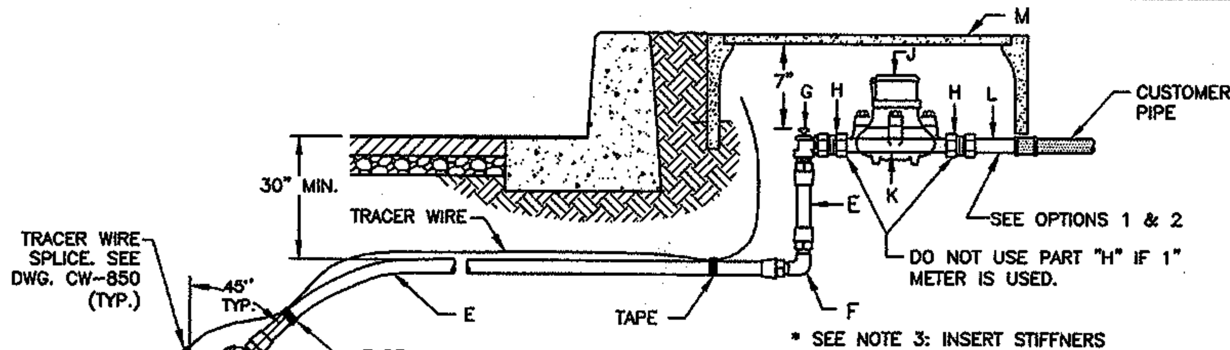
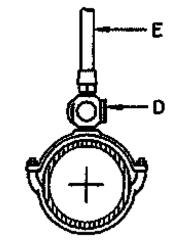
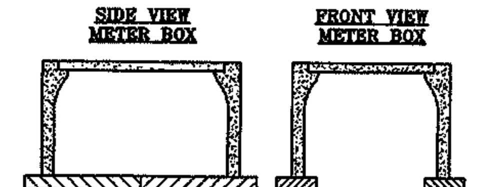
PART LETTER	PART NAME	PART SIZE	MUELLER INSTA-TITE/MUELLER PACK-JOINT	FORD	A.Y. McDONALD	CAMBRIDGE BRASS	SMITH-BLAIR	APAC	IN FULL TRAFFIC AREAS: BROOKS	IN FULL TRAFFIC AREAS: CHRISTY	OUTSIDE FULL TRAFFIC AREAS: CHRISTY	OUTSIDE FULL TRAFFIC AREAS: ARMORCAST
A	SERVICE SADDLE ALL BRONZE	NOMINAL MAIN SIZE x 1" CC	H-13400 SERIES	S90 SERIES	3805 SERIES	800 SERIES	393 SERIES	-----	-----	-----		-----
B	SERVICE SADDLE DUCTILE IRON	NOMINAL MAIN SIZE x 1" CC	DR 2A SERIES	F202 SERIES	-----	-----	313 SERIES	102 SERIES	-----	-----		-----
C	SERVICE SADDLE ALL BRONZE	NOMINAL MAIN SIZE x 1" CC	BR 2B SERIES	202B SERIES	3825 SERIES	810 SERIES	323 SERIES	-----	-----	-----		-----
D	CORPORATION STOP (BALL)	1" CC x 1" MFG. F/PE IPS	B-25005N/E25009N, B20045N + 15429N	FB1001-4-NL	74701B-33 1"	301NL-A4PE4	-----	-----	-----	-----		-----
E	1" PE PLASTIC PIPE	1" PE PLASTIC PIPE IPS	HIGH DENSITY POLYETHYLENE PIPE, IRON PIPE SIZE, AWWA STANDARD C901, PE 3408, PC 200, IDR7					-----	-----	-----		-----
F	1" 90° ELBOW	1" MFG F/PE IPS	H-15464N	L66-44-NL	74761-3Q 1"	105NL-PE4PE4	-----	-----	-----	-----		-----
G	ANGLE METER STOP (BALL)	1" x 1" x 1"	B-24266N/E-24259N	BA63-444W-NL	74602B-33 1"	210NL-PE4T4	-----	-----	-----	-----		-----
H	METER ADAPTER	1" METER TO 5/8" x 3/4" METER	H-10879N	A24-NL	710J24	440NL-N4R2	-----	-----	-----	-----		-----
J	METER	BY CWS COMPANY: 5/8" x 3/4" METER (USE FOR LOT SIZE < 10,000 SQ. FT.) LENGTH 7 1/2". 1" METER (USE FOR LOT SIZE 10,000 SQ. FT. OR LARGER OF IF REQ'D TO MEET CITY'S FIRE SPRINKLER ORDINANCE) LENGTH 10"							-----	-----		-----
K	METER SPACER	DEVELOPER'S CONTRACTOR SHALL INSTALL SCH. 80 PVC NIPPLE IN PLACE OF METER: 1-1/4" DIAMETER, 11" LONG WITH PIT					-----	-----	-----	-----		-----
L	METER COUPLING	1" METER SWIVEL NUT x M.I.P.	H-10890N	C38-44-2-625-NL	74624	417NL-T4M4	-----	-----	-----	-----		-----
M	METER BOX	12" x 20" x 12"	-----	-----	-----	-----	-----	-----	#37 BOX W/ CAST IRON COVER	#B12 BOX W/ CAST IRON COVER	FL12 BOX W/ SYN12S LID CWS OPTION: 1-PIECE COVER FL12D	P6000485-ROTOCAST BOX W/ A6000484DQ COVER & DROP-IN LID A6000487 CWS OPTION: 1-PIECE COVER A6000484



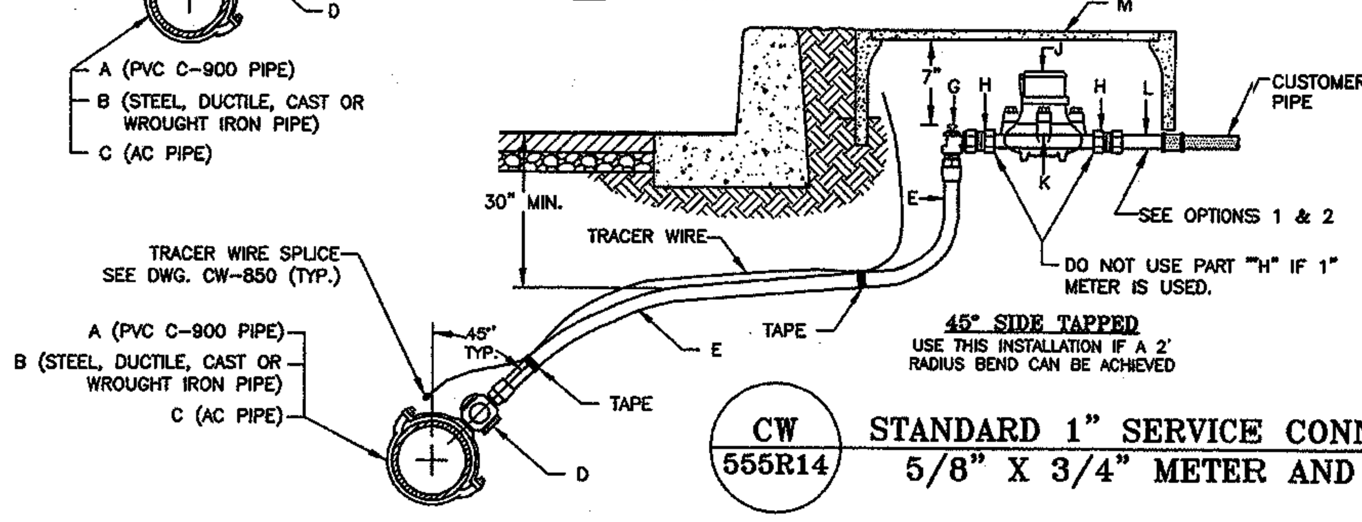
45° SIDE TAPPED
USE THIS INSTALLATION IF A 2' RADIUS BEND CAN NOT BE ACHIEVED



TAPPED AT TOP OF MAIN
USE THIS INSTALLATION ONLY WHEN METER BOX IS LOCATED DIRECTLY ABOVE THE MAIN.



WHEN REQUIRED BY CWS COMPANY, PLACE BRICKS ON TWO SIDES OF METER BOX FOR SUPPORT (OR 2" x 4" PRESSURE TREATED LUMBER)



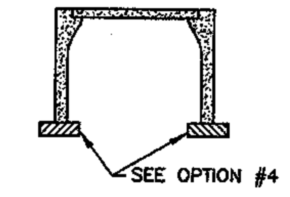
45° SIDE TAPPED
USE THIS INSTALLATION IF A 2' RADIUS BEND CAN BE ACHIEVED

NOTES:
1. ALL PE PLASTIC PIPE REQUIRES TRACER WIRE TAPED TO PE PIPE AND EXTENDED INTO METER BOX PER LATEST REVISION OF DWG. CW-850 AND AS SPECIFIED IN CWS CO. MATERIAL SPECIFICATIONS DWG. CW-832.
2. SADDLES ARE REQUIRED ON ALL PVC C-900, AC, STEEL, OR WROUGHT IRON PIPE.
3. INSERT STIFFNERS SHALL BE USED ON ALL PE PIPE WITH COMPRESSION CONNECTIONS.
4. WHEN USING MUELLER INSTA-TITE, BEVEL THE PE PIPE WITH MUELLER'S BEVELING TOOL PER MANUFACTURER'S SPECIFICATIONS.
5. RESPONSIBILITY FOR SERVICE MAINTENANCE BY CWS CO. ENDS AT DOWNSTREAM METER COUPLING (OR LEFT TO DISTRICT'S DISCRETION).
6. ALL PIPE FITTINGS IN CONTACT WITH WATER SHALL BE LEAD FREE (< 0.25% LEAD) AND COMPLIANT TO NSF-61/SECTION 8.

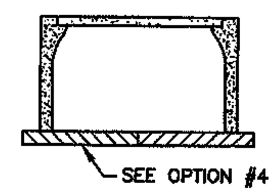
OPTIONS: THESE OPTIONS MAY BE REQUIRED BY CWS CO.

1. EXTEND CUSTOMER'S PIPING ±12" BEYOND METER BOX WITH TWO 12" NIPPLES & TWO 90° ELLS, BRASS (OR GALVANIZED IF PREFERRED BY CWS). SEE NOTE 5.
2. INSTALL BALL VALVE DOWNSTREAM FROM METER WHEN CUSTOMER'S PIPING IS UPHILL FROM METER OR CUSTOMER'S VALVE IS A GREAT DISTANCE FROM METER.
3. INSTALL 1" COPPER TUBING, TYPE K SOFT, INSTEAD OF PE WHEN CWS REPRESENTATIVE DETERMINES THAT CONDITIONS ARE UNFAVORABLE TO PE.

CW 555R14 — STANDARD 1" SERVICE CONNECTION FOR 5/8" X 3/4" METER AND 1" METER



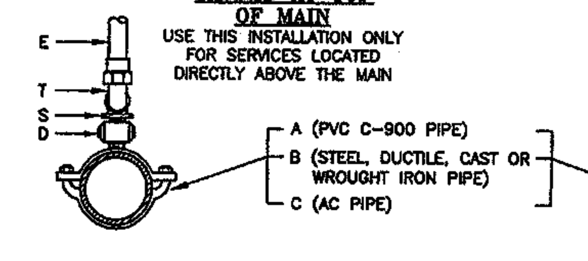
FRONT VIEW METER BOX



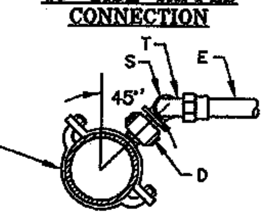
SIDE VIEW METER BOX

PART LETTER	PART NAME	MUELLER	FORD	A.Y. McDONALD	CAMBRIDGE BRASS	SMITH-BLAIR	APAC	BROOKS	CHRISTY
A	SERVICE SADDLE, ALL BRASS WITH 2" AWWA CC THREAD	H-13400	S90 SERIES	3805 SERIES	800 SERIES	393 SERIES	-----	-----	-----
B	SERVICE SADDLE, DUCTILE IRON BODY, DOUBLE STEEL STRAP WITH 2" AWWA CC THREAD	DR2A	F202 SERIES	4825A	-----	313 SERIES	102 SERIES	-----	-----
C	SERVICE SADDLE, BRASS BODY, DOUBLE BRONZE STRAP WITH 2" AWWA CC THREAD	BR2B	202B SERIES	3825 SERIES	810 SERIES	323 SERIES	-----	-----	-----
D	2" CORPORATION STOP – AWWA CC THREAD X MIP	B-2996N	FB400-7-NL	73128B	301NL-A7M7	-----	-----	-----	-----
E	2" HDPE PIPE	HIGH DENSITY POLYETHYLENE PIPE, IRON PIPE SIZE, AWWA STANDARD C901, PE 3408, PC 200, IDR7						-----	-----
F	2" 90° ELL COUPLING – PEP X PEP	-----	L66-77-IDR7-NL	74761-33	105NL-PE7PE7	-----	-----	-----	-----
G	2" STRAIGHT COUPLING – PEP X MIP	E-15429N	C86-77-IDR7-NL	74753-33	117NL-PE7M7	-----	-----	-----	-----
H	2" BALL ANGLE METER VALVE – F.I.P. X METER FLANGE	B-24288N-3	BFA13-777WR-NL	74604B	210NL-F7MF7	-----	-----	-----	-----
J	2" METER, (BY CWS COMPANY) LENGTH 17" NOTE: DEVELOPER'S CONTRACTOR SHALL INSTALL SPACER IN PLACE OF METER PER CWS CO'S DIRECTION	-----	-----	-----	-----	-----	-----	-----	-----
K	2" METER FLANGE – FLG. X F.I.P; BRONZE WITH FULL FACE GASKET AND #304 STAINLESS STEEL BOLTS & NUTS	-----	CF31-77-NL	7610F	421NL-7S/S	-----	-----	-----	-----
L	2" NIPPLE – LEAD FREE BRASS	-----	-----	-----	-----	-----	-----	-----	-----
M	17" X 28" METER BOX	-----	-----	-----	-----	-----	-----	BROOKS CONCRETE #65 BOX W/ #65S CONCRETE COVER & LID NOTE: CAST IRON COVERS REQUIRED IN TRAFFIC AREAS	CHRISTY CONCRETE B65 BOX W/ B65E CONCRETE COVER & LID NOTE: CAST IRON COVERS REQUIRED IN TRAFFIC AREAS
N	ADAPTER – 2" METER FLG. X 1-1/2" MET FLG.	-----	A87-NL	710J67	-----	-----	-----	-----	-----
P	1-1/2" METER, (BY CWS COMPANY) LENGTH 13" NOTE: DEVELOPER'S CONTRACTOR SHALL INSTALL SPACER IN PLACE OF METER PER CWS CO'S DIRECTION	-----	-----	-----	-----	-----	-----	-----	-----
Q	1-1/2" METER FLANGE – FLG. X F.I.P.; BRONZE WITH FULL FACE GASKET AND #304 STAINLESS STEEL BOLTS & NUTS	-----	CF31-66-NL	7610F	421NL-6S/S	-----	-----	-----	-----
R	1-1/2" NIPPLE – LEAD FREE BRASS	-----	-----	-----	-----	-----	-----	-----	-----
S	2" 90° ELL, LEAD FREE BRASS – FIP X FIP	-----	-----	-----	-----	-----	-----	-----	-----
T	2" 90° ELL COUPLING – MIP X PEP	-----	L86-77-IDR7-NL	74779M-33	105NL-B7M7	-----	-----	-----	-----

TAPPED AT TOP OF MAIN
USE THIS INSTALLATION ONLY FOR SERVICES LOCATED DIRECTLY ABOVE THE MAIN



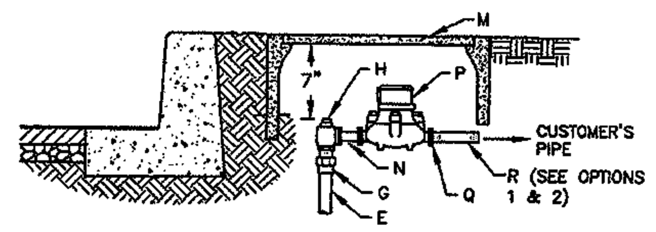
45° SIDE TAPPED CONNECTION



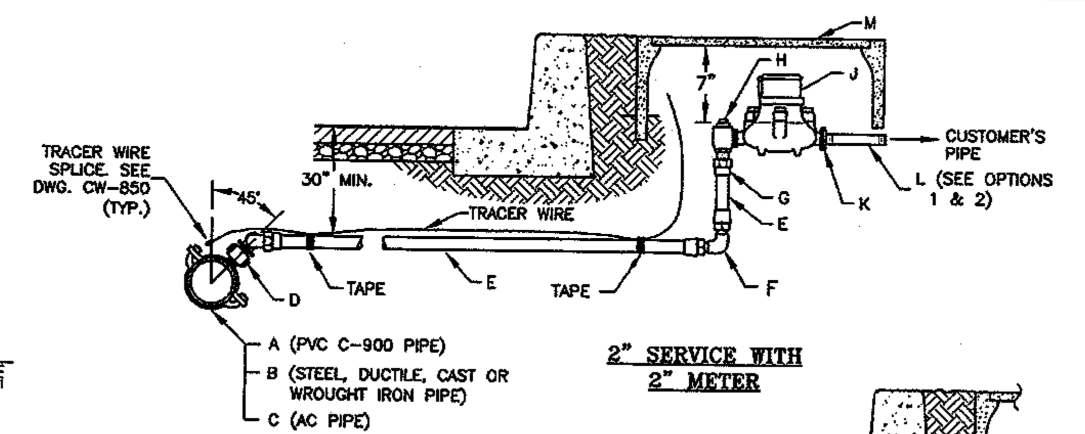
NOTES:
1. 2" SERVICE SHALL BE INSTALLED FOR ALL 1-1/2" METERS.
2. A SADDLE SHALL BE USED FOR ALL 2" SERVICES.
3. ALL PE PLASTIC PIPE REQUIRES TRACER WIRE TAPED TO PE PIPE AND EXTENDED INTO METER BOX PER LATEST REVISION OF DWG. CW-850 AND AS SPECIFIED IN CWS CO. MATERIAL SPECIFICATIONS DWG. CW-832.
4. INSERT STIFFNERS SHALL BE USED ON ALL PE PIPE WITH COMPRESSION CONNECTIONS.
5. RESPONSIBILITY FOR SERVICE MAINTENANCE BY CWS CO. ENDS AT DOWNSTREAM METER COUPLING (OR LEFT TO DISTRICT'S DISCRETION).
6. ALL PIPE FITTINGS IN CONTACT WITH DRINKING WATER SHALL BE LEAD FREE (< 0.25% LEAD) AND COMPLIANT TO NSF-61/SECTION 8.

OPTIONS: THESE OPTIONS MAY BE REQUIRED BY CWS CO.

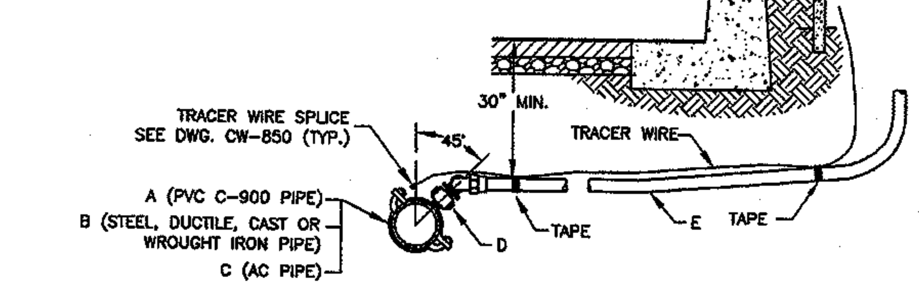
1. EXTEND CUSTOMER'S PIPING ±12" BEYOND METER BOX WITH TWO 12" NIPPLES & TWO 90° ELLS, BRASS (OR GALVANIZED IF PREFERRED BY CWS). SEE NOTE 5.
2. INSTALL BALL VALVE DOWNSTREAM FROM METER WHEN CUSTOMER'S PIPING IS UPHILL FROM METER OR CUSTOMER'S VALVE IS A GREAT DISTANCE FROM METER.
3. INSTALL 2" COPPER TUBING, TYPE K SOFT, INSTEAD OF PE WHEN CWS REPRESENTATIVE DETERMINES THAT CONDITIONS ARE UNFAVORABLE TO PE.
4. WHEN REQUIRED BY CWS COMPANY, PLACE BRICKS ON TWO SIDES OF METER BOX FOR SUPPORT (OR 2" x 4" PRESSURE TREATED LUMBER)



2" SERVICE WITH 1-1/2" METER

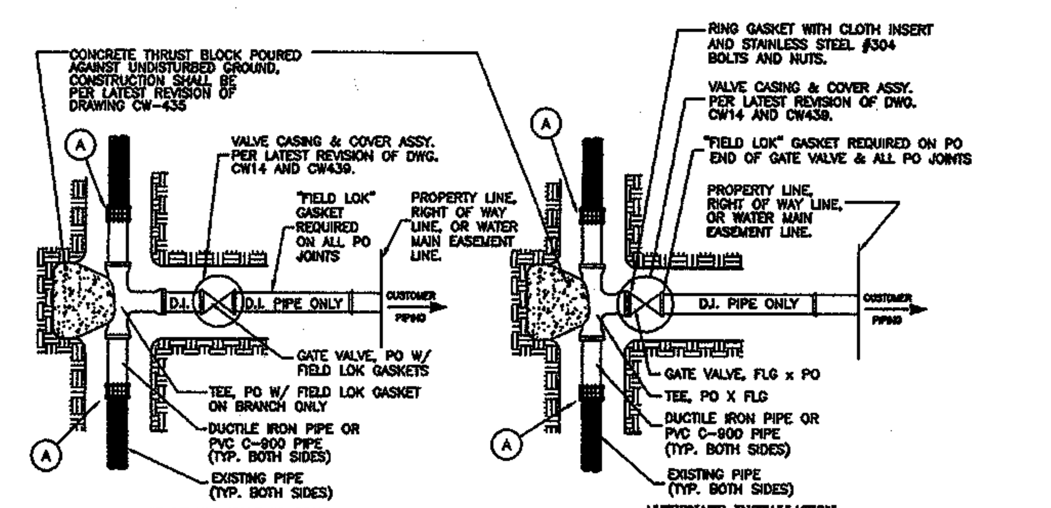


2" SERVICE WITH 2" METER



ALTERNATE INSTALLATION WITH SWEEP JOINT

CW 436R8 — STANDARD 2" SERVICE CONNECTION FOR 2" METER OR 1-1/2" METER



TYPICAL MATERIALS FOR ___ INCH FIRE SERVICE: (STANDARD INSTALLATION)

1 – ___" X ___" TEE PO CL DI
1 – ___" GATE VALVE PO NRS NO RS
1 – VALVE CASING AND COVER ASSEMBLY
___ – FEET OF ___" DUCTILE IRON PIPE (FOR FIRE SERVICE RUN)
___ – 20" POLYWRAP TUBING 8 MIL W/PVC TAPE
___ – ___" "FIELD LOK" GASKET F/PO
___ – FEET OF ___" DUCTILE IRON PIPE OR PVC C-900 PIPE (FOR TEE RUN)

TYPICAL MATERIALS FOR ___ INCH FIRE SERVICE: (ALTERNATE INSTALLATION)

1 – ___" X ___" TEE PO X FLG CL DI
1 – ___" GATE VALVE FLG X PO NRS NO RS
1 – VALVE CASING AND COVER ASSEMBLY
___ – FEET OF ___" DUCTILE IRON PIPE (FOR FIRE SERVICE RUN)
1 – GAL. METAL GUARD #301
1 – ROLL BIT OR RES WRAP
___ – 20" POLYWRAP TUBING 8 MIL W/PVC TAPE
___ – ___" "FIELD LOK" GASKET F/PO
___ – FEET OF PVC C-900 PIPE OR DUCTILE IRON PIPE (FOR TEE RUN)

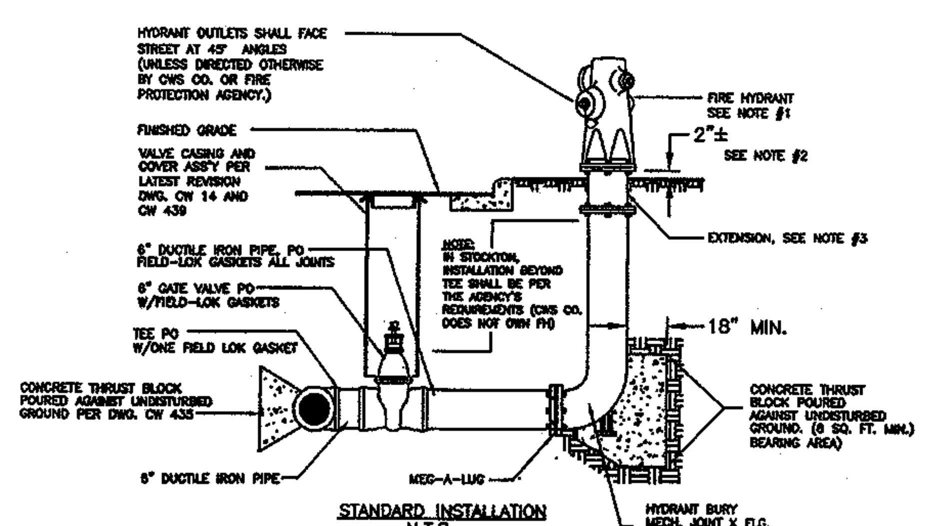
NOTES:
1. A DOUBLE CHECK VALVE OR REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY IS REQUIRED.
2. POLYETHYLENE ENCASEMENT WITH PVC TAPE IS REQUIRED FOR ALL DUCTILE IRON PIPE AND ALL FITTINGS.
3. PROTECT ALL UNDERGROUND BOLTS, NUTS, FLEX. COUPLINGS, AND BARE STEEL PER C.W.S. CO. PROTECTION COATING SPECIFICATIONS.
4. BLOCK AND POUR CONCRETE THRUST BLOCKS ON ALL ELLS, TEES, AND CAPS, PER LATEST REVISION OF DRAWING CW-435.
5. THE USE OF "FIELD LOK" GASKETS DOES NOT ELIMINATE THE NEED FOR CONCRETE THRUST BLOCKS.

FLANGE MATERIAL – CHECK ONE BOX

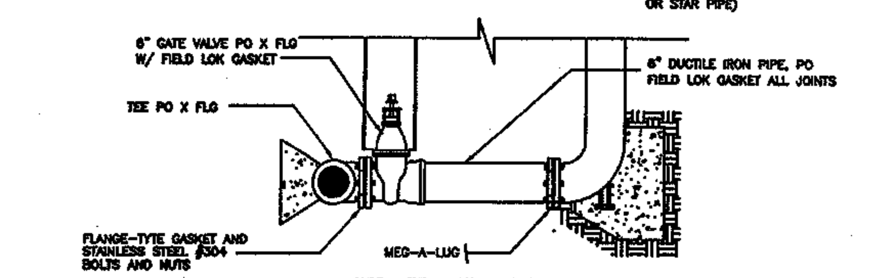
- ☐ 1 – 4" FLANGE TYTE GASKET; 8 – 5/8" ϕ x 3" #304 SS MACHINE BOLTS W/ HN
- ☐ 1 – 6" FLANGE TYTE GASKET; 8 – 3/4" ϕ x 3-1/2" #304 SS MACHINE BOLTS W/ HN
- ☐ 1 – 8" FLANGE TYTE GASKET; 8 – 3/4" ϕ x 3-1/2" #304 SS MACHINE BOLTS W/ HN
- ☐ 1 – 10" FLANGE TYTE GASKET; 12 – 7/8" ϕ x 4" #304 SS MACHINE BOLTS W/ HN

MATERIAL FOR ITEM (A) (EITHER INSTALLATION)	
TIE-INS FROM D.I. TO D.I. OR PVC C-900 OR ACME(<10"DIA.) USE SOLID SLEEVE MJ; TIE-INS FROM D.I. TO CI USE SOLID SLEEVE MJ DUAL PURPOSE	TIE-INS FROM D.I. TO OD STEEL USE OD STEEL X DI FLEX. COUPLING (10" SLV IF STL OR STD SLV IF D.I.)
TIE-INS FROM D.I. TO ACRB (ASBESTOS CEMENT ROUGH BARREL) USE ACRB X DI FLEX. COUPLING (10" SLEEVE IF STEEL OR STANDARD SLEEVE IF DUCTILE IRON).	TIE-INS FROM D.I. TO STD STEEL USE STD X DI FLEX. COUPLING (10" SLV IF STL OR STD SLV IF D.I.); TIE-INS FROM PVC C-900 TO PVC C-900 USE "CERTAINTEED" PVC CLOSURE COUPLING

CW 840R4 — STANDARD PRIVATE FIRE SERVICE CONNECTION



STANDARD INSTALLATION
N.T.S.



ALTERNATE INSTALLATION
N.T.S.

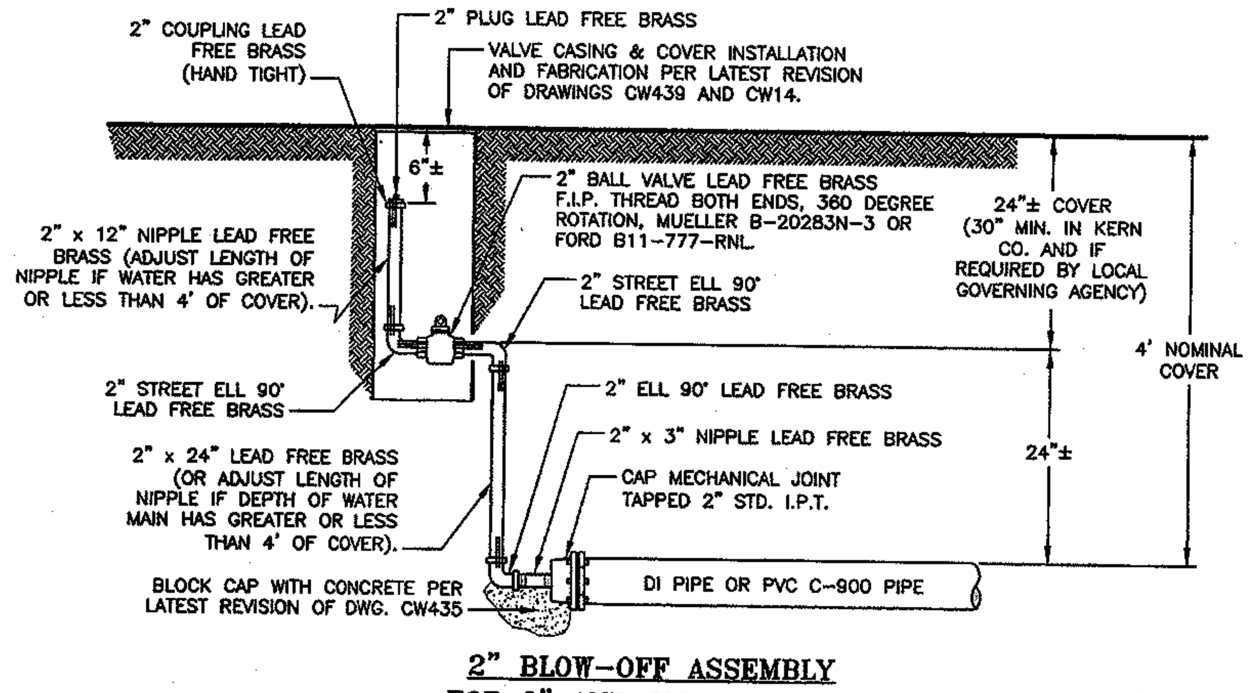
NOTES:
1. For district specific fire hydrant models and requirements, see district fire hydrant form, note 17 on main extension drawing, or verify with CWS Co. representive.
2. All fire hydrant materials shall comply with latest CWS Co. material specifications.
3. A hydrant extension may be required to adjust for finished grade.
4. For wet barrel hydrants this dimension is from finished grade to bury's flange or extension's flange when an extension is required.
5. Push-on, flanged fitting joints, and/or threaded-flanged risers may be required in certain fire protection districts. Verify with a CWS Co. representative all fire hydrant material prior to the installation. (In Stockton verify with the Fire Protection Agency that has jurisdiction).
6. Fire hydrant barricades shall be required when a vertical or rolled curb does not exist, or when the fire hydrant needs to be protected from moving vehicles, per latest revision of drawing CW-822.
7. All machine bolts and nuts shall be 304 stainless steel, except for breakoff bolts .
8. A 90° Elbow with Field Lok gaskets may be required for the fire hydrant installation when space is limited and the hydrant lead must run parallel to the main or the location of the fire hydrant requires the bend.
9. Protect all underground bolts and nuts per CWS Co. Standard Coating Specification.
10. A break-off check valve may be required in sloped terrain as specified by district personnel. Use Clow Model LB400 or approved equal.

CW 380R13 — TYPICAL FIRE HYDRANT INSTALLATION

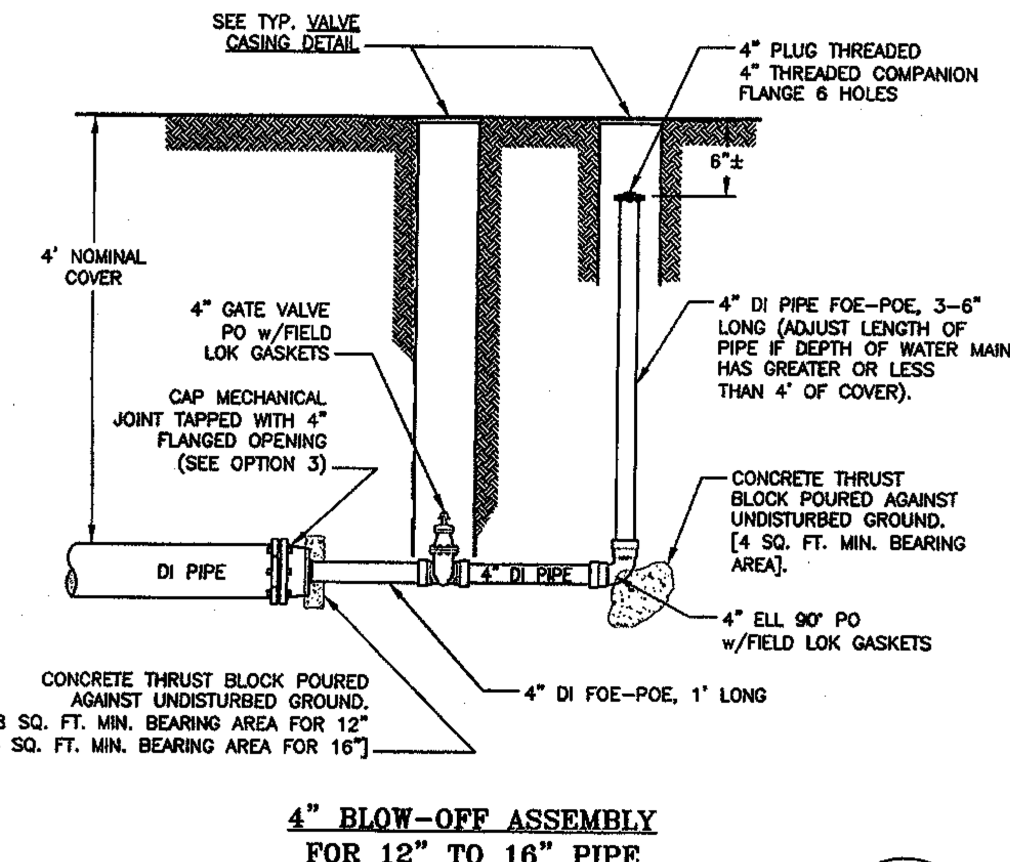
NOTE:
1. ALL PIPE FITTINGS IN CONTACT WITH WATER SHALL BE LEAD FREE (<0.25% LEAD) AND COMPLIANT TO NSF-61/SECTION 8.

OPTIONS: THESE OPTIONS MAY BE REQUIRED BY CWS CO. AT THEIR DISCRETION.

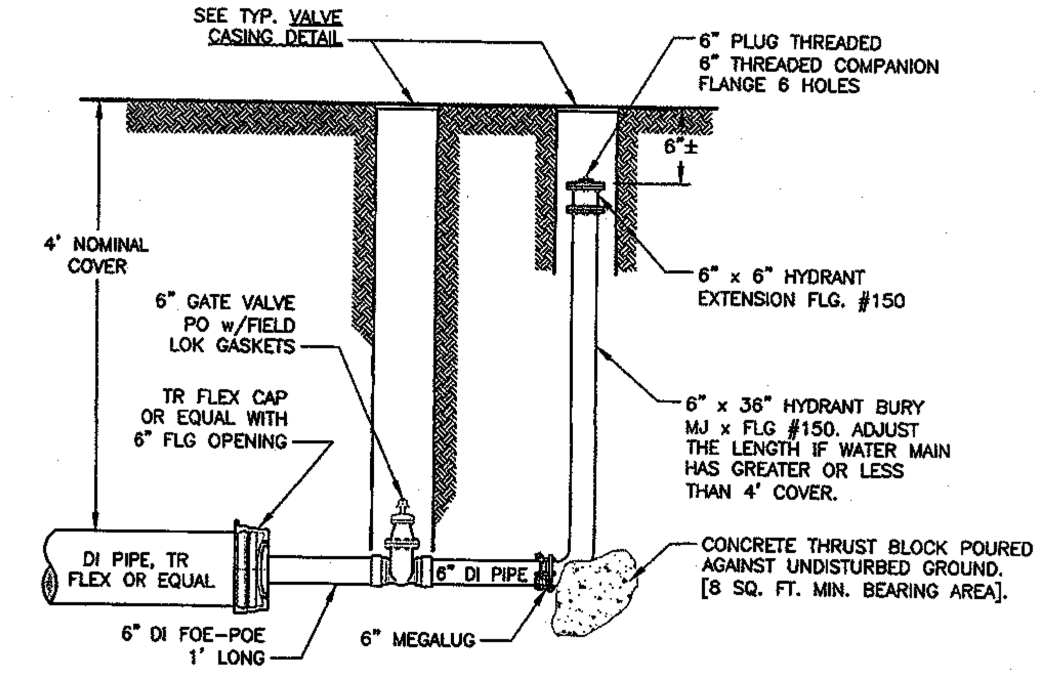
1. FOR 2" BLOW OFFS LOCATED OUTSIDE TRAVELED WAYS OR WHERE STREET RECONSTRUCTION IS NOT A CONCERN, THE BALL VALVE MAY BE PLACED CLOSER TO FINISHED GRADE (+/-12") WITH SHORTER OR NO PERMANENT RISER. SWING JOINT (ONE STREET ELL) MAY BE ADDED AS AN OFFSET TO PROPERLY LOCATE THE BALL VALVE.
2. IN LIEU OF NOTCHING VALVE CASING FOR 2" PIPE, CASING MAY BE SET ON BRICKS OR PRESSURE TREATED LUMBER SO CASING IS JUST ABOVE 2" PIPE.
3. IN LIEU OF CAP WITH FLANGED OPENING FOR 12" PIPE, 12" x 4" REDUCER PO WITH FIELD LOK GASKETS MAY BE USED.



2" BLOW-OFF ASSEMBLY FOR 8" AND SMALLER PIPE
N.T.S.



4" BLOW-OFF ASSEMBLY FOR 12" TO 16" PIPE
N.T.S.



6" BLOW-OFF ASSEMBLY FOR 18" AND LARGER PIPE
N.T.S.

CW 122R4 — STANDARD BLOW OFF ASSEMBLY

ENGINEERING
CALIFORNIA WATER SERVICE CO.
DEPARTMENT

REVISIONS:

	DATE:	INIT.
DISTRIBUTION MAP ☐		
PLAT SHEET ☐		
SYSTEM SCHEMATIC ☐		
STATION SCHEMATIC ☐		
ZONE MAP ☐		
VALVE RECORD ☐		

PLAT SHEET NO.:

SCALE: N.T.S.

DRAWN BY: M. FONG

DESIGNED BY:

CHECKED BY: DATE: [signature] 1/25/2010

APPROVED BY: DATE: [signature] 1/25/2010

TITLE: CALIFORNIA WATER SERVICE COMPANY STANDARD DRAWINGS

DISTRICT: ALL

DATE: 1-21-2010

PROJECT ID.:

DRAWING NO.: CWDWGS

SHT 2 OF 2