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UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. THE EXISTING UTILITIES BELONG TO ROBESON COUNTY WATER SYSTEM.
3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.
4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.
7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.
9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

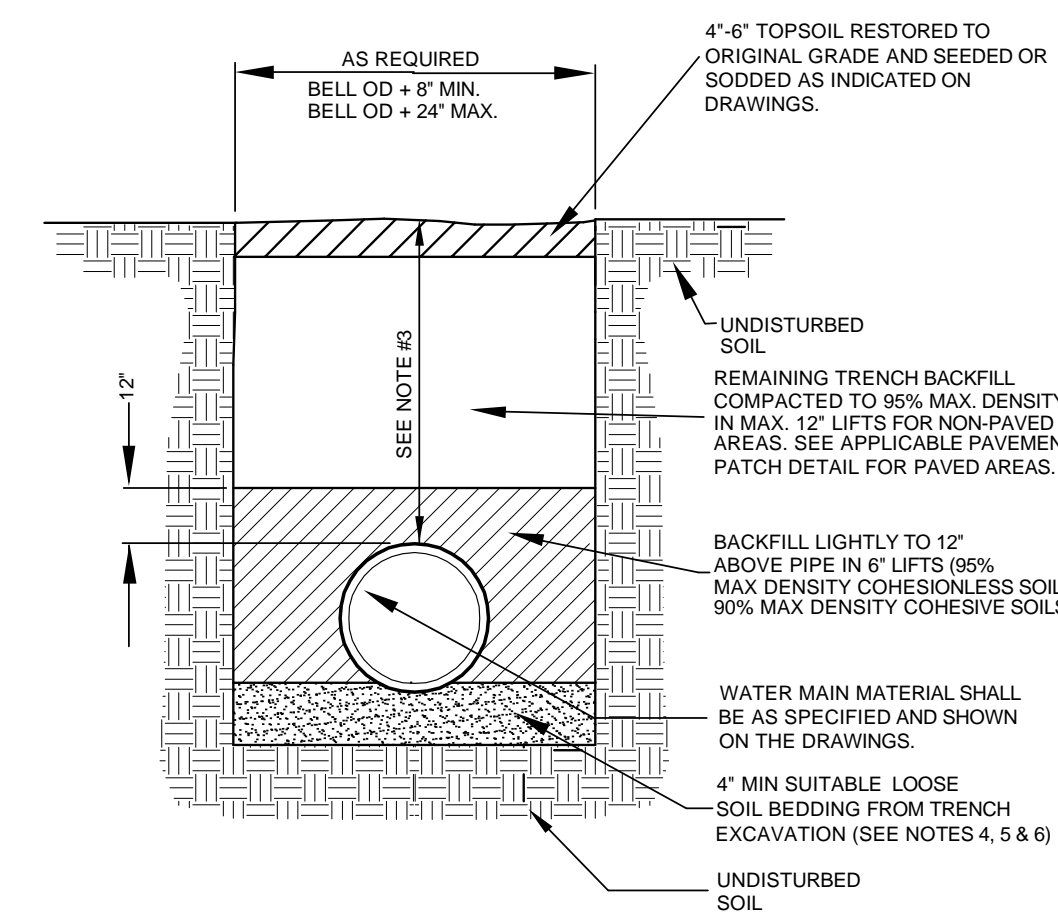
PROJECT REFERENCE NO.	SHEET NO.
B-4616	UC-2
DESIGNED BY:	
DRAWN BY: BH	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

PROJECT ESTIMATE QUANTITIES

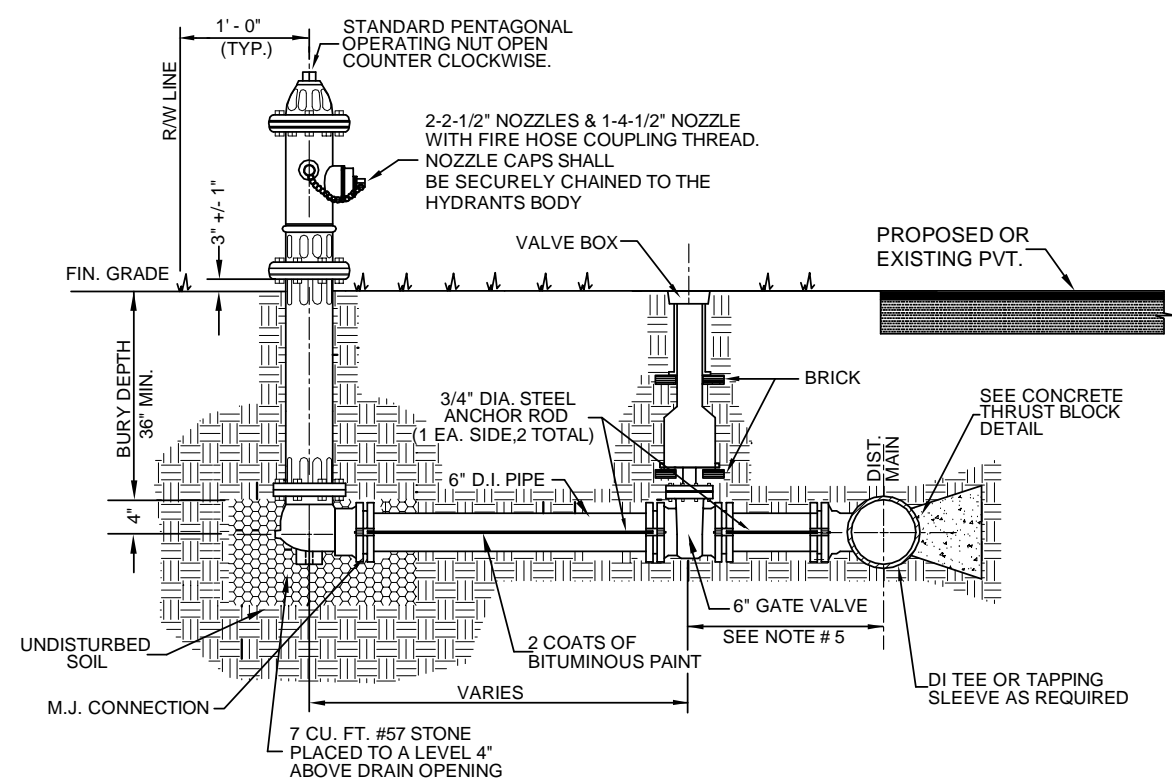
PAY ITEM DESCRIPTION	QUANTITIES	UNIT
8" WATER LINE	2,600	LF
DUCTILE IRON WATER PIPE FITTINGS	915	LB
6" VALVE	1	EA
8" VALVE	1	EA
ABANDON 8" UTILITY PIPE	2,400	LF
16" ENCASEMENT PIPE	202	LF

- NOTES:
1. ALL EXCAVATIONS SHALL COMPLY WITH THE TERMS AND CONDITIONS OF THE CONSTRUCTION STANDARDS FOR EXCAVATIONS IN OSHA 'SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION', CHAPTER XV11 OF TITLE 29, CFR, PART 1926. THE CONTRACTOR SHALL HAVE A COMPETENT PERSON ON SITE AT ALL TIMES DURING EXCAVATION AND BACKFILLING.
 2. CONTRACTOR SHALL USE TRENCH BOX SHORING IN ALL OPEN CUTS IN PAVED AREAS. TRENCH WIDTH SHALL BE MAINTAINED AT THE MINIMUM PRACTICAL WIDTH.
 3. SEE PLANS FOR MINIMUM COVER.
 4. LOOSE SOIL OR SELECT MATERIAL IS DEFINED AS "NATIVE" SOIL EXCAVATED FROM THE TRENCH, FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH.
 5. BEDDING MATERIAL SHALL EXTEND TO UNDISTURBED TRENCH WALLS AND TRENCH BOTTOM. BEDDING MATERIAL WILL NOT BE PAID FOR UNLESS SPECIFICALLY APPROVED BY THE PROJECT REPRESENTATIVE AND ONLY FOR THE AUTHORIZED QUANTITY.
 6. WHERE NATIVE SOIL IS DETERMINED TO BE ADEQUATE BY THE ENGINEER, NO EXCAVATION BELOW THE BOTTOM OF PIPE IS REQUIRED.
 7. BEDDING MATERIAL SHALL BE PROPERLY RODDED AND COMPACTED AROUND THE PIPE HAUNCHES.
 8. TEST FOR DENSITY OF COMPACTION MAY BE MADE AT THE OPTION OF THE ENGINEER AND DEFICIENCIES SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. THE ENGINEER MAY HAVE COMPACTION TEST PERFORMED AFTER THE BACKFILL IS COMPLETE. CONTRACTOR SHALL BE REQUIRED TO EXCAVATE TO VARIOUS ELEVATIONS FOR DENSITY TESTING EXCAVATION, BACKFILL AND RECOMPACTION SHALL BE PERFORMED AT NO ADDITIONAL COSTS TO THE OWNER.

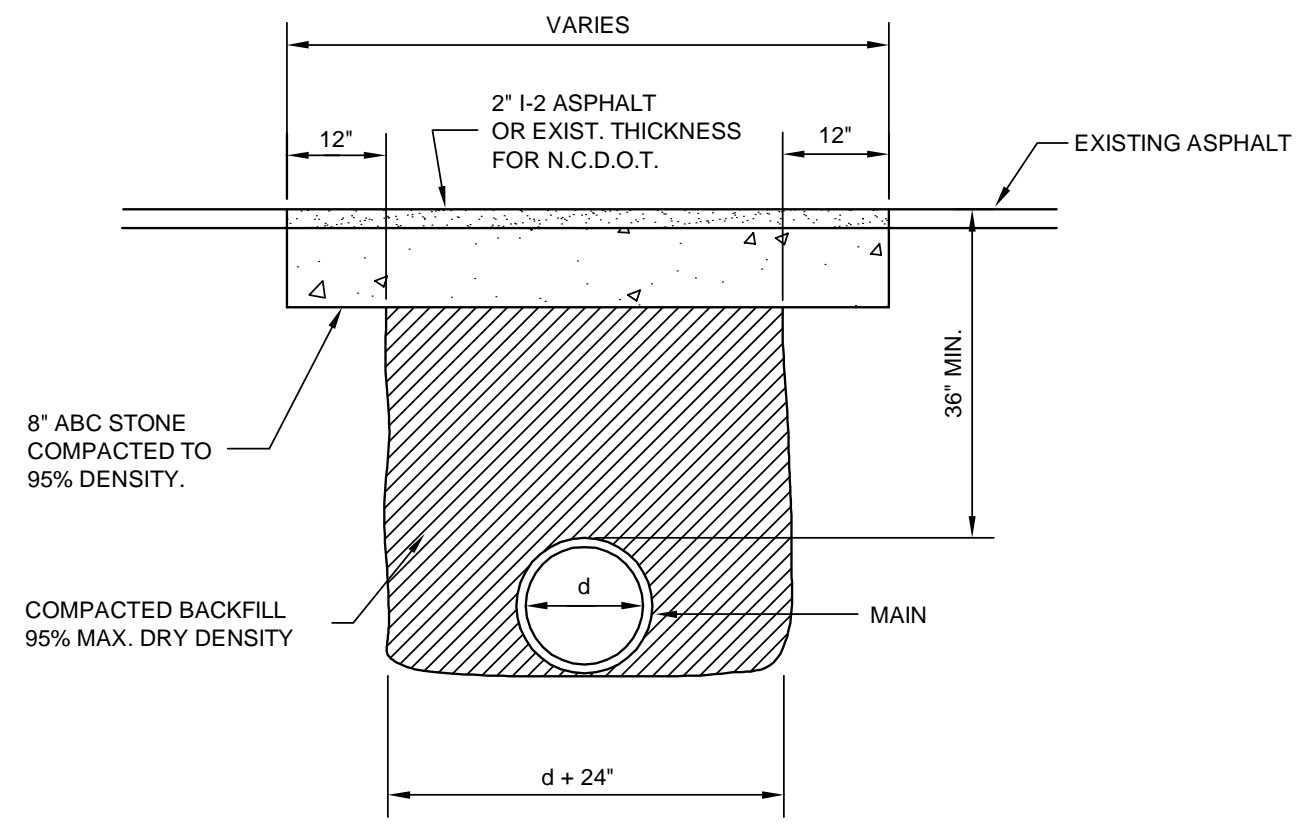


WATER MAIN BEDDING DETAIL

- NOTES:
1. ALL VALVES AND HYDRANTS SHALL HAVE M.J. CONNECTIONS WITH IRON RETAINING GLAND M.J. RESTRAINT OR ANCHOR LUGS AND 3/4" DIA. STEEL ANCHOR RODS.
 2. 3/4" DIA. STEEL RODS AND ALL BURIED SURFACES SHALL BE PAINTED WITH 2 COATS OF BITUMINOUS PAINT. MARRED OR SCRATCHED SURFACES SHALL BE REPAINTED. PAINT SHALL CURE PRIOR TO BACK FILLING TRENCH.
 3. FIRE HYDRANTS SHALL BE PLACED AS DIRECTED BY THE ENGINEER.
 4. HYDRANT BRANCH SHALL NOT BE BACK FILLED UNTIL INSPECTED AND APPROVED BY ENGINEER.
 5. HYDRANT EXTENSIONS SHALL BE APPROVED BY ENGINEER.

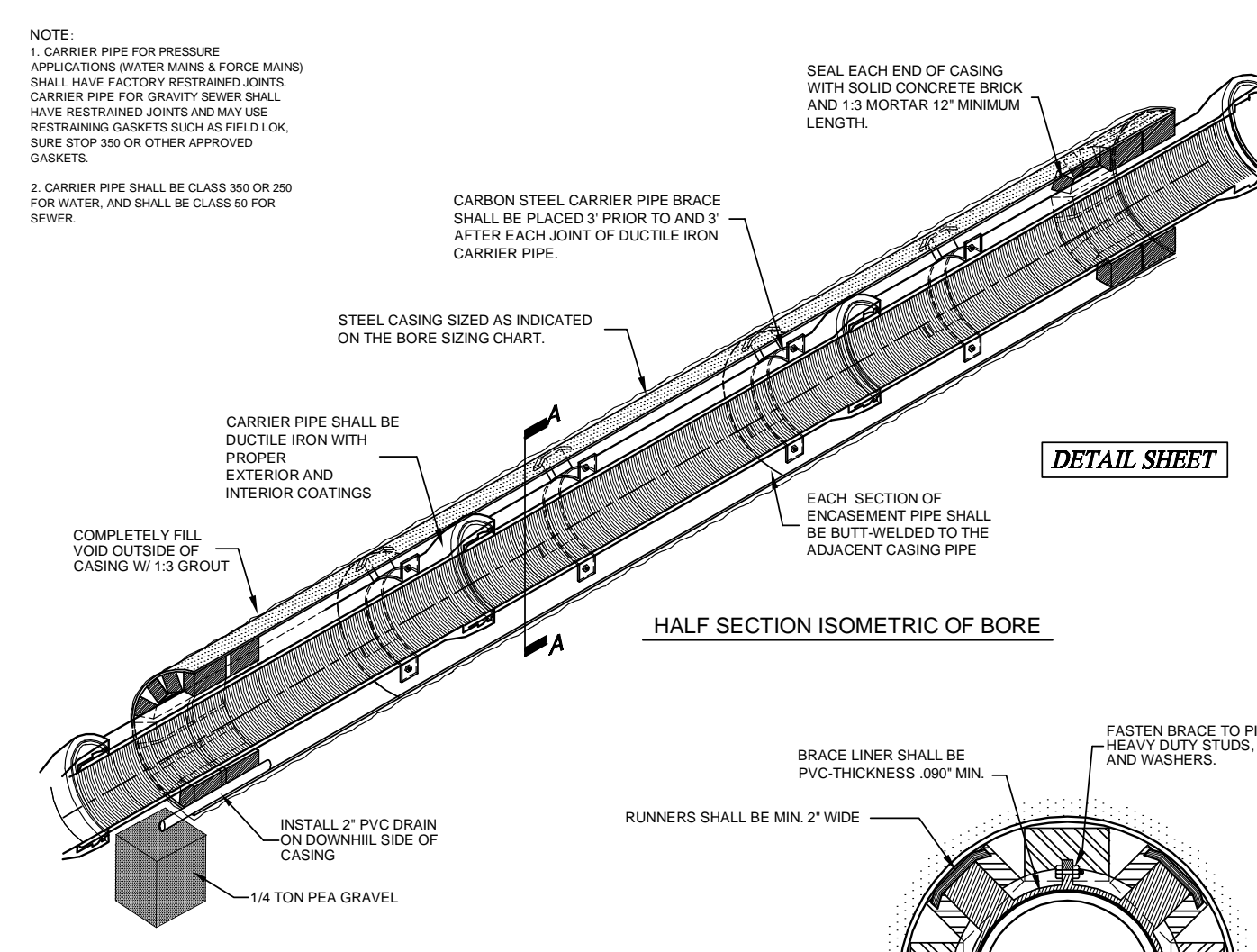


HYDRANT DETAIL



OPEN CUT & PATCH DETAIL

<ul style="list-style-type: none"> Preliminary - Do not use for construction Progress Drawings - Do not use for construction Preliminary Plat - Not for recordation, conveyances, or sales Final Drawing - Not released for construction Final Drawing - For Review Purposes Only Final Drawing - Released For Construction

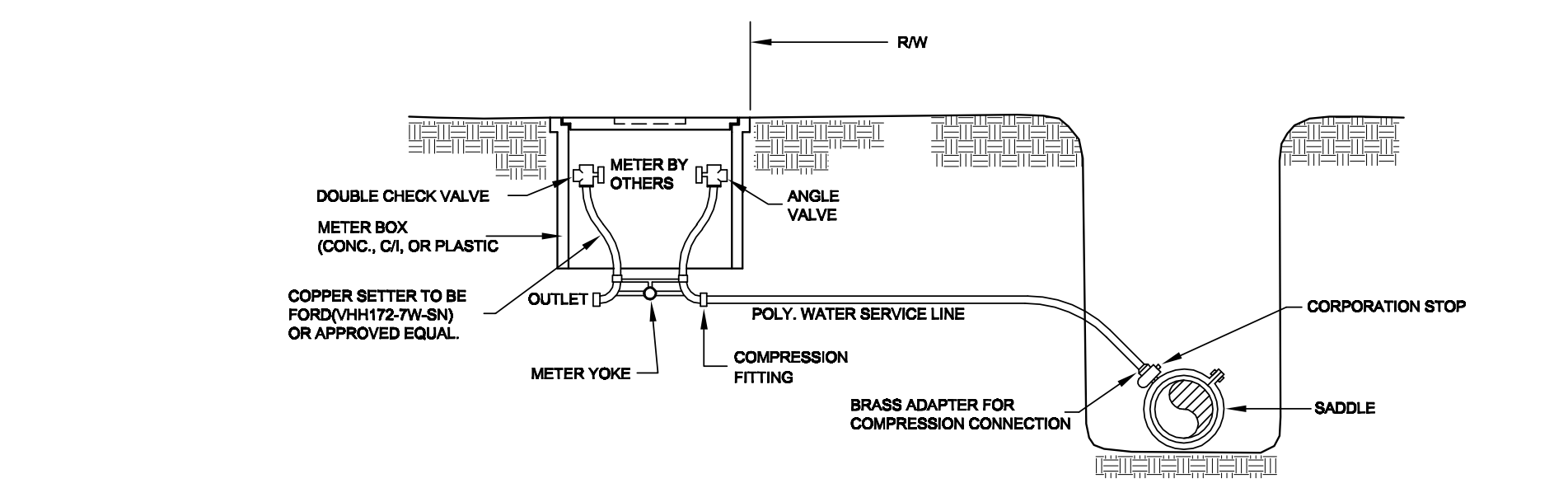


BORE SIZING CHART

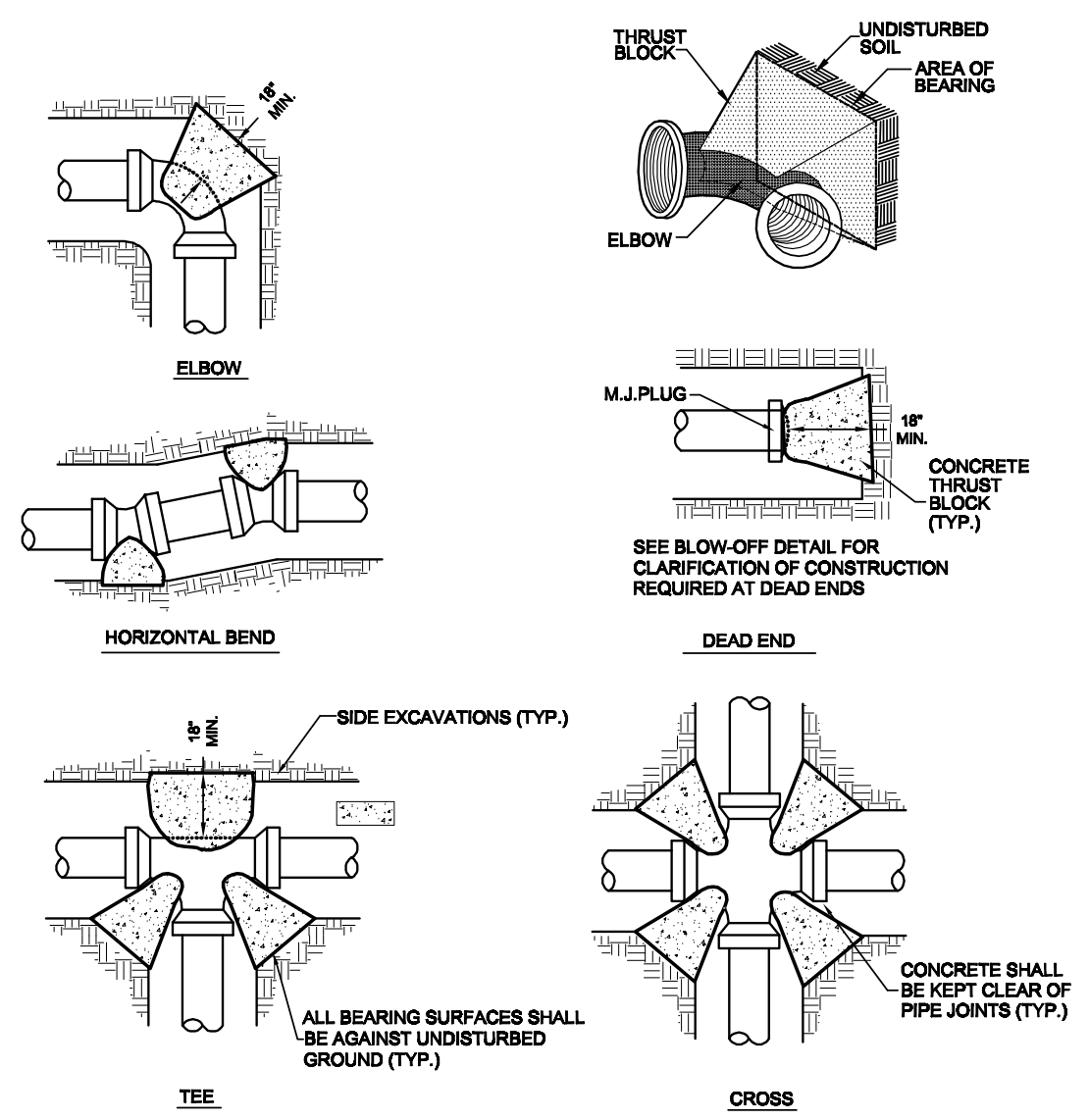
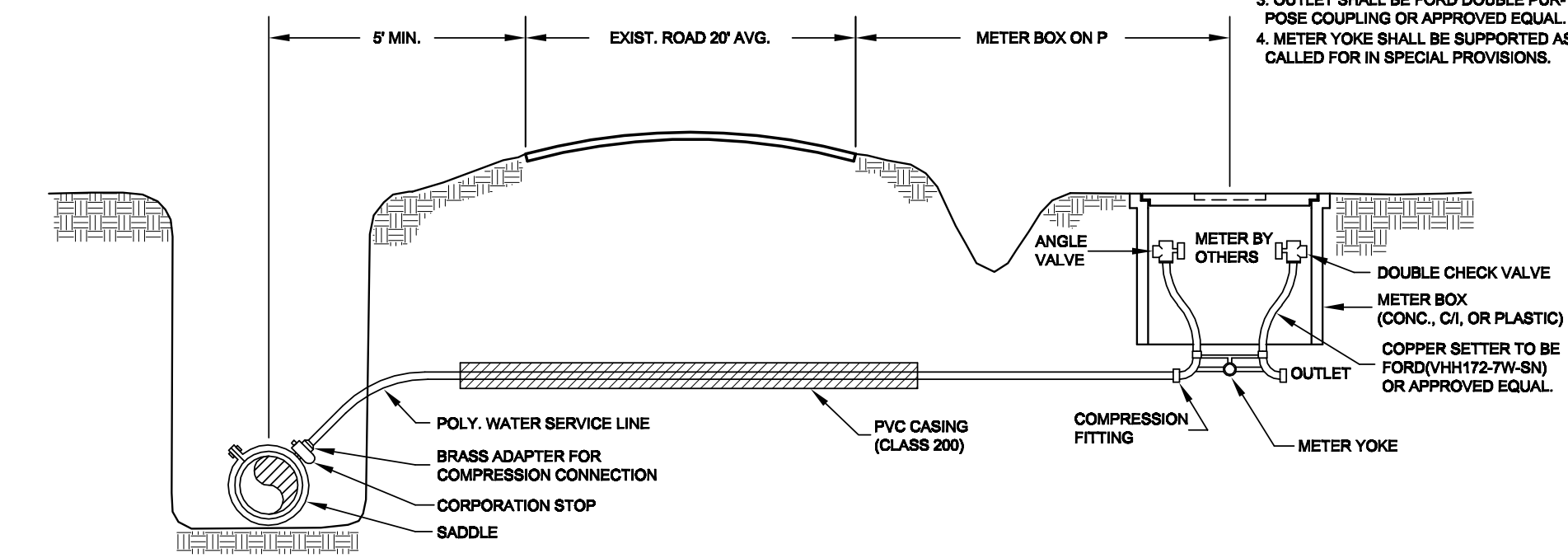
CARRIER PIPE SIZE	MIN. CASING SIZE	ROADWAYS MIN. WALL THICKNESS	RAILROADS MIN. WALL THICKNESS
6"	12"	0.25"	0.250"
8"	16"	0.25"	0.281"
12"	24"	0.25"	0.375"
16"	24"	0.25"	0.375"
18"	30"	0.312"	0.469"
24"	36"	0.375"	0.532"
30"	42"	0.500"	0.625"
36"	48"	0.500"	0.688"

* CONTRACTOR MAY SUBSTITUTE A LARGER SIZE CASING PIPE HAVING THE MIN. WALL THICKNESS SHOWN FOR SEWER MAINS. ALL ADDITIONAL COSTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR BORING AND JACKING.

BORE UNDER ROADWAYS/RAILROADS



TYPICAL HOUSE SERVICE DETAIL



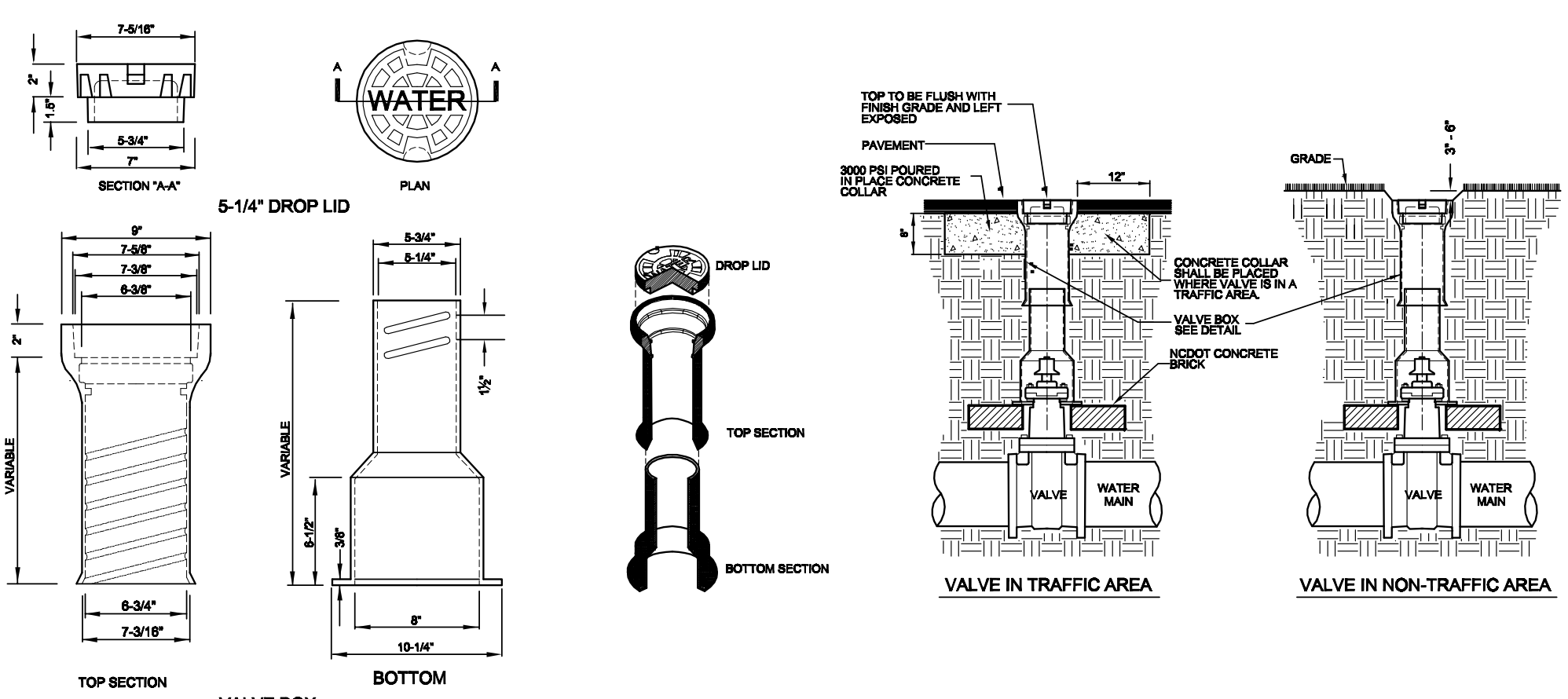
CONCRETE THRUST BLOCK DETAIL

THRUST BLOCKING SCHEDULE

FITTING SIZE (IN)	MINIMUM BLOCKING AREA AND VOLUME IN S.F. AND (C.Y.)					
	11 1/4"	22 1/2"	45"	90"	TEE	PLUG
2			0.23 (0.11)	0.38 (0.11)	0.30 (0.11)	0.30 (0.11)
4			0.83 (0.18)	1.35 (0.18)	0.86 (0.18)	0.86 (0.18)
6	0.40 (0.01)	0.80 (0.02)	1.73 (0.20)	3.00 (0.33)	2.17 (0.25)	2.17 (0.25)
8	0.80 (0.02)	1.50 (0.04)	3.08 (0.34)	5.40 (0.60)	3.83 (0.42)	3.83 (0.42)
10	1.20 (0.03)	2.30 (0.07)	4.72 (0.52)	8.40 (0.94)	5.92 (0.65)	5.92 (0.65)
12	1.70 (0.05)	3.30 (0.12)	6.82 (0.75)	12.00 (1.33)	8.48 (0.94)	8.48 (0.94)
16	3.00 (0.33)	5.90 (0.65)	11.60 (0.86)	21.30 (1.57)	15.00 (0.97)	15.00 (0.97)
20	4.80 (0.52)	9.20 (0.78)	18.00 (1.32)	33.30 (3.60)	23.30 (1.87)	23.30 (1.87)
24	8.70 (0.75)	13.20 (0.97)	26.00 (2.28)	48.00 (6.29)	33.60 (3.24)	33.60 (3.24)
30	10.40 (0.77)	20.70 (1.80)	40.80 (4.45)	75.00 (10.30)	52.90 (6.32)	52.90 (6.32)
36	15.00 (1.29)	29.80 (3.11)	58.40 (7.67)	108.0 (17.90)	75.80 (10.90)	75.80 (10.90)

NOTE: Values given are based on 150 psi water pressure and 2000 lb/ft soil bearing capacity. Soils with less bearing capacity such as muck, peat or soft clay will require greater blocking areas and volumes.

The thrust blocking shown above is based on the use of mechanical joint as shown on plans.



Valve Box Detail

DESIGNED BY: SRN
 DRAWN BY: CBB
 CHECKED BY: SRN
 DATE: FEB. 2016
 SCALE: NOTED
 FIELD BOOK: -
 FILE NO.: D-1
 PROJECT NO.: -

KNA CONSULTING ENGINEERS

SEAL

STATE OF NORTH CAROLINA
 PUBLIC WORKS ENGINEER
 JOHN P. NOBLE
 No. 10077-0017

KOONCE, NOBLE & ASSOCIATES, INC. - CONSULTING ENGINEERS
 208 EAST 5th STREET - P.O. BOX 1027 - LUMBERTON, N.C. 28559 • PHONE: 910-739-9376 • FAX: 910-739-9378 • LIC. NO.: F-0103 • EMAIL: knaengineering@att.net

ROBESON COUNTY COUNTY-WIDE WATER SYSTEM
WATER MAIN RELOCATION - NC HWY. 211 - DETAIL SHEET

SHEET NO. **D-1**

OF

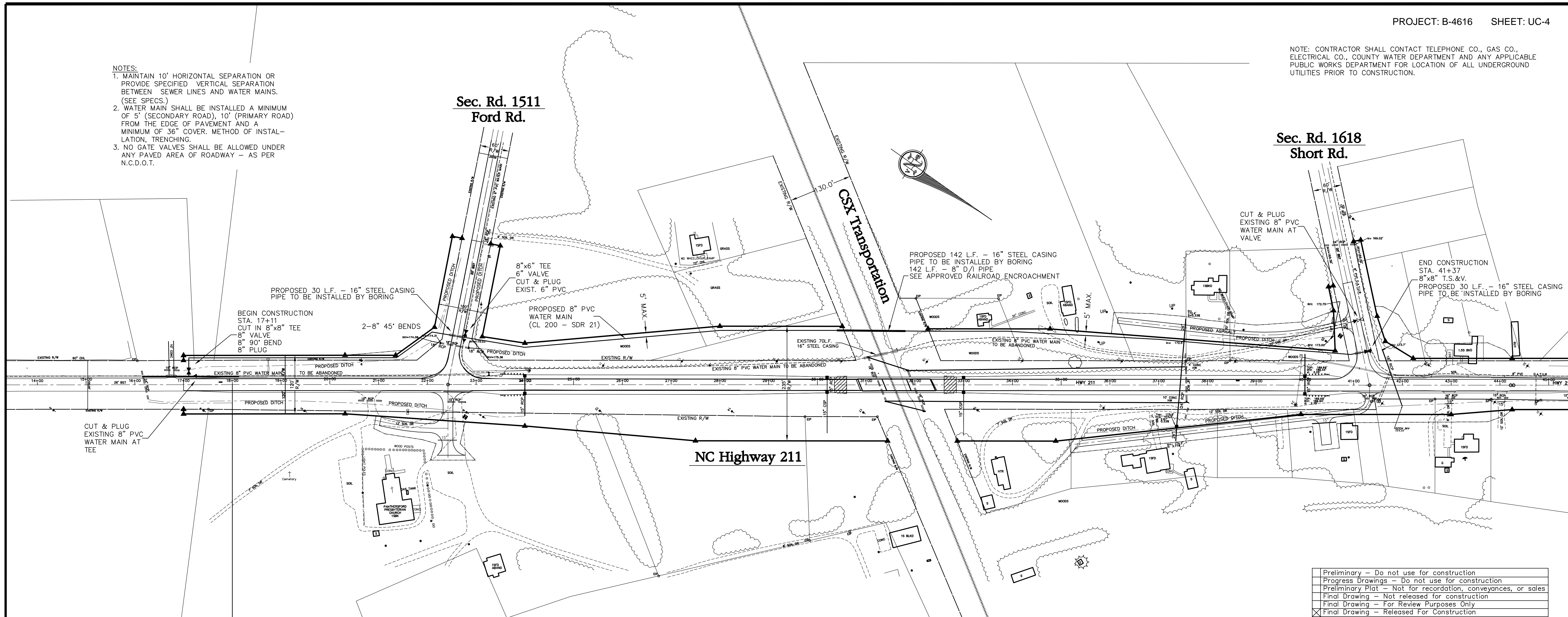
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- NOTES:
1. MAINTAIN 10' HORIZONTAL SEPARATION OR PROVIDE SPECIFIED VERTICAL SEPARATION BETWEEN SEWER LINES AND WATER MAINS. (SEE SPECS.)
 2. WATER MAIN SHALL BE INSTALLED A MINIMUM OF 5' (SECONDARY ROAD), 10' (PRIMARY ROAD) FROM THE EDGE OF PAVEMENT AND A MINIMUM OF 36" COVER. METHOD OF INSTALLATION, TRENCHING.
 3. NO GATE VALVES SHALL BE ALLOWED UNDER ANY PAVED AREA OF ROADWAY - AS PER N.C.D.O.T.

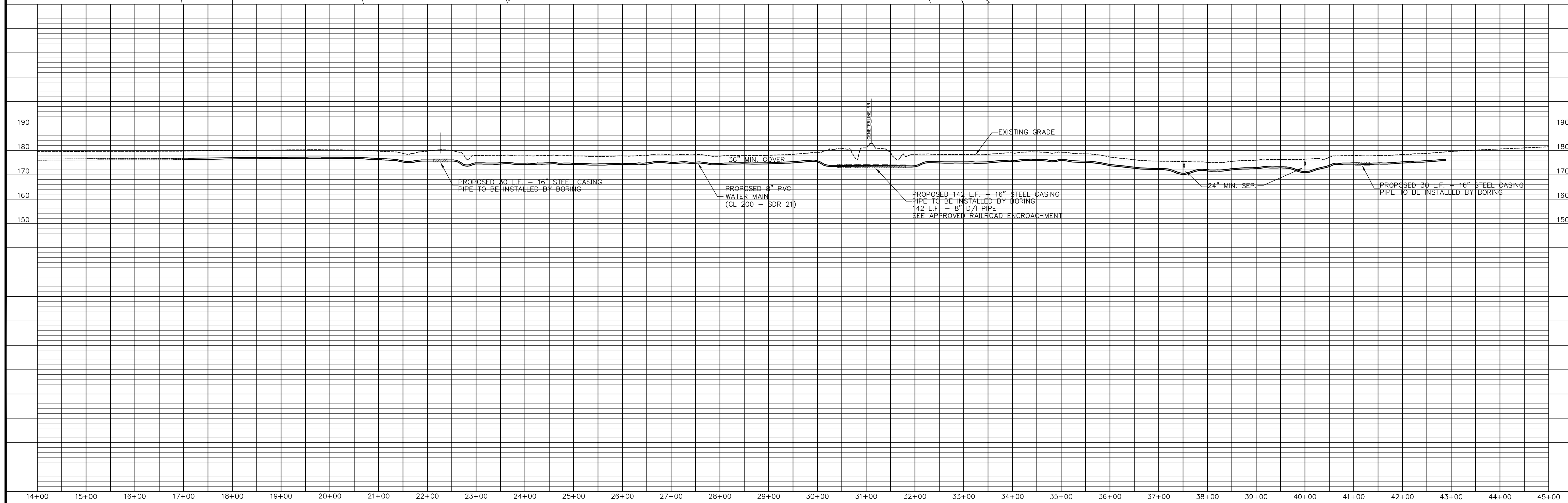
NOTE: CONTRACTOR SHALL CONTACT TELEPHONE CO., GAS CO., ELECTRICAL CO., COUNTY WATER DEPARTMENT AND ANY APPLICABLE PUBLIC WORKS DEPARTMENT FOR LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.

Sec. Rd. 1511
Ford Rd.

Sec. Rd. 1618
Short Rd.



Preliminary	- Do not use for construction
Progress Drawings	- Do not use for construction
Preliminary Plat	- Not for recordation, conveyances, or sales
Final Drawing	- Not released for construction
Final Drawing	- For Review Purposes Only
Final Drawing	- Released For Construction



DESIGNED BY: JLV
 DRAWN BY: CBB
 CHECKED BY: JLV
 DATE: MAY 2015
 SCALE: 1"=100'H
 FIELD BOOK: -
 FILE NO: EIT - WaterMainRelocation
 PROJECT NO: -

KNA
 CONSULTING ENGINEERS

SEAL
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 J. V. LITTLE, III
 No. 17,000
 Exp. 12/31/2017

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ROBESON COUNTY COUNTY-WIDE WATER SYSTEM
NC HIGHWAY 211 - B-4616 WATER MAIN RELOCATION

SHEET NO.
1
 OF 1

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