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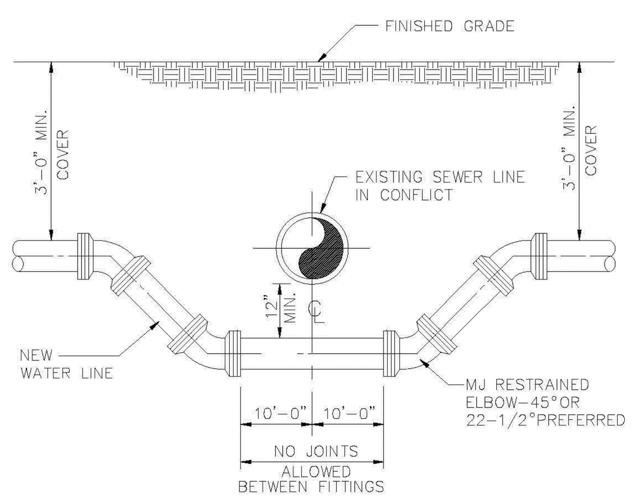


NOTES
WHERE CONDITIONS PERMIT, PIPE DEFLECTION MAY BE USED INSTEAD OF BENDS TO OBTAIN THE MINIMUM CLEARANCE. FACTORY OFFSETS MAY BE USED.

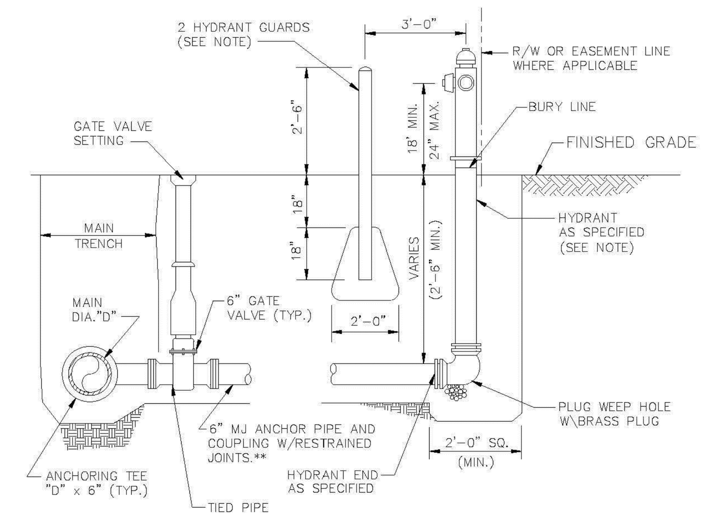
TYPICAL CONFLICT DETAIL

USE MEGALUGS AT ALL PIPE JOINTS

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

ENGINEERING STANDARDS 2022

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



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.

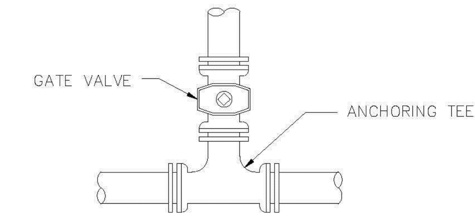
HYDRANTS CONNECTED TO NEW MAINS SHALL BE CONNECTED USING A HYDRANT TEE.

ALL POMPANO BEACH HYDRANTS SHALL BE PAINTED RED.

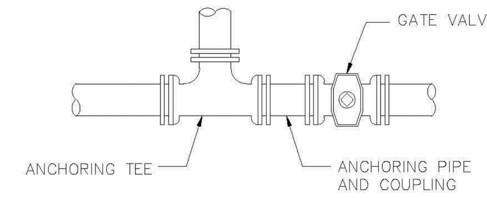
TYPICAL FIRE HYDRANT ASSEMBLY

ENGINEERING STANDARDS 2022

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



RESTRAINED VALVE AT TEE (BRANCH)



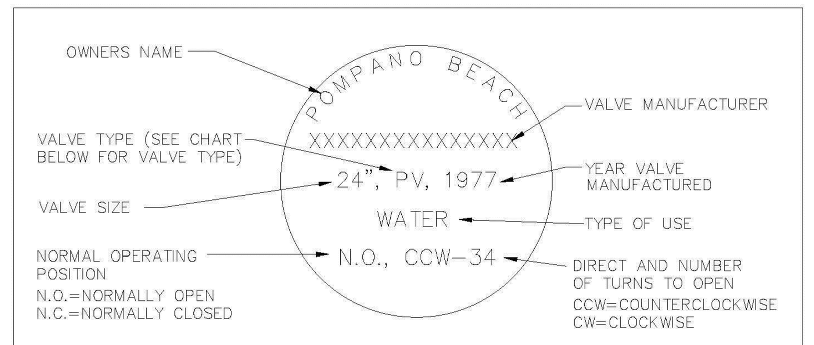
RESTRAINED VALVE AT TEE (IN LINE)

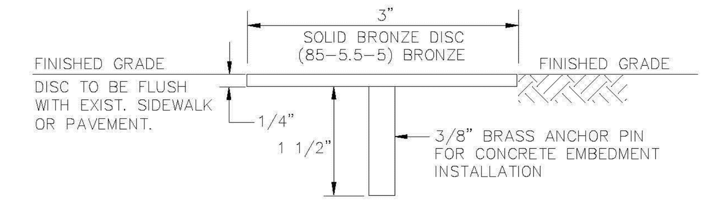
USE MEGALUGS AT ALL PIPE JOINTS

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

ENGINEERING STANDARDS 2022

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





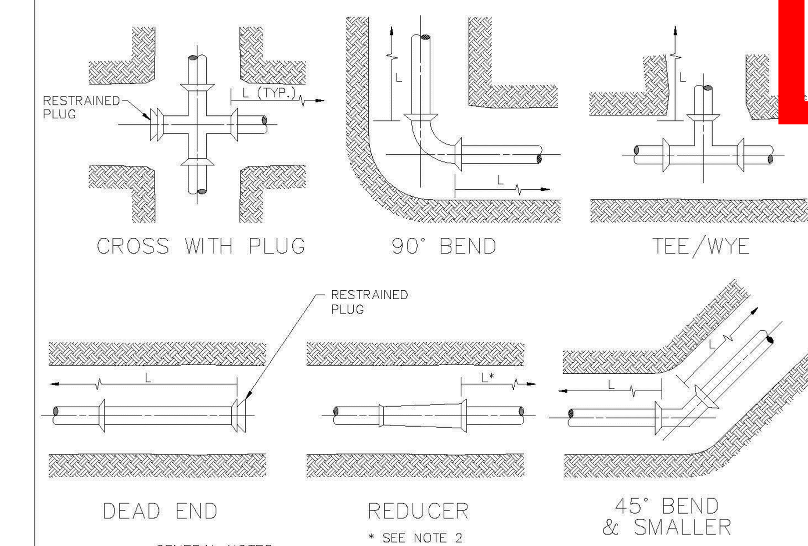
VALVE TYPES
BALL VALVE--BALLV
RESILIENT WEDGE GATE VALVE--RWGV
BUTTERFLY VALVE--BV
PLUG VALVE--PV

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



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		ENGINEERING DIVISION CITY OF POMPANO BEACH	RESTRAINED JOINT INFORMATION
BY	DATE		DATE: MAY 2022
		SCALE: N.T.S.	DWG. NO. 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°	
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		ENGINEERING DIVISION CITY OF POMPANO BEACH	RESTRAINED JOINT INFORMATION
BY	DATE		DATE: MAY 2022
		SCALE: N.T.S.	DWG. NO. 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)

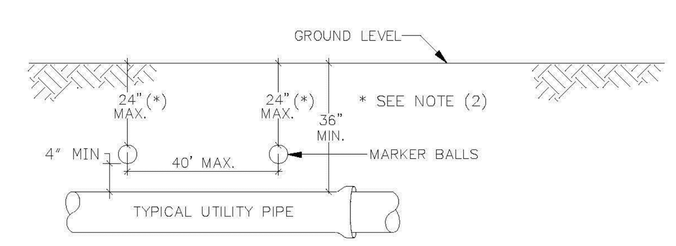
FITTING TYPE		4"	6"	8"	10"	12"	16"	20"	24"	30" (200psi)	36" (200psi)	42" (200psi)	48" (200psi)
90° HORIZ. BEND		14	20	25	30	35	45	54	62	98	112	124	135
45° HORIZ. BEND		6	8	11	13	15	19	22	26	41	46	51	56
22.5° HORIZ. BEND		3	4	5	6	7	9	11	12	19	22	25	27
11.25° HORIZ. BEND		1	2	3	3	4	4	5	6	10	11	12	13
90° 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	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		ENGINEERING DIVISION CITY OF POMPANO BEACH	RESTRAINED JOINT INFORMATION
BY	DATE		DATE: MAY 2022
		SCALE: N.T.S.	DWG. NO. 118-3



GENERAL NOTES:
1. 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 145.7 Khz.
D. THE MARKER BALLS CAN BE BURIED IN ANY ORIENTATION.

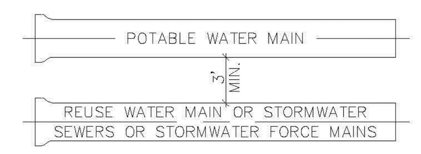
THE MARKER BALLS SHALL BE DETECTABLE BY STANDARD METAL DETECTION EQUIPMENT AND SHALL BE MANUFACTURED BY TEMPO OR 3M LOCATOR SYSTEM OR EQUIVALENT (FREQUENCY 145.7 Khz)

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

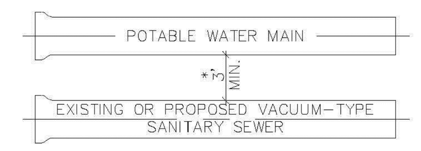
WATER PIPE IDENTIFICATION

ENGINEERING STANDARDS 2022

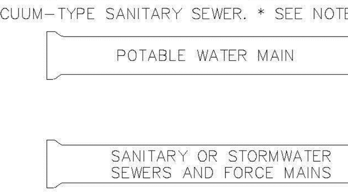
REVISIONS		ENGINEERING DIVISION CITY OF POMPANO BEACH	WATER PIPE IDENTIFICATION
BY	DATE		
S.S.	01/12		DATE: JAN. 2022
S.S.	06/16	SCALE: N.T.S.	DWG. NO. 119-1



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).

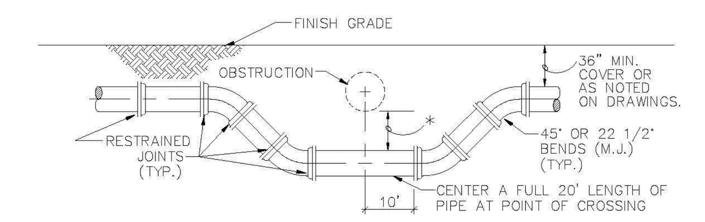


A MINIMUM HORIZONTAL SEPARATION OF 6' (OUTSIDE TO OUTSIDE), SHALL BE MAINTAINED BETWEEN POTABLE WATER MAINS AND EXISTING OR PROPOSED GRAVITY-OR PRESSURE TYPE SANITARY SEWER, WASTEWATER FORCE MAIN OR NOT REGULATED REUSE WATER MAIN. ** SEE NOTE D(1)(C).

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

ENGINEERING STANDARDS 2022

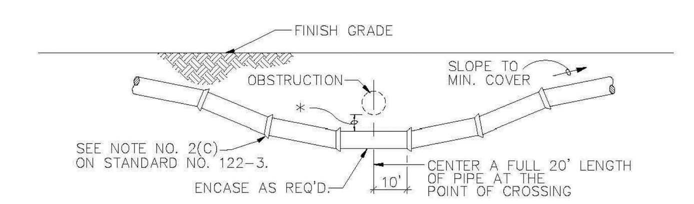
REVISIONS		ENGINEERING DIVISION CITY OF POMPANO BEACH	MIN. HORIZONTAL SEPARATION FOR POTABLE WATER
BY	DATE		
S.S.	01/12		DATE: JAN. 2022
		SCALE: N.T.S.	DWG. NO. 121-1



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".

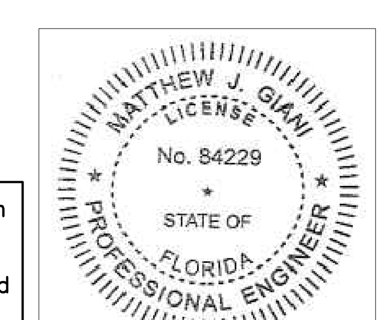
UTILITY CROSSINGS

ENGINEERING STANDARDS 2022

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

This item has been digitally signed and sealed by Matthew J. Giani on the date on the digital seal.

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



REVISIONS

DATE	BY	DESCRIPTION

SDA ENGINEERING
ENGINEERING ○ SURVEYING ○ PLANNING
ENGINEERING AUTH. NO. 5634 SURVEYING LIC. NO. LB-6456
3410 N. Andrews Avenue Ext. • Pompano Beach, Fl. 33064
PH: 954-943-9433 • FAX: 954-783-4754

DRAWN BY: MJG
CHECKED BY: JFD
DESIGNED BY: MJG
APPROVED BY: S.D.A.
SCALE: N.T.S.

ATLANTIC ONE
MIXED-USE DEVELOPMENT
POMPANO BEACH, BROWARD COUNTY, FLORIDA

WATER AND SEWER DETAILS

SEAL
FOR THE FIRM, BY:
Matthew J Giani
Digitally signed by Matthew J Giani
Date: 2024.06.10 16:35:53 -04'00'
MATTHEW GIANI, P.E.
FLA. P.E. No. 84229

DATE: JUNE 2024

JOB NO. 1136B.01

SHEET CE6