PROJECT REFERENCE NO.	SHEET NO.
R-2233BB	UC-3A

DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
REVISED:

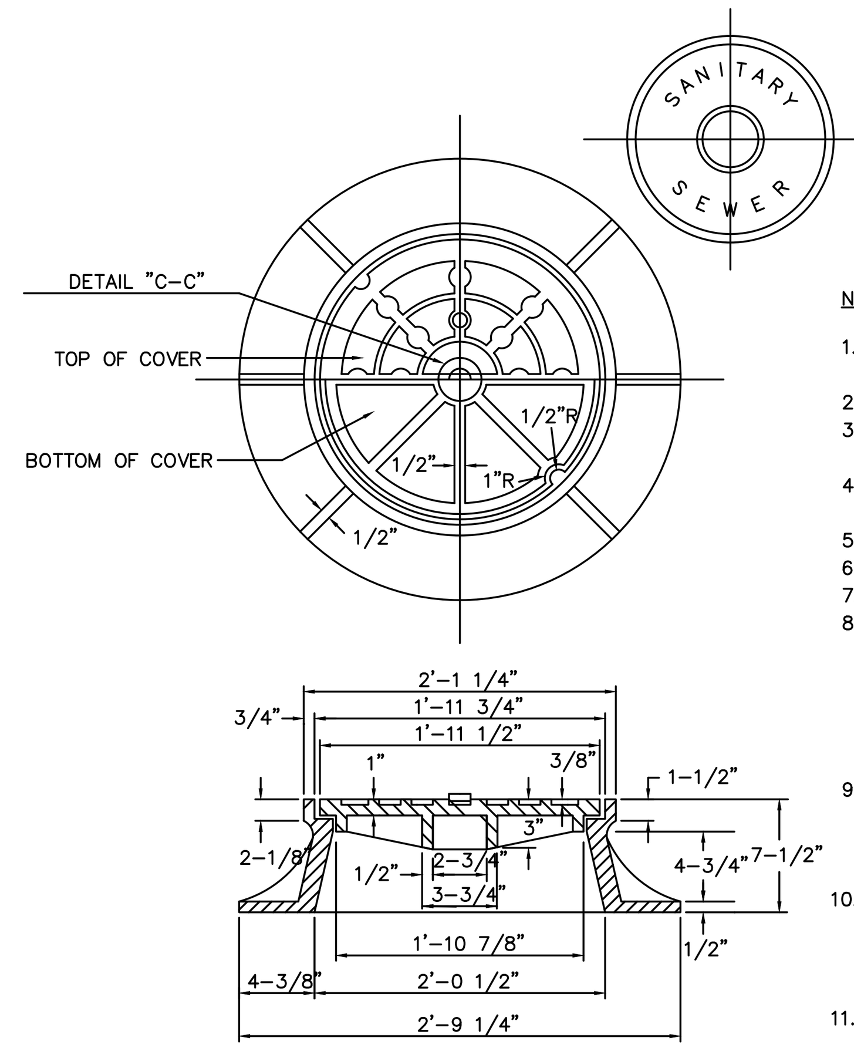
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21130 DAVID ODOM
DocuSigned by:
D2741ED0F708411...
4/28/2020

UTILITY CONSTRUCTION PLANS ONLY

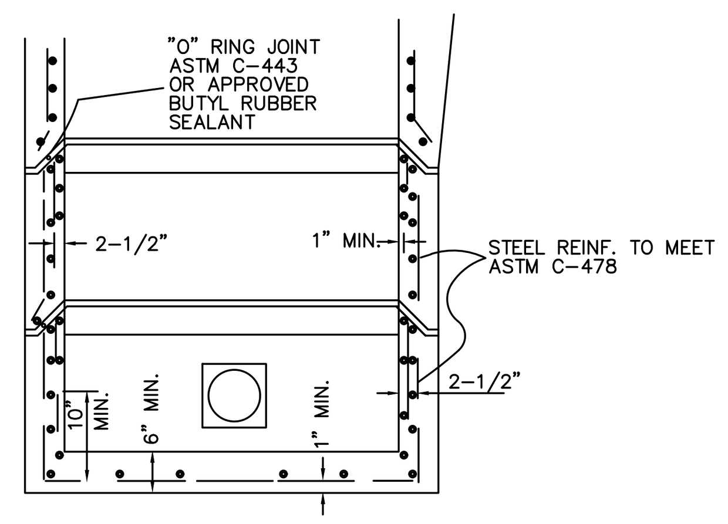
UTILITY CONSTRUCTION



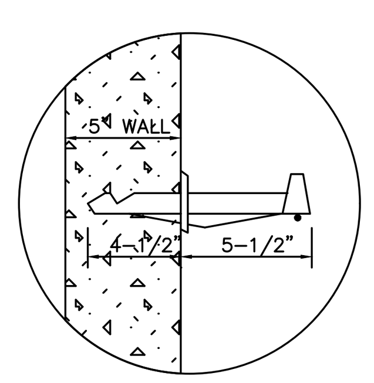
NOTES:

1. All castings to be free from sand holes & no plugging will be allowed.
2. Cast with the use of aluminum patterns.
3. Casting to be painted while hot with coal tar.
4. Covers used for storm drain manholes shall have "storm sewer" cast of them.
5. Slight draft allowed on straight faces.
6. Covers shall be solid with no vent holes.
7. Standard letters unless otherwise specified.
8. Approximate weight of FRAME – 190 lbs.
   Approximate weight of COVER – 120 lbs.
   Approximate weight of TOTAL – 310 Llbs.
9. Dewey Bros. Inc. Standard Manhole Ring & Cover Code No. MH RCR-2001, and the Vulcan Foundry, Inc. V-1384 Ring and Cover meets these specifications.
10. When the manhole is exposed to road traffic, the top of the frame is to be flush with the ground. At the other locations it shall be 9" above the ground.
11. Rims and covers to be gray cast iron complying to ASTM A48, class 30 iron.

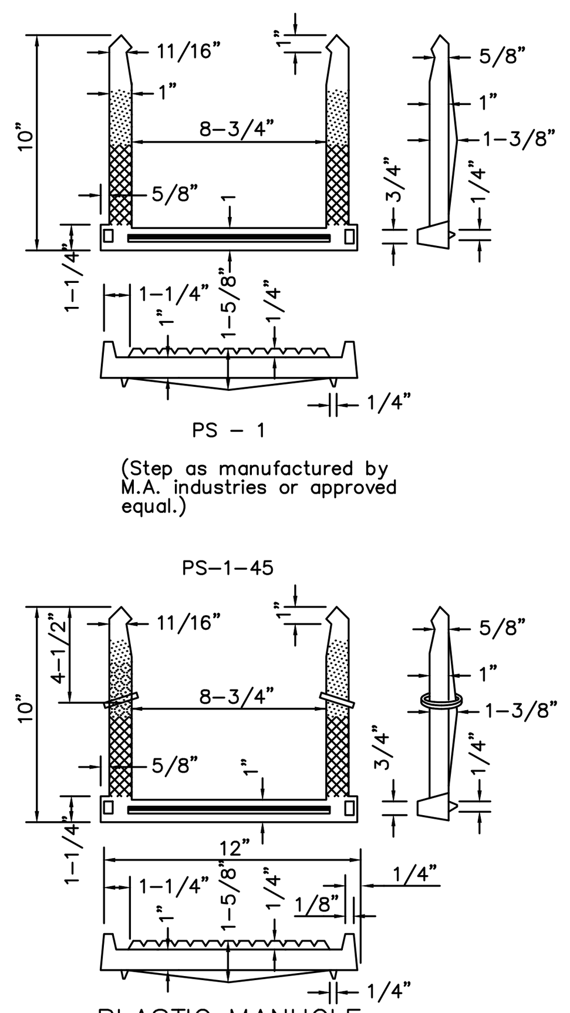
CAST IRON FRAME AND COVER FOR MANHOLE



REINF. STEEL DETAIL



TYPICAL STEP INSTALLATION



(Step as manufactured by M.A. Industries or approved equal.)

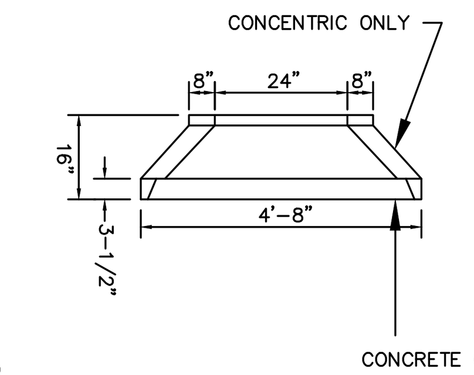
PLASTIC MANHOLE STEP DETAIL

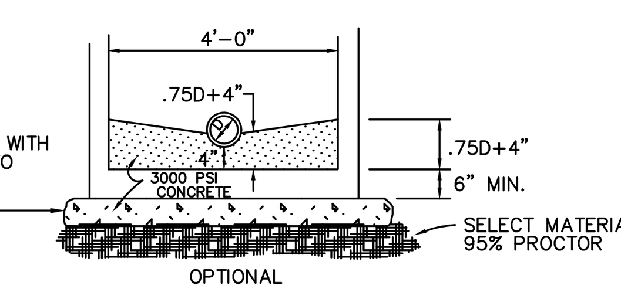
Note:
Steps are to be polypropylene plastic reinforced with 1/2" diameter grade 60 steel rods.

PLASTIC MANHOLE STEP DETAILS
MANHOLE STEEL REINFORCING DETAIL

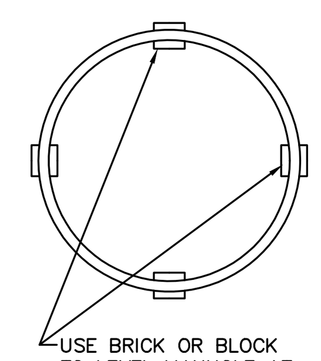
NOTES:

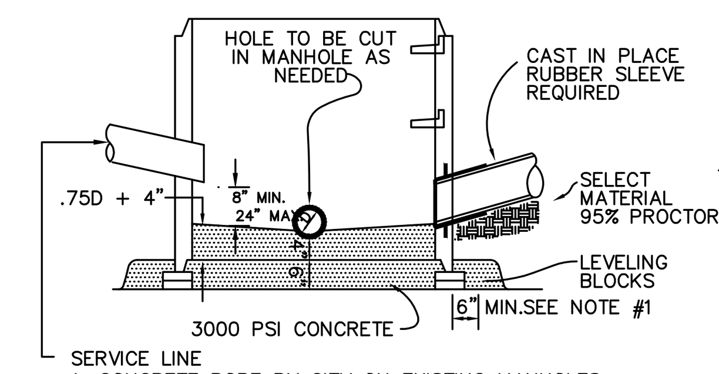
1. 6" MIN. CONCRETE SLAB TO BE POURED TO GROUND CUT.
2. INVERTS TO IN & OUT PIPES TO BE BUILT AFTER MANHOLE HAS BEEN SET.
3. MANHOLE TO BE LEVELED & ASSEMBLED SO AS TO EVENLY DISTRIBUTE WALL BEARING LOAD.
4. SEE DETAIL WS-2 FOR REINFORCING DETAILS AND STEP DETAILS.
5. 6" MIN. EXTENSION BEYOND EXTERIOR WALL OF MANHOLE.
6. PRE CAST MANHOLE JOINTS TO BE SEALED WITH "O" RING JOINT-ASTM C-443 OR WITH APPROVED BUTYL RUBBER SEALANT.
7. CONCRETE SLAB SHALL EXTEND A MIN. OF 3" ABOVE BOTTOM OF FIRST MANHOLE SECTION.
8. ALL LIFT HOLES TO BE SEALED WITH TAPERED NEOPRENE PLUGS OR OTHER APPROVED EQUAL. LIFT HOLES TO BE SEALED FROM OUTSIDE.
9. PROVIDE REINFORCED CONCRETE FOOTING WHEN MANHOLE IS GREATER THEN 12' OR ON POOR SOIL BASE.
10. MANHOLE MUST MEET AASHTO M199
11. MANHOLE SHALL BE PRE CAST CONCRETE WITH CONCENTRIC CONE SECTIONS COMPLYING TO ASTM C-478.
    4" THICK 95% PROCTOR COMPACTED #57 WASHED STONE TO BE 6" CONCRETE W/OUTSIDE DROP.





OPTIONAL MONOLITHIC BASE



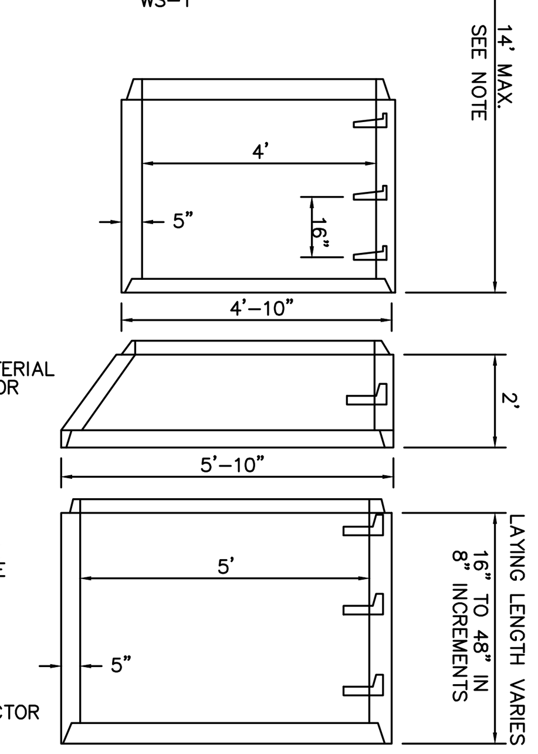


SERVICE LINE
1. CONCRETE BORE BY CITY ON EXISTING MANHOLES
2. DEVELOPER ON NEW MANHOLES

PRE CAST CONCRETE MANHOLE

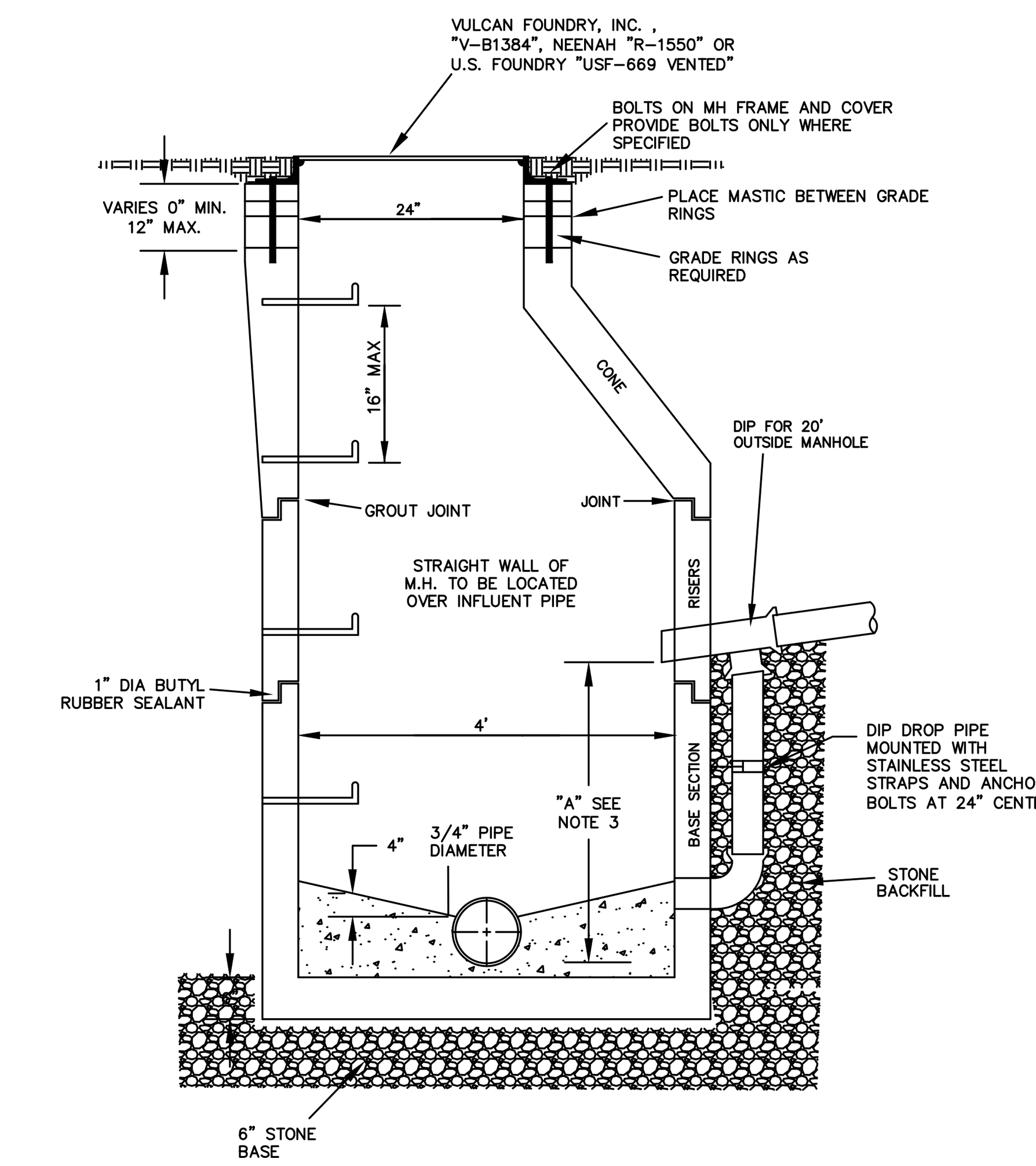
NOTE:
PRE CAST MANHOLE MAY BE CONSTRUCTED TO A MAXIMUM DEPTH OF 14' USING 4' PRE CAST MANHOLE SECTIONS. IF MANHOLE DEPTH EXCEEDS 14', USE 5' MANHOLE SECTIONS AS SHOWN.

FOR STANDARD DETAIL OF FRAME & COVER SEE SHEET WS-1



STANDARD FOOTING AS SHOWN AT LEFT TO BE USED.

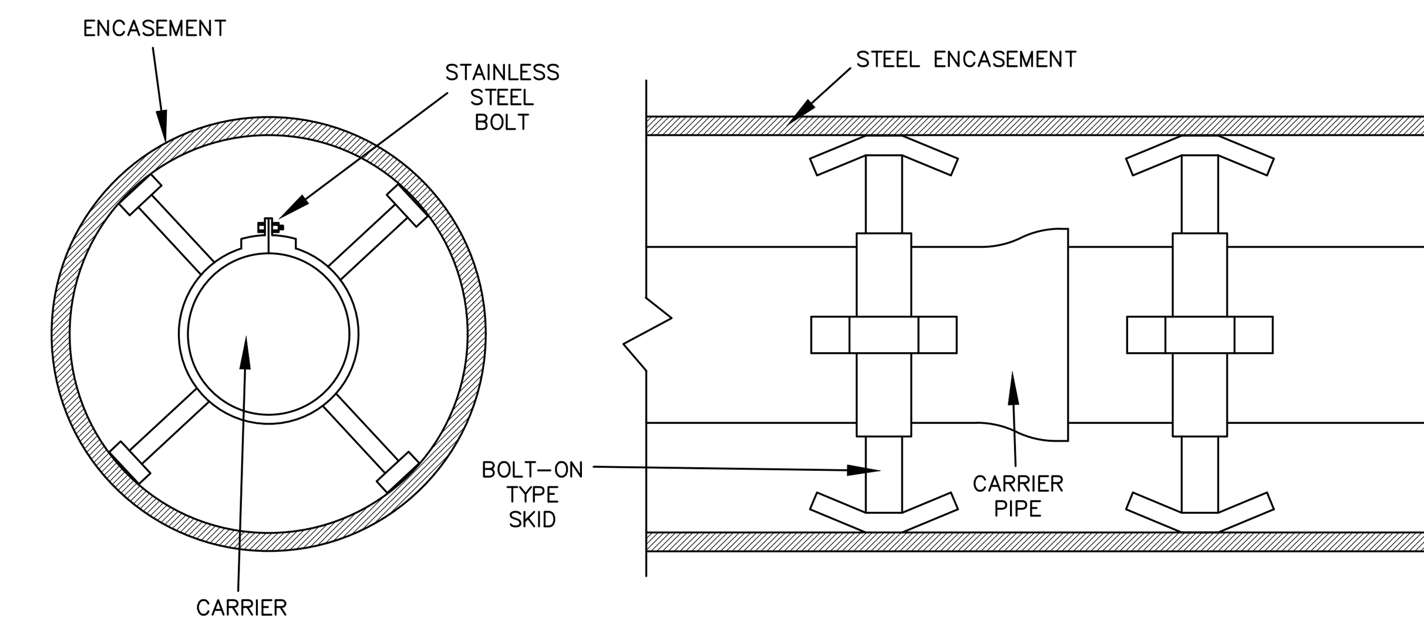
GROUT JOINTS ON INSIDE OF MANHOLE AND WRAP THE OUTSIDE OF THE JOINTS WITH CRETEX MANHOLE WRAP



NOTES:
1. MANHOLE RISERS AND CONE SECTIONS SHALL CONFORM TO ASTM C-478, LATEST REVISION.
2. TRANSITION RINGS SHALL HAVE A MINIMUM CLEARANCE OF 2'-0" ABOVE THE EFFLUENT OVERT ELEVATION.
3. A DROP MANHOLE SHALL BE REQUIRED WHEN DIM. "A" EXCEEDS 24" EXCEPT WHEN THE INLET LIES WITHIN THE LOWER HALF OF THE OUTLET PIPE.
3. FLEXIBLE WATERTIGHT, SYNTHETIC RUBBER SLEEVES, WITH STAINLESS STEEL CLAMP: DRAW BOLT AND NUT; OR CAST-IN SLEEVE; OR "A" LOCK CONNECTION SHALL BE FURNISHED FOR EACH PIPE TO MANHOLE CONNECTION.

SEWER DETAILS
PRECAST MANHOLE WITH OUTSIDE DROP

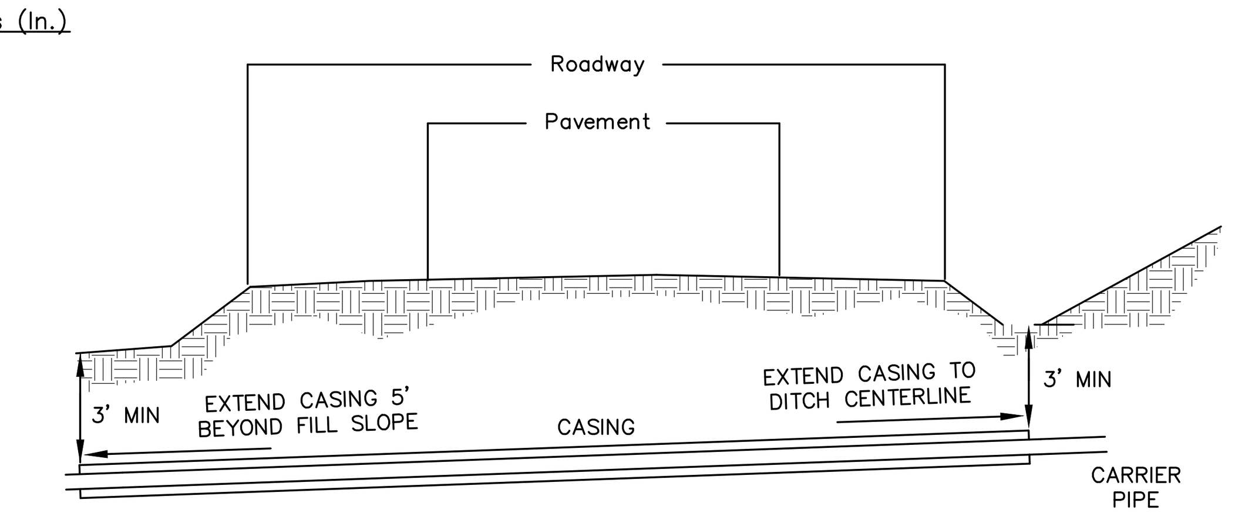
FILE NO.:
SCALE: NTS
DATE: DEC. 17, 2002
STANDARD DETAIL NUMBER
S-2



ENCASEMENT DETAIL
NTS

MINIMUM WALL THICKNESS OF SMOOTH WALL OR SPIRAL WELDED STEEL ENCASEMENT PIPE FOR BORING AND JACKING IS AS FOLLOWS:

Pipe Sizes (O.D.)	Wall Thickness (In.)
4"-12-3/4"	0.188
16"	0.250
18"	0.250
20"	0.250
24"	0.250
30"	0.250
36"	0.250
48"	0.250



NOTE:
1. SMOOTH WALL STEEL PIPE SHALL BE JACKED THROUGH DRY BORE SLIGHTLY LARGER THAN PIPE AS SPOIL IS MUCKED BY THE AUGER BACK THROUGH THE PIPE. AS THE DRY BORING OPERATION PROGRESSES, EACH NEW SECTION OF THE ENCASEMENT PIPE SHALL BE BUTT-WELDED TO THE SECTION PREVIOUSLY JACKED INTO PLACE. ENCASEMENT SHALL EXTEND FROM DITCH LINE TO DITCH LINE IN CUT SECTIONS, 5' BEYOND THE TOE OF THE SLOPES IN FILL SECTIONS.
2. IF VOIDS ARE ENCOUNTERED OR OCCUR OUTSIDE THE ENCASEMENT PIPE, GROUT HOLES SHALL BE INSTALLED IN THE TOP SECTION OF THE ENCASEMENT PIPE AT 10' CENTERS AND THE VOIDS FILLED WITH 1:3 PORTLAND CEMENT GROUT AT SUFFICIENT PRESSURE TO PREVENT SETTLEMENT IN THE ROADWAY.
3. IN THE EVENT AN OBSTRUCTION IS ENCOUNTERED DURING THE BORING AND JACKING OPERATION, THE AUGER IS TO BE WITHDRAWN AND THE EXCESS PIPE IS TO BE CUT OFF, CAPPED, AND FILLED WITH 1:3 PORTLAND CEMENT GROUT AT SUFFICIENT PRESSURE TO FILL ALL VOIDS BEFORE MOVING TO ANOTHER BORING SITE.
4. CASING PIPE SHALL BE SEALED AT THE ENDS TO PREVENT FLOWING WATER AND DEBRIS FROM ENTERING THE ANNULAR SPACE BETWEEN THE CASING AND THE CARRIER.

TYPICAL HIGHWAY CROSSING
NTS