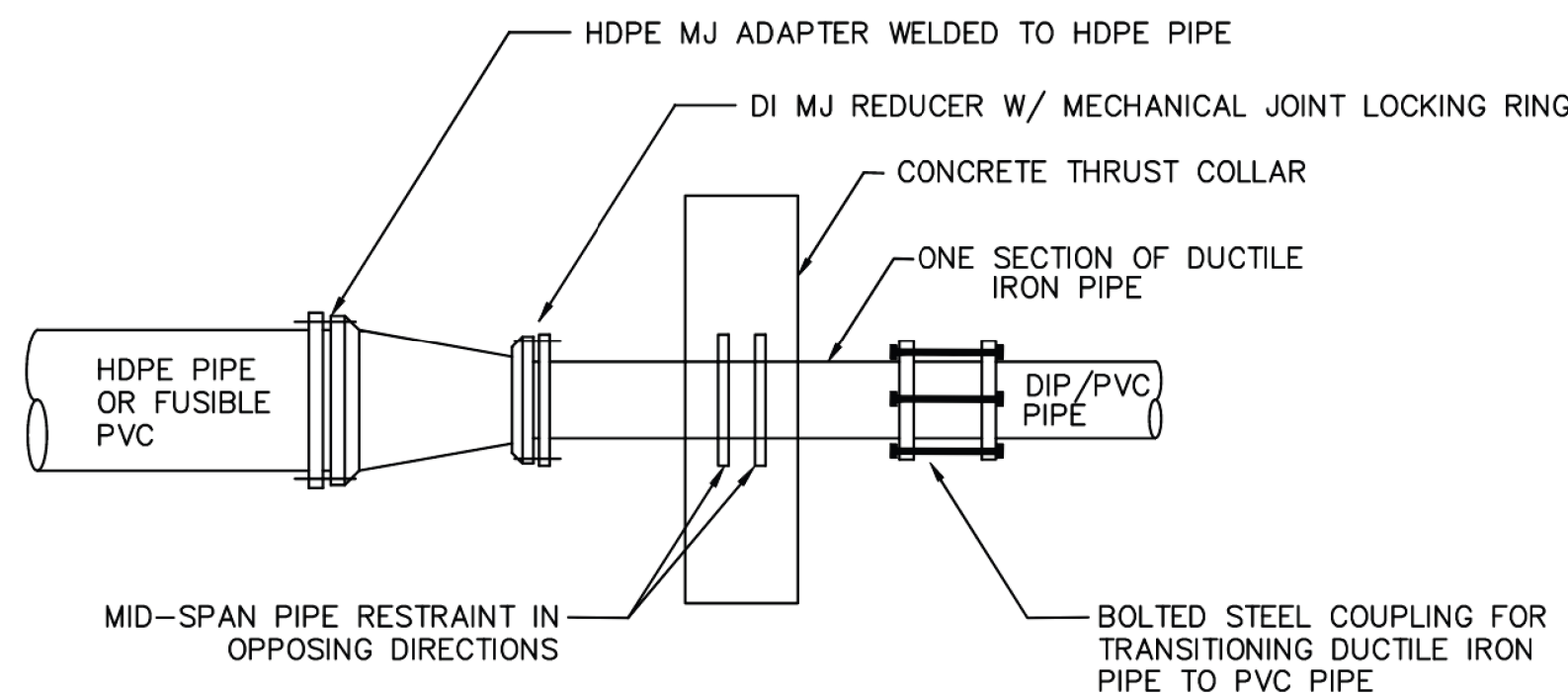
PAVEMENT (ONE OR TWO LANES)
 3'-0" MIN. COVER OR AS SHOWN ON THE PLANS
 TRANSITION FITTING AS REQUIRED
 BRICK CLOSURE
 ST'L. CASING PIPE
 EXISTING GROUND
 RESTRAINED JOINT CARRIER PIPE

STANDARD BORE AND JACK DETAIL
 NOT TO SCALE

CUBIC YARDS OF CONCRETE TO ANCHOR VERTICAL BEND				
PIPE DIA.	1'-1/4" BEND	2'-1/2" BEND	4' BEND	
6"	842 #	1653 #	3247 #	1.0 CY
8"	1444 #	2839 #	5773 #	1.5 CY
12"	3248 #	6612 #	12988 #	3.5 CY
16"	5775 #	11756 #	23090 #	6.0 CY



1. DIRECTIONAL DRILLING METHODS HAVE NOT BEEN GIVEN STATEWIDE APPROVAL FOR USE ON NCDOT RIGHT OF WAY. UNDER NO CONDITION SHALL JETTING ALONE OR WET BORING WITH WATER OF UTILITY PIPELINES BE ALLOWED. DIRECTIONAL BORING USING JETTING WITH A BENTONITE (OR EQUIVALENT MATERIAL) SLURRY IS APPROVED AT A MINIMUM DEPTH OF THREE (3') FEET BELOW THE INVERT AT THE CROSSING LOCATION OR TEN (10') FEET BELOW THE SURFACE OF PARTIAL AND/OR FULL CONTROL OF ACCESS ROADS. DIRECTIONAL BORING IS NOT ALLOWED IN EMBANKMENT MATERIAL. DIRECTIONAL BORING IS ALLOWED BENEATH EMBANKMENT MATERIAL IN NATURALLY OCCURRING SOIL. ANY PARALLEL INSTALLATION UTILIZING THE DIRECTIONAL BORING METHOD SHALL BE MADE AT A MINIMUM DEPTH OF FIVE (5') FEET (COVER) BELOW THE GROUND SURFACE AND OUTSIDE THE THEORETICAL 1:1 SLOPE, AT A MINIMUM OF 5' FROM THE EXISTING EDGE OF PAVEMENT EXCEPT WHERE THE PARALLEL INSTALLATION CROSSES A PAVED ROADWAY. ALL DIRECTIONAL BORES SHALL MAINTAIN TEN (10') FEET MINIMUM (CLEAR) HORIZONTAL DISTANCE FROM THE NEAREST PART OF ANY STRUCTURE, INCLUDING BUT NOT LIMITED TO BRIDGES, FOOTINGS, PIPE CULVERTS OR BOX CULVERTS. DIRECTIONAL BORES ARE NOT ALLOWED BENEATH BRIDGE FOOTINGS, CULVERT WINGWALL FOOTINGS OR RETAINING WALLS. THE TIP OF THE DRILL STRING SHALL HAVE A CUTTER HEAD. DETECTION WIRE SHALL BE INSTALLED WITH NON-FERROUS MATERIAL. ANY CHANGES SHALL BE SUBMITTED TO THE DISTRICT ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. FOR MULTIPLE CONDUIT INSTALLATIONS (INCLUDING PERPENDICULAR AND PARALLEL INSTALLATIONS), INSTALL CONDUITS WITH FIVE (5') FEET MINIMUM (CLEAR) HORIZONTAL SEPARATION BETWEEN EACH CONDUIT OR INSTALL MULTIPLE CONDUITS WITHIN A SINGLE DUCT.
2. ALL DIRECTIONAL DRILLED PIPING FOR SEWER FORCE MAINS AND WATERLINES SHALL BE A MINIMUM OF SDR-11.
3. AN OVBORSE SHALL NOT BE MORE THAN TWO (2") INCHES GREATER THAN THE DIAMETER OF THE PIPE OR ENCASEMENT. AN OVBORSE EXCEEDING TWO (2") INCHES GREATER THAN THE DIAMETER OF THE PIPE OR ENCASEMENT WILL BE CONSIDERED IF THE ENCROACHMENT AGREEMENT INCLUDES A STATEMENT SIGNED AND SEALED BY A NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER INDICATING THAT AN OVBORSE IN EXCESS OF TWO (2") INCHES OF THE DIAMETER OF THE PIPE OR ENCASEMENT WILL ARCH AND NO DAMAGE WILL BE DONE TO THE PAVEMENT OR SUB-GRADE. HDPE PIPE INSTALLED BY DIRECTIONAL BORING SHALL NOT BE CONNECTED TO EXISTING PIPE OR FITTINGS FOR ONE (1) WEEK FROM THE TIME OF INSTALLATION TO ALLOW TENSIONAL STRESSES TO RELAX.



2 ASSEMBLY
NOT TO SCALE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

8/17/99

REVISIONS

PROJECT TYPICAL DETAILS



2810 WYOLF RD
SUITE 200
RALEIGH, NC 27602
PHONE: 919.261.5519
NC CORP. #C-00257

PROJECT REFERENCE NO.		SHEET NO.
I-5898		UC-3E
DESIGNED BY: EPH		
DRAWN BY: TLK		
CHECKED BY: EPH		
APPROVED BY: BWK		
REVISED:		
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		11/7/2025 UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

S:\Exchange\Standards\Water\CGS106.pro

* DIGITAL FILE 28 Aug 2002

SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	FAIRLY DRY CLAY 4,000 LBS/FT²	SOFT CLAY 2,000 LBS/FT²	GRAVEL, COARSE 16,000 LBS/FT²	ALWAYS DRY CLAY 8,000 LBS/FT²	SAND, COMPACT, FIRM 8,000 LBS/FT²	SAND - CLEAN, DRY 4,000 LBS/FT²	QUICKSAND-VERY POOR SOIL 1,000 LBS/FT²	ROCK-POOR 10,000 PSI
6"									
11-1/4"	812	1 FT²	1	1	1	1	1	1	1
22-1/2"	1653	1 FT²	1	1	1	1	1	2	1
45°	3247	1 FT²	2	1	1	1	1	4	1
90°	5994	2 FT²	3	1	1	1	2	6	1
PLUG	4239	1 FT²	2	1	1	1	1	4	1
8"									
11-1/4"	1444	1 FT²	1	1	1	1	1	2	1
22-1/2"	2939	1 FT²	2	1	1	1	1	3	1
45°	5773	2 FT²	3	1	1	1	2	6	1
90°	10596	3 FT²	6	1	2	2	3	11	2
PLUG	7536	2 FT²	4	1	1	1	2	8	1
12"									
11-1/4"	3248	1 FT²	2	1	1	1	1	3	1
22-1/2"	6612	2 FT²	4	1	1	1	2	7	1
45°	12988	3 FT²	7	1	2	2	3	13	2
90°	23976	6 FT²	12	2	3	3	6	24	3
PLUG	16956	4 FT²	9	1	2	2	4	17	2
16"									
11-1/4"	5775	2 FT²	3	1	1	1	2	6	1
22-1/2"	11756	3 FT²	6	1	2	1	3	12	1
45°	23090	6 FT²	12	2	3	3	6	23	3
90°	42624	11 FT²	22	3	6	6	11	43	4
PLUG	30144	8 FT²	15	2	4	4	8	30	3

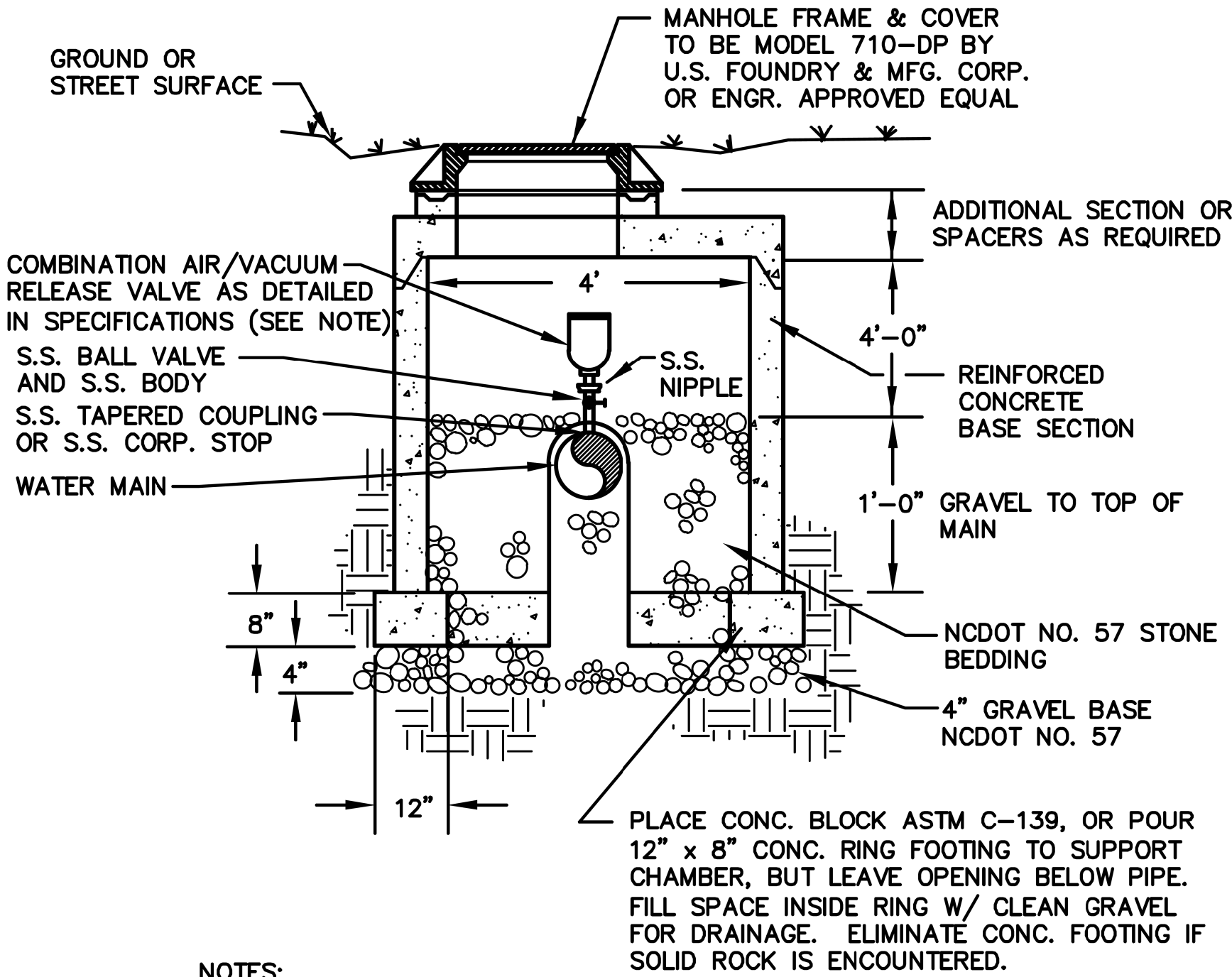
BASED ON TEST PRESSURE OF 150 PSI

NOTES:
REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.
USE 6"-90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY.

CITY OF GREENSBORO
STANDARD REACTION BEARING AREAS FOR
HORIZONTAL WATER PIPE BENDS

STD. NO.
106

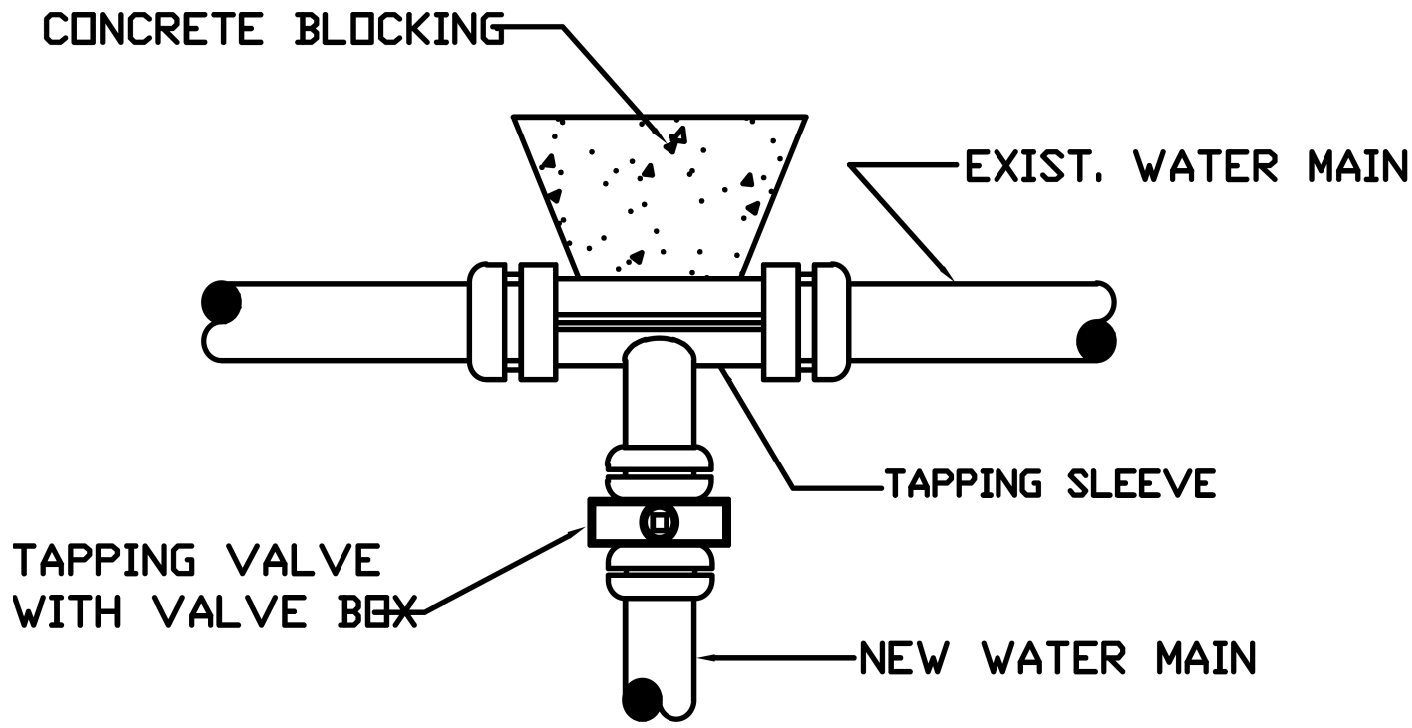
REV.



- NOTES:
1. PROVIDE BASKWASH ACCESSORIES ASSEMBLED TO VALVE CONSISTING OF A 90° EL., A SHUT OFF VALVE, CLEARWATER INLET VALVE, RUBBER SUPPLY HOSE AND QUICK DISCONNECT COUPLINGS.
 2. OWNER IS RESPONSIBLE FOR ROUTINE MAINTENANCE ON AIR RELEASE VALVES AND PERTINENT EQUIPMENT AS REQUIRED BY MFR.

COMBINATION AIR/VACUUM RELEASE VALVE DETAIL

NOT TO SCALE



NOTE: TAPPING SLEEVE SHALL BE
TYPE 316 STAINLESS
STEEL SLEEVE TYPE.

TAPPING SLEEVE AND VALVE ASSEMBLY

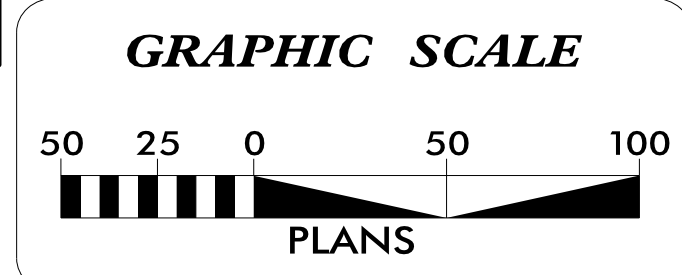
NOT TO SCALE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

8/17/99

REVISIONS

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

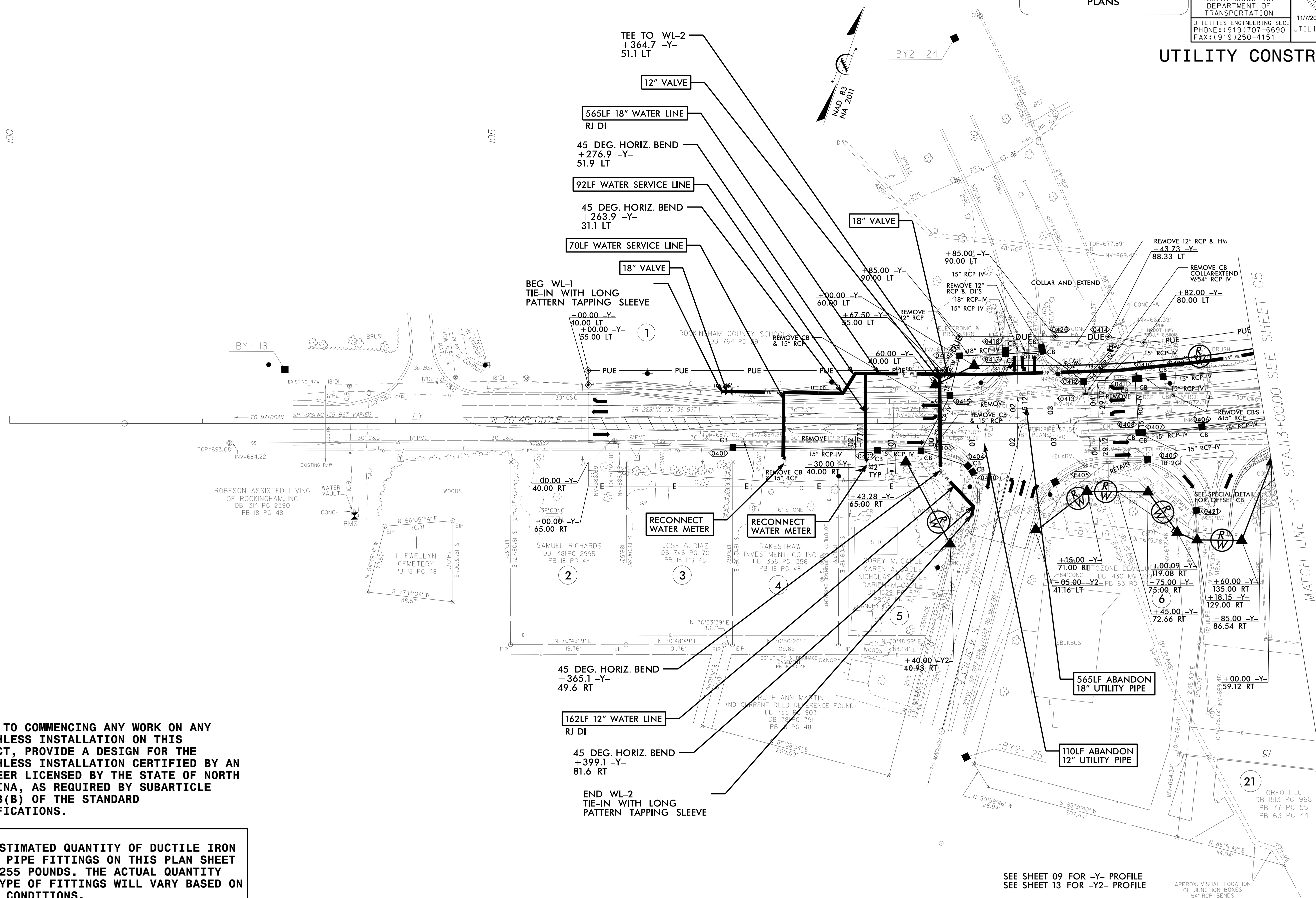


PROJECT REFERENCE NO.		SHEET NO.
I-5898		UC-4
DESIGNED BY:	EPH	
DRAWN BY:	TLK	
CHECKED BY:	EPH	
APPROVED BY:	BWK	
REVISED:		
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		11/7/2025
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

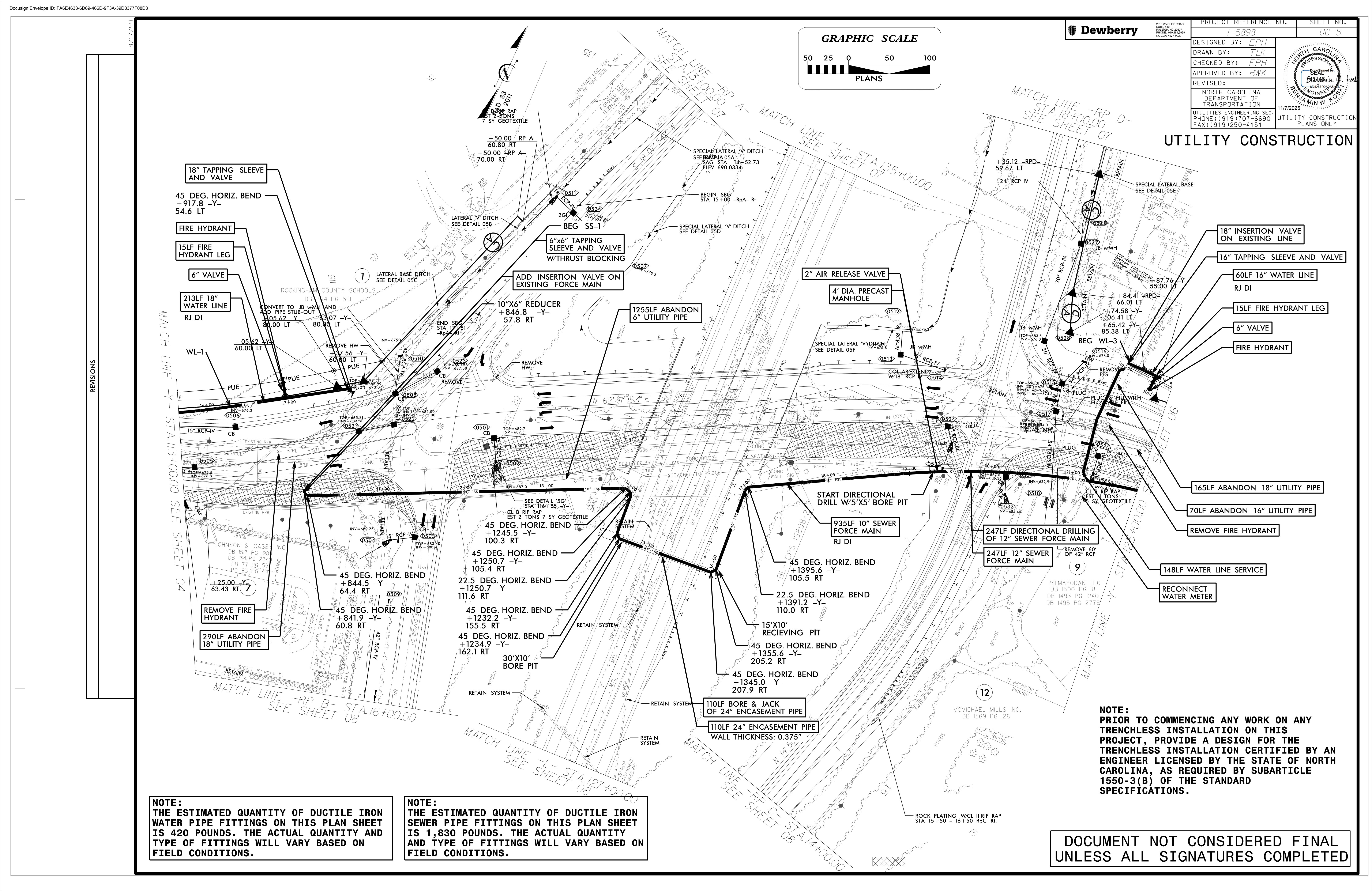
NOTE:
PRIOR TO COMMENCING ANY WORK ON ANY
TRENCHLESS INSTALLATION ON THIS
PROJECT, PROVIDE A DESIGN FOR THE
TRENCHLESS INSTALLATION CERTIFIED BY AN
ENGINEER LICENSED BY THE STATE OF NORTH
CAROLINA, AS REQUIRED BY SUBARTICLE
1550-3(B) OF THE STANDARD
SPECIFICATIONS.

NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON
WATER PIPE FITTINGS ON THIS PLAN SHEET
IS 2,255 POUNDS. THE ACTUAL QUANTITY
AND TYPE OF FITTINGS WILL VARY BASED ON
FIELD CONDITIONS.



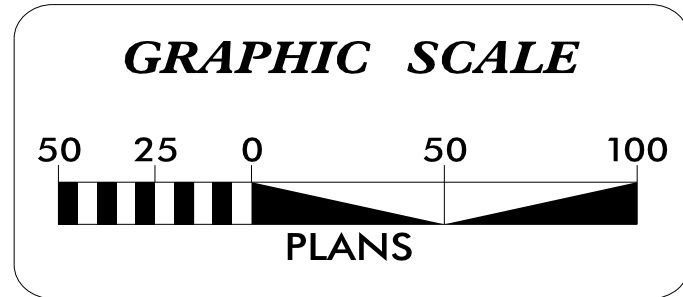
SEE SHEET 09 FOR -Y- PROFILE
SEE SHEET 13 FOR -Y2- PROFILE

APPROX. VISUAL LOCATION
OF JUNCTION BOXES
54" RCP BENDS



PROJECT REFERENCE NO.		SHEET NO.
I-5898		UC-5
DESIGNED BY:	EPH	Professional Engineer Benjamin W. Koski North Carolina Professional Engineer No. 40428 Exp. 12/31/2025
DRAWN BY:	TLK	
CHECKED BY:	EPH	
APPROVED BY:	BWK	
REVISED:		
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		11/7/2025
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION



NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON
WATER PIPE FITTINGS ON THIS PLAN SHEET
IS 420 POUNDS. THE ACTUAL QUANTITY AND
TYPE OF FITTINGS WILL VARY BASED ON
FIELD CONDITIONS.

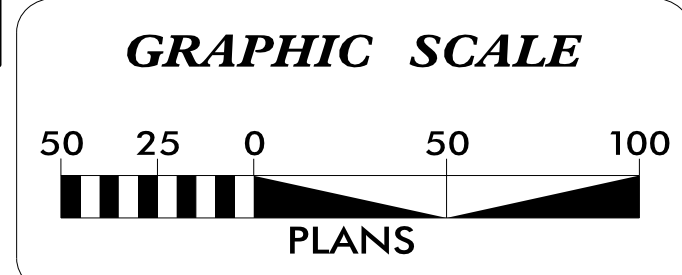
NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON
SEWER PIPE FITTINGS ON THIS PLAN SHEET
IS 1,830 POUNDS. THE ACTUAL QUANTITY
AND TYPE OF FITTINGS WILL VARY BASED ON
FIELD CONDITIONS.

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

8/17/99

REVISIONS

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

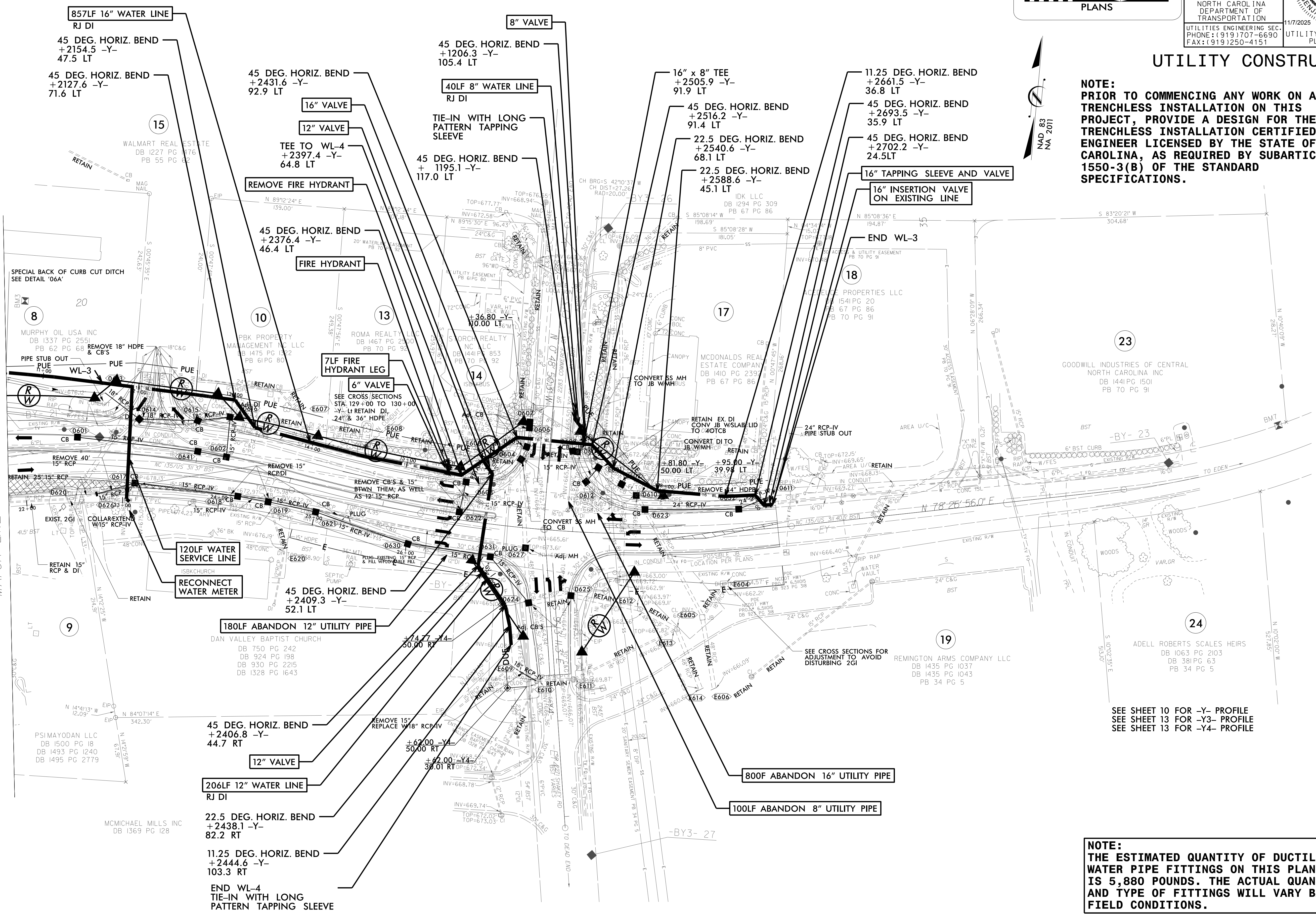


PROJECT REFERENCE NO.		SHEET NO.
I-5898		UC-6A
DESIGNED BY:	EPH	
DRAWN BY:	TLK	
CHECKED BY:	EPH	
APPROVED BY:	BWK	
REVISED:		
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		11/7/2025
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

NOTE:
PRIOR TO COMMENCING ANY WORK ON ANY
TRENCHLESS INSTALLATION ON THIS
PROJECT, PROVIDE A DESIGN FOR THE
TRENCHLESS INSTALLATION CERTIFIED BY AN
ENGINEER LICENSED BY THE STATE OF NORTH
CAROLINA, AS REQUIRED BY SUBARTICLE
1550-3(B) OF THE STANDARD
SPECIFICATIONS.

MATCH LINE STA. 125+00.00 SEE SHEET 05



SEE SHEET 10 FOR -Y- PROFILE
SEE SHEET 13 FOR -Y3- PROFILE
SEE SHEET 13 FOR -Y4- PROFILE

NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON
WATER PIPE FITTINGS ON THIS PLAN SHEET
IS 5,880 POUNDS. THE ACTUAL QUANTITY
AND TYPE OF FITTINGS WILL VARY BASED ON
FIELD CONDITIONS.

 **Dewberry**

NAD 83
NA 2011

2025
QUALITY CONSTRUCTION
PLANS ONLY

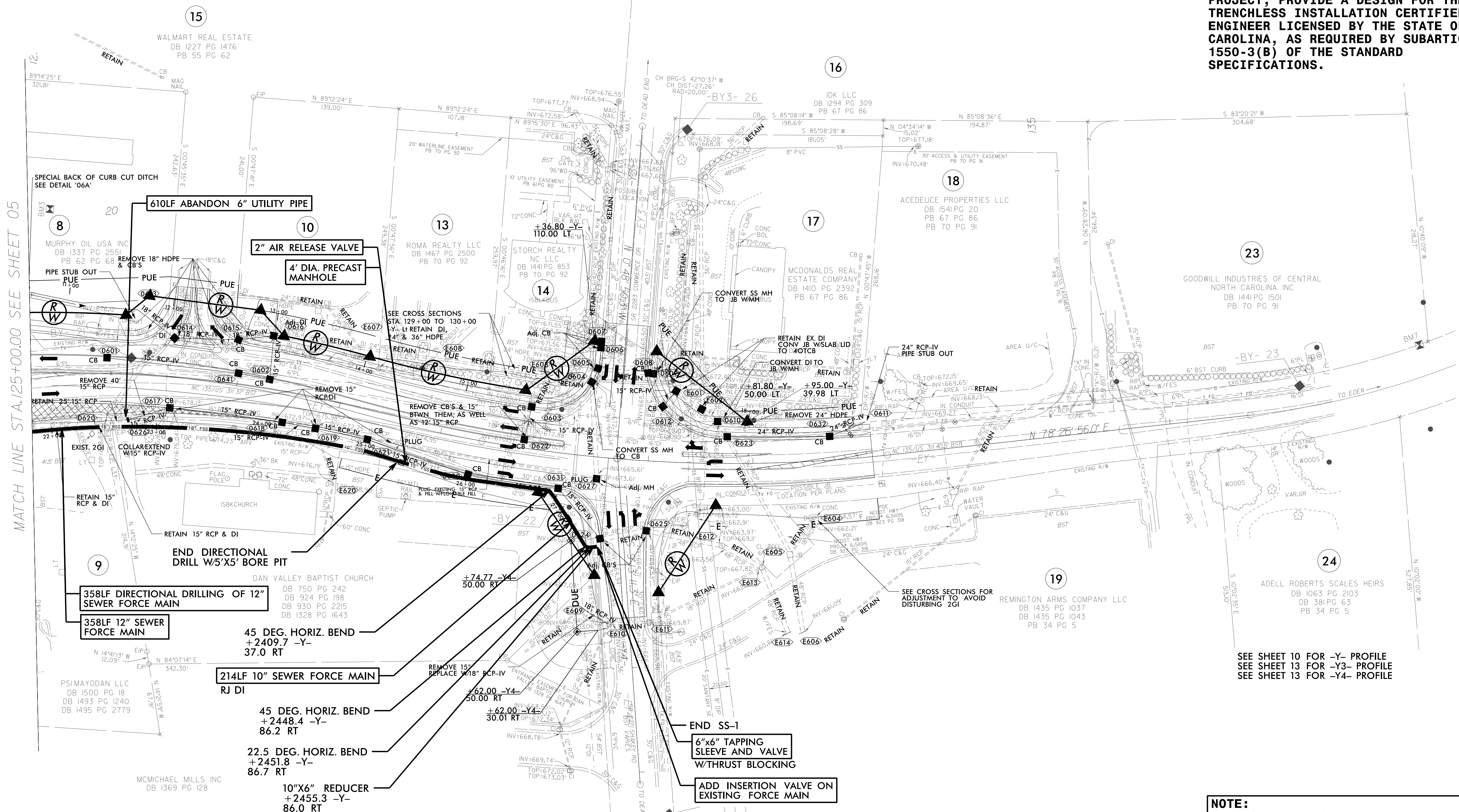
NOTE:
PRIOR TO COMMENCING ANY WORK ON ANY
TRENCHLESS INSTALLATION ON THIS
PROJECT, PROVIDE A DESIGN FOR THE
TRENCHLESS INSTALLATION CERTIFIED BY AN
ENGINEER LICENSED BY THE STATE OF NORTH
CAROLINA, AS REQUIRED BY SUBARTICLE
1550-3(B) OF THE STANDARD
SPECIFICATIONS.

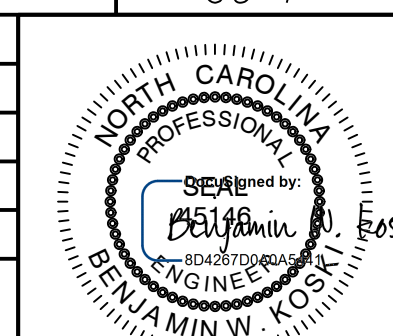
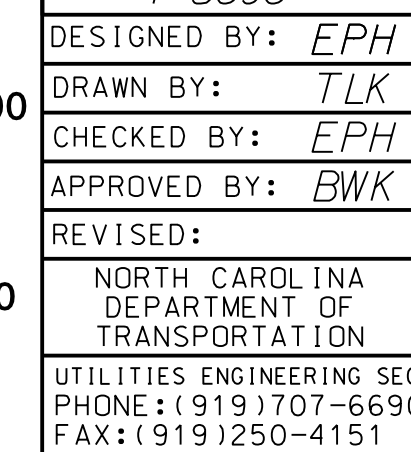
SEE SHEET 10 FOR -Y- PROFILE
SEE SHEET 13 FOR -Y3- PROFILE
SEE SHEET 13 FOR -Y4- PROFILE

NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON
SEWER PIPE FITTINGS ON THIS PLAN SHEET
IS 585 POUNDS. THE ACTUAL QUANTITY AND
TYPE OF FITTINGS WILL VARY BASED ON
FIELD CONDITIONS.

REVISIONS

MATCH LINE STA. 125+00.00 SEE SHEET 05

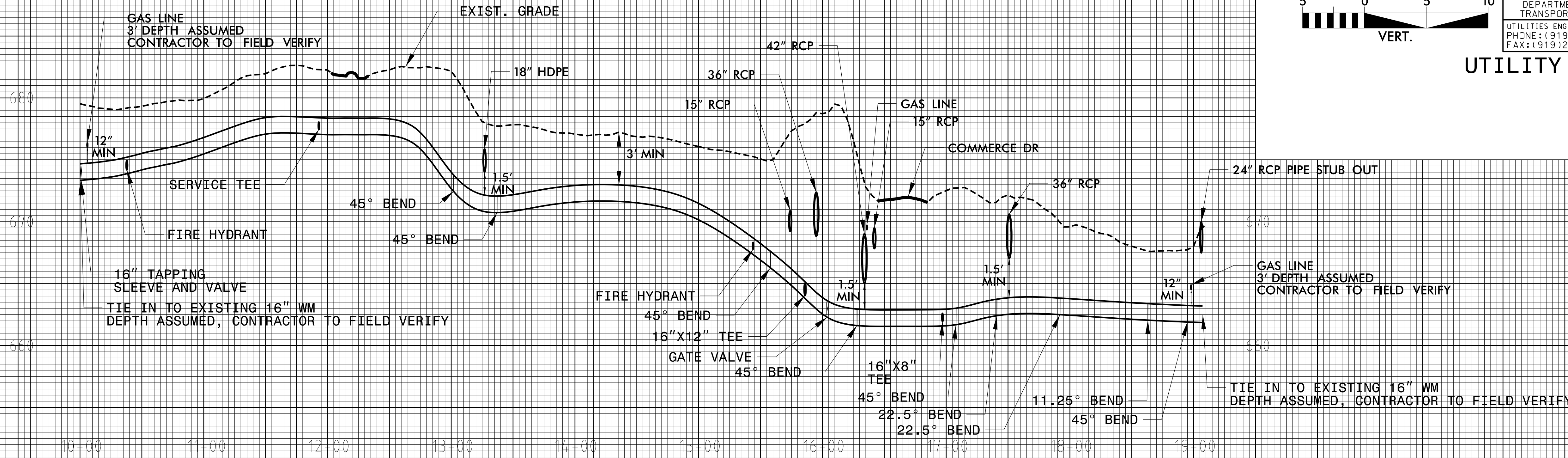
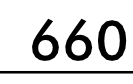




UTILITY CONSTRUCTION

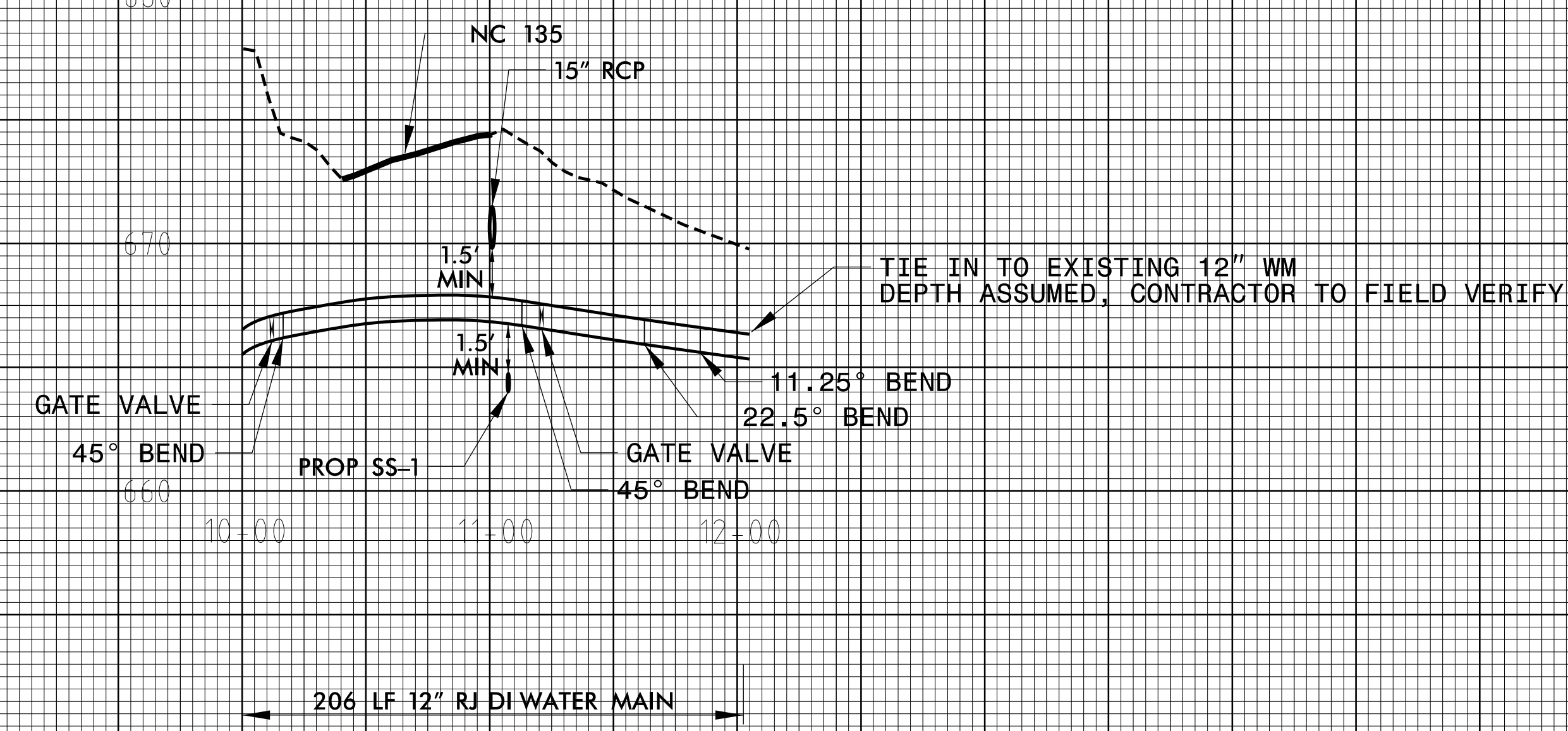
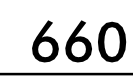


UTILITY CONSTRUCTION



917 LF 16" RJ DI WATER MAIN

WL-3



206 LF 12" RJ DI WATER MAIN

WL-4

