

## GENERAL

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2018

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## LOW PRESSURE COLLECTION

\*WASTE WATER COLLECTION BY LOW PRESSURE NOT TO BE USED, EXCEPT AT THE SOLE DISCRETION OF LOUDOUN WATER.\*

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## PRETREATMENT

PT-1	GREASE INTERCEPTOR	AUG. 2018
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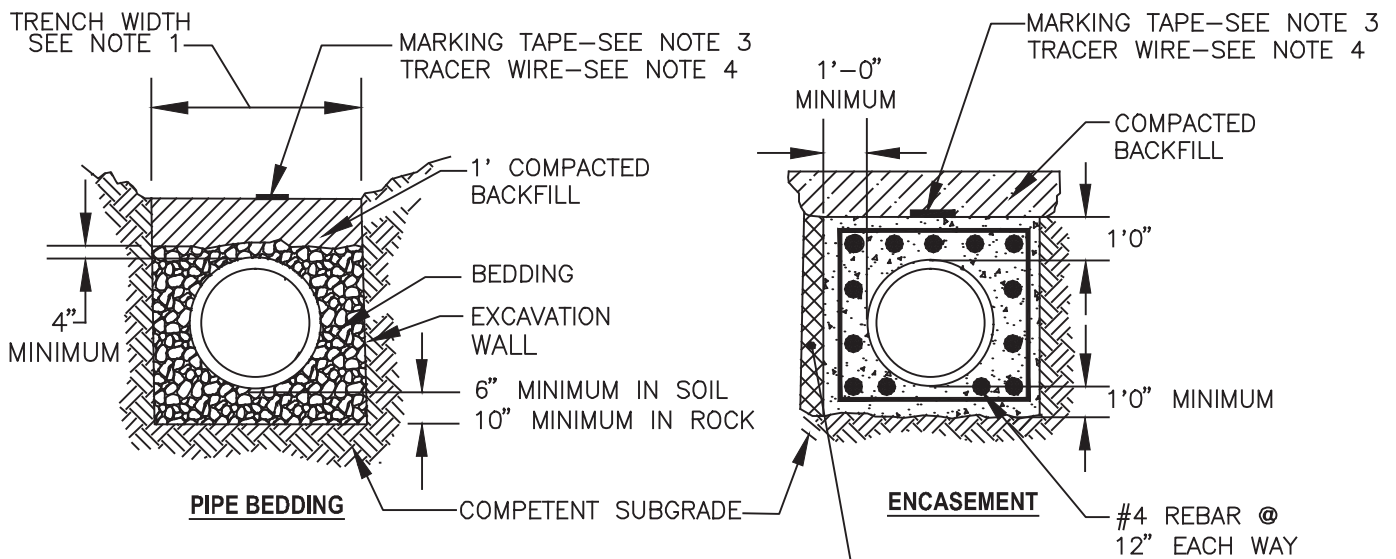
# LOUDOUN WATER

1. ALL WATER MAINS AND SANITARY SEWERS MUST BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT LOUDOUN WATER ENGINEERING DESIGN MANUAL AND PROJECT SPECIFICATIONS. OWNER MUST ENSURE THAT BUILDING PLANS ACCOMMODATE WATER AND SEWER ENTRANCE POINTS, METERING CONSIDERATIONS, PRETREATMENT DEVICES, AND BACKFLOW PREVENTION DEVICES, TO ACCOMPLISH FULL COMPLIANCE WITH LOUDOUN WATER'S REQUIREMENTS.
2. NO BLASTING IS PERMITTED WITHIN 25' OF LOUDOUN WATER'S EXISTING UTILITIES.
3. A 6" MARKING TAPE MUST BE PLACED ABOVE ALL PIPE LINES.
4. UTILITIES OUTSIDE THE PUBLIC RIGHT-OF-WAY AND PAVEMENT SHALL BE PROVIDED WITH ABOVE GROUND MARKING STAKES. MARKERS ARE TO BE SPACED AT INTERVALS OF 300-500 FEET, AND AT MANHOLES, VALVES, AND CHANGES IN DIRECTION, TO ACCOMPLISH A CONTINUOUS LINE OF SIGHT BETWEEN MARKERS.
5. ALL PRESSURIZED PIPELINES SHALL BE RESTRAINED WITH CONCRETE REACTION BLOCKING AT ENDS AND CHANGES IN DIRECTION, EXCEPT WHERE OTHERWISE DIRECTED BY LOUDOUN WATER.
6. LANDSCAPING IS NOT PERMITTED WITHIN LOUDOUN WATER'S EASEMENTS, OR WITHIN 5' OF FIRE HYDRANTS AND METER BOXES.
7. SANITARY SEWER AND WATER MAINS MUST HAVE A MINIMUM 15' HORIZONTAL SEPARATION FROM PROPOSED OR EXISTING BUILDINGS, UNLESS PRIOR PERMISSION IS GRANTED BY LOUDOUN WATER.
8. UNLESS OTHERWISE SPECIFIED, ALL WATER MAINS MUST BE DUCTILE IRON PIPE, CLASS 52 MINIMUM.
9. ALL MECHANICAL JOINT ASSEMBLIES TO BE COATED PER STANDARD DETAIL CP-3.
10. WATER SERVICES MUST HAVE A MINIMUM 6' HORIZONTAL SEPARATION FROM SANITARY LATERALS.
11. ALL HYDRANTS AND METER BOXES MUST HAVE A MINIMUM 5' HORIZONTAL SEPARATION FROM EDGE OF DRIVEWAY APRONS.
12. UNLESS OTHERWISE SPECIFIED, ALL SANITARY SEWERS MUST BE PVC DR25 CONFORMING TO AWWA C900/C905.
13. ALL SANITARY SEWER LATERALS MUST BE 4" PVC DR25 AT 2.08% SLOPE UNLESS OTHERWISE SPECIFIED, AND MUST ENTER THE MAIN AT 90 DEGREES.
14. PROVIDE POSITIVE DRAINAGE AWAY FROM SANITARY MANHOLES THROUGHOUT CONSTRUCTION.
15. TOPS OF MANHOLES LOCATED OUTSIDE OF PAVEMENT MUST BE 1' ABOVE FINISHED GRADE. THIS REQUIREMENT SHALL NOT APPLY IN DEVELOPED LAWNS.
16. EXISTING SANITARY MANHOLES SHALL BE CORE BORED IN ORDER TO RECEIVE PROPOSED PIPE.
17. USE OF FIRE HYDRANT METERS IS RESTRICTED TO DESIGNATED HYDRANTS, AND TO METERS ISSUED BY LOUDOUN WATER. DESIGNATED HYDRANTS SHALL BE PAINTED FEDERAL SAFETY YELLOW. LOCATION OF THESE HYDRANTS WILL BE DETERMINED AT THE PRECONSTRUCTION MEETING.
18. SEPARATION BETWEEN PIPE JOINT AND ANY TAP SHALL BE A MINIMUM OF 2- FEET (PIPE DIAMETERS LESS THAN 12-INCH) AND 5- FEET (PIPE DIAMETERS 12-INCH AND LARGER).

AUG.  
2018

STANDARD NOTES

G-5



TYPE OF LINE	BEDDING MATERIAL *
4"φ-24"φ PVC AND DUCTILE IRON	68 OR 78
1 1/4" - 3" PVC AND HDPE	68, 78 OR 8
COPPER TUBING	68, 78 OR 8

\*CONFORMING TO VDOT ROAD AND BRIDGE SPECIFICATION

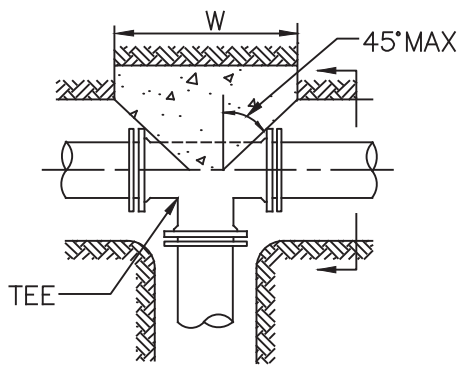
**NOTES:**

1. MINIMUM TRENCH WIDTH IN SOIL FOR LINES 16"φ AND SMALLER: PIPE DIAMETER +12"  
 MINIMUM TRENCH WIDTH IN SOIL FOR LINES LARGER THAN 16"φ: PIPE DIAMETER +18"  
 MINIMUM TRENCH WIDTH IN ROCK: PIPE DIAMETER +48"
2. FOR PIPES OF 30"φ AND GREATER OR OF A MATERIAL NOT LISTED ABOVE, SPECIFICATIONS SHALL BE MADE ON A PROJECT SPECIFIC BASIS, BUT SHALL BE NO LESS THAN THE ABOVE.
3. PLACE UTILITY MARKING TAPE. ADD MARKING TAPE WITH TEXT IDENTIFYING PIPE JOINTS AS RESTRAINED, WHERE ABOVE RESTRAINED JOINT PIPING SYSTEM OR PIPE JOINTS WITH LOCKING GASKETS.
4. ADD TRACER WIRE FOR PRESSURIZED PVC OR PE LINES, AND FOR ALL SANITARY LATERALS. FOR 12"φ PIPE AND LARGER, AFFIX TRACER WIRE TO PIPE ON CENTER LINE.
5. ENCASEMENT:
  - A) BEGIN AND END ENCASEMENT AT A PIPE JOINT.
  - B) CONCRETE TO BE CLASS A3 PER APPROVED MATERIALS LIST (3000 PSI).
  - C) BUOYANCY CALCULATIONS REQUIRED FOR PIPES LARGER THAN 12"φ OR IF ENCASEMENT IS TO BE LONGER THAN 60'.
- D) ALL REINFORCEMENT TO HAVE MINIMUM 2" CONCRETE COVER.

OCT.  
2016

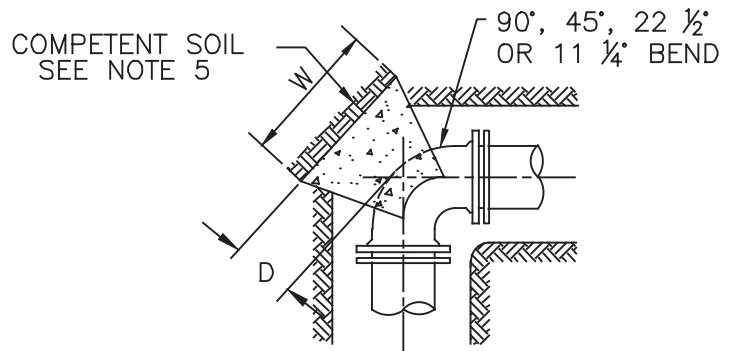
PIPE BEDDING AND ENCASEMENT

G-6



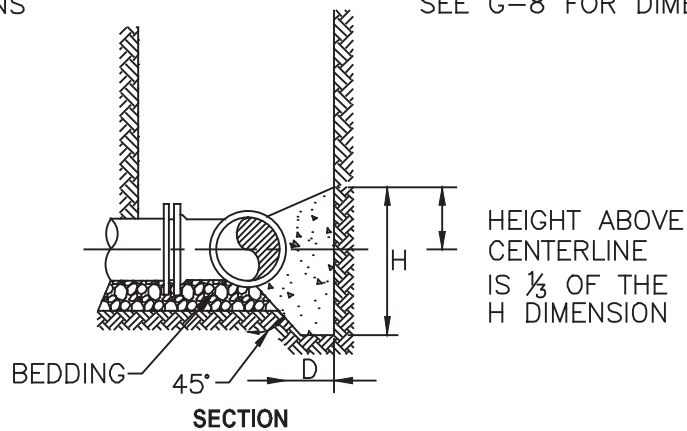
PLAN

SEE G-8 FOR DIMENSIONS



PLAN

SEE G-8 FOR DIMENSIONS



SECTION

SEE G-8 FOR DIMENSIONS

**NOTES:**

1. WRAP FITTING WITH POLYETHYLENE SHEETING. PROVIDE FORM WORK FOR ALL BLOCKS. PRIOR TO BACKFILL, FORMS MUST BE STRIPPED AND BLOCKING INSPECTED.
2. CONCRETE TO BE CLASS B2 (2200 PSI) OR BETTER.
3. BLOCKING MUST NOT OBSTRUCT ACCESS TO MECHANICAL JOINT ASSEMBLY.
4. AT TEE USE DIMENSIONS FOR DEAD END OF SAME DIAMETER AS BRANCH OF TEE.
5. SEE G-8 FOR DIMENSIONS. TABLE IS BASED ON  $R=2PA\sin(\phi/2)$ , A SOIL BEARING OF 3000 PSF, A TEST PRESSURE OF 150 PSI, AND A SAFETY FACTOR OF 1.5. INCREASE BLOCKING DIMENSIONS AS REQUIRED IN SOILS WITH LOWER BEARING VALUES.
6. FOR FITTINGS LARGER THAN 24", BLOCKING SHALL BE DESIGNED ON PROJECT SPECIFIC BASIS.

OCT.  
2016

CONCRETE THRUST BLOCK

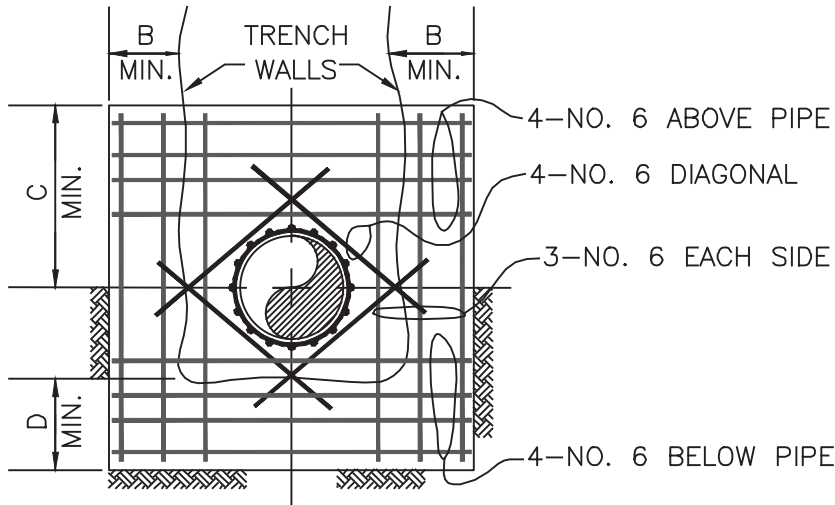
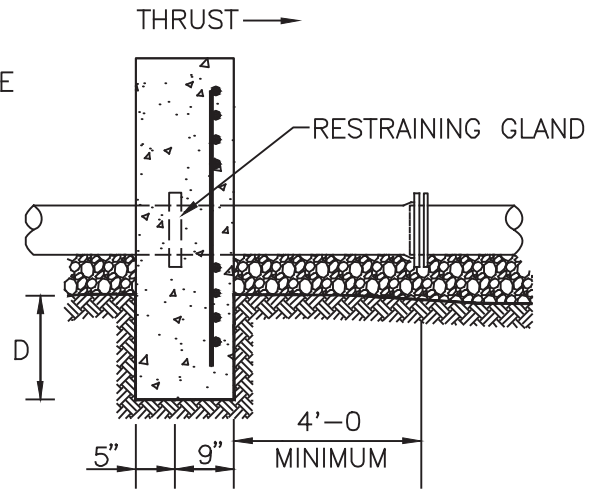
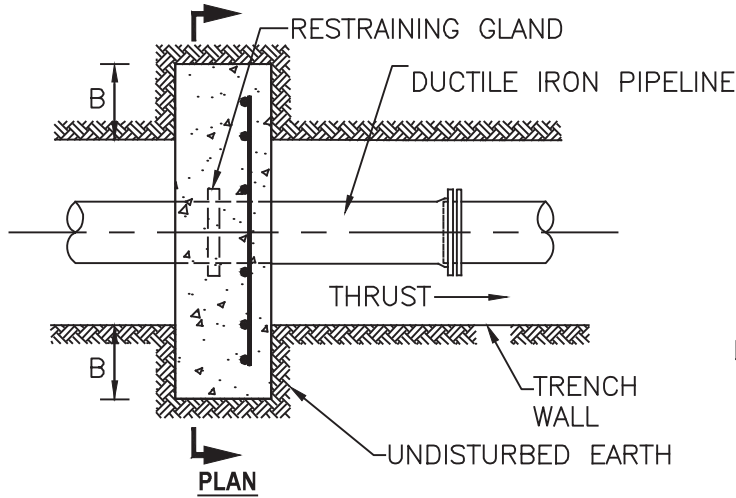
G-7

MINIMUM DIMENSIONS (FEET)				
PIPE SIZE (INCHES)	BEND	W	H	D
6	DEAD END/TEE	1.75	1.25	1.0
	90	2	1.5	1.0
	45	1.75	1.0	1.0
	22 ½/11 ¼	1.25	.75	1.0
8	DEAD END/TEE	2.25	1.75	1.25
	90	2.75	2.0	1.25
	45	2.25	1.25	1.0
	22 ½/11 ¼	1.5	1.0	1.0
10	DEAD END/TEE	3.0	2.0	1.75
	90	3.0	2.75	1.75
	45	2.25	2.0	1.25
	22 ½/11 ¼	1.75	1.5	1.0
12	DEAD END/TEE	3.5	2.5	1.75
	90	3.75	3.0	1.75
	45	3.0	2.25	1.25
	22 ½/11 ¼	2.0	1.75	1.0
16	DEAD END/TEE	4.0	3.75	2.0
	90	5.0	4.25	2.0
	45	4.0	3.0	1.5
	22 ½/11 ¼	3.0	2.0	1.25
20	DEAD END/TEE	5.5	4.5	2.5
	90	6.5	5.25	2.5
	45	5.25	3.5	1.75
	22 ½/11 ¼	3.75	2.5	1.5
24	DEAD END/TEE	6.25	5.5	3.0
	90	8.0	6.0	3.0
	45	6.5	4.0	2.5
	22 ½/11 ¼	4.0	3.5	1.5

OCT.  
2016

THRUST BLOCK DIMENSIONS

G-8



ANCHOR SCHEDULE MINIMUM DIMENSIONS (FT)			
LINE SIZE	B	C	D
6"	1.0	1.5	1.0
8"	1.0	1.5	1.0
10"	1.0	1.5	1.0
12"	1.25	1.5	1.25

**NOTES:**

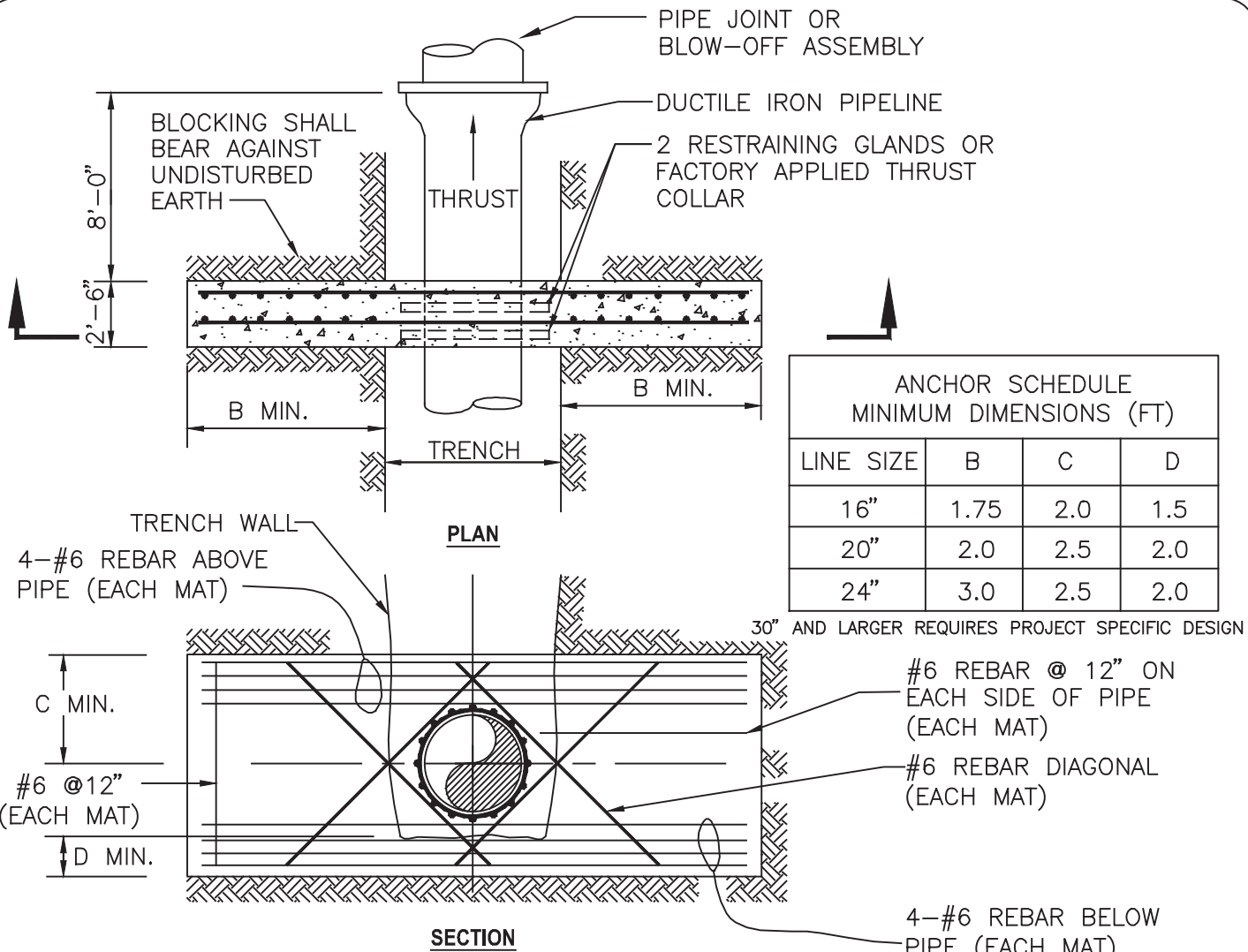
1. DIMENSIONS "B" & "D" ARE MINIMUM VALUES FOR BEARING IN EARTH. BEARING AREA IS BASED ON 150 PSI TEST PRESSURE, A SOIL BEARING OF 3000 PSF, AND A SAFETY FACTOR OF 1.5. INCREASE BLOCKING DIMENSIONS AS REQUIRED IN SOILS WITH LOWER BEARING VALUES.
2. WHERE ANCHOR IS BEING CAST ON EXISTING MAIN, USE RESTRAINING GLANDS FOR MID-SPAN APPLICATIONS. OTHER SPLIT GLANDS PROHIBITED.
3. MAINTAIN MINIMUM 1.5" CLEARANCE BETWEEN PIPE AND REBAR. 1" MINIMUM CONCRETE COVER REQUIRED ON ALL REBAR.
4. CONCRETE TO BE CLASS A3 (3000 PSI). ANCHOR MUST BE MONOLITHIC (SINGLE POUR).
5. PRIOR TO PLACING CONCRETE, FORMS, GLAND, AND REINFORCEMENT MUST BE APPROVED.
6. PRIOR TO BACKFILL, BLOCKING MUST BE INSPECTED AND APPROVED.

OCT.  
2016

LINE ANCHOR

G-9



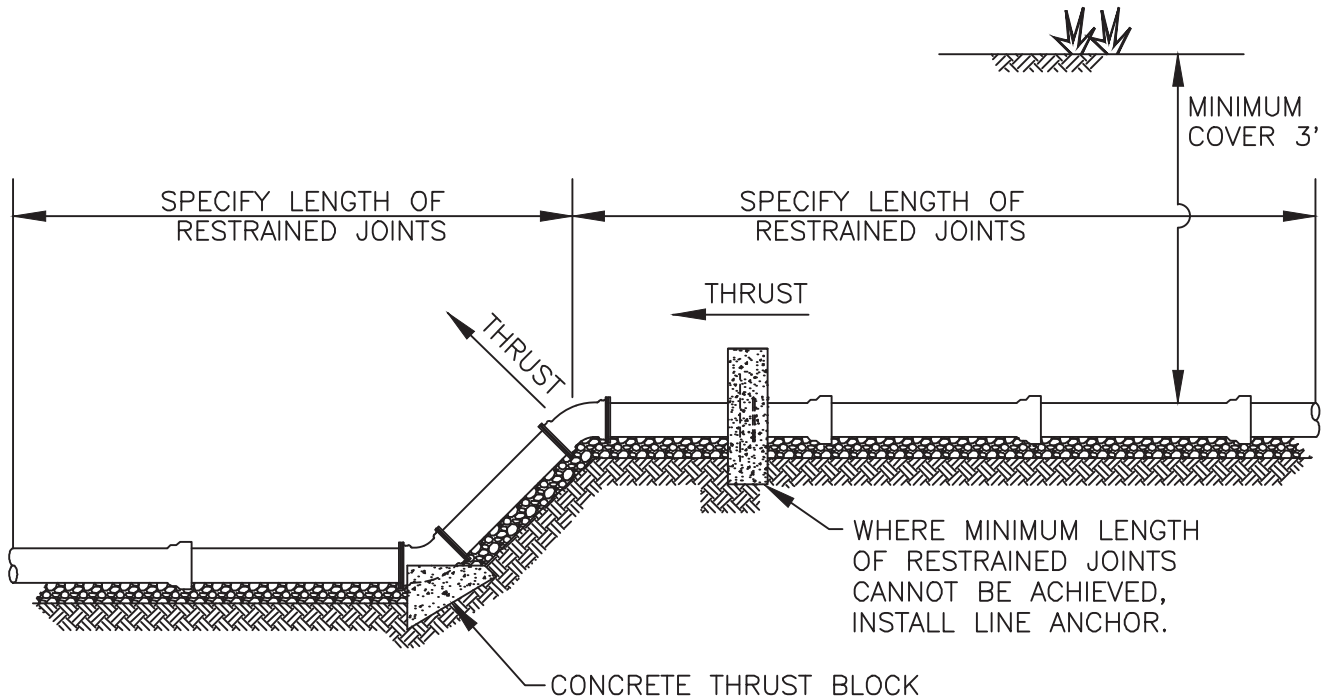


- NOTES:**
1. DIMENSIONS "B" & "D" ARE MINIMUM VALUES FOR BEARING IN EARTH. BEARING AREA IS BASED ON 150 PSI TEST PRESSURE, A SOIL BEARING OF 3000 PSF, AND A SAFETY FACTOR OF 1.5. INCREASE BLOCKING DIMENSIONS AS REQUIRED IN SOILS WITH LOWER BEARING VALUES.
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  6. PRIOR TO BACKFILL, BLOCKING MUST BE INSPECTED AND APPROVED.

OCT.  
2016

LINE ANCHOR  
ON LARGE PIPE

G-10



**NOTES:**

1. RESTRAIN ALL JOINTS FOR THE SPECIFIED DIMENSIONS IN BOTH DIRECTIONS FROM THE BENDS. BENDS SHALL BE RESTRAINED TO THE ADJACENT PIECES OF PIPE. JOINT TYPES SHALL BE ONE OF THE FOLLOWING:

16" & LARGER

APPROVED RESTRAINED JOINT PIPING SYSTEM AND APPROVED RESTRAINING GLAND AT FITTINGS.

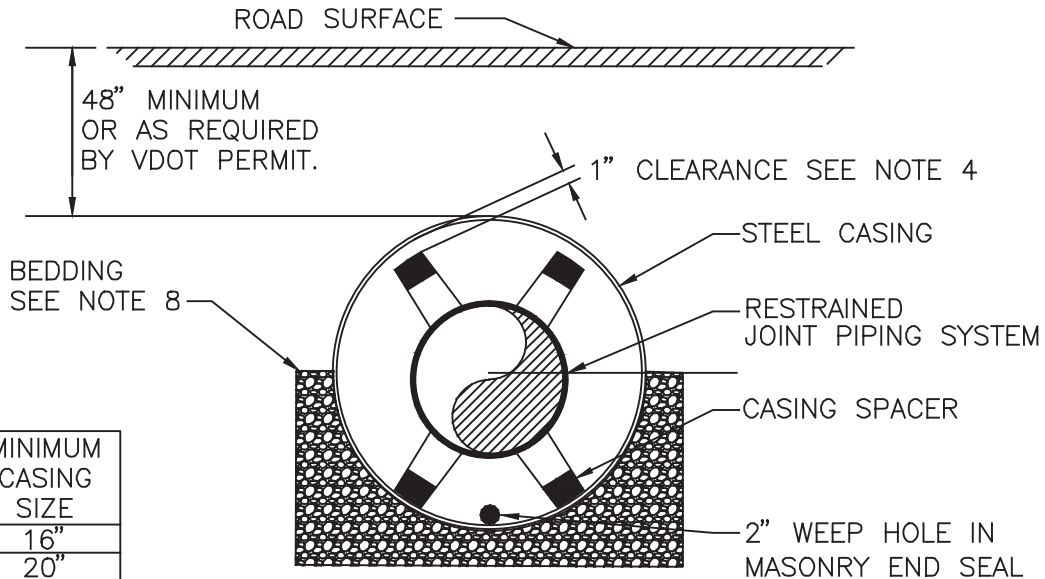
12" & SMALLER

- A) RESTRAINED JOINT PIPING SYSTEM SPECIFIED FOR THE PARTICULAR INSTALLATION.
- B) FIELD LOK ® GASKET IN PUSH-ON JOINTS.
- C) AMERICAN FASTGRIP ® IN PUSH-ON JOINTS.
- D) APPROVED RESTRAINING GLAND AT FITTINGS.

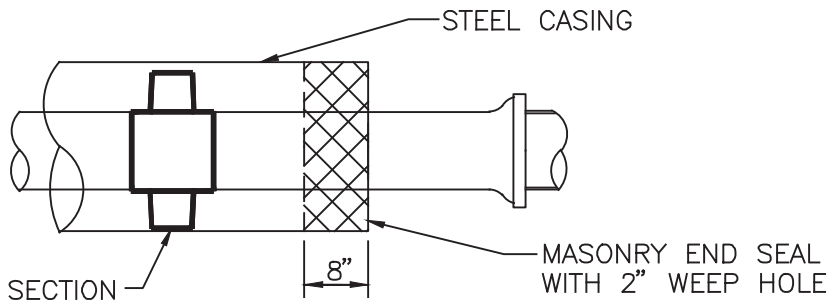
OCT.  
2016

RESTRAINT OF VERTICAL OFFSET

G-11



PIPE SIZE	MINIMUM CASING SIZE
6"	16"
8"	20"
10"/12"	24"
16"	30"
20"	36"
24"	42"
30"	48"
36"	54"



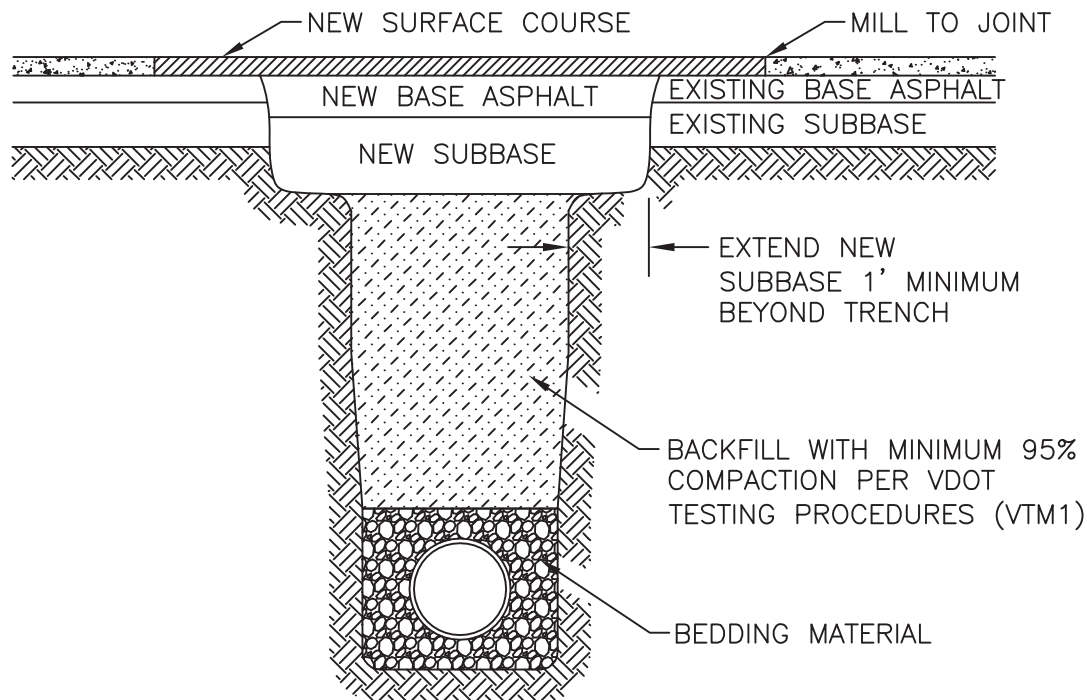
**NOTES:**

1. MATERIALS SUBMITTAL REQUIRED FOR CASING PIPE, CARRIER PIPE, AND SPACERS.
2. SEE LOUDOUN WATER'S APPROVED MATERIALS LIST FOR CASING AND SPACER REQUIREMENTS.
3. CARRIER PIPE WITHIN CASING TO BE A RESTRAINED JOINT PIPING SYSTEM.
4. SPACERS SHALL PLACE THE CARRIER PIPE IN THE CENTERED AND RESTRAINED POSITION.
5. CONSULT THE MANUFACTURER OF THE CARRIER AS TO WHETHER PIPE SHOULD BE PUSHED OR PULLED THROUGH CASING. INSTALLATION SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR THE TYPE OF JOINT EMPLOYED.
6. FOR CASINGS 48" AND LARGER, WELD A RUNNER IN THE BOTTOM OF THE CASING TO PREVENT THE CARRIER PIPE FROM SPINNING DURING INSTALLATION.
7. FOR GRAVITY SEWER INSTALLATIONS, FILL ANNULAR SPACE WITH GROUT. FOR ALL OTHER INSTALLATIONS, LEAVE ANNULAR SPACE EMPTY.
8. FOR CASING INSTALLED BY OPEN CUT, PROVIDE #57 STONE BEDDING, EXTENDING TO SPRING LINE OF CASING.

OCT.  
2016

CASING INSTALLATION

G-12



	THICKNESS	MATERIAL*
SURFACE ASPHALT	1.5"	SM9.5
BASE ASPHALT	1.5 x EXISTING OR 6" MAX.	BM25d
SUBBASE	1.5 x EXISTING OR 12" MAX.	TYPE I 21A OR 21B
BACKFILL		SELECT MATERIAL

\* IN ACCORDANCE WITH VDOT'S ROAD AND BRIDGE SPECIFICATIONS

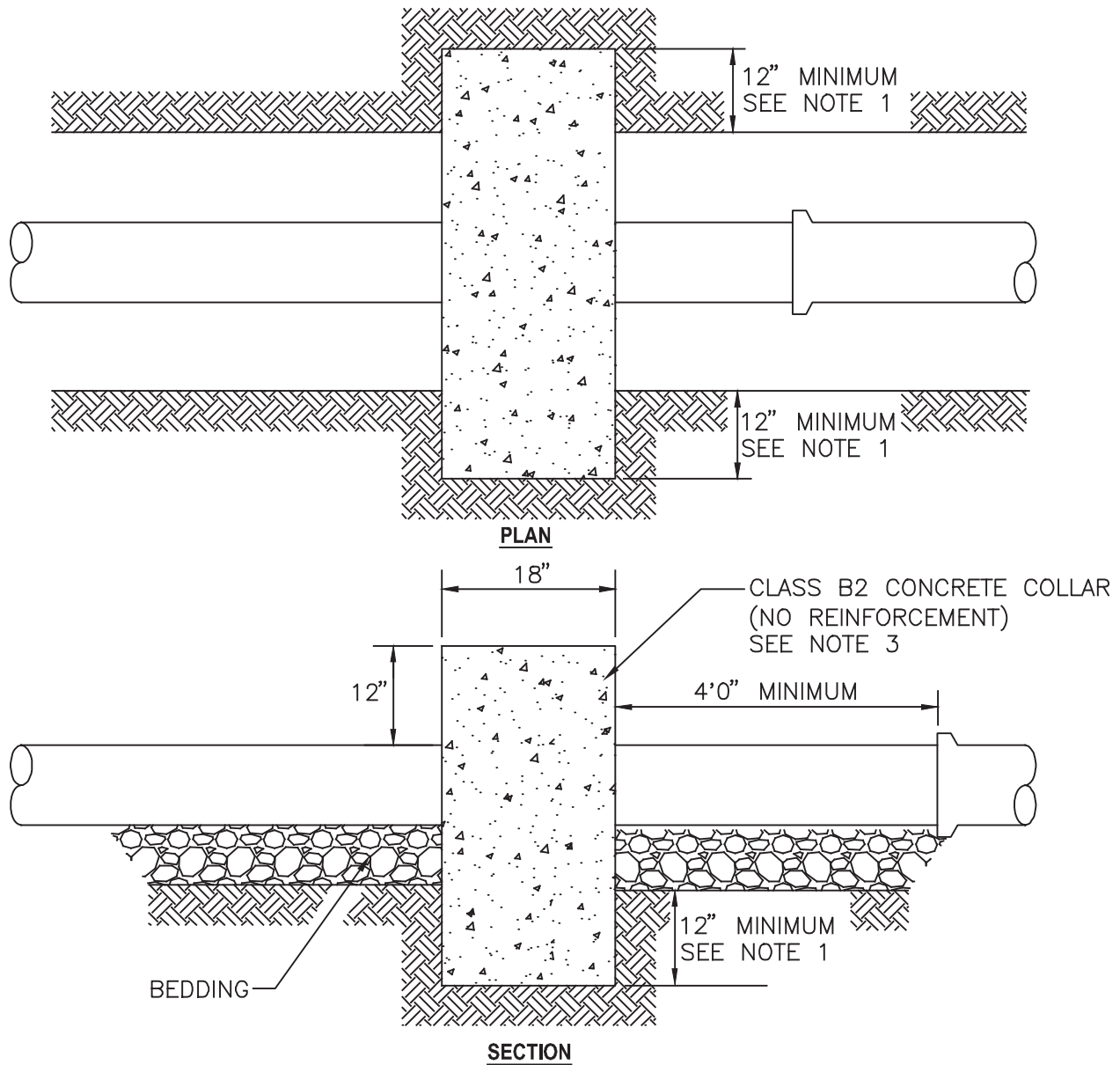
**NOTES:**

1. THIS FIGURE IS NOT FOR USE WITHIN PUBLIC RIGHTS OF WAY.
2. EXTEND LIMITS OF PATCH SO AS TO REPLACE ALL PAVEMENT DAMAGED BY THE PIPE INSTALLATION.
3. ALL CUT OR BROKEN EDGES SHALL BE TRIMMED TO NEAT AND STRAIGHT LINES. APPLY TACK COAT OF RC-250 AT A RATE OF 0.1 GALLON PER SQUARE YARD BEFORE PLACING PLANT MIX.

APR.  
2010

PAVEMENT PATCH  
ON PRIVATE PROPERTY

G-13



**NOTES:**

1. EXTEND COLLAR INTO UNDISTURBED TRENCH WALL, UNDISTURBED TRENCH BOTTOM, OR STRUCTURAL FILL.
2. PROVIDE FORMS ADEQUATE TO PREVENT COLLAR FROM BEING OVERSIZED.
3. CONCRETE COLLAR TO BE USED WITH ALL PVC PIPELINES. FOR DUCTILE IRON AND CONCRETE PIPELINES, CLAY COLLAR MAY BE USED AND COLLAR DIMENSIONS MAY BE INCREASED.

OCT.  
2016

IMPERVIOUS TRENCH CHECK

G-15

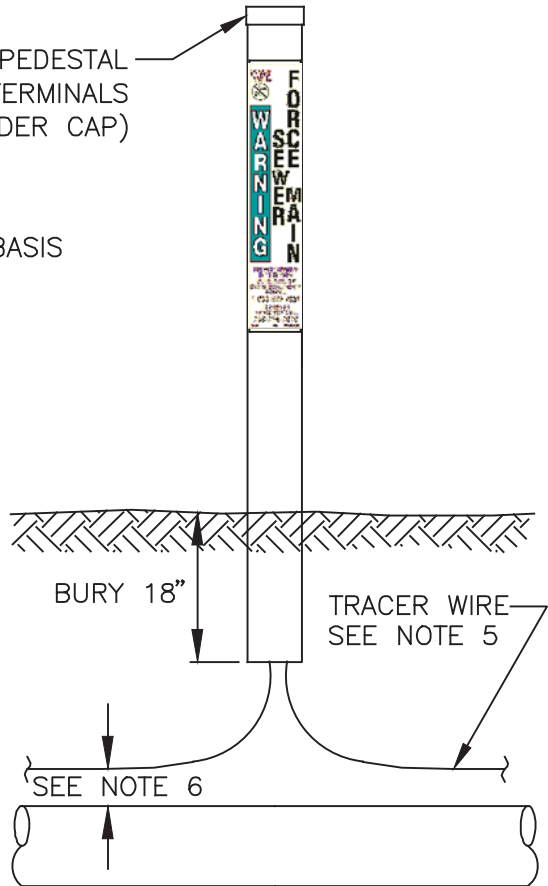
UTILITY	TYPE OF PIPE	POST	DECALS (3 PER POST)
WATER	IRON	78" BLUE MARKER	SD-7443K
	NON-METALLIC	54" BLUE TRACER PEDESTAL AND 78" BLUE MARKER	SD-7443K
RECLAIMED WATER	IRON	78" PURPLE MARKER	SD-7617K
	NON-METALLIC	54" PURPLE TRACER PEDESTAL AND 78" PURPLE MARKER	SD-7617K
GRAVITY SEWER	ALL TYPES	78" GREEN MARKER	SD-7442K
PRESSURIZED SEWER	IRON	78" GREEN MARKER	SD-7441K
	NON-METALLIC	54" GREEN TRACER PEDESTAL AND 78" GREEN MARKER	SD-7441K

TRACER PEDESTAL  
(TWO WIRE TERMINALS  
LOCATED UNDER CAP)

INSTALL MARKER DIRECTLY ABOVE THE PIPE.  
CALL VA811 FOR MARKING OF PIPELINE AS BASIS  
OF INSTALLATION.

**NOTES:**

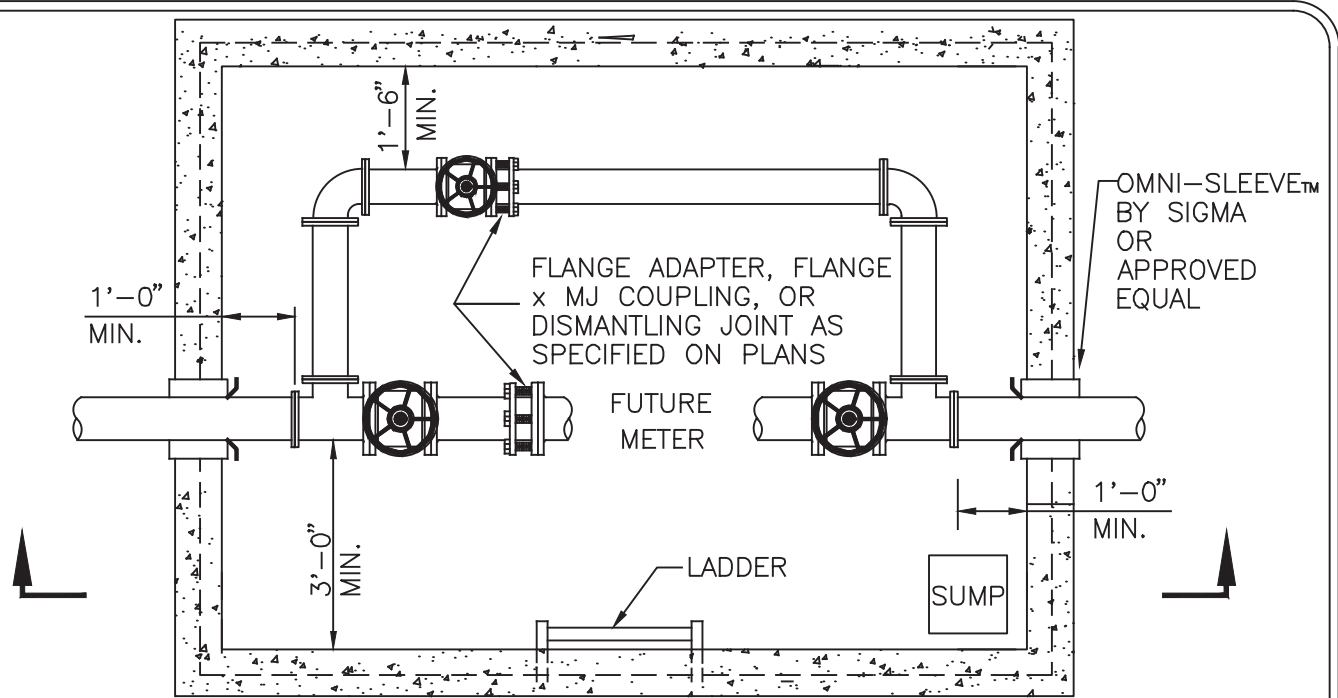
1. MARKER POSTS TO BE TRIVIEW BY RHINO MARKING AND PROTECTION SYSTEMS.
2. TRACER PEDESTALS TO BE TRIVIEW FLEX TEST STATION BY RHINO MARKING AND PROTECTION SYSTEMS.
3. TRACER PEDESTALS TO BE LOCATED NO MORE THAN 1000' APART.
4. MARKER POSTS TO BE SPACED AT INTERVALS OF 300'-500', AT MANHOLES, VALVES, AND CHANGES IN DIRECTION, TO ACCOMPLISH A CONTINUOUS LINE-OF-SIGHT.
5. TRACER WIRE TO BE #12 SOLID COPPER WITH 45 MIL POLYETHYLENE INSULATION. NO SPLICES.
6. TYPICALLY 4"-12". FOR PIPES 12"Ø AND LARGER, AFFIX WIRE TO PIPE ON CENTER LINE.



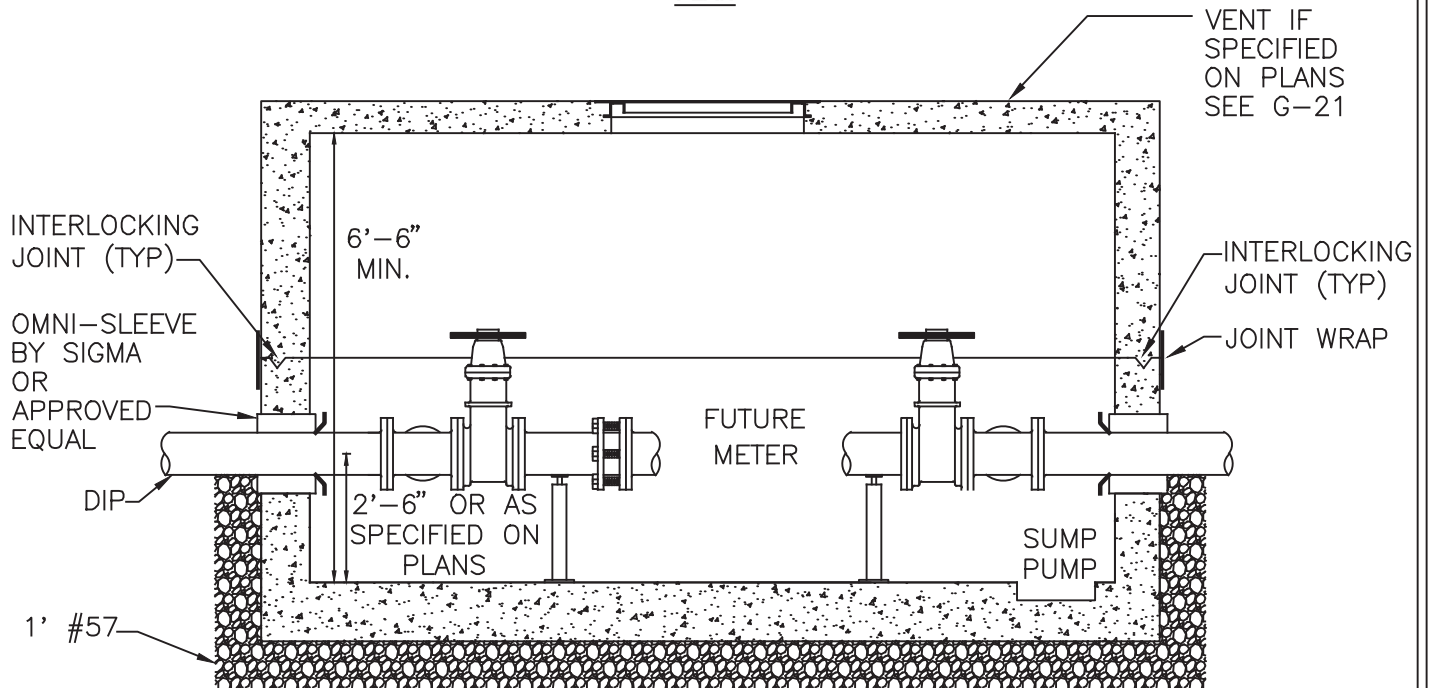
OCT.  
2016

MARKER POSTS AND TRACER  
PEDESTALS

G-16



**PLAN**



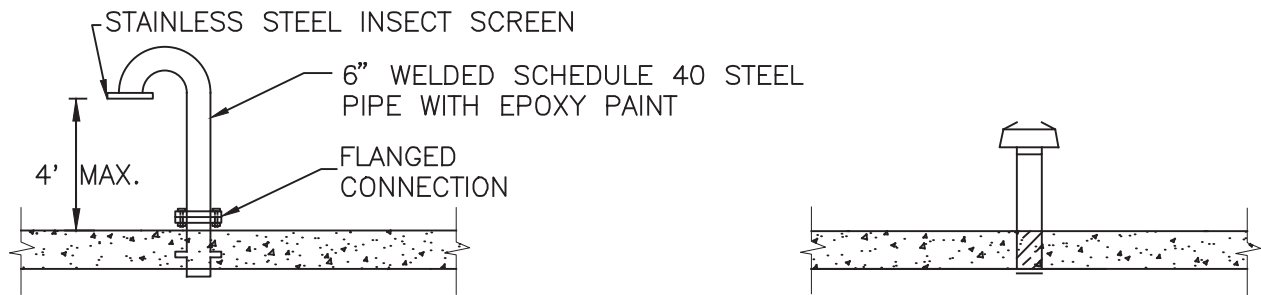
**SECTION**

NOTE:  
SEE G-21 FOR VAULT NOTES.

AUG.  
2018

VAULT FEATURES

G-20



## VENTS

### NOTES:

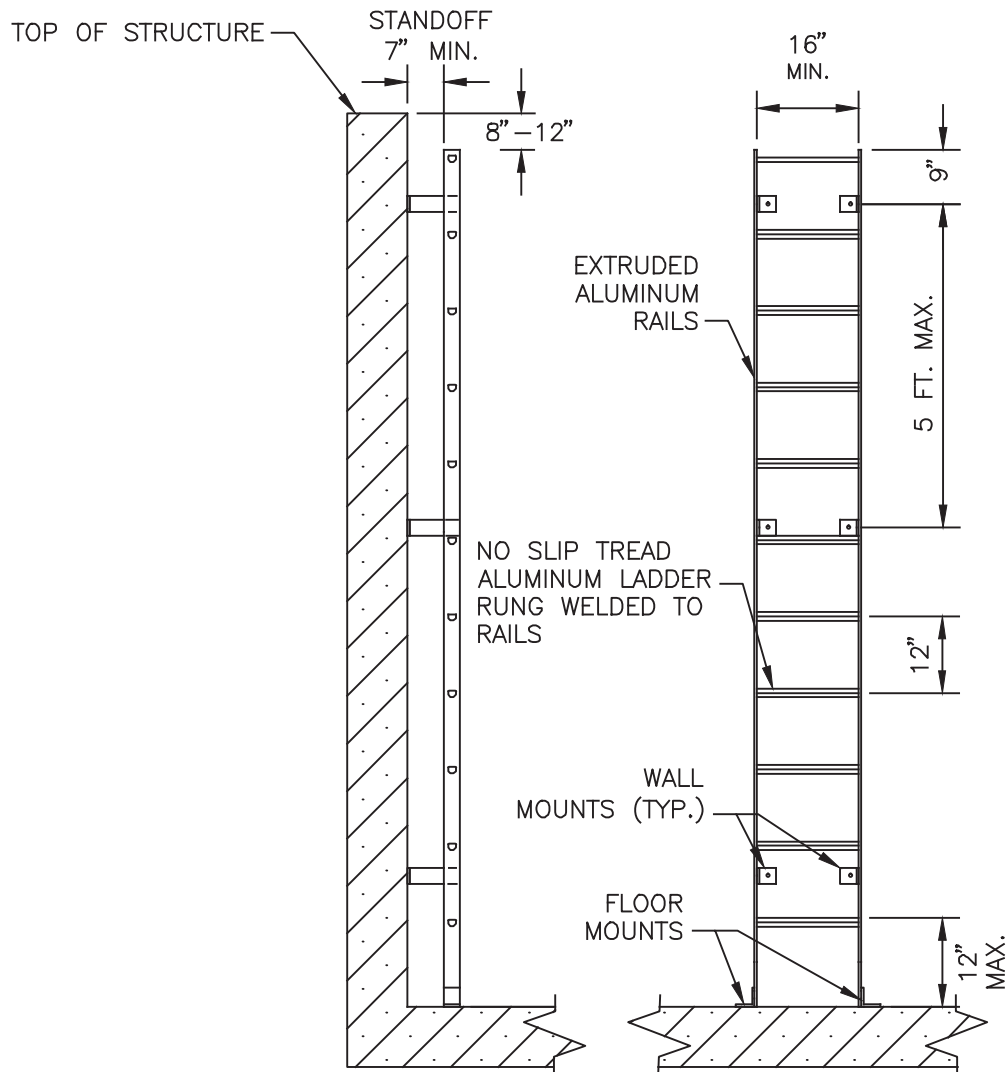
1. LOUDOUN WATER APPROVED SHOP DRAWING REQUIRED FOR ALL FABRICATIONS. SEE APPROVED MATERIALS LIST FOR ADDITIONAL REQUIREMENTS.
2. INCORPORATE VENT AS DIRECTED BY LOUDOUN WATER.
3. SLOPE FLOOR TO SUMP.
4. SUPPORT PIPING WITH STEEL PIPE STANDS OR CONCRETE PIERS.
5. PAINT PIPING IF SO DIRECTED BY LOUDOUN WATER.
6. FOR ALL UNDERGROUND STRUCTURES WHERE ENTRY IS BY ACCESS DOOR AND LADDER, INCORPORATE SAFETY FEATURES AS FOLLOWS.
  - A) PROVIDE GRAB BAR WHERE POSSIBLE. WHERE SITE CONSTRAINTS PROHIBIT THE USE OF A GRAB BAR, INSTALL A LADDER MOUNTED SAFETY POST. SEE G-23.
  - B) AT STRUCTURES OF 10' OR GREATER DEPTH IN THE WATER SYSTEM, PROVIDE FALL ARREST. THIS MAY BE BY THE MILLER DURAHOIST™ SYSTEM OR BY THE MILLER VI-GO™ LADDER MOUNTED CABLE SYSTEM. FOR DURAHOIST™, INSTALL DAVIT BASE, POSITIONED TO ALLOW DAVIT LINE TO BE CENTERED OVER LADDER. FOR VI-GO™, PROVIDE TWO CABLE SLEEVES.
  - C) AT STRUCTURES IN WASTEWATER COLLECTION OR TREATMENT SYSTEM MAKE PROVISIONS FOR RETRIEVAL. LOUDOUN WATER USES THE DURAHOIST™ SYSTEM BY MILLER FALL PROTECTION. IF THE STRUCTURE IS AT A STATION OR FACILITY WITH APPROPRIATE STORAGE, PROVIDE THE DURAHOIST™ MIGHTEVAC™ SRL WITH EMERGENCY RETRIEVAL HOIST.
7. FINAL GRADING AROUND VAULT SHALL PROVIDE POSITIVE DRAINAGE AWAY FROM ACCESS DOOR HATCH COVER.
8. EXTERIOR OF VAULT SHALL BE COATED WITH BITUMASTIC SEALER.
9. INTERIOR WALLS OF THE VAULT SHALL BE COATED WITH WHITE DRYLOCK.
10. CONTRACTOR TO COORDINATE EXTENSION OF ELECTRIC SERVICE TO VAULT WITH OWNER.
11. AFTER WALL SLEEVES HAVE BEEN CAST INTO STRUCTURE AND WIRES HAVE BEEN INSTALLED, ALL VOIDS AROUND SLEEVES SHALL BE FILLED WITH REVERE NEO-SEAL COATING (NO B24700).
12. ALL VAULTS TO HAVE A SUMP PUMP. SUMP PUMP TO BE PROVIDED BY THE CONTRACTOR.

AUG.  
2018

VAULT NOTES

G-21

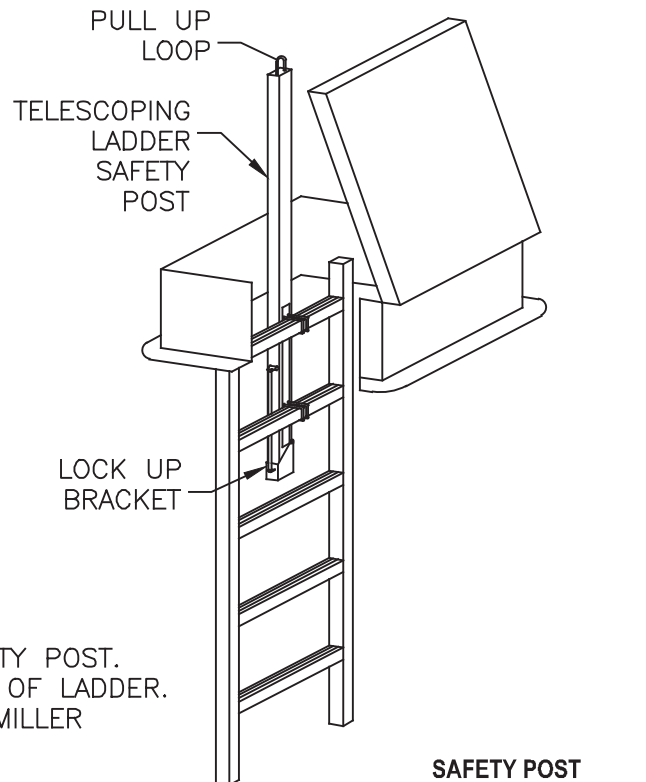
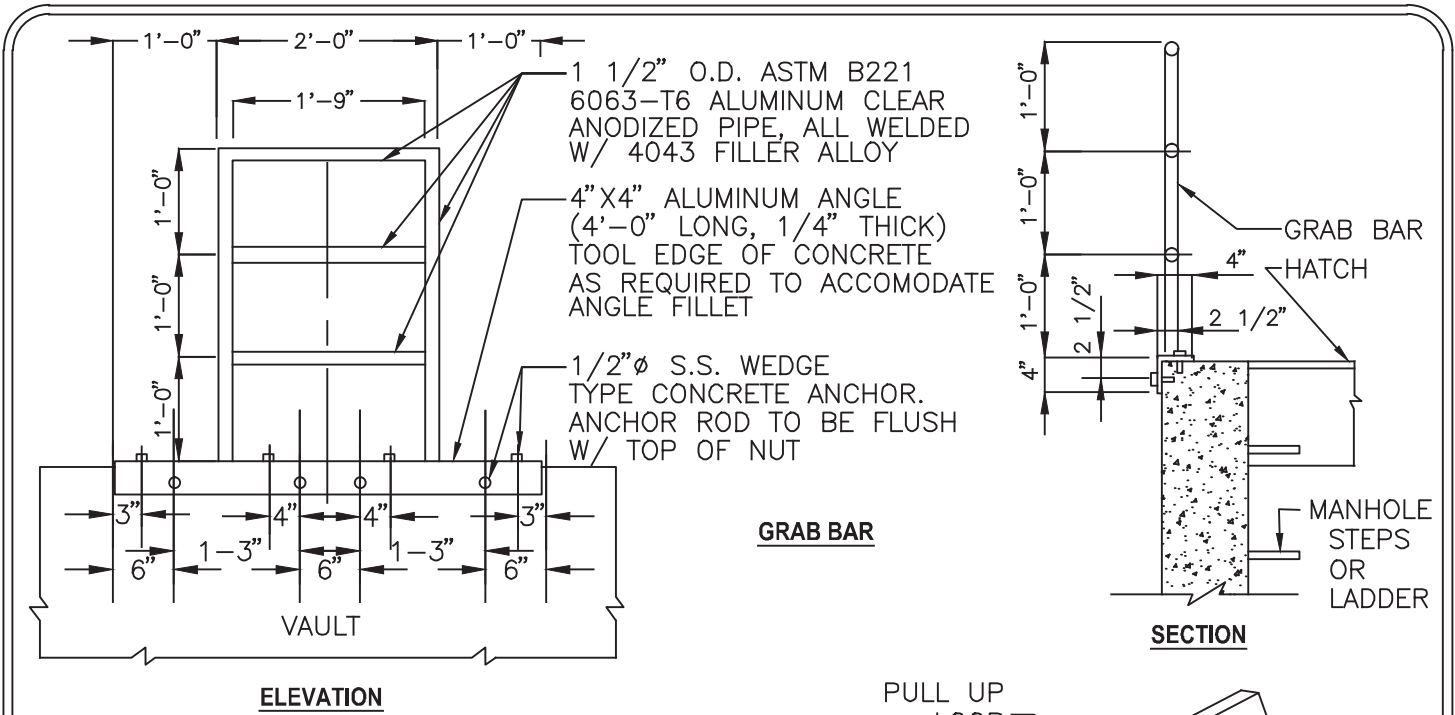




APR.  
2017

VAULT LADDER

G-22



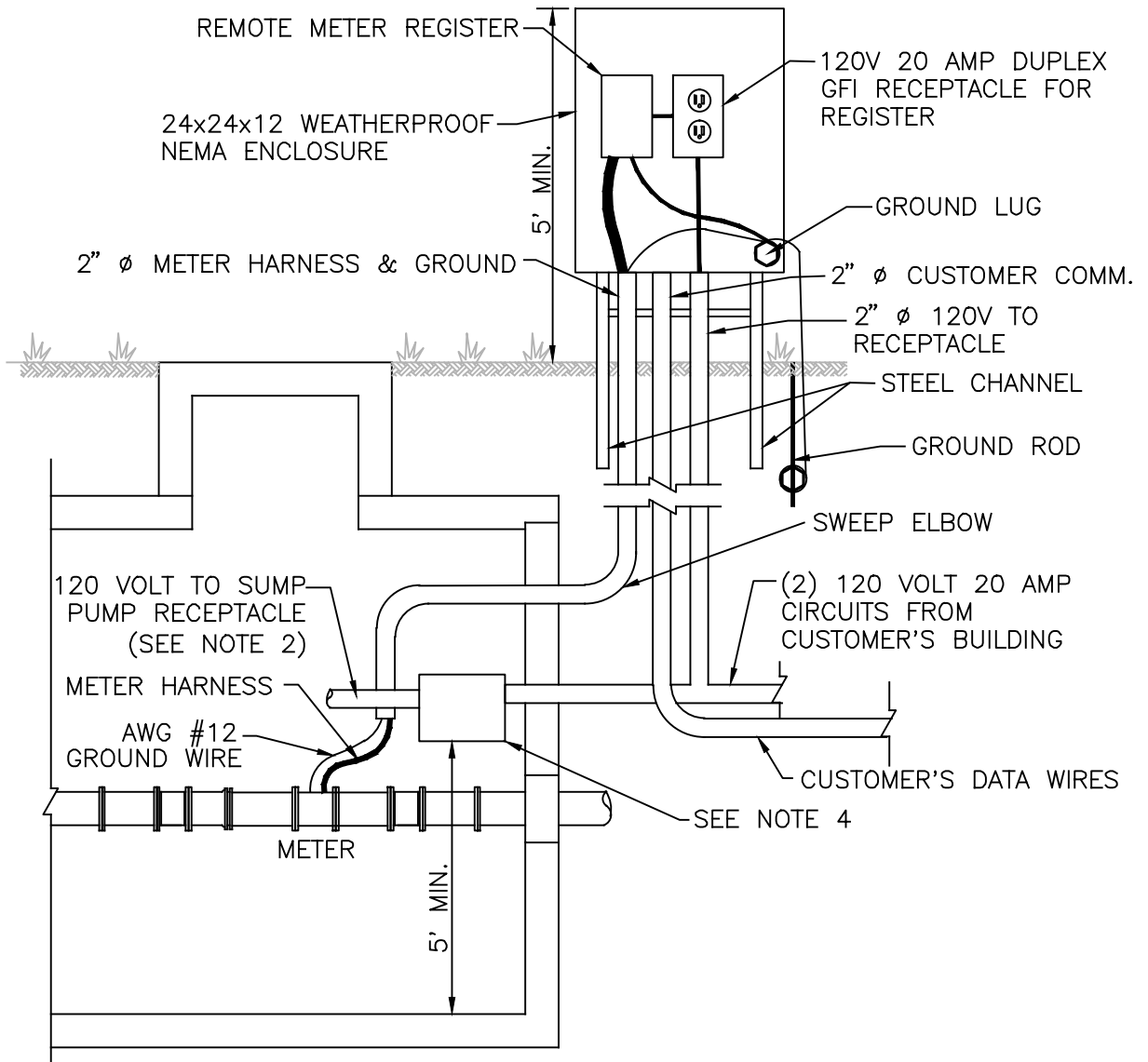
**NOTES:**

1. HATCH TO OPEN AWAY FROM GRAB BAR OR SAFETY POST.
2. CENTER GRAB BAR OR SAFETY POST ON CENTER OF LADDER. SAFETY POST MAY BE OFFSET WHEN USED WITH MILLER VI-GO™ SYSTEM.

OCT.  
2016

HATCH SAFETY FEATURES

G-23



**NOTES:**

1. CONDUIT TO BE PVC SCHEDULE 40.
2. CONTINUE CIRCUIT TO GFI DUPLEX RECEPTACLE. SEE W-29 OR R-13 FOR LOCATION OF RECEPTACLE.
3. METER, METER HARNESS, AND CONVERTER ARE SUPPLIED BY LOUDOUN WATER FOR INSTALLATION BY CONTRACTOR.
4. MUST BE WATERPROOF. MINIMUM 5' FROM BOTTOM; MULTIPLE BOXES ALLOWED.

NOV.  
2017

ELECTRONICS  
AT MAGNETIC METER

G-24