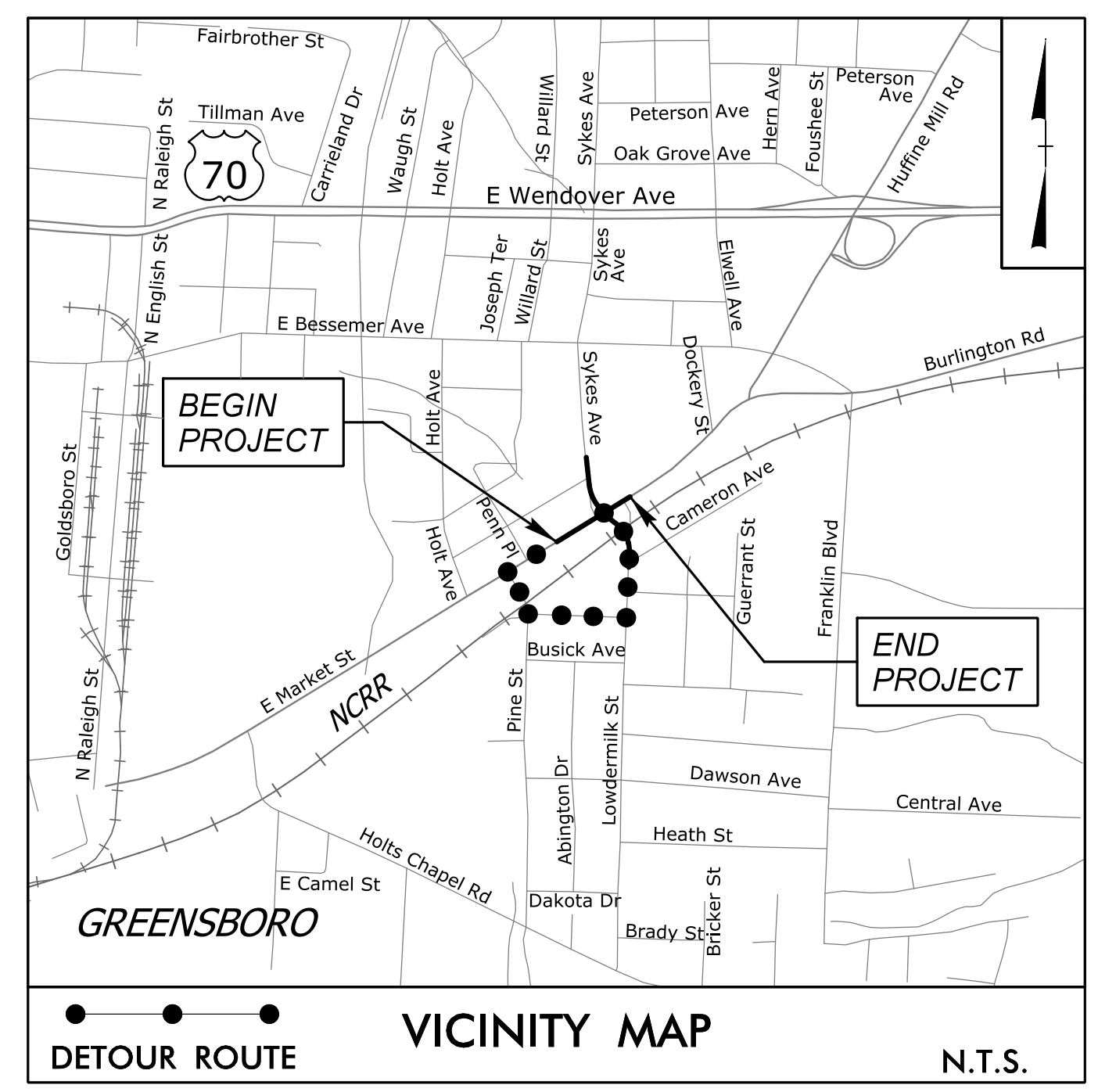


TIP PROJECT: Y-4807B

T.I.P. NO.	SHEET NO.
Y-4807B	UC-1

100% PLANS



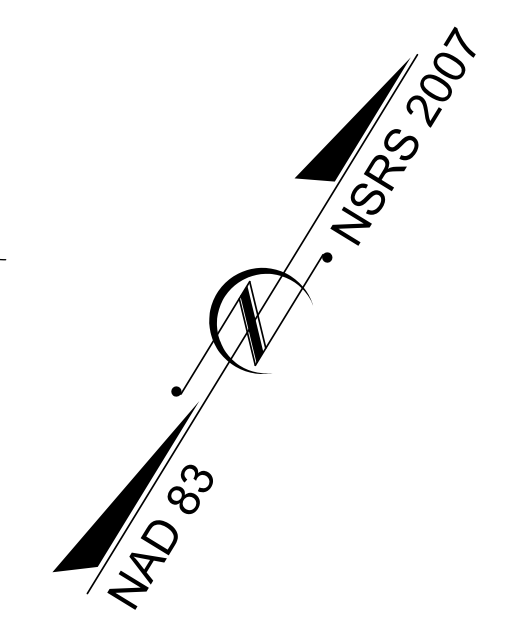
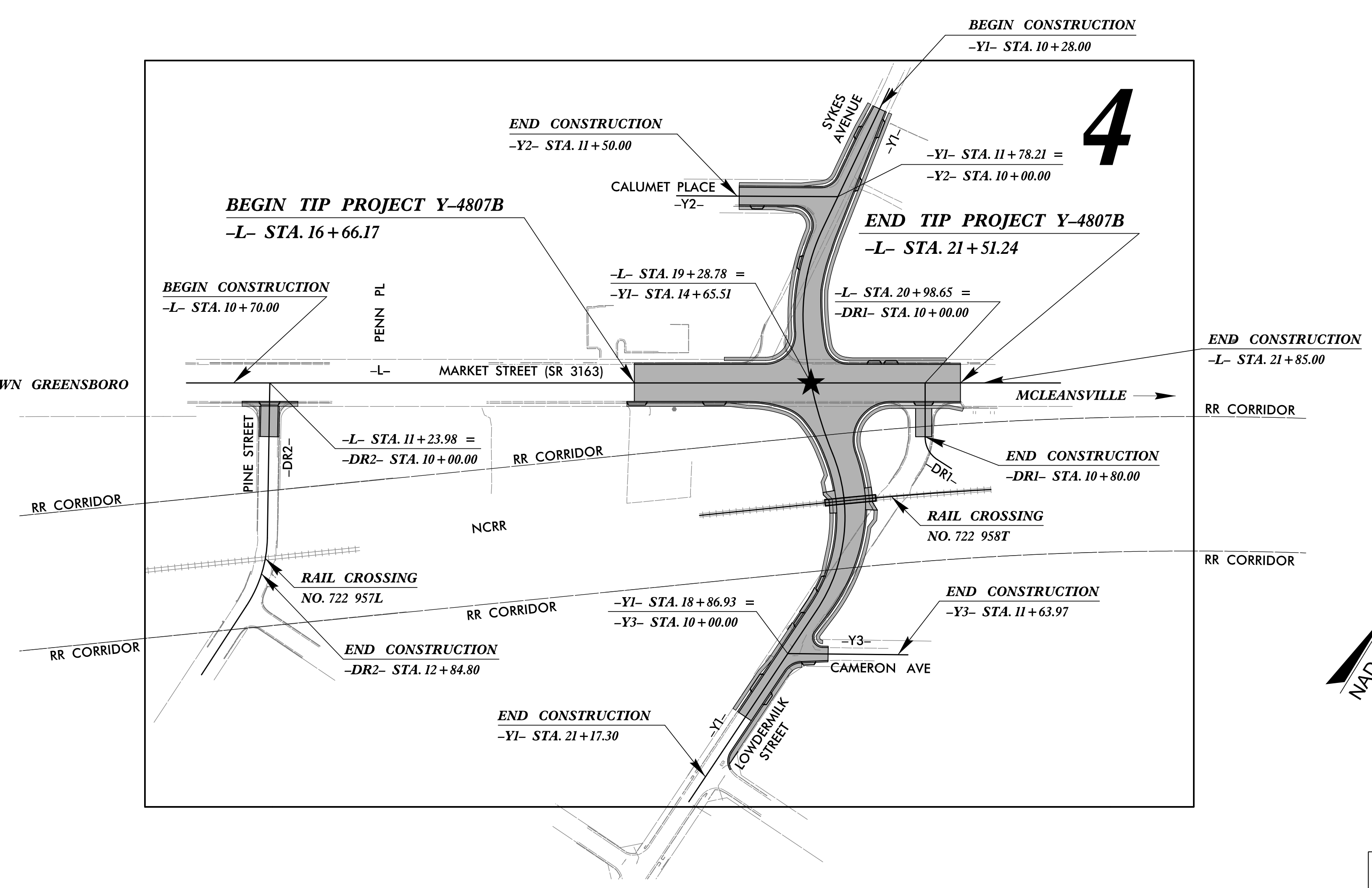
**CONSTRUCTION INSPECTION
REQUIRED FOR W/L INSTALLATION.
CALL (336) 373-2377 TO SCHEDULE
AN INSPECTOR.**

STATE OF NORTH CAROLINA RAIL DIVISION

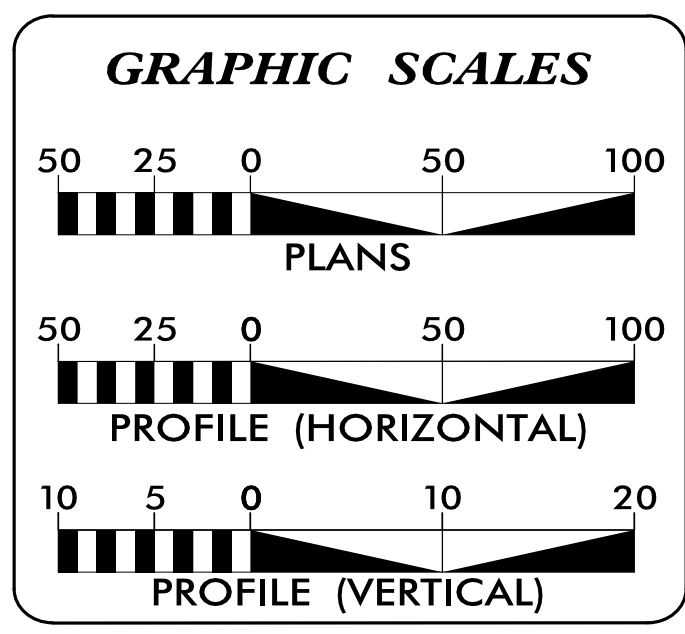
UTILITY CONSTRUCTION PLANS GUILFORD COUNTY

**LOCATION: RAILWAY-HIGHWAY CROSSING CLOSURE AT PINE STREET AND NCRR
CROSSING 722 957L & 722 958T IN GREENSBORO**

TYPE OF WORK: WATER LINE RELOCATION



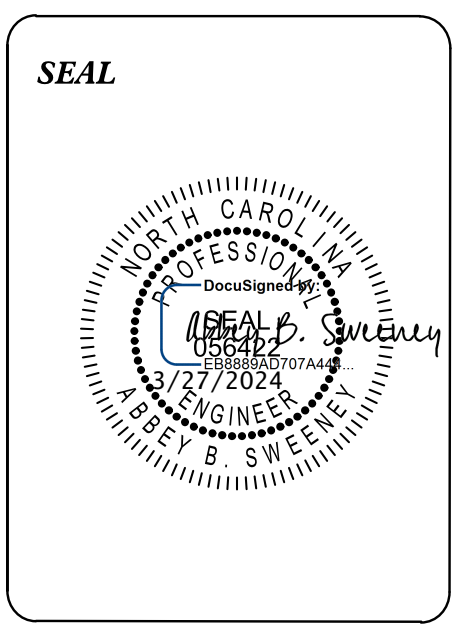
DOCUMENT NOT CONSIDERED FINAL
UNTIL ALL SIGNATURES ARE COMPLETED



SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A THRU UC-3C	DETAILS
UC-4	UTILITY CONSTRUCTION SHEET
UC-5	PROFILE SHEET

WATER AND SEWER OWNERS ON PROJECT	
(A) CITY OF GREENSBORO	
JOHN FERSNER, P.E.	OWNER CONTACT #1
BRIAN BOYD	OWNER CONTACT #2

PREPARED IN THE OFFICE OF	
stv STV Engineers, Inc. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-0991	
NIKKI T. HONEYCUTT, P.E.	CONSULTANT CONTACT #1
ABBEY B. SWEENEY, P.E.	CONSULTANT CONTACT #2
	CONSULTANT CONTACT #3

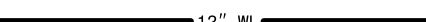

























DIVISION OF HIGHWAYS UTILITIES UNIT	
1555 MAIL SERVICES CENTER RALEIGH, NC 27699-1555 PHONE (919) 707-6690 FAX (919) 250-4151	
C. DAYTON MARTIN, III	REGIONAL UTILITY COORDINATOR
ALI KOUCHEKI, P.E.	UTILITIES REGIONAL ENGINEER
DOUG JOYNER	SENIOR UTILITIES ENGINEER
	SENIOR UTILITIES COORDINATOR

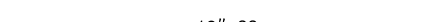



STATE OF NORTH CAROLINA RAIL DIVISION

UTILITIES PLAN SHEET SYMBOLS









PROPOSED WATER SYMBOLS





Water Line (Sized as Shown)	
11 1/4 Degree Bend	
22 1/2 Degree Bend	
45 Degree Bend	
90 Degree Bend	
Plug	
Tee	
Cross	
Reducer	
Gate Valve	
Butterfly Valve	
Tapping Valve	
Line Stop	
Line Stop with Bypass	
Blow Off	
Fire Hydrant	
Relocate Fire Hydrant	
Remove Fire Hydrant	REM FH
Water Meter	
Relocate Water Meter	
Remove Water Meter	REM WM
Water Pump Station	
RPZ Backflow Preventer	
DCV Backflow Preventer	
Relocate RPZ Backflow Preventer	
Relocate DCV Backflow Preventer	

PROPOSED SEWER SYMBOLS


















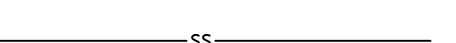
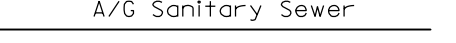

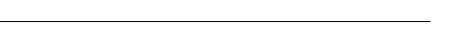












Gravity Sewer Line (Sized as Shown)	
Force Main Sewer Line (Sized as Shown)	
Manhole (Sized per Note)	
Sewer Pump Station	

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	
Pay Item Note	

EXISTING UTILITIES SYMBOLS

Power Pole		*Underground Power Line	
Telephone Pole		*Underground Telephone Cable	
Joint Use Pole		*Underground Telephone Conduit	
Utility Pole		*Underground Fiber Optics Telephone Cable	
Utility Pole with Base		*Underground TV Cable	
H-Frame Pole		*Underground Fiber Optics TV Cable	
Power Transmission Line Tower		*Underground Gas Pipeline	
Water Manhole		Aboveground Gas Pipeline	
Power Manhole		*Underground Water Line	
Telephone Manhole		Aboveground Water Line	
Sanitary Sewer Manhole		*Underground Gravity Sanitary Sewer Line	
Hand Hole for Cable		Aboveground Gravity Sanitary Sewer Line	
Power Transformer		*Underground SS Forced Main Line	
Telephone Pedestal		Underground Unknown Utility Line	
CATV Pedestal		SUE Test Hole	
Gas Valve		Water Meter	
Gas Meter		Water Valve	
Located Miscellaneous Utility Object		Fire Hydrant	
Abandoned According to Utility Records	AATUR	Sanitary Sewer Cleanout	
End of Information	E.O.I.		

*For Existing Utilities
 Utility Line Drawn from Record (Type as Shown)
 Designated Utility Line (Type as Shown)

5/14/99
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 REV: 2/1/2012

UTILITY CONSTRUCTION

GENERAL UTILITY NOTES:

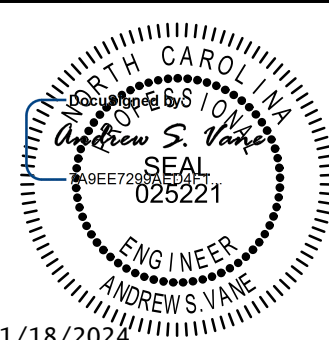
- ALL UTILITY CONSTRUCTION, WORKMANSHIP, AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE CITY OF GREENSBORO STANDARD SPECIFICATIONS FOR WATER AND SEWER UTILITY CONSTRUCTION UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL VERIFY IN THE FIELD THE ALIGNMENT AND ELEVATION OF ALL EXISTING WATER MAINS AT CONNECTION AND TAP LOCATIONS PRIOR TO CONSTRUCTION.
- ALL CHANGES MADE DURING THE CONSTRUCTION PHASE SHALL BE APPROVED BY THE CITY OF GREENSBORO ENGINEERING DIVISION PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL FIELD VERIFY POSSIBLE CONFLICTS WELL IN ADVANCE OF PIPE LAYING OPERATIONS AS TO ALLOW THE ADJUSTMENT OF LINE AND GRADE WELL BEFORE CONFLICT. FAILURE TO DO THIS ON THE PART OF THE CONTRACTOR, MAY RESULT IN ADDITIONAL COST IN MATERIALS AND WORK TO THE CONTRACTOR, NOT PAID BY THE CITY.
- DISTANCES AND/OR STATION REFERENCES SHOWN FOR WATER PIPE, VALVES, FITTINGS, REDUCERS OR HYDRANTS IN RELATION TO FIXED OBJECTS ARE APPROXIMATE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING RESTRAINED JOINT PIPE (IF INDICATED ON THE PLANS) OR THRUST BLOCKS AT ALL PROPOSED TEES, BENDS, TAPPING SLEEVES, REDUCERS, PLUGS, ETC., AS REQUIRED TO RESTRAIN THE PIPE WITH THE MINIMUM ALLOWABLE RESTRAINT BEING AS SPECIFIED IN THE CITY OF GREENSBORO STANDARD SPECIFICATIONS FOR WATER AND SEWER UTILITY CONSTRUCTION. ALL THRUST BLOCKING SHALL CONFORM TO THE THRUST BLOCK DETAILS AS PER CITY OF GREENSBORO STD. NO. 106.
- THE CONTRACTOR SHALL RESTORE TO THEIR ORIGINAL STATE ALL CULVERTS, WALLS, GATES, FENCES, HEDGES, SHRUBS, MAIL BOXES, DRIVEWAYS, LIGHT POLES, POWER POLES, SIGNS, WATER LINES, GAS LINES, GAS VALVES, TELEPHONE PEDESTALS, WATER METERS, WATER VALVES, SANITARY SEWERS, SANITARY SERVICE LATERALS, LAWNS, GARDENS, AND ANY OTHER EXISTING ITEM DISTURBED OR MOVED DUE TO CONSTRUCTION. FINISHED AREAS CONTIGUOUS TO RESIDENTIAL LAWNS SHALL BE LANDSCAPED IN A MANNER SUCH THAT SOIL PARTICLES SHALL NOT EXCEED 1½ INCHES IN DIAMETER (SEE "SEEDBED PREPARATION FOR LAWN AREAS" IN CONTRACT SPECIAL PROVISIONS). THE COST OF THE WORK WILL BE INCLUDED IN THE UNIT BID AND CONSTRUCTION PRICES FOR OTHER BID ITEMS IN THE CONTRACT.
- ALL WORK MUST BE PERFORMED WITHOUT DISRUPTING THE OPERATION OF ANY EXISTING SANITARY SEWER OR WATER SERVICE UNLESS APPROVED OTHERWISE IN ADVANCE BY THE CITY OF GREENSBORO.
- THE CONTRACTOR SHALL USE CAUTION WHEN WORKING AROUND EXISTING GAS, SEWER, WATER, ELECTRIC, TELEPHONE, FIBER OPTIC, OR CATV SERVICE LINES AND LATERALS, AND OTHER UTILITIES. ANY EXISTING UTILITY DAMAGED DURING CONSTRUCTION MUST BE REPLACED OR REPAIRED IMMEDIATELY. THE CONTRACTOR SHALL COORDINATE ANY NECESSARY UTILITY REPLACEMENT OR REPAIR OF THE UTILITY ONLY AFTER RECEIVING APPROVAL TO DO THE WORK FROM THE UTILITY OWNER. ANY AUTHORIZED REPAIRS ARE TO BE PER THE UTILITY OWNER'S APPROVED SPECIFICATIONS AND MATERIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ASSOCIATED REPAIR COSTS.
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS.
- NO SUBSURFACE PLANS FOR THE ROADWAY ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHALL MAKE HIS/HER OWN INVESTIGATION AS TO THE SUBSURFACE CONDITION.
- THE CONTRACTOR SHALL COORDINATE ALL CONNECTION AND TESTING ACTIVITIES WITH THE CITY OF GREENSBORO ENGINEERING DIVISION.
- EXISTING UTILITY LOCATIONS SHOWN ON THE CONSTRUCTION PLANS WERE COMPILED BASED ON INFORMATION AVAILABLE TO THE ENGINEER. THESE LOCATIONS ARE NOT INTENDED TO BE EXACT OR COMPLETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY LOCATIONS AND ELEVATIONS WITH THE APPROPRIATE UTILITY COMPANIES. THE CONTRACTOR AGREES TO TAKE FULL RESPONSIBILITY FOR ANY AND ALL DAMAGES TO UTILITIES THAT MAY OCCUR DUE TO FAILURE TO EXACTLY LOCATE AND PROTECT ALL EXISTING UTILITIES. THE CONTRACTOR SHALL VERIFY LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION BY CONTACTING NORTH CAROLINA 811 (1-800-632-4949) OR THE APPROPRIATE UTILITY AUTHORITY AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO PERFORMING ANY EXCAVATION.

GENERAL UTILITY NOTES CONTINUED:

- ABANDONMENT:
THE FOLLOWING REQUIREMENTS SHALL APPLY FOR THE PROPOSED ABANDONMENT OF EXISTING FACILITIES UNLESS OTHERWISE SHOWN ON THE PLANS OR APPROVED BY THE ENGINEER. ALL AREAS DISTURBED BY ABANDONMENT WILL BE RESTORED. ABANDONMENT SHALL BE ACCOMPLISHED AFTER TIE IN OF ALL EXISTING SERVICES TO THE NEW WATER MAIN.
- TRAFFIC CONTROL IS REQUIRED FOR ALL CONSTRUCTION ACTIVITIES WITHIN 15' OF THE EDGE OF ANY ROADWAY. TRAFFIC CONTROL DEVICES, PRACTICES, AND PROCEDURES SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) LATEST EDITION BY THE FEDERAL HIGHWAY ADMINISTRATION.
- CONTRACTOR SHALL KEEP AND MAINTAIN A SET OF PLANS WITH ACCURATE LOCATIONS, MEASUREMENTS AND OTHER DATA NOT READILY AVAILABLE FROM ABOVE GROUND "AS-BUILT" EFFORTS. A COPY OF THESE PLANS SHALL BE SUBMITTED TO THE OWNER AT THE COMPLETION OF THE PROJECT.
- SERVICE CLEANOUTS AND METER BOXES SHALL NOT BE LOCATED IN DRIVEWAYS, SIDEWALKS, OR STREETS. SEE CITY OF GREENSBORO DETAIL #101 FOR TYPICAL INSTALLATION LOCATION.
- THE MAXIMUM OPEN JOINT DEFLECTION FOR ALIGNMENT AND GRADE FOR 12-INCH WATER MAIN SHALL BE (5) DEGREES.
- FOR REFERENCE TO CITY OF GREENSBORO STANDARD DETAILS, SEE BELOW:

PROJECT SPECIFIC NOTES:

- PROPOSED WATER LINES SHALL BE DUCTILE IRON RESTRAINED JOINT PC350 PIPE UNLESS INDICATED OTHERWISE.
- CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.
- ENDS OF CASING PIPE SHALL BE SEALED IN A MANOR TO ALLOW LEAKAGE TO PASS BUT PREVENT FOREIGN MATERIAL ENTRY, IN CONFORMANCE WITH NCR 102 SECTION 4.5B.
- CONSTRUCTION INSPECTION REQUIRED FOR W/L INSTALLATION. CALL (336) 373-2377 TO SCHEDULE AN INSPECTOR.
- OPEN CUT AND REPAIR PAVEMENT PER COG STD. #107. CONTACT UTILITY COORDINATION AT (336) 373-2424 FOR PERMIT.

PROJECT REFERENCE NO. Y-4807B	SHEET NO. UC-3
DESIGNED BY: ABN	
DRAWN BY: ABN	
CHECKED BY: ASV	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	1/18/2024
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

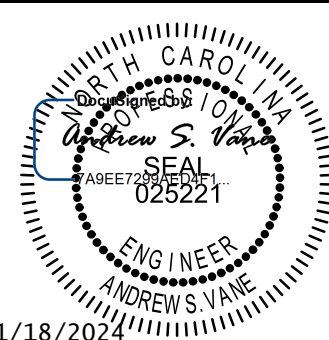
UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
Y-4807B	UC-3A
DESIGNED BY: ABN	
DRAWN BY: ABN	
CHECKED BY: ASV	
APPROVED BY:	
REVISER:	1/18/2024
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

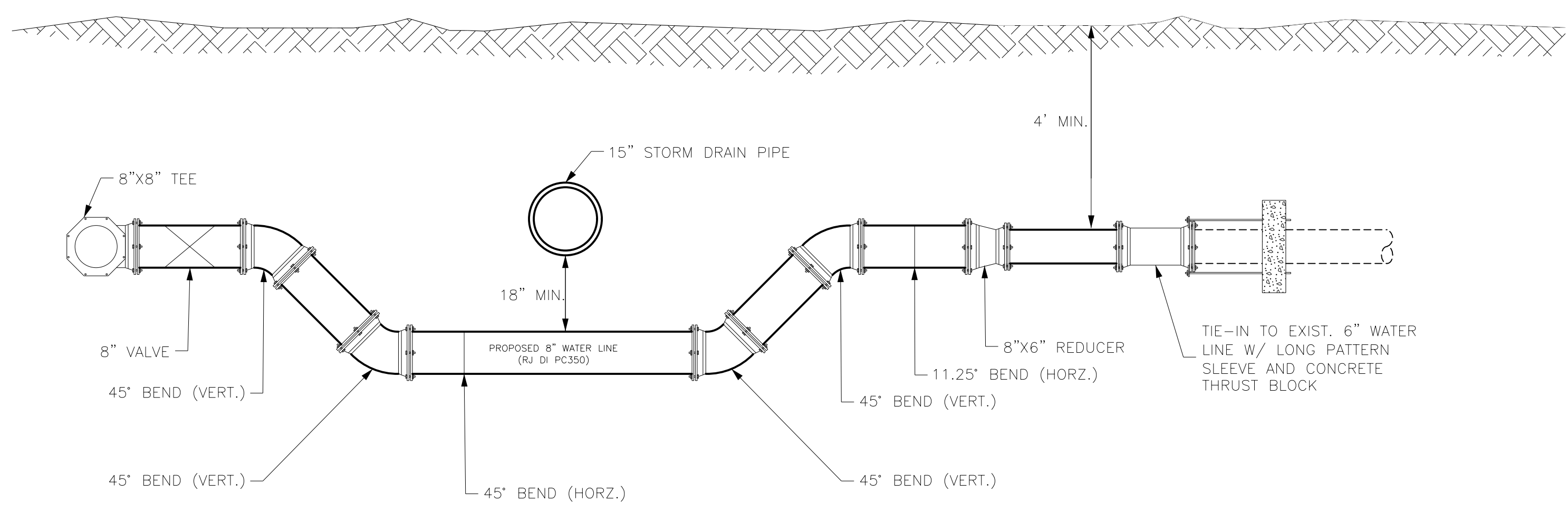
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 Charlotte, NC 28202
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DETAIL A



PROFILE VIEW
NOT TO SCALE

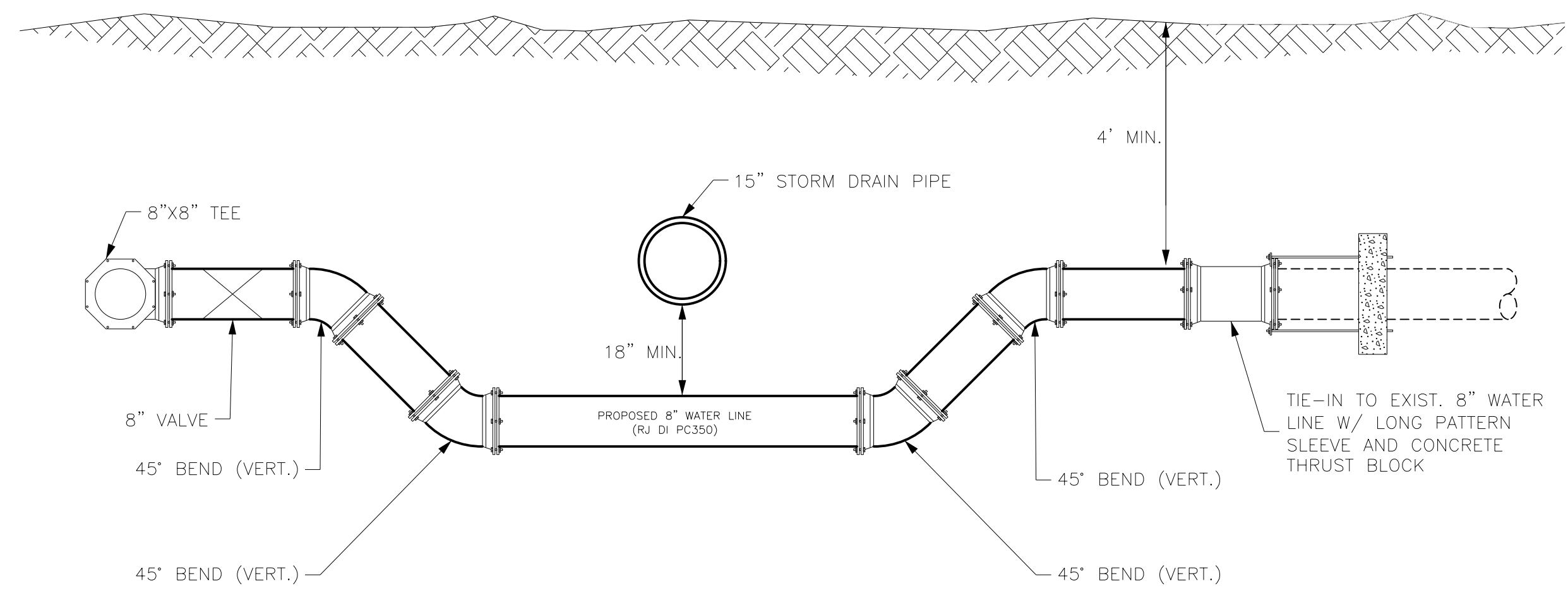
TYPE "4"
(BEDDING FOR D.I. PIPE)

PIPE BEDDED IN SAND, GRAVEL OR CRUSHED STONE TO A DEPTH OF 1/8 PIPE DIAMETER, 4" MINIMUM UNDER PIPE. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

MAXIMUM TRENCH WIDTH AT TOP OF PIPE

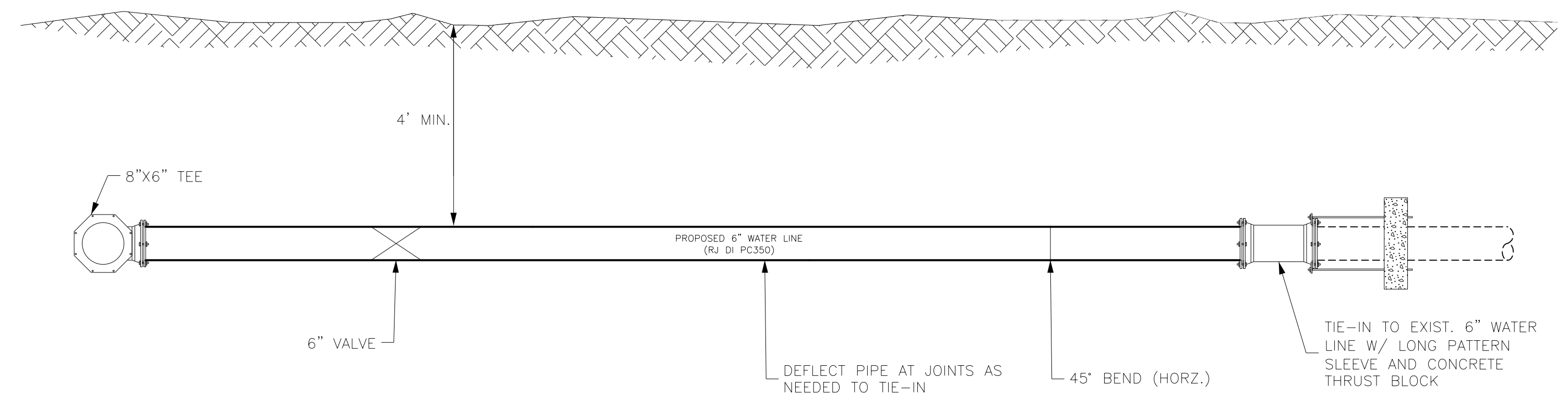
NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

DETAIL B



PROFILE VIEW
NOT TO SCALE

DETAIL C



PROFILE VIEW
NOT TO SCALE

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PROJECT TYPICAL DETAILS

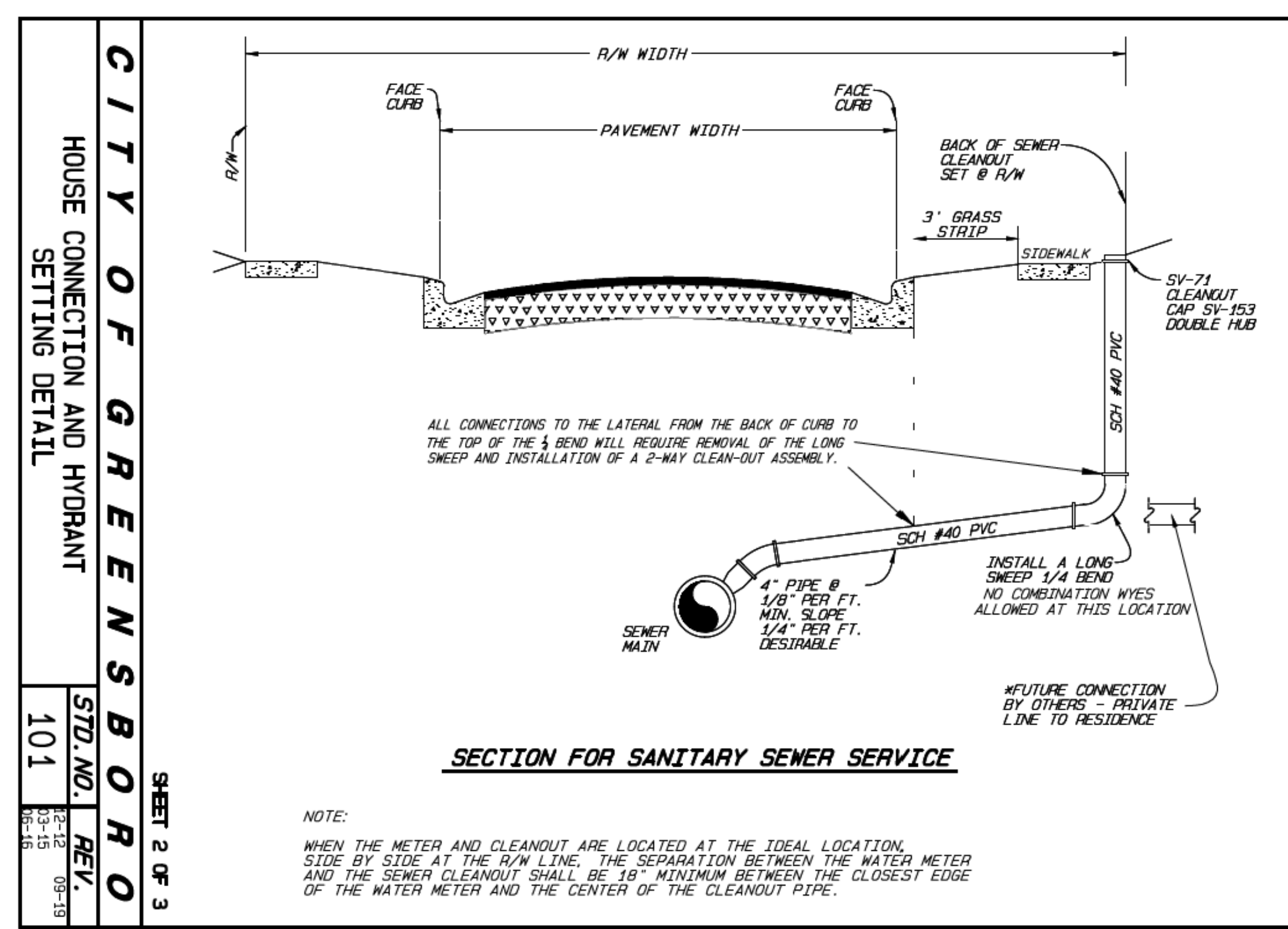
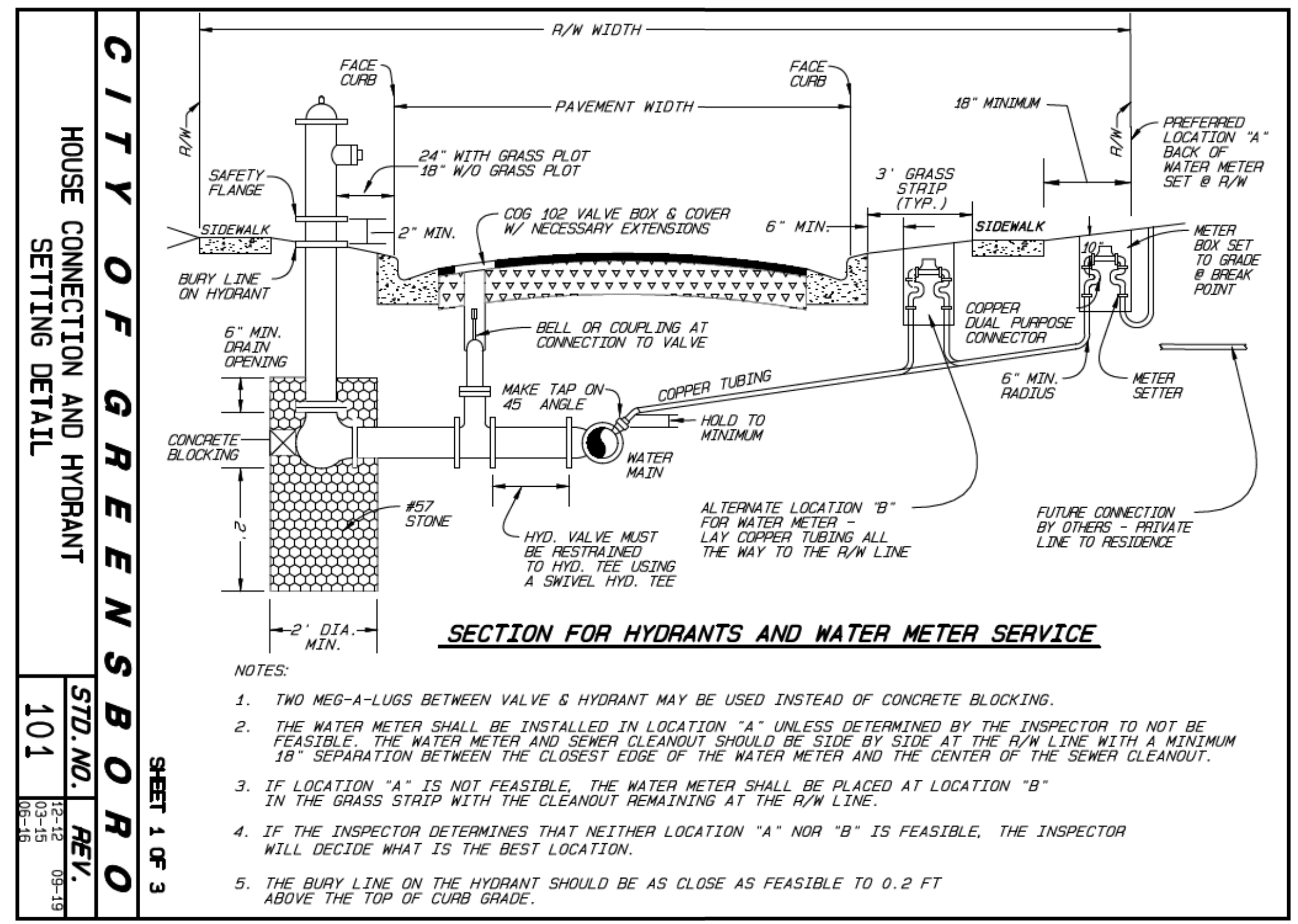
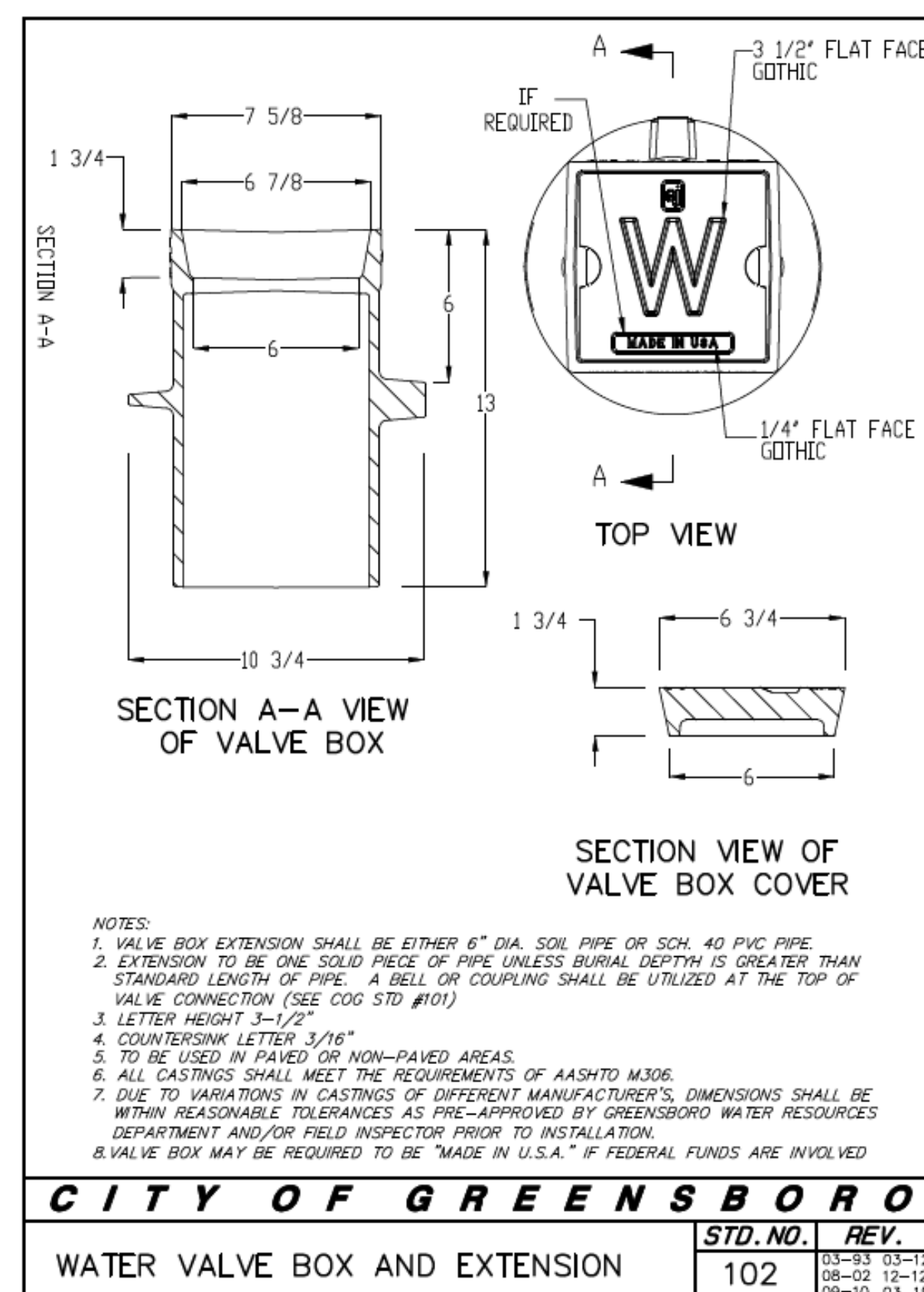
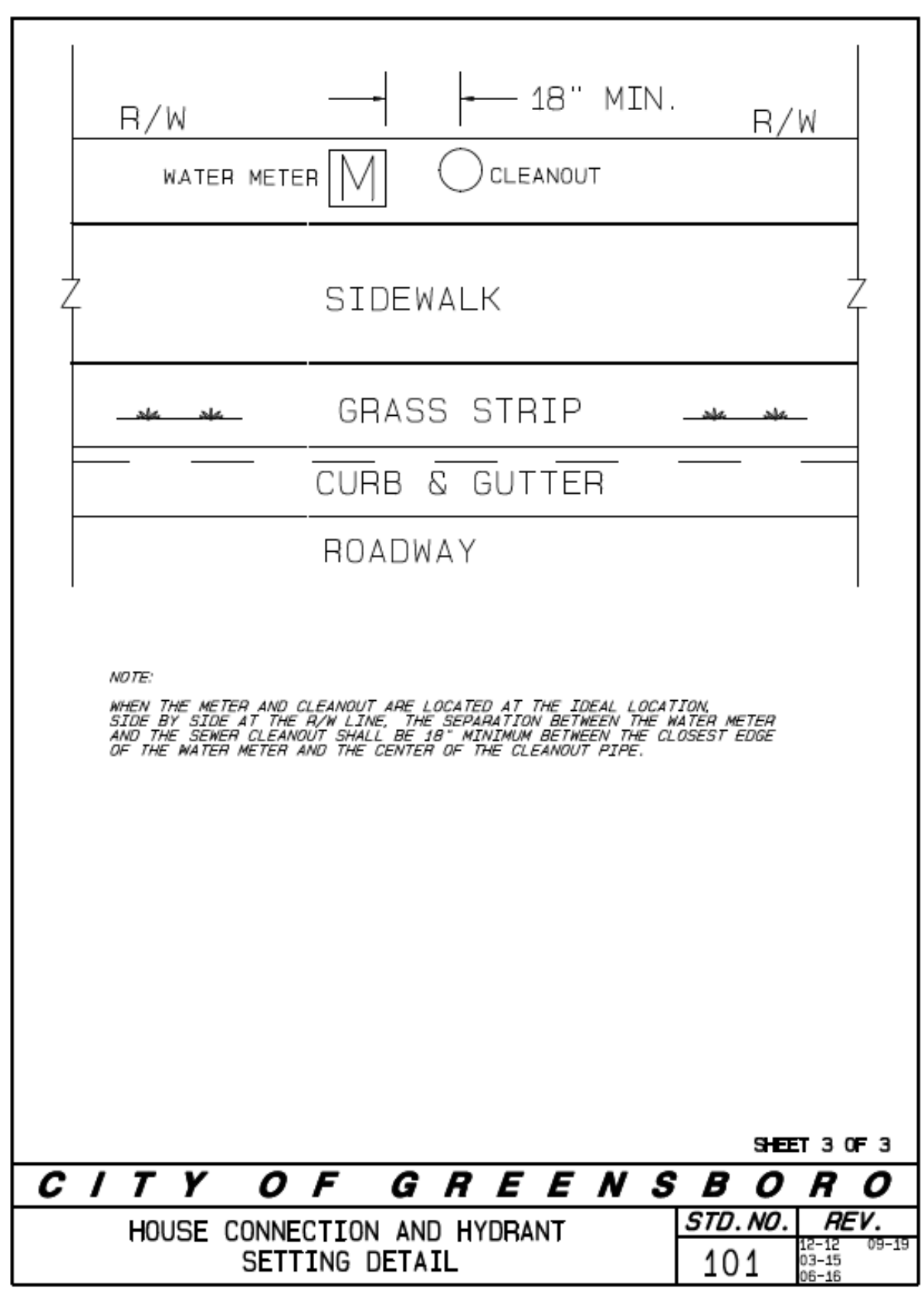
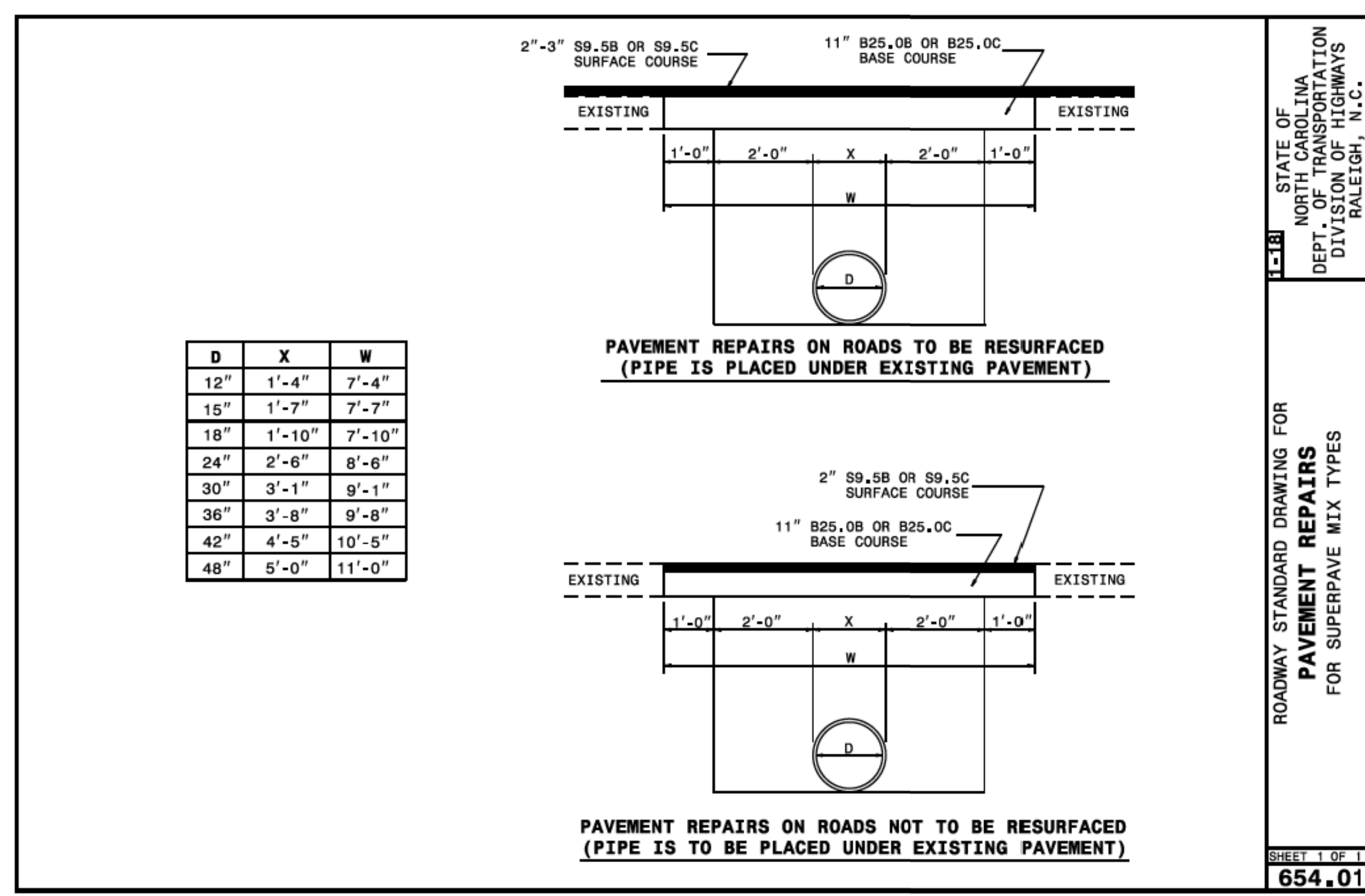
PROJECT REFERENCE NO.	SHEET NO.
Y-4807B	UC-3B
DESIGNED BY: ABN	
DRAWN BY: ABN	
CHECKED BY: ASV	
APPROVED BY:	
REVISER:	1/18/2024
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

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 Charlotte, NC 28202
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PROJECT TYPICAL DETAILS

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Y-4807B	UC-3C
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DRAWN BY: ABN	
CHECKED BY: ASV	
APPROVED BY:	
REVISED:	1/18/2024
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
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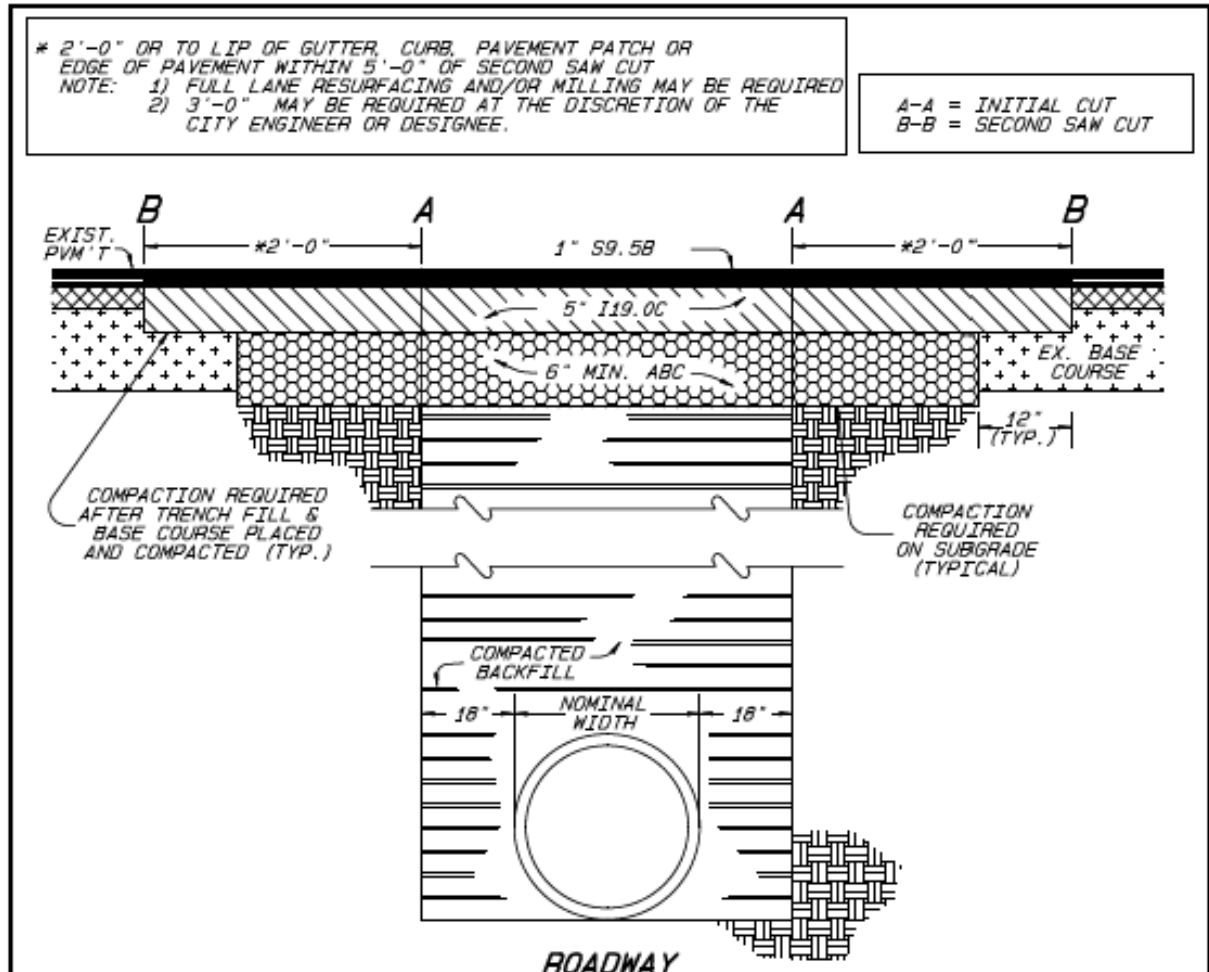
SIZE AND DEPTH OF HOLE	STAT. THROST IN	FAT. PL. OR CLAY	SPRT. CLAY	GRAVEL COURSE	ALUMS. OR CLAY	CONCT. SAND & GRAVEL	SAND CLAY RY	GRAVEL COURSE	CONCT. SAND & GRAVEL	GRAVEL COURSE	CONCT. SAND & GRAVEL
6"											
11-1/4"	812	1 FT ²	1	1	1	1	1	1	1	1	1
22-1/2"	1653	1 FT ²	1	1	1	1	1	1	2	1	1
45"	3247	1 FT ²	2	1	1	1	1	1	4	1	1
90"	5994	2 FT ²	3	1	1	1	2	6	1	1	1
PLUG	4239	1 FT ²	2	1	1	1	1	4	1	1	1
8"											
11-1/4"	1444	1 FT ²	1	1	1	1	1	2	1	1	1
22-1/2"	2939	1 FT ²	2	1	1	1	1	3	1	1	1
45"	5773	2 FT ²	3	1	1	1	2	6	1	1	1
90"	10656	3 FT ²	6	1	2	2	3	11	2	2	2
PLUG	7536	2 FT ²	4	1	1	1	2	8	1	1	1
12"											
11-1/4"	3248	1 FT ²	2	1	1	1	1	3	1	1	1
22-1/2"	6612	2 FT ²	4	1	1	1	2	7	1	1	1
45"	12988	3 FT ²	7	1	2	2	3	13	2	2	2
90"	23976	6 FT ²	12	2	3	3	6	24	3	3	3
PLUG	16956	4 FT ²	9	1	2	2	4	17	2	2	2
16"											
11-1/4"	5775	2 FT ²	3	1	1	1	2	6	1	1	1
22-1/2"	11756	3 FT ²	6	1	2	1	3	12	1	1	1
45"	23090	6 FT ²	12	2	3	3	6	23	3	3	3
90"	42624	11 FT ²	22	3	6	6	11	43	4	4	4
PLUG	30144	8 FT ²	15	2	4	4	8	30	3	3	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.	REV.
	106	

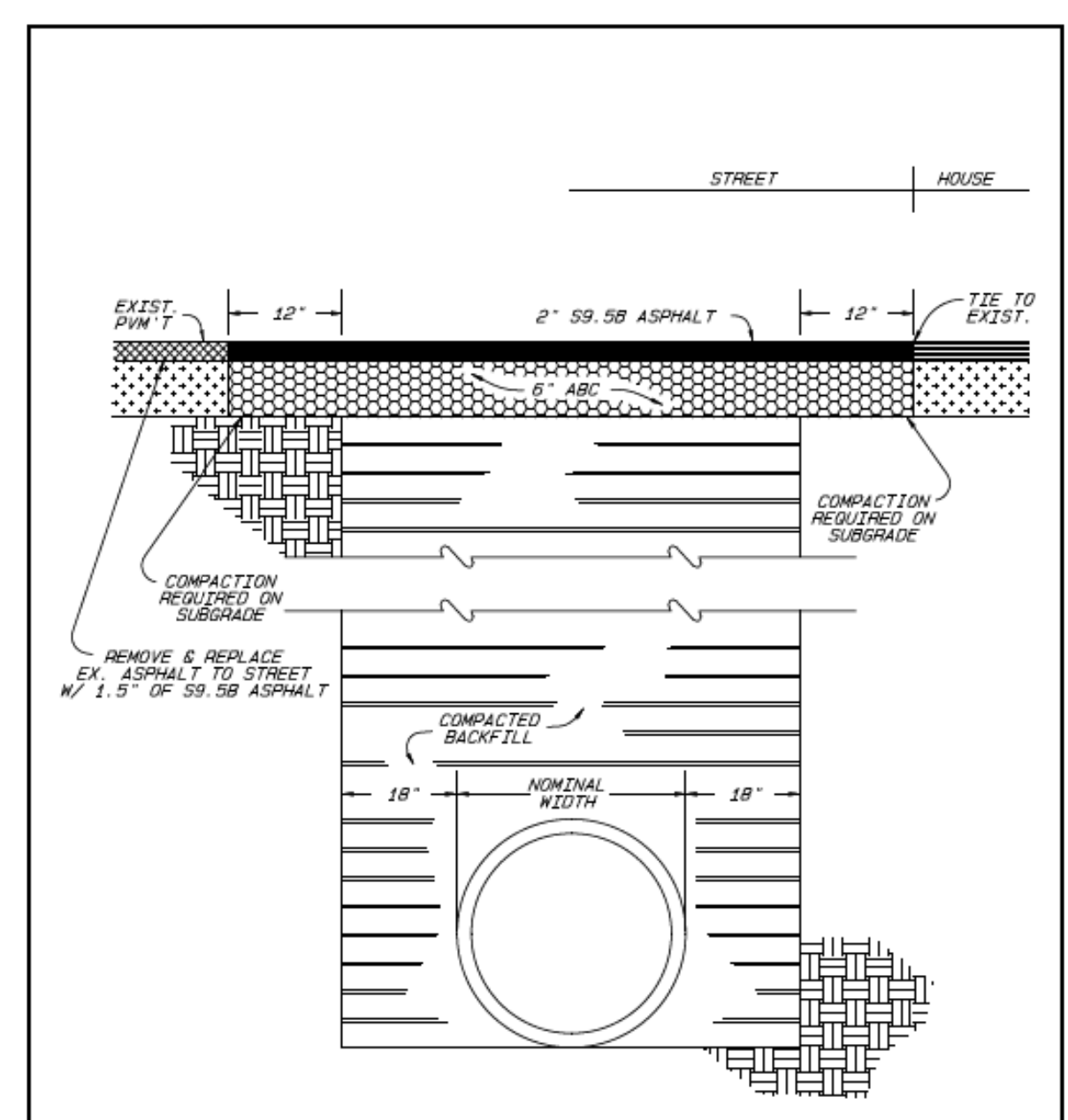


ROADWAY

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

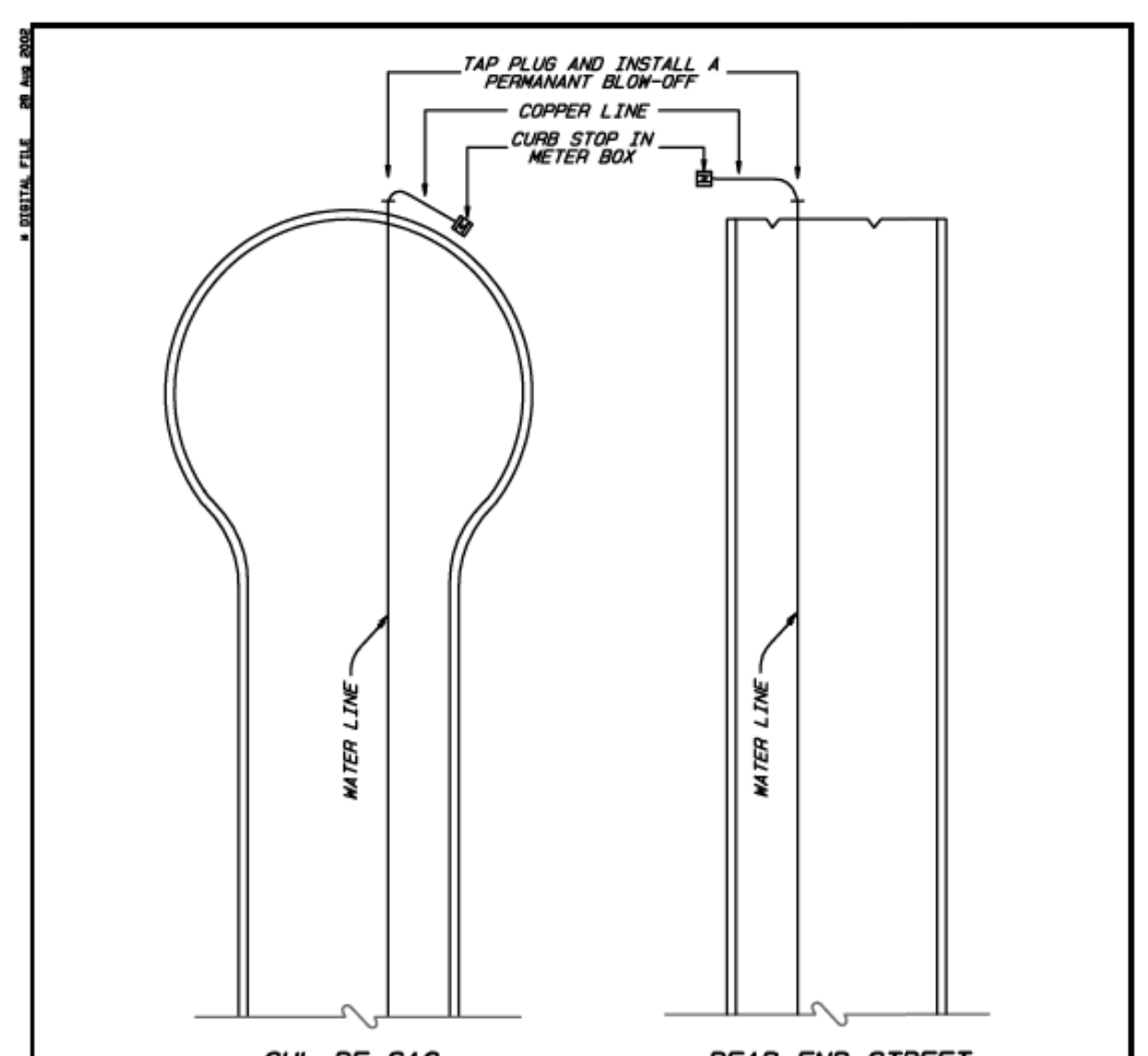
CITY OF GREENSBORO

PAVEMENT REPAIR FOR PIPE/UTILITY PLACED UNDER EXISTING PAVEMENT (ROADWAY)	STD. NO.	REV.
	107	03-12 03-15 03-18



CITY OF GREENSBORO

PAVEMENT REPAIR FOR PIPE/UTILITY PLACED UNDER EXISTING PAVEMENT (ASPHALT DRIVEWAYS)	STD. NO.	REV.
	107-A	03-03 03-15 03-18

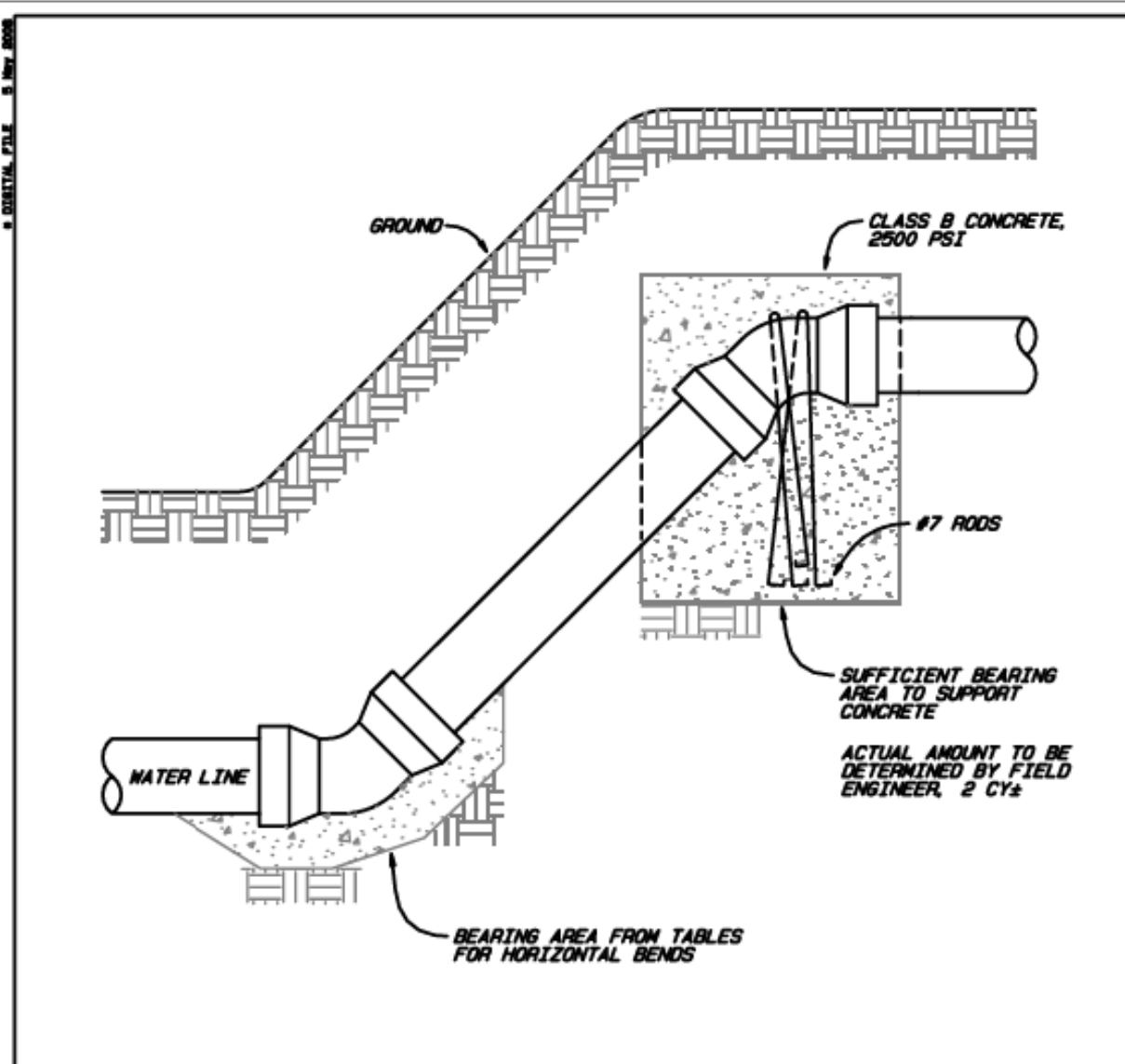


BLOW-OFF SIZING	
2" MAIN	3/4" COPPER
4" MAIN	1" COPPER
6" MAIN	1-1/2" COPPER
8" MAIN	2" COPPER

NOTE:
 INSTALL "L" OR 90° BEND LOOKING UP IN METER BOX (TO COPPER).

CITY OF GREENSBORO

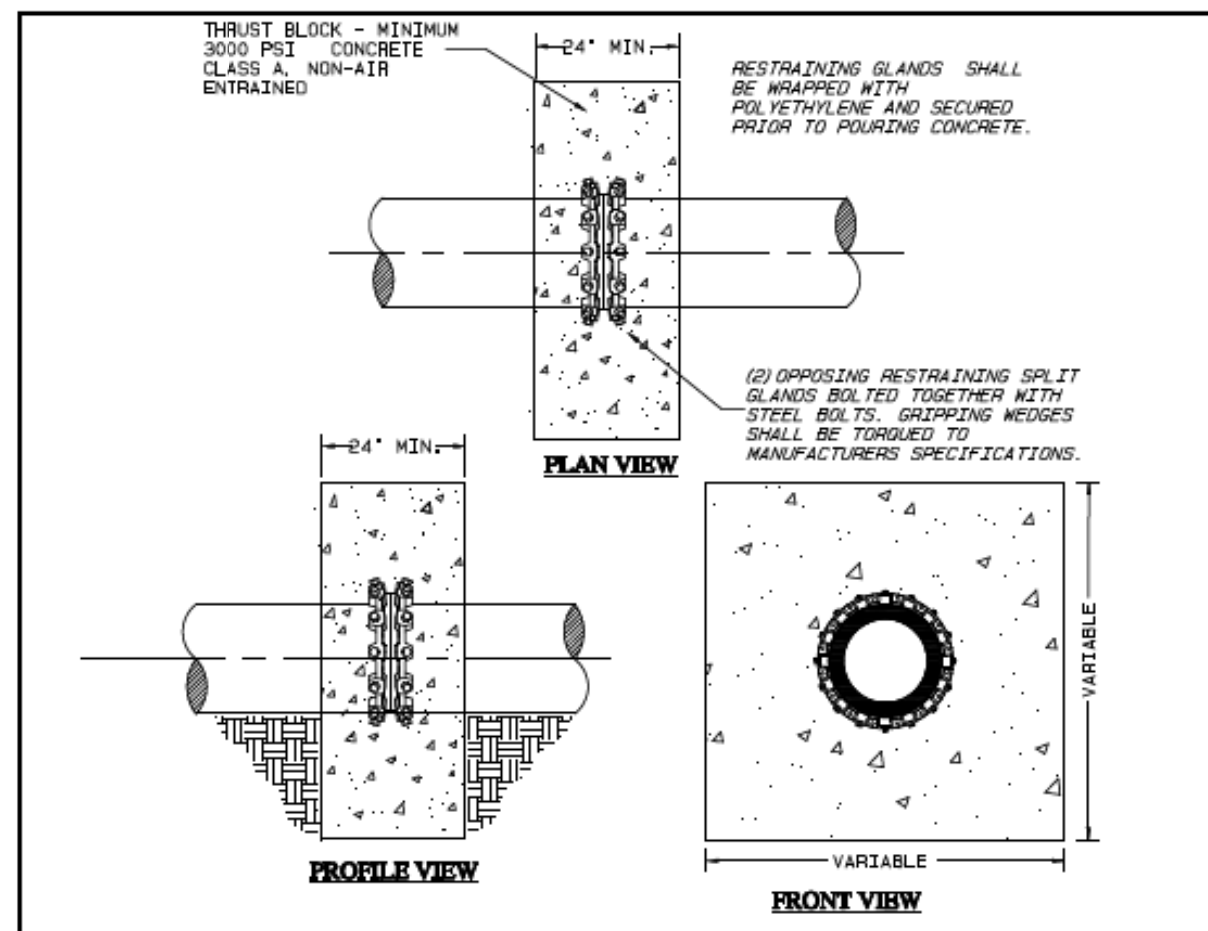
STANDARD WATER LINE BLOW-OFF	STD. NO.	REV.
	108	08-02



PIPE DIA.	11-1/4" BEND	22-1/2" BEND	45" BEND
6"	812 # 1/2 CY	1653 # 1/2 CY	3247 # 1.0 CY
8"	1444 # 1/2 CY	2939 # 3/4 CY	5773 # 1.5 CY
12"	3248 # 1.0 CY	6612 # 1-3/4 CY	12988 # 3.5 CY
16"	5775 # 1-1/2 CY	11756 # 3.0 CY	23090 # 6.0 CY

CITY OF GREENSBORO

STANDARD VERTICAL BEND ANCHORS	STD. NO.	REV.
	110	08-05 03-03



NOTES:
 1. SEE CITY OF GREENSBORO - WATER LINE AND SEWER LINE STANDARD CONSTRUCTION SPECIFICATIONS, SUB-ARTICLE 3.02 & 3.03 FOR (TRENCH AND BACKFILL) AND (TRENCH STABILIZATION) REQUIREMENTS.
 2. THRUST BLOCK SHALL BE ORIENTED APPROXIMATELY CENTER OF PIPE JOINT.
 3. OPTIONAL # 4 WELDED COLLAR (INSTALLED BY PIPE MANUFACTURER) MAY BE USED IN LIEU OF RESTRAINING GLANDS. ALL OTHER DESIGN REQUIREMENTS SHALL APPLY AS SHOWN.
 4. FOR PIPES LARGER THAN 16" DIAMETER, THE DEADMAN THRUST RESTRAINT WITH BLOCKING MUST BE DESIGNED AND SEALED BY A N.C. PROFESSIONAL ENGINEER.
 5. ANY PROPOSED MODIFICATIONS TO THIS STANDARD BASED ON THE FIELD CONDITIONS MUST BE PRE-APPROVED BY THE CITY OF GREENSBORO FIELD INSPECTOR AND/OR THE ENGINEER OF RECORD.
 6. QUANTITIES SHOWN BELOW ARE TO THE NEAREST QUARTER YARD AND ARE BASED ON MINIMUM MASS WEIGHT REQUIREMENTS OF THE TEST PRESSURES SHOWN.

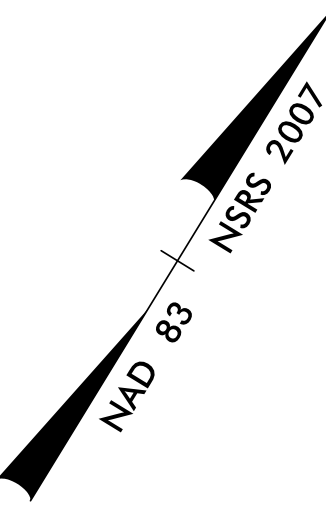
PIPE DIAMETER	MINIMUM CUBIC YARDS OF CONCRETE REQUIRED		
	150 PSI TEST PRES.	200 PSI TEST PRES.	250 PSI TEST PRES.
6"	0.75	1.0	1.25
8"	1.5	2.0	2.25
10"	2.0	3.0	3.5
12"	3.0	4.0	5.0
16"	5.5	7.25	9.0

CITY OF GREENSBORO

DEADMAN THRUST RESTRAINT WITH MASS WEIGHT BLOCKING	STD. NO.	REV.
	118	08-13 06-15

5/14/24

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City of Greensboro



PROJECT REFERENCE NO.	SHEET NO.
Y-4807B	UC-04
DESIGNED BY: ABN	
DRAWN BY: ABN	
CHECKED BY: ASV	
APPROVED BY:	
REVISED:	2/9/2024
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

5-5/8" WATER METER
141.9 LF WATER SERVICE LINE
5-REMOVE WATER METER

8" VALVE
12"X8" TEE
-WLB- STA. 13+80.76
-WLD- STA. 10+00.00
-WLD- STA. 10+05.00

2-5/8" WATER METER
93.6 LF WATER SERVICE LINE

REMOVE FIRE HYDRANT
2-REMOVE WATER METER

2-45° BENDS (HORZ.)
-WLB- STA. 14+34.95
-WLB- STA. 14+54.26

TIE-IN TO EXIST. 12" WATER LINE
W/ LONG PATTERN SLEEVE AND
CONCRETE THRUST COLLAR

-L- STA. 21+85.00
2-45° BENDS (VERT.)
-WLD- STA. 10+08.85
-WLD- STA. 10+11.41

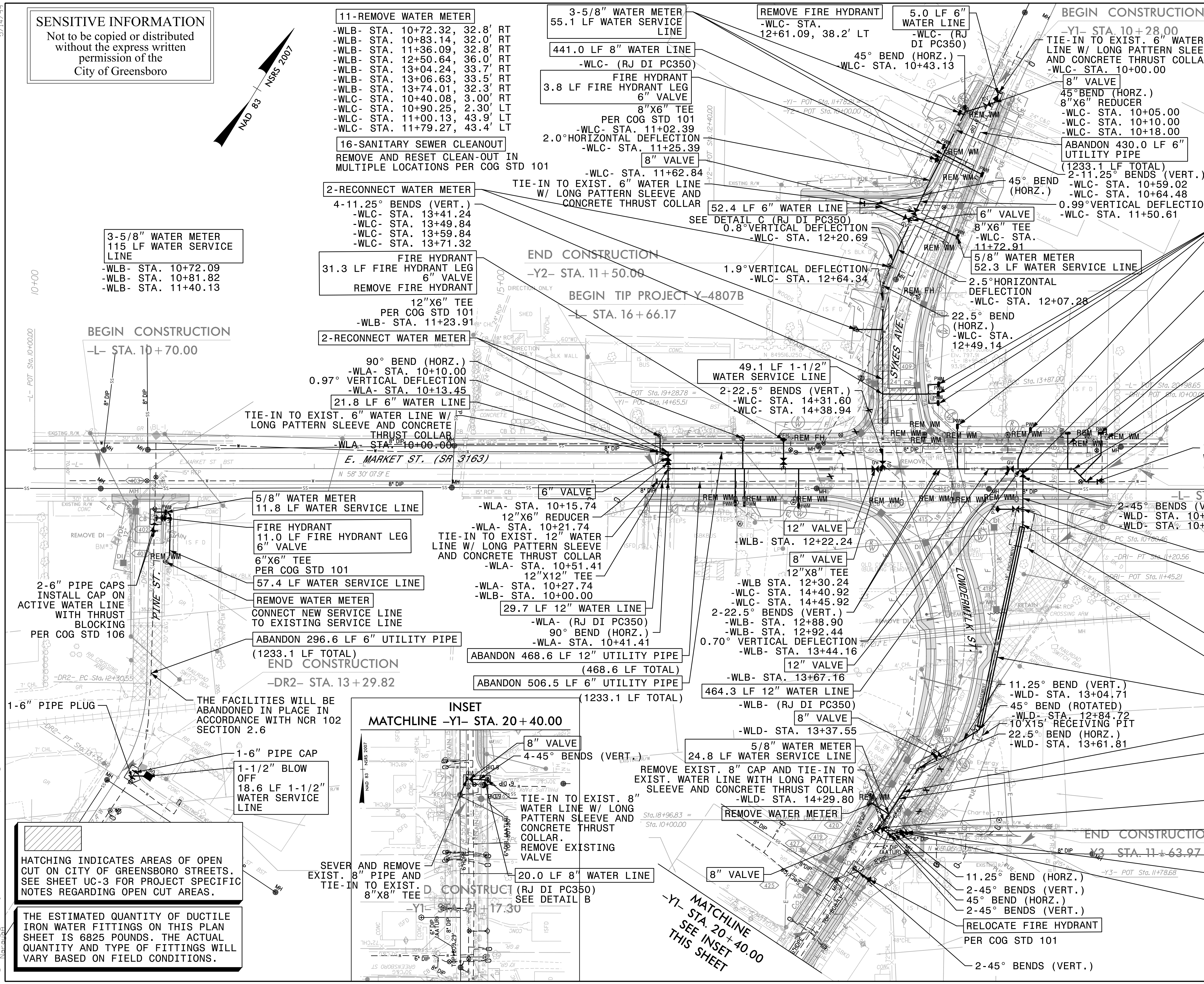
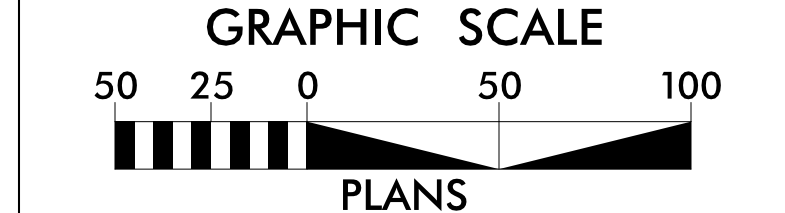
END CONSTRUCTION
-DR1- STA. 10+80.00
2.5° VERTICAL DEFLECTION
-WLD- STA. 10+31.41

FIRE HYDRANT
27.1 LF FIRE HYDRANT LEG
6" VALVE
8"X6" TEE
PER COG STD 101
-WLD- STA. 10+43.19
11.25° BEND (ROTATED)
-WLD- STA. 10+59.54
20'X40' BORE PIT

219.2 LF BORE AND JACK OF 16"
239.2 LF 16" ENCASEMENT PIPE
(0.375" WALL THICKNESS)

429.8 LF 8" WATER LINE
-WLD- (RJ DI PC350)
4-11.25° BENDS (VERT.)
-WLD- STA. 13+81.84
-WLD- STA. 13+91.47
-WLD- STA. 14+06.47
-WLD- STA. 14+16.79
SEVER AND REMOVE EXIST. 8"
PIPE AND TIE-IN TO EXIST.
8"X8" TEE
8"X6" REDUCER
TIE-IN TO EXIST. 6" WATER
LINE W/ LONG PATTERN SLEEVE
AND CONCRETE THRUST COLLAR

5.0 LF 6" WATER LINE
(RJ DI PC350) SEE DETAIL A
24.7 LF 8" WATER LINE
(RJ DI PC350) SEE DETAIL A



11-REMOVE WATER METER
-WLB- STA. 10+72.32, 32.8' RT
-WLB- STA. 10+83.14, 32.0' RT
-WLB- STA. 11+36.09, 32.8' RT
-WLB- STA. 12+50.64, 36.0' RT
-WLB- STA. 13+04.24, 33.7' RT
-WLB- STA. 13+06.63, 33.5' RT
-WLB- STA. 13+74.01, 32.3' RT
-WLC- STA. 10+40.08, 3.00' RT
-WLC- STA. 10+90.25, 2.30' LT
-WLC- STA. 11+00.13, 43.9' LT
-WLC- STA. 11+79.27, 43.4' LT

3-5/8" WATER METER
55.1 LF WATER SERVICE LINE
441.0 LF 8" WATER LINE
-WLC- (RJ DI PC350)
FIRE HYDRANT
3.8 LF FIRE HYDRANT LEG
6" VALVE
8"X6" TEE
PER COG STD 101
-WLC- STA. 11+02.39
2.0° HORIZONTAL DEFLECTION
-WLC- STA. 11+25.39
8" VALVE
-WLC- STA. 11+62.84
TIE-IN TO EXIST. 6" WATER LINE
W/ LONG PATTERN SLEEVE AND
CONCRETE THRUST COLLAR

REMOVE FIRE HYDRANT
-WLC- STA.
12+61.09, 38.2' LT
5.0 LF 6" WATER LINE
-WLC- (RJ DI PC350)
45° BEND (HORZ.)
-WLC- STA. 10+43.13

BEGIN CONSTRUCTION
-Y1- STA. 10+28.00
TIE-IN TO EXIST. 6" WATER
LINE W/ LONG PATTERN SLEEVE
AND CONCRETE THRUST COLLAR
-WLC- STA. 10+00.00
8" VALVE
45° BEND (HORZ.)
8"X6" REDUCER
-WLC- STA. 10+05.00
-WLC- STA. 10+10.00
-WLC- STA. 10+18.00

ABANDON 430.0 LF 6" UTILITY PIPE
(1233.1 LF TOTAL)
2-11.25° BENDS (VERT.)
-WLC- STA. 10+59.02
-WLC- STA. 10+64.48
0.99° VERTICAL DEFLECTION
-WLC- STA. 11+50.61

52.4 LF 6" WATER LINE
SEE DETAIL C (RJ DI PC350)
0.8° VERTICAL DEFLECTION
-WLC- STA. 12+20.69
1.9° VERTICAL DEFLECTION
-WLC- STA. 12+64.34
2.5° HORIZONTAL DEFLECTION
-WLC- STA. 12+07.28
22.5° BEND (HORZ.)
-WLC- STA. 12+49.14

END CONSTRUCTION
-Y2- STA. 11+50.00
BEGIN TIP PROJECT Y-4807B
-L- STA. 16+66.17

49.1 LF 1-1/2" WATER SERVICE LINE
2-22.5° BENDS (VERT.)
-WLC- STA. 14+31.60
-WLC- STA. 14+38.94

5/8" WATER METER
52.3 LF WATER SERVICE LINE
8" VALVE
8"X6" TEE
-WLC- STA. 11+72.91

3-5/8" WATER METER
115 LF WATER SERVICE LINE
-WLB- STA. 10+72.09
-WLB- STA. 10+81.82
-WLB- STA. 11+40.13

2-RECONNECT WATER METER
4-11.25° BENDS (VERT.)
-WLC- STA. 13+41.24
-WLC- STA. 13+49.84
-WLC- STA. 13+59.84
-WLC- STA. 13+71.32
FIRE HYDRANT
31.3 LF FIRE HYDRANT LEG
6" VALVE
REMOVE FIRE HYDRANT
12"X6" TEE
PER COG STD 101
-WLB- STA. 11+23.91

BEGIN CONSTRUCTION
-L- STA. 10+70.00

2-RECONNECT WATER METER
90° BEND (HORZ.)
-WLA- STA. 10+10.00
0.97° VERTICAL DEFLECTION
-WLA- STA. 10+13.45
21.8 LF 6" WATER LINE
TIE-IN TO EXIST. 6" WATER LINE W/
LONG PATTERN SLEEVE AND
CONCRETE THRUST COLLAR
-WLA- STA. 10+00.00

5/8" WATER METER
11.8 LF WATER SERVICE LINE
FIRE HYDRANT
11.0 LF FIRE HYDRANT LEG
6" VALVE
6"X6" TEE
PER COG STD 101
57.4 LF WATER SERVICE LINE
REMOVE WATER METER
CONNECT NEW SERVICE LINE
TO EXISTING SERVICE LINE
ABANDON 296.6 LF 6" UTILITY PIPE
(1233.1 LF TOTAL)
END CONSTRUCTION
-DR2- STA. 13+29.82

21.8 LF 6" WATER LINE
TIE-IN TO EXIST. 6" WATER LINE W/
LONG PATTERN SLEEVE AND
CONCRETE THRUST COLLAR
-WLA- STA. 10+00.00
E. MARKET ST. (SR 3163)
N 58° 30' 07.9" E

6" VALVE
-WLA- STA. 10+15.74
12"X6" REDUCER
-WLA- STA. 10+21.74
TIE-IN TO EXIST. 12" WATER
LINE W/ LONG PATTERN SLEEVE
AND CONCRETE THRUST COLLAR
-WLA- STA. 10+51.41
12"X12" TEE
-WLA- STA. 10+27.74
-WLB- STA. 10+00.00

29.7 LF 12" WATER LINE
-WLA- (RJ DI PC350)
90° BEND (HORZ.)
-WLA- STA. 10+41.41

ABANDON 468.6 LF 12" UTILITY PIPE
(468.6 LF TOTAL)
ABANDON 506.5 LF 6" UTILITY PIPE
(1233.1 LF TOTAL)

12" VALVE
-WLB- STA. 12+22.24
8" VALVE
12"X8" TEE
-WLB- STA. 12+30.24
-WLC- STA. 14+40.92
-WLC- STA. 14+45.92
2-22.5° BENDS (VERT.)
-WLB- STA. 12+88.90
-WLB- STA. 12+92.44
0.70° VERTICAL DEFLECTION
-WLB- STA. 13+44.16

12" VALVE
-WLB- STA. 13+67.16
464.3 LF 12" WATER LINE
-WLB- (RJ DI PC350)
8" VALVE
-WLD- STA. 13+37.55

5/8" WATER METER
24.8 LF WATER SERVICE LINE
REMOVE EXIST. 8" CAP AND TIE-IN TO
EXIST. WATER LINE WITH LONG PATTERN
SLEEVE AND CONCRETE THRUST COLLAR
-WLD- STA. 14+29.80

REMOVE WATER METER
8" VALVE
11.25° BEND (VERT.)
-WLD- STA. 13+04.71
45° BEND (ROTATED)
-WLD- STA. 12+84.72
10'X15' RECEIVING PIT
22.5° BEND (HORZ.)
-WLD- STA. 13+61.81

2-45° BENDS (VERT.)
-WLD- STA. 10+59.54
20'X40' BORE PIT

2-45° BENDS (VERT.)
-WLD- STA. 10+59.54
20'X40' BORE PIT

2-45° BENDS (VERT.)
-WLD- STA. 10+59.54
20'X40' BORE PIT

2-45° BENDS (VERT.)
-WLD- STA. 10+59.54
20'X40' BORE PIT

2-45° BENDS (VERT.)
-WLD- STA. 10+59.54
20'X40' BORE PIT

2-6" PIPE CAPS
INSTALL CAP ON
ACTIVE WATER LINE
WITH THRUST
BLOCKING
PER COG STD 106

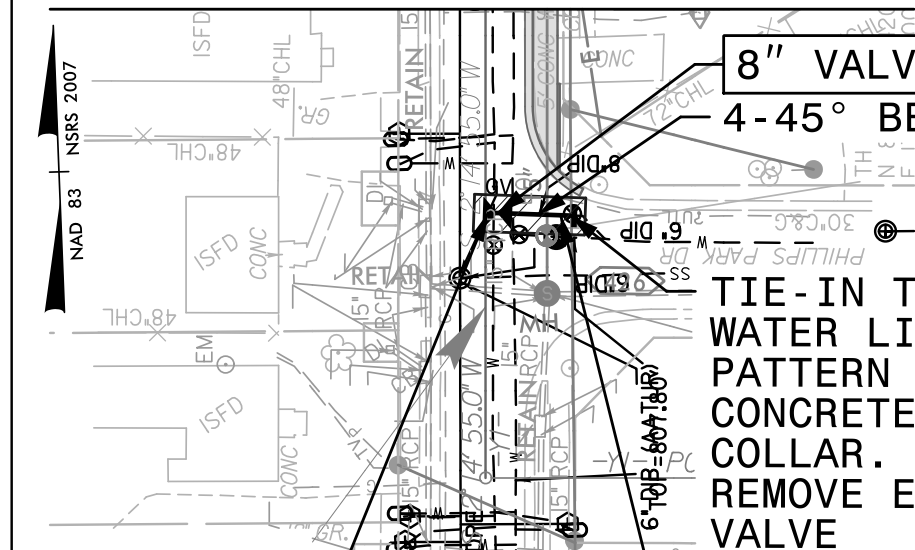
1-6" PIPE PLUG
THE FACILITIES WILL BE
ABANDONED IN PLACE IN
ACCORDANCE WITH NCR 102
SECTION 2.6

1-6" PIPE CAP
1-1/2" BLOW
OFF
18.6 LF 1-1/2"
WATER SERVICE
LINE

HATCHING INDICATES AREAS OF OPEN CUT
ON CITY OF GREENSBORO STREETS.
SEE SHEET UC-3 FOR PROJECT SPECIFIC
NOTES REGARDING OPEN CUT AREAS.

THE ESTIMATED QUANTITY OF DUCTILE
IRON WATER FITTINGS ON THIS PLAN
SHEET IS 6825 POUNDS. THE ACTUAL
QUANTITY AND TYPE OF FITTINGS WILL
VARY BASED ON FIELD CONDITIONS.

INSET
MATCHLINE -Y1- STA. 20+40.00



8" VALVE
4-45° BENDS (VERT.)
TIE-IN TO EXIST. 8"
WATER LINE W/ LONG
PATTERN SLEEVE AND
CONCRETE THRUST
COLLAR.
REMOVE EXISTING
VALVE
20.0 LF 8" WATER LINE
(RJ DI PC350)
SEE DETAIL B

MATCHLINE
-Y1- STA. 20+40.00
SEE INSET
THIS SHEET

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5/28/24

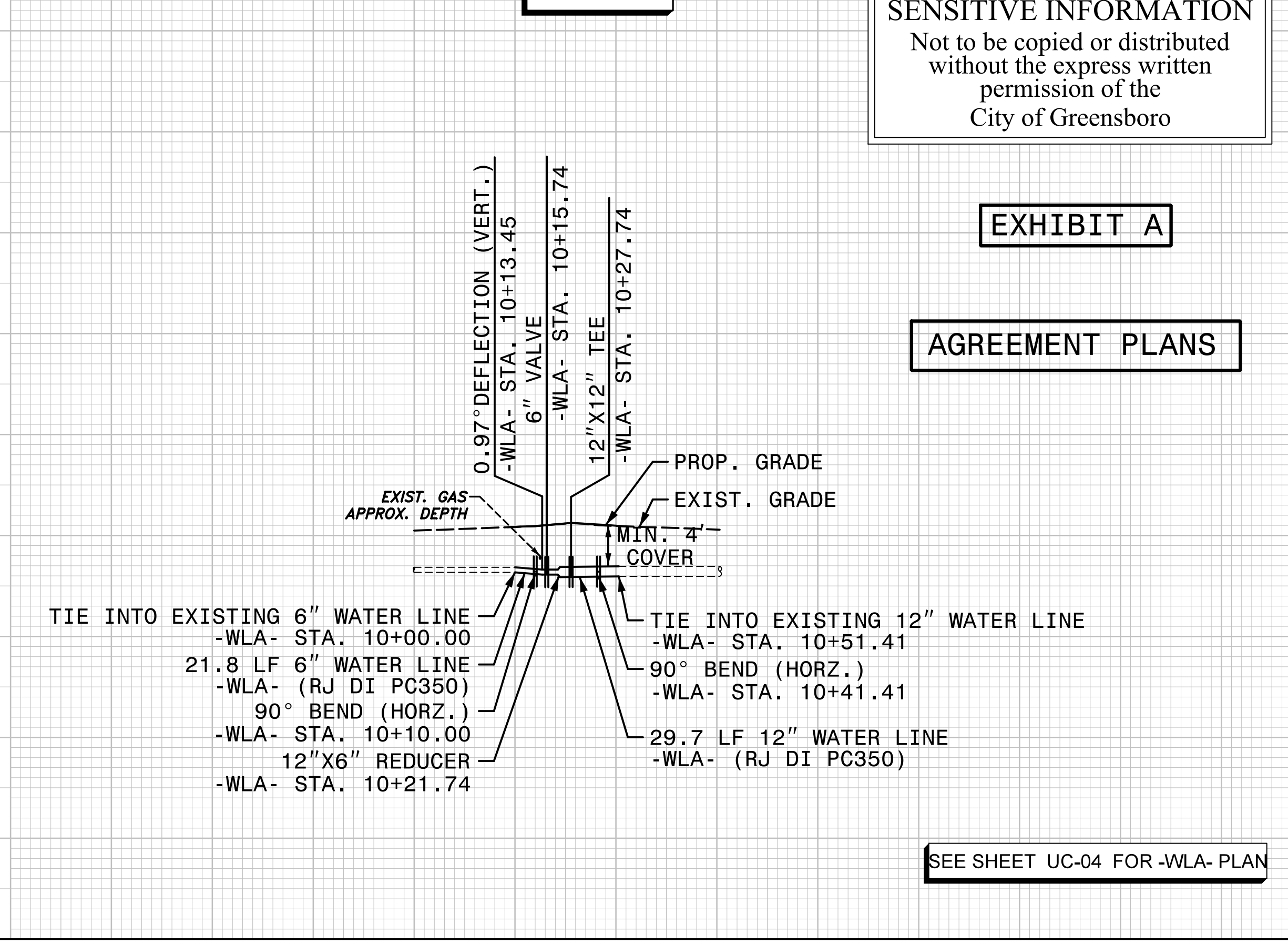
SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

-WLA-

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EXHIBIT A

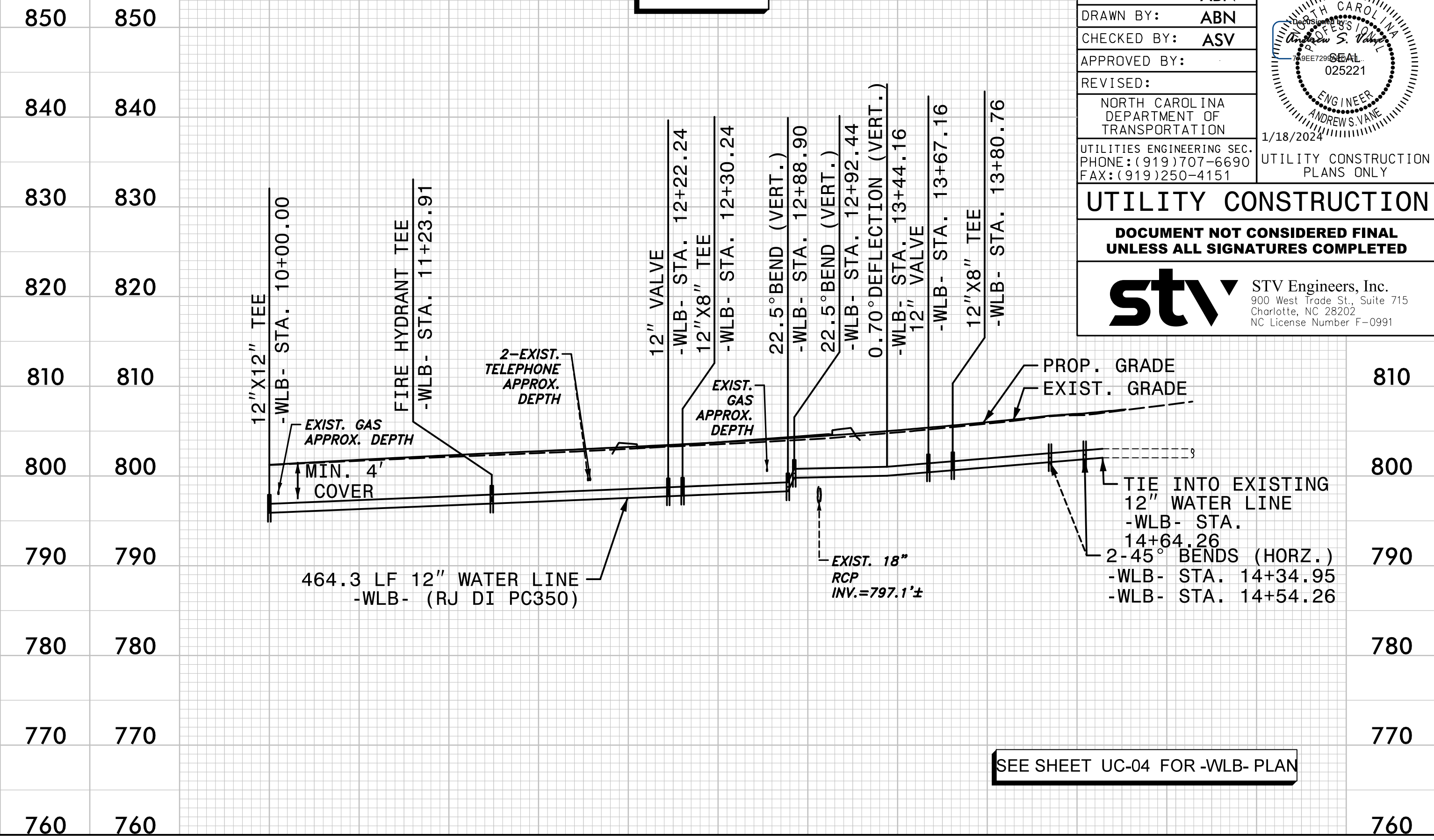
AGREEMENT PLANS



SEE SHEET UC-04 FOR -WLA- PLAN

SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

-WLB-



SEE SHEET UC-04 FOR -WLB- PLAN

PROJECT REFERENCE NO. Y-4807B SHEET NO. UC-05

DESIGNED BY: ABN
DRAWN BY: ABN
CHECKED BY: ASV
APPROVED BY:
REVISED:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
1/18/2024
UTILITY CONSTRUCTION PLANS ONLY

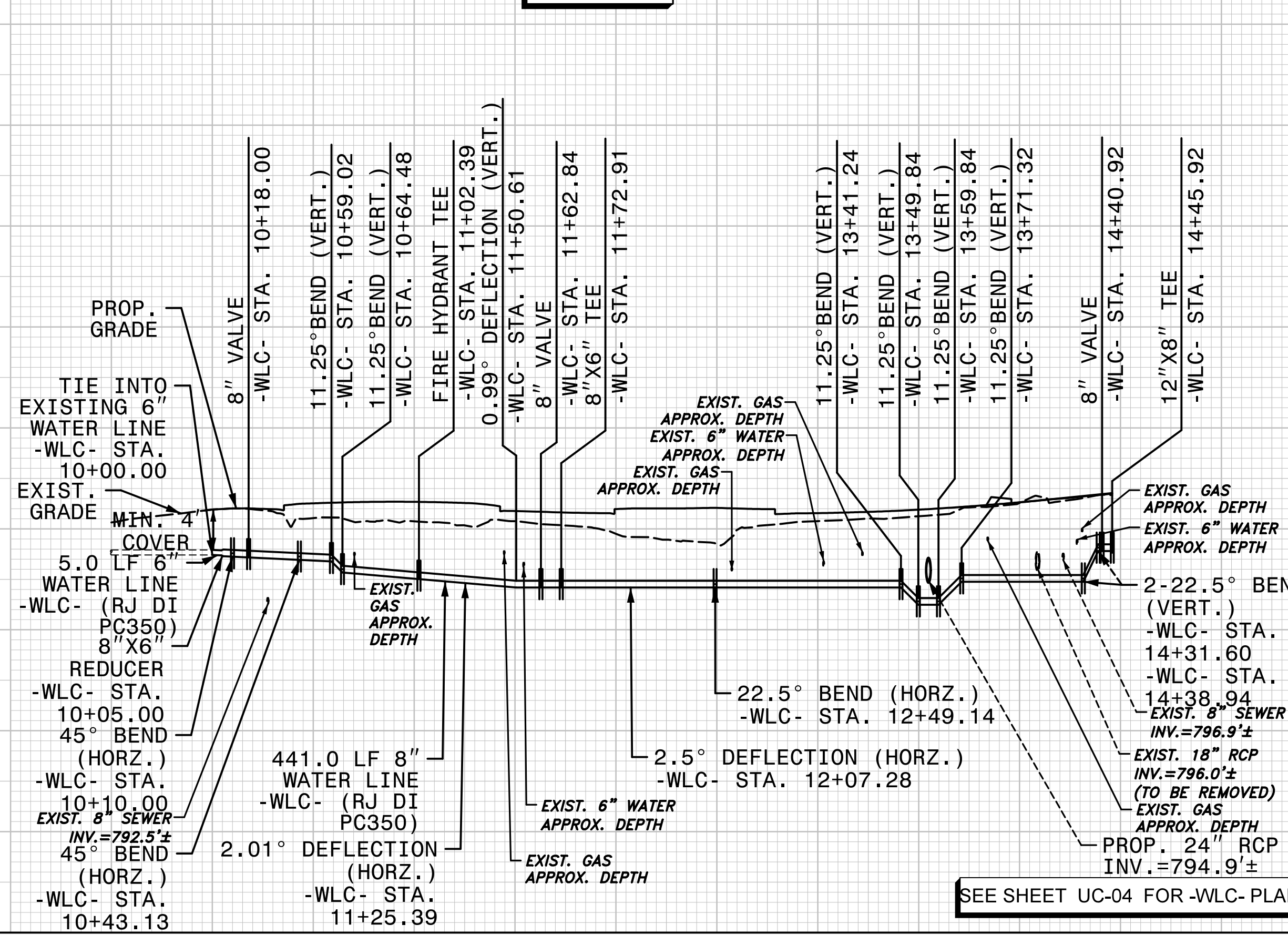
UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

stv STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

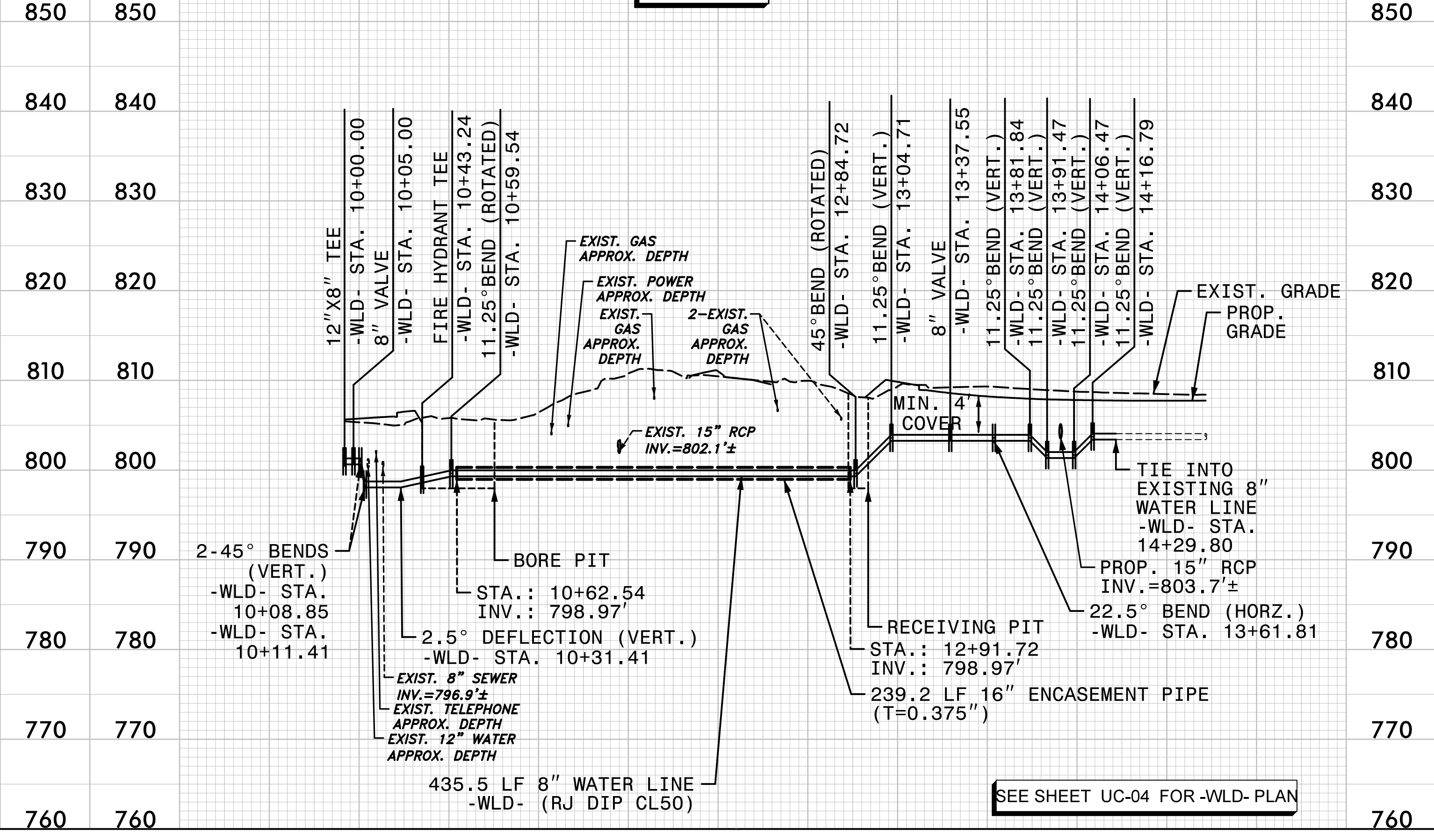
-WLC-



SEE SHEET UC-04 FOR -WLC- PLAN

SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

-WLD-



SEE SHEET UC-04 FOR -WLD- PLAN

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mabbelqz