♦

VOLUME 2 - STANDARD DRAWINGS

FOR INSTALLATION OF
WATER MAINS 20″ AND SMALLER

♦

October 2022

EAST BAY MUNICIPAL UTILITY DISTRICT

EAST BAY MUNICIPAL UTILITY DISTRICT
STANDARD DRAWINGS FOR INSTALLATION OF
WATER MAINS 20" AND SMALLER

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WATER MAINS 20" AND SMALLER

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REFERENCES

1. Volume 1 - Standard Specifications for Installation of Water Mains 20" and Smaller, October 2022

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EAST BAY MUNICIPAL UTILITY DISTRICT
STANDARD DRAWINGS FOR INSTALLATION OF
WATER MAINS 20" AND SMALLER

SERVICES

5/8" THRU 2"

3" THRU 8"

SEWER REPAIR

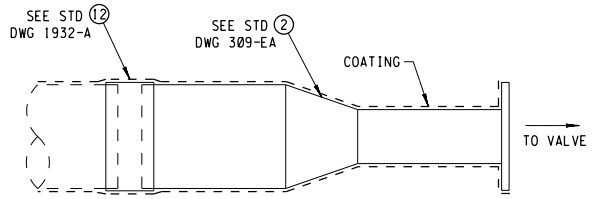
TELEMETRY CABLE

VALVES

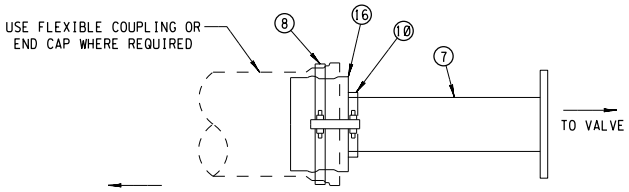
REFERENCES

1. Volume 1 - Standard Specifications for Installation of Water Mains 20" and Smaller, October 2022

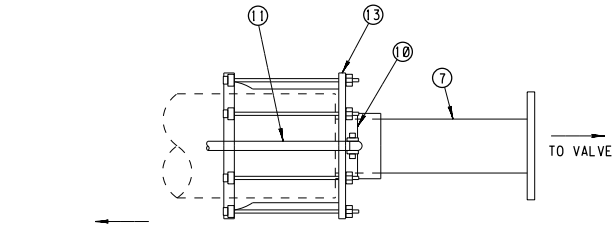
TYPE A CONNECTIONS



WELDED STEEL MAINS

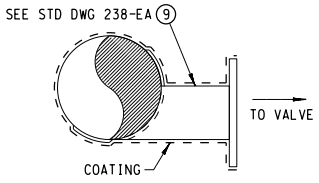


CAST IRON MAINS



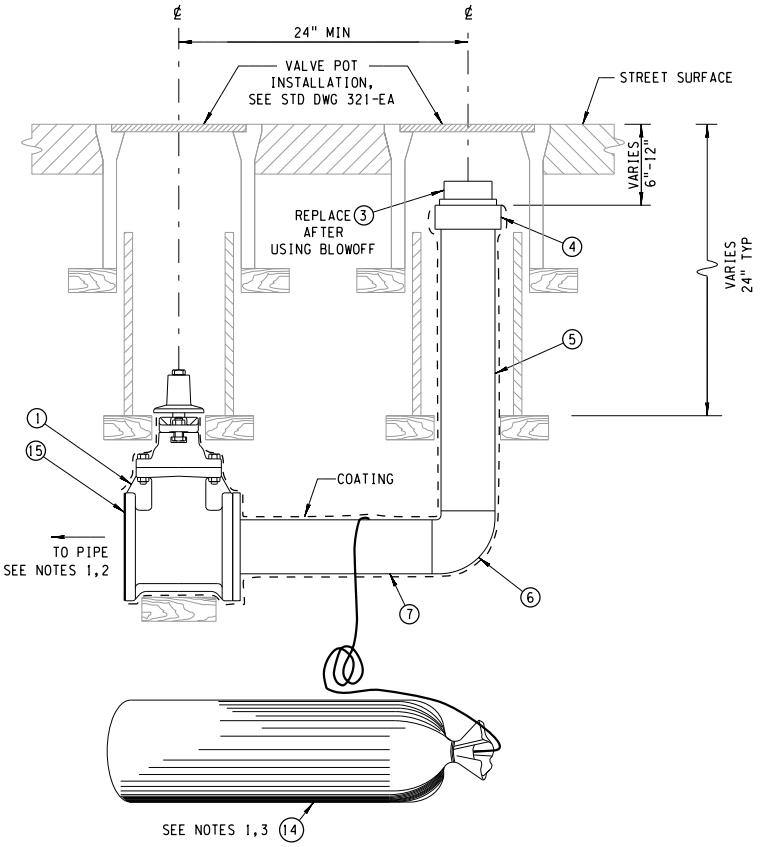
PVC AND AC MAINS

TYPE B CONNECTION



WELDED STEEL MAINS

4" BLOWOFF ASSEMBLY



MATERIAL LIST		TYPE A			TYPE B
ITEM	DESCRIPTION	WELDED STEEL	CAST IRON	PVC	WELDED STEEL
(1)	GATE VALVE - 4" FLANGED	1	1	1	1
(2)	TAPER, W.S. S.M. END FLG'D VARIABLE OR REDUCER WITH SKIRTED FLANGE	1	-	-	-
(3)	PLUG - 4", PLASTIC	1	1	1	1
(4)	COUPLINGS - 4"	1	1	1	1
(5)	RISER - 4" SCREW PIPE VARIABLE	1	1	1	1
(6)	ELL - 4" 90 DEG SCREW	1	1	1	1
(7)	NIPPLE - 4" FLG'D, SCREW 16" LONG	1	2	2	1
(8)	COLLAR - SINGLE - VARIABLE	-	1	-	-
(9)	SKEW NOZZLE - FLANGED	-	-	-	1
(10)	COLLAR - PLUG - VARIABLE	-	1	1	-
(11)	RODS - VARIABLE	-	2	2	-
(12)	BUTTSTRAP	1	-	-	-
(13)	FLEXIBLE COUPLING WITH END CAP, 4" TAP	-	1	1	-
(14)	32-LB MAGNESIUM ANODE	1	1	1	1
(15)	INSULATING FLANGE KIT	1	1	1	1
(16)	PLUG VARIABLE - 4" TAP	-	1	1	-

NOTES

1. ON CEMENT MORTAR COATED STEEL MAINS, INSTALL INSULATING FLANGE KIT ON VALVE FLANGE AND CEMENT MORTAR COAT FROM THE FLANGE TO THE MAIN. MASTIC COAT THE VALVE, TAPE WRAP THE LATERAL PIPING AND INSTALL A 32-POUND MAGNESIUM ANODE ON ITEM 7, PER STD DWG 286-EA.
2. ON PLASTIC COATED STEEL MAINS, OMIT THE INSULATION FLANGE KIT AND OMIT MAGNESIUM ANODE. MASTIC COAT THE VALVE AND TAPE WRAP THE LATERAL PIPING, FROM FLANGE TO MAIN.
3. ON CAST IRON, AND PVC MAINS, MASTIC COAT THE VALVE AND ITEMS 8, 10, 11 AND 16. TAPE WRAP THE LATERAL PIPING. INSTALL A 32-POUND MAGNESIUM ANODE ON ITEM 7.
4. FOR NEW INSTALLATIONS SEE STD DWG 332-EA FOR SIZE ON SIZE 6" AND 8" STEEL AND PVC MAINS OR 332-EA-1 FOR SIZE ON SIZE 6" AND 8" RESTRAINED DUCTILE IRON AND PVC MAINS WITH 4" BLOWOFFS.

REDUCED DRAWING

NO	DATE	REVISION	BY	REC	APP
4	21 JUL 2022	REDRAWN AND REVISED	RPP	DSL	CAW
3	30 JUN 2008	REVISED	JH	ST	AST
2	17 MAY 1993	REVISED	CAD	WB	-
1	26 FEB 1992	REVISED	KKC	WD	-

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	W.L.RAMOS
	DRAWN BY	J.GIOVANNINI
REVIEW	PIPELINE AEW	
	SUPERVISOR PIPELINE ENGINEERING	W.E.BRADBURY
RECOMMENDED	SUPVR PLANT ENG R.P.E. NO. E 1955	L.B.HERTZBERG
	MGR.DLS. & CONST. DIV R.P.E. NO. 13447	W.F.ANTON
APPROVED	CHIEF ENGINEER R.P.E. NO. C 7624	D.G.LARKIN

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

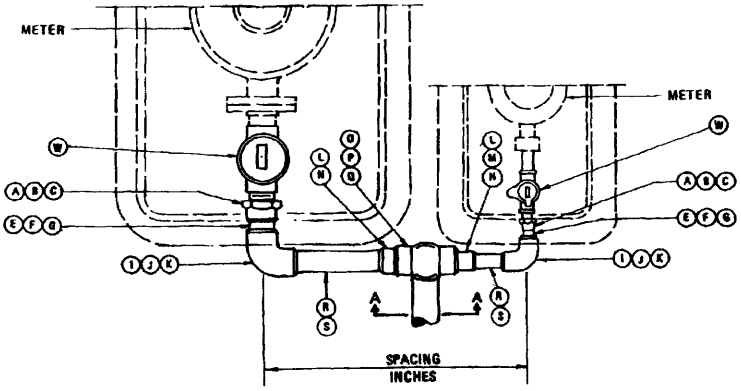
STANDARD DRAWING

4" BLOWOFF ASSEMBLIES

FOR 6" MAINS OR LARGER

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	01 MAR 1972

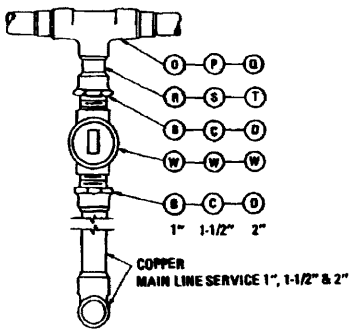
169-EA

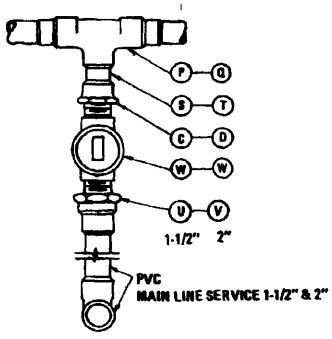


PLAN

CASE NO.	FITTINGS IN PLAN	SPACING INCHES
I	W-A-E-I-R-O-R-I-E-A-W	16
II	W-B-F-J-R-L-P-L-R-I-E-A-W	16
III	W-B-F-J-R-L-P-L-R-J-F-B-W	16
IV	W-C-G-K-S-N-Q-M-R-I-E-A-W	21
V	W-C-G-K-S-N-Q-M-R-J-F-B-W	21
VI	W-C-G-K-S-N-Q-N-S-K-G-C-W	26

ITEM	MATERIAL
	COUPLING – COP. TO MIPT
A	3/4"
B	1"
C	1-1/2"
D	2"
	NIPPLE – COPPER PIPE
E	3/4" x 3"
F	1" x 3-1/8"
G	1-1/2" x 3-3/8"
	ELL – COP. TO COP.
I	1" x 3/4" REDUCING ELL
J	1"
K	1-1/2"
	BUSHING – COP. TO COP.
L	1-1/2" TO 1"
M	2" TO 1"
N	2" TO 1-1/2"
	TEE – COP. TO COP. TO COP.
O	1" x 1" x 1"
P	1-1/2" x 1-1/2" x 1-1/2"
Q	2" x 2" x 2"
	PIPE – COPPER
R	1"
S	1-1/2"
T	2"
U	1-1/2" COUPLING MIPT TO SOCKET
V	2" COUPLING MIPT TO SOCKET
W	CURB STOP – SAME SIZE AS PIPE RUN





VIEW A-A

NOTES

1. CASE I – A 1" MAIN LINE SERVICE WITH TWO 3/4" BRANCH SERVICES. REFER TO DRAWING 1995 EA, NOTE 2.
2. CASE II – A 1-1/2" MAIN LINE SERVICE WITH ONE 1" BRANCH AND ONE 3/4" BRANCH.
3. CASE III – A 1-1/2" MAIN LINE SERVICE WITH TWO 1" BRANCH SERVICES.
4. CASE IV – A 2" MAIN LINE SERVICE WITH ONE 1-1/2" BRANCH AND ONE 3/4" BRANCH.
5. CASE V – A 2" MAIN LINE SERVICE WITH ONE 1-1/2" BRANCH AND ONE 1" BRANCH.
6. CASE VI – A 2" MAIN LINE SERVICE WITH TWO 1-1/2" BRANCH SERVICES.
7. FITTINGS AS SHOWN BY LETTER DESIGNATION IN TABLE ARE ARRANGED IN ORDER OF ASSEMBLY, READING FROM LEFT TO RIGHT.
8. REFER TO DRAWINGS 291-EA, 292-EA & 1995 EA FOR MAIN LINE SERVICE INSTALLATIONS AND METER CONNECTIONS.
9. ALL FITTINGS, EXCEPT U AND V ARE WROUGHT COPPER, BRASS, OR OTHER COPPER-BASE ALLOY FOR SOLDER JOINTS. FITTINGS U AND V ARE PLASTIC FOR SOLVENT WELD TO PLASTIC SERVICE LINE.

APPROVED _____ CHIEF ENGINEER, R.P.E. NO. C26724

NO.	DATE	REVISION	BY	REC.	APP
2	24 AUG 00	REVISED	RGA		
1	09 FEB 89	REVISED & REDRAWN	NTN		

DESIGN
DESIGNED BY EBMUD
DESIGN CHECKED BY Hubert Lai
DRAWN BY J GIOVANNINI

REVIEW
CORROSION CHECK BY R. Chapman
SR. CIVIL ENG. R.P.E. NO. C 27714
MGR. OF DESIGN R.P.E. NO. C 18814
ASST. CH. ENG. FOR DES. & CONST. R.P.E. NO. C 29111

RECOMM

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

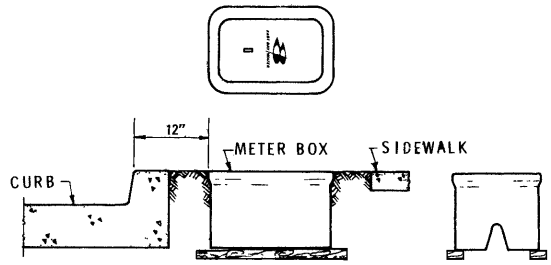
STANDARD DRAWING

DUAL BRANCH SERVICE COPPER INSTALLATIONS

3/4" THRU 1-1/2"

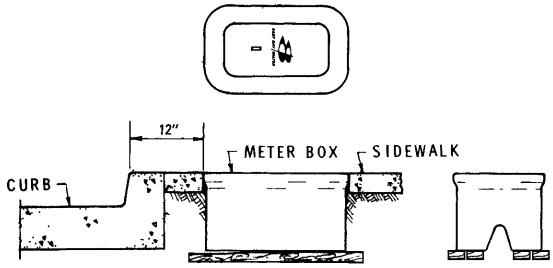
STRUCTURE OR ZONE DESIGNATION
SCALE NO SCALE
DATE 12 SEP 67

184-EA



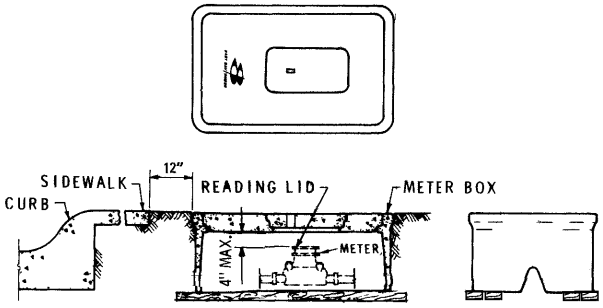
PARKING STRIP INSTALLATION

(#1 BOX SHOWN)



IN SIDEWALK INSTALLATION

(#5 BOX SHOWN)



BEHIND SIDEWALK INSTALLATION

(#6 BOX SHOWN)

N O T E S:

1. ALL METER BOXES MUST BE SET TRUE, PERPENDICULAR TO STREET AND FLUSH WITH EXISTING SURFACE.
2. METER BOXES WILL NOT SUPPORT VEHICLE WHEEL LOAD, UNLESS RATED FOR H 20 TRAFFIC.
3. SPACE BETWEEN BOXES IN MULTIPLE METER INSTALLATION SHALL BE 2".
4. AVOID SETTING METER BOXES IN TRAVELED WALKWAYS, DRIVEWAYS WHEREVER POSSIBLE.
5. DO NOT SET METER BOXES ON PRIVATE PROPERTY.
6. ALL METER BOXES ARE COMMERCIAL PRODUCTS. SHAPE AND DIMENSIONS MAY VARY.
7. METER BOXES FOR 1-1/2" AND 2" SERVICES SHALL REST ON 2"x8"x12" REDWOOD BLOCKS, 4 EACH FOR #5 AND #6 BOXES, AND 2 EACH FOR #1 BOX
8. READING LIDS SHOULD BE WITHIN 4" OF BOX COVER.
9. BOXES AVAILABLE IN CONCRETE AND LIGHT-WEIGHT POLYMERIC CONCRETE.

METER BOX DIMENSIONS

SERVICE LATERAL	BOX NO.	DIMENSIONS (INCHES)		
		LENGTH	WIDTH	HEIGHT
3/4"	1	18 TO 19-1/2	11 TO 13-3/4	12
1"	5	22 TO 24	13 TO 14	11 TO 12
1-1/2" TO 2"	6	31-3/4 TO 36	20 TO 24	12

NO.	DATE	REVISION	BY	REC.	APP.
3	3 MAR 11	REVISED - CHANGE "METER" COLUMN TO "SERVICE LATERAL"	MB	ST	AST
2	30JUNE08	REVISED	JH	ST	AST

✓ REVISED 17 MARCH 89 D.A.S.

APPROVED _____ CHIEF ENGINEER R P E No C 7624

DESIGN: DESIGN BY EBMUD; DESIGN CHECK BY W Ramos; DRAWN BY J. GIOVANNINI

REVIEW: MECH | ELECT | STRUCT; PIPELINE | CORR | FNDN

RECOMMENDED: SUPVR PIPELINE ENG R P E NO C 10603 W.E. Bradley; MGR DES & CONST DIV R P E NO C 13447

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

METER BOX INSTALLATIONS

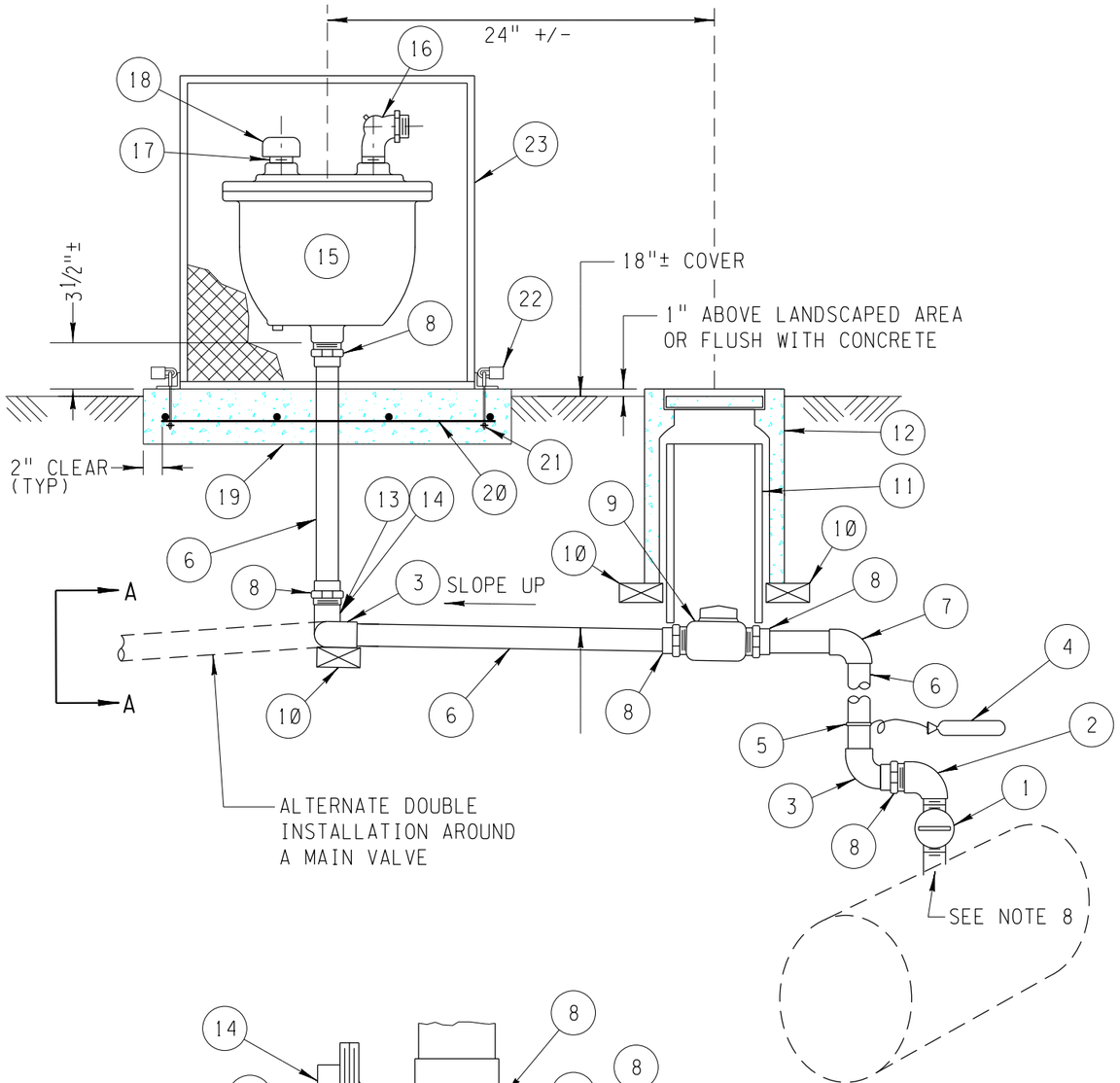
#1, #5, AND #6 METER BOXES

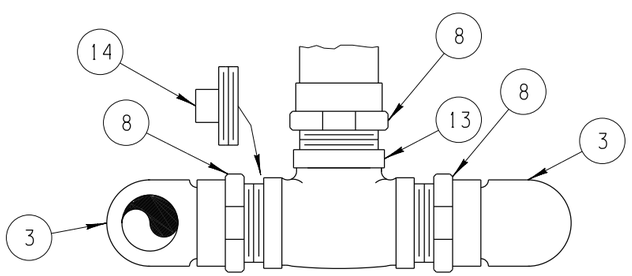
STRUCTURE OR ZONE DESIGNATION

SCALE NONE

DATE 7MAR73

186-EA





SECTION A

DOUBLE INSTALLATION
AROUND A MAIN VALVE
SHOWN HERE.

USE PLUG (14) FOR
SINGLE INSTALLATION

ITEM	QTY'S SINGLE	QTY'S DOUBLE	DESCRIPTION (SEE NOTES 7, 8)
1	1	2	CHABOT COCK, BRASS, MIP X MIP
2	1	2	ELL, 90 DEG, CLASS 125, BRASS, FPT
3	2	4	STREET ELL, 90 DEG, COPPER
4	1	1	ANODE, MAGNESIUM, 9 LB, PRE-PACKAGED
5	1	1	GROUND CLAMP, BRONZE
6	AS REQ'D	AS REQ'D	COPPER PIPE, BLUE POLY-CLAD, TYPE K, RIGID
7	1	2	ELL, 90 DEG, COPPER
8	8	10	MALE ADAPTER, COPPER, MIP X SOC
9	1	2	CURB COCK, BRASS, FIP X FIP
10	4	7	BRICK PAVER, CLAY OR CONC
11	AS REQ'D	AS REQ'D	RISER, 8", PVC DR-14, NOTCHED
12	1	2	VALVE BOX, G05, CI LID "WATER"
13	1	1	TEE, BRASS, CLASS 125, FPT
14	1	0	PLUG, BRASS, CLASS 125
15	1	1	COMBINATION AIR VALVE, 1" OR 2" AS SPECIFIED
16	1	1	HOSE BIB, ½", KEYLESS, WITH ¼" ADAPTER
17	1	1	CLOSE NIPPLE, BRASS, SCH 40, MPT
18	1	1	MUSHROOM VENT CAP, SCREENED, HDG
19	1	1	32" X 20" X 4" CONCRETE PAD
20	1 MAT	1 MAT	4" X 4" 6/6 WELDED WIRE MESH
21	2 SETS	2 SETS	⅜" X 3" FORGED EYEBOLTS W/NUTS AND FENDER WASHERS, STL, HDG
22	2	2	PADLOCKS, "CONTRACTORS"
23	1	1	ENCLOSURE, GREEN, BPDI GS-1
24	1	1	FROST GUARD, GREEN, (NOT SHOWN), BPDI FG-1, R-13

NOTES:

1. AIR VALVE OUTLET SHALL BE ABOVE THE 100-YR FLOOD LEVEL AS SPECIFIED BY THE ENGINEER. THIS DESIGN SHALL NOT BE USED IN LOCATIONS SUBJECT TO FLOODING ≥ 1FT. DEEP.
2. IF SITE CONDITIONS PRECLUDE THIS DESIGN, USE STD DWG 0189.2-B.
3. MAINTAIN AN UPWARD SLOPE FROM CHABOT COCK TO AIR VALVE VENT.
4. APPLY MASTIC COAT OR WAX TAPE TO ALL UNCOATED BURIED PIPE AND FITTINGS. WRAP RISER FROM AIR VALVE TO TEE WITH TWO LAYERS 20 MIL PIPE TAPE.
5. INSTALL ANODE SIMILAR TO STD DWG 1020?-G. DO NOT PLACE ANODE IN MAIN PIPE TRENCH.
6. USE 1" AIR VALVE ASSEMBLIES FOR 6" THROUGH 16" PIPE. USE 2" AIR VALVE ASSEMBLIES FOR 20" PIPE AND LARGER OR AS SPECIFIED BY THE ENGINEER. THIS DRAWING MAY NOT BE SUITABLE WHERE AIR VALVES ARE PART OF AN ENGINEERED TRANSIENT PRESSURE MITIGATION.
7. NOMINAL SIZE OF PLUMBING TO MATCH AIR VALVE.
8. CONNECTIONS TO TOP OF MAINS ARE MADE SIMILAR TO THOSE SHOWN ON STD DWG 9020-GB.
9. LOCATE IN THE PUBLIC WAY OR EBMUD RIGHT OF WAY ONLY, SIMILAR TO FIRE HYDRANTS, OR AS DIRECTED BY THE ENGINEER.

NO.	DATE	REVISION	BY	REC.	APP.

DESIGN
DESIGNED BY
DESIGN CHECKED BY Marina Boyce
DRAWN BY BK

REVIEW
CORROSION CHECK BY Mark Lewis
SENIOR CIVIL ENGINEER R.P.E. NO. C 59576 Marshall Lefond
RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 48598
APPROVED, ACTING DIRECTOR OF ENGINEERING R.P.E. NO. C 44278

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

AIR VALVE INSTALLATION

ABOVE GRADE

STRUCTURE OR ZONE DESIGNATION
SCALE NONE
DATE 11 SEP 14

0189.1-B

USER: dkolodzi
PLOT DATE: 12-NOV-2014 09:47
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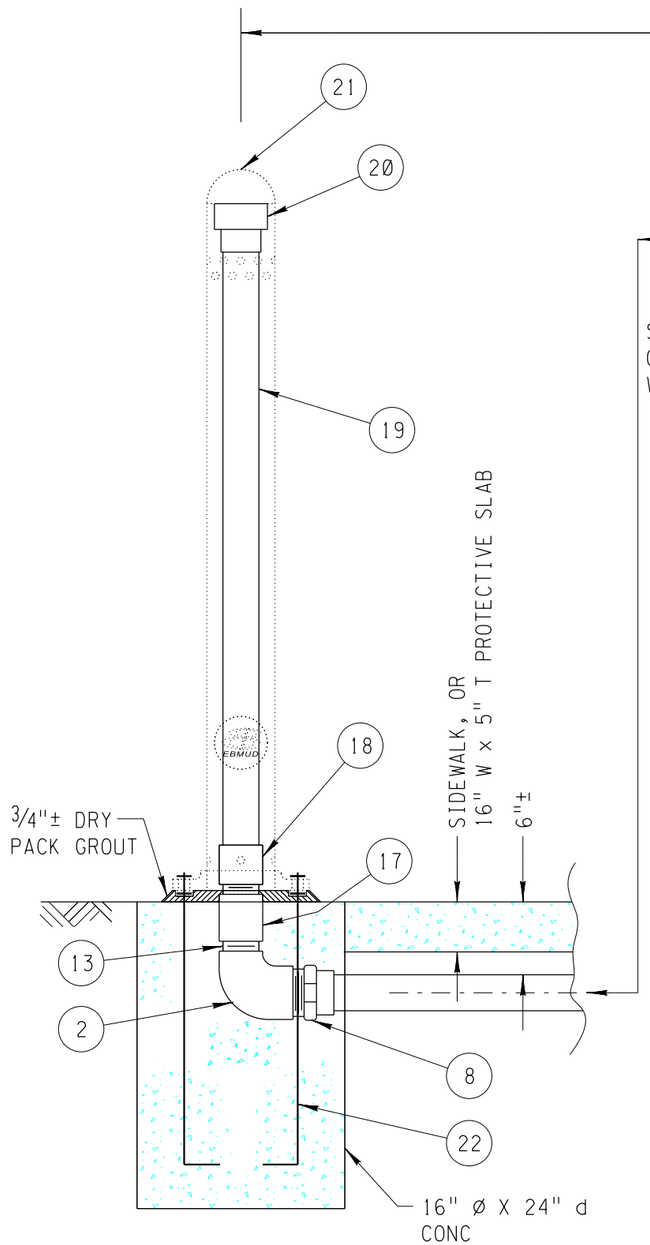
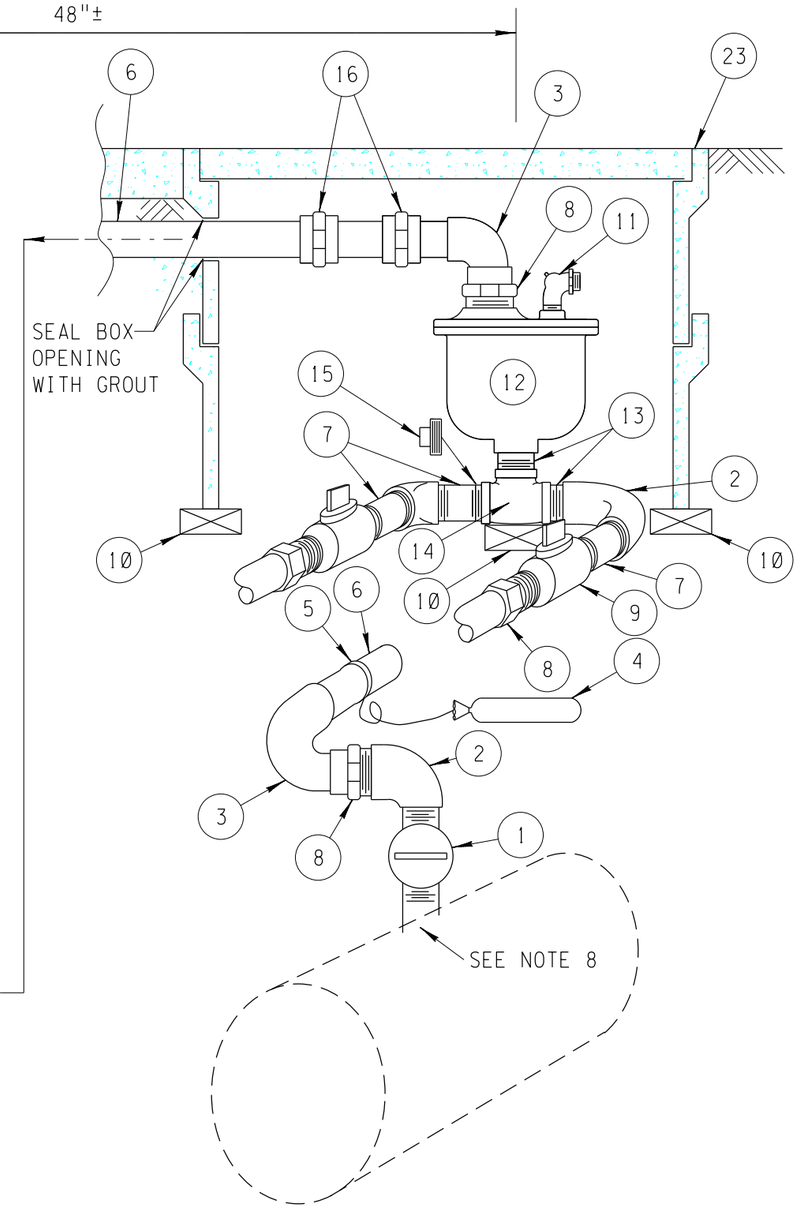




DOUBLE INSTALLATION
AROUND A MAIN VALVE
SHOWN HERE.
USE PLUG (16) FOR
SINGLE INSTALLATION.

ITEM	QTY'S SINGLE	QTY'S DOUBLE	DESCRIPTION (SEE NOTES 6, 7)
1	1	2	CHABOT COCK, BRASS, MIP X MIP
2	3	5	ELL, 90 DEG, CLASS 125, BRASS, FPT
3	2	3	STREET ELL, 90 DEG, COPPER
4	1	1	ANODE, MAGNESIUM, 9 LB, PRE-PACKAGED
5	1	1	GROUND CLAMP, BRONZE
6	AS REQ'D	AS REQ'D	COPPER PIPE, BLUE POLY-CLAD, TYPE K, RIGID
7	1	3	NIPPLE, 4" LONG, BRASS, SCH 40, MPT
8	4	6	MALE ADAPTER, COPPER, MIP X SOC
9	1	2	CURB COCK, BRASS, FIP X FIP
10	9	9	BRICK PAVER, CLAY OR CONC
11	1	1	HOSE BIB,1/2", KEYLESS, WITH 1/4" ADAPTER
12	1	1	COMBINATION AIR VALVE
13	3	3	NIPPLE, 2" LONG, BRASS, SCH 40, MPT
14	1	1	TEE, BRASS, CLASS 125, FPT
15	1	0	PLUG, BRASS, CLASS 125, MPT
16	2	2	UNION, BRASS/COPPER, SOC X SOC
17	1	1	COUPLING, BRASS, CLASS 125, FPT
18	1	1	MALE ADAPTER, PVC, SCH 40
19	4 ft	4 ft	PIPE, PVC, SCH 40
20	1	1	VENT CAP, SCREENED, PVC, GIZMO VC-S, SOC
21	1	1	AIR VALVE BOLLARD, STD DWG 2007-A
22	4	4	ANCHOR L-BOLT SETS (2 NUTS, WASHERS), HDG, 5/8" X 18"
23	2	2	METER BOX, POLYMER CONCRETE, NO. 6 (ONE LID)

NOTES:

1. AIR VALVE OUTLET SHALL BE ABOVE THE 100-YR FLOOD LEVEL AS SPECIFIED BY THE ENGINEER. THIS DESIGN MAY BE MODIFIED BY EXTENDING THE BOLLARD AND VENT RISER AS NEEDED.
2. SEE STD DWG 0189.1-B FOR ALTERNATE INSTALLATION.
3. MAINTAIN UPWARD SLOPE OF PIPEWORK FROM CHABOT COCK TO VENT.
4. APPLY MASTIC COAT OR WAX TAPE TO ALL BURIED, UNCOATED METAL PIPE AND FITTINGS. APPLY TWO LAYERS OF 20 MIL PIPE TAPE TO METAL PARTS IN CONCRETE.
5. INSTALL ANODE SIMILAR TO STD DWG 10207-G. DO NOT PLACE ANODE IN MAIN PIPE TRENCH.
6. USE 1" AIR VALVE ASSEMBLIES FOR 6" THROUGH 16" PIPE. USE 2" AIR VALVE ASSEMBLIES FOR PIPES 20" AND LARGER, OR AS SPECIFIED BY THE ENGINEER. THIS DRAWING MAY NOT BE SUITABLE WHERE AIR VALVES ARE PART OF AN ENGINEERED TRANSIENT PRESSURE MITIGATION.
7. NOMINAL SIZE OF PLUMBING TO MATCH AIR VALVE SIZE.
8. CONNECTIONS TO TOP OF MAINS ARE MADE SIMILAR TO THOSE SHOWN ON STD DWG 9020-GB.
9. LOCATE IN THE PUBLIC WAY OR EBMUD RIGHT OF WAY, SIMILAR TO FIRE HYDRANT, OR AS DIRECTED BY THE ENGINEER.

NO.	DATE	REVISION	BY	REC.	APP.

DESIGN
DESIGNED BY
DESIGN CHECKED BY Marisa Boyce
DRAWN BY

REVIEW
CORROSION CHECK BY Mark Lewis
SENIOR CIVIL ENGINEER R.P.E. NO. C 59576 Marshall Lofland
RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 48598 S. Trautwein
APPROVED, ACTING DIRECTOR OF ENGINEERING R.P.E. NO. C 44278 Jo Lovelace

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

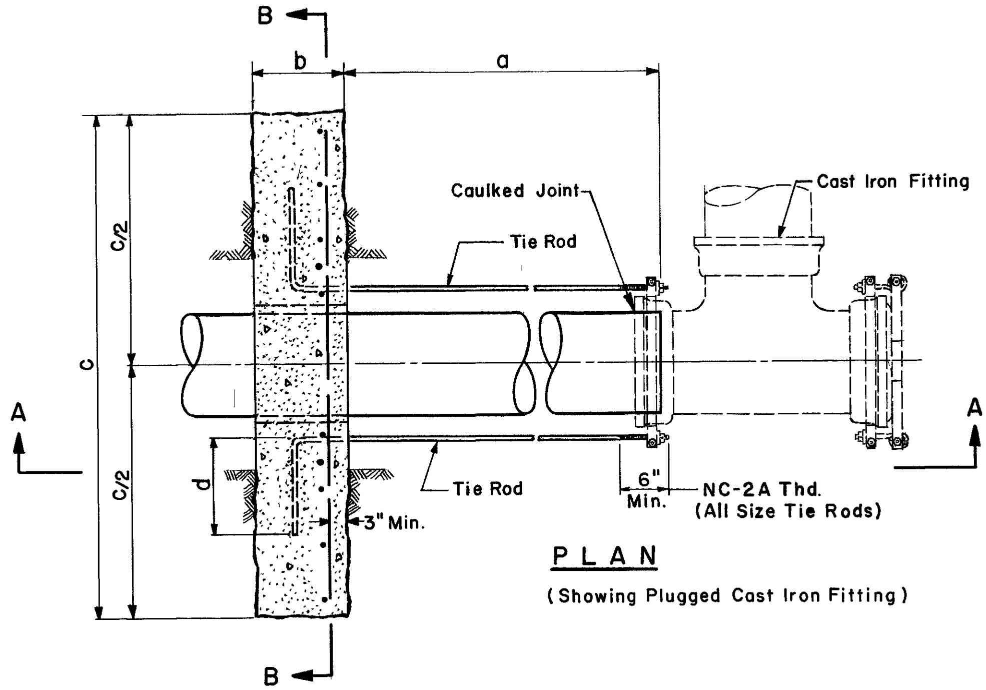
AIR VALVE INSTALLATION

BELOW GRADE

STRUCTURE OR ZONE DESIGNATION
SCALE NONE
DATE 11 SEP 14

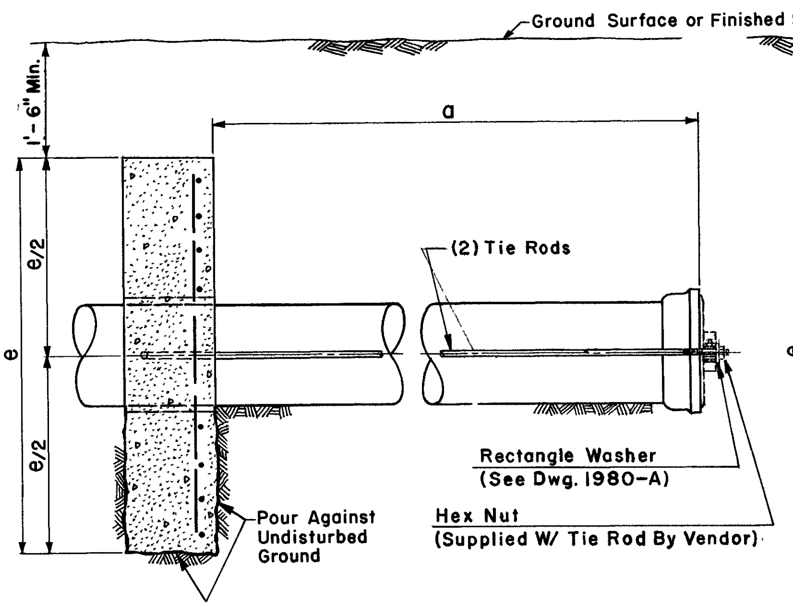
0189.2-B

USER: bkoloszi
PLOT DATE: 12-NOV-2014 09:49
FILE: H:\general\std-dwgs\2013\0189.2-B.dgn



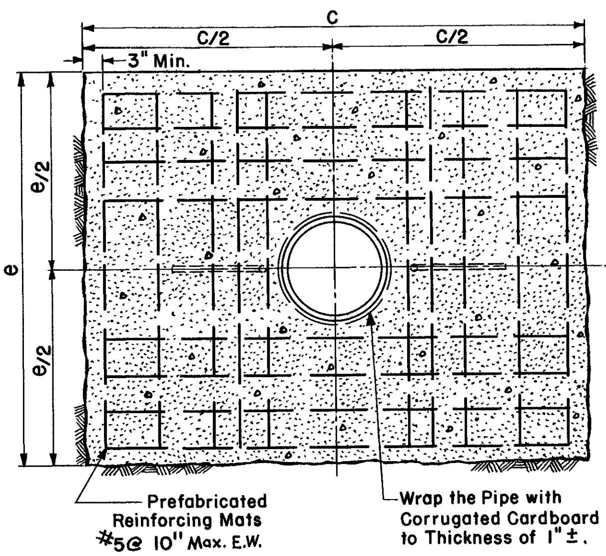
PLAN

(Showing Plugged Cast Iron Fitting)



SECTION A—A

(Showing Plugged Cast Iron Pipe)



SECTION B—B

DIAMETER OF PIPE (Inches)	ALLOWABLE PRESSURE PSI	TIE ROD (Blank Dim.)	DIMENSIONS				
			a	b	c	d	e
6	0 - 150	5/8" x 6'-6"	5'-0"	1'-0"	3'-0"	6"	3'-0"
8	0 - 150	5/8" x 7'-6"	6'-0"	1'-0"	3'-6"	6"	3'-6"
12	0 - 150	7/8" x 10'-0"	7'-9"	1'-0"	6'-1"	1'-3"	4'-9"
16	0 - 150	1" x 12'-9"	10'-0"	1'-3"	8'-6"	1'-6"	5'-6"

NOTES:

1. Working pressures shall not exceed pressures as indicated on the schedule above.
2. Anchor tie rod stock shall be A-36 steel or approved equivalent, and reinforcing bars to be grade 60 steel
3. Apply mastic, in accordance with E.B.M.U.D. Specifications.
4. 4" C.I. plugged fittings do not require concrete anchor, but shall be blocked.
5. Concrete shall have a minimum compressive stregth of 3000 psi. at 28 days.
6. Horizontal mat bars may be temporarily removed and replaced to permit pipe placement.

APPROVED ______ CHIEF ENGINEER R. E. No 648

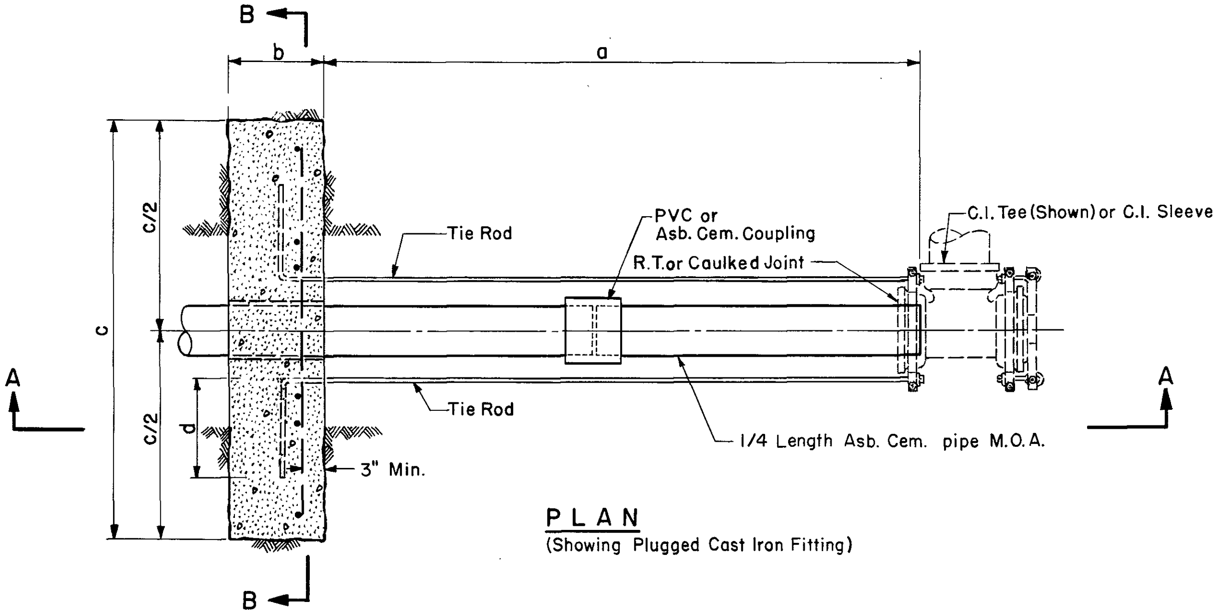
REVISED 7 DEC 88 D.A.S.

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

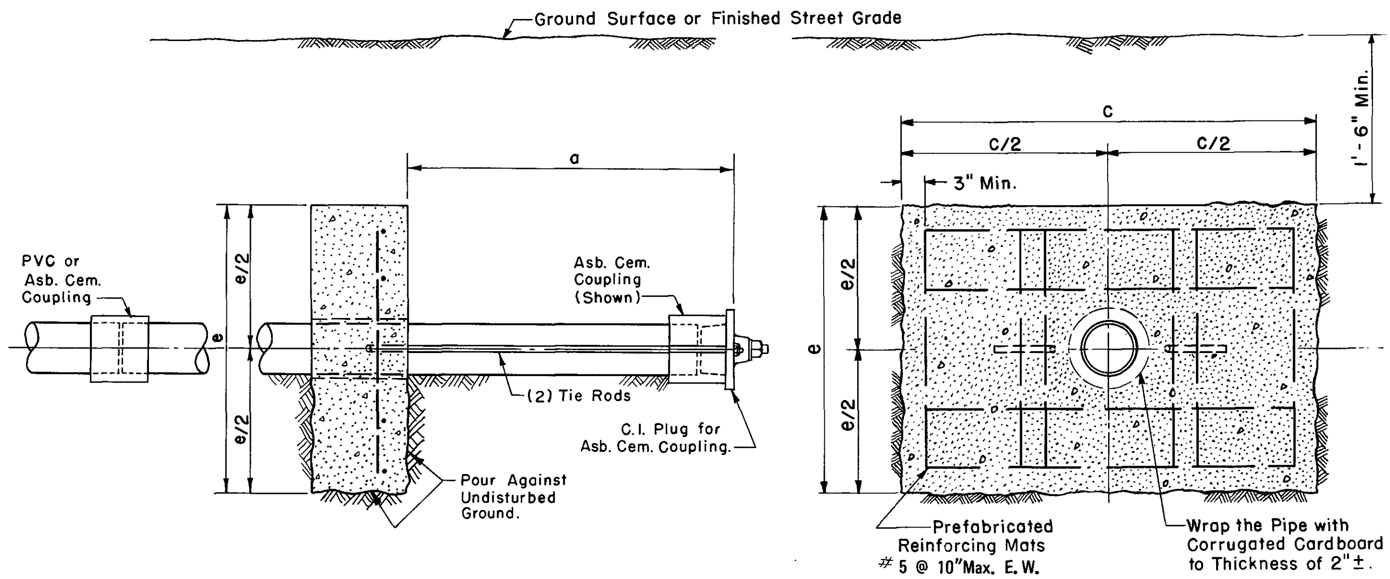
STANDARD DRAWING

ANCHOR INSTALLATIONS
FOR PLUGGED FITTINGS
ON CAST IRON PIPE

DESIGNED BY	B. L. Soo	TRACED BY	R. L.
DRAWN BY	R. Leach	SCALE	None
CHECKED BY	C. F. Yerly	DATE	2-17-58
RECOMMENDED BY			
APPROVED BY	J. W. Trahern	NO.	193-EA



PLAN
(Showing Plugged Cast Iron Fitting)



SECTION A-A
(Showing Plugged Asb. Cem. Fitting)

SECTION B-B

DIAMETER OF PIPE (Inches)	ALLOWABLE PRESSURE PSI	TIE ROD SIZE	DIMENSIONS				
			a	b	c	d	e
4	0 - 150	1/2" x 6'-0"	4'-6"	1'-0"	3'-0"	6"	2'-4"
6	0 - 150	1/2" x 6'-6"	5'-0"	1'-0"	3'-0"	6"	3'-0"
8	0 - 150	5/8" x 7'-6"	6'-0"	1'-0"	3'-6"	6"	3'-6"
12	0 - 150	7/8" x 10'-0"	7'-9"	1'-0"	6'-1"	1'-3"	4'-9"

NOTES:

1. Working pressures shall not exceed pressures as indicated on the schedule above.
2. Anchor tie rod stock shall be A-36 steel or approved equivalent. and reinforcing bars to be grade 60 steel
3. Apply mastic, in accordance with E.B.M.U.D. Specifications.
4. Concrete shall have a minimum compressive strength of 3000 psi at 28 days.
5. When 8" PVC or D.I. pipe is installed in any Ring-Tite jointed cast iron fitting or valve, use District Code No. 41137 adapter ring.
6. Horizontal mat bars may be temporarily removed and replaced to permit pipe placement.

REDUCED DRAWING

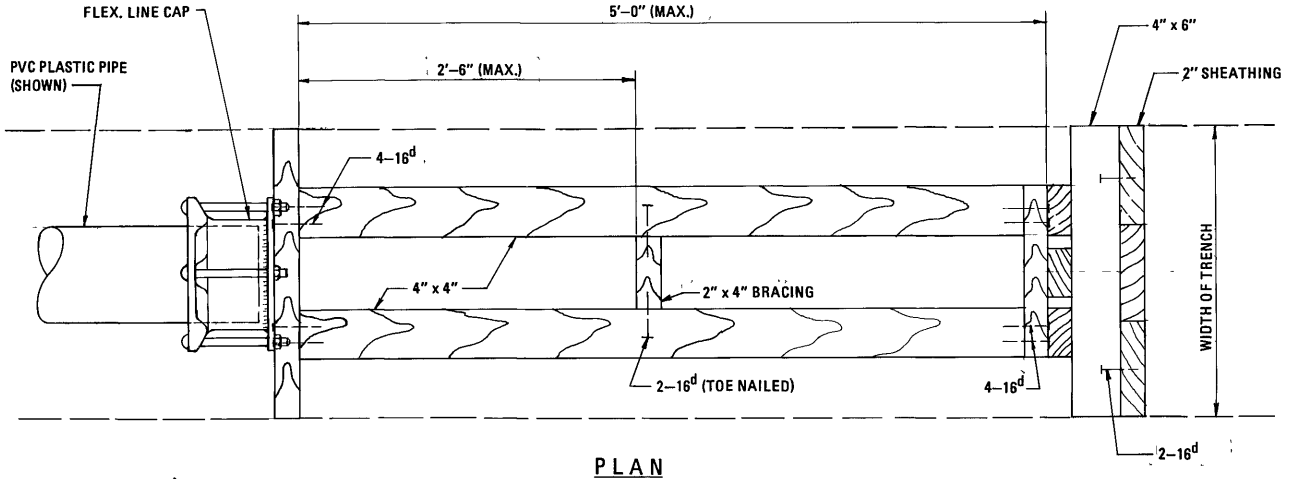
REVISED 7 DEC 88 D.A.S.

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

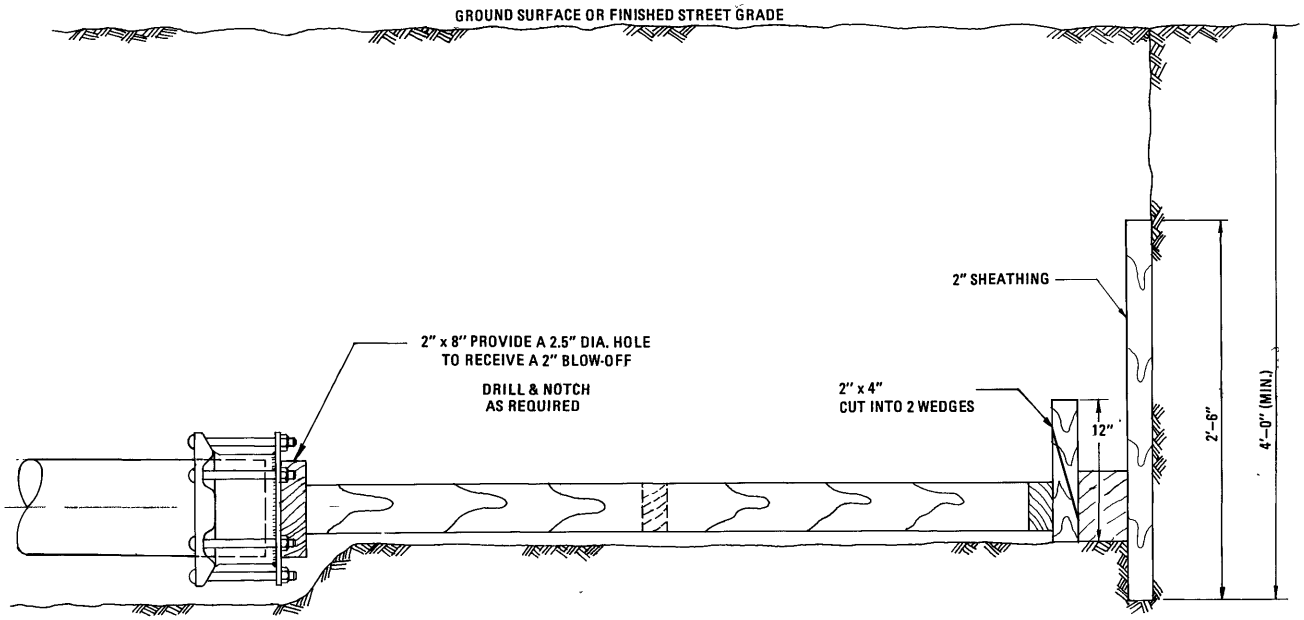
STANDARD DRAWING
ANCHOR INSTALLATIONS
FOR PLUGGED FITTINGS
ON A.C. AND PVC PIPE

DESIGNED BY	B. G. Soo	TRACED BY	R. L.
DRAWN BY	R. Leach	SCALE	None
CHECKED BY	C.F. Yeuly	DATE	2-17-58
RECOMMENDED BY			
APPROVED BY	J.W. Trahern	NO.	194-EA

APPROVED ________ CHIEF ENGINEER R.E. No. 648



PLAN



ELEVATION

DIAMETER OF PIPE (INCHES)	ALLOWABLE PRESSURE (PSI)
6	0–110
8	0–80

NOTES:

1. THE TERM "TEMPORARY" AS USED HEREIN INDICATES A PERIOD NOT EXCEEDING 30 DAYS.
2. LUMBER SHALL BE CONSTRUCTION GRADE DOUGLAS FIR.
3. WHEN 8" PVC PIPE IS INSTALLED IN ANY RING-TITE JOINTED CAST IRON FITTING OR VALVE, USE DISTRICT CODE NO. 41137 ADAPTER RING.
4. COAT FLEX. LINE CAP, BOLTS AND NUTS WITH MASTIC.

√ REVISED & REDRAWN NOV. 23, 1988 N.T.N. WB

APPROVED _____ CHIEF ENGINEER R P E. NO. C26724

DESIGN
DESIGNED BY E.B.M.U.D.
DESIGN CHECKED BY Hubert Lai
DRAWN BY R. LEACH

REVIEW
CORROSION CHECK BY K. Chapman
SR. CIVIL ENGR. R.P.E. NO. C 27714

RECOM.
MGR. OF DESIGN R.P.E. NO. C 16814
ASST. CH. ENG. FOR DES. & CONST., R.P.E. NO. C 29111

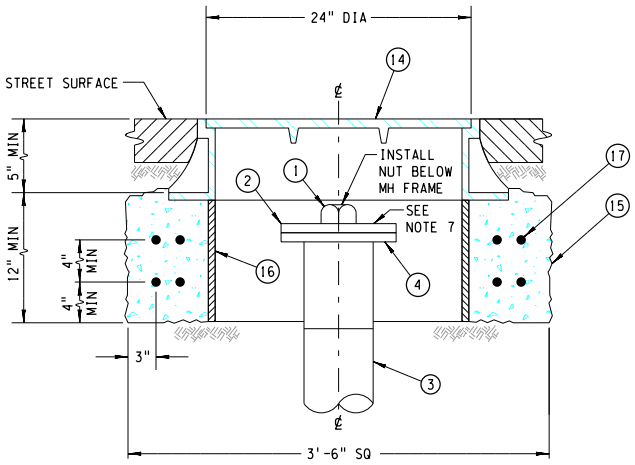
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

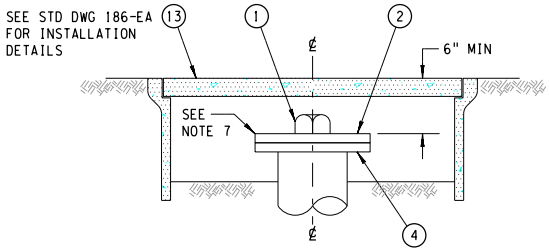
TEMPORARY END BLOCKING FOR 6" & 8" PIPE

STRUCTURE OR ZONE DESIGNATION NONE
SCALE NONE
DATE OF ORIG. DWG. 17 FEB. 57

196–EA



STREET INSTALLATION



CURB INSTALLATION

MATERIAL LIST		
ITEM	DESCRIPTION	QUANTITIES
1	PLUG,2"GALVANIZED SCREW	1
2	FLANGE,THREADED,13-1/2"OD x 2"IPTF	1
3	PIPE,8",MORTAR LINED AND PLASTIC COATED STEEL,10GA.,STD DWG 1884-A	AS NEEDED
4	FLANGE,8"WITH ATTACHED PIPE SECTION,STD DWGS 323-EA AND 324-EA	1
5	TEE,8"x8"x6",STEEL,STD DWG 309-EA	1
6	PLATE HEAD,8",STEEL FLAT HEAD,5/8"x9 3/4"x9 3/4"	1
7	FLANGE,6"WITH ATTACHED PIPE SECTION, STD DWGS 323-EA OR 324-EA	1
8	COUPLING,FLEXIBLE FOR 6-5/8"OD PIPE	1
9	PIPE,6"MORTAR LINED AND PLASTIC COATED STEEL,10GA.,STD DWG 1884-A	AS NEEDED
10	VALVE,6"GATE,FLANGED	1
11	VALVE POT & COVER,8"	1
12	ANCHOR,CONCRETE	1
13	METER BOX NO.6, STD DWG 186-EA (CURB INSTALLATION ONLY)	1
14	MANHOLE FRAME & COVER,24" CIRCULAR, DISTRICT FURNISHED (STREET INSTALLATION ONLY)	1
15	FOOTING,CONCRETE (STREET INSTALLATION ONLY)	1
16	24" FIBER TUBE FORM (STREET INSTALLATION ONLY)	1
17	BAR,REINFORCING,NO.4x3'LONG (STREET INSTALLATION ONLY)	8
18	32-LB GALVANIC ANODE, STD DWG 286-EA, FIG B	1
19	POLYWRAP PER STD DWG 4569-B	AS NEEDED
20	6" 45° DUCTILE IRON ELBOW,FLANGED	1
21	MAINLINE SIZE WITH 6" BRANCH TR FLEX OR EQUAL x FLANGED REDUCING TEE	1

NOTES

1. ALL ITEMS EXCEPT ITEMS 11 THROUGH 17 SHALL BE COATED PER SPECIFICATION.
2. FOR MAINS WITH CEMENT MORTAR COATING (ML&CS) OR DUCTILE IRON, A FLANGE INSULATING KIT SHALL BE INSTALLED BETWEEN VALVE AND MAIN.
3. ITEM 6 PLATE HEAD IS FOR PRESSURE UP TO 200 PSIG.
4. BOLTS, NUTS AND WASHERS TO BE IN ACCORDANCE WITH SPEC SECTION 05 05 26P.
5. BOND ALL JOINTS PER STD DWG 220-EA, AS INDICATED ON THE PROJECT DRAWINGS.
6. ALL DUCTILE IRON PIPE AND FLANGED FITTINGS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SPEC SECTION 33 05 19.05P.
7. ENCAPSULATE FLANGES, NUTS AND BOLTS IN PETROLATUM WAX TAPE.

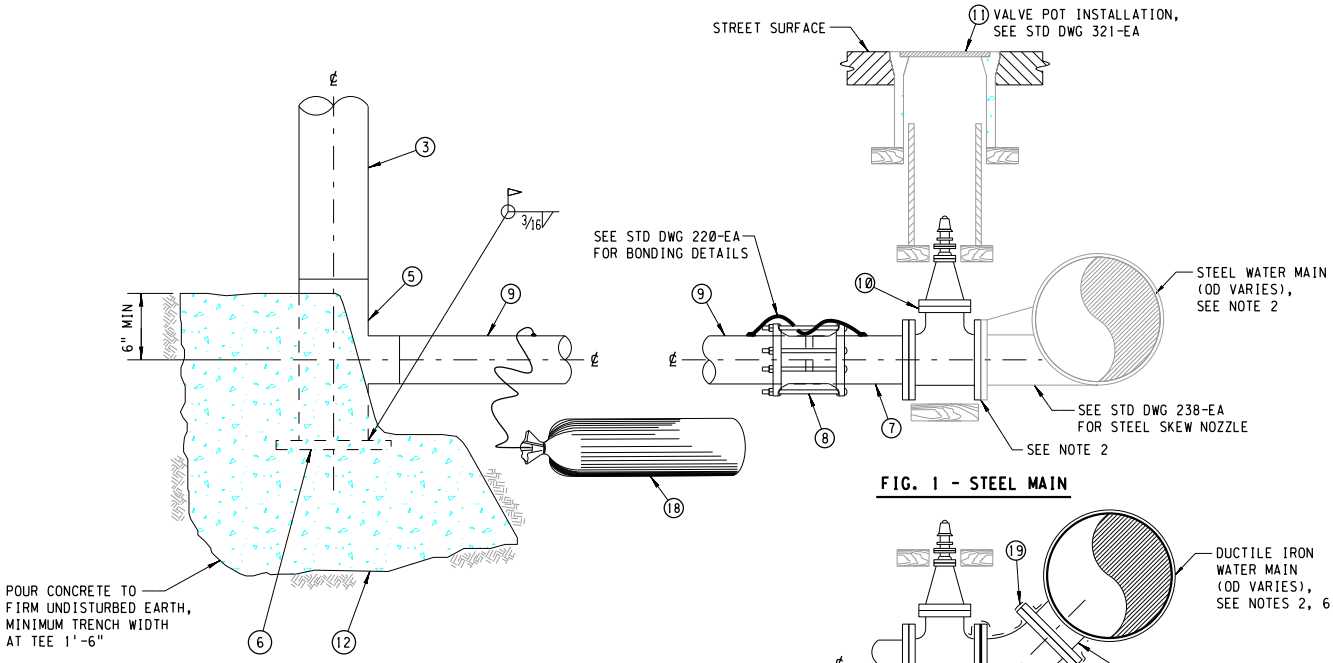


FIG. 1 - STEEL MAIN

FIG. 2 - DUCTILE IRON MAIN

REDUCED DRAWING

NO	DATE	REVISION	BY	REC	APP
4	12 AUG 2022	REVISED AND REDRAWN	KAP	DJL	CAC
3	30 JUN 2008	REVISED	JH	ST	AST
2	17 MAY 1993	REVISED	CAD	WB	-
1	26 FEB 1992	REVISED	KKC	WB	-

DESIGN	DESIGNED BY	D.HENDRICKSON
	DRAWN BY	E.JOW & OTHERS
	CHECKED BY	J.E.OSBORN
REVIEW	CORROSION CHECKED BY	G.DOWN
	PROJECT ENGR.	L.E.HANSON
	SUPERVISOR MECH. & ELEC DESIGN	LES PAUL
	SUPERVISOR STRUCTURES DESIGN	W.W.RAMSAY
	MANAGER DESIGN ENGRG.	J.W.TRAHERN
	MANAGER WATER PROD. & DIST.	DON LARKIN
	APPROVED, CHIEF ENGINEER R.C.E. NO 14187	P.H.GILBERT

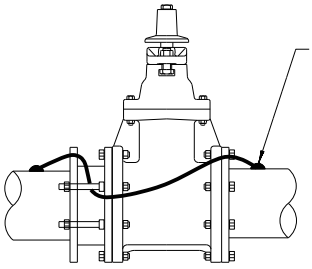
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

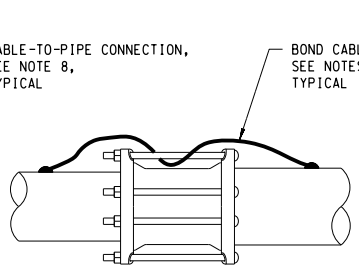
BLOWOFF AND PUMPING TEE, 6"

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	24 MAY 1955

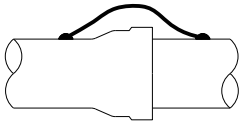
199-EA



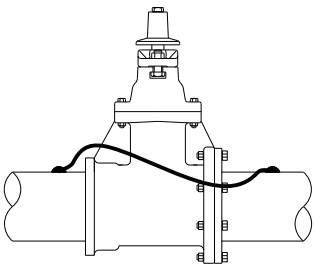
FLANGED ADAPTOR FOR CI



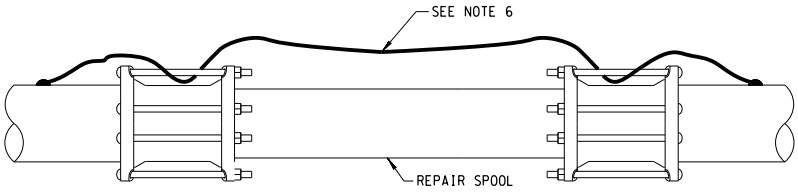
RESTRAINED OR FLEXIBLE COUPLING



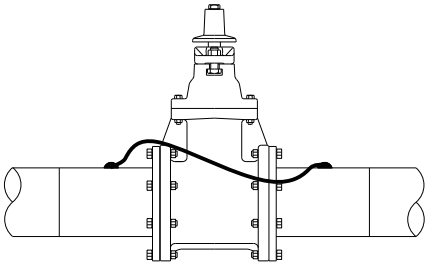
BELL AND SPIGOT



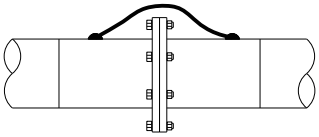
GATE VALVE WITH BELL BY FLANGE ENDS



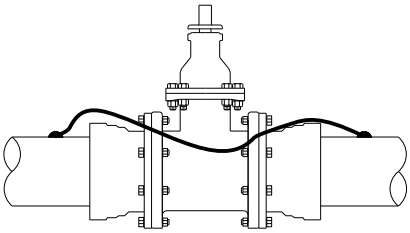
METALLIC PIPE REPAIR



GATE VALVE FLANGED (AND SKIRTED)



FLANGED PIPE JOINT



GATE VALVE WITH FLANGED ENDS
AND RESTRAINED FLANGED ADAPTORS

NOTES

1. BONDING JUMPERS SHALL BE INSTALLED, AS SHOWN ON THIS DRAWING, ACROSS NON-WELDED OR NON-INSULATING JOINTS, INCLUDING BOLTED JOINTS AND FLANGES, FOR STEEL AND DUCTILE IRON PIPE.

2. FLANGED ADAPTOR FOR JOINING CAST IRON PIPE IS SHOWN. STEEL OR DUCTILE IRON FLANGED ADAPTOR SHALL BE BONDED IN SIMILAR MANNER.

3. FLANGED VALVES ARE SHOWN. RESTRAINED PUSH ON VALVES, AS APPROVED BY THE ENGINEER, SHALL BE BONDED IN SIMILAR MANNER.

4. BOND CABLE SHALL BE STRANDED COPPER WITH THWN OR HMWPE INSULATION.
   BOND CABLE SIZE:
   FOR PIPES 4 THRU 10-INCHES IN DIAMETER USE WIRE GAUGE #8
   FOR PIPES 12 AND 14-INCHES IN DIAMETER USE WIRE GAUGE #6
   FOR PIPES 16 AND 20-INCHES IN DIAMETER USE WIRE GAUGE #4

5. INSTALL BOND WIRE WITH 3-INCHES OF SLACK TO ALLOW FOR JOINT MOVEMENT.

6. WRAP ALL ISOLATED STEEL AND IRON WITH PETROLATUM WAX TAPE PER SPEC SECTION 33 10 01P.

7. BOND TO REPAIR SPOOL IF REPAIR SPOOL IS METALLIC.

8. BONDING JUMPERS MUST NOT BE INSTALLED ACROSS INSULATING JOINTS OR INSULATING COUPLINGS.

9. EXOTHERMIC WELD CONNECTIONS TO STEEL PIPE, PER STD DWG 4508-B,
   PIN BRAZE CONNECTIONS TO DUCTILE IRON PIPE, PER STD DWG 4572-B.

10. FOR GATE VALVE LINE INSTALLATION SEE STD DWGS 288-EA AND 288-EA-1.

11. FOR PIPE TRENCH EXCAVATION AND BACKFILL SEE STD DWG 1992-A.

REDUCED DRAWING

NO	DATE	REVISION	BY	REC	APP
3	12 AUG 2022	REVISED AND REDRAWN	PP	DJL	CAV
2	30 JUN 2008	REVISED (PER PIPE COMMITTEE)	JH	ST	AST
1	03 DEC 1987	REVISED	DAS	WB	-

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	EBMUD
	DRAWN BY	A.L.H.
REVIEW		
	PIPELINE WLR	CORR AEW
RECOMMENDED	SUPERVISOR PIPELINE ENGINEERING	W.E.BRADBURY
	SUPERVISOR PLANT ENGINEERING	L.B.HERTZBERG
	MANAGER DESIGN & CONST.	W.F.ANTON
APPROVED	CHIEF ENGINEER R.P.E. NO. C 7624	D.G.LARKIN

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

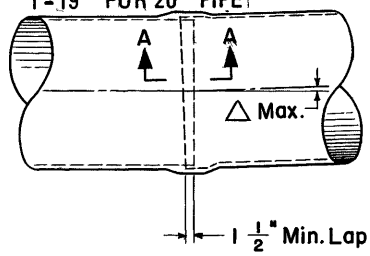
STANDARD DRAWING

BONDING JUMPER

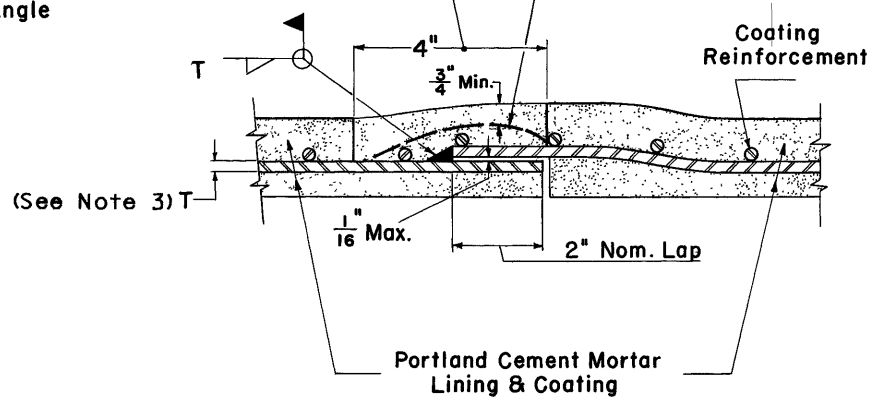
STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	18 DEC 1968

220-EA

△Max.= Max. Allowable Deflection Angle
4-1/4° For 6" Pipe
3-1/2° For 8" Pipe
2°-10' For 12" Pipe
1°-40' For 16" Pipe
1°-19' FOR 20" PIPE



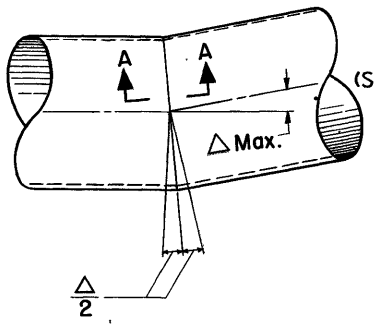
(Deflection Attainable May Be Less Than Max. Due To Variation in Fit Of Bell & Spigot)

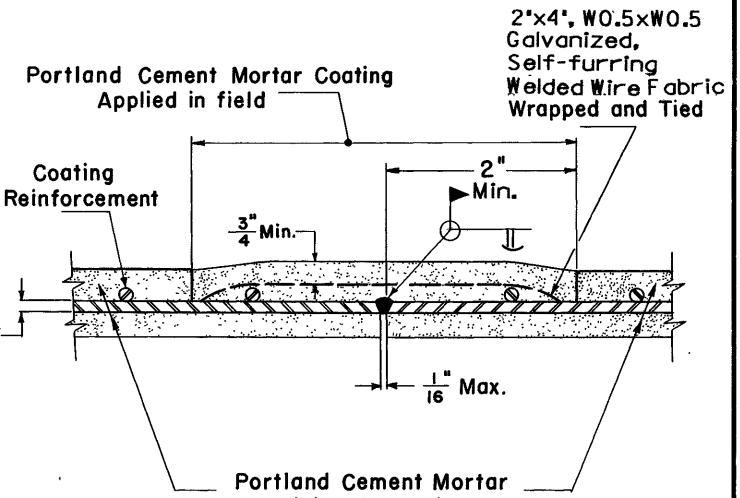


SECTION A-A

TYPICAL BELL & SPIGOT JOINT

△Max.= Max. For Field Cut Deflection Angle
22-1/2° For 6", 8" & 12" Pipe
15° For 16" & 20" Pipe





SECTION A-A

TYPICAL BUTT JOINT

Notes:

1. See EBMUD Specifications For Required Field Coating At Joints And Fittings.
2. See Standard Drawing 309-EA For Fittings To Be Used With This Pipe.
3. See Standard Drawing 1216-A For Pipe Thickness.

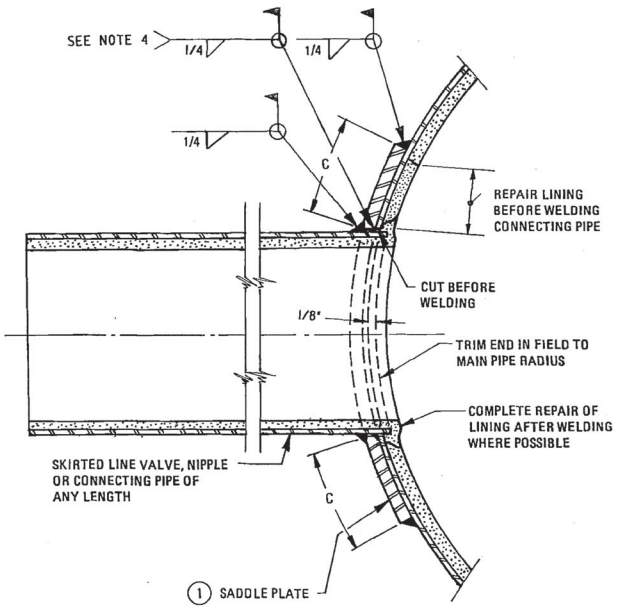
REVISED 17 MAY 93 C.A.D.
REVISED 6 DEC 88 D.A.S.

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

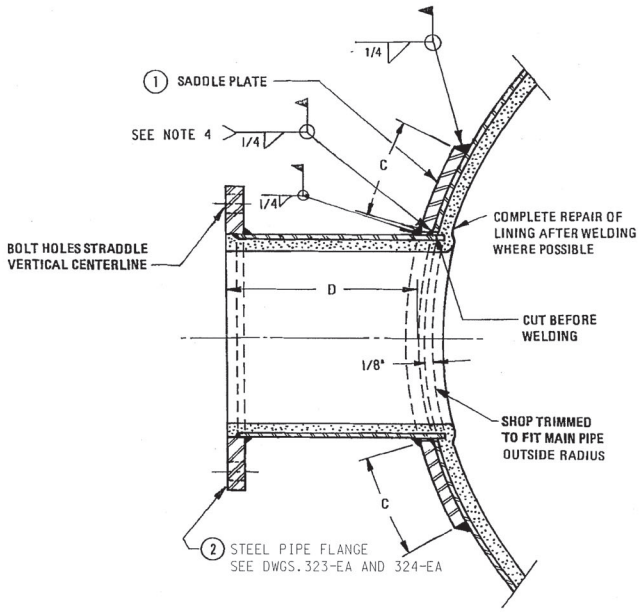
STANDARD DRAWING
STEEL PIPE
MORTAR LINED & COATED
JOINT DETAILS
4" THRU 20"

DESIGNED BY EBMUD	TRACED BY
DRAWN BY R. Leach	SCALE None
CHECKED BY H.B. Green	DATE 12-6-54
RECOMMENDED BY	
APPROVED BY G Borgeson	NO. 237-EA

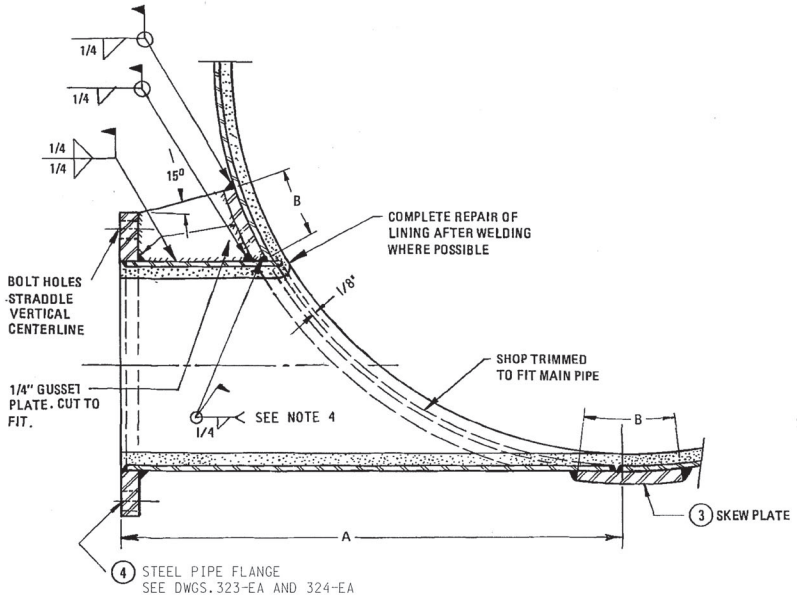
APPROVED R.C. Kennedy
CHIEF ENGINEER R E No 648



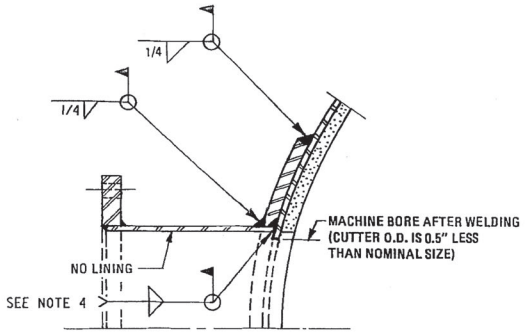
SADDLE PLATE CONNECTION
ITEM (1)



SADDLE NOZZLE
ITEMS (1) AND (2)



SKEW NOZZLE
ITEMS (3) AND (4)



DETAIL OF SADDLE NOZZLE INSTALLATION UNDER PRESSURE
(WET TAP)

PIPE SIZE NOMINAL	OUTLET SIZE NOMINAL	NOZZLE O.D. x 10 GA.	PLATE THICKNESS	SKEW NOZZLE DIMENSIONS		SADDLE NOZZLE DIMENSIONS	
				A	B	C	D
6"	4"	4.500"	1/4"	–	–	2"	12"
8"	4"	4.500"	1/4"	10"	3"	2"	12"
	6"	6.625"	3/8"	–	–	3"	12"
12"	4"	4.500"	1/4"	12"	3"	2-1/2"	12"
	6"	6.625"	3/8"	12"	3-1/2"	3"	12"
	8"	8.625"	3/8"	–	–	4"	12"
16"	4"	4.500"	1/4"	15"	3"	2-1/2"	12"
	6"	6.625"	3/8"	15"	3-1/2"	3"	12"
	8"	8.625"	3/8"	–	–	4"	12"
	12"	12.75"	3/8"	–	–	5"	12"
20"	6"	6.625"	3/8"	17"	5-1/2"	4"	8"
	8"	8.625"	3/8"	–	–	6"	8"
	12"	12.75"	3/8"	–	–	8"	8"

SHOP NOTES:

1. PERMANENTLY IMPRINT O.D. OF PIPE AND NOZZLE ON EDGE OF SADDLE PLATE.
2. STEEL SHALL BE ASTM-A36, OR APPROVED EQUAL.
3. SADDLE PLATE AND SKEW PLATE SHALL BE ROUND.
4. BEVEL SADDLE OR SKEW PLATE TO CLEAR FILLET WELD.

FIELD NOTE:

1. COATING NOT SHOWN. REPAIR AND EXTEND EXISTING COATING FROM CONNECTION AT MAIN TO INSULATING JOINT OR FLANGE INSULATING SET IN NOZZLE.

REDUCED DRAWING

NO.	DATE	REVISION	BY	REC.	APP'D
3	30JUNE08	REVISED			

REVISED 17 MAY 93 C.A.D.
REVISED NOV. 23, 1988 N.T.N.

APPROVED

E. B. M. U. D.
Hayashi
AEW

SUPERVISOR PIPELINE ENGINEERING
SUPERVISOR PLANT ENGINEERING
MANAGER DESIGN & CONST

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

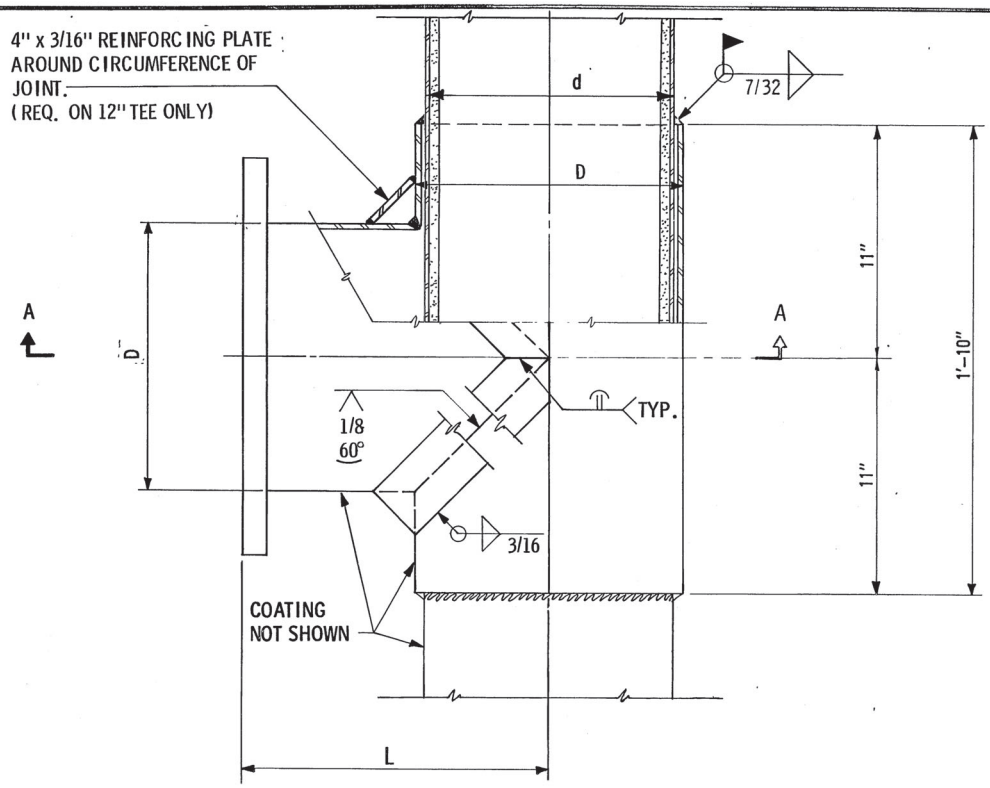
STEEL PIPE NOZZLE AND SADDLE PLATE CONNECTIONS

20" & SMALLER MAINS

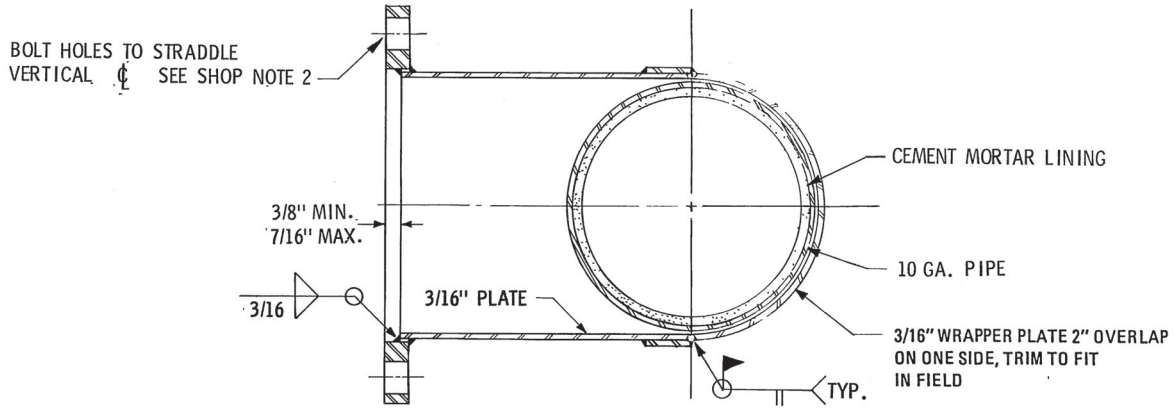
STRUCTURE OR ZONE DESIGNATION
SCALE NONE
DATE 1 NOV 71

238-EA

USER: bkolodzi
PLOT DATE: 03-JUL-2008 14:01
FILE: H:\general\std-dwgs\revisions2008\238ea.dgn



PLAN



SHOP NOTES

1. STEEL PLATE SHALL BE ASTM-A36, OR APPROVED EQUAL.
2. SEE DWGS. 323-EA AND 324-EA FOR FLANGE DETAILS.

FIELD NOTES

1. FOR MORTAR COATED PIPE REMOVE MORTAR TO 3" BEYOND TEE; IF ROD WRAPPED, TACK WELD ROD TO PIPE BEFORE CUTTING; OVERLAP PIPE COATING 1-1/2" MIN. WHEN COATING TEE.
2. FOR PLASTIC COATED PIPE: REMOVE COATING TO BARE STEEL TO 2" BEYOND TEE; AFTER WELDING IS COMPLETED, PREPARE SURFACES AND APPLY COATING TO ALL EXPOSED STEEL IN ACCORDANCE WITH E.B.M.U.D. SPECIFICATIONS FOR PLASTIC COATINGS.

SECTION A-A

NOMINAL SIZE	STEEL CYLINDER OUTSIDE DIAMETER		L
	d PIPE	D SPLIT TEE	
6"	6.90"	7.34"	8.5"
	6.625"	7.06"	
8"	9.05"	9.49"	10.5"
	8.625"	9.06"	
12"	13.20"	13.64	12"
	12.75"	13.20"	

REVISED 17 MAY 93 C.A.D. W.B.
REVISED NOV. 23, 1988 N.T.N. W.B.

APPROVED J.S. Harenza
CHIEF ENGINEER R.C.E. NO. 14167

DESIGNED BY	Alvin K. Yee
DRAWN BY	M. L. FONG
CHECKED BY	L.N. Lee
CORROSION CHECK BY	A Westerback
PROJECT ENGR.	Alvin K. Yee
SUPERVISOR MECH & ELEC DESIGN	Lee B. Matthews
SUPERVISOR STRUCTURES DESIGN	W.C. Ramsay
SUPERVISOR HYDRAULIC DESIGN	F.C. Brown
MANAGER DESIGN ENGRG	R. Gallotson
MANAGER WATER PROD	D.D. Larken

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

STEEL PIPE SPLIT TEES

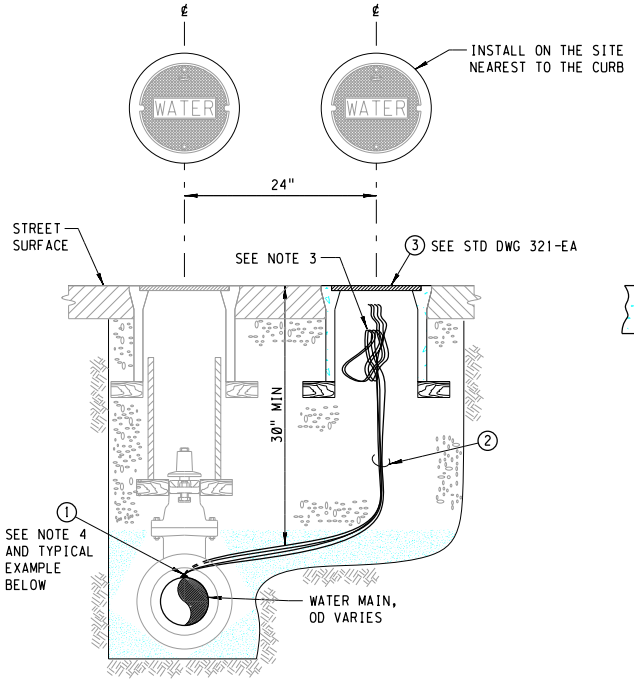
6" 8" & 12" WET TAP

STRUCTURE OR ZONE DESIGNATION —
SCALE NONE
DATE 27 JUL 66

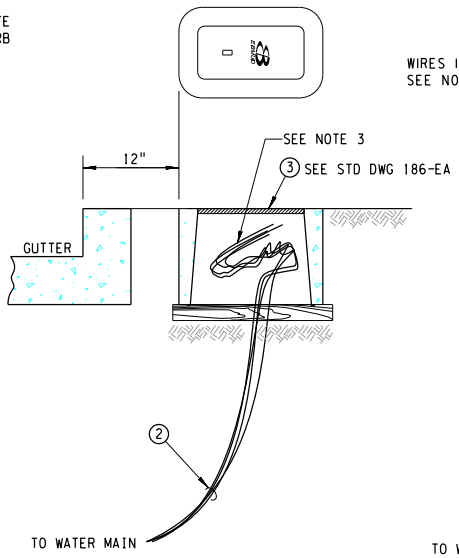
282-EA

NO.	DATE	REVISION	BY	REC.	APP
3	30JUNE08	REVISED (PER PIPE COMMITTEE)	H	ST	MJ

TYPE "Z" TEST OUTLET



TYPE "Y" TEST OUTLET



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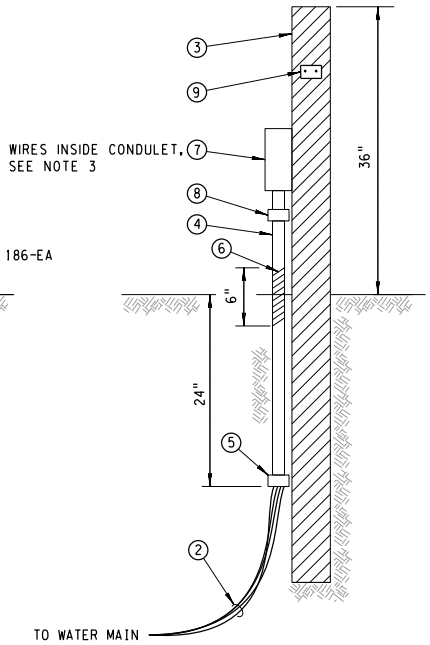
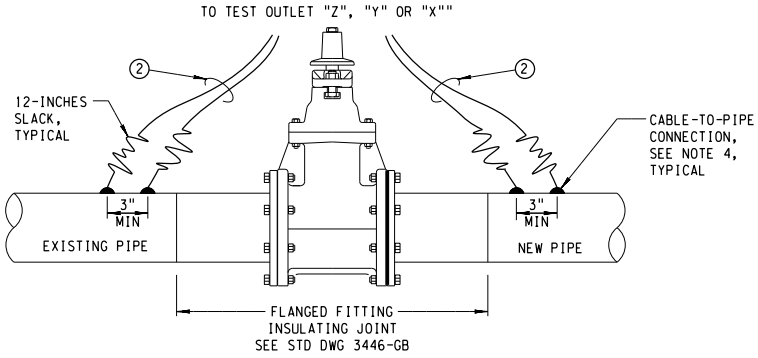
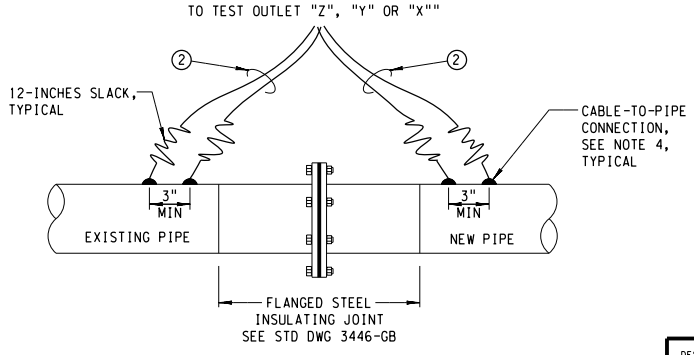


MATERIAL LIST FOR TYPE "Z", SEE NOTE 2		
ITEM	DESCRIPTION	QUANTITIES
1	EXOTHERMIC WELDING OR PIN BRAZE KIT AND COATING REPAIR MATERIALS, SEE NOTE 4	AS NEEDED
2	STRANDED COPPER WIRE, #8 AWG, THHN/THWN (BLACK)	AS NEEDED
3	CONCRETE VALVE POT WITH COVER, SEE STD DWG 321-EA	1

MATERIAL LIST FOR TYPE "Y", SEE NOTE 2		
ITEM	DESCRIPTION	QUANTITIES
1	EXOTHERMIC WELDING OR PIN BRAZE KIT AND COATING REPAIR MATERIALS, SEE NOTE 4	AS NEEDED
2	STRANDED COPPER WIRE, #8 AWG, THHN/THWN (BLACK)	AS NEEDED
3	METER BOX #1 WITH COVER, SEE STD DWG 186-EA	1

MATERIAL LIST FOR TYPE "X", SEE NOTE 2		
ITEM	DESCRIPTION	QUANTITIES
1	EXOTHERMIC WELDING OR PIN BRAZE KIT AND COATING REPAIR MATERIALS, SEE NOTE 4	AS NEEDED
2	STRANDED COPPER WIRE, #8 AWG, THHN/THWN (BLACK)	AS NEEDED
3	4" X 4" X 6' WHITE RECYCLED PLASTIC POST	AS NEEDED
4	4' LONG, 2" DIA. STEEL CONDUIT	1
5	2" INSULATING BUSHING	1
6	10-MIL PVC TAPE	AS NEEDED
7	CONDULET, GALVANIZED STEEL, TYPE E	1
8	2" TWO HOLE GALVANIZED STEEL, 2" CONDUIT CLAMP	1
9	CORROSION CONTROL TAG	1





TYPICAL EXAMPLES, INSULATING JOINT WITH TEST LEAD CONNECTIONS

NOTES

1. INSTALL INSULATING JOINT TEST STATIONS (IJ/TS) AT THE LOCATIONS INDICATED ON THE PROJECT DRAWINGS.
2. TEST OUTLETS ARE IDENTIFIED BY TYPES "X", "Y", AND "Z":

   TYPE "X" - POST MOUNTED, INSTALLED IN UNDEVELOPED AREAS.
   TYPE "Y" - FLUSH-TO-GRADE IN A CONCRETE METER BOX, INSTALLED BEHIND CURB ONLY.
   TYPE "Z" - FLUSH-TO-GRADE IN A TRAFFIC RATED VALVE POT, INSTALLED IN STREET OR BEHIND CURB.
3. EXTEND THE PIPELINE TEST WIRES INTO THE TEST OUTLET AND WRAP THE ENDS OF THE WIRES WITH PVC TAPE. LEAVE 30-INCHES OF SLACK COILED IN THE BOTTOM OF THE TYPE "Y" AND TYPE "Z" TEST OUTLETS, AND 6-INCHES OF SLACK IN THE TYPE "X" CONDULET.
4. EXOTHERMIC WELD CONNECTIONS TO STEEL OR DUCTILE IRON PIPE, PER STD DWG 4508-B, PIN BRAZE CONNECTIONS TO DUCTILE IRON PIPE, PER STD DWG 4572-B.
5. CONTACT THE CORROSION CONTROL SECTION TO ACTIVATE THE CATHODIC PROTECTION SYSTEM AND TAG THE WIRES.

NO	DATE	REVISION	BY	REC	APP
4	09 SEP 2022	REVISED AND REDRAWN	KAP	OSL	CAO
3	30 JUN 2008	REVISED	JH	ST	AST
2	17 MAY 1993	REVISED	CAD	WB	-
1	26 FEB 1992	REVISED	KKC	WB	-

REDUCED DRAWING

DESIGNED BY	A.WESTERBACK
DRAWN BY	H.KASAI
DESIGN CHECKED BY	T.L.HOM WJB
CORROSION CHECK BY	A.WESTERBACK
PROJECT ENGR.	T.L.HOM
SUPERVISOR STRUCTURES DESIGN	W.W.RAMSAY
SUPERVISOR MECH.& ELEC DESIGN	L.B.HERTZBERG
MANAGER DESIGN ENGRG.	R.T.TILLOTSON WB
MANAGER WATER PROD.& DIST.	D.G.LARKIN
APPROVED CHIEF ENGINEER R.P.E. NO. C 14167	J.S.HARNETT

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

INSULATING JOINT TEST STATION INSTALLATION

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	21 MAY 1968

285-EA

SUPERSEDES DWG 3308-GA

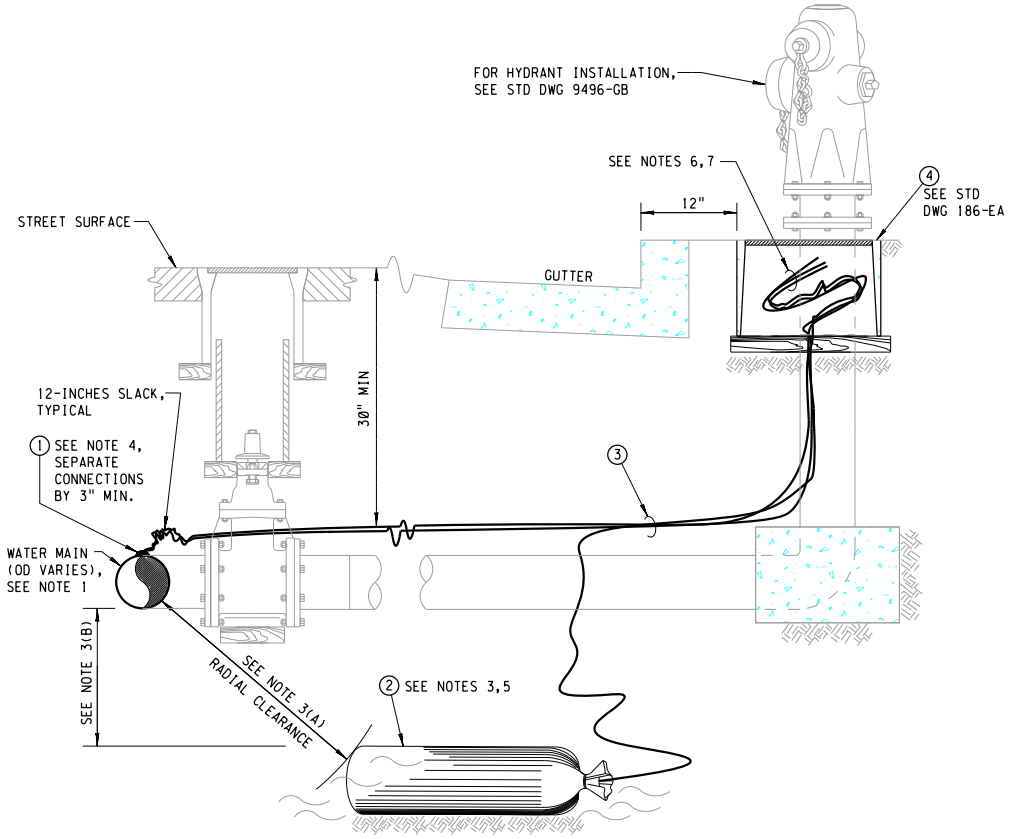


FIG. A

GALVANIC ANODE WITH TEST STATION (GA/TS) INSTALLATION

MATERIAL LIST FOR GA/TS		
ITEM	DESCRIPTION	QUANTITIES
1	EXOTHERMIC WELDING OR PIN BRAZE KIT AND COATING REPAIR MATERIALS, SEE NOTE 4	AS NEEDED
2	32-POUND MAGNESIUM ANODE	1
3	STRANDED COPPER WIRE, #8 AWG, THHN/THWN (BLACK)	AS NEEDED
4	METER BOX #1 WITH COVER, SEE STD DWG 186-EA	1

NOTES (FIG. A)

1. GA/TS SHALL BE USED ONLY WHEN SPECIFIED, TYPICALLY NEXT TO THE HYDRANT IN THE SAME TRENCH (FOR ROUTINE PIPE REPAIRS SEE STD DWG 4571-B - GALVANIC ANODE INSTALLATION FOR METALLIC MAIN BREAK).

2. THE TWO ALTERNATE TYPES OF TEST OUTLETS ARE:

   TYPE "X" - CONDULET (NOT SHOWN, SEE STD DWG 285-EA).
   TYPE "Y" - METER BOX #1 (SHOWN, SEE STD DWG 186-EA).

3. RADIAL CLEARANCE AND DEPTH REQUIREMENTS:

   A. MINIMUM RADIAL CLEARANCE OF 10 FEET IS PREFERRED UNLESS LIMITED BY RIGHT OF WAY.

   B. THE TOP OF THE ANODE SHALL BE A MINIMUM 1-FOOT BELOW THE BOTTOM OF THE PIPE.

4. EXOTHERMIC WELD CONNECTIONS TO STEEL OR DUCTILE IRON PIPE, PER STD DWG 4508-B, PIN BRAZE CONNECTIONS TO DUCTILE IRON PIPE, PER STD DWG 4572-B.

5. REMOVE PAPER OR PLASTIC SHIPPING BAG AROUND ANODE AND SATURATE WITH WATER BEFORE BACKFILL. BURY ANODE IN NATIVE SOIL (12" MIN COVER).

6. EXTEND THE PIPELINE TEST WIRES INTO THE TEST OUTLET AND WRAP THE ENDS OF THE WIRES WITH PVC TAPE. LEAVE 30-INCHES OF SLACK COILED IN THE BOTTOM OF THE TYPE "Y" OUTLET.

7. CONTACT CORROSION CONTROL SECTION TO ACTIVATE THE SYSTEM AND TAG THE WIRES.

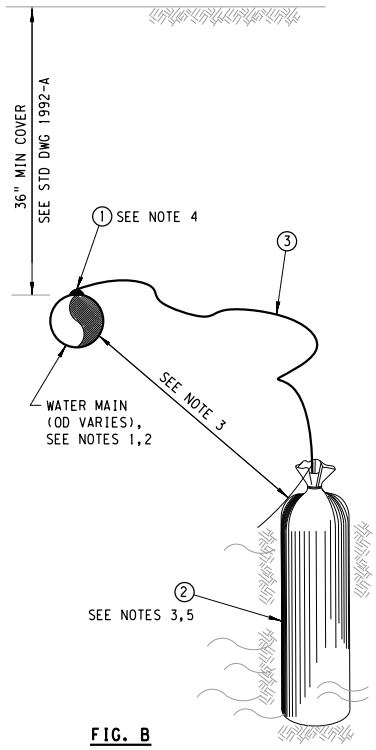


FIG. B

GALVANIC ANODE (GA) INSTALLATION

MATERIAL LIST FOR GA		
ITEM	DESCRIPTION	QUANTITIES
1	EXOTHERMIC WELDING OR PIN BRAZE KIT AND COATING REPAIR MATERIALS, SEE NOTE 4	AS NEEDED
2	32-POUND MAGNESIUM ANODE	1
3	STRANDED COPPER WIRE, #8 AWG, THHN/THWN (BLACK)	AS NEEDED

NOTES (FIG. B)

1. GA IS REQUIRED ON ALL ROUTINE LEAK REPAIRS ON METALLIC PIPELINES, ALSO SEE STD DWG 4571-B - GALVANIC ANODE INSTALLATION FOR METALLIC MAIN BREAK.

2. GA IS REQUIRED ON ALL INSTALLATIONS OF PLASTIC COATED STEEL PIPE (ML&PCS) LESS THAN 250 FEET LONG, WHEN SPECIFIED.

3. LAY ANODE IN THE BOTTOM OF TRENCH WITH 3-FOOT MINIMUM CLEARANCE FROM THE PIPE. (THE ANODE MAY BE INSTALLED VERTICALLY [AS SHOWN] OR HORIZONTALLY IF MORE CONVENIENT).

4. EXOTHERMIC WELD CONNECTIONS TO STEEL OR DUCTILE IRON PIPE, PER STD DWG 4508-B, PIN BRAZE CONNECTIONS TO DUCTILE IRON PIPE, PER STD DWG 4572-B.

5. REMOVE PAPER OR PLASTIC SHIPPING BAG AROUND ANODE AND SATURATE WITH WATER BEFORE BACKFILL. BURY ANODE IN NATIVE SOIL (12" MIN COVER).

REDUCED DRAWING

NO	DATE	REVISION	BY	REC	APP
3	09 SEP 2022	REVISED AND REDRAWN	KAP	DJL	CAV
2	30 JUN 2008	REVISED	JH	ST	AST
1	26 FEB 1992	REVISED	KKC	WB	-

DESIGN	DESIGNED BY	A. WESTERBACK
	DESIGN CHECKED BY	T.L.HOM
	DRAWN BY	J.GIOVANNINI
REVIEW	PIPRLINE WWR CORR AEW	
RECOMMENDED	SUPERV. PIPELINE ENG. R.P.E. NO. C 10603	W.E.BRADBURY
	MGR PLANT ENG'G DIV. R.P.E. NO. E 1955	L.B.HERTZBERG
	DIRECTOR OF ENGINEERING R.P.E. NO. C 13447	W.F.ANTON
APPROVED	CHIEF ENGINEER R.P.E. NO. C 7624	D.G.LARKIN

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

GALVANIC ANODE WITH TEST STATION AND GALVANIC ANODE INSTALLATION

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	18 DEC 1968

286-EA

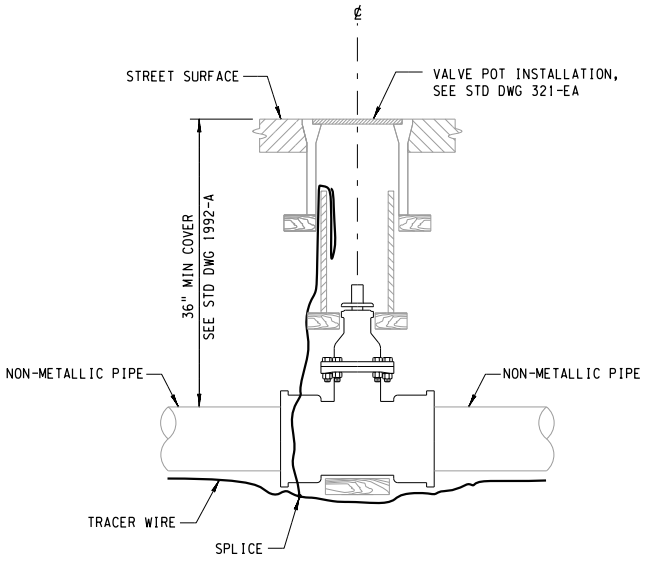


FIG. A

NON-METALLIC PIPE

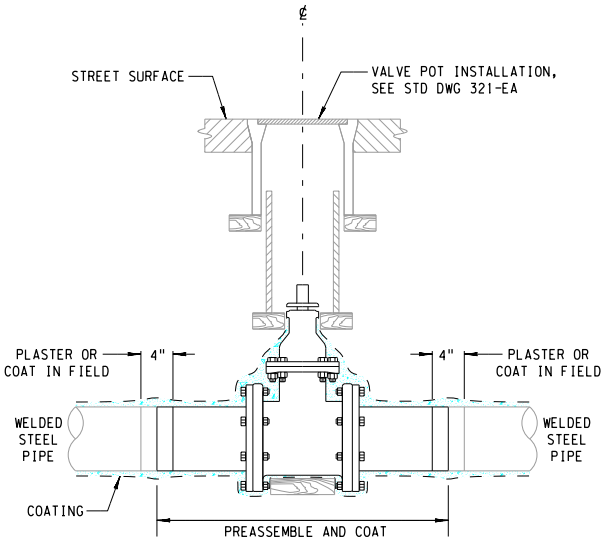


FIG. B

WELDED STEEL PIPE

VALVE COATING

COAT ALL UNCOATED BOLTS AND NUTS AND UNCOATED METALLIC SURFACES OF COUPLINGS, FLANGES, SADDLES, WITH PETROLATUM WAX TAPE PER EBMUD STD SPEC SECTION Ø9961.1

TRACER WIRE

ALL NON-METALLIC PIPE SHALL HAVE A TRACER WIRE (NO 12 SOLID COPPER TW OR THHN) LAID ON THE TRENCH BOTTOM CENTERED UNDER THE PIPE, A CONTACT 1 PAD SHALL BE PROVIDED INSIDE THE VALVE POT PER EBMUD SPECIFICATIONS.

ADAPTER RING

WHEN 8" PVC IS INSTALLED IN ANY RING WITH JOINTED CAST IRON FITTING OR VALVE USE DISTRICT CODE NO 41137 ADAPTER RING

VALVE ASSEMBLY

THE VALVE TOGETHER WITH THE FLANGED PIPE SECTIONS SHALL BE PREASSEMBLED AND COATED. SEE STD DWGS 323-EA AND 324-EA FOR FABRICATION OF FLANGED PIPE SECTIONS AND BOLT-UP TORQUES.

COATED MAINS

CEMENT MORTAR COATED PIPE

COAT THE ENTIRE ASSEMBLY WITH CEMENT MORTAR EXCEPT
- VALVE OPERATING NUT -- LEAVE BARE
- VALVE GLAND ASSEMBLY AND STEM -- COAT WITH MASTIC OR WAX TAPE
- PIPE SECTION ENDS -- LEAVE BARE FOR WELDING AFTER INSTALLATION, PLASTER GIRTH JOINTS WITH CEMENT MORTAR AND REPAIR ANY DAMAGED COATING

DIELECTRIC AND PLASTIC COATED PIPE

SHOP COAT THE ENTIRE ASSEMBLY WITH COAL TAR EPOXY OR HIGH-BUILD EPOXY
- VALVE OPERATING NUT -- LEAVE BARE
- PIPE SECTION ENDS -- LEAVING BARE AFTER INSTALLATION, COAT GIRTH JOINTS AND REPAIR ANY DAMAGED COATING AS SPECIFIED FOR THE PIPELINE

NOTES

1. SEE STD DWG 1241-A FOR VALVE OPERATING SHAFT EXTENSION.

REDUCED DRAWING

NO	DATE	REVISION	BY	REC	APP
5	09 SEP 2022	REVISED AND REDRAWN	KAP	DSL	CAC
4	30 JUN 2008	REVISED	JH	ST	AST
3	25 MAR 1998	REVISED	PAC	-	-
2	04 NOV 1997	REVISED	PAC	-	-
1	23 NOV 1987	REVISED	NTN	WB	-

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	T.L.HOM
	DRAWN BY	E.HALL
REVIEW	SUPERVISOR HYDRAULIC DESIGN	O.F.EIDE
	CORROSION CHECK BY	A.WESTERBACK
	APPROVED MGR. OF DESIGN & CONST.	W.F.ANTON
	APPROVED CHIEF ENGINEER R.P.E. NO. C 7624	D.G.LARKIN

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

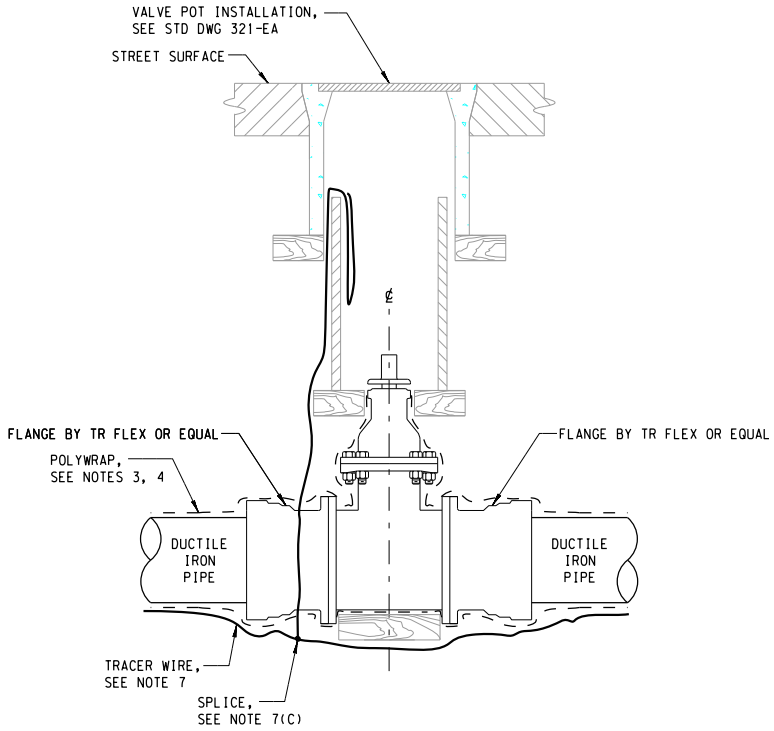
STANDARD DRAWING

GATE VALVE LINE INSTALLATIONS

12" AND SMALLER

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	AUG 1969

288-EA



GATE VALVE WITH FLANGED ENDS

NOTES

1. VALVE SHALL BE FUSION BONDED EPOXY COATED PER SPEC SECTION 09 96 56.10P.

2. FOR INSTALLATION OF MECHANICAL VALVES TRIM THE PIPE/BEVEL IF NECESSARY TO ENSURE GASKET IS IN CONTACT WITH THE FULL PIPE BARREL, AND NOT IN CONTACT WITH THE BEVEL PER SPEC SECTION 33 11 13.21P.

3. POLYWRAP PER STD DWG 4569-B.

4. WRAP VALVE WITH A FLAT SHEET OBTAINED BY SPLITTING OPEN A LENGTH OF POLYWRAP TUBE.

   A. POLYWRAP SHALL EXTEND BEYOND FITTINGS BY 8" ON EACH SIDE AND SHALL BE SECURED BY TAPE.

   B. PASS THE SHEET UNDER THE FITTING AND BRING THE EDGES UP AROUND THE FITTING (OR TO THE STEM ON A VALVE).

   C. POLYWRAP SHALL OVERLAP 6" WHEN SPLIT IS REQUIRED, SEAL SPLIT WITH TAPE.

   D. FOLD OVER AND TAPE SLACK AND OVERLAP AT JOINTS TO ENSURE A SNUG FIT.

   E. TAPE POLYWRAP SECURELY IN PLACE AT VALVE STEM AND OTHER PENETRATIONS ALLOWING FOR FREE MOVEMENT OF VALVE STEM.

5. BOND ALL JOINTS PER STD DWG 220-EA, AS INDICATED ON THE PROJECT DRAWINGS.

6. FOR PIPE TRENCH EXCAVATION AND BACKFILL SEE STD DWG 1992-A.

7. ALL DUCTILE IRON PIPES SHALL HAVE A TRACER WIRE AWG NO. 12 TW OR THHN, SOLID, INSULATED TRACER WIRE WITH ALL PIPE INSTALLATION METHODS, INCLUDING JACKING OR DRILLING.

   A. INSTALL WIRE ON THE TRENCH BOTTOM UNDER THE VERTICAL PROJECTION OF THE PIPE TO PROTECT THE WIRE IN ALL INSTALLATIONS. WIRE SHALL NOT SPIRAL AROUND PIPE BARREL.

   B TRACER WIRE SHALL FORM A MECHANICALLY AND ELECTRICALLY CONTINUOUS LINE THROUGHOUT THE PIPELINE, INCLUDING JACKED OR DRILLED PORTIONS, AND SHALL THEN EXTEND TO THE NEAREST VALVE OR OTHER PIPELINE APPURTENANCE DESIGNATED BY THE ENGINEER. AT THE VALVE, THE WIRE SHALL EXTEND UP OUTSIDE THE VALVE POT RISER PIPE INTO THE CONCRETE VALVE POT SPACE WHERE THERE SHALL BE A 12" LEAD FOR TESTING PURPOSES.

   C. WIRE SHALL BE SPLICED WITH A TYPE DBR/Y-6 DIRECT BURY SPLICE KIT MANUFACTURED BY 3M, STORE CODE 025043, NO SUBSTITUTION. INSTALL AS RECOMMENDED BY THE MANUFACTURER AND WRAP SPLICES AND DAMAGED INSULATION WITH PVC TAPE.

NO	DATE	REVISION	BY	REC	APP

DESIGN

DESIGNED BY	EBMUD
DESIGN CHECKED BY	EBMUD
DRAWN BY	EBMUD

REVIEW

CORROSION CHECKED BY R.P.E. NO. CR 1080	KEITH A. PACKARD
SR CIVIL ENGINEER R.P.E. NO. C 66307	DAVID KATZEV
RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 57170	CARLTON D. CHAN
APPROVED DIRECTOR OF ENGINEERING & CONST. R.P.E. NO. C 44278	OLUJIMI O. YOLOYE

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

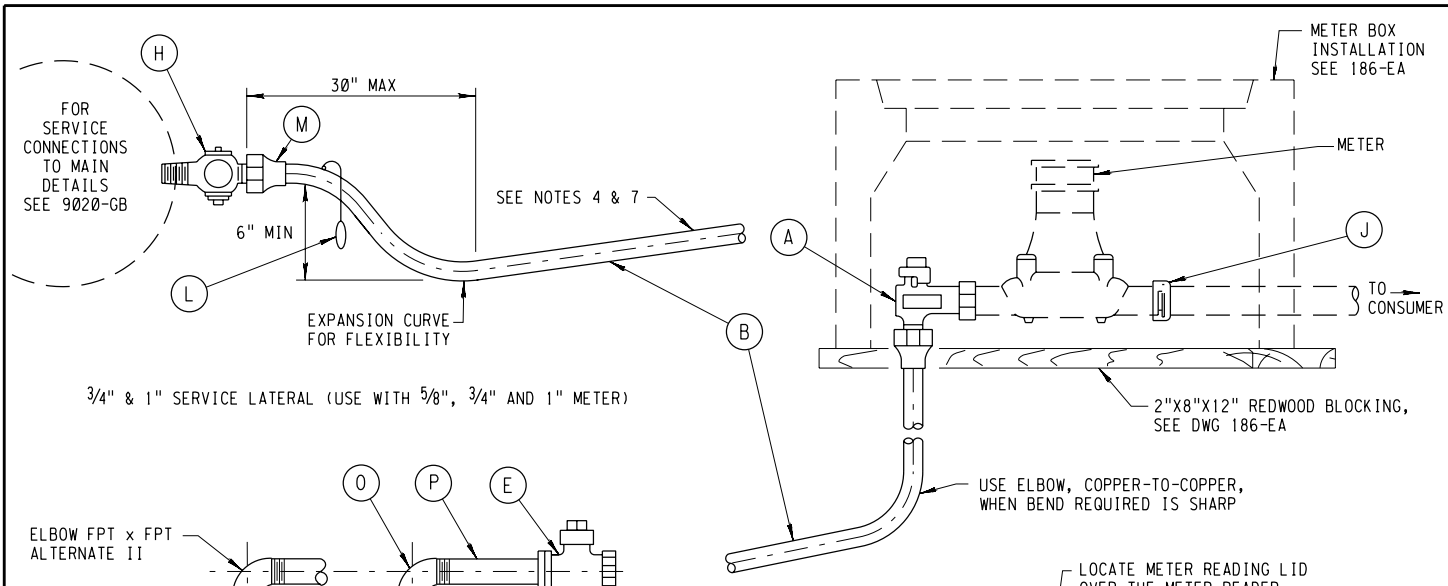
STANDARD DRAWING

GATE VALVE LINE INSTALLATION
ON DUCTILE IRON PIPE

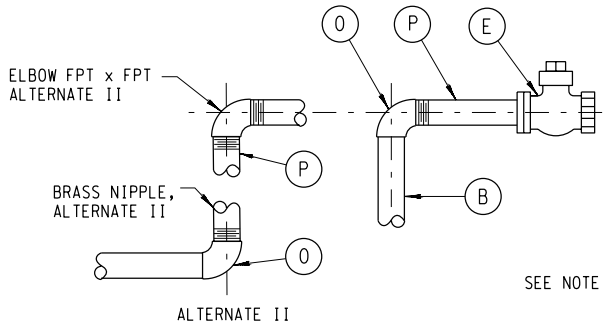
FOR 12" AND SMALLER DI MAINS

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	17 AUG 2022

288-EA-1

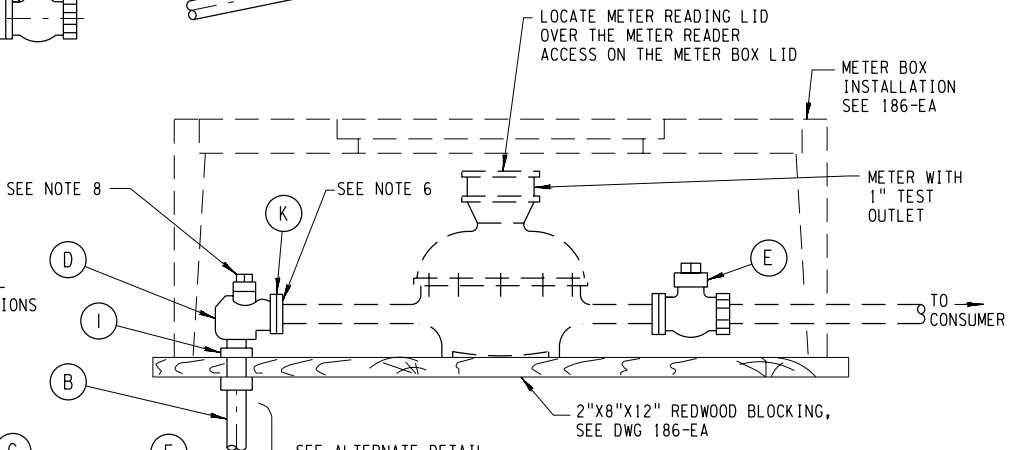


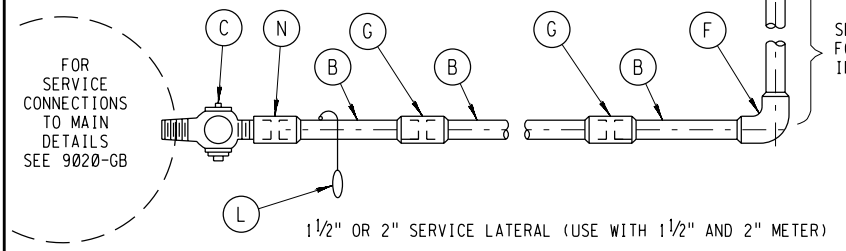
3/4" & 1" SERVICE LATERAL (USE WITH 5/8", 3/4" AND 1" METER)



ALTERNATE RISER INSTALLATION

FOR 1½" OR 2" SERVICE, AS REQUIRED BY FIELD CONDITIONS
ALTERNATE II IS PROVIDED AS AN ALTERNATE INSTALLATION DETAIL





1½" OR 2" SERVICE LATERAL (USE WITH 1½" AND 2" METER)

PARTS LIST

ITEM	MATERIAL	METER SIZE (SEE NOTE 3)				
		5/8"	3/4"	1"	1½"	2"
A	ANGLE STOP	1" X 3/4"	1" X 3/4"	1"	-	-
B	EXTRUSION-COATED COPPER TUBING (SEE NOTE 4)	3/4" OR 1"	3/4" OR 1"	1"	1½"	2"
C	COPORATION COCK, CHABOT COCK, BALL VALVE, MIP X MIP (SEE NOTE 4)	3/4" OR 1"	3/4" OR 1"	1"	-	-
D	METER COCK, ANGLE, BALL VALVE, FIP X METER FLANGE	-	-	-	1½"	2"
E	BALL VALVE, T HEAD, FIP x METER FLANGE	-	-	-	1½"	2"
F	90° ELBOW, COPPER TO COPPER	-	-	-	1½"	2"
G	COUPLING, COPPER TO COPPER	-	-	-	1½"	2"
H	COCK, MAIN, AWWA	3/4" OR 1"	3/4" OR 1"	1"	-	-
I	MIP x TUBING ADAPTER	-	-	-	1½"	2"
J	INSULATING METER COUPLING	3/4"	3/4"	1"	-	-
K	INSULATING METER FLANGE KIT	-	-	-	1½"	2"
L	9 LB. GALVANIC ANODE, DWG. 10207-G	-	-	-	-	-
M	TIP NUT, COPPER	3/4"	3/4"	1"	-	-
N	ADAPTER, COPPER SOC X FIP	-	-	-	1½"	2"
	ALTERNATE INSTALLATION MATERIAL					
O	ELBOW, COPPER x FIP	-	-	-	1½"	2"
P	BRASS NIPPLE	-	-	-	1½"	2"

NOTES:

1. THE SERVICE LINE SHALL REST ON UNDISTURBED EARTH WITH A 36" MINIMUM COVER.
2. ALL INTERMEDIATE JOINTS SHALL BE SOLDER TYPE, 95/5 TIN/ANTIMONY.
3. FOR SEC.8A, SCH. OF RATES AND CHARGES LOW PRESSURE, THE MINIMUM SIZE OF SERVICE LATERAL AND METER SHALL BE AS FOLLOWS:

MIN. DIFF. BTW. METER ELEV & RES. OVERFLOW	SIZE OF SERVICE LATERAL	SIZE OF METER
75 FT	1 INCH	3/4" INCH

4. USE BARE COPPER WHEN PULLING OR MOLING SERVICE.
5. COAT ALL UNCOATED FITTINGS WITH WAX TAPE PRIMER AND WAX TAPE WHEN USING POLYETHYLENE SLEEVE TUBING.
6. COAT BOLTS AND NUTS WITH MASTIC.
7. 3/4" TAPS AND LATERALS ARE ONLY TO BE INSTALLED WHERE THE STATIC PRESSURE IS GREATER THAN 60 PSI.
8. TAG "FOR EBMUD USE ONLY".

REVISED 11 APRIL 05
REVISED 24 AUG 00
REVISED 16 MAY 97
REVISED 17 SEPTEMBER 96
REVISED 6 AUGUST 96 RS
REVISED 17 MARCH 89 D.A.S. WS

NO.	DATE	REVISION	BY	REC.	APP.
8	3 MAR 11	MISC REVISIONS	MB	ST	AST
7	30JUNE08	REVISIONS	JH	ST	AST

APPROVED D L Larkin
CHIEF ENGINEER R.P.E. No C 7624

DESIGN
DESIGNED BY E.B.M.U.D.
DRAWN BY J. GIOVANNINI
CHECKED BY H F Lomas

REVIEW
CORROSION CHECK BY A WESTERBACK
PROJECT ENGR.
SUPERVISOR MECH. & ELEC. DESIGN E B Hutchings
SUPERVISOR HYDRAULIC DESIGN H E Dunlap
MANAGER OPERATIONS & MAINTENANCE W E Pope
MANAGER DESIGN & CONST J Jordan
MANAGER WATER PROD. & DIST. W Marcus

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

SERVICE RENEWALS & NEW COMMERCIAL INSTALLATIONS
COPPER

FOR 5/8" THROUGH 2" METERS

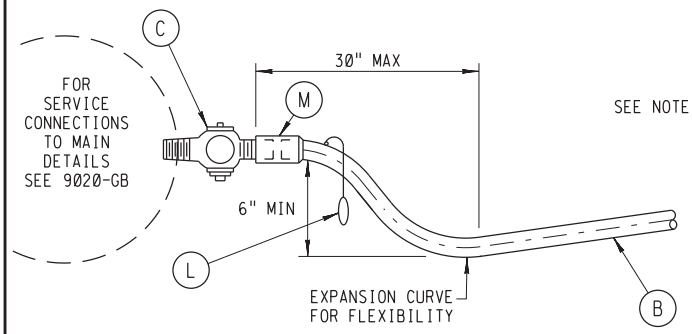
STRUCTURE OR ZONE DESIGNATION
SCALE NONE
DATE 24 DEC 69

291-EA

SUPERSEDES 183-EA

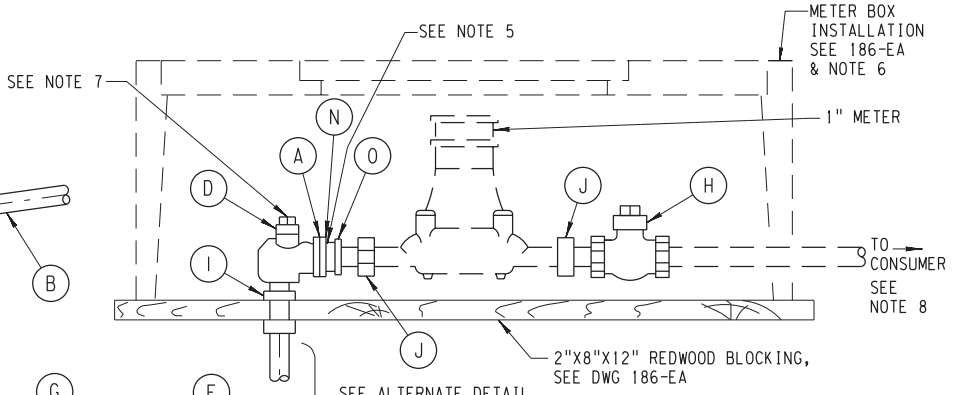
DISTRIBUTION SYSTEM MAP NO.

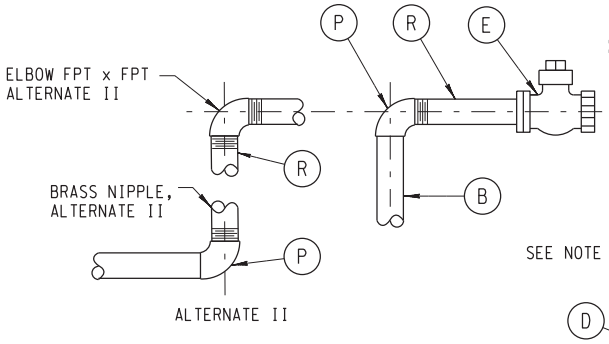
PLOT DATE: 08-MAR-2011 09:59
FILE: H:\general\std-dwgs\revision\new 2011\291ea.dgn



FLOWS ≤ 50 GPM

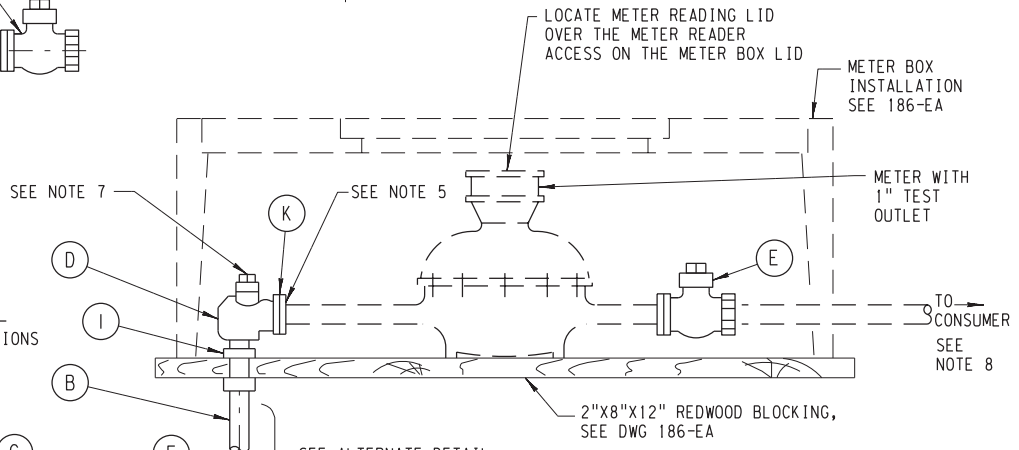
1½" SERVICE LATERAL - USE WITH 1" METER

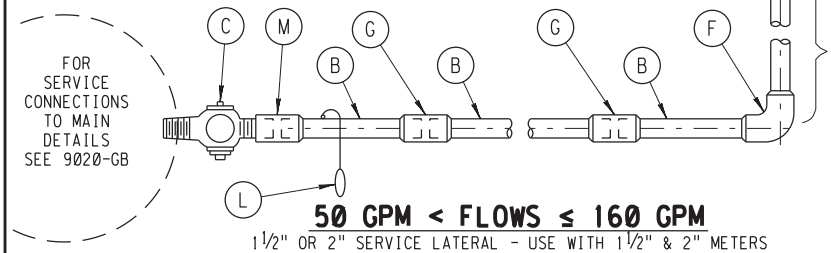




ALTERNATE RISER INSTALLATION

FOR 1½" OR 2" SERVICE, AS REQUIRED BY FIELD CONDITIONS
ALTERNATE II IS PROVIDED AS AN ALTERNATE INSTALLATION DETAIL





50 GPM < FLOWS ≤ 160 GPM

1½" OR 2" SERVICE LATERAL - USE WITH 1½" & 2" METERS

PARTS LIST

ITEM	MATERIAL	METER SIZE (SEE NOTE 3)		
		1"	1½"	2"
A	METER FLANGE GASKET, FULL FACED, ⅛" THICK EPDM	1½"	-	-
B	EXTRUSION-COATED COPPER TUBING (SEE NOTE 4)	1½"	1½"	2"
C	COPORATION COCK, CHABOT COCK, BALL VALVE, MIP x MIP (SEE NOTE 4)	1½"	-	-
D	METER COCK, ANGLE, BALL VALVE, FIP x METER FLANGE	1½"	1½"	2"
E	BALL VALVE, T HEAD, FIP x METER FLANGE	-	1½"	2"
F	90° ELBOW, COPPER TO COPPER	-	1½"	2"
G	COUPLING, COPPER TO COPPER	-	1½"	2"
H	CURB COCK, FIP x FIP BALL VALVE	1"	-	-
I	ADAPTER, COPPER SOC x MIT	-	1½"	2"
J	INSULATING METER COUPLING	1"	-	-
K	INSULATING METER FLANGE KIT	-	1½"	2"
L	9 LB. GALVANIC ANODE, DWG. 10207-G	-	-	-
M	ADAPTER, COPPER SOC x FIP	1½"	1½"	2"
N	METER FLANGE, FLAT, SERRATED FACED, FIP	1½"	-	-
O	BRASS BUSHING, SCREWED	1½" X 1"	-	-
	ALTERNATE INSTALLATION MATERIAL			
P	ELBOW, COPPER x FIP	-	1½"	2"
R	NIPPLE BRASS	-	1½"	2"

NOTES:

1. THE SERVICE LINE SHALL REST ON UNDISTURBED EARTH WITH A 36" MINIMUM COVER.
2. ALL INTERMEDIATE JOINTS SHALL BE SOLDER TYPE, 95/5 TIN/ ANTIMONY.
3. FOR SEC.8A, SCH. OF RATES AND CHARGES LOW PRESSURE, THE MINIMUM SIZE OF SERVICE LATERAL AND METER SHALL BE AS FOLLOWS:

MIN. DIFF. BTW. METER ELEV & RES. OVERFLOW	SIZE OF SERVICE LATERAL	SIZE OF METER
75 FT	1½ INCH	1 INCH

4. COAT ALL UNCOATED FITTINGS WITH WAX TAPE PRIMER AND WAX TAPE WHEN USING POLYETHYLENE SLEEVE TUBING.
5. COAT BOLTS AND NUTS WITH MASTIC OR WAX TAPE.
6. FOR 1" METERS SUPPLIED BY A 1½" SERVICE, INSTALL #6 METER BOX.
7. TAG "FOR EBMUD USE ONLY".
8. RECOMMEND MINIMUM 1½" HOUSE LINE ON CUSTOMER'S SIDE OF THE METER.

NO.	DATE	REVISION	BY	REC.	APP.
1	25 JUN 13	NOTE 5 & NOTE 8, ITEM 1	JLR	JLR	CFD

DESIGN
DESIGNED BY Marian Boyce
DESIGN CHECKED BY C F Dodge
DRAWN BY G BALSAM

REVIEW
CORROSION CHECK BY
SENIOR CIVIL ENGINEER R.P.E. NO. C 48598 S. Turnbull
RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 38862 A.S. Jay
APPROVED, DIRECTOR OF ENGINEERING R.P.E. NO. C 44782 Steven Shiu

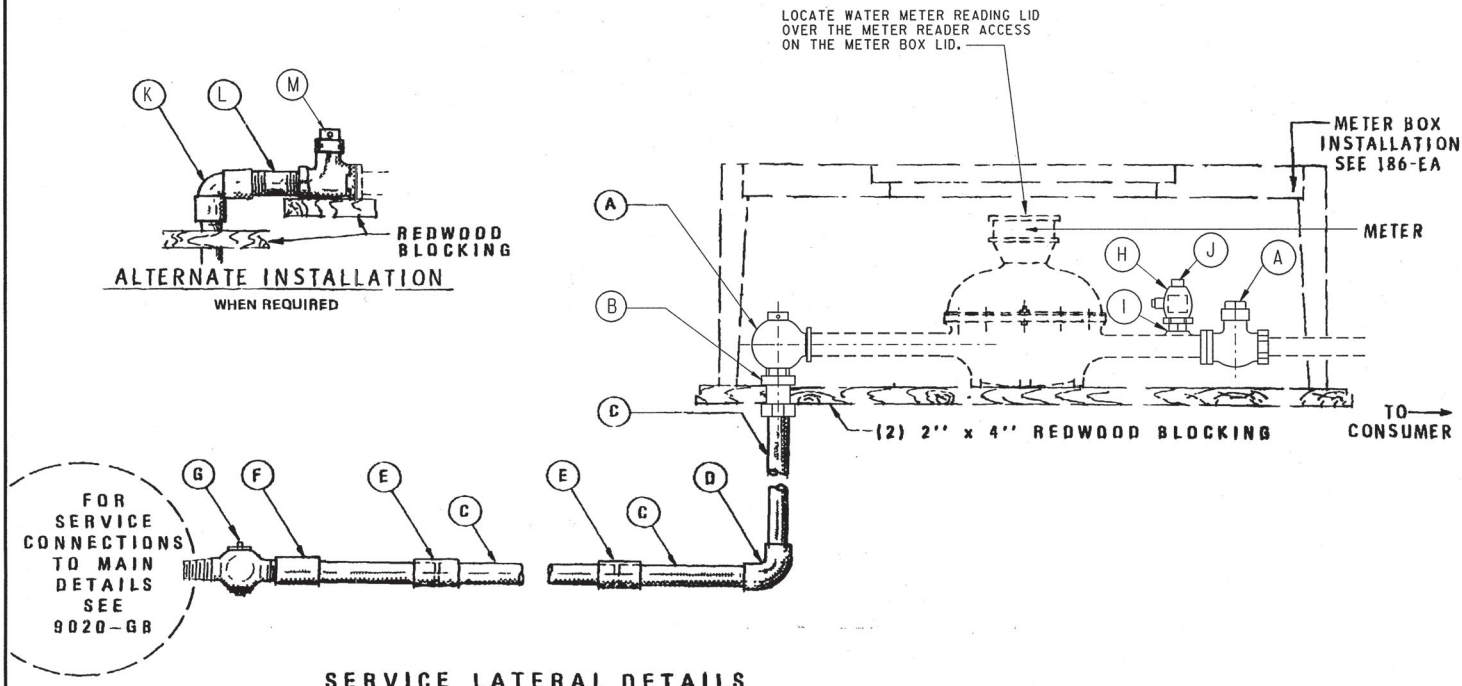
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

SERVICE INSTALLATIONS - NEW CONSTRUCTION OF ONE & TWO FAMILY DWELLINGS
COPPER
FOR 1" THRU 2" METERS

STRUCTURE OR ZONE DESIGNATION
SCALE NONE
DATE 7 MAR 11

291.1-EA



SERVICE LATERAL DETAILS

ITEM	MATERIAL	METER SIZE 1½"	METER SIZE 2"
A	ANGLE STOP, T HEAD FPT X METER FLANGE	1-1/2"	2'
B	PVC MPT X SOCKET ADAPTER, SCH 80	1 1/2"	2"
C	PLASTIC (PVC) SERVICE PIPE SEE NOTE 2	1 1/2"	2"
D	ELBOW, PLASTIC, SOCKET	1 1/2"	2"
E	COUPLING, PLASTIC, SOCKET	1-1/2"	2"
F	COUPLING, PLASTIC, IPT F TO SOCKET	1-1/2"	2"
G	CHABOT STOP	1 1/2"	2"
H	BALL VALVE, STAINLESS STEEL HANDLE FPT X FPT	1"	1"
I	NIPPLE BRASS	1"	1"
J	BRASS PLUG	1"	1"
	ALTERNATE INSTALLATION MATERIAL		
K	ELBOW, PLASTIC, SOCKET TO FPT , SCH 80	1½"	2"
L	NIPPLE, PLASTIC, LENGTH AS REQ'D, SCH 80	1½"	2"
M	BALL VALVE, T HEAD, MPT X METER FLANGE	1½"	2"

NOTES

1. THE SERVICE LINE SHALL REST ON UNDISTURBED EARTH WITH A 36" MINIMUM COVER
2. COPPER SERVICE (DWG NO 291-EA) INSTALLATIONS SHALL BE USED WHERE THE SERVICE LATERAL MAY BE EXPOSED TO GASOLINE OR OTHER PETROLEUM DISTILLATES
3. TEST OUTLET SHALL BE NORMALLY CLOSED.

REVISED 4 NOV 97 RJE
REVISED 16 MAY 97 RJE
REVISED 17 MAY 93 C.A.D.
REVISED 19 DEC 88 NTN

APPROVED _____ CHIEF ENGINEER B.P.E. No. C 7024

DESIGN	DESIGNED BY E.B.M.U.D.	EAST BAY MUNICIPAL UTILITY DISTRICT OAKLAND, CALIFORNIA
DESIGN	DESIGN CHECKED BY W. Tsimoras	STANDARD DRAWING
DESIGN	DRAWN BY J GIOVANNINI	SERVICE INSTALLATIONS PLASTIC
REVIEW	CORROSION CHECK BY A Westerback	FOR 1-1/2" AND 2" METERS
REVIEW	PROJECT ENGR	
REVIEW	SUPERVISOR MECH & ELEC DESIGN	STRUCTURE OR ZONE DESIGNATION
REVIEW	SUPERVISOR HYDRAULIC DESIGN	SCALE NONE
REVIEW	MANAGER OPERATIONS & MAINTENANCE	DATE 24 DEC 69
	MANAGER DESIGN & CONST	292-EA
	MANAGER WATER PROD & DIST	DISTRIBUTION SYSTEM MAP NO.

USER: ratendid
PLOT DATE: 6-NOV-1997 15:13
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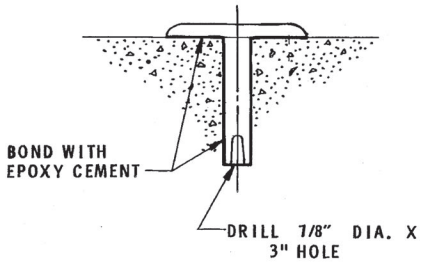
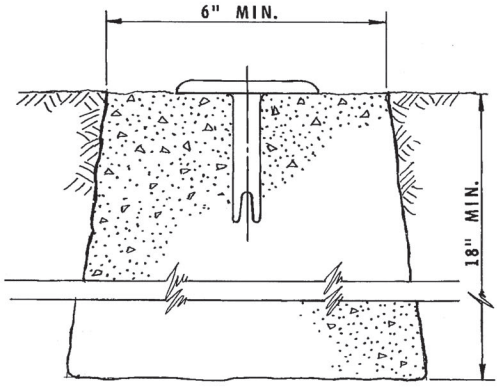
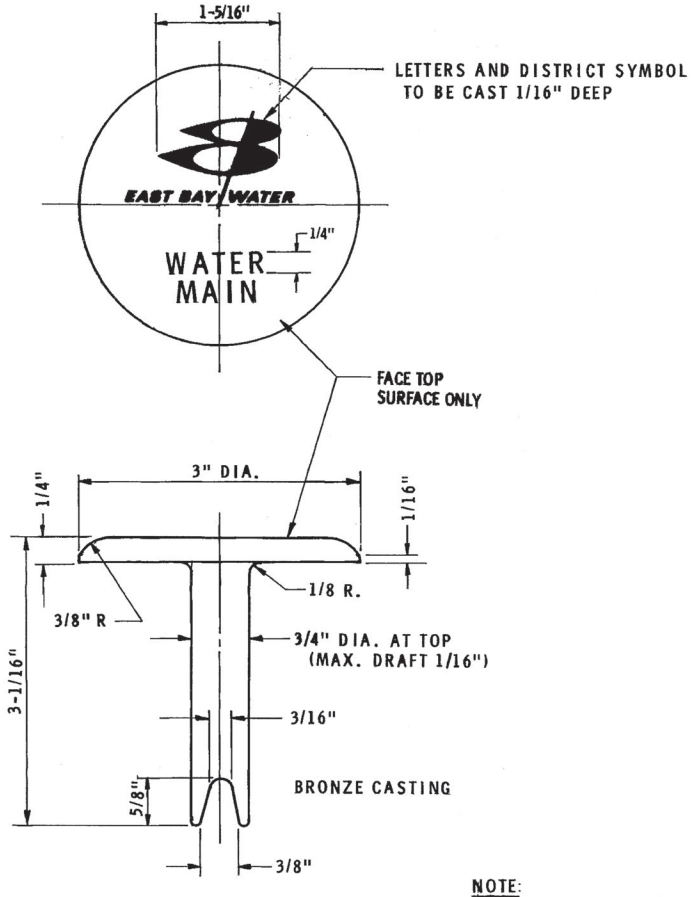


CONCRETE PAVEMENT



UNPAVED AREAS

MARKER PLATE INSTALLATION



NOTE:
INSTALL MARKER PLATES DIRECTLY OVER PIPE.

MARKER PLATE

REVISED 3 DEC 87 N.N.G. WB

APPROVED D.D. Jenkins
CHIEF ENGINEER R.P.E. No. C 7624

NO.	DATE	REVISION	BY	REC.	APP.
2	30JUNE08	REVISED (PER PIPE COMMITTEE)	M	87	DJS

DESIGN
DESIGN BY EBMUD
DESIGN CHECK BY J. Williams
DRAWN BY Bayashi

REVIEW
MECH — ELECT — ST —
PIPELINE WEB CORR — ON —
MANAGER WATER PROD & DISTRIB
PROJECT ENGR
SUPERVISOR PIPELINE ENGINEERING M. Bradbury

RECOMMENDATION
MANAGER DESIGN & CONST

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

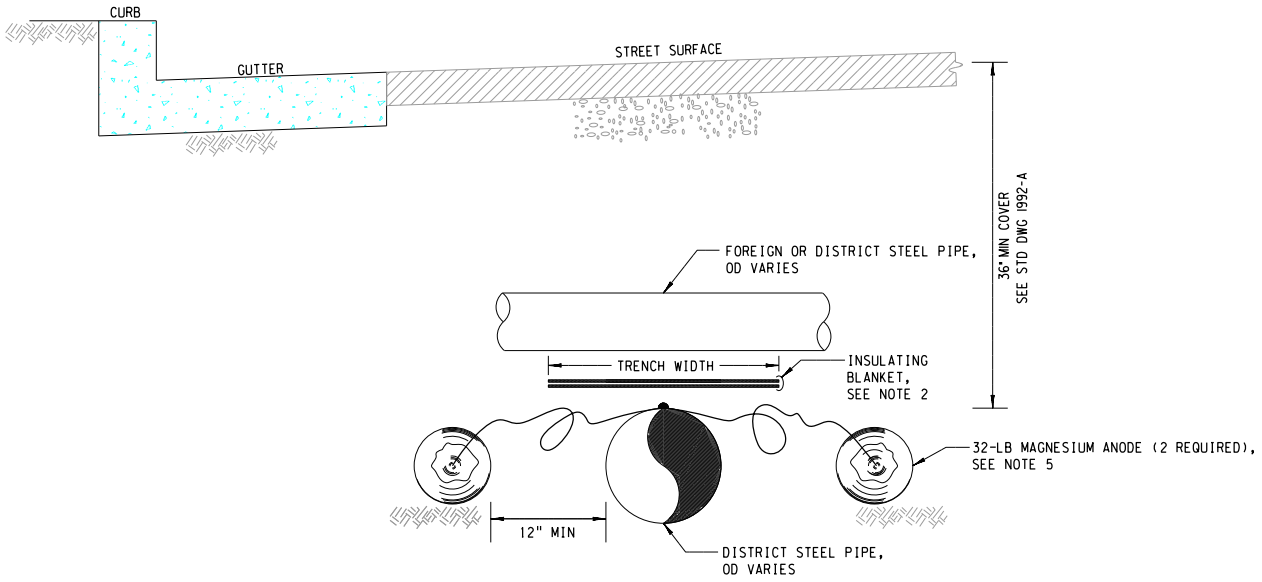
STANDARD DRAWING

PIPELINE LOCATION MARKER

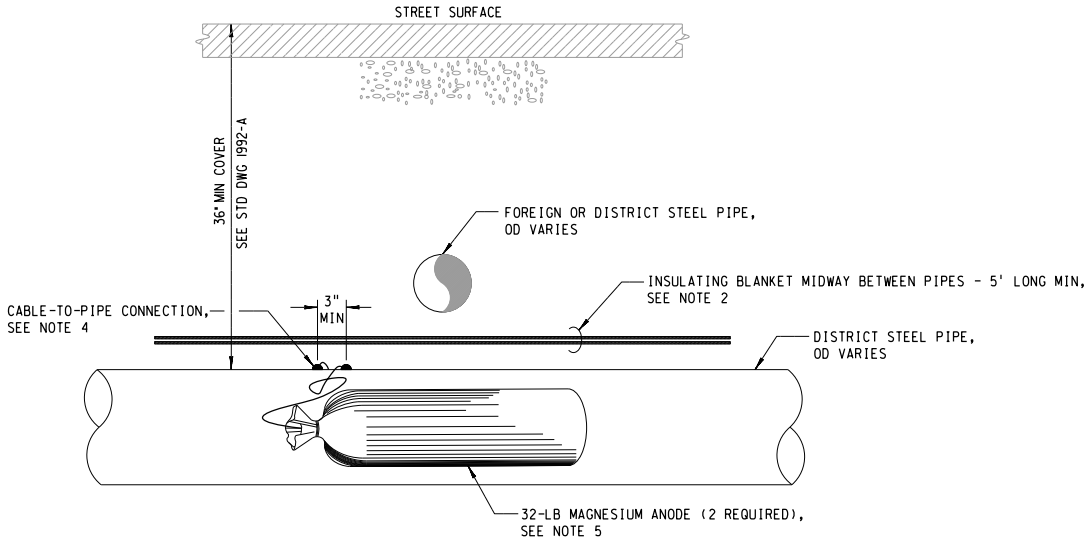
STRUCTURE OR ZONE DESIGNATION
SCALE NONE
DATE 17 FEB 72

303-EA

USER: bkolodzi
PLOT DATE: 15-JUL-2008 08:57
FILE: H:\general\std-dwgs\revisions2008\303ea.dgn



TYPICAL CROSS SECTION AT PIPE CROSSING



TYPICAL LONGITUDINAL SECTION AT PIPE CROSSING

NOTES

1. THIS DRAWING APPLIES WHEN BOTH THE DISTRICT AND FOREIGN PIPES ARE STEEL.
2. INSERT INSULATING BLANKET MIDWAY BETWEEN PIPES (2 LAYERS OF 8-MIL THICK POLYETHYLENE SHEET), AS INDICATED ON THE PROJECT DRAWINGS.
3. REMOVE PAPER OR PLASTIC SHIPPING BAG AROUND ANODE AND SATURATE WITH WATER BEFORE BACKFILL. BURY ANODE IN NATIVE SOIL (12" MIN COVER).
4. FOR EXOTHERMIC WELD CONNECTION SEE STD DWG 4508-B.
5. FOR GALVANIC ANODE INSTALLATION SEE STD DWG 286-EA.

REDUCED DRAWING

NO	DATE	REVISION	BY	REC	APP
4	09 SEP 2022	REVISED AND REDRAWN	KAP	DJL	CAO
3	14 DEC 2011	REVISED NOTES 1 & 3	KL	AST	AST
2	30 JUN 2008	REVISE	JH	ST	AST
1	26 FEB 1992	REVISED	KKC	WB	-

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	A.WESTERBACK
	DRAWN BY	J.GIOVANNINI
REVIEW	CORR AEW	
	SR ELEC ENG R.P.E. NO. E 5654	T.L.HOM
	SUPVR PLANT ENGR R.P.E. NO. E 1955	L.B.HERTZBERG
RECOMMENDED	SUPVR PIPELINE ENG'G R.P.E. NO. C 10603	W.E.BRADBURY
	MGR DES & CONST DIV R.P.E. NO. C 13447	A.W.ANTON
APPROVED	CHIEF ENGINEER R.P.E. NO. C 7624	D.G.LARKIN

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

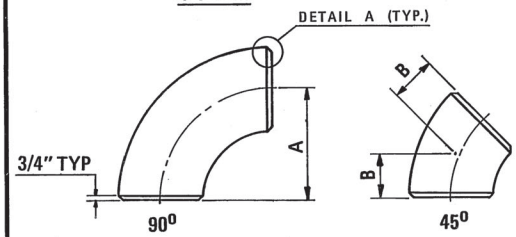
STANDARD DRAWING

ELECTROLYSIS PROTECTION
AT STEEL PIPELINE CROSSINGS

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	18 OCT 1972

308-EA

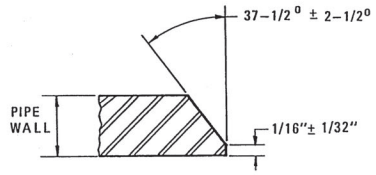
ITEM



ELBOW
LONG RADIUS

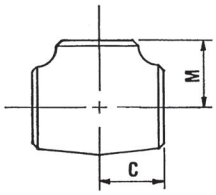
DIMENSIONS

SIZE	90° A	45° B
4"	6"	2–1/2"
6"	9"	3–3/4"
8"	12"	5"
12"	18"	7–1/2"
16"	27"	11–1/4"
20"	33"	13–1/2"



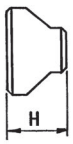
WELDING BEVEL EDGE

DETAIL A



TEE

SIZE	C	M
4" x 4"	4–1/8"	4–1/8"
6" x 4"	5–5/8"	5–1/8"
6" x 6"	5–5/8"	5–5/8"
8" x 4"	7"	6–1/8"
8" x 6"	7"	6–5/8"
8" x 8"	7"	7"
12" x 6"	10"	8–5/8"
12" x 8"	10"	9"
12" x 12"	10"	10"
16" x 16"	13–1/2"	13–1/2"
20" x 20"	16–1/2"	16–1/2"



REDUCER

SIZE	H
6" x 4"	5–1/2"
8" x 4"	6"
8" x 6"	6"
12" x 4"	8"
12" x 6"	8"
12" x 8"	8"
16" x 8"	15"
16" x 12"	15"
20" x 12"	20"
20" x 16"	20"

DISHED HEAD

SIZE	E
4"	2–1/2"
6"	3–1/2"
8"	4"
12"	6"
16"	8"
20"	10"

NOTES

1. FITTINGS SHALL CONFORM TO ANSI B 16.9, STANDARD WEIGHT, AND ARE FOR USE WITH 4.500", 6.625", 8.625", 12.75", 18.0" AND 22.0" O.D. PIPE.
2. FOR JOINT DETAILS, SEE STD. DWGS. 237-EA OR 310-EA.
3. FOR WET TAPS USE STEEL PIPE TEES, STD. DWG. 282-EA OR STEEL PIPE NOZZLE, STD. DWG. 238-EA.
4. FOR STEEL PIPE FLANGES, SEE STD. DWGS. 323-EA AND 324-EA.
5. FITTINGS SHALL BE SUPPLIED UNCOATED.
6. FITTINGS SHALL BE LINED IN ACCORDANCE WITH AWWA C-104 WITH LINING THICKNESS INDICATED ON DWG'S. 1216-A OR 1884-A. PRIOR TO MORTAR LINING, ABRASIVE BLAST INTERIOR OF FITTINGS TO A "COMMERCIAL BLAST CLEANING" SSPC-SP-6.
7. ELBOWS MAY BE TRIMMED TO THE REQUIRED ANGLE IN THE FIELD.

REVISED 17 MAY 93 C.A.D.
REVISED 18 NOV 87 NTN

APPROVED _____
ASST. GEN. MGR. & CHIEF ENGINEER, R.P.E. NO. C 13447

NO.	DATE	REVISION	BY	REC.	APP.
3	30JUNE08	REVISED (PER PIPE COMMITTEE)		87.	

DESIGN
DESIGN BY E.B.M.U.D.
DESIGN CHECK BY
DRAWN BY WADSWORTH & J.J.G.
MECH ELECT STRUCT
PIPELINE CORR FNDN

REVIEW
RECOM.
SUPVR. PIPELINE ENG'G. R.P.E. NO. C - 18774
MANAGER DIST. ENG'G. R.P.E. C-13325

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

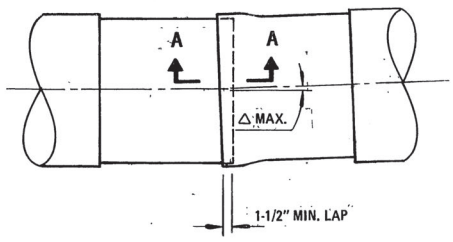
MORTAR LINED STEEL PIPE FITTINGS

4" THRU 20"

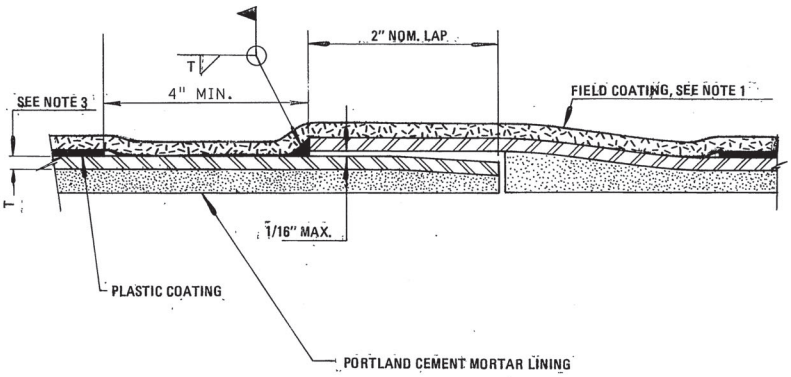
STRUCTURE OR ZONE DESIGNATION
SCALE NONE
DATE 21 NOV 73

309-EA

△ MAX. = MAX. ALLOWABLE DEFLECTION ANGLE
6-1/4° FOR 4" PIPE
4-1/4° FOR 6" PIPE
3-1/2° FOR 8" PIPE
2° – 10' FOR 12" PIPE
1° – 40' FOR 16" PIPE
1° – 19' FOR 20" PIPE



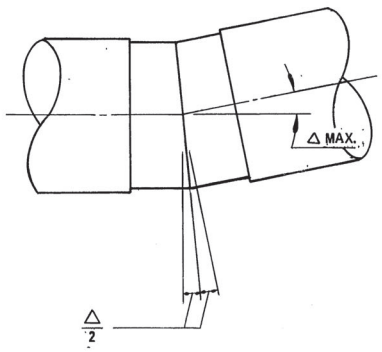
(DEFLECTION ATTAINABLE MAY BE LESS THAN MAX. DUE TO VARIATION IN FIT OF BELL & SPIGOT.)

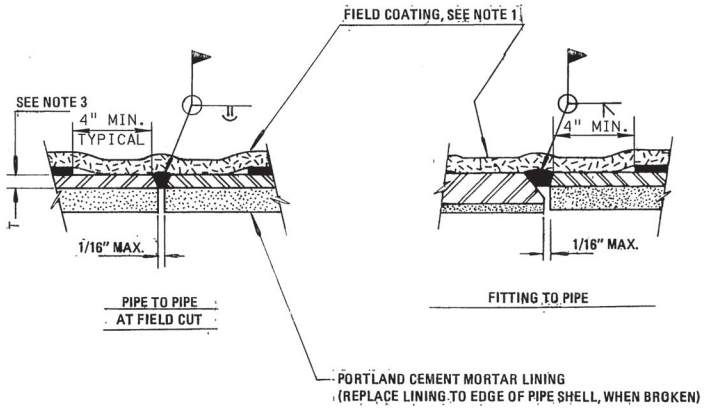


SECTION A–A

TYPICAL BELL & SPIGOT JOINT

△ MAX. = MAX. FOR FIELD CUT DEFLECTION ANGLE
22-1/2° FOR 4" THRU 12" PIPE
15° FOR 16" AND 20" PIPE





TYPICAL BUTT JOINT AT FIELD CUTS & FITTINGS

NOTES

1. SEE E.B.M.U.D. SPECIFICATIONS FOR REQUIRED FIELD COATING AT JOINTS AND FITTINGS.
2. SEE STANDARD DRAWING 309–EA FOR FITTINGS TO BE USED WITH THIS PIPE.
3. SEE STANDARD DRAWING 1884–A FOR PIPE THICKNESS.

REVISED 17 MAY 93 C.A.D. UB
REVISED 18 NOV. 87 N.T.N. UB

APPROVED W. Larkin
CHIEF ENGINEER R.P.E. No. C 7624

NO.	DATE	REVISION	BY
3	30JUNE08	REVISED	

DESIGN
DESIGN BY EBMUD
DESIGN CHECK BY Williams
DRAWN BY WADSWORTH

REVIEW
MECH ELECT STRUCT
PIPELINE CORR REW FNDN

RECOMMENDED
SUPVR. PIPELINE ENG. R.P.E. NO. C-10603 W. E. Bradley
DIRECTOR OF ENGINEERING R.P.E. NO. C-13447 W. Winter

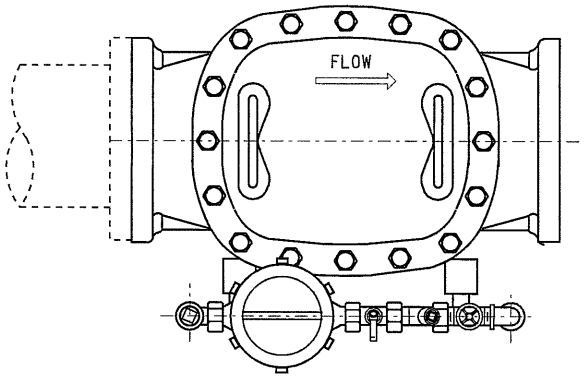
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

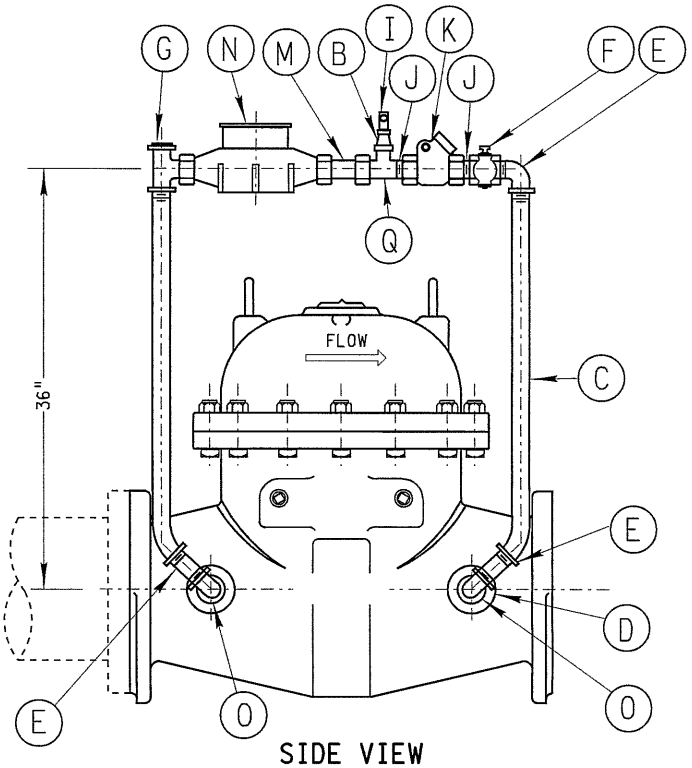
STANDARD DRAWING
STEEL PIPE
MORTAR LINED & PLASTIC COATED
JOINT DETAILS
4" THRU 20"

STRUCTURE OR ZONE DESIGNATION
SCALE NONE
DATE 6 FEB 74

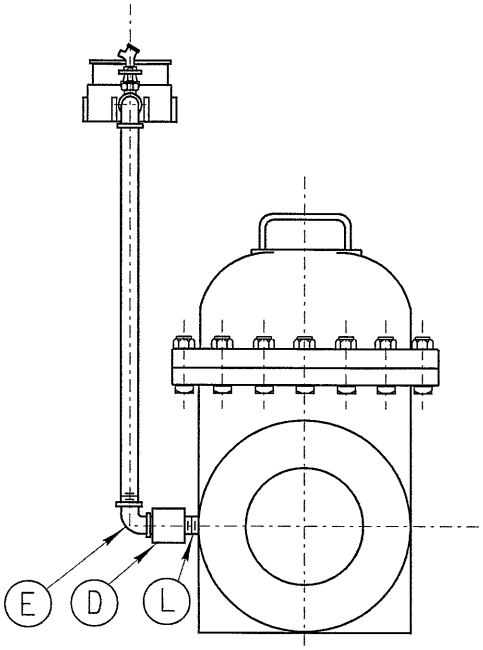
310-EA

MATERIAL LIST			
ITEM	REQ'D.	DESCRIPTION	REMARKS
B	1	3/4" x 1/2" BUSHING	
C		SOFT COPPER (PLASTIC COATED OR TAPE WRAPPED)	
D	2	COUPLING BRASS	
E	3	ADAPTER 90° COMP x MIP	OR FLARE
F	1	CURB COCK	
G	1	ANGLE COCK	
H	1	TEE (REDUCING ON RUN) BRASS	
I	1	HOSE BIB	
J	3	SHORT NIPPLE BRASS	
K		CHECK VALVE	
L	2	NIPPLE (LENGTH AS REQUIRED) BRASS	
M	1	METER COUPLING (WITH 3/4" OUTLET)	DIST. FURN.
N	1	WATER METER	DIST. FURN.
O	2	BUSHING BRASS	IF NEEDED
P	2	1-1/2" COMPANION FLANGE	DIST. FURN.
Q	1	TEE BRASS	
R		4 NUTS AND BOLTS, 2 GASKETS	

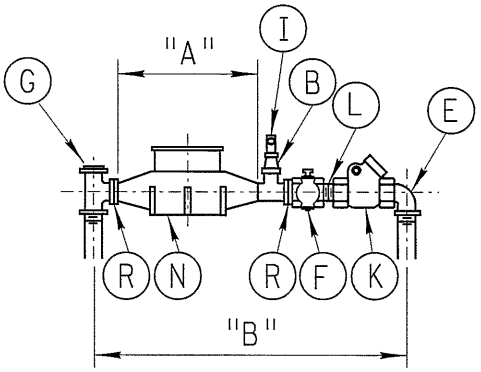




SIDE VIEW



END VIEW



TYPICAL CONNECTION 1-1/2" WATER METER FOR 10" DETECTOR CHECK

GENERAL NOTES:

1. THE CHECK VALVE SHALL BE OF HTE AUTOMATIC COMPOUND LEVER TYPE, OR DISTRICT APPROVED ALTERNATIVE, AND SHALL OPEN WHEN THE PRESSURE LOSS THROUGH THE BY-PASS METER IS FROM 1.5 TO 3.5 PSIG.

SHOP NOTES:

1. THE BY-PASS ASSEMBLY SHALL BE CONNECTED IN THE FLOW SEQUENCE SHOWN USING FITTINGS AND PIPING LENGHTS TO GET REQUIRED DIMENSIONS AND SHALL BE "RIGHT HANDED" AS SHOWN.

FIELD NOTES:

1. INSTALL WITH E.B.M.U.D. NO. 6 METER BOX (SEE DWG. 3684-B).
2. INSTALL FLANGE INSULATION KIT AT MAIN IF MAIN IS METALLIC, OTHER THAN PLASTIC-COATED STEEL.
3. COAT ALL METALLIC PIPE AND FITTINGS WITH MASTIC PER E.B.M.U.D. SPECIFICATIONS.
4. INSTALL PACKAGED 32 LB. ANODE TO LATERAL PER DWG. 286-EA, FIG. B.
5. INSTALLATION PER DWG. 3684-B.

DETECTOR CHECK SIZE	METER SIZE	PIPE & FITTING SIZE	LENGTH "A"	LENGTH "B"
4"	5/8" x 3/4"	3/4"		
6"	5/8" x 3/4"	3/4"	a	
8"	1"	1"		
10"	1-1/2" FLG.	1-1/2"	b 14-1/4"	28"

a. BETWEEN FITTING ENDS
b. BETWEEN NIPPLE ENDS

REVISED JULY 26, 2005 RES

DESIGN	DESIGNED BY EBMUD	EAST BAY MUNICIPAL UTILITY DISTRICT OAKLAND, CALIFORNIA
	DESIGN CHECKED BY W. RAMOS	
	DRAWN BY J. GIOVANNINI	STANDARD DRAWING
REVIEW		DETECTOR CHECK METERS ASSEMBLY
RECOMMENDED MGR. OF DESIGN R.P.E. NO. C	L.B. HERTZBERG	STRUCTURE OR ZONE DESIGNATION —
APPROVED, DIRECTOR OF ENGINEERING R.P.E. NO. C	W.F. ANTON	SCALE NONE
		DATE 01 OCT 74
		314-EA

USER: tlee
PLOT DATE: 28-JUL-2005 09:48
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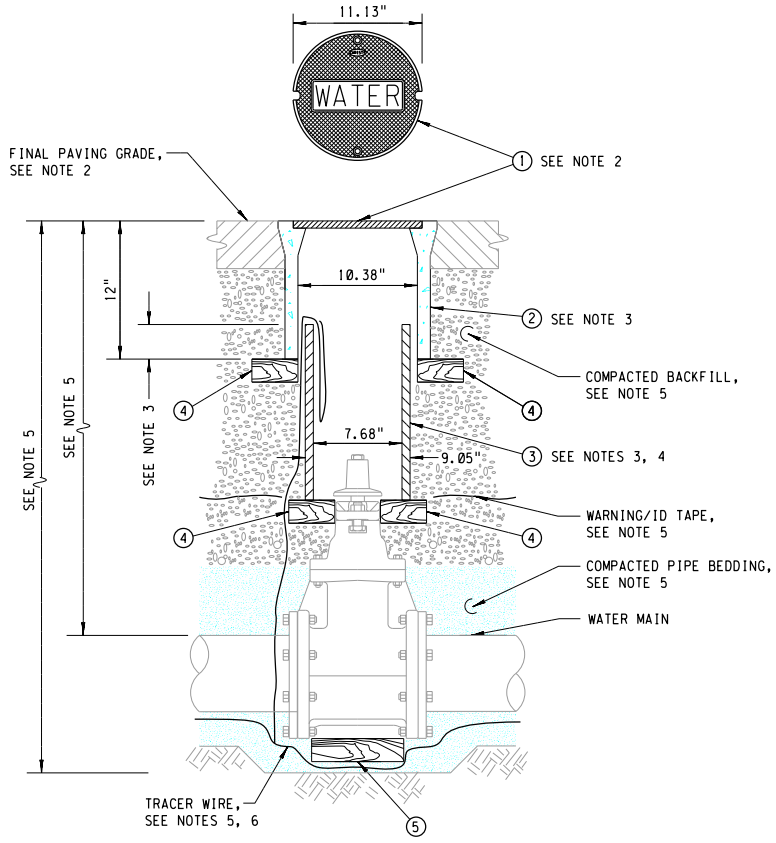


MATERIAL LIST		
ITEM	DESCRIPTION	QUANTITIES
1	CI COVER, CHRISTY G05	1
2	CONCRETE TRAFFIC VALVE BOX, CHRISTY G05	1
3	8" RISER PIPE, AWWA C900 DR-14 PVC PIPE	AS NEEDED
4	REDWOOD BLOCKING 2"X4"X12"	4
5	REDWOOD BLOCKING 2"X8"X12"	1

NOTES

1. VALVE POT INSTALLATION INCLUDES CI COVER, CONCRETE TRAFFIC VALVE BOX, RISER PIPE AND REDWOOD BLOCKINGS, SEE MATERIAL LIST.
2. TOP OF VALVE POT COVER TO FIT FLUSH WITH SURFACE OF PAVEMENT OR FINISHED GRADE IF UNPAVED.
3. PLACE CONCRETE VALVE POT BOX WITH OVERLAP BETWEEN 2 INCHES MINIMUM AND 4 INCHES MAXIMUM WITH RISER PIPE.
4. PREVENT CONCRETE AND DEBRIS FROM SPILLING INTO RISER PIPE.
5. FOR PIPE TRENCH EXCAVATION AND BACKFILLL SEE STD DWG 1992-EA AND SPEC SECTION 31 23 33P.
6. FOR TRACER WIRE AND GATE VALVE LINE INSTALLATION SEE STD DWGS 288-EA AND 288-EA-1.
7. INSTALL GATE VALVE OPERATING SHAFT EXTENSION ON GATE VALVES IF OPERATING NUT IS MORE THAN 36" BELOW GROUND LEVEL. TOP OF SHAFT EXTENSION OPERATING NUT SHALL BE BETWEEN 12" AND 24" OF FINISH GRADE, SEE STD DWG 1241-EA.
8. INSTALL BUTTERFLY VALVE OPERATING SHAFT EXTENSION WITH SHEARPIN ON ALL BUTTERFLY VALVES. TOP OF OPERATING NUT SHALL BE BETWEEN 12" TO 24" OF FINISHED GRADE. SEE STD DWG 1241-EA.
9. VALVE POT COVER COLOR CODE: RED = ZONE VALVES (ALWAYS CLOSED)
   WHITE = HYDRANT VALVES
   BLUE = DISTRIBUTION LINE VALVES
   PURPLE = RECYCLED WATER VALVES
10. SEE SPEC SECTION 33 11 13.21P ARTICLE 3.10 - INSTALLATION OF VALVE POTS.

REDUCED DRAWING

NO.	DATE	REVISION	BY	REC.	APP.
4	12 AUG 2022	REVISED AND REDRAWN	PJP	DJL	CDC
3	05 JAN 2017	UPDATE	GC	RHM	CDC
2	31 OCT 1997	REVISED	EBMUD	EBMUD	EBMUD
1	03 DEC 1987	REVISED	WB	WB	WB

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	W.BODE
	DRAWN BY	R.D.B.
REVIEW	CORR AEW	
RECOMMENDED	SUPVR.PIPELINE ENG'G R.P.E. NO. C-18774	W.L.RAMOS
	MANAGER DIST.ENG'G R.P.E. NO. C-13325	R.L.KOLM
	DIRECTOR OF ENG'G R.P.E. NO. C-13447	W.F.ANTON
APPROVED	ASST.GEN.MGR.&CHIEF ENGINEER R.P.E. NO. C-7624	D.G.LARKIN

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

VALVE POT INSTALLATION

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	30 JAN 1979

321-EA

1. THIS DRAWING IS APPLICABLE FOR LOW PRESSURE SERVICES UP TO:
   A. 175 PSI FOR FLANGES 12" AND SMALLER
   B. 150 PSI FOR FLANGES 16" AND LARGER
   C. SEE DRAWING 324-EA FOR HIGHER PRESSURES

FLANGES

2. FLANGES SHALL BE IN ACCORDANCE WITH AWWA C207 CLASS D FLAT FACED RING OR HUB FLANGES. AWWA C207 CLASS E RING OR HUB FLANGES ARE ACCEPTABLE ALTERNATIVES WITH PRIOR APPROVAL OF THE DISTRICT. IN CASE OF CONFLICT BETWEEN THIS DRAWING AND AWWA C207, AWWA C207 SHALL GOVERN. THE MINIMUM FLANGE THICKNESS, NUMBER OF BOLTS AND BOLT DIAMETER FOR AWWA C207 CLASS D FLANGES ARE LISTED IN THE TABLE ON THIS DRAWING.

3. ASME B16.5 CLASS 150 SLIP-ON AND WELDING NECK TYPE OR B16.47, SERIES A, CLASS 150 FLANGES ARE ACCEPTABLE ALTERNATIVES. USE TYPE AS CALLED OUT ON REFERRING DRAWING.
   A. RAISED FACE ASME FLANGES MAY BE USED ONLY IF THE MATING FLANGE IS STEEL, STAINLESS STEEL OR DUCTILE IRON.

   B. ASME FLANGES THAT ARE FLAT FACED WITHOUT PROJECTION MAY BE USED IN ALL INSTALLATIONS.

   C. ASME FLANGES SHALL BE FLAT FACED IF THE MATING FLANGE IS CAST IRON OR IF THE MATERIAL OF THE MATING FLANGE IS UNCERTAIN.

   D. NOTE THAT ASME FLANGES WERE PREVIOUSLY REFERRED TO AS ANSI FLANGES.

4. IN ACCORDANCE WITH AWWA C207, THE FLANGE LAYBACK, AFTER WELDING PIPE SECTION TO THE FLANGE AND BEFORE BOLTING THE FLANGE, SHALL NOT EXCEED 1° FOR A SINGLE FLANGE OR 1.5° FOR TWO MATING SURFACES. THE LAYBACK "G" FOR A SINGLE FLANGE IS SHOWN IN INCHES IN THE TABLE FOR 0.75°.

5. ALL FLAT FACED FLANGES SHALL HAVE EITHER A SERRATED CONCENTRIC OR SPIRAL FINISH HAVING FROM 24 GROOVES/IN TO 40 GROOVES/IN SHALL BE USED. THE CUTTING TOOL SHALL HAVE AN APPROXIMATE 0.06 IN OR LARGER RADIUS. THE RESULTING SURFACE SHALL HAVE A 125 TO 500 MICRO-INCH ROUGHNESS.

6. COAT FLANGE FACES WITH A RUST INHIBITOR OR OTHER REMOVABLE PROTECTIVE COATING AFTER WELDING PIPE TO FLANGE OR AFTER FLANGE FACE MACHINING. REMOVE PROTECTIVE COATING PRIOR TO FINAL ASSEMBLY OF FLANGES.

BOLTING

7. BOLTS SHALL HAVE REGULAR HEXAGONAL HEADS IN ACCORDANCE WITH ASME B18.2.1. NUTS SHALL HAVE HEAVY HEXAGONAL HEADS IN ACCORDANCE WITH ASME B18.2.2.

8. ALL BOLTS AND NUTS SHALL BE THREADED IN ACCORDANCE WITH ASME B1.1 FOR SCREW THREADS, COARSE THREAD SERIES (UNC), CLASS 2A OR 2B FIT. FOR BOLTS LARGER THAN 1", UN-8 SERIES THREADS WITH 8 THREADS/INCH ARE ALSO ACCEPTABLE.

9. BOLTING SHALL MEET ONE OF THE FOLLOWING AS REQUIRED BY PROJECT DRAWINGS AND SPECIFICATIONS:
   A. CARBON STEEL: BOLTS SHALL CONFORM TO SAE J429, GRADE 5, ASTM A325, ASTM A449, TYPE 1 OR ASTM A193 GRADE B7. NUTS UP TO 1-1/2" SHALL BE ASTM A563, GRADE B OR SAE J995 STANDARD HEXAGONAL FLAT NUTS. NUTS GREATER THAN 1-1/2" SHALL BE ASTM A563, GRADE A HEAVY HEXAGONAL FLAT NUTS.
   B. STAINLESS STEEL WITH RUBBER GASKETS: THE BOLTS SHALL BE ASTM A193, CLASS 1, B8 (TYPE 304) OR B8M (TYPE 316). NUTS SHALL BE ASTM A194, GRADE 8 (TYPE 304) OR GRADE 8M (TYPE 316) STANDARD HEX. WASHERS SHALL MATCH.
   C. STAINLESS STEEL WITH FIBER GASKETS: THE BOLTS SHALL BE ASTM A193, CLASS 2, B8 (TYPE 304) OR N8N (TYPE 304N), CARBIDE SOLUTION TREATED AND STRAIN HARDENED. NUTS SHALL BE ASTM A194, GRADE 1 STD HEX OR GRADE 8-S1 HEAVY HEX AND STRAIN HARDENED. WASHERS SHALL MATCH.

ANTI-SEIZE COMPOUND

10. THREAD ANTI-SEIZE COMPOUND SHALL BE USED ON ALL BOLT THREADS. SEE SECTION 05 05 26 FOR ACCEPTABLE PRODUCTS. FAILURE TO LUBRICATE THE BOLTING THREADS WITH ANTI-SEIZE COMPOUND PRIOR TO NUT INSTALLATION WILL RESULT IN LOW BOLT TENSION AND INSUFFICIENT GASKET PRESSURE.

GASKETS

11. FLAT FACED FLANGES SHALL USE RUBBER OR NON-ASBESTOS FIBER GASKETS. RAISED FACE FLANGES SHALL USE NON-ASBESTOS FIBER GASKETS.

12. FIBER GASKETS SHALL BE USED WITH HIGH STRENGTH STAINLESS STEEL BOLTING.

13. RUBBER GASKETS SHALL BE FULL-FACED PEROXIDE CURED EPDM WITH A THICKNESS OF 1/16" OR 1/8".

14. NON-ASBESTOS FIBER GASKETS SHALL MEET THE REQUIREMENTS OF AWWA C207. FACES SHALL BE LUBRICATED ON BOTH SIDES WITH FOOD GRADE ANTI-SEIZE COMPOUND.

15. FLANGES 24" AND SMALLER SHALL USE FULL FACED GASKETS. FLANGES OVER 24" SHALL USE RING GASKETS.

DIMENSIONS

16. THE FLANGE ID "B" SHALL BE 1/8" LARGER THAN THE PIPE OUTSIDE DIAMETER FOR PIPES UP TO 16" AND 3/16" LARGER FOR PIPES 20" AND LARGER. NOTE THAT DISTRICT STANDARD PIPELINE PIPE DIAMETERS ARE DIFFERENT FROM ASME B36.10 AND B36.19 PIPE. VERIFY ACTUAL PIPE DIAMETER BEFORE FABRICATING FLANGES. SEE APPLICABLE PIPE DRAWINGS (SUCH AS 1884-A, 7830-GB-1 AND 9499-GB) FOR PIPE OUTSIDE DIAMETER.

17. NOTE THAT FLANGE DRILLING FOR AWWA C207 CLASS D FLANGES, ASME B16.1 CLASS 125 FLANGES, ASME B16.5 CLASS 150 FLANGES, AND ASME B16.47 SERIES A CLASS 150 FLANGES ARE IDENTICAL.

18. THE OVERALL LENGTH "L" SHALL BE 12" FOR FLANGES UP TO 18" FOR FLANGES 24" AND LARGER.

19. THE BOLT HOLE DIAMETER "H" SHALL BE 1/8" LARGER THAN THE BOLT DIAMETER.

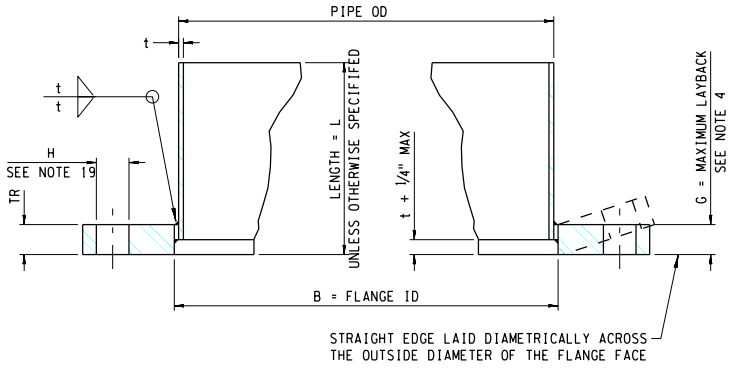
BOLTING PROCEDURES

20. INITIAL BOLTING: HAND TIGHTEN EACH, THEN "SNUG" EACH TO 10% OF FINAL TORQUE AND CHECK GAP AROUND CIRCUMFERENCE FOR UNIFORMITY. SELECTIVELY TIGHTEN WHERE GAP IS LARGER.

21. FLANGE BOLTS FOR RUBBER GASKETS SHALL BE TIGHTENED TO FINAL TORQUE WITH MINIMUM PASSES AS FOLLOWS:

PASS	PERCENT OF FINAL TORQUE	PATTERN
1	20 TO 30	CROSS
2	50 TO 70	CROSS
3	100	CROSS
4	100	CIRCULAR CLOCKWISE

AFTER HYDROTESTING, REPEAT PASSES 3 & 4.



LP FLANGE & PIPE SECTION ASSEMBLY

PIPE SIZE	MIN. FLANGE THICKNESS TR		BOLTS		BOLT TORQUE		MAXIMUM FLANGE LAYBACK G
	RING	HUB	#	DIAM	RUBBER	FIBER	
4	0.625	0.500	8	5/8	35	120	0.029
6	0.688	0.562	8	3/4	56	200	0.028
8	0.688	0.562	8	3/4	70	220	0.031
10	0.688	0.688	12	7/8	87	300	0.034
12	0.812	0.688	12	7/8	104	350	0.040
16	1.000	0.750	16	1	119	450	0.048
20	1.125	0.750	20	1 1/8	137	600	0.048
24	1.250	1.000	20	1 1/4	205	700	0.051
30	1.375	1.000	28	1 1/4	207	800	0.056
36	1.625	1.125	32	1 1/2	304	1000	0.064
42	1.750	1.25	36	1 1/2	359	1000	0.071
48	1.875	1.375	44	1 1/2	362	1000	0.074
54	2.125	1.375	44	1 3/4	516	1500	0.079
60	2.250	1.500	52	1 3/4	526	1500	0.084
66	2.500	1.500	52	1 3/4	625	1500	0.090
72	2.625	1.500	60	1 3/4	625	1500	0.094
78	2.750	1.750	64	2	761	2000	0.097
84	2.875	1.750	64	2	877	2000	0.102
90	3.000	2.000	68	2 1/4	1036	3000	0.107
96	3.250	2.000	68	2 1/4	1252	3000	0.112
102	3.250	-	72	2 1/2	1458	4000	0.117
108	3.375	-	72	2 1/2	1820	4000	0.121

TABLE DIMENSIONS ARE IN INCHES, TORQUE IS FT-LBS

22. FLANGE BOLTS FOR NON-ASBESTOS COMPOSITION GASKETS SHALL BE TIGHTENED WITH MINIMUM PASSES AS FOLLOWS:

PASS	PERCENT OF FINAL TORQUE	PATTERN
1	20 TO 30	CROSS
2	50 TO 70	CROSS
3	100	CROSS
4	100	CIRCULAR CLOCKWISE
ALLOW MINIMUM 4 HR FOR GASKET TO UNDERGO RELAXATION, THEN:		
5	100	CROSS
6	100	CIRCULAR CLOCKWISE

23. BOLTS SHALL IN ALL PASSES BE TIGHTENED IN DIAMETRICAL PAIRS AND IN A CROSS PATTERN AS RECOMMENDED BY THE GASKET MANUFACTURER OR ASME PCC-1, TABLES 4 OR 4.1.

24. A CALIBRATED TORQUE WRENCH SHALL BE USED ON ALL PASSES TO ENSURE UNIFORM BOLTING. TORQUE MULTIPLIERS ARE REQUIRED FOR HIGHER TORQUE VALUES.

C.T.WAY
APPROVED, DIRECTOR OF ENGINEERING, R.P.E. NO. C26724

REVISED AND REDRAWN 14 JAN 99 DLH

NO.	DATE	REVISION	BY	REC.	APP.
7	10-15-20	REVISED NOTE	JC	MLR	CAV
6	03-10-20	REVISED VALUES	DJB	DJB	CAV
5	02-01-17	REVISED NOTES	MLR	DJB	CAV
4	06-30-08	REVISED NOTES	JH	ST	AST

DESIGN
DESIGNED BY EBMUD
DESIGN CHECKED BY HUBERT LAI
DRAWN BY dlh

REVIEW
CORROSION CHECK BY K.CHAPMAN
SR. CIVIL ENG. R.P.E. NO. C 27714 W.BODE
RECOMMENDED MGR. OF DESIGN R.P.E. NO. C 16814 J.M.HILLIARD/W.BODE
APPROVED, DIRECTOR OF ENGINEERING R.P.E. NO. C 31966 D.M.DIEMER

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

STEEL PIPE FLANGES
LOW PRESSURE

WITH ATTACHED PIPE SECTION

STRUCTURE OR ZONE DESIGNATION —
SCALE NONE
DATE 1FEB 81

0323-EA

SUPERSEDES DWG. NO. 198-EA & 323-EA

1. THIS DRAWING IS APPLICABLE FOR HIGH PRESSURE SERVICES UP TO: 275 PSI.
SEE DRAWING 323-EA FOR LOWER PRESSURES.

FLANGES

2. FLANGES SHALL BE IN ACCORDANCE WITH AWWA C207 CLASS E FLAT FACED RING OR HUB FLANGES. REQUIREMENTS FROM AWWA C207 ARE REPEATED BELOW FOR CONVENIENCE. IN CASE OF CONFLICT BETWEEN THIS DRAWING AND AWWA C207, AWWA C207 SHALL GOVERN.

3. ASME B16.5 CLASS 150 SLIP-ON AND WELDING NECK TYPE OR B16.47 SERIES A CLASS 150 FLANGES ACCEPTABLE ALTERNATIVES. USE TYPE AS CALLED OUT ON REFERRING DRAWING.

A. RAISED FACE ASME FLANGES MAY BE USED ONLY IF THE MATING FLANGE IS STEEL, STAINLESS STEEL OR DUCTILE IRON.

B. ASME FLANGES THAT ARE FLAT FACED WITHOUT PROJECTION MAY BE USED IN ALL INSTALLATIONS.

C. ASME FLANGES SHALL BE FLAT FACED IF THE MATING FLANGE IS CAST IRON OR IF THE MATERIAL OF THE MATING FLANGE IS UNCERTAIN.

D. 304L & 316L SST FLANGES, ASME CLASS 150, ARE LIMITED TO 230 PSI MAXIMUM. USE 304 OR 316 (NOT "L") FOR FULL PRESSURE RATING.

E. NOTE THAT ASME FLANGES WERE PREVIOUSLY REFERRED TO AS ANSI FLANGES.

4. IN ACCORDANCE WITH AWWA C207, THE FLANGE LAYBACK, AFTER WELDING PIPE SECTION TO THE FLANGE AND BEFORE BOLTING THE FLANGE, SHALL NOT EXCEED 1° FOR A SINGLE FLANGE OR 1.5° FOR TWO MATING SURFACES. THE LAYBACK "G" FOR A SINGLE FLANGE IS SHOWN IN INCHES IN THE TABLE FOR 0.75°.

5. ALL FLAT FACED FLANGES SHALL HAVE EITHER A SERRATED CONCENTRIC OR SPIRAL FINISH HAVING FROM 24 GROOVES/IN TO 40 GROOVES/IN SHALL BE USED. THE CUTTING TOOL SHALL HAVE AN APPROXIMATE 0.06 IN OR LARGER RADIUS. THE RESULTING SURFACE SHALL HAVE A 125 TO 500 MICRO-INCH ROUGHNESS.

6. COAT FLANGE FACES WITH A RUST INHIBITOR OR OTHER REMOVABLE PROTECTIVE COATING AFTER WELDING PIPE TO FLANGE OR AFTER FLANGE FACE MACHINING. REMOVE PROTECTIVE COATING PRIOR TO FINAL ASSEMBLY OF FLANGES.

BOLTING

7. BOLTS SHALL HAVE REGULAR HEXAGONAL HEADS IN ACCORDANCE WITH ASME B18.2.1. NUTS SHALL HAVE HEAVY HEXAGONAL HEADS IN ACCORDANCE WITH ASME B18.2.2.

8. ALL BOLTS AND NUTS SHALL BE THREADED IN ACCORDANCE WITH ASME B1.1 FOR SCREW THREADS, COARSE THREAD SERIES (UNC), CLASS 2A OR 2B FIT. FOR BOLTS LARGER THAN 1", UN-8 SERIES THREADS WITH 8 THREADS/INCH ARE ALSO ACCEPTABLE.

9. BOLTING SHALL MEET ONE OF THE FOLLOWING AS REQUIRED BY THE PROJECT DRAWINGS AND SPECIFICATIONS.

A. CARBON STEEL: BOLTS SHALL CONFORM TO SAE J429, GRADE 5, ASTM A449, TYPE I OR ASTM A193 GRADE B7. NUTS UP TO 1-1/2" SHALL BE ASTM A563, GRADE B OR SAE J995, GRADE 5, HEXAGONAL FLAT NUTS. NUTS GREATER THAN 1-1/2" SHALL BE ASTM A563, GRADE A HEAVY HEXAGONAL FLAT NUTS.

B. STAINLESS STEEL: BOLTS SHALL BE HIGH STRENGTH AND CONFORM TO ASTM A193, CLASS 2, TYPE B8 (TYPE 304) OR TYPE B8N (TYPE 304N), CARBIDE SOLUTION TREATED AND STRAIN HARDENED. NUTS SHALL BE ASTM A194, GRADE1 STD HEX OR GRADE 8-S1 HEAVY HEX AND STRAIN HARDENED. WASHERS SHALL MATCH.

ANTI-SEIZE COMPOUND

10. THREAD ANTI-SEIZE COMPOUND SHALL BE USED ON ALL BOLT THREADS. SEE SECTION 05 05 26 FOR ACCEPTABLE PRODUCTS. FAILURE TO LUBRICATE THE BOLTING THREADS WITH ANTI-SEIZE COMPOUND PRIOR TO NUT INSTALLATION WILL RESULT IN LOW BOLT TENSION AND INSUFFICIENT GASKET PRESSURE.

GASKETS

11. GASKETS SHALL BE NON-ASBESTOS FIBER COMPOSITION GASKETS MEETING THE REQUIREMENTS OF AWWA C207.

12. ALL STEEL FLANGE SETS SHALL USE RING GASKETS. USE FULL FACE GASKETS ONLY WHEN MATING TO A VALVE OR APPURTENANCE WITH CAST IRON FLANGES.

13. GASKETS SHALL BE LUBRICATED ON BOTH SIDES WITH FOOD GRADE ANTI-SEIZE COMPOUND.

DIMENSIONS

14. NOTE THAT FLANGE DRILLING FOR AWWA C207, CLASS E FLANGES, ASME B16.5 CLASS 150 FLANGES, AND ASME B16.47 SERIES A CLASS 150 FLANGES ARE IDENTICAL.

15. THE OVERALL LENGTH "L" SHALL BE 12" FOR FLANGES UP TO 20" DIAMETER AND 18" FOR FLANGES 24" AND LARGER.

16. THE BOLT HOLE DIAMETER "H" SHALL BE 1#8" LARGER THAN THE BOLT DIAMETER.

17. THE FLANGE ID "B" SHALL BE 1#8" LARGER THAN THE PIPE OUTSIDE DIAMETER FOR PIPES UP TO 16" AND 3#16" LARGER FOR PIPES 20" AND LARGER. NOTE THAT DISTRICT STANDARD PIPELINE PIPE DIAMETERS ARE DIFFERENT FROM ASME B36.10 AND B36.19 PIPE. VERIFY ACTUAL PIPE DIAMETER BEFORE FABRICATING FLANGES. SEE APPLICABLE PIPE DRAWINGS (SUCH AS 1884-A, 7830-GB-1 AND 9499-GB) FOR PIPE OUTSIDE DIAMETER.

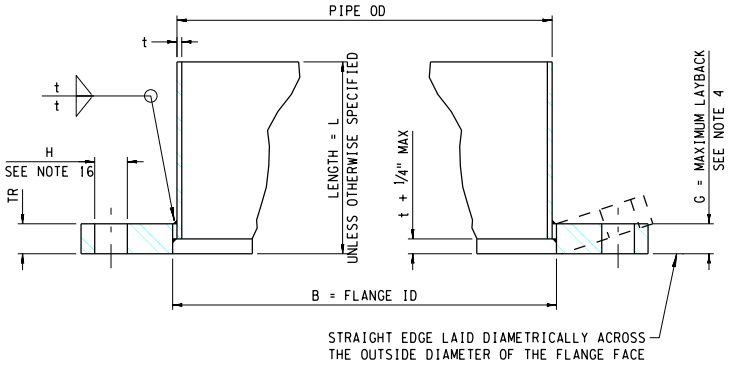
BOLTING PROCEDURES

18. INITIAL BOLTING: HAND TIGHTEN EACH, THEN "SNUG" EACH TO 10% OF FINALTORQUE AND CHECK GAP AROUND CIRCUMFERENCE FOR UNIFORMITY. SELECTIVELY TIGHTEN WHERE WHERE GAP IS LARGER.

19. FLANGE BOLTS FOR NON-ASBESTOS COMPOSITION GASKETS SHALL BE TIGHTENED WITH A MINIMUM OF SIX PASSES AS FOLLOWS:

PASS	PERCENT OF FINAL TORQUE	PATTERN
1	20 TO 30	CROSS
2	50 TO 70	CROSS
3	100	CROSS
4	100	CIRCULAR CLOCKWISE
ALLOW MINIMUM 4 HR FOR GASKET TO UNDERGO RELAXATION, THEN:		
5	100	CROSS
6	100	CIRCULAR CLOCKWISE

20. BOLTS SHALL IN ALL PASSES BE TIGHTENED IN DIAMETRICAL PAIRS AND IN A CROSS PATTERN RECOMMENDED BY THE GASKET MANUFACTURER OR ASME PCC-1, TABLES 4 OR 4.1.



HP FLANGE & PIPE SECTION ASSEMBLY

PIPE SIZE	MIN. FLANGE THICKNESS TR		BOLTS		BOLT TORQUE	MAXIMUM FLANGE LAYBACK G
	RING	HUB	#	DIAM		
4	1.125	0.938	8	5/8	120	0.029
6	1.313	1.000	8	3/4	200	0.028
8	1.500	1.125	8	3/4	220	0.031
10	1.563	1.188	12	7/8	300	0.034
12	1.750	1.250	12	7/8	350	0.040
16	2.000	1.438	16	1	450	0.048
20	2.375	1.688	20	1 1/8	600	0.048
24	2.625	1.875	20	1 1/4	700	0.051
30	2.875	2.125	28	1 1/4	800	0.056
36	3.125	2.375	32	1 1/2	1000	0.064
42	3.375	2.625	36	1 1/2	1000	0.071
48	3.500	2.750	44	1 1/2	1000	0.074
54	3.750	3.000	44	1 3/4	1500	0.079
60	3.875	3.125	52	1 3/4	1500	0.084
66	4.250	3.375	52	1 3/4	1500	0.090
72	4.375	3.500	60	1 3/4	1500	0.094
78	4.750	3.875	64	2	2000	0.097
84	4.750	3.875	64	2	2000	0.102
90	5.125	4.250	68	2 1/4	3000	0.107
96	5.125	4.250	68	2 1/4	3000	0.112
102	5.500	-	72	2 1/2	4000	0.117
108	5.500	-	72	2 1/2	4000	0.121

TABLE DIMENSIONS ARE IN INCHES, TORQUE IS FT-LBS

21. A CALIBRATED TORQUE WRENCH SHALL BE USED ON ALL PASSES TO ENSURE UNIFORM BOLTING. TORQUE MULTIPLIERS ARE REQUIRED FOR HIGHER TORQUE VALUES.

NO.	DATE	REVISION	BY	REC.	APP.
4	03-10-20	REVISED VALUES	DJB	DJB	CAV
3	02-01-17	REVISED NOTES	MLR	DJB	CAV
2	06-30-08	REVISED NOTES	JH	ST	AST

DESIGN	DESIGNED BY	ROBERT DAVIS
	DESIGN CHECKED BY	NATHAN GRONLUND
	DRAWN BY	EBMUD
REVIEW	CORROSION CHECK BY	
	SR. MECH ENG, R.P.E. NO. M 29694	DAVID BAILEY
	RECOMMENDED, MGR. OF DESIGN R.P.E. NO. C 39851	DAVID PRATT
	APPROVED, DIRECTOR OF ENGINEERING R.P.E. NO. C 44782	XAVIER IRIAS

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

STEEL PIPE FLANGES
HIGH PRESSURE

WITH ATTACHED PIPE SECTION

STRUCTURE OR ZONE DESIGNATION —
SCALE NONE
DATE 22 DEC. 2006

324-EA

NOTES

1. THIS DRAWING IS APPLICABLE FOR COLD WATER SERVICE WITH EXTRA-HIGH PRESSURES UP TO: 600 PSI

   SEE DRAWING 324-EA FOR PRESSURES 275 PSIG AND LOWER.
   SEE DRAWING 323-EA FOR PRESSURES 175 PSIG AND LOWER.

FLANGES

2. FLANGES 4-INCH THRU 24-INCH SHALL BE IN ACCORDANCE WITH ASME B16.5 CLASS 300, SLIP-ON OR WELDING-NECK. FLANGES 24-INCH THRU 60-INCH SHALL BE IN ACCORDANCE WITH ASME B16.47 CLASS 300 SERIES A, WELDING-NECK.

   A. FLANGE MATERIAL SHALL BE CARBON STEEL OR STAINLESS STEEL AS SPECIFIED.

   B. ONLY RAISED FACE ASME FLANGES SHALL BE USED IN ORDER TO PROVIDE A PROPER SEAL AT THE TORQUES SHOWN ON THE TABLE.

   C. THE MATING FLANGE SHALL ALSO BE CARBON STEEL OR STAINLESS STEEL. MATING TO CAST OR DUCTILE IRON FLANGES IS NOT PERMITTED.

   D. NOTE THAT ASME FLANGES WERE PREVIOUSLY REFERRED TO AS ANSI FLANGES.

3. COAT FLANGE FACES WITH A RUST INHIBITOR OR OTHER REMOVABLE PROTECTIVE COATING AFTER WELDING PIPE TO FLANGE OR AFTER ANY FLANGE FACE MACHINING. SEE SPEC SECTION 33 11 06 FOR ACCEPTABLE PRODUCTS. REMOVE PROTECTIVE COATING PRIOR TO FINAL ASSEMBLY OF FLANGES.

SKIRT

4. PROVIDE A PIPE SECTION (SKIRT) ON FLANGES WHEN SPECIFIED.

5. IN ACCORDANCE WITH AWWA C207, THE FLANGE LAYBACK, AFTER WELDING THE SKIRT TO THE FLANGE AND BEFORE BOLTING THE FLANGE, SHALL NOT EXCEED 1Δ FOR A SINGLE FLANGE OR 1.5Δ FOR TWO MATING SURFACES. THE LAYBACK "G" FOR A SINGLE FLANGE IS SHOWN IN INCHES IN THE TABLE FOR 0.75Δ.

6. THE OVERALL SKIRT LENGTH "L" SHALL BE 12" FOR FLANGES UP TO 20" DIAMETER AND 18" FOR FLANGES 24" AND LARGER.

7. FILLET WELD MINIMUM SIZE SHALL MATCH THE PIPE THICKNESS. GROOVE WELDS SHALL BE FULL PENETRATION.

BOLTING

8. BOLTS SHALL HAVE HEAVY HEXAGONAL HEADS IN ACCORDANCE WITH ANSI/ASME B18.2.1.

   A. STEEL BOLTS SHALL CONFORM TO ASTM A193 GRADE B7.

   B. STAINLESS STEEL BOLTS (3/4") SHALL BE USED ON 4" AND 6" STAINLESS STEEL FLANGES. BOLTS SHALL CONFORM TO ASTM A193, CLASS 2, TYPE B8, (TYPE 304) OR TYPE B8N (TYPE 304N), CARBIDE SOLUTION TREATED AND STRAIN HARDENED. NUTS SHALL BE ASTM A194, GRADE 1 STD HEX OR GRADE 8-S1 HEAVY HEX AND STRAIN HARDENED. WASHERS SHALL MATCH.

9. NUTS SHALL HAVE HEAVY HEXAGONAL HEADS IN ACCORDANCE WITH ANSI/ASME B18.2.2. NUTS SHALL CONFORM TO ASTM A194 GRADE 2H, OR ASTM A563 GRADE DH.

10. ALL BOLTS AND NUTS SHALL BE THREADED IN ACCORDANCE WITH ANSI B1.1 FOR SCREW THREADS. BOLTS 1-INCH AND SMALLER SHALL BE UNIFIED COARSE THREAD SERIES (UNC), CLASS 2B FIT. BOLTS LARGER THAN 1-INCH, SHALL BE UNC CLASS 2B, OR UN-8 SERIES THREADS WITH 8 THREADS/INCH.

11. BOLTING SHALL BE COATED TO MINIMIZE CORROSION:

   A. BURIED FLANGE SETS SHALL BE COMPLETELY COATED WITH PETROLEUM (WAX) TAPE.

   B. EXPOSED FLANGE SETS SHALL HAVE THE BOLTING FINISH COATED WITH HIGH-BUILD EPOXY WITH COLOR TO MATCH PIPING.

ANTI-SEIZE COMPOUND

12. THREAD ANTI-SEIZE COMPOUND OF HIGH-PURITY MINERAL OIL AND ALUMINUM SHALL BE USED ON ALL BOLT THREADS. SEE SPEC SECTION 05 05 26 FOR ACCEPTABLE PRODUCTS. FAILURE TO LUBRICATE THE BOLTING THREADS PRIOR TO NUT INSTALLATION AND TORQUING WILL RESULT IN LOWER PRESSURE CAPABILITIES AND POSSIBLE LEAKAGE.

GASKETS

13. GASKETS SHALL BE 1/16-INCH THICK NON-ASBESTOS FIBER IN EPDM BINDER COMPOSITION GASKETS MEETING THE REQUIREMENTS OF AWWA C207. DO NOT USE A THICKER GASKET AS IT REQUIRES A HIGHER TORQUE THAN THAT SHOWN ON THE TABLE AND MAY RESULT IN LEAKAGE. RUBBER GASKETS ARE NOT ACCEPTABLE.

14. ALL FLANGES SHALL USE RING TYPE GASKETS THAT EXTEND TO THE INSIDE EDGE OF THE BOLTS. FULL-FACE GASKETS ARE NOT PERMITTED.

15. GASKETS SHALL BE LUBRICATED ON BOTH SIDES WITH FOOD GRADE ANTI-SEIZE COMPOUND.

16. INSULATING GASKETS REQUIRE DIFFERENT TORQUE VALUES. USE THE GASKET MANUFACTURER'S TORQUE RECOMMENDATIONS.

DIMENSIONS

17. FLANGE DIMENSION SHALL BE PER ASME B16.5 OR ASME B16.47. DIMENSIONS GIVEN IN THE TABLE ARE FROM THESE STANDARDS.

18. THE PIPING OD SHALL ADHERE TO ASME B36.10. THE DISTRICT STANDARD PIPING DIMENSIONS ARE NOT ACCEPTABLE FOR THIS PRESSURE SERVICE.

BOLTING PROCEDURES

19. TORQUE VALUES SHOWN PROVIDE THE MINIMUM REQUIRED GASKET COMPRESSION. IF NECESSARY, TORQUE MAY BE INCREASED BY UP TO 100% FOR 4"-24" AND 50% FOR 30"-60".

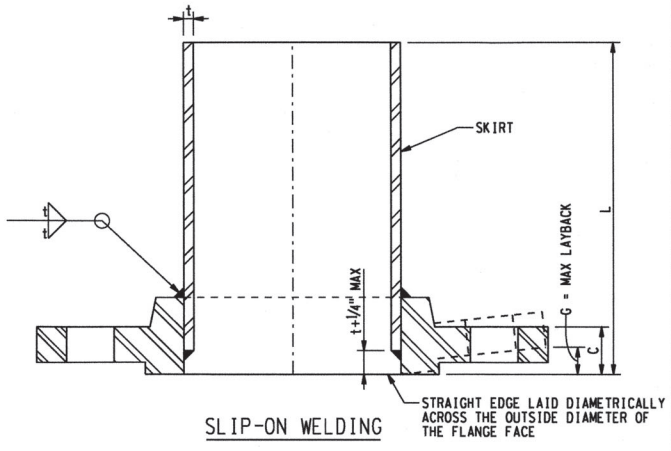
20. INITIAL BOLTING: HAND TIGHTEN, THEN "SNUG" TO 10% OF FINAL TORQUE VALUE AND CHECK GAP AROUND CIRCUMFERENCE FOR UNIFORMITY. SELECTIVELY TIGHTEN WHERE GAP IS LARGER.

21. FLANGE BOLTS FOR NON-ASBESTOS FIBER COMPOSITION GASKETS SHALL BE TIGHTENED WITH A MINIMUM OF SIX PASSES AS FOLLOWS:

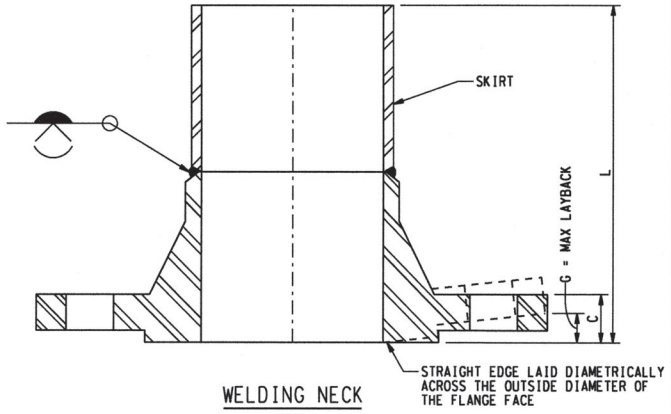
PASS	PERCENT OF FINAL TORQUE	PATTERN
1	20 TO 30	CROSS
2	50 TO 70	CROSS
3	100	CROSS
4	100	CIRCULAR CLOCKWISE
ALLOW MINIMUM 24 HR FOR GASKET TO UNDERGO RELAXATION		
5	100	CROSS
6	100	CIRCULAR CLOCKWISE

22. BOLTS SHALL IN ALL PASSES BE TIGHTENED IN DIAMETRICAL PAIRS AND IN A CROSS PATTERN RECOMMENDED BY THE GASKET MANUFACTURER OR ASME PCC-1, TABLES 4 OR 4.1 .

23. A CALIBRATED TORQUE WRENCH SHALL BE USED ON ALL PASSES TO ENSURE UNIFORM BOLTING.



SLIP-ON WELDING



WELDING NECK

XHP FLANGE & PIPE SECTION ASSEMBLY

NTS

ASME STANDARD	PIPE SIZE	MIN. FLANGE THICKNESS C	BOLTS		LUBRICATED BOLT TORQUE, MINIMUM NOTES 18, 19	MAXIMUM FLANGE LAYBACK G
		SLIP-ON AND WNF	#	DIAM		
B16.5	4	1.25	8	3/4	95	0.029
	6	1.44	12	3/4	100	0.028
	8	1.62	12	7/8	160	0.031
	10	1.88	16	1	185	0.034
	12	2	16	1 1/8	270	0.040
	16	2.25	20	1 1/4	330	0.048
	20	2.5	24	1 1/4	410	0.048
	24	2.75	24	1 1/2	580	0.051
B16.47	30	3.62	28	1 3/4	1150	0.056
	36	4.12	32	2	1500	0.064
	42	4.69	32	1 5/8	1250	0.071
	48	5.25	32	1 7/8	2150	0.074
	54	6.00	28	2 1/4	3350	0.079
	60	6.44	32	2 1/4	3550	0.084

TABLE DIMENSIONS ARE IN INCHES, TORQUE IS FT-LBS

NO.	DATE	REVISION	BY	REC.	APP.
1	20DEC2016	REVISED NOTE 8, ETC	MEE	MEE	DP

DESIGN
DESIGNED BY Matthew E. Eberhard
DESIGN CHECKED BY David P. Dennis
DRAWN BY K. ENG

REVIEW
SR. MECH. ENGR. R.P.E. NO. M 29694 David L. Gibson
RECOMMENDED MANAGER OF DESIGN R.P.E. NO. C 39851 Daniel L. Pratt
APPROVED, DIRECTOR OF ENGINEERING & CONST. R.P.E. NO. C 44782 Frank Dias

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

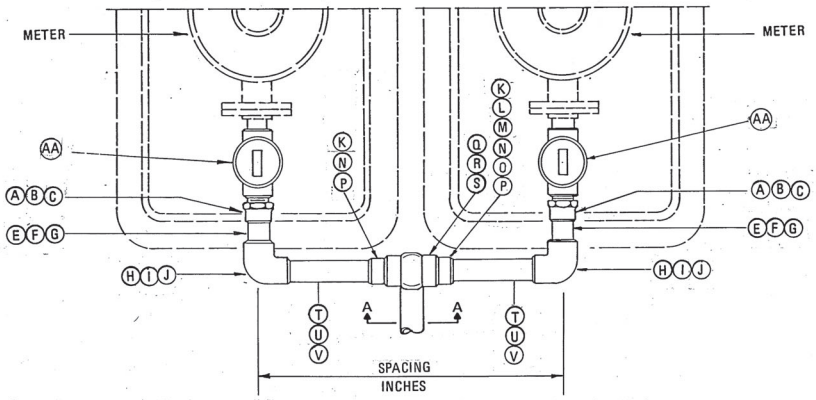
STANDARD DRAWING

STEEL PIPE FLANGES,
EXTRA-HIGH PRESSURE (XHP)
SLIP-ON, WELDING-NECK, & SKIRTED

PROJECT NO.
SCALE NONE
DATE 18MAY2009

325-EA

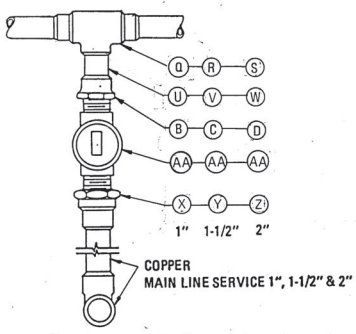
USER: pcorioso
DATE: 21-DEC-2016 13:46
FILE: H:\stdssv8\stddwgs\325-EA.R01

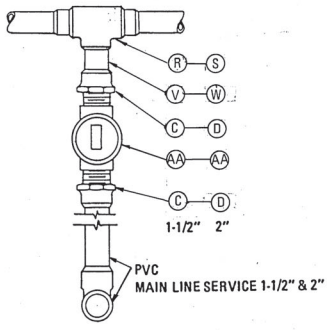


PLAN

CASE NO.	FITTINGS IN PLAN	SPACING INCHES
I	AA-A-E-H-T-K-Q-K-T-H-E-A-AA	16
II	AA-B-F-I-U-N-R-L-T-H-E-A-AA	16
III	AA-B-F-I-U-N-R-N-U-I-F-B-AA	16
IV	AA-C-G-J-V-P-S-M-T-H-E-A-AA	21
V	AA-C-G-J-V-P-S-O-U-I-F-B-AA	21
VI	AA-C-G-J-V-P-S-P-V-J-G-C-AA	26

ITEM	MATERIAL
	ADAPTER – SOC. TO MIPT
A	3/4"
B	1"
C	1-1/2"
D	2"
	PIPE
E	3/4" x 3"
F	1" x 3-1/8"
G	1-1/2" x 3-3/8"
	ELL – SOC. x SOC.
H	3/4"
I	1"
J	1-1/2"
	BUSHING – SOC. x SOC.
K	1" TO 3/4"
L	1-1/2" TO 3/4"
M	2" TO 3/4"
N	1-1/2" TO 1"
O	2" TO 1"
P	2" TO 1-1/2"
	TEE – SOC. x SOC. x SOC.
Q	1" x 1" x 1"
R	1-1/2" x 1-1/2" x 1-1/2"
S	2" x 2" x 2"
	PIPE
T	3/4"
U	1"
V	1-1/2"
W	2"
X	1" COUPLING MIPT TO SOCKET
Y	1-1/2" COUPLING MIPT TO SOCKET
Z	2" COUPLING MIPT TO SOCKET
AA	CURB STOP – SAME SIZE AS PIPE RUN





VIEW A–A

NOTES

1. CASE I – A 1" MAIN LINE SERVICE WITH TWO 3/4" BRANCH SERVICES.
2. CASE II – A 1-1/2" MAIN LINE SERVICE WITH ONE 1" BRANCH AND ONE 3/4" BRANCH.
3. CASE III – A 1-1/2" MAIN LINE SERVICE WITH TWO 1" BRANCH SERVICES.
4. CASE IV – A 2" MAIN LINE SERVICE WITH ONE 1-1/2" BRANCH AND ONE 3/4" BRANCH.
5. CASE V – A 2" MAIN LINE SERVICE WITH ONE 1-1/2" BRANCH AND ONE 1" BRANCH.
6. CASE VI – A 2" MAIN LINE SERVICE WITH TWO 1-1/2" BRANCH SERVICES.
7. FITTINGS AS SHOWN BY LETTER DESIGNATION IN TABLE ARE ARRANGED IN ORDER OF ASSEMBLY, READING FROM LEFT TO RIGHT.
8. REFER TO DRAWINGS 291–EA AND 292–EA FOR MAIN LINE SERVICE INSTALLATIONS AND METER CONNECTIONS.
9. ALL FITTINGS, EXCEPT X, Y & Z, ARE PVC, SCH. 80. FITTINGS X, Y & Z ARE WROUGHT COPPER, BRASS OR OTHER COPPER-BASE ALLOY FOR SOLDER JOINT.

APPROVED G T Way
CHIEF ENGINEER, R.P.E. NO. C26724

DESIGN
DESIGNED BY EBMUD
DESIGN CHECKED BY Hubert Lai
DRAWN BY N. NELSON

REVIEW
CORROSION CHECK BY K. Chapman
SR. CIVIL ENGR. R.P.E. NO. C 27714 U Bodas

RECOM.
MGR. OF DESIGN R.P.E. NO. C 16814 J M Hilliard / U Bodas
ASST. CH. ENG. FOR DES. & CONST., R.P.E. NO. C 29111 J M Dreier

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

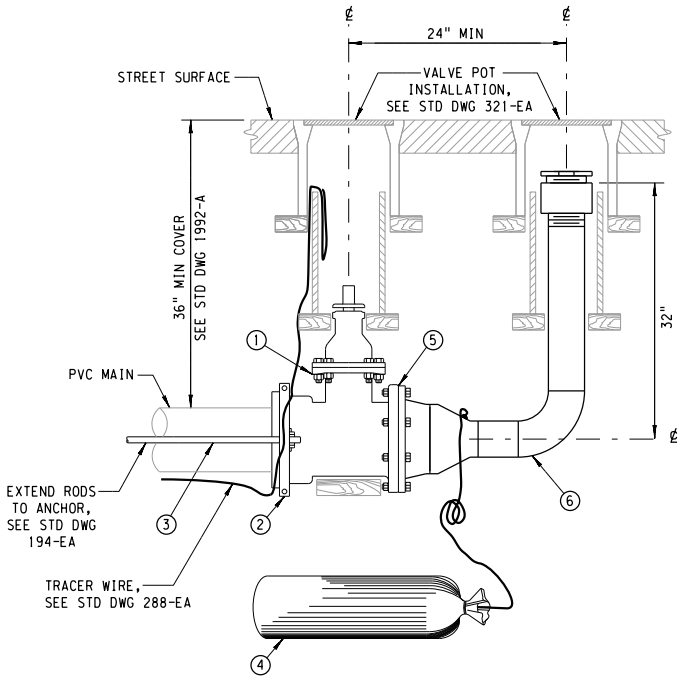
STANDARD DRAWING

DUAL BRANCH SERVICE PVC INSTALLATIONS

3/4" THRU 1-1/2"

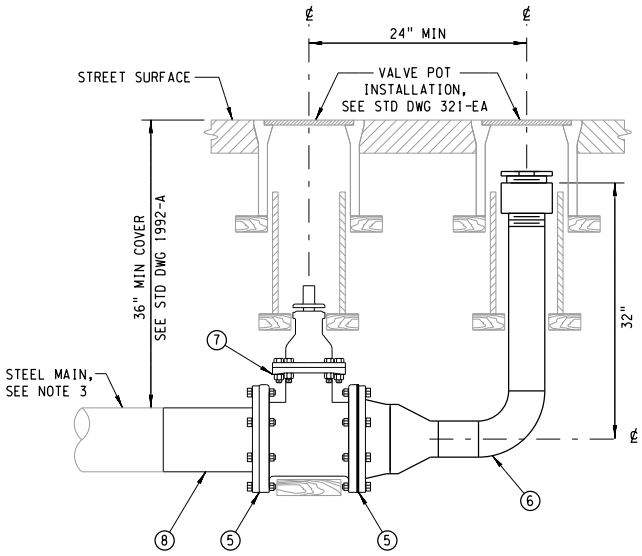
STRUCTURE OR ZONE DESIGNATION
SCALE NONE
DATE 23 FEB. '89

330-EA



4" BLOWOFF INSTALLATION

(FOR 6" AND 8" PVC MAINS)



4" BLOWOFF INSTALLATION

(FOR 6" AND 8" STEEL MAINS)

MATERIAL LIST

ITEM	DESCRIPTION	QUANTITY REQUIRED		
		PVC MAIN	ML&PCS MAIN	ML&CS MAIN
①	GATE VALVE, PUSH ON BY FLANGED, RESILIENT SEAT, NON-RISING STEM WITH NUT OPERATOR	1	-	-
②	SINGLE COLLAR	1	-	-
③	TIE ROD 5/8" x 7'-6"	2	-	-
④	32 LB GALVANIC ANODE, STD DWG. 286-EA, FIG. B	1	-	1
⑤	FLANGE GASKET, 150#, STD DWGS 323-EA AND 324-EA	1	2	1
⑥	4" STEEL BLOWOFF ASSEMBLY PER STD DWG 3677-B	1	1	1
⑦	RESILIENT SEAT GATE VALVE, FLANGED, NON-RISING STEM, WITH NUT OPERATOR	-	1	1
⑧	SKIRTED FLANGE, ML&PCS, STD DWGS 323-EA AND 324-EA	-	1	1
⑨	FLANGE INSULATING KIT, SEE STD DWG 3186-B	-	-	1

NOTES

1. WAX TAPE ITEMS 1, 2, 3, AND 7 (INCLUDING BOLTS AND NUTS).
2. USE RUST INHIBITING GREASE ON ALL THREADS.
3. ON CEMENT MORTAR COATED STEEL MAINS, INSTALL INSULATING FLANGE KIT ON VALVE FLANGE AND CEMENT MORTAR COAT FROM THE FLANGE TO THE MAIN. INSTALL 32-LB ANODE ON STEEL BLOWOFF RISER, ITEM 6.

REDUCED DRAWING

NO	DATE	REVISION	BY	REC	APP
2	09 SEP 2022	REVISED AND REDRAWN	KAP	DSL	CAC
1	30 JUN 2008	REVISED (PER PIPE COMMITTEE)	JH	ST	AST

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	BORIS YUKHT
	DRAWN BY	P.LUI
REVIEW		
	CORROSION CHECKED BY	KENT A.CHAPMAN
	SR CIVIL ENGINEER R.P.E. NO. C 27714	W.BODE
	RECOMMENDED MGR OF DESIGN R.P.E. NO. C 30187	DESI ALVAREZ
	APPROVED ASST. CH. ENG. R.P.E. NO. C 29111	D.DIEMER

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

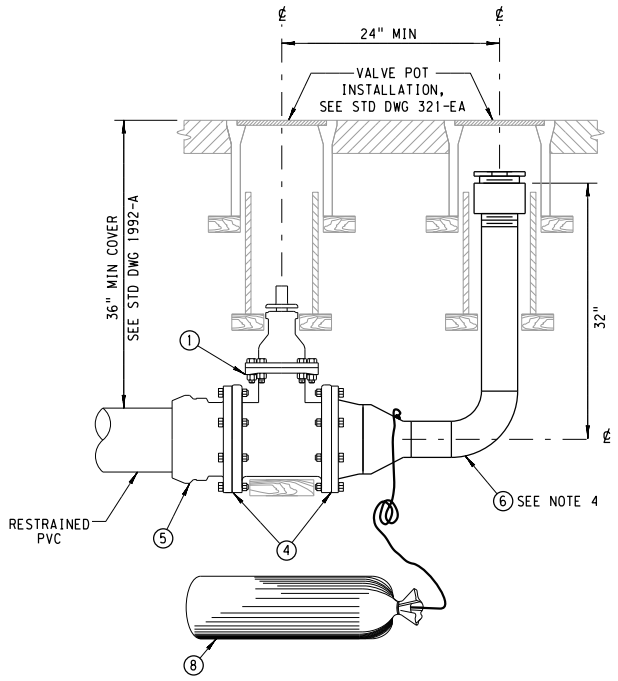
STANDARD DRAWING

SIZE ON SIZE MAIN-LINE VALVE WITH 4" BLOWOFF

FOR 6" AND 8" STEEL & PVC MAINS

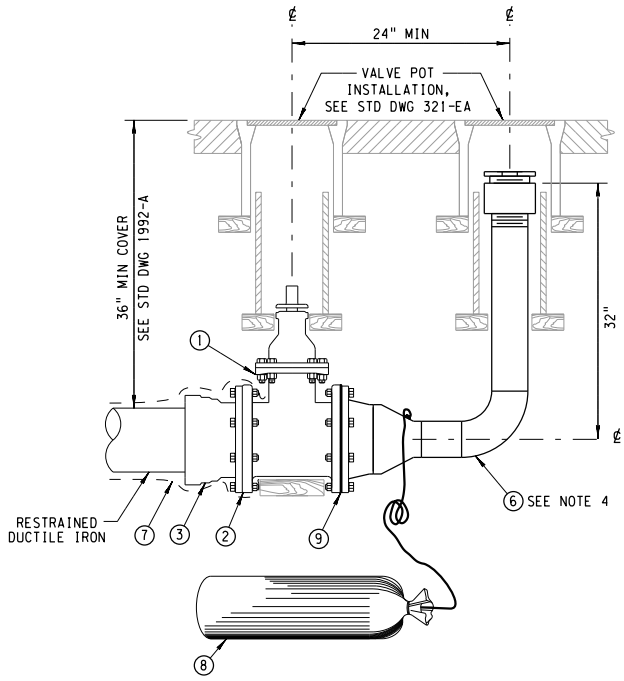
STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	29 JAN 1992

332-EA



4" BLOWOFF INSTALLATION

(FOR 6" AND 8" RESTRAINED PVC MAINS)



4" BLOWOFF INSTALLATION

(FOR 6" AND 8" RESTRAINED DUCTILE IRON MAINS)

MATERIAL LIST			
ITEM	DESCRIPTION	QUANTITY REQUIRED	
		RESTRAINED PVC	RESTRAINED DUCTILE IRON
1	GATE VALVE, RESILIENT SEAT, FLANGED, NON-RISING STEM WITH NUT OPERATOR	1	1
2	GASKET, FULL FACE, W/ BULB-TYPE RINGS, 350 PSI, 1/8" THK, EPDM	-	1
3	FLANGE ADAPTOR, DUCTILE IRON, TR FLEX OR EQUAL	-	1
4	FLANGE GASKET, 150#, STD DWGS 323-EA AND 324-EA	2	-
5	FLANGE ADAPTOR, PVC RESTRAINED (RCT OR APPROVED EQUAL)	1	-
6	4" STEEL BLOWOFF ASSEMBLY PER STD DWG 3677-B	1	1
7	POLYWRAP PER STD DWG 4569-B	-	AS NEEDED
8	32-LB GALVANIC ANODE, STD DWG 286-EA	1	1
9	FLANGE INSULATING KIT, SEE STD DWG 3186-B	-	1

NOTES

1. WAX TAPE ALL BARE METAL (INCLUDING BOLTS AND NUTS).
2. USE RUST INHIBITING GREASE ON ALL THREADS.
3. BOND ALL JOINTS PER STD DWG 220-EA, AS INDICATED ON THE PROJECT DRAWINGS.
4. FOR 4" DUCTILE IRON BLOWOFF RISER INSTALLATION SEE STD DWG 3677-B-1.

NO	DATE	REVISION	BY	REC	APP

DESIGN

DESIGNED BY	EBMUD
DESIGN CHECKED BY	EBMUD
DRAWN BY	EBMUD

REVIEW

CORROSION CHECKED BY R.P.E. NO. CR 1080	KEITH A. PACKARD
SR CIVIL ENGINEER R.P.E. NO. C 66307	DAVID KATZEV
RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 57170	CARLTON D. CHAN
APPROVED DIRECTOR OF ENGINEERING & CONST. R.P.E. NO. C 44278	OLUJIMI O. YOLOYE

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

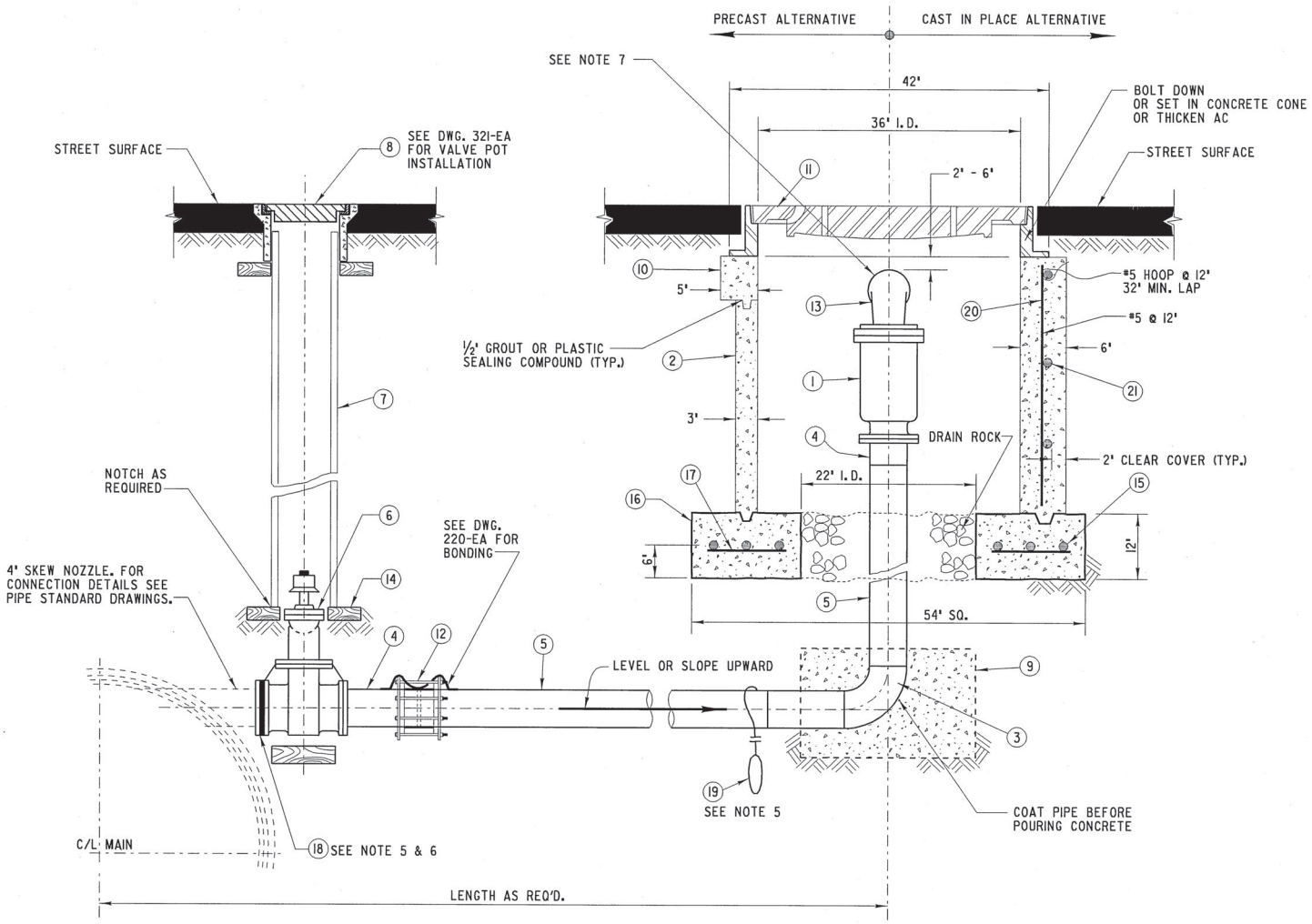
STANDARD DRAWING

SIZE ON SIZE MAIN-LINE VALVE WITH 4" BLOWOFF

FOR 6" AND 8" RESTRAINED DUCTILE IRON AND PVC

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	
DATE	17 AUG 2022

332-EA-1



ITEM	REQ'D.	DESCRIPTION
21	AS REQ'D.	BAR REINFORCING, #5 HOOP @ 12' WITH 32' MIN. LAP
20	11	BAR, REINFORCING, #5 @ 12'
19	AS REQ'D.*	32-LB GALVANIC ANODE, DWG. 286-EA, FIG. B (SEE NOTE 5)
18	AS REQ'D.	FLANGE INSULATION KIT (SEE NOTE 5 & 6)
17	12	BAR, REINFORCING, #4 @ 6' E.W.
16	1	FOOTING CONCRETE
15	12	BAR, REINFORCING, #4 @ 6' E.W.
14	3	WOOD BLOCKING, 2' x 8' x 12'
13	- *	SEE NOTE 7
12	1 *	COUPLING, FLEXIBLE FOR 4.5' O.D. PIPE
11	1 *	MANHOLE FRAME AND VENTED COVER, 36' CIRCULAR HEAVY DUTY, WITH 8 VENT HOLES ½' DIA.
10	1	6' GRADE RING, 36' I.D.
9	1	ANCHOR CONCRETE
8	1 *	VALVE POT COVER, 8'
7	1	VALVE POT, 8'
6	1 *	VALVE, 4' GATE, FLANGED
5	- *	PIPE, 4' STEEL, MORTAR LINED AND PLASTIC COATED
4	2 *	FLANGE, 4' WITH ATTACHED PIPE SECTION
3	1 *	ELBOW, 4' ST'L. 90° (SEE 309-EA)
2	1	RISER RING, 36' I.D. x HIGHT AS REQ'D.
1	1 *	VALVE, 4' AIR VACUUM & AIR RELEASE, FLANGED

MATERIAL LIST

*FURNISHED BY DISTRICT

NOTES:

1. THE MINIMUM COMPRESSIVE STRENGTH OF THE CONCRETE IN THE MANHOLE SHALL BE 4000 PSI.
2. ALL PIPE AND FITTINGS, IN CONTACT WITH THE SOIL, SHALL BE COATED WITH TAPE WRAP OR MASTIC PER EBMUD SPECIFICATION. EXTEND COATING TO TOP OF AIR VALVE.
3. FLANGES, GASKETS, BOLTING, AND ASSEMBLY SHALL CONFORM TO DWGS. 323-EA AND 324-EA.
4. MANHOLE SET IN TRAFFIC AREAS SHOULD BE PLACED TO MINIMIZE TRAFFIC DISRUPTION DURING FUTURE ACCESS FOR MAINTENANCE.
5. USE FLANGE INSULATING KIT AND INSTALL ANODE (ITEM 19) FOR MORTAR COATED STEEL MAINS ONLY.
6. IF MAIN IS MORTAR COATED, EXTEND COATING FROM NOZZLE TO GATE VALVE PER STANDARD DRAWING 3446-GB, FIG. FF-2
7. AIR INLET/OUTLET WILL TERMINATE IN A SAFE LOCATION ABOVE THE 100-YEAR FLOOD LEVEL.

NO.	DATE	REVISION	BY	REC.	APP.
1	30JUNE08	REVISED			

DESIGN
DESIGNED BY EBMUD
DESIGN CHECKED BY BORIS YUKHT
DRAWN BY JESTRADA

REVIEW
CORROSION CHECK BY R.BIANCHETTI
SR. CIVIL ENG. R.P.E. NO. C 27714 W.BODE
RECOMMENDED MGR. OF DESIGN R.P.E. NO. C 39851 G.ZITO FOR MLM
APPROVED, DIRECTOR OF ENGINEERING R.P.E. NO. C 31966 D.M.DIEMER

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

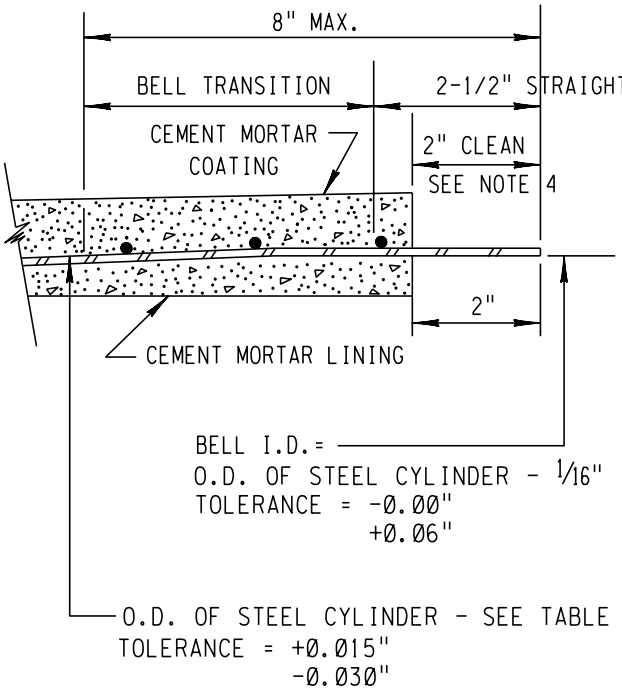
STANDARD DRAWING

4" AIR, VACUUM AND AIR RELEASE VALVE ASSEMBLY

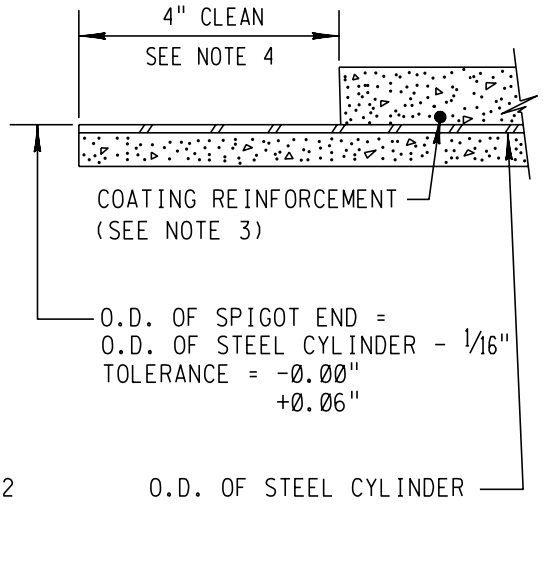
(STREET INSTALLATION IN MANHOLE)

STRUCTURE OR ZONE DESIGNATION —
SCALE N.T.S.
DATE 10 JUN '93

333-EA



TYPICAL BELL END DETAIL



TYPICAL SPIGOT END DETAIL

NOMINAL PIPE SIZE	STEEL CYLINDER		LINING THICKNESS		MAX. WORKING PRESSURE
	O.D.	THICKNESS	MIN.	MAX.	
4"	4.500"	10 GA. (0.134")	1/8"	1/4"	200 PSI
6"	6.625"	10 GA. (0.134")	1/4"	3/8"	200 PSI
8"	8.625"	10 GA. (0.134")	1/4"	3/8"	200 PSI
12"	12.75"	10 GA. (0.134")	1/4"	1/2"	175 PSI
16"	18.00"	8 GA. (0.165")	3/8"	5/8"	175 PSI
20"	22.00"	3/16"	3/8"	5/8"	150 PSI

NOTES:

1. PIPE CYLINDER, LINING, AND COATING SHALL CONFORM TO THE REQUIREMENTS OF E.B.M.U.D. SPECIFICATIONS.

2. OUT OF ROUNDNESS OF STEEL CYLINDER AT BELL & SPIGOT ENDS SHALL BE NOT GREATER THAN 1% MEASURED AS THE DIFFERENCE BETWEEN MAJOR & MINOR OUTSIDE DIAMETERS.

3. PORTLAND CEMENT MORTAR COATING SHALL BE NOT LESS THAN 7/8" THICK. SEE SPECIFICATIONS FOR PERMISSIBLE TYPES OF COATING REINFOREMENT.

4. "CLEAN" AREAS SHALL BE FREE OF ALL COATING MATERIALS.

NO.	DATE	REVISION	BY	REC.	APP.
4	8 NOV 11	REVISED	H	ST	AGI

REVISED 30 JUNE 08 AGI
REVISED 17 MAY 93 C.A.D. DLB
✓ REVISED 15 OCT 80, N.T.N. JMC

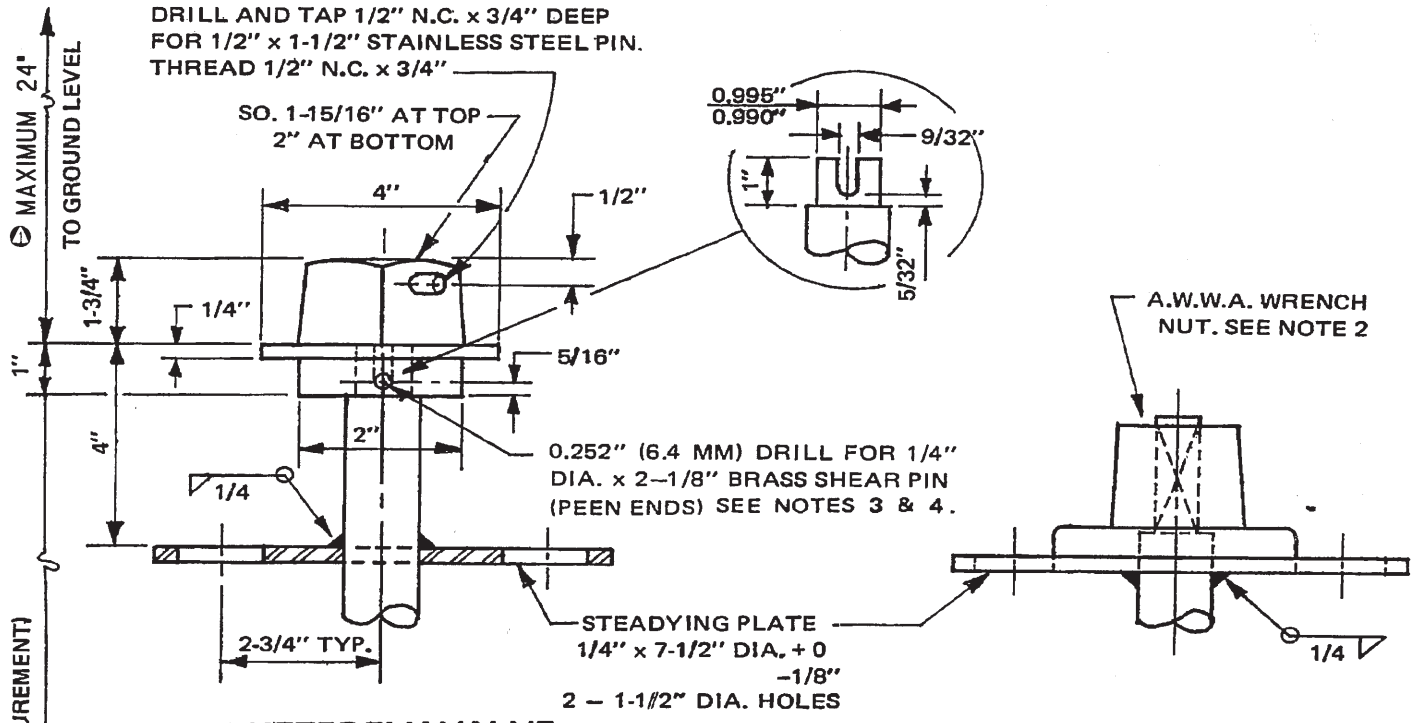
APPROVED O. G. Jarbain
CHIEF ENGINEER RPE NO. C7624 ✓

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

STEEL PIPE MORTAR LINED & COATED 20" & SMALLER

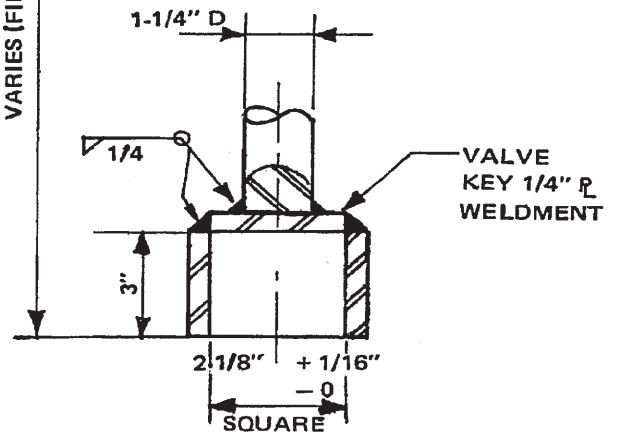
DESIGNED BY	CORROSION CHK. AEW
DRAWN BY R. LEACH	SCALE NONE
CHECKED BY	DATE 23 JUL 54
RECOMMENDED BY	NO. 1216-A
APPROVED BY	

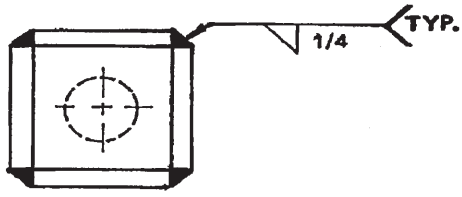


BUTTERFLY VALVE

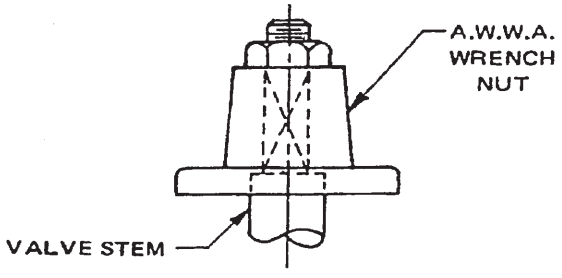
GATE VALVE

EXTENDED OPERATING NUT ASSEMBLIES





BOTTOM VIEW



OPERATING NUT & VALVE KEY ASSEMBLIES AT VALVE

APPROVED _____
ASST. GEN. MGR. & CHIEF ENGINEER R. P. E. NO. 7884

NOTES:

1. COAT ENTIRE ASSEMBLY WITH MASTIC.
2. PEEN TOP OF SHAFT TO SECURE 2" A.W.W.A. WRENCH NUT OR ATTACH BY WELDING.
3. BRASS SHEAR PIN PURCHASED, TESTED AND INSTALLED BY EBMUD. PIN IS CUT FROM FREE CUTTING BRASS ROD, SAE CDA 360, HALF HARD. ONE PIN FROM EACH ORDER HAS BEEN TESTED AND HAS FAILED BETWEEN 175-200 FT.-LBS. TORQUE WHEN INSERTED IN ASSEMBLY.
4. REPLACEMENT PINS MUST MEET ABOVE SPECIFICATIONS.

REVISED 16 JUNE 08 AGJ
REVISED 9 DEC 87 N.T.N. GB
⚠ REVISED, 29 MARCH 05

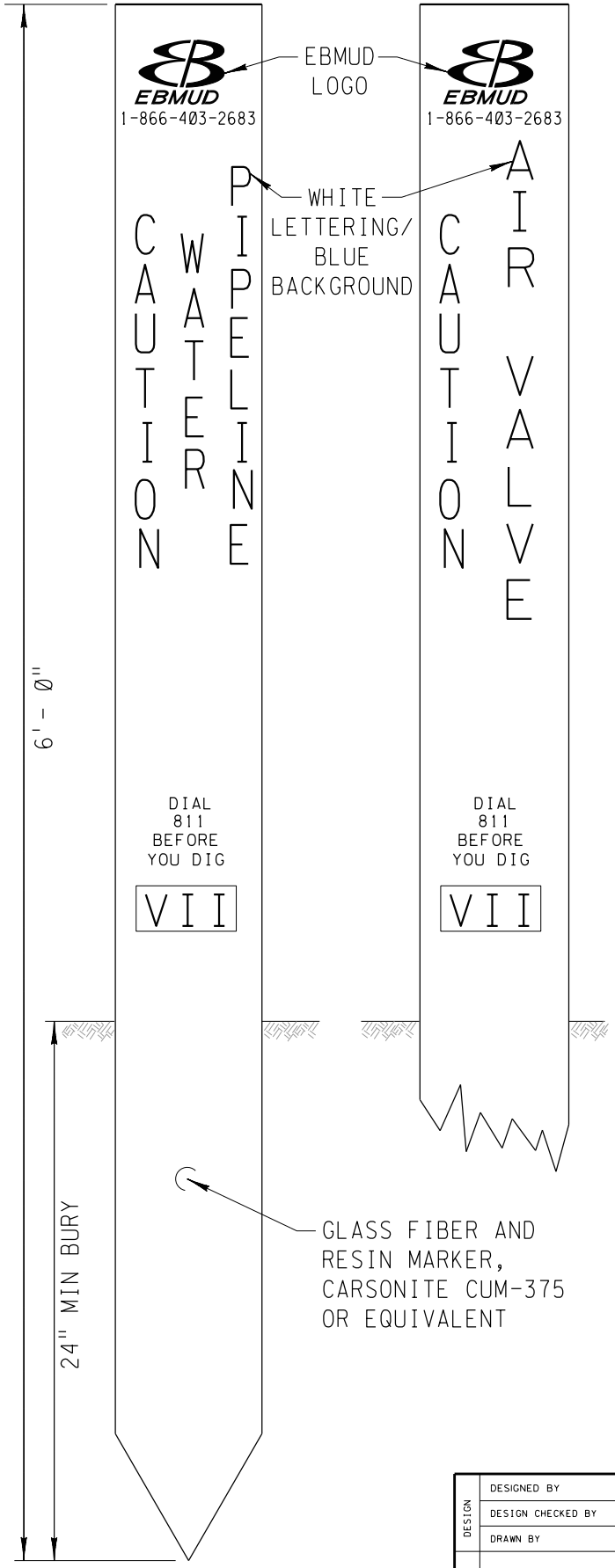
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

VALVE OPERATING SHAFT EXTENSION

DESIGNED BY E.B.M.U.D.	TRACED BY
DRAWN BY J. GIOVANNINI	SCALE NONE
CHECKED BY	DATE OF ORIG. DWG. 11 APR 63
RECOMMENDED BY	NO. 1241-A
APPROVED BY	

USER: bkolodzi
PLOT DATE: 03-JUL-2008 08:42
FILE: H:\general\std-dwgs\revisions2008\s1241a.dgn



AFFIX THE APPROPRIATE UTILITY MARKER DECAL TO IDENTIFY THE FACILITY BEING INSTALLED, REPLACE OR INSPECT AS NEEDED. DISTRICT-FURNISHED DECALS INCLUDE:

AIR VALVE

BUTTERFLY VALVE*

BLOW OFF

BLOW OFF & PUMPING TEE

BLOW OFF & PUMPING RISER

CAUTION WATER PIPELINE

GATE VALVE*

FIRE HYDRANT (RED BACKROUND)

TEST STATION

* WHEN VALVE IS A BYPASS VALVE, ADD SQUARE DECAL DESIGNATED "BP" BELOW VALVE DECAL.

* WHEN VALVE IS A ZONE VALVE, ADD SQUARE DECAL DESIGNATED "ZV" (RED BACKGROUND) BELOW VALVE DECAL.

ROMAN NUMERAL REPRESENTS THE DISTANCE (NEAREST FOOT), MEASURED PERPENDICULAR, FROM THE FACE OF THE MARKER POST TO THE CENTER OF THE FACILITY.USE DISTRICT SUPPLIED ADHESIVE ROMAN NUMERALS.

PLACEMENT

1. ALL MARKER POSTS MUST BE SET TRUE (FACING THE FACILITY) AND PLUMB. USE DISTRICT SUPPLIED ADHESIVE FACILITY LABELS & AFFIX TO FIBERGLASS POSTS.
2. DO NOT SET MARKER POSTS IN TRAVELED WAY.
3. DO NOT SET MARKER POSTS ON PRIVATE PROPERTY.
4. USE MARKER POSTS WHERE REFERENCES CANNOT BE ENGRAVED ON PERMANENT CURBS. REFER TO DWG. 2002-A FOR CURB MARKING DETAIL.
5. WHEN PLACING "CAUTION WATER PIPELINE" MARKERS IN RIGHT-OF-WAY TO IDENTIFY PIPE LOCATIONS, PLACE THE MARKERS EVERY 400 FT TO 500 FT OR WITHIN LINE OF SIGHT, AND PLACE AT SIGNIFICANT PIPE ALIGNMENT ANGLE POINTS AS NEEDED.
6. USE DECALS WITH PURPLE BACKGROUND COLOR TO REFERENCE RECYCLED WATER FACILITIES TO DIFFERENTIATE FROM POTABLE WATER.

NO	DATE	REVISION	BY	REC	APP
4	09 SEP 2022	REVISED AND REDRAWN	KAP	DJL	COC
3	30 JUN 2008	REVISED	AST	-	-
2	17 MAY 1993	REVISED	CAD	AB	-
1	26 FEB 1992	REVISED	KKC	AB	-

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	W.BODE
	DRAWN BY	EBMUD
REVIEW		
	SR.CIVIL ENGR R.P.E. NO. C 27734	W.BODE
RECOM.	MGR. OF DESIGN R.P.E. NO. C 16814	J.M.HILLIARD/WB
	ASST.CH.ENG.,D&C. R.P.E. NO. C 29111	D.M.DIEMER
	APPROVED CHIEF ENGINEER R.P.E. NO. C 26724	C.T.WAY

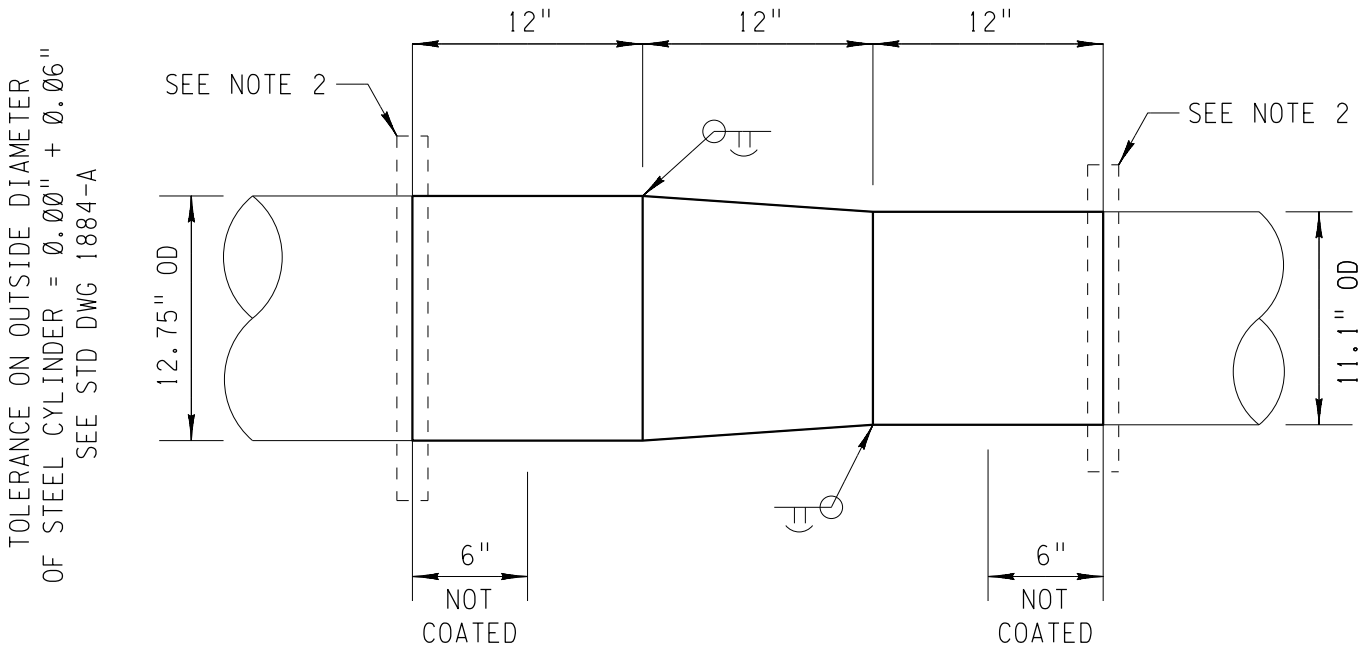
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

PIPELINE MARKER POST

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	20 MAR 1957

1336-A



NOTES

1. STEEL SHALL BE 3/16" THICK, ASTM-A36, OR APPROVED EQUAL.
2. SEE STD DWGS 323-EA AND 324-EA FOR FLANGE DETAIL WHEN A FLANGE IS REQUIRED.
3. TAPER SHALL BE LINED WITH CEMENT MORTAR 1/4" TO 3/8" THICK.
4. INSTAL CEMENT MORTAR COATING, EXCEPT WHERE NOTED, 7/8" THICK, REINFORCED WITH 2"X4" - WØ.5 X WØ.5 MIN GALVANIZED, SELF-FURRING WELDED WIRE FABRIC.
5. LINING AND COATING SHALL CONFORM TO EBMUD SPECIFICATIONS.
6. THIS DRAWING MAY BE USED FOR MORTAR LINED TAPERS WITH OTHER TYPES OF COATINGS.

NO	DATE	REVISION	BY	REC	APP
4	09 SEP 2022	REVISED AND REDRAWN	KAP	DSL	COO
3	30 JUN 2008	REVISED	AST	-	-
2	17 MAY 1993	REVISED	CAD	WB	-
1	Ø1 FEB 1980	REVISED & REDRAWN	NTN	WB	-

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	W.BODE
	DRAWN BY	LEACH
REVIEW		
	CORROSION CHECK BY	AEW
SUPVR.PIPELINE ENG'G R.P.E. NO. C 18774		W.L.RAMOS
MANAGER,DIST.ENG'G R.P.E. NO. C 13325		R.L.KOLM
APPROVED, ASST.GEN.MGR. & CHIEF ENGINEER R.P.E. NO. C 13447		W.F.ANTON

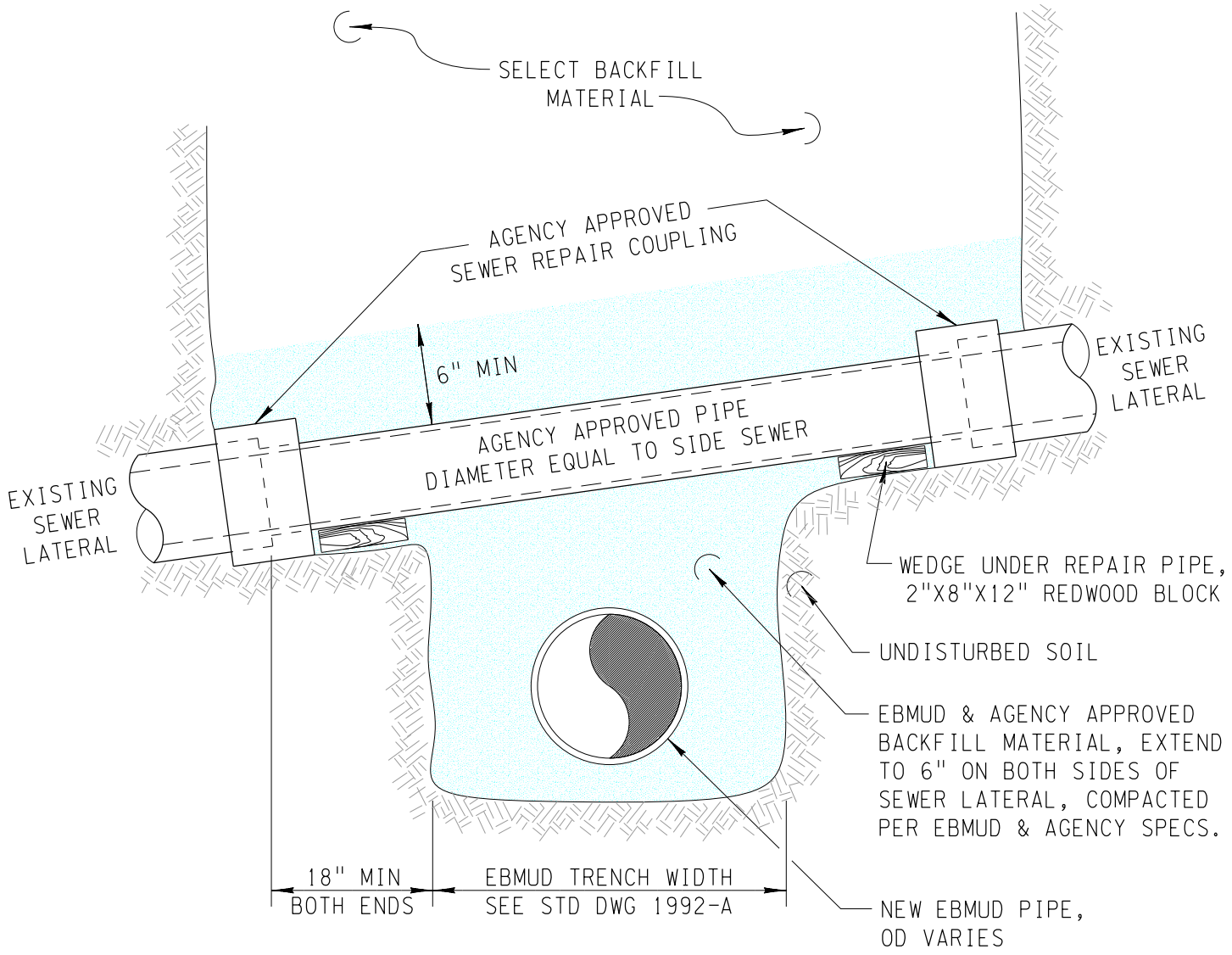
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

12" X 10" STEEL PIPE TAPER FOR CONNECTION TO 10" C.I. MAIN

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	22 MAR 1957

1337-A



NOTES

1. NOTIFY THE RESPECTIVE SEWER AGENCY OF JOB LOCATIONS AND STARTING DATES.

2. NOTIFY THE RESPECTIVE SEWER AGENCY OF DAMAGED LATERALS AS SOON AS PRACTICABLE.

NO	DATE	REVISION	BY	REC	APP
3	09 SEP 2022	REVISED AND REDRAWN	KAP	DJL	COO
2	30 JUN 2008	REVISED	AST	-	-
1	18 AUG 1987	REVISED AND REDRAWN	NNG	WB	-

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	W.BODE
	DRAWN BY	EBMUD
REVIEW		
	SR.CIVIL ENGR R.P.E. NO. C 27734	W.BODE
RECOM.	MGR. OF DESIGN R.P.E. NO. C 16814	J.M.HILLIARD/WB
	ASST.CH.ENG.,D&C. R.P.E. NO. C 29111	D.M.DIEMER
	APPROVED CHIEF ENGINEER R.P.E. NO. C 26724	C.T.WAY

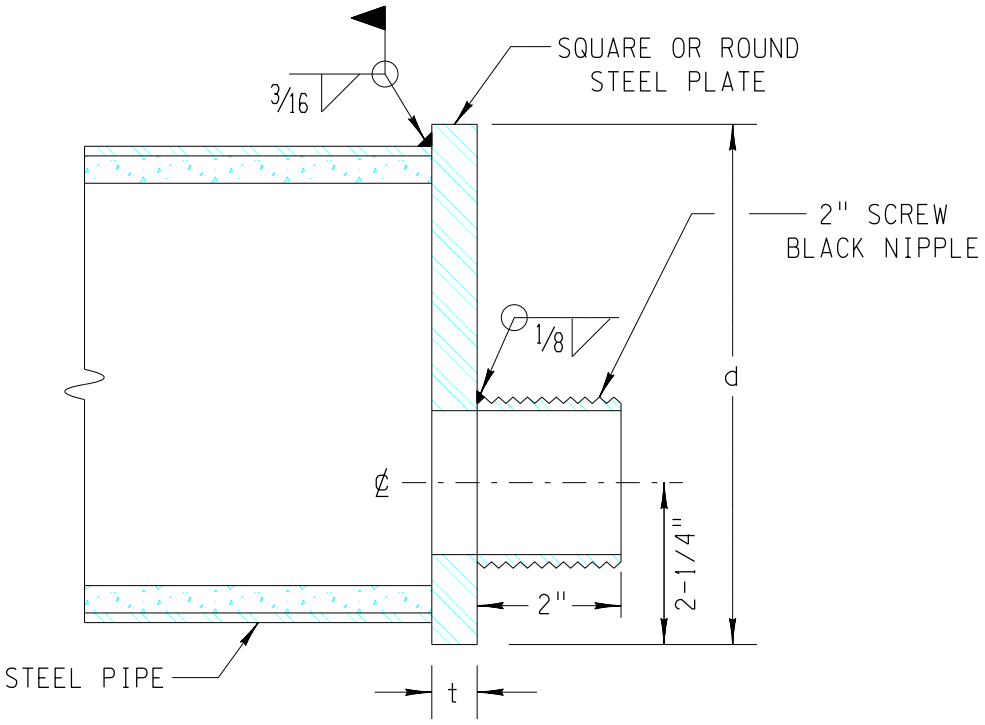
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

REPAIR METHOD FOR SEWER LATERALS DAMAGED DURING PIPELINE CONSTRUCTION

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	01 DEC 1959

1466-A



NOMINAL PIPE SIZE	PLATE DIMENSIONS	
	t	d (MIN)
4"	1/2"	5-1/2"
6"	5/8"	7-7/16"

NOTES

1. WHERE A BLOWOFF IS NOT REQUIRED, INSTALL A CAP ON THE NIPPLE.
2. PLATE THICKNESSES LISTED ARE FOR PRESSURES UP TO 200 POUNDS PER SQUARE INCH.
3. BLOWOFF HEAD SHALL BE FIELD COATED WITH:
   A. CEMENT MORTAR ON CEMENT MORTAR COATED PIPE.
   B. MASTIC ON OTHER COATED PIPE.
4. PROVIDE PROTECTION FOR NIPPLE THREADS TO PREVENT DAMAGE PRIOR TO INSTALLATION.

NO	DATE	REVISION	BY	REC	APP
2	09 SEP 2022	REVISED AND REDRAWN	KAP	DJL	CAC
1	18 AUG 1987	REVISED AND REDRAWN	NNG	WB	-

DESIGNED BY		EBMUD
DESIGN CHECKED BY		EBMUD
DRAWN BY		EBMUD
SR.CIVIL ENGR. R.P.E. NO. C 27714		W.BODE
RECOM.	MGR. OF DESIGN R.P.E. NO. C 16814	J.M.HILLARD/WB
	ASST.CH.ENG.,D.&C. R.P.E. NO. C 29111	D.M.DIEMER
APPROVED, CHIEF ENGINEER R.P.E. NO. C 13325/C 26724		R.L.KOLM FOR C.T.WAY

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

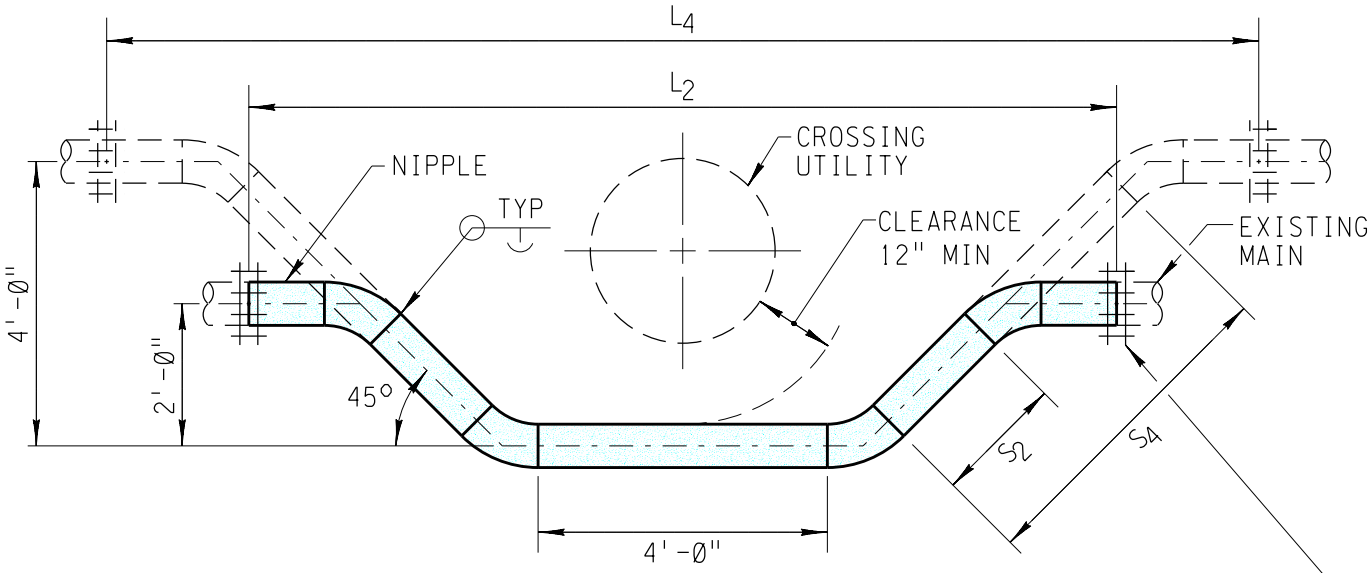
STANDARD DRAWING

BLOWOFF HEAD

FOR 4" & 6" STEEL PIPE

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	08 NOV 1965

1679-A



FIELD NOTES

1. INSTALL 32-LB GALVANIC ANODE, SEE STD DWG 286-EA, FIG. B.
2. INSULATED CONNECTION: WHEN THE EXISTING MAIN IS CAST IRON OR MORTAR LINED AND COATED STEEL, ISOLATE THE OFFSET BY USING INSULATING FLEXIBLE COUPLINGS AT THE CONNECTIONS.
3. CONDUCTIVE CONNECTION: WHEN THE EXISTING MAIN HAS A DIELECTRIC COATING WITH ELECTRICALLY CONDUCTIVE JOINTS, INSTALL BONDING JUMPERS WITH REGULAR FLEXIBLE COUPLINGS, SEE STD DWG 220-EA, OR MAKE CONNECTIONS WITH WELDED JOINTS.
4. WHEN INSTALLED AS A PART OF A NEW PLASTIC COATED STEEL MAIN, MAKE THE CONNECTIONS WITH THE WELDED JOINTS INSTEAD OF FLEXIBLE COUPLINGS.
5. COAT ALL EXPOSED METAL PER EBMUD SPECIFICATIONS.
6. IF CROSSING UTILITY IS STEEL AND PIPE CLEARANCE IS LESS THAN 12", PROVIDE FOR ELECTROLYSIS PROTECTION PER STD DWG 308-EA, USING 32-LB ANODES EACH SIDE.
7. SUPPORT LOWER 45-DEG ELBOWS WITH BLOCKS OR CONCRETE ANCHORS.
8. IF STEEL PIPE OFFSET-RETURN IS USED OVER CROSSING UTILITY AND DOES NOT HAVE A MIN 36-INCH OF COVER SEE STD DWG 2003-A FOR CONCRETE SLAB INSTALLATION.

PIPE SIZE	2 FOOT OFFSET		4 FOOT OFFSET	
	L_2	S_2	L_4	S_4
4"	9'- 10"	2'- 5"	13'- 10"	5'- 3"
6"	10'- 9"	2'- 2 1/4"	14'- 9"	5'- 1/4"
8"	11'- 2"	2'- Ø"	15'- 2"	4'- 10"
12"	12'- 4"	1'- 7"	16'- 4"	4'- 5"

SHOP NOTES

1. FABRICATE FROM MORTAR LINED AND PLASTIC COATED STEEL PIPE, PIPE NIPPLES, AND ELBOWS. SEE STD DWGS 1884-A AND 309-EA.
2. REPAIR PLASTIC COATING IN SHOP PER EBMUD SPECIFICATIONS.
3. MORTAR LINING SHALL BE CONTINUOUS AND FLUSH WITH ENDS.
4. HOLD BACK COATING 6" FROM SPIGOT ENDS.

NO	DATE	REVISION	BY	REC	APP
4	09 SEP 2022	REVISED AND REDRAWN	KAP	DJL	CAA
3	30 JUN 2008	REVISED	JH	ST	AST
2	17 MAY 1993	REVISED	CAD	WB	-
1	26 FEB 1992	REVISED	KKC	WB	-

DESIGN

DESIGNED BY	EBMUD
DESIGN CHECKED BY	W.L.RAMOS
DRAWN BY	GIOVANNINI
RECOMMENDED BY	W.B.BODE R.L.KOLM
APPROVED BY	W.F.ANTON
APPROVED, ASST. GEN. MGR & CHIEF ENGINEER R.P.E. NO. C 7624	D.G.LARKIN

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

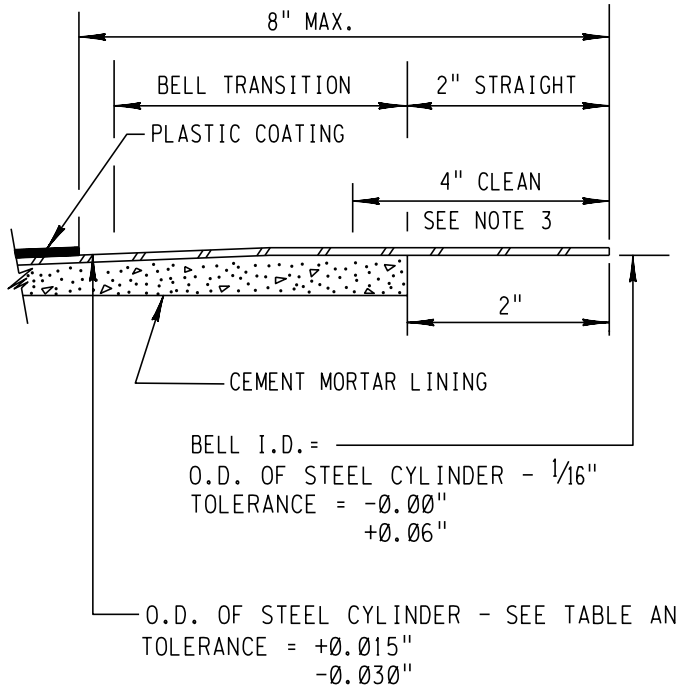
STANDARD DRAWING

MORTAR LINED & PLASTIC COATED STEEL PIPE OFFSET - RETURN

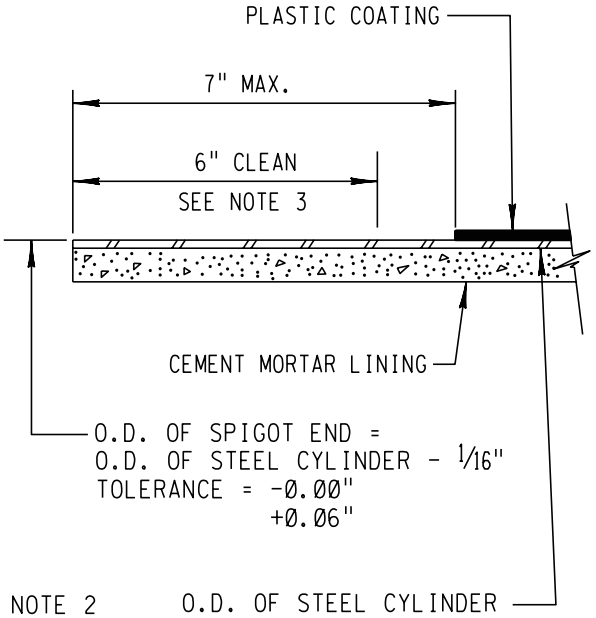
4", 6", 8" & 12"

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	02 MAR 1973

1870-A



TYPICAL BELL END DETAIL



TYPICAL SPIGOT END DETAIL

NOMINAL PIPE SIZE	STEEL CYLINDER		LINING THICKNESS		COATING THICKNESS, MIN.	MAX. WORKING PRESSURE
	O.D.	THICKNESS	MIN.	MAX.		
4"	4.500"	10 GA. (0.134")	1/8"	1/4"	50 MILS	200 PSI
6"	6.625"	10 GA. (0.134")	1/4"	3/8"	50 MILS	200 PSI
8"	8.625"	10 GA. (0.134")	1/4"	3/8"	50 MILS	200 PSI
12"	12.75"	10 GA. (0.134")	1/4"	1/2"	50 MILS	175 PSI
16"	18.00"	8 GA. (0.165")	3/8"	5/8"	50 MILS	175 PSI
20"	22.00"	3/16" (0.187")	3/8"	5/8"	80 MILS	150 PSI

NOTES:

1. PIPE CYLINDER, LINING, AND COATING SHALL CONFORM TO THE REQUIREMENTS OF E.B.M.U.D. SPECIFICATIONS.
2. OUT OF ROUNDNESS OF STEEL CYLINDER AT BELL & SPIGOT ENDS SHALL BE NOT GREATER THAN 1% MEASURED AS THE DIFFERENCE BETWEEN MAJOR & MINOR OUTSIDE DIAMETERS.
3. "CLEAN" AREAS SHALL BE FREE OF ALL COATING MATERIALS.

REVISED & REDRAWN 18 NOV 87 NTN

NO.	DATE	REVISION	BY	REC.	APP.
3	8 NOV 11	REVISED			
2	30JUNE08	REVISED			

APPROVED
CHIEF ENGINEER, R.P.E. NO. C 26724

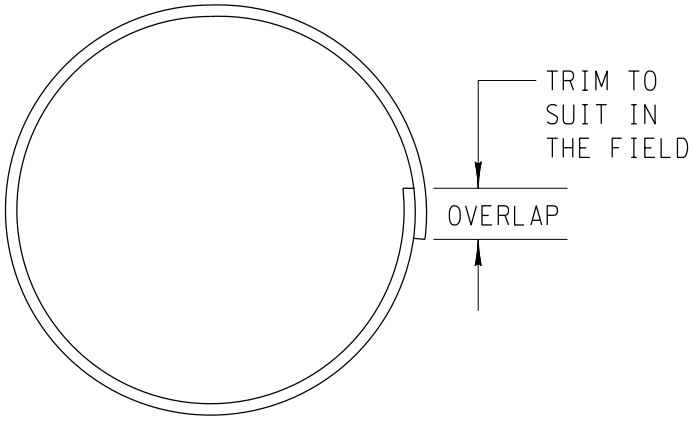
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

STEEL PIPE MORTAR LINED & PLASTIC COATED 20" & SMALLER

DESIGNED BY E.B.M.U.D.
SR. CIVIL ENGR. R.P.E. NO. C 27714
MGR. OF DESIGN R.P.E. NO. C 16814
ASST. CH. ENG., D.&C. R.P.E. NO. C-29111
RECOM.

DRAWN BY JJG
SCALE NONE
ORIG. DWG. DATED 3 JUN 73
NO. 1884-A



NOMINAL PIPE SIZE	PIPE CYLINDER	BUTTSTRAP SIZE	OVERLAP	BUTTSTRAP OUTSIDE CIRCUMFERENCE INCLUDING OVERLAP
4"	4.500"	3/16" x 4"	1"	16-5/16" (1 PIECE)
6"	6.625"	3/16" x 4"	1"	23" (1 PIECE)
6"	6.90"	3/16" x 4"	1"	23-7/8" (1 PIECE)
8"	8.625"	3/16" x 4"	1"	29-1/4" (1 PIECE)
8"	9.05"	3/16" x 4"	1"	30-5/8" (1 PIECE)
12"	12.75"	3/16" x 4"	2"	43-1/4" (1 PIECE)
12"	13.20"	3/16" x 4"	2"	44-5/8" (1 PIECE)
16"	17.80"	3/16" x 4"	2"	59-1/8" (1 PIECE)
16"	18"	3/16" x 4"	2"	59-3/4" (1 PIECE)
20"	21-25/32"	3/16" x 6"	2"	71-5/8" (1 PIECE)
20"	22"	3/16" x 6"	2"	72-1/4" (1 PIECE)
24"	25-3/4"	3/16" x 6"	2"	84-1/16" (1 PIECE)
30"	31-7/8"	3/16" x 6"	2"	103-5/16" (1 PIECE)
36"	37-7/8"	1/4" x 6"	2"	122-9/16" (1 PIECE)
42"	43-7/8"	1/4" x 6"	2"	141-7/16" (2 PIECES)*
48"	49-7/8"	5/16" x 6"	2"	160-1/4" (2 PIECES)*
54"	55-7/8"	5/16" x 8"	2"	178-7/8" (2 PIECES)*
60"	61-7/8"	3/8" x 8"	2"	197-3/16" (2 PIECES)*

* OF EQUAL LENGTH

NOTES

1. THIS DRAWING TO BE USED FOR EBMUD YARD STOCK ONLY.
2. MATERIAL SHALL BE ASTM A-36 HOT-ROLLED CARBON STEEL.
3. BUTTSTRAPS 30" AND LARGER ARE LIMITED TO 175 PSI.

NO	DATE	REVISION	BY	REC	APP
3	09 SEP 2022	REVISED AND REDRAWN	KAP	DJL	CAC
2	12 AUG 2010	REVISED	JH	ST	AST
1	16 FEB 1989	REVISED AND REDRAWN	EQH	EQH	WB

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	HUBERT LAI
	DRAWN BY	J.GIOVANNINI
REVIEW		
	SR.CIVIL ENGR R.P.E. NO. C 27734	W.BODE
RECOM.	MGR. OF DESIGN R.P.E. NO. C 16814	J.M.HILLIARD/WB
	ASST.CH.ENG.,D&C. R.P.E. NO. C 29111	D.M.DIEMER
APPROVED	CHIEF ENGINEER R.P.E. NO. C 26724	C.T.WAY

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

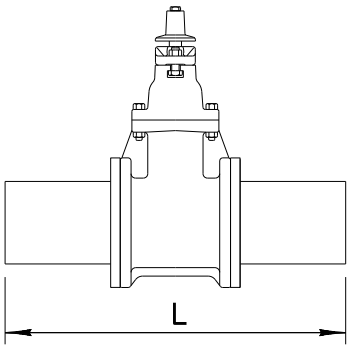
STANDARD DRAWING

STOCK BUTTSTRAPS FOR STEEL PIPE

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	24 DEC 1975

1932-A

ITEM	DIMENSIONS	REMARKS

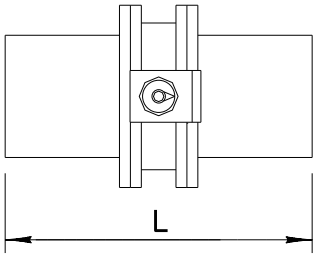


SIZE	L
4"	33"
6"	34 -1/2"
8"	35 -1/2"

FLANGED GATE VALVES WITH SKIRTED FLANGES ATTACHED. SHOP ASSEMBLED, TESTED & COATED IN ACCORDANCE WITH EBMUD SPECIFICATIONS.

LINE VALVE
ASSEMBLED FOR FIELD WELDING

GATE VALVES
4" , 6" & 8"



SIZE	L
12"	32"
16"	32"

FLANGED BUTTERFLY VALVES WITH SKIRTED FLANGES ATTACHED. SHOP ASSEMBLED, TESTED & COATED IN ACCORDANCE WITH EBMUD SPECIFICATIONS.

LINE VALVE
ASSEMBLED FOR FIELD WELDING

BUTTERFLY VALVES
12" & 16"

NOTES

1. FOR STEEL PIPE FLANGES, SEE STD DWG 323-EA.
2. FOR JOINT DETAILS, SEE STD DWG 310-EA.

NO	DATE	REVISION	BY	REC	APP
3	09 SEP 2022	REVISED AND REDRAWN	KAP	DJL	CAC
2	30 JUN 2008	REVISED	JH	ST	AST
1	23 MAR 1995	REVISED	RW	-	-

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	W.BODE
	DRAWN BY	E.Y.
REVIEW		
	CORROSION CHECK BY	R.L.BIANCHETTI
	SR. CIVIL ENG. R.P.E. NO. C 27714	W.BODE
	RECOMMENDED MGR. OF DESIGN R.P.E. NO. C 31966	M.L.MILLER/AST
	APPROVED, DIRECTOR OF ENGINEERING R.P.E. NO. C 29111	D.M.DIEMER

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

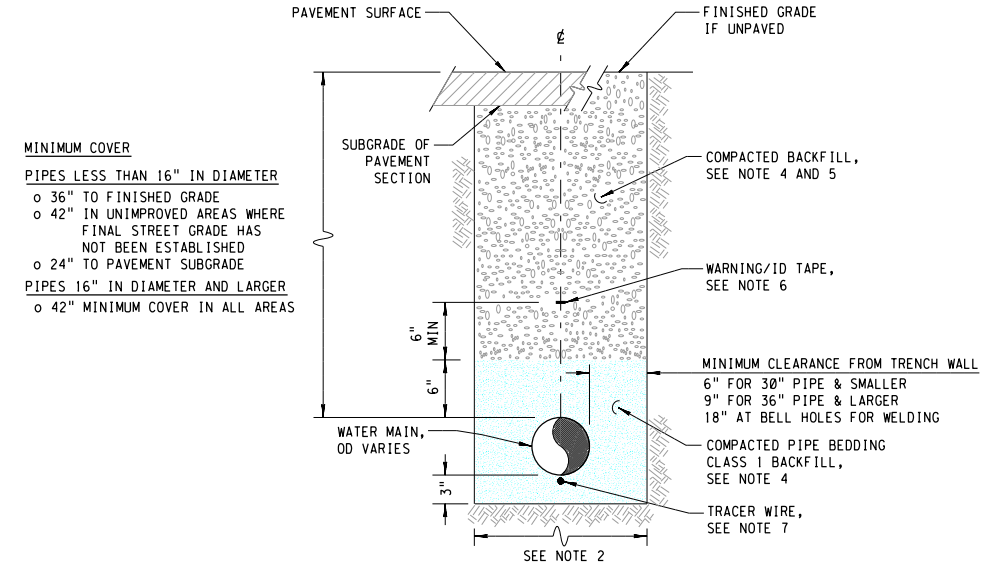
STANDARD DRAWING

SKIRTED VALVES

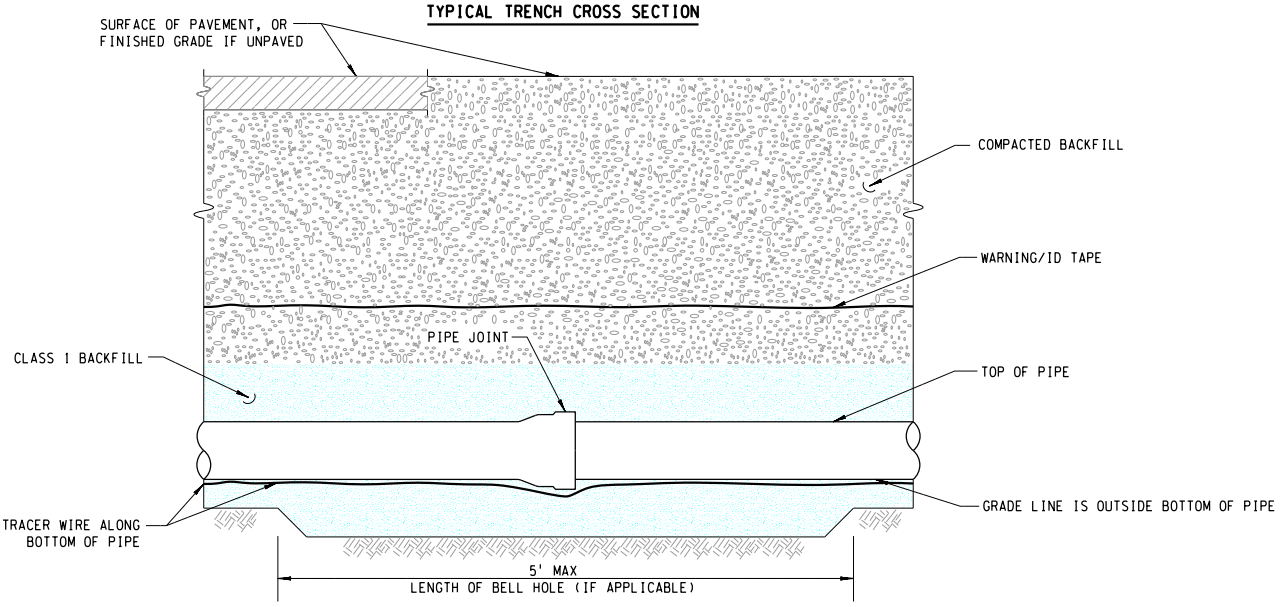
16" AND SMALLER

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	23 MAR 1993

1965-A



TYPICAL TRENCH CROSS SECTION



TYPICAL TRENCH LONGITUDINAL SECTION AT PIPE JOINT

NOTES

1. CONFORM TO ALL SAFETY STANDARDS, ORDERS, RULES AND REGULATIONS OF CAL-OSHA AND OTHER AGENCIES HAVING JURISDICTION.
2. THE WIDTH OF THE TRENCH AT THE TOP OF THE PIPE SHALL NOT EXCEED:
   - o 16" IN DIAMETER AND SMALLER - THE OUTSIDE DIAMETER OF THE PIPE PLUS 24"
   - o 20" IN DIAMETER AND LARGER - TWO TIMES THE OUTSIDE DIAMETER OF THE PIPE
3. FOR BACKFILL AND COMPACTION REQUIREMENTS, SEE SPEC SECTION 31 23 33P.
4. FOR MAIN BREAK REPAIR, AGGREGATE BASE MAY BE USED IN LIEU OF THE BACKFILL AND THE CLASS 1 BACKFILL.
5. CONTROLLED LOW STRENGTH MATERIAL MAY BE USED AS AN ALTERNATIVE BACKFILL MATERIAL ABOVE PIPE BEDDING, WHERE PERMITTED. SEE SPEC SECTION 31 23 23.34P FOR ADDITIONAL REQUIREMENTS.
6. WARNING/IDENTIFICATION TAPE SHALL BE NON-DETECTABLE 3" BLUE TAPE, BLACK-IMPRINTED WITH "CAUTION - BURIED LINE BELOW" SHALL BE INSTALLED ALONG THE LINE OF WATER MAIN PIPE INSTALLED IN GROUND OUTSIDE BUILDINGS. INSTALL TAPE APPROXIMATELY 1 FOOT ABOVE AND ALONG THE CENTERLINE OF THE PIPE. IF THE TAPE IS NOT CONTINUOUS, THE TAPE ENDS SHALL BE OVERLAPPED BY 2 FEET.
7. TRACER WIRE (AWG NO. 12 TW OR THHN) SHALL BE INSTALLED BELOW ALL NON-METALLIC OR NON-ELECTRICALLY CONTINUOUS PIPE, SEE STD DWGS 288-EA AND 288-EA-1.
8. IF CLEAN UTILITY CORRIDOR (CUC) IS REQUIRED, SEE STD DWG 9950-GB.

NO	DATE	REVISION	BY	REC	APP
3	12 AUG 2022	REVISED AND REDRAWN	PJP	DJL	CAW
2	30 JUN 2008	REVISED	JH	ST	AST
1	17 MAY 1993	REVISED	CAD	WB	WB

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	EBMUD
	DRAWN BY	EBMUD
REVIEW		
	SENIOR CIVIL ENGINEER R.P.E. NO. C 27714	W.BODE
RECOMMENDED	MGR OF DESIGN R.P.E. NO. C 16814	J.W.HILLIARD
	ASS. CH. ENG. FOR DES.&CONST R.P.E. NO. C 29111	D.M.DIEMER
APPROVED	CHIEF ENGINEER R.P.E. NO. C 26724	C.T.WAY

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

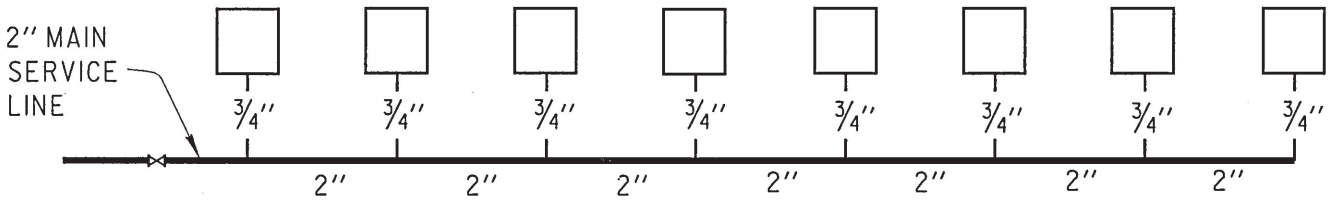
PIPE TRENCH EXCAVATION AND BACKFILL

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	23 FEB 1989

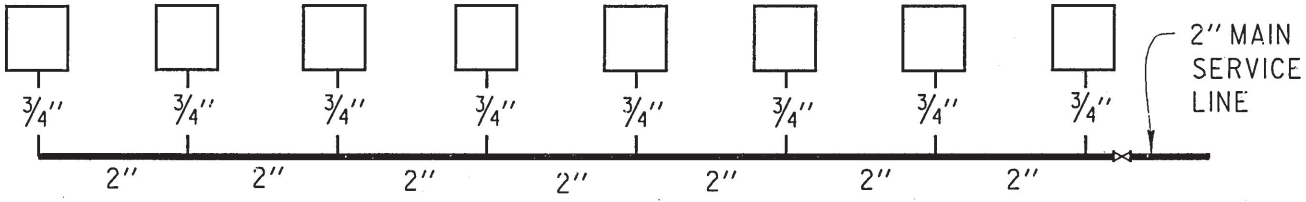
1992-A

SUPERSEDES 318-EA & 317-EA

EXAMPLES OF 2" MAIN LINE SERVICE WITH 8 - ¾" BRANCHES



PREFERRED ALIGNMENT



OPTIONAL ALIGNMENT

NOTES

1. THE MAXIMUM NUMBER OF CONNECTED BRANCHES ON THE SERVICE LINE SHALL NOT EXCEED THE FOLLOWING:

FOR 1" SERVICE LINE	UP TO 2 - ¾" BRANCHES, SEE NOTE 2
FOR 1½" SERVICE LINE	UP TO 4 - ¾" BRANCHES, OR 2 - 1" BRANCHES
FOR 2" SERVICE LINE	UP TO 8 - ¾" BRANCHES, OR 4 - 1" BRANCHES, OR 2 - 1½" BRANCHES

2. A 1" SERVICE LINE IS ALLOWABLE FOR STATIC PRESSURES GREATER THAN 60 PSI. FOR PRESSURES LESS THAN 60 PSI, USE MINIMUM 1½" SERVICE LINE OR USE SEPARATE 1" SERVICE LINES FOR EACH METER.

3. REFER TO DWG. 291-EA FOR MAIN LINE SERVICE INSTALLATIONS AND METER CONNECTIONS.

4. PIPE MATERIALS SHALL BE COPPER.

5. ANY OTHER BRANCH SERVICE COMBINATION NOT NOTED ABOVE SHALL BE REVIEWED AND APPROVED BY WATER DISTRIBUTION PLANNING DIVISION.

6. IF LATERAL IS COPPER WITH POLYETHYLENE SLEEVE, THE BRANCH ASSEMBLY MUST BE WAX PRIMED AND COATED PER DWG. 291-EA.

C.T. WAY
APPROVED, CHIEF ENGINEER, R.P.E. NO. C 26724

NO.	DATE	REVISION	BY	REC.	APP.
2	6/30/08	REVISED PER WDPD/PIPE COMMITTEE RECOMMENDATION	JLR	JLR	WRR
1	5/24/00	REVISED PER WDPD/PIPE COMMITTEE RECOMMENDATION	CDC	JLR	WRR

DESIGN: DESIGNED BY E.B.M.U.D.; DESIGN CHECKED BY; DRAWN BY D. STOKES
REVIEW: RECOMMENDED BY MGR. OF DESIGN R.P.E. NO. C 16814 J.M. HILLIARD/MB; RECOMMENDED BY ASST. CH. ENGR., D&C R.P.E. NO. C 29111 D.M. DIEMER

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWINGS

MULTIPLE BRANCH SERVICE INSTALLATIONS

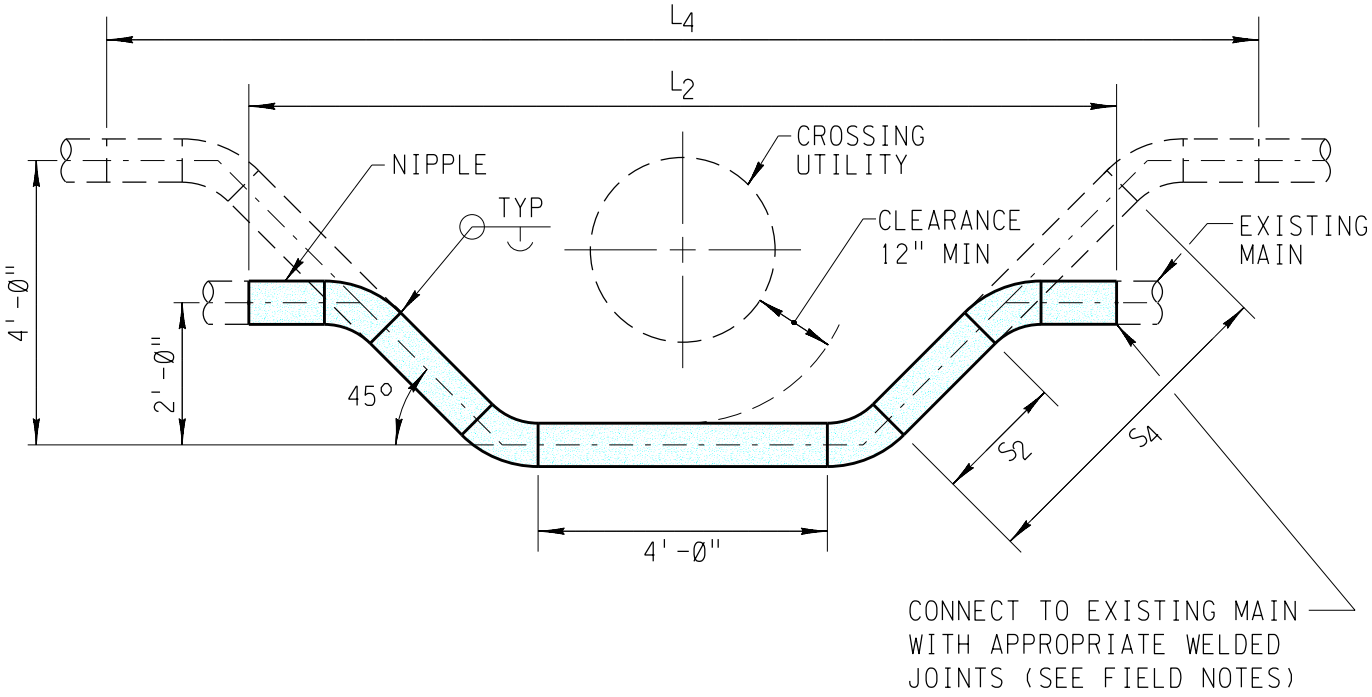
¾" THRU 2"

STRUCTURE OR ZONE DESIGNATION
SCALE NONE
DATE 24 FEB 89

1995-A

SUPERSEDES DWG. 185-EA

USER: bkoldzi
PLOT DATE: 15-JUL-2008 06:58
FILE: s:\esd-cadcam\Pipe\data\sgeneral\esd-dwgs\revisions2008\s1995a.dgn



FIELD NOTES

1. MORTAR COAT ALL EXPOSED METAL AND INSTALL POLYWRAP IN ACCORDANCE WITH EBMUD SPECIFICATIONS.
2. THIS DRAWING SHALL BE USED ONLY WHEN AN OFFSET RETURN IS INSTALLED AS PART OF A NEW ML&CS MAIN OR FOR CONNECTION TO EXISTING ML&CS PIPE.
3. FOR CONNECTION TO OTHER THAN ML&CS PIPE USE ML&PCS OFFSET-RETURN PER STD DWG 1870-A.
4. SUPPORT LOWER 45-DEGREE ELBOWS WITH BLOCKS OR CONCRETE ANCHORS.
5. IF STEEL PIPE OFFSET-RETURN IS USED OVER CROSSING UTILITY AND DOES NOT HAVE A MINIMUM 36-INCH OF COVER, SEE STD DWG 2003-A FOR CONCRETE SLAB INSTALLATION.

PIPE SIZE	2 FOOT OFFSET		4 FOOT OFFSET	
	L_2	S_2	L_4	S_4
4"	9'- 10"	2'- 5"	13'- 10"	5'- 3"
6"	10'- 9"	2'- 2 1/4"	14'- 9"	5'- 1/4"
8"	11'- 2"	2'- Ø"	15'- 2"	4'-10"
12"	12'- 4"	1'- 7"	16'- 4"	4'- 5"

SHOP NOTES

1. FABRICATE FROM MORTAR LINED AND COATED STEEL PIPE, PIPE NIPPLES, AND ELBOWS. SEE STD DWGS 1216-A AND 309-EA.
2. REPAIR MORTAR COATING IN SHOP PER EBMUD SPECIFICATIONS.
3. MORTAR LINING SHALL BE CONTINUOUS AND FLUSH WITH ENDS.
4. HOLD BACK COATING 4" FROM SPIGOT ENDS.

NO	DATE	REVISION	BY	REC	APP
2	09 SEP 2022	REVISED AND REDRAWN	KAP	DSL	CAC
1	30 JUN 2008	REVISION	JH	ST	AST

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	B.YUKHT
	DRAWN BY	K.CROWE
REVIEW	CORROSION CHECK BY	R.BIANCHETTI
	SENIOR CIVIL ENGINEER R.P.E. NO. C 27714	W.B.BODE
	RECOMMENDED MGR OF DESIGN R.P.E. NO. C 31966	M.L.MILLER
	APPROVED, DIRECTOR OF ENGINEERING R.P.E. NO. C 29111	D.M.DIEMER

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

MORTAR LINED & COATED STEEL PIPE OFFSET - RETURN

4", 6", 8" & 12"

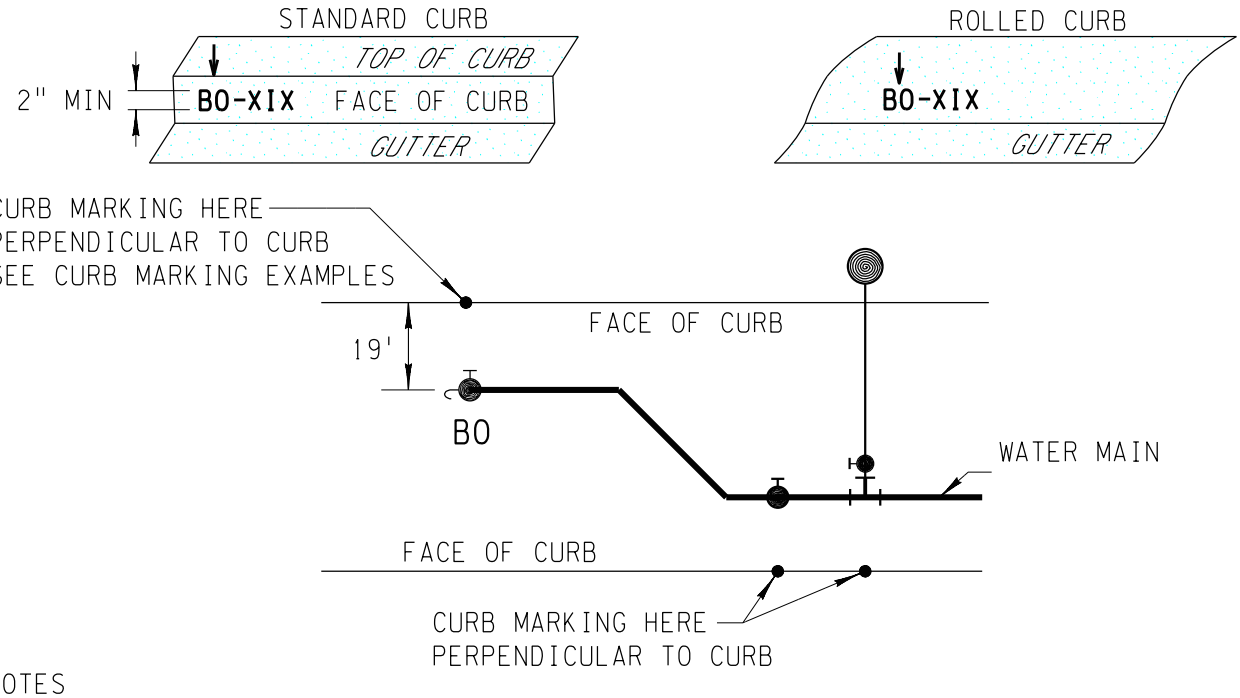
STRUCTURE OR ZONE DESIGNATION: ALL
SCALE: NONE
DATE: 10 JUN 1993

1996-A

CURB MARKING	APPURTENANCE/FACILITY
AV	AIR VALVE
BF	BUTTERFLY VALVE
BO	BLOW OFF
BP	BYPASS
BOPT	BLOW OFF & PUMPING TEE
BOPR	BLOW OFF & PUMPING RISER
No Letters	GATE VALVE
No Letters	HYDRANT
RW	RECYCLED WATER
TS	TEST STATION
ZV	ZONE VALVE

ROMAN NUMERALS	EXAMPLES	
1'=I	4=IV	15=XV
5'=V	8=VIII	19=XIX
10'=X	9=IX	24=XXIV
50'=L	13=XIII	45=XLIV
100'=C	14=XIV	49=XLIX

CURB MARKING EXAMPLES



NOTES

1. MARK APPURTENANCE @ 90 DEGREES FROM NEAREST CURB, 2" HIGH MINIMUM DIMENSION.
2. CHISEL OR GRIND ARROW POINTING TO APPURTENANCE ON TOP OF CURB.
3. CHISEL OR GRIND LETTERS AND ROMAN NUMERALS ON FACE OF CURB.
4. FILL IN CURB MARKINGS WITH HIGH GLOSS ENAMEL RED PAINT.
5. WHEN CURBS ARE PAINTED RED, FILL IN CURB MARKINGS WITH HIGH GLOSS ENAMEL WHITE PAINT.
6. RECLAIMED WATER CURB MARKING POSTS SHALL BE PAINTED WITH HIGH GLOSS ENAMEL PURPLE PAINT.

NO	DATE	REVISION	BY	REC	APP
1	09 SEP 2022	REVISED AND REDRAWN	KAP	DSL	CAC

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	EBMUD
	DRAWN BY	W.MCALEER
REVIEW	SENIOR CIVIL ENGINEER R.P.E. NO. C 48598	S.V.TERENTIEFF
	RECOMMENDED SR.CIVIL ENGINEER R.P.E. NO. C 48598	S.V.TERENTIEFF
	RECOMMENDED, MNG OF PIPELINE INFRASTRUCTURE R.P.E. NO. C 38862	A.S.TONG

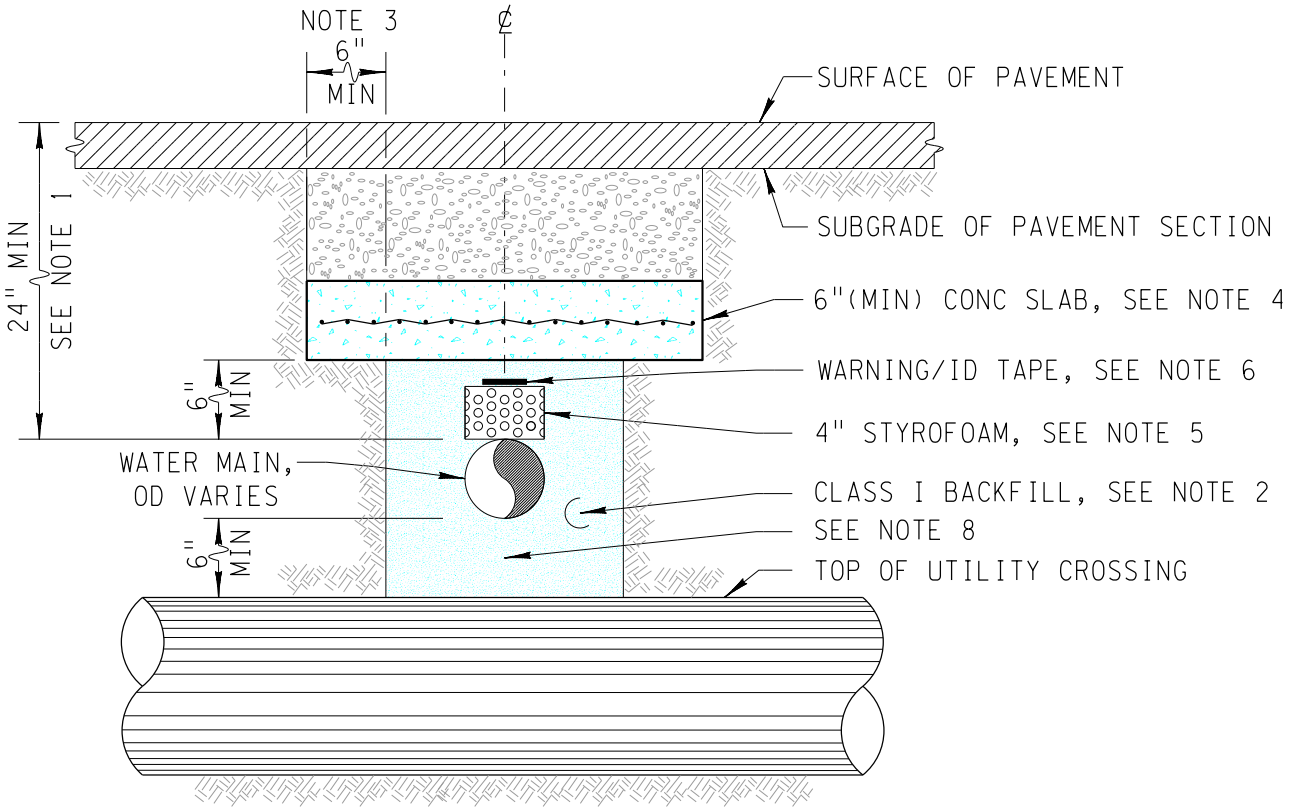
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

CURB FIELD MARKINGS

STRUCTURE OR ZONE DESIGNATION: ALL
SCALE: NONE
DATE: 04 DEC 2007

2002-A



NOTES

1. STD DWG 2003-A TO BE USED WHEN WATER MAIN COVER IS LESS THAN MINS PER STD DWG 1992-A AND AT LEAST 24".

2. SEE STD DWG 1992-A FOR PIPE TRENCH EXCAVATION AND BACKFILL.

3. PROVIDE MINIMUM BEARING OF 6" ON EACH SIDE OF TRENCH WALL FOR CONCRETE SLAB. CONCRETE SLAB TO EXTEND A MINIMUM OF 1' BEYOND LENGTH OF SHALLOW PIPE IN EITHER DIRECTION.

4. CONC SLAB MIN 6" THICK REINFORCED WITH 2" X 4" X 12.5 GA WELDED WIRE FABRIC.

5. PROVIDE 4" STYROFOAM PANEL WIDTH EQUAL TO PIPE OUTSIDE DIAMETER FOR THE LENGTH OF THE CONCRETE SLAB.

6. WARNING/ID TAPE SHALL BE INSTALLED ABOVE THE STYROFOAM PANEL AND RUN CONTINOUSLY ALONG THE ENTIRE LENGTH OF PIPE.

7. FOR STEEL PIPE OFFSET-RETURN SEE STD DWGS 1870-A AND 1996-A. FOR DUCTILE IRON PIPE OFFSET-RETURN SEE STD DWG 2010-A.

8. WHEN 12" VERTICAL CLEARANCE CANNOT BE OBTAINED BETWEEN DISTRICT METALLIC PIPE AND OTHER METALLIC UTILITY, INSTALL SHIELD BETWEEN THE PIPES PER STD DWG 308-EA.

NO	DATE	REVISION	BY	REC	APP
1	12 AUG 2022	REVISED AND REDRAWN	PJP	DJL	CAW

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	EBMUD
	DRAWN BY	EBMUD
REVIEW	SENIOR CIVIL ENGINEER R.P.E. NO. C 48598	S.TERENTIEFF
	RECOMMENDED SENIOR CIVIL ENGINEER R.P.E. NO. C 48598	S.TERENTIEFF
	RECOMMENDED MGR.OF PIPELINE INFRASTRUCTURE R.P.E. NO. C 38862	A.S.TONG

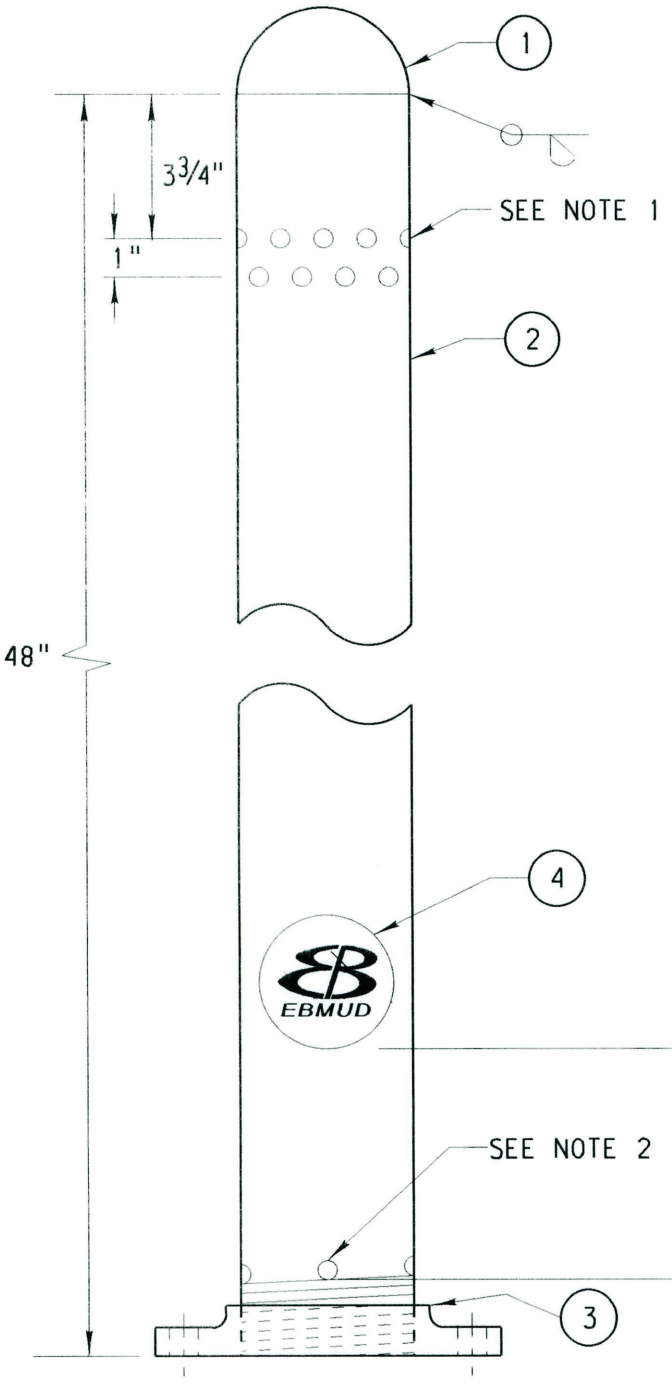
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

PROTECTIVE SLAB FOR
SHALLOW UTILITY CROSSING

STRUCTURE OR ZONE DESIGNATION: ALL
SCALE: NONE
DATE: 30 JUN 2008

2003-A



ITEM	DESCRIPTION
1	WELDING CAP, STL, 10g
2	PIPE, 4", STL, SCH 40, A53 Gr A
3	FLANGE, CI, CLASS 25, THRD
4	2 X EBMUD HYDRANT STICKERS

NOTES:

1. DRILL 2 OFFSET ROWS OF 8 VENT HOLES, 1/2" DIAMETER. MAKE BOTH SIDES SAFE.
2. DRILL 4 DRAIN HOLES, 1/2" DIAMETER.
3. FILL EVERY OTHER BOLT HOLE OF FLANGE WITH POLYESTER BODY PUTTY BEFORE PAINTING.
4. SHOP COATING:
   - BLAST CLEAN.
   - PRIME WITH SHERWIN WILLIAMS MACROPOXY 646 (MILL WHITE).
   - TOP COAT WITH SHERWIN WILLIAMS HI-SOLIDS POLYURETHANE GLOSS 100 (WHITE).

AIR VALVE BOLLARD ASSEMBLY

NO.	DATE	REVISION	BY	REC.	APP.

DESIGN
DESIGNED BY
DESIGN CHECKED BY Marian Boyce
DRAWN BY BK

REVIEW
CORROSION CHECK BY
SENIOR CIVIL ENGINEER R.P.E. NO. C 59576
RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C48598 S. Ferentinos
APPROVED, DIRECTOR OF ENGINEERING R.P.E. NO. C 44782

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

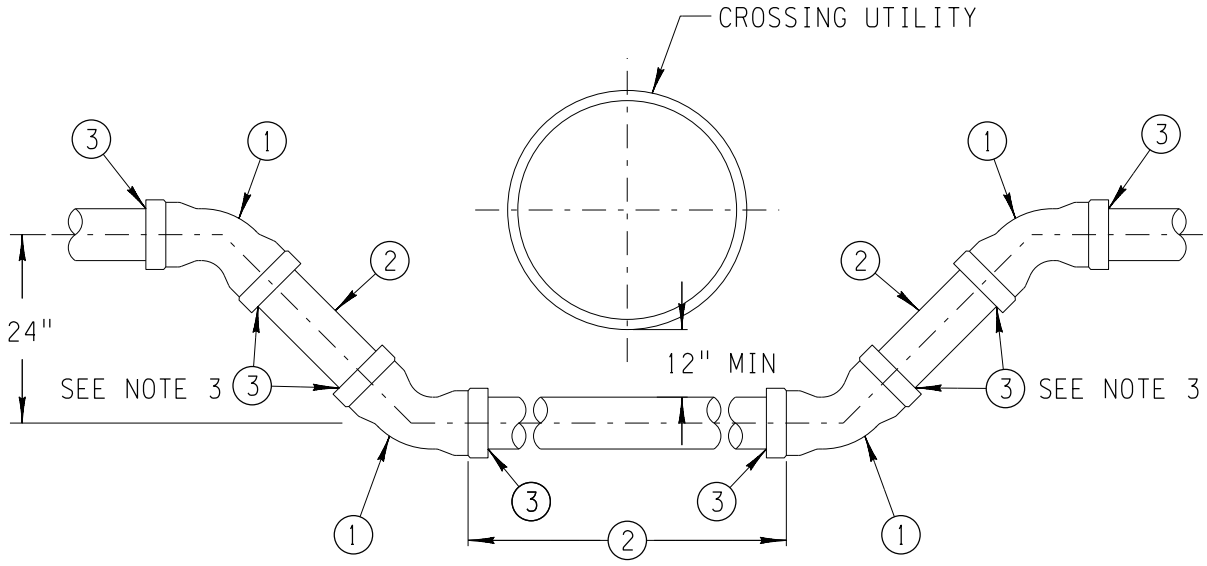
STANDARD DRAWING

AIR VALVE BOLLARD ASSEMBLY

STRUCTURE OR ZONE DESIGNATION
SCALE NONE
DATE 11 SEP 14

2007-A

FILE: H:\general\std-dwgs\2013\2007-A.dgn



MATERIAL LIST		
ITEM	DESCRIPTION	QUANTITIES REQ'D
(1)	RESTRAINED JOINT DUCTILE IRON ELBOW	4
(2)	DUCTILE IRON PIPE LENGTH FIELD CUT AS REQUIRED	AS NEEDED
(3)	GRIPPER RINGS FOR FIELD CUT PIPE	UP TO 8

NOTES

1. IF DUCTILE IRON PIPE OFFSET-RETURN IS USED OVER CROSSING UTILITY AND DOES NOT HAVE A MINIMUM OF 36" COVER, INSTALL CONCRETE SLAB PER STD DWG 2003-A.
2. WHEN 12" VERTICAL CLEARANCE CANNOT BE OBTAINED BETWEEN DISTRICT METALLIC PIPE AND OTHER METALLIC UTILITY, INSTALL SHIELD BETWEEN THE PIPES PER STD DWG 308-EA.
3. GRIPPER RINGS SHALL NOT BE USED ON VERTICAL INSTALLATIONS GREATER THAN 45°.
4. GRIPPER RINGS ARE REQUIRED IF FACTORY WELD BEAD HAS BEEN REMOVED FROM SPIGOT END OF PIPE.
5. POLYWRAP PER STD DWG 4569-B.
6. INSTALL TRACER WIRE PER STD DWG 1992-A.
7. BOND ALL JOINTS PER STD DWG 220-EA, AS INDICATED ON THE PROJECT DRAWINGS.

NO	DATE	REVISION	BY	REC	APP

DESIGN
DESIGNED BY EBMUD
DESIGN CHECKED BY EBMUD
DRAWN BY EBMUD

REVIEW
CORROSION CHECKED BY R.P.E. NO. CR 1080 — KEITH A. PACKARD
SR CIVIL ENGINEER R.P.E. NO. C 66307 — DAVID KATZEV
RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 57170 — CARLTON D. CHAN
APPROVED DIRECTOR OF ENGINEERING & CONST. R.P.E. NO. C 44278 — OLUJIMI O. YOLOYE

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

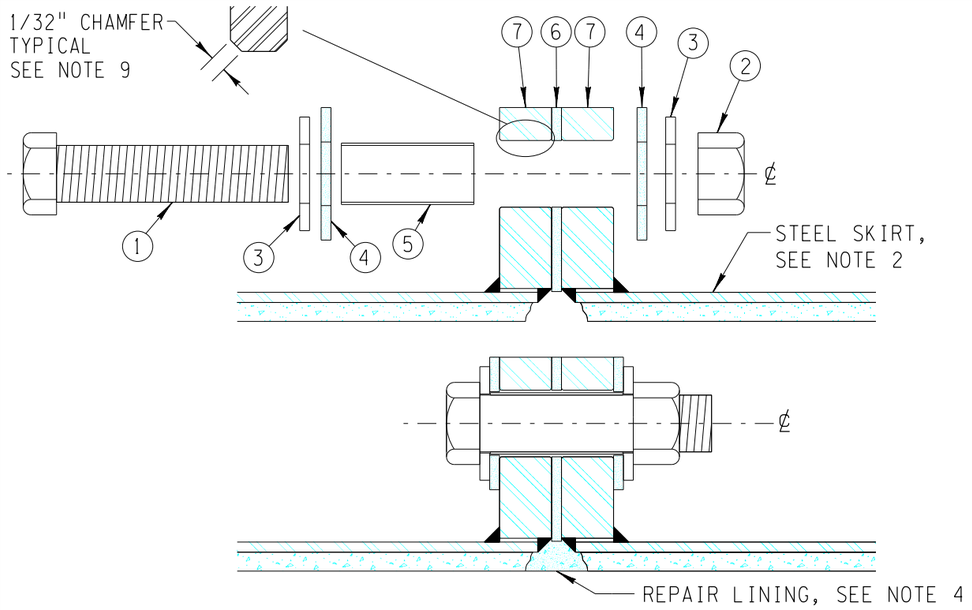
STANDARD DRAWING

DUCTILE IRON PIPE OFFSET-RETURN

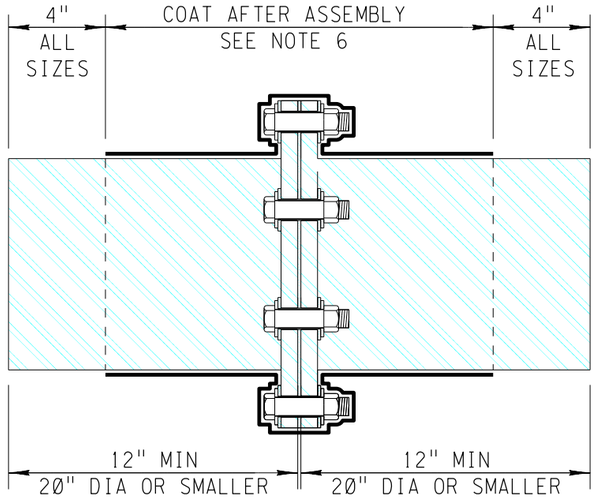
4", 6", 8" & 12"

STRUCTURE OR ZONE DESIGNATION: ALL
SCALE: NONE
DATE: 17 AUG 2022

2010-A



INSULATING JOINT DETAILS



INSULATING JOINT ASSEMBLY

	ITEM	DESCRIPTION		NOMINAL SIZE (INCHES) 4	6	8	10	12	16	20
FLANGE INSULATING KIT	1	BOLTS SHALL BE MEDIUM STRENGTH BOLTS CONFORMING TO SAE J449, GRADE 5, ASTM A325 OR ASTM A449, TYPE 1. ASTM A193 GRADE B7 BOLTS ARE ALSO ACCEPTABLE	QUANTITY	8	8	8	12	12	16	20
			DIAMETER	5/8	3/4	3/4	7/8	7/8	1	1 1/8
			LENGTH	3	3 1/2	3 1/2	4 3/4	4	4 1/2	5
	2	NUTS UP TO 1 1/2": ASTM A563-GR. B OR SAE J995 OVER 1 1/2": ASTM A563 GR. A HEAVY HEX	QUANTITY	8	8	8	12	12	16	20
			TORQUE TO__FT.-LBS.	45	75	75	120	120	180	250
	3	WASHER, STEEL, SAE STANDARD. SEE NOTES 3 AND 8	QUANTITY	16	16	16	24	24	32	40
			OUTSIDE DIAMETER	1 5/16	1 1/2	1 1/2	1 3/4	1 3/4	2	2 1/2
			INSIDE DIAMETER	21/32	25/32	25/32	29/32	29/32	1 1/32	1 5/32
	4	INSULATING WASHER ROUND 1/8" THICK FIBERGLASS EPOXY, NEMA GRADE G-10 SEE NOTE 3 AND 8	QUANTITY	16	16	16	24	24	32	40
			OUTSIDE DIAMETER	1 1/2	1 1/2	1 3/4	1 3/4	2	2 1/4	2 1/2
			INSIDE DIAMETER	23/32	27/32	27/32	31/32	31/32	1 1/32	1 1/4
	5	INSULATING SLEEVE, 1/32", HIGH DENSITY POLYETHYLENE, OR SPIRAL WOUND MYLAR. SEE NOTE 3	QUANTITY	8	8	8	12	12	16	20
			INSIDE DIAMETER	5/8	3/4	3/4	7/8	7/8	1	1 1/8
			LENGTH	1 3/8	1 3/4	1 3/4	1 3/4	2	2 3/8	2 5/8
	6	INSULATING GASKET, 1/8" THICK, FULL FACE FOR FLANGES 20" AND SMALLER: NEOPRENE FACED REINFORCED PHENOLIC.	QUANTITY	1	1	1	1	1	1	1
			OUTSIDE DIAMETER	9	11	13 1/2	16	19	23 1/2	27 1/2
			INSIDE DIAMETER	4	6	8	10	12	16	20
	7	FLANGE, AWWA CLASS D, HUB OR RING, SEE STD DWG 323-EA								

MATERIALS AND DESCRIPTION

NOTES

1. THIS DRAWING IS APPLICABLE FOR SERVICE PRESSURES UP TO:
   A. 175 PSI FOR FLANGES 12" AND SMALLER
   B. 150 PSI FOR FLANGES 16" AND LARGER

2. THE STEEL SKIRT SHALL CONFORM TO THE APPLICABLE EBMUD SPECIFICATION FOR STEEL PIPE. FLANGES SHALL CONFORM TO STD DWG 323 EA.

3. INSULATING GASKETS, INSULATING WASHERS (2 PER BOLT), INSULATING BOLT SLEEVE AND STEEL WASHERS (2 PER BOLT) SHALL BE COMMERCIALLY AVAILABLE FLANGE INSULATING KITS FOR ASME CLASS 150 FLANGES. INSULATING GASKETS AND WASHERS SHALL EACH BE MADE FROM ONE PIECE OF MATERIAL. INSULATING GASKETS IN SIZES 54" AND LARGER MAY BE SEGMENTED WITH PRIOR DISTRICT APPROVAL.

4. REPAIR CEMENT MORTAR LINING AFTER FLANGES ARE BOLTED TOGETHER. THREAD ANTI-SEIZE COMPOUND SHALL BE USED ON ALL BOLT THREADS. SEE SECTION 05 05 26P FOR ACCEPTABLE PRODUCTS.

5. THE RESISTANCE ACROSS THE FLANGE SHALL BE NOT LESS THAN ONE MEGAOHM AS MEASURED WITH AN INSULATION RESISTANCE TESTOR.

6. THE OUTSIDE SHOP COATING SHALL BE COAL TAR EPOXY, PIPE TAPE WRAP OR EPOXY PER EBMUD SPECIFICATIONS.

7. FOR DETAILS OF INSTALLATION IN PIPELINES AND FIELD COATING REFER TO DRAWING 3446-GB.

8. IF BELLVILLE WASHERS ARE USED FOR TORQUING, STEEL WASHERS SHALL BE USED BETWEEN THE BELLVILLE WASHERS AND THE INSULATING WASHERS.

9. FLANGE BOLT HOLES SHALL BE CHAMFERED 45° X 1/32" AT BOTH ENDS PRIOR TO ASSEMBLING THE INSULATING JOINT.

10. BOLT LENGTHS SHOWN ARE FOR STEEL TO STEEL FLANGE CONNECTIONS. FOR STEEL TO CAST IRON CONNECTIONS, THE BOLT LENGTHS WILL BE APPROXIMATELY 1/2" LONGER. DUE TO VARIATIONS IN THICKNESS OF CAST IRON FLANGES, THE ACTUAL LENGTH OF INSULATING SLEEVES AND BOLTS SHALL BE DETERMINED DURING ASSEMBLY.

NO	DATE	REVISION	BY	REC	APP
5	09 SEP 2022	REVISED AND REDRAWN	KAP	DJL	CAC
4	30 JUN 2008	REVISED	JH	ST	AST
3	21 DEC 2006	REVISED	RD	DJB	DLP
2	17 MAY 1993	REVISED	CAD	-	-
1	13 JAN 1992	REVISED	JE	-	-

DESIGN	DESIGNED BY	A.WESTERBACK
	DESIGN CHECKED BY	G.H.DOWD
	DRAWN BY	R.D.BYRNE
REVIEW	PIPELINE WB CORR AEW	
	DRAFTING	A.J.BURNELL
RECOM.	SUPERV.PIPELINE ENG'G R.P.E. NO. C 18774	W.L.RAMOS
	MGR.,DIST.ENG'G. R.P.E. NO. C 13325	R.KOLM
APPROVED	DIRECTOR OF ENGINEERING R.P.E. NO. C 13447	W.ANTON

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

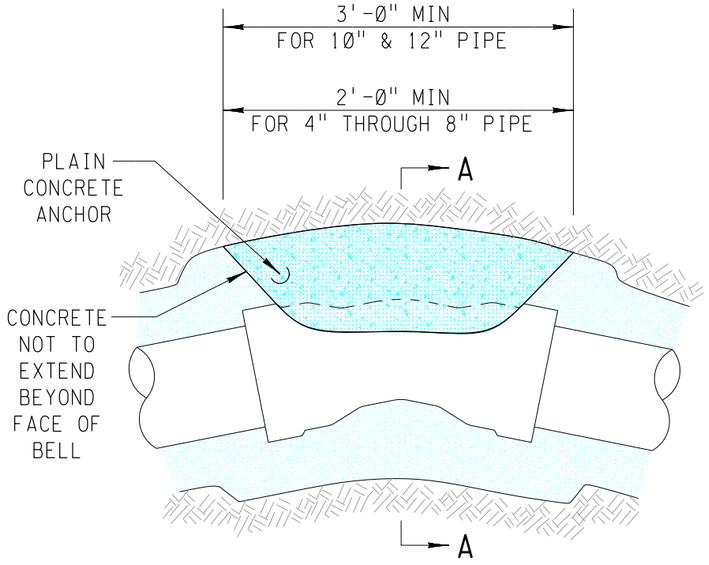
FLANGE INSULATING JOINT

AWWA CLASS D

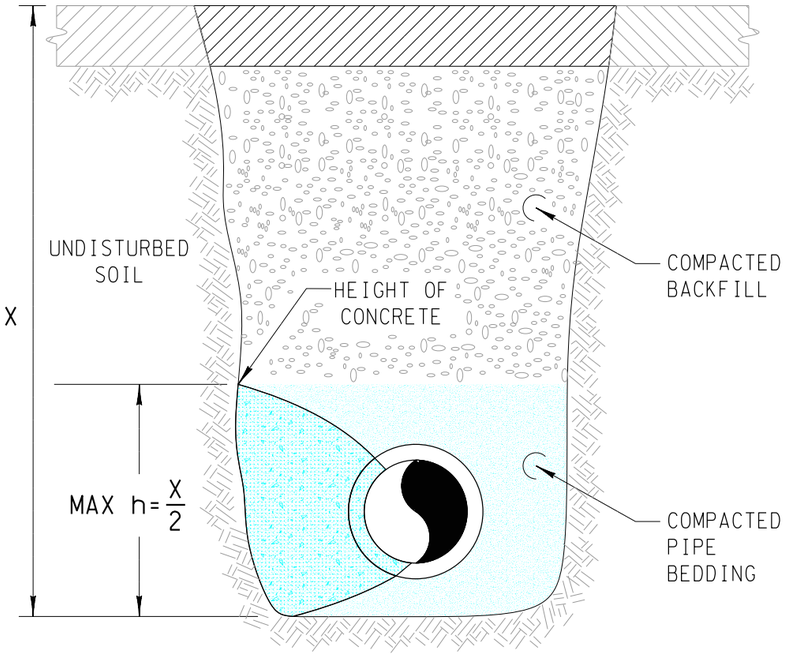
STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	01 AUG 1979

3186-B

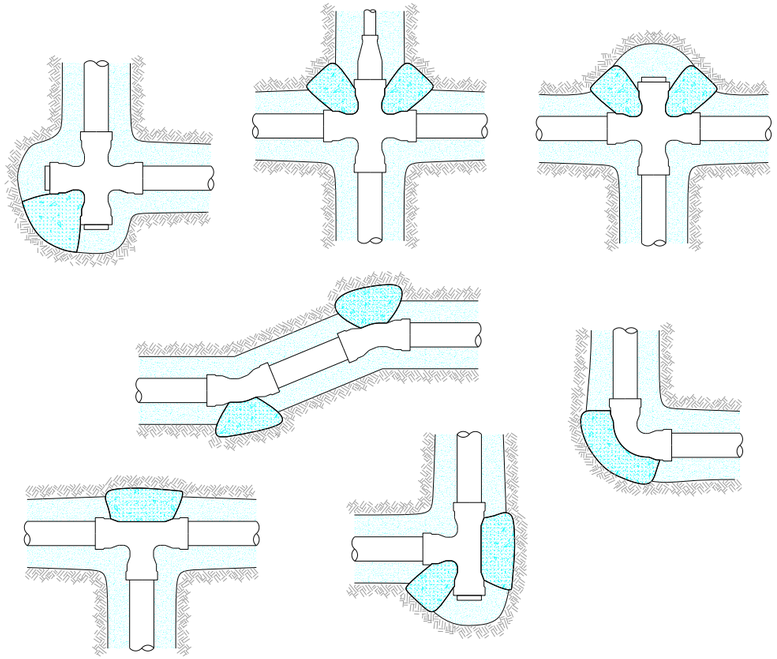
SUPERSEDES STD DWGS 3186-B & 3188-B



PLAN



ANCHOR BLOCK SECTION A-A



ANCHOR BLOCK LOCATIONS

REQUIRED SIZE OF ANCHOR BEARING AREA IN SQ. FT.				
PIPE SIZE	FITTING	SOFT CLAY	MEDIUM CLAY OR LOOSE GRANULAR SOIL	HARD CLAY OR MEDIUM GRANULAR SOIL
4"	TEE/CROSS	4	2	2
4"	22½°ELL	2	2	2
4"	45°ELL	3	2	2
4"	90°ELL	5	3	2
6"	TEE/CROSS	9	3	3
6"	22½°ELL	3	2	2
6"	45°ELL	7	3	2
6"	90°ELL	12	4	3
8"	TEE/CROSS	*	5	4
8"	22½°ELL	5	3	2
8"	45°ELL	10	4	3
8"	90°ELL	*	7	4
12"	TEE/CROSS	*	12	6
12"	22½°ELL	12	5	3
12"	45°ELL	*	9	5
12"	90°ELL	*	*	9

* USE ONLY RESTRAINED JOINTS - WHEN SIZE OF ANCHOR BEARING AREA REQUIRED BY THE SOFT CLAY IS TOO LARGE TO OBTAIN, USE RESTRAINED PUSH-ON FITTINGS OR 5/8" TIE RODS AND CONCRETE ANCHORS TO RESTRAIN THE FITTING FROM MOVING OFF THE STABBED PIPE ENDS, SIMILAR TO STD DWG 194-EA.

NOTES

1. POUR CONCRETE AGAINST UNDISTURBED SOIL.
2. NO CONCRETE IS TO BE PLACED BEYOND THE FACE OF THE BELL.
3. MAXIMUM HEIGHT OF ANCHOR IS HALF THE DEPTH FROM GROUND SURFACE TO BASE OF ANCHOR BLOCK AT THE TRENCH WALL.
4. POLYWRAP PORTION OF FITTING IN CONTACT WITH CONCRETE IN ACCORDANCE WITH EBMUD SPECIFICATIONS.
5. SOIL IDENTIFICATION CHARACTERISTICS
   SOFT CLAY - MOLDED BY LIGHT FINGER PRESSURE.
   MEDIUM CLAY - MOLDED BY STRONG FINGER PRESSURE.
   HARD CLAY - DIFFICULT TO INDENT BY THUMBNAIL.
   LOOSE GRANULAR SOIL - EASILY EXCAVATED WITH SHOVEL.
   MEDIUM GRANULAR SOIL - DIFFICULT TO EXCAVATE WITH SHOVEL.

NO	DATE	REVISION	BY	REC	APP
3	09 SEP 2022	REVISED AND REDRAWN	KAP	DSL	CAC
2	30 JUN 2008	REVISED	AST	-	-
1	13 DEC 1988	REVISED	DAS	WB	-

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	W.BODE
	DRAWN BY	N.NELSON
REVIEW	CORR AEW	
RECOM.	SUPVR.PIPELINE ENG'G R.P.E. NO. C 18774	W.L.RAMOS
	MANAGER, DIST.ENG'G R.P.E. NO. C 13325	R.L.KOLM
	APPROVED ASST.GEN.MGR.&CHIEF ENGINEER R.P.E. NO. C 13447	W.F.ANTON

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

ANCHORAGE
FOR HORIZONTAL BENDS
AT UNRESTRAINED JOINTS

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	25 FEB 1981

3360-B

FLANGED STEEL INSULATING JOINT

(STD DWG 3186-B)

NORMALLY USED TO INSULATE SECTIONS OF MAIN LOCATED IN DIFFERENT TYPES OF SOIL

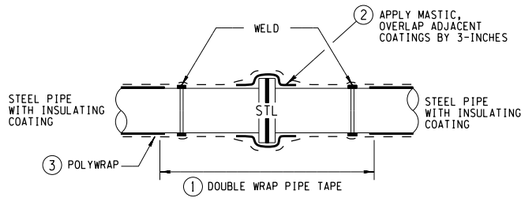


FIG. S-1

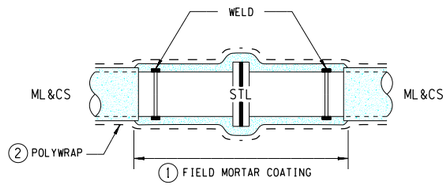


FIG. S-2

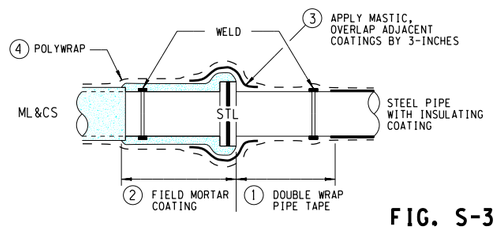


FIG. S-3

FLANGED FITTING INSULATING JOINTS

USED WHENEVER A FLANGED JOINT IS AVAILABLE IN WHICH A FLANGED INSULATING KIT CAN BE INSERTED, A VALVE IS SHOWN, BUT DRAWING ALSO APPLIES TO OTHER FLANGED FITTINGS.

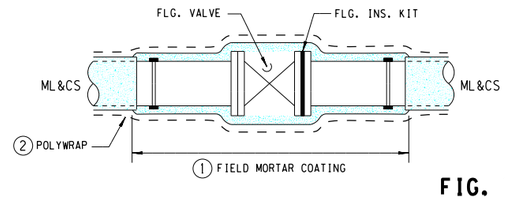


FIG. FF-1

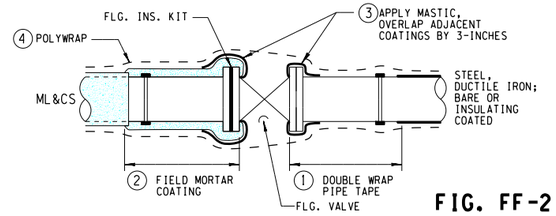


FIG. FF-2

SPECIAL NOTE

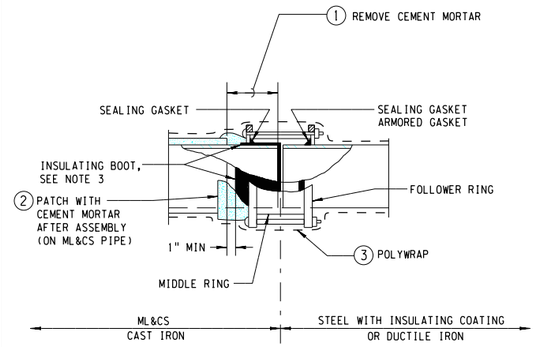
VALVE FLANGES THICKER THAN STANDARD WILL REQUIRE LONGER BOLTS AND INSULATING SLEEVES THAN LISTED IN STD DWG 3186-B.

IF INSUFFICIENT SPACE EXISTS AT ANY BOLT ON THE VALVE FLANGE SIDE OF THE JOINT FOR INSTALLATION OF THE INSULATING WASHER, THE WASHER MAY BE OMITTED FROM THOSE BOLTS ON THE VALVE FLANGE SIDE ONLY AND THE BOLT LENGTHS MAY BE DECREASED BY A SUITABLE AMOUNT.

PAINT IDENTYFYING MARK ON END WITH INSULATING FLANGE.

FLEXIBLE COUPLING INSULATING JOINTS

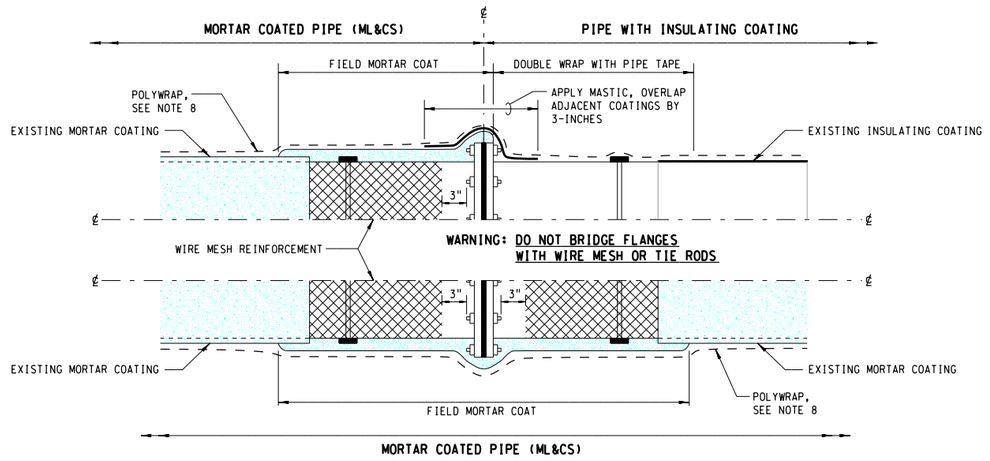
USED WHERE UNRESTRAINED JOINTS ARE PERMISSIBLE, FOR CAST IRON, STEEL AND CAST IRON/STEEL INSULATING JOINTS.



NOTES

1. AFTER INSTALLATION REPLACE CEMENT MORTAR AS SHOWN, DO NOT USE REINFORCING WIRE.
2. DO NOT BOND ACROSS INSULATING COUPLING.
3. WHEN CONNECTING PIPE UNDER CATHODIC PROTECTION (PLASTIC COATED OR TAPE WRAPPED) STEEL OR DUCTILE IRON) TO PIPE NORMALLY NOT UNDER CATHODIC PROTECTION (ML&CS OR CAST IRON), THE INSULATING BOOT ALWAYS GOES ON THE PIPE END NOT UNDER CATHODIC PROTECTION.

FIG. FC-1



FIELD COATING DETAILS

GENERAL NOTES

1. NUMBERS IN CIRCLES INDICATE SEQUENCE OF COATING OPERATION.
2. "ML&CS" IS MORTAR LINED AND COATED STEEL PIPE.
3. WHERE CEMENT MORTAR COATED C.I. PIPE IS ENCOUNTERED, FIELD COATING SHALL BE THE SAME AS FOR ML&CS.
4. INSULATING COATING INCLUDES COAL TAR ENAMEL, PLASTIC AND COAL TAR EPOXY.
5. FIELD MORTAR COATING TO A MINIMUM THICKNESS OF 3/4" SHALL BE APPLIED OVER A 2" X 4"W Ø.5 WIRE MESH REINFORCEMENT. DO NOT BRIDGE FLANGES WITH WIRE MESH OR TIE RODS.
6. FOR WELDED JOINTS, SEE STANDARD PIPE DRAWINGS.
7. BACKFILL TO BE FREE OF ROCKS AND CLODS. AVOID ALL IN-JURY TO COATING.
8. POLYWRAP, MASTIC COATING, AND PIPE TAPE SHALL CONFORM TO EBMUD SPECIFICATIONS. EXTEND POLYWRAP AT LEAST 12 INCHES ONTO UNDISTURBED PIPE EACH SIDE OF INSULATING JOINT.
9. FOR TYPICAL EXAMPLES OF INSULATING JOINT WITH TEST LEAD CONNECTIONS SEE STD DWG 285-EA.
10. ASSEMBLE ALL FLANGED INSULATING JOINTS IN THE SHOP WHENEVER POSSIBLE AND CALL CORROSION CONTROL TO CHECK THEM BEFORE INSTALLING.
11. ALL UNCOATED FERROUS METAL SURFACES IN THE COMPLETED PIPELINES SHALL BE COATED IN ACCORDANCE WITH EBMUD STD SPECIFICATIONS.

NO	DATE	REVISION	BY	REC	APP
4	09 SEP 2022	REVISED AND REDRAWN	KAP	DSL	CAC
3	30 JUN 2008	REVISED	JH	ST	AST
2	26 FEB 1992	REVISED	JE	WB	-
1	12 DEC 1988	REVISED	NTN	WB	-

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	A.WESTERBACK
	DRAWN BY	I.YAMASAKI
REVIEW	MECH ELECT HOM STRUCT	
	PIPELINE WLR CORR AEW FNDN	
RECOMMENDED	SUPVR.PIPELINE ENG'G. R.P.E. NO. C-10603	W.E.BRADBURY
	MGR.,PLANT ENG'G.DIV. R.P.E. NO. E-1955	L.B.HERTZBERG
	MANAGER,DIST.ENG'G. R.P.E. NO. C-13325	R.L.KOLM
	DIRECTOR OF ENG'G. R.P.E. NO. C-13447	W.F.ANTON
	APPROVED, ASST.GEN.MGR & CHIEF ENGINEER R.P.E. NO. C-7624	D.G.LARKIN

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

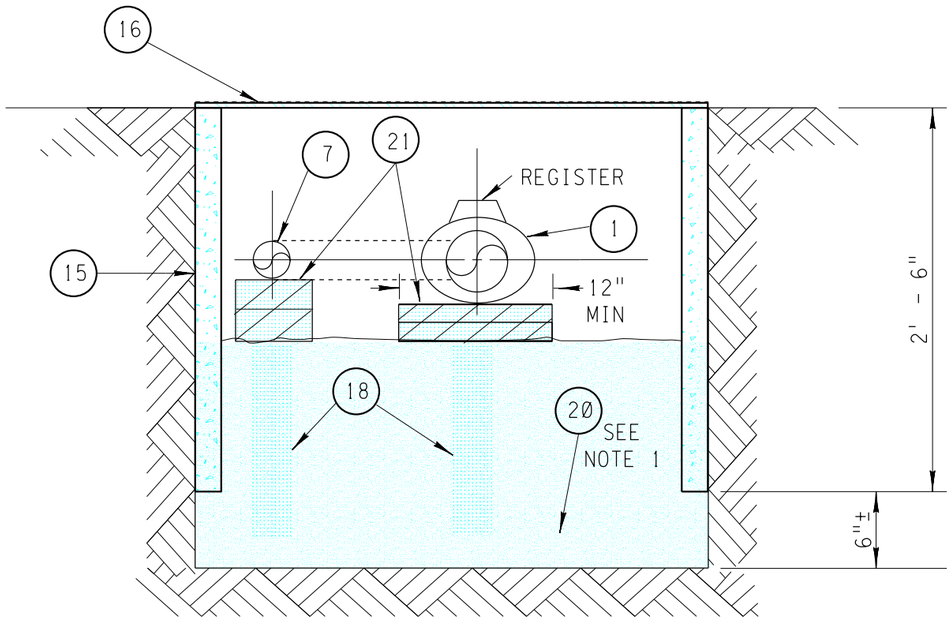
STANDARD DRAWING

INSULATING JOINTS
INSTALLATION DETAILS

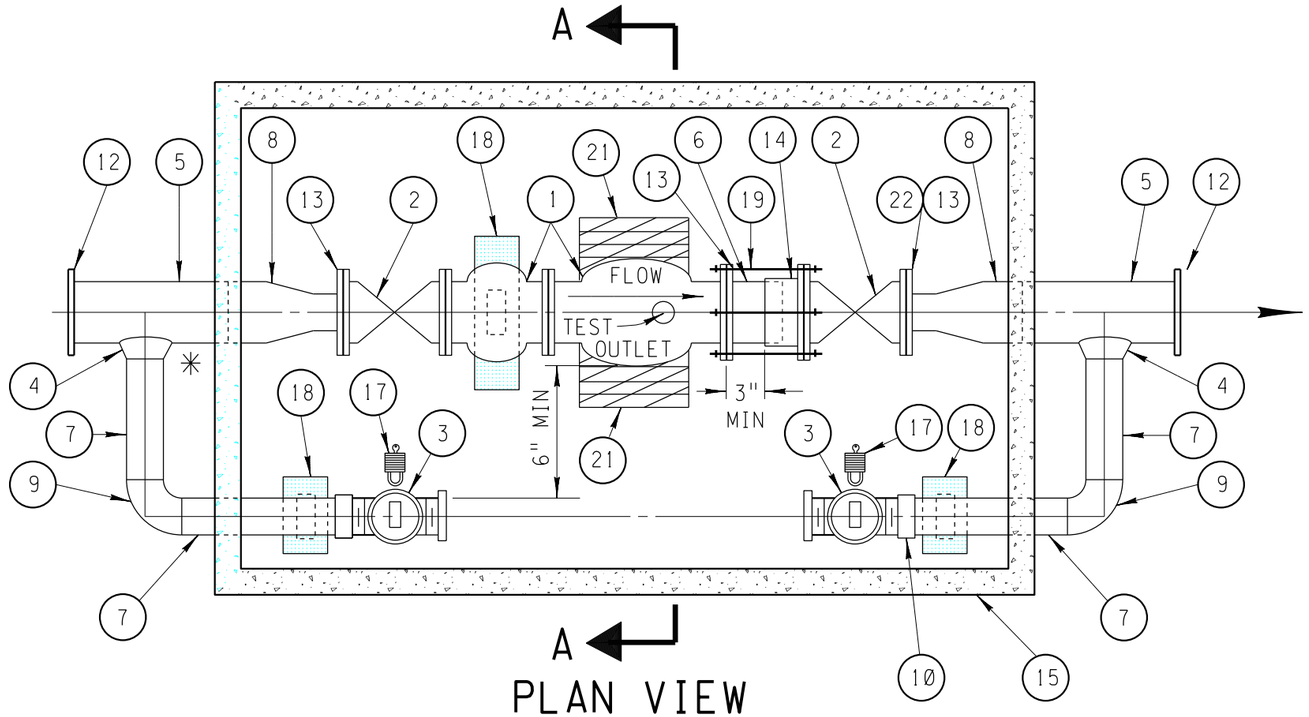
STRUCTURE OR ZONE DESIGNATION: ALL
SCALE: NONE
DATE: 25 JUL 1956

3446-GB

SUPERSEDES STD DWG 3101-G



SECTION A-A



PLAN VIEW

MATERIAL LIST			
ITEM	REQ'D	DESCRIPTION	REMARKS
1	1	COMPOUND METER, 3", PLATE STRAINER, 3"	
2	2	GATE VALVE, 3", 125 LB, FLG'D, NRS, NUT OPERATOR, OPEN RIGHT	
3	2	CURB STOP, 2", 300 PSI WP, NO LEAD BRASS, W/LOCK WING & PLUG	
4	2	WELDOLET, 2" X 4", RUN	
5	3'±	PIPE, 4" DIA, SCH 40, ML&PCS	
6	1'±	PIPE, 3" DIA, SCH 40	SEE NOTE 10
7	9'±	PIPE, 2" DIA, SCH 40, TAPED WRAPPED STEEL	
8	2	REDUCER, CONCENTRIC, 4" X 3", SCH 40	
9	2	90° ELBOW, 2", SCH 40, TAPE WRAPPED STEEL	
10	1	INSULATING UNION	
11	-	-	
12	2	SLIP ON FLANGE, 4" AWWA CLASS D, 150 LB DRILLING	
13	3	SLIP ON FLANGE, 3" AWWA CLASS D, 150 LB DRILLING	SEE NOTE 10
14	1	FLANGED COUPLING ADAPTER, 3", ROCKWELL STYLE 912	SEE NOTE 10
15	1	PANEL VAULT, 5' X 3' X 2.5' DEEP	
16	1	STEEL DIAMOND PATTERN LID OR QUASITE COVER, AS REQ'D	
17	2	DISTRICT SECURITY LOCK (DFAA2)	
18	AS REQD	REDWOOD BLOCK PIPE SUPPORT, SEE ITEM 21	
19	4	TIE RODS	SEE NOTE 10
20	1/4CYD±	1/4± CUBIC YD ROCK FILL FOR DRAINAGE	
21	AS REQD	2" x 4" REDWOOD BLOCKS TAPEWRAPPED	
22	1	INSULATING FLANGE KIT, 3"	

NOTES

1. MINIMUM 3/4" DRAIN ROCK FILL LEVEL TO BE BOTTOM OF BOX.
2. TAPE WRAP ALL BURIED BARE STEEL AND BYPASS PIPING.
3. METER VAULTS FOR 3" AND 4" COMPOUND METERS TO BE 3'X 5'X 2.5' DEEP.
4. BYPASS VALVES MUST BE ACCESSIBLE AND OPERABLE FROM INSIDE VAULT.
5. NO VEHICLE TRAFFIC ON VAULTS.
6. REMOTE READERS SHALL BE INSTALLED ON METERS.
7. ✳ WHEN POSSIBLE, WELDOLETS TO BYPASS PIPING SHOULD BE POSITIONED INSIDE VAULT.
8. IF THE DEVICE LAYOUT AS SHOWN CANNOT FIT IN THE EXISTING METER BOX, THEN CONTACT THE METER SHOP FOR A REVISED LAYOUT.
9. COAT ALL UNCOATED METALIC SURFACES OF PIPE, FITTINGS, BOLTS AND NUTS WITH PETROLATUM WAX TAPE PER EBMUD STANDARD, SPECIFICATION 09961.1.
10. ITEMS 6,13,14 AND 19 ARE AVAILABLE AS A COMPLETE DISMANTLING JOINT ASSEMBLY.

REVISED JUNE 5, 2020 DJB
REVISED JULY 26, 2005 RES

DESIGN
DESIGNED BY P.A. JOHNSON
DESIGN CHECKED BY E.J. CARVILLE
DRAWN BY T.VERELLEY TOM LEE

REVIEW

RECOMMENDED
SENIOR CIVIL ENGINEER P.A.C.
R.P.E. NO. C 36285

APPROVED
MGR. OF DESIGN D.L.P.
R.P.E. NO. C 39851

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

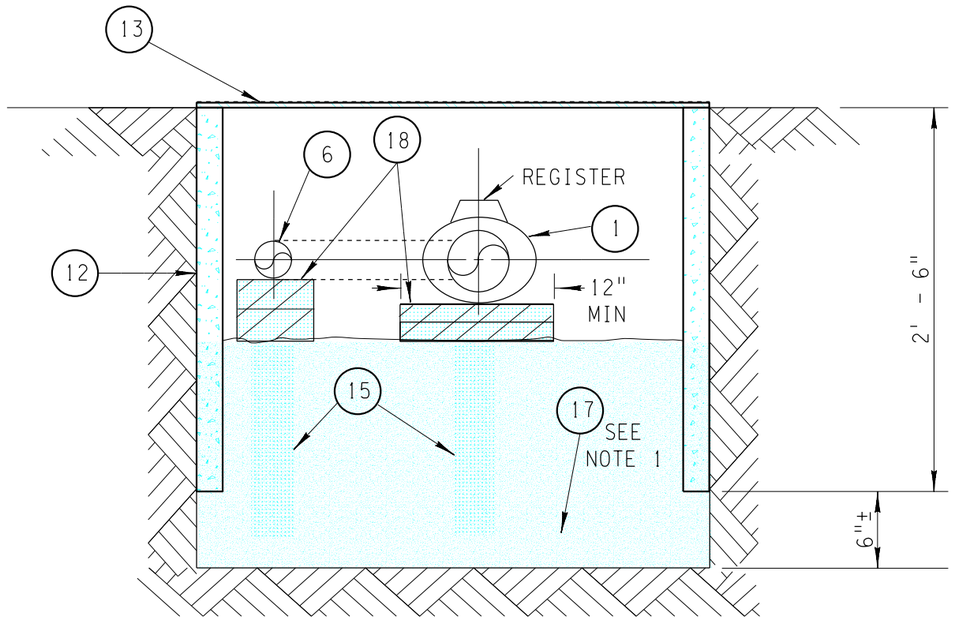
STANDARD DRAWING

3" COMPOUND METER SETTING WITH 2" BYPASS

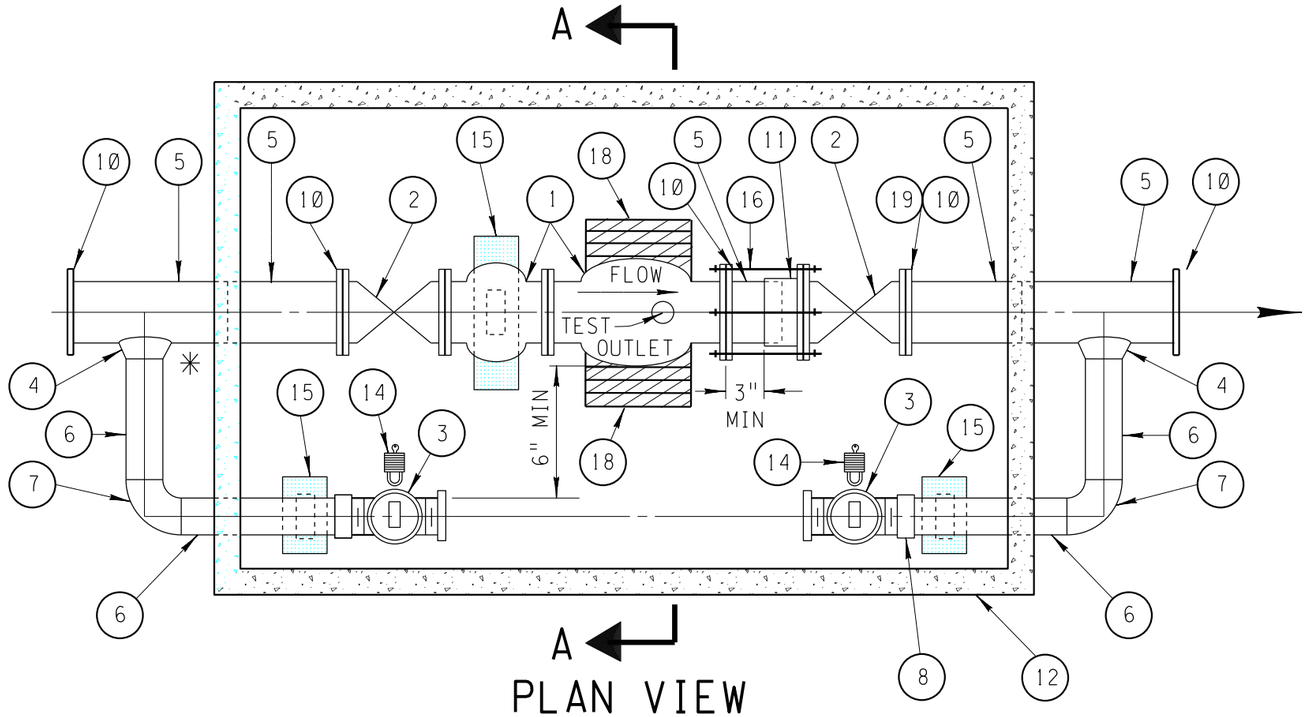
AUTOMATIC METER READING COMPATIBILITY

STRUCTURE OR ZONE DESIGNATION ALL
SCALE 1" = 1' - 0"
DATE 04 DEC 89

3602-B-1



SECTION A-A



PLAN VIEW

MATERIAL LIST			
ITEM	REQ'D	DESCRIPTION	REMARKS
1	1	COMPOUND METER, 4", PLATE STRAINER, ATTACHED	
2	2	GATE VALVE, 4", 125 LB, FLG'D, NRS, NUT OPERATOR, OPEN RIGHT	
3	2	CURB STOP, 2", 300 PSI WP, NO LEAD BRASS, W/LOCK WING & PLUG	
4	2	WELDOLET, 2" X 4", RUN	
5	4'±	PIPE, 4" DIA, SCH 40, ML&PCS	SEE NOTE 10
6	9'±	PIPE, 2" DIA, SCH 40, TAPE WRAPPED STEEL	
7	2	90° ELBOW, 2", SCH 40, TAPE WRAPPED STEEL	
8	1	INSULATING UNION	
9	-	-	
10	5	SLIP ON FLANGE, 4" AWWA CLASS D, 150 LB DRILLING	SEE NOTE 10
11	1	FLANGED COUPLING ADAPTER, 4", ROCKWELL STYLE 912	SEE NOTE 10
12	1	METER BOX, PANEL VAULT, 5' X 3' X 2.5' DEEP	
13	1	STEEL DIAMOND PATTERN LID OR QUASITE COVER, AS REQ'D	
14	2	DISTRICT SECURITY LOCK (DFAA2)	
15	AS REQD	REDWOOD BLOCK PIPE SUPPORT, SEE ITEM 18	
16	4	TIE RODS	SEE NOTE 10
17	1/4CYD±	1/4± CUBIC YD ROCK FILL FOR DRAINAGE	
18	AS REQD	2" x 4" REDWOOD BLOCKS TAPEWRAPPED	
19	1	INSULATING FLANGE KIT, 4"	

NOTES

1. MINIMUM 3/4" DRAIN ROCK FILL LEVEL TO BE BOTTOM OF BOX.
2. TAPE WRAP ALL BURIED BARE STEEL AND BYPASS PIPING.
3. METER VAULTS FOR 3" AND 4" COMPOUND METERS TO BE 3'X 5'X 2.5' DEEP.
4. BYPASS VALVES MUST BE ACCESSIBLE AND OPERABLE FROM INSIDE VAULT.
5. NO VEHICLE TRAFFIC ON VAULTS.
6. REMOTE READERS SHALL BE INSTALLED ON METERS.
✳7. WHEN POSSIBLE, WELDOLETS TO BYPASS PIPING SHOULD BE POSITIONED INSIDE VAULT.
8. IF THE DEVICE LAYOUT AS SHOWN CANNOT FIT IN THE EXISTING METER BOX, THEN CONTACT THE METER SHOP FOR A REVISED LAYOUT.
9. COAT ALL UNCOATED METALIC SURFACES OF PIPE, FITTINGS, BOLTS AND NUTS WITH PETROLATUM WAX TAPE PER EBMUD STANDARD, SPECIFICATION 09961.1.
10. ITEMS 5,10,11 AND 16 ARE AVAILABLE AS A COMPLETE DISMANTLING JOINT ASSEMBLY.

REVISED JUNE 5, 2020 DJB
REVISED JULY 26, 2005 RES

DESIGN
DESIGNED BY P.A. JOHNSON
DESIGN CHECKED BY E.J. CARVILLE
DRAWN BY W. MCALEER TOM LEE

REVIEW

RECOMMENDED SENIOR CIVIL ENGINEER R.P.E. NO. C 36285 P.A.C.

APPROVED MGR. OF DESIGN R.P.E. NO. C 39851 D.L.P.

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

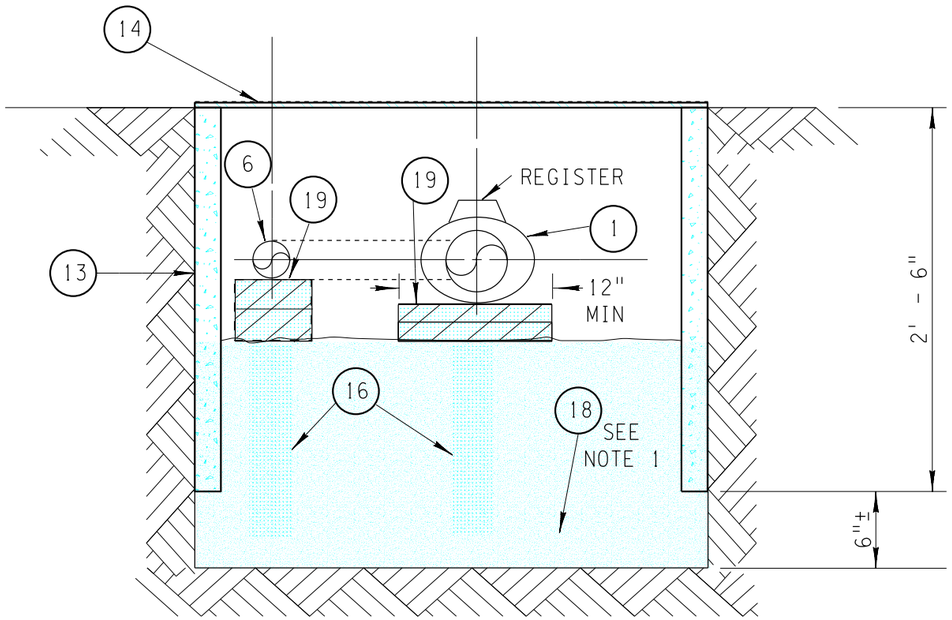
STANDARD DRAWING

4" COMPOUND METER SETTING WITH 2" BYPASS

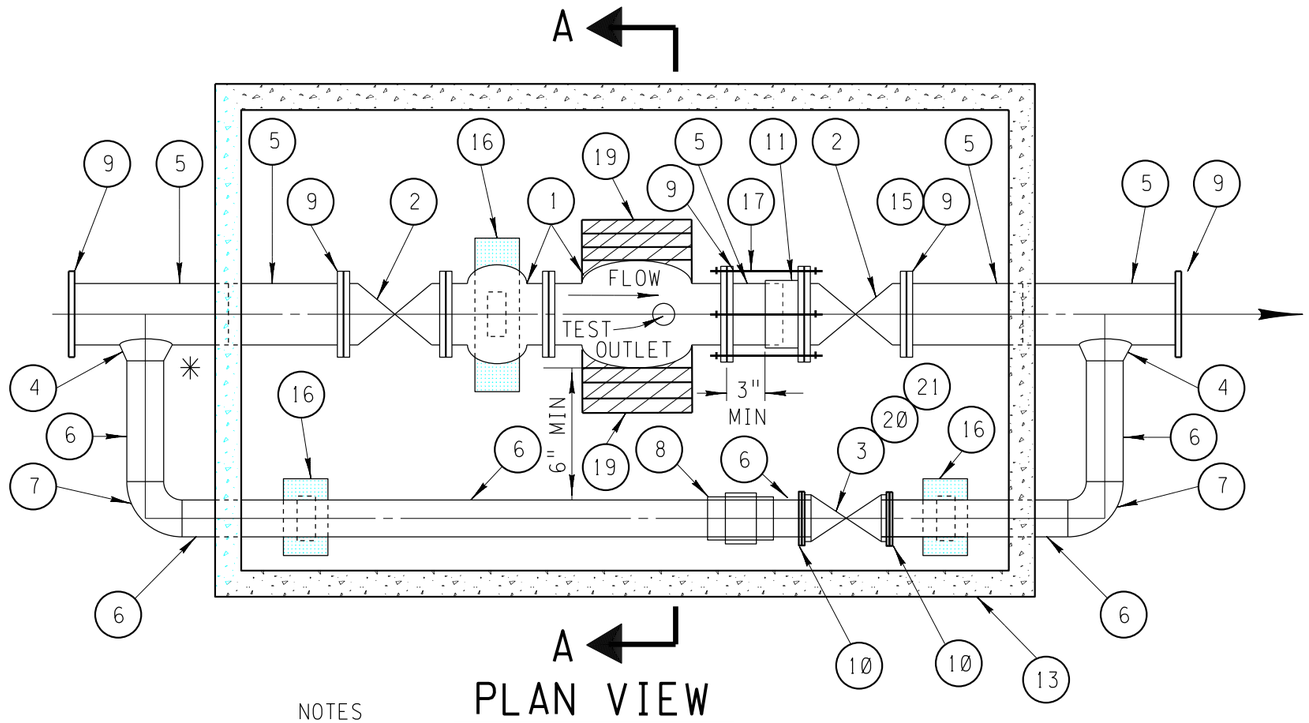
AUTOMATIC METER READING COMPATIBILITY

STRUCTURE OR ZONE DESIGNATION ALL
SCALE NONE
DATE 04 DEC 89

3602-B-2



SECTION A-A



MATERIAL LIST			
ITEM	REQ'D	DESCRIPTION	REMARKS
1	1	COMPOUND METER, 6", PLATE STRAINER, ATTACHED	
2	2	GATE VALVE, 6", 125 LB, FLG'D, NRS, NUT OPERATOR, OPEN RIGHT	
3	1	GATE VALVE, 4", 125 LB, FLG'D, NRS, NUT OPERATOR, OPEN RIGHT	
4	2	WELDOLET, 4" X 6", RUN	
5	4'±	PIPE, 6" DIA, SCH 40, ML&PCS	SEE NOTE 11
6	9'±	PIPE, 4" DIA, ML&PCS	
7	2	90° ELBOW, 4", SCH 40	
8	1	COUPLING, 4", ROCKWELL STYLE 411, INSULATING	
9	5	SLIP ON FLANGE, 6" AWWA CLASS D, 150 LB DRILLING	SEE NOTE 11
10	2	SLIP ON FLANGE, 4" AWWA CLASS D, 150 LB DRILLING	
11	1	FLANGED COUPLING ADAPTER, 6", ROCKWELL STYLE 912	SEE NOTE 11
12			
13	1	METER BOX, PANEL VAULT, 4' X 6' X DEPTH AS REQ'D	
14	1	STEEL DIAMOND PATTERN LID OR QUASITE COVER, AS REQ'D	
15	1	INSULATING FLANGE KIT, 6"	
16	AS REQD	REDWOOD BLOCK PIPE SUPPORT, SEE ITEM 19	
17	3	TIE RODS	SEE NOTE 11
18	1/4CYD±	1/4± CUBIC YD ROCK FILL FOR DRAINAGE	
19	AS REQD	2" x 4" REDWOOD BLOCKS TAPEWRAPPED	
20	1	GATE VALVE LOCKING CAP, PIPELINE PRODUCTS GVL-200	
21	1	DISTRICT SECURITY LOCK (DFAA2)	

NOTES

1. MINIMUM 3/4" DRAIN ROCK FILL LEVEL TO BE BOTTOM OF BOX.
2. TAPE WRAP ALL BURIED BARE STEEL AND BYPASS PIPING.
3. METER VAULTS FOR 6" AND 8" COMPOUND METERS TO BE 4'X 6' .
4. BYPASS VALVES MUST BE ACCESSIBLE AND OPERABLE FROM INSIDE VAULT.
5. NO VEHICLE TRAFFIC ON VAULTS.
6. REMOTE READERS SHALL BE INSTALLED ON METERS.
7. DEPENDING ON INSTALLATION LOCATION AND LENGTH OF METER ASSEMBLY, DOWNSTREAM GATE VALVE MAY HAVE TO BE LOCATED OUTSIDE OF THE METER VAULT. SEE DRAWING 321-EA FOR VALVE POT INSTALLATION DETAILS.
8. ✳ WHEN POSSIBLE, WELDOLETS TO BYPASS PIPING SHOULD BE POSITIONED INSIDE VAULT.
9. IF THE DEVICE LAYOUT AS SHOWN CANNOT FIT IN THE EXISTING METER BOX, THEN CONTACT THE METER SHOP FOR A REVISED LAYOUT.
10. COAT ALL UNCOATED METALIC SURFACES OF PIPE, FITTINGS, BOLTS AND NUTS WITH PETROLATUM WAX TAPE PER EBMUD STANDARD, SPECIFICATION 09961.1.
11. ITEMS 5,9,11 AND 17 ARE AVAILABLE AS A COMPLETE DISMANTLING JOINT ASSEMBLY.

REVISED JUNE 5, 2020 DJB
REVISED JULY 26, 2005 RES

DESIGN
DESIGNED BY P.A. JOHNSON
DESIGN CHECKED BY E.J. CARVILLE
DRAWN BY W. MCALEER TOM LEE

REVIEW

RECOMMENDED SENIOR CIVIL ENGINEER R.P.E. NO. C 36285 P.A.C.

APPROVED MGR. OF DESIGN R.P.E. NO. C 39851 D.L.P.

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

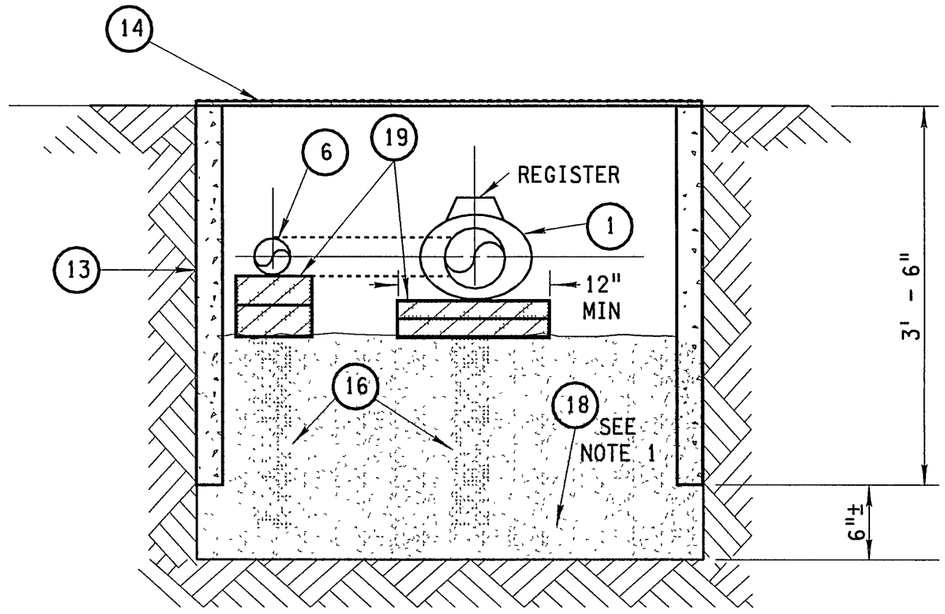
STANDARD DRAWING

6" COMPOUND METER SETTING WITH 4" BYPASS

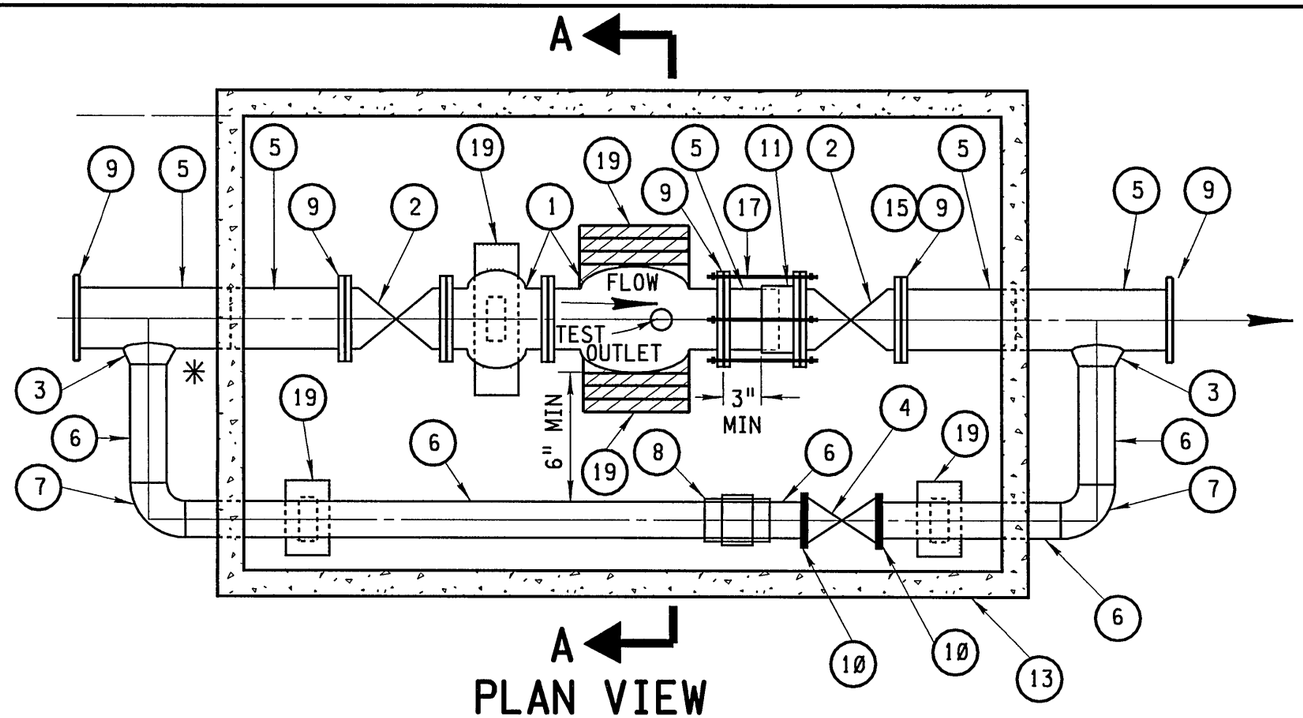
AUTOMATIC METER READING COMPATIBILITY

STRUCTURE OR ZONE DESIGNATION ALL
SCALE NONE
DATE 04 DEC 89

3602-B-3



SECTION A-A



PLAN VIEW

MATERIAL LIST			
ITEM	REQ'D	DESCRIPTION	REMARKS
1	1	COMPOUND METER, 8", PLATE STRAINER, 3"	
2	2	GATE VALVE, 8", 125 LB, FLG'D, NRS, NUT OPERATOR, OPEN RIGHT	
3	2	WELDOLET, 4" X 8", RUN	
4	1	GATE VALVE, 4", 125 LB, FLG'D, NRS, NUT OPERATOR, OPEN RIGHT	
5	4'±	PIPE, 8" DIA, SCH 40, ML&PCS	
6	17'±	PIPE, 4" DIA, SCH 40, ML&PCS	
7	2	90° ELBOW, 4", SCH 40	
8	1	COUPLING, 4", ROCKWELL STYLEEE 411, INSULATING	
9	5	SLIP ON FLANGE, 8" AWWA CLASS D, 150 LB DRILLING	
10	2	SLIP ON FLANGE, 4" AWWA CLASS D, 150 LB DRILLING	
11	1	FLANGED COUPLING ADAPTER, 8", ROCKWELL STYLE 912	
12			
13	1	METER BOX, PANEL VAULT, 4' X 6' X DEPTH AS REQ'D	
14	1	STEEL DIAMOND PATTERN LID OR QUASITE COVER, AS REQ'D	
15	1	INSULATING FLANGE KIT, 8"	
16	AS REQD	REDWOOD BLOCK PIPE SUPPORT, SEE ITEM 21	
17	3	TIE RODS	
18	1/4CYD±	1/4± CUBIC YD ROCK FILL FOR DRAINAGE	
19	AS REQD	2" x 4" REDWOOD BLOCKS TAPEWRAPPED	

NOTES

1. MINIMUM ROCK FILL LEVEL TO BE BOTTOM OF BOX.
2. TAPE WRAP ALL BURIED BARE STEEL AND BYPASS PIPING.
3. METER VAULTS FOR 6" AND 8" COMPOUND METERS TO BE 4'X 6' .
4. BYPASS VALVES MUST BE ACCESSIBLE AND OPERABLE FROM INSIDE VAULT.
5. NO VEHICLE TRAFFIC ON VAULTS.
6. REMOTE READERS SHALL BE INSTALLED ON METERS.
7. DEPENDING ON INSTALLATION LOCATION AND LENGTH OF METER ASSEMBLY, DOWNSTREAM GATE VALVE MAY HAVE TO BE LOCATED OUTSIDE OF THE METER VAULT. SEE DRAWING 321-EA FOR VALVE POT INSTALLATION DETAILS.

*8. WHEN POSSIBLE, WELDOLETS TO BYPASS PIPING SHOULD BE POSITIONED INSIDE VAULT.

REVISED JULY 26, 2005 RES

DESIGN
DESIGNED BY P.A. JOHNSON
DESIGN CHECKED BY E.J. CARVILLE
DRAWN BY W. MCALEER TOM LEE

REVIEW

RECOMMENDED SENIOR CIVIL ENGINEER R.P.E. NO. C 36285 P.A.C.

APPROVED MGR. OF DESIGN R.P.E. NO. C 39851 D.L.P.

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

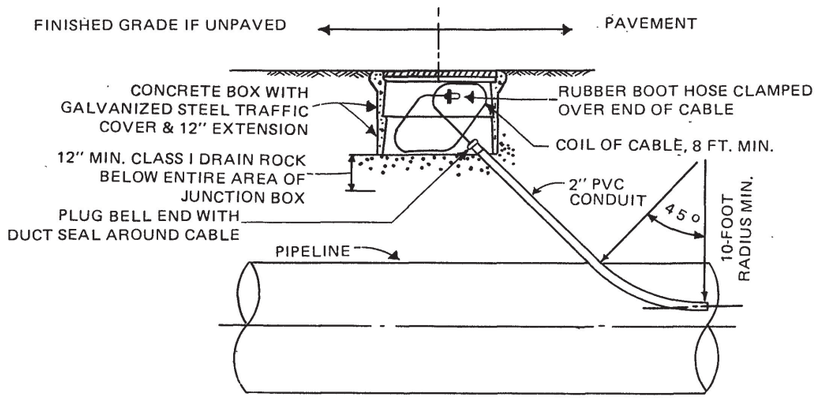
STANDARD DRAWING

8" COMPOUND METER SETTING WITH 4" BYPASS

AUTOMATIC METER READING COMPATIBILITY

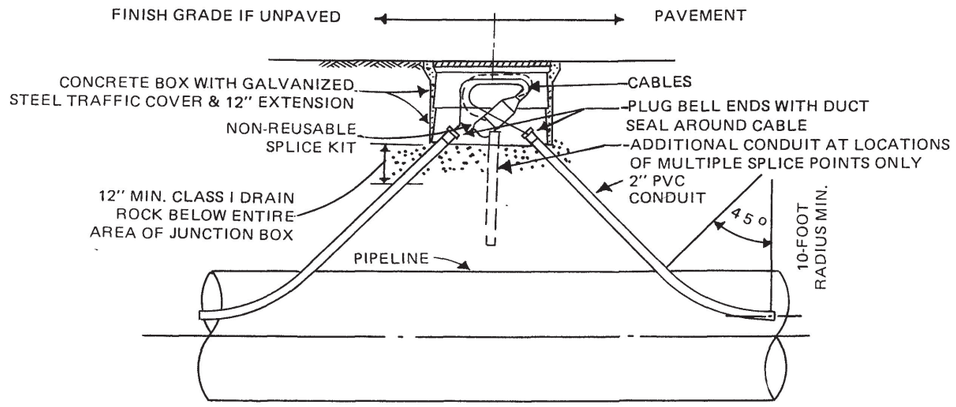
STRUCTURE OR ZONE DESIGNATION ALL
SCALE NONE
DATE 04 DEC 89

3602-B-4



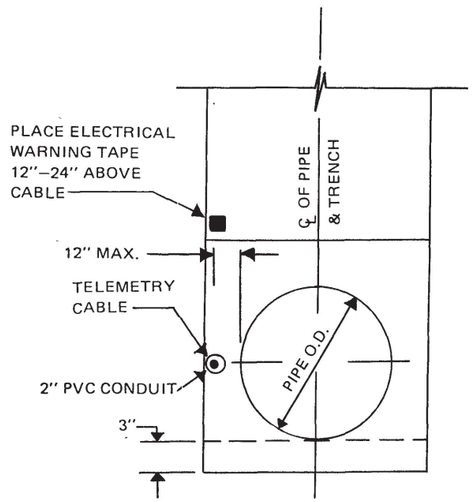
TELEMETRY JUNCTION BOX AT END POINTS

(N.T.S.)



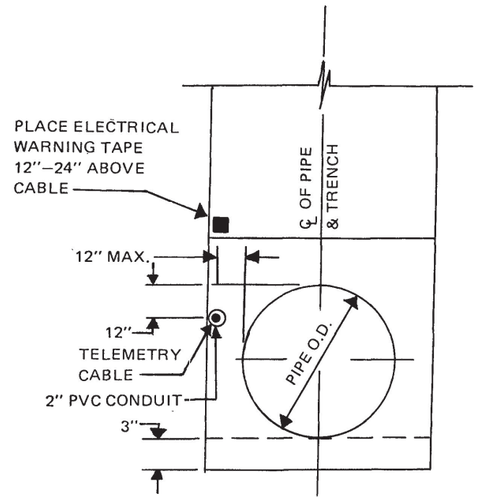
TELEMETRY JUNCTION BOX AT SPLICE POINTS

(N.T.S.)



TELEMETRY CABLE INSTALLATION IN PIPE TRENCH 20" AND SMALLER PIPES

(N.T.S.)

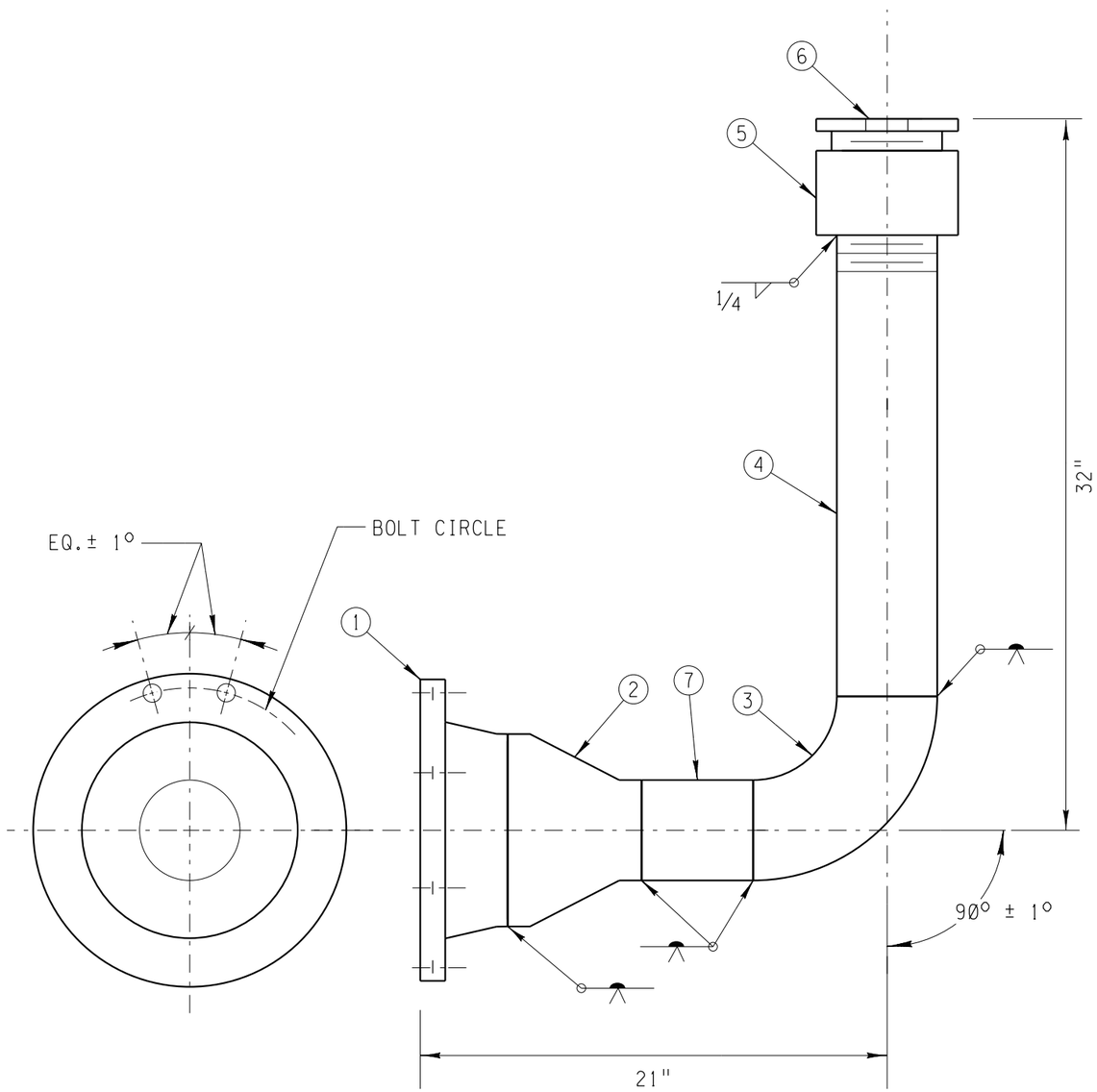


TELEMETRY CABLE INSTALLATION IN PIPE TRENCH 24" AND LARGER PIPES

(N.T.S.)

APPROVED C T Way
CHIEF ENGINEER, R.P.E. NO. C 26724

DESIGN	DESIGNED BY EBMUD	EAST BAY MUNICIPAL UTILITY DISTRICT OAKLAND, CALIFORNIA
	DESIGN CHECKED BY Hubert Lai	STANDARD DRAWING
	DRAWN BY K. Crowe	TELEMETRY CABLE INSTALLATION DETAILS
REVIEW		
RECOM.	SR. CIVIL ENGR. R.P.E. NO. C 27714	STRUCTURE OR ZONE DESIGNATION
	MGR. OF DESIGN R.P.E. NO. C 16814	SCALE N.T.S.
	ASST. CH. ENG., D.&C. R.P.E. NO. C-29111	DATE 24 FEB. '89
		3604–B



MATERIAL LIST		
ITEM NO.	DESCRIPTION	QUANT. REQ'D
①	6" OR 8" WELD NECK STEEL FLANGE, FLAT FACE, SEE NOTE 3	1 EA
②	6"X4" OR 8"X4", STD WT, CONCENTRIC REDUCER, SEE NOTE 4	1 EA
③	4", STD WT, 90° LONG RADIUS ELBOW, SEET NOTE 4	1 EA
④	4" STEEL PIPE, STD WT, MIP THREAD ONE END, SEE NOTE 2	1 EA
⑤	4" STEEL THREADED FULL MERCHANT COUPLING	1 EA
⑥	4" SCH 80 MIP THREAD PVC OR ABS PLUG	1 EA
⑦	4" SCH 40 STEEL, STD WT, SEE NOTE 2	1 EA

NOTES

1. COMPLETED ASSEMBLY SHALL HAVE A CONTINUOUS INSULATING COATING, FREE OF HOLIDAYS AND OTHER DEFECTS. THE FOLLOWING ALTERNATIVES FOR COATING ARE ACCEPTABLE:

   a) FUSION-BONDED EPOXY FOR THE EXTERIOR OF ASSEMBLY. DRY COATING SHALL BE 12 MILS MIN AND 20 MILS MAX. REFER TO SPEC SECTION 09 96 56.10P FOR APPROVED PRODUCTS AND SURFACE PREPARATION REQUIREMENTS;

   b) HIGH-BUILD EPOXY COATING FOR THE EXTERIOR OF ASSEMBLY. DRY COATING SHALL BE 12 MILS MIN. AND 20 MILS MAX. REFER TO SPEC SECTION 09 96 56.05 FOR APPROVED PRODUCTS AND SURFACE PREPARATION REQUIREMENTS;

   c) 50 MILS TAPE WRAP COATING FOR EXTERIOR OF ASSEMBLY PER SPEC SECTION 33 11 13.06P

2. STEEL PIPE: ASTM A53, TYPE E OR S, GRADE B. MIP = MALE END IRON PIPE.

3. STEEL FLANGE: ASME B16.5, CLASS 150. STEEL PER ASTM A105 GRADE B. REFER TO STD DWG 323-EA.

4. ELBOW AND REDUCER: ASME B16.9, STEEL PER ASTM A234 GRADE WPB, STD WT.

5. COATING NOT SHOWN ON DETAIL FOR CLARITY. NO HOLD BACK.

NO	DATE	REVISION	BY	REC	APP
5	09 SEP 2022	REVISED AND REDRAWN	KAP	DSL	CDC
4	03 APR 2019	REVISED	MTS	MM	CDC
3	30 JUN 2008	REVISED	JH	ST	AST
2	16 JUL 2002	REVISED, ADDED TOLERANCE	RA	-	-
1	17 MAY 1993	REVISED	CAD	-	-

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	BORIS YUKHT
	DRAWN BY	P.LUI
REVIEW	CORROSION CHECK BY	K.CHAPMAN
	SR. CIVIL ENG. R.P.E. NO. C 27714	W.BODE
RECOMMENDED MGR. OF DESIGN R.P.E. NO. C 30187		DESI ALVAREZ
APPROVED ASST. CHIEF ENGR. R.P.E. NO. C 29111		D.M.DIEMER

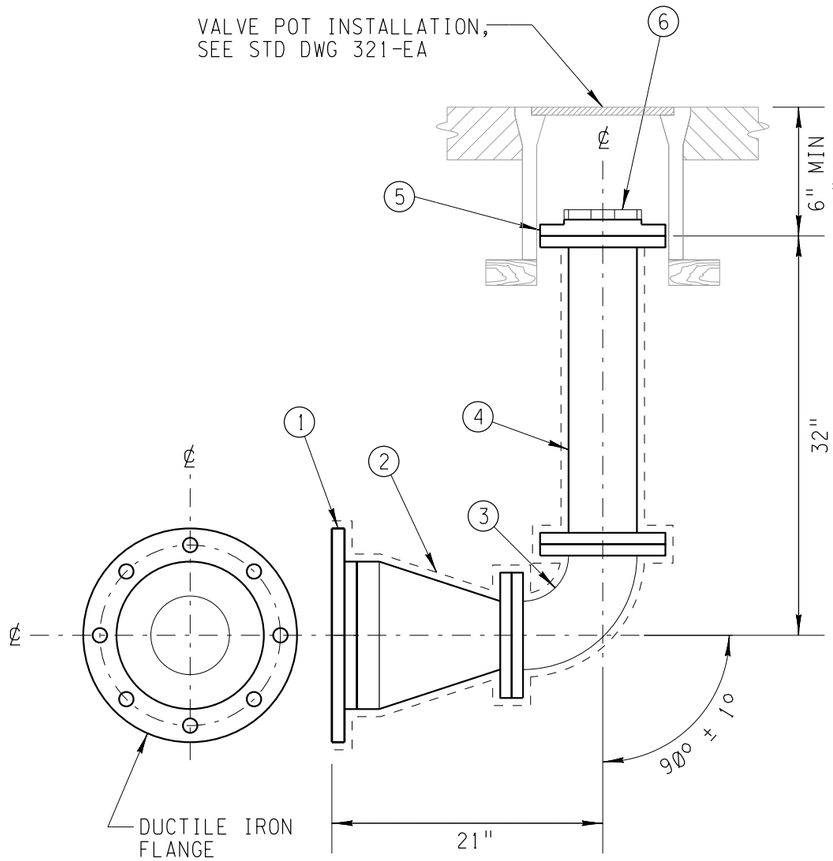
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

4" BLOWOFF ASSEMBLY FABRICATION DETAIL

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	29 JAN 1992

3677-B



MATERIAL LIST		
ITEM	DESCRIPTION	QUANT. REQ'D
1	FLANGE BY FLANGE DUCTILE IRON CONCENTRIC REDUCER, PIPE SIZE BY 4"	1
2	POLYWRAP PER STD DWG 4569-B	AS NEEDED
3	4" FLANGE BY FLANGE 90° ELBOW	1
4	4" FLANGE BY FLANGE SPOOL, LENGTH AS REQUIRED	1
5	4" DUCTILE IRON THREADED COMPANION FLANGE	1
6	4" THREADED PLASTIC PLUG	1

NOTES

1. ALL MATERIALS SHALL BE DUCTILE IRON UNLESS OTHERWISE INDICATED.
2. ALL DUCTILE IRON PIPE AND FLANGED FITTINGS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SPEC SECTION 33 05 19.05P.
3. BOLTS, NUTS AND WASHERS SHALL BE IN ACCORDANCE WITH SPEC SECTION 05 05 26P. GASKETS SHALL BE FULL FACE WITH BULB-TYPE RINGS, 350 PSI, 1/8" THICK, EPDM.
4. BOND ALL JOINTS PER STD DWG 220-EA, AS INDICATED ON THE PROJECT DRAWINGS.

NO	DATE	REVISION	BY	REC	APP

DESIGN

DESIGNED BY	EBMUD
DESIGN CHECKED BY	EBMUD
DRAWN BY	EBMUD

REVIEW

CORROSION CHECKED BY
R.P.E. NO. CR 1080
KEITH A. PACKARD

SR CIVIL ENGINEER
R.P.E. NO. C 66307
DAVID KATZEV

RECOMMENDED
MGR PIPELINE INFRASTRUCTURE
R.P.E. NO. C 57170
CARLTON D. CHAN

APPROVED
DIRECTOR OF ENGINEERING & CONST.
R.P.E. NO. C 44278
OLUJIMI O. YOLOYE

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

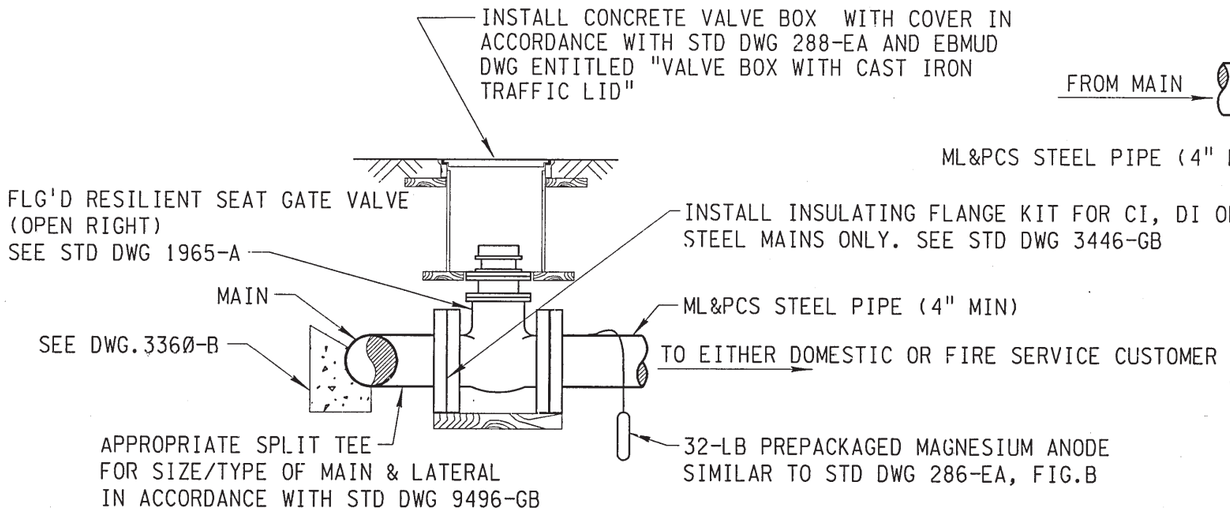
DUCTILE IRON 4" BLOWOFF ASSEMBLY FABRICATION DETAIL

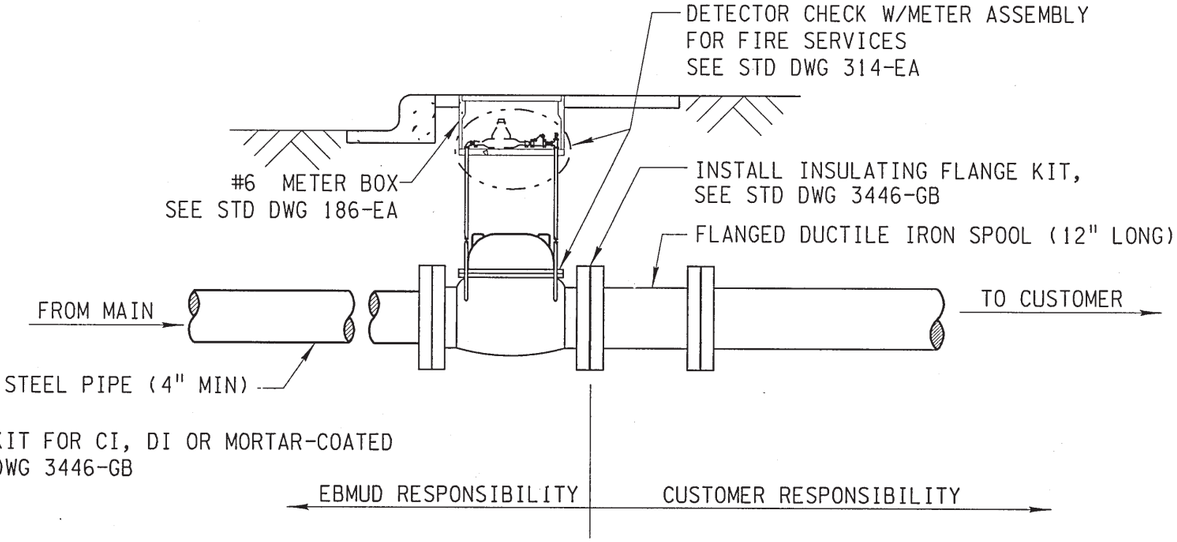
STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	17 AUG 2022

3677-B-1

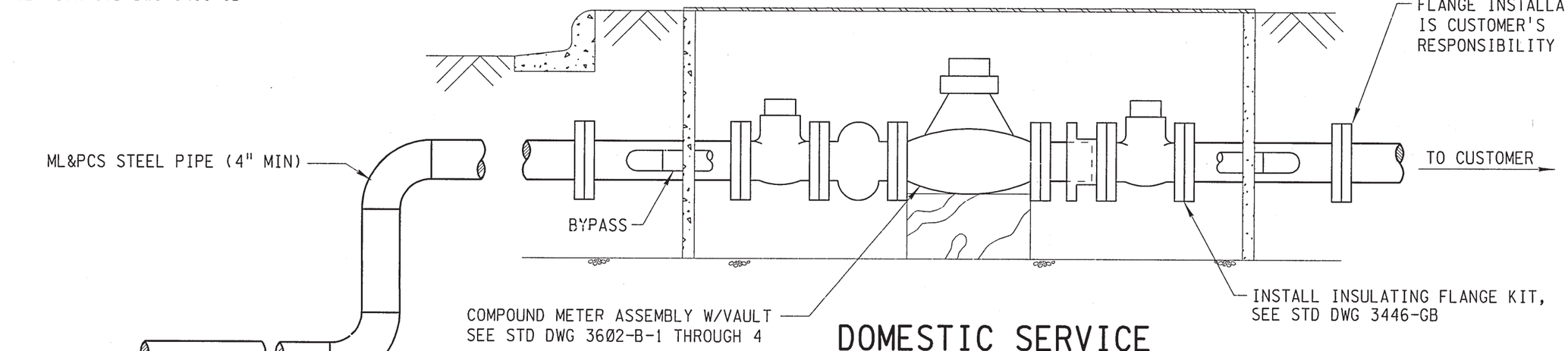
NOTES:

1. 12" ML & PCS AND 12" TAPS ARE USED WHEN INSTALLING LATERALS TO 10" METERS.
2. 4" ML & PCS AND 4" TAPS ARE USED WHEN INSTALLING LATERALS TO 3" DOMESTIC METERS.





FIRE SERVICE



DOMESTIC SERVICE

NO.	DATE	REVISION	BY	REC.	APP.
1	30JUNE08	REVISED			

DESIGN
DESIGNED BY D MCINTIRE
DESIGN CHECKED BY R STANTON
DRAWN BY TOM LEE

REVIEW

RECOMMENDED
SENIOR CIVIL ENGINEER
R.P.E. NO. C 48598

APPROVED
MGR. OF DESIGN
R.P.E. NO. C 39851

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

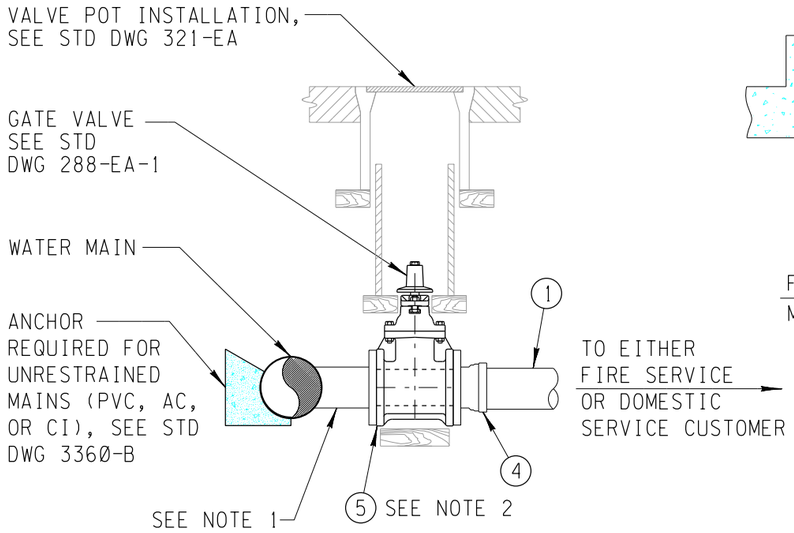
STANDARD DRAWING

MAIN CONNECTION FOR FIRE SERVICES OR 3" AND LARGER DOMESTIC SERVICES

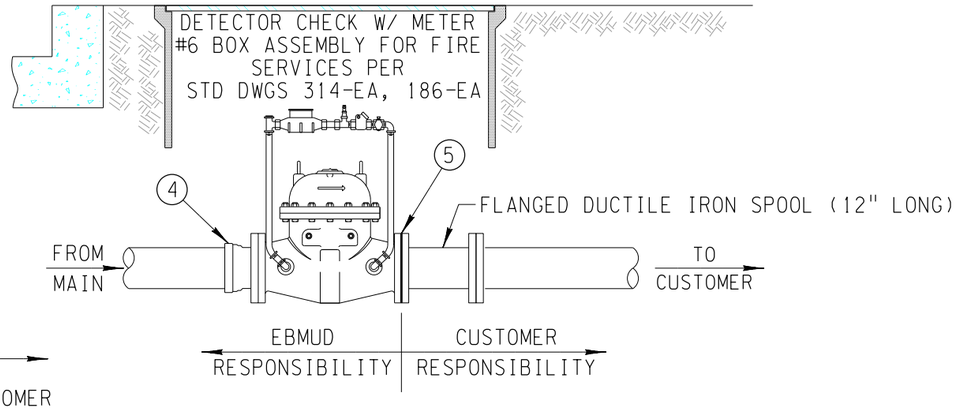
STRUCTURE OR ZONE DESIGNATION ALL
SCALE NONE
DATE

3684-B

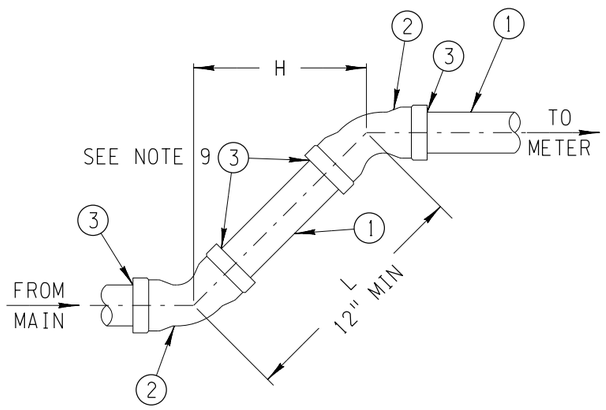
USER: bkolodzi
PLOT DATE: 03-JUL-2008 08:50
FILE: H:\general\std-dwgs\revisions2008\3684b.dgn



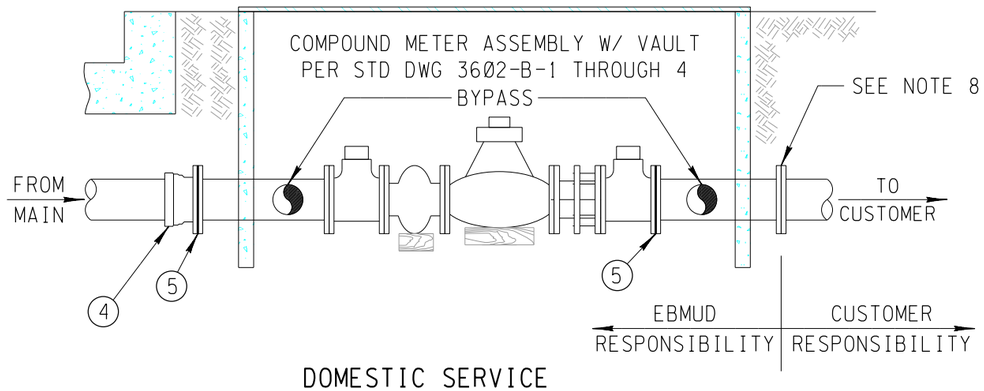
TEE AND GATE VALVE FROM MAIN LINE



FIRE SERVICE



ANGLED BEND



DOMESTIC SERVICE

MATERIAL LIST		
ITEM	DESCRIPTION	QUANTITIES REQUIRED
1	DUCTILE IRON PIPE LENGTH FIELD CUT AS REQUIRED	AS NEEDED
2	45° DIP BEND TR FLEX OR EQUAL	2
3	GRIPPER RINGS FOR FIELD CUT PIPE SEE NOTE 9	4
4	FLANGE X TR FLEX ADAPTOR OR EQUAL	2
5	INSULATING FLANGE KIT PER STD DWG 3186-B	AS NEEDED

NOTES

1. SELECT APPROPRIATE TEE FOR SIZE/TYPE OF MAIN & LATERAL PER STD DWG 9496-GB.
2. INSTALL INSULATING FLANGE KIT FOR MORTAR COATED STEEL, PLASTIC COATED STEEL, AND CAST IRON MAINS ONLY BETWEEN TEE AND FLANGED GATE VALVE.
3. 12" TAPS ARE USED WHEN INSTALLING LATERALS TO 10" METERS.
4. 4" TAPS ARE USED WHEN INSTALLING LATERALS TO 3" DOMESTIC METERS.
5. POLYWRAP NOT SHOWN FOR CLARITY. INCLUDE WHERE REQUIRED PER SPECIFICATIONS AND REFERENCED DETAILS, SEE STD DWG 4569-B.
6. ALL DUCTILE IRON PIPE AND FLANGED FITTINGS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SPEC SECTION 33 05 19.05P.
7. BOND ALL JOINTS PER STD DWG 220-EA, AS INDICATED ON THE PROJECT DRAWINGS.
8. FLANGE INSTALLATION IS CUSTOMER'S RESPONSIBILITY AND SHOULD BE COORDINATED WITH EBMUD.
9. GRIPPER RINGS SHALL NOT BE INSTALLED ON VERTICAL INSTALLATIONS EXCEEDING 45 DEGREES.

NO	DATE	REVISION	BY	REC	APP

DESIGN

DESIGNED BY	EBMUD
DESIGN CHECKED BY	EBMUD
DRAWN BY	EBMUD

REVIEW

CORROSION CHECKED BY R.P.E. NO. CR 1080	KEITH A. PACKARD
SR CIVIL ENGINEER R.P.E. NO. C 66307	DAVID KATZEV
RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 57170	CARLTON D. CHAN
APPROVED DIRECTOR OF ENGINEERING & CONST. R.P.E. NO. C 44278	OLUJIMI O. YOLOYE

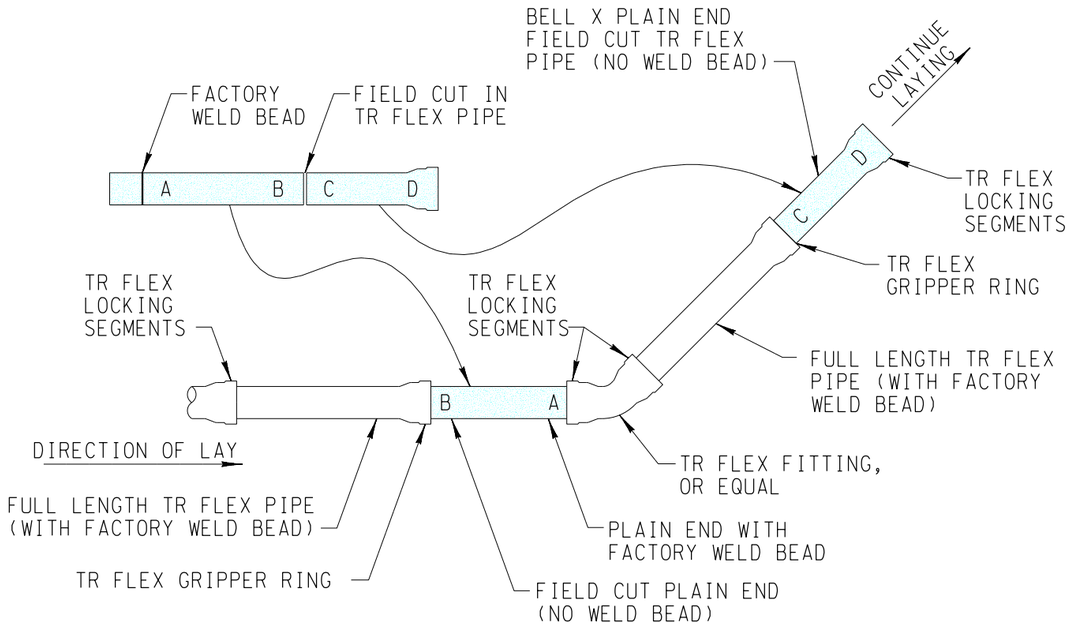
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

DUCTILE IRON MAIN CONNECTION FOR FIRE SERVICES OR 3" AND LARGER DOMESTIC SERVICES

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	17 AUG 2022

3684-B-1



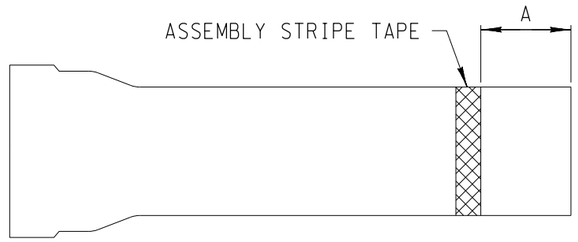
TR FLEX GRIPPER RING - INSTALLATION EXAMPLE

THE ILLUSTRATION SHOWS HOW TO USE TR FLEX GRIPPER RINGS IN PIPE WHILE UTILIZING FITTINGS. A FIELD CUT IS MADE TO A TR FLEX PIPE AT THE DESIRED LOCATION. THE SPIGOT END WITH THE FACTORY WELD BEAD (A) IS INSTALLED INTO ONE END OF THE TR FLEX FITTING AND RESTRAINED WITH CONVENTIONAL TR FLEX LOCKING SEGMENTS. THE FIELD CUT AND BEVELED PLAIN END (B) IS INSTALLED INTO THE BELL OF THE PRECEDING PIPE AND RESTRAINED WITH A TR FLEX GRIPPER RING. A FULL LENGTH TR FLEX PIPE IS THEN INSTALLED INTO THE OTHER SOCKET OF THE TR FLEX FITTING AND RESTRAINED WITH TR FLEX LOCKING SEGMENTS. THE REMAINING BELL BY PLAIN END CUT PIECE IS THEN INSTALLED INTO THE SOCKET OF THE FULL LENGTH TR FLEX PIPE WITH A TR FLEX GRIPPER RING. LAYING CONTINUES WITH CONVENTIONAL TR FLEX PIPE.

DEFLECTION

IF THE TR FLEX GRIPPER RING IS NOT SQUARE WITH THE PIPE DURING INSTALLATION, ANY SUBSEQUENT MOVEMENT OF THE JOINT AS PRESSURE IS APPLIED COULD RESULT IN LOOSENING THE RING AND POSSIBLE JOINT SEPARATION.

THE JOINT DEFLECTION SHOULD BE SET ONLY AFTER THE INSTALLATION IS COMPLETE.



PIPE DIA (IN)	DIMENSIONS (IN)		
	OD	OD BELL	A
4	4.80	7.00	4.375
6	6.90	9.27	4.875
8	9.05	11.68	5.375
12	13.20	16.43	5.875
16	17.40	21.10	7.500
"A" DENOTES LOCATION OF ASSEMBLY STRIPE TAPE FROM FIELD CUT END.			

ASSEMBLY STRIPE TAPE

IT IS IMPORTANT TO HAVE A HIGHLY VISIBLE ASSEMBLY MARK ACCURATELY LOCATED ON THE PIPE SPIGOT END. IT IS RECOMMENDED THAT 2 INCH DUCT TAPE, OR A SIMILAR TYPE TAPE, BE USED FOR THIS ASSEMBLY STRIPE.

MEASURE FROM THE SQUARE FIELD CUT END TO THE LOCATION SHOWN IN THE TABLE AND MAKE SEVERAL MARKS AROUND THE PIPE BARREL AT THE MEASURED DISTANCE. APPLY THE TAPE AROUND THE PIPE SPIGOT SUCH THAT THE SPIGOT END OF THE TAPE IS ALIGNED WITH THE MARKS.

FIELD CUT TR FLEX PIPE

NOTES

1. INSTALLATION EXAMPLES ARE FOR US PIPE TR FLEX DUCTILE IRON PIPE AND FITTINGS. FOR ADDITIONAL FITTINGS AND DIMENSIONS, REFERENCE MANUFACTURER PRODUCT INFORMATION.
2. ALL DUCTILE IRON APPURTENANCES SHALL BE POLYWRAPPED PER STD DWG 4569-B.
3. DUCTILE IRON PIPE SHALL BE IN ACCORDANCE WITH AWWA STANDARD C151 - DUCTILE IRON PIPE, CENTRIFUGALLY CAST.
4. SEE SPEC SECTION 33 05 19.07P FOR INSTALLATION OF DUCTILE IRON PIPE AND FITTINGS.
5. WHEN PIPE IS CUT IN THE FIELD, THE OUTSIDE OF THE PLAIN END SHALL BE BEVELED ABOUT ONE-QUARTER INCH AT AN ANGLE OF ABOUT 30 DEGREES AND THE LEADING EDGE FOUNDED.
6. TR FLEX GRIPPER RINGS ARE USED TO RESTRAIN FIELD CUT PIPE (PIPE WITHOUT WELDMENT) INSIDE TR FLEX PIPE AND FITTINGS. SEE MANUFACTURER INFORMATION FOR SUITABLE WORKING CONDITIONS AND INSTALLATION DETAILS.
7. GRIPPER RINGS SHALL NOT BE USED ON VERTICAL INSTALLATIONS GREATER THAN 45°.
8. BOLTS, NUTS AND WASHERS SHALL BE IN ACCORDANCE WITH SPEC SECTION 05 05 26P - FLANGE BOLTING.
9. BOND ALL JOINTS PER STD DWG 220-EA, AS INDICATED ON THE PROJECT DRAWINGS.

NO	DATE	REVISION	BY	REC	APP

DESIGN

DESIGNED BY	EBMUD
DESIGN CHECKED BY	EBMUD
DRAWN BY	EBMUD

REVIEW

CORROSION CHECKED BY Keith Packard
R.P.E. NO. CR 1080 KEITH A. PACKARD

SR CIVIL ENGINEER David Katzev
R.P.E. NO. C 66307 DAVID KATZEV

RECOMMENDED Carlton D. Chan
MGR PIPELINE INFRASTRUCTURE
R.P.E. NO. C 57170 CARLTON D. CHAN

APPROVED Olujimi O. Yoloye
DIRECTOR OF ENGINEERING & CONST.
R.P.E. NO. C 44278 OLUJIMI O. YOLOYE

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

DUCTILE IRON
PIPE INSTALLATION

TR FLEX FIELD CUT PIPE

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	17 AUG 2022

4501-B

DIRECTIONS

1. READ ALL INSTRUCTIONS PROVIDED WITH THE EXOTHERMIC WELD EQUIPMENT.

2. COLLECT ALL EXOTHERMIC WELD MATERIALS AND PPE AS SHOWN ON THE EQUIPMENT CHECKLIST.

3. STRIP THE INSULATION FROM THE END OF THE WIRE. REMOVE THE MINIMUM LENGTH OF INSULATION TO FIT THE COPPER SLEEVE AND CRIMP THE COPPER SLEEVE TO THE EXPOSED COPPER.

4. REMOVE PIPE COATING (TAPE OR MORTAR) TO EXPOSE A BARE STEEL PATCH FOR THE SURFACE OF THE GRAPHITE MOLD. USE AN ANGLE GRINDER WITH AN ABRASIVE WHEEL TO CLEAN THE PIPE SURFACE TO CLEAN AND SHINY METAL. PIPE SURFACE MUST BE DRY.

5. PUSH THE CABLE INTO THE BOTTOM OF THE MOLD AND PLACE THE MOLD AGAINST THE TOP OF THE PIPE WITH THE CABLE INLINE WITH THE LENGTH OF THE PIPE.

6. PUT ON FACE SHIELD, SAFETY GLASSES, RESPIRATORY PROTECTION, AND GLOVES.

7. PUT THE CADWELD PLUS PACKAGE INTO THE TOP OF THE MOLD AND CONNECT THE CLIP FROM THE CONTROL UNIT TO THE IGNITOR STRIP ON THE PACKAGE. CLOSE THE MOLD COVER.

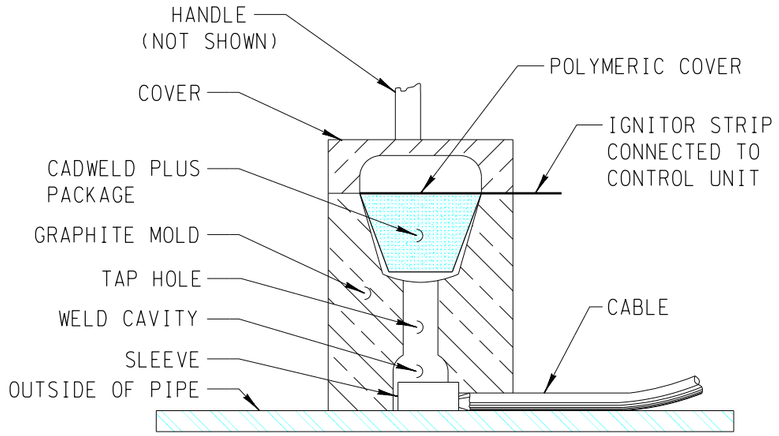
8. PRESS DOWN ON THE HANDLE OF THE GRAPHITE MOLD AND PUSH THE BUTTON ON THE BATTERY UNIT TO IGNITE THE WELD METAL.

9. HOLD THE MOLD AGAINST THE PIPE FOR AN ADDITIONAL 5 SECONDS TO ALLOW THE WELD METAL TO SOLIDIFY AND FUSE THE WIRE TO THE PIPE.

10. LIFT THE MOLD STRAIGHT UP AND DISCARD THE REMNANTS OF THE PACKAGE. USE A WIRE BRUSH OR SCRAPING TOOL TO REMOVE SLAG AND DEBRIS FROM THE MOLD.

11. STRIKE THE WELD NUGGET WITH A MODERATE AMOUNT OF FORCE USING A 1-POUND HAMMER TO TEST ADHERENCE AND TO REMOVE SLAG FROM THE WELD NUGGET. REPLACE ALL CONNECTIONS THAT DO NOT PASS THE HAMMER TEST.

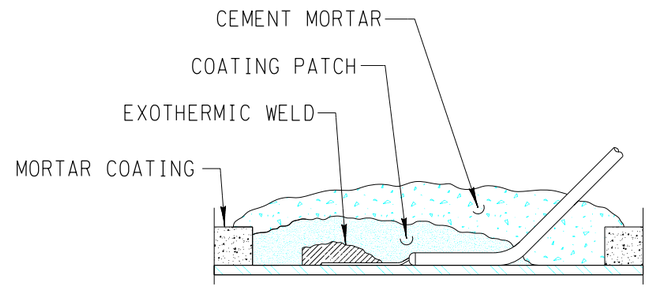
12. COVER THE WELD NUGGET AND EXPOSED STEEL WITH EPOXY PUTTY OR SIMILAR APPROVED COATING PATCH. COATING PATCH SHALL BE 1/4" THICK OVER WELD AND BARE WIRE. OVERLAP COATING AND WIRE INSULATION BY 1/2" INCH.



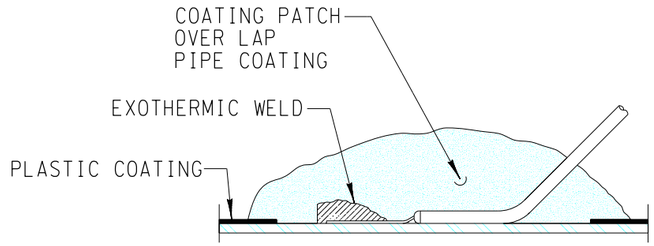
EQUIPMENT CHECKLIST

- o GRAPHITE MOLD
- o CADWELD PLUS PACKAGE (STEEL OR CAST IRON SPECIFIC)
- o CADWELD PLUS CONTROL UNIT WITH BATTERIES
- o ANGLE GRINDER WITH ABRASIVE WHEEL
- o FACE SHIELD, SAFETY GLASSES, RESPIRATORY PROTECTION, GLOVES
- o 1-POUND HAMMER
- o WIRE BRUSH, SCRAPING TOOL, COTTON RAG AS NEEDED TO CLEAN SURFACES
- o COATING PATCHES SUCH AS EPOXY PUTTY, TRENTON PATCH PADS OR VISCOTAQ PADS

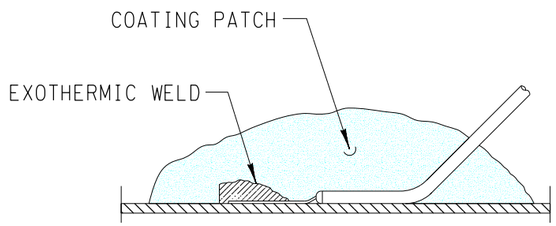
CONNECTION DETAILS



CEMENT MORTAR COATED STEEL PIPE



PLASTIC COATED STEEL PIPE



CAST IRON PIPE

NO	DATE	REVISION	BY	REC	APP

DESIGN

DESIGNED BY	EBMUD
DESIGN CHECKED BY	EBMUD
DRAWN BY	EBMUD

REVIEW

CORROSION CHECKED BY
R.P.E. NO. CR 1080
KEITH A. PACKARD

SR CIVIL ENGINEER
R.P.E. NO. C 78318
DUSTIN J. LA VALLEE

RECOMMENDED
MGR PIPELINE INFRASTRUCTURE
R.P.E. NO. C 57170
CARLTON D. CHAN

APPROVED
DIRECTOR OF ENGINEERING & CONST.
R.P.E. NO. C 44278
OLUJIMI O. YOLOYE

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

EXOTHERMIC WELD CONNECTION

COPPER WIRE TO STEEL OR CAST IRON PIPE

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	17 AUG 2022

4508-B

SUPERSEDES 1823-A

POLYWRAP INSTALLATION STEPS

1. CUT POLYWRAP TUBE 2 FEET LONGER THAN PIPE SEGMENT AND SLIP ONTO PIPE.

2. STARTING 18-INCHES FROM SPIGOT END, TAKE UP SLACK OF POLYWRAP AND TAPE POLYWRAP THE ENTIRE CIRCUMFERENCE OF PIPE AT 2 FOOT INTERVALS AS SHOWN IN FIGURE 1.

3. PRIOR TO LAYING PIPE IN TRENCH FOR JOINTING, BUNCH THE 12 INCH OVERLAP TUBE ACCORDION FASHION LENGTHWISE UNTIL IT CLEARS THE PIPE END. SEE FIGURE 2.

4. PLACE PIPE IN TRENCH.

5. SLIP THE END OF THE POLYWRAP SECTION FROM THE PREVIOUS PIPE (BELL) OVER THE NEW PIPE (SPIGOT) AS SHOWN IN FIGURE 3, AND SECURE IN PLACE WITH CIRCUMFERENTIAL TAPE.

6. REPAIR CUTS, TEARS, PUNCTURES, OR DAMAGE TO POLYWRAP WITH 3 LAYERS OF ADHESIVE TAPE OR A SHORT LENGTH OF POLYWRAP SECURED IN PLACE.

POLYWRAP INSTALLATION STEPS FOR APPURTENANCES

1. PROVIDE OPENINGS FOR BRANCHES, BLOWOFFS, AIR VALVES, AND SIMILAR APPURTENANCES BY CUTTING AN "X" IN THE POLYWRAP AND TEMPORARILY FOLDING BACK THE FILM.

2. INSTALL APPURTENANCE.

3. TAPE SLACK SECURELY TO THE APPURTENANCES, AND REPAIR THE CUT AND OTHER DAMAGED AREAS AS DESCRIBED IN STEP 6 OF POLYWRAP INSTALLATION STEPS.

POLYWRAP INSTALLATION STEPS FOR DIRECT SERVICE TAPS

1. INSTALL POLYWRAP ON PIPE AS DESCRIBED UNDER POLYWRAP INSTALLATION STEPS.

2. WRAP TWO OR THREE LAYERS OF POLYETHYLENE PLASTIC TAPE COMPLETELY AROUND THE PIPE AND POLYWRAP TO COVER THE AREA WHERE THE TAPPING MACHINE AND CHAIN WILL BE MOUNTED.

3. CUT HOLE IN TAPE AND POLYWRAP SO SADDLE GASKET SITS FLUSH AGAINST PIPE. MOUNT THE TAPPING MACHINE ON THE PIPE AREA COVERED BY THE TAPE. THEN MAKE TAP AND INSTALL THE CORPORATION STOP.

4. AFTER INSTALLATION, INSPECT AREA AROUND SERVICE TAP AND MAKE ANY REPAIRS TO THE TAPE OR SURROUNDING POLYWRAP WITH TAPE.

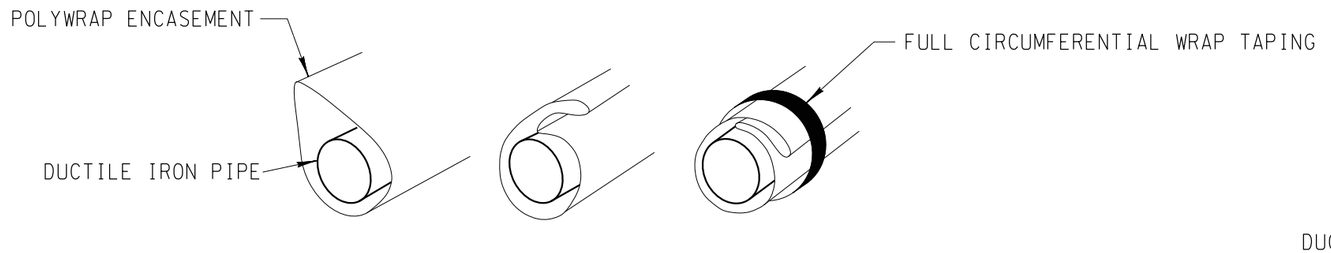


FIGURE 1 - POLYWRAP SLACK REDUCTION PROCEDURE

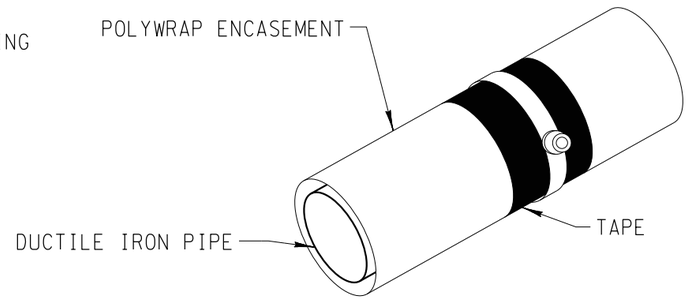


FIGURE 4 - POLYWRAP SERVICE TAP

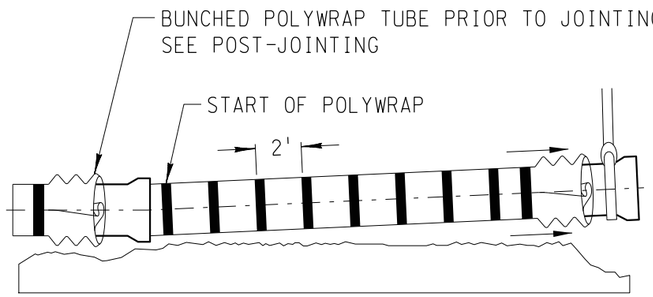


FIGURE 2 - POLYWRAP INSTALLATION PROCEDURE

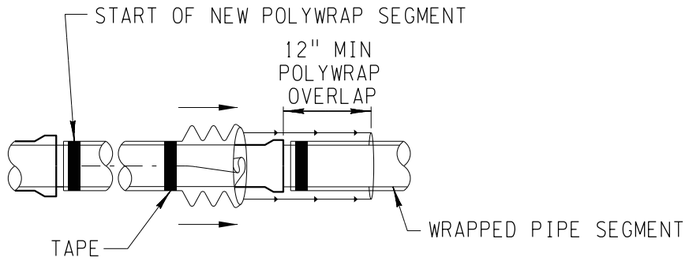


FIGURE 3 - POLYWRAP INSTALLATION PROCEDURE AT JOINT

MATERIAL LIST	
ITEM	DESCRIPTION
POLYWRAP	V-BIO PER SPEC SECTION 33 11 13.10P
TAPE	POLYETHYLENE PLASTIC TAPE PER SPEC SECTION 33 11 13.10P

NO	DATE	REVISION	BY	REC	APP

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	EBMUD
	DRAWN BY	EBMUD
REVIEW	CORROSION CHECKED BY R.P.E. NO. CR 1080	KEITH A. PACKARD
	SR CIVIL ENGINEER R.P.E. NO. C 66307	DAVID KATZEV
	RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 57170	CARLTON D. CHAN
	APPROVED DIRECTOR OF ENGINEERING & CONST. R.P.E. NO. C 44278	OLUJIMI O. YOLOYE

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

POLYWRAP INSTALLATION

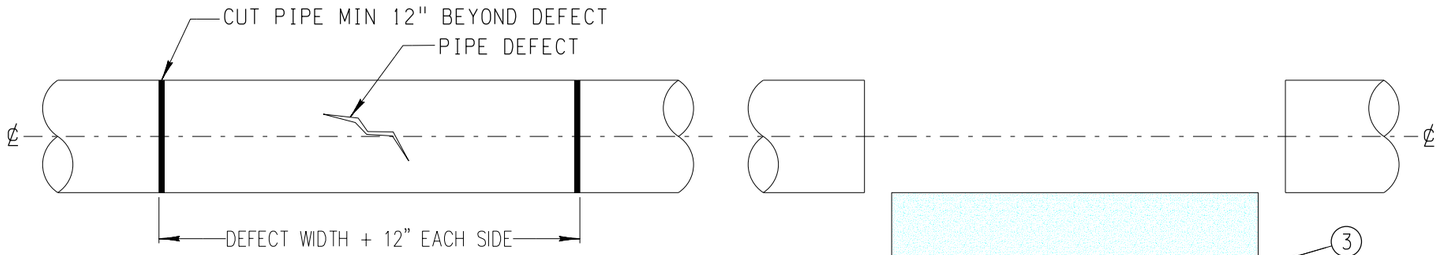
DI PIPE, APPURTENANCES AND DIRECT SERVICE TAPS

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	17 AUG 2022

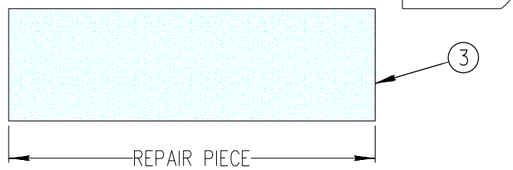
4569-B

REPAIR USING RESTRAINED FLEX COUPLINGS

1. THOROUGHLY CLEAN THE PIPE WHERE THE COUPLING WILL BE INSTALLED. BE SURE TO REMOVE BUILD-UP, DIRT, DEBRIS, THAT COULD POTENTIALLY AFFECT THE GASKET SEAL.
2. MEASURE THE PIPE DIAMETER TO CONFIRM THE APPROPRIATE COUPLING TO USE.
3. CUT THE DAMAGED PIPE 12" BEYOND THE DEFECT ON EITHER SIDE.
4. CUT THE REPAIR PIECE 1" SHORTER THAN THE PIECE REMOVED.
5. SLIDE COUPLINGS ONTO EXISTING PIPE. POSITION THE REPAIR PIECE BETWEEN THE COUPLINGS AND SLIDE THE COUPLINGS INTO PLACE.
6. TIGHTEN THE COUPLING BOLTS ACCORDING TO THE TORQUE LISTED ON THE MANUFACTURER LITERATURE.
7. REPAIR TRACER WIRE IF NECESSARY.
8. INSTALL 32-POUND ANODE PER STD DWG 4571-B AS REQUIRED.
9. REPAIR POLYWRAP PER STD DWG 4569-B.

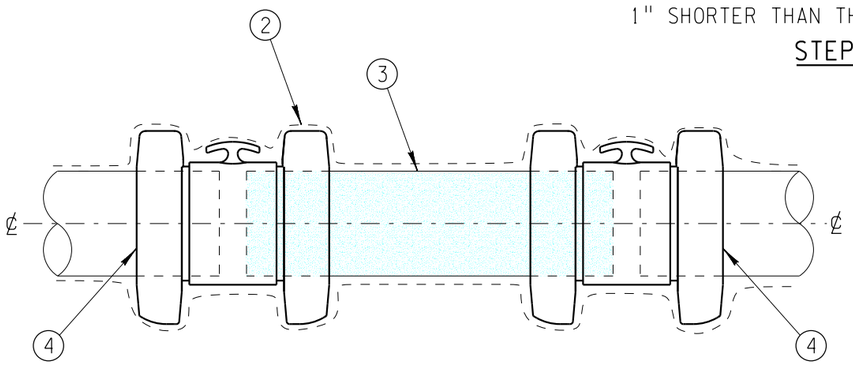


STEPS 1-3



1" SHORTER THAN THE PIECE REMOVED

STEP 4

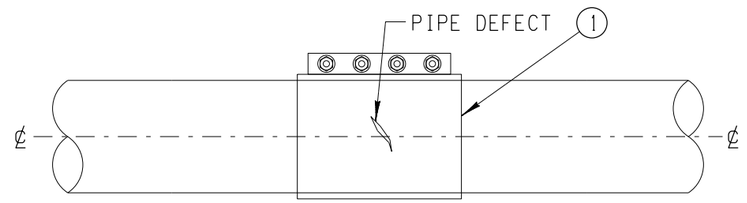


STEPS 5-9

NO	DATE	REVISION	BY	REC	APP

REPAIR USING FULL CIRCLE CLAMP

1. THOROUGHLY CLEAN THE PIPE WHERE CLAMP WILL BE INSTALLED. BE SURE TO REMOVE BUILD-UP, DIRT, AND DEBRIS THAT COULD POTENTIALLY AFFECT THE GASKET SEAL.
2. MEASURE THE PIPE DIAMETER TO CONFIRM THE APPROPRIATE CLAMP SIZE.
3. PLACE CLAMP AROUND PIPE CENTERED OVER DAMAGED AREA WITH THE GASKET PROPERLY IN PLACE. MESH THE LUG FINGERS TO THEIR APPROPRIATE POSITION. TIGHTEN THE CENTER-MOST BOLT(S) BY HAND.
4. ROTATE CLAMP AWAY FROM GASKET TAPER TO ENSURE PROPER SEATING AND POSITION BOLTS AND NUTS FOR CONVENIENT TIGHTENING. TIGHTEN NUTS WORKING FROM THE CENTER OUTWARD.
5. TIGHTEN THE REPAIR CLAMP BOLTS ACCORDING TO THE TORQUE LISTED ON THE MANUFACTURER LITERATURE.
6. INSTALL 32-POUND ANODE PER STD DWG 4571-B AS REQUIRED.
7. REPAIR POLYWRAP PER STD DWG 4569-B.



STEPS 1-7

MATERIAL LIST			
ITEM	DESCRIPTION	CLAMP	COUPLINGS
1	FULL CIRCLE CLAMP, SIZE AS REQUIRED	1	–
2	POLYWRAP PER STD DWG 4569-B, LENGTH AS REQUIRED	AS NEEDED	AS NEEDED
3	DUCTILE IRON OR PVC PIPE, LENGTH AS REQUIRED	–	AS NEEDED
4	RESTRAINED FLEXIBLE COUPLINGS	–	2

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	EBMUD
	DRAWN BY	EBMUD
REVIEW	CORROSION CHECKED BY R.P.E. NO. CR 1080	KEITH A. PACKARD
	SR CIVIL ENGINEER R.P.E. NO. C 66307	DAVID KATZEV
RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 57170		CARLTON D. CHAN
APPROVED DIRECTOR OF ENGINEERING & CONST. R.P.E. NO. C 44278		OLUJIMI O. YOLOYE

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

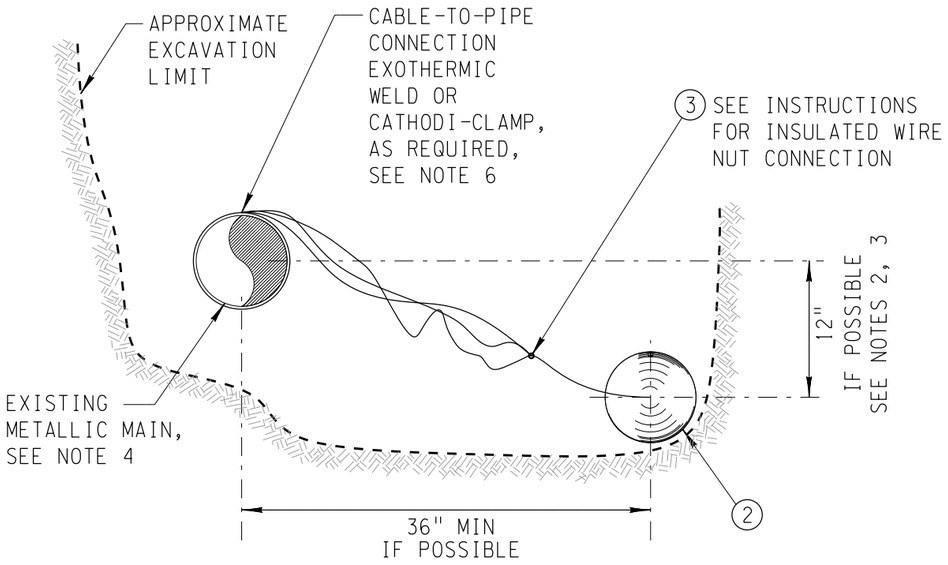
STANDARD DRAWING

DUCTILE IRON PIPE REPAIR DETAILS AND FIELD CLOSURE

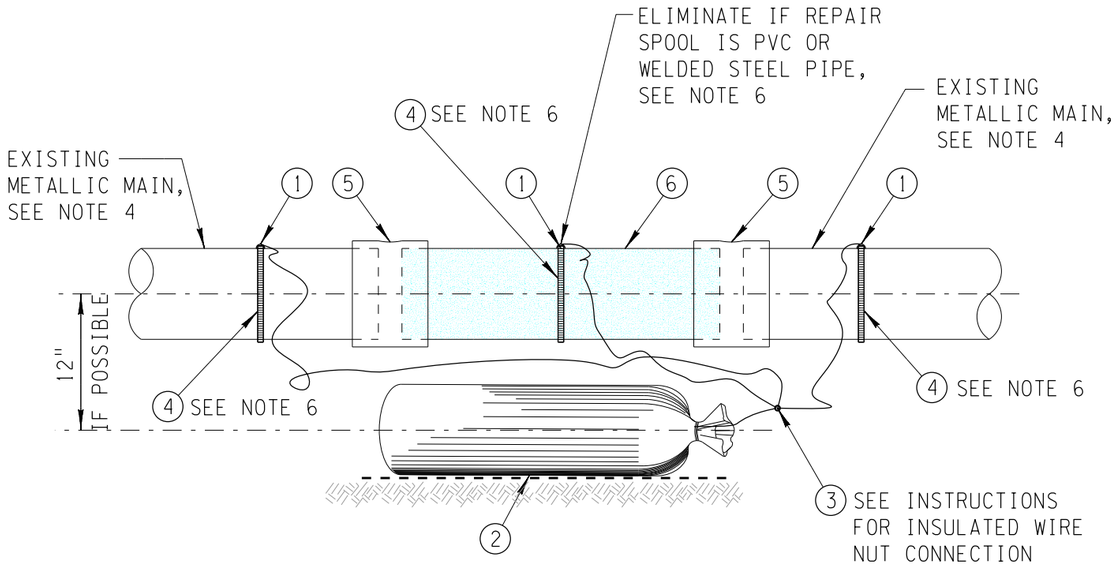
4" - 16" DUCTILE IRON

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	17 AUG 2022

4570-B



TYPICAL TRENCH SECTION AT MAIN BREAK



TYPICAL TRENCH LONGITUDINAL SECTION AT MAIN BREAK

INSTRUCTIONS FOR INSULATED WIRE NUT CONNECTION

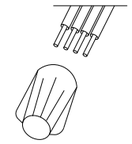
A. STRIP WIRE INSULATION BACK APPRX ½" TO EXPOSE BRIGHT CLEAN COPPER CONDUCTOR.

B. ALIGN ALL CONDUCTORS AND PLACE STRIPPED WIRES TOGETHER WITH ENDS OF INSULATION EVEN.

C. TWIST CONNECTOR ONTO WIRES BY PUSHING FIRMLY UNTIL HAND-TIGHT. DO NOT OVER-TIGHTEN.

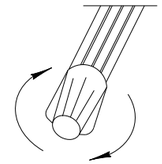
D. WIPE SEALANT IN AND AROUND CONDUCTORS AND CONNECTOR OPENING WHILE TIGHTENING.

E. IF ANY CONDUCTORS ARE NOT SECURED, USE A NEW WIRE NUT AND REPEAT STEPS A THROUGH D.



STEPS A-B

THREE WIRES ARE USED TO CONNECT TO EACH PIPE SEGMENT, THE FOURTH WIRE IS FROM AN ANODE (WHEN INSTALLED)



STEPS C-D

MATERIAL LIST		
ITEM	DESCRIPTION	QUANTITIES REQUIRED
(1)	EXOTHERMIC WELD SUPPLIES	COMPLETE KIT
(2)	32-POUND MAGNESIUM ANODE	1
(3)	DIRECT BURY SPLICE KIT	1
(4)	CATHODI-CLAMP WITH WIRE	AS REQUIRED FOR ALL METALLIC SEGMENTS
(5)	RESTRAINED FLEXIBLE COUPLING	2
(6)	REPAIR SPOOL (STEEL, DI OR PVC)	AS REQUIRED

NOTES

1. REMOVE PAPER OR PLASTIC SHIPPING BAG AROUND ANODE BEFORE BURYING ANODE.
2. BURY ANODE IN NATIVE SOIL (12" MIN COVER).
3. ANODE CAN BE INSTALLED HORIZONTALLY OR VERTICALLY. TOP OF ANODE SHALL BE A MINIMUM OF 36-INCHES BELOW GRADE.
4. METALLIC MAINS INCLUDE STEEL, CAST IRON, DUCTILE IRON, AND WROUGHT IRON PIPE.
5. FOR DUCTILE IRON REPAIR SEE STD DWG 4570-B.
6. STAINLESS STEEL CATHODI-CLAMP MAY BE USED IN LIEU OF EXOTHERMIC WELDS ON CI, DI, AND WI PIPE.

NO	DATE	REVISION	BY	REC	APP

DESIGN

DESIGNED BY	EBMUD
DESIGN CHECKED BY	EBMUD
DRAWN BY	EBMUD

REVIEW

CORROSION CHECKED BY R.P.E. NO. CR 1080 — KEITH A. PACKARD

SR CIVIL ENGINEER R.P.E. NO. C 78318 — DUSTIN J. LA VALLEE

RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 57170 — CARLTON D. CHAN

APPROVED DIRECTOR OF ENGINEERING & CONST. R.P.E. NO. C 44278 — OLUJIMI O. YOLOYE

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

GALVANIC ANODE INSTALLATION FOR METALLIC MAIN BREAK

STRUCTURE OR ZONE DESIGNATION: ALL

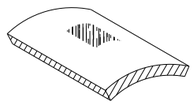
SCALE: NONE

DATE: 17 AUG 2022

4571-B

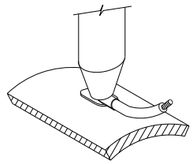
PIN-BRAZED CONNECTION INSTRUCTIONS

STEP 1. FILE STRUCTURE CONNECTION AREA TO BARE SHINY METAL AND CLEAN. ENSURE AREA IS SUFFICIENT TO ACCOMMODATE BRAZING PIN. AREA SHALL BE SMOOTH, NO PEEN PATTERN.

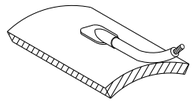


STEP 2. STRIP INSULATION FROM WIRE. ATTACH LUG TO CABLE BY CRIMPING.

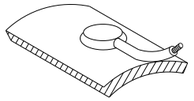
STEP 3. ATTACH GROUND TO BARE METAL ON THE PIPE, OR TO A WIRE CONNECTION THAT HAS ALREADY BEEN COMPLETED ON THE PIPE OR FITTING. LOAD GUN WITH THE LUG AND CERAMIC FERRULE. ADJUST AS NECESSARY. BRAZE LUG TO PIPE.



STEP 4. PEEN CONNECTION WITH A HAMMER TO TEST CONNECTION FOR SOUNDNESS. SEE NOTE 5.



STEP 5. COVER CONNECTION AND EXPOSED PIPE SURFACE WITH REPAIR PATCH. SEE NOTE 6.



NOTES

1. PROCEDURE SHOWN ABOVE SHALL BE USED AS A GENERAL GUIDE ONLY. CONSULT MANUFACTURER'S LITERATURE FOR SPECIFIC INSTALLATION INSTRUCTIONS.

2. TO PREVENT THE CLEANED METAL SURFACE RE-OXIDIZING, PIN BRAZING SHALL TAKE PLACE AS SOON AS POSSIBLE AFTER SURFACE PREPARATION. NOT MORE THAN 5 MINUTES DELAY.

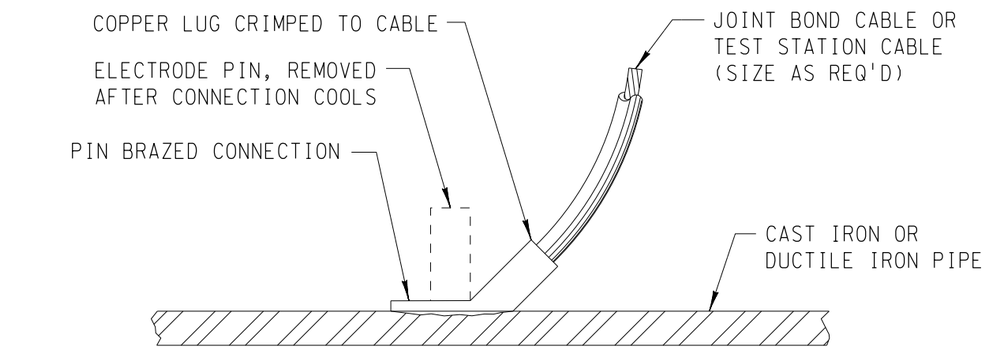
3. THE DESIRED POSITION OF THE REQUIRED PIN BRAZE AREA SHALL BE ACCURATELY MARKED ON THE PIPE. DO NOT USE ANY OIL BASED MARKER E.G. SPRAY PAINT, AS THIS WILL CONTAMINATE THE GRINDING BURR.

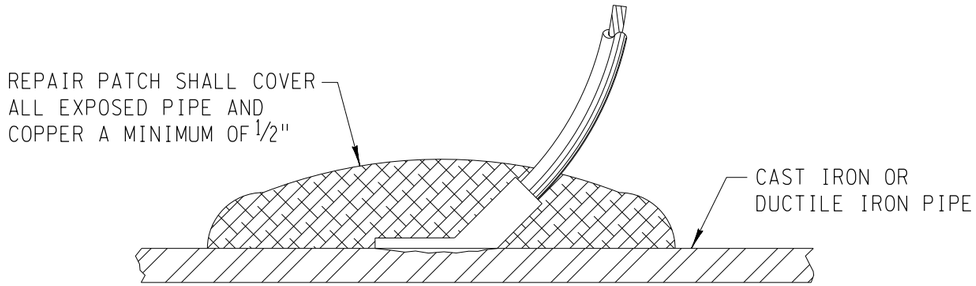
4. WHEN PIN BRAZING ONTO A COATED PIPELINE, A MINIMUM AREA OF 2 INCHES BY 2 INCHES OF COATING SHALL BE REMOVED.

5. THE SHANK OF THE BRAZE PIN SHALL BE CAREFULLY BROKEN OFF WITH A HAMMER TAKING CARE NOT TO DAMAGE THE LUG. THIS SHALL BE DONE BEFORE ANOTHER PIN BRAZE IS MADE TO THE BOND.

6. COVER THE BRAZED CONNECTION WITH A STANDARD REPAIR PATCH. THE PATCH SHALL EXTEND A MINIMUM OF 1/2-INCH OVER THE EXISTING PIPE COATING.

PIN-BRAZED CABLE-TO-PIPE CONNECTION DETAILS





MATERIAL LIST	
DESCRIPTION	REQUIRED
PIN BRAZE KIT FOR CAST IRON OR DUCTILE IRON, POWER SUPPLY, STRUCTURE AND GROUND CABLES	COMPLETE
FUSING PIN	AS REQUIRED
CERAMIC FERRULES	AS REQUIRED
COPPER LUG, CRIMPED TO CABLE	AS REQUIRED
REPAIR PATCH	AS REQUIRED

NO	DATE	REVISION	BY	REC	APP

DESIGN
DESIGNED BY EBMUD
DESIGN CHECKED BY EBMUD
DRAWN BY EBMUD

REVIEW
CORROSION CHECKED BY R.P.E. NO. CR 1080 — KEITH A. PACKARD
SR CIVIL ENGINEER R.P.E. NO. C 66307 — DAVID KATZEV
RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 57170 — CARLTON D. CHAN
APPROVED DIRECTOR OF ENGINEERING & CONST. R.P.E. NO. C 44278 — OLUJIMI O. YOLOYE

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

PIN BRAZING CONNECTION

COPPER WIRE TO DUCTILE IRON PIPE

STRUCTURE OR ZONE DESIGNATION: ALL
SCALE: NONE
DATE: 17 AUG 2022

4572-B

CAST IRON & DUCTILE IRON MAINS

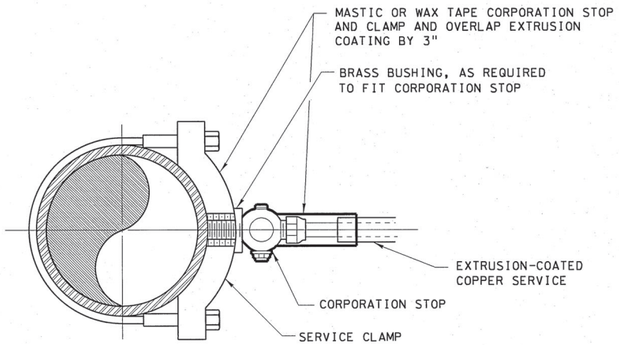


FIGURE I

NOTES

1. FOR ALL COPPER SERVICES, INSTALL ANODE PER STANDARD DWG. 10207-G.
2. IF MAIN IS MORTAR COATED, REPLACE MORTAR COATING AND MORTAR COAT ENTIRE SERVICE CLAMP ASSEMBLY.
3. COAT ALL EXPOSED METAL, INCLUDING CORPORATION STOP, BUSHING, THREADS, BOLTS AND SERVICE CLAMP WITH MASTIC OR WAX TAPE.
4. WHEN MAIN IS POLYWRAPPED, REPAIR AND EXTEND POLYWRAP TO COVER 6" OF SERVICE LINE.

ASBESTOS CEMENT & PVC MAINS

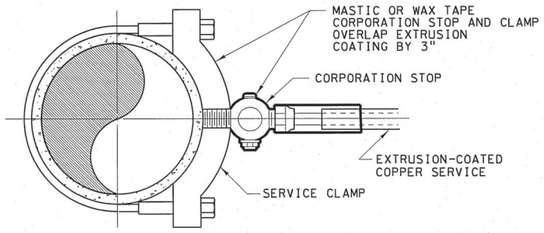


FIGURE IV

NOTES

1. FOR ALL COPPER SERVICES, INSTALL ANODE PER STANDARD DWG. 10207-G
2. FOR PVC MAINS STAGGER MULTIPLE TAPS AND KEEP TAPS AT LEAST 18 IN APART LENGTHWISE.
3. FPVC TAPS OVER 1" ON 14" FPVC AND SMALLER REQUIRE TAPPING TEE, SMITH-BLAIR RESTRAINED ASSEMBLY TAPPING TEE SPECIAL FOR UNDERGROUND SOLLUTIONS, OR EQUAL AS APPROVED BY ENGINEER. FOR TAPS ON 16" FPVC AND LARGER, CONSULT ENGINEER.

WELDED STEEL MAINS

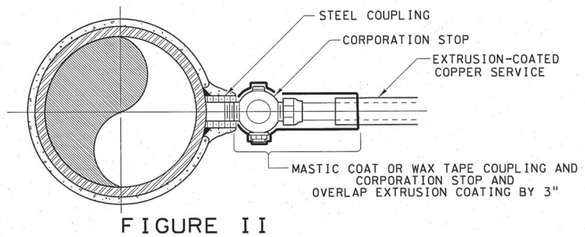


FIGURE II

CEMENT MORTAR COATED
(MAY BE POLYWRAPPED)

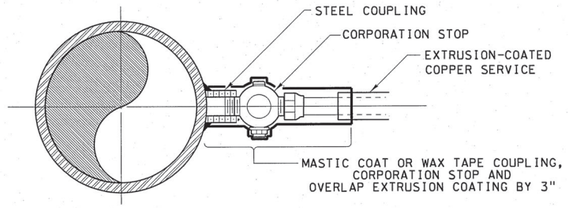


FIGURE III

BITUMINOUS OR PLASTIC COATED

NOTES

1. ALL FIGURES - INSERT TEMPORARY SCREW PLUG IN COUPLING PRIOR TO WELDING.
2. FIGURE II - REPLACE CEMENT MORTAR COATING ON MAIN AND MORTAR COAT ENTIRE COUPLING.
3. FIGURE III - REPLACE COATING ON MAIN AND COAT COUPLING WITH MASTIC OR WAX TAPE.
4. FOR SERVICE INSTALLATION USING A SERVICE CLAMP ON STEEL MAINS USE FIG.I
5. WHEN MAIN IS POLYWRAPPED, REPAIR AND EXTEND POLYWRAP TO COVER 6" OF SERVICE LINE.

HDPE MAINS

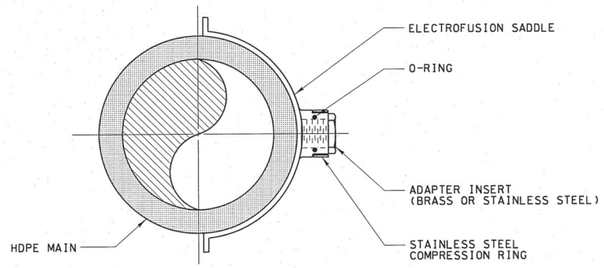


FIGURE V

HDPE ELECTROFUSION SADDLE DETAIL-
CENTRAL PLASTICS TOP LOAD
STYLE TRANSITION SADDLE-
IPS X 2" FPT OR
APPROVED EQUAL

NOTES

1. PREPARATION INSTRUCTIONS
   a. SCRAPE & CLEAN SADDLE AREA
   b. PLACE SADDLE (FEELER GAUGE)
   c. SECURE SADDLE TO PIPE (TOP LOADING)
2. FUSE SADDLE
   a. CONNECT PROCESSOR
   b. ELECTROFUSE
3. TAPPING SERVICE
   a. ALLOW PIPE & SADDLE TO COOL
   b. TAP SERVICE

GENERAL NOTES

1. MAKE SERVICE CONNECTION AT THE SPRINGLINE OF THE MAIN.
2. ALL MAIN COCKS MUST BE AWWA STYLE THREADS.
3. WHEN PULLING OR MOLING SERVICE, USE BARE COPPER AND INSTALL ANODE PER DWG. 10207-G
4. USE CHABOT STOP FOR 1-1/2" AND 2" SERVICES.
5. USE FLARED CORPORATION STOP ON ALL 3/4" AND 1" SERVICES.
6. NEW INSTALLATIONS: MINIMUM SERVICE LATERAL AND TAP SIZE OF ONE AND TWO FAMILY DWELLINGS IS 1 1/2 INCH. ALL OTHER SERVICE LATERAL INSTALLATIONS AND TAP SIZES SHALL BE SIZED AS SHOWN ON WORK ORDERS.
7. 3/4" TAPS AND LATERALS MAY BE INSTALLED WHERE THE STATIC PRESSURE IS GREATER THAN 60 PSI WITH THE EXCEPTION OF NOTE 6.

NO.	DATE	REVISION	BY	REC.	APP.
6	31 MAY '12	REVISED (REMOVED FIGURE VI) & NOTES	MB	ST	AST
5	3 MAR 11	MISC REVISIONS & PER CRC TITLE 24, PART 2.5, CHAPTER 3, SECTIONS R313J & R313Z	MB	ST	AST
4	17 JUNE 08	REVISED	JH	ST	AST
3	17 MAR '03	INSULATOR AND COATING REVISIONS	WM	NI	DLP
2	24 AUG '00	REVISED AND REDRAWN	WM	SC	PAC
1	10 JUN '93	REVISED AND REDRAWN	BK	WB	DA

DESIGN
DESIGNED BY EBMUD
DESIGN CHECKED BY J. ORTIZ
DRAWN BY K. CROWE

REVIEW
CORROSION CHECK BY M. LEWIS
SR. CIVIL ENG. R.P.E. NO. C 45819 N. IRIAS
RECOMMENDED MGR. OF DESIGN R.P.E. NO. C 39851 D. PRATT
APPROVED, DIRECTOR OF ENGINEERING R.P.E. NO. C 31966 M. MILLER

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

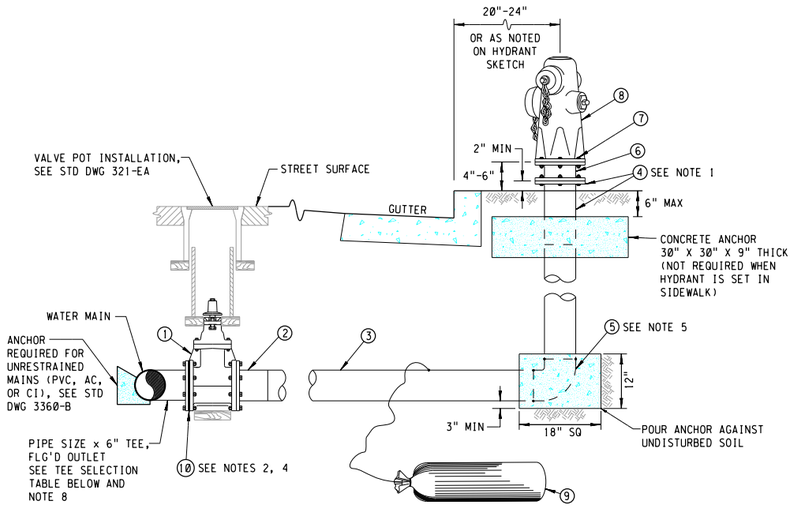
DISTRIBUTION MAIN SERVICE CONNECTIONS
CI, DI, STEEL, AC, PVC & HDPE MAINS

3/4" THRU 2"

STRUCTURE OR ZONE DESIGNATION
SCALE NO SCALE
DATE 21 MAR. '89

9020-GB

SUPERCEDES DWG. 133-EA



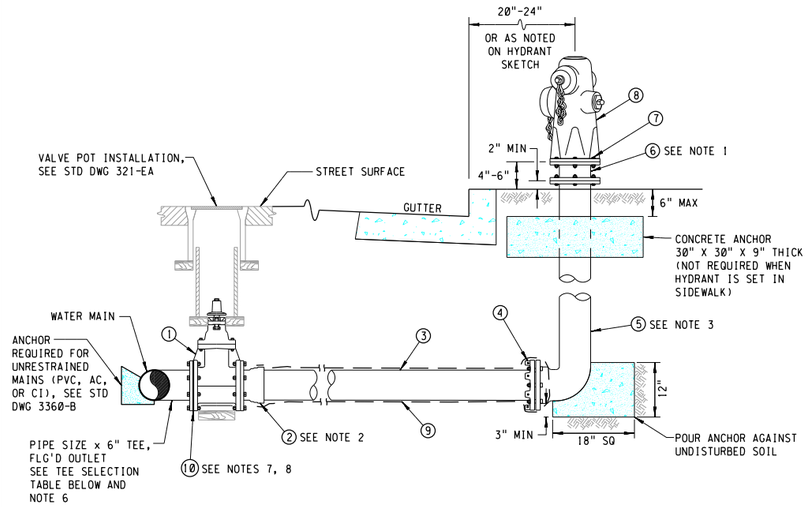
MATERIAL LIST		
ITEM	DESCRIPTION	QUANTITY REQUIRED
①	6" GATE VALVE, FLANGED	1
②	6" FLANGE WITH ATTACHED ML&PCS PIPE SECTION, STD DWG 323-EA OR 324-EA	1
③	6" PIPE, ML&PCS x 10 GA. LENGTH AS REQUIRED (HYDRANT RUN)	AS NEEDED
④	FLANGE, SPECIAL 6 HOLES, WITH 15" LONG SCH. 40 STEEL PIPE SECTION	1
⑤	6" ELBOW, ML&PCS 90°, STD DWG 309-EA	1
⑥	HYDRANT EXTENSION, DUCTILE IRON, FUSION BONDED EPOXY LINED AND COATED, LENGTH AS REQUIRED	IF NEEDED
⑦	HYDRANT SET (6 HOLE GASKET, 6 BREAKAWAY BOLTS & NUTS)	1
⑧	HYDRANT BODY	1
⑨	32-LB. GALVANIC ANODE, STD DWG 286-EA, FIG B	1
⑩	FLANGE INSULATING KIT (SEE NOTES 2 & 4)	1

NOTES

1. SEE STD DWG 9496-GB-1 - FIRE HYDRANT INSTALLATION DETAILS INCLUDING HYDRANT SETTING, FLANGE, EXTENSION, AND BOLT DETAILS.
2. USE FLANGE INSULATING KIT FOR CI, DI OR CEMENT COATED STEEL MAINS ONLY.
3. IF MAIN IS MORTAR COATED STEEL, EXTEND MORTAR COATING FROM TEE OR NOZZLE TO GATE VALVE PER STD DWG 3446-GB.
4. SEE STD DWGS 323-EA AND 324-EA FOR FLANGE MATERIALS AND FLANGE FACING REQUIREMENTS.
5. DETERMINE LENGTHS OF THE HYDRANT ELBOW TO ACCOMODATE A CLEARANCE OF 4"-6" FROM THE GROUND ELEVATION.
6. BOND ALL NON-WELDED, NON-INSULATED PIPE JOINTS, SEE STD DWG 220-EA.
7. WRAP BARE METAL WITH PETROLATUM WAX TAPE PER SPEC SECTION 33 10 01P.
8. IF MAINLINE PIPE IS UNRESTRAINED, INSTALL THRUST BLOCK AT TEE PER STD DWG 3360-B.

STEEL HYDRANT INSTALLATION

FIG 1



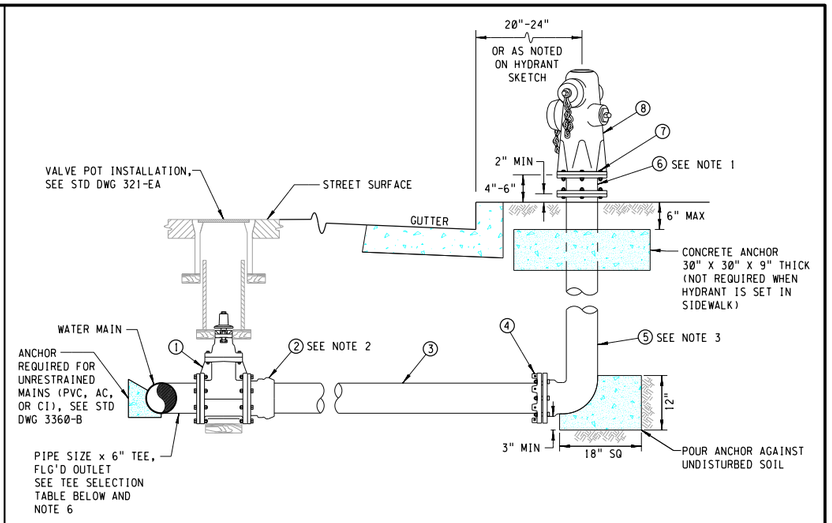
MATERIAL LIST		
ITEM	DESCRIPTION	QUANTITY REQUIRED
①	6" GATE VALVE, FLANGED OR RESTRAINED PUSH-ON X FLG	1
②	6" FLANGE X HUB ADAPTER, RESTRAINED	1
③	6" PIPE, MORTAR LINED AND ZINC COATED DUCTILE IRON (ML&ZCDI) WITH RESTRAINED JOINTS, LENGTH AS REQUIRED (HYDRANT RUN)	AS NEEDED
④	6" RESTRAINED MECHANICAL FITTING FOR DI, (MEGALUG MODEL 1100 OR EQUIVALENT)	1
⑤	6" ELBOW, HYDRANT X MECHANICAL JOINT, DI FUSION BONDED EPOXY LINED AND COATED	1
⑥	HYDRANT EXTENSION, DUCTILE IRON, FUSION BONDED EPOXY LINED AND COATED, LENGTH AS REQUIRED	IF NEEDED
⑦	HYDRANT SET (6 HOLE GASKET, 6 BREAKAWAY BOLTS & NUTS)	1
⑧	HYDRANT BODY	1
⑨	POLYWRAP, STD DWG 4569-B	AS NEEDED
⑩	FLANGE INSULATING KIT (SEE NOTES 7 & 8)	1

NOTES

1. SEE STD DWG 9496-GB-1 - FIRE HYDRANT INSTALLATION DETAILS INCLUDING HYDRANT SETTING, FLANGE, EXTENSION, AND BOLT DETAILS.
2. OMIT HUB ADAPTER IF RESTRAINED PUSH-ON VALVE IS USED.
3. DETERMINE LENGTHS OF THE HYDRANT ELBOW AND EXTENSION TO ACCOMMODATE A CLEARANCE OF 4"-6" FROM THE GROUND ELEVATION. ELBOW LENGTHS: 24", 30", 36", 42", 48".
4. INCLUDE TRACER WIRE IF HYDRANT RUN IS >50' IN LENGTH OR NOT PERPENDICULAR TO MAIN.
5. WRAP BARE METAL WITH PETROLATUM WAX TAPE PER SPEC SECTION 33 10 01P.
6. IF MAINLINE PIPE IS UNRESTRAINED, INSTALL THRUST BLOCK AT TEE PER STD DWG 3360-B.
7. USE FLANGE INSULATING KIT FOR CI, CEMENT COATED STEEL, OR PLASTIC COATED STEEL MAINS ONLY.
8. SEE STD DWGS 323-EA AND 324-EA FOR FLANGE MATERIALS AND FLANGE FACING REQUIREMENTS.
9. INSTALL JOINT BONDING CABLES WHEN REQUIRED ON THE PROJECT DRAWINGS. BOND ALL NON-WELDED, NON-INSULATED PIPE JOINTS, SEE STD DWG 220-EA.

RESTRAINED DUCTILE IRON HYDRANT INSTALLATION

FIG 2



MATERIAL LIST		
ITEM	DESCRIPTION	QUANTITY REQUIRED
①	6" GATE VALVE, FLANGED OR RESTRAINED PUSH-ON X FLG	1
②	6" FLANGE X HUB ADAPTER, RESTRAINED	1 (RCT OR EQUIVALENT)
③	6" PIPE, IPVC WITH RESTRAINED JOINTS, (COUPLING OR HARNESS) LENGTH, AS REQUIRED (HYDRANT RUN)	AS NEEDED
④	6" RESTRAINED MECHANICAL FITTING FOR IPVC (MEGALUG MODEL 2000PV OR EQUIVALENT)	1
⑤	6" ELBOW, HYDRANT X MECHANICAL JOINT, DI, FUSION BONDED EPOXY LINED AND COATED	1
⑥	HYDRANT EXTENSION, DUCTILE IRON, FUSION BONDED EPOXY LINED AND COATED, LENGTH AS REQUIRED	IF NEEDED
⑦	HYDRANT SET (6 HOLE GASKET, 6 BREAKAWAY BOLTS & NUTS)	1
⑧	HYDRANT BODY	1

NOTES

1. SEE STD DWG 9496-GB-1 - FIRE HYDRANT INSTALLATION DETAILS INCLUDING HYDRANT SETTING, FLANGE, EXTENSION, AND BOLT DETAILS.
2. OMIT HUB ADAPTER IF RESTRAINED PUSH-ON VALVE IS USED.
3. DETERMINE LENGTHS OF THE HYDRANT ELBOW AND EXTENSION TO ACCOMMODATE A CLEARANCE OF 4"-6" FROM THE GROUND ELEVATION. ELBOW LENGTHS: 24", 30", 36", 42", 48".
4. INCLUDE TRACER WIRE IF HYDRANT RUN IS >50' IN LENGTH OR NOT PERPENDICULAR TO MAIN.
5. WRAP BARE METAL WITH PETROLATUM WAX TAPE PER SPEC SECTION 33 10 01P.
6. IF MAINLINE PIPE IS UNRESTRAINED, INSTALL THRUST BLOCK AT TEE PER STD DWG 3360-B.

RESTRAINED IPVC HYDRANT INSTALLATION

FIG 3

TEE SELECTION

MAINLINE MATERIAL	DRY INSTALLATION	WET INSTALLATION
HDPE	HDPE TEE (PIPE SIZE BY 6") WITH FLANGE ADAPTOR AND BACKUP RING	-
STEEL - MORTAR COATED	6" - USE TEE (STD DWG 309-EA) AND SKIRTED FLANGE 8" & LARGER - USE FLANGED SADDLE NOZZLE (STD DWG 238-EA)	6" - USE SPLIT TEE (DWG 282-EA) AND SKIRTED FLANGE 8" & LARGER - USE FLANGED SADDLE NOZZLE (DWG 238-EA)
STEEL - PLASTIC COATED	6"-12" - USE TEE (STD DWG 309-EA) AND LINE VALVE (STD DWG 1965-A)	
CI*, AC*, PVC*, DI	DUCTILE IRON TEE	USE SPLIT TEE (STD DWG 282-EA)

* ANCHOR REQUIRED FOR CI, AC, OR UNRESTRAINED PVC WATER MAINS, SEE STD DWG 3360-B

REDUCED DRAWING

NO	DATE	REVISION	BY	REC	APP
5	12 AUG 2022	REVISED AND REDRAWN	PP	OSL	CAC
4	30 JUN 2008	CHANGES RECOMMENDED BY PIPE COMMITEE	JH	ST	AST
3	28 SEP 1998	BOLT DIMENSION CHANGES	AB	PAC	DLP
2	26 AUG 1996	DIMENSIONAL CHANGES	RW	PAC	DLP
1	10 JUN 1993	CHANGES RECOMMENDED BY MATERIAL REVIEW COMMITTEE	BY	WBB	DA

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	EBMUD
	DRAWN BY	K.CROWE
REVIEW	CORROSION CHECKED BY	K.CHAPMAN
	SR CIVIL ENGINEER R.P.E. NO. C 27714	W.BODE
	RECOMMENDED MGR. OF DESIGN R.P.E. NO. C 30187	D.ALVAREZ
	APPROVED ASST. CHIEF ENGR. R.P.E. NO. C 29111	D.DIEMER

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

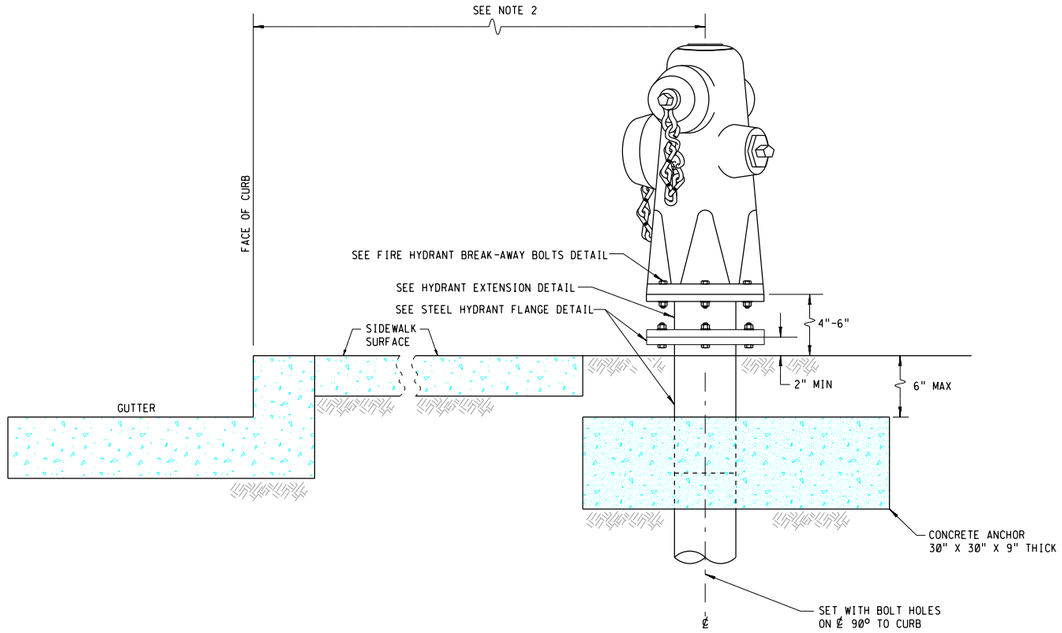
FIRE HYDRANT INSTALLATION

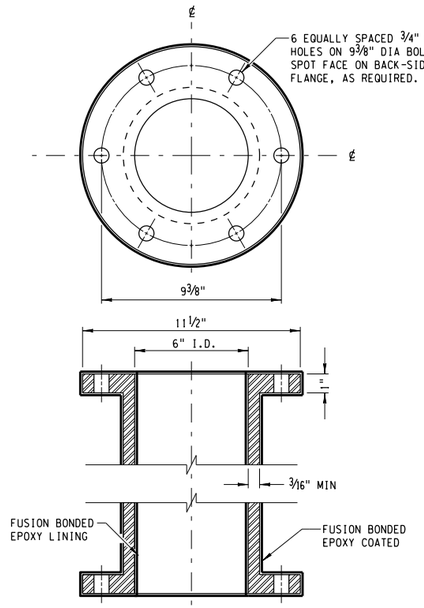
STEEL, DI & IPVC

STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	26 FEB 1992

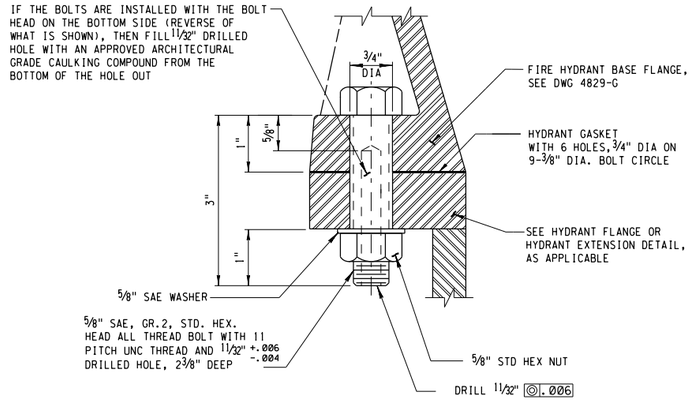
9496-GB

SUPERSEDES STD DWG'S 296-EA, 3361-B

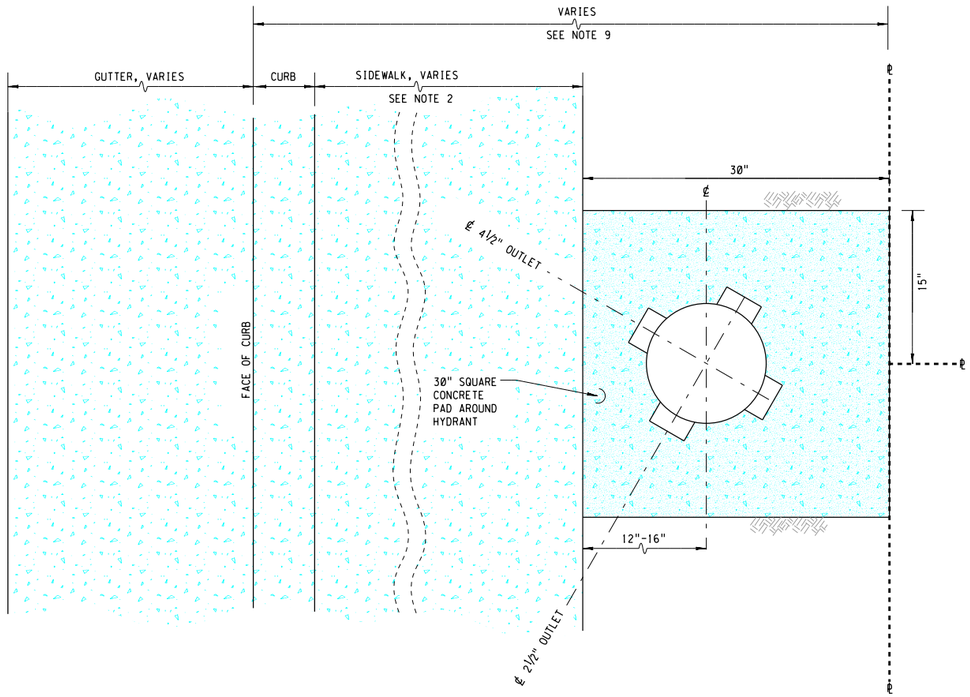




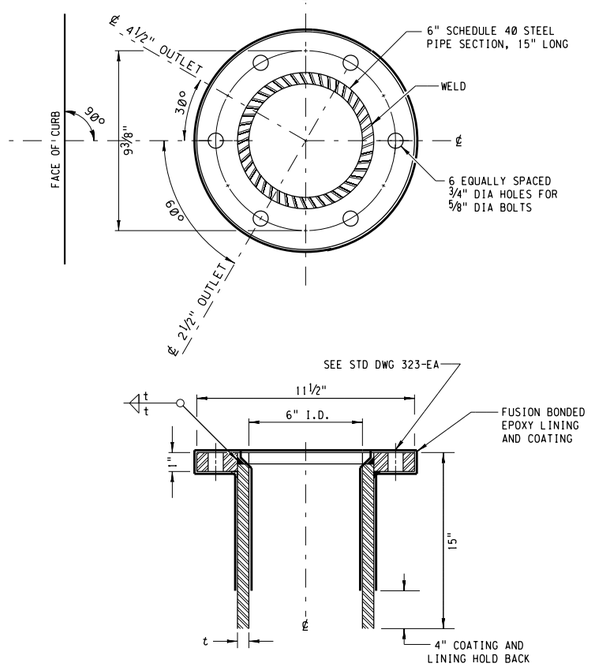
HYDRANT EXTENSION DETAIL



FIRE HYDRANT BREAK-AWAY BOLTS DETAIL



LOCATION PLAN OF HYDRANT BEHIND SIDEWALK AREA



STEEL HYDRANT FLANGE DETAIL

(SEE STD DWG 9496-GB, FIG 1)

NOTES

1. FOR STEEL, DI AND PVC HYDRANT INSTALLATION, MATERIAL LIST AND TEE SELECTIONS SEE STD DWG 9496-GB.
2. INSTALL FIRE HYDRANT BEHIND SIDEWALK WHERE SIDEWALK WIDTH IS LESS THAN 6'.

   HYDRANTS TO BE SET BEHIND SIDEWALK SHALL BE LOCATED IN CONFORMANCE WITH THE FIRE AGENCY'S AND CITY OR COUNTY REQUIREMENTS.
3. INSTALL HYDRANT WITH PROPER SETBACK CLEARANCES FROM FACE OF CURB AND EDGE OF SIDEWALK. MAINTAIN MINIMUM 5' CLEARANCE FROM FENCES, WALLS, STRUCTURES, AND EDGES OF DRIVEWAYS.
4. INSTALL HYDRANT PER EBMUD SPEC SECTION 33 11 13.21P.
5. AFFIX EBMUD LOGO DECAL TO HYDRANT BODY FACING THE STREET.
6. BOLTS SHALL BE TIGHTENED IN DIAMETRICAL PAIRS IN AT LEAST TWO EQUALPASSES WITH CALIBRATED TORQUE WRENCH. THE FINAL PASS SHALL GIVE 75FT - LBS TORQUE ON EACH BOLT.
7. USE CORROSION INHIBITING GREASE ON ALL THREADS. SEE SPEC SECTION 33 10 01P.
8. FUSION BONDED EPOXY AND HIGH-BUILD EPOXY LININGS SHALL BE 12-MILS MINIMUM. MAXIMUM THICKNESS SHALL BE MANUFACTURER'S MAXIMUM NSF-61 CERTIFIED THICKNESS.
9. FIRE HYDRANT LATERALS NOT IN DEDICATED STREET SHALL HAVE A MINIMUM RIGHT-OF-WAY WIDTH OF 5' CENTERED ON THE PIPE EXTENDING FROM THE MAIN OR STREET RIGHT-OF-WAY TO AT LEAST 5' BEYOND THE APPURTENANCE. A TEMPORARY CONSTRUCTION EASEMENT MAY BE CONSIDERED TO SUPPLEMENT RIGHT-OF-WAY NEEDS DURING INITIAL CONSTRUCTION BUT ADEQUATE ACCESS FOR FUTURE MAINTENANCE SHALL BE PROVIDED.

NO	DATE	REVISION	BY	REC	APP

DESIGN	DESIGNED BY	EBMUD
	DESIGN CHECKED BY	EBMUD
	DRAWN BY	EBMUD
REVIEW	CORROSION CHECKED BY R.P.E. NO. CR 1088	KEITH A. PACKARD
	SR CIVIL ENGINEER R.P.E. NO. C 66307	DAVID KATZEV
	RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 57170	CARLTON D. CHAN
	APPROVED DIRECTOR OF ENGINEERING & CONST. R.P.E. NO. C 44278	OLUSIMI O. YOLOYE

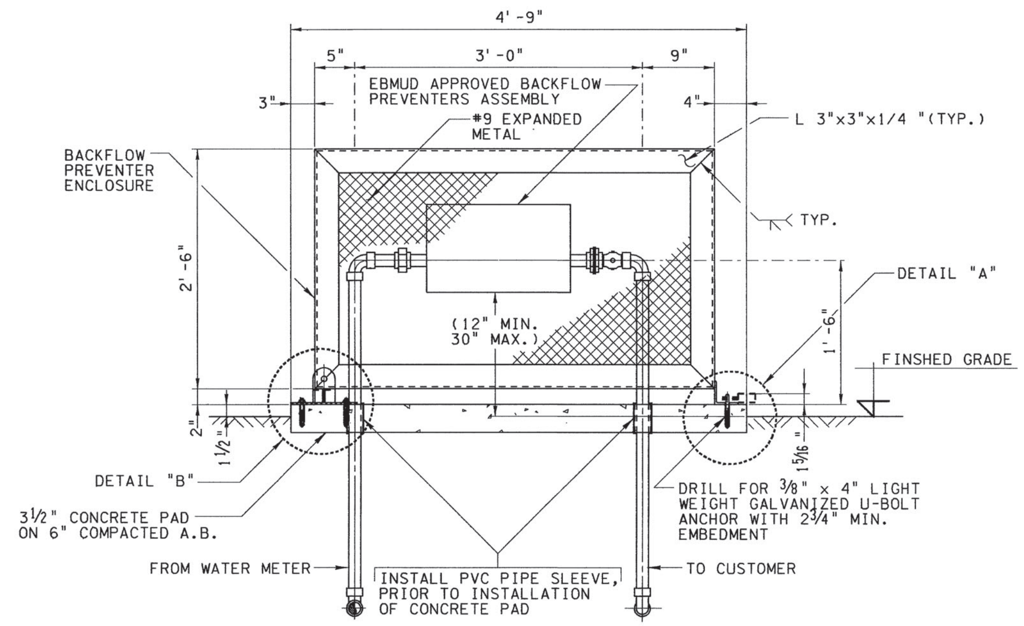
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

FIRE HYDRANT INSTALLATION DETAILS

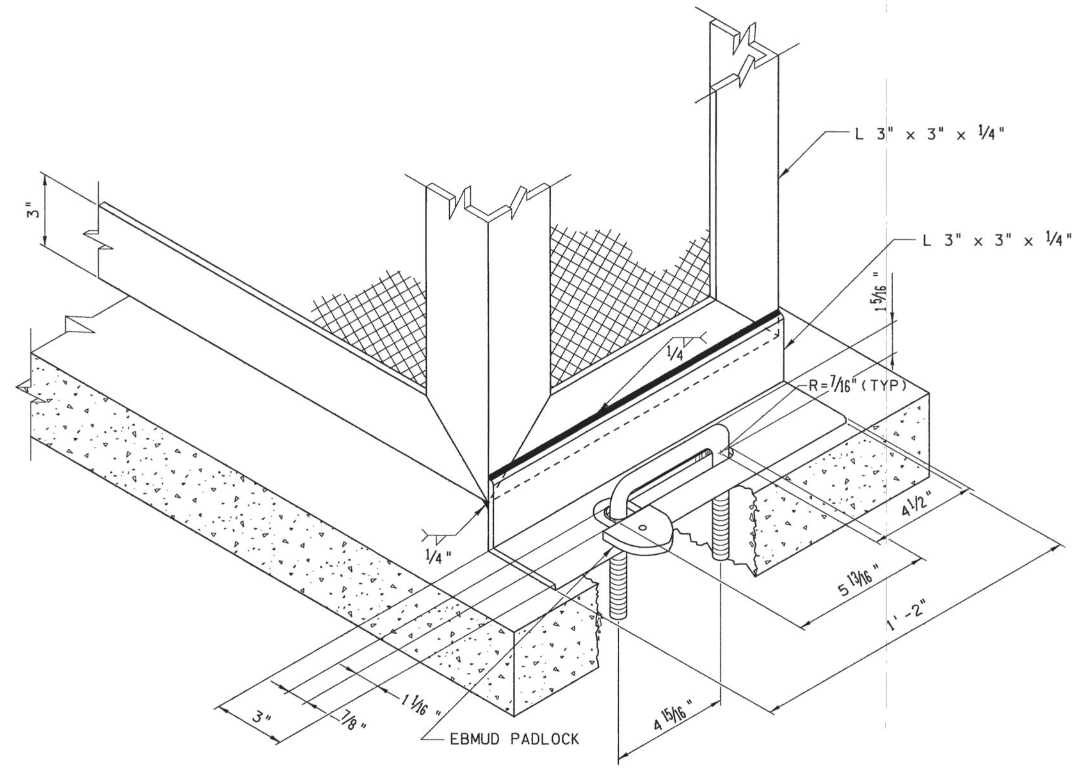
STRUCTURE OR ZONE DESIGNATION	ALL
SCALE	NONE
DATE	17 AUG 2022

9496-GB-1



SECTION "A-A"

SCALE: 1"=1'-0"

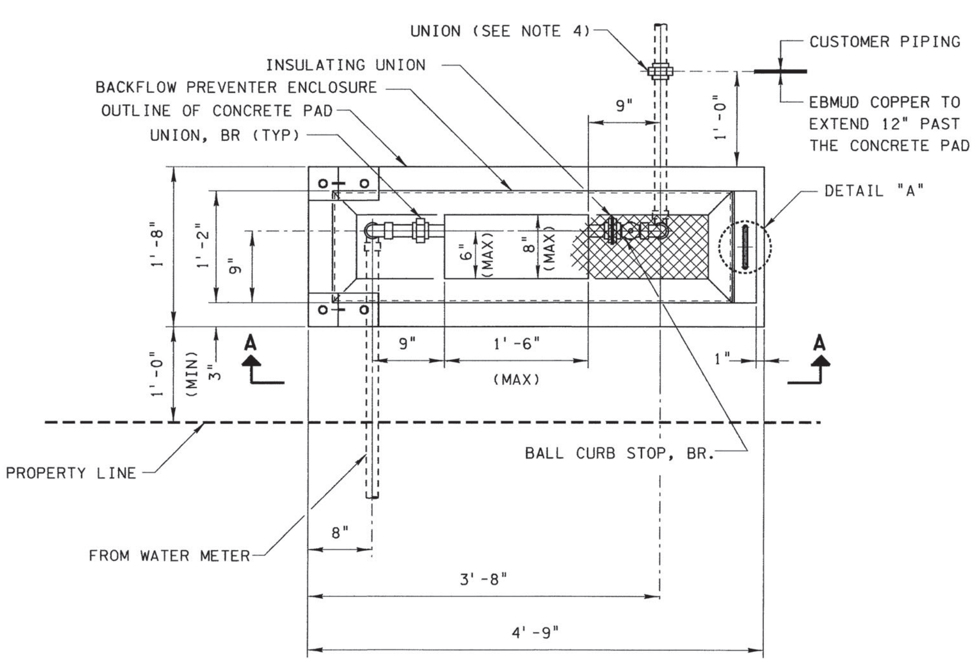


DETAIL "A"

SCALE : 3"=1'-0"

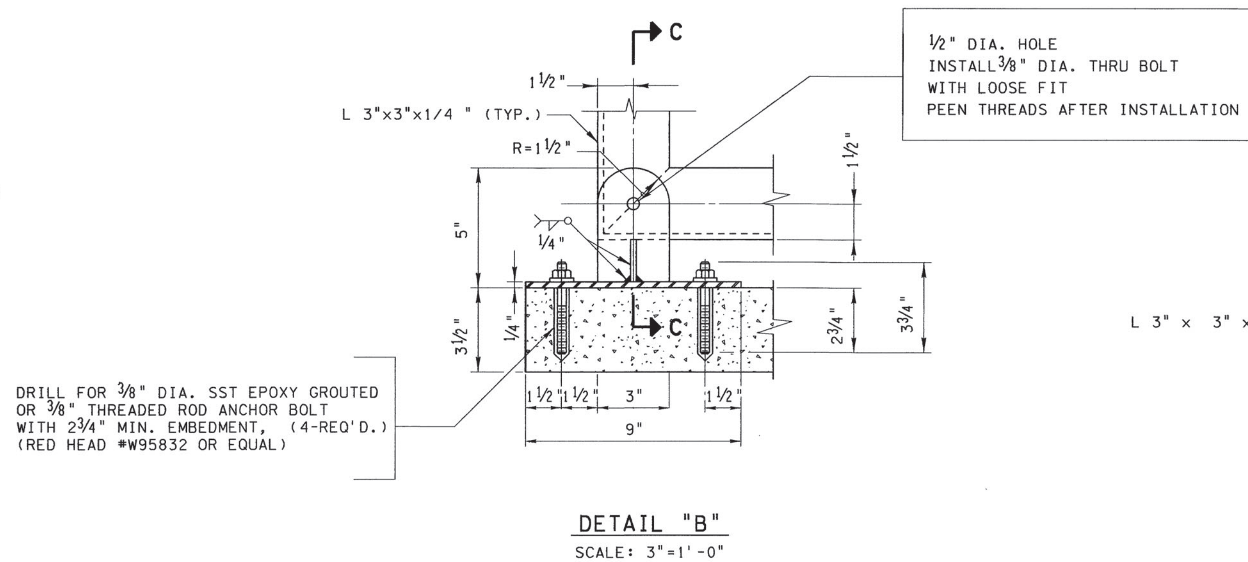
NOTES

1. SEE EBMUD LIST OF APPROVED BACKFLOW PREVENTER ASSEMBLIES.
2. REMOVE SLAG AND BURRS, EASE SHARP EDGES, ABRASIVE BLAST AND HOT DIP GALVANIZE ENCLOSURE AFTER FABRICATION.
3. INSTALLATION SHALL BE LOCATED IN A PROTECTED AREA OR PROTECTION SUCH AS TRAFFIC BARRIER POST MUST BE PROVIDED. INSTALL A MINIMUM OF TWO 4" GALVANIZED STEEL GUARD POST TO BE 42" HIGH AND 36" BELOW GROUND IN CONCRETE AND FILLED WITH CONCRETE.
4. INSTALL INSULATING JOINT WHERE CONNECTING TO DISSIMILAR METALS.
5. DRILLING FOR ANCHOR BOLTS SHALL BE DONE IN PLACE WITH ALL HINGES AND SUPPORT ASSEMBLED.
6. THICKNESS OF ALL FILLET WELDS SHALL BE NOT LESS THAN 1/4".
7. MATERIALS FOR BACKFLOW PREVENTER ENCLOSURE SHALL BE PRIME QUALITY COMMERCIAL GRADE HOT ROLLED SHEET OR PLATE ASTM A-36 OR EQUAL.
8. PREFABROCATED ENCLOSURES MAY BE SUBSTITUTED UPON DISTRICT APPROVAL.



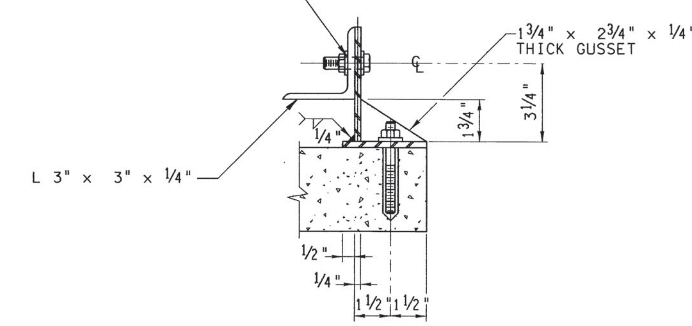
PLAN

SCALE: 1"=1'-0"



DETAIL "B"

SCALE: 3"=1'-0"



SECTION "C-C"

SCALE: 3"=1'-0"

NO.	DATE	REVISION	BY	REC.	APP.

S:\

DESIGN	DESIGNED BY EBMUD
	DESIGN CHECKED BY Dennis Jenkins
	DRAWN BY HC EY TL KKC
REVIEW	CORROSION CHECK BY [signature]
	SR. CIVIL ENG. R.P.E. NO. C 27714 [signature]
	RECOMMENDED MGR. OF DESIGN R.P.E. NO. E 3966 [signature]
	APPROVED, DIRECTOR OF ENGINEERING R.P.E. NO. C 2911 [signature]

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

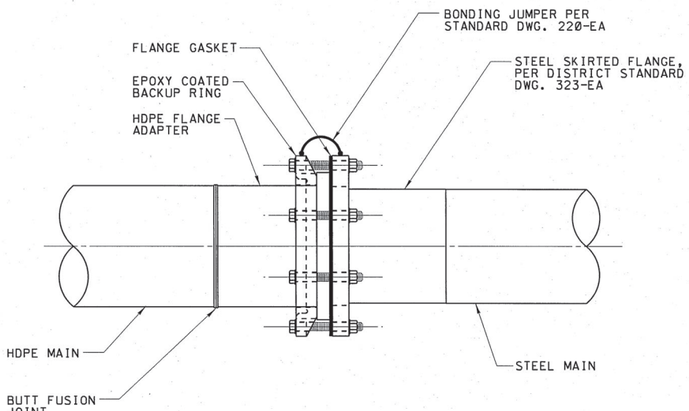
BACKFLOW PREVENTER ASSEMBLY

FOR SERVICES UP TO 1 1/2" DIA.

STRUCTURE OR ZONE DESIGNATION	NONE
SCALE	AS SHOWN
DATE	10 JUN '93

9498-GB

FILE: ZGN:300124J9498GB.DGN
TYPE:
VIEW:
PRF:
PLOT DATE: 12-MAR-1993 11:03

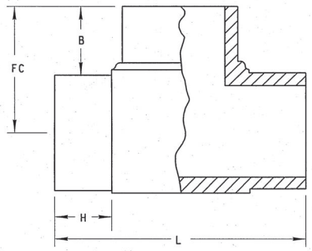


DETAIL 1
HDPE FLANGE CONNECTION
(FOR HDPE TO STEEL PIPE OR FLANGED VALVE)
(N.T.S.)

DETAIL 2
IPS & DIPS BELL MECHANICAL JOINT "MJ" ADAPTER
(FOR HDPE TO CAST IRON OR PVC PIPE)
(N.T.S.)

DETAIL 3
HDPE ELECTROFUSION COUPLING CONNECTION (IPS TO IPS)
(FOR HDPE TO HDPE PIPE)
N.T.S.

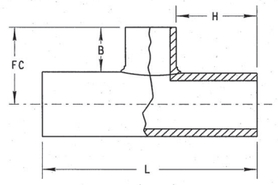
IPS FITTINGS MOLDED TEES



NOMINAL SIZE (IN)	PIPE OD (IN)	DR	DIMENSIONS			
			L (IN)	H (IN)	FC (IN)	B (IN)
6	6.625	09	16.25	4	8.25	4.94
		11	18	4.5	9	5.69
8	8.625	11	23.75	5.85	11.9	7.59
12	12.75	11	31.6	7.5	15.9	9.53

ISCO IPS FITTINGS MOLDED TEES OR EQUAL AS APPROVED BY ENGINEER.

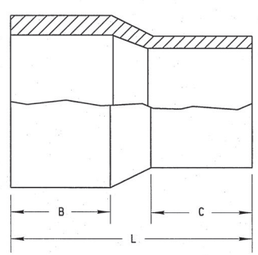
IPS FITTINGS REDUCING TEE



NOMINAL SIZE (IN)	PIPE OD (IN)	DR	DIMENSIONS			
			L (IN)	H (IN)	FC (IN)	B (IN)
8x6	8.625 x 6.625	11	28	9.8125	12.25	7.9375
12x6	12.75 x 6.625	11	28	9.8125	14.375	8
12x8	12.75 x 8.625	11	30	9.875	14.625	8.25

ISCO IPS FITTINGS REDUCING TEE OR EQUAL AS APPROVED BY ENGINEER.

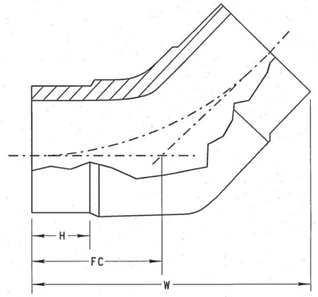
IPS FITTING CONCENTRIC REDUCER



NOMINAL SIZE (IN)	PIPE OD (IN)	DR	DIMENSIONS		
			L (IN)	B (IN)	C (IN)
8x6	8.625 x 6.625	09	12	4.5	4
		11	12	4.5	4
12x8	12.75 x 8.625	11	16	6	6

ISCO IPS FITTINGS CONCENTRIC REDUCER OR EQUAL AS APPROVED BY ENGINEER.

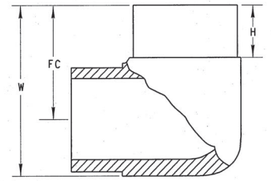
IPS FITTINGS MOLDED 45° ELL



NOMINAL SIZE (IN)	PIPE OD (IN)	DR	DIMENSIONS		
			H (IN)	FC (IN)	W (IN)
6	6.625	09	4.125	9	17.70
		11	4.125	9	17.70
8	8.625	11	6	11	21.8

ISCO IPS FITTINGS MOLDED 45° ELL OR EQUAL AS APPROVED BY ENGINEER.

IPS FITTINGS MOLDED 90° ELL



NOMINAL SIZE (IN)	PIPE OD (IN)	DR	DIMENSIONS		
			H (IN)	FC (IN)	W (IN)
6	6.625	09	4.125	8	12.5
		11	4.125	8	12.5
8	8.625	11	6	12	16.5

ISCO IPS FITTINGS MOLDED 90° ELL OR EQUAL AS APPROVED BY ENGINEER.

IPS SIZE	AVG OD	SDR PR	9 200	11 160
4	4.500	MIN WALL	0.500	0.409
		AVG ID	3.440	3.633
		LB/FT	2.705	2.263
6	6.625	MIN WALL	0.736	0.602
		AVG ID	5.064	5.348
		LB/FT	5.863	4.905
8	8.625	MIN WALL	0.958	0.784
		AVG ID	6.593	6.963
		LB/FT	9.936	8.315
10	10.750	MIN WALL	1.194	0.977
		AVG ID	8.218	8.678
		LB/FT	15.434	12.916
12	12.750	MIN WALL	1.417	1.159
		AVG ID	9.747	10.293
		LB/FT	21.723	18.172

NOTES:

IPS SIZES 4" IPS AND LARGER PER ASTM F714.

PR = PRESSURE RATING IS IN PSI FOR WATER AT 80°F AND LOWER, FOR PE3408/3608.

SDR = STANDARD DIMENSION RATIO, MEASURED IN ACCORDANCE WITH ASTM D-2122.

ALL DIMENSIONS ARE IN INCHES.

PE3408/3608 PIPE DATA & PRESSURE RATING

POLYETHYLENE PIPE IRON PIPE SIZE (IPS) PIPE DATA

GENERAL NOTES FOR HDPE

1. FURNISH AND INSTALL HIGH DENSITY POLYETHYLENE (HDPE) PIPE AS SHOWN ON THESE DRAWINGS AND AS REQUIRED IN SPECIFICATION SECTION 02616.
2. HDPE PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH AMERICAN WATER WORKS ASSOCIATION (AWWA) C906 FOR WATER SERVICE MAINS AND AWWA C901 FOR WATER SERVICE LATERALS.
3. INSTALL METALLIC TRACERS AND IDENTIFICATION TAPE WITHIN EXCAVATIONS IN ACCORDANCE WITH EBMUD SPECIFICATIONS. FOR TRENCHLESS INSTALLATIONS, USE TRACER WIRES ONLY.
4. HDPE PIPE SHALL BE HYDROSTATICALLY TESTED INDEPENDENTLY FROM THE ML&PCS PIPE WHEN PRACTICAL AND IN ACCORDANCE WITH SPECIFICATION SECTION 02616 AND APPLICABLE ASTM GUIDELINES AND MANUFACTURER RECOMMENDATIONS.
5. COAT ALL EXPOSED METALLIC SURFACES OF COUPLINGS, FLANGES, SADDLES, BOLTS AND NUTS WITH MASTIC OR WAX TAPE.

NO.	DATE	REVISION	BY	REC.	APP.
1	31 MAY 12	REVISED-ADDED FITTINGS	MRB	ST	AST

DESIGN: DESIGNED BY S. TERENTIEFF; DESIGN CHECKED BY J.HUNTAMER; DRAWN BY DMD
REVIEW: CORROSION CHECK BY M.LEWIS; RECOMMENDED SR.CIVIL ENGINEER S.TERENTEFF R.P.E. NO. C 48598; APPROVED MGR. OF PIPELINE INFRASTRUCTURE A.TONG R.P.E. NO. C 38862

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

HDPE STANDARD DETAILS & GENERAL NOTES 12" AND UNDER

STRUCTURE OR ZONE DESIGNATION
SCALE NONE
DATE 30 JUNE 08

9946-GB

DISTRIBUTION SYSTEM MAP NO.

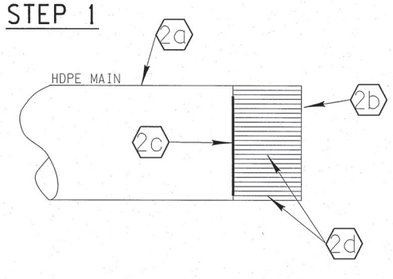
LOGIN: MWHITE
PLOT DATE: 04-JUN-2012 12:15
FILE: H:\general\std-dwgs\revision&new 2011\9946gb*rev1.dgn

PREFERRED METHOD

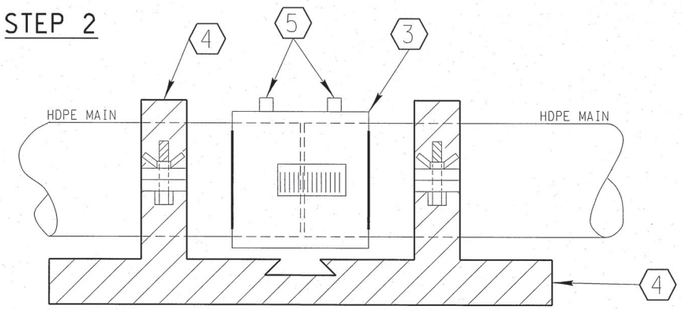
INSTALLATION PROCEDURES FOR ELECTROFUSION COUPLING

1. READ OPERATING INSTRUCTIONS PROVIDED BY THE FUSION MACHINE MANUFACTURER. ENSURE THE ELECTROFUSION FITTING IS THE CORRECT SIZE (DIAMETER & IPS), PRESSURE CLASS, AND COMPATIBLE WITH THE FUSION MACHINE.
2. PREPARE PIPE:
   a. CHECK PIPE FOR OUT-OF-ROUND CONDITION. RESTORE THE ROUNDNESS IF NECESSARY.
   b. CUT PIPE ENDS SQUARE. ENSURE PIPE ENDS ARE CLEAN AND FREE FROM ANY CONTAMINANTS.
   c. MARK OFF EACH PIPE END AT THE STAB DEPTH LOCATION (1/2 OF THE COUPLING) WITH NON-PETROLEUM BASED MARKER.
   d. SCRAPE THE OUTSIDE PIPE SURFACE WITH MANUFACTURER'S RECOMMENDED SCRAPING TOOL TO EXPOSE THE VIRGIN PIPE MATERIAL. REMOVE ANY DEBRIS AND CLEAN PIPE.
3. INSERT COUPLING INTO BOTH PIPE ENDS AT THE STAB DEPTH MARKS LOCATION. DO NOT JAM PIPES INTO THE COUPLING.
4. SUPPORT AND RESTRAIN EACH PIPE WITH MANUFACTURER'S RECOMMENDED RESTRAINT DEVICES.
5. CONNECT FUSION LEAD ENDS BETWEEN THE COUPLING AND THE FUSION UNIT. SCAN BAR-CODE AND START THE FUSION PROCESS. REMOVE FUSION LEADS WHEN FUSION CYCLE IS COMPLETE.
6. ALLOW COUPLING TO COOL IN ACCORDANCE WITH COUPLING MANUFACTURER'S RECOMMENDED COOLING TIME BEFORE REMOVING THE RESTRAINT DEVICES OR PLACING ANY STRESS ON THE JOINT.

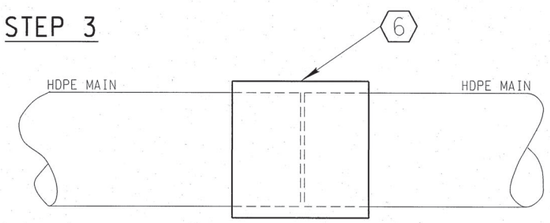
STEP 1



STEP 2



STEP 3



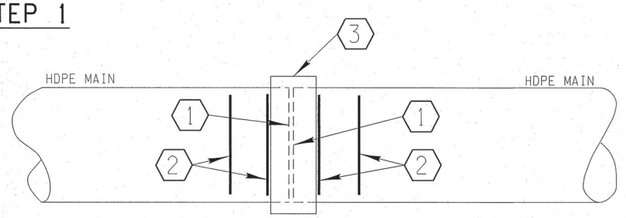
HDPE PIPE REPAIR USING ELECTROFUSION COUPLING

INSTALLATION PROCEDURES FOR MECHANICAL COUPLING

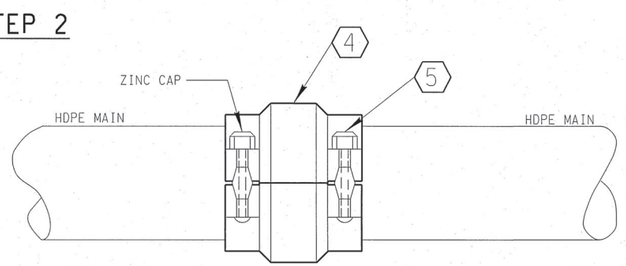
SEE NOTE 3

1. CUT PIPE ENDS SQUARE USING GUILLOTINE CUTTING TOOL/BLADE. ENSURE PIPE ENDS ARE CLEAN AND FREE FROM DAMAGE OR SCRATCHES WITHIN 1" FROM ENDS.
2. MARK OFF EACH PIPE END AT $^{15}/_{16}$" (FOR 2" - 12" DIAMETER PIPE) AND AT THE INSERTION DEPTH LOCATION (REFER TO MANUFACTURER'S TABLE).
3. PLACE GASKET OVER BOTH PIPE ENDS. PUSH ENDS TOGETHER UNTIL THEY BUTT. ALIGN PIPE MARKS WITH OUTER EDGE OF GASKETS. LUBRICATE THE BACK OF GASKET WITH VEGETABLE OIL.
4. PLACE HOUSING OVER GASKET AND ENSURE THE HOUSING TONGUE AND RECESS ARE PROPERLY MATED.
5. INSERT BOLTS AND APPLY ZINC CAPS FINGER TIGHT. TIGHTEN THE CAPS UNIFORMLY AND ON ALTERNATING SIDES UNTIL HOUSING BOLT PADS MEET FIRMLY METAL-TO-METAL.
6. FULLY ENCAPSULATE THE ASSEMBLY WITH WAX TAPE IN TWO LAYERS. OVERLAP THE TAPE IN HALF TAPE WIDTH. PRESS AND SMOOTH OUT THE LAP SEAM TO ENSURE THEY ARE SEALED. EXTEND THE TAPE 4" BEYOND EACH END OF THE COUPLING.

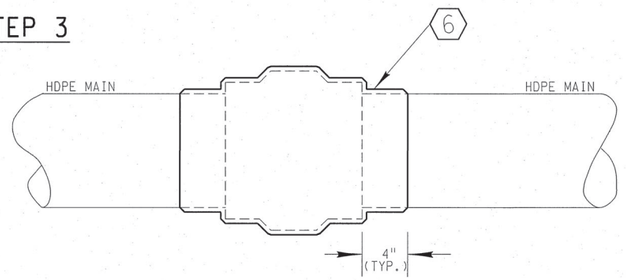
STEP 1



STEP 2

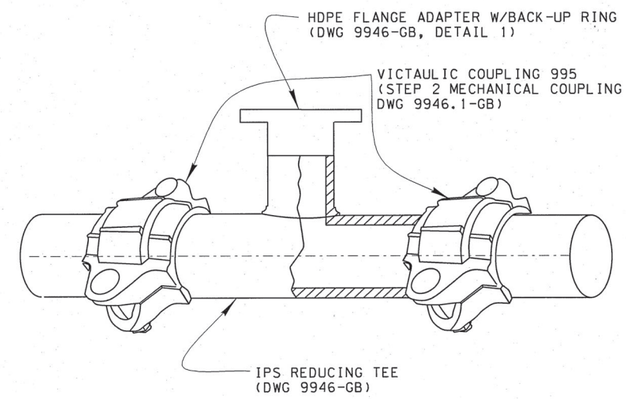


STEP 3



HDPE PIPE REPAIR USING VICTAULIC COUPLING

EMERGENCY HYDRANT REPAIR DETAIL



NOTE: IPS REDUCING TEE WITH HDPE FLANGE ADAPTER WITH BACK-UP RING PRE-FUSED PIECE.

GENERAL NOTES:

1. USE MECHANICAL COUPLING REPAIR DETAIL AS SHOWN ON THIS DRAWING ONLY IF FUSION JOINT CANNOT BE ACHIEVED.
2. REFER TO STANDARD DRAWING 9946-GB FOR GENERAL NOTES FOR HDPE PIPE AND CONNECTION OF HDPE PIPE TO OTHER PIPE MATERIALS.
3. MECHANICAL COUPLING SHALL BE VICTAULIC 995 OR EQUAL AS APPROVED BY ENGINEER.

APPROVED, DIRECTOR OF ENGINEERING, R.P.E. NO. C 44782

NO.	DATE	REVISION	BY	REC.	APP.

DESIGN: DESIGNED BY Marsha Bourgee; DESIGN CHECKED BY; DRAWN BY BK

REVIEW: CORROSION CHECK BY Mark Lewis; RECOMMENDED SR.CIVIL ENGINEER R.P.E. NO. C 43650 S. Terentieff; APPROVED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 38862 A.S. Fong

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

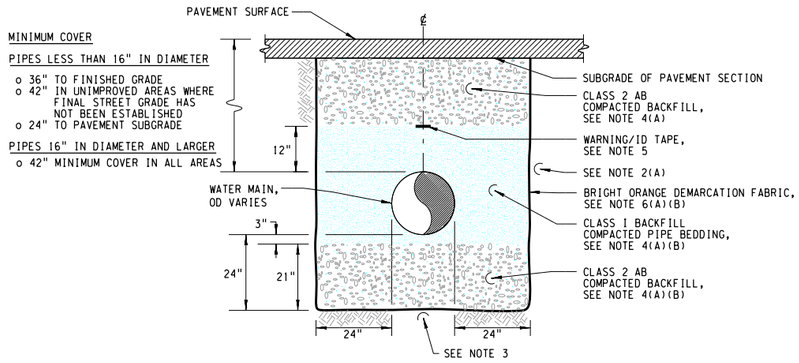
HDPE PIPE REPAIR DETAILS
12" AND UNDER

STRUCTURE OR ZONE DESIGNATION
SCALE NONE
DATE 4 JUNE 12

9946.1-GB

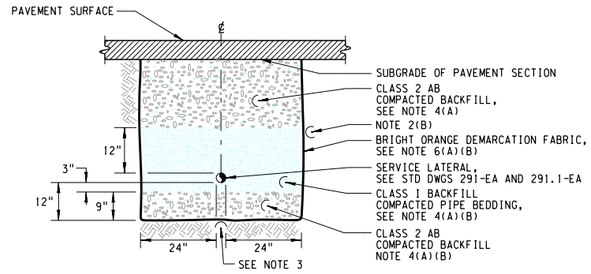
DISTRIBUTION SYSTEM MAP NO.

PLOT DATE: 06-JUN-2012 15:01
FILE: H:\general\std-dwgs\revision\new 2011\9946.1-GB.dgn



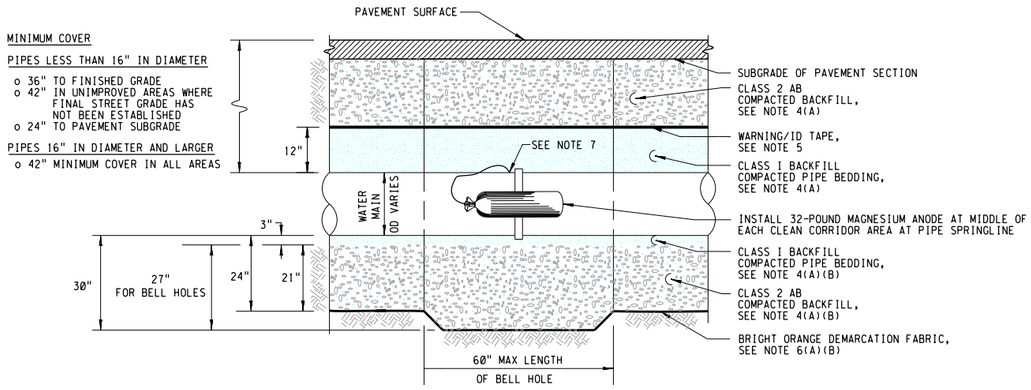
TRENCH SECTION FOR PIPE INSTALLATION

WATER MAINS 20 INCHES OR SMALLER, HYDRANTS, AND SERVICES LATERALS 3 INCHES OR GREATER

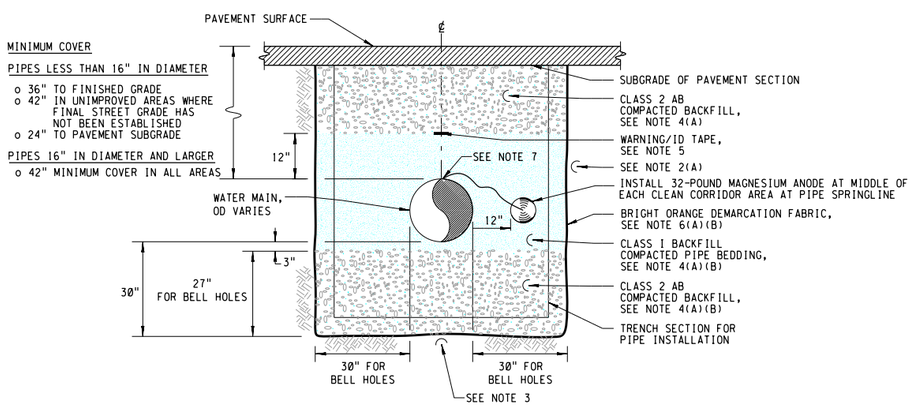


TRENCH SECTION FOR LATERALS INSTALLATION

DOMESTIC SERVICE LATERALS LESS THAN 3 INCHES, AND ANY APPURTENANCES



BELL HOLE DETAIL



TRENCH SECTION FOR BELL HOLES

WATER MAINS 20 INCHES OR SMALLER, HYDRANTS, AND SERVICES LATERALS 3 INCHES OR GREATER

NOTES

INTENTION OF CLEAN UTILITY CORRIDOR (CUC): PROTECT EBMUD STAFF HEALTH AND SAFETY FROM EXPOSURE TO CONTAMINATED MATERIALS DURING INSTALLATIONS, MAINTENANCE, AND EMERGENCY MAIN BREAK REPAIRS.

1. CONFORM TO ALL SAFETY STANDARDS, ORDERS, RULES AND REGULATIONS OF CAL-OSHA AND OTHER AGENCIES HAVING JURISDICTION.

2. FOR CONTAMINANTS OF CONCERN (COC):

   (A) CONFIRMATION TESTING IN UNCHARACTERIZED AREAS FOR WATER MAINS 20 INCHES AND SMALLER:

   APPLICANT SHALL COLLECT SOIL AND GROUNDWATER SAMPLES FOR THE CUC AT A FREQUENCY OF ONE SAMPLE EVERY 15 FEET ALONG THE PROPOSED UTILITY ALIGNMENT(S). APPLICANT SHALL COLLECT THE SOIL SAMPLES ALONG THE SIDE WALLS AND FLOOR OF THE UTILITY TRENCH, AND GROUNDWATER SAMPLES WHERE GROUNDWATER IS ENCOUNTERED. COMPOSITING OF SIDE WALL AND FLOOR SOIL SAMPLES AND/OR ANY CHANGES TO SAMPLE FREQUENCY REQUIRES EBMUD APPROVAL.

   (B) CONFIRMATION TESTING IN UNCHARACTERIZED AREAS FOR SERVICES:

   APPLICANT SHALL COLLECT A MINIMUM OF TWO SAMPLES FOR EACH MAIN SERVICE LATERAL, HYDRANT LATERAL, FIRE SERVICE LATERAL, AND ANY APPURTENANCES.

3. IF TRENCH STABILIZATION IS REQUIRED DUE TO GROUNDWATER OR OTHER SITE CONDITIONS, ANY REQUIRED STABILIZATION MATERIALS SHALL BE PLACED OUTSIDE OF THE CUC LIMITS AND DEMARCATION FABRIC.

4. (A) FOR COMPACTION REQUIREMENTS, SEE SPEC SECTION 31 23 33P.

   (B) THE APPLICANT'S GEOTECHNICAL ENGINEER SHALL TEST THE COMPACTION OF THE 21" (27" FOR BELL HOLES AND 9" FOR SERVICES LESS THAN 3" IN DIAMETER) OF IMPORTED MATERIALS THAT WILL BE INSTALLED UNDER THE MAINS, HYDRANT RUNS, ANY APPURTENANCES, AND SERVICES BEFORE THE PIPE IS INSTALLED.

5. WARNING/IDENTIFICATION TAPE SHALL BE INSTALLED ABOVE THE PIPE AS SPECIFIED AND RUN CONTINUOUSLY ALONG THE ENTIRE LENGTH OF THE PIPELINE, SEE SPEC SECTION 33 11 13.21P.

6. TO PROTECT EBMUD STAFF, CUCs SHALL INCLUDE BARRIERS SUCH AS:

   (A) PERMANENT DEMARCATION FABRIC (SEE SPEC SECTION 31 23 33P FOR ACCEPTABLE PRODUCTS) OVER CONTAMINATED SOIL TO PREVENT EBMUD STAFF CONTACT WITH SOIL. AT A MINIMUM, BRIGHT ORANGE DEMARCATION FABRIC SHALL BE INSTALLED ON ALL TRENCH FLOORS AND SIDEWALLS DURING PIPE INSTALLATIONS AND DURING BACKFILL.

   (B) 10-20 MIL PLASTIC OVER SOIL CONTAMINATED WITH VOLATILE ORGANIC COMPOUNDS (VOCS) TO PREVENT WORKER EXPOSURE TO CONTAMINANTS. THIS MAY BE TEMPORARY.

   (C) OTHER BEST MANAGEMENT PRACTICES AS APPROVED BY EBMUD STAFF.

7. FOR ANODE CONNECTION DETAILS SEE STANDARD DWG 286-EA.

8. IF RECOGNIZED ENVIRONMENTAL CONDITIONS (REC) ARE ENCOUNTERED DURING THE CONSTRUCTION OF THE CUC, EBMUD EXPECTS THE REC TO BE REMOVED. IF CONTAMINATION OR RECs RESULT IN ADDITIONAL REMEDIATION AND THE COLLECTION OF CONFIRMATION SAMPLES, THE DETAILS AND SAMPLE RESULTS SHALL BE SHARED WITH EBMUD, DOCUMENTATION OF CONTAMINATION SUCH AS TRENCH LOGS AND ANALYTICAL DATA PACKAGES SHALL BE PROVIDED TO EBMUD.

9. ALL CUC INSTALLATIONS SHALL EXTEND A MINIMUM OF 15 FEET, IN EITHER DIRECTION, PAST THE EXTENT OF CONFIRMED CONTAMINATION. IF THE NEW PIPELINE IS CONNECTING TO AN EXISTING PIPELINE, THE CUC SHALL TERMINATE FIVE FEET BEYOND THAT CONNECTION. THE TERMINATING LOCATION OF THE CUC WILL BE CONFIRMED BY EBMUD UPON RECEIPT OF THE FINAL ANALYTICAL RESULTS. IF THERE IS 30 FEET OR LESS BETWEEN TWO CONTAMINATED AREAS, THE CUC SHALL SPAN 30 FEET PROVIDING FOR A CONTINUOUS CUC BETWEEN THE TWO AREAS.

REDUCED DRAWING

NO	DATE	REVISION	BY	REC	APP

DESIGN
DESIGNED BY EBMUD
DESIGN CHECKED BY EBMUD
DRAWN BY EBMUD

REVIEW
CORROSION CHECKED BY Keith Packard R.P.E. NO. CR 1088 KEITH A. PACKARD
ACTING SR CIVIL ENGINEER R.P.E. NO. C 89874 HENK WILLIAMS
RECOMMENDED MGR PIPELINE INFRASTRUCTURE R.P.E. NO. C 57170 CARLTON D. CHAN
APPROVED DIRECTOR OF ENGINEERING R.P.E. NO. C 44278 KAMINI O. YOLOYE

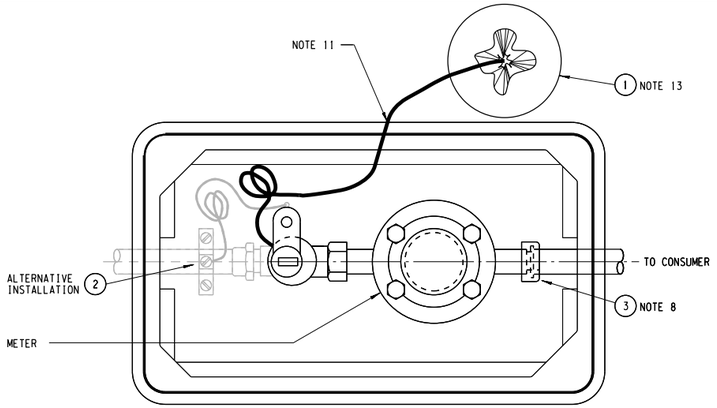
EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

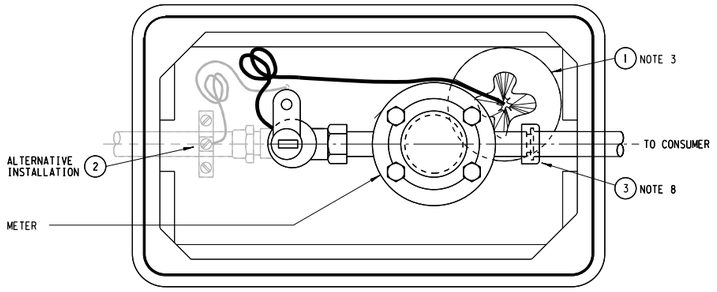
CLEAN UTILITY CORRIDOR

STRUCTURE OR ZONE DESIGNATION ALL
SCALE NONE
DATE 22 JUL 2022

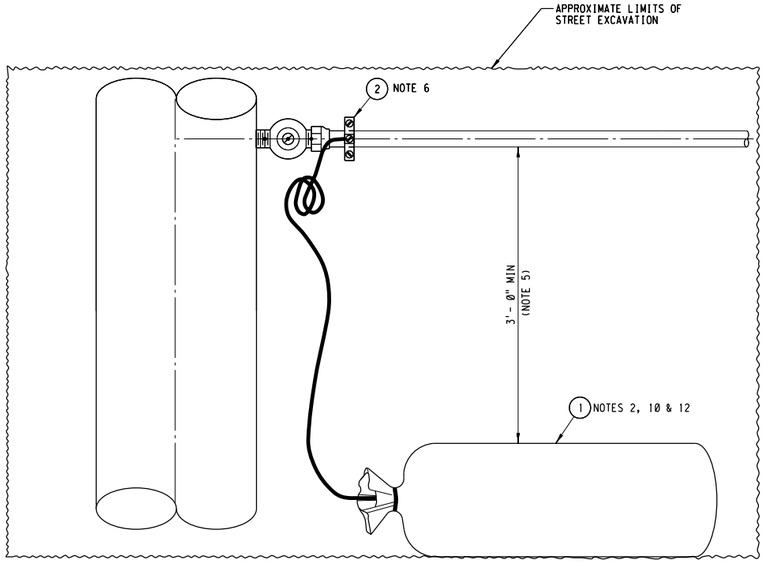
9950-GB



PLAN - OUTSIDE BOX INSTALLATION

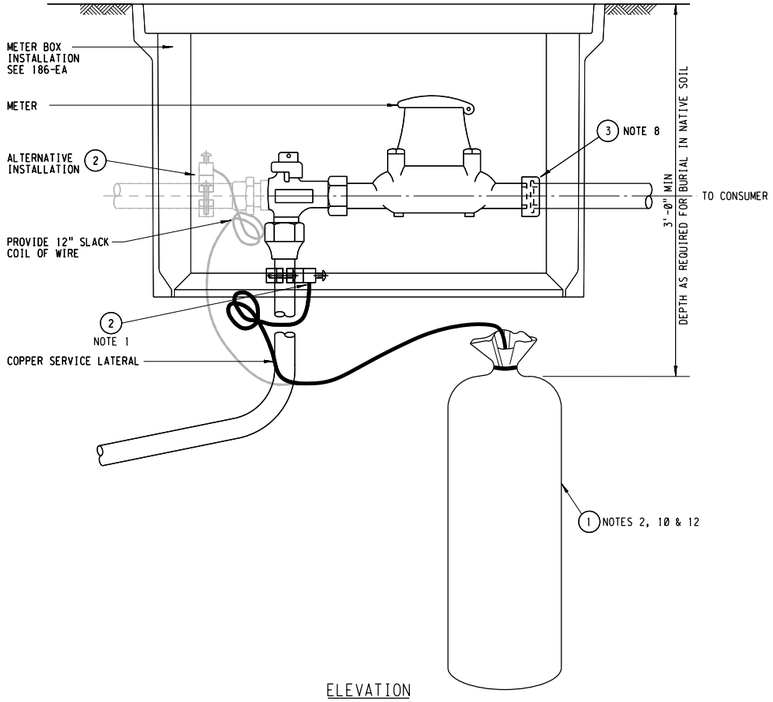


PLAN - INSIDE BOX INSTALLATION



PLAN

MATERIAL LIST	
ITEM	DESCRIPTION
1	ANODE, MAGNESIUM, 9 POUND, HIGH POTENTIAL, PRE-PACKAGED, W/ 10' NO. 8 STRANDED COPPER WIRE (TYPE 9D3)
2	GROUND CLAMP, BRONZE ADJUSTABLE WITH 10 SOL-2 STR TERMINAL LUG
3	INSULATING METER COUPLING SIZE AS REQUIRED

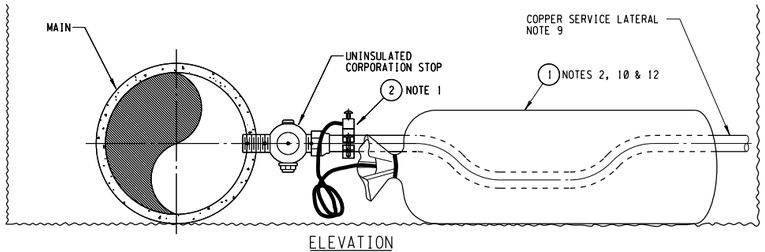


ELEVATION

METER BOX INSTALLATION

NTS

(TYPICALLY USED FOR RETROFIT OF EXISTING SERVICES)



ELEVATION

INSTALLATION IN STREET EXCAVATION

NTS

(TYPICALLY USED ON NEW OR RENEWED SERVICES)

NOTES

1. CONNECT WIRE TO COPPER TUBE USING BRONZE PIPE CLAMP (SOLDERED OR BRAZED CONNECTION IS ACCEPTABLE ALTERNATE).
2. REMOVE PLASTIC OR PAPER SHIPPING PACKAGING PRIOR TO INSTALLATION.
3. LOCATE ANODE WHERE CONVENIENT WITHIN METER BOX.
4. ANODE DIMENSIONS VARY SLIGHTLY BY MANUFACTURER.
5. INSTALL ANODE AT THE MAXIMUM DISTANCE FROM SERVICE LATERAL WITHIN LIMITS OF EXCAVATION.
6. LOCATE CLAMP CONNECTION WHERE CONVENIENT.
7. USE CAUTION WHEN EXCAVATING FOR ANODE INSTALLATION IN "JOINT TRENCH" (GAS/ELECTRIC) AREAS.
8. INSULATING METER COUPLING REQUIRED. DOWNSTREAM OF METER PREFERRED.
9. INSTALL 9-LB ANODE ON EACH SERVICE.
10. BURY ANODE IN NATIVE SOIL AND SATURATE ANODE WITH WATER PRIOR TO BACKFILL (MIN 5 GALLONS).
11. DRILL A HOLE NO BIGGER THAN 1" TO BRING ANODE WIRE THROUGH THE METER BOX. WIRE MAY BE BROUGHT IN FROM UNDER THE METER BOX AS WELL.
12. UNDER NO CIRCUMSTANCE IS THE ANODE TO BE BURIED IN SAND OR ROCK BACKFILL.
13. IF NECESSARY, REPAIR PAVEMENT TO MATCH ORIGINAL.

3" ON ORIGINAL DOCUMENT
0 1 2 3

NO.	DATE	REVISION	BY	REC.	APP.
4	19JAN2017	REVISED	RHM	RHM	CAC
3	4FEB2010	DRAFTING CORRECTIONS	ML	CFD	AST
2	30JUN2008	REVISED	JH	ST	AST
1	28JAN2004	REVISE ANODE TYPE, WIRE GAGE	DLK	DLK	FOR DLP

A COPY OF THE ORIGINAL DRAWING WITH ORIGINAL SIGNATURES CAN BE FOUND IN ENGINEERING RECORDS.

DESIGN
DESIGNED BY MARK LEWIS
DESIGN CHECKED BY NICK IRIAS
DRAWN BY FACILITY DRAFTING

REVIEW
PROJECT ENGR. R.P.E. NO. C 48598 S. TERENTIEFF
RECOMMENDED MGR. OF DESIGN R.P.E. NO. C 39851 DAVID L. PRATT
APPROVED DIRECTOR OF ENGINEERING R.P.E. NO. C 31966 DAVID L PRATT FOR M.L. MILLER

EAST BAY MUNICIPAL UTILITY DISTRICT
OAKLAND, CALIFORNIA

STANDARD DRAWING

CATHODIC PROTECTION

GALVANIC ANODE INSTALLATION ON COPPER SERVICES - 3/4" THRU 2"

PROJ NO.
SCALE AS SHOWN
DATE 17 MAR 2003

10207-G

STRUCT. DISC. NUMBER

04

REV.

REF 3:
REF 4:
REF 1:
REF 2:

PLOT SCALE:
USER: dsikanal
DATE: 26-JAN-2017 10:17
FILE: H:\general\std-dwgs\2017\s10207gREV4.dgn