City of Baltimore

Department of Public Works

Standard Details

March 2008

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BOOK OF STANDARDS
TABLE OF CONTENTS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BOOK OF STANDARDS
INDEX OF DRAWINGS

STORM WATER DETAILS:

BC 376.92	Curb Armor for Type 'H' Inlet Head	1 of 1
BC 376.93	18 In. Inlet Frame and Cover	1 of 1
BC 377.12	Type 'J' Chute Inlet	1 of 1
BC 380.01	Type 'S' Inlet Single Grate	1 of 1
BC 380.02	Type 'S' Frame and Grate Parallel Bars	1 of 1
BC 380.03	Type 'S' Frame and Grate Sections Parallel Bars	1 of 1
BC 380.04	Type 'S' Frame and Grate Transverse Bars	1 of 1
BC 380.05	Type 'S' Frame and Grate Sections Transverse Bars	1 of 1
BC 380.06	Curved Vane (S-CV) Grate(s) with Class 35 Type 'S' Frame New Construction	1 of 1
BC 380.07	Curved Vane (S-CV) Grate(s) for Existing Type 'S' Frame	1 of 1
BC 380.11	Type 'S' Inlet Single Grate (Ditch Installation)	1 of 1
BC 380.21	Type 'S' Inlet Double Grate Tandem	1 of 1
BC 380.31	Type 'S' Inlet Double Grate Tandem (Ditch Installation)	1 of 1
BC 380.51	Type 'S' Combination Inlet Double Grate Tandem	1 of 1
BC 380.52	Precast Special Curb Type 'S' Combination Inlet Double Grate Tandem	1 of 1
BC 380.53	Beam and Plate Detail Type 'S' Combination Inlet Double Grate Tandem	1 of 1
BC 380.99	Method of Depressing Paving at Inlets	1 of 1
BC 383.02	Brick or Cast in Place Standard Storm Manhole	1 of 1
BC 383.04	48" Dia. Precast Storm Manhole for 15" to 24" Pipes	1 of 1
BC 383.05	60" Dia. Precast Storm Manhole for 27" to 36" Pipes	1 of 1
BC 383.06	72" Dia. Precast Storm Manhole for 42" to 48" Pipes	1 of 1
BC 383.07	84" Dia. Precast Storm Manhole for 54" to 60" Pipes	1 of 1
BC 383.21	Standard 24 In. Manhole Cover	1 of 1
BC 383.22	Standard 24 In. Manhole Frame	1 of 1
BC 383.23	Standard 30 In. Manhole Cover	1 of 1
BC 383.24	Standard 30 In. Manhole Frame	1 of 1
BC 383.25	Locking Device for Manhole Frame and Cover	1 of 1
BC 383.31	Typical Manhole Channels: Standard Channel No. 1, Standard Channel No. 2	1 of 1
BC 383.32	Typical Manhole Channels: Standard Channel No. 3, Standard Channel No. 4, Standard Channel No. 5	1 of 1
BC 383.33	Typical Manhole Channels: Standard Channel No. 6, Standard Channel No. 7	1 of 1
BC 383.34	Typical Manhole Channels: Standard Channel No. 8, Standard Channel No. 9, Standard Channel No. 10	1 of 1
BC 383.35	Typical Manhole Channels: Standard Channel No. 11, Standard Channel No. 12	1 of 1
BC 383.92	Stainless Steel Manhole Step	1 of 1
BC 383.93	Polypropylene Manhole Step for Precast Manholes	1 of 1
BC 386.41	Concrete Cradle for R.C.P. Storm Drains	1 of 1
BC 386.51	Concrete Encasement for Storm Drains	1 of 1
BC 389.01	Standard Berm Ditches Concrete and Sod	1 of 1
BC 389.02	Standard Side Ditches - V Slope	1 of 1
BC 389.03	Standard Side Ditches - Trapezoidal	1 of 1

BC 389.04	Standard Median Ditches - Trapezoidal	1 of 1
BC 389.05	Standard Median Ditches - V Slope	1 of 1

WASTEWATER DETAILS:

Dwg. No.	Description	Pages
BC 830.01	Gravel Cradle for E.S.C.P. Sanitary Sewers	1 of 1
BC 830.02	Gravel Cradle for R.C.P. Sanitary Sewers	1 of 1
BC 830.03	Gravel Cradle for P.V.C. Sanitary Sewers	1 of 1
BC 830.04	Concrete Encasement for Sanitary Sewers	1 of 1
BC 830.05	Standard Brick and Concrete Curves for Sanitary Sewers	1 of 1
BC 830.06	Concrete Cradle for Sanitary Sewers	1 of 1
BC 830.13	Typical Plugging Detail Sanitary House Connection	1 of 1
BC 830.14	Typical Installations of Sanitary House Connections	1 of 1
BC 830.15	Typical House Connection with Cleanout in Public Right of Way	1 of 1
BC 830.16	Typical Installations of Standpipe House Connections	1 of 1
BC 830.17	Saddle Installation Detail for New House Connection to Existing Sewer	1 of 1
BC 830.18	Pipe Replacement Detail for New House Connections to Existing Sewers	1 of 1
BC 830.19	Measuring and Recording As Built Location of New Sanitary House Connections	1 of 2
BC 830.19	Measuring and Recording As Built Location of New Sanitary House Connections	2 of 2
BC 830.20	Typical Detail for Leakage Exfiltration Testing	1 of 1
BC 831.01	Standard Brick Sanitary Manhole	1 of 1
BC 831.02	Sanitary Manhole Type C	1 of 1
BC 831.03	Sanitary Terminal Manhole	1 of 1
BC 831.04	48” Diameter Precast Sanitary Manhole for Pipe Diameters up to 24”	1 of 1
BC 831.05	60” Diameter Precast Sanitary Manhole for Pipe Diameters up to 36”	1 of 1
BC 831.06	72” Diameter Precast Sanitary Manhole for Pipe Diameters up to 48”	1 of 1
BC 831.07	48” Diameter Precast “Doghouse” Riser for Pipe Diameters up to 24”	1 of 1
BC 831.08	60” Diameter Precast “Doghouse” Riser for Pipe Diameters up to 36”	1 of 1
BC 831.09	Sanitary Type A Drop Connection/Sanitary Type B Drop Connection	1 of 1
BC 831.10	Manhole Abandonment	1 of 1
BC 831.20	Sanitary Offset Manhole 30" Cover	1 of 1
BC 831.21	Standard Sanitary Manhole Precast Slab	1 of 1
BC 831.22	Precast Manhole Slab for 24" Frame	1 of 1
BC 831.23	Special Fittings	1 of 1
BC 831.24	Standard San. 24" Manhole Cover	1 of 1
BC 831.25	Standard 24" Manhole Frame	1 of 1
BC 831.26	Standard Sanitary 30" Manhole Cover	1 of 1
BC 831.27	Standard 30" Manhole Frame	1 of 1

BC 831.28	Locking Device for Manhole Frame & Cover	1 of 1
BC 831.29	Cleanout Cover Assembly	1 of 1
BC 831.30	Type 1 Step for Brick Manholes	1 of 1
BC 831.31	Type 2 Step for Precast & Cast in Place Manholes	1 of 1
BC 831.32	Copolymer Polypropylene Steps for Precast and Cast in Place Manholes	1 of 1
BC 831.35	Typical Manhole Channels Standard Channel No.1 and No.2	1 of 1
BC 831.36	Typical Manhole Channels Standard Channel No.3, No.4 and No.5	1 of 1
BC 831.37	Typical Manhole Channels Standard Channel No.6 and No.7	1 of 1
BC 831.38	Typical Manhole Channels Standard Channel No.8, No.9 and No. 10	1 of 1
BC 831.39	Typical Manhole Channels Standard Channel No. 11 and No. 12	1 of 1

WATER DETAILS:

Dwg. No.	Description	Pages
BC 833.01	Standard Installation of Fire Hydrant with Tee and Valve (Sectional Vault)	1 of 1
BC 833.02	Standard Installation of Fire Hydrant with Tee and Valve (Roadway Box)	1 of 1
BC 833.03	Standard Installation of Fire Hydrant with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 833.04	Standard Installation of Fire Hydrant with Tapping Sleeve and Valve (Roadway Box)	1 of 1
BC 834.01	Standard Installation of Resilient - Seated Valve with Roadway Box (4" - 14")	1 of 1
BC 834.02	Standard Installation of Tapping Valve with Small Sectional Vault (4" - 8")	1 of 1
BC 834.03	Standard Installation of Tapping Valve with Roadway Box (4" - 8")	1 of 1
BC 834.04	Standard Installation of Tapping Valve with Large Sectional Vault (10" - 12")	1 of 1
BC 834.05	Standard Installation of Tapping Valve with Roadway Box (10" - 12")	1 of 1
BC 834.06	Standard Installation of Tapping Sleeve and Horizontal Valve with Sectional	1 of 1
BC 834.07	Standard Installation of Tapping Sleeve and Horizontal Valve with Roadway Box	1 of 1
BC 835.01	Standard Installation of Butterfly Valve with Sectional Vault (30" - 72")	1 of 1
BC 835.02	Standard Installation of Butterfly Valve with Roadway Box (30" - 72")	1 of 1
BC 835.03	Standard Butterfly Valve Over Torque Protector	1 of 1
BC 836.01	Standard Installation of 3/4" Water Supply Service (5/8" Meter)	1 of 1
BC 837.01	Standard Installation of 1" Water Supply Service (3/4" Meter)	1 of 1
BC 838.01	Standard Installation of Twin Water Supply Services (5/8" Meters)	1 of 1
BC 839.01	Standard Installation of 1 1/2" Water Supply Service (1" Meter) for 6" Main and Larger	1 of 1
BC 839.02	Standard Installation of 1 1/2" Water Supply Service (1" Meter) for Mains Smaller Than 6"	1 of 1
BC 840.01	Standard Installation of 2" Water Supply Service (1 1/2" Meter) for 8" Main and Larger	1 of 1
BC 840.02	Standard Installation of 2" Water Supply Service (1 1/2" Meter) for 6" Main and Smaller	1 of 1

Standard Storm Water Details

March 2008

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BOOK OF STANDARDS
STORM WATER INDEX OF DRAWINGS

STORM WATER DETAILS:

BC 376.93	18 In. Inlet Frame and Cover	1 of 1
BC 377.12	Type 'J' Chute Inlet	1 of 1
BC 380.01	Type 'S' Inlet Single Grate	1 of 1
BC 380.02	Type 'S' Frame and Grate Parallel Bars	1 of 1
BC 380.03	Type 'S' Frame and Grate Sections Parallel Bars	1 of 1
BC 380.04	Type 'S' Frame and Grate Transverse Bars	1 of 1
BC 380.05	Type 'S' Frame and Grate Sections Transverse Bars	1 of 1
BC 380.06	Curved Vane (S-CV) Grate(s) with Class 35 Type 'S' Frame New Construction	1 of 1
BC 380.07	Curved Vane (S-CV) Grate(s) for Existing Type 'S' Frame	1 of 1
BC 380.11	Type 'S' Inlet Single Grate (Ditch Installation)	1 of 1
BC 380.21	Type 'S' Inlet Double Grate Tandem	1 of 1
BC 380.31	Type 'S' Inlet Double Grate Tandem (Ditch Installation)	1 of 1
BC 380.51	Type 'S' Combination Inlet Double Grate Tandem	1 of 1
BC 380.52	Precast Special Curb Type 'S' Combination Inlet Double Grate Tandem	1 of 1
BC 380.53	Beam and Plate Detail Type 'S' Combination Inlet Double Grate Tandem	1 of 1
BC 380.99	Method of Depressing Paving at Inlets	1 of 1
BC 383.02	Brick or Cast in Place Standard Storm Manhole	1 of 1
BC 383.04	48" Dia. Precast Storm Manhole for 15" to 24" Pipes	1 of 1
BC 383.05	60" Dia. Precast Storm Manhole for 27" to 36" Pipes	1 of 1
BC 383.06	72" Dia. Precast Storm Manhole for 42" to 48" Pipes	1 of 1
BC 383.07	84" Dia. Precast Storm Manhole for 54" to 60" Pipes	1 of 1
BC 383.21	Standard 24 In. Manhole Cover	1 of 1
BC 383.22	Standard 24 In. Manhole Frame	1 of 1
BC 383.23	Standard 30 In. Manhole Cover	1 of 1
BC 383.24	Standard 30 In. Manhole Frame	1 of 1
BC 383.25	Locking Device for Manhole Frame and Cover	1 of 1
BC 383.31	Typical Manhole Channels: Standard Channel No. 1, Standard Channel No. 2	1 of 1
BC 383.32	Typical Manhole Channels: Standard Channel No. 3, Standard Channel No. 4,	1 of 1
BC 383.33	Typical Manhole Channels: Standard Channel No. 6, Standard Channel No. 7	1 of 1
BC 383.34	Typical Manhole Channels: Standard Channel No. 8, Standard Channel No. 9,	1 of 1
BC 383.35	Typical Manhole Channels: Standard Channel No. 11, Standard Channel No. 12	1 of 1
BC 383.92	Stainless Steel Manhole Step	1 of 1
BC 383.93	Polypropylene Manhole Step for Precast Manholes	1 of 1
BC 386.41	Concrete Cradle for R.C.P. Storm Drains	1 of 1
BC 386.51	Concrete Encasement for Storm Drains	1 of 1
BC 389.01	Standard Berm Ditches Concrete and Sod	1 of 1
BC 389.02	Standard Side Ditches - V Slope	1 of 1
BC 389.03	Standard Side Ditches - Trapezoidal	1 of 1
BC 389.04	Standard Median Ditches - Trapezoidal	1 of 1
BC 389.05	Standard Median Ditches - V Slope	1 of 1

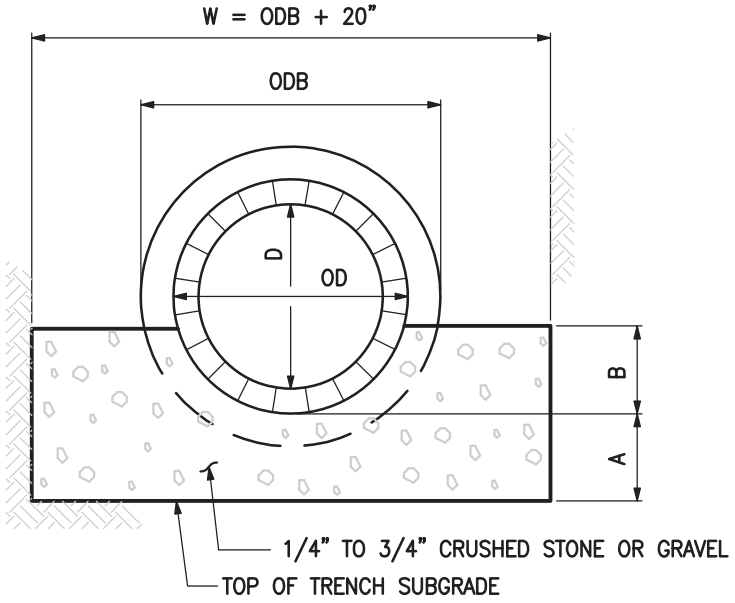
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BOOK OF STANDARDS
STORM WATER CROSS INDEX OF DRAWINGS

STORM WATER DETAILS:

Old Dwg. No.	Dwg. No.	Description	Pages
BC 302.01 1 OF 2	BC 302.02	Gravel Cradle for R.C.P. Storm Drains	1 of 1
BC 302.01 2 OF 2	BC 302.03	Gravel Cradle for P.V.C. Storm Drains	1 of 1
	BC 302.04	Gravel Cradle for HDPE Storm Drains	1 of 1
BC 318.01	BC 318.02	Concrete or Brick 'Y' Single or Double	1 of 1
BC 320.01	BC 320.01	Brick and Concrete Curves for Storm Drains	1 of 1
BC 350.01	BC 350.02	End Support Wall Circular and Elliptical Pipe	1 of 2
BC 350.01	BC 350.02	End Support Wall Circular and Elliptical Pipe Tables	2 of 2
BC 352.01	BC 352.02	Type 'B' Endwalls B-48, B-54, B-60, B-66, B-72, B-78, B-84	1 of 1
BC 354.01	BC 354.02	Type 'C' Endwall Circular and Elliptical Pipe	1 of 2
BC 354.01	BC 354.02	Type 'C' Endwall Circular and Elliptical Pipe Tables	2 of 2
BC 356.01	BC 356.02	Type 'E' Endwall Circular and Elliptical Pipe	1 of 2
BC 356.01	BC 356.02	Type 'E' Endwall Circular and Elliptical Pipe Tables	2 of 2
BC 358.01,	BC 358.02	Type 'F' Endwall Circular and Elliptical Pipe	1 of 2
BC 358.02,	"	"	"
BC 358.11,	"	"	"
BC 358.12	"	"	"
BC 358.01,	BC 358.02	Type 'F' Endwall Circular and Elliptical Pipe Tables	2 of 2
BC 358.02,	"	"	"
BC 358.11,	"	"	"
BC 358.12	"	"	"
BC 358.91	BC 358.91	Standard Type 'F' Endwall Modifications	1 of 1
BC 360.01	BC 360.02	Type 'G' Endwall Circular and Elliptical Pipe	1 of 1
BC 360.91	BC 360.91	Standard Type 'G' Endwall Modifications	1 of 1
BC 368.01	BC 368.01	Concrete End Section Circular Pipe - Option No. 1	1 of 1
BC 368.02	BC 368.02	Concrete End Section Circular Pipe - Option No. 2	1 of 1
BC 370.01	BC 370.02	Metal End Section Circular Pipe	1 of 2
BC 370.11	BC 370.02	Connections Metal End Sections Circular Pipe	2 of 2
BC 376.01	BC 376.01	Type No. 1 'E' Grate(s) and Frame	1 of 1
	BC 376.02	Curved Vane (E-CV) Grate(s) with Class 35 Type 'E' Frame New Construction	1 of 1
	BC 376.03	Curved Vane (E-CV) Grate(s) for Existing Type No. 1 'E' Frame	1 of 1
BC 376.13	BC 376.14	Type 'E' Inlet	1 of 1

BC 376.22	BC 376.22	Precast Special Curb for Undepressed 'E' Combination Inlet	1 of 2
BC 376.22	BC 376.22	Precast Special Curb for Depressed 'E' Combination Inlet	2 of 2
BC 376.23	BC 376.24	Type 'E' Combination Inlet	1 of 1
BC 376.29	BC 376.30	Duplex Type 'E' Inlet	1 of 1
BC 376.53	BC 376.54	Type 'H' Inlet	1 of 1
BC 376.62	BC 376.62	Type No. 2 'H' Grate	1 of 1
BC 376.63	BC 376.64	Type 'H' Combination Inlet	1 of 1
BC 376.91	BC 376.91	Precast Type 'H' Inlet Head	1 of 1
BC 376.92	BC 376.92	Curb Armor for Type 'H' Inlet Head	1 of 1
BC 376.93	BC 376.93	18 In. Inlet Frame and Cover	1 of 1
BC 377.11	BC 377.12	Type 'J' Chute Inlet	1 of 1
BC 379.01	BC 380.01	Type 'S' Inlet Single Grate	1 of 1
BC 379.02	BC 380.02	Type 'S' Frame and Grate Parallel Bars	1 of 1
BC 379.03	BC 380.03	Type 'S' Frame and Grate Sections Parallel Bars	1 of 1
BC 379.04 1 OF 2	BC 380.04	Type 'S' Frame and Grate Transverse Bars	1 of 1
BC 379.04 2 OF 2	BC 380.05	Type 'S' Frame and Grate Sections Transverse Bars	1 of 1
	BC 380.06	Curved Vane (S-CV) Grate(s) with Class 35 Type 'S' Frame New Construction	1 of 1
	BC 380.07	Curved Vane (S-CV) Grate(s) for Existing Type 'S' Frame	1 of 1
BC 379.11	BC 380.11	Type 'S' Inlet Single Grate (Ditch Installation)	1 of 1
BC 379.21	BC 380.21	Type 'S' Inlet Double Grate Tandem	1 of 1
BC 379.31	BC 380.31	Type 'S' Inlet Double Grate Tandem (Ditch Installation)	1 of 1
BC 379.51	BC 380.51	Type 'S' Combination Inlet Double Grate Tandem	1 of 1
BC 379.52	BC 380.52	Precast Special Curb Type 'S' Combination Inlet Double Grate Tandem	1 of 1
BC 379.53	BC 380.53	Beam and Plate Detail Type 'S' Combination Inlet Double Grate Tandem	1 of 1
BC 379.99	BC 380.99	Method of Depressing Paving at Inlets	1 of 1
BC 383.01,	BC 383.02	Brick or Cast in Place Standard Storm Manhole	1 of 1
BC 383.02	"	"	"
BC 383.04	BC 383.04	48" Dia. Precast Storm Manhole for 15" to 24" Pipes	1 of 1
BC 383.05	BC 383.05	60" Dia. Precast Storm Manhole for 27" to 36" Pipes	1 of 1
BC 383.06	BC 383.06	72" Dia. Precast Storm Manhole for 42" to 48" Pipes	1 of 1
	BC 383.07	84" Dia. Precast Storm Manhole for 54" to 60" Pipes	1 of 1
BC 383.11	BC 383.21	Standard 24 In. Manhole Cover	1 of 1
BC 383.12	BC 383.22	Standard 24 In. Manhole Frame	1 of 1
BC 383.13	BC 383.23	Standard 30 In. Manhole Cover	1 of 1
BC 383.14	BC 383.24	Standard 30 In. Manhole Frame	1 of 1
BC 383.15	BC 383.25	Locking Device for Manhole Frame and Cover	1 of 1
BC 383.31	BC 383.31	Typical Manhole Channels: Standard Channel No. 1, Standard Channel No. 2	1 of 1

BC 383.32	BC 383.32	Typical Manhole Channels: Standard Channel No. 3, Standard Channel No. 4, Standard Channel No. 5	1 of 1
BC 383.33	BC 383.33	Typical Manhole Channels: Standard Channel No. 6, Standard Channel No. 7	1 of 1
BC 383.34	BC 383.34	Typical Manhole Channels: Standard Channel No. 8, Standard Channel No. 9, Standard Channel No. 10	1 of 1
BC 383.35	BC 383.35	Typical Manhole Channels: Standard Channel No. 11, Standard Channel No. 12	1 of 1
BC 383.90,	BC 383.92	Stainless Steel Manhole Step	1 of 1
BC 383.91	"	"	"
	BC 383.93	Polypropylene Manhole Step for Precast Manholes	1 of 1
BC 386.41	BC 386.41	Concrete Cradle for R.C.P. Storm Drains	1 of 1
BC 386.51	BC 386.51	Concrete Encasement for Storm Drains	1 of 1
BC 389.01	BC 389.01	Standard Berm Ditches Concrete and Sod	1 of 1
BC 389.02	BC 389.02	Standard Side Ditches - V Slope	1 of 1
BC 389.03	BC 389.03	Standard Side Ditches - Trapezoidal	1 of 1
BC 389.04	BC 389.04	Standard Median Ditches - Trapezoidal	1 of 1
BC 389.05	BC 389.05	Standard Median Ditches - V Slope	1 of 1



NOTES:

1. STONE (NO. 6 AGGREGATE) MAY BE SUBSTITUTED FOR GRAVEL.
2. WHEN 2 TIER TRENCH SUPPORT IS REQUIRED, ADD 24" TO "W" FOR CALCULATING THE AMOUNT OF PAVING NEEDED FOR TRENCH REPAIR.

REINFORCED CONCRETE PIPE					
DIMENSIONS					
D	OD	ODB	A	B	W
15"	19"	23"	7"	6"	43"
18"	22.5"	27"	7"	6"	47"
21"	25.75"	30.5"	7"	6"	50.5"
24"	29"	34"	7"	6"	54"
27"	32.25"	37.5"	7"	6"	57.5"
30"	36"	41.5"	7"	6"	61.5"
33"	39.5"	45.5"	7"	6"	65.5"
36"	42.75"	49"	8"	6"	69"
42"	50"	57.5"	8"	6"	77.5"
48"	57"	66"	9"	6"	86"
54"	64"	72.5"	9"	7"	92.5"
60"	72"	75.5"	6"	8"	95.5"
66"	79"	81"	6"	8"	101"
72"	86"	88"	6"	9"	108"

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

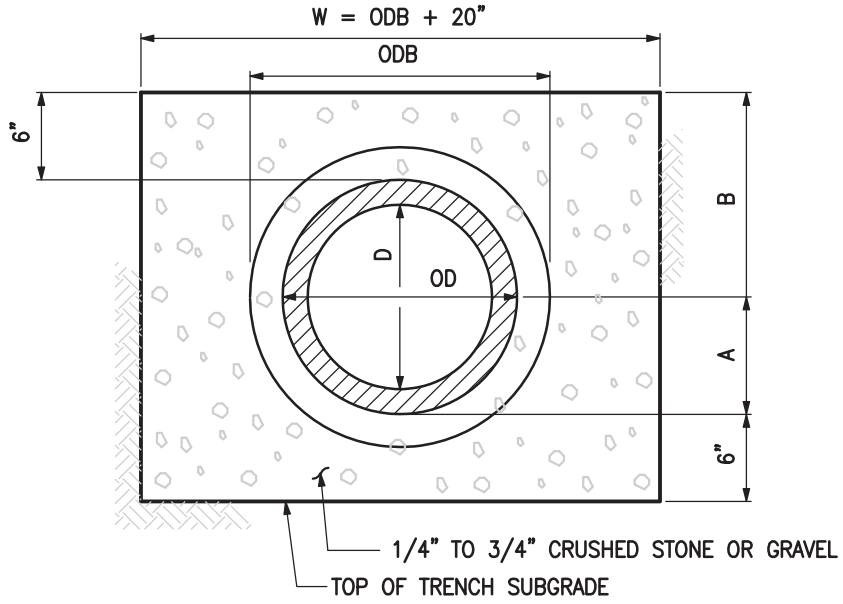
GRAVEL CRADLE FOR
RCP STORM DRAINS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 302.02

SCALE : NONE

SHEET 1 OF 1



NOTES:

1. STONE (NO. 6 AGGREGATE) MAY BE SUBSTITUTED FOR GRAVEL.
2. WHEN 2 TIER TRENCH SUPPORT IS REQUIRED, ADD 24" TO "W" FOR CALCULATING THE AMOUNT OF PAVING NEEDED FOR TRENCH REPAIR.
3. HAUNCHING AREA (A) AROUND THE PIPE SHALL BE COMPACTED TO A MINIMUM 95% PROCTOR DENSITY. TAMPING SHALL BE DONE IN 4" LAYERS TO THE SPRING LINE. COMPACTION OF THE EMBEDMENT MATERIAL SHOULD BE DONE IN A WAY THAT THE COMPACTION EQUIPMENT WILL NOT DAMAGE THE PIPE OR CAUSE DEFLECTION OF/IN THE PIPE. WHEN HYDRO-HAMMERS ARE USED TO ACHIEVE COMPACTION THEY SHOULD NOT BE USED WITHIN 3' OF THE TOP OF PIPE AND THEN ONLY IF THE EMBEDMENT MATERIAL DENSITY HAS BEEN PREVIOUSLY COMPACTED TO A MINIMUM 85% PROCTOR DENSITY.

PVC PIPE						
DIMENSIONS						
D	OD	ODB	A	B	W	
					MIN	MAX
6"	6.25"	7"	3.13"	9.13"	30"	60"
8"	8.5"	9.5"	4.25"	10.25"	30"	60"
10"	10.5"	12"	5.25"	11.25"	30"	60"
12"	12.5"	14"	6.25"	12.25"	36"	60"
15"	15.25"	16.5"	7.63"	13.63"	42"	60"
18"	18.75"	20"	9.38"	15.38"	42"	66"
21"	22"	23.5"	11"	17"	48"	66"
24"	24.75"	26.5"	12.38"	18.38"	48"	72"
27"	28"	30"	14"	20"	54"	78"

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

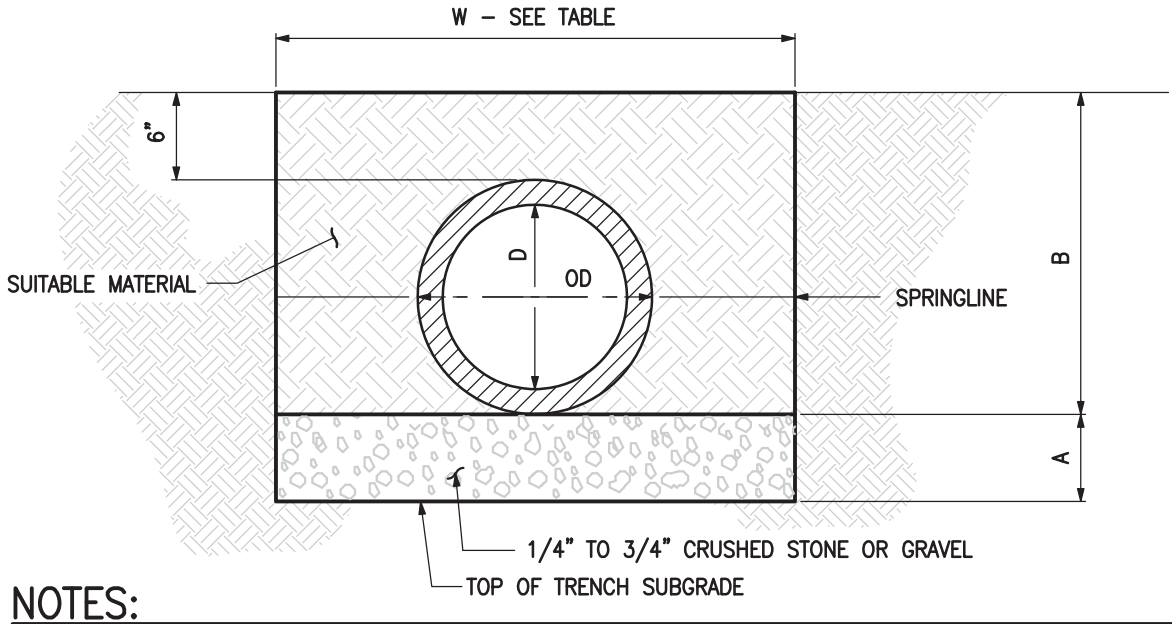
GRAVEL CRADLE FOR
PVC STORM DRAINS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 302.03

SCALE : NONE

SHEET 1 OF 1



NOTES:

1. NO. 57 AGGREGATE MAY BE SUBSTITUTED FOR GRAVEL.
2. WHEN 2 TIER TRENCH SUPPORT IS REQUIRED, ADD 24" TO "W" FOR CALCULATING THE AMOUNT OF PAVING NEEDED FOR TRENCH REPAIR.
3. HAUNCHING AREA (A) AROUND THE PIPE SHALL BE COMPACTED TO A MINIMUM 95% PROCTOR DENSITY. TAMPING SHALL BE DONE IN 4" LAYERS TO THE SPRING LINE. COMPACTION OF THE EMBEDMENT MATERIAL SHOULD BE DONE IN A WAY THAT THE COMPACTION EQUIPMENT WILL NOT DAMAGE THE PIPE OR CAUSE DEFLECTION OF/IN THE PIPE. WHEN HYDRO–HAMMERS ARE USED TO ACHIEVE COMPACTION THEY SHOULD NOT BE USED WITHIN 3' OF THE TOP OF PIPE AND THEN ONLY IF THE EMBEDMENT MATERIAL DENSITY HAS BEEN PREVIOUSLY COMPACTED TO A MINIMUM 85% PROCTOR DENSITY.
4. ALL SUITABLE MATERIAL EXCAVATED FROM UTILITY TRENCHES SHALL BE USED AS FAR AS PRACTICABLE, FOR BACKFILL IN TRENCHES. SOILS AND SOIL AGGREGATE MIXTURES USED AS TRENCH BACKFILL SHALL CONFORM TO THE MINIMUM COMMON BORROW REQUIREMENTS IN THE CITY SPECIFICATIONS FOR MATERIALS, HIGHWAYS, BRIDGES, UTILITIES, AND INCIDENTAL STRUCTURES.

HDPE PIPE				
DIMENSIONS				
D	OD	A	B	W
12"	14.2"	4"	20.2"	30"
15"	17.7"	4"	23.7"	34"
18"	21.5"	4"	27.5"	39"
24"	28.4"	4"	34.4"	48"
30"	35.5"	6"	41.5"	56"
36"	41.4"	6"	47.4"	64"
42"	48.0"	6"	54.0"	72"
48"	54.0"	6"	60.0"	80"
54"	61.0"	6"	67.0"	88"
60"	67.3"	6"	73.3"	96"

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

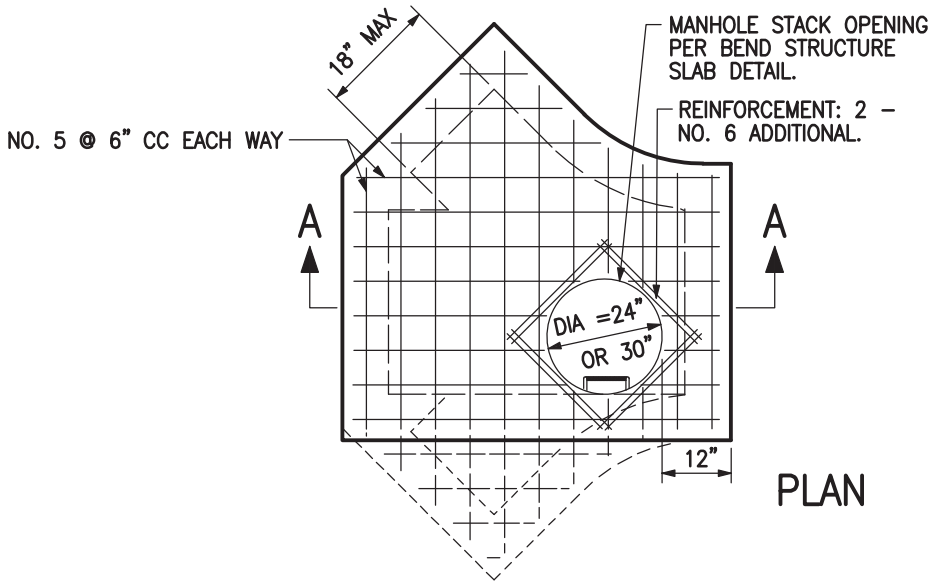
GRAVEL CRADLE FOR
HDPE STORM DRAINS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 302.04

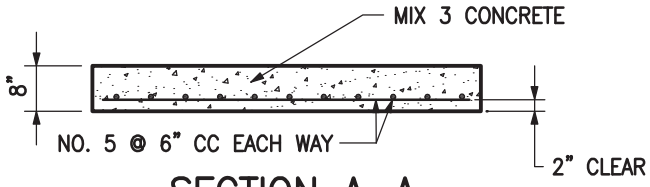
SCALE : NONE

SHEET 1 OF 1

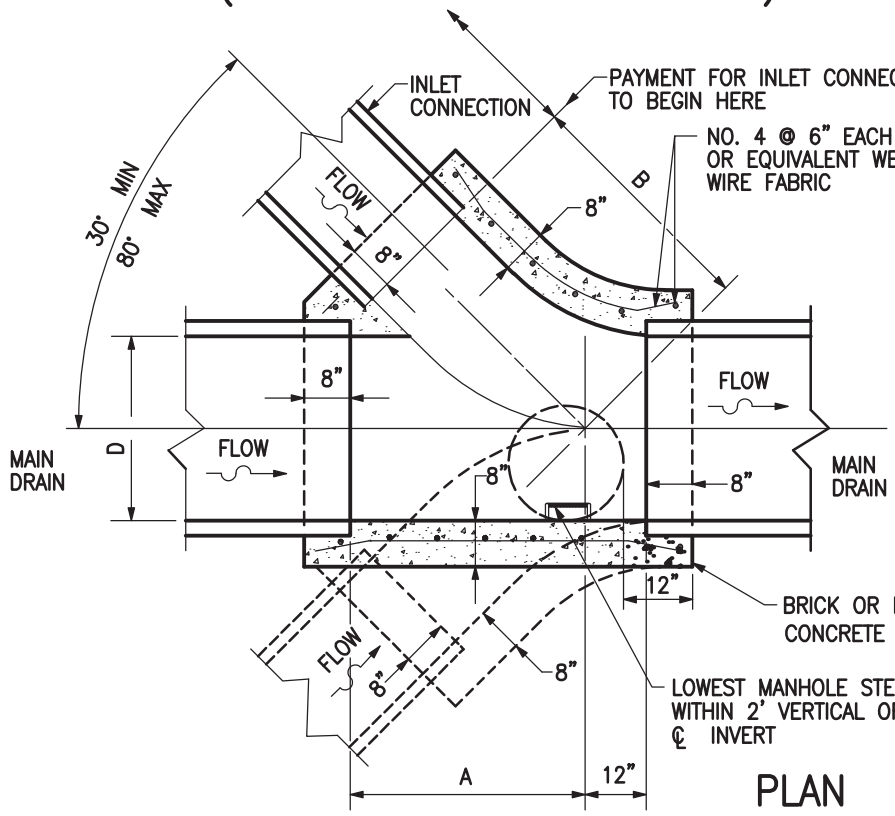


PLAN

MINIMUM DIMENSIONS		
D	A	B
15"–18"	3'–9"	2'–9"
21"–30"	4'–4"	3'–7"
33"–36"	4'–7"	3'–11"



SECTION A–A (ROOF SLAB REINFORCEMENT)



PLAN

NOTES:

1. WALLS AND BOTTOM SHALL BE BRICK OR MIX 3 REINFORCED CONCRETE. USE NO. 4 BARS AT 6" EACH WAY OR EQUIVALENT WELDED WIRE FABRIC.
2. SLAB OPENING FOR MANHOLE STACK IS 3' DIA EXCEPT WHERE FRAME INSTALLED WITHOUT PRECAST MANHOLE RISER.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

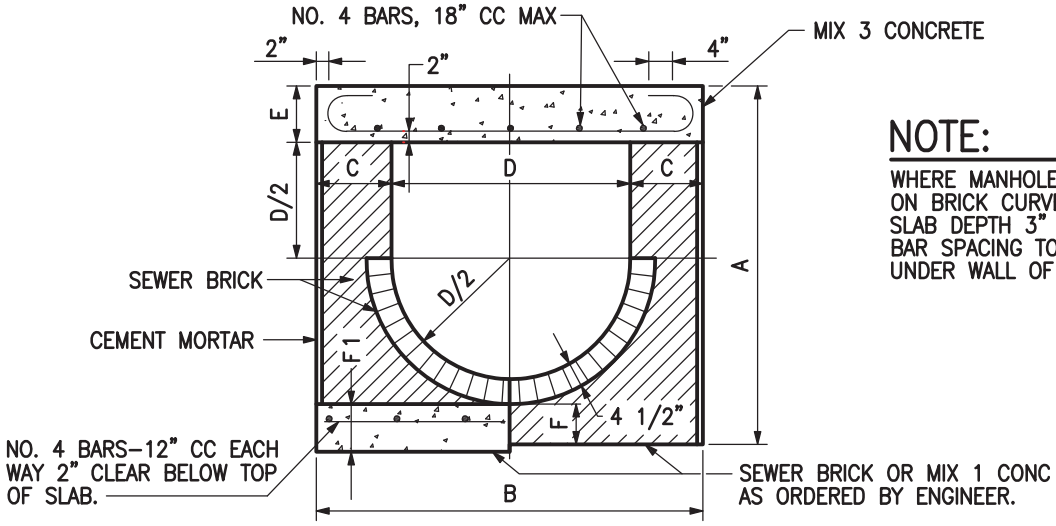
CONCRETE OR
BRICK 'Y'
SINGLE OR DOUBLE

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 318.02

SCALE : NONE

SHEET 1 OF 1



NOTE:

WHERE MANHOLES ARE BUILT ON BRICK CURVES, INCREASE SLAB DEPTH 3" AND DECREASE BAR SPACING TO 2 1/2" CC UNDER WALL OF MANHOLE.

DIMENSIONS								
D	A	B	C	E	F	F1	STEEL	NO. OF TEMP BAR
24"	3'–5"	3'–6"	9"	8"	4 1/2"	6"	NO. 5 BARS @ 10" CC	3
27"	3'–8"	3'–9"	9"	8"	4 1/2"	6"	NO. 5 BARS @ 8" CC	3
30"	3'–11"	4'–0"	9"	8"	4 1/2"	6"	NO. 5 BARS @ 7" CC	3
33"	4'–2"	4'–3"	9"	8"	4 1/2"	6"	NO. 5 BARS @ 6" CC	3
36"	4'–5"	4'–6"	9"	8"	4 1/2"	6"	NO. 5 BARS @ 5" CC	3
42"	5'–3"	5'–8"	13"	10"	6 1/2"	8"	NO. 5 BARS @ 6" CC	5
48"	5'–9"	6'–2"	13"	10"	6 1/2"	8"	NO. 5 BARS @ 5" CC	5
54"	6'–3"	6'–8"	13"	10"	6 1/2"	8"	NO. 6 BARS @ 8" CC	5
60"	6'–9"	7'–2"	13"	10"	6 1/2"	8"	NO. 6 BARS @ 6" CC	5

QUANTITIES PER LINEAR FOOT				
SIZE	MIX 3 CONC CU YDS	BRICK (FLAT) CU YDS	BRICK (ON EDGE) CU YDS	STEEL LBS
24"	0.0864	0.1724	0.0518	7.235
27"	0.0926	0.1920	0.0573	8.934
30"	0.0988	0.2121	0.0627	10.369
33"	0.1049	0.2327	0.0682	12.286
36"	0.1111	0.2538	0.0736	14.968
42"	0.1749	0.4374	0.0845	16.576
48"	0.1903	0.4985	0.0954	20.474
54"	0.2058	0.5616	0.1064	20.344
60"	0.2212	0.6266	0.1173	27.513

FOR BRICK BOTTOM

NOTE: QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

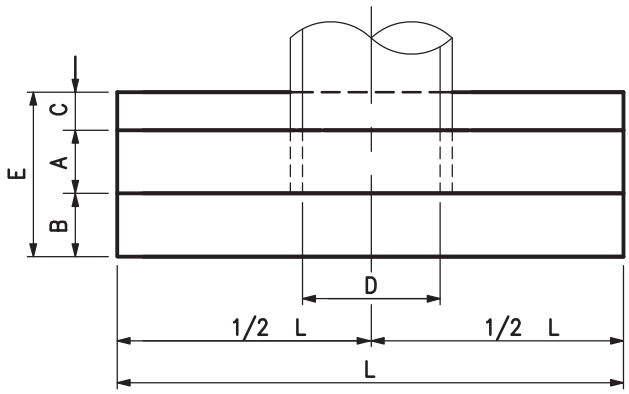
BRICK AND CONCRETE CURVES FOR STORM DRAINS

ISSUED	REVISED	REVISED
3 / 2008		

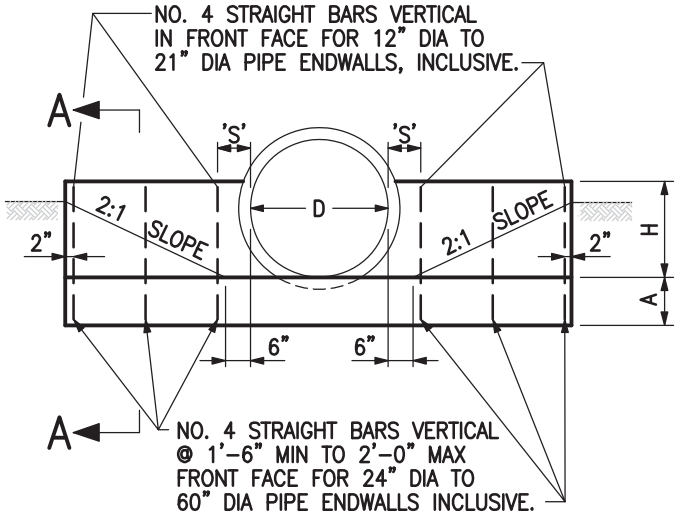
STANDARD NO.
BC 320.01

SCALE : NONE

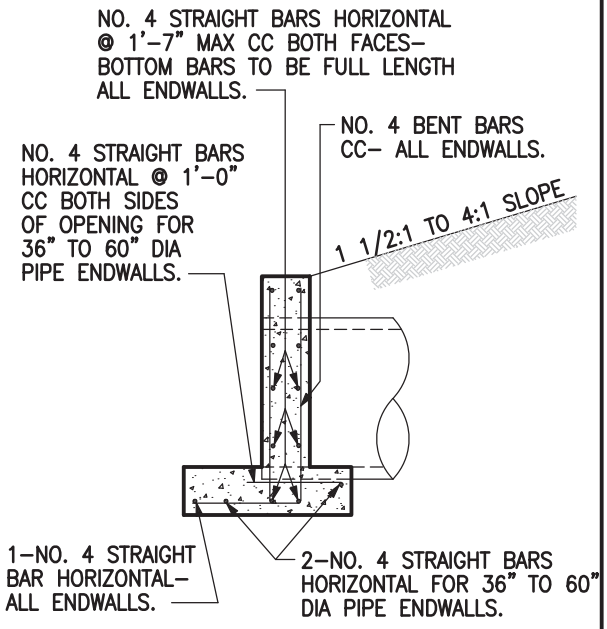
SHEET 1 OF 1



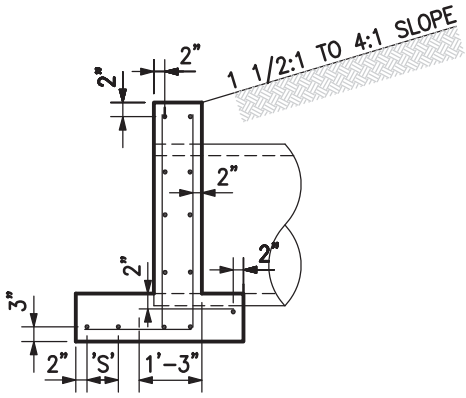
PLAN



ELEVATION



SECTION A - A



DISPOSITION OF BARS DETAIL

NOTES:

1. SPECIFICATIONS: LATEST DPW
2. CONCRETE: CONCRETE SHALL BE MIX 3
3. REINFORCING: DEFORMED STEEL BARS- NO. 4
4. CHAMFER: ALL EXPOSED EDGES 1"x1" OR AS DIRECTED.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

END SUPPORT WALL
CIRCULAR AND ELLIPTICAL PIPE

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 350.02

SCALE : NONE

SHEET 1 OF 2

OPENING		DIMENSIONS							QUANTITIES	
D INCHES	AREA SQ FT	A	B	C	E	H	L	S	CONC CY	STEEL LBS
14" X 23"	1.8	9"	14"	6"	2'–5"	1'–2"	5'–11"	6"	0.54	33
19" X 30"	3.3	9"	14"	6"	2'–5"	1'–5"	7'–5"	6"	0.70	47
22" X 34"	4.1	12"	16"	10"	3'–2"	1'–7"	8'–2"	6"	1.30	57
24" X 38"	5.1	12"	16"	10"	3'–2"	1'–8"	8'–10"	6"	1.42	64
27" X 42"	6.3	12"	16"	10"	3'–2"	1'–10"	9'–7"	6"	1.57	72
29" X 45"	7.4	12"	16"	10"	3'–2"	1'–11"	10'–4"	8"	1.72	77
32" X 49"	8.8	12"	16"	10"	3'–2"	2'–1"	11'–3"	8"	1.92	85
34" X 53"	10.2	12"	20"	12"	3'–8"	2'–2"	12'–1"	8"	2.31	90
38" X 60"	12.9	12"	20"	12"	3'–8"	2'–6"	13'–7"	8"	2.70	102
43" X 68"	16.6	12"	20"	12"	3'–8"	2'–8"	14'–6"	8"	2.91	118

NOTE: QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

HORIZONTAL ELLIPTICAL REINFORCED CONCRETE PIPE

OPENING		DIMENSIONS							QUANTITIES	
D INCHES	AREA SQ FT	A	B	C	E	H	L	S	CONC CY	STEEL LBS
12	0.79	9"	6"	6"	1'–9"	0'–10"	4'–0"	4"	0.27	24
15	1.23	9"	6"	6"	1'–9"	1'–0 1/2"	4'–9"	4"	0.34	26
18	1.77	9"	6"	6"	1'–9"	1'–3"	5'–6"	4"	0.41	29
21	2.40	9"	6"	6"	1'–9"	1'–5"	6'–3"	4"	0.48	33
24	3.14	9"	14"	6"	2'–5"	1'–6"	7'–0"	6"	0.67	38
27	3.98	9"	14"	6"	2'–5"	1'–8"	7'–9"	6"	0.77	49
30	4.91	9"	14"	6"	2'–5"	1'–9"	8'–6"	6"	0.85	53
33	5.94	9"	14"	6"	2'–5"	1'–11"	9'–3"	6"	0.95	56
36	7.07	12"	16"	10"	3'–2"	2'–0"	10'–0"	6"	1.65	85
42	9.62	12"	16"	10"	3'–2"	2'–3"	11'–6"	8"	1.96	96
48	12.57	12"	16"	10"	3'–2"	2'–6"	13'–0"	8"	2.27	106
54	15.90	12"	20"	12"	3'–8"	2'–9"	14'–6"	8"	2.86	121
60	19.64	12"	20"	12"	3'–8"	3'–0"	16'–0"	8"	3.22	143

NOTE: QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

CIRCULAR REINFORCED CONCRETE PIPE

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

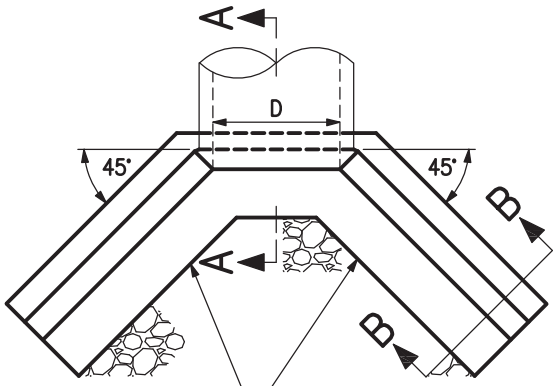
END SUPPORT WALL
CIRCULAR AND ELLIPTICAL PIPE
TABLES

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 350.02

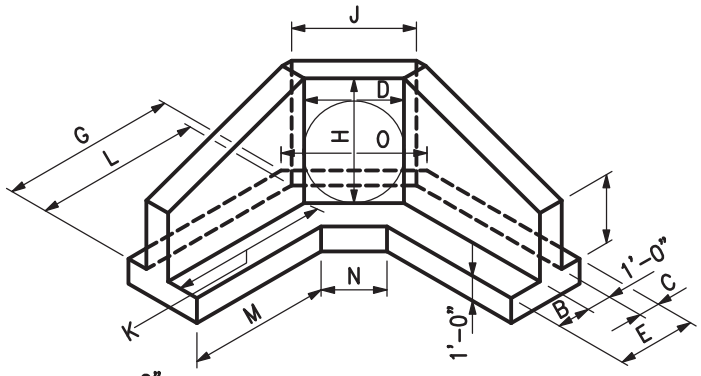
SCALE : NONE

SHEET 2 OF 2

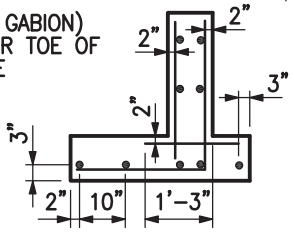


LIMITS OF RIPRAP (OR GABION) SCOUR PROTECTION FOR TOE OF ENDWALLS – SEE NOTE

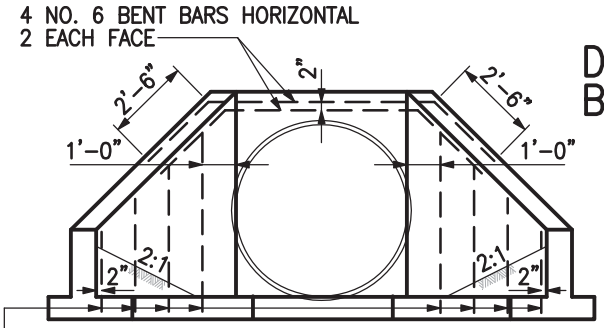
PLAN



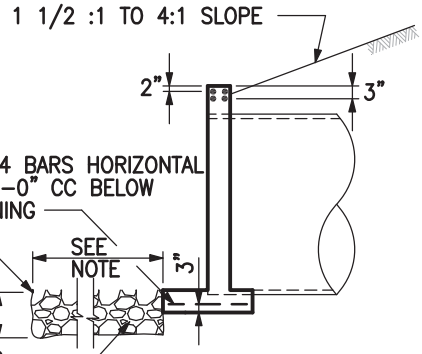
ISOMETRIC VIEW



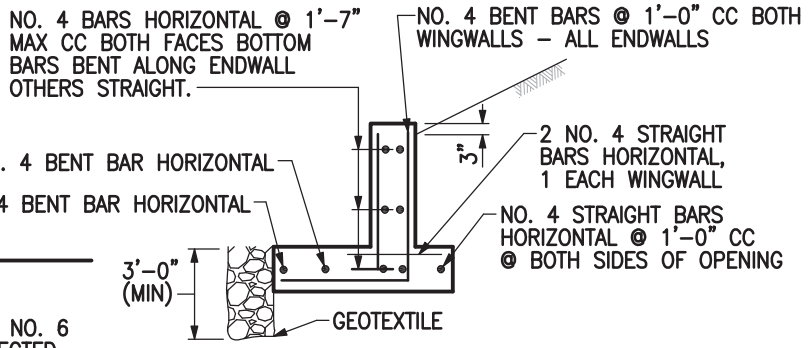
DISPOSITION OF BARS DETAIL



ELEVATION



SECTION A–A



SECTION B–B

NOTES:

1. SPECIFICATIONS: LATEST DPW
2. CONCRETE SHALL BE MIX 3
3. REINFORCING: DEFORMED STEEL BARS NO. 4 AND NO. 6
4. CHAMFER: ALL EXPOSED EDGES 1"x1" OR AS DIRECTED
5. SCOUR PROTECTION: FINAL LIMITS TO BE DETERMINED BY ENGINEER

OPENING		DIMENSIONS												QUANTITIES	
D INCHES	AREA SQ FT	B	C	E	F	G	H	J	K	L	M	N	O	CONC CY	STEEL LBS
48"	12.57	1'-4"	10"	3'-2"	2'-9"	7'-0 3/4"	5'-0"	4'-10"	6'-3 1/2"	6'-8 1/2"	5'-9"	2'-10 3/4"	5'-6"	4.3	262
54"	15.9	1'-8"	1'-0"	3'-8"	3'-0"	7'-8 1/2"	5'-6"	5'-4"	6'-10 1/2"	7'-3 1/2"	6'-2 1/4"	3'-1 1/2"	6'-2"	5.3	301
60"	19.64	1'-8"	1'-0"	3'-8"	3'-3"	8'-5"	6'-0"	5'-10"	7'-7 1/4"	8'-0 1/4"	6'-11"	3'-7 1/2"	6'-8"	6.0	361
66"	23.80	2'-6"	1'-3"	4'-9"	3'-0"	11'-2 1/2"	6'-8 1/2"	6'-4"	10'-3 1/4"	10'-8 1/2"	9'-3"	3'-5"	7'-4 1/2"	9.7	585
72"	28.27	2'-6"	1'-3"	4'-9"	3'-3"	12'-1"	7'-3"	6'-10"	11'-1 3/4"	11'-6 3/4"	10'-1 1/4"	3'-11"	7'-10 1/2"	10.9	645
78"	33.20	3'-0"	1'-6"	5'-6"	3'-6"	13'-0 1/2"	7'-9 1/2"	7'-4"	12'-0"	12'-5"	10'-9"	4'-0"	8'-6 3/4"	13.3	865
84"	38.48	3'-0"	1'-6"	5'-6"	3'-9"	13'-10"	8'-4"	7'-10"	12'-9 1/2"	13'-2 1/2"	11'-6 1/2"	4'-6"	9'-0 3/4"	14.7	984

NOTE: QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

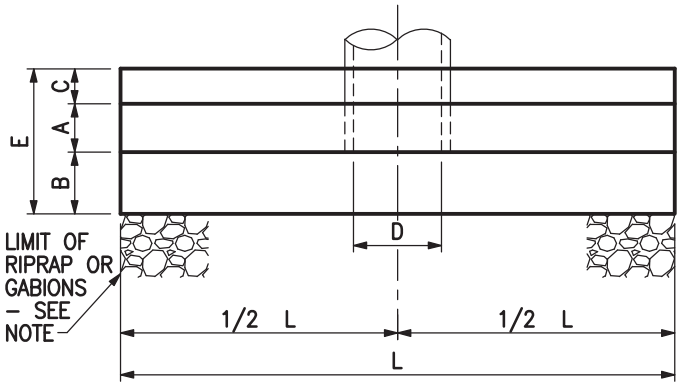
ISSUED	REVISED	REVISED
3 / 2008		

TYPE 'B' ENDWALLS
B-48, B-54, B-60,
B-66, B-72, B-78, B-84

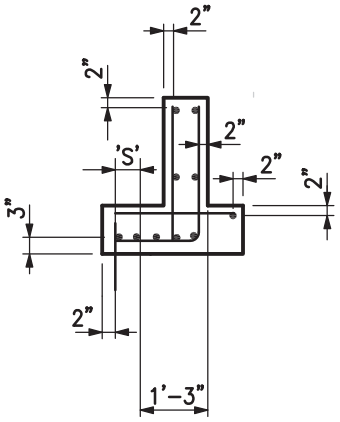
STANDARD NO.
BC 352.02

SCALE : NONE

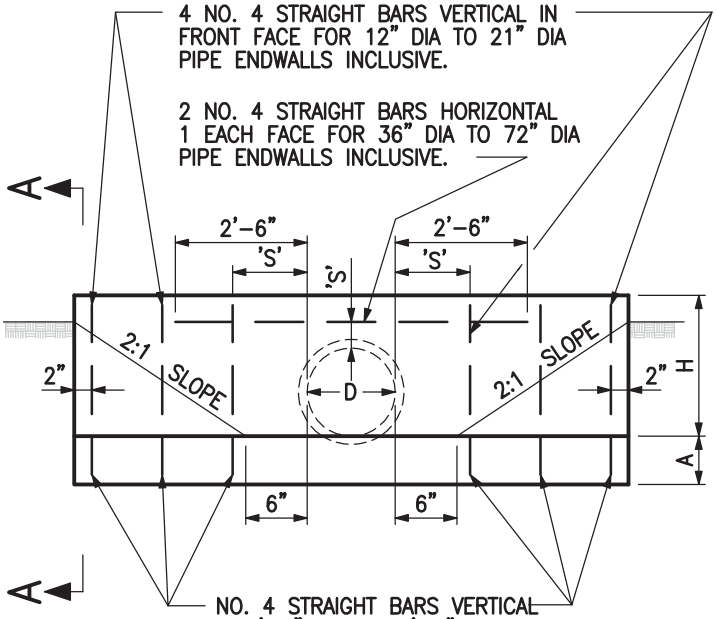
SHEET 1 OF 1



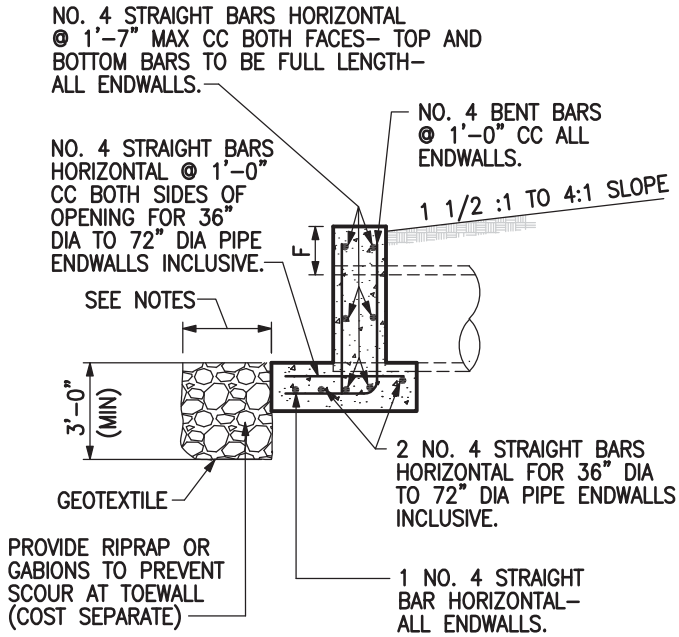
PLAN



DISPOSITION OF BARS DETAIL



ELEVATION



SECTION A–A

NOTES:

1. SPECIFICATIONS: LATEST DPW
2. CONCRETE SHALL BE MIX 3
3. REINFORCING: DEFORMED STEEL BARS NO. 4
4. CHAMFER: ALL EXPOSED EDGES 1"x1" OR AS DIRECTED
5. SCOUR PROTECTION: FINAL LIMITS TO BE DETERMINED BY ENGINEER

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

TYPE 'C' ENDWALL CIRCULAR AND ELLIPTICAL PIPE

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 354.02

SCALE : NONE

SHEET 1 OF 2

OPENING		DIMENSIONS								QUANTITIES	
D INCHES	AREA SQ FT	A	B	C	E	F	H	L	S	CONC CY	STEEL LBS
14 X 23	1.8	9"	8"	6"	1'-11"	12"	2'-2"	8'-7"	6"	0.88	56
19 X 30	3.3	9"	8"	6"	1'-11"	12"	2'-6"	10'-6"	6"	1.15	63
22 X 34	4.1	9"	14"	6"	2'-5"	13"	2'-11"	12'-6"	6"	1.74	100
24 X 38	5.1	9"	14"	6"	2'-5"	13"	3'-1"	13'-6"	6"	1.92	116
27 X 42	6.3	9"	14"	6"	2'-5"	13"	3'-4"	14'-10"	6"	2.19	124
29 X 45	7.4	9"	14"	10"	2'-9"	14"	3'-7"	16'-0"	8"	2.61	141
32 X 49	8.8	12"	16"	10"	3'-2"	14"	3'-10"	17'-0"	8"	4.08	202
34 X 53	10.2	12"	16"	10"	3'-2"	14"	4'-0"	18'-0"	8"	4.40	210
38 X 60	12.9	12"	16"	10"	3'-2"	15"	4'-5"	20'-4"	8"	5.23	266
43 X 68	16.6	12"	20"	12"	3'-8"	15"	4'-10"	22'-8"	8"	6.52	307

NOTE: QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

HORIZONTAL ELLIPTICAL CONCRETE PIPE

OPENING		DIMENSIONS								QUANTITIES	
D INCHES	AREA SQ FT	A	B	C	E	F	H	L	S	CONC CY	STEEL LBS
12	0.79	9"	6"	6"	1'-9"	9"	1'-9"	6'-6"	4"	0.61	41
15	1.23	9"	6"	6"	1'-9"	9"	2'-0"	7'-9"	4"	0.77	47
18	1.77	9"	6"	6"	1'-9"	9"	2'-3"	9'-0"	4"	0.95	54
21	2.40	9"	6"	6"	1'-9"	9"	2'-6"	10'-3"	4"	1.14	70
24	3.14	9"	14"	6"	2'-5"	9"	2'-9"	11'-6"	6"	1.56	80
27	3.98	9"	14"	6"	2'-5"	9"	3'-0"	12'-10"	6"	1.82	88
30	4.91	9"	14"	6"	2'-5"	12"	3'-6"	14'-2"	6"	2.22	98
33	5.94	9"	14"	6"	2'-5"	12"	3'-9"	15'-5"	6"	2.48	105
36	7.07	12"	16"	10"	3'-2"	12"	4'-0"	16'-8"	6"	4.16	182
42	9.62	12"	16"	10"	3'-2"	12"	4'-6"	19'-2"	8"	5.07	206
48	12.57	12"	16"	10"	3'-2"	12"	5'-0"	21'-8"	8"	6.09	244
54	15.90	12"	20"	12"	3'-8"	12"	5'-6"	24'-2"	8"	7.62	275
60	19.64	12"	20"	12"	3'-8"	12"	6'-0"	26'-8"	8"	8.82	304
72	28.27	12"	20"	12"	3'-8"	12"	7'-0"	31'-8"	8"	11.46	377

NOTE: QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

CIRCULAR REINFORCED CONCRETE PIPE

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

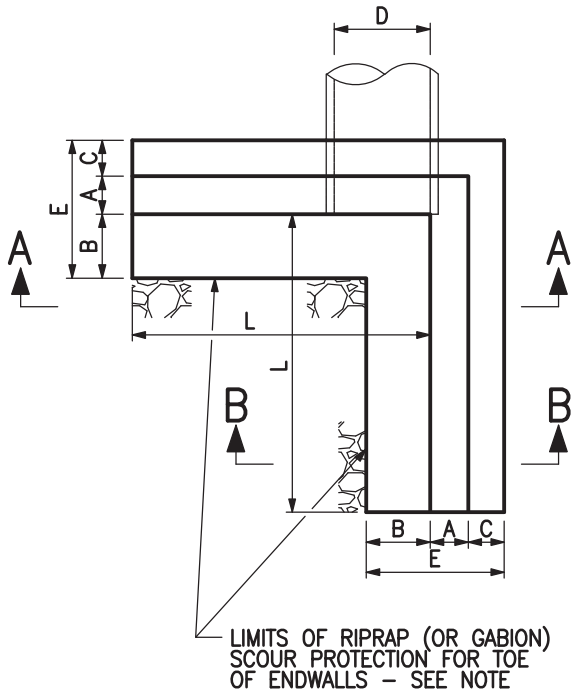
TYPE 'C' ENDWALL CIRCULAR AND ELLIPTICAL PIPE TABLES

ISSUED	REVISED	REVISED
3 / 2008		

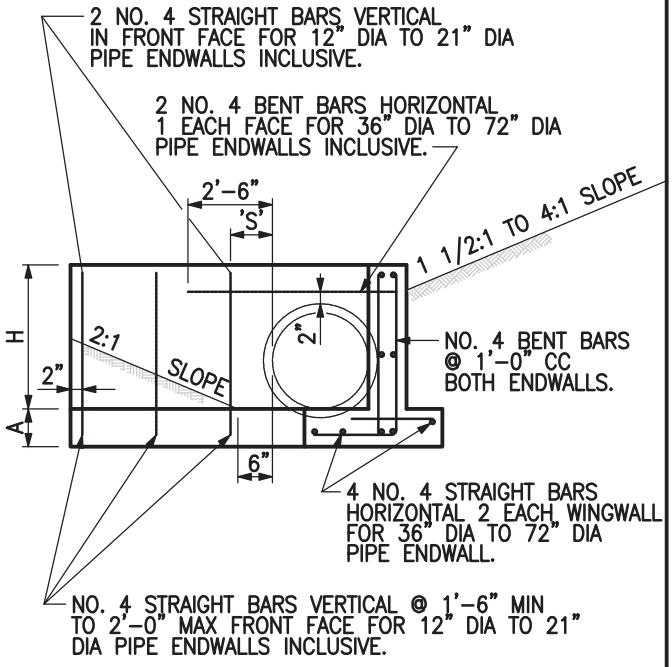
STANDARD NO.
BC 354.02

SCALE : NONE

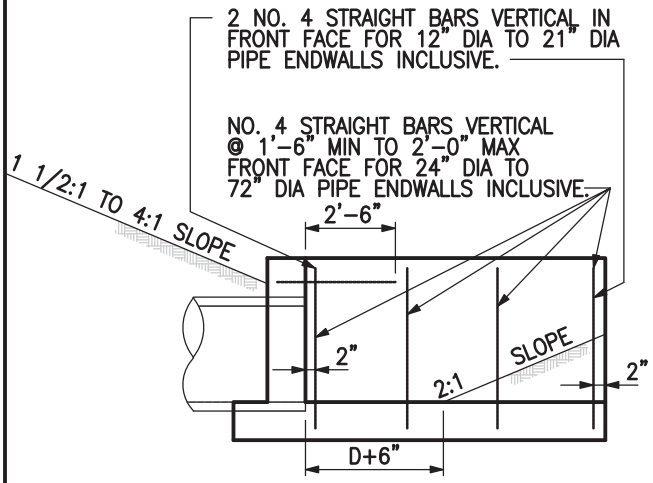
SHEET 2 OF 2



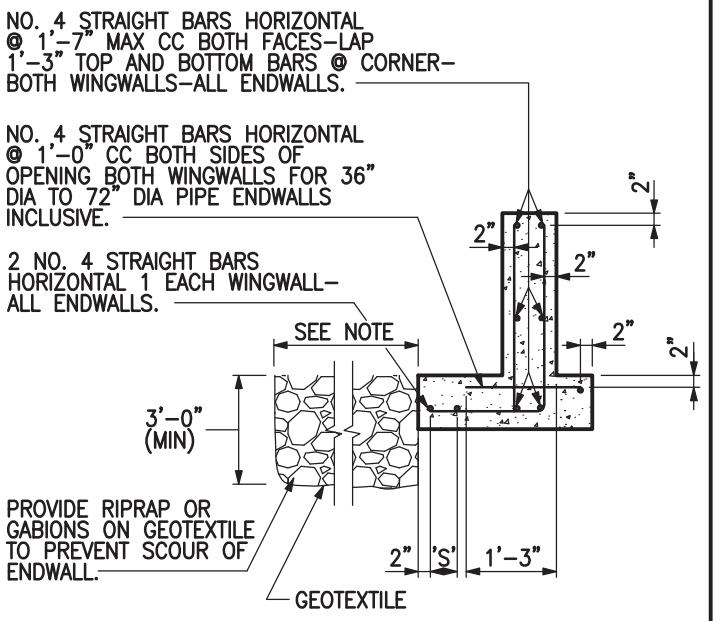
PLAN



SECTION A–A



END VIEW



SECTION B–B

NOTES:

1. SPECIFICATIONS: LATEST DPW
2. CONCRETE SHALL BE MIX 3
3. REINFORCING: DEFORMED STEEL BARS NO. 4
4. CHAMFER: ALL EXPOSED EDGES 1"x1" OR AS DIRECTED.
5. SCOUR PROTECTION: FINAL LIMITS TO BE DETERMINED BY ENGINEER.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

TYPE 'E' ENDWALL CIRCULAR AND ELLIPTICAL PIPE

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 356.02

SCALE : NONE

SHEET 1 OF 2

OPENING		DIMENSIONS							QUANTITIES	
D INCHES	AREA SQ FT	A	B	C	E	H	L	C	CONC CY	STEEL LBS
14 X 23	1.81	9"	6"	6"	1'–9"	2'–2"	5'–10"	6"	1.30	75
19 X 30	3.32	9"	14"	6"	2'–5"	3'–2"	8'–6"	6"	2.60	118
22 X 34	5.10	9"	14"	6"	2'–5"	3'–2"	8'–6"	6"	2.57	118
27 X 42	7.42	9"	16"	10"	3'–2"	3'–6"	11'–3"	6"	5.50	265
32 X 49	8.86	12"	16"	10"	3'–2"	3'–11"	11'–3"	8"	5.80	271
34 X 53	10.23	12"	16"	10"	3'–2"	3'–11"	11'–3"	8"	5.65	261
38 X 60	12.92	12"	20"	12"	3'–2"	4'–3"	13'–9"	8"	8.12	366

NOTE: QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

HORIZONTAL ELLIPTICAL REINFORCED CONCRETE PIPE

OPENING		DIMENSIONS							QUANTITIES	
D INCHES	AREA SQ FT	A	B	C	E	H	L	S	CONC CY	STEEL LBS
12	0.79	9"	6"	6"	1'–9"	1'–9"	3'–6"	4"	0.76	55
15	1.23	9"	6"	6"	1'–9"	2'–0"	4'–3"	4"	0.99	61
18	1.77	9"	6"	6"	1'–9"	2'–3"	5'–0"	4"	1.17	68
21	2.40	9"	6"	6"	1'–9"	2'–6"	5'–9"	4"	1.38	77
24	3.14	9"	14"	6"	2'–5"	2'–9"	6'–6"	4"	1.84	106
27	3.98	9"	14"	6"	2'–5"	3'–0"	7'–3"	6"	2.11	115
30	4.91	9"	14"	6"	2'–5"	3'–6"	8'–0"	6"	2.57	140
33	5.94	9"	14"	6"	2'–5"	3'–9"	8'–9"	6"	2.92	148
36	7.07	12"	16"	10'	3'–2"	4'–0"	9'–6"	6"	4.99	235
42	9.62	12"	16"	10"	3'–2"	4'–6"	11'–0"	8"	6.12	303
48	12.57	12"	16"	10"	3'–2"	5'–0"	12'–6"	8"	7.34	341
54	15.90	12"	20"	12"	3'–8"	5'–6"	14'–0"	8"	9.17	438
60	19.64	12"	20"	12"	3'–8"	6'–0"	15'–6"	8"	10.86	496
72	28.27	12"	20"	12"	3'–8"	7'–0"	17'–0"	8"	12.69	597

NOTE: QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

CIRCULAR REINFORCED CONCRETE PIPE

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

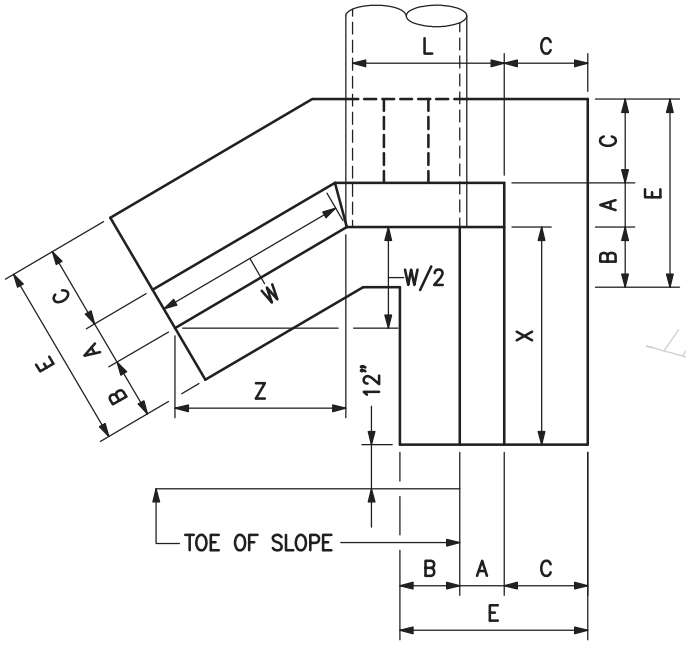
TYPE 'E' ENDWALL CIRCULAR AND ELLIPTICAL PIPE TABLES

ISSUED	REVISED	REVISED
3 / 2008		

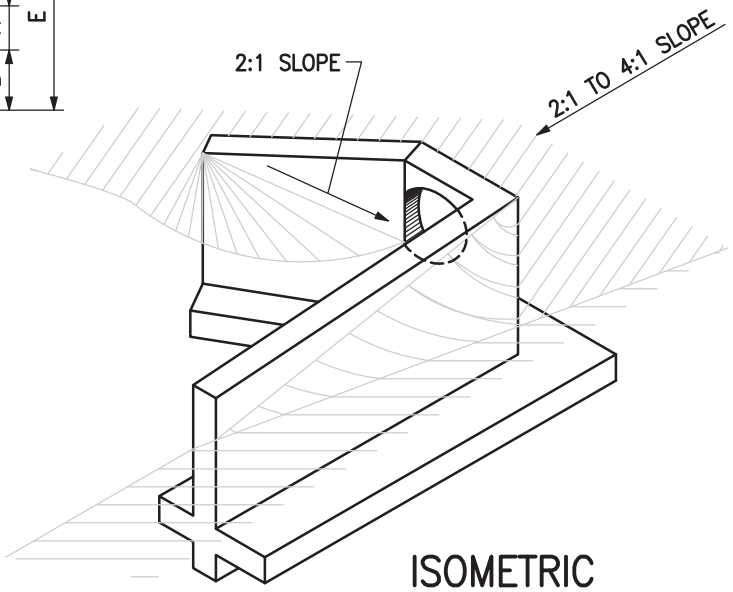
STANDARD NO.
BC 356.02

SCALE : NONE

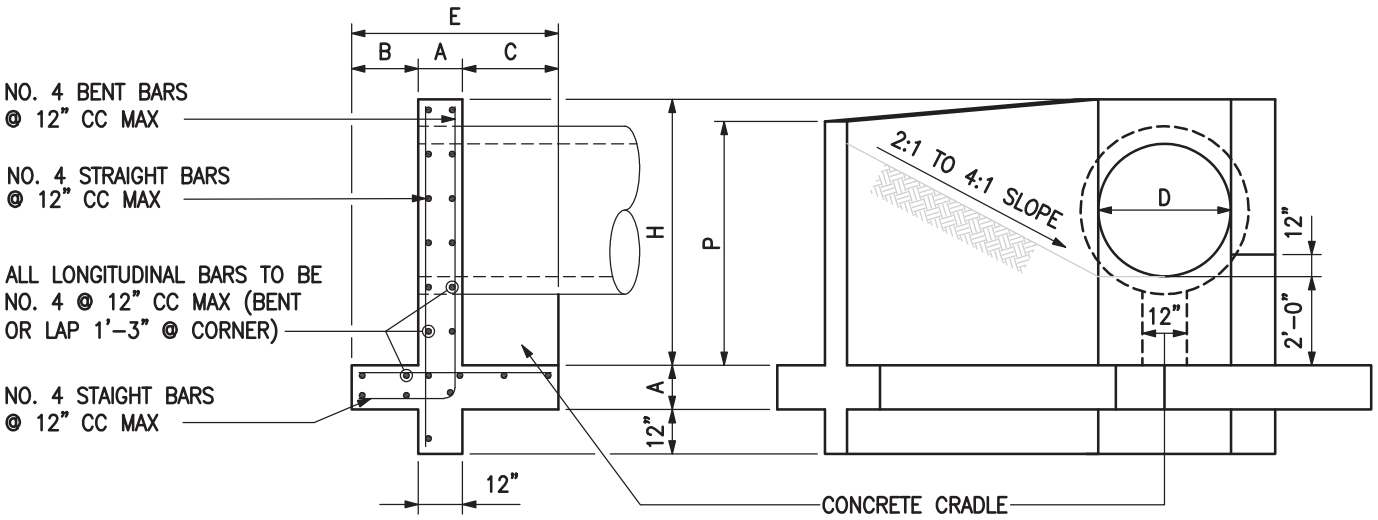
SHEET 2 OF 2



PLAN



ISOMETRIC



TYPICAL BAR DISPOSITION

ELEVATION

NOTES:

1. SPECIFICATIONS: LATEST DPW
2. CONCRETE: SHALL BE MIX 3
3. REINFORCING: DEFORMED STEEL BARS
4. CHAMFER: ALL EXPOSED EDGES 1"x1" OR AS DIRECTED
5. COVER: MINIMUM COVER TO BE 2" UNLESS OTHERWISE NOTED

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

ISSUED	REVISED	REVISED
3 / 2008		

TYPE 'F' ENDWALL CIRCULAR
AND ELLIPTICAL PIPE

STANDARD NO.
BC 358.02

SCALE : NONE

SHEET 1 OF 2

OPENING		DIMENSIONS										QUANTITES	
D	AREA	A	B	C	E	L	H	W	X	Z	P	CONC	STEEL
INCHES	SQ FT											CY	LBS
15	1.23	12"	1'-0"	1'-6"	3'-6"	2'-0"	4'-0"	3'-0"	5'-0"	2'-7"	3'-5"	3.13	228
18	1.78	12"	1'-3"	1'-10"	4'-1"	2'-3"	4'-0"	3'-6"	6'-0"	3'-0"	3'-7"	3.99	284
21	2.41	12"	1'-3"	1'-10"	4'-1"	2'-7"	4'-3"	4'-0"	7'-0"	3'-6"	3'-11"	4.66	322
24	3.14	12"	1'-3"	1'-10"	4'-1"	3'-0"	4'-6"	4'-6"	8'-0"	3'-11"	4'-2"	5.35	367
27	4.42	12"	1'-3"	1'-10"	4'-1"	3'-3"	4'-10"	5'-0"	9'-2"	4'-4"	4'-5"	6.09	408
30	4.91	12"	1'-6"	2'-2"	4'-8"	3'-6"	5-1"	5'-6"	10'-4"	4'-9"	4'-7"	7.37	517
33	6.60	12"	1'-6"	2'-2"	4'-8"	3'-9"	5'-6"	6'-0"	11'-4"	5'-4"	4'-10"	8.03	561
36	7.07	12"	1'-6"	2'-2"	4'-8"	4'-0"	6'-0"	6'-6"	12'-4"	5'-8"	5'-0"	8.76	620
42	9.62	12"	1'-10"	2'-2"	5'-4"	4'-6"	6'-6"	7'-6"	14'-8"	6'-6"	5'-5"	11.20	765
48	12.57	12"	1'-10"	2'-6"	5'-4"	5'-0"	6'-8"	8'-3"	16'-8"	7'-2"	5'-10"	12.95	841

NOTE: QUANITTIES IN TABLE TO BE USED FOR ESTIMATING ONLY

TYPE 'F' ENDWALL 2:1 SLOPE

OPENING		DIMENSIONS										QUANTITES	
D	AREA	A	B	C	E	L	H	W	X	Z	P	CONC	STEEL
INCHES	SQ FT											CY	LBS
15	1.23	12"	1'-0"	1'-6"	3'-6"	2'-0"	3'-11"	2'-6"	2'-6"	2'-2"	3'-5"	2.30	186
18	1.78	12"	1'-3"	1'-10"	4'-1"	2'-3"	4'-2"	3'-0"	3'-0"	2'-7"	3'-7"	2.94	213
21	2.41	12"	1'-3"	1'-10"	4'-1"	2'-7"	4'-6"	3'-6"	3'-6"	3'-0"	3'-10"	3.44	260
24	3.14	12"	1'-3"	1'-10"	4'-1"	3'-0"	4'-9"	4'-0"	4'-0"	3'-5"	4'-1"	3.96	285
27	4.42	12"	1'-3"	1'-10"	4'-1"	3'-3"	5'-0"	4'-4"	4'-7"	3'-9"	4'-4"	4.41	310
30	4.91	12"	1'-6"	2'-2"	4'-8"	3'-6"	5-4"	4'-8"	5'-2"	4'-1"	4'-6"	5.23	395
33	6.60	12"	1'-6"	2'-2"	4'-8"	3'-9"	5'-7"	5'-0"	5'-8"	4'-4"	4'-8"	5.70	431
36	7.07	12"	1'-6"	2'-2"	4'-8"	4'-0"	5'-10"	5'-4"	6'-2"	4'-7"	4'-10"	6.15	455
42	9.62	12"	1'-10"	2'-2"	5'-4"	4'-6"	6'-5"	6'-4"	7'-4"	5'-6"	5'-2"	7.86	538
48	12.57	12"	1'-10"	2'-6"	5'-4"	5'-0"	6'-11"	7'-0"	8'-4"	6'-1"	5'-6"	8.92	614

NOTE: QUANITTIES IN TABLE TO BE USED FOR ESTIMATING ONLY

TYPE 'F' ENDWALL 4:1 SLOPE

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

TYPE 'F' ENDWALL CIRCULAR AND ELLIPTICAL PIPE TABLES

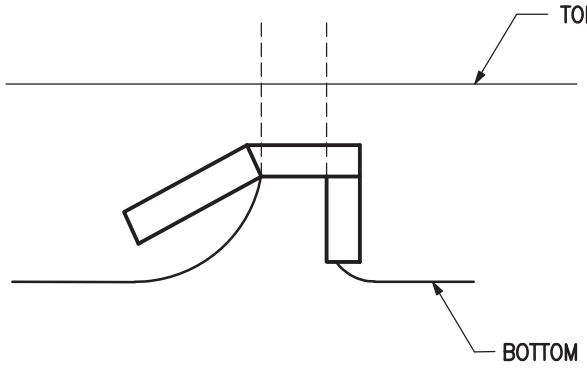
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 358.02

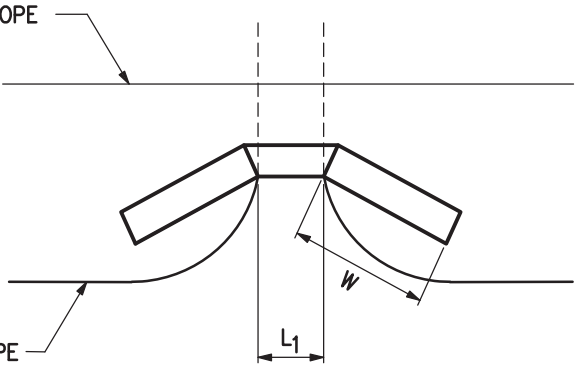
SCALE : NONE

SHEET 2 OF 2

CASE 1

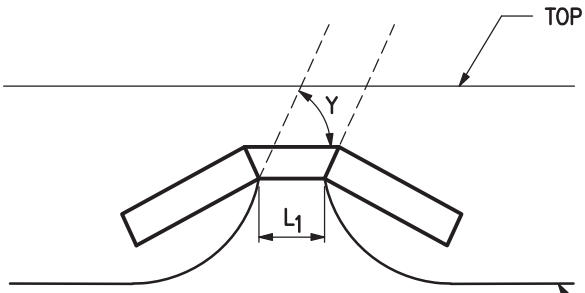


CASE 2



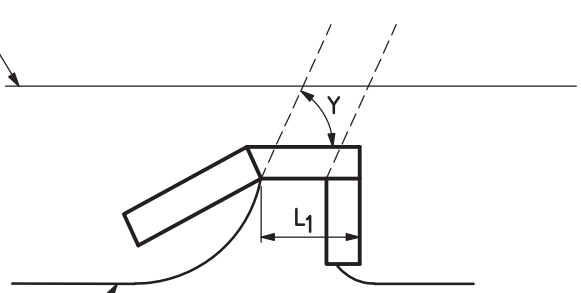
$L_1 = D$

CASE 3



$L_1 = \frac{D}{\text{SIN } Y}$

CASE 4



BOTTOM OF SLOPE

$L_1 = \frac{D}{\text{SIN } Y} + A$

NOTES:

CASE 1. THIS CONDITION IS COVERED BY THE STANDARD TYPE 'F' ENDWALL.

CASE 2. WHEN A WATER COURSE IS PERPENDICULAR OR ASKEW TO THE CENTERLINE, AND THE SIDE DITCH DRAINAGE IS IN BOTH DIRECTIONS AND IT IS MORE ECONOMICAL OR BETTER PRACTICE TO PLACE THE PIPE AT RIGHT ANGLES TO THE CENTERLINE, THE 'F' ENDWALL CAN BE USED BY MAKING THE SHORTER WING EQUAL IN LENGTH AND ANGLE TO THE LONGER WING.

CASE 3. WHEN THE DRAINAGE CONDITIONS ARE SIMILAR TO CASE 2 BUT IT IS DESIRED TO PLACE THE PIPE ASKEW, THE 'F' ENDWALL CAN BE USED. THE WINGS WILL BE PLACED THE SAME AS CASE 2, BUT THE LENGTH OF THE HEADWALL WILL BE INCREASED DUE TO THE INCREASED AREA OF THE PIPE.

CASE 4. WHEN A PIPE IS PLACED ASKEW TO FOLLOW THE NATURAL WATER COURSE AND THE SIDE DITCH DRAINAGE IS IN ONE DIRECTION, THE 'F' ENDWALL WILL BE USED WITH THE EXCEPTION THAT THE HEADWALL WILL BE LENGTHENED DUE TO THE INCREASE AREA OF THE PIPE.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

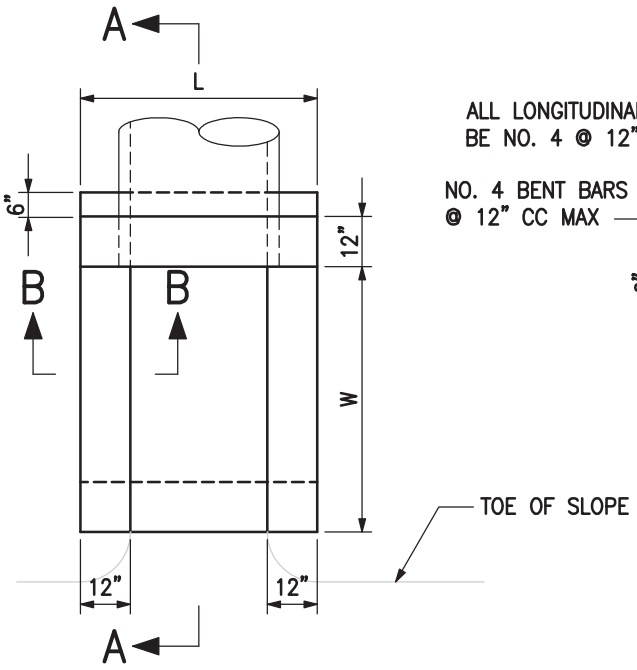
STANDARD TYPE 'F' ENDWALL MODIFICATIONS

ISSUED	REVISED	REVISED
3 / 2008		

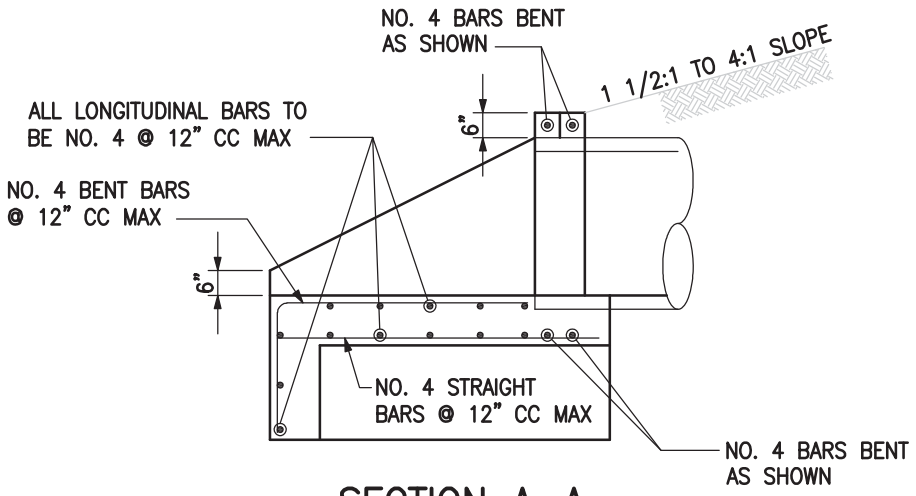
STANDARD NO.
BC 358.91

SCALE : NONE

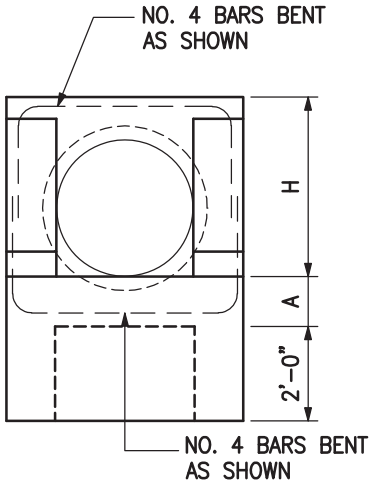
SHEET 1 OF 1



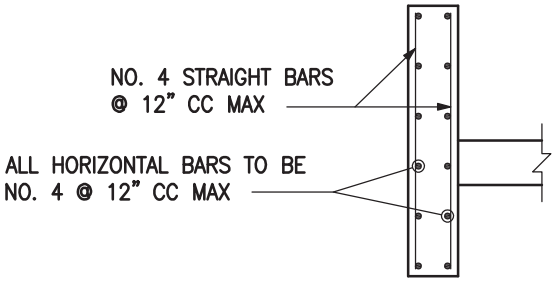
PLAN



SECTION A–A



ELEVATION



SECTION B–B

OPENING		DIMENSIONS				QUANTITIES	
D	AREA	A	H	L	W	CONC	STEEL
INCHES	SQ FT					CY	LBS
15	1.23	12"	1'–11"	3'–3"	1'–10"	1.27	110
18	1.78	12"	2'–2"	3'–6"	2'–6"	1.60	144
21	2.41	12"	2'–6"	3'–9"	3'–0"	1.90	162
24	3.14	12"	2'–9"	4'–0"	3'–6"	2.21	186
27	4.42	12"	3'–0"	4'–3"	4'–0"	2.54	206
30	4.91	12"	3'–4"	4'–6"	4'–8"	2.98	245
33	6.60	12"	3'–7"	4'–9"	5'–4"	3.42	276
36	7.07	12"	3'–10"	5'–0"	5'–8"	3.74	301
42	9.62	12"	4'–5"	5'–6"	6'–10"	4.53	378
48	12.57	12"	4'–11"	6'–0"	7'–10"	5.59	448

NOTES:

1. SPECIFICATIONS: LATEST DPW
2. CONCRETE: SHALL BE MIX 3
3. REINFORCING: DEFORMED STEEL BARS
4. CHAMFER: ALL EXPOSED EDGES 1"x1" OR AS DIRECTED
5. COVER: MINIMUM COVER TO BE 2" UNLESS OTHERWISE NOTED

NOTE: QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

TYPE 'G' ENDWALL
CIRCULAR AND ELLIPTICAL PIPE

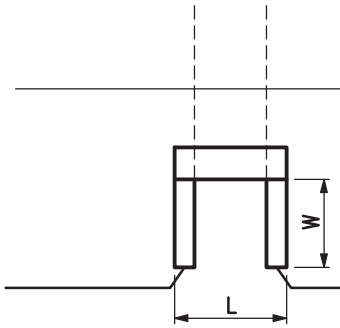
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 360.02

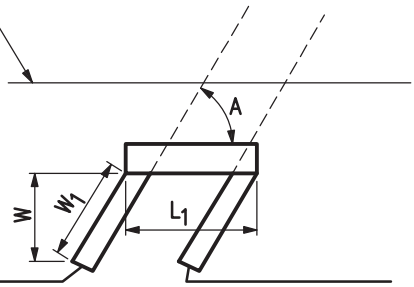
SCALE : NONE

SHEET 1 OF 1

CASE 1



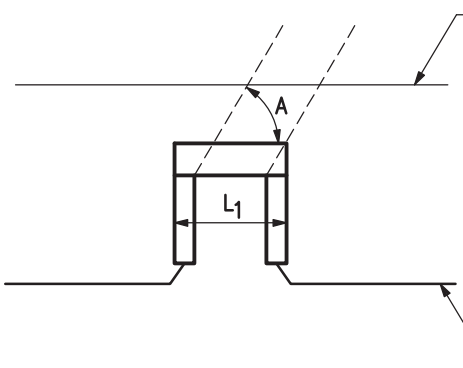
CASE 2



$$L_1 = \frac{D + 2K_1}{\text{SIN } A}$$

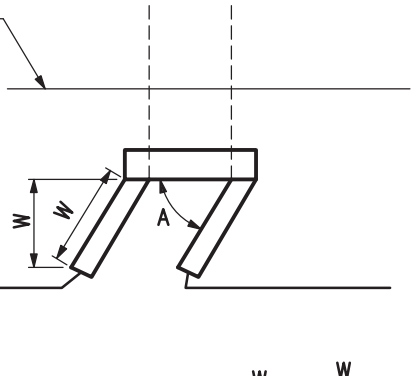
$$W_1 = \frac{W}{\text{SIN } A}$$

CASE 3



$$L_1 = \frac{D}{\text{SIN } A} + 2K_1$$

CASE 4



$$W_1 = \frac{W}{\text{SIN } A}$$

A = 60° TO 90°

NOTES:

CASE 1. THIS CONDITION IS COVERED BY THE STANDARD TYPE 'G' ENDWALL.

CASE 2. WHEN A PIPE IS TO BE PLACED ASKEW TO FOLLOW THE NATURAL WATER COURSE, THE STANDARD 'G' ENDWALL SHOULD BE MODIFIED BY LENGTHENING THE HEADWALL TO ALLOW FOR THE INCREASED AREA OF THE PIPE DUE TO THE ASKEW AND THE WINGS LENGTHENED TO CARE FOR THE SLOPE.

CASE 3. WHEN IT IS NOT PRACTICAL TO PLACE THE ENDWALL ON THE OUTLET END IN LINE WITH THE ENDWALL ON THE INLET END, IT IS NECESSARY TO ASKEW THE PIPE. THIS REQUIRES THE LENGTHENING OF THE HEADWALL ONLY TO ALLOW FOR THE INCREASED AREA OF THE PIPE DUE TO THE ASKEW. THE LENGTH OF THE WINGS ARE STANDARD.

CASE 4. WHEN A WATER COURSE IS ASKEW AND IT IS MORE ECONOMICAL OR BETTER PRACTICE TO PLACE THE PIPE AT RIGHT ANGLES TO THE CENTER LINE AND RECUT THE OUTLET, THE 'G' ENDWALL CAN BE USED BY PLACING THE WINGS PARALLEL TO THE COURSE AND LENGTHENING THE WINGWALLS ONLY, THE HEADWALL REMAINS STANDARD.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

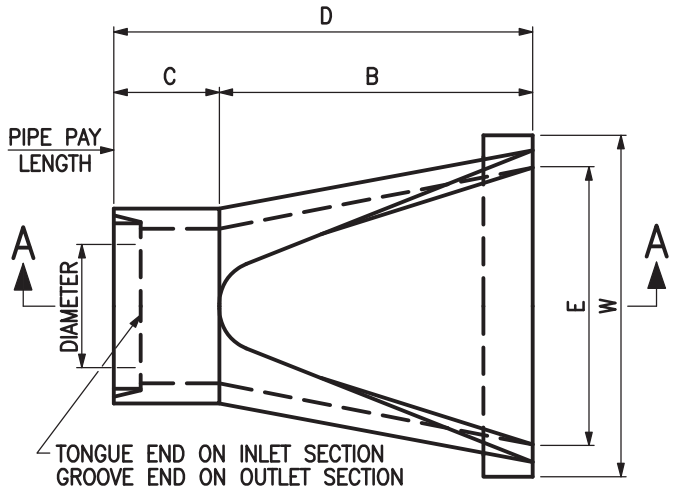
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

STANDARD TYPE 'G' ENDWALL MODIFICATIONS

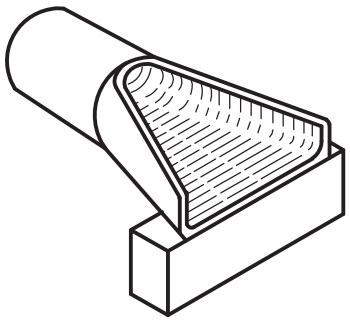
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 360.91

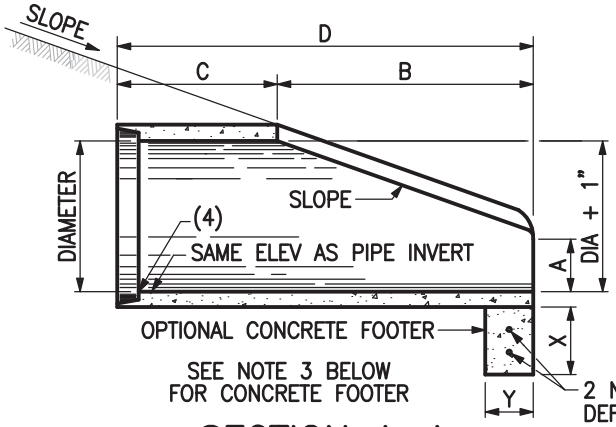
SCALE : NONE | SHEET 1 OF 1



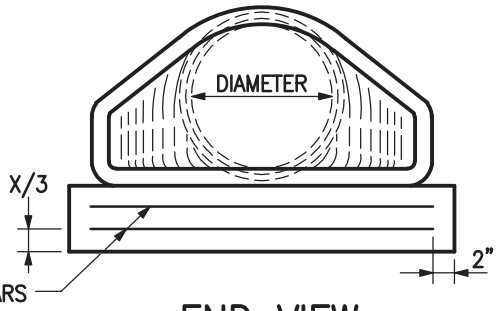
PLAN



ISOMETRIC VIEW



SECTION A–A



END VIEW

NOTES:

1. CONTRACTOR HAS OPTION OF FURNISHING END SECTIONS CONFORMING TO DETAILS ON THIS SHEET OR END SECTIONS CONFORMING TO DETAILS ON STANDARD BC 368.02.
2. END SECTIONS MUST BE REINFORCED TO CONFORM WITH CLASS IV PIPE.
3. CONCRETE FOOTER SHALL BE USED WHEN SPECIFIED ON THE PLANS. COST OF CONCRETE FOOTER TO BE INCLUDED IN PRICE OF END SECTION. CONCRETE TO BE MIX 2. REINFORCEMENT TO BE NO. 3 BARS.
4. INVERT ELEVATION TO BE AT THE PIPE END OF THE STANDARD END SECTION. ELEVATIONS TO BE NOTED ON THE CONSTRUCTION PLANS.

CONCRETE END SECTION							CONCRETE FOOTER				
DIMENSIONS							DIMENSIONS			QUANTITIES	
D INCHES	SLOPE	A	B	C	D	E	W	X	Y	CONC CY	STEEL LBS
12	3:1	4"	2'–0"	4'–0 7/8"	6'–0 7/8"	2'–0"	3'–0"	12"	9"	0.08	24.00
15	3:1	6"	2'–3"	3'–10"	6'–1"	2'–6"	3'–6"	12"	9"	0.10	28.50
18	3:1	9"	2'–3"	3'–10"	6'–1"	3'–0"	4'–0"	12"	9"	0.11	33.00
21	3:1	9"	3'–0"	3'–1 1/2"	6'–1 1/2"	3'–6"	4'–6"	12"	9"	0.13	37.50
24	3:1	9 1/2"	3'–7 1/2"	2'–6"	6'–1 1/2"	4'–0"	5'–0"	15"	9"	0.17	42.00
27	3:1	10 1/2"	4'–1 1/2"	2'–0"	6'–1 1/2"	4'–6"	5'–6"	15"	9"	0.19	46.50
30	3:1	1'–0"	4'–6"	1'–7 3/4"	6'–1 3/4"	5'–0"	6'–0"	15"	9"	0.21	51.00
33	3:1	1'–2"	4'–7"	2'–2"	6'–9"	5'–6"	6'–6"	15"	9"	0.23	55.50
36	3:1	1'–3"	5'–3"	2'–10 3/4"	8'–1 3/4"	6'–0"	7'–3"	15"	9"	0.25	62.25
42	3:1	1'–6" OR 1'–9"	5'–3"	2'–11"	8'–2"	6'–6"	7'–9"	15"	9"	0.27	66.75
48	3:1	2'–0"	6'–0"	2'–2"	8'–2"	7'–0"	8'–6"	18"	12"	0.47	73.50
54	2.4:1	2'–3"	5'–5"	2'–9 1/4"	8'–2 1/4"	7'–6"	9'–0"	18"	12"	0.50	78.00

NOTE: QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

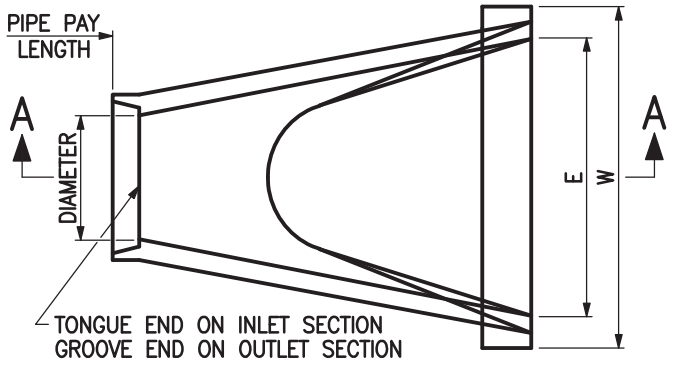
CONCRETE END SECTION
CIRCULAR PIPE
OPTION NO. 1

ISSUED	REVISED	REVISED
3 / 2008		

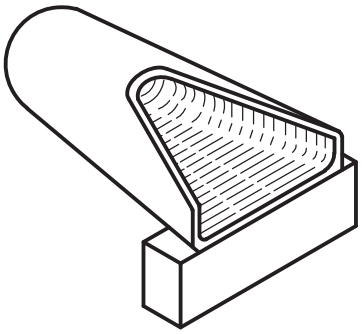
STANDARD NO.
BC 368.01

SCALE : NONE

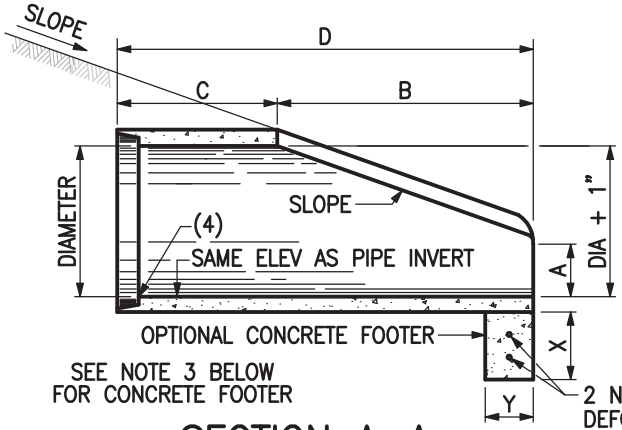
SHEET 1 OF 1



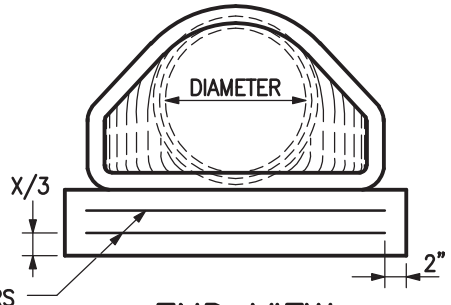
PLAN



ISOMETRIC VIEW



SECTION A–A



END VIEW

NOTES:

1. CONTRACTOR HAS OPTION OF FURNISHING END SECTIONS CONFORMING TO DETAILS ON THIS SHEET OR END SECTIONS CONFORMING TO DETAILS ON STANDARD BC 368.01.
2. END SECTIONS MUST BE REINFORCED TO CONFIRM WITH CLASS IV PIPE.
3. CONCRETE FOOTER SHALL BE USED WHEN SPECIFIED ON THE PLANS. COST OF CONCRETE FOOTER TO BE INCLUDED IN PRICE OF END SECTION. CONCRETE TO BE MIX 2. REINFORCEMENT TO BE NO. 3 BARS.
4. INVERT ELEVATION TO BE AT THE PIPE END OF THE STANDARD END SECTION. ELEVATIONS TO BE NOTED ON THE CONSTRUCTION PLANS.

CONCRETE END SECTION							CONCRETE FOOTER				
DIMENSIONS							DIMENSIONS			QUANTITIES	
D INCHES	SLOPE	A	B	C	D	E	W	X	Y	CONC CY	STEEL LBS
12	3:1	4"	2'–0"	4'–0 7/8"	6'–0 7/8"	2'–0"	3'–0"	12"	9"	0.08	24.00
15	3:1	6 1/2"	2'–4"	3'–10"	6'–2"	2'–6"	3'–6"	12"	9"	0.10	28.50
18	3:1	10 1/4"	2'–2"	4'–0"	6'–2"	3'–0"	4'–0"	12"	9"	0.11	33.00
21	3:1	9"	3'–0"	3'–1 1/2"	6'–1 1/2"	3'–6"	4'–6"	12"	9"	0.13	37.50
24	3:1	11"	3'–7"	2'–8"	6'–3"	4'–0"	5'–0"	15"	9"	0.17	42.00
27	3:1	10 1/2"	4'–1 1/2"	2'–0"	6'–1 1/2"	4'–6"	5'–6"	15"	9"	0.19	46.50
30	3:1	1'–1"	4'–5"	1'–10"	6'–3"	5'–0"	6'–0"	15"	9"	0.21	51.00
33	3:1	1'–2"	4'–7"	2'–2"	6'–9"	5'–6"	6'–6"	15"	9"	0.23	55.50
36	3:1	1'–3 1/2"	5'–3"	3'–1"	8'–1 1/2"	6'–0"	7'–3"	15"	9"	0.25	62.25
42	3:1	1'–9 1/4"	5'–5"	2'–10"	8'–3"	6'–6"	7'–9"	15"	9"	0.27	66.75
48	3:1	2'–1"	6'–0"	2'–2"	8'–2"	7'–0"	8'–6"	18"	12"	0.47	73.50
54	2.4:1	2'–5"	5'–2"	2'–10"	8'–0"	7'–6"	9'–0"	18"	12"	0.50	78.00

NOTE: QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

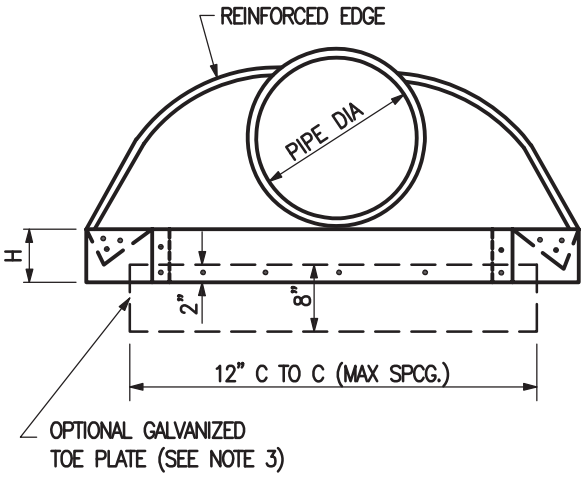
CONCRETE END SECTION
CIRCULAR PIPE
OPTION NO. 2

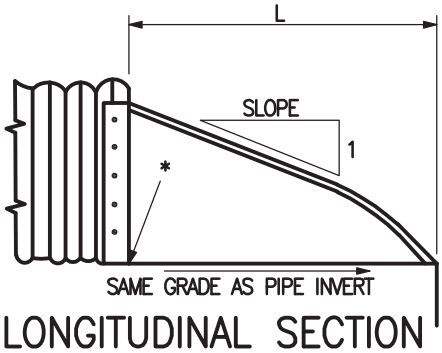
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 368.02

SCALE : NONE

SHEET 1 OF 1

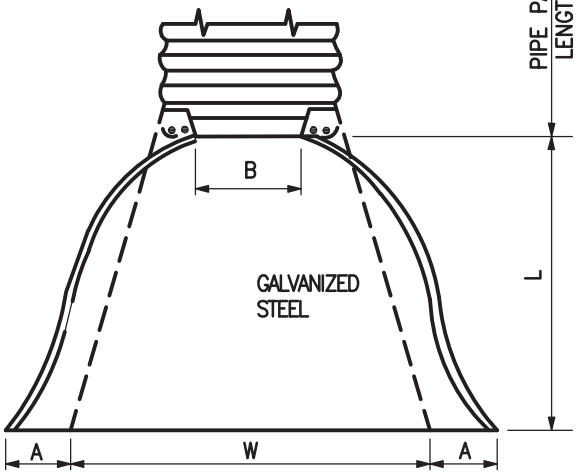




LONGITUDINAL SECTION

* INVERT ELEVATION TO BE AT THE PIPE END OF THE STANDARD END SECTION. ELEVATIONS TO BE NOTED ON CONSTRUCTION PLANS.

END VIEW



PLAN

TABLE OF DIMENSIONS								
PIPE DIA	GA	A 1" ±	B MAX	H 1" ±	L 1 1/2" ±	W 2" ±	APPROX SLOPE	BODY
12"	16	6"	6"	6"	21"	24"	2 1/2	1 PC
15"	16	7"	8"	6"	26"	30"	2 1/2	1 PC
18"	16	8"	10"	6"	31"	36"	2 1/2	1 PC
21"	16	9"	12"	6"	36"	42"	2 1/2	1 PC
24"	16	10"	13"	6"	41"	48"	2 1/2	1 PC
30"	14	12"	16"	8"	51"	60"	2 1/2	1 PC
36"	14	14"	19"	9"	60"	72"	2 1/2	2 PC
42"	12	16"	22"	11"	69"	84"	2 1/2	2 PC
48"	12	18"	27"	12"	78"	90"	2 1/4	2 PC
54"	12	18"	30"	12"	84"	102"	2	2 PC
60"	12	18"	33"	12"	87"	114"	1 3/4	3 PC
66"	12	18"	36"	12"	87"	120"	1 1/2	3 PC
72"	12	18"	39"	12"	87"	126"	1 1/3	3 PC
78"	12	18"	42"	12"	87"	132"	1 1/4	3 PC
84"	12	18"	45"	12"	87"	138"	1 1/6	3 PC

NOTES:

1. ALL 3 PIECE BODIES TO HAVE 12 GA SIDES AND 10 GA CENTER PANELS WIDTH OF CENTER PANELS TO BE GREATER THAN 20% OF THE PIPE PERIPHERY MULTIPLE PANEL BODIES TO HAVE LAP SEAMS WHICH ARE TO BE TIGHTLY JOINED BY 3/8" ø GALVANIZED RIVETS OR BOLTS.

2. FOR 60" THRU 84" SIZES, REINFORCED EDGES TO BE SUPPLEMENTED WITH GALVANIZED STIFFENER ANGLES. THE ANGLES WILL BE 2"x2"x1/4" FOR 60" THRU 72" DIAMETER AND 2 1/2"x2 1/2"x1/4" FOR 78" AND 84" DIAMETER. THE ANGLES TO BE ATTACHED BY 3/8" ø GALVANIZED NUTS AND BOLTS.

3. TOE PLATE SHALL BE USED WHEN SPECIFIED ON THE PLANS. COST OF TOE PLATE TO BE INCLUDED IN BID PRICE PER EACH OF METAL END SECTION.

4. TYPE 3 CONNECTION INCLUDES ONE FOOT OF PIPE LENGTH FOR 42" THRU 84" DIAMETER AS A CONNECTOR SECTION. THE CONNECTOR SECTION WILL BE ATTACHED TO THE END SECTION BY GALVANIZED RIVETS OR BOLTS.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

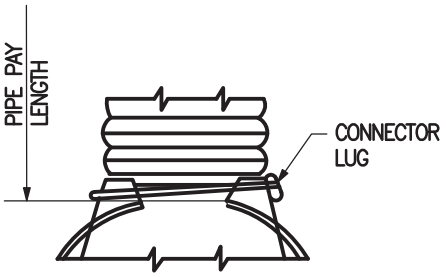
ISSUED	REVISED	REVISED
3 / 2008		

METAL END SECTION
CIRCULAR PIPE

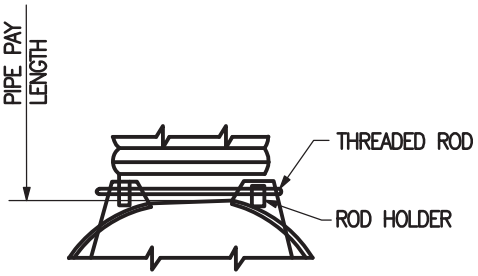
STANDARD NO.
BC 370.02

SCALE : NONE

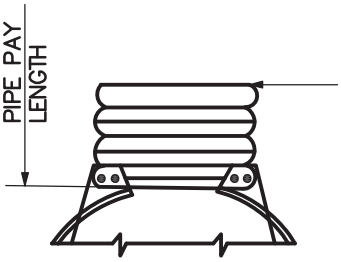
SHEET 1 OF 2



TYPE 1
FOR 12" THRU 24" ONLY



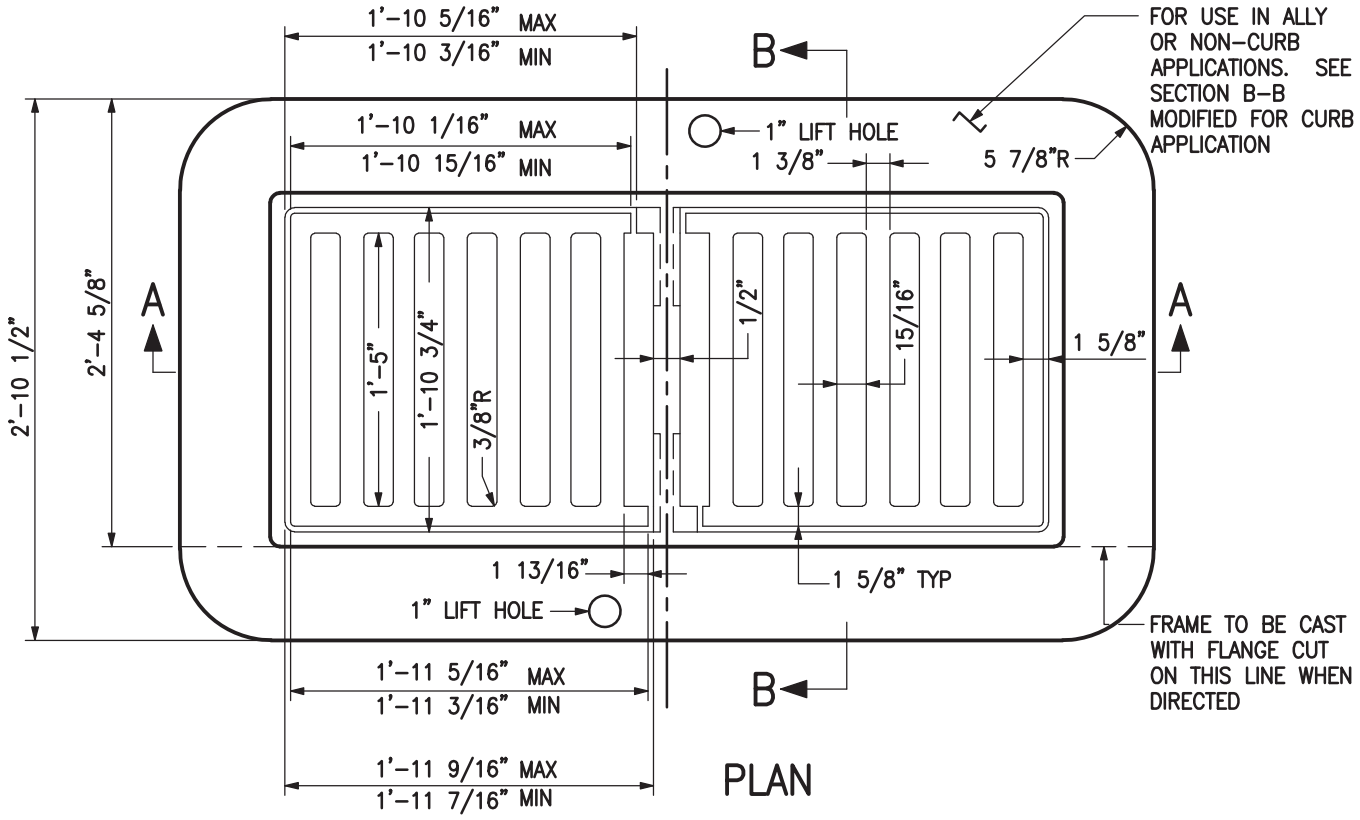
TYPE 2
FOR 30" THRU 36" ONLY



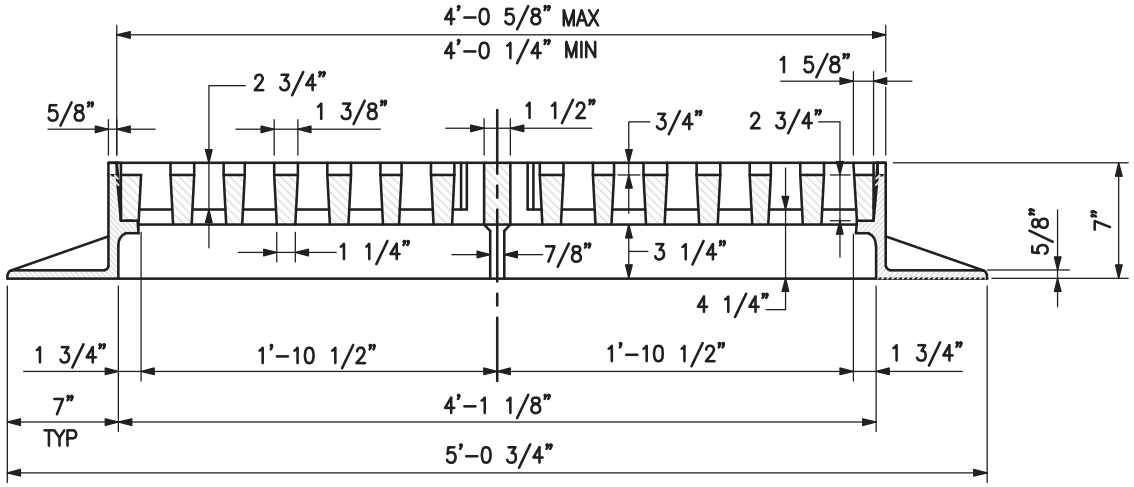
TYPE 3
FOR 42" THRU 84" ONLY

CONNECTIONS FOR CIRCULAR PIPE

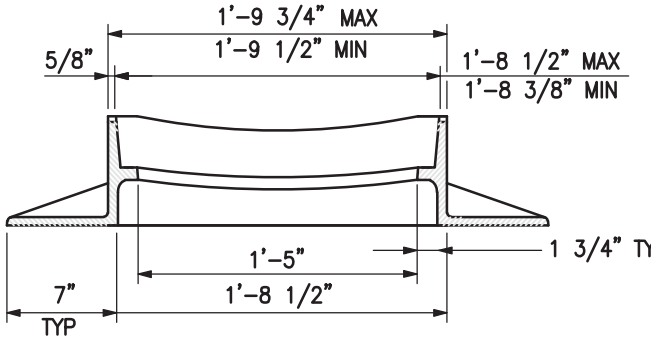
CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		CONNECTIONS METAL END SECTION CIRCULAR PIPE	STANDARD NO. BC 370.02		
			SCALE : NONE	SHEET 2 OF 2	



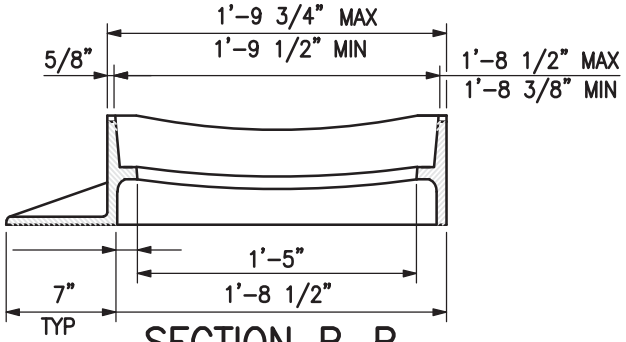
PLAN



SECTION A-A

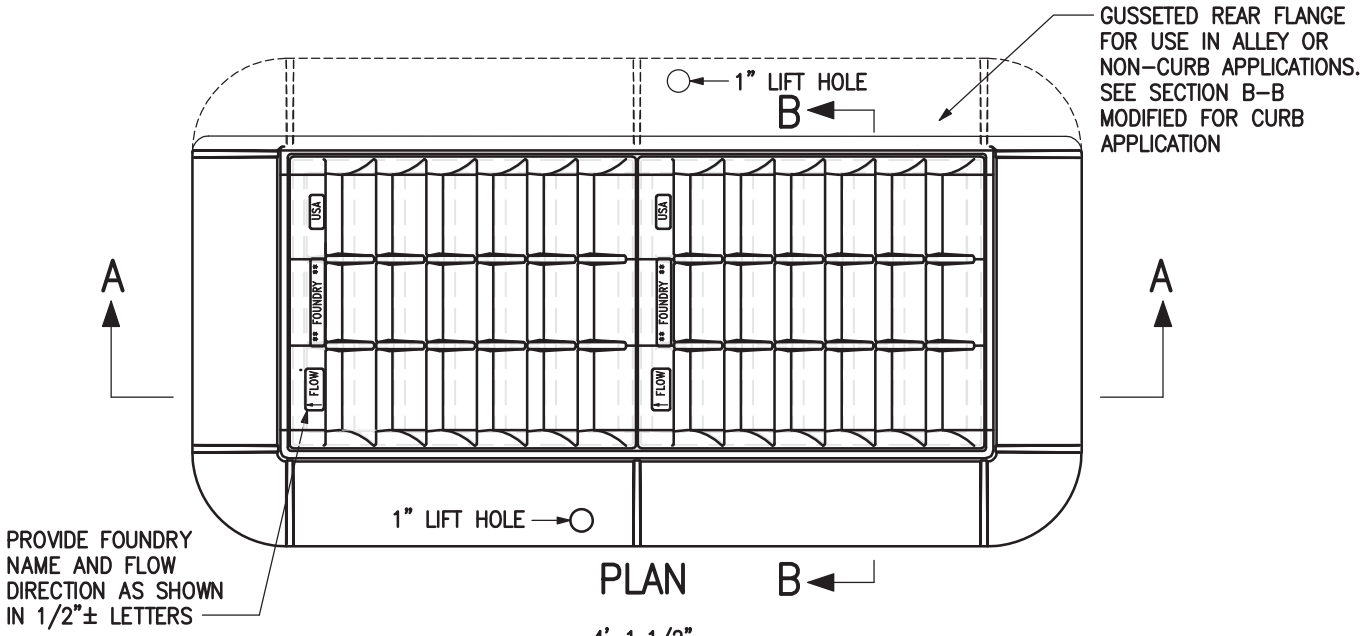


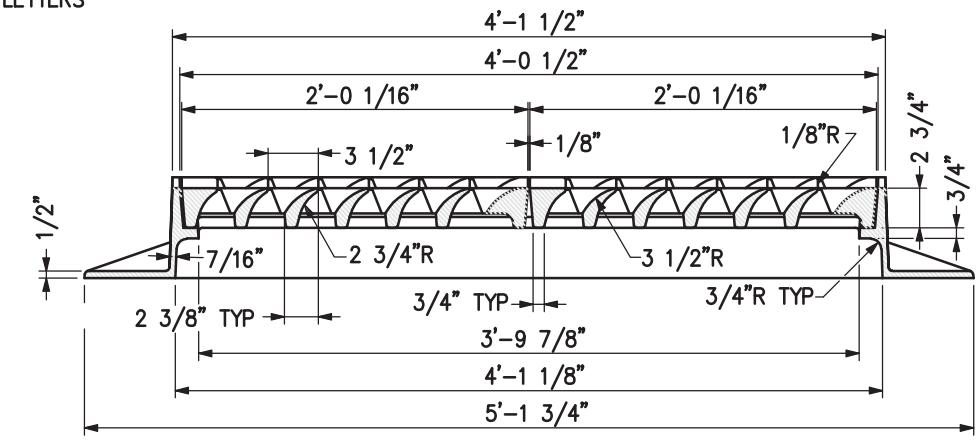
SECTION B-B



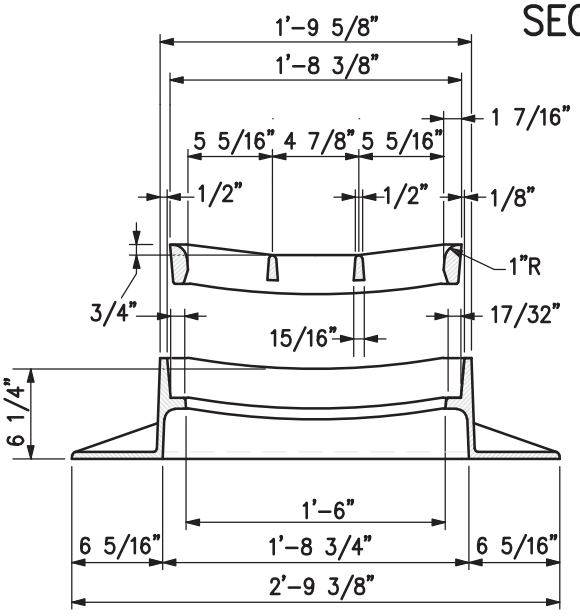
SECTION B-B MODIFIED

CITY OF BALTIMORE	APPROVED:	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED / REVISED
	HEAD, BUREAU OF WATER AND WASTEWATER		3 / 2008	
	DIRECTOR, DEPARTMENT OF PUBLIC WORKS	TYPE NO. 1 'E' GRATE(S) AND FRAME	STANDARD NO. BC 376.01	
			SCALE: NONE	SHEET 1 OF 1

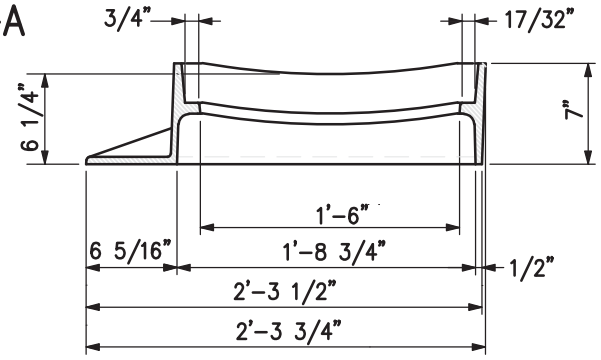




SECTION A-A



SECTION B-B



SECTION B-B
MODIFIED

NOTES:

1. GRATE(S) SHALL SIT SQUARE UPON FRAME SUPPORTS WITHOUT ROCKING OR SHIFTING UNDER LOAD. GRATE SHALL MEET OR EXCEED AASHTO M306 PROOF LOAD REQUIREMENTS.
2. MATERIAL: GRAY IRON CASTINGS AASHTO DESIGNATION M105-06.
3. WEIGHT: GRATE APPROXIMATELY 129 LBS EACH.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

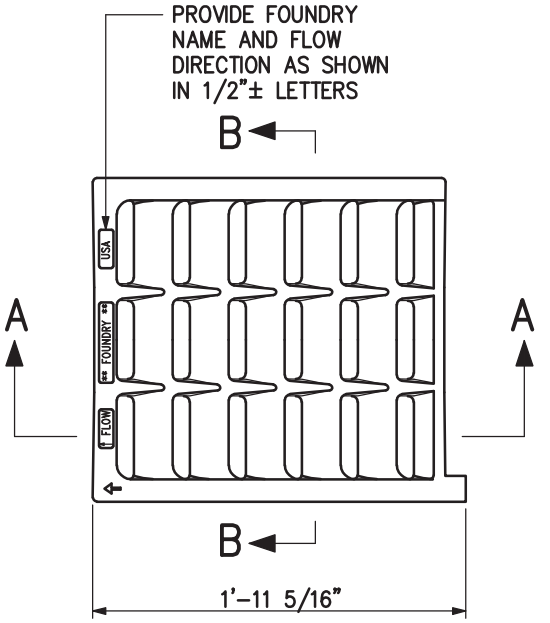
CURVED VANE (E-CV) GRATE(S)
WITH CLASS 35 TYPE 'E' FRAME
NEW CONSTRUCTION

ISSUED	REVISED	REVISED
3 / 2008		

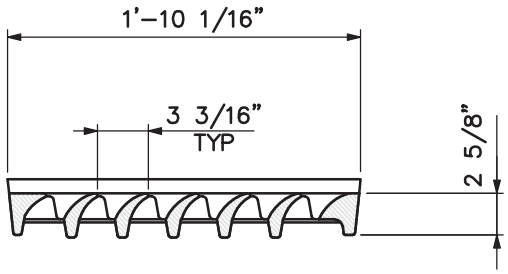
STANDARD NO.
BC 376.02

SCALE : NONE

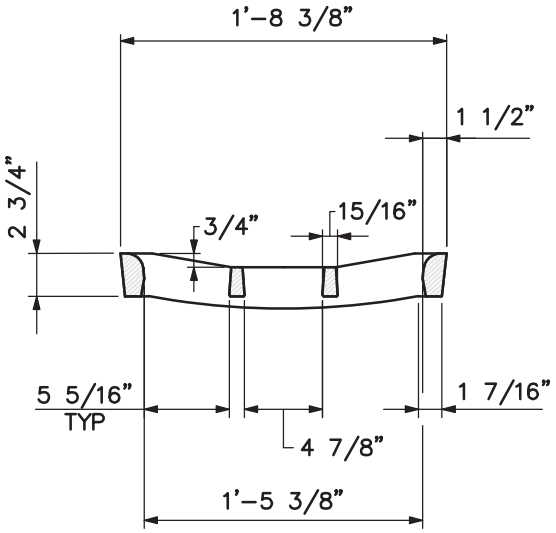
SHEET 1 OF 1



PLAN



SECTION A–A

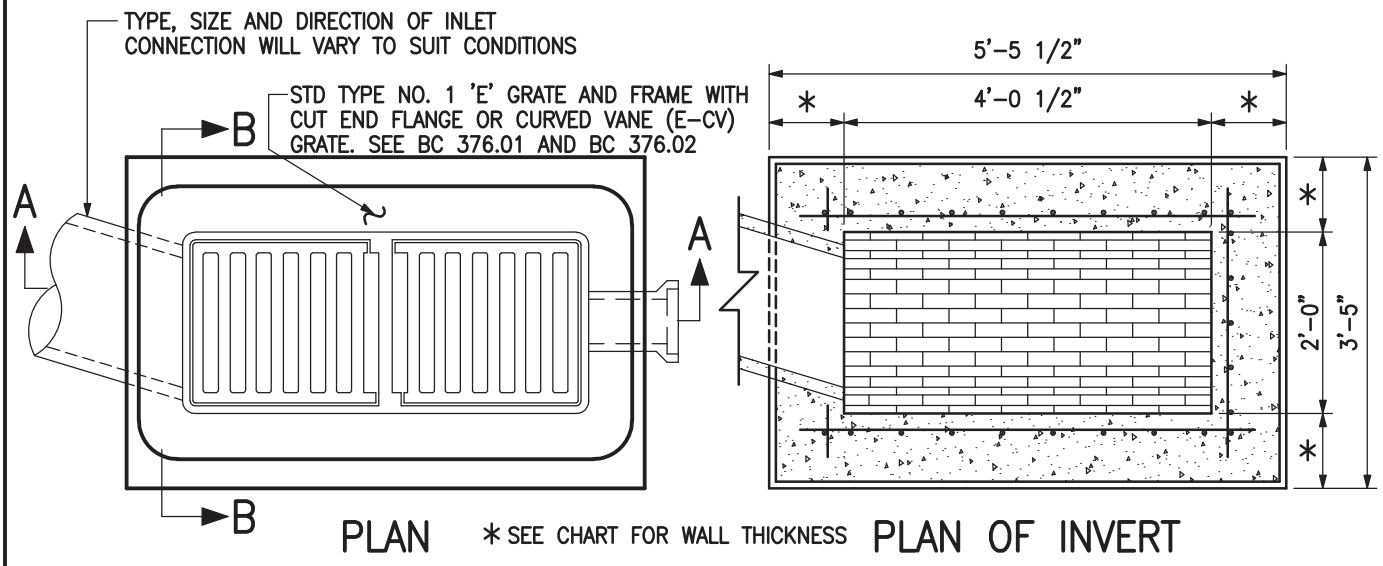


SECTION B–B

NOTES:

1. GRATE(S) SHALL SIT SQUARE UPON FRAME SUPPORTS WITHOUT ROCKING OR SHIFTING UNDER LOAD. GRATE SHALL MEET OR EXCEED AASHTO M306 PROOF LOAD REQUIREMENTS.
2. MATERIAL: GRAY IRON CASTINGS AASHTO DESIGNATION M105–06.
3. WEIGHT: GRATE APPROXIMATELY 140 LBS.

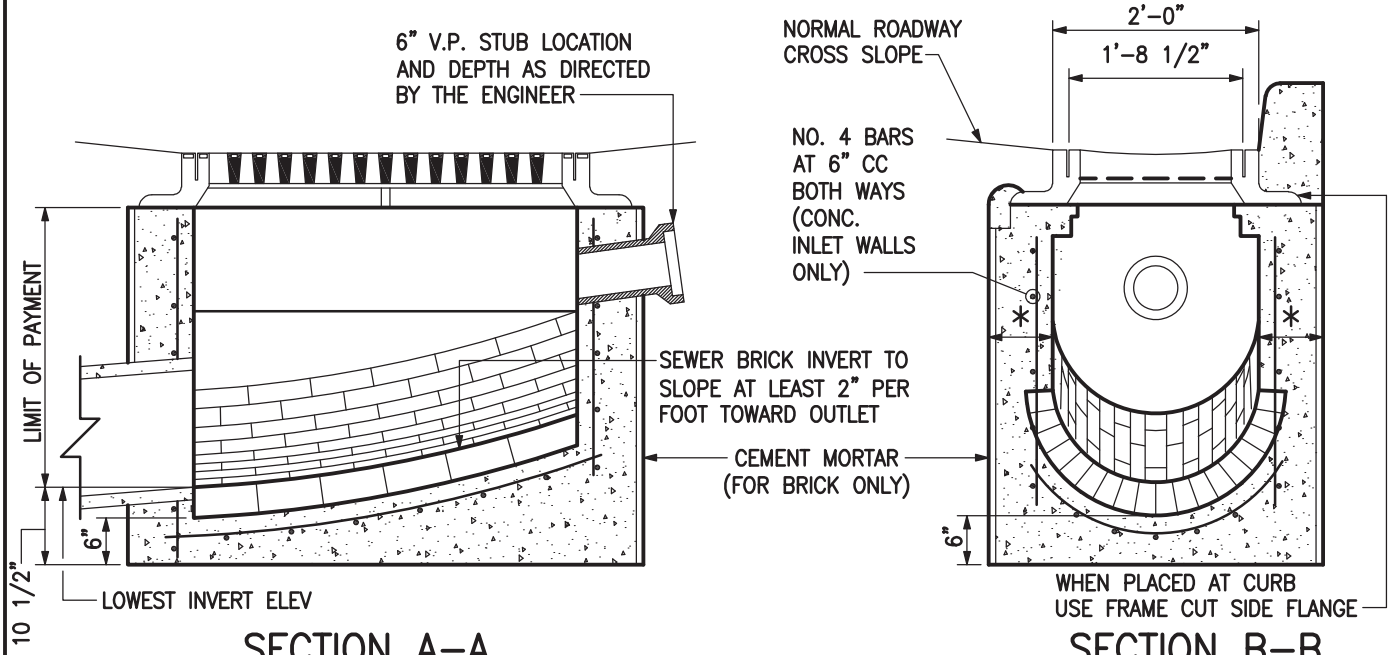
CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		CURVED VANE (E-CV) GRATE(S) FOR EXISTING TYPE NO. 1 'E' FRAME	STANDARD NO. BC 376.03		
			SCALE : NONE	SHEET 1 OF 1	



PLAN

* SEE CHART FOR WALL THICKNESS

PLAN OF INVERT



SECTION A-A

SECTION B-B

	PRECAST	CAST-IN-PLACE/BRICK
WALL THICKNESS	6" MIN	8 1/2 "
REINF	2 LAYERS- 4x4 W4.0 x W4.0- WWF	NO. 4 BARS @ 6" CC EW 2" COVER
CONCRETE	MIX 6	MIX 3
ALLOWABLE DEPTH	DPW APPROVAL REQUIRED OVER 15'	

NOTES:

1. INLET MAY BE CONSTRUCTED OF BRICK, CAST IN PLACE OR PRECAST MIX 3 CONCRETE WITH NO. 4 DEFORMED BARS AT 6" CC BOTH WAYS. 2" CLEAR FROM FACE OF INSIDE WALL. SEE LATEST DPW SPECIFICATIONS FOR INLETS.
2. TOP 4" OF PRECAST/CONCRETE WALLS MAY BE BRICK MASONRY TO BRING GRATE TO REQUIRED GRADE.
3. PLACE 1/4" EXPANSION MATERIAL BETWEEN FRAME AND ABUTTING RIGID PAVEMENT; AND BETWEEN ENDS OF INLET CURB AND NORMAL CURB.
4. IF 6" MIX 1 CONCRETE IS USED AS FOUNDATION FOR BRICK INLET, PLACE NO. 4 DEFORMED BARS AT 12" CC BOTH WAYS, 2" CLEAR FROM TOP.
5. COST OF FURNISHING AND PLACING 6" V.P. STUB WITH V.P. STOPPER TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF INLET.
6. DEPTH OF INLET CONNECTION IN STREETS AT CURB LINE TO BE 52" FROM INVERT TO ESTABLISHED CURB GRADE. DEPTH OF INLET CONNECTION IN ALLEYS TO BE 42" FROM INVERT TO ALLEY GRADE. NO DEVIATION FROM THESE DEPTHS WILL BE CONSIDERED FOR PAYMENT UNLESS DIRECTED BY THE ENGINEER IN WRITING.

CITY OF BALTIMORE 1797

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

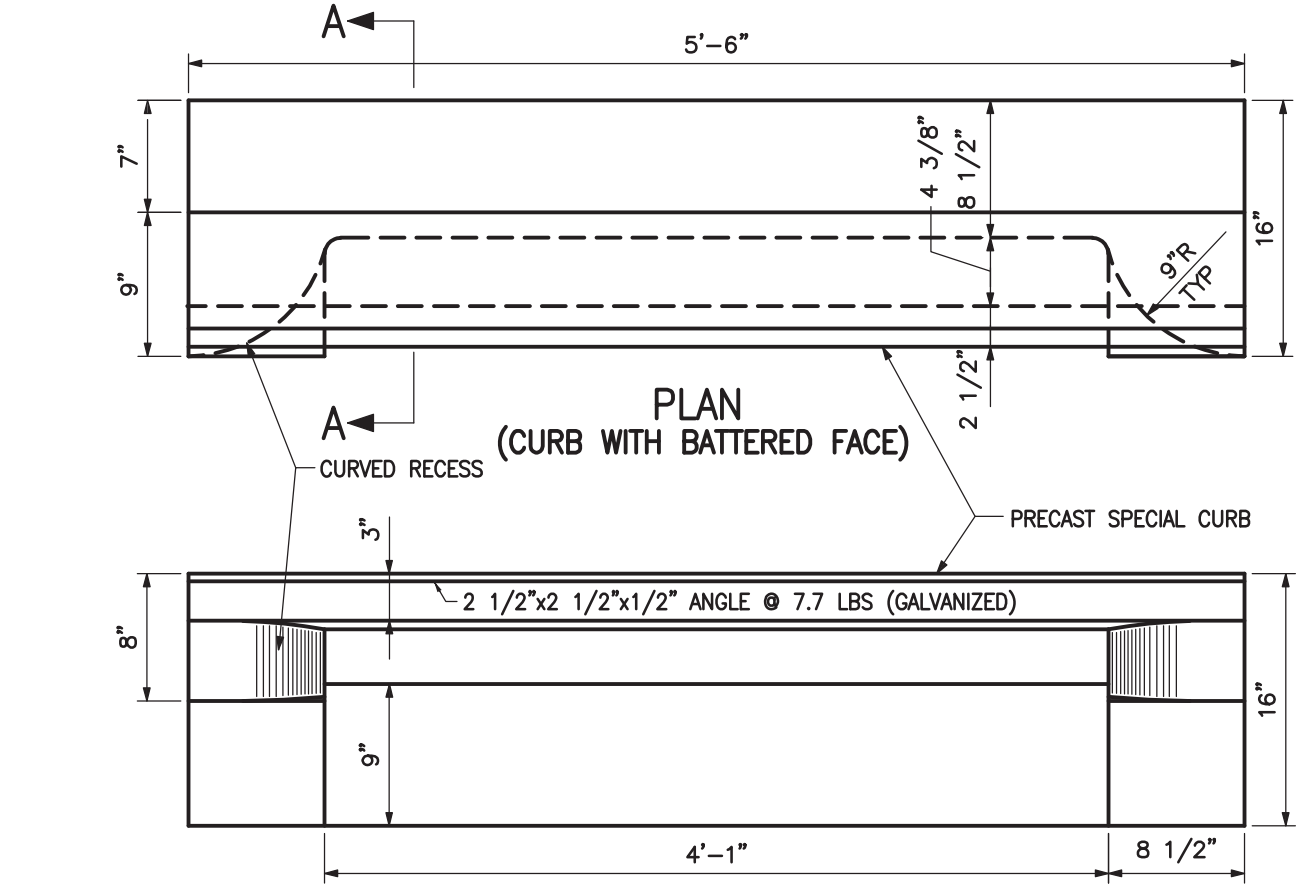
ISSUED	REVISED	REVISED
3 / 2008		

TYPE 'E' INLET

STANDARD NO.
BC 376.14

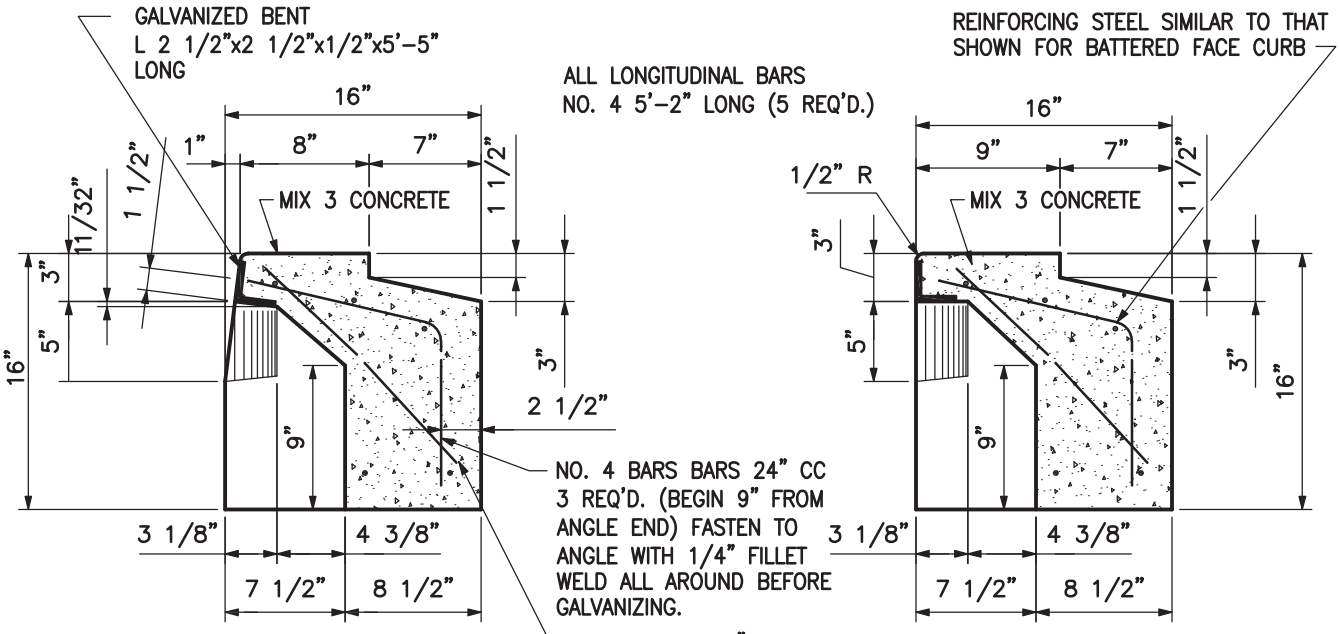
SCALE : NONE

SHEET 1 OF 1



PLAN
(CURB WITH BATTERED FACE)

FRONT ELEVATION
(CURB WITH BATTERED FACE)



SECTION A–A
(BATTERED FACE)

SECTION A–A
(VERTICAL FACE)

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

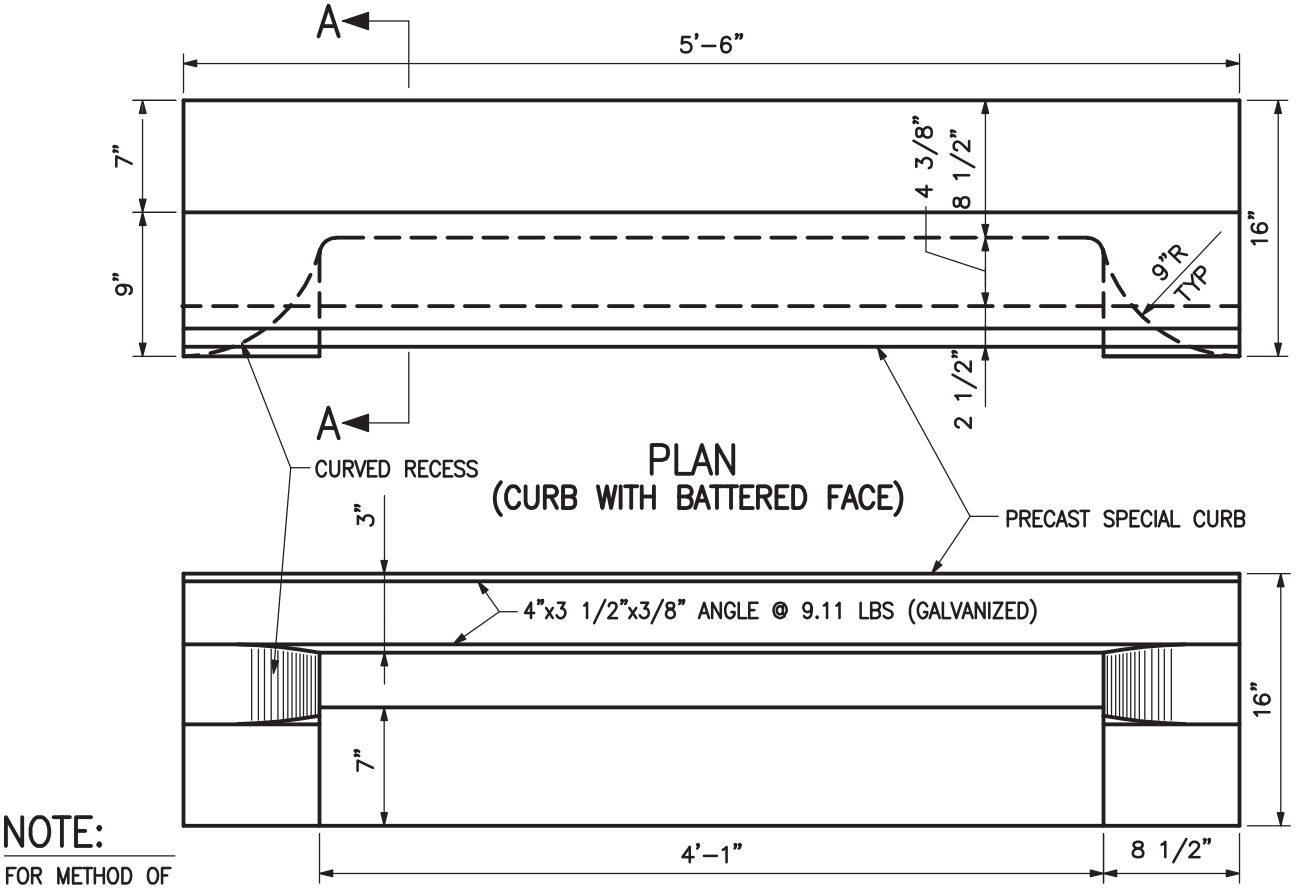
PRECAST SPECIAL CURB
FOR UNDEPRESSED 'E'
COMBINATION INLET

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 376.22

SCALE : NONE

SHEET 1 OF 2

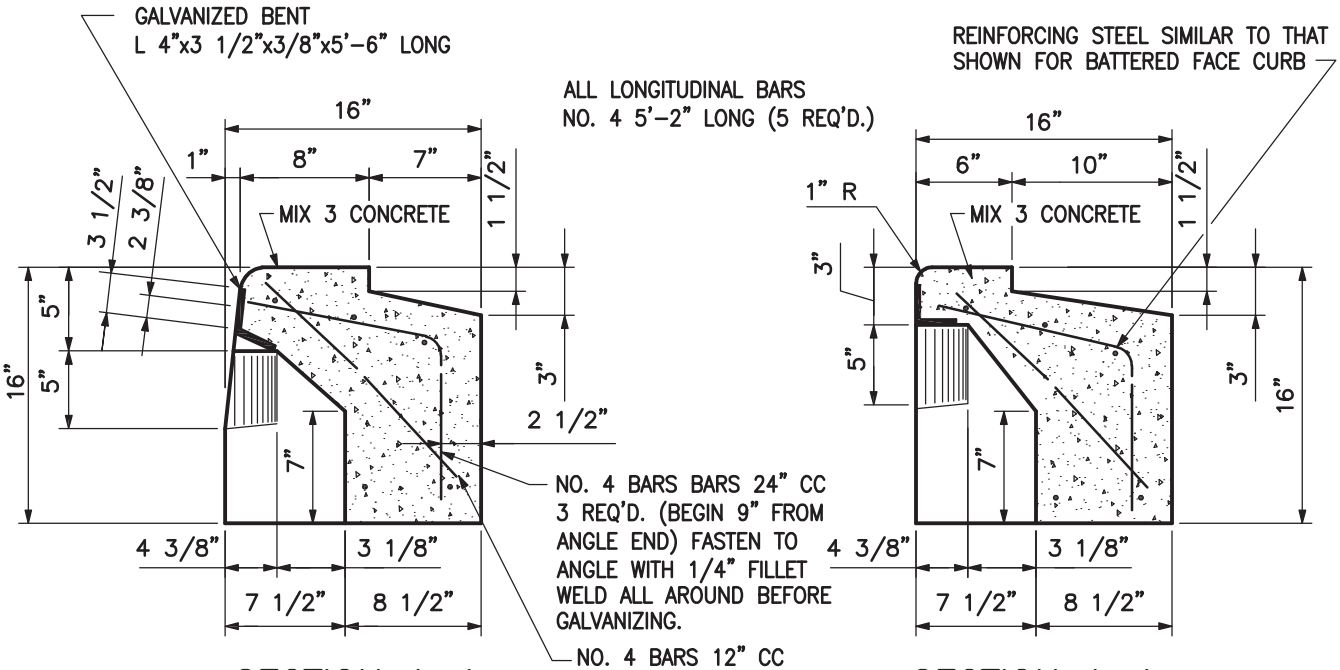


PLAN
(CURB WITH BATTERED FACE)

NOTE:

FOR METHOD OF DEPRESSING PAVING AT INLETS SEE BC 380.99

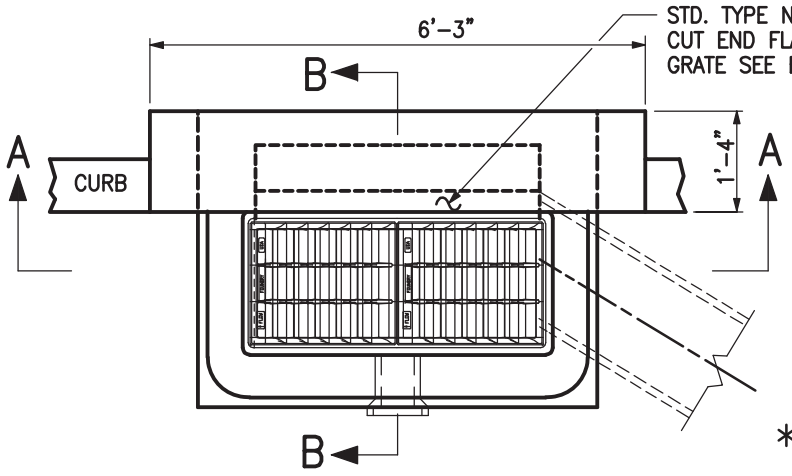
FRONT ELEVATION
(CURB WITH BATTERED FACE)



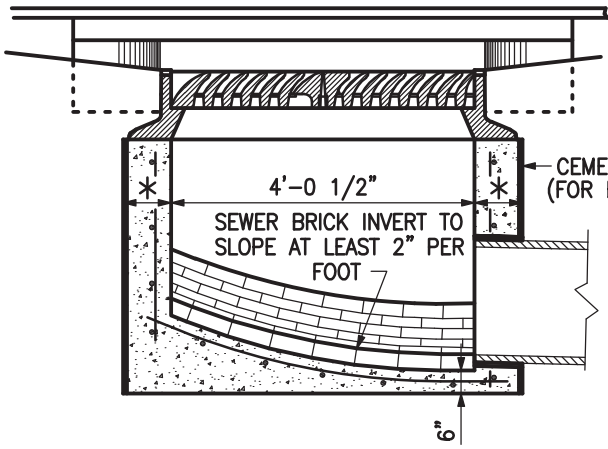
SECTION A–A
(BATTERED FACE)

SECTION A–A
(VERTICAL FACE)

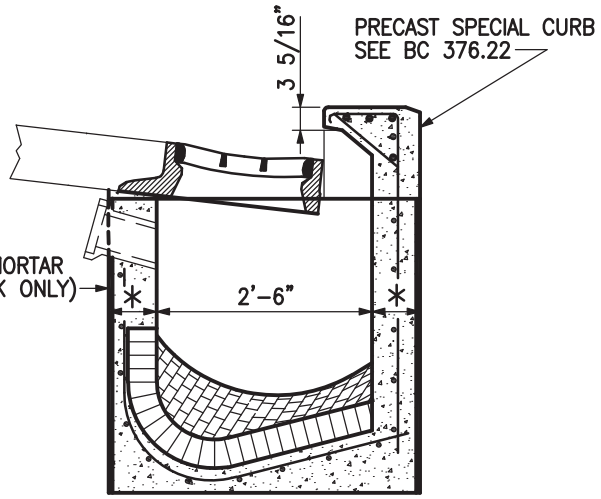
APPROVED: Bryan Sam HEAD, BUREAU OF WATER AND WASTEWATER Shirley C. Williams DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	PRECAST SPECIAL CURB FOR DEPRESSED 'E' COMBINATION INLET	STANDARD NO. BC 376.22		
		SCALE: NONE	SHEET 2 OF 2	



PLAN



SECTION A-A



SECTION B-B

	PRECAST	CAST-IN-PLACE/BRICK
WALL THICKNESS	6" MIN	8 1/2 "
REINF	2 LAYERS- 4x4 W4.0 x W4.0- WWF	NO. 4 BARS @ 6" CC EW 2" COVER
CONCRETE	MIX 6	MIX 3
ALLOWABLE DEPTH	DPW APPROVAL REQUIRED OVER 15'	

NOTES:

1. INLET MAY BE CONSTRUCTED OF BRICK, CAST IN PLACE OR PRECAST MIX 3 CONCRETE WITH NO. 4 DEFORMED BARS AT 6" CC BOTH WAYS. 2" CLEAR FROM FACE OF INSIDE WALL. SEE LATEST DPW SPECIFICATIONS FOR INLETS.
2. TOP 4" OF PRECAST/CONCRETE WALLS MAY BE BRICK MASONRY TO BRING GRATE TO REQUIRED GRADE.
3. PLACE 1/4" EXPANSION MATERIAL BETWEEN FRAME AND ABUTTING RIGID PAVEMENT; AND BETWEEN ENDS OF INLET CURB AND NORMAL CURB.
4. IF 6" MIX 1 CONCRETE IS USED AS FOUNDATION FOR BRICK INLET, PLACE NO. 4 DEFORMED BARS AT 12" CC BOTH WAYS, 2" CLEAR FROM TOP.
5. COST OF FURNISHING AND PLACING 6" V.P. STUB WITH V.P. STOPPER TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF INLET.
6. DEPTH OF INLET CONNECTION IN STREETS AT CURB LINE TO BE 52" FROM INVERT TO ESTABLISHED CURB GRADE. DEPTH OF INLET CONNECTION IN ALLEYS TO BE 42" FROM INVERT TO ALLEY GRADE. NO DEVIATION FROM THESE DEPTHS WILL BE CONSIDERED FOR PAYMENT UNLESS DIRECTED BY THE ENGINEER IN WRITING.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

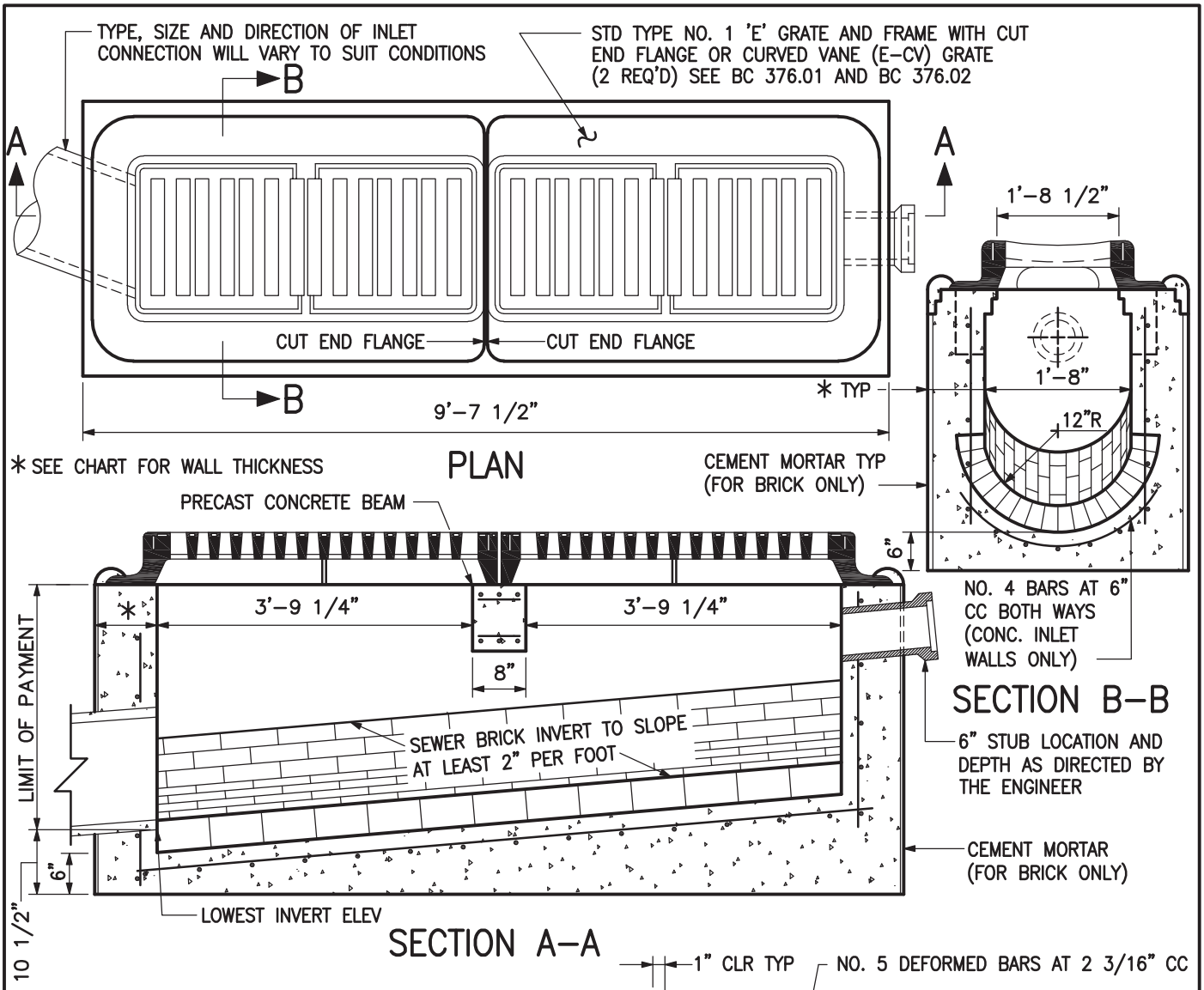
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

TYPE 'E'
COMBINATION INLET

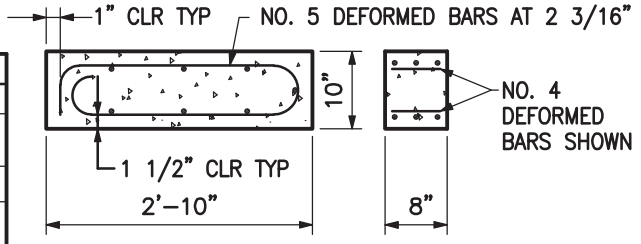
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 376.24

SCALE : NONE | SHEET 1 OF 1



	PRECAST	CAST-IN-PLACE/BRICK
WALL THICKNESS	6" MIN	8 1/2 "
REINF	2 LAYERS- 4x4 W4.0 x W4.0- WWF	NO. 4 BARS @ 6" CC EW 2" COVER
CONCRETE	MIX 6	MIX 3
ALLOWABLE DEPTH	DPW APPROVAL REQUIRED OVER 15'	



PRECAST CONCRETE BEAM

NOTES:

1. INLET MAY BE CONSTRUCTED OF BRICK, CAST IN PLACE OR PRECAST MIX 3 CONCRETE WITH NO. 4 DEFORMED BARS AT 6" CC BOTH WAYS. 2" CLEAR FROM FACE OF INSIDE WALL. SEE LATEST DPW SPECIFICATIONS FOR INLETS.
2. TOP 4" OF PRECAST/CONCRETE WALLS MAY BE BRICK MASONRY TO BRING GRATE TO REQUIRED GRADE.
3. PLACE 1/4" EXPANSION MATERIAL BETWEEN FRAME AND ABUTTING RIGID PAVEMENT; AND BETWEEN ENDS OF INLET CURB AND NORMAL CURB.
4. IF 6" MIX 1 CONCRETE IS USED AS FOUNDATION FOR BRICK INLET, PLACE NO. 4 DEFORMED BARS AT 12" CC BOTH WAYS, 2" CLEAR FROM TOP.
5. COST OF FURNISHING AND PLACING 6" V.P. STUB WITH V.P. STOPPER TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF INLET.
6. DEPTH OF INLET CONNECTION IN STREETS AT CURB LINE TO BE 52" FROM INVERT TO ESTABLISHED CURB GRADE. DEPTH OF INLET CONNECTION IN ALLEYS TO BE 42" FROM INVERT TO ALLEY GRADE. NO DEVIATION FROM THESE DEPTHS WILL BE CONSIDERED FOR PAYMENT UNLESS DIRECTED BY THE ENGINEER IN WRITING.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

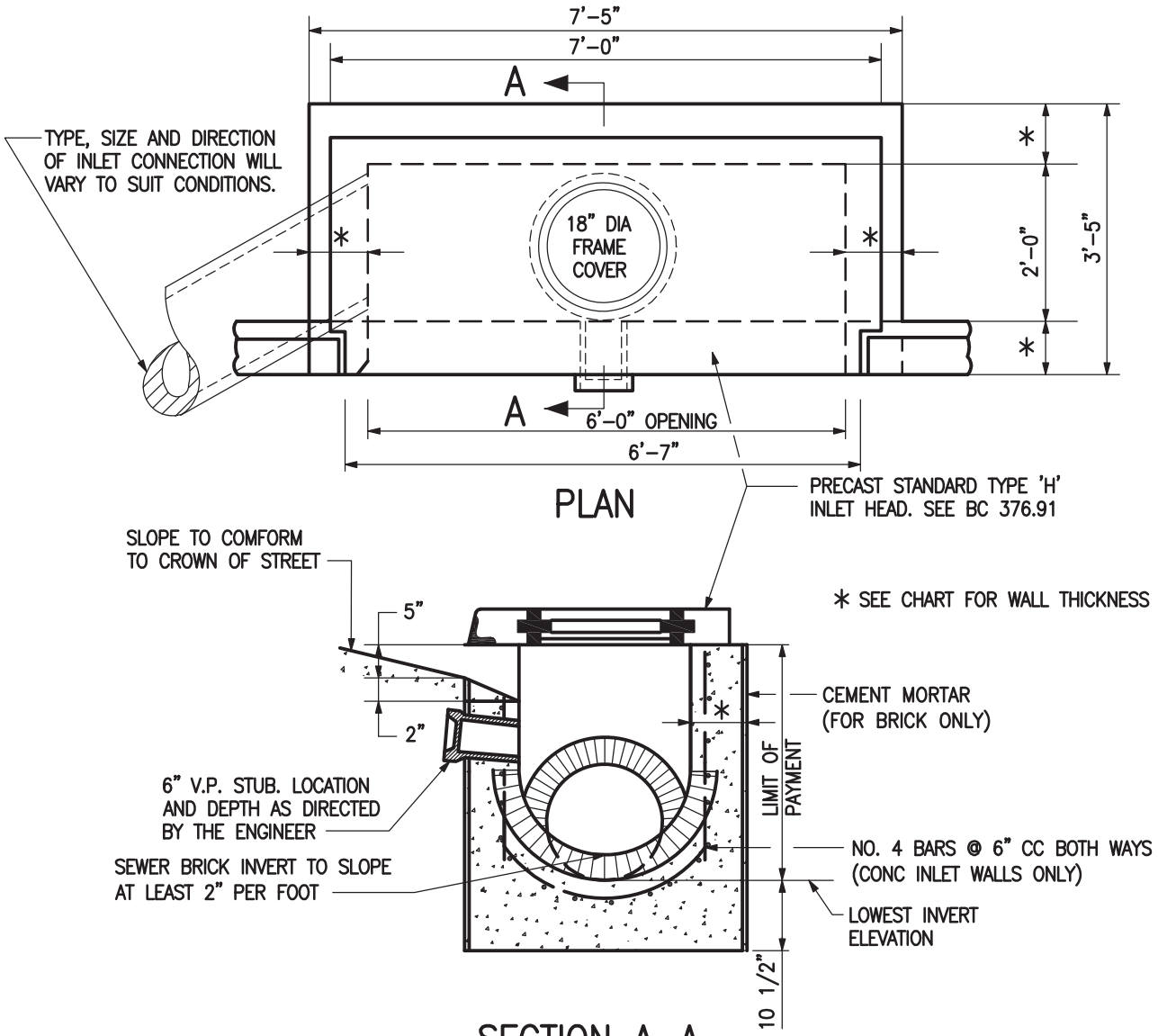
DUPLEX TYPE 'E' INLET

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 376.30

SCALE : NONE

SHEET 1 OF 1



	PRECAST	CAST-IN-PLACE/BRICK
WALL THICKNESS	6" MIN	8 1/2 "
REINF	2 LAYERS- 4x4 W4.0 x W4.0- WWF	NO. 4 BARS @ 6" CC EW 2" COVER
CONCRETE	MIX 6	MIX 3
ALLOWABLE DEPTH	DPW APPROVAL REQUIRED OVER 15'	

NOTES:

1. INLET MAY BE CONSTRUCTED OF BRICK OR MIX 3 CONCRETE WITH NO. 4 DEFORMED BARS @ 6" CC BOTH WAYS. 2" CLEAR FROM FACE OF INSIDE WALL. SEE LATEST DPW SPEC FOR INLETS.
2. TOP 4" OF CONCRETE WALLS MAY BE BRICK MASONRY TO BRING GRATE TO REQUIRED GRADE.
3. PLACE 1/4" EXPANSION MATERIAL BETWEEN FRAME AND ABUTTING RIGID PAVEMENT; AND BETWEEN ENDS OF INLET CURB AND NORMAL CURB.
4. IF 6" MIX 1 CONCRETE IS USED AS FOUNDATION FOR BRICK INLET, PLACE NO. 4 DEFORMED BARS @ 12" CC BOTH WAYS. 2" CLEAR FROM TOP.
5. COST OF FURNISHING AND PLACING 6" V.P. STUB WITH V.P. STOPPER TO BE INCLUDED IN THE PRICE BID PER INLET.
6. DEPTH OF INLET CONNECTION IN STREETS AT CURB LINE TO BE 52" FROM INVERT TO ESTABLISHED CURB GRADE. NO DEVIATION FROM THIS DEPTH WILL BE CONSIDERED FOR PAYMENT UNLESS DIRECTED BY THE ENGINEER IN WRITING.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

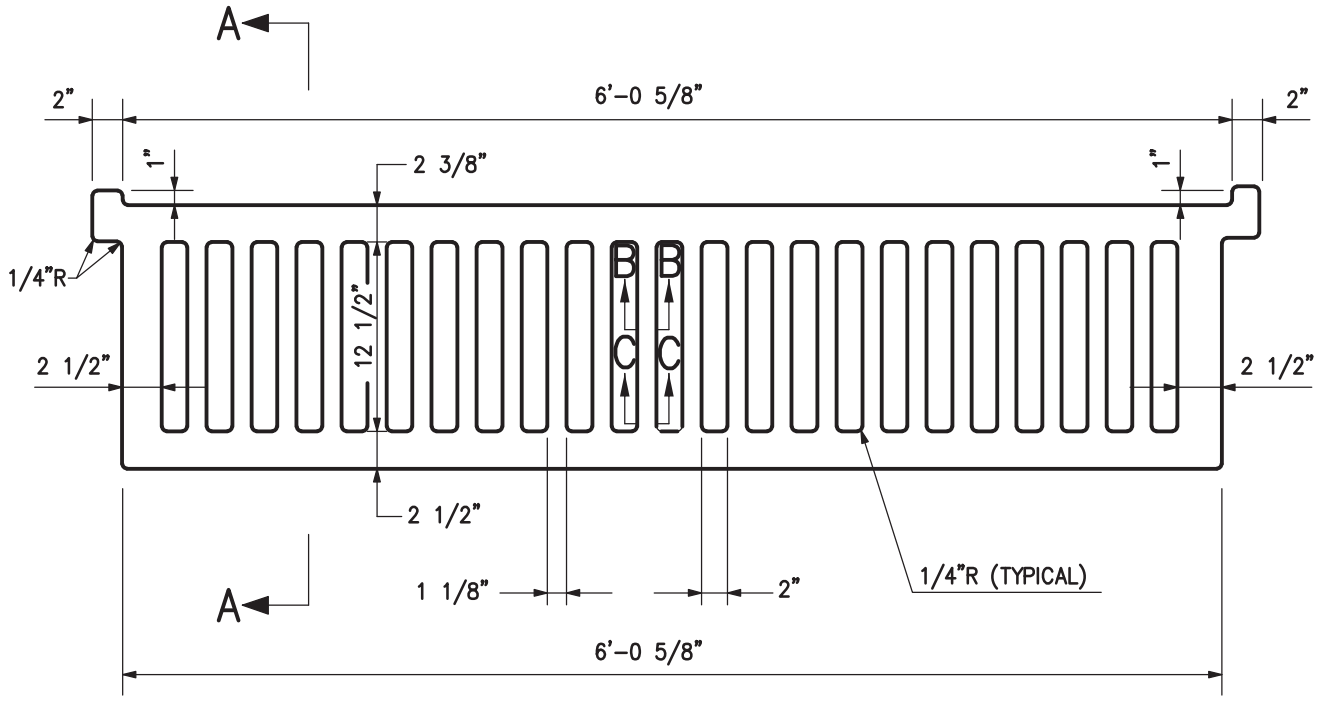
ISSUED	REVISED	REVISED
3 / 2008		

TYPE 'H' INLET

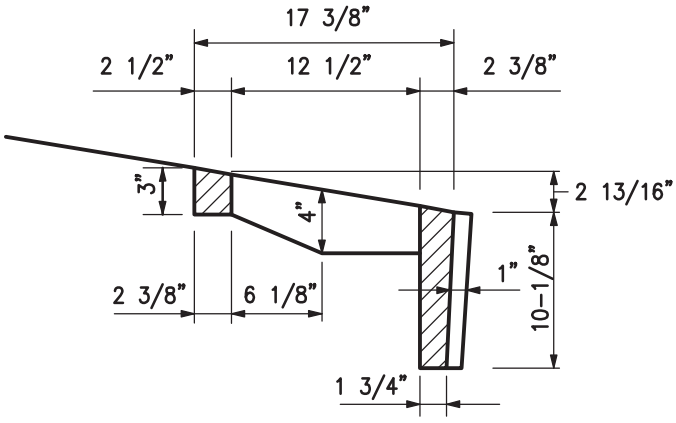
STANDARD NO.
BC 376.54

SCALE : NONE

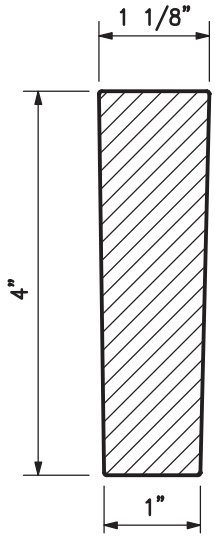
SHEET 1 OF 1



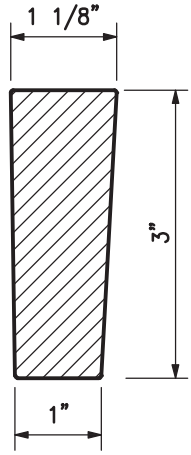
PLAN



SECTION A–A

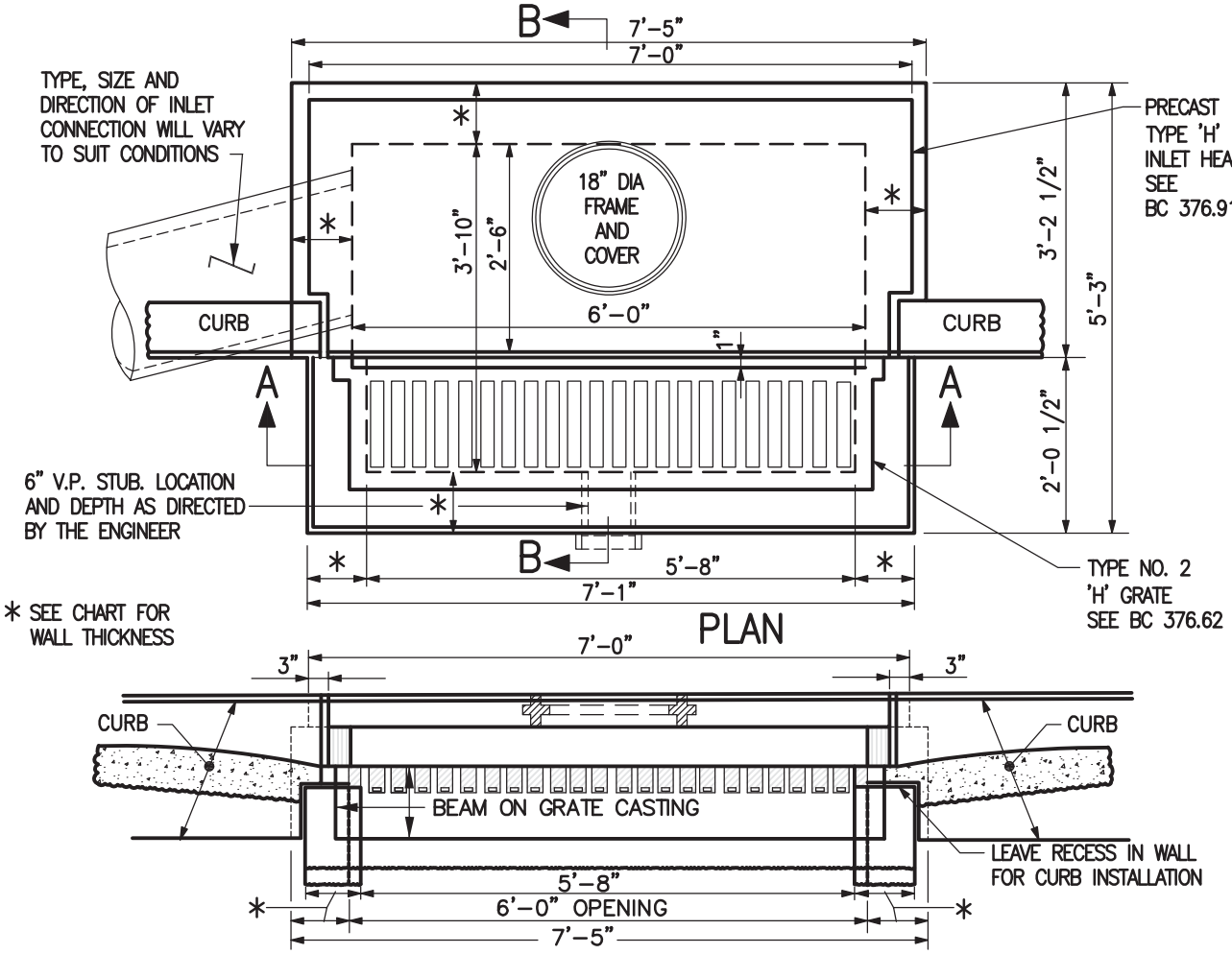


SECTION B–B
HALF SIZE



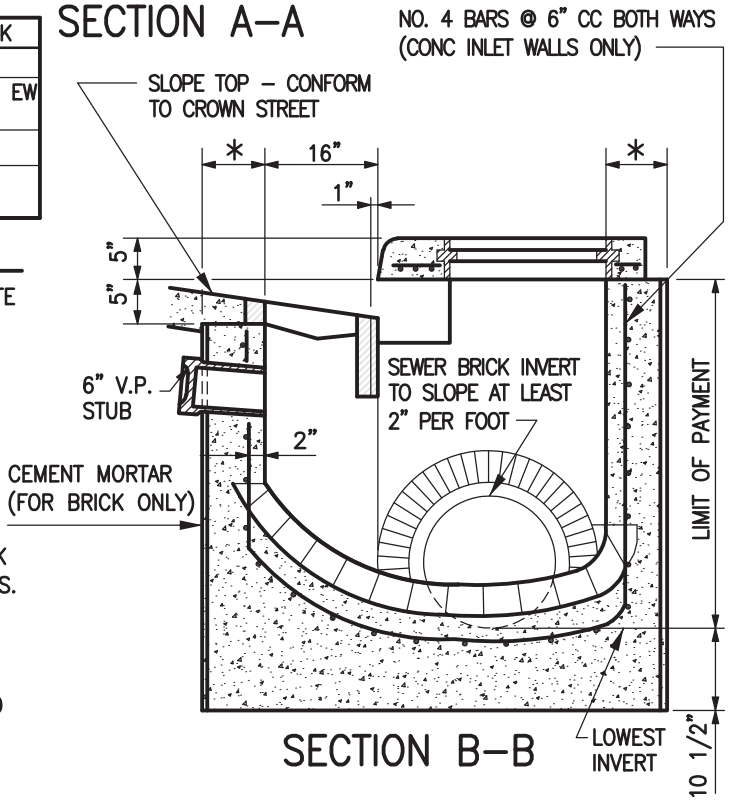
SECTION C–C
HALF SIZE

CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		TYPE NO. 2 'H' GRATE	STANDARD NO. BC 376.62		
			SCALE : NONE	SHEET 1 OF 1	



SECTION A–A

	PRECAST	CAST–IN–PLACE/BRICK
WALL THICKNESS	6" MIN	8 1/2"
REINF	2 LAYERS– 4x4 W4.0 x W4.0– WWF	NO. 4 BARS @ 6" CC EW 2" COVER
CONCRETE	MIX 6	MIX 3
ALLOWABLE DEPTH	DPW APPROVAL REQUIRED OVER 15'	



SECTION B–B

NOTES:

1. INLET MAY BE CONSTRUCTED OF BRICK OR MIX 3 CONCRETE WITH NO. 4 DEFORMED BARS @ 6" CC BOTH WAYS. 2" CLEAR FROM FACE OF INSIDE WALL. SEE LATEST DPW SPEC FOR INLETS.
2. TOP 4" OF CONCRETE WALLS MAY BE BRICK MASONRY TO BRING GRATE TO REQUIRED GRADE.
3. PLACE 1/4" EXPANSION MATERIAL BETWEEN FRAME AND ABUTTING RIGID PAVEMENT; AND BETWEEN ENDS OF INLET CURB AND NORMAL CURB.
4. IF 6" MIX 1 CONCRETE IS USED AS FOUNDATION FOR BRICK INLET, PLACE NO. 4 DEFORMED BARS @ 12" CC BOTH WAYS. 2" CLEAR FROM TOP.
5. COST OF FURNISHING AND PLACING 6" V.P. STUB WITH V.P. STOPPER TO BE INCLUDED IN THE PRICE BID PER INLET.
6. DEPTH OF INLET CONNECTION IN STREETS AT CURB LINE TO BE 52" FROM INVERT TO ESTABLISHED CURB GRADE. NO DEVIATION FROM THIS DEPTH WILL BE CONSIDERED FOR PAYMENT UNLESS DIRECTED BY THE ENGINEER IN WRITING.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

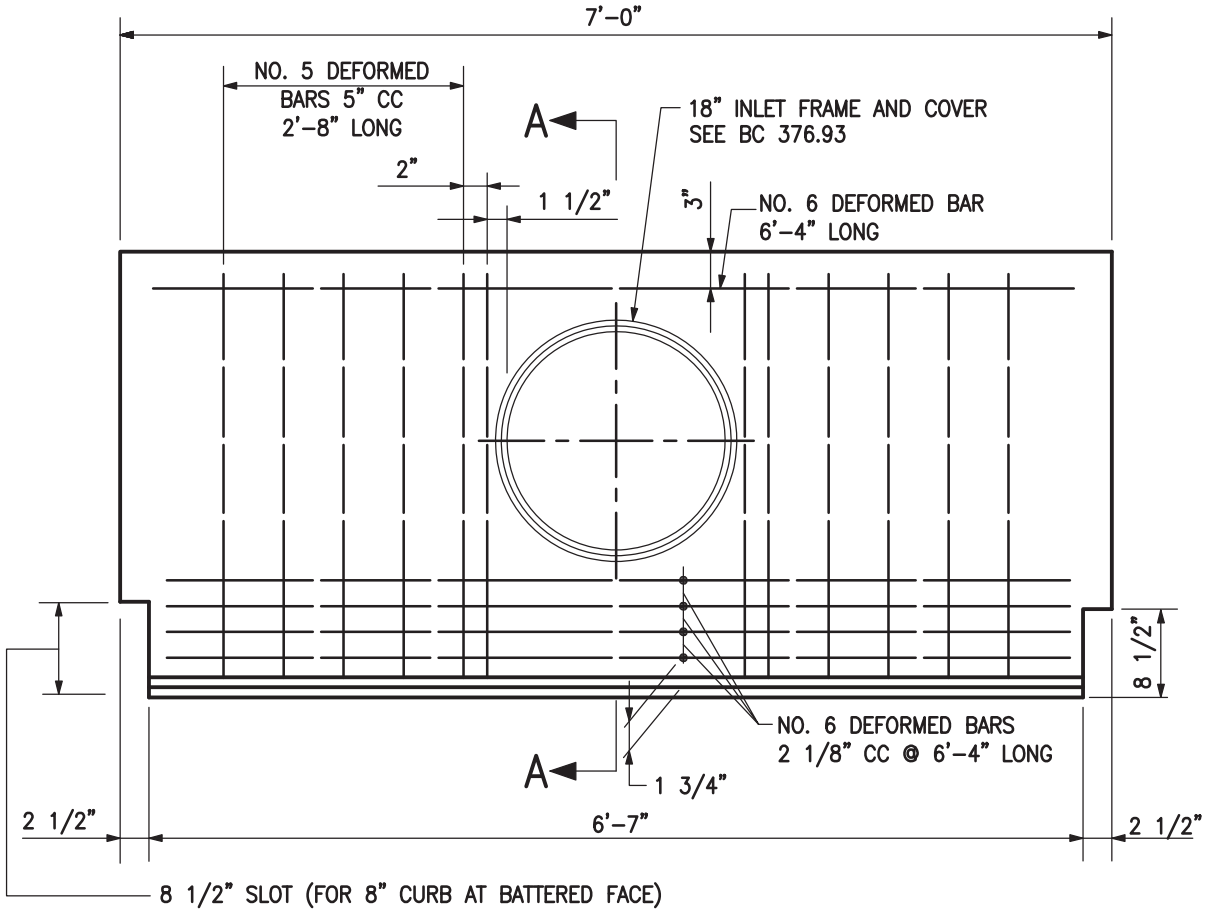
TYPE 'H'
COMBINATION INLET

ISSUED	REVISED	REVISED
3 / 2008		

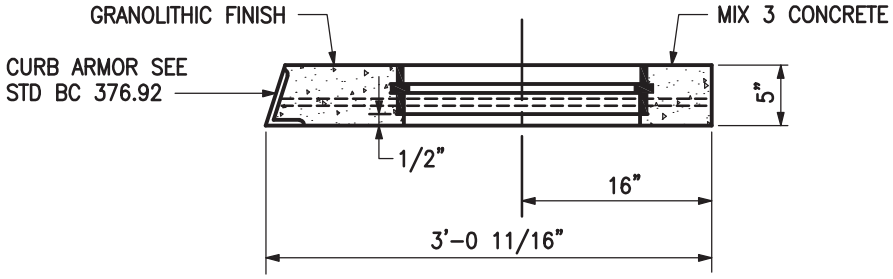
STANDARD NO.
BC 376.64

SCALE : NONE

SHEET 1 OF 1

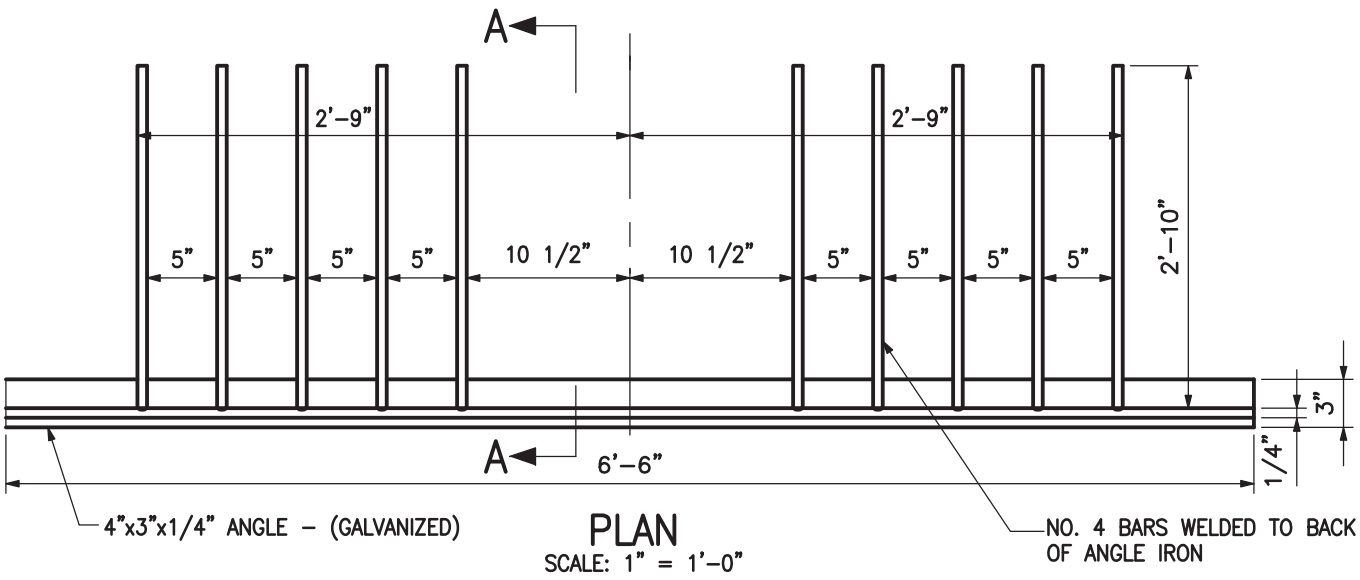


PLAN

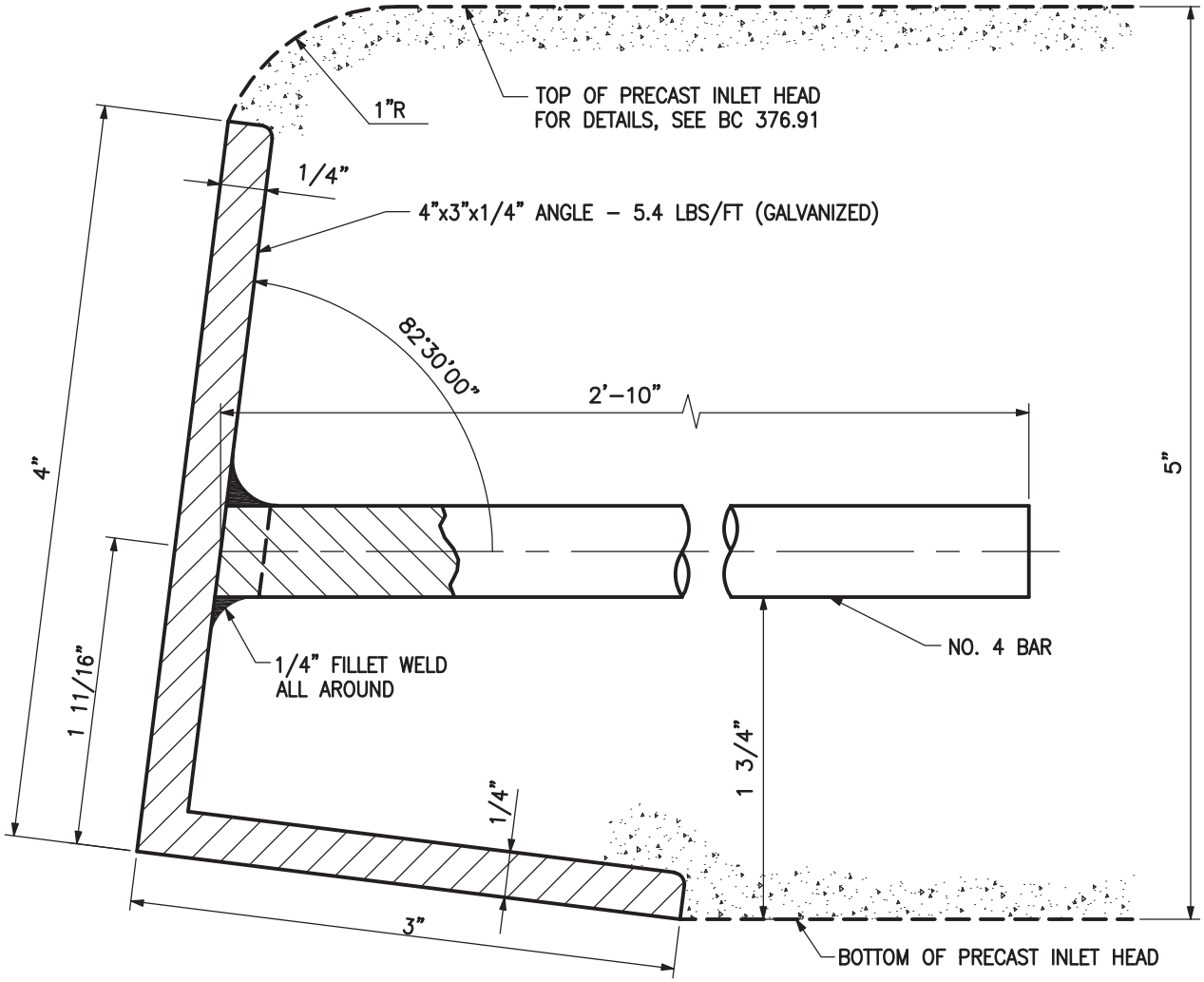


SECTION A-A

CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		PRECAST TYPE 'H' INLET HEAD	STANDARD NO. BC 376.91		
			SCALE : NONE	SHEET 1 OF 1	



PLAN
SCALE: 1" = 1'–0"



SECTION A–A
SCALE: FULL SIZE

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

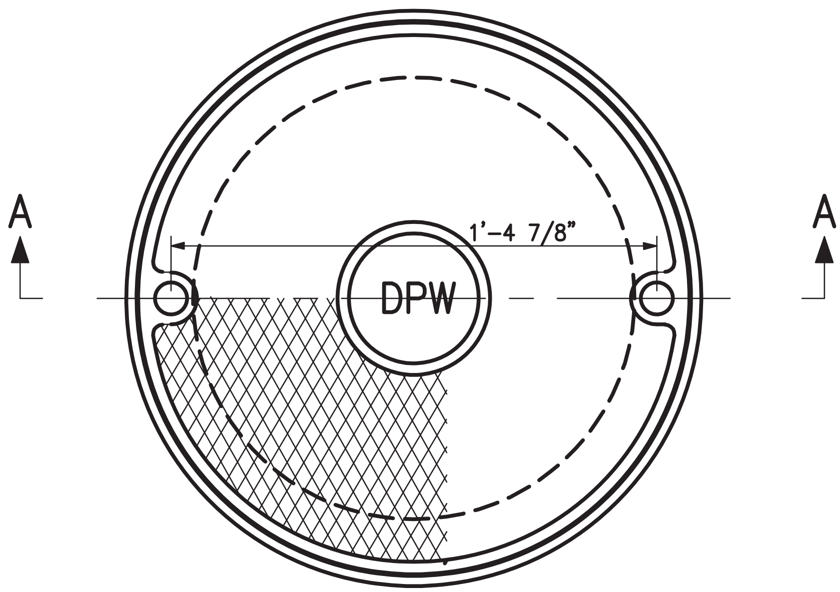
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

CURB ARMOR FOR TYPE
'H' INLET HEAD

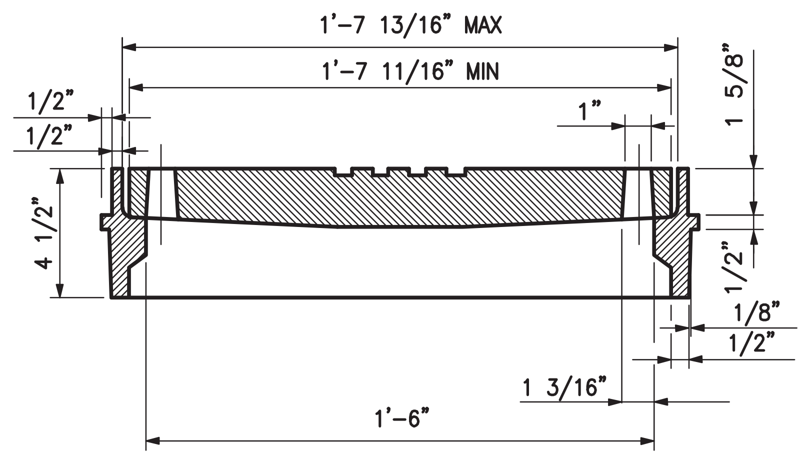
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 376.92

SCALE : NONE | SHEET 1 OF 1

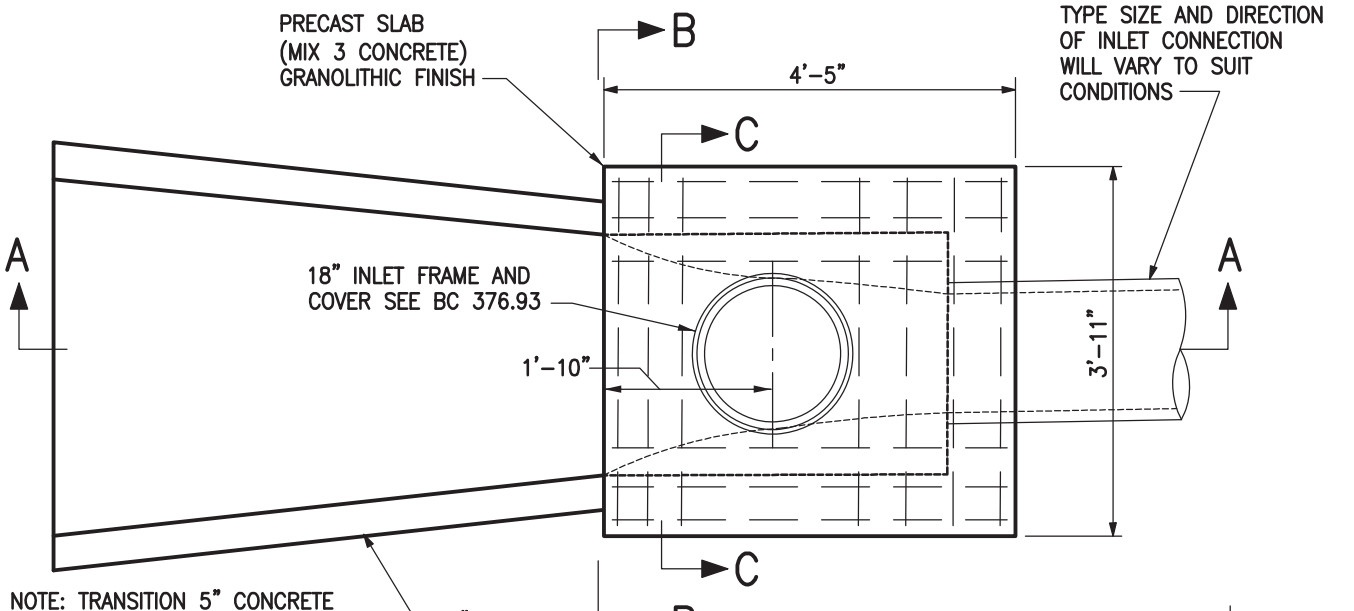


PLAN

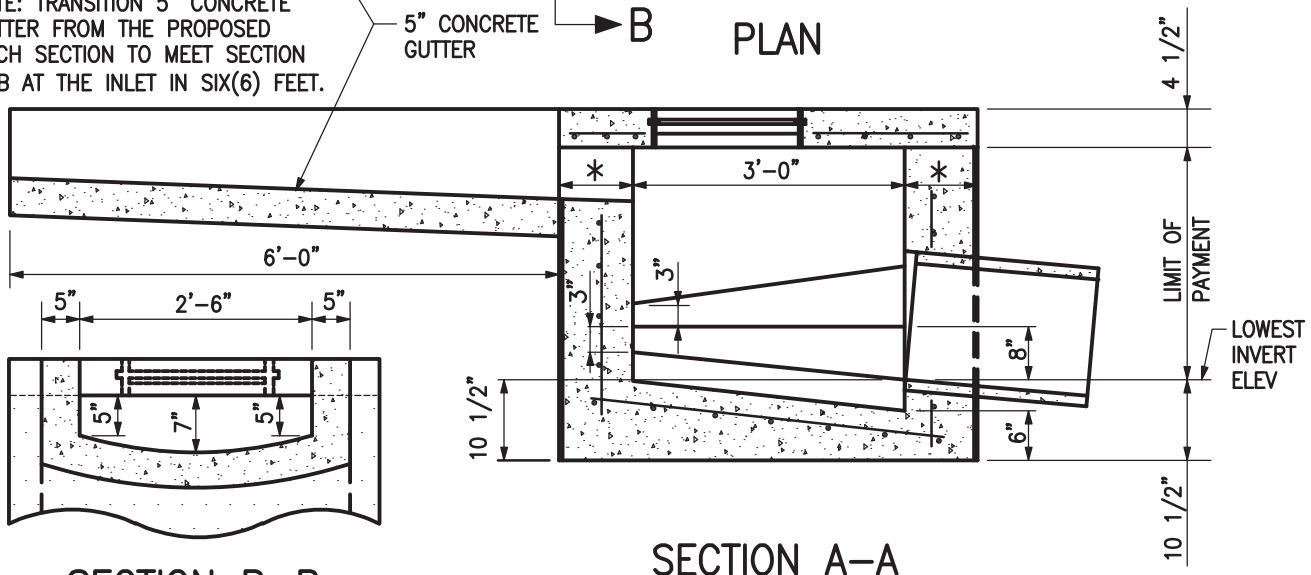


SECTION A-A

APPROVED :	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
HEAD, BUREAU OF WATER AND WASTEWATER		3 / 2008		
DIRECTOR, DEPARTMENT OF PUBLIC WORKS	18 IN. INLET FRAME AND COVER	STANDARD NO. BC 376.93		
		SCALE : NONE	SHEET 1 OF 1	



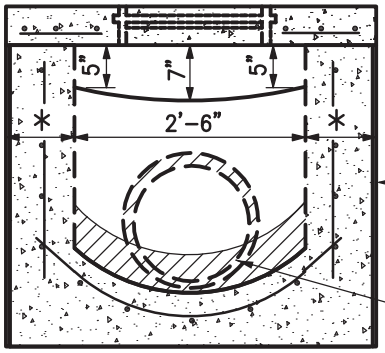
PLAN



SECTION B–B

SECTION A–A

* SEE CHART FOR WALL THICKNESS



SECTION C–C

	PRECAST	CAST–IN–PLACE/BRICK
WALL THICKNESS	6" MIN	8 1/2 "
REINF	2 LAYERS– 4x4 W4.0 x W4.0– WWF	NO. 4 BARS @ 6" CC EW 2" COVER
CONCRETE	MIX 6	MIX 3
ALLOWABLE DEPTH	DPW APPROVAL REQUIRED OVER 15'	

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

TYPE 'J'
CHUTE INLET

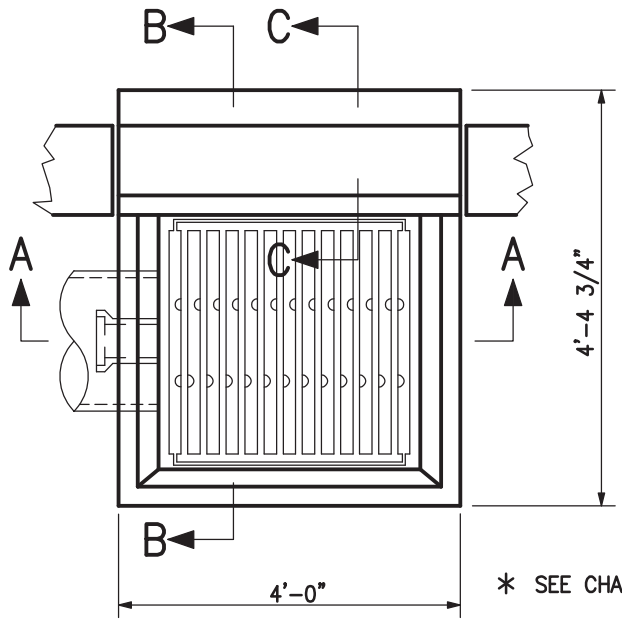
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 377.12

SCALE : NONE

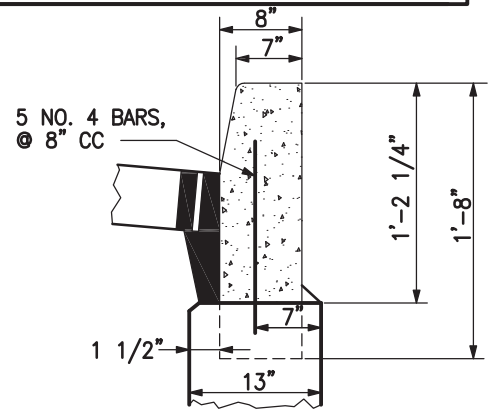
SHEET 1 OF 1

	PRECAST	CAST–IN–PLACE/BRICK
WALL THICKNESS	6" MIN	8 1/2 "
REINF	2 LAYERS– 4x4 W4.0 x W4.0– WWF	NO. 4 BARS @ 6" CC EW 2" COVER
CONCRETE	MIX 6	MIX 3
ALLOWABLE DEPTH	DPW APPROVAL REQUIRED OVER 15'	

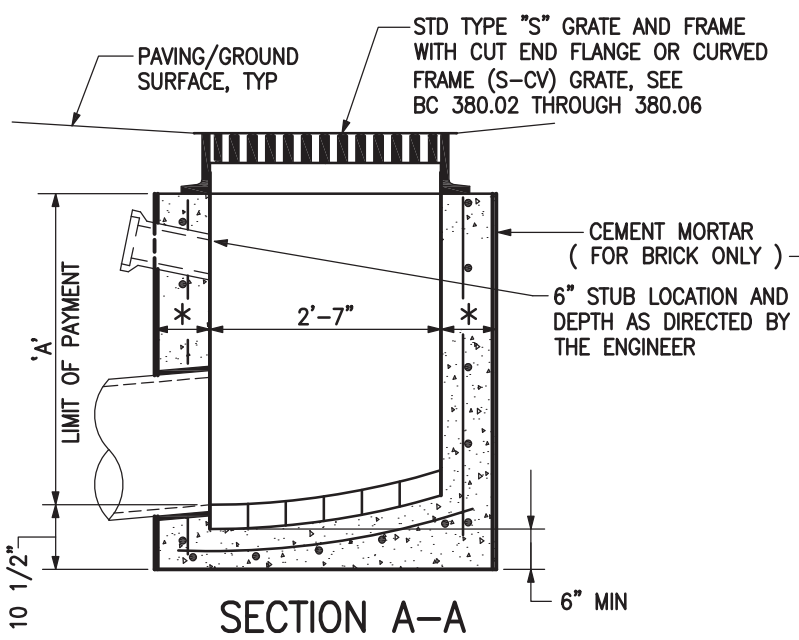


PLAN

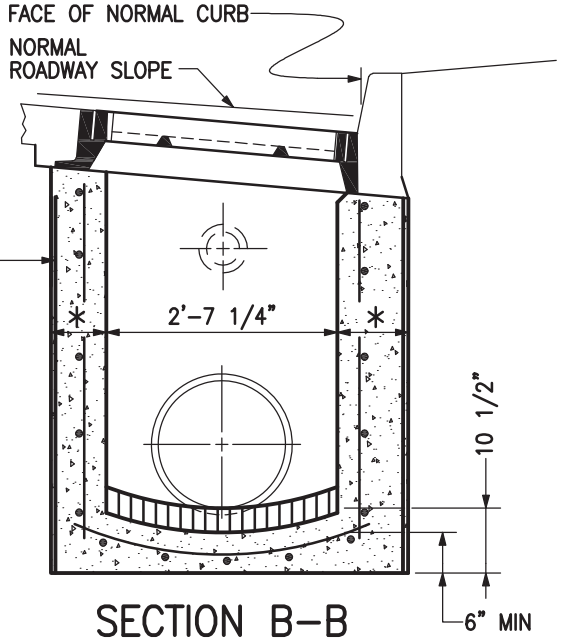
* SEE CHART FOR WALL THICKNESS



SECTION C–C
TYPE 'A' CURB



SECTION A–A



SECTION B–B

NOTES:

1. INLET MAY BE CONSTRUCTED OF BRICK, CAST IN PLACE OR PRECAST MIX 3 CONCRETE WITH NO. 4 DEFORMED BARS AT 6" CC BOTH WAYS. 2" CLEAR FROM FACE OF INSIDE WALL. SEE LATEST DPW SPECIFICATIONS FOR INLETS.
2. TOP 4" OF PRECAST/CONCRETE WALLS MAY BE BRICK MASONRY TO BRING GRATE TO REQUIRED GRADE.
3. PLACE 1/4" EXPANSION MATERIAL BETWEEN FRAME AND ABUTTING RIGID PAVEMENT; AND BETWEEN ENDS OF INLET CURB AND NORMAL CURB.
4. IF 6" MIX 1 CONCRETE IS USED AS FOUNDATION FOR BRICK INLET, PLACE NO. 4 DEFORMED BARS AT 12" CC BOTH WAYS, 2" CLEAR FROM TOP.
5. COST OF FURNISHING AND PLACING 6" V.P. STUB WITH V.P. STOPPER TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF INLET.
6. DEPTH OF INLET CONNECTION IN STREETS AT CURB LINE TO BE 52" FROM INVERT TO ESTABLISHED CURB GRADE. DEPTH OF INLET CONNECTION IN ALLEYS TO BE 42" FROM INVERT TO ALLEY GRADE. NO DEVIATION FROM THESE DEPTHS WILL BE CONSIDERED FOR PAYMENT UNLESS DIRECTED BY THE ENGINEER IN WRITING.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

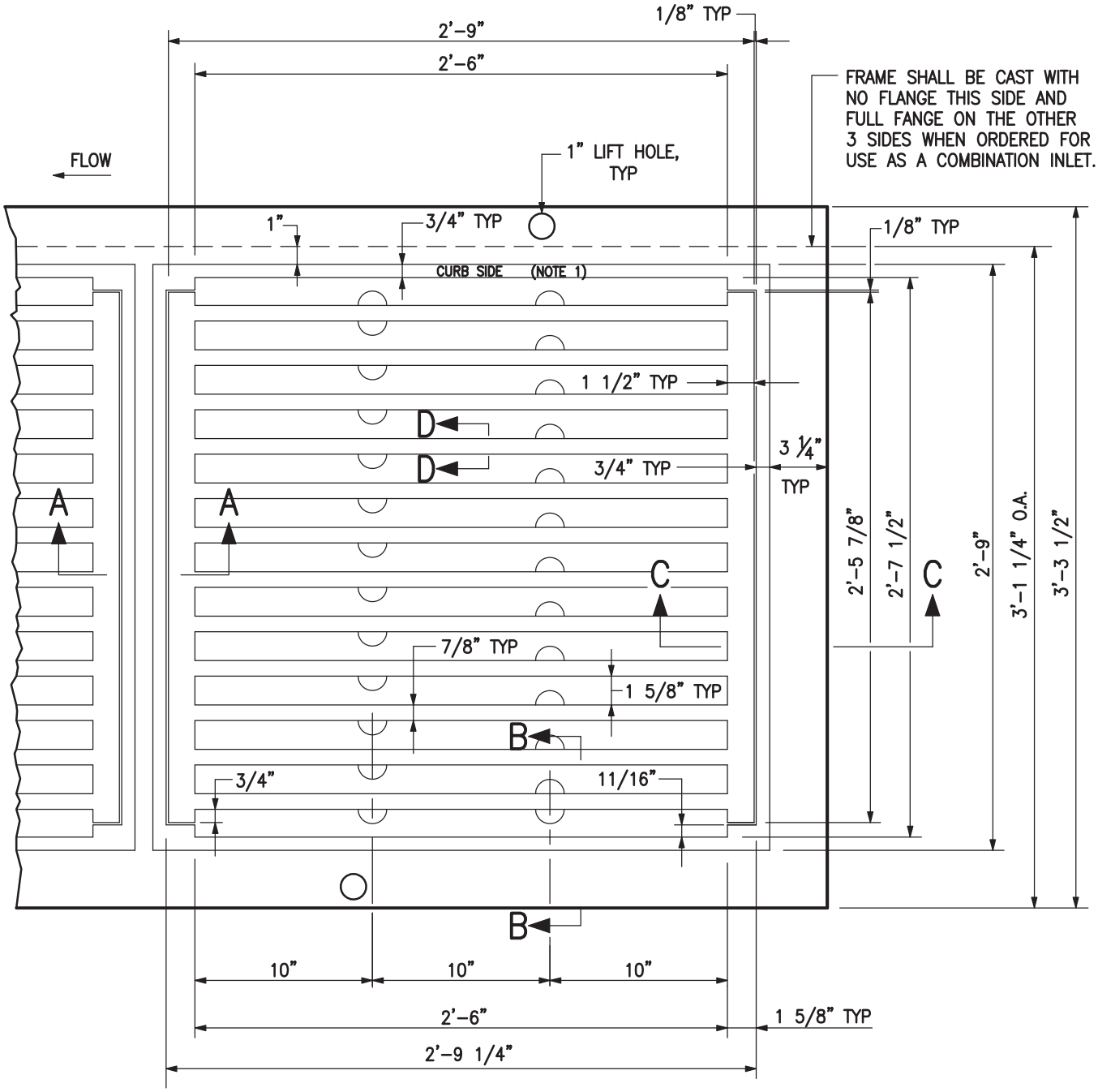
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

TYPE 'S' INLET
SINGLE GRATE

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 380.01

SCALE : NONE | SHEET 1 OF 1



PLAN

NOTES:

1. 3/4" STANDARD FLAT FACE GOTHIC LETTERS RAISED 1/8".
2. CASTING MATERIALS SHALL BE GRAY IRON AND SHALL MEET OR EXCEED AASHTO M-306 PROOF LOAD REQUIREMENTS.
3. FOR SECTIONAL VIEWS OF THIS FRAME AND GRATE, SEE STANDARD NO. BC 380.03.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

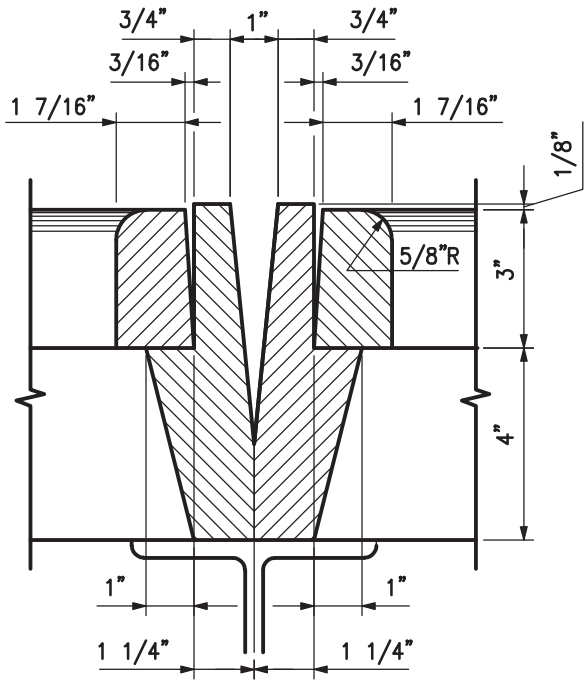
TYPE 'S' FRAME AND GRATE
PARALLEL BARS

ISSUED	REVISED	REVISED
3 / 2008		

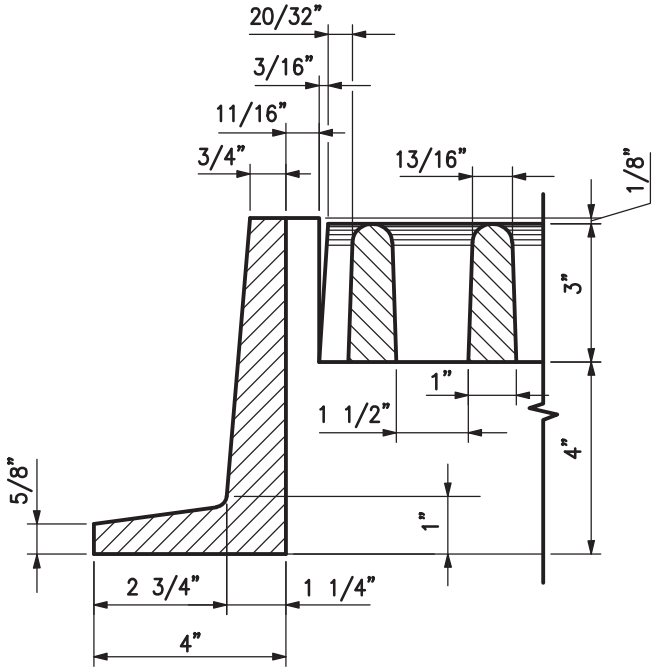
STANDARD NO.
BC 380.02

SCALE : NONE

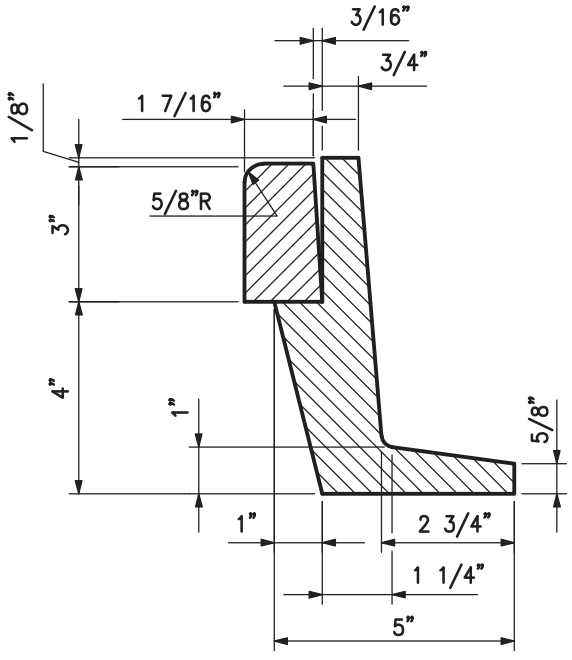
SHEET 1 OF 1



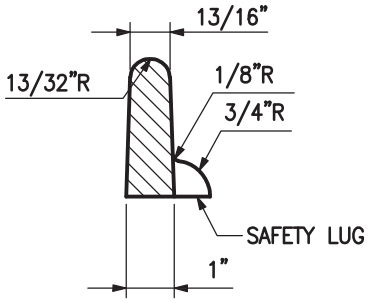
SECTION A–A



SECTION B–B



SECTION C–C



SECTION D–D

NOTE:

FOR PLAN VIEW OF THESE SECTIONS, SEE BC 380.02.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

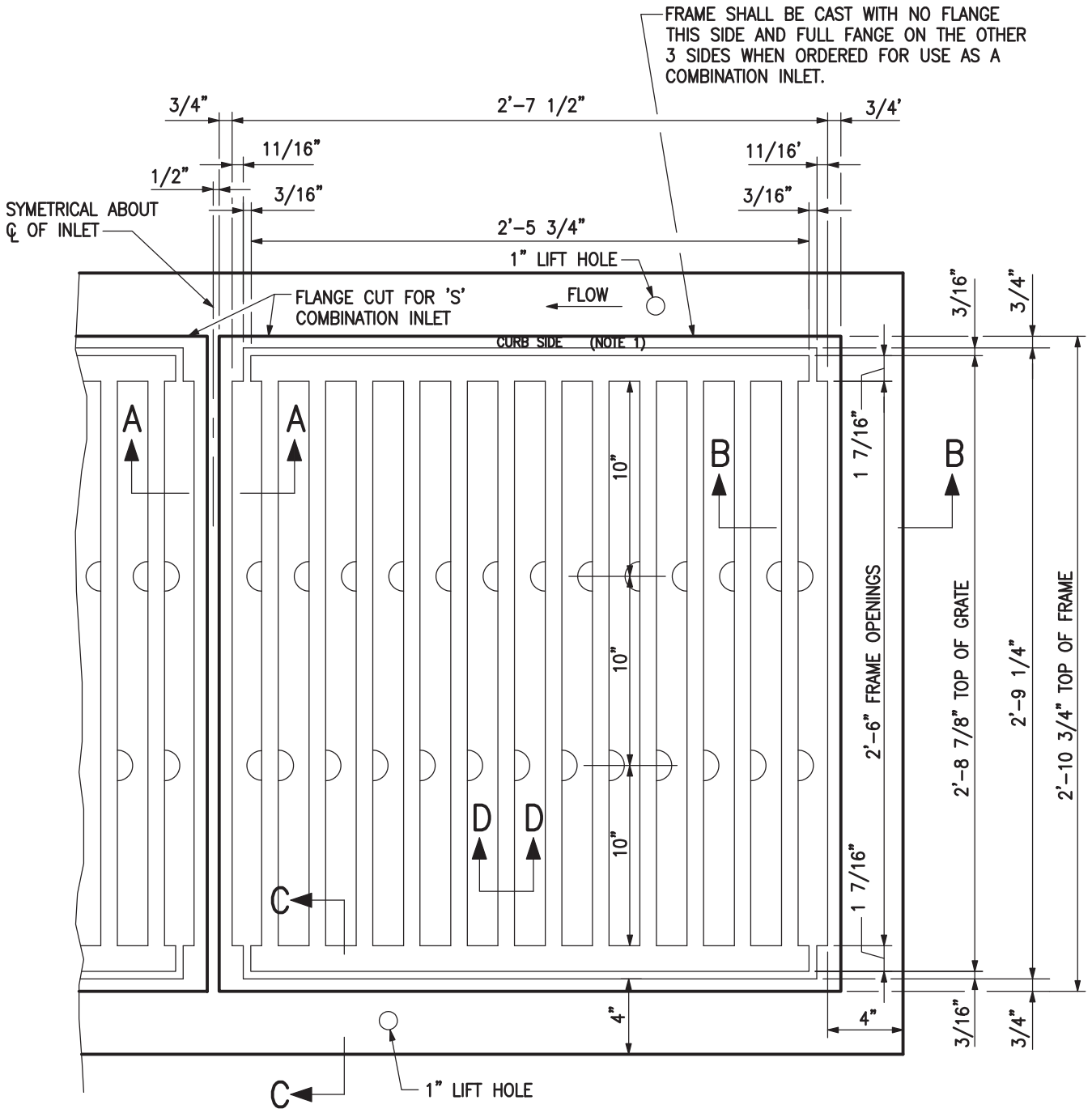
TYPE 'S' FRAME AND GRATE
SECTIONS PARALLEL BARS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 380.03

SCALE : NONE

SHEET 1 OF 1

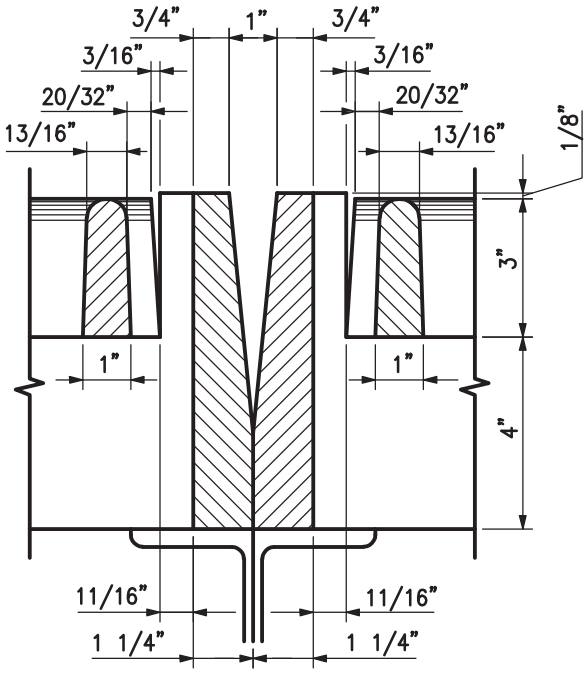


PLAN

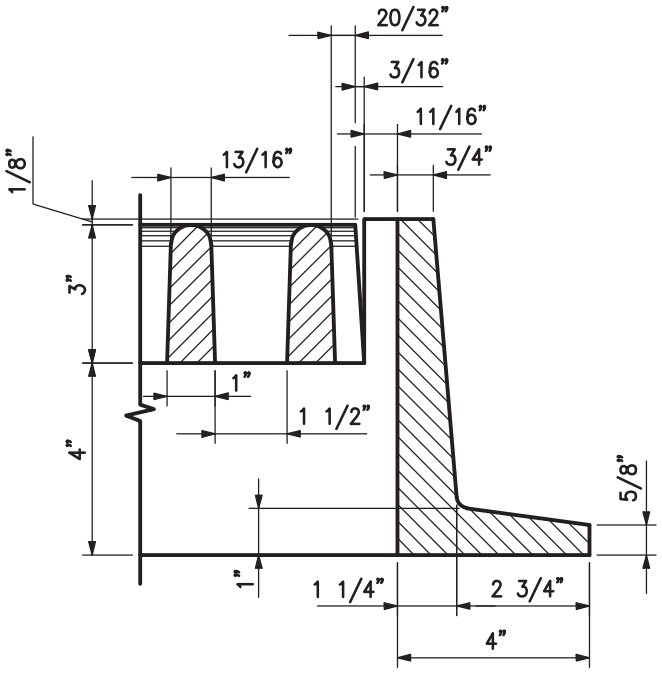
NOTES:

1. 3/4" STANDARD FLAT FACE GOTHIC LETTERS RAISED 1/8".
2. CASTING MATERIALS SHALL BE GRAY IRON AND SHALL MEET OR EXCEED AASHTO M-306 PROOF LOAD REQUIREMENTS.
3. FOR SECTIONAL VIEWS OF THIS FRAME AND GRATE, SEE STANDARD NO. BC 380.05.

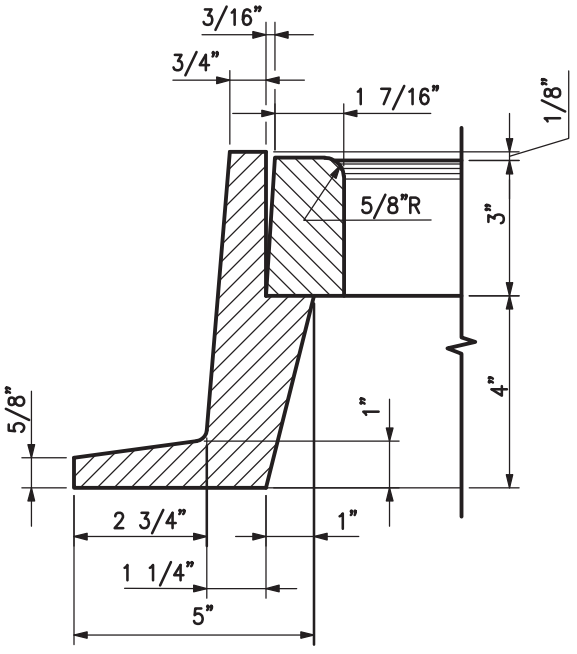
CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		TYPE 'S' FRAME AND GRATE TRANSVERSE BARS	STANDARD NO. BC 380.04		
			SCALE : NONE	SHEET 1 OF 1	



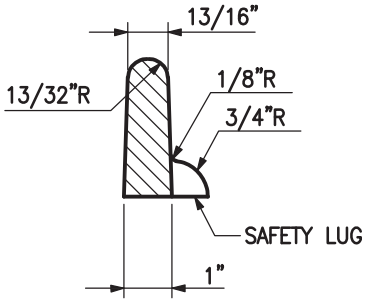
SECTION A–A



SECTION B–B



SECTION C–C



SECTION D–D

NOTE:

FOR PLAN VIEW OF THESE SECTIONS, SEE BC 380.04.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

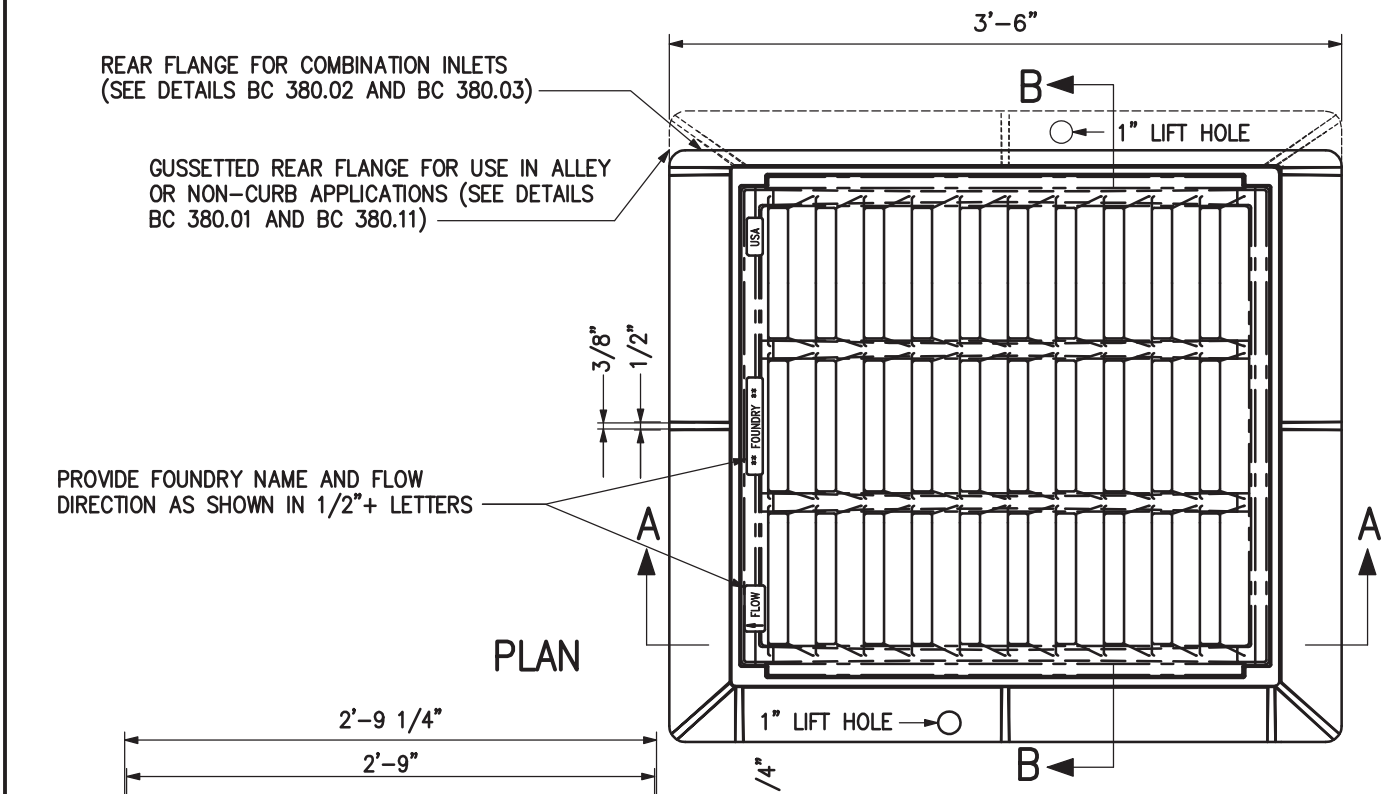
TYPE 'S' FRAME AND GRATE
SECTIONS TRANSVERSE BARS

ISSUED	REVISED	REVISED
3 / 2008		

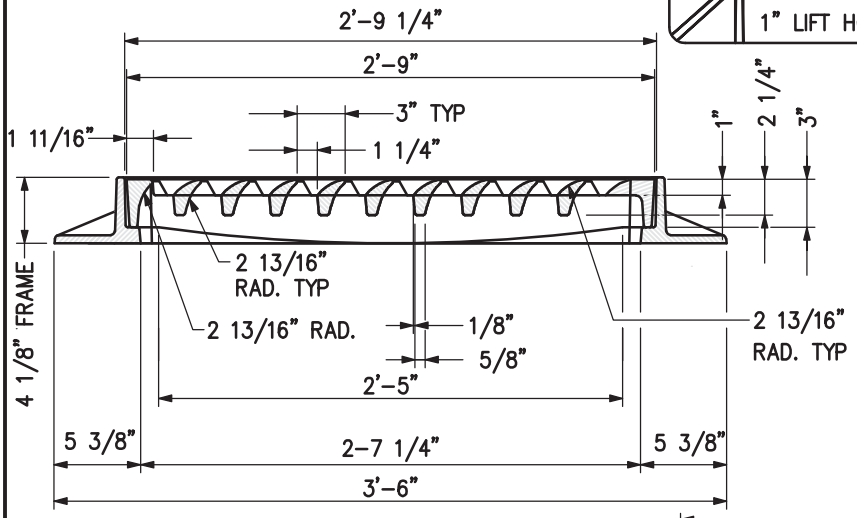
STANDARD NO.
BC 380.05

SCALE : NONE

SHEET 1 OF 1



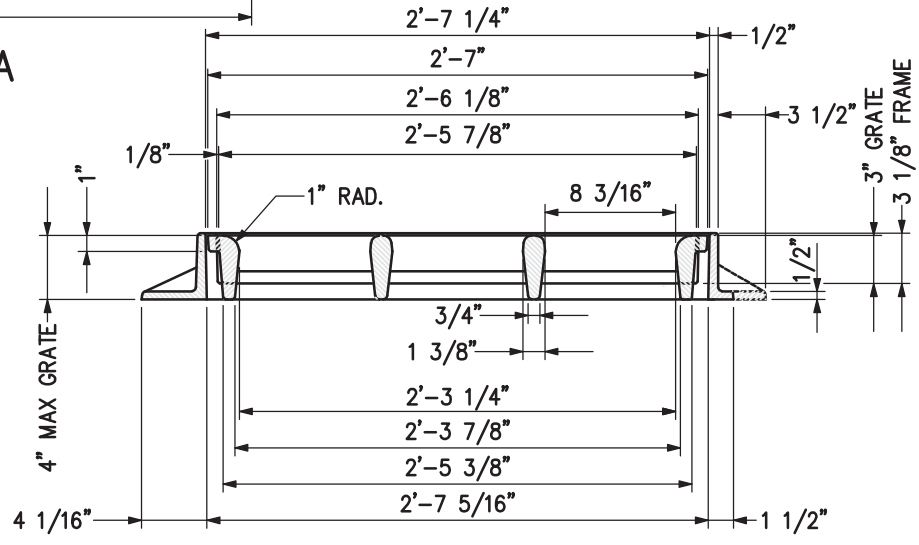
PLAN



SECTION A-A

NOTES:

1. GRATE(S) SHALL SIT SQUARE UPON FRAME SUPPORTS WITHOUT ROCKING OR SHIFTING UNDER LOAD. GRATE SHALL MEET OR EXCEED AASHTO M 306 PROOF LOAD REQUIREMENTS.
2. MATERIAL: GRAY IRON CASTING AASHTO DESIGNATION M105-06.
3. WEIGHT: GRATE APPROX. 297 LBS., FRAME APPROX. 244 LBS.
4. FRAME: PER THIS DETAIL OR BC 380.02, AND BC 380.03.



SECTION B-B

APPROVED:

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

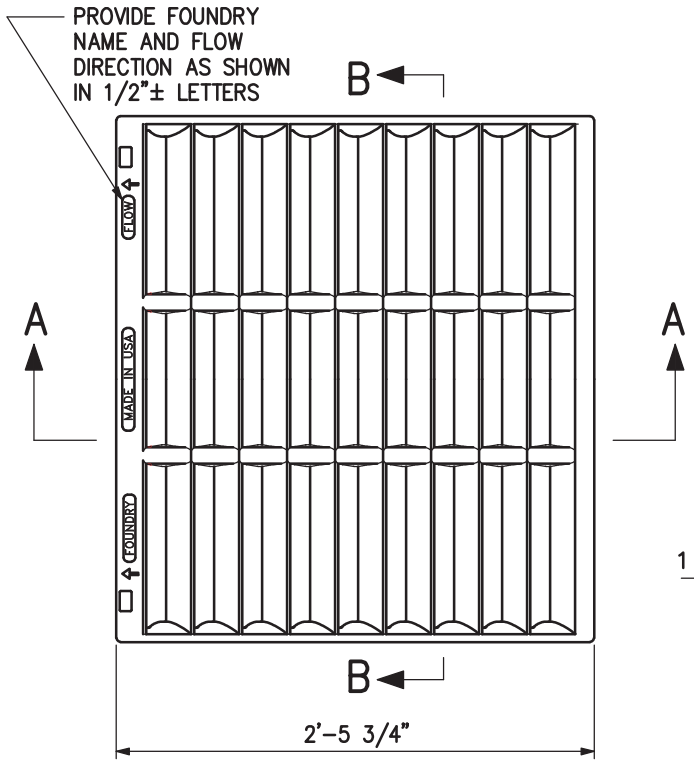
ISSUED	REVISED	REVISED
3 / 2008		

CURVED VANE (S-CV) GRATE
WITH CLASS 35 TYPE 'S' FRAME
NEW CONSTRUCTION

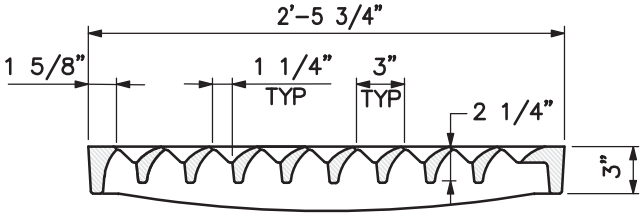
STANDARD NO.
BC 380.06

SCALE: NONE

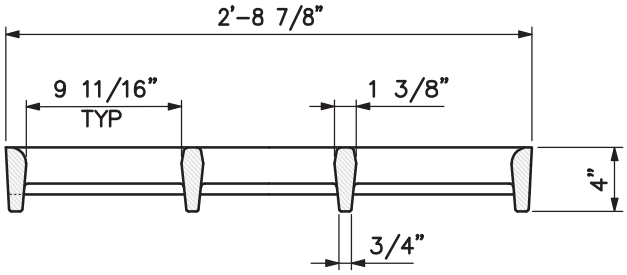
SHEET 1 OF 1



PLAN



SECTION A–A



SECTION B–B

NOTES:

1. GRATE(S) SHALL SIT SQUARE UPON FRAME SUPPORTS WITHOUT ROCKING OR SHIFTING UNDER LOAD. GRATE SHALL MEET OR EXCEED AASHTO M306 PROOF LOAD REQUIREMENTS.
2. MATERIAL: GRAY IRON CASTING AASHTO DESIGNATION M105–06
3. WEIGHT: GRATE APPROXIMATELY 308 LBS.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

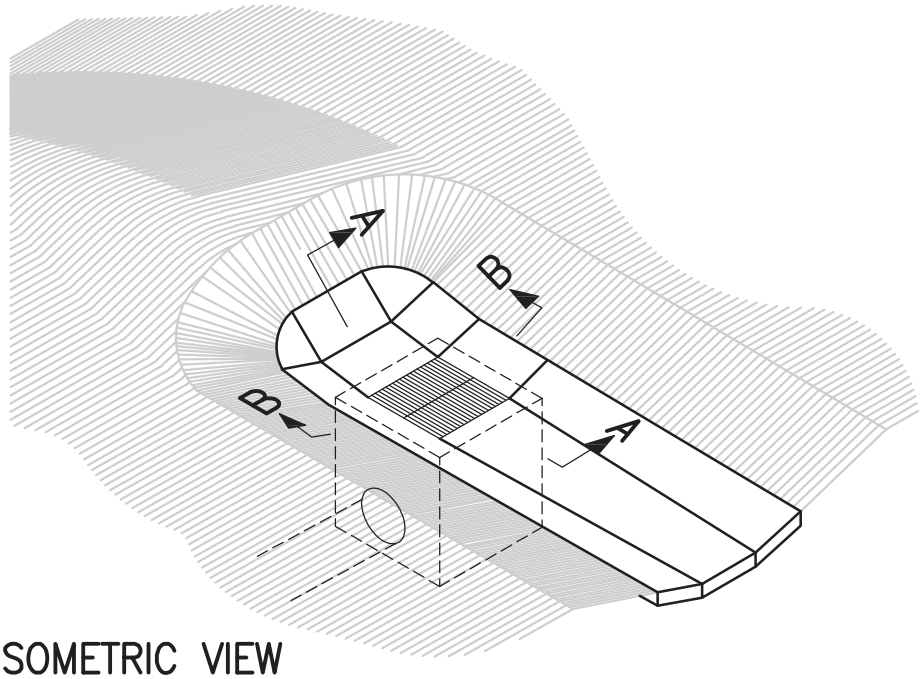
CURVED VANE (S-CV) GRATE(S)
FOR EXISTING TYPE 'S' FRAME

ISSUED	REVISED	REVISED
3 / 2008		

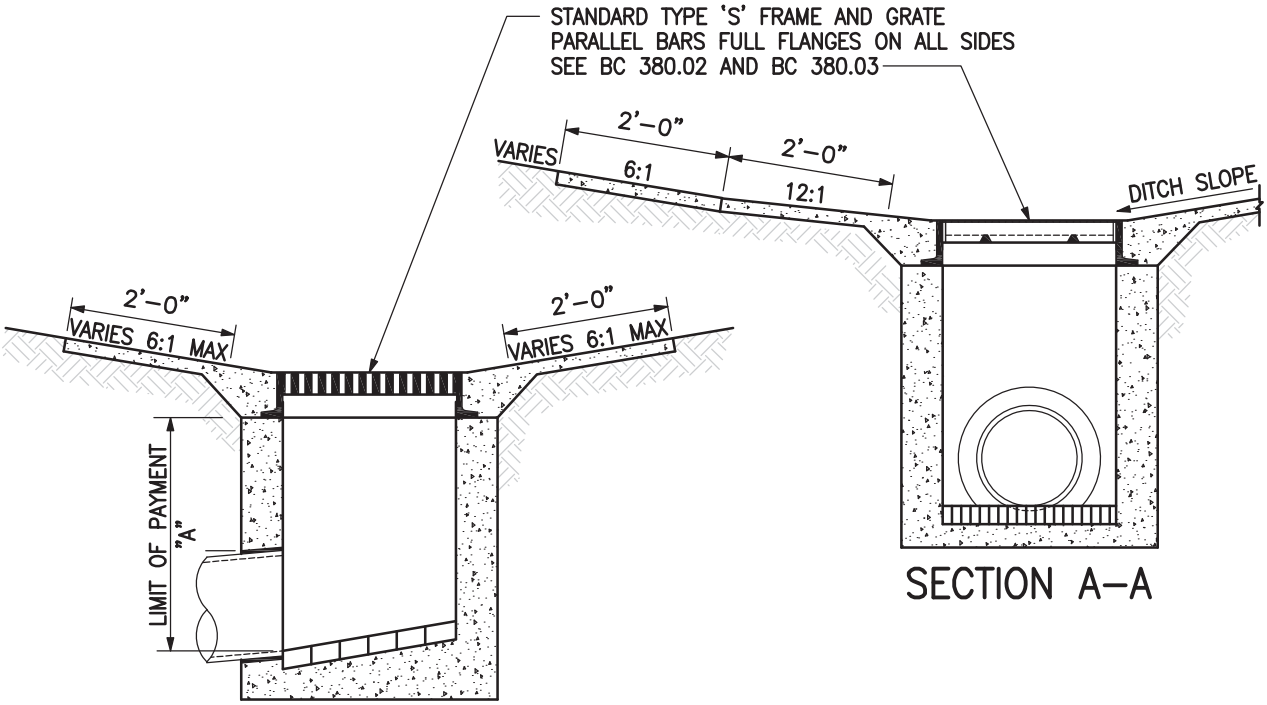
STANDARD NO.
BC 380.07

SCALE : NONE

SHEET 1 OF 1



ISOMETRIC VIEW



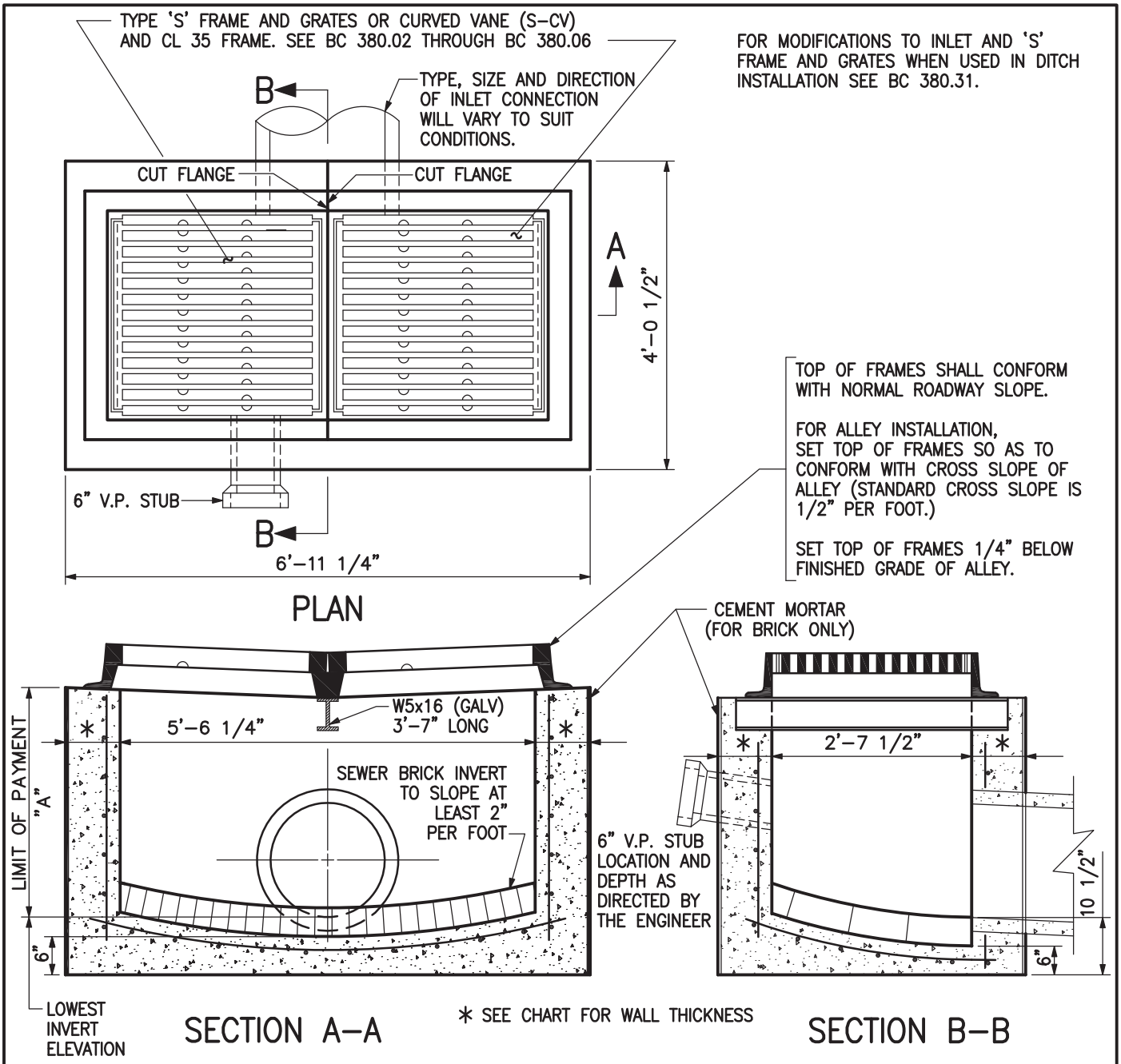
SECTION A–A

SECTION B–B

NOTES:

1. THE CONCRETE MEDIAN DITCH TO BE USED IN CONNECTION WITH THIS INLET, WILL BE WARPED FROM THE STANDARD SECTION TO MEET THE SECTION AT THE END OF THE INLET. THIS TRANSITION WILL TAKE PLACE WITHIN A DISTANCE OF TEN (10) FEET FROM THE INLET.
2. FOR INLET STRUCTURE SEE BC 380.21

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		TYPE 'S' INLET SINGLE GRATE (DITCH INSTALLATION)	STANDARD NO. BC 380.11		
			SCALE : NONE	SHEET 1 OF 1	



	PRECAST	CAST-IN-PLACE/BRICK
WALL THICKNESS	6" MIN	8 1/2 "
REINF	2 LAYERS- 4x4 W4.0 x W4.0- WWF	NO. 4 BARS @ 6" CC EW 2" COVER
CONCRETE	MIX 6	MIX 3
ALLOWABLE DEPTH	DPW APPROVAL REQUIRED OVER 15'	

NOTES:

1. INLET MAY BE CONSTRUCTED OF BRICK, CAST IN PLACE OR PRECAST CONCRETE. SEE TABLE FOR CONCRETE AND STEEL REQUIREMENTS. SEE LATEST DPW SPEC FOR INLETS.
2. TOP 4" OF CONCRETE WALLS MAY BE BRICK MASONRY TO BRING GRATE TO REQUIRED GRADE.
3. PLACE 1/4" EXPANSION MATERIAL BETWEEN FRAME AND ABUTTING RIGID PAVEMENT AND BETWEEN ENDS OF INLET CURB AND NORMAL CURB.
4. IF 6" MIX 1 CONCRETE IS USED AS FOUNDATION FOR BRICK INLET, PLACE NO. 4 DEFORMED BARS AT 12" CC BOTH WAYS, 2" CLEAR FROM TOP.
5. REINFORCEMENT REQUIRED ON OUTSIDE, AS WELL AS ON INSIDE OF WALLS, WHEN "A" IS GREATER THAN 7'-0". BAR SPACING SAME AS FOR INSIDE WALL.
6. DEPTH OF INLET CONNECTION IN ALLEYS TO BE 42" FROM INVERT OF ALLEY GRADE. NO DEVIATION FROM THE 42" DEPTH WILL BE CONSIDERED FOR PAYMENT UNLESS DIRECTED BY THE ENGINEER IN WRITING.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

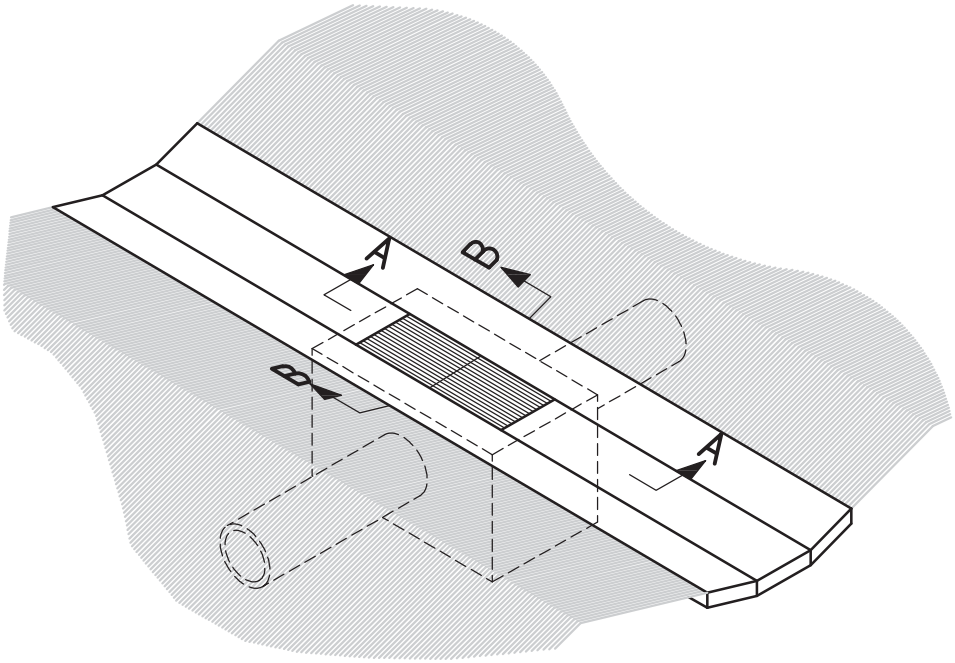
TYPE 'S' INLET
DOUBLE GRATE
TANDEM

ISSUED	REVISED	REVISED
3 / 2008		

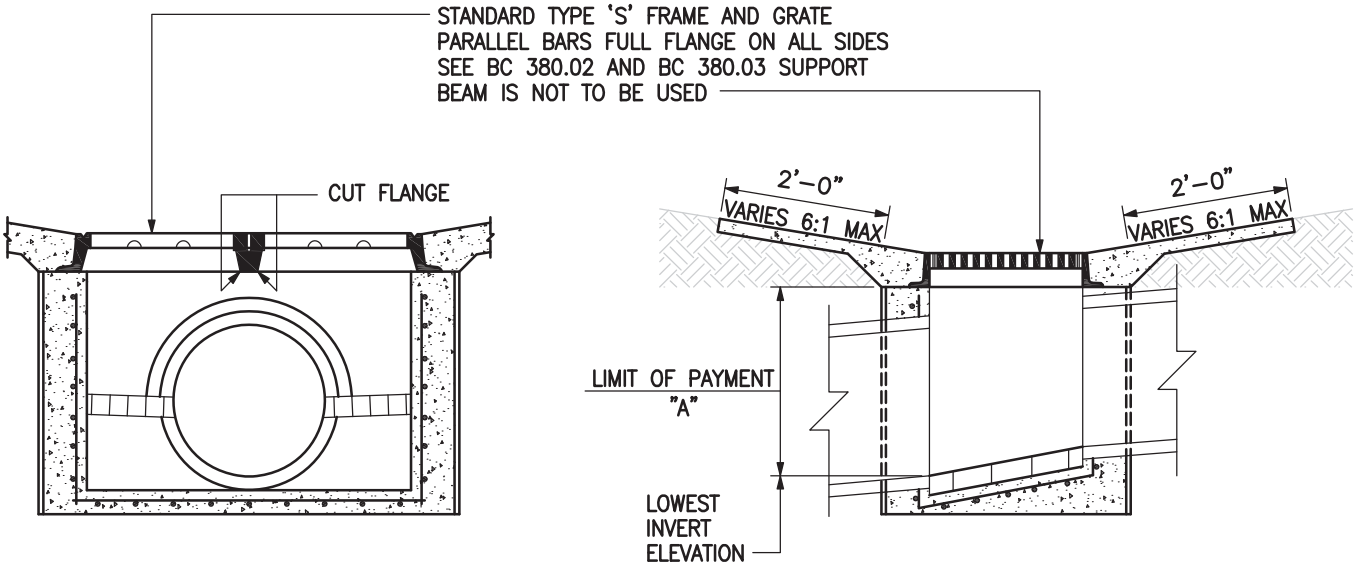
STANDARD NO.
BC 380.21

SCALE : NONE

SHEET 1 OF 1



ISOMETRIC VIEW



NOTE: FOR INLET BOX DIMENSIONS AND DETAILS, SEE BC 380.21

SECTION A–A

SECTION B–B

NOTES:

1. THE CONCRETE MEDIAN DITCH TO BE USED IN CONNECTION WITH THIS INLET, WILL BE WARPED FROM THE STANDARD SECTION TO MEET THE SECTION AT THE END OF THE INLET. THIS TRANSITION WILL TAKE PLACE WITHIN A DISTANCE OF TEN (10) FEET FROM THE INLET.
2. FOR INLET AT DITCH TERMINUS, MODIFY SLOPES AS SHOWN ON BC 380.11
3. FOR INLET STRUCTURE SEE BC 380.21

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

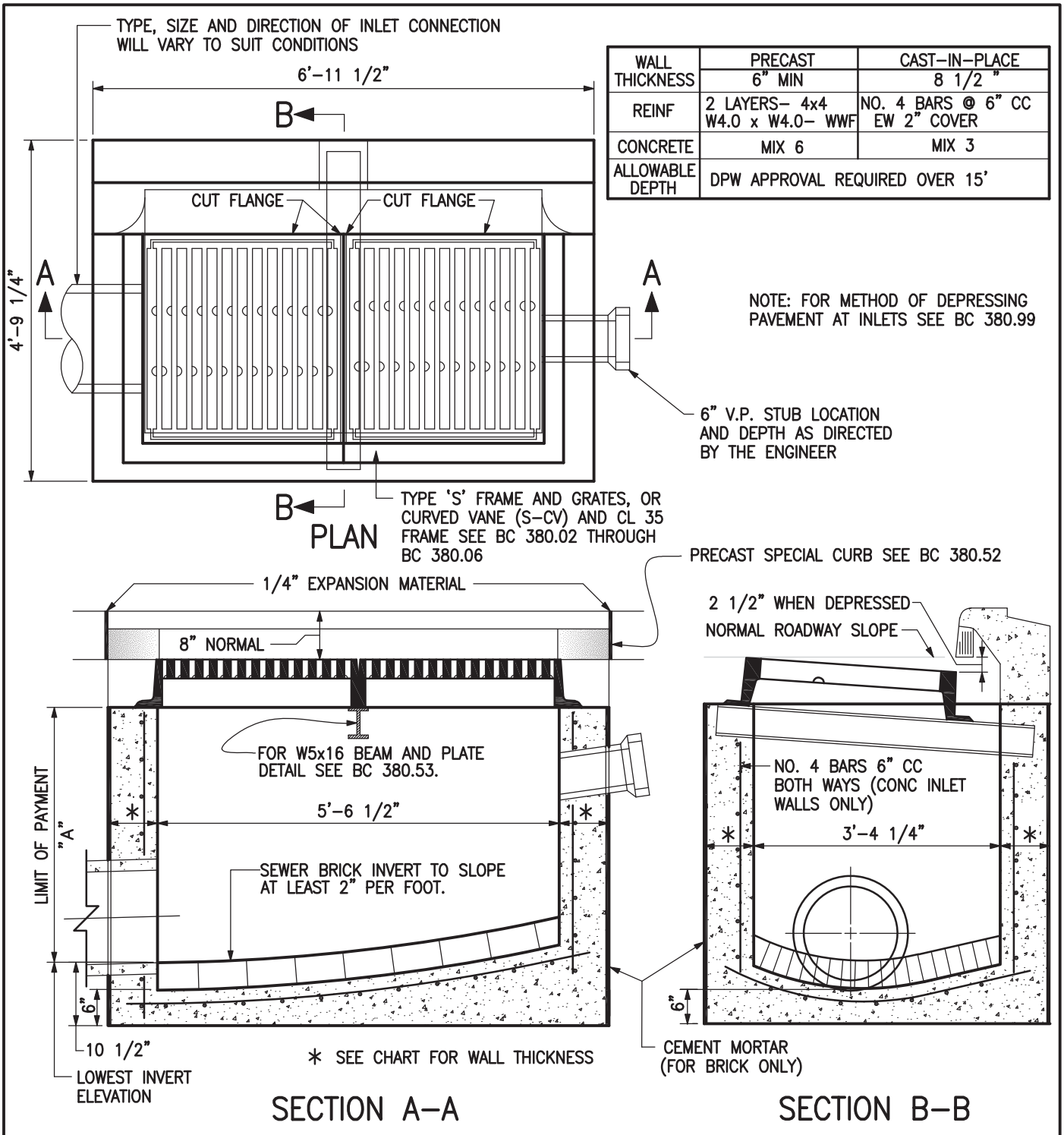
TYPE 'S' INLET
DOUBLE GRATE TANDEM
(DITCH INSTALLATION)

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 380.31

SCALE : NONE

SHEET 1 OF 1



WALL THICKNESS	PRECAST	CAST-IN-PLACE
	6" MIN	8 1/2 "
REINF	2 LAYERS- 4x4 W4.0 x W4.0- WWF	NO. 4 BARS @ 6" CC EW 2" COVER
CONCRETE	MIX 6	MIX 3
ALLOWABLE DEPTH	DPW APPROVAL REQUIRED OVER 15'	

NOTE: FOR METHOD OF DEPRESSING PAVEMENT AT INLETS SEE BC 380.99

NOTES:

1. INLET MAY BE CONSTRUCTED OF BRICK, CAST IN PLACE OR PRECAST CONCRETE. SEE TABLE FOR CONCRETE AND STEEL REQUIREMENTS. SEE LATEST DPW SPEC FOR INLETS.
2. TOP 4" OF CONCRETE WALLS MAY BE BRICK MASONRY TO BRING GRATE TO REQUIRED GRADE.
3. PLACE 1/4" EXPANSION MATERIAL BETWEEN FRAME AND ABUTTING RIGID PAVEMENT, AND BETWEEN ENDS OF INLET CURB AND NORMAL CURB.
4. IF 6" MIX 1 CONCRETE IS USED AS FOUNDATION FOR BRICK INLET, PLACE NO. 4 DEFORMED BARS AT 12" CC BOTH WAYS, 2" CLEAR FROM TOP.
5. REINFORCEMENT REQUIRED ON OUTSIDE, AS WELL AS ON INSIDE OF WALLS, WHEN "A" IS GREATER THAN 8'-0". BAR SPACING SAME AS FOR INSIDE WALL.
6. DEPTH OF INLET CONNECTION IN STREETS AT CURB LINE TO BE 52" FROM INVERT TO ESTABLISHED GRADE. NO DEVIATION FROM THE 52" DEPTH WILL BE CONSIDERED FOR PAYMENT UNLESS DIRECTED BY THE ENGINEER IN WRITING.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

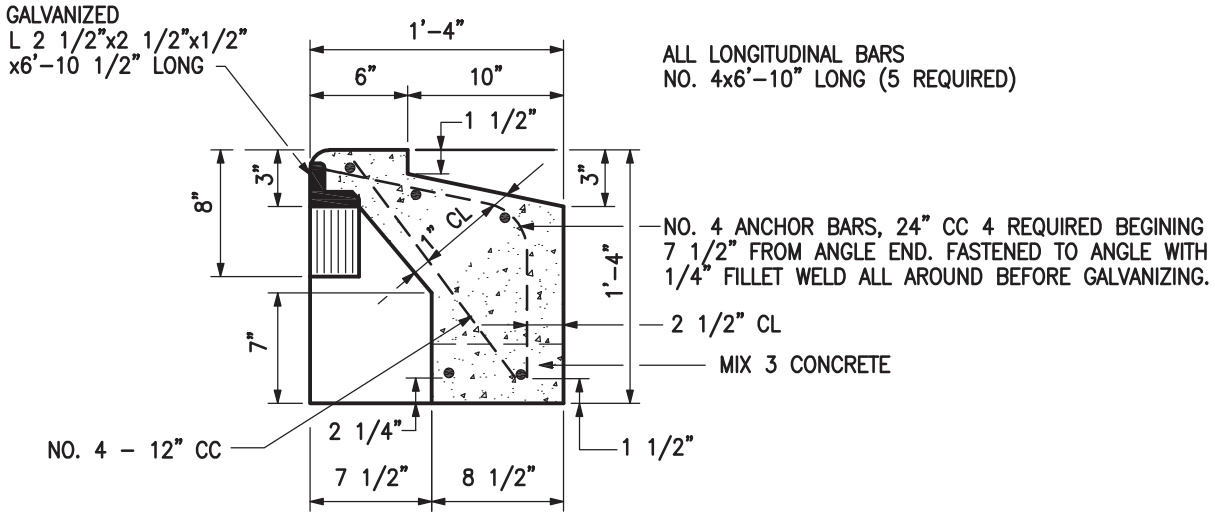
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

ISSUED	REVISED	REVISED
3 / 2008		

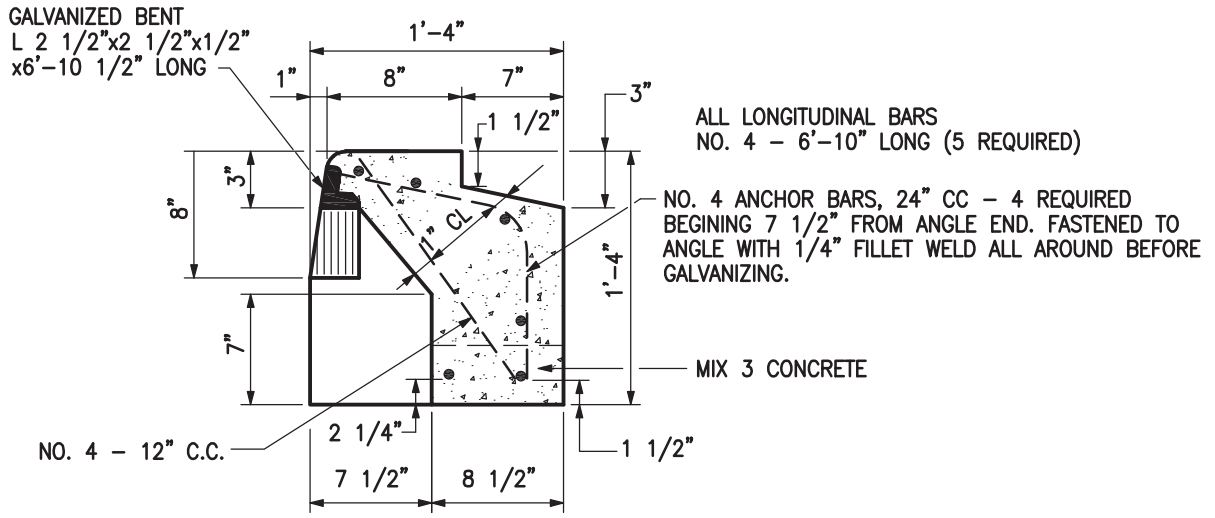
TYPE 'S'
COMBINATION INLET
DOUBLE GRATE TANDEM

STANDARD NO.
BC 380.51

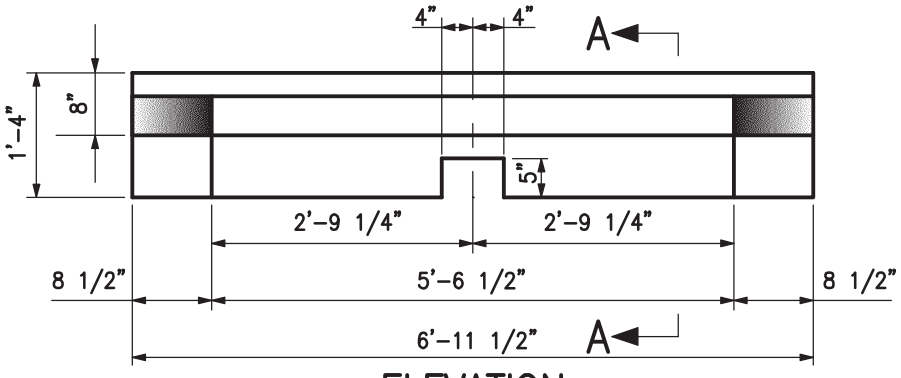
SCALE : NONE | SHEET 1 OF 1



SECTION A–A
(VERTICAL FACE)

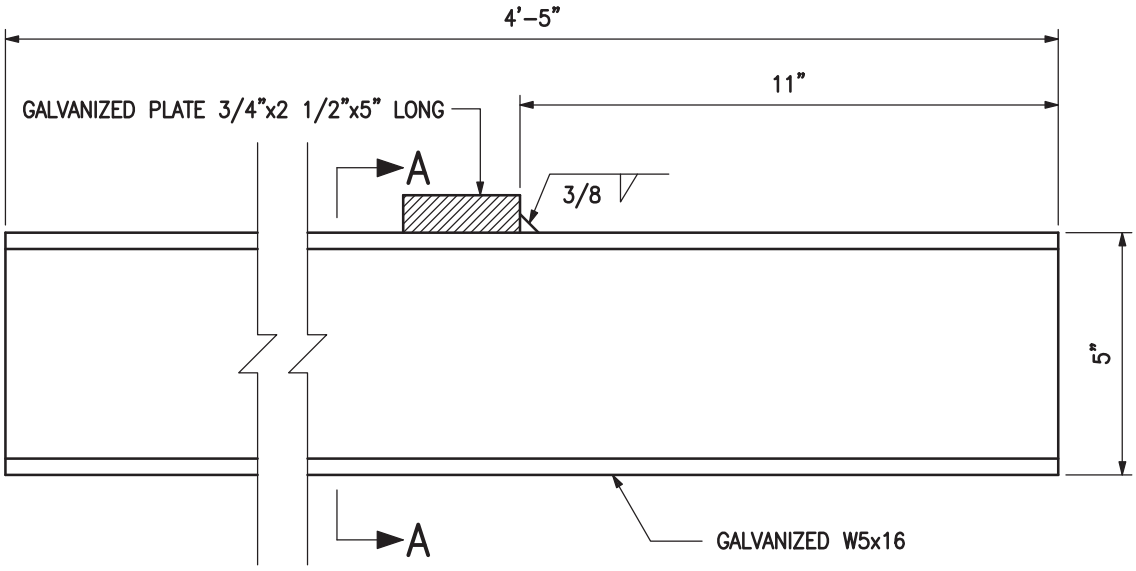


SECTION A–A
(BATTERED FACE)

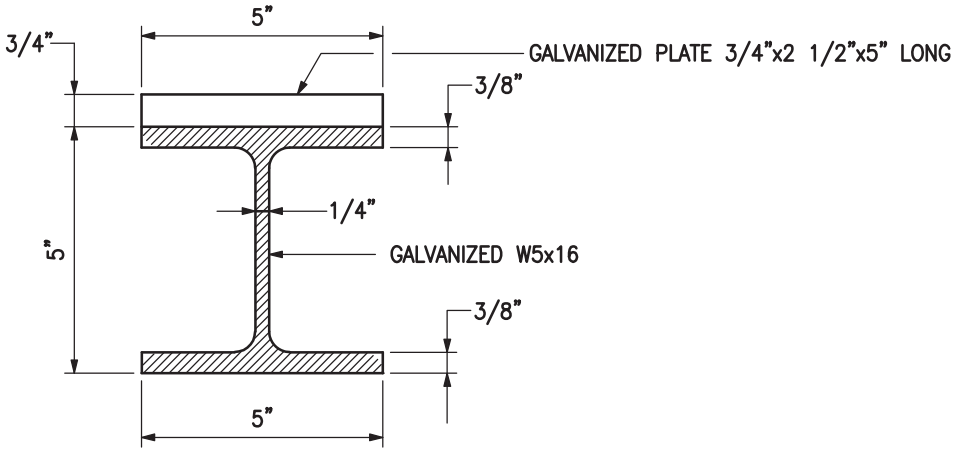


ELEVATION

APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER / DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	PRECAST SPECIAL CURB TYPE 'S' COMBINATION INLET DOUBLE GRATE TANDEM	STANDARD NO. BC 380.52		
		SCALE: NONE	SHEET 1 OF 1	

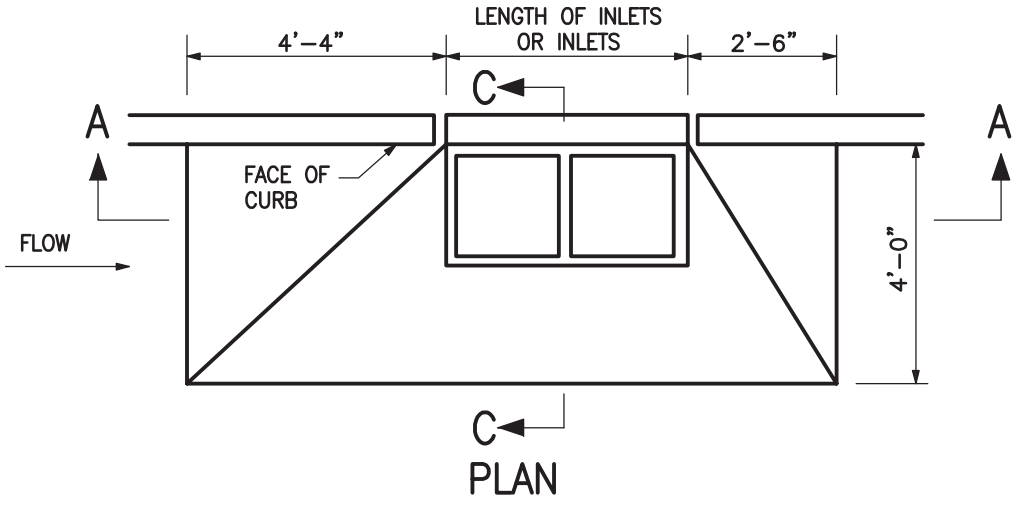


ELEVATION

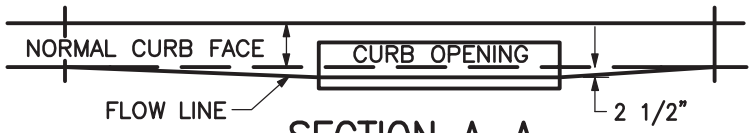


SECTION A–A

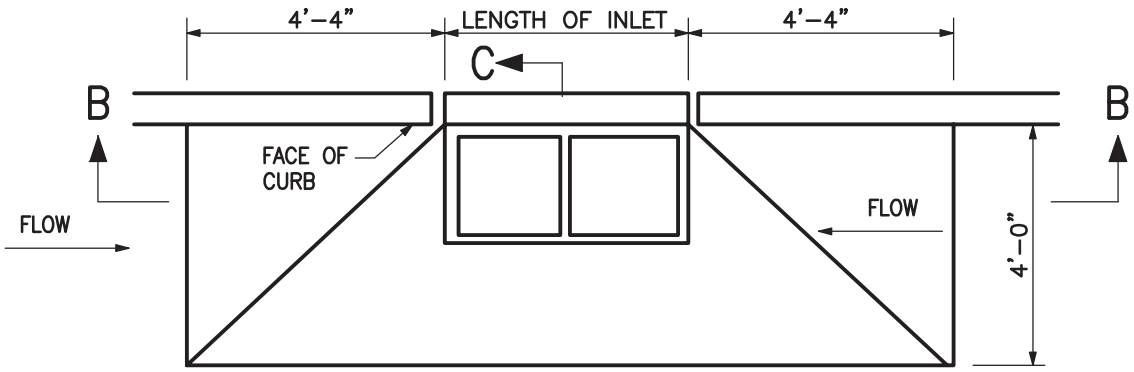
	APPROVED :	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
	HEAD, BUREAU OF WATER AND WASTEWATER		3 / 2008		
	DIRECTOR, DEPARTMENT OF PUBLIC WORKS	BEAM AND PLATE DETAIL TYPE 'S' COMBINATION INLET DOUBLE GRATE TANDEM	STANDARD NO. BC 380.53		
			SCALE : NONE	SHEET 1 OF 1	



PLAN

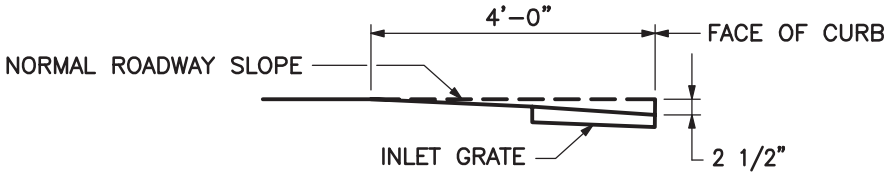


SECTION A–A
FLOW INTERCEPT (ON GRADE)



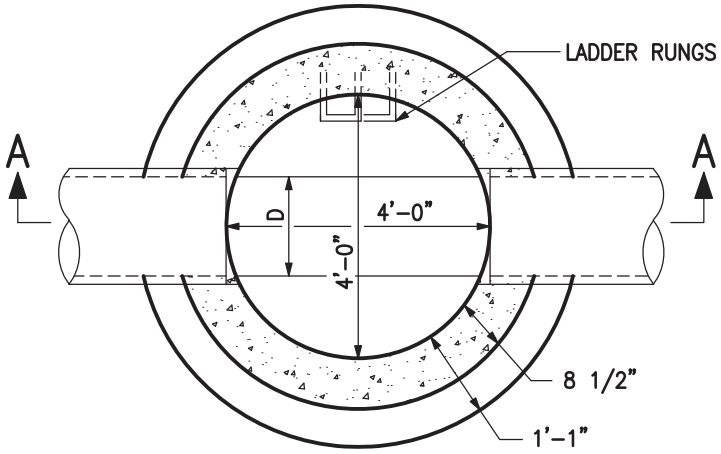
PLAN

SECTION B–B

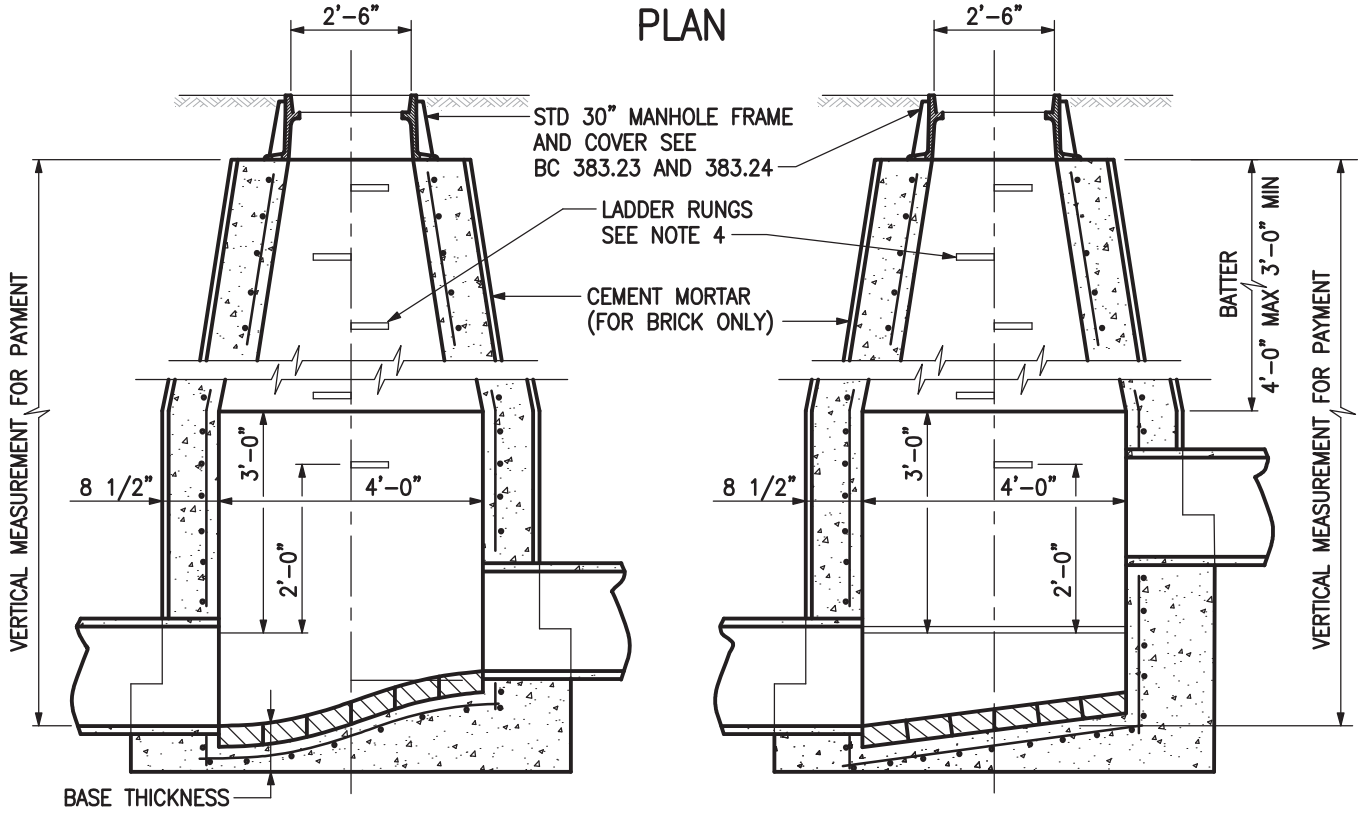


SECTION C–C
FLOW IN SUMP

CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		METHOD OF DEPRESSING PAVING AT INLETS	STANDARD NO. BC 380.99		
			SCALE: NONE	SHEET 1 OF 1	



PLAN



SECTION A–A
(DIFFERENCE IN INVERT ELEV <12")

SECTION A–A
(DIFFERENCE IN INVERT ELEV >12")

NOTES:

1. MANHOLE SHALL BE CONSTRUCTED OF REINFORCED CONCRETE (MIX 2). REINFORCING TO BE NO. 4 DEFORMED BARS @ 6" CC BOTH WAYS, 2" COVER. BRICK AND MORTAR MAY ALSO BE USED.
2. MANHOLE WALL THICKNESS: 8" TO DEPTH OF 12'–0" 12" (BELOW DEPTH OF 12'–0" TO DEPTH OF 24'–0")
3. MANHOLE BASE THICKNESS: 8" WALL–USE 12" BASE 12" WALL–USE 15" BASE
4. LADDER RUNGS SHALL BE INSTALLED IN STAGGERED ALIGNMENT AT 1'–3" TYPICAL C/C. RUNG TYPE SHALL BE IN ACCORDANCE WITH STANDARD BC 383.92 OR 383.93. LADDER RUNGS SHALL BE INCIDENTAL TO THE COST OF THE MANHOLE.
5. BENCH AND CHANNEL TO BE CONSTRUCTED OF ONE COURSE OF SEWER BRICK ON EDGE. BENCH TO SLOPE A MINIMUM OF 1" PER FOOT TOWARDS CHANNEL.
6. BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO ONE HALF DIAMETER OF THE OUTGOING PIPE OR AS DIRECTED BY THE ENGINEER.
7. CHANNEL TO THE SLOPE 1/4 INCH PER FOOT TOWARDS OUTLET OR AS DIRECTED BY THE ENGINEER.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

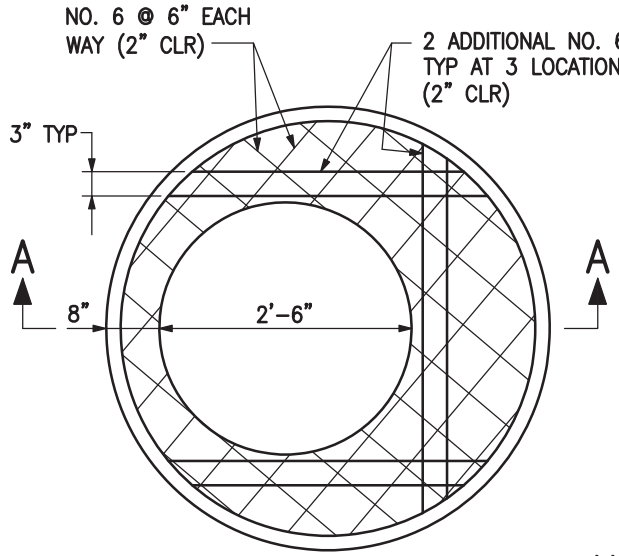
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

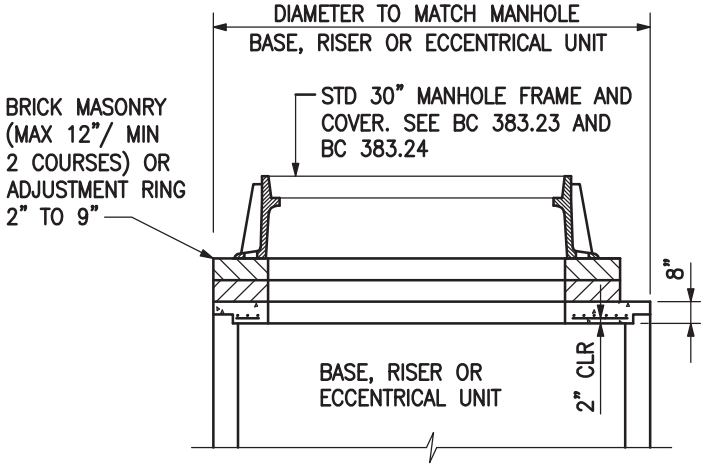
BRICK OR CAST IN PLACE
STANDARD STORM
MANHOLE

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 383.02

SCALE : NONE | SHEET 1 OF 1

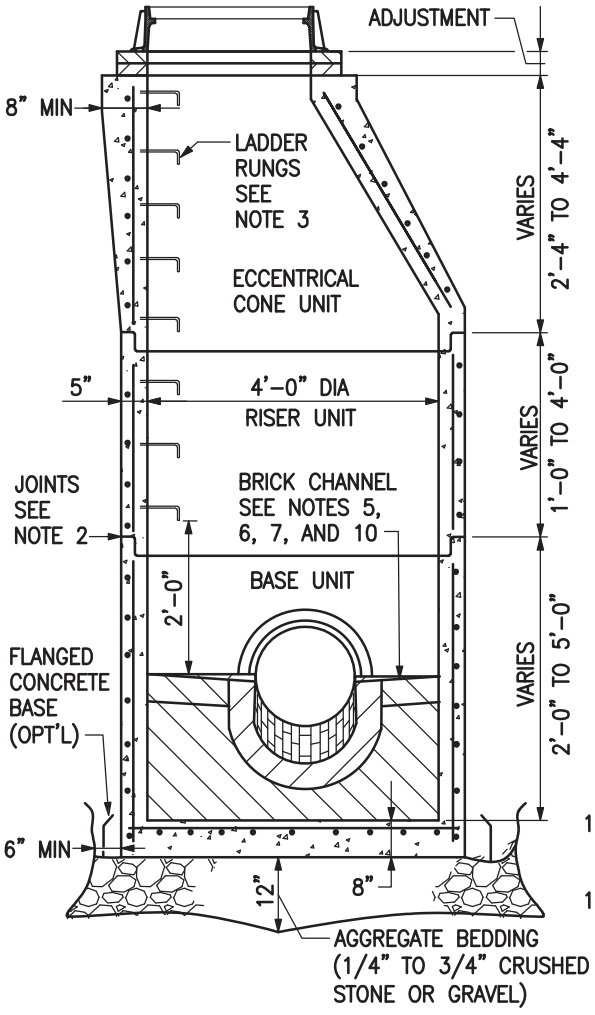




SECTION A–A

OPTIONAL FLAT SLAB TOP

(SHOWN WITHOUT MANHOLE FRAME AND CLOVER – SEE NOTE 9)



SECTION

NOTES:

1. MANHOLE DESIGN SPECIFICATIONS SHALL CONFORM TO "PRECAST REINFORCED CONCRETE MANHOLE SECTION ASTM DESIGNATION C–478, LATEST REVISIONS".
2. MANHOLE SECTIONS MANUFACTURED ACCORDING TO ASTM C–478 AND AASHTO M199. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATER TIGHT USING 'O' RING RUBBER GASKETS AND PROFILE JOINTS MEETING ASTM C–443 AND C–361. FLEXIBLE PLASTIC GASKET TO MEET AASHTO M198 TYPE B.
3. LADDER RUNGS SHALL BE INSTALLED IN STAGGERED ALIGNMENT AT 1'–3" TYPICAL CC. RUNG TYPE SHALL BE IN ACCORDANCE WITH STANDARD BC 383.92 OR 383.93. LADDER RUNGS SHALL BE INCIDENTAL TO THE COST OF THE MANHOLE.
4. LIFT EYES OR LIFT INSERTS SHALL BE PROVIDED IN EACH SECTION FOR HANDLING.
5. BENCH AND CHANNEL TO BE CONSTRUCTED OF ONE COURSE OF SEWER BRICK ON EDGE. BENCH TO SLOPE A MINIMUM OF 1" PER FOOT TOWARDS CHANNEL.
6. BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO ONE HALF DIAMETER OF THE OUTGOING PIPE OR AS DIRECTED BY THE ENGINEER.
7. CHANNEL TO THE SLOPE 1/4 INCH PER FOOT TOWARDS OUTLET OR AS DIRECTED BY THE ENGINEER.
8. USE NON–SHRINK GROUT JOINT FILLER.
9. USE FLAT SLAB TOP WHEN MANHOLE LENGTH IS NOT SUFFICIENT FOR ECCENTRICAL CONE UNIT.
10. VERTICAL MEASUREMENT FOR PAYMENT SHALL BE FROM THE INVERT OF THE OUTGOING PIPE TO THE BOTTOM OF THE MANHOLE FRAME.
11. MATERIAL PROPERTIES: CONCRETE SHALL BE MIX 6, WWF PER ASTM A135, REBAR PER ASTM A615 GRADE 60.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

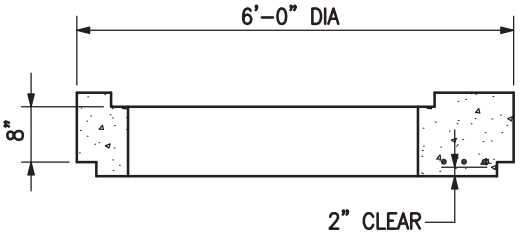
ISSUED	REVISED	REVISED
3 / 2008		

48" DIA PRECAST
STORM MANHOLE FOR
15" TO 24" PIPES

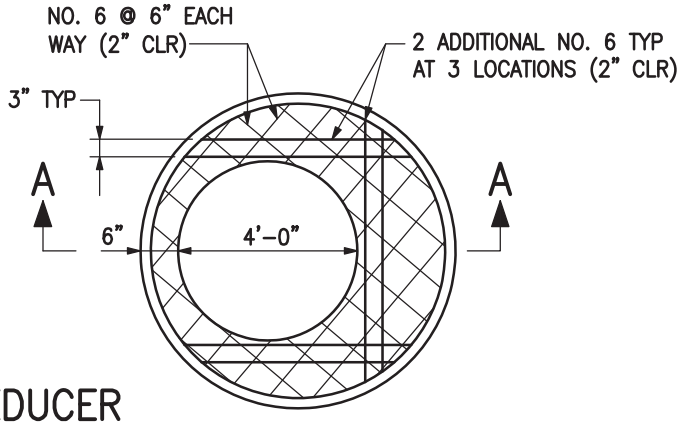
STANDARD NO.
BC 383.04

SCALE : NONE

SHEET 1 OF 1



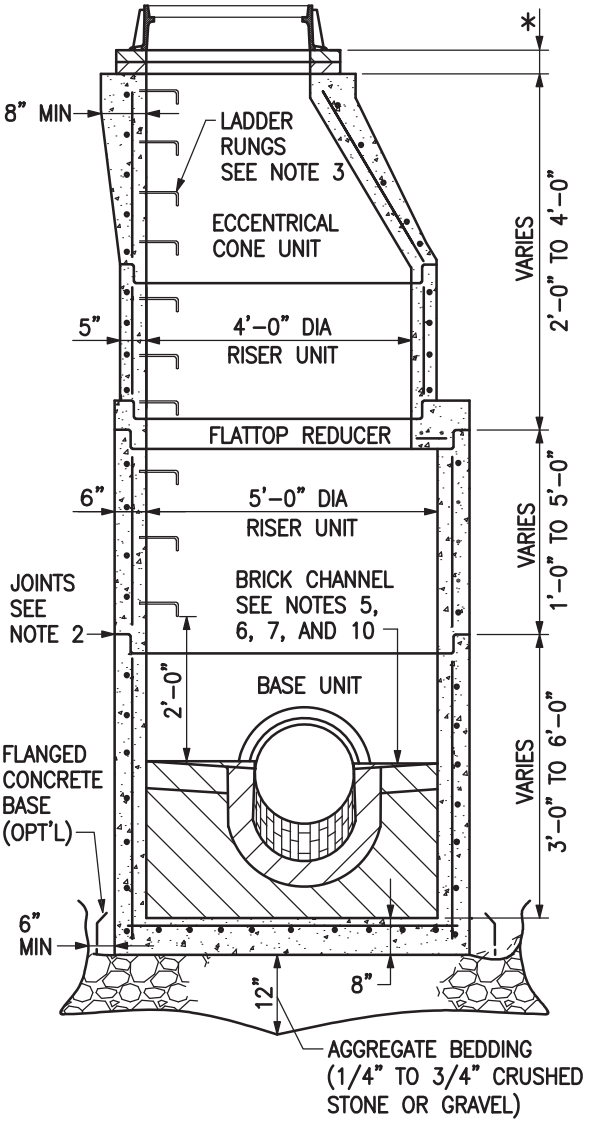
SECTION A-A



PLAN

FLATTOP REDUCER

* ADJUSTMENT - SEE SECTION A-A ON BC 383.04



SECTION

NOTES:

1. MANHOLE DESIGN SPECIFICATIONS SHALL CONFORM TO "PRECAST REINFORCED CONCRETE MANHOLE SECTION ASTM DESIGNATION C-478, LATEST REVISIONS".
2. MANHOLE SECTIONS MANUFACTURED ACCORDING TO ASTM C-478 AND AASHTO M199. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATER TIGHT USING 'O' RING RUBBER GASKETS AND PROFILE JOINTS MEETING ASTM C-443 AND C-361. FLEXIBLE PLASTIC GASKET TO MEET AASHTO M198 TYPE B.
3. LADDER RUNGS SHALL BE INSTALLED IN STAGGERED ALIGNMENT AT 1'-3" TYPICAL CC. RUNG TYPE SHALL BE IN ACCORDANCE WITH STANDARD BC 383.92 OR 383.93. LADDER RUNGS SHALL BE INCIDENTAL TO THE COST OF THE MANHOLE.
4. LIFT EYES OR LIFT INSERTS SHALL BE PROVIDED IN EACH SECTION FOR HANDLING.
5. BENCH AND CHANNEL TO BE CONSTRUCTED OF ONE COURSE OF SEWER BRICK ON EDGE. BENCH TO SLOPE A MINIMUM OF 1" PER FOOT TOWARDS CHANNEL.
6. BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO ONE HALF DIAMETER OF THE OUTGOING PIPE OR AS DIRECTED BY THE ENGINEER.
7. CHANNEL TO THE SLOPE 1/4 INCH PER FOOT TOWARDS OUTLET OR AS DIRECTED BY THE ENGINEER.
8. USE NON-SHRINK GROUT JOINT FILLER.
9. USE FLAT SLAB TOP WHEN MANHOLE LENGTH IS NOT SUFFICIENT FOR ECCENTRICAL CONE UNIT.
10. VERTICAL MEASUREMENT FOR PAYMENT SHALL BE FROM THE INVERT OF THE OUTGOING PIPE TO THE BOTTOM OF THE MANHOLE FRAME.
11. MATERIAL PROPERTIES: CONCRETE SHALL BE MIX 6, WWF PER ASTM A135, REBAR PER ASTM A615 GRADE 60.
12. FLATTOP REDUCER REINFORCEMENT TO CONSIST OF REBAR SPACING AS SHOWN OR TWO CONTINUOUS CAGES WITH ONE WIRE PER CAGE INSIDE AND OUTSIDE WIRE AREA 0.12 PER ASTM A185.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

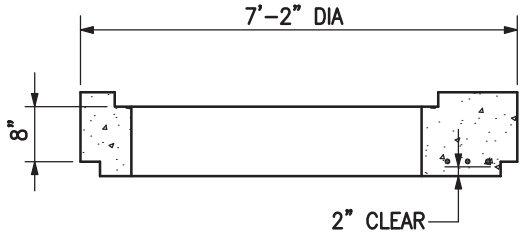
60" DIA PRECAST
STORM MANHOLE FOR
27" TO 36" PIPES

ISSUED	REVISED	REVISED
3 / 2008		

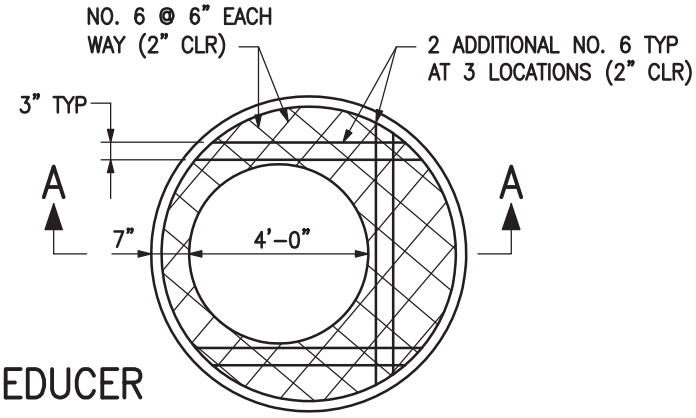
STANDARD NO.
BC 383.05

SCALE : NONE

SHEET 1 OF 1

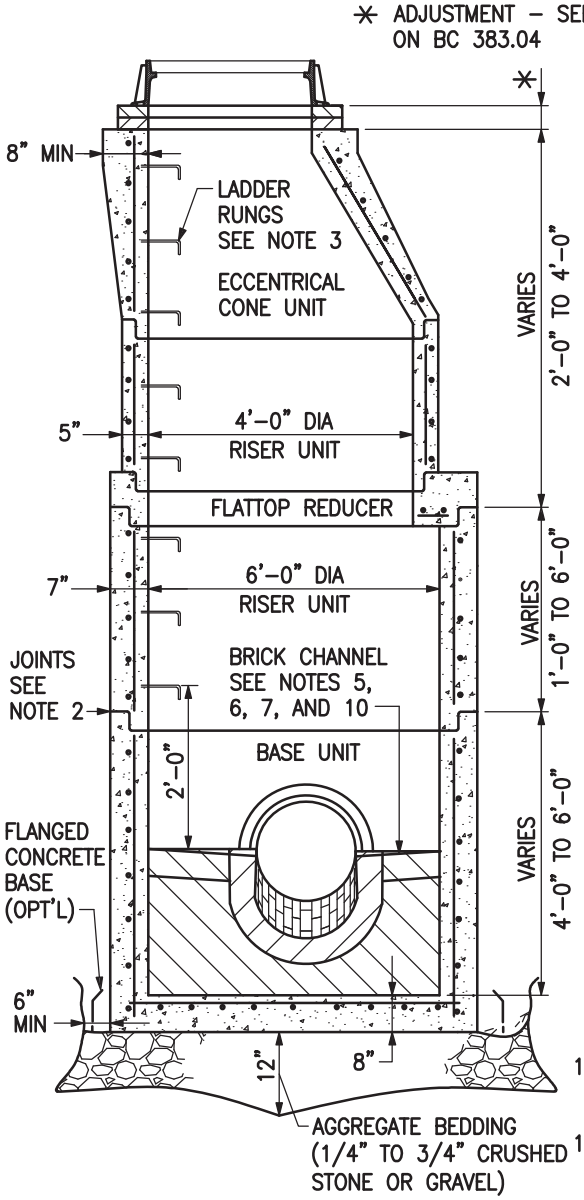


SECTION A-A



PLAN

FLATTOP REDUCER



SECTION

NOTES:

1. MANHOLE DESIGN SPECIFICATIONS SHALL CONFORM TO "PRECAST REINFORCED CONCRETE MANHOLE SECTION ASTM DESIGNATION C-478, LATEST REVISIONS".
2. MANHOLE SECTIONS MANUFACTURED ACCORDING TO ASTM C-478 AND AASHTO M199. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATER TIGHT USING 'O' RING RUBBER GASKETS AND PROFILE JOINTS MEETING ASTM C-443 AND C-361. FLEXIBLE PLASTIC GASKET TO MEET AASHTO M198 TYPE B.
3. LADDER RUNGS SHALL BE INSTALLED IN STAGGERED ALIGNMENT AT 1'-3" TYPICAL CC. RUNG TYPE SHALL BE IN ACCORDANCE WITH STANDARD BC 383.92 OR 383.93. LADDER RUNGS SHALL BE INCIDENTAL TO THE COST OF THE MANHOLE.
4. LIFT EYES OR LIFT INSERTS SHALL BE PROVIDED IN EACH SECTION FOR HANDLING.
5. BENCH AND CHANNEL TO BE CONSTRUCTED OF ONE COURSE OF SEWER BRICK ON EDGE. BENCH TO SLOPE A MINIMUM OF 1" PER FOOT TOWARDS CHANNEL.
6. BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO ONE HALF DIAMETER OF THE OUTGOING PIPE OR AS DIRECTED BY THE ENGINEER.
7. CHANNEL TO THE SLOPE 1/4 INCH PER FOOT TOWARDS OUTLET OR AS DIRECTED BY THE ENGINEER.
8. USE NON-SHRINK GROUT JOINT FILLER.
9. USE FLAT SLAB TOP WHEN MANHOLE LENGTH IS NOT SUFFICIENT FOR ECCENTRICAL CONE UNIT.
10. VERTICAL MEASUREMENT FOR PAYMENT SHALL BE FROM THE INVERT OF THE OUTGOING PIPE TO THE BOTTOM OF THE MANHOLE FRAME.
11. MATERIAL PROPERTIES: CONCRETE SHALL BE MIX 6, WWF PER ASTM A135, REBAR PER ASTM A615 GRADE 60.
12. FLATTOP REDUCER REINFORCEMENT TO CONSIST OF REBAR SPACING AS SHOWN OR TWO CONTINUOUS CAGES WITH ONE WIRE PER CAGE INSIDE AND OUTSIDE WIRE AREA 0.12 PER ASTM A185.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

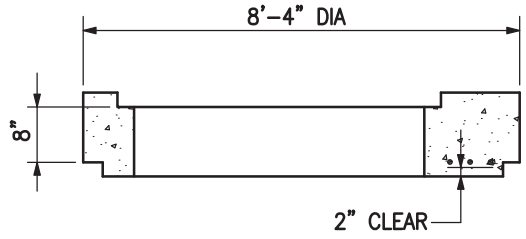
72" DIA PRECAST
STORM MANHOLE FOR
42" TO 48" PIPES

ISSUED	REVISED	REVISED
3 / 2008		

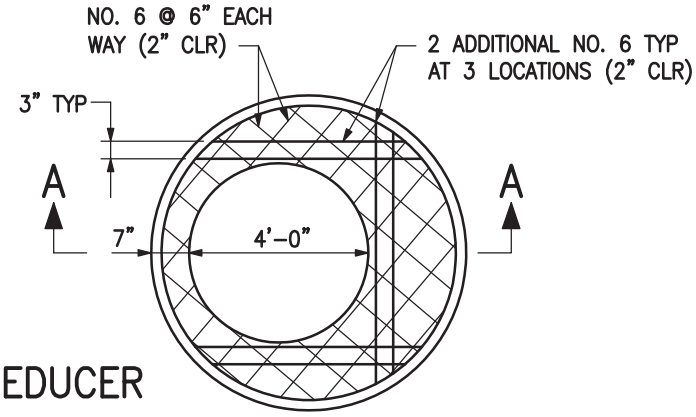
STANDARD NO.
BC 383.06

SCALE : NONE

SHEET 1 OF 1



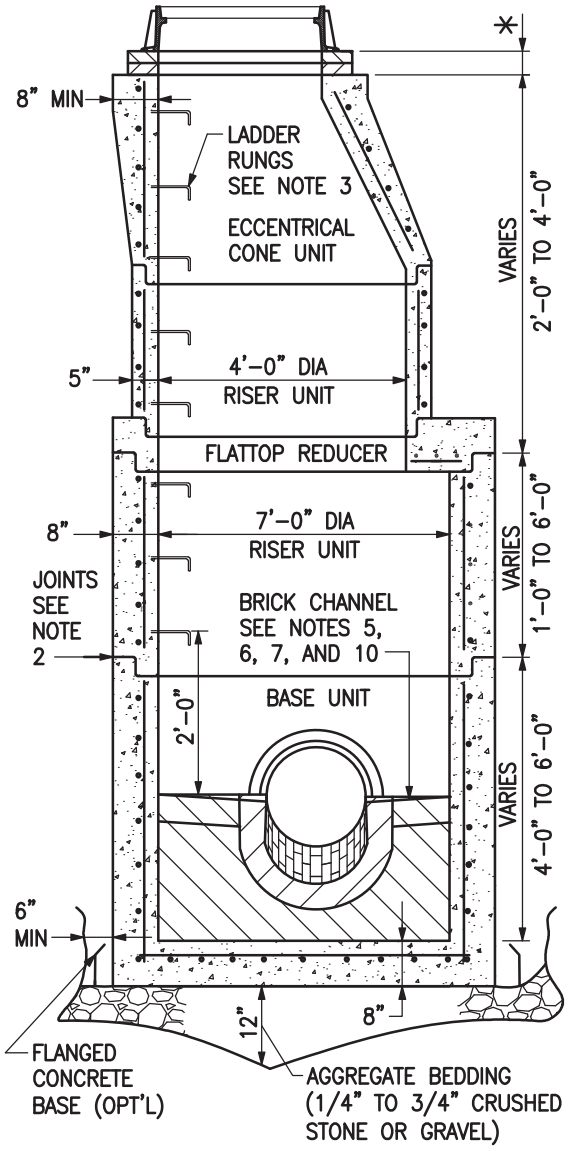
SECTION A-A



PLAN

FLATTOP REDUCER

✳ ADJUSTMENT – SEE SECTION A-A ON BC 383.04



SECTION

NOTES:

1. MANHOLE DESIGN SPECIFICATIONS SHALL CONFORM TO "PRECAST REINFORCED CONCRETE MANHOLE SECTION ASTM DESIGNATION C-478, LATEST REVISIONS".
2. MANHOLE SECTIONS MANUFACTURED ACCORDING TO ASTM C-478 AND AASHTO M199. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATER TIGHT USING 'O' RING RUBBER GASKETS AND PROFILE JOINTS MEETING ASTM C-443 AND C-361. FLEXIBLE PLASTIC GASKET TO MEET AASHTO M198 TYPE B.
3. LADDER RUNGS SHALL BE INSTALLED IN STAGGERED ALIGNMENT AT 1'-3" TYPICAL CC. RUNG TYPE SHALL BE IN ACCORDANCE WITH STANDARD BC 383.92 OR 383.93. LADDER RUNGS SHALL BE INCIDENTAL TO THE COST OF THE MANHOLE.
4. LIFT EYES OR LIFT INSERTS SHALL BE PROVIDED IN EACH SECTION FOR HANDLING.
5. BENCH AND CHANNEL TO BE CONSTRUCTED OF ONE COURSE OF SEWER BRICK ON EDGE. BENCH TO SLOPE A MINIMUM OF 1" PER FOOT TOWARDS CHANNEL.
6. BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO ONE HALF DIAMETER OF THE OUTGOING PIPE OR AS DIRECTED BY THE ENGINEER.
7. CHANNEL TO THE SLOPE 1/4 INCH PER FOOT TOWARDS OUTLET OR AS DIRECTED BY THE ENGINEER.
8. USE NON-SHRINK GROUT JOINT FILLER.
9. USE FLAT SLAB TOP WHEN MANHOLE LENGTH IS NOT SUFFICIENT FOR ECCENTRICAL CONE UNIT.
10. VERTICAL MEASUREMENT FOR PAYMENT SHALL BE FROM THE INVERT OF THE OUTGOING PIPE TO THE BOTTOM OF THE MANHOLE FRAME.
11. MATERIAL PROPERTIES: CONCRETE SHALL BE MIX 6, WWF PER ASTM A135, REBAR PER ASTM A615 GRADE 60.
12. FLATTOP REDUCER REINFORCEMENT TO CONSIST OF REBAR SPACING AS SHOWN OR TWO CONTINUOUS CAGES WITH ONE WIRE PER CAGE INSIDE AND OUTSIDE WIRE AREA 0.12 PER ASTM A185.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

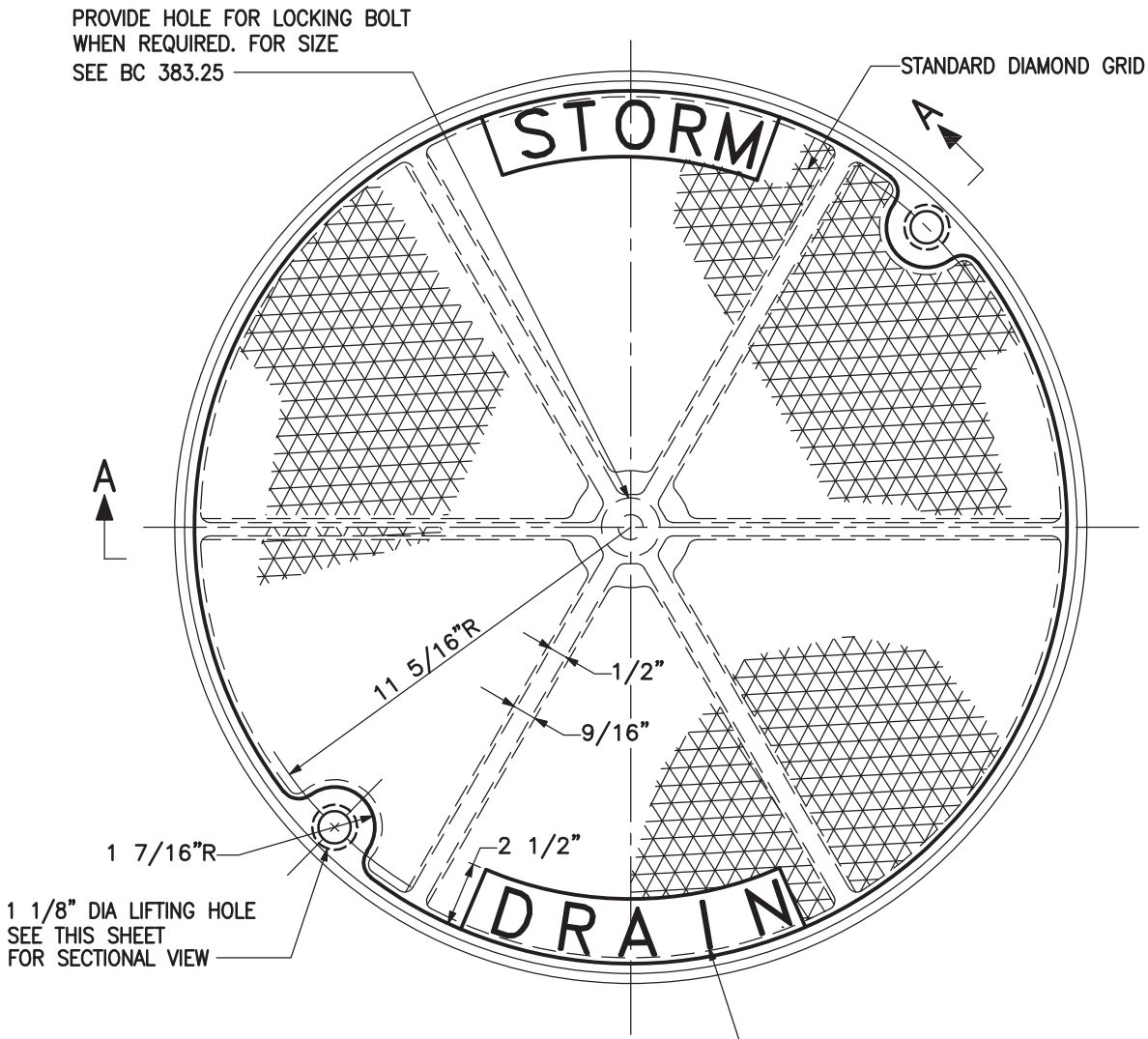
84" DIA PRECAST
STORM MANHOLE FOR
54" TO 60" PIPES

ISSUED	REVISED	REVISED
3 / 2008		

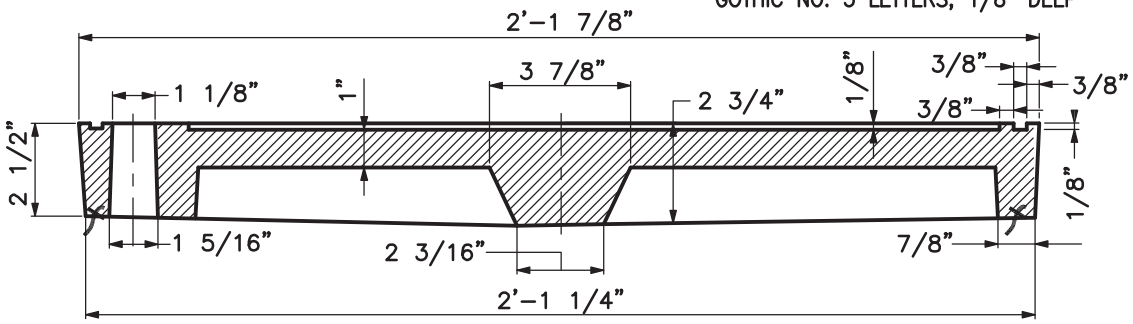
STANDARD NO.
BC 383.07

SCALE : NONE

SHEET 1 OF 1



PLAN



SECTION A–A

NOTES:

1. FOR STD 24" MANHOLE FRAME SEE BC 383.22
2. MATERIAL SHALL BE CAST GRAY IRON ASTM A–48, CLASS 35B
3. COVER SHALL MEET OR EXCEED AASHTO M 306 PROOF LOAD REQUIREMENTS.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

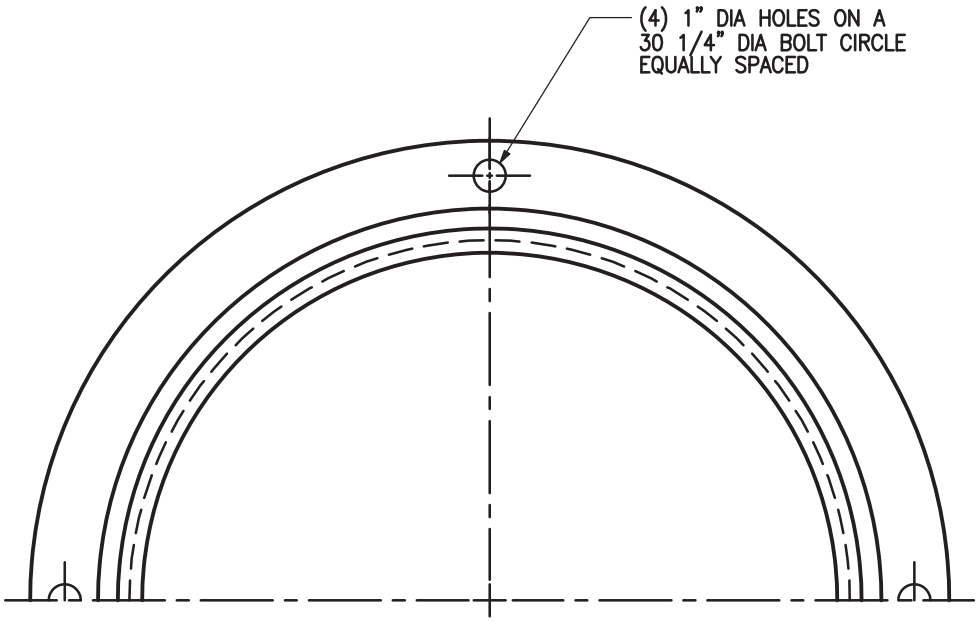
STANDARD 24 IN.
MANHOLE COVER

ISSUED	REVISED	REVISED
3 / 2008		

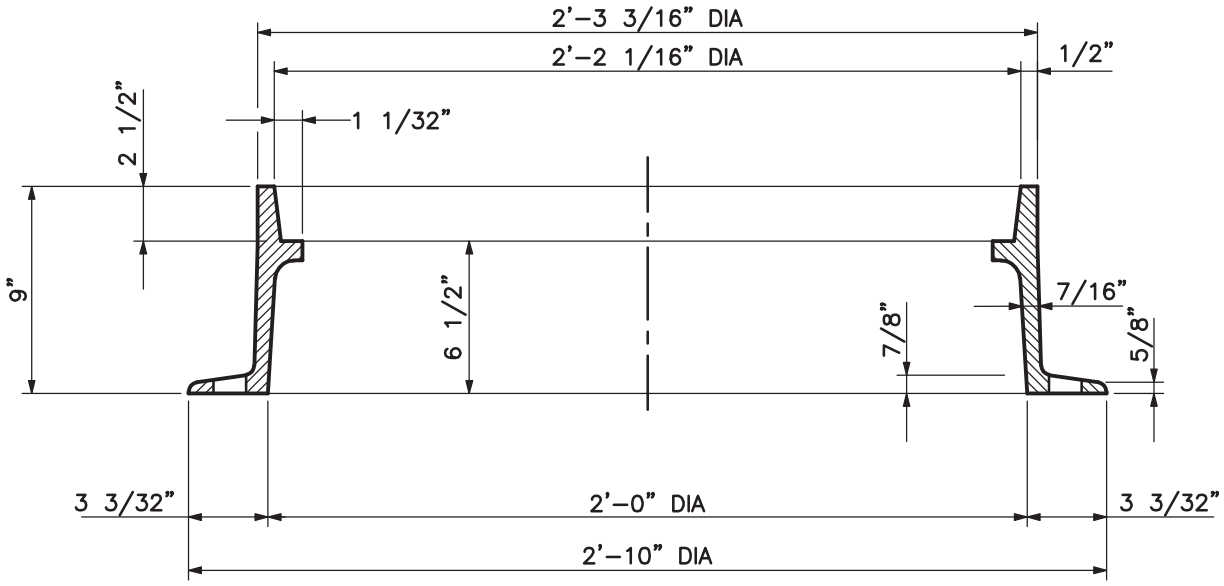
STANDARD NO.
BC 383.21

SCALE : NONE

SHEET 1 OF 1



PARTIAL PLAN

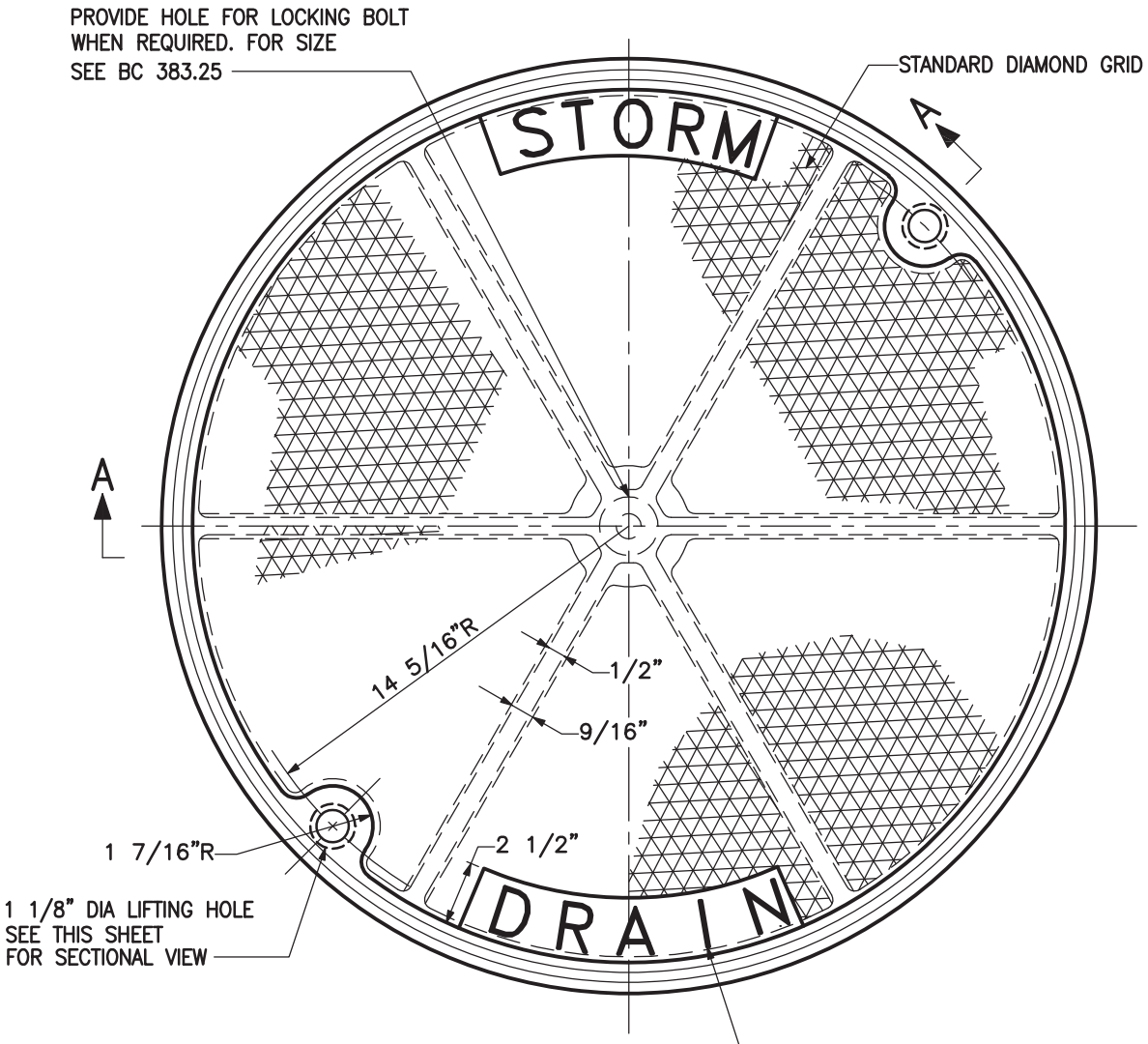


SECTION

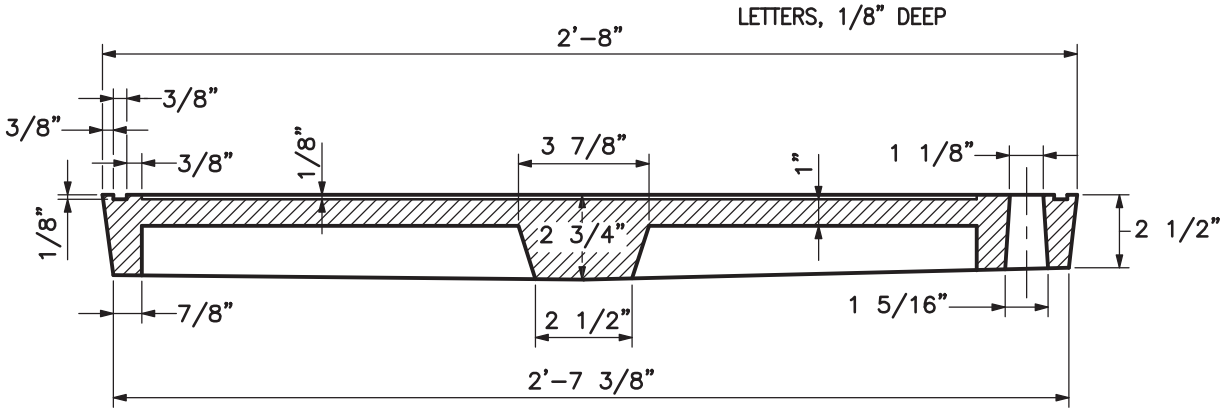
NOTES:

1. FOR 24" LOCK TYPE FRAME SEE BC 383.25
2. FOR STD 24" MANHOLE COVER SEE BC 383.21
3. MATERIAL SHALL BE CAST GRAY IRON ASTM A–48, CLASS 35B
4. FRAME SHALL MEET OR EXCEED AASHTO M 306 PROOF LOAD REQUIREMENTS.

CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		STANDARD 24 IN. MANHOLE FRAME	STANDARD NO. BC 383.22		
			SCALE : NONE	SHEET 1 OF 1	



PLAN



SECTION A–A

NOTES:

1. FOR STD 30" MANHOLE FRAME SEE BC 383.24
2. MATERIAL SHALL BE CAST GRAY IRON ASTM A–48, CLASS 35B
3. COVER SHALL MEET OR EXCEED AASHTO M 306 PROOF LOAD REQUIREMENTS.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

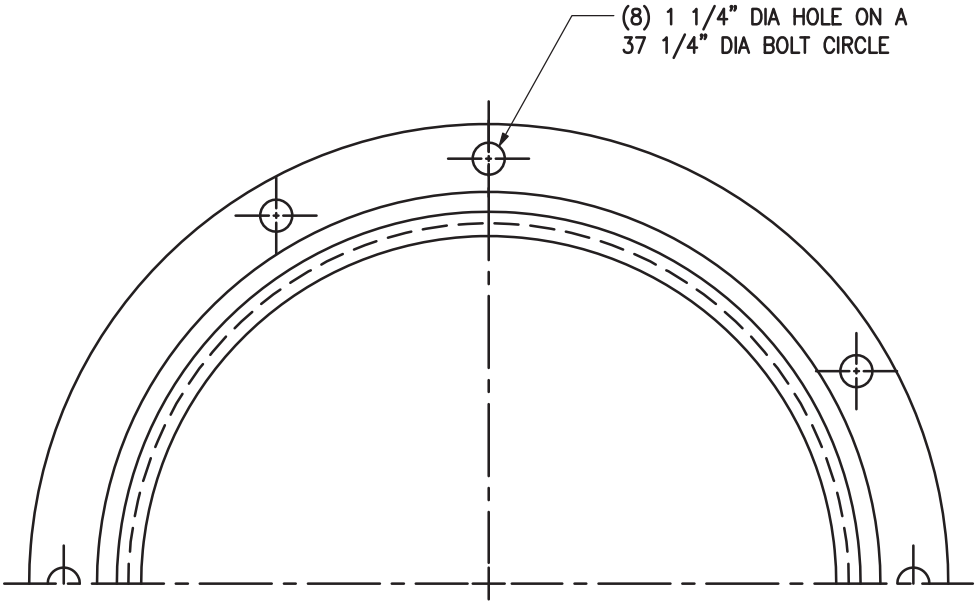
STANDARD 30 IN.
MANHOLE COVER

ISSUED	REVISED	REVISED
3 / 2008		

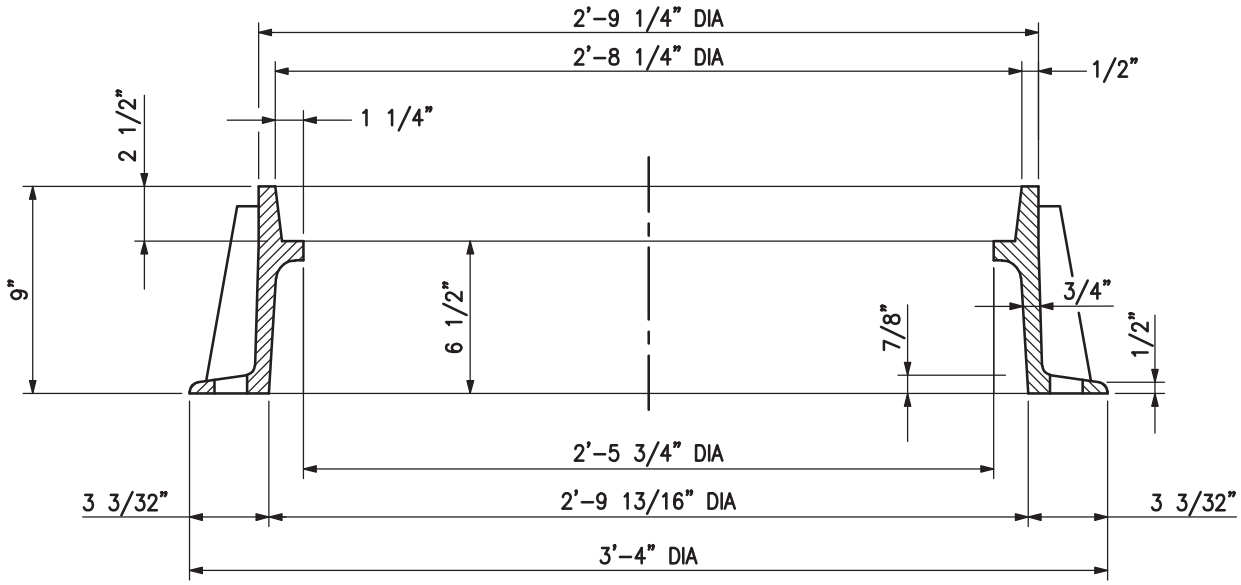
STANDARD NO.
BC 383.23

SCALE : NONE

SHEET 1 OF 1



PARTIAL PLAN

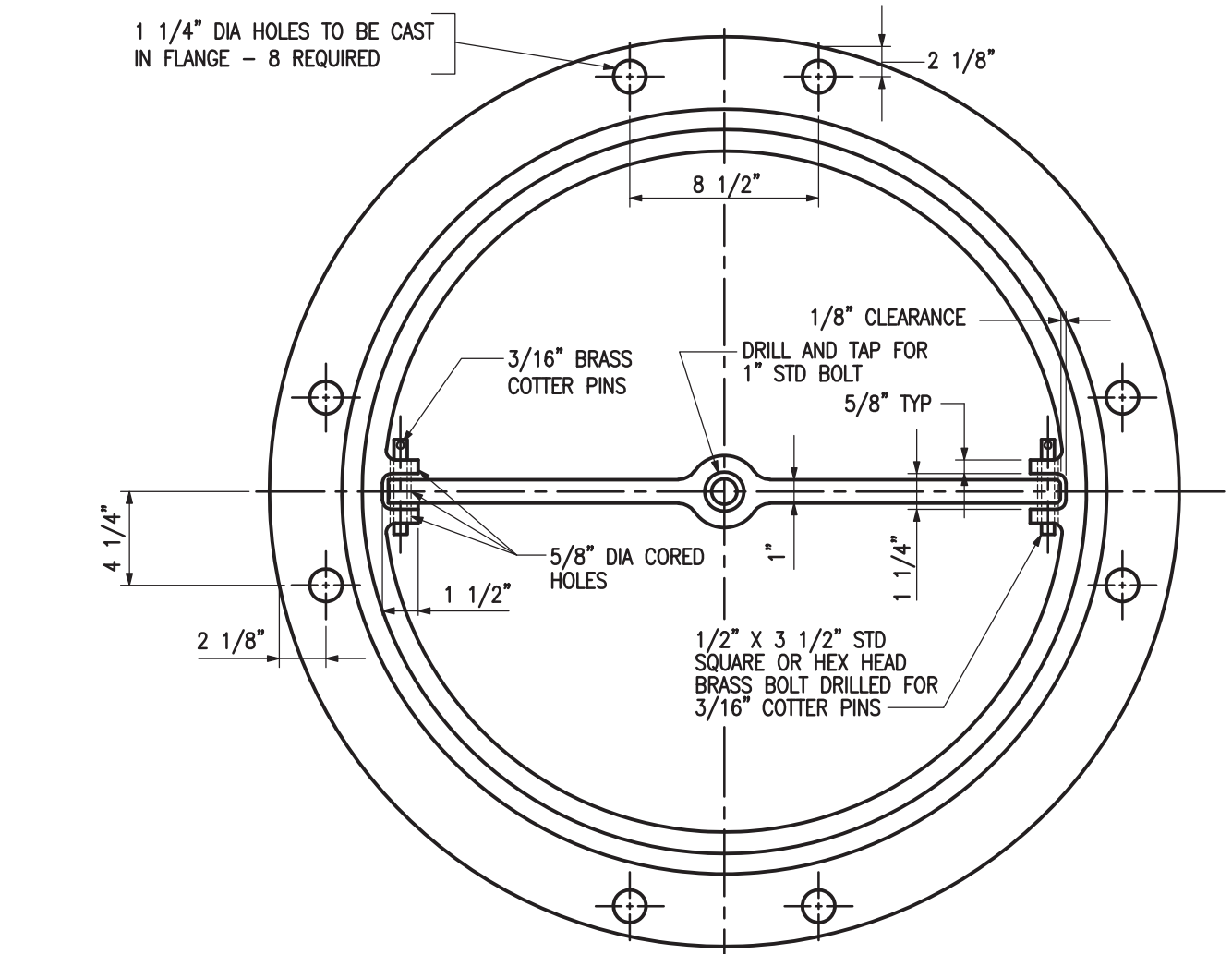


SECTION

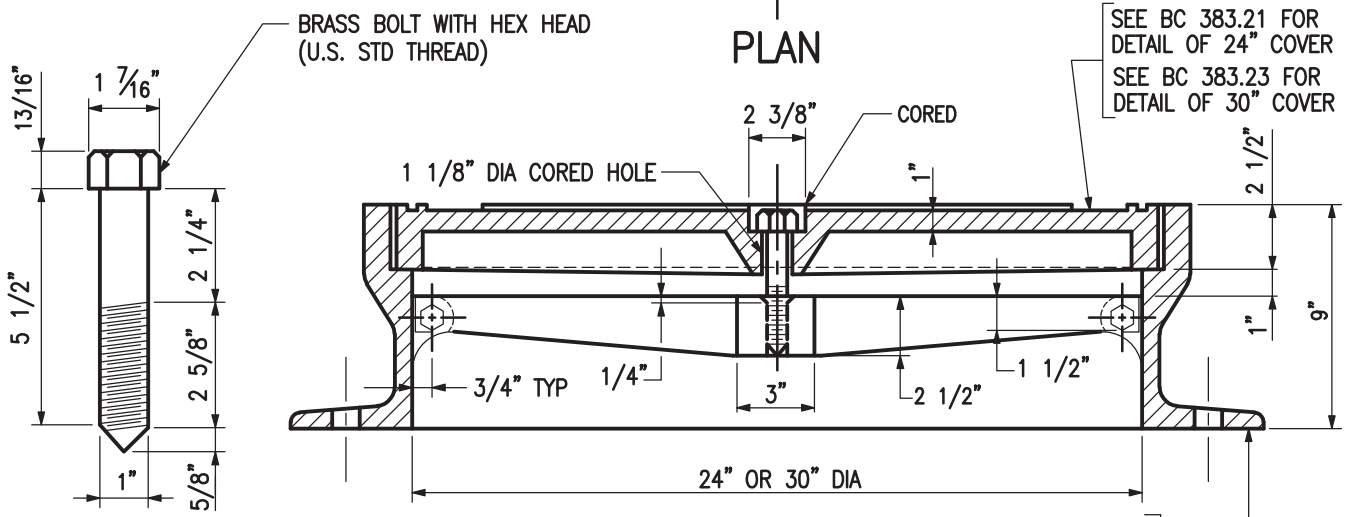
NOTES:

1. FOR 30" LOCK TYPE FRAME SEE BC 383.25
2. FOR STD 30" MANHOLE COVER SEE BC 383.23
3. MATERIAL SHALL BE CAST GRAY IRON ASTM A-48, CLASS 35B
4. FRAME SHALL MEET OR EXCEED AASHTO M 306 PROOF LOAD REQUIREMENTS.

CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		STANDARD 30 IN. MANHOLE FRAME	STANDARD NO. BC 383.24		
			SCALE: NONE	SHEET 1 OF 1	



PLAN



BOLT

SECTION

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

LOCKING DEVICE FOR MANHOLE FRAME AND COVER

ISSUED	REVISED	REVISED
3 / 2008		

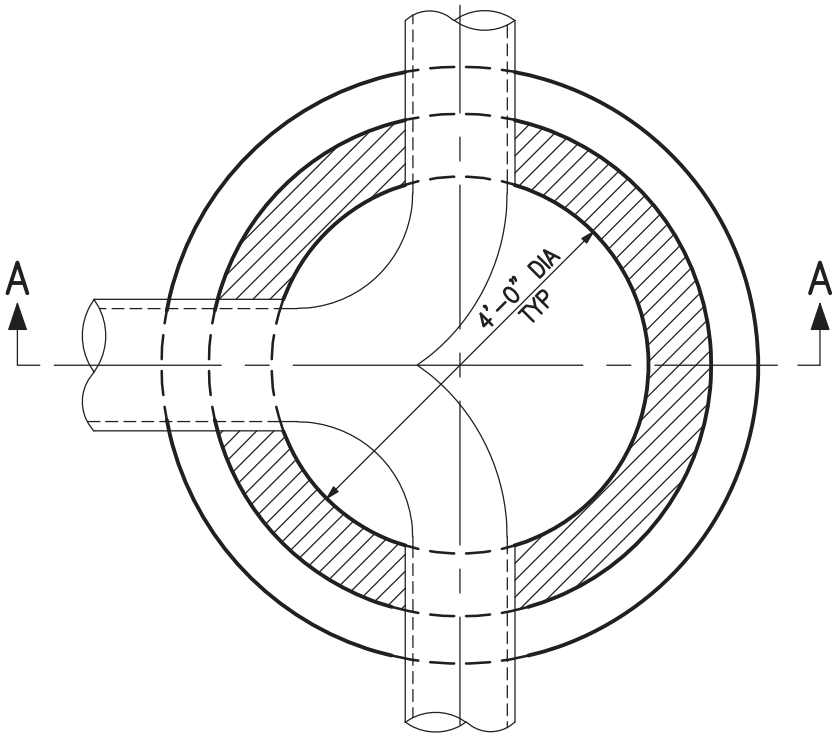
STANDARD NO.
BC 383.25

SCALE : NONE

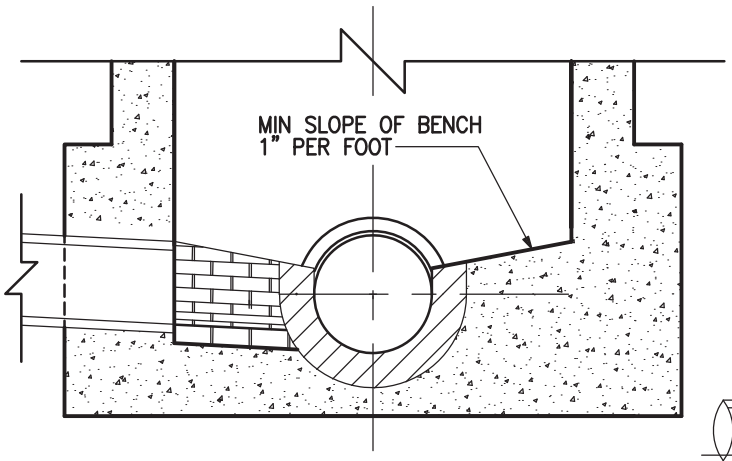
SHEET 1 OF 1

NOTE:

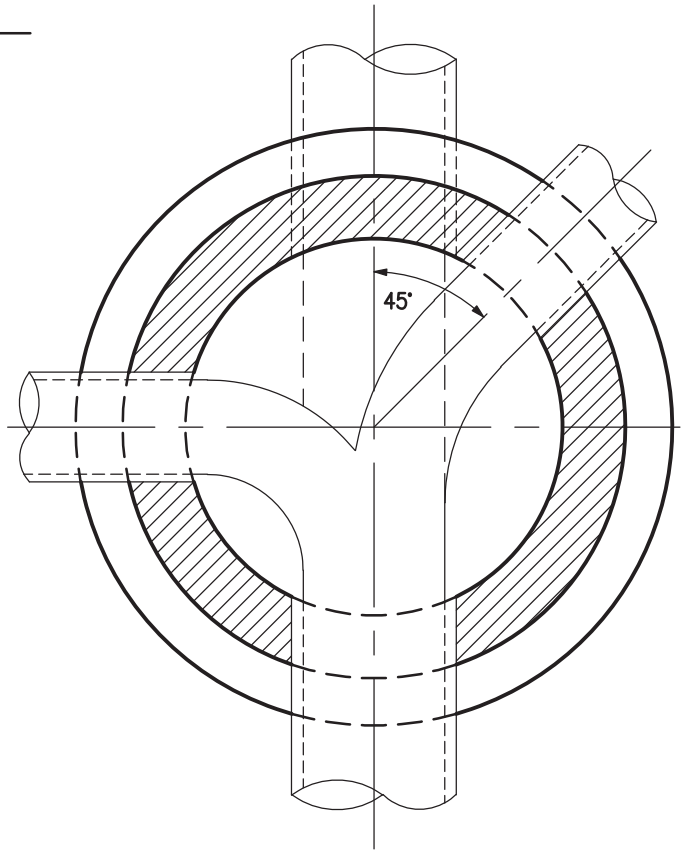
BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO DIAMETER OF OUTGOING PIPE



STANDARD CHANNEL NO. 1



SECTION A–A
(STANDARD CHANNEL NO. 1)

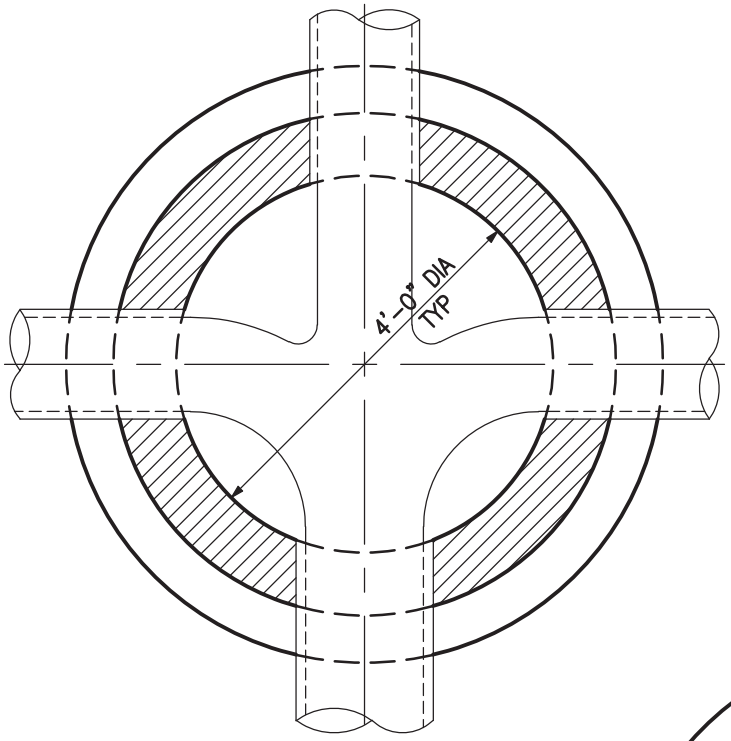


STANDARD CHANNEL NO. 2

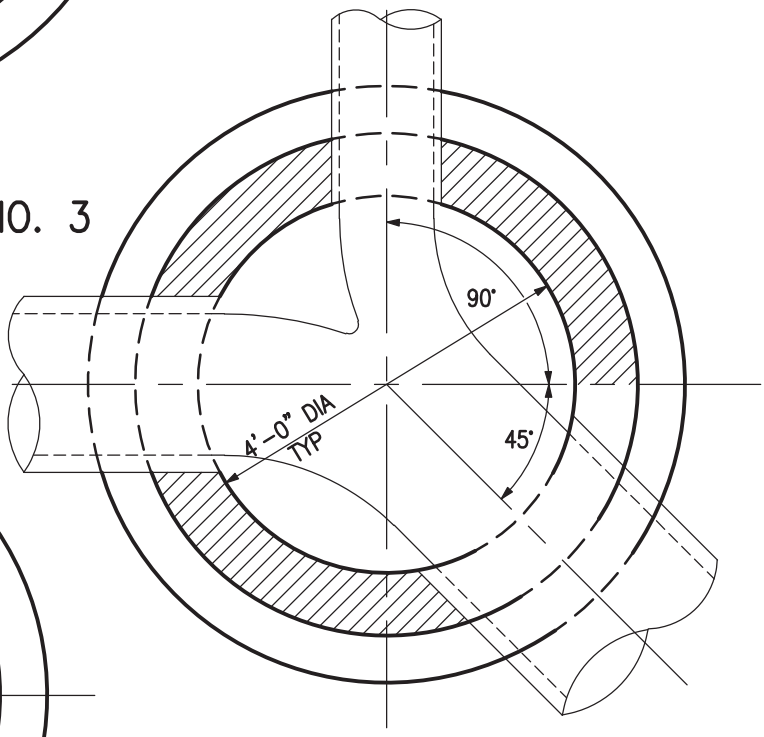
CITY OF BALTIMORE	APPROVED:	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED / REVISED
	HEAD, BUREAU OF WATER AND WASTEWATER		3 / 2008	
	DIRECTOR, DEPARTMENT OF PUBLIC WORKS	TYPICAL MANHOLE CHANNELS STANDARD CHANNEL NO. 1 STANDARD CHANNEL NO. 2	STANDARD NO. BC 383.31	
			SCALE: NONE	SHEET 1 OF 1

NOTE:

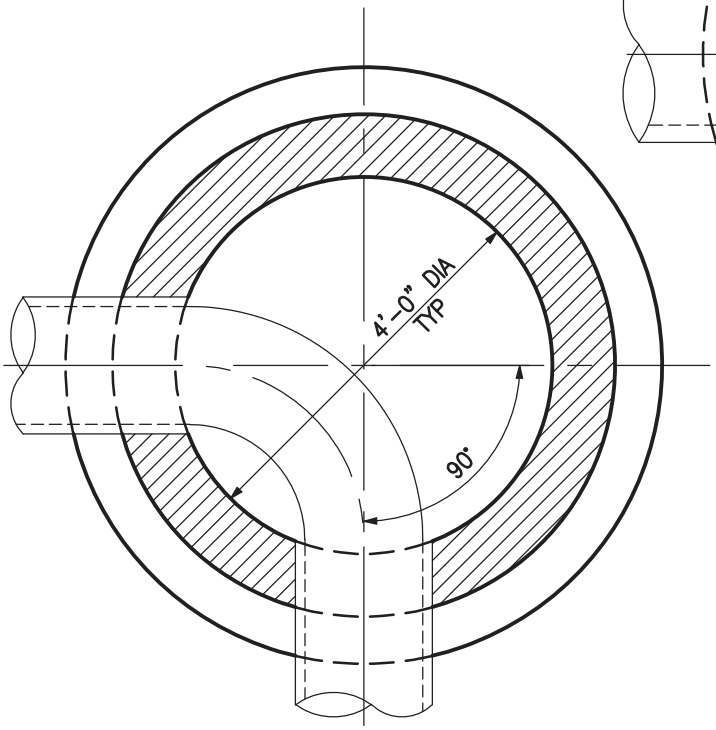
BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO DIAMETER OF OUTGOING PIPE



STANDARD CHANNEL NO. 3



STANDARD CHANNEL NO. 4



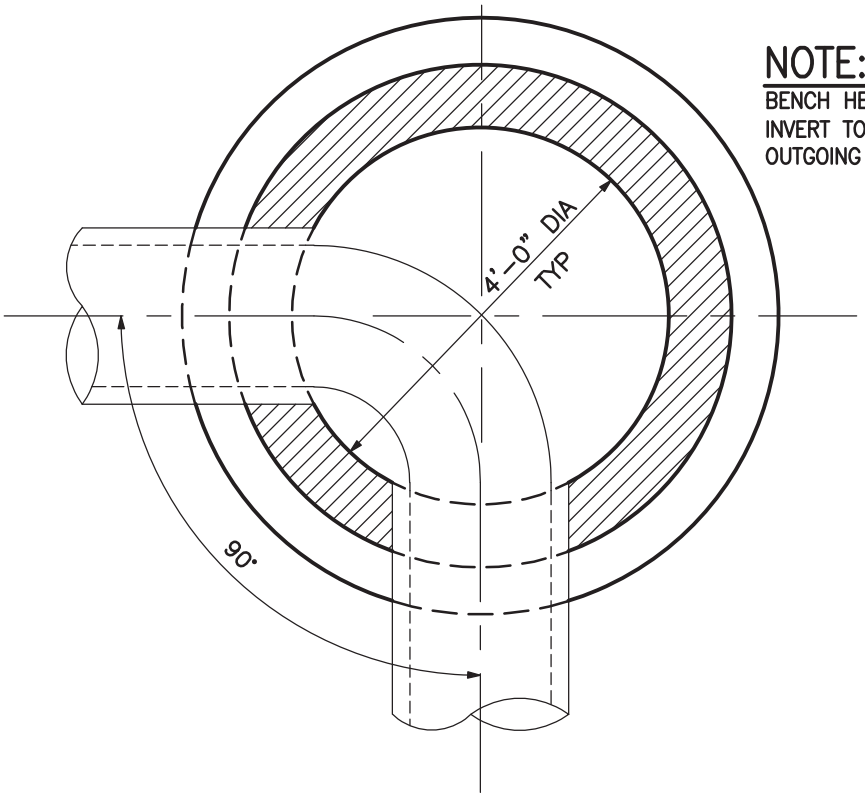
STANDARD CHANNEL NO. 5

(FOR 8", 10", 12", AND 15" PIPE SEWERS)

CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		TYPICAL MANHOLE CHANNELS STANDARD CHANNEL NO. 3 STANDARD CHANNEL NO. 4 STANDARD CHANNEL NO. 5	STANDARD NO. BC 383.32		
			SCALE: NONE	SHEET 1 OF 1	

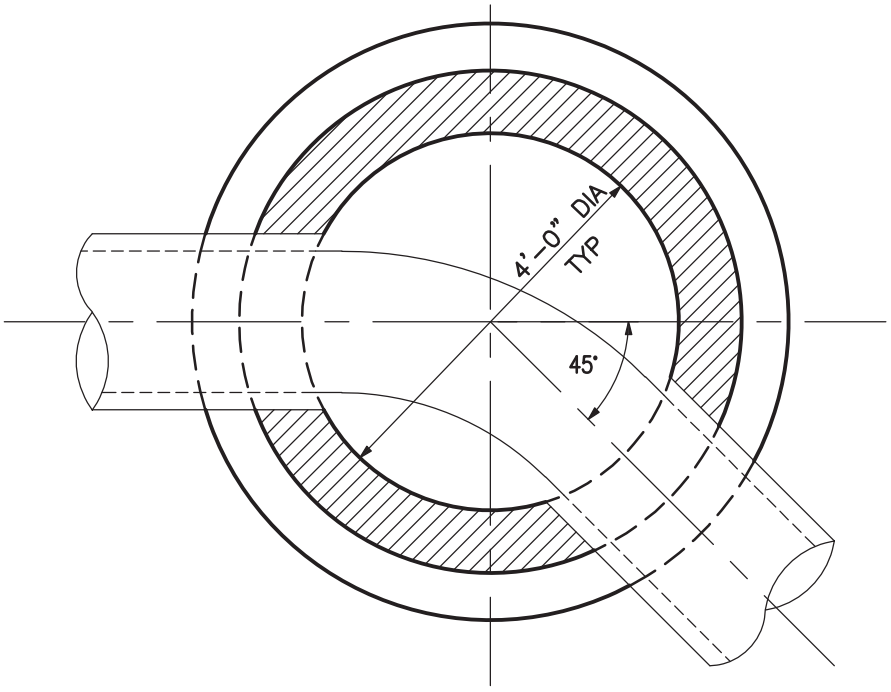
NOTE:

BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO DIAMETER OF OUTGOING PIPE



STANDARD CHANNEL NO. 6

(FOR 18", 21" AND 24" PIPE SEWERS)

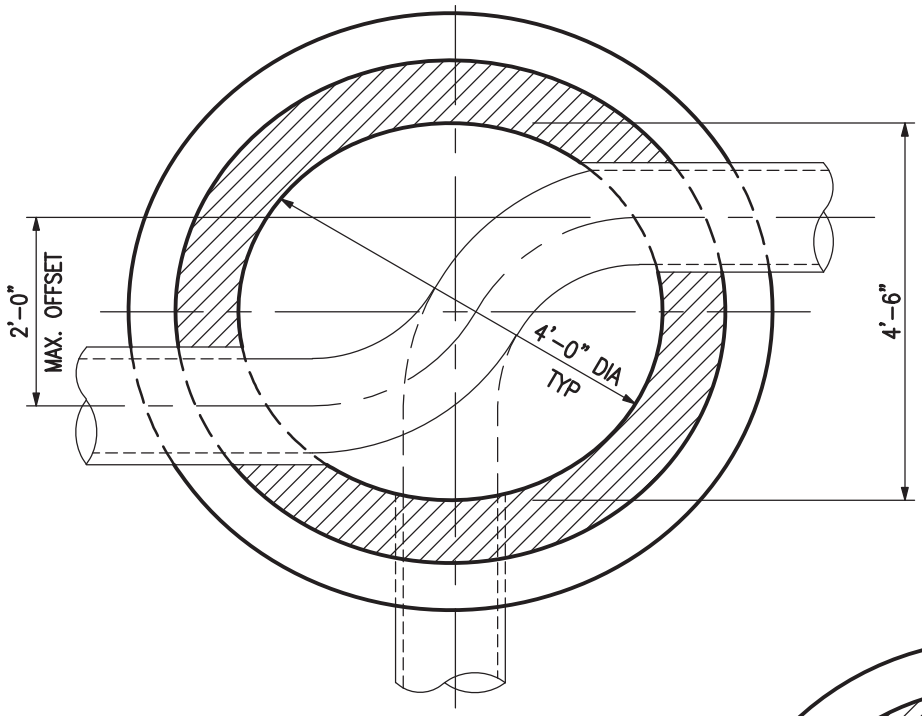


STANDARD CHANNEL NO. 7

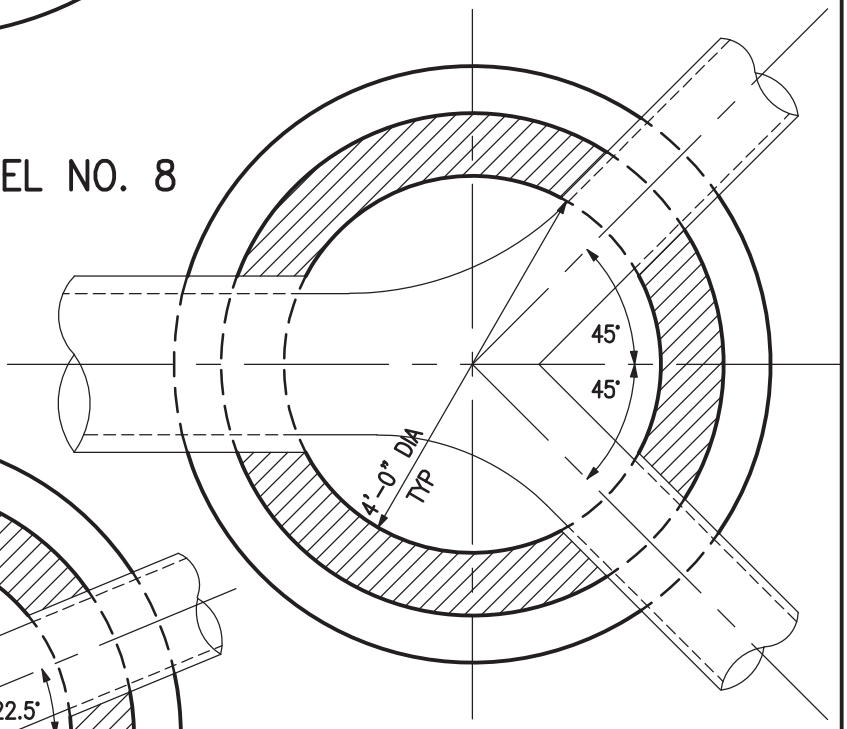
APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	TYPICAL MANHOLE CHANNELS STANDARD CHANNEL NO. 6 STANDARD CHANNEL NO. 7	STANDARD NO. BC 383.33		
		SCALE: NONE	SHEET 1 OF 1	

NOTE:

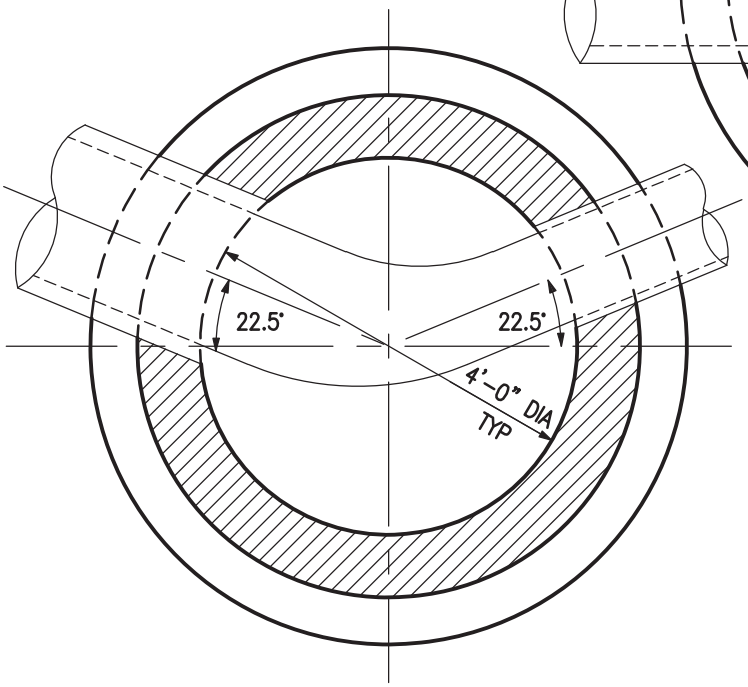
BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO DIAMETER OF OUTGOING PIPE



STANDARD CHANNEL NO. 8



STANDARD CHANNEL NO. 9



STANDARD CHANNEL NO.10

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

TYPICAL MANHOLE CHANNELS
STANDARD CHANNEL NO. 8
STANDARD CHANNEL NO. 9
STANDARD CHANNEL NO. 10

ISSUED	REVISED	REVISED
3 / 2008		

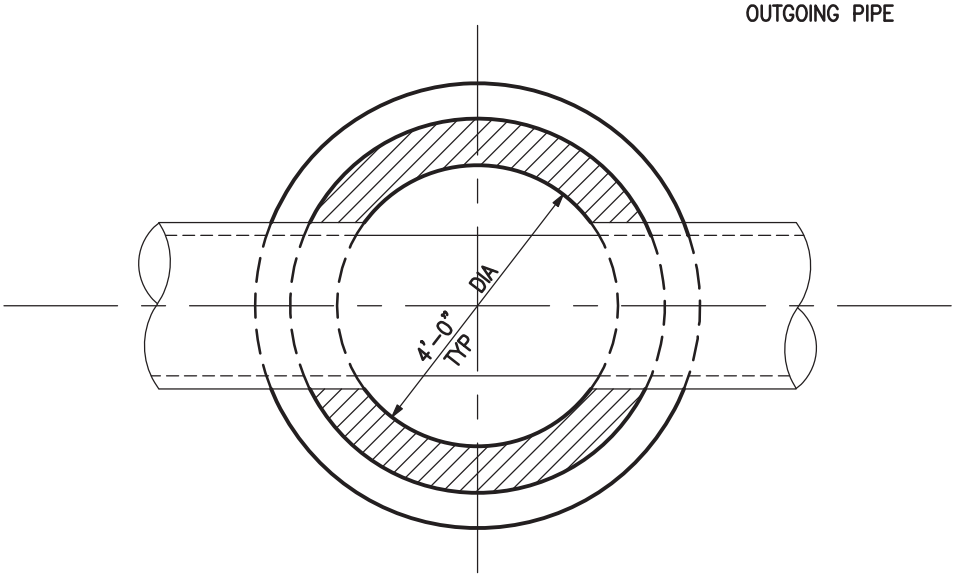
STANDARD NO.
BC 383.34

SCALE : NONE

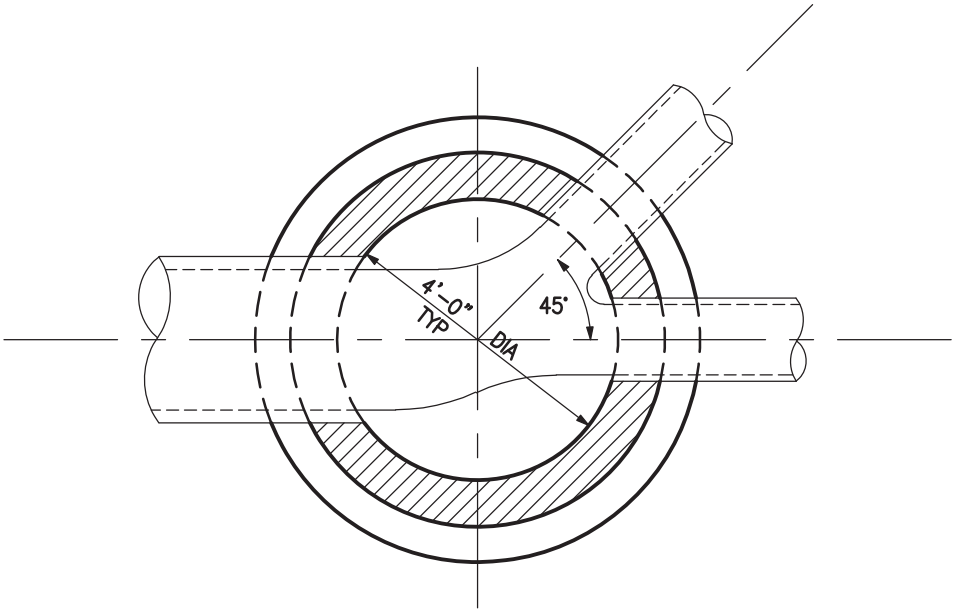
SHEET 1 OF 1

NOTE:

BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO DIAMETER OF OUTGOING PIPE



STANDARD CHANNEL NO. 11



STANDARD CHANNEL NO. 12

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

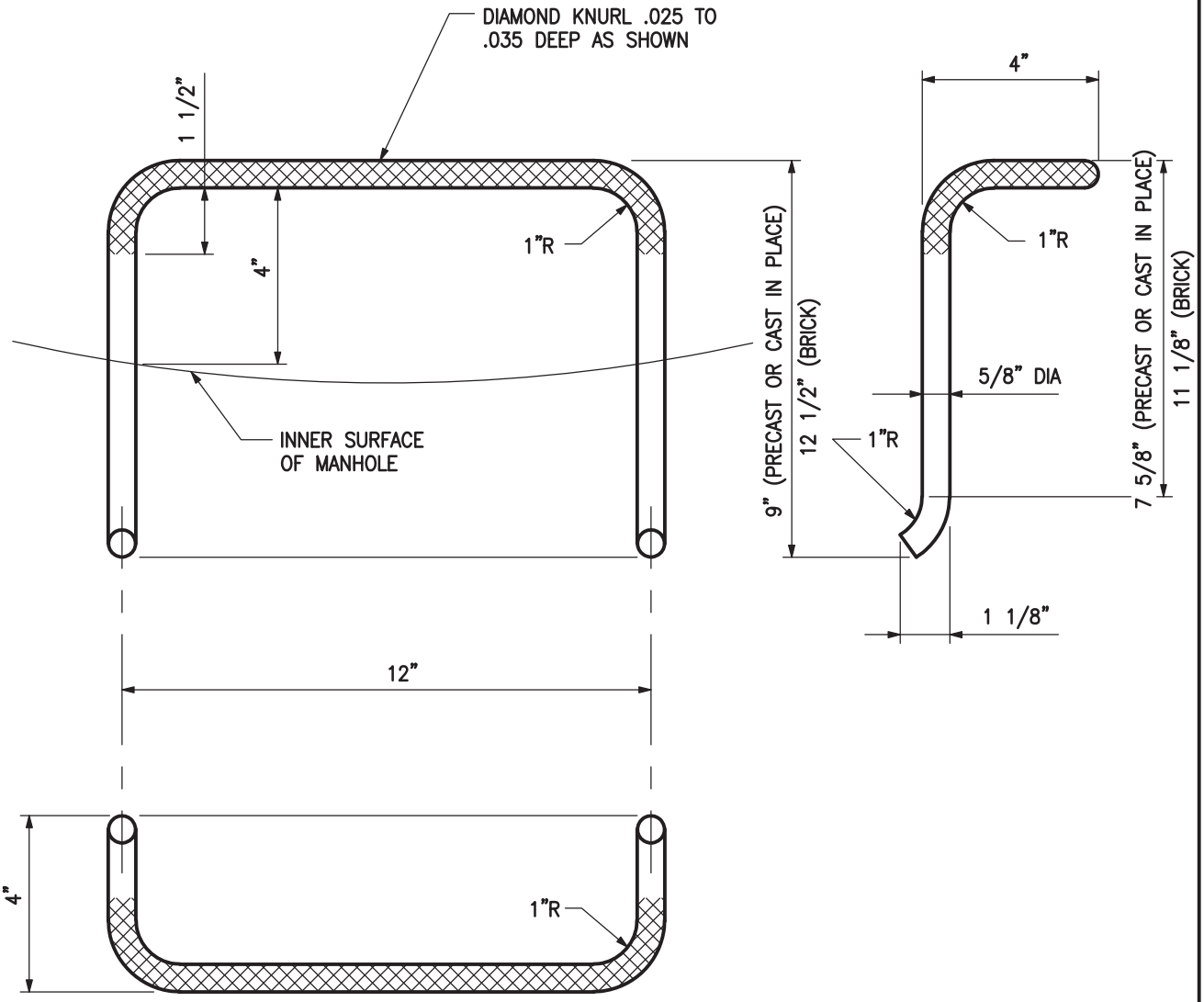
TYPICAL MANHOLE CHANNELS
STANDARD CHANNEL NO. 11
STANDARD CHANNEL NO. 12

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 383.35

SCALE : NONE

SHEET 1 OF 1



DROP FRONT
IN-LINE OR STAGGERED

NOTES:

1. KNURL BEFORE BENDING, MIN KNURLING AS SHOWN.
2. STEPS TO BE TYPE 410 STAINLESS STEEL, MILL FINISH.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

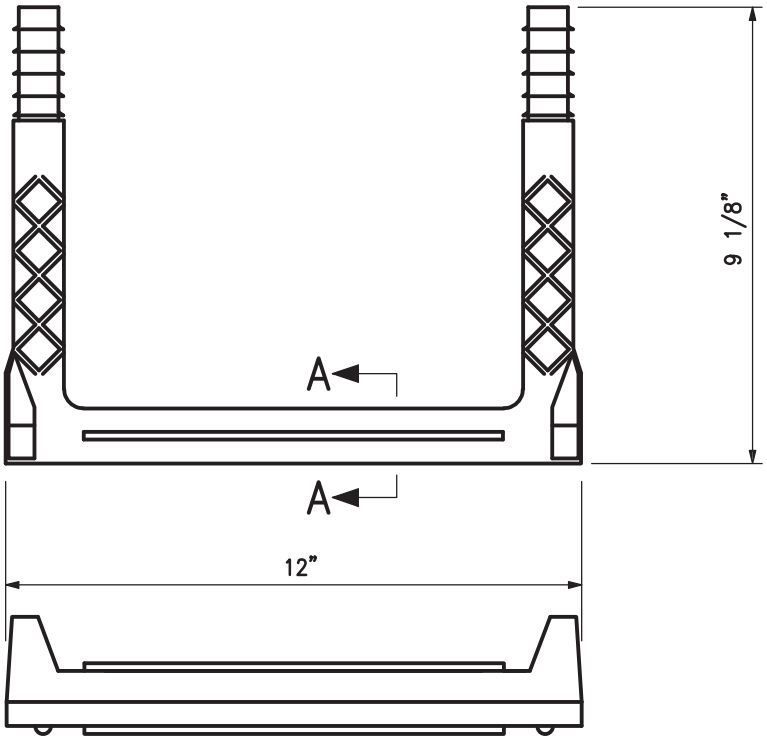
STAINLESS STEEL
MANHOLE STEP

ISSUED	REVISED	REVISED
3 / 2008		

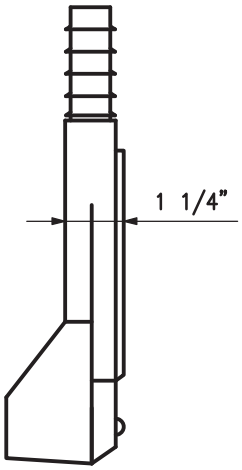
STANDARD NO.
BC 383.92

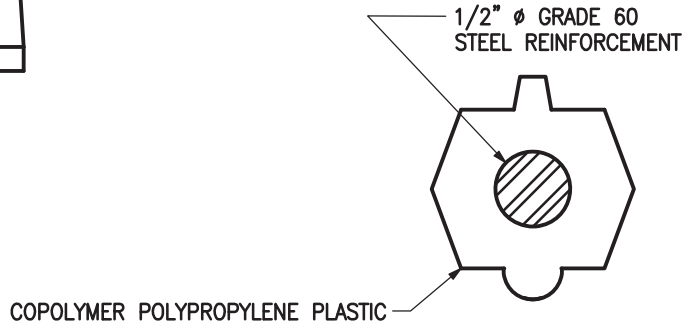
SCALE : NONE

SHEET 1 OF 1

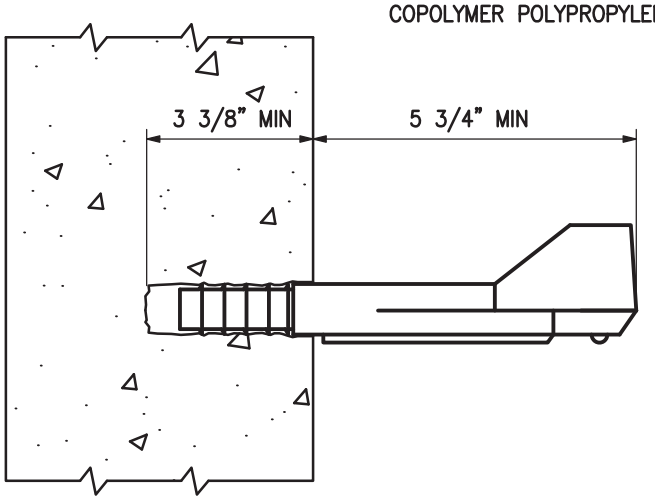


PLAN





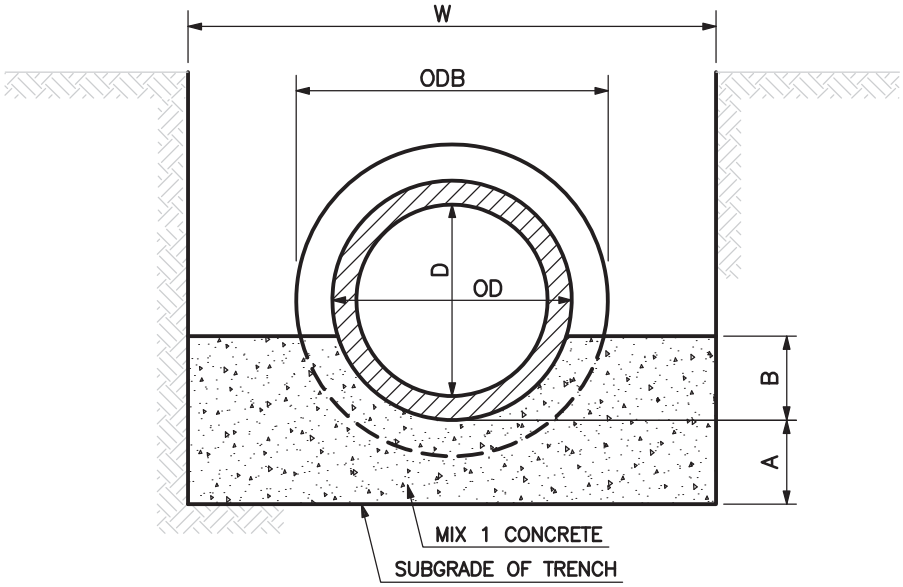
SECTION A–A



NOTE:

COPOLYMER POLYPROPYLENE SHALL BE CERTIFIED BY THE MANUFACTURER TO CONFORM TO ASTM D4101 AND HAVE A MINIMUM EXPOSED SECTION THICKNESS OF 1/8".

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		POLYPROPYLENE MANHOLE STEP FOR PRECAST MANHOLES	STANDARD NO. BC 383.93		
			SCALE : NONE	SHEET 1 OF 1	



NOTE:

WHEN 2 TIER TRENCH SUPPORT IS REQUIRED, ADD 24" TO "W" FOR CALCULATING THE AMOUNT OF PAVING NEEDED FOR TRENCH REPAIR.

REINFORCED CONCRETE PIPE								
DIMENSIONS							CUBIC YARDS PER LIN. FT	
D	OD	ODB	A	B	W			
					MIN	MAX	MIN	MAX
15"	19"	23"	4"	5"	42"	60"	0.0817	0.1234
18"	22.5"	27"	5"	6"	42"	66"	0.0973	0.1651
21"	25.75"	30.5"	6"	7"	48"	66"	0.1310	0.1912
24"	29"	34"	6"	8"	48"	72"	0.1351	0.2215
27"	32.25"	37.5"	7"	8"	54"	78"	0.1674	0.2601
30"	36"	41.5"	8"	9"	60"	78"	0.2116	0.2904
33"	39.5"	45.5"	9"	10"	60"	84"	0.2304	0.3477
36"	42.75"	49"	9"	11"	66"	90"	0.2648	0.3883
42"	50"	57.5"	11"	13"	72"	96"	0.3407	0.4889
48"	57"	66"	12"	15"	84"	102"	0.4450	0.5700
54"	64"	72.5"	14"	16"	90"	108"	0.5336	0.6724
60"	72"	75.5"	15"	18"	102"	114"	0.6318	0.7336
66"	79"	81"	17"	20"	108"	120"	0.7588	0.8730
72"	86"	88"	18"	22"	114"	126"	0.8503	0.9738

NOTE: QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

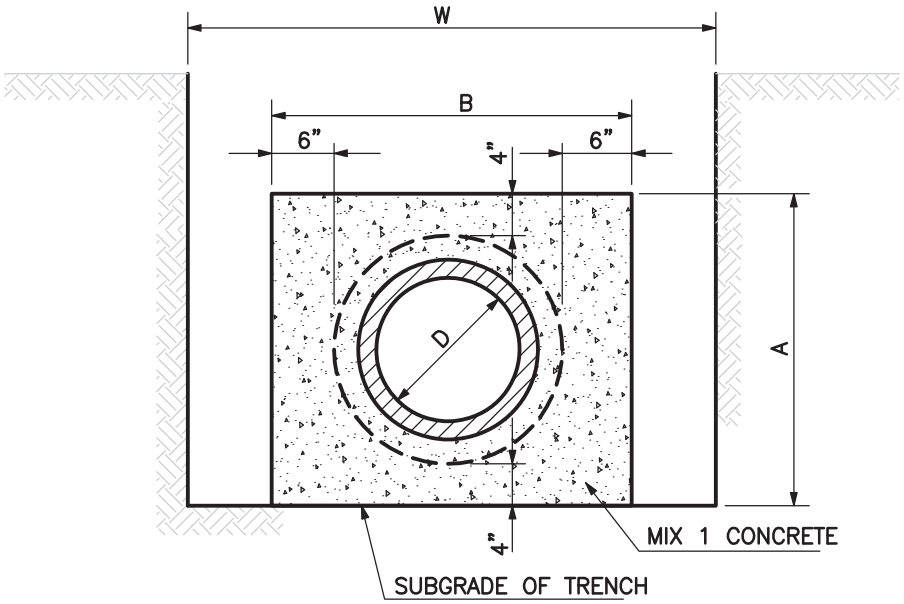
CONCRETE CRADLE FOR
RCP STORM DRAINS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 386.41

SCALE : NONE

SHEET 1 OF 1



DIMENSIONS			CUBIC YARDS PER LIN. FT
D	A	B	
EXTRA STRENGTH CLAY PIPE			
6"	18"	22"	0.0894
8"	21"	25"	0.1143
10"	23.5"	27.5"	0.1348
12"	26"	30"	0.1569
15"	30"	34"	0.1912
18"	34.5"	38.5"	0.2407
21"	38"	42"	0.2701
24"	42"	46"	0.3132
27"	47"	51"	0.3890
30"	51"	55"	0.4432
REINFORCED CONCRETE PIPE			
15"	31"	35"	0.2064
18"	35"	39"	0.2487
21"	38.5"	42.5"	0.2864
24"	42"	46"	0.3261
27"	45.5"	49.5"	0.3692
30"	49.5"	53.5"	0.4204

DIMENSIONS			CUBIC YARDS PER LIN. FT
D	A	B	
PVC PIPE			
6"	15"	19"	0.0654
8"	17.5"	21.5"	0.0822
10"	20"	24"	0.1012
12"	22"	26"	0.1156
15"	24.5"	28.5"	0.1326
18"	28"	32"	0.1594
21"	31.5"	35.5"	0.1898
24"	34.5"	38.5"	0.2179
27"	38"	42"	0.2521
DUCTILE IRON PIPE			
6"	17"	21"	0.0819
8"	19.5"	23.5"	0.1006
10"	21.5"	25.5"	0.1154
12"	23.5"	27.5"	0.1294
14"	26.5"	30.5"	0.1594
16"	28.5"	32.5"	0.1764
18"	30.5"	34.5"	0.1918

NOTE: QUANTITIES IN TABLE TO BE USED FOR ESTIMATING ONLY

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

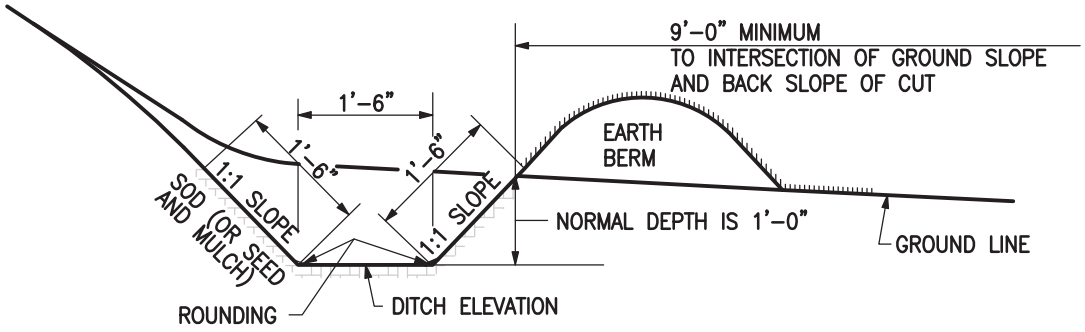
CONCRETE ENCASEMENT
FOR STORM DRAINS

ISSUED	REVISED	REVISED
3 / 2008		

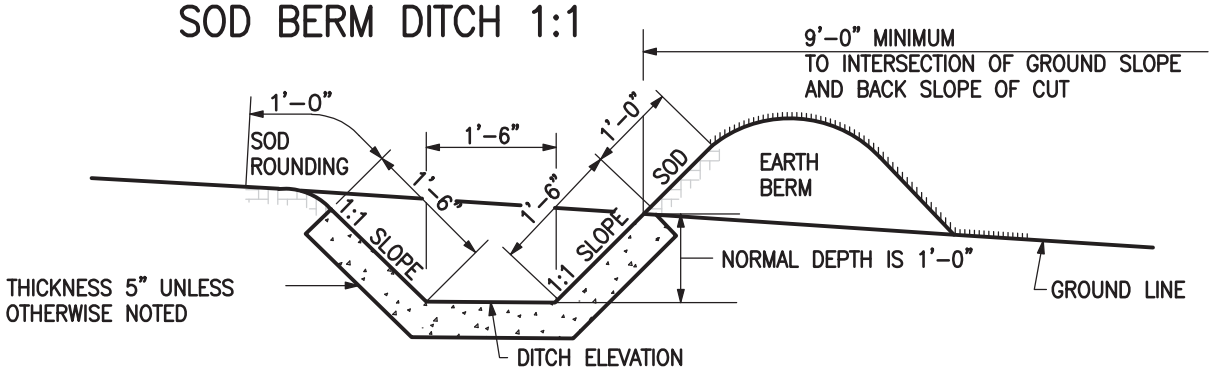
STANDARD NO.
BC 386.51

SCALE : NONE

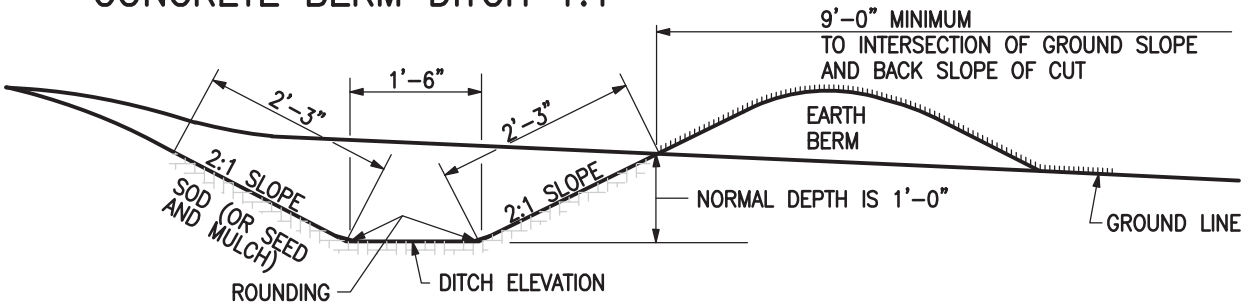
SHEET 1 OF 1



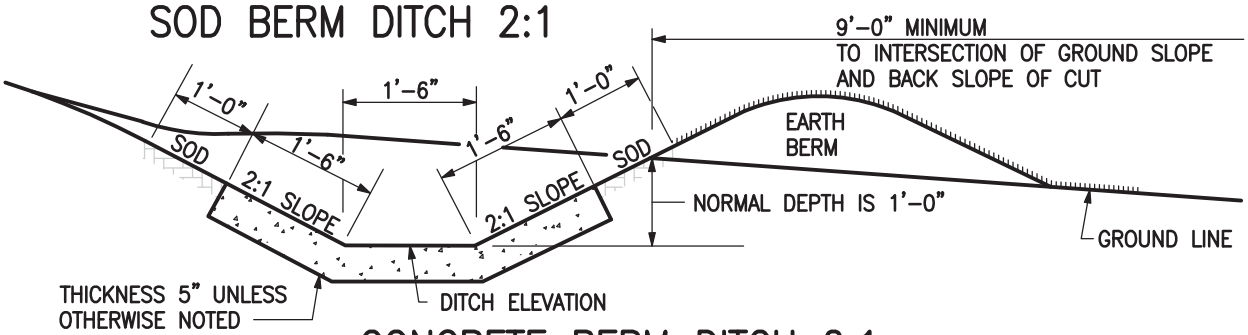
SEED AND MULCH BERM DITCH 1:1
SOD BERM DITCH 1:1



CONCRETE BERM DITCH 1:1



SEED AND MULCH BERM DITCH 2:1
SOD BERM DITCH 2:1



CONCRETE BERM DITCH 2:1

NOTES:

1. DITCH ELEVATIONS AS NOTED ON PLANS.
2. 2" TOP SOIL AND SEED AND MULCH ALL CONSTRUCTION SLOPES NOT OTHERWISE TREATED.
3. WHERE DITCH LOCATION IS OTHER THAN SHOWN, DISTANCE FROM DITCH ℄ TO A REFERENCE POINT SHALL BE INDICATED ON THE PLANS.
4. EARTH BERM TO BE CONSTRUCTED FROM DITCH EXCAVATION AND COMPACTED AS DIRECTED BY THE ENGINEER. THIS WILL NOT BE A PAY ITEM.
5. ALL SOD TO BE PLACED PER SPECIFICATION SECTION 32 92 23 SODDING.
6. CONCRETE SHALL BE MIX 6.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

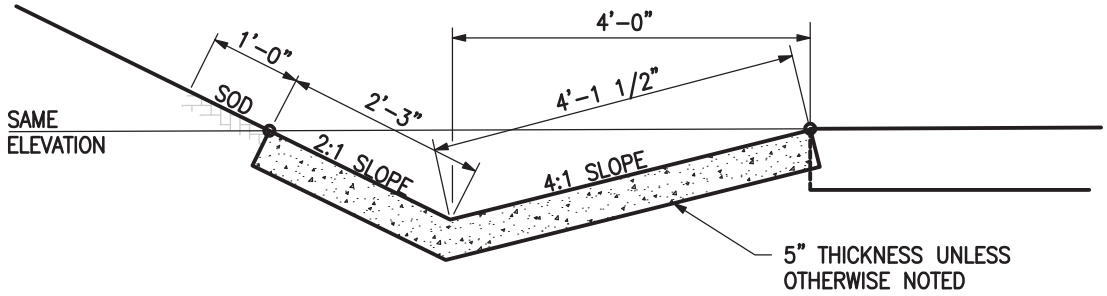
STANDARD BERM DITCHES
CONCRETE AND SOD

ISSUED	REVISED	REVISED
3 / 2008		

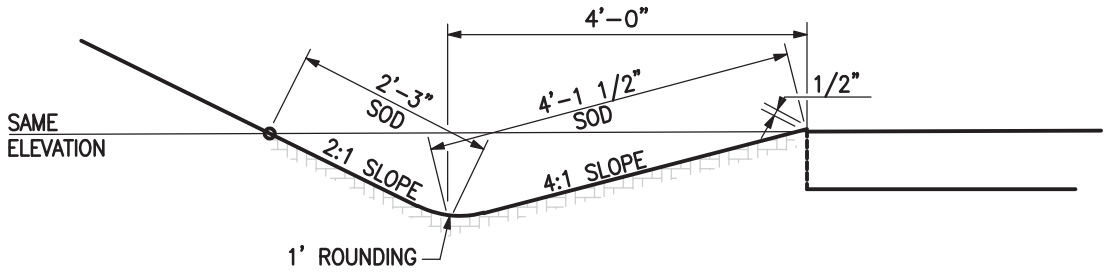
STANDARD NO.
BC 389.01

SCALE : NONE

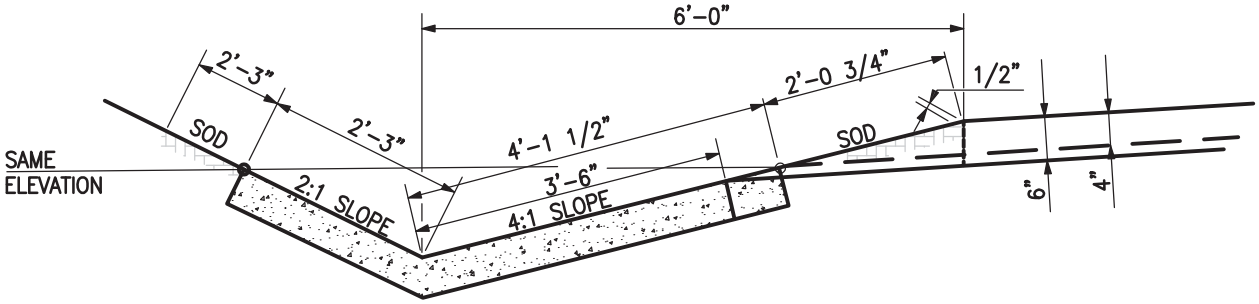
SHEET 1 OF 1



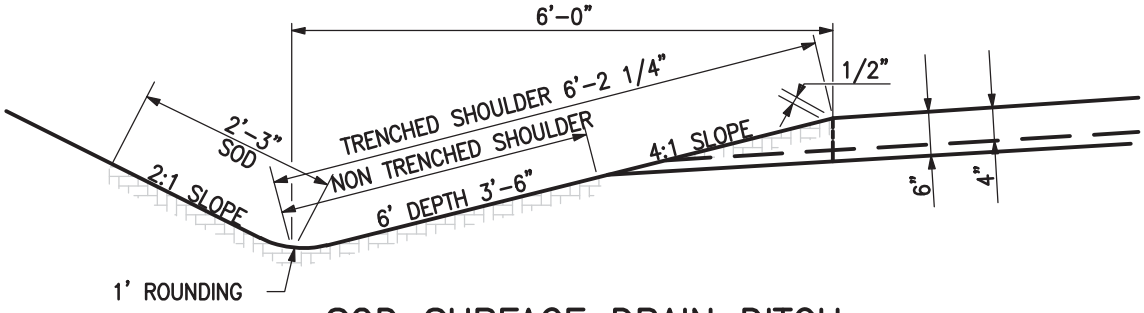
CONCRETE SURFACE DRAIN DITCH



SOD SURFACE DRAIN DITCH



CONCRETE SURFACE DRAIN DITCH

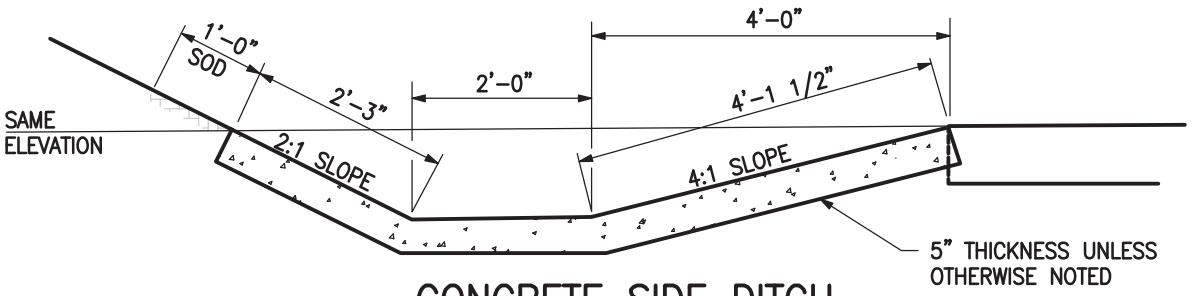


SOD SURFACE DRAIN DITCH

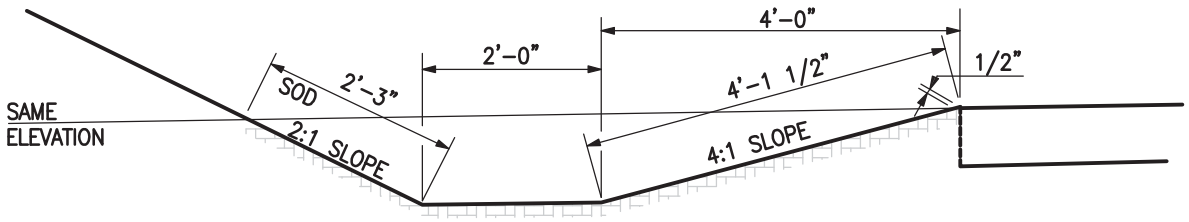
NOTES:

1. CONCRETE TO BE EXTENDED AS REQUIRED WHERE DEPTH OF FLOW IN DITCH EXCEEDS LIMIT OF CONCRETE AS INDICATED ABOVE.
2. OMIT SOD STRIP ON SHOULDER SIDE OF DITCH OF NON-TRENCHED SHOULDERS.
3. ALL SOD TO BE PLACED PER SPECIFICATION SECTION 32 92 23 SODDING.
4. CONCRETE SHALL BE MIX 2.

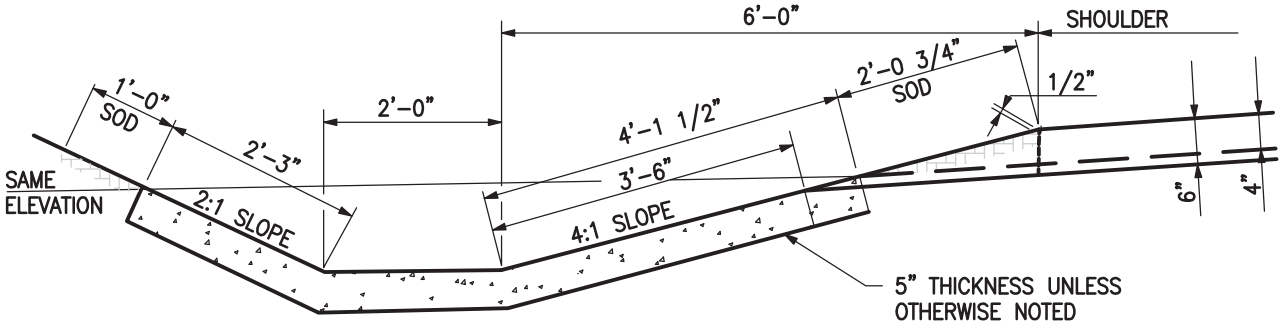
CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		STANDARD SIZE DITCHES-V SLOPE	STANDARD NO. BC 389.02		
			SCALE : NONE	SHEET 1 OF 1	



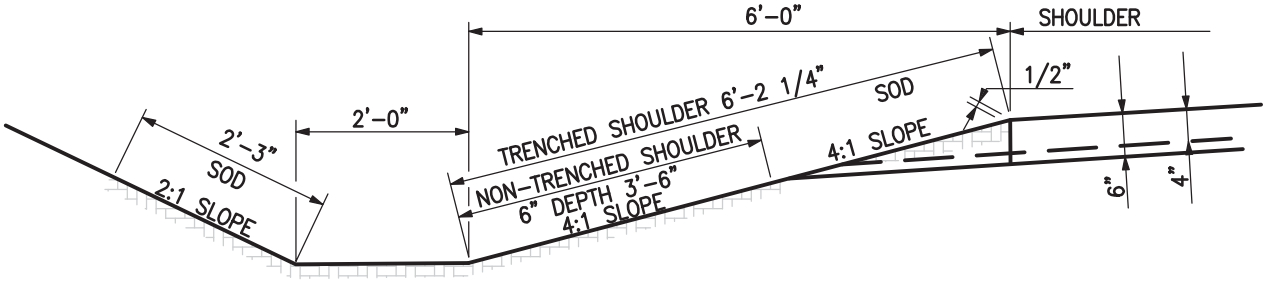
CONCRETE SIDE DITCH



SOD SIDE DITCH
"A"



CONCRETE SIDE DITCH



SOD SIDE DITCH
"B"

NOTES:

1. WHEN DITCHES ARE CONSTRUCTED OTHER THAN AS SHOWN, THE ELEVATIONS WILL BE NOTED ON THE PLANS.
2. ALL SOD TO BE PLACED PER SPECIFICATION SECTION 32 92 23 SODDING.
3. CONCRETE SHALL BE MIX 2.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

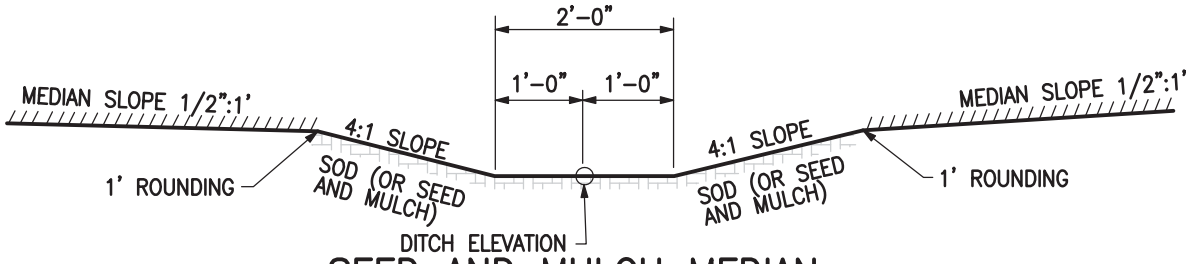
STANDARD SIDE DITCHES
TRAPEZOIDAL

ISSUED	REVISED	REVISED
3 / 2008		

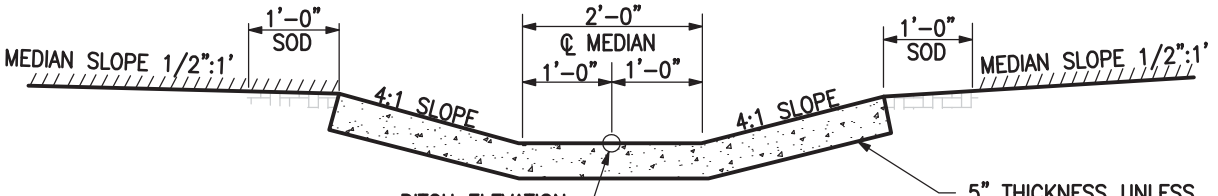
STANDARD NO.
BC 389.03

SCALE : NONE

SHEET 1 OF 1



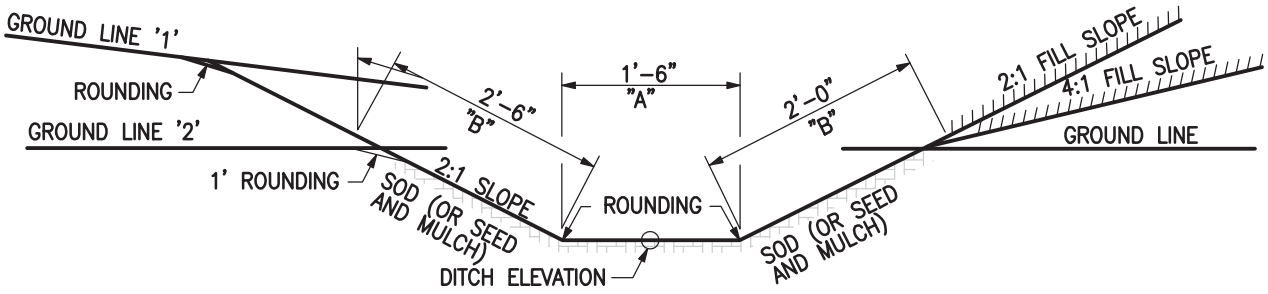
SEED AND MULCH MEDIAN
DITCH SOD MEDIAN DITCH



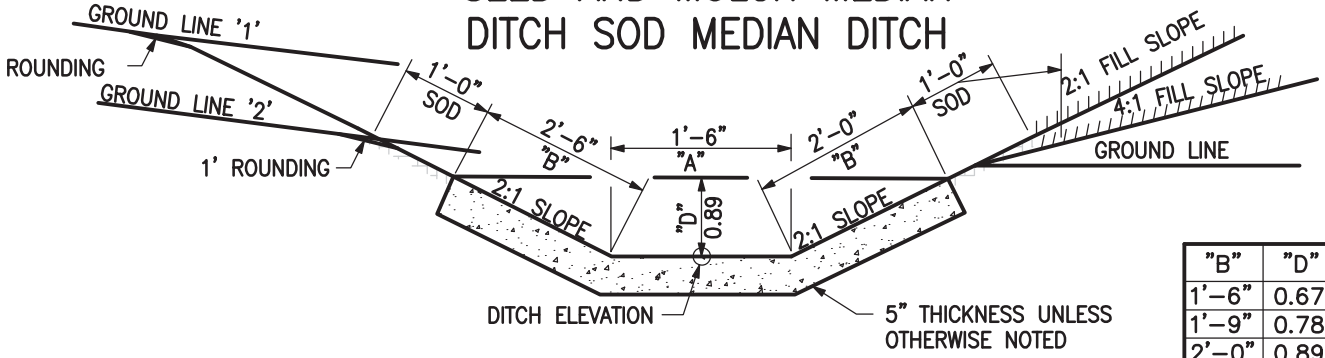
CONCRETE SIDE DITCH

NOTES:

1. DITCH DEPTHS OTHER THAN 6" TO BE NOTED BY ELEVATIONS ON PLANS.
2. DIMENSION "B" MAY BE MODIFIED BY NOTE ON PLANS.
3. 4" TOP SOIL AND SEED AND MULCH ALL CONSTRUCTION SLOPES NOT OTHERWISE TREATED.
4. WHERE DITCH IS OTHER THAN 6" DEPTH, THE 4:1 SLOPE RATIO SHALL BE MAINTAINED, EXCEPT TRANSITIONS TO INLETS OF DRAINAGE STRUCTURES.
5. WHERE ℄ DITCH IS NOT AT ℄ MEDIAN, OFFSET DISTANCES SHALL BE INDICATED ON PLANS.
6. CONCRETE SHALL BE MIX 2.



SEED AND MULCH MEDIAN
DITCH SOD MEDIAN DITCH



"B"	"D"
1'–6"	0.67'
1'–9"	0.78'
2'–0"	0.89'
2'–3"	1.01'
2'–6"	1.12'
2'–9"	1.23'
3'–0"	1.34'
3'–3"	1.45'
3'–6"	1.57'
3'–9"	1.68'
4'–0"	1.79'

CONCRETE SIDE DITCH

NOTES:

1. ELEVATIONS AS NOTED ON PLANS.
2. DIMENSIONS "A" AND "B" MAY BE MODIFIED BY NOTE ON PLANS.
3. 2" TOP SOIL AND SEED AND MULCH ALL CONSTRUCTION SLOPES NOT OTHERWISE TREATED.
4. WHERE DITCH IS NOT ADJACENT TO TOE OF FILL, DISTANCES FROM ℄ DITCH TO A REFERENCE POINT SHALL BE INDICATED ON THE PLANS.
5. ALL SOD TO BE PLACED PER SPECIFICATION SECTION 32 92 23 SODDING.
6. CONCRETE SHALL BE MIX 2.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

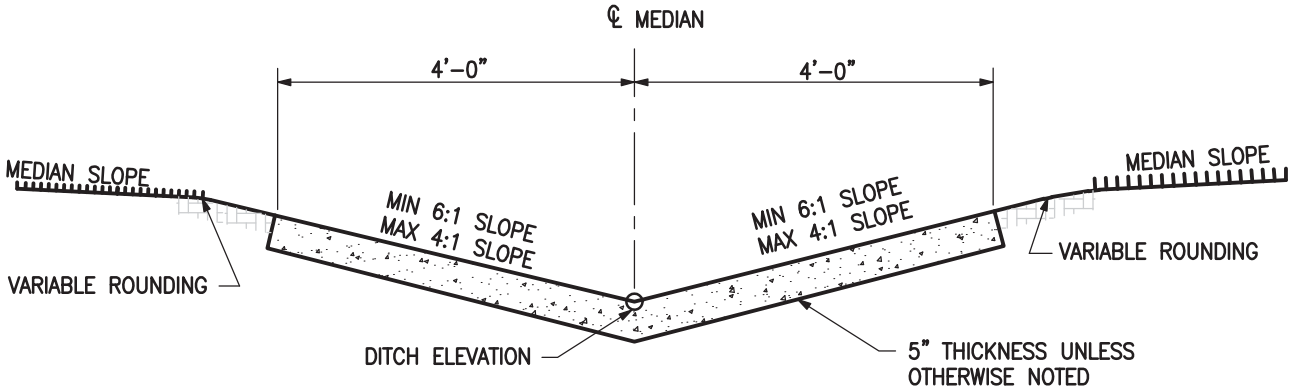
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD MEDIAN DITCHES
TRAPEZOIDAL

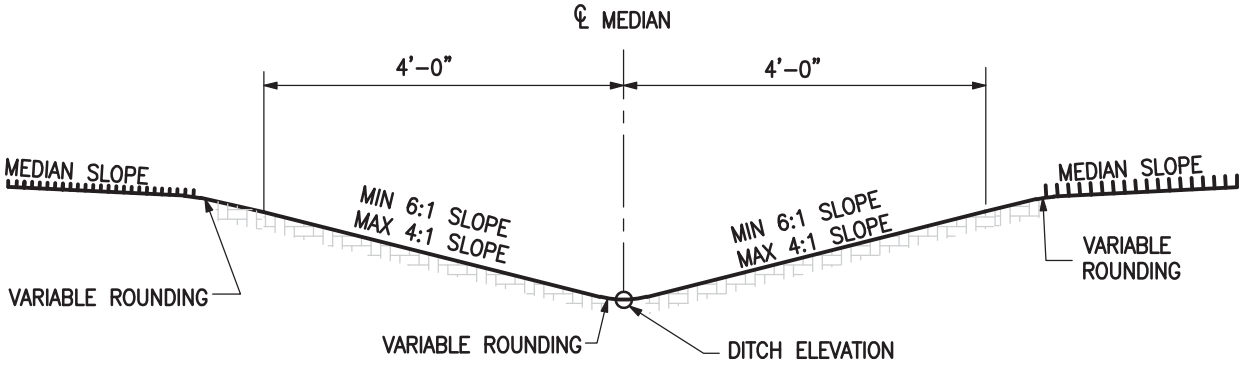
STANDARD NO.
BC 389.04

SCALE : NONE

SHEET 1 OF 1



CONCRETE MEDIAN 'V' DITCH



SOD MEDIAN 'V' DITCH

NOTES:

1. ELEVATIONS AS NOTED ON PLANS.
2. 2" TOP SOIL AND SEED AND MULCH ALL CONSTRUCTION SLOPES NOT OTHERWISE TREATED.
3. WHERE DITCH IS NOT ADJACENT TO TOE OF FILL, DISTANCES FROM ℄ DITCH TO A REFERENCE POINT SHALL BE INDICATED ON THE PLANS.
4. ALL SOD TO BE PLACED PER SPECIFICATION SECTION 32 92 23 SODDING.
5. CONCRETE SHALL BE MIX 2.

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		STANDARD MEDIAN DITCHES-V SLOPE	STANDARD NO. BC 389.05		
			SCALE : NONE	SHEET 1 OF 1	

Standard Wastewater Details

March 2008

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BOOK OF STANDARDS
WASTEWATER INDEX OF DRAWINGS

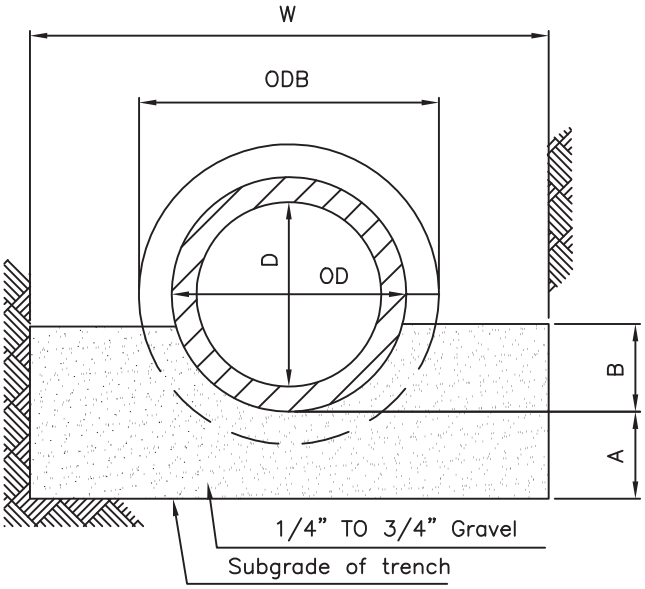
WASTEWATER DETAILS:

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BOOK OF STANDARDS
WASTEWATER CROSS INDEX OF DRAWINGS

WASTEWATER DETAILS:

Old Dwg. No.	Dwg. No.	Description	Pages
BC 830.01 1 OF 3	BC 830.01	Gravel Cradle for E.S.C.P. Sanitary Sewers	1 of 1
BC 830.01 2 OF 3	BC 830.02	Gravel Cradle for R.C.P. Sanitary Sewers	1 of 1
BC 830.01 3 OF 3	BC 830.03	Gravel Cradle for P.V.C. Sanitary Sewers	1 of 1
BC 830.02	BC 830.04	Concrete Encasement for Sanitary Sewers	1 of 1
BC 830.03	BC 830.05	Standard Brick and Concrete Curves for Sanitary Sewers	1 of 1
BC 830.04	BC 830.06	Concrete Cradle for Sanitary Sewers	1 of 1
BC 830.13	BC 830.13	Typical Plugging Detail Sanitary House Connection	1 of 1
BC 830.10	BC 830.14	Typical Installations of Sanitary House Connections	1 of 1
BC 830.11	BC 830.15	Typical House Connection with Cleanout in Public Right of Way	1 of 1
BC 830.12	BC 830.16	Typical Installations of Standpipe House Connections	1 of 1
	BC 830.17	Saddle Installation Detail for New House Connection to Existing Sewer	1 of 1
	BC 830.18	Pipe Replacement Detail for New House Connections to Existing Sewers	1 of 1
	BC 830.19	Measuring and Recording As Built Location of New Sanitary House Connections	1 of 2
	BC 830.19	Measuring and Recording As Built Location of New Sanitary House Connections	2 of 2
	BC 830.20	Typical Detail for Leakage Exfiltration Testing	1 of 1
BC 870.01	BC 831.01	Standard Brick Sanitary Manhole	1 of 1
BC 870.02	BC 831.02	Sanitary Manhole Type C	1 of 1
BC 870.03	BC 831.03	Sanitary Terminal Manhole	1 of 1
BC 870.35	BC 831.04	48” Diameter Precast Sanitary Manhole for Pipe Diameters up to 24”	1 of 1
BC 870.36	BC 831.05	60” Diameter Precast Sanitary Manhole for Pipe Diameters up to 36”	1 of 1
BC 870.37	BC 831.06	72” Diameter Precast Sanitary Manhole for Pipe Diameters up to 48”	1 of 1
BC 870.39	BC 831.07	48” Diameter Precast “Doghouse” Riser for Pipe Diameters up to 24”	1 of 1

	BC 831.08	60” Diameter Precast “Doghouse” Riser for Pipe Diameters up to 36”	1 of 1
BC 870.04	BC 831.09	Sanitary Type A Drop Connection/Sanitary Type B Drop Connection	1 of 1
	BC 831.10	Manhole Abandonment	1 of 1
BC 870.05	BC 831.20	Sanitary Offset Manhole 30" Cover	1 of 1
BC 870.06	BC 831.21	Standard Sanitary Manhole Precast Slab	1 of 1
BC 870.07	BC 831.22	Precast Manhole Slab for 24" Frame	1 of 1
BC 870.08	BC 831.23	Special Fittings	1 of 1
BC 870.11	BC 831.24	Standard San. 24" Manhole Cover	1 of 1
BC 870.12	BC 831.25	Standard 24" Manhole Frame	1 of 1
BC 870.13	BC 831.26	Standard Sanitary 30" Manhole Cover	1 of 1
BC 870.14	BC 831.27	Standard 30" Manhole Frame	1 of 1
BC 870.15	BC 831.28	Locking Device for Manhole Frame & Cover	1 of 1
	BC 831.29	Cleanout Cover Assembly	1 of 1
BC 870.16	BC 831.30	Type 1 Step for Brick Manholes	1 of 1
BC 870.l7	BC 831.31	Type 2 Step for Precast & Cast in Place Manholes	1 of 1
	BC 831.32	Copolymer Polypropylene Steps for Precast and Cast in Place Manholes	1 of 1
BC 870.30	BC 831.35	Typical Manhole Channels Standard Channel No.1 and No.2	1 of 1
BC 870.31	BC 831.36	Typical Manhole Channels Standard Channel No.3, No.4 and No.5	1 of 1
BC 870.32	BC 831.37	Typical Manhole Channels Standard Channel No.6 and No.7	1 of 1
BC 870.33	BC 831.38	Typical Manhole Channels Standard Channel No.8, No.9 and No. 10	1 of 1
BC 870.34	BC 831.39	Typical Manhole Channels Standard Channel No. 11 and No. 12	1 of 1



NOTES:

1. Stone (No. 6 Aggregate) may be substituted for gravel.
2. The trench widths "W" shown in the table below shall be used when constructing sanitary sewers using Ductile Iron Pipe.
3. When 2 tier trench support is required, add 24" to "W" for calculating the amount of paving needed for trench repair.

EXTRA STRENGTH CLAY PIPE								
DIMENSIONS							CUBIC YARDS PER LIN. FT.	
D	OD	ODB	A	B	W			
					MIN.	MAX.	MIN.	MAX.
6"	7.75"	10"	5"	4"	30"	60"	0.0631	0.1325
8"	10.25"	13"	6"	5"	30"	60"	0.0745	0.1594
10"	12.5"	15.5"	6"	6"	30"	60"	0.0776	0.1702
12"	14.75"	18"	6"	6"	36"	60"	0.0941	0.1682
15"	18.75"	22"	6"	6"	42"	60"	0.1100	0.1656
18"	22.5"	26.5"	6"	6"	42"	66"	0.1074	0.1814
21"	26.5"	30"	6"	6"	48"	66"	0.1235	0.1790
24"	30"	34"	6"	6"	48"	72"	0.1223	0.1963
27"	33.75"	39"	7"	6"	54"	78"	0.1524	0.2326
30"	37.25"	43"	7"	6"	60"	78"	0.1717	0.2319

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

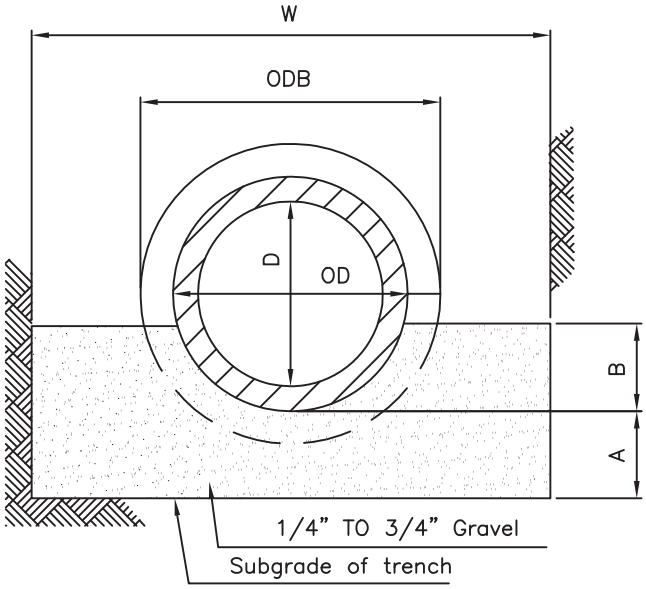
GRAVEL CRADLE FOR
E.S.C.P. SANITARY SEWERS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 830.01

SCALE : NONE

SHEET 1 OF 1



NOTES:

1. Stone (No. 6 Aggregate) may be substituted for gravel.
2. When 2 tier trench support is required, add 24" to "W" for calculating the amount of paving needed for trench repair.

REINFORCED CONCRETE PIPE								
DIMENSIONS							CUBIC YARDS PER LIN. FT.	
D	OD	ODB	A	B	W			
					MIN.	MAX.	MIN.	MAX.
15"	19"	23"	7"	6"	42"	60"	0.1203	0.1805
18"	22.5"	27"	7"	6"	42"	66"	0.1182	0.1984
21"	25.75"	30.5"	7"	6"	48"	66"	0.1372	0.1974
24"	29"	34"	7"	6"	48"	72"	0.1346	0.2148
27"	32.25"	37.5"	7"	6"	54"	78"	0.1528	0.2330
30"	36"	41.5"	7"	6"	60"	78"	0.1711	0.2313
33"	39.5"	45.5"	7"	6"	60"	84"	0.1710	0.2512
36"	42.75"	49"	8"	6"	66"	90"	0.2063	0.2927
42"	50"	57.5"	8"	6"	72"	96"	0.2249	0.3113
48"	57"	66"	9"	6"	84"	102"	0.2848	0.3542
54"	64"	72.5"	9"	7"	90"	108"	0.3209	0.3949
60"	72"	75.5"	6"	8"	102"	114"	0.3046	0.3478
66"	79"	81"	6"	8"	108"	120"	0.3232	0.3664
72"	86"	88"	6"	9"	114"	126"	0.3620	0.4083

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

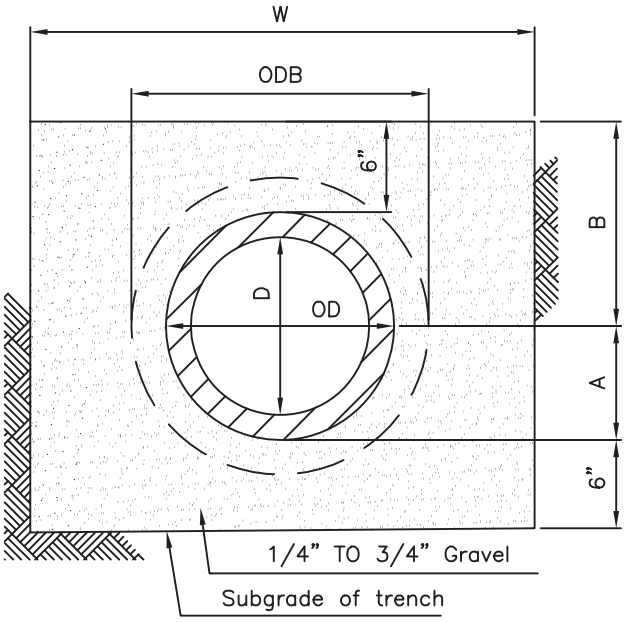
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

GRAVEL CRADLE FOR R.C.P. SANITARY SEWERS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 830.02

SCALE : NONE | SHEET 1 OF 1



NOTES:

1. Stone (No. 6 Aggregate) may be substituted for gravel.

2. When 2 tier trench support is required, add 24" to "W" for calculating the amount of paving needed for trench repair

3. Haunching area (A) around the pipe shall be compacted to a minimum 95% proctor density. Tamping shall be done in 4" layers to the spring line. Compaction of the embedment material should be done in a way that the compaction equipment will not damage the pipe or cause deflection of/in the pipe. When Hydro–Hammers are used to achieve compaction they should not be used within 3' of the top of pipe and then only if the embedment material density has been previously compacted to a minimum 85% proctor density.

P.V.C. PIPE								
DIMENSIONS							CUBIC YARDS PER LIN. FT.	
D	OD	ODB	A	B	W			
					MIN.	MAX.	MIN.	MAX.
6"	6.25"	7"	3.13"	9.13"	30"	60"	0.1330	0.2737
8"	8.5"	9.5"	4.25"	10.25"	30"	60"	0.1436	0.3018
10"	10.5"	12"	5.25"	11.25"	30"	60"	0.1513	0.3250
12"	12.5"	14"	6.25"	12.25"	36"	60"	0.1953	0.3465
15"	15.25"	16.5"	7.63"	13.63"	42"	60"	0.2474	0.3735
18"	18.75"	20"	9.38"	15.38"	42"	66"	0.2612	0.4510
21"	22"	23.5"	11"	17"	48"	66"	0.3220	0.4794
24"	24.75"	26.5"	12.38"	18.38"	48"	72"	0.3300	0.5568
27"	28"	30"	14"	20"	54"	78"	0.3972	0.6441

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

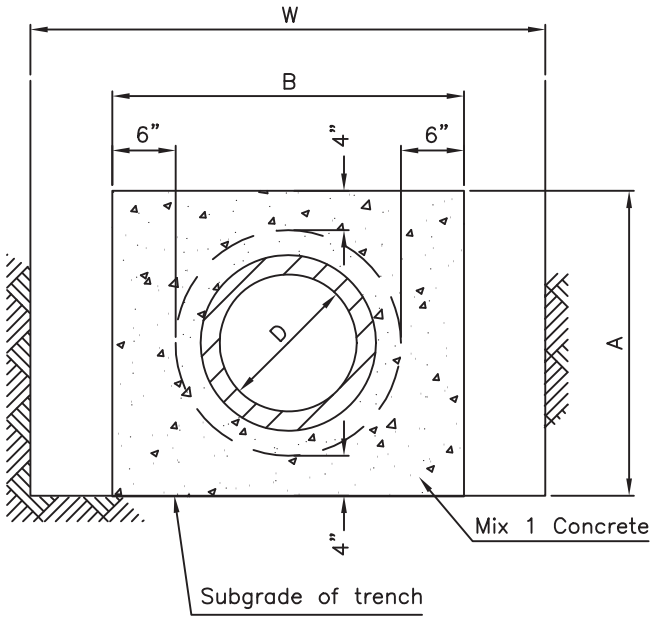
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

GRAVEL CRADLE FOR
P.V.C. SANITARY SEWERS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 830.03

SCALE : NONE | SHEET 1 OF 1



DIMENSIONS			C.Y. PER L.F.
D	A	B	
EXTRA STRENGTH CLAY PIPE			
6"	18"	22"	0.0894
8"	21"	25"	0.1143
10"	23.5"	27.5"	0.1348
12"	26"	30"	0.1569
15"	30"	34"	0.1912
18"	34.5"	38.5"	0.2407
21"	38"	42"	0.2701
24"	42"	46"	0.3132
27"	47"	51"	0.3890
30"	51"	55"	0.4432
REINFORCED CONCRETE PIPE			
15"	31"	35"	0.2064
18"	35"	39"	0.2487
21"	38.5"	42.5"	0.2864
24"	42"	46"	0.3261
27"	45.5"	49.5"	0.3692
30"	49.5"	53.5"	0.4204

DIMENSIONS			C.Y. PER L.F.
D	A	B	
P.V.C. PIPE			
6"	15"	19"	0.0654
8"	17.5"	21.5"	0.0822
10"	20"	24"	0.1012
12"	22"	26"	0.1156
15"	24.5"	28.5"	0.1326
18"	28"	32"	0.1594
21"	31.5"	35.5"	0.1898
24"	34.5"	38.5"	0.2179
27"	38"	42"	0.2521
DUCTILE IRON PIPE			
6"	17"	21"	0.0819
8"	19.5"	23.5"	0.1006
10"	21.5"	25.5"	0.1154
12"	23.5"	27.5"	0.1294
14"	26.5"	30.5"	0.1594
16"	28.5"	32.5"	0.1764
18"	30.5"	34.5"	0.1918

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

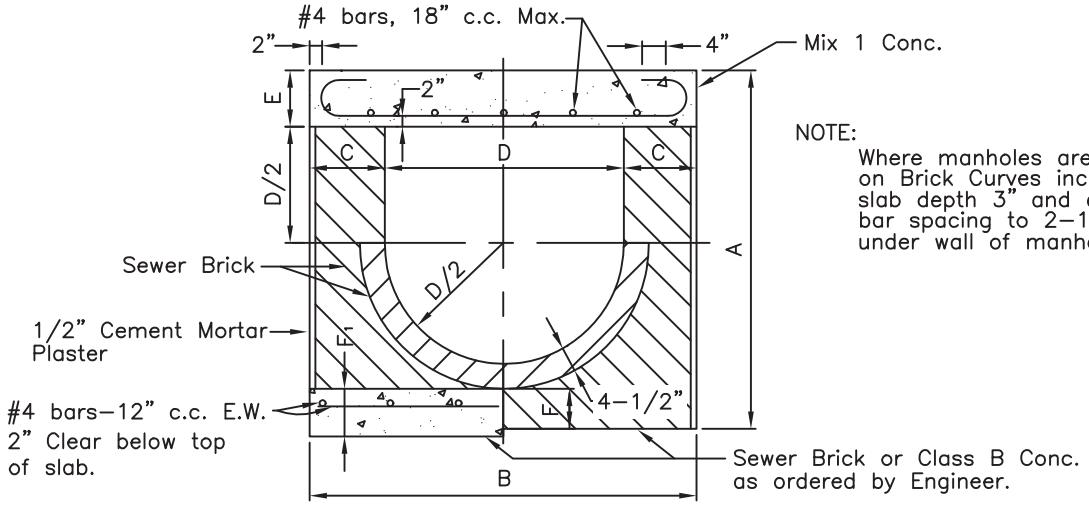
ISSUED	REVISED	REVISED
3 / 2008		

CONCRETE ENCASEMENT FOR SANITARY SEWERS

STANDARD NO. BC 830.04

SCALE : NONE

SHEET 1 OF 1



NOTE:
Where manholes are built on Brick Curves increase slab depth 3" and decrease bar spacing to 2–1/2" c.c. under wall of manhole.

DIMENSIONS								
D	A	B	C	E	F	F_1	STEEL	No. of Temp. bar
24"	3'–5"	3'–6"	9"	8"	4–1/2"	6"	#5 bars @ 10" c.c.	3
27"	3'–8"	3'–9"	9"	8"	4–1/2"	6"	#5 bars @ 8" c.c.	3
30"	3'–11"	4'–0"	9"	8"	4–1/2"	6"	#5 bars @ 7" c.c.	3
33"	4'–2"	4'–3"	9"	8"	4–1/2"	6"	#5 bars @ 6" c.c.	3
36"	4'–5"	4'–6"	9"	8"	4–1/2"	6"	#5 bars @ 5" c.c.	3
42"	5'–3"	5'–8"	13"	10"	6–1/2"	8"	#5 bars @ 6" c.c.	5
48"	5'–9"	6'–2"	13"	10"	6–1/2"	8"	#5 bars @ 5" c.c.	5
54"	6'–3"	6'–8"	13"	10"	6–1/2"	8"	#6 bars @ 8" c.c.	5
60"	6'–9"	7'–2"	13"	10"	6–1/2"	8"	#6 bars @ 6" c.c.	5

QUANTITIES PER LINEAR FOOT					
SIZE	Class A Conc.		Brick (Flat)	Brick (On Edge)	STEEL
24"	0.0864 Cu. Yds.	FOR BRICK BOTTOM	0.1724 Cu. Yds.	0.0518 Cu. Yds.	7.235 lbs.
27"	0.0926		0.1920	0.0573	8.934
30"	0.0988		0.2121	0.0627	10.369
33"	0.1049		0.2327	0.0682	12.286
36"	0.1111		0.2538	0.0736	14.968
42"	0.1749		0.4374	0.0845	16.576
48"	0.1903		0.4985	0.0954	20.474
54"	0.2058		0.5616	0.1064	20.344
60"	0.2212		0.6266	0.1173	27.513

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

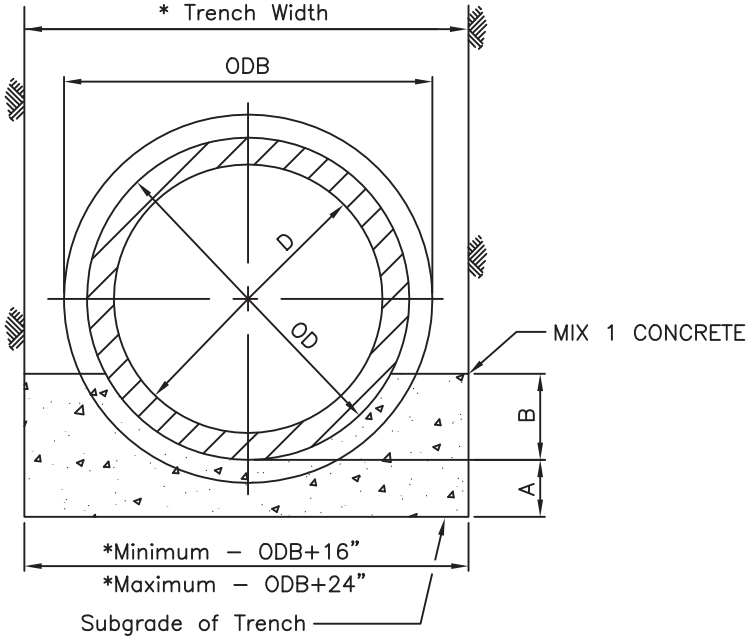
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD BRICK AND CONCRETE CURVES FOR SANITARY SEWERS

STANDARD NO. BC 830.05

SCALE : NONE | SHEET 1 OF 1



* For Pipes 60" And Larger in Diameter, Trench Width Varies from OD+24" Minimum To OD+36" Maximum.

EXTRA STRENGTH CLAY PIPE						
DIMENSIONS					CUBIC YARDS PER LIN. FT.	
D	OD	ODB	A	B	MIN.	MAX.
15"	$18\frac{11}{16}$"	22"	4"	5"	0.0727	0.0912
18"	$22\frac{7}{16}$"	$26\frac{1}{2}$"	5"	6"	0.0987	0.1213
21"	$26\frac{3}{8}$"	30"	6"	7"	0.1235	0.1502
24"	$30\frac{1}{16}$"	34"	6"	8"	0.1413	0.1701
27"	$33\frac{5}{8}$"	39"	7"	8"	0.1701	0.2010
30"	$37\frac{1}{8}$"	43"	8"	9"	0.2066	0.2416

REINFORCED CONCRETE PIPE						
DIMENSIONS					CUBIC YARDS PER LIN. FT.	
D	OD	ODB	A	B	MIN.	MAX.
15"	19"	23"	4"	5"	0.0748	0.0933
18"	$22\frac{1}{2}$"	27"	5"	6"	0.1001	0.1227
21"	$25\frac{3}{4}$"	$30\frac{1}{2}$"	6"	7"	0.1260	0.1527
24"	29"	34"	6"	8"	0.1423	0.1711
27"	$32\frac{1}{4}$"	$37\frac{1}{2}$"	7"	8"	0.1655	0.1964
30"	36"	$41\frac{1}{2}$"	8"	9"	0.2007	0.2357
33"	$39\frac{1}{2}$"	$45\frac{1}{2}$"	9"	10"	0.2377	0.2768
36"	$42\frac{3}{4}$"	49"	9"	11"	0.2597	0.3009
42"	50"	$57\frac{1}{2}$"	11"	13"	0.3500	0.3994
48"	57"	66"	12"	15"	0.4311	0.4867
54"	64"	$72\frac{1}{2}$"	14"	16"	0.5220	0.5837
60"	72"	$75\frac{1}{2}$"	15"	18"	0.6106	0.7124
66"	79"	81"	17"	20"	0.7303	0.8445
72"	86"	88"	18"	22"	0.8297	0.9532

APPROVED:

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

CONCRETE CRADLE
FOR SANITARY SEWERS

STANDARD NO.
BC 830.06

ISSUED 3 / 2008

REVISED

REVISED

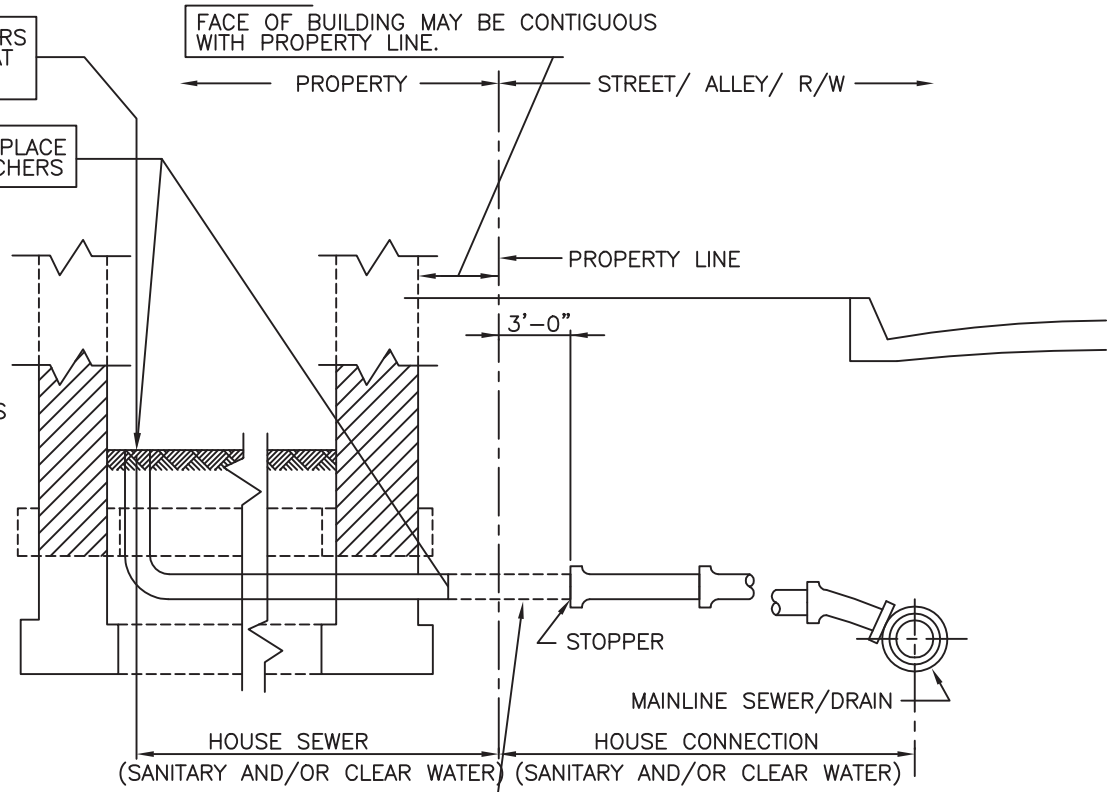
SCALE : NONE

SHEET 1 OF 1

WHERE PLANS INDICATE PLUGGING HOUSE SEWERS INSIDE PROPERTY LINES. PLUG HOUSE SEWER AT SUBGRADE OF UNPAVED CELLAR FLOORS.

ANY PORTION OF THE HOUSE SEWERS LEFT IN PLACE SHALL BE PLUGGED AT THE ENDS OF THE REACHERS

NOTE:
DIAMETER OF HOUSE SEWERS/CONNECTIONS TO BE PLUGGED VARY FROM 4" TO 8". STOPPERS TO BE OF ANY APPROVED COMMERCIAL GAS TIGHT TYPE.



WHERE PLANS INDICATE PLUGGING HOUSE CONNECTIONS OUTSIDE PROPERTY LINES. REMOVE LENGTH OF HOUSE CONNECTION PIPE AND INSTALL STOPPER LOCATION OF PLUGGED (STOPPER) END OF HOUSE CONNECTION TO BE NOT LESS THAN 3'-0" OUTSIDE OF PROPERTY LINE UNLESS SUITABLE BELL IS FOUND WITHIN THE 3'-0" MIN.

LEGEND

HOUSE CONNECTION TO BE PLUGGED OUTSIDE OF PROPERTY LINES.

HOUSE SEWER/HOUSE CONNECTION TO BE PLUGGED INSIDE PROPERTY LINES.

M.H. L.H. SEWERS, MANHOLES AND LAMPHOLES TO BE ABANDONED.

M.H. – EXISTING MANHOLE
F.C. – FRONT CONNECTION
R.C. – REAR CONNECTION
S.C. – SIDE CONNECTION
(6.0') – APPROX. DEPTH OF CONNECTION AT PROPERTY LINE
0+17.0 – APPROX. LOCATION OF CONNECTION AT PROPERTY LINE OR SHOWN BY DIMENSION
L.H. – LAMPHOLE

APPROVED:
HEAD, BUREAU OF WATER AND WASTEWATER
DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

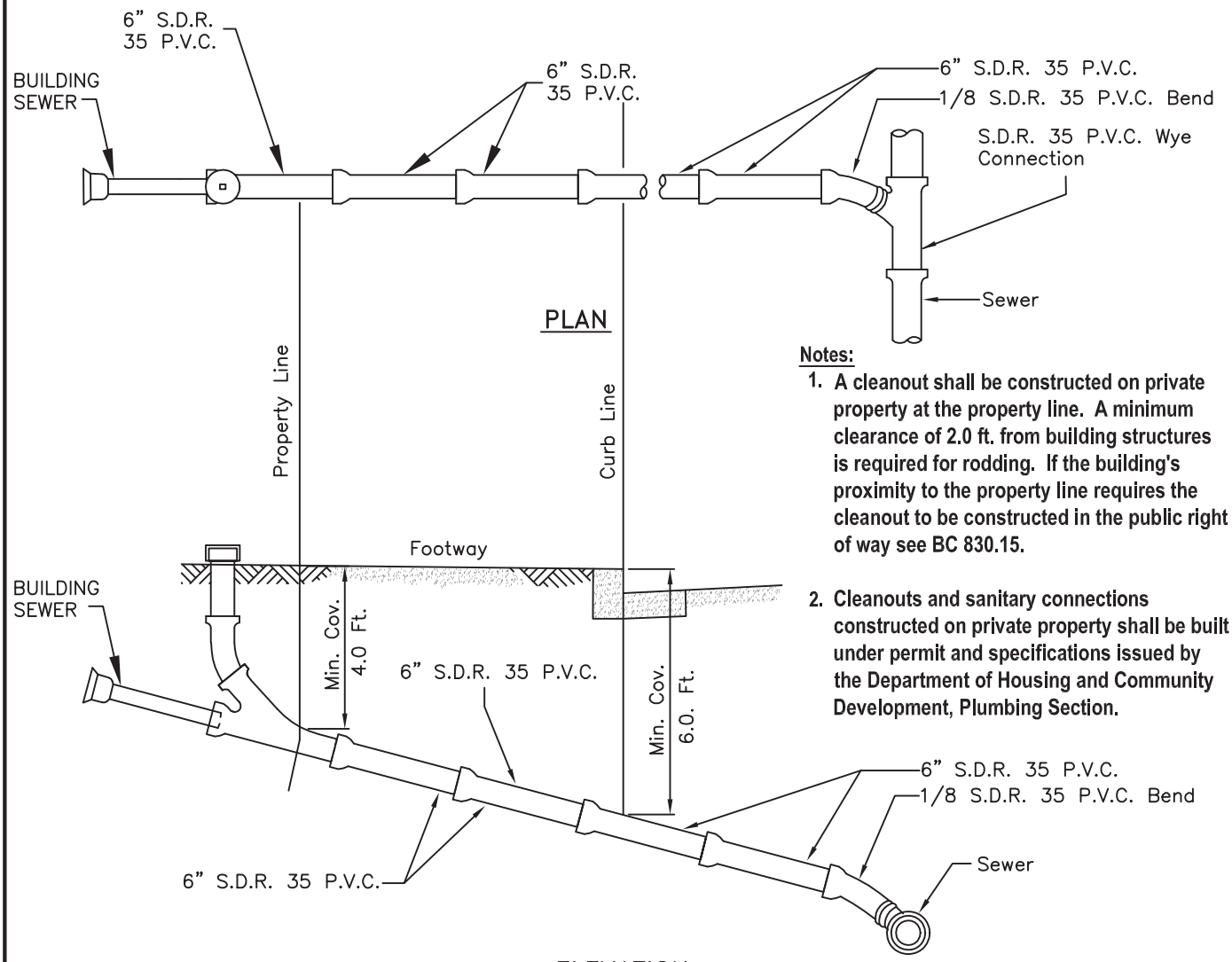
TYPICAL PLUGGING DETAIL
SANITARY HOUSE CONNECTIONS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 830.13

SCALE: NONE

SHEET 1 OF 1



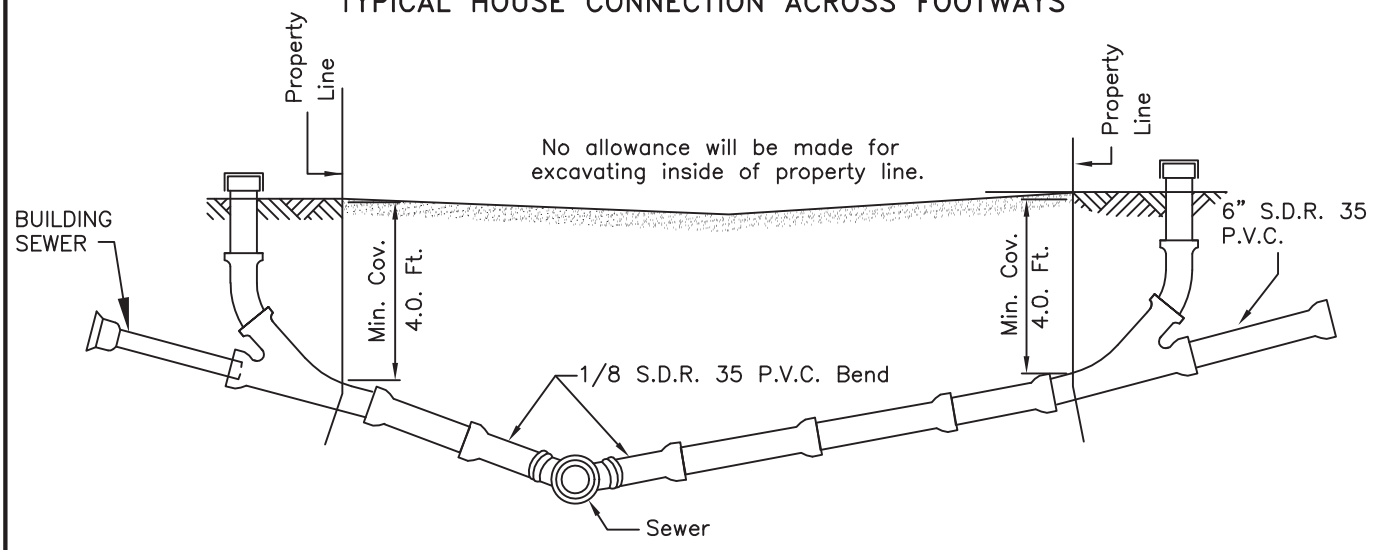
ELEVATION

TYPICAL HOUSE CONNECTION ACROSS FOOTWAYS

Notes:

1. **A cleanout shall be constructed on private property at the property line. A minimum clearance of 2.0 ft. from building structures is required for rodding. If the building's proximity to the property line requires the cleanout to be constructed in the public right of way see BC 830.15.**

2. **Cleanouts and sanitary connections constructed on private property shall be built under permit and specifications issued by the Department of Housing and Community Development, Plumbing Section.**



TYPICAL HOUSE CONNECTION IN ALLEYS

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

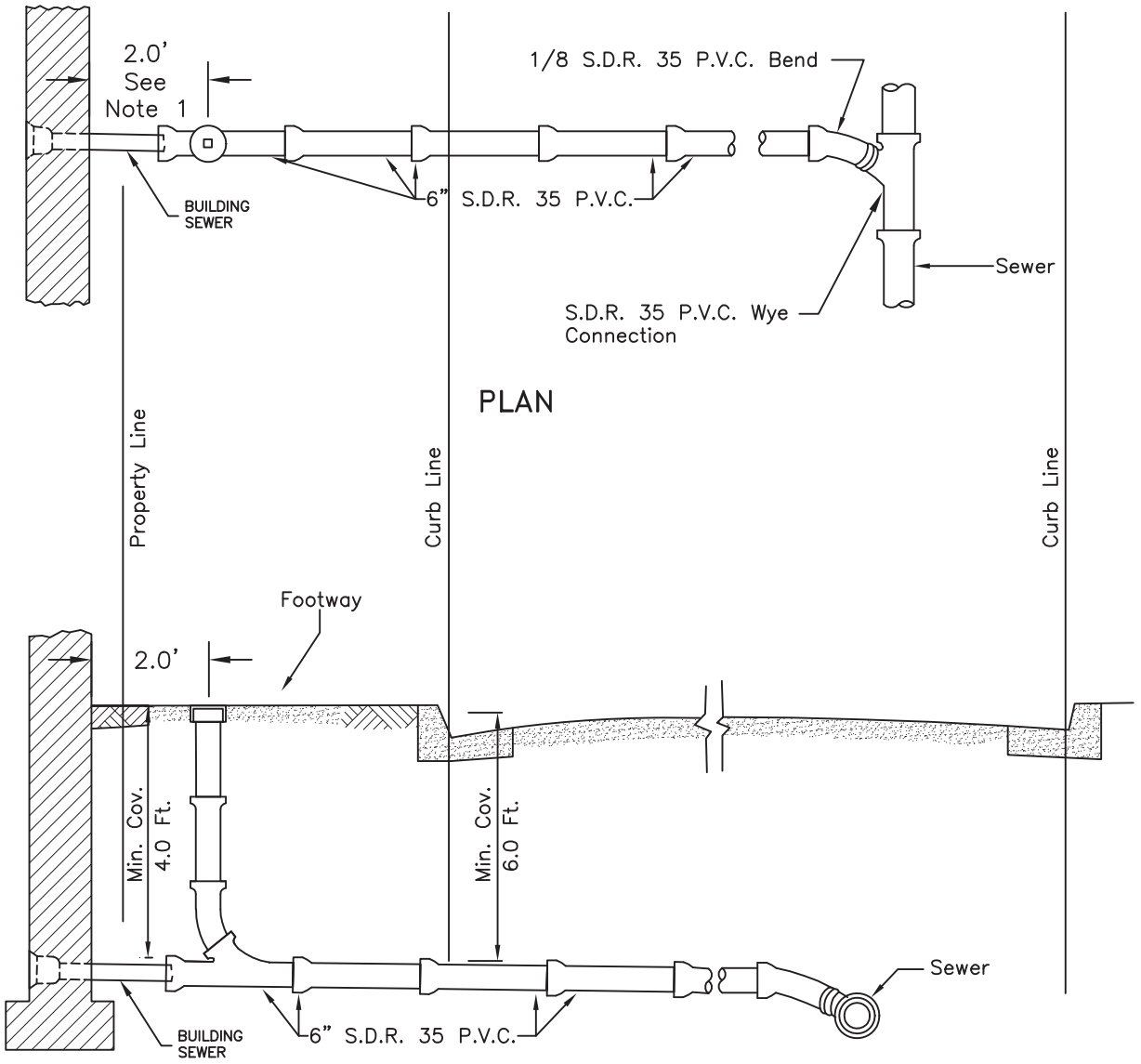
TYPICAL INSTALLATIONS OF SANITARY HOUSE CONNECTIONS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 830.14

SCALE : NONE

SHEET 1 OF 1



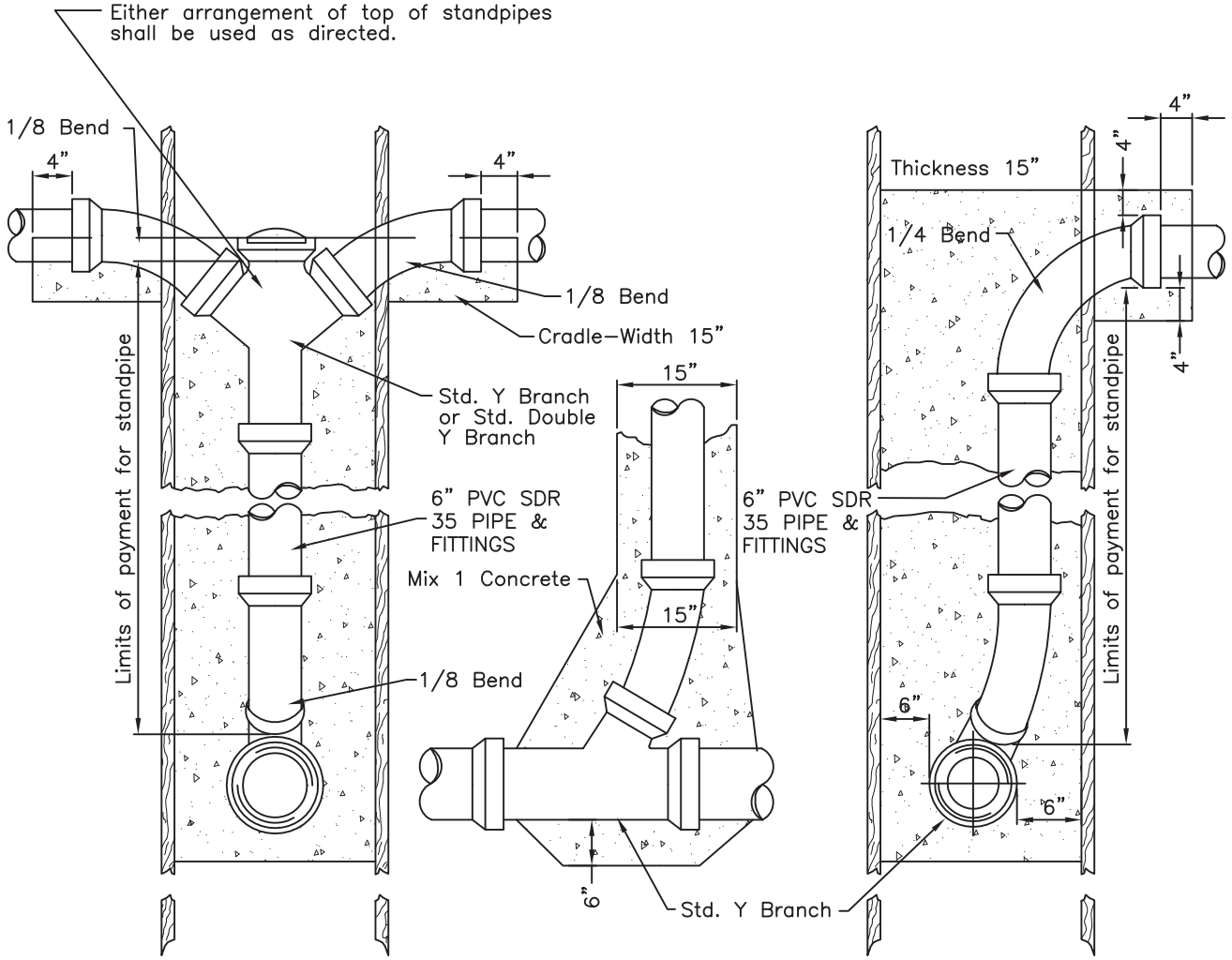
ELEVATION

Notes:

1. All cleanouts shall be constructed on private property under permits issued by the Department of Housing and Community Development, Plumbing Section. However, when the building's proximity to the property line requires the cleanout to be built in the public right of way the cleanout shall be built under permit issued by the Department of Public Works, Wastewater Engineering Office.

2. See BC 831.29 for cleanout cover.

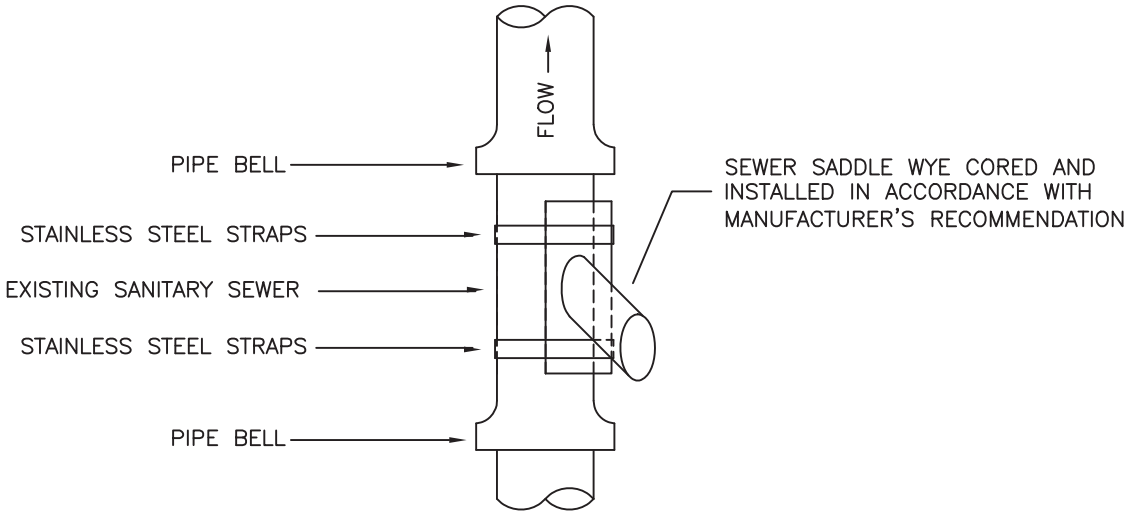
CITY OF BALTIMORE	APPROVED :	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
	HEAD, BUREAU OF WATER AND WASTEWATER		3 / 2008		
	DIRECTOR, DEPARTMENT OF PUBLIC WORKS	TYPICAL HOUSE CONNECTION WITH CLEANOUT IN PUBLIC RIGHT-OF-WAY	STANDARD NO. BC 830.15		
			SCALE : NONE	SHEET 1 OF 1	



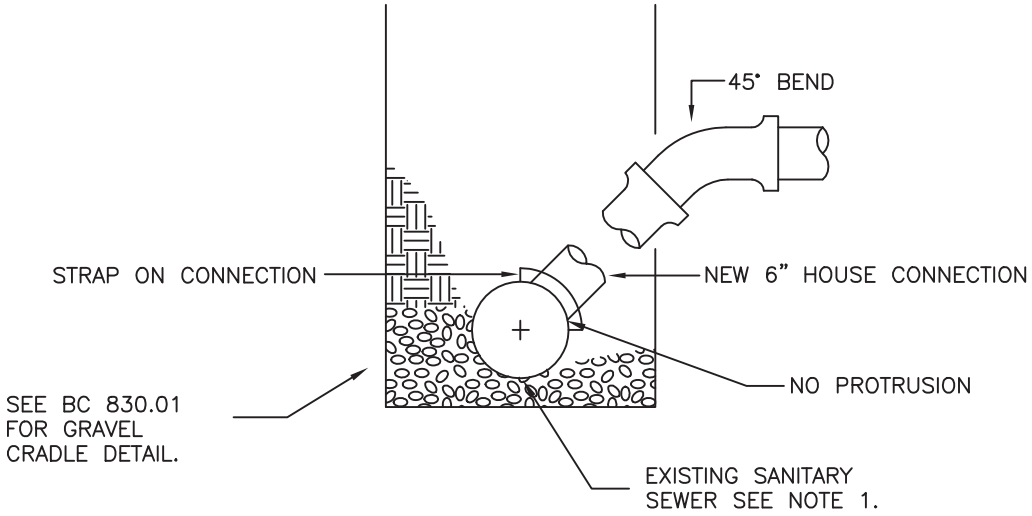
Note:

House connections to be laid not less than 15" below cellar floor if depth of sewer will allow except where "Written Request" is made for connection above floor; connections must be placed at greater depth wherever necessary to properly drain fixtures in cellar.

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		TYPICAL INSTALLATIONS OF STANDPIPE HOUSE CONNECTIONS	STANDARD NO. BC 830.16		
			SCALE : NONE	SHEET 1 OF 1	



PLAN



SECTION

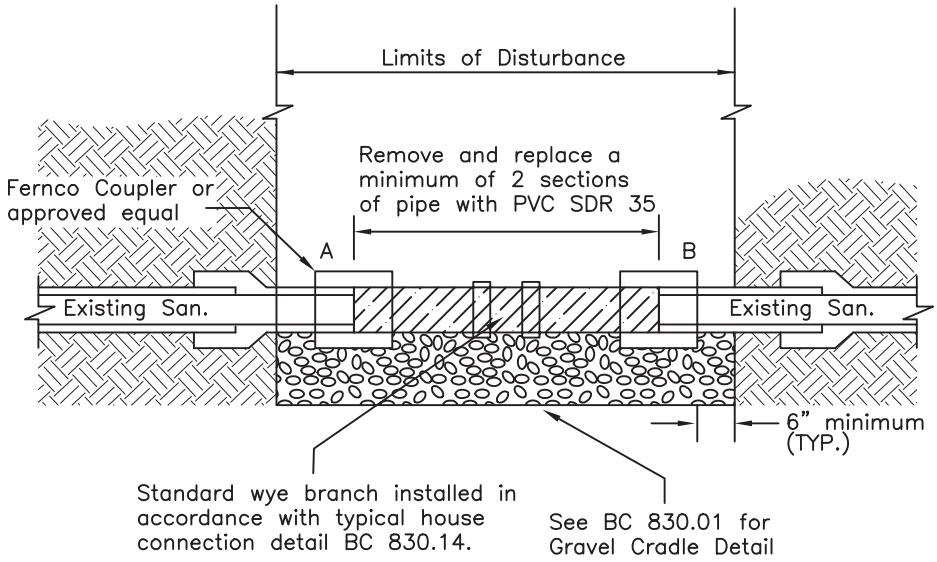
NOTES:

1. Existing sewer main shall be at least 10 inches in diameter for 6 inch house connections when using a sewer saddle. When sewer main is less than 10" in diameter, then pipe replacement method shall be used as shown on Standard Detail BC 830.18. A manhole shall be used when the house connection is 8" or larger.

2. Contractor shall maintain all flows in accordance with all state and local requirements.

3. When directed by the City, concrete encase saddle connection in accordance with Standard Detail BC 830.04.

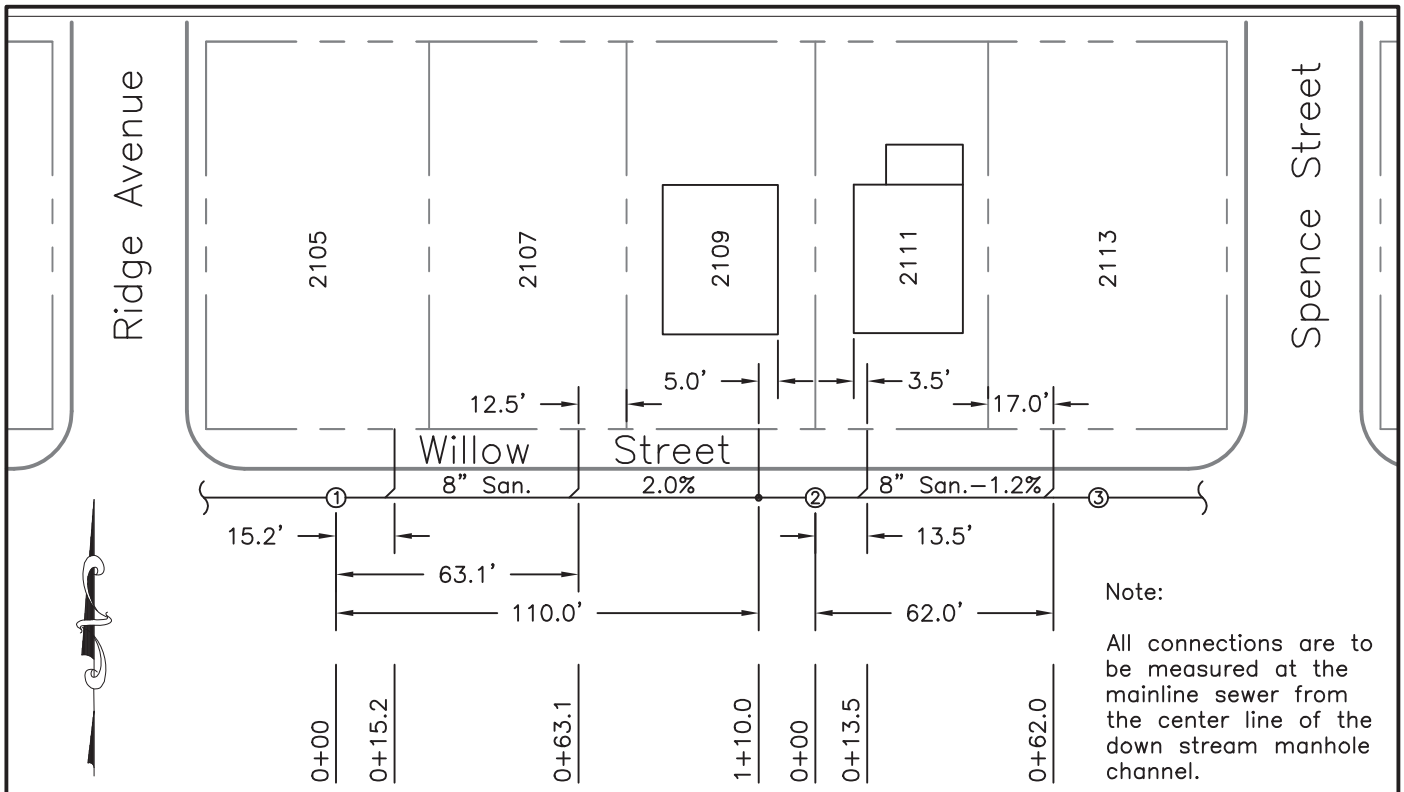
CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		SADDLE INSTALLATION DETAIL FOR NEW HOUSE CONNECTION TO EXISTING SEWER	STANDARD NO. BC 830.17		
			SCALE : NONE	SHEET 1 OF 1	



NOTES:

1. Saw cut pipe at station A and B unless pipe bell corresponds with location.
2. Offset pipe joints will not be permitted.
3. Where existing pipe is at least 10" or larger, a sewer saddle may be used as shown in standard detail BC 830.17.
4. Contractor shall maintain all flows in accordance with all state and local requirements.

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		PIPE REPLACEMENT DETAIL FOR NEW HOUSE CONNECTIONS TO EXISTING SEWERS	STANDARD NO. BC 830.18		
			SCALE : NONE	SHEET 1 OF 1	



Note:

All connections are to be measured at the mainline sewer from the center line of the down stream manhole channel.

*See Sheet 2 of 2 for form.

Willow St. from Ridge Ave. to Spence St. PREPARER'S NAME

M.H. 1 to M.H. 2 COMPLETION DATE 07/10/90

HOUSE No.	FRONT REAR OR SIDE	STA. OF Y	SIZE/ TYPE	STAND-PIPE * SIZE LENGTH AND KIND	LOCATION AT R/W OR PROPERTY LINE	COVER ** At Curb	COVER ** At P.L.
2105	Front	0 + 15.2	6" PVC		Blind 'Y'		
2107	Front	0 + 63.1	6" PVC		12.5' West of East Property Line		9.2'
2109	Front	1 + 10.0	6" PVC	4.5'	5.0' West of East Wall of House		6.0'

Willow St. from Ridge Ave. to Spence St. PREPARER'S NAME

M.H. 2 to M.H. 3 COMPLETION DATE 07/10/90

HOUSE No.	FRONT REAR OR SIDE	STA. OF Y	SIZE/ TYPE	STAND-PIPE * SIZE LENGTH AND KIND	LOCATION AT R/W OR PROPERTY LINE	COVER ** At Curb	COVER ** At P.L.
2111	Front	0 + 13.5	6" PVC		3.5' East of West Wall of House		5.4'
2113	Front	0+ 62.0	6" PVC		17.0' East of West Property Line	6.1'	

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

MEASURING AND RECORDING AS-BUILT LOCATION OF NEW SANITARY HOUSE CONNECTIONS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 830.19

SCALE : NONE

SHEET 1 OF 2

_____ from _____ to _____ _____
PREPARER'S NAME

M.H. _____ to M.H. _____ COMPLETION DATE _____

HOUSE No.	FRONT REAR OR SIDE	STA. OF Y	SIZE/ TYPE	STAND-PIPE * SIZE LENGTH AND KIND	LOCATION AT R/W OR PROPERTY LINE	COVER ** At Curb	COVER ** At P.L.

* NOTE IF THIS IS A DOUBLE STANDPIPE CONNECTION AND ALSO STATE COVER FROM GROUND LINE TO TOP PF STANDPIPE

**NOTE COVER AT CURB LINE ONLY IF DIFFERENT THAN P.L. OR IF CONNECTION DOESN'T EXTEND TO P.L.

APPROVED:
HEAD, BUREAU OF WATER AND WASTEWATER
DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

MEASURING AND RECORDING AS-BUILT LOCATION OF NEW SANITARY HOUSE CONNECTIONS

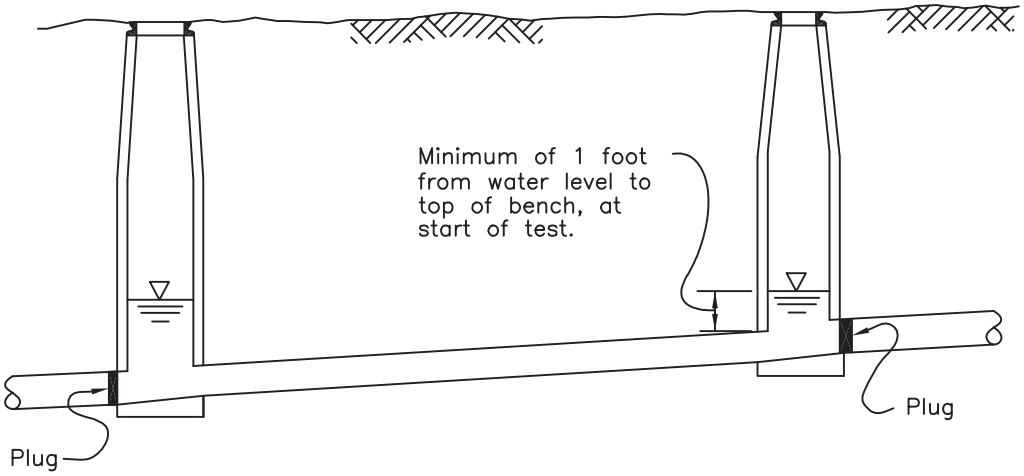
STANDARD NO. BC 830.19

ISSUED 3 / 2008
REVISED
REVISED

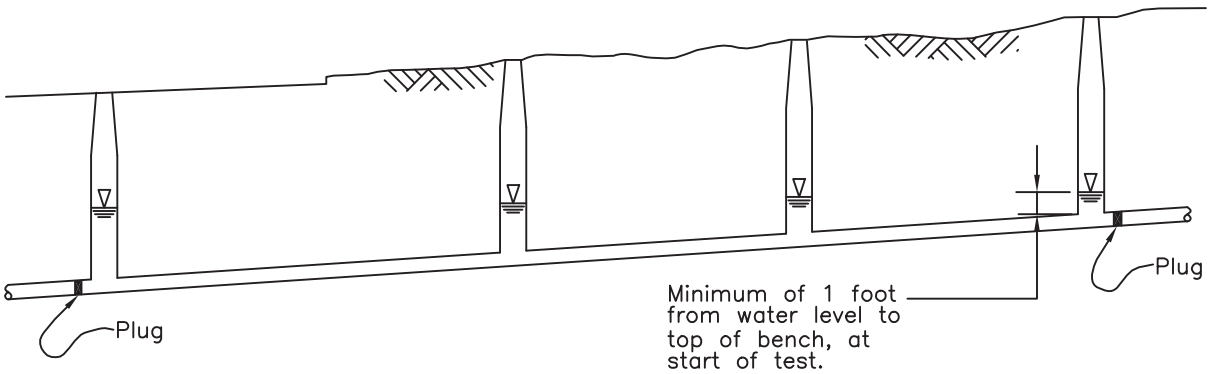
SCALE : NONE

NOTES:

Plug any newly installed house connections at property line prior to testing.

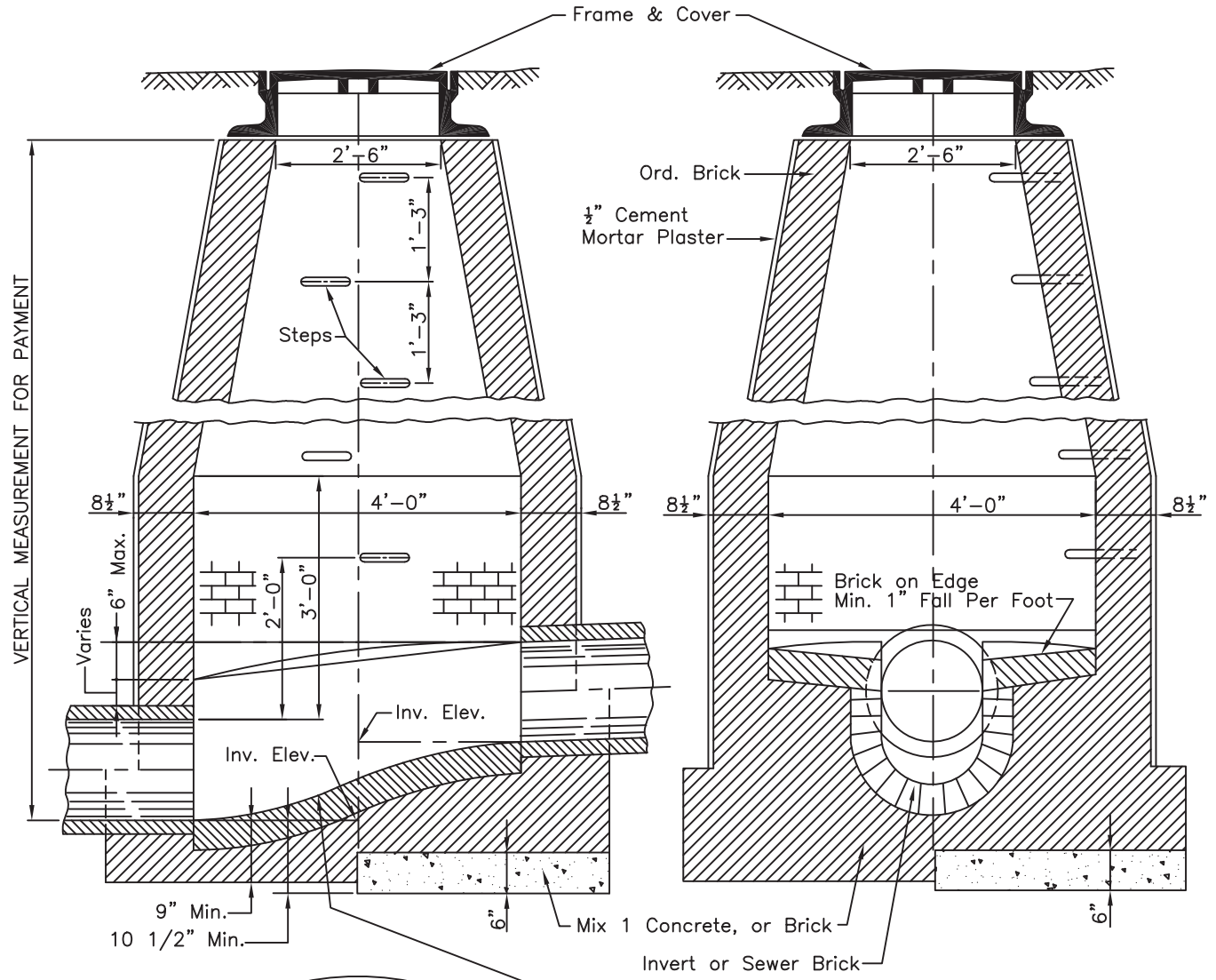


SINGLE SECTIONS

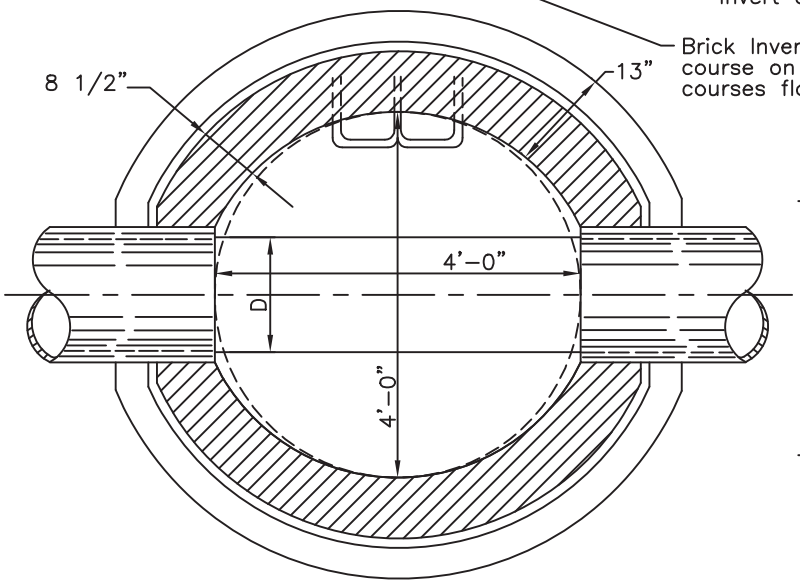


MULTIPLE SECTIONS

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		TYPICAL DETAIL FOR LEAKAGE EXFILTRATION TESTING	STANDARD NO. BC 830.20		
			SCALE : NONE	SHEET 1 OF 1	



Brick Invert to be constructed with one course on edge & a minimum of two courses flat.

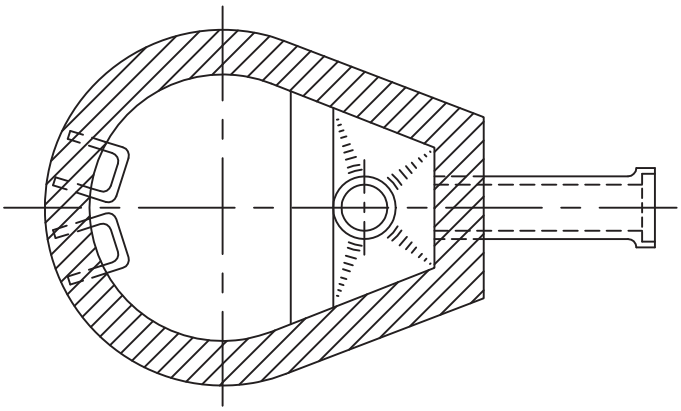


NOTE:
If Conc. Slab is used, place #4 bars 12" c.c. both ways 2" clear from top when required by Engineer.

MANHOLE WALL THICKNESS
8 1/2" Depth of 12'-0"
13" below Depth of 12'-0"

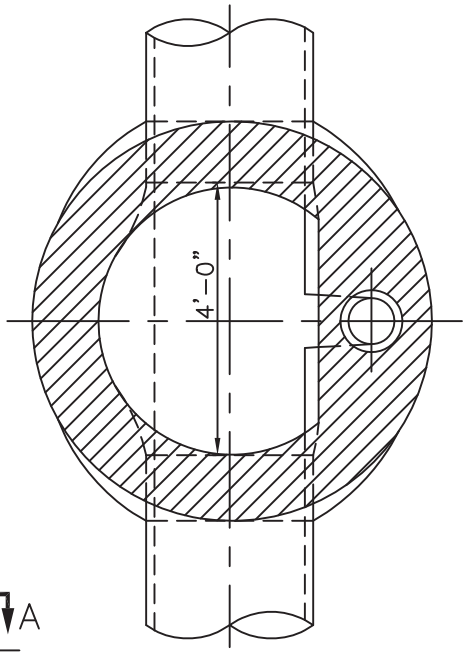
NOTE:
Bench Height above Outgoing Pipe Invert to be equal to Diameter of Outgoing Pipe.

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		STANDARD BRICK SANITARY MANHOLE	STANDARD NO. BC 831.01		
			SCALE : NONE	SHEET 1 OF 1	

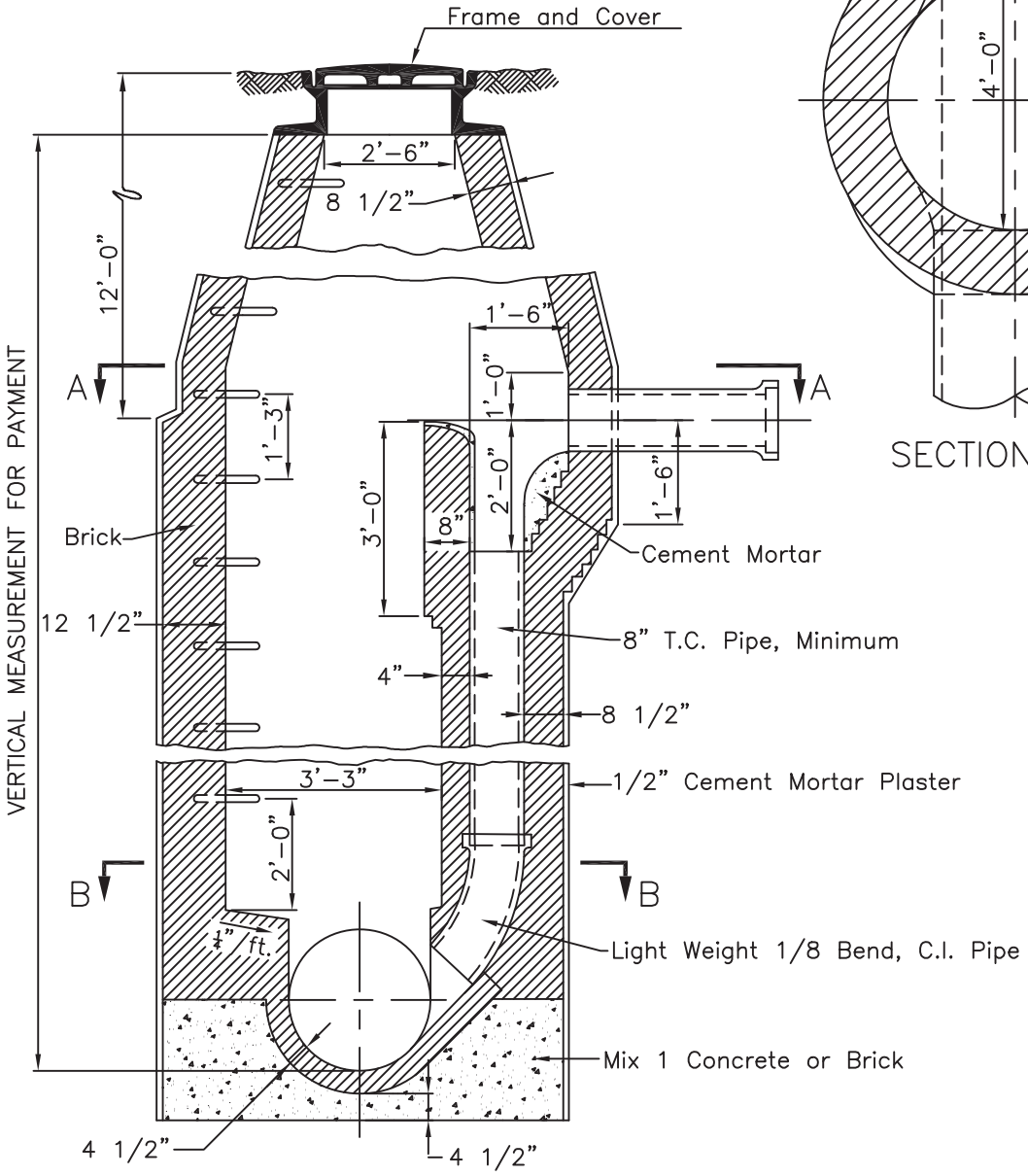


SECTION A–A

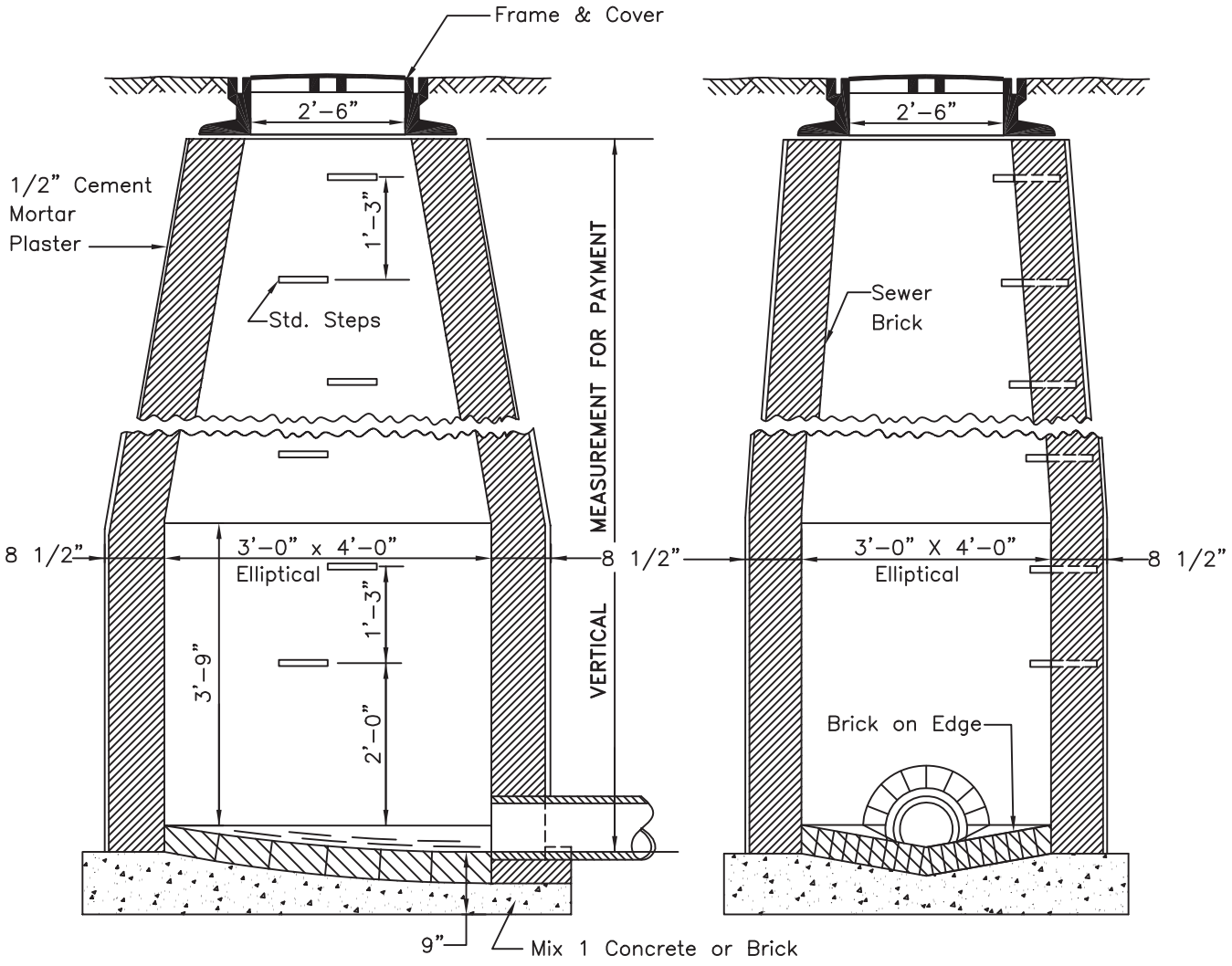
MANHOLE WALL THICKNESS
8" To Depth of 12'–0"
12" Below Depth of 12'–0"



SECTION B–B



CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		STANDARD MANHOLE TYPE C	STANDARD NO. BC 831.02		
			SCALE : NONE	SHEET 1 OF 1	

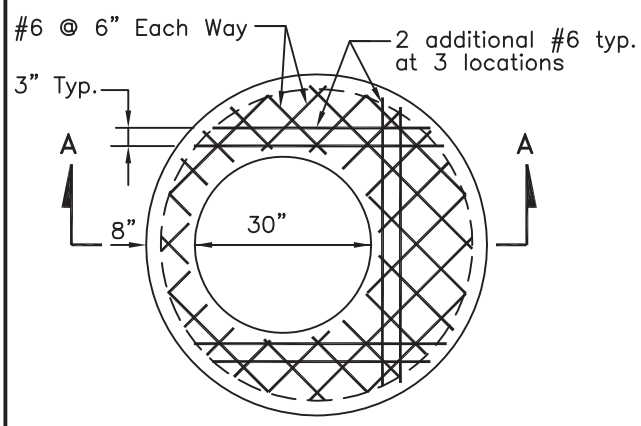


MANHOLE WALL THICKNESS

8" To Depth of 12'–0"

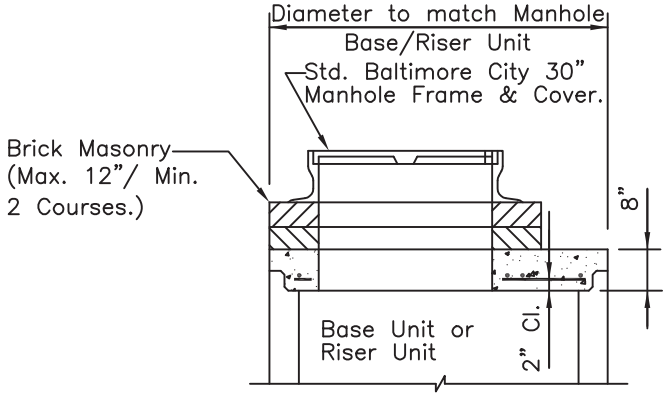
13" Below Depth of 12'–0"

APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	SANITARY TERMINAL MANHOLE	STANDARD NO. BC 831.03		
		SCALE : NONE	SHEET 1 OF 1	

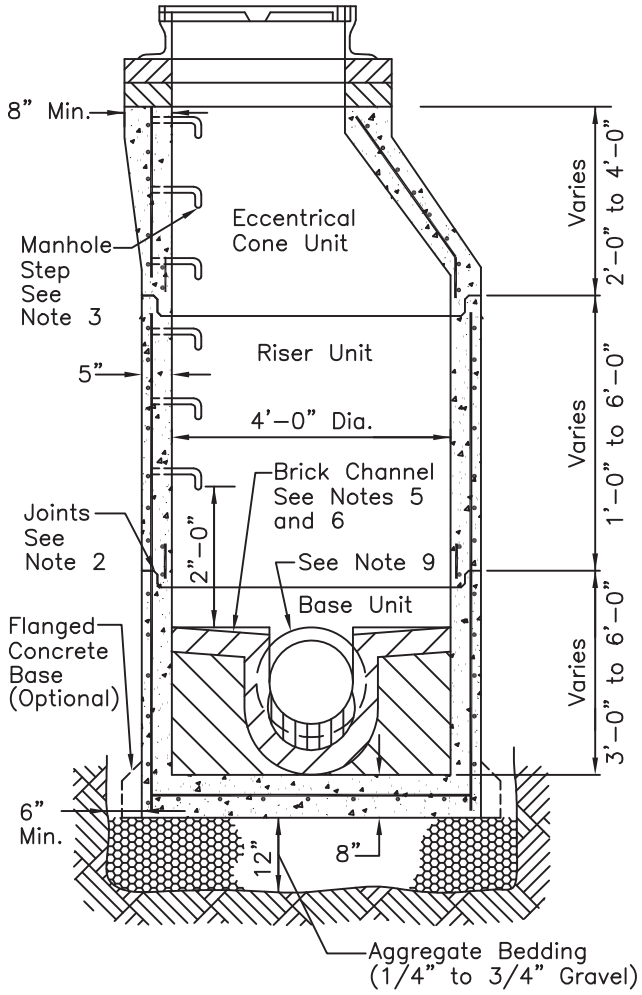


OPTIONAL FLAT TOP SLAB

(Shown without manhole frame and cover)
See Note 7



SECTION–A–A



NOTES:

1. Manhole design specifications shall conform to "Precast Reinforced Concrete Manhole Section A.S.T.M. designation C–478, latest revisions".
2. The manufacturer shall form male and female ends of joints using their own design. The joints shall be sealed by the contractor and made water tight using 'O' ring rubber gaskets meeting A.S.T.M. C–443 and C–361. Any excessive openings within the joints shall be filled using a non–shrinking grout filler.
3. Manhole steps shall be installed by the manufacturer in vertical alignment at 1'–0" typical c/c. Manhole steps shall be incidental to the cost of the manhole.
4. Lift holes or eyes shall be provided in each section for handling. When directed by the Engineer, these holes shall be plugged with water tight stoppers or a non–shrinking grout after installation.
5. Bench and channel to be constructed of one course of sewer brick on edge. Bench to slope a minimum of 1" per foot towards channel.
6. Bench height above outgoing pipe invert to be equal to the diameter of the outgoing pipe or as directed by the Engineer.
7. Use flat top slab when manhole length is not sufficient for eccentrical cone unit.
8. Vertical measurement for payment shall be from the invert of the outgoing pipe to the bottom of the manhole frame.
9. The pipe shall be sealed at manhole using an "A–Lok" gasket as manufactured by A–LOK Products Inc. or an approved equal meeting A.S.T.M. C–923, cast integrally in the manhole wall.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

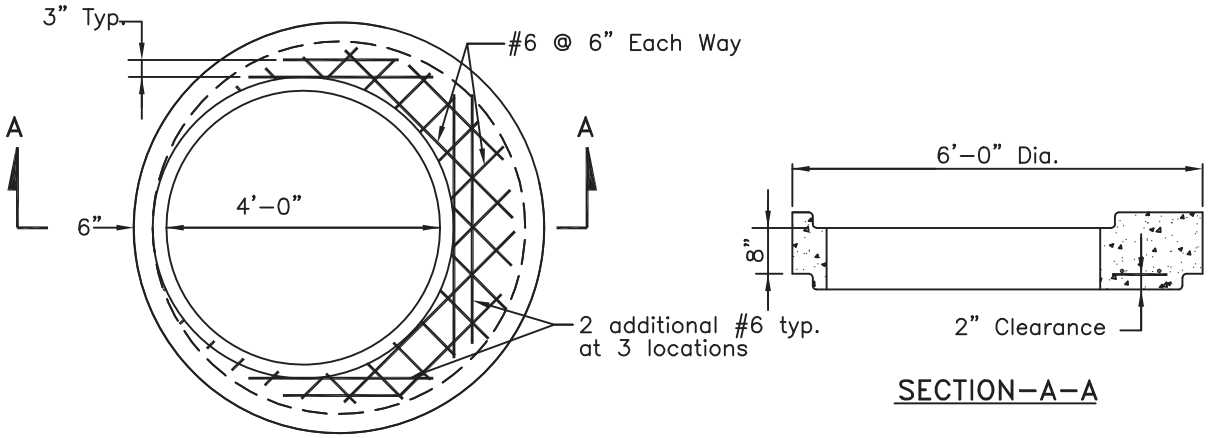
ISSUED	REVISED	REVISED
3 / 2008		

48" DIAMETER PRECAST SANITARY MANHOLE FOR PIPE DIAMETERS UP TO 24"

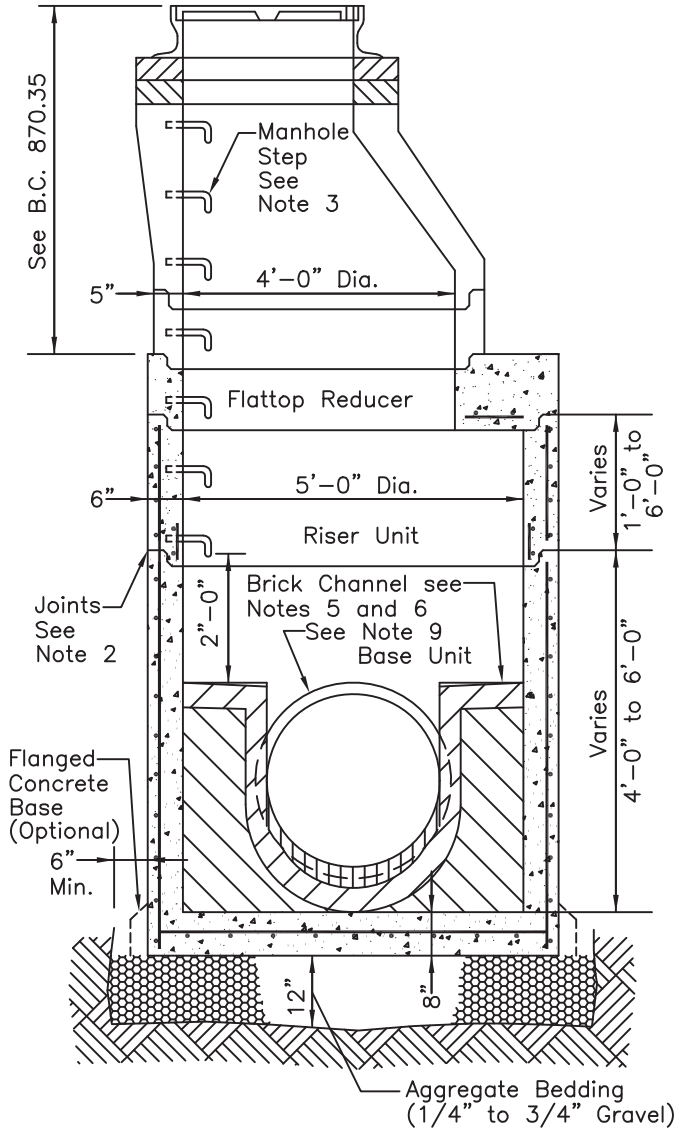
STANDARD NO. BC 831.04

SCALE : NONE

SHEET 1 OF 1



FLATTOP REDUCER



NOTES:

1. Manhole design specifications shall conform to "Precast Reinforced Concrete Manhole Section A.S.T.M. designation C–478, latest revisions".
2. The manufacturer shall form male and female ends of joints using their own design. The joints shall be sealed by the contractor and made water tight using 'O' ring rubber gaskets meeting A.S.T.M. C–443 and C–361. Any excessive openings within the joints shall be filled using a non–shrinking grout filler.
3. Manhole steps shall be installed by the manufacturer in vertical alignment at 1'–0" typical c/c. Manhole steps shall be incidental to the cost of the manhole.
4. Lift holes or eyes shall be provided in each section for handling. When directed by the Engineer, these holes shall be plugged with water tight stoppers or a non–shrinking grout after installation.
5. Bench and channel to be constructed of one course of sewer brick on edge. Bench to slope a minimum of 1" per foot towards channel.
6. Bench height above outgoing pipe invert to be equal to the diameter of the outgoing pipe or as directed by the Engineer.
7. Use flat top slab when manhole length is not sufficient for eccentrical cone unit.
8. Vertical measurement for payment shall be from the invert of the outgoing pipe to the bottom of the manhole frame.
9. The pipe shall be sealed at manhole using an "A–Lok" gasket as manufactured by A–LOK Products Inc. or an approved equal meeting A.S.T.M. C–923, cast integrally in the manhole wall.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

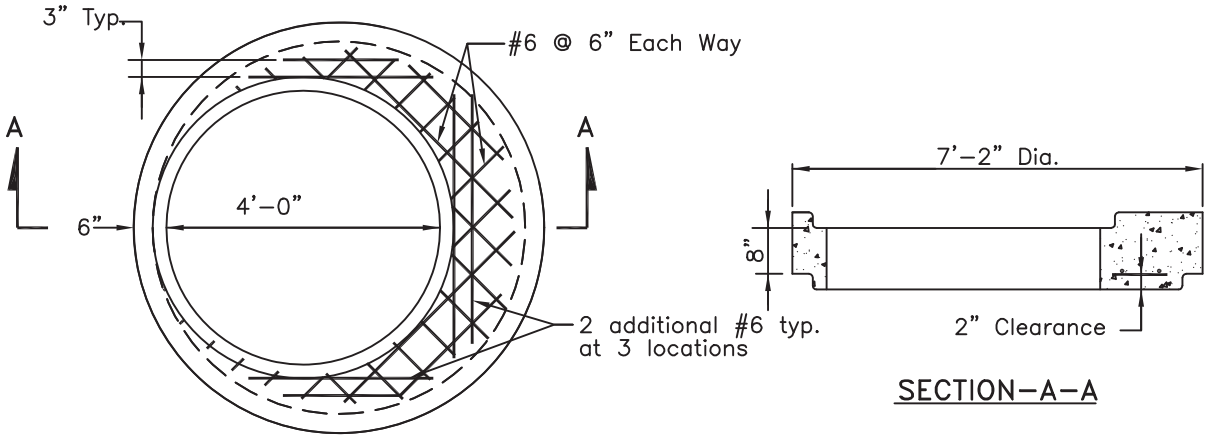
60" DIAMETER PRECAST SANITARY MANHOLE FOR PIPE DIAMETERS UP TO 36"

ISSUED	REVISED	REVISED
3 / 2008		

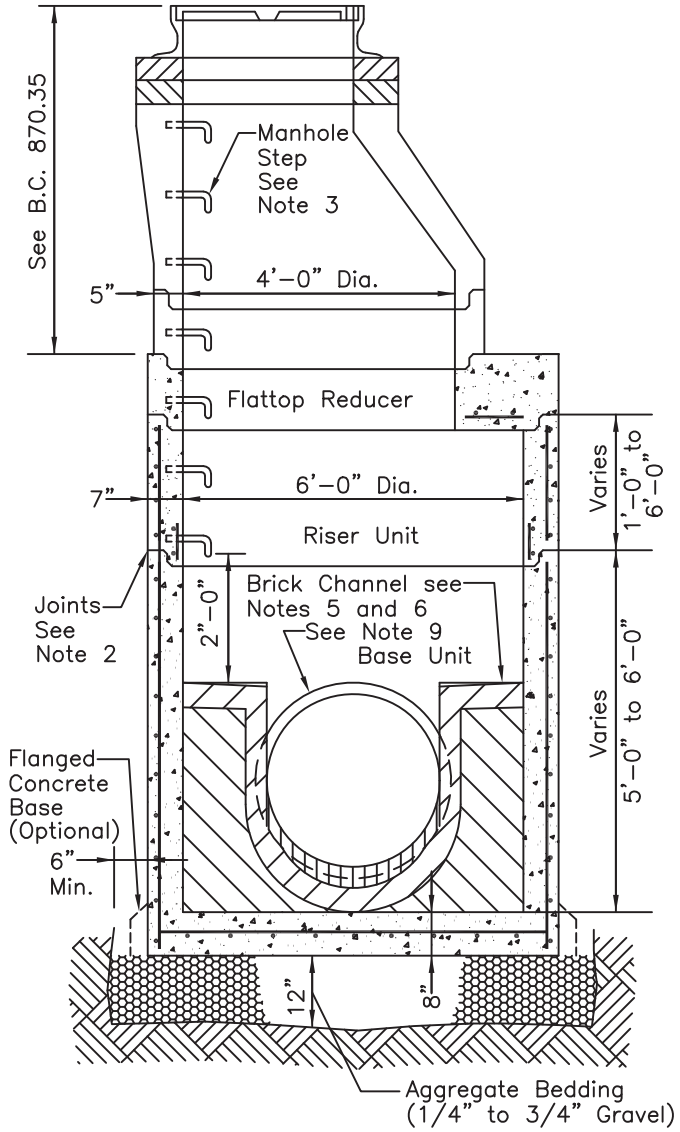
STANDARD NO. BC 831.05

SCALE : NONE

SHEET 1 OF 1



FLATTOP REDUCER



NOTES:

1. Manhole design specifications shall conform to "Precast Reinforced Concrete Manhole Section A.S.T.M. designation C–478, latest revisions".
2. The manufacturer shall form male and female ends of joints using their own design. The joints shall be sealed by the contractor and made water tight using 'O' ring rubber gaskets meeting A.S.T.M. C–443 and C–361. Any excessive openings within the joints shall be filled using a non–shrinking grout filler.
3. Manhole steps shall be installed by the manufacturer in vertical alignment at 1'–0" typical c/c. Manhole steps shall be incidental to the cost of the manhole.
4. Lift holes or eyes shall be provided in each section for handling. When directed by the Engineer, these holes shall be plugged with water tight stoppers or a non–shrinking grout after installation.
5. Bench and channel to be constructed of one course of sewer brick on edge. Bench to slope a minimum of 1" per foot towards channel.
6. Bench height above outgoing pipe invert to be equal to the diameter of the outgoing pipe or as directed by the Engineer.
7. Use flat top slab when manhole length is not sufficient for eccentrical cone unit.
8. Vertical measurement for payment shall be from the invert of the outgoing pipe to the bottom of the manhole frame.
9. The pipe shall be sealed at manhole using an "A–Lok" gasket as manufactured by A–LOK Products Inc. or an approved equal meeting A.S.T.M. C–923, cast integrally in the manhole wall.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

ISSUED	REVISED	REVISED
3 / 2008		

72" DIAMETER PRECAST SANITARY MANHOLE FOR PIPE DIAMETERS UP TO 48"

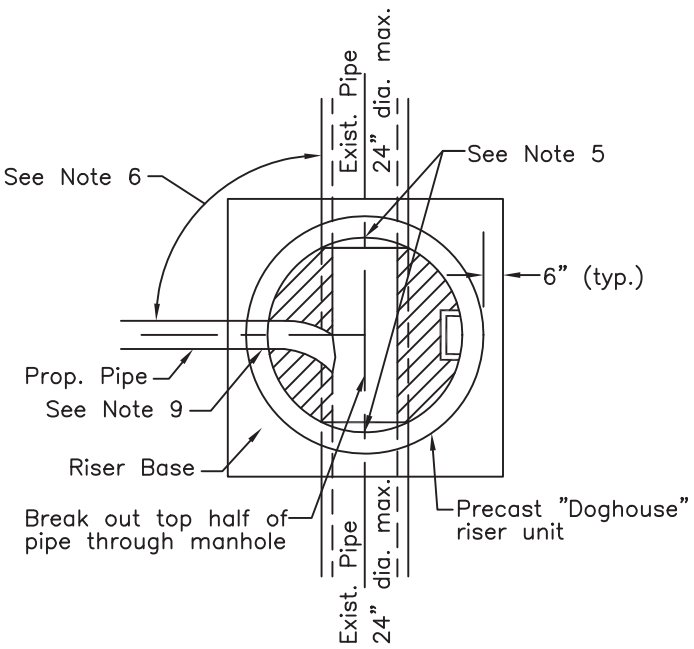
STANDARD NO. BC 831.06

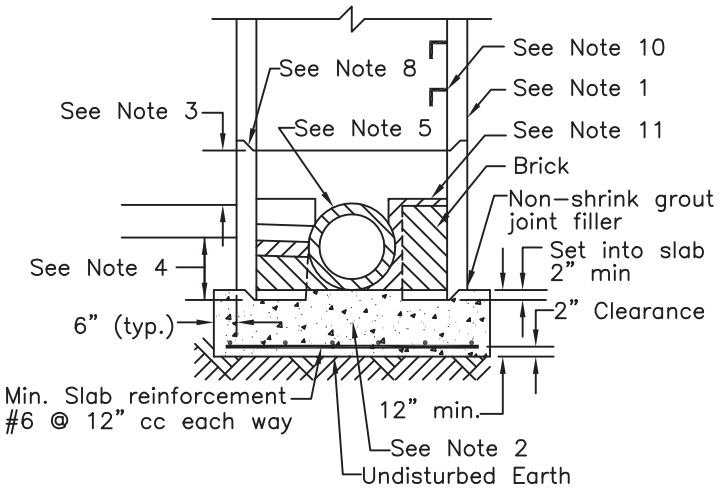
SCALE : NONE

SHEET 1 OF 1

NOTES:

1. Manhole design specifications shall conform to "Precast Reinforced Concrete Manhole Section A.S.T.M. designation C–478, latest revisions".
2. Manhole base shall be Mix No. 3 (3,500 psi) poured–in–place concrete.
3. Provide 12" minimum clearance from top of highest pipe opening to upper riser joint.
4. Provide 6" minimum clearance from incoming pipe opening to bottom of doghouse unit.
5. Minimum 1" clearance shall be maintained between existing pipes and precast doghouse pipe openings. Openings shall be grouted with non–shrink grout joint filler.
6. Locate centerline of proposed incoming pipe a maximum of 90 degrees from existing incoming pipe, on either side of manhole. In all cases, a minimum 1' wide section of manhole wall shall be maintained between pipe openings in doghouse base unit.
7. See standard detail BC–831.04 for precast sanitary manhole risers use with doghouse riser shown.
8. The manufacturer shall form male and female ends of joints using their own designs. The joints shall be sealed by the contractor and made water tight using "O" ring rubber gaskets meeting A.S.T.M. C–443 and C–361. Any excessive openings within the joints shall be filled using a non–shrink grout filler.
9. The proposed pipe shall be sealed at manhole using an "A–LOK" gasket as manufactured by A–LOK Products Inc. or an approved equal meeting A.S.T.M. C–923, cast integrally in the manhole wall.
10. Ladder rungs shall be supplied and installed by the manufacturer in vertical alignment at 1'–0" typical c/c. Rung type shall be in accordance with Standard B.C.–831.31. Ladder rungs shall be incidental to the cost of the manhole.
11. Bench and channel to be constructed of one course of sewer brick on edge. Bench to slope a minimum of 1" per foot towards channel.

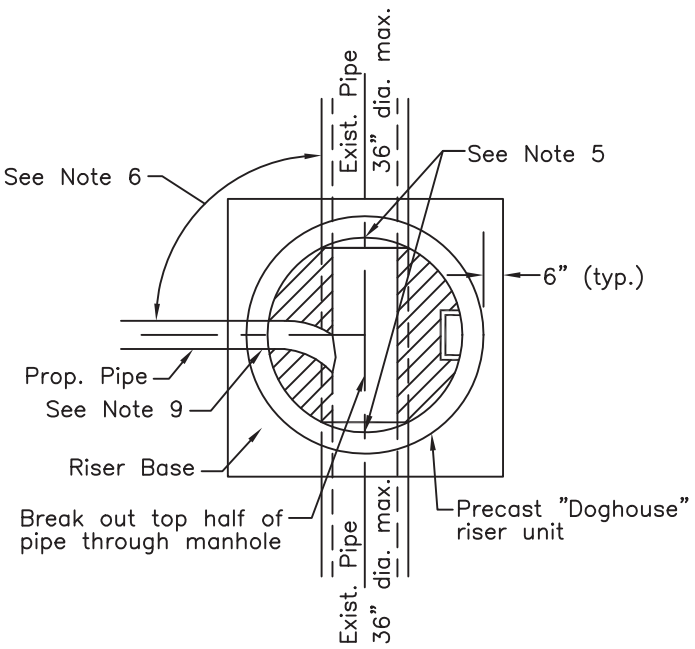


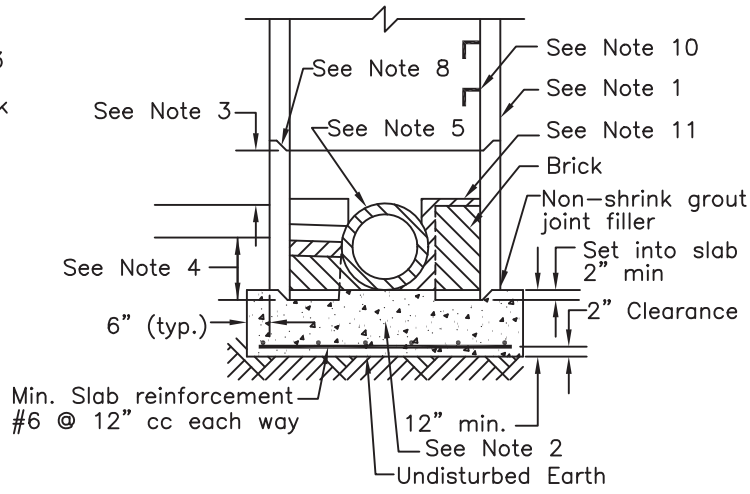


CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		48" DIAMETER PRECAST "DOGHOUSE" RISER FOR PIPE DIAMETERS UP TO 24" TITLE LINE 4	STANDARD NO. BC 831.07		
			SCALE : NONE	SHEET 1 OF 1	

NOTES:

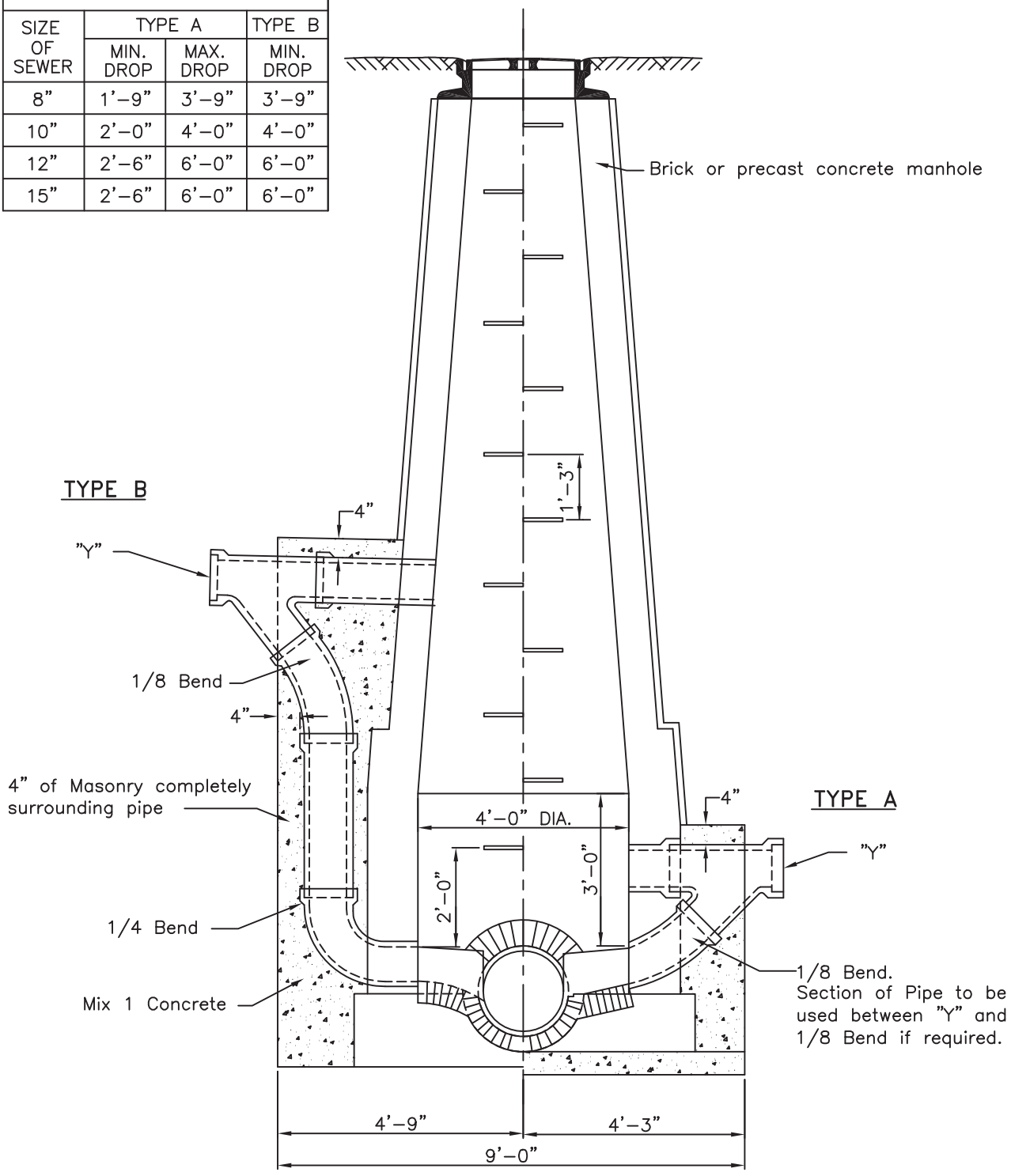
1. Manhole design specifications shall conform to "Precast Reinforced Concrete Manhole Section A.S.T.M. designation C–478, latest revisions".
2. Manhole base shall be Mix No. 3 (3,500 psi) poured–in–place concrete.
3. Provide 12" minimum clearance from top of highest pipe opening to upper riser joint.
4. Provide 6" minimum clearance from incoming pipe opening to bottom of doghouse unit.
5. Minimum 1" clearance shall be maintained between existing pipes and precast doghouse pipe openings. Openings shall be grouted with non–shrink grout joint filler.
6. Locate centerline of proposed incoming pipe a maximum of 90 degrees from existing incoming pipe, on either side of manhole. In all cases, a minimum 1' wide section of manhole wall shall be maintained between pipe openings in doghouse base unit.
7. See standard detail BC–831.05 for precast sanitary manhole risers use with doghouse riser shown.
8. The manufacturer shall form male and female ends of joints using their own designs. The joints shall be sealed by the contractor and made water tight using "O" ring rubber gaskets meeting A.S.T.M. C–443 and C–361. Any excessive openings within the joints shall be filled using a non–shrink grout filler.
9. The proposed pipe shall be sealed at manhole using an "A–LOK" gasket as manufactured by A–LOK Products Inc. or an approved equal meeting A.S.T.M. C–923, cast integrally in the manhole wall.
10. Ladder rungs shall be supplied and installed by the manufacturer in vertical alignment at 1'–0" typical c/c. Rung type shall be in accordance with Standard B.C.–831.31. Ladder rungs shall be incidental to the cost of the manhole.
11. Bench and channel to be constructed of one course of sewer brick on edge. Bench to slope a minimum of 1" per foot towards channel.





CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER; DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		60" DIAMETER PRECAST "DOGHOUSE" RISER FOR PIPE DIAMETERS UP TO 36"	STANDARD NO. BC 831.08		
			SCALE : NONE	SHEET 1 OF 1	

DROP CONNECTIONS			
SIZE OF SEWER	TYPE A		TYPE B
	MIN. DROP	MAX. DROP	MIN. DROP
8"	1'–9"	3'–9"	3'–9"
10"	2'–0"	4'–0"	4'–0"
12"	2'–6"	6'–0"	6'–0"
15"	2'–6"	6'–0"	6'–0"



Notes:

1. PVC pipe shall be used for drop connection.
2. For 15" Sewers with drop connections use Special "Y" with 12" Branch.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

SANITARY-TYPE A
DROP CONNECTION

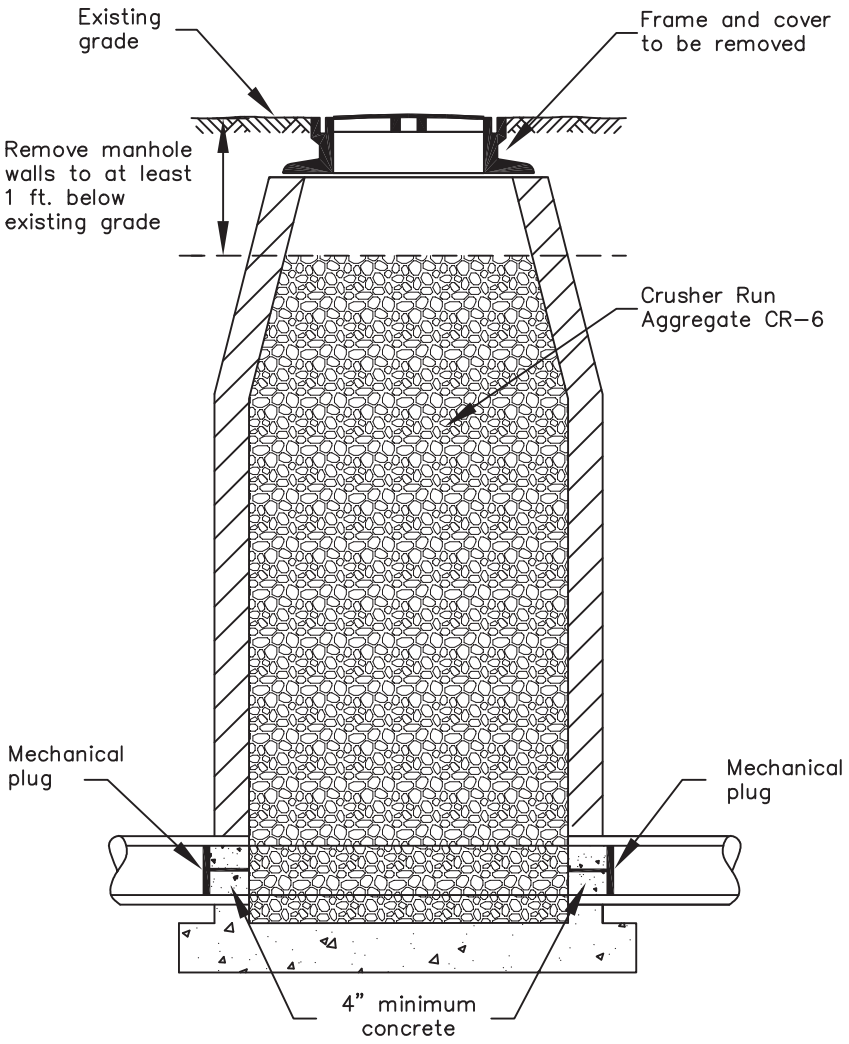
SANITARY-TYPE B
DROP CONNECTION

ISSUED	REVISED	REVISED
3 / 2008		

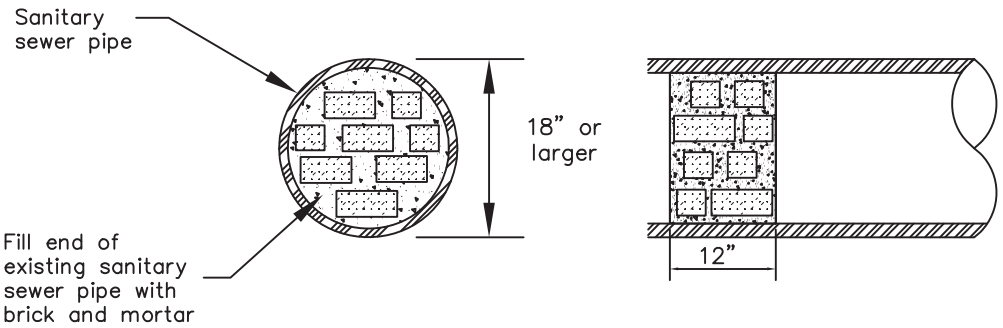
STANDARD NO.
BC 831.09

SCALE : NONE

SHEET 1 OF 1



MANHOLE ABANDONMENT



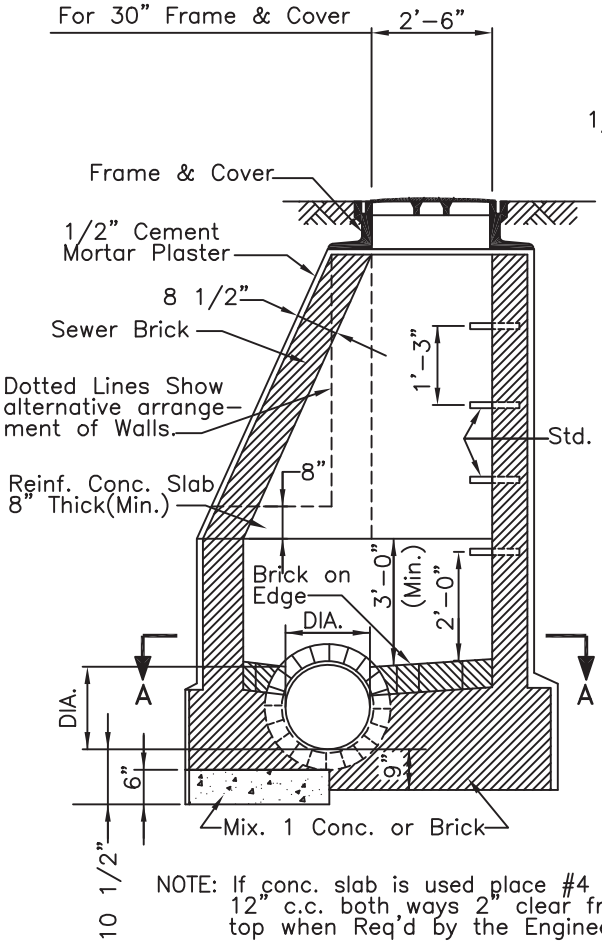
BRICK BULKHEAD

Notes:

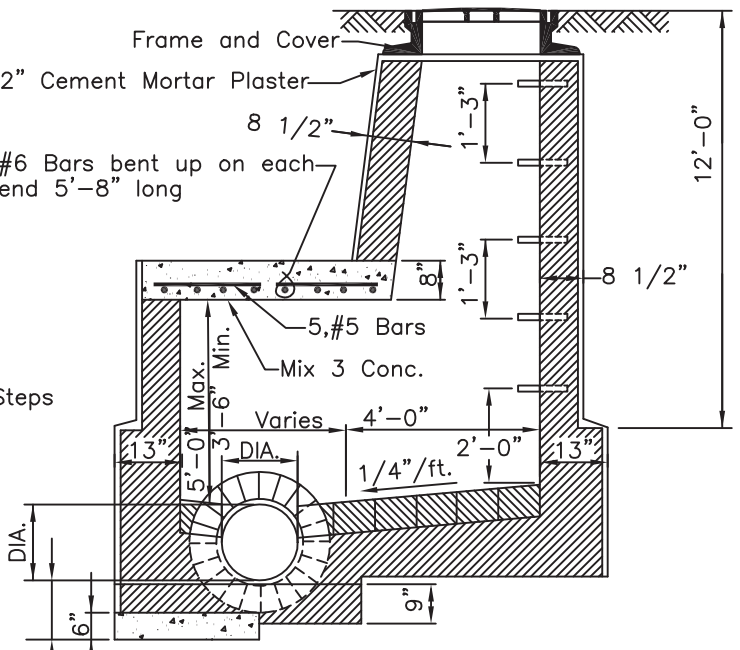
1. Remove frame and cover, plug incoming and outgoing pipes, tear down manhole walls 1 ft. below existing grade and fill manhole with select backfill using Crusher Run Aggregate CR–6.

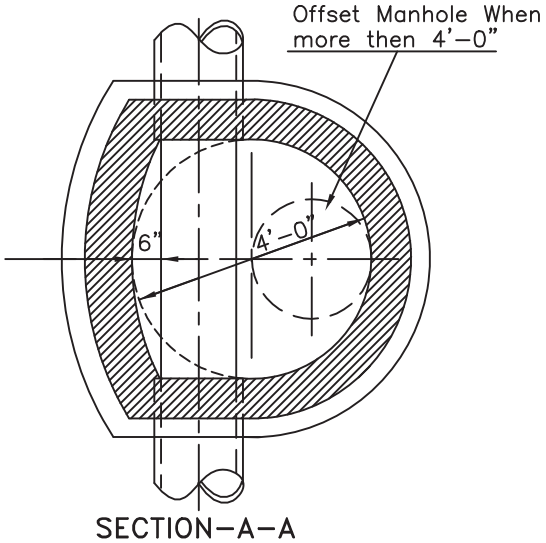
2. For sewers 15" and smaller use mechanical plugs for plugging pipe. For sewers 18" and larger a 12" thick masonry bulkhead may be substituted for mechanical plug.

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		MANHOLE ABANDONMENT	STANDARD NO. BC 831.10		
			SCALE : NONE	SHEET 1 OF 1	

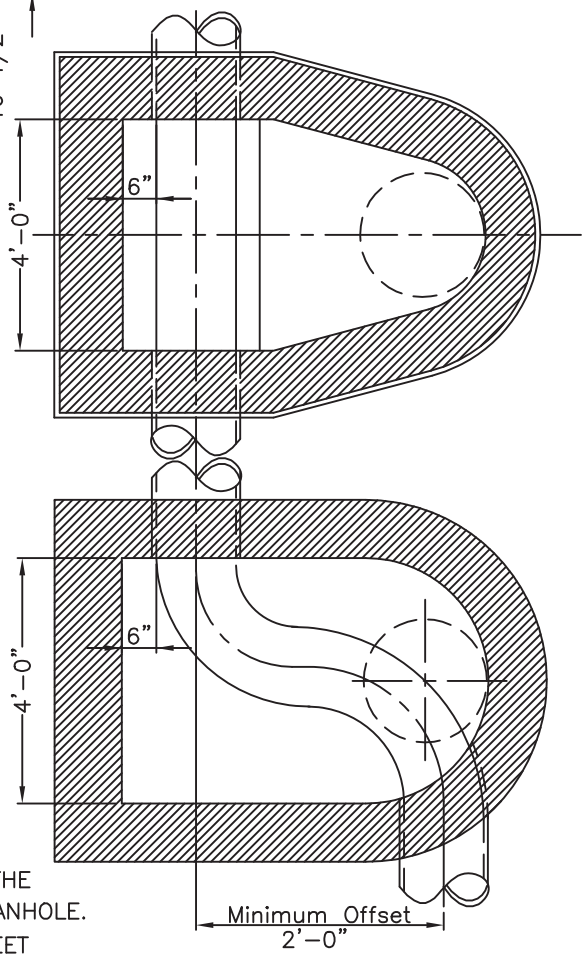


NOTE: If conc. slab is used place #4 Bars 12" c.c. both ways 2" clear from top when Req'd by the Engineer





SECTION–A–A



BASIS OF PAYMENT

SANITARY OFFSET MANHOLES SHALL BE PAID FOR ON THE BASIS OF THE LUMP SUM BID FOR EACH COMPLETE MANHOLE. NO ADDITIONAL PAYMENT WILL BE MADE FOR LINEAR FEET OF EXTRA VERTICAL DEPTH.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

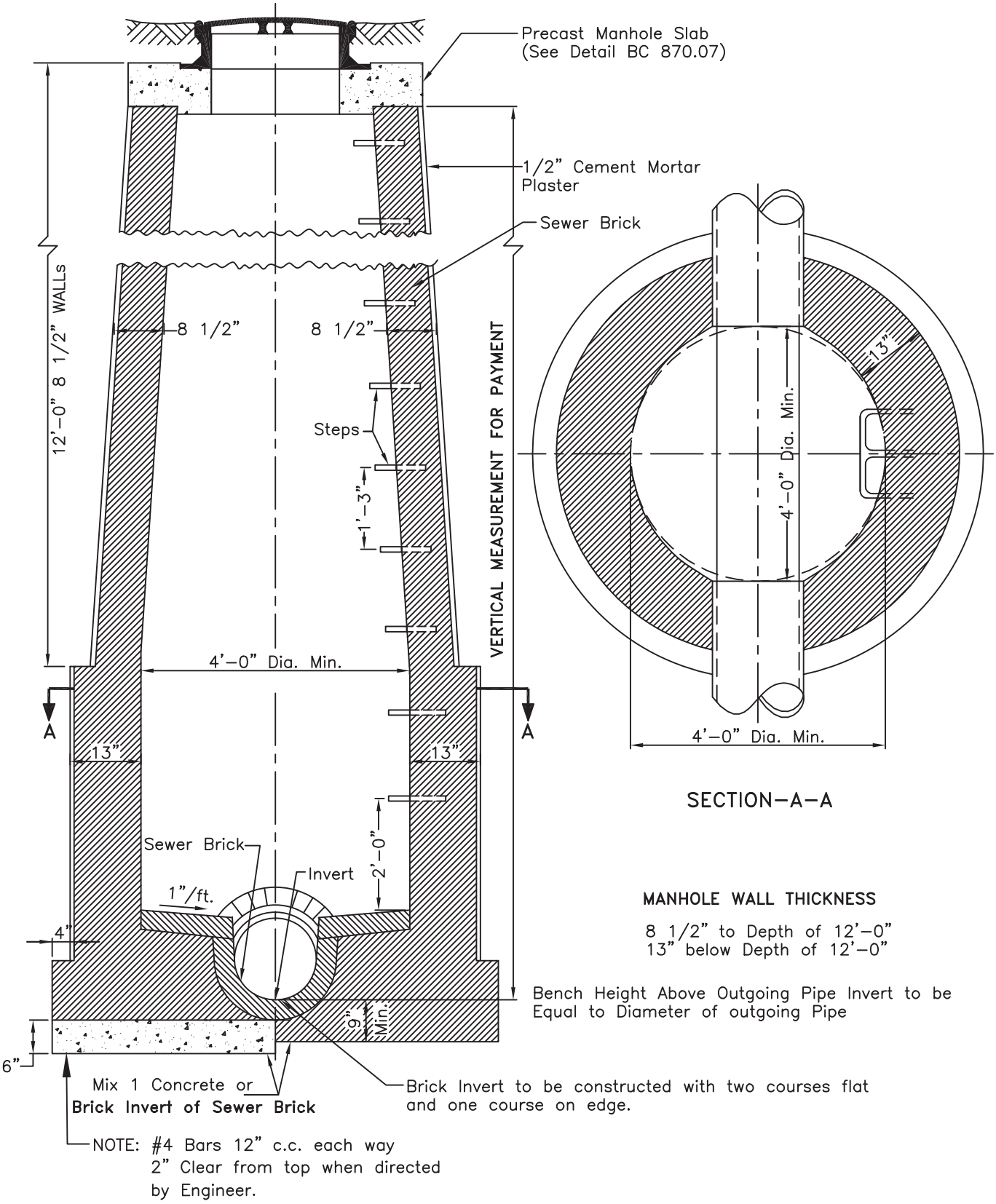
ISSUED	REVISED	REVISED
3 / 2008		

SANITARY OFFSET MANHOLE 30" COVER

STANDARD NO. BC 831.20

SCALE : NONE

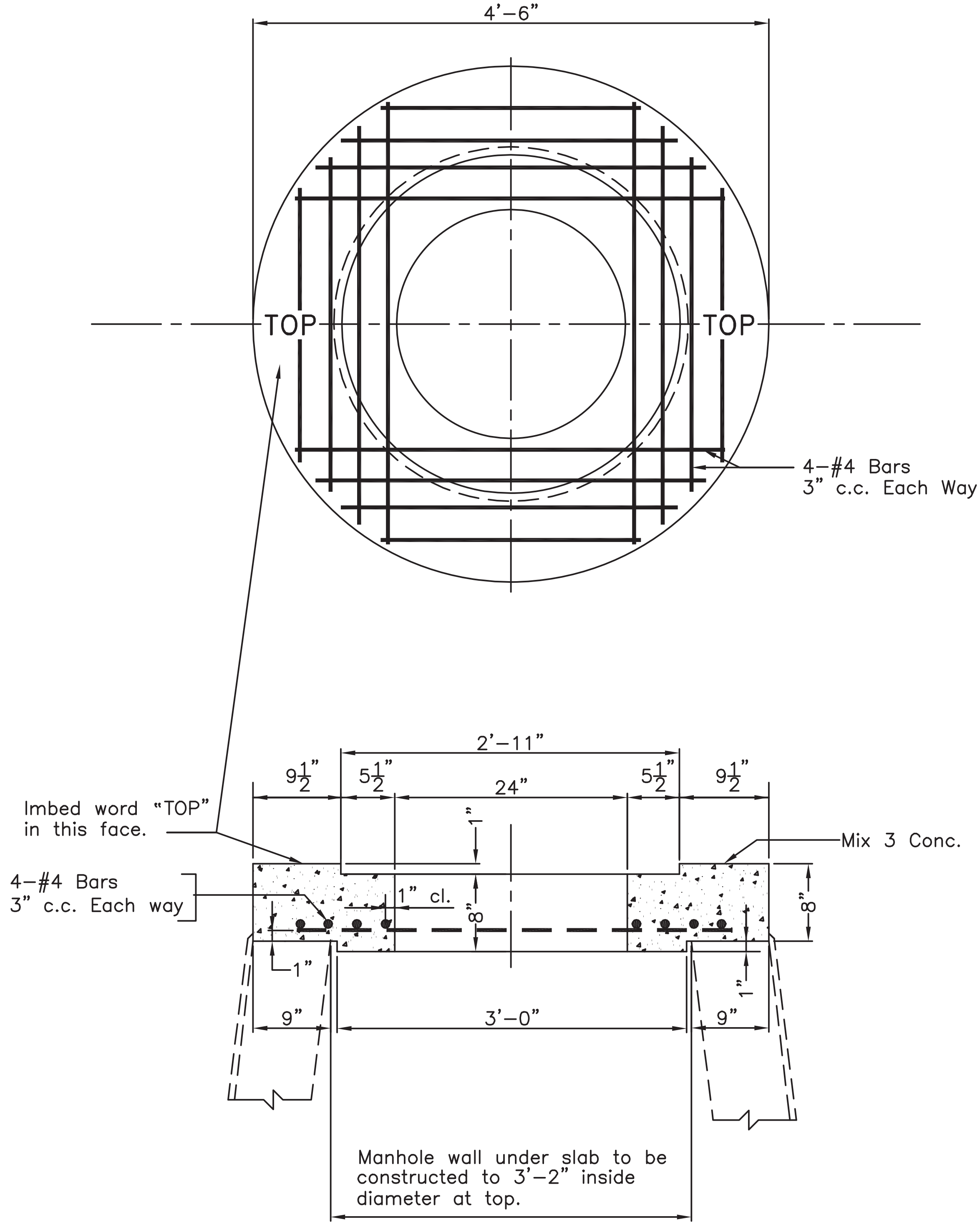
SHEET 1 OF 1



MANHOLE WALL THICKNESS

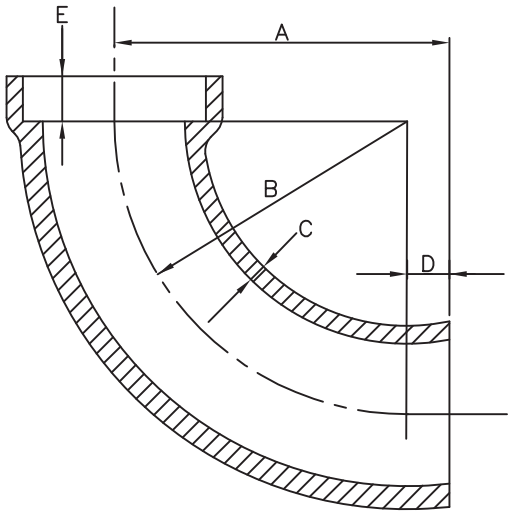
8 1/2" to Depth of 12'–0"
13" below Depth of 12'–0"

CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
	3 / 2008		
APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	STANDARD SANITARY MANHOLE PRECAST SLAB	STANDARD NO. BC 831.21		
		SCALE : NONE	SHEET 1 OF 1	

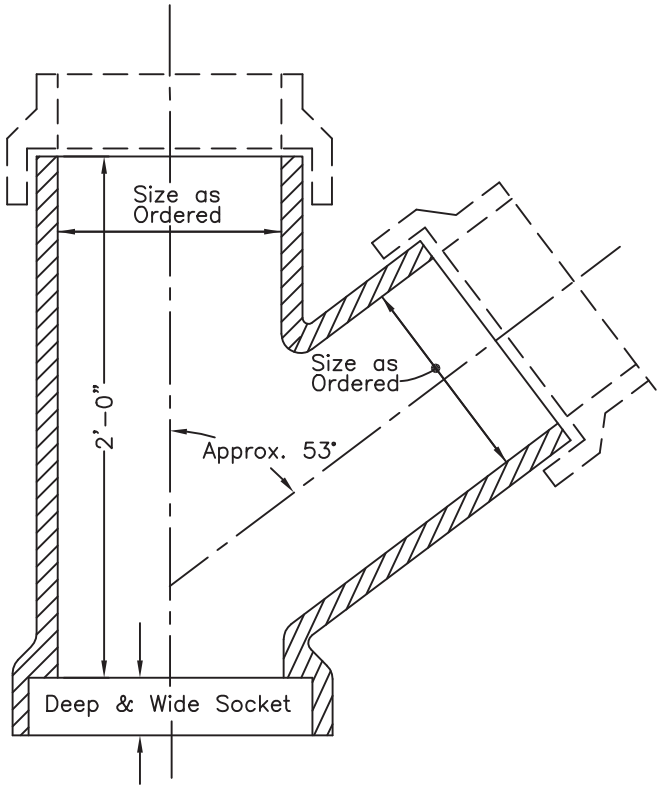


APPROVED :	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
HEAD, BUREAU OF WATER AND WASTEWATER		3 / 2008		
DIRECTOR, DEPARTMENT OF PUBLIC WORKS	PRECAST MANHOLE SLAB FOR 24" FRAME	STANDARD NO. BC 831.22		
		SCALE : NONE	SHEET 1 OF 1	

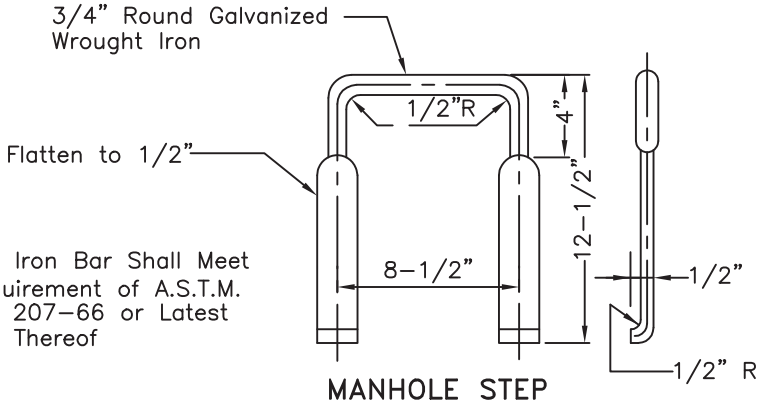
SIZE	A	B	C	D	E
10"	23"	20"	7/8"	3"	2–3/4"
8"	21"	18"	3/4"	3"	2–3/4"
6"	18"	15"	5/8"	3"	2–1/2"



QUARTER BEND



SPECIAL "Y" BRANCH



Note: Wrought Iron Bar Shall Meet the Requirement of A.S.T.M. Spec. A 207–66 or Latest Revision Thereof

MANHOLE STEP

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

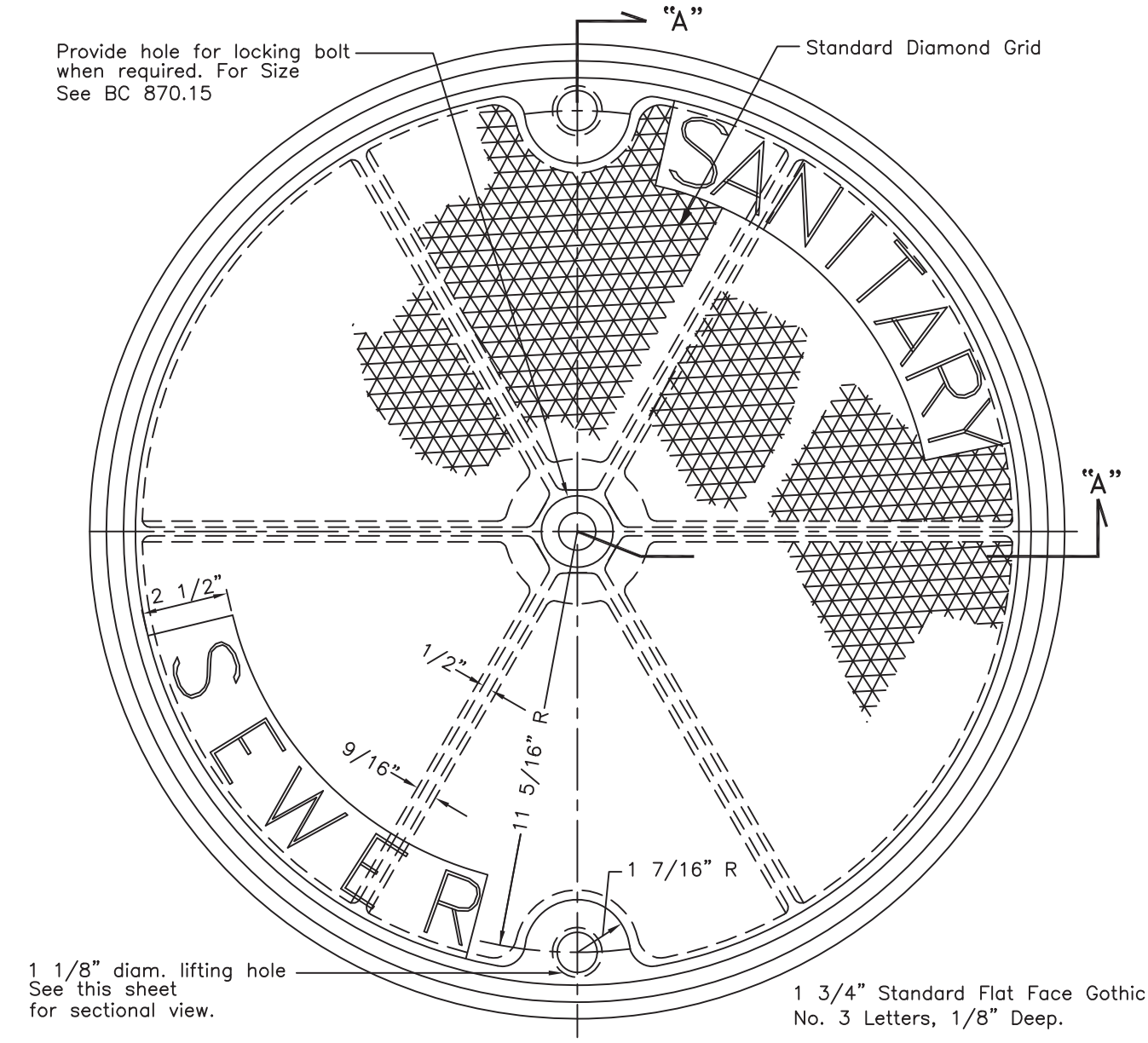
SPECIAL FITTINGS

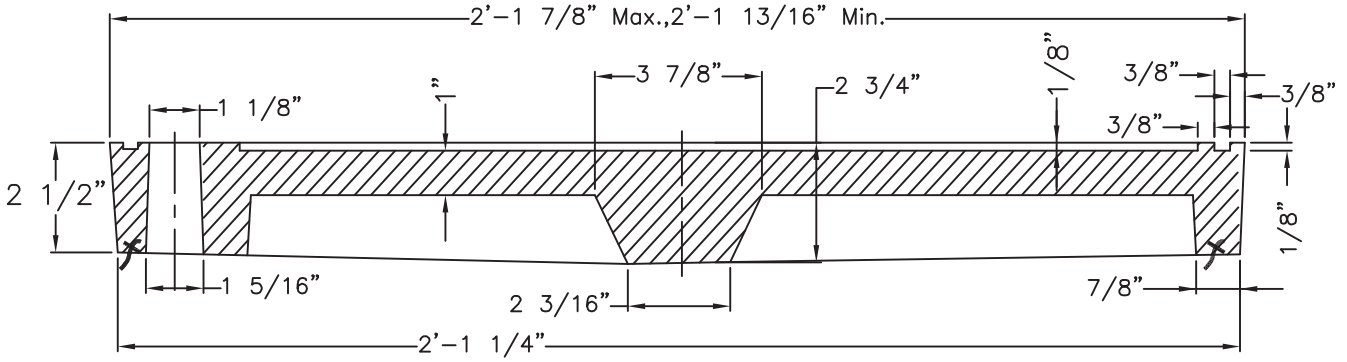
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 831.23

SCALE : NONE

SHEET 1 OF 1





For Std. 24" Manhole Frame
See BC 831.25

SECTION "A–A"

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

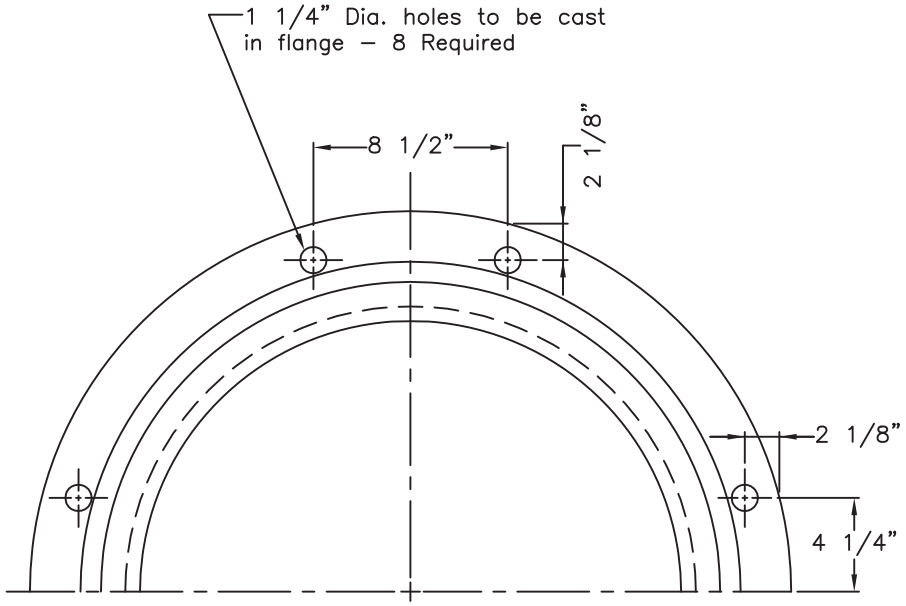
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

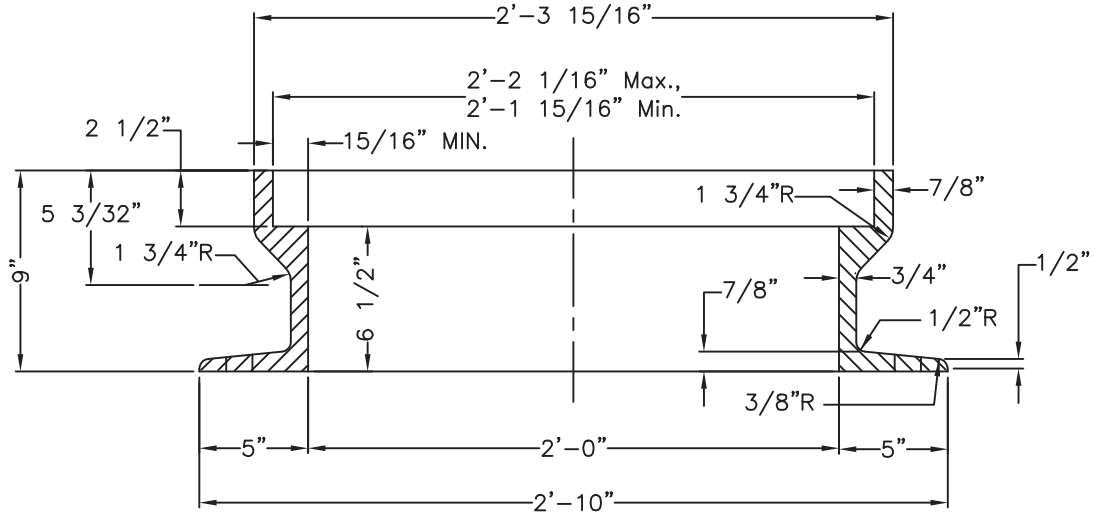
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD SAN 24 IN. MANHOLE COVER

STANDARD NO. BC 831.24

SCALE : NONE | SHEET 1 OF 1

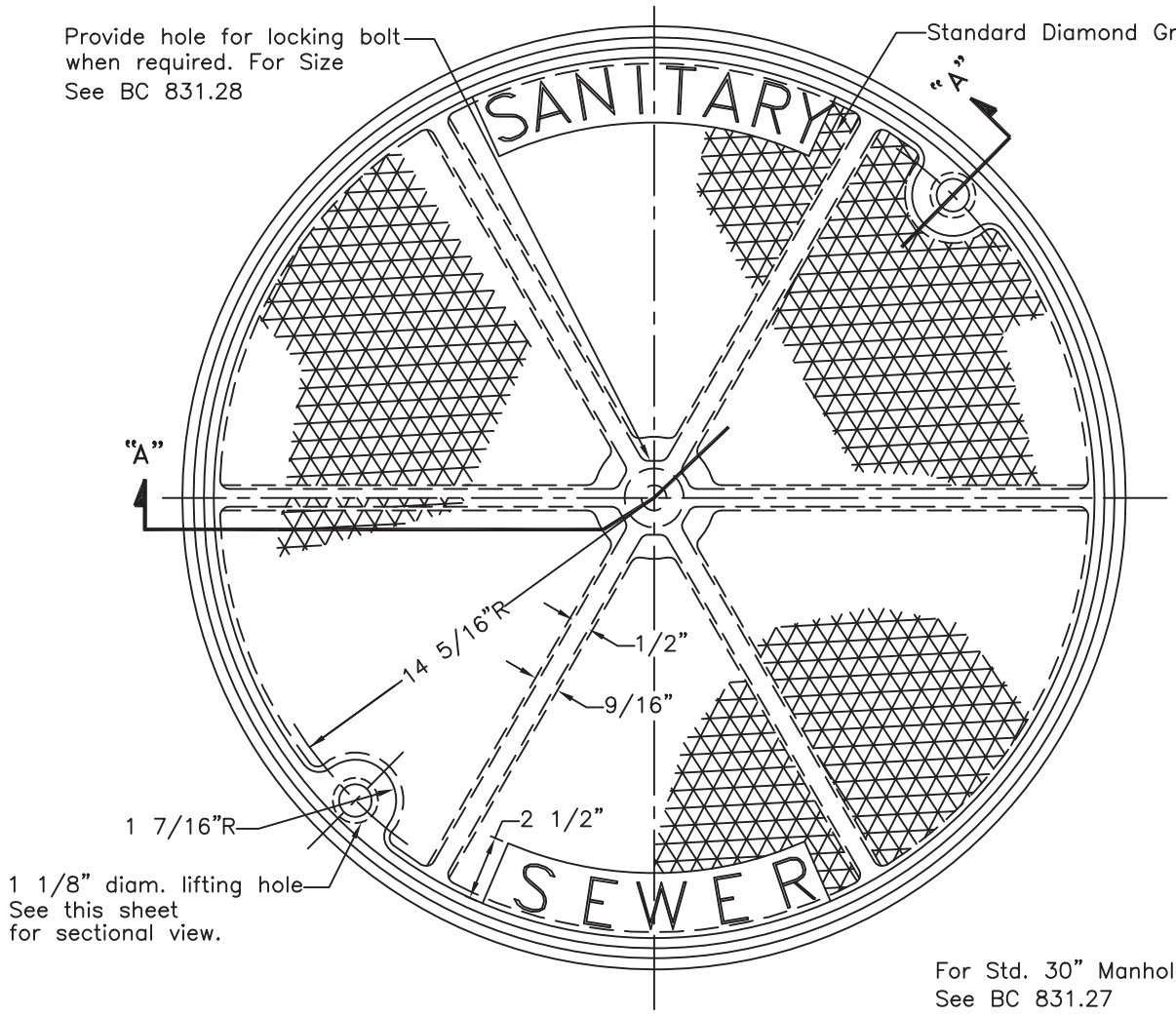




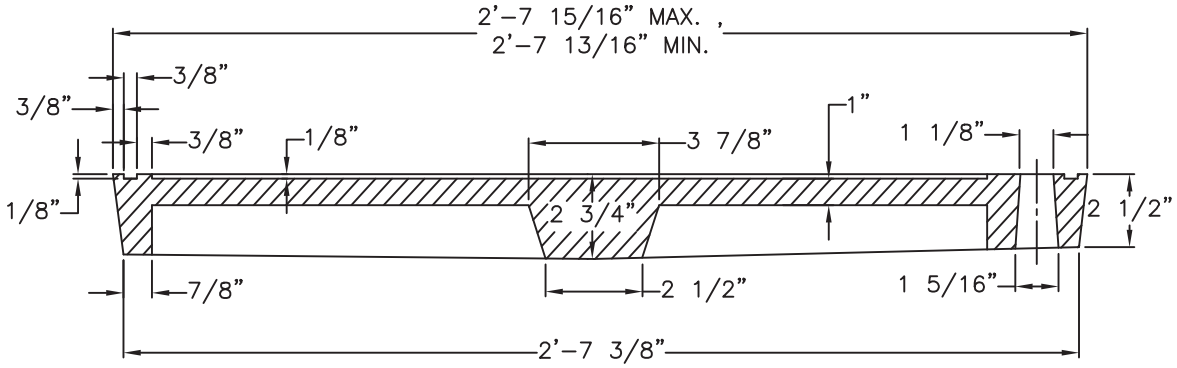
For 24" Lock Type Frame
See BC 831.28

For Std. 24" Manhole Cover
See BC 831.24

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		STANDARD 24 IN. MANHOLE FRAME	STANDARD NO. BC 831.25		
			SCALE : NONE	SHEET 1 OF 1	



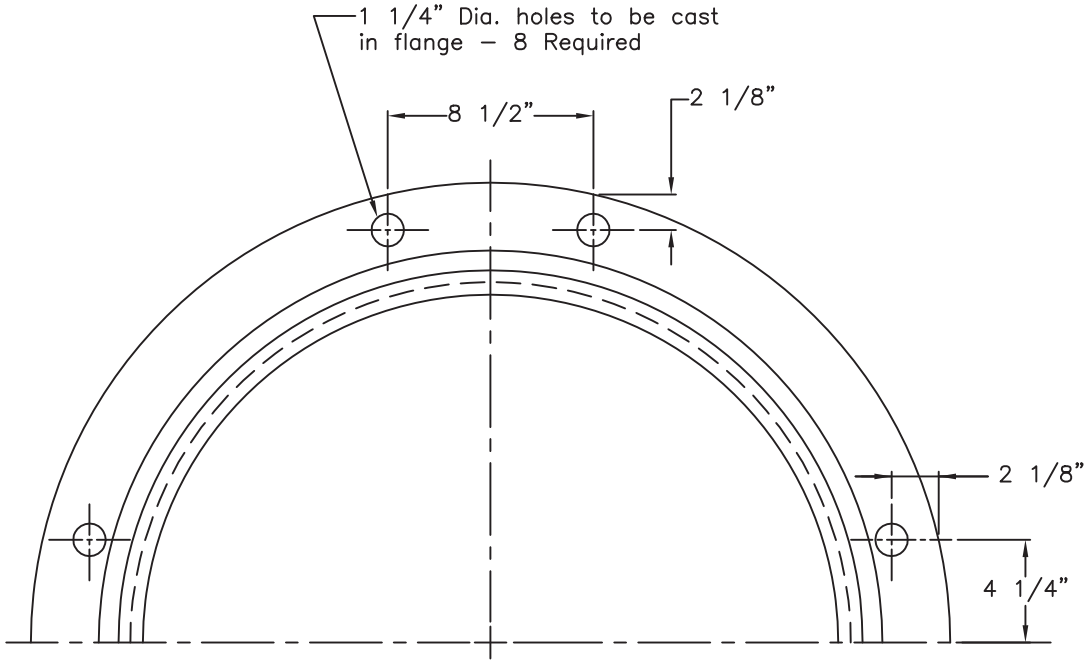
For Std. 30" Manhole Frame
See BC 831.27

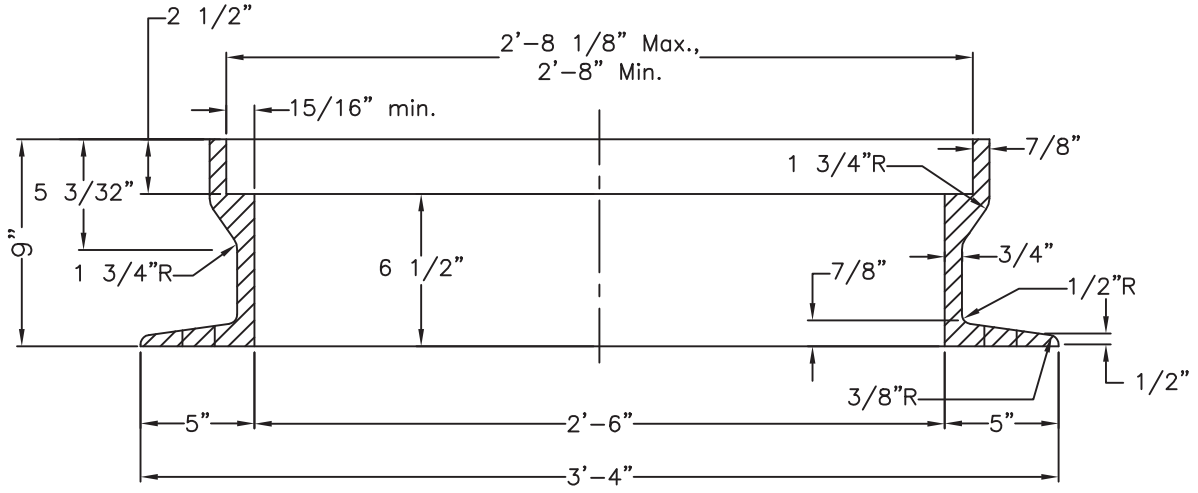


1 3/4" Standard Flat Face Gothic No.3 Letters, 1/8" Deep.

SECTION "A-A"

APPROVED: Bryan Sennett HEAD, BUREAU OF WATER AND WASTEWATER Shirley C. Williams DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	STANDARD SANITARY 30 IN. MANHOLE COVER	STANDARD NO. BC 831.26		
		SCALE : NONE	SHEET 1 OF 1	





For 30" Lock Type Frame
See BC 831.28

For Std. 30" Manhole Cover
See BC 831.26

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

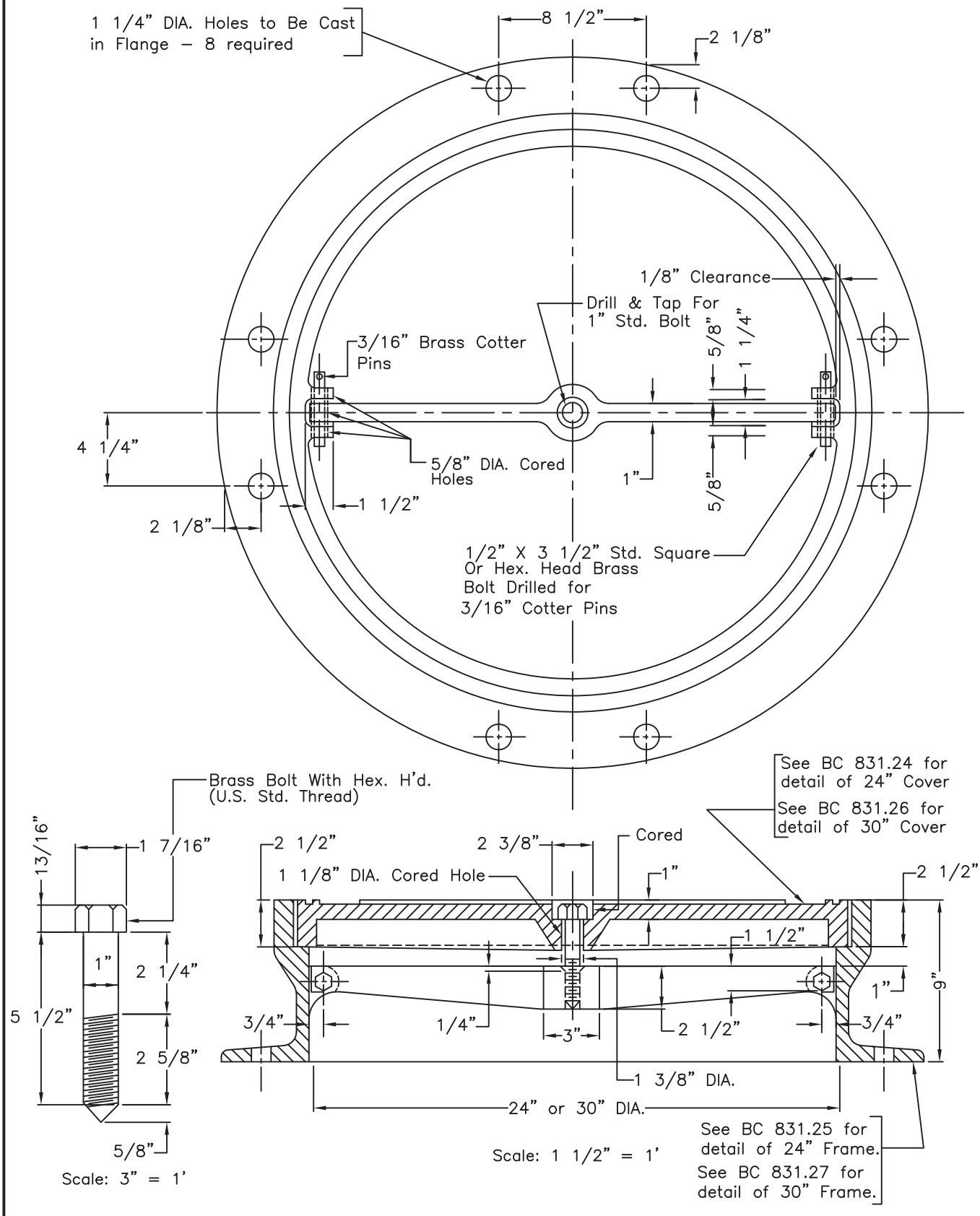
STANDARD 30 IN.
MANHOLE FRAME

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 831.27

SCALE : NONE

SHEET 1 OF 1



APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

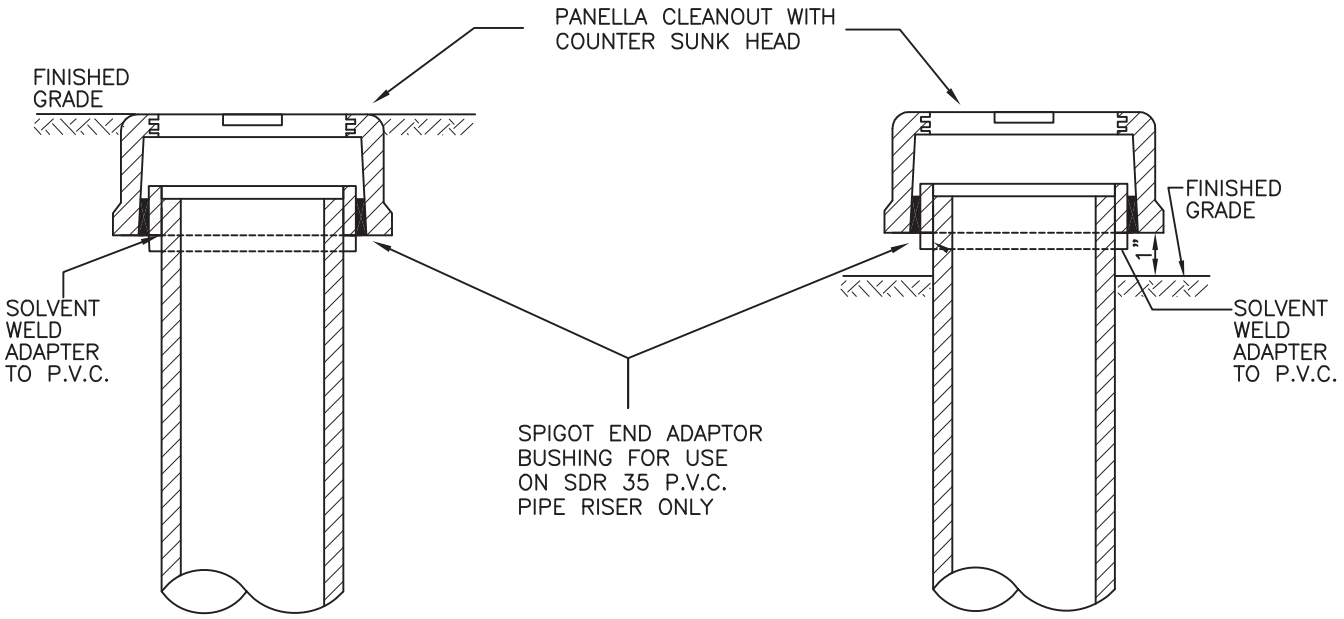
ISSUED	REVISED	REVISED
3 / 2008		

LOCKING DEVICE FOR MANHOLE FRAME & COVER

STANDARD NO. BC 831.28

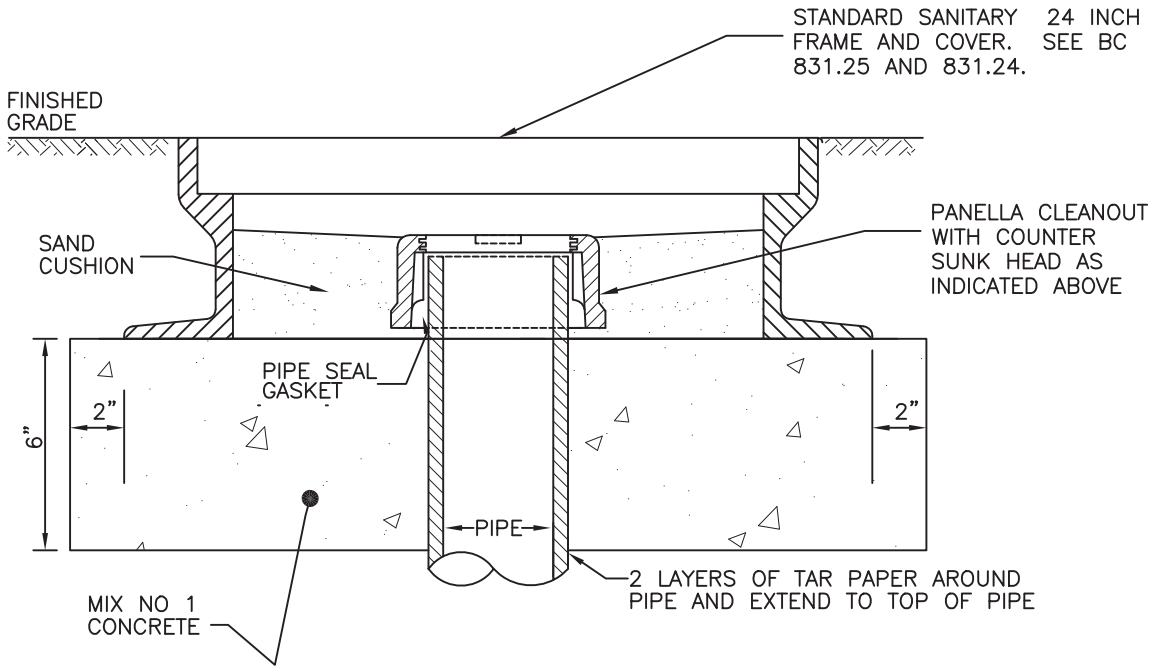
SCALE : NONE

SHEET 1 OF 1



DETAIL FOR SIDEWALK AREA ONLY

DETAIL FOR NON–TRAFFIC AREA ONLY



DETAIL FOR ROADWAY AREA ONLY

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

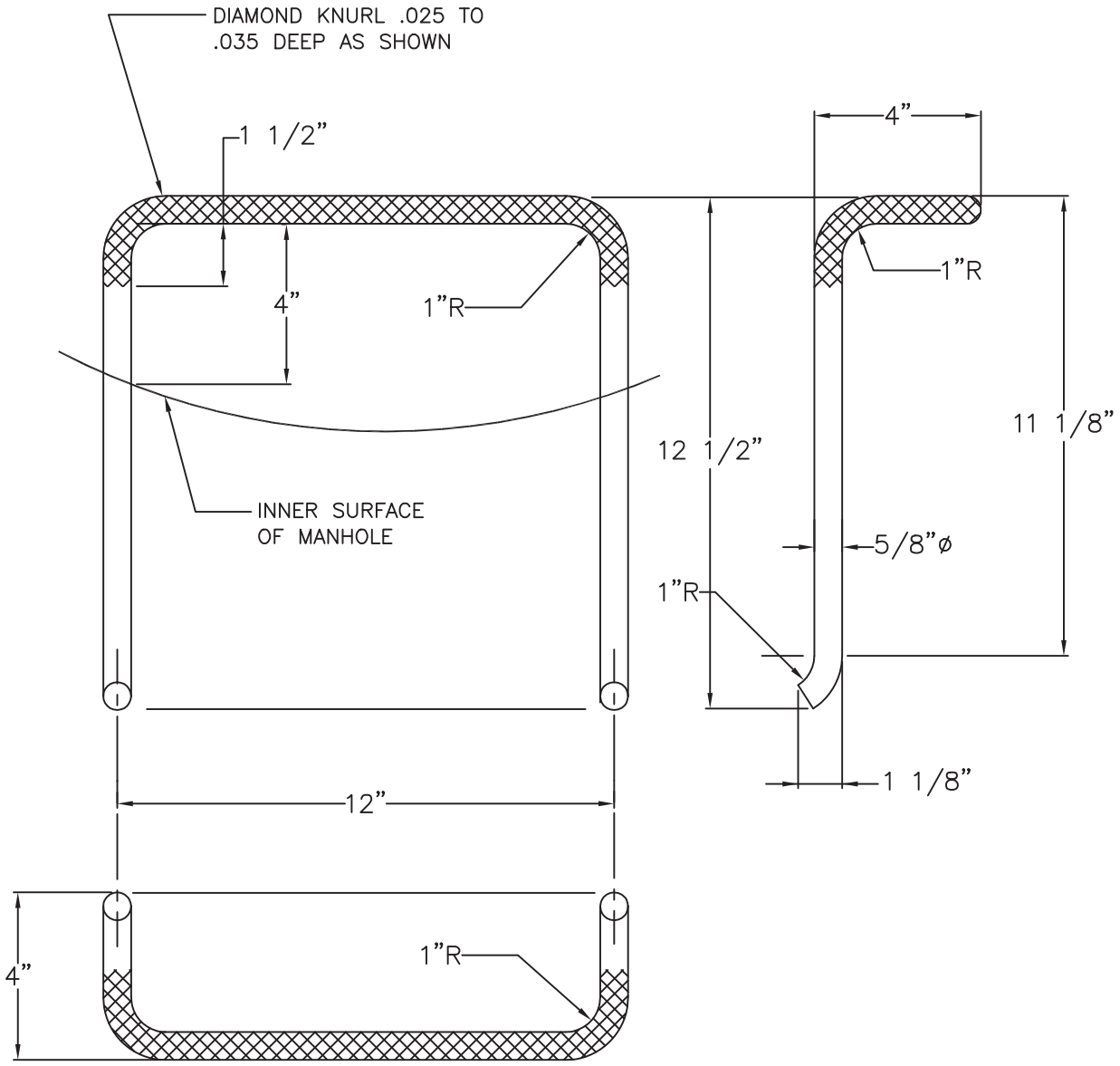
ISSUED	REVISED	REVISED
3 / 2008		

CLEANOUT COVER ASSEMBLY

STANDARD NO. BC 831.29

SCALE : NONE

SHEET 1 OF 1



DROP FRONT
IN–LINE OR STAGGERED

NOTE:

1. KNURL BEFORE BENDING, MIN. KNURLING AS SHOWN.
2. STEPS TO BE TYPE 410 STAINLESS STEEL, MILL FINISH.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

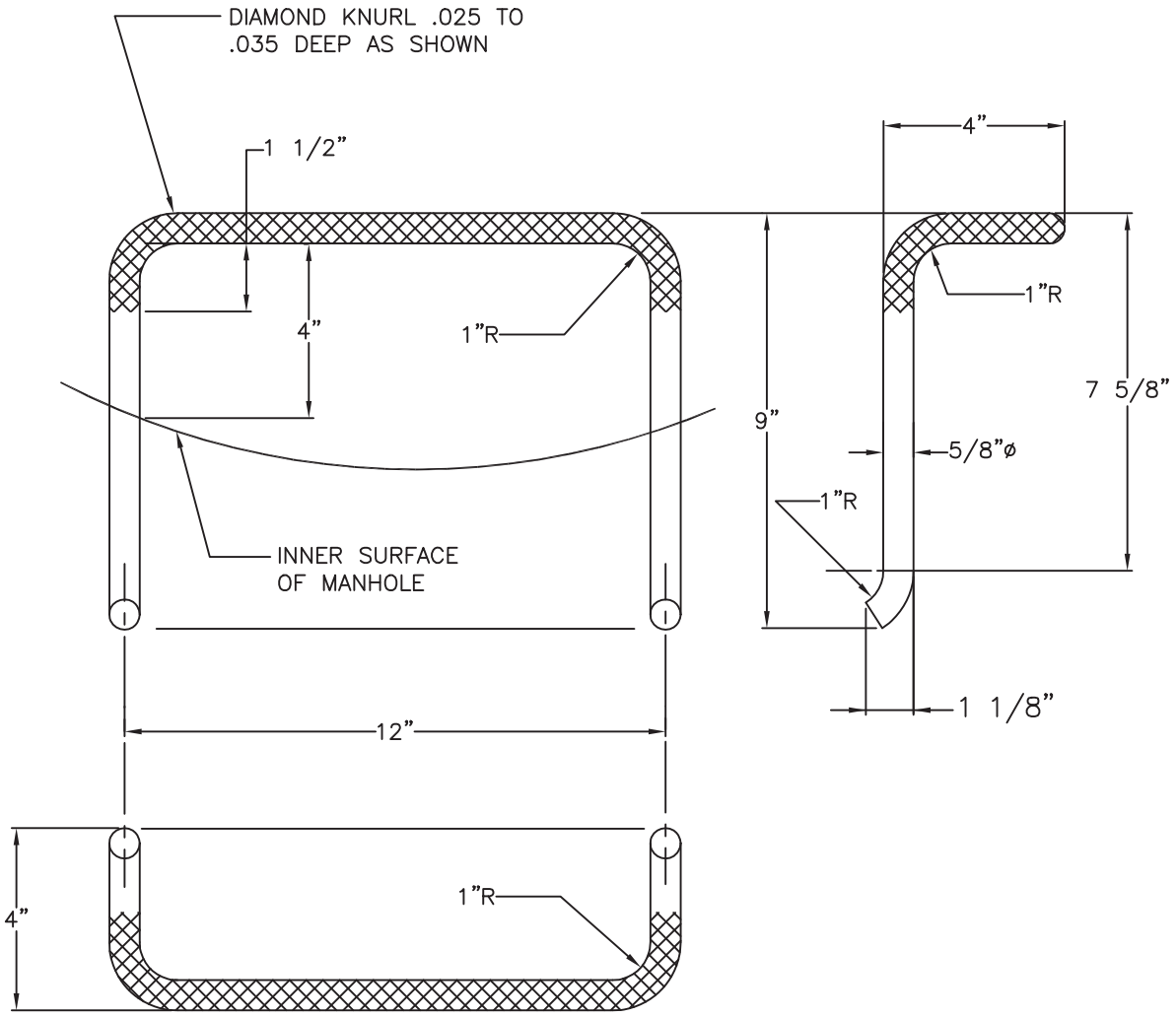
TYPE 1 STEP FOR BRICK MANHOLES

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 831.30

SCALE : NONE

SHEET 1 OF 1



DROP FRONT
IN–LINE OR STAGGERED

NOTE:

1. KNURL BEFORE BENDING, MIN. KNURLING AS SHOWN.
2. STEPS TO BE TYPE 410 STAINLESS STEEL, MILL FINISH.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

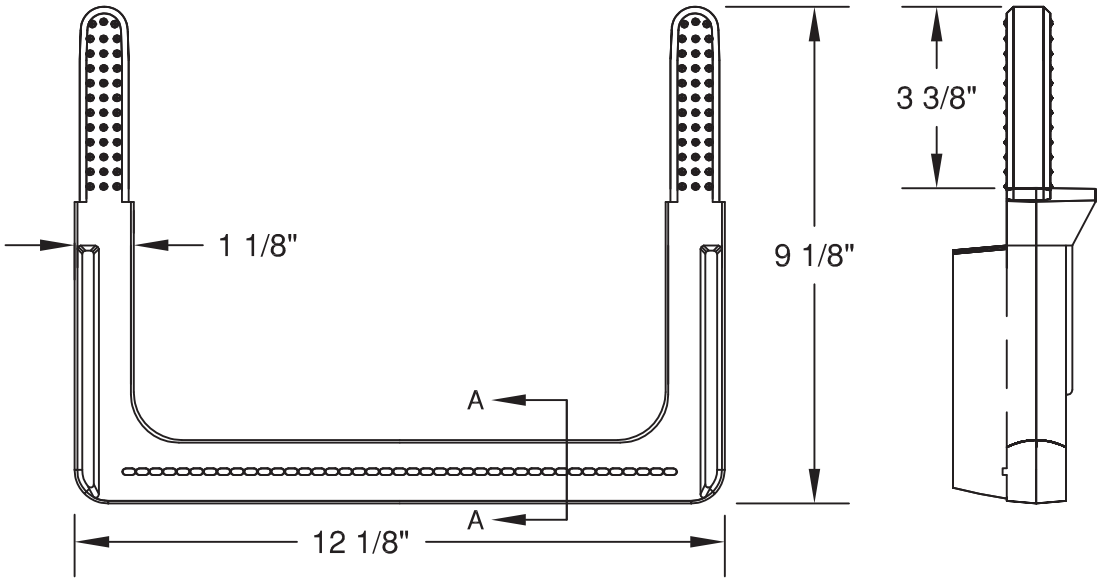
ISSUED	REVISED	REVISED
3 / 2008		

TYPE 2 STEP FOR PRECAST & CAST IN PLACE MANHOLES

STANDARD NO. BC 831.31

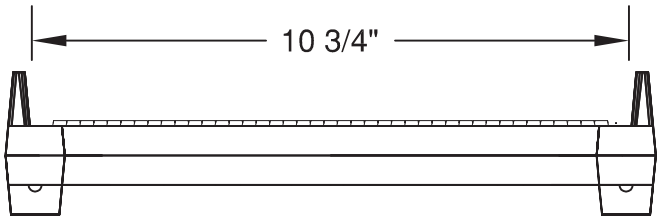
SCALE : NONE

SHEET 1 OF 1

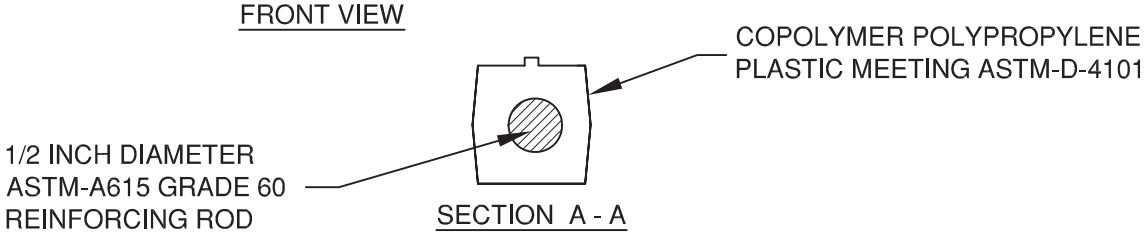


PLAN

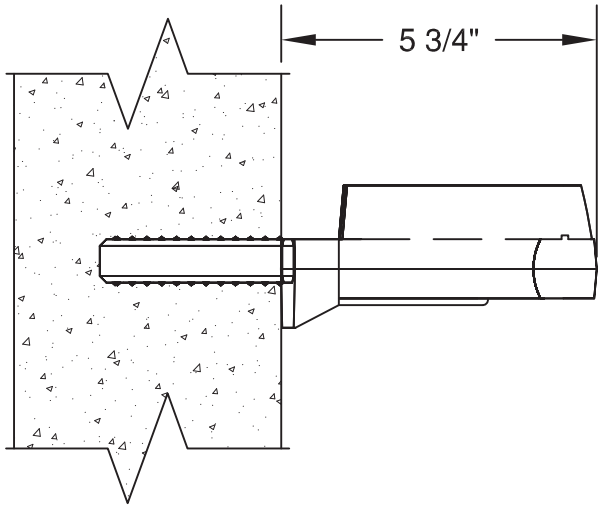
SIDE VIEW



FRONT VIEW

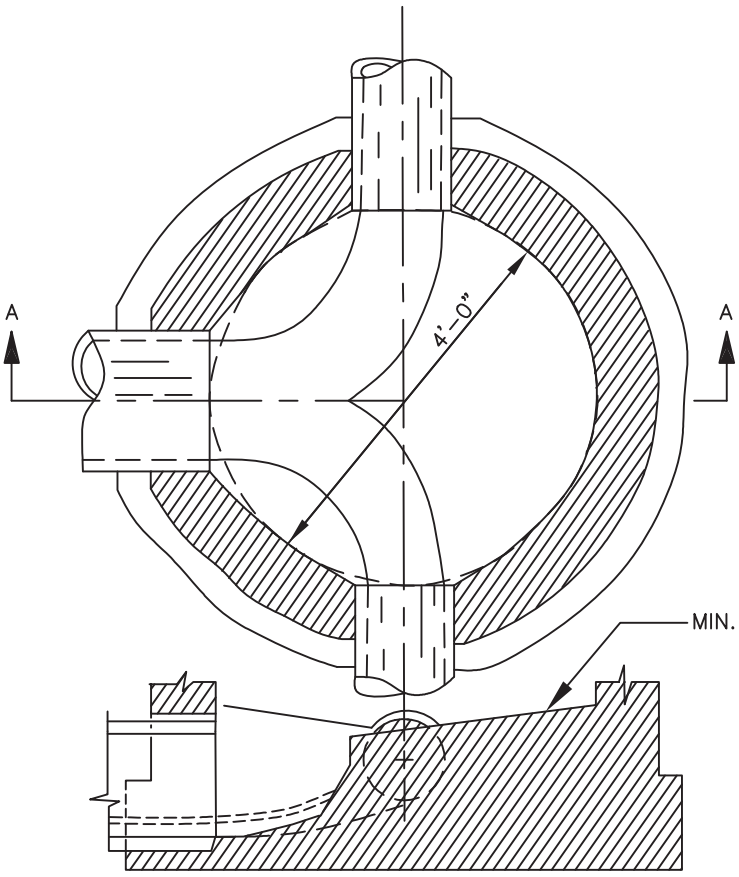


SECTION A - A



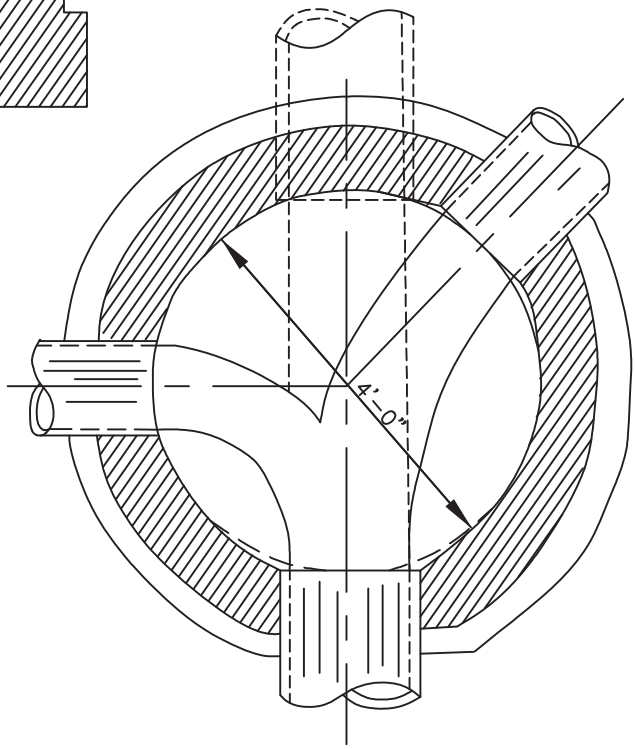
INSTALLATION VIEW

APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	COPOLYMER POLYPROPYLENE STEPS FOR PRECAST AND CAST IN PLACE MANHOLES	STANDARD NO. BC 831.32		
		SCALE : NONE	SHEET 1 OF 1	



BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO DIAMETER OF OUTGOING PIPE

SECTION A–A
STANDARD CHANNEL NO. 1



STANDARD CHANNEL NO. 2

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

ISSUED	REVISED	REVISED
3 / 2008		

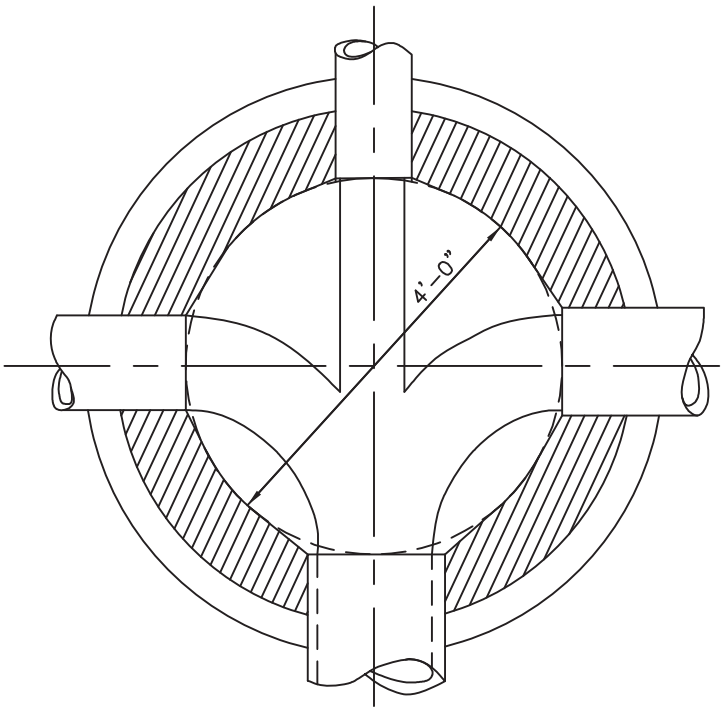
TYPICAL MANHOLE CHANNELS

STANDARD CHANNEL NO. 1
STANDARD CHANNEL NO. 2

STANDARD NO.
BC 831.35

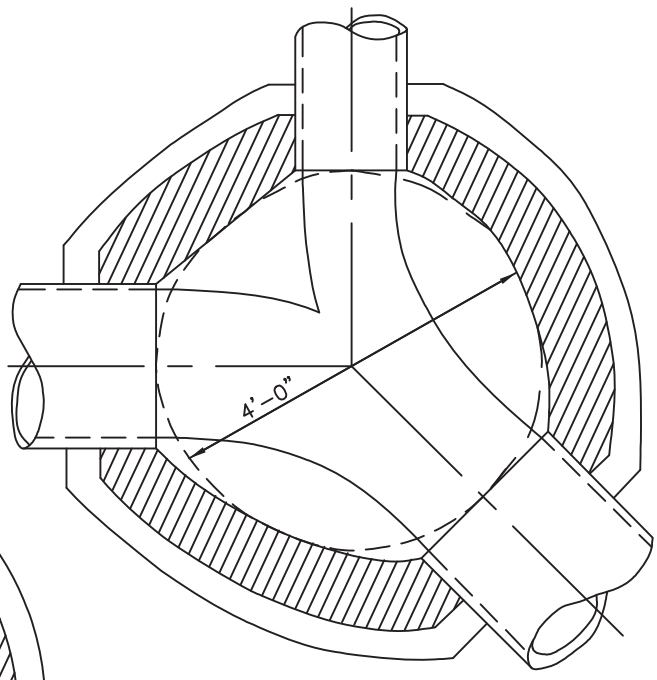
SCALE : NONE

SHEET 1 OF 1

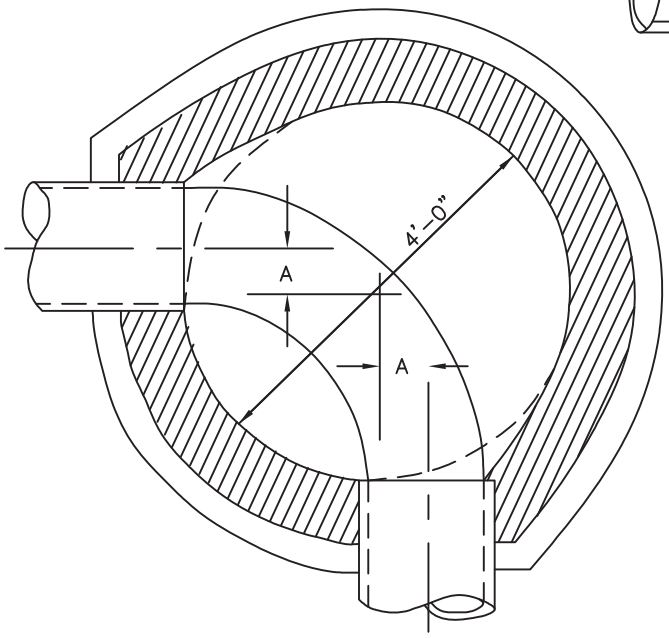


BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO DIAMETER OF OUTGOING PIPE

STANDARD CHANNEL NO.3



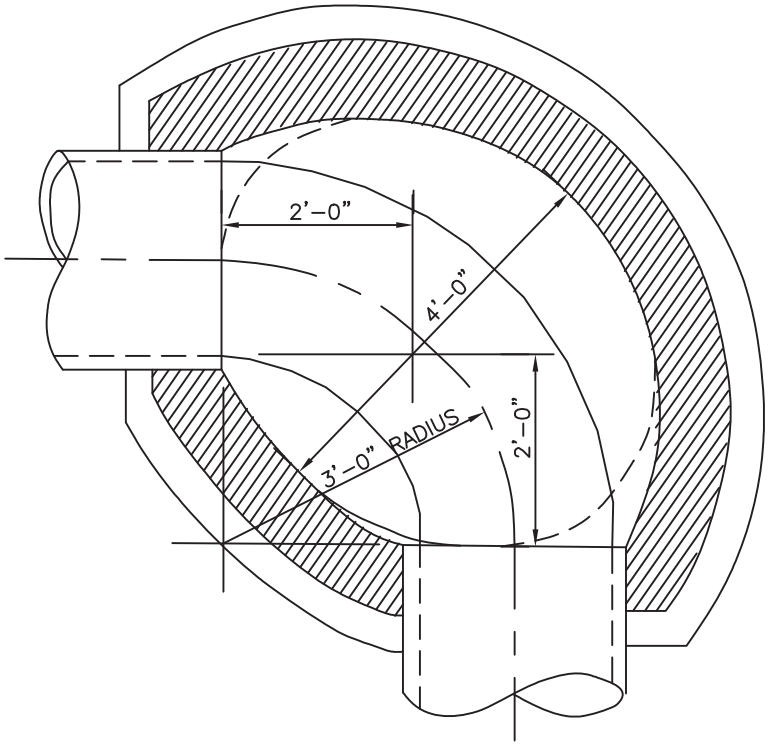
STANDARD CHANNEL NO. 4



STANDARD CHANNEL NO. 5
(FOR 8",10", 12" AND 15" PIPE SEWERS)

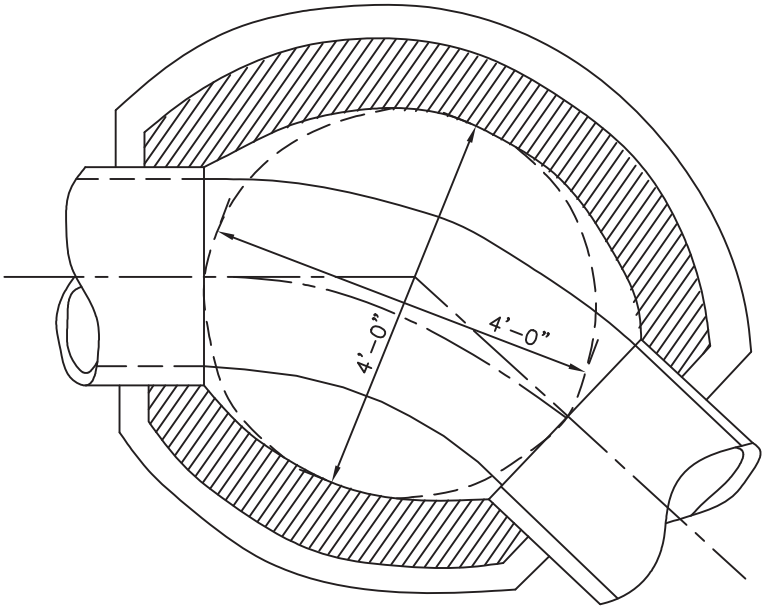
NOTE:
A = 3" FOR 8" AND 10" PIPE SEWERS
A = 6" FOR 12" AND 15" PIPE SEWERS

CITY OF BALTIMORE 1797	APPROVED : Bryan Simmons HEAD, BUREAU OF WATER AND WASTEWATER Shirley C. Williams DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED / REVISED / REVISED 3 / 2008	
		TYPICAL MANHOLE CHANNELS STANDARD CHANNEL NO. 3 STANDARD CHANNEL NO. 4 STANDARD CHANNEL NO. 5	STANDARD NO. BC 831.36	
			SCALE : NONE	SHEET 1 OF 1



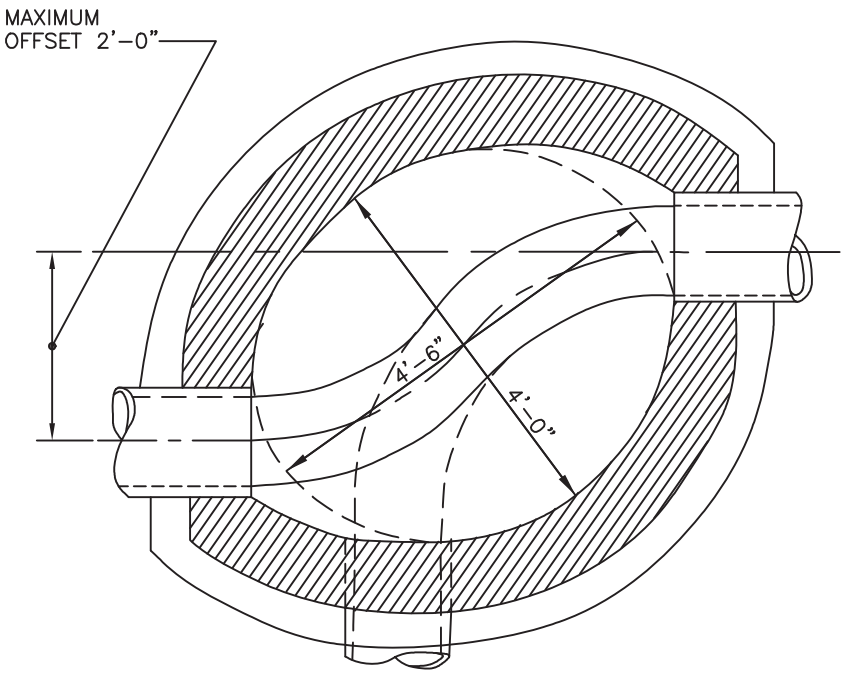
BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO DIAMETER OF OUTGOING PIPE

STANDARD CHANNEL NO. 6
(FOR 18", 21" AND 24" PIPE SEWERS)



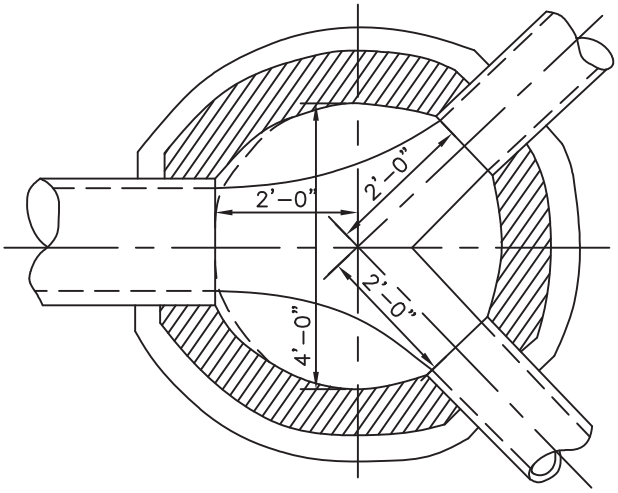
STANDARD CHANNEL NO. 7

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED / REVISED / REVISED 3 / 2008	
		TYPICAL MANHOLE CHANNELS STANDARD CHANNEL NO. 6 STANDARD CHANNEL NO. 7	STANDARD NO. BC 831.37 SCALE : NONE / SHEET 1 OF 1	

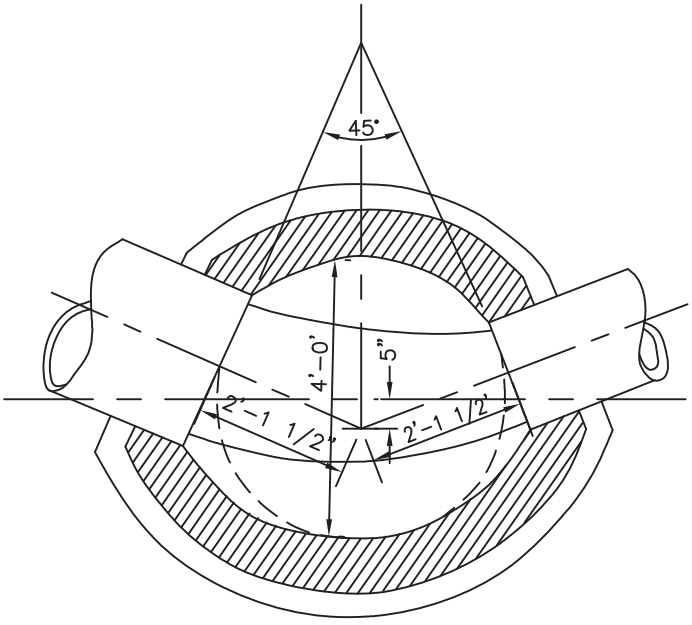


BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO DIAMETER OF OUTGOING PIPE

STANDARD CHANNEL NO. 8



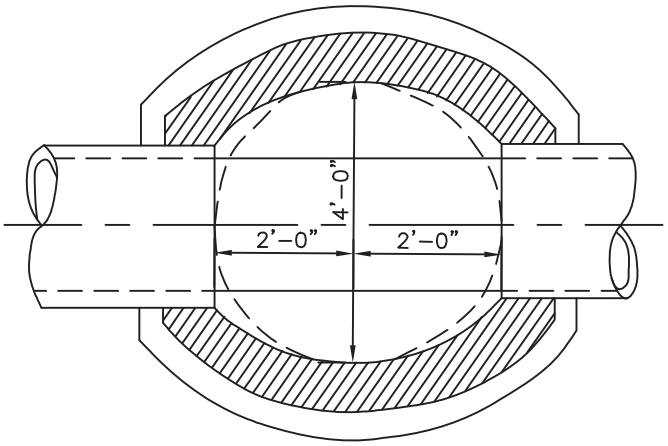
STANDARD CHANNEL NO. 9



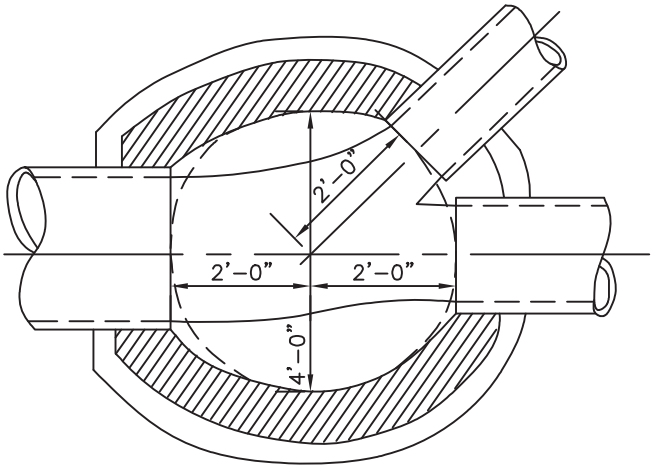
STANDARD CHANNEL NO.10

CITY OF BALTIMORE	APPROVED:	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED / REVISED
	HEAD, BUREAU OF WATER AND WASTEWATER		3 / 2008	
	DIRECTOR, DEPARTMENT OF PUBLIC WORKS	TYPICAL MANHOLE CHANNELS STANDARD CHANNEL NO. 8 STANDARD CHANNEL NO. 9 STANDARD CHANNEL NO. 10	STANDARD NO. BC 831.38	
			SCALE : NONE	SHEET 1 OF 1

BENCH HEIGHT ABOVE OUTGOING PIPE INVERT TO BE EQUAL TO DIAMETER OF OUTGOING PIPE



STANDARD CHANNEL NO. 11



STANDARD CHANNEL NO. 12

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		TYPICAL MANHOLE CHANNELS STANDARD CHANNEL NO. 11 STANDARD CHANNEL NO. 12	STANDARD NO. BC 831.39		
			SCALE : NONE		SHEET 1 OF 1

Standard Water Details

March 2008

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BOOK OF STANDARDS
WATER INDEX OF DRAWINGS

WATER DETAILS:

BC 841.01	Standard Installation for Fire Protection 1 1/2" Water Supply Service (3/4" Meter) for 4" Main	1 of 1
BC 841.02	Standard Installation for Fire Protection 1 1/2" Water Supply Service (1" Meter) for 4" Main	1 of 1
BC 841.03	Standard Installation for Fire Protection 1 1/2" Twin Water Supply Services (3/4" Meters) for 4" Main	1 of 1
BC 841.04	Standard Installation for Fire Protection 1 1/2" Twin Water Supply Services (1" Meters) for 4" Main	1 of 1
BC 841.05	Standard Installation for Fire Protection 1 1/2" Water Supply Service (3/4" Meter) for 6" Main and Larger	1 of 1
BC 841.06	Standard Installation for Fire Protection 1 1/2" Water Supply Service (1" Meter) for 6" Main and Larger	1 of 1
BC 841.07	Standard Installation for Fire Protection 1 1/2" Twin Water Supply Services (3/4" Meters) for 6" Main and Larger	1 of 1
BC 841.08	Standard Installation for Fire Protection 1 1/2" Twin Water Supply Services (1" Meters) for 6" Main and Larger	1 of 1
BC 842.01	Standard Installation of 4" & 6" Water Supply Services (4" & 6" Meters)	1 of 1
BC 842.02	Standard Installation of 4" & 6" Water Supply Services (3" & 4" Meters with Reducers)	1 of 1
BC 842.03	Standard Vault for 4" & 6" Water Supply Services	1 of 1
BC 843.01	Standard Installation of 4" & 6" Water Supply Services (3", 4", & 6" Meters) with Tee and Valve (Roadway Box)	1 of 1
BC 843.02	Standard Installation of 4" & 6" Water Supply Services (3", 4", & 6" Meters) with Tee and Valve (Sectional Vault)	1 of 1
BC 843.03	Standard Installation of 4" & 6" Water Supply Services (3", 4", & 6" Meters) with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 844.01	Standard Vault for 4", 6", 8", & 10" Detector Checks with Large Domestic Meters	1 of 3
BC 844.01	Rebar Schedule for Standard Vault for 4", 6", 8", & 10" Detector Checks with Large Domestic Meters	2 of 3
BC 844.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", & 10" Detector Checks with Large Domestic Meters	3 of 3
BC 845.01	Standard Vault for 4", 6", 8", & 10" Detector Checks with Reduced Size Large Domestic Meters	1 of 3
BC 845.01	Rebar Schedule for Standard Vault for 4", 6", 8", & 10" Detector Checks with Reduced Size Large Domestic Meters	2 of 3
BC 845.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", & 10" Detector Checks with Reduced Size Large Domestic Meters	3 of 3
BC 846.01	Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Small Domestic Meters	1 of 2
BC 846.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Small Domestic Meters	2 of 2
BC 847.01	Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters	1 of 3
BC 847.01	Rebar Schedule for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters	2 of 3

BC 847.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters	3 of 3
BC 848.01	Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Large Domestic Meters	1 of 3
BC 848.01	Rebar Schedule for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Large Domestic Meters	2 of 3
BC 848.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Large Domestic Meters	3 of 3
BC 849.01	Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Reduced Size Large Domestic Meters	1 of 3
BC 849.01	Rebar Schedule for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Reduced Size Large Domestic Meters	2 of 3
BC 849.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Reduced Size Large Domestic Meters	3 of 3
BC 850.01	Standard Installation of 4", 6", 8", 10", & 12" Fire Supply Services with Water Supply Service (Outside Fire Hydrants) with Tee and Valve (Sectional Vault)	1 of 1
BC 850.02	Standard Installation of 4", 6", 8", 10", & 12" Fire Supply Services with Water Supply Service (Outside Fire Hydrants) with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 851.01	Standard Installation of 4", 6", 8", & 10" Fire Supply Services with Water Supply Service (No Outside Fire Hydrants) with Tee and Valve (Sectional Vault)	1 of 1
BC 851.02	Standard Installation of 4", 6", 8", & 10" Fire Supply Services with Water Supply Service (No Outside Fire Hydrants) with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 852.01	Standard Installation for 4", 6", 8", 10", & 12" Water Supply Services (4", 6", 8", 10", & 12" Combined Services) with Tee and Valve (Sectional Vault)	1 of 1
BC 852.02	Standard Installation for 4", 6", 8", 10", & 12" Water Supply Services (4", 6", 8", 10", & 12" Combined Services) with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 853.01	Standard Water Meter Vaults	1 of 1
BC 854.01	Standard Installation of Water Main on Structures (Steel Pipe Only)	1 of 1
BC 854.02	Bolt Size Chart for Standard Installation of Water Main on Structures (Steel Pipe Only)	1 of 1
BC 855.01	Water Main Relocation Under Proposed Utility	1 of 1
BC 856.01	Standard Air Release Valve and Vault Precast and Cast in Place	1 of 1
BC 857.01	Standard Installation for Blow	1 of 1
BC 858.01	Standard Plug Clamps - 1	1 of 2
BC 858.01	Standard Plug Clamps - 2	2 of 2
BC 859.01	Standard Tie Bolt	1 of 1
BC 860.01	Buttress for Tees (For 4" - 20")	1 of 1
BC 861.01	Buttress for Caps (For 4" - 20")	1 of 1
BC 862.01	Buttress for Horizontal Bends (For 4" - 20")	1 of 1
BC 863.01	Thrust Blocks for Reducers (For 8" x 4" to 16" x 12")	1 of 1

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BOOK OF STANDARDS
WATER CROSS INDEX OF DRAWINGS

WATER DETAILS:

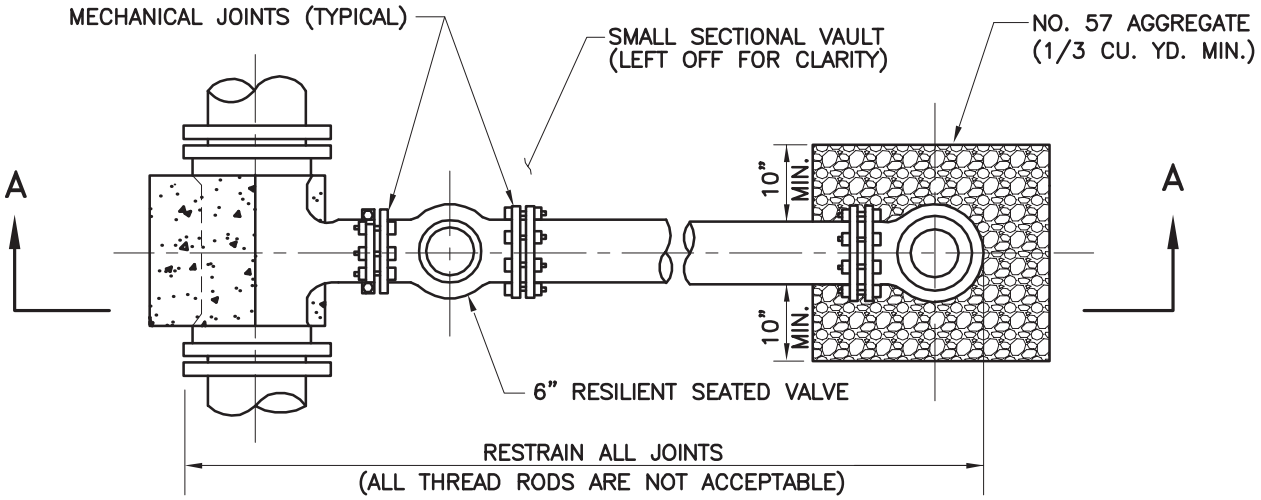
Old Dwg. No.	Dwg. No.	Description	Pages
BC 835.01	BC 833.01	Standard Installation of Fire Hydrant with Tee and Valve (Sectional Vault)	1 of 1
BC 835.01	BC 833.02	Standard Installation of Fire Hydrant with Tee and Valve (Roadway Box)	1 of 1
BC 835.02	BC 833.03	Standard Installation of Fire Hydrant with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 835.02	BC 833.04	Standard Installation of Fire Hydrant with Tapping Sleeve and Valve (Roadway Box)	1 of 1
	BC 834.01	Standard Installation of Resilient - Seated Valve with Roadway Box (4" - 14")	1 of 1
BC 836.20	BC 834.02	Standard Installation of Tapping Valve with Small Sectional Vault (4" - 8")	1 of 1
	BC 834.03	Standard Installation of Tapping Valve with Roadway Box (4" - 8")	1 of 1
BC 836.21	BC 834.04	Standard Installation of Tapping Valve with Large Sectional Vault (10" - 12")	1 of 1
	BC 834.05	Standard Installation of Tapping Valve with Roadway Box (10" - 12")	1 of 1
	BC 834.06	Standard Installation of Tapping Sleeve and Horizontal Valve with Sectional Vault (4" - 24")	1 of 1
	BC 834.07	Standard Installation of Tapping Sleeve and Horizontal Valve with Roadway Box (4" - 14")	1 of 1
	BC 835.01	Standard Installation of Butterfly Valve with Sectional Vault (30" - 72")	1 of 1
	BC 835.02	Standard Installation of Butterfly Valve with Roadway Box (30" - 72")	1 of 1
	BC 835.03	Standard Butterfly Valve Over Torque Protector	1 of 1
BC 840.01	BC 836.01	Standard Installation of 3/4" Water Supply Service (5/8" Meter)	1 of 1
BC 840.02	BC 837.01	Standard Installation of 1" Water Supply Service (3/4" Meter)	1 of 1
BC 840.03	BC 838.01	Standard Installation of Twin Water Supply Services (5/8" Meters)	1 of 1
BC 840.04	BC 839.01	Standard Installation of 1 1/2" Water Supply Service (1" Meter) for 6" Main and Larger	1 of 1

BC 840.05	BC 839.02	Standard Installation of 1 1/2" Water Supply Service (1" Meter) for Mains Smaller Than 6"	1 of 1
BC 840.06	BC 840.01	Standard Installation of 2" Water Supply Service (1 1/2" Meter) for 8" Main and Larger	1 of 1
BC 840.07	BC 840.02	Standard Installation of 2" Water Supply Service (1 1/2" Meter) for 6" Main and Smaller	1 of 1
BC 840.08	BC 840.03	Standard Installation of 2" Water Supply Service (2" Meter) for 8" Main and Larger	1 of 2
BC 840.09	BC 840.03	Standard Installation of 2" Water Supply Service (2" Meter) for 8" Main and Larger	2 of 2
	BC 841.01	Standard Installation for Fire Protection 1 1/2" Water Supply Service (3/4" Meter) for 4" Main	1 of 1
	BC 841.02	Standard Installation for Fire Protection 1 1/2" Water Supply Service (1" Meter) for 4" Main	1 of 1
	BC 841.03	Standard Installation for Fire Protection 1 1/2" Twin Water Supply Services (3/4" Meters) for 4" Main	1 of 1
	BC 841.04	Standard Installation for Fire Protection 1 1/2" Twin Water Supply Services (1" Meters) for 4" Main	1 of 1
	BC 841.05	Standard Installation for Fire Protection 1 1/2" Water Supply Service (3/4" Meter) for 6" Main and Larger	1 of 1
	BC 841.06	Standard Installation for Fire Protection 1 1/2" Water Supply Service (1" Meter) for 6" Main and Larger	1 of 1
	BC 841.07	Standard Installation for Fire Protection 1 1/2" Twin Water Supply Services (3/4" Meters) for 6" Main and Larger	1 of 1
	BC 841.08	Standard Installation for Fire Protection 1 1/2" Twin Water Supply Services (1" Meters) for 6" Main and Larger	1 of 1
BC 840.10 1 OF 3	BC 842.01	Standard Installation of 4" & 6" Water Supply Services (4" & 6" Meters)	1 of 1
BC 840.10 2 OF 3	BC 842.02	Standard Installation of 4" & 6" Water Supply Services (3" & 4" Meters with Reducers)	1 of 1
BC 840.10 3 OF 3	BC 842.03	Standard Vault for 4" & 6" Water Supply Services	1 of 1
	BC 843.01	Standard Installation of 4" & 6" Water Supply Services (3", 4", & 6" Meters) with Tee and Valve (Roadway Box)	1 of 1
	BC 843.02	Standard Installation of 4" & 6" Water Supply Services (3", 4", & 6" Meters) with Tee and Valve (Sectional Vault)	1 of 1
	BC 843.03	Standard Installation of 4" & 6" Water Supply Services (3", 4", & 6" Meters) with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 840.14 1 OF 2	BC 844.01	Standard Vault for 4", 6", 8", & 10" Detector Checks with Large Domestic Meters	1 of 3
BC 840.14 1 OF 2	BC 844.01	Rebar Schedule for Standard Vault for 4", 6", 8", & 10" Detector Checks with Large Domestic Meters	2 of 3

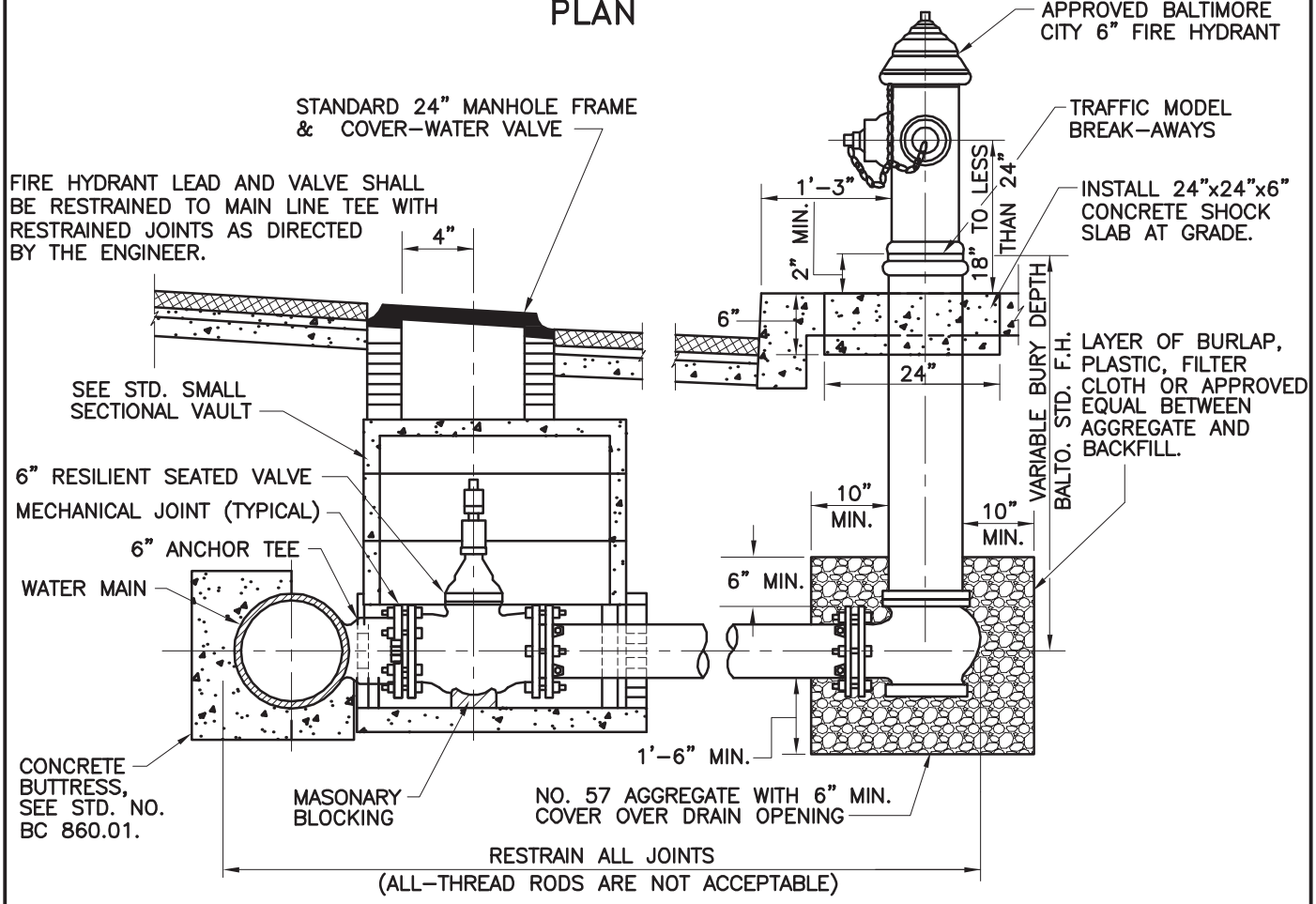
BC 840.14 2 OF 2	BC 844.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", & 10" Detector Checks with Large Domestic Meters	3 of 3
BC 840.15 1 OF 2	BC 845.01	Standard Vault for 4", 6", 8", & 10" Detector Checks with Reduced Size Large Domestic Meters	1 of 3
BC 840.15 1 OF 2	BC 845.01	Rebar Schedule for Standard Vault for 4", 6", 8", & 10" Detector Checks with Reduced Size Large Domestic Meters	2 of 3
BC 840.15 2 OF 2	BC 845.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", & 10" Detector Checks with Reduced Size Large Domestic Meters	3 of 3
BC 840.16 1 OF 2	BC 846.01	Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Small Domestic Meters	1 of 2
BC 840.16 2 OF 2	BC 846.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Small Domestic Meters	2 of 2
BC 840.17 1 OF 2	BC 847.01	Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters	1 of 3
BC 840.17 1 OF 2	BC 847.01	Rebar Schedule for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters	2 of 3
BC 840.17 2 OF 2	BC 847.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters	3 of 3
BC 840.18 1 OF 2	BC 848.01	Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Large Domestic Meters	1 of 3
BC 840.18 1 OF 2	BC 848.01	Rebar Schedule for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Large Domestic Meters	2 of 3
BC 840.18 2 OF 2	BC 848.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Large Domestic Meters	3 of 3
BC 840.19 1 OF 2	BC 849.01	Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Reduced Size Large Domestic Meters	1 of 3
BC 840.19 1 OF 2	BC 849.01	Rebar Schedule for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Reduced Size Large Domestic Meters	2 of 3
BC 840.19 2 OF 2	BC 849.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Reduced Size Large Domestic Meters	3 of 3
BC 840.90	BC 850.01	Standard Installation of 4", 6", 8", 10", & 12" Fire Supply Services with Water Supply Service (Outside Fire Hydrants) with Tee and Valve (Sectional Vault)	1 of 1
BC 840.90	BC 850.02	Standard Installation of 4", 6", 8", 10", & 12" Fire Supply Services with Water Supply Service (Outside Fire Hydrants) with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 840.91	BC 851.01	Standard Installation of 4", 6", 8", & 10" Fire Supply Services with Water Supply Service (No Outside Fire Hydrants) with Tee and Valve (Sectional Vault)	1 of 1

BC 840.91	BC 851.02	Standard Installation of 4", 6", 8", & 10" Fire Supply Services with Water Supply Service (No Outside Fire Hydrants) with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 840.92	BC 852.01	Standard Installation for 4", 6", 8", 10", & 12" Water Supply Services (4", 6", 8", 10", & 12" Combined Services) with Tee and Valve (Sectional Vault)	1 of 1
BC 840.92	BC 852.02	Standard Installation for 4", 6", 8", 10", & 12" Water Supply Services (4", 6", 8", 10", & 12" Combined Services) with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 840.93	BC 853.01	Standard Water Meter Vaults	1 of 1
BC 890.34	BC 854.01	Standard Installation of Water Main on Structures (Steel Pipe Only)	1 of 1
BC 890.35	BC 854.02	Bolt Size Chart for Standard Installation of Water Main on Structures (Steel Pipe Only)	1 of 1
	BC 855.01	Water Main Relocation Under Proposed Utility	1 of 1
	BC 856.01	Standard Air Release Valve and Vault Precast and Cast in Place	1 of 1
BC 890.30	BC 857.01	Standard Installation for Blow	1 of 1
BC 890.31	BC 858.01	Standard Plug Clamps - 1	1 of 2
BC 890.32	BC 858.01	Standard Plug Clamps - 2	2 of 2
BC 890.33	BC 859.01	Standard Tie Bolt	1 of 1
BC 837.23	BC 860.01	Buttress for Tees (For 4" - 20")	1 of 1
BC 837.22	BC 861.01	Buttress for Caps (For 4" - 20")	1 of 1
BC 837.12 to BC 837.21	BC 862.01	Buttress for Horizontal Bends (For 4" - 20")	1 of 1
	BC 863.01	Thrust Blocks for Reducers (For 8" x 4" to 16" x 12")	1 of 1
	BC 864.01	In-Line Thrust Blocks (For 4" - 12")	1 of 1
BC 837.25	BC 865.01	Double Caps, Jack and Buttress (For D.I. and C.I. Pipe Only)	1 of 1
BC 837.01 to BC 837.03	BC 866.01	Anchorages for Upper Vertical Bends (For 4" - 20")	1 of 1
BC 837.04 to BC 837.11	BC 867.01	Buttress for Lower Vertical Bends (For 4" - 20")	1 of 1
	BC 868.01	Buttress for Wye Connection (For 4" - 20")	1 of 1
BC 890.01	BC 869.01	Table of Sections Required for Concrete Valve Vaults	1 of 1
BC 890.02	BC 870.01	Standard Sections for Small Concrete Vaults	1 of 3
BC 890.04	BC 870.01	Detail of Small Sectional Concrete Vault	2 of 3
BC 890.05	BC 870.01	Details of "D" and "E" Sections - Small Sectional Concrete Vault	3 of 3
BC 890.02	BC 871.01	Standard Sections for Large Sectional Concrete Vaults	1 of 4
BC 890.06	BC 871.01	Detail of Large Sectional Concrete Vault ("A" and "B" Sections)	2 of 4
BC 890.07	BC 871.01	Detail of Large Sectional Concrete Vault ("C" and "D" Sections)	3 of 4
BC 890.08	BC 871.01	"E" Section and "F" Sections Large Concrete Vault Top Slab	4 of 4

BC 835.03	BC 872.01	7 1/2" Roadway Box Top	1 of 6
BC 835.03	BC 872.01	7 1/2" Roadway Box Bottom	2 of 6
BC 835.04	BC 872.01	7 1/2" Roadway Box Extension	3 of 6
	BC 872.01	7 1/2" Roadway Box Lid (On Resilient or Butterfly Valve)	4 of 6
	BC 872.01	1 1/2", 2", & 2 1/2" Valve Box Riser (Heavy Duty)	5 of 6
BC 890.11	BC 872.01	Standard 7 1/2" Valve Cover - Water	6 of 6
BC 890.12	BC 873.01	Standard 12" Meter Frame	1 of 3
BC 890.13	BC 873.01	Standard 12" Meter Cover	2 of 3
BC 890.14	BC 873.01	Standard 12" Meter Cover - Locking Bolt and Details	3 of 3
BC 890.18	BC 874.01	18" x 12" Meter Frame Adapter	1 of 2
BC 890.19	BC 874.01	18" x 12" Meter Frame Adapter	2 of 2
BC 890.20	BC 875.01	Standard 18" Manhole Cover - Water	1 of 2
BC 890.21	BC 875.01	Standard 18" Manhole Frame	2 of 2
BC 890.22	BC 876.01	Standard 24" Manhole Cover - Water	1 of 2
BC 890.23	BC 876.01	Standard 24" Manhole Frame - Water	2 of 2
BC 890.24	BC 877.01	Standard 30" Manhole Cover - Water	1 of 2
BC 890.25	BC 877.01	Standard 30" Manhole Frame - Water	2 of 2



PLAN



NOTES: 1. BALTIMORE STANDARD FIRE HYDRANT HAS VARIABLE BURY DEPTH, ANY VERTICAL ADJUSTMENT SHALL BE MADE USING BALTIMORE STD. FIRE HYDRANT EXTENSION PIECES.

2. CONCRETE SHALL BE MIX 3.

SECTION A–A

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

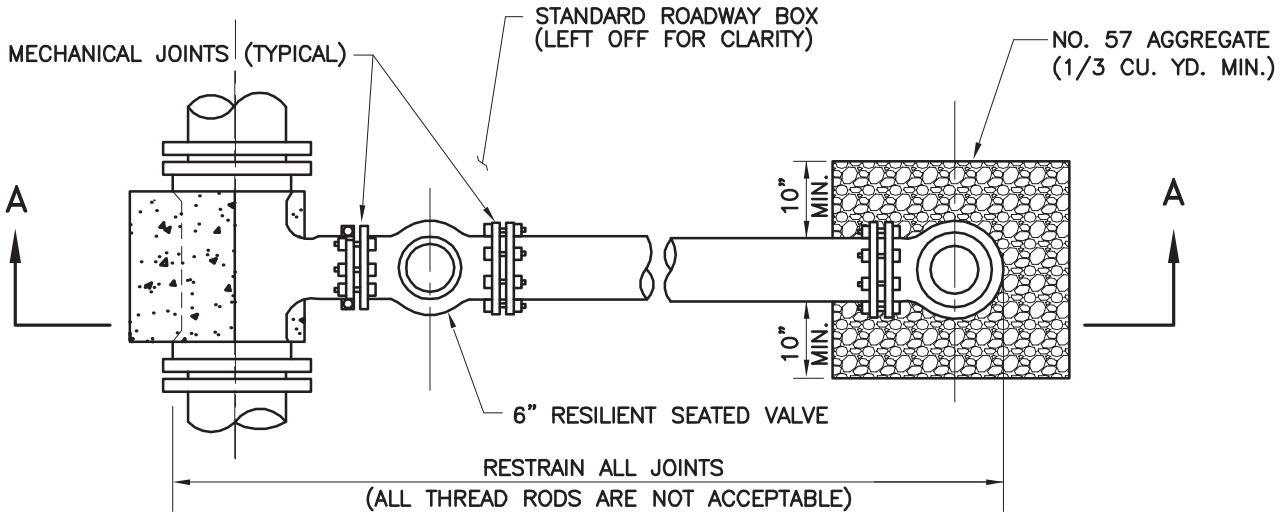
STANDARD INSTALLATION
OF FIRE HYDRANT
WITH TEE AND VALVE
(SECTIONAL VAULT)

ISSUED	REVISED	REVISED
3 / 2008		

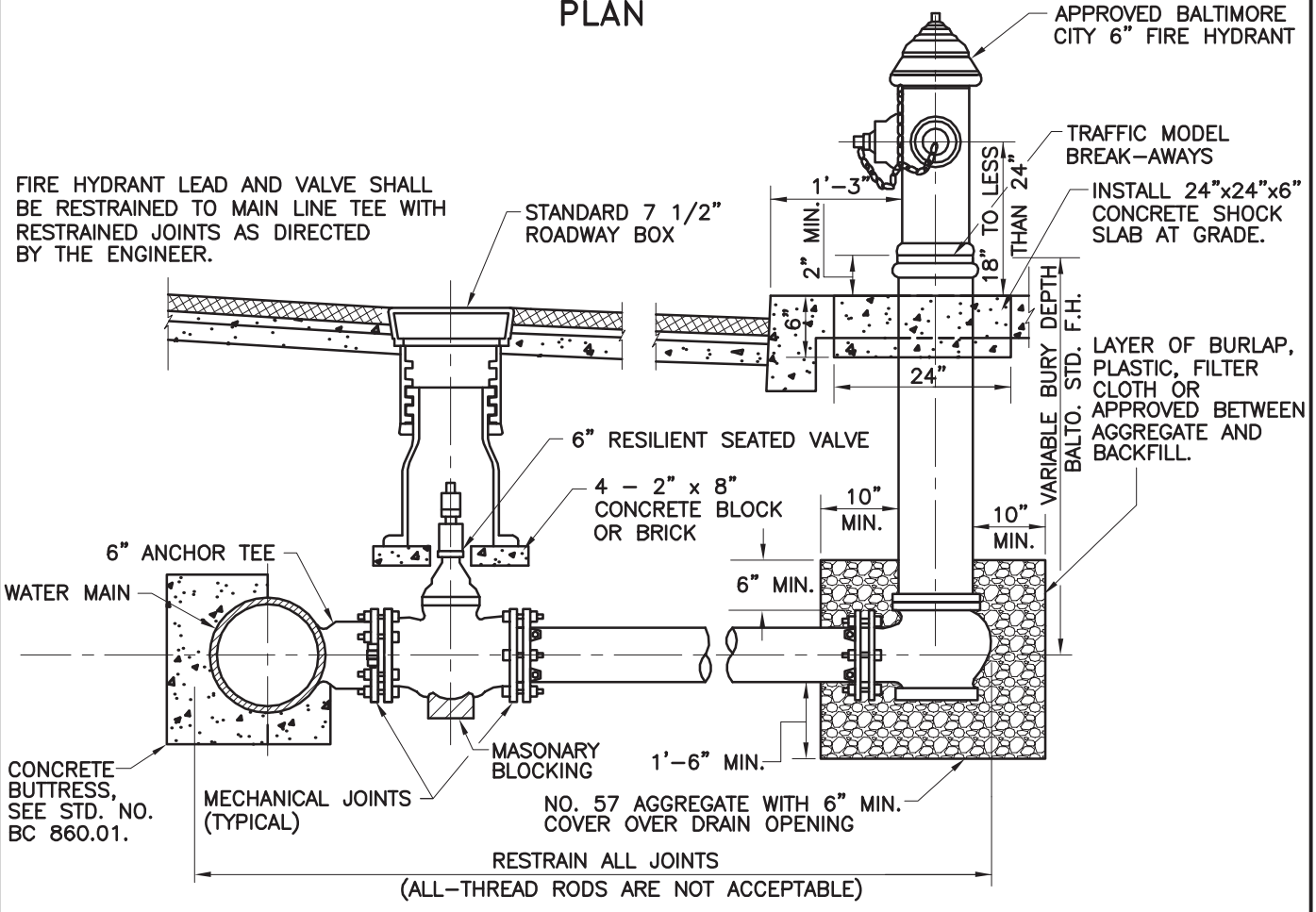
STANDARD NO.
BC 833.01

SCALE : NONE

SHEET 1 OF 1



PLAN



NOTES: 1. BALTIMORE STANDARD FIRE HYDRANT HAS VARIABLE BURY DEPTH, ANY VERTICAL ADJUSTMENT SHALL BE MADE USING BALTIMORE STD. FIRE HYDRANT EXTENSION PIECES.

2. CONCRETE SHALL BE MIX 3.

SECTION A-A

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

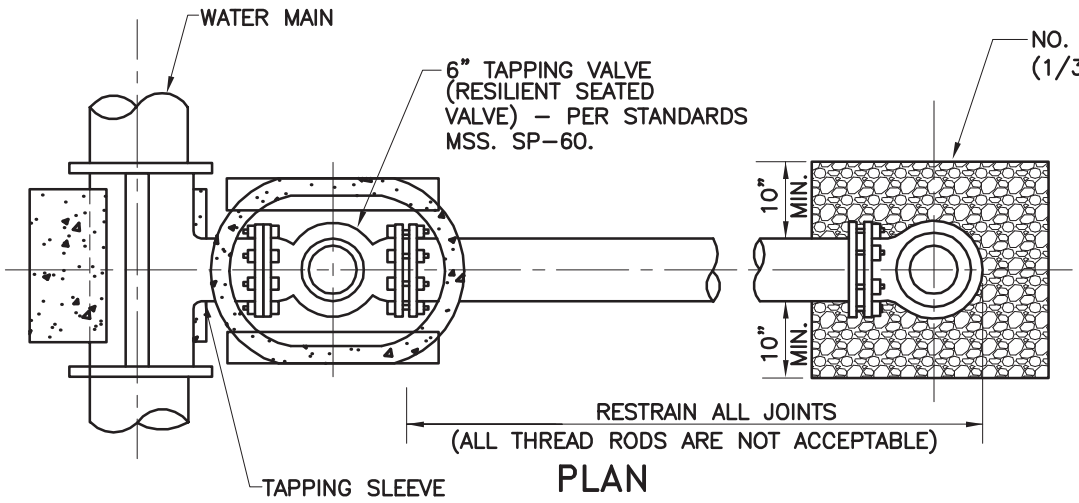
STANDARD INSTALLATION
OF FIRE HYDRANT
WITH TEE AND VALVE
(ROADWAY BOX)

ISSUED	REVISED	REVISED
3 / 2008		

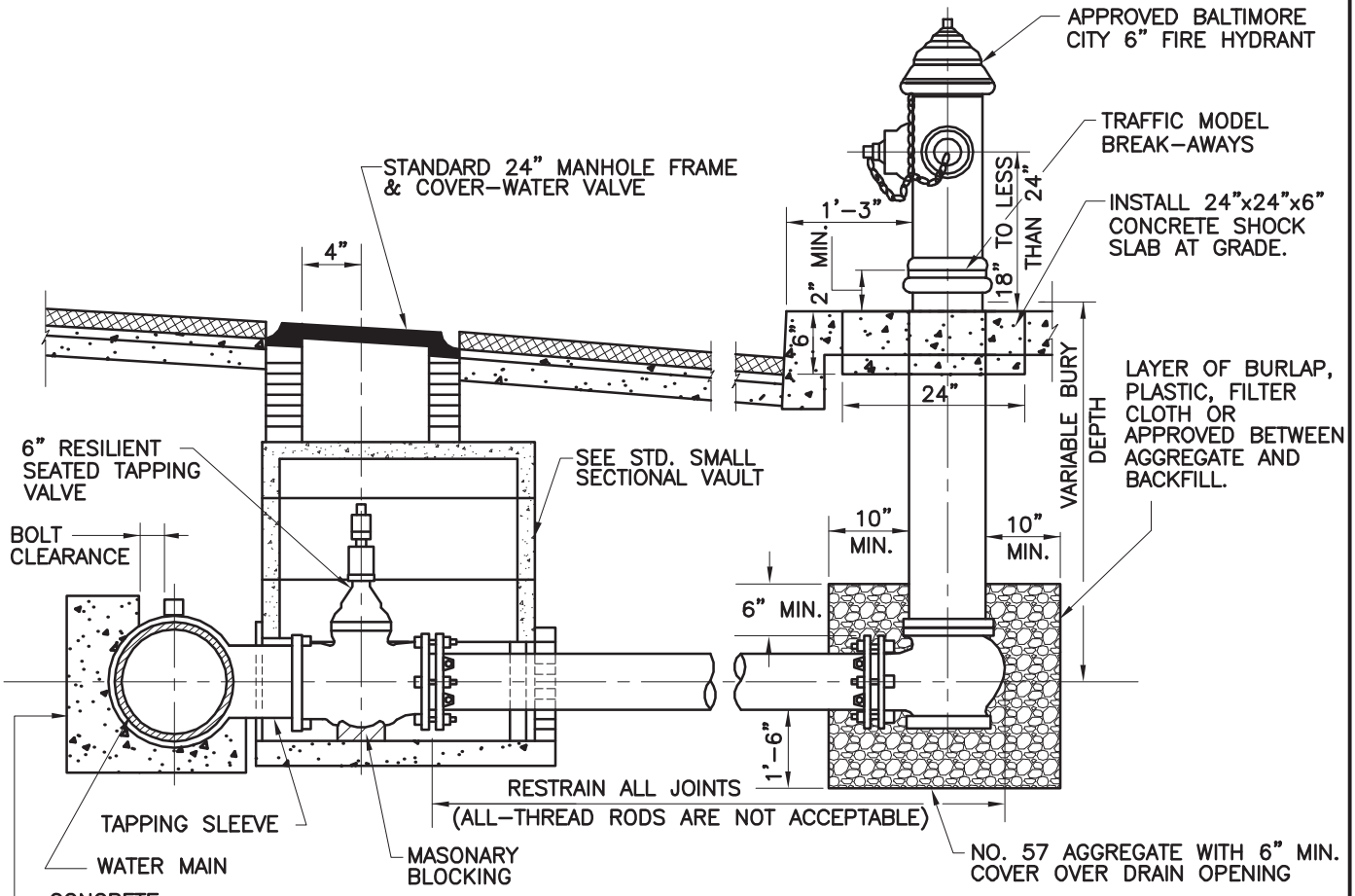
STANDARD NO.
BC 833.02

SCALE : NONE

SHEET 1 OF 1



PLAN

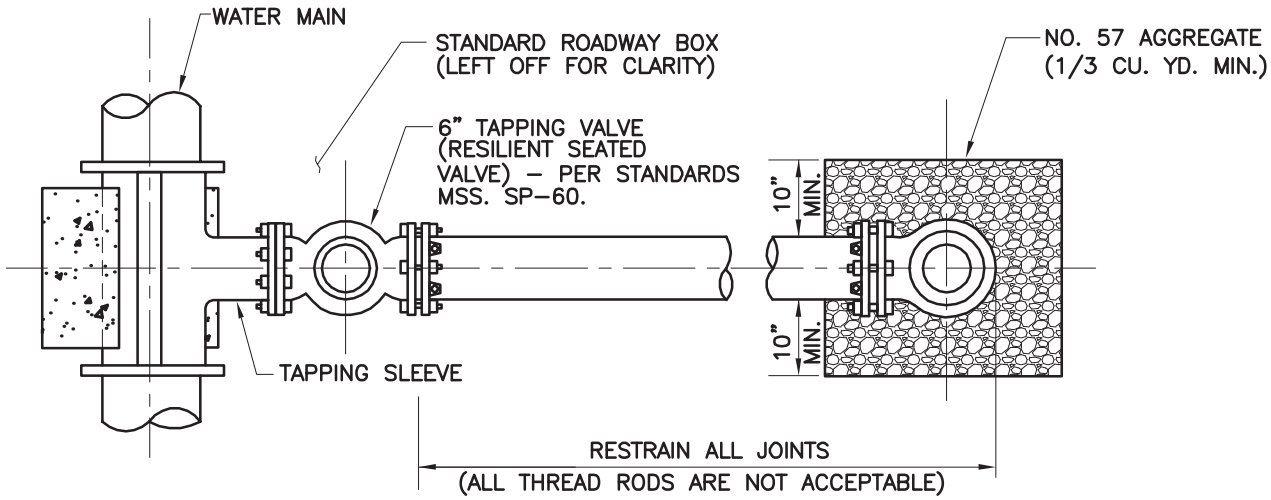


NOTES: 1. BALTIMORE STANDARD FIRE HYDRANT HAS VARIABLE BURY DEPTH, ANY VERTICAL ADJUSTMENT SHALL BE MADE USING BALTIMORE STD. FIRE HYDRANT EXTENSION PIECES.

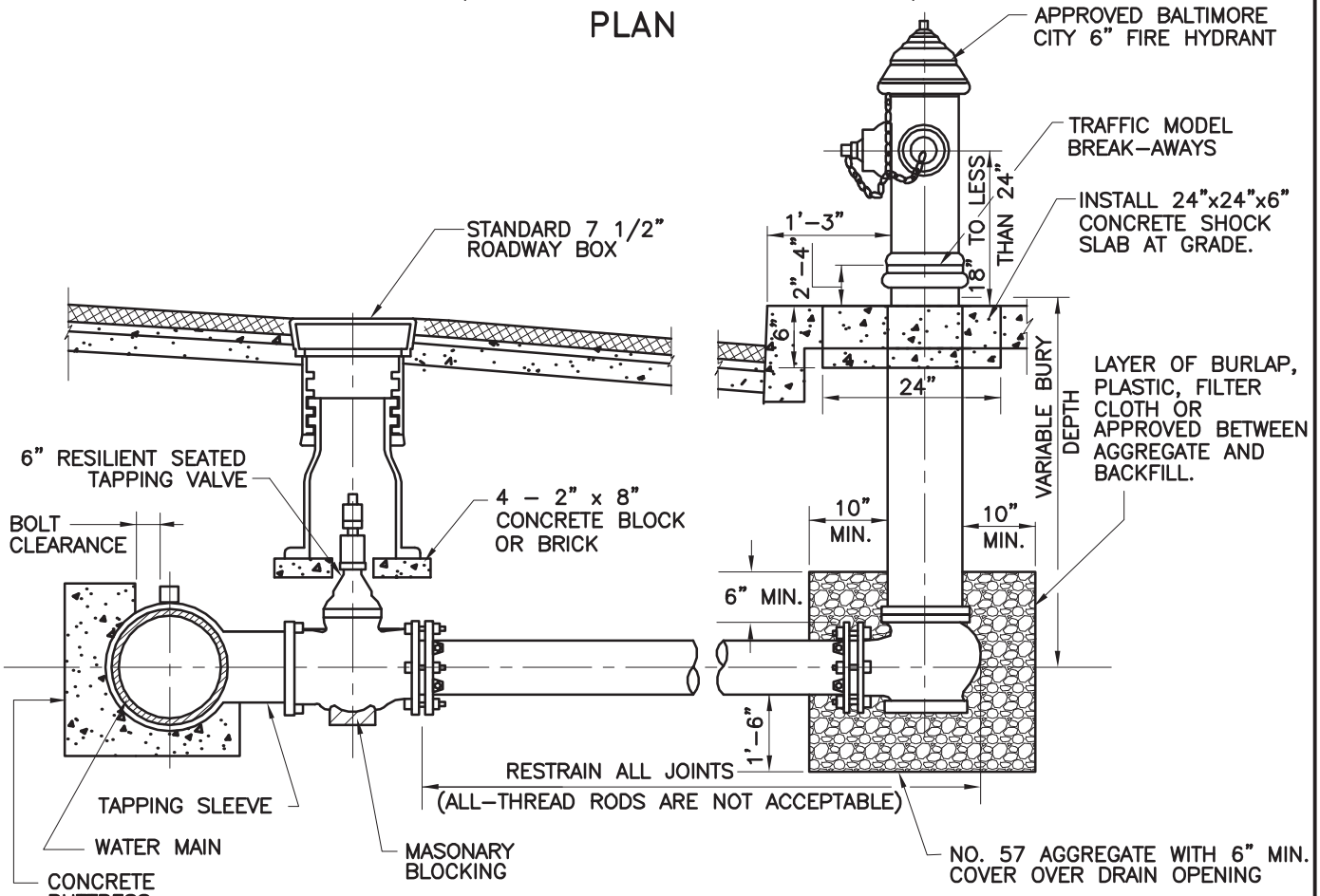
2. CONCRETE SHALL BE MIX 3.

ELEVATION

CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER; DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED: 3 / 2008	REVISED / REVISED
		STANDARD INSTALLATION OF FIRE HYDRANT WITH TAPPING SLEEVE AND VALVE (SECTIONAL VAULT)	STANDARD NO. BC 833.03	
			SCALE : NONE	SHEET 1 OF 1



PLAN



NOTES: 1. BALTIMORE STANDARD FIRE HYDRANT HAS VARIABLE BURY DEPTH, ANY VERTICAL ADJUSTMENT SHALL BE MADE USING BALTIMORE STD. FIRE HYDRANT EXTENSION PIECES.

2. CONCRETE SHALL BE MIX 3.

ELEVATION

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

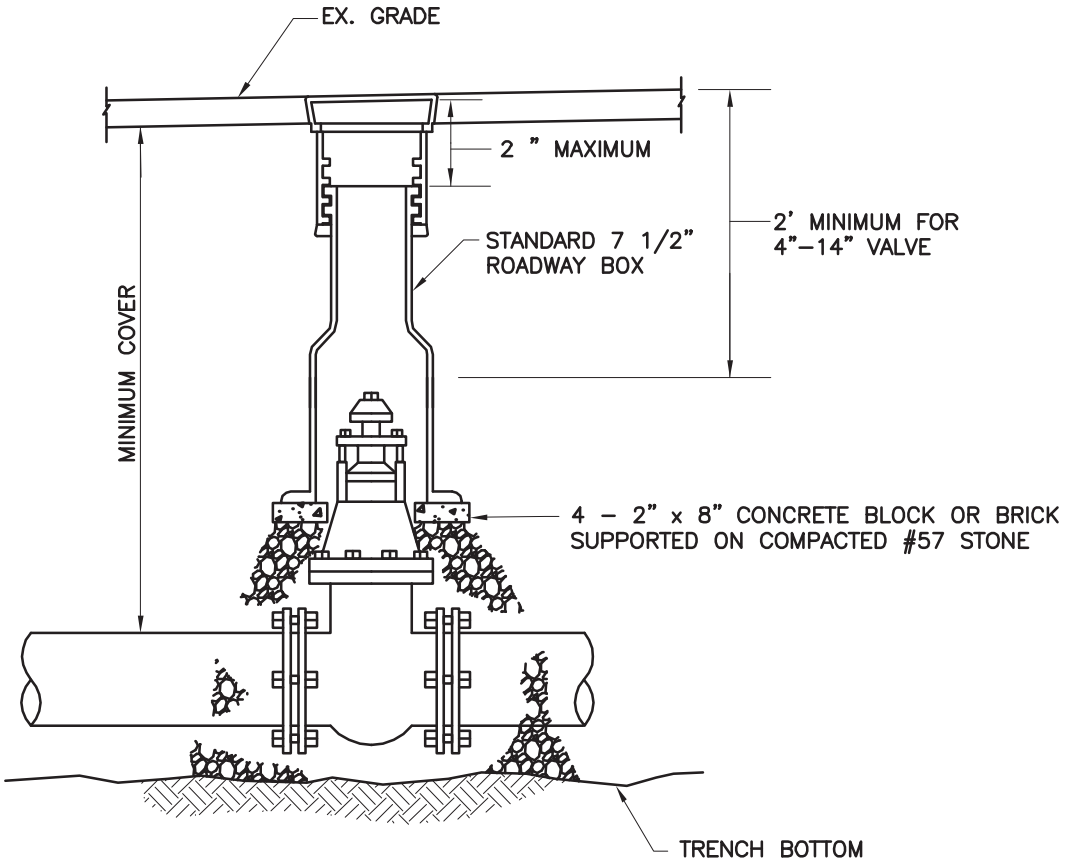
STANDARD INSTALLATION
OF FIRE HYDRANT WITH
TAPPING SLEEVE AND VALVE
(ROADWAY BOX)

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 833.04

SCALE : NONE

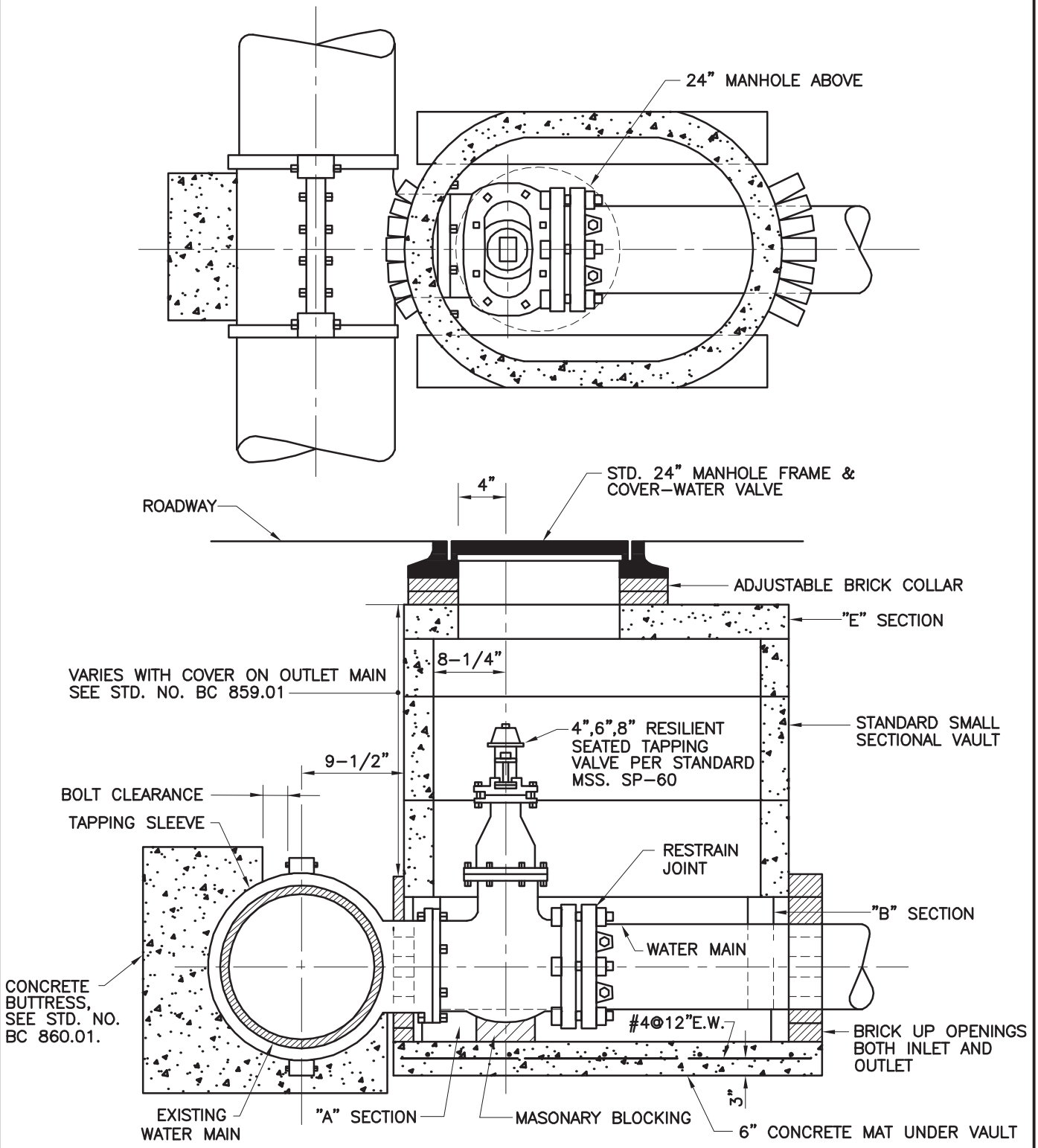
SHEET 1 OF 1



NOTES:

1. NORMAL SETTING FOR 4"–14" SHOWN
2. DIMENSIONS NOTED MAY VARY DEPENDING ON MANUFACTURER

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		STANDARD INSTALLATION OF RESILIENT - SEATED VALVE WITH ROADWAY BOX (4" - 14")	STANDARD NO. BC 834.01		
			SCALE : NONE	SHEET 1 OF 1	



NOTES:

1. ALL TAPPING VALVES SHALL CONFORM TO DPW – WATER & WASTEWATER APPROVED STANDARDS.
2. FOR DIMENSIONS & REINFORCEMENT OF THE VARIOUS SECTIONS, SEE STD. NO. BC 870.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

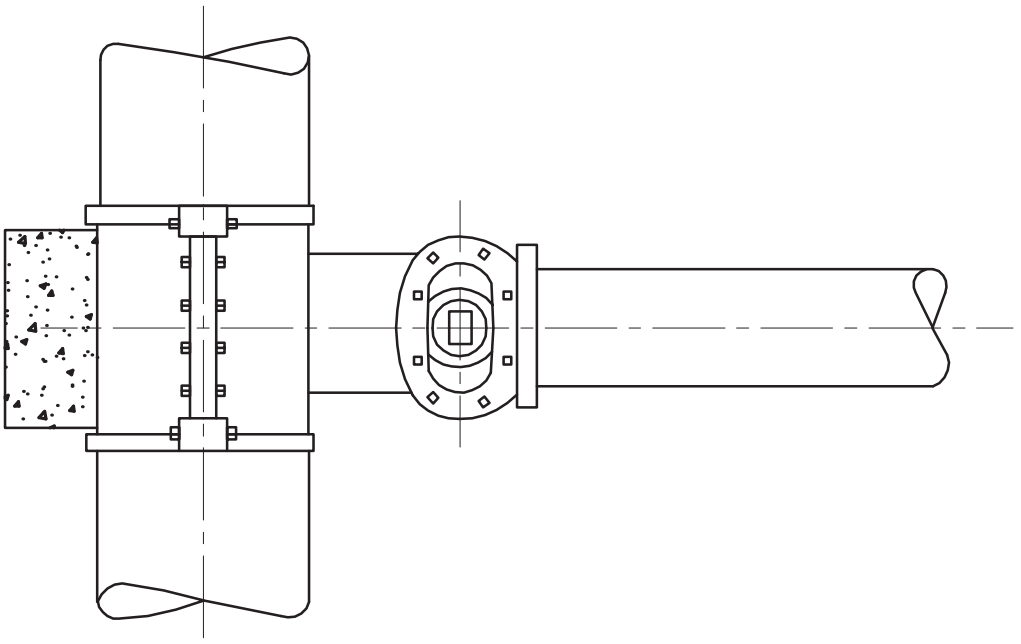
ISSUED	REVISED	REVISED
3 / 2008		

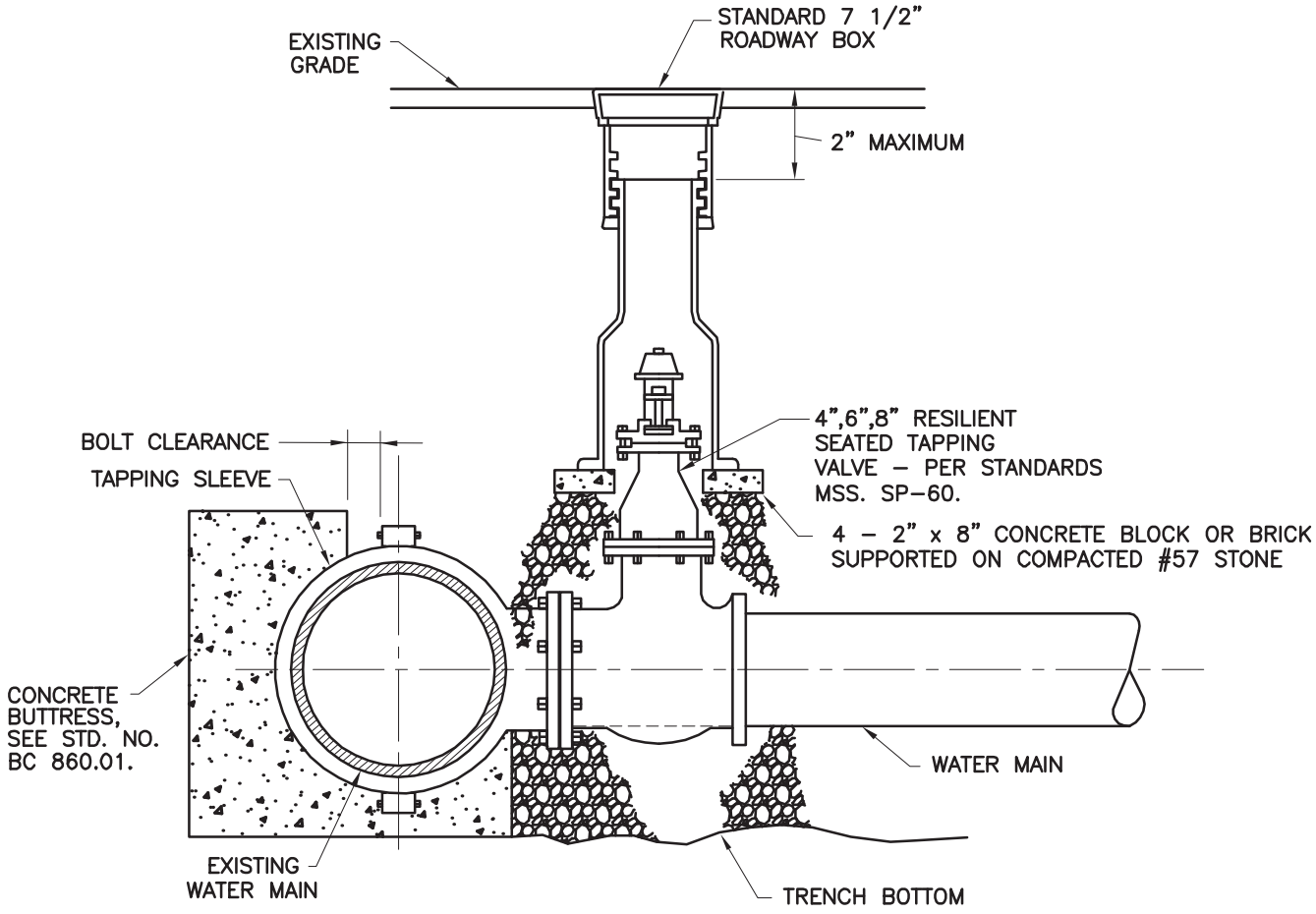
STANDARD INSTALLATION OF TAPPING VALVE WITH SMALL SECTIONAL VAULT (4" - 8")

STANDARD NO. BC 834.02

SCALE : NONE

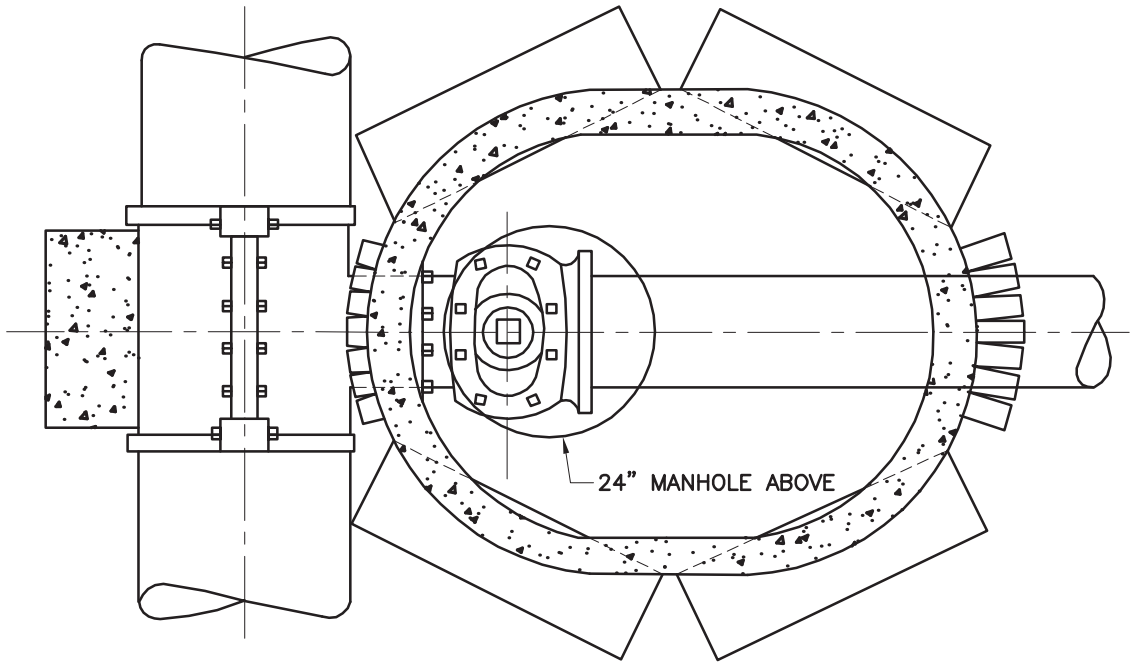
SHEET 1 OF 1

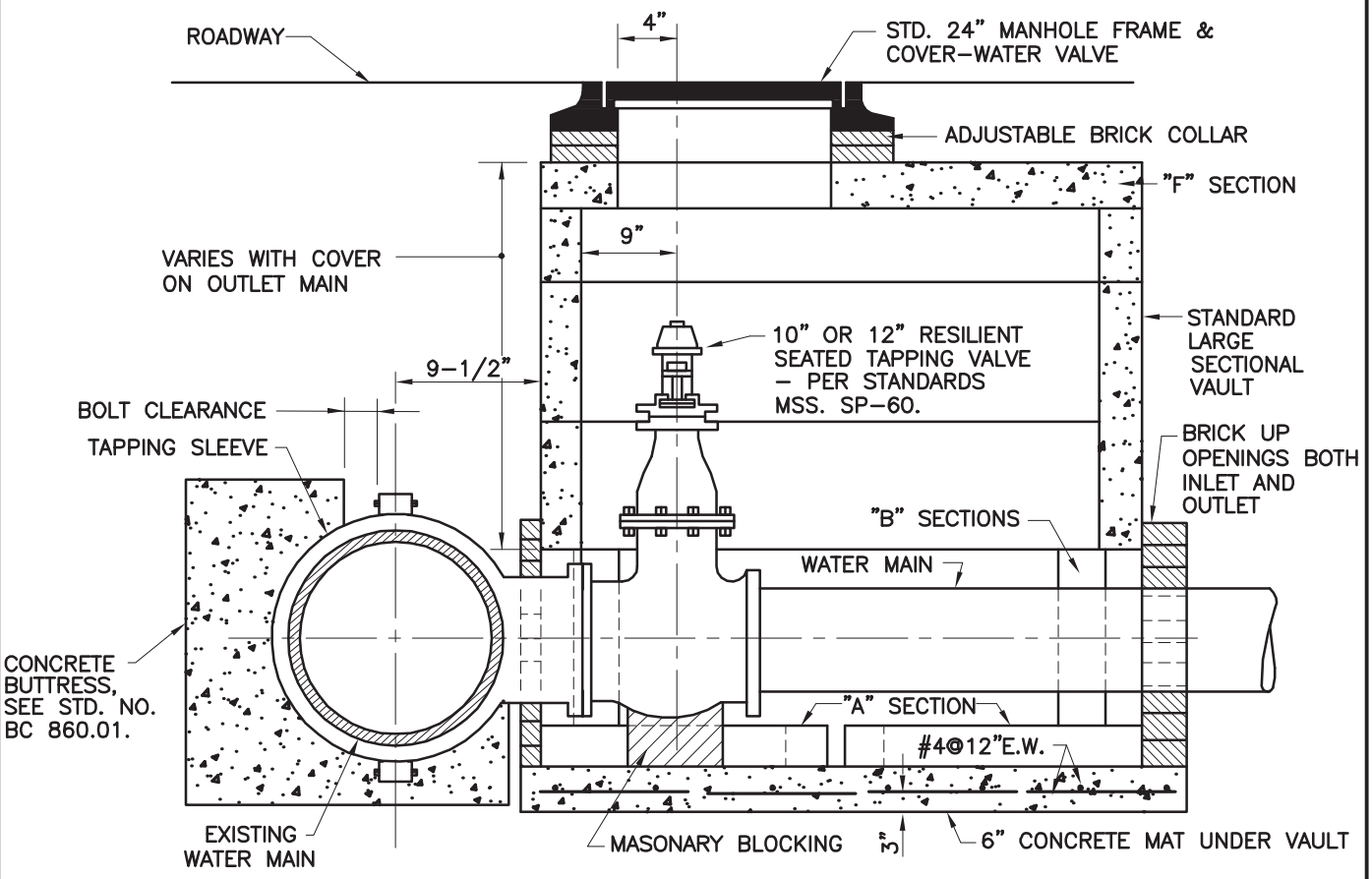




NOTE:
ALL TAPPING VALVES SHALL CONFORM TO DPW – WATER & WASTEWATER APPROVED STANDARDS.

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		STANDARD INSTALLATION OF TAPPING VALVE WITH ROADWAY BOX (4" - 8")	STANDARD NO. BC 834.03		
			SCALE : NONE	SHEET 1 OF 1	





NOTES:

1. ALL TAPPING VALVES SHALL CONFORM TO DPW – WATER & WASTEWATER APPROVED STANDARDS.
2. FOR DIMENSIONS & REINFORCEMENT OF THE VARIOUS SECTIONS, SEE STD. NO. BC 871.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

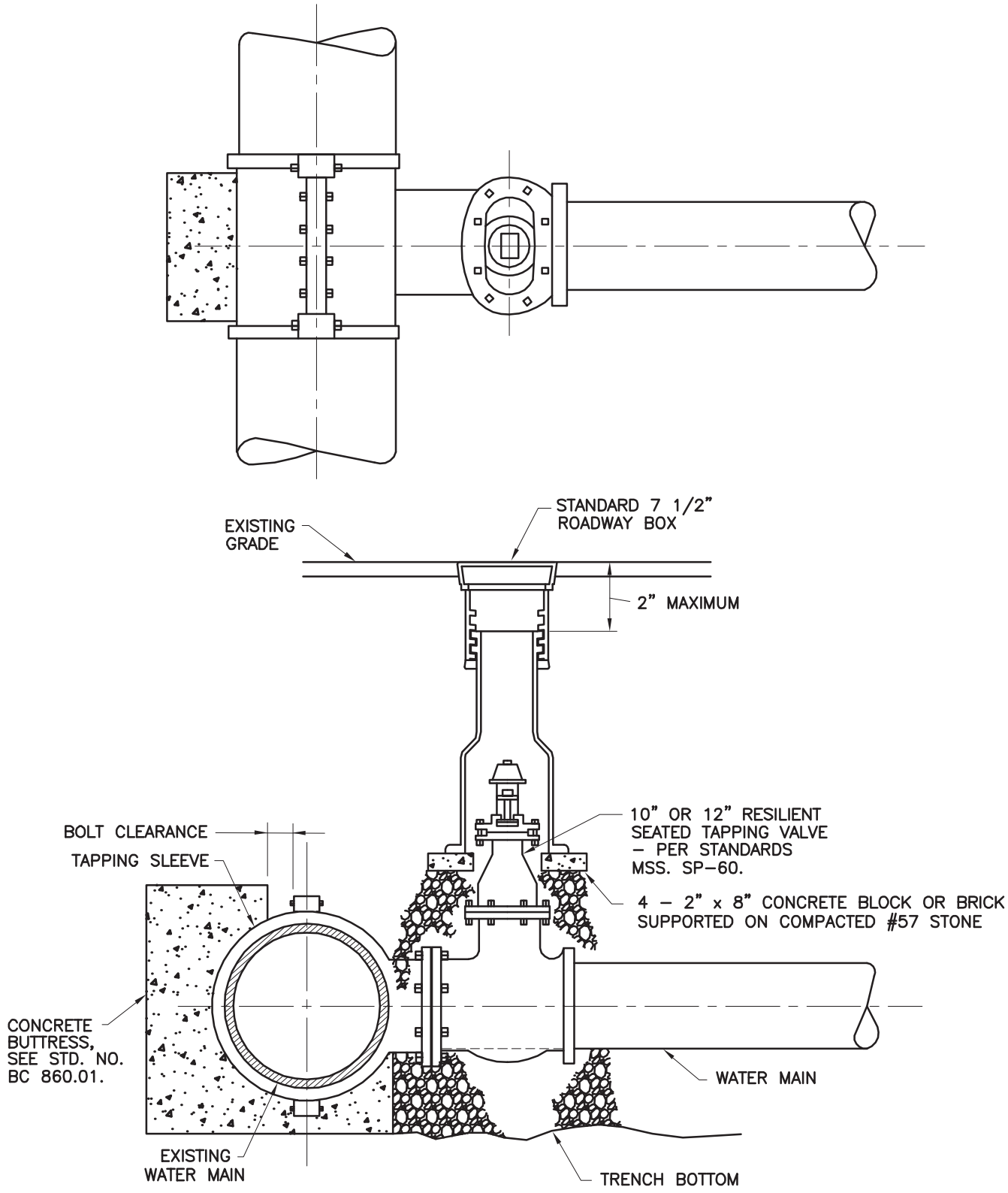
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD INSTALLATION OF TAPPING VALVE WITH LARGE SECTIONAL VAULT (10" - 12")

STANDARD NO. BC 834.04

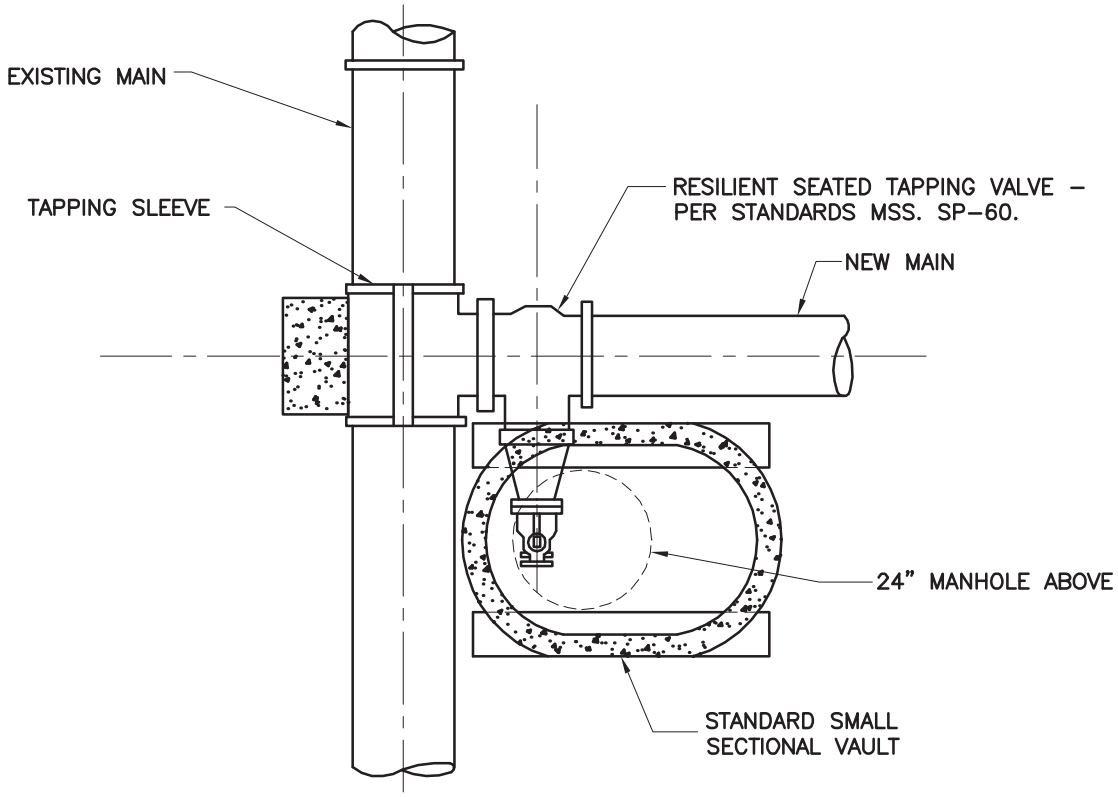
SCALE : NONE

SHEET 1 OF 1

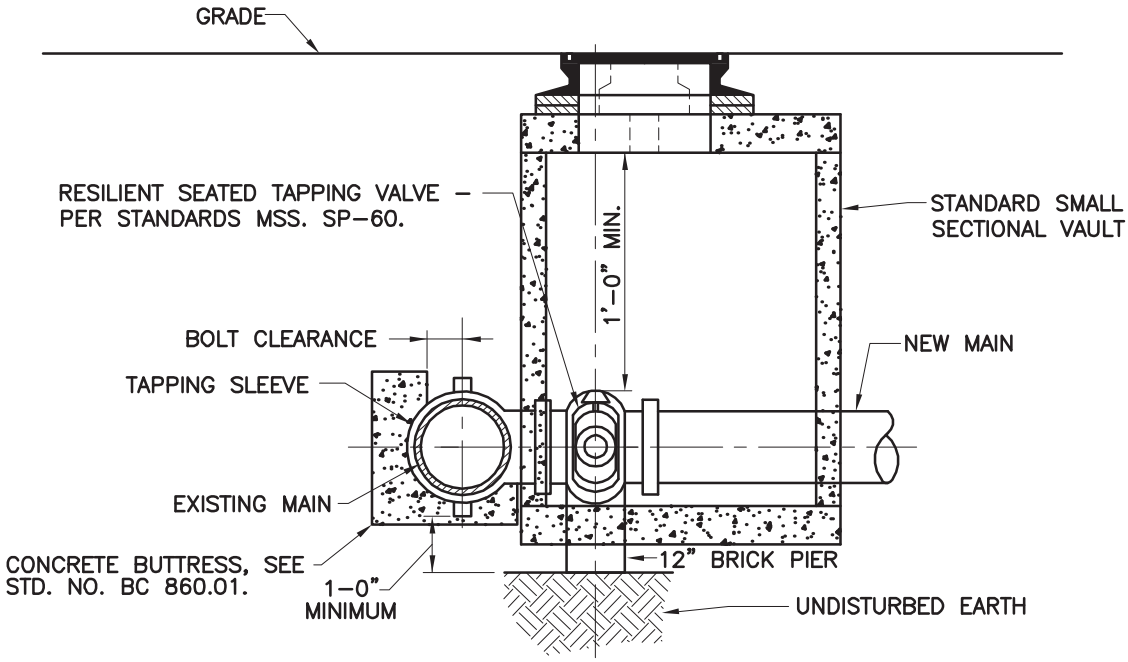


NOTE:
ALL TAPPING VALVES SHALL CONFORM TO DPW – WATER & WASTEWATER APPROVED STANDARDS.

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		STANDARD INSTALLATION OF TAPPING VALVE WITH ROADWAY BOX (10" - 12")	STANDARD NO. BC 834.05		
			SCALE : NONE	SHEET 1 OF 1	



PLAN



ELEVATION

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

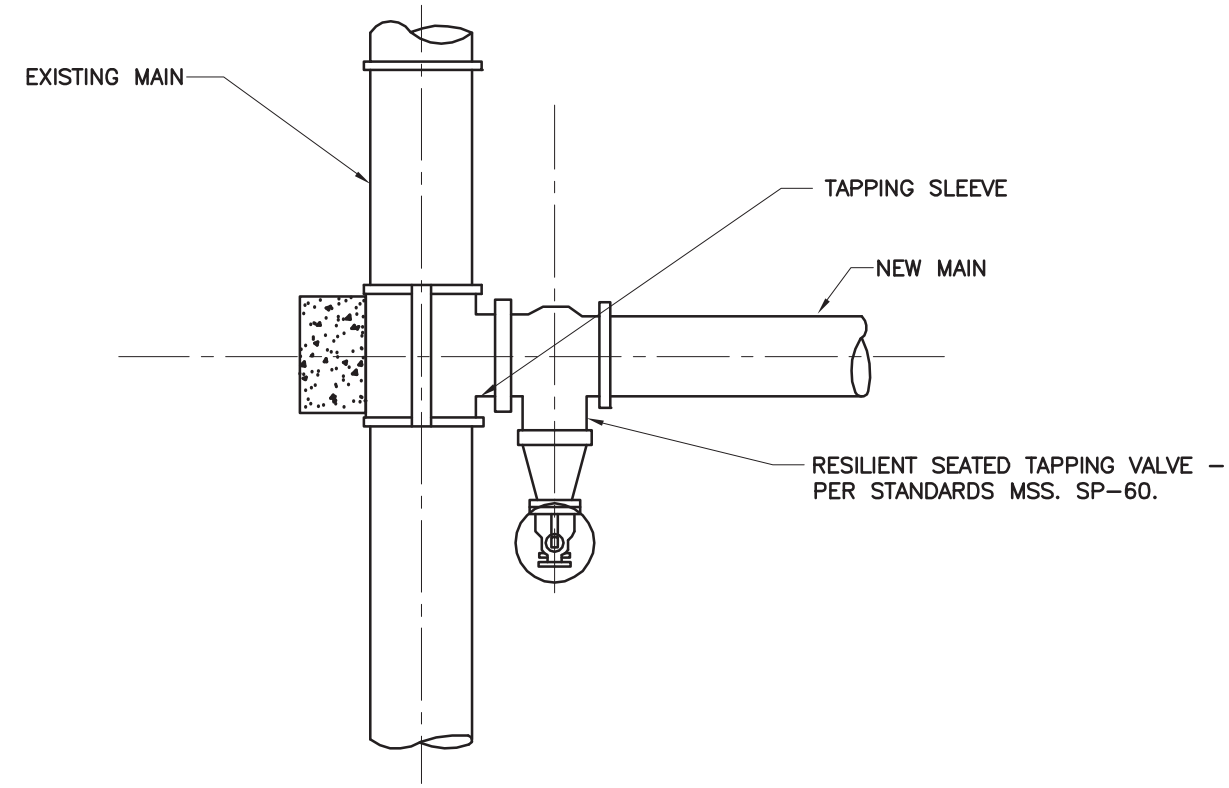
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD INSTALLATION OF TAPPING SLEEVE AND HORIZONTAL VALVE WITH SECTIONAL VAULT (4" - 24")

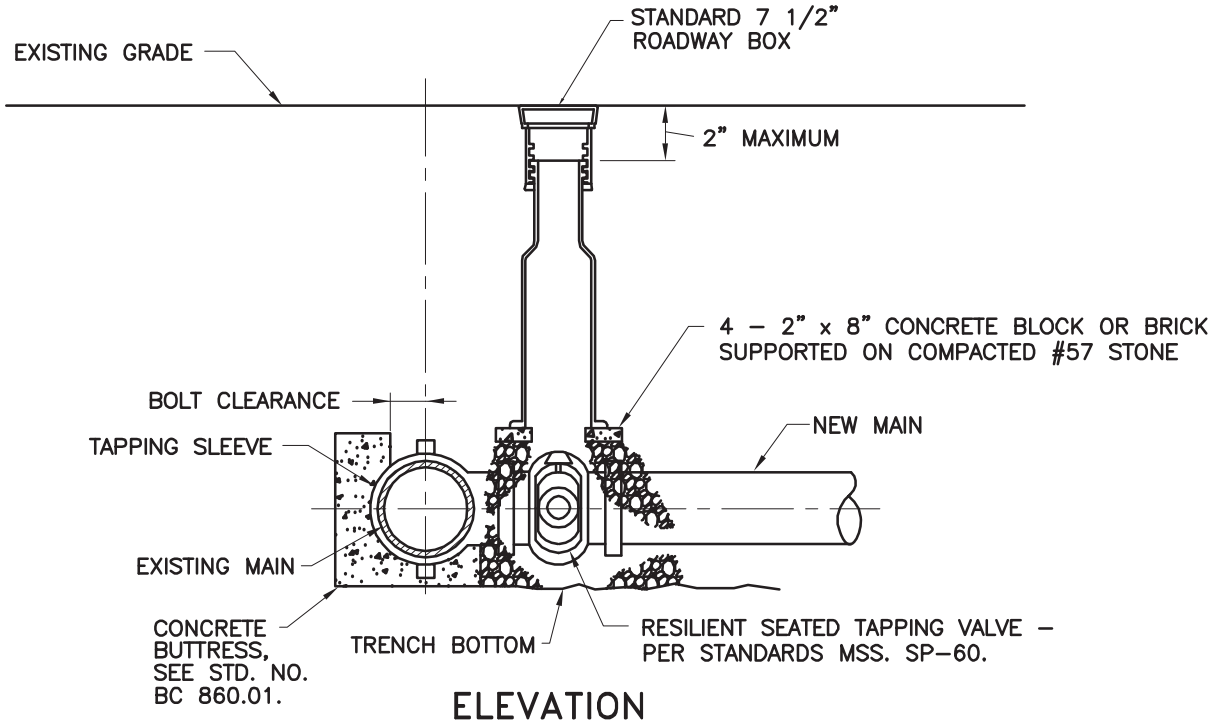
STANDARD NO. BC 834.06

SCALE : NONE

SHEET 1 OF 1



PLAN



ELEVATION

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

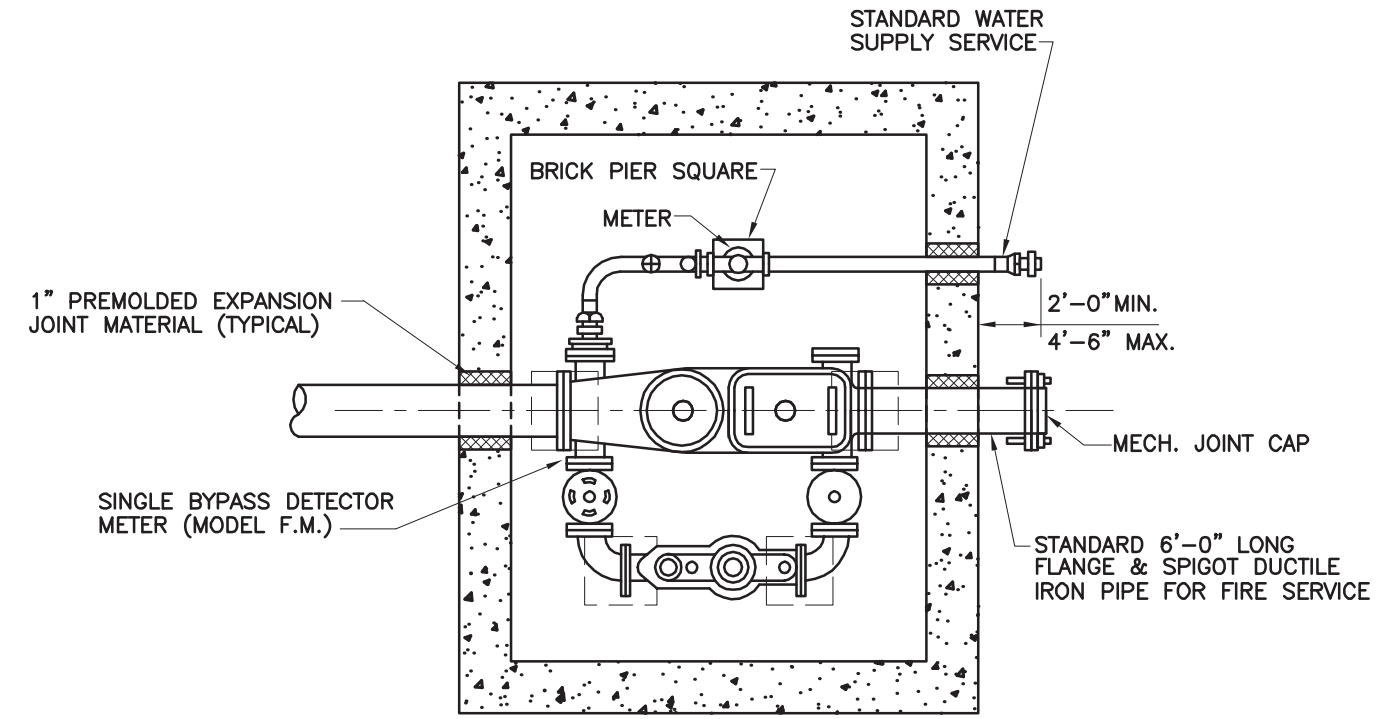
STANDARD INSTALLATION
OF TAPPING SLEEVE AND
HORIZONTAL VALVE WITH
ROADWAY BOX (4" - 24")

ISSUED	REVISED	REVISED
3 / 2008		

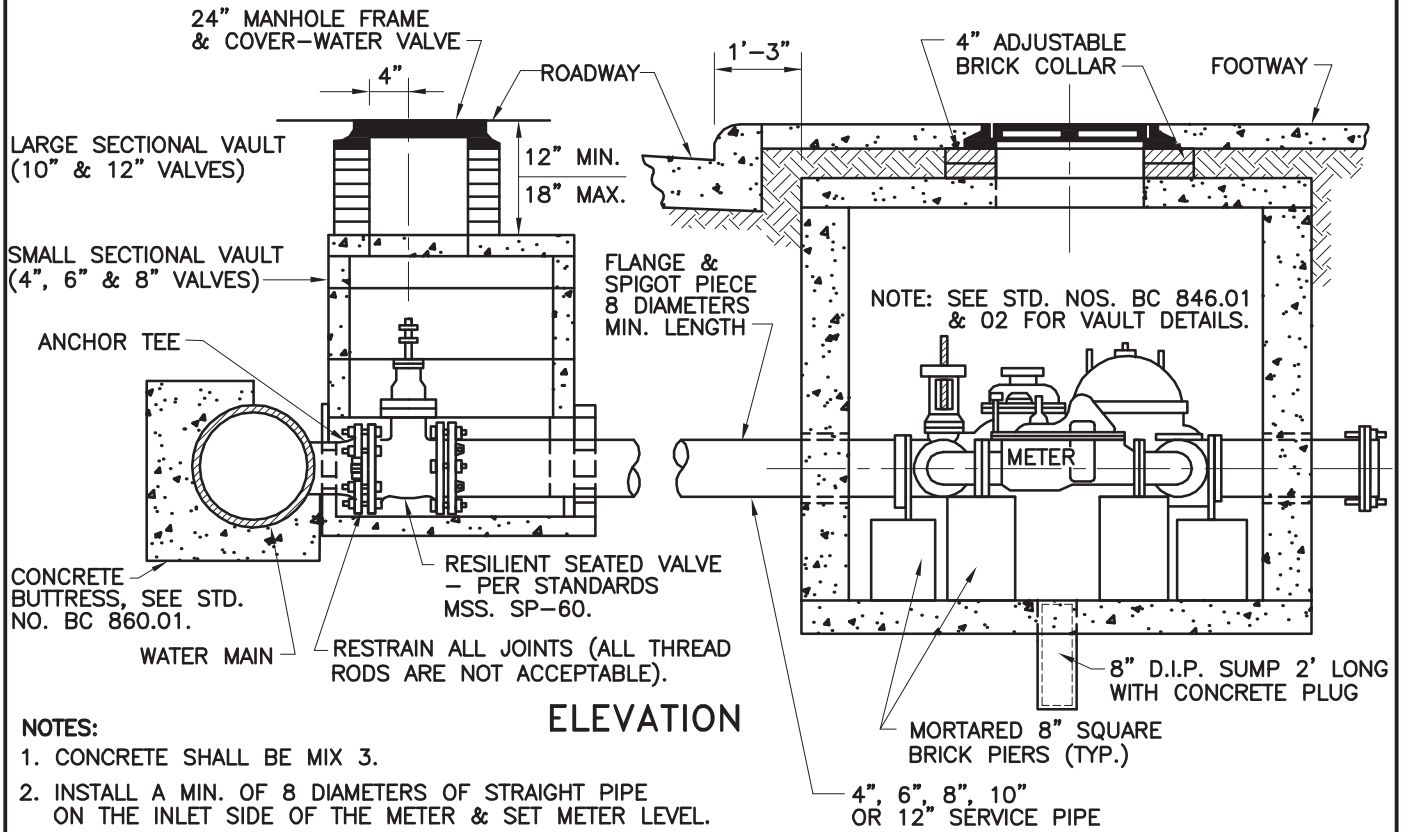
STANDARD NO.
BC 834.07

SCALE : NONE

SHEET 1 OF 1



PLAN (METER VAULT ONLY)



ELEVATION

NOTES:

1. CONCRETE SHALL BE MIX 3.
2. INSTALL A MIN. OF 8 DIAMETERS OF STRAIGHT PIPE ON THE INLET SIDE OF THE METER & SET METER LEVEL.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

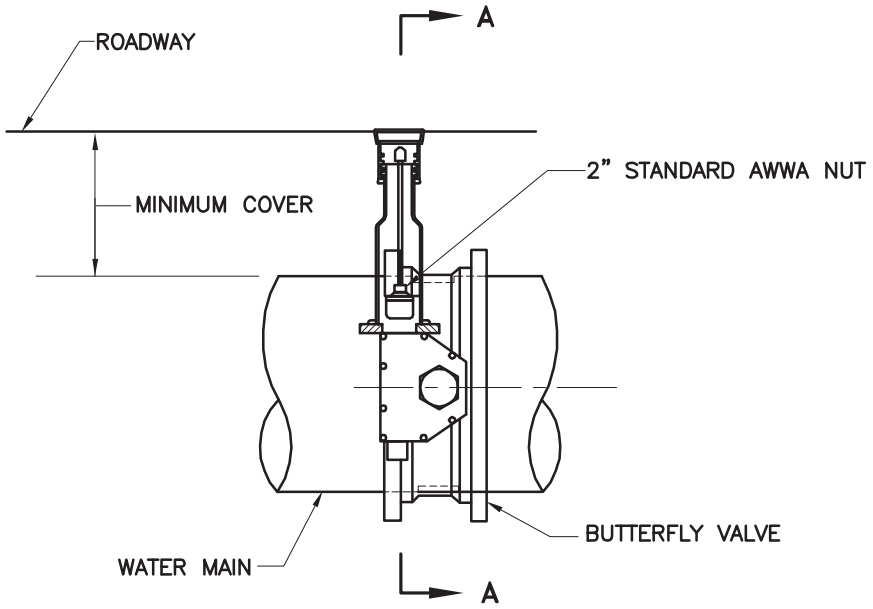
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD INSTALLATION OF 4", 6", 8", 10", & 12" FIRE SUPPLY SERVICES WITH WATER SUPPLY SERVICE (OUTSIDE FIRE HYDRANTS) WITH TEE AND VALVE (SECTIONAL VAULT)

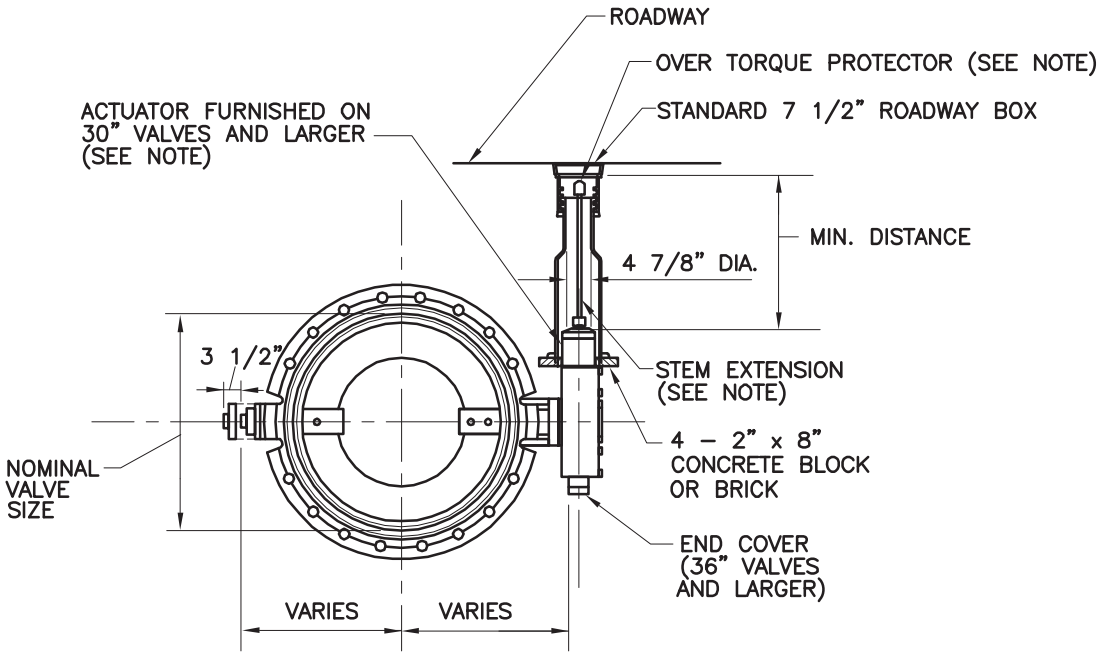
STANDARD NO. BC 850.01

SCALE : NONE

SHEET 1 OF 1



ELEVATION



NOTE:
SEE DPW BUTTERFLY VALVE SPECIFICATION FOR ALL BUTTERFLY VALVES 30"–72"

SECTION A–A

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

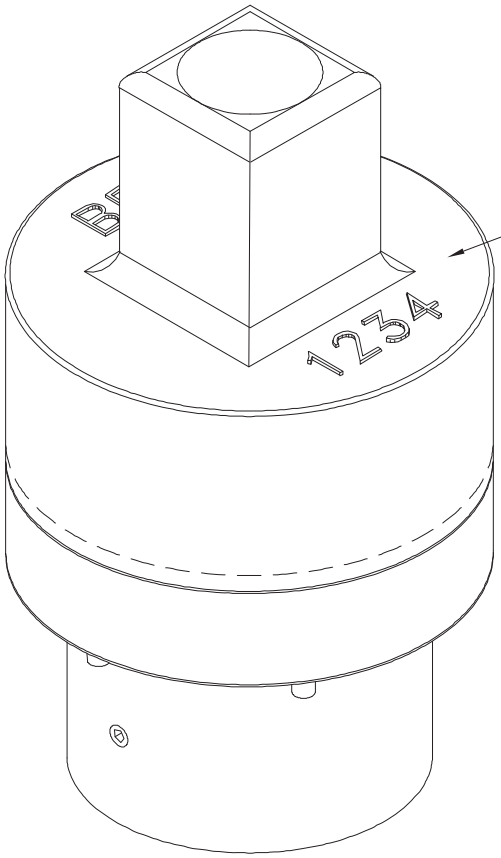
STANDARD INSTALLATION
OF BUTTERFLY VALVE
WITH ROADWAY BOX
(30" - 72")

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 835.02

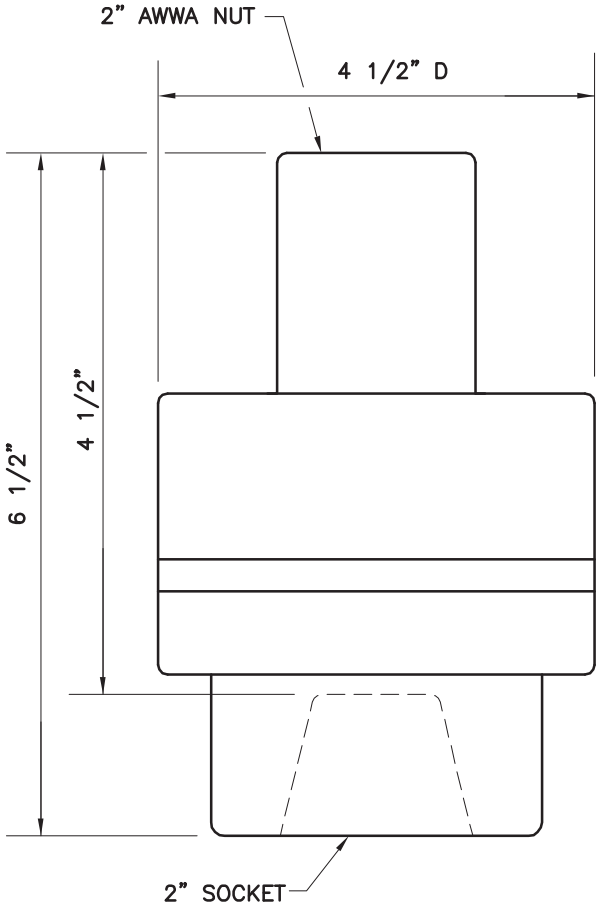
SCALE : NONE

SHEET 1 OF 1



IDENTIFICATION DISK

INCLUDE: VALVE SIZE, VALVE TYPE (I.E., BUTTERFLY VALVE–BFV), & NUMBER OF TURNS TO OPEN WITH ARROW



USE: AUNSPACH CONTROLS, MODEL D86 BW–250 VALVE OVER TORQUE PROTECTOR OR APPROVED EQUAL

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

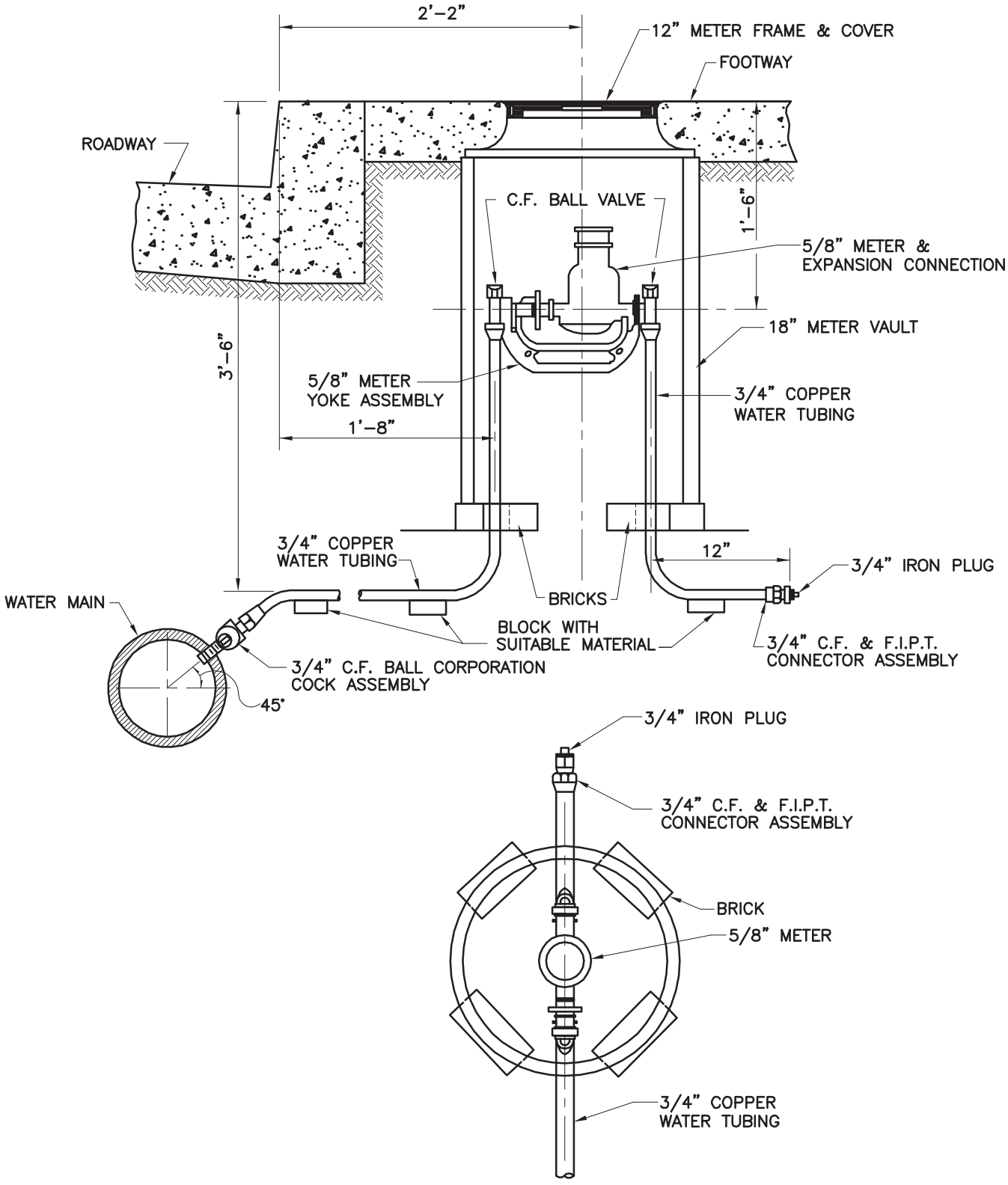
STANDARD BUTTERFLY VALVE OVER TORQUE PROTECTOR

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 835.03

SCALE : NONE

SHEET 1 OF 1



NOTE:

SEE STD NO. BC 853.01 FOR METER VAULT.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

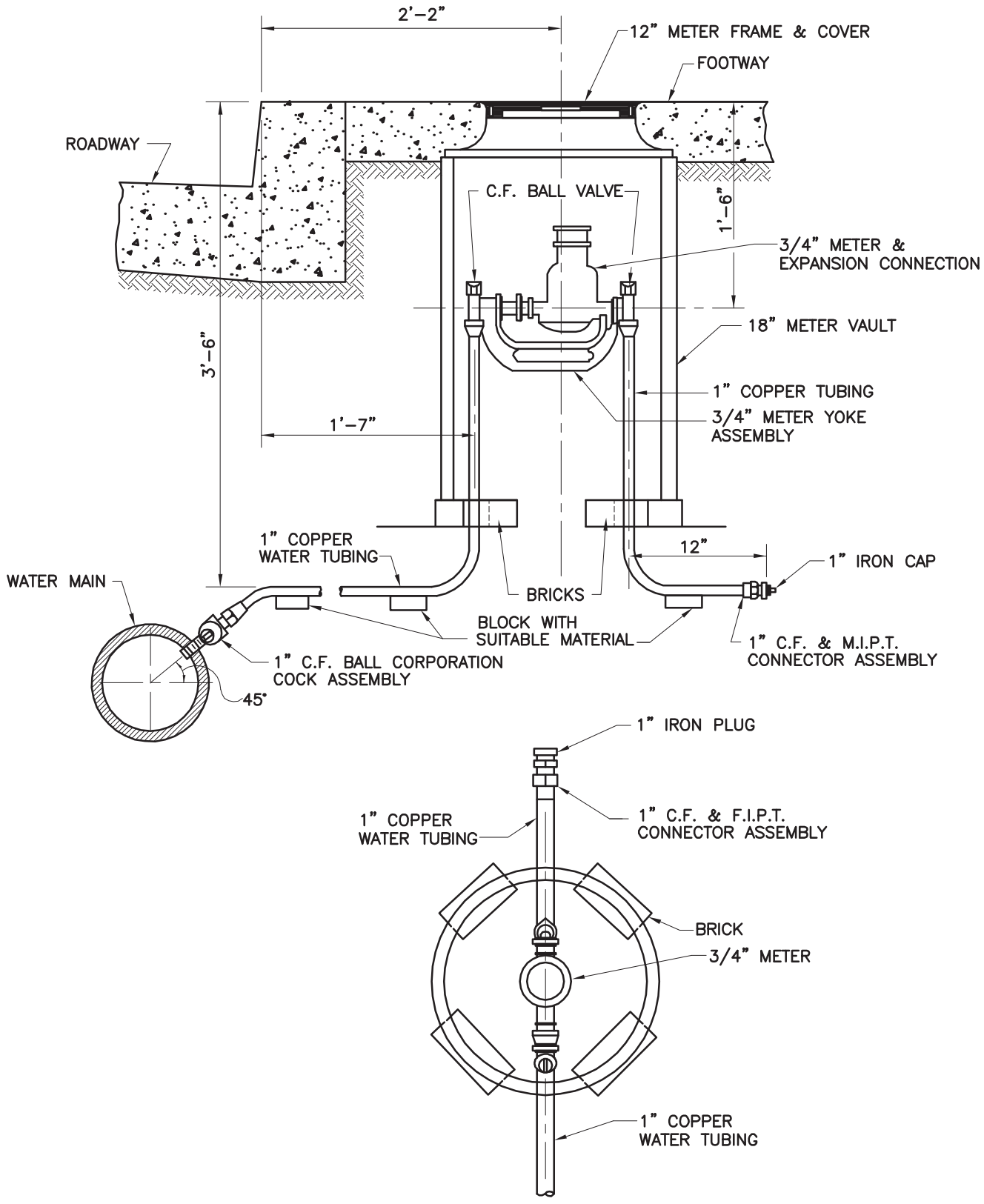
STANDARD INSTALLATION OF 3/4" WATER SUPPLY SERVICE (5/8" METER)

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 836.01

SCALE : NONE

SHEET 1 OF 1



NOTE:

SEE STD NO. BC 853.01 FOR METER VAULT.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

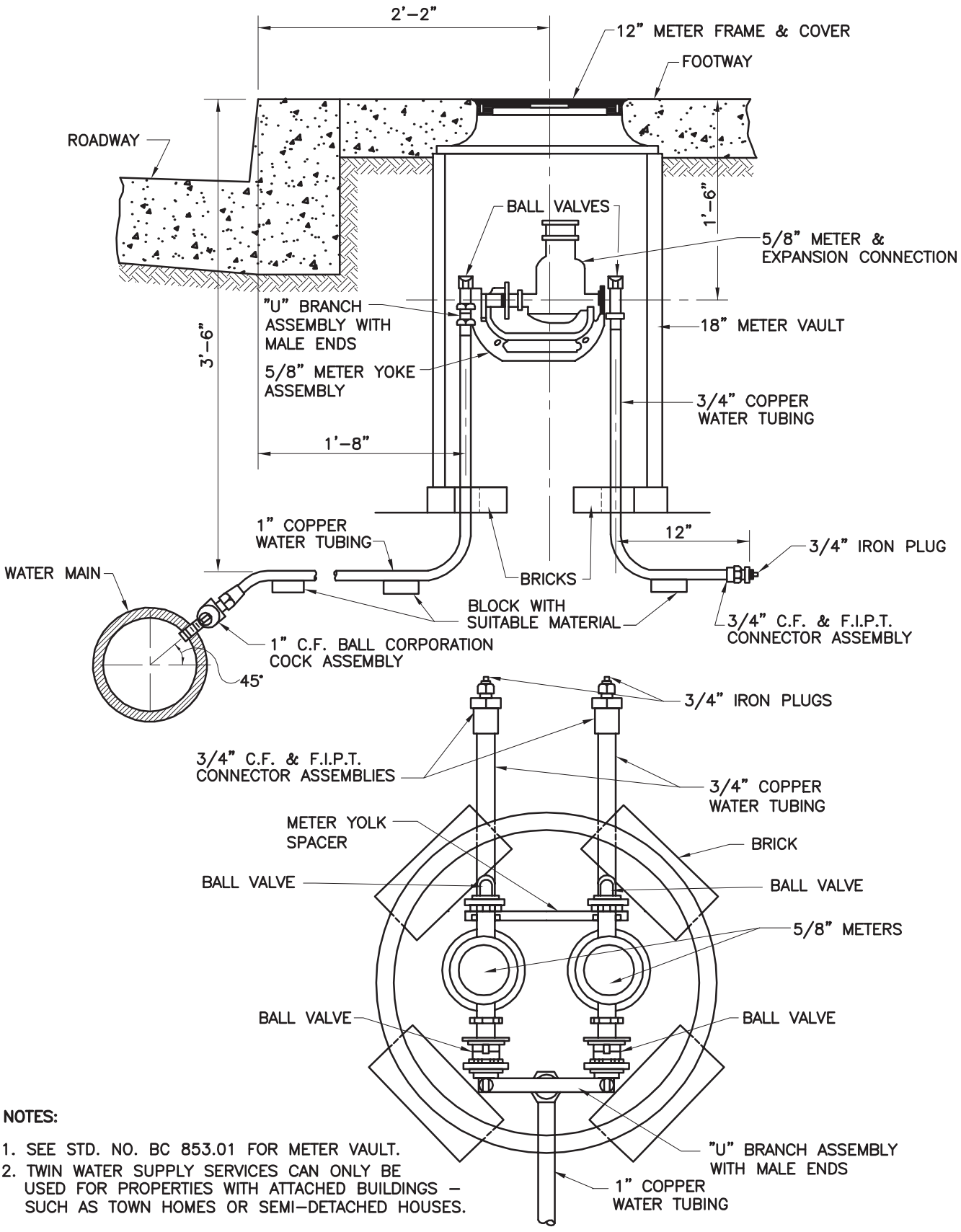
STANDARD INSTALLATION OF
1" WATER SUPPLY SERVICE
(3/4" METER)

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 837.01

SCALE : NONE

SHEET 1 OF 1



NOTES:

1. SEE STD. NO. BC 853.01 FOR METER VAULT.
2. TWIN WATER SUPPLY SERVICES CAN ONLY BE USED FOR PROPERTIES WITH ATTACHED BUILDINGS – SUCH AS TOWN HOMES OR SEMI–DETACHED HOUSES.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

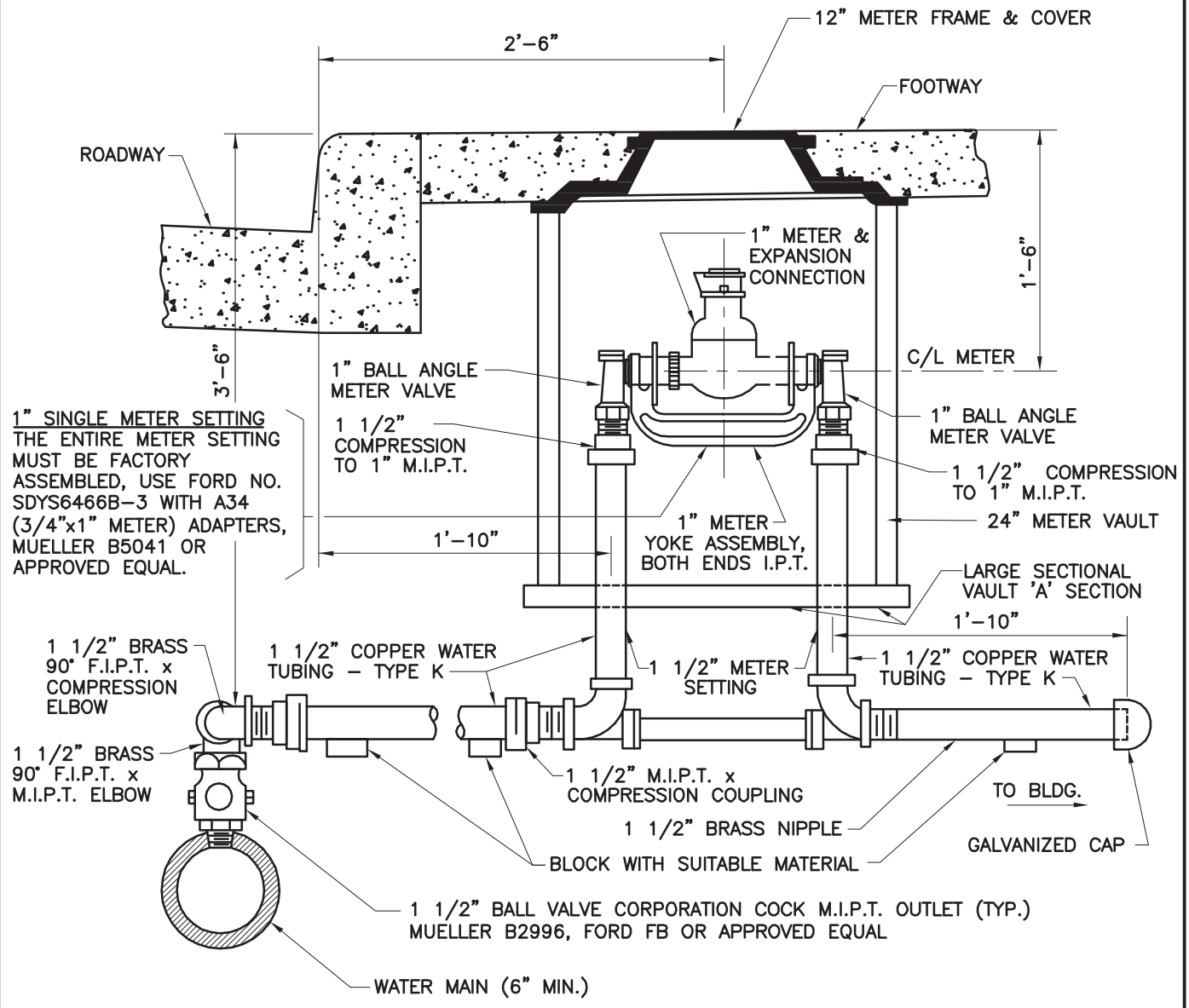
STANDARD INSTALLATION OF TWIN WATER SUPPLY SERVICES (5/8" METERS)

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 838.01

SCALE : NONE

SHEET 1 OF 1



NOTE:
SEE STD. NO. BC 853.01 FOR METER VAULT.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

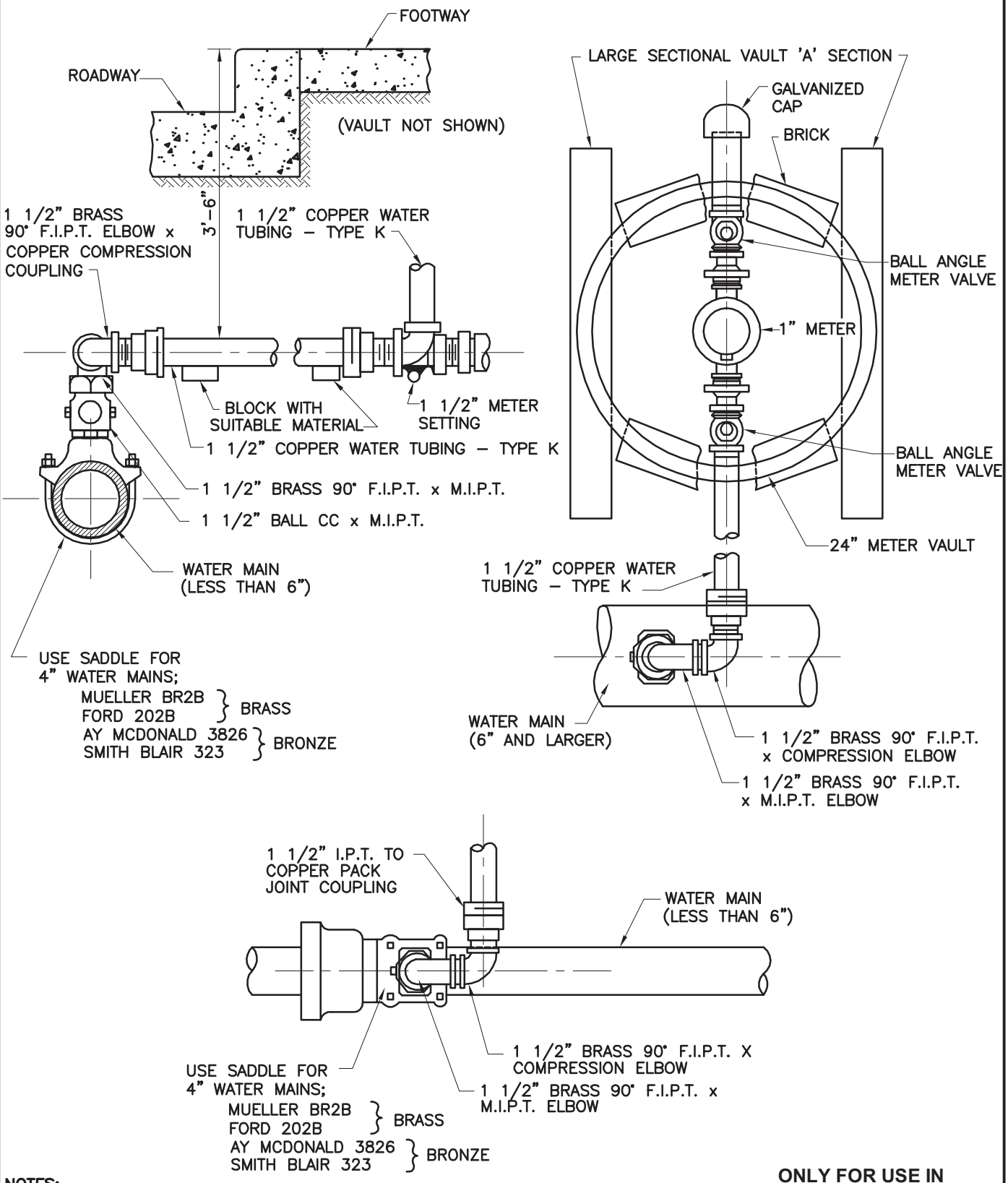
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

STANDARD INSTALLATION OF 1 1/2" WATER SUPPLY SERVICE (1" METER) FOR 6" MAIN AND LARGER

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 839.01

SCALE : NONE | SHEET 1 OF 1



NOTES:

1. FOR METER SETTINGS, SEE STD. NO. BC 839.01.
2. SEE STD. NO. BC 853.01 FOR METER VAULT.

ONLY FOR USE IN BALTIMORE COUNTY

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

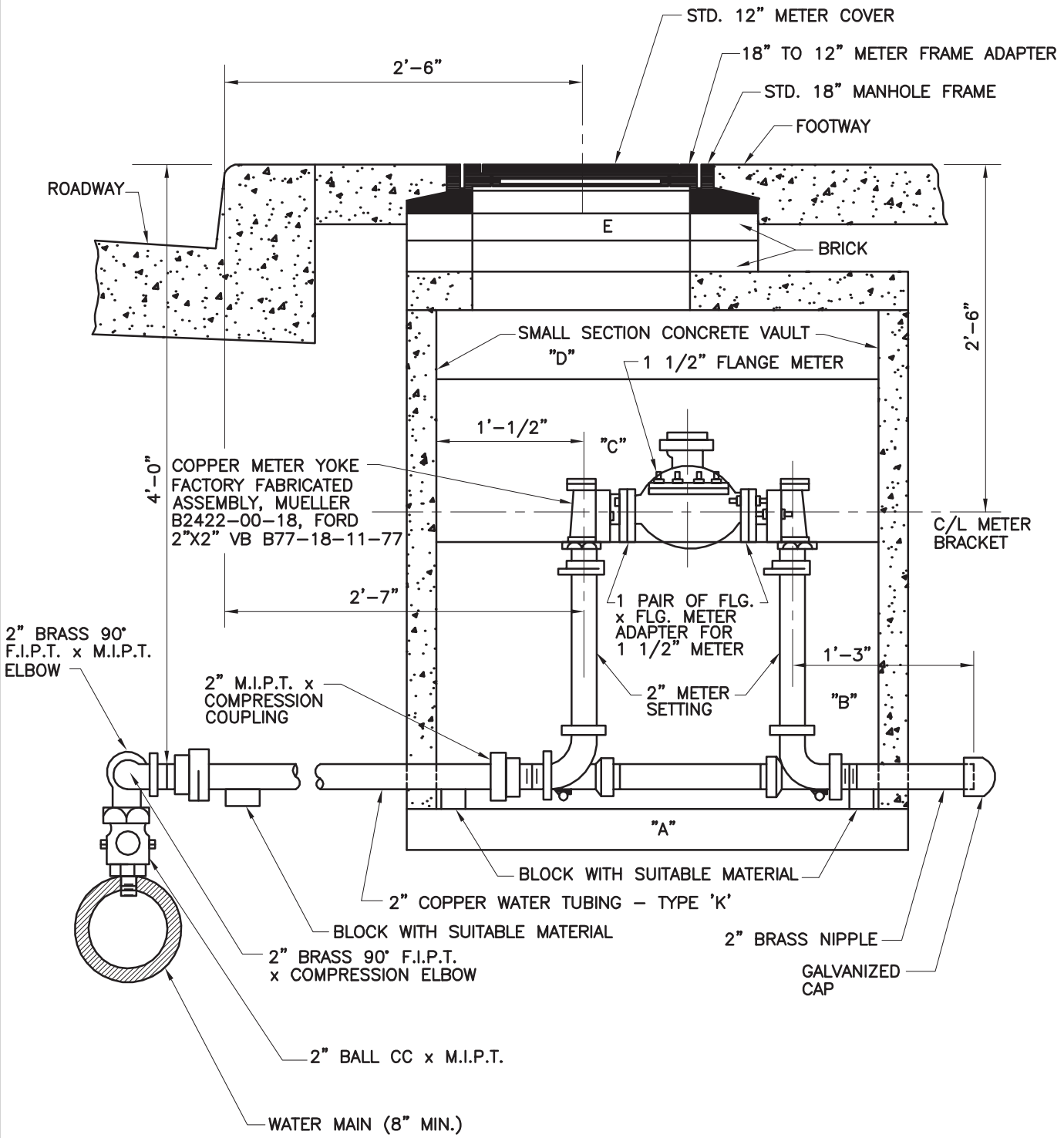
STANDARD INSTALLATION OF 1 1/2" WATER SUPPLY SERVICE (1" METER) FOR MAINS SMALLER THAN 6"

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 839.02

SCALE : NONE

SHEET 1 OF 1



APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

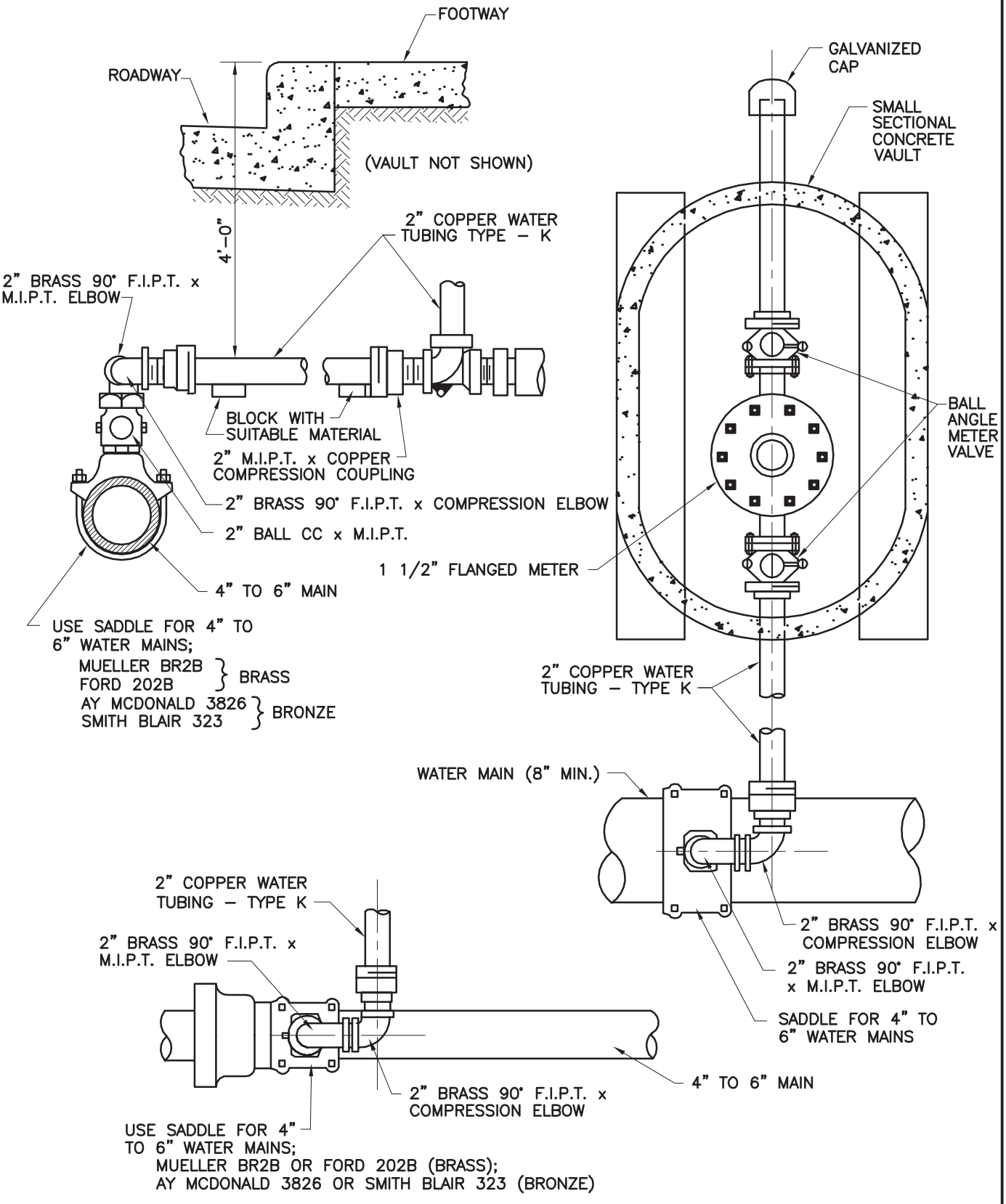
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD INSTALLATION OF
2" WATER SUPPLY SERVICE
(1 1/2" METER) FOR
8" MAIN AND LARGER

STANDARD NO.
BC 840.01

SCALE : NONE

SHEET 1 OF 1



NOTE: FOR METER SETTINGS, SEE STD. NO. BC 840.01.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

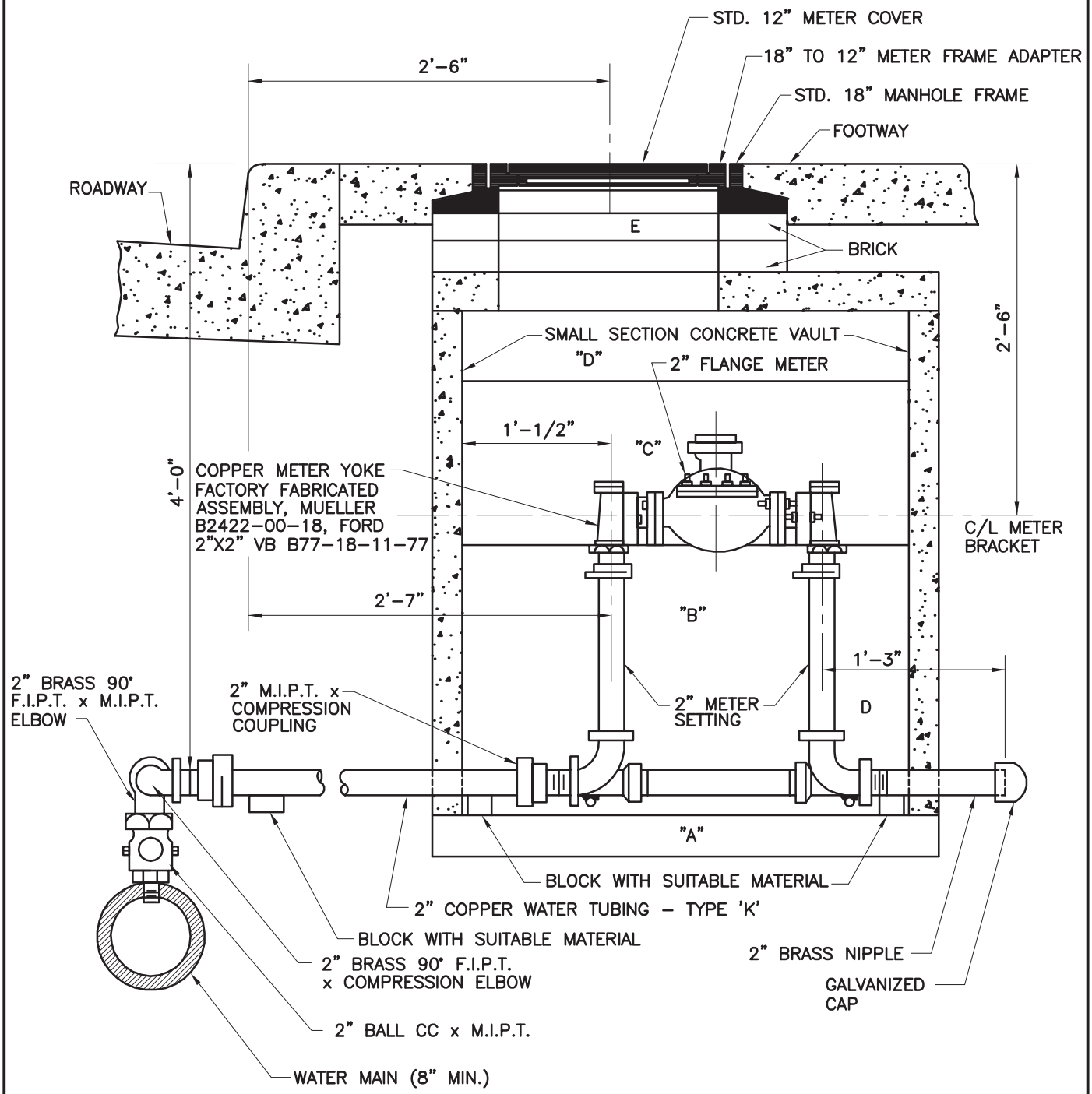
STANDARD INSTALLATION OF 2" WATER SUPPLY SERVICE (1 1/2" METER) FOR 6" MAIN AND SMALLER

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 840.02

SCALE : NONE

SHEET 1 OF 1



APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

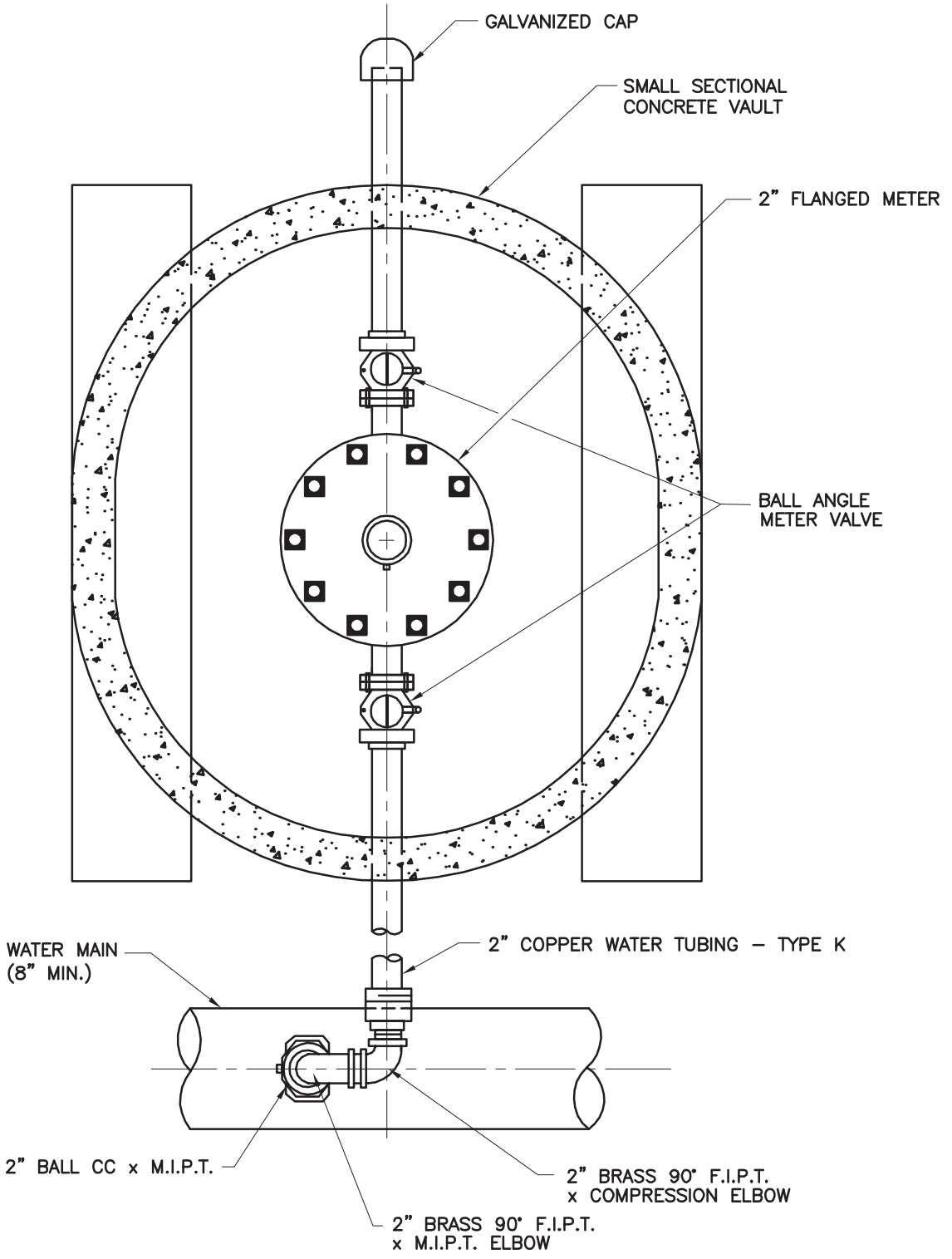
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD INSTALLATION OF
2" WATER SUPPLY SERVICE
(2" METER) FOR
8" MAIN AND LARGER

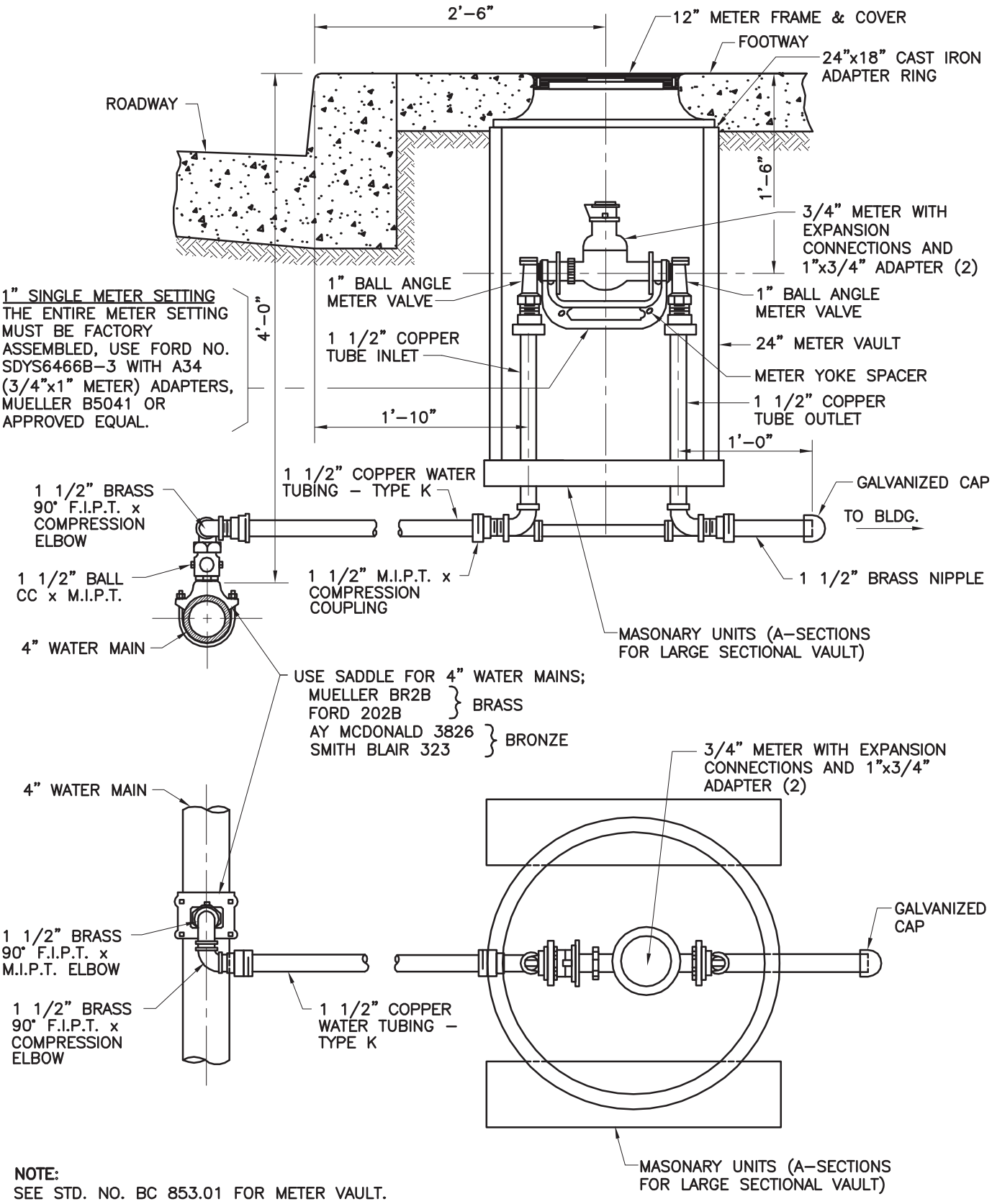
STANDARD NO.
BC 840.03

SCALE : NONE

SHEET 1 OF 2



CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER; DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED: 3 / 2008	REVISED / REVISED
		STANDARD INSTALLATION OF 2" WATER SUPPLY SERVICE (2" METER) FOR 8" MAIN AND LARGER	STANDARD NO. BC 840.03	
			SCALE : NONE	SHEET 2 OF 2



NOTE:
SEE STD. NO. BC 853.01 FOR METER VAULT.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

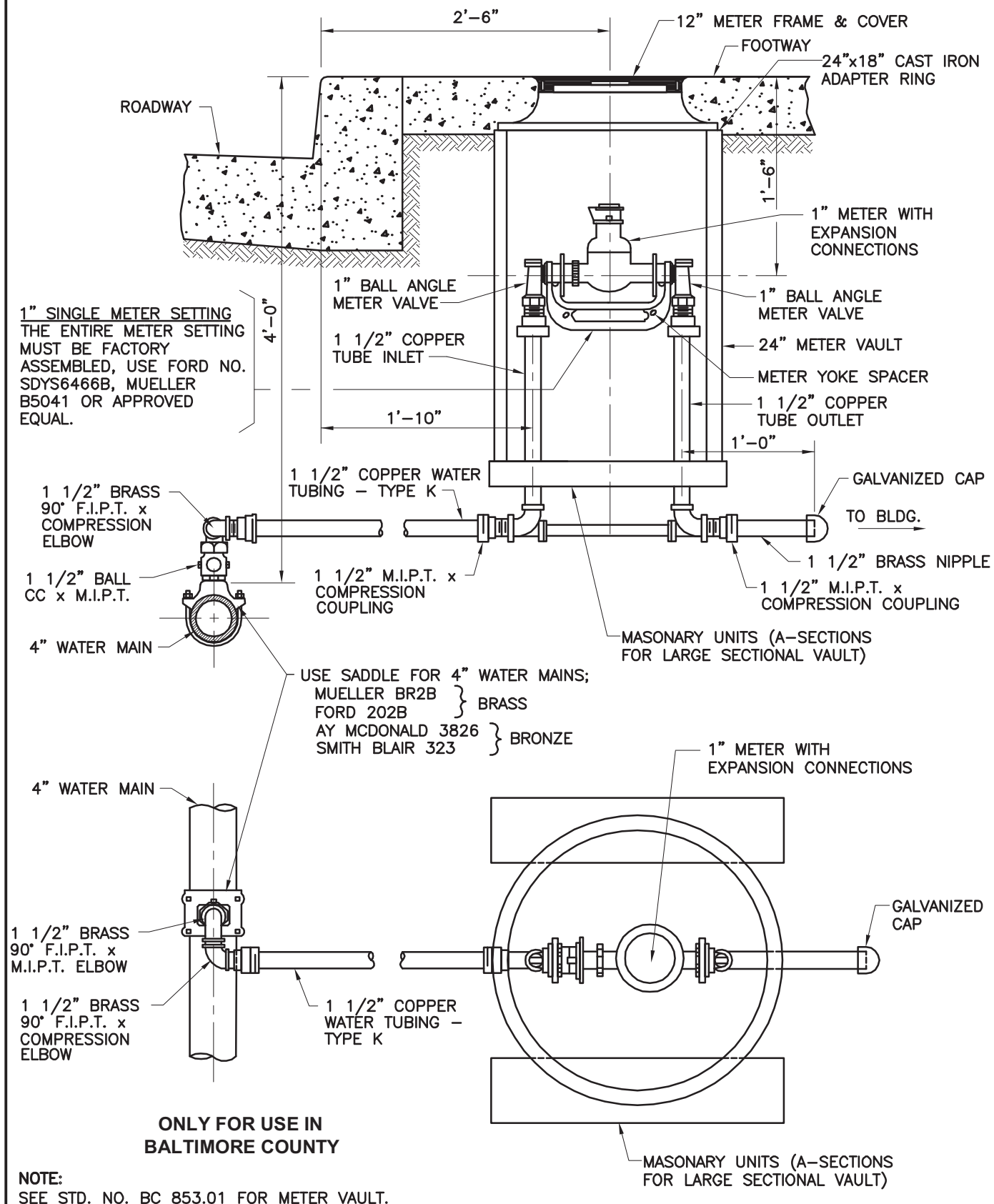
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

STANDARD INSTALLATION FOR FIRE PROTECTION 1 1/2" WATER SUPPLY SERVICE (3/4" METER) FOR 4" MAIN

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 841.01

SCALE : NONE | SHEET 1 OF 1



ONLY FOR USE IN BALTIMORE COUNTY

NOTE:
SEE STD. NO. BC 853.01 FOR METER VAULT.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

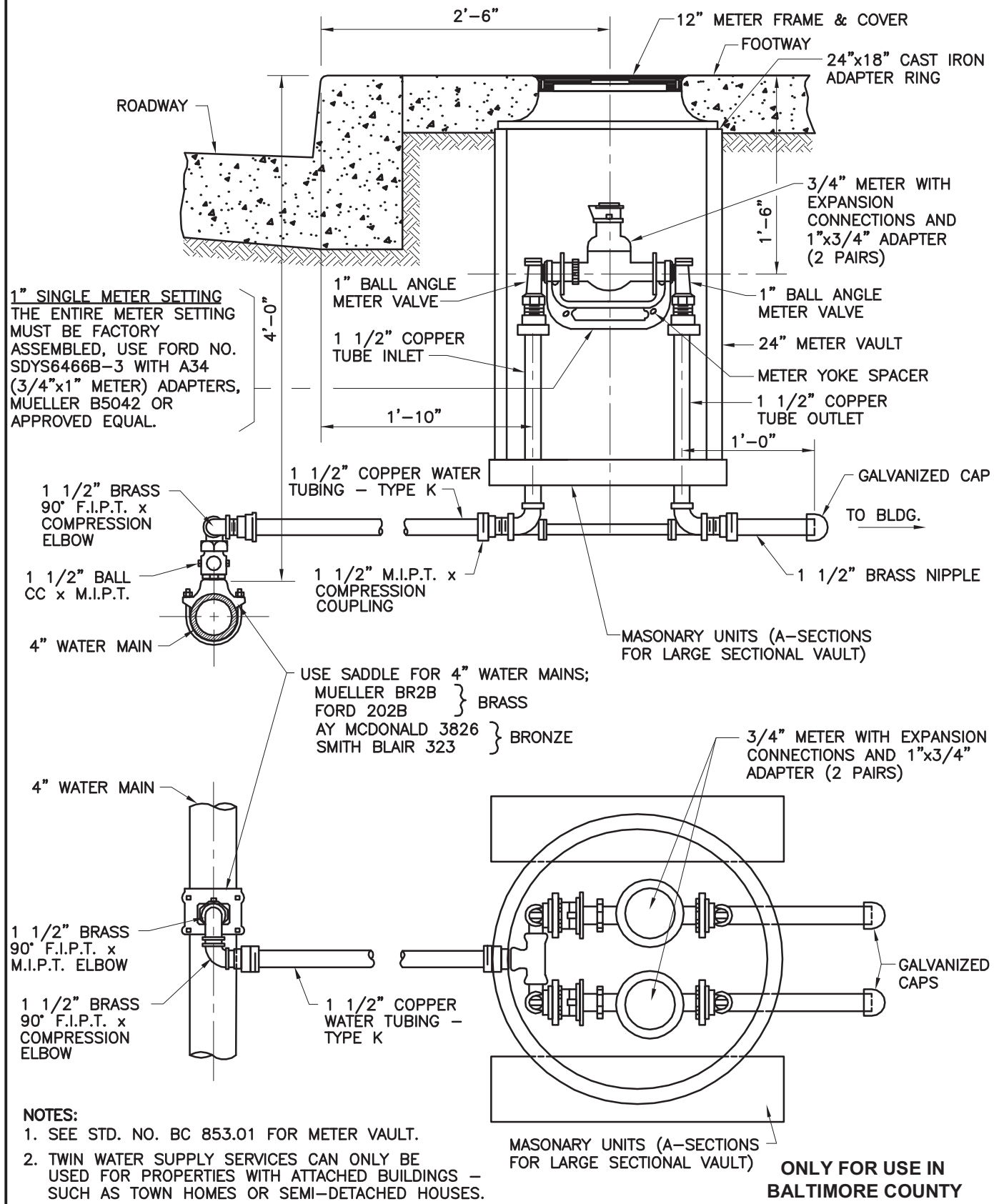
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD INSTALLATION FOR FIRE PROTECTION 1 1/2" WATER SUPPLY SERVICE (1" METER) FOR 4" MAIN

STANDARD NO. BC 841.02

SCALE : NONE

SHEET 1 OF 1



NOTES:

1. SEE STD. NO. BC 853.01 FOR METER VAULT.
2. TWIN WATER SUPPLY SERVICES CAN ONLY BE USED FOR PROPERTIES WITH ATTACHED BUILDINGS – SUCH AS TOWN HOMES OR SEMI–DETACHED HOUSES.

ONLY FOR USE IN BALTIMORE COUNTY

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

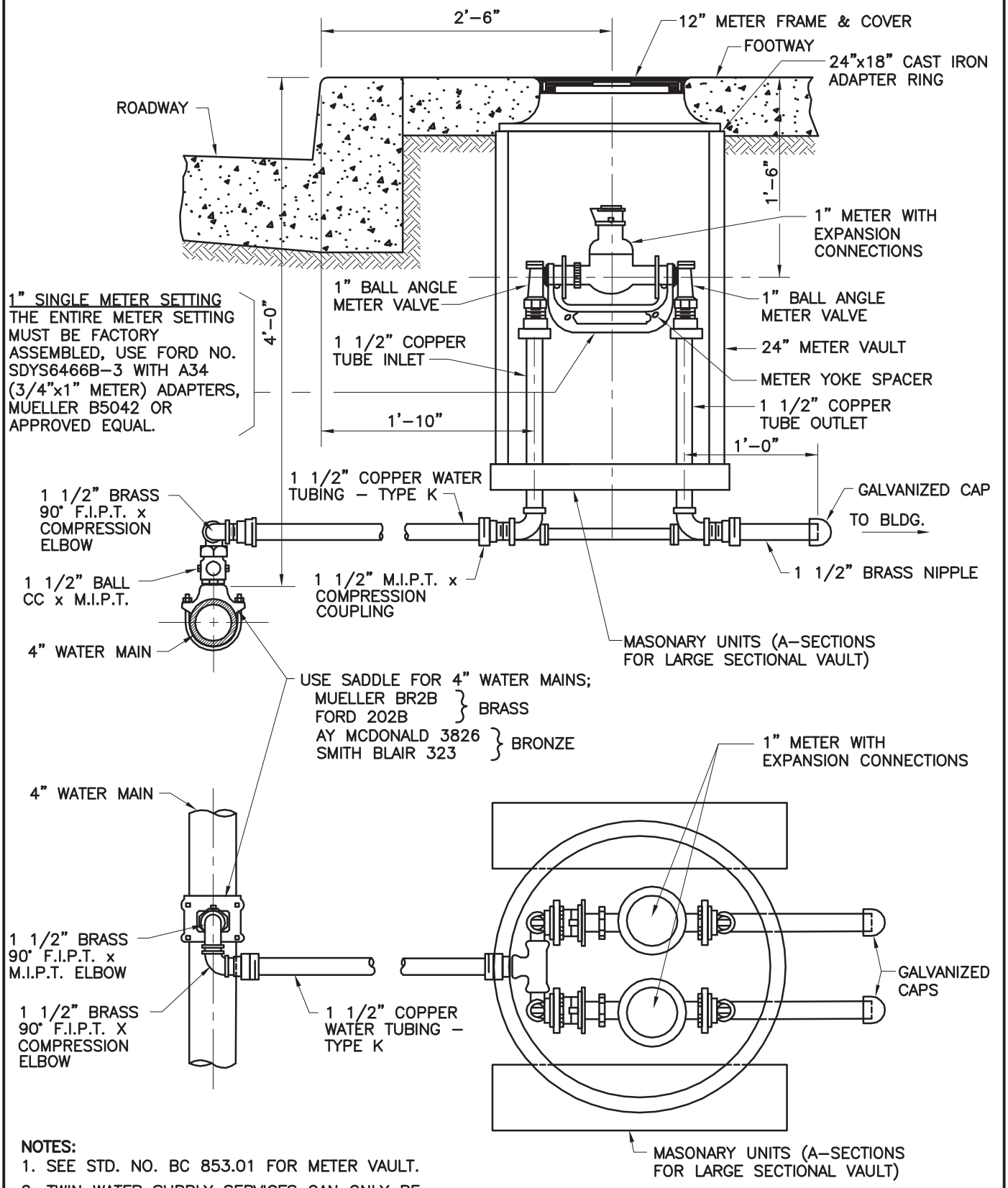
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD INSTALLATION FOR FIRE PROTECTION 1 1/2" TWIN WATER SUPPLY SERVICES (3/4" METERS) FOR 4" MAIN

STANDARD NO. BC 841.03

SCALE : NONE

SHEET 1 OF 1



NOTES:

1. SEE STD. NO. BC 853.01 FOR METER VAULT.
2. TWIN WATER SUPPLY SERVICES CAN ONLY BE USED FOR PROPERTIES WITH ATTACHED BUILDINGS – SUCH AS TOWN HOMES OR SEMI–DETACHED HOUSES.

ONLY FOR USE IN BALTIMORE COUNTY

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

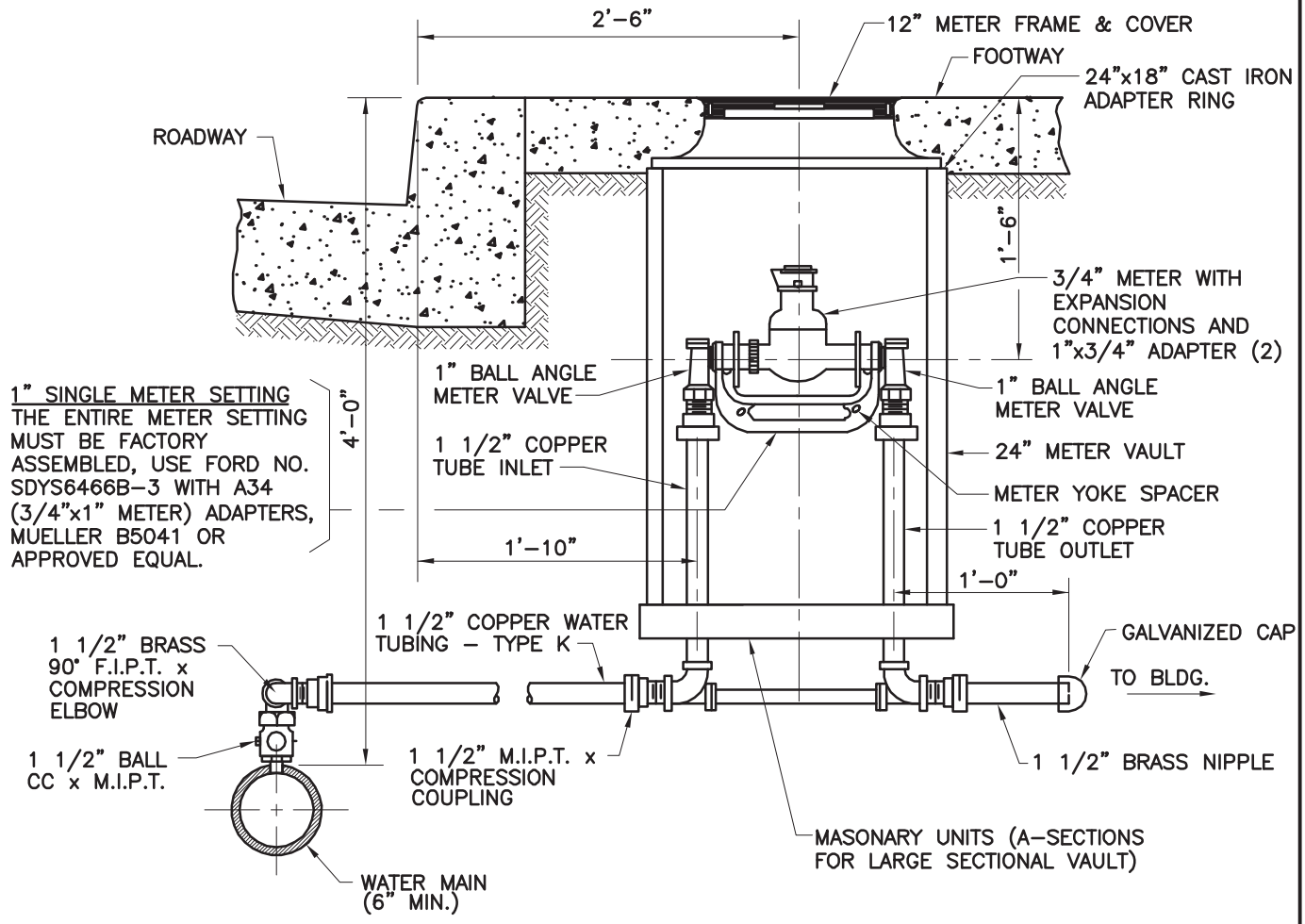
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

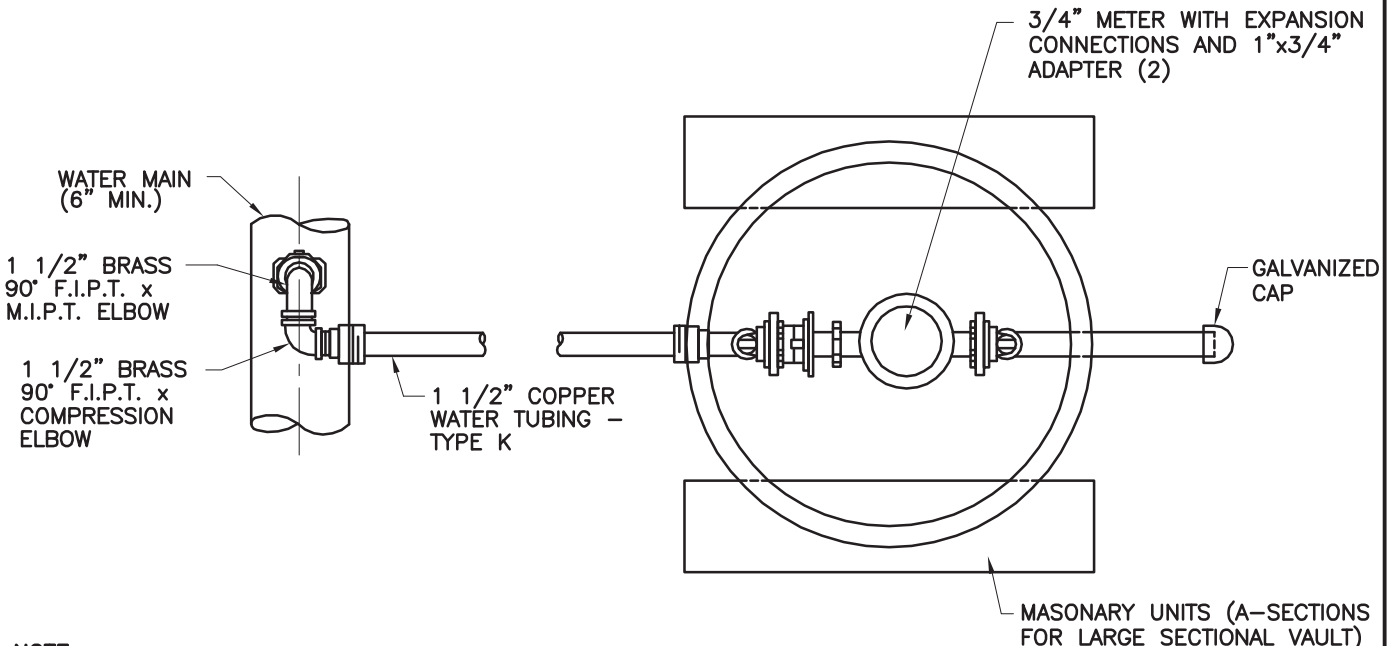
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD INSTALLATION FOR FIRE PROTECTION 1 1/2" TWIN WATER SUPPLY SERVICES (1" METERS) FOR 4" MAIN

STANDARD NO. BC 841.04

SCALE : NONE | SHEET 1 OF 1





NOTE:

SEE STD. NO. BC 853.01 FOR METER VAULT.

ONLY FOR USE IN BALTIMORE COUNTY

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

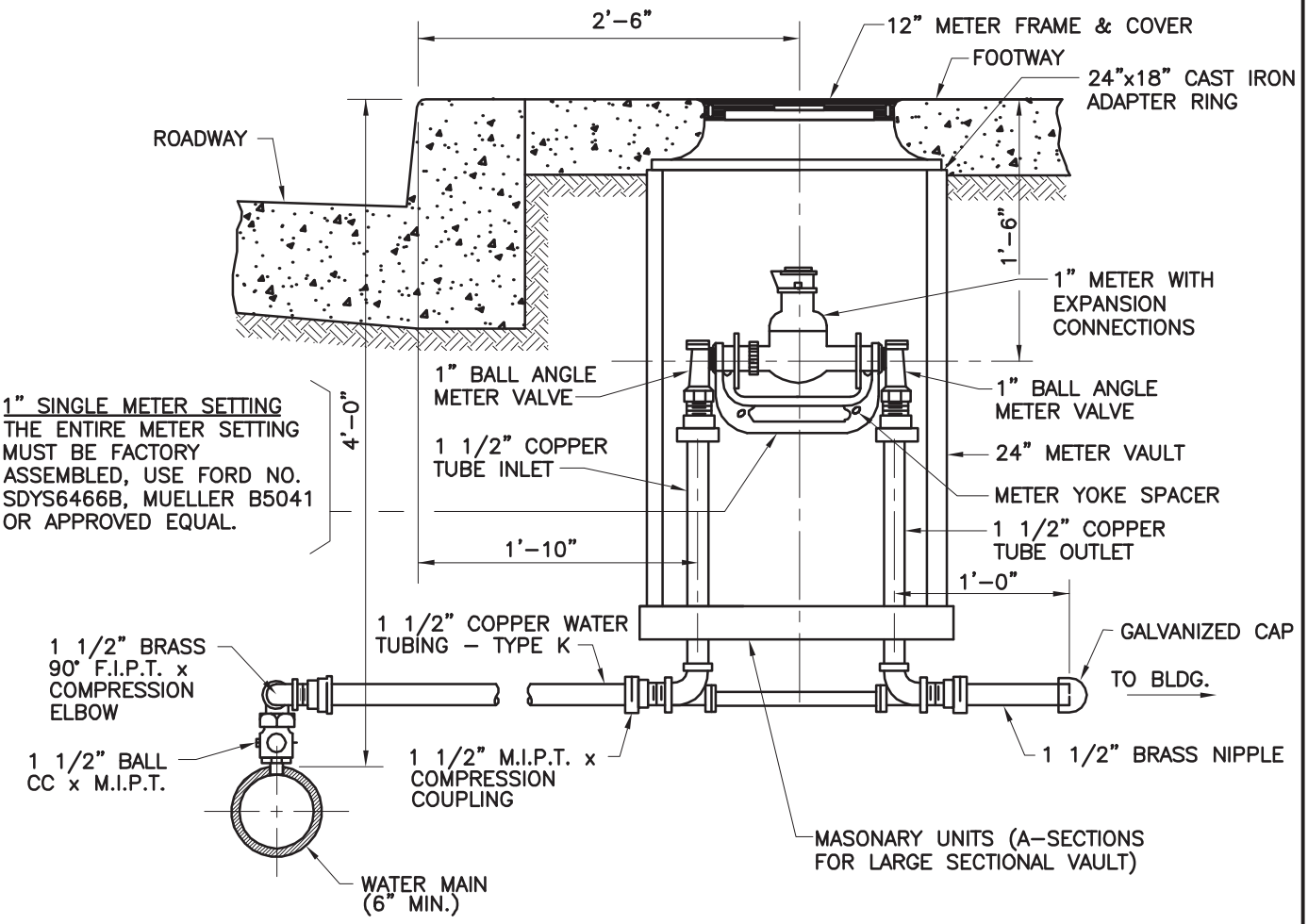
ISSUED	REVISED	REVISED
3 / 2008		

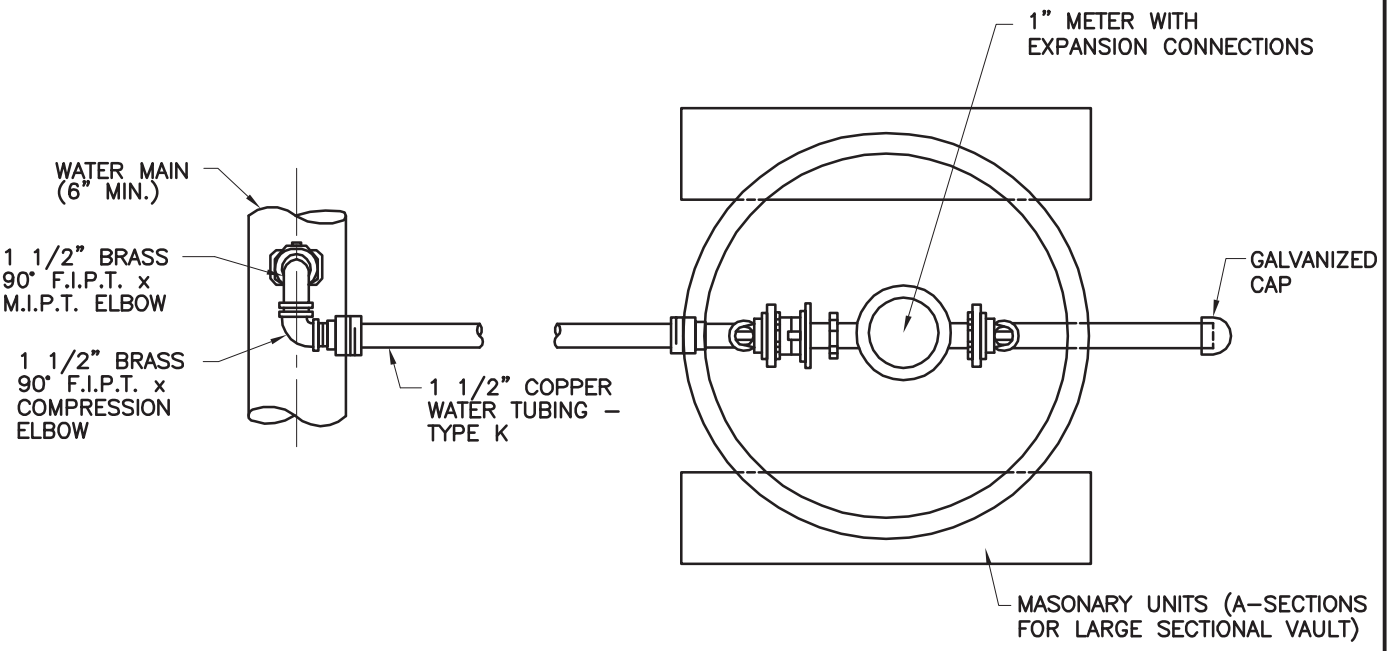
STANDARD INSTALLATION FOR FIRE PROTECTION 1 1/2" WATER SUPPLY SERVICE (3/4" METER) FOR 6" MAIN AND LARGER

STANDARD NO. BC 841.05

SCALE : NONE

SHEET 1 OF 1





NOTE:

SEE STD. NO. BC 853.01 FOR METER VAULT.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

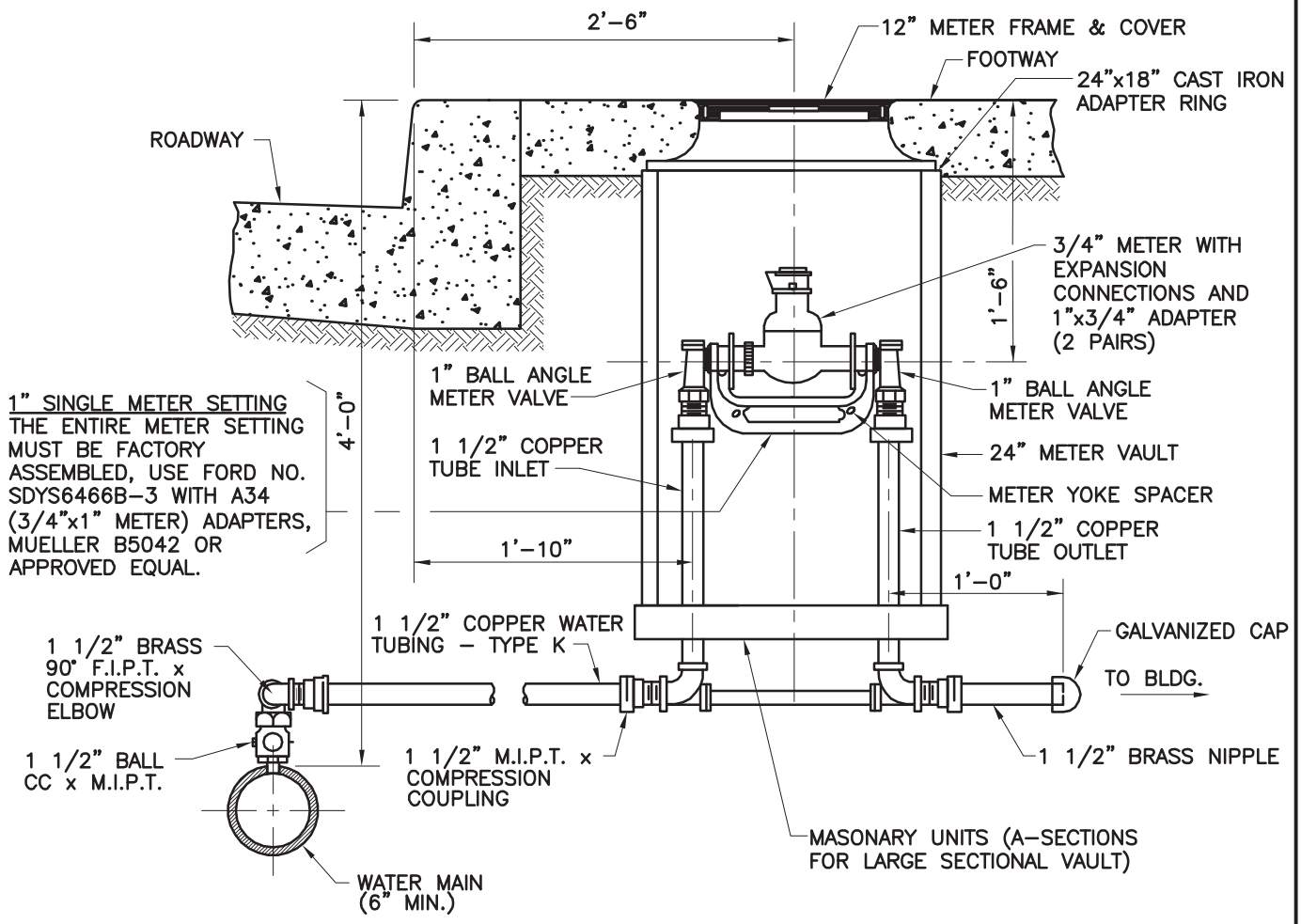
ISSUED	REVISED	REVISED
3 / 2008		

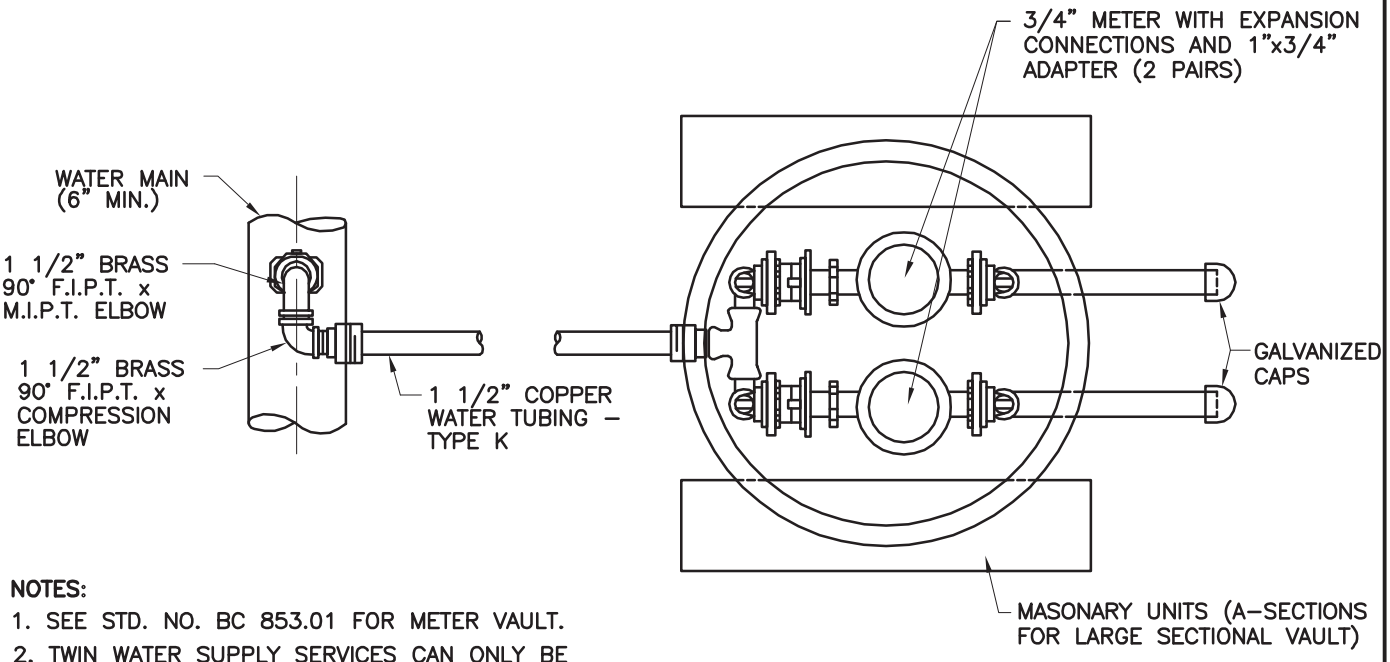
STANDARD INSTALLATION FOR FIRE PROTECTION 1 1/2" WATER SUPPLY SERVICE (1" METER) FOR 6" MAIN AND LARGER

STANDARD NO. BC 841.06

SCALE : NONE

SHEET 1 OF 1





NOTES:

1. SEE STD. NO. BC 853.01 FOR METER VAULT.
2. TWIN WATER SUPPLY SERVICES CAN ONLY BE USED FOR PROPERTIES WITH ATTACHED BUILDINGS – SUCH AS TOWN HOMES OR SEMI–DETACHED HOUSES.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

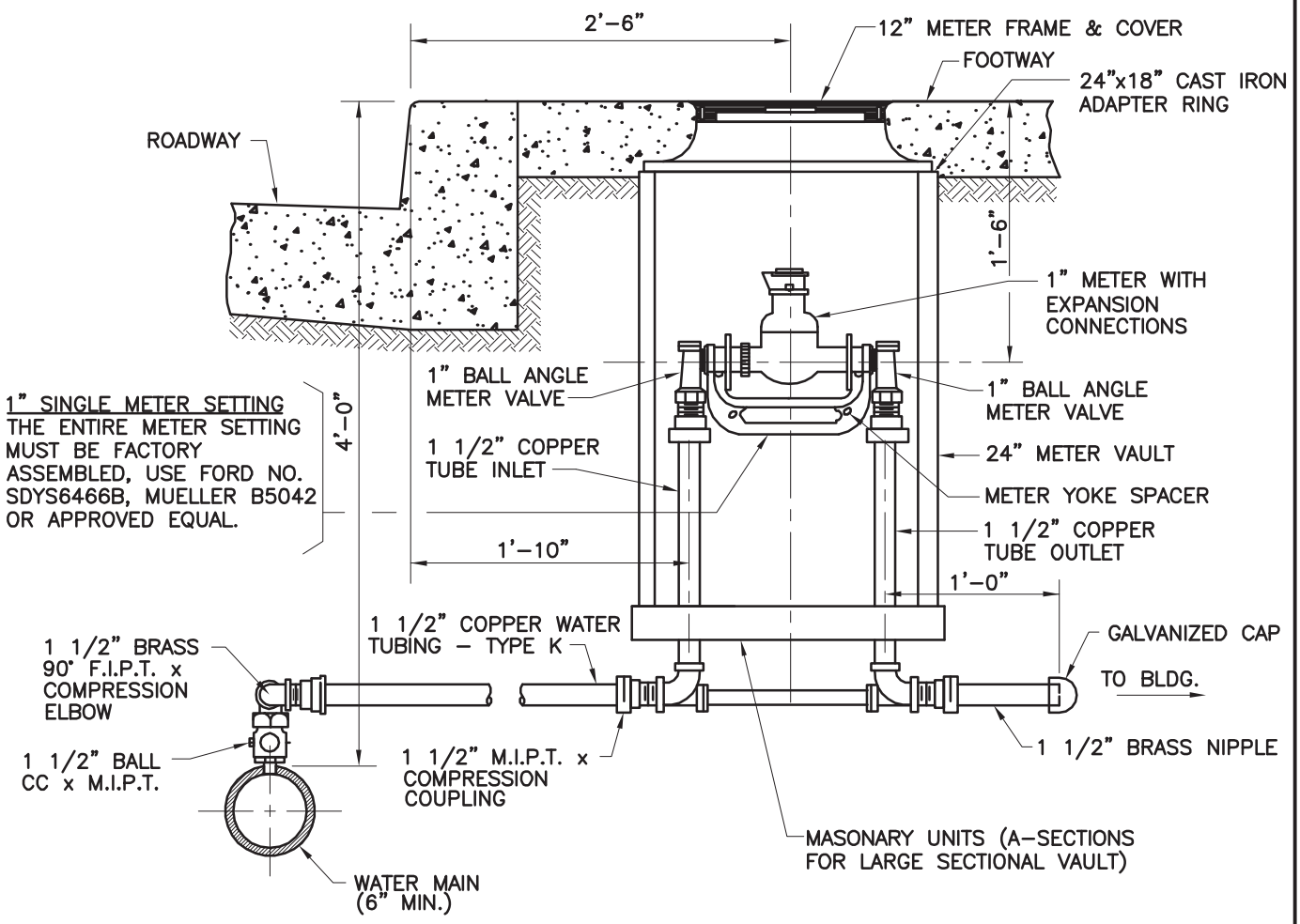
ISSUED	REVISED	REVISED
3 / 2008		

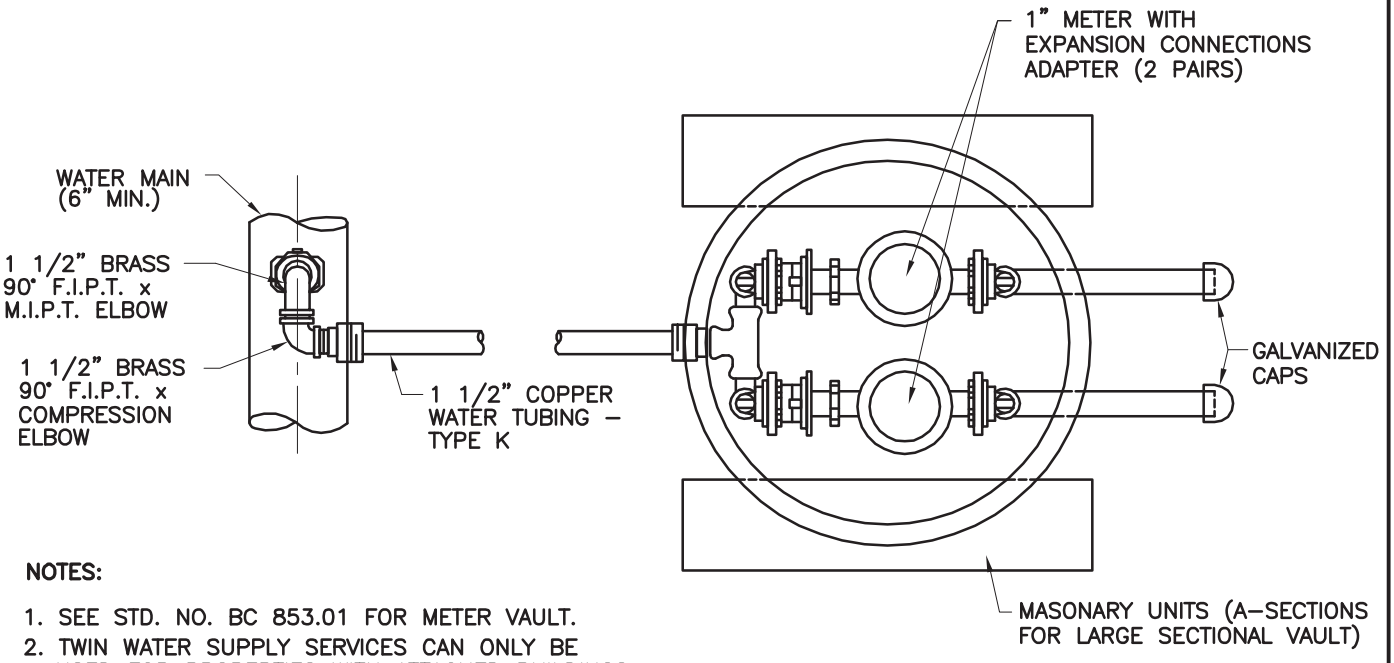
STANDARD INSTALLATION FOR FIRE PROTECTION 1 1/2" TWIN WATER SUPPLY SERVICES (3/4" METERS) FOR 6" MAIN AND LARGER

STANDARD NO. BC 841.07

SCALE : NONE

SHEET 1 OF 1





NOTES:

1. SEE STD. NO. BC 853.01 FOR METER VAULT.
2. TWIN WATER SUPPLY SERVICES CAN ONLY BE USED FOR PROPERTIES WITH ATTACHED BUILDINGS – SUCH AS TOWN HOMES OR SEMI–DETACHED HOUSES.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

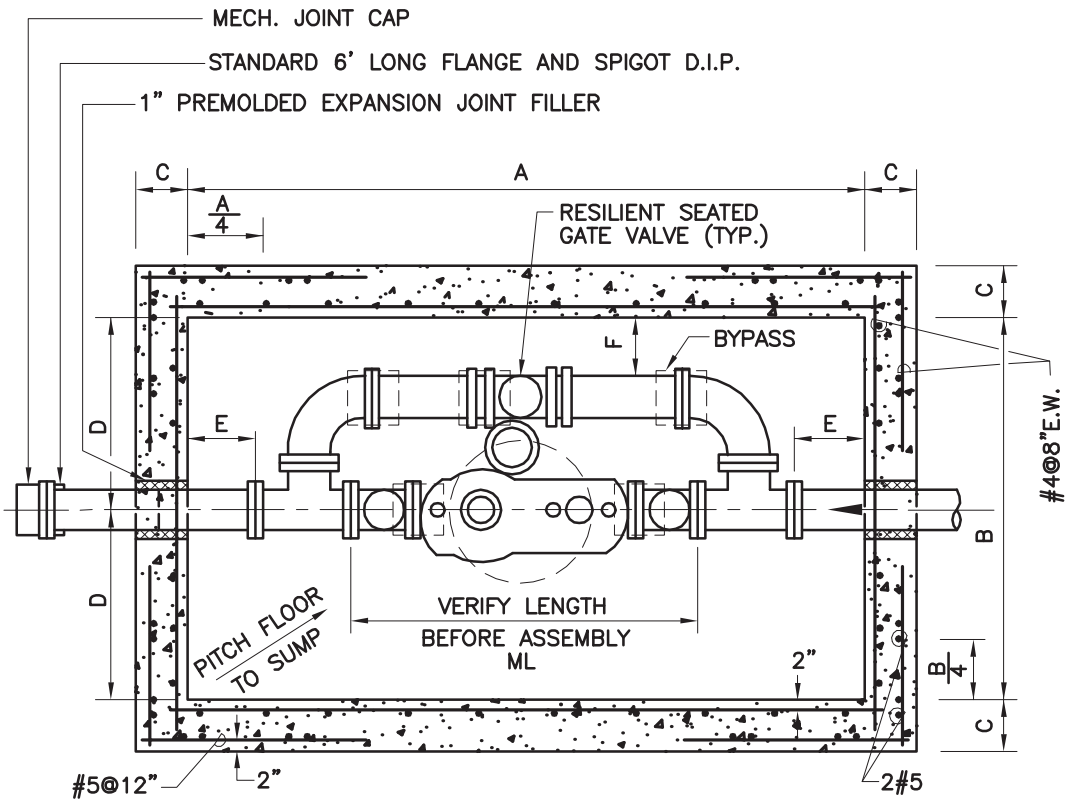
ISSUED	REVISED	REVISED
3 / 2008		

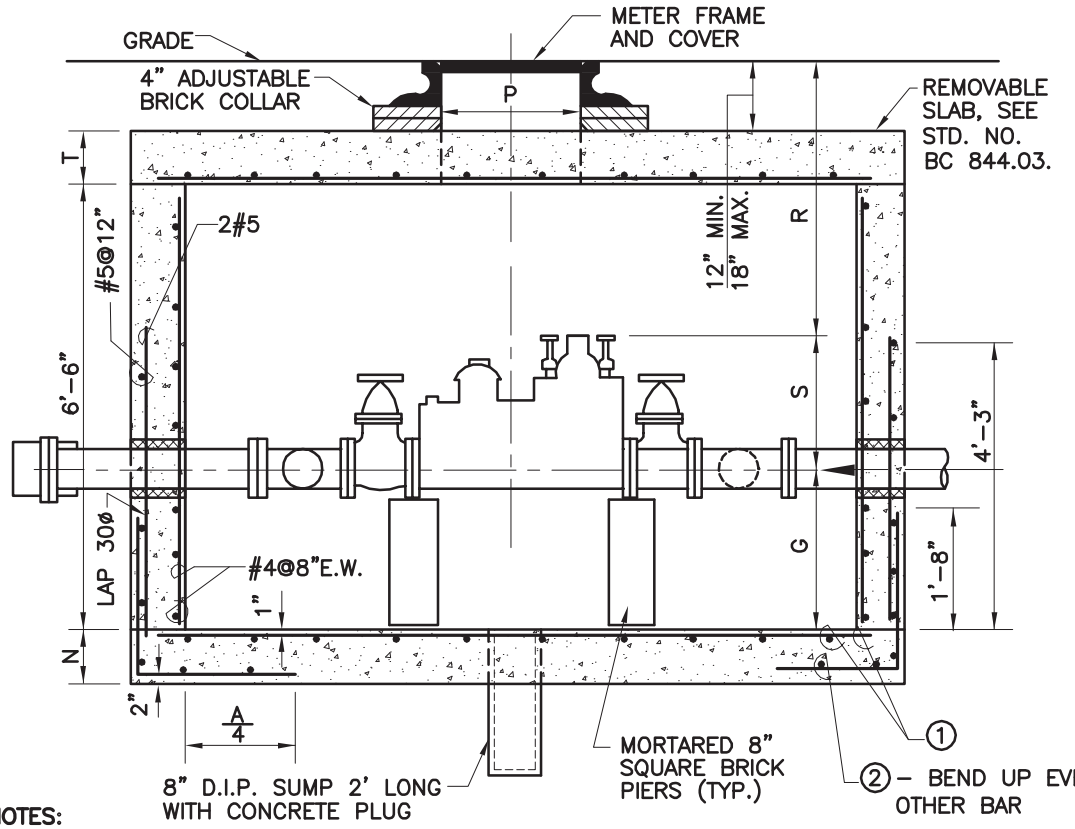
STANDARD INSTALLATION FOR FIRE PROTECTION 1 1/2" TWIN WATER SUPPLY SERVICES (1" METERS) FOR 6" MAIN AND LARGER

STANDARD NO. BC 841.08

SCALE : NONE

SHEET 1 OF 1





SIZE	4"	6"
A	8'–4"	9'–10"
B	4'–6"	5'–6"
C	9"	9"
D	2'–3"	2'–9"
E	13 1/2"	14 1/2"
F	11"	14 1/2"
G	2'–8"	2'–8"
H	3'–0"	3'–6"
L	4'–11"	5'–8"
N	6"	6"
P	24"	24"
R	4'–3" 4'–9"	3'–10" 4'–4"
S	1'–5"	1'–10"
①	#4@12	#4@12
②	#5@6	#5@6
ML	29"	36 1/2"
BP	4"	6"

NOTES:

1. FOR CURB SETBACK, SEE STD. NO. BC 851.01.
2. CONCRETE SHALL BE MIX 3.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

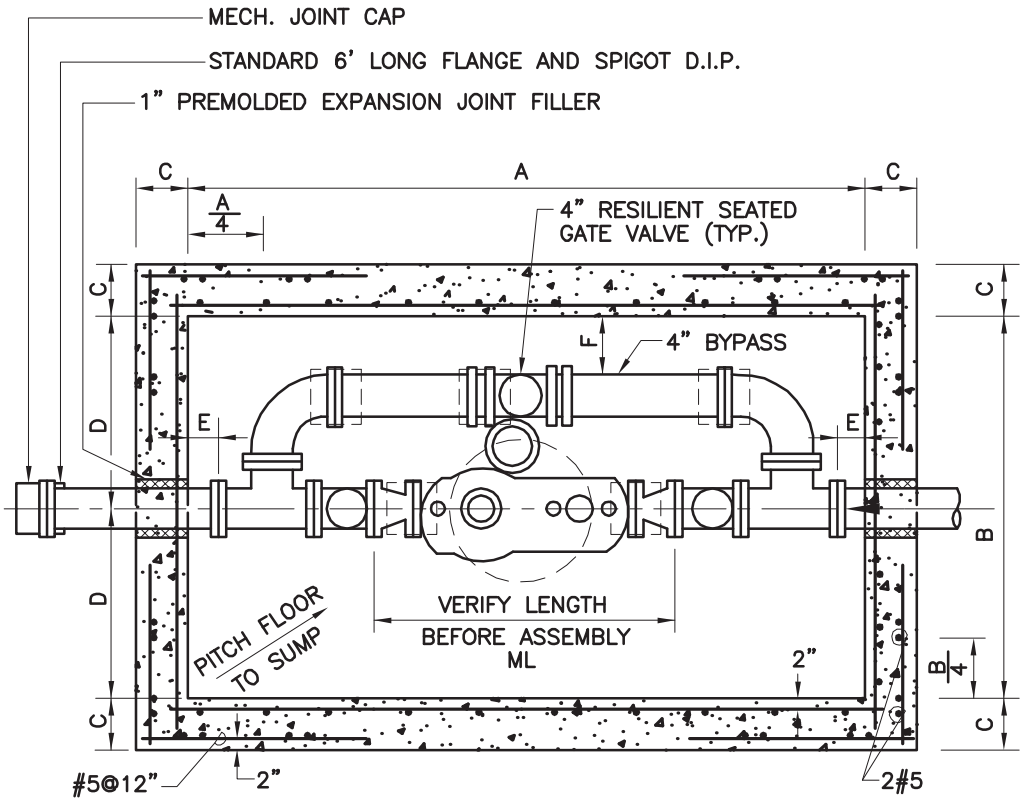
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

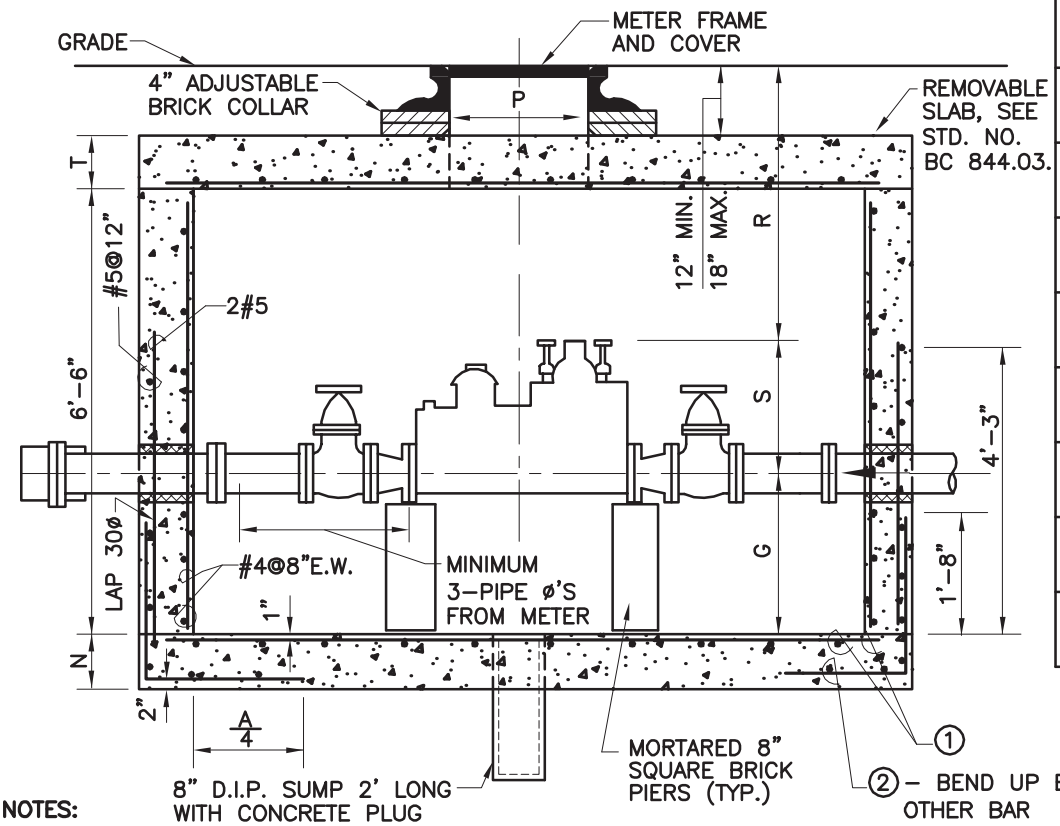
STANDARD INSTALLATION
OF 4" & 6"
WATER SUPPLY SERVICES
(4" & 6" METERS)

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 842.01

SCALE : NONE | SHEET 1 OF 1





	4" SERV. 3" METER	6" SERV. 4" METER	6" SERV. 3" METER
A	8'-4"	9'-10"	9'-10"
B	4'-6"	5'-6"	5'-6"
C	9"	9"	9"
D	2'-3"	2'-9"	2'-9"
E	9"	9"	11 1/2"
F	11"	15 1/2"	15 1/2"
G	2'-8"	2'-8"	2'-8"
H	3'-0"	3'-6"	3'-6"
L	4'-11"	5'-8"	5'-8"
N	6"	6"	6"
P	24"	24"	24"
R	4'-6" 5'-0"	4'-3" 4'-9"	4'-6" 5'-0"
S	14"	17"	14"
①	#4@12	#4@12	#4@12
②	#5@6	#5@6	#5@6
ML	24"	29"	24"

NOTES:

1. FOR CURB SETBACK, SEE STD. NO. BC 853.01.
2. CONCRETE SHALL BE MIX 3.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

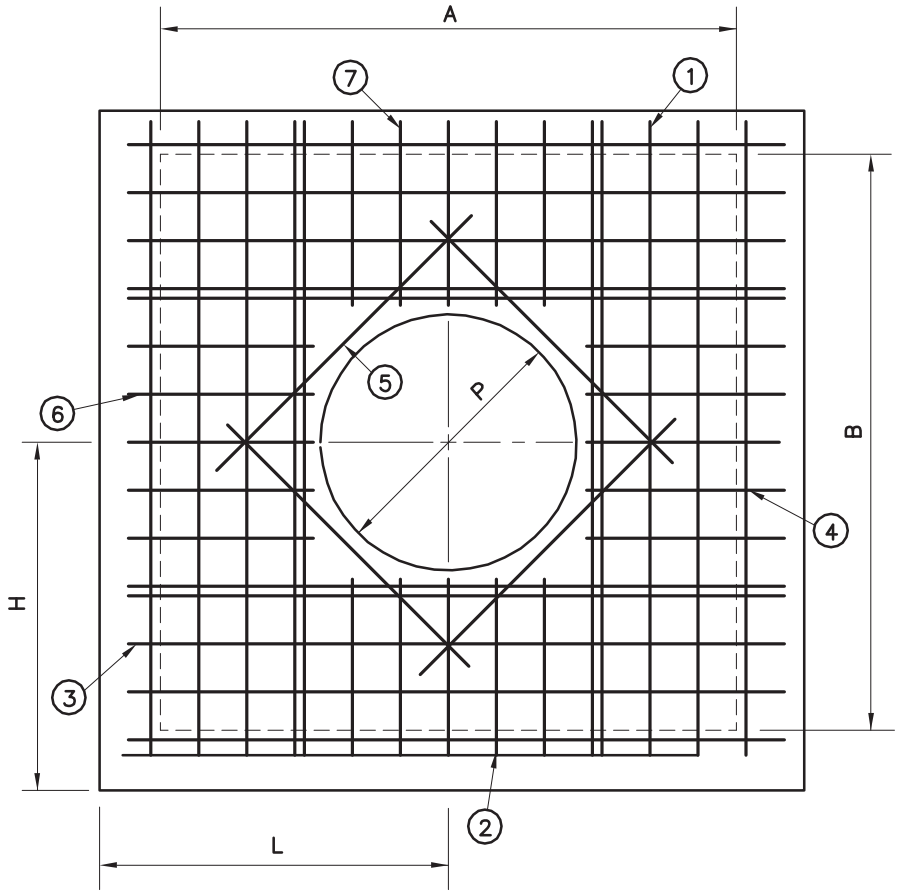
STANDARD INSTALLATION
OF 4" & 6"
WATER SUPPLY SERVICES
(3" & 4" METERS WITH REDUCERS)

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 842.02

SCALE : NONE

SHEET 1 OF 1



ROOF SLAB MATERIAL										CONCRETE QUANTITY (CUBIC YARDS)		
			STRAIGHT BARS									
SIZE	T	REBARS	①	②	③	④	⑤	⑥	⑦	WALLS	FLOOR	ROOF SLAB
4"	10"	#6@6"	18@5'–8"	3@1'–8"	10@9'–6"	3@3'–7"	4@3'–3"	3@3'–7"	3@1'–8"	5.18	1.09	1.80
6"	10"	#6@6"	20@6'–8"	3@2'–2"	12@11'–0"	3@4'–4"	4@3'–3"	3@4'–4"	3@2'–2"	6.08	1.47	2.45

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

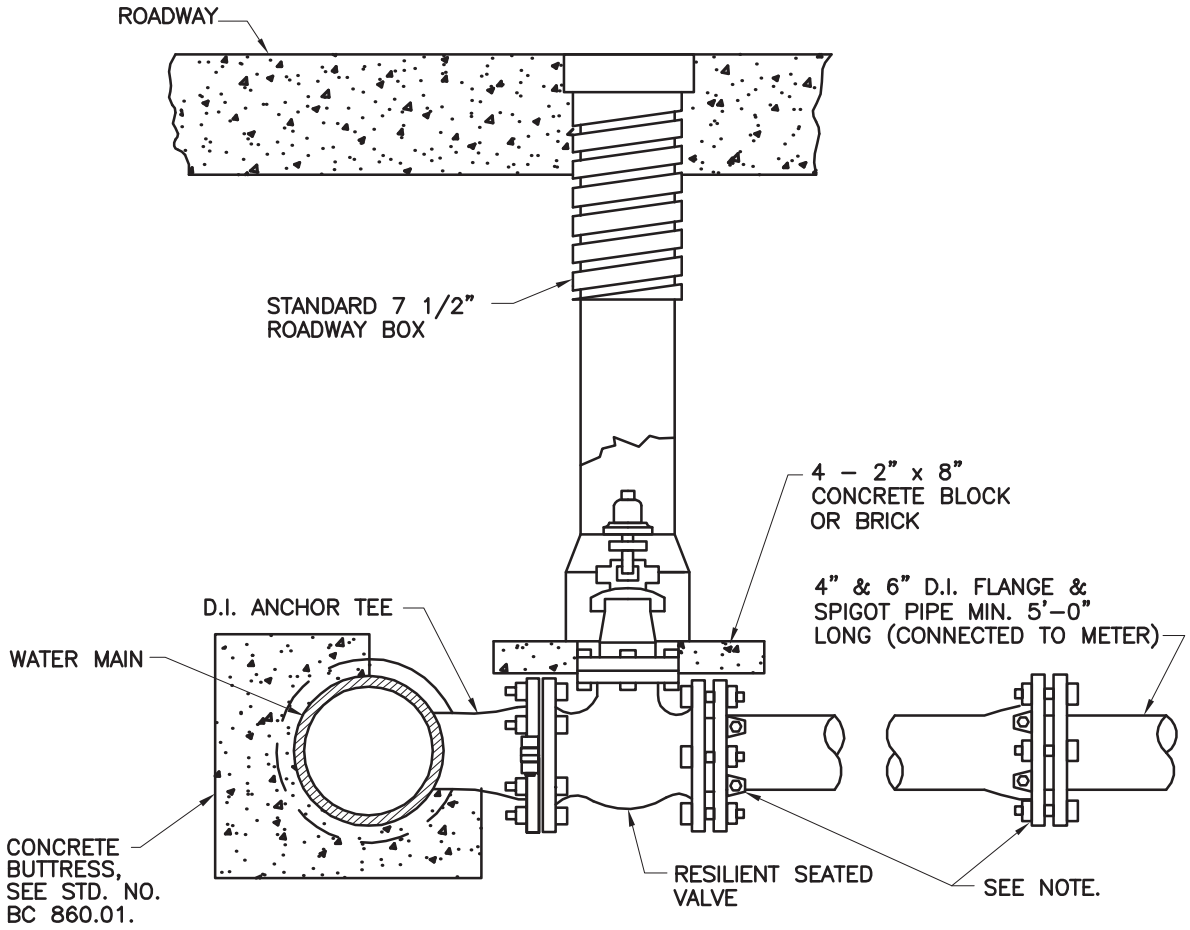
STANDARD VAULT
FOR 4" & 6"
WATER SUPPLY SERVICES

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 842.03

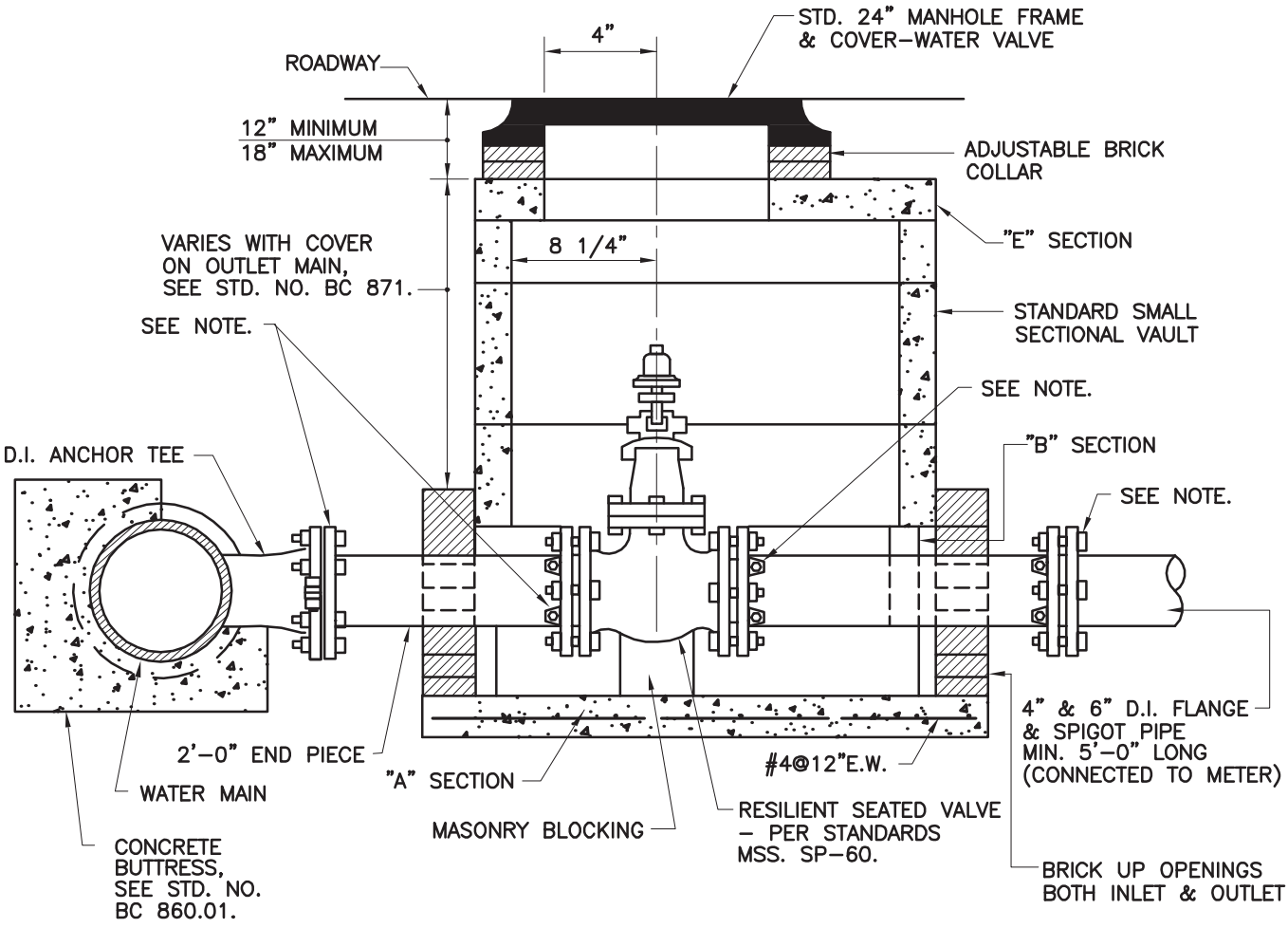
SCALE : NONE

SHEET 1 OF 1



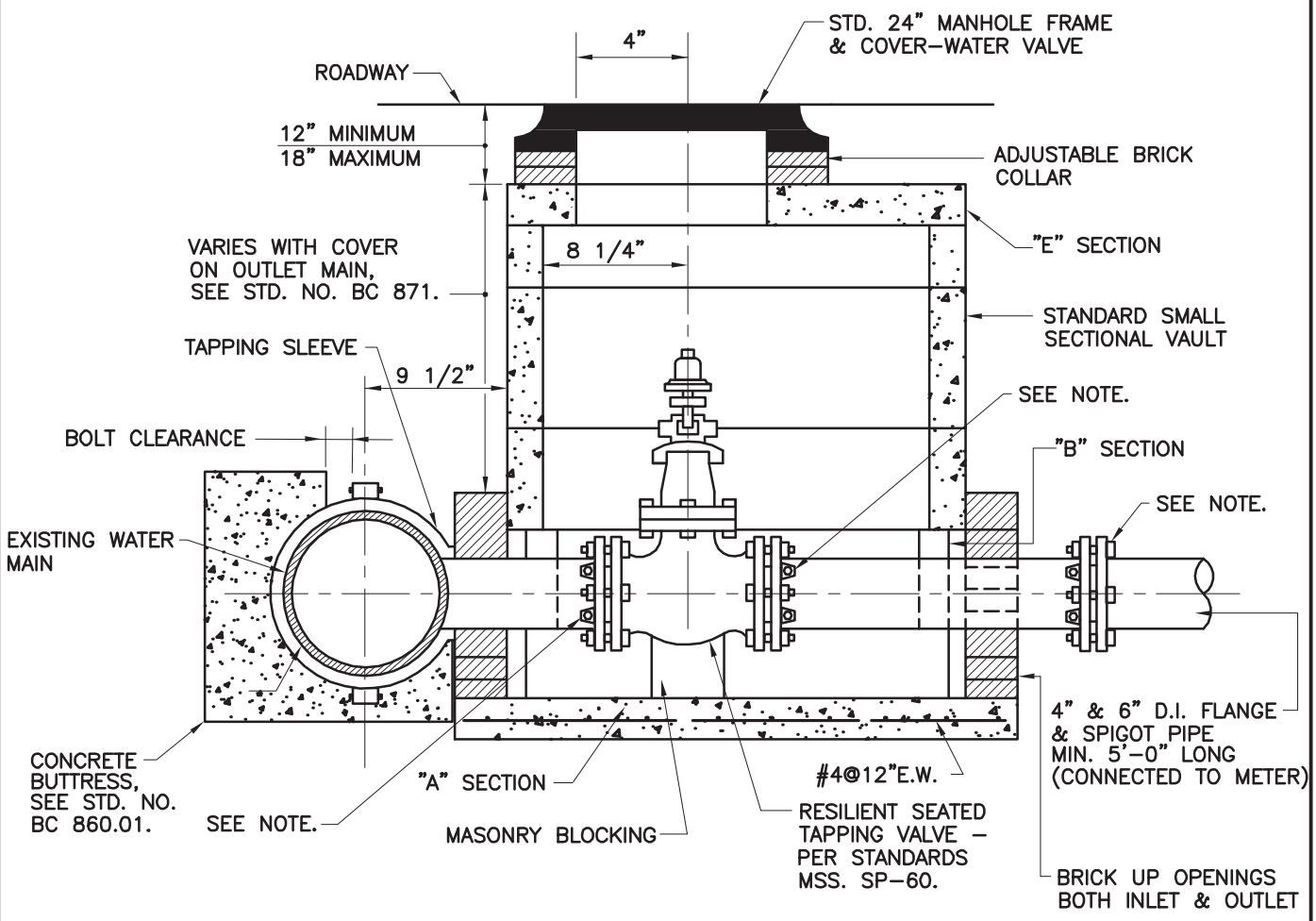
NOTE: ALL JOINTS MUST BE RESTRAINED BACK TO MAIN (ALL–THREAD RODS ARE NOT ACCEPTABLE).

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		STANDARD INSTALLATION OF 4" & 6" WATER SUPPLY SERVICES (3", 4", & 6" METERS) WITH TEE AND VALVE (ROADWAY BOX)	STANDARD NO. BC 843.01		
			SCALE : NONE	SHEET 1 OF 1	



NOTE: ALL JOINTS MUST BE RESTRAINED BACK TO MAIN (ALL–THREAD RODS ARE NOT ACCEPTABLE).

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		STANDARD INSTALLATION OF 4" & 6" WATER SUPPLY SERVICES (3", 4", & 6" METERS) WITH TEE AND VALVE (SECTIONAL VAULT)	STANDARD NO. BC 843.02		
			SCALE : NONE	SHEET 1 OF 1	



NOTE: ALL JOINTS MUST BE RESTRAINED BACK TO MAIN (ALL–THREAD RODS ARE NOT ACCEPTABLE).

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

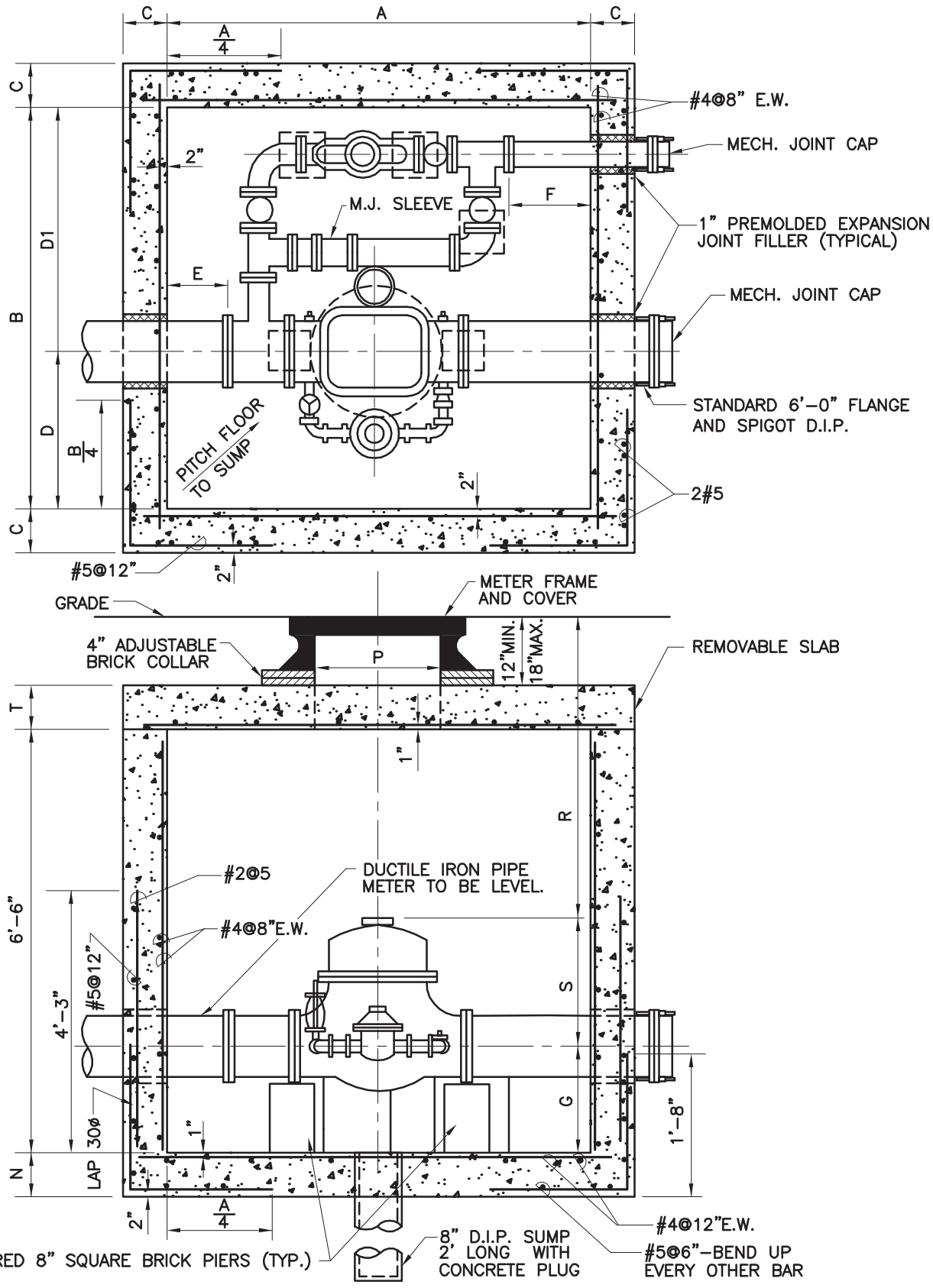
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD INSTALLATION OF 4" & 6" WATER SUPPLY SERVICES (3", 4", & 6" METERS) WITH TAPPING SLEEVE AND VALVE (SECTIONAL VAULT)

STANDARD NO. BC 843.03

SCALE : NONE

SHEET 1 OF 1



NOTE: CONCRETE SHALL BE MIX 3.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD VAULT FOR 4", 6", 8", & 10" DETECTOR CHECKS WITH LARGE DOMESTIC METERS

STANDARD NO. BC 844.01

SCALE : NONE

SHEET 1 OF 3

	4" DETECTOR CHECK W/4" DOM. METER AND 4" BYPASS	6" DETECTOR CHECK W/4" DOM. METER AND 4" BYPASS	8" DETECTOR CHECK W/6" DOM. METER AND 6" BYPASS	8" DETECTOR CHECK W/4" DOM. METER AND 4" BYPASS	10" DETECTOR CHECK W/6" DOM. METER AND 6" BYPASS	10" DETECTOR CHECK W/4" DOM. METER AND 4" BYPASS
SIZE	4"	6"	8"	8"	10"	10"
A	6'–10"	6"–11 1/2"	8'–2"	7'–1/2"	8'–6"	7'–4 1/2"
B	6'–7 1/2"	7'–1"	8'–2"	7'–6"	8'–6"	7'–10"
C	9"	9"	9"	9"	9"	9"
D	2'–5"	2'–9"	3'–1"	3'–1"	3'–2"	3'–2"
D1	4'–2 1/2"	4'–4"	5'–1"	4'–5"	5'–4"	4'–8"
E	9"	9"	9"	9"	9"	9"
F	9"	9"	9"	9"	11"	11"
G	2'–8"	2'–5"	2'–2"	2'–2"	2'–2"	2'–2"
H	3'–2"	3'–6"	3'–10"	3'–10"	3'–11"	3'–11"
L	3'–3 1/4"	3'–9 1/4"	4'–1 1/4"	4'–1 1/4"	4'–10"	4'–10"
N	6"	6"	6"	6"	6"	6"
P	30"	30"	30"	30"	30"	30"
R	4'–7" 5'–1"	4'–6" 5'–0"	4'–4" 4'–10"	4'–3" 4'–9"	4'–0" 4'–6"	3'–11" 4'–5"
S	11 3/4"	1'–4 1/4"	1'–10 1/4"	1'–10 1/4"	2'–1 3/4"	2'–1 3/4"

NOTE: FOR 12" D.C. USE 10" D.C. VAULT WITH CORRESPONDING DOMESTIC METER AND BYPASS SIZES.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

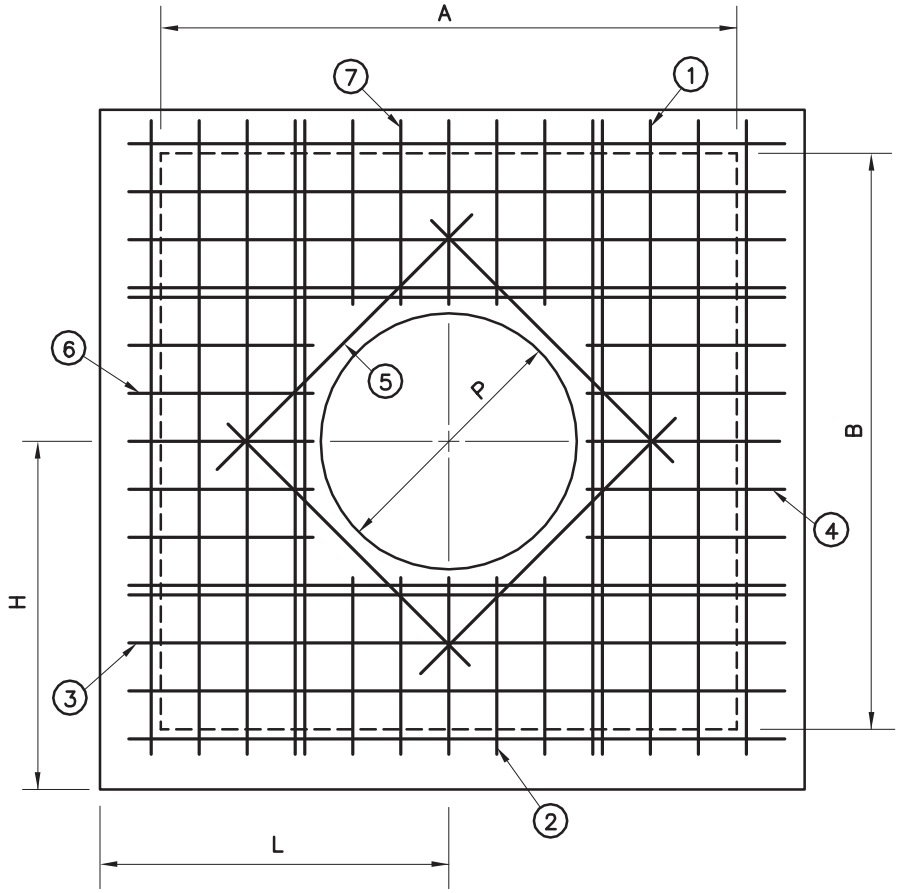
REBAR SCHEDULE FOR STANDARD VAULT FOR 4", 6", 8", & 10" DETECTOR CHECKS WITH LARGE DOMESTIC METERS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 844.01

SCALE : NONE

SHEET 2 OF 3



SIZE	T	REBARS	ROOF SLAB MATERIAL — STRAIGHT BARS ①	②	③	④	⑤	⑥	⑦	CONCRETE QUANTITY (CUBIC YARDS) WALLS	FLOOR	ROOF SLAB
4"W/ 4"DOM.	9"	#6@6"	14@7'-9"	5@1'-7"	13@8'-0"	5@3'-6"	4@3'-3"	5@1'-8"	5@3'-4"	5.40	1.25	1.88
6"W/ 4"DOM.	9"	#6@6"	14@8'-3"	5@1'-11"	14@8'-1"	5@3'-1"	4@3'-3"	5@2'-2"	5@3'-6"	5.61	1.34	2.02
8"W/ 6"DOM.	10"	#6@5"	19@9'-4"	6@2'-3"	19@9'-4"	6@4'-0"	4@3'-3"	6@2'-6"	6@4'-3"	6.44	1.73	2.88
8"W/ 4"DOM.	9"	#6@5 1/2"	15@8'-8"	5@2'-3"	16@8'-2"	5@2'-10"	4@3'-3"	5@2'-6"	5@3'-7"	5.82	1.42	2.14
10"W/ 6"DOM.	10"	#6@5"	19@9'-8"	6@2'-4"	20@9'-8"	6@3'-7"	4@3'-3"	6@3'-3"	6@4'-6"	6.68	1.85	3.09
10"W/ 4"DOM.	9"	#6@5 1/2"	15@9'-0"	5@2'-4"	17@8'-6"	5@2'-6"	4@3'-3"	5@3'-3"	5@3'-10"	6.03	1.53	2.30

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

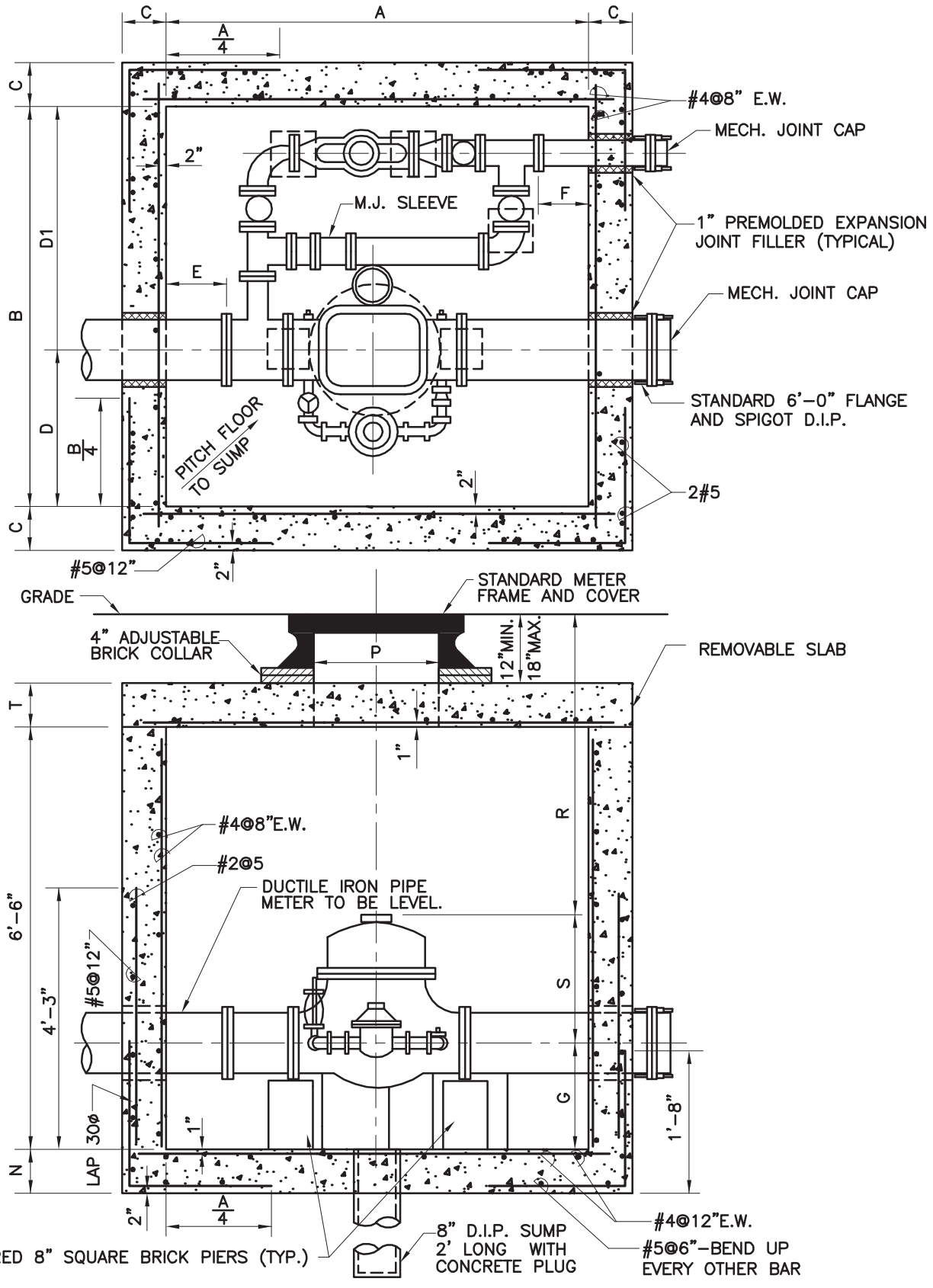
ROOF SLAB AND CONCRETE QUANTITIES
FOR STANDARD VAULT FOR
4", 6", 8", & 10" DETECTOR CHECKS
WITH LARGE DOMESTIC METERS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 844.01

SCALE : NONE

SHEET 3 OF 3



NOTE: CONCRETE SHALL BE MIX 3.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD VAULT FOR 4", 6", 8", & 10" DETECTOR CHECKS WITH REDUCED SIZE LARGE DOMESTIC METERS

STANDARD NO. BC 845.01

SCALE : NONE

SHEET 1 OF 3

	4" DETECTOR CHECK W/4" DOM. METER AND 4" BYPASS	6" DETECTOR CHECK W/3" DOM. METER AND 4" BYPASS	8" DETECTOR CHECK W/4" DOM. METER AND 6" BYPASS	8" DETECTOR CHECK W/3" DOM. METER AND 4" BYPASS	10" DETECTOR CHECK W/4" DOM. METER AND 6" BYPASS	10" DETECTOR CHECK W/3" DOM. METER AND 4" BYPASS
SIZE	4"	6"	8"	8"	10"	10"
A	7'–0"	7'–1 1/2"	8'–3 1/2"	7'–2 1/2"	8'–7 1/2"	7'–6 1/2"
B	6'–6 1/2"	7'–0"	8'–0"	7'–5"	8'–3"	7'–8"
C	9"	9"	9"	9"	9"	9"
D	2'–5"	2'–9"	3'–1"	3'–1"	3'–2"	3'–2"
D1	4'–1 1/2"	4'–3"	4'–11"	4'–4"	5'–1"	4'–6"
E	9"	9"	9"	9"	9"	9"
F	9"	9"	9"	9"	11"	11"
G	2'–8"	2'–5"	2'–2"	2'–2"	2'–2"	2'–2"
H	3'–2"	3'–6"	3'–10"	3'–10"	3'–11"	3'–11"
L	3'–3 1/4"	3'–9 1/4"	4'–1 1/4"	4'–1 1/4"	4'–10"	4'–10"
N	6"	6"	6"	6"	6"	6"
P	30"	30"	30"	30"	30"	30"
R	4'–7" 5'–1"	4'–6" 5'–0"	4'–4" 4'–10"	4'–3" 4'–9"	4'–0" 4'–6"	3'–11" 4'–5"
S	11 3/4"	1'–4 1/4"	1'–10 1/4"	1'–10 1/4"	2'–1 3/4"	2'–1 3/4"

NOTE: FOR 12" D.C. USE 10" D.C. VAULT WITH CORRESPONDING DOMESTIC METER AND BYPASS SIZES.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

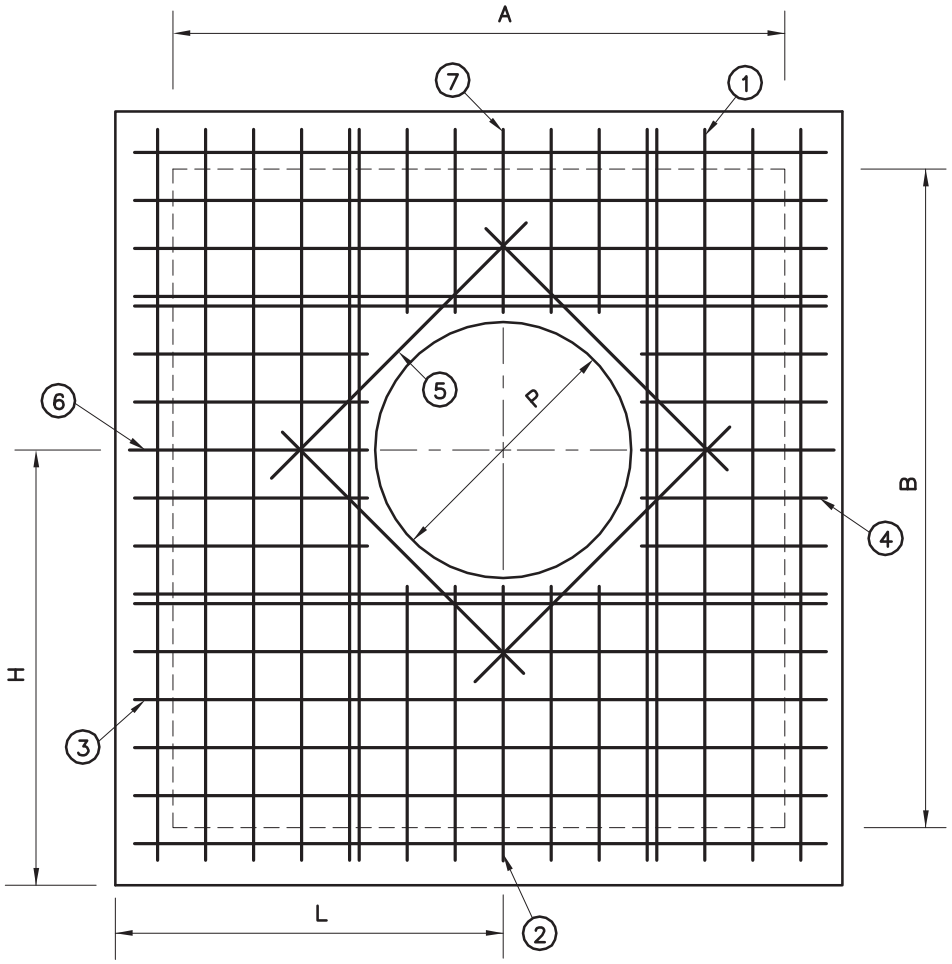
REBAR SCHEDULE FOR
STANDARD VAULT FOR
4", 6", 8", & 10" DETECTOR CHECKS WITH
REDUCED SIZE LARGE DOMESTIC METERS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 845.01

SCALE : NONE

SHEET 2 OF 3



ROOF SLAB MATERIALS										CONCRETE QUANTITY (CUBIC YARDS)		
			STRAIGHT BARS									
SIZE	T	REBARS	①	②	③	④	⑤	⑥	⑦	WALLS	FLOOR	ROOF SLAB
4" W/ 3" DOM	9"	#6@6"	14@7'-8"	5@1'-7"	13@8'-2"	5@3'-8"	4@3'-3"	5@1'-8"	5@3'-3"	5.43	1.27	1.91
6" W/ 3" DOM	9"	#6@6"	14@8'-2"	5@1'-11"	14@8'-3"	5@3'-3"	4@3'-3"	5@2'-2"	5@3'-5"	5.64	1.36	2.04
8" W/ 4" DOM	10"	#6@5"	19@9'-2"	6@2'-3"	19@9'-5"	6@4'-1"	4@3'-3"	6@2'-6"	6@4'-1"	6.42	1.72	2.87
8" W/ 3" DOM	9"	#6@5 1/2"	15@8'-7"	5@2'-3"	16@8'-4"	5@3'-0"	4@3'-3"	5@2'-6"	5@3'-6"	5.82	1.44	2.16
10" W/ 4" DOM	10"	#6@5"	19@9'-5"	6@2'-4"	20@9'-9"	6@3'-8"	4@3'-3"	6@3'-3"	6@4'-3"	6.64	1.83	3.05
10" W/ 3" DOM	9"	#6@5 1/2"	15@8'-10"	5@2'-4"	17@8'-8"	5@2'-7"	4@3'-3"	5@3'-3"	5@3'-8"	6.03	1.53	2.30

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

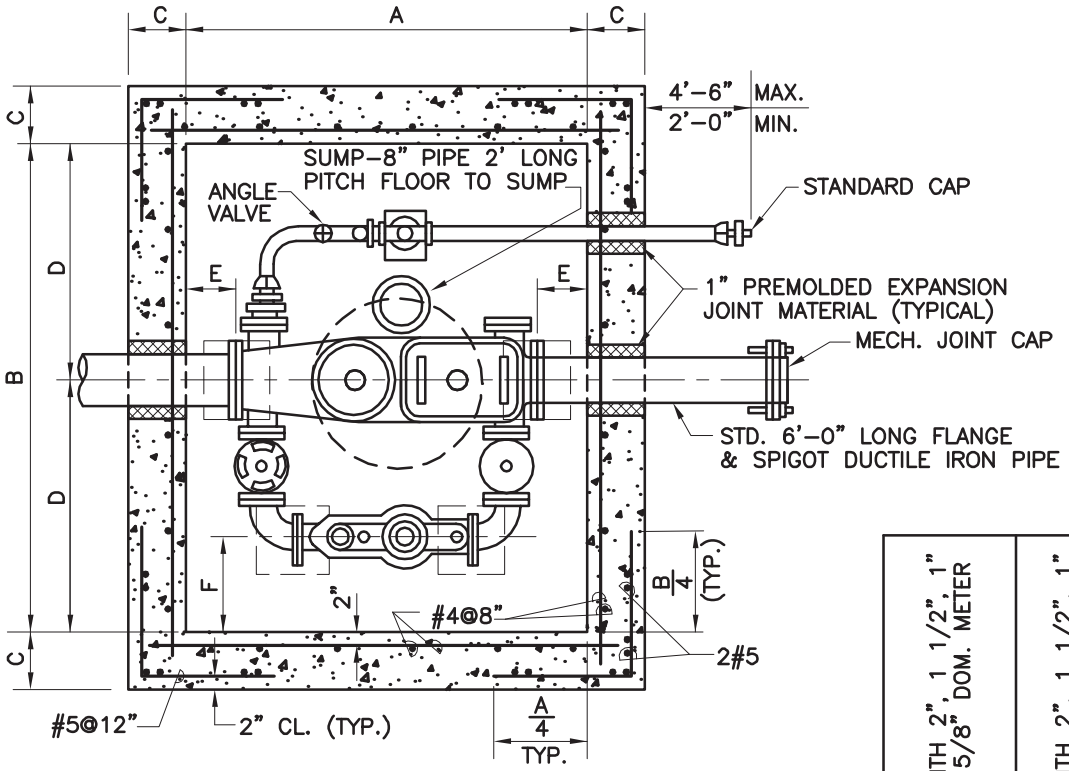
ROOF SLAB AND CONCRETE QUANTITIES FOR STANDARD VAULT FOR 4", 6", 8", & 10" DETECTOR CHECKS WITH REDUCED SIZE LARGE DOMESTIC METERS

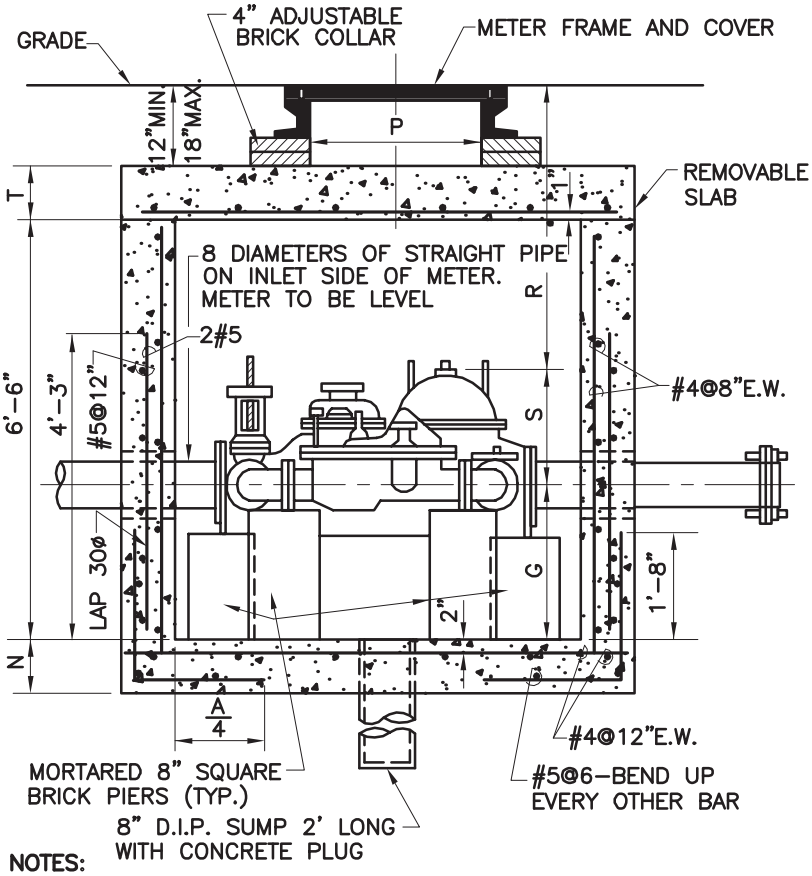
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 845.01

SCALE : NONE

SHEET 3 OF 3





	4" F.M. WITH 2", 1 1/2", 1" 3/4", OR 5/8" DOM. METER	6" F.M. WITH 2", 1 1/2", 1" 3/4" OR 5/8" DOM. METER	8" F.M. WITH 2", 1 1/2", 1" 3/4" OR 5/8" DOM. METER	10" F.M. WITH 2", 1 1/2", 1" 3/4" OR 5/8" DOM. METER
SIZE	4"	6"	8"	10"
A	4'–3"	5'–3"	5'–11"	7'–2"
B	5'–7 1/2"	6'–6"	7'–6"	9'–0"
C	9"	9"	9"	9"
D	2'–9 3/4"	3'–3"	3'–9"	4'–6"
E	9"	9"	9"	9"
F	1'–4"	1'–5"	1'–6"	1'–8"
G	2'–8"	2'–5"	2'–2"	2'–4"
H	3'–6 3/4"	4'–0"	4'–6"	5'–3"
K	3'–6 3/4"	4'–0"	4'–6"	5'–3"
L	2'–7"	3'–1"	3'–6"	3'–10"
M	3'–2"	3'–8"	3'–11"	4'–10"
N	6"	6"	6"	6"
P	18"	24"	30"	30"
R	4'–3" TO 4'–9"	4'–4" TO 4'–10"	4'–3" TO 4'–9"	3'–6" TO 4'–0"
S	1'–2 1/2"	1'–5 1/2"	1'–9 1/2"	2'–6"

NOTES:

1. CONCRETE SHALL BE MIX 3.
2. FOR 12" F.M. USE 10" F.M. VAULT WITH CORRESPONDING DOMESTIC METERS.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

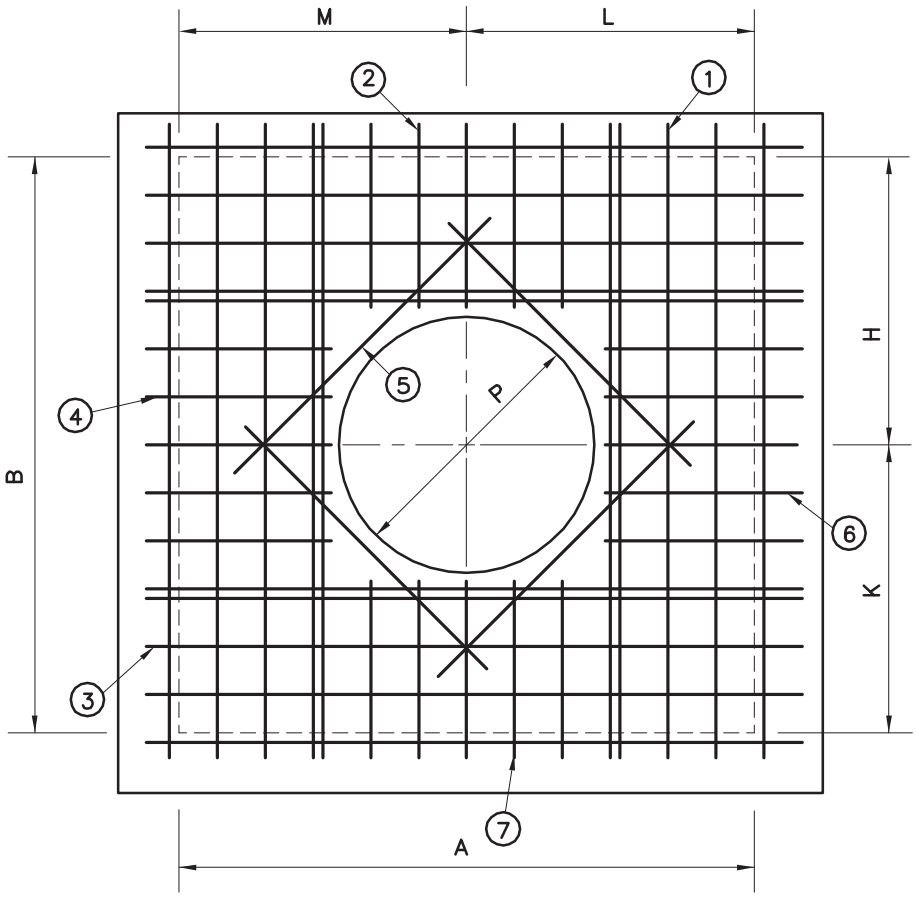
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD VAULT FOR
4", 6", 8", 10", & 12" F.M. METERS
WITH SMALL DOMESTIC METERS

STANDARD NO.
BC 846.01

SCALE : NONE

SHEET 1 OF 2



ROOF SLAB MATERIAL										CONCRETE QUANTITY (CUBIC YARDS)		
SIZE	T	REBARS	STRAIGHT BARS									
			①	②	③	④	⑤	⑥	⑦	WALLS	FLOOR	ROOF SLAB
4"	8"	#6@7"	9@6'–9"	3@2'–6"	11@5'–5"	3@2'–1"	4@3'–3"	3@1'–6"	3@2'–6"	4.11	0.75	1.01
6"	8 1/2"	#6@6"	11@7'–8"	4@2'–8"	14@6'–5"	4@2'–4"	4@3'–3"	4@1'–9"	4@2'–8"	4.81	1.00	1.42
8"	9"	#6@6"	12@8'–8"	5@2'–11"	15@7'–1"	5@2'–4"	4@3'–3"	5@1'–11"	5@2'–11"	5.42	1.24	1.85
10"	10"	#6@6"	14@10'–2"	5@3'–8"	18@8'–4"	5@3'–3"	4@3'–3"	5@2'–3"	5@3'–8"	6.38	1.69	2.81

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

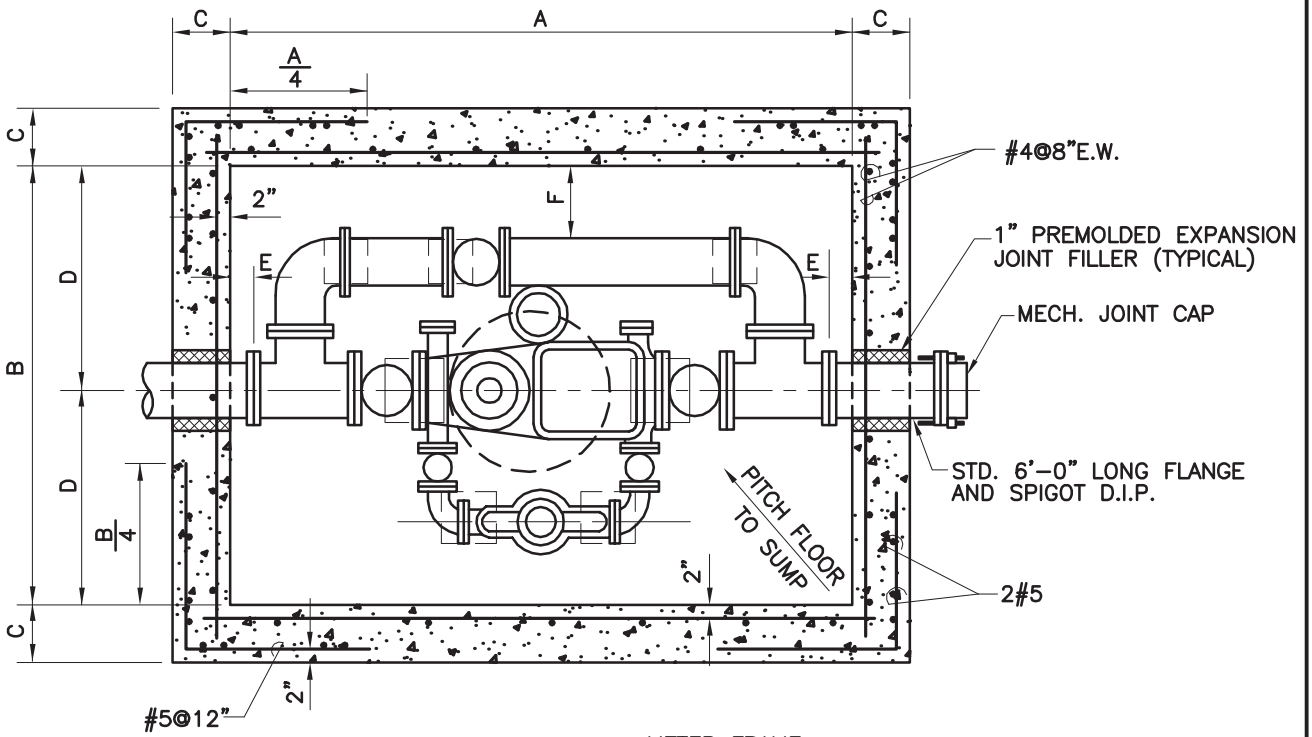
ROOF SLAB AND CONCRETE QUANTITIES
FOR STANDARD VAULT FOR
4", 6", 8", 10", & 12" F.M. METERS
WITH SMALL DOMESTIC METERS

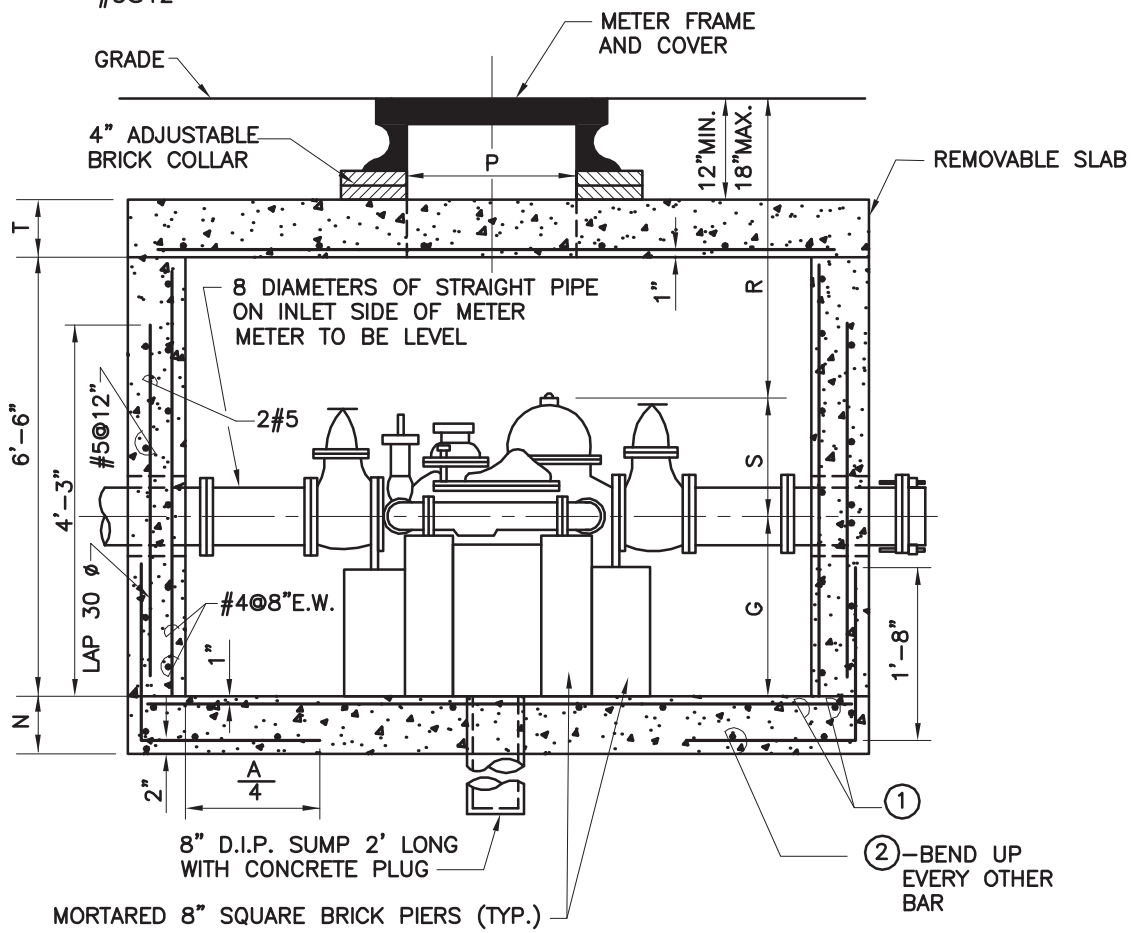
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 846.01

SCALE : NONE

SHEET 2 OF 2





NOTE: CONCRETE SHALL BE MIX 3.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD VAULT FOR 4", 6", 8", 10", & 12" F.M. METERS

STANDARD NO. BC 847.01

SCALE : NONE

SHEET 1 OF 3

	4" F.M. WITH BYPASS	6" F.M. WITH BYPASS	8" F.M. WITH BYPASS	10" F.M. WITH BYPASS	12" F.M. WITH BYPASS
SIZE	4"	6"	8"	10"	12"
A	7'–11"	9'–8"	10'–10"	13'–0"	13'–6"
B	5'–6"	6'–0"	6'–11"	8'–6"	8'–6"
C	9"	9"	9"	9"	9"
D	2'–9"	3'–0"	3'–5 1/2"	4'–3"	4'–3"
E	9"	9"	9"	9"	9"
F	1'–3"	1'–2"	1'–4"	1'–8"	1'–7"
G	2'–8"	2'–5"	2'–2"	2'–2"	2'–2"
H	3'–6"	3'–9"	4'–2 1/2"	5'–0"	5'–0"
L	4'–8 1/2"	5'–7"	6'–2"	7'–3"	7'–6"
N	6"	6"	6"	6"	6"
P	30"	30"	30"	30"	30"
R	4'–5" 4'–11"	4'–5" 4'–11"	4'–4" 4'–10"	3'–8" 4'–2"	3'–8" 4'–2"
S	1'–2 1/2"	1'–5 1/2"	1'–9 1/2"	2'–6"	2'–6"
(1)	#4@12"E.W.	#4@12"E.W.	#4@12"E.W.	#4@9"E.W.	#4@9"E.W.
(2)	#5@6"	#5@6"	#5@6"	#5@4 1/2"	#5@4 1/2"

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

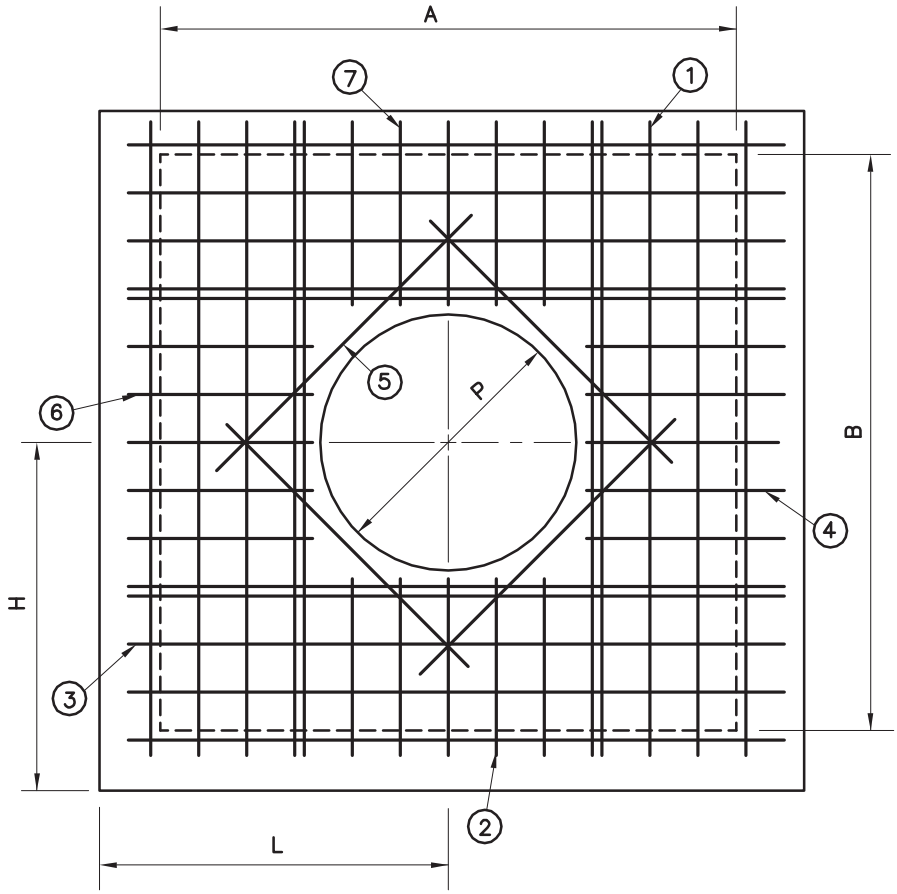
REBAR SCHEDULE FOR
STANDARD VAULT FOR
4", 6", 8", 10", & 12" F.M. METERS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 847.01

SCALE : NONE

SHEET 2 OF 3



ROOF SLAB MATERIAL										CONCRETE QUANTITY (CUBIC YARDS)		
			STRAIGHT BARS									
SIZE	T	REBARS	①	②	③	④	⑤	⑥	⑦	WALLS	FLOOR	ROOF SLAB
4"	10"	#6@7"	13@6'-8"	5@1'-11"	9@9'-1"	5@3'-1"	4@3'-3"	5@3'-1"	5@1'-11"	5.42	1.22	2.03
6"	10"	#6@6 1/2"	17@7'-2"	5@2'-2"	11@10'-10"	5@4'-0"	4@3'-3"	5@4'-0"	5@2'-2"	6.20	1.55	2.58
8"	10"	#6@5"	25@8'-1"	6@2'-7 1/2"	17@12'-0"	6@4'-7"	4@3'-3"	6@4'-7"	6@2'-7 1/2"	6.95	1.92	3.20
10"	10"	#6@4 1/2"	33@9'-8"	7@3'-5"	23@14'-2"	7@5'-8"	4@3'-3"	7@5'-8"	7@3'-5"	8.37	2.69	4.48
12"	10"	#6@4 1/2"	33@9'-8"	7@3'-5"	23@14'-8"	7@5'-11"	4@3'-3"	7@5'-11"	7@3'-5"	8.49	2.78	4.63

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

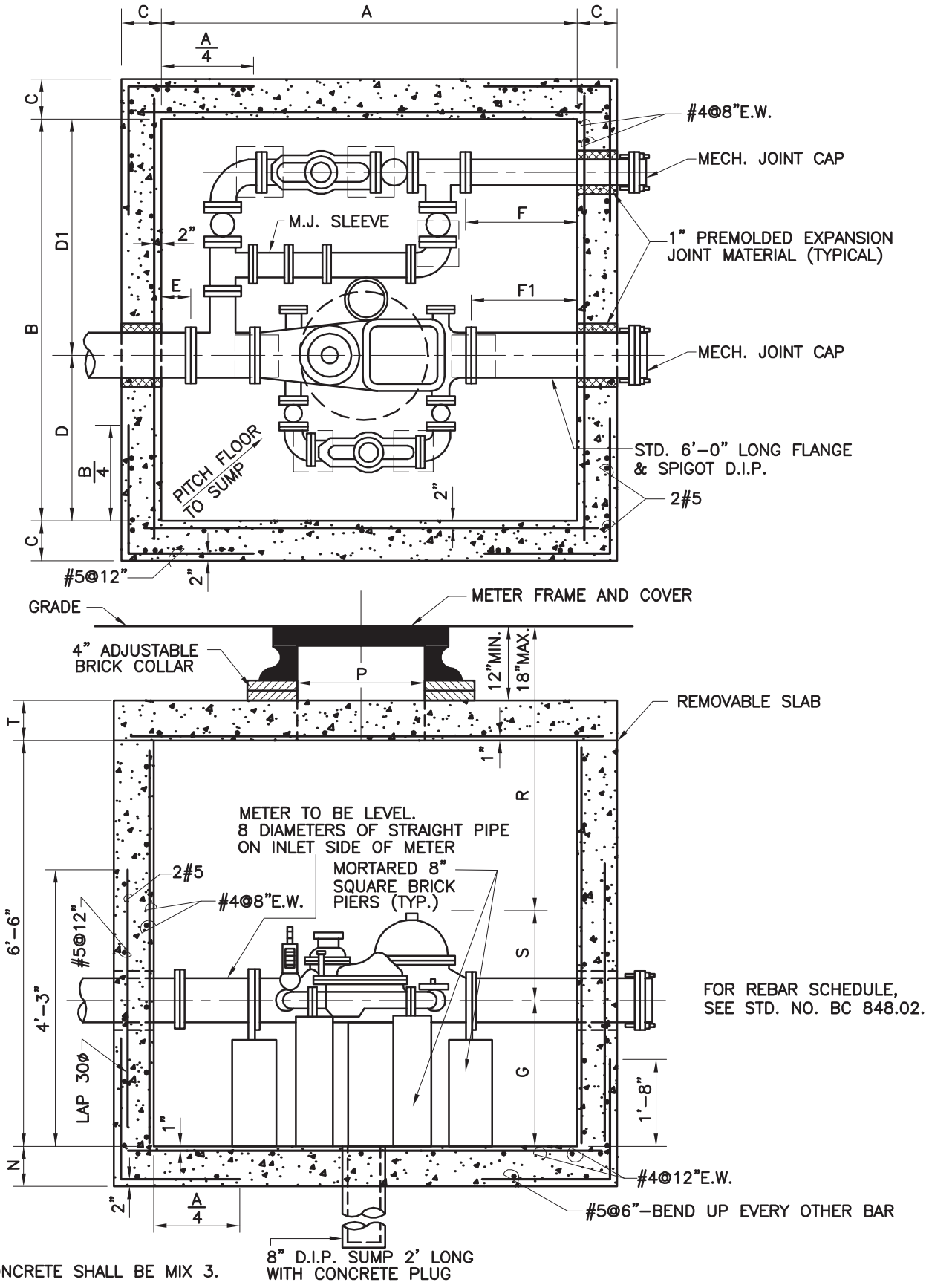
ROOF SLAB AND CONCRETE QUANTITIES
FOR STANDARD VAULT FOR
4", 6", 8", 10", & 12" F.M. METERS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 847.01

SCALE : NONE

SHEET 3 OF 3



FOR REBAR SCHEDULE, SEE STD. NO. BC 848.02.

NOTE: CONCRETE SHALL BE MIX 3.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD VAULT FOR 4", 6", 8", 10", & 12" F.M. METERS WITH LARGE DOMESTIC METERS

STANDARD NO. BC 848.01

SCALE : NONE

SHEET 1 OF 3

	4" F.M. WITH 4" DOM. METER AND 4" BYPASS	6" F.M. WITH 4" DOM. METER AND 4" BYPASS	8" F.M. WITH 6" DOM. METER AND 6" BYPASS	8" F.M. WITH 4" DOM. METER AND 4" BYPASS	10" F.M. WITH 6" DOM. METER AND 6" BYPASS	10" F.M. WITH 4" DOM. METER AND 4" BYPASS
SIZE	4"	6"	8"	8"	10"	10"
A	6'–10"	6'–11 1/2"	8'–2"	7'–5"	9'–2"	9'–2"
B	7'–10"	7'–7"	8'–9 1/2"	8'–1 1/2"	9'–9"	9'–1"
C	9"	9"	9"	9"	9"	9"
D	2'–10"	3'–3"	3'–9"	3'–9"	4'–6"	4'–6"
D1	4'–2"	4'–4"	5'–1/2"	4'–4 1/2"	5'–3"	4'–7"
E	9"	9"	9"	9"	9"	9"
F	9"	9"	9"	—	—	—
G	2'–8"	2'–5"	2'–2"	2'–2"	2'–2"	2'–2"
H	3'–7"	4'–0"	4'–6"	4'–6"	5'–3"	5'–3"
L	3'–11 1/2"	4'–8 1/2"	5'–2 1/2"	5'–2 1/2"	6'–2"	6'–2"
N	6"	6"	6"	6"	6"	6"
P	30"	30"	30"	30"	30"	30"
R	4'–4" 4'–10"	4'–4" 4'–10"	4'–4" 4'–10"	4'–4" 4'–10"	3'–8" 4'–2"	3'–8" 4'–2"
S	1'–2 1/2"	1'–5 1/2"	1'–9 1/2"	1'–9 1/2"	2'–6"	2'–6"
F1	—	—	—	9"	11"	11"

NOTE: FOR 12" F.M. USE 10" F.M. VAULT WITH CORRESPONDING DOMESTIC METERS & BYPASS SIZES.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

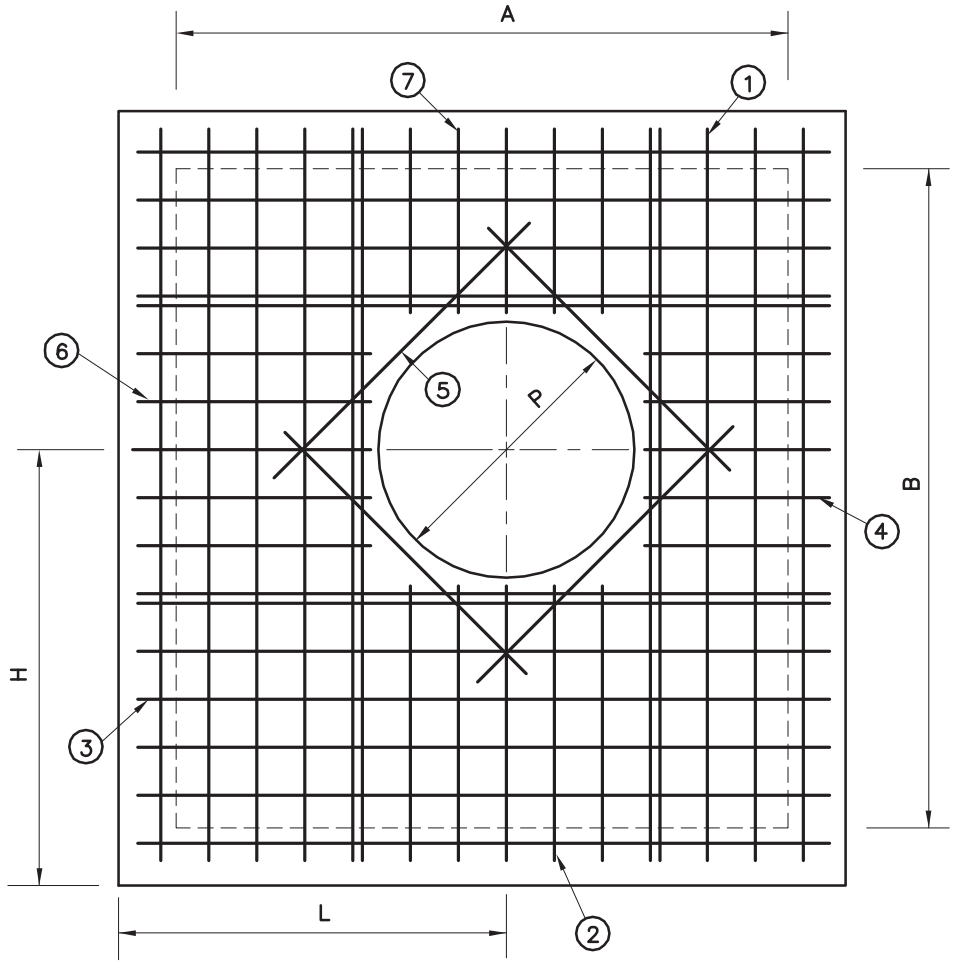
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

REBAR SCHEDULE FOR
STANDARD VAULT FOR
4", 6", 8", 10", & 12" F.M. METERS
WITH LARGE DOMESTIC METERS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 848.01

SCALE : NONE



ROOF SLAB MATERIALS										CONCRETE QUANTITY (CUBIC YARDS)		
			STRAIGHT BARS									
SIZE	T	REBARS	①	②	③	④	⑤	⑥	⑦	WALLS	FLOOR	ROOF SLAB
4" W/ 3" DOM	9"	#6@6"	14@8'-2"	5@2'-0"	14@8'-0"	5@2'-9"	4@3'-3"	5@2'-4"	5@3'-4"	5.54	1.31	1.97
6" W/ 3" DOM	9"	#6@5 1/2"	15@8'-9"	5@2'-5"	16@8'-1"	5@2'-2"	4@3'-3"	5@3'-1"	5@3'-6"	5.79	1.42	2.13
8" W/ 6" DOM	10"	#6@5"	19@9'-11"	6@2'-11"	20@9'-4"	6@2'-10"	4@3'-3"	6@3'-7"	6@4'-2"	6.67	1.84	3.07
8" W/ 3" DOM	10"	#6@6"	15@9'-3"	5@2'-11"	16@8'-7"	5@2'-1"	4@3'-3"	5@3'-7"	5@3'-6"	6.15	1.59	2.65
10" W/ 6" DOM	10"	#6@4 1/2"	23@10'-11"	7@3'-8"	25@10'-4"	7@2'-11"	4@3'-3"	7@4'-7"	7@4'-5"	7.37	2.22	3.70
10" W/ 3" DOM	10"	#6@4 1/2"	23@10'-3"	7@3'-8"	23@10'-4"	7@2'-11"	4@3'-3"	7@4'-7"	7@3'-9"	7.13	2.09	3.48

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

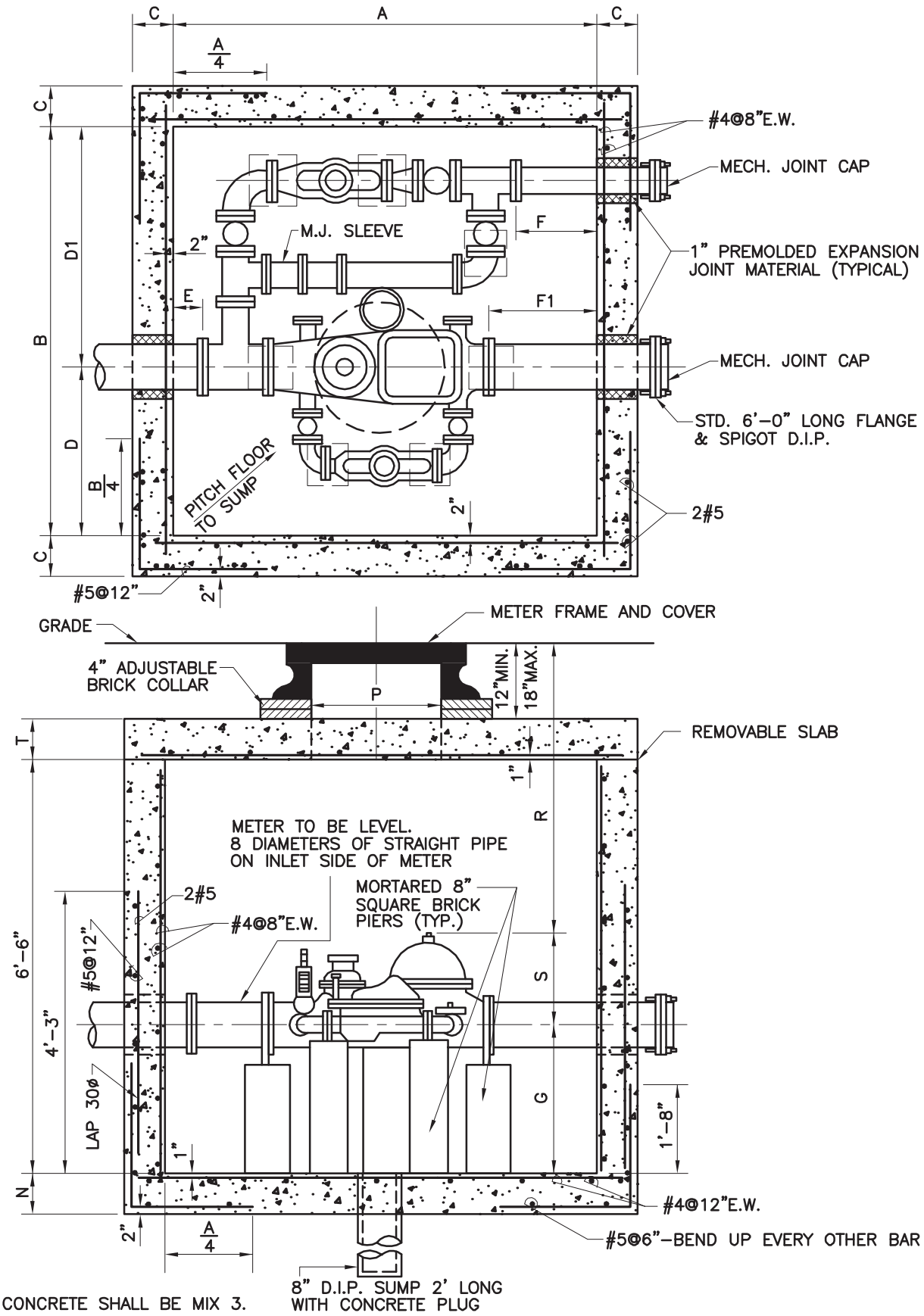
ROOF SLAB AND CONCRETE QUANTITIES FOR STANDARD VAULT FOR 4", 6", 8", 10", & 12" F.M. METERS WITH LARGE DOMESTIC METERS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 848.01

SCALE : NONE

SHEET 3 OF 3



NOTE: CONCRETE SHALL BE MIX 3.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD VAULT FOR
4", 6", 8", 10", & 12" F.M. METERS WITH
REDUCED SIZE LARGE DOMESTIC METERS

STANDARD NO.
BC 849.01

SCALE : NONE

SHEET 1 OF 3

	4" F.M. WITH 3" DOM. METER AND 4" BYPASS	6" F.M. WITH 3" DOM. METER AND 4" BYPASS	8" F.M. WITH 4" DOM. METER AND 6" BYPASS	8" F.M. WITH 3" DOM. METER AND 4" BYPASS	10" F.M. WITH 4" DOM. METER AND 6" BYPASS	10" F.M. WITH 3" DOM. METER AND 4" BYPASS
SIZE	4"	6"	8"	8"	10"	10"
A	7'–0"	7'–1 1/2"	8'–3 1/2"	7'–5"	9'–2"	9'–2"
B	6'–11"	7'–6"	8'–7 1/2"	8'–1/2"	9'–7"	9'–0"
C	9"	9"	9"	9"	9"	9"
D	2'–10"	3'–3"	3'–9"	3'–9"	4'–6"	4'–6"
D1	4'–1"	4'–3"	4'–10 1/2"	4'–3 1/2"	5'–1"	4'–6"
E	9"	9"	9"	9"	9"	9"
F	9"	9"	9"	—	—	—
F1	—	—	—	9"	11"	11"
G	2'–8"	2'–5"	2'–2"	2'–2"	2'–2"	2'–2"
H	3'–7"	4'–0"	4'–6"	4'–6"	5'–3"	5'–3"
L	3'–11 1/2"	4'–8 1/2"	5'–2 1/2"	5'–2 1/2"	6'–2"	6'–2"
N	6"	6"	6"	6"	6"	6"
P	30"	30"	30"	30"	30"	30"
R	4'–4" 4'–10"	4'–4" 4'–10"	4'–4" 4'–10"	4'–3" 4'–9"	3'–8" 4'–2"	3'–7" 4'–1"
S	1'–2 1/2"	1'–5 1/2"	1'–9 1/2"	1'–9 1/2"	2'–6"	2'–6"

NOTE: FOR 12" F.M. USE 10" F.M. VAULT WITH CORRESPONDING DOMESTIC METERS & BYPASS SIZES.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

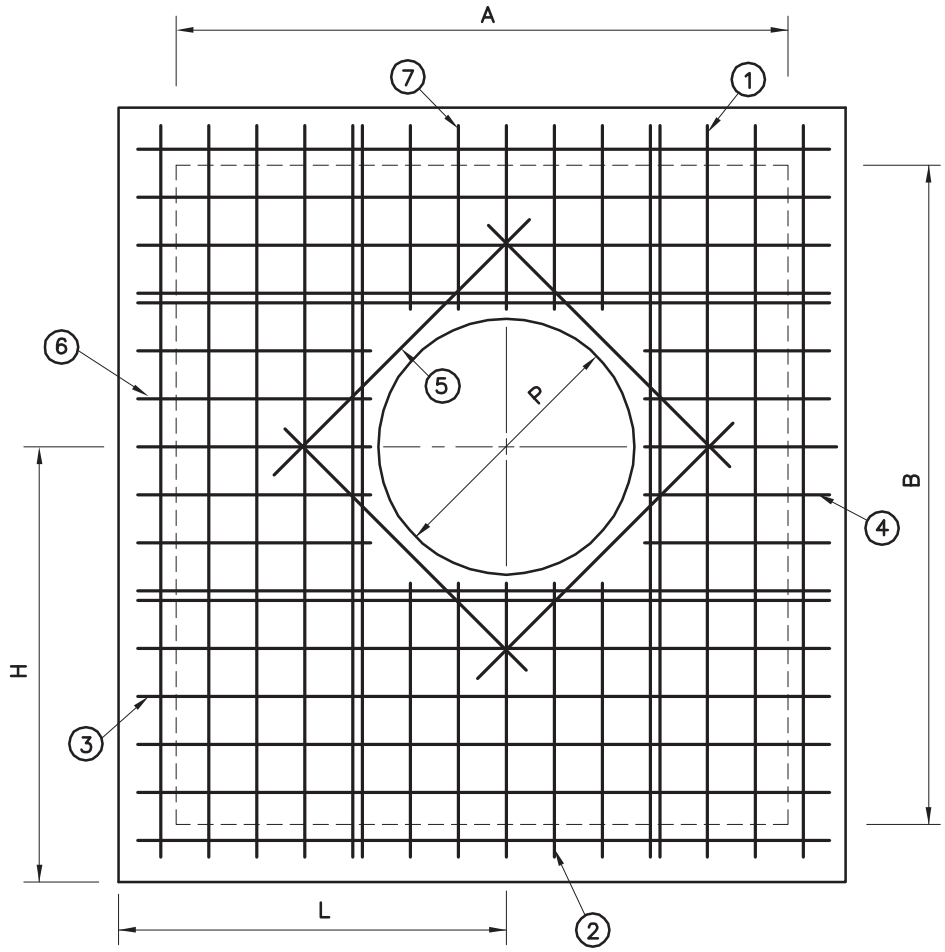
REBAR SCHEDULE FOR STANDARD VAULT FOR 4", 6", 8", 10", & 12" F.M. METERS WITH REDUCED SIZE LARGE DOMESTIC METERS

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 849.01

SCALE : NONE

SHEET 2 OF 3



SIZE	T	REBARS	ROOF SLAB MATERIALS							CONCRETE QUANTITY (CUBIC YARDS)		
			STRAIGHT BARS									
			①	②	③	④	⑤	⑥	⑦	WALLS	FLOOR	ROOF SLAB
4" W/ 3" DOM	9"	#6@6"	14@8'-1"	5@2'-0"	14@8'-2"	5@2'-11"	4@3'-3"	5@2'-4"	5@3'-3"	5.57	1.32	1.98
6" W/ 3" DOM	9"	#6@6"	15@8'-8"	5@2'-5"	15@8'-3"	5@2'-4"	4@3'-3"	5@3'-1"	5@3'-5"	5.82	1.44	2.16
8" W/ 4" DOM	10"	#6@5"	20@9'-9"	6@2'-11"	20@9'-5"	6@3'-0"	4@3'-3"	6@3'-7"	6@4'-0"	6.65	1.84	3.07
8" W/ 3" DOM	9"	#6@5 1/2"	17@9'-2"	5@2'-11"	16@8'-7"	5@2'-1"	4@3'-3"	5@3'-7"	5@3'-5"	6.12	1.58	2.37
10" W/ 4" DOM	10"	#6@5"	22@10'-9"	6@3'-8"	22@10'-4"	6@2'-11"	4@3'-3"	6@4'-7"	6@4'-3"	7.31	2.19	3.65
10" W/ 3" DOM	9"	#6@5 1/2"	20@10'-3"	5@3'-8"	19@10'-4"	5@2'-11"	4@3'-3"	5@4'-7"	5@3'-8"	7.10	2.07	3.11

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

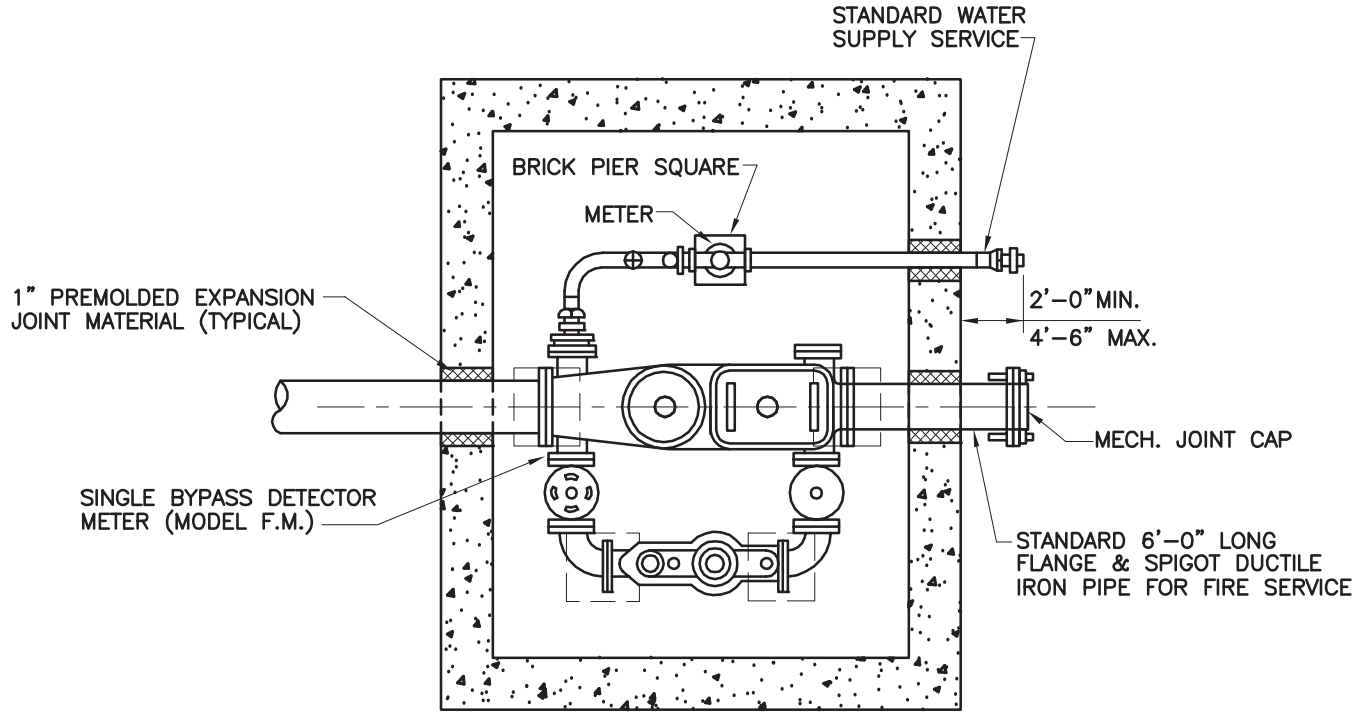
ROOF SLAB AND CONCRETE QUANTITIES FOR STANDARD VAULT FOR 4", 6", 8", 10", & 12" F.M. METERS WITH REDUCED SIZE LARGE DOMESTIC METERS

ISSUED	REVISED	REVISED
3 / 2008		

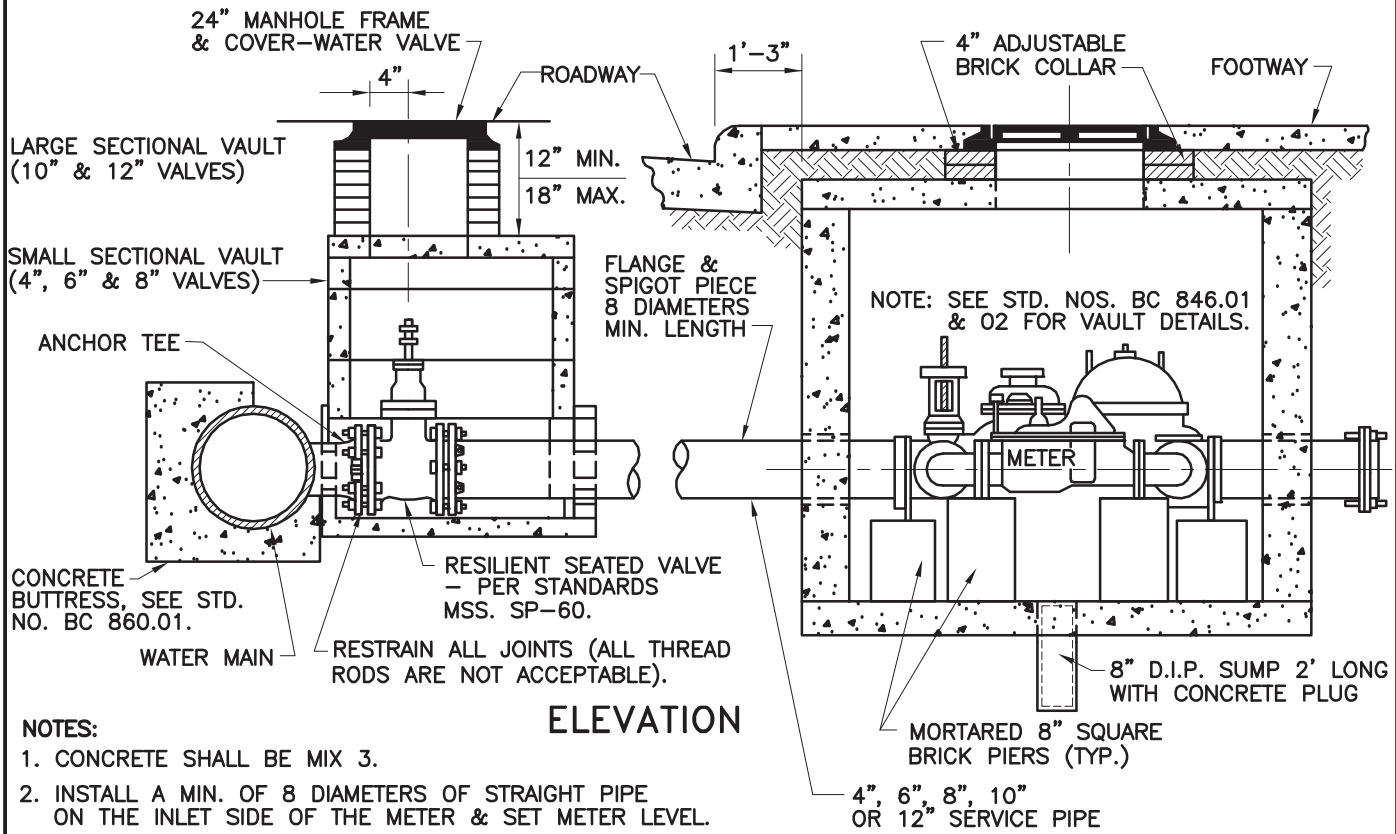
STANDARD NO. BC 849.01

SCALE : NONE

SHEET 3 OF 3



PLAN (METER VAULT ONLY)



ELEVATION

NOTES:

1. CONCRETE SHALL BE MIX 3.
2. INSTALL A MIN. OF 8 DIAMETERS OF STRAIGHT PIPE ON THE INLET SIDE OF THE METER & SET METER LEVEL.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

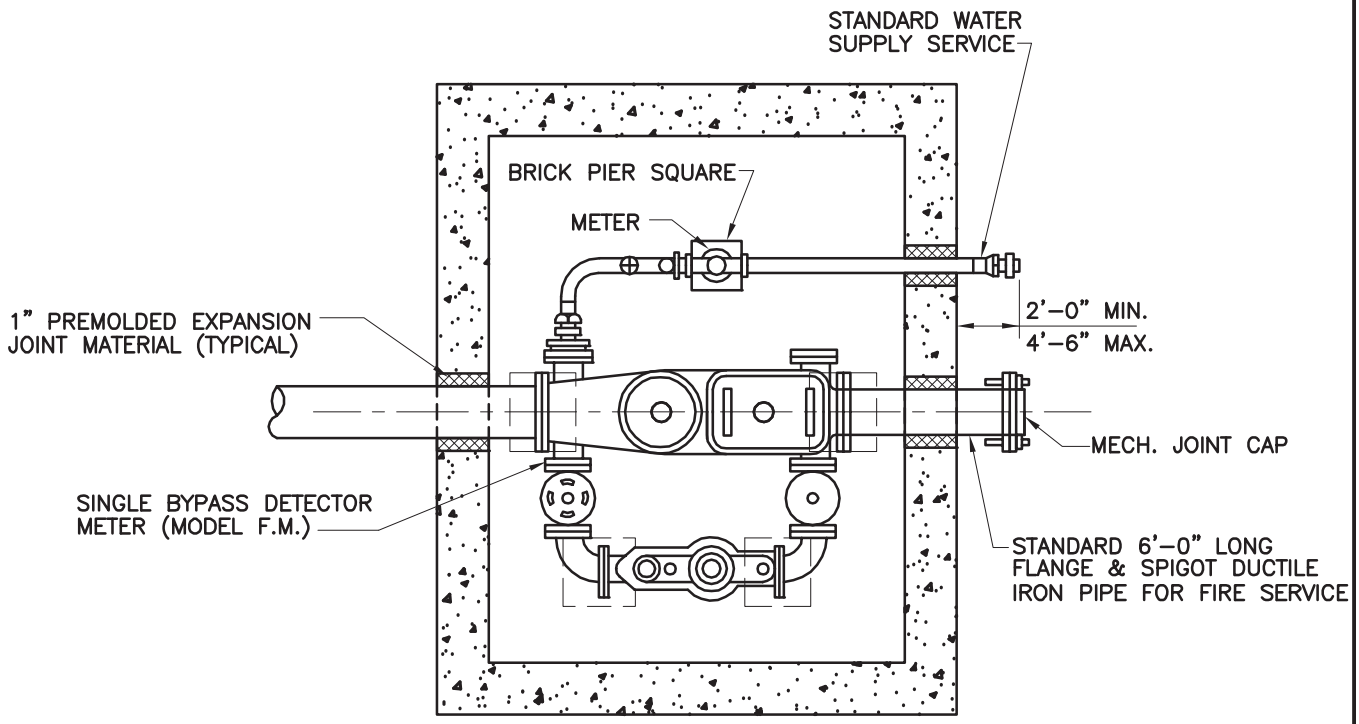
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD INSTALLATION OF 4", 6", 8", 10", & 12" FIRE SUPPLY SERVICES WITH WATER SUPPLY SERVICE (OUTSIDE FIRE HYDRANTS) WITH TEE AND VALVE (SECTIONAL VAULT)

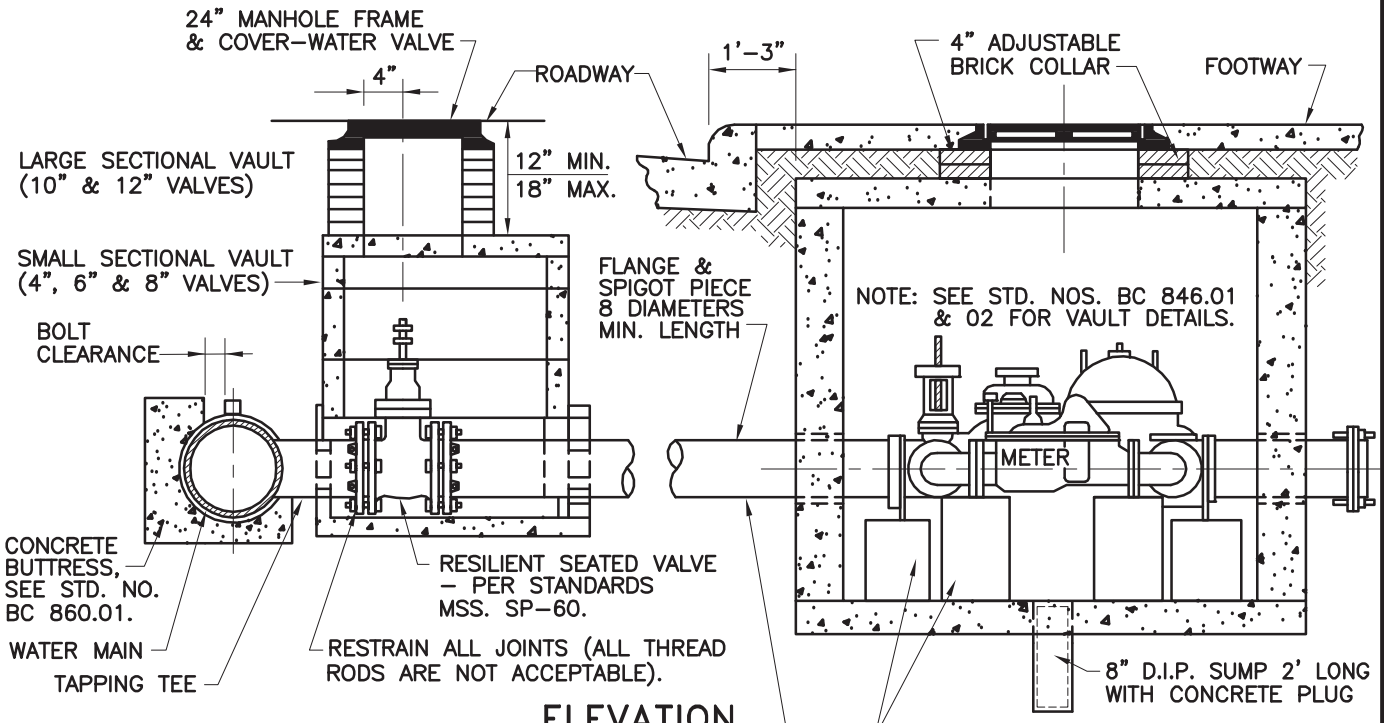
STANDARD NO. BC 850.01

SCALE : NONE

SHEET 1 OF 1



PLAN (METER VAULT ONLY)



ELEVATION

NOTES:

1. CONCRETE SHALL BE MIX 3.
2. INSTALL A MIN. OF 8 DIAMETERS OF STRAIGHT PIPE ON THE INLET SIDE OF THE METER & SET METER LEVEL.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

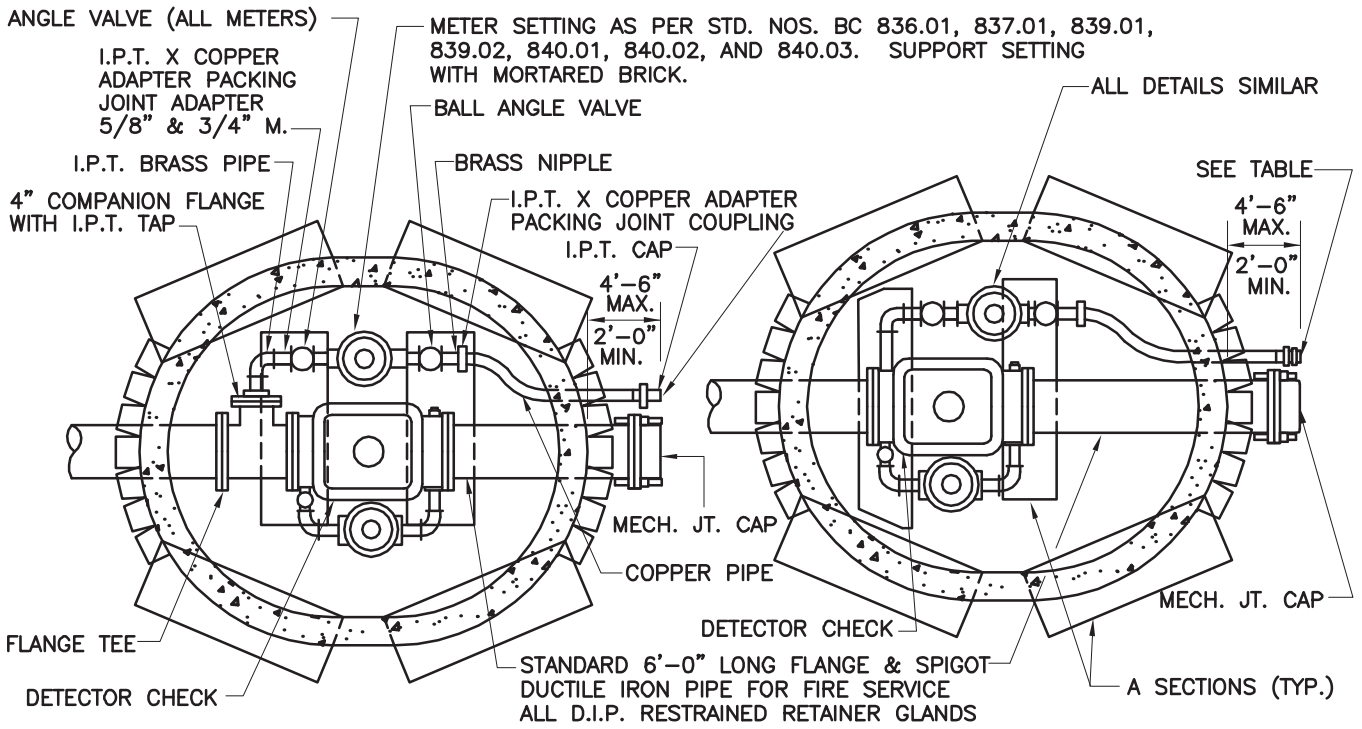
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD INSTALLATION OF 4", 6", 8", 10", & 12" FIRE SUPPLY SERVICES WITH WATER SUPPLY SERVICE (OUTSIDE FIRE HYDRANTS) WITH TAPPING SLEEVE AND VALVE (SECTIONAL VAULT)

STANDARD NO. BC 850.02

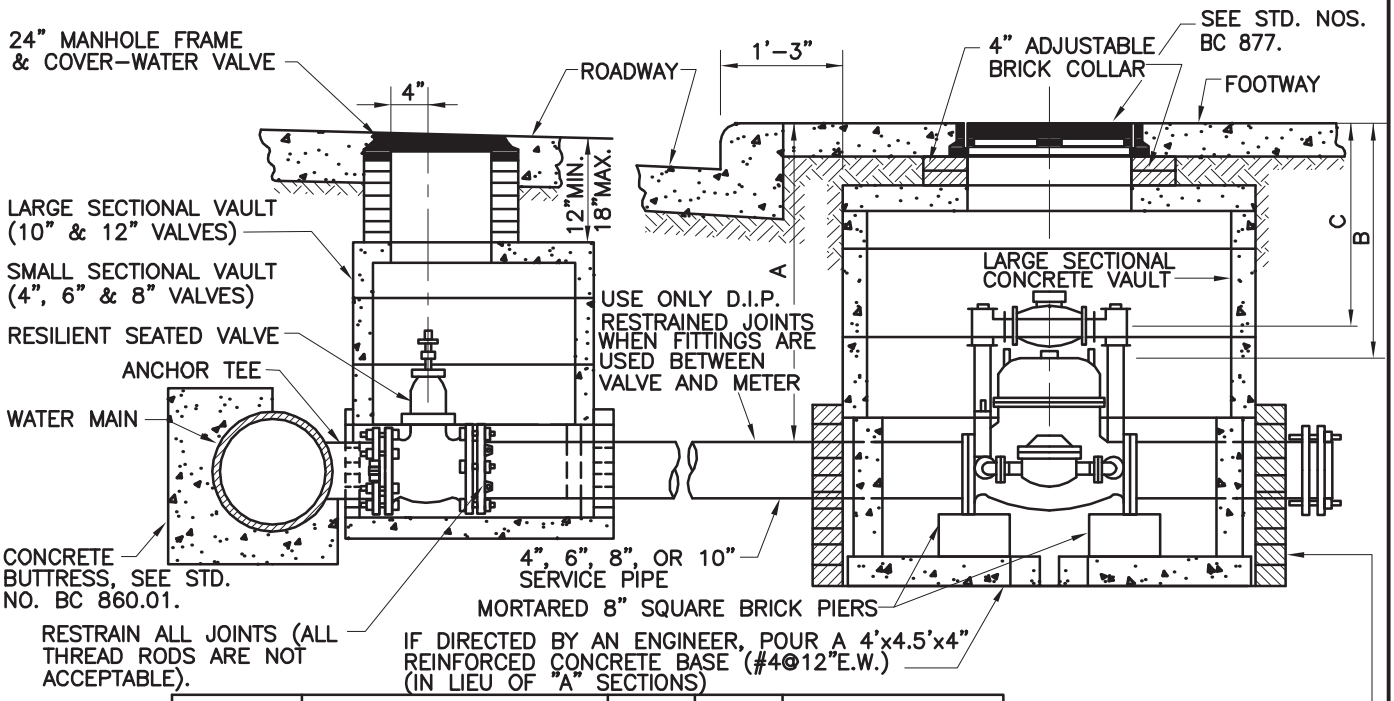
SCALE : NONE

SHEET 1 OF 1



W.S.S. WITH TEE

W.S.S. SIDE CONNECTION



D.C. METER	WATER SUPPLY SERVICE		A	B	C
	SIDE CONN.	WITH TEE			
4"	3/4" – 1"	1 1/2", 2"	4'-9"	3'-9"	AS PER STD. NOS. BC 836 TO 840.
6"	3/4"-1 1/2"	2"	5'-4"	4'	
8"	3/4"-2"	N/A	5'-10"	4'	
10"	3/4"-2"	N/A	6'	4'	

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

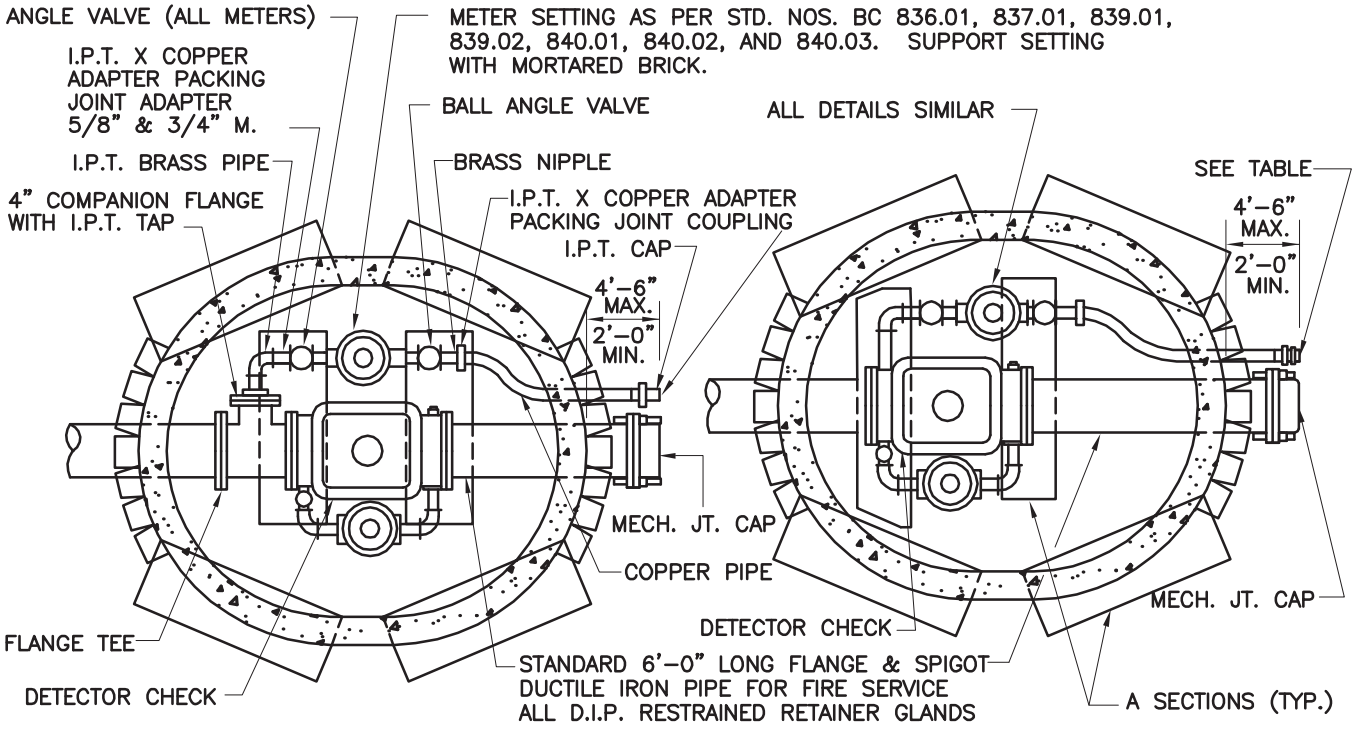
STANDARD INSTALLATION OF 4", 6", 8", 10", & 12" FIRE SUPPLY SERVICES WITH WATER SUPPLY SERVICE (NO OUTSIDE FIRE HYDRANTS) WITH TEE AND VALVE (SECTIONAL VAULT)

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 851.01

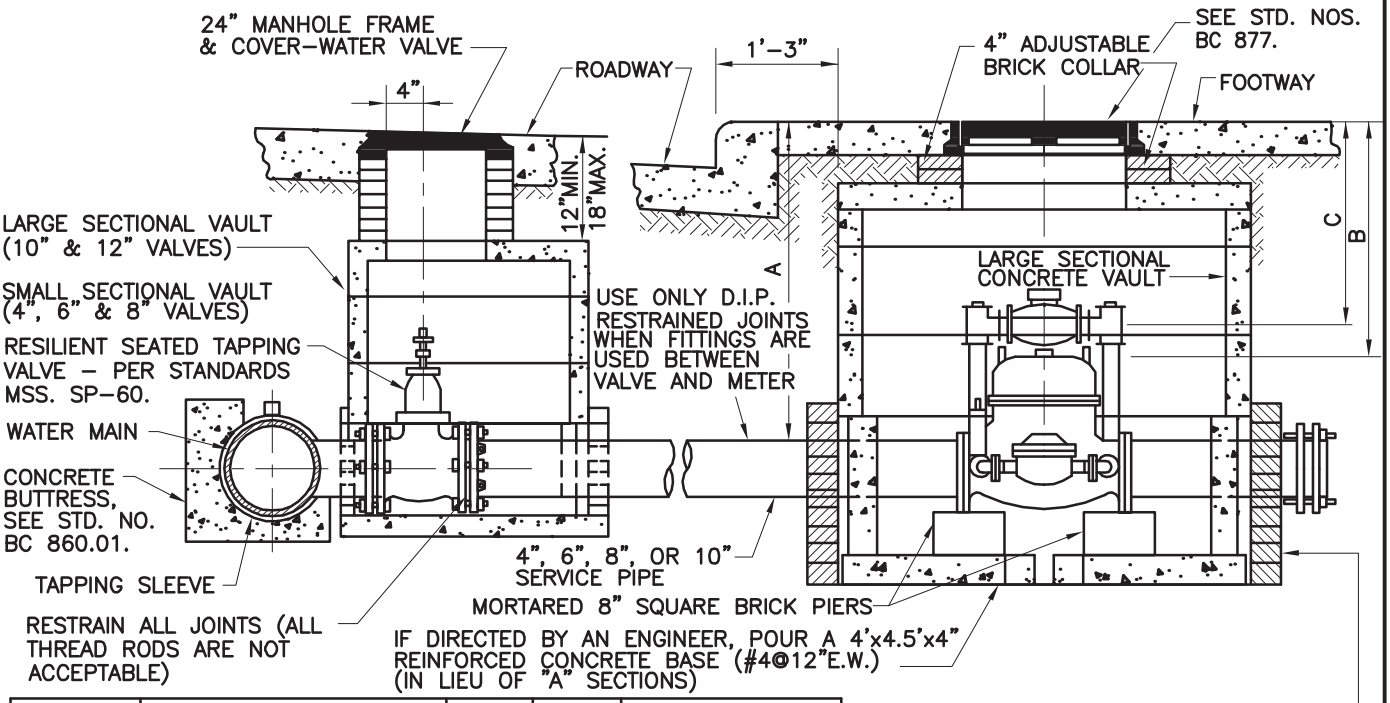
SCALE : NONE

SHEET 1 OF 1



W.S.S. WITH TEE

W.S.S. SIDE CONNECTION



D.C. METER	WATER SUPPLY SERVICE		A	B	C
	SIDE CONN.	WITH TEE			
4"	3/4" – 1"	1 1/2", 2"	4'-9"	3'-9"	AS PER STD. NOS. BC 836 TO 840.
6"	3/4"-1 1/2"	2"	5'-4"	4'	
8"	3/4"-2"	N/A	5'-10"	4'	
10"	3/4"-2"	N/A	6'	4'	

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

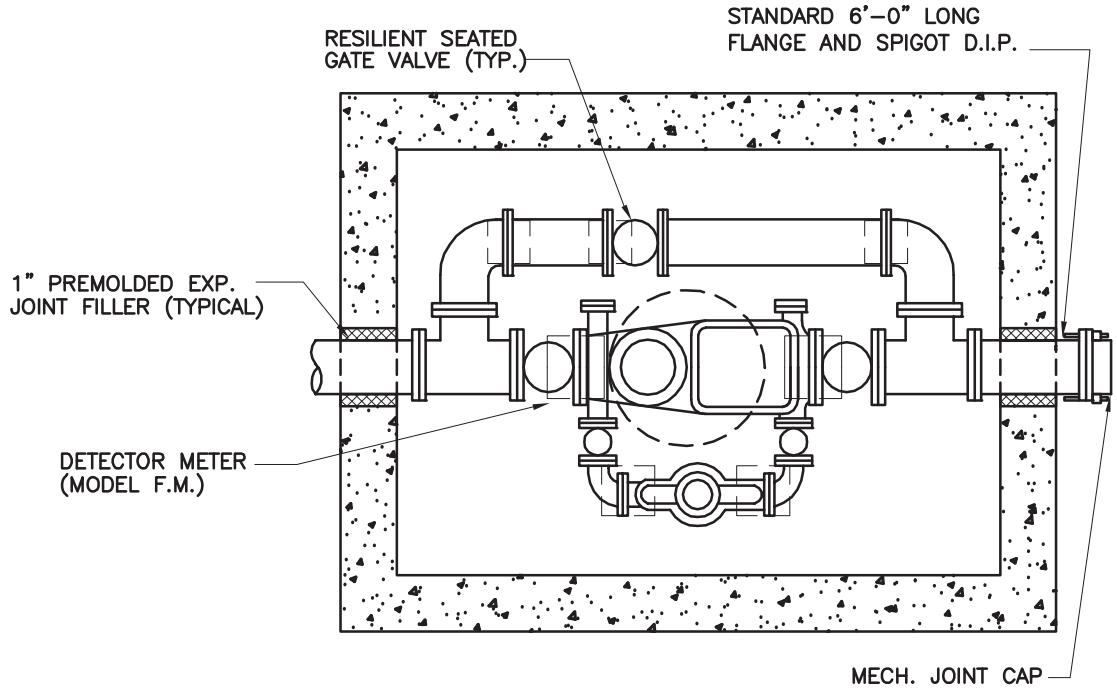
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD INSTALLATION OF 4", 6", 8", 10", & 12" FIRE SUPPLY SERVICES WITH WATER SUPPLY SERVICE (NO OUTSIDE FIRE HYDRANTS) WITH TAPPING SLEEVE AND VALVE (SECTIONAL VAULT)

STANDARD NO. BC 851.02

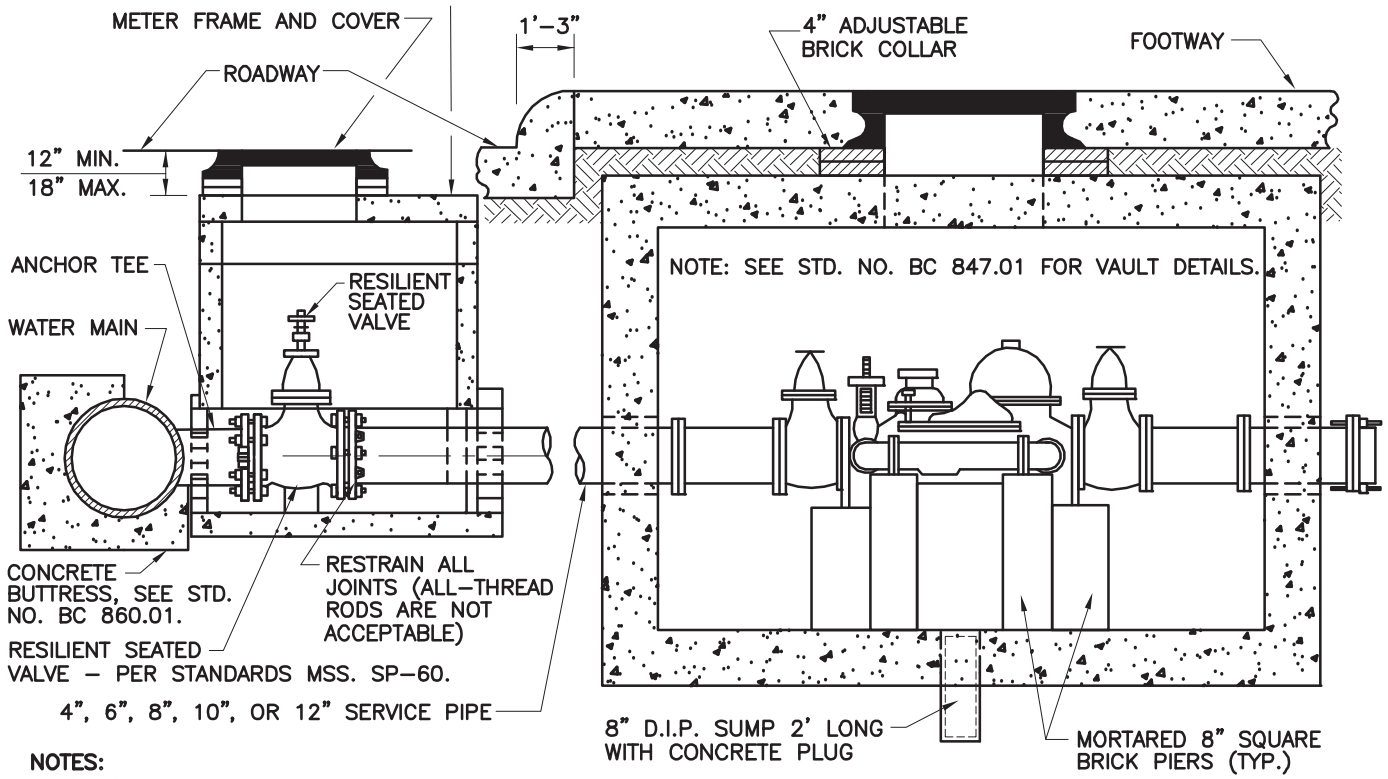
SCALE : NONE

SHEET 1 OF 1



PLAN (METER VAULT ONLY)

LARGE SECTIONAL VAULT (10" & 12" VALVES)
SMALL SECTIONAL VAULT (4", 6", & 8" VALVES)



ELEVATION

NOTES:

1. CONCRETE SHALL BE MIX 3.
2. INSTALL A MIN. OF 8 DIAMETERS OF STRAIGHT PIPE ON THE INLET SIDE OF THE METER AND SET METER LEVEL.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

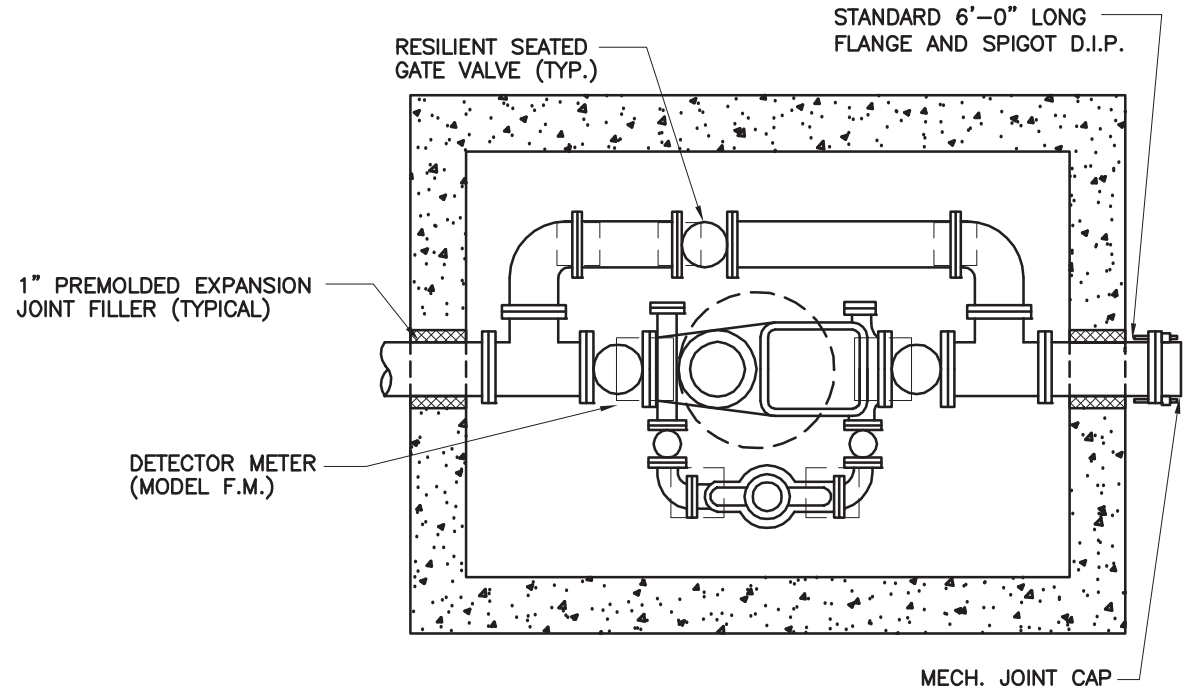
STANDARD INSTALLATION OF
4", 6", 8", 10", & 12" WATER SUPPLY SERVICES
(4", 6", 8", 10", & 12" COMBINED SERVICES)
WITH TEE AND VALVE (SECTIONAL VAULT)

ISSUED	REVISED	REVISED
3 / 2008		

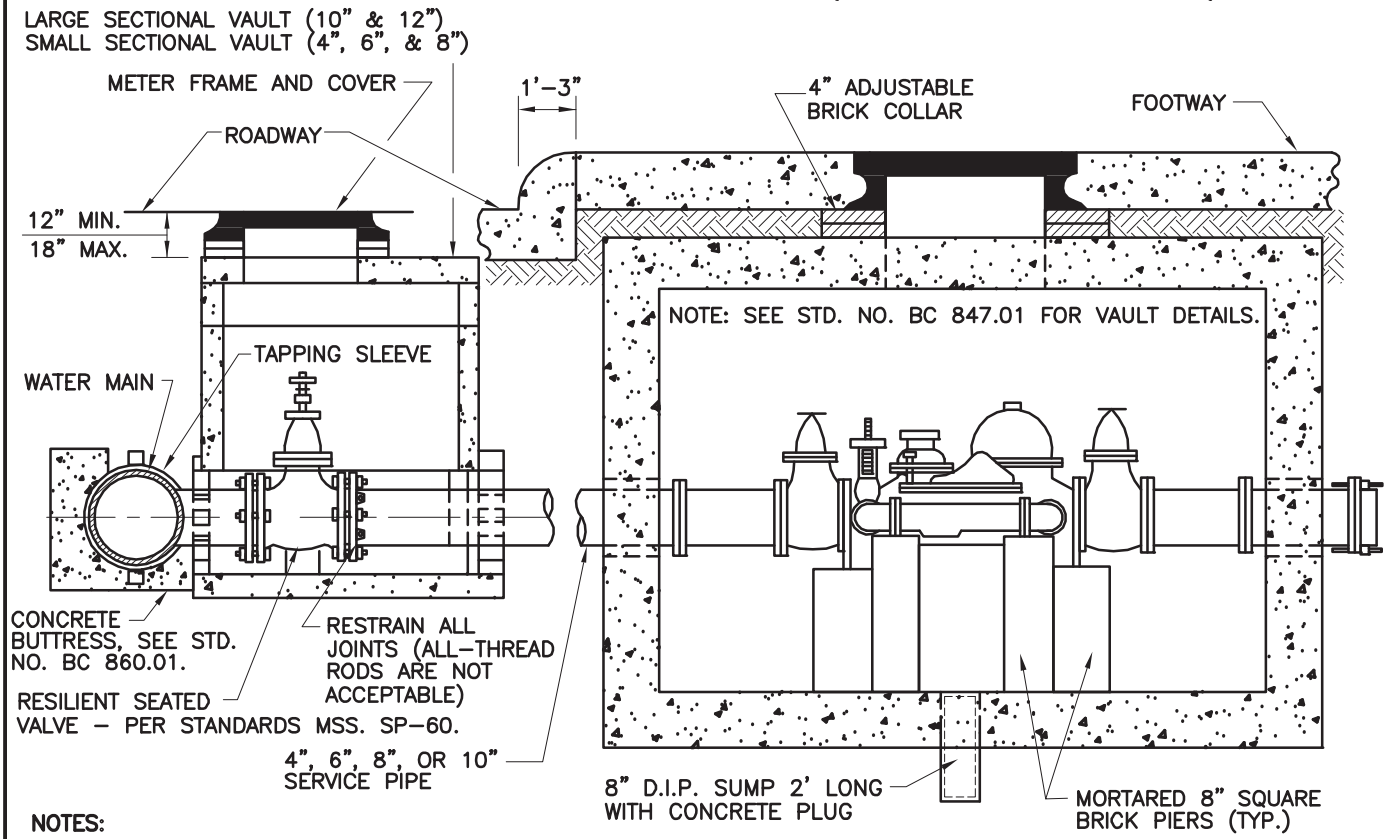
STANDARD NO.
BC 852.01

SCALE : NONE

SHEET 1 OF 1



PLAN (METER VAULT ONLY)



ELEVATION

NOTES:

1. CONCRETE SHALL BE MIX 3.
2. INSTALL A MIN. OF 8 DIAMETERS OF STRAIGHT PIPE ON THE INLET SIDE OF THE METER AND SET METER LEVEL.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

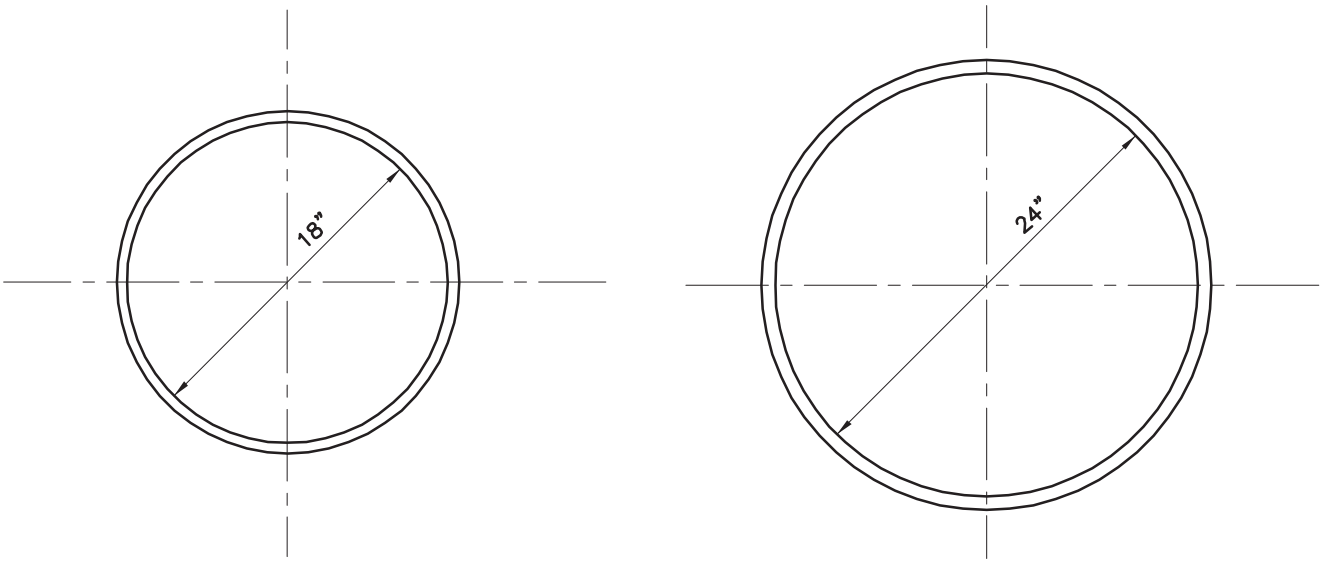
STANDARD INSTALLATION OF
4", 6", 8", 10", & 12" WATER SUPPLY SERVICES
(4", 6", 8", 10", & 12" COMBINED SERVICES)
WITH TAPPING SLEEVE AND VALVE
(SECTIONAL VAULT)

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 852.02

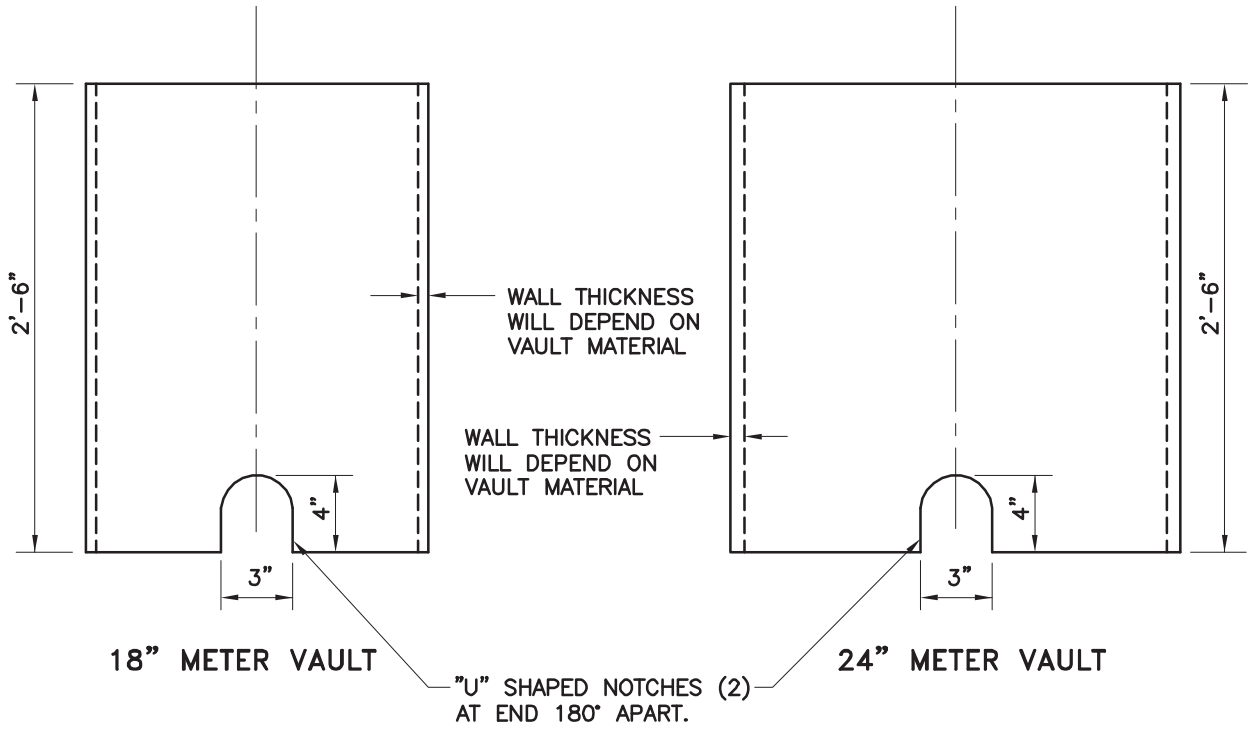
SCALE : NONE

SHEET 1 OF 1



NOTE:

METER VAULTS SHOULD BE PVC, PE, FIBERGLASS, OR APPROVED EQUAL.



CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

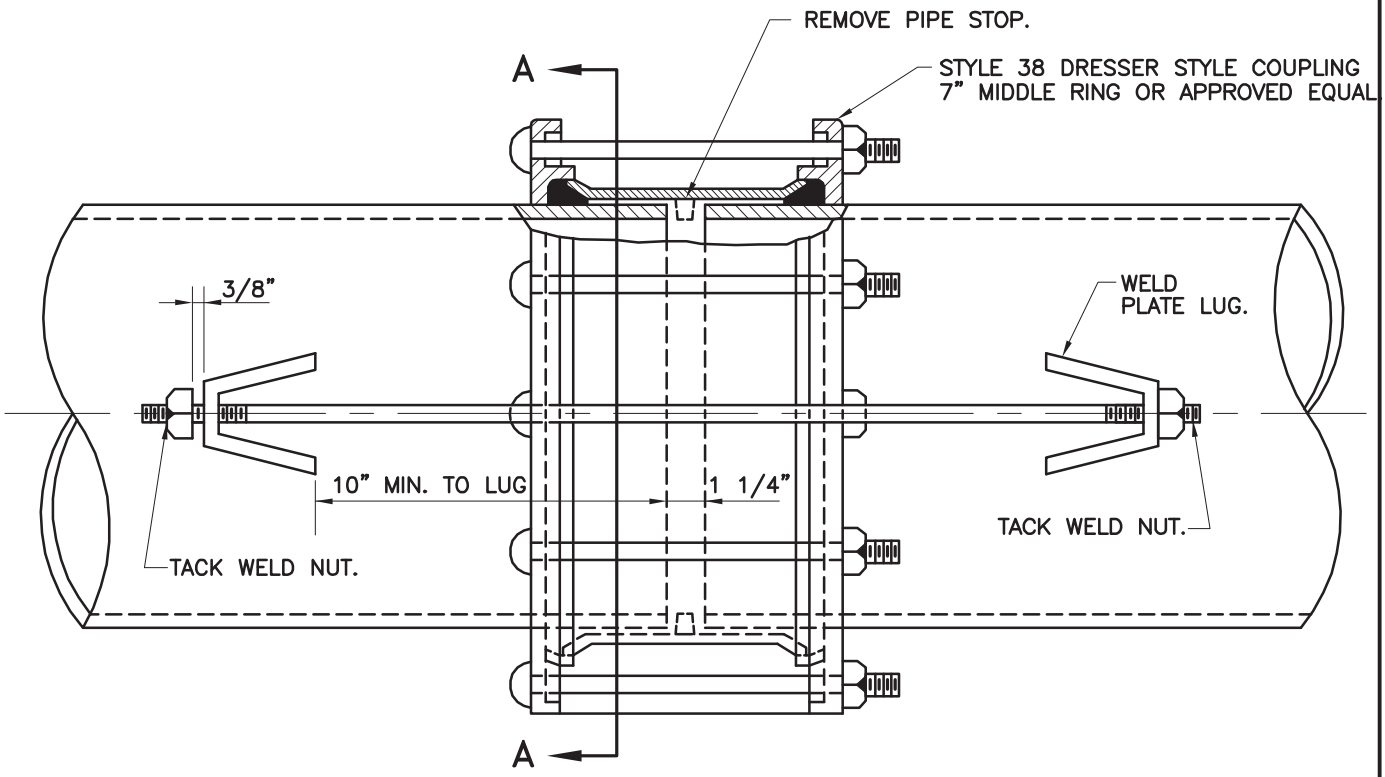
ISSUED	REVISED	REVISED
3 / 2008		

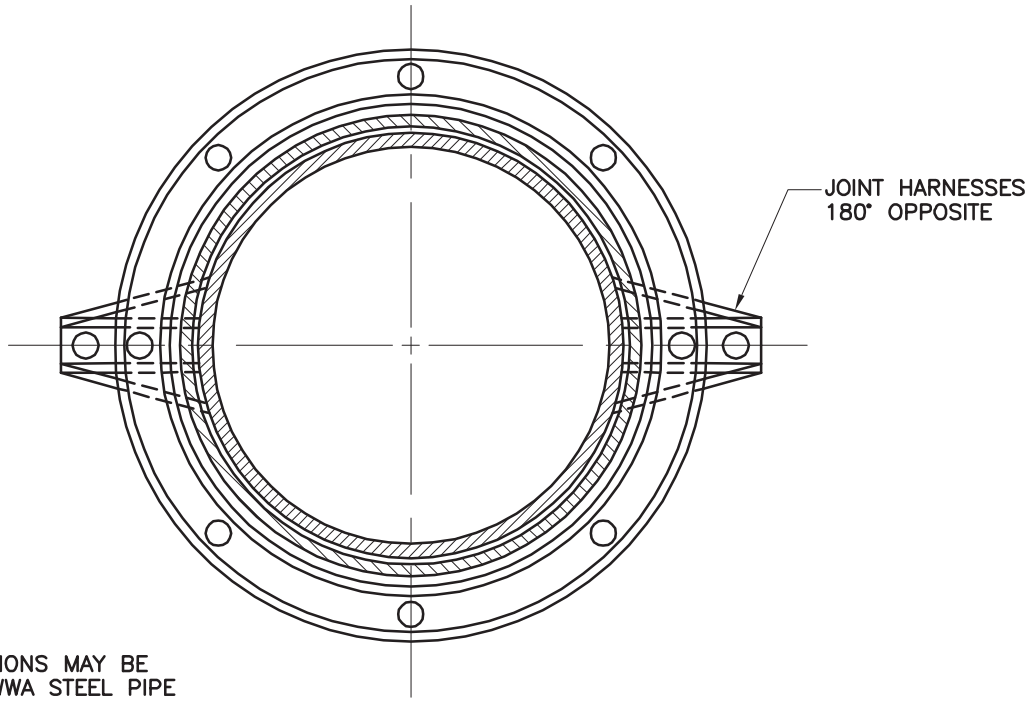
STANDARD WATER METER VAULTS

STANDARD NO. BC 853.01

SCALE : NONE

SHEET 1 OF 1

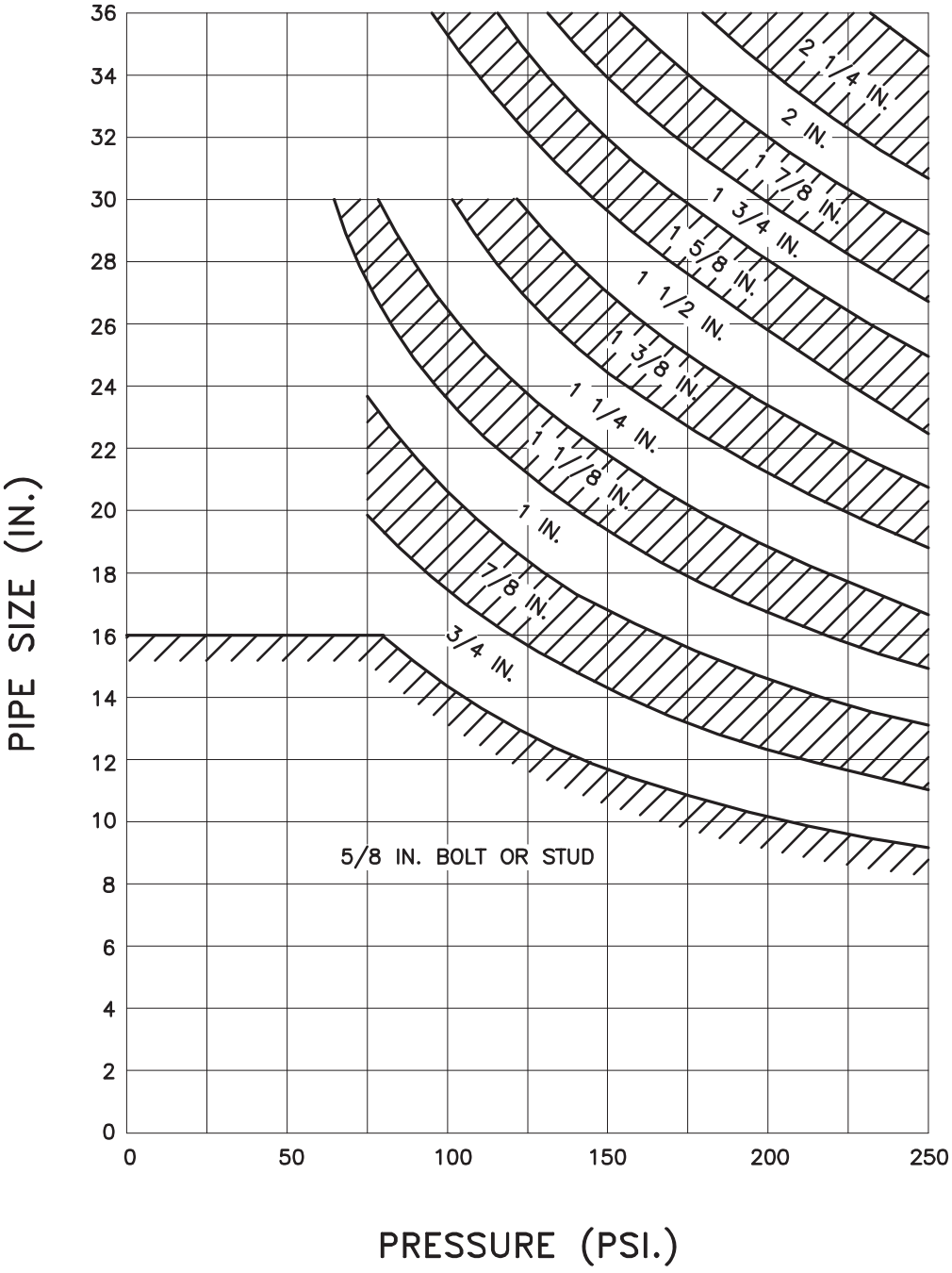




NOTE:
PLATE LUG DIMENSIONS MAY BE OBTAINED FROM AWWA STEEL PIPE MANUAL.

SECTION A–A

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED / REVISED / REVISED 3 / 2008	
		STANDARD INSTALLATION OF WATER MAIN ON STRUCTURES (STEEL PIPE ONLY)	STANDARD NO. BC 854.01	
			SCALE : NONE	SHEET 1 OF 1



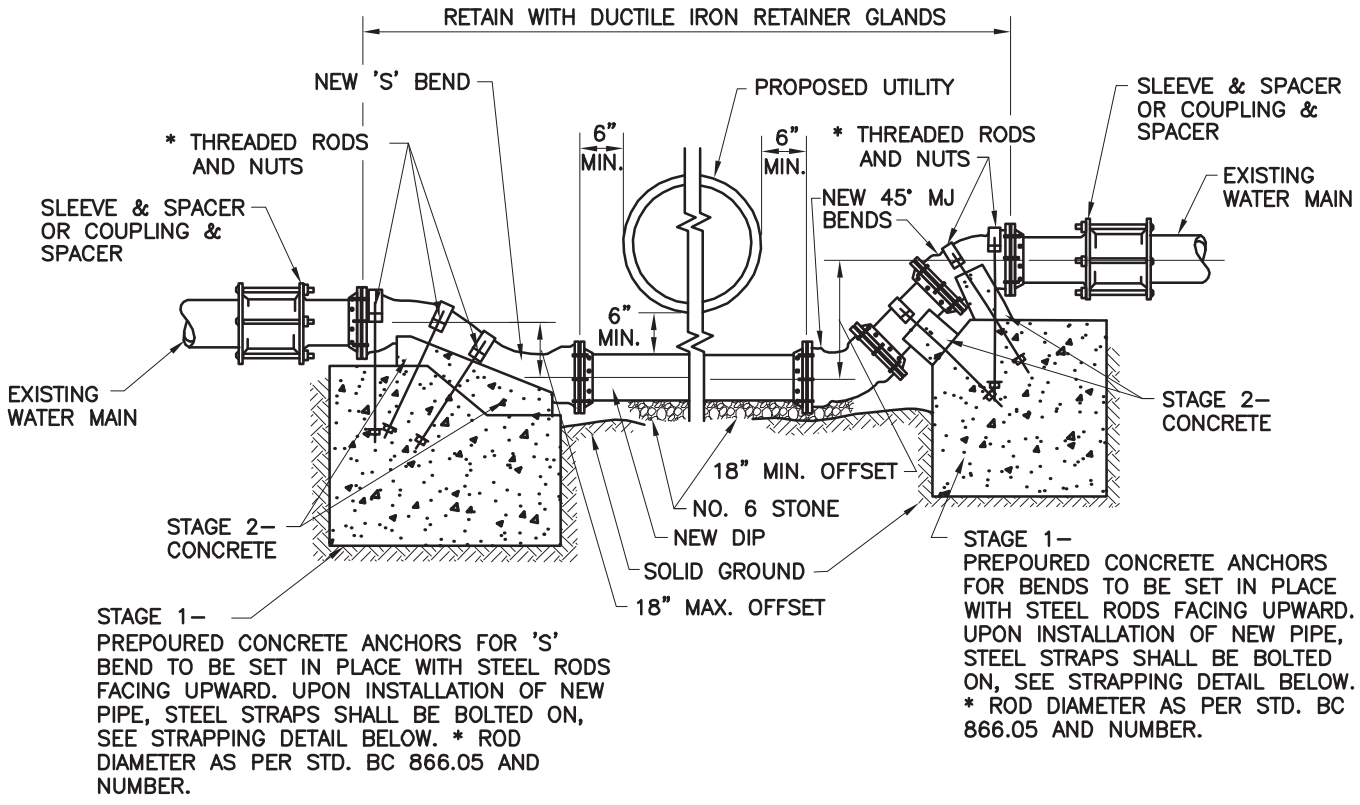
NOTE:
THE BOLT SIZE SHOWN IN A STRIP AREA MAY BE USED FOR ANY COMBINATION OF PIPE SIZE AND PRESSURE LINES INTERSECTING IN THAT AREA.

SOURCE:
AWWA STEEL PIPE MANUAL

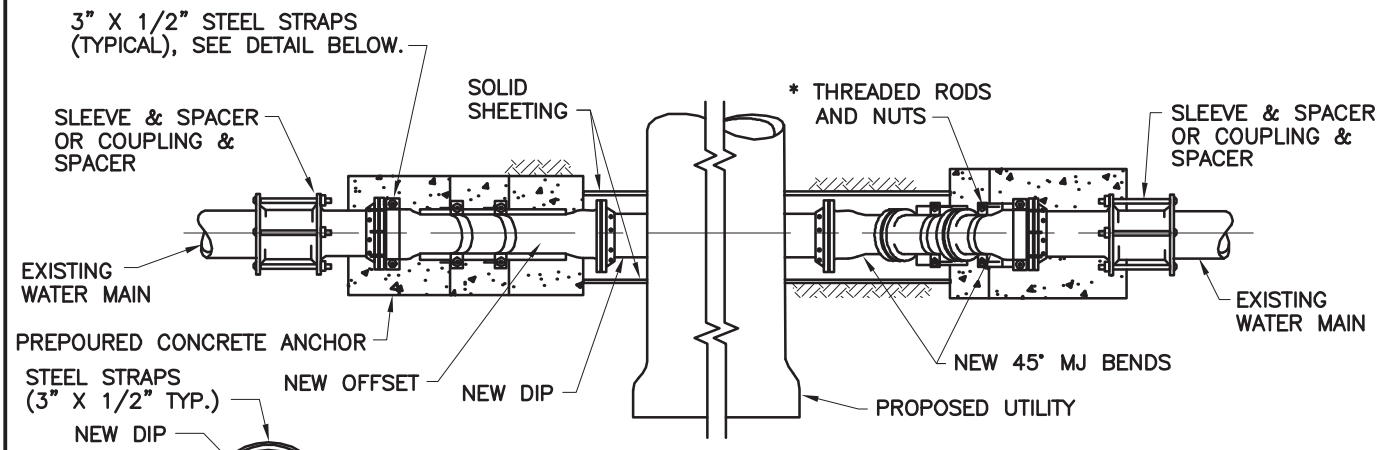
CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED / REVISED / REVISED 3 / 2008	
		BOLT SIZE CHART FOR STANDARD INSTALLATION OF WATER MAIN ON STRUCTURES (STEEL PIPE ONLY)	STANDARD NO. BC 854.02	
			SCALE : NONE	SHEET 1 OF 1

'S' BEND ≤ 18" OFFSET

TWO 45° BENDS < 18" OFFSET



ELEVATION



PLAN

STRAPPING DETAIL

NOTE:
COAT ALL EXPOSED REBAR OR BARE METAL WITH ROYSTON ROSKOTE MASTIC A–51 PLUS OR APPROVED EQUAL.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

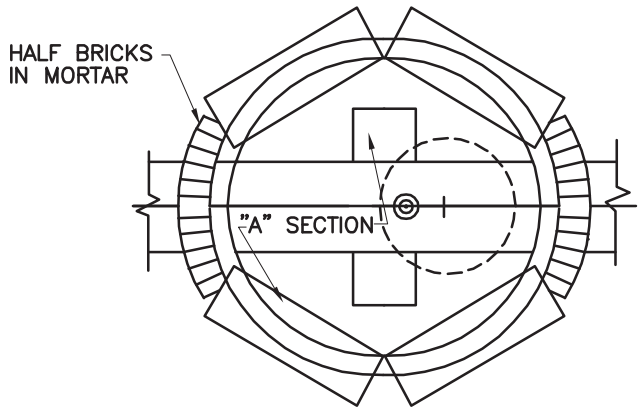
ISSUED	REVISED	REVISED
3 / 2008		

WATER MAIN RELOCATION
UNDER PROPOSED UTILITY

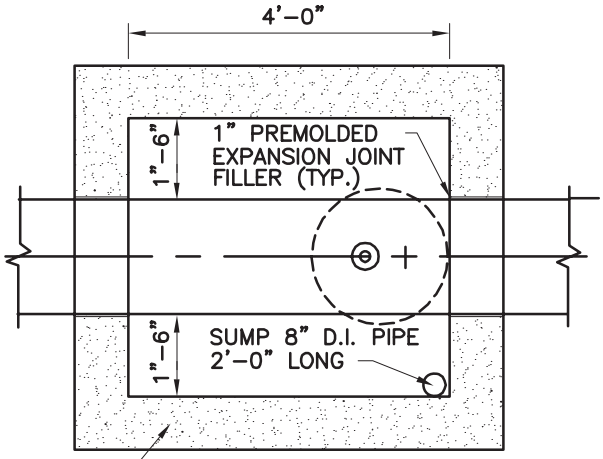
STANDARD NO.
BC 855.01

SCALE : NONE

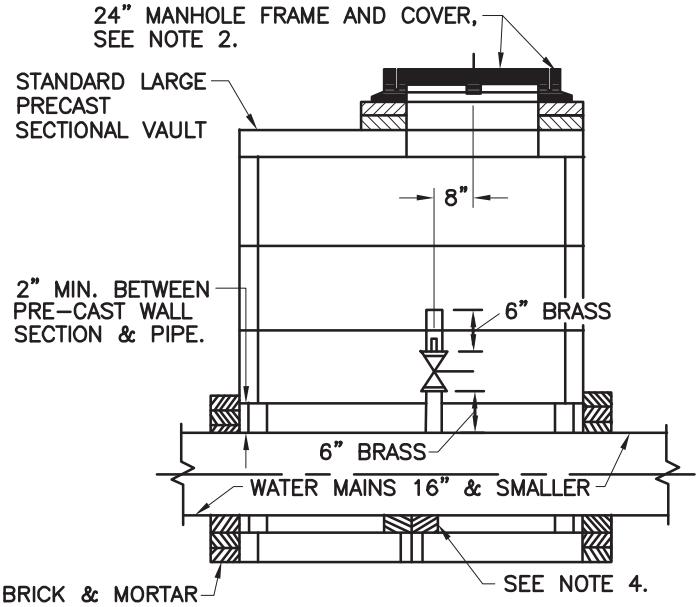
SHEET 1 OF 1



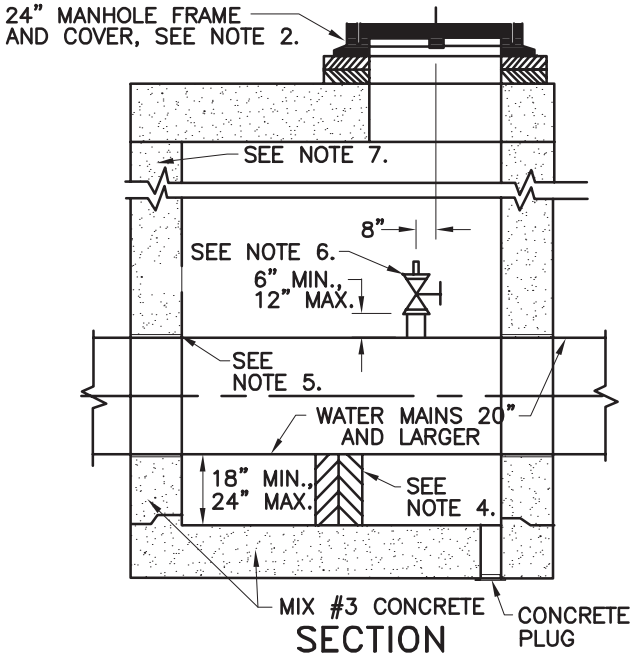
PLAN



PLAN



SECTION



SECTION

NOTES:

1. HYDRANT MAY BE INSTALLED AS AN ALTERNATE TO THE AIR RELEASE VALVE.
2. MANHOLE COVER TO BE MARKED "WATER VALVE MAIN VAULT".
3. FOR CONNECTION TO 4" DUCTILE IRON PIPE, USE SERVICE SADDLE (FORD FC-202 OR SMITH-BLAIR 315). FOR CONNECTION TO 4"-30" HDPE PIPE, USE APPROVED ELECTROFUSION TAPPING SADDLE.
4. SUPPORTS FOR PIPES:
   4" TO 16" PIPES "A" SECTION & 8" BRICK PIER:
   20" TO 30" PIPES: 12" X 12" BRICK PIER;
   36"+ PIPES: 12" WIDE REINF. CONC. CRADLE.
   PROVIDE BOND BREAKER.
5. PLACE 1" PREMOLDED EXPANSION JOINT FILLER AROUND PIPE (TYP.) FOR CAST-IN-PLACE STRUCTURES.
6. PIPE 36" & LARGER - PROVIDE VERTICAL OUTLET, VALVE & BLIND FLANGE WITH GASKET. DRILL & TAP CENTER OF BLIND FLANGE & PROVIDE FORD FB500-4 CORPORATION WITH LA21-44 EIGHTH BEND OR APPROVED EQUAL.
7. CAST-IN-PLACE VAULT (SHOWN) OR PRECAST VAULT WITH DOGHOUSE OPENINGS (NOT SHOWN).
8. FOR CONNECTION TO 6" - 12" DUCTILE IRON PIPE, CONTRACTOR MAY INSTALL CORPORATION USING SERVICE SADDLE (FORD FC-202 OR SMITH-BLAIR 315). FOR CONNECTION TO 16" - 30" DUCTILE IRON PIPE, CONTRACTOR MAY INSTALL CORPORATION USING SERVICE SADDLE (FORD FC-202 OR SMITH-BLAIR 317).

TABLE 1	
PIPE DIAMETER	AIR RELEASE ASSEMBLY
4"	1" CORP. WITH TAPPING SADDLE/ GATE VALVE
6"	1" CORP./GATE VALVE
8"-12"	1.5" CORP./GATE VALVE
16"-30"	2" CORP./GATE VALVE
36"-48"	4" RESILIENT GATE VALVE, FL. x FL.
54"+	6" RESILIENT GATE VALVE, FL. x FL.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

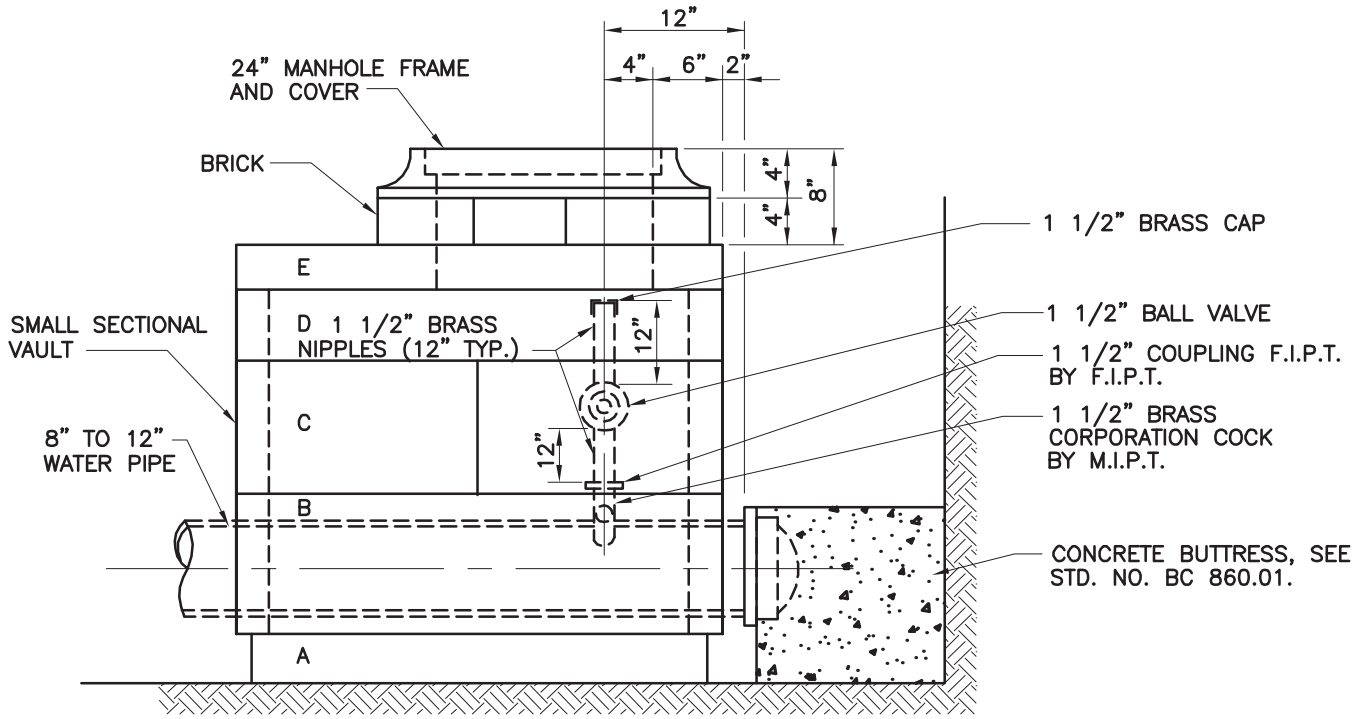
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD AIR RELEASE VALVE AND VAULT PRECAST AND CAST IN PLACE

STANDARD NO. BC 856.01

SCALE : NONE

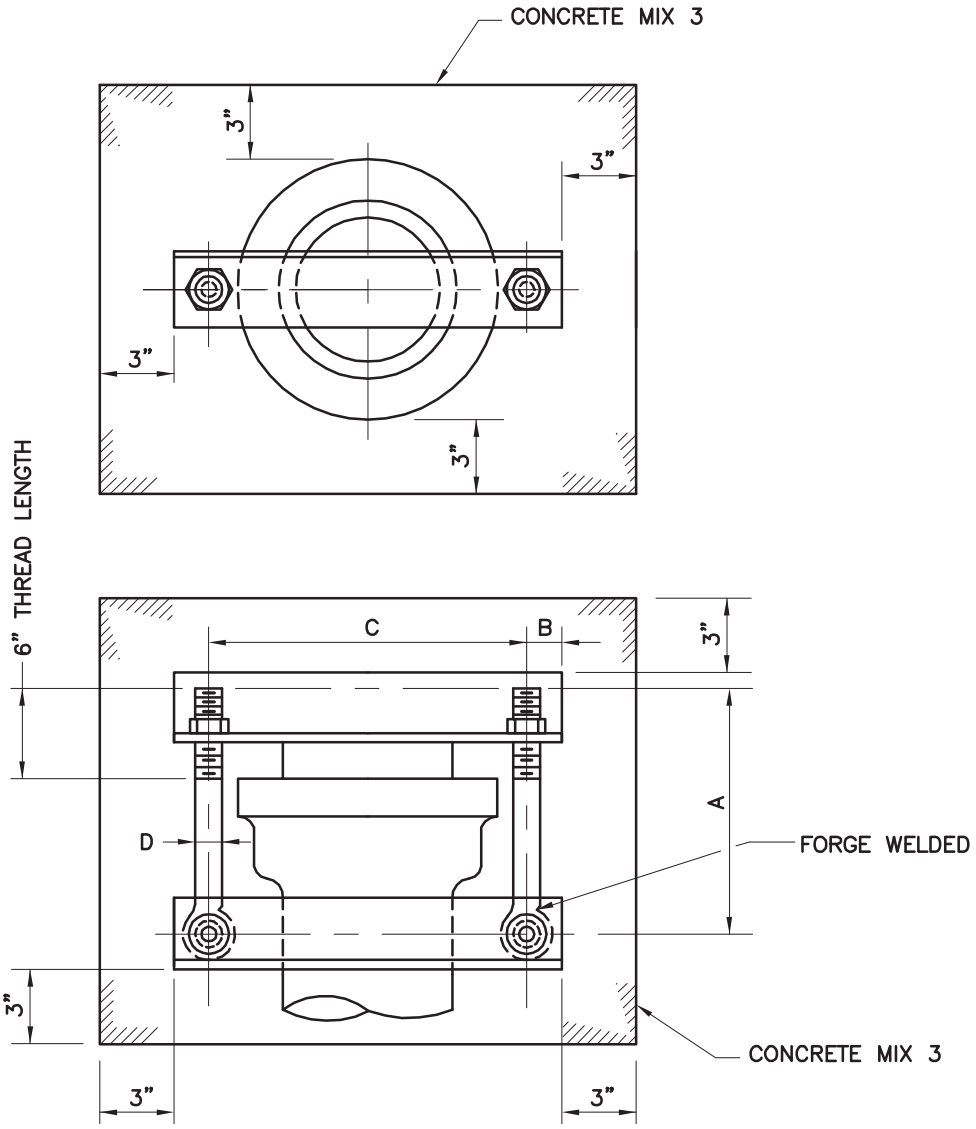
SHEET 1 OF 1



NOTES:

1. ON 4" AND 6" PIPE (ALL TYPES) USE 1" CORPORATION STOP, 1" GATE VALVE AND 1" PIPE.
2. ON 4" DUCTILE IRON PIPE USE SERVICE SADDLE (FORD FC202 OR SMITH–BLAIR 315).
3. FOR CONNECTION TO 6" – 12" DUCTILE IRON PIPE, CONTRACTOR MAY INSTALL CORPORATION USING SERVICE SADDLE (MUELLER BR–2B, FORD 202B AY MCDONALD 3826, OR APPROVED EQUAL).
4. ON 4" – 12" HDPE PIPE, USE APPROVED ELECTROFUSION TAPPING SADDLE.
5. BRASS PIPE SHALL BE SEAMLESS RED BRASS PIPE, EXTRA STRONG, CONFORMING TO A.S.T.M. B43 – LATEST EDITION.
6. USE HYDRANT FOR PIPES LARGER THAN 12 INCHES IN DIAMETER. CONNECT HYDRANT WITHIN 5 FEET OF END CAP.

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		STANDARD INSTALLATION FOR BLOW	STANDARD NO. BC 857.01		
			SCALE : NONE	SHEET 1 OF 1	



NOTE:
MAKE HOLES IN ANGLE 1/8" LARGER THAN DIAMETER OF BOLT.

SIZE OF MAIN	SIZE OF ANGLE	C TO C EYE BOLT HOLES "C"	DIA. OF EYEBOLT "D"	LENGTH OF EYEBOLT "A"	NO. U.S. THREADS PER INCH	EDGE DIST. "B"
4"	3"x3"x3/8"	11"	3/4"	12"	10	2"
6"	3"x3"x3/8"	12 1/2"	3/4"	12"	10	2"
8"	3"x3"x3/8"	15"	7/8"	12 1/2"	9	2"
10"	4"x3"x3/8"	17 1/2"	1 1/8"	13 1/2"	7	2"
12"	5"x4"x3/8"	20 3/16"	1 1/2"	14 1/2"	6	2 1/4"
16"	6"x4"x1/2"	25 1/4"	1 5/8"	16 3/4"	5 1/2	2 1/2"
20"	6"x4"x3/4"	30 7/8"	2 1/4"	16 3/4"	4 1/2	3 5/8"

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

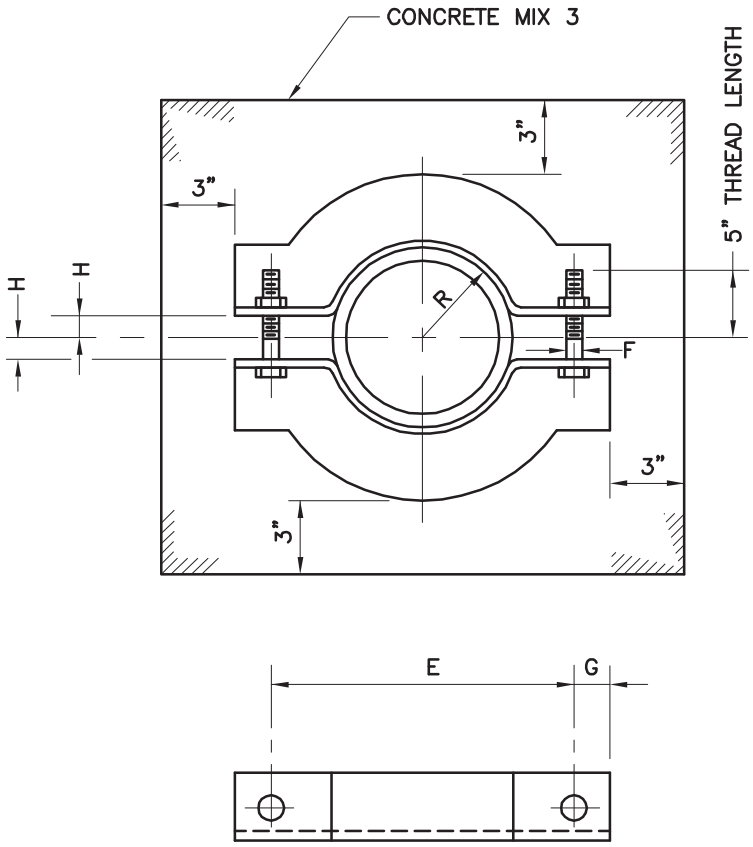
STANDARD
PLUG CLAMPS - 1

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 858.01

SCALE : NONE

SHEET 1 OF 2



NOTE:
MAKE HOLES IN ANGLE STRAP 1/8" LARGER THAN DIAMETER OF BOLT.

SIZE OF MAIN	SIZE OF ANGLE STRAP	RADIUS OF STRAP "R"	DISTANCE OF HOLES C TO C "E"	DIA. OF BOLT "F"	EDGE DIST. "G"	"H"
4"	3"x3"x3/8"	2 1/2"	11"	3/4"	2"	1"
6"	3"x3"x3/8"	3 9/16"	12 1/2"	3/4"	2"	1"
8"	3"x3"x3/8"	4 21/32"	15"	7/8"	2"	1 1/4"
10"	4"x3"x3/8"	5 23/32"	17 1/2"	1 1/8"	2"	1 1/4"
12"	5"x4"x3/8"	6 3/4"	20 3/16"	1 1/2"	2 1/4"	1 1/2"
16"	6"x4"x1/2"	8 29/32"	25 1/4"	1 5/8"	2 1/2"	1 1/2"
20"	6"x4"x3/4"	11 1/32"	30 7/8"	2 1/4"	3 5/8"	1 3/4"

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

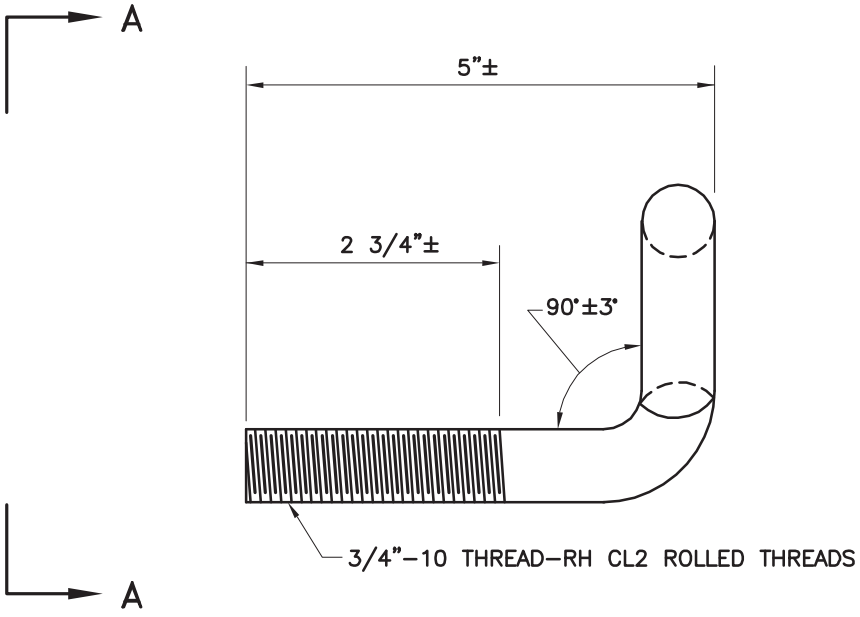
STANDARD
PLUG CLAMPS - 2

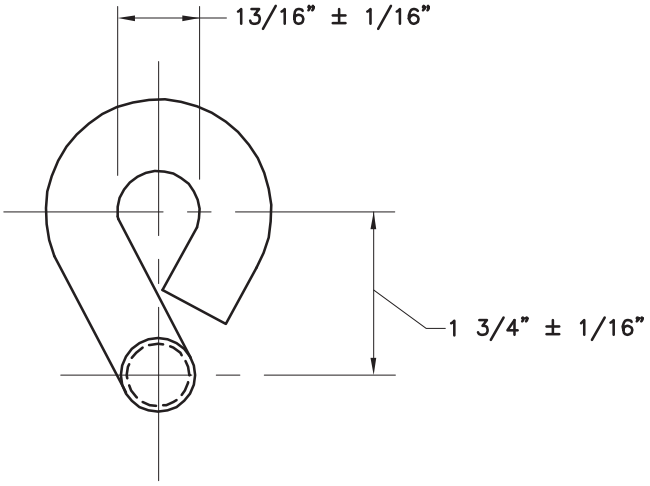
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 858.01

SCALE : NONE

SHEET 2 OF 2





VIEW A–A

MATERIAL:
C1010, BLACK ANNEALED
45,000 TO 55,000 P.S.I. TENSILE
26,000 TO 35,000 P.S.I. YIELD
% ELONG. TO 2" 30–45%
% ELONG. 8" 25–40%

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

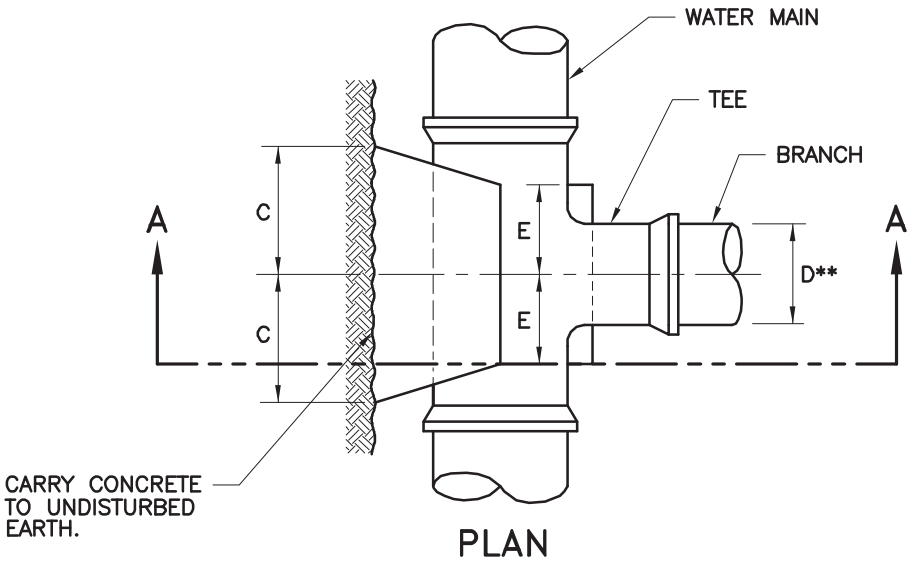
STANDARD TIE BOLT

ISSUED	REVISED	REVISED
3 / 2008		

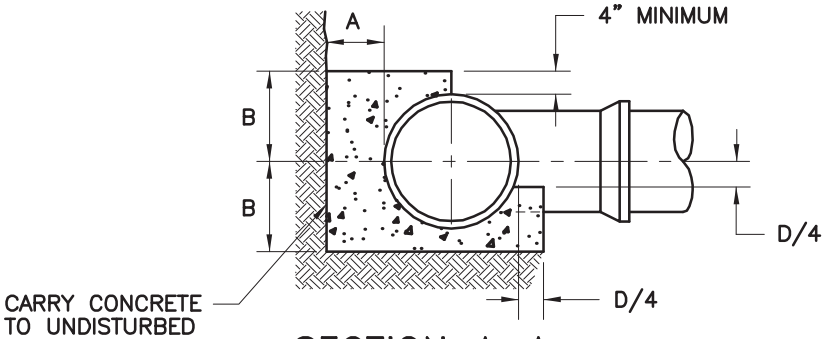
STANDARD NO.
BC 859.01

SCALE : NONE

SHEET 1 OF 1



PLAN



SECTION A–A

BUTTRESS FOR TEES							
	PIPE SIZE OF BRANCH						
D**	4"	6"	8"	10"	12"	16"	20"
A	8"	8"	10"	1'–0"	1'–0"	1'–6"	2'–0"
B	9"	1'–0"	1'–0"	1'–6"	1'–6"	2'–0"	2'–6"
C	9"	1'–0"	1'–6"	1'–6"	2'–0"	2'–6"	3'–0"
E	6"	6"	8"	8"	8"	10"	1'–2"
D** INDICATES NOMINAL DIAMETER PIPE SIZES							

NOTES:

1. ALL CONCRETE TO BE MIX 3, f'c = 3,500 PSI AT 28 DAYS.
2. THE MINIMUM DIMENSION AS SHOWN IS BASED ON THE FOLLOWING CONDITIONS AND LIMITATIONS:
   a. ALLOWABLE SOIL BEARING CAPACITY = 2,000 PSF.
   b. OPERATING WATER PRESSURE = 150 PSI.
   c. DEPTH FROM FINISHED GRADE TO TOP OF PIPE ASSUMED TO EQUAL 4'–0" OR DEEPER.
   d. ELEVATION OF GROUNDWATER TABLE ASSUMED TO BE BELOW BOTTOM OF THE CONCRETE BLOCK.
3. ALL DIMENSIONS ARE MINIMUM EXCEPT WHERE LARGER DIMENSION WILL INTERFERE WITH THE PIPE JOINTS OR NOT FACILITATE BOLT REMOVAL ON MECHANICAL JOINTS.
4. ALL DIMENSIONS ARE FOR DUCTILE IRON PIPE FITTINGS OR PVC PIPE WITH DUCTILE IRON PIPE FITTINGS. BUTTRESSES FOR HDPE PIPE AND FITTINGS SHALL BE CONSIDERED SITE SPECIFIC AND SHALL REQUIRE BALTIMORE CITY APPROVAL.

SITE SPECIFIC DESIGN CRITERIA:

IF THE ABOVE STATED CONDITIONS AND LIMITATIONS ARE NOT MET, OR THE PIPE DIAMETER IS GREATER THAN 20", A SITE SPECIFIC DESIGN WILL BE REQUIRED FOR APPROVAL.

a. DESIGN THRUST FORCE SHALL BE CALCULATED BASED ON THE OUTSIDE DIAMETER OF THE PIPE.
b. DESIGN THRUST FORCES = CALCULATED THRUST X 1.5 FACTOR OF SAFETY.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

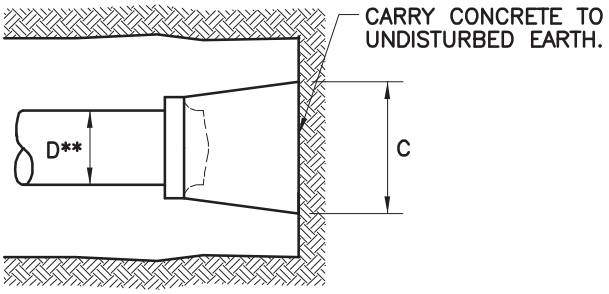
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

BUTTRESS FOR TEES
(FOR 4" - 20")

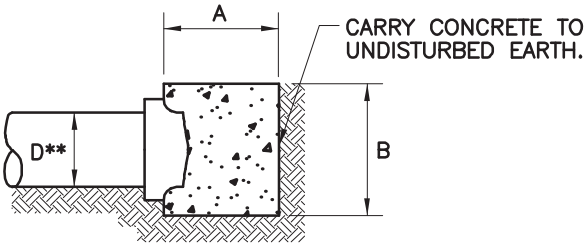
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 860.01

SCALE : NONE | SHEET 1 OF 1



PLAN



SECTION

BUTTRESS FOR CAPS							
	PIPE SIZE						
D**	4"	6"	8"	10"	12"	16"	20"
A	8"	8"	10"	12"	12"	1'–6"	2'–0"
B	1'–0"	1'–6"	2'–0"	2'–6"	3'–0"	4'–0"	5'–0"
C	1'–6"	2'–0"	2'–6"	3'–0"	3'–6"	4'–6"	5'–6"
D** INDICATES NOMINAL DIAMETER PIPE SIZES							

NOTES:

1. ALL CONCRETE TO BE MIX 3, f'c = 3,500 PSI AT 28 DAYS.
2. THE MINIMUM DIMENSION AS SHOWN IS BASED ON THE FOLLOWING CONDITIONS AND LIMITATIONS:
   a. ALLOWABLE SOIL BEARING CAPACITY = 2,000 PSF.
   b. OPERATING WATER PRESSURE = 150 PSI.
   c. DEPTH FROM FINISHED GRADE TO TOP OF PIPE ASSUMED TO EQUAL 4'–0" OR DEEPER.
   d. ELEVATION OF GROUNDWATER TABLE ASSUMED TO BE BELOW BOTTOM OF THE CONCRETE BLOCK.
3. ALL DIMENSIONS ARE MINIMUM EXCEPT WHERE LARGER DIMENSION WILL INTERFERE WITH THE PIPE JOINTS OR NOT FACILITATE BOLT REMOVAL ON MECHANICAL JOINTS.
4. ALL DIMENSIONS ARE FOR DUCTILE IRON PIPE FITTINGS OR PVC PIPE WITH DUCTILE IRON PIPE FITTINGS. BUTTRESSES FOR HDPE PIPE AND FITTINGS SHALL BE CONSIDERED SITE SPECIFIC AND SHALL REQUIRE BALTIMORE CITY APPROVAL.

SITE SPECIFIC DESIGN CRITERIA:

IF THE ABOVE STATED CONDITIONS AND LIMITATIONS ARE NOT MET, OR THE PIPE DIAMETER IS GREATER THAN 20", A SITE SPECIFIC DESIGN WILL BE REQUIRED FOR APPROVAL.

a. DESIGN THRUST FORCE SHALL BE CALCULATED BASED ON THE OUTSIDE DIAMETER OF THE PIPE.
b. DESIGN THRUST FORCES = CALCULATED THRUST X 1.5 FACTOR OF SAFETY.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

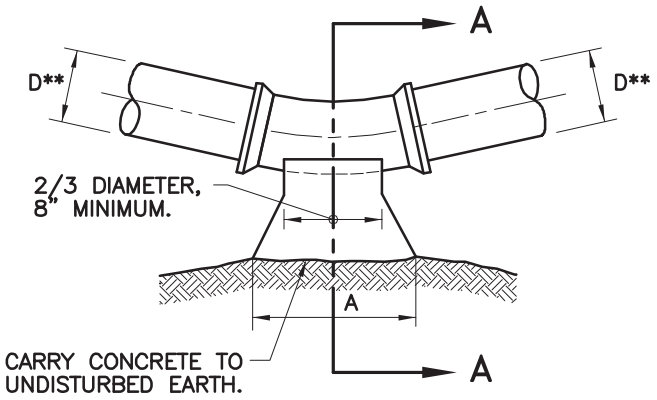
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

BUTTRESS FOR CAPS
(FOR 4" - 20")

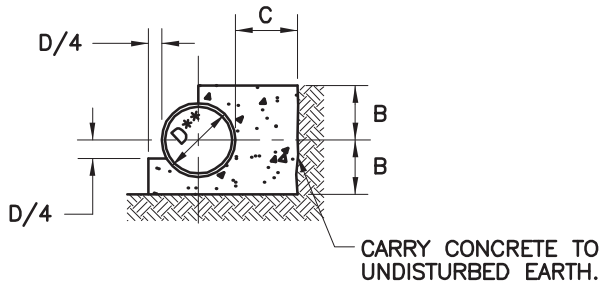
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 861.01

SCALE : NONE | SHEET 1 OF 1



PLAN



SECTION A–A

BUTTRESS FOR HORIZONTAL BENDS								
		PIPE SIZE						
	D**	4"	6"	8"	10"	12"	16"	20"
1/32 BEND	A	9"	9"	1'–0"	1'–0"	1'–6"	2'–0"	3'–0"
	B	9"	9"	9"	1'–0"	1'–0"	1'–0"	1'–0"
	C	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"	1'–6"	2'–0"
1/16 BEND	A	1'–0"	1'–0"	1'–6"	1'–6"	2'–0"	3'–0"	3'–0"
	B	9"	9"	1'–0"	1'–0"	1'–6"	1'–6"	2'–0"
	C	1'–0"	1'–0"	1'–0"	1'–0"	1'–6"	2'–0"	3'–0"
1/8 BEND	A	1'–6"	1'–6"	2'–0"	2'–6"	3'–0"	4'–0"	4'–6"
	B	1'–0"	1'–0"	1–0"	1'–6"	2'–0"	2'–0"	2'–6"
	C	1'–0"	1'–0"	1'–0"	2'–0"	2'–6"	3'–0"	4'–0"
1/4 BEND	A	2'–6"	2'–6"	3'–0"	3'–6"	4'–0"	5'–6"	SITE SPECIFIC DESIGN REQUIRED
	B	1'–0"	1'–0"	1'–6"	2'–0"	2'–6"	2'–6"	
	C	1'–6"	2'–0"	2'–6"	2'–6"	3'–6"	4'–0"	
D** INDICATES NOMINAL DIAMETER PIPE SIZES								

NOTES:

1. ALL CONCRETE TO BE MIX 3, f'c = 3,500 PSI AT 28 DAYS.
2. THE MINIMUM DIMENSION AS SHOWN IS BASED ON THE FOLLOWING CONDITIONS AND LIMITATIONS:
   a. ALLOWABLE SOIL BEARING CAPACITY = 2,000 PSF.
   b. OPERATING WATER PRESSURE = 150 PSI.
   c. DEPTH FROM FINISHED GRADE TO TOP OF PIPE ASSUMED TO EQUAL 4'–0" OR DEEPER.
   d. ELEVATION OF GROUNDWATER TABLE ASSUMED TO BE BELOW BOTTOM OF THE CONCRETE BLOCK.
3. ALL DIMENSIONS ARE MINIMUM EXCEPT WHERE LARGER DIMENSION WILL INTERFERE WITH THE PIPE JOINTS OR NOT FACILITATE BOLT REMOVAL ON MECHANICAL JOINTS.
4. ALL DIMENSIONS ARE FOR DUCTILE IRON PIPE FITTINGS OR PVC PIPE WITH DUCTILE IRON PIPE FITTINGS. BUTTRESSES FOR HDPE PIPE AND FITTINGS SHALL BE CONSIDERED SITE SPECIFIC AND SHALL REQUIRE BALTIMORE CITY APPROVAL.

SITE SPECIFIC DESIGN CRITERIA:

IF THE ABOVE STATED CONDITIONS AND LIMITATIONS ARE NOT MET, OR THE PIPE DIAMETER IS GREATER THAN 20", A SITE SPECIFIC DESIGN WILL BE REQUIRED FOR APPROVAL.

a. DESIGN THRUST FORCE SHALL BE CALCULATED BASED ON THE OUTSIDE DIAMETER OF THE PIPE.
b. DESIGN THRUST FORCES = CALCULATED THRUST X 1.5 FACTOR OF SAFETY.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

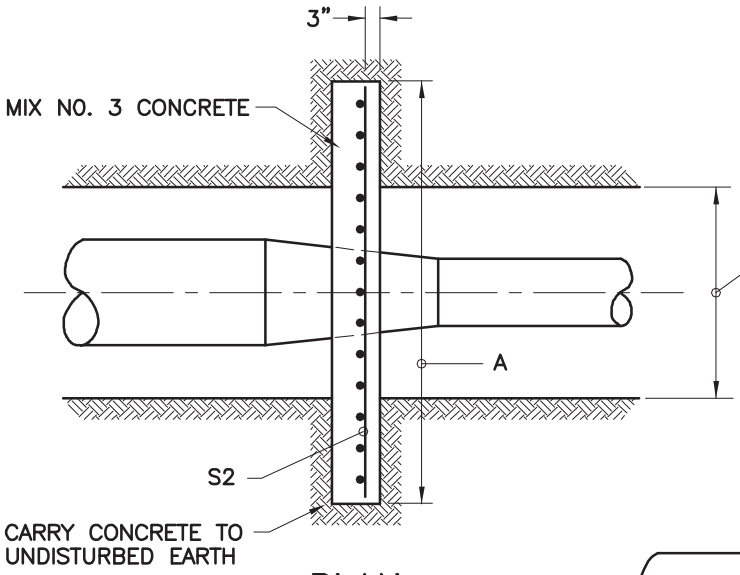
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

BUTTRESS FOR HORIZONTAL BENDS
(FOR 4" - 20")

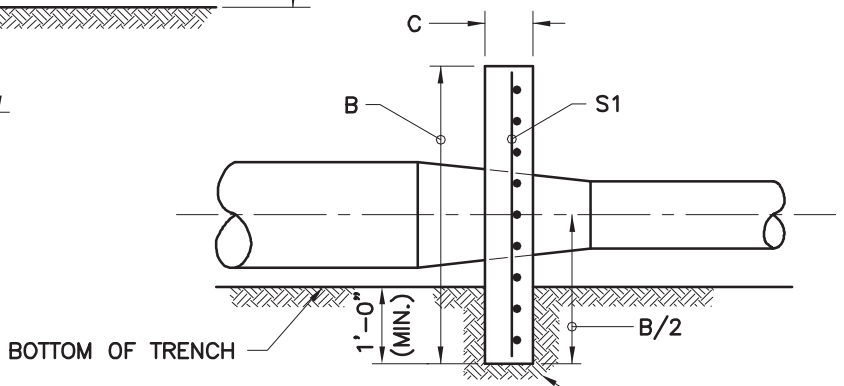
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 862.01

SCALE : NONE | SHEET 1 OF 1



PLAN



PROFILE

SIZE	A	B	C	S1	S2
8" x 4"	6' – 0"	3' – 0"	1'–0"	12 – #6	6 – #6
12" x 4"	6' – 0"	3' – 0"	1'–0"	12 – #6	6 – #6
12" x 6"	6' – 0"	3' – 0"	1'–0"	12 – #6	6 – #6
12" x 8"	6' – 0"	3' – 0"	1'–0"	12 – #6	6 – #6
16" x 6"	8' – 0"	3' – 6"	1'–0"	16 – #6	7 – #6
16" x 8"	8' – 0"	3' – 6"	1'–0"	16 – #6	7 – #6
16" x 10"	8' – 0"	3' – 6"	1'–0"	16 – #6	7 – #6
16" x 12"	8' – 0"	3' – 6"	1'–0"	16 – #6	7 – #6

NOTES:

1. ALL CONCRETE TO BE MIX 3, f'c = 3,500 PSI AT 28 DAYS.
2. THE MINIMUM DIMENSION AS SHOWN IS BASED ON THE FOLLOWING CONDITIONS AND LIMITATIONS:
   a. ALLOWABLE SOIL BEARING CAPACITY = 2,000 PSF.
   b. OPERATING WATER PRESSURE = 150 PSI.
   c. DEPTH FROM FINISHED GRADE TO TOP OF PIPE ASSUMED TO EQUAL 4'–0" OR DEEPER.
   d. ELEVATION OF GROUNDWATER TABLE ASSUMED TO BE BELOW BOTTOM OF THE CONCRETE BLOCK.
3. ALL DIMENSIONS ARE MINIMUM EXCEPT WHERE LARGER DIMENSION WILL INTERFERE WITH THE PIPE JOINTS OR NOT FACILITATE BOLT REMOVAL ON MECHANICAL JOINTS.
4. ALL DIMENSIONS ARE FOR DUCTILE IRON PIPE FITTINGS OR PVC PIPE WITH DUCTILE IRON PIPE FITTINGS. BUTTRESSES FOR HDPE PIPE AND FITTINGS SHALL BE CONSIDERED SITE SPECIFIC AND SHALL REQUIRE BALTIMORE CITY APPROVAL.
5. THRUST BLOCKS FOR REDUCERS CAN ONLY BE INSTALLED ON CONCENTRIC TYPE PIPE REDUCERS.

SITE SPECIFIC DESIGN CRITERIA:

IF THE ABOVE STATED CONDITIONS AND LIMITATIONS ARE NOT MET, OR THE PIPE DIAMETER IS GREATER THAN 20", A SITE SPECIFIC DESIGN WILL BE REQUIRED FOR APPROVAL.

a. DESIGN THRUST FORCE SHALL BE CALCULATED BASED ON THE OUTSIDE DIAMETER OF THE PIPE.
b. DESIGN THRUST FORCES = CALCULATED THRUST X 1.5 FACTOR OF SAFETY.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

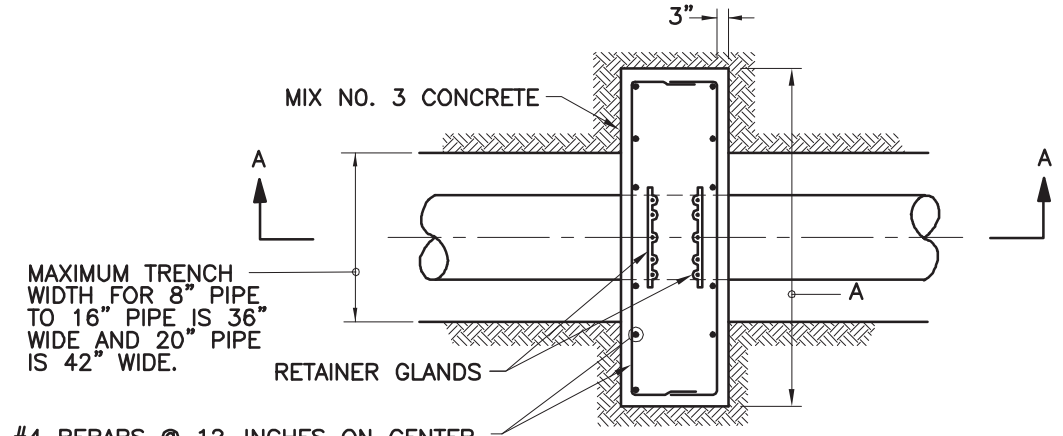
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

ISSUED	REVISED	REVISED
3 / 2008		

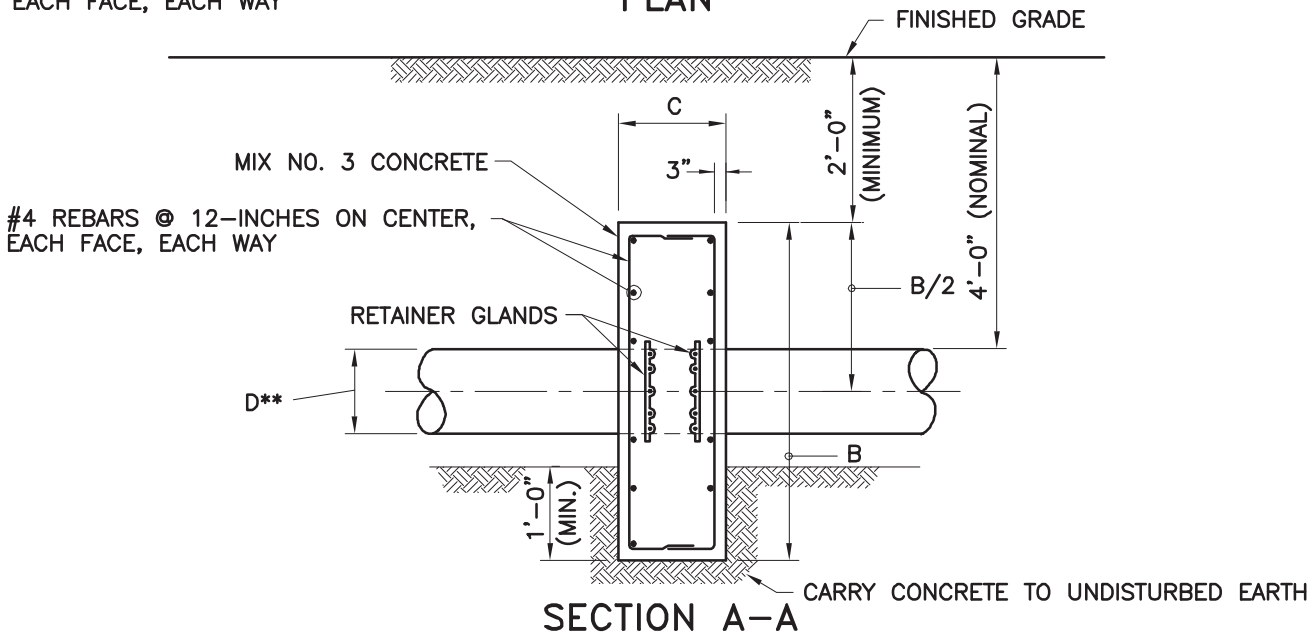
THRUST BLOCKS FOR REDUCERS
(FOR 8" X 4" TO 16" X 12")

STANDARD NO.
BC 863.01

SCALE : NONE | SHEET 1 OF 1



PLAN



SECTION A-A

IN-LINE THRUST BLOCK					
PIPE SIZE					
D**	4"	6"	8"	10"	12"
A	4'-6"	5'-0"	5'-0"	6'-0"	6'-0"
B	2'-6"	3'-0"	4'-0"	4'-6"	5'-0"
C	1'-0"	1'-0"	1'-6"	1'-6"	2'-0"
D** INDICATES NOMINAL DIAMETER PIPE SIZES					

NOTES:

1. ALL CONCRETE TO BE MIX 3, f'c = 3,500 PSI AT 28 DAYS.
2. THE MINIMUM DIMENSION AS SHOWN IS BASED ON THE FOLLOWING CONDITIONS AND LIMITATIONS:
   a. ALLOWABLE SOIL BEARING CAPACITY = 2,000 PSF.
   b. OPERATING WATER PRESSURE = 150 PSI.
   c. DEPTH FROM FINISHED GRADE TO TOP OF PIPE ASSUMED TO EQUAL 4'-0" OR DEEPER.
   d. ELEVATION OF GROUNDWATER TABLE ASSUMED TO BE BELOW BOTTOM OF THE CONCRETE BLOCK.
3. ALL DIMENSIONS ARE MINIMUM EXCEPT WHERE LARGER DIMENSION WILL INTERFERE WITH THE PIPE JOINTS OR NOT FACILITATE BOLT REMOVAL ON MECHANICAL JOINTS.
4. ALL DIMENSIONS ARE FOR DUCTILE IRON PIPE FITTINGS OR PVC PIPE WITH DUCTILE IRON PIPE FITTINGS. BUTTRESSES FOR HDPE PIPE AND FITTINGS SHALL BE CONSIDERED SITE SPECIFIC AND SHALL REQUIRE BALTIMORE CITY APPROVAL.

SITE SPECIFIC DESIGN CRITERIA:

IF THE ABOVE STATED CONDITIONS AND LIMITATIONS ARE NOT MET, OR THE PIPE DIAMETER IS GREATER THAN 20", A SITE SPECIFIC DESIGN WILL BE REQUIRED FOR APPROVAL.

a. DESIGN THRUST FORCE SHALL BE CALCULATED BASED ON THE OUTSIDE DIAMETER OF THE PIPE.
b. DESIGN THRUST FORCES = CALCULATED THRUST X 1.5 FACTOR OF SAFETY.

CITY OF BALTIMORE 1797

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

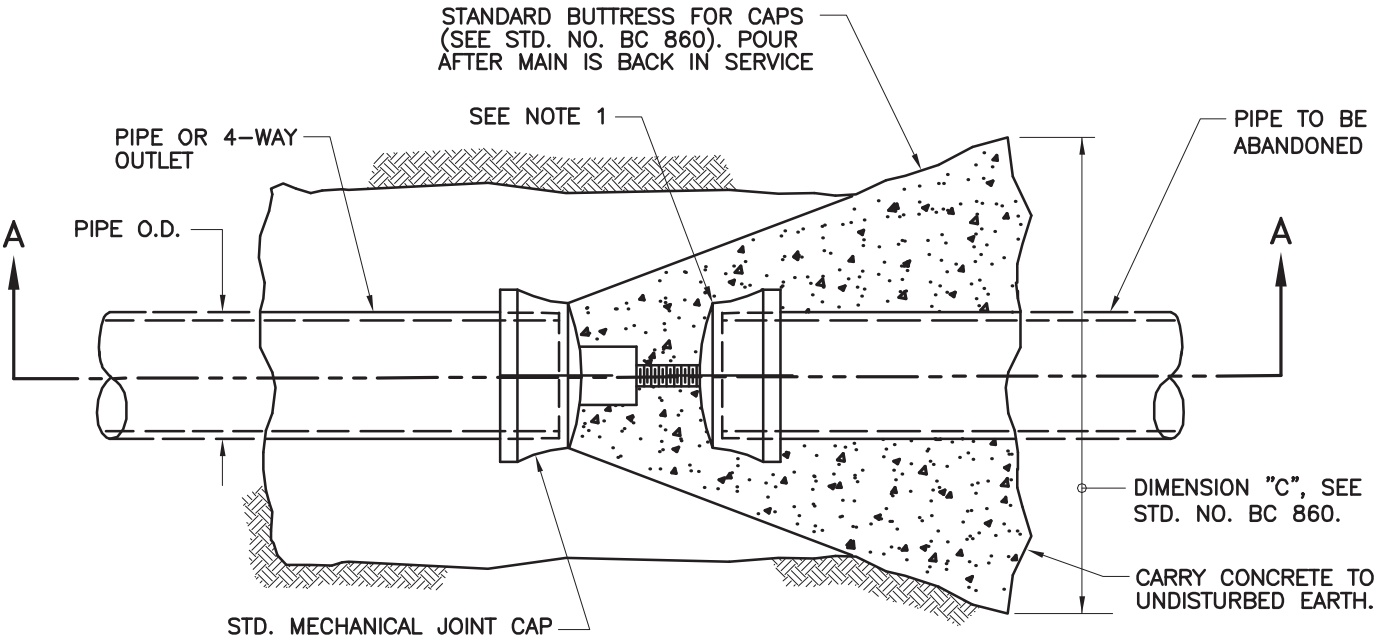
IN-LINE THRUST BLOCKS
(FOR 4" - 12")

ISSUED	REVISED	REVISED
3 / 2008		

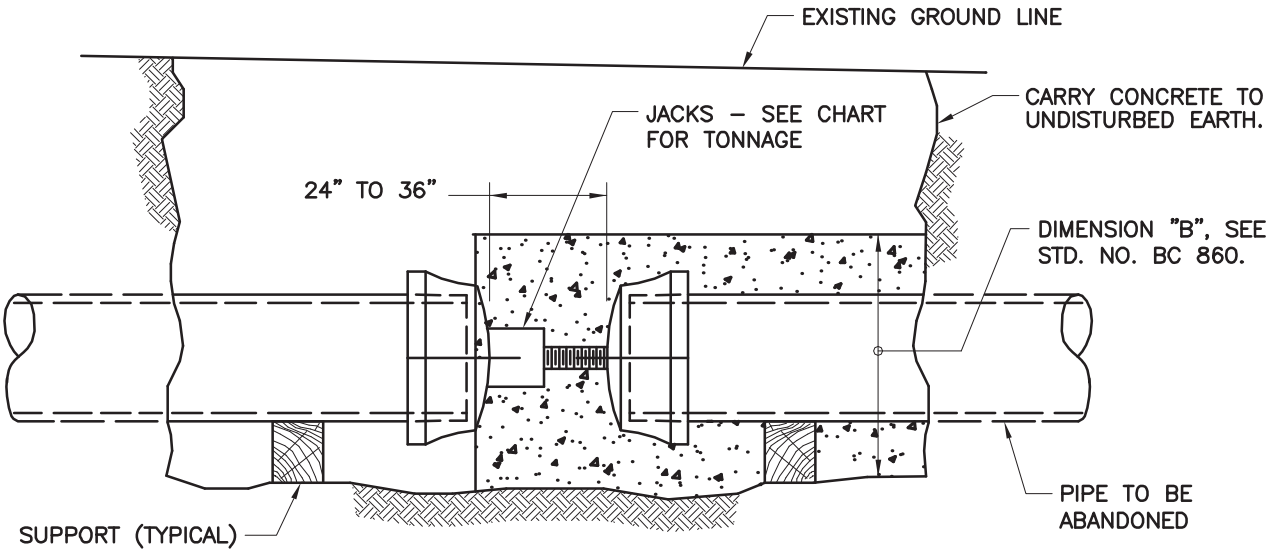
STANDARD NO.
BC 864.01

SCALE : NONE

SHEET 1 OF 1



PLAN VIEW



SECTION A–A

NOTES:

1. GLANDS, BOLTS AND GASKETS NOT REQUIRED ON THIS CAP UNLESS LEAKAGE IS PRESENT IN ABANDONED PIPE. FOR CAP DIAMETER >12", JACK LOAD WITH BLOCKING ON CAPS.
2. O.D. MEASURED IN INCHES.
3. IN LIEU OF JACK, STEEL BLOCKING OF SAME CAPACITY MAY BE USED.

JACK TONNAGE CHART	
JACK TONNAGE AT 100 PSI	$\frac{O.D.^2}{25}$ TONS
JACK TONNAGE AT 150 PSI	$\frac{O.D.^2}{16}$ TONS
JACK TONNAGE AT 200 PSI	$\frac{O.D.^2}{12}$ TONS

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

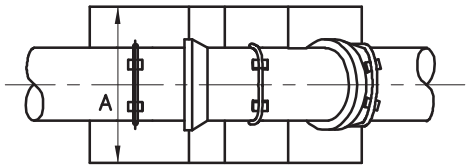
DOUBLE CAPS, JACK, AND BUTTRESS (FOR D.I. AND C.I. PIPE ONLY)

ISSUED	REVISED	REVISED
3 / 2008		

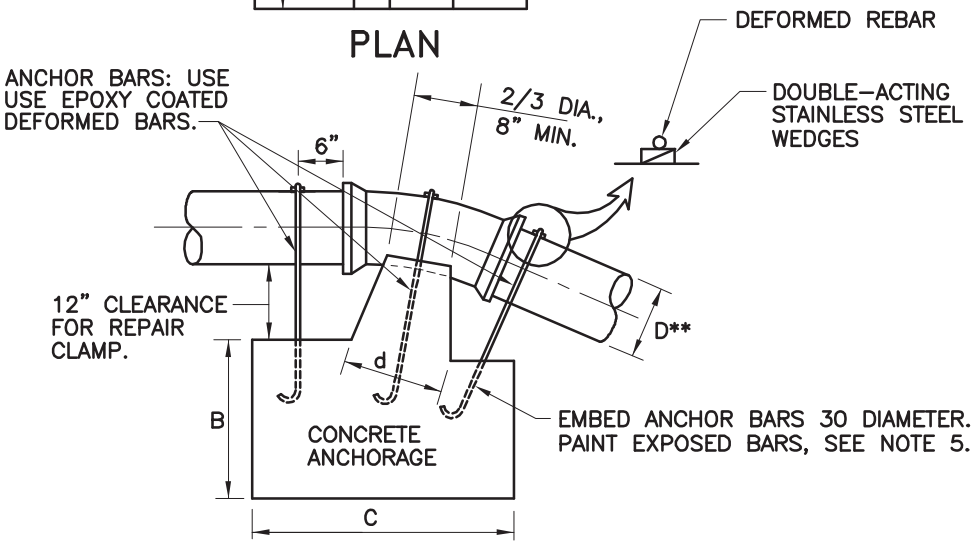
STANDARD NO. BC 865.01

SCALE : NONE

SHEET 1 OF 1



PLAN



ELEVATION

ANCHORAGES FOR UPPER VERTICAL BENDS								
		PIPE SIZE						
	D**	4"	6"	8"	10"	12"	16"	20"
1/32 BEND	A	1'–6"	2'–0"	2'–0"	3'–0"	3'–6"	4'–6"	5'–0"
	B	2'–0"	2'–0"	3'–0"	3'–0"	3'–0"	3'–6"	4'–6"
	C	2'–6"	2'–6"	3'–0"	3'–6"	4'–0"	4'–6"	5'–0"
1/16 BEND	A	2'–6"	2'–6"	3'–6"	4'–0"	4'–6"	5'–6"	6'–0"
	B	3'–0"	2'–6"	3'–0"	3'–0"	3'–6"	4'–6"	5'–6"
	C	3'–0"	3'–6"	3'–6"	4'–6"	5'–0"	5'–6"	6'–6"
1/8 BEND	A	3'–6"	3'–6"	4'–0"	5'–0"	6'–0"	7'–0"	8'–0"
	B	3'–6"	3'–6"	4'–0"	4'–0"	4'–6"	5'–6"	6'–6"
	C	3'–6"	3'–6"	4'–6"	5'–6"	6'–0"	7'–0"	8'–0"
D**	INDICATES NOMINAL DIAMETER PIPE SIZES							

EPOXY COATED ANCHOR BARS			
PIPE SIZE	1/32 BEND	1/16 BEND	1/8 BEND
6"	3–#6	3–#6	3–#6
8"	3–#6	3–#6	3–#6
10"	3–#6	3–#6	3–#6
12"	3–#6	3–#6	3–#6
16"	3–#6	3–#6	3–#6
20"	3–#6	3–#6	3–#6

NOTES:

1. ALL CONCRETE TO BE MIX 3, f'c = 3,500 PSI AT 28 DAYS.
2. THE MINIMUM DIMENSION AS SHOWN IS BASED ON THE FOLLOWING CONDITIONS AND LIMITATIONS:
   a. ALLOWABLE SOIL BEARING CAPACITY = 2,000 PSF.
   b. OPERATING WATER PRESSURE = 150 PSI.
   c. DEPTH FROM FINISHED GRADE TO TOP OF PIPE ASSUMED TO EQUAL 4'–0" OR DEEPER.
   d. ELEVATION OF GROUNDWATER TABLE ASSUMED TO BE BELOW BOTTOM OF THE CONCRETE BLOCK.
3. ALL DIMENSIONS ARE MINIMUM EXCEPT WHERE LARGER DIMENSION WILL INTERFERE WITH THE PIPE JOINTS OR NOT FACILITATE BOLT REMOVAL ON MECHANICAL JOINTS.
4. ALL DIMENSIONS ARE FOR DUCTILE IRON PIPE FITTINGS OR PVC PIPE WITH DUCTILE IRON PIPE FITTINGS. BUTTRESSES FOR HDPE PIPE AND FITTINGS SHALL BE CONSIDERED SITE SPECIFIC AND SHALL REQUIRE BALTIMORE CITY APPROVAL.

SITE SPECIFIC DESIGN CRITERIA:

IF THE ABOVE STATED CONDITIONS AND LIMITATIONS ARE NOT MET, OR THE PIPE DIAMETER IS GREATER THAN 20", A SITE SPECIFIC DESIGN WILL BE REQUIRED FOR APPROVAL.

a. DESIGN THRUST FORCE SHALL BE CALCULATED BASED ON THE OUTSIDE DIAMETER OF THE PIPE.
b. DESIGN THRUST FORCES = CALCULATED THRUST X 1.5 FACTOR OF SAFETY.

CITY OF BALTIMORE 1797

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

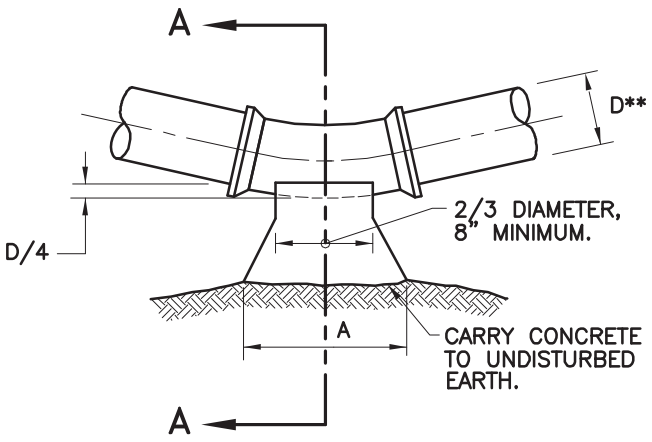
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

ANCHORAGES FOR
UPPER VERTICAL BENDS
(FOR 4" - 20")

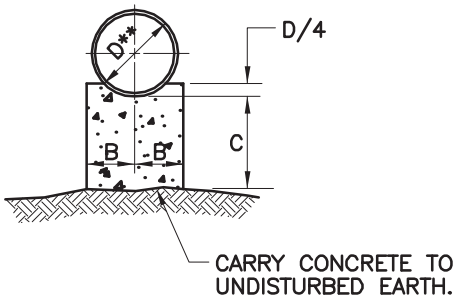
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 866.01

SCALE : NONE | SHEET 1 OF 1



ELEVATION



SECTION A–A

BUTTRESS FOR LOWER VERTICAL BENDS								
	PIPE SIZE							
	D**	4"	6"	8"	10"	12"	16"	20"
1/32 BEND	A	1'–0"	1'–0"	1'–6"	1'–6"	1'–6"	2'–0"	3'–0"
	B	6"	6"	6"	9"	9"	1'–0"	1'–0"
	C	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"
1/16 BEND	A	1'–0"	1'–6"	2'–0"	2'–0"	2'–6"	3'–0"	4'–0"
	B	6"	6"	9"	1'–0"	1'–0"	1'–3"	1'–6"
	C	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"
1/8 BEND	A	1'–6"	2'–0"	2'–6"	3'–0"	3'–6"	4'–0"	5'–0"
	B	6"	9"	1'–0"	1'–0"	1'–3"	2'–0"	2'–3"
	C	1'–0"	1'–0"	1'–0"	1'–0"	1'–6"	1'–6"	2'–0"
D** INDICATES NOMINAL DIAMETER PIPE SIZES								

NOTES:

1. ALL CONCRETE TO BE MIX 3, f'c = 3,500 PSI AT 28 DAYS.
2. THE MINIMUM DIMENSION AS SHOWN IS BASED ON THE FOLLOWING CONDITIONS AND LIMITATIONS:
   a. ALLOWABLE SOIL BEARING CAPACITY = 2,000 PSF.
   b. OPERATING WATER PRESSURE = 150 PSI.
   c. DEPTH FROM FINISHED GRADE TO TOP OF PIPE ASSUMED TO EQUAL 4'–0" OR DEEPER.
   d. ELEVATION OF GROUNDWATER TABLE ASSUMED TO BE BELOW BOTTOM OF THE CONCRETE BLOCK.
3. ALL DIMENSIONS ARE MINIMUM EXCEPT WHERE LARGER DIMENSION WILL INTERFERE WITH THE PIPE JOINTS OR NOT FACILITATE BOLT REMOVAL ON MECHANICAL JOINTS.
4. ALL DIMENSIONS ARE FOR DUCTILE IRON PIPE FITTINGS OR PVC PIPE WITH DUCTILE IRON PIPE FITTINGS. BUTTRESSES FOR HDPE PIPE AND FITTINGS SHALL BE CONSIDERED SITE SPECIFIC AND SHALL REQUIRE BALTIMORE CITY APPROVAL.

SITE SPECIFIC DESIGN CRITERIA:

IF THE ABOVE STATED CONDITIONS AND LIMITATIONS ARE NOT MET, OR THE PIPE DIAMETER IS GREATER THAN 20", A SITE SPECIFIC DESIGN WILL BE REQUIRED FOR APPROVAL.

a. DESIGN THRUST FORCE SHALL BE CALCULATED BASED ON THE OUTSIDE DIAMETER OF THE PIPE.
b. DESIGN THRUST FORCES = CALCULATED THRUST X 1.5 FACTOR OF SAFETY.

CITY OF BALTIMORE 1797

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

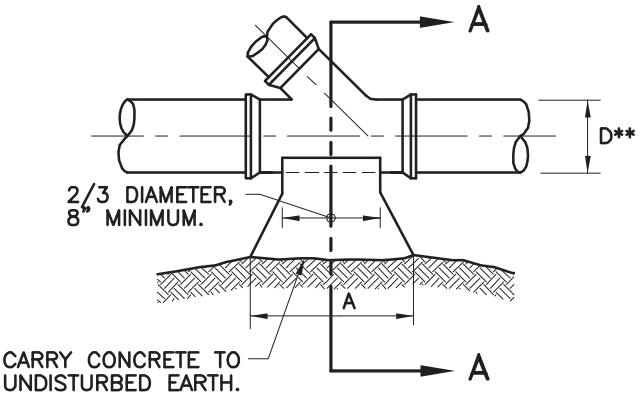
BUTTRESS FOR
LOWER VERTICAL BENDS
(FOR 4" - 20")

ISSUED	REVISED	REVISED
3 / 2008		

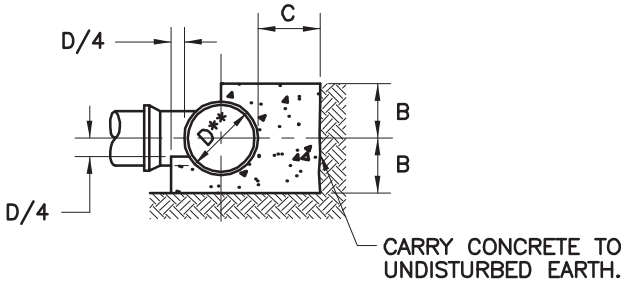
STANDARD NO.
BC 867.01

SCALE : NONE

SHEET 1 OF 1



PLAN



SECTION A–A

BUTTRESS FOR WYE CONNECTION							
	PIPE SIZE						
D**	4"	6"	8"	10"	12"	16"	20"
A	1'–6"	1'–6"	2'–0"	2'–6"	3'–0"	4'–0"	4'–6"
B	1'–0"	1'–0"	1'–0"	1'–6"	2'–0"	2'–0"	2'–6"
C	1'–0"	1'–0"	1'–0"	2'–0"	2'–6"	3'–0"	4'–0"
D** INDICATES NOMINAL DIAMETER PIPE SIZES							

NOTES:

1. ALL CONCRETE TO BE MIX 3, f'c = 3,500 PSI AT 28 DAYS.
2. THE MINIMUM DIMENSION AS SHOWN IS BASED ON THE FOLLOWING CONDITIONS AND LIMITATIONS:
   a. ALLOWABLE SOIL BEARING CAPACITY = 2,000 PSF.
   b. OPERATING WATER PRESSURE = 150 PSI.
   c. DEPTH FROM FINISHED GRADE TO TOP OF PIPE ASSUMED TO EQUAL 4'–0" OR DEEPER.
   d. ELEVATION OF GROUNDWATER TABLE ASSUMED TO BE BELOW BOTTOM OF THE CONCRETE BLOCK.
3. ALL DIMENSIONS ARE MINIMUM EXCEPT WHERE LARGER DIMENSION WILL INTERFERE WITH THE PIPE JOINTS OR NOT FACILITATE BOLT REMOVAL ON MECHANICAL JOINTS.
4. ALL DIMENSIONS ARE FOR DUCTILE IRON PIPE FITTINGS OR PVC PIPE WITH DUCTILE IRON PIPE FITTINGS. BUTTRESSES FOR HDPE PIPE AND FITTINGS SHALL BE CONSIDERED SITE SPECIFIC AND SHALL REQUIRE BALTIMORE CITY APPROVAL.

SITE SPECIFIC DESIGN CRITERIA:

IF THE ABOVE STATED CONDITIONS AND LIMITATIONS ARE NOT MET, OR THE PIPE DIAMETER IS GREATER THAN 20", A SITE SPECIFIC DESIGN WILL BE REQUIRED FOR APPROVAL.

a. DESIGN THRUST FORCE SHALL BE CALCULATED BASED ON THE OUTSIDE DIAMETER OF THE PIPE.
b. DESIGN THRUST FORCES = CALCULATED THRUST X 1.5 FACTOR OF SAFETY.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

BUTTRESS FOR
WYE CONNECTION
(FOR 4" - 20")

ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 868.01

SCALE : NONE

SHEET 1 OF 1

4" VALVE (SMALL VAULT)

COVER ON MAIN	STANDARD CONCRETE SECTIONS					FRAME AND COVER
	A	B	C	D	E	
1'–6" TO 1'–9"	2	2	0	2	1	1
1'–10" TO 2'–3"	2	2	2	0	1	1
2'–4" TO 2'–9"	2	2	2	2	1	1
2'–10" TO 3'–3"	2	2	2	4	1	1
3'–4" TO 3'–9"	2	2	4	2	1	1
3'–10" TO 4'–3"	2	2	4	4	1	1
4'–4" TO 4'–9"	2	2	4	6	1	1

6" VALVE (SMALL VAULT)

COVER ON MAIN	STANDARD CONCRETE SECTIONS					FRAME AND COVER
	A	B	C	D	E	
2'–0" TO 2'–1"	2	2	2	0	1	1
2'–4" TO 2'–7"	2	2	2	2	1	1
2'–10" TO 3'–1"	2	2	2	4	1	1
3'–4" TO 3'–7"	2	2	4	2	1	1
3'–10" TO 4'–1"	2	2	4	4	1	1
4'–4" TO 4'–7"	2	2	4	6	1	1
4'–10" TO 5'–1"	2	2	6	4	1	1

8" VALVE (SMALL VAULT)

COVER ON MAIN	STANDARD CONCRETE SECTIONS					FRAME AND COVER
	A	B	C	D	E	
1'–11"	2	2	2	0	1	1
2'–3" TO 2'–5"	2	2	2	2	1	1
2'–9" TO 2'–11"	2	2	2	4	1	1
3'–3" TO 3'–5"	2	2	4	2	1	1
3'–9" TO 3'–11"	2	2	4	4	1	1
4'–3" TO 4'–5"	2	2	4	6	1	1
4'–9" TO 4'–11"	2	2	6	4	1	1

10" VALVE (LARGE VAULT)

COVER ON MAIN	STANDARD CONCRETE SECTIONS					FRAME AND COVER
	A	B	C	D	E	
2'–3" TO 2'–9"	4	2	2	2	2	1
2'–9" TO 3'–3"	4	2	2	4	2	1
3'–3" TO 3'–9"	4	2	2	6	2	1
3'–9" TO 4'–3"	4	2	4	4	2	1
4'–3" TO 4'–9"	4	2	4	6	2	1
4'–9" TO 5'–3"	4	2	4	8	2	1

12" VALVE (LARGE VAULT)

COVER ON MAIN	STANDARD CONCRETE SECTIONS					FRAME AND COVER
	A	B	C	D	E	
2'–6" TO 2'–7"	4	2	2	2	2	1
2'–9" TO 3'–1"	4	2	2	4	2	1
3'–3" TO 3'–7"	4	2	2	6	2	1
3'–9" TO 4'–1"	4	2	4	4	2	1
4'–3" TO 4'–7"	4	2	4	6	2	1
4'–9" TO 5'–1"	4	2	4	8	2	1

NOTE:
FOR 10" AND 12" TAPPING SLEEVE AND VALVES,
"F" SECTION SHALL BE SUBSTITUTED FOR "E" SECTION.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

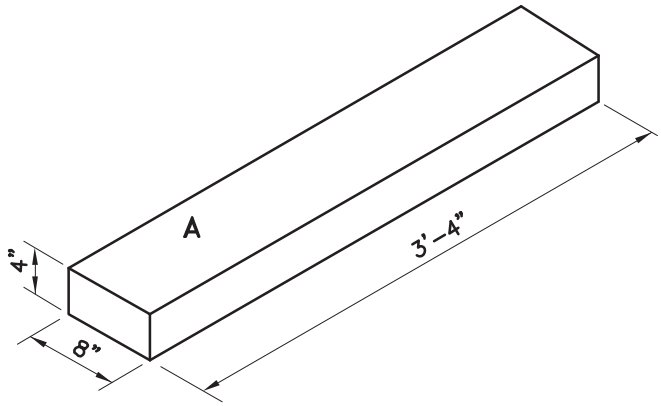
TABLE OF SECTIONS
REQUIRED FOR CONCRETE
VALVE VAULTS

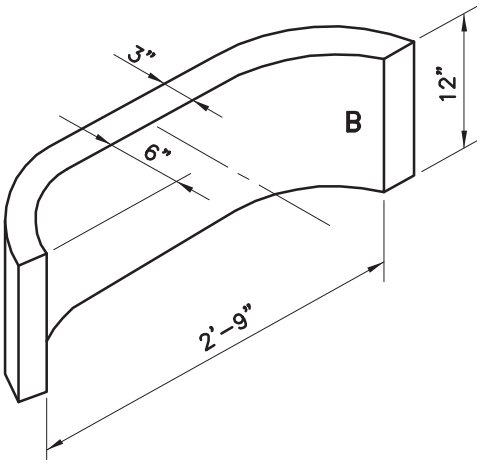
ISSUED	REVISED	REVISED
3 / 2008		

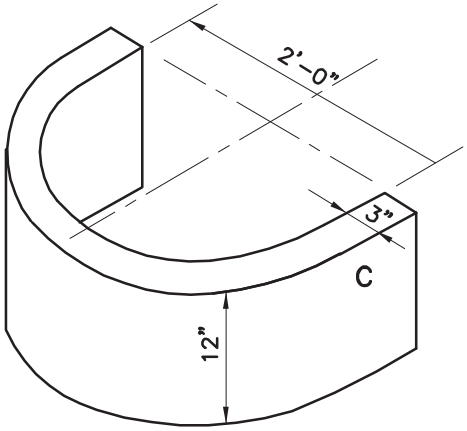
STANDARD NO.
BC 869.01

SCALE : NONE

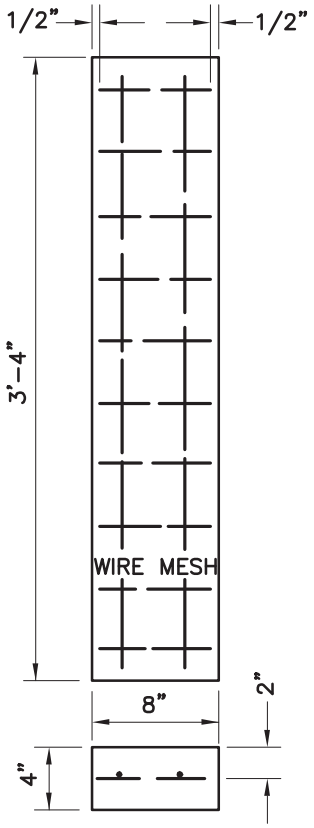
SHEET 1 OF 1



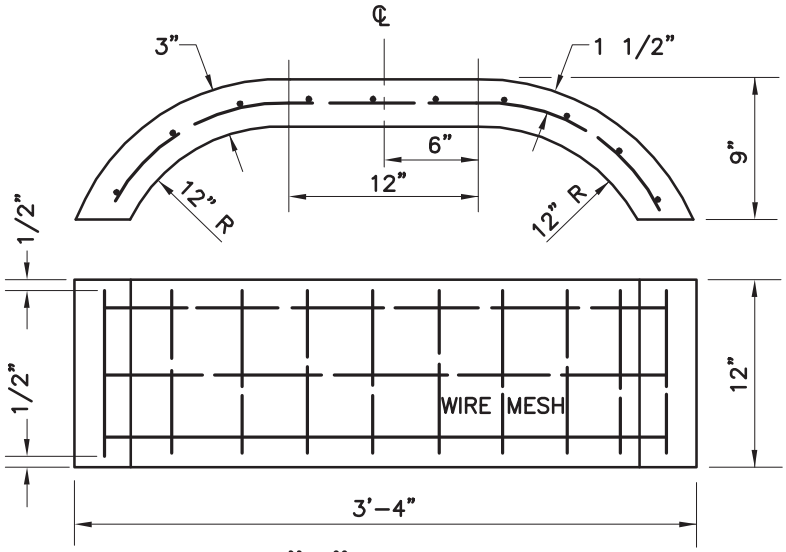




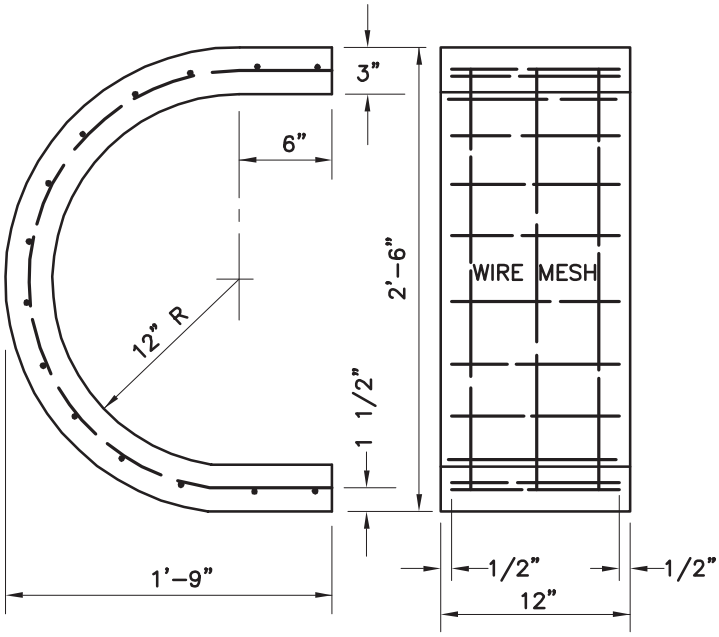
CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED 3 / 2008	REVISED / REVISED
		STANDARD SECTIONS FOR SMALL CONCRETE VAULTS	STANDARD NO. BC 870.01	
			SCALE : NONE	SHEET 1 OF 3



"A" SECTION



"B" SECTION

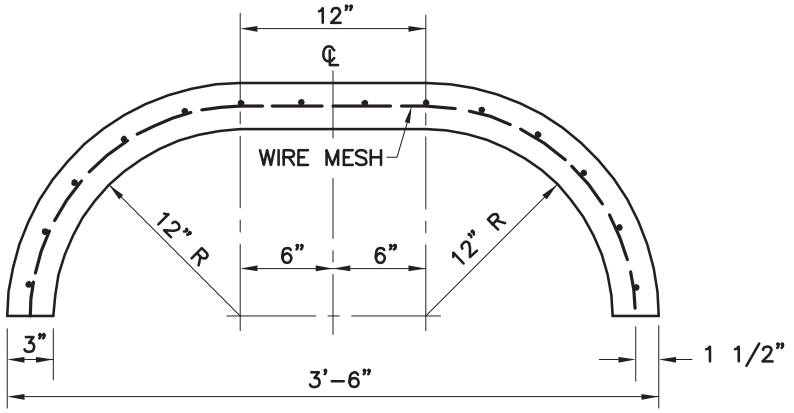


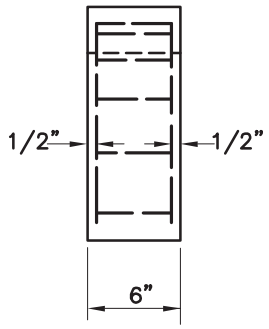
"C" SECTION

NOTES:

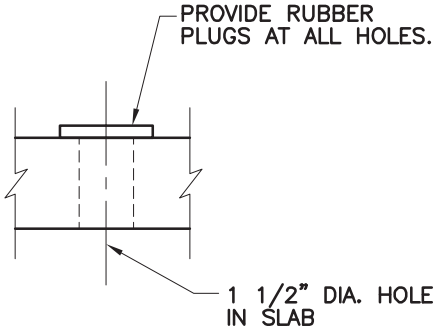
1. CONCRETE SHALL BE MIX 3.
2. WIRE MESH SHALL BE 4"x4" NO. 6 WIRE.

CITY OF BALTIMORE 1797	APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER; DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED: 3 / 2008	REVISED / REVISED
		DETAIL OF SMALL SECTIONAL CONCRETE VAULT	STANDARD NO. BC 870.01	
			SCALE : NONE	SHEET 2 OF 3

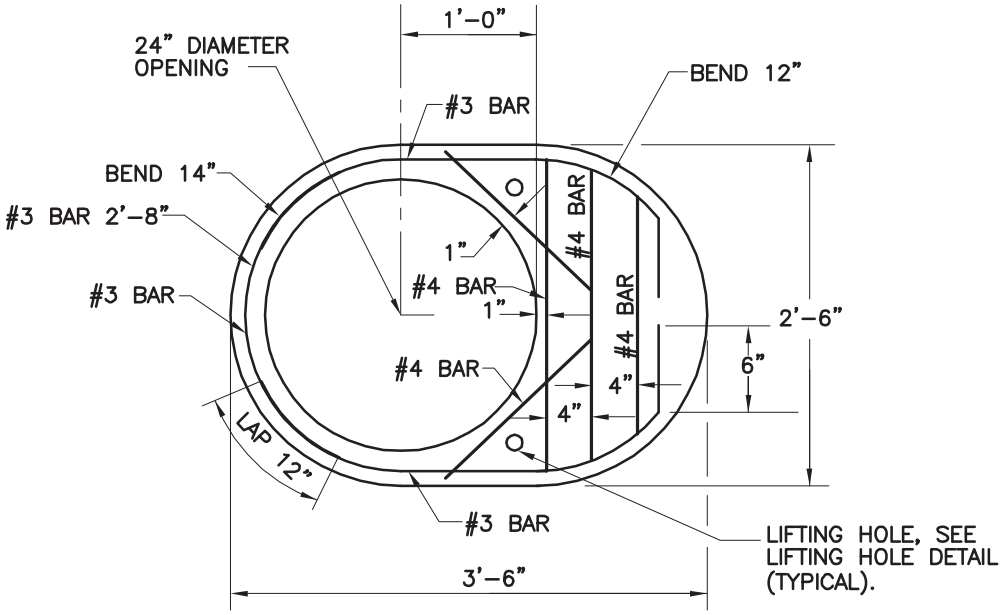


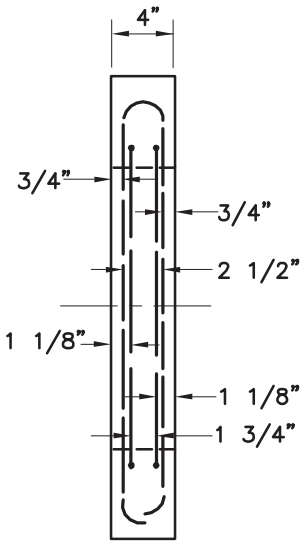


"D" SECTION



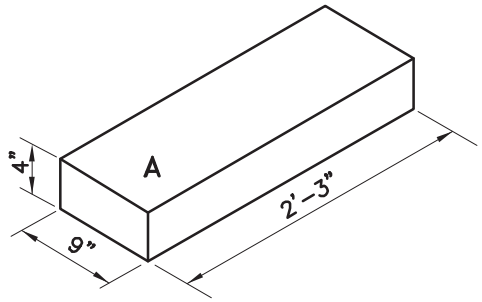
LIFTING HOLE DETAIL

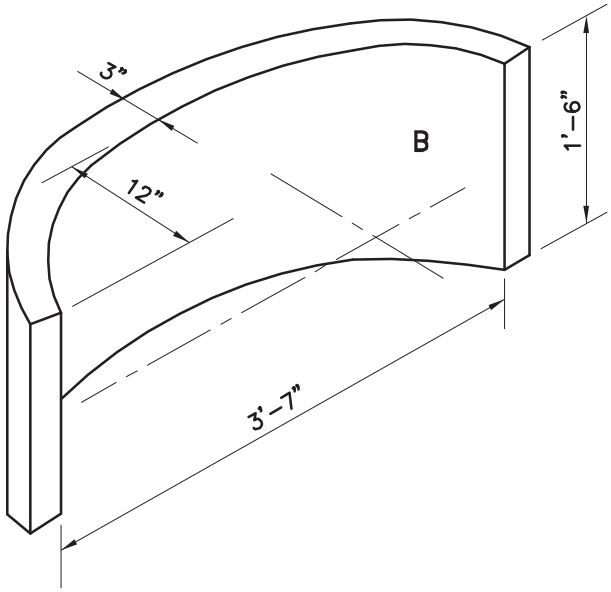


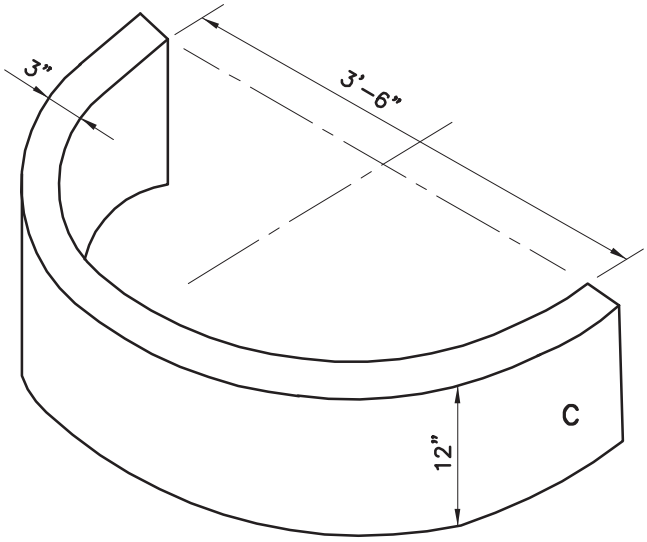


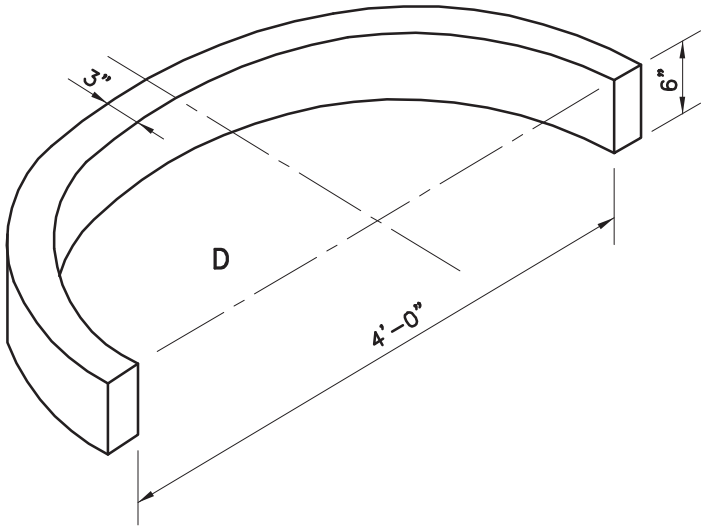
"E" SECTION

APPROVED: HEAD, BUREAU OF WATER AND WASTEWATER; DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	DETAILS OF "D" AND "E" SECTIONS - SMALL SECTIONAL CONCRETE VAULT	STANDARD NO. BC 870.01		
		SCALE : NONE	SHEET 3 OF 3	









APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

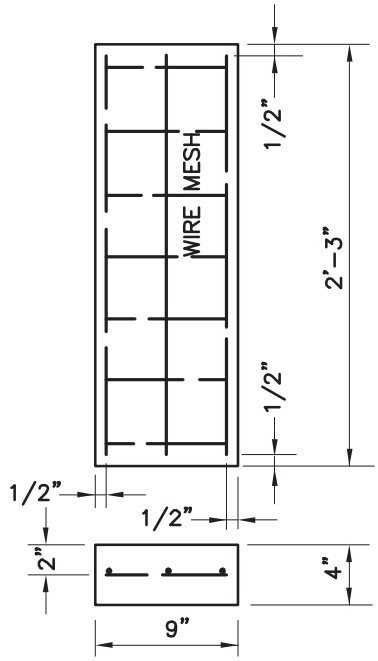
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD SECTIONS FOR LARGE SECTIONAL CONCRETE VAULTS

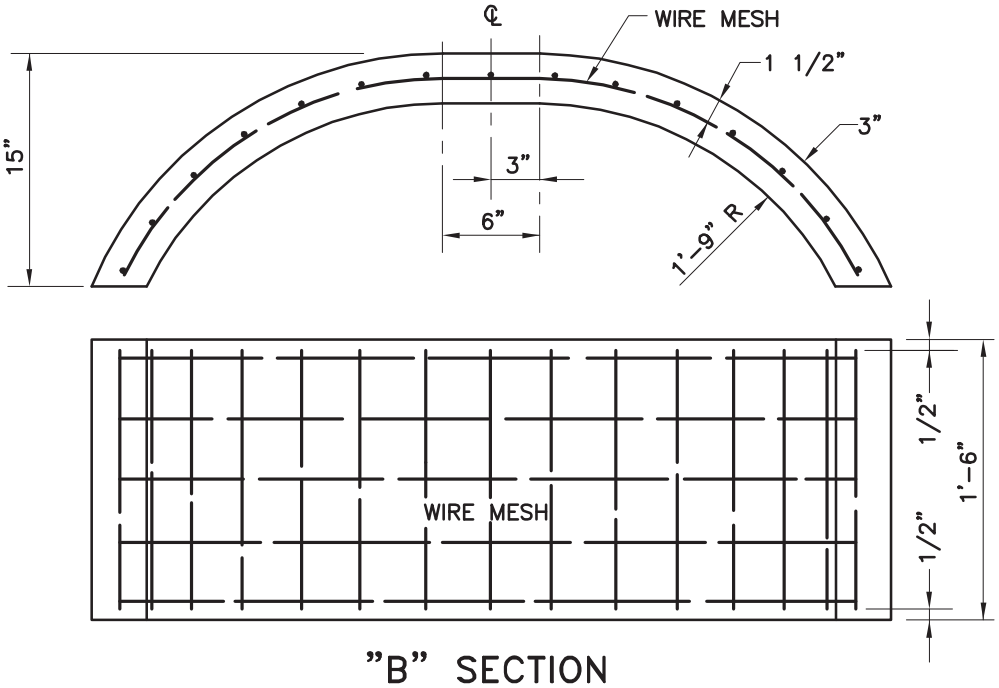
STANDARD NO. BC 871.01

SCALE : NONE

SHEET 1 OF 4



"A" SECTION

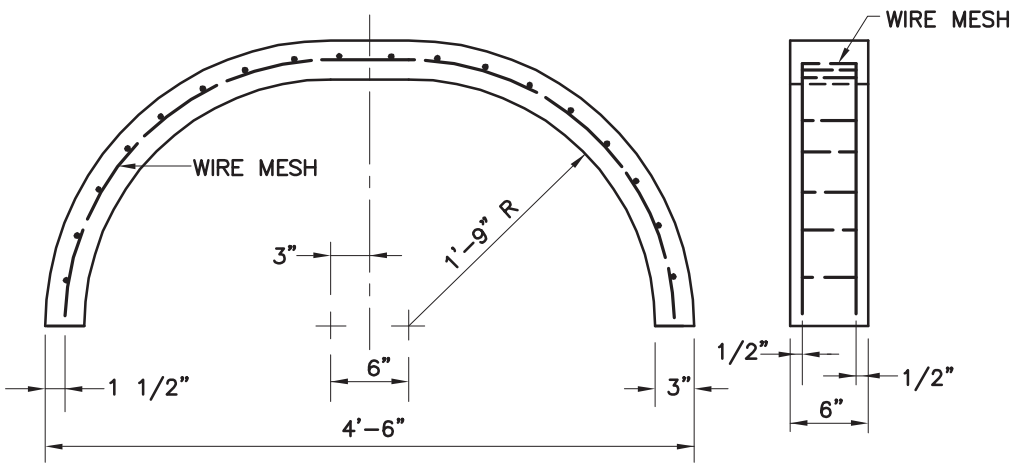


"B" SECTION

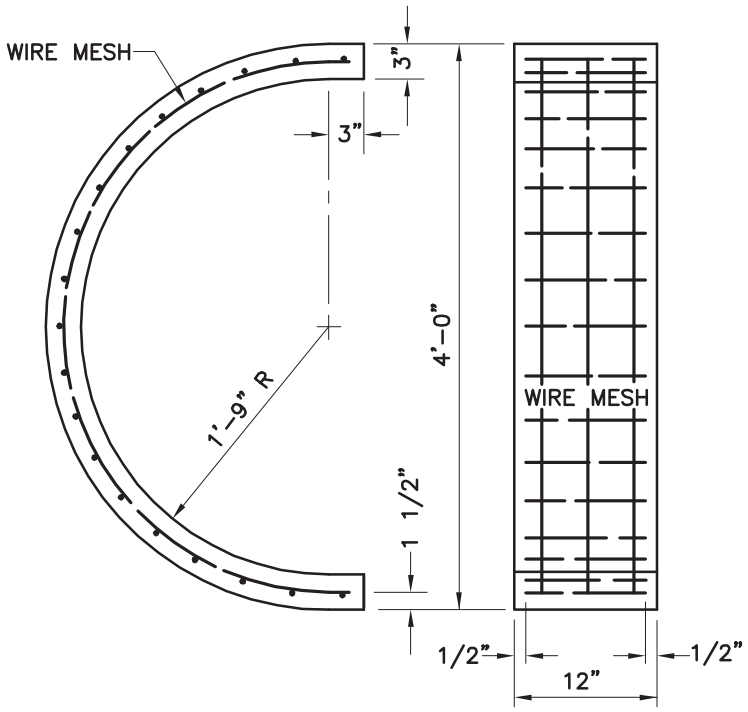
NOTES:

1. CONCRETE SHALL BE MIX 3.
2. WIRE MESH SHALL BE 4"x4" NO. 6 WIRE.

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED / REVISED / REVISED 3 / 2008	
		DETAIL OF LARGE SECTIONAL CONCRETE VAULT ("A" & "B" SECTIONS)	STANDARD NO. BC 871.01	
			SCALE : NONE	SHEET 2 OF 4



"D" SECTION



"C" SECTION

NOTE:
CONCRETE SHALL BE MIX 3.
WIRE MESH SHALL BE 4"x4" NO. 6 WIRE.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

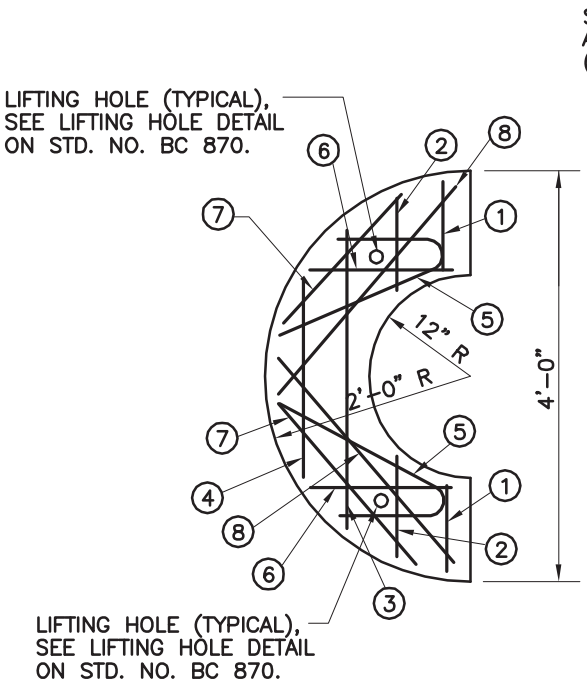
CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

DETAIL OF
LARGE SECTIONAL CONCRETE VAULT
("C" & "D" SECTIONS)

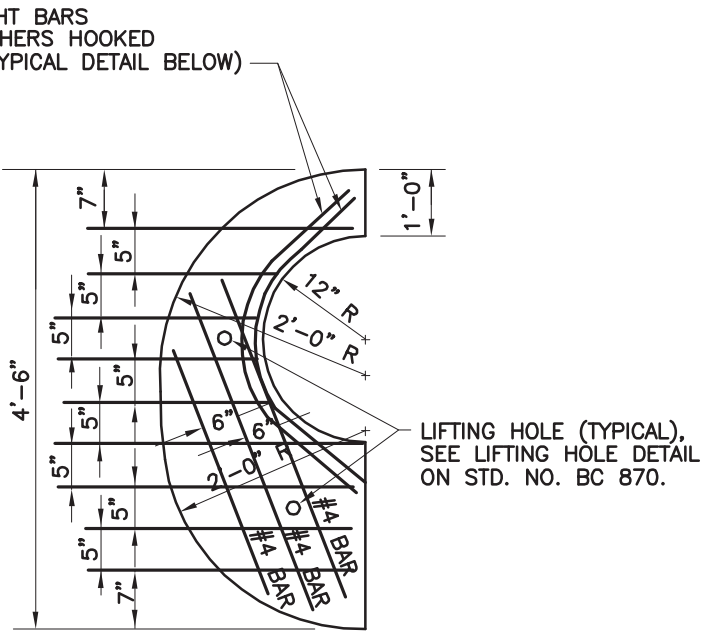
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO.
BC 871.01

SCALE : NONE | SHEET 3 OF 4



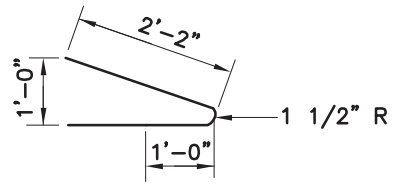
"E" SECTION



"F" SECTION

NOTES:

1. CONCRETE SHALL BE 5,000 PSI.
2. REINFORCING BARS SHALL BE FY=60,000 PSI.



⑤ # 3 BARS–2 IN TOP
3 BARS–2 IN BOTTOM

⑥ = 1 3/4"

① ② ③ ④ = 2 1/2"

① # 3 BARS 9" – 2 OF THIS

② # 3 BARS 0" – 2 OF THIS

③ # 3 BARS 3'–3" – 1 OF THIS

④ # 3 BARS 2'–3" – 1 OF THIS

⑥ # 3 BARS 15" – 2 OF THIS

⑦ # 4 BARS 2'–0" – 2 IN BOTTOM

⑧ # 4 BARS 2'–9" – 2 IN BOTTOM

"E" SECTION & "F" SECTION – LARGE VAULT TOP SLAB

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

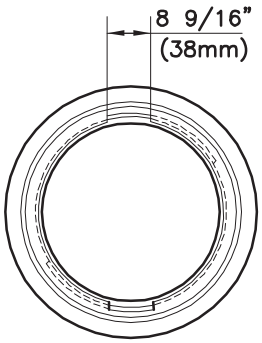
"E" SECTION & "F" SECTION
LARGE CONCRETE VAULT
TOP SLAB

ISSUED	REVISED	REVISED
3 / 2008		

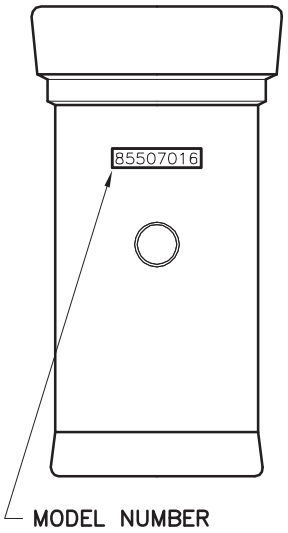
STANDARD NO.
BC 871.01

SCALE : NONE

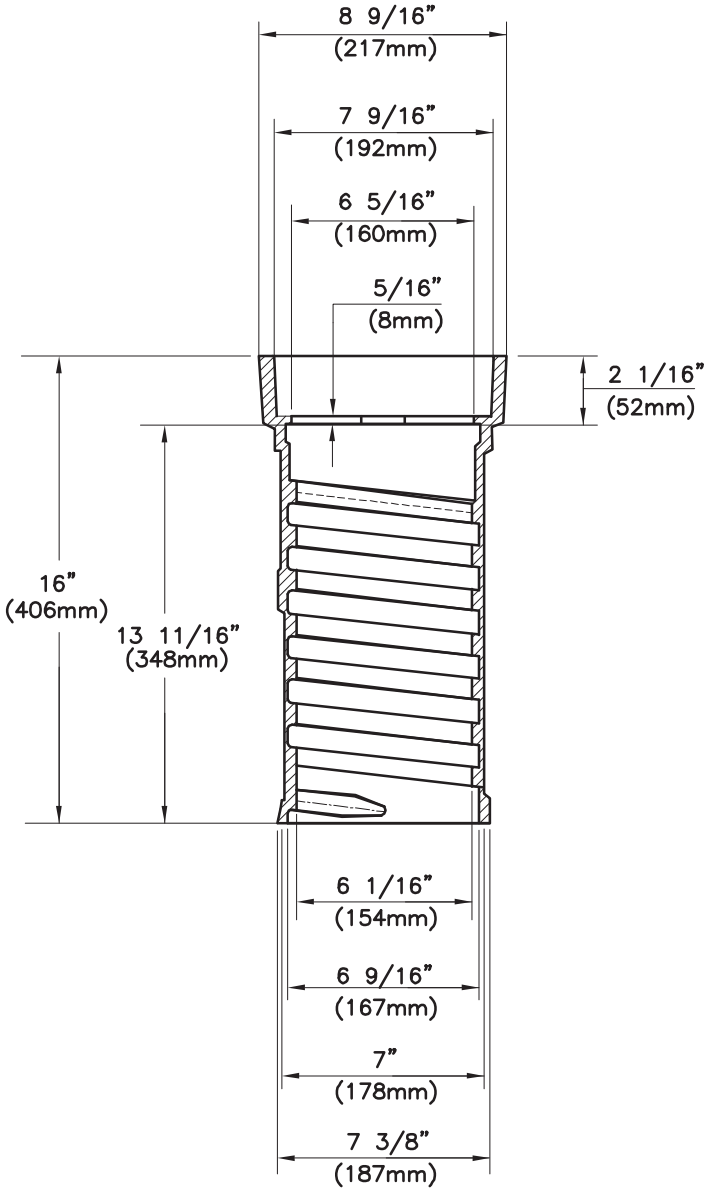
SHEET 4 OF 4



TOP VIEW

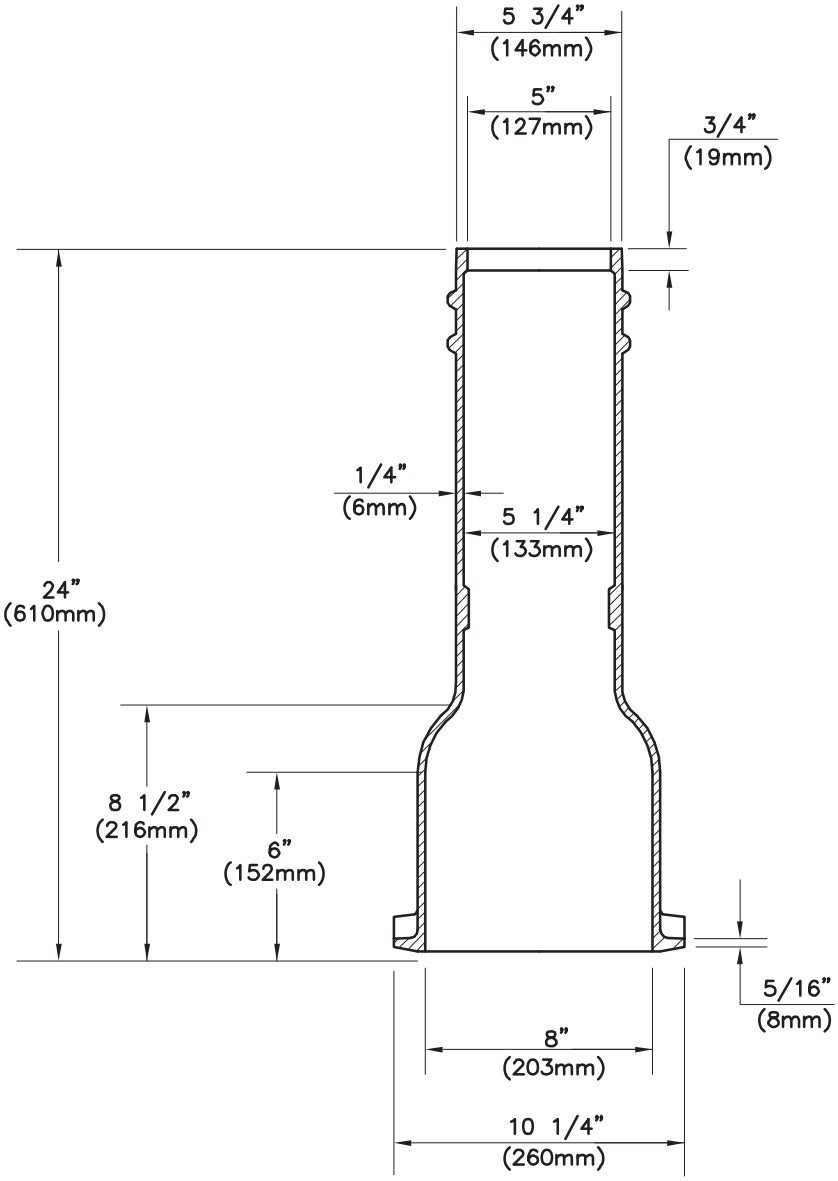


SIDE VIEW

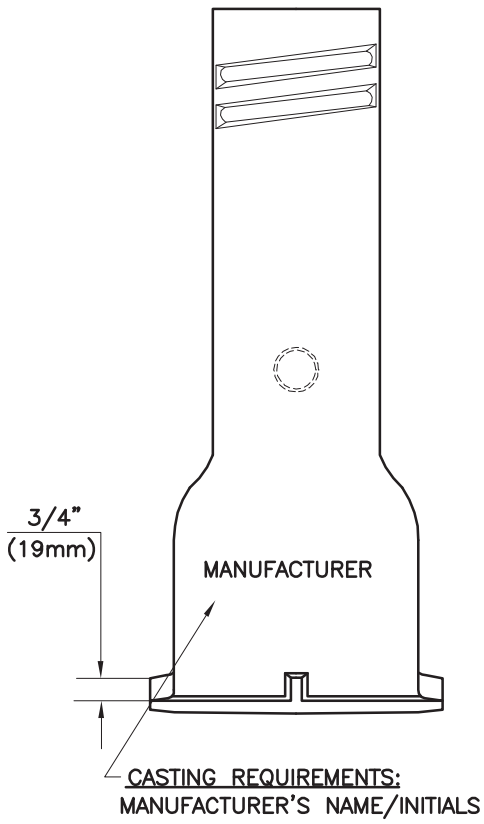


SECTION

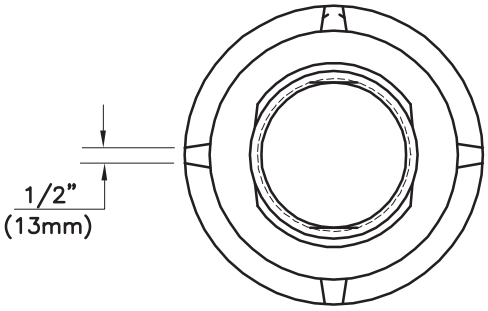
APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	7 1/2" ROADWAY BOX TOP	STANDARD NO. BC 872.01		
		SCALE : NONE	SHEET 1 OF 6	



SECTION



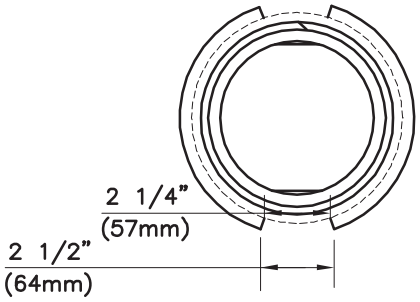
SIDE VIEW



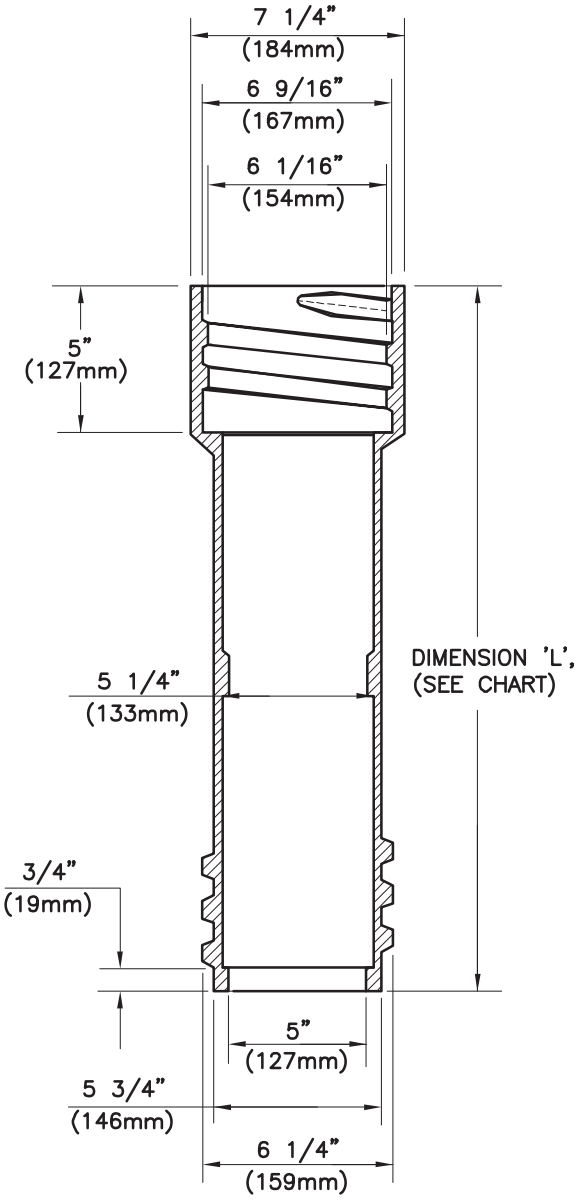
BOTTOM VIEW

APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	7 1/2" ROADWAY BOX BOTTOM	STANDARD NO. BC 872.01		
		SCALE : NONE	SHEET 2 OF 6	

EXTENSION MODEL	DIMENSION 'L'
14–INCH EXTENSION	18" (457mm)
18–INCH EXTENSION	24" (610mm)
24–INCH EXTENSION	30" (762mm)

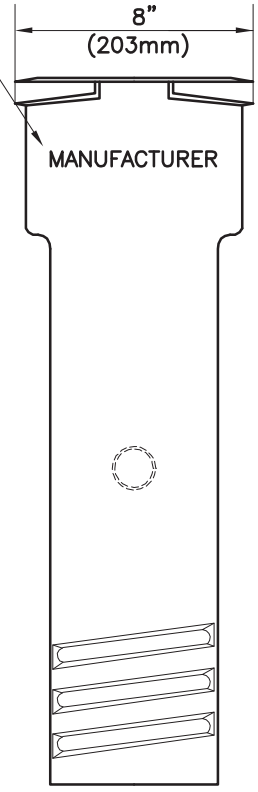


SIDE VIEW



SECTION

CASTING REQUIREMENTS:
MANUFACTURER'S NAME/INITIALS



SIDE VIEW

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

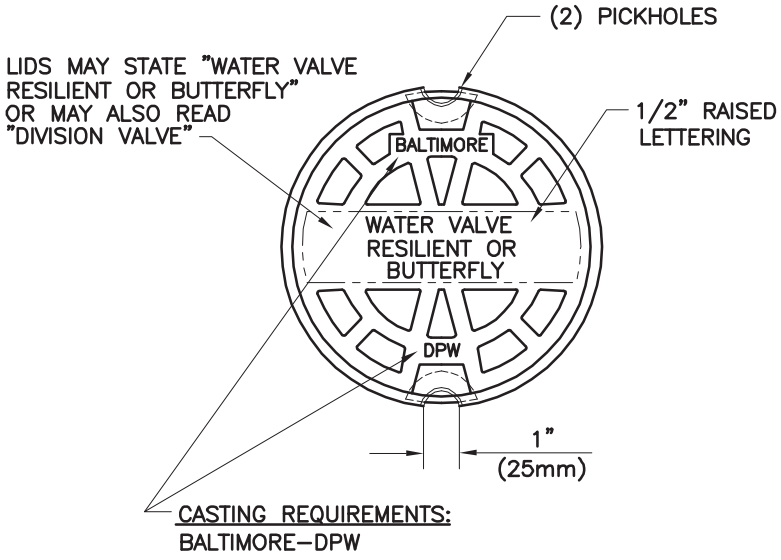
7 1/2" ROADWAY BOX EXTENSION

ISSUED	REVISED	REVISED
3 / 2008		

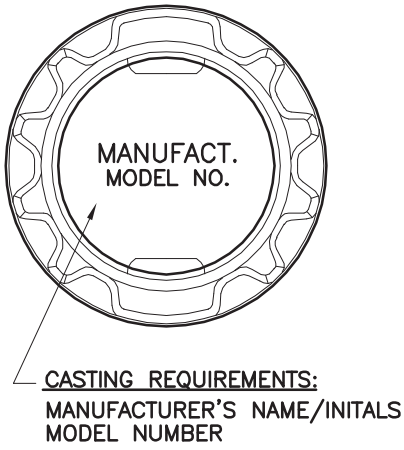
STANDARD NO.
BC 872.01

SCALE : NONE

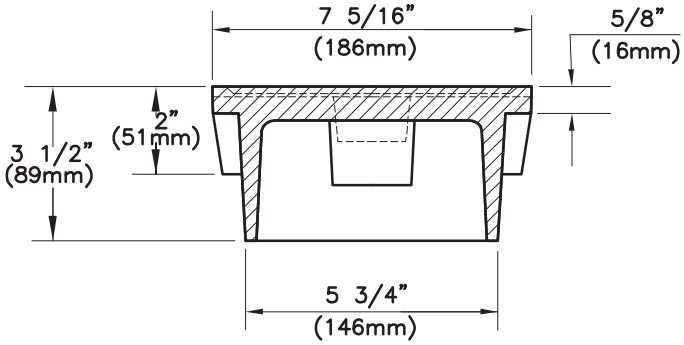
SHEET 3 OF 6



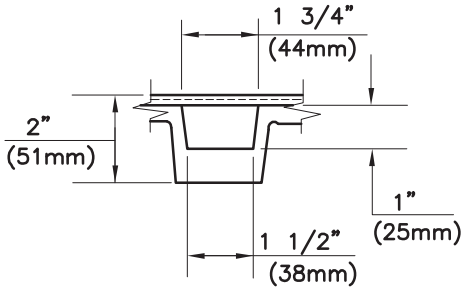
TOP VIEW



BOTTOM VIEW

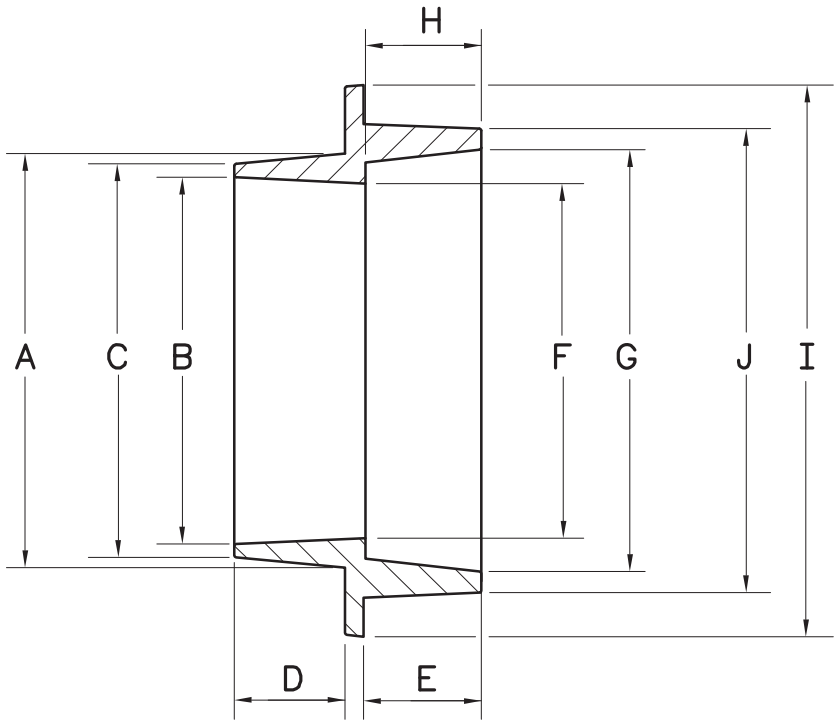


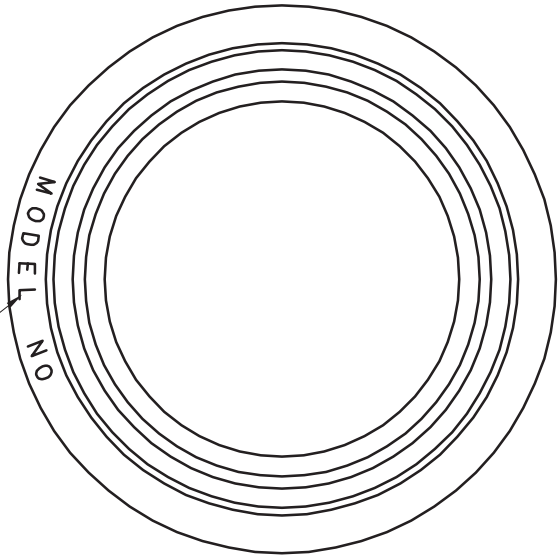
SECTION



PICK HOLE DETAIL

CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
			3 / 2008		
		7 1/2" ROADWAY BOX LID (ON RESILIENT OR BUTTERFLY VALVE)	STANDARD NO. BC 872.01		
			SCALE : NONE	SHEET 4 OF 6	





CASTING REQUIREMENTS:
MODEL NUMBER

VALVE BOX RISER CHART

SIZE (INCHES)	DIMENSIONS – INCHES (MILLIMETERS)										ESTIMATED RISER WEIGHT
	A	B	C	D	E	F	G	H	I	J	
1 1/2"	7 1/2" (191mm)	7 1/16" (180mm)	6 7/16" (164mm)	2" (51mm)	1 1/8" (29mm)	6 5/16" (161mm)	7 1/2" (190mm)	2 1/16" (52mm)	9 11/16" (247mm)	8 3/16" (208mm)	9 lbs (4kg)
2"	7 1/2" (191mm)	6 1/2" (166mm)	7 1/16" (180mm)	2" (51mm)	1 5/8" (41mm)	6 5/16" (161mm)	7 1/2" (190mm)	2 1/16" (52mm)	9 3/4" (248mm)	8 3/16" (208mm)	10 lbs (5kg)
2 1/2"	7 1/2" (191mm)	6 9/16" (167mm)	7" (178mm)	2" (51mm)	2 1/8" (54mm)	6 5/16" (161mm)	7 1/2" (190mm)	2 1/16" (52mm)	9 13/16" (249mm)	8 3/16" (208mm)	12 lbs (5kg)

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

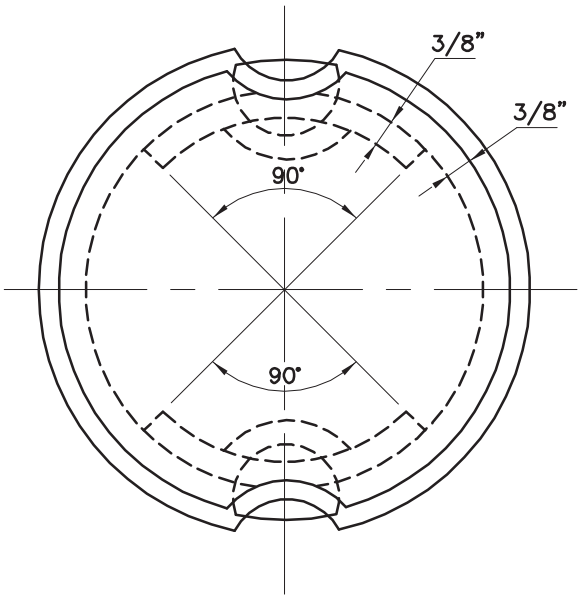
1 1/2", 2", & 2 1/2" VALVE BOX RISER
(HEAVY DUTY)

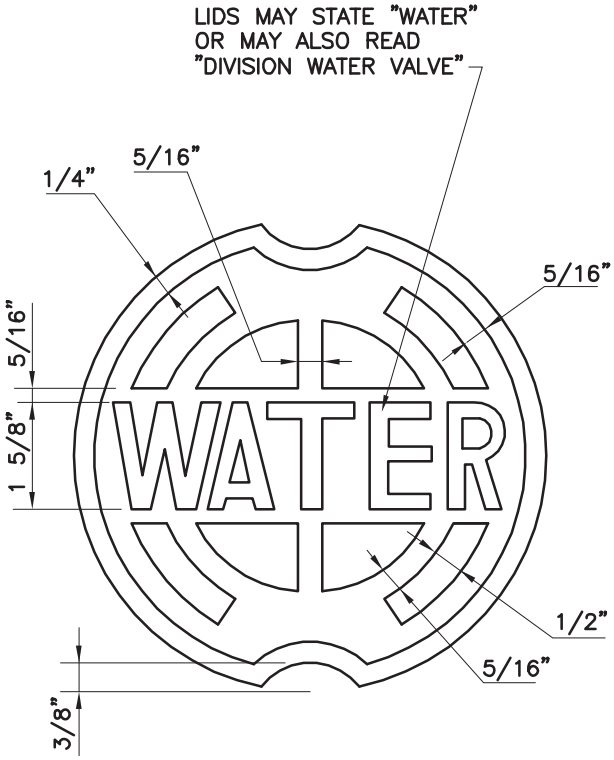
ISSUED	REVISED	REVISED
3 / 2008		

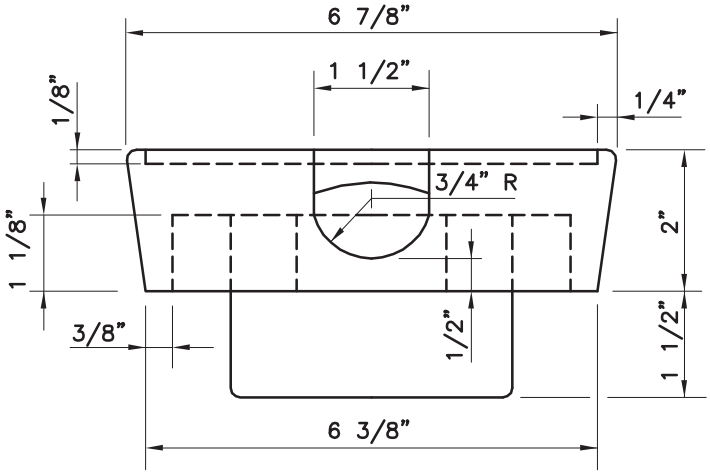
STANDARD NO.
BC 872.01

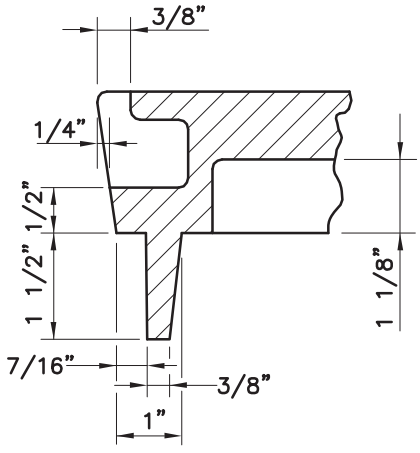
SCALE : NONE

SHEET 5 OF 6

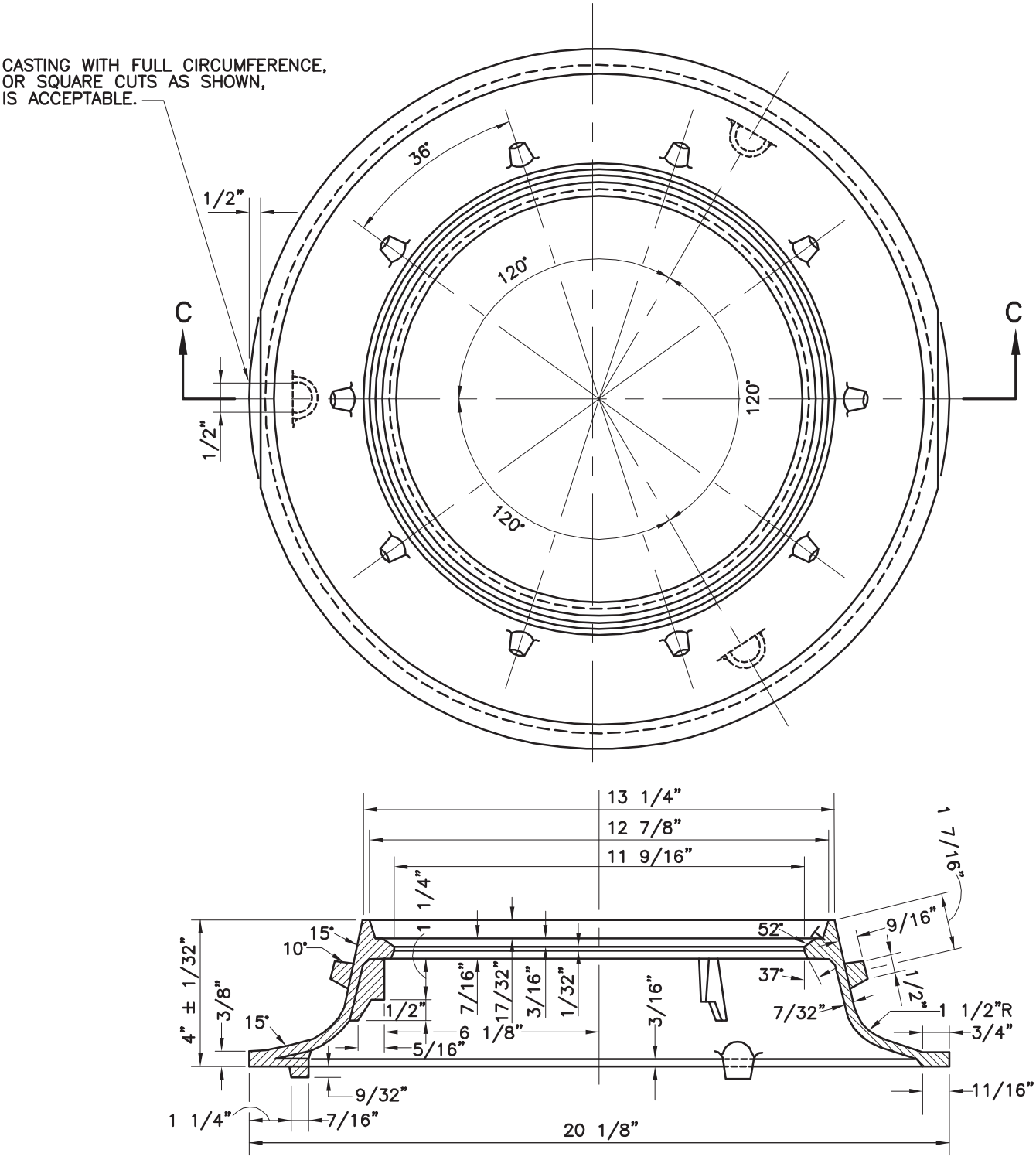








APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	STANDARD 7 1/2" VALVE COVER - WATER	STANDARD NO. BC 872.01		
		SCALE : NONE	SHEET 6 OF 6	



SECTION C–C

NOTES:

1. AVERAGE WEIGHT OF FRAME – 22 LBS.
2. MATERIAL SHALL BE CAST IRON, 21,000 PSI TENSILE STRENGTH.

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

ISSUED	REVISED	REVISED
3 / 2008		

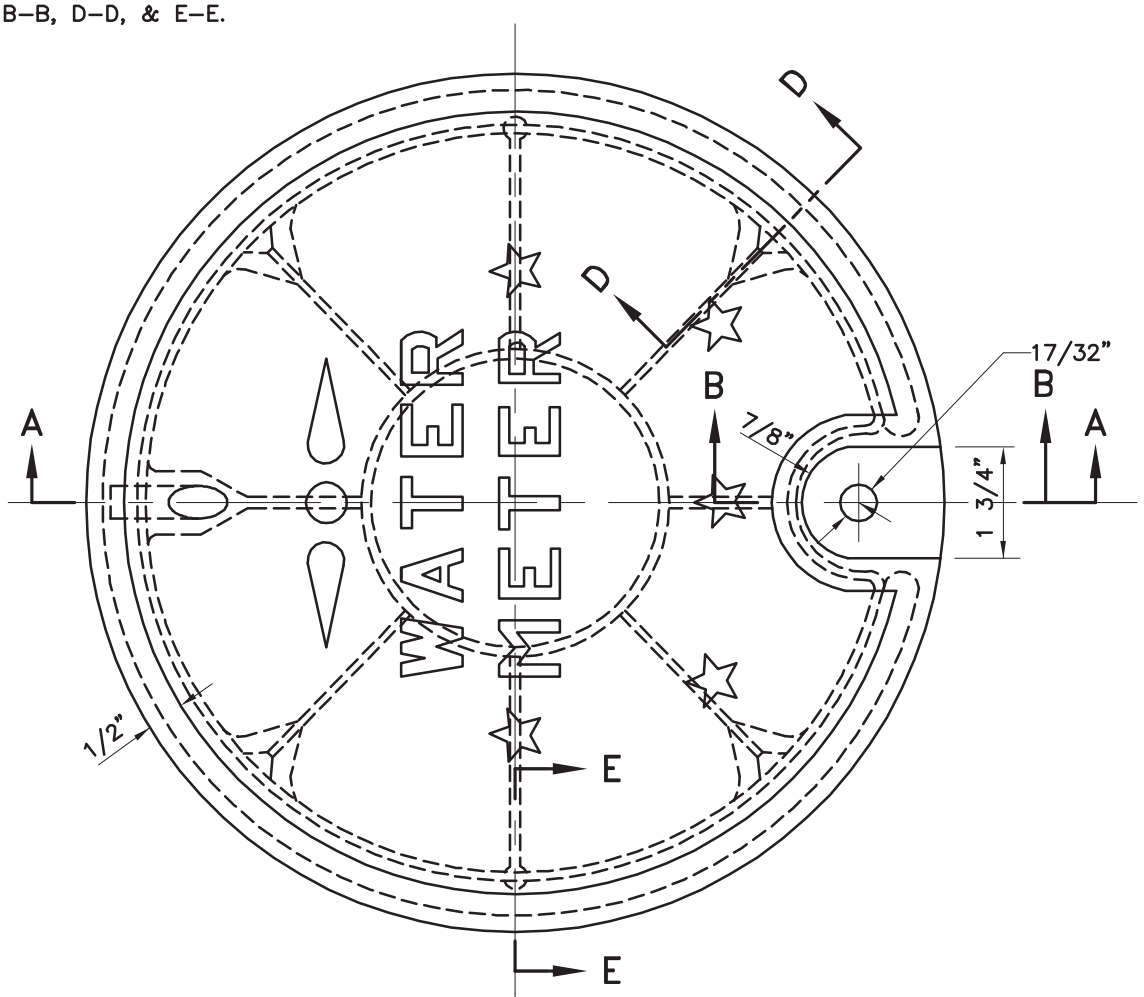
STANDARD 12" METER FRAME

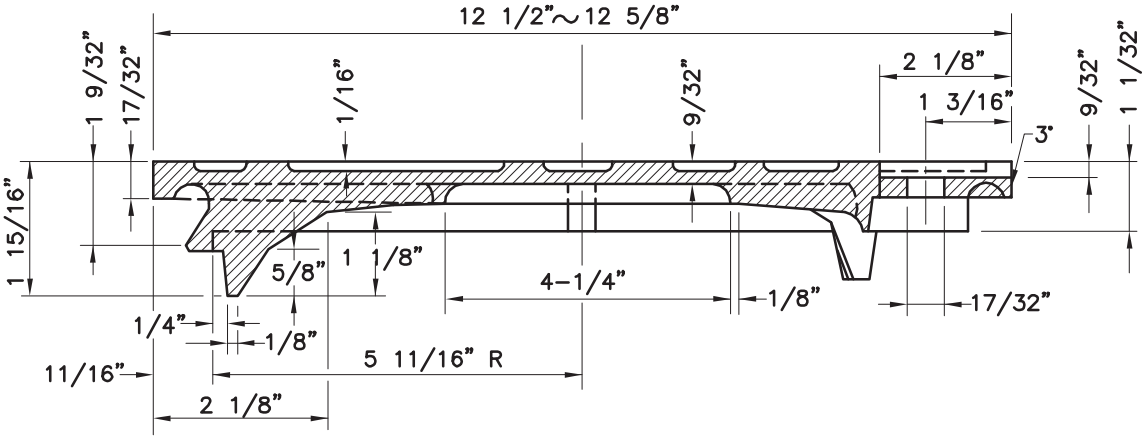
STANDARD NO. BC 873.01

SCALE : NONE

SHEET 1 OF 3

SEE STD. NO. BC 863.03 FOR
SECTION VIEWS B–B, D–D, & E–E.

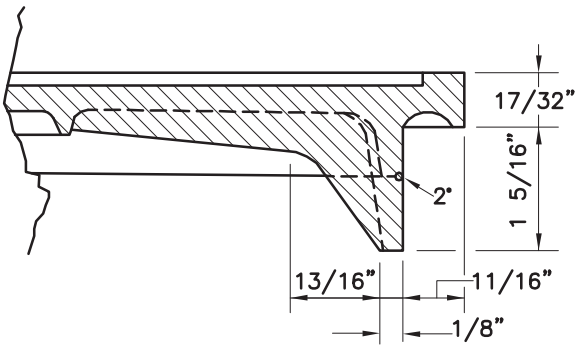




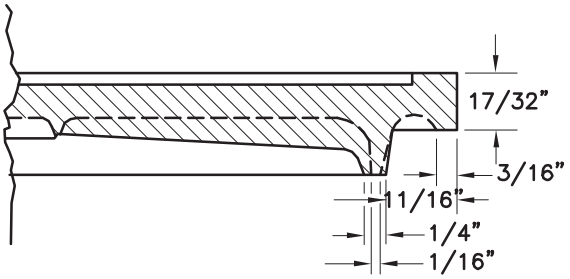
SECTION A–A

NOTE:
METER COVER MATERIAL SHALL BE CAST IRON
21,000 PSI TENSILE STRENGTH. WEIGHT=11LBS.

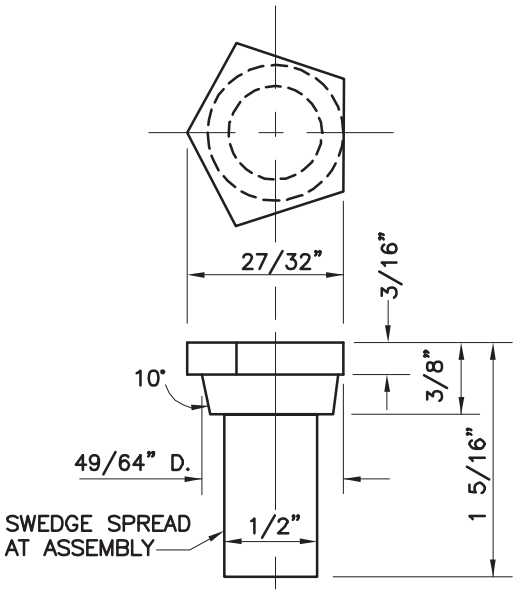
APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	STANDARD 12" METER COVER	STANDARD NO. BC 873.01		
		SCALE : NONE	SHEET 2 OF 3	



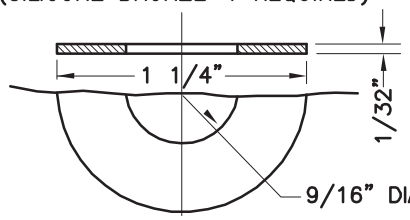
SECTION D–D



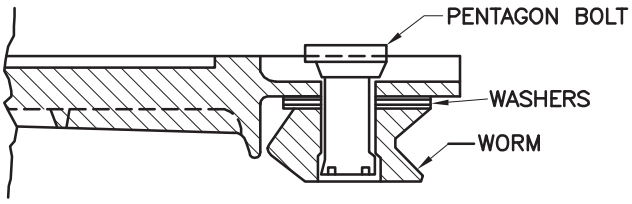
SECTION E–E



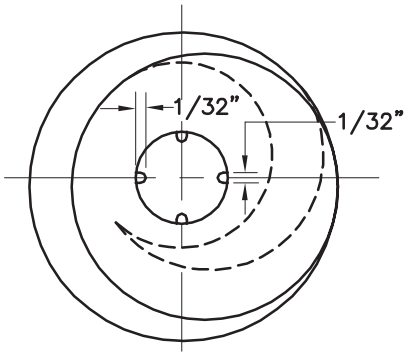
LOCKING BOLT
(SILICONE BRONZE–1 REQUIRED)

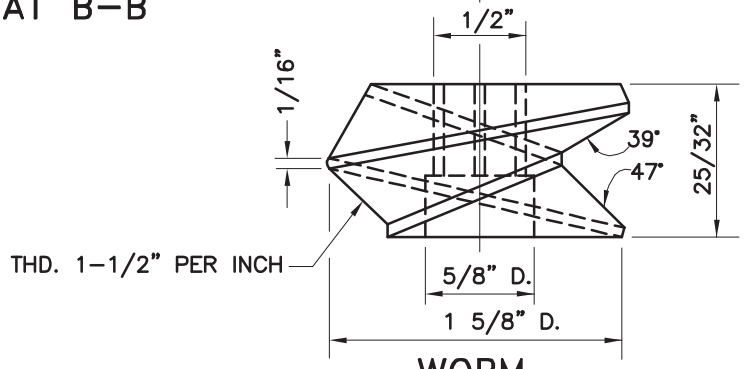


WASHERS (COPPER ALLOY – 1 REQUIRED)
(NYLON – 1 REQUIRED)



ASSEMBLED SECTION AT B–B





WORM
(CAST IRON – 1 REQUIRED)

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

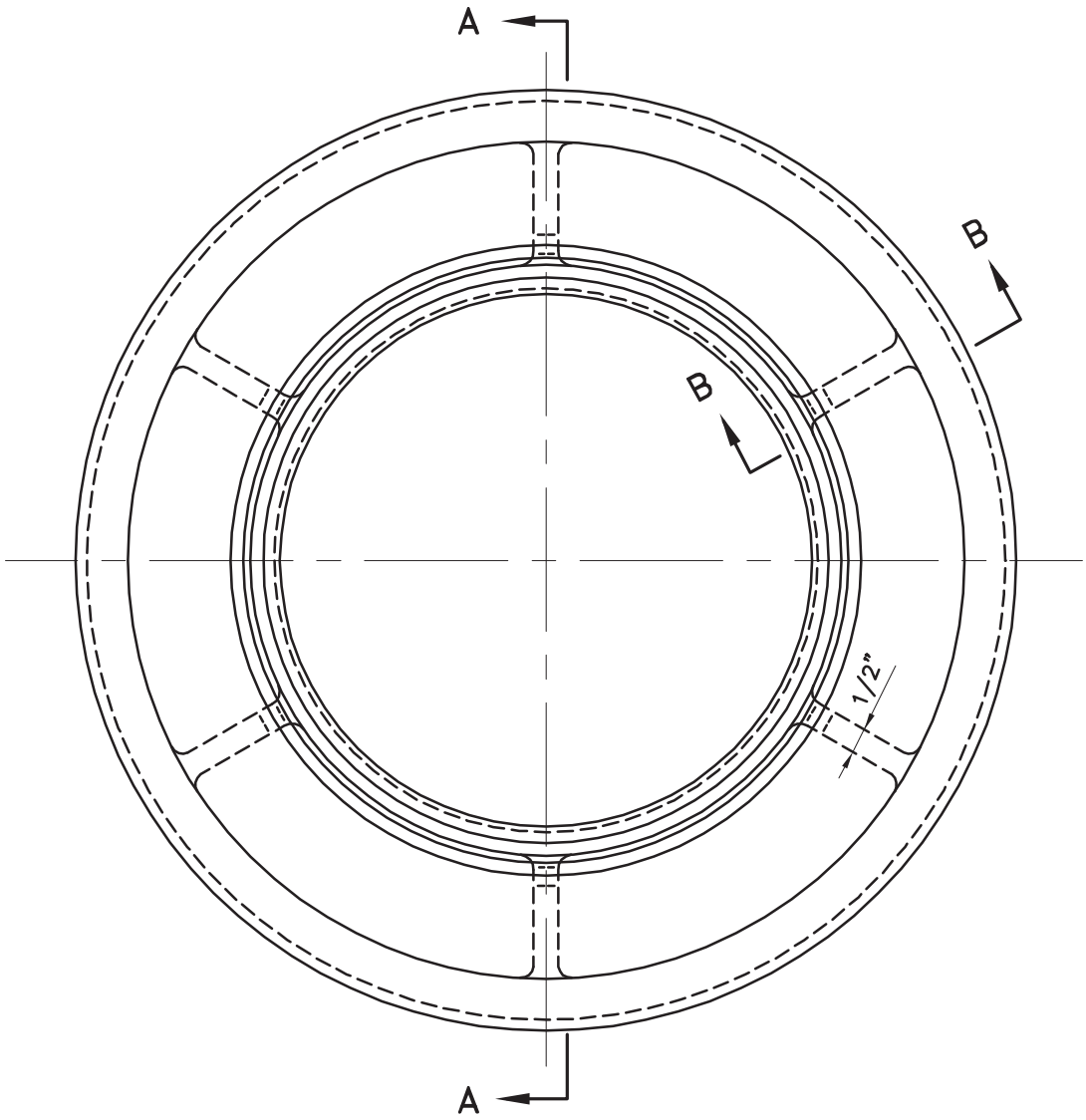
STANDARD 12" METER COVER -
LOCKING BOLT AND DETAILS

ISSUED	REVISED	REVISED
3 / 2008		

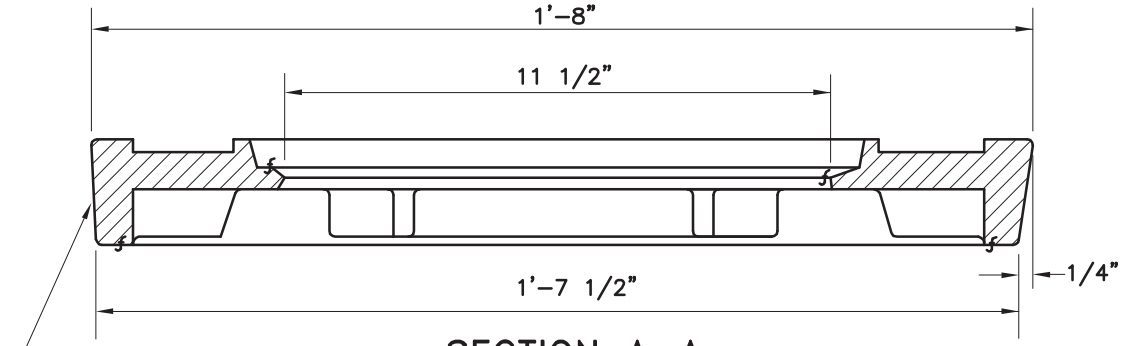
STANDARD NO.
BC 873.01

SCALE : NONE

SHEET 3 OF 3



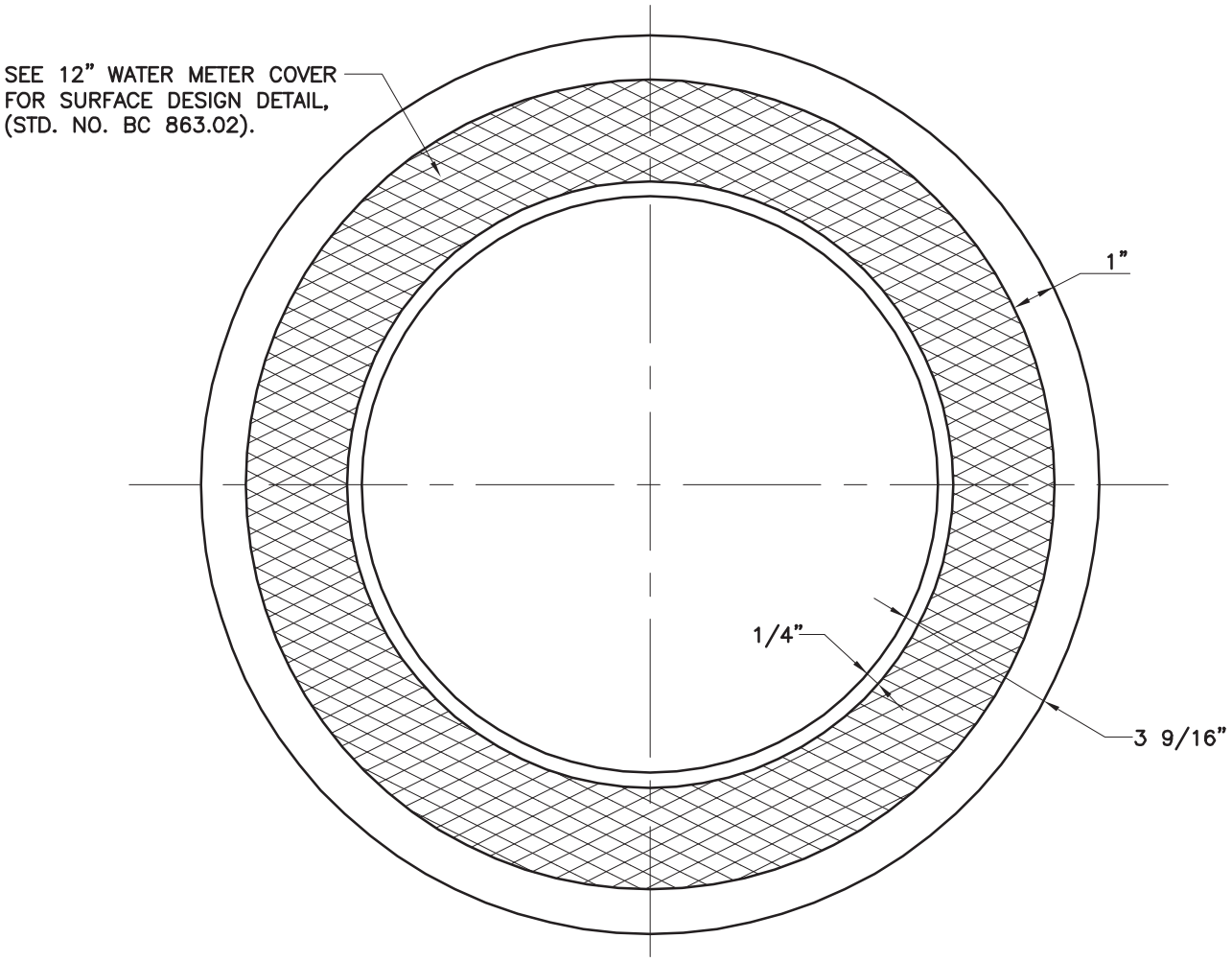
PLAN



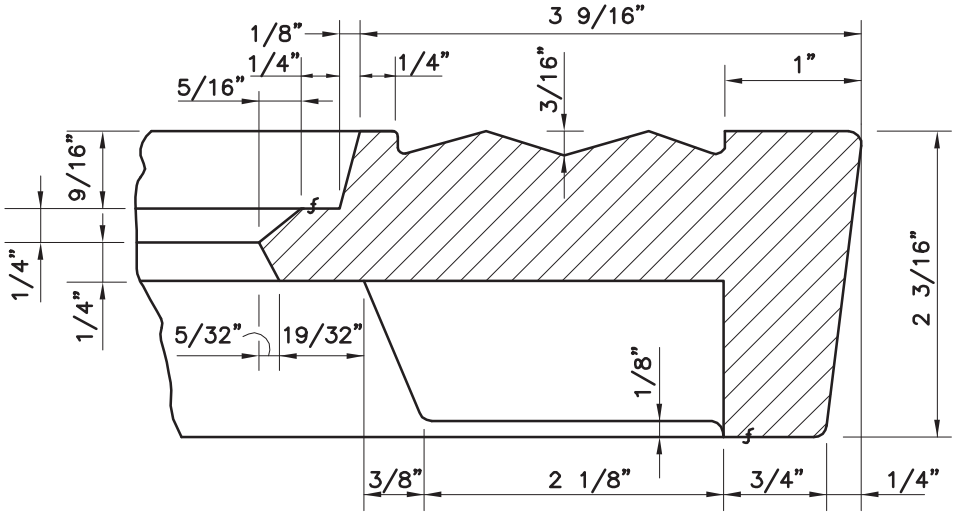
SECTION A–A

SEE SECTION B–B FOR DETAILS.

	APPROVED :	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED / REVISED
	HEAD, BUREAU OF WATER AND WASTEWATER		3 / 2008	
	DIRECTOR, DEPARTMENT OF PUBLIC WORKS	18" X 12" METER FRAME ADAPTER	STANDARD NO. BC 874.01	
			SCALE : NONE	SHEET 1 OF 2

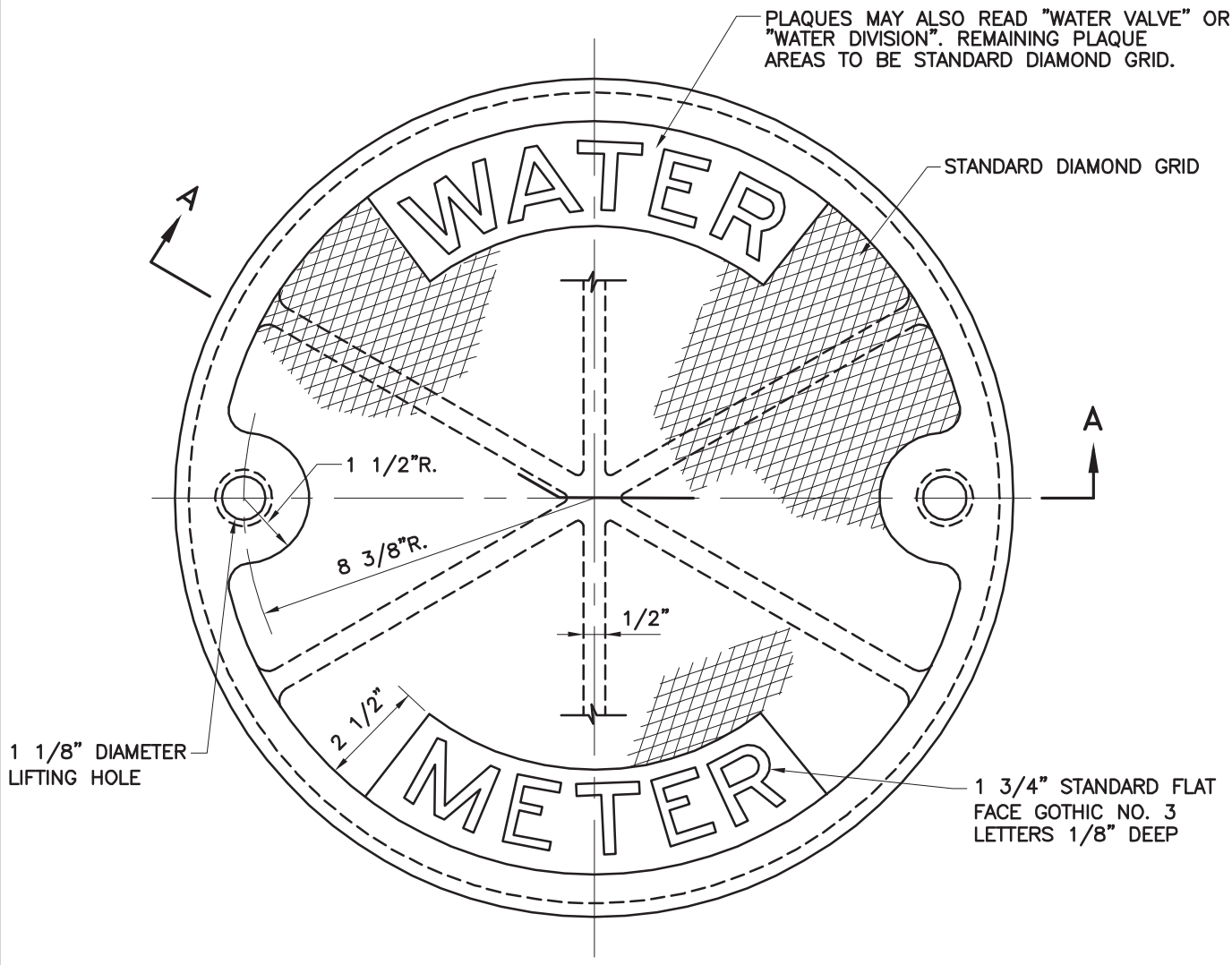


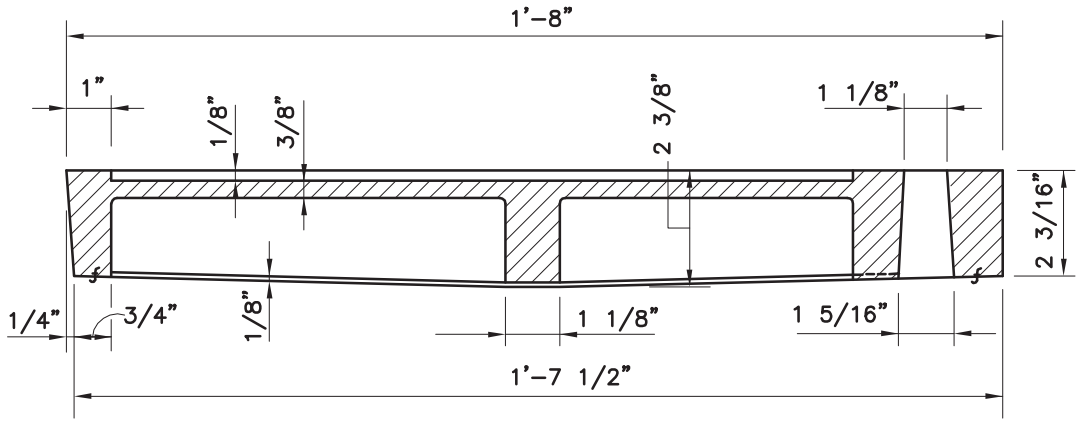
GRID PLAN



SECTION B–B

APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	18" X 12" METER FRAME ADAPTER	STANDARD NO. BC 874.01		
		SCALE : NONE	SHEET 2 OF 2	

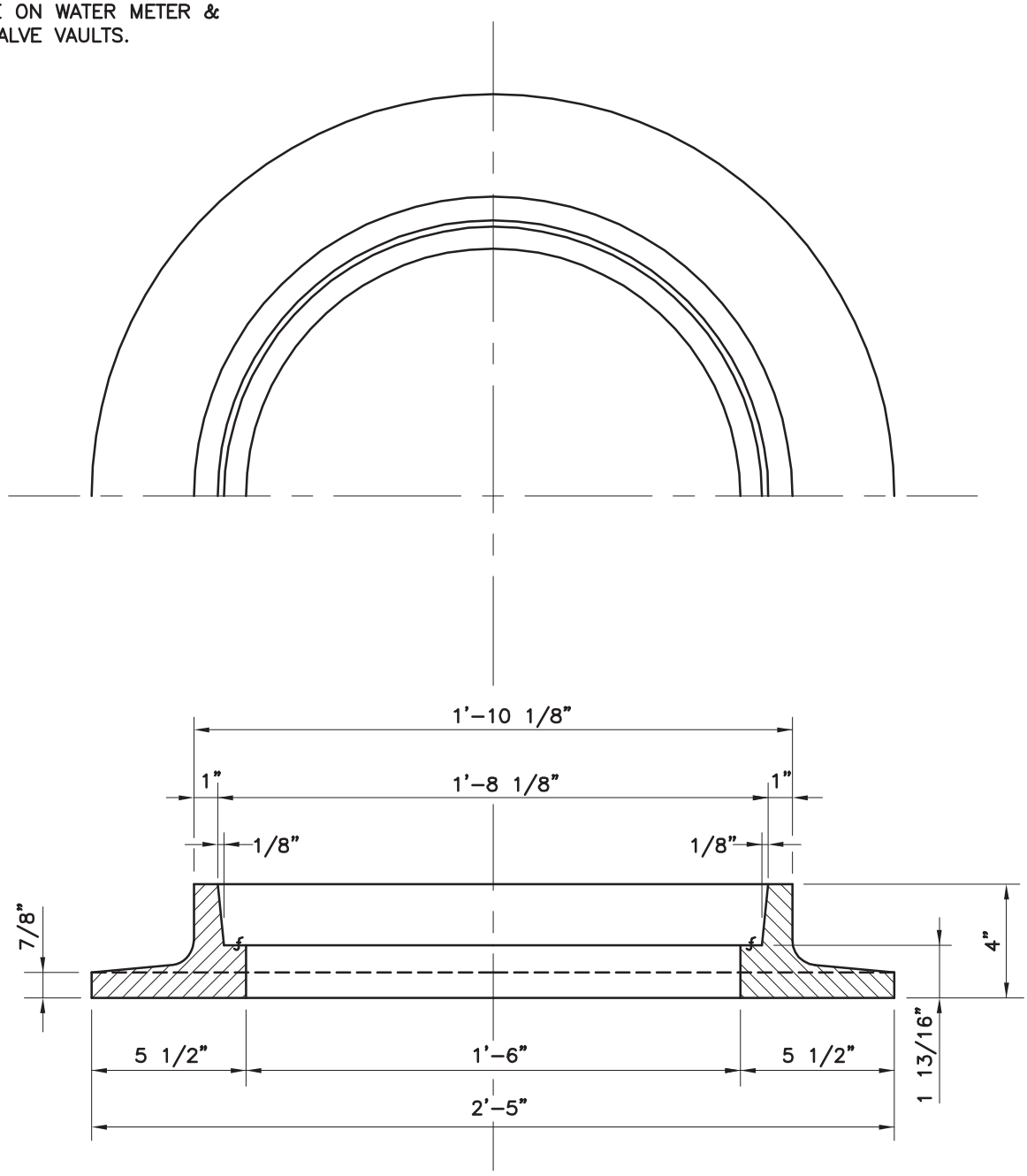




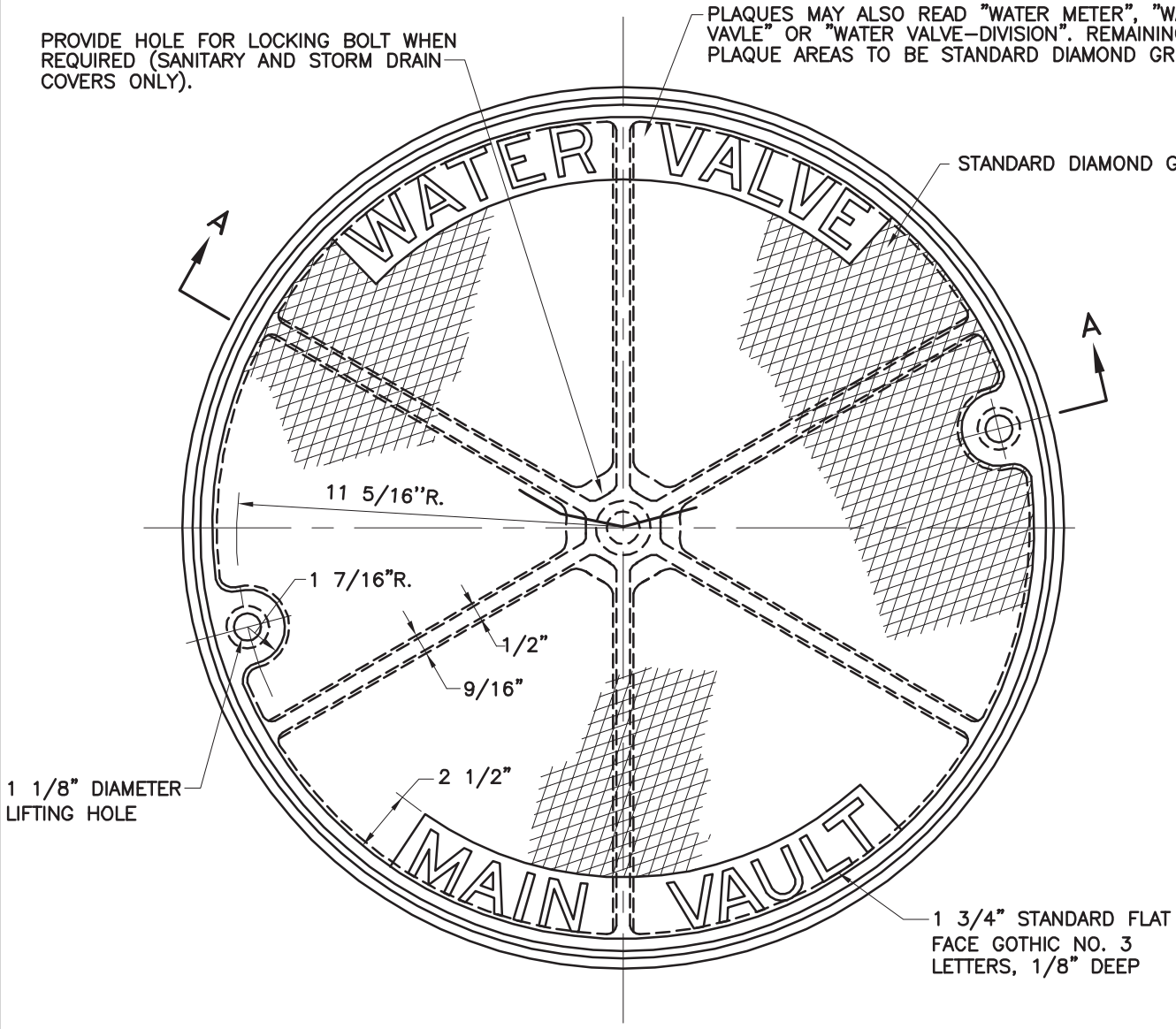
SECTION A-A

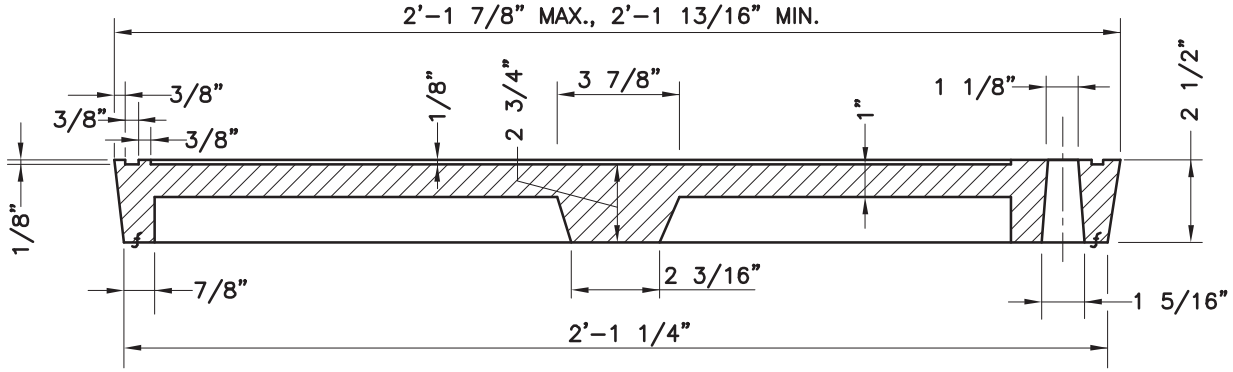
APPROVED: Bryan Sam HEAD, BUREAU OF WATER AND WASTEWATER Thule C. Williams DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	STANDARD 18" MANHOLE COVER - WATER	STANDARD NO. BC 875.01		
		SCALE : NONE	SHEET 1 OF 2	

FOR USE ON WATER METER &
WATER VALVE VAULTS.



APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	STANDARD 18" MANHOLE FRAME	STANDARD NO. BC 875.01		
		SCALE : NONE	SHEET 2 OF 2	





SECTION A–A

THIS COVER IDENTICAL WITH STANDARD 24" SANITARY AND STORM DRAIN COVERS (EXCEPT FOR 1" DIAMETER PERFORATIONS IN STORM DRAIN COVERS).

APPROVED :

HEAD, BUREAU OF WATER AND WASTEWATER

DIRECTOR, DEPARTMENT OF PUBLIC WORKS

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

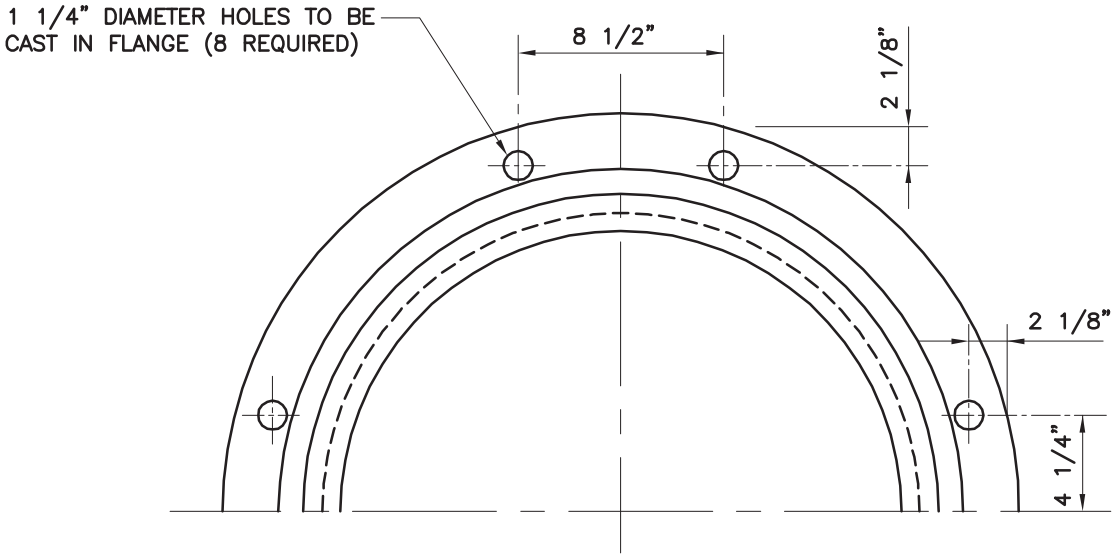
STANDARD 24" MANHOLE COVER - WATER

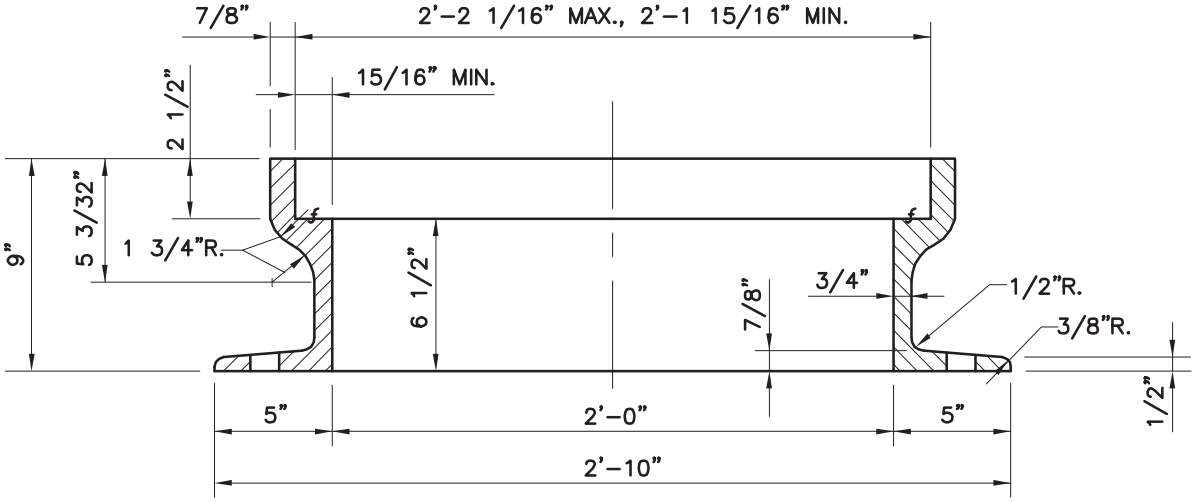
ISSUED	REVISED	REVISED
3 / 2008		

STANDARD NO. BC 876.01

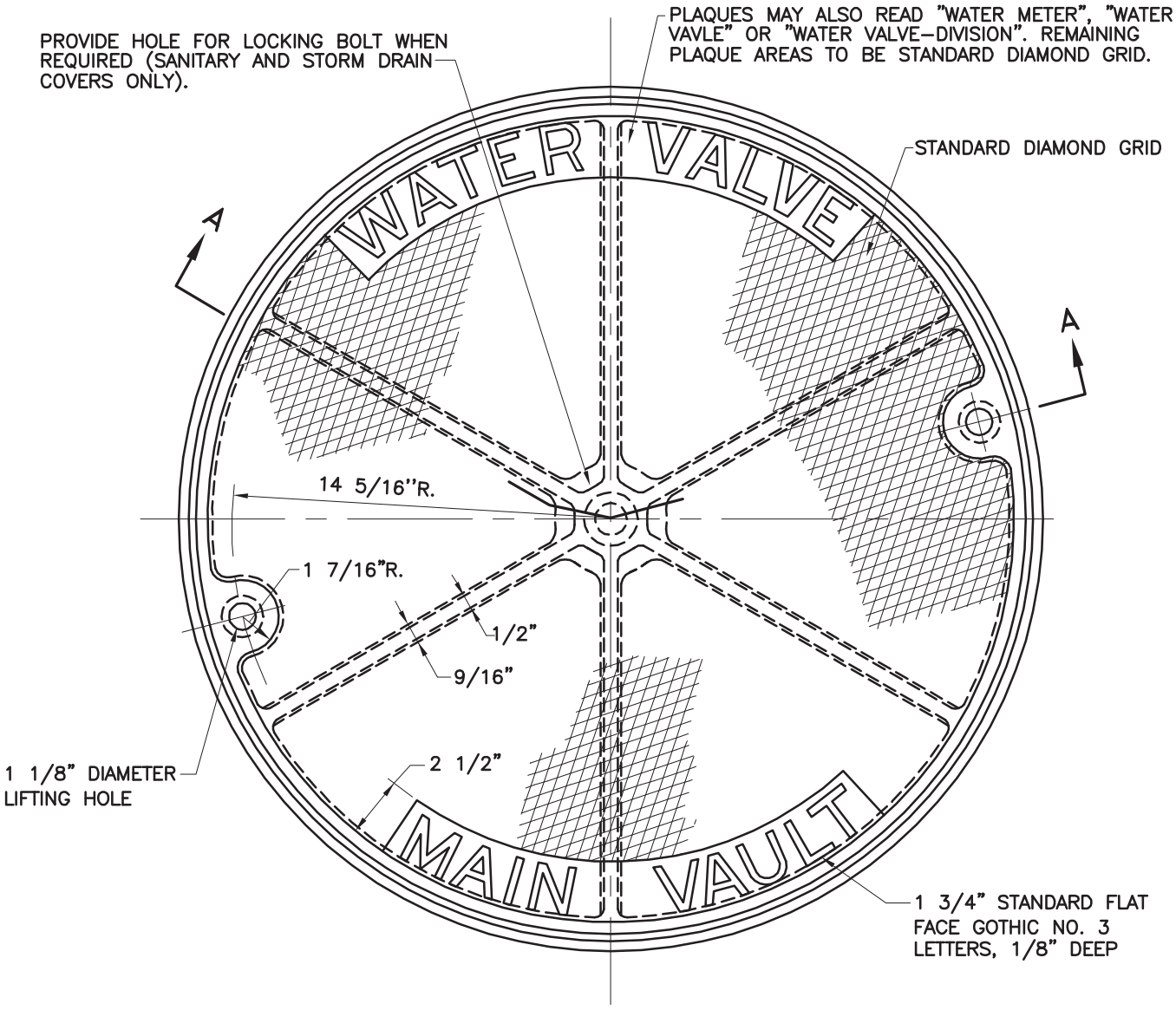
SCALE : NONE

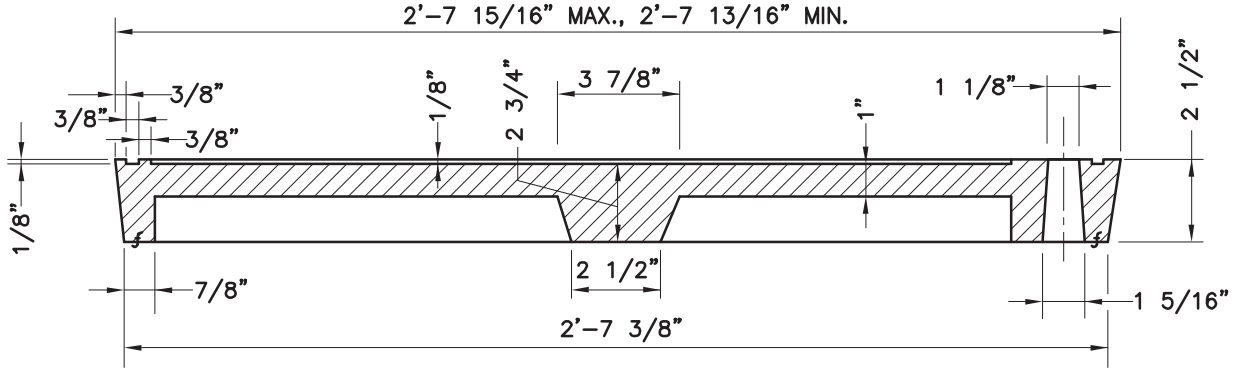
SHEET 1 OF 2





APPROVED : Bryan Sam HEAD, BUREAU OF WATER AND WASTEWATER Shirley A. Williams DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	STANDARD 24" MANHOLE FRAME - WATER	STANDARD NO. BC 876.01		
		SCALE : NONE	SHEET 2 OF 2	

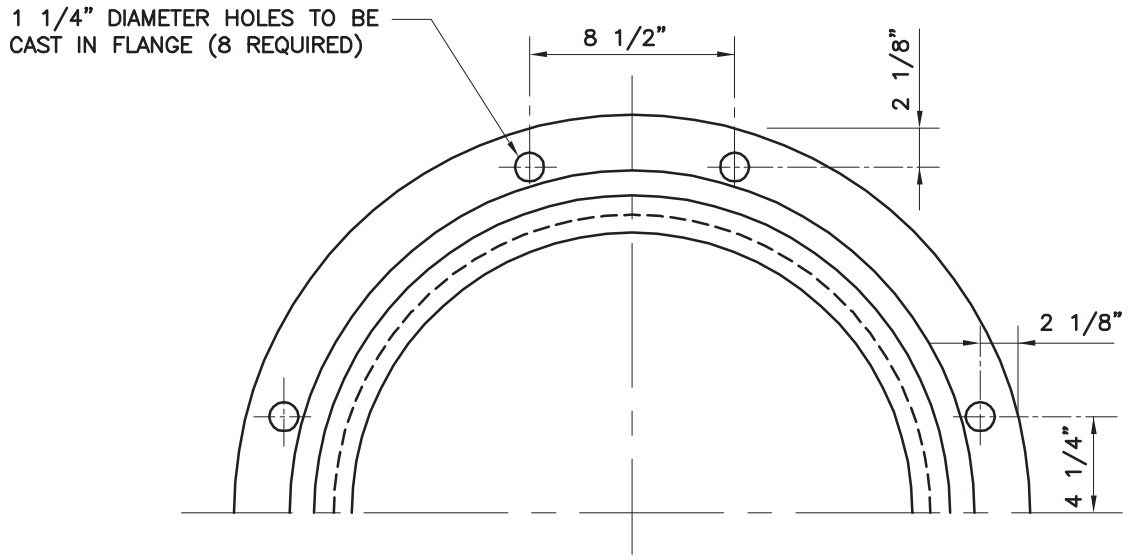


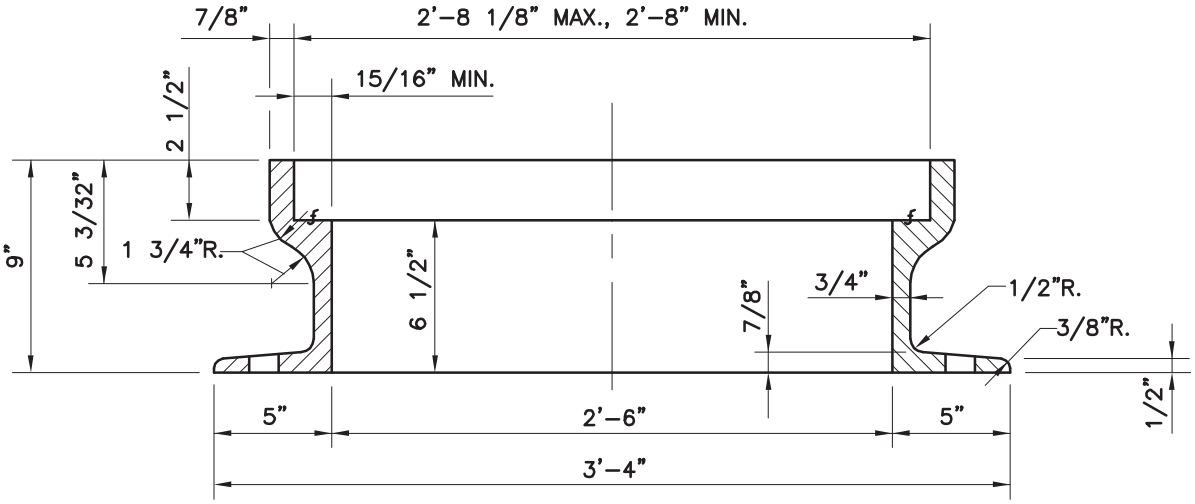


SECTION A–A

THIS COVER IDENTICAL WITH STANDARD 30" SANITARY AND STORM DRAIN COVERS (EXCEPT FOR 1" DIAMETER PERFORATIONS IN STORM DRAIN COVERS).

APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED	REVISED	REVISED
		3 / 2008		
	STANDARD 30" MANHOLE COVER - WATER	STANDARD NO. BC 877.01		
		SCALE : NONE	SHEET 1 OF 2	





CITY OF BALTIMORE 1797	APPROVED : HEAD, BUREAU OF WATER AND WASTEWATER DIRECTOR, DEPARTMENT OF PUBLIC WORKS	CITY OF BALTIMORE DEPARTMENT OF PUBLIC WORKS BUREAU OF WATER AND WASTEWATER	ISSUED / REVISED / REVISED 3 / 2008	
		STANDARD 30" MANHOLE FRAME - WATER	STANDARD NO. BC 877.01	
			SCALE : NONE	SHEET 2 OF 2

Appendix

March 2008

CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BOOK OF STANDARDS
CROSS INDEX OF DRAWINGS

STORM WATER DETAILS:

Old Std. No.	Dwg. No.	Description	Pages
BC 302.01 1 OF 2	BC 302.02	Gravel Cradle for R.C.P. Storm Drains	1 of 1
BC 302.01 2 OF 2	BC 302.03	Gravel Cradle for P.V.C. Storm Drains	1 of 1
	BC 302.04	Gravel Cradle for HDPE Storm Drains	1 of 1
BC 318.01	BC 318.02	Concrete or Brick 'Y' Single or Double	1 of 1
BC 320.01	BC 320.01	Brick and Concrete Curves for Storm Drains	1 of 1
BC 350.01	BC 350.02	End Support Wall Circular and Elliptical Pipe	1 of 2
BC 350.01	BC 350.02	End Support Wall Circular and Elliptical Pipe Tables	2 of 2
BC 352.01	BC 352.02	Type 'B' Endwalls B-48, B-54, B-60, B-66, B-72, B-78, B-84	1 of 1
BC 354.01	BC 354.02	Type 'C' Endwall Circular and Elliptical Pipe	1 of 2
BC 354.01	BC 354.02	Type 'C' Endwall Circular and Elliptical Pipe Tables	2 of 2
BC 356.01	BC 356.02	Type 'E' Endwall Circular and Elliptical Pipe	1 of 2
BC 356.01	BC 356.02	Type 'E' Endwall Circular and Elliptical Pipe Tables	2 of 2
BC 358.01,	BC 358.02	Type 'F' Endwall Circular and Elliptical Pipe	1 of 2
BC 358.02,	"	"	"
BC 358.11,	"	"	"
BC 358.12	"	"	"
BC 358.01,	BC 358.02	Type 'F' Endwall Circular and Elliptical Pipe Tables	2 of 2
BC 358.02,	"	"	"
BC 358.11,	"	"	"
BC 358.12	"	"	"
BC 358.91	BC 358.91	Standard Type 'F' Endwall Modifications	1 of 1
BC 360.01	BC 360.02	Type 'G' Endwall Circular and Elliptical Pipe	1 of 1
BC 360.91	BC 360.91	Standard Type 'G' Endwall Modifications	1 of 1
BC 368.01	BC 368.01	Concrete End Section Circular Pipe - Option No. 1	1 of 1
BC 368.02	BC 368.02	Concrete End Section Circular Pipe - Option No. 2	1 of 1
BC 370.01	BC 370.02	Metal End Section Circular Pipe	1 of 2
BC 370.11	BC 370.02	Connections Metal End Sections Circular Pipe	2 of 2
BC 376.01	BC 376.01	Type No. 1 'E' Grate(s) and Frame	1 of 1
	BC 376.02	Curved Vane (E-CV) Grate(s) with Class 35 Type 'E' Frame New Construction	1 of 1
	BC 376.03	Curved Vane (E-CV) Grate(s) for Existing Type No. 1 'E' Frame	1 of 1
BC 376.13	BC 376.14	Type 'E' Inlet	1 of 1

BC 376.22	BC 376.22	Precast Special Curb for Undepressed 'E' Combination Inlet	1 of 2
BC 376.22	BC 376.22	Precast Special Curb for Depressed 'E' Combination Inlet	2 of 2
BC 376.23	BC 376.24	Type 'E' Combination Inlet	1 of 1
BC 376.29	BC 376.30	Duplex Type 'E' Inlet	1 of 1
BC 376.53	BC 376.54	Type 'H' Inlet	1 of 1
BC 376.62	BC 376.62	Type No. 2 'H' Grate	1 of 1
BC 376.63	BC 376.64	Type 'H' Combination Inlet	1 of 1
BC 376.91	BC 376.91	Precast Type 'H' Inlet Head	1 of 1
BC 376.92	BC 376.92	Curb Armor for Type 'H' Inlet Head	1 of 1
BC 376.93	BC 376.93	18 In. Inlet Frame and Cover	1 of 1
BC 377.11	BC 377.12	Type 'J' Chute Inlet	1 of 1
BC 379.01	BC 380.01	Type 'S' Inlet Single Grate	1 of 1
BC 379.02	BC 380.02	Type 'S' Frame and Grate Parallel Bars	1 of 1
BC 379.03	BC 380.03	Type 'S' Frame and Grate Sections Parallel Bars	1 of 1
BC 379.04 1 OF 2	BC 380.04	Type 'S' Frame and Grate Transverse Bars	1 of 1
BC 379.04 2 OF 2	BC 380.05	Type 'S' Frame and Grate Sections Transverse Bars	1 of 1
	BC 380.06	Curved Vane (S-CV) Grate(s) with Class 35 Type 'S' Frame New Construction	1 of 1
	BC 380.07	Curved Vane (S-CV) Grate(s) for Existing Type 'S' Frame	1 of 1
BC 379.11	BC 380.11	Type 'S' Inlet Single Grate (Ditch Installation)	1 of 1
BC 379.21	BC 380.21	Type 'S' Inlet Double Grate Tandem	1 of 1
BC 379.31	BC 380.31	Type 'S' Inlet Double Grate Tandem (Ditch Installation)	1 of 1
BC 379.51	BC 380.51	Type 'S' Combination Inlet Double Grate Tandem	1 of 1
BC 379.52	BC 380.52	Precast Special Curb Type 'S' Combination Inlet Double Grate Tandem	1 of 1
BC 379.53	BC 380.53	Beam and Plate Detail Type 'S' Combination Inlet Double Grate Tandem	1 of 1
BC 379.99	BC 380.99	Method of Depressing Paving at Inlets	1 of 1
BC 383.01,	BC 383.02	Brick or Cast in Place Standard Storm Manhole	1 of 1
BC 383.04	BC 383.04	48" Dia. Precast Storm Manhole for 15" to 24" Pipes	1 of 1
BC 383.05	BC 383.05	60" Dia. Precast Storm Manhole for 27" to 36" Pipes	1 of 1
BC 383.06	BC 383.06	72" Dia. Precast Storm Manhole for 42" to 48" Pipes	1 of 1
	BC 383.07	84" Dia. Precast Storm Manhole for 54" to 60" Pipes	1 of 1
BC 383.11	BC 383.21	Standard 24 In. Manhole Cover	1 of 1
BC 383.12	BC 383.22	Standard 24 In. Manhole Frame	1 of 1
BC 383.13	BC 383.23	Standard 30 In. Manhole Cover	1 of 1
BC 383.14	BC 383.24	Standard 30 In. Manhole Frame	1 of 1
BC 383.15	BC 383.25	Locking Device for Manhole Frame and Cover	1 of 1
BC 383.31	BC 383.31	Typical Manhole Channels: Standard Channel No. 1, Standard Channel No. 2	1 of 1
BC 383.32	BC 383.32	Typical Manhole Channels: Standard Channel No. 3, Standard Channel No. 4, Standard Channel No. 5	1 of 1

BC 383.33	BC 383.33	Typical Manhole Channels: Standard Channel No. 6, Standard Channel No. 7	1 of 1
BC 383.34	BC 383.34	Typical Manhole Channels: Standard Channel No. 8, Standard Channel No. 9, Standard Channel No. 10	1 of 1
BC 383.35	BC 383.35	Typical Manhole Channels: Standard Channel No. 11, Standard Channel No. 12	1 of 1
BC 383.90,	BC 383.92	Stainless Steel Manhole Step	1 of 1
	BC 383.93	Polypropylene Manhole Step for Precast Manholes	1 of 1
BC 386.41	BC 386.41	Concrete Cradle for R.C.P. Storm Drains	1 of 1
BC 386.51	BC 386.51	Concrete Encasement for Storm Drains	1 of 1
BC 389.01	BC 389.01	Standard Berm Ditches Concrete and Sod	1 of 1
BC 389.02	BC 389.02	Standard Side Ditches - V Slope	1 of 1

WASTEWATER DETAILS:

Old Std. No.	Std. No.	Description	Pages
BC 830.01 1 OF 3	BC 830.01	Gravel Cradle for E.S.C.P. Sanitary Sewers	1 of 1
BC 830.01 2 OF 3	BC 830.02	Gravel Cradle for R.C.P. Sanitary Sewers	1 of 1
BC 830.01 3 OF 3	BC 830.03	Gravel Cradle for P.V.C. Sanitary Sewers	1 of 1
BC 830.02	BC 830.04	Concrete Encasement for Sanitary Sewers	1 of 1
BC 830.03	BC 830.05	Standard Brick and Concrete Curves for Sanitary Sewers	1 of 1
BC 830.04	BC 830.06	Concrete Cradle for Sanitary Sewers	1 of 1
BC 830.13	BC 830.13	Typical Plugging Detail Sanitary House Connection	1 of 1
BC 830.10	BC 830.14	Typical Installations of Sanitary House Connections	1 of 1
BC 830.11	BC 830.15	Typical House Connection with Cleanout in Public Right of Way	1 of 1
BC 830.12	BC 830.16	Typical Installations of Standpipe House Connections	1 of 1
	BC 830.17	Saddle Installation Detail for New House Connection to Existing Sewer	1 of 1
	BC 830.18	Pipe Replacement Detail for New House Connections to Existing Sewers	1 of 1
	BC 830.19	Measuring and Recording As Built Location of New Sanitary House Connections	1 of 2
	BC 830.19	Measuring and Recording As Built Location of New Sanitary House Connections	2 of 2
	BC 830.20	Typical Detail for Leakage Exfiltration Testing	1 of 1
BC 870.01	BC 831.01	Standard Brick Sanitary Manhole	1 of 1
BC 870.02	BC 831.02	Sanitary Manhole Type C	1 of 1
BC 870.03	BC 831.03	Sanitary Terminal Manhole	1 of 1

BC 870.35	BC 831.04	48” Diameter Precast Sanitary Manhole for Pipe Diameters up to 24”	1 of 1
BC 870.36	BC 831.05	60” Diameter Precast Sanitary Manhole for Pipe Diameters up to 36”	1 of 1
BC 870.37	BC 831.06	72” Diameter Precast Sanitary Manhole for Pipe Diameters up to 48”	1 of 1
BC 870.39	BC 831.07	48” Diameter Precast “Doghouse” Riser for Pipe Diameters up to 24”	1 of 1
	BC 831.08	60” Diameter Precast “Doghouse” Riser for Pipe Diameters up to 36”	1 of 1
BC 870.04	BC 831.09	Sanitary Type A Drop Connection/Sanitary Type B Drop Connection	1 of 1
	BC 831.10	Manhole Abandonment	1 of 1
BC 870.05	BC 831.20	Sanitary Offset Manhole 30" Cover	1 of 1
BC 870.06	BC 831.21	Standard Sanitary Manhole Precast Slab	1 of 1
BC 870.07	BC 831.22	Precast Manhole Slab for 24" Frame	1 of 1
BC 870.08	BC 831.23	Special Fittings	1 of 1
BC 870.11	BC 831.24	Standard San. 24" Manhole Cover	1 of 1
BC 870.12	BC 831.25	Standard 24" Manhole Frame	1 of 1
BC 870.13	BC 831.26	Standard Sanitary 30" Manhole Cover	1 of 1
BC 870.14	BC 831.27	Standard 30" Manhole Frame	1 of 1
BC 870.15	BC 831.28	Locking Device for Manhole Frame & Cover	1 of 1
	BC 831.29	Cleanout Cover Assembly	1 of 1
BC 870.16	BC 831.30	Type 1 Step for Brick Manholes	1 of 1
BC 870.l7	BC 831.31	Type 2 Step for Precast & Cast in Place Manholes	1 of 1
	BC 831.32	Copolymer Polypropylene Steps for Precast and Cast in Place Manholes	1 of 1
BC 870.30	BC 831.35	Typical Manhole Channels Standard Channel No.1 and No.2	1 of 1
BC 870.31	BC 831.36	Typical Manhole Channels Standard Channel No.3, No.4 and No.5	1 of 1
BC 870.32	BC 831.37	Typical Manhole Channels Standard Channel No.6 and No.7	1 of 1
BC 870.33	BC 831.38	Typical Manhole Channels Standard Channel No.8, No.9 and No. 10	1 of 1
BC 870.34	BC 831.39	Typical Manhole Channels Standard Channel No. 11 and No. 12	1 of 1

WATER DETAILS:

Old Std. No.	Std. No.	Description	Pages
BC 835.01	BC 833.01	Standard Installation of Fire Hydrant with Tee and Valve (Sectional Vault)	1 of 1
BC 835.01	BC 833.02	Standard Installation of Fire Hydrant with Tee and Valve (Roadway Box)	1 of 1
BC 835.02	BC 833.03	Standard Installation of Fire Hydrant with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 835.02	BC 833.04	Standard Installation of Fire Hydrant with Tapping Sleeve and Valve (Roadway Box)	1 of 1
	BC 834.01	Standard Installation of Resilient - Seated Valve with Roadway Box (4" - 14")	1 of 1
BC 836.20	BC 834.02	Standard Installation of Tapping Valve with Small Sectional Vault (4" - 8")	1 of 1
	BC 834.03	Standard Installation of Tapping Valve with Roadway Box (4" - 8")	1 of 1
BC 836.21	BC 834.04	Standard Installation of Tapping Valve with Large Sectional Vault (10" - 12")	1 of 1
	BC 834.05	Standard Installation of Tapping Valve with Roadway Box (10" - 12")	1 of 1
	BC 834.06	Standard Installation of Tapping Sleeve and Horizontal Valve with Sectional Vault (4" - 24")	1 of 1
	BC 834.07	Standard Installation of Tapping Sleeve and Horizontal Valve with Roadway Box (4" - 14")	1 of 1
	BC 835.01	Standard Installation of Butterfly Valve with Sectional Vault (30" - 72")	1 of 1
	BC 835.02	Standard Installation of Butterfly Valve with Roadway Box (30" - 72")	1 of 1
	BC 835.03	Standard Butterfly Valve Over Torque Protector	1 of 1
BC 840.01	BC 836.01	Standard Installation of 3/4" Water Supply Service (5/8" Meter)	1 of 1
BC 840.02	BC 837.01	Standard Installation of 1" Water Supply Service (3/4" Meter)	1 of 1
BC 840.03	BC 838.01	Standard Installation of Twin Water Supply Services (5/8" Meters)	1 of 1
BC 840.04	BC 839.01	Standard Installation of 1 1/2" Water Supply Service (1" Meter) for 6" Main and Larger	1 of 1
BC 840.05	BC 839.02	Standard Installation of 1 1/2" Water Supply Service (1" Meter) for Mains Smaller Than 6"	1 of 1
BC 840.06	BC 840.01	Standard Installation of 2" Water Supply Service (1 1/2" Meter) for 8" Main and Larger	1 of 1
BC 840.07	BC 840.02	Standard Installation of 2" Water Supply Service (1 1/2" Meter) for 6" Main and Smaller	1 of 1

BC 840.08	BC 840.03	Standard Installation of 2" Water Supply Service (2" Meter) for 8" Main and Larger	1 of 2
BC 840.09	BC 840.03	Standard Installation of 2" Water Supply Service (2" Meter) for 8" Main and Larger	2 of 2
	BC 841.01	Standard Installation for Fire Protection 1 1/2" Water Supply Service (3/4" Meter) for 4" Main	1 of 1
	BC 841.02	Standard Installation for Fire Protection 1 1/2" Water Supply Service (1" Meter) for 4" Main	1 of 1
	BC 841.03	Standard Installation for Fire Protection 1 1/2" Twin Water Supply Services (3/4" Meters) for 4" Main	1 of 1
	BC 841.04	Standard Installation for Fire Protection 1 1/2" Twin Water Supply Services (1" Meters) for 4" Main	1 of 1
	BC 841.05	Standard Installation for Fire Protection 1 1/2" Water Supply Service (3/4" Meter) for 6" Main and Larger	1 of 1
	BC 841.06	Standard Installation for Fire Protection 1 1/2" Water Supply Service (1" Meter) for 6" Main and Larger	1 of 1
	BC 841.07	Standard Installation for Fire Protection 1 1/2" Twin Water Supply Services (3/4" Meters) for 6" Main and Larger	1 of 1
	BC 841.08	Standard Installation for Fire Protection 1 1/2" Twin Water Supply Services (1" Meters) for 6" Main and Larger	1 of 1
BC 840.10 1 OF 3	BC 842.01	Standard Installation of 4" & 6" Water Supply Services (4" & 6" Meters)	1 of 1
BC 840.10 2 OF 3	BC 842.02	Standard Installation of 4" & 6" Water Supply Services (3" & 4" Meters with Reducers)	1 of 1
BC 840.10 3 OF 3	BC 842.03	Standard Vault for 4" & 6" Water Supply Services	1 of 1
	BC 843.01	Standard Installation of 4" & 6" Water Supply Services (3", 4", & 6" Meters) with Tee and Valve (Roadway Box)	1 of 1
	BC 843.02	Standard Installation of 4" & 6" Water Supply Services (3", 4", & 6" Meters) with Tee and Valve (Sectional Vault)	1 of 1
	BC 843.03	Standard Installation of 4" & 6" Water Supply Services (3", 4", & 6" Meters) with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 840.14 1 OF 2	BC 844.01	Standard Vault for 4", 6", 8", & 10" Detector Checks with Large Domestic Meters	1 of 3
BC 840.14 1 OF 2	BC 844.01	Rebar Schedule for Standard Vault for 4", 6", 8", & 10" Detector Checks with Large Domestic Meters	2 of 3
BC 840.14 2 OF 2	BC 844.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", & 10" Detector Checks with Large Domestic Meters	3 of 3
BC 840.15 1 OF 2	BC 845.01	Standard Vault for 4", 6", 8", & 10" Detector Checks with Reduced Size Large Domestic Meters	1 of 3
BC 840.15 1 OF 2	BC 845.01	Rebar Schedule for Standard Vault for 4", 6", 8", & 10" Detector Checks with Reduced Size Large Domestic Meters	2 of 3

BC 840.15 2 OF 2	BC 845.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", & 10" Detector Checks with Reduced Size Large Domestic Meters	3 of 3
BC 840.16 1 OF 2	BC 846.01	Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Small Domestic Meters	1 of 2
BC 840.16 2 OF 2	BC 846.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Small Domestic Meters	2 of 2
BC 840.17 1 OF 2	BC 847.01	Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters	1 of 3
BC 840.17 1 OF 2	BC 847.01	Rebar Schedule for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters	2 of 3
BC 840.17 2 OF 2	BC 847.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters	3 of 3
BC 840.18 1 OF 2	BC 848.01	Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Large Domestic Meters	1 of 3
BC 840.18 1 OF 2	BC 848.01	Rebar Schedule for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Large Domestic Meters	2 of 3
BC 840.18 2 OF 2	BC 848.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Large Domestic Meters	3 of 3
BC 840.19 1 OF 2	BC 849.01	Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Reduced Size Large Domestic Meters	1 of 3
BC 840.19 1 OF 2	BC 849.01	Rebar Schedule for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Reduced Size Large Domestic Meters	2 of 3
BC 840.19 2 OF 2	BC 849.01	Roof Slab and Concrete Quantities for Standard Vault for 4", 6", 8", 10", & 12" F. M. Meters with Reduced Size Large Domestic Meters	3 of 3
BC 840.90	BC 850.01	Standard Installation of 4", 6", 8", 10", & 12" Fire Supply Services with Water Supply Service (Outside Fire Hydrants) with Tee and Valve (Sectional Vault)	1 of 1
BC 840.90	BC 850.02	Standard Installation of 4", 6", 8", 10", & 12" Fire Supply Services with Water Supply Service (Outside Fire Hydrants) with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 840.91	BC 851.01	Standard Installation of 4", 6", 8", & 10" Fire Supply Services with Water Supply Service (No Outside Fire Hydrants) with Tee and Valve (Sectional Vault)	1 of 1
BC 840.91	BC 851.02	Standard Installation of 4", 6", 8", & 10" Fire Supply Services with Water Supply Service (No Outside Fire Hydrants) with Tapping Sleeve and Valve (Sectional Vault)	1 of 1
BC 840.92	BC 852.01	Standard Installation for 4", 6", 8", 10", & 12" Water Supply Services (4", 6", 8", 10", & 12" Combined Services) with Tee and Valve (Sectional Vault)	1 of 1
BC 840.92	BC 852.02	Standard Installation for 4", 6", 8", 10", & 12" Water Supply Services (4", 6", 8", 10", & 12" Combined Services) with Tapping Sleeve and Valve (Sectional Vault)	1 of 1

BC 840.93	BC 853.01	Standard Water Meter Vaults	1 of 1
BC 890.34	BC 854.01	Standard Installation of Water Main on Structures (Steel Pipe Only)	1 of 1
BC 890.35	BC 854.02	Bolt Size Chart for Standard Installation of Water Main on Structures (Steel Pipe Only)	1 of 1
	BC 855.01	Water Main Relocation Under Proposed Utility	1 of 1
	BC 856.01	Standard Air Release Valve and Vault Precast and Cast in Place	1 of 1
BC 890.30	BC 857.01	Standard Installation for Blow	1 of 1
BC 890.31	BC 858.01	Standard Plug Clamps - 1	1 of 2
BC 890.32	BC 858.01	Standard Plug Clamps - 2	2 of 2
BC 890.33	BC 859.01	Standard Tie Bolt	1 of 1
BC 837.23	BC 860.01	Buttress for Tees (For 4" - 20")	1 of 1
BC 837.22	BC 861.01	Buttress for Caps (For 4" - 20")	1 of 1
BC 837.12 to BC 837.21	BC 862.01	Buttress for Horizontal Bends (For 4" - 20")	1 of 1
	BC 863.01	Thrust Blocks for Reducers (For 8" x 4" to 16" x 12")	1 of 1
	BC 864.01	In-Line Thrust Blocks (For 4" - 12")	1 of 1
BC 837.25	BC 865.01	Double Caps, Jack and Buttress (For D.I. and C.I. Pipe Only)	1 of 1
BC 837.01 to BC 837.03	BC 866.01	Anchorages for Upper Vertical Bends (For 4" - 20")	1 of 1
BC 837.04 to BC 837.11	BC 867.01	Buttress for Lower Vertical Bends (For 4" - 20")	1 of 1
	BC 868.01	Buttress for Wye Connection (For 4" - 20")	1 of 1
BC 890.01	BC 869.01	Table of Sections Required for Concrete Valve Vaults	1 of 1
BC 890.02	BC 870.01	Standard Sections for Small Concrete Vaults	1 of 3
BC 890.04	BC 870.01	Detail of Small Sectional Concrete Vault	2 of 3
BC 890.05	BC 870.01	Details of "D" and "E" Sections - Small Sectional Concrete Vault	3 of 3
BC 890.02	BC 871.01	Standard Sections for Large Sectional Concrete Vaults	1 of 4
BC 890.06	BC 871.01	Detail of Large Sectional Concrete Vault ("A" and "B" Sections)	2 of 4
BC 890.07	BC 871.01	Detail of Large Sectional Concrete Vault ("C" and "D" Sections)	3 of 4
BC 890.08	BC 871.01	"E" Section and "F" Sections Large Concrete Vault Top Slab	4 of 4
BC 835.03	BC 872.01	7 1/2" Roadway Box Top	1 of 6
BC 835.03	BC 872.01	7 1/2" Roadway Box Bottom	2 of 6
BC 835.04	BC 872.01	7 1/2" Roadway Box Extension	3 of 6
	BC 872.01	7 1/2" Roadway Box Lid (On Resilient or Butterfly Valve)	4 of 6
	BC 872.01	1 1/2", 2", & 2 1/2" Valve Box Riser (Heavy Duty)	5 of 6
BC 890.11	BC 872.01	Standard 7 1/2" Valve Cover - Water	6 of 6
BC 890.12	BC 873.01	Standard 12" Meter Frame	1 of 3
BC 890.13	BC 873.01	Standard 12" Meter Cover	2 of 3
BC 890.14	BC 873.01	Standard 12" Meter Cover - Locking Bolt and Details	3 of 3

BC 890.18	BC 874.01	18" x 12" Meter Frame Adapter	1 of 2
BC 890.19	BC 874.01	18" x 12" Meter Frame Adapter	2 of 2
BC 890.20	BC 875.01	Standard 18" Manhole Cover - Water	1 of 2
BC 890.21	BC 875.01	Standard 18" Manhole Frame	2 of 2
BC 890.22	BC 876.01	Standard 24" Manhole Cover - Water	1 of 2
BC 890.23	BC 876.01	Standard 24" Manhole Frame - Water	2 of 2
BC 890.24	BC 877.01	Standard 30" Manhole Cover - Water	1 of 2
BC 890.25	BC 877.01	Standard 30" Manhole Frame - Water	2 of 2