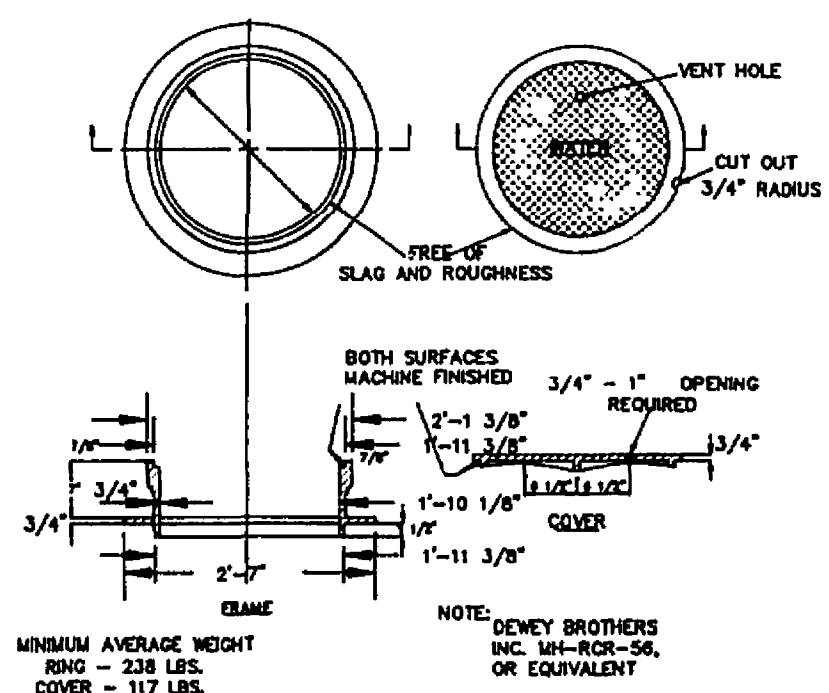
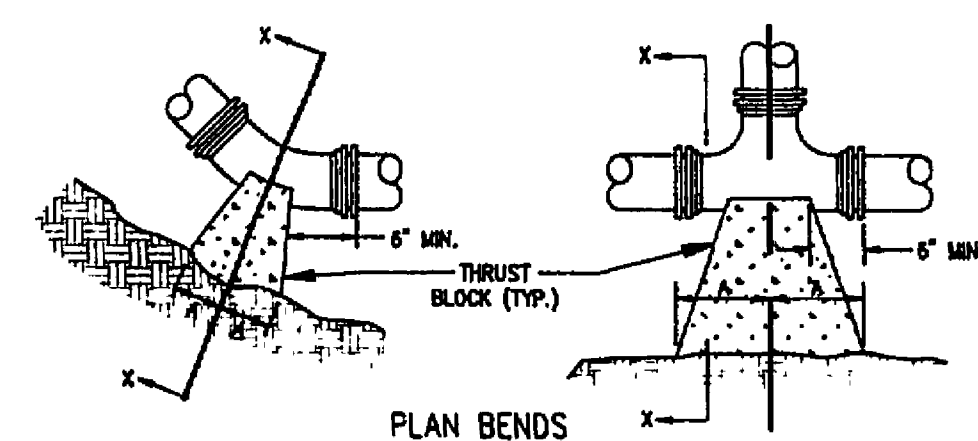


TYPICAL WATER PRESSURE TEST RIG

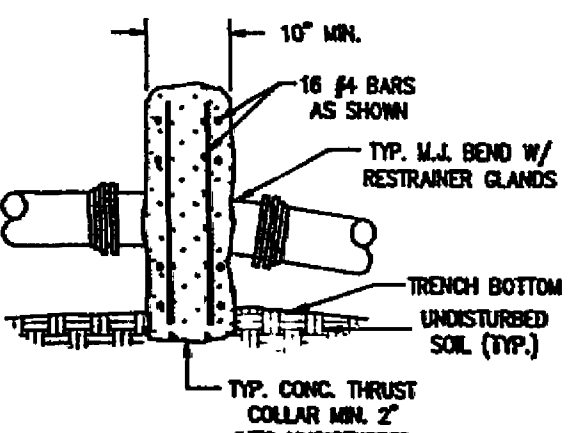
NOTE: 1. SUBSTITUTE SEWER FOR WATER ON SANITARY SEWER MANHOLE FRAME & COVERS.



MANHOLE FRAME AND COVER



PLAN AND ELEVATION PLUGS

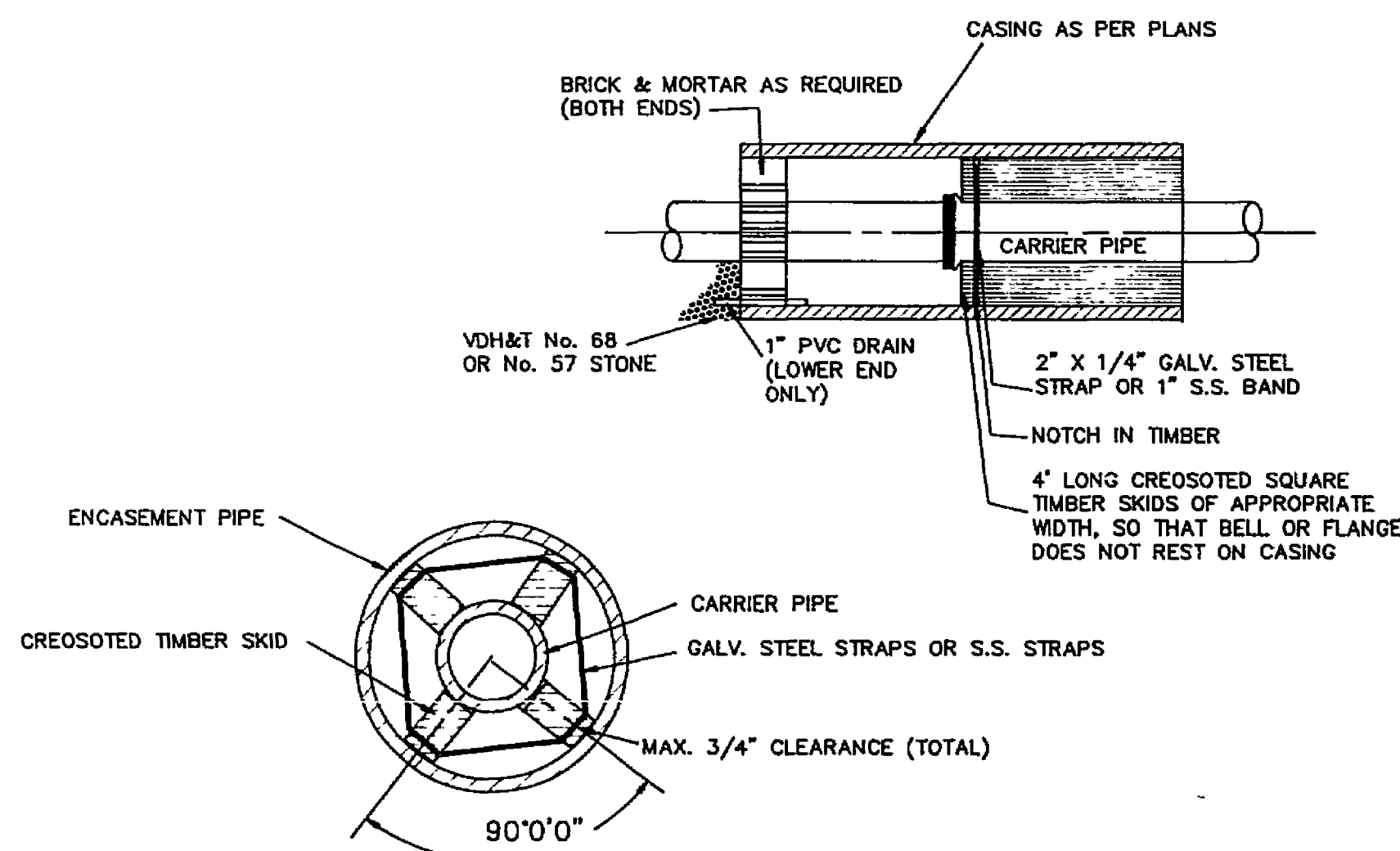


SECTION OF VERTICAL BEND

PIPE SIZE	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	TEE	PLUG
4"	18"	12"	10"	8"	11"	10"
6"	24"	18"	14"	10"	15"	14"
8"	30"	24"	18"	12"	19"	18"
10"	36"	30"	22"	14"	23"	22"
12"	42"	36"	26"	16"	27"	26"
14"	48"	42"	30"	18"	31"	30"
16"	54"	48"	34"	20"	35"	34"
18"	60"	54"	38"	22"	39"	38"
20"	66"	60"	42"	24"	43"	42"
24"	84"	72"	54"	30"	51"	50"
30"	108"	96"	72"	36"	63"	62"

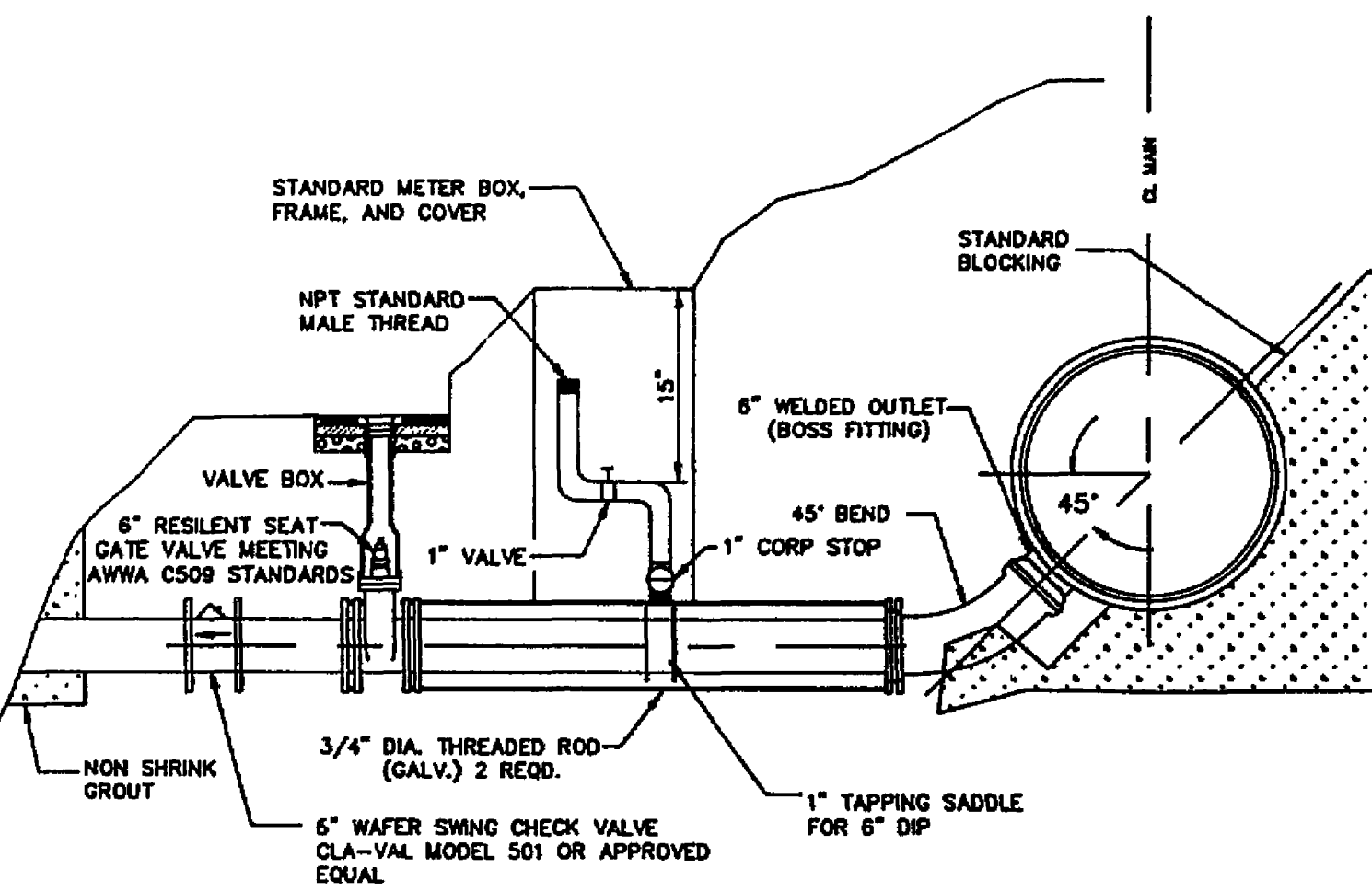
THRUST BLOCK CONSTRUCTION

NO SCALE



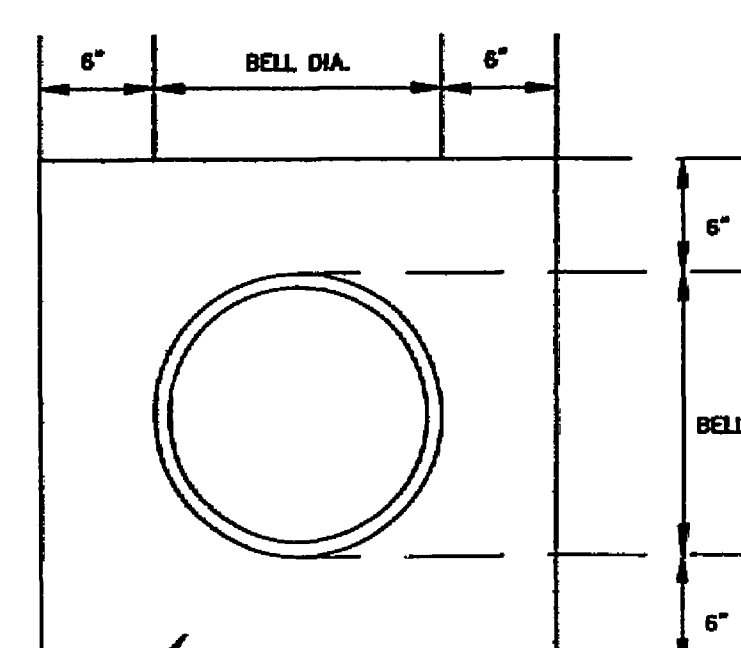
PIPE SUPPORT IN CASING PIPE

FOR DUCTILE IRON PIPE, SOAP-BASED LUBRICANT MAY BE USED TO EASE SLIDING OF SKID. FOR PVC PIPE, FLAX SOAP OR DRILLING MUD SHOULD BE UTILIZED FOR LUBRICATION.



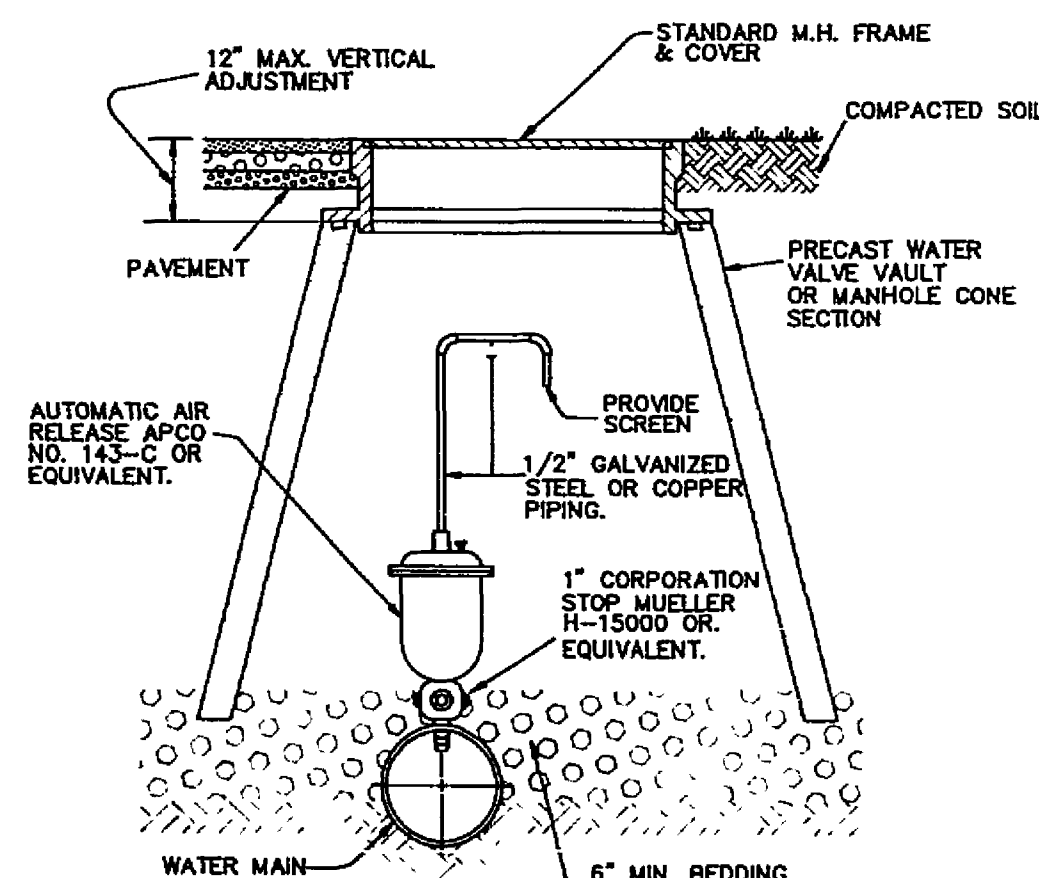
FLUSH TYPE BLOW OFF

1. INSTALL FLUSH TYPE BLOW OFF WITH A SAMPLING TAP WHERE SPECIFICALLY CALLED OUT ON CONSTRUCTION DRAWINGS. WHERE NO SAMPLING TAP IS SPECIFIED OMIT 1" SAMPLING TAP AND ALL ASSOCIATED APPURTENANCES. IN ALL OTHER INSTANCES THE STANDARD BLOW OFF DETAIL SHOULD BE USED FOR CONSTRUCTION OF BLOW OFF ASSEMBLY.
2. SAMPLING TAP SHALL BE CONSTRUCTED USING GUIDELINES AS SET FORTH IN THE ROANOKE COUNTY PLUMBING STANDARDS.



CONCRETE ENCASED PIPE

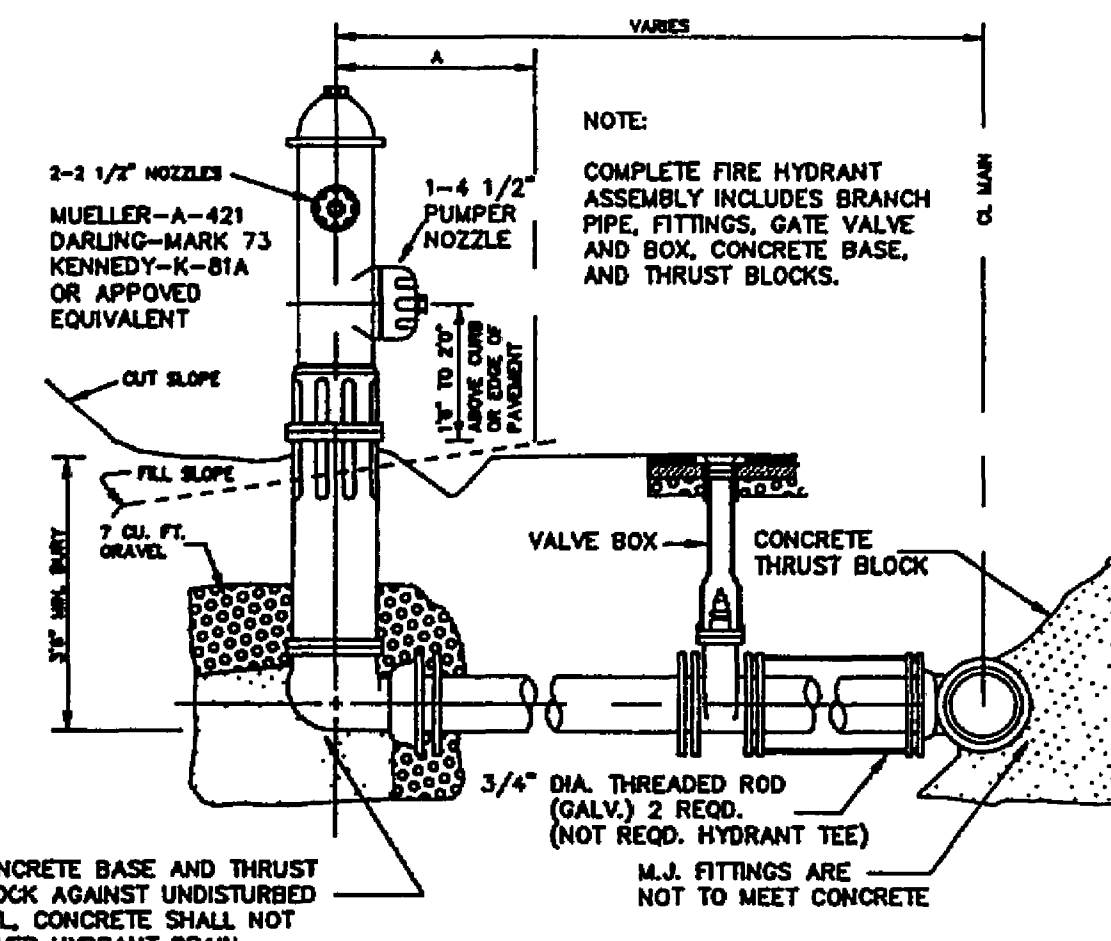
CONCRETE 2,500 P.S.I. @ 28 DAYS



NOTE: FOR FORCEMAIN AIR RELEASE VALVES USE APCO No. 400 OR EQUIVALENT WITH 2" CORPORATION STOP.

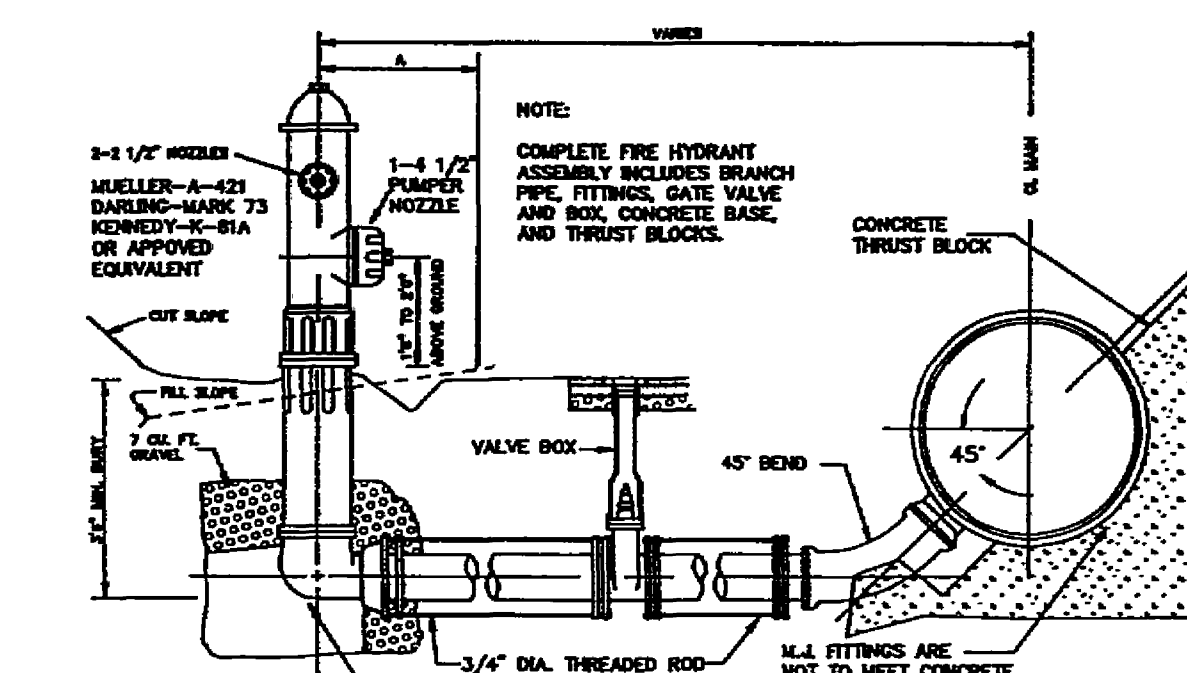
AUTOMATIC AIR RELEASE ASSEMBLY

1. MAIN BODY OF HYDRANT MUST BE SILVER AND HAVE RED CAPS AND BONNET.
2. DISTANCE "A" WITH CURB AND CUTTER. 2' MIN., 4' MAX. FROM BACK OF CURB.
3. DISTANCE "A" WITHOUT CURB AND CUTTER. 6' MIN., 12' MAX. FROM EDGE OF PAVEMENT.
4. AREA AROUND HYDRANT AT A RADIUS OF 4' TO BE APPROXIMATELY LEVEL AND UNOBSTRUCTED FOR ROAD CONSTRUCTION.

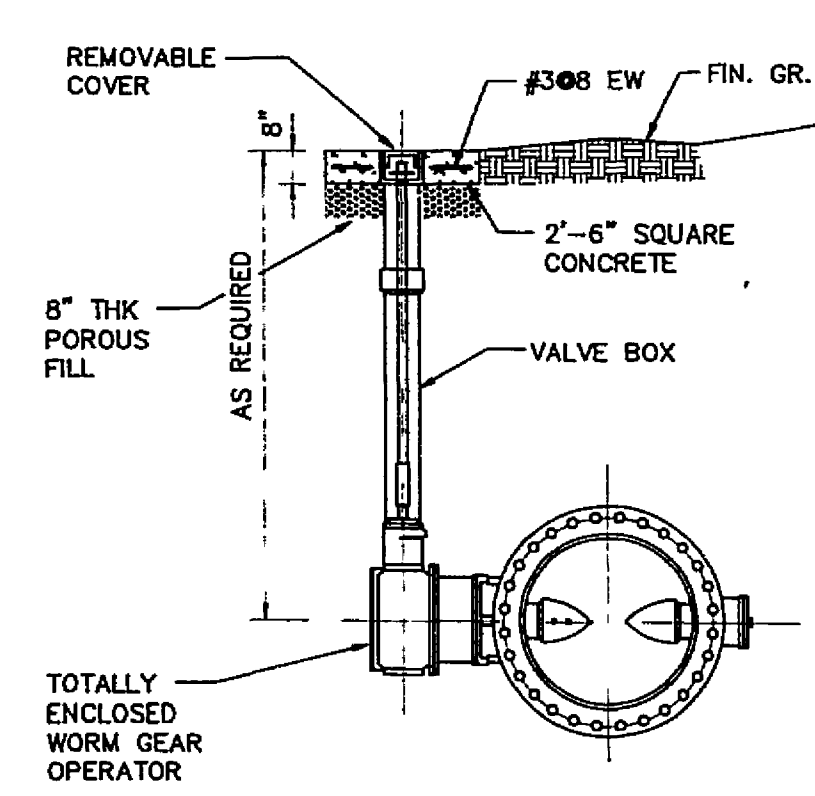


FIRE HYDRANT SETTING

1. MAIN BODY OF HYDRANT MUST BE SILVER AND HAVE RED CAPS AND BONNET.
2. DISTANCE "A" WITH CURB AND CUTTER. 2' MIN., 4' MAX. FROM BACK OF CURB.
3. DISTANCE "A" WITHOUT CURB AND CUTTER. 6' MIN., 12' MAX. FROM EDGE OF PAVEMENT.
4. AREA AROUND HYDRANT AT A RADIUS OF 4' TO BE APPROXIMATELY LEVEL AND UNOBSTRUCTED FOR ROAD CONSTRUCTION.



BLOW OFF ASSEMBLY



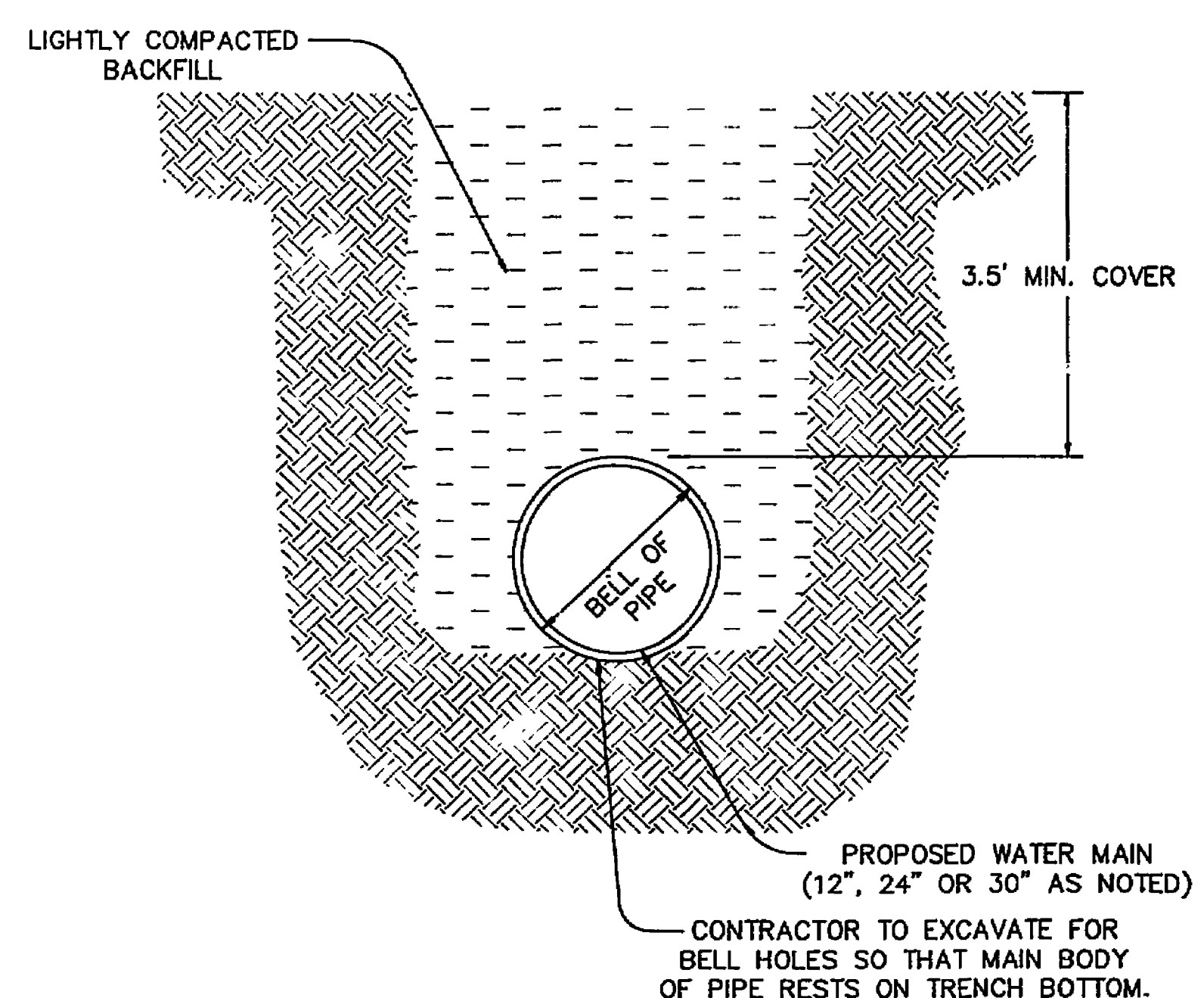
BURIED BUTTERFLY VALVE (BFV)

VAULT AND WATER STANDARDS FOR CONSTRUCTION

1. VAULTS, MANHOLE BASES, RISERS, TAPERS AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE MANUFACTURED IN ACCORDANCE WITH VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS, SECTION 503.
2. MANHOLE BASE AND RISER SECTIONS CONSTRUCTION SHALL BE VERTICAL WITH MAXIMUM 1" IN 4' TILT.
3. A MAXIMUM OF 2 CONSTRUCTION GRADE RINGS OR MAXIMUM OF 1' OF GRADE RINGS AND FRAME AND COVER ADJUSTMENT ARE ALLOWABLE.
4. FINAL ADJUSTMENT OF FRAME AND COVER SHALL BE IN ACCORDANCE TO FRAME AND COVER ADJUSTMENT DETAIL USING NON SHRINK CONCRETE WITH MAXIMUM OF 4 BRICKS OR CONCRETE BLOCKS FOR GRADE CONTROL. FRAME AND COVER ARE TO BE SET AT FINISH GRADE OR 1/4" ABOVE FINISH GRADE IN PAVEMENT AND YARD AREAS AND MINIMUM 8" ABOVE FINISH GRADE IN OTHER AREAS. MANHOLE FRAMES AND COVERS ARE NOT TO BE SET IN DRAINAGE SWALE, VALLEY GUTTER, ETC.
5. JOINTS AND OPENINGS IN MANHOLE UNITS SHALL BE MADE WATER TIGHT BY USING BUTYL SEALANTS, "O" RING GASKETS OR MASTIC. THE CONCRETE SURFACE SHALL BE CLEANED PRIOR TO USE OF SEALANT.
6. FRAME AND COVERS
 - A) DEWEY BROTHERS INC. MH - RCR - 55.
 - B) APPROVED EQUAL.
7. ALL LIFT HOLES, OPENINGS AROUND PIPE, ETC. SHALL BE FILLED FROM INSIDE AND OUTSIDE TO THICKNESS OF STRUCTURE.
8. ALL UNITS USED IN MANHOLE AND VAULT CONSTRUCTION SHALL BE SECURELY CONNECTED BY INTERLOCKING BETWEEN UNITS. CONCRETE COLLARS OR OTHER APPROVED METHOD.
9. AREA AROUND METER BOX AT A RADIUS OF 4' TO BE ON FINISH GRADE AND UNOBSTRUCTED EXCEPT FOR ROAD CONSTRUCTION.

APPROVED MATERIALS

1. METER BOXES
 - A) FORD IRONCONCRETE METER BOX WITH NO. 2 IRONCONCRETE TOP OR APPROVED EQUAL.
 - B) SOUTHEASTERN DISTRIBUTOR MODEL MB-5 PLASTIC BOX WITH FORD OR CHARLOTTE MODEL C-32 CAST IRON BASE AND COVER (NOT APPROVED FOR ROADWAY AREA).
 - C) APPROVED EQUAL.
2. METER SETTER (INCLUDING INLET RISER VALVE AND DOUBLE CHECK VALVE ON OUTLET).
 - A) FORD VBIH 72-15-WD.
 - B) APPROVED EQUAL.
3. METER SETTER EXTENDER OR RISER
 - A) NOT ALLOWED UNLESS APPROVED BY THE UTILITY DIRECTOR.
4. CORPORATION STOP
 - A) MUELLER MODEL H-1500
 - B) FORD MODEL F-500
 - C) APPROVED EQUAL.
5. U-BRANCH
 - A) FORD MODEL U28-43
 - B) MUELLER MODEL H 15382
 - C) APPROVED EQUAL.
6. SERVICE SADDLES (FOR PVC PIPE)
 - A) FORD MODEL FS 202 AND FC 202 WITH STAINLESS STEEL BAND AND BOLTS.
 - B) APPROVED EQUAL.



WATER MAIN INSTALLATION

REVISION	DATE	DESCRIPTION
DESIGNED - PAM		WATER DETAILS FOR PHASE 2 SOUTH LOOP TRANSMISSION MAIN
DRAWN - PAM-JNG		PREPARED FOR ROANOKE COUNTY UTILITY DEPARTMENT
CHECKED - MSW		CAVE SPRING, WINDSOR HILLS, & CATAMBA MAGISTERIAL DISTRICTS ROANOKE COUNTY, VIRGINIA
LUMSDEN ASSOCIATES, P.C. ENGINEERS-SURVEYORS-PLANNERS ROANOKE, VIRGINIA		SCALE: NONE DATE: 8/5/94 COMM: 91-376 SHEET 15 of 16

