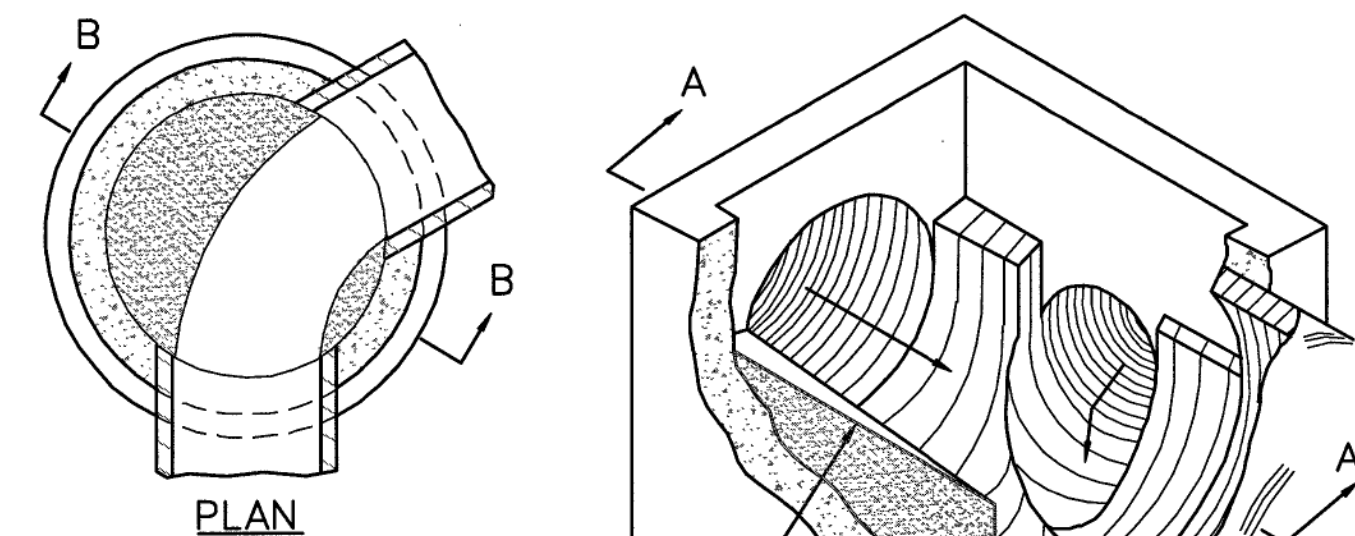
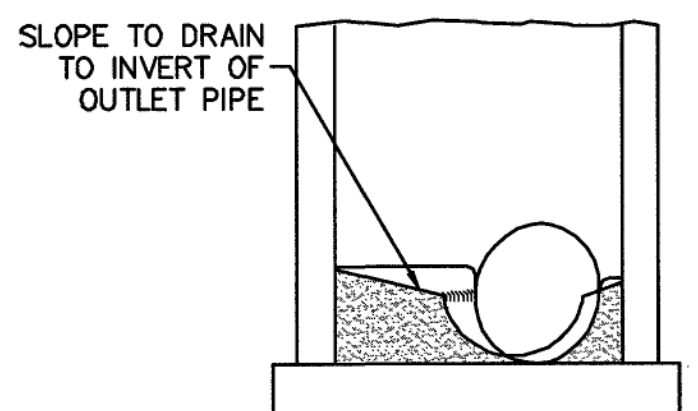


- NOTE:**
1. USE RETAINER GLANDS ON 45° BENDS.
 2. WATER LINES SHOULD BE ABOVE STORM DRAINS WHEREVER POSSIBLE WITH MINIMUM 3' COVER (2 FEET FOR DUCTILE IRON PIPE).
 3. ALL WATER LINES TRAVELING UNDER STORM DRAINS TO BE DUCTILE IRON.

TYPICAL METHOD OF ADJUSTING WATERLINES
NOT TO SCALE



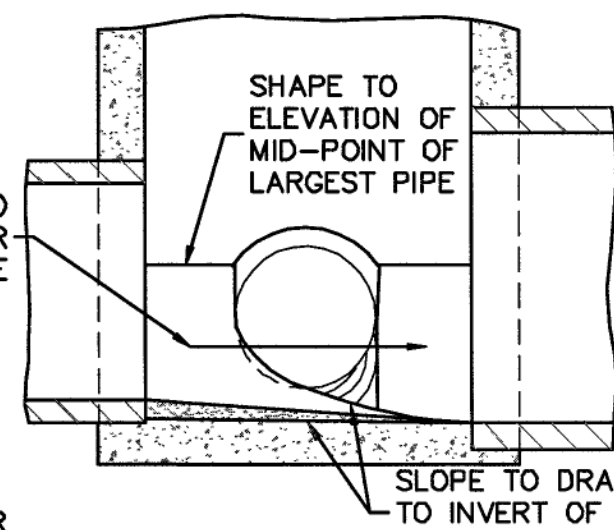
TRANSITION BETWEEN PIPE DIAMETERS WHEN DIFFERENT SIZES OF PIPE ARE ENCOUNTERED



SECTION B-B
TREATMENT AT MANHOLES

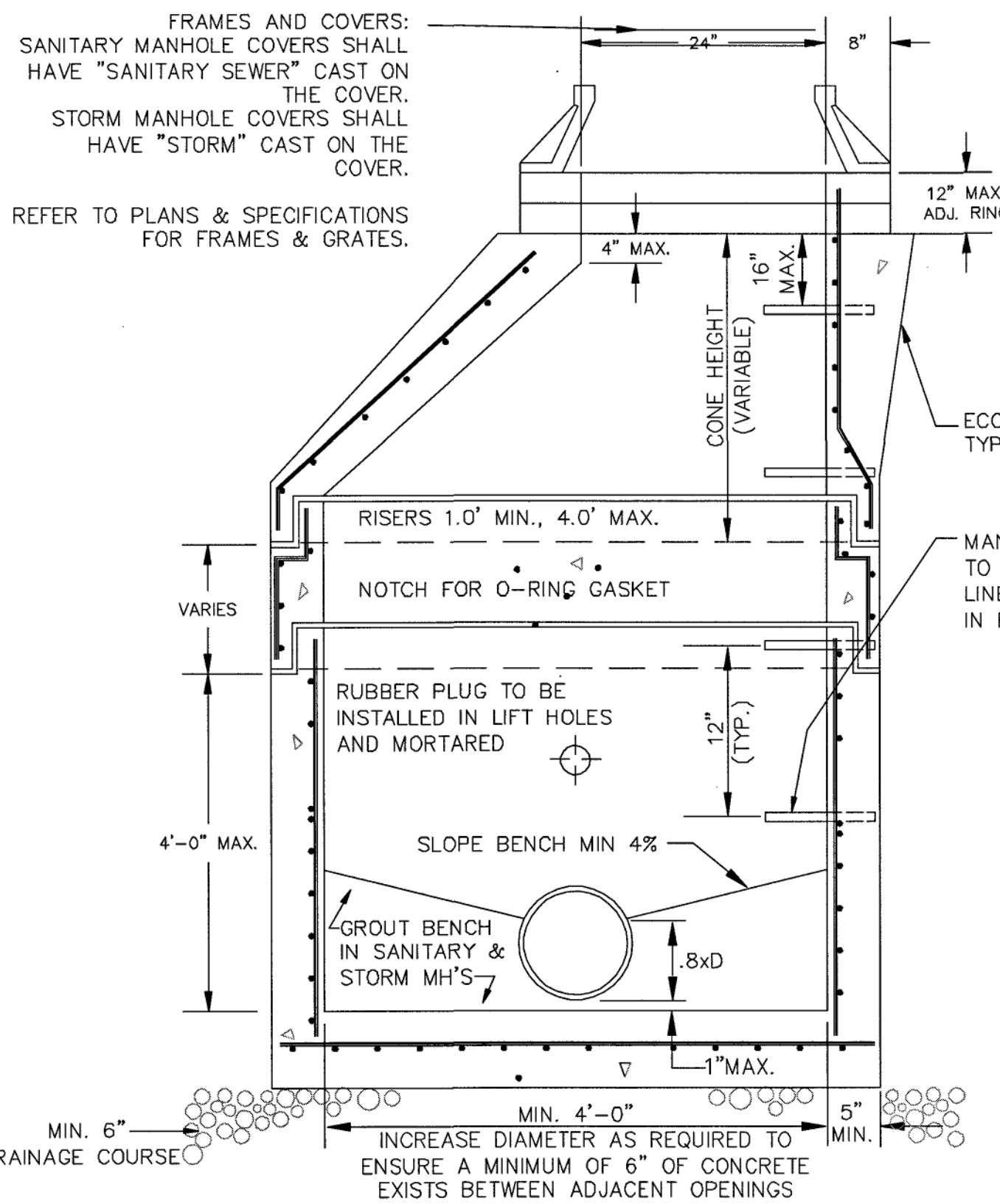
- NOTES:**
1. SURFACES SHALL BE LEFT SMOOTH BY HAND TROWELING. COARSE AGGREGATE SHALL NOT REMAIN EXPOSED.
 2. DETAILS OF INVERT SHAPING AS SHOWN HEREON ARE FOR EXAMPLE PURPOSES ONLY. EACH MANHOLE OR DROP INLET SHALL BE SHAPED INDIVIDUALLY TO FIT THE PARTICULAR INLET AND OUTLET CONFIGURATION AND FLOW LINES.

METHOD OF SHAPING MANHOLE AND INLET INVERTS
NOT TO SCALE



SECTION A-A
TREATMENT AT DROP INLETS

FRAMES AND COVERS:
SANITARY MANHOLE COVERS SHALL HAVE "SANITARY SEWER" CAST ON THE COVER.
STORM MANHOLE COVERS SHALL HAVE "STORM" CAST ON THE COVER.
REFER TO PLANS & SPECIFICATIONS FOR FRAMES & GRATES.

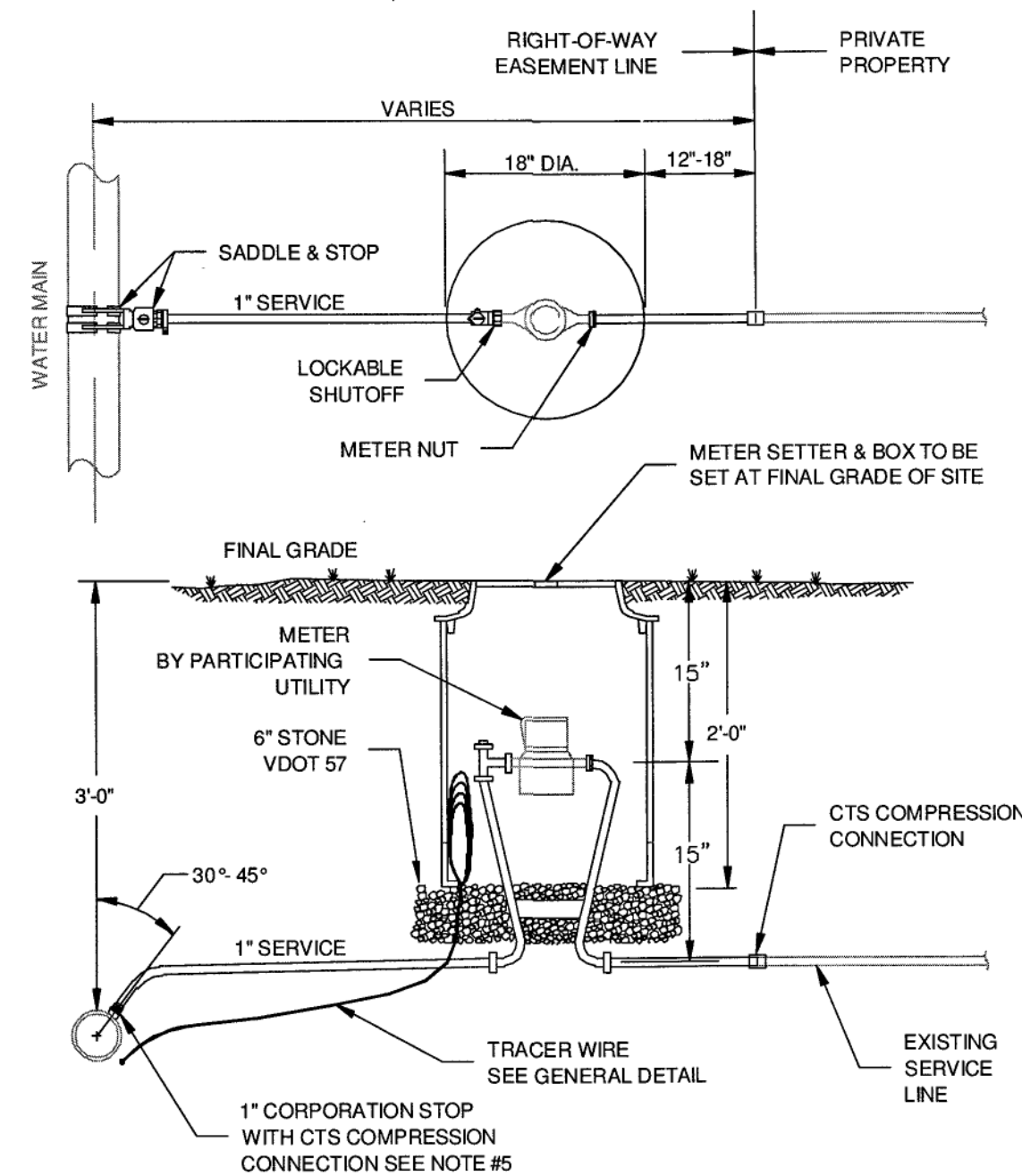


NOTES:

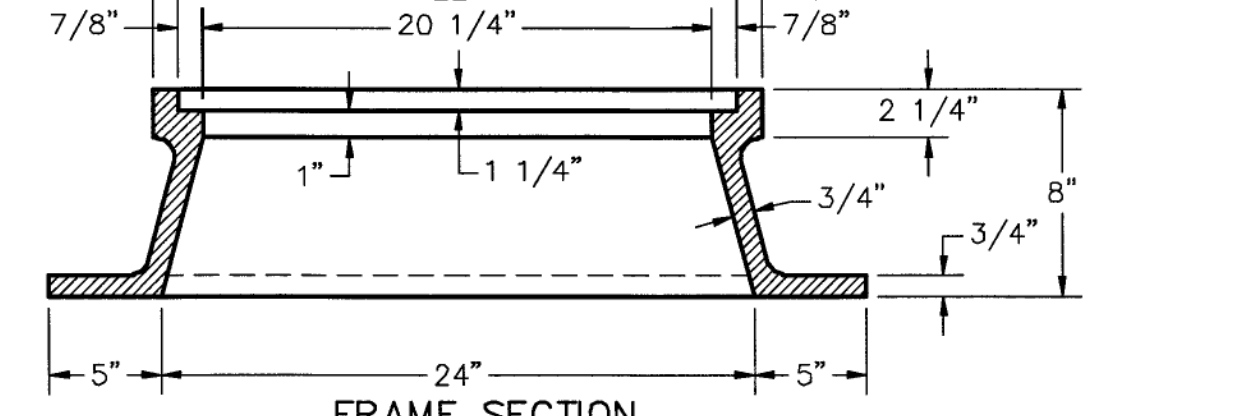
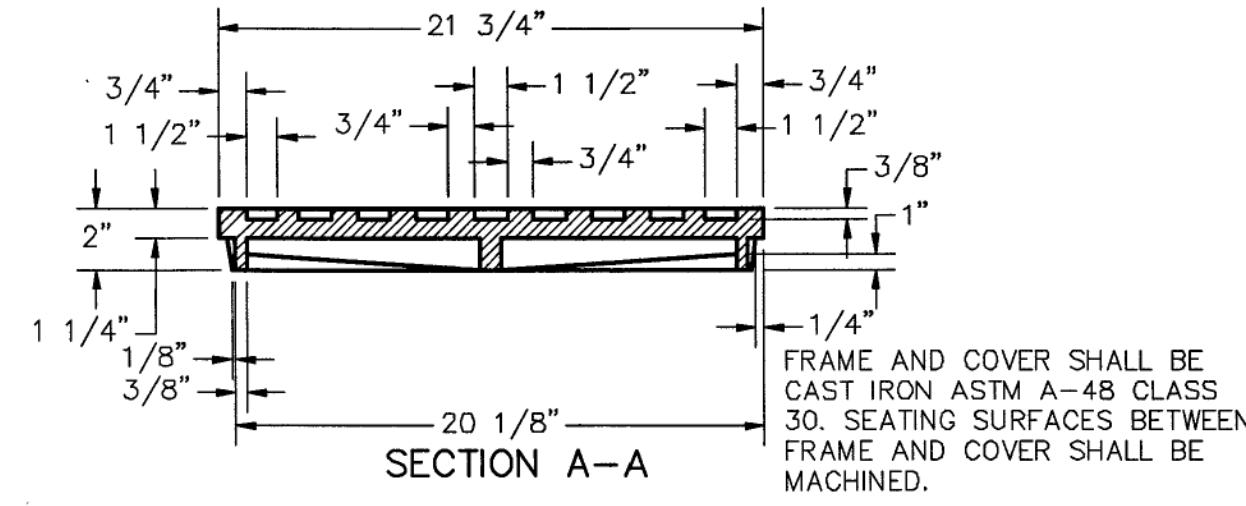
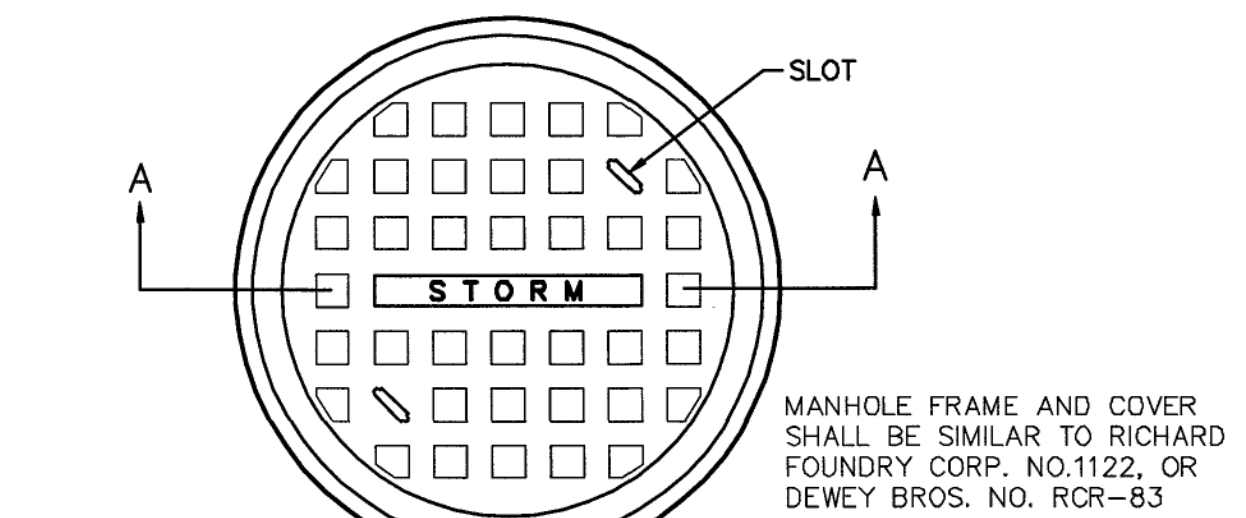
1. MANHOLE TO MEET CURRENT REQUIREMENTS OF ASTM C-478.
2. CONCRETE TO BE 4000 PSI MINIMUM COMPRESSIVE STRENGTH.
3. TAPERED JOINT WITH O-RING GASKET TO MEET CURRENT REQUIREMENTS OF ASTM C-443, OR DOUBLE BUTYL RUBBER SEALANT, ASTM C-990.
4. FLEXIBLE JOINT CONNECTION, ASTM C-923, REQUIRED ON ALL PIPE CONNECTIONS TO MANHOLES. ANY VOID SHALL BE FILLED FLUSH WITH INSIDE FACE OF MANHOLE WITH NON-SHRINK GROUT.
5. DROP MANHOLES REQUIRED FOR SANITARY DROPS 2'-0" OR GREATER.

PRECAST CONCRETE MANHOLE
NO SCALE

1. SETTER TO BE A.Y. McDONALD 20-215WXDD33, FORD VB72-15W-11-33 OR APPROVED EQUAL.
2. SADDLES MUST BE USED WITH ALL PLASTIC & DUCTILE IRON PIPE. SERVICE SADDLES SHALL BE USED IN ACCORDANCE WITH WATER DISTRIBUTION PIPING SPECIFICATION. SERVICE SADDLES FOR PLASTIC PIPE SHALL BE: POWERSEAL 3417, OR 9419AS, ROMAC 302S, OR 306, OR FORD METER FS202 OR FS303. FOR DUCTILE IRON PIPE USE THE ABOVE, OR POWERSEAL 3413, ROMAC 202 OR FORD METER F202.
3. METER BOX SHALL BE CARSON/MID-STATES PLASTICS, INC. PLASTIC BOX WITH FORD A32-T (ELECTRONIC READ LID) OR A.Y. McDONALD MODEL 74M32CTC CAST IRON BASE & COVER OR APPROVED EQUAL. METER BOX SHALL NOT BE PLACED IN AREAS SUBJECT TO VEHICULAR TRAFFIC. IF TRAFFIC BEARING BOX IS REQUIRED, DESIGN ENGINEER SHALL CONSULT WITH PARTICIPATING UTILITY TO DETERMINE SITE SPECIFIC REQUIREMENTS.
4. CORPORATION STOP SHALL BE FORD F1000-4-G OR APPROVED EQUAL.
5. SERVICE SHALL BE "K" TYPE COPPER, OR COPPER TUBE SIZE POLYETHYLENE (PE) 4710, SODR-9 (200 psi).
6. WHENEVER SIDEWALK EXISTS OR IS PROPOSED, MODIFY METER LOCATION AS DIRECTED.

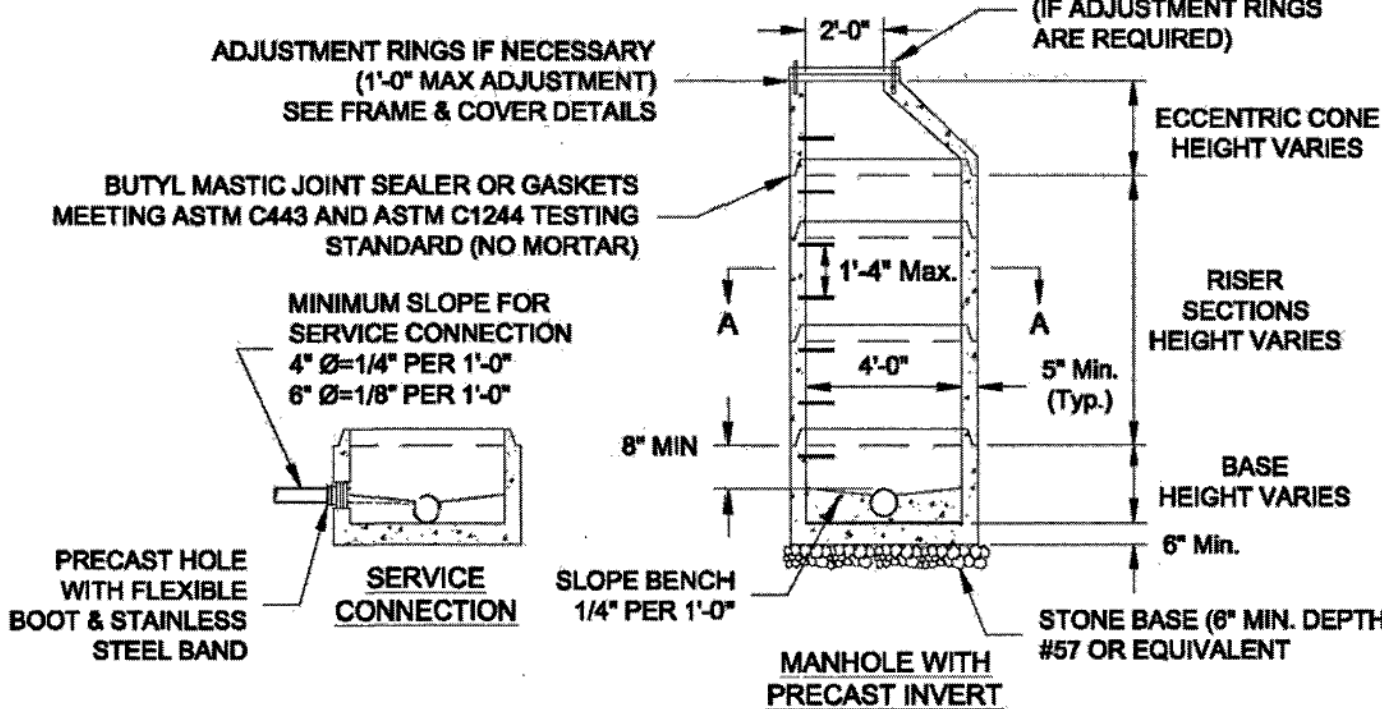


RESIDENTIAL WATER SERVICE ADJUSTMENT
NO SCALE



STANDARD MANHOLE FRAME AND COVER
NO SCALE

1. MATERIALS AND FABRICATION IN ACCORDANCE WITH ASTM C478-09.
2. WHEN USED AS SAMPLING MANHOLE FLOW SHALL PASS STRAIGHT THROUGH, I.e., 180°.
3. STEPS SHALL BE VERTICALLY ALIGNED. FIRST STEP SHALL BE WITHIN 12" OF COVER, BOTTOM STEP SHALL BE WITHIN 24" OF BOTTOM OF MANHOLE.
4. FRAME AND COVER SHALL BE PROPERLY ALIGNED WITH THE 2 FOOT OPENING OF THE MANHOLE STRUCTURE AND BOLTED IN PLACE.
5. FLAT TOP MANHOLES MAY ONLY BE SUBSTITUTED WITH THE PERMISSION OF THE PARTICIPATING UTILITY.
6. FLEXIBLE JOINT MANHOLE CONNECTION SHALL BE AS MANUFACTURED BY PRES-SEAL GASKET CORPORATION OR EQUAL.
7. GROUT ANNUAL SPACE BETWEEN PIPE AND PRECAST MANHOLE ON INSIDE OF MANHOLE.
8. WHEN REPLACING AN EXISTING MANHOLE OR INSTALLING A NEW PRECAST MANHOLE ON AN EXISTING SEWER, A MINIMUM OF SIX FEET (6') OF EXISTING PIPE SHALL BE REMOVED AND REPLACED WITH NEW MATERIAL ON INLET AND OUTLET OF MANHOLE.
9. MANHOLES WHERE THE INVERT IS LOWER THAN THE NORMAL GROUNDWATER ELEVATION (I.E., ALONG CREEKS, RIVERS, LOW-LYING AREAS, ETC.) SHALL HAVE A FULL EXTERIOR COATING AND JOINT WRAP APPLIED IN ADDITION TO JOINT SEALANT. SEE NOTES 10 & 11.
10. IF REQUIRED EXTERIOR VERTICAL WALL SURFACES SHALL BE FACTORY COATED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION. COATING SHALL BE HIGH BUILD COAL TAR EPOXY MEETING ASTM D1227. COATING SHALL BE APPLIED IN TWO COATS TO A MINIMUM TOTAL THICKNESS OF 18 MILS.
11. IF REQUIRED ALL MANHOLES SHALL UTILIZE AN EXTERNAL FRAME AND JOINT SEAL AT ALL JOINTS AND AT THE FRAME/CHIMNEY INTERFACE. SEAL SHALL BE MADE OF EPDM RUBBER IN ACCORDANCE WITH ASTM D412 OR POLYOLEFIN BACKED EXTERIOR JOINT WRAP IN ACCORDANCE WITH ASTM E-1745, C-877, AND C-890. EDM SEAL SHALL HAVE A MINIMUM THICKNESS OF 60 MILS. POLYOLEFIN BACKED EXTERIOR JOINT WRAP SHALL HAVE A BACKING BAND ELEMENT WITH MINIMUM THICKNESS OF 4 MILS. AND BUTYL ROLLER ADHESIVE WITH MINIMUM THICKNESS OF 60 MILS. SEAL SHALL AGGRESSIVELY BOND TO CONCRETE AND METAL STRUCTURES.
12. FOR PIPE LARGER THAN 15 INCHES IN DIAMETER, THE MINIMUM INSIDE DIAMETER OF THE MANHOLE SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS BASED ON PIPE SIZE AND ANGLE BETWEEN INLET AND OUTLET PIPING.
13. 6" MINIMUM DIAMETER MANHOLE SHALL BE REQUIRED WHEN DEPTHS EXCEED 15'.

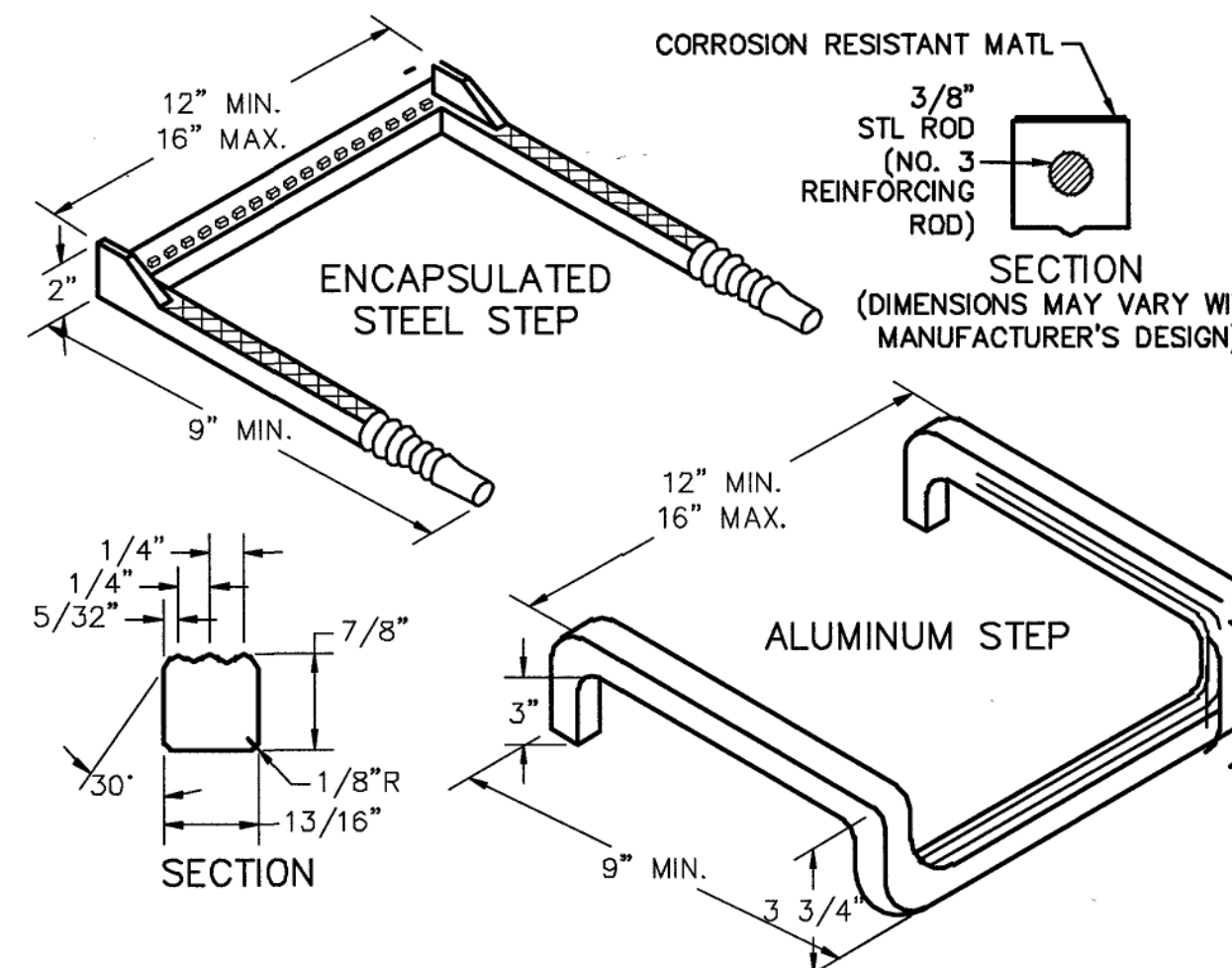


WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

4' STANDARD MANHOLE
FOR PIPE 15" OR SMALLER
(FOR DEPTHS UP TO 15 FEET)

01/01/14

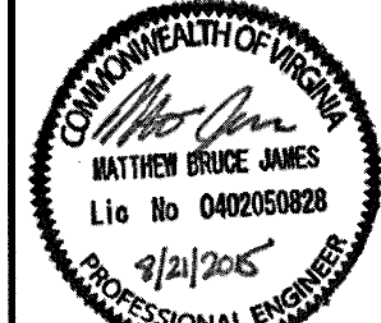
S-1



NOTES:

1. STEPS WILL BE REQUIRED IN ALL STRUCTURES WITH A DEPTH 4'-0" OR GREATER. UNLESS OTHERWISE NOTED ON THE PLANS.
2. ALL STEPS SHALL PROTRUDE 3" FROM THE INSIDE FACE OF STRUCTURE WALL.
3. THE MAXIMUM STEP SPACING SHALL BE 1'-4" CENTER TO CENTER.
4. STEPS SHALL WITHSTAND A MINIMUM LOAD OF 300 POUNDS WHEN EXTENDED 5" FROM THE FACE OF THE SUPPORT.
5. STEPS ARE TO BE VERTICALLY ALIGNED AND UNIFORMLY SPACED FOR THE ENTIRE DEPTH OF ANY STRUCTURE.
6. IN PRECAST UNITS, STEPS MAY BE CAST IN PLACE OR MORTARED INTO HOLES PROVIDED BY THE FABRICATOR.
7. STEPS DIFFERING IN DIMENSIONS, CONFIGURATIONS OR MATERIALS FROM THOSE SHOWN MAY ALSO BE USED PROVIDED THEY MEET THE MINIMUM REQUIREMENTS SHOWN HEREON AND THE CONTRACTOR HAS FURNISHED THE ENGINEER WITH DETAILS AND CERTIFIED TEST REPORTS OF THE PROPOSED SUBSTITUTE AND HAS RECEIVED WRITTEN APPROVAL FOR THE USE OF SUCH STEPS FROM THE ENGINEER.
8. PORTION OF AL STEP EMBEDDED IN CONC SHALL BE COATED W/ AN ASPHALT COATING.

MANHOLE STEP
NO SCALE



Draper Aden Associates
Engineering • Surveying • Environmental Services
Richmond, VA
Charlottesville, VA
Hampton Roads, VA
Blacksburg, VA
2206 South Main Street
Blacksburg, VA 24060
540-536-0000 FAX 540-536-0291
www.daa.com

UTILITY & SITE DETAILS
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REVISIONS	
DESIGNED BY:	MBJ
DRAWN BY:	AJH
CHECKED BY:	LBL
SCALE:	NO SCALE
DATE:	AUGUST 21, 2015
PROJECT NUMBER:	B14120B-01
C302	