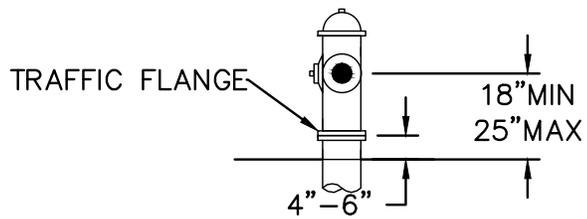


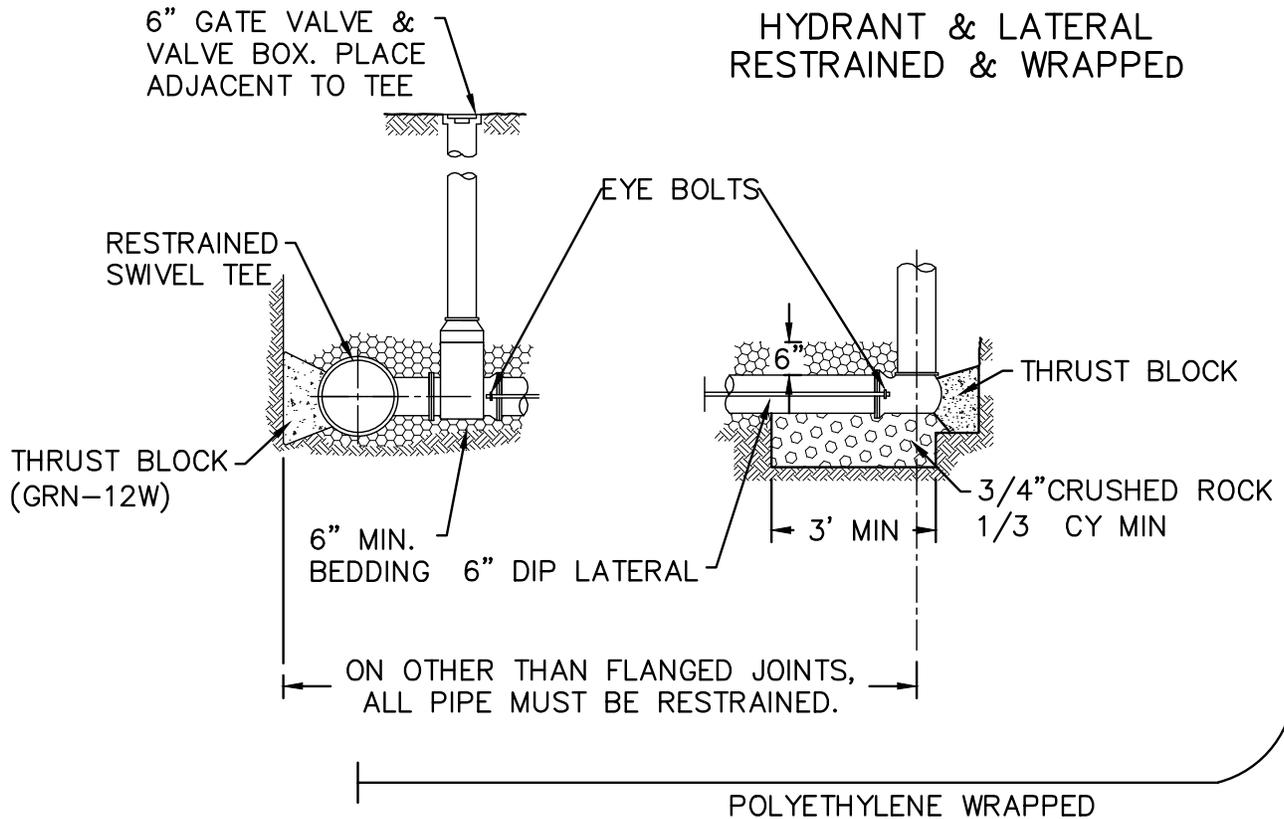
# DETAIL TABLE OF CONTENTS

SHEET NUMBER	SHEET TITLE	REVISION NUMBER
GRN-1W	TYPICAL FIRE HYDRANT AND ASSEMBLY	1
GRN-2W	BLOWOFF DETAIL	1
GRN-3W	COMBINATION AIR VALVE AND MANHOLE	1
GRN-4W	COMBINATION AIR VALVE AND MANHOLE SECTION A-A	1
GRN-5W	COMBINATION AIR VALVE AND MANHOLE SECTION B-B	1
GRN-6W	PRESSURE REDUCING VAULT-PLAN VIEW	1
GRN-7W	PRESSURE REDUCING VAULT-PROFILE VIEW	1
GRN-8W	PRV VAULT SCHEDULE	1
GRN-9W	AIR VENT PIPE INSTALLATION AND DETAIL-OPEN FIELD	1
GRN-10W	AIR VENT DETAIL-RESIDENTIAL	1
GRN-11W	6 INCH DIAMETER AIR VENT PIPE SCREEN	1
GRN-12W	THRUST BLOCKS-HORIZONTAL BENDS DETAIL	1
GRN-13W	RESTRAINED JOINTS AT VERTICAL BENDS	1
GRN-14W	GATE VALVE DETAIL	1
GRN-15W	POLYETHYLENE WRAP	1
GRN-16W	CARSONITE MARKER POST	1
GRN-17W	METER PIT DETAIL	1
GRN-18W	DIRECT BURY BUTTERFLY VALVE INSTALLATION	1
GRN-19W	BUTTERFLY VALVE INSTALLATION-ELEVATION VIEW	1
GRN-20W	BUTTERFLY VALVE INSTALLATION-PLAN VIEW	1
GRN-21W	LENGTH OF RESTRAINED PIPE	1
GRN-22W	PIPE BEDDING DETAILS	1
GRN-23W	FLANGE LUG DETAIL	1
GRN-24W	TRACER WIRE DETAIL	1

DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	TOC
	TABLE OF CONTENTS	



HYDRANT & LATERAL  
RESTRAINED & WRAPPED



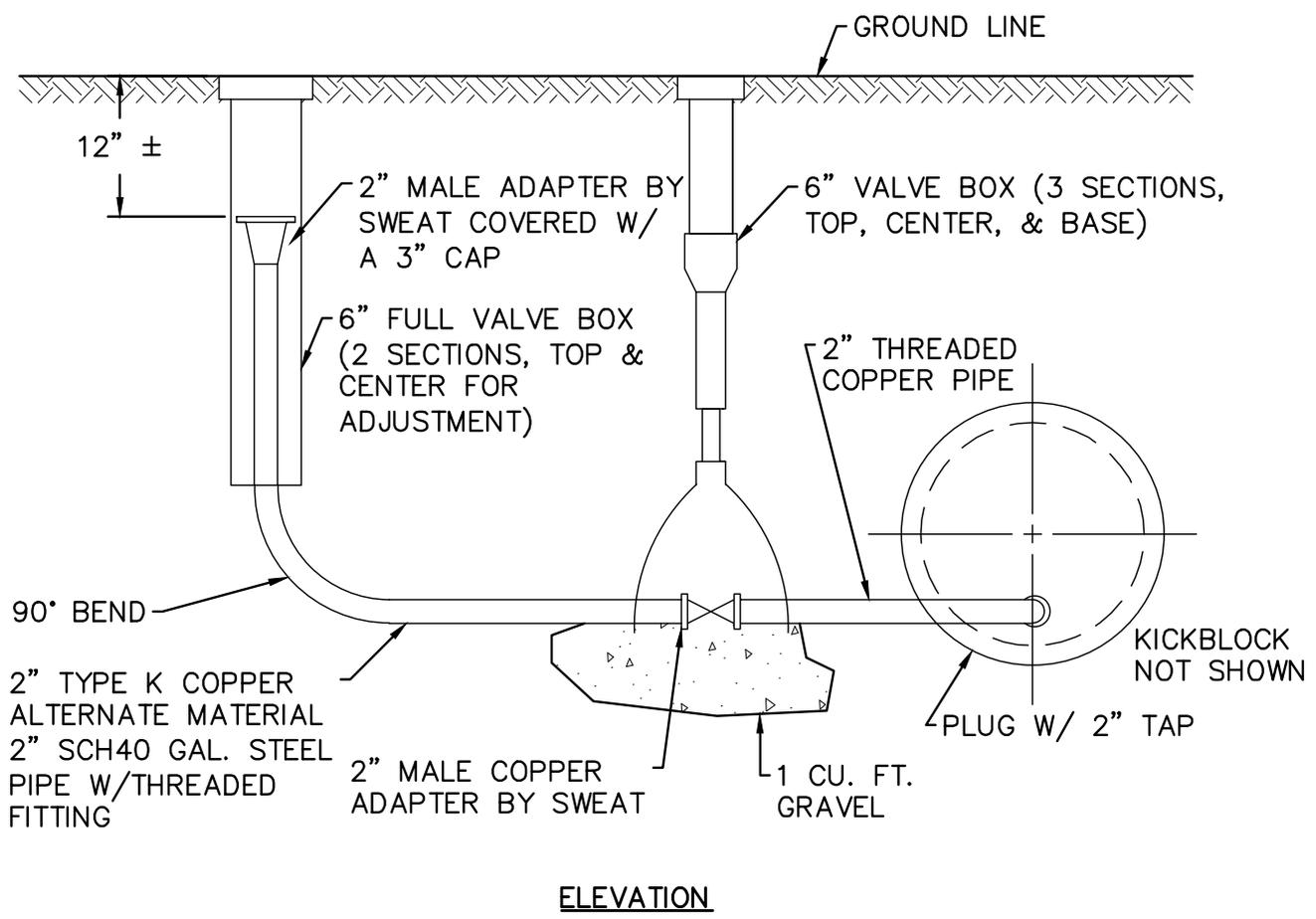
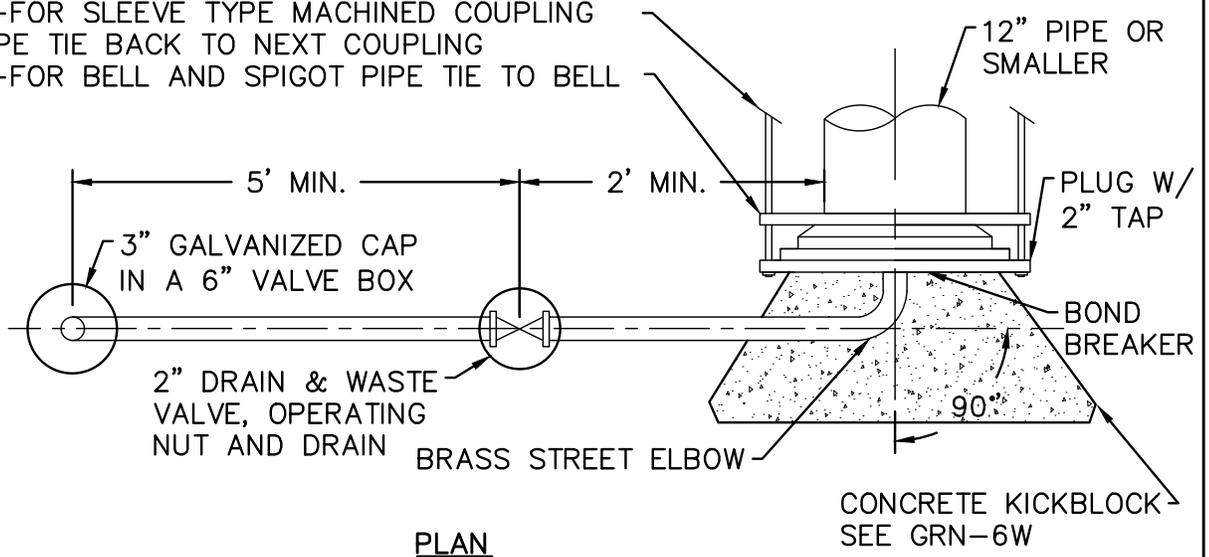
NOTES:

1. TOTAL VOLUME OF HYDRANT PIT SHALL BE A MINIMUM OF 1 C.Y. OF 3/4" CRUSHED ROCK.
2. HYDRANT SHALL BE SET 7'-0" FROM EDGE OF PAVEMENT WHERE NO CURB EXISTS OR 4'-0" FROM BACK OF CURB, WITH A MINIMUM OF 2' SEPARATION FROM PROPERTY LINE
3. WEEP HOLES ON HYDRANT BARREL SHALL NOT BE BLOCKED.

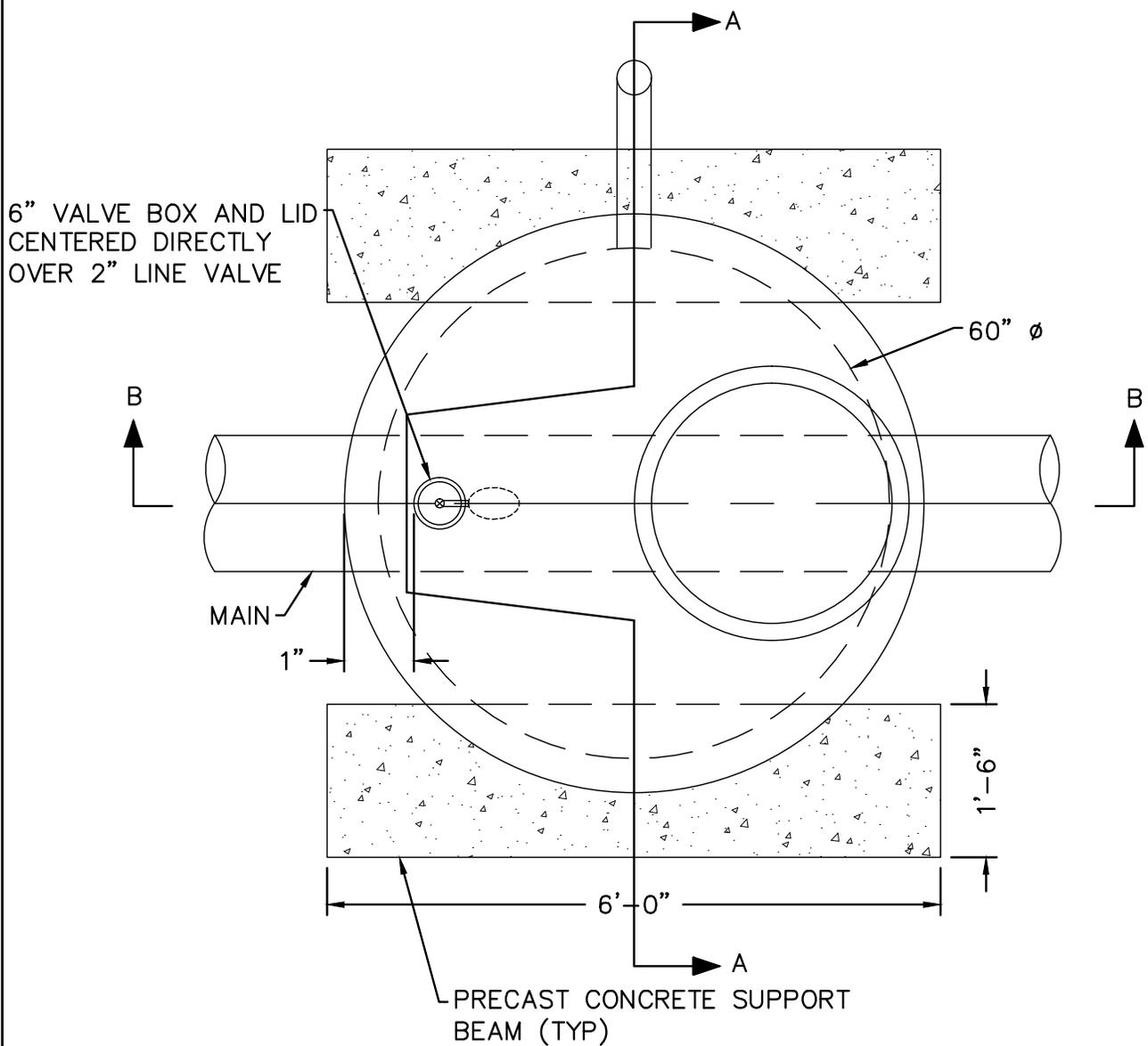
NOT TO SCALE

DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-1W
	TYPICAL FIRE HYDRANT AND ASSEMBLY	

NOTE:  
 PLUG SHALL BE MECHANICALLY RESTRAINED:  
 A—SEE GRN-23W FOR REQ'D LENGTH TO BE RESTRAINED  
 B—FOR SLEEVE TYPE MACHINED COUPLING  
 PIPE TIE BACK TO NEXT COUPLING  
 C—FOR BELL AND SPIGOT PIPE TIE TO BELL



DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	
	BLOWOFF DETAIL	
		GRN-2W



PLAN

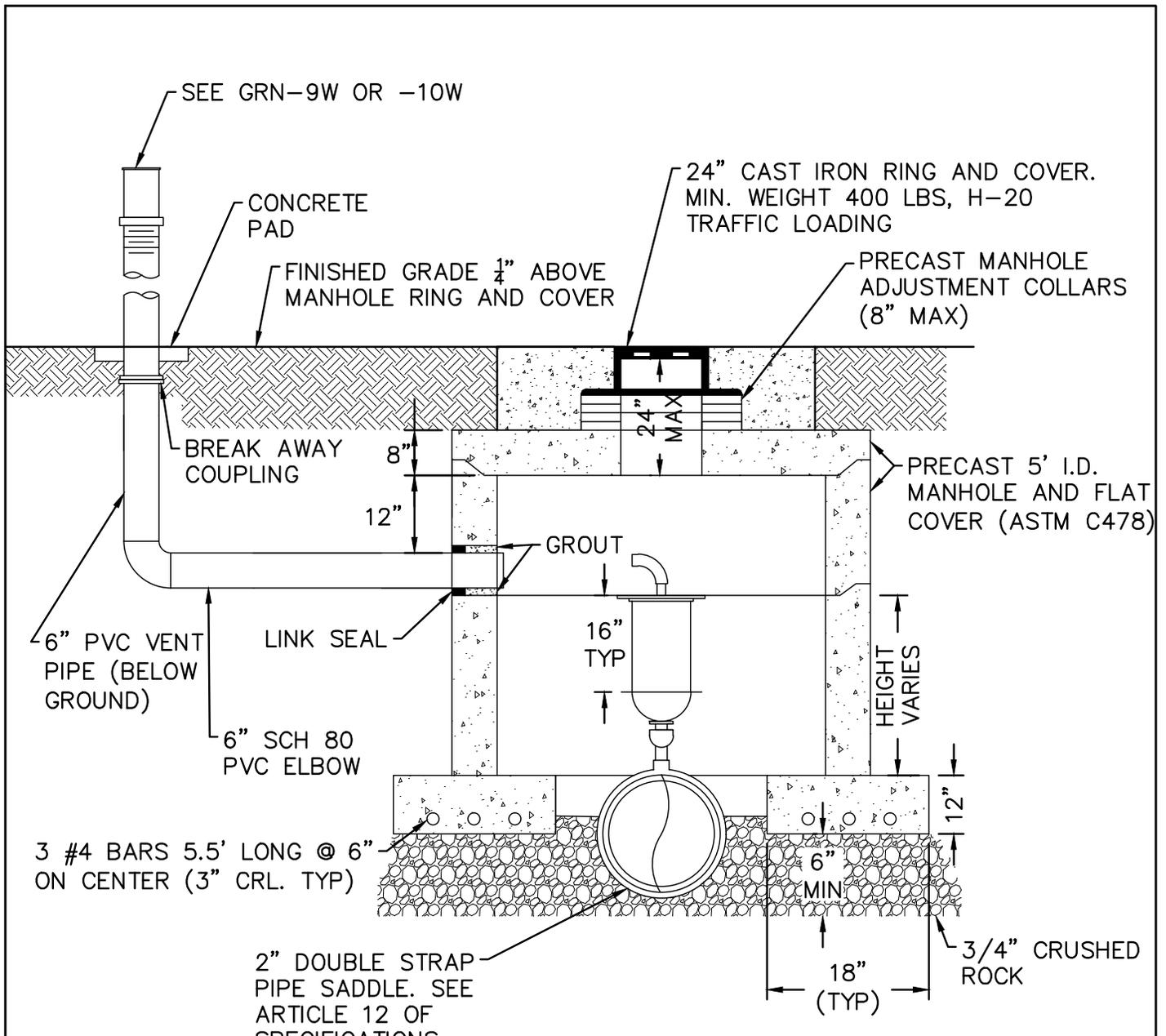
NOTE:  
FOR SECTION A-A, SEE GRN-4W  
FOR SECTION B-B, SEE GRN-5W

DATE  
03/13

GREATROCK NORTH WATER AND SANITATION DISTRICT

COMBINATION AIR  
VALVE AND MANHOLE

GRN-3W



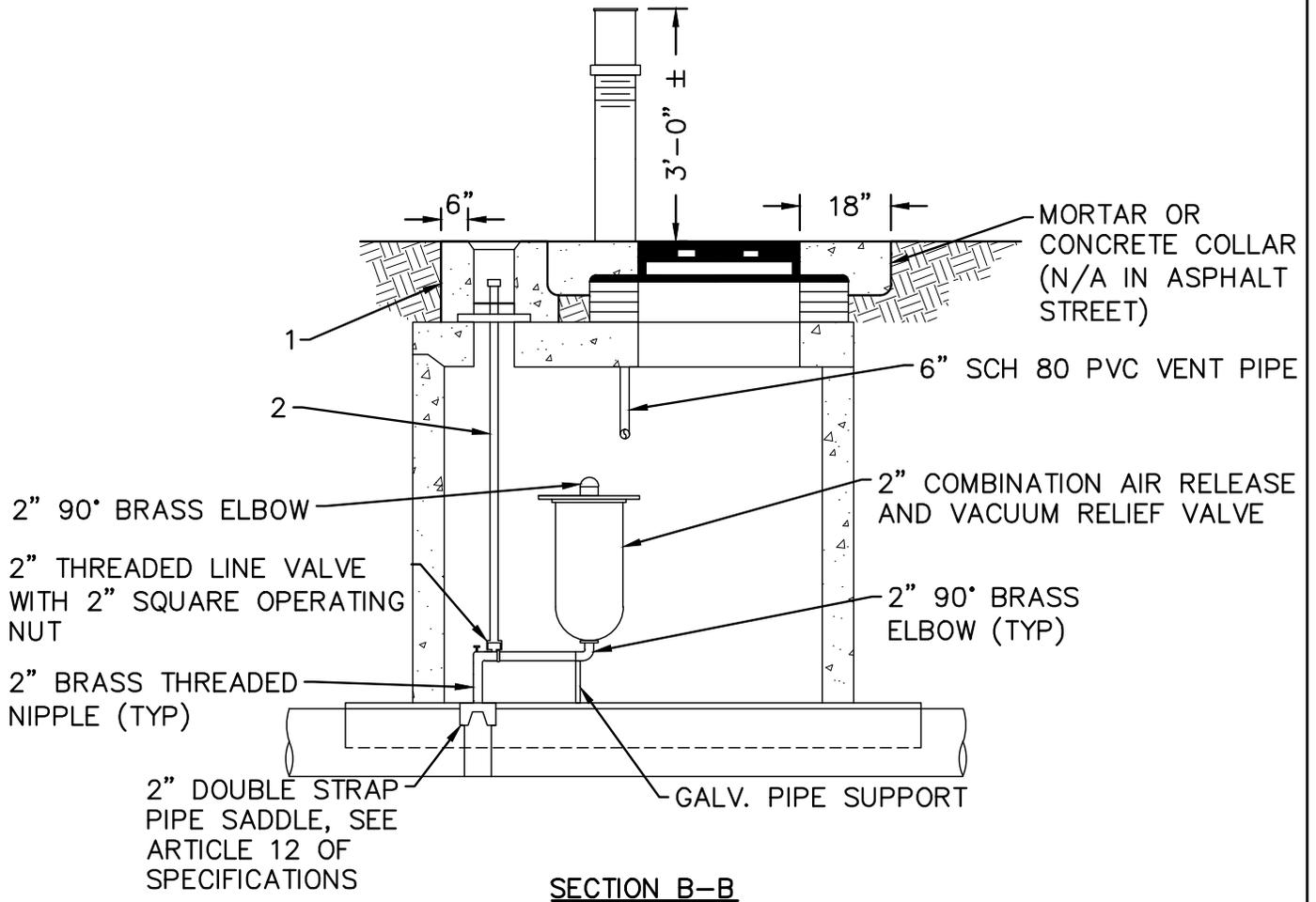
**SECTION A-A**

(VALVE BOX NOT SHOWN)  
NTS

**IRRIGATION NOTE:**

WHERE AIR VALVE IS INSTALLED ON AN IRRIGATION MAIN, MANHOLE COVER AND VALVE BOX LID SHALL BE IN CONFORMANCE WITH THE REQUIREMENTS OF THE IRRIGATION SYSTEM

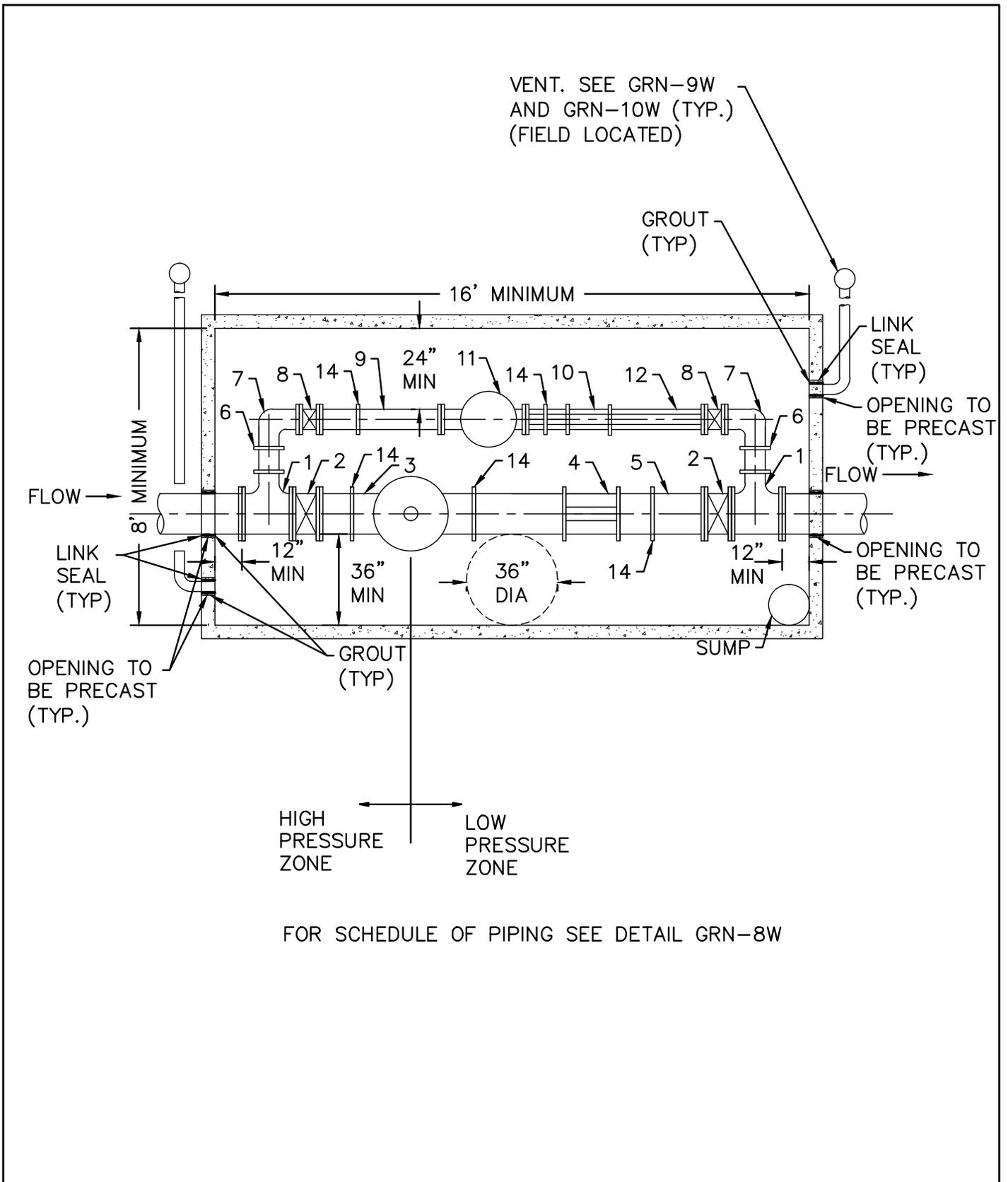
DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-4W
	COMBINATION AIR VALVE AND MANHOLE	



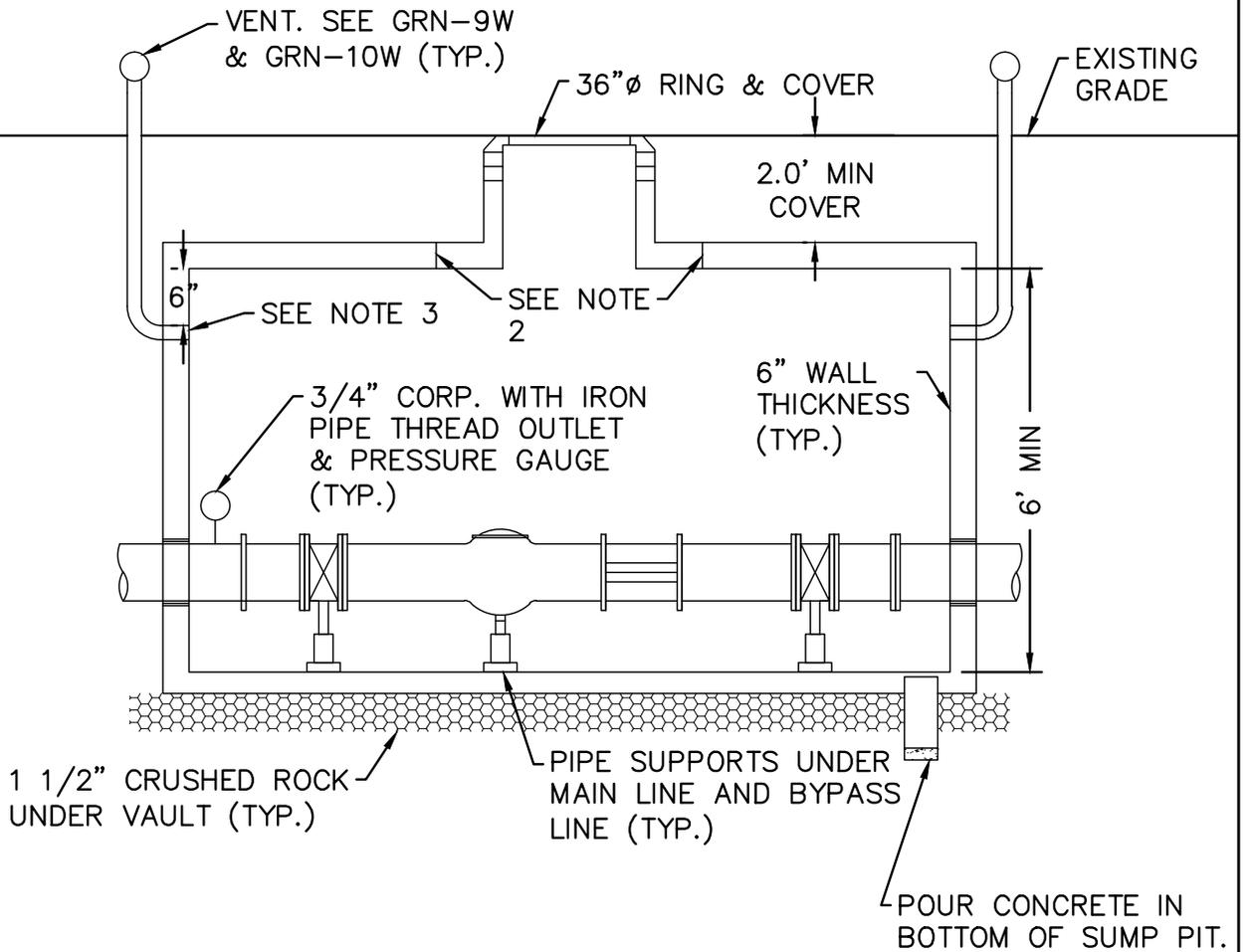
SECTION B-B NOTES

1. 6" THICK CONCRETE ENCASEMENT AROUND VALVE BOX. LEAVE 2" BELOW SURFACE WHEN LOCATED IN ASPHALT
2. VALVE NUT EXTENSION WITH CENTERING RING IN VALVE BOX. LEAVE 2" OPERATING NUT 2"-3" BELOW LID

DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-5W
	COMBINATION AIR VALVE AND MANHOLE	



DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	
	PRESSURE-REDUCING VAULT-PLAN VIEW	GRN-6W



**NOTES:**

1. EXTERIOR CONCRETE SURFACES SHALL BE DAMP-PROOFED IN ACCORDANCE WITH THE SPECIFICATIONS.
2. VAULT LID SHALL HAVE A REMOVABLE SECTION (MIN. 6' WIDE) WITH LIFTING RING.
3. CONNECT GALVANIZED SCREEN TO VENT PIPE WITH HOSE CLAMP AROUND PIPE. (TYP.)

DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-7W
	PRESSURE REDUCING VAULT-PROFILE VIEW	

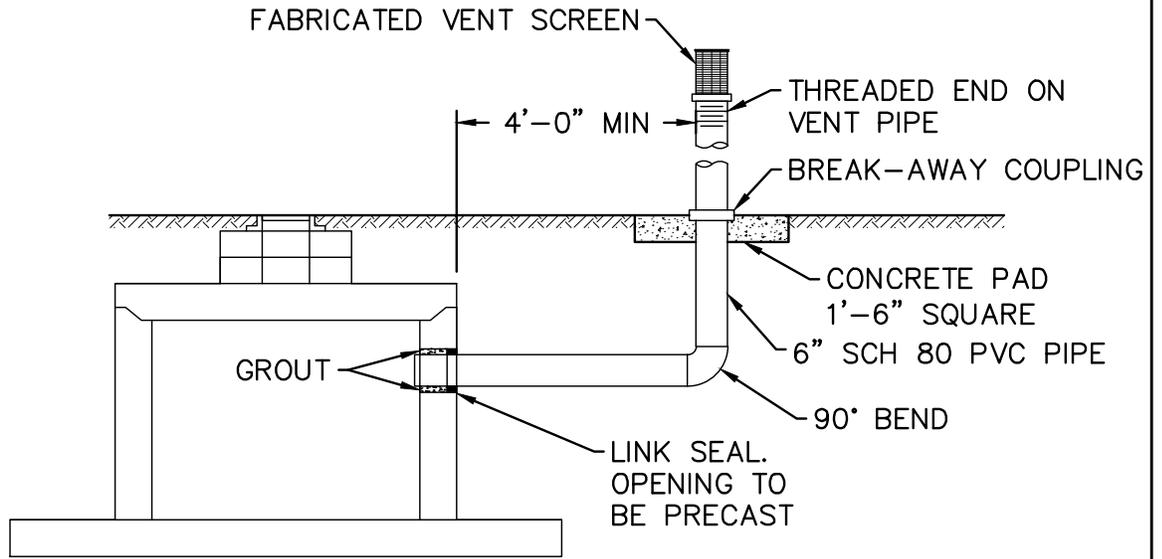
PRV VAULT PIPING SCHEDULE

1. 4" X \*" TEE (FL X FL X FL)
2. \*" GATE VALVE (FL X FL)
3. \*" PRESSURE REDUCING / SUSTAINING VALVE  
SEE 8.6.6 OF SPECIFICATIONS
4. \*" DRESSER COUPLING
5. \*" SPOOL (FL X PE)
6. 4" SPOOL
7. 4" 90° BEND (FL X FL)
8. 4" GATE VALVE (FL X FL)
9. 4" SPOOL (FL X FL)
10. 4" DRESSER COUPLING
11. 4" PRESSURE REDUCING / SUSTAINING VALVE  
SEE 8.6.6 OF SPECIFICATIONS
12. 4" SPOOL (FL X PE)
13. ALL FITTINGS AND PIPING WILL BE PAINTED  
"PRECAUTION BLUE" ENAMEL
14. HDG PIPE SUPPORT

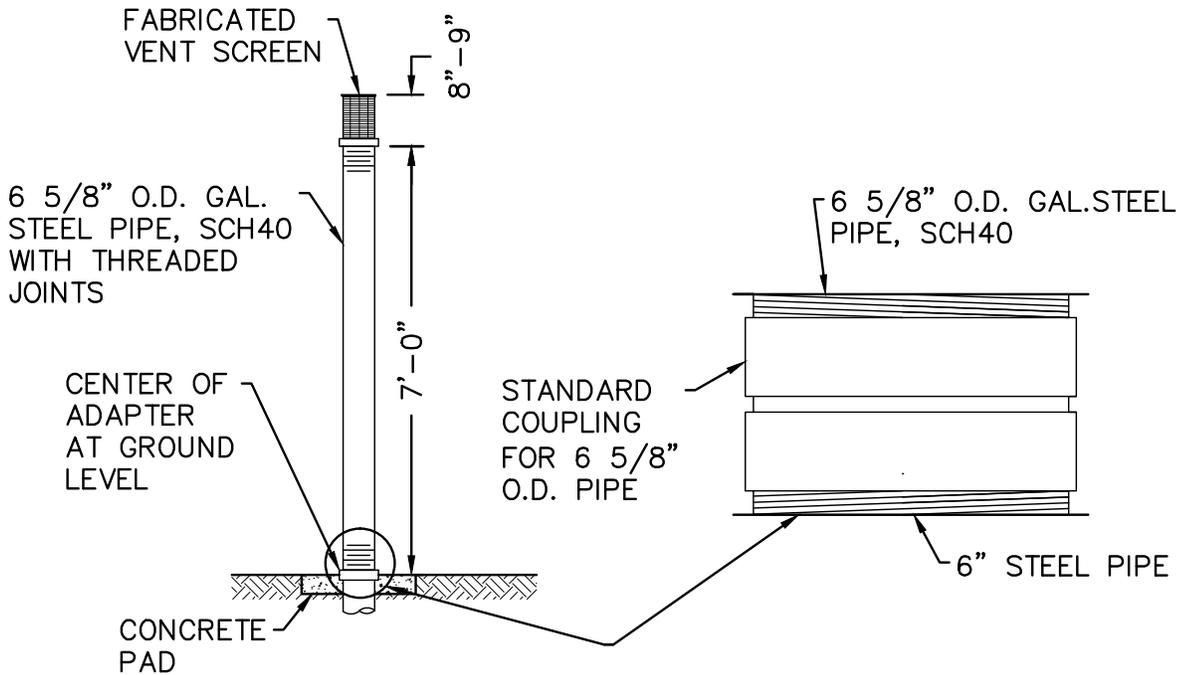
\*" = SIZE TO BE DETERMINED BY MAIN PIPELINE

DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-8W
	PRV VAULT SCHEDULE	

**NOTE:**  
 VENT PIPES TO BE  
 LOCATED AS DIRECTED BY  
 THE DISTRICT.



VENT PIPE INSTALLATION

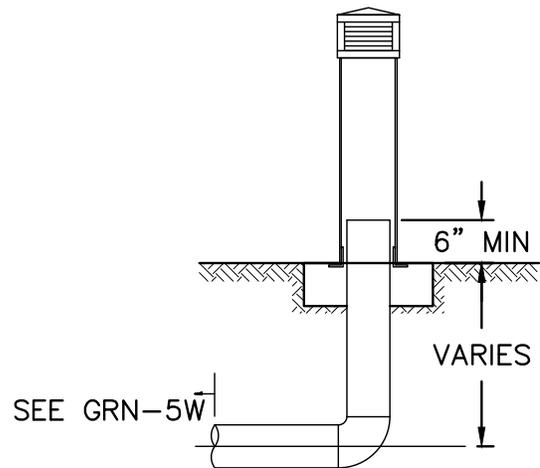
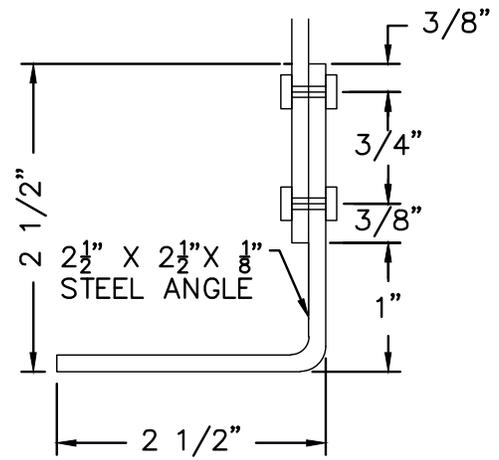
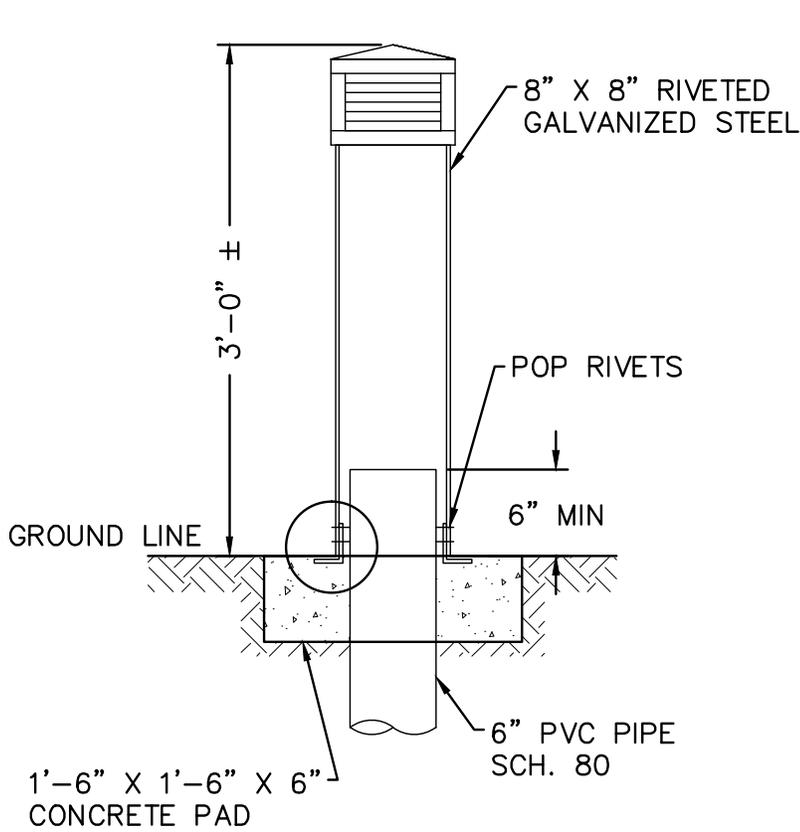


GREATROCK NORTH WATER AND SANITATION DISTRICT

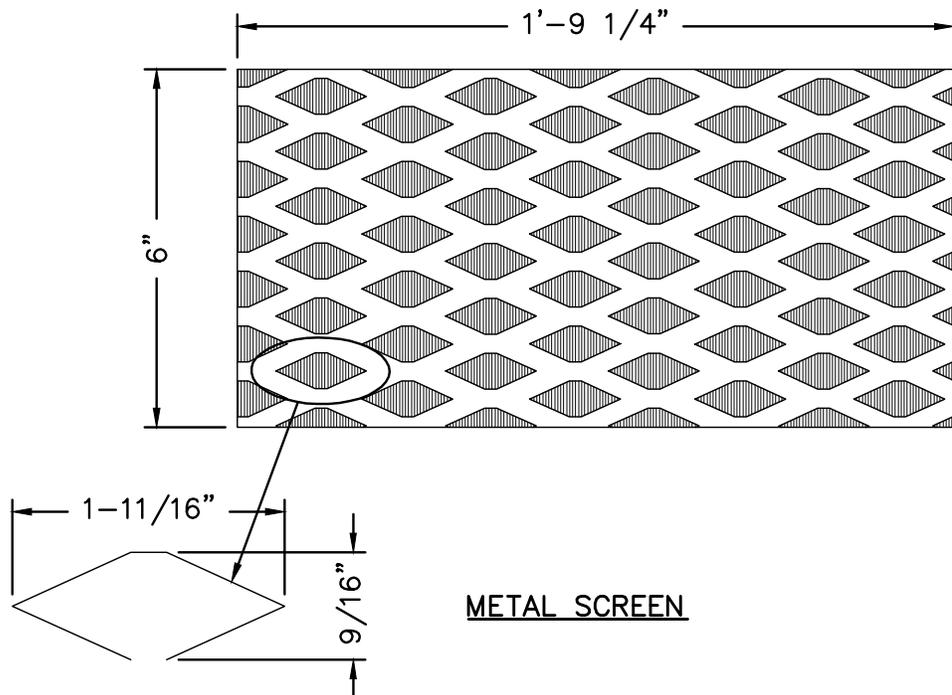
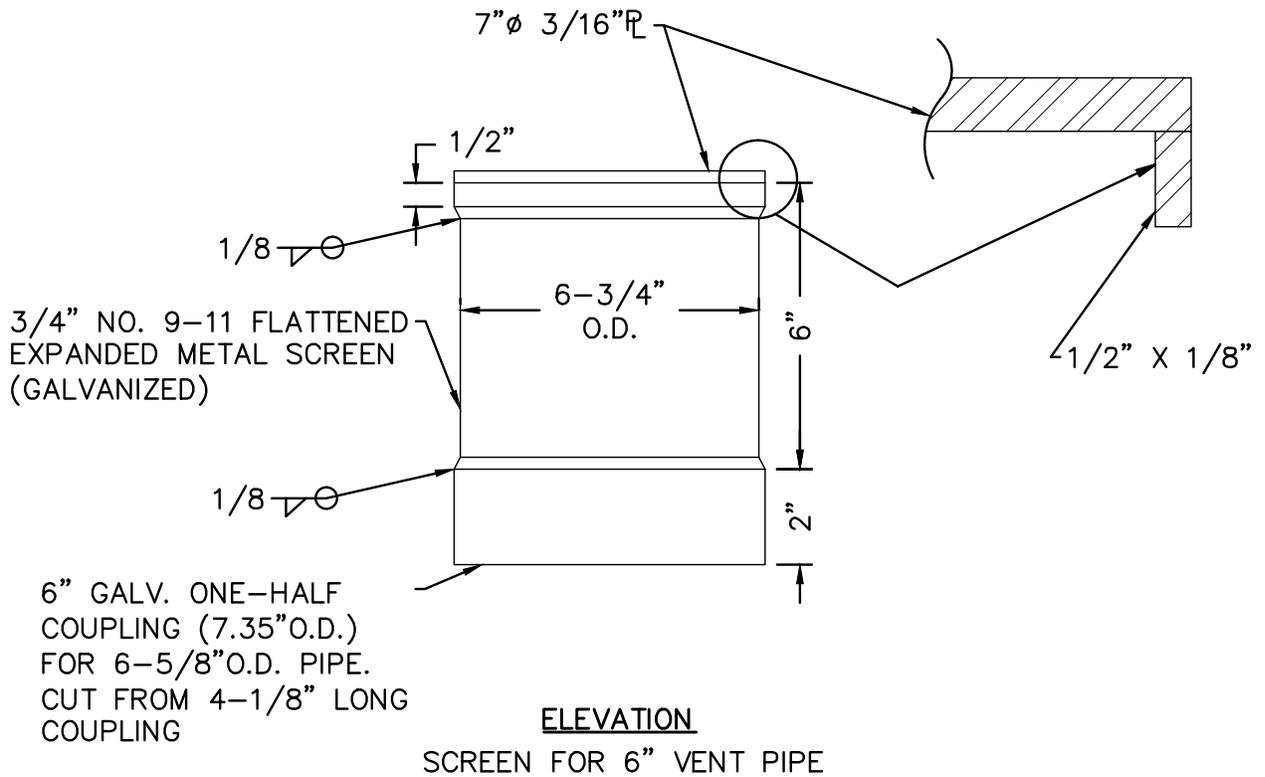
DATE  
03/13

AIR VENT PIPE  
 INSTALLATION AND  
 DETAIL-OPEN FIELD

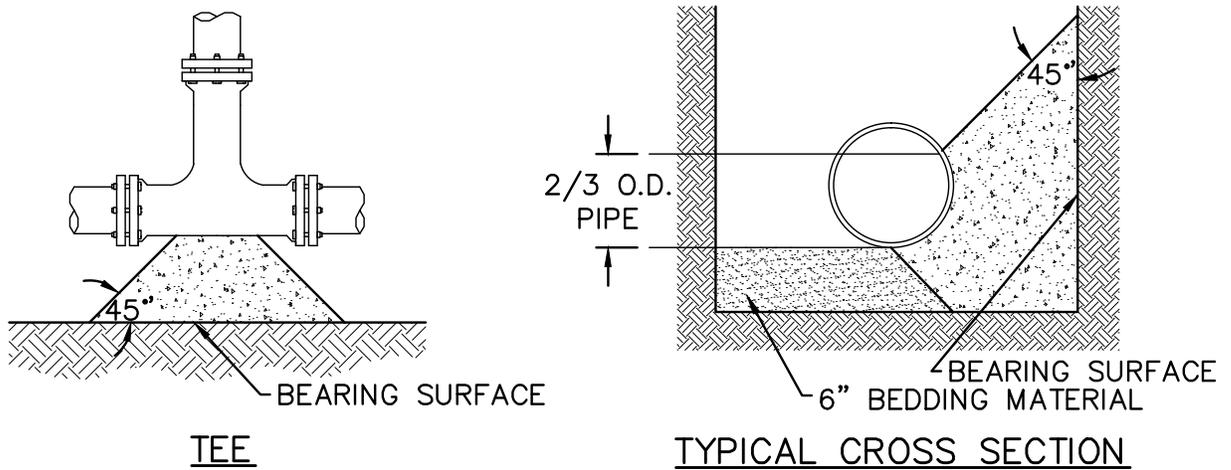
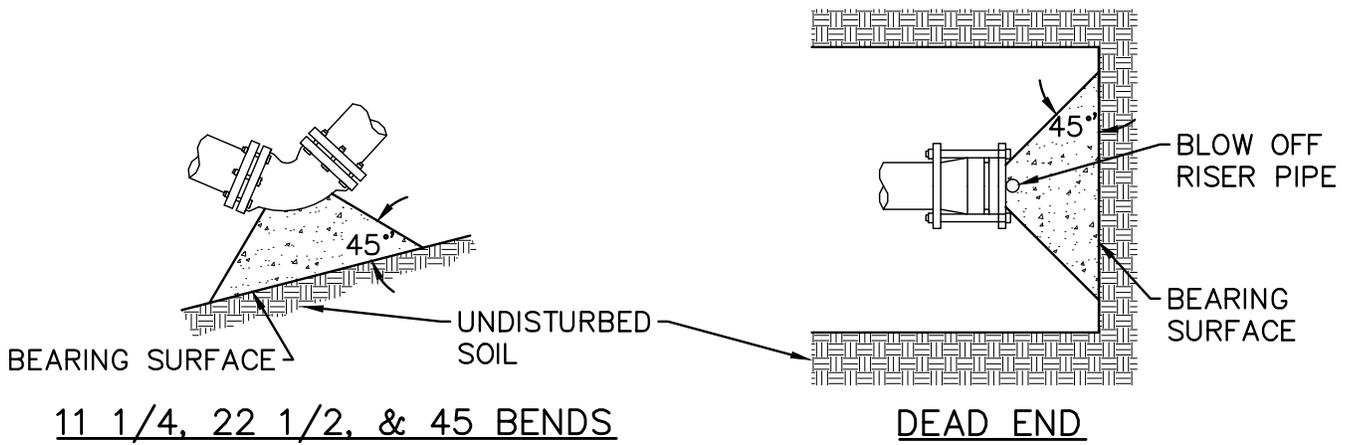
GRN-9W



DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-10W
	AIR VENT DETAIL-RESIDENTIAL	



DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-11W
	6" DIAMETER VENT PIPE SCREEN	



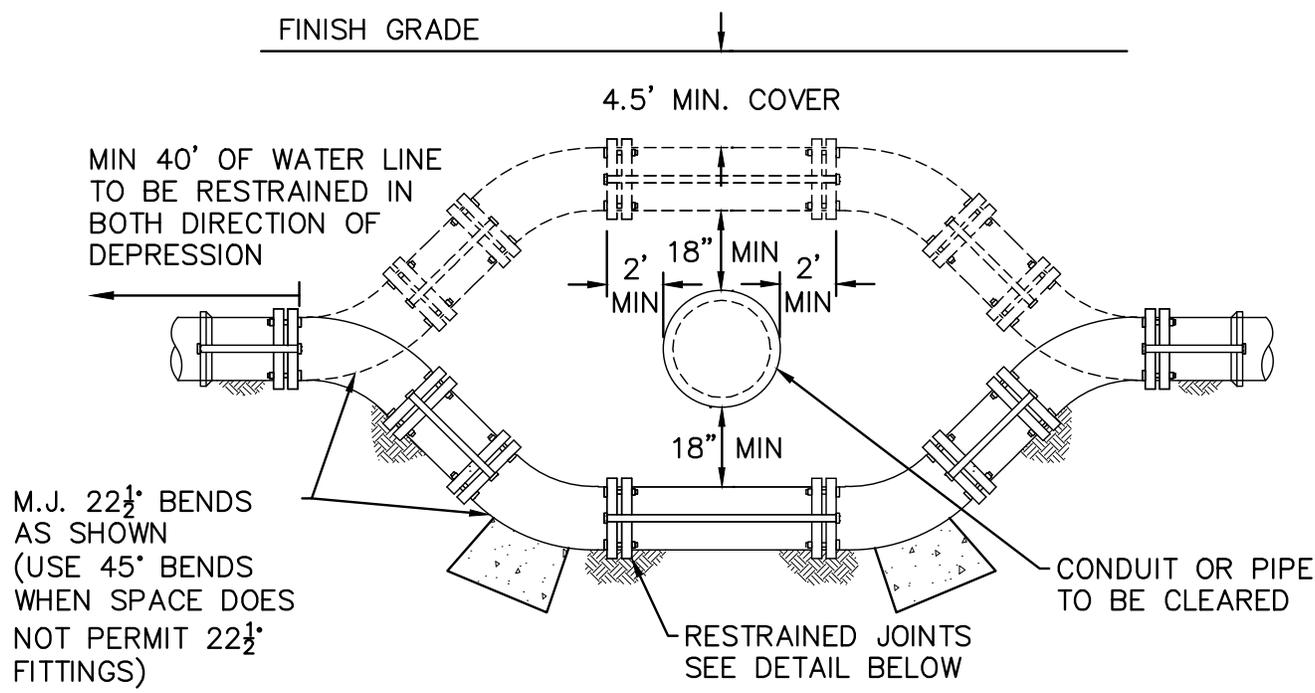
MINIMUM BEARING SURFACE AREA  
(IN SQUARE FEET)

SIZE OF PIPE	BENDS				TEE OR DEAD END
	11 1/4°	22 1/2°	45°	90°	
4"	2.00	2.00	2.00	2.00	2.00
6"	2.00	2.00	2.25	4.25	3.00
8"	2.00	2.00	4.00	8.00	5.25
12"	2.00	4.25	8.25	12.00	11.00
16"	3.50	6.50	12.50	23.00	16.50
20"	5.00	10.00	19.50	35.50	25.00

NOTES:

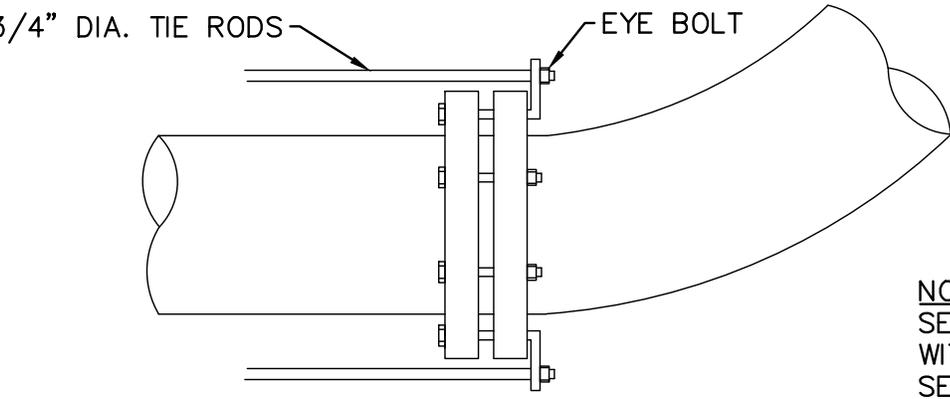
1. PLACE 4 MIL. POLYETHYLENE BETWEEN CONCRETE AND FITTING (CONCRETE SHALL NOT INTERFERE WITH JOINT.).
2. MINIMUM CONCRETE THICKNESS SHALL BE 12 INCHES.
3. THE HORIZONTAL DIMENSION OF THE BEARING AREA SHALL BE BETWEEN 0.8 AND 1.25 TIMES THE VERTICAL DIMENSION.
4. THRUST BLOCK ORIENTATION SHALL BE SUCH THAT THE CENTER OF THE FITTING CORRESPONDS WITH THE CENTER OF THE THRUST BLOCK.
5. THE MINIMUM ALLOWABLE ANGLE (EITHER VERTICAL OR HORIZONTAL) SHALL BE 45 DEGREES.

DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-12W
	THRUST BLOCKS- HORIZONTAL BENDS DETAIL	



**TYPICAL DETAIL FOR WATER LINE DEPRESSION**

4", 6", 8", 10", 12" DIAMETERS

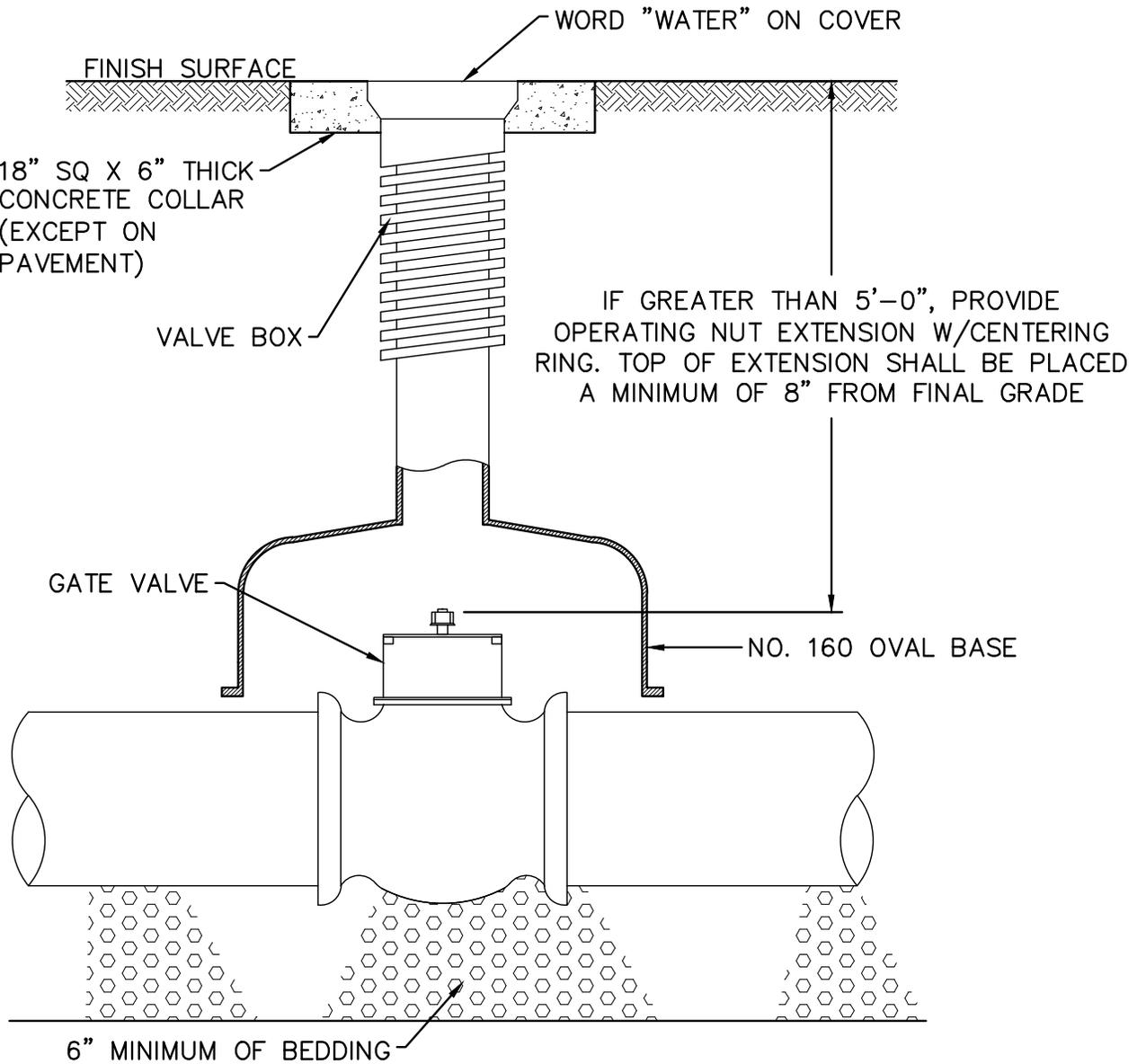


**NOTE:**  
SEE GRN-6SW FOR CROSSING  
WITH STORM OR SANITARY  
SEWER

**TYPICAL RESTRAINED JOINTS**

MAY USE MEG-A-LUGS OR RODDING

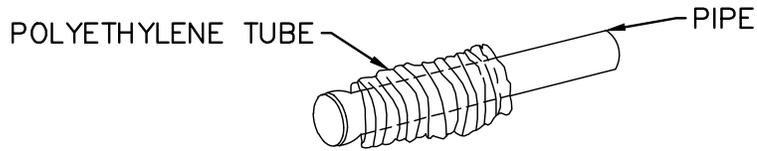
DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-13W
	RESTRAINED JOINTS AT VERTICAL BENDS	



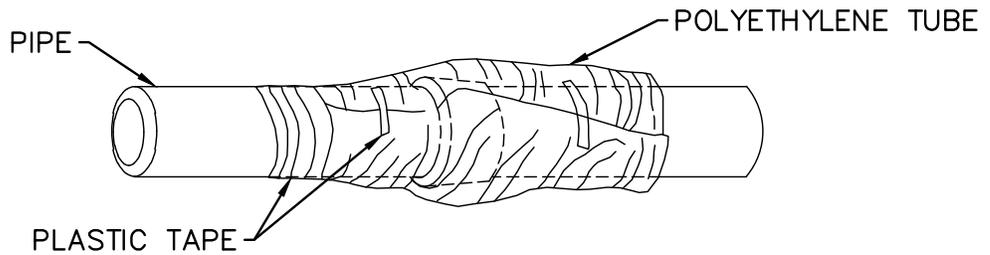
**NOTES:**

1. FITTINGS SHALL BE WRAPPED WITH 8 MIL MINIMUM THICKNESS POLYETHYLENE
2. GATE VALVES SHALL BE PER 8.6.4 OF THE SPECIFICATIONS
3. VALVE BOX SHALL BE PER 8.6.8 OF THE SPECIFICATIONS

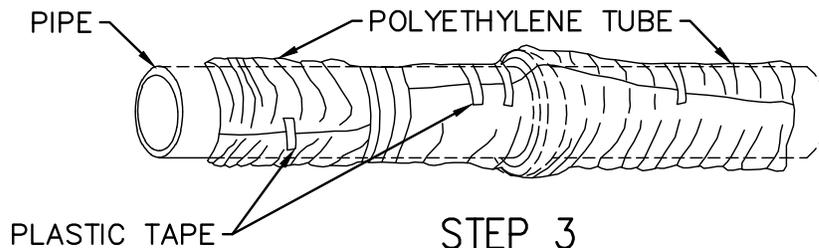
DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-14W
	GATE VALVE DETAIL	



STEP 1



STEP 2

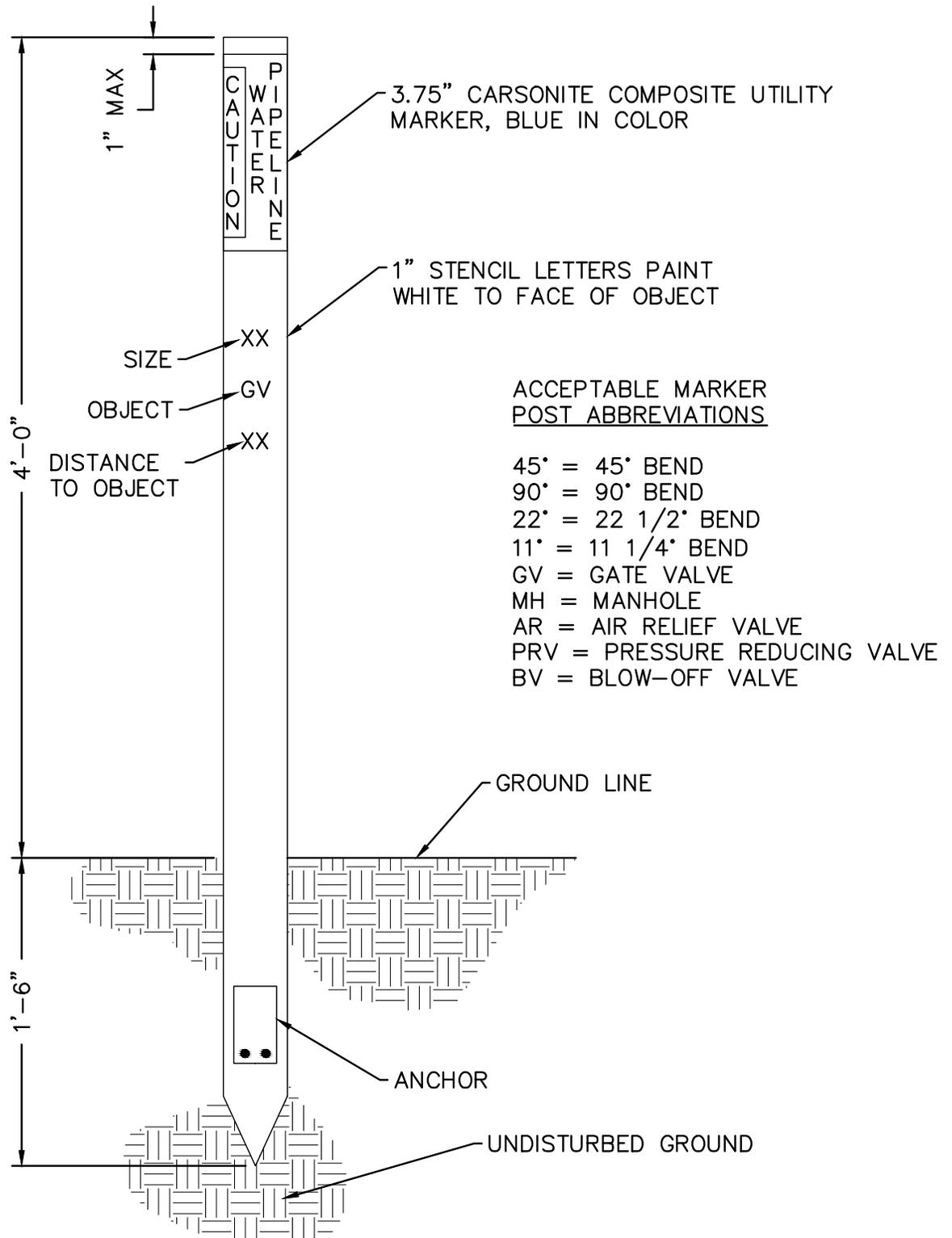


STEP 3

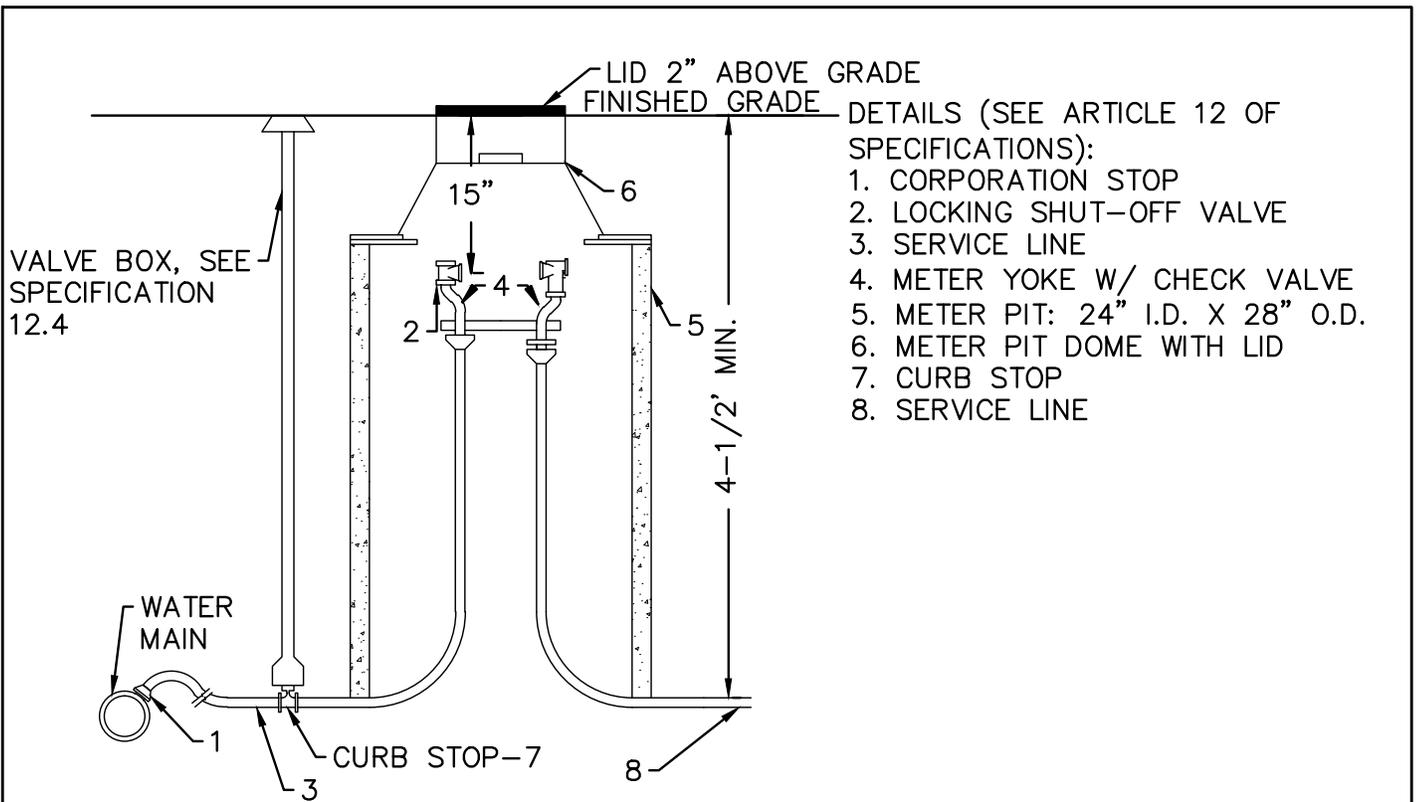
### FIELD INSTALLATION—POLYETHYLENE WRAP

- STEP-1 PLACE TUBE OF POLYETHYLENE MATERIAL AROUND PIPE PRIOR TO LOWERING PIPE INTO TRENCH
- STEP-2 PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH THREE CIRCUMFERENTIAL TURNS OF TWO-INCH WIDE PLASTIC TAPE TO HOLD PLASTIC TUBE AROUND SPIGOT END
- STEP-3 ADJACENT TUBE OVERLAPS FIRST TUBE AND IS SECURED WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE WILL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED INTO AN OVERLAP ON TOP OF THE PIPE AND HELD IN PLACE BY MEANS OF PIECES OF THE PLASTIC TAPE AT APPROXIMATELY THREE TO FIVE FOOT INTERVALS

DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-15W
	POLYETHYLENE WRAP	

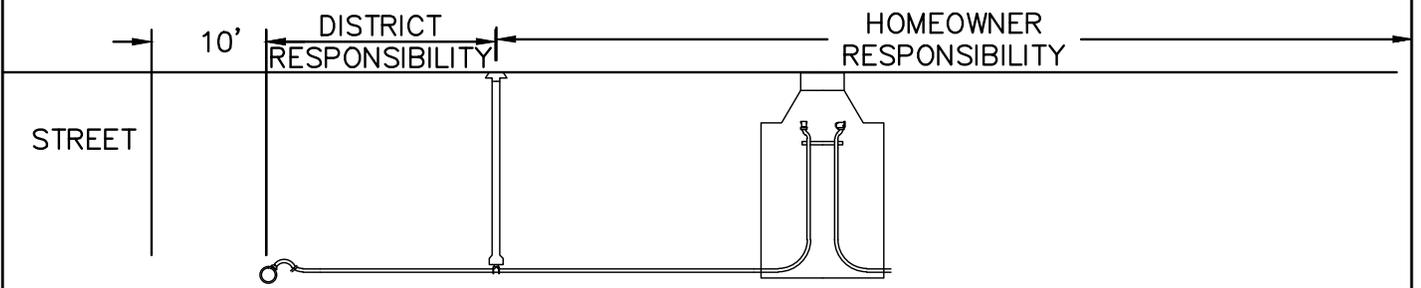


DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-16W
	CARSONITE MARKER POST	

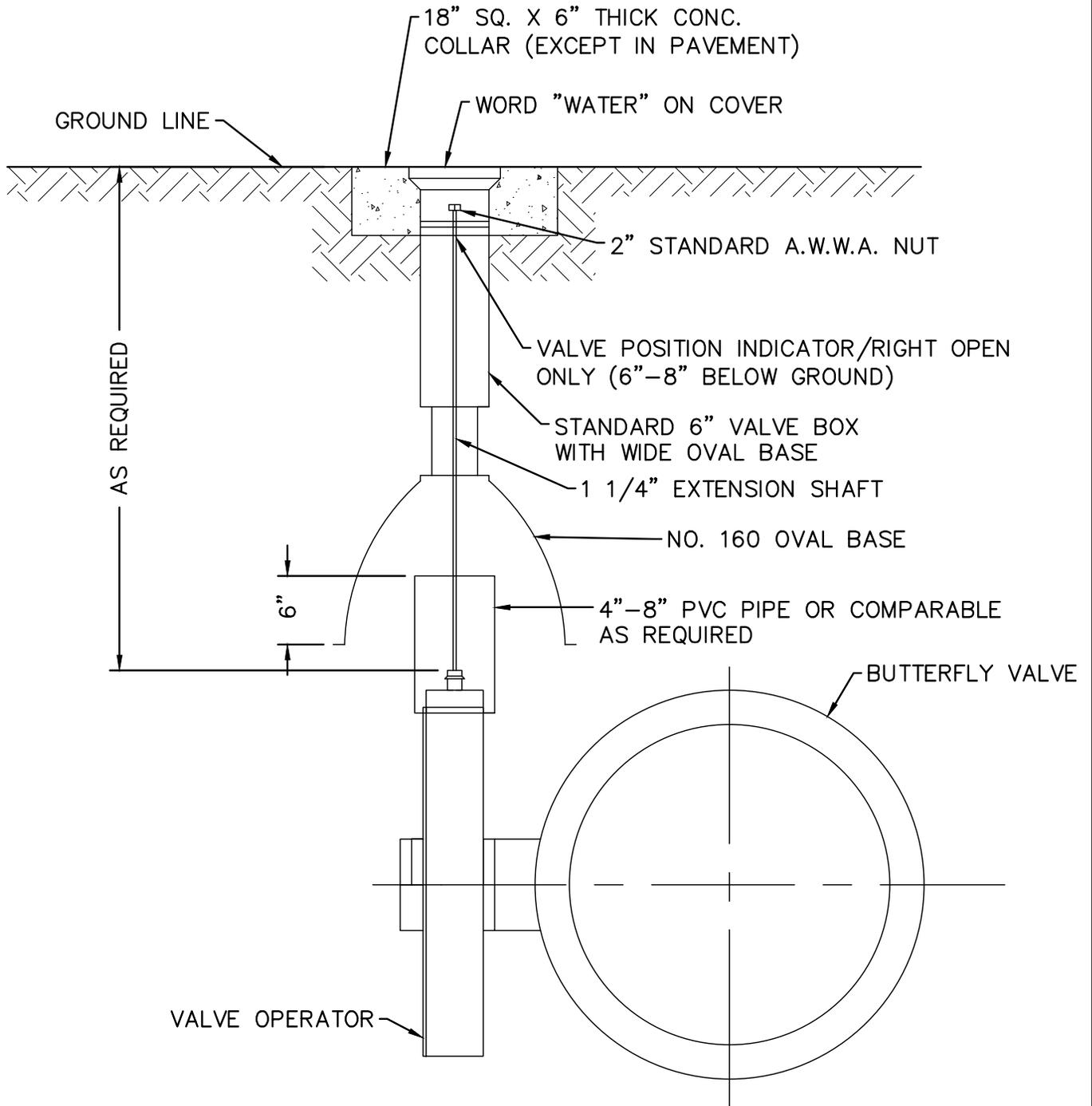


**NOTES:**

1. WATER METER FURNISHED AND INSTALLED BY GREATROCK NORTH WATER & SANITATION DISTRICT.
2. SERVICE LINE MUST HAVE MINIMUM COVER OF 4.5 FEET.
3. WATER DISTRICT PERSONNEL SHALL INSPECT THE SERVICE LINE FROM THE CURB STOP TO THE HOUSE (24 HR. NOTICE REQUIRED FOR INSPECTION).
4. ALL METER PITS SHALL BE STAKED FOR FINISH GRADE IF INSTALLATION PROCEEDS CONSTRUCTION.
5. THE DEPTH OF THE YOKE BELOW THE METER PIT LID IS CRITICAL DIMENSION.
6. NO BENDS PERMITTED IN SERVICE LINE BETWEEN TAP AND 5' BEYOND OUTLET SIDE OF METER. NO CHANGES IN PIPE DIAMETER OR CONNECTIONS OF ANY TYPE ARE PERMITTED IN THE SERVICE LINE UNTIL 5 FEET OR MORE FROM THE OUTLET SIDE OF METER PIT.
7. CHECK VALVE MAY BE INSTALLED INSIDE HOUSE DOWNSTREAM OF SHUTOFF VALVE IN LIEU OF YOKE.

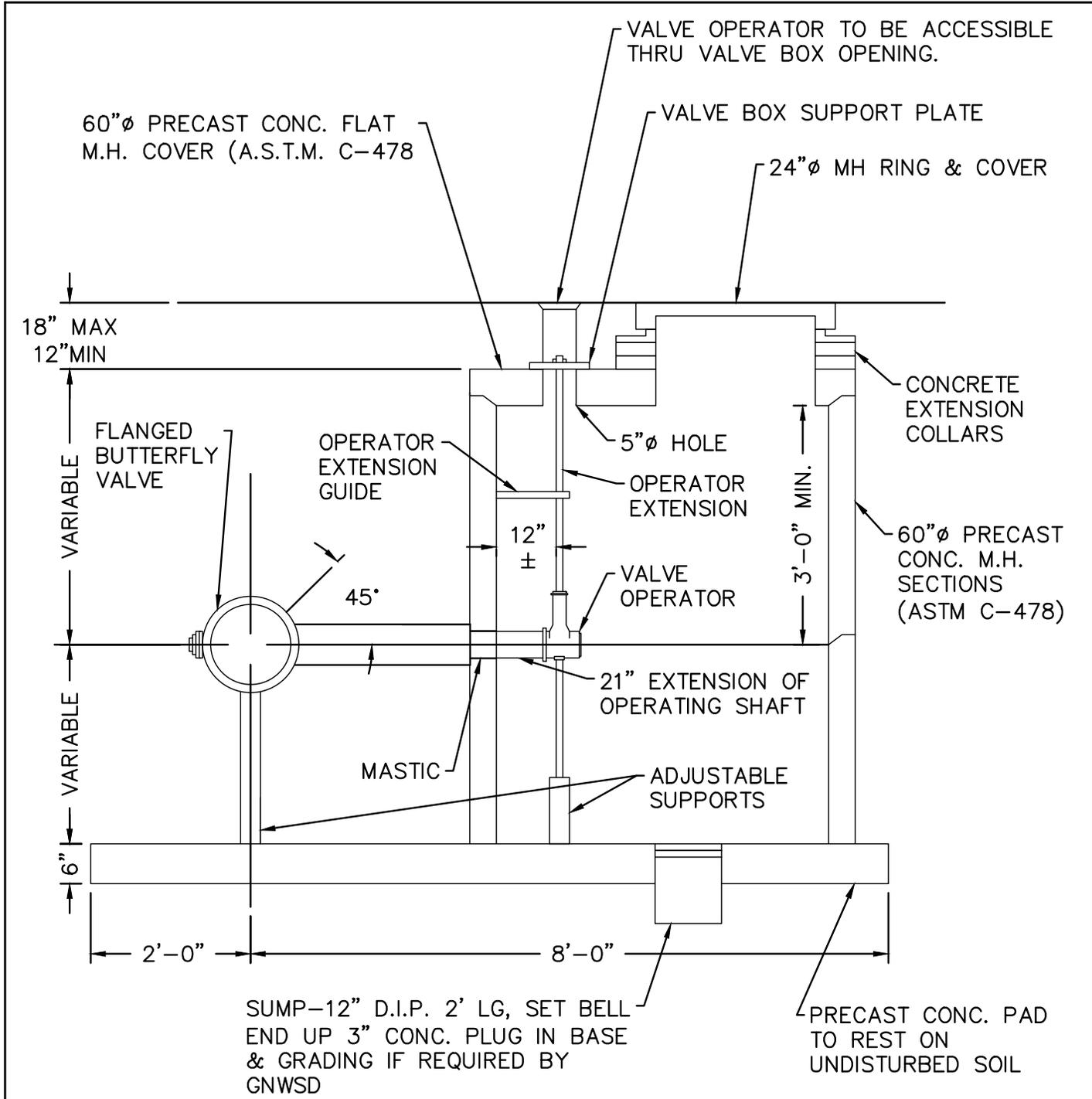


DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-17W
	METER PIT DETAIL	



**NOTE:**  
 THE VALVE BOX SHALL NOT BE PLACED DIRECTLY ON THE SOIL PIPE. THIS TYPE OF INSTALLATION IS USED FOR 20" AND SMALLER VALVES ONLY. BUTTERFLY VALVE AND OPERATOR SHALL BE POLYETHYLENE WRAPPED

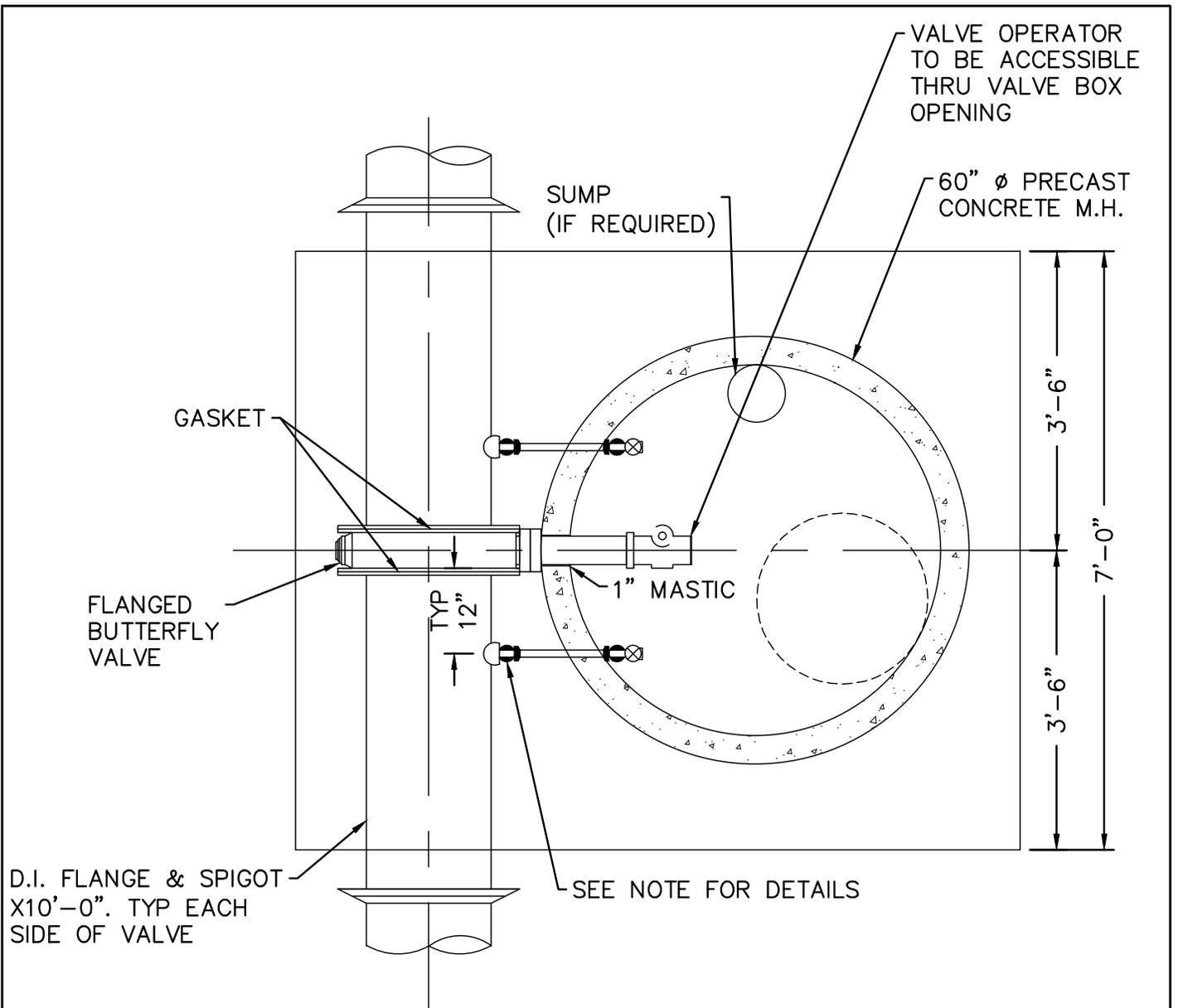
DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-18W
	DIRECT BURY BUTTERFLY VALVE INSTALLATION	



ELEVATION

NOTE:  
1. PIPE AND VALVE SHALL BE POLYETHYLENE WRAPPED

DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-19W
	BUTTERFLY VALVE INSTALLATION: ELEVATION VIEW	



D.I. FLANGE & SPIGOT  
X10'-0". TYP EACH  
SIDE OF VALVE

SUMP  
(IF REQUIRED)

VALVE OPERATOR  
TO BE ACCESSIBLE  
THRU VALVE BOX  
OPENING

60" Ø PRECAST  
CONCRETE M.H.

GASKET

FLANGED  
BUTTERFLY  
VALVE

TYP  
12"

1" MASTIC

3'-6"  
3'-6"  
7'-0"

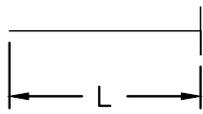
SEE NOTE FOR DETAILS

**NOTE:**

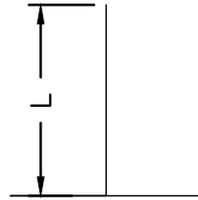
- 1 1/4" MUELLER CORP. STOP-MUELLER H-15000 & FIELD TAP (D.I.P ONLY)
- FOR STEEL PIPE 1 1/4" THREADED OUTLET, 1 1/4" THREADED
- CORP. STOP-MUELLER H-15025
- 1 1/4" COPPER TUBING TYPE "K"
- 1 1/4" COUPLING-MUELLER H-15425
- 1 1/4" THREADED GATE VALVE
- 1 1/4" AIR & VACUUM VALVE
- (ONE EACH SIDE OF VALVE)

**PLAN**

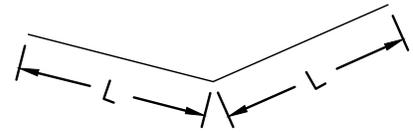
DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-20W
	BUTTERFLY VALVE INSTALLATION: PLAN VIEW	



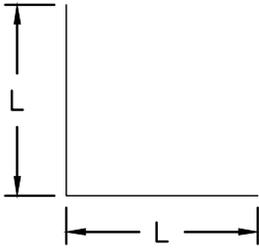
DEAD END



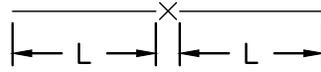
TEE



BENDS



90° BEND



VALVE

ROD DIAMETER, GRADE, & LENGTH OF RESTRAINED PIPE

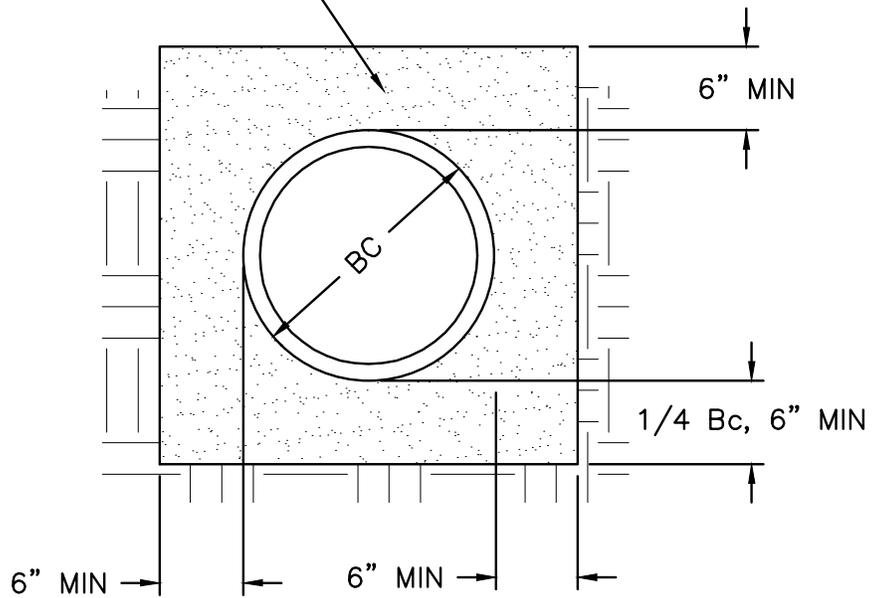
NOMINAL PIPE ∅	4"	6"	8"	12"	16"	20"	24"
FITTING	L	L	L	L	L	L	L
90° BEND, TEE, DEAD END	30'	45'	60'	86'	108'	132'	155'
VALVE	30'	45'	60'	86'	108'	132'	155'
45° BEND	9'	13'	18'	25'	32'	39'	45'
22 1/2° BEND	2'	4'	5'	7'	8'	10'	12'
11 1/4° BEND	2'	2'	2'	2'	2'	3'	3'

NOTES:

1. LENGTH OF RESTRAINED PIPE MEASURED EACH WAY FROM VALVES AND BENDS.
2. MINIMUM 4.5' GROUND COVER REQUIRED.
3. BASED ON 150 POUNDS PER SQUARE INCH WORKING PRESSURE.
4. CROSSES MUST BE RESTRAINED IN ALL DIRECTIONS
5. WHEN REDUCERS ARE USED ON A VALVE INSTALLATION THE LENGTH OF THE RESTRAINT SHALL BE BASED ON THE SIZE OF THE PIPE, NOT THE SIZE OF THE VALVE
6. WHEN INSTALLING VALVES ON EXISTING MAINS 12" AND SMALLER, USE MECHANICAL JOINT RESTRAINTS IN ACCORDANCE WITH MS-29 ON INSTALLED VALVES AND ASSOCIATED FITTINGS. REMOVE ALL PUSH-ON JOINTS WITHIN THE EXCAVATION. LENGTH OF RESTRAINED PIPE GIVEN ABOVE DOES NOT APPLY.

DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-21W
	LENGTH OF RESTRAINED PIPE	

BEDDING MATERIAL

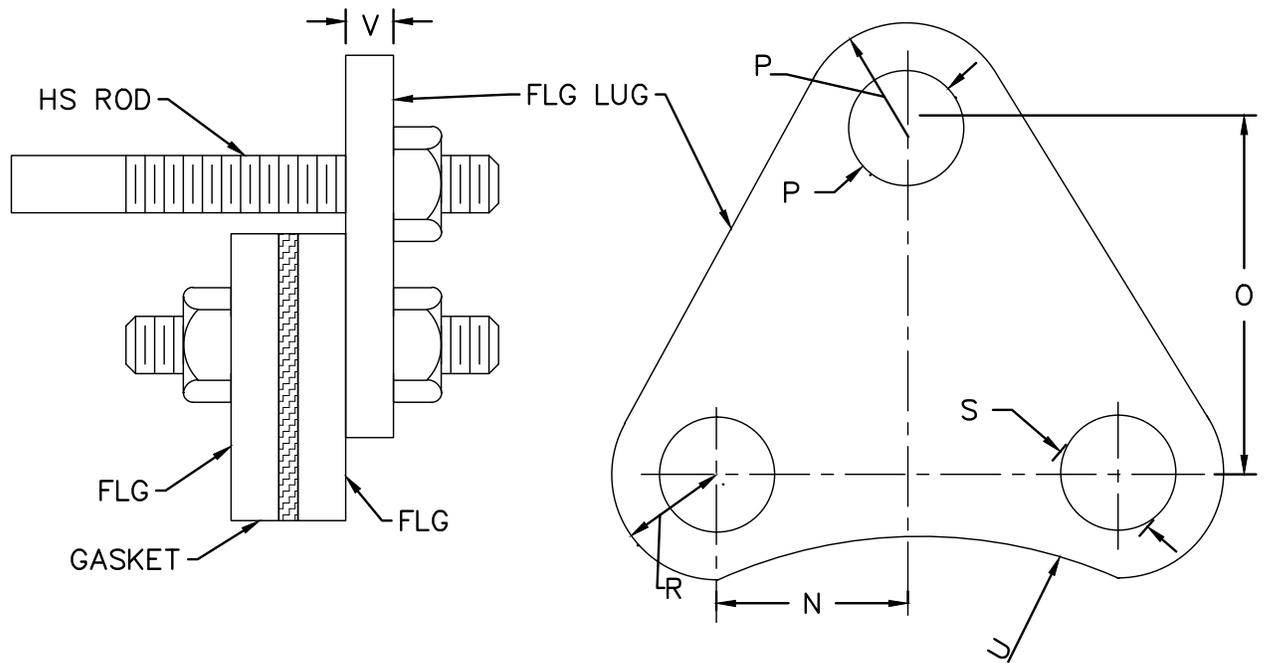


DATE  
03/13

GREATROCK NORTH WATER AND SANITATION DISTRICT

PIPE BEDDING  
DETAILS

GRN-22W

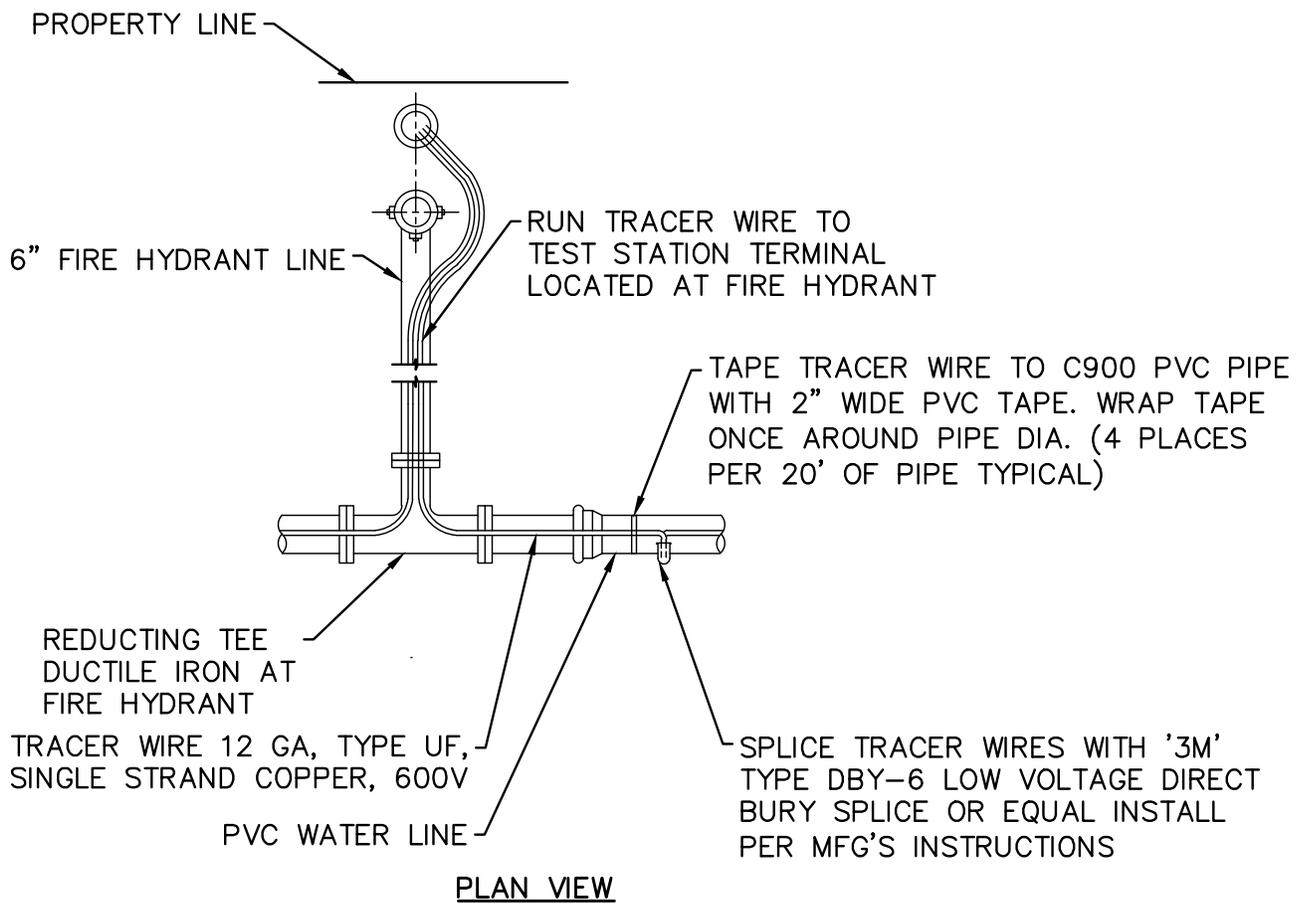
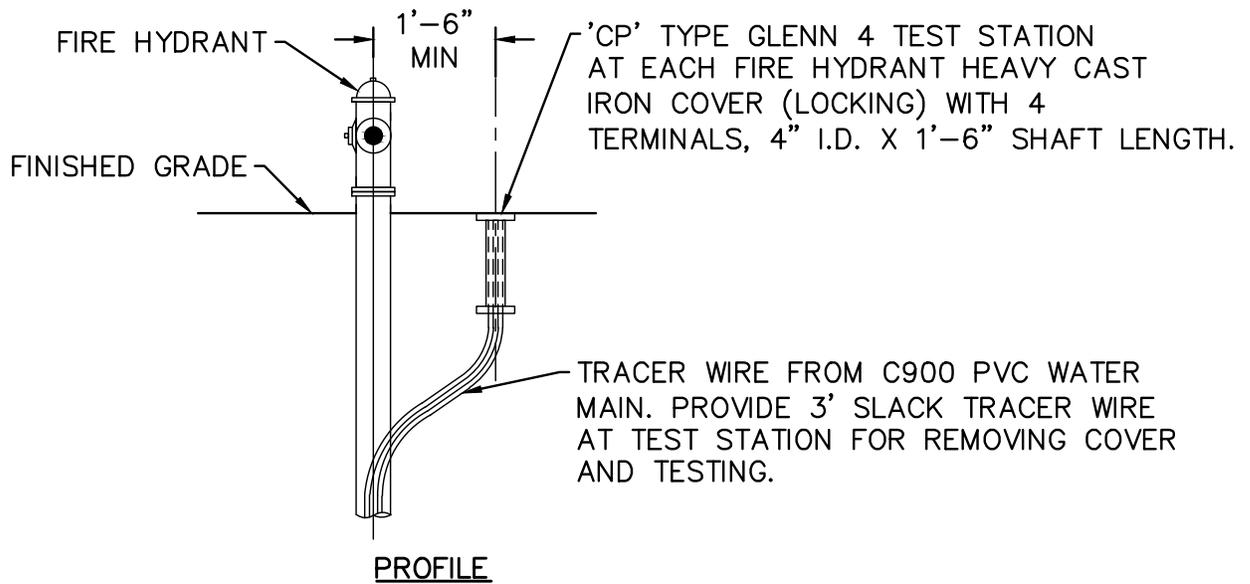


**DIMENSIONS**  
(IN INCHES)

NOMINAL PIPE $\phi$	N	O	HS RODS		R	S	U	V	NOMINAL PIPE $\phi$
			P	ROD $\phi$					
3	2 1/8	2 9/16	5/8	1/2	3/4	5/8	2 3/8	3/4	3
4	1 7/16	2	5/8	1/2	3/4	5/8	3 1/8	3/4	4
6	1 13/16	2 1/16	5/8	1/2	7/8	3/4	4	3/4	6
8	2 1/4	2 1/4	5/8	1/2	7/8	3/4	5 1/8	3/4	8
10	1 7/8	2 1/16	3/4	5/8	1	7/8	6 1/4	3/4	10
12	2 1/4	2 5/16	7/8	3/4	1	7/8	5 7/8	1	12
16	2 1/8	2 7/16	1 1/8	1	1 1/8	1	9 5/8	1 1/8	16
20	2	2 5/8	1 1/4	1 1/8	1 1/4	1 1/8	11 3/8	1 1/4	20

**NOTE:**  
STEEL FOR FLANGE LUG SHALL BE ASTM A 36

DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-23W
	FLANGE LUG DETAIL	



PVC WATER MAIN TRACER WIRE INSTALLATION DETAIL

DATE 03/13	GREATROCK NORTH WATER AND SANITATION DISTRICT	GRN-24W
	TRACER WIRE DETAIL	