

Fauquier County Water and Sanitation Authority

7172 Kennedy Road

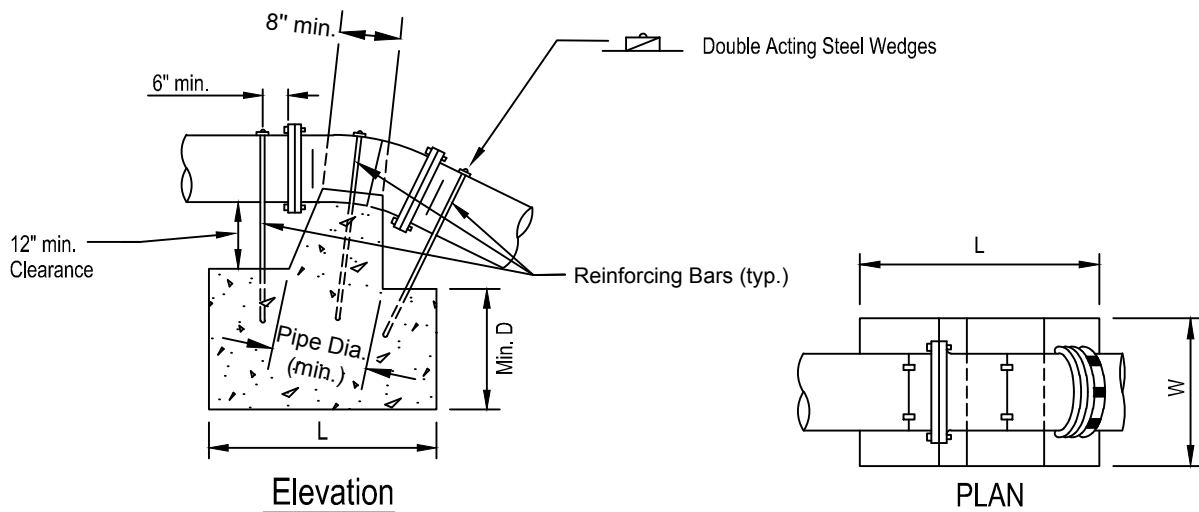
Warrenton, Virginia 20187

Standard Details

Part 1



February 2015



Reinforcing Bar Notes:

- 1) Reinforcing Bars shall be hooked at each end and embedded minimum 8" into concrete. Exposed portion of all bars shall be painted with a minimum two coats of bituminous paint.
- 2) Where 3 bars are used, they shall be arranged as shown on the detail above.
- 3) Where 4 bars are used, 2 bars shall be located at each of end of the bend, symmetrically located on either side of the fitting.

Bend		Size									
		3"	4"	6"	8"	10"	12"	16"	20"	24"	30"
11-1/4°	L	1'-6"	1'-6"	2'-0"	2'-0"	2'-3"	2'-6"	3'-3"	4'-0"	4'-6"	5'-0"
	W	1'-6"	1'-6"	2'-0"	2'-0"	2'-3"	2'-6"	3'-3"	4'-0"	4'-6"	5'-0"
	D	1'-6"	1'-6"	1'-6"	2'-0"	2'-0"	2'-3"	2'-6"	2'-6"	3'-0"	3'-0"
	Reinf Bars (No., Size)	3, #5	3, #5	3, #5	3, #6	3, #6	3, #6	3, #6	3, #6	3, #8	3, #8
22-1/2°	L	1'-6"	2'-0"	2'-6"	2'-9"	3'-6"	4'-0"	4'-6"	5'-6"	6'-0"	7'-0"
	W	1'-6"	2'-0"	2'-6"	2'-9"	3'-6"	4'-0"	4'-6"	5'-6"	6'-0"	7'-0"
	D	1'-6"	1'-6"	2'-0"	2'-3"	2'-3"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"
	Reinf Bars (No., Size)	3, #5	3, #5	3, #5	3, #6	3, #6	4, #6	4, #6	3, #8	4, #8	4, #8
45°	L	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	6'-0"	7'-6"	8'-6"	10'-0"
	W	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	6'-0"	7'-6"	8'-6"	10'-0"
	D	1'-6"	2'-0"	2'-0"	2'-6"	2'-9"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"
	Reinf Bars (No., Size)	3, #5	3, #5	3, #5	3, #6	4, #6	4, #6	4, #8	4, #8	4, #8	4, #9

Concrete Notes:

- 1) Fc=3000 PSI AT 28 DAYS.
- 2) Carry all bearing surfaces to undisturbed earth or firm subgrade.
- 3) The anchorage dimensions shown are based on design water pressure of 150 psi. Where a higher pressure specification is required, the volume of the concrete (L x W x D) shall be adjusted proportionally according to the design pressure used.

AV-01

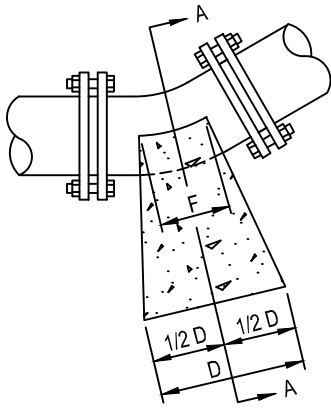


Fauquier County
Water and Sanitation Authority

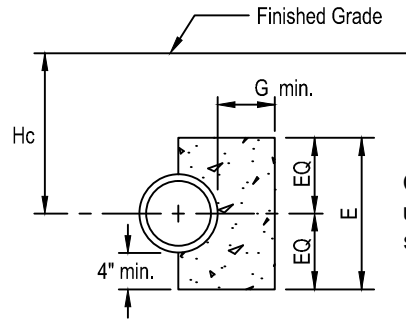
Anchorage for
11-1/4°, 22-1/2° & 45° Upper Vertical Bends

Not to Scale

Revised: 03/31/05



PLAN



SECTION A-A

Carry concrete to undisturbed earth or firm subgrade.

SOIL PROPERTIES	SIZE	Concrete Block Dimensions At 150 PSI Pressure				Amount to be added to dimension 'D' for each 50 psi (or portion thereof) design pressure above 150 psi (up to 300 psi).	Adjustment to Concrete Area for Different Height, Hc. To Be Measured from Finished Grade to C of Pipe			
		D	E	F	G		Up To 8'	8'-1" To 12'	12'-1" To 16'	16'-1" To 20'
CS = 1000 PSF Φ = 15° Soft Silty Clay & Better	3"	4"	1'	4"	6"	2"	CONC. BLOCK AREA 1.0 X D X E	CONC. BLOCK AREA 0.875 X D X E	CONC. BLOCK AREA 0.75 X D X E	CONC. BLOCK AREA 0.625 X D X E
	4"	4"	1'	4"	6"	2"				
	6"	6"	1'-2"	6"	7"	2"				
	8"	8"	1'-4"	8"	7"	2"				
	10"	9"	1'-6"	8"	8"	4"				
	12"	1'	1'-8"	1'	9"	4"				
	16"	1'-3"	2'	1'	9"	6"				
	20"	1'-3"	2'-6"	1'	10"	6"				
	24"	1'-6"	3'	1'	1'	6"				
30"	2'	3'-6"	1'-4"	1'-2"	9"					
CS = 0 PSF Φ = 15° Loose Silty Sand	3"	10"	1'-6"	6"	9"	2"	CONC. BLOCK AREA 1.0 X D X E	CONC. BLOCK AREA 0.5 X D X E	CONC. BLOCK AREA 0.375 X D X E	CONC. BLOCK AREA 0.25 X D X E
	4"	1'	2'	6"	9"	2"				
	6"	1'-6"	2'	6"	1'	2"				
	8"	2'-4"	2'	8"	1'	2"				
	10"	2'-6"	2'-3"	8"	1'	4"				
	12"	3'-4"	2'-6"	1'	1'	4"				
	16"	4'-2"	3'	1'	1'-6"	6"				
	20"	4'-6"	3'-6"	1'	1'-6"	6"				
	24"	5'-8"	4'	1'-6"	1'-6"	6"				
30"	7'	5'	2'	1'-6"	9"					

Notes:

- 1) Dimensions D & E shall be adjusted based on required area for value of Hc.
- 2) Dimensions F & G are constant for a given pipe size.
- 3) Dimension D shall be adjusted for required pressure in excess of 150 psi before making adjustment for Hc (above).

Soil and Concrete Notes:

- 1) FC = 3000 psi at 28 days.
- 2) CS = Soil cohesion in psf
- 3) Φ = Angle of Internal Friction.
- 4) All bearing surfaces shall be carried to undisturbed earth or firm subgrade.

BB-01

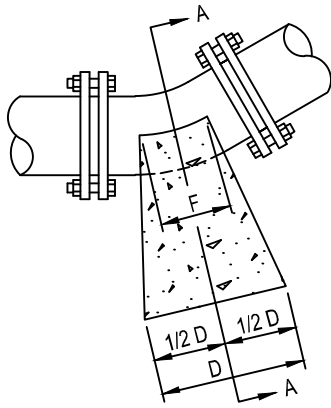


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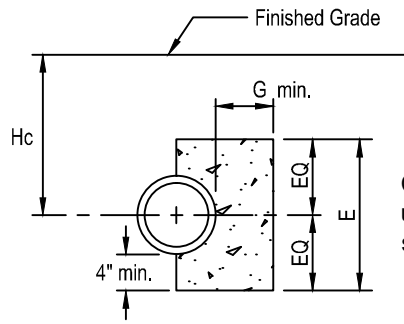
Buttresses for
11-1/4° Horizontal Bend

Not to Scale

Revised: 03/31/05



PLAN



SECTION A-A

Carry concrete to undisturbed earth or firm subgrade.

SOIL PROPERTIES	SIZE	Concrete Block Dimensions At 150 PSI Pressure				Amount to be added to dimension 'D' for each 50 psi (or portion thereof) design pressure above 150 psi (up to 300 psi).	Adjustment to Concrete Area for Different Height, Hc. To Be Measured from Finished Grade to $\frac{C}{2}$ of Pipe			
		D	E	F	G		Up To 8'	8'-1" To 12'	12'-1" To 16'	16'-1" To 20'
CS = 1000 PSF $\Phi = 15^\circ$ Soft Silty Clay & Better	3"	6"	1'-0"	6"	7"	2"	CONC. BLOCK AREA = 1.0 X D X E	CONC. BLOCK AREA = 0.875 X D X E	CONC. BLOCK AREA = 0.75 X D X E	CONC. BLOCK AREA = 0.625 X D X E
	4"	6"	1'-0"	6"	7"	2"				
	6"	8"	1'-2"	6"	8"	2"				
	8"	1'-0"	1'-4"	8"	8"	4"				
	10"	1'-3"	1'-6"	8"	10"	4"				
	12"	1'-6"	1'-8"	1'-0"	1'-0"	6"				
	16"	2'-0"	2'-0"	1'-0"	1'-3"	6"				
	20"	2'-6"	2'-6"	1'-0"	1'-6"	9"				
	24"	3'-0"	3'-0"	1'-0"	1'-6"	9"				
	30"	4'-0"	3'-6"	1'-4"	1'-9"	1'-0"				
CS = 0 PSF $\Phi = 15^\circ$ Loose Silty Sand	3"	1'-0"	1'-6"	6"	9"	2"	CONC. BLOCK AREA = 1.0 X D X E	CONC. BLOCK AREA = 0.5 X D X E	CONC. BLOCK AREA = 0.375 X D X E	CONC. BLOCK AREA = 0.25 X D X E
	4"	1'-6"	2'-0"	6"	9"	2"				
	6"	2'-0"	2'-0"	6"	1'-0"	2"				
	8"	3'-4"	2'-0"	8"	1'-0"	4"				
	10"	4'-2"	2'-3"	8"	1'-0"	4"				
	12"	4'-8"	2'-9"	1'-0"	1'-6"	6"				
	16"	5'-9"	3'-6"	1'-0"	1'-6"	6"				
	20"	7'-10"	4'-0"	1'-0"	2'-0"	9"				
	24"	9'-10"	5'-0"	1'-6"	2'-0"	9"				
	30"	11'-8"	6'-0"	2'-0"	2'-0"	1'-0"				

Notes:

- 1) Dimensions D & E shall be adjusted based on required area for value of Hc.
- 2) Dimensions F & G are constant for a given pipe size.
- 3) Dimension D shall be adjusted for required pressure in excess of 150 psi before making adjustment for Hc (above).

Soil and Concrete Notes:

- 1) FC = 3000 psi at 28 days.
- 2) CS = Soil cohesion in psf
- 3) Φ = Angle of Internal Friction.
- 4) All bearing surfaces shall be carried to undisturbed earth or firm subgrade.

BB-02

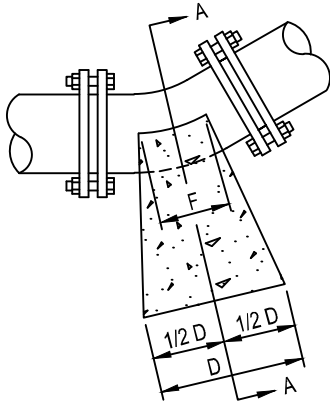


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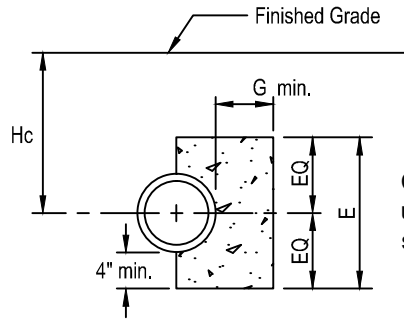
Buttresses for
22-1/2° Horizontal Bend

Not to Scale

Revised: 03/31/05



PLAN



SECTION A-A

Carry concrete to undisturbed earth or firm subgrade.

SOIL PROPERTIES	SIZE	Concrete Block Dimensions At 150 PSI Pressure				Amount to be added to dimension 'D' for each 50 psi (or portion thereof) design pressure above 150 psi (up to 300 psi).	Adjustment to Concrete Area for Different Height, Hc. To Be Measured from Finished Grade to C of Pipe			
		D	E	F	G		Up To 8'	8'-1" To 12'	12'-1" To 16'	16'-1" To 20'
CS = 1000 PSF Φ = 15° Soft Silty Clay & Better	3"	9"	1'-0"	6"	6"	4"	CONC. BLOCK AREA 1.0 X D X E	CONC. BLOCK AREA 0.875 X D X E	CONC. BLOCK AREA 0.75 X D X E	CONC. BLOCK AREA 0.625 X D X E
	4"	9"	1'-0"	6"	6"	4"				
	6"	1'-0"	1'-2"	6"	8"	4"				
	8"	1'-6"	1'-4"	8"	9"	6"				
	10"	2'-0"	1'-6"	8"	10"	6"				
	12"	2'-6"	1'-8"	1'-0"	1'-0"	9"				
	16"	3'-6"	2'-6"	1'-0"	1'-3"	9"				
	20"	4'-8"	2'-6"	1'-0"	1'-4"	1'-4"				
	24"	5'-0"	3'-0"	1'-0"	1'-9"	2'-0"				
	30"	6'-0"	4'-0"	1'-4"	2'-3"	2'-0"				
CS = 0 PSF Φ = 15° Loose Silty Sand	3"	1'-6"	1'-6"	6"	1'-0"	4"	CONC. BLOCK AREA 1.0 X D X E	CONC. BLOCK AREA 0.5 X D X E	CONC. BLOCK AREA 0.375 X D X E	CONC. BLOCK AREA 0.25 X D X E
	4"	2'-0"	2'-0"	6"	1'-0"	4"				
	6"	3'-0"	2'-0"	6"	1'-0"	4"				
	8"	4'-0"	2'-6"	8"	1'-0"	6"				
	10"	6'-0"	2'-6"	8"	1'-0"	6"				
	12"	7'-0"	3'-0"	1'-0"	1'-6"	9"				
	16"	11'-0"	4'-0"	1'-0"	1'-6"	9"				
	20"	11'-8"	5'-0"	1'-0"	2'-0"	1'-4"				
	24"	12'-6"	6'-0"	1'-6"	2'-0"	2'-0"				
	30"	20'-0"	6'-0"	2'-0"	2'-6"	2'-0"				

Notes:

- 1) Dimensions D & E shall be adjusted based on required area for value of Hc.
- 2) Dimensions F & G are constant for a given pipe size.
- 3) Dimension D shall be adjusted for required pressure in excess of 150 psi before making adjustment for Hc (above).

Soil and Concrete Notes:

- 1) FC = 3000 psi at 28 days.
- 2) CS = Soil cohesion in psf
- 3) Φ = Angle of Internal Friction.
- 4) All bearing surfaces shall be carried to undisturbed earth or firm subgrade.

BB-03

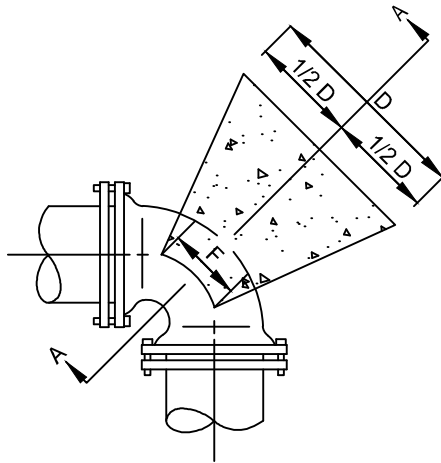


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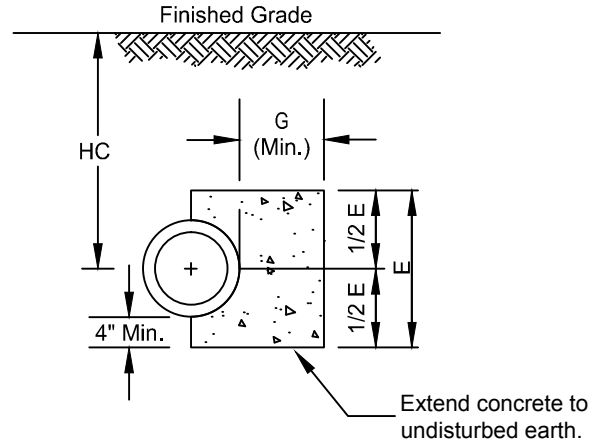
Buttresses for
45° Horizontal Bend

Not to Scale

Revised: 03/31/05



Plan



Section A - A

SIZE	Concrete Block Dimensions At 150 PSI Pressure				Amount to be added to dimension 'D' for each 50 psi (or portion thereof) design pressure above 150 psi (up to 300 psi).	Adjustment to Concrete Area for Different Height, Hc. To Be Measured from Finished Grade to C of Pipe			
	D	E	F	G		Up To 8'-0"	8'-1" To 12'	12'-1" To 16'	16'-1" To 20'
3"	2'-6"	2'-0"	8"	1'-0"	6"	CONC. BLOCK AREA 1.0 X D X E	C. B. A. 0.5 X D X E	C. B. A. 0.375 X D X E	C. B. A. 0.25 X D X E
4"	3'-4"	2'-0"	8"	1'-0"	6"				
6"	5'-2"	2'-0"	1'-0"	1'-6"	6"				
8"	6'-8"	2'-6"	1'-0"	1'-6"	9"				
10"	10'-0"	3'-0"	1'-6"	1'-6"	9"				
12"	10'-0"	4'-0"	1'-6"	2'-0"	1'-0"				
16"	12'-6"	5'-0"	2'-0"	2'-0"	1'-0"				
20"	15'-10"	6'-0"	2'-0"	2'-0"	2'-0"				

Notes:

- 1) Dimensions D & E shall be adjusted based on required area for value of Hc.
- 2) Dimensions F & G are constant for a given pipe size.
- 3) Dimension D shall be adjusted for required pressure in excess of 150 psi before making adjustment for Hc (above).
- 4) Special design required for lines 24" in diameter or greater.

Concrete Notes:

- 1) FC = 3000 psi at 28 days.
- 2) All bearing surfaces shall be carried to undisturbed earth or firm subgrade.

BB-04

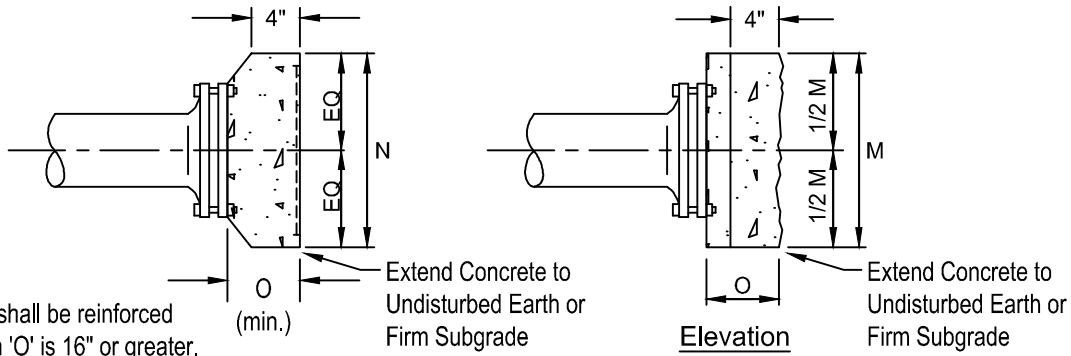


Fauquier County
Water and Sanitation Authority

Buttresses for
90° Horizontal Bend

Not to Scale

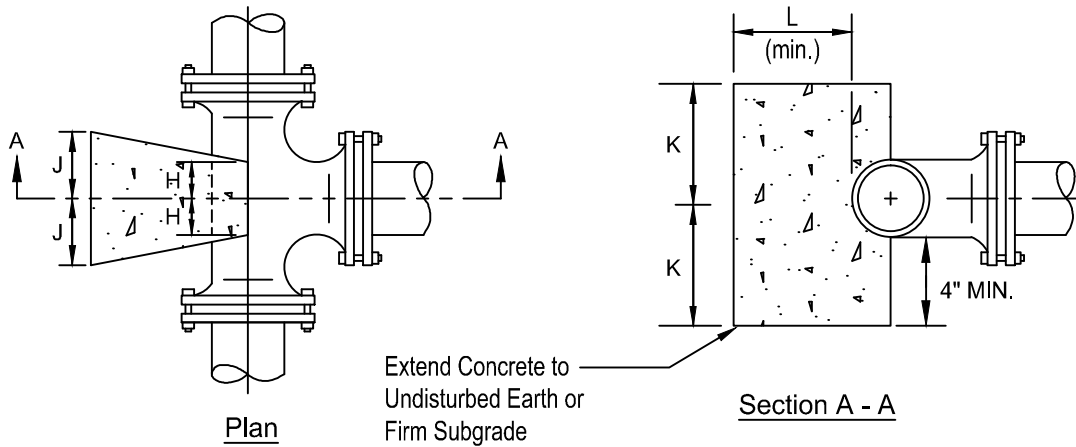
Revised: 03/31/05



Note: Concrete shall be reinforced when dimension 'O' is 16" or greater.

Buttress Sizing for Plugs and Caps										
	Size (Pipe Diameter) of Plug/Cap									
	3"	4"	6"	8"	10"	12"	16"	20"	24"	30"
M	*	*	*	2'-6"	2'-8"	3'-6"	4'-8"	6'-0"	6'-8"	8'-0"
N	*	*	*	1'-6"	2'-2"	2'-6"	3'-4"	4'-0"	5'-0"	6'-8"
O	*	*	*	10"	1'-0"	1'-2"	1'-4"	1'-6"	1'-8"	2'-0"

Reinforce with 66" EW



Buttress Sizing for Tees										
	Size (Pipe Diameter) of Branch									
	3"	4"	6"	8"	10"	12"	16"	20"	24"	30"
J	6"	6"	8"	9"	1'-1"	1'-3"	1'-8"	2'-0"	2'-6"	3'-4"
K	6"	8"	10"	1'-3"	1'-4"	1'-9"	2'-4"	3'-0"	3'-4"	4'-0"
L	6"	6"	8"	9"	10"	12"	1'-2"	1'-6"	1'-8"	2'-0"
H	4"	4"	6"	6"	6"	6"	8"	1'-0"	1'-0"	1'-0"

Surface Area of Block = 2J x 2K

Notes:

- 1) FC = 3000 psi at 28 days.
- 2) Buttress block dimensions are appropriate for design water pressure less than or equal to 150 psi.
- 3) Where design water pressure exceeds 150 psi, block dimensions shall be proportioned based on actual design pressure.
- 4) All bearing surfaces shall be extended to undisturbed earth or firm subgrade.
- 5) Tapping assemblies and sleeves shall be buttressed as comparably sized tees.

BT-01

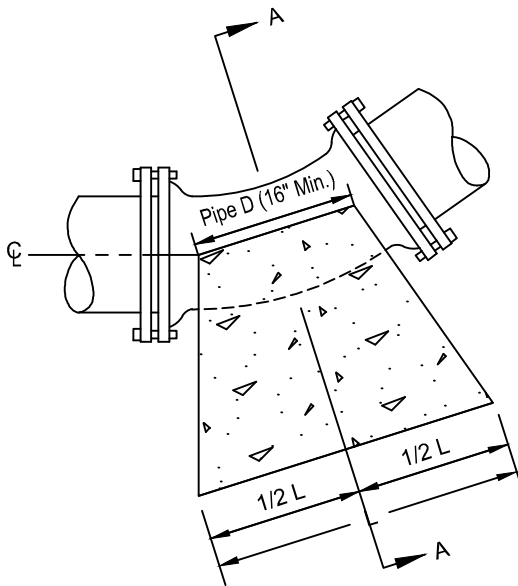


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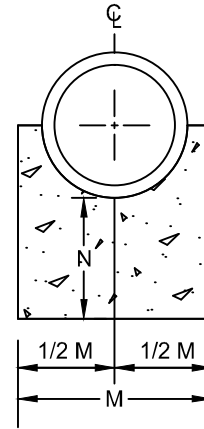
Buttresses for
Tees, Plugs and Caps

Not to Scale

Revised: 03/31/05



Elevation



Section

Buttresses for Lower Vertical Bends											
Bend, °		Size									
		3"	4"	6"	8"	10"	12"	16"	20"	24"	30"
11-1/4°	L	6"	6"	6"	8"	8"	8"	1'-1"	1'-5"	1'-10"	2'-8"
	M	1'-0"	1'-0"	1'-2"	1'-4"	1'-6"	2'-0"	2'-4"	2'-8"	3'-0"	3'-4"
	N	8"	8"	8"	8"	8"	8"	9"	10"	12"	1'-2"
22-1/2°	L	6"	6"	10"	11"	1'-3"	1'-4"	2'-1"	2'-9"	3'-7"	3'-3"
	M	1'-0"	1'-0"	1'-2"	1'-4"	1'-6"	2'-0"	2'-4"	2'-8"	3'-0"	3'-2"
	N	8"	8"	8"	8"	9"	9"	12"	1'-2"	1'-4"	1'-6"
45°	L	10"	1'-0"	1'-2"	1'-9"	2'-5"	2'-8"	4'-0"	5'-6"	6'-0"	8'-2"
	M	1'-0"	1'-0"	1'-2"	1'-4"	1'-6"	2'-0"	2'-4"	2'-8"	3'-6"	4'-0"
	N	8"	8"	8"	8"	12"	1'-2"	1'-6"	2'-0"	2'-6"	3'-0"

Notes:

- 1) FC = 3000 psi at 28 days.
- 2) Buttress block dimensions are appropriate for design water pressure less than or equal to 150 psi.
- 3) Where design water pressure exceeds 150 psi, block dimensions shall be proportioned based on actual design pressure.
- 4) Where soil bearing pressure is less than 2500 psi, dimension 'L' shall be multiplied by 2 and Dimension 'M' shall be multiplied by 1.5.
- 4) All bearing surfaces shall be extended to undisturbed earth or firm subgrade.

BV-01

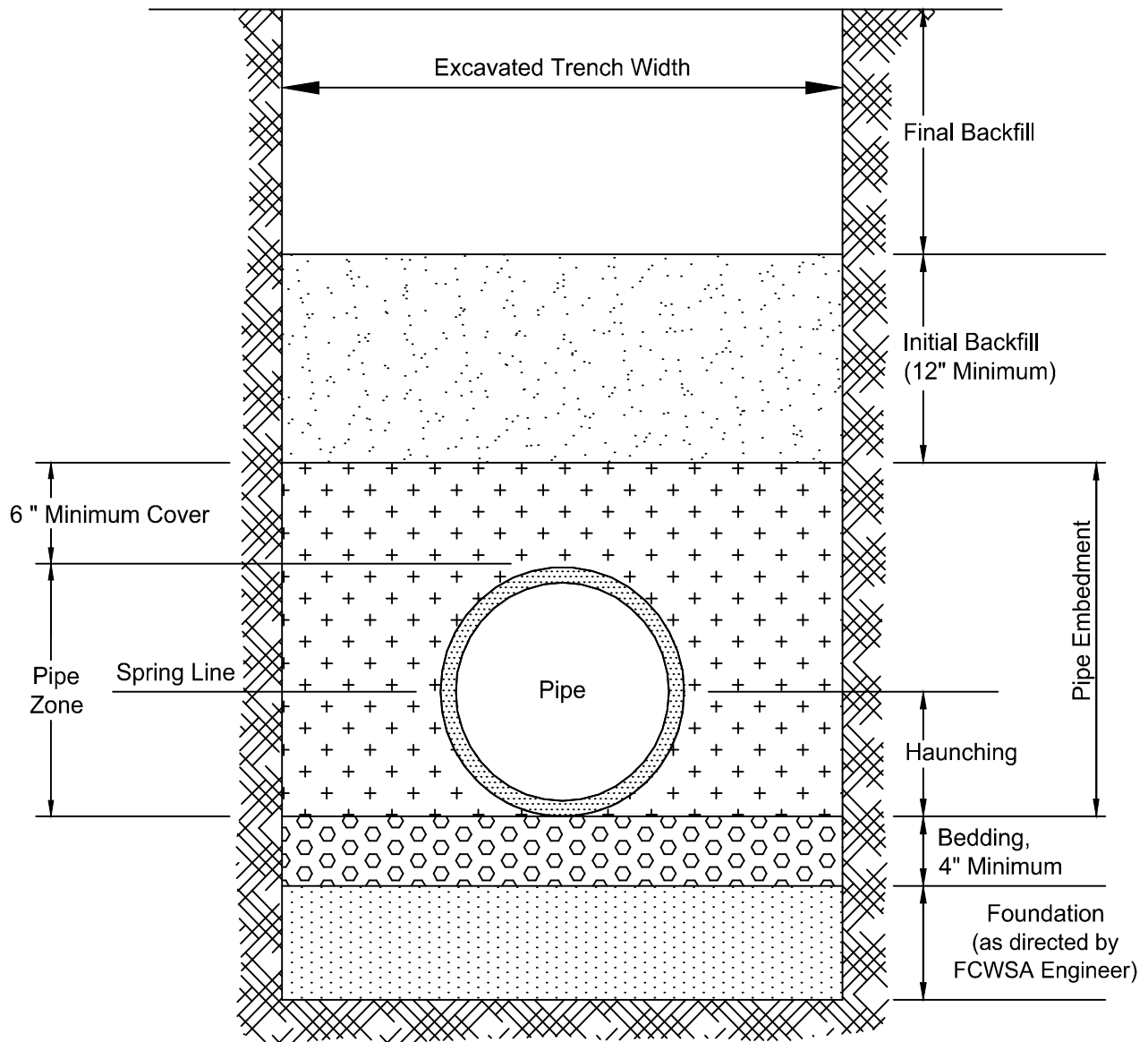


Fauquier County
Water and Sanitation Authority

Buttresses for
11-1/4°, 22-1/2° & 45° Lower Vertical Bends

Not to Scale

Revised: 03/31/05



Notes:

- 1) Pipe bedding shall be crushed stone not larger than 3/4 inch.
- 2) Pipe embedment shall be crushed stone not larger than 3/4 inch, or loose soil free of stones larger than 1 inch in their greatest dimension.
- 3) Initial backfill shall be loose soil free of foreign materials, frozen soil and stones larger than 3 inches in their greatest dimension.
- 4) Final backfill shall be loose soil free of foreign materials, frozen soil, and stones larger than 8 inches in their greatest dimension.
- 5) The top 6" (to finished grade) of final backfill shall meet the requirements for Initial Backfill.
- 6) Installation of DIP shall, in addition to the above, conform to ANSI/AWWA C600-99.

G-01

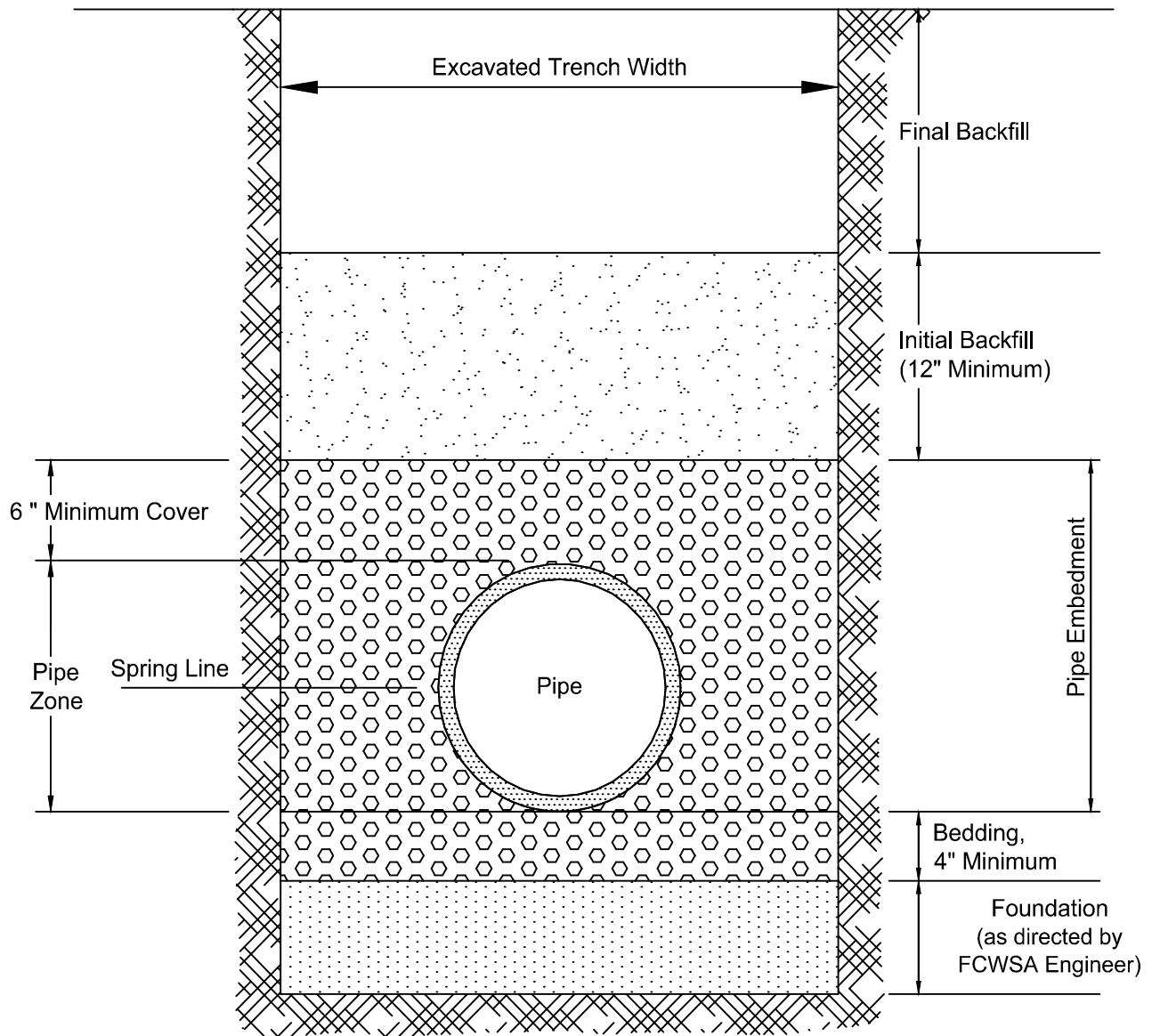


Fauquier County
Water and Sanitation Authority

Pipe Embedment and Backfill
for Ductile Iron Pipe

Not to Scale

Revised: 03/31/05



Notes:

- 1) Pipe bedding and embedment shall be crushed stone not larger than 3/4 inch.
- 2) Initial backfill shall be loose soil free of foreign materials, frozen soil and stones larger than 3 inches in their greatest dimension.
- 3) Final backfill shall be loose soil free of foreign materials, frozen soil, and stones larger than 8 inches in their greatest dimension.
- 4) The top 6" (to finished grade) of final backfill shall meet the requirements for Initial Backfill.
- 5) Installation of plastic pipe shall, in addition to the above, conform to ANSI/AWWA C605-94.

G-02

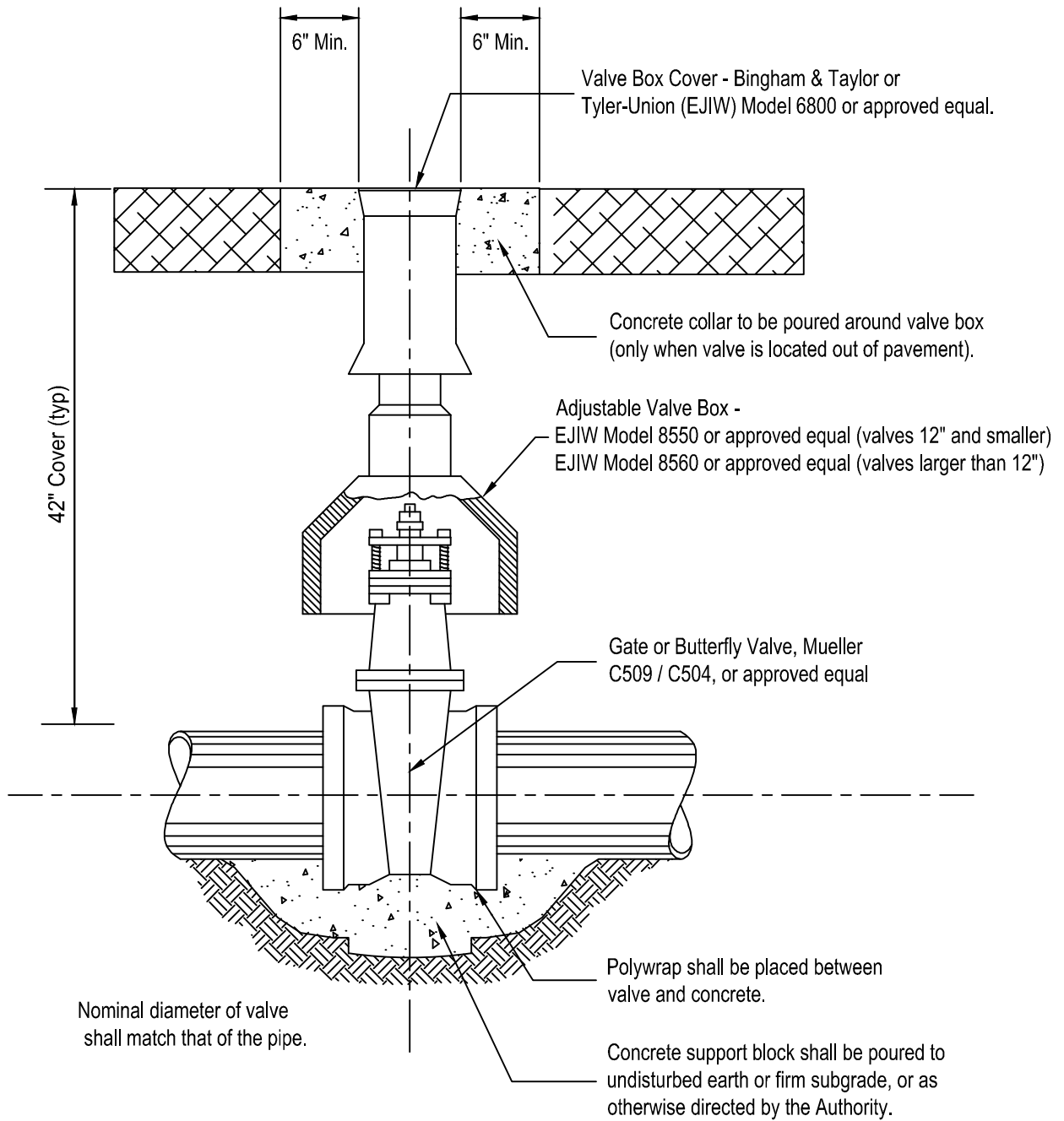


Fauquier County
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Pipe Embedment and Backfill
for Plastic Pipe

Not to Scale

Revised: 03/31/05



G-03

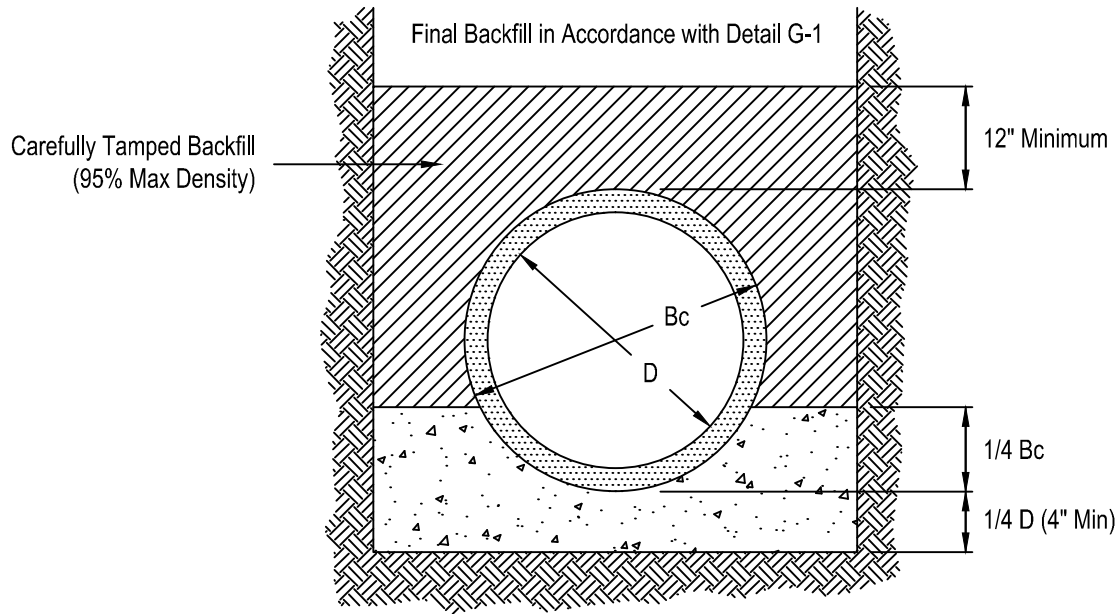


Fauquier County
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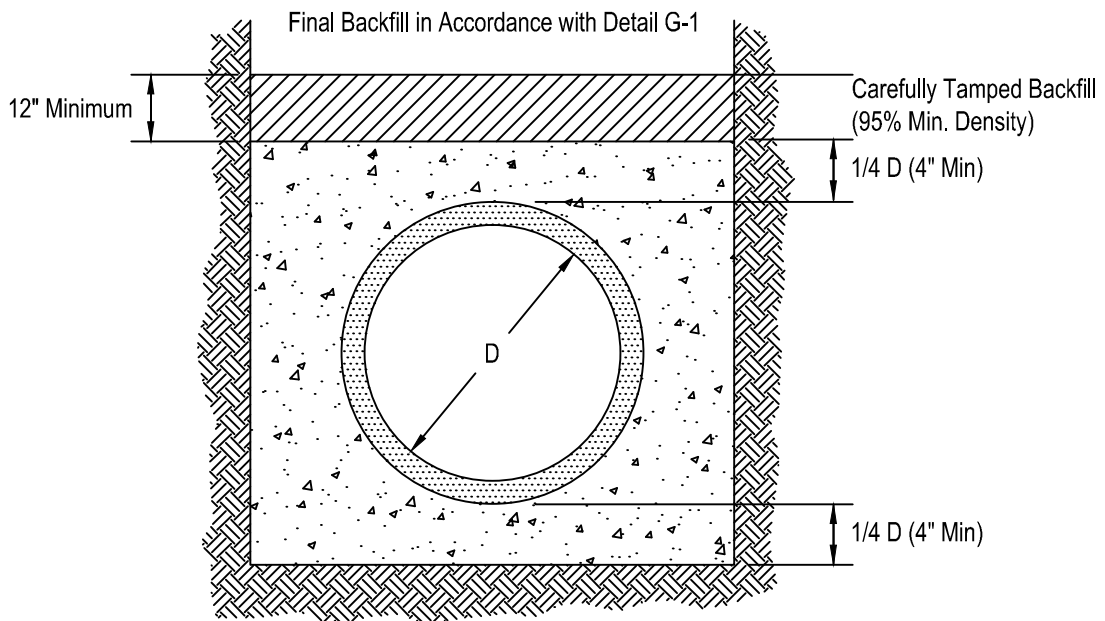
Typical Gate Valve and Valve Box

Not to Scale

Revised: 04/02/2010



Standard Concrete Cradle



Standard Concrete Encasement

Concrete Cradle and Encasement Notes:

- 1) Concrete to be class "B" unless otherwise specified.
- 2) Trench width shall be as Specified in the USM or as shown on plans.
- 3) Reinforcing shall be provided as directed by the Authority Engineer or Inspector.

G-04

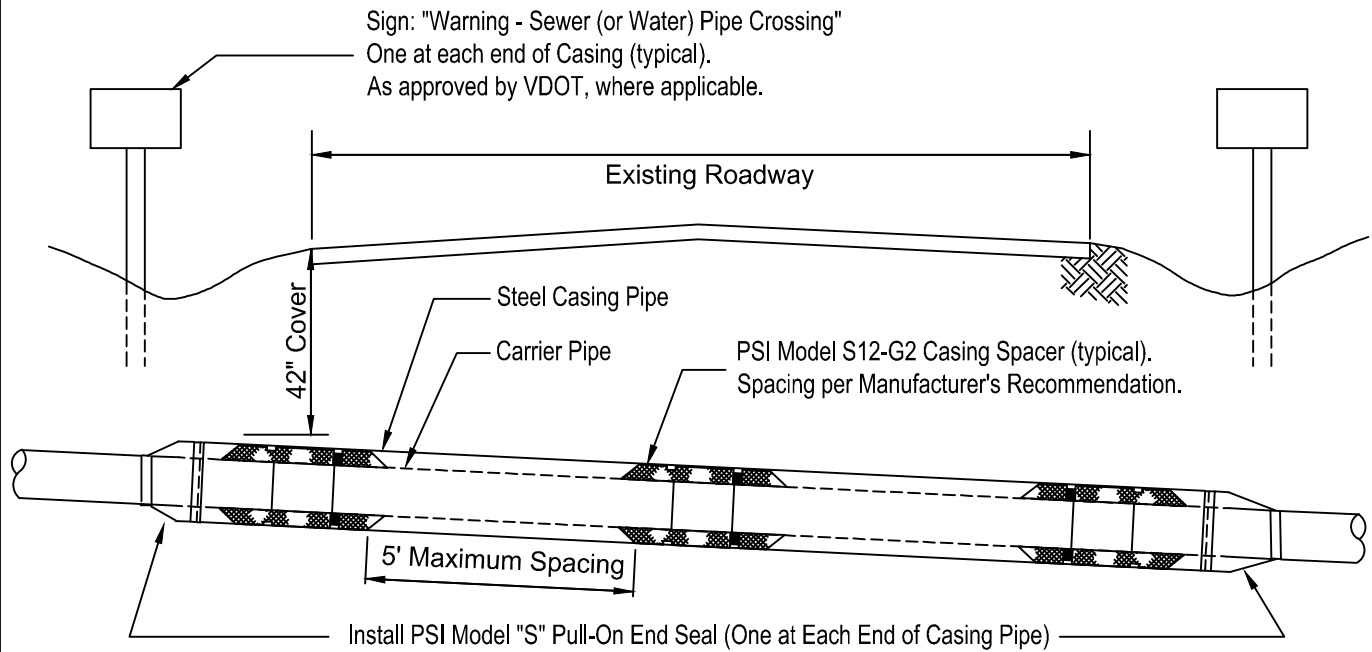


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Standard Concrete Cradle and Encasement

Not to Scale

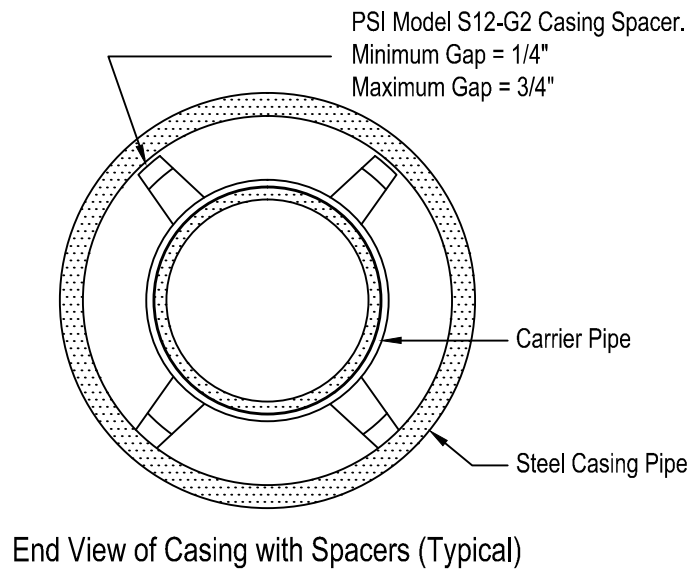
Revised: 03/31/05



Notes:

- 1) Neat grout or sand will be pumped into the void between the carrier and the casing pipe at the direction of the Authority Engineer or Inspector.
- 2) All carrier pipe shall be restrained joint ductile iron and shall be pushed through the casing.
- 3) Casing spacers shall be sized to center the carrier pipe within the casing. Casing spacers shall be PSI Model S12-G2 or approved equal.
- 4) The number of casing spacers required will vary depending upon pipe sizes. Follow manufacturers recommendation.
- 5) The gap between any casing spacer and the inside of the casing pipe shall be minimum 1/4" and maximum 3/4".
- 6) Casing end seals shall be PSI Model "S" or approved equal.
- 7) See plans for length of casing pipe (adjust in field as directed by Authority Inspector).

Carrier Pipe	Casing Pipe	
	Minimum Casing Pipe O.D.	Minimum Casing Thickness
		Cover up to 15'
4	14	3/8"
6	16	3/8"
8	18	3/8"
10	18	3/8"
12	24	3/8"
14	24	3/8"
16	30	3/8"
18	30	3/8"
20	30	3/8"
24	36	3/8"
30	42	7/16"
36	48	7/16"
42	54	7/16"
48	60	7/16"



G-05



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Water and Sanitation Authority

**Steel Casing
Detail**

Not to Scale

Revised: 03/31/05

Sanitary Sewer Design Table

Description			Flow Determination						Sewer Design, Manning's n=0.13														
			Manhole Number From	Units		GPD per Unit	Domestic Flows (mgd)			Industrial Flow (mgd)	Total Peak Flow (mgd)	Length (ft)	Slope %	Pipe Diameter (in)	at d/D = 0.80		at Peak Flow		Drop in Manhole (ft)		Invert Elevation		
To	Incr.	Total		Average Flow	Peaking Factor		Peak Flow	Capacity MGD	Velocity FPS						Depth (in)	Velocity (fps)	Upper End	Lower End					

G-06

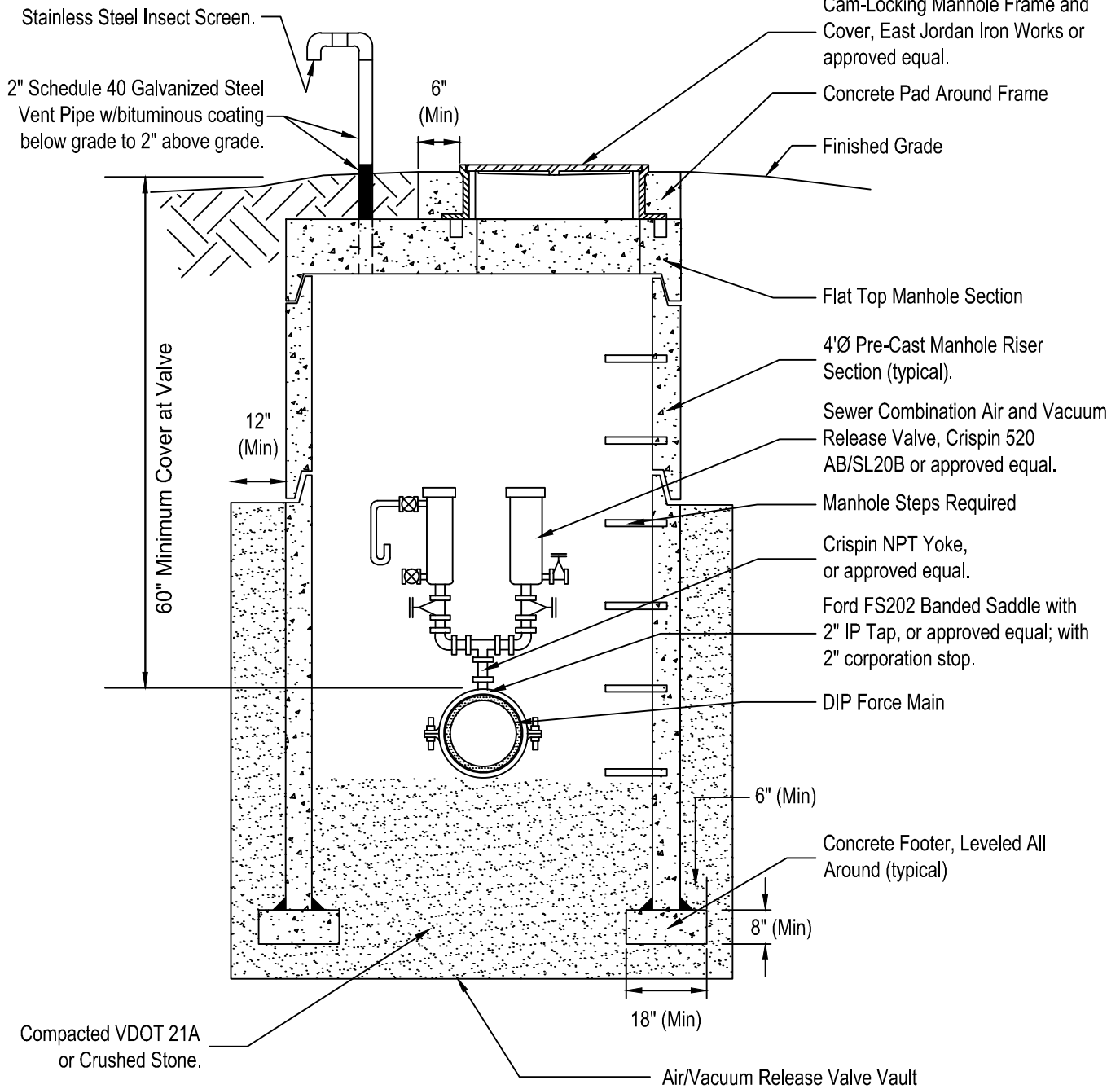


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Sanitary Sewer Design Calculation Sheet

Not to Scale

Revised: 03/31/05



Note:
 See Manhole Detail in USM for Manhole
 Components not detailed here.

SC-01



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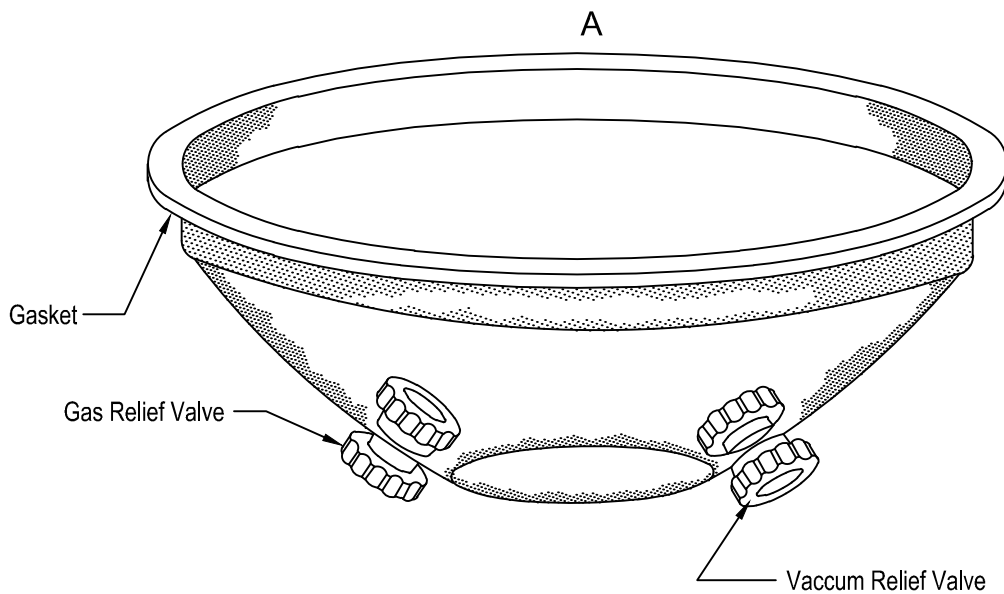
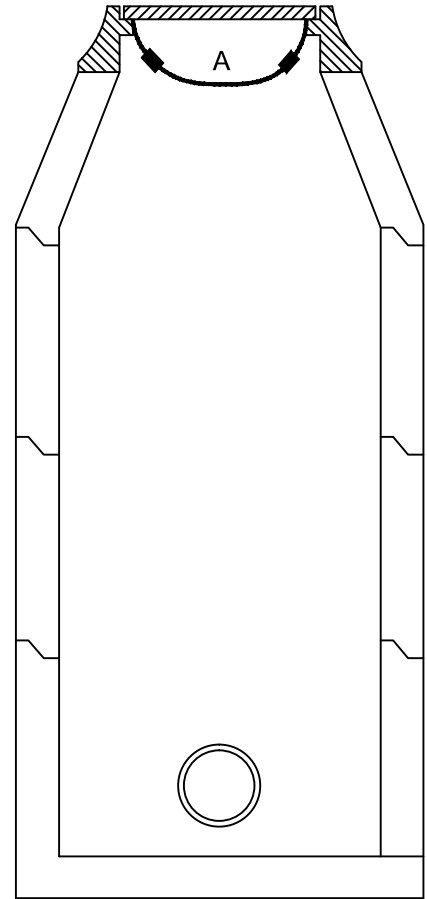
Combination Air/Vacuum Release Valve for Sewage Force Main

Not to Scale

Revised: 05/16/07

Notes:

- 1) The manhole insert shall be constructed of non-corrodable materials which will not be damaged by sewer gases or road oil.
- 2) Both the gas relief and the vacuum relief valves shall be self-cleaning and made of non-corrodable materials.
- 3) The gas relief valve shall be automatically activated at a pressure differential of approx. 2.25 psi.
- 4) The vacuum relief valve shall be automatically activated at a pressure differential of approx. 2.25 psi.
- 5) A properly fitted rubber gasket shall be installed under the lip of the insert to insure a tight seal between the insert and the manhole frame.
- 6) The insert shall be deep enough to prevent the manhole cover from coming into contact with the valves when the manhole cover is removed or installed.
- 7) The insert shall be designed to restrict inflow to no more than 1 gal. in 24 hrs.



SC-02

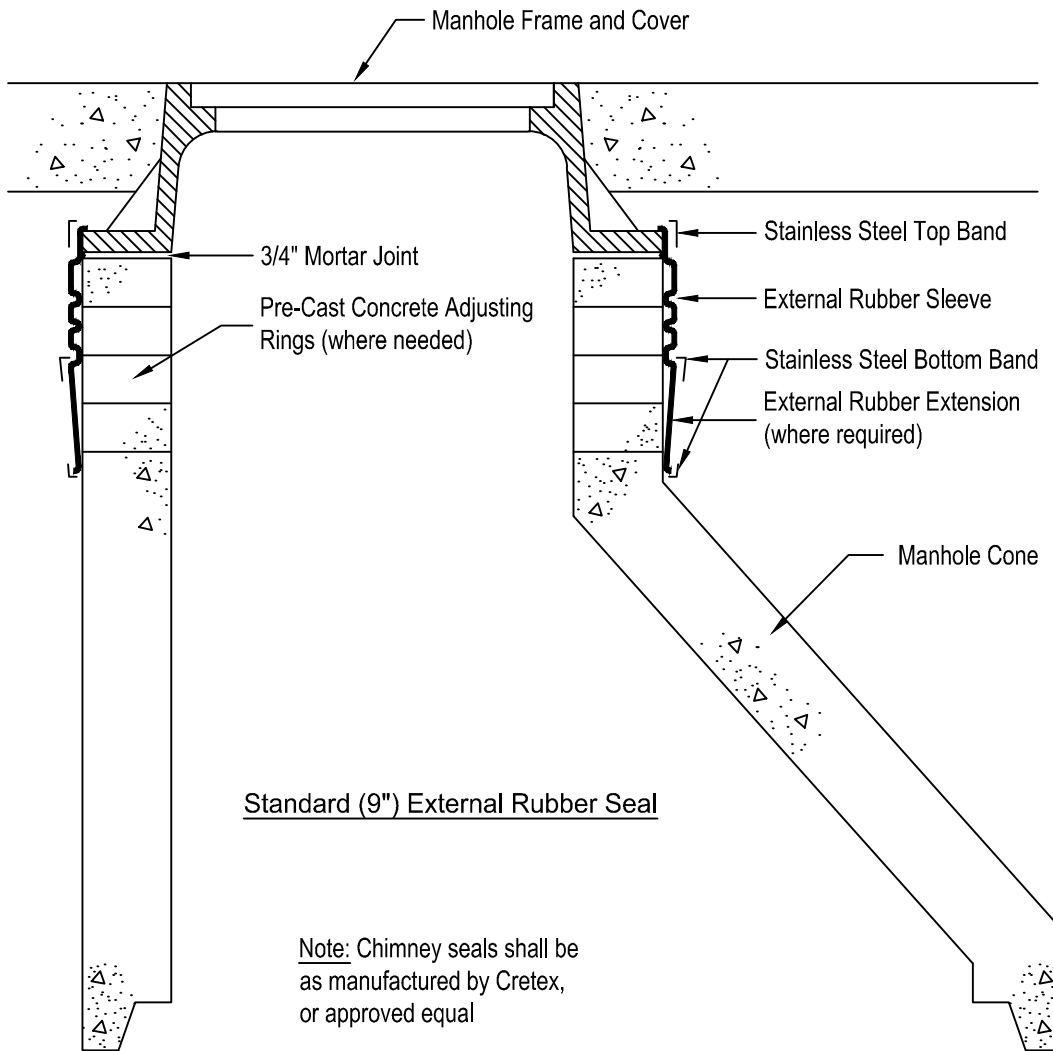


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Waterproof
Manhole Insert

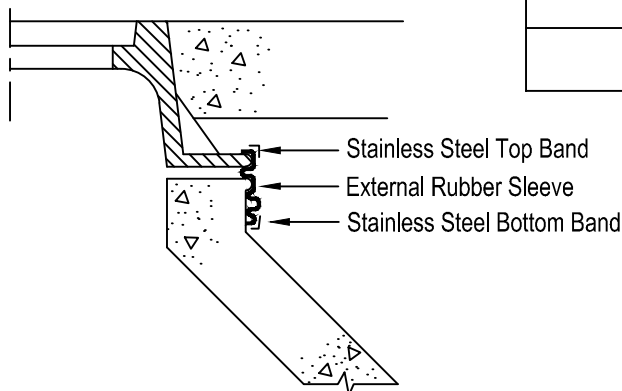
Not to Scale

Revised: 03/31/05



Chimney Height to be Spanned	Items Required
0 - 3"	Narrow (6") Seal only
> 3" - 6-1/2"	Standard (9") Seal only
> 6-1/2" - 12"	Standard (9") Seal + Extension
> 12"	Standard (9") Seal + Multiple Extensions

Narrow (6") External Rubber Seal



SC-03

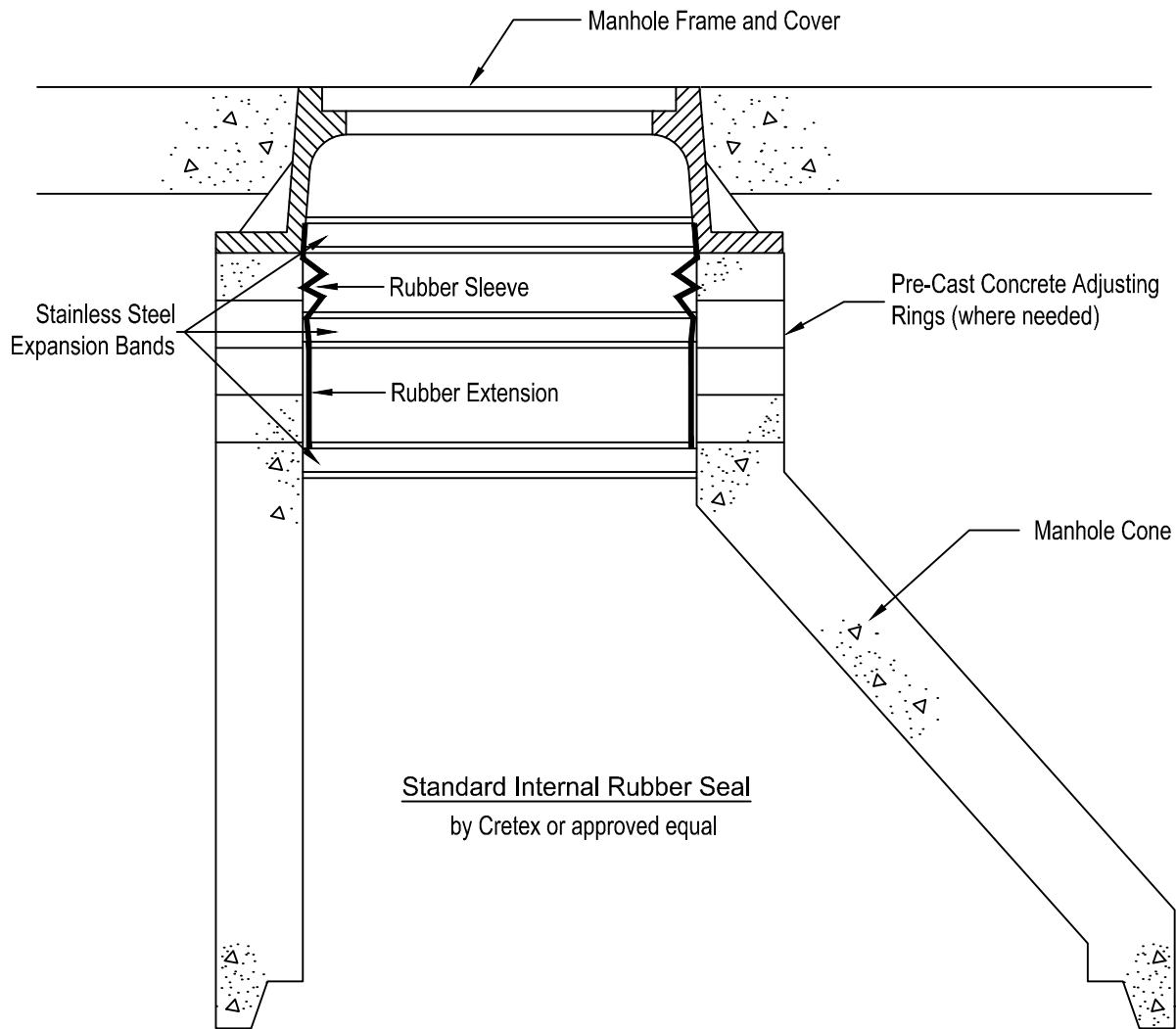


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External Manhole Chimney Seal

Not to Scale

Revised: 03/31/05



Note: Chimney seals shall be as manufactured by Cretex, or approved equal

Chimney Height to be Spanned	Items Required
0 - 4-1/2"	Chimney Seal Only
> 4-1/2" - 9"	Seal + 7" Extension
> 9" - 12"	Seal + 10" Extension
> 12"	Seal + Multiple Extensions (as Needed)

SC-04



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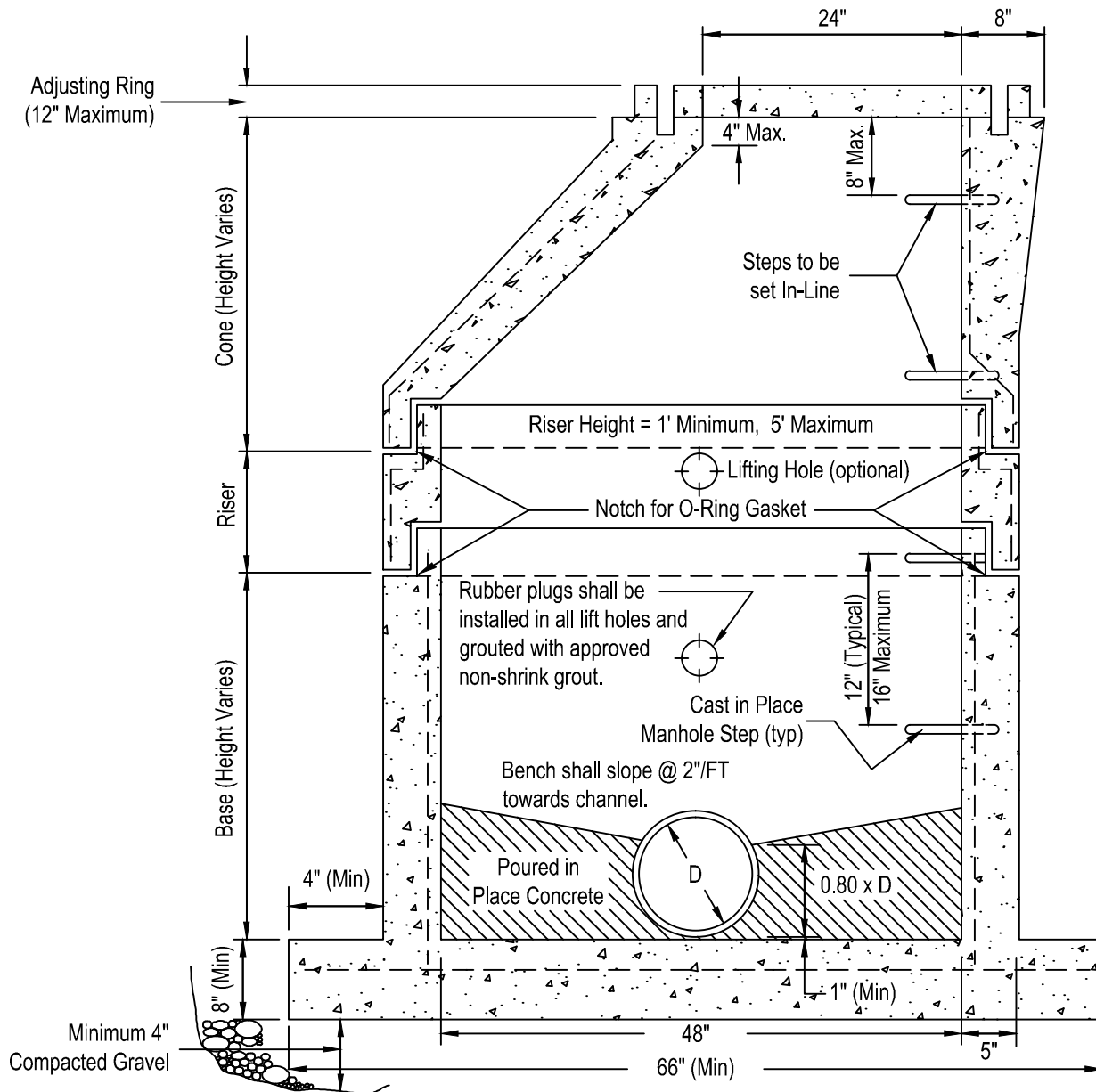
Internal Manhole Chimney Seal

Not to Scale

Revised: 03/31/05

Notes:

- 1) All manholes shall meet the current requirements of ASTM Specification C-476.
- 2) Concrete to be 4000 psi minimum compressive strength.
- 3) All reinforcing steel shall meet the current requirements of ASTM Specification A-615.
- 4) Tapered joint with O-Ring gasket shall meet the current requirements of ASTM Specifications C-361 & C-443.
- 5) Approved flexible joint shall be used on all pipe connections to manholes. Installation shall be in accordance with manufacturer's specifications.
- 6) 301 Mastic or approved equal shall be used in addition to the joint specified.
- 7) The entire exterior of the manhole shall be coated with 16 Mils DFT of Kop Coat 300M or approved equal. Coating may be applied at the factory, but any gouges and/or bare spots shall be touched-up before backfilling.



SC-05



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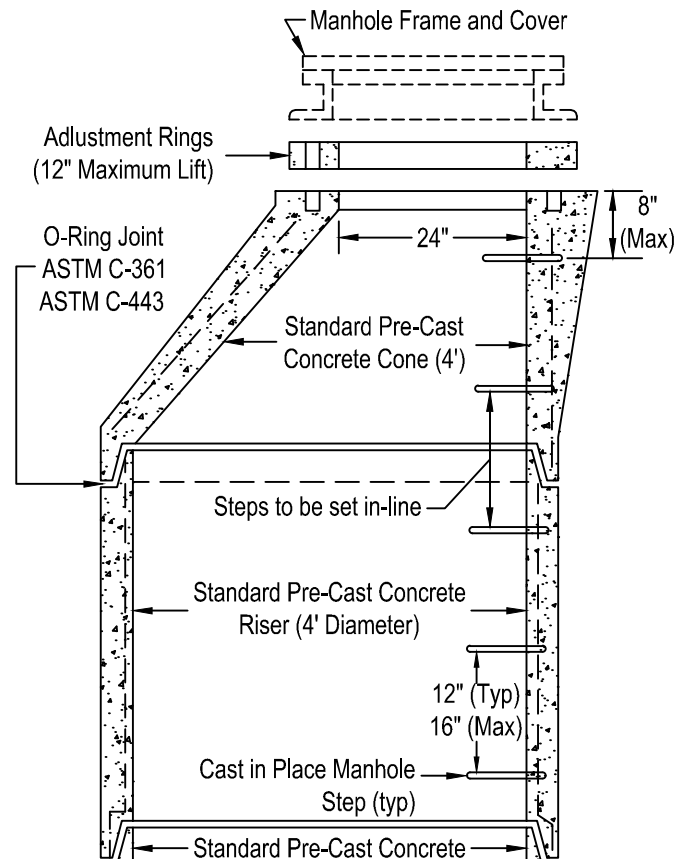
**Standard 4' ID Precast
Concrete Manhole**

Not to Scale

Revised: 03/31/05

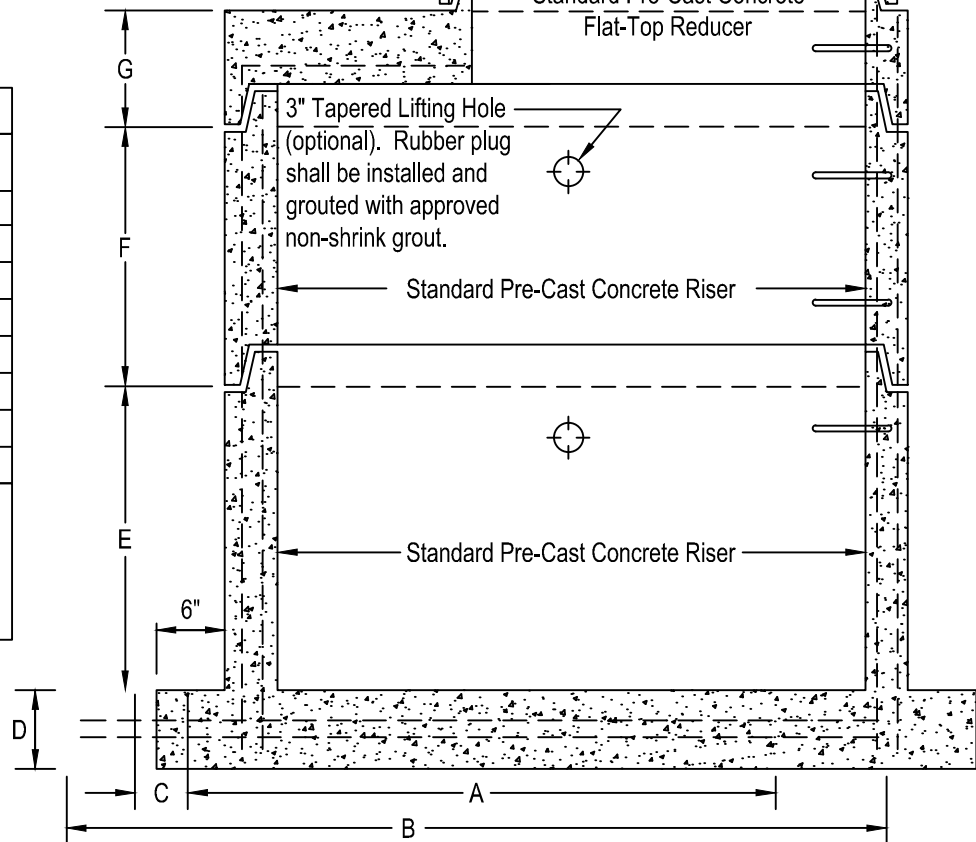
Notes:

- 1) All manholes shall meet the requirements of ASTM Specification C-478.
- 2) Concrete shall be minimum 4000 psi compressive strength.
- 3) All reinforcing steel shall meet the requirements of ASTM Specification A-615.
- 4) Tapered joint with O-Ring gasket shall meet the current requirements of ASTM Specifications C-361 & C-343.
- 5) 301 Mastic or approved equal shall be used in addition to the joint specified.
- 6) Approved flexible joint shall be used on all pipe connections to manholes. Installation shall be in accordance with manufacturer's specifications.
- 7) A minimum 6" of compacted gravel shall be placed under the base section of the manhole.
- 8) The entire exterior of the manhole shall be coated with 16 Mil DFT of Kop Coat 300M or approved equal. Coating may be applied at the factory, but any gouges and/or bare spots shall be touched-up before backfilling.
- 9) Manholes shall be designed and constructed in accordance with the Dimension Table below.



Dimension Table		
Manhole Diameter (ft) *		
5'		
6'		
Dimension (from drawing at right)	A	60" 72"
	B	84" 98"
	C	6" 7"
	D	8" 8"
	E	Varies
	F	Varies
	G	13" min.

* Note: Manholes greater than 6' in diameter require a detailed design, which shall be included on the construction plans and profiles.



SC-06



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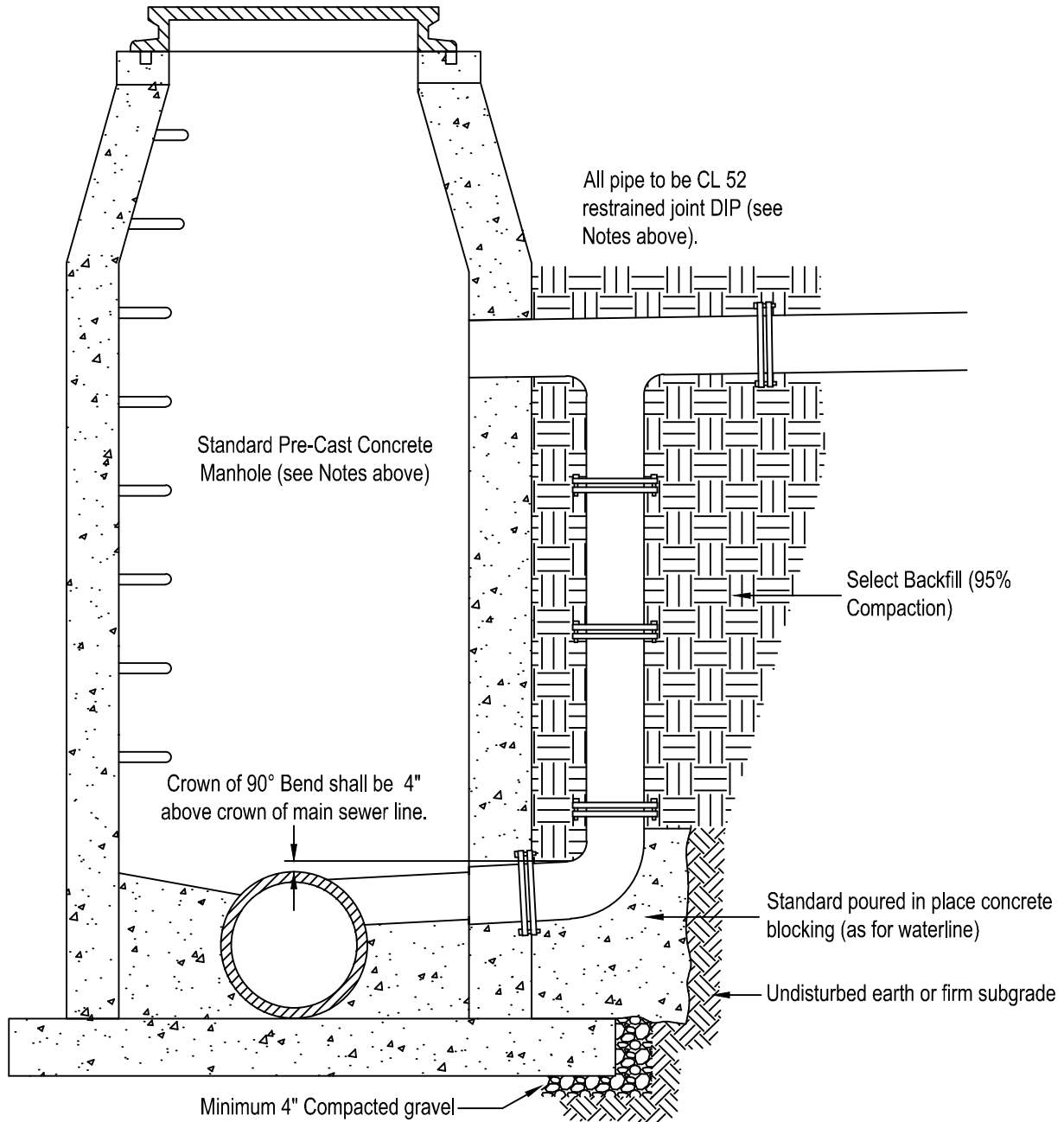
Typical 5' and 6' Diameter Pre-Cast
Concrete Manhole with 4' Stack

Not to Scale

Revised: 03/31/05

Notes:

- 1) See appropriate details for pre-cast concrete manhole construction requirements.
- 2) All piping for outside drop shall be constructed of Class 52 Ductile Iron Pipe with Mega-Lug restraints, including both sides of tee and 90° bend.
- 3) All piping shall be DIP Class 52 along the run leading to the manhole with outside drop.
- 4) Concrete blocking for 90° bend shall meet the specifications for water line blocking (see appropriate detail).



SC-07



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Typical 4' Manhole with Outside Drop Connection

Not to Scale

Revised: 03/31/05