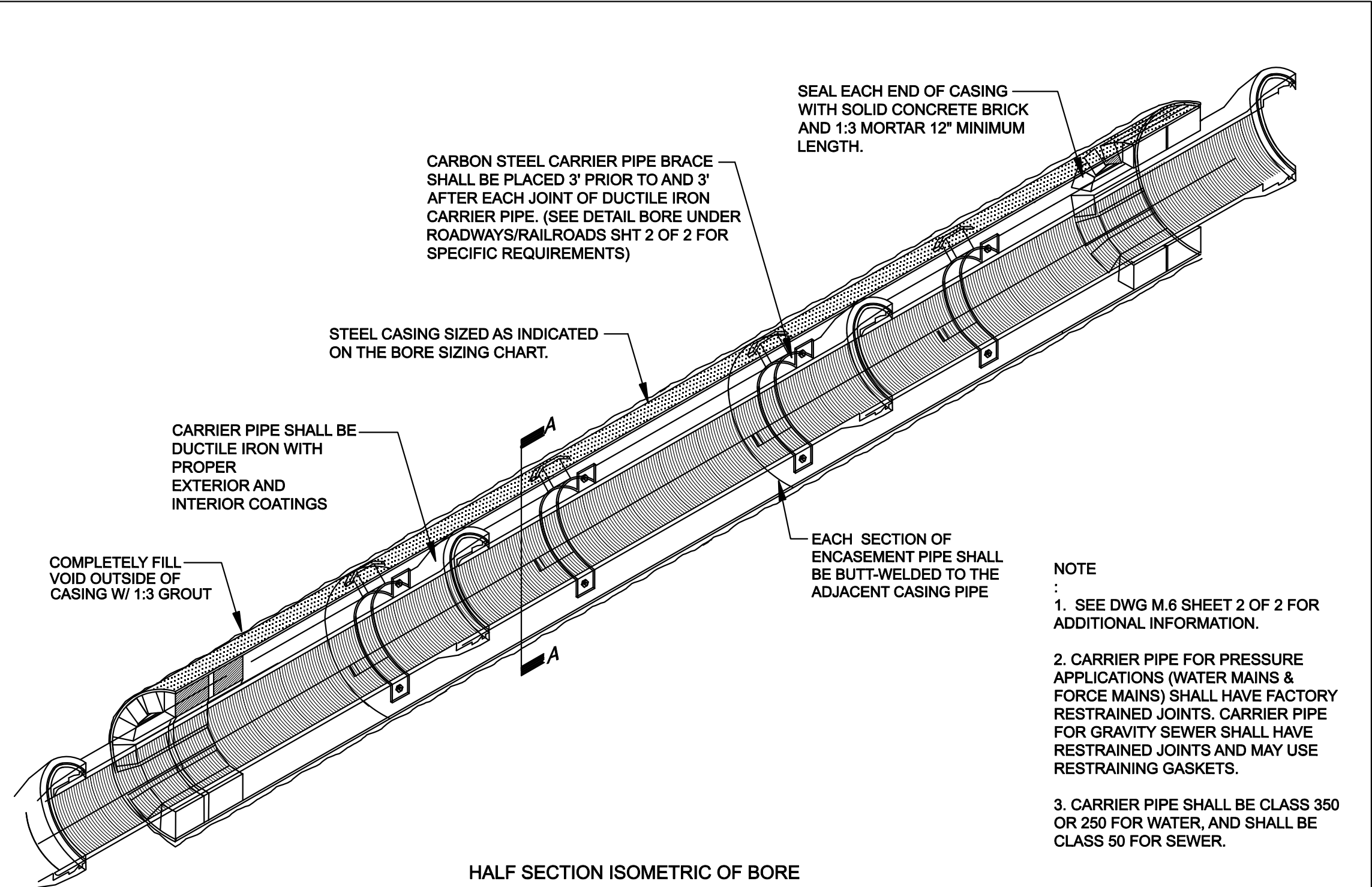


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UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO. B-4490	SHEET NO. UC-3L
DESIGNED BY:	
DRAWN BY: NONE	
CHECKED BY:	
APPROVED BY:	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 2/2/2016

UTILITY CONSTRUCTION

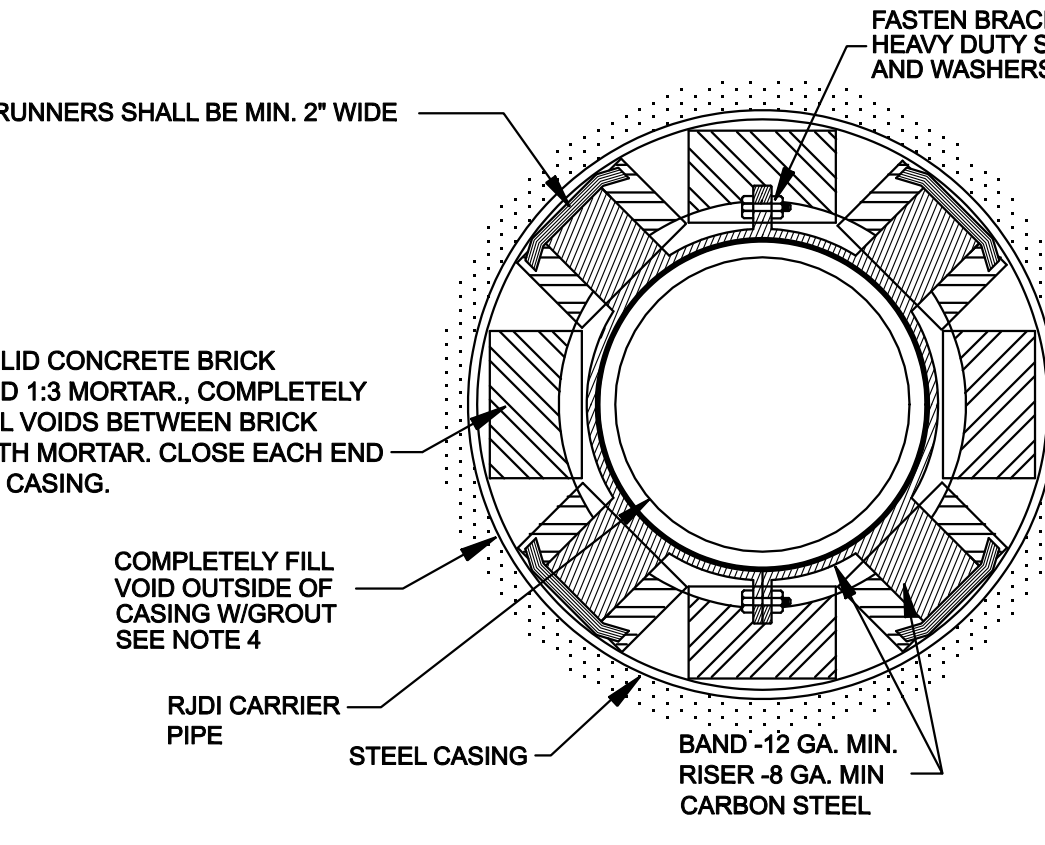


BORE UNDER ROADWAYS/RAILROADS N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.			NO.	DATE	REVISION
SHEET NO. 1 OF 2	DWG. NO. M.6 DATE: JULY 01, 2015	DWG. BY: FAYPWC APPROVED BY: J.E.G.	WATER RESOURCES ENGINEERING DEPARTMENT		1.	JAN 05	ADDED NOTES 2 & 3
					2.	OCT 09	Clarified restraint requirements.

2015-M6 BORE_ROAD_RAIL.dwg

CARRIER PIPE SIZE	MIN. CASING SIZE	ROADWAYS MIN. WALL THICKNESS	RAILROADS MIN. WALL THICKNESS
4"	10"	0.188"	0.188"
6"	12"	0.25"	0.281"
8"	16"	0.25"	0.281"
12"	24"	0.25"	0.375"
16"	30"	0.312"	0.469"
18"	30"	0.312"	0.469"
24"	36"	0.375"	0.532"
30"	42"	0.500"	0.625"
36"	48"	0.500"	0.688"

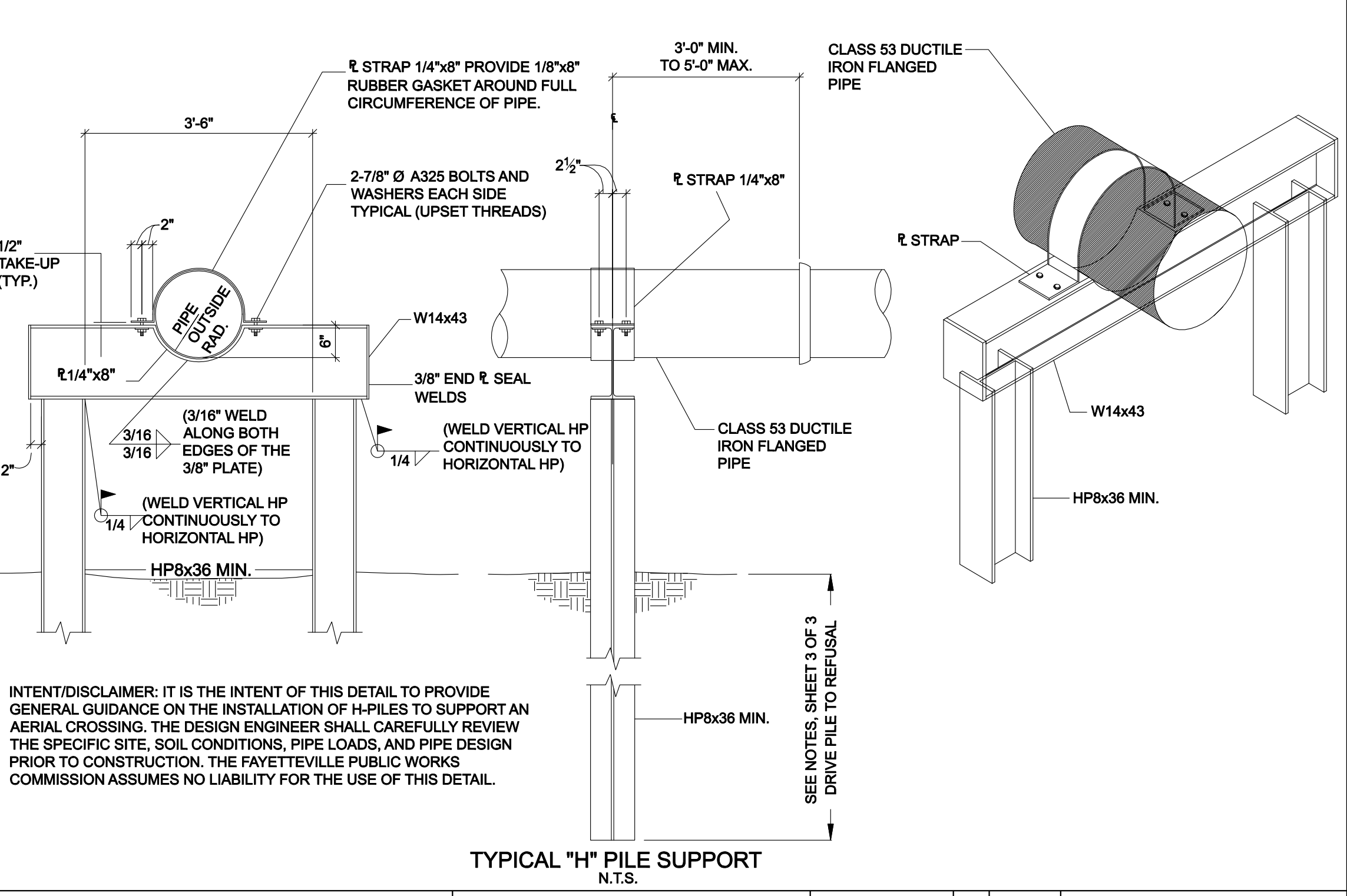
*CONTRACTOR MAY SUBSTITUTE A LARGER SIZE CASING PIPE HAVING THE MIN. WALL THICKNESS SHOWN FOR SEWER MAINS. ALL ADDITIONAL COSTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR BORING AND JACKING.



BORE UNDER ROADWAYS/RAILROADS N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.			NO.	DATE	REVISION
SHEET NO. 2 OF 2	DWG. NO. M.6 DATE: JULY 01, 2015	DWG. BY: FAYPWC APPROVED BY: J.E.G.	WATER RESOURCES ENGINEERING DEPARTMENT		1.	2/11/04	ADDED 6" CARRIER PIPE TO BORE SIZING CHART
					2.	JULY 10	REVISED NOTES, SIZING CHART

2015-M6 BORE_ROAD_RAIL.dwg

- NOTES:
- 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 35,000 PSI
 - EACH END OF ENCASEMENT TO BE PLUGGED WITH BRICK. ALL VOIDS OUTSIDE THE CASING PIPE SHALL BE COMPLETELY FILLED WITH 1:3 PORTLAND CEMENT GROUT AT SUFFICIENT PRESSURE TO INSURE NO SETTLEMENT OF ROADWAY/RAILROAD. METHOD OF GROUTING SHALL BE AS APPROVED BY THE PERMITTING AGENCY.
 - IT IS RECOMMENDED THAT THE BORE BE ACCOMPLISHED BEFORE PIPE CONSTRUCTION BEGINS.
 - THE BORING SHALL BE PERFORMED FROM "UPSTREAM" TO "DOWNSTREAM" DIRECTION MAINTAINING THE CRITICAL DOWNSTREAM INVERT ELEVATION. SHOULD THE BORE NOT BE ON GRADE, A REVISED PLAN SHALL BE SUBMITTED TO FAYPWC FOR APPROVAL.
 - THE BORING OPERATION SHALL BE CONDUCTED IN A MANNER THAT THE FLOW OF TRAFFIC IS NOT IMPEDED 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 W/1:3 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" DIAM. AND/OR LARGER AND FOR BORES EXCEEDING 100' IN LENGTH OR AS SPECIFIED.
 - SUBCONTRACTORS SHALL ADHERE TO ALL PERMIT REQUIREMENTS AND SHALL PROVIDE APPROVED INSURANCE CERTIFICATES AS REQUIRED.
 - CONTRACTOR SHALL EXECUTE AND PERFORM ALL REQUIREMENTS AND CONDITIONS STIPULATED BY THE PERMITTING AGENCY.
 - SEE DWG. M.6 SHEET 1 OF 2 FOR ADDITIONAL INFORMATION.
 - CARRIER PIPE FOR PRESSURE APPLICATIONS (WATER MAINS & FORCE MAINS) SHALL HAVE FACTORY RESTRAINED JOINTS. CARRIER PIPE FOR GRAVITY SEWER SHALL HAVE RESTRAINED JOINTS AND MAY USE RESTRAINING GASKETS.



H-PILE DETAIL 16" THRU 24" PIPE FOR AERIAL CROSSINGS N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.			NO.	DATE	REVISION
SHEET NO. 2 OF 3	DWG. NO. M.13 DATE: JULY 01, 2015	DWG. BY: FAYPWC APPROVED BY: J.E.G.	WATER RESOURCES ENGINEERING DEPARTMENT		1.	7/09	UPDATED DETAIL
					2.	09/2010	REVISED NOTES

2015-M13 H-PILE AERIAL CROSSING.dwg

- NOTES:
- STEEL H-PILES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A992 GRADE 50.
 - A SUBSURFACE GEO-TECHNICAL REPORT IS REQUIRED TO DETERMINE PILE EMBEDMENT LENGTH.
 - THIS DETAIL IS FOR GUIDANCE/INFORMATION ONLY. THE DESIGN ENGINEER SHALL BE RESPONSIBLE FOR PROVIDING A PROJECT SPECIFIC DESIGN.
 - FOR ALL AERIAL CROSSINGS, A PROJECT SPECIFIC DESIGN SHALL BE SUBMITTED TO FAYPWC FOR REVIEW AND APPROVAL.
 - A SUBSURFACE GEO-TECHNICAL EVALUATION IS REQUIRED IN ORDER TO DESIGN THE PILE LENGTH, EMBEDMENT, AND SPACING FOR THE SPECIFIC PROJECT LOCATION. THE DESIGN ENGINEER SHALL PROVIDE A COPY OF THE REPORT AND THE DESIGN TO FAYPWC.
 - THE DESIGN ENGINEER SHALL FURNISH A STRUCTURAL DESIGN BASED UPON ACTUAL FIELD CONDITIONS AND THE INTENDED USE OF THE STRUCTURE. LATERAL LOADS MAY REQUIRE THE ADDITION OF A BATTERED PILE. THE DESIGN ENGINEER SHALL CONSIDER SUCH LOADS AS ICE/SNOW, FLOODING, ETC.
 - FOR AERIAL SUPPORT OF PRESSURE MAINS, THE ENGINEER SHALL ENSURE THAT THE PIPE JOINTS CAN PROVIDE THE NECESSARY THRUST RESTRAINT. CALCULATIONS SHALL BE SUBMITTED TO FAYPWC FOR REVIEW, PRIOR TO CONSTRUCTION.
 - LOCATION AND SPACING OF PILES SHALL BE BASED UPON ACTUAL FIELD CONDITIONS AND AS SPECIFIED BY THE DESIGN ENGINEER. EACH PIPE JOINT SHALL BE SUPPORTED BY A PILE, UNLESS OTHERWISE APPROVED BY FAYPWC.
 - ANY CHANGES TO THIS DETAIL SHALL BE REVIEWED AND APPROVED BY FAYPWC PRIOR TO CONSTRUCTION.
 - ANY REVISIONS TO THIS DETAIL SHALL BE SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER AND SUBMITTED TO FAYPWC FOR REVIEW.
 - PILES SHOULD NOT BE PLACED IN THE CENTERLINE OF THE STREAM.
 - PILES SHALL BE DRIVEN UTILIZING A VIBRATORY HAMMER OR PILE HAMMER.
 - ALL PILES SHALL BE DRIVEN TO REFUSAL. THE DESIGN ENGINEER SHALL PROVIDE FAYPWC WITH CALCULATIONS AND/OR A REPORT THAT CLEARLY DEFINES WHAT CONSTITUTES REFUSAL. SHOULD THE CONTRACTOR UTILIZE A DIFFERENT DRIVING METHOD THAN SPECIFIED, THEN REVISED CALCULATIONS SHALL BE PROVIDED TO FAYPWC.
 - PILES SHALL BE CUT OFF SQUARE AT THE REQUIRED ELEVATIONS WITH METHOD OF CUT APPROVED BY THE DESIGN ENGINEER.
 - EXPANSION JOINTS SHALL BE PROVIDED AS REQUIRED. THE EXPANSION JOINTS SHALL BE SUPPORTED BY PLACEMENT OF PIERS WITHIN 3 FEET ON BOTH SIDES OF THE JOINT OR AS SPECIFIED IN THE DESIGN.
 - ALL PILE LOCATIONS SHALL BE STAKED IN THE FIELD.
 - ALL WELDS SHALL BE BY A CERTIFIED WELDER.
 - ALL STEEL MEMBERS AND STRAPS WILL BE POWER TOOL CLEANED TO A MIN. OF SS-PC-SP3 AND HOT-DIP GALVANIZED PER ASTM A123. BOLTS AND WASHERS WILL BE HOT-DIP GALVANIZED PER ASTM A153. ALL WELDS WILL BE GRINDING AND COATED WITH 2 COATS OF A COLD APPLIED GALVANIZING PAINT.
 - ALL DI PIPE IN SANITARY SEWER SERVICE SHALL BE PROTECTO 401 LINED.

H-PILE DETAIL NOTES		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.			NO.	DATE	REVISION
SHEET NO. 3 OF 3	DWG. NO. M.13 DATE: JULY 01, 2015	DWG. BY: FAYPWC APPROVED BY: J.E.G.	WATER RESOURCES ENGINEERING DEPARTMENT		1.	7/09	UPDATED DETAIL
					2.	09/2010	REVISED NOTES

2015-M13 H-PILE AERIAL CROSSING.dwg

Prepared by:

AECOM

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DATE: 6/22/2016
TIME: 7:45:30 AM
DRN: B4490_UF_per_03.dwg