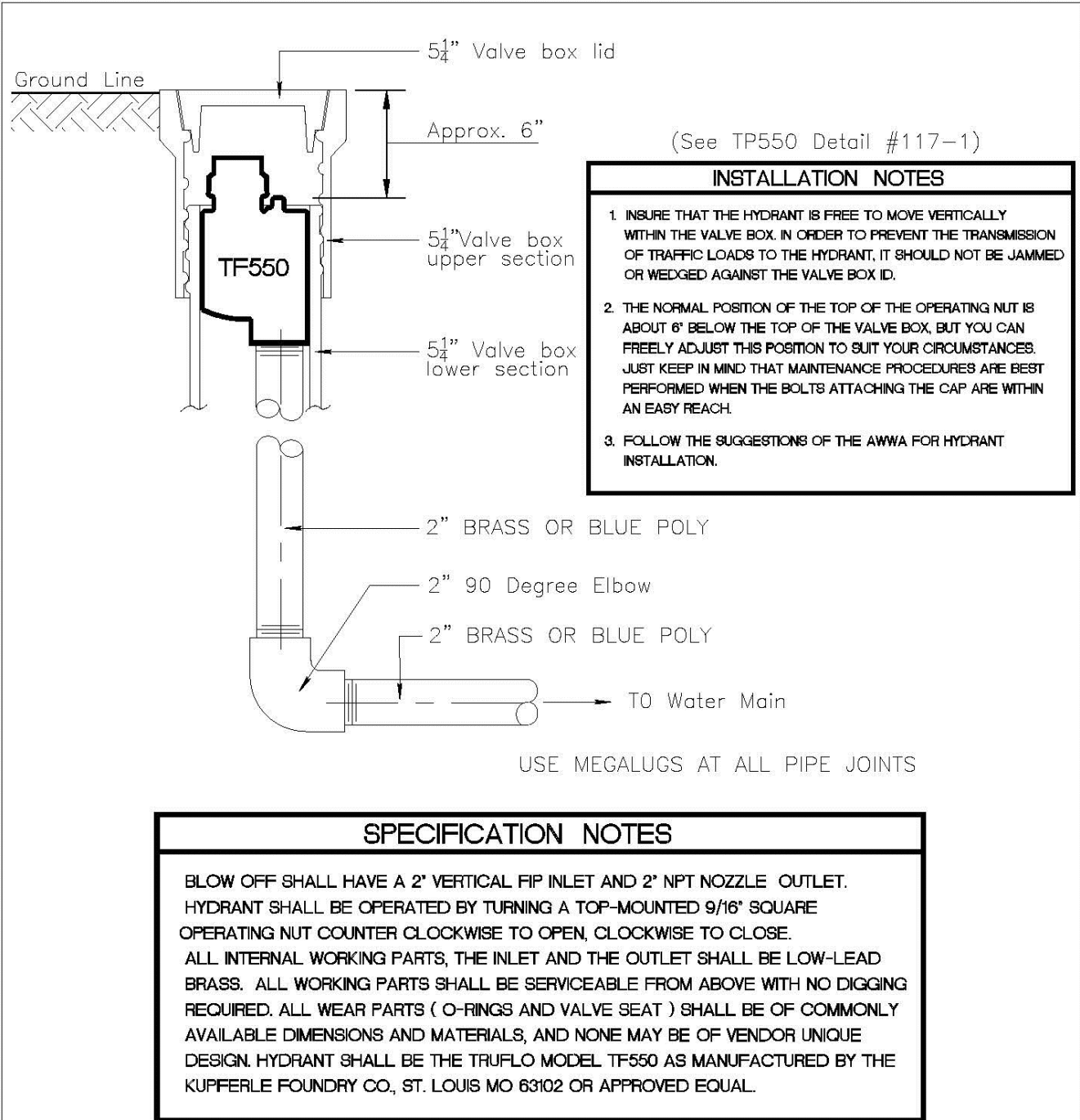


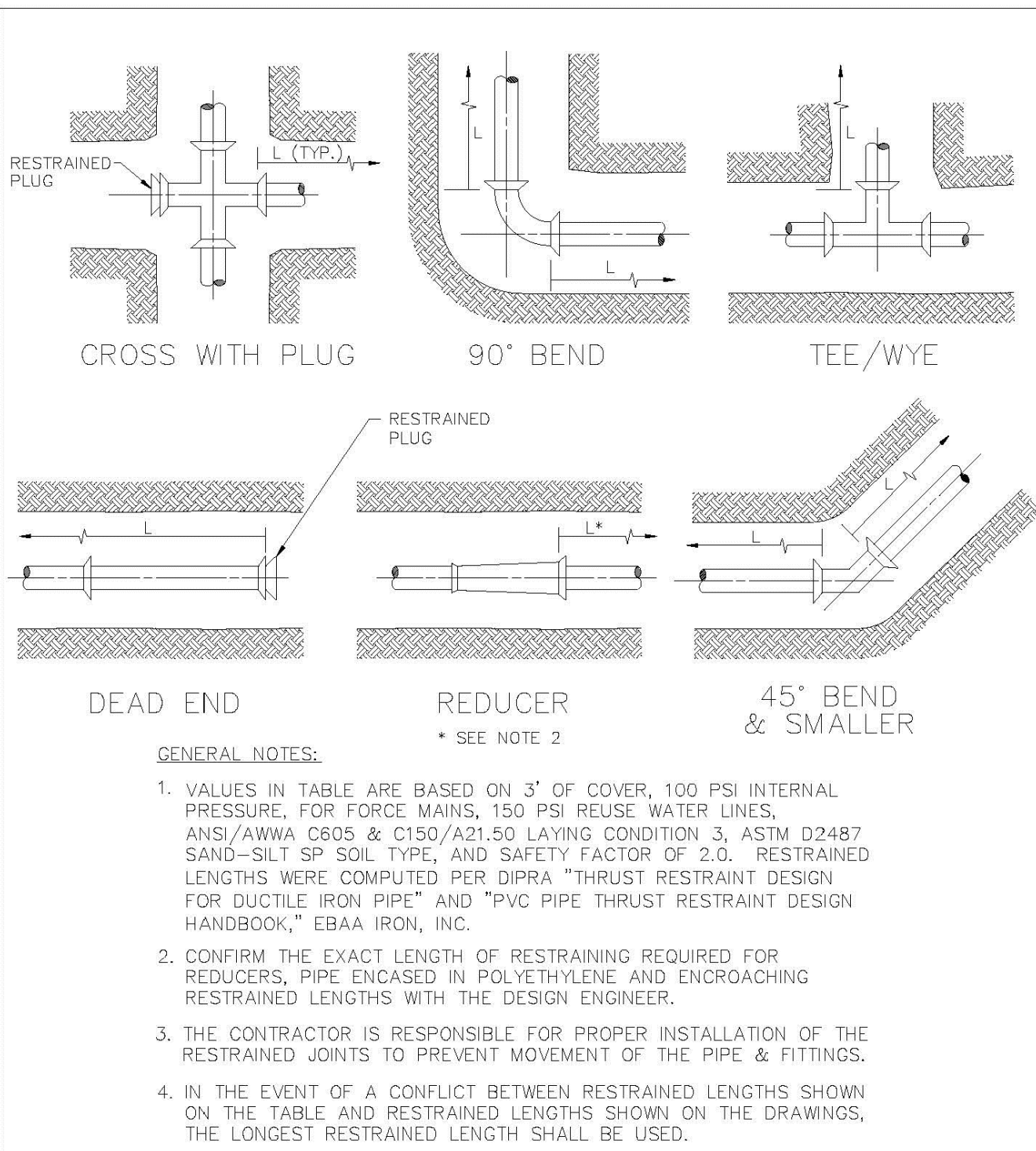
UNDERGROUND VALVE IDENTIFICATION MARKER

ENGINEERING STANDARDS 2022			
REVISIONS	ENGINEERING DIVISION	UNDERGROUND VALVE IDENTIFICATION MARKER	
BY DATE	CITY OF POMPAÑO BEACH		
S.S. JUNE 2005			
T.W. 11-2007			
T.W. 02-2008			
S.S. 1-24-12	SCALE: N.T.S.	DATE: FEB. 2022	115-1



TF550 INSTALLATION AND SPECIFICATION

ENGINEERING STANDARDS 2022			
REVISIONS	ENGINEERING DIVISION	TF550 INSTALLATION AND SPECIFICATION	
BY DATE	CITY OF POMPAÑO BEACH		
S.S. FEB. 2006			
T.W. 11-2007			
T.W. 07-2008	SCALE: N.T.S.	DATE: MAY 2022	117-2



RESTRAINED JOINT INFORMATION

ENGINEERING STANDARDS 2022			
REVISIONS	ENGINEERING DIVISION	RESTRAINED JOINT INFORMATION	
BY DATE	CITY OF POMPAÑO BEACH		
S.S. FEB. 2006			
T.W. 11-2007			
T.W. 07-2008	SCALE: N.T.S.	DATE: MAY 2022	118-1

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°	CROSS WITH PLUG	DEAD END TEE/WYE
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°	CROSS WITH PLUG	DEAD END TEE/WYE
12"	144	60	29	14		
24"	258	107	51	25		

RESTRAINED JOINT INFORMATION

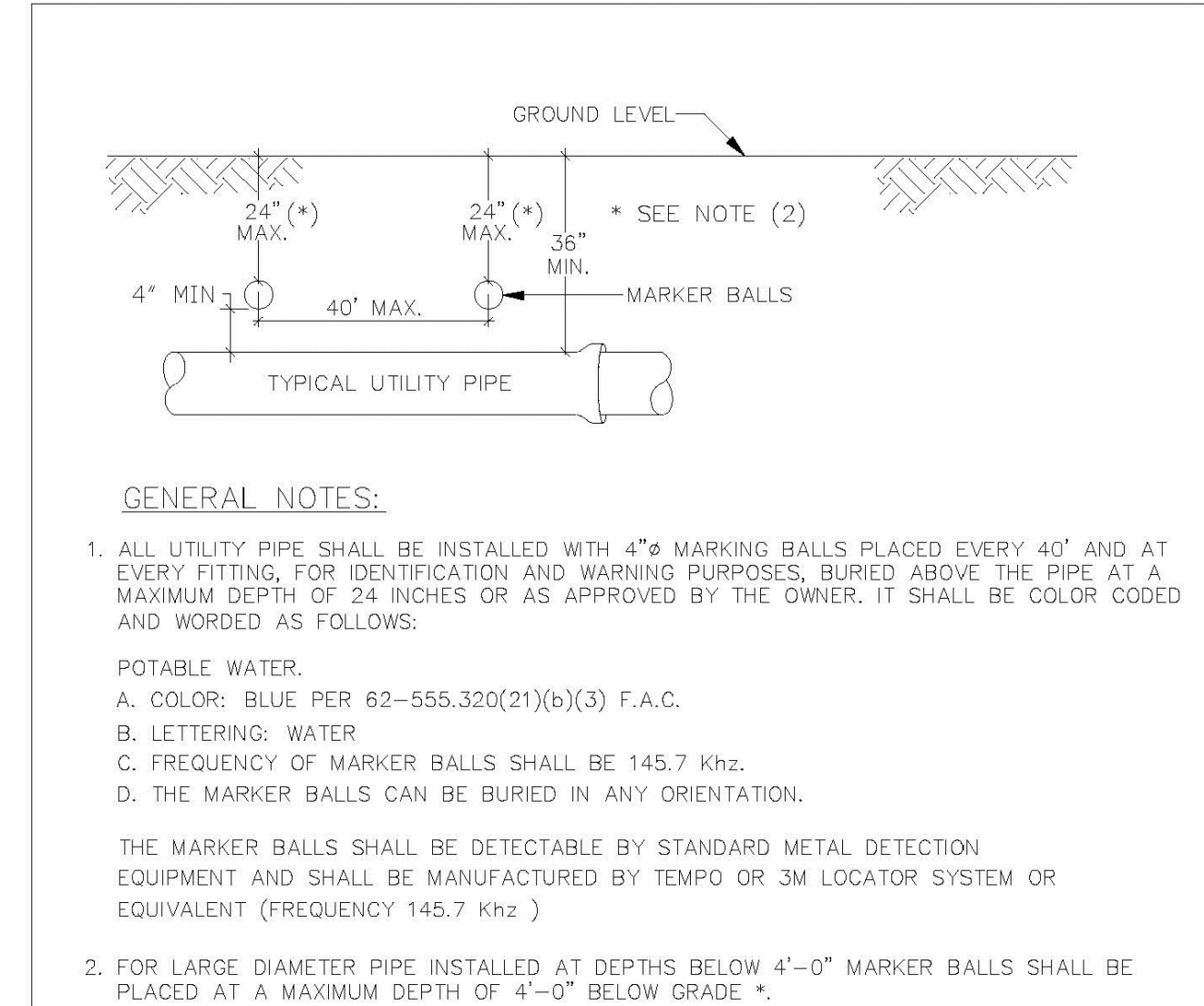
ENGINEERING STANDARDS 2022			
REVISIONS	ENGINEERING DIVISION	RESTRAINED JOINT INFORMATION	
BY DATE	CITY OF POMPAÑO BEACH		
S.S. FEB. 2006			
T.W. 11-2007			
T.W. 07-2008	SCALE: N.T.S.	DATE: MAY 2022	118-2

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	3"	6"	8"	10"	12"	16"	20"	24"	30"	36"	42"	48"	60"	72"	84"	96"	108"	120"
90° HORIZ. BEND	14	26	36	39	35	43	54	67	98	110	124	138						
45° HORIZ. BEND	6	9	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	29	41	53	64	74	95	115	134	214	246	276	304						
45° VERT. OFFSET	7	10	13	16	19	25	30	35	57	66	74	83						
22.5° VERT. OFFSET	12	16	24	29	34	39	48	56	89	102	114	126						
11.25° VERT. OFFSET	3	4	6	7	8	10	12	15	23	27	31	34						
PLUG (DEAD END)	32	45	59	70	83	107	129	151	214	246	276	304						
IN-LINE VALVE	32	45	45	45	45	56	65	80	110	125	140	155						
TEE (BRANCH RESTRAINT)	6" x 6"	21	35	-	-	-	-	-	-	-	-	-						
	8" x 6"	16	34	47	-	-	-	-	-	-	-	-						
	10" x 6"	16	32	46	58	-	-	-	-	-	-	-						
	12" x 6"	13	30	44	57	69	-	-	-	-	-	-						
	15" x 6"	7	28	41	55	67	80	-	-	-	-	-						
	20" x 6"	1	21	38	52	65	88	108	-	-	-	-						
	24" x 6"	1	16	34	49	62	86	108	129	-	-	-						
	30" x 6"	1	8	28	44	58	83	106	127	208	-	-						
	36" x 6"	1	1	22	38	54	80	103	124	208	290	-						
	42" x 6"	1	1	15	33	48	77	100	122	205	239	270	-					
	48" x 6"	1	1	7	27	44	73	97	120	203	238	269	298	-				
	6" x 8"	23	-	-	-	-	-	-	-	-	-	-						
REDUCER (LARGER PIPE RESTRAINT)	8" x 8"	28	29	-	-	-	-	-	-	-	-	-						
	10" x 8"	37	43	24	-	-	-	-	-	-	-	-						
	12" x 8"	47	60	44	41	-	-	-	-	-	-	-						
	16" x 8"	99	90	78	75	45	-	-	-	-	-	-						
	20" x 8"	153	116	107	105	81	45	-	-	-	-	-						
	24" x 8"	146	140	135	131	111	82	45	-	-	-	-						
200psi	30" x 8"	209	204	197	188	177	153	116	75	-	-	-						
	36" x 8"	243	236	233	226	217	166	145	135	74	-	-						
	42" x 8"	273	270	265	259	252	234	211	183	133	72	-						
	48" x 8"	301	296	294	289	283	268	248	228	183	131	71	-					

- NOTES:
- THE DATA IN THE ABOVE TABLE ARE BASED UPON THE FOLLOWING INSTALLATION CONDITIONS:
SOL TYPE--SAND TEST PRESSURE--150 PS/200 PSI DEPTH OF BURY--3'
BEND TYPE--S SWEET FACTOR--1.5 SWEET FACTOR--1.5 VERTICAL OFFSET--3'
 - 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.

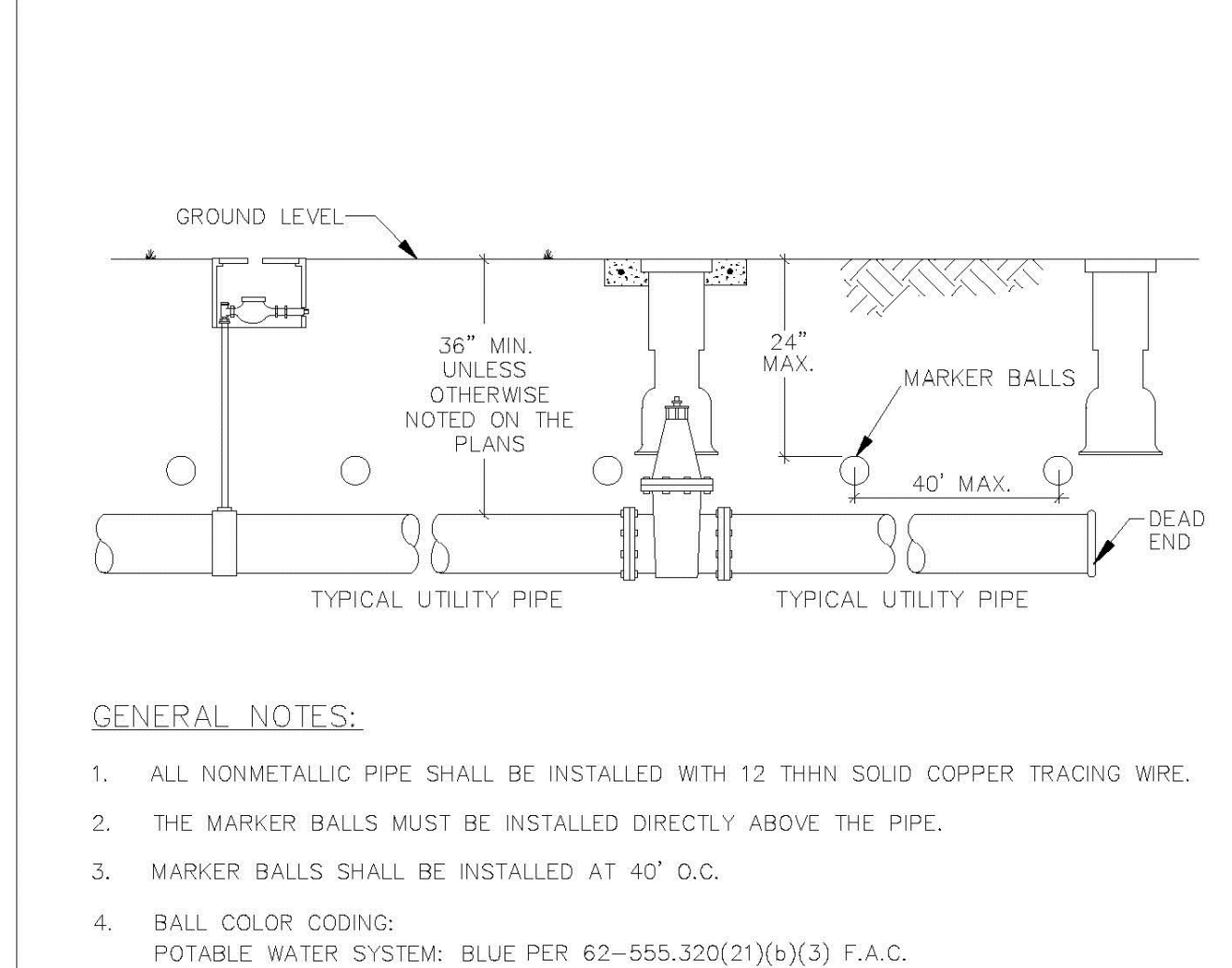
RESTRAINED JOINT INFORMATION

ENGINEERING STANDARDS 2022			
REVISIONS	ENGINEERING DIVISION	RESTRAINED JOINT INFORMATION	
BY DATE	CITY OF POMPAÑO BEACH		
S.S. 01/12			
S.S. 06/16			
	SCALE: N.T.S.	DATE: JAN. 2022	118-3



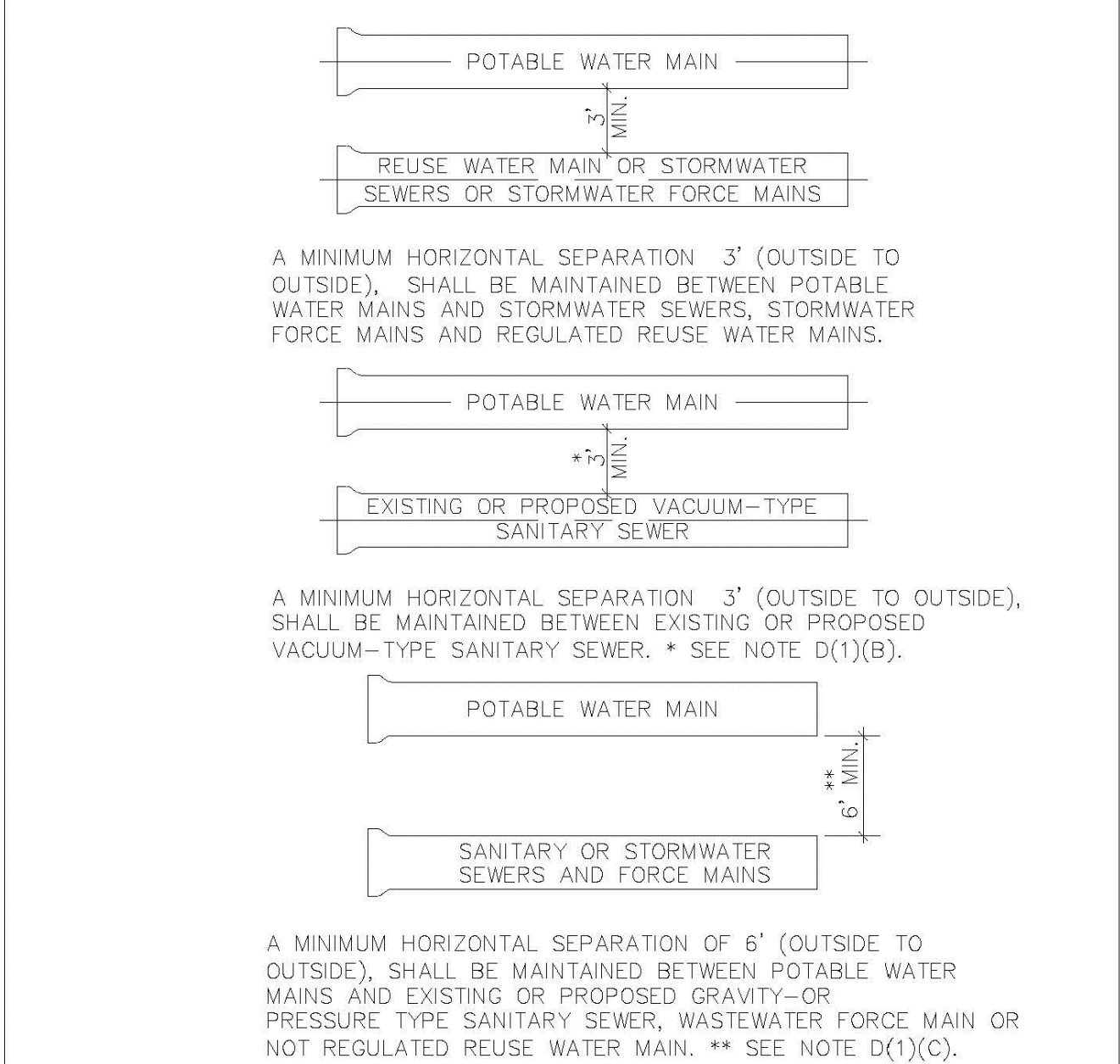
WATER PIPE IDENTIFICATION

ENGINEERING STANDARDS 2022			
REVISIONS	ENGINEERING DIVISION	WATER PIPE IDENTIFICATION	
BY DATE	CITY OF POMPAÑO BEACH		
S.S. 01/12			
S.S. 06/16			
	SCALE: N.T.S.	DATE: JAN. 2022	119-1



UTILITY PIPE AND MARKER BALLS LOCATION

ENGINEERING STANDARDS 2022			
REVISIONS	ENGINEERING DIVISION	UTILITY PIPE AND MARKER BALLS LOCATION	
BY DATE	CITY OF POMPAÑO BEACH		
S.S. 01/12			
S.S. 06/16			
	SCALE: N.T.S.	DATE: JAN. 2022	120-1



MINIMUM HORIZONTAL SEPARATION REQUIREMENTS FOR POTABLE WATER, REUSE, STORMWATER AND SEWER LINES

ENGINEERING STANDARDS 2022			
REVISIONS	ENGINEERING DIVISION	MIN. HORIZONTAL SEPARATION FOR POTABLE WATER	
BY DATE	CITY OF POMPAÑO BEACH		
S.S. 01/12			
	SCALE: N.T.S.	DATE: JAN. 2022	121

REVISIONS	DATE	BY

CAULFIELD & WHEELER, INC.
CIVIL ENGINEERING - LAND PLANNING
LANDSCAPE ARCHITECTURE - SURVEYING
7900 GLADES ROAD - SUITE 100
BOCA RATON, FLORIDA 33434
PHONE (561)-392-1991 / FAX (561)-750-452

OAKS @ PALM AIRE
WATER DISTRIBUTION & SANITARY SEWER DETAILS
POMPAÑO BEACH, FLORIDA

DATE	06/12/23
DRAWN BY	RHT
F.B./ PG.	N/A
SCALE	n.t.s.

RYAN D. WHEELER
PROFESSIONAL ENGINEER
LICENSE NO. 71477
STATE OF FLORIDA
FOR THE FIRM
DATED Dec 11, 2024

OB #10326
WS 4
OF 8 SHEETS

PZ23-120000-17
01/15/2025