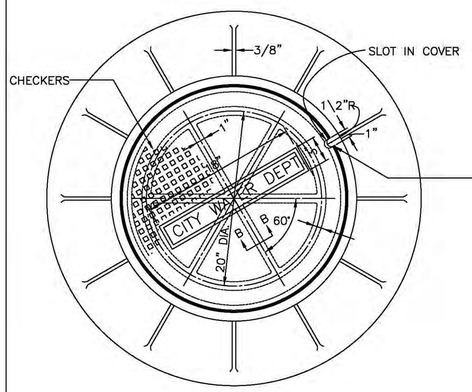
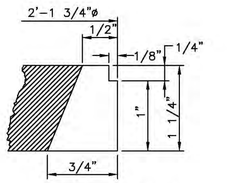
CLEVELAND DIVISION OF WATER CONSTRUCTION STANDARDS

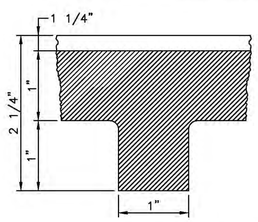
Supply Main Details

Primarily for use on mains 20" and larger

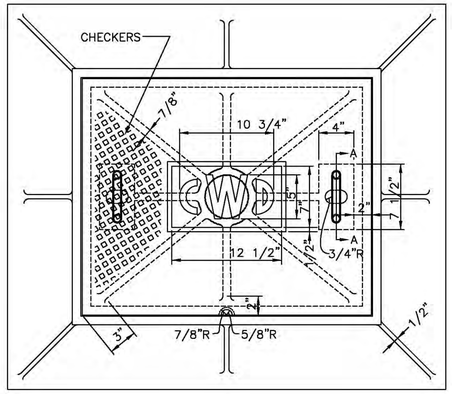


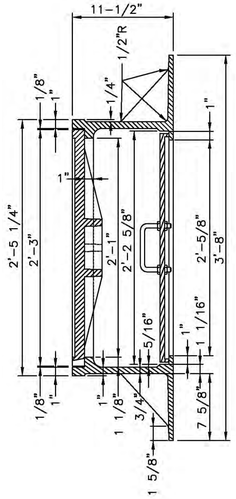


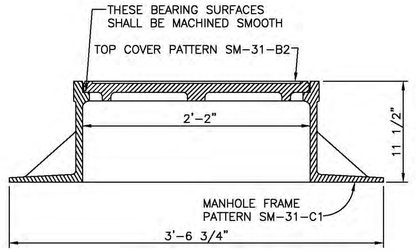
FULL SIZE SECTION AT SLOT



FULL SIZE SECTION AT B–B







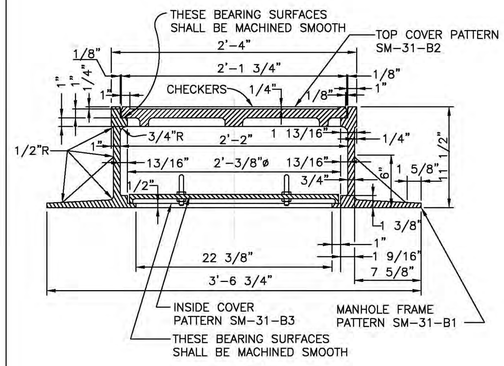
MANHOLE FRAME AND COVER MARK NO. 3

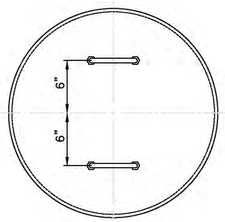
SCALE: 1 1/2" = 1'–0"

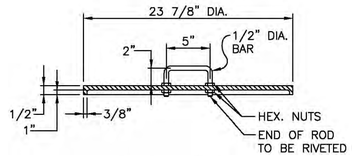
CONSISTING OF { C.I. MANHOLE FRAME PATTERN SM–31–C1
C.I. TOP COVER PATTERN SM–31–B2

{ DIMENSIONS NOT GIVEN ARE THE SAME AS THOSE SHOWN FOR MANHOLE FRAME PATTERN MARK SM–31–B1

EST WT. 602#





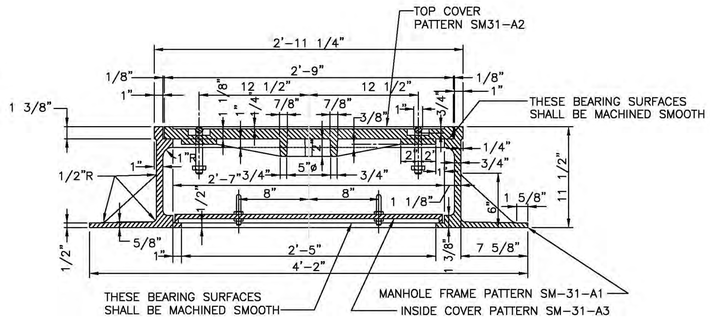


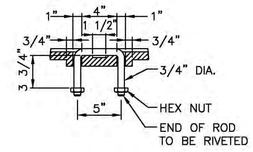
INSIDE COVER (C.I.) PATTERN SM–31–B3

MANHOLE FRAME AND COVER MARK SM–31B

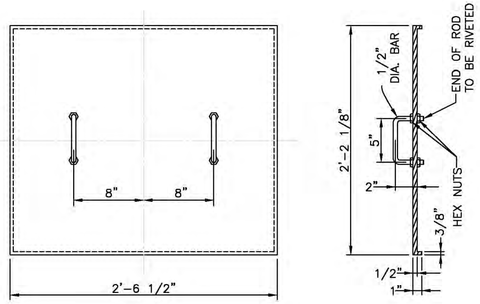
SCALE: 1 1/2" = 1'–0"

CONSISTING OF { C.I. MANHOLE FRAME PATTERN SM–31–B1
C.I. TOP COVER PATTERN SM–31–B2
C.I. INSIDE COVER PATTERN SM–31–B3
EST. WT. 756#





SECTION A–A



INSIDE COVER (C.I.) PATTERN SM–31–A3

MANHOLE FRAME AND COVER MARK SM–31A

SCALE: 1 1/2" = 1'–0"

CONSISTING OF { C.I. MANHOLE FRAME PATTERN SM–31–A1
C.I. TOP COVER PATTERN SM–31–A2
C.I. INSIDE COVER PATTERN SM–31–A3

SEE DETAIL SPECIFICATIONS PART E, SECTION 8–9

C.W.D. REFERENCE DWG. No: SM–31

REVISIONS		
NO.	DATE	BY

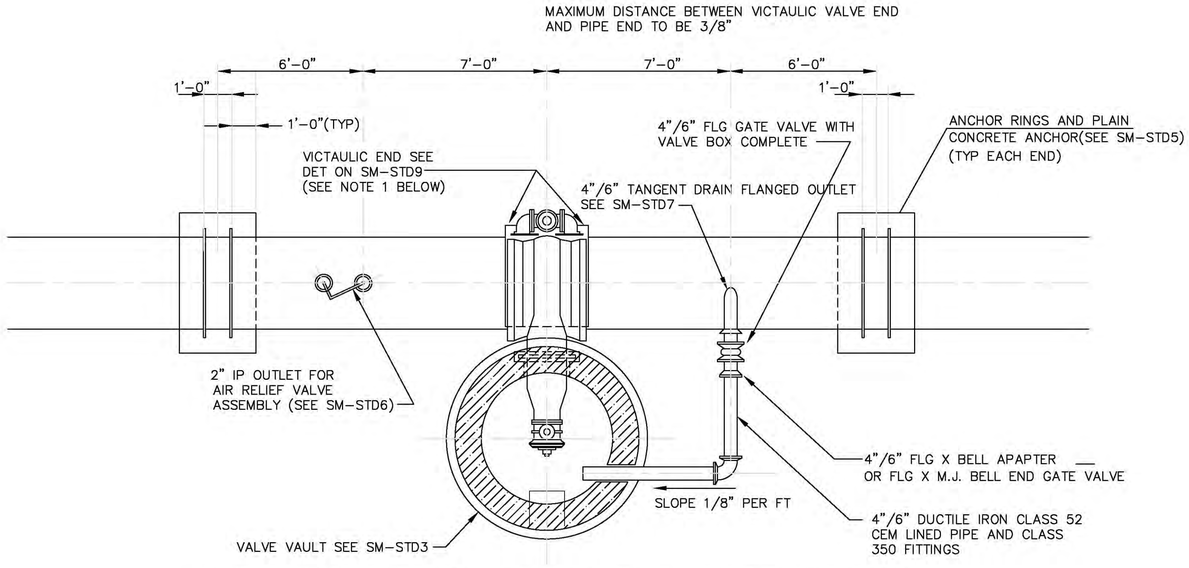
STANDARD DETAILS

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER
CLEVELAND, OHIO

SUBJECT MANHOLE FRAMES AND COVERS
DETAILS

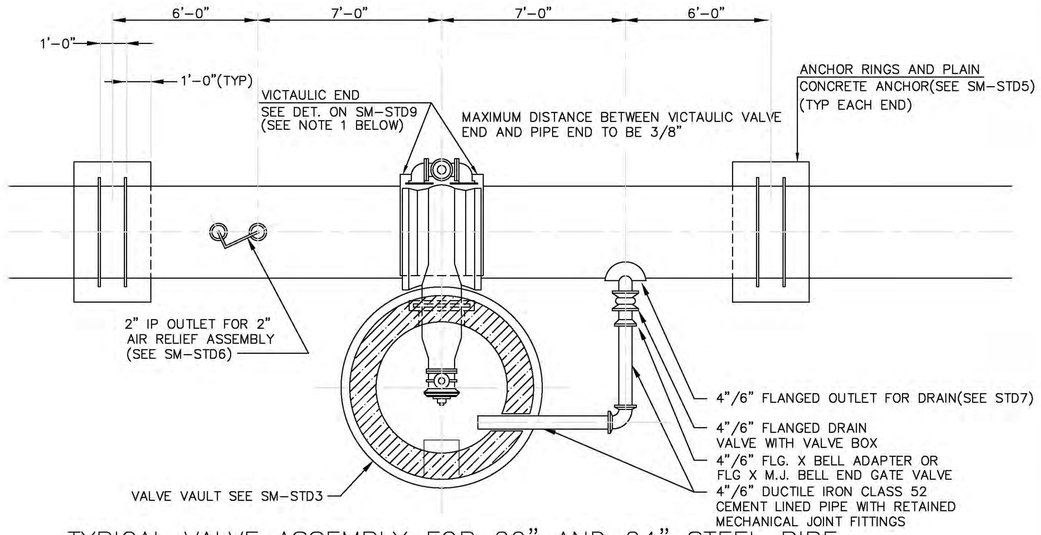
DRAWN BY DLT\PB
DESIGNED BY
CHECKED BY
SCALE AS NOTED
DATE 10/1/97

No. SM–STD1



TYPICAL VALVE ASSEMBLY FOR 20" AND 24" PCC PIPE

SCALE: 3/8" = 1'-0"

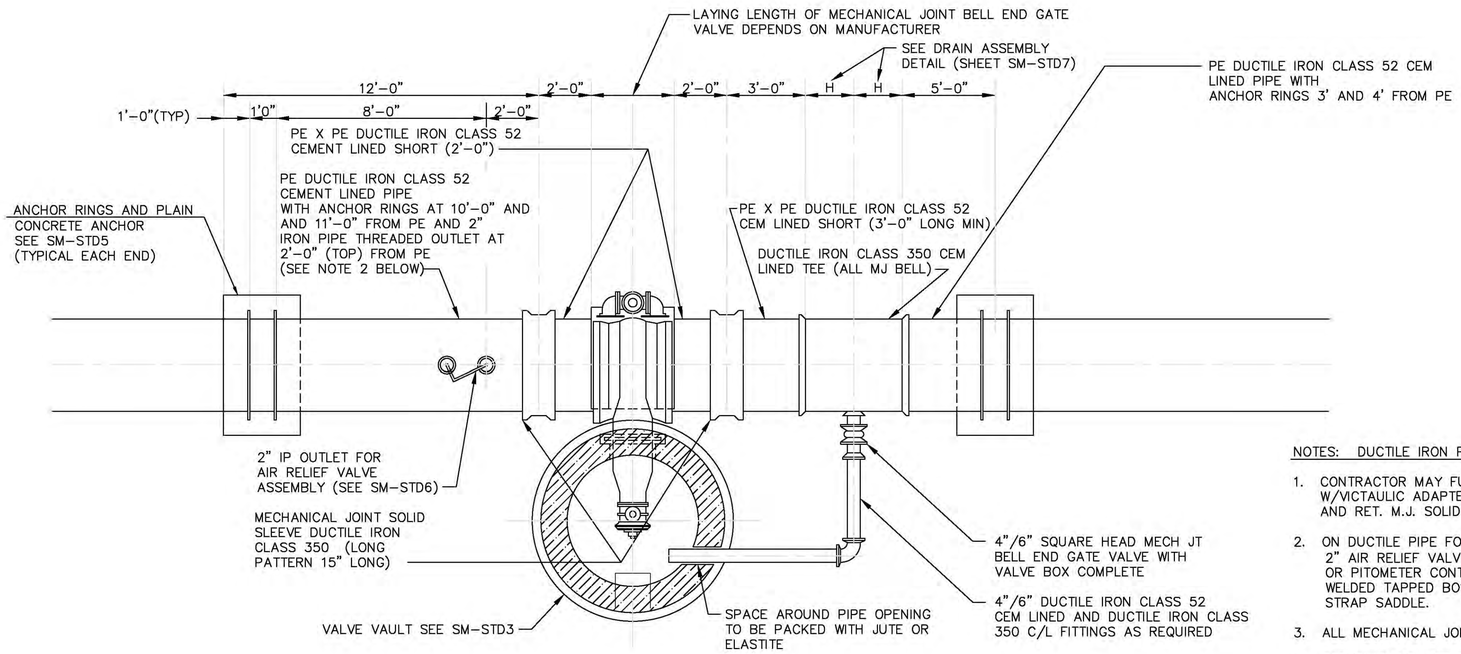


TYPICAL VALVE ASSEMBLY FOR 20" AND 24" STEEL PIPE

SCALE: 3/8" = 1'-0"

NOTE: PCCP & STEEL PIPE VALVE ASSEMBLY

1. CONTRACTOR MAY FURNISH FLANGED END GATE VALVE W/ VICTAULIC ADAPTERS IN LIEU OF VICTAULIC END GATE VALVE.
2. WHERE WORKING PRESSURE EXCEEDS 150 PSI, OR WHERE SPECIFIED, VALVE ASSEMBLIES SHALL BE FURNISHED WITH FLANGED ENDS.



TYPICAL VALVE ASSEMBLY FOR 20" AND 24" DUCTILE IRON PIPE

SCALE: 3/8" = 1'-0"

NOTES: DUCTILE IRON PIPE VALVE ASSEMBLY

1. CONTRACTOR MAY FURNISH VICTAULIC END GATE VALVE W/VICTAULIC ADAPTERS IN LIEU OF RET. M.J. GATE VALVE AND RET. M.J. SOLID SLEEVES.
2. ON DUCTILE PIPE FOR 2" IP THREADED OUTLET FOR 2" AIR RELIEF VALVE ASSEMBLY OR PITOMETER CONTRACTOR SHALL PROVIDE EITHER WELDED TAPPED BOSS OR APPROVED 2" IP OUTLET STRAP SADDLE.
3. ALL MECHANICAL JOINTS SHALL BE RETAINED.
4. FOR DIMENSION OF TEE FOR DRAIN, SEE DUCTILE IRON DRAIN ASSEMBLY SCHEDULE ON DRAWING SM-STD7 .

DRAIN ASSEMBILES

MAIN SIZE 20", 24", & 30" – 4" DRAIN
MAIN SIZE 36",42" & 48" – 6" DRAIN

REVISIONS		
NO.	DATE	BY

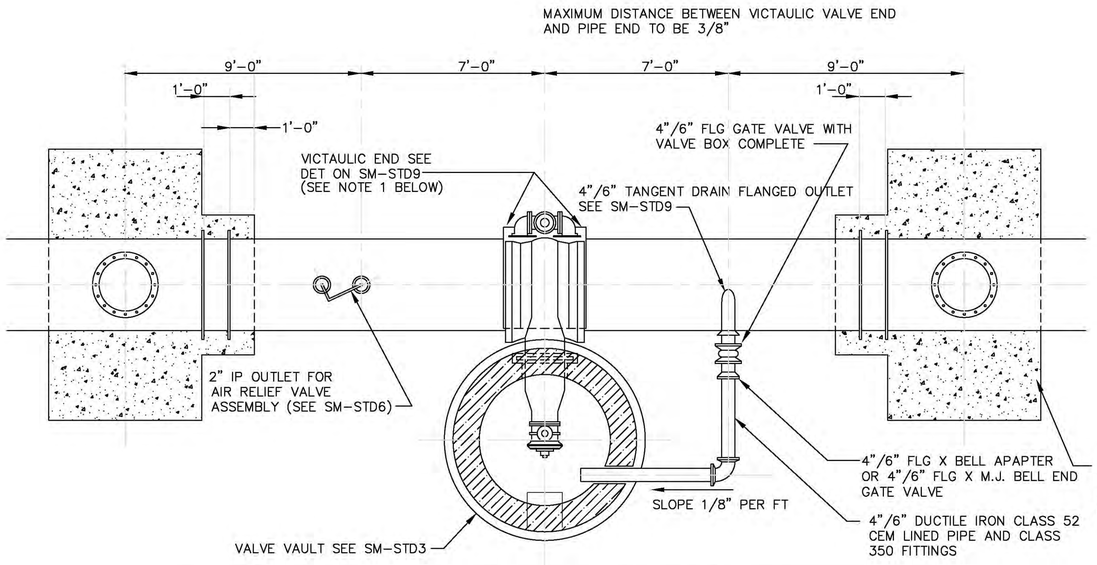
STANDARD DETAILS

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER
CLEVELAND, OHIO

SUBJECT 20" & 24" VALVE ASSEMBLY DETAILS

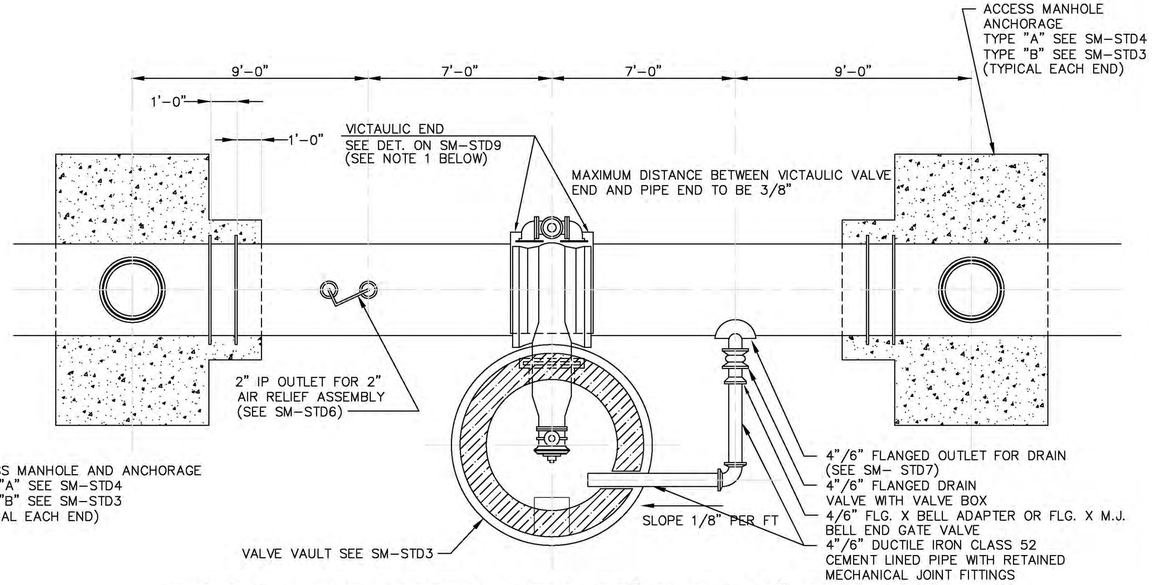
DRAWN BY DLT\PB
DESIGNED BY
CHECKED BY
SCALE AS NOTED
DATE 10/1/97

No. SM-STD2A



TYPICAL VALVE ASSEMBLY FOR 30" THRU 48" PCC PIPE

SCALE: 3/8" = 1'-0"

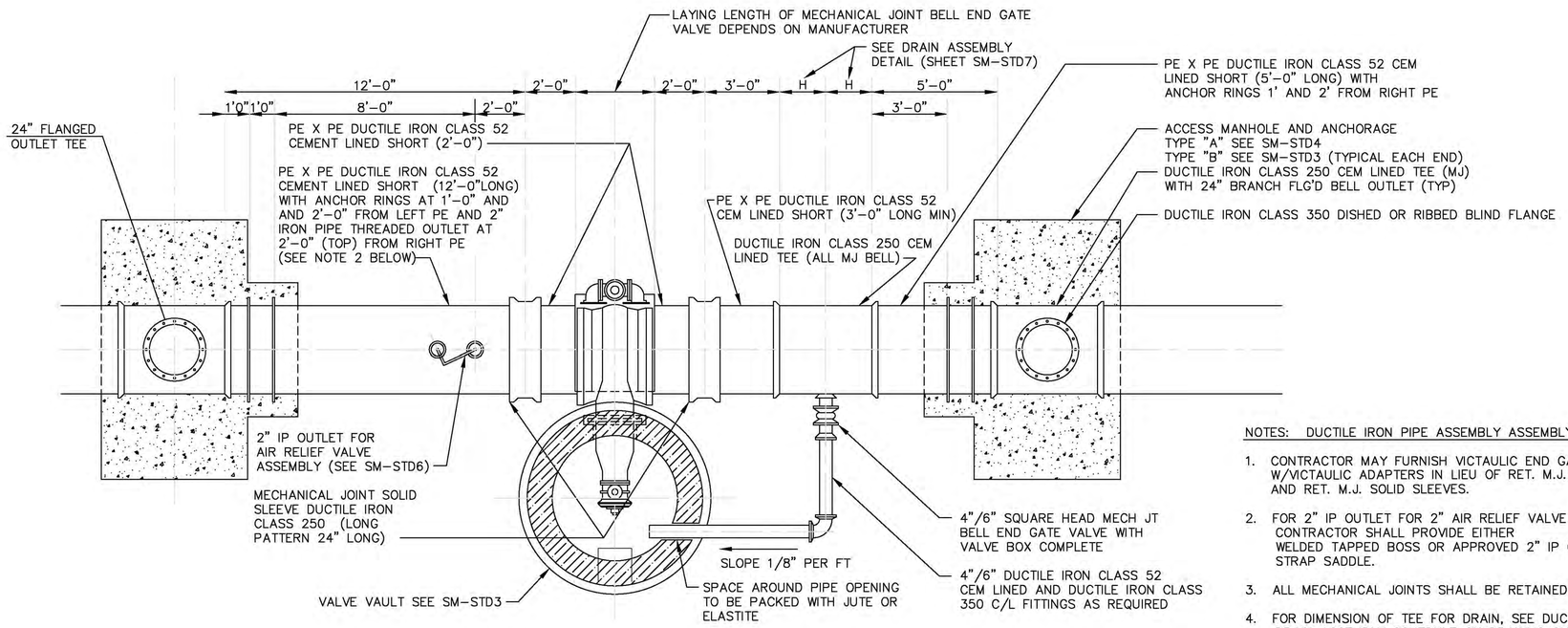


TYPICAL VALVE ASSEMBLY FOR 30" THRU 48" STEEL PIPE

SCALE: 3/8" = 1'-0"

NOTES: PCCP & STEEL PIPE VALVE ASSEMBLY

1. CONTRACTOR MAY FURNISH FLANGED END GATE VALVE W/VICTAULIC ADAPTERS IN LIEU OF VICTAULIC END GATE VALVE.
2. WHERE WORKING PRESSURE EXCEEDS 150 PSI, OR WHERE SPECIFIED, VALVE ASSEMBLIES SHALL BE FURNISHED WITH FLANGED ENDS.



TYPICAL VALVE ASSEMBLY FOR 30" THRU 48" DUCTILE IRON PIPE

SCALE: 3/8" = 1'-0"

NOTES: DUCTILE IRON PIPE ASSEMBLY ASSEMBLY

1. CONTRACTOR MAY FURNISH VICTAULIC END GATE VALVE W/VICTAULIC ADAPTERS IN LIEU OF RET. M.J. GATE VALVE AND RET. M.J. SOLID SLEEVES.
2. FOR 2" IP OUTLET FOR 2" AIR RELIEF VALVE ASSEMBLY CONTRACTOR SHALL PROVIDE EITHER WELDED TAPPED BOSS OR APPROVED 2" IP OUTLET STRAP SADDLE.
3. ALL MECHANICAL JOINTS SHALL BE RETAINED.
4. FOR DIMENSION OF TEE FOR DRAIN, SEE DUCTILE IRON DRAIN ASSEMBLY SCHEDULE ON DRAWING SM-STD7 .

DRAIN ASSEMBILES

MAIN SIZE 20",24", & 30" – 4" DRAIN
MAIN SIZE 36",42" & 48" – 6" DRAIN

REVISIONS		
NO.	DATE	BY

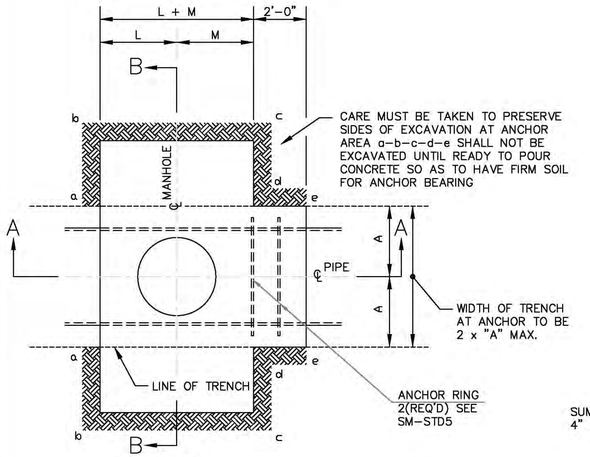
STANDARD DETAILS

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER
CLEVELAND, OHIO

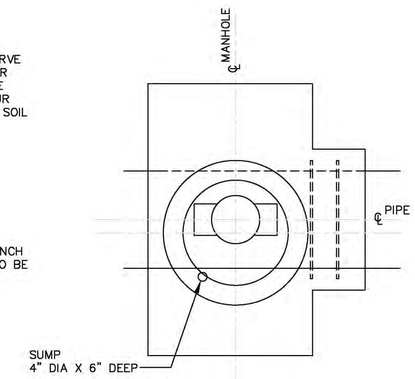
SUBJECT 30" THRU 48"
VALVE ASSEMBLY DETAILS

DRAWN BY DLT\PB
DESIGNED BY
CHECKED BY DATE 10/1/97
SCALE AS NOTED

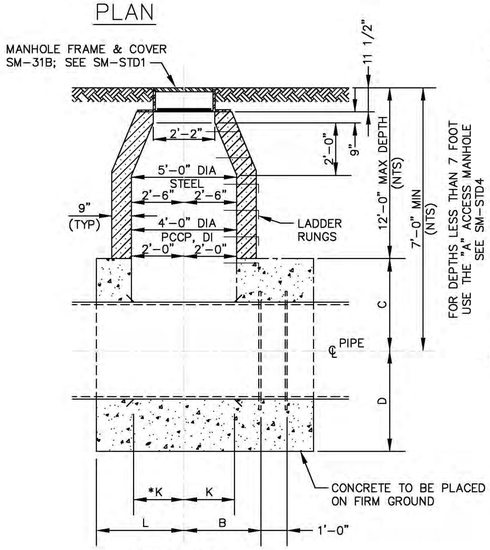
No. SM-STD2B



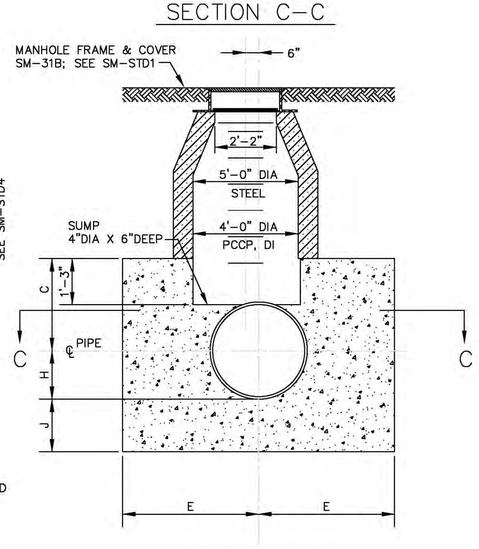
PLAN



SECTION C-C



SECTION A-A



SECTION B-B

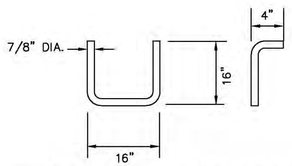
ACCESS MANHOLE AND ANCHORAGE - TYPE "B"

SCALE: 3/8" = 1'-0"

ACCESS MANHOLE - TYPE "B" SCHEDULE

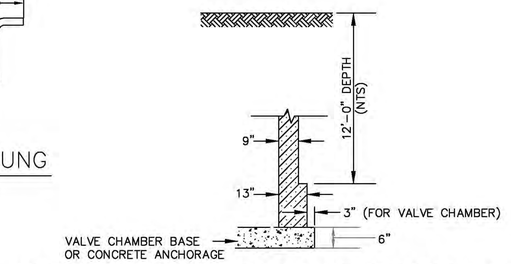
	PIPE SIZE	PIPE O.D.	DEPTH (MIN)	A (MAX)	B (MIN)	C (MIN)	D (MIN)	E (MIN)	H	J (MIN)	K *	L (MIN)	M (MIN)
DUCTILE	30"	32.00"	7'-0"	2'-4"	3'-1"	2'-7"	3'-4"	5'-0"	1'-4"	2'-0"	2'-1"	3'-4"	2'-10"
	36"	38.30"	7'-0"	2'-7"	2'-8"	2'-10"	3'-7"	5'-0"	1'-7 1/8"	2'-0"	1'-8"	3'-4"	2'-6"
	42"	44.50"	7'-0"	2'-10"	2'-11"	3'-2"	4'-4"	5'-2"	1'-10 1/4"	2'-6"	1'-11"	3'-4"	2'-8"
	48"	50.80"	7'-0"	3'-2"	3'-2"	3'-5"	5'-0"	5'-6"	2'-1 3/8"	2'-10"	2'-2"	3'-4"	2'-11"
PCCP	30"	35.50"	7'-0"	2'-6"	2'-9"	2'-9"	3'-6"	5'-0"	1'-5 3/4"	2'-0"	–	3'-4"	2'-6"
	36"	42.00"	7'-0"	2'-9"	2'-9"	3'-0"	3'-9"	5'-0"	1'-9"	2'-0"	–	3'-4"	2'-6"
	42"	49.00"	7'-0"	3'-1"	2'-9"	3'-6"	4'-7"	5'-2"	2'-0 1/2"	2'-6"	–	3'-6"	2'-6"
	48"	55.50"	7'-0"	3'-4"	2'-9"	3'-7"	5'-2"	5'-6"	2'-3 3/4"	2'-10"	–	3'-6"	2'-6"
STEEL	30"	31.188"	7'-0"	2'-4"	2'-9"	2'-7"	3'-4"	5'-0"	1'-3 5/8"	2'-0"	–	3'-4"	2'-6"
	36"	37.250"	7'-0"	2'-7"	2'-9"	2'-10"	3'-7"	5'-0"	1'-6 5/8"	2'-0"	–	3'-4"	2'-6"
	42"	43.563"	7'-0"	2'-10"	2'-9"	3'-1"	4'-4"	5'-2"	1'-9 3/4"	2'-6"	–	3'-6"	2'-6"
	48"	49.625"	7'-0"	3'-1"	2'-9"	3'-4"	5'-0"	5'-6"	2'-0 13/16"	2'-10"	–	3'-6"	2'-6"

*ON DUCTILE IRON PIPE ALTERNATE ACCESS MANHOLE OUTLET SHALL BE A 24" FLANGED OUTLET TEE. A DISHED OR RIBBED BLIND FLANGE RATED FOR MINIMUM 250PSI SHALL BE USED FOR THE COVER.
NOTE: OUTSIDE DIAMETERS OF STEEL PIPE ARE BASED ON MAXIMUM 10 FOOT DEPTH. SEE SPECIFICATIONS, PART E, SECTION 16-3



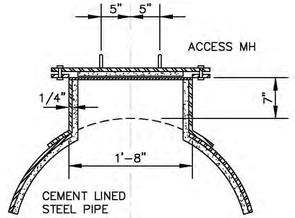
DETAIL OF LADDER RUNG

NUMBER DEPENDS ON DEPTH OF VALVE CHAMBER



ACCESS MANHOLE OR VALVE CHAMBER WALL DETAIL FOR DEPTHS EXCEEDING 12'-0"

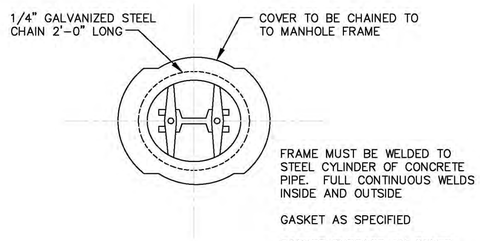
SCALE: 3/8" = 1'-0"



20" ACCESS MANHOLE OUTLET AND COVER

SCALE: 3/8" = 1'-0" (FOR STEEL PIPE)

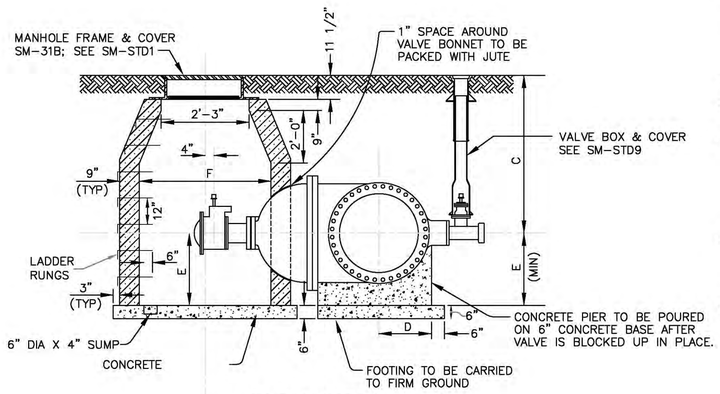
(20" HINGED FLANGED MANHOLE COVER TO BE PROVIDED)



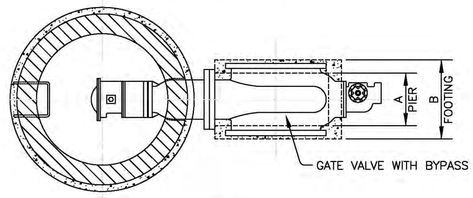
16" X 18" STANDARD MANHOLE COVER AND FRAME

SCALE: 3/8" = 1'-0" (FOR PCC PIPE)

(FRAME, COVER AND YOKES TO BE CAST IRON)



ELEVATION



PLAN

CHAMBER FOR GATE VALVE 20" AND OVER

SCALE: 3/8" = 1'-0"

1. ALL BRICK SHALL BE EITHER O.D.O.T. ITEM 704.01, "GRADE SM", ASTM DESIGNATION: C32-84, "SPECIFICATION FOR SEWER AND MANHOLE BRICK (MADE FROM CLAY OR SHALE)," OR SHALL BE SOLID TYPE O.D.O.T. ITEM 704.02, PER ASTM DESIGNATION: C55-85," SPECIFICATION FOR CONCRETE BUILDING BLOCK." TYPE II, GRADES N-11 OR S-11, EXCEPT AS MODIFIED PER ODOT SPECIFICATIONS.
2. PLAIN CONCRETE SHALL BE CLASS "C" CONCRETE PER ODOT ITEM 499.03
3. ALL CEMENT MORTAR SHALL BE MIXED IN THE PROPORTION OF ONE(1) PART CEMENT, THREE (3) PARTS SAND.
4. BRICK WALLS OF MANHOLES SHALL BE LAID IN 1:3 PORTLAND CEMENT MORTAR, ARRANGED RADIALLY AS HEADERS, FORMING A WALL NINE INCHES THICK. WALLS OF DEEP MANHOLES SHALL BE 13" THICK BELLOW POINT 12 FEET FROM THE SURFACE. ALL BRICK SHALL BE LAID IN FULL MORTAR BEDS AND JOINTS, WITH NO MORTAR JOINTS APPEARING ON THE INNER SURFACE OF THE MANHOLE EXCEEDING THREE-EIGHTHS (3/8) INCHES THICK.
5. TOP WALLS OF MANHOLES SHALL BE PROPERLY LEVELED OFF WITH MORTAR SO AS TO FORM A FLAT SURFACE UPON WHICH THE CAST IRON MANHOLE RING IS TO REST. MANHOLE SHALL BE CARRIED TO PROPER HEIGHT AS INDICATED BY THE CONTRACT DRAWINGS.
6. ALL OUTSIDE WALLS OF BRICK MANHOLES SHALL BE PLASTERED WITH A SMOOTH COATING OF 1:3 PORTLAND CEMENT MORTAR, AT LEAST ONE-HALF (1/2) INCH THICK.

VALVE CHAMBER SCHEDULE

SIZE	A	B	C (MIN)	D	E	F
20"	1'-4"	2'-4"	5'-0"	1'-3"	2'-3"	4'-0"
24"	1'-4"	2'-4"	5'-0"	1'-3"	2'-3"	4'-0"
30"	1'-9"	2'-9"	5'-0"	1'-6"	2'-6"	4'-6"
36"	2'-0"	3'-0"	5'-0"	2'-0"	2'-9"	5'-0"
42"	2'-3"	3'-6"	5'-0"	2'-4"	3'-0"	5'-0"
48"	2'-6"	4'-0"	5'-0"	2'-8"	3'-3"	5'-0"

NOTE: FOR VALVE STEM EXTENSION AND BRACING DETAIL SEE SM-STD6

C.W.D. REFERENCE DWG. No SM-32, SM-578B

REVISIONS		
NO.	DATE	BY

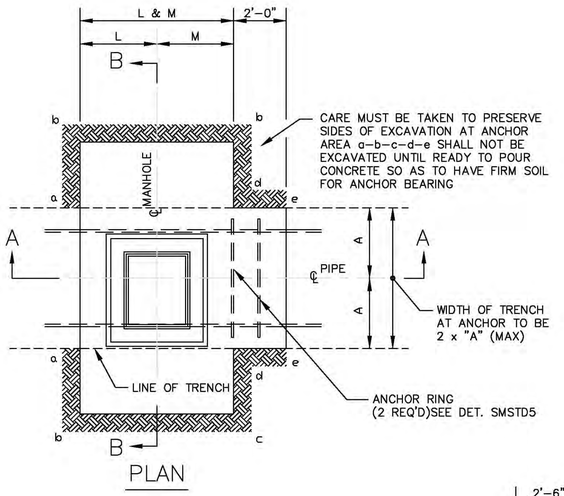
STANDARD DETAILS

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER
CLEVELAND, OHIO

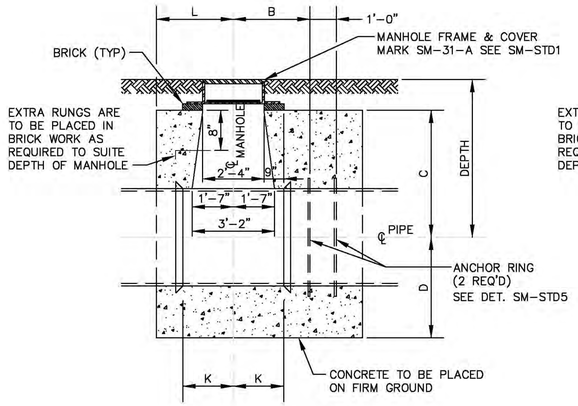
SUBJECT: VALVE VAULT DETAILS
ACCESS MANHOLE DETAILS
& ANCHORAGE, TYPE "B"

DRAWN BY DLT\PB
DESIGNED BY
CHECKED BY
DATE 10/1/97
SCALE AS SHOWN

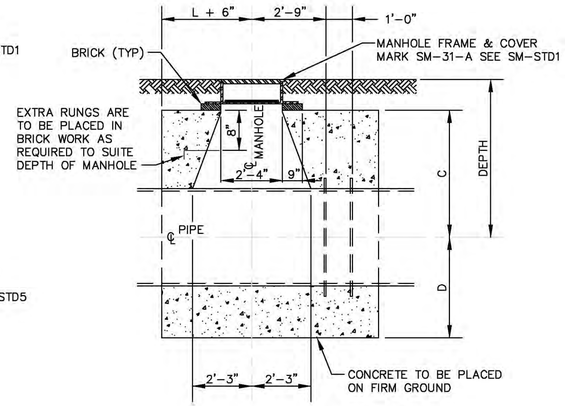
No. SM-STD3



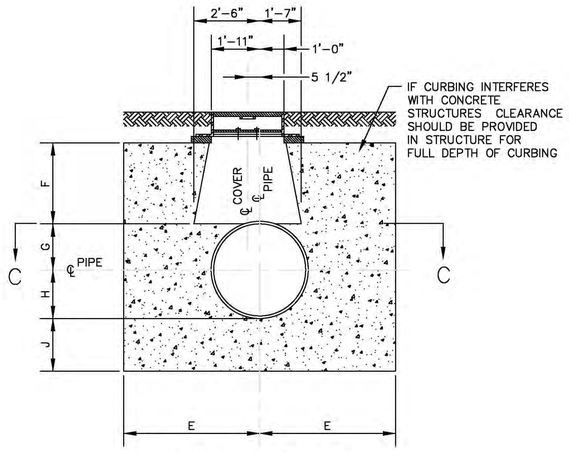
PLAN



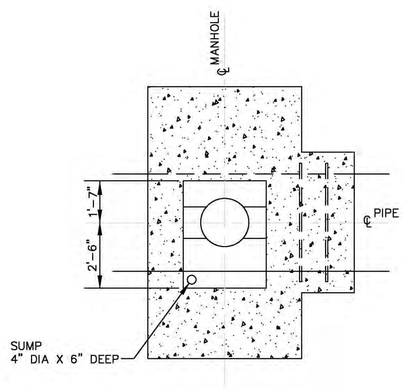
SECTION "A-A"
(DUCTILE IRON PIPE)



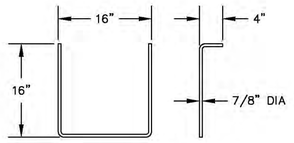
SECTION "A-A"
(STEEL & PCC PIPE)



SECTION "B-B"



SECTION "C-C"



LADDER RUNGS

ACCESS MANHOLE AND ANCHORAGE – TYPE "A"

SCALE: 3/8" = 1'-0"

ACCESS MANHOLE – TYPE A SCHEDULE

	PIPE SIZE	PIPE O.D.	DEPTH (MIN)	DEPTH (MAX)	A (MAX)	B (MIN)	C (MIN)	D (MIN)	E (MIN)	F (MIN)	G & H	J (MIN)	K	L (MIN)	M (MIN)
DUCTILE	30"	32.00"	5'-6"	7'-0"	2'-4"	3'-1"	4'-4"	3'-4"	5'-0"	3'-0"	1'-4"	2'-0"	2'-1"	3'-4"	2'-10"
	36"	38.30"	5'-6"	7'-0"	2'-7"	2'-8"	4'-4'	3'-7"	5'-0"	2'-8 7/8"	1'-7 1/8"	2'-0"	1'-8"	3'-4"	2'-6"
	42"	44.50"	6'-0"	7'-0"	2'-10"	2'-11"	4'-10"	4'-4"	5'-2"	2'-11 3/4"	1'-10 1/4"	2'-6"	1'-11"	3'-4"	2'-8"
	48"	50.80"	6'-0"	7'-0"	3'-2"	3'-2"	4'-10"	5'-0"	5'-6"	2'-8 5/8"	2'-1 3/8"	2'-10"	2'-2"	3'-4"	2'-11"
PCCP	30"	35.50"	5'-6"	7'-0"	2'-6"	2'-9"	4'-4"	3'-6"	5'-0"	2'-10 1/4"	1'-5 3/4"	2'-0"	–	3'-4"	2'-6"
	36"	42.00"	5'-6"	7'-0"	2'-9"	2'-9"	4'-4"	3'-9"	5'-0"	2'-7"	1'-9"	2'-0"	–	3'-4"	2'-6"
	42"	49.00"	6'-0"	7'-0"	3'-1"	2'-9"	4'-10"	4'-7"	5'-2"	2'-9 1/2"	2'-0 1/2"	2'-6"	–	3'-6"	2'-6"
	48"	55.50"	6'-0"	7'-0"	3'-4"	2'-9"	4'-10"	5'-2"	5'-6"	2'-6 1/4"	2'-3 3/4"	2'-10"	–	3'-6"	2'-6"
STEEL	30"	31.188"	5'-6"	7'-0"	2'-4"	2'-9"	4'-4"	3'-4"	5'-0"	3'-0 3/8"	1'-3 5/8"	2'-0"	–	3'-4"	2'-6"
	36"	37.250"	5'-6"	7'-0"	2'-7"	2'-9"	4'-4"	3'-7"	5'-0"	2'-9 3/8"	1'-6 5/8"	2'-0"	–	3'-4"	2'-6"
	42"	43.563"	6'-0"	7'-0"	2'-10"	2'-9"	4'-10"	4'-4"	5'-2"	3'-0 1/4"	1'-9 3/4"	2'-6"	–	3'-6"	2'-6"
	48"	49.625"	6'-0"	7'-0"	3'-1"	2'-9"	4'-10"	5'-0"	5'-6"	2'-9 3/16"	2'-0 13/16"	2'-10"	–	3'-6"	2'-6"

NOTE: WHERE DEPTH OF WATER MAIN TO PIPE ℄ EXCEEDS 7'-0"
USE TYPE "B" ACCESS MANHOLE– SEE SM-STD3

REVISIONS		
NO.	DATE	BY

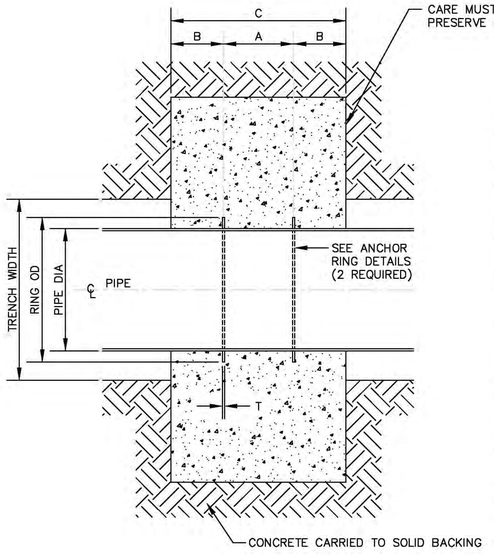
STANDARD DETAILS

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER
CLEVELAND, OHIO

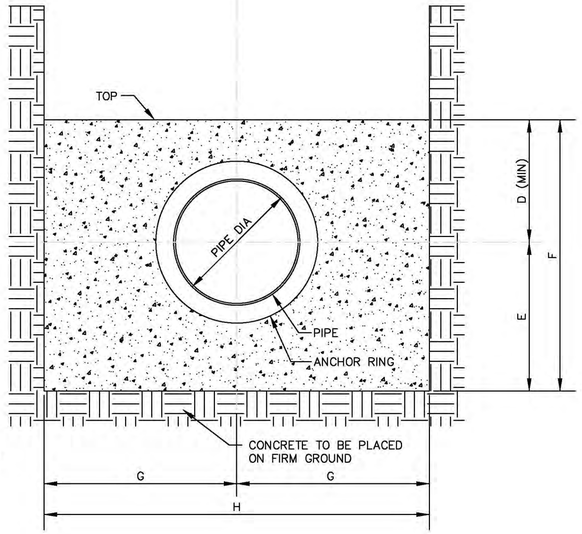
SUBJECT: ACCESS MANHOLE
& ANCHORAGE, TYPE "A" DETAILS

DRAWN BY DLT\PB
DESIGNED BY
CHECKED BY
SCALE AS NOTED
DATE 10/1/97

No. SM-STD4



SIDE SECTION

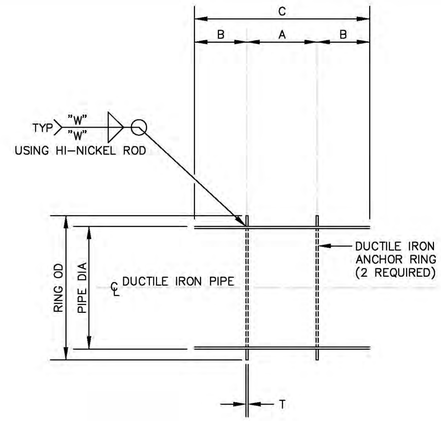


FRONT SECTION

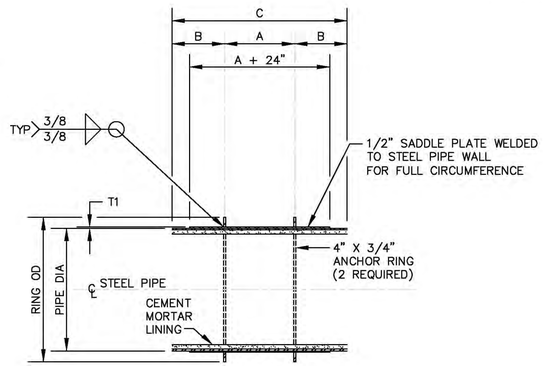
PLAIN ANCHOR AND ANCHORAGE DETAIL

NOTES:

1. ALL PIPE AND FITTING THICKNESSES SHALL BE AS SPECIFIED.
2. ALL PIPE JOINTS SHALL BE OF THE TYPE SPECIFIED OR AS SHOWN ON APPROVED DETAILED SHOP DRAWINGS.
3. ALL WELDS, REINFORCEMENT PLATES AND OTHER PERTINENT INFORMATION SHALL BE OF THE TYPE AND SIZE SHOWN ON APPROVED SHOP DRAWINGS.
4. ALL WELDS SHALL BE SHOP WELDS AND SHALL BE FULL AND CONTINUOUS.
5. ALL JOINTS NOT WELDED SHALL BE BONDED TO MAKE THE ENTIRE STRUCTURE ELECTRICALLY CONTINUOUS.

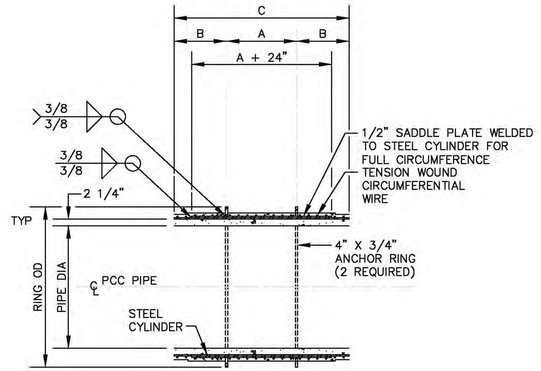


DUCTILE IRON PIPE



STEEL PIPE

T1: FOR THICKNESS OF STEEL PIPE SEE DETAILED SPECIFICATIONS, PART E, SECTION 3–6



PCC PIPE

ANCHOR RING DETAILS

NOTE: RING DIAMETERS AND RING THICKNESS ARE MINIMUMS. DIAMETERS ARE/OR THICKNESS SHALL BE INCREASED WHEN WORKING PRESSURES EXCEED 150PSI

ANCHOR AND FLANGE SCHEDULE

	DIA	A	B	C **	D (MIN)	E (MIN)	F (MIN)	G (MIN)	H (MIN)	TRENCH WIDTH (MAX)	RING OD (MIN)	T (MIN)	W
											DUCTILE IRON PIPE		
	20"	1'–0"	1'–0"	3'–0"	2'–3"	2'–3"	4'–6"	3'–6"	7'–0"	4'–0"	25.70"	1/2"	3/8"
	24"	1'–0"	1'–0"	3'–0"	2'–8"	3'–0"	5'–8"	4'–0"	8'–0"	4'–6"	30.25"	1/2"	7/16"
*	30"	1'–0"	1'–3"	3'–6"	3'–0"	3'–6"	6'–6"	5'–0"	10'–0"	5'–0"	36.50"	5/8"	1/2"
*	36"	1'–0"	1'–3"	3'–6"	3'–3"	3'–9"	7'–0"	5'–6"	11'–0"	5'–6"	43.40"	5/8"	1/2"
*	42"	2'–0"	1'–6"	5'–0"	3'–6"	4'–6"	8'–0"	6'–0"	12'–0"	6'–0"	49.50"	3/4"	5/8"
*	48"	2'–0"	1'–6"	5'–0"	4'–0"	5'–0"	9'–0"	6'–6"	13'–0"	6'–8"	56.50"	3/4"	5/8"

NOTES:
1.) RING DIAMETERS AND RING THICKNESS ARE MINIMUMS. DIAMETER AND/ OR THICKNESS SHALL BE INCREASED WHEN WORKING PRESSURES EXCEED 150PSI

* 2.) FOR ANCHORAGE ON ACCESS MANHOLES, "TYPE A" AND "TYPE B", ON 42" AND 48" PIPE, DIMENSION "A" IS 1'–0".

* 3.) FOR ANCHORAGE ON ACCESS MANHOLES, TYPE "A" AND TYPE "B", DIMENSION "B" IS 1'–0".

** 4.) FOR PLAIN ANCHORS ONLY.

REVISIONS		
NO.	DATE	BY

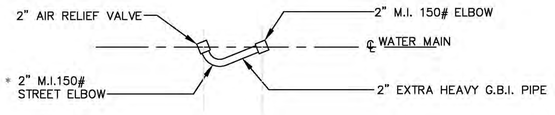
STANDARD DETAILS

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER
CLEVELAND, OHIO

SUBJECT ANCHOR RING AND PLAIN CONCRETE ANCHOR DETAILS

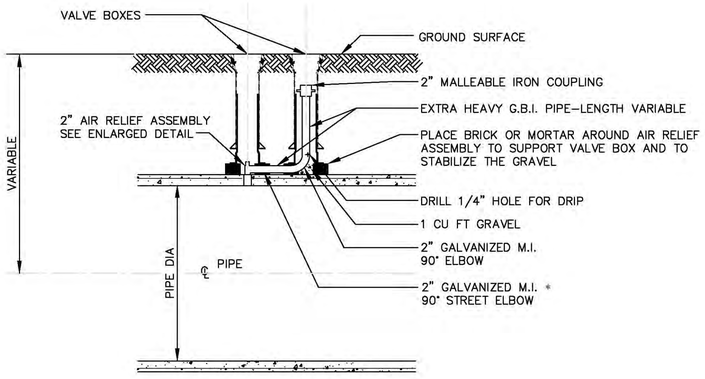
DRAWN BY DLT\PB
DESIGNED BY
CHECKED BY DATE 10/1/97
SCALE 1" = 1'–0"

No. SM–STD5



PLAN

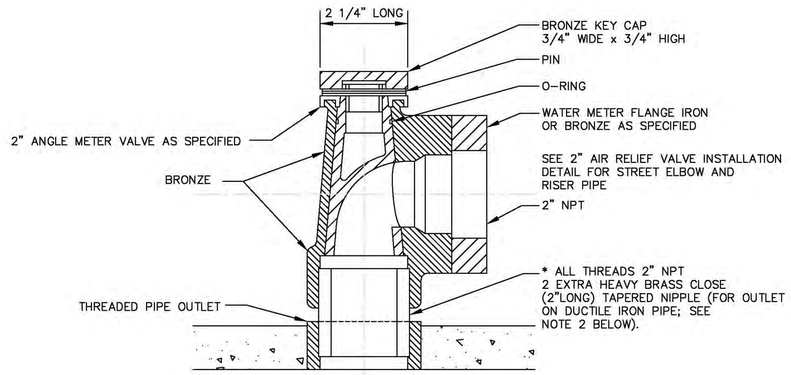
* MAY BE DELETED AND STRAIGHT PIECE FROM VALVE TO RISER USED.



DOUBLE VALVE BOX ASSEMBLY

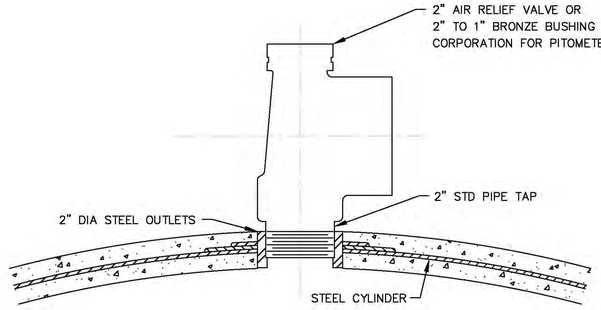
2" AIR RELIEF VALVE INSTALLATION DETAIL

NOT TO SCALE



2" AIR RELIEF ASSEMBLY

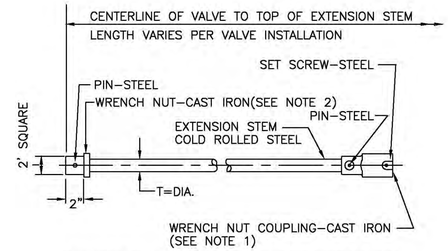
NOT TO SCALE



ENLARGED DETAIL SHOWING CONNECTION FOR AIR RELIEF VALVE OR PITOMETER

NOT TO SCALE

P.C.C. PIPE



VALVE SIZE	20"	24"	30"	36"	42"	48"
T (DIA.)	1 1/4"	1 3/8"	2"	2 1/4"	2 1/2"	2 3/4"

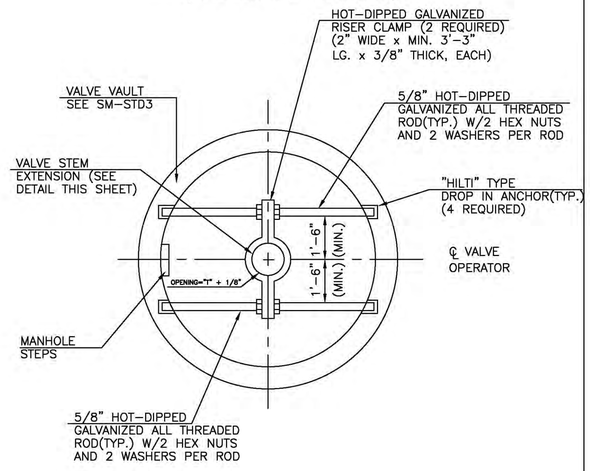
NOTES:

1.) OPENING AND DEPTH OF WRENCH NUT COUPLING SIZED TO FIT CWD STANDARD WRENCH NUT.

2.) WRENCH NUT ON 20" VALVE TO BE 1–3/4" SQ. (TOP), 1–7/8" SQ(BOTTOM) AND 1–3/4" DEEP.

VALVE STEM EXTENSION

(TO BE USED WITH STEM BRACING)



VALVE STEM EXTENSION AND STEM BRACING DETAIL

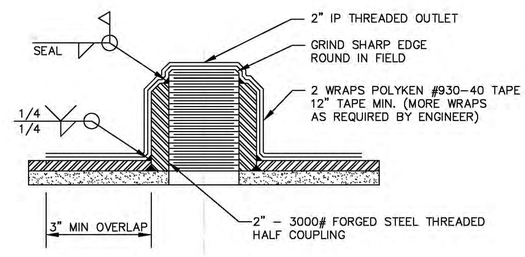
NOTES:

1) VALVE STEM EXTENSION AND BRACING REQUIRED WHERE TOP OF VALVE WRENCH NUT IS GREATER THAN 4 FEET BELOW FINISHED GRADE.

2) ARRANGEMENT OF THREADED RODS AND RISER CLAMPS SHALL BE SET VERTICALLY OVER VALVE WRENCH NUT.

3) IN LIEU OF "HILTI" TYPE ANCHORS THREADED ROD MAY BE BEST SET IN 4" DEEP x 3/4" DIAMETER HOLES FILLED WITH EPOXY GROUT.

4) ALL THREADED RODS, NUTS AND WASHERS, AND RISER CLAMPS SHALL BE FIELD COATED WITH BITUMASTIC PAINT AS SPECIFIED.



2" IRON PIPE THREADED OUTLET FOR AIR RELIEF VALVE OR PITOMETER

NOT TO SCALE

STEEL PIPE

NOTES:

1. ALL THREADED OUTLETS SHALL BE FURNISHED AND SHIPPED WITH MALLEABLE IRON PLUGS IN PLACE.
2. ON DUCTILE IRON PIPE, FOR 2" I.P. THREADED OUTLET FOR 2" AIR RELIEF ASSEMBLY OR 2" PITOMETER TAP CONTRACTOR SHALL FURNISH PIPE WITH EITHER WELDED TAPPED BOSS OR APPROVED 2" I.P. OUTLET DOUBLE STRAP SADDLE.
3. 2" I.P. OUTLET FOR PITOMETERS SHALL BE FURNISHED WITH 2" TO 1" BRONZE BUSHING AND 1" BRONZE CORPORATION VALVE.
4. FOR PITOMETER VAULT DETAILS SEE DETAIL DWG. SM–STD8

C.W.D. REFERENCE No. SM–292A

REVISIONS		
NO.	DATE	BY

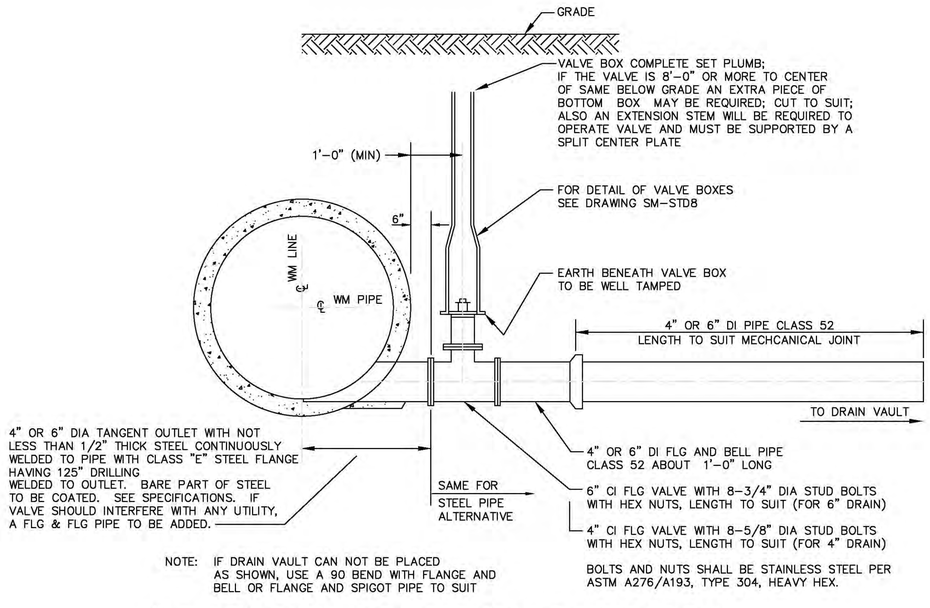
STANDARD DETAILS

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER
CLEVELAND, OHIO

SUBJECT 2" AIR RELIEF DETAILS, 2" OUTLET DETAILS FOR AIR RELIEF/PITOMETER

DRAWN BY. DLT\PB
DESIGNED BY.
CHECKED BY. DATE 10/1/97
SCALE NONE

No. SM–STD6

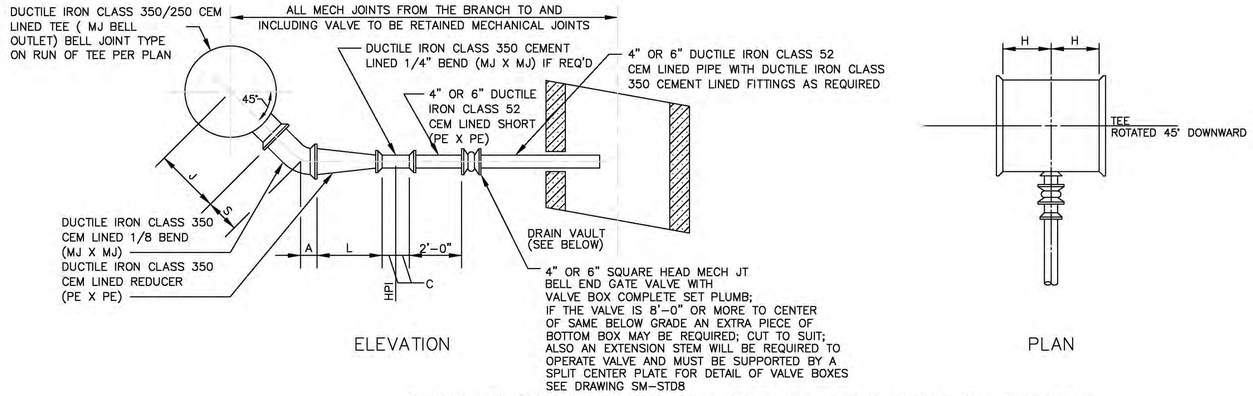


NOTE: IF DRAIN VAULT CAN NOT BE PLACED
AS SHOWN, USE A 90 BEND WITH FLANGE AND
BELL OR FLANGE AND SPIGOT PIPE TO SUIT

4" OR 6" DRAIN ASSEMBLY FOR PCC PIPE DETAIL

NOT TO SCALE

4" ASSEMBLIES REQUIRED ON 20", 24", & 30", PIPE
6" ASSEMBLIES REQUIRED ON 36", 42", & 48", PIPE



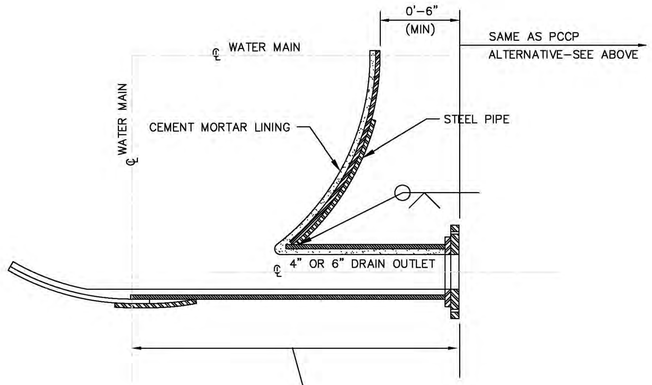
4" OR 6" DRAIN ASSEMBLY FOR DUCTILE IRON PIPE DETAIL

NOT TO SCALE

4" ASSEMBLIES REQUIRED ON 20", 24", & 30", PIPE
6" ASSEMBLIES REQUIRED ON 36", 42", & 48", PIPE

DUCTILE IRON DRAIN ASSEMBLY-SCHEDULE

TEE			1/8 BEND		REDUCER		1/4 BEND	
SIZE	H	J	S	A	SIZE	L	4"	6"
20"X 6"	14"	17"	13"	5"	6"X 4"	25"	6 1/2"	–
24"X 6"	15"	19"	13"	5"	6"X 4"	25"	6 1/2"	–
30"X 6"	18"	23"	13"	5"	6"X 4"	25"	6 1/2"	–
36"X 8"	20"	26"	13.5"	5.5"	8"X 4"	27"	6 1/2"	–
36"X 8"	20"	26"	13.5"	5.5"	8"X 6"	27"	–	8"
42"X12"	23"	30"	15.5"	7.5"	12"X 6"	30"	–	8"
48"X12"	26"	34"	15.5"	7.5"	12"X 6"	30"	–	8"

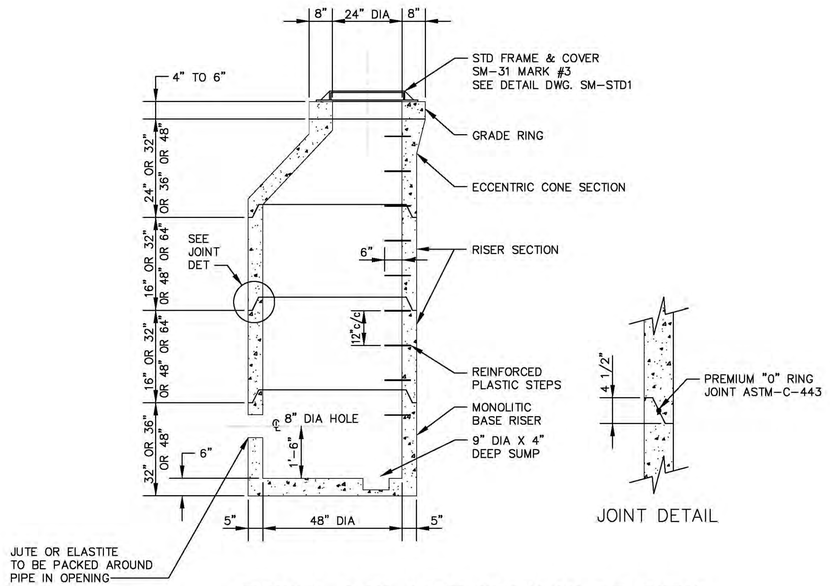


NOTE: IF DRAIN VAULT CAN NOT BE PLACED
AS SHOWN, USE A 90° BEND WITH FLANGE AND
BELL OR FLANGE AND SPIGOT PIPE TO SUIT

4" ASSEMBLIES REQUIRED ON 20", 24", & 30" PIPE
6" ASSEMBLIES REQUIRED ON 36", 42", & 48" PIPE

4" OR 6" TANGENTIAL OUTLET FOR STEEL PIPE DETAIL

NOT TO SCALE

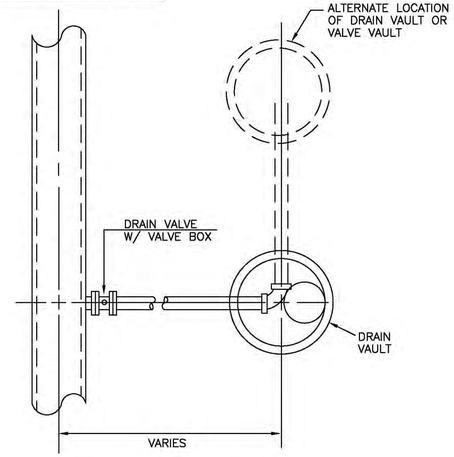


TYPICAL PRE-CAST DRAIN VAULT DETAIL

NOT TO SCALE

NOTES:

REINFORCING TO CONSIST OF WELDED STEEL WIRE: 9 GAUGE WIRE AT
12" c/c VERTICALLY AND 4 GAUGE WIRE AT 4" c/c HORIZONTALLY
PLACED IN CENTER OF WALL.



PLAN VIEW

TYPICAL DRAIN ASSEMBLY

N.T.S.

REVISIONS		
NO.	DATE	BY

STANDARD DETAILS

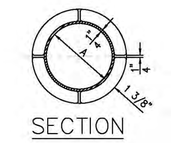
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER
CLEVELAND, OHIO

SUBJECT DRAIN ASSEMBLY DETAILS
OUTLET/ DRAIN/ VAULT DETAILS

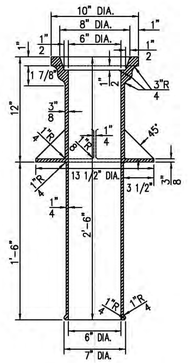
DRAWN BY DLT\PB
DESIGNED BY
CHECKED BY
SCALE NONE
DATE 10/1/97

No. SM-STD7

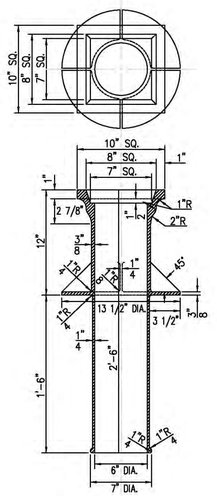
BASE NO.	VALVE SIZE	A	B	C	D	E
2 & 3	3", 4", 6" & 8"	7 1/2"	10 3/4"	4 1/4"	3'-1 1/4"	4'-6"
4	10", 12" & 16"	11"	14 1/4"	6 1/4"	2'-5 1/4"	4'-0"



BASE NO. 2, 3 & 4
EST. WT. 71 POUNDS (NOS. 2 & 3)
EST. WT. 79 POUNDS (NOS. 4)



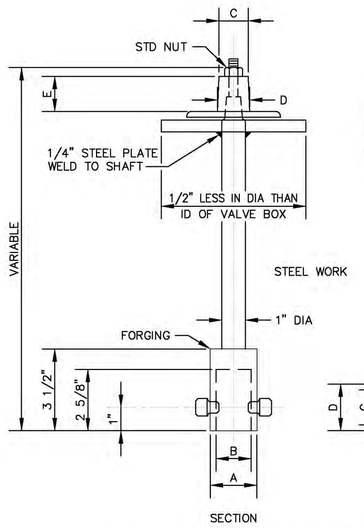
TOP NO. 1 & 2 (ROUND HEAD)
EST. WT. 73 POUNDS

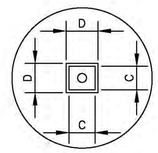


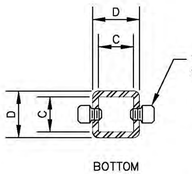
TOP NO. 3 & 4 (SQUARE HEAD)
EST. WT. 73 POUNDS

VALVE BOXES

SCALE: 1 1/2" = 1'-0"







NOTE: VALVE NUTS TO BE CONTERSUNK
1/8" TO RECEIVE SET SCREWS

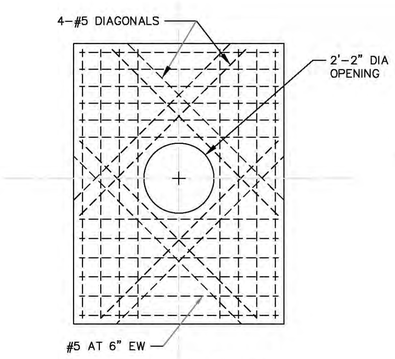
VALVE SIZE	A	B	C	D	E
3" AND SMALLER	2"	1 1/2"	1 1/4"	1 3/8"	1 1/2"
4" TO 20"	2 1/2"	2"	1 3/4"	1 7/8"	1 3/4"
24" AND LARGER	2 5/8"	2 1/8"	* 2"	* 2"	2"

*-NOT TAPERED

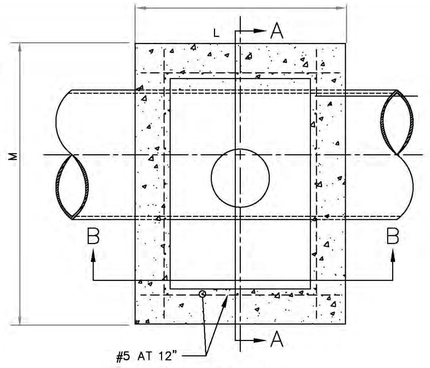
VALVE EXTENSION STEM DETAIL

SCALE: 1/4" = 1'-0"

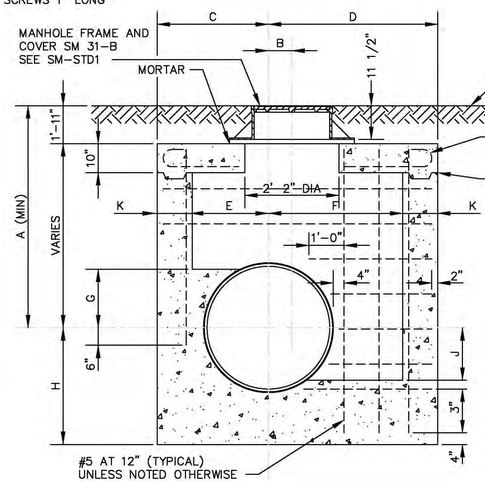
NOTE: EXTENSION STEM REQUIRED WHENEVER DEPTH TO TOP OF VALVE OPERATING NUT EXCEEDS 4'-0"



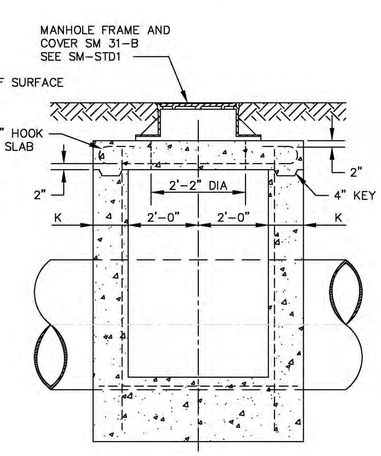
TOP SLAB PLAN



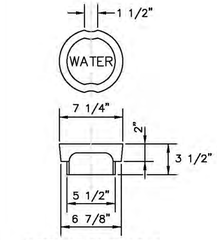
PLAN



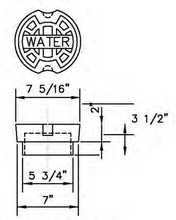
SECTION A-A



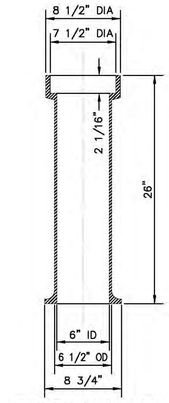
SECTION B-B



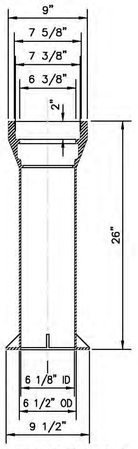
ALTERNATE COVER NO. 1



ALTERNATE COVER NO. 2
WEIGHT 13 POUNDS



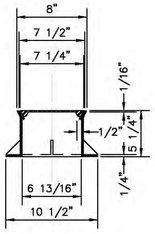
ALTERNATE LONG TOP NO. 1
WEIGHT 55.5 POUNDS



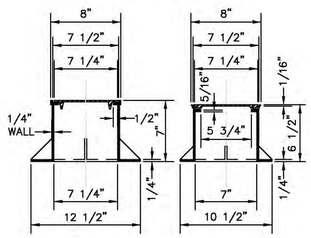
ALTERNATE LONG TOP NO. 2
WEIGHT 65 POUNDS

LONG STYLE VALVE BOX
ROUND TOP AND COVER DETAIL

SCALE: 1 1/2" = 1'-0"



ALTERNATE SHORT
TOP NO. 3
WT 21 LBS

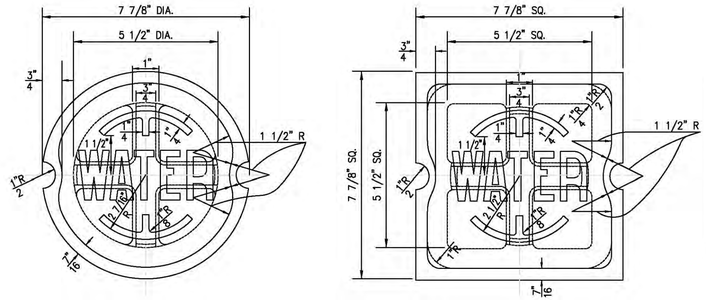


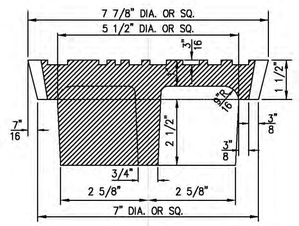
ALTERNATE SHORT
TOP NO. 1
WT 36 LBS

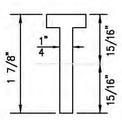
ALTERNATE SHORT
TOP NO. 2
WT 29 LBS

SHORT STYLE VALVE BOX
ROUND TOP AND COVER DETAIL

SCALE: 1 1/2" = 1'-0"







VALVE BOX COVER DETAIL

N T S

PITOMETER VAULT DETAIL

NOT TO SCALE

PITOMETER VAULT - SCHEDULE

PIPE SIZE	A (MIN)	B	C	D	E	F	G	H	J	K	L	M
20"	6'-0"	7"	2'-5"	4'-0"	1'-7"	3'-2"	8"	2'-0"	7"	10"	5'-8"	6'-5"
24"	5'-0"	7"	2'-5"	4'-0"	1'-7"	3'-2"	10"	2'-3"	10"	10"	5'-8"	6'-5"
30"	4'-9"	7"	2'-5"	4'-2"	1'-7"	3'-4"	1'-1"	2'-4"	1'-2"	10"	5'-8"	6'-7"
36"	5'-0"	8"	2'-10"	4'-6"	1'-10"	3'-6"	1'-3"	3'-0"	1'-4"	1'-0"	6'-0"	7'-4"
42"	5'-3"	8"	3'-2"	4'-10"	2'-2"	3'-10"	1'-6"	3'-4"	1'-6"	1'-0"	6'-0"	8'-0"
48"	5'-6"	8"	3'-6"	5'-0"	2'-6"	4'-0"	1'-10"	3'-8"	1'-9"	1'-0"	6'-0"	8'-6"

CWD REFERENCE No. SM-292, SM-292A & SM-723

REVISIONS		
NO.	DATE	BY

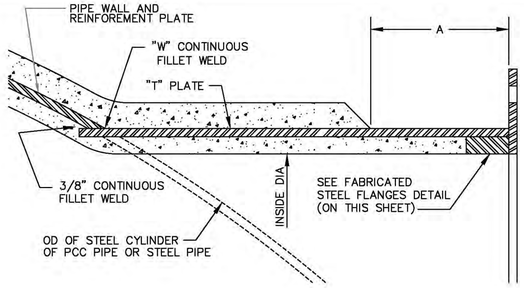
STANDARD DETAILS

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER
CLEVELAND, OHIO

SUBJECT: VALVE BOX, STEM & PITOMETER DETAILS

DRAWN BY: DLT\PB
DESIGNED BY:
CHECKED BY: DATE 10/1/97
SCALE: AS NOTED

No. SM-STD8

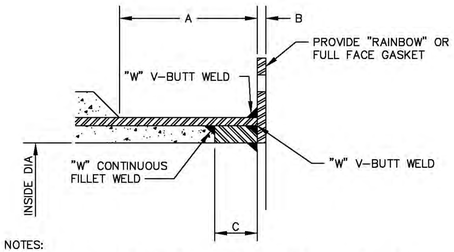


FLANGED OUTLET ON PRESTRESSED CONCRETE CYLINDER PIPE

AND STEEL PIPE

NOTE: DIMENSIONS SHOWN HEREON ARE MINIMUM AND SHALL BE INCREASED ACCORDINGLY PER DESIGN AND PRESSURE REQUIREMENTS

WHERE "INSULATED " FLANGES ARE REQUIRED OR CALLED FOR THE FLANGE BOLT HOLE SHALL BE DRILLED 1/16" LARGER TO ACCOMODATE THE BOLT INSULATED SLEEVES.



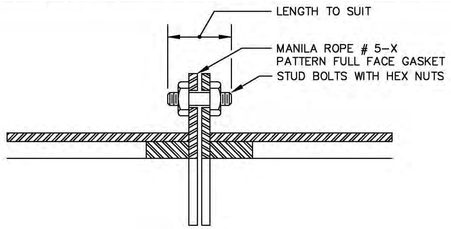
NOTES:

1. CAST FORGED OR ROLLED STEEL FLANGES MAY BE USED INSTEAD OF FABRICATED STEEL.
2. FLANGES SHALL BE CLASS "E" (RING) ALL FLANGES SHALL BE DRILLED TO AMERICAN 125 LB CAST IRON FLANGE STANDARD.
3. ALL BOLTS AND NUTS SHALL BE STAINLESS STEEL , ASTM A 276/A193/A194 TYPE 304, HEAVY HEX

FABRICATED STEEL FLANGES DETAIL

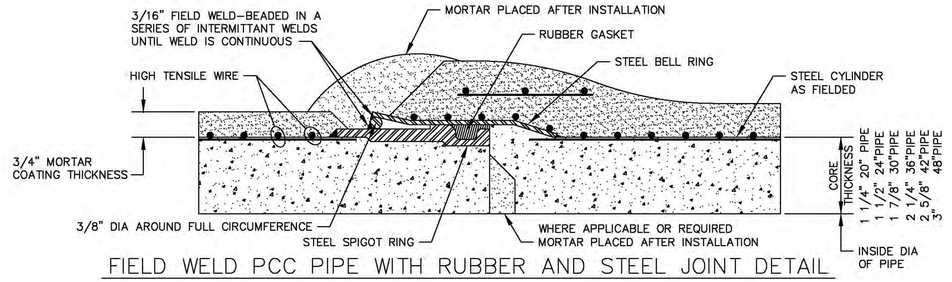
FABRICATED STEEL FLANGES–SCHEDULE

INSIDE DIA	A	B	C	"T"	W	BC	OD	HOLE		BOLT SIZE
								NO.	SIZE	
12"	8"	1 3/4"	1 7/8"	1/4"	1/4"	17"	19"	12	1"	7/8"
16"	8"	2"	2 1/8"	1/4"	1/4"	21 1/4"	23 1/2"	16	1 1/8"	1"
20"	8"	2 3/8"	2 1/2"	1/4"	1/4"	25"	27 1/2"	20	1 1/4"	1 1/8"
24"	8"	2 5/8"	2 3/4"	5/16"	5/16"	29 1/2"	32"	20	1 3/8"	1 1/4"
30"	8"	2 7/8"	3"	3/8"	3/8"	36"	38 3/4"	28	1 3/8"	1 1/4"
36"	8"	3 1/4"	3 3/8"	3/8"	3/8"	42 3/4"	46"	32	1 5/8"	1 1/2"
42"	8"	3 3/8"	3 1/2"	7/16"	7/16"	49 1/2"	53"	36	1 5/8"	1 1/2"
48"	8"	3 1/2"	3 5/8"	1/2"	1/2"	56"	59 1/2"	44	1 5/8"	1 1/2"

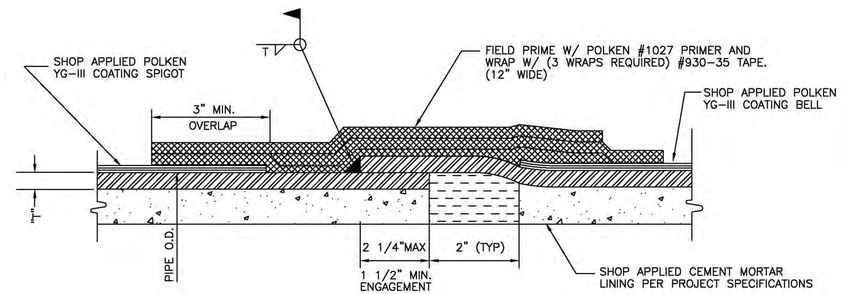


FLANGE CONNECTIONS DETAIL

(SECTIONS THROUGH ℄)



FIELD WELD PCC PIPE WITH RUBBER AND STEEL JOINT DETAIL

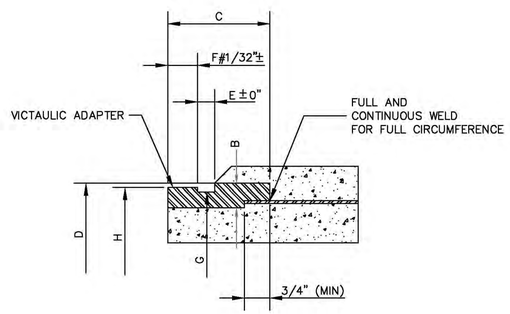


NOTES:

1. FOR STEEL PIPE THICKNESS "T" AND PIPE O.D. SEE DETAILED SPECIFICATIONS
2. FOR PIPE SIZES 20" THRU 30" ONE(1) FULL AND CONTINUOUS FILLET WELD ON OUTSIDE OF LAP JOINT FOR FULL JOINT CIRCUMFERENCE IS REQUIRED.
3. FOR PIPE SIZES 36" THRU 48" ONE(1) FULL AND CONTINUOUS FILLET WELD ON OUTSIDE AND ONE (1) FULL AND CONTINUOUS FILLET WELD ON INSIDE OF LAP JOINT, EACH FOR FULL JOINT CIRCUMFERENCE, IS REQUIRED.

STEEL PIPE FIELD WELDED JOINT DETAIL

GENERAL NOTE: FOR FEILD WELD JOINTS ALL SUCH WELDS SHALL BE FILLET WELDS MADE FOR THE FULL JOINT CIRCUMFERENCE. WELDS MAY BE MADE WITH A "DOUBLE PASS."

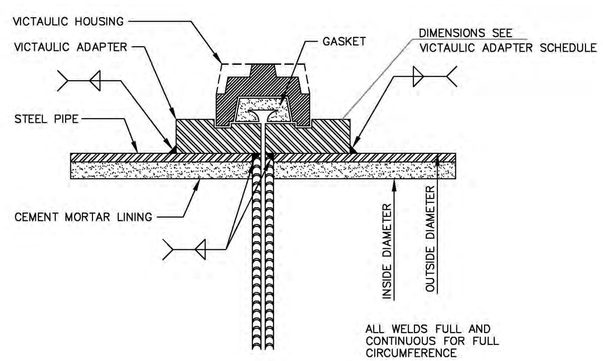


SHOULDERED PIPE END FOR VICTAULIC COUPLING

(PCC PIPE)
(STYLE 44)

VICTAULIC ADAPTER–SCHEDULE

SIZE	B	C	D	E	F	G	H
20"	1"	4"	23 1/4"	3/4"	1 3/16"	22.34"	22.87"
24"	1"	4"	27 1/2"	3/4"	1 3/16"	26.59"	27.13
30"	1 1/4"	4 1/2"	34 1/8"	1"	1 3/4"	33.00"	33.75"
36"	1 1/4"	4 1/2"	40 7/16"	1"	1 3/4"	39.43"	40.19"
42"	1 1/4"	4 1/2"	47 1/8"	1 1/4"	1 3/4"	45.81"	46.63"
48"	1 1/2"	4 1/2"	53 7/8"	1 1/4"	1 3/4"	52.19"	53.13"



VICTAULIC COUPLING–STYLE 44

(STEEL PIPE)

NOTE: DUCTILE IRON–PIPE ENDS SHALL BE SHOULDERED JOINTS OF EITHER CAST PIPE OR WITH WELDED END RING, ADAPTED FOR INSTALLATION OF A STYLE 44 JOINT AND COUPLING CONFORMING TO THE DIMENSIONS SHOWN HEREON.

REVISIONS		
NO.	DATE	BY

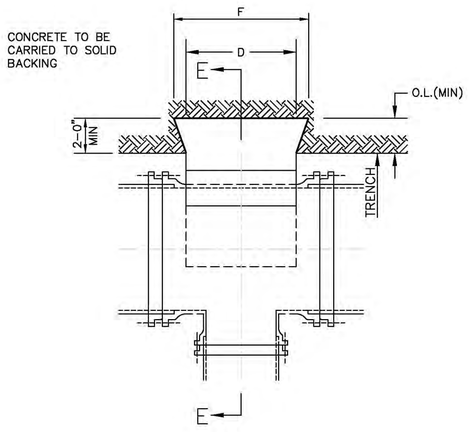
STANDARD DETAILS

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER
CLEVELAND, OHIO

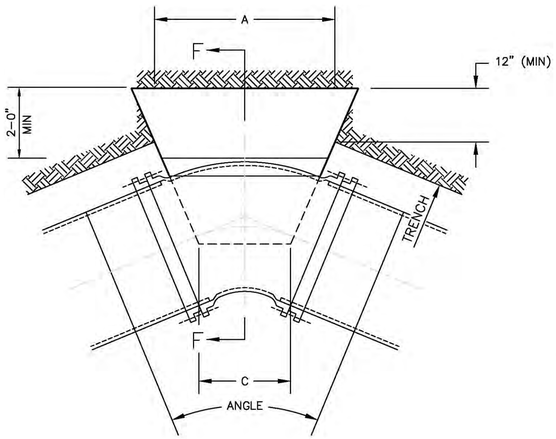
SUBJECT: FLANGE AND VICTAULIC DETAILS; PCCP AND STEEL PIPE WELDED JOINTS

DRAWN BY DLT\PB
DESIGNED BY
CHECKED BY
SCALE NONE
DATE 10/1/97

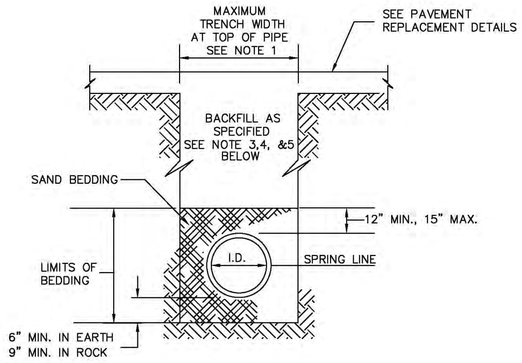
No. SM–STD9



PLAN



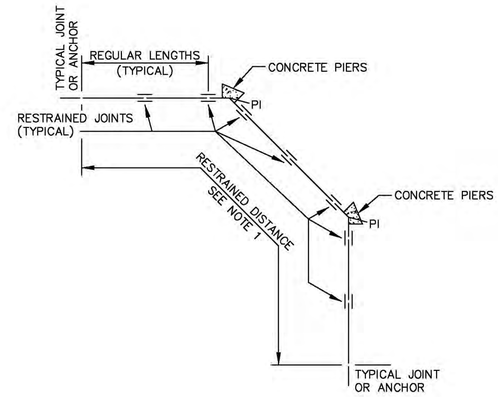
PLAN



NOTES:

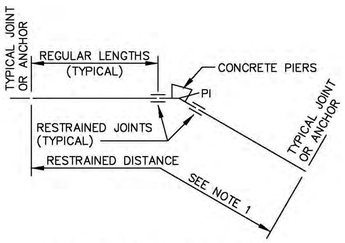
1. THE MINIMUM WIDTH OF UNSHEETED TRENCH SHALL BE EIGHTEEN(18) INCHES LARGER THAN THE OUTSIDE DIAMETER OF THE PIPE EXCEPT BY CONSENT OF THE ENGINEER; THE MAXIMUM CLEAR WIDTH OF THE TRENCH SHALL NOT BE NOT MORE THAN TWO(2) FEET GREATER THAN THE OUTSIDE PIPE DIAMETER . WHEN SHEETING AND BRACING IS USED, THE TRENCH WIDTH SHALL BE INCREASED ACCORDINGLY.
2. ALL TRENCH EXCAVATION SHALL CONFORM TO THE RULES AND REGULATIONS OF THE OHIO STATE INDUSTRIAL COMMISSION (OSIC) AND THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).
3. BACKFILLING SHALL CONSIST OF A SAND BEDDING BACKFILL, AND BACKFILL EXCAVATED FROM THE TRENCHES , OR WHERE REQUIRED, PREMIUM BACKFILL MATERIAL. BACKFILL ABOVE THE ONE (1) FOOT SAND BEDDING BACKFILL MAY BE MADE WITH MATERIAL EXCAVATED FROM THE TRENCHES, PROVIDING SAME IS SATISFACTORY TO THE ENGINEER. IF, IN THE OPINION OF THE ENGINEER, THE MATERIAL EXCAVATED IS UN SATISFACTORY, THE CONTRACTOR SHALL FURNISH, AT HIS OWN EXPENSE, OTHER MATERIAL SUITABLE FOR BACKFILL. ALL BACKFILL SHALL BE CAREFULLY PLACED INTO TRENCH AND NOT DOZED OR DUMPED FROM THE TOP OF THE TRENCH.
4. PREMIUM BACKFILL SHALL BE PLACED WHERE EXISTING AND FUTURE PERMANENT PAVEMENT, SIDEWALKS, DRIVEWAYS, SEWER PIPE CROSSINGS AND CURB CROSSINGS HAVE BEEN OPEN OR UNDER-CUT. THE PLACE OF PREMIUM BACKILL ALSO APPLIES TO ALL EXCAVATION WITHIN THREE(3) FEET OF EXISTING OR FUTURE PERMANENT PAVEMENT, SIDEWALKS, DRIVEWAYS, DRIVEWAY APRONS, SEWER PIPE CROSSINGS AND CURB CROSSINGS. IF PART OF THE TRENCH IS UNDER EXISTING OR FUTURE PAVEMENT, SIDEWALK, DRIVEWAY, DRIVEWAY APRONS, OR CURB THE ENTIRE TRENCH SHALL BE BACKFILLED WITH PREMIUM BACKFILL.
5. PREMIUM BACKFILL SHALL CONSIST OF CRUSHED LIMESTONE. THE PREMIUM BACKFILL SHALL BE AS SUCH THAT CAN BE READILY INCORPORATED IN AN 8-INCH LAYER AND SHALL BE IN ACCORDANCE WITH OHIO DEPARTMENT OF TRANS-PORTATION CONSTRUCTION AND MATERIALS SPECIFICATIONS, ITEM 304, "AGGREGATE BASE," SECTION304.02, "AGGREGATE." SEE DETAIL SPECIFICATIONS, PART D, SECTION D-27, PARAGRAPH H.

TRENCH & BEDDING DETAILS



TYPICAL HORIZONTAL BENDS

NOT TO SCALE



TYPICAL HORIZONTAL BEND

NOT TO SCALE

SECTION E-E

SECTION F-F

CONCRETE PIERS FOR TEES

NOT TO SCALE

CONCRETE PIERS FOR BENDS

NOT TO SCALE

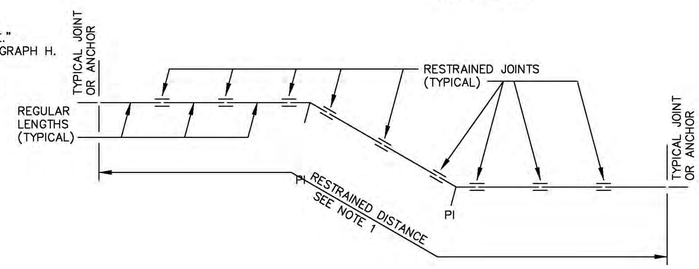
CONCRETE PIERS-SCHEDULE

PIPE SIZE	D (APPROX.)	E (MIN)	F (MIN)
6"-8"	1'-6"	1'-6"	3'-6"
12"	2'-0"	1'-10"	4'-0"
16"	2'-6"	2'-2"	4'-6"
20"	3'-0"	3'-2"	5'-0"
24"	3'-8"	3'-8"	5'-8"
30"	4'-2"	4'-2"	6'-2"
36"	4'-8"	4'-8"	6'-8"
42"	5'-2"	5'-4"	7'-2"
48"	5'-8"	5'-10"	7'-8"

CONCRETE PIERS-SCHEDULE

	11-1/4", 22-1/2", 45"		
PIPE SIZE	A (MIN)	B (MIN)	C (APPROX.)
6"-8"	2'-8"	1'-6"	0'-8"
12"	3'-0"	1'-10"	1'-0"
16"	3'-2"	2'-2"	1'-0"
20"	3'-10"	3'-2"	1'-3"
24"	4'-3"	3'-8"	1'-6"
30"	5'-0"	4'-2"	2'-0"
36"	5'-6"	4'-8"	2'-6"
42"	6'-0"	5'-4"	3'-0"
48"	7'-0"	5'-10"	3'-6"

NOTE: DIMENSIONS HEREON FOR CONCRETE PIER ARE APPROXIMATE AND FOR AND FOR REFERENCE ONLY. ALL CONCRETE SHALL BE FORMED AND POURED TO UNDISTURBED EARTH.



TYPICAL VERTICAL BENDS

NOT TO SCALE

RESTRAINED DISTANCE

NOTES:

1. THE HORIZONTAL AND VERTICAL BENDS LAYOUTS SHOW TYPICAL ARRANGEMENT FOR BOTH HORIZONTAL AND VERTICAL BENDS. IN SPECIAL CASES MAY REQUIRE A COMBINATION OF HORIZONTAL AND VERTICAL "RESTRAINED DISTANCES," OR THE TIED DISTANCE MAY END AT AN ANCHOR INSTEAD OF TYPICAL JOINT. THE PLAN AND PROFILE DRAWINGS GIVE DEFINATE "RESTRAINED DISTANCES" AT ALL REQUIRED POINTS. THE STRAIGHT LENGTHS OF PIPE DESIGNATED AS "REGULAR LENGTHS" SHALL BE MINIMUM 20'-0" LONG.

REVISIONS		
NO.	DATE	BY

STANDARD DETAILS

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER
CLEVELAND, OHIO

SUBJECT: THRUST BLOCK, RESTRAINT & AND TRENCH DETAILS

DRAWN BY DLT\PB
DESIGNED BY
CHECKED BY DATE 10/1/97
SCALE NONE

No. SM-STD11