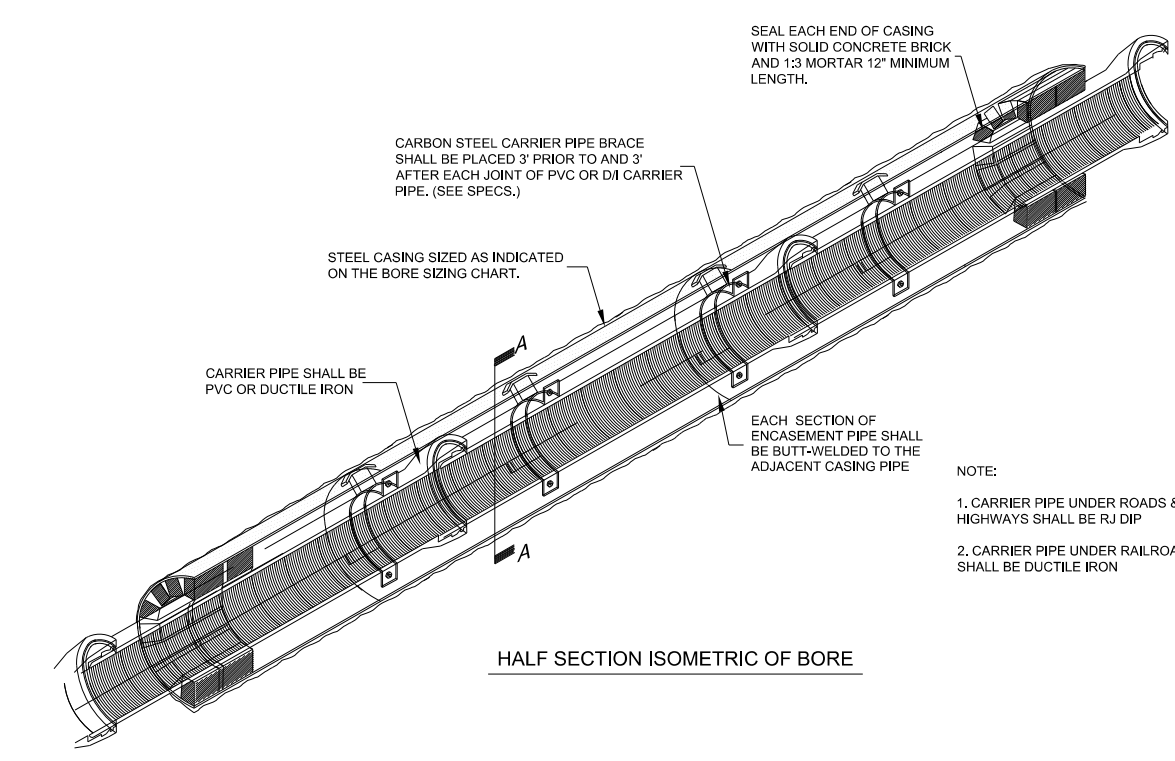
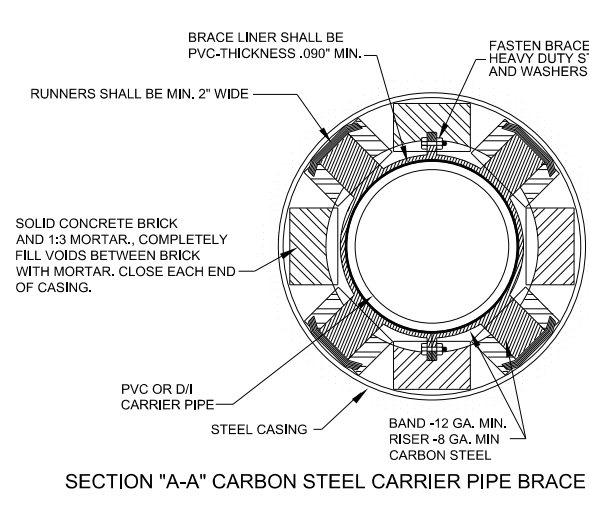


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PROJECT REFERENCE NO.	I-5987B	SHEET NO.	UC-3A
DESIGNED BY:	BLP		
DRAWN BY:	BLP		
CHECKED BY:	DSJ		
APPROVED BY:			
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p>Prepared in the Office of:</p> <p>M PO Box 700 MOTT Fuquay-Varina, NC 27526 MACDONALD www.mottmac.com/america</p> <p>UTILITY CONSTRUCTION</p>	

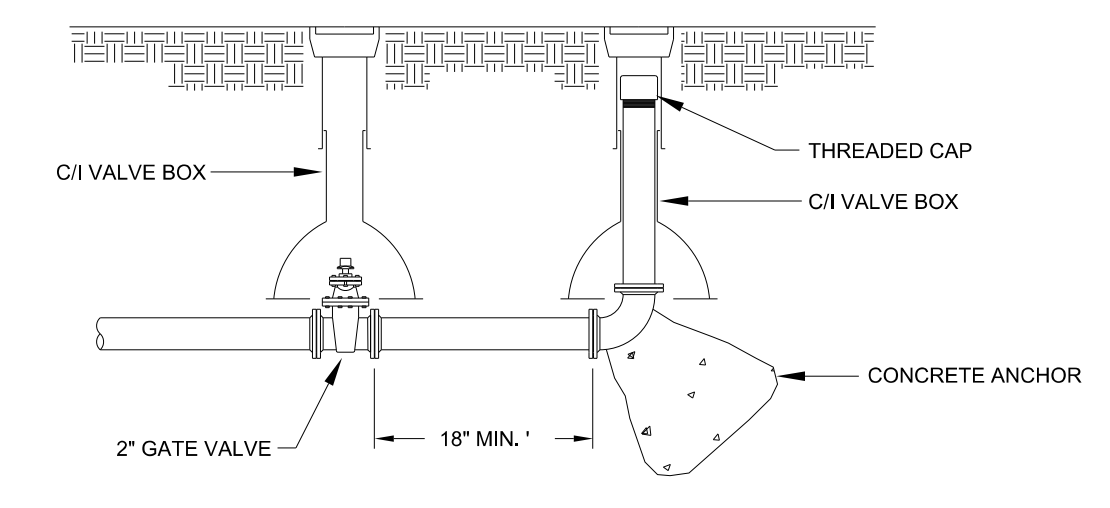


CARRIER PIPE SIZE	ROADWAY CASING SIZE (MIN. WALL THICKNESS)	RAILROAD CASING SIZE (MIN. WALL THICKNESS)
6"	12"	0.188"
8"	16"	0.250"
12"	24"	0.250"
16"	36"	0.250"
18"	36"	0.250"
24"	48"	0.375"
30"	48"	0.375"



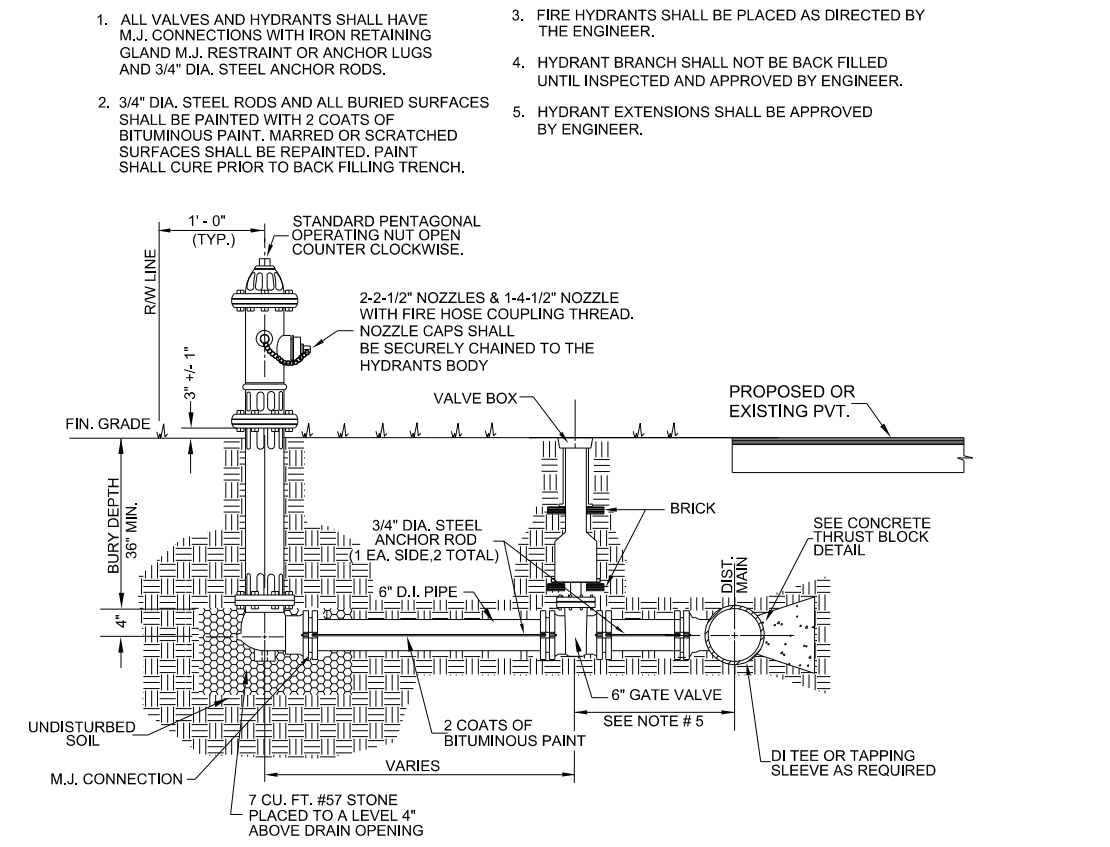
BORING DETAIL FOR HIGHWAYS AND RAILROADS

- CONTRACTOR MAY SUBSTITUTE A LARGER SIZE CASING PIPE HAVING THE MIN. WALL THICKNESS SHOWN FOR SEVERAL SIZES. ALL ADDITIONAL COSTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR BORING AND JACKING.
- INSTALLATION SHALL BE DRY BORE AND JACKING OF SMOOTH WALL STEEL PIPE. JETTING OR WET BORING WITH WATER SHALL NOT BE ALLOWED.
- SEE BORE SIZING CHART FOR CARRIER PIPE SIZE AND STEEL CASING SIZE. MIN. DIA. AND WALL THICKNESS.
- CASING PIPE SHALL BE IN ACCORDANCE WITH ASTM A-53, GRADE B WITH A MINIMUM YIELD STRENGTH OF 30,000 PSI.
- THE BORE SHALL BE ACCOMPLISHED BEFORE PIPE CONSTRUCTION BEGINS. THE MINIMUM TOLERANCE, IF ANY, IN VARIATION OF INVERT ELEVATIONS BETWEEN ENDS OF CASING AND CARRIER PIPE IS SHOWN ON THE PLAN PROFILE FOR EACH SPECIFIC BORE LOCATION AND STATION.
- THE BORING SHALL BE PERFORMED FROM "UPHILL" TO "DOWNHILL" DIRECTION MAINTAINING THE ORIGINAL UPHILL ELEVATION IF APPROVED BY THE ENGINEER. GRADE ADJUSTMENTS DOWNHILL TO CORRECTIVE FOR AN INVERT ELEVATION VARIANCE SHALL BE CONSIDERED AT NO ADDITIONAL COSTS TO THE OWNER.
- THE BORING OPERATION SHALL BE CONDUCTED IN A MANNER THAT THE FLOW OF TRAFFIC IS NOT IMPAIRED OR IN SUCH A MANNER SO AS NOT TO CREATE A HAZARD.
- IF AN OBSTRUCTION IS ENCOUNTERED DURING THE BORING OPERATION, THE AUGER SHALL BE WITHDRAWN, THE EXCESS CASING PIPE CUT-OFF, CAPPED AND THE INTERIOR AND EXTERIOR Voids SHALL BE COMPLETELY Filled WITH PORTLAND CEMENT GROUT UNDER PRESSURE. NO SEPARATE PAYMENT FOR UNSUCCESSFUL BORES.
- CONTRACTOR SHALL FIELD ADJUST AND INSTALL PROPER PIPE BRACES TO ACCOMPLISH GRADE AND INVERTS AS SHOWN ON THE DRAWINGS.
- A MANUAL CONTROL STEERING HEAD OR OTHER GUIDANCE SYSTEM IS RECOMMENDED FOR BORES 30" DIA. AND/OR LONGER AND FOR BORES EXCEEDING 100' IN LENGTH OR AS SPECIFIED.
- SUBCONTRACTORS SHALL BE APPROVED BY THE ENGINEER AND SHALL PROVIDE APPROVED INSURANCE CERTIFICATES AS REQUIRED.
- CONTRACTOR SHALL EXECUTE AND PERFORM ALL REQUIREMENTS AND CONDITIONS STIPULATED BY ENCROACHMENT PERMITS.

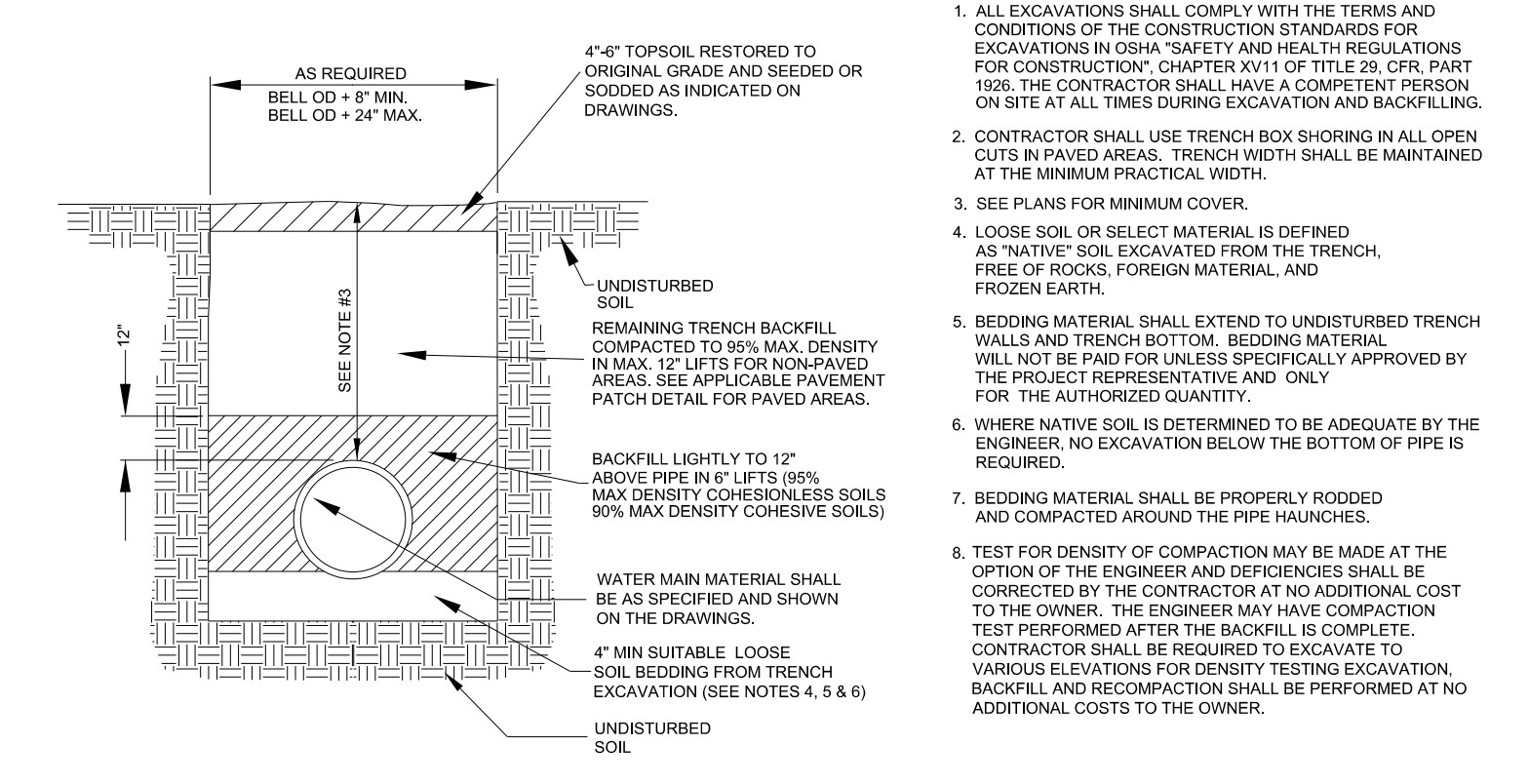


TYPICAL BLOWOFF ASSEMBLY

- ALL VALVES AND HYDRANTS SHALL HAVE M.J. CONNECTIONS WITH BRON RETAINING GLAND M.J. RESTRAINT OR ANCHOR LUGS AND 3/4" DIA. STEEL ANCHOR RODS.
- 3/4" DIA. STEEL RODS AND ALL BURIED SURFACES SHALL BE PAINTED WITH 2 COATS OF BUTYRACIOUS PAINT, MARBLED OR SCRATCHED SURFACES SHALL BE REPAIRED. PAINT SHALL CURE PRIOR TO BACK FILLING TRENCH.
- HYDRANT BRANCH SHALL NOT BE BACK FILLED UNTIL INSPECTED AND APPROVED BY ENGINEER.
- HYDRANT EXTENSIONS SHALL BE APPROVED BY ENGINEER.

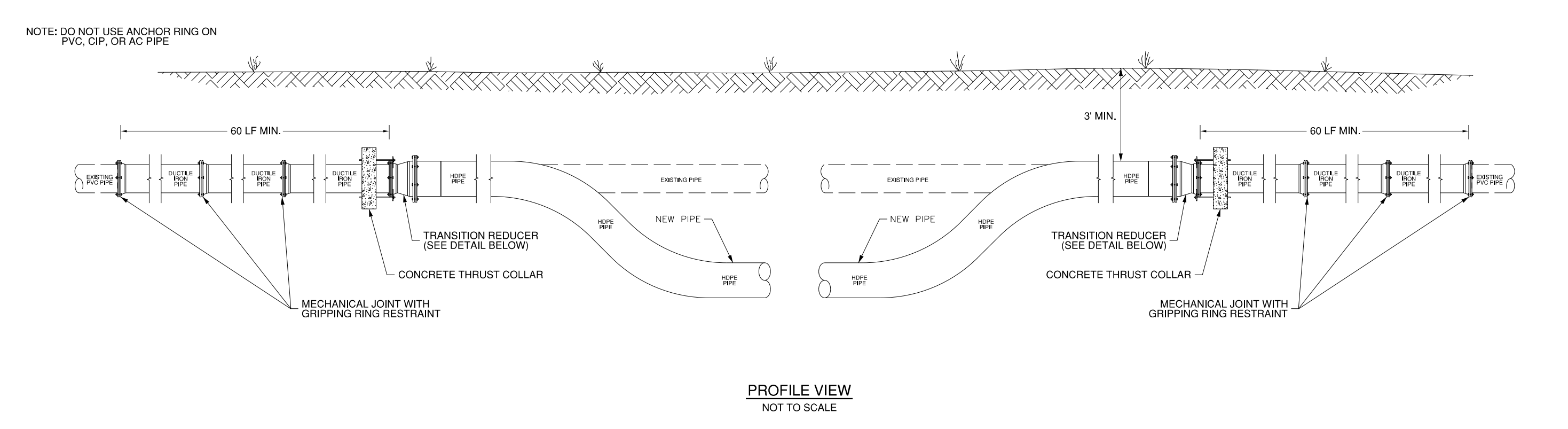


HYDRANT DETAIL

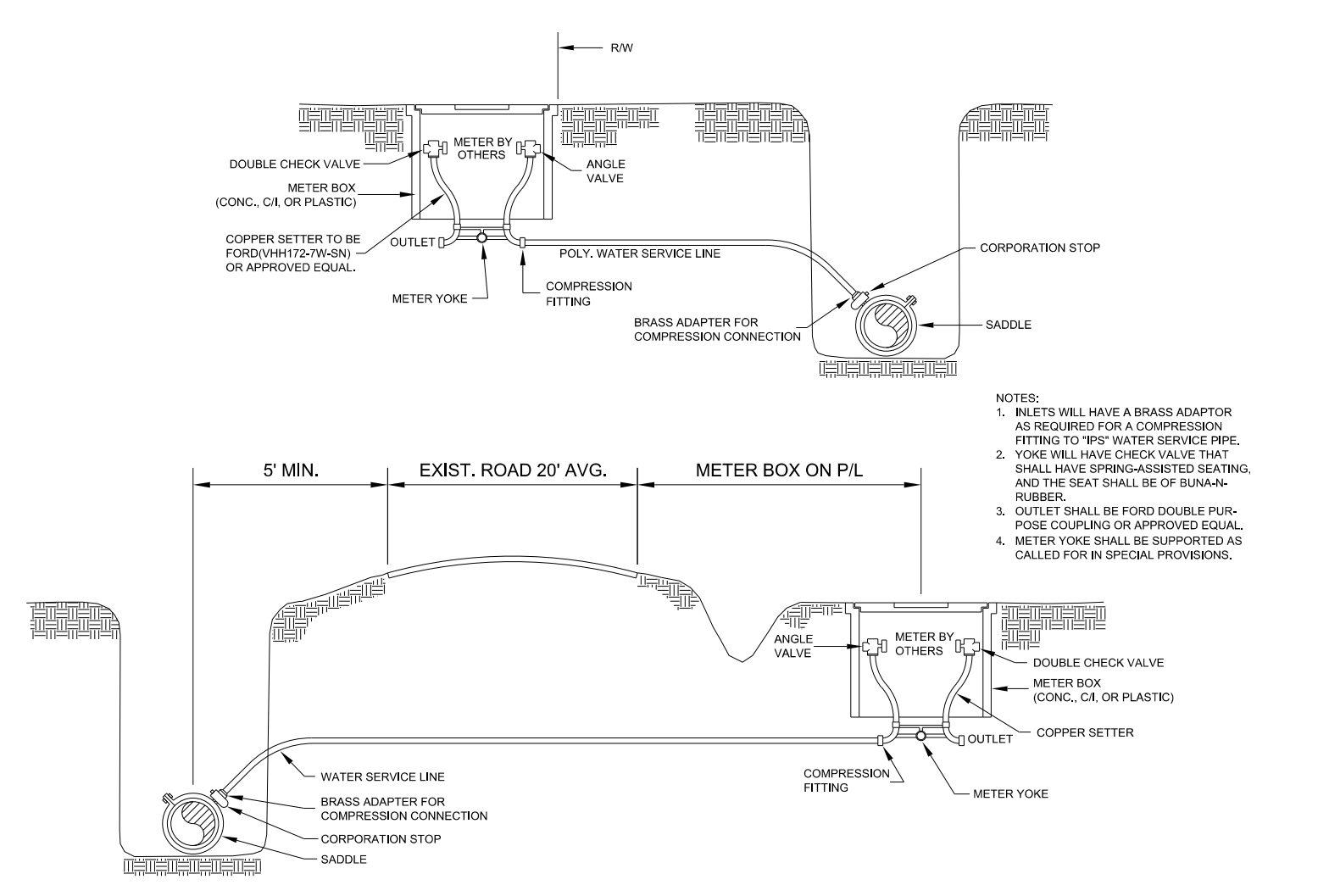


WATER MAIN BEDDING DETAIL

- ALL EXCAVATIONS SHALL COMPLY WITH THE TERMS AND CONDITIONS OF THE CONSTRUCTION STANDARDS FOR EXCAVATIONS IN OTHER SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION, CHAPTER XVII OF TITLE 29, CFR, PART 1926. THE CONTRACTOR SHALL HAVE A COMPETENT PERSON ON SITE AT ALL TIMES DURING EXCAVATION AND BACKFILLING.
- CONTRACTOR SHALL USE TRENCH BOX SHORING IN ALL OPEN CUTS IN PAVED AREAS. TRENCH WIDTH SHALL BE MAINTAINED AT THE MINIMUM PRACTICAL WIDTH.
- SEE PLANS FOR MINIMUM COVER.
- LOOSE SOIL OR SELECT MATERIAL IS DEFINED AS "NATIVE" SOIL EXCAVATED FROM THE TRENCH, FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH.
- 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.
- WHERE NATIVE SOIL IS DETERMINED TO BE ADEQUATE BY THE ENGINEER, NO EXCAVATION BELOW THE BOTTOM OF PIPE IS REQUIRED.
- BEDDING MATERIAL SHALL BE PROPERLY RODEED AND COMPACTED AROUND THE PIPE HAUNCHES.
- 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.



STANDARD DETAIL FOR UTILITY RELOCATION BY HORIZONTAL DIRECTIONAL DRILL USING HDPE PIPE



TYPICAL HOUSE SERVICE DETAIL

- INLETS WILL HAVE A BRASS ADAPTER AS REQUIRED FOR A COMPRESSION FITTING TO 1/2" WATER SERVICE PIPE.
- NOE WILL HAVE CHECK VALVE THAT SHALL HAVE SPRING-ASSISTED SEATING AND THE SEAT SHALL BE OF BUNA-N RUBBER.
- OUTLET SHALL BE FORD DOUBLE PURPOSE COUPLING OR APPROVED EQUAL.
- METER YOKE SHALL BE SUPPORTED AS CALLED FOR IN SPECIAL PROVISIONS.