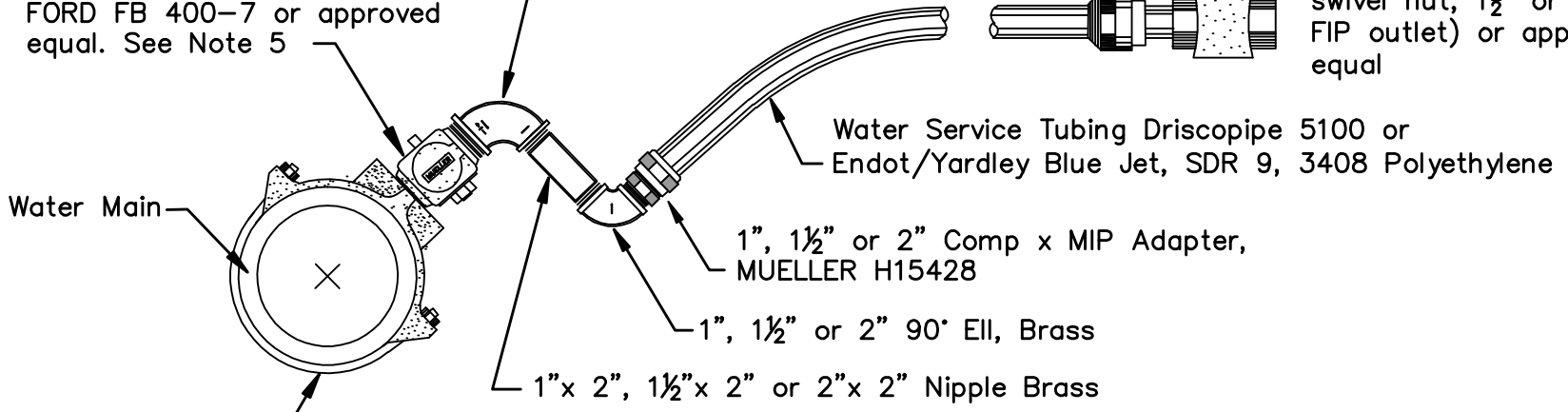


- △ 1" Threaded Corporation Stop  
MUELLER H-10003,
- 1 1/2" Threaded Corporation Stop  
FORD FB 400-6 or
- 2" Threaded Corporation Stop  
FORD FB 400-7 or approved  
equal. See Note 5

- 1 1/4" x 1" 90° Ell, Brass;
- 1 1/2" x 1 1/2" 90° Ell, Brass or
- 2" x 2" 90° Ell, Brass

Curb Stop  
MUELLER H24350 or Ford  
B43-332-WQ with Lock  
Wing and Compression inlet  
(3/4" or 1" use meter  
swivel nut, 1 1/2" or 2" use  
FIP outlet) or approved  
equal



Iron service saddle  
Ford FC 202 series  
w/stainless steel band  
and epoxy coated ductile  
iron body or approved  
equal.

NOTES:

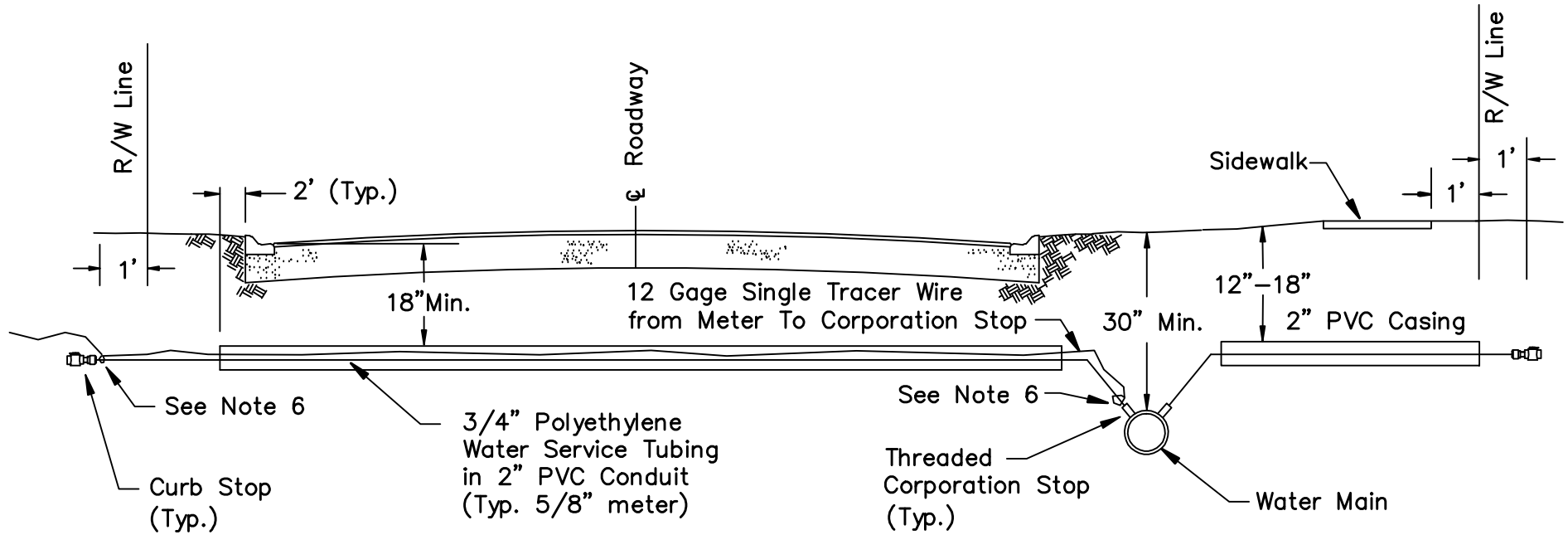
1. CONTRACTOR TO STAKE SERVICE CONNECTIONS, WHICH ARE TO BE 2 FT. FROM SIDE LOT LINE ON EITHER SIDE OF LOT (SEE INDEX 401 SHEET 3 OF 3). THESE SERVICES TO BE CONSISTENT WITHIN THE SUBDIVISION. DRIVEWAYS SHALL NOT BE BUILT OVER METERS OR SERVICE TAPS. METERS OR SERVICE TAPS SHALL NOT BE INSTALLED WITHIN OR UNDER DRIVEWAYS.
2. ALL LINES SHALL BE CHLORINATED AND PRESSURE TESTED (TEST FOR TWO HOURS @ 150 P.S.I.) UNDER THE DIRECTION OF THE UTILITIES DEPARTMENT. AFTER SUCCESSFUL COMPLETION OF THE TESTING AND CHLORINATION, THE PRESSURE SHALL REMAIN ON THE SYSTEM AT ALL TIMES.
3. TEN FT. SEPARATION REQUIRED BETWEEN PARALLEL WATER & SANITARY SEWER LINES.
4. SADDLE IS REQUIRED FOR ALL SERVICE CONNECTIONS TO MAINS.
5. TAPS SHOULD BE MADE ON A 45° ANGLE FROM TOP OF PIPE. FOR COVER 12" OR LESS, TAP SHALL BE MADE ON A 90° ANGLE FROM TOP OF PIPE.
6. MINIMUM DISTANCE BETWEEN SERVICE TAPS TO BE NOT LESS THAN 36".

# WATER MAIN SERVICE CONNECTION DETAIL

CITY INDEX NO. 401; 1 OF 3  
N.T.S.

				CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY B.V.D.	WATER MAIN SERVICE	DATE 08/09
				CHECKED BY L.M.M.	CONNECTION DETAIL	INDEX NO. 401
△	8/09	CHG. CORP STOP NO.	PUB. SVC.	DESIGNED BY R.S.F.		
REV.	DATE	DESCRIPTION	APP.			
						1 OF 3

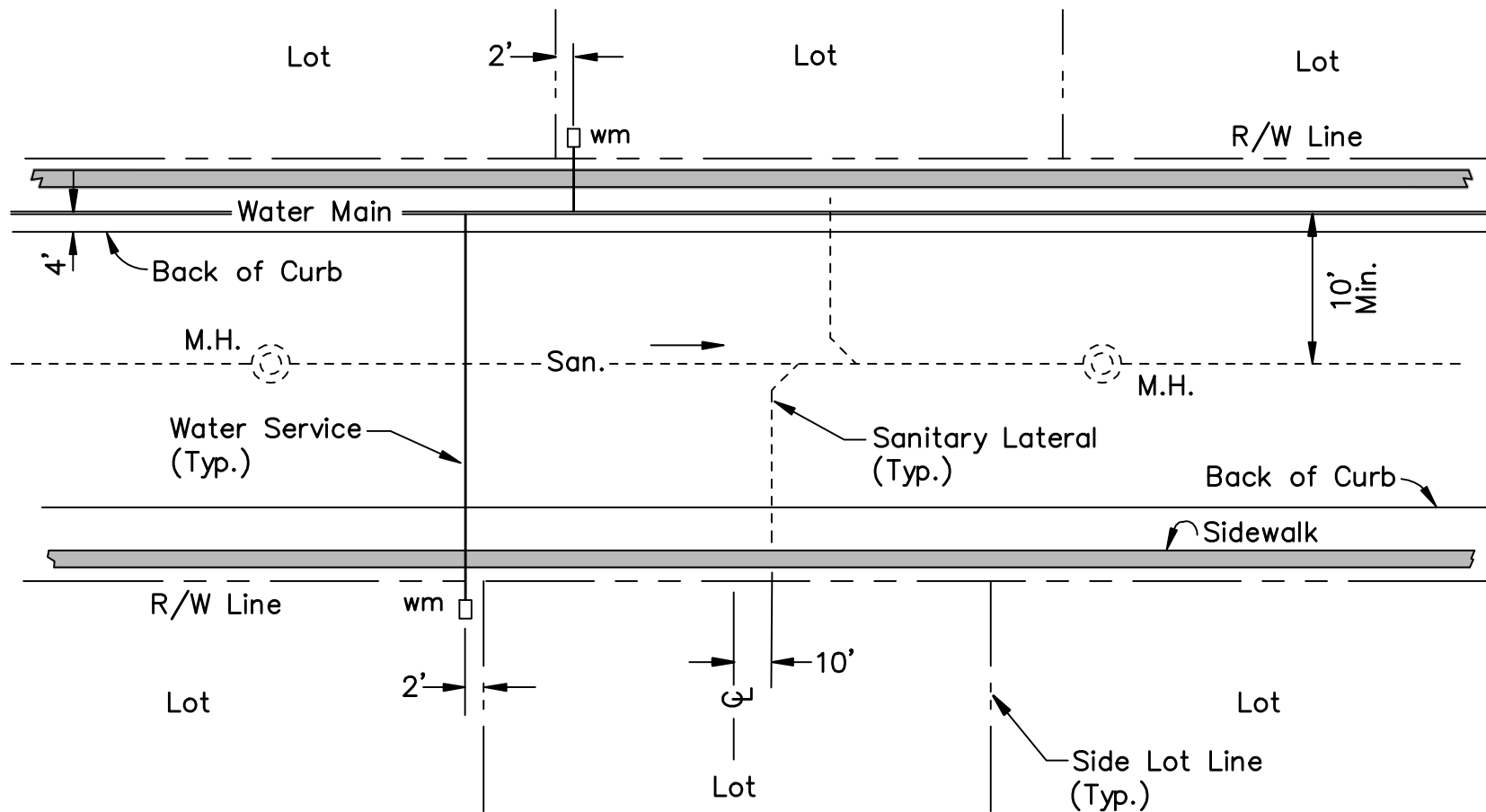
- NOTES:
1. 2" PVC CASING SHALL EXTEND TO CUSTOMER SIDE OF SIDEWALK.
  2. PVC CONDUIT TO BE MIN. 18" BELOW THE SURFACE MEASURED FROM TOP OF FACE OF CURB.
  3. WATER MAINS TO BE MIN. 30" BELOW GRADE and APPROX. 4' BACK OF CURB
  4. CURB STOP TO BE LOCATED APPROX. 1 FOOT BACK OF RIGHT-OF-WAY.
  5. SERVICE LINE TO BE MIN. 12" and MAX. 18" BELOW GRADE.
  6. CONNNECT 12 GAGE TRACER WIRE WITH TIE WRAPS AT CORPORATION STOP AND AT CURB STOP. PROVIDE 1 FOOT MINIMUM EXCESS LENGTH OF TRACER WIRE IN METER BOX.



## WATER MAIN SERVICE LINES TYPICAL SECTION

CITY INDEX NO. 401; 2 OF 3  
N.T.S.

				CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY M.P.	WATER MAIN	DATE 02/09
				CHECKED BY G.L.B.	SERVICE LINES	INDEX NO. 401
				DESIGNED BY Pub. Util.	TYPICAL SECTION	2 OF 3
REV.	DATE	DESCRIPTION	APP.			



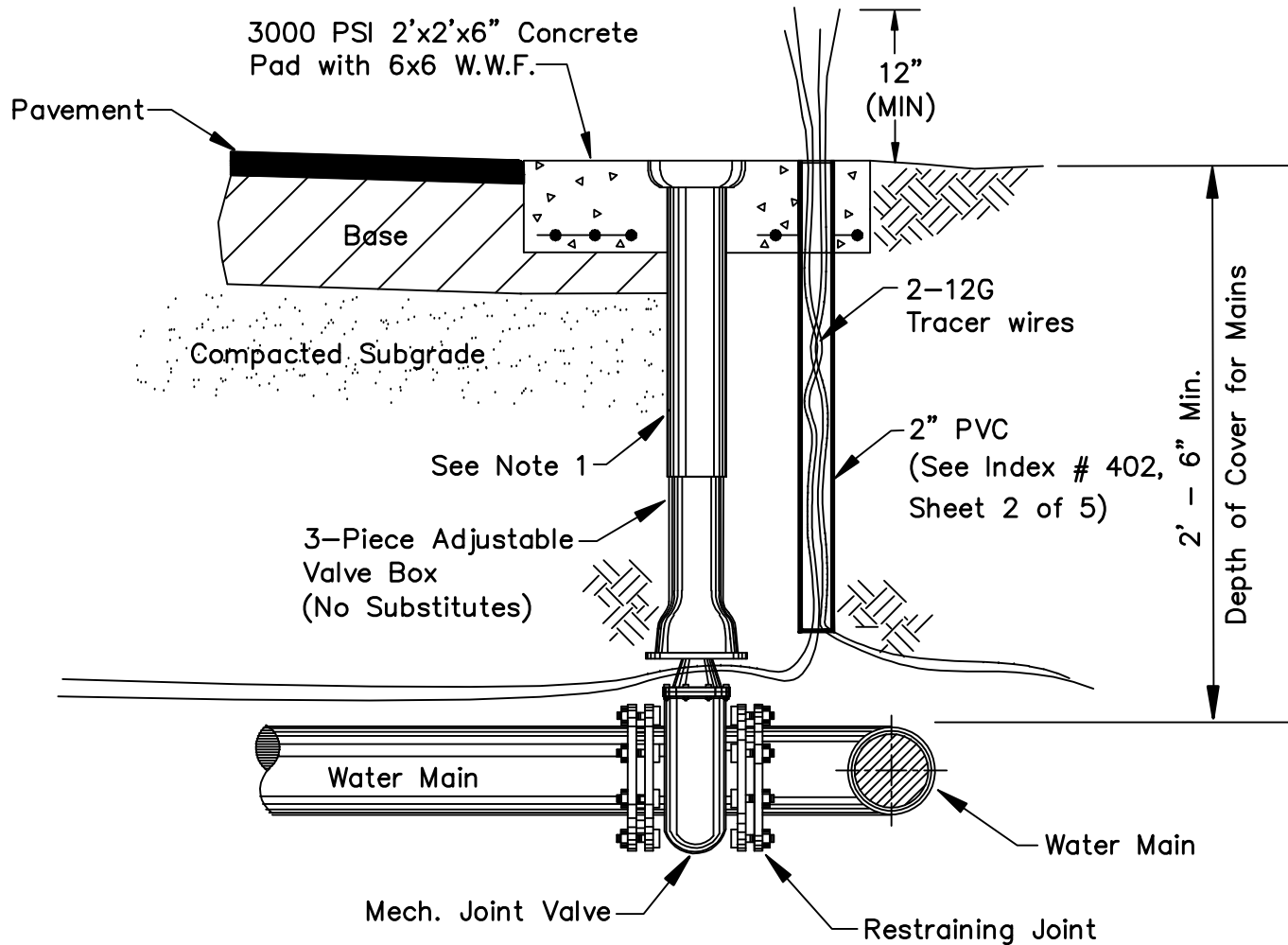
## WATER METER SERVICE LOCATIONS

**NOTES:**

1. SANITARY LATERALS TO BE WITHIN 10' OF CENTER OF LOT ON DOWNHILL SIDE OF CENTER OF LOT.
2. SEE INDEX 401, SHEET 1 OF 3, NOTE 2 REGARDING WATER METER AND SERVICE TAP LOCATIONS UNDER DRIVEWAYS.

CITY INDEX NO. 401; 3 OF 3  
N.T.S.

				<b>CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT</b>		
				REDRAWN BY M.J.P.	WATER METER AND	DATE 02/09
				CHECKED BY G.L.B.	SERVICE LOCATIONS	INDEX NO. 401
REV.	DATE	DESCRIPTION	APP.	DESIGNED BY G.C.H.	3 OF 3	



NOTE:  
1. NO PVC RISERS ALLOWED

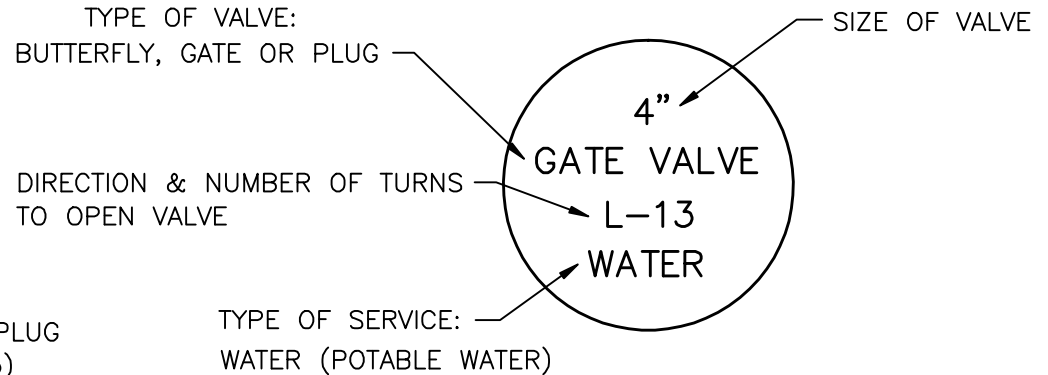
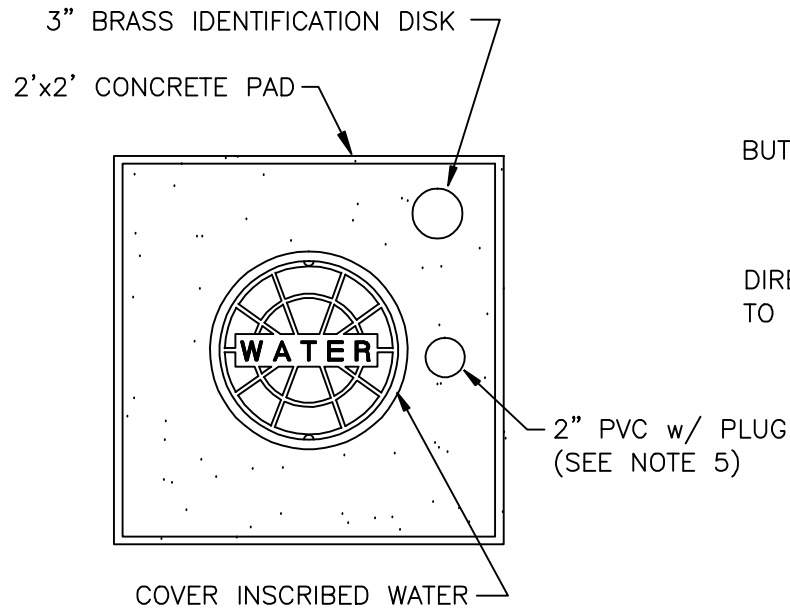
## TYPICAL VALVE & BOX SETTING

CITY INDEX NO. 402; 1 OF 5  
N.T.S.

				CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY B.V.D.	TYPICAL VALVE & BOX	DATE 02/09
				CHECKED BY TLM	SETTING	INDEX NO. 402
REV.	DATE	DESCRIPTION	APP.	DESIGNED BY Pub. Util.		1 OF 5

NOTES:

1. EXTENSION ON VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.
2. OPERATING NUT SHALL BE SET SO AS TO BE WITHIN 12" TO 18" OF GRADE.
3. INSTALL 3" BRASS IDENTIFICATION DISK IN CONCRETE.
4. INSTALL 2" PVC WITH PLUG FOR TRACER WIRE STORAGE.
5. LOCATOR WIRE ACCESS – 2" (WHITE OR GRAY) SCHEDULE 80 PVC, BRASS FEMALE ADAPTOR COUPLING AND 2" BRASS PLUG W/ RECESS NUT. TERMINATE INSULATED, SOLID 12 GAUGE COPPER TRACER WIRE AT TOP W/ A MINIMUM 12" OF EXTRA WIRE.



**3" BRASS IDENTIFICATION DISK**

**WATER VALVE BOX  
CONCRETE PAD PLAN VIEW**

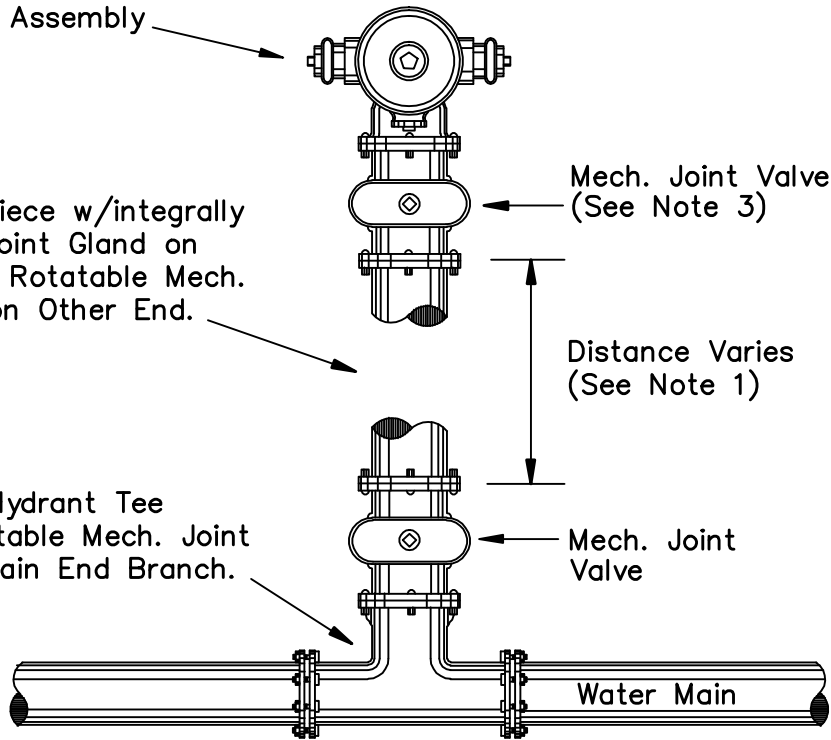
CITY INDEX NO. 402; 2 OF 5  
N.T.S.

				CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY D.King	WATER VALVE BOX	DATE 02/09
				CHECKED BY RM	CONCRETE PAD	INDEX NO. 402
				DESIGNED BY Pub. Util.	PLAN VIEW	2 OF 5
REV.	DATE	DESCRIPTION	APP.			

Fire Hydrant Assembly  
(Typ.)

Connecting Piece w/integrally  
cast Mech. Joint Gland on  
one End—D.I. Rotatable Mech.  
Joint Gland on Other End.

Valve and Hydrant Tee  
w/D.I. Rotatable Mech. Joint  
Gland on Plain End Branch.



NOTES:

1. ON HYDRANTS REQUIRING RUNOUT  
LAST TWO JOINTS MUST BE RESTRAINED  
(SEE DETAIL 403 SHEET 2 OF 2).
2. HYDRANT RUN OUTS SHALL BE  
MAXIMUM 10 FEET OR LESS  
FROM WATER MAIN.
3. ON HYDRANT RUNOUTS GREATER  
THAN 10 FEET, INSTALL MECH. JOINT  
VALVE AT MAIN AND AT HYDRANT.

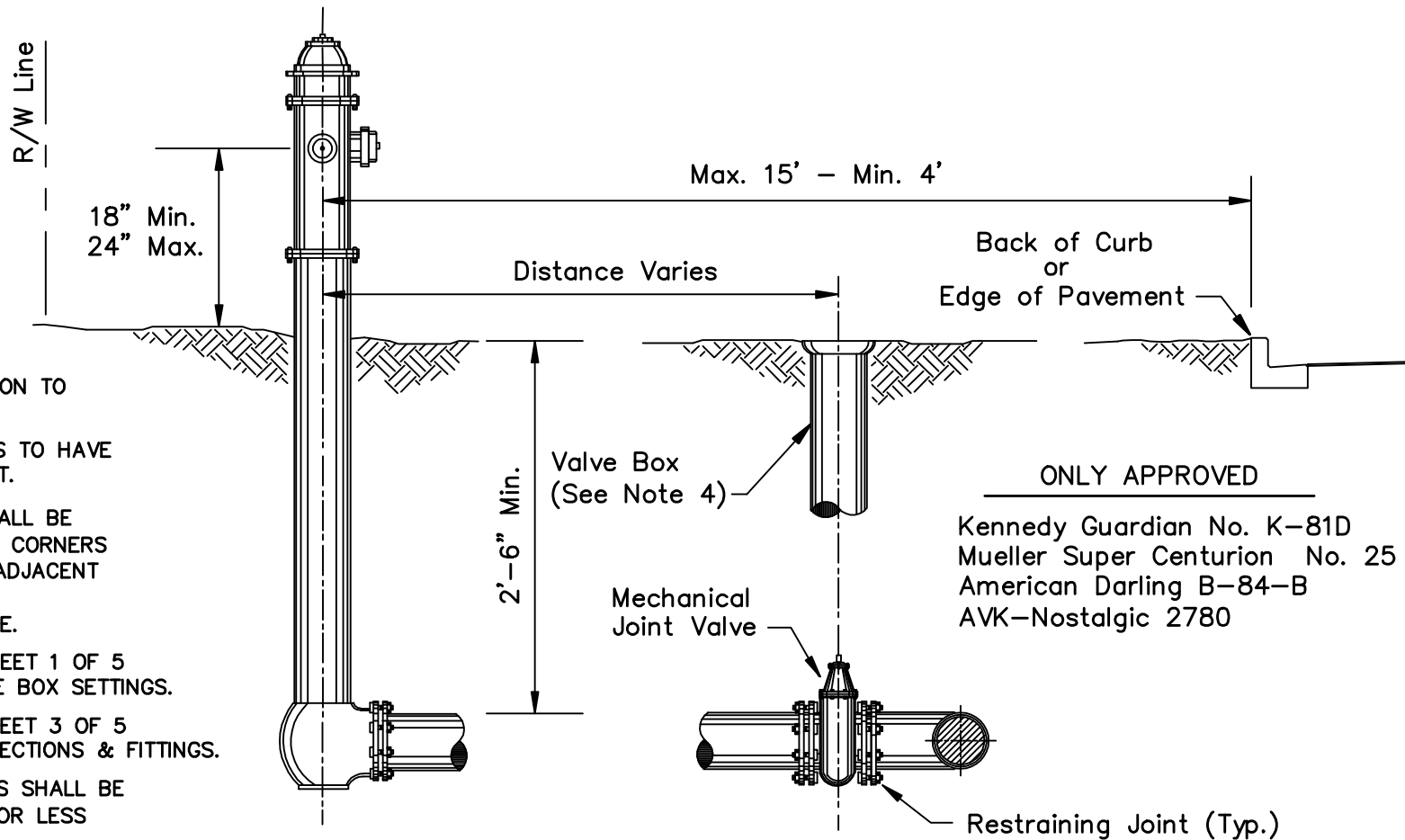
ONLY APPROVED

Kennedy Guardian No. K-81D  
Mueller Super Centurion No. 25  
American Darling B-84-B  
AVK-Nostalgic 2780

TYPICAL HYDRANT SETTING  
PLAN VIEW

CITY INDEX NO. 402; 3 OF 5  
N.T.S.

				CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY B.V.D.	TYPICAL HYDRANT	DATE 02/09
				CHECKED BY G.L.B.	SETTING	INDEX NO. 402
				DESIGNED BY G.C.H.	PLAN VIEW	3 OF 5
REV.	DATE	DESCRIPTION	APP.			



**NOTES:**

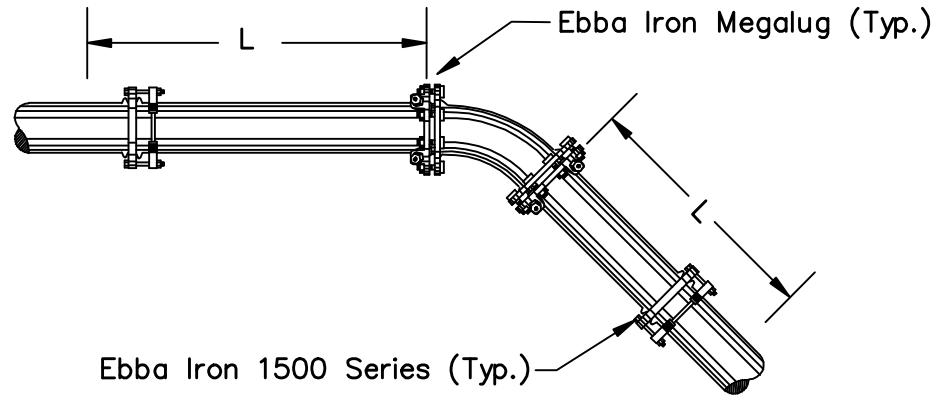
1. STEAMER CONNECTION TO FACE STREET.
2. ALL FIRE HYDRANTS TO HAVE 5 1/4" VALVE SEAT.
3. FIRE HYDRANTS SHALL BE PLACED AT STREET CORNERS OR IN THE R.O.W. ADJACENT TO SIDE LOT LINES WHENEVER POSSIBLE.
4. SEE INDEX 402, SHEET 1 OF 5 FOR TYPICAL VALVE BOX SETTINGS.
5. SEE INDEX 402, SHEET 3 OF 5 FOR TYPICAL CONNECTIONS & FITTINGS.
6. HYDRANT RUN OUTS SHALL BE MAXIMUM 10 FEET OR LESS FROM WATER MAIN.
7. ON HYDRANT RUNOUTS GREATER THAN 10 FEET FROM THE MAIN, INSTALL MECH. JOINT VALVE AT MAIN AND AT HYDRANT.

**TYPICAL FIRE HYDRANT SETTING**

CITY INDEX NO. 402; 4 OF 5  
N.T.S.

				CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY B.V.D.	TYPICAL FIRE HYDRANT	DATE 02/09
				CHECKED BY G.C.H.	SETTING	INDEX NO. 402
REV.	DATE	DESCRIPTION	APP.	DESIGNED BY T.C.J.		4 OF 5





ON ALL TEES, A MINIMUM OF 5' SHALL BE RESTRAINED ON EACH RUN LEG  
 L = MINIMUM LENGTH TO BE RESTRAINED ON EACH SIDE OF FITTING (ft.)  
 FIGURES BASED ON 30" BURY DEPTH, 150 PSI TEST PRESSURE.  
 8" PVC MAXIMUM SIZE USED IN SYSTEM

NOM. PIPE SIZE	ELBOWS (deg.)				VALVE TEES BRANCH	DEAD END
	11.25	22.50	45	90		
LENGTH IN FEET (L)						
4"	2	4	9	21	28	46
6"	3	6	12	29	47	65
8"	4	8	16	38	66	85

THE FOLLOWING JOINTS MUST BE RESTRAINED IN ALL APPLICATIONS:

1. BEND – INLET AND OUTLET
2. TEE – OUTLET BRANCH
3. OFFSETS – INLET AND OUTLET
4. CAPS
5. PLUGS
6. DEAD ENDS
7. HYDRANT RUNOUTS SHALL BE RESTRAINED AS DEAD ENDS

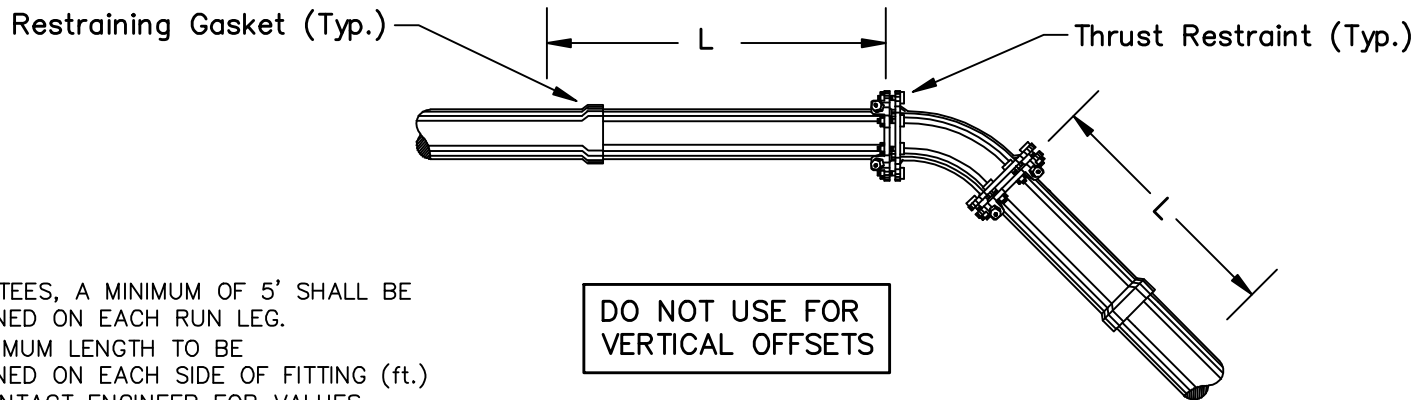
NOTE:

THRUST RESTRAINT AT FITTINGS AND VALVES SHALL BE EBBA IRON MEGALUG RESTRAINERS.  
 THRUST RESTRAINT BETWEEN PIPE JOINTS SHALL BE EBBA IRON 1500 SERIES RESTRAINERS.

## PVC PIPE THRUST RESTRAINING

CITY INDEX NO. 403; 1 OF 2  
 N.T.S.

				CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY B.V.D.	PVC PIPE	DATE 02/09
				CHECKED BY G.L.B.	THRUST	INDEX NO. 403
				DESIGNED BY G.C.H.	RESTRAINING	
REV.	DATE	DESCRIPTION	APP.			1 of 2



ON ALL TEES, A MINIMUM OF 5' SHALL BE RESTRAINED ON EACH RUN LEG.

L = MINIMUM LENGTH TO BE RESTRAINED ON EACH SIDE OF FITTING (ft.)

☆ = CONTACT ENGINEER FOR VALUES

FIGURES BASED ON 30" BURY DEPTH, 150 PSI TEST PRESSURE

FIGURES DON'T APPLY TO POLY WRAPPED PIPE

NOM. PIPE SIZE	ELBOWS (deg.)				VALVE TEES BRANCH	DEAD END
	11.25	22.50	45	90		
LENGTH IN FEET (L)						
4"	2	3	7	17	18	30
6"	2	5	10	23	30	42
8"	3	6	12	30	42	54
12"	4	8	17	42	☆	76
16"	5	10	22	53	☆	97
20"	6	13	26	63	☆	117

THE FOLLOWING JOINTS MUST BE RESTRAINED IN ALL APPLICATIONS:

1. BEND – INLET AND OUTLET
2. TEE – ALL BRANCHES
3. OFFSETS – INLET AND OUTLET
4. CAPS
5. PLUGS
6. DEAD ENDS
7. HYDRANT RUNOUTS SHALL BE RESTRAINED AS DEAD ENDS

NOTE:

THRUST RESTRAINT ON SLIPJOINT DUCTILE IRON PIPE SHALL BE U.S. PIPE FIELD LOCK GASKETS FOR TYTON JOINT PIPE or AMERICAN FAST-GRIP GASKETS FOR AMERICAN FASTITE PIPE. THRUST RESTRAINT ON DUCTILE IRON FITTINGS SHALL BE PROVIDED BY THE USE OF MEGALUG RETAINERS AND MECHANICAL JOINT FITTINGS.

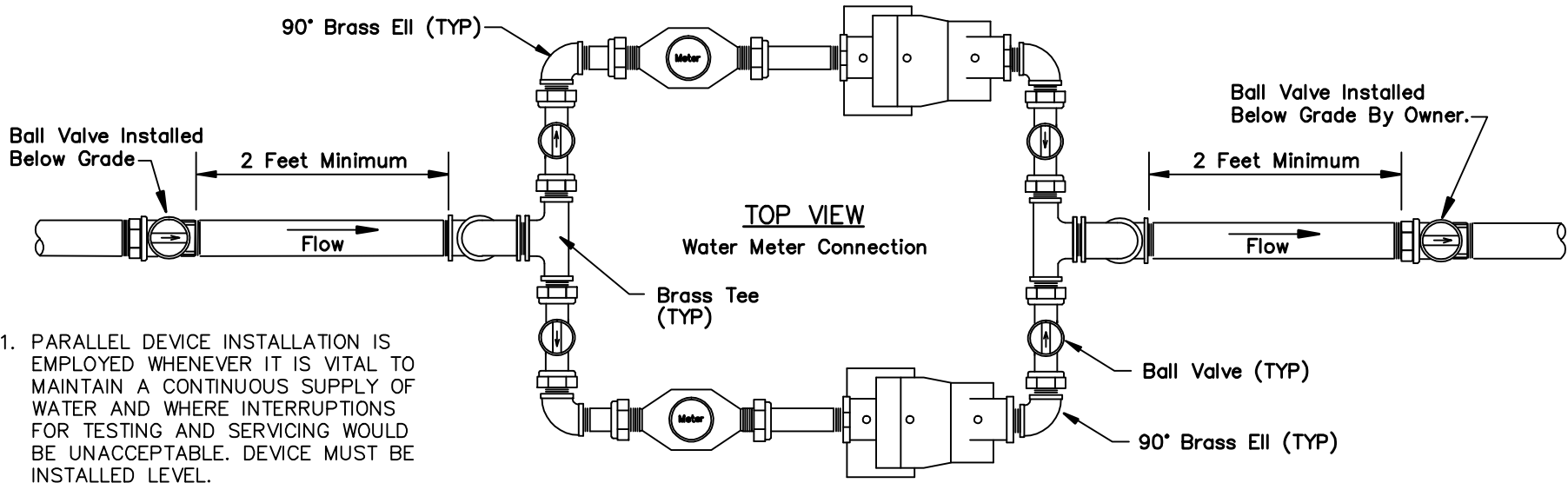
## DUCTILE IRON PIPE THRUST RESTRAINING

CITY INDEX NO. 403; 2 OF 2

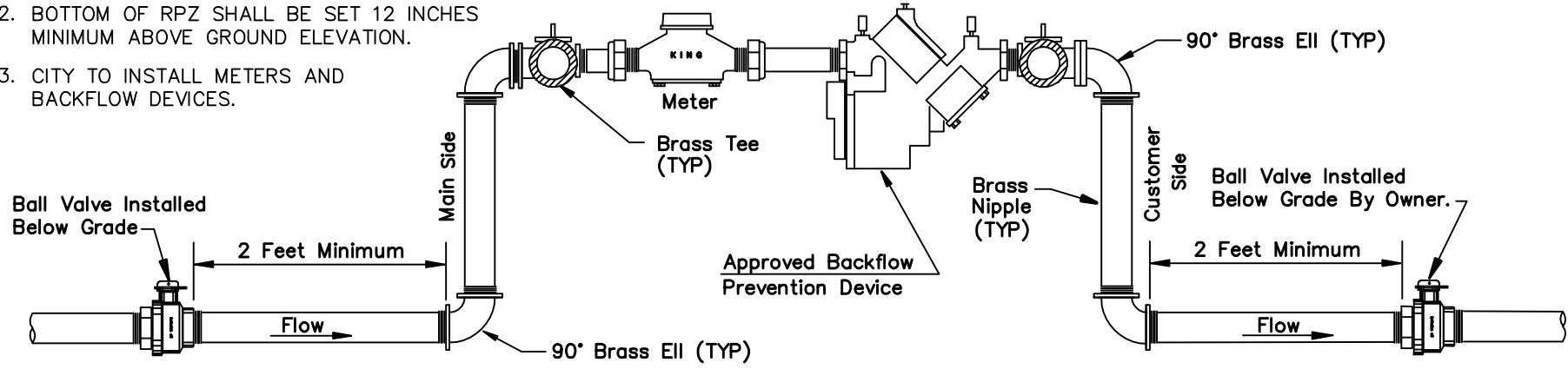
N.T.S.

REV.	DATE	DESCRIPTION	APP.	CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY B.V.D.	DUCTILE IRON PIPE	DATE 02/09
				RECHECKED BY G.L.B.	THRUST	INDEX NO. 403
				DESIGNED BY G.C.H.	RESTRAINING	2 OF 2





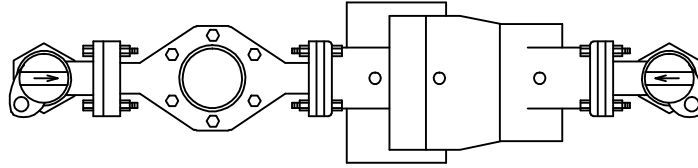
1. PARALLEL DEVICE INSTALLATION IS EMPLOYED WHENEVER IT IS VITAL TO MAINTAIN A CONTINUOUS SUPPLY OF WATER AND WHERE INTERRUPTIONS FOR TESTING AND SERVICING WOULD BE UNACCEPTABLE. DEVICE MUST BE INSTALLED LEVEL.
2. BOTTOM OF RPZ SHALL BE SET 12 INCHES MINIMUM ABOVE GROUND ELEVATION.
3. CITY TO INSTALL METERS AND BACKFLOW DEVICES.



## TYPICAL DUAL PARALLEL METER SET 3/4" AND 1" MODELS

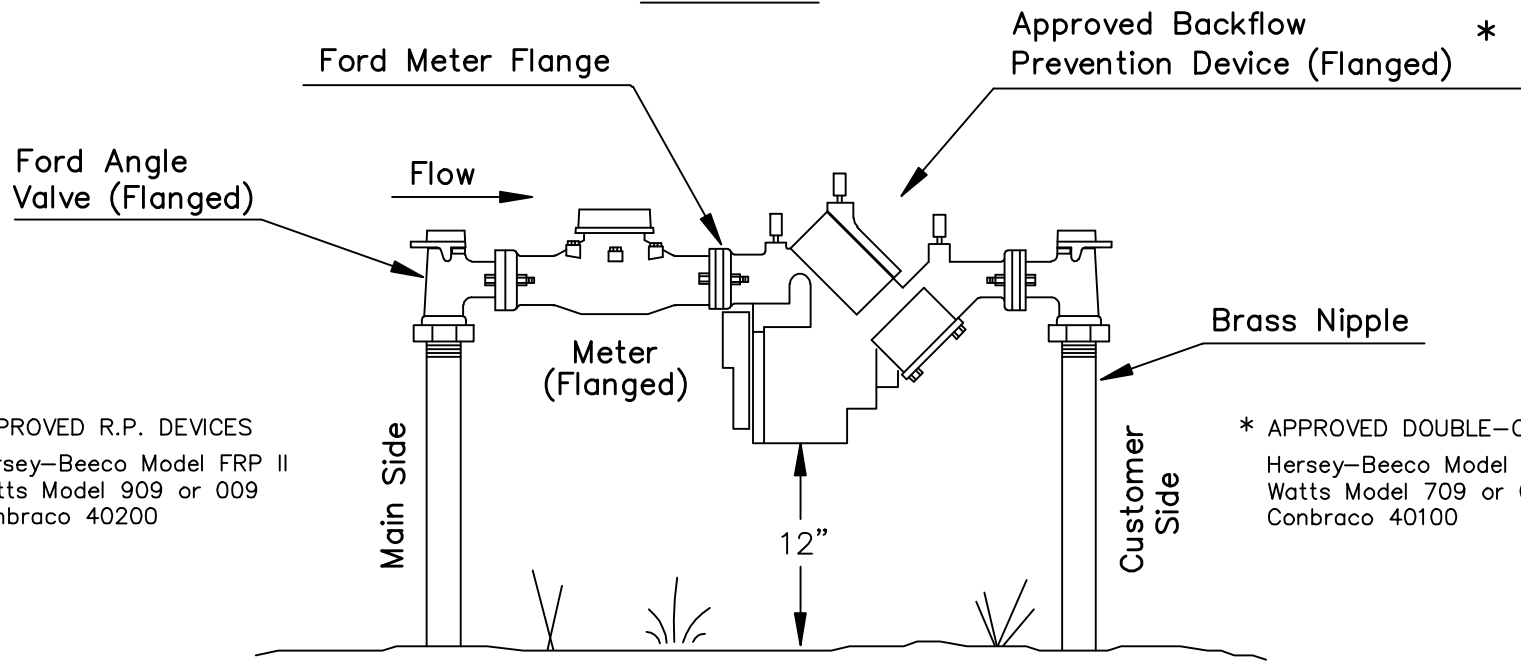
CITY INDEX NO. 405; 1 OF 5  
N.T.S.

				CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY E.A.	TYPICAL DUAL PARALLEL METER SET	DATE 02/09
				CHECKED BY G.L.B.	3/4" AND 1"	INDEX NO. 405
REV.	DATE	DESCRIPTION	APP.	DESIGNED BY Pub. Util.	MODELS	1 Of 5



NOTE:  
Device must be installed level.

TOP VIEW



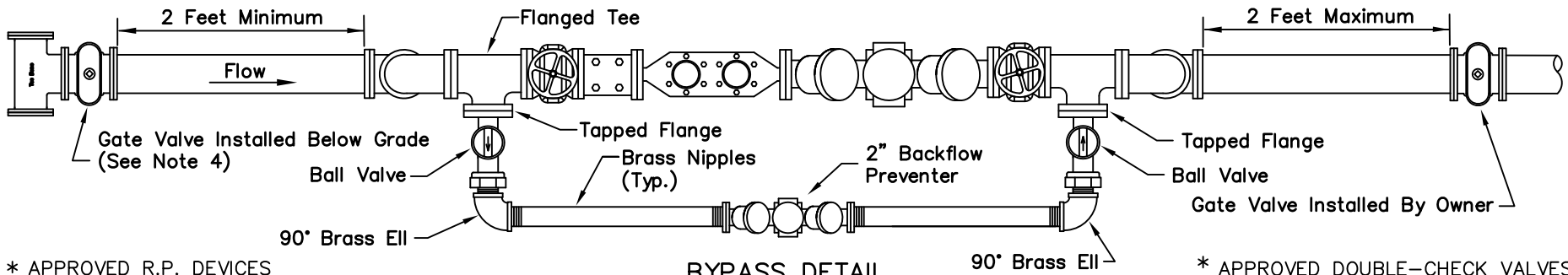
\* APPROVED R.P. DEVICES  
Hersey-Beeco Model FRP II  
Watts Model 909 or 009  
Conbraco 40200

\* APPROVED DOUBLE-CHECK VALVES  
Hersey-Beeco Model FDC  
Watts Model 709 or 007  
Conbraco 40100

TYPICAL METER SETS W/  
BACKFLOW PREVENTERS 1-1/2" & 2" MODELS

CITY INDEX NO. 405; 2 OF 5  
N.T.S.

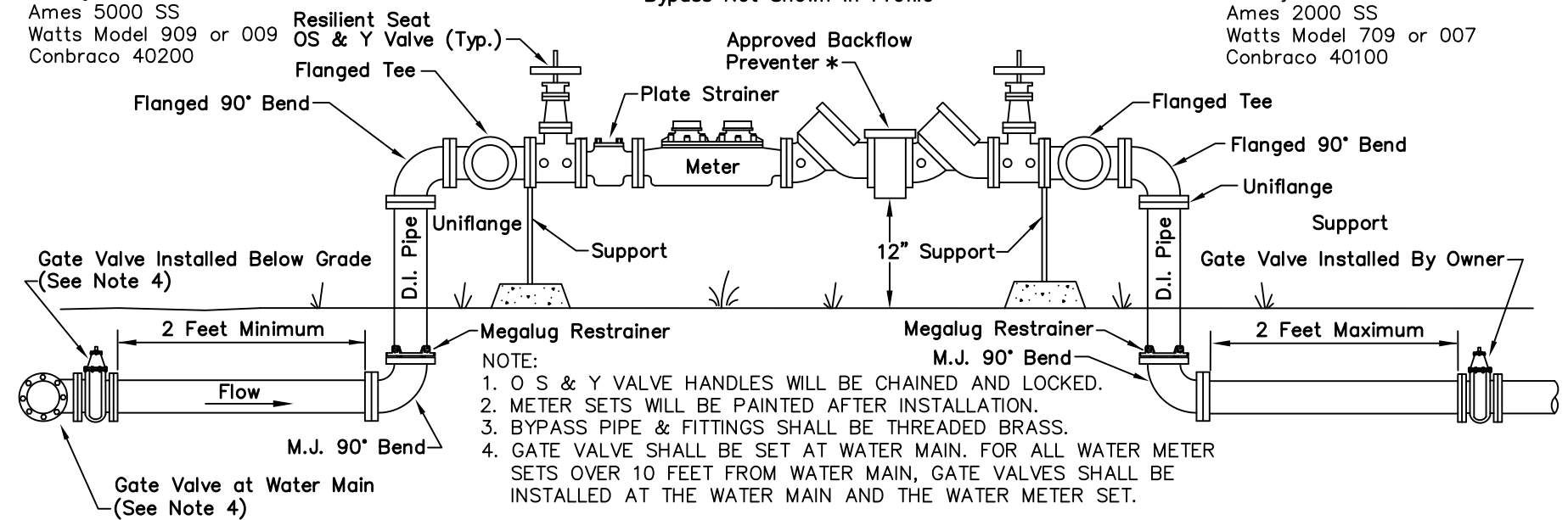
				CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY MP	TYPICAL METER SETS W/ BACKFLOW PREVENTERS	DATE 02/09
				CHECKED BY G.L.B.	1 1/2" and 2" MODELS	INDEX NO. 405
REV.	DATE	DESCRIPTION	APP.	DESIGNED BY Pub. Util.		2 OF 5



**BYPASS DETAIL**  
Bypass Not Shown in Profile

\* APPROVED R.P. DEVICES  
Hersey-Beeco Model 6CM  
Ames 5000 SS  
Watts Model 909 or 009  
Conbraco 40200

\* APPROVED DOUBLE-CHECK VALVES  
Hersey-Beeco Model No. 2  
Ames 2000 SS  
Watts Model 709 or 007  
Conbraco 40100

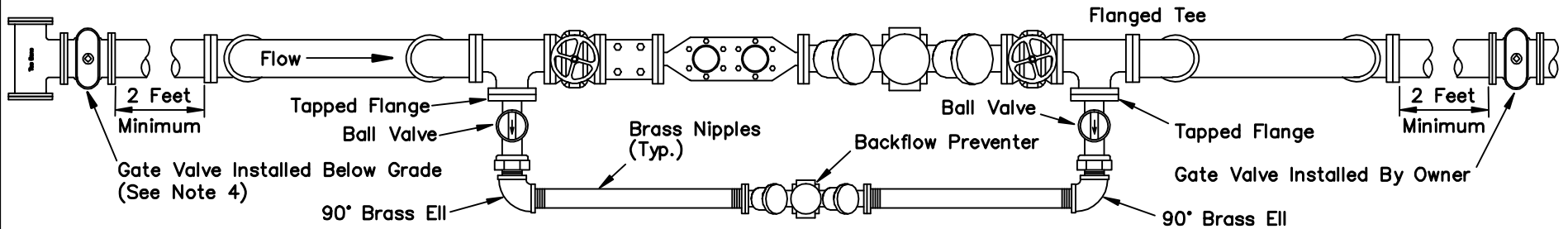


- NOTE:
1. OS & Y VALVE HANDLES WILL BE CHAINED AND LOCKED.
  2. METER SETS WILL BE PAINTED AFTER INSTALLATION.
  3. BYPASS PIPE & FITTINGS SHALL BE THREADED BRASS.
  4. GATE VALVE SHALL BE SET AT WATER MAIN. FOR ALL WATER METER SETS OVER 10 FEET FROM WATER MAIN, GATE VALVES SHALL BE INSTALLED AT THE WATER MAIN AND THE WATER METER SET.

## TYPICAL COMPOUND WATER METER SET 90° RISE 3", 4" & 6" MODELS

CITY INDEX NO. 405; 3 OF 5  
N.T.S.

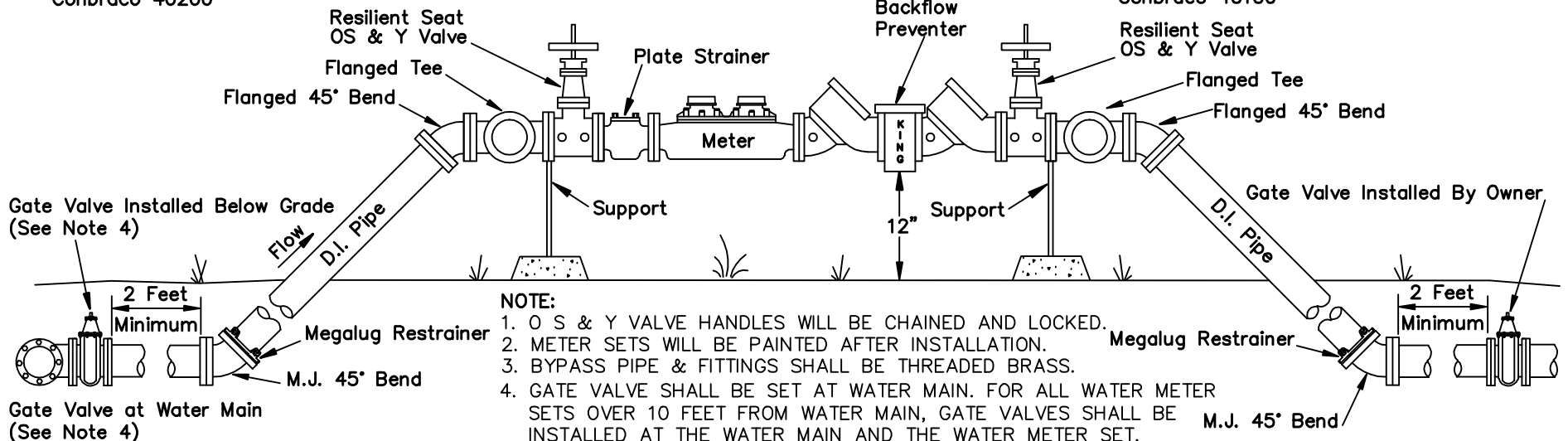
				CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY MP	TYPICAL COMPOUND	DATE 02/09
1	5/17/2012	DEPARTMENT NAME	DSR	CHECKED BY GLB	WATER METER SET	INDEX NO. 405
REV.	DATE	DESCRIPTION	APP.	DESIGNED BY Pub. Util.	90° RISE	3 Of 5
					3",4" and 6" MODELS	



**BYPASS DETAIL**  
Bypass Not Shown In Profile

**\* APPROVED R.P. DEVICES**  
Hersey-Beeco Model 6CM  
Ames 5000 SS  
Watts Model 909 or 009  
Conbraco 40200

**\* APPROVED DOUBLE-CHECK VALVES**  
Hersey-Beeco Model No. 2  
Ames 2000 SS  
Watts Model 709 or 007  
Conbraco 40100



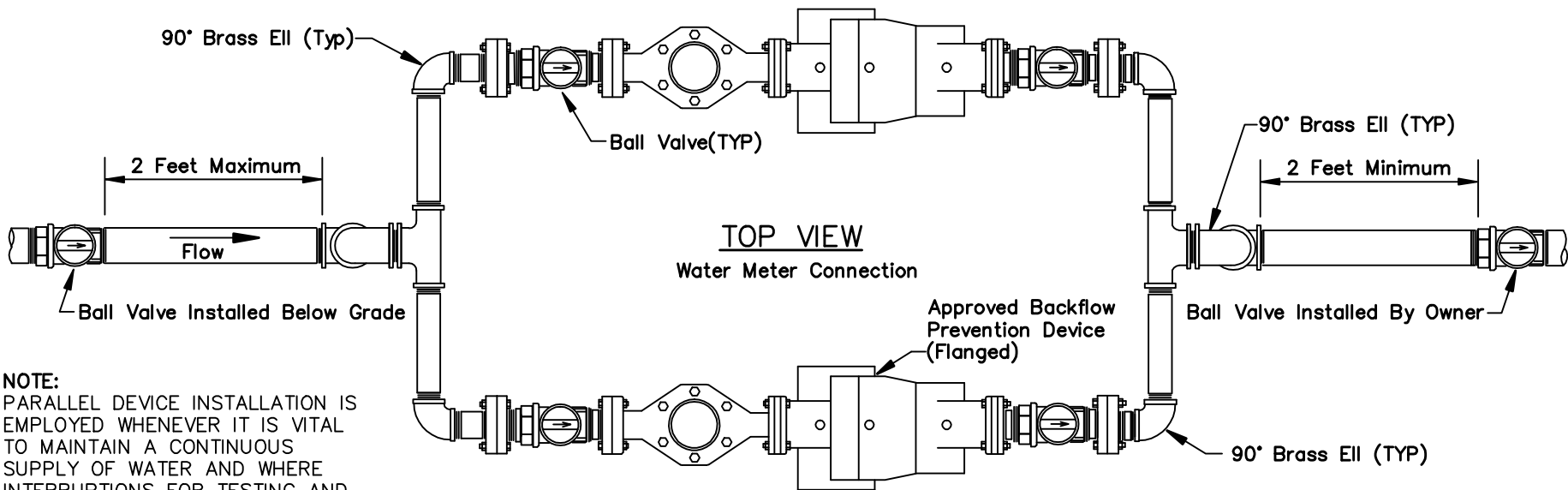
- NOTE:**
1. O S & Y VALVE HANDLES WILL BE CHAINED AND LOCKED.
  2. METER SETS WILL BE PAINTED AFTER INSTALLATION.
  3. BYPASS PIPE & FITTINGS SHALL BE THREADED BRASS.
  4. GATE VALVE SHALL BE SET AT WATER MAIN. FOR ALL WATER METER SETS OVER 10 FEET FROM WATER MAIN, GATE VALVES SHALL BE INSTALLED AT THE WATER MAIN AND THE WATER METER SET.

## TYPICAL COMPOUND WATER METER SET

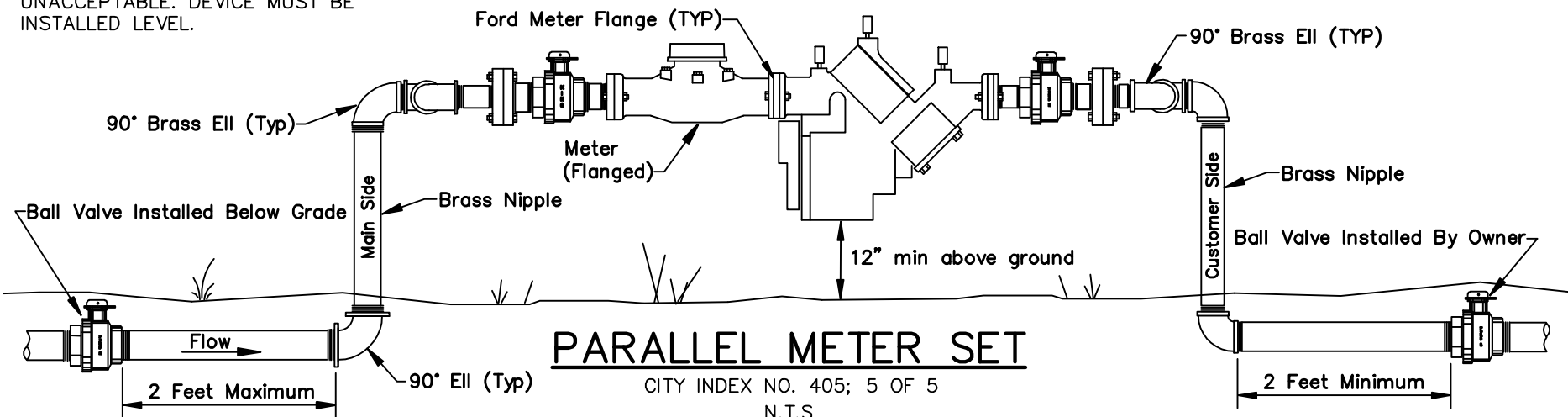
### 45° RISE 3", 4" & 6" MODELS

CITY INDEX NO. 405; 4 OF 5 N.T.S.

				CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY MP	TYPICAL COMPOUND	DATE 02/09
				CHECKED BY G.L.B.	WATER METER SET	INDEX NO. 405
REV.	DATE	DESCRIPTION	APP.	DESIGNED BY Pub. Util.	45° RISE	4 OF 5
					3", 4" and 6" MODELS	



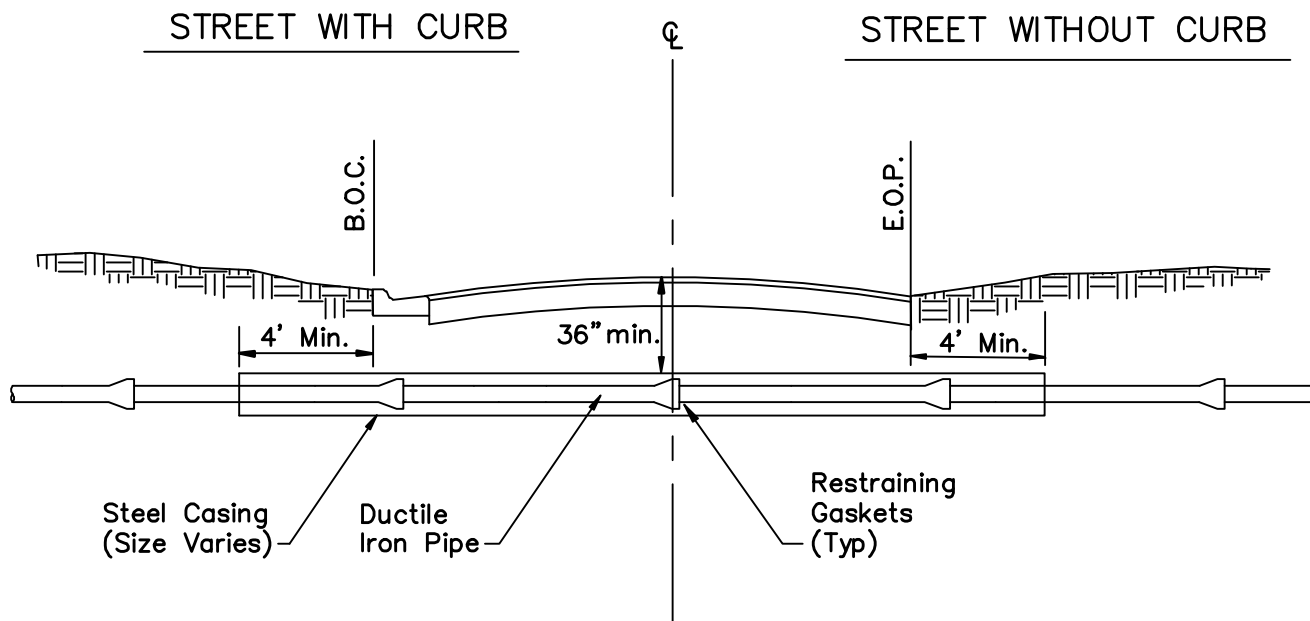
**NOTE:**  
PARALLEL DEVICE INSTALLATION IS EMPLOYED WHENEVER IT IS VITAL TO MAINTAIN A CONTINUOUS SUPPLY OF WATER AND WHERE INTERRUPTIONS FOR TESTING AND SERVICING WOULD BE UNACCEPTABLE. DEVICE MUST BE INSTALLED LEVEL.



CITY INDEX NO. 405; 5 OF 5

N.T.S

REV.	DATE	DESCRIPTION	APP.	CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT	
				REDRAWN BY E.A.	DATE 02/09
				CHECKED BY G.L.B.	INDEX NO. 405
				DESIGNED BY Pub. Util.	5 Of 5



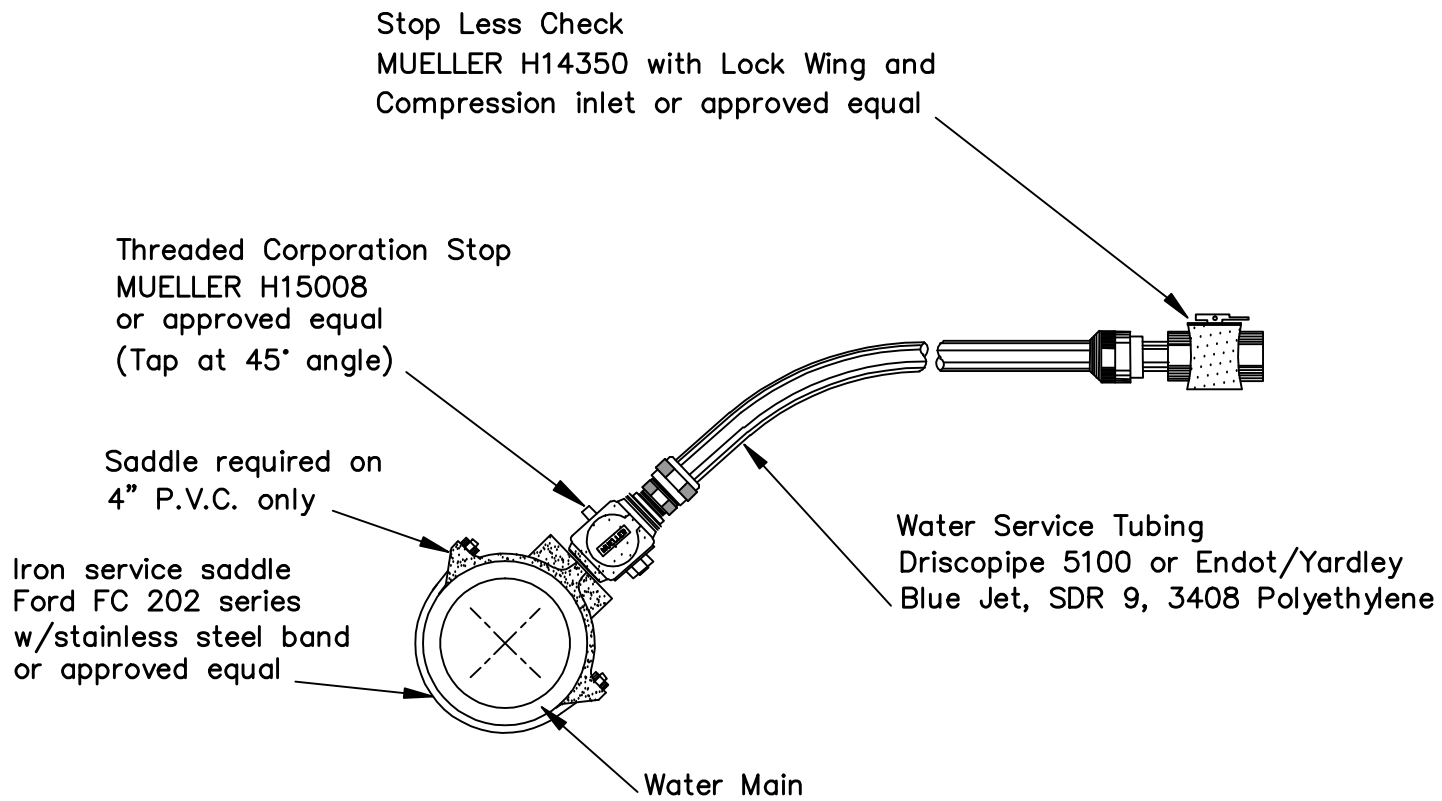
**NOTES:**

1. ALL PIPE THRU CASING TO BE DUCTILE IRON PIPE.
2. NUMBER 12 TRACING WIRE WILL BE USED OVER D.I.P. IF END CONNECTIONS ARE MADE TO PVC PIPE.
3. ALL PIPES WITHIN CASING TO BE RESTRAINED BY RESTRAINING GASKETS.
4. CASING PIPE TO MEET F.D.O.T. STANDARDS.
5. APPROVED CASING SPACERS MUST BE INSTALLED TO KEEP PIPE CENTERED IN CASING.
6. ENDS OF CASING MUST BE PLUGGED WITH BRICKS OR CEMENT TO PREVENT INFILLRATION OF SOIL OR BY ENGINEER'S APPROVED METHOD.

## JACK AND BORE

CITY INDEX NO. 407; 1 OF 1  
N.T.S.

				<b>CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT</b>		
				REDRAWN BY B.V.D.	JACK AND BORE	DATE 02/09
				CHECKED BY G.C.H.		INDEX NO. 407
REV.	DATE	DESCRIPTION	APP.	DESIGNED BY G.C.H.		1 OF 1

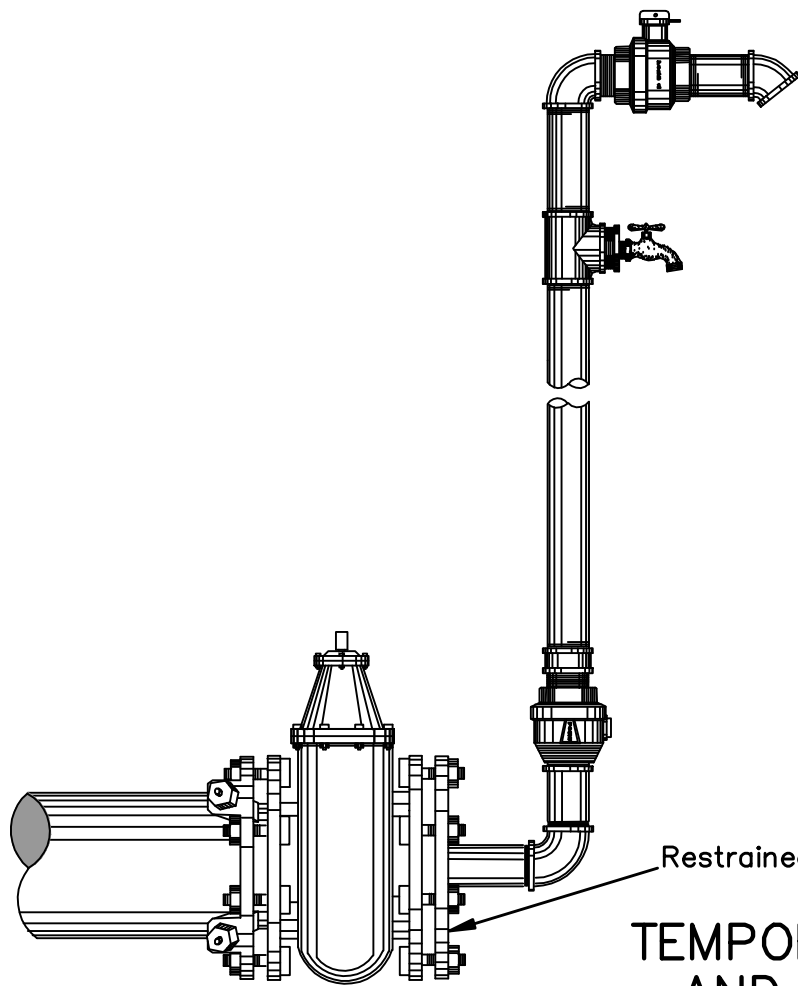


## CHLORINATION TAP

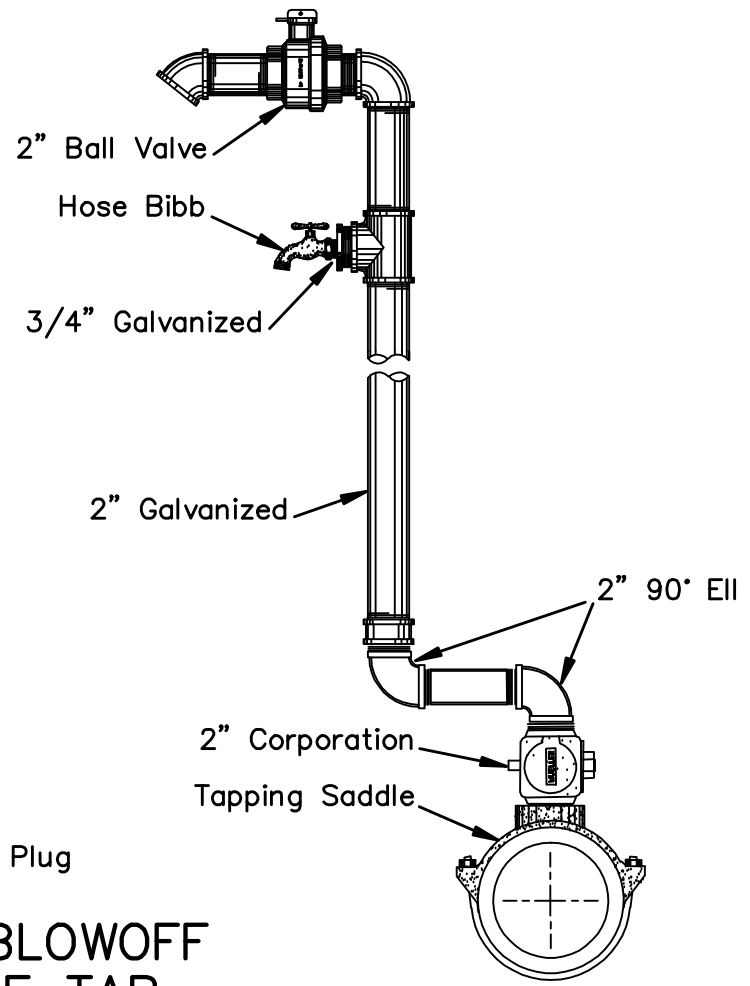
CITY INDEX NO. 408; 1 OF 2

N.T.S.

REV.	DATE	DESCRIPTION	APP.	CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY B.V.D.	CHLORINATION TAP	DATE 02/09
				CHECKED BY L.M.M.		INDEX NO. 408
				DESIGNED BY R.S.F.		1 OF 2



END CONNECTION



TOP CONNECTION

## TEMPORARY BLOWOFF AND SAMPLE TAP

CITY INDEX NO. 408; 2 OF 2  
N.T.S.

				CITY OF CLEARWATER, FLORIDA ENGINEERING DEPARTMENT		
				REDRAWN BY B.V.D.	TEMPORARY BLOWOFF	DATE 02/09
				CHECKED BY G.L.B.	AND	INDEX NO. 408
				DESIGNED BY G.C.H.	SAMPLE TAP	2 OF 2
REV.	DATE	DESCRIPTION	APP.			