



JCSUD

JOHNSON COUNTY
SPECIAL UTILITY DISTRICT

Standard Water Details

October 2024



The following design drawings are intended to aid Johnson County Special Utility District (JCSUD) in arriving at a uniform design for the construction of water and wastewater utilities in the JCSUD service area. In most cases, there are circumstances that will be considered should the designer see a need to vary from these standards. Request for variances from these standards shall be presented to JCSUD for consideration. Variance consideration by JCSUD does not constitute or guarantee acceptance or approval.

Reviewed & Approved By:

A handwritten signature in blue ink, appearing to read 'Tyler Lyles', written over a horizontal line.

Tyler Lyles
Water Operations Manager

A handwritten signature in blue ink, appearing to read 'James Lyles', written over a horizontal line.

James Lyles
Wastewater Operations Manager

A handwritten signature in blue ink, appearing to read 'Dana Collier', written over a horizontal line.

Dana Collier
Deputy General Manager
System Development & Operations

A handwritten signature in blue ink, appearing to read 'Jeremiah Bihi', written over a horizontal line.

Jeremiah Bihi, P.E.
District Engineer

Revisions

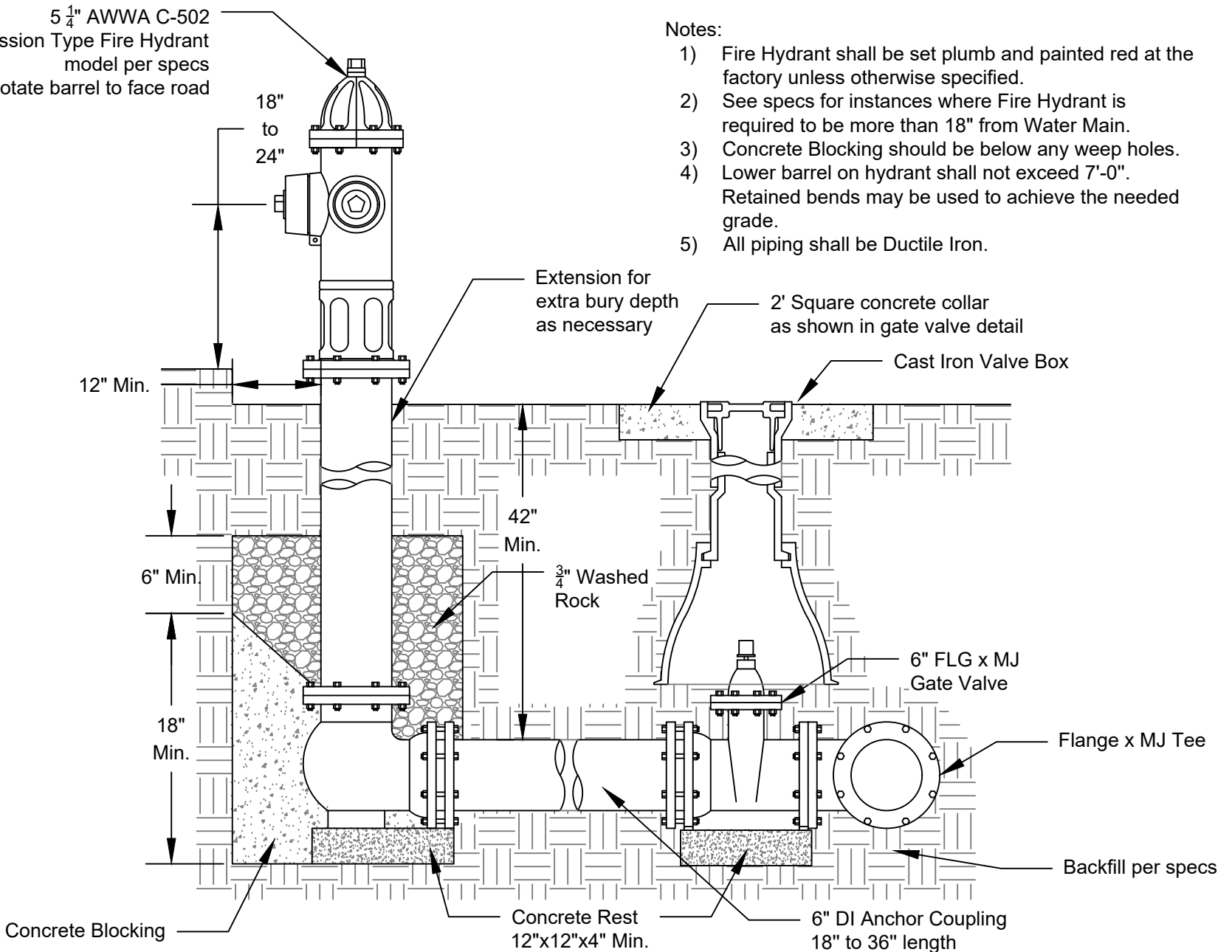
<u>Date</u>	<u>Revision</u>
01/12/2023	VL-303 & VL-304 Added
02/28/2023	SV-100 Amended
05/03/2023	VL-202 Added
05/15/2023	VL-200 & VL-201 Amended
10/18/2023	Large scale wording update & VL-301 Amended
10/25/2024	VL-303 Ductile Iron Req.
10/31/2024	FH-100 Renamed Flange x MJ Tee

Standard Water Details

<u>Sheet ID</u>	<u>Detail Name</u>
FH-100	Standard Fire Hydrant
SV-100	Standard Meter - Short Service
SV-101	2" Non-Standard Meter - Short Service
SV-102	Standard Meter - Long Service
SV-103	Standard Dual Meter Service
SV-200	Parkway Service
SV-300	Cul-De-Sac Main Line Deflection
TB-100	Straight Thrust block
TB-101	11.25 Thrust block
TB-102	22.5 Thrust block
TB-103	30 Thrust block
TB-104	45 Thrust block
TB-105	67.5 Thrust block
TB-106	90 Thrust block
TB-200	Vertical Thrust block
TR-100	Trench and Backfill
TR-101	Backfill and Pavement Repair
TR-102	Concrete Encasement
TR-200	Markers
TR-201	State Highway Crossing
TR-202	County Road Crossing
TR-203	Pipeline Crossing
TR-300	Step Down After Tie-in

VL-100	Gate Valve
VL-200	Automatic Flush Valve Assembly
VL-201	Automatic Flush Valve Side Profile
VL-202	Sampling Station Side Profile
VL-300	Air Relief Valve
VL-301	Blow-Off Valve
VL-302	Backflow Prevention Assembly
VL-303	Pressure Reducing Valve 6" and Greater
VL-304	Pressure Reducing Valve Smaller than 6"

5 1/4" AWWA C-502
 Compression Type Fire Hydrant
 model per specs
 Rotate barrel to face road



- Notes:
- 1) Fire Hydrant shall be set plumb and painted red at the factory unless otherwise specified.
 - 2) See specs for instances where Fire Hydrant is required to be more than 18" from Water Main.
 - 3) Concrete Blocking should be below any weep holes.
 - 4) Lower barrel on hydrant shall not exceed 7'-0". Retained bends may be used to achieve the needed grade.
 - 5) All piping shall be Ductile Iron.

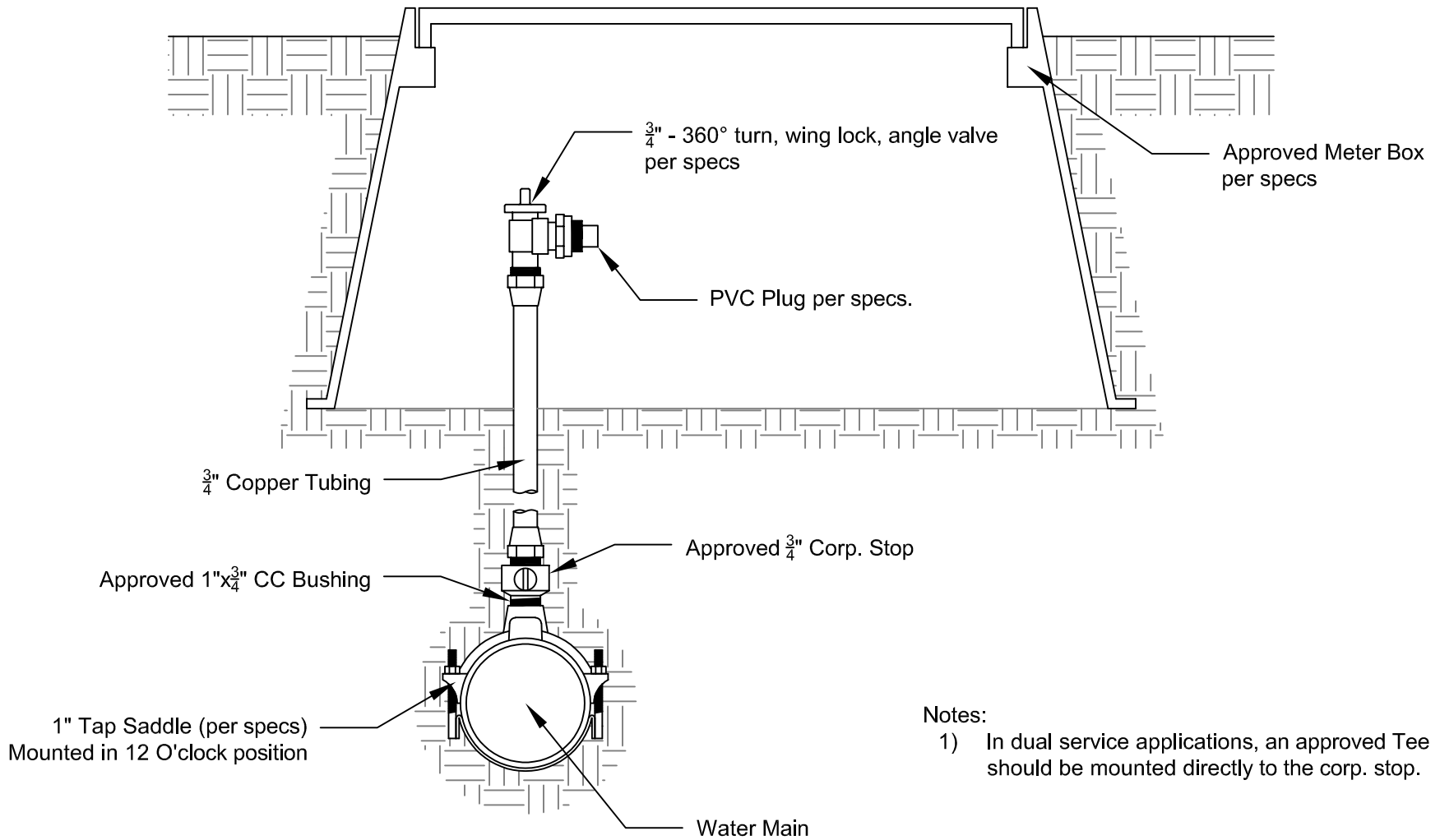


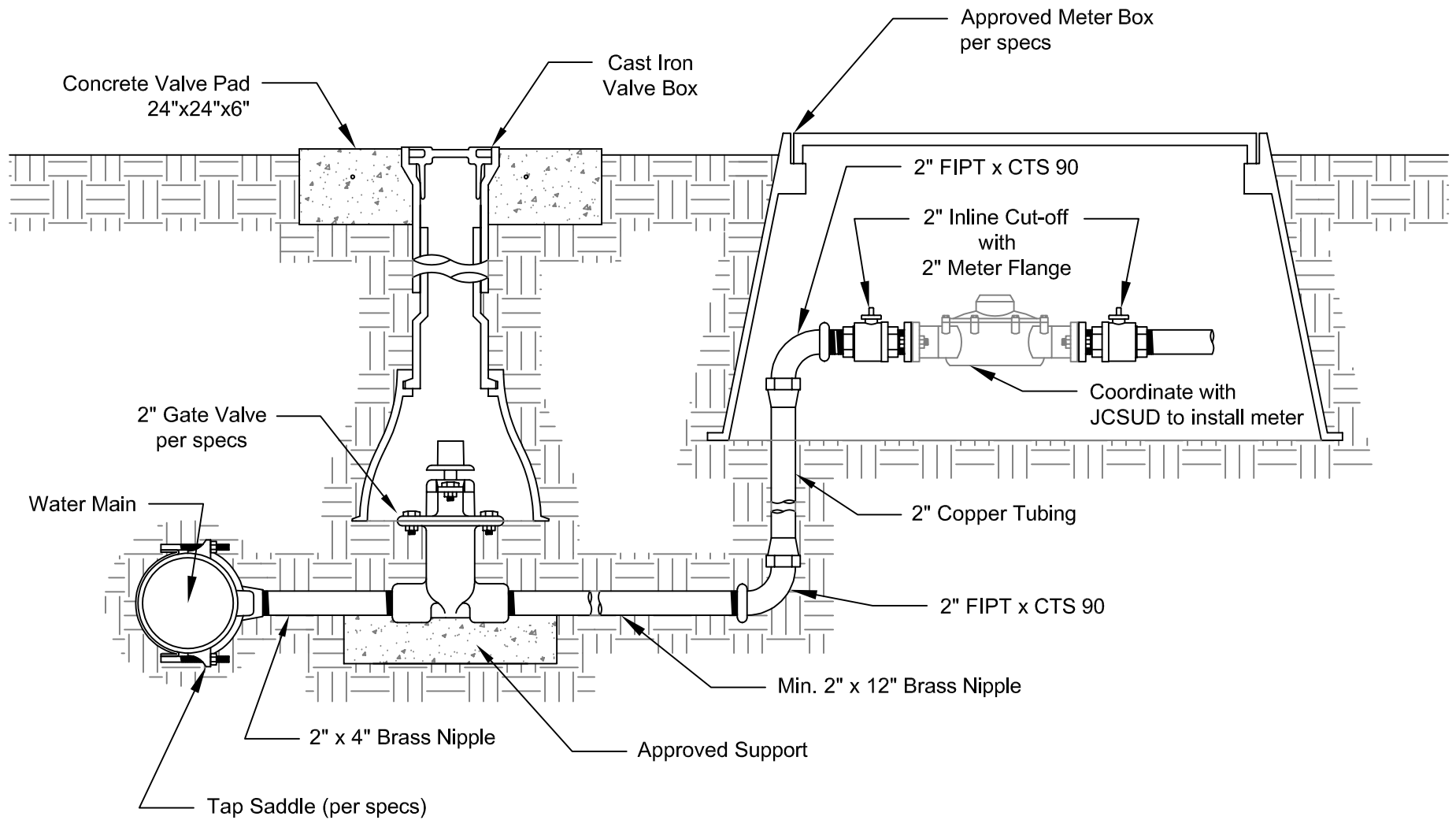
Standard Fire Hydrant

Standard Detail

Not To Scale

FH-100



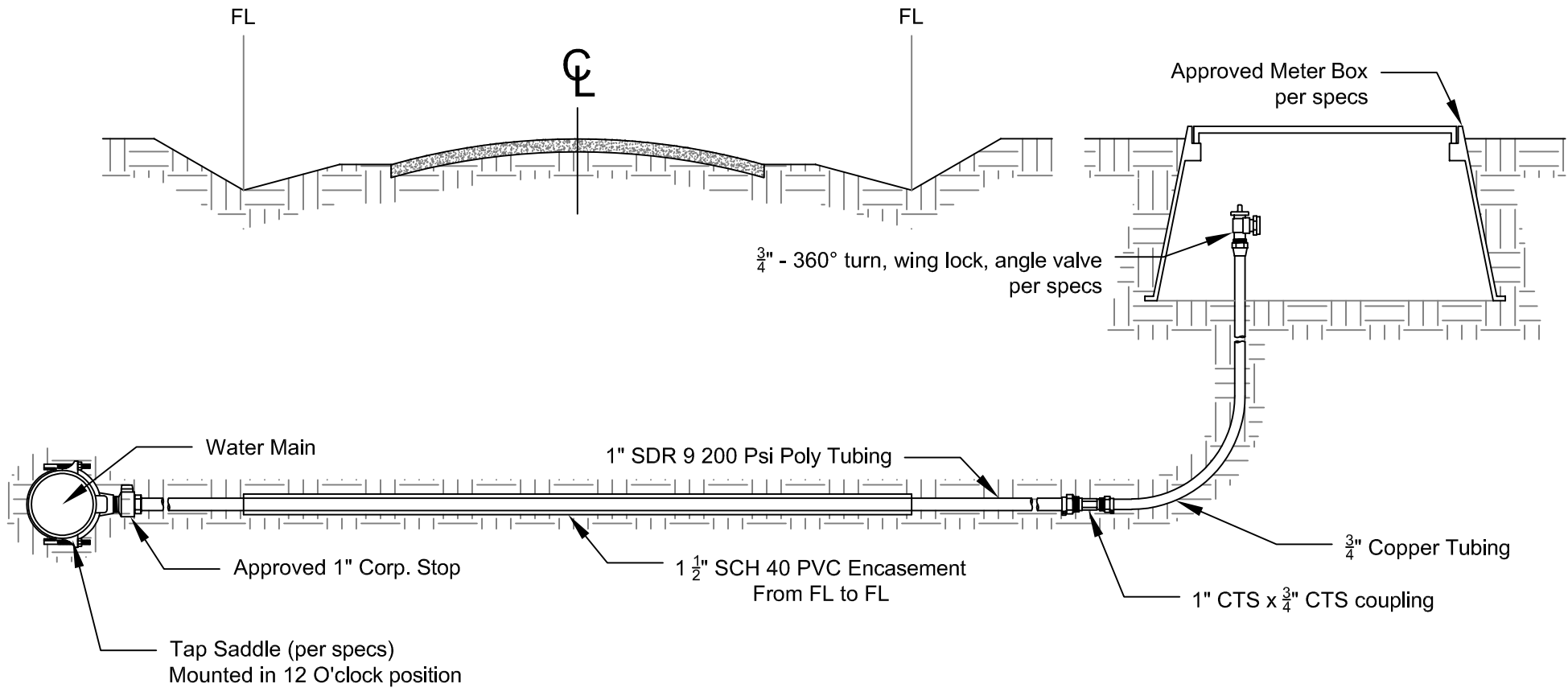


2" Non-Standard Meter - Short Service

Standard Detail

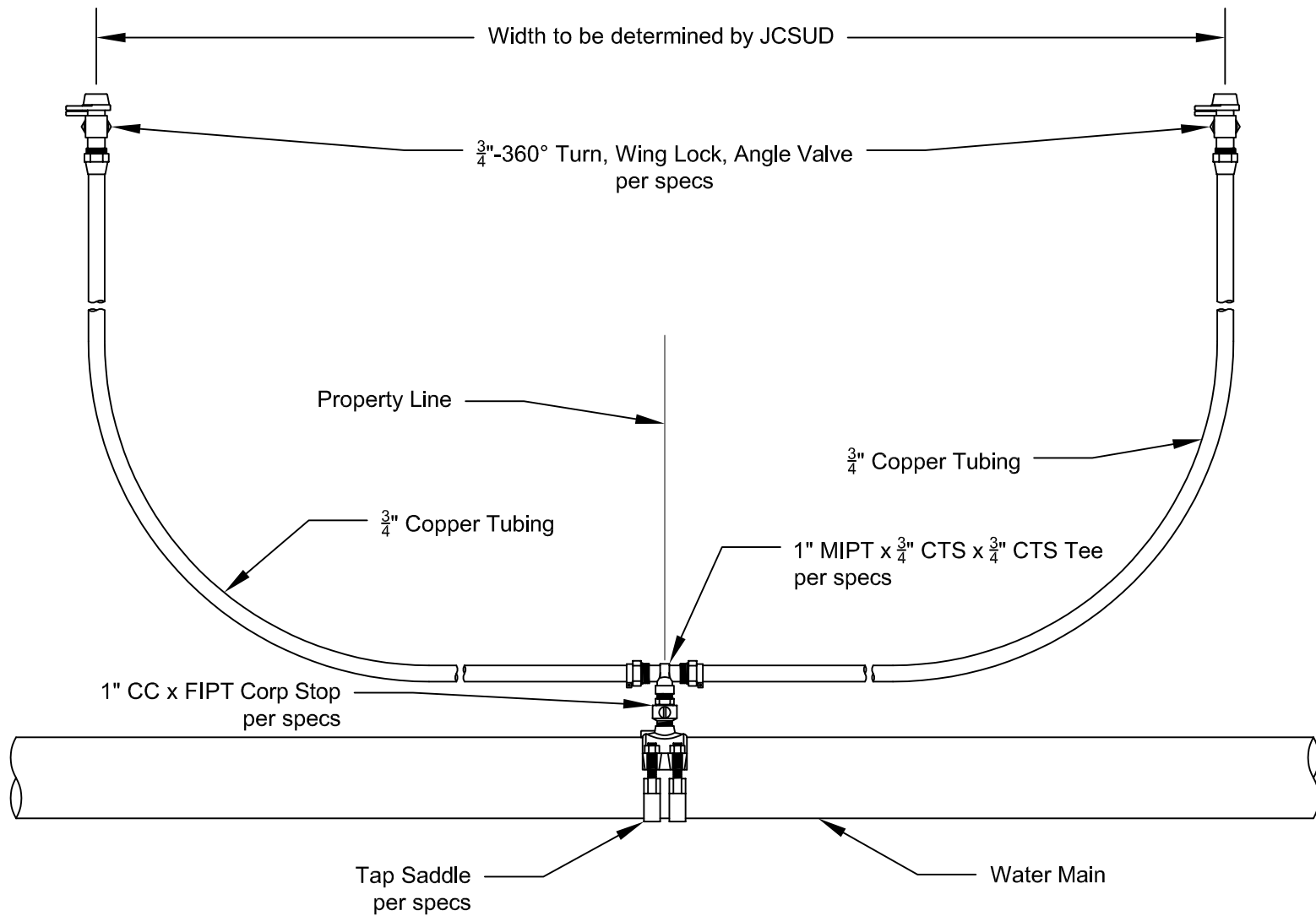
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SV-101



Notes:

- 1) In dual service applications, an approved Tee should replace coupling, see Dual Meter Service Specs.

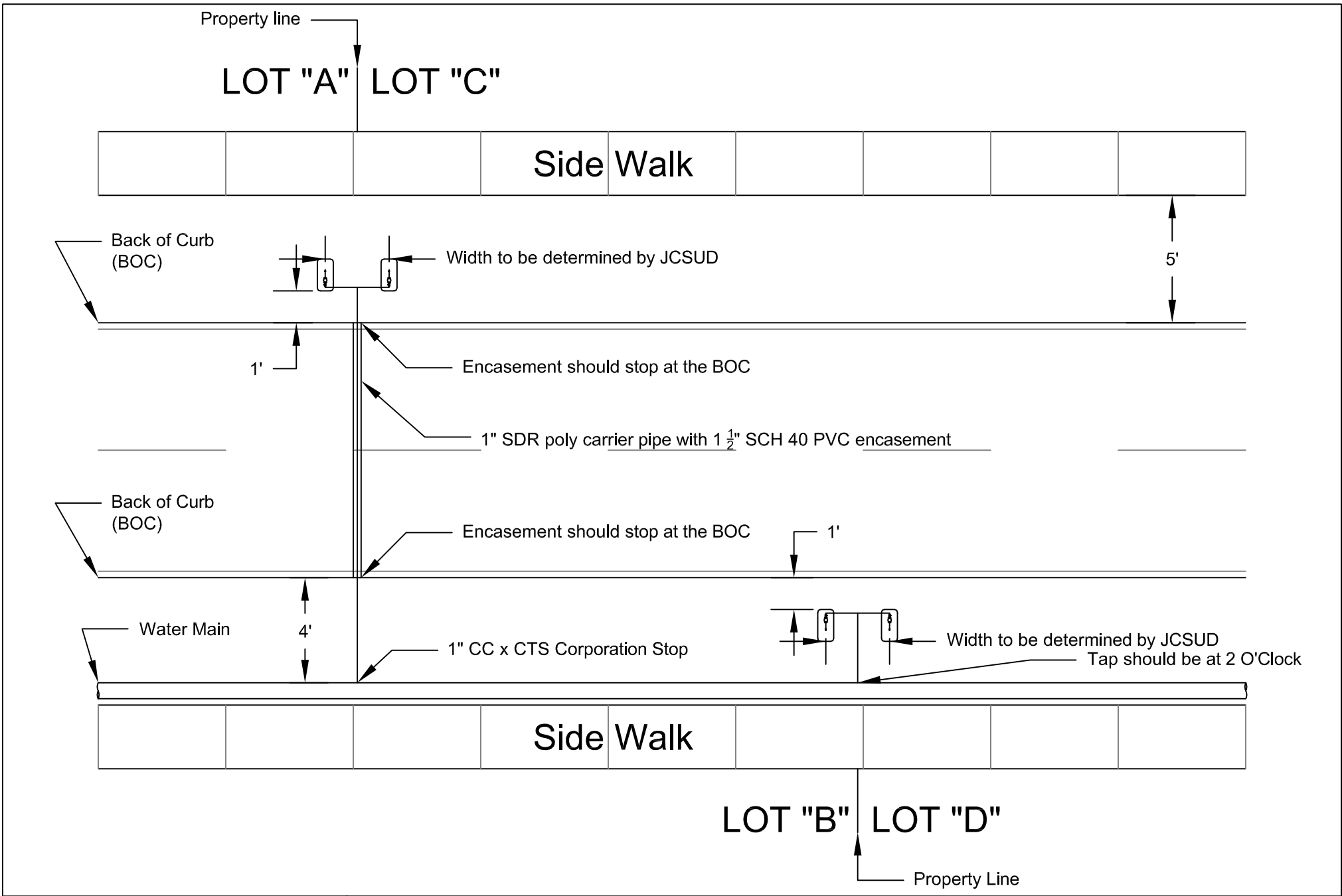


Standard Dual Meter Service

Standard Detail

Not To Scale

SV-103

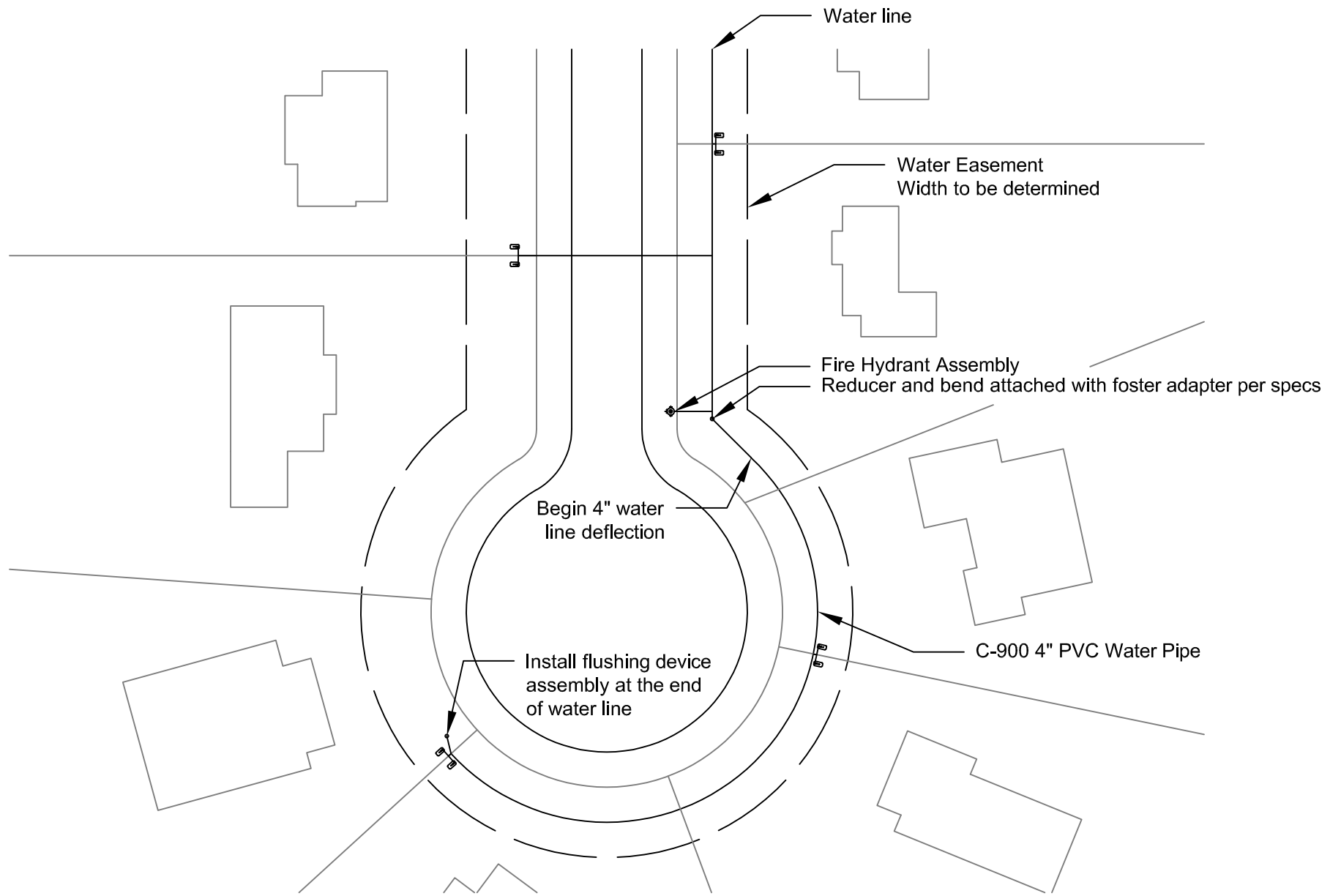


Parkway Service

Standard Detail

Not To Scale

SV-200

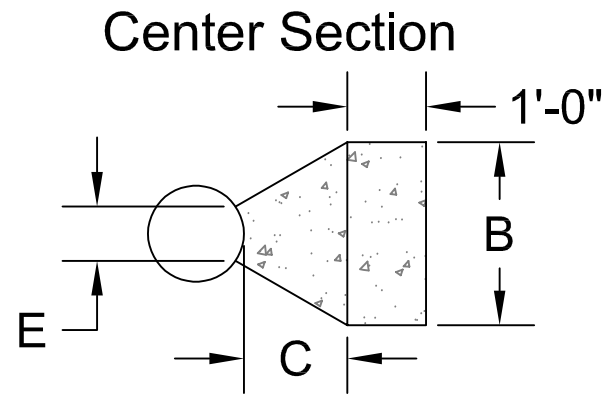
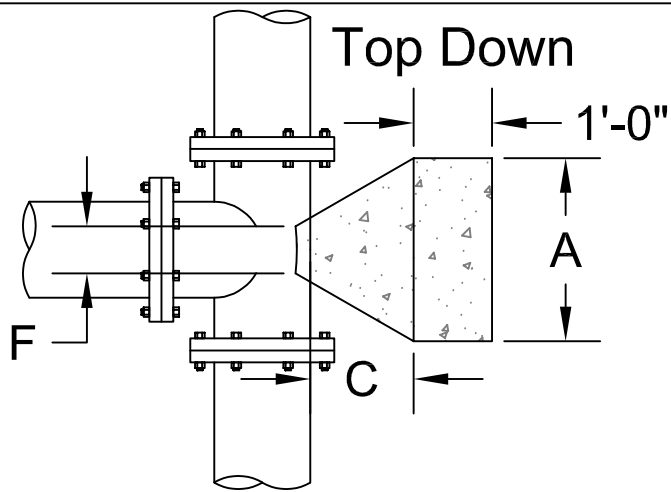


Cul-De-Sac Main Line Deflection

Standard Detail

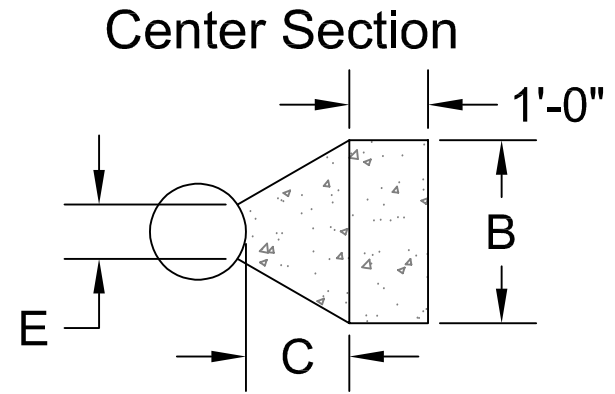
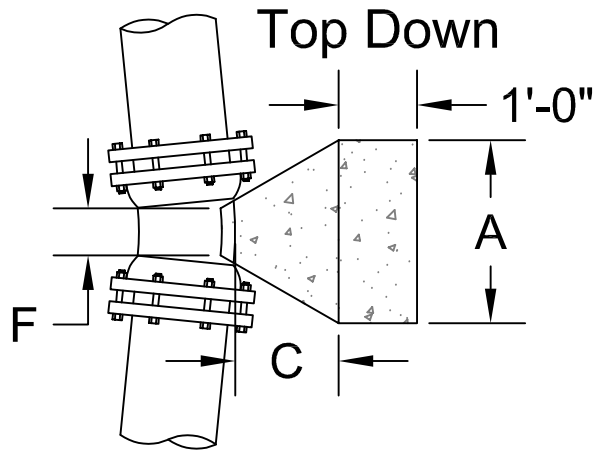
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SV-300



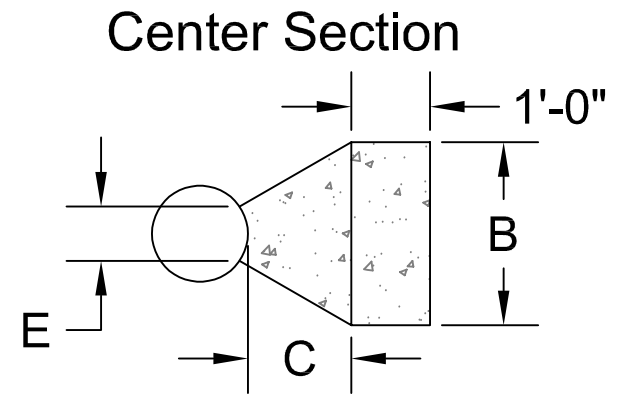
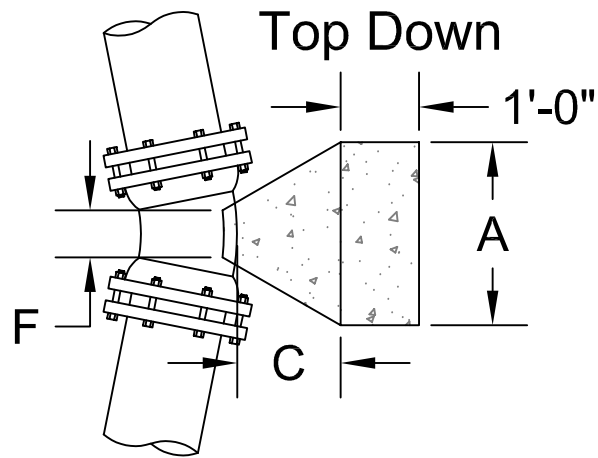
I.D.	Thrust (Tons)	$\Delta = 0$									
		Earth			Rock			C (FT)	D (FT)	E (FT)	F (FT)
		A (FT)	B (FT)	Vol (C.Y.)	A (FT)	B (FT)	Vol (C.Y.)				
4, 6, 8	5.1	2.5	2.5	0.3	2	2	0.2	1.5	0.4	0.4	0.4
10, 12	11.3	3.5	3.5	0.6	2.5	2.5	0.3	1.5	0.5	0.5	0.5
16, 18	25.5	5.5	5.5	1.6	4	4	0.9	2	0.6	0.6	0.6
20	31.5	6	6	1.9	4	4	0.9	2	0.7	0.7	0.7
24	45.2	7	7	3.1	5	5	1.7	2.5	0.9	0.9	0.9
30	53	7.5	7.5	4.1	5.5	5.5	2.4	3	2.9	2.9	2.9
36	76.3	9	9	7.3	6.5	6.5	4.2	4	4.5	4.5	4.5
42	104	10.5	10.5	11	7.5	7.5	6.2	4.5	5	5	5
48	136	12	12	15.6	8.5	8.5	8.7	5	5.5	5.5	5.5
54	172	13.5	13.5	21.4	9.5	9.5	11.9	5.5	6	6	6
60	212	15	15	28.4	10.5	10.5	15.7	6	6.5	6.5	6.5
66	257	16.5	16.5	36.8	11.5	11.5	20.5	6.5	6.8	6.8	6.8
72	305	17.5	17.5	47.2	12.5	12.5	27.2	7.5	7.5	7.5	7.5
78	358	19	19	58.9	13.5	13.5	33.7	8	7.5	7.5	7.5
84	416	20.5	20.5	72.3	14.5	14.5	41.2	8.5	8	8	8
90	477	22	22	87.7	15.5	15.5	49.7	9	8.5	8.5	8.5
96	543	23.5	23.5	104.8	16.5	16.5	61	9.5	9	9	9

O.D. (D) is assumed for estimation only



I.D.	$\Delta = 11.25$										
	Thrust (Tons)	Earth			Rock			C (FT)	D (FT)	E (FT)	F (FT)
		A (FT)	B (FT)	Vol (C.Y.)	A (FT)	B (FT)	Vol (C.Y.)				
4, 6, 8	1	1	1.5	0.1	1	1	0.1	1.5	0.4	0.9	0.4
10, 12	2.2	1.5	1.5	0.1	1	1.5	0.1	1.5	0.5	1.2	0.6
16, 18	5	2	2.5	0.3	1.5	2	0.2	1.5	0.6	1.6	0.8
20	6.2	2	3.5	0.4	1.5	3	0.3	1.5	0.7	1.8	0.9
24	8.9	3	3.5	0.5	1.5	3	0.3	1.5	0.9	2.1	1.1
30	10.4	3	3.5	0.6	2	3.5	0.4	1.5	2.9	2.6	1.4
36	15	3.5	4.5	0.9	2	4	0.5	1.5	4.5	3.3	1.7
42	20.4	4.5	5	1.5	2.5	5	0.8	1.8	5	3.8	1.9
48	26.6	4.5	6	2	2.5	6	1.1	2	5.5	4.3	2.2
54	33.7	6	6	3	3	6	1.4	2.3	6	4.8	2.5
60	41.6	6	7	3.8	3	7	1.8	2.5	6.5	5.3	2.7
66	50.3	6.5	8	5.1	3.5	8	2.7	2.8	6.8	5.7	3
72	59.9	7.5	8	6.3	4	8	3.3	3	7.5	6.3	3.3
78	70.3	8	9	8.1	4	9	3.9	3.3	7.5	6.7	3.6
84	81.5	8.5	10	10.3	4.5	10	5.3	3.5	8	7.2	3.8
90	93.5	9.5	10	12.2	5	10	6.3	3.8	8.5	7.7	4.1
96	106.4	10	11	15	5	11	7.4	4	9	8.2	4.4

O.D. (D) is assumed for estimation only



I.D.	Thrust (Tons)	$\Delta = 22.5$									
		Earth			Rock			C (FT)	D (FT)	E (FT)	F (FT)
		A (FT)	B (FT)	Vol (C.Y.)	A (FT)	B (FT)	Vol (C.Y.)				
4, 6, 8	2	1.5	1.5	0.1	1	1	0.1	1.5	0.4	0.9	0.8
10, 12	4.4	2	2.5	0.3	1.5	1.5	0.1	1.5	0.5	1.2	1.1
16, 18	9.9	3	3.5	0.6	2	2.5	0.3	1.5	0.6	1.6	1.6
20	12.3	3.5	3.5	0.4	2	3	0.4	1.5	0.7	1.8	1.8
24	17.7	4	4.5	1	3	3.5	0.5	1.5	0.9	2.1	2.2
30	20.7	5	4.5	1.5	3	4	0.8	1.9	2.9	2.6	2.7
36	29.8	5.5	5.5	2.3	4	4	1.3	2.3	4.5	3.3	3.3
42	40.5	7	6	3.6	4.5	5	2.1	2.6	5	3.8	3.8
48	52.9	8	7	5.7	4.5	6	2.8	3	5.5	4.3	4.4
54	67	9	8	8	6	6	4.1	3.4	6	4.8	4.9
60	82.7	9.5	9	10.6	6	7	5.3	3.8	6.5	5.3	5.5
66	100.1	10.5	10	14.1	6.5	8	7.2	4.1	6.8	5.7	6.9
72	119.1	11	11	17.6	7.5	8	9.1	4.5	7.5	6.3	6.6
78	139.8	12	12	22.5	8	9	11.7	4.9	7.5	6.7	7.1
84	162.1	13	12.5	27.2	8.5	10	14.8	5.3	8	7.2	7.6
90	186.1	14	13.5	33.7	9.5	10	17.7	5.6	8.5	7.7	8.2
96	211.7	15	14.5	41.2	10	11	21.8	6	9	8.2	8.7

O.D. (D) is assumed for estimation only

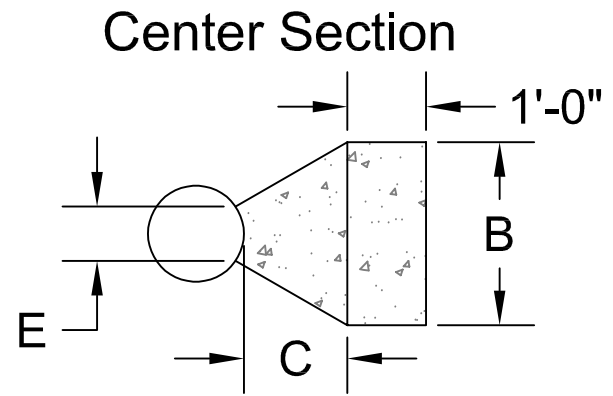
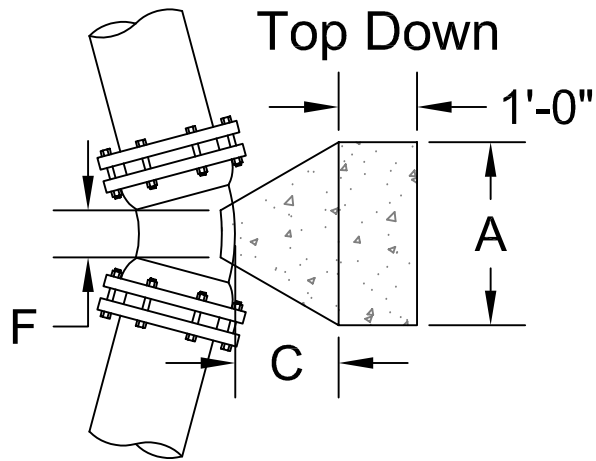


22.5° Thrust Block

Standard Detail

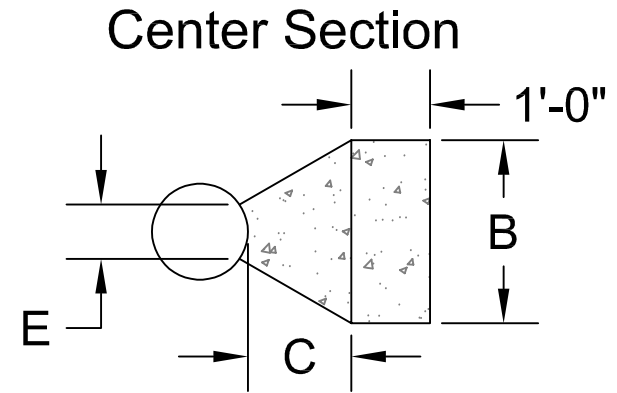
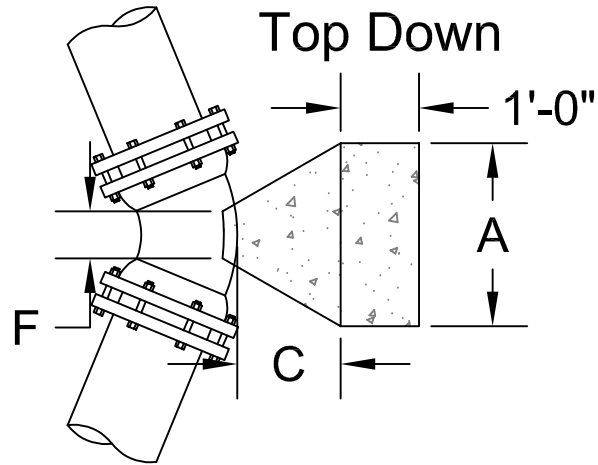
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TB-102



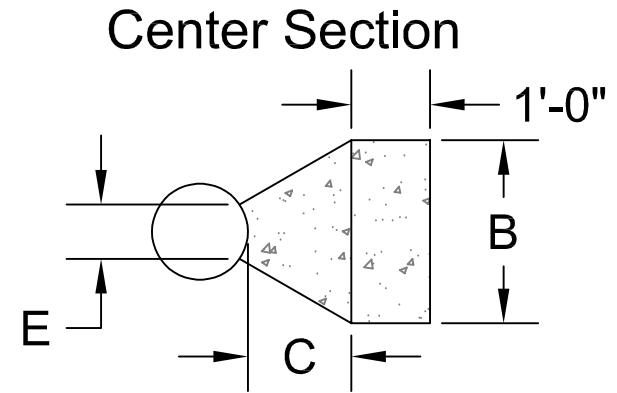
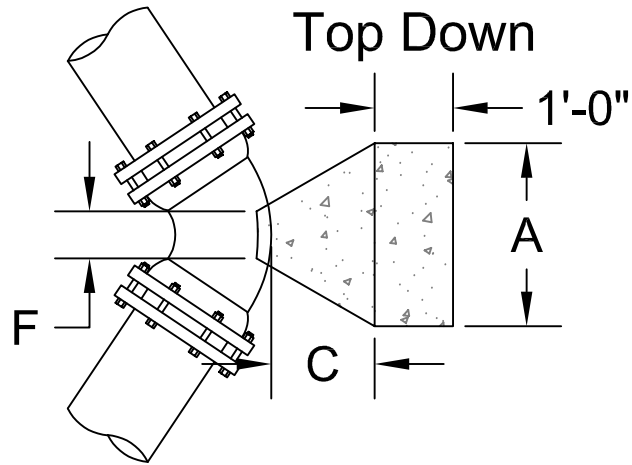
I.D.	Thrust (Tons)	$\Delta = 30$									
		Earth			Rock			C (FT)	D (FT)	E (FT)	F (FT)
		A (FT)	B (FT)	Vol (C.Y.)	A (FT)	B (FT)	Vol (C.Y.)				
4, 6, 8	2.6	2	1.5	0.2	1	1.5	0.1	1.5	0.4	0.9	1
10, 12	5.9	2.5	2.5	0.3	2	1.5	0.2	1.5	0.5	1.2	1.5
16, 18	13.2	3.5	4	0.8	2.5	3	0.4	1.5	0.6	1.6	2.2
20	16.3	4.5	4	1	3	3	0.5	1.5	0.7	1.8	2.4
24	23.4	6	4	1.4	3.5	3.5	0.7	1.5	0.9	2.1	2.9
30	27.5	6.5	5	3	3.5	4	0.9	1.9	2.9	2.6	3.6
36	39.5	7	6	3.4	4.5	4.5	1.6	2.3	4.5	3.3	4.4
42	53.8	8	7	5.1	5.5	5	2.5	2.6	5	3.8	5.1
48	70.3	9	8	7.4	6	6	3.7	3	5.5	4.3	5.8
54	89	10	9	10.3	7	6.5	5.3	3.4	6	4.8	6.5
60	110	11	10	13.9	7.5	7.5	7.3	3.8	6.5	5.3	7.3
66	132.9	12.5	11	18.9	8.5	8	9.6	4.1	6.8	5.7	8
72	158.2	13.5	12	24	9	9	12.3	4.5	7.5	6.3	8.7
78	185.6	14.5	13	30	10	9.5	15.6	4.9	7.5	6.7	9.4
84	215.3	15.5	14	37.1	10.5	10.5	19.5	5.3	8	7.2	10.1
90	247.1	16.5	15	45	11.5	11	23.9	5.6	8.5	7.7	10.9
96	281.2	18	16	55.5	12.5	11.5	28.9	6	9	8.2	11.6

O.D. (D) is assumed for estimation only



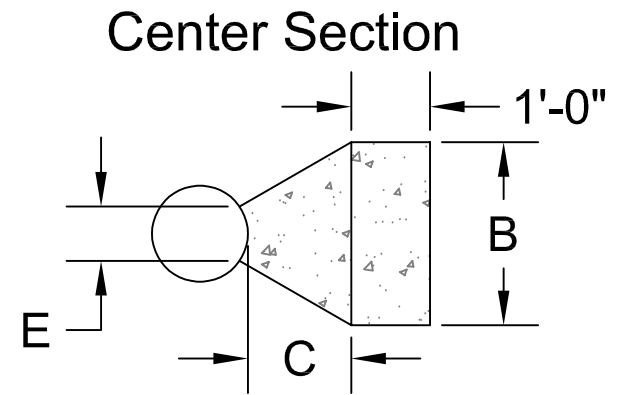
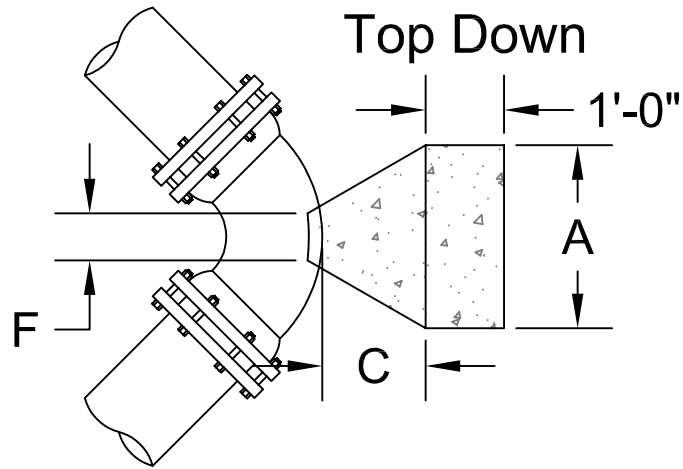
I.D.	Thrust (Tons)	$\Delta = 45$									
		Earth			Rock			C (FT)	D (FT)	E (FT)	F (FT)
		A (FT)	B (FT)	Vol (C.Y.)	A (FT)	B (FT)	Vol (C.Y.)				
4, 6, 8	3.9	2	2	0.2	1.5	1.5	0.1	1.5	0.4	0.9	1.5
10, 12	8.7	3.5	2.5	0.5	2	2.5	0.3	1.5	0.5	1.2	2.2
16, 18	19.5	4.5	4.5	1.2	3	3.5	0.6	1.5	0.6	1.6	3.2
20	24.1	5.5	4.5	1.5	3.5	3.5	0.7	1.5	0.7	1.8	3.6
24	34.6	8	4.5	2.3	4.5	4	1.1	1.5	0.9	2.1	4.3
30	40.6	8.5	5	3.2	5.5	4	1.6	1.9	2.9	2.6	5.4
36	58.5	10	6	5.3	6.5	4.5	2.6	2.3	4.5	3.3	6.5
42	79.6	11.5	7	8.1	8	5	4.2	2.6	5	3.8	7.5
48	104	13	8	11.9	9	6	6.3	3	5.5	4.3	8.6
54	131.5	15	9	17.1	10.5	6.5	8.9	3.4	6	4.8	9.7
60	162.4	16.5	10	23.1	11	7.5	12	3.8	6.5	5.3	10.7
66	196.5	18	11	30.1	12	8.5	16.2	4.1	6.8	5.7	11.8
72	233.9	19.5	12	38.6	14	8.5	20.7	4.5	7.5	6.3	12.9
78	274.5	21.5	13	49.8	14.5	9.5	25.9	4.9	7.5	6.7	13.9
84	318.4	23	14	61.2	15.5	10.5	32.6	5.3	8	7.2	15
90	365.5	24.5	15	74.5	17.5	10.5	39.6	5.6	8.5	7.7	16.1
96	415.6	26	16	89.5	18.5	11.5	48.5	6	9	8.2	17.1

O.D. (D) is assumed for estimation only



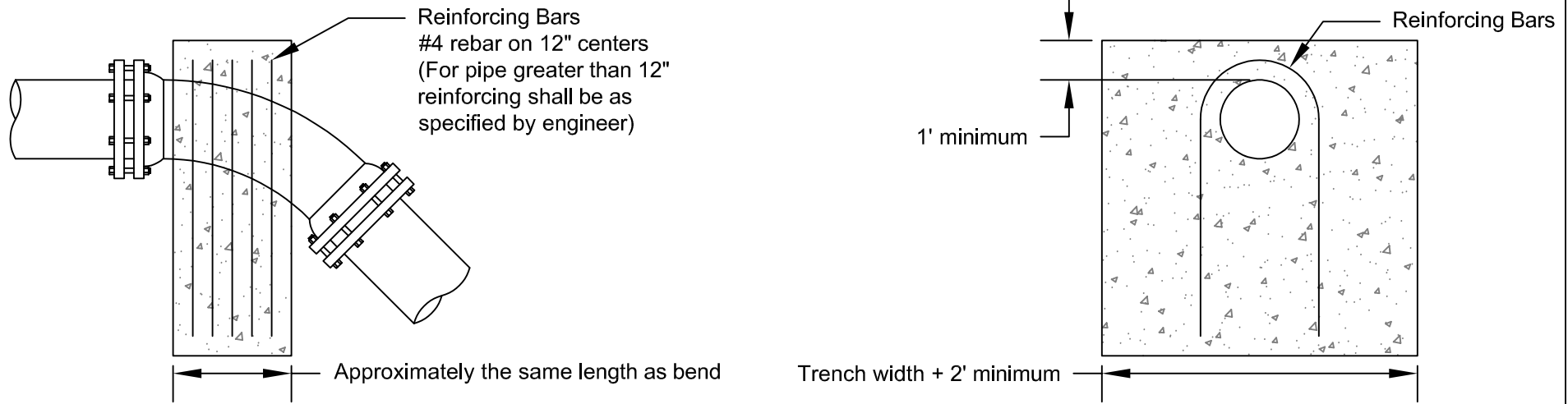
I.D.	Thrust (Tons)	$\Delta = 67.5$									
		Earth			Rock			C (FT)	D (FT)	E (FT)	F (FT)
		A (FT)	B (FT)	Vol (C.Y.)	A (FT)	B (FT)	Vol (C.Y.)				
4, 6, 8	5.6	3	2	0.3	2	1.5	0.2	1.5	0.4	0.9	2.1
10, 12	12.6	5.5	2.5	0.8	3.5	2	0.5	1.5	0.5	1.2	3.1
16, 18	28.3	7.5	4	1.9	5.5	3	1	1.5	0.6	1.6	4.7
20	34.9	9	4	2.3	5.5	3.5	1.5	1.5	0.7	1.8	5.2
24	50.3	11.5	4.5	3.5	6.5	4	2.1	1.5	0.9	2.1	6.2
30	58.9	12	5	4.8	7.5	4	3.3	1.9	2.9	2.6	7.8
36	84.9	14.5	6	6.2	9.5	4.5	5.3	2.3	4.5	3.3	9.4
42	115.5	17	7	12.8	11	5.5	8.7	2.6	5	3.8	10.9
48	150.9	19	8	18.4	13	6	12.4	3	5.5	4.3	12.5
54	191	21.5	9	26	15	6.5	18.1	3.4	6	4.8	14
60	235.8	24	10	35.6	16	7.5	24	3.8	6.5	5.3	15.6
66	285.3	26	11	46	18	8	32.5	4.1	6.8	5.7	17.1
72	339.5	28.5	12	57.8	19	9	41	4.5	7.5	6.3	18.7
78	398.5	31	13	75.7	21	9.5	53.2	4.9	7.5	6.7	20.2
84	462.1	33.5	14	94.7	22	10.5	64.8	5.3	8	7.2	21.8
90	530.5	35.5	15	114.4	24.5	11	81.2	5.6	8.5	7.7	23.3
96	603.6	38	16	138.9	25.5	12	95.1	6	9	8.2	24.9

O.D. (D) is assumed for estimation only

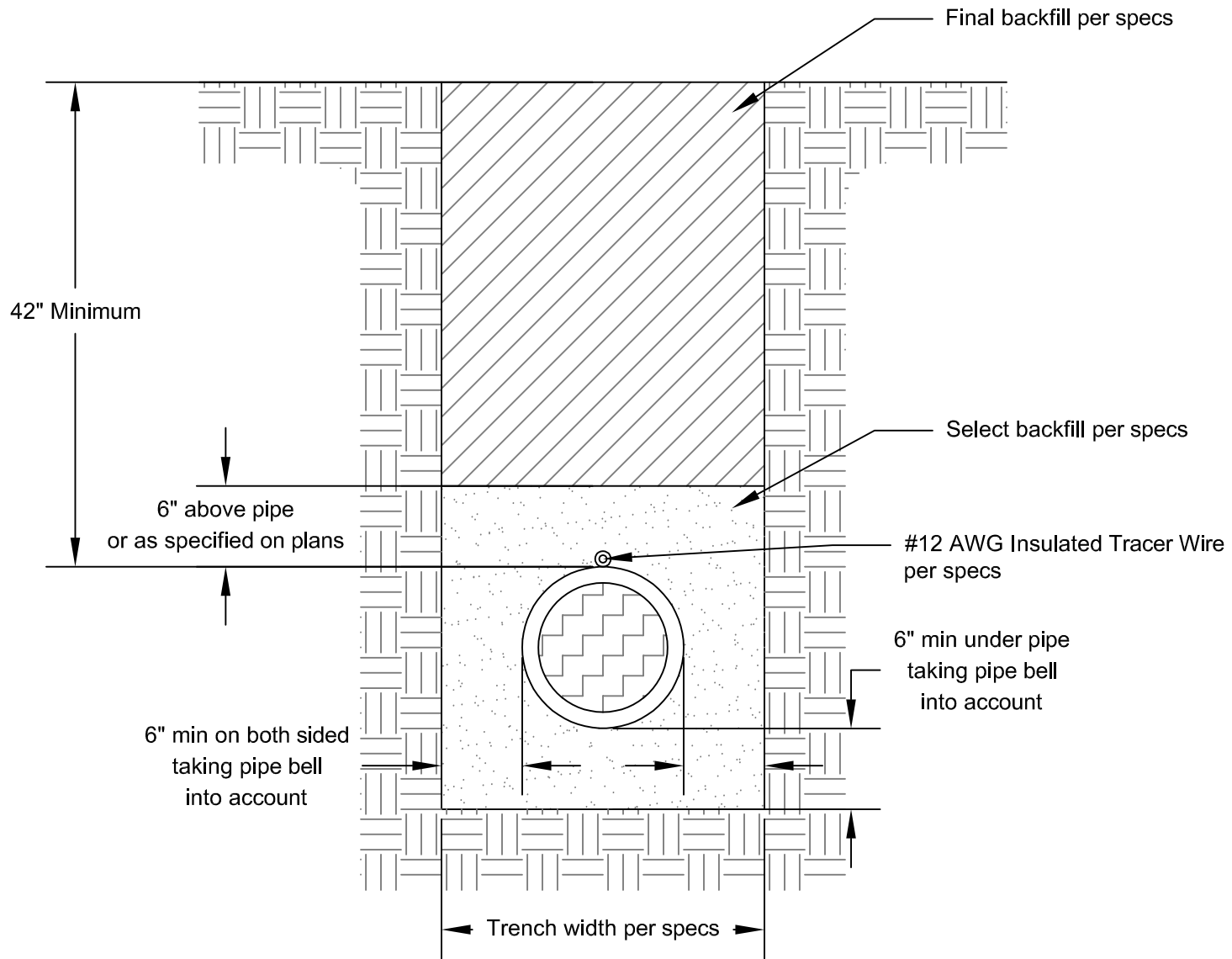


I.D.	Thrust (Tons)	$\Delta = 90$									
		Earth			Rock			C (FT)	D (FT)	E (FT)	F (FT)
		A (FT)	B (FT)	Vol (C.Y.)	A (FT)	B (FT)	Vol (C.Y.)				
4, 6, 8	7.1	5	1.5	0.4	2	2	0.2	1.5	0.4	0.9	2.7
10, 12	16	6.5	2.5	1	3.5	2.5	0.5	1.5	0.5	1.2	4
16, 18	36	9	4	2.4	4.5	4	1	1.5	0.6	1.6	6
20	44.4	10	4.5	3.1	6	4	1.5	1.5	0.7	1.8	6.6
24	64	14.5	4.5	5	8	4	2.1	1.5	0.9	2.1	7.9
30	75	15	5	6.7	10	4	3.3	1.9	2.9	2.6	9.9
36	108	18	6	11.4	12	4.5	5.3	2.3	4.5	3.3	11.9
42	147	21	7	17.8	14	5.5	8.7	2.6	5	3.8	13.9
48	192	24	8	26.2	16	6	12.4	3	5.5	4.3	15.9
54	243	27	9	36.9	18	7	18.1	3.4	6	4.8	17.9
60	299.8	30	10	50.3	20	7.5	24	3.8	6.5	5.3	19
66	362.8	33	11	66.2	22	8.5	32.5	4.1	6.8	5.7	21.8
72	431.8	36	12	85.6	24	9	41	4.5	7.5	6.3	23.8
78	506.7	39	13	108.2	26	10	53.2	4.9	7.5	6.7	25.7
84	587.7	42	14	134.4	28	10.5	64.8	5.3	8	7.2	27.7
90	674.6	45	15	164.9	30	11.5	81.2	5.6	8.5	7.7	29
96	767.5	48	16	199	32	12	95.1	6	9	8.2	31.6

O.D. (D) is assumed for estimation only



I.D.	11.25°		22.5°		30°		45°		67.5°		90°	
	Thrust (Tons)	Vol (C.Y.)	Thrust (Tons)	Vol (C.Y.)	Thrust (Tons)	Vol (C.Y.)	Thrust (Tons)	Vol (C.Y.)	Thrust (Tons)	Vol (C.Y.)	Thrust (Tons)	Vol (C.Y.)
4, 6, 8	1	0.5	2	1	2.5	1.3	3.6	1.8	4.6	2.3	5	2.5
10, 12	2.2	1.1	4.3	2.2	5.7	2.8	8	4	10.5	5.2	11.3	5.7
16, 18	5	2.5	9.7	4.9	12.7	6.4	18	9	23.5	11.8	25.5	12.7
20	6.1	3.1	12	6	15.7	7.9	22.2	11.1	29.2	14.5	31.4	15.7
24	8.2	4.4	17.3	8.7	22.6	11.3	32	16	41.8	20.9	45.2	22.6
30	10.5	5.2	20.3	10.1	26.5	13.3	37.5	18.8	49	24.5	53.1	26.5
36	14.9	7.5	29.2	14.6	38.2	19.1	54	27	70.5	35.3	76.4	28.2
42	20.3	10.1	39.8	19.9	52	26	73.5	36.7	96	48	104	52
48	26.5	13.2	51.9	26	67.9	33.9	96	48	126	62.7	136	67.9
54	33.5	16.8	65.7	32.9	85.9	42.9	122	60.7	159	79.4	172	85.9
60	41.4	20.7	81.2	40.6	106	53	150	75	196	98	212	106
66	50.1	25	98.2	49.1	128	64.2	182	90.7	237	119	257	128
72	59.6	29.8	117	58.4	153	76.3	216	108	282	141	305	153
78	69.9	35	137	68.6	179	90	254	127	331	166	358	179
84	81.1	40.5	159	79.5	208	104	294	147	384	192	416	208
90	93.1	46.5	183	91.3	239	119	337	169	441	221	477	239
96	106	53	208	104	272	136	384	192	502	251	543	272



Trench and Backfill

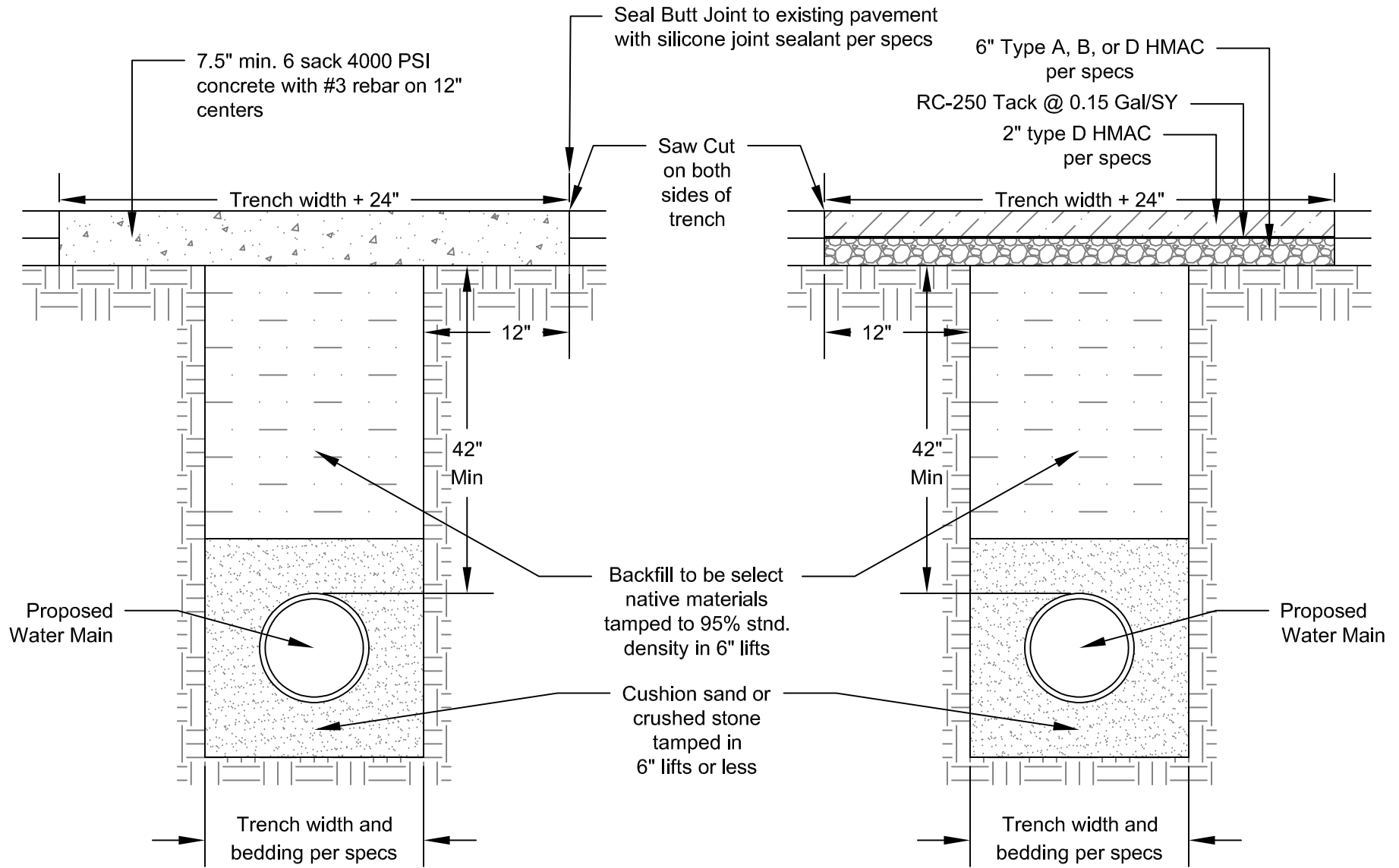
Standard Detail

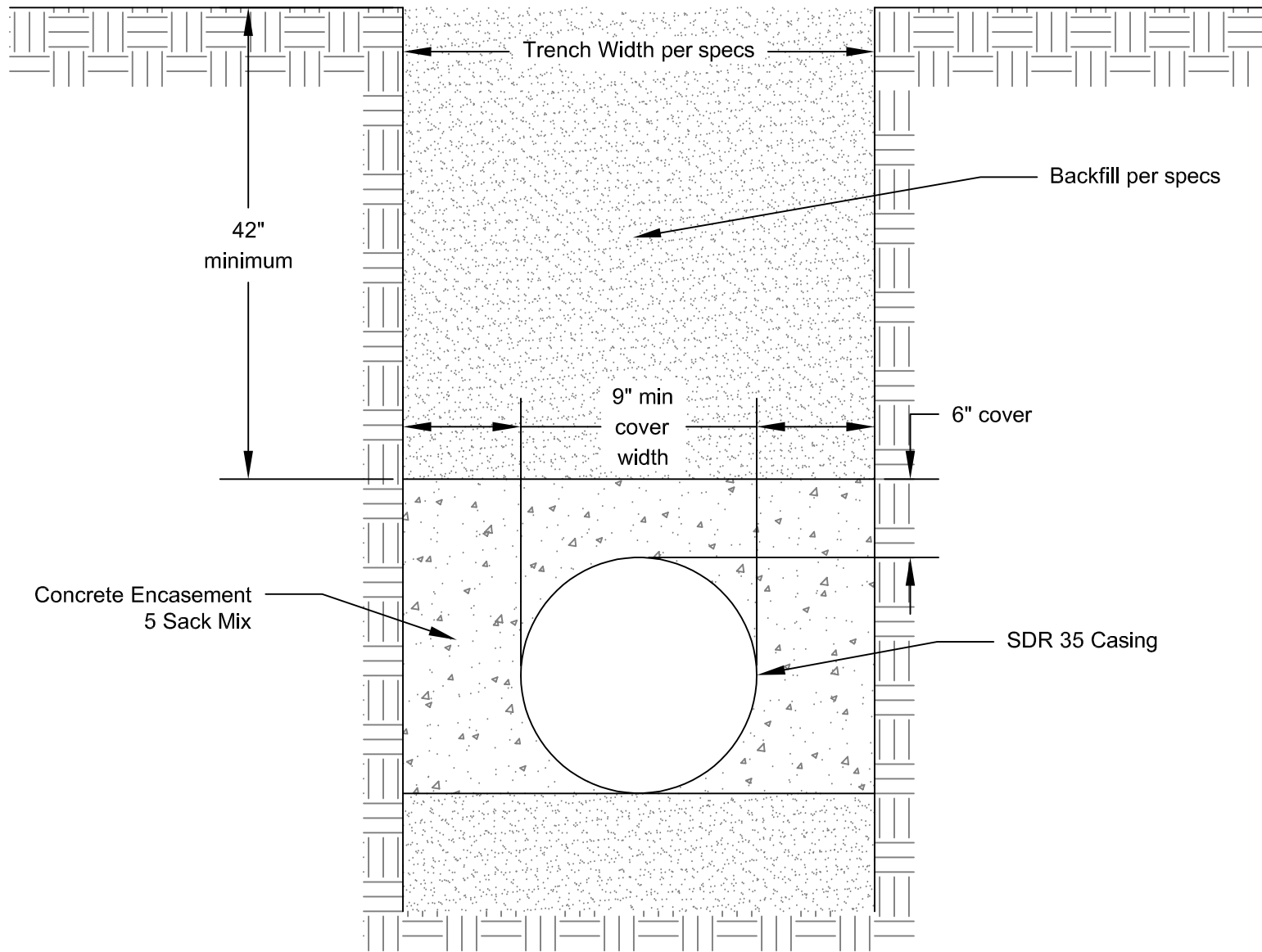
Not To Scale

TR-100

Concrete Street

Asphalt Street





Concrete Encasement

Standard Detail

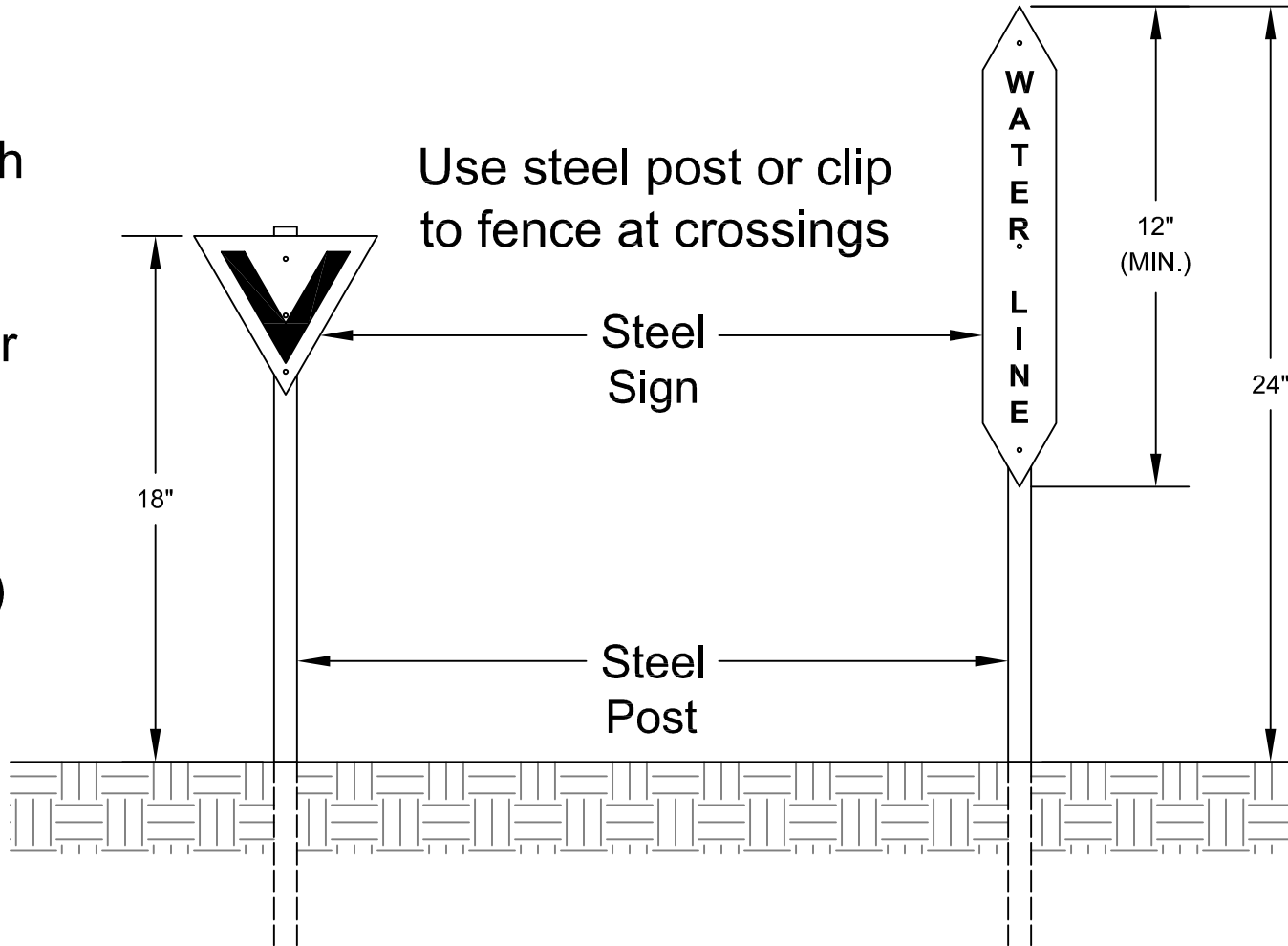
Not To Scale

TR-102

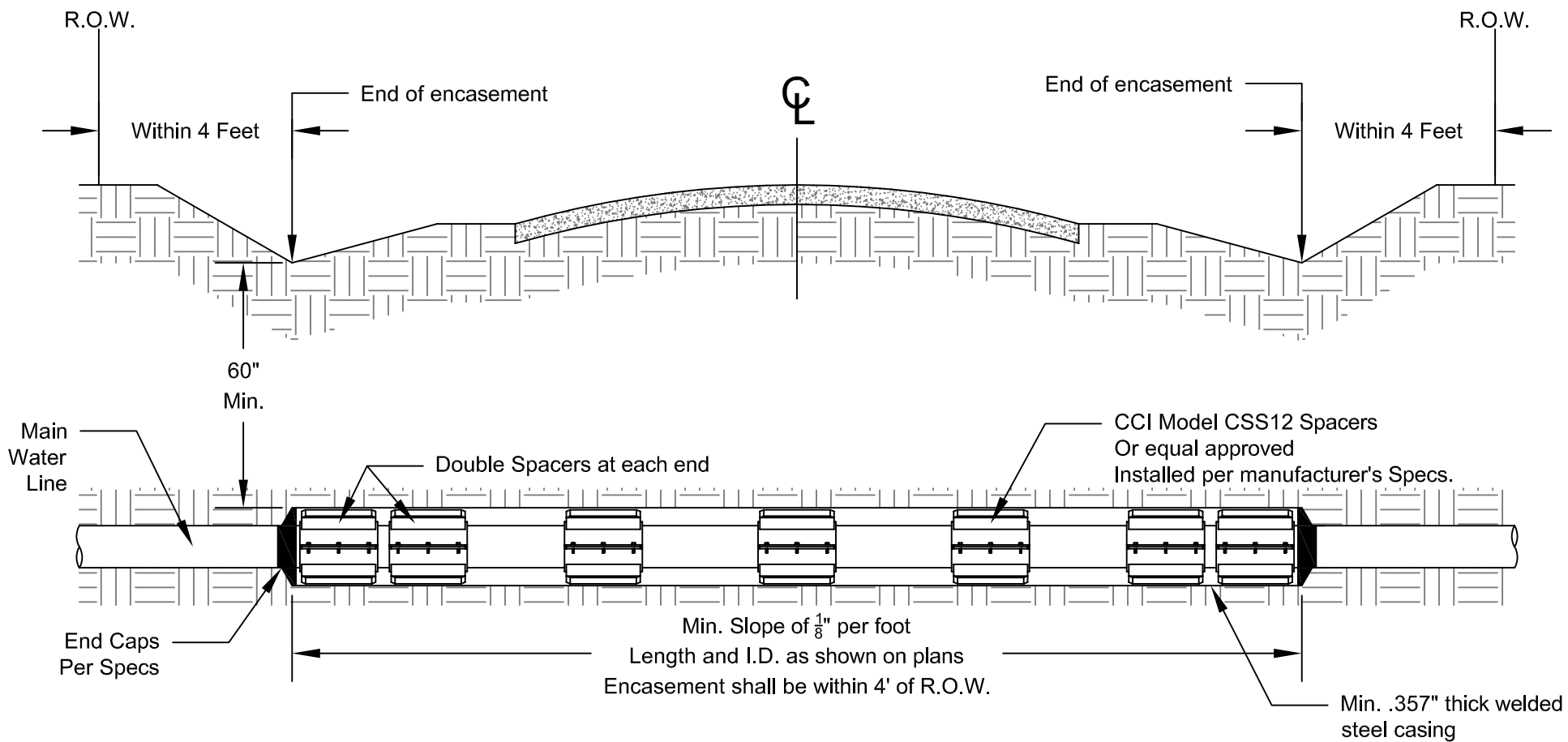
**Valve
Marker**

**Line
Marker**

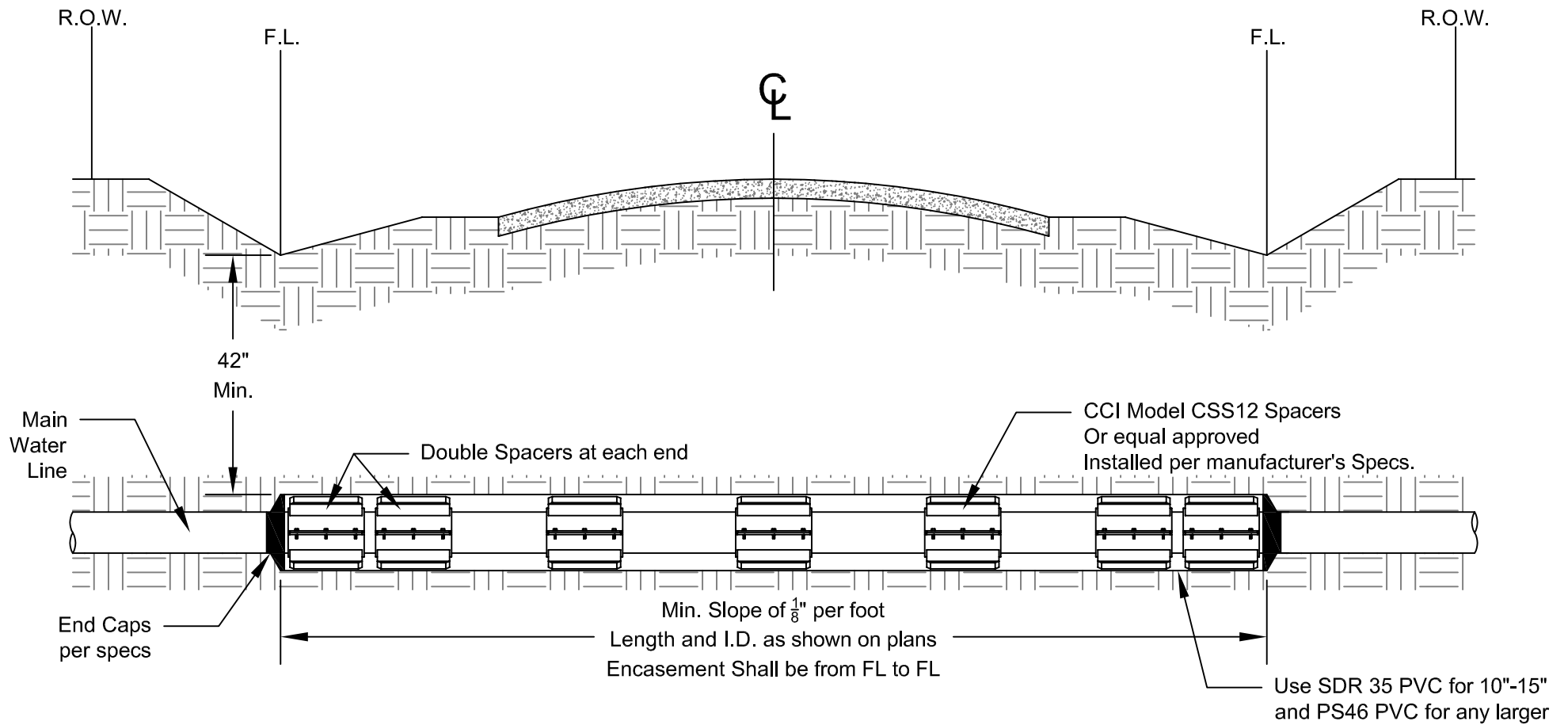
Furnish
one
valve
marker
per
valve
pad
(Typ.)

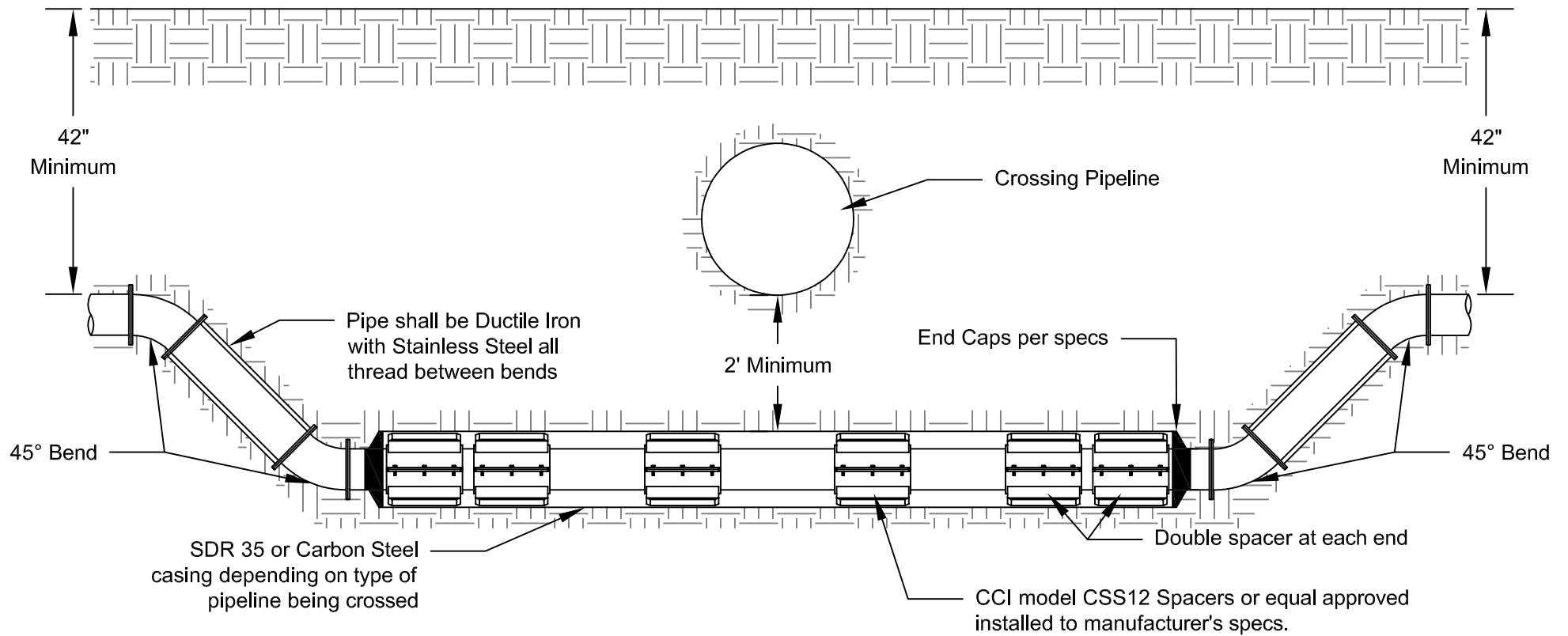


Furnish
two
line
markers
per
road
crossing
(Typ.)



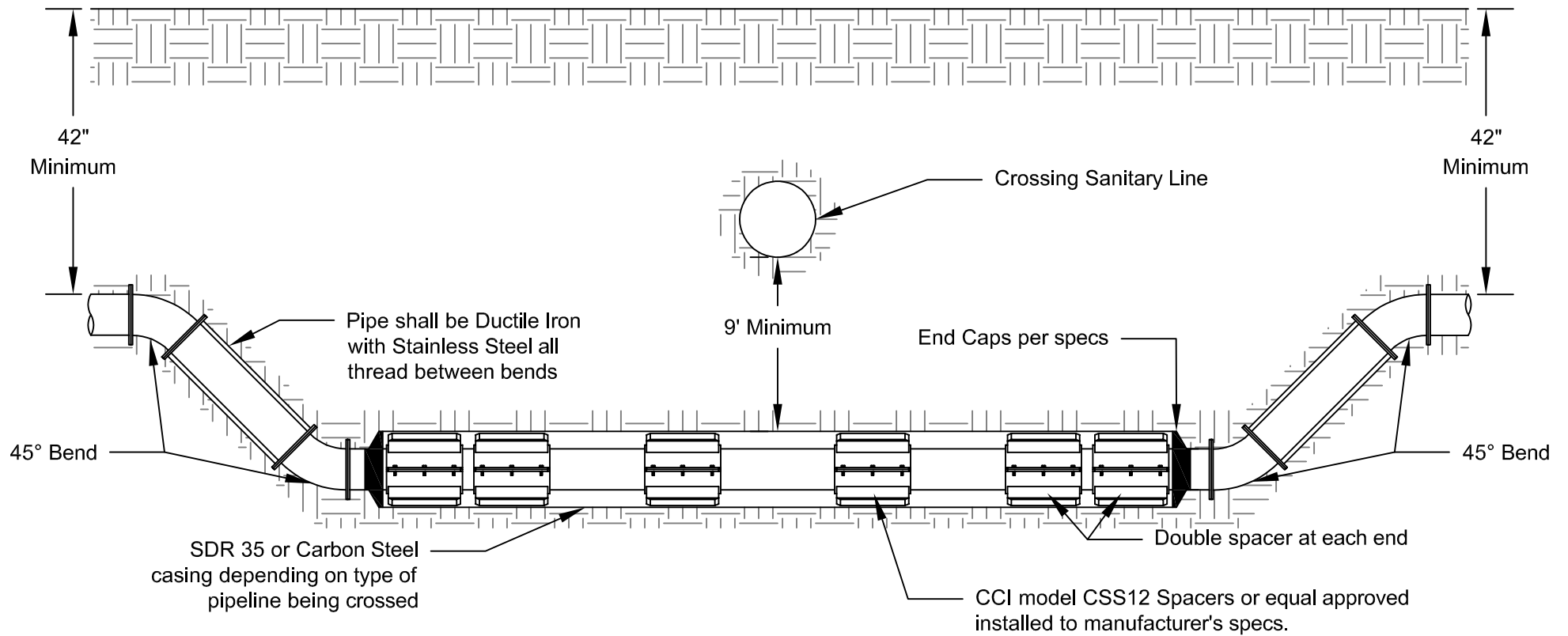
Note:
Contractor to follow all
TXDOT Guidelines





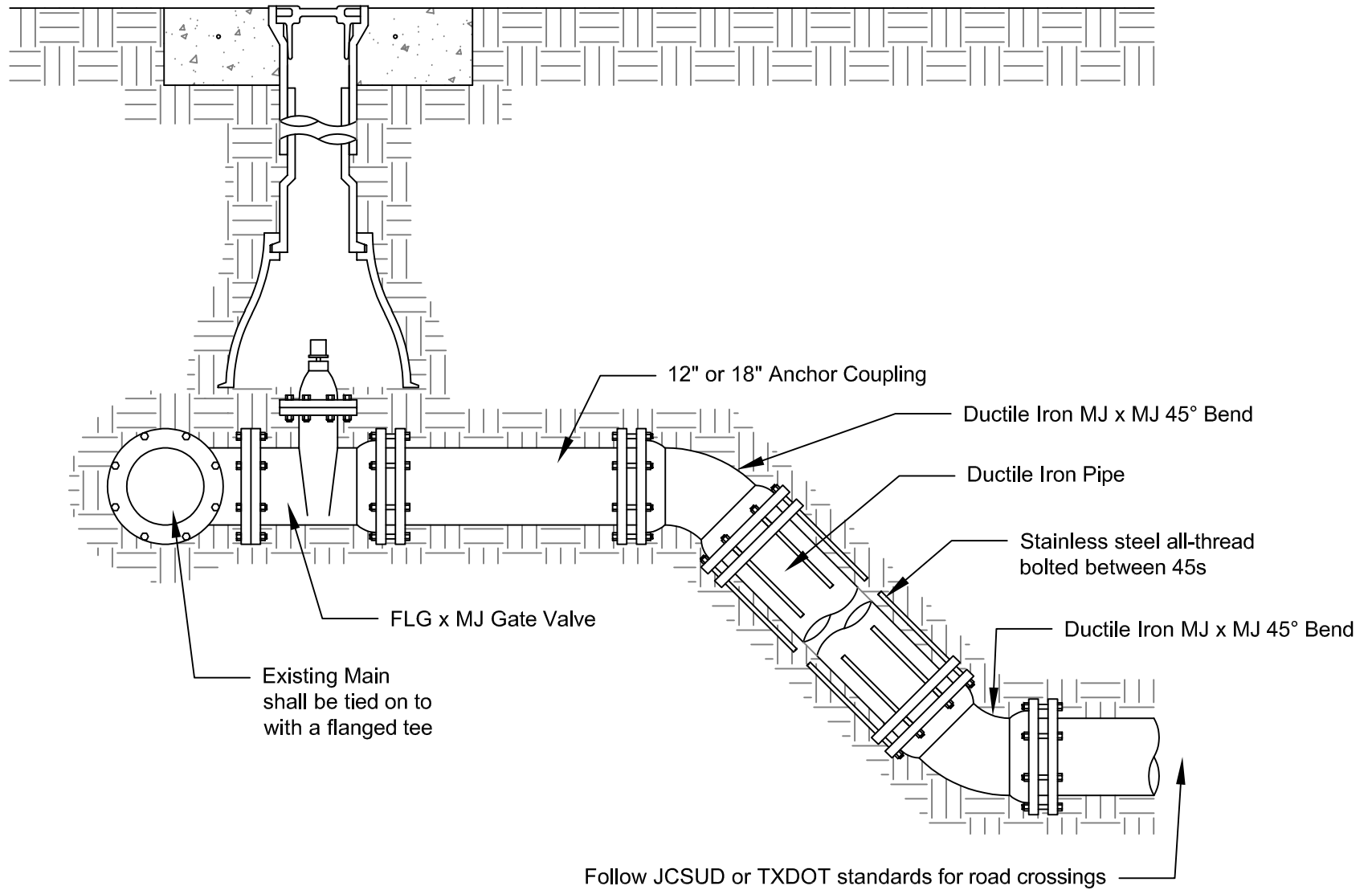
Notes:

- 1) Fittings and Joints should be equipped with joint restrains.
- 2) Table 2-06 in the specifications will be used to determine the casing diameter.



Notes:

- 1) Fittings and Joints should be equipped with joint restrains.
- 2) Table 2-06 in the specifications will be used to determine the casing diameter.

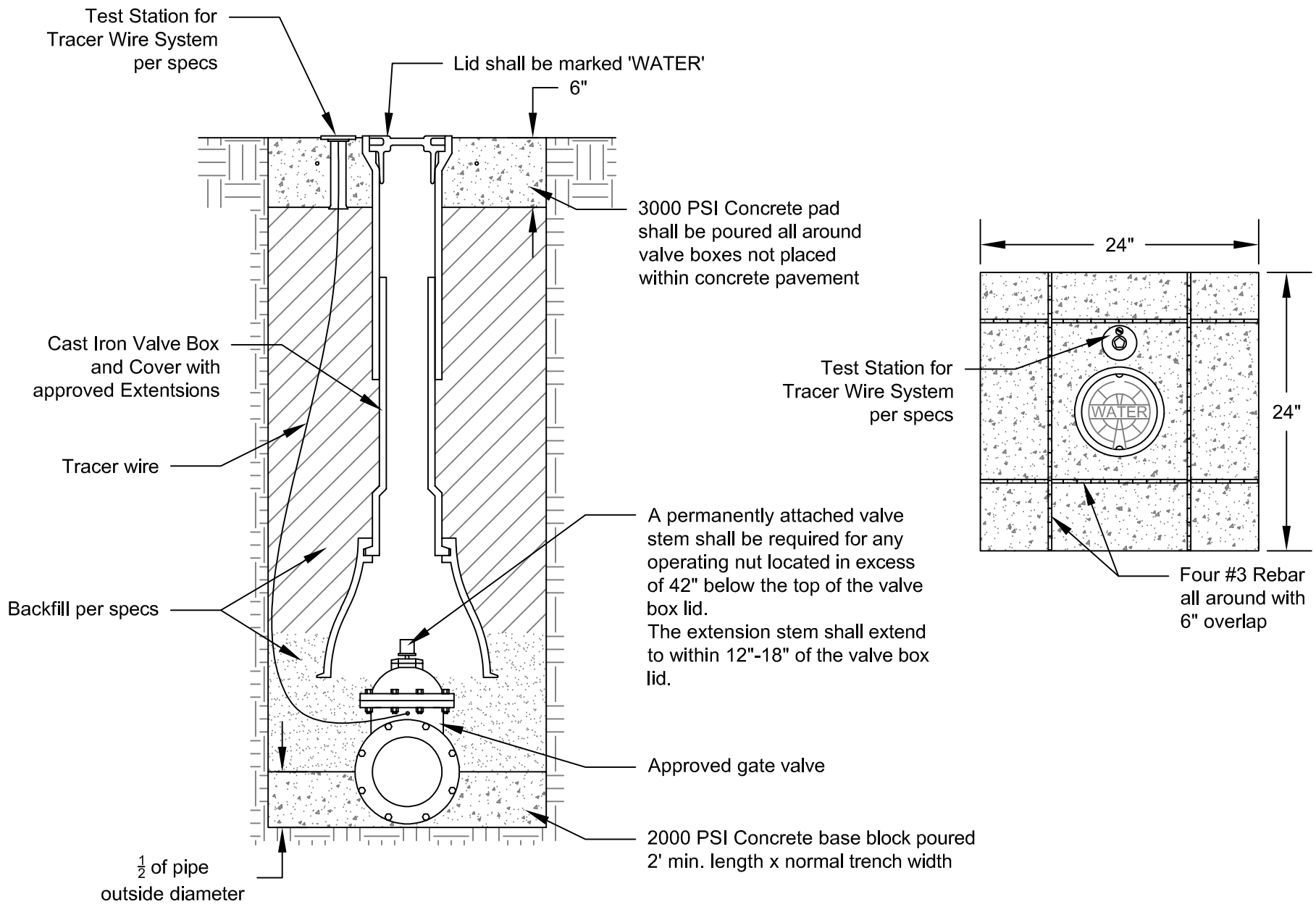


Step Down After Tie-in

Standard Detail

Not To Scale

TR-300

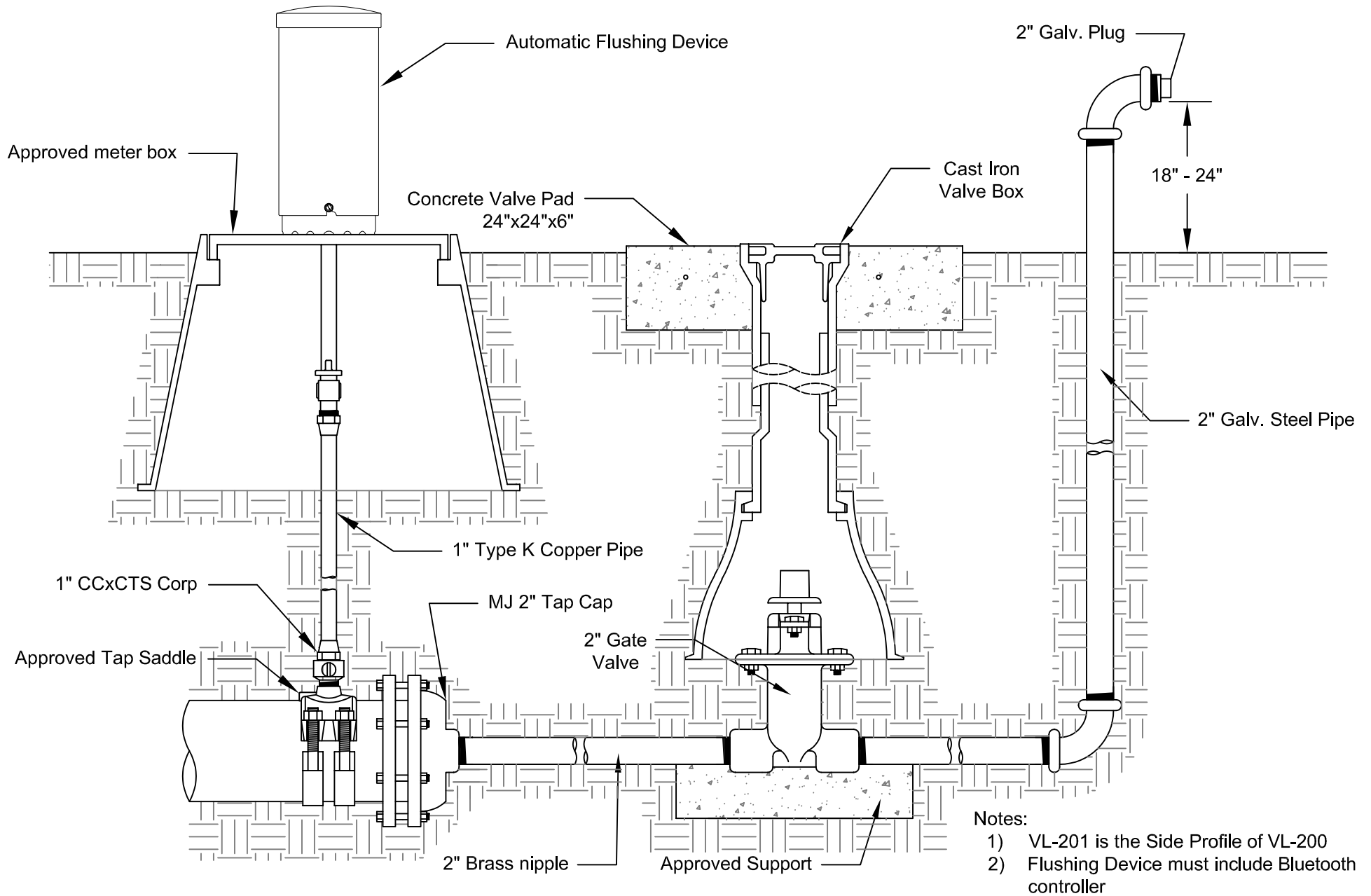


Gate Valve

Standard Detail

Not To Scale

VL-100



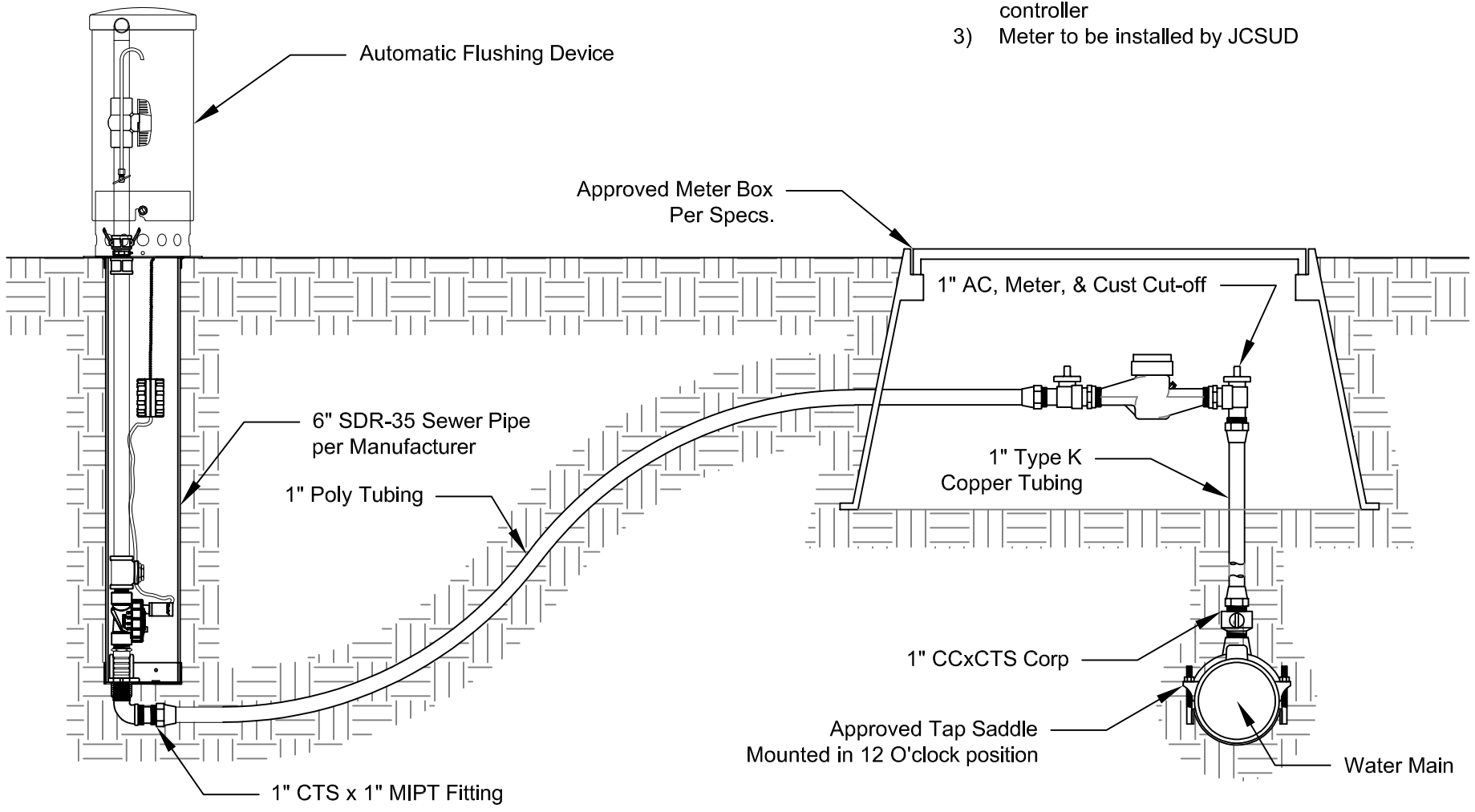
Automatic Flush Valve Assembly

Standard Detail

Not To Scale

VL-200

- Notes:
- 1) VL-201 is the Side Profile of VL-200
 - 2) Flushing Device must include Bluetooth controller
 - 3) Meter to be installed by JCSUD

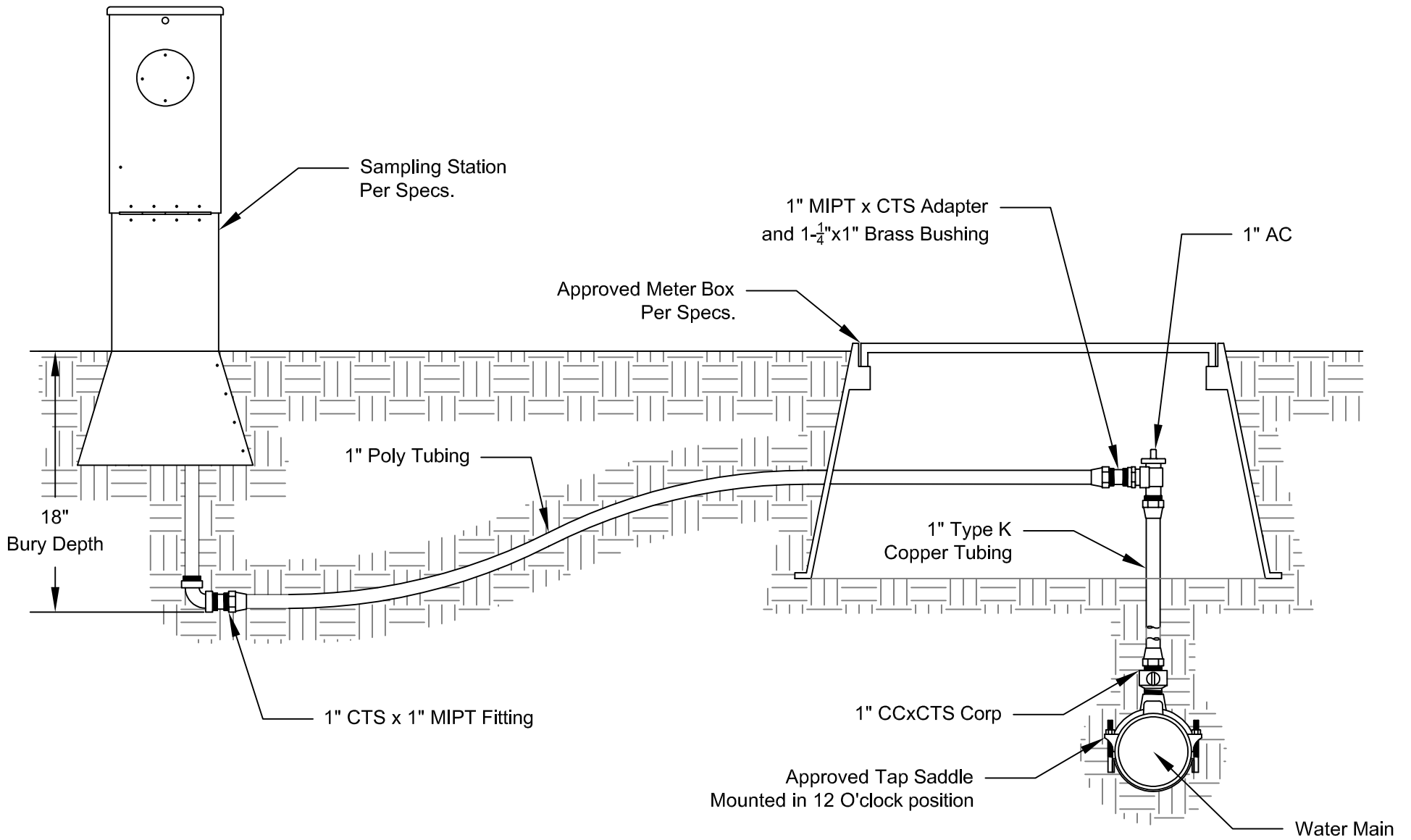


Automatic Flush Valve Side Profile

Standard Detail

Not To Scale

VL-201

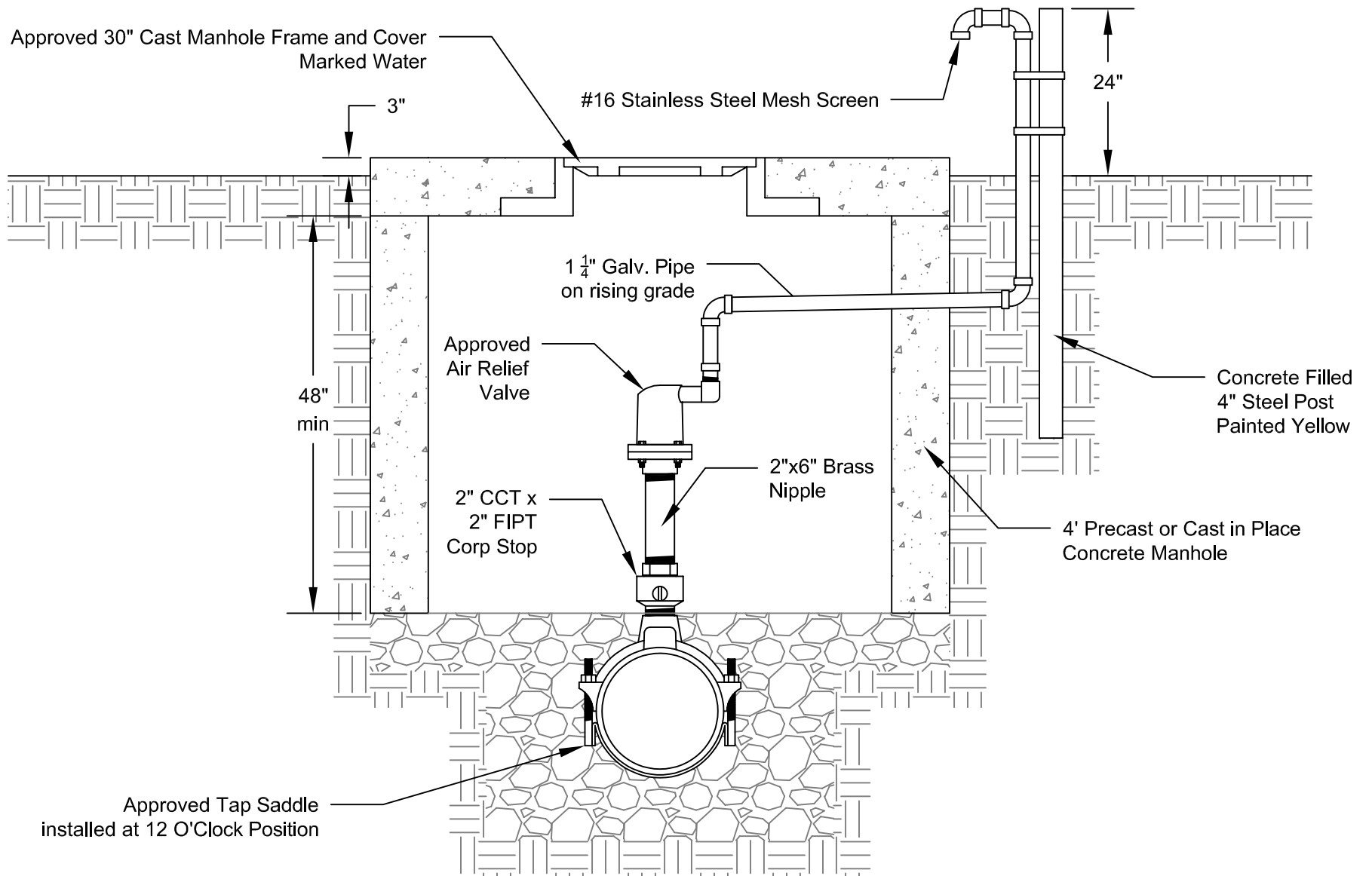


Sampling Station Side Profile

Standard Detail

Not To Scale

VL-202

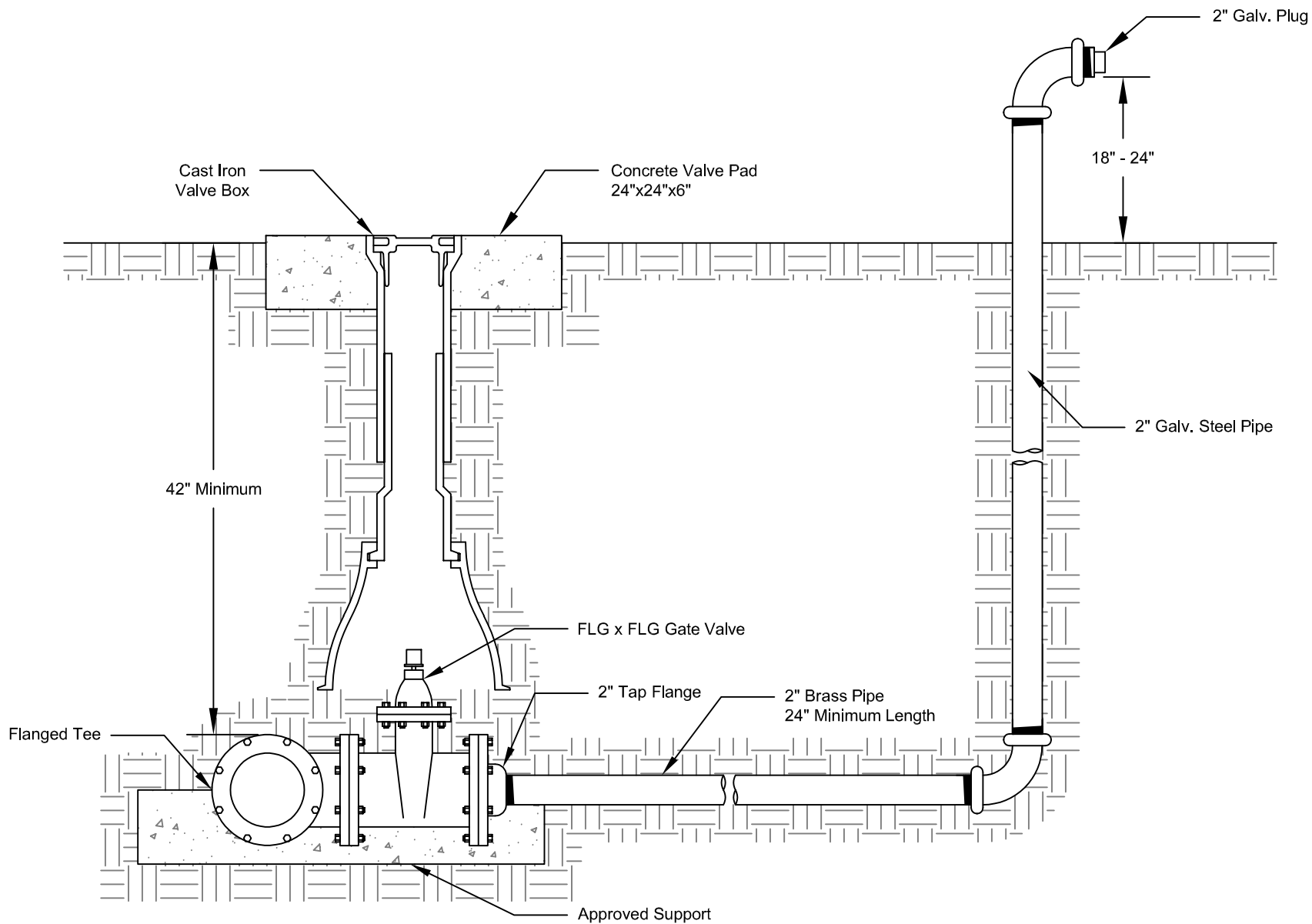


2" Air Relief Valve

Standard Detail

Not To Scale

VL-300

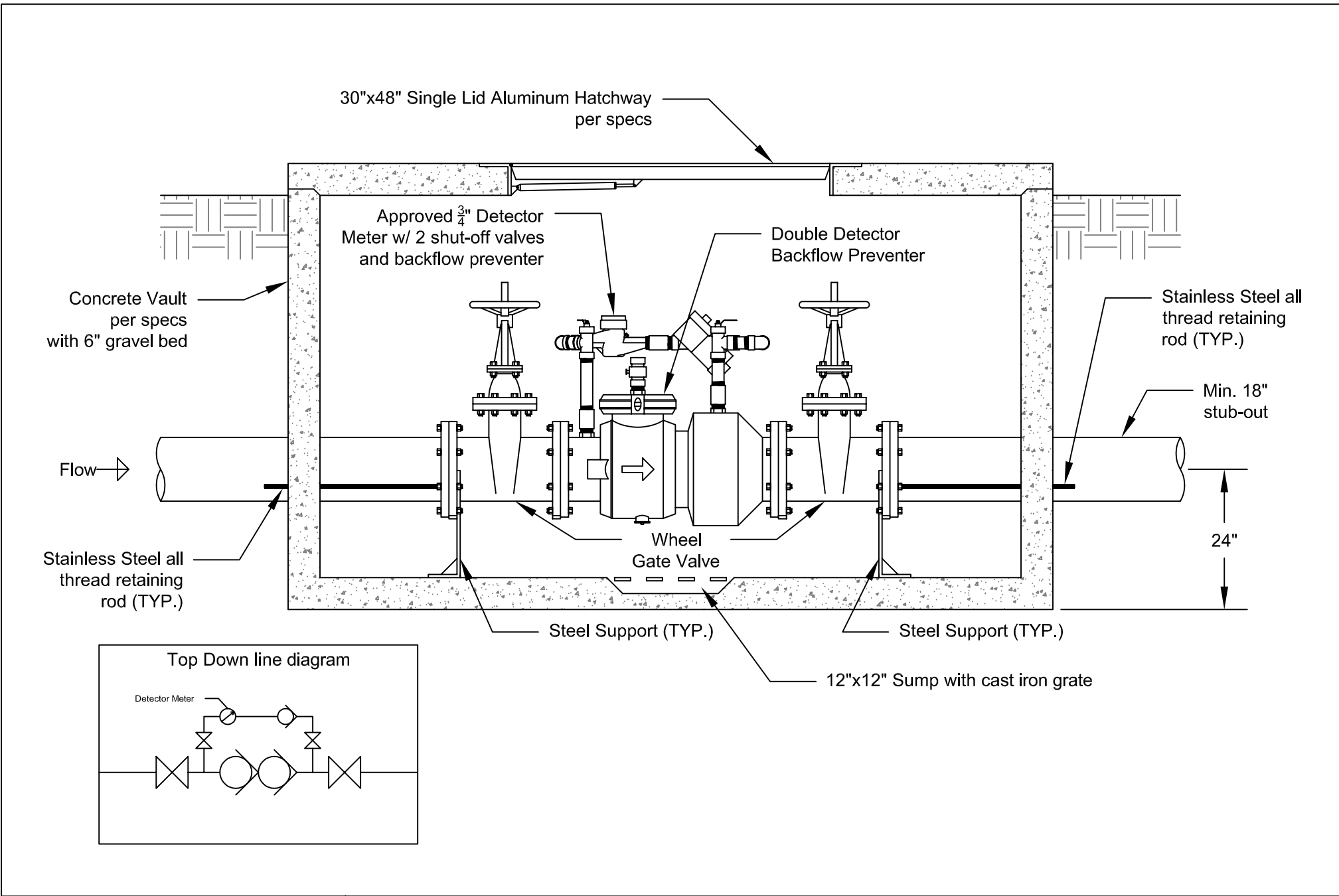


Blow-Off Valve

Standard Detail

Not To Scale

VL-301

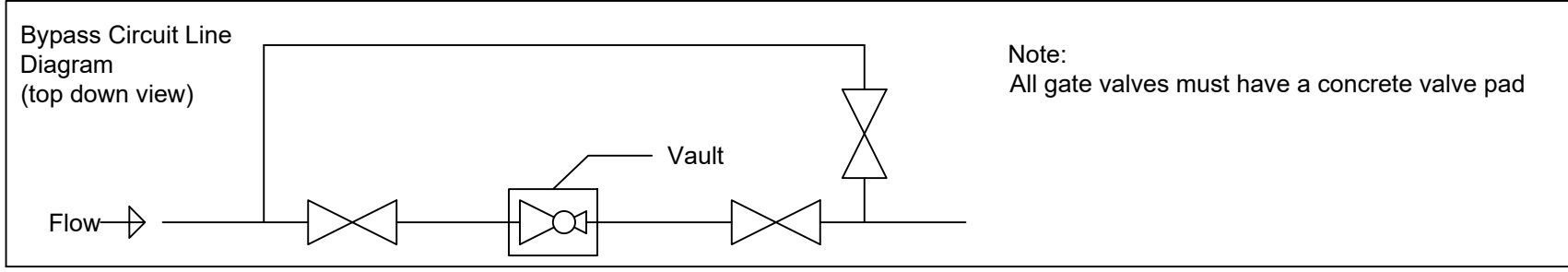
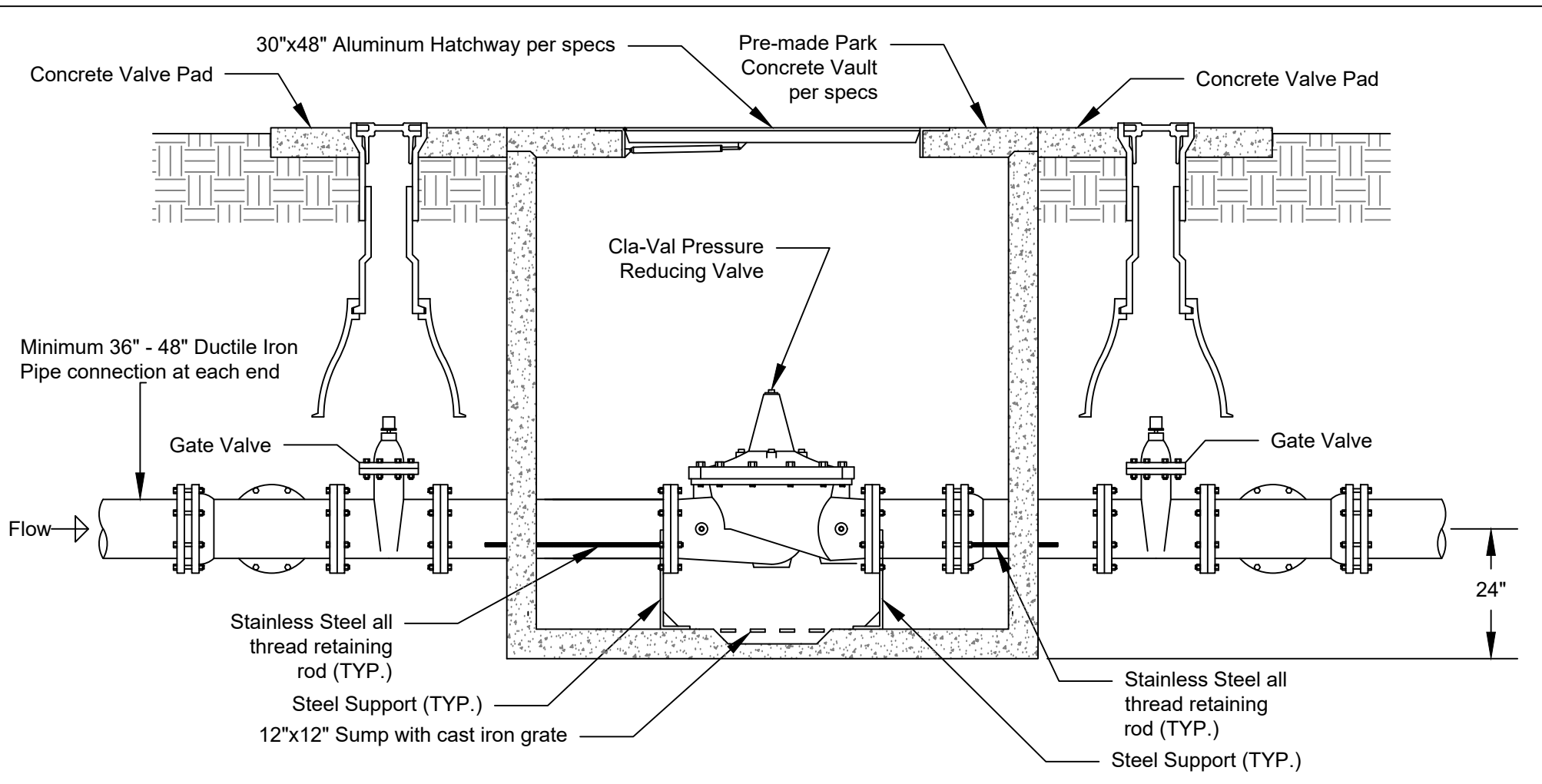


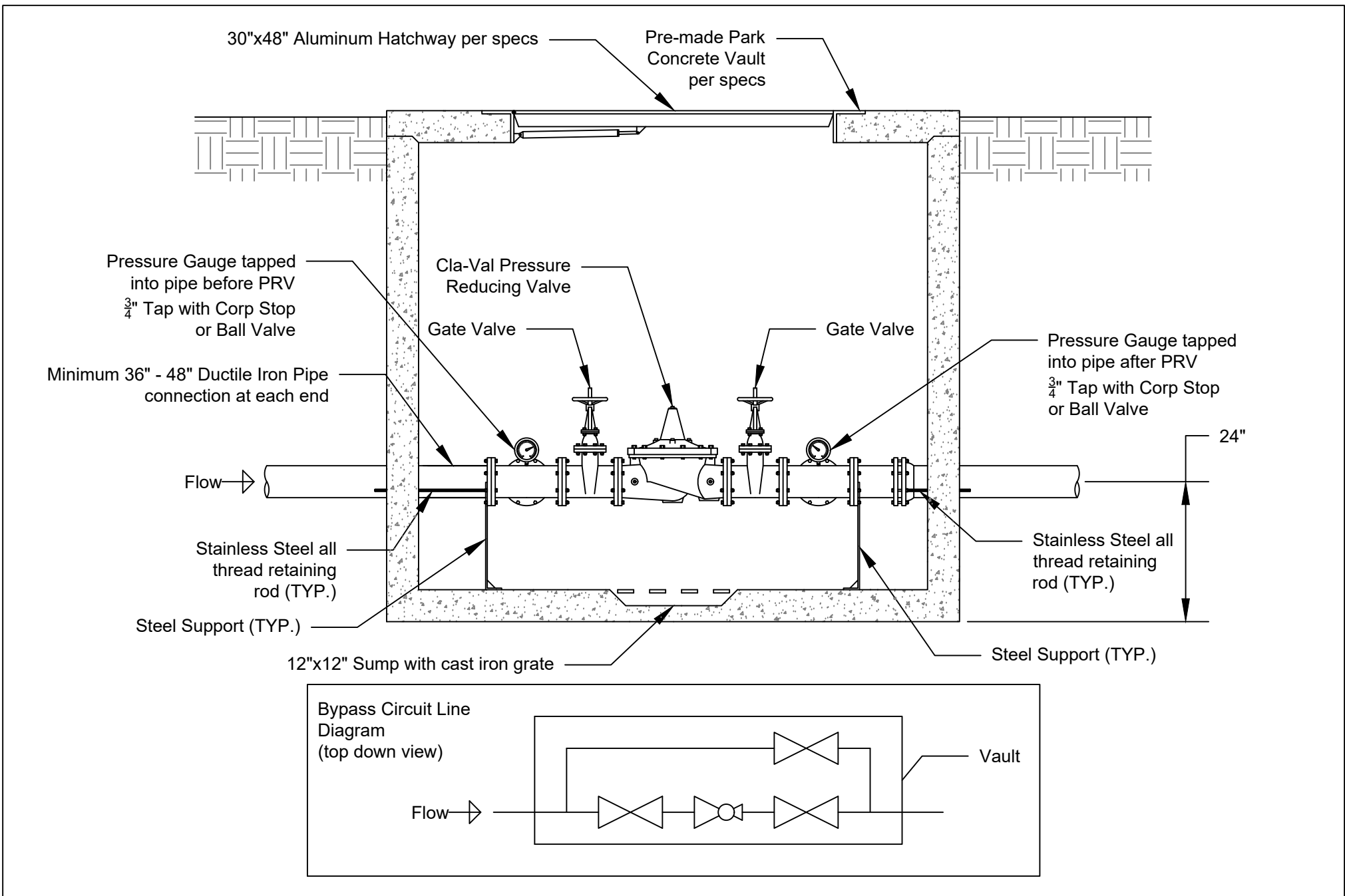
Backflow Prevention Assembly

Standard Detail

Not To Scale

VL-302





Pressure Reducing Valve Smaller than 6"

Standard Detail

Not To Scale

VL-304