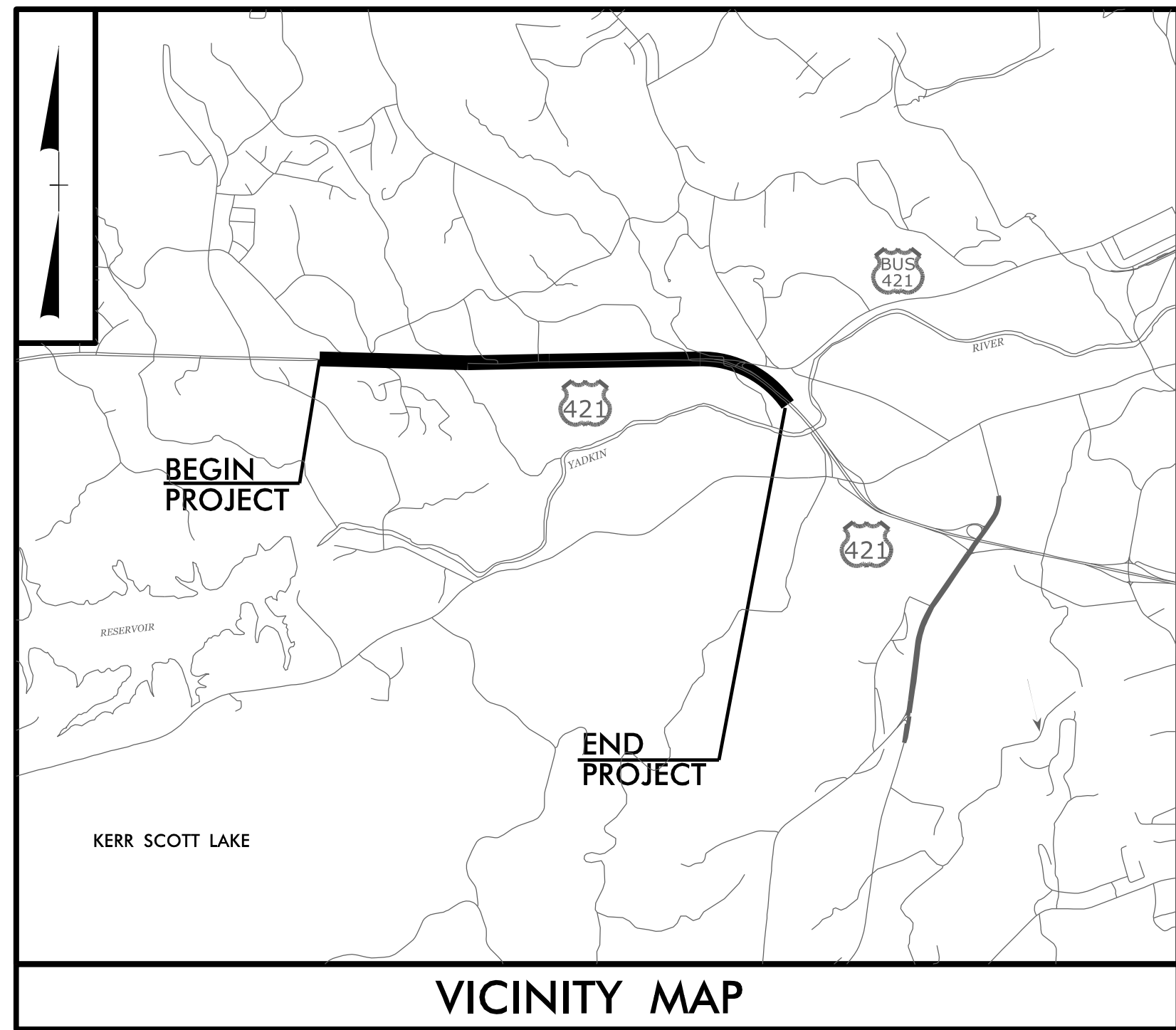


**TIP PROJECT: U-5312**



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

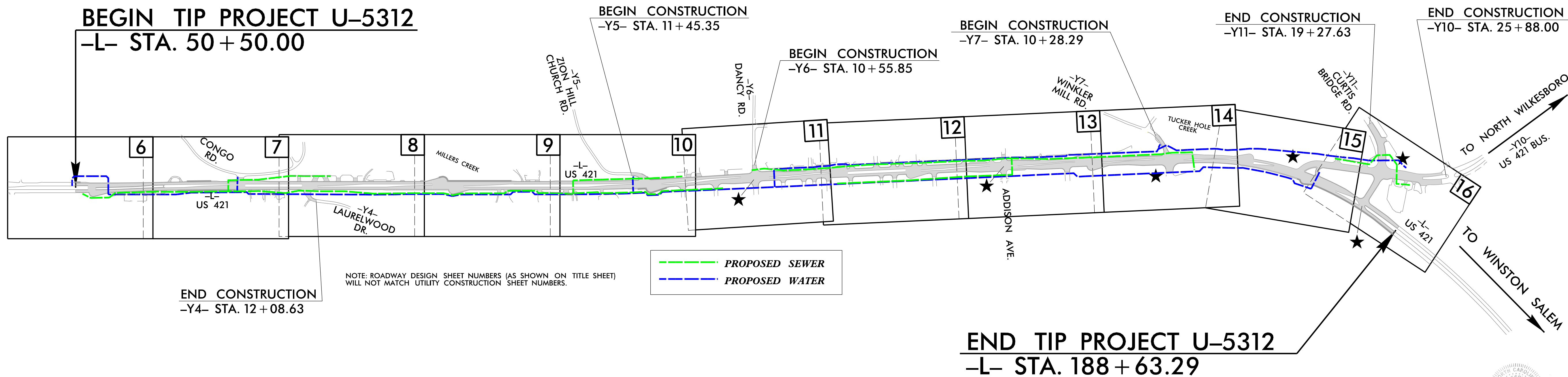
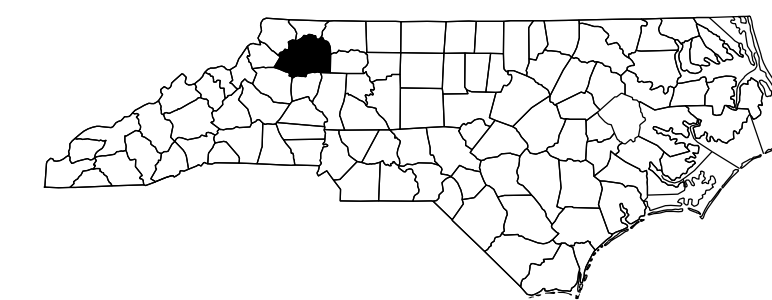
**WILKES COUNTY**

**LOCATION: US 421 FROM NC 16 TO US 421 BUSINESS IN WILKESBORO**  
**TYPE OF WORK: WATER AND SANITARY SEWER RELOCATION**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.
N.C.	U-5312	UC-1
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION
45446.1.1	NHS-0421(072)	PE
45446.2.1	NHS-0421(072)	RW
45446.2.U1	NHS-0421(072)	UTILITY

LICENSE # C-0281

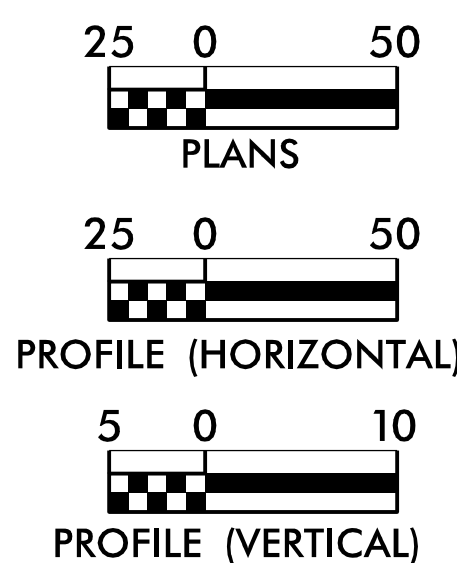
AGREEMENT PLANS



NOTE: ROADWAY DESIGN SHEET NUMBERS (AS SHOWN ON TITLE SHEET) WILL NOT MATCH UTILITY CONSTRUCTION SHEET NUMBERS.

**CONTRACT:**

**GRAPHIC SCALES**



**INDEX OF SHEETS**

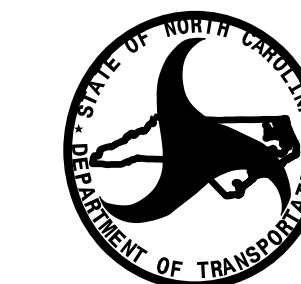
SHEET No.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	PLAN SHEET SYMBOLS
UC-3A-UC-3D	NOTES AND DETAILS
UC-4 - UC-18	SEWER PLAN AND PROFILE SHEETS
UC-19 - UC-33	WATER PLAN AND PROFILE SHEETS

**UTILITY OWNERS ON PROJECT**

UTILITY	OWNER
WATER /SEWER	TOWN OF WILKESBORO

**Municipal Services Engineering Company, P.A.**  
P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393  
P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767  
LICENSE NUMBER: C-0281

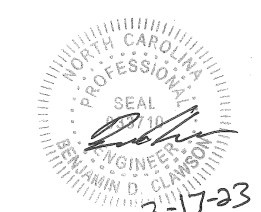
UTILITY DESIGN ENGINEER BENJAMIN D. CLAWSON, PE



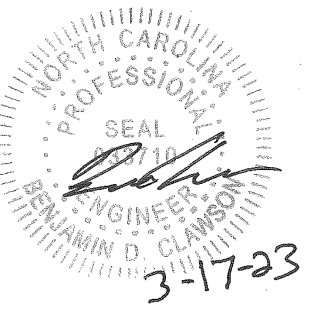
**DIVISION OF HIGHWAYS UTILITIES UNIT**

1555 MAIL SERVICES CENTER  
RALEIGH NC 27699-1555  
PHONE (919) 707-6690  
FAX (919) 250-4119

BRANDON GREER NCDOT CONTACT  
DANIEL ADAMS PROJECT ENGINEER  
DESIREE HAGWOOD PROJECT DESIGN ENGINEER



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS



# 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	
Water Meter	
Relocate Water Meter	
Remove Water Meter	
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	

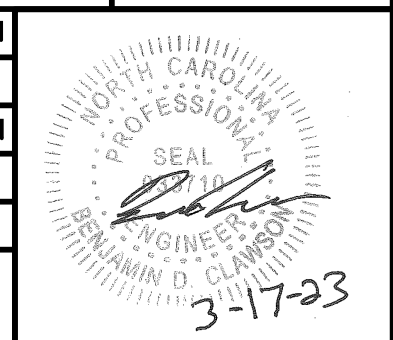
Thrust Block	
Air Release Valve	
Utility Vault	
Concrete Pier	
Steel Pier	
Plan Note	
Pay Item Note	

NOTE  
PAY ITEM

## 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)

PROJECT REFERENCE NO.	SHEET NO.
U-5312	UC-2A
DESIGNED BY: B. DIXON	
DRAWN BY: R. MOSS	
CHECKED BY: B. DIXON	
APPROVED BY:	
REVISED:	
MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.	
P.O. BOX 97 GARNER, NC. 27529 1919172-5393	UTILITY CONSTRUCTION PLANS ONLY

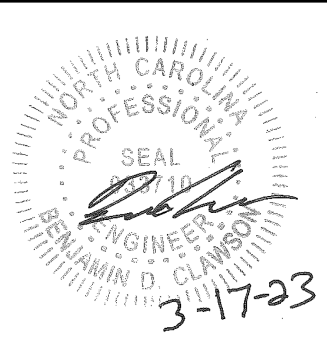
## GENERAL NOTES

1. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY SHOULD ANY FIELD CONDITIONS BE ENCOUNTERED THAT VARY FROM THE INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS.
2. LOCATIONS OF SHOWN UTILITIES ARE APPROXIMATE. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING EXACT LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO ANY EXCAVATION FOR THE PROJECT. NO SEPARATE MEASUREMENT OR DIRECT PAYMENT WILL BE MADE FOR THIS WORK AND ALL COST SHALL BE INCLUDED IN THE PRICE BID FOR THE ITEM TO WHICH IT PERTAINS.
3. BURIED TELEPHONE CABLES (FIBER OPTICS AND CONVENTIONAL) ARE KNOWN TO VARY DUE TO INSTALLATION TECHNIQUES. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR COORDINATING WITH THE UTILITY COMPANY TO DETERMINE SPECIFIC CABLE LOCATIONS. THE ENGINEER MUST BE NOTIFIED OF THE EXACT LOCATIONS AND ELEVATIONS OF THE CABLES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE LOCAL ELECTRIC UTILITY COMPANY ANY ADDITIONAL SUPPORT OF EXISTING ELECTRIC UTILITY POLES AS REQUIRED FOR THE EXCAVATION.
5. REGULATIONS AND CODES, SHALL BE CONSISTENT WITH NCDOT, NCDENR REQUIREMENTS AND STATE BUILDING CODE.
6. RELATION OF WATER MAINS TO SEWERS
  - (a) LATERAL SEPARATION OF SEWERS AND WATER MAINS. WATER MAINS SHALL BE LAID AT LEAST 10 FEET Laterally FROM EXISTING OR PROPOSED SEWERS, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT A 10-FOOT LATERAL SEPARATION-- IN WHICH CASE:
    - (1) THAT WATER MAIN IS LAID IN A SEPARATE TRENCH, WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER; OR DENR-PUBLIC WATER SUPPLY SECTION 15A: 18C.0900
    - (2) THE WATER MAIN IS LAID IN THE SAME TRENCH AS THE SEWER WITH THE WATER MAIN LOCATED AT ONE SIDE ON A BENCH OF UNDISTURBED EARTH, AND WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER.
    - (b) CROSSING A WATER MAIN OVER A SEWER. WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS OVER A SEWER, THE WATER MAIN SHALL BE LAID AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT AN 18 INCH VERTICAL SEPERATION--IN WHICH CASE BOTH THE WATER MAIN AND SEWER SHALL BE CONSTRUCTED OF FERROUS MATERIALS AND WITH JOINTS THAT ARE EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING.
    - (c) CROSSING A WATER MAIN UNDER A SEWER. WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS UNDER A SEWER, BOTH THE WATER MAIN AND THE SEWER SHALL BE CONSTRUCTED OF FERROUS MATERIALS AND WITH JOINTS THAT ARE EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING. A SECTION OF WATER MAIN PIPE SHALL BE CENTERED AT THE POINT OF CROSSING.
7. RELATION OF SANITARY SEWERS TO STORM SEWERS
  - (a) A 24 INCH VERTICAL SEPARATION SHALL BE PROVIDED BETWEEN STORM SEWER AND SANITARY SEWER OR FERROUS PIPE SHALL BE PROVIDED.
8. THE LOCATION OF ALL STRUCTURES SHOWN HEREIN WAS BY AN ACTUAL FIELD SURVEY AND REPRESENTS THE BEST INFORMATION AVAILABLE TO THE ENGINEER AT THE TIME OF THE SURVEY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION, SIZE, AND TYPE OF ALL UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION WHETHER SHOWN ON THE PLANS OR NOT. IT IS ADVISABLE THE CONTRACTOR VISIT THE SITE PRIOR TO BIDDING AND BECOME FAMILIAR WITH THE SITE AND ANY POTENTIAL CONFLICTS.
9. THE CONTRACTOR IS RESPONSIBLE FOR ALL SITE LAYOUTS AND STAKING AND THE COSTS SHALL BE INCLUDED IN HIS BID.
10. THE CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES THE CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO THE NORMAL WORKING HOURS. THE CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT. EXEMPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER.
11. ALL EXISTING UTILITIES AND IMPROVEMENTS THAT BECOME DAMAGED DURING CONSTRUCTION SHALL BE COMPLETELY RESTORED TO THE SATISFACTION OF THE OWNER AND ENGINEER AT THE CONTRACTOR'S SOLE EXPENSE.
12. THE CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE AND DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES, INCLUDING, BUT NOT LIMITED TO BRACING AND SHORING. OBSERVATION VISITS TO THE SITE BY THE ENGINEER AND/OR THE ENGINEER'S REPRESENTATIVE(S) SHALL NOT INCLUDE INSPECTION OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
13. ALL WORK WITHIN NCDOT RIGHT-OF-WAY SHALL MEET REQUIREMENTS OF THE LATEST EDITION OF NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES AND THE PROJECT SPECIFICATIONS. SHOULD A CONFLICT ARISE BETWEEN THE TWO, THE MOST STRINGENT SHALL APPLY.
14. FIELD SURVEY DATA PROVIDED BY NCDOT. VERTICAL DATUM BASED ON NAD88. HORIZONTAL COORDINATES BASED ON NAD83/95.
15. DURING THE PROGRESS OF THE WORK, THE CONTRACTOR SHALL KEEP THE WORK AREA AND ADJACENT AREAS FREE FROM ACCUMULATIONS OF WASTE MATERIAL, RUBBISH AND OTHER DEBRIS TO THE SATISFACTION OF THE ENGINEER.
16. THE CONTRACTOR SHALL REMOVE AND PROPERLY REINSTALL ANY FIXTURES, FENCES, AND/OR OTHER STRUCTURES THAT MAY INTERFERE WITH CONSTRUCTION OF THE PROJECT TO THE SATISFACTION OF THE ENGINEER, AND THE COSTS FOR SUCH SHALL BE INCLUDED IN HIS BID.
17. THE CONTRACTOR IS URGED TO VISIT AND FAMILIARIZE THEMSELVES WITH THE JOB SITE AND TO COMPLETELY READ AND UNDERSTAND THE CONTRACT DOCUMENTS PRIOR TO SUBMITTING A BID.
18. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION, SIZE AND TYPE OF ALL UNDERGROUND UTILITIES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RELOCATION (AS DIRECTED BY THE ENGINEER) OF ANY CONFLICTING UNDERGROUND UTILITIES, IF REQUIRED, AT NO ADDITIONAL COST TO THE OWNER. IT IS ADVISABLE THAT THE CONTRACTOR VISIT THE SITE PRIOR TO BIDDING AND BECOME FAMILIAR WITH THE SITE AND ANY POTENTIAL CONFLICTS.
19. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND PROVIDING LAY DOWN AREA FOR MATERIAL STORAGE.
20. CONTRACTOR IS RESPONSIBLE FOR REMOVING DEMOLISHED MATERIALS AND DISPOSING THEM AT A LOCATION PROPERLY PERMITTED TO RECEIVE SUCH MATERIAL.
21. THE CONTRACTOR SHALL NOTIFY THE OWNER AT LEAST 48 HOURS PRIOR TO MAKING ANY TIE-IN TO THE EXISTING WATER LINE.
22. MINIMUM DEPTH OF COVER FOR BURIED PIPELINE SHALL BE THREE (3) FEET UNLESS OTHERWISE NOTED.
23. MAINTAIN 2'-0" MINIMUM CLEARANCE BETWEEN ALL EXISTING PIPES CROSSED, UNLESS OTHERWISE NOTED.
24. THE CONTRACTOR SHALL FURNISH AND INSTALL SHEETING NECESSARY FOR THE INSTALLATION OF THE PIPELINE.
25. INSTALLATION, TESTING AND MATERIAL SPECIFICATIONS SHALL BE IN ACCORDANCE WITH THE DESIGN DOCUMENTS STANDARDS AND MANUFACTURERS INSTRUCTIONS UNLESS NOTED OTHERWISE. SHOULD THERE BE A CONFLICT AMONG THE AFOREMENTIONED DOCUMENTS, THE MOST STRINGENT SHALL APPLY.
26. THRUST BLOCKING SHALL BE PROVIDED AT ALL BENDS, VALVES, AND FITTINGS AND WHERE A CHANGE IN ALIGNMENT OCCURS. THRUST BLOCKING MAY REQUIRE TO BE RODDED IF DIRECTED TO DO SO BY THE ENGINEER.
27. ALL UNDERGROUND FITTINGS SHALL BE MECHANICAL JOINT, DUCTILE IRON COMPACT FITTINGS UNLESS OTHERWISE NOTED. THE COST OF FITTINGS SHALL BE INCIDENTAL TO COST OF PIPE UNLESS OTHERWISE NOTED IN BID FORM.
30. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE LOCAL POWER COMPANY ANY ADDITIONAL SUPPORT OF EXISTING POWER POLES AS REQUIRED FOR THE PIPELINE TRENCH EXCAVATION. ALL COST OF SUCH WORK SHALL BE INCLUDED IN THE CONTRACTOR'S BID.
31. PROVIDE TEMPORARY LINER (STRAW AND NETTING) FOR ALL DISTURBED DITCH LINES. THE CONTRACTOR SHALL REMOVE AND REINSTALL ALL FENCE, SIGNAGE, MAILBOXES, ETC. AS REQUIRED FOR PIPE INSTALLATION. THE COST OF ANY ADDITIONAL FENCE MATERIALS REQUIRED SHALL BE INCLUDED IN CONTRACTORS BID.
32. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RECONNECTION OF ANY WATER SERVICE DISTURBED AS A RESULT OF THE CONSTRUCTION.
33. INTERRUPTION OF WATER SERVICE SHALL BE LIMITED TO 4 HOURS. INDIVIDUAL SERVICE CONNECTION INTERRUPTIONS SHALL BE SCHEDULED BETWEEN REGULAR WORKING HOURS UNLESS OTHERWISE PERMITTED BY THE UTILITY OWNER. WATER SERVICES SHALL BE RESTORED WITHIN THE SAME DAY.
34. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING LOCATION, SIZE, TYPE AND ELEVATION OF ALL UNDERGROUND UTILITIES, AS WELL AS RECONNECTING ANY WATER AND/OR SANITARY SEWER SERVICES DISTURBED DURING CONSTRUCTION, EVEN IF THEY ARE NOT SHOWN ON THE PLANS. THE WATER LINE SHALL BE INSTALLED AS TO PROVIDE A MINIMUM OF 3 FEET COVERAGE ABOVE THE TOP OF THE PIPE FROM FINISHED GRADE, UNLESS SHOWN DIFFERENTLY ON PLANS. THE CONTRACTOR SHALL VERIFY THAT ALL NEW WATER AND SANITARY SEWER LINES HAVE TEN (10') FEET HORIZONTAL CLEARANCE BETWEEN EACH OTHER.
35. THE CONTRACTOR IS HEREIN FOREWARNED AS TO THE POSSIBILITY OF HAVING TO VARY THE DEPTH OF THE PIPELINE INSTALLATION TO ACHIEVE MINIMUM CLEARANCE OF EXISTING OR PROPOSED UTILITIES OR STORM DRAINAGE WHILE MAINTAINING A MINIMUM COVER SPECIFIED (WHETHER EXISTING OR PROPOSED PIPELINES, CONDUITS, CABLES, MAINS, STORM DRAINAGE ARE SHOWN ON THE PLANS OR NOT).
36. CONNECTING TO EXISTING WATER MAINS MAY ALTER SUCH LINES TO THE EXTENT THAT THESE PIPELINES WITH EXISTING PIPE BENDS, VALVES AND OTHER RELATED APPURTENANCES MAY ALSO REQUIRE REACTION BLOCKING; THIS IS ALSO THE RESPONSIBILITY OF THE CONTRACTOR.
37. THE CONTRACTOR SHALL SUBMIT HIS PROPOSED METHOD OF ANCHORING TO THE ENGINEER FOR REVIEW AND APPROVAL OF RESTRAINING ALL PIPE, PIPE BENDS, VALVES AND OTHER RELATED APPURTENANCES. ANCHORING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONNECTING TO EXISTING WATER MAINS MAY ALTER SUCH LINES TO THE EXTENT THAT THESE PIPELINES WITH EXISTING PIPE BENDS, VALVES AND OTHER RELATED APPURTENANCES MAY ALSO REQUIRE REACTION BLOCKING; THIS ALSO THE RESPONSIBILITY OF THE CONTRACTOR.
38. THE CONTRACTOR SHALL WARRANT ALL WORK FOR A PERIOD OF ONE (1) YEAR FROM THE FINAL DATE OF ACCEPTANCE BY THE OWNER AND SHALL BE RESPONSIBLE FOR THE REPAIR AND/OR REPLACEMENT OF ALL FAILURES DETERMINED BY THE OWNER TO BE CAUSED BY WORKMANSHIP AND/OR SUBSTANDARD MATERIALS.
39. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE OWNER, THE INSTALLATION OF ALL WATER MAINS, APPURTENANCES, SHUT-DOWNS, TIE-INS, TESTING AND WORK REQUIRED.
40. THE CONTRACTOR AT ALL TIMES SHALL MAINTAIN PROPER BARRICADING, DUST CONTROL, TRAFFIC CONTROL, SHORING AND SAFETY MEASURES OF EVERY NATURE.
41. ALL REQUIRED TESTING (CHLORINATION, BACTERIOLOGICAL, HYDROSTATIC AND LEAKAGE) SHALL BE COMPLETED PRIOR TO PLACING ANY WATER MAIN OR APPURTENANCE INTO SERVICE AND SHALL BE PERFORMED UNDER THE SUPERVISION OF THE OWNER OR HIS REPRESENTATIVE.
42. WATER MAINS, SERVICES AND APPURTENANCES SHALL NOT BE BACKFILLED PRIOR TO INSPECTION, FIELD MEASUREMENTS AND TESTING UNTIL APPROVED BY THE OWNER.
43. MAINTAIN SERVICE FROM EXISTING WATER LINES UNTIL DIRECTED BY ENGINEER TO TRANSFER SERVICES TO NEW WATER LINE. THE CONTRACTOR SHALL NOT MAKE ANY CONNECTION OF NEW WATER LINE(S) TO EXISTING WATER LINE(S) OR TRANSFER SERVICES (IF REQUIRED) UNTIL SATISFACTORY HYDROSTATIC PRESSURE TEST AND BACTERIOLOGICAL TEST RESULTS HAVE BEEN OBTAINED AND CONFIRMED ACCEPTABLE.
44. FIRE HYDRANTS AND VALVES REMOVED DURING THE COURSE OF THIS WORK SHALL REMAIN THE PROPERTY OF ORANGE-ALAMANCE WATER SYSTEM, AND DISPOSAL OF SUCH SHALL BE COORDINATED WITH THE TOWN.
45. LINE ABANDONMENT SHALL CONSIST OF EMPTYING AND PLUGGING EXISTING LINES THAT ARE REPLACED AND SHALL BE INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL PAYMENT WILL BE ALLOWED

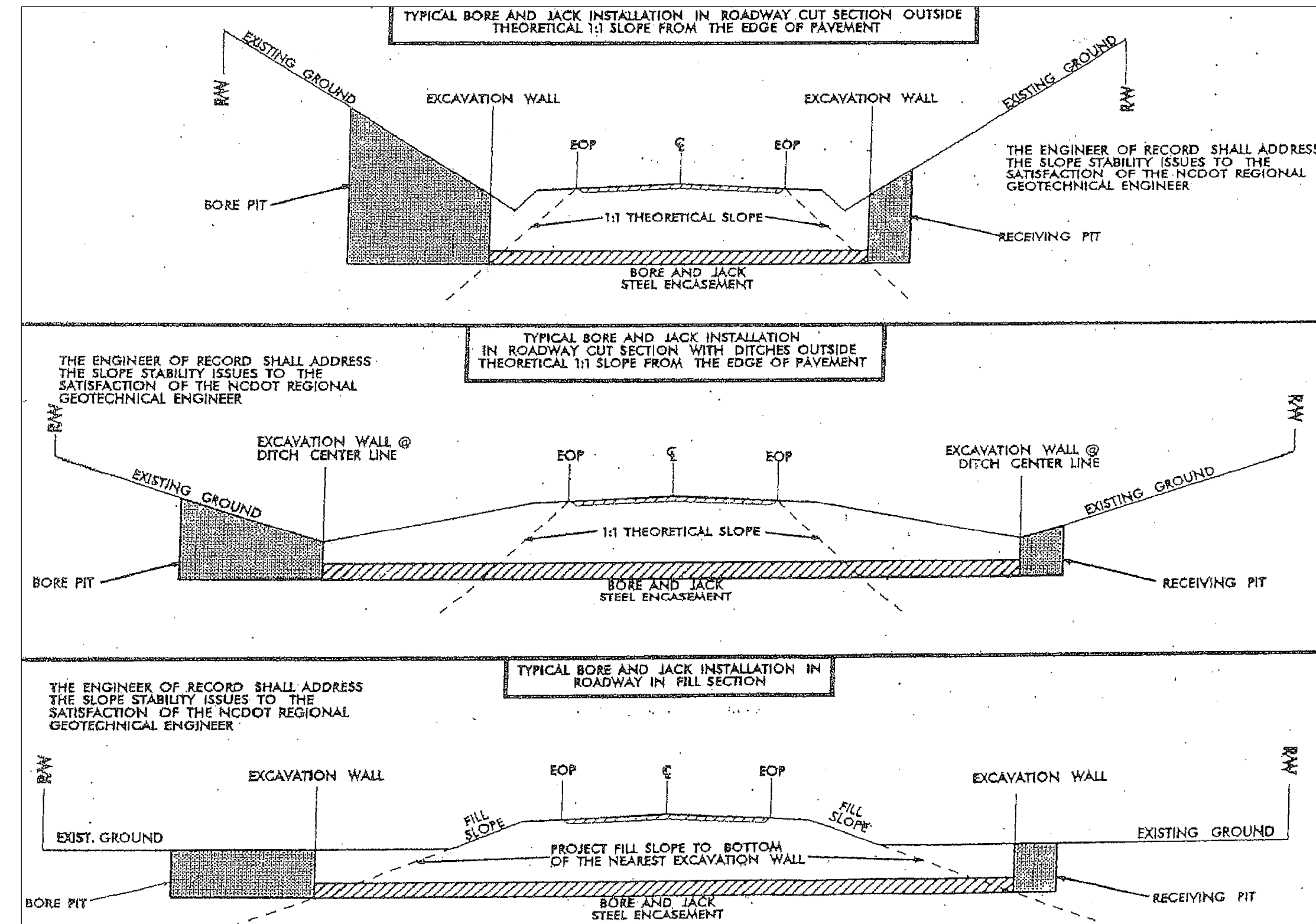
# PROJECT TYPICAL DETAILS

NOTE:

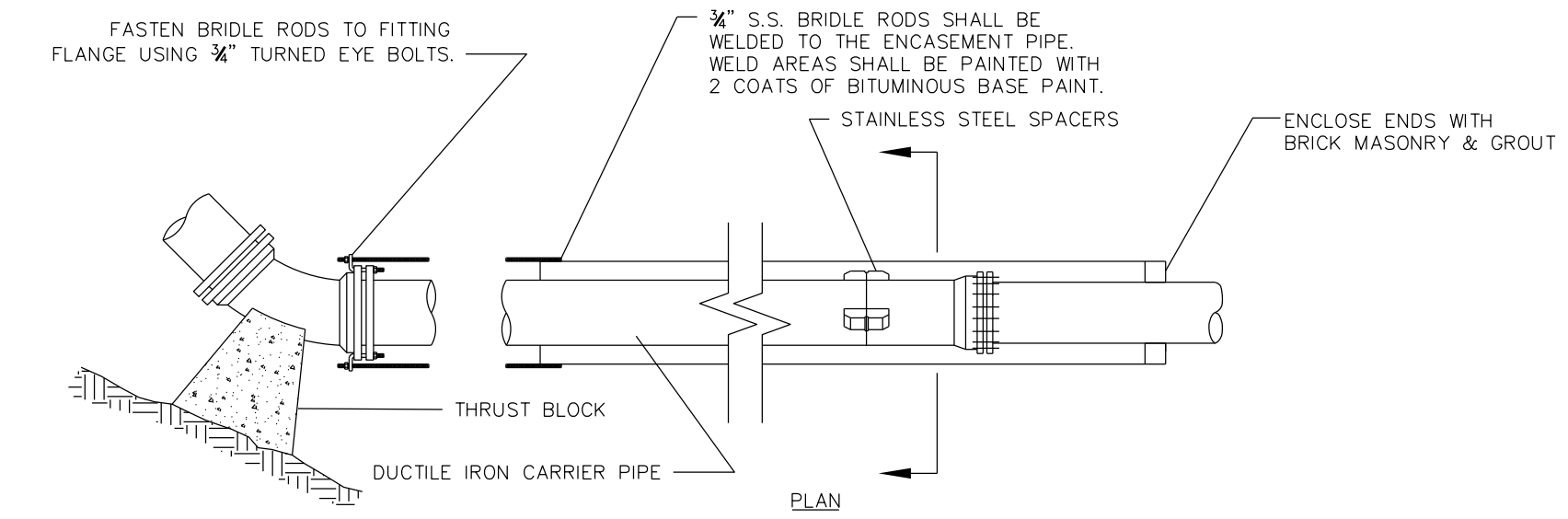
1. AN AS-BUILT PLAN AND PROFILE SHALL BE PROVIDED FROM ENTRY TO EXIT FOR EACH DIRECTIONAL BORE SECTION BY THE DIRECTIONAL BORE CONTRACTOR. THIS SHALL INCLUDE ACCURATE HORIZONTAL AND VERTICAL DIMENSIONS AND SHALL MEET OR EXCEED NCDOT VERTICAL REQUIREMENTS FROM HDD PIPE TO EDGE OF PAVEMENT.
2. ALL BORE SECTIONS SHALL BE HYDROSTATICALLY TESTED PER SPECIFICATIONS AFTER INSTALLATION AND PRIOR TO CONNECTION TO THE OPEN CUT WATER/SEWER LINE. A FINAL TEST WILL BE A PART OF THE TOTAL MAIN LINE SYSTEM TEST.
3. LENGTH OF CROSSING, LOCATION OF INSPECTION/OBSERVATION EXCAVATION, NUMBER OF HDD PIPE JOINTS, LOCATION OF DRILL MACHINE, AUGER ENTRANCE LOCATION AND TIE-IN POINTS ARE TO BE APPROVED BY THE ENGINEER PRIOR TO ANY START OF WORK.
4. THE BORE DEVELOPED FOR THE DIRECTIONALLY DRILLED PIPE SHALL BE KEPT AT A MINIMUM DIAMETER FOR THE PIPE INSTALLATION. THE AUGER HEAD SIZE SHALL BE APPROVED BY THE ENGINEER PRIOR TO THE START OF ANY WORK.
5. THE CONTRACTOR SHALL ALLOW SUFFICIENT LENGTHS OF PIPE TO EXTEND PAST THE TERMINATION POINT TO ALLOW FOR CONTRACTION. PULLED HDD PIPE SHALL BE ALLOWED TO RELAX FOR 7 DAYS OR THE AMOUNT OF TIME RECOMMENDED BY THE MANUFACTURER PRIOR TO MAKING ANY CONNECTIONS.
6. FUSIBLE PVC HAS BEEN APPROVED FOR USE WITHIN NCDOT RIGHT-OF-WAYS.
7. MINIMUM OF THREE(3) RESTRAINED JOINTS ARE REQUIRED UPSTREAM AND DOWNSTREAM OF FUSIBLE PVC MJ ADAPTER ON EACH END OF THE HORIZONTAL DIRECTIONALLY DRILLED PIPE UNLESS OTHERWISE APPROVED BY THE ENGINEER.

PROJECT REFERENCE NO.	SHEET NO.
U-5312	UC-3A
DESIGNED BY: B.DIXON	
DRAWN BY: R.MOSS	
CHECKED BY: B.DIXON	
APPROVED BY:	
REVISED:	
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	
P.O. BOX 97 GARNER, NC 27529 (919) 772-5393	
UTILITY CONSTRUCTION PLANS ONLY	

## UTILITY CONSTRUCTION



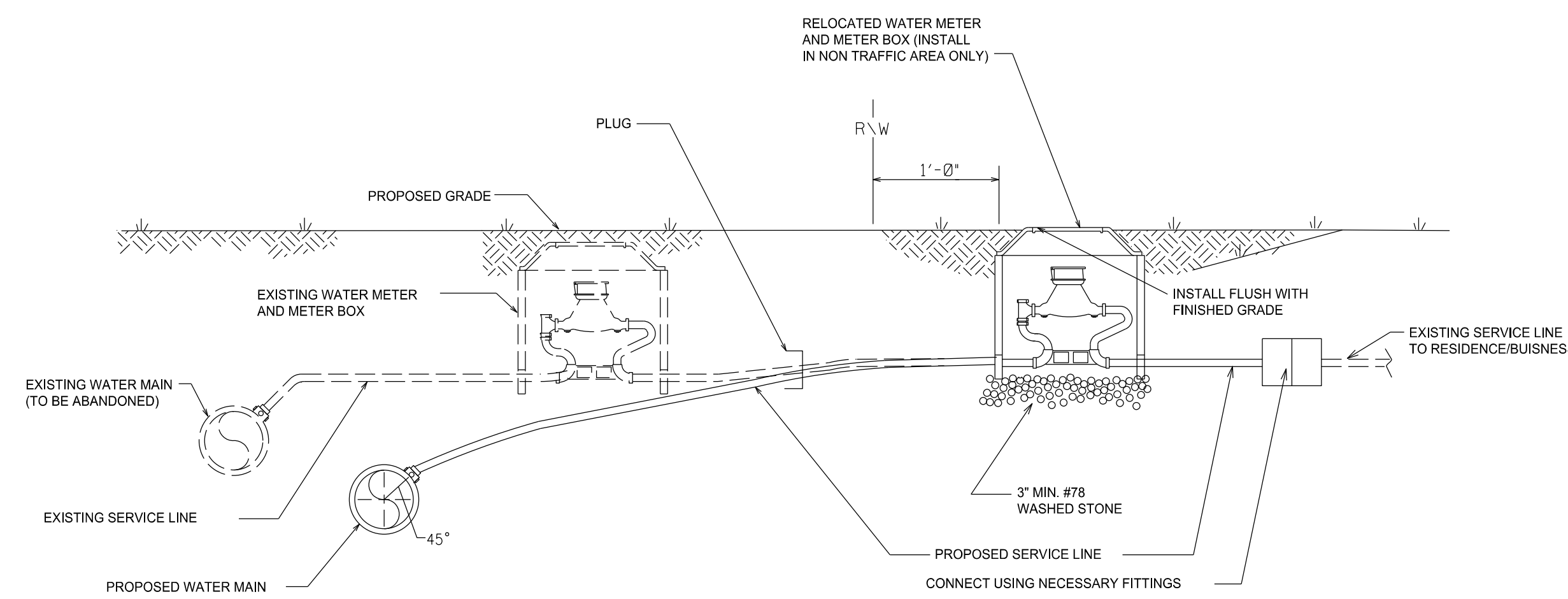
**PROPOSED SECTIONS**



NOTES:

1. STAINLESS STEEL SPACERS SHALL BE USED. NO TIMBER SKIDS ARE ALLOWED.
2. TWO SPACERS PER JOINT SHALL BE USED FOR D.I.P. CARRIER PIPE.
3. ENCASED BORES ALONG GRAVITY COLLECTION SYSTEMS SHALL NOT REQUIRE BRIDLE RODS.
4. 2 EA. 3/4" S.S. BRIDLE RODS SHALL BE REQUIRED ON ALL LINES 8"Ø AND SMALLER. 4 EA. 3/4" S.S. BRIDLE RODS SHALL BE REQUIRED ON ALL LINES 10"Ø AND LARGER.
5. CARRIER PIPE SHALL BE INSTALLED USING 'FIELD LOK' GASKETS OR APPROVED EQUAL.

**STANDARD BORE ENCASUREMENT**



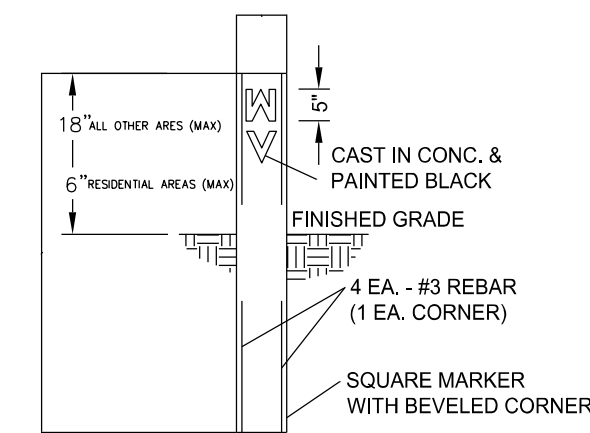
**WATER METER RELOCATION DETAIL**

NOTES:

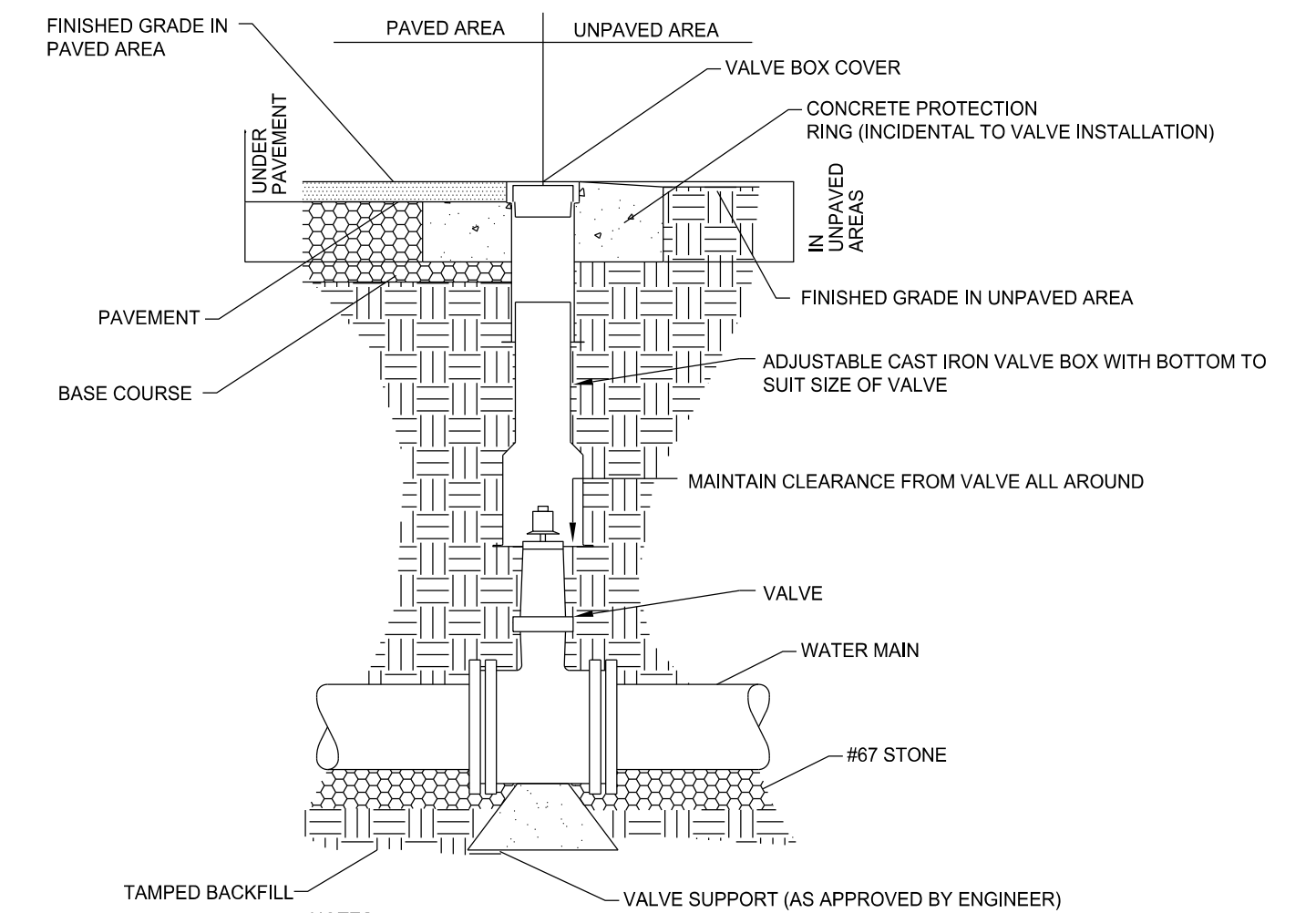
1. RELOCATION SHALL INCLUDE THE REMOVAL AND INSTALLATION AT THE SPECIFIED LOCATION OF THE WATER METER, METER SETTER AND YOKE. METER VALVES, AND METER BOX WITH LID, AND CONNECTION TO PROPOSED WATER MAIN AND EXISTING SERVICE.
2. THE NEW WATER SERVICE LINE SHALL BE OF THE SAME TYPE AND GRADE AS THE EXISTING WATER SERVICE LINE UNLESS OTHERWISE SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER.
3. THE NEW WATER SERVICE LINE SHALL BE INSTALLED WITH A MINIMUM OF 36" COVER BELOW FINISHED GRADE.
4. WHEN SPECIFIED, DRY BORE UNDER PAVEMENT SHALL BE INCIDENTAL TO SERVICE LINE INSTALLATION.

NOTES:

1. VALVE MARKERS SHALL BE PLACED AT R.W. (INCIDENTAL TO VALVE INSTALLATION).
2. LETTERS "WV" SHALL FACE TOWARDS VALVE.
3. MARKER SHALL HAVE BRASS OR BRONZE EMBED ON TOP OR SIDE.
4. CONTRACTOR SHALL STAMP DISTANCE TO CENTER OF VALVE INTO EMBED.
5. BLOW-OFF ASSEMBLY SHALL INCLUDE 1 EA. MARKER W/ "BO" OR "MV" CAST.



**VALVE MARKER DETAIL**

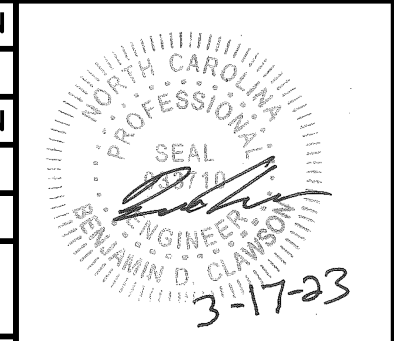


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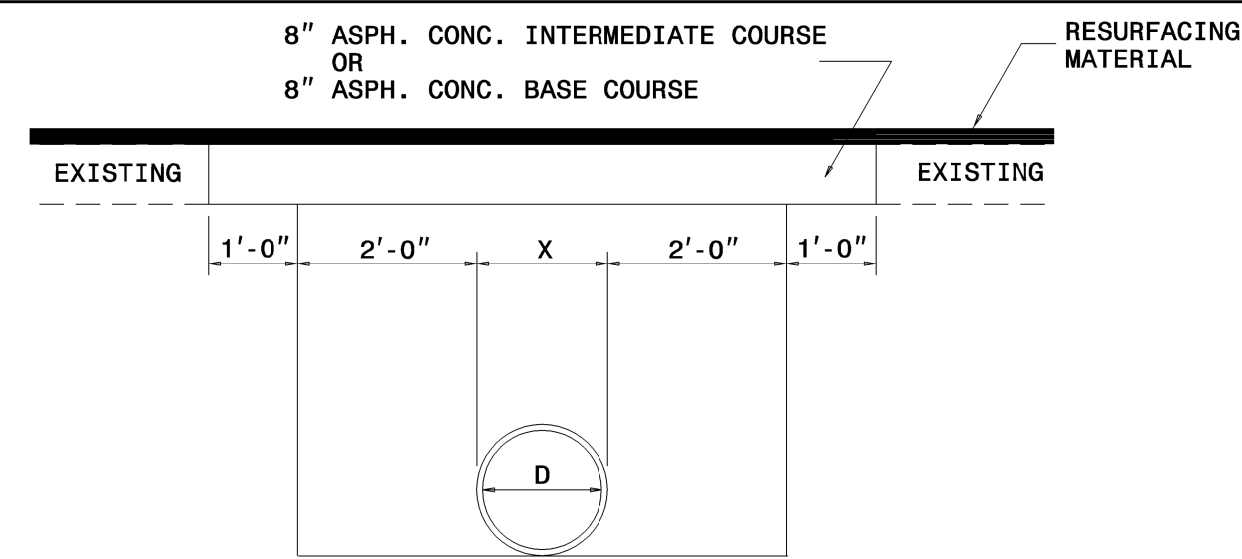
1. DIP MAY BE USED FOR VALVE BOX EXTENSION
2. VALVE BOX SHALL NOT CONTACT WATERMAIN OR VALVE
3. CONCRETE PROTECTION RING SHALL BE USED IN ALL UNPAVED AREAS
4. VALVE BOX AND COVER INCIDENTAL TO VALVE INSTALLATION

**TYPICAL VALVE DETAIL**

# PROJECT TYPICAL DETAILS

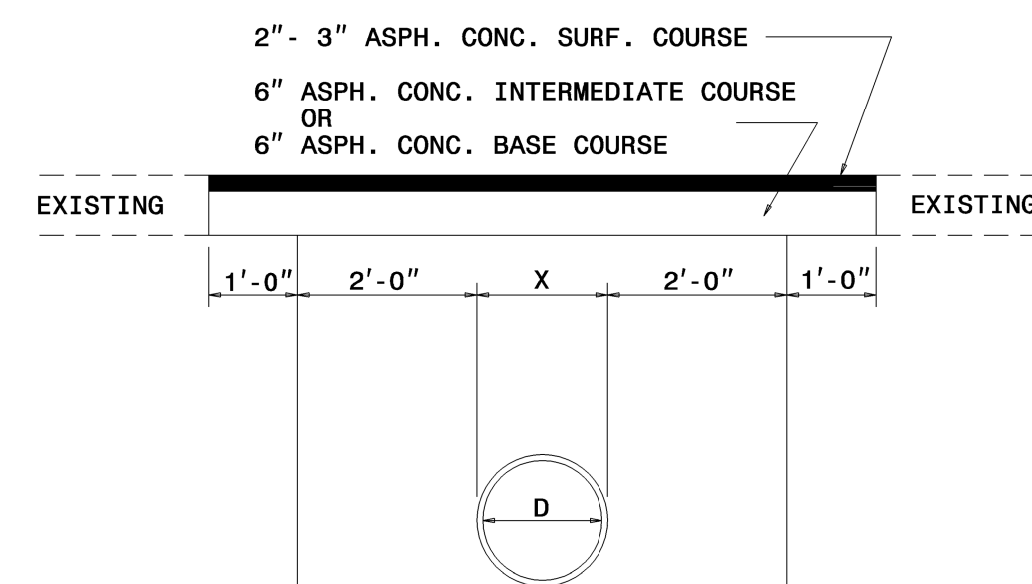
PROJECT REFERENCE NO.	SHEET NO.
U-5312	UC-3B
DESIGNED BY: B.DIXON	
DRAWN BY: R.MOSS	
CHECKED BY: B.DIXON	
APPROVED BY:	
REVISER:	
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	
P.O. BOX 97 GARNER, NC 27529 (919) 772-5393	UTILITY CONSTRUCTION PLANS ONLY

## UTILITY CONSTRUCTION

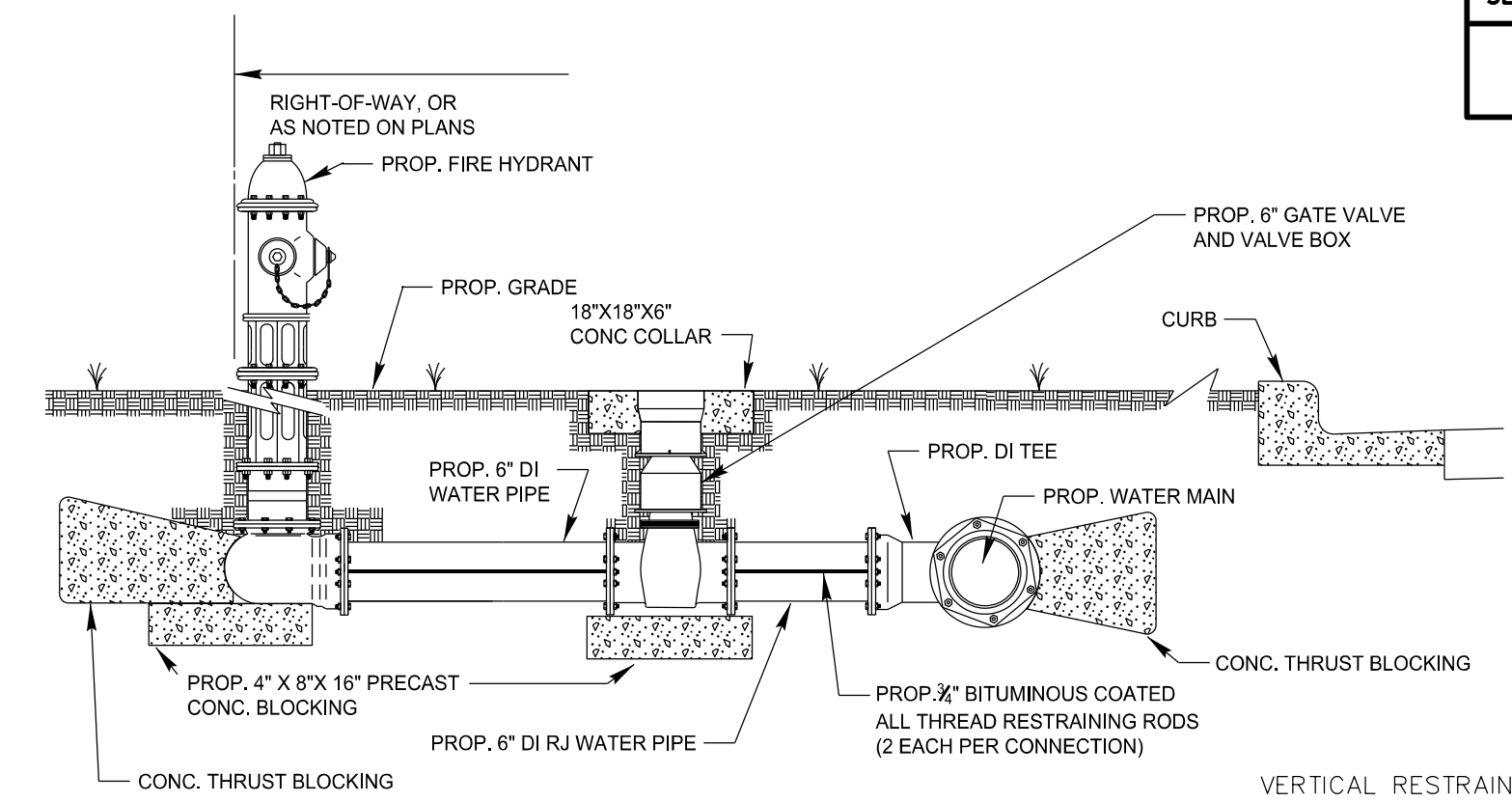


**PAVEMENT REPAIRS ON ROADS TO BE RESURFACED  
(PIPE IS PLACED UNDER EXISTING PAVEMENT)**

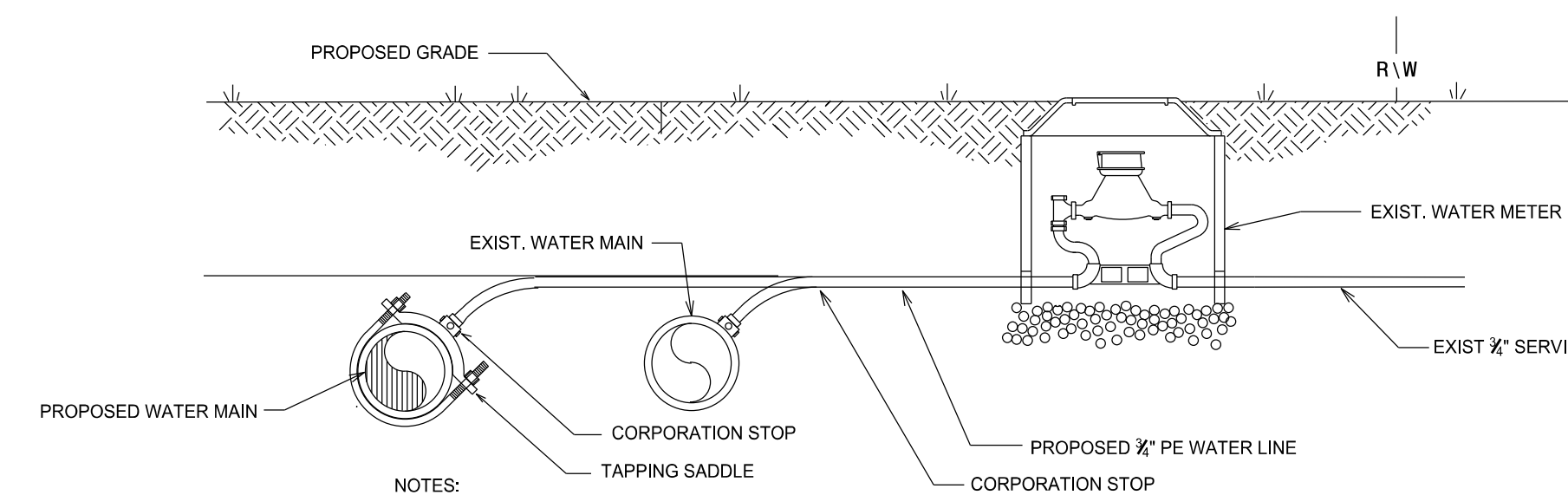
D	X	W
12"	1'-4"	7'-4"
15"	1'-7"	7'-7"
18"	1'-10"	7'-10"
24"	2'-6"	8'-6"
30"	3'-1"	9'-1"
36"	3'-8"	9'-8"
42"	4'-5"	10'-5"
48"	5'-0"	11'-0"



**PAVEMENT REPAIRS ON ROADS NOT TO BE RESURFACED  
(PIPE IS TO BE PLACED UNDER EXISTING PAVEMENT)**



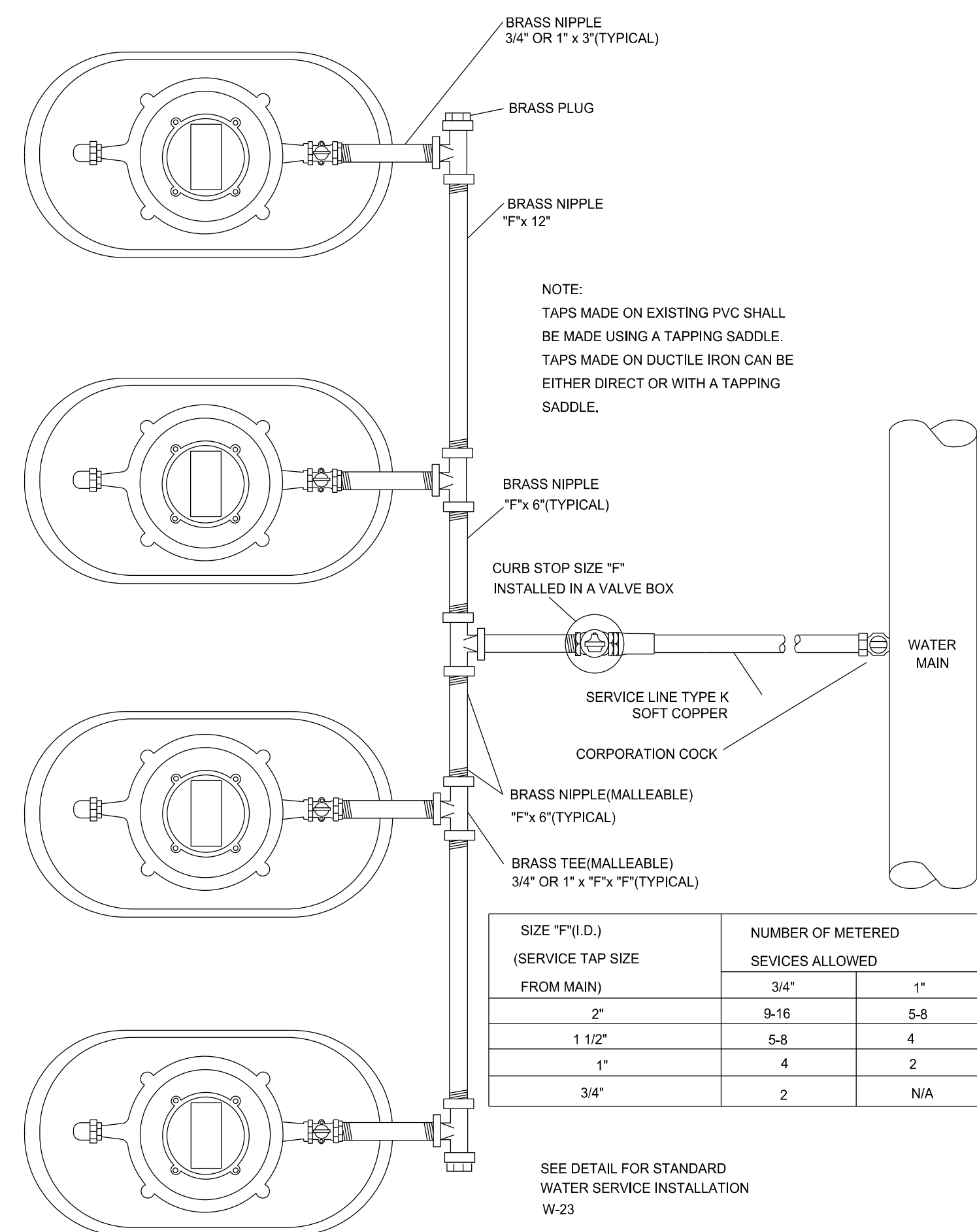
**FIRE HYDRANT INSTALLATION DETAIL  
(UNPAVED AREAS)**



NOTES:

1. INSTALLATION SHALL INCLUDE THE APPROPRIATE LOCATION OF THE WATER METER, METER SETTER AND YOKE, METER VALVES, AND METER BOX WITH LID.
2. THE NEW WATER SERVICE LINE SHALL BE INSTALLED WITH A MINIMUM OF 36\"/>

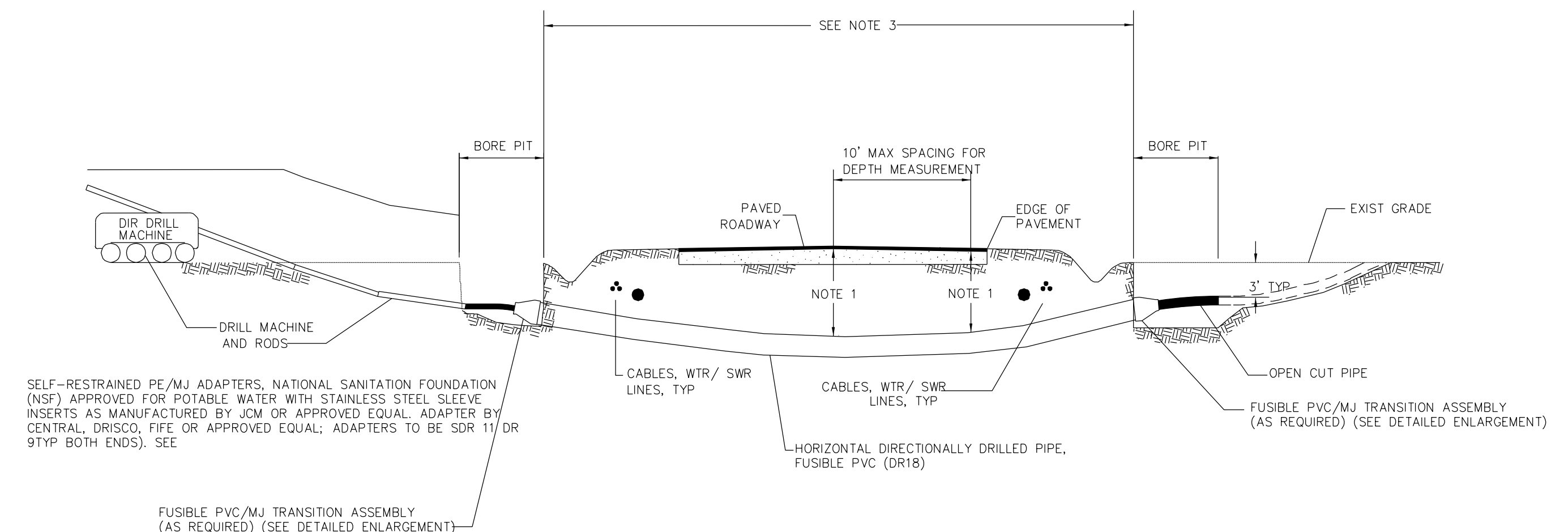
**RECONNECT EXISTING WATER METER DETAIL**



SIZE "F"(I.D.) (SERVICE TAP SIZE FROM MAIN)	NUMBER OF METERED SERVICES ALLOWED	
	3/4"	1"
2"	8-16	5-8
1 1/2"	5-8	4
1"	4	2
3/4"	2	N/A

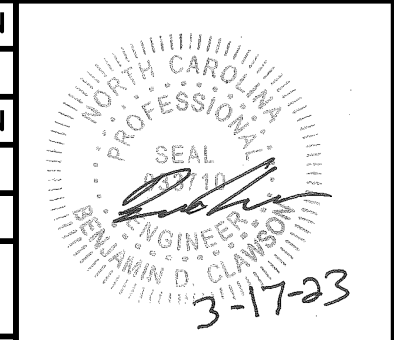
SEE DETAIL FOR STANDARD WATER SERVICE INSTALLATION W-23

**GANG METER DETAIL**

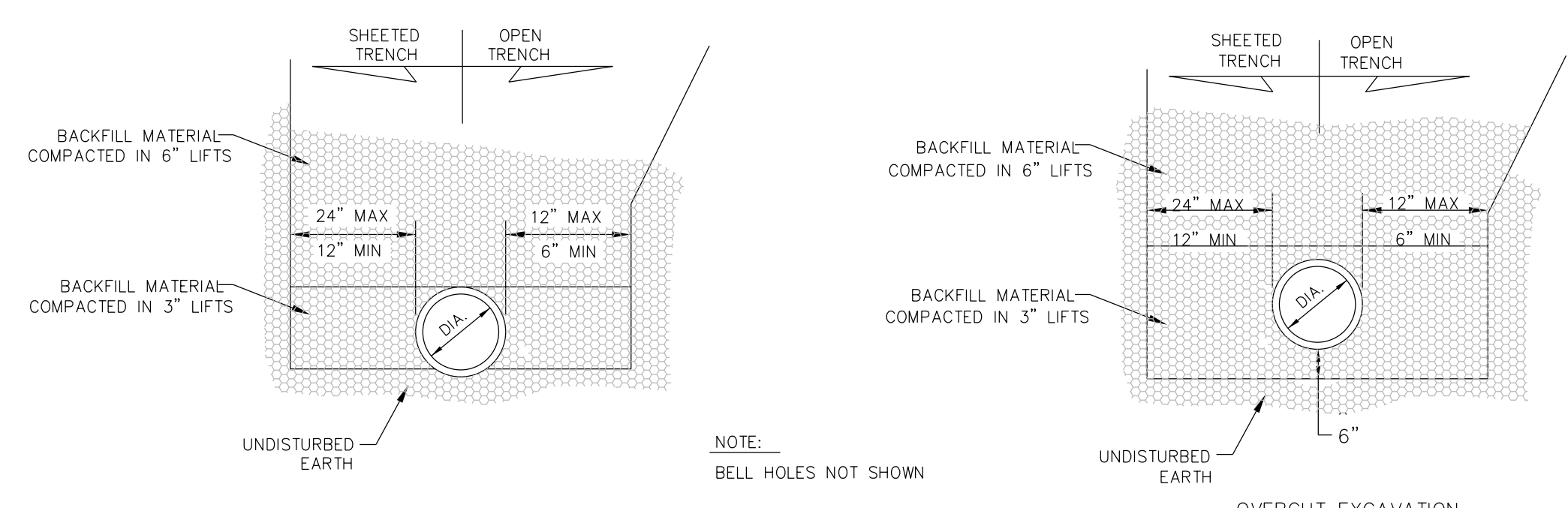


**FUSIBLE PVC/MJ TRANSITION ASSEMBLY**

# PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
U-5312	UC-3C
DESIGNED BY: B.DIXON	
DRAWN BY: R.MOSS	
CHECKED BY: B.DIXON	
APPROVED BY:	
REVISED:	
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	
P.O. BOX 97 GARNER, NC 27529 (919) 772-5393	
UTILITY CONSTRUCTION PLANS ONLY	

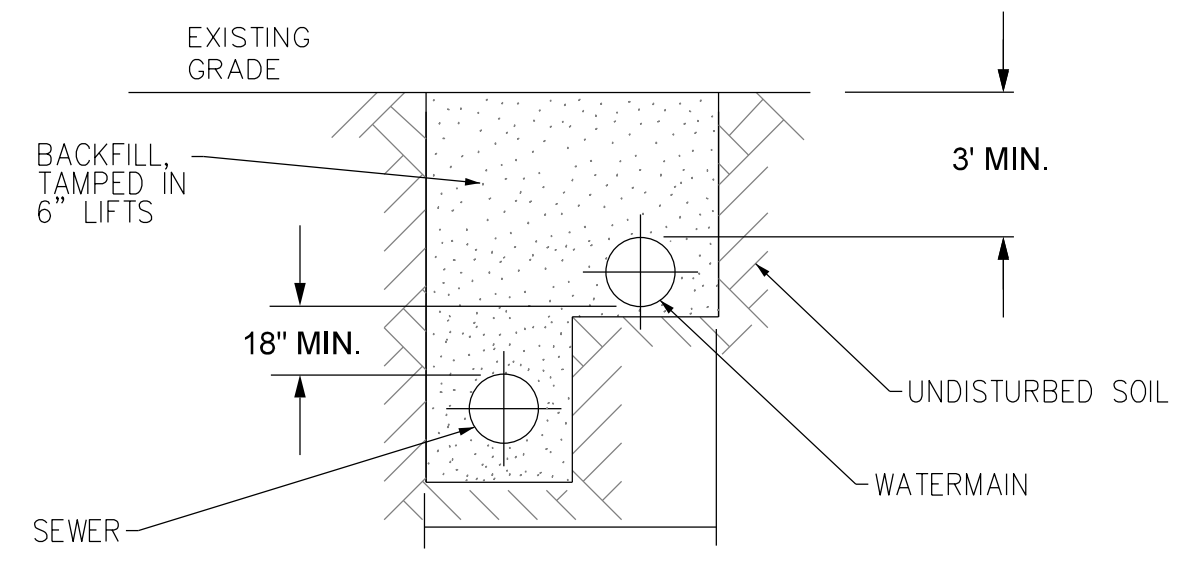
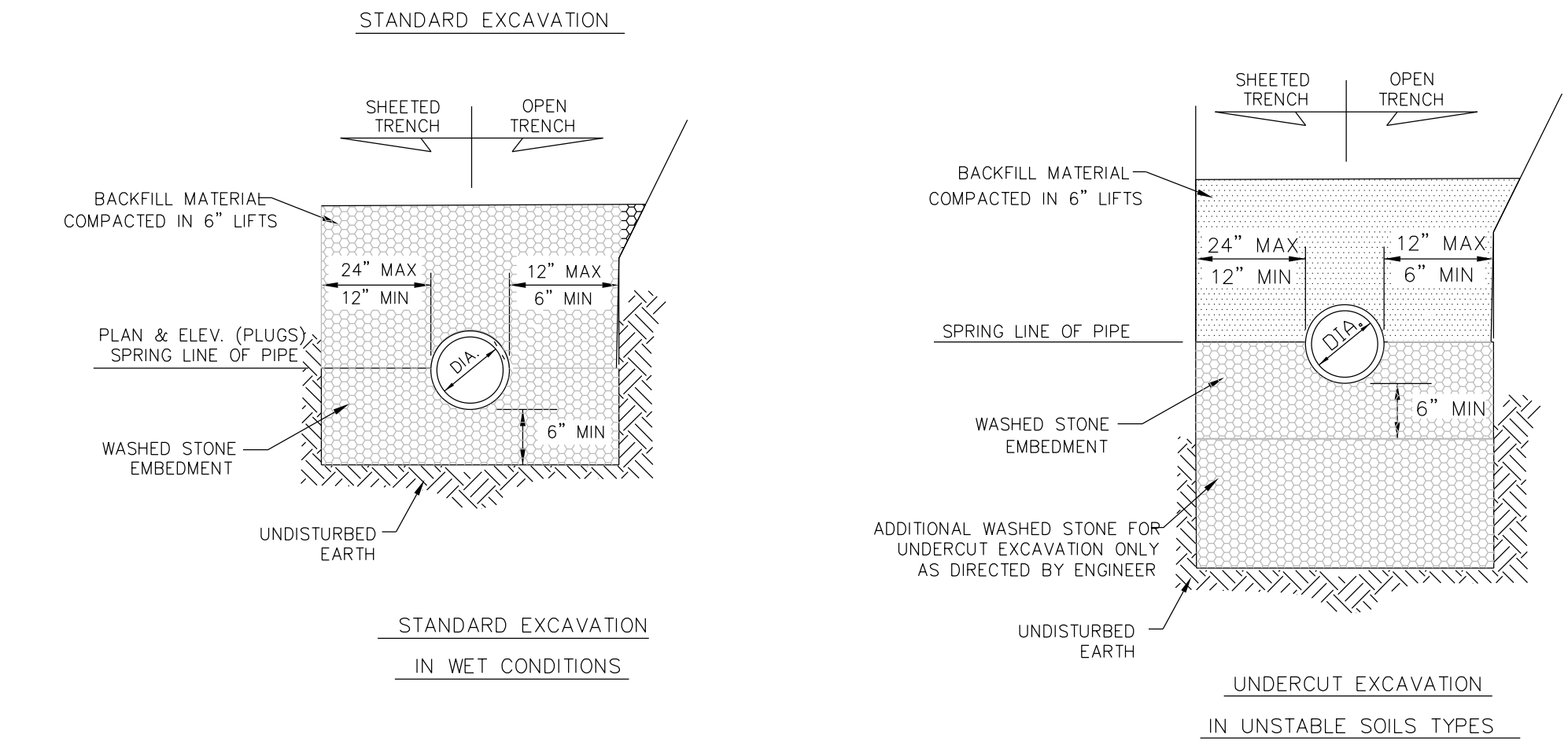
## UTILITY CONSTRUCTION



MAXIMUM TRENCH WIDTH AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
6	30	24	48
10	34	36	60
16	40	54	78

NOTES:  
CONSTRUCTION OF TRENCHES SHALL BE IN ACCORDANCE WITH THE LATEST OSHA REGULATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE REGULATIONS.  
NO BOULDERS OR STONES IN EXCESS OF 4" IN SIZE SHALL BE USED AS PART OF THE INITIAL BACKFILL.  
PIPE BEDDING MATERIAL SHALL BE # 57 WASHED STONE.



NOTE: SEE "TYPICAL TRENCH DETAILS" (THIS SHEET) FOR ADDITIONAL NOTES.

### TRENCH WITH BENCHED EXCAVATION FOR WATER AND SEWER

### TYPICAL TRENCH DETAIL

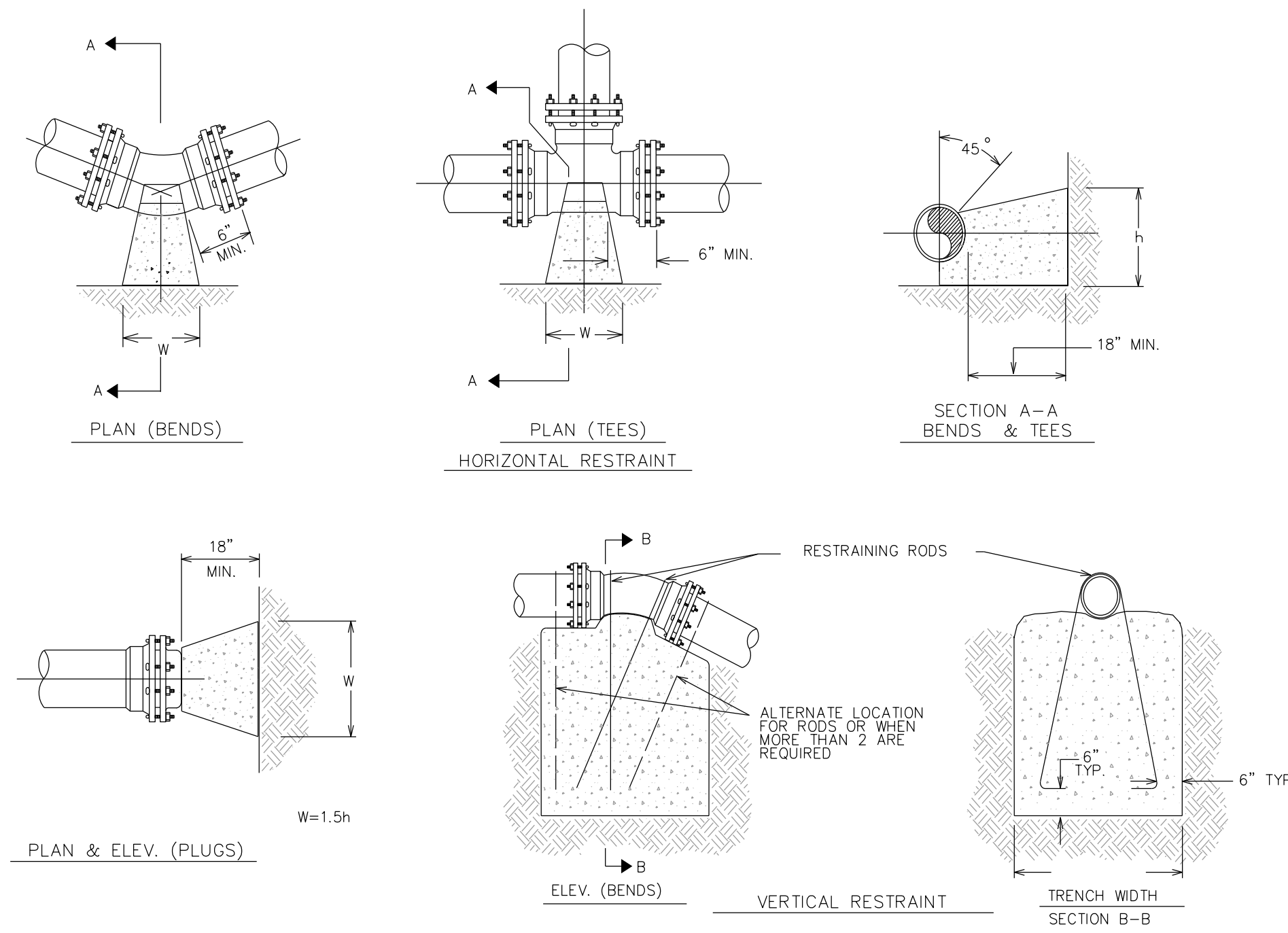
BASED ON TEST PRESSURE OF 200 P.S.I.

PIPE SIZE	DEGREE OF BEND	LBS. STATIC THRUST *	HORIZONTAL RESTRAINT (ALL AREAS GIVEN ARE IN SQUARE FEET)								VERTICAL RESTRAINT (ALL VOLUMES GIVEN ARE IN CUBIC YARDS)**					
			ALLOWABLE SOIL BEARING (PSF)								PIPE SIZE	RESTRAINING RODS NO. REQ'D	DIA.	DEGREE OF BEND		
			1000	2000	3000	4000	5000	6000	7000	8000						
6"	11 1/4°	1,385	2	1	1	1	1	1	1	1	6"	2	1/2"	0.50	1.0	1.75
	22 1/2°	2,758	3	2	2	2	2	2	2	2						
	45°	5,409	5	3	3	3	3	3	3	3						
	90°	9,999	10	5	5	5	5	5	5	5						
	TEE/PLUG	7,068	7	4	3	2	2	2	2	2						
10"	11 1/4°	3,846	4	2	2	2	2	2	2	2	10"	2	3/4"	1.25	2.25	4.50
	22 1/2°	7,661	8	4	3	2	2	2	2	2						
	45°	15,028	15	8	5	4	3	3	3	2						
	90°	27,768	28	14	9	7	5	4	5	4						
	TEE/PLUG	19,635	20	10	7	5	4	3	3	3						
16"	11 1/4°	9,854	10	5	3	3	2	2	2	2	16"	4	3/4"	3.0	6.0	11.50
	22 1/2°	19,612	20	10	7	5	4	3	3	3						
	45°	38,471	38	17	13	10	8	6	5	5						
	90°	71,085	71	36	24	18	14	12	10	9						
	TEE/PLUG	50,265	50	25	17	13	10	8	7	6						

\* INCLUDES 1.25 SAFETY FACTOR

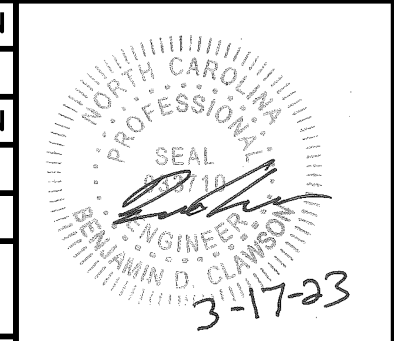
GENERAL NOTES:  
1. CONCRETE SHALL BE CLASS "B".  
2. CONCRETE SHALL NOT CONTACT BOLTS ENDS OF MECHANICAL JOINT FITTINGS.  
3. CONSULT WITH ENGINEER FOR CONCRETE REQUIREMENTS ON MAINS LARGER THAN 16 INCHES. (FOR VERTICAL & HORIZONTAL BENDS)  
4. ALLOWABLE SOIL BEARING SHALL BE DETERMINED BY THE ENGINEER.

### THRUST RESTRAINT FOR WATER MAINS

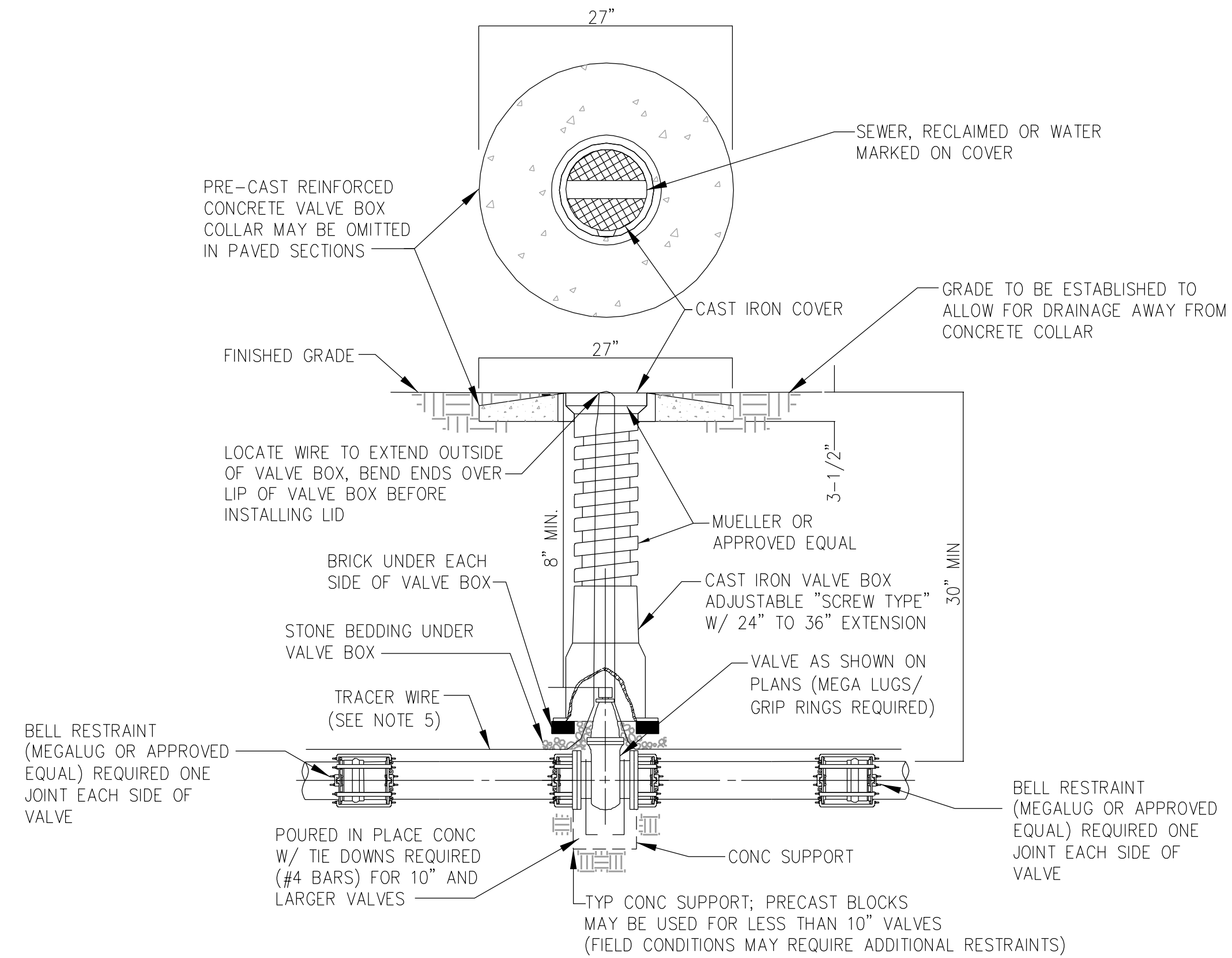


### THRUST BLOCKING FOR PIPE LINES

# PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
U-5312	UC-3D
DESIGNED BY: B.DIXON	
DRAWN BY: R.MOSS	
CHECKED BY: B.DIXON	
APPROVED BY:	
REVISER:	
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	
P.O. BOX 97 GARNER, NC 27529 (919) 772-5393	
UTILITY CONSTRUCTION PLANS ONLY	

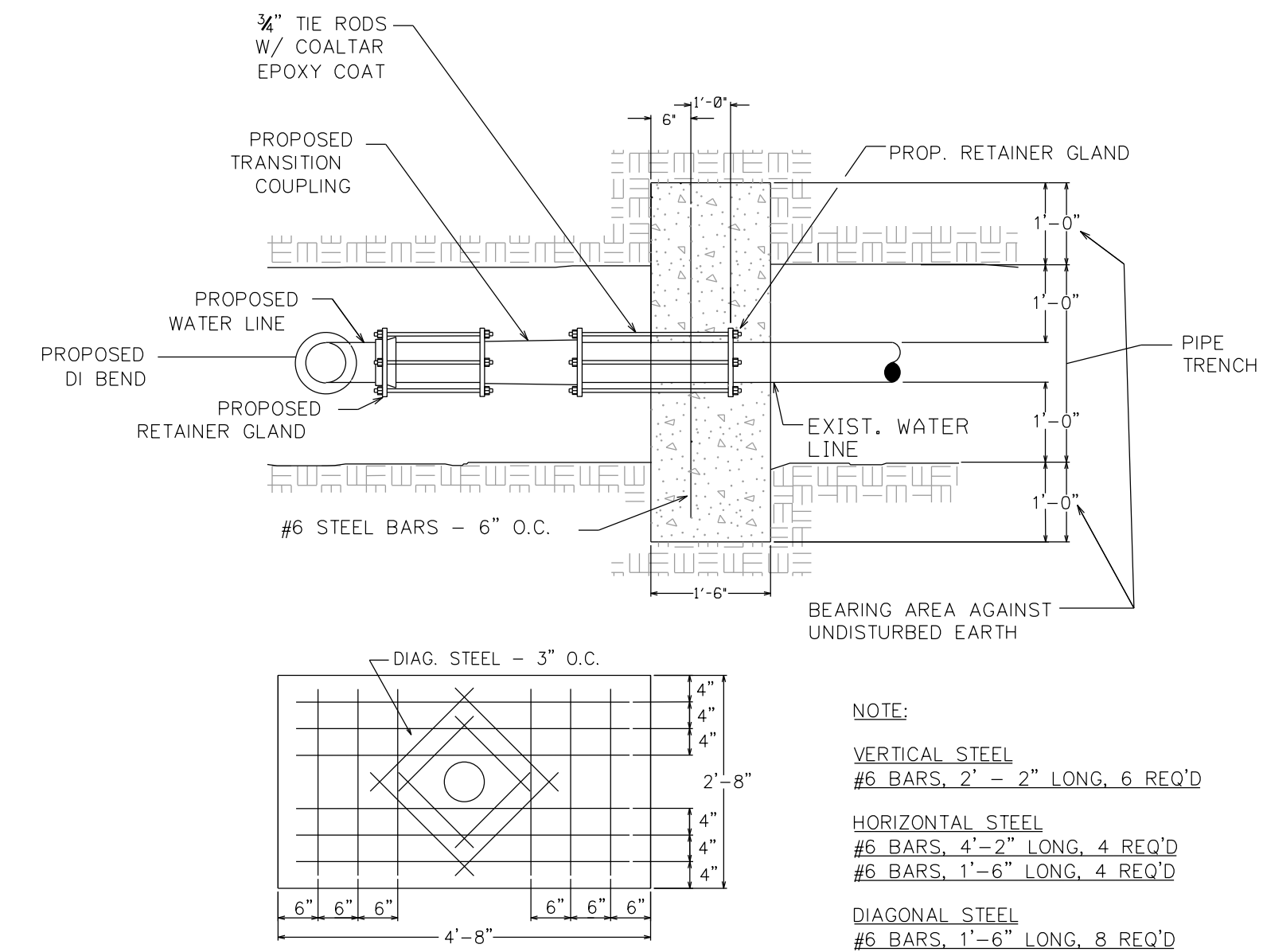
## UTILITY CONSTRUCTION



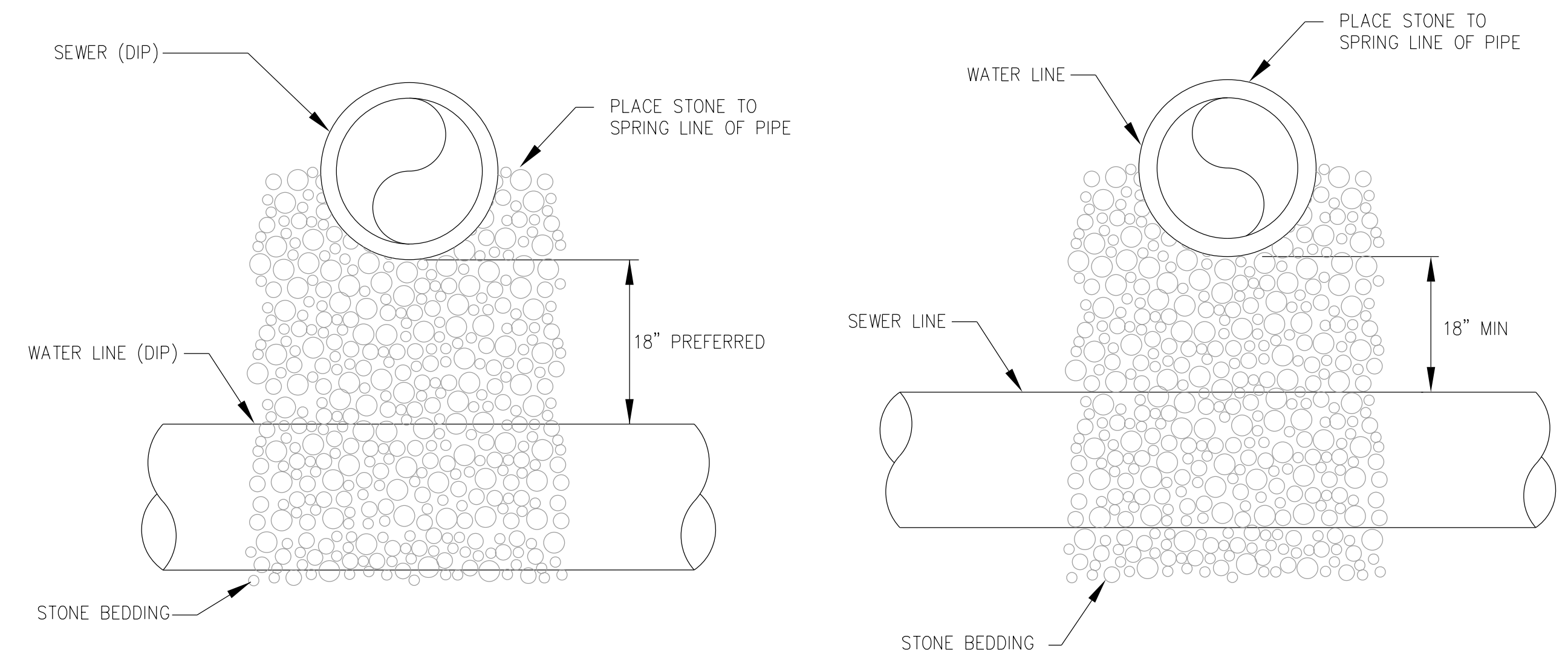
**NOTES:**

- TOP OF VALVE BOX AND COLLAR SHALL BE PAINTED GREEN FOR SEWER FM, PURPLE FOR RECLAIMED WATER, AND BLUE FOR WATER.
- EXTENSION STEM WILL BE REQUIRED TO BE WITHIN 2 FEET OF THE SURFACE IF OPERATING NUT WOULD OTHERWISE BE OVER 5 FEET BELOW GRADE. EXTENSIONS SHALL BE PERMANENTLY ATTACHED TO VALVE NUT AND SHALL BE PROVIDED WITH HORIZONTAL SPACERS FOR VERTICAL ALIGNMENT WITHIN THE VALVE BOX.
- MINIMUM CLEARANCE TO EXTENSION IS 8".
- WIRE COLORS REQUIRED: SEWER-GREEN/WATER-BLUE/RECLAIMED WATER-PURPLE OR GREEN WITH PURPLE STRIPE
- 12 GA. COPPERHEAD SUPER FLEX TRACER WIRE OR APPROVED EQUAL.

**VALVE BOX DETAIL**



**THRUST RESTRAINT WITH RETAINER GLANDS FOR PROP. PIPE TO EXIST. PIPE**



**NOTES:**

- BOTH THE WATER MAIN AND THE SEWER MAIN SHALL BE FERROUS MATERIALS WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS FOR A MINIMUM DISTANCE OF 10 FEET ON EACH SIDE OF THE CROSSING.
- ALTERNATIVELY, PIPES MAY BE SLEEVED WITH FERROUS MATERIALS FOR A MINIMUM DISTANCE OF 10 FEET ON EACH SIDE OF THE CROSSING AS APPROVED BY BRUNSWICK COUNTY ENGINEERING.

**NOTES:**

- SOIL REPLACED UNDER THE WATER MAIN SHALL BE COMPACTED.
- IF THE WATER MAIN CROSSES AT LESS THAN 18" ABOVE THE SEWER MAIN BOTH THE WATER MAIN AND THE SEWER MAIN SHALL BE FERROUS MATERIALS WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS FOR A MINIMUM DISTANCE OF 10 FEET ON EACH SIDE OF THE CROSSING, OR THEY MAY HAVE FERROUS SLEEVES PUT AROUND THEM AS APPROVED BY BRUNSWICK COUNTY ENGINEERING.

SEWER CROSSING ABOVE WATER LINE

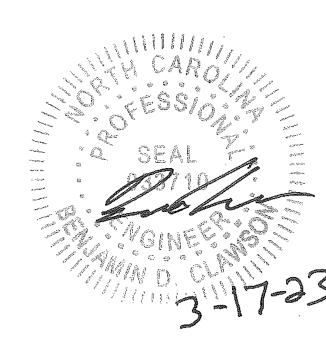
SEWER CROSSING BELOW WATER LINE

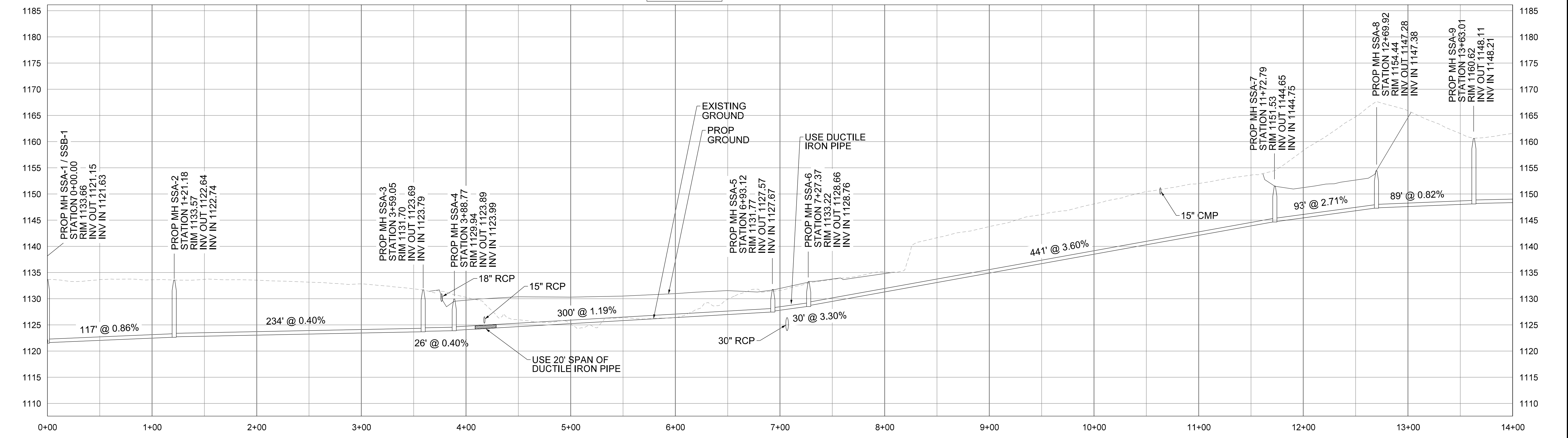
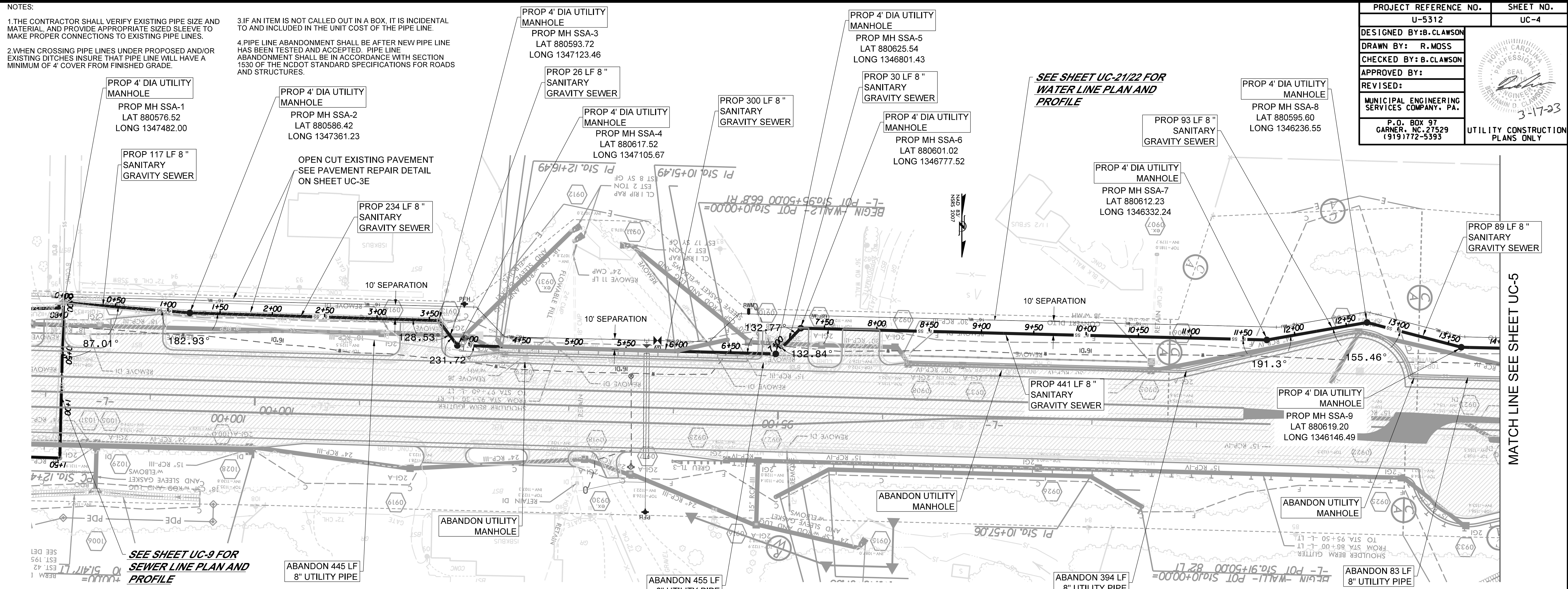
**SEWER OFFSETS ABOVE AND BELOW WATER MAINS**

**NOTES:**

1. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.  
 2. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.

3. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.  
 4. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-4
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISID:		MUNICIPAL ENGINEERING SERVICES COMPANY, PA. P.O. BOX 97 GARNER, NC. 27529 19191772-5393	
			UTILITY CONSTRUCTION PLANS ONLY



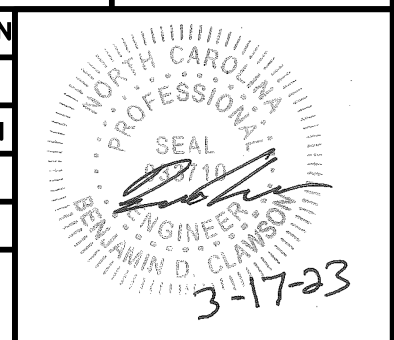


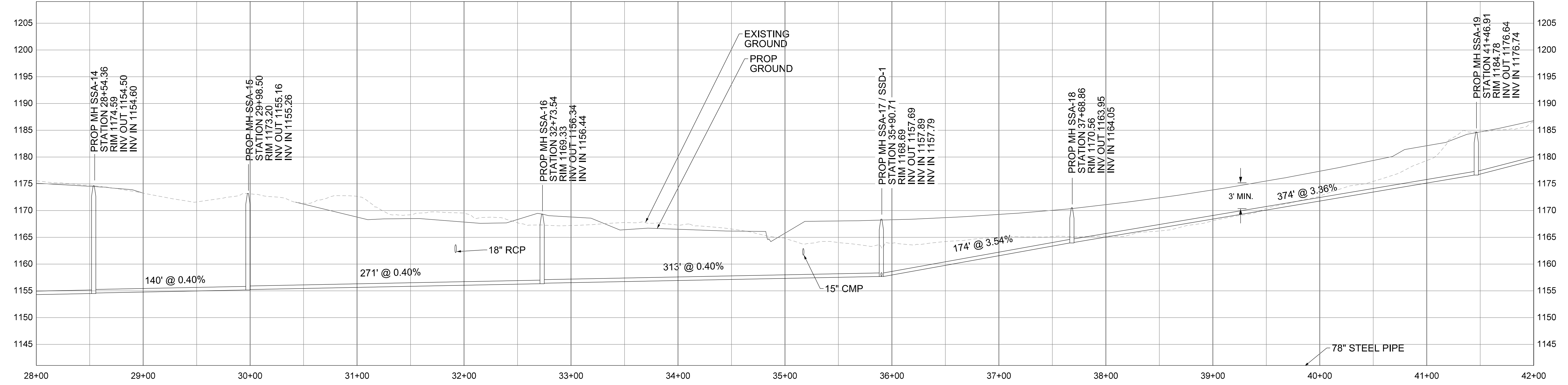
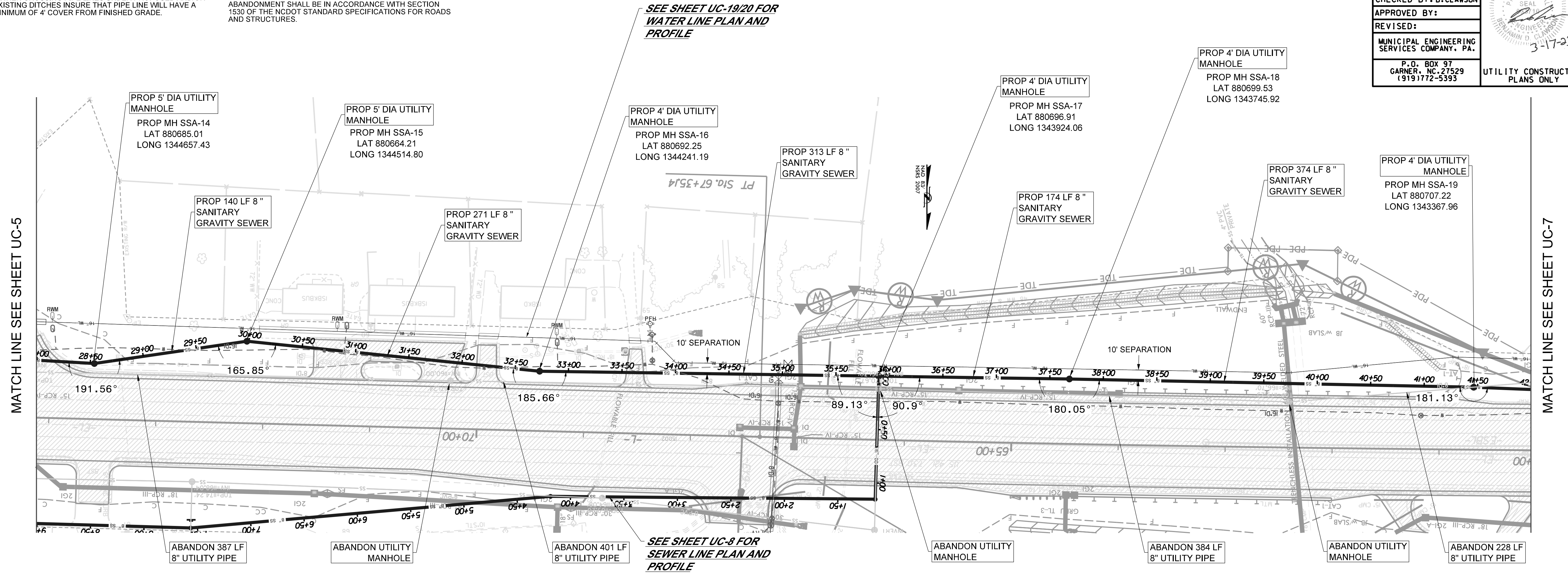


NOTES:

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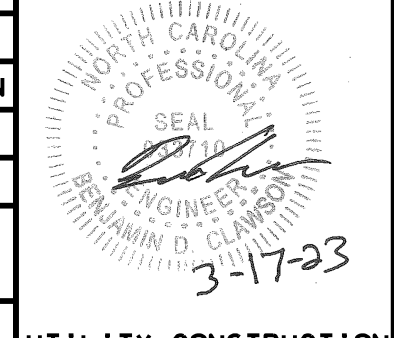
PROJECT REFERENCE NO.	SHEET NO.
U-5312	UC-6
DESIGNED BY: B. CLAWSON	
DRAWN BY: R. MOSS	
CHECKED BY: B. CLAWSON	
APPROVED BY:	
REVISID:	
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	
P.O. BOX 97 GARNER, NC. 27529 1919172-5393	UTILITY CONSTRUCTION PLANS ONLY



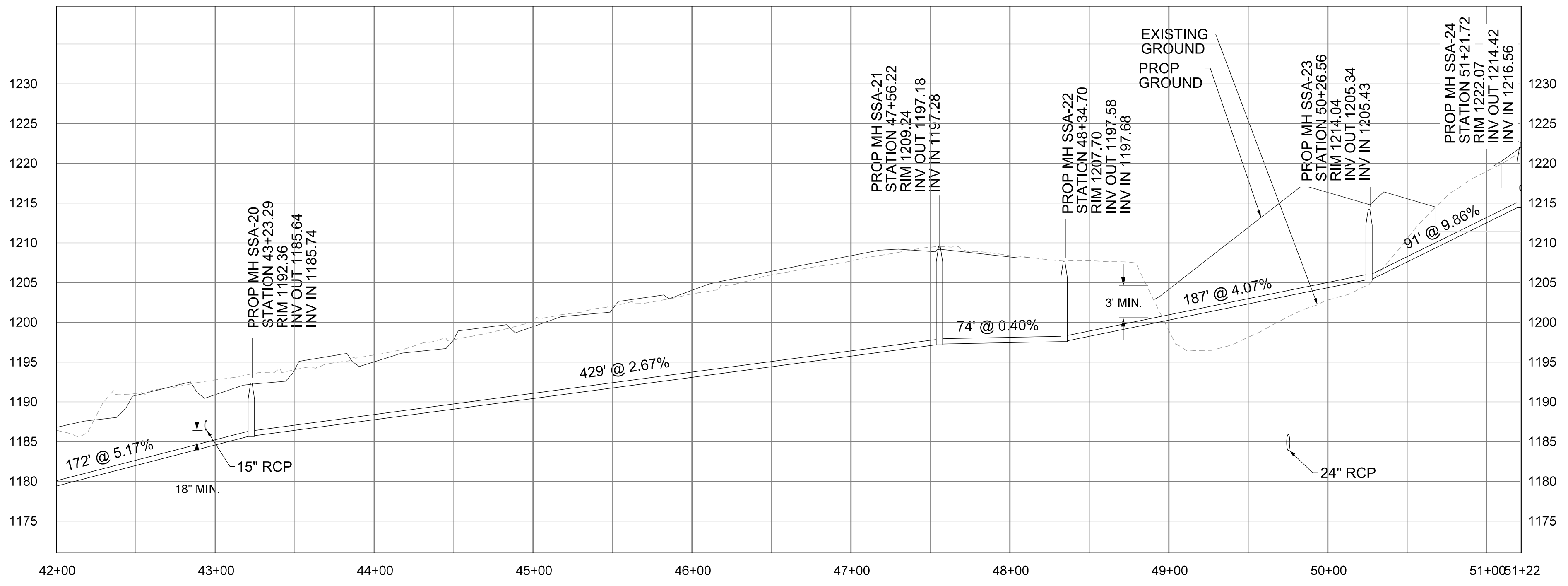
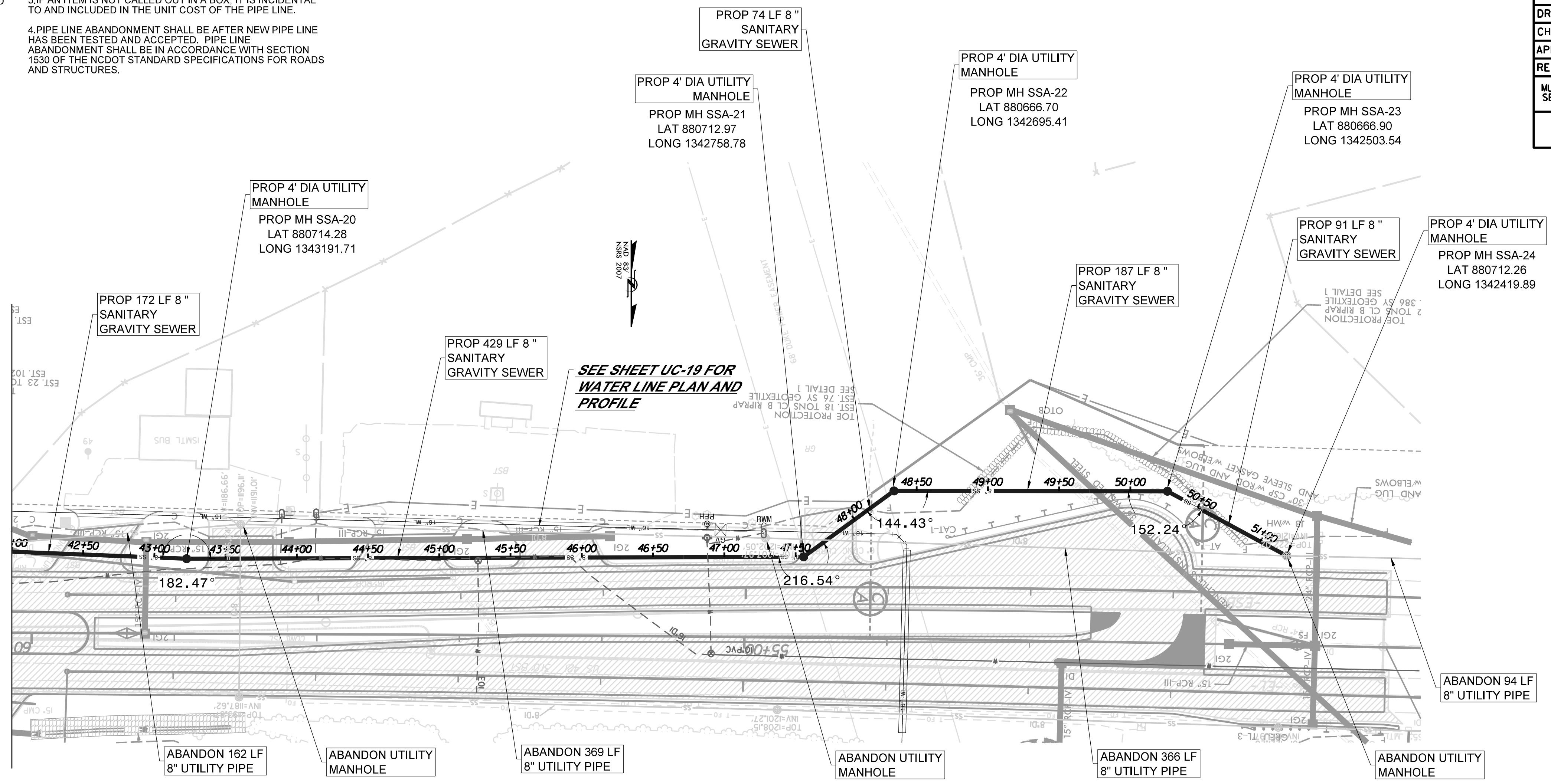
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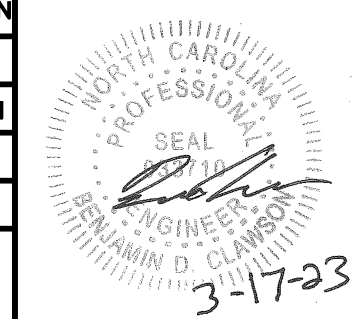
1. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.  
 2. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.

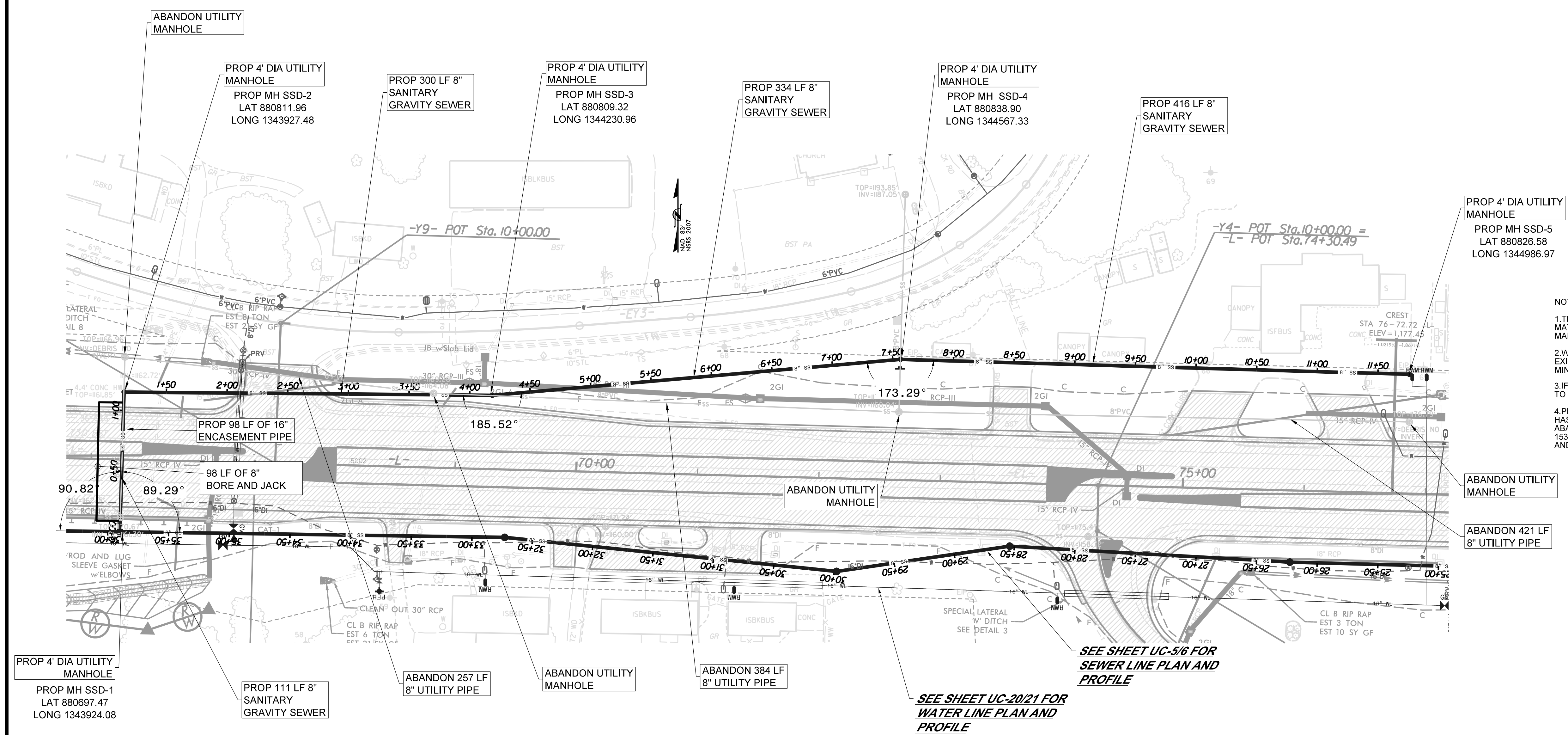
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PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-7
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISID:			
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	P.O. BOX 97 GARNER, NC. 27529 19191772-5393		
			UTILITY CONSTRUCTION PLANS ONLY

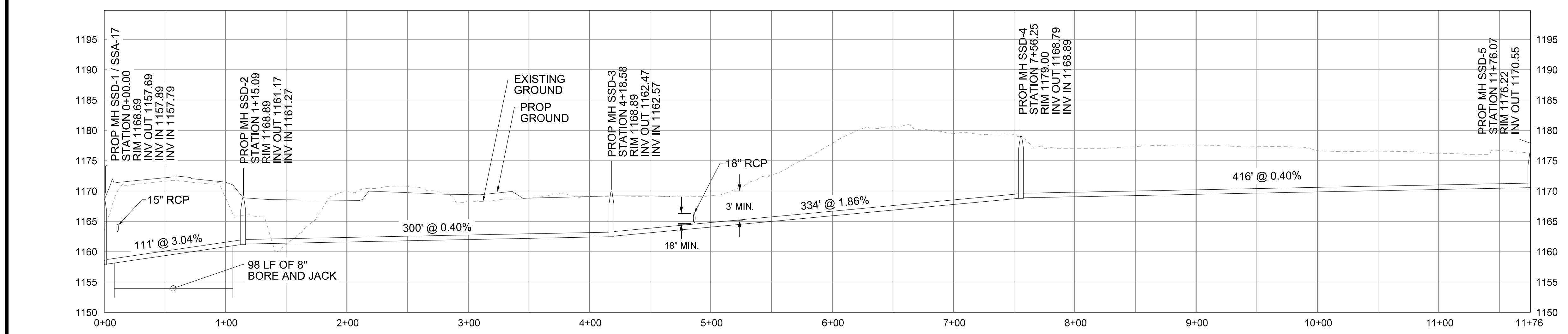
MATCH LINE SEE SHEET UC-6



PROJECT REFERENCE NO.	SHEET NO.
U-5312	UC-8
DESIGNED BY: B. CLAWSON	
DRAWN BY: R. MOSS	
CHECKED BY: B. CLAWSON	
APPROVED BY:	
REVISED:	
MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.	UTILITY CONSTRUCTION PLANS ONLY
P.O. BOX 97 GARNER, NC 27529 19191772-5393	



- NOTES:
1. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
  2. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
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SEE SHEET UC-5/6 FOR SEWER LINE PLAN AND PROFILE

SEE SHEET UC-20/21 FOR WATER LINE PLAN AND PROFILE

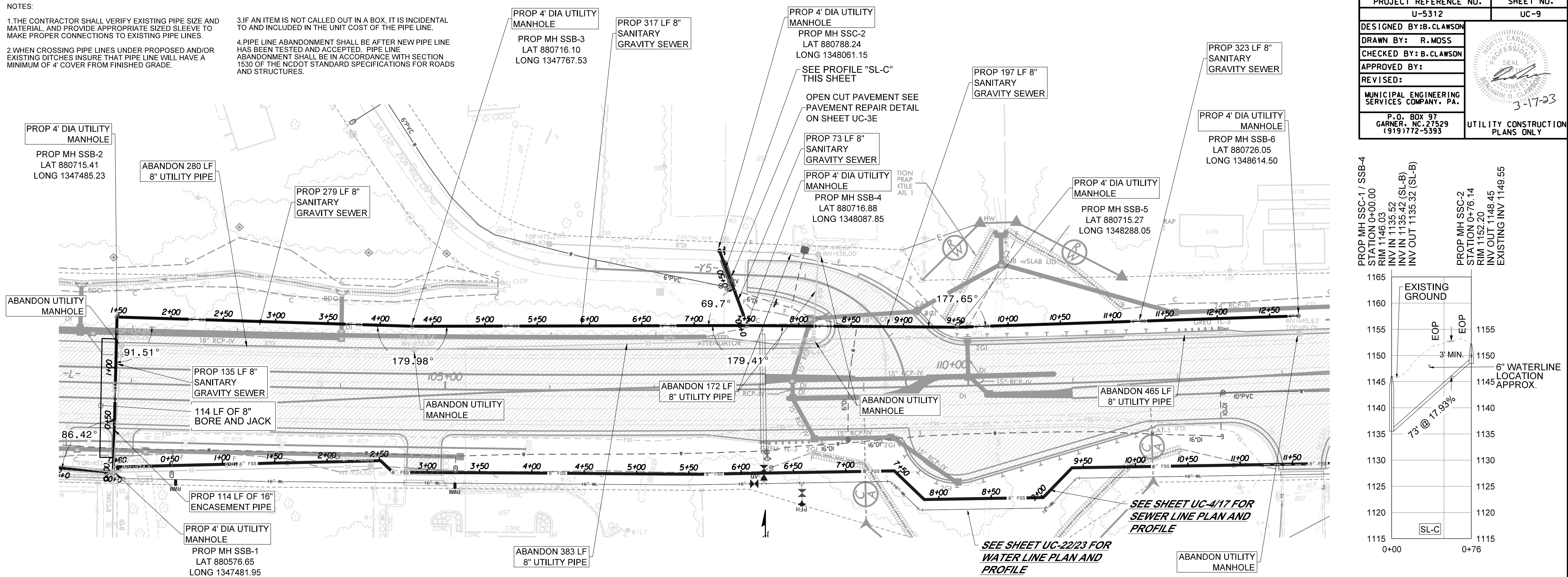
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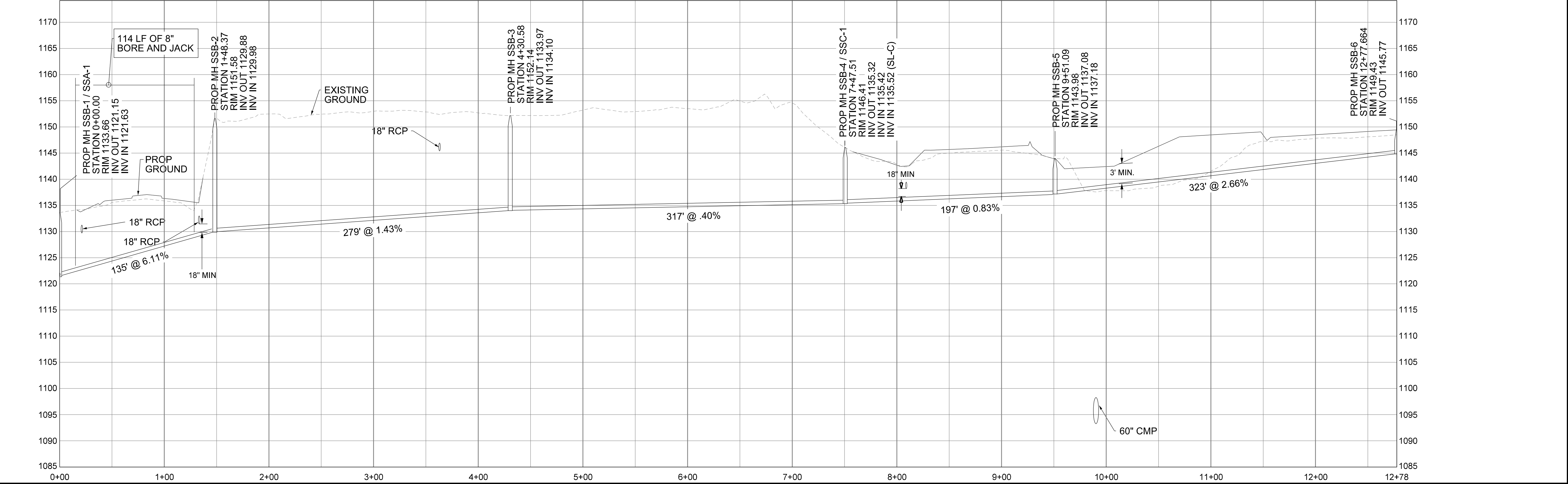
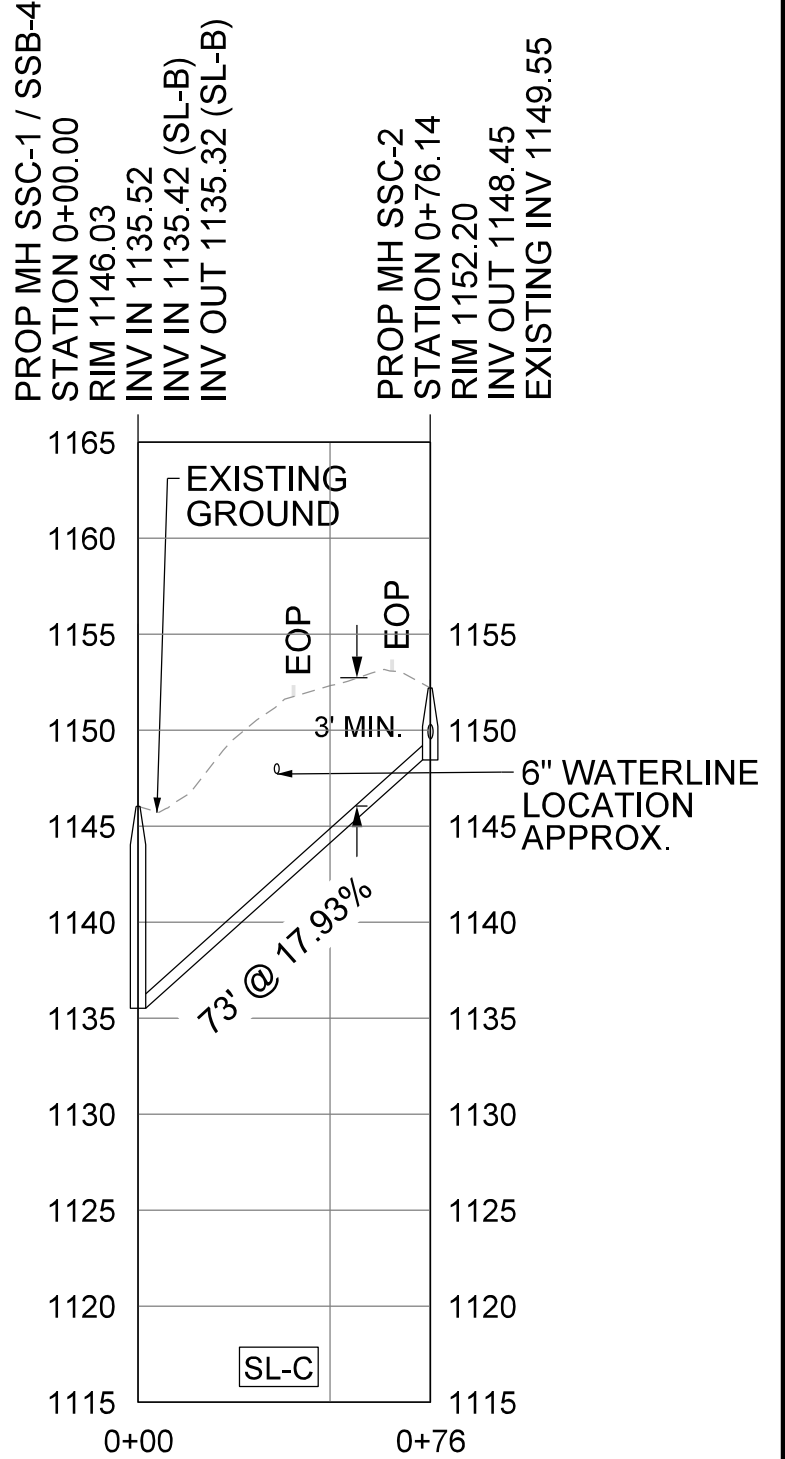
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PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-9
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISID:			
MUNICIPAL ENGINEERING SERVICES COMPANY, P.A. P.O. BOX 97 GARNER, NC 27529 (919) 772-5393			
UTILITY CONSTRUCTION PLANS ONLY			



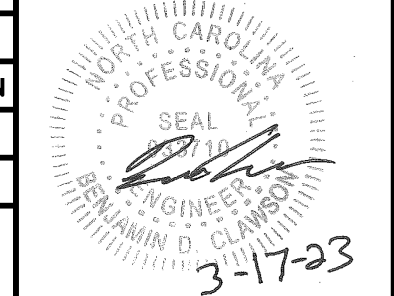
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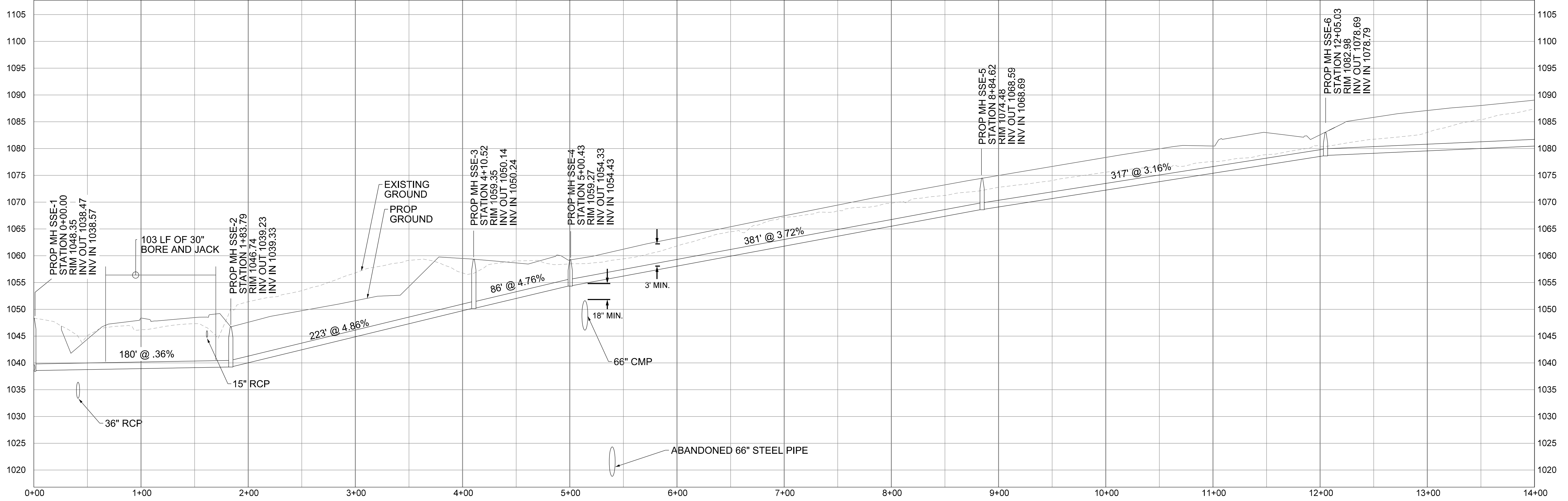
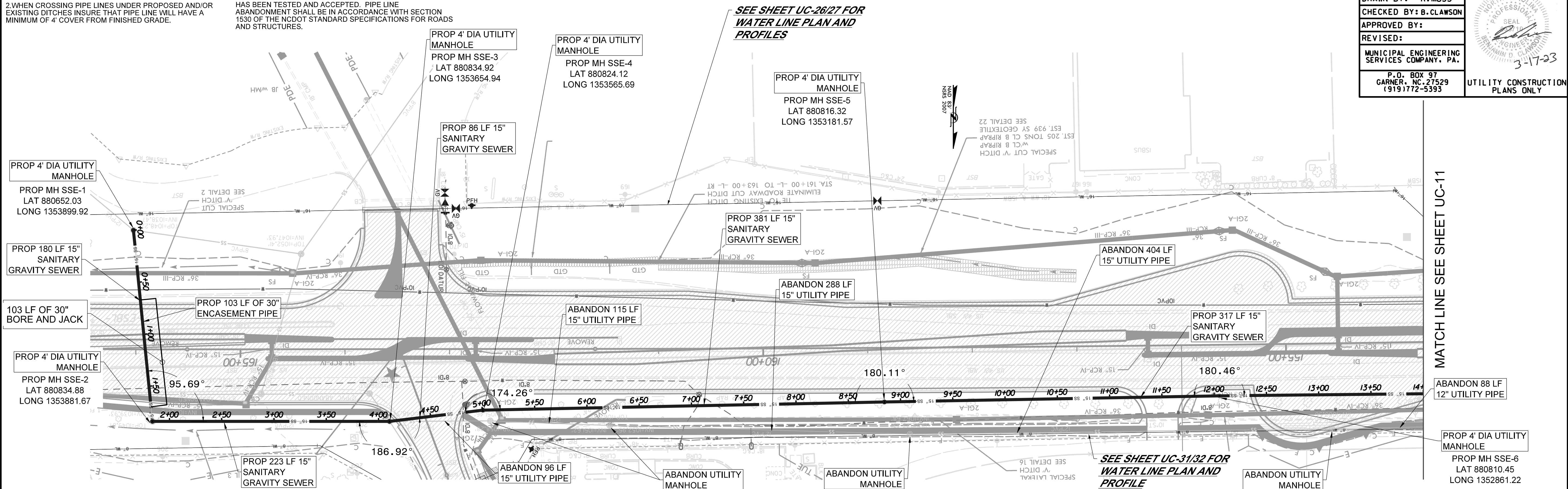
1. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.

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PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-10
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISER:		MUNICIPAL ENGINEERING SERVICES COMPANY, P.A. P.O. BOX 97 GARNER, NC 27529 (919) 772-5393	
			UTILITY CONSTRUCTION PLANS ONLY



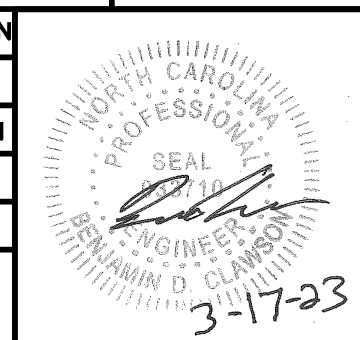
NOTES:

1. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.

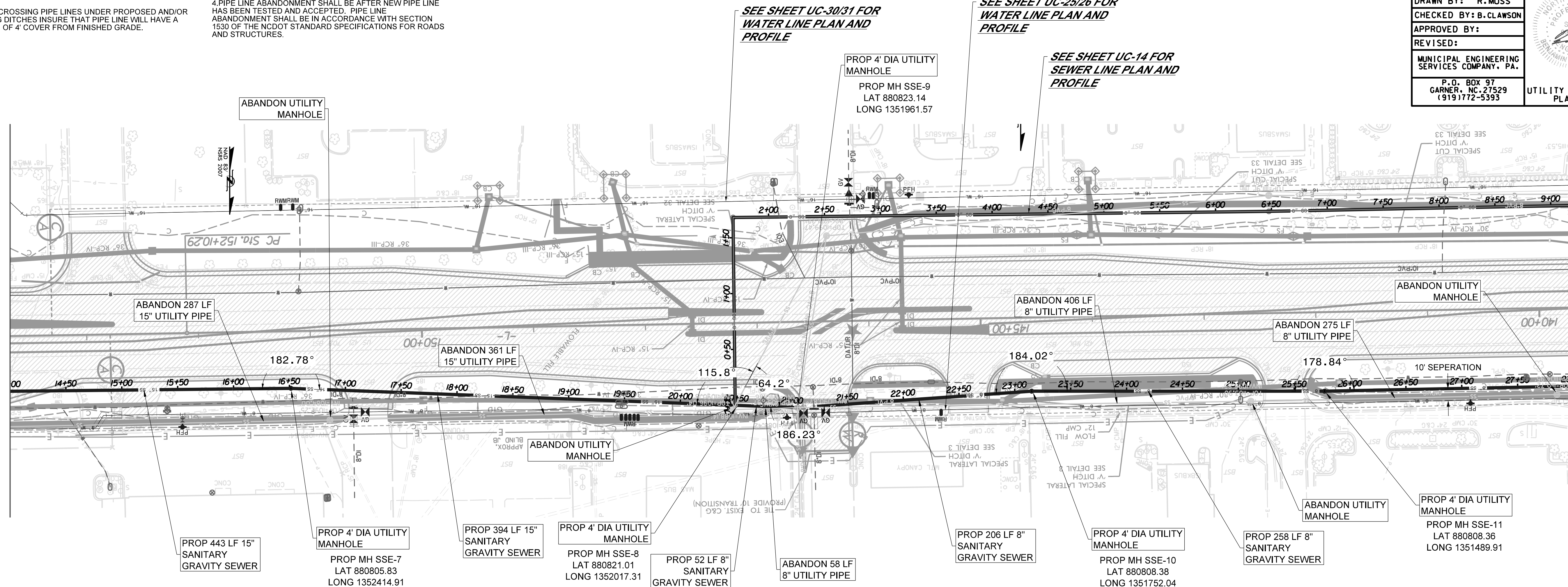
2. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.

3. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.

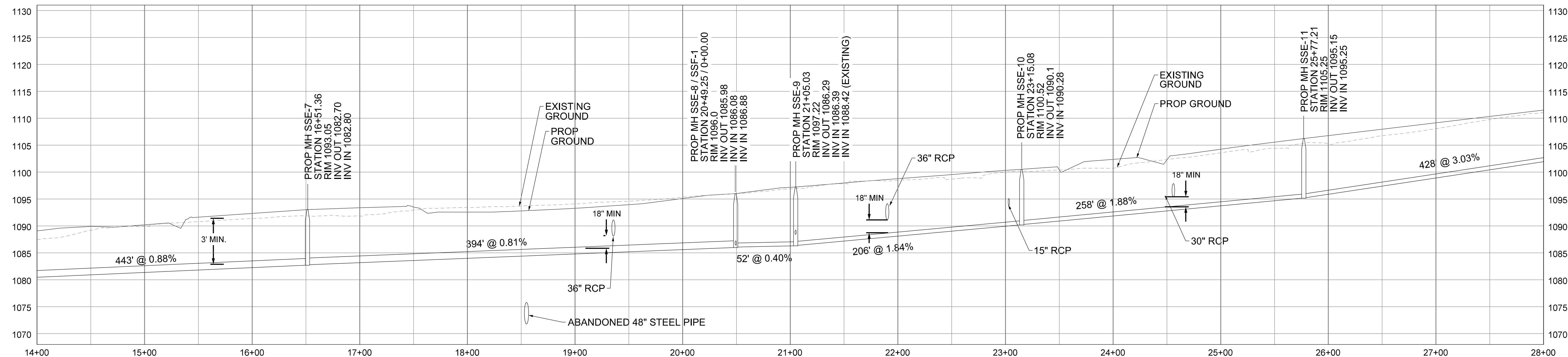
4. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1330 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-11
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISED:			
MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.	P.O. BOX 97 GARNER, NC 27529 (919) 772-5393	UTILITY CONSTRUCTION PLANS ONLY	

MATCH LINE SEE SHEET UC-10

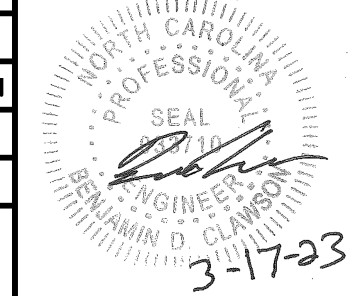


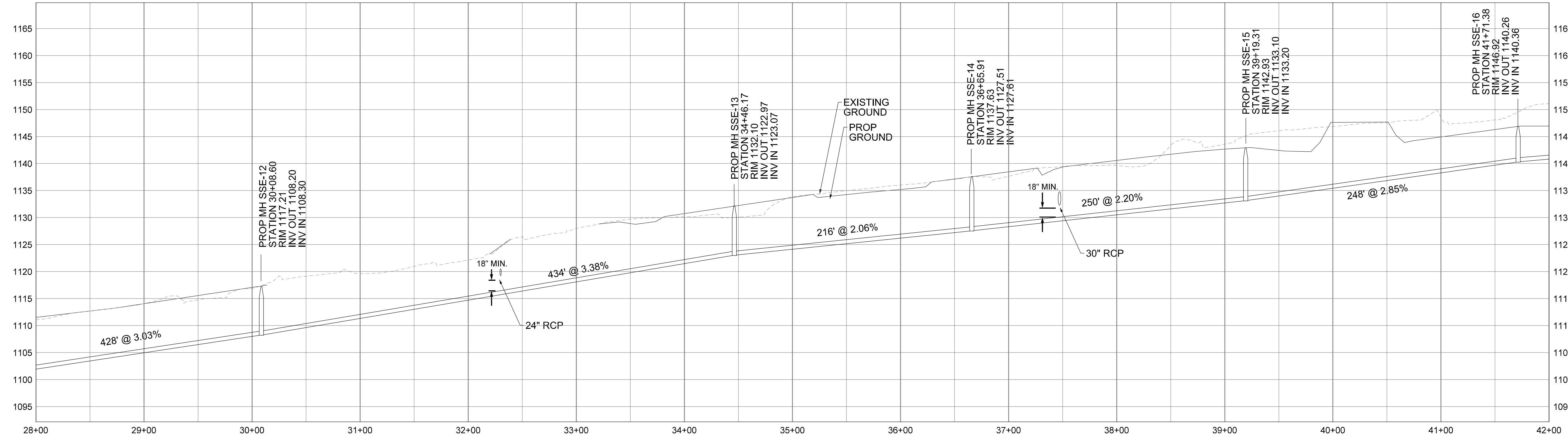
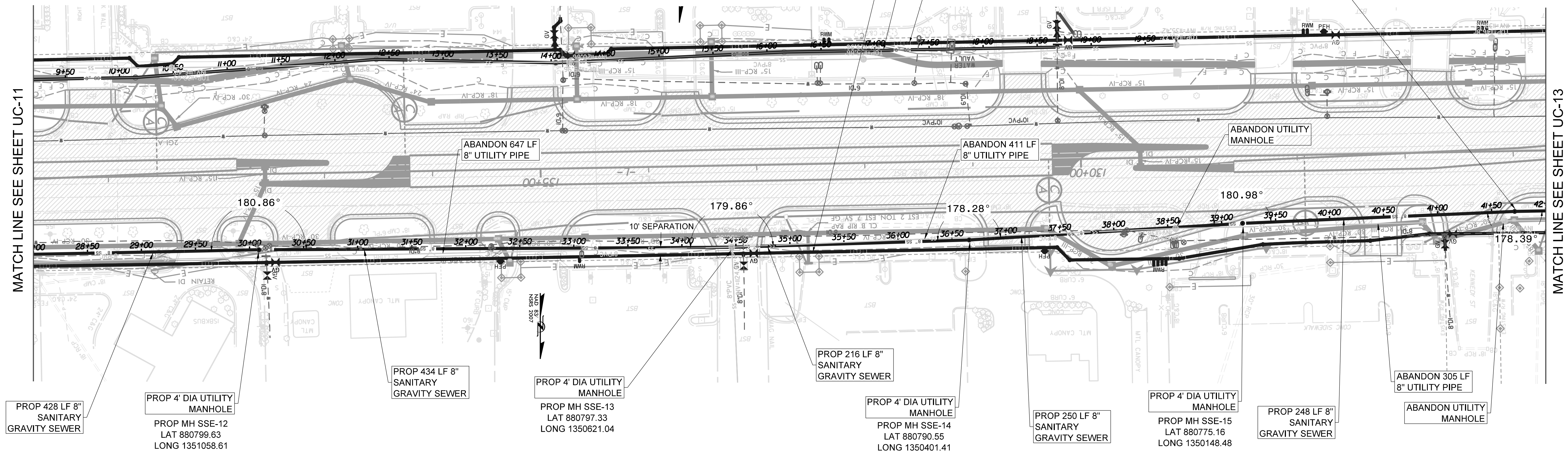
MATCH LINE SEE SHEET UC-12



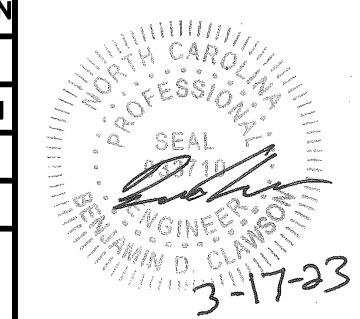
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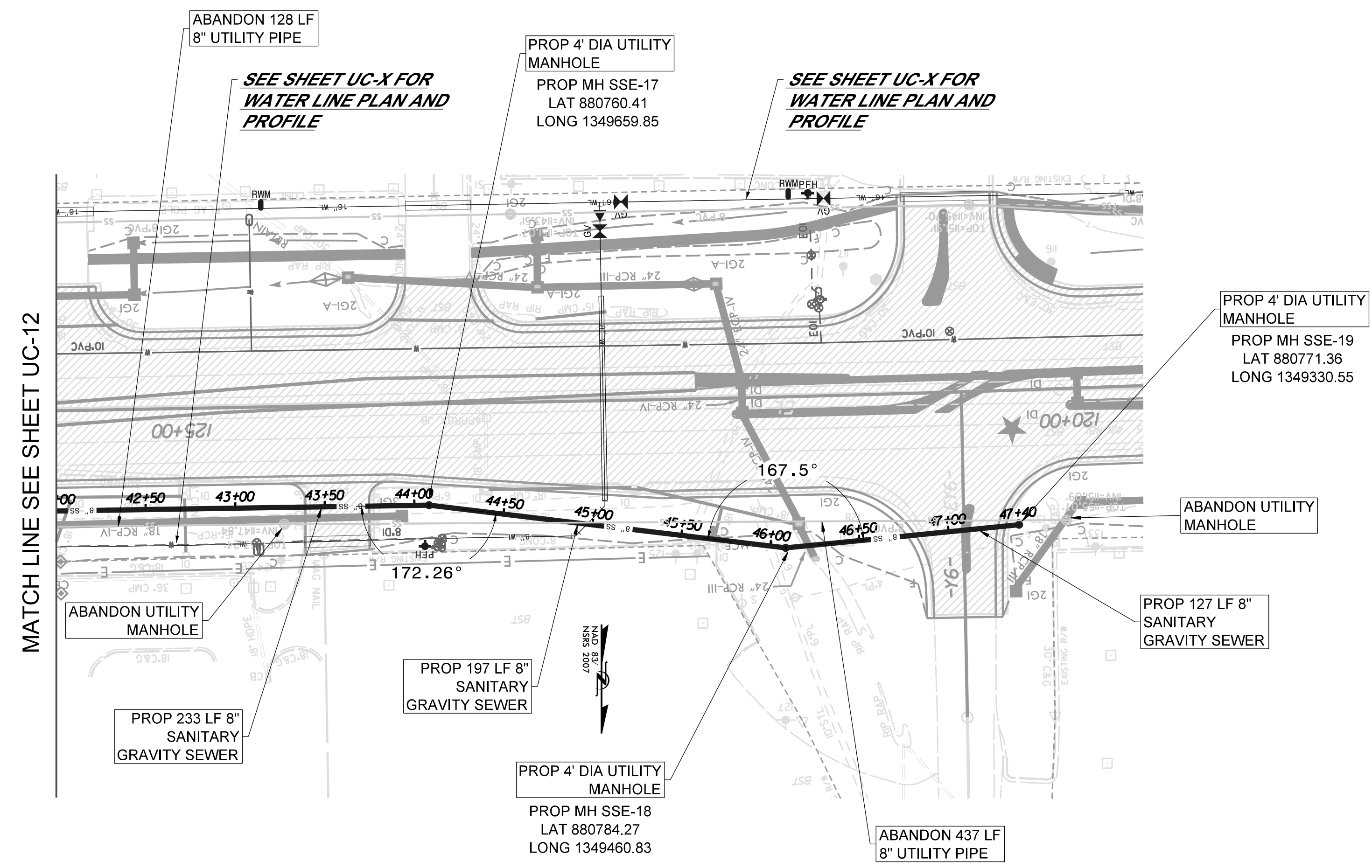
1. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
2. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
3. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
4. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-12
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISIED:			
MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.	P.O. BOX 97 GARNER, NC. 27529 (919) 772-5393		
			UTILITY CONSTRUCTION PLANS ONLY

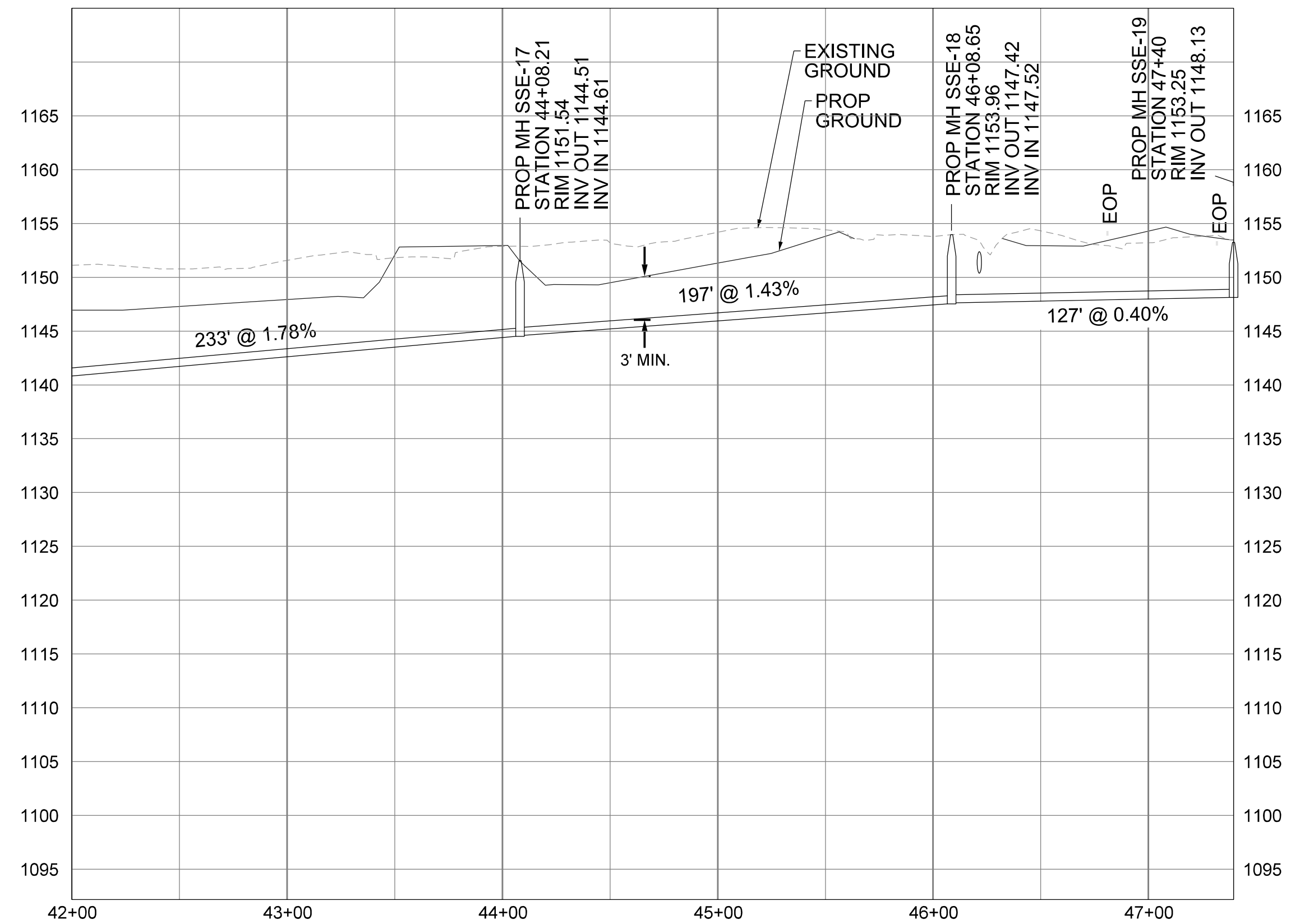




PROJECT REFERENCE NO.	SHEET NO.
U-5312	UC-13
DESIGNED BY: B. CLAWSON	
DRAWN BY: R. MOSS	
CHECKED BY: B. CLAWSON	
APPROVED BY:	
REVISER:	
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	
P.O. BOX 97 GARNER, NC 27529 19191772-5393	UTILITY CONSTRUCTION PLANS ONLY

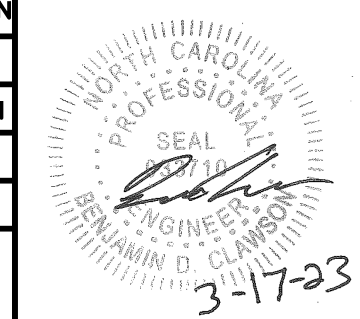


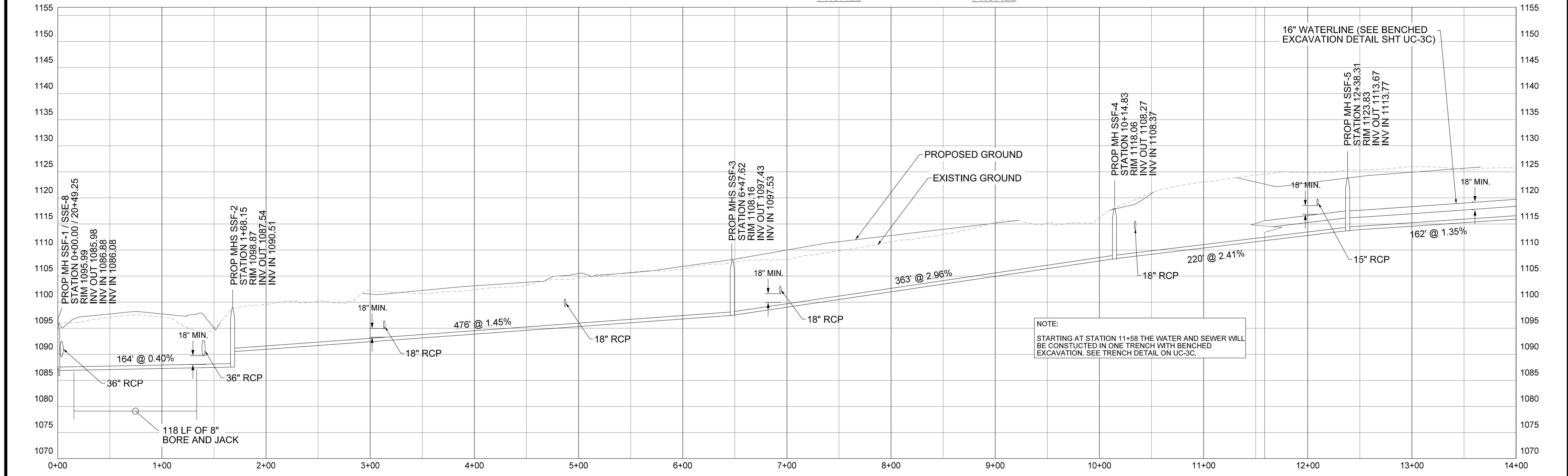
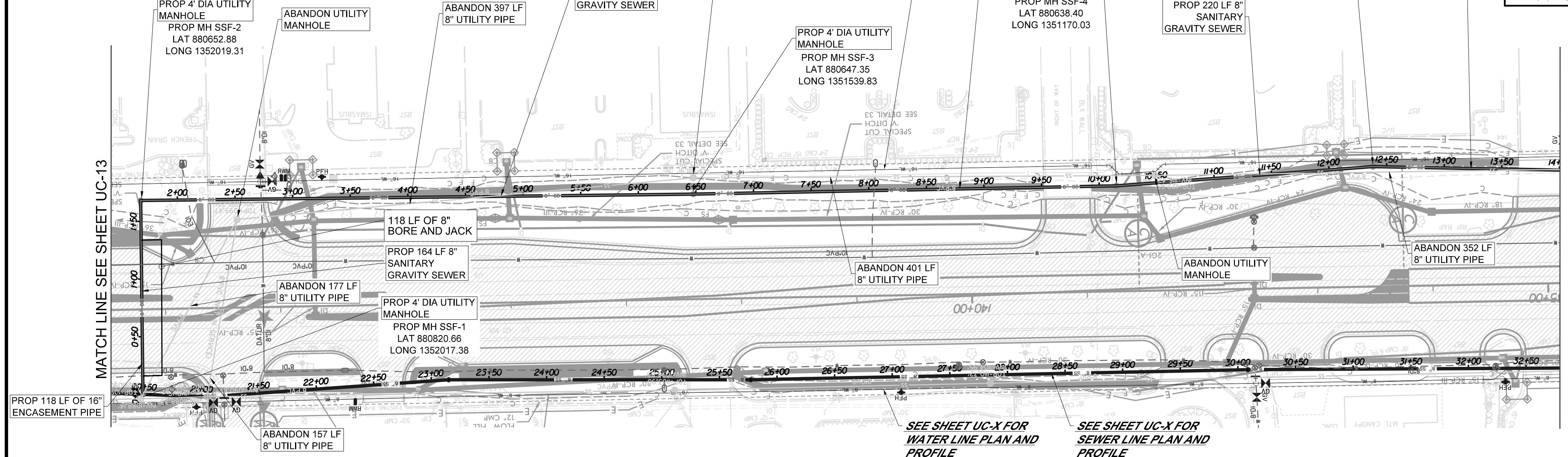
- NOTES:
1. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
  2. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
  3. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
  4. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.



NOTES:

1. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
2. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
3. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
4. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-14
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISED:			
MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.	P.O. BOX 97 GARNER, NC. 27529 (919) 772-5393		
			UTILITY CONSTRUCTION PLANS ONLY



NOTE:  
 STARTING AT STATION 11+58 THE WATER AND SEWER WILL BE CONSTRUCTED IN ONE TRENCH WITH BENCHED EXCAVATION. SEE TRENCH DETAIL ON UC-3C.

MATCH LINE SEE SHEET UC-13

MATCH LINE SEE SHEET UC-15

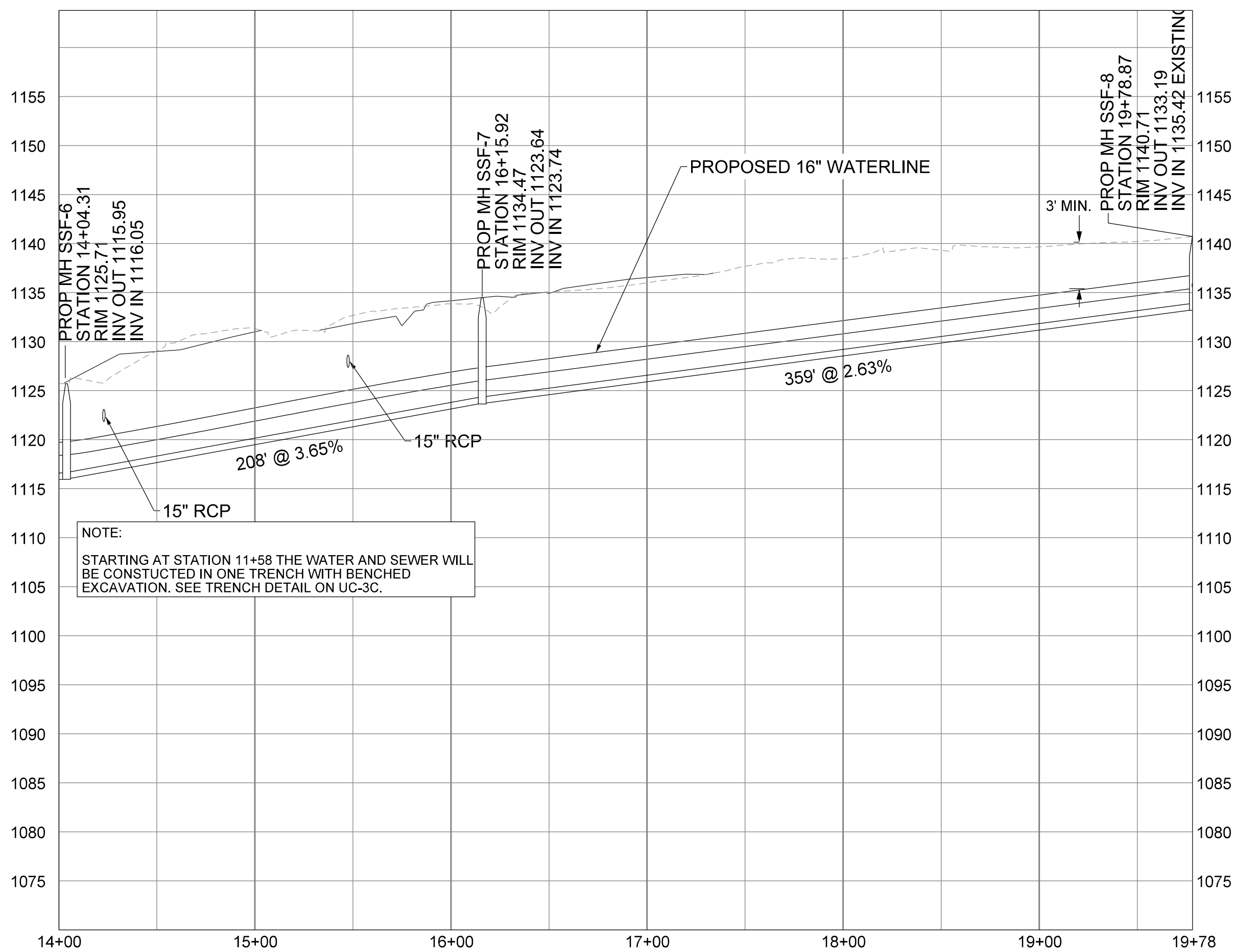
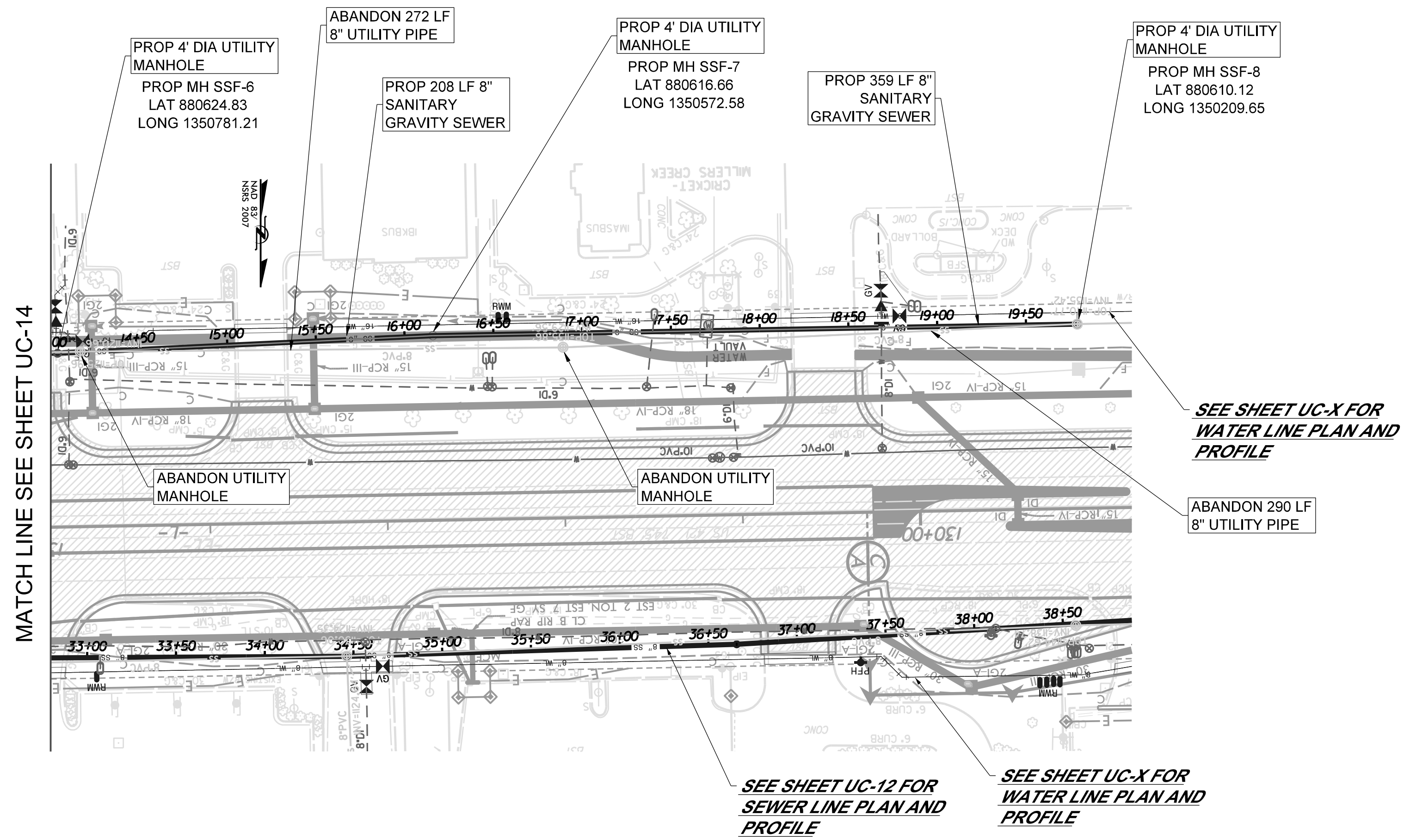
SEE SHEET UC-30 FOR WATER LINE PLAN AND PROFILE

SEE SHEET UC-X FOR WATER LINE PLAN AND PROFILE

SEE SHEET UC-X FOR SEWER LINE PLAN AND PROFILE

NOTES:

1. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
2. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
3. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
4. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.



PROJECT REFERENCE NO.	SHEET NO.
U-5312	UC-15
DESIGNED BY: B. CLAWSON	
DRAWN BY: R. MOSS	
CHECKED BY: B. CLAWSON	
APPROVED BY:	
REVISED:	
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	
P.O. BOX 97 GARNER, NC 27529 19191772-5393	UTILITY CONSTRUCTION PLANS ONLY

NOTES:

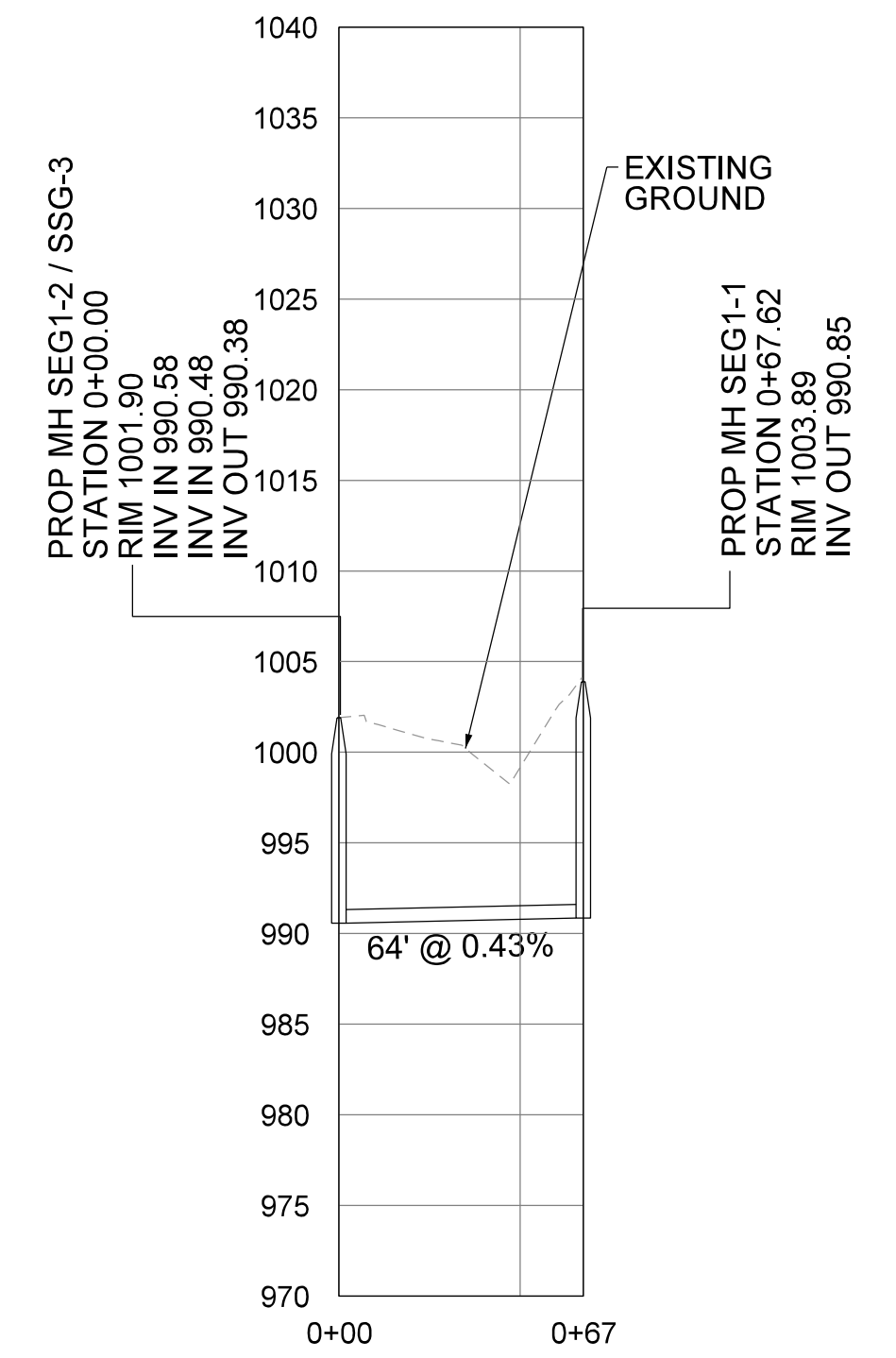
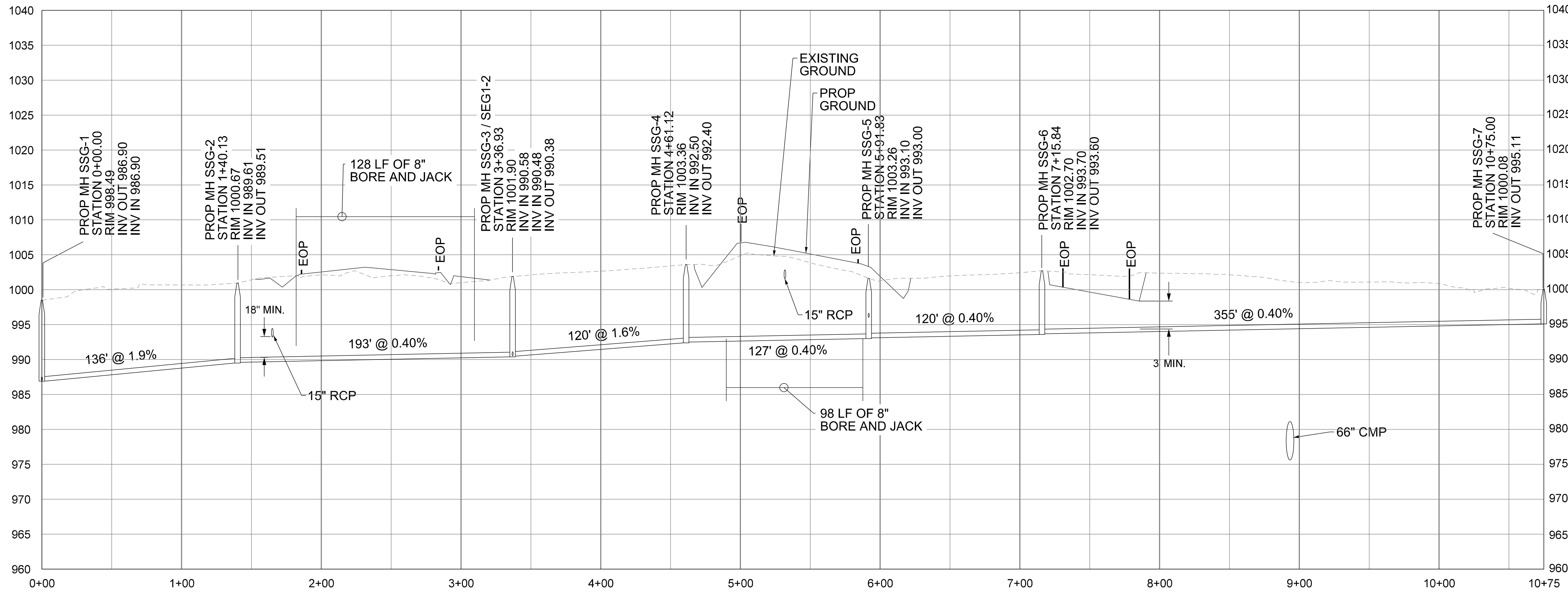
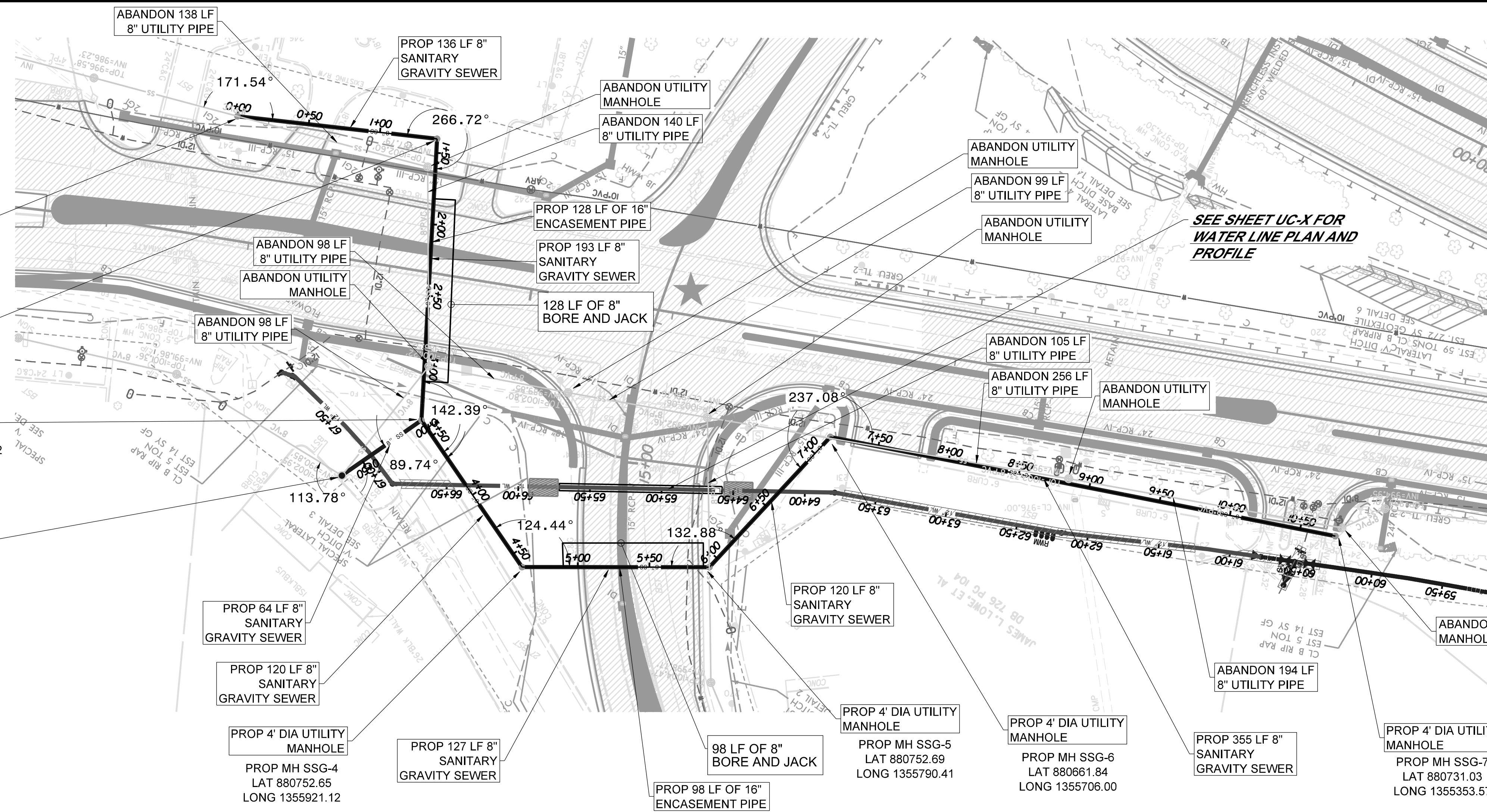
1. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
2. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
3. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
4. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

PROP 4' DIA UTILITY MANHOLE  
PROP MH SSG-1  
LAT 880437.93  
LONG 1356119.64

PROP 4' DIA UTILITY MANHOLE  
PROP MH SSG-2  
LAT 880453.71  
LONG 1355980.41

PROP 4' DIA UTILITY MANHOLE  
PROP MH SSG-3 / SEG 1-2  
LAT 880650.21  
LONG 1355991.33

PROP 4' DIA UTILITY MANHOLE  
PROP MH SEG1-1  
LAT 880650.34  
LONG 1355991.49

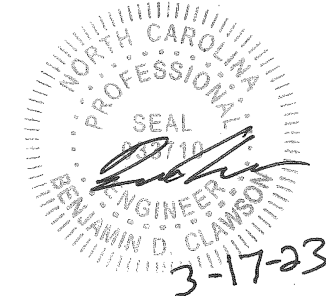


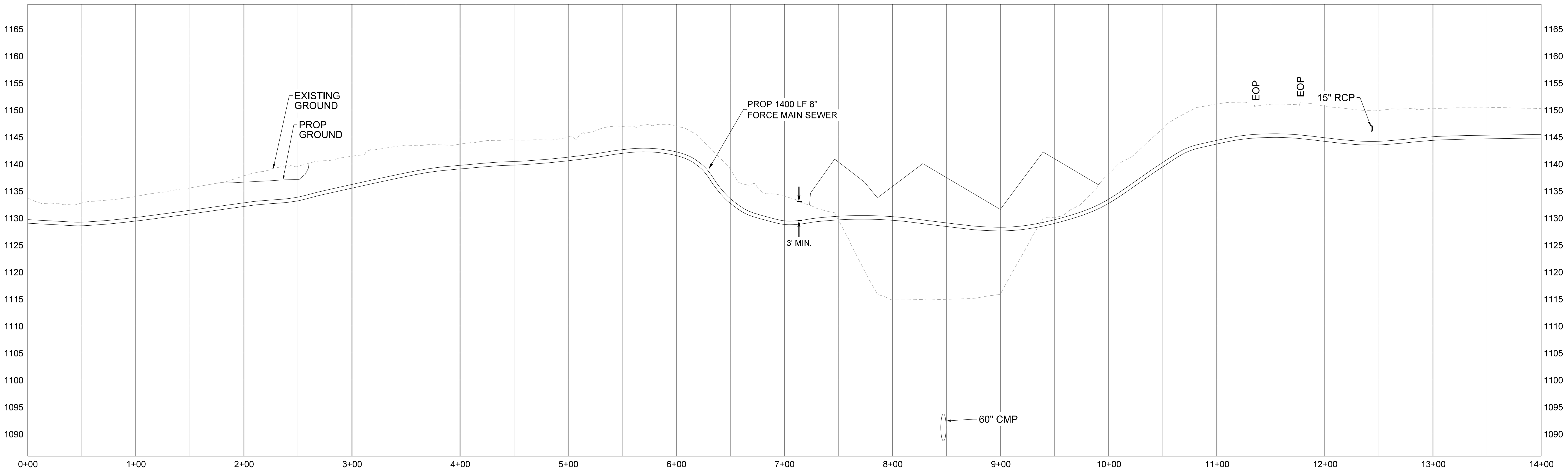
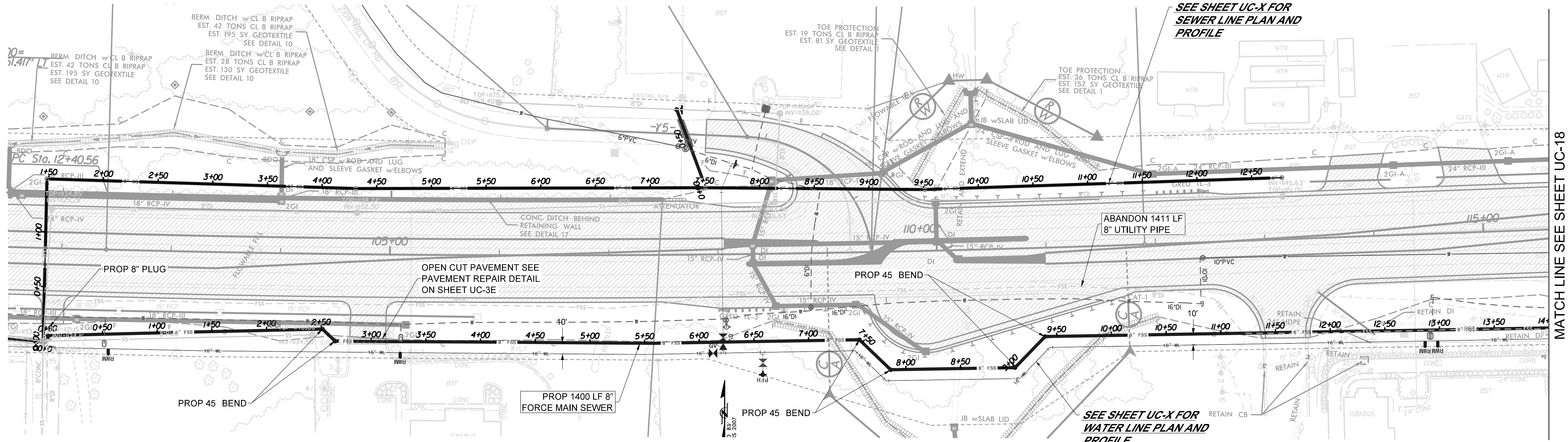
PROJECT REFERENCE NO. U-5312	SHEET NO. UC-16
DESIGNED BY: B. CLAWSON	
DRAWN BY: R. MOSS	
CHECKED BY: B. CLAWSON	
APPROVED BY:	
REVISER:	UTILITY CONSTRUCTION PLANS ONLY
MUNICIPAL ENGINEERING SERVICES COMPANY, PA. P.O. BOX 97 GARNER, NC 27529 19191772-5393	

NOTES:

1. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
2. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
3. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
4. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

TOTAL WEIGHT OF DUCTILE IRON SEWER PIPE FITTINGS ON SHEET UC-17 IS 830 LBS.

PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-17
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISED:			
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	P.O. BOX 97 GARNER, NC. 27529 (919) 772-5393		
			UTILITY CONSTRUCTION PLANS ONLY



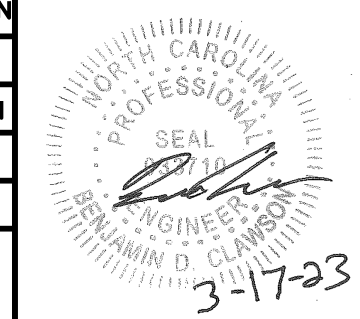
MATCH LINE SEE SHEET UC-18

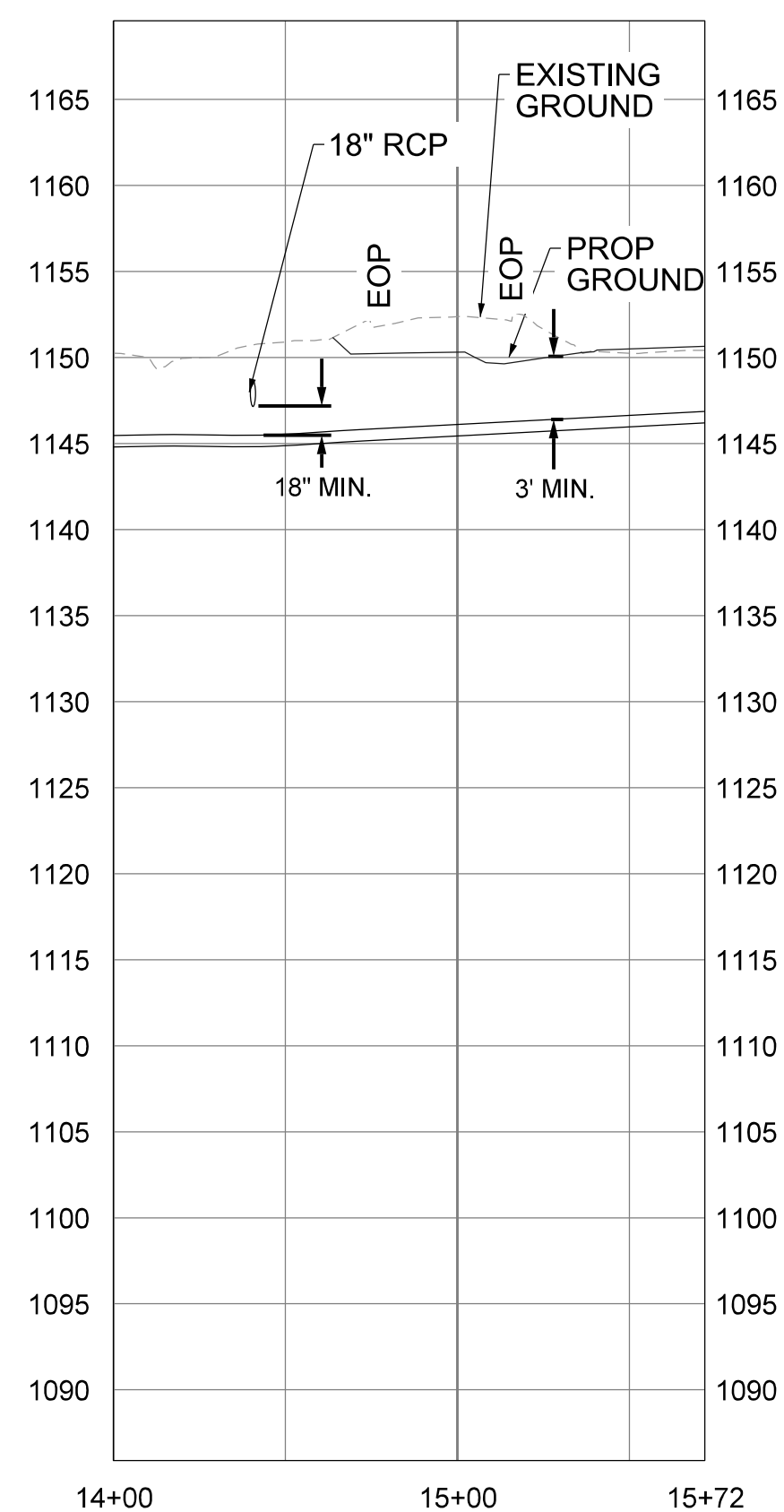
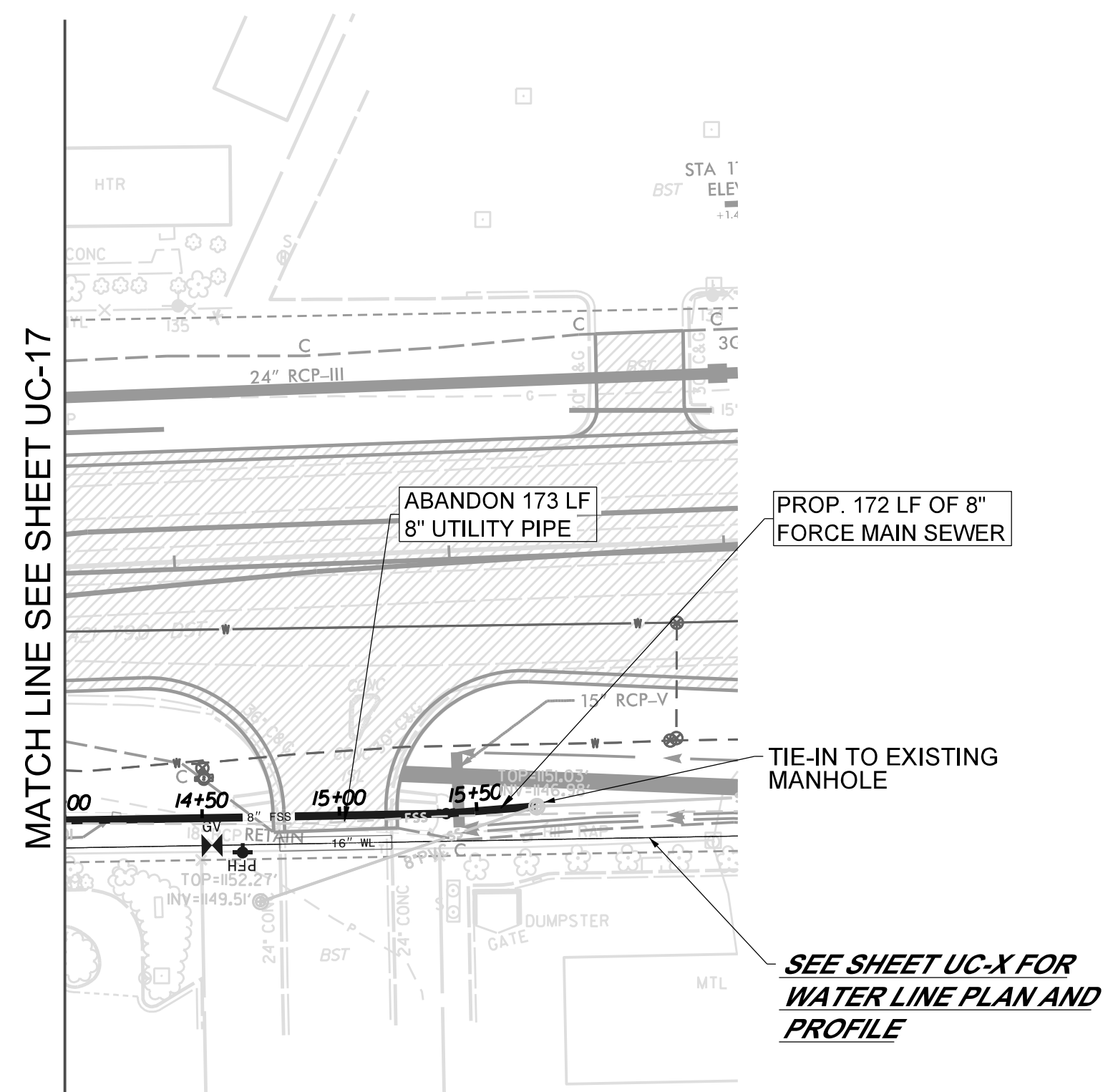
SEE SHEET UC-X FOR SEWER LINE PLAN AND PROFILE

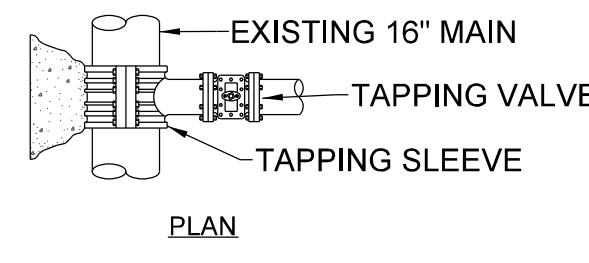
SEE SHEET UC-X FOR WATER LINE PLAN AND PROFILE

NOTES:

1. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
2. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
3. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
4. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-18
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISID:			
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.		P.O. BOX 97 GARNER, NC 27529 (919) 772-5393	
		UTILITY CONSTRUCTION PLANS ONLY	



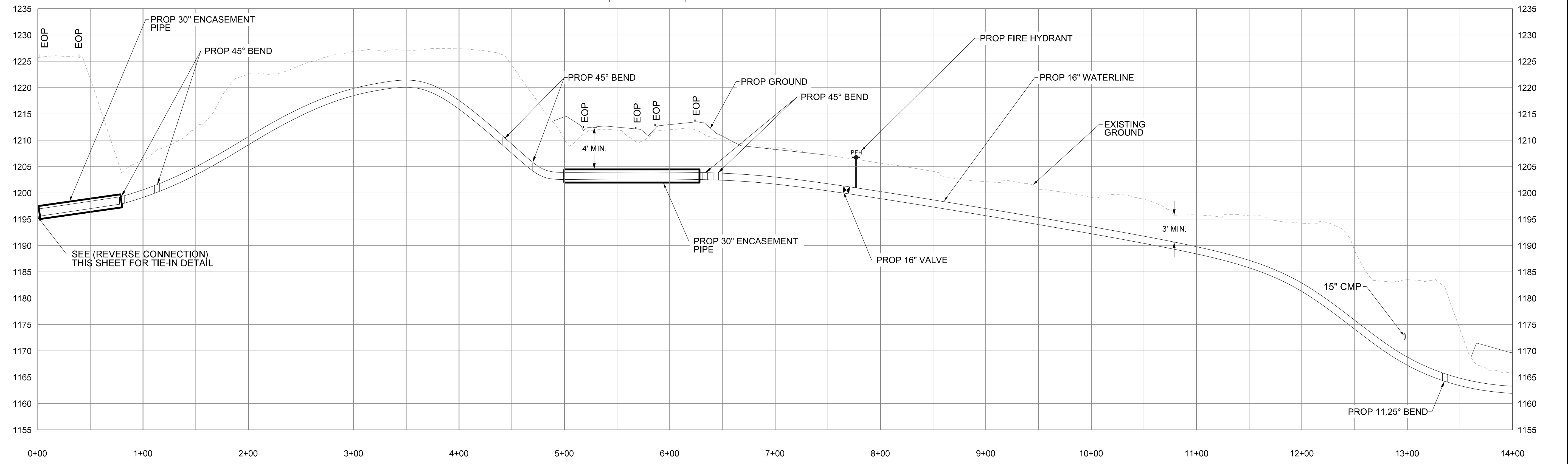
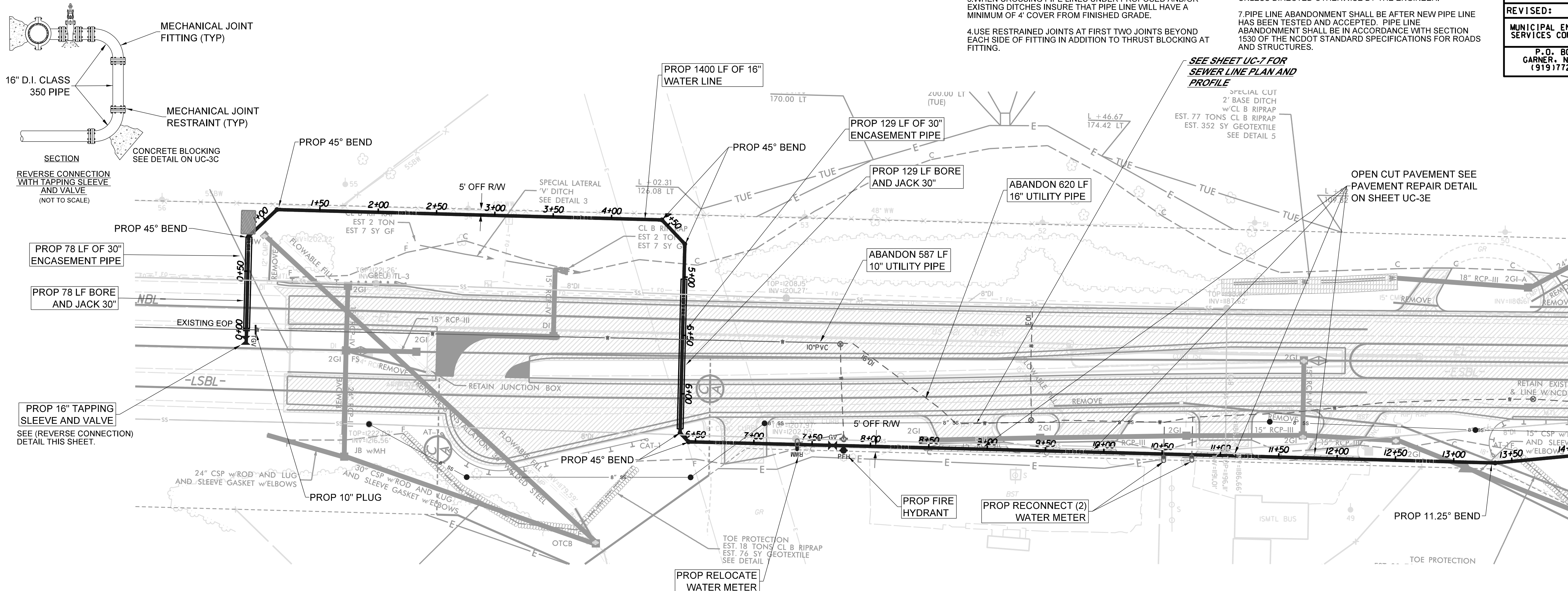


NOTES:  
 1. SOLID CONCRETE OR BRICK BLOCKING SHALL BE USED FOR DUCTILE IRON PIPE.  
 2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.

TOTAL WEIGHT OF DUCTILE IRON WATER PIPE FITTINGS ON SHEET UC-19 IS 2385 LBS.

NOTES:  
 1. ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.  
 2. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.  
 3. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.  
 4. USE RESTRAINED JOINTS AT FIRST TWO JOINTS BEYOND EACH SIDE OF FITTING IN ADDITION TO THRUST BLOCKING AT FITTING.  
 5. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.  
 6. TWO OR MORE ADJACENT METERS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD DETAIL. ALL GANG METER INSTALLATIONS ON THIS PROJECT SHALL HAVE 1-INCH SERVICE TAP & SUPPLY LINE FROM MAIN LINE UNLESS DIRECTED OTHERWISE BY THE ENGINEER.  
 7. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-19
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISIED:			
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	P.O. BOX 97 GARNER, NC. 27529 (919) 772-5393		
		UTILITY CONSTRUCTION PLANS ONLY	



MATCH LINE SEE SHEET UC-20

NOTES:

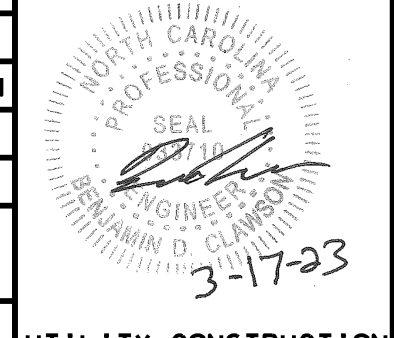
1. ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.
2. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
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4. USE RESTRAINED JOINTS AT FIRST TWO JOINTS BEYOND EACH SIDE OF FITTING IN ADDITION TO THRUST BLOCKING AT FITTING.
5. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
6. TWO OR MORE ADJACENT METERS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD DETAIL. ALL GANG METER INSTALLATIONS ON THIS PROJECT SHALL HAVE 1-INCH SERVICE TAP & SUPPLY LINE FROM MAIN LINE UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
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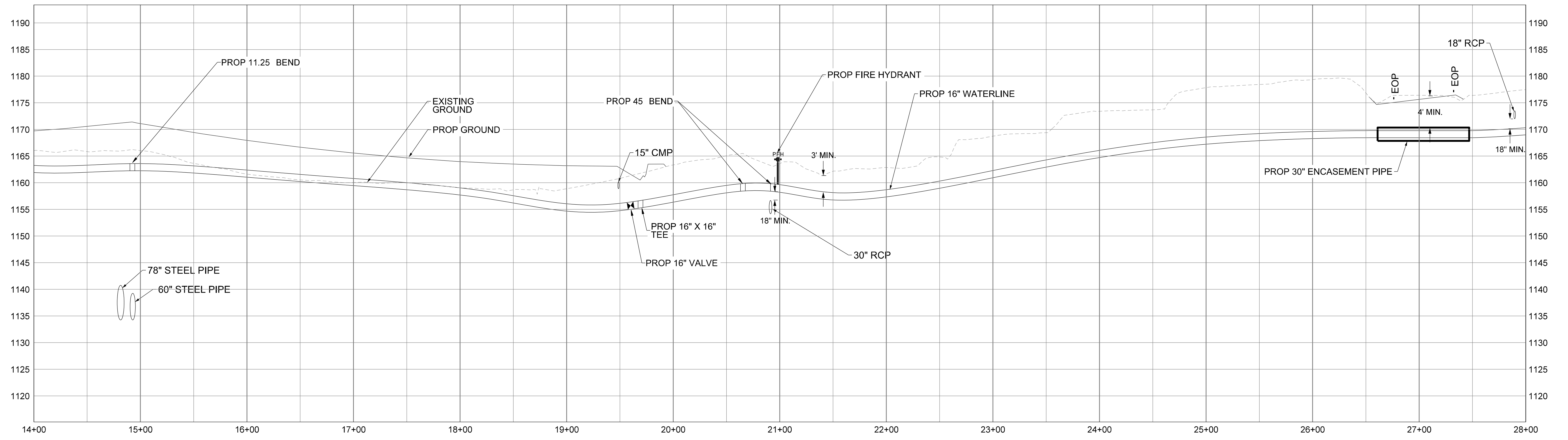
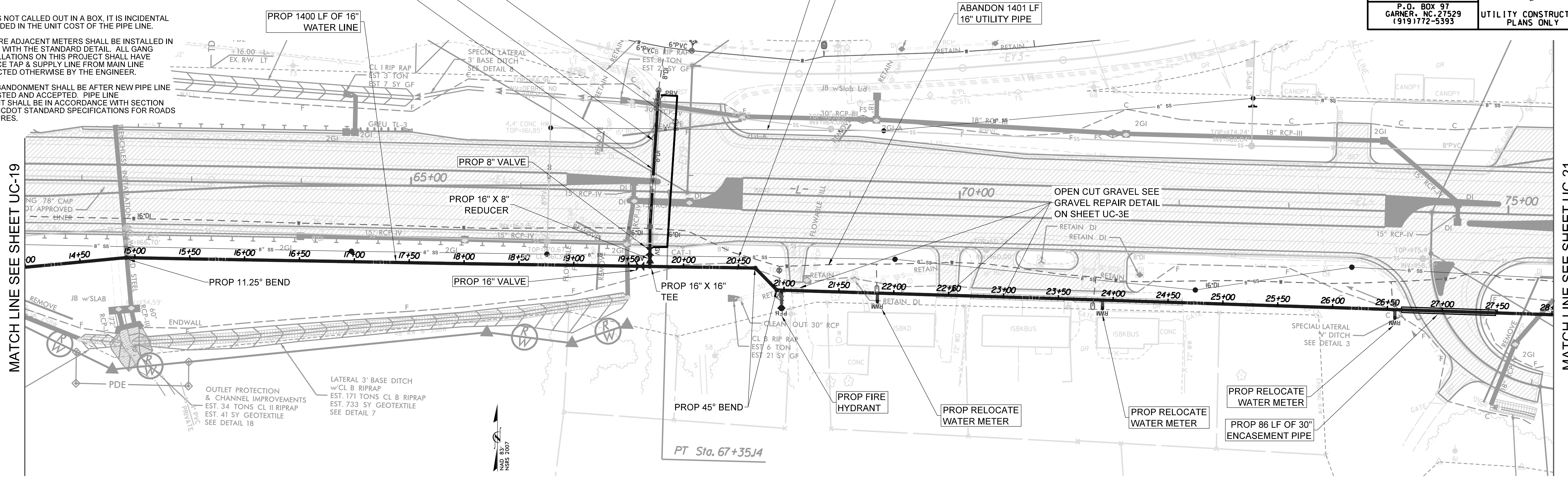
- 140 LF OF 16" BORE AND JACK
- PROP 140 LF OF 16" ENCASEMENT PIPE
- PROP 143 LF OF 8" WATER LINE
- SEE SHEET UC-X FOR PROFILE
- PROP 1400 LF OF 16" WATER LINE

TOTAL WEIGHT OF DUCTILE IRON WATER PIPE FITTINGS ON SHEET UC-20 IS 1925 LBS.

SEE SHEET UC-8 FOR SEWER LINE PLAN AND PROFILE

SEE SHEET UC-6 FOR SEWER LINE PLAN AND PROFILE

PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-20
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISER:		MUNICIPAL ENGINEERING SERVICES COMPANY, P.A. P.O. BOX 97 GARNER, NC 27529 (919) 772-5393	
			UTILITY CONSTRUCTION PLANS ONLY



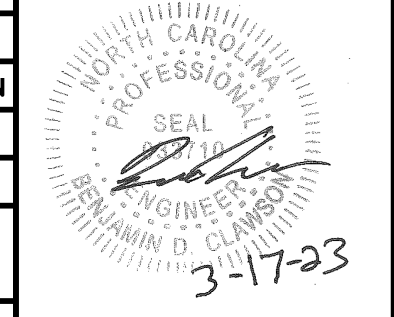


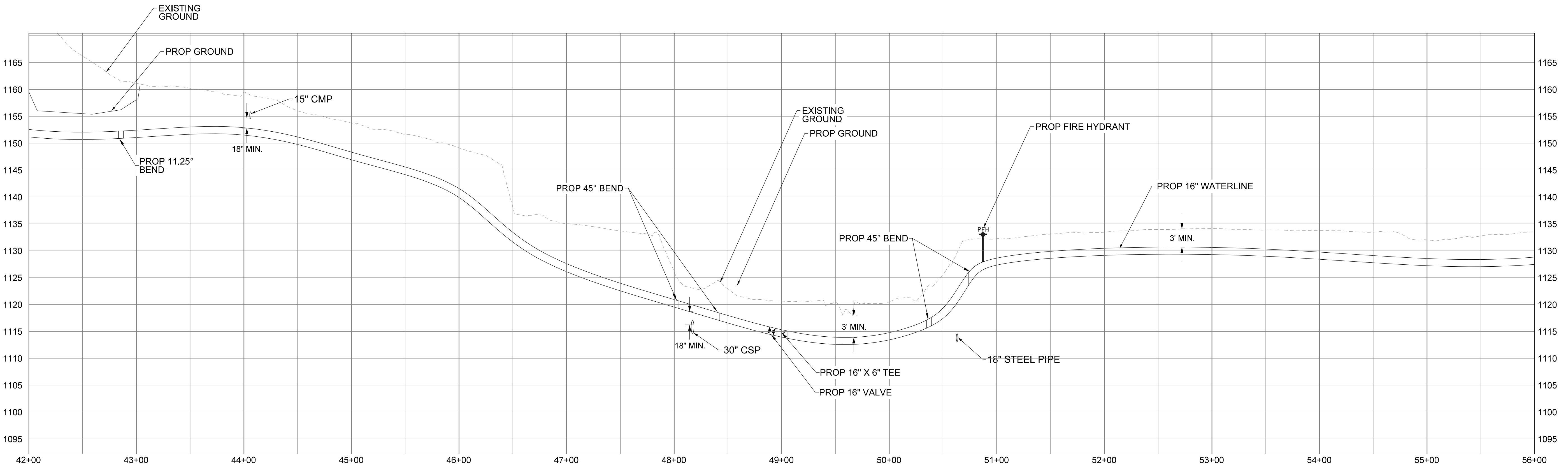
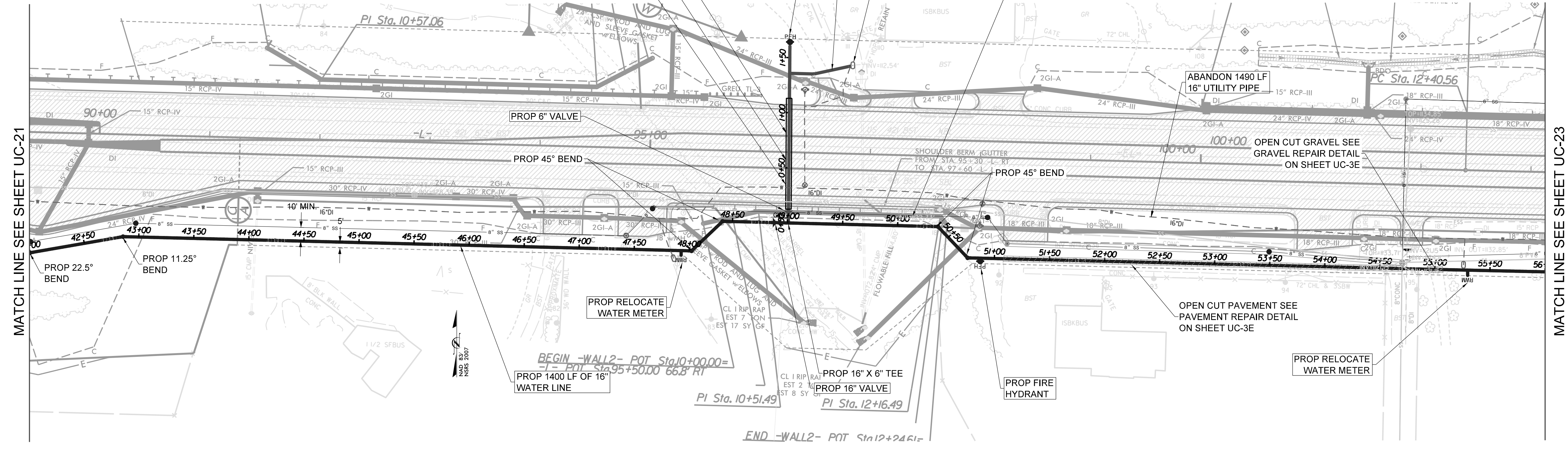


NOTES:

1. ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.
2. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
3. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
4. USE RESTRAINED JOINTS AT FIRST TWO JOINTS BEYOND EACH SIDE OF FITTING IN ADDITION TO THRUST BLOCKING AT FITTING.
5. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
6. TWO OR MORE ADJACENT METERS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD DETAIL. ALL GANG METER INSTALLATIONS ON THIS PROJECT SHALL HAVE 1-INCH SERVICE TAP & SUPPLY LINE FROM MAIN LINE UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
7. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

TOTAL WEIGHT OF DUCTILE IRON WATER PIPE FITTINGS ON SHEET UC-22 IS 2700 LBS.

PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-22
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISID:		MUNICIPAL ENGINEERING SERVICES COMPANY, PA. P.O. BOX 97 GARNER, NC. 27529 (919) 772-5393	
			UTILITY CONSTRUCTION PLANS ONLY

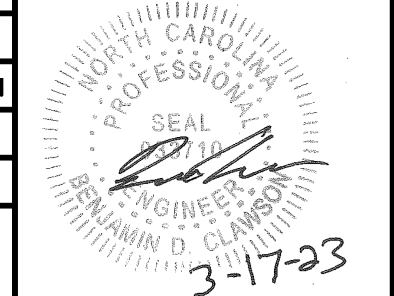


NOTES:

1. ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.
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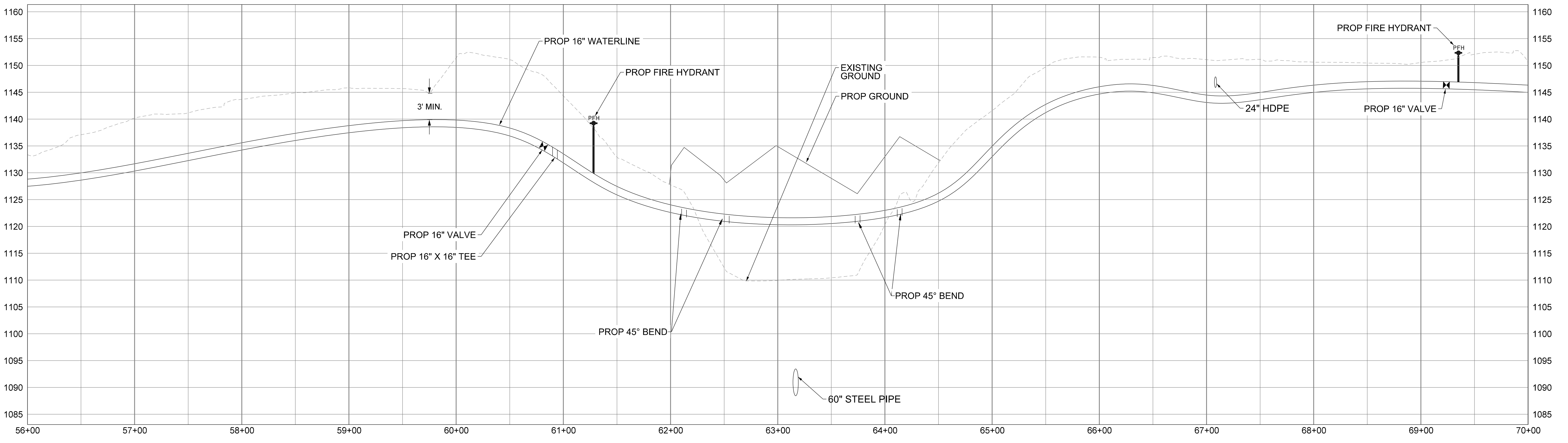
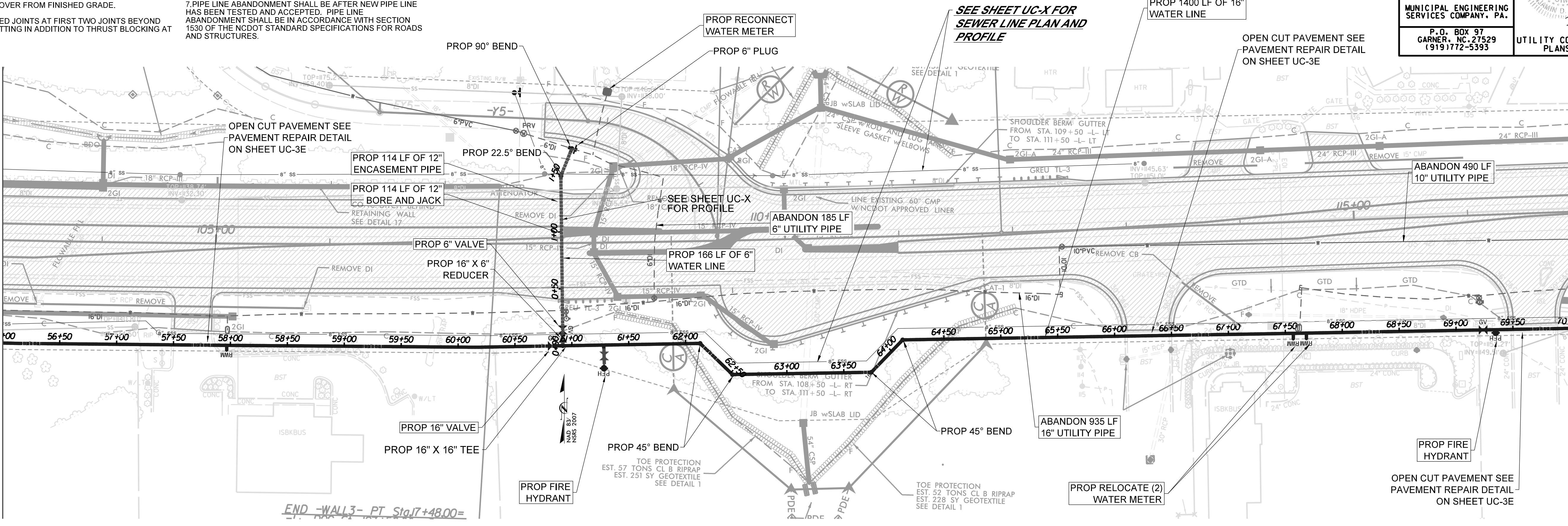
5. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
6. TWO OR MORE ADJACENT METERS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD DETAIL. ALL GANG METER INSTALLATIONS ON THIS PROJECT SHALL HAVE 1-INCH SERVICE TAP & SUPPLY LINE FROM MAIN LINE UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
7. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

TOTAL WEIGHT OF DUCTILE IRON WATER PIPE FITTINGS ON SHEET UC-23 IS 2425 LBS.

PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-23
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISID:			
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	P.O. BOX 97 GARNER, NC 27529 (919) 772-5393		
		UTILITY CONSTRUCTION PLANS ONLY	

MATCH LINE SEE SHEET UC-22

MATCH LINE SEE SHEET UC-24

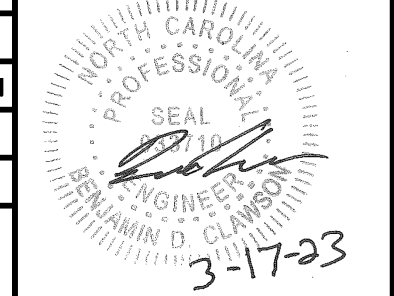


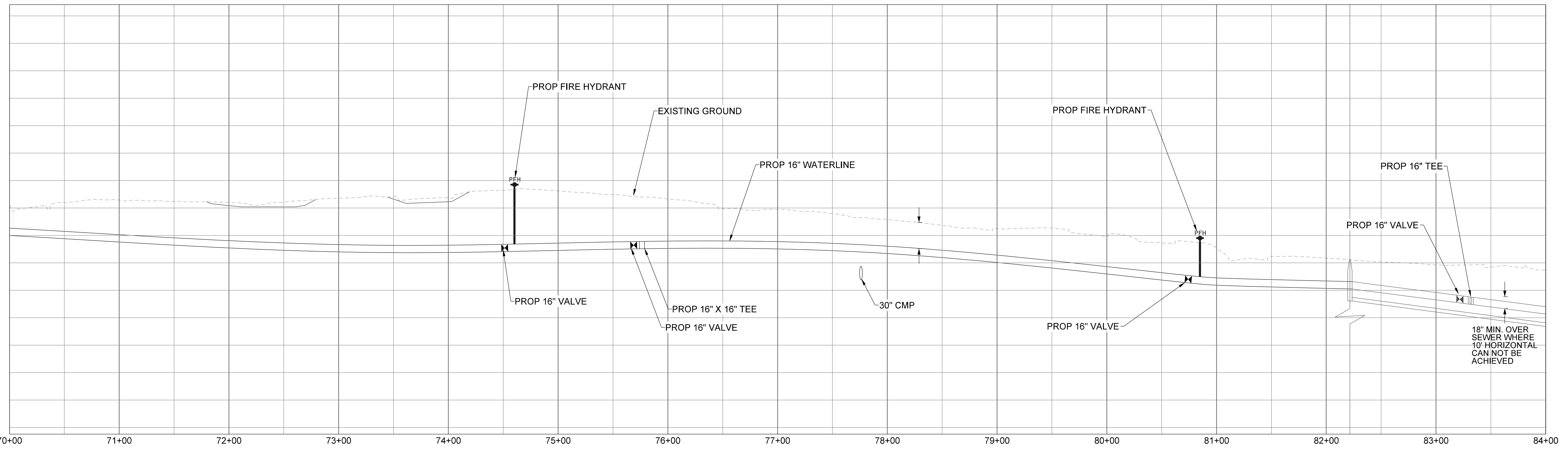
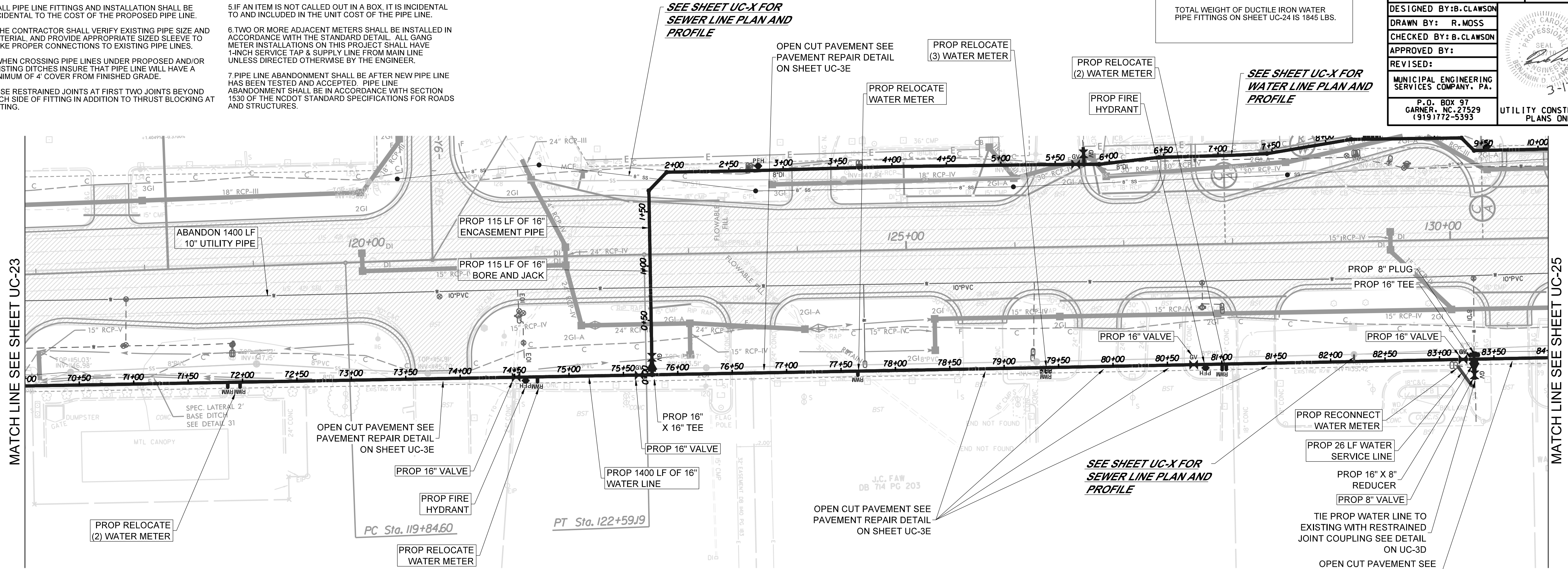
NOTES:

1. ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.
2. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
3. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
4. USE RESTRAINED JOINTS AT FIRST TWO JOINTS BEYOND EACH SIDE OF FITTING IN ADDITION TO THRUST BLOCKING AT FITTING.

5. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
6. TWO OR MORE ADJACENT METERS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD DETAIL. ALL GANG METER INSTALLATIONS ON THIS PROJECT SHALL HAVE 1-INCH SERVICE TAP & SUPPLY LINE FROM MAIN LINE UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
7. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

TOTAL WEIGHT OF DUCTILE IRON WATER PIPE FITTINGS ON SHEET UC-24 IS 1845 LBS.

PROJECT REFERENCE NO. U-5312	SHEET NO. UC-24
DESIGNED BY: B. CLAWSON	
DRAWN BY: R. MOSS	
CHECKED BY: B. CLAWSON	
APPROVED BY:	
REVISED:	
MUNICIPAL ENGINEERING SERVICES COMPANY, PA. P.O. BOX 97 GARNER, NC 27529 (919) 772-5393	
UTILITY CONSTRUCTION PLANS ONLY	



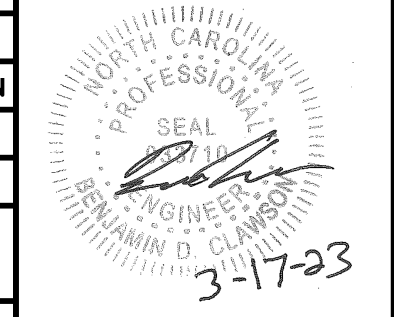
MATCH LINE SEE SHEET UC-23

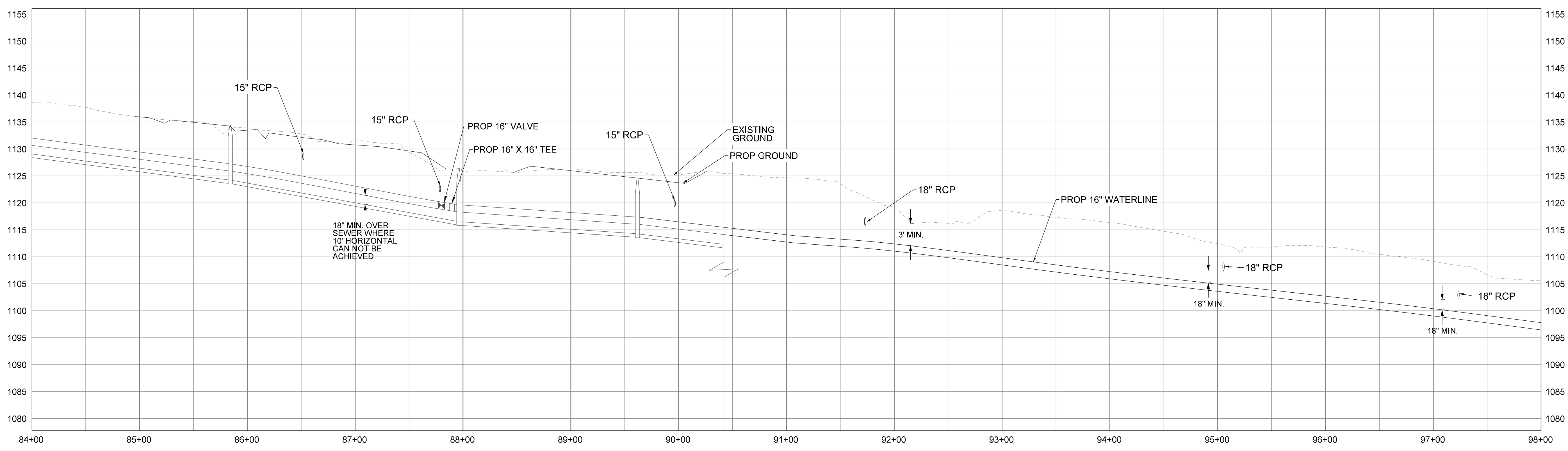
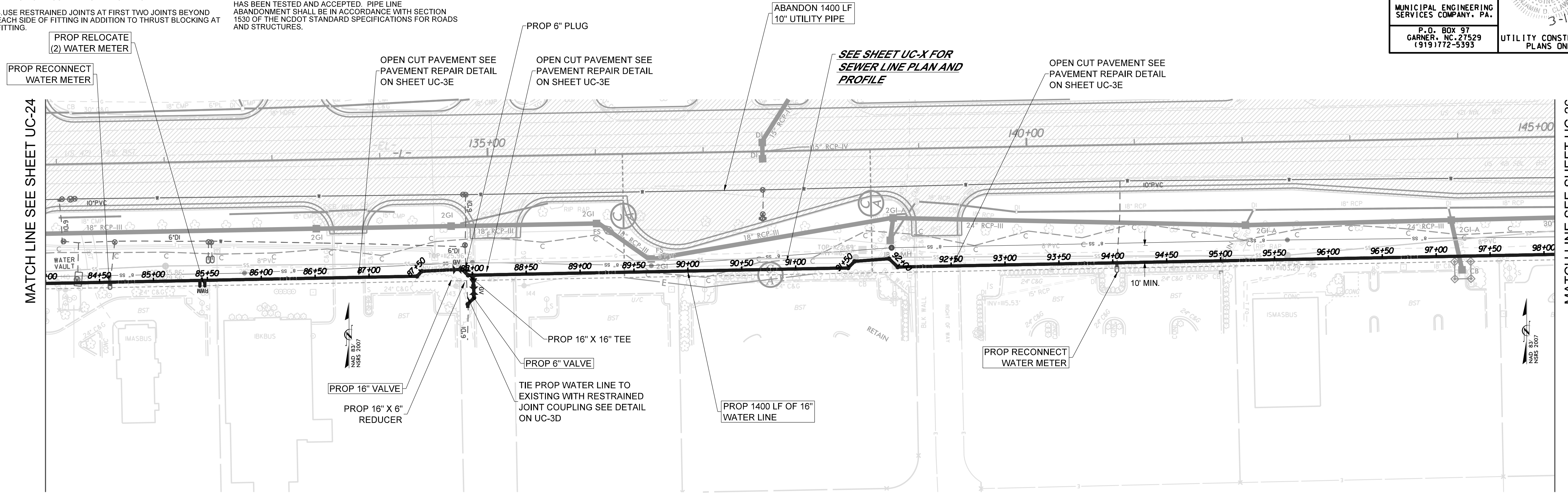
MATCH LINE SEE SHEET UC-25

NOTES:

1. ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.
2. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
3. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
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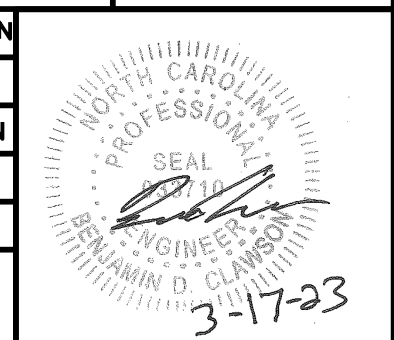
TOTAL WEIGHT OF DUCTILE IRON WATER PIPE FITTINGS ON SHEET UC-25 IS 3775 LBS.

PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-25
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISIED:			
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.		P.O. BOX 97 GARNER, NC 27529 19191772-5393	
		UTILITY CONSTRUCTION PLANS ONLY	

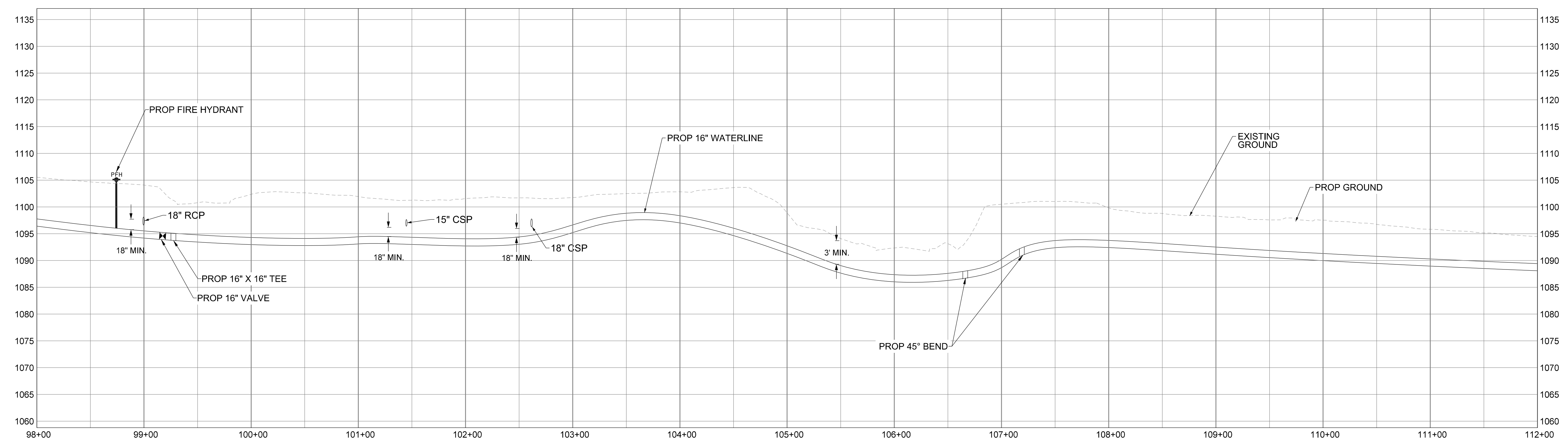
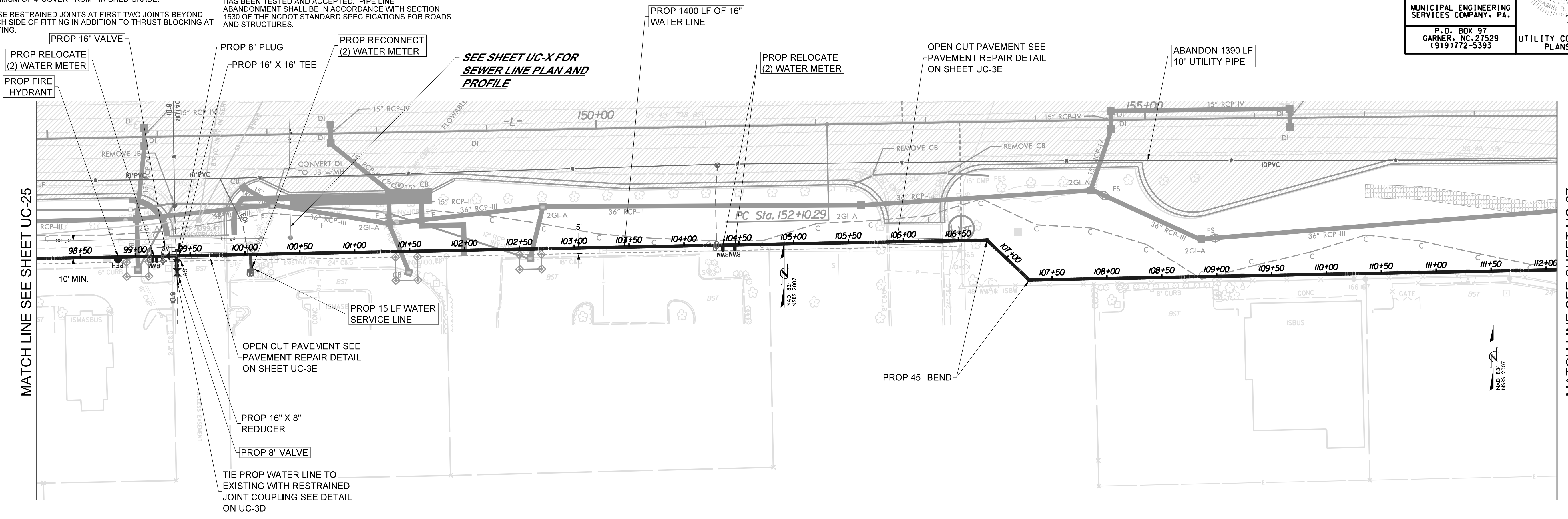


NOTES:

1. ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.
2. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
3. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
4. USE RESTRAINED JOINTS AT FIRST TWO JOINTS BEYOND EACH SIDE OF FITTING IN ADDITION TO THRUST BLOCKING AT FITTING.
5. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
6. TWO OR MORE ADJACENT METERS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD DETAIL. ALL GANG METER INSTALLATIONS ON THIS PROJECT SHALL HAVE 1-INCH SERVICE TAP & SUPPLY LINE FROM MAIN LINE UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
7. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-26
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISID:			
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.		P.O. BOX 97 GARNER, NC. 27529 19191772-5393	
		UTILITY CONSTRUCTION PLANS ONLY	

TOTAL WEIGHT OF DUCTILE IRON WATER PIPE FITTINGS ON SHEET UC-26 IS 1625 LBS.

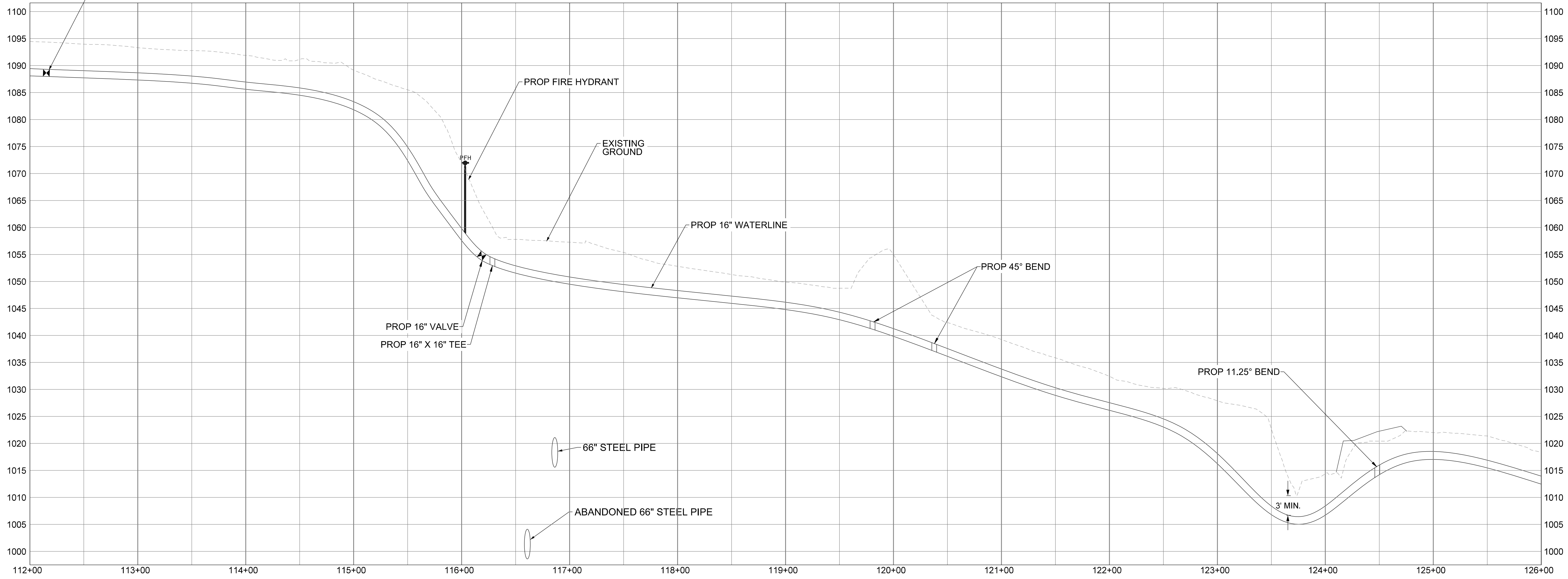
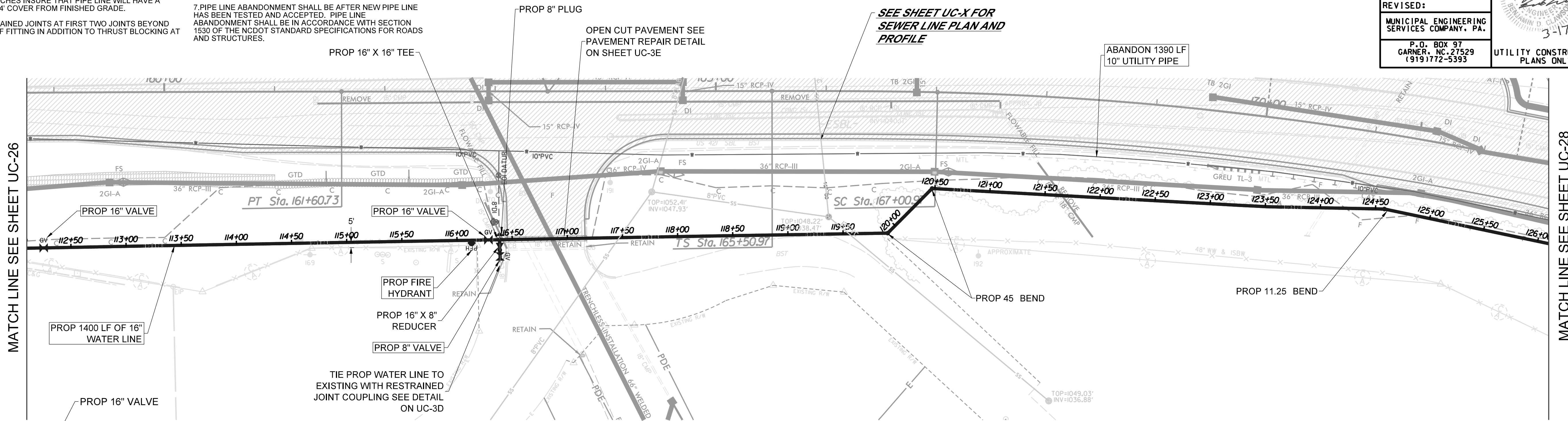
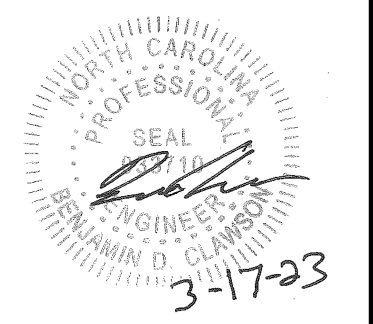


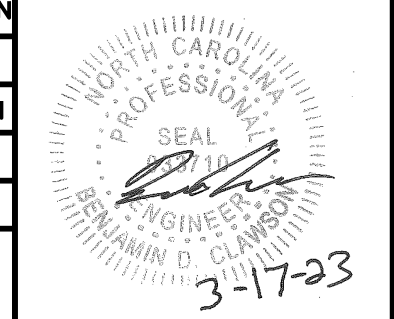
NOTES:

1. ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.
2. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
3. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
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6. TWO OR MORE ADJACENT METERS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD DETAIL. ALL GANG METER INSTALLATIONS ON THIS PROJECT SHALL HAVE 1-INCH SERVICE TAP & SUPPLY LINE FROM MAIN LINE UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
7. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

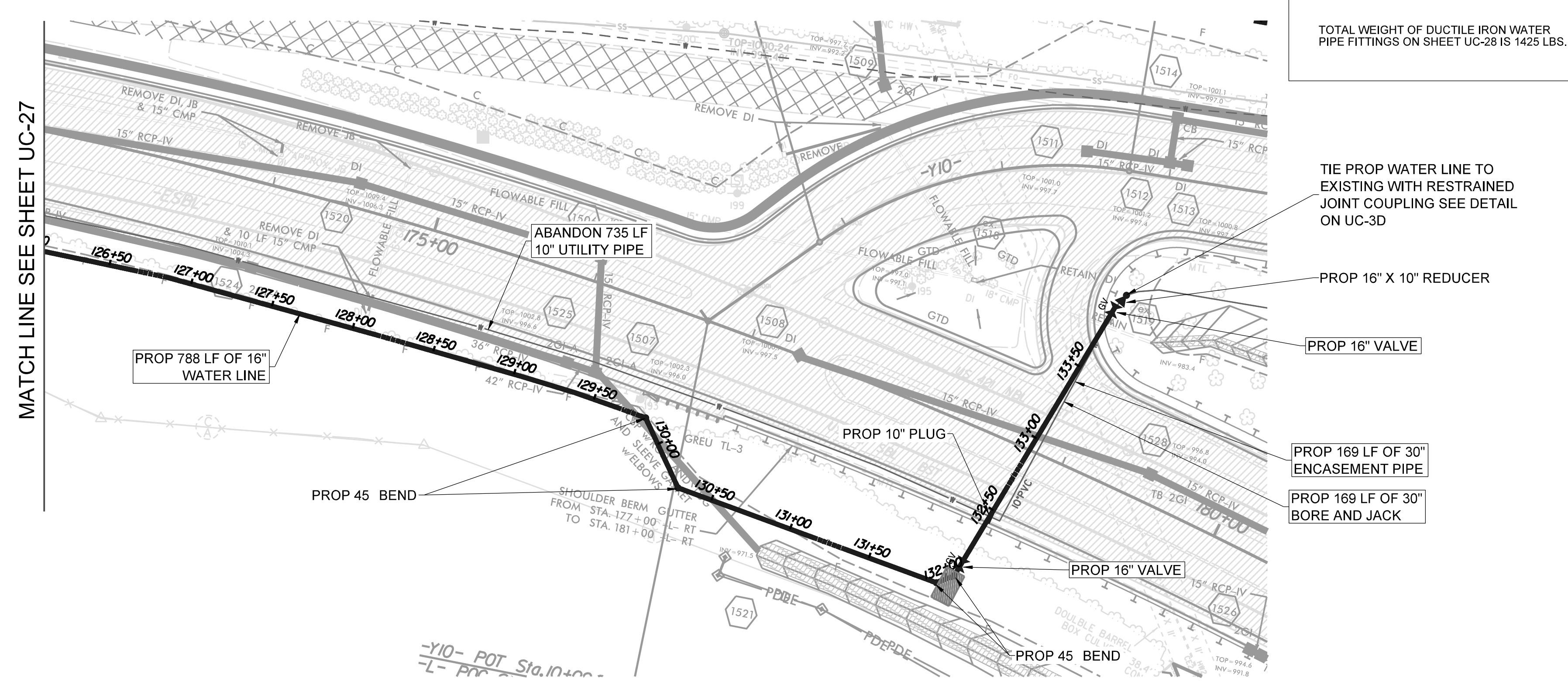
TOTAL WEIGHT OF DUCTILE IRON WATER PIPE FITTINGS ON SHEET UC-27 IS 1970 LBS.

PROJECT REFERENCE NO.	SHEET NO.
U-5312	UC-27
DESIGNED BY: B. CLAWSON	
DRAWN BY: R. MOSS	
CHECKED BY: B. CLAWSON	
APPROVED BY:	
REVISED:	
MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.	
P.O. BOX 97 GARNER, NC. 27529 (919) 772-5393	UTILITY CONSTRUCTION PLANS ONLY



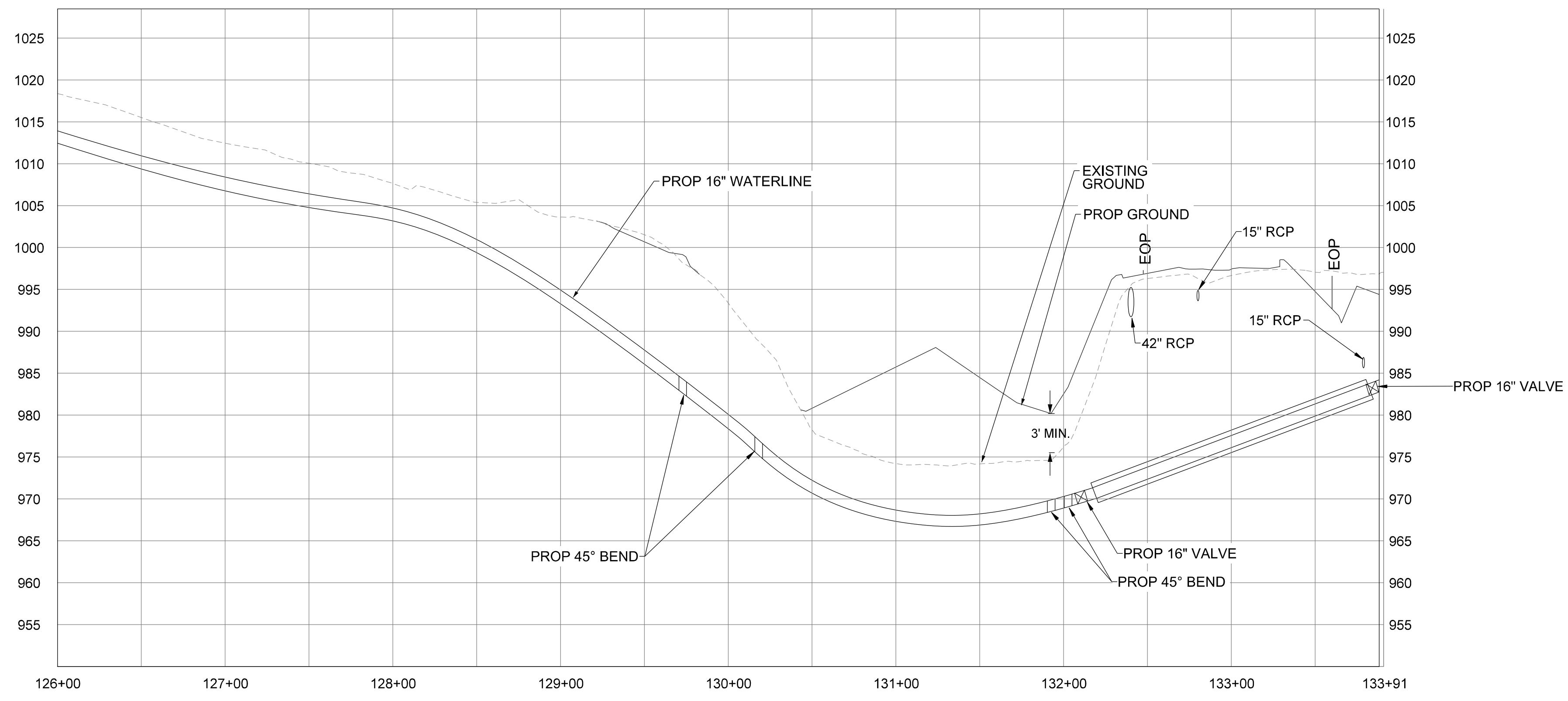
PROJECT REFERENCE NO.	SHEET NO.
U-5312	UC-28
DESIGNED BY: B. CLAWSON	
DRAWN BY: R. MOSS	
CHECKED BY: B. CLAWSON	
APPROVED BY:	
REVISER:	
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	
P.O. BOX 97 GARNER, NC 27529 1919172-5393	UTILITY CONSTRUCTION PLANS ONLY

- NOTES:
- ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.
  - THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
  - WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
  - USE RESTRAINED JOINTS AT FIRST TWO JOINTS BEYOND EACH SIDE OF FITTING IN ADDITION TO THRUST BLOCKING AT FITTING.
  - IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
  - TWO OR MORE ADJACENT METERS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD DETAIL. ALL GANG METER INSTALLATIONS ON THIS PROJECT SHALL HAVE 1-INCH SERVICE TAP & SUPPLY LINE FROM MAIN LINE UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
  - PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

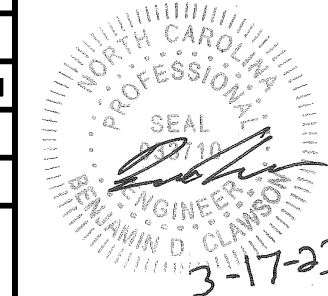


TOTAL WEIGHT OF DUCTILE IRON WATER PIPE FITTINGS ON SHEET UC-28 IS 1425 LBS.

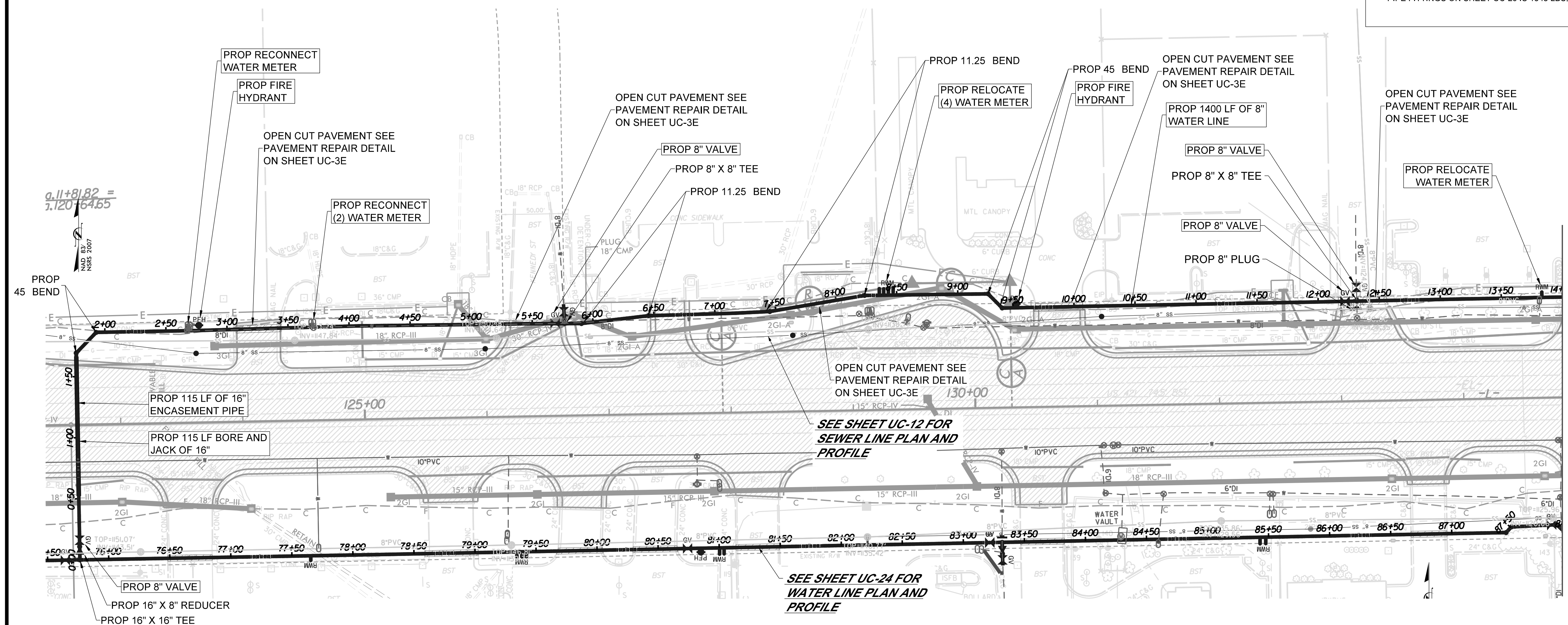
- TIE PROP WATER LINE TO EXISTING WITH RESTRAINED JOINT COUPLING SEE DETAIL ON UC-3D
- PROP 16" X 10" REDUCER
- PROP 16" VALVE
- PROP 169 LF OF 30" ENCASEMENT PIPE
- PROP 169 LF OF 30" BORE AND JACK



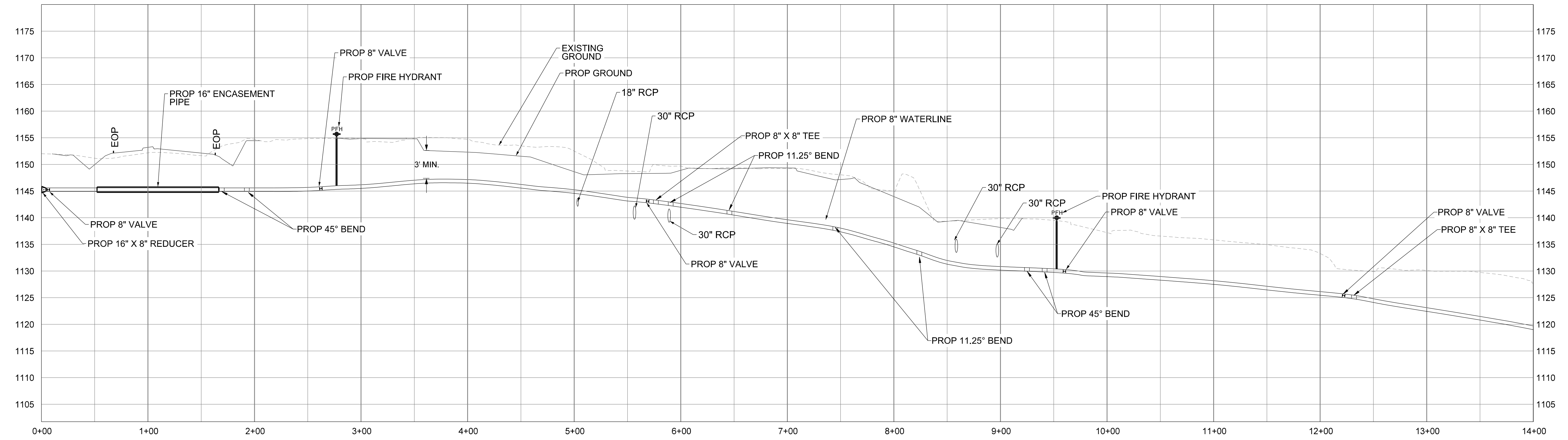


PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-29
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISED:			
MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.	P.O. BOX 97 GARNER, NC 27529 19191772-5393		UTILITY CONSTRUCTION PLANS ONLY

TOTAL WEIGHT OF DUCTILE IRON WATER PIPE FITTINGS ON SHEET UC-29 IS 1545 LBS.

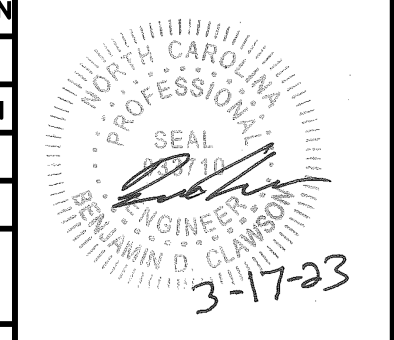


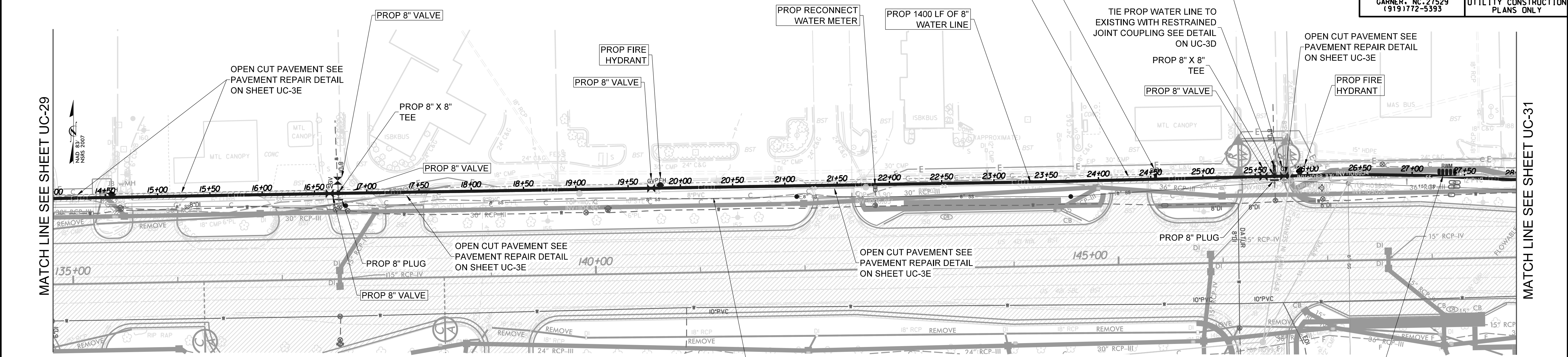
- NOTES:
1. ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.
  2. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
  3. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
  4. USE RESTRAINED JOINTS AT FIRST TWO JOINTS BEYOND EACH SIDE OF FITTING IN ADDITION TO THRUST BLOCKING AT FITTING.
  5. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
  6. TWO OR MORE ADJACENT METERS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD DETAIL. ALL GANG METER INSTALLATIONS ON THIS PROJECT SHALL HAVE 1-INCH SERVICE TAP & SUPPLY LINE FROM MAIN LINE UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
  7. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.



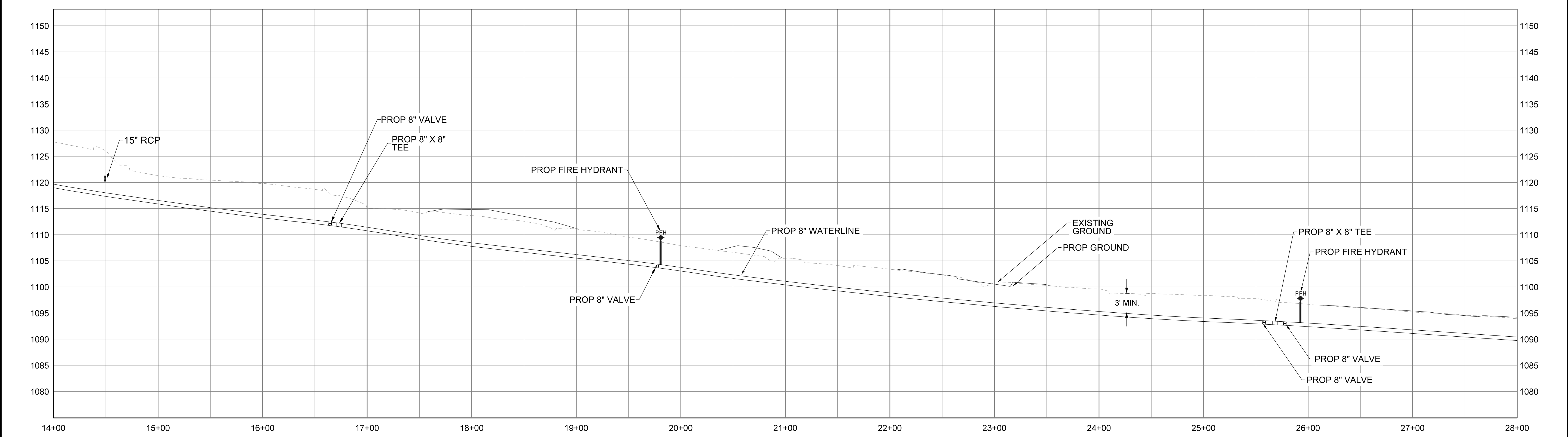
**NOTES:**

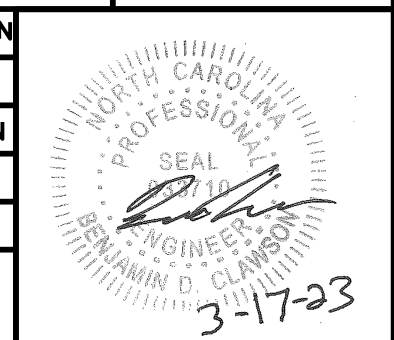
1. ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.
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PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-30
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISID:			
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.			
P.O. BOX 97 GARNER, NC 27529 (919) 772-5393			
UTILITY CONSTRUCTION PLANS ONLY			



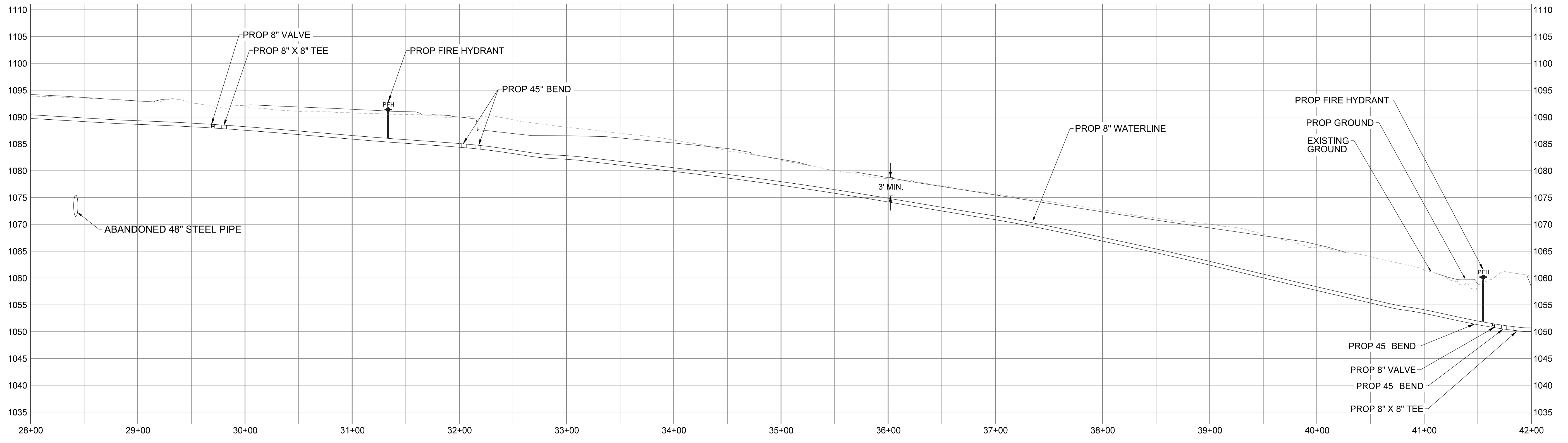
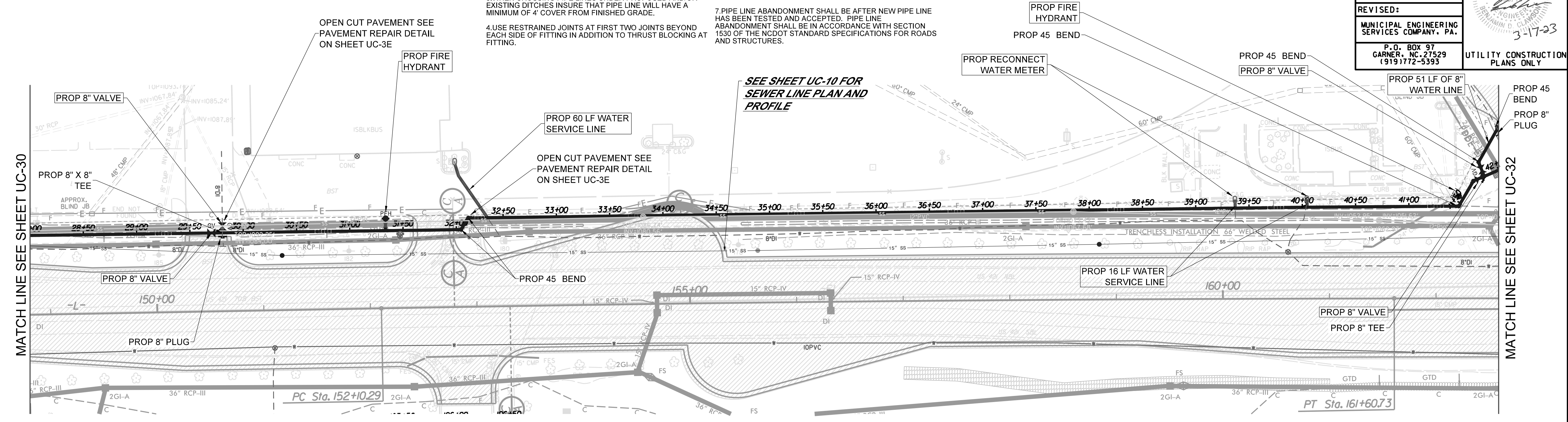
SEE SHEET UC-11 FOR SEWER LINE PLAN AND PROFILE

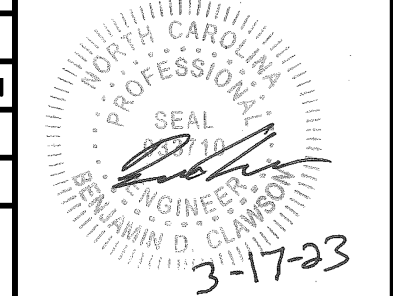


PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-31
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISED:			
MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.		UTILITY CONSTRUCTION PLANS ONLY	
P.O. BOX 97 GARNER, NC 27529 (919) 772-5393			

- NOTES:
1. ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.
  2. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
  3. WHEN CROSSING PIPE LINES UNDER PROPOSED AND/OR EXISTING DITCHES INSURE THAT PIPE LINE WILL HAVE A MINIMUM OF 4' COVER FROM FINISHED GRADE.
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TOTAL WEIGHT OF DUCTILE IRON WATER PIPE FITTINGS ON SHEET UC-31 IS 1010 LBS.

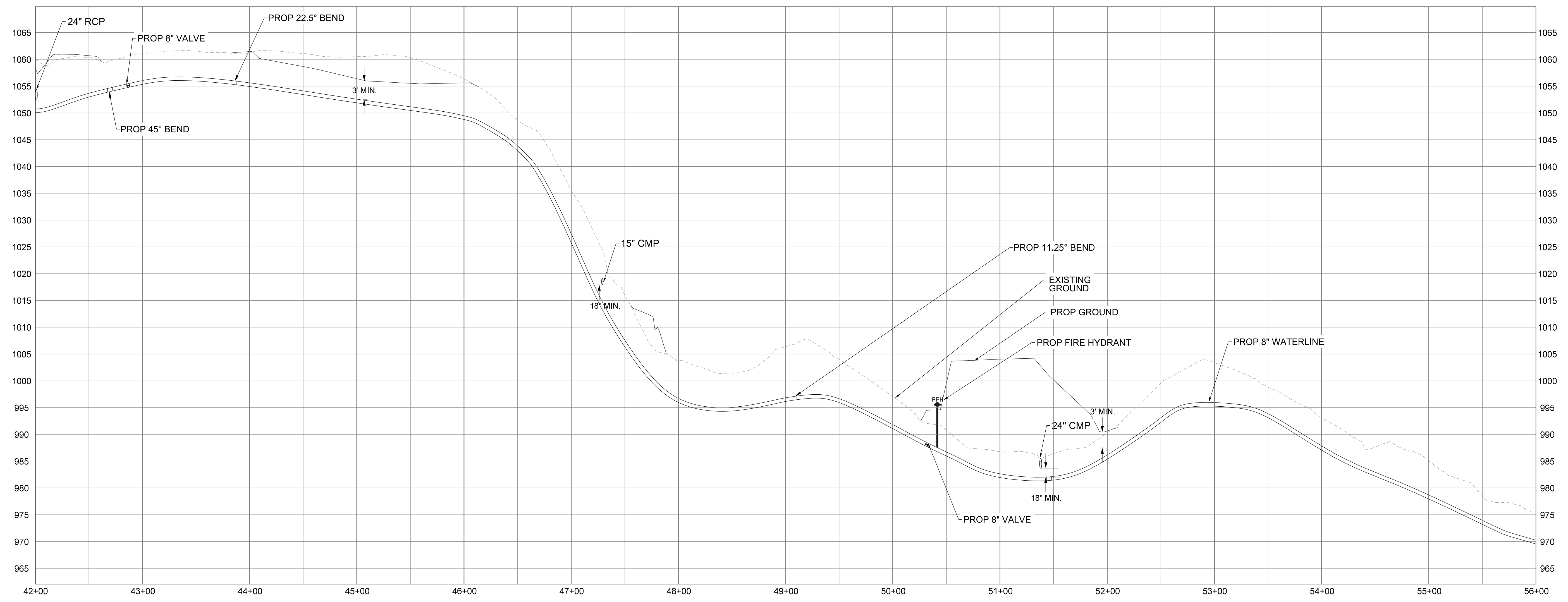
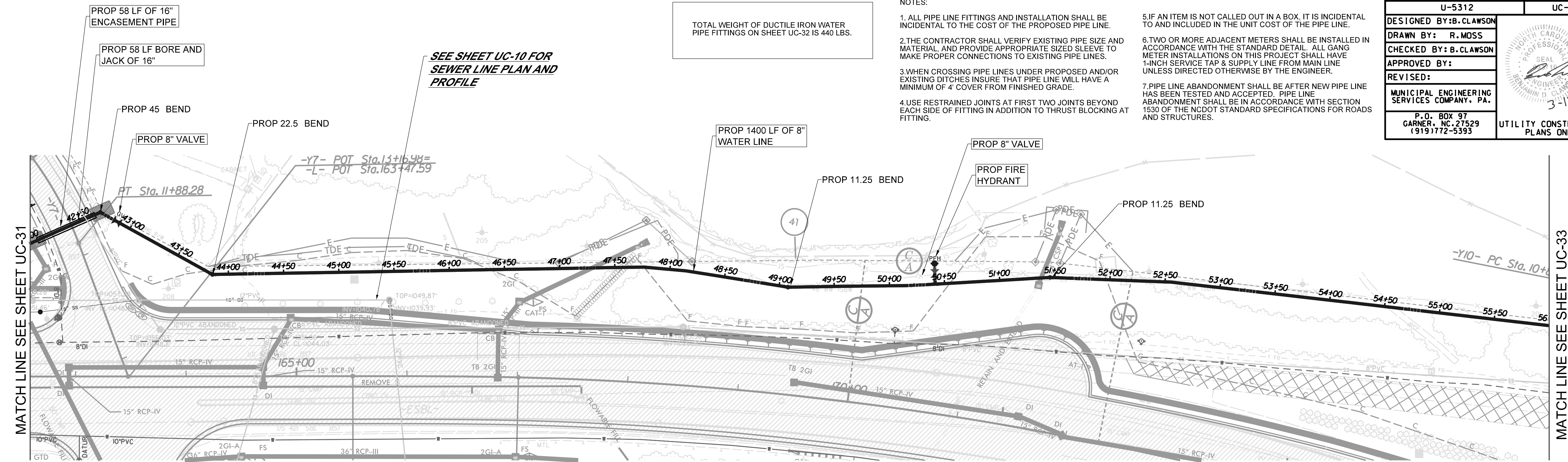


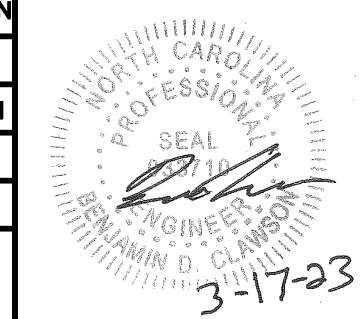
PROJECT REFERENCE NO.	U-5312	SHEET NO.	UC-32
DESIGNED BY:	B. CLAWSON		
DRAWN BY:	R. MOSS		
CHECKED BY:	B. CLAWSON		
APPROVED BY:			
REVISER:			
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.		P.O. BOX 97 GARNER, NC 27529 (919) 772-5393	
		UTILITY CONSTRUCTION PLANS ONLY	

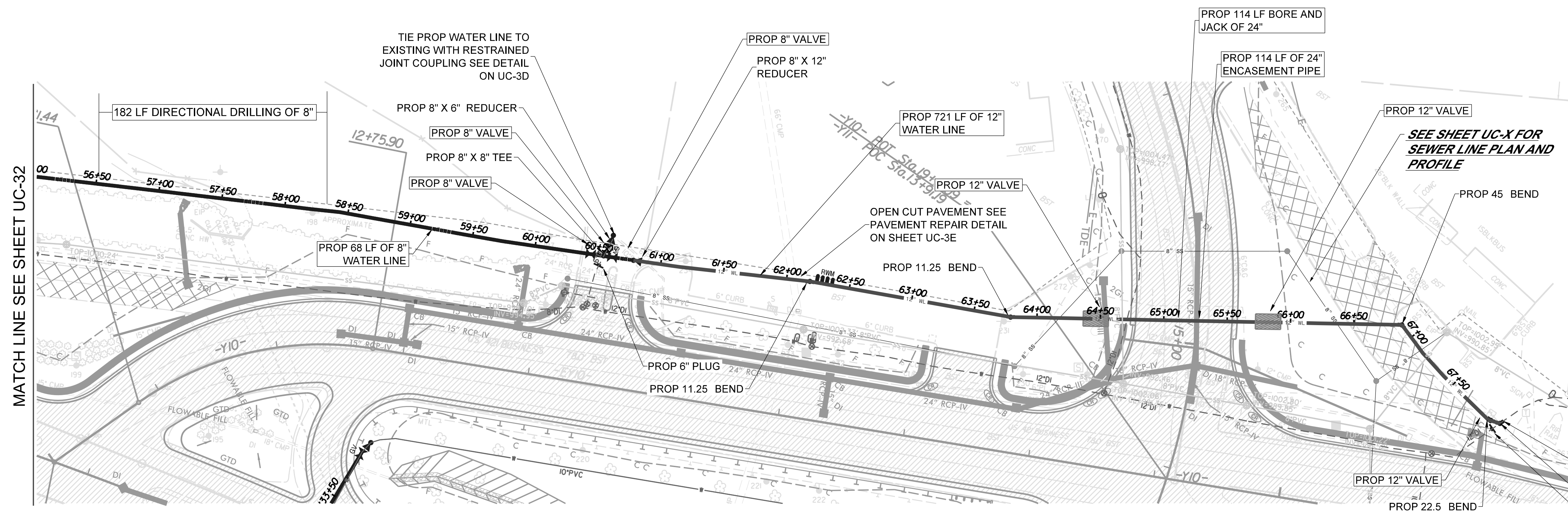
- NOTES:
1. ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.
  2. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
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TOTAL WEIGHT OF DUCTILE IRON WATER PIPE FITTINGS ON SHEET UC-32 IS 440 LBS.

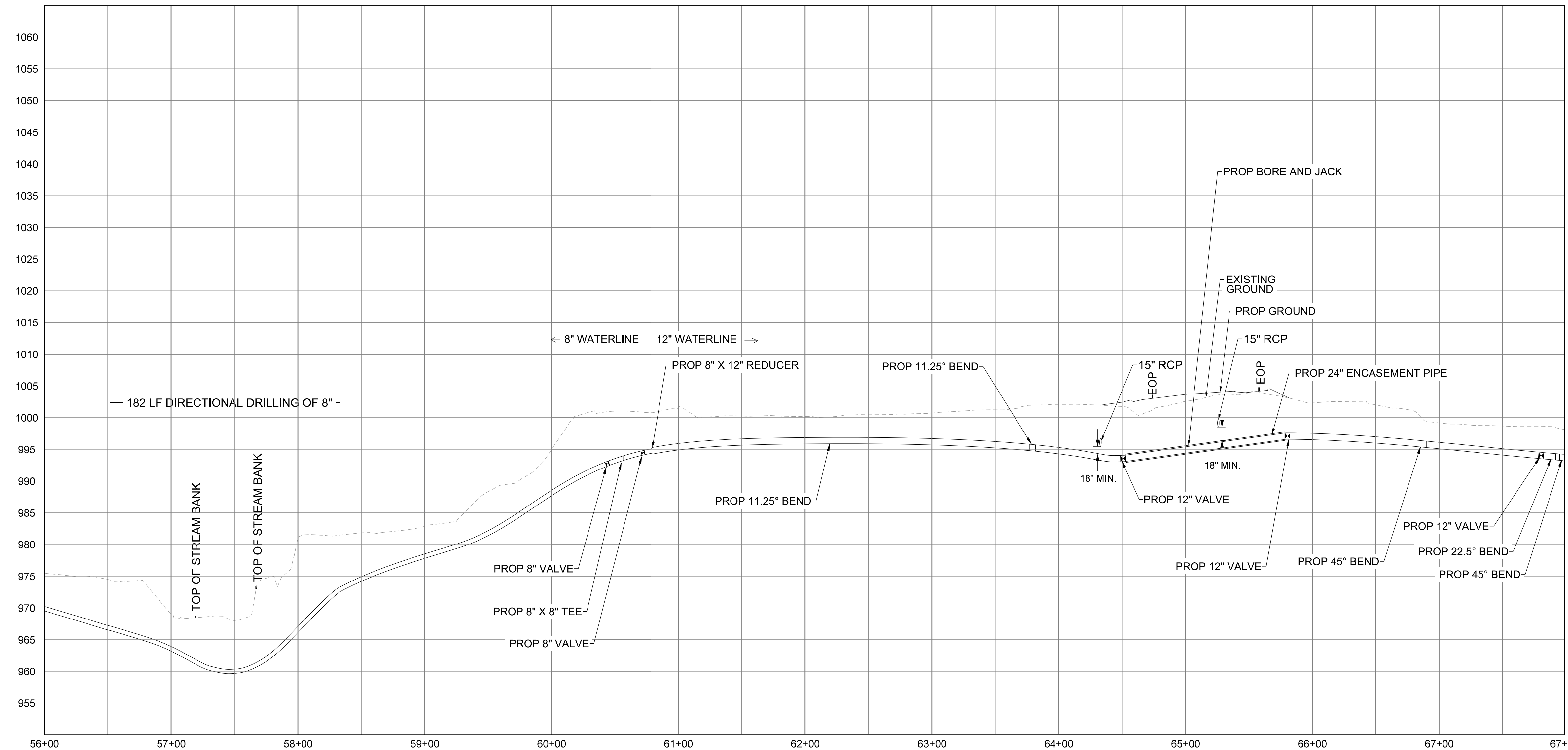
SEE SHEET UC-10 FOR SEWER LINE PLAN AND PROFILE



PROJECT REFERENCE NO.	SHEET NO.
U-5312	UC-33
DESIGNED BY: B. CLAWSON	
DRAWN BY: R. MOSS	
CHECKED BY: B. CLAWSON	
APPROVED BY:	
REVISED:	
MUNICIPAL ENGINEERING SERVICES COMPANY, P.A.	UTILITY CONSTRUCTION PLANS ONLY
P.O. BOX 97 GARNER, NC 27529 1919172-5393	



- NOTES:
1. ALL PIPE LINE FITTINGS AND INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE PROPOSED PIPE LINE.
  2. THE CONTRACTOR SHALL VERIFY EXISTING PIPE SIZE AND MATERIAL, AND PROVIDE APPROPRIATE SIZED SLEEVE TO MAKE PROPER CONNECTIONS TO EXISTING PIPE LINES.
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  7. PIPE LINE ABANDONMENT SHALL BE AFTER NEW PIPE LINE HAS BEEN TESTED AND ACCEPTED. PIPE LINE ABANDONMENT SHALL BE IN ACCORDANCE WITH SECTION 1530 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.



TOTAL WEIGHT OF DUCTILE IRON WATER PIPE FITTINGS ON SHEET UC-33 IS 1645 LBS.