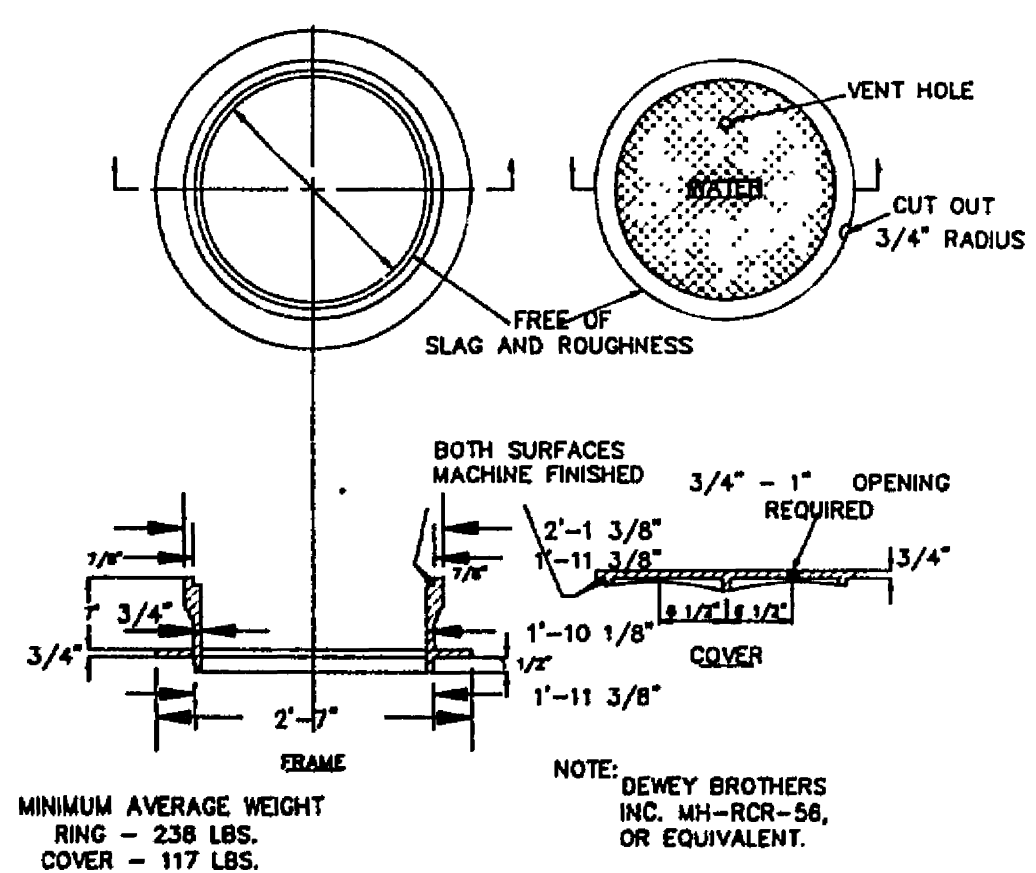


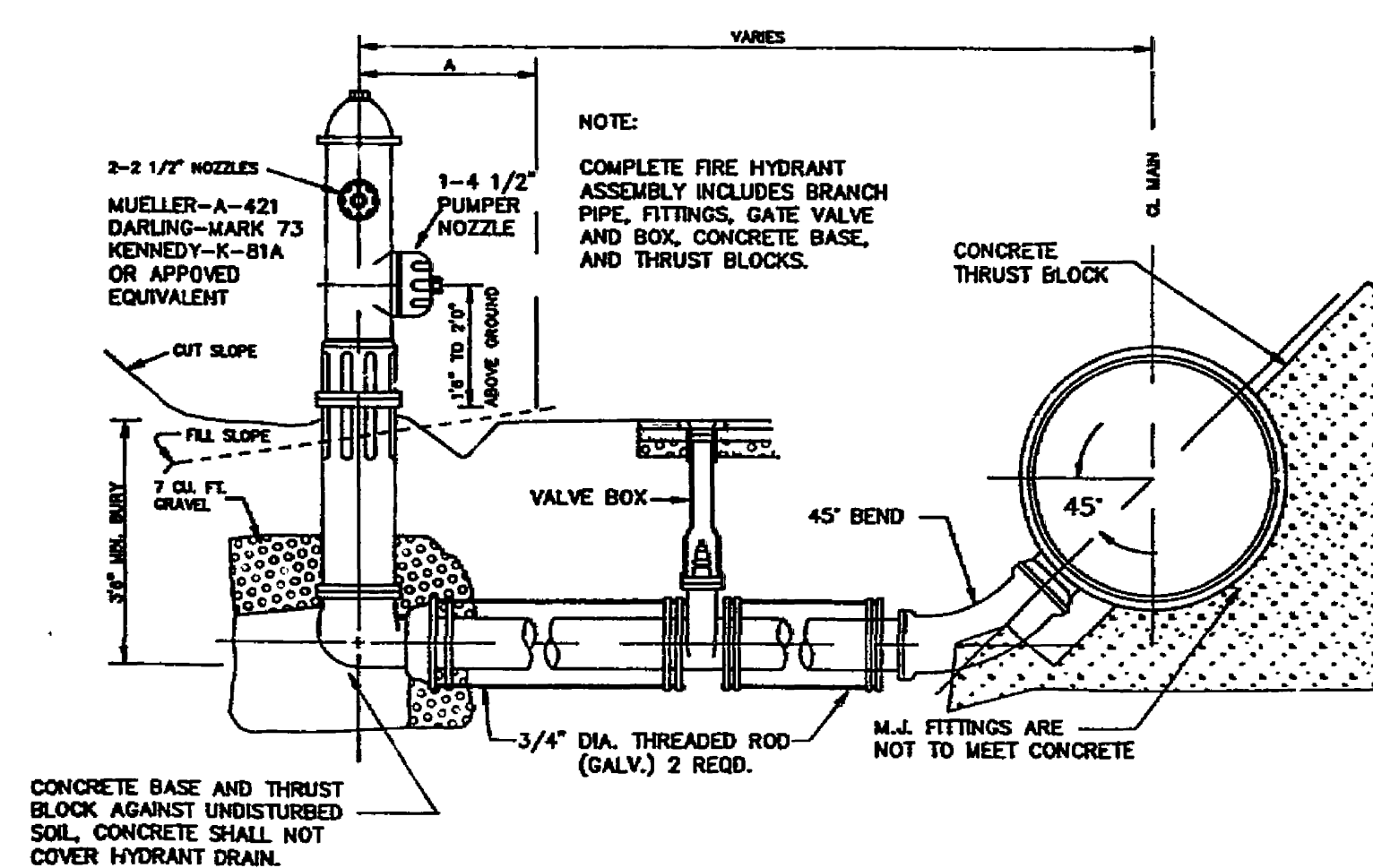
**TYPICAL WATER PRESSURE TEST RIG**

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

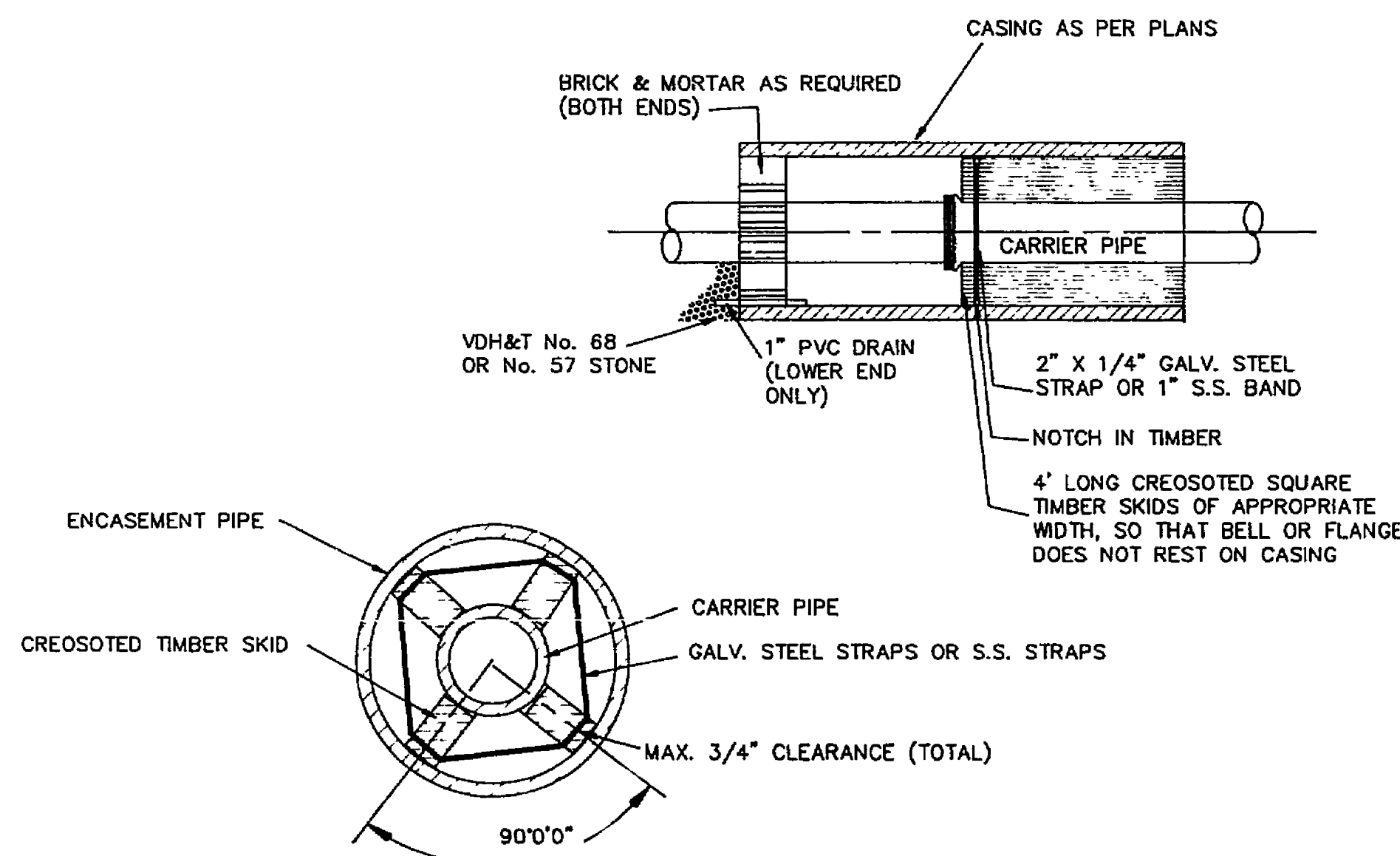


**MANHOLE FRAME AND COVER**

- NOTES:
- (1) MAIN BODY OF HYDRANT MUST BE SILVER AND HAVE RED CAPS AND BONNET.
  - (2) DISTANCE "A" WITH CURB AND GUTTER, 2" MIN., 4" MAX. FROM BACK OF CURB.
  - (3) DISTANCE "A" WITHOUT CURB AND GUTTER, 5" 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**

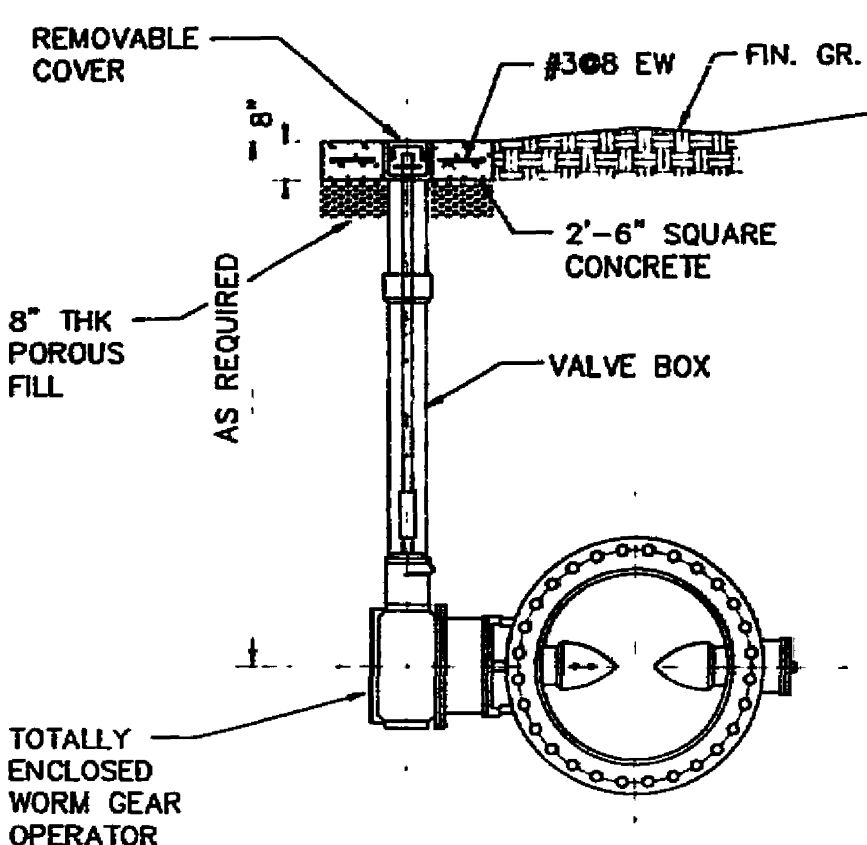


FOR DUCTILE IRON PIPE, SOAP-BASED LUBRICANT MAY BE USED TO EASE SLIDING OF SKID. FOR PVC PIPE, FLAX SOAP OR DRILLING MUD SHOULD BE UTILIZED FOR LUBRICATION.

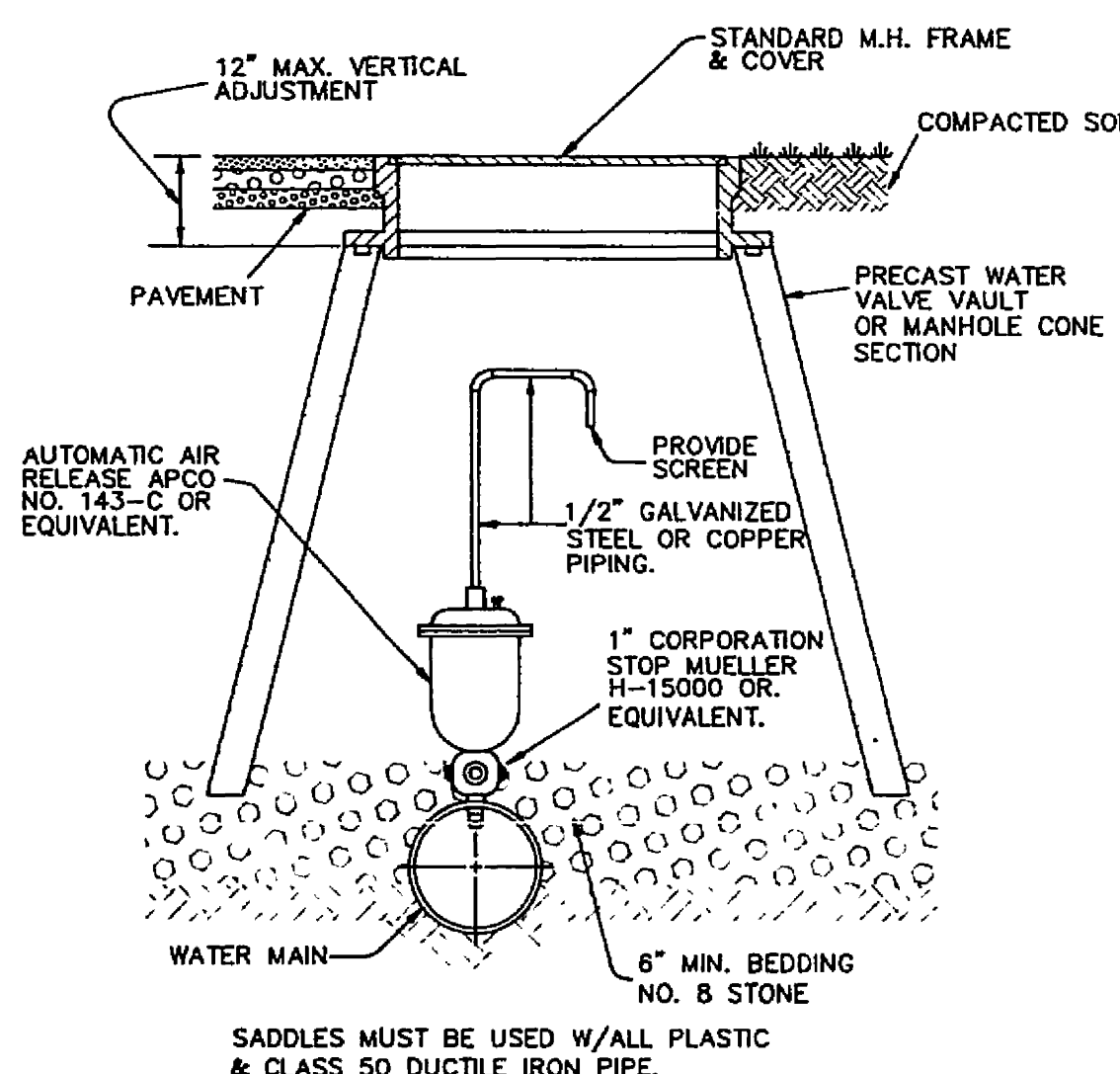
**PIPE SUPPORT IN CASING PIPE**

**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 6" 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 WATERTIGHT 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 - 58.  
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 METHODS.
9. AREA AROUND METER BOX AT A RADIUS OF 4' TO BE ON FINISH GRADE AND UNOBSTRUCTED EXCEPT FOR ROAD CONSTRUCTION.

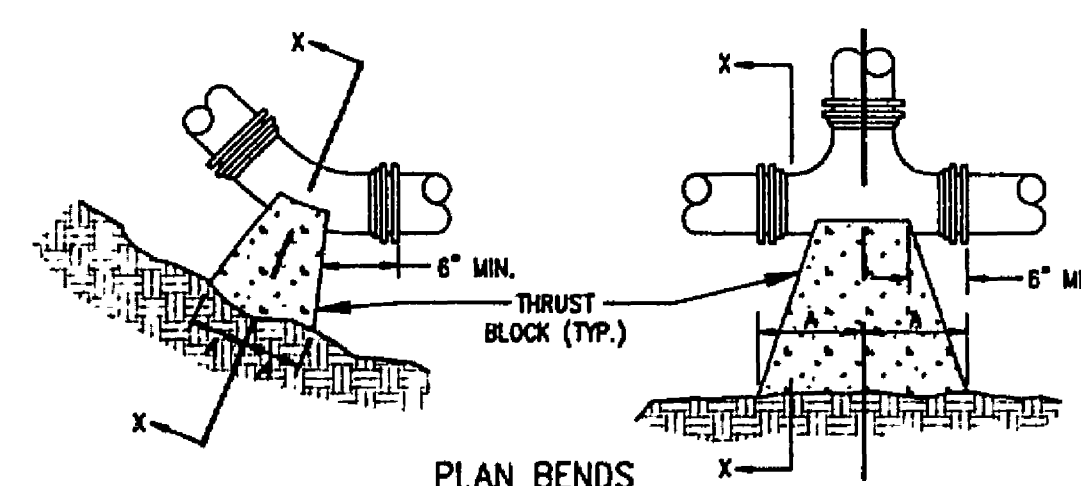


**BURIED BUTTERFLY VALVE (BFV)**

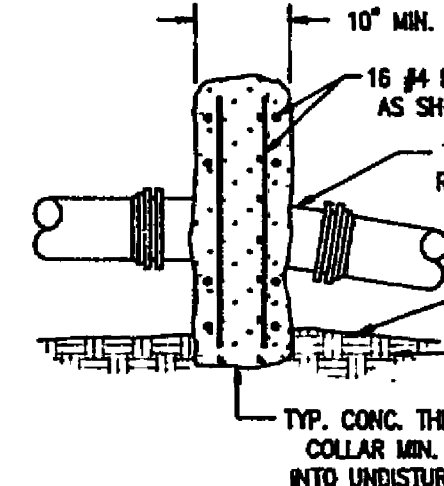


NOTE: FOR FORCE MAIN AIR RELEASE VALVES USE APCO NO. 400 OR EQUIVALENT WITH 2" CORPORATION STOP.

**AUTOMATIC AIR RELEASE ASSEMBLY**



**PLAN AND ELEVATION PLUGS**

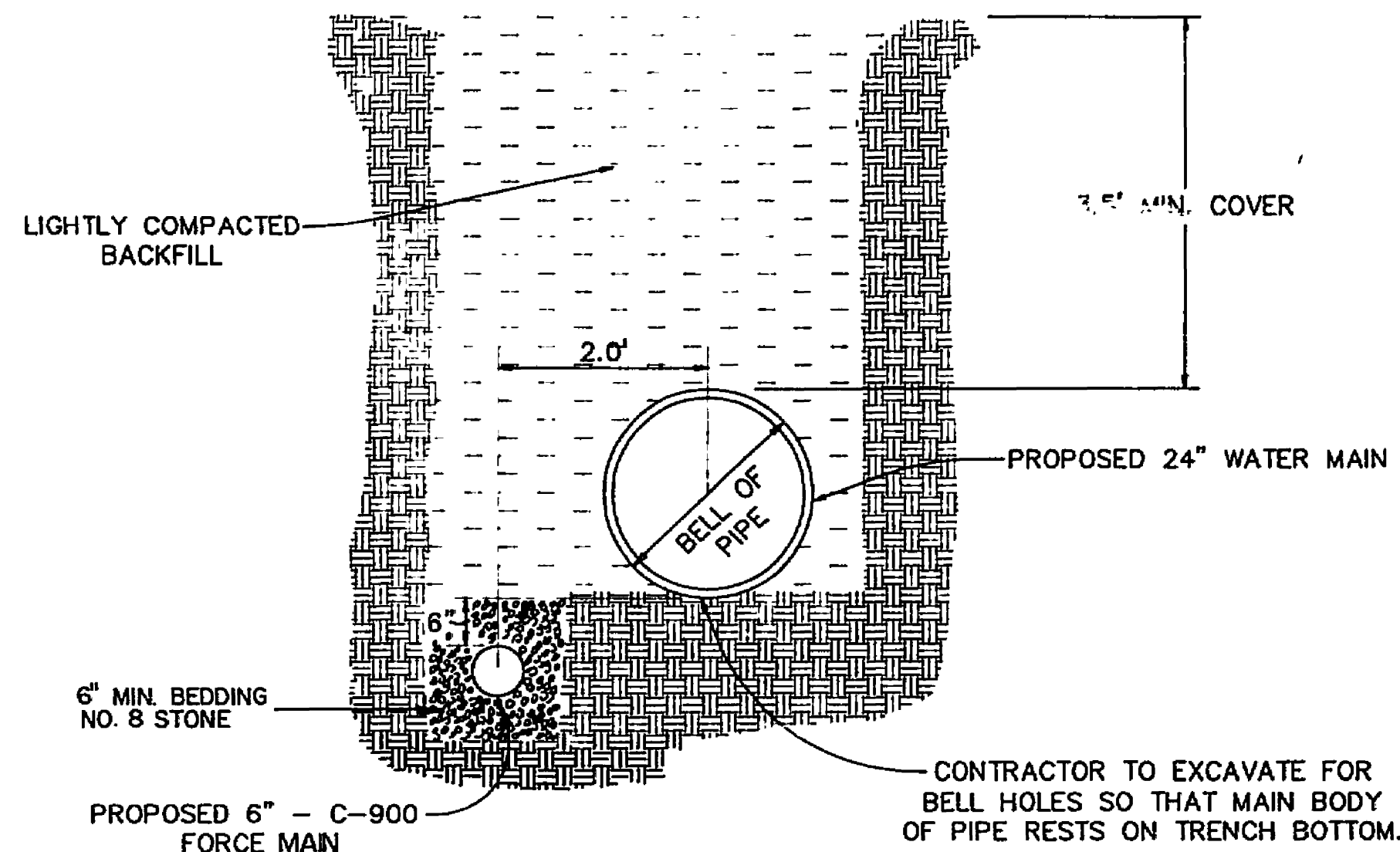


**SECTION OF VERTICAL BEND**

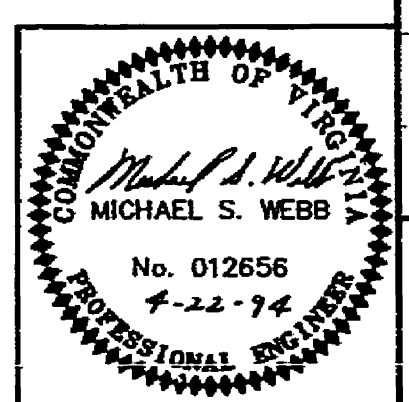
PIPE SIZE	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	TEE	PLUG
4"	A	B	A	B	A	C
6"	8"	12"	8"	8"	8"	10"
8"	12"	16"	10"	10"	10"	12"
10"	16"	20"	14"	14"	14"	16"
12"	20"	24"	18"	18"	18"	20"
14"	24"	28"	22"	22"	22"	24"
16"	28"	32"	26"	26"	26"	28"
18"	32"	36"	30"	30"	30"	32"
20"	36"	40"	34"	34"	34"	36"
22"	40"	44"	38"	38"	38"	40"
24"	44"	48"	42"	42"	42"	44"
26"	48"	52"	46"	46"	46"	48"
28"	52"	56"	50"	50"	50"	52"
30"	56"	60"	54"	54"	54"	56"
32"	60"	64"	58"	58"	58"	60"
34"	64"	68"	62"	62"	62"	64"
36"	68"	72"	66"	66"	66"	68"

**THRUST BLOCK CONSTRUCTION**

NO SCALE



**WATER MAIN INSTALLATION**



REVISION		DATE	DESCRIPTION
DESIGNED - GLR			WATER DETAILS FOR PHASE I
DRAWN - MDH			SOUTH LOOP TRANSMISSION MAIN
CHECKED - MSW			PREPARED FOR ROANOKE COUNTY UTILITY DEPARTMENT
			CAVE SPRING, WINDSOR HILLS, & CATAWBA MAGISTERIAL DISTRICTS
			ROANOKE COUNTY, VIRGINIA
LUMSDEN ASSOCIATES, P.C.		SCALE: NONE	COMD: 91-376
ENGINEERS-SURVEYORS-PLANNERS		DATE: 4/19/94	SHEET 10 of 12
ROANOKE, VIRGINIA			