

PVC HORIZONTAL BENDS AND VERTICAL UP BENDS					
PIPE SIZE (IN.)	RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING – EACH WAY)			CROSS WITH PLUG, READ END, REUSE W/RE	
	90°	45°	22.5°	11.25°	
6	26	11	6	3	53
8	33	14	7	4	68
12	46	19	10	5	96

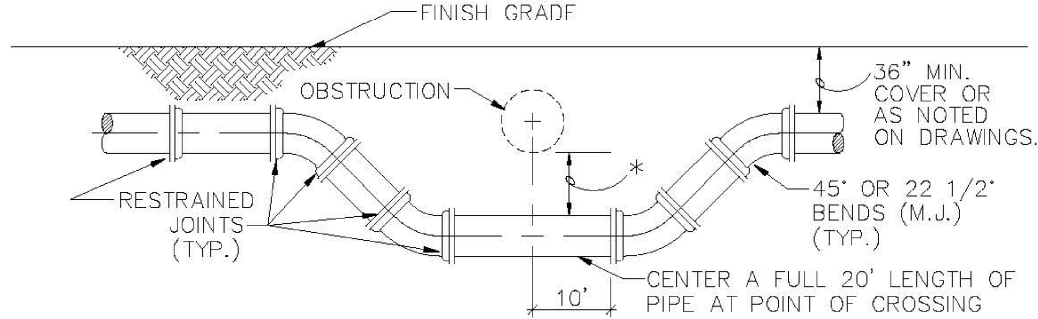
PVC VERTICAL DOWN BEND					
PIPE SIZE (IN.)	RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING – EACH WAY)			CROSS WITH PLUG, READ END, REUSE W/RE	
	90°	45°	22.5°	11.25°	
6	26	11	6	3	
8	33	14	7	4	
12	46	19	10	5	

DIP HORIZONTAL BENDS AND VERTICAL UP BENDS					
PIPE SIZE (IN.)	RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING – EACH WAY)			CROSS WITH PLUG, READ END, REUSE W/RE	
	90°	45°	22.5°	11.25°	
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)			CROSS WITH PLUG, READ END, REUSE W/RE	
	90°	45°	22.5°	11.25°	
12"	144	60	29	14	
24"	258	107	51	25	

RESTRAINED JOINT INFORMATION

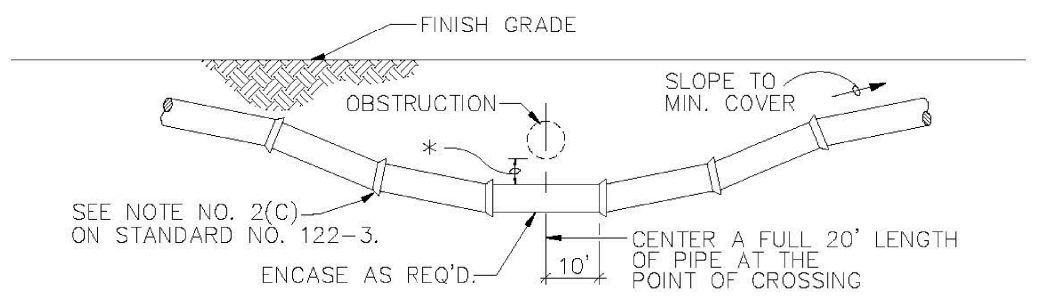
ENGINEERING STANDARDS 2022			
REVISIONS	ENGINEERING DIVISION CITY OF POMPAÑO BEACH	RESTRAINED JOINT INFORMATION	
BY DATE			
S.S. 01/12			DATE: MAY 2022 DWG. NO.
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SPECIAL UTILITY CROSSING – FITTING TYPE

* 12" MINIMUM CLEARANCE REQUIRED FOR PRESSURE TYPE SANITARY SEWER, WASTEWATER OR STORMWATER FORCE MAIN OR REUSE WATER MAIN CROSSINGS. IF MINIMUM CLEARANCE CANNOT BE OBTAINED, REFER TO "PROTECTION OF POTABLE WATER SUPPLY" FOR WATER MAIN CROSSINGS. SEE NOTE 2(B), ON STANDARD NO. 122-3

6" MINIMUM CLEARANCE REQUIRED FOR WATER AND STORMWATER, SEWER MAIN CROSSINGS. SEE NOTE 2(A), ON STANDARD NO. 122-3.



STANDARD UTILITY CROSSING – DEFLECTION TYPE

NOTES: 1. THE DEFLECTION TYPE CROSSING SHALL BE USED WHEREVER POSSIBLE. ONLY UNDER SPECIFIC ORDERS BY THE ENGINEER SHALL THE FITTING TYPE CROSSING BE ALLOWED. 2. CONSTRUCT STANDARD CROSSING USING NO MORE THAN 75% OF MANUFACTURERS' MAXIMUM JOINT DEFLECTION. 3. FOR POTABLE WATER MAINS, REFER TO "PROTECTION OF POTABLE WATER SUPPLY".

UTILITY CROSSINGS

ENGINEERING STANDARDS 2022			
REVISIONS	ENGINEERING DIVISION CITY OF POMPAÑO BEACH	UTILITY CROSSINGS	
BY DATE			
S.S. 01/12			DATE: JAN. 2022 DWG. NO.
	SCALE: N.T.S.		122-1

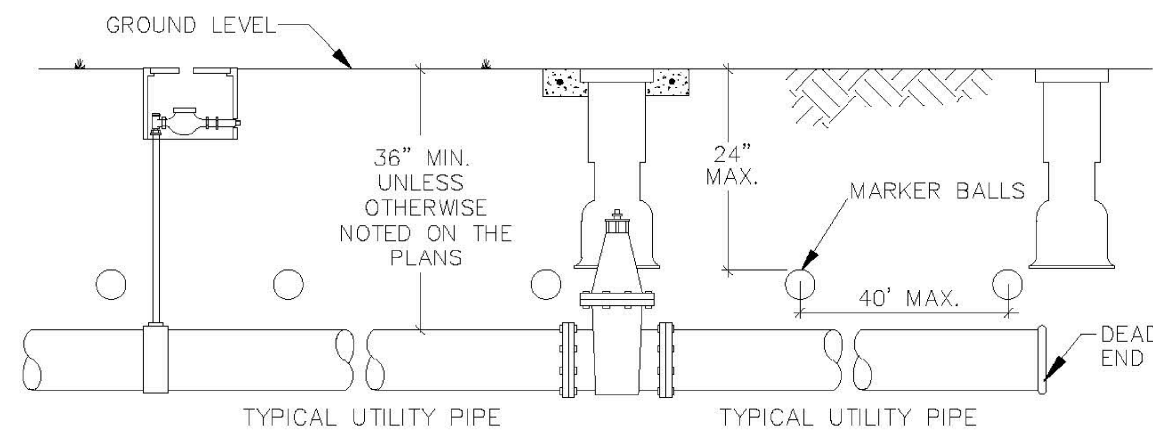
MIN. LENGTH OF PIPE (FEET) TO BE RESTRAINED
(SOURCES: EBAA IRON RESTRAINT LENGTH CALCULATION PROGRAM FOR PVC PIPE, RELEASE 3.1, AND DIPA THRUST RESTRAINT FOR DUCTILE IRON PIPE, RELEASE 3.2)

FITTING TYPE	PIPE SIZE															
	4"	6"	8"	10"	12"	16"	20"	24"	30"	36"	42"	48"	200psi			
90° HORIZ. BEND	14	20	26	30	36	48	60	84	96	112	124	136				
45° HORIZ. BEND	6	8	11	13	15	18	22	26	31	46	51	56				
22.5° HORIZ. BEND	3	4	5	6	7	8	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	270	304				
45° VERT. OFFSET	7	10	13	16	19	25	30	35	57	66	74	83				
22.5° VERT. OFFSET	3	4	5	6	7	8	10	12	15	23	27	31				
11.25° VERT. OFFSET	1	1	1	1	1	2	2	3	4	6	7	8				
PLUG (READ END)	32	45	59	70	83	107	129	151	214	246	270	304				
IN-LINE VALVE	30	45	45	45	45	56	60	80	110	125	140	155				
TEE (BRANCH RESTRAINT)	4" Ø	23	—	—	—	—	—	—	—	—	—	—				
	6" Ø	31	35	—	—	—	—	—	—	—	—	—				
	8" Ø	38	47	—	—	—	—	—	—	—	—	—				
	10" Ø	46	57	66	75	—	—	—	—	—	—	—				
	12" Ø	53	65	77	89	—	—	—	—	—	—	—				
	15" Ø	67	81	95	109	—	—	—	—	—	—	—				
	20" Ø	91	111	131	151	—	—	—	—	—	—	—				
	24" Ø	116	141	166	191	—	—	—	—	—	—	—				
	30" Ø	146	181	216	251	—	—	—	—	—	—	—				
	36" Ø	176	216	256	296	—	—	—	—	—	—	—				
	42" Ø	206	246	286	326	—	—	—	—	—	—	—				
	48" Ø	236	276	316	356	—	—	—	—	—	—	—				
REDUCER (LARGER PIPE RESTRAINT)	4" Ø	23	—	—	—	—	—	—	—	—	—	—				
	6" Ø	31	—	—	—	—	—	—	—	—	—	—				
	8" Ø	38	—	—	—	—	—	—	—	—	—	—				
	10" Ø	46	—	—	—	—	—	—	—	—	—	—				
	12" Ø	53	—	—	—	—	—	—	—	—	—	—				
	15" Ø	67	—	—	—	—	—	—	—	—	—	—				
	20" Ø	91	—	—	—	—	—	—	—	—	—	—				
	24" Ø	116	—	—	—	—	—	—	—	—	—	—				
	30" Ø	146	—	—	—	—	—	—	—	—	—	—				
	36" Ø	176	—	—	—	—	—	—	—	—	—	—				
	42" Ø	206	—	—	—	—	—	—	—	—	—	—				
	48" Ø	236	—	—	—	—	—	—	—	—	—	—				

NOTES:
1. THE DATA IN THE ABOVE TABLE ARE BASED UPON THE FOLLOWING INSTALLATION CONDITIONS:
SOL TYPE-SAND TEST PRESSURE-150 PSI/200 PSF
TRENCH TYPE-SAFETY FACTOR-1.5
MINIMUM PIPE LENGTH ALONG TEE RUN-5' VERTICAL OFFSET-3'
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			
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BY DATE			
S.S. 01/12			DATE: MAY 2022 DWG. NO.
	SCALE: N.T.S.		118-3



GENERAL NOTES:

- ALL NONMETALLIC PIPE SHALL BE INSTALLED WITH 12 THHN SOLID COPPER TRACING 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 62-655.320(21)(b)(3) F.A.C.

UTILITY PIPE AND MARKER BALLS LOCATION

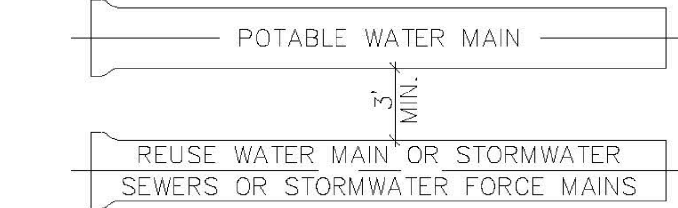
ENGINEERING STANDARDS 2022			
REVISIONS	ENGINEERING DIVISION CITY OF POMPAÑO BEACH	UTILITY PIPE AND MARKER BALLS LOCATION	
BY DATE			
S.S. 01/12			DATE: JAN. 2022 DWG. NO.
S.S. 06/16			
	SCALE: N.T.S.		120-1

- D. NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST TEN FEET BETWEEN THE OUTSIDE OF THE WATER MAIN AND ALL PARTS OF ANY EXISTING OR PROPOSED "ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEM".
2. VERTICAL SEPARATION
 - A. NEW OR RELOCATED, UNDERGROUND WATER MAINS CROSSING ANY EXISTING OR PROPOSED GRAVITY-OR VACUUM-TYPE SANITARY SEWER OR STORM SEWER SHALL BE LAID SO THE OUTSIDE OF THE WATER MAIN IS AT LEAST SIX INCHES, AND PREFERABLY 12 INCHES ABOVE OR AT LEAST 12 INCHES BELOW THE OUTSIDE OF THE OTHER PIPELINE. HOWEVER, IT IS PREFERABLE TO LAY THE WATER MAIN ABOVE THE OTHER PIPELINE.
 - B. NEW OR RELOCATED, UNDERGROUND WATER MAINS CROSSING ANY EXISTING OR PROPOSED PRESSURE-TYPE SANITARY SEWER, WASTEWATER OR STORM WATER FORCE MAIN, OR PIPELINE CONVEYING REUSE WATER SHALL BE LAID SO THE OUTSIDE OF THE WATER MAIN IS AT LEAST 12 INCHES, ABOVE OR BELOW THE OUTSIDE THE OTHER PIPELINE. HOWEVER, IT IS PREFERABLE TO LAY THE WATER MAIN ABOVE THE OTHER PIPELINE.
 - C. AT THE UTILITY CROSSINGS DESCRIBED IN PARAGRAPHS (A) AND (B) ABOVE, ONE FULL LENGTH OF WATER MAIN PIPE SHALL BE CENTERED ABOVE OR BELOW THE OTHER PIPELINE SO THE WATER MAIN JOINTS WILL BE AS FAR AS POSSIBLE FROM THE OTHER PIPELINE. ALTERNATIVELY, AT SUCH CROSSINGS, THE PIPES SHALL BE ARRANGED SO THAT ALL WATER MAIN JOINTS ARE AT LEAST THREE FEET FROM ALL JOINTS IN VACUUM-TYPE SANITARY SEWERS, STORM SEWERS, STORM WATER FORCE MAINS, OR PIPELINES CONVEYING REUSE WATER REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C. AND AT LEAST SIX FEET FROM ALL JOINTS IN GRAVITY- OR PRESSURE-TYPE SANITARY SEWERS, WASTEWATER FORCE MAINS, OR PIPELINES CONVEYING REUSE WATER NOT REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C.

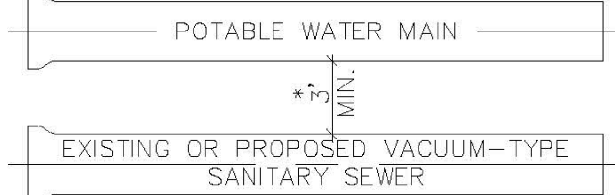
WHERE THE HORIZONTAL CAN BEING LOCATED LESS THAN THE REQUIRED MINIMUM DISTANCES FROM JOINTS IN THE OTHER PIPELINE OR THE HORIZONTAL IS LESS THAN THREE FEET FROM ANOTHER PIPELINE OR THE UNDER GROUND WATER MAIN IS CROSSING ANOTHER PIPELINE AND IS LESS THAN THE REQUIRED MINIMUM VERTICAL DISTANCE FROM THE OTHER PIPELINE, THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY FOR RECOMMENDED SOLUTIONS TO MEET THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION REQUIREMENTS PER CHAPTER 62-555, F.A.C.

PROTECTION OF POTABLE WATER SUPPLY NOTES

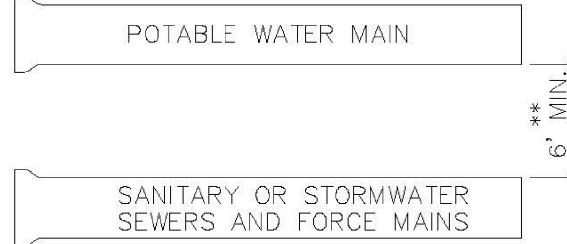
ENGINEERING STANDARDS 2022			
REVISIONS	ENGINEERING DIVISION CITY OF POMPAÑO BEACH	POTABLE WATER SUPPLY NOTES	
BY DATE			
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	SCALE: N.T.S.		122-3



A MINIMUM HORIZONTAL SEPARATION 3' (OUTSIDE TO OUTSIDE), SHALL BE MAINTAINED BETWEEN POTABLE WATER MAINS AND STORMWATER SEWERS, STORMWATER FORCE MAINS AND REGULATED REUSE WATER MAINS.



A MINIMUM HORIZONTAL SEPARATION 3' (OUTSIDE TO OUTSIDE), SHALL BE MAINTAINED BETWEEN EXISTING OR PROPOSED VACUUM-TYPE SANITARY SEWER. * SEE NOTE D(1)(B).



A MINIMUM HORIZONTAL SEPARATION OF 6' (OUTSIDE TO OUTSIDE), SHALL BE MAINTAINED BETWEEN POTABLE WATER MAINS AND EXISTING OR PROPOSED GRAVITY-OR PRESSURE TYPE SANITARY SEWER, WASTEWATER FORCE MAIN OR NOT REGULATED REUSE WATER MAIN. ** SEE NOTE D(1)(C).

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

ENGINEERING STANDARDS 2022			
REVISIONS	ENGINEERING DIVISION CITY OF POMPAÑO BEACH	MIN. HORIZONTAL SEPARATION FOR POTABLE WATER	
BY DATE			
S.S. 01/12			DATE: JAN. 2022 DWG. NO.
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