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See Sheet 1A For Index of Sheets
 See Sheet 1B For Conventional Symbols
 See 1C Sheet Series For Survey Control

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

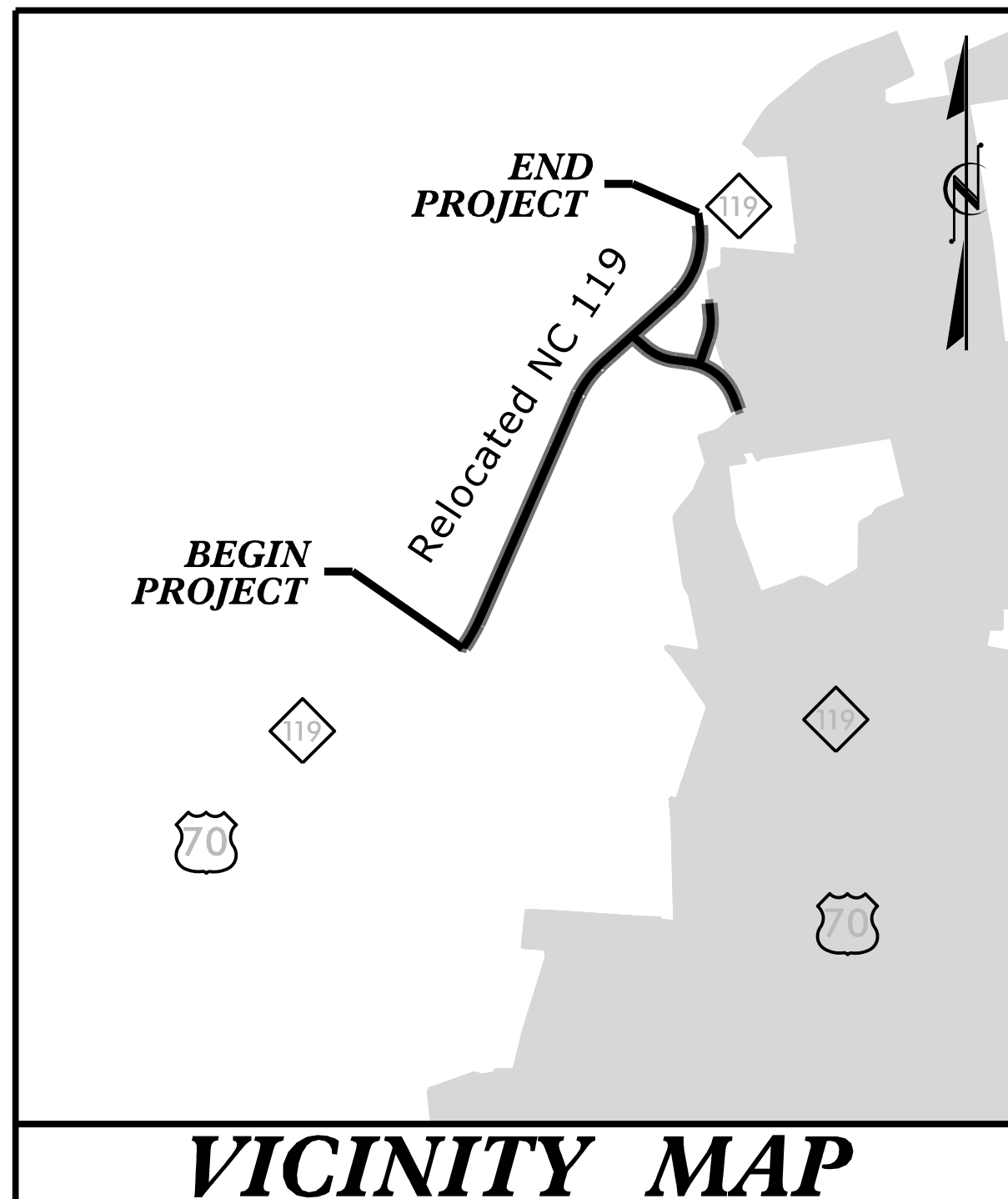
T.I.P. NO.	SHEET NO.
U-3109B	UC-1

AGREEMENT PLANS

ALAMANCE COUNTY

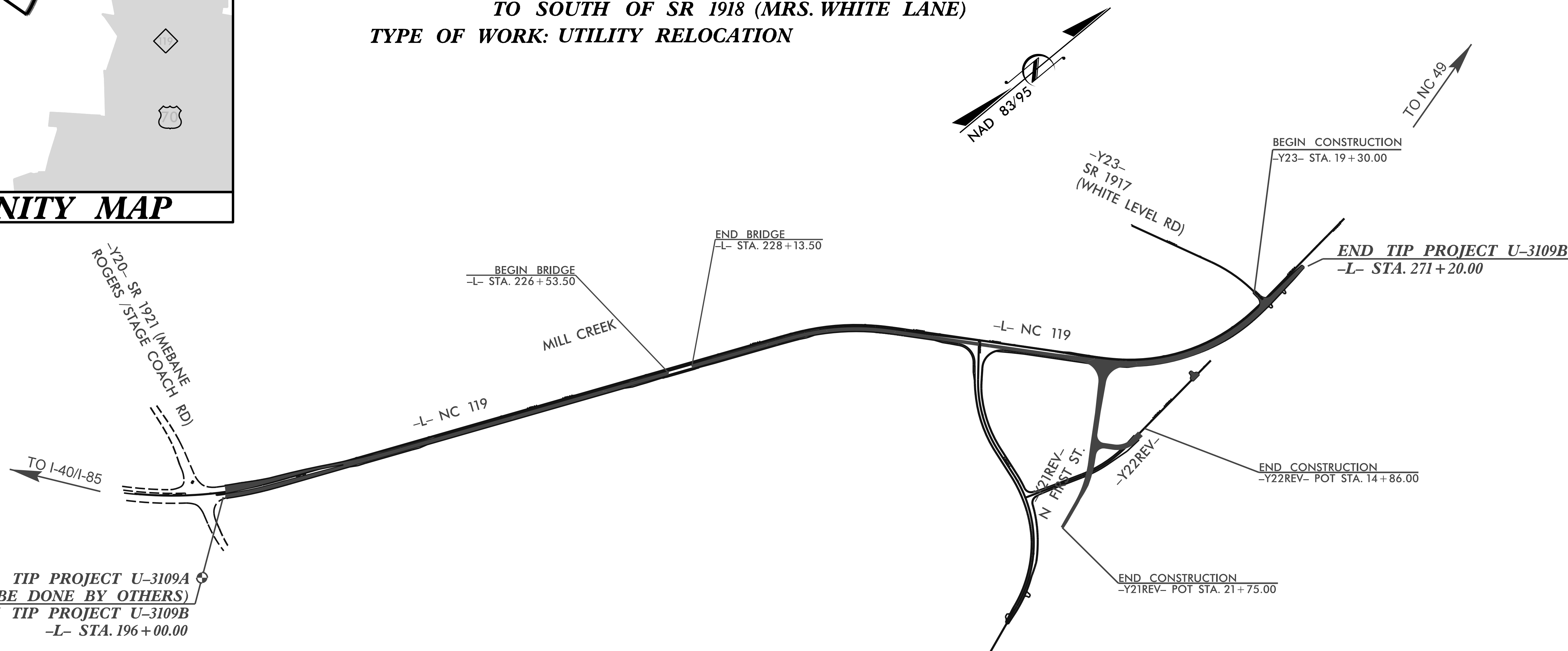
**LOCATION: NC 119 RELOCATION FROM NORTH OF
 SR 1921 (MEBANE ROGERS/STAGE COACH ROAD)
 TO SOUTH OF SR 1918 (MRS. WHITE LANE)**
TYPE OF WORK: UTILITY RELOCATION

TIP PROJECT: U-3109B



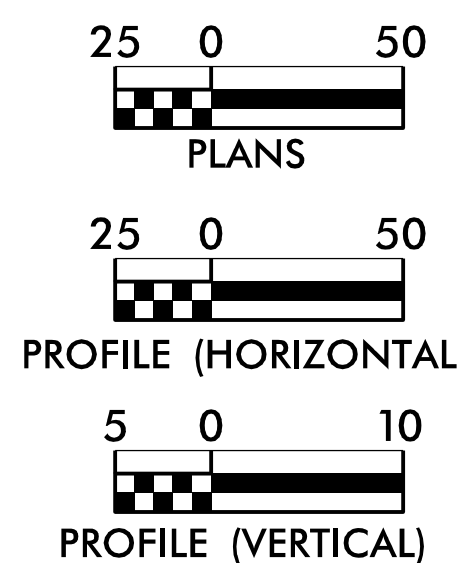
VICINITY MAP

NOT TO SCALE



CONTRACT:

GRAPHIC SCALES



SHEET No.	DESCRIPTION	INDEX OF SHEETS
UC-1	TITLE SHEET	
UC-2	PLAN SHEET SYMBOLS	
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UC-3A TO UC-3B	NOTES AND DETAILS ORANGE ALAMANCE WATER	
UC-4	PLAN AND PROFILE SHEET ORANGE ALAMANCE WATER	
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UC-6	PROFILE SHEET CITY OF MEBANE WATER	
UC-7	DETAIL SHEET CITY OF MEBANE WATER	

UTILITY OWNERS ON PROJECT

UTILITY	OWNER
WATER	ORANGE ALAMANCE WATER SYSTEM, INC. PHONE: (919) 563-6212
WATER	CITY OF MEBANE PHONE: (919) 563-5901

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 William H. Dixon, P.E.

alley, williams, carmen & king, inc.
 ENGINEERS, ARCHITECTS & SURVEYORS
 740 chapel hill road burlington, n.c. 27215 p.o. box 1179 336/226-5534
 Firm's Engineering License No. F-0203
UTILITY DESIGN ENGINEER Troy King, P.E.

PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS UTILITIES UNIT
 1555 MAIL SERVICES CENTER RALEIGH NC 27699-1555
 PHONE (919) 707-6690 FAX (919) 256-4119

Vacant UTILITIES REGIONAL ENGINEER
Tucker R. Martin, P.E. UTILITIES PROJECT ENGINEER
Tanga Sampson UTILITIES COORDINATOR

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	
11¼ Degree Bend	
22½ 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		Sanitary Sewer Cleanout	
End of Information			

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



PROJECT REFERENCE NO.	SHEET NO.
U-3109B	UC-3
DESIGNED BY: B.DIXON	
DRAWN BY: R. MOSS	
CHECKED BY: B.DIXON	
APPROVED BY:	
REVISED:	
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	UTILITY CONSTRUCTION PLANS ONLY
P.O. BOX 97 GARNER, NC. 27529 1919172-5393	


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

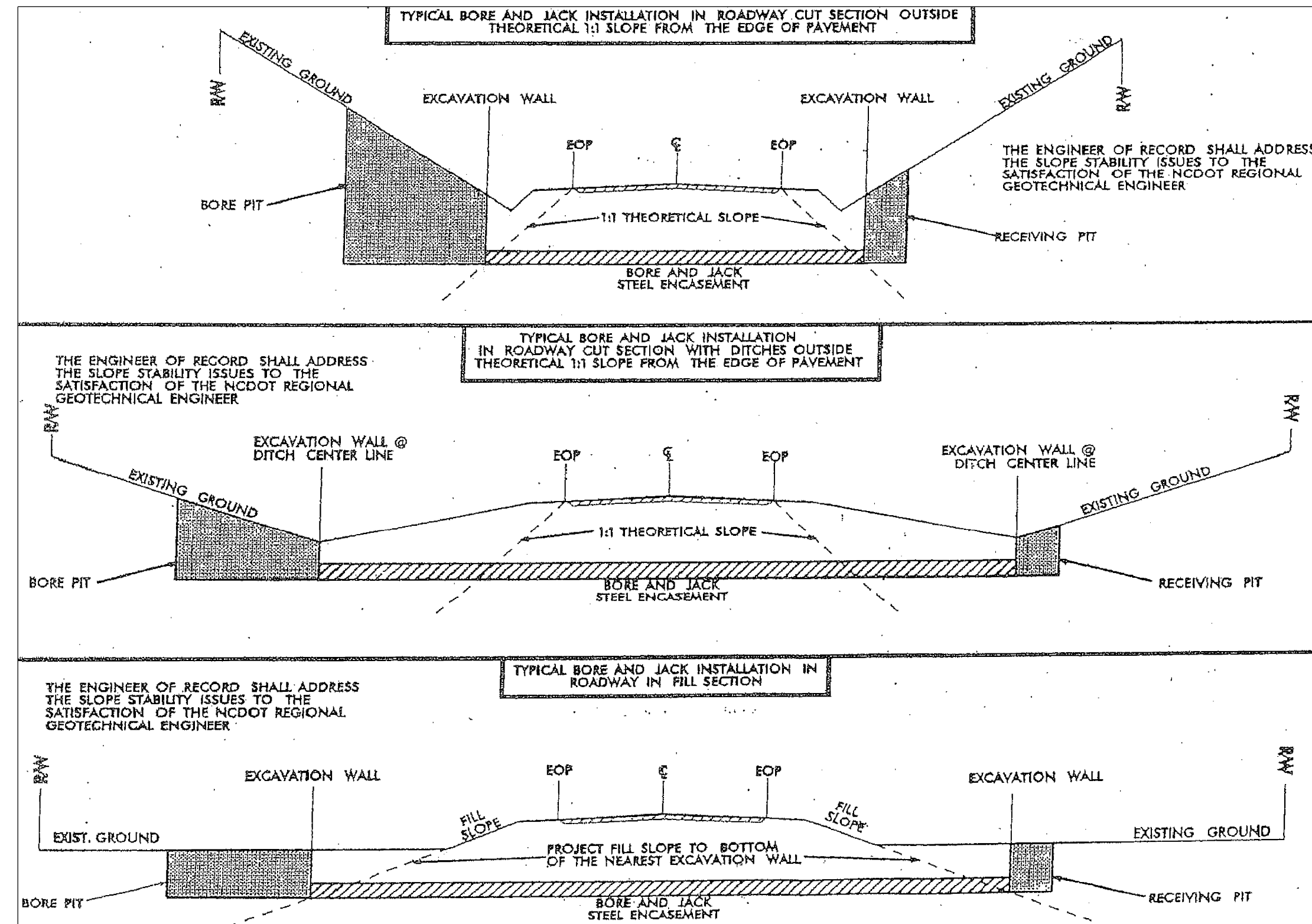
PROJECT TYPICAL DETAILS

NOTE:

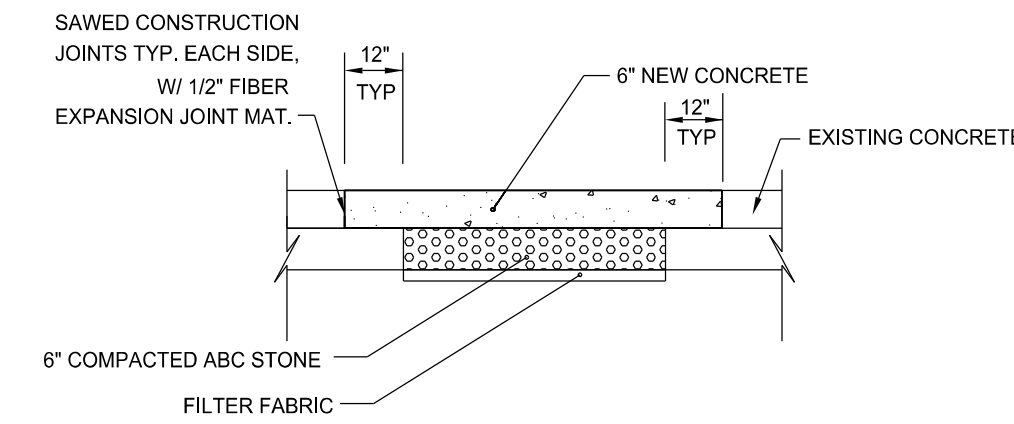
1. AN AS-BUILT PLAN AND PROFILE SHALL BE PROVIDED FROM ENTRY TO EXIT FOR EACH DIRECTIONAL BORE SECTION BY THE DIRECTIONAL BORE CONTRACTOR. THIS SHALL INCLUDE ACCURATE HORIZONTAL AND VERTICAL DIMENSIONS AND SHALL MEET OR EXCEED NCDOT VERTICAL REQUIREMENTS FROM HDD PIPE TO EDGE OF PAVEMENT.
2. ALL BORE 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-3109B	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 1919 1772-5393	
UTILITY CONSTRUCTION PLANS ONLY	

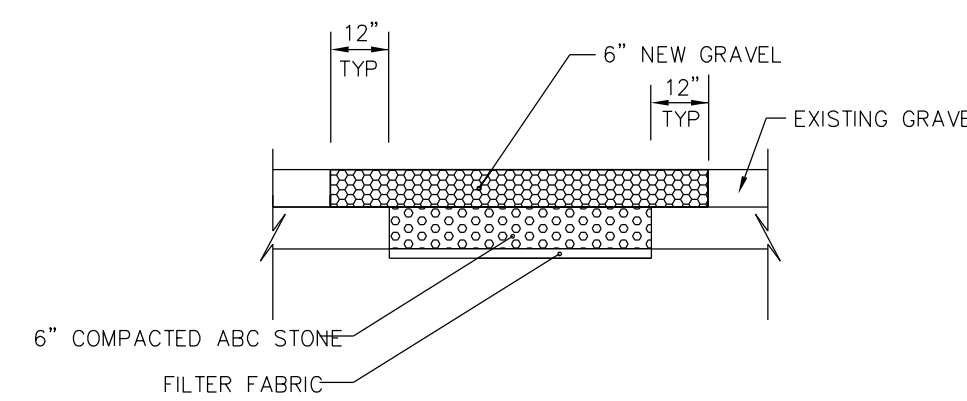
UTILITY CONSTRUCTION



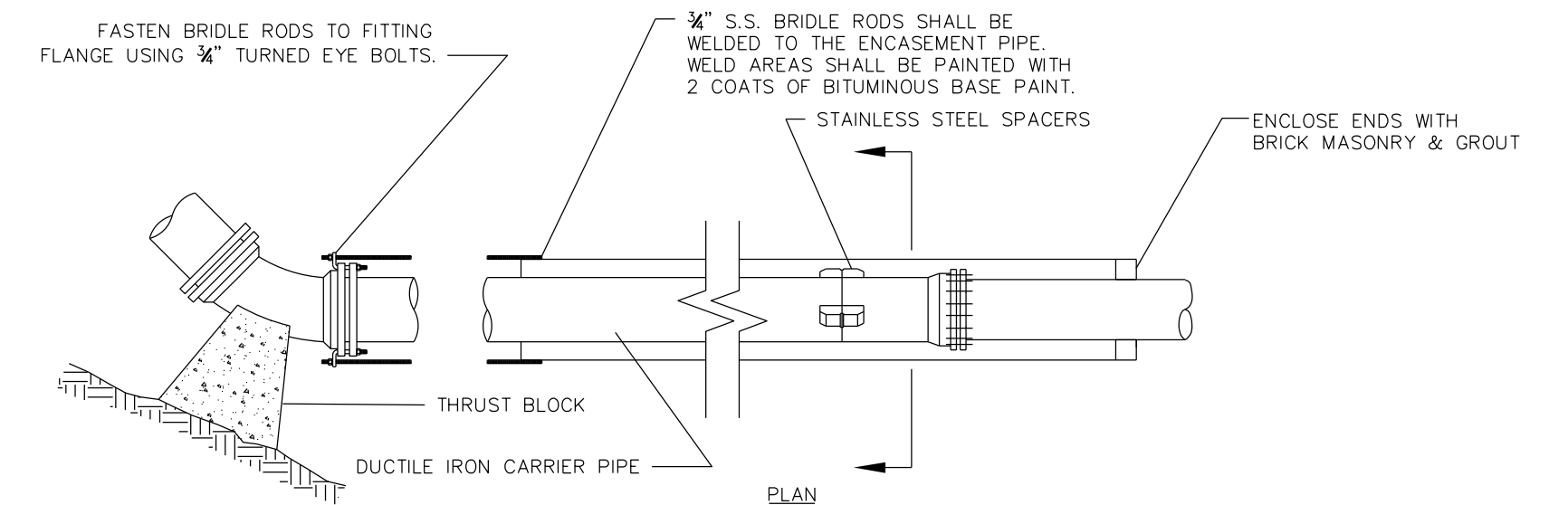
PROPOSED SECTIONS



CONCRETE DRIVE REPAIR DETAIL



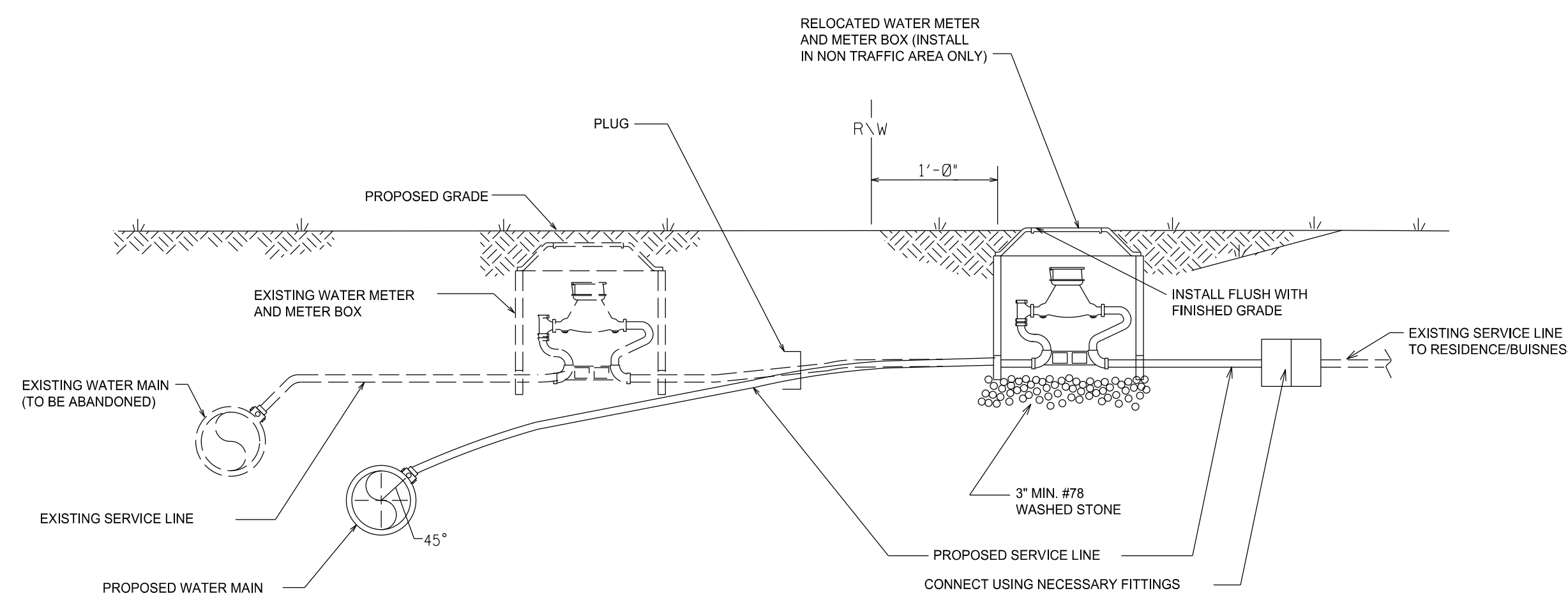
GRAVEL DRIVE REPAIR DETAIL



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



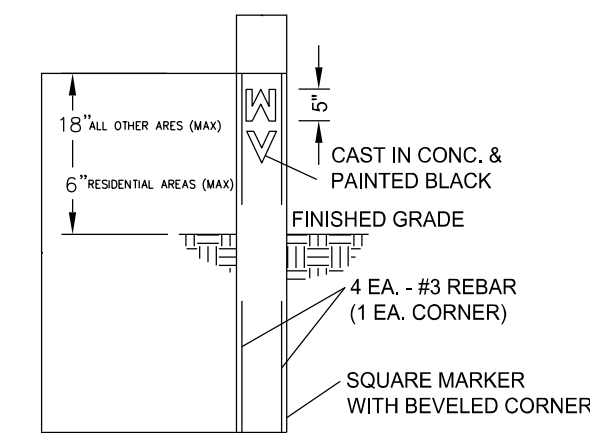
WATER METER RELOCATION DETAIL

NOTES:

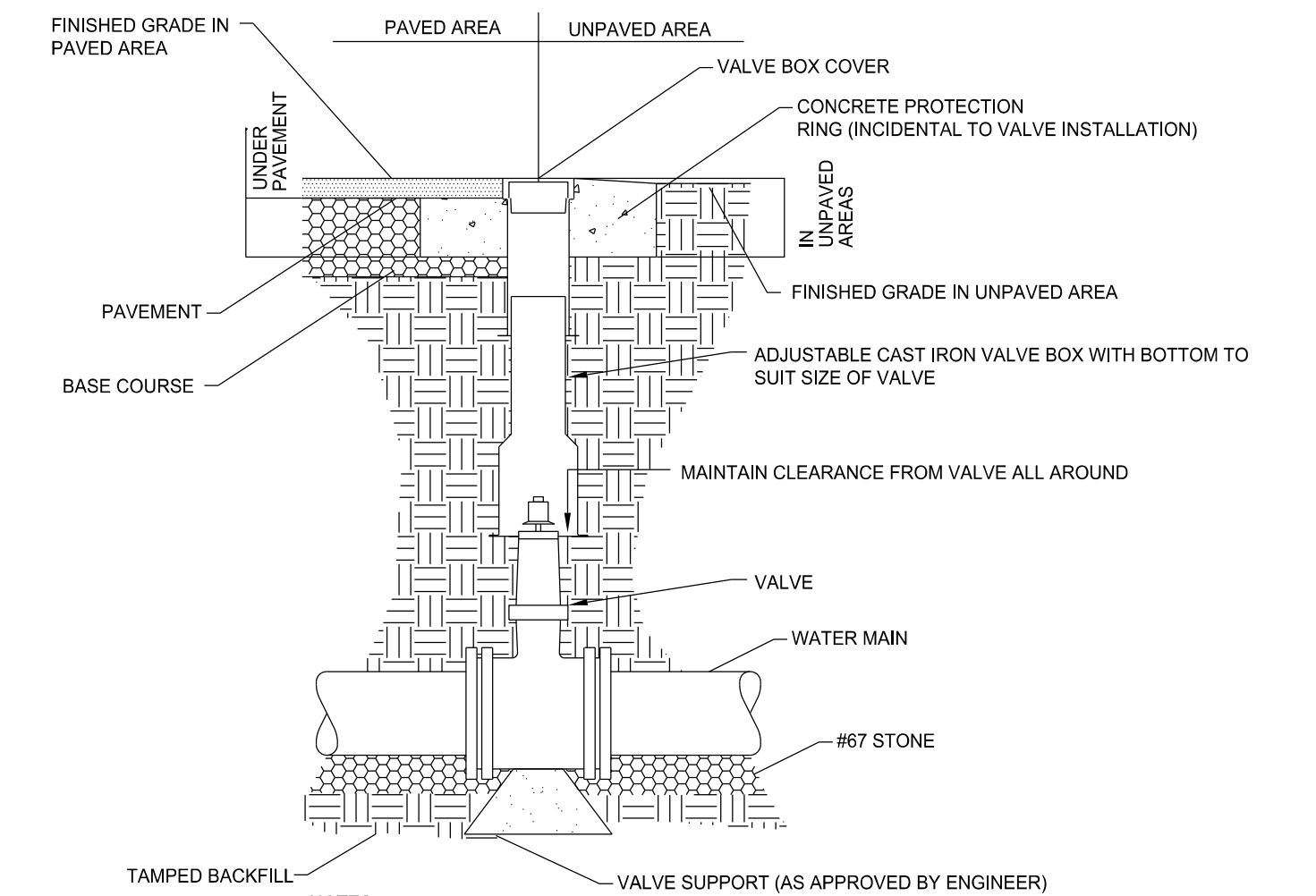
1. RELOCATION SHALL INCLUDE THE REMOVAL AND INSTALLATION AT THE SPECIFIED LOCATION OF THE WATER METER, METER SETTER AND YOKE, METER VALVES, AND METER BOX WITH LID, AND CONNECTION TO PROPOSED WATER MAIN AND EXISTING SERVICE.
2. THE NEW WATER SERVICE LINE SHALL BE OF THE SAME TYPE AND GRADE AS THE EXISTING 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



NOTES:

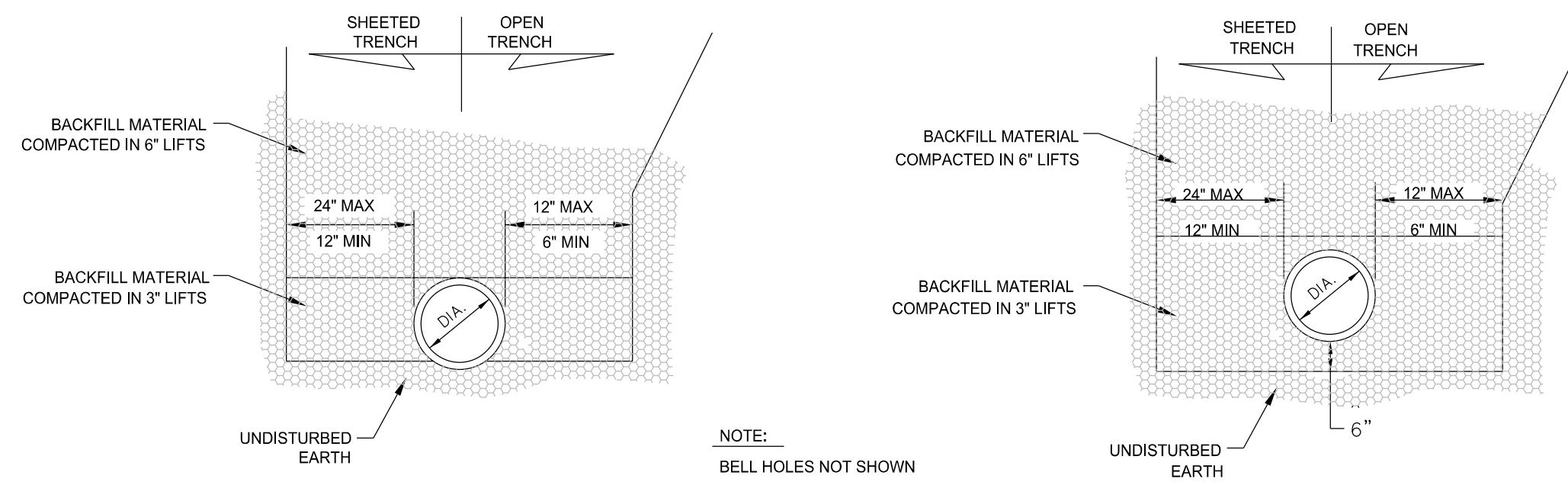
1. DIP MAY BE USED FOR VALVE BOX EXTENSION
2. VALVE BOX SHALL NOT CONTACT WATERMAIN OR VALVE
3. CONCRETE PROTECTION RING SHALL BE USED IN ALL UNPAVED AREAS
4. VALVE BOX AND COVER INCIDENTAL TO VALVE INSTALLATION

TYPICAL VALVE DETAIL

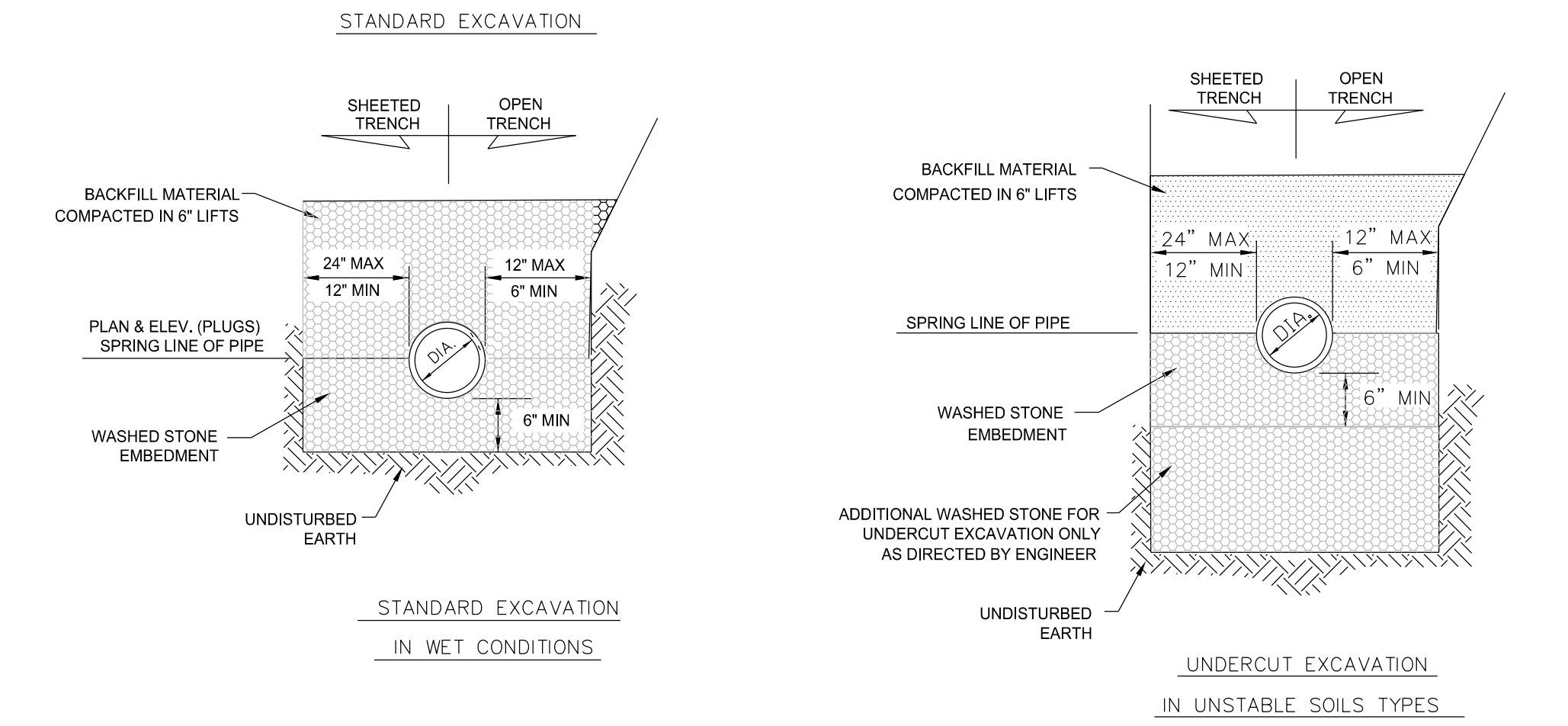
PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
U-3109A	UC-3B
DESIGNED BY: B. DIXON	
DRAWN BY: R. MOSS	
CHECKED BY: B. DIXON	
APPROVED BY:	
REVISED:	
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	UTILITY CONSTRUCTION PLANS ONLY
P.O. BOX 97 GARNER, NC 27529 (919) 772-5393	

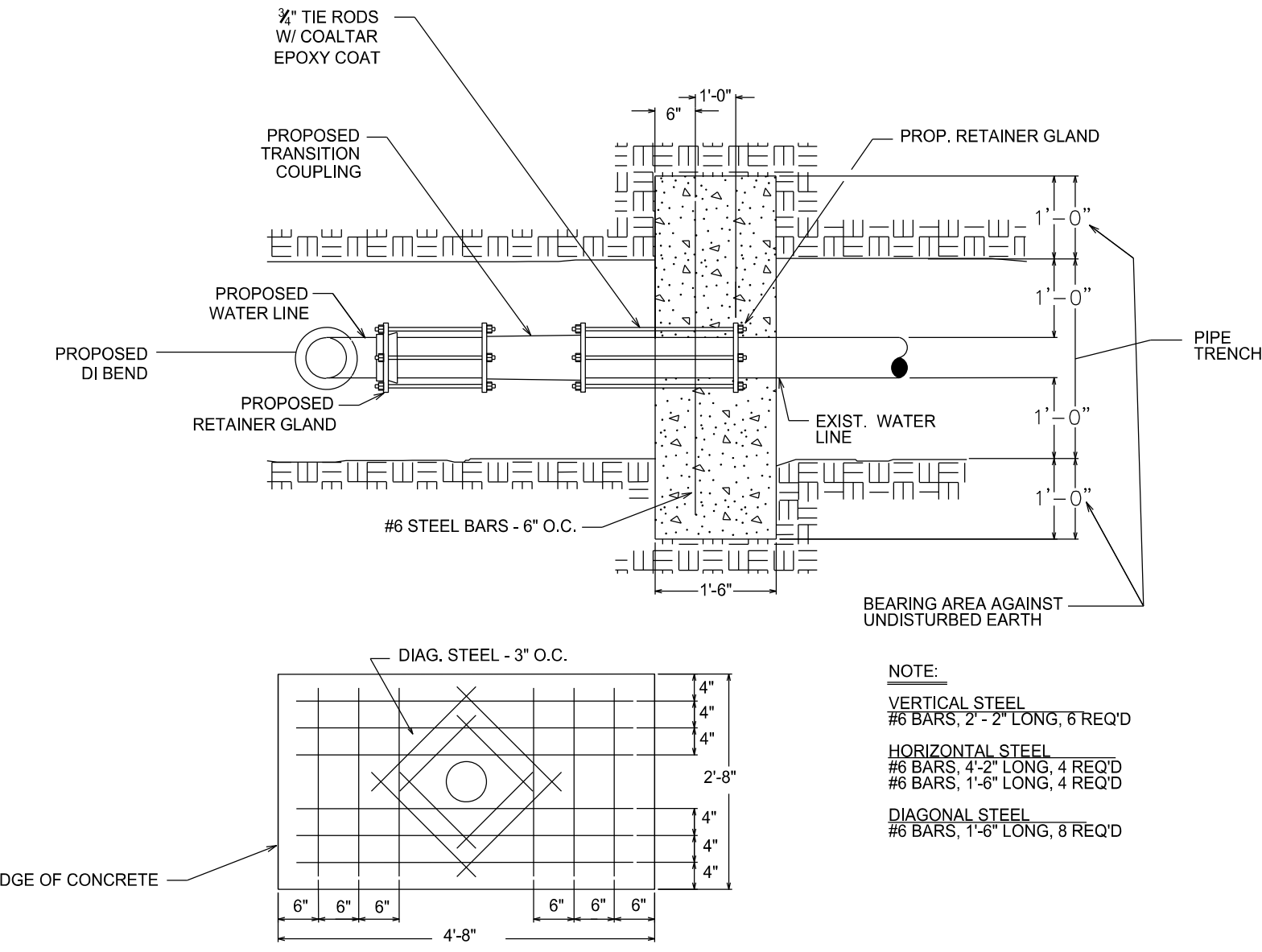
UTILITY CONSTRUCTION



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:
 VERTICAL STEEL #6 BARS, 2'-2" LONG, 6 REQ'D
 HORIZONTAL STEEL #6 BARS, 4'-2" LONG, 4 REQ'D
 #6 BARS, 1'-6" LONG, 4 REQ'D
 DIAGONAL STEEL #6 BARS, 1'-8" LONG, 8 REQ'D

TYPICAL TRENCH DETAIL

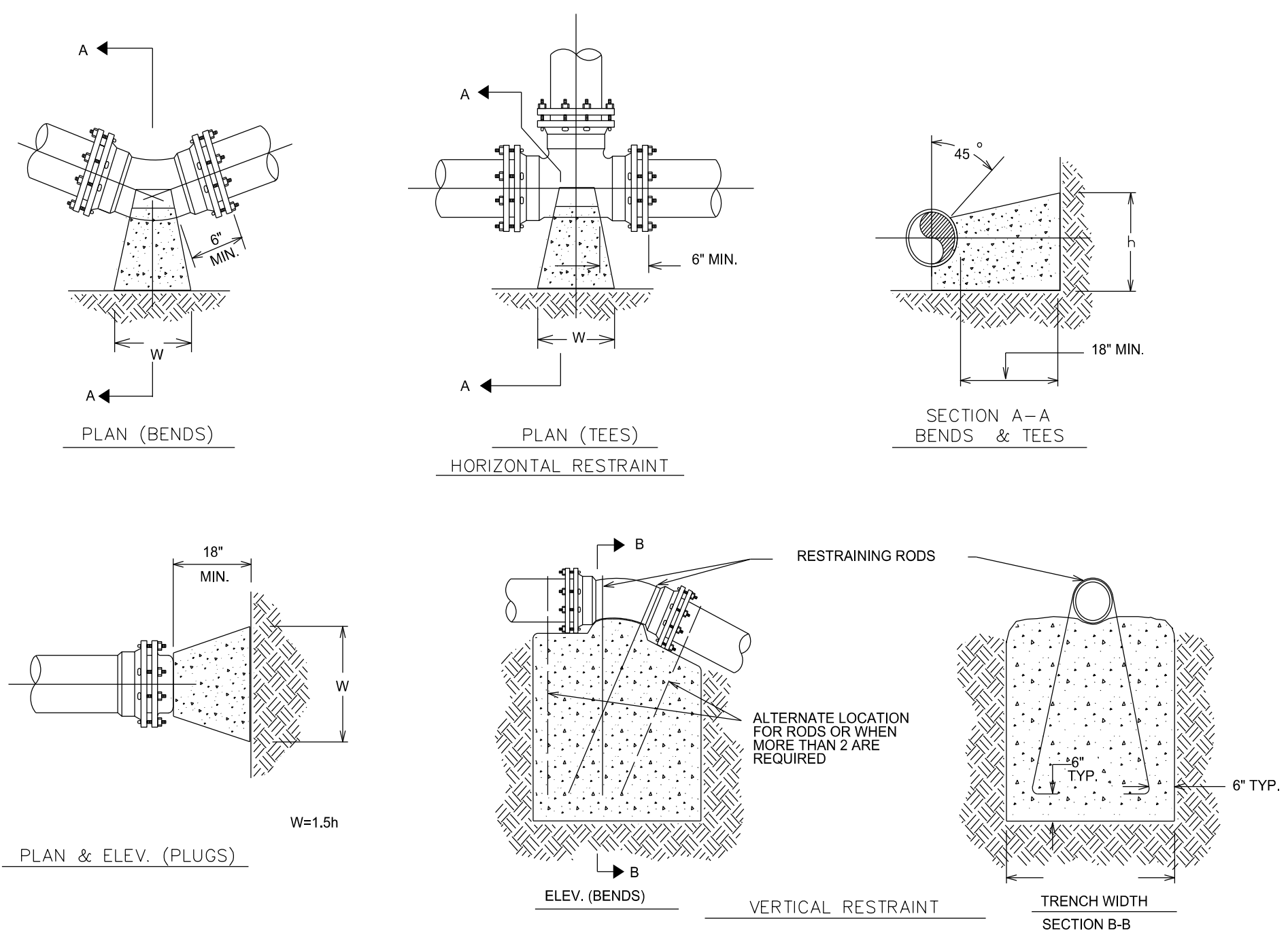
THRUST RESTRAINT WITH RETAINER GLANDS

BASED ON TEST PRESSURE OF 200 P.S.I.																											
		HORIZONTAL RESTRAINT (ALL AREAS GIVEN ARE IN SQUARE FEET)								VERTICAL RESTRAINT (ALL VOLUMES GIVEN ARE IN CUBIC YARDS)**																	
PIPE SIZE	DEGREE OF BEND	LBS. STATIC THRUST *	ALLOWABLE SOIL BEARING (PSF)								PIPE SIZE	RESTRAINING RODS		DEGREE OF BEND													
			1000	2000	3000	4000	5000	6000	7000	8000		NO. REQ'D	DIA.	11/4°	22 1/2°	45°											
6"	11/4°	1,385	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6"	2	1/2"	0.50	1.0	1.75	
	22 1/2°	2,758	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10"	2	3/4"	1.25	2.25	4.50	
	45°	5,409	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	16"	4	3/4"	3.0	6.0	11.50	
	90°	9,999	10	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3							
	TEE/PLUG	7,068	7	4	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2						
10"	11/4°	3,846	4	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1							
	22 1/2°	7,661	8	4	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2							
	45°	15,028	15	8	5	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3							
	90°	27,768	28	14	9	7	6	5	4	4	4	4	4	4	4	4	4	4	4	4							
	TEE/PLUG	19,635	20	10	7	5	4	3	3	3	3	3	3	3	3	3	3	3	3	3							
16"	11/4°	9,854	10	5	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2							
	22 1/2°	19,612	20	10	7	5	4	3	3	3	3	3	3	3	3	3	3	3	3	3							
	45°	38,471	38	17	13	10	8	6	5	4	4	4	4	4	4	4	4	4	4	4							
	90°	71,085	71	36	24	18	14	12	10	9	9	9	9	9	9	9	9	9	9	9							
	TEE/PLUG	50,265	50	25	17	13	10	8	7	6	6	6	6	6	6	6	6	6	6	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.

**INCLUDES 1.50 SAFETY FACTOR

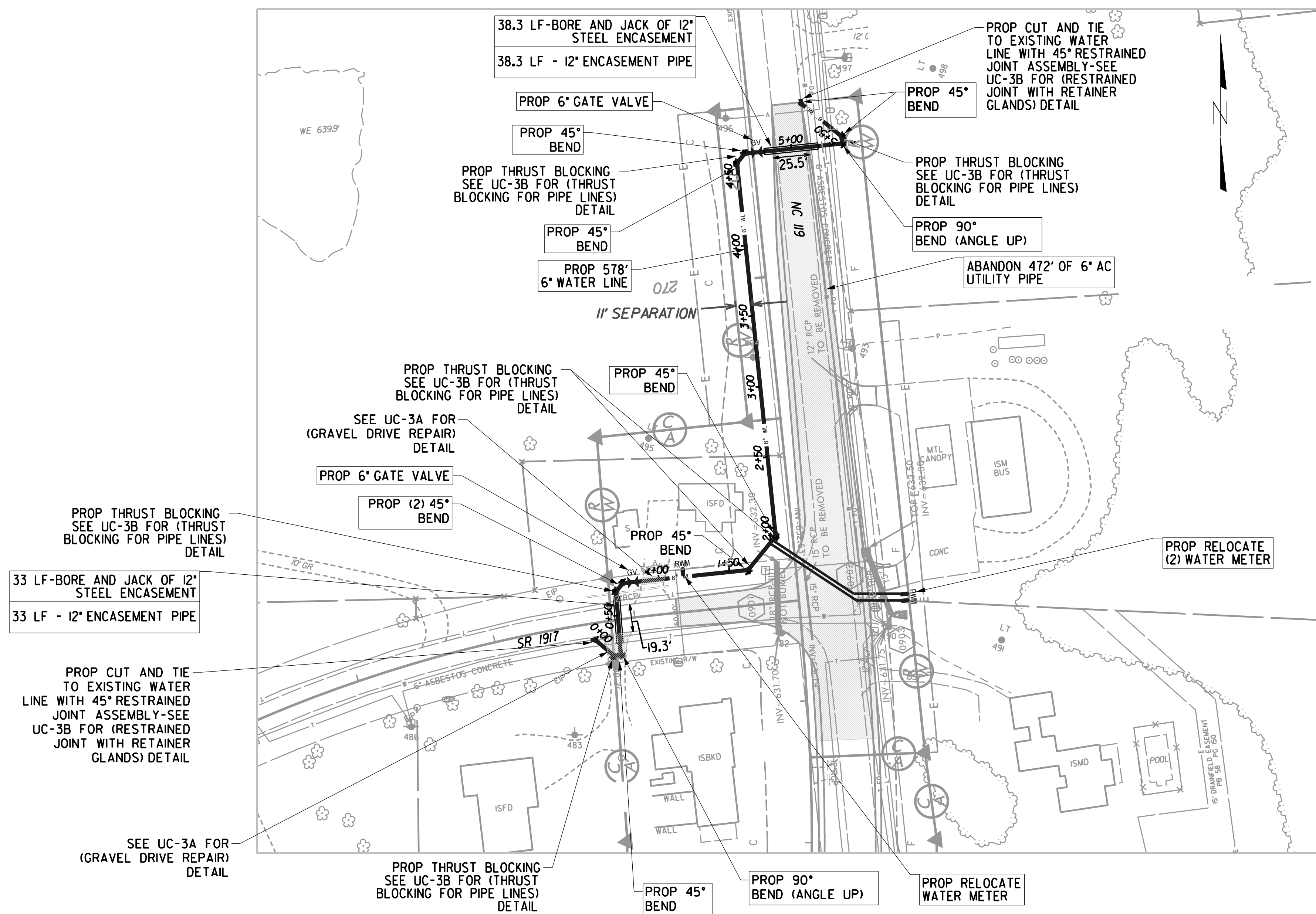


THRUST RESTRAINT FOR WATER MAINS

THRUST BLOCKING FOR PIPE LINES

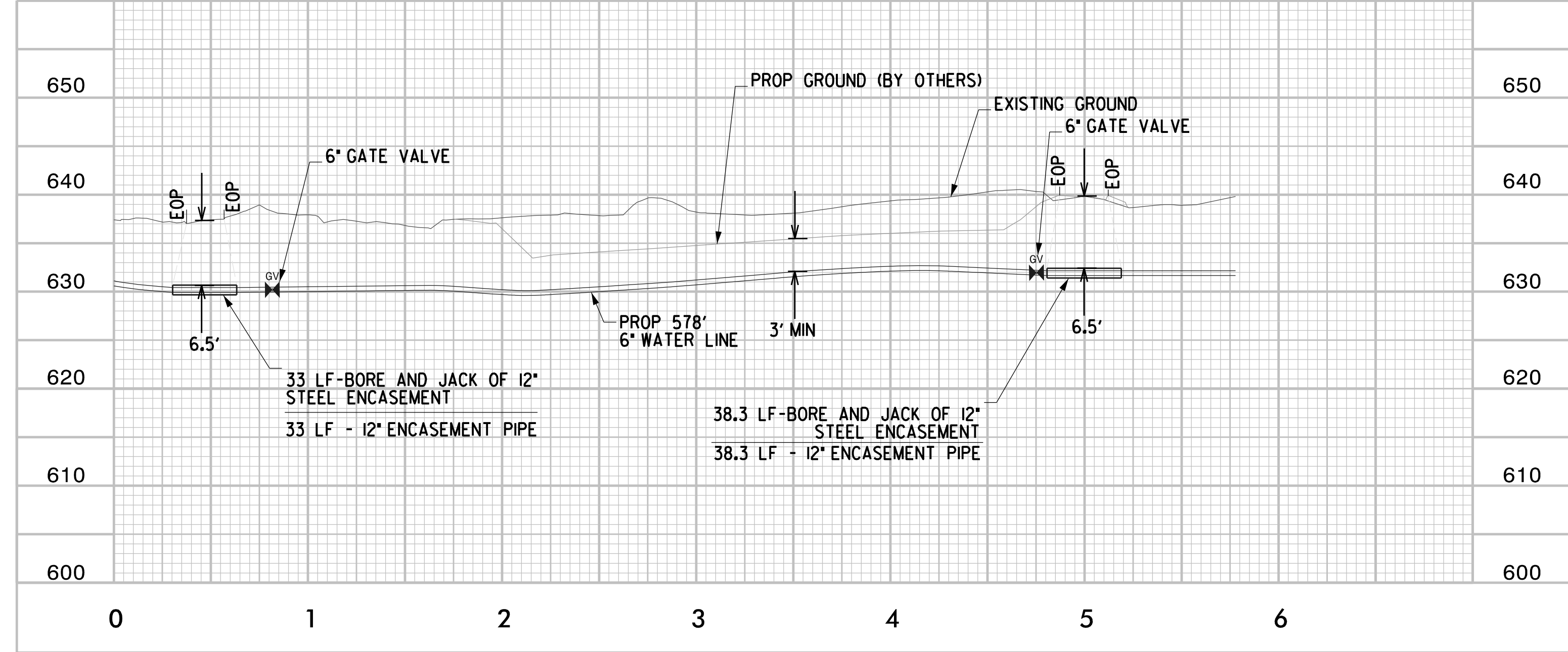
PROJECT REFERENCE NO.	SHEET NO.
U-3109B	UC-4
DESIGNED BY: B. DIXON	
DRAWN BY: R. MOSS	
CHECKED BY: B. DIXON	
APPROVED BY:	
REVISED:	
MUNICIPAL ENGINEERING SERVICES COMPANY, PA.	UTILITY CONSTRUCTION PLANS ONLY
P.O. BOX 97 GARNER, NC 27529 19191772-5393	

UTILITY CONSTRUCTION



SUPPLEMENTAL UTILITY 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. USE RESTRAINED JOINTS AT FIRST TWO JOINTS BEYOND EACH SIDE OF FITTING IN ADDITION TO THRUST BLOCKING AT FITTING.
- 4. IF AN ITEM IS NOT CALLED OUT IN A BOX, IT IS INCIDENTAL TO AND INCLUDED IN THE UNIT COST OF THE PIPE LINE.
- 5. TWO OR MORE ADJACENT METERS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD DETAIL.
- 6. 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.
- 7. ALL 6-INCH PIPE SHALL BE C900, DR18 PVC EXCEPT WHERE NOTED OTHERWISE ON THE DRAWINGS.



NOTE:
 - FRONT SIDE OF BORE PIT TO BE 1:1 FROM EOP
 - ENDS OF ENCASEMENT REQUIRED TO OUTSIDE OF EOP ACCORDING TO THE PROPOSED SECTIONS ON DETAIL SHEET UC-3A

GENERAL UTILITY NOTES (APPLICABLE TO ALL SHEETS):

- EXISTING 12" WATER MAIN IN HIGHWAY 119 IS THE ONLY SOURCE OF WATER TO MILL CREEK SUBDIVISION. WATER MAIN SHALL REMAIN ACTIVE AT ALL TIMES UNTIL THE NEW LINE IS CERTIFIED AND OPERATIONAL.
- CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND CONFLICTS BROUGHT TO THE ATTENTION OF THE ENGINEER.
- THE CONTRACTOR SHALL WORK ON EXISTING RIGHT-OF-WAY. STAGING AREAS FOR MATERIALS AND EQUIPMENT ARE THE RESPONSIBILITY OF THE CONTRACTOR. ANY AGREEMENTS WITH PRIVATE PROPERTY OWNERS SHALL BE IN WRITING AND WILL HOLD HARMLESS THE CITY AND ENGINEER. COPIES OF ANY AGREEMENTS SHALL BE PROVIDED TO THE CITY AND ENGINEER.
- REPAIR GRAVEL DRIVEWAYS WITH A MINIMUM OF 8" STONE TO MATCH EXISTING DRIVEWAY.
- ALL FITTINGS, VALVES, HYDRANTS, ETC. SHALL HAVE A MINIMUM WORKING PRESSURE RATING OF AT LEAST 250 PSI.
- FOR WATER MAINS 12" AND GREATER IN SIZE, FIRE HYDRANTS SHALL HAVE MAIN VALVE OPENING OF 5 1/4" WITH 4-6" BURY.
- ALL FIRE HYDRANT RELOCATIONS SHALL INCLUDE NEW FIRE HYDRANTS. ALL EXISTING FIRE HYDRANTS SHALL BE RETURNED TO CITY OF MEBANE PUBLIC WORKS DEPARTMENT BY CONTRACTOR. COORDINATE DELIVERY TIME & LOCATION WITH PUBLIC WORKS.
- CONTRACTOR SHALL NOT OPERATE GATE VALVES. CONTRACTOR SHALL COORDINATE WITH CITY PERSONNEL TO SCHEDULE VALVE OPENING/CLOSURE. ONLY CITY PERSONNEL SHALL OPEN/CLOSE EXISTING GATE VALVES.
- ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CITY OF MEBANE'S STANDARD SPECIFICATIONS AND DETAIL DRAWINGS.
- ALL PIPE SHALL BE DUCTILE IRON CLASS 50 AND FITTINGS SHALL BE DIP PRESSURE CLASS 350 AT A MINIMUM.
- EXISTING WATER MAIN TO BE ABANDONED BETWEEN POINTS OF CONNECTION. EXISTING MAIN SHALL BE FILLED WITH GROUT OR FLOWABLE FILL.
- ALL LOCATIONS WHERE A PLUG IS TO BE INSTALLED ON AN EXISTING WATER LINE, THE PLUG SHALL BE RODDED BACK TO AN ADJACENT VALVE OR TEE. IF THERE IS NOT AN EXISTING VALVE OR TEE IN THE VICINITY, A DEADMAN SHALL BE INSTALLED WITH RODDING TO THE PLUG. CONCRETE BLOCKING SHALL ALSO BE INSTALLED AT ALL PLUG LOCATIONS.
- STREET AND STORM DRAINAGE IMPROVEMENTS SHOWN ON PLANS INDICATE PROPOSED/FUTURE IMPROVEMENTS BY OTHERS.
- TRAFFIC CONTROL TO BE IN ACCORDANCE WITH NCDOT ROADWAY PLANS.
- EROSION CONTROL TO BE IN ACCORDANCE WITH NCDOT ROADWAY PLANS.

NOTE:
SCOPE OF WORK INCLUDED ON THIS SHEET IS LIMITED TO RELOCATION OF THE EXISTING 12" WATER LINE AND APPURTENANCES (INCLUDING ENCASEMENT) IN HWY. 119.



PROJECT REFERENCE NO. U-3109B	SHEET NO. UC-5
DESIGNED BY: M. REICH	
DRAWN BY: W. FOX	
CHECKED BY: M. REICH	
APPROVED BY: M. REICH	
REVISED:	

aw
ck

alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road
burlington, n.c. 27215
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336/226-5534
Firm's Engineering License No. F-0203

ROADWAY DESIGN DATA AND DRAWINGS PROVIDED BY NCDOT

EX. WATER MAIN COVER INFORMATION		
LOCATION	APPROX. COVER	TOP WIL ELEV.
A (12" GV)	5.4'	607.81
B (6" FH/GV)	3.1'	592.54
C (12" GV)	4.5'	581.49
C IS LOCATED AT -Y21REV- STA: 23+45		

STA. 20+65, 27'-40" RT.
1-12" TAPPING SLEEVE
W/12" TAPPING VALVE
1-12" 90° BEND
1-12" INSERT VALVE
1-12" PLUG
CONCRETE THRUST RESTRAINT
AIR RELEASE VALVE IN 5-FT DIAMETER MANHOLE

MATCH LINE
-Y21REV-
STA. 22+00
SEE SHEET 11

-Y21REV-
PI Sta 18+43.06
 $\Delta = 21' 37" 21.5"$ (RT)
D = 6' 51' 42.4"
L = 315.12'
T = 159.46'
R = 835.00'
SE = 0.06
RO = 144'

-Y22REV-
PI Sta 12+15.41
 $\Delta = 53' 49' 55.0"$ (LT)
D = 37' 49' 18.2"
L = 144.69'
T = 78.18'
R = 154.00'
SE = 0.04
RO = 72'

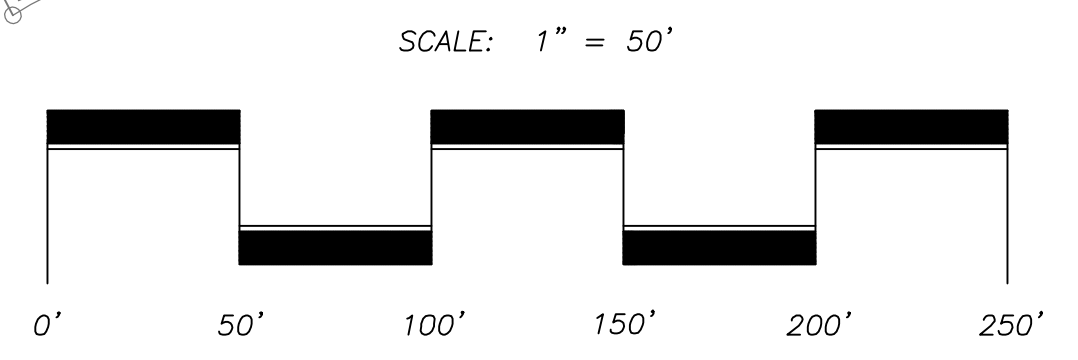
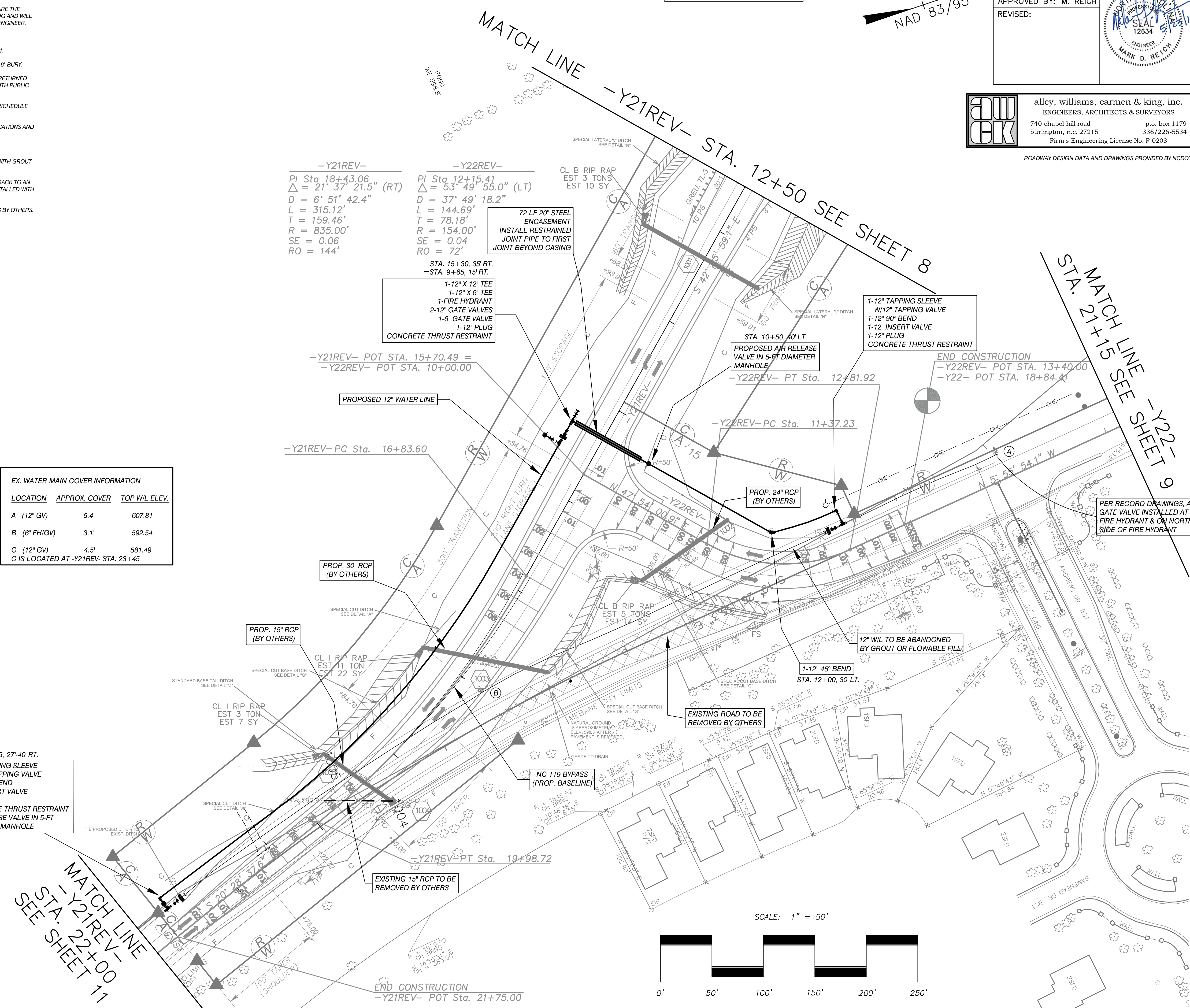
STA. 15+30, 35' RT.
=STA. 9+65, 15' RT.
1-12" X 12" TEE
1-12" X 6" TEE
1-FIRE HYDRANT
2-12" GATE VALVES
1-6" GATE VALVE
1-12" PLUG
CONCRETE THRUST RESTRAINT

1-12" TAPPING SLEEVE
W/12" TAPPING VALVE
1-12" 90° BEND
1-12" INSERT VALVE
1-12" PLUG
CONCRETE THRUST RESTRAINT

STA. 10+50, 40' LT.
PROPOSED AIR RELEASE VALVE IN 5-FT DIAMETER MANHOLE

END CONSTRUCTION
-Y22REV- POT STA. 13+40.00
-Y22- POT STA. 18+84.41

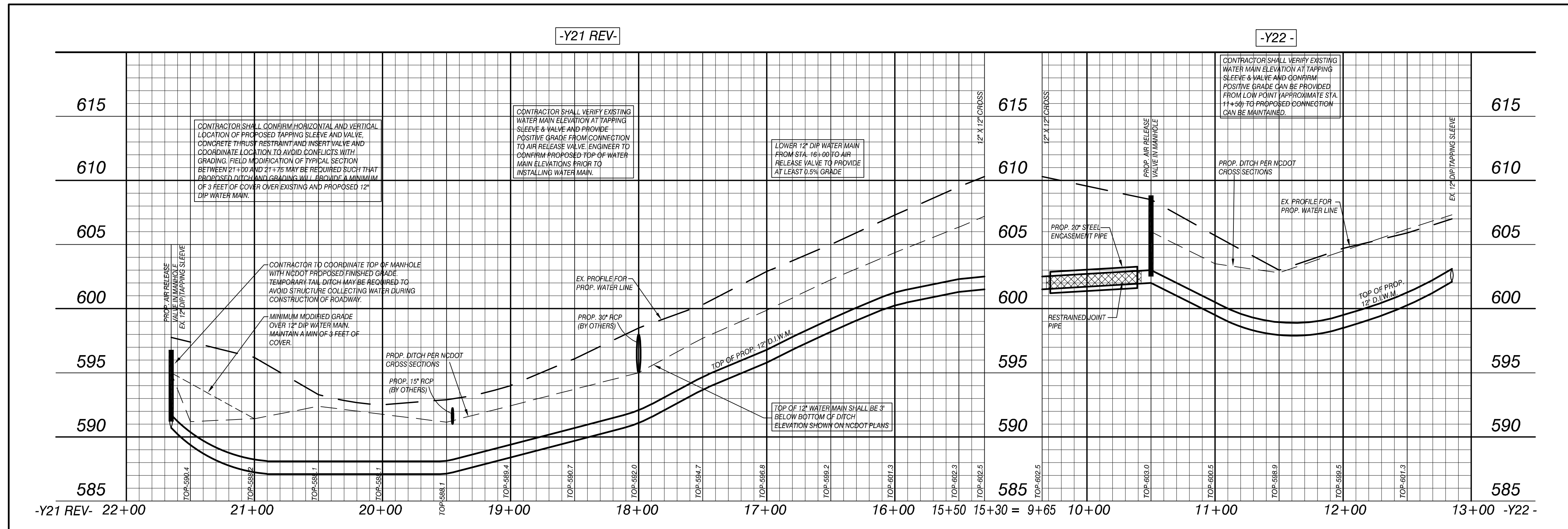
PER RECORD DRAWINGS, A GATE VALVE INSTALLED AT FIRE HYDRANT & ON NORTH SIDE OF FIRE HYDRANT



PROJECT REFERENCE NO.	SHEET NO.
U-3109B	UC-6
DESIGNED BY: M. REICH	
DRAWN BY: W. FOX	
CHECKED BY: M. REICH	
APPROVED BY: M. REICH	
REVISED:	

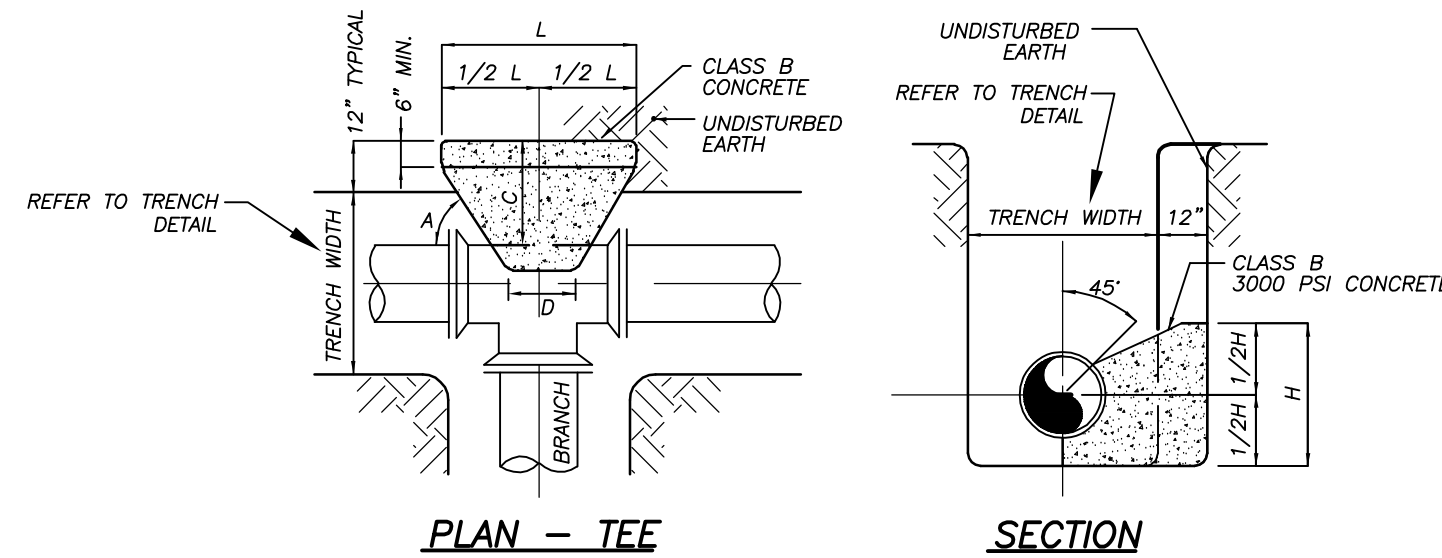
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alley, williams, carmen & king, inc.
ENGINEERS, ARCHITECTS & SURVEYORS
740 chapel hill road p.o. box 1179
burlington, n.c. 27215 336/226-5534
Firm's Engineering License No. F-0203



B. D. = BRANCH DIAMETER
FOR 12" TEE USE BLOCKING DIMENSIONS LISTED
FOR THE CORRESPONDING PRESSURE FOR A PLUG

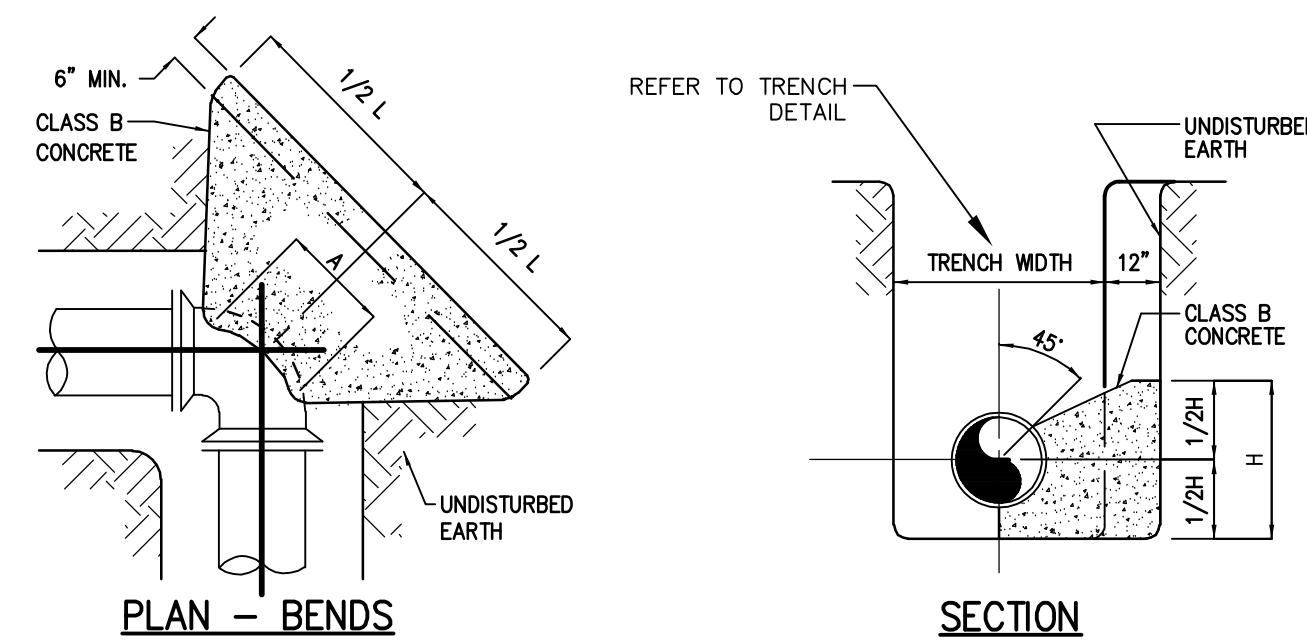
BUTTRESS DIMENSIONS				
B. D.	L	H	C	D
6"	1'-9"	1'-9"		
8"	2'-3"	2'-3"		
12"	3'-6"	3'-6"		
16"	6'-0"	6'-0"	SEE NOTE NO. 1	SEE NOTE NO. 2
18"	5'-6"	5'-6"		
30"	12'-0"	10'-0"		



NOTES:

- DIMENSION "C" SHOULD BE LARGE ENOUGH TO MAKE ANGLE "A" EQUAL TO OR GREATER THAN 45°.
- DIMENSION "D" SHOULD BE AS LARGE AS POSSIBLE WITHOUT INTERFERING WITH EHT MECHANICAL JOINTS.
- BUTTRESS DIMENSIONS ARE BASED UPON A SOIL RESISTANCE OF TWO TONS PER SQ. FT. AND A WATER PRESSURE OF 150 P.S.I.
- USE 2.5 mil POLYETHYLENE WRAPPED AROUND FITTINGS AND BOLTS.

THRUST BLOCK - TEES

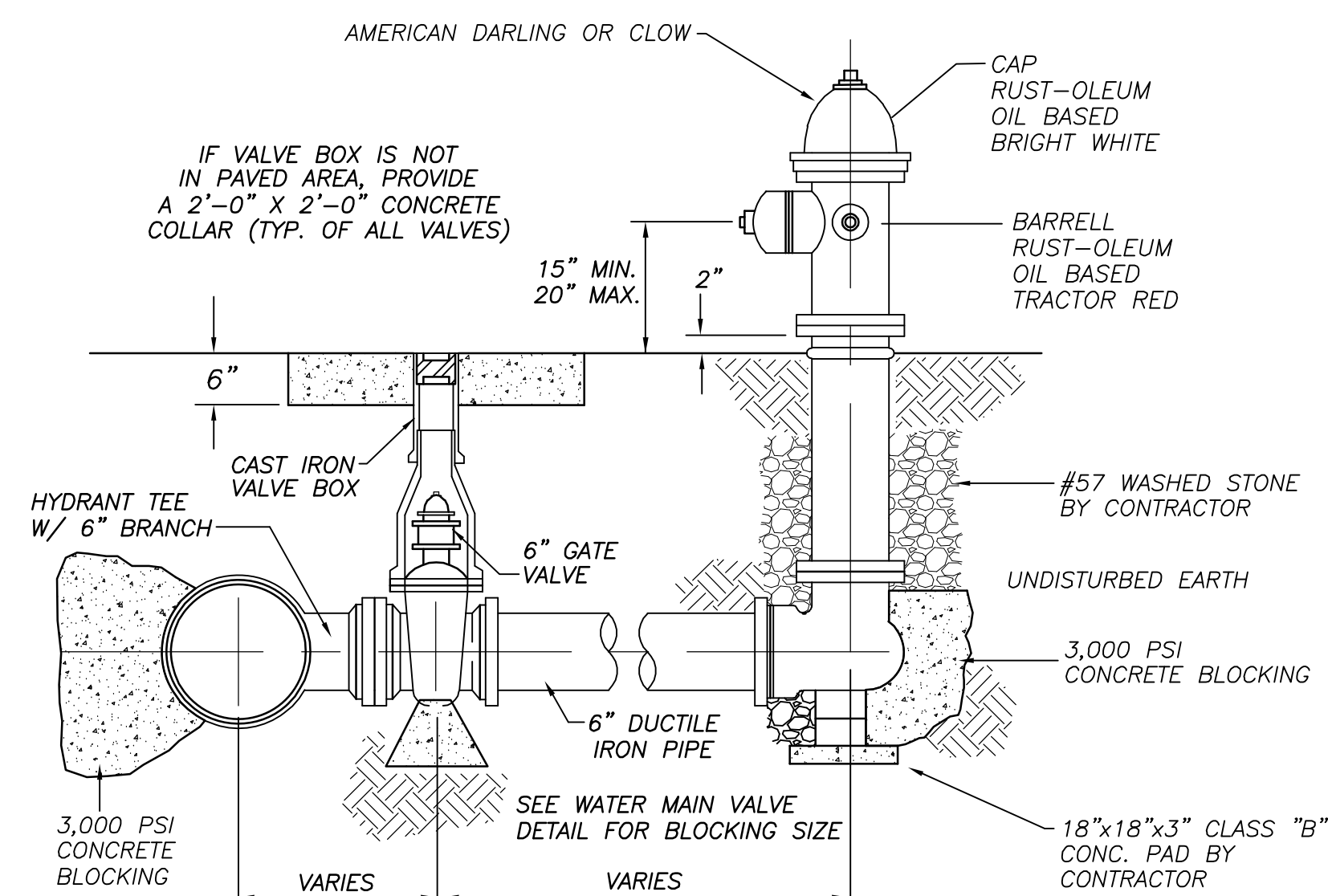


PIPE SIZE	BUTTRESS DIMENSIONS					
	22 1/2' BENDS		45' BENDS		90' BENDS	
	L	H	L	H	L	H
6"	1'-0"	1'-0"	1'-0"	1'-0"	1'-4"	1'-2"
8"	1'-0"	1'-0"	1'-4"	1'-2"	1'-10"	1'-6"
12"	1'-4"	1'-4"	1'-10"	1'-10"	2'-8"	2'-3"

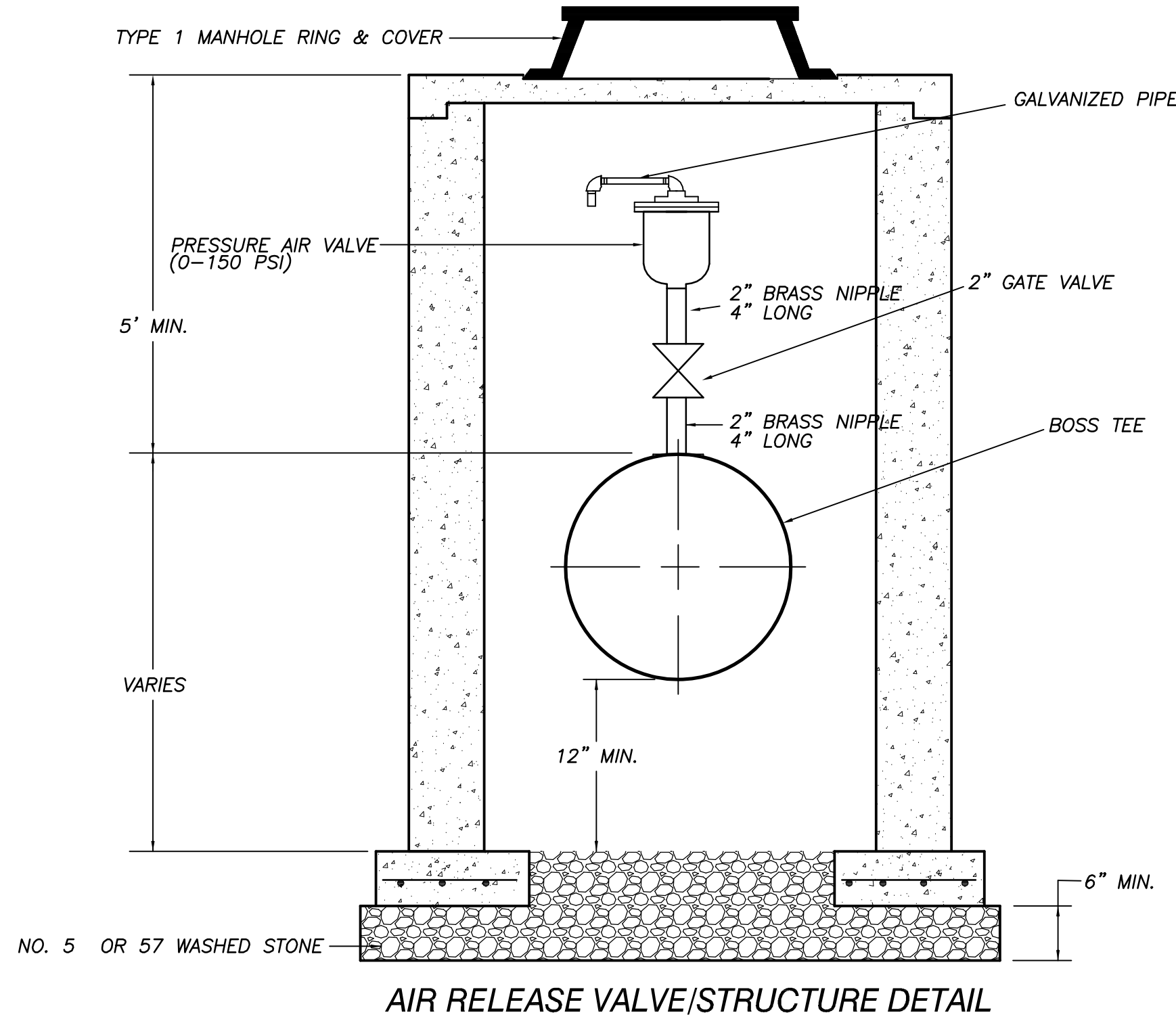
NOTES:

- DIMENSION "A" SHOULD BE AS LARGE AS POSSIBLE WITHOUT INTERFERING WITH THE MECHANICAL JOINT BOLTS.
- THE SHAPE OF THE BACK OF THE BUTTRESS MAY VARY PROVIDED THE CONCRETE IS AGAINST FIRM, UNDISTURBED EARTH.
- BUTTRESS DIMENSIONS ARE BASED UPON A SOIL RESISTANCE OF TWO TONS PER SQ. FT. AND A WATER PRESSURE OF 150 P.S.I.

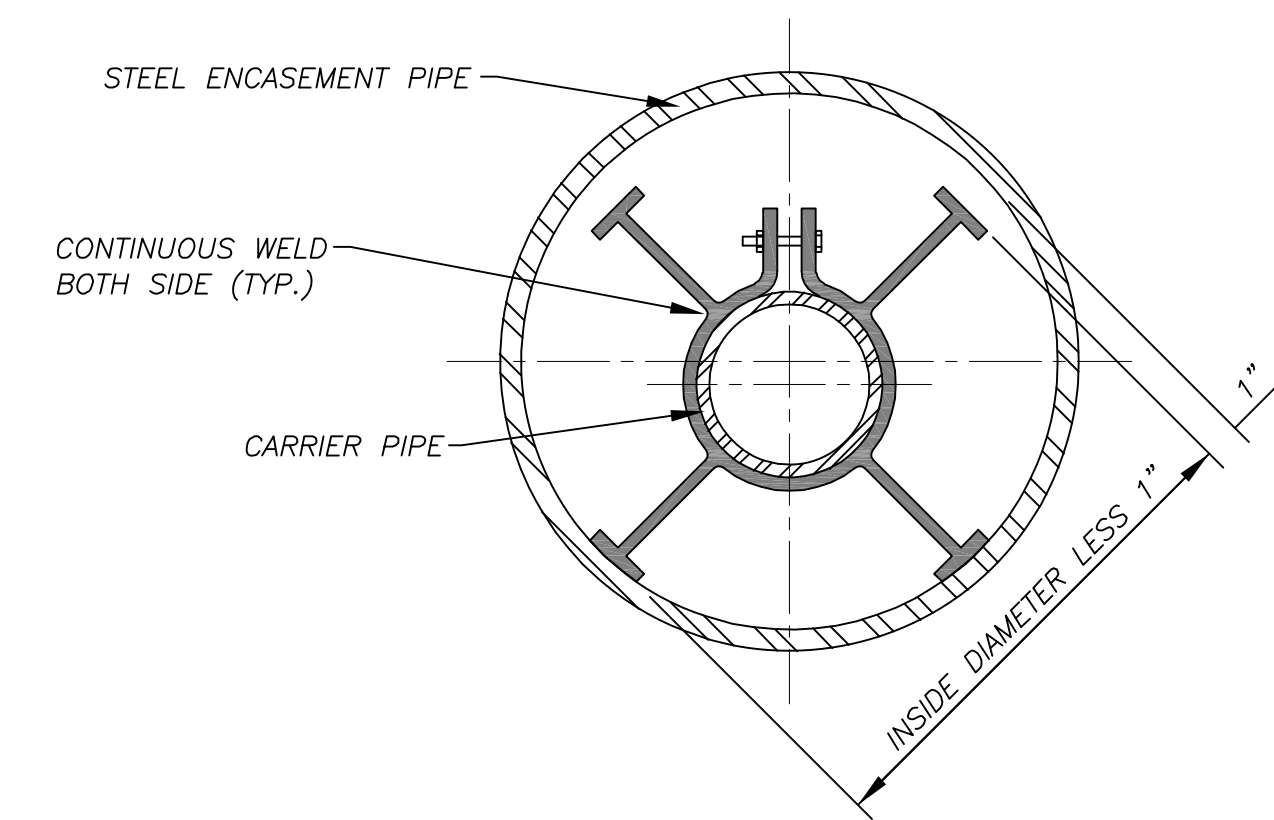
THRUST BLOCK - BENDS



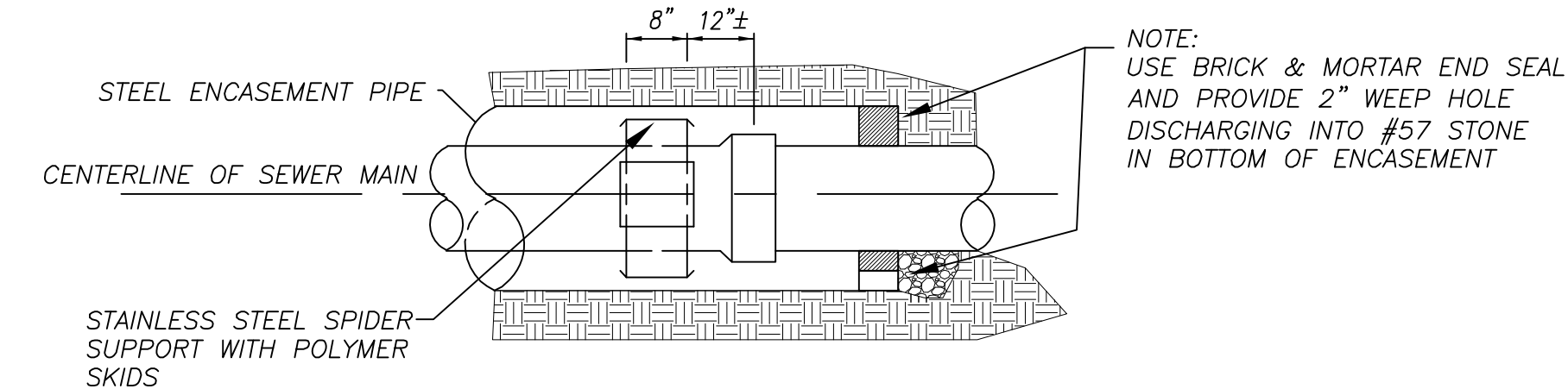
FIRE HYDRANT INSTALLATION



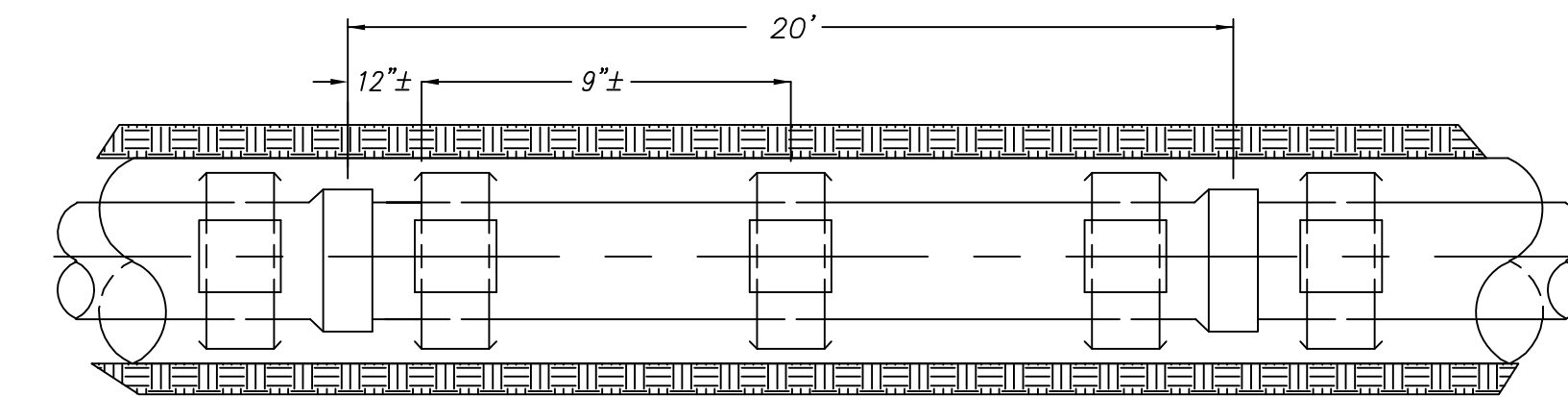
AIR RELEASE VALVE/STRUCTURE DETAIL



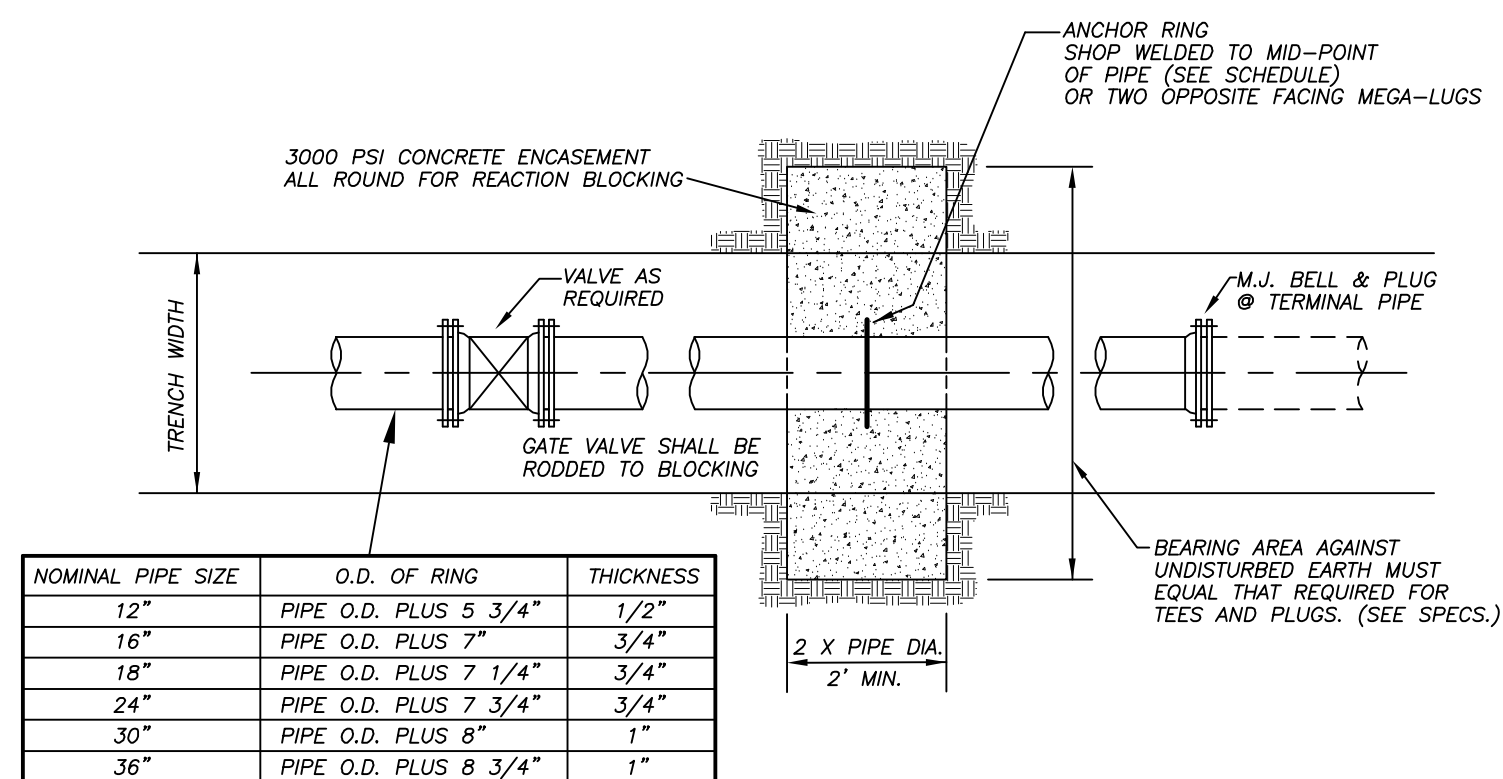
SPIDER SUPPORT DETAIL



CASING END SECTION



**SIDE VIEW
TYPICAL SPACING FOR STAINLESS STEEL SPIDERS
STEEL ENCASEMENT DETAIL**



NOMINAL PIPE SIZE	O.D. OF RING	THICKNESS
12"	PIPE O.D. PLUS 5 3/4"	1/2"
16"	PIPE O.D. PLUS 7"	3/4"
18"	PIPE O.D. PLUS 7 1/4"	3/4"
24"	PIPE O.D. PLUS 7 3/4"	3/4"
30"	PIPE O.D. PLUS 8"	1"
36"	PIPE O.D. PLUS 8 3/4"	1"

THRUST RESTRAINT WITH ANCHOR RING DETAIL