

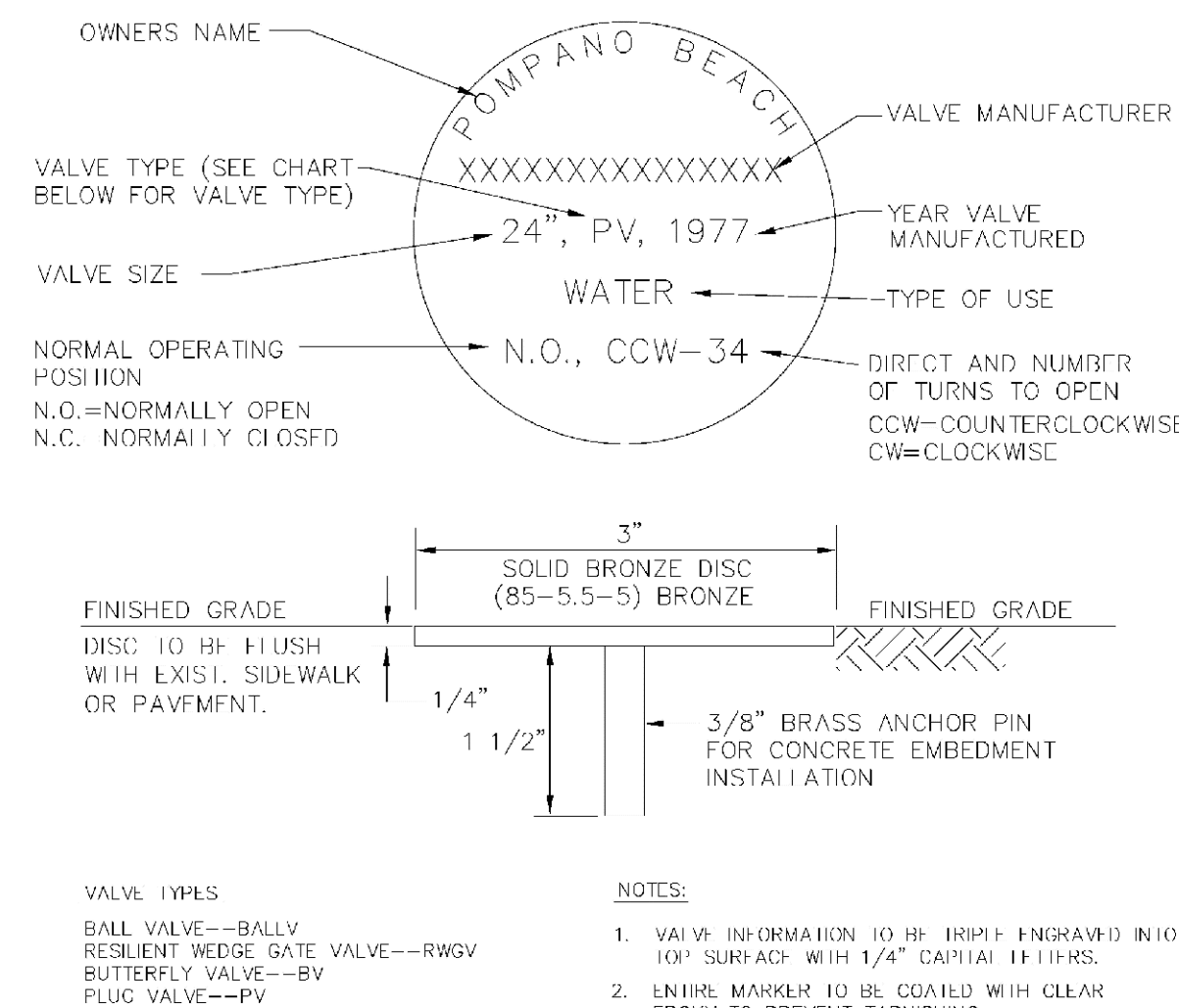
DOMESTIC SERVICE ONLY

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

USE MEGALUGS AT ALL PIPE JOINTS

ENGINEERING STANDARDS 2022

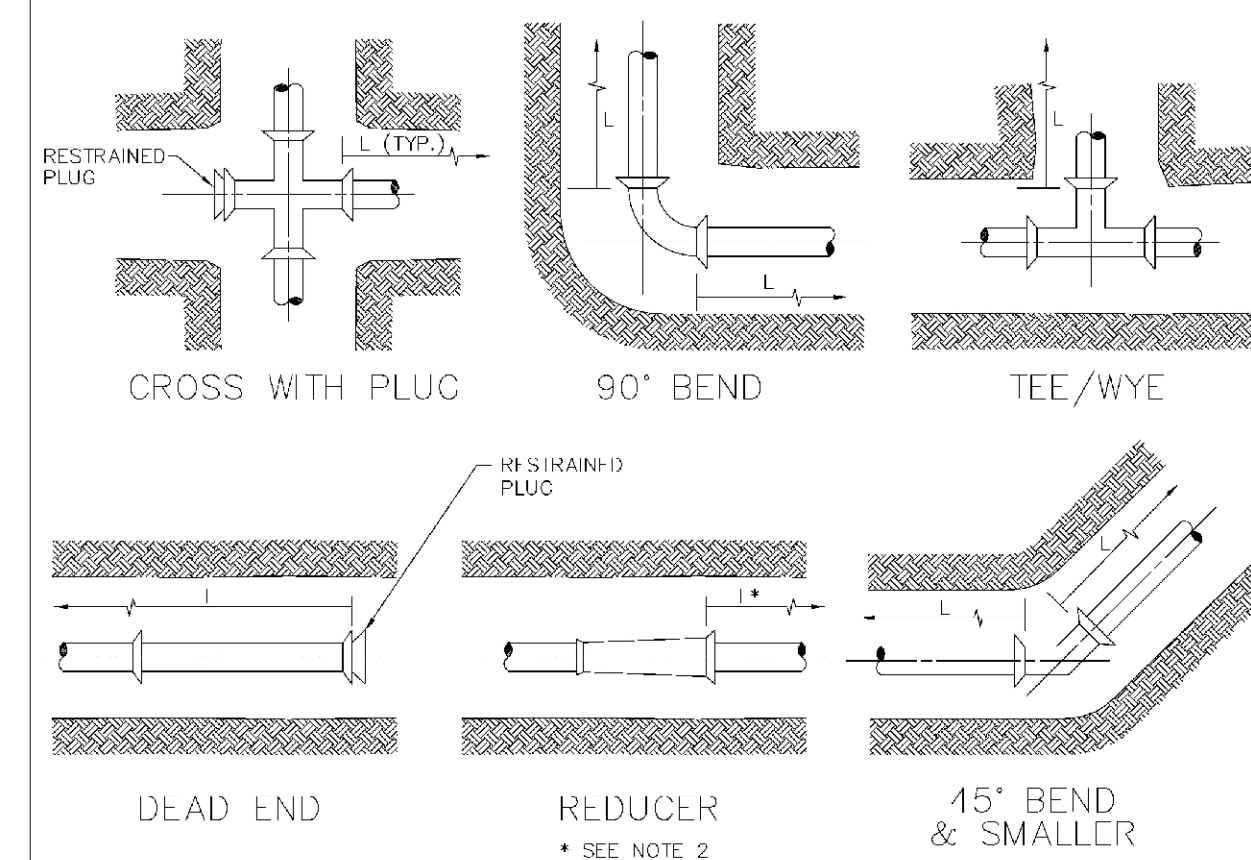
REVISIONS		ENGINEERING DIVISION CITY OF POMPAÑO BEACH	DOMESTIC SERVICE ONLY	DATE: APRIL 2022 DWG. NO.
BY	DATE			
T.W.	04-08	SCALE: N.T.S.		112-1
S.S.	01-2012			
S.S.	11-2012			



UNDERGROUND VALVE IDENTIFICATION MARKER

ENGINEERING STANDARDS 2022

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



GENERAL NOTES:

- 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," ESEA IRON, INC.
- CONFIRM THE EXACT LENGTH OF RESTRAINING REQUIRED FOR REDUCERS, PIPE ENCASED IN POLYETHYLENE AND ENCASED RESTRAINED LENGTHS WITH THE DESIGN ENGINEER.
- THE CONTRACTOR IS RESPONSIBLE FOR PROPER INSTALLATION OF THE RESTRAINED JOINTS TO PREVENT MOVEMENT OF THE PIPE & FITTINGS.
- 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		ENGINEERING DIVISION CITY OF POMPAÑO BEACH	RESTRAINED JOINT INFORMATION	DATE: MAY 2022 DWG. NO.
BY	DATE			
		SCALE: N.T.S.		118-1

PVC HORIZONTAL BENDS AND VERTICAL UP BENDS					
PIPE SIZE (IN.)	RESTRAINED JOINT LENGTH L		(MINIMUM DISTANCE IN FEET FROM FITTING - EACH WAY)		
	90°	45°	22.5°	11.25°	CROSS WITH PLUG, 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)		
	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)		
	90°	45°	22.5°	11.25°	CROSS WITH PLUG, 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)		
	90°	45°	22.5°	11.25°	
12"	114	60	29	14	
24"	258	107	51	25	

RESTRAINED JOINT INFORMATION

ENGINEERING STANDARDS 2022

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

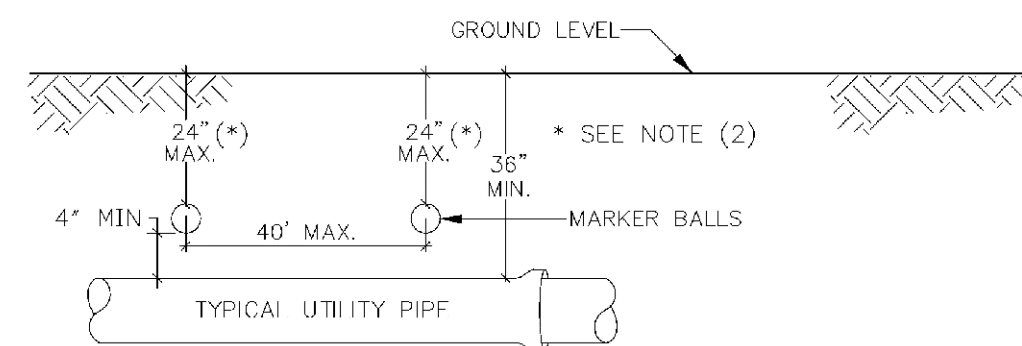
MIN. LENGTH OF PIPE (FEET) TO BE RESTRAINED										
(SOURCES: ESEA IRON RESTRAINT LENGTH CALCULATION PROGRAM FOR PVC PIPE, RELEASE 3.1, AND DIPRA THRUST RESTRAINT FOR DUCTILE IRON PIPE, RELEASE 3.2)										
FITTING TYPE	PIPE SIZE									
	4"	6"	8"	10"	12"	16"	20"	24"	30"	36"
90° HORIZ. BEND	14	20	25	30	35	45	54	63	88	112
45° HORIZ. BEND	6	8	11	13	15	19	22	26	41	46
22.5° HORIZ. BEND	3	4	5	6	7	9	11	12	19	22
11.25° HORIZ. BEND	1	2	3	3	4	4	5	5	10	11
90° VERT. OFFSET	29	41	52	64	74	93	115	134	216	276
45° VERT. OFFSET	7	10	13	16	19	25	30	35	57	68
22.5° VERT. OFFSET	3	4	5	6	7	9	11	12	23	27
11.25° VERT. OFFSET	1	1	1	1	2	2	3	3	6	7
FLUID (LOAD END)	32	45	59	70	85	107	129	151	214	246
IN-LINE VALVE	32	45	45	45	45	56	65	80	110	125
TYP. (BRANCH FLUSHING)	4"x Ø	23	-	-	-	-	-	-	-	-
	6"x Ø	21	25	-	-	-	-	-	-	-
	8"x Ø	18	34	47	-	-	-	-	-	-
	10"x Ø	16	32	46	58	-	-	-	-	-
	12"x Ø	12	20	44	67	69	-	-	-	-
	15"x Ø	7	25	41	55	67	90	-	-	-
	20"x Ø	1	31	38	52	65	86	109	-	-
	24"x Ø	1	16	34	42	67	86	108	179	-
	30"x Ø	1	8	28	44	58	83	105	127	208
	36"x Ø	1	1	22	39	51	80	103	124	206
REDUCER (LARGEST PIPE RESTRAINT)	45"x Ø	1	1	10	33	49	77	100	122	205
	48"x Ø	1	1	7	27	44	73	97	125	205
	6"x Ø	23	-	-	-	-	-	-	-	-
	8"x Ø	38	25	-	-	-	-	-	-	-
	10"x Ø	57	43	24	-	-	-	-	-	-
	12"x Ø	72	60	41	41	-	-	-	-	-
	15"x Ø	99	80	58	75	45	-	-	-	-
	20"x Ø	123	116	107	105	81	45	-	-	-
	24"x Ø	146	140	132	131	111	85	45	-	-
	30"x Ø	209	224	197	188	177	153	116	75	-
200psi	36"x Ø	243	236	233	228	217	196	168	135	74
	42"x Ø	273	270	265	259	252	234	211	183	133
	48"x Ø	301	288	284	280	283	268	249	226	183
	48"x Ø	301	288	284	280	283	268	249	226	183

- NOTES:
- THE DATA IN THE ABOVE TABLE ARE BASED UPON THE FOLLOWING INSTALLATION CONDITIONS:
SOIL TYPE--SAND TEST PRESSURE--100 PSI/200 PSI DEPTH OF BURIAL--3'
SAFETY FACTOR--1.5 MINIMUM PIPE LENGTH ALONG ALL RUNS--5'
 - THE RESTRAINED PIPE LENGTHS APPLY TO DUCTILE IRON AND PVC PIPE.
 - ALL JOINTS BETWEEN UPPER AND LOWER BENDS SHALL BE RESTRAINED.
 - RESTRAINED PIPE LENGTHS APPLY TO PIPE ON BOTH SIDES OF VALVES AND FITTINGS.

RESTRAINED JOINT INFORMATION

ENGINEERING STANDARDS 2022

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



GENERAL NOTES:

- ALL UTILITY PIPE SHALL BE INSTALLED WITH 4"Ø MARKING BALLS PLACED EVERY 40' AND AT EVERY FITTING, FOR IDENTIFICATION AND WARNING PURPOSES, BURIED ABOVE THE PIPE AT A MAXIMUM DEPTH OF 24" INCHES OR AS APPROVED BY THE OWNER. IT SHALL BE COLOR CODED AND WORDED AS FOLLOWS:

POTABLE WATER:

- COLOR: BLUE PER 62-555.320(21)(b)(3) F.A.C.
- LETTERING: WATER
- FREQUENCY OF MARKER BALLS SHALL BE 145' / Khz.
- THE MARKER BALLS CAN BE BURIED IN ANY ORIENTATION.

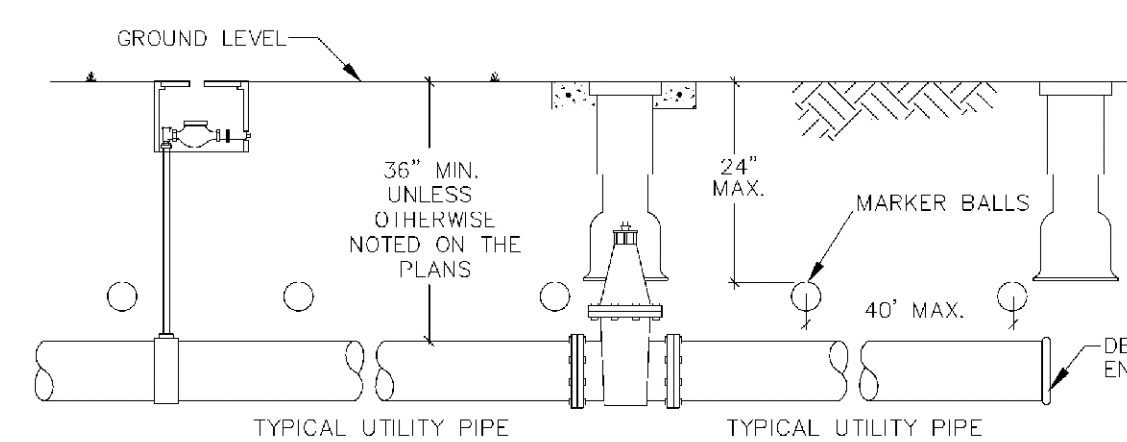
THE MARKER BALLS SHALL BE DETECTABLE BY STANDARD METAL DETECTION EQUIPMENT AND SHALL BE MANUFACTURED BY IEMPO OR 3M LOCATION SYSTEM OR EQUIVALENT (FREQUENCY 145.7 Khz.)

- FOR LARGE DIAMETER PIPE INSTALLED AT DEPTHS BELOW 4'-0" MARKER BALLS SHALL BE PLACED AT A MAXIMUM DEPTH OF 4'-0" BELOW GRADE.

WATER PIPE IDENTIFICATION

ENGINEERING STANDARDS 2022

REVISIONS		ENGINEERING DIVISION CITY OF POMPAÑO BEACH	WATER PIPE IDENTIFICATION	DATE: JAN. 2022 DWG. NO.
BY	DATE			
S.S.	01/12	SCALE: N.T.S.		119-1
S.S.	06/16			



GENERAL NOTES:

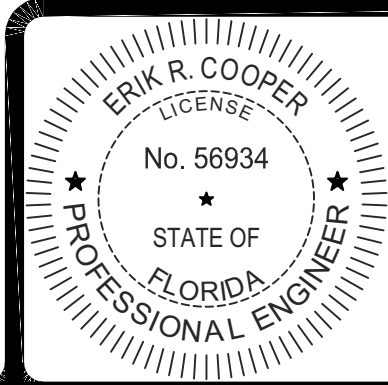
- ALL NONMETALLIC PIPE SHALL BE INSTALLED WITH 12 INCH SOLID COPPER IMAGING WIRE.
- THE MARKER BALLS MUST BE INSTALLED DIRECTLY ABOVE THE PIPE.
- MARKER BALLS SHALL BE INSTALLED AT 40' O.C.
- BALL COLOR CODING:
POTABLE WATER SYSTEM: BLUE PER 62-555.320(21)(b)(3) F.A.C.

UTILITY PIPE AND MARKER BALLS LOCATION

ENGINEERING STANDARDS 2022

REVISIONS		ENGINEERING DIVISION CITY OF POMPAÑO BEACH	UTILITY PIPE AND MARKER BALLS LOCATION	DATE: JAN. 2022 DWG. NO.
BY	DATE			
S.S.	01/12	SCALE: N.T.S.		120-1
S.S.	06/16			

2001 N. ANDREWS AVE



THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY
ERIK R. COOPER, P.E. ON
4/12/2024.

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CHENEY BROTHERS POMPAÑO BEACH
SECTION 27, TOWNSHIP 48S., RANGE 42E.
CITY OF POMPAÑO BEACH, FLORIDA
CONCEPTUAL WATER AND
WASTEWATER DETAILS

REVISIONS

DESIGN E.C.	DRAWN B.L.	CHECKED	APPROVED	DATE
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JOB NO. 22-187	DRAWING NO. 22187C14	SHEET 14 OF 15
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