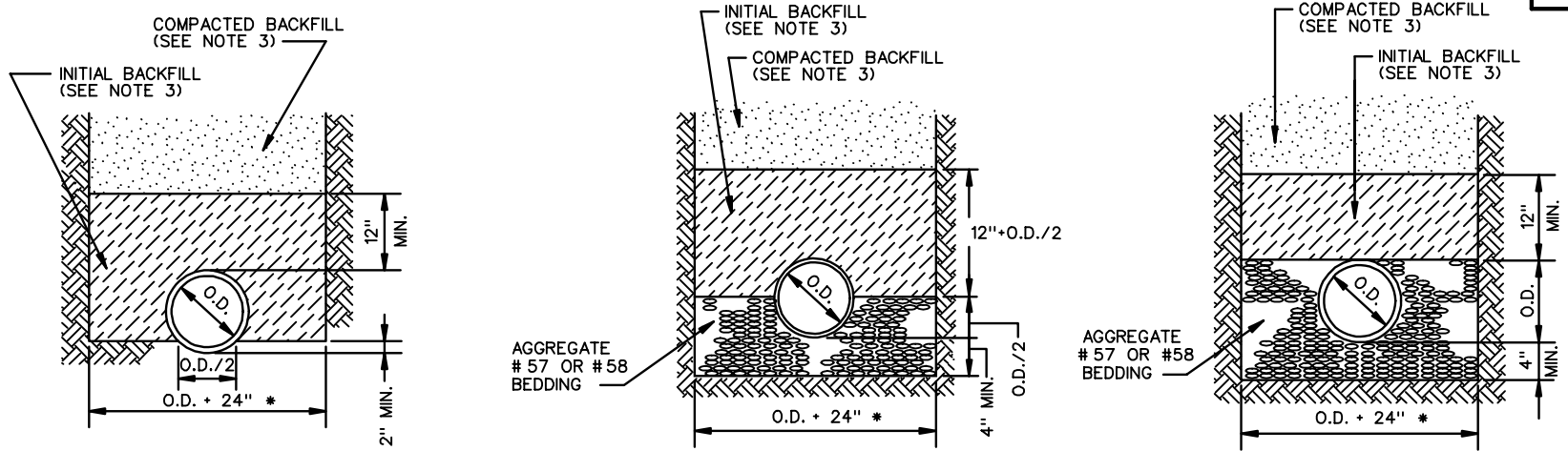


SECTION
1400

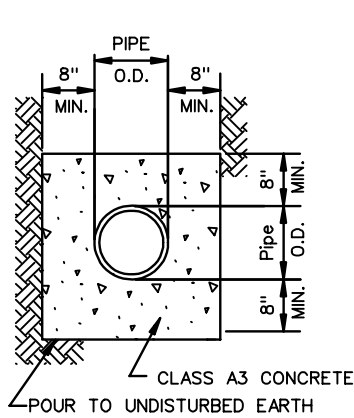
UTILITIES



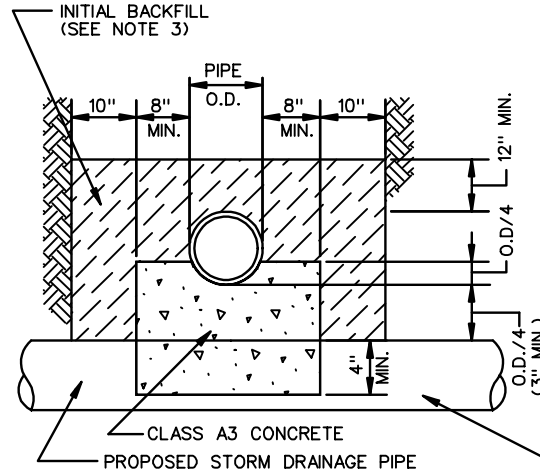
TYPE 1

TYPE 2

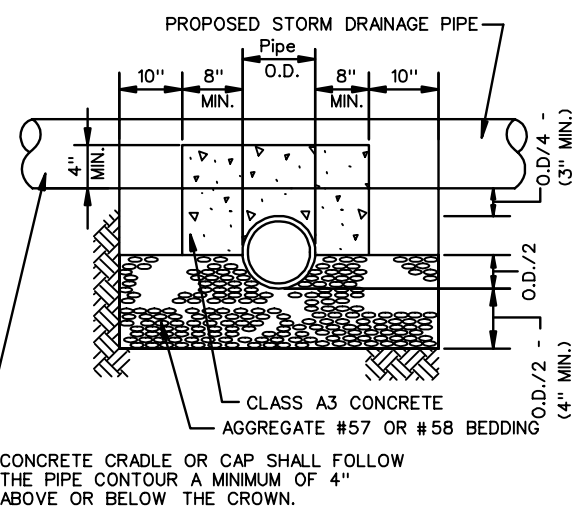
TYPE 3



CONCRETE ENCASMENT



CONCRETE CRADLE



CONCRETE CAP

NOTES:

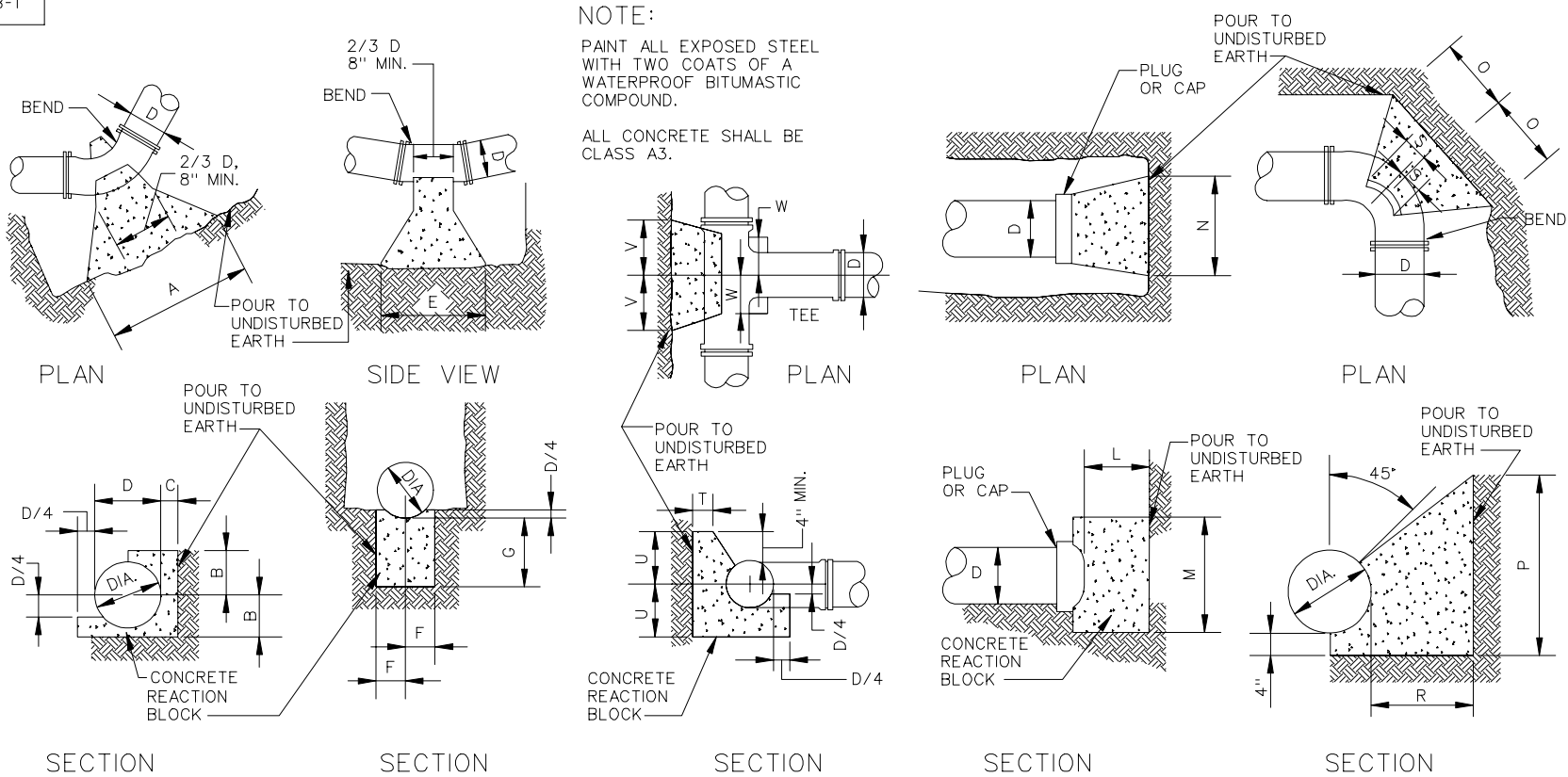
1. WHERE THE TRENCH BOTTOM IS IN ROCK, IT SHALL BE EXCAVATED TO A MINIMUM OF 8" BELOW THE BOTTOM OF THE PIPE BACKFILLED WITH BEDDING MATERIAL.
2. WHERE PIPE FOUNDATIONS ARE YIELDING, PIPE SHALL BE BEDDED ON A MINIMUM OF 8" BEDDING MATERIAL.

3. INITIAL AND COMPACTED BACKFILL SHALL MEET THE REQUIREMENTS OF SECTION 520.03 OF THE VDOT SPECIFICATIONS. CRUSHED GLASS CONFORMING TO THE SIZE REQUIREMENTS FOR CRUSHER RUN AGGREGATE SIZE 25 OR 26 AND MEETING THE REQUIREMENTS OF SECTION 520.03 OF THE VDOT SPECIFICATION MAY BE USED AS BACKFILL MATERIAL.

* FOR PIPE LESS THAN 12" THE TRENCH WIDTH MAY BE 36" MAXIMUM.

UTILITY BEDDING AND PROTECTION
WATER AND SANITARY SEWER FACILITIES

VIRGINIA DEPARTMENT OF TRANSPORTATION



HORIZONTAL BENDS
11 1/4° - 45°

UPPER VERTICAL BENDS

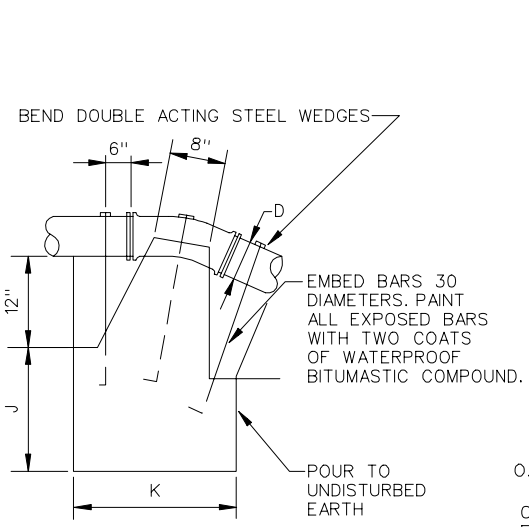
TEES

PLUGS

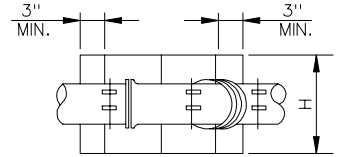
HORIZONTAL BENDS 90

DIA.	HORIZONTAL BENDS									UPPER VERTICAL BENDS									PLUGS			HORIZONTAL BENDS 90°					TEE BRANCH				
	11 1/4°			22 1/2°			45°			11 1/4°			22 1/2°			45°			L	M	N	O	P	R	S	T	U	V	W		
	A	B	C	A	B	C	A	B	C	E	F	G	E	F	G	E	F	G													
4"	.50	.58	.75	.75	.58	.75	1.25	.58	.75	.50	.58	.58	.75	.58	.58	1.25	.58	.58	.50	1.17	1.50	1.17	1.17	1.67	.42	.75	.67	.75	.50		
6"	.50	.58	.75	.75	.58	.75	1.25	.58	.75	.50	.58	.58	.75	.58	.58	1.25	.58	.58	.50	1.17	1.50	1.17	1.17	1.67	.42	.75	.67	.75	.50		
8"	.67	.67	.75	1.00	.67	.75	2.00	.67	.75	.67	.67	.58	1.00	.67	.67	2.08	.75	.83	.67	1.50	2.25	1.58	1.50	1.75	.50	.75	.83	1.00	.67		
10"	.83	.75	.75	1.50	.75	.83	2.50	.75	.92	.83	.75	.67	1.50	.83	.67	2.08	.75	.83	.67	2.00	2.50	1.67	2.08	1.75	.50	.83	1.00	1.25	.67		
12"	1.00	.83	.75	1.75	.92	.92	2.92	.92	1.17	1.00	.83	.67	1.75	.83	.67	2.50	.92	.92	.83	2.33	3.25	2.00	2.50	1.92	.58	1.00	1.25	1.42	.67		
16"	1.33	1.00	.75	2.33	1.00	1.17	3.67	1.25	1.42	1.33	1.00	.75	2.25	.83	.75	3.33	1.25	1.25	1.00	2.92	4.17	2.08	3.00	2.17	.83	1.17	1.67	1.83	.83		
20"	1.67	1.17	1.00	3.17	1.17	1.33	4.75	1.50	1.83	1.67	1.17	.83	3.00	1.17	1.00	4.17	1.50	1.50	1.33	3.75	5.17	3.50	3.83	2.83	1.00	1.33	2.08	2.25	1.17		
24"	2.00	1.33	1.00	4.00	1.33	1.50	6.08	1.67	1.92	2.00	1.33	1.00	3.50	1.33	1.00	5.00	1.75	1.75	1.67	4.33	6.25	4.67	4.00	3.00	1.00	1.50	2.50	2.67	1.33		
30"	2.50	1.50	1.08	5.00	1.58	1.75	7.95	2.00	3.08	2.50	1.58	1.08	4.17	1.58	1.08	6.25	2.25	2.25	2.00	5.42	7.42	5.75	5.00	3.83	1.17	1.75	3.08	3.92	1.83		
36"	3.00	1.92	1.17	5.75	2.00	2.00	8.92	2.50	3.33	3.00	1.58	1.17	5.33	2.00	1.17	7.50	2.50	2.67	2.00	6.50	9.00	6.83	6.00	4.83	1.17	2.00	3.75	3.92	1.83		

REACTION BLOCKING
 WATER AND SANITARY SEWER FACILITIES

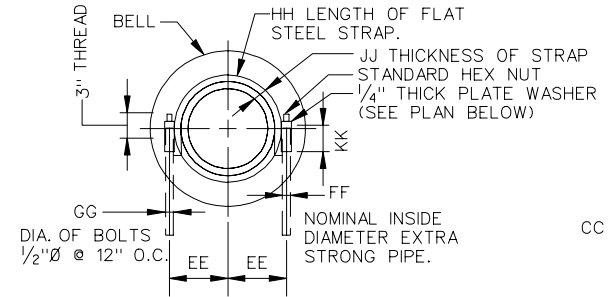


ELEVATION

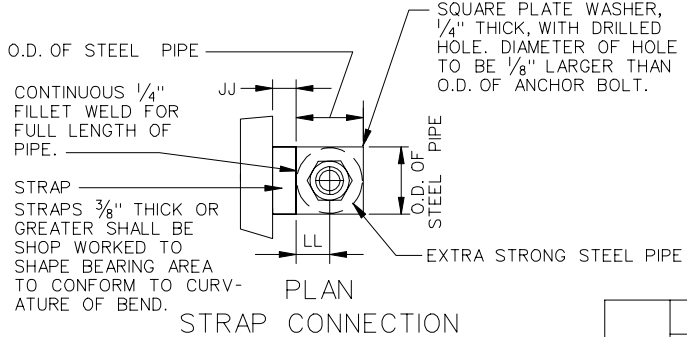


PLAN

LOWER VERTICAL BENDS
4" TO 12" MAINS

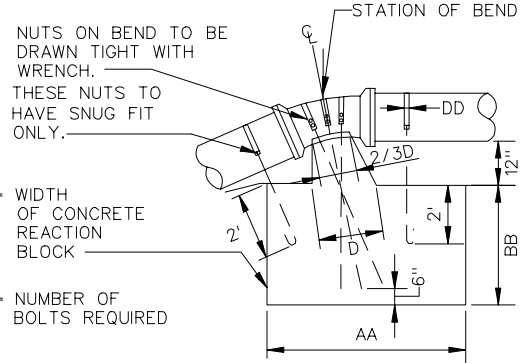


CROSS SECTION



STRAP CONNECTION

LOWER VERTICAL BENDS
16" AND LARGER MAINS



ELEVATION

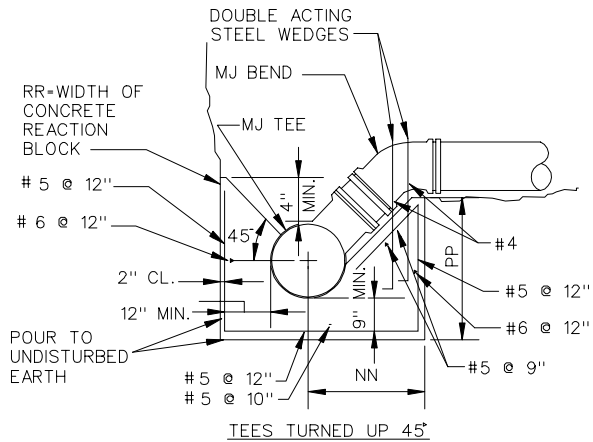
- NOTES:
- FOR 11 1/4° BENDS USE ONE STRAP ON BEND WITH ANCHOR BOLTS ON CENTER LINE OF BEND.
 - PAINT ALL EXPOSED STEEL WITH TWO COATS OF A WATERPROOF BITUMASTIC COMPOUND.

DIA.	LOWER VERTICAL BENDS																		
	11 1/4°			22 1/2°			45°			11 1/4°			22 1/2°			45°			
	H	J	K	H	J	K	H	J	K	H	J	K	H	J	K	H	J	K	
4"	1.50	1.25	2.00	2.00	1.83	2.50	2.50	2.50	3.00	3.00									
6"	1.50	1.25	2.00	2.00	1.83	2.50	2.50	3.00	3.00										
8"	1.50	1.75	3.33	3.33	2.25	3.25	3.25	3.25	4.50	4.50									
10"	1.50	1.25	3.67	3.67	2.50	4.00	4.00	3.67	4.75	4.75									
12"	3.00	2.00	4.00	4.00	2.50	4.50	4.50	3.67	5.00	5.00									

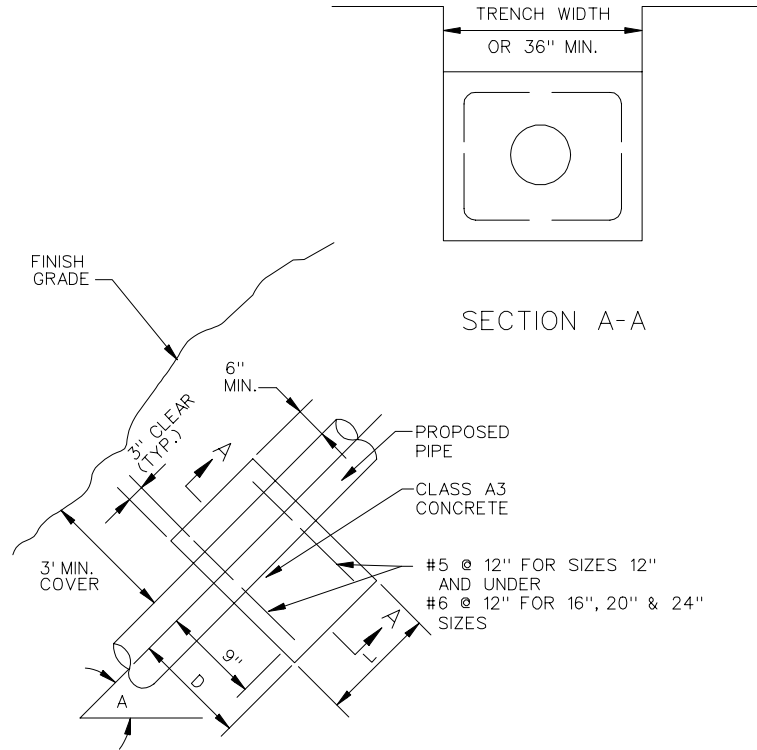
LOWER VERTICAL BENDS																																							
DIA.	LOWER VERTICAL BENDS REINFORCING BARS			11 1/4°												22 1/2°												45°											
	11 1/4"	22 1/2"	45"	AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	LL	MM	AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	LL	MM	AA	BB	CC	DD	EE	FF	GG	HH	JJ	KK	LL	MM
	4"	3-#4	3-#4	3-#4																																			
6"	3-#4	3-#4	3-#4																																				
8"	3-#4	3-#4	3-#4																																				
10"	3-#4	3-#4	3-#5																																				
12"	3-#4	3-#4	3-#5																																				
16"				4.00	2.00	3.50	.17	.81	.08	.06	2.83	.02	.19	.06	6	5.75	2.5	4.50	.17	.81	.08	.06	2.83	.02	.19	.06	10	6.67	4.00	5.50	.17	.81	.08	.06	2.83	.02	.19	.06	10
20"				5.00	2.50	4.00	.17	.99	.08	.06	3.53	.03	.19	.06	6	7.50	3.00	4.75	.17	.99	.08	.06	3.58	.03	.19	.06	10	8.25	4.75	6.00	.17	.99	.08	.06	3.58	.03	.19	.06	10
24"				5.75	2.50	4.25	.17	1.17	.10	.07	4.42	.03	.42	.08	6	8.50	3.67	5.00	.21	1.18	.12	.08	4.52	.03	.42	.08	10	9.50	5.50	6.50	.21	1.18	.12	.08	4.42	.03	.42	.11	10
30"				6.50	2.67	5.50	.21	1.44	.12	.08	5.67	.04	.50	.08	6	9.00	4.50	5.75	.21	1.44	.12	.09	5.67	.04	.50	.08	10	11.25	6.25	7.00	.21	1.44	.12	.09	5.67	.04	.50	.08	10
36"				7.00	4.00	5.00	.21	1.71	.17	.10	7.50	.04	.54	.07	6	10.00	5.50	6.17	.21	1.71	.17	.11	7.50	.04	.54	.07	10	12.00	7.00	8.50	.21	1.71	.17	.09	7.50	.04	.54	.07	10

REACTION BLOCKING
WATER AND SANITARY SEWER FACILITIES

TEES TURNED UP				
BRANCH SIZE				
D	NN	NN	PP	RR
DIA.	11 1/4° 22 1/2°	45°	11 1/4° 22 1/2° 45°	11 1/4° 22 1/2° 45°
4"	3.00	2.50	2.50	2.50
6"	3.00	2.50	2.50	2.50
8"	3.00	2.50	2.50	2.50
10"	3.00	2.50	2.50	2.67
12"	4.00	3.00	2.50	2.83



STRAPPING DETAILS FOR TEES TURNED UP



SIZE	4"	6"	8"	12"	16"	20"	24"
"D"	12"	15"	15"	18"	21"	24"	27"
"L"	18"	21"	24"	27"	30"	33"	36"

NOTE:

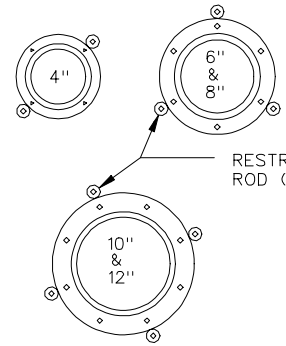
THE STRAIGHT RUN PIPE SHALL BE PROVIDED WITH ANCHOR BLOCKS SPACED THUS:

ANGLE "A"	ANCHOR BLOCKS NOT NEEDED
0° - 10°	SPACING @ 100'
10° - 16°	SPACING @ 60'
16° - 20°	

STRAIGHT PIPE CONCRETE ANCHOR BLOCK

REACTION BLOCKING WATER AND SANITARY SEWER FACILITIES

SIZE (DIA. - INCHES)	4"	6"	8"	10"	12"	16"	18"	20"	24"
LENGTH ("L" - FEET)	12'	17'	22'	26'	31'	39'	43'	47'	55'

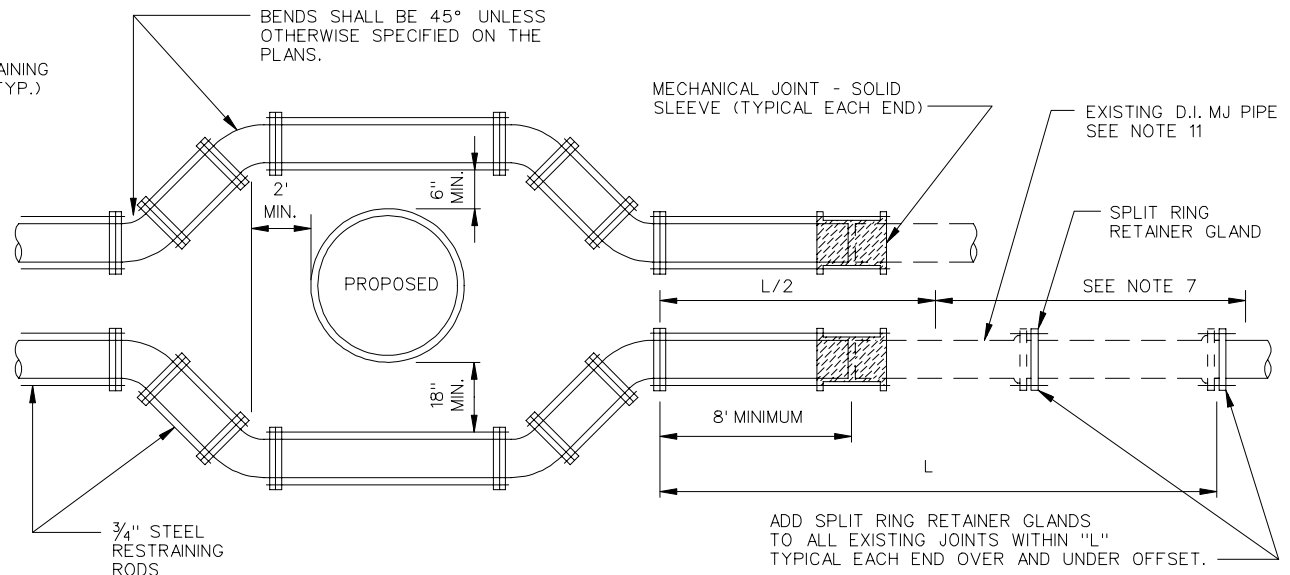


RESTRAINING ROD (TYP.)

SEE TABLE FOR 16" - 24"

TABLE		
PIPE SIZE	NUMBER OF BOLTS	NUMBER OF RODS
16"	12	6
18"	12	6
20"	14	6
24"	16	8

SEE NOTE 7 FOR REDUCTION IN NUMBER OF RODS REQUIRED.



ADD SPLIT RING RETAINER GLANDS TO ALL EXISTING JOINTS WITHIN "L" TYPICAL EACH END OVER AND UNDER OFFSET.

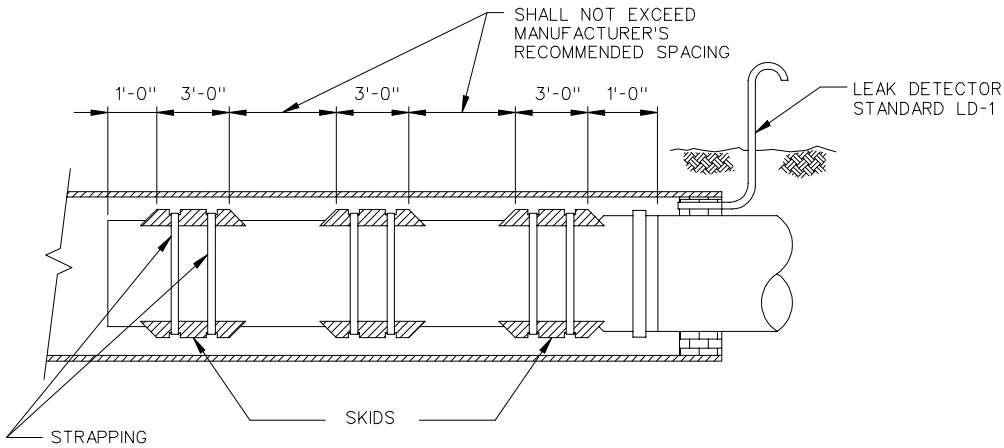
DESIGN CONDITIONS

PRESSURE - 150 PSI TYPE SOIL - SILT
 DEPTH OF COVER - 3 FEET ROD STRESS - 25,000 PSI

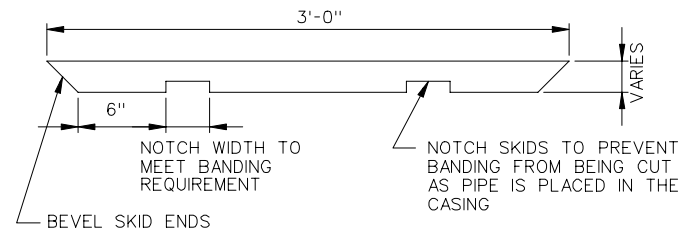
NOTES:

1. RETAINER GLANDS ARE REQUIRED AT EACH FITTING.
2. ALL PIPE AND FITTINGS SHALL BE DUCTILE IRON, MECHANICAL JOINT, CLASS 52 (MIN). WATER MAIN AND FITTINGS SHALL BE CEMENT MORTAR LINED.
3. FOR 12" AND SMALLER LINES, MECHANICAL JOINT OFFSET FITTINGS MAY BE USED IN LIEU OF THE 45° BENDS SHOWN SUBJECT TO THE APPROVAL OF THE ENGINEER. IF USED, THE OFFSETS MUST RESULT IN THE CLEARANCES SHOWN BEING MET OR EXCEEDED.
4. RODS MAY BE INSERTED THROUGH BOLT HOLES IN LIEU OF USING TIE-BOLTS. IF USED, KEEPER NUT & WASHER MUST BE INSTALLED BEHIND GLAND.
5. BOLT HOLES ARE SHOWN AS NORMALLY PROVIDED IN MECHANICAL JOINT FITTINGS, I.E. STRADDLING THE VERTICAL AXIS WHEN FITTING IS POSITIONED FOR A HORIZONTAL CHANGE OF DIRECTION. FITTINGS WITH BOLT HOLES OTHERWISE ORIENTED SHOULD NOT BE USED IN RODDED ASSEMBLIES.
6. TIE BOLTS AND THREADED RODS SHALL BE 3/4" WITH A MINIMUM YIELD STRENGTH OF 7550 POUNDS EACH. SPACE SYMMETRICALLY AROUND PIPE.
7. NUMBER OF RODS MAY BE REDUCED TO 50% OF THE NUMBER INDICATED AT L/2 FROM THE BEND AND BEYOND. TWO RODS MINIMUM REQUIRED PER JOINT.
8. ALL RODS AND FASTENERS SHALL BE GIVEN TWO COATS OF ASPHALTIC PAINT AFTER ASSEMBLY.
9. EXISTING C.I. PIPE SHALL BE REPLACED WITH AN 8' MINIMUM LENGTH OF D.I. PIPE AT BOTH ENDS OF THE OFFSET AND RETAINER GLANDS INSTALLED.
10. THE EXISTING PIPING SHALL HAVE ALL JOINTS WITHIN THE LENGTH "L" RESTRAINED BY ADDING A SPLIT RING RETAINER GLAND ("MEG-A-LUG" OR EQUAL) WITH BOLTS TO THE M.J. BELL.
11. LENGTH "L" IN FEET SHALL CONFORM TO THE TABLE ABOVE.
12. SPLIT RING RETAINER GLANDS ARE FOR USE ON DUCTILE IRON MECHANICAL JOINT PIPE ONLY. IF EXISTING PIPE IS ANY OTHER MATERIAL, REMOVE AND REPLACE WITH D.I. MECHANICAL JOINT PIPE FOR THE LENGTH "L" SPECIFIED.

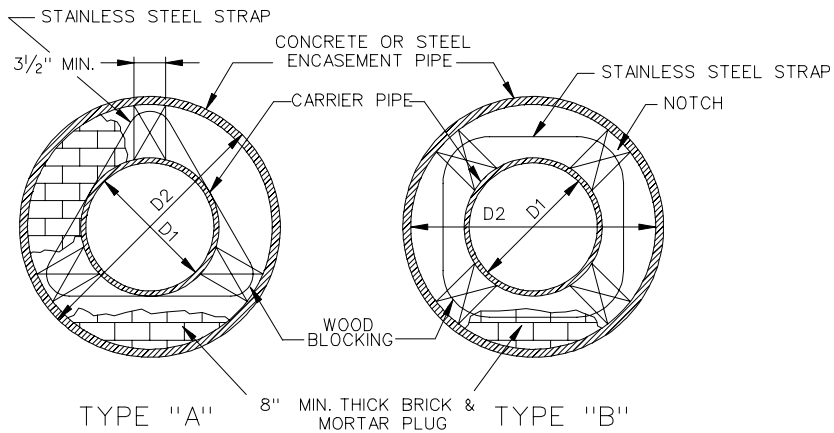
VERTICAL OFFSET WATER AND SANITARY SEWER FACILITIES



SECTION
ENCASUREMENT PIPE WITH CARRIER PIPE



SKID

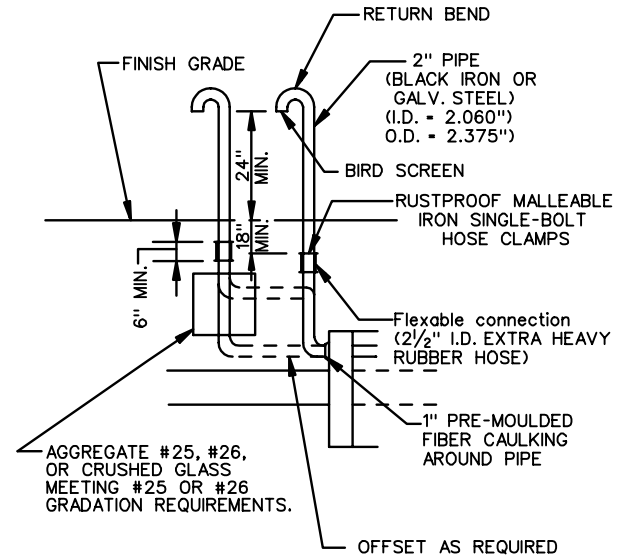


CONCRETE OR STEEL ENCASUREMENT PIPE

ENCASUREMENT PIPE I.D. (IN.)	STEEL ENCASUREMENT PIPE MINIMUM THICKNESS	
	COVER TO 15 FEET	COVER 15 FT. & OVER
12"	1/4"	↑
16"	1/4"	USE MIN. 5/16"
18"	1/4"	↓
24"	1/4"	
30"	3/8"	3/8"
36"	3/8"	3/8"
48"	7/16"	7/16"
54"	7/16"	7/16"
60"	7/16"	7/16"

NOTES:

- TIMBER SKIDS SHALL BE LOCUST, CYPRESS, PRESERVATIVE TREATED HARDWOOD, NEOPRENE, NYLON, PLASTIC OR OTHER MATERIAL OF HIGH ABRASION RESISTANCE AND A LOW FRICTION COEFFICIENT APPROVED BY THE ENGINEER. PRESERVATIVE FOR TIMBER SKIDS SHALL CONFORM TO SECTION 236 OF THE SPECIFICATIONS.
- METAL STRAPS AND CLIPS HOLDING BLOCKING TO CARRIER PIPE SHALL BE STAINLESS STEEL WITH A MINIMUM CROSS SECTION OF 0.014 SQ. IN. STRAP SPACING SHALL BE A MINIMUM OF TWO (2) BANDS PER SKID LENGTH.
- STEEL ENCASUREMENT PIPE SHALL BE GRADE B AND SHALL CONFORM TO SECTION 232.02 (C)7 OF THE SPECIFICATIONS.
- CARRIER PIPE SHALL BE PUSHED OR PULLED THROUGH THE ENCASUREMENT PIPE SO THAT JOINTS ARE ALWAYS BEING COMPRESSED.
- CARRIER PIPE SHALL BE WRAPPED WITH TAR PAPER AT MASONRY PLUG.
- MASONRY PLUG SHALL BE WATERTIGHT.
- CONCRETE PIPE FOR H-20 LIVE LOAD AS PER STANDARD PC-1.
- ENCASUREMENT PIPE SHALL BE BEDDED IN ACCORDANCE WITH STANDARD PB-1.



Notes:

WRAP CONNECTION IN POLYETHELENE
AND PLASTER WITH ROOFING CEMENT
OR ASPHALTIC MATERIAL.

STANDARD LEAK DETECTOR

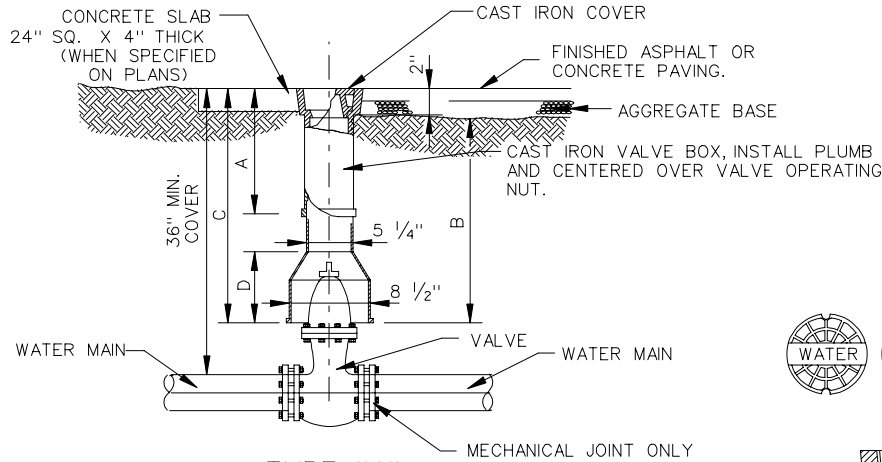
LD-1

LEAK DETECTOR

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV 8/07

1405.01

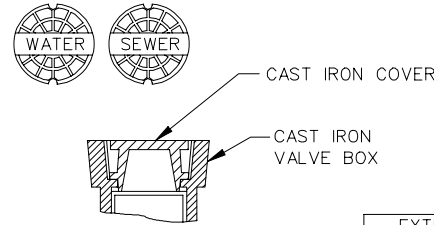


TYPE "A"
(SCREW TYPE)

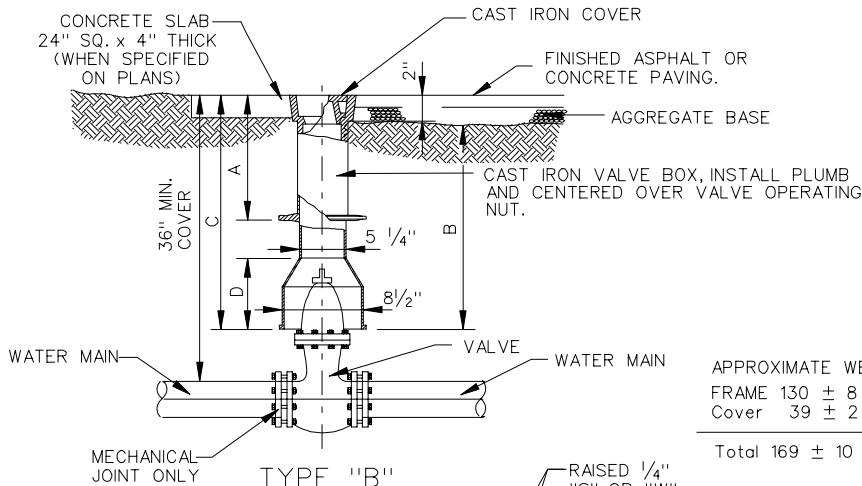
TYPE "A"

EXTENSION RANGE - C	DIM. A	DIM. B	DIM. D
18"-24"	10.5"	14.5"	6.5"
24"-29"	15"	24"	6.5"
36"-48"	15"	36"	8.5"
36"-60"	26"	36"	8.5"

LONGER BOXES ARE MADE BY ADDING EXTENSIONS.



TYPE "B"

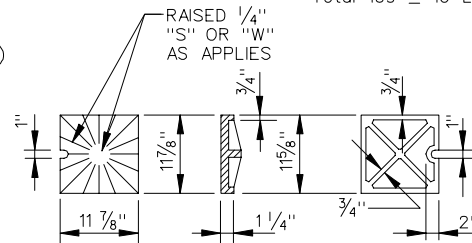


TYPE "B"
(SLIP TYPE)

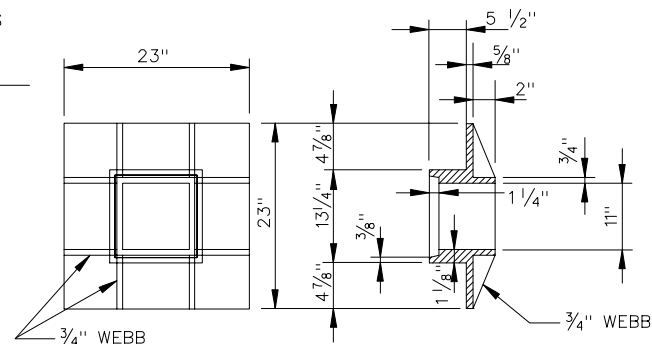
EXTENSION RANGE - C	DIM. A	DIM. B	DIM. D
18"-24"	10.5"	15"	6.5"
23"-29"	15.5"	15"	6.5"
24"-36"	15.5"	24.5"	6.5"
36"-48"	15.5"	26"	8.5"
38"-48"	26.5"	24.5"	6.5"
36"-60"	26.5"	36"	8.5"

LONGER BOXES ARE MADE BY ADDING EXTENSIONS.

APPROXIMATE WEIGHTS
 FRAME 130 ± 8 LBS.
 Cover 39 ± 2 LBS.
 Total 169 ± 10 LBS.



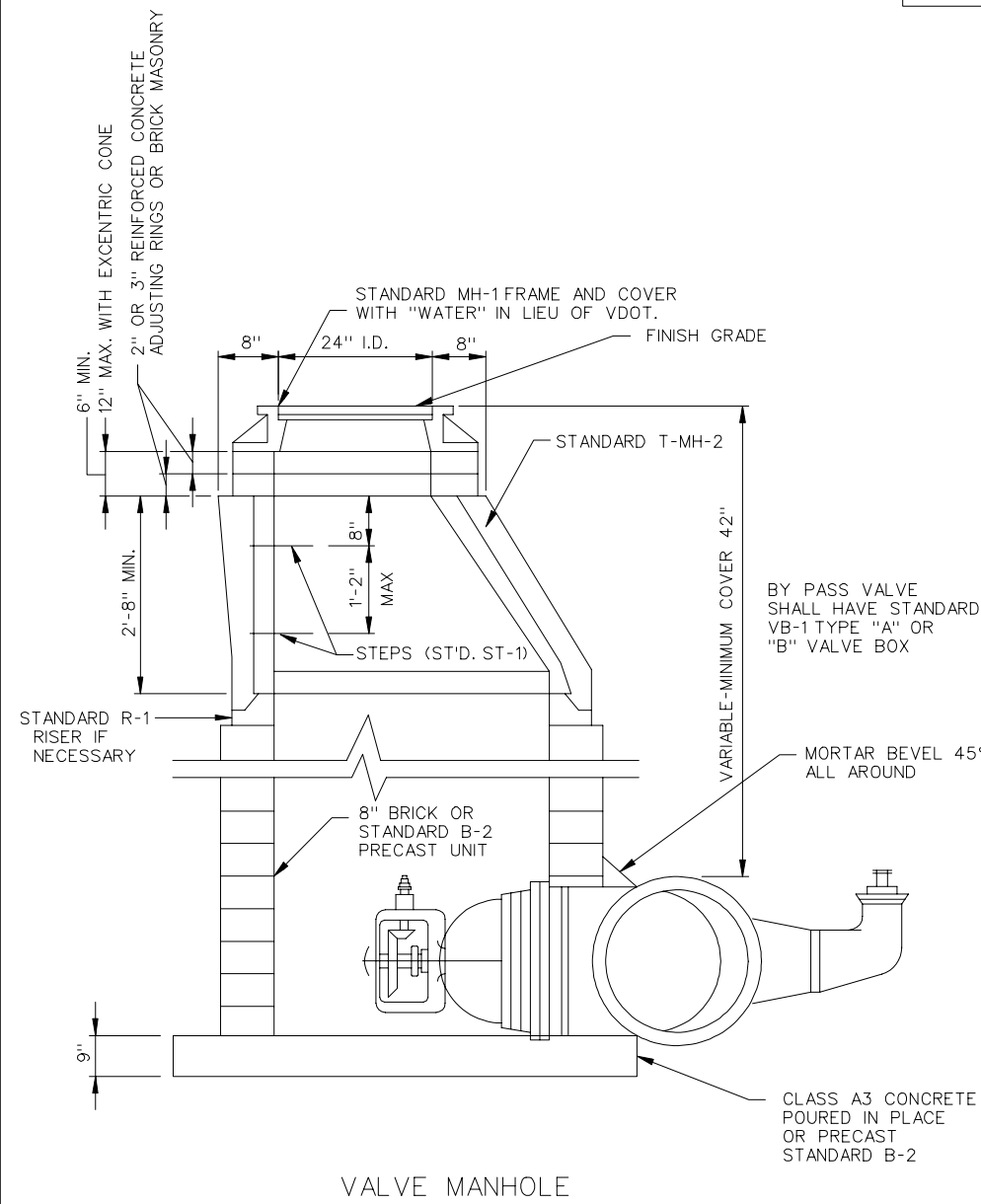
TYPE "C"



NOTE:

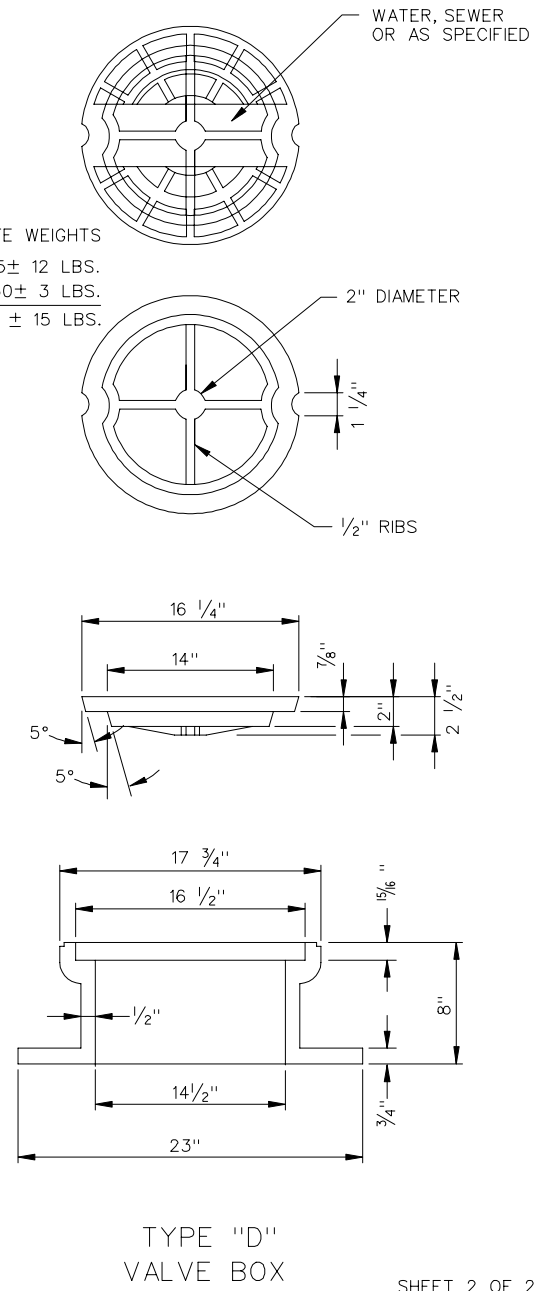
1. CAST IRON SHALL CONFORM TO ASTM A-48M CLASS 30S.

VALVE BOX AND VALVE MANHOLE
 WATER AND SANITARY SEWER FACILITIES

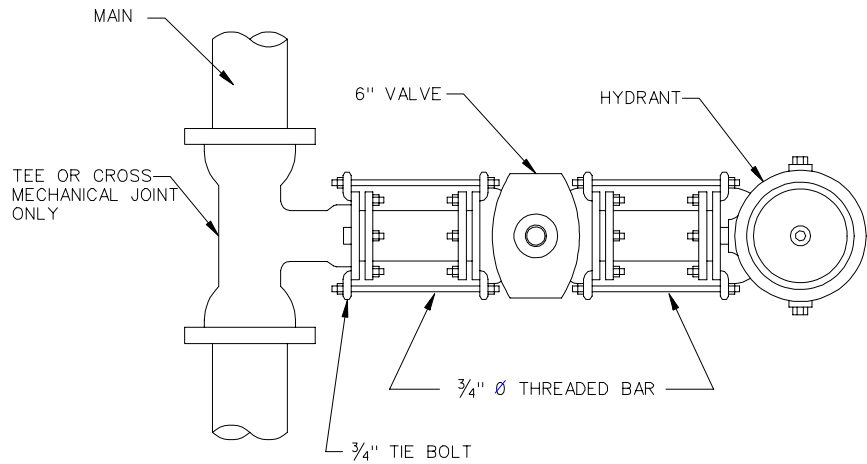


APPROXIMATE WEIGHTS

FRAME 115 ± 12 LBS.
COVER 50 ± 3 LBS.
TOTAL 165 ± 15 LBS.



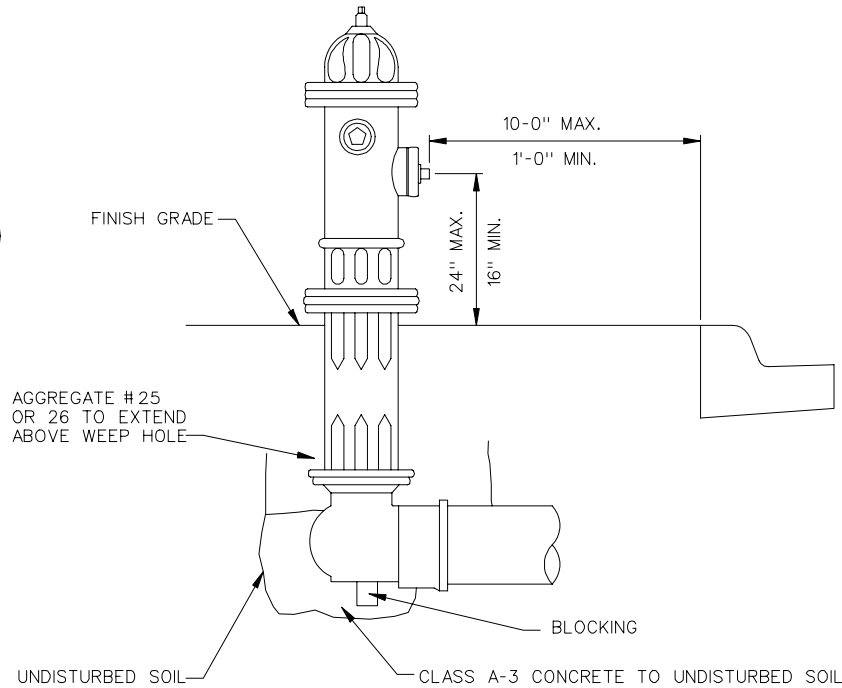
VALVE BOX AND VALVE MANHOLE
WATER AND SANITARY SEWER FACILITIES



TYPE 1 RESTRAINT

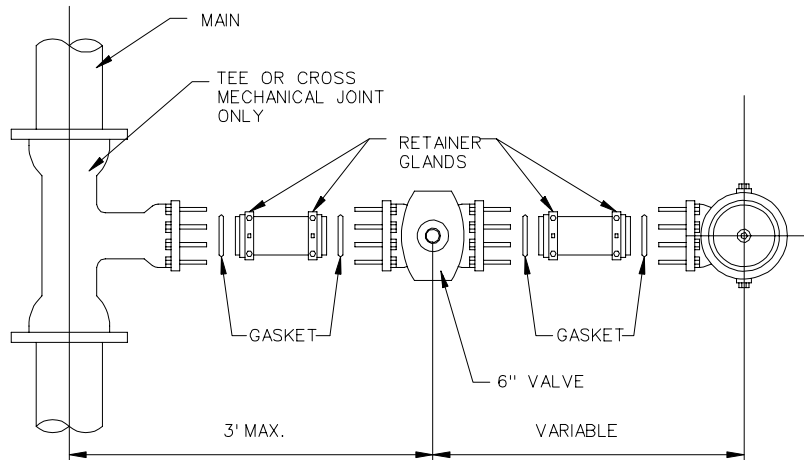
NOTES:

RODS MAY BE INSERTED THROUGH BOLT HOLES IN LIEU OF USING TIE-BOLTS. IF USED, KEEPER NUT & WASHER MUST BE INSTALLED BEHIND GLAND.



NOTES:

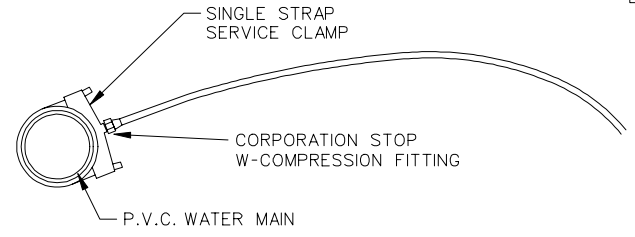
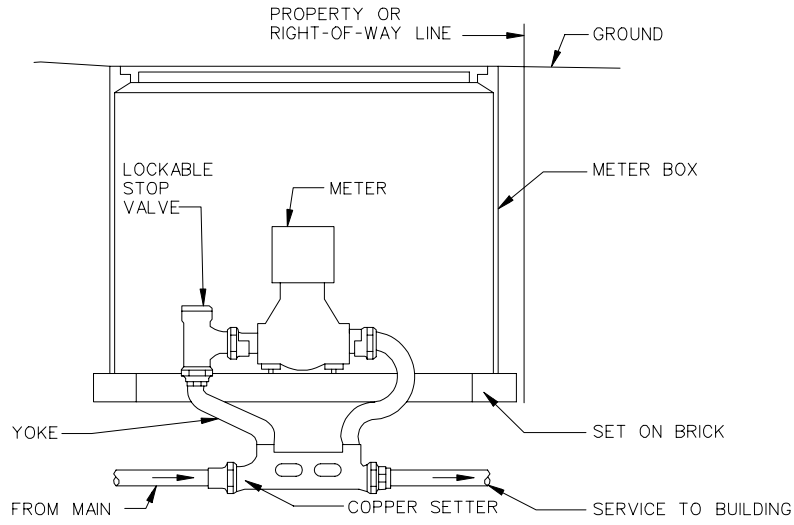
1. HYDRANTS TO BE SET WITH BURY LINE POSITIONED AT GRADE WITH NOZZLES SET AS INDICATED ABOVE.
2. WHEN SET BEHIND CURB THE HOSE NOZZLES ARE TO BE PARALLEL OR AT RIGHT ANGLES TO THE CURB, WITH THE PUMPER NOZZLE FACING THE CURB.
3. BOWL OF THE HYDRANT TO BE BLOCKED AGAINST UNDISTURBED EARTH WITH CLASS A3 CONCRETE OR AS DIRECTED BY THE ENGINEER.
4. FIRE HYDRANTS SHALL HAVE TWO 2 1/2" HOSE NOZZLE AND THE SIZE OF THE PUMPER NOZZLE & TYPE OF OPERATING NUT SHALL BE AS SPECIFIED ON THE PLANS.



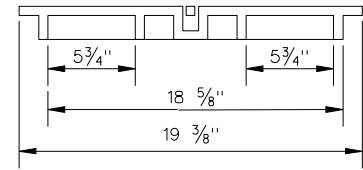
TYPE 2 RESTRAINT

FIRE HYDRANT

VIRGINIA DEPARTMENT OF TRANSPORTATION



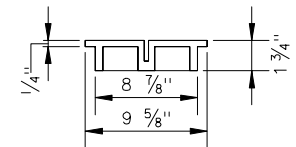
P.V.C. TAP INSTALLATION



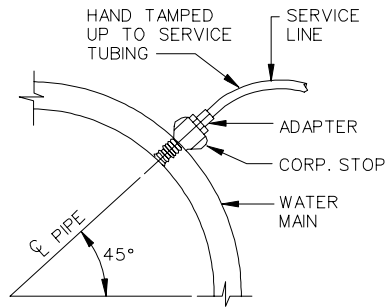
SECTION BB

NOTE:

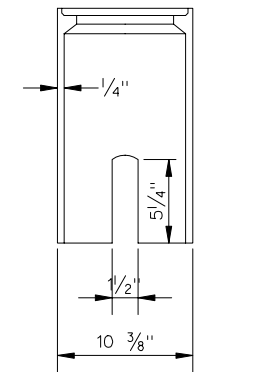
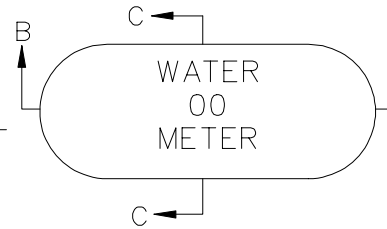
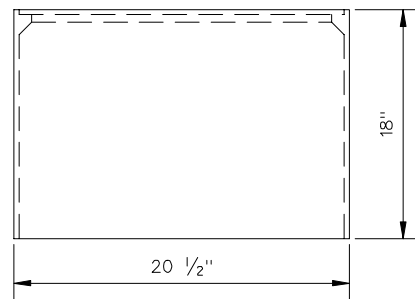
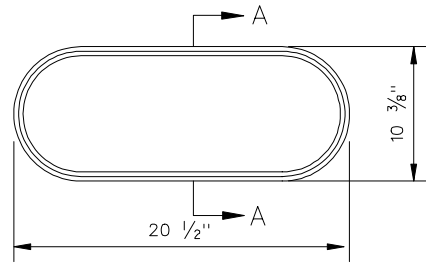
DETAIL IS FOR 5/8" THRU 1" DISC METERS



SECTION CC



C.I./D.I. TAP INSTALLATION

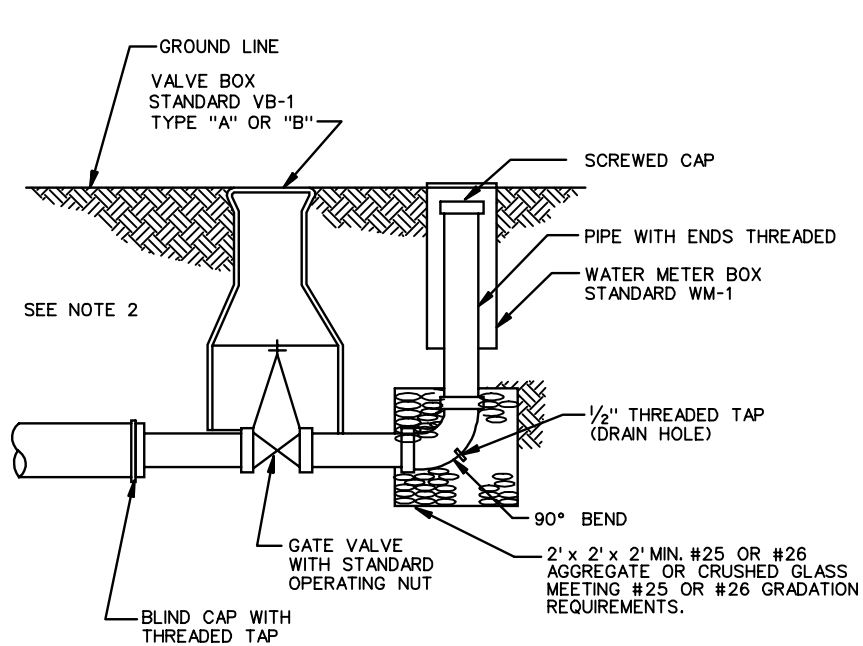


SECTION AA

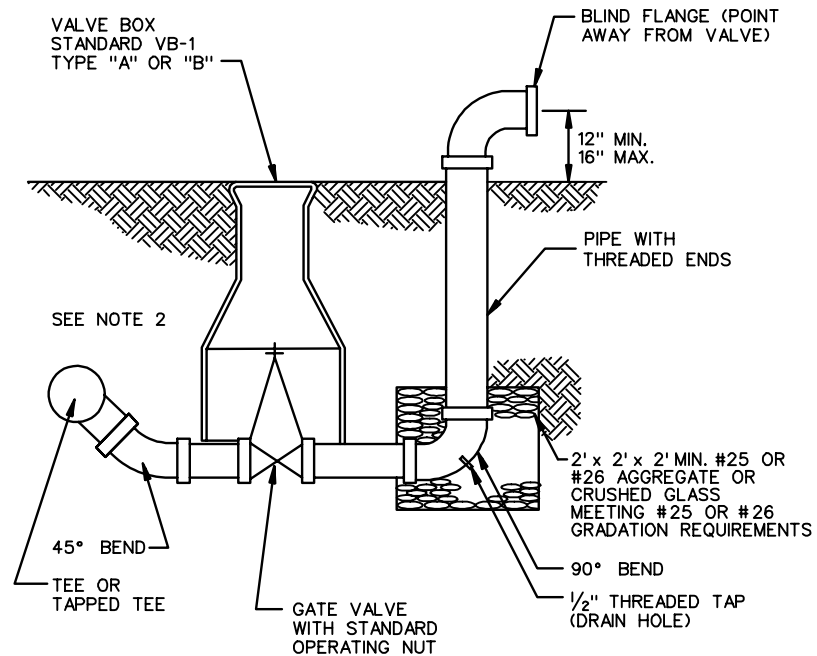
WATER METER BOX FOR 5/8" THRU 1" METER

CAST IRON SHALL CONFORM TO ASTM A-48 CLASS 30S
ALL COPPER FITTINGS SHALL BE FLARED TYPE

WATER METER AND BOX
WATER SERVICE LINES



TYPE "A"



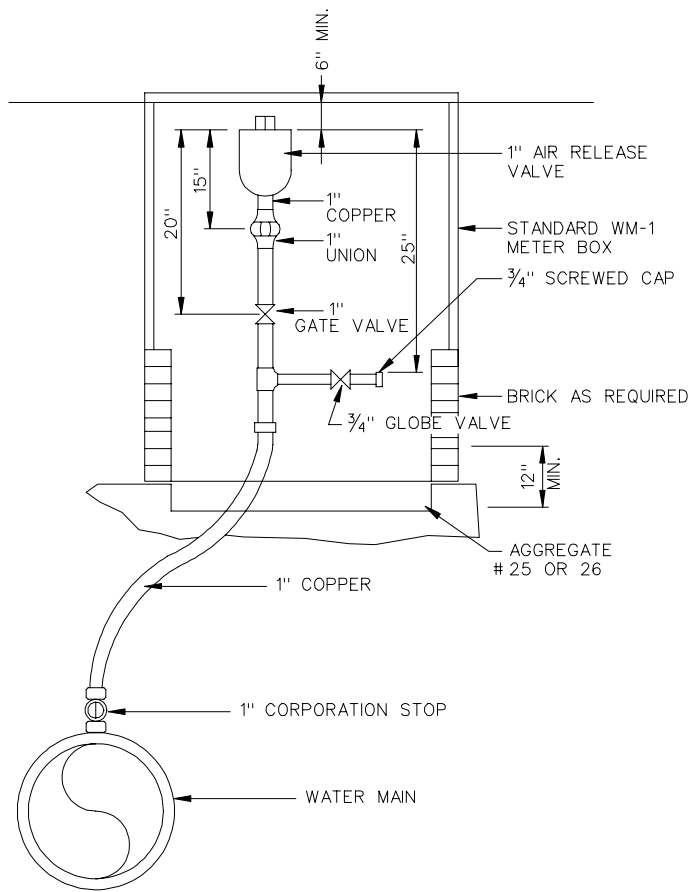
TYPE "B"

NOTES:

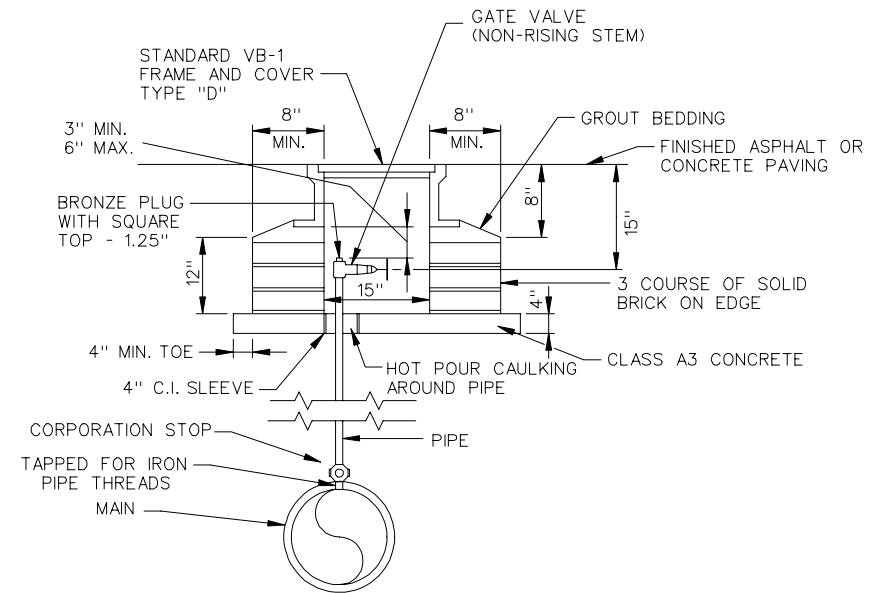
1. ALL BLOW-OFFS SHOULD BE PLACED IN A POSITION TO ASSURE NATURAL DRAINAGE.
2. EITHER TYPE "A" OR TYPE "B" BLOW-OFF MAY BE USED AT DEAD OR SAG SITUATION.
3. BLOW-OFF PIPE SHALL BE THREADED BLACK IRON OR GALVANIZED STEEL PIPE.
4. SIZE OF BLOW-OFF SHALL BE SPECIFIED ON THE PLANS.

BLOW-OFF VALVE AND BOX WATER AND SANITARY SEWER FACILITIES

VIRGINIA DEPARTMENT OF TRANSPORTATION



TYPE "A"

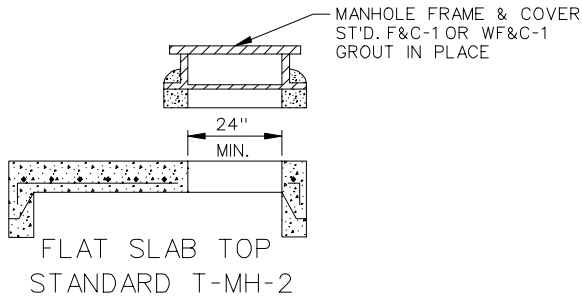


TYPE "B"

NOTES:

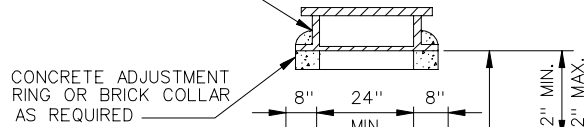
1. TAP FOR AIR RELEASE VALVE SHALL BE STANDARD THREADED TAP OR SADDLE TAP DEPENDING ON MANUFACTURER'S RECOMMENDATION FOR TYPE AND THICKNESS OF PIPE ENCOUNTERED.
2. GRAVEL BEDDED MAY BE USED IN PLACE OF CONCRETE IN NON-TRAFFIC AREAS AT DESCRETION OF ENGINEER.
3. PIPE SHALL BE BLACK IRON / GALVANIZED PIPE.
4. IF 4" OR 6" PVC PIPE IS USED, SADDLE IS REQUIRED FOR CORPORATION STOP.
5. ALL COPPER FITTINGS WILL BE FLARE TYPE.

AIR RELEASE VALVE AND BOX WATER AND SANITARY SEWER FACILITIES



FLAT SLAB TOP
STANDARD T-MH-2

MANHOLE FRAME & COVER
STANDARD F&C-1 OR
WF&C-1, GROUT IN PLACE

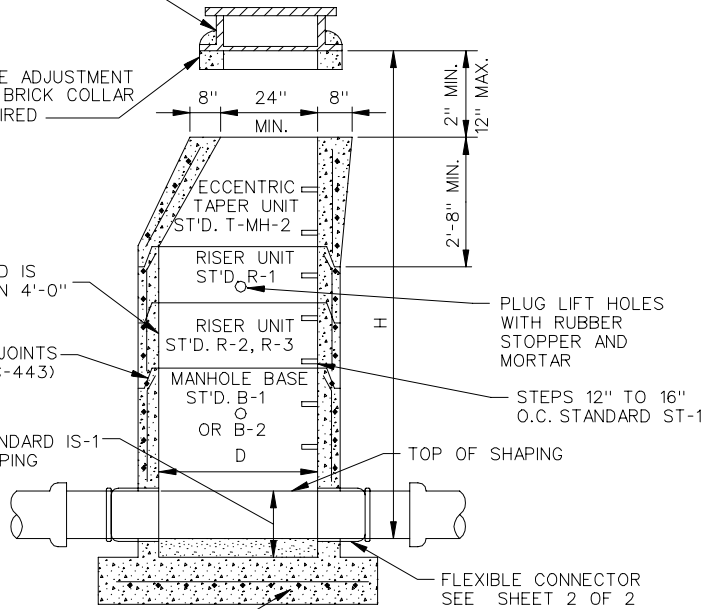


CONCRETE ADJUSTMENT
RING OR BRICK COLLAR
AS REQUIRED

REQ'D WHEN D IS
GREATER THAN 4'-0"

O-RING JOINTS
(ASTM C-443)

STANDARD IS-1
SHAPING



PLUG LIFT HOLES
WITH RUBBER
STOPPER AND
MORTAR

STEPS 12" TO 16"
O.C. STANDARD ST-1

TOP OF SHAPING

FLEXIBLE CONNECTOR
SEE SHEET 2 OF 2

BASE STANDARD B-1 OR B-2

PRECAST CONCRETE MANHOLE

NOTES:

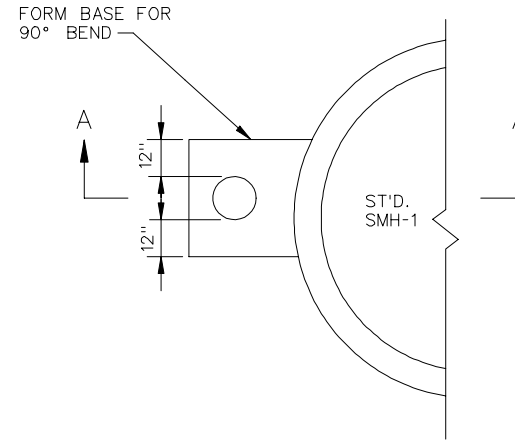
1. WHEN HEIGHT H EXCEEDS 12' A MINIMUM NOMINAL DIAMETER D OF THE BASE UNIT SHALL BE 5' WITH A SECTION HEIGHT OF 6' AND A STANDARD RISER UNIT R-2 OR R-3 SHALL BE REQUIRED.
2. FLAT SLAB TOP STANDARD T-MH-2 SHALL ONLY BE ALLOWED ON SHALLOW MANHOLES.
3. STEPS SHALL BE ENCASED IN CORROSION RESISTANT RUBBER OR OTHER MATERIAL APPROVED BY THE ENGINEER.
4. STEPS SHALL BE OMITTED WHEN SPECIFIED IN THE PLANS.
5. SEE STANDARD SHEET NUMBER 106.07, VOLUME I, FOR ADDITIONAL MANHOLE DETAILS.

NOTES:

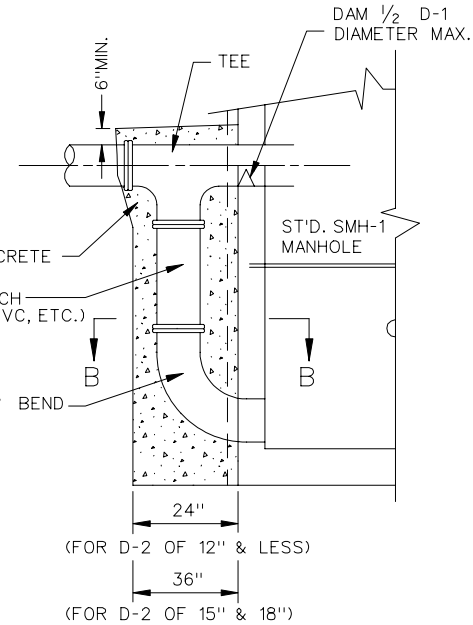
FOR DIMENSIONS NOT
SHOWN SEE VDOT ST'D.
B-1, B-2 & R-1

CONCRETE ENCASEMENT
TO EXTEND TO LIMITS
OF EXCAVATION

DIA. OF DROP PIPE	
D-1	D-2
8"	8"
10"	8"
12"	10"
15"	12"
18"	15"
24" & ABOVE	18"



SECTION B-B

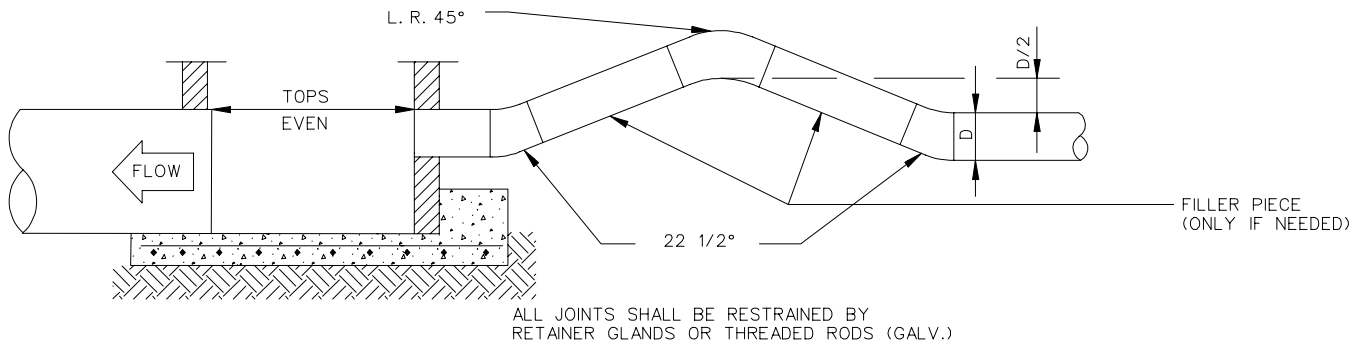


SECTION A-A

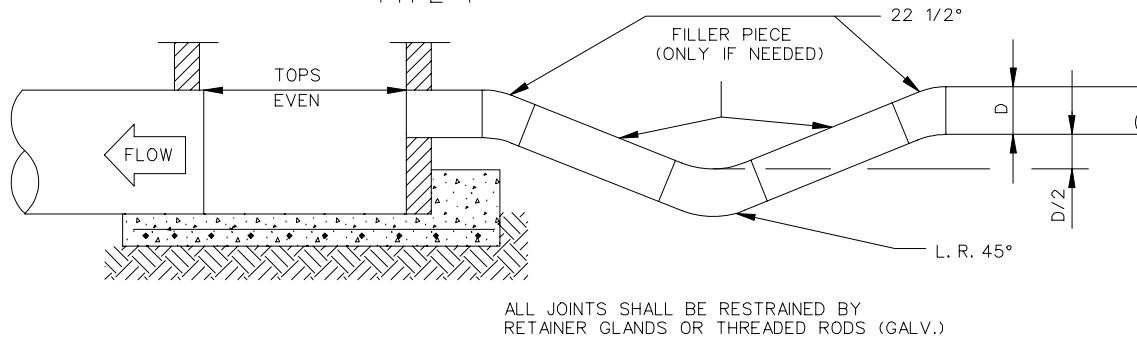
SANITARY DROP CONNECTION

SANITARY SEWER MANHOLE

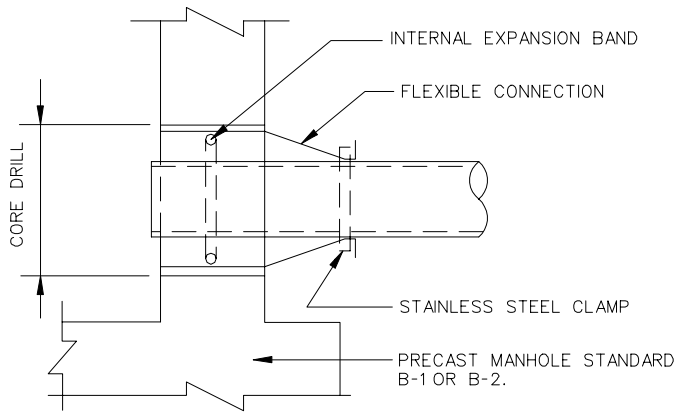
VIRGINIA DEPARTMENT OF TRANSPORTATION



FORCE MAIN DISCHARGE
TYPE 1



FORCE MAIN DISCHARGE
TYPE 2

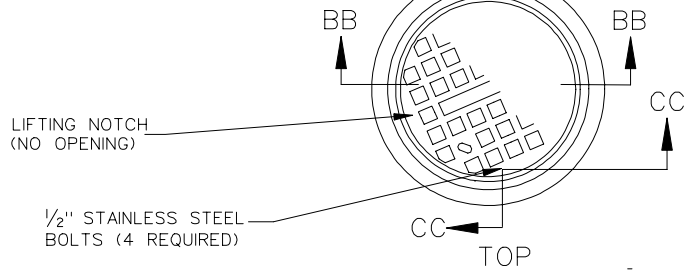


FLEXIBLE CONNECTION

PIPE TO PRECAST MANHOLE CONNECTIONS SHALL BE MADE WITH A FLEXIBLE BOOT. THE BOOT SHALL MEET ASTM SPECIFICATION C-923 AND CONSIST OF NEOPRENE RUBBER, EPDM RUBBER, OR POLYISOPRENE RUBBER, WHERE PREFERENCE MAY BE GIVEN TO A CERTAIN MATERIAL IN PROJECT SPECIFIC INSTANCES. THE INTERNAL EXPANSION BAND TO SECURE THE BOOT IN PLACE SHALL BE COMPOSED OF STAINLESS STEEL OR A NON-METALLIC MATERIAL. THE EXTERNAL BAND TO CLAMP AND SEAL THE BOOT TO THE PIPE SHALL BE CORROSION RESISTANT STAINLESS STEEL CONFORMING TO ASTM SPECIFICATION A-167. THE PORT TO RECEIVE THE BOOT SHALL BE CORE DRILLED AND SHOULD BE MANUFACTURED TO ALLOW FOR LATERAL AND VERTICAL MOVEMENT. ALL FIELD INSTALLATION OF PIPE THRU MANHOLE SEAL SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS.

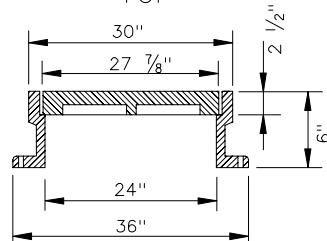
WF&C-1

4 7/8" CORED HOLES C 90°

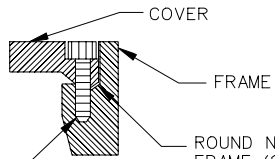


APPROXIMATE WEIGHTS

FRAME	220±	11 LBS.
COVER	260±	13 LBS.
TOTAL	480±	24 LBS.



SECTION BB - BB



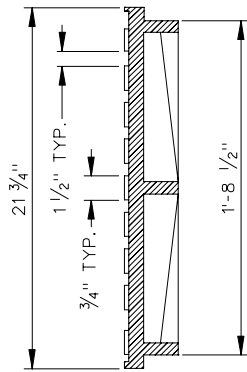
SECTION CC - CC

1. DETAILS NOT SHOWN ARE AS REQUIRED FOR ST'D F&C-1 M.H. FRAME AND COVER.
2. FRAME SHALL BE SET IN 1/4" BED OF NON-SAG JOINT SEALER & BOLTED TO THE MANHOLE CONE SECTION WITH 4 3/4" ANCHOR BOLTS.
3. CAST IRON SHALL CONFORM TO ASTM A-48, CLASS 30S.
4. SEATING SURFACES BETWEEN FRAME AND COVER SHALL BE MACHINED.
5. 1/4" x 1" CONTINUOUS NEOPRENE GASKET SHALL BE INSTALLED BETWEEN THE INNER COVER AND THE FRAME.
6. RECESSED PICK HOLE SHALL NOT EXTEND THRU THE COVER.

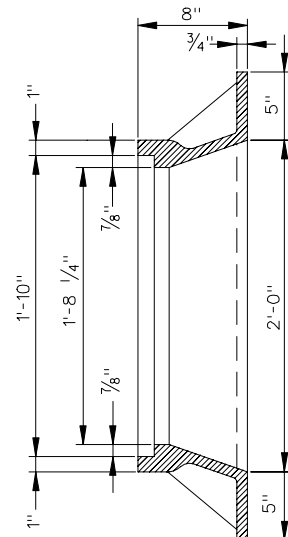
WATERTIGHT MANHOLE FRAME AND COVER

F&C-1

CAST IRON COVER MARKED "SEWER" OR "WATER" AS APPLIES.



SECTION A-A

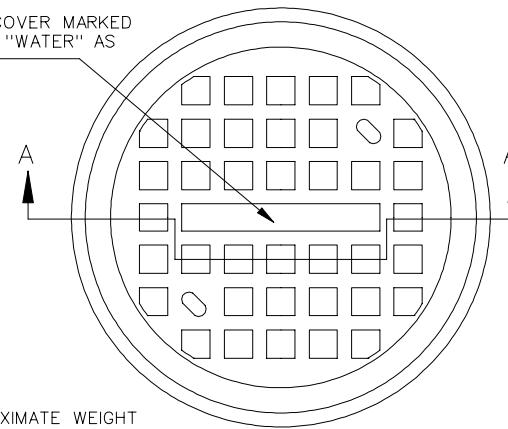


SECTION B-B

NOTES:

1. CAST IRON SHALL CONFORM TO ASTM A-48M, CLASS 30S.
2. CASTING AND FRAME ARE TO BE MACHINED TO ENSURE A FIRM TIGHT FIT.
3. DIMENSIONS NOT SHOWN ARE THE SAME AS STANDARD MH-1 FRAME AND COVER.

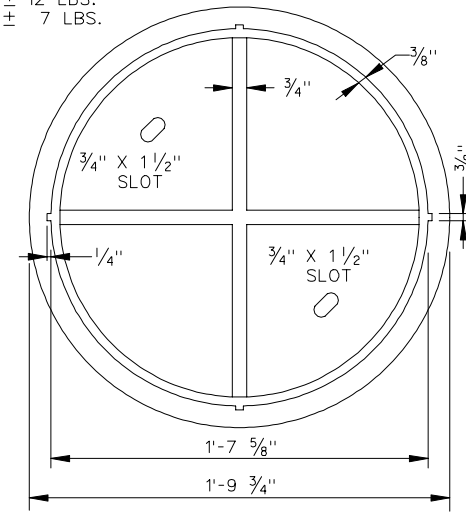
MANHOLE FRAME AND COVER



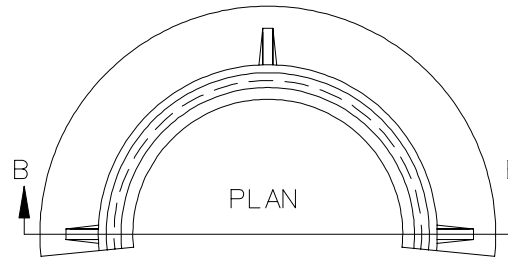
APPROXIMATE WEIGHT

CAST IRON FRAME	239 ±	12 LBS.
COVER	137 ±	7 LBS.

TOP



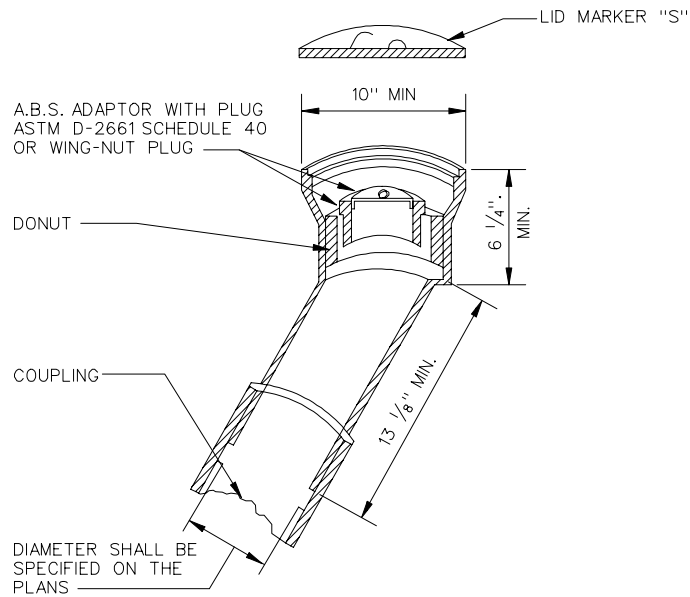
BOTTOM



PLAN

WATER AND SANITARY SEWER FACILITIES

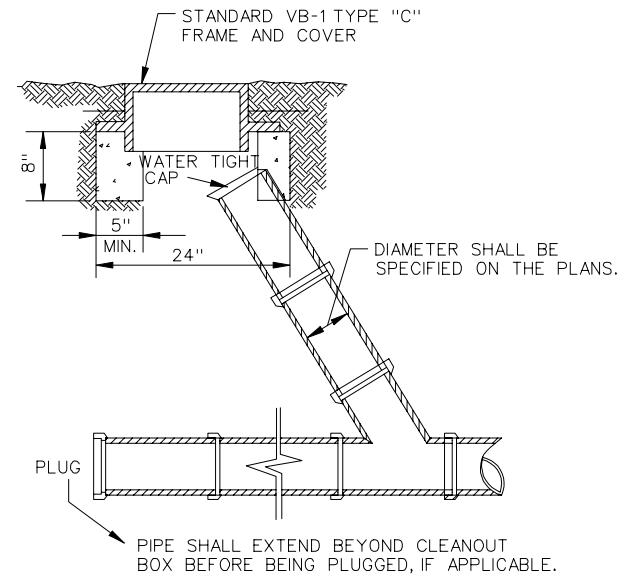
VIRGINIA DEPARTMENT OF TRANSPORTATION



NOTES:

1. CLEANOUT MAY ALSO BE INSTALLED WITH IRON BODY SCREW WITH BRASS PLUG AND ONE INCH OF LEAD POURED IN PLACE & CAULKED ON INSIDE & OUTSIDE EDGE.
2. CLEANOUT SHALL BE SUITABLY BRACED WITH 2" x 4" CROSS PIECE EXTENDED OVER & HAVING SOLID BEARING AT LEAST ONE FOOT ON EACH SIDE OF DITCH
3. CLEANOUT WYE AND RISER SHALL BE CONSTRUCTED OF THE SAME MATERIAL AS THE MAIN UNLESS OTHERWISE SPECIFIED.

TYPE "A"



NOTES:

1. CAST IRON FRAME AND COVER SHALL BE SUFFICIENTLY TRUE TO A PLANE SURFACE, SO THAT TOPS WILL NOT ROCK.
2. CLEANOUT WYE AND RISER SHALL BE CONSTRUCTED OF THE SAME MATERIALS AS THE MAIN UNLESS OTHERWISE SPECIFIED.

TYPE "B"

SEWER CLEANOUT

VIRGINIA DEPARTMENT OF TRANSPORTATION