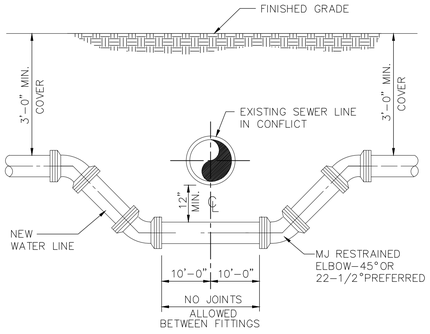


NOTES

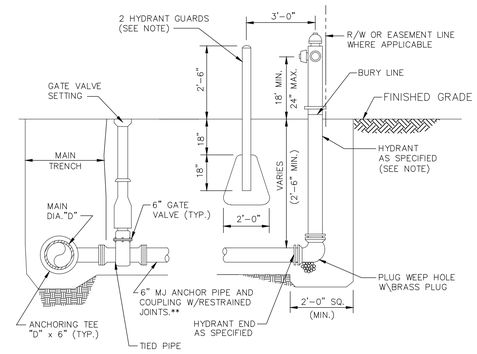
WHERE CONDITIONS PERMIT, PIPE DEFLECTION MAY BE USED INSTEAD OF BENDS TO OBTAIN THE MINIMUM CLEARANCE. FACTORY OFFSETS MAY BE USED.

TYPICAL CONFLICT DETAIL

USE MEGALUGS AT ALL PIPE JOINTS

ALL D.I.P. TO BE PAINTED BLUE ON TOP HALF OF PIPE.

ENGINEERING STANDARDS 2022			
REVISIONS BY / DATE: S.S. 04-2005; S.S. 01-2012	ENGINEERING DIVISION CITY OF POMPANO BEACH	TYPICAL CONFLICT (WATER)	DATE: MAY 2022 DWG. NO. 108-1
	SCALE: N.T.S.		



NOTES

HYDRANT GUARDS TO BE 6" DIAMETER GALVANIZED STEEL PIPE PAINTED YELLOW FILLED WITH CONCRETE. OMIT GUARDS IN LOCATIONS WHERE SIDEWALKS EXIST.

**USE 2-3/4" S.S. TIE RODS WHEN DISTANCE BETWEEN MAIN AND HYDRANT < 10'. TIE RODS WILL BE USED W/RESTRAINED JOINTS OR USE MEGALUGS AT ALL PIPE JOINTS

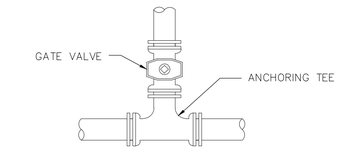
HYDRANTS INSTALLED ON EXISTING WATER MAINS MUST USE A MUELLER MJ DI TAPPING SLEEVE, H-615 OR APPROVED EQUAL.

HYDRANTS CONNECTED TO NEW MAINS SHALL BE CONNECTED USING A HYDRANT TEE.

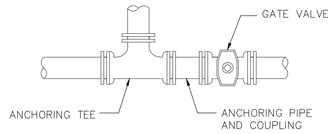
ALL POMPANO BEACH HYDRANTS SHALL BE PAINTED RED.

TYPICAL FIRE HYDRANT ASSEMBLY

ENGINEERING STANDARDS 2022			
REVISIONS BY / DATE: T.W. 11-2007; T.W. 10-2010; S.S. 2-2012; S.S. 11-2012	ENGINEERING DIVISION CITY OF POMPANO BEACH	FIRE HYDRANT ASSEMBLY	DATE: MAY 2022 DWG. NO. 109-1
	SCALE: N.T.S.		



RESTRAINED VALVE AT TEE (BRANCH)

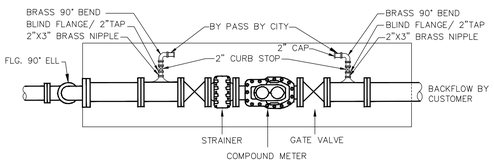


RESTRAINED VALVE AT TEE (IN LINE)

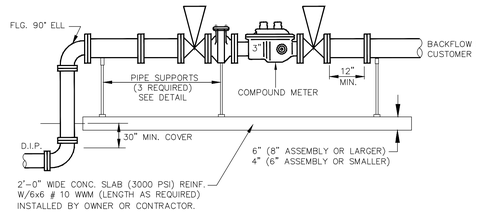
USE MEGALUGS AT ALL PIPE JOINTS

ALL D.I.P. TO BE PAINTED BLUE ON THE TOP HALF OF PIPE.

ENGINEERING STANDARDS 2022			
REVISIONS BY / DATE: S.S. JUNE 2005	ENGINEERING DIVISION CITY OF POMPANO BEACH	RESTRAINED VALVE AT TEE	DATE: MAY 2022 DWG. NO. 111-1
	SCALE: N.T.S.		



PLAN



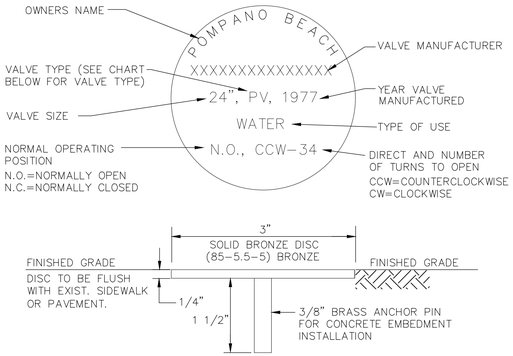
ELEVATION

DOMESTIC SERVICE ONLY

PLEASE SEE METER INSTALL DIMENSION LIST ON STANDARD NO. 106-4

USE MEGALUGS AT ALL PIPE JOINTS

ENGINEERING STANDARDS 2022			
REVISIONS BY / DATE: TCW 04-08; S.S. 01-2012; S.S. 11-2012	ENGINEERING DIVISION CITY OF POMPANO BEACH	DOMESTIC SERVICE ONLY	DATE: APRIL 2022 DWG. NO. 112-1
	SCALE: N.T.S.		



VALVE TYPES

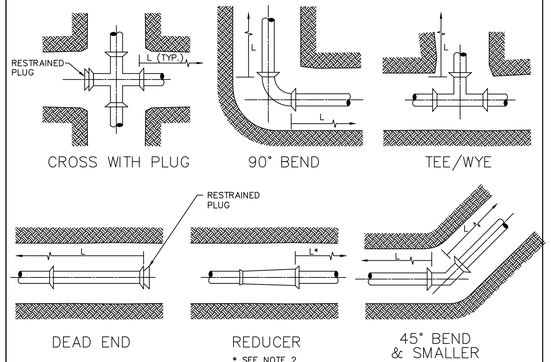
BALL VALVE--BALLV
RESILIENT WEDGE GATE VALVE--RWGV
BUTTERFLY VALVE--BV
PLUG VALVE--PV

NOTES:

1. VALVE INFORMATION TO BE TRIPLE ENGRAVED INTO TOP SURFACE WITH 1/4" CAPITAL LETTERS.
2. ENTIRE MARKER TO BE COATED WITH CLEAR EPOXY TO PREVENT TARNISHING.
3. VALVE INFORMATION TO BE APPROVED BY CITY OF POMPANO BEACH UTILITIES DEPARTMENT.
4. MARKERS SHALL BE MANUFACTURED BY RG WRENCH, OR APPROVED EQUAL

UNDERGROUND VALVE IDENTIFICATION MARKER

ENGINEERING STANDARDS 2022			
REVISIONS BY / DATE: S.S. JUNE 2005; T.W. 11-2007; T.W. 02-2008; S.S. 1-24-12	ENGINEERING DIVISION CITY OF POMPANO BEACH	UNDERGROUND VALVE IDENTIFICATION MARKER	DATE: FEB. 2022 DWG. NO. 115-1
	SCALE: N.T.S.		



GENERAL NOTES:

1. VALUES IN TABLE ARE BASED ON 3' OF COVER, 100 PSI INTERNAL PRESSURE, FOR FORCE MAINS, 150 PSI REUSE WATER LINES, ANSI/AWWA C605 & C150/A21.50 LAYING CONDITION 3, ASTM D2487 SAND-SILT SP SOIL TYPE, AND SAFETY FACTOR OF 2.0. RESTRAINED LENGTHS WERE COMPUTED PER DIPRA "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE" AND "PVC PIPE THRUST RESTRAINT DESIGN HANDBOOK," EBAA IRON, INC.
2. CONFIRM THE EXACT LENGTH OF RESTRAINING REQUIRED FOR REDUCERS, PIPE ENCASED IN POLYETHYLENE AND ENCROACHING RESTRAINED LENGTHS WITH THE DESIGN ENGINEER.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROPER INSTALLATION OF THE RESTRAINED JOINTS TO PREVENT MOVEMENT OF THE PIPE & FITTINGS.
4. IN THE EVENT OF A CONFLICT BETWEEN RESTRAINED LENGTHS SHOWN ON THE TABLE AND RESTRAINED LENGTHS SHOWN ON THE DRAWINGS, THE LONGEST RESTRAINED LENGTH SHALL BE USED.

RESTRAINED JOINT INFORMATION

ENGINEERING STANDARDS 2022			
REVISIONS BY / DATE:	ENGINEERING DIVISION CITY OF POMPANO BEACH	RESTRAINED JOINT INFORMATION	DATE: MAY 2022 DWG. NO. 118-1
	SCALE: N.T.S.		

PVC HORIZONTAL BENDS AND VERTICAL UP BENDS

PIPE SIZE (IN.)	RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING - EACH WAY) BENDS 90°	45°	22.5°	11.25°	CROSS WITH PLUG DEAD END TEE/WYE
6	26	11	6	3	53
8	33	14	7	4	68
12	46	19	10	5	96

PVC VERTICAL DOWN BEND

PIPE SIZE (IN.)	RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING - EACH WAY) BENDS 90°	45°	22.5°	11.25°
6	26	11	6	3
8	33	14	7	4
12	46	19	10	5

DIP HORIZONTAL BENDS AND VERTICAL UP BENDS

PIPE SIZE (IN.)	RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING - EACH WAY) BENDS 90°	45°	22.5°	11.25°	CROSS WITH PLUG DEAD END TEE/WYE
12"	68	28	14	7	144
24"	119	49	24	12	258

DIP VERTICAL DOWN BEND

PIPE SIZE (IN.)	RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING - EACH WAY) BENDS 90°	45°	22.5°	11.25°
12"	144	60	29	14
24"	258	107	51	25

RESTRAINED JOINT INFORMATION

ENGINEERING STANDARDS 2022			
REVISIONS BY / DATE:	ENGINEERING DIVISION CITY OF POMPANO BEACH	RESTRAINED JOINT INFORMATION	DATE: MAY 2022 DWG. NO. 118-2
	SCALE: N.T.S.		

MIN. LENGTH OF PIPE (FEET) TO BE RESTRAINED
(SOURCES: EBAA IRON RESTRAINT LENGTH CALCULATION PROGRAM FOR PVC PIPE, RELEASE 3.1. AND DIPRA THRUST RESTRAINT FOR DUCTILE IRON PIPE, RELEASE 3.2)

FITTING TYPE		PIPE SIZE 4"	6"	8"	10"	12"	16"	20"	24"	200psi 30"	36"	42"	48"
90° HORIZ. BEND		14	20	25	30	35	45	54	62	98	112	124	135
45° HORIZ. BEND		6	8	11	13	15	19	22	26	41	46	51	56
22.5° HORIZ. BEND		3	4	5	6	7	9	11	12	19	22	25	27
11.25° HORIZ. BEND		1	2	3	3	4	4	5	6	10	11	12	13
90° VERT. OFFSET	UPPER BEND	29	41	53	64	74	95	115	134	214	246	276	304
	LOWER BEND	7	10	13	16	19	25	30	35	57	66	74	83
45° VERT. OFFSET	UPPER BEND	12	19	24	29	34	39	48	56	89	102	114	126
	LOWER BEND	3	4	6	7	8	10	12	15	23	27	31	34
22.5° VERT. OFFSET	UPPER BEND	6	9	12	14	17	19	23	27	43	49	55	60
	LOWER BEND	1	2	4	4	4	5	6	7	11	13	15	16
11.25° VERT. OFFSET	UPPER BEND	3	4	6	7	8	9	11	13	21	24	27	30
	LOWER BEND	1	1	1	2	2	2	3	3	6	6	7	8
PLUG (DEAD END)		32	45	59	70	83	107	129	151	214	246	276	304
IN-LINE VALVE		32	45	45	45	56	65	80	110	125	140	155	
TEE (BRANCH RESTRAINT)	4"x ø	23	–	–	–	–	–	–	–	–	–	–	–
	6"x ø	21	35	–	–	–	–	–	–	–	–	–	–
	8"x ø	18	34	47	–	–	–	–	–	–	–	–	–
	10"x ø	16	32	46	58	–	–	–	–	–	–	–	–
	12"x ø	13	30	44	57	69	–	–	–	–	–	–	–
	16"x ø	7	26	41	55	67	90	–	–	–	–	–	–
	20"x ø	1	21	38	52	65	88	109	–	–	–	–	–
	24"x ø	1	16	34	49	62	86	108	129	–	–	–	–
	30"x ø	1	8	28	44	58	83	106	127	208	–	–	–
	36"x ø	1	1	22	39	54	80	103	124	206	240	–	–
	42"x ø	1	1	15	33	49	77	100	122	205	239	270	–
	48"x ø	1	1	7	27	44	73	97	120	203	238	269	298
REDUCER (LARGER PIPE RESTRAINT)	6"x ø	23	–	–	–	–	–	–	–	–	–	–	–
	8"x ø	38	25	–	–	–	–	–	–	–	–	–	–
	10"x ø	57	43	24	–	–	–	–	–	–	–	–	–
	12"x ø	72	60	44	41	–	–	–	–	–	–	–	–
	16"x ø	99	90	78	75	45	–	–	–	–	–	–	–
	20"x ø	123	116	107	105	81	45	–	–	–	–	–	–
	24"x ø	146	140	132	131	111	82	45	–	–	–	–	–
200psi	30"x ø	209	204	197	188	177	153	116	75	–	–	–	–
	36"x ø	243	236	233	226	217	196	168	135	74	–	–	–
	42"x ø	273	270	265	259	252	234	211	183	133	72	–	–
	48"x ø	301	298	294	289	283	268	249	226	183	131	71	–

NOTES:
1. THE DATA IN THE ABOVE TABLE ARE BASED UPON THE FOLLOWING INSTALLATION CONDITIONS:
SOIL TYPE-SAND TEST PRESSURE-150 PSI/200 PSI DEPTH OF BURY-3'
TRENCH TYPE-3 SAFETY FACTOR-1.5 VERTICAL OFFSET-3'
MINIMUM PIPE LENGTH ALONG TEE RUN-5'
2. THE RESTRAINED PIPE LENGTHS APPLY TO DUCTILE IRON AND PVC PIPE.
3. ALL JOINTS BETWEEN UPPER AND LOWER BENDS SHALL BE RESTRAINED.
4. RESTRAINED PIPE LENGTHS APPLY TO PIPE ON BOTH SIDES OF VALVES AND FITTINGS.

RESTRAINED JOINT INFORMATION

ENGINEERING STANDARDS 2022			
REVISIONS BY / DATE:	ENGINEERING DIVISION CITY OF POMPANO BEACH	RESTRAINED JOINT INFORMATION	DATE: MAY 2022 DWG. NO. 118-3
	SCALE: N.T.S.		

KEITH
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Pompano Beach, FL 33060
PH: (954) 788-3400
Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC26000457

Plotted by: fascuntar On 2/25/2025 3:45 PM

REVISIONS

NO.	DESCRIPTION	DATE

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	02/25/25
DESIGNED BY:	BB
DRAWN BY:	BB/FA
CHECKED BY:	NW
BID-CONTRACT:	

This item has been digitally signed and sealed by **NILES T. WARRICK, P.E.** on the date adjacent to the seal.

NILES T. WARRICK LICENSE No. 94320 STATE OF FLORIDA PROFESSIONAL ENGINEER

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

2025.02.25 17:02:08-05'00'

NILES T. WARRICK, P.E.
FLORIDA REG. NO. 94320
(FOR THE FIRM)

CLIENT

PORTMAN HOLDINGS

PROJECT

2400 E ATLANTIC
2400 East Atlantic Blvd.
Pompano Beach, FL

SHEET TITLE

WATER AND SEWER DETAILS

SHEET NUMBER	CU-502
PROJECT NUMBER	14267.00

Drawing name: H:\14267.00 - 2400 E Atlantic - Portman Holdings\Engineering\Cadd\14267.00-CU-SXX.dwg

STATUS: DRC SET

DRC

PZ25-12000001

04/02/2025