5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5206	UC-3B

6/9/2015

AERIAL PIPE CROSSING GENERAL NOTES:

1. ALL MATERIALS UTILIZED ON THESE DETAIL SHEETS SHALL CONFORM TO NCDOT'S 2012 STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, AS WELL AS NCDENR'S MINIMUM DESIGN CRITERIA FOR THE PERMITTING OF GRAVITY SEWERS, UNLESS NOTED OTHERWISE HEREIN.

2. RESTRAINED JOINT PIPE AND FITTINGS SHALL CONSIST OF BOLTED RETAINER RINGS AND WELDED RETAINER BARS OR BOLTLESS TYPE WHICH INCLUDE DUCTILE IRON LOCKING SEGMENTS AND RUBBER RETAINERS. BOLTS FOR RESTRAINED JOINTS (IF APPLICABLE) SHALL CONFORM TO ANSI B18.2. RESTRAINED PIPE AND FITTINGS SHALL BE FLEX-RING OR LOK-RING TYPE JOINTS.

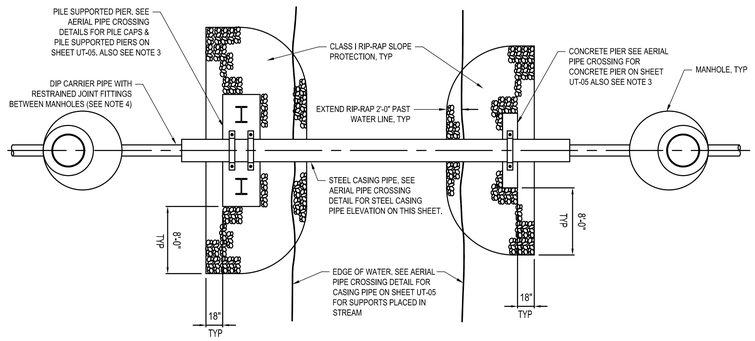
3. CONCRETE PROPERTIES SHALL BE AS FOLLOWS:
   CONCRETE COMPRESSIVE STRENGTH = 4000 PSI
   NOMINAL SLUMP = 4 INCHES
   WATER/CEMENTITOUS MATERIALS RATIO = 0.45 (MAX)
   AIR CONTENT = 6% * 1.5%
CONCRETE SHALL BE COMPOSED OF CEMENT, WATER, COARSE AGGREGATES, FINE AGGREGATES AND AIR. CEMENT SHALL BE TYPE I/II OR II IN ACCORDANCE WITH ASTM C-150. MATERIAL REQUIREMENTS FOR ALL FINE AND COARSE AGGREGATES SHALL CONFORM TO ASTM C-33. COARSE AGGREGATE SHALL BE SIZE No. 57 OR 67. AN APPROVED CLASS 'F' FLYASH MAY BE SUBSTITUTED FOR AN EQUAL AMOUNT OF CEMENT BY WEIGHT UP TO 25%.

4. ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/4".

5. CONVENTIONAL REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60 AND SHALL BE PLACED IN ACCORDANCE WITH "RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS" (LATEST EDITION) AS PUBLISHED BY THE CONCRETE REINFORCING INSTITUTE. SPLICES SHALL BE CLASS 'B' CONFORMING TO THE PROVISIONS OF ACI 318 - "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".

6. NEOPRENE BEARING PADS SHALL BE FORMED FROM PREVIOUSLY UNVULCANIZED, 100% VIRGIN NEOPRENE, WITH DUROMETER HARDNESS = 50.

7. PILES SHALL BE STRUCTURAL STEEL HP12x53 PILES AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36. PILES SHALL BE DRIVEN TO DEPTHS REQUIRED TO OBTAIN AN ULTIMATE BEARING CAPACITY OF NOT LESS THAN TWO TIMES THE DESIGN LOADING OF 30 TONS. PILES SHALL PENETRATE A MINIMUM OF FIFTEEN FEET INTO UNDISTURBED SOIL. IN DRIVING PILES, A METHOD APPROVED BY THE ENGINEER SHALL BE USED WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED. IF REQUESTED BY THE ENGINEER, PILES SHALL BE TESTED TO DETERMINE THE ULTIMATE CAPACITY OF THE PILES. THE METHOD OF LOAD TESTING SHALL CONFORM TO ASTM D1143 AND THE NORTH CAROLINA STATE BUILDING CODE. WHERE PILES ARE EXPOSED, PILES SHALL BE PAINTED AND/OR COATED IN ACCORDANCE WITH NCDOT SPECIFICATIONS.



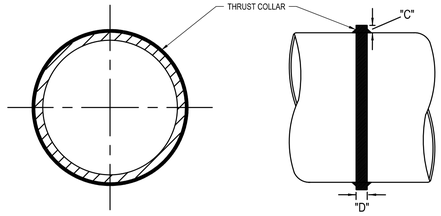
NOTES:
1. RIP RAP FOR SLOPE PROTECTION SHALL BE CLASS I RIP RAP IN ACCORDANCE WITH SECTION 868 OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES".

2. RIP RAP SHALL BE PLACED IN ACCORDANCE WITH DRAWING 868.01 OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION'S "ROADWAY STANDARD DRAWINGS".

3. SUPPORT TYPE FOR PIERS SHALL BE DETERMINED BY ENGINEER BASED ON SUBGRADE CONDITIONS AT SITE. SEE AERIAL PIPE CROSSING DETAIL FOR CONCRETE PIER ON SHEET UT-05 FOR SUBGRADE PARAMETERS FOR EACH TYPE OF FOUNDATION.

4. WHERE DUCTILE IRON PIPE IS USED FOR CARRIER PIPE, DUCTILE IRON CARRIER PIPE SHALL BE INSTALLED UTILIZING 2 PIPE ALIGNMENT GUIDES PER JOINT ONE FOURTH OF THE PIPE JOINT LENGTH IN FROM BOTH THE BELL AND SPIGOT ENDS.

AERIAL PIPE CROSSING
TYPICAL PLAN

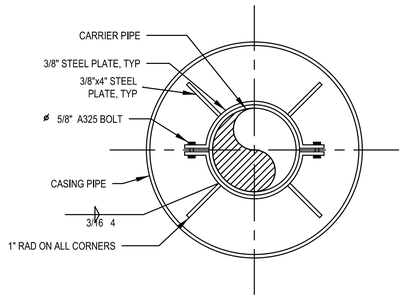


THRUST COLLAR, AND THRUST SCHEDULE

I.D. PIPE	"C"	"D"
6" - 16"	2"	3/8"
20" - 24"	3"	1/2"
30" - 36"	4"	5/8"
48" & greater	6"	7/8"

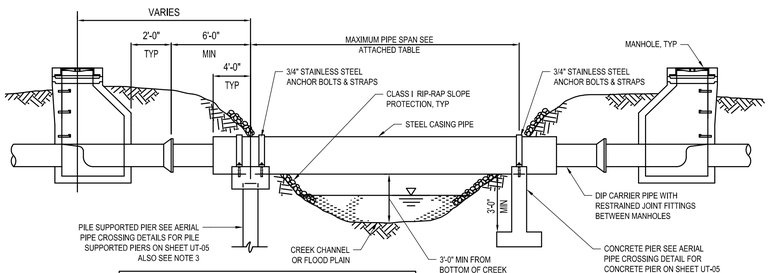
NOTE:
1. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.

THRUST COLLAR DETAIL



NOTE:
USE A MINIMUM OF TWO SPIDERS PER PIPE JOINT ONE FOURTH OF THE PIPE JOINT LENGTH IN FROM BOTH THE BELL AND SPIGOT ENDS.

PIPE ALIGNMENT GUIDE



ALLOWABLE SPANS FOR STEEL CASING PIPE			
CARRIER PIPE, DIP DIAMETER (IN.)	CASING PIPE, STEEL DIAMETER (IN.)	MINIMUM CASING PIPE WALL THICKNESS (IN.)	ALLOWABLE SPAN (FT.)
6	14	0.3750	40
8	16	0.3750	45
10	18	0.3750	50
12	20	0.3750	50
14	24	0.3750	55
16	26	0.3750	55
18	30	0.3750	60
20	32	0.3750	60
24	36	0.4375	65
30	42	0.4375	65
36	48	0.500	65
42	56	0.5000	65

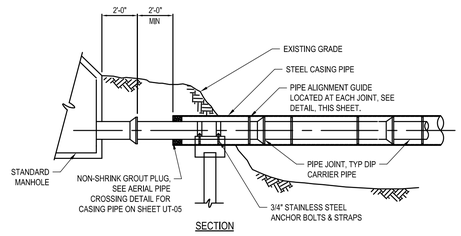
NOTES:
1. STEEL PIPE SHALL BE EITHER SPIRAL WELDED OR SMOOTH WALL SEAMLESS WITH A MINIMUM YIELD STRENGTH OF 35,000 PSI. PAINTING AND LINING SHALL BE AS REQUIRED BY NCDOT OR NCDENR.

2. DUCTILE IRON PIPE SHALL BE SUPPORTED WITH TWO SPIDERS AT EVERY JOINT WITHIN THE CASING PIPE USING APPROVED PIPE ALIGNMENT GUIDE. SEE DETAIL, THIS SHEET. ALL JOINTS SHALL BE RESTRAINED JOINT, SEE NOTE 2 OF THE AERIAL PIPE CROSSING GENERAL NOTES.

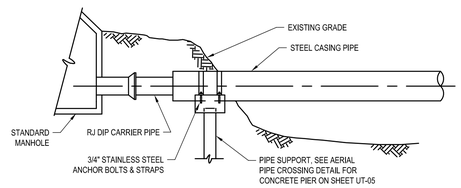
3. SUPPORT TYPE FOR PIERS SHALL BE DETERMINED BY ENGINEER BASED ON SUBGRADE CONDITIONS AT SITE. SEE AERIAL PIPE CROSSING DETAIL FOR CONCRETE PIER ON SHEET UT-05 FOR SUBGRADE PARAMETERS FOR EACH TYPE OF FOUNDATION. SEE AERIAL PIPE CROSSING DETAIL FOR CONCRETE SUPPORTS ON SHEET UT-05 FOR SUPPORTS PLACED WITHIN STREAM.

4. BOTTOM OF PIPE TO BE AT A MINIMUM OF 1' ABOVE THE 25 YEAR FLOOD ELEVATION.

STEEL CASING PIPE ELEVATION

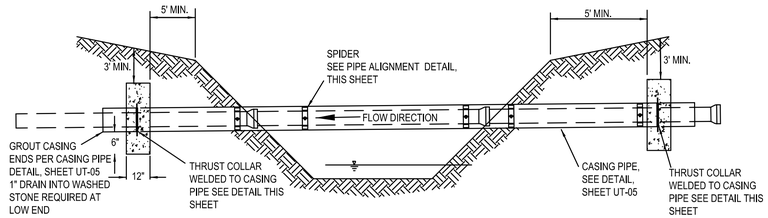


SECTION

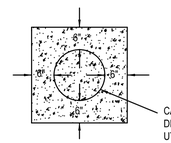


ELEVATION

TYPICAL PIPE SECTION &
ELEVATION



PROFILE VIEW



CONCRETE COLLAR

NOTES:
1. FOR CROSSINGS OF LESS THAN 10' NO CASING IS REQUIRED IF THE JOINT OF PIPE IS CENTERED ON THE CROSSING.

2. THRUST COLLAR MAY BE FIELD WELDED ON STEEL CASING PIPE. IF NO CASING IS REQUIRED THE THRUST COLLAR MUST BE FACTORY WELDED ON DIP CARRIER PIPE.

AERIAL PIPE CROSSING
TYPICAL PROFILE