

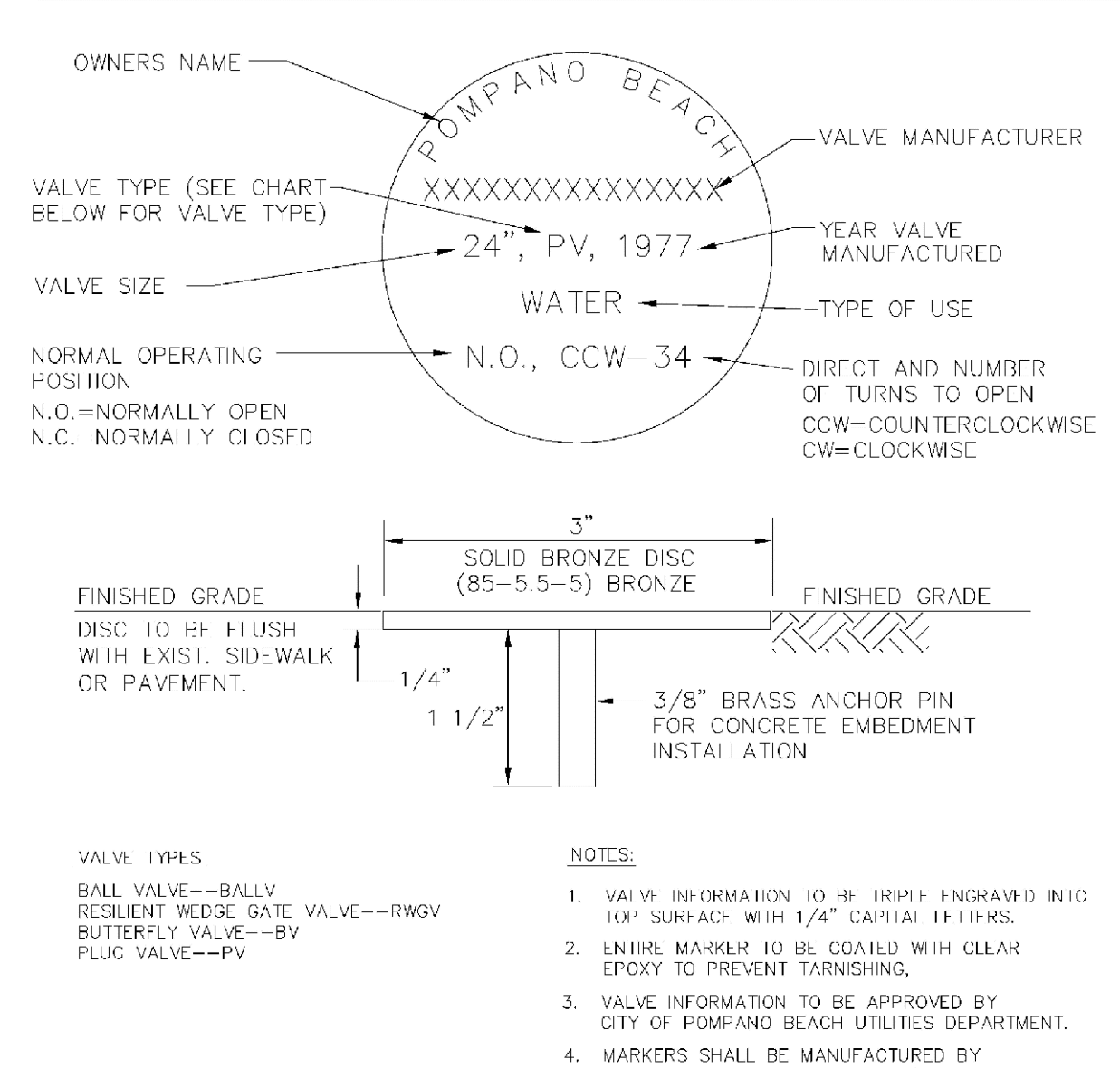
DOMESTIC SERVICE ONLY

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

USE MEGALUGS AT ALL PIPE JOINTS

ENGINEERING STANDARDS 2022

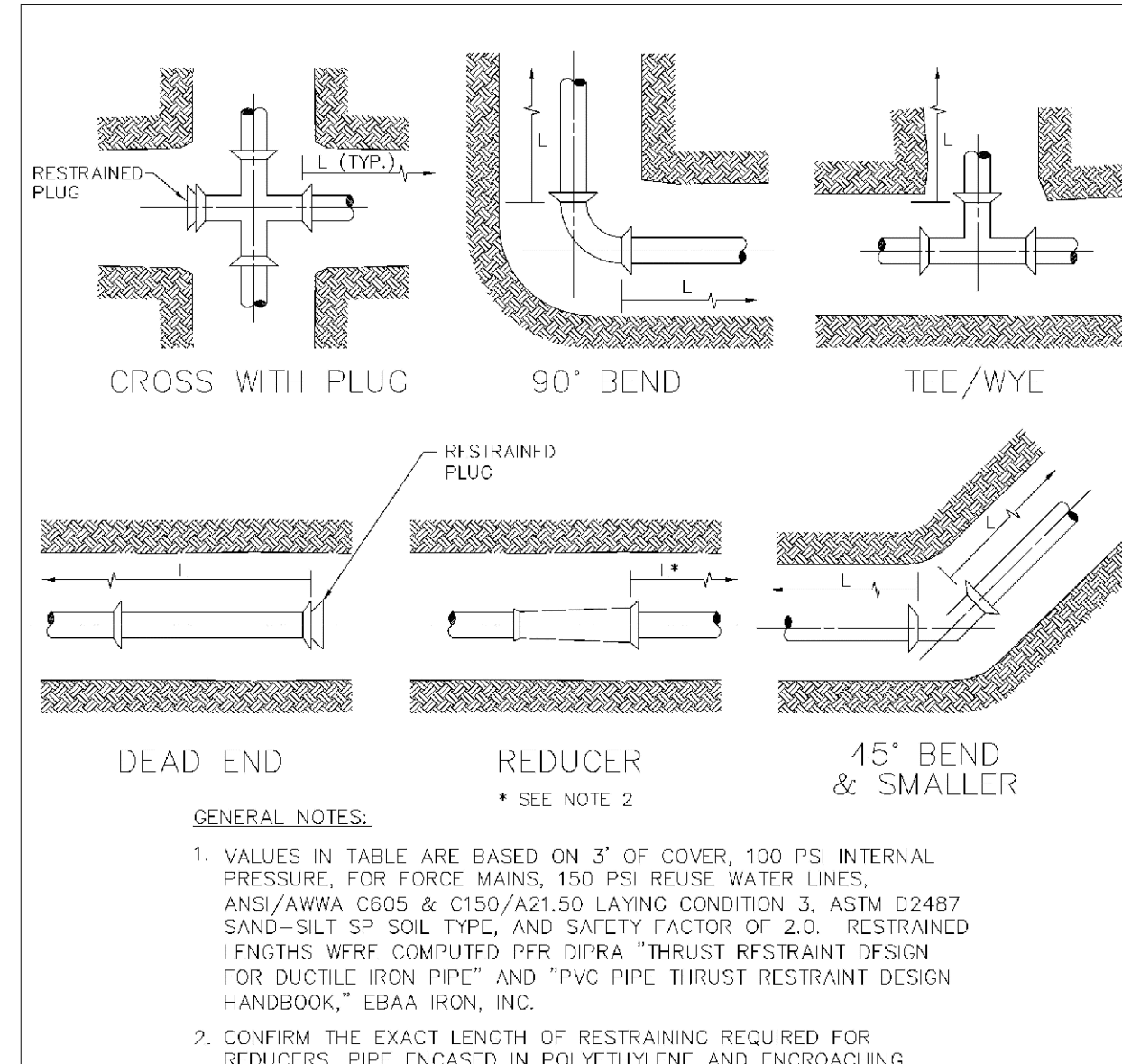
REVISIONS		ENGINEERING DIVISION CITY OF POMPAÑO BEACH	DOMESTIC SERVICE ONLY	DATE: APRIL 2022 DWG. NO.
BY	DATE			
TOW	04-08	SCALE: N.T.S.		112-1
S.S.	01-2012			
S.S.	11-2012			



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			
S.S.	02-2008			



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 C905 & 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 ENCROACHING 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

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

PVC VERTICAL DOWN BEND		RESTRAINED JOINT LENGTH L		(MINIMUM DISTANCE IN FEET FROM FITTING - EACH WAY)	
PIPE SIZE (IN.)		BENDS		CROSS WITH PLUG OR TEE/WYE	
6	26	11	6	3	53
8	33	14	7	4	68
12	46	19	10	5	96

DIP HORIZONTAL BENDS AND VERTICAL UP BENDS		RESTRAINED JOINT LENGTH L		(MINIMUM DISTANCE IN FEET FROM FITTING - EACH WAY)	
PIPE SIZE (IN.)		BENDS		CROSS WITH PLUG OR TEE/WYE	
6	26	11	6	3	53
8	33	14	7	4	68
12	46	19	10	5	96

DIP VERTICAL DOWN BEND		RESTRAINED JOINT LENGTH L		(MINIMUM DISTANCE IN FEET FROM FITTING - EACH WAY)	
PIPE SIZE (IN.)		BENDS		CROSS WITH PLUG OR TEE/WYE	
6	26	11	6	3	53
8	33	14	7	4	68
12	46	19	10	5	96

RESTRAINED JOINT INFORMATION

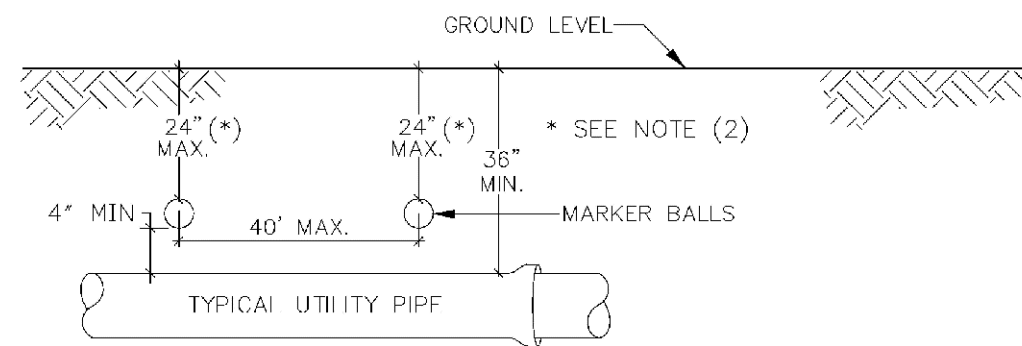
REVISIONS		ENGINEERING DIVISION CITY OF POMPAÑO BEACH	RESTRAINED JOINT INFORMATION	DATE: MAY 2022 DWG. NO.
BY	DATE			
		SCALE: N.T.S.		118-2

FITTING TYPE		PIPE SIZE															
		4"	6"	8"	10"	12"	16"	20"	24"	30"	36"	42"	48"	60"	72"	84"	96"
90° HORIZ. BEND	UPPER BEND	14	20	26	32	38	45	54	63	72	81	90	100	110	120	132	144
	LOWER BEND	6	8	11	13	15	19	22	26	31	36	41	46	51	56	63	70
22.5° HORIZ. BEND	UPPER BEND	3	4	5	6	7	9	11	12	14	16	18	20	22	25	27	30
	LOWER BEND	1	2	3	3	4	4	5	5	6	7	8	9	10	11	12	13
90° VERT. OFFSET	UPPER BEND	29	41	53	65	77	91	105	120	135	150	165	180	200	216	234	252
	LOWER BEND	7	10	13	16	19	22	26	30	35	40	45	51	56	63	70	78
45° VERT. OFFSET	UPPER BEND	12	16	21	26	31	37	43	50	57	65	72	81	90	100	110	120
	LOWER BEND	3	4	5	6	7	8	10	12	14	16	18	20	22	25	27	30
22.5° VERT. OFFSET	UPPER BEND	6	9	12	14	17	19	22	26	31	36	41	46	51	56	63	70
	LOWER BEND	1	2	3	4	4	5	6	7	8	9	10	11	12	13	15	16
11.25° VERT. OFFSET	UPPER BEND	3	4	5	6	7	8	9	11	13	15	17	19	21	24	27	30
	LOWER BEND	1	1	1	2	2	2	3	3	3	4	4	5	5	6	7	8
FLUID (LOAD END)	UPPER BEND	32	45	59	73	87	102	117	133	149	165	182	200	216	234	252	270
	LOWER BEND	32	45	59	73	87	102	117	133	149	165	182	200	216	234	252	270
IN-LINE VALVE	UPPER BEND	32	45	59	73	87	102	117	133	149	165	182	200	216	234	252	270
	LOWER BEND	32	45	59	73	87	102	117	133	149	165	182	200	216	234	252	270
TYP. (BRANCH FLUSHING)	UPPER BEND	4"	6"	8"	10"	12"	16"	20"	24"	30"	36"	42"	48"	60"	72"	84"	96"
	LOWER BEND	4"	6"	8"	10"	12"	16"	20"	24"	30"	36"	42"	48"	60"	72"	84"	96"
REDUCER (LARGER PIPE RESTRAINT)	UPPER BEND	4"	6"	8"	10"	12"	16"	20"	24"	30"	36"	42"	48"	60"	72"	84"	96"
	LOWER BEND	4"	6"	8"	10"	12"	16"	20"	24"	30"	36"	42"	48"	60"	72"	84"	96"
200psi	UPPER BEND	146	180	224	268	312	356	400	444	488	532	576	620	664	708	752	796
	LOWER BEND	146	180	224	268	312	356	400	444	488	532	576	620	664	708	752	796

- 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'-5'
SAFETY FACTOR: 1.5 WORKING OFFSET: 3'-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

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

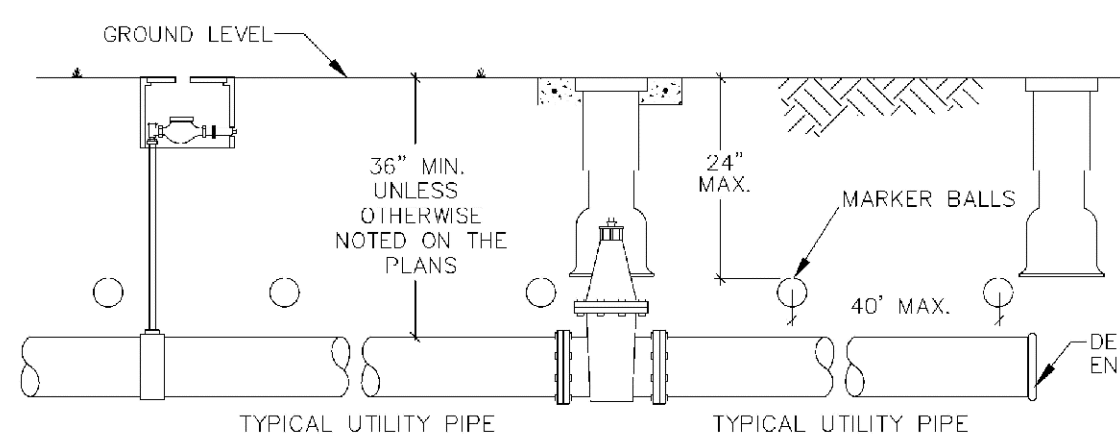


GENERAL NOTES:

- 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:
A. COLOR: BLUE PER 62-555.320(21)(b)(3) F.A.C.
B. LETTERING: WATER
C. FREQUENCY OF MARKER BALLS SHALL BE 145' / KHz.
D. 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

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			



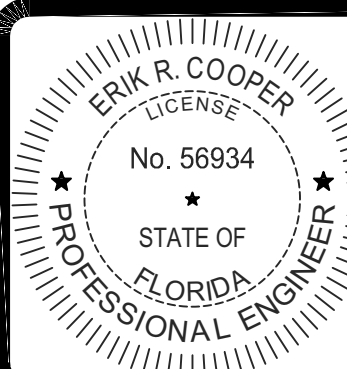
GENERAL NOTES:

- 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

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
2/23/2024.

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

REVISIONS

DESIGN	DRAWN	CHECKED	APPROVED	DATE
E.C.	B.L.			

JOB NO.
22-187

DRAWING NO.
22187-14

04/03/2024