DRC
PZ23-12000042
04/03/2024

118-2 — RESTRAINED JOINT INFORMATION

PVC HORIZONTAL BENDS AND VERTICAL UP BENDS

RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING – EACH WAY)

PIPE SIZE (IN.)	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

RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING – EACH WAY)

PIPE SIZE (IN.)	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

RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING – EACH WAY)

PIPE SIZE (IN.)	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

RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING EACH WAY)

PIPE SIZE (IN.)	BENDS 90°	45°	22.5°	11.25°
12"	144	60	29	14
24"	258	107	51	25

RESTRAINED JOINT INFORMATION

ENGINEERING STANDARDS 2022

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

118-3 — RESTRAINED JOINT INFORMATION

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		PIPE SIZE 4"	6"	8"	10"	12"	16"	20"	24"	200psi 30"	36"	42"	48"
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	8	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	125	118	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	–

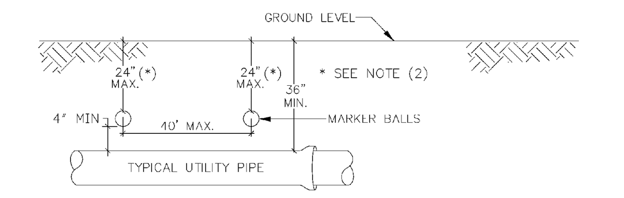
NOTES:
1. THE DATA IN THE ABOVE TABLE ARE BASED UPON THE FOLLOWING INSTALLATION CONDITIONS: SOIL TYPE–SAND; TEST PRESSURE–150 PSI/200 PSI; DEPTH OF BURY–3'; TRENCH TYPE–3; SAFETY FACTOR–1.5; VERTICAL OFFSET–3'; MINIMUM PIPE LENGTH ALONG TEE RUN–5'
2. THE RESTRAINED PIPE LENGTHS APPLY TO DUCTILE IRON 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 BY DATE | ENGINEERING DIVISION CITY OF POMPANO BEACH | RESTRAINED JOINT INFORMATION | DATE: MAY 2022 DWG. NO. 118-3 | SCALE: N.T.S.

119-1 — WATER PIPE IDENTIFICATION



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)

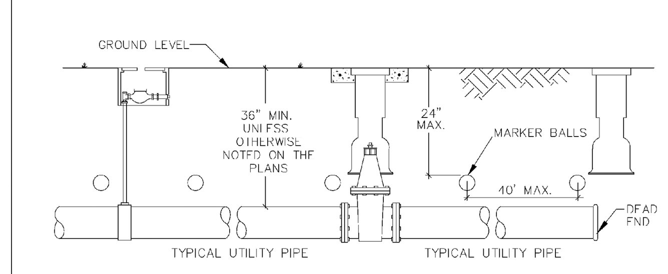
2. FOR LARGE DIAMETER PIPE INSTALLED AT DEPTHS BELOW 4' 0" MARKER BALLS SHALL BE PLACED AT A MAXIMUM DEPTH OF 4'–0" BELOW GRADE *.

WATER PIPE IDENTIFICATION

ENGINEERING STANDARDS 2022

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

120-1 — UTILITY PIPE AND MARKER BALLS LOCATION



GENERAL NOTES:

1. ALL NONMETALLIC PIPE SHALL BE INSTALLED WITH 12 THHN SOLID COPPER TRACING WIRE.
2. THE MARKER BALLS MUST BE INSTALLED DIRECTLY ABOVE THE PIPE.
3. MARKER BALLS SHALL BE INSTALLED AT 40' O.C.
4. 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 BY DATE S.S. 01/12 S.S. 06/16 | ENGINEERING DIVISION CITY OF POMPANO BEACH | UTILITY PIPE AND MARKER BALLS LOCATION | DATE: JAN. 2022 DWG. NO. 120-1 | SCALE: N.T.S.

121-1 — MIN. HORIZONTAL SEPARATION FOR POTABLE WATER

POTABLE WATER MAIN
3' MIN.
REUSE WATER MAIN OR STORMWATER SEWERS OR STORMWATER FORCE MAINS

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.

POTABLE WATER MAIN
*3' MIN.
EXISTING OR PROPOSED VACUUM–TYPE SANITARY SEWER

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

POTABLE WATER MAIN
6' MIN. **
SANITARY OR STORMWATER SEWERS AND FORCE MAINS

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).

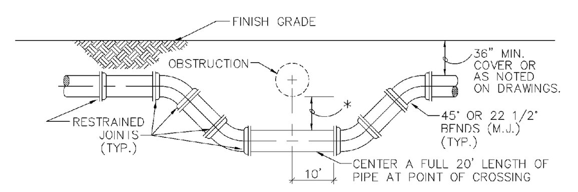
MINIMUM HORIZONTAL SEPARATION REQUIREMENTS FOR POTABLE WATER, REUSE, STORMWATER AND SEWER LINES

ENGINEERING STANDARDS 2022

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

Stephen Botek
Digitally signed by Stephen Botek
Date: 2024.02.27 13:16:04 -05'00'

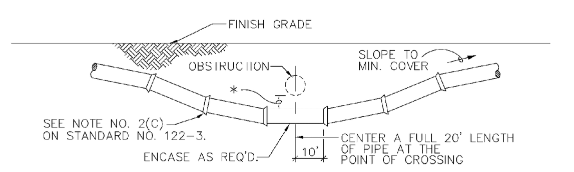
122-1 — UTILITY CROSSINGS



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

122-2 — POTABLE WATER SUPPLY NOTES

PROTECTION OF POTABLE WATER SUPPLY NOTES

A. GENERAL
IN ADDITION TO THESE REQUIREMENTS, ALL POTABLE WATER MAINS CONSTRUCTED IN THE VICINITY OF STORM SEWERS, SANITARY SEWERS OR FORCE MAINS SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF FLORIDA ADMINISTRATIVE CODE CHAPTER 62–555, GREAT LAKES–UPPER MISSISSIPPI RIVER BOARD OF STATE SANITARY ENGINEERS (GLUMRB) "RECOMMENDED STANDARDS FOR WATER WORKS", AND GLUMRB "RECOMMENDED STANDARDS FOR WASTEWATER FACILITIES".

B. DEFINITIONS
FOR THE PURPOSES OF THIS SPECIFICATION, THE WORDS "OTHER PIPE" OR "OTHER PIPES" SHALL MEAN SANITARY SEWER MAIN, SEWAGE FORCE MAIN, STORMWATER MAIN OR ANY COMBINATION THEREOF.

C. CROSS CONNECTIONS PROHIBITED
THERE SHALL BE NO PHYSICAL CONNECTIONS BETWEEN A PUBLIC OR PRIVATE POTABLE WATER SUPPLY SYSTEM AND ANY OTHER PIPE OR APPURTENANCE THERETO WHICH WOULD PERMIT THE PASSAGE OF ANY WASTEWATER, POLLUTED WATER, OR ANY OTHER WATER INTO THE POTABLE SUPPLY. NO WATER PIPE SHALL PASS THROUGH OR COME INTO CONTACT WITH ANY PART OF A SANITARY SEWER MANHOLE OR STORMWATER MANHOLE.

D. RELATION OF OTHER PIPES TO POTABLE WATER MAINS

1. HORIZONTAL SEPARATION
   A. NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST THREE FEET BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED STORM WATER, STORM WATER FORCE MAIN, OR PIPELINE CONVEYING REUSE WATER NOT REGULATED UNDER PART III OF CHAPTER 62–610,F.A.C.
   B. NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST THREE FEET, AND PREFERABLY TEN FEET, BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED VACUUM–TYPE SANITARY SEWER.
   C. NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST SIX FEET, AND PREFERABLY TEN FEET, BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED GRAVITY–OR PRESSURE–TYPE SANITARY SEWER, WASTEWATER FORCE MAIN, OR PIPELINE CONVEYING REUSE WATER NOT REGULATED UNDER CHAPTER 62 610, F.A.C. THE MINIMUM HORIZONTAL SEPARATION DISTANCE BETWEEN WATER MAINS AND GRAVITY TYPE SEWERS SHALL BE REDUCED TO THREE FEET WHERE THE BOTTOM OF THE WATER IS LAID AT LEAST SIX INCHES ABOVE THE TOP OF THE SEWER.

ENGINEERING STANDARDS 2022

REVISIONS BY DATE S.S. 01/12 | ENGINEERING DIVISION CITY OF POMPANO BEACH | POTABLE WATER SUPPLY NOTES | DATE: JAN. 2022 DWG. NO. 122-2 | SCALE: N.T.S.

122-3 — POTABLE WATER SUPPLY NOTES

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 OR CHAPTER 62–610, F.A.C.

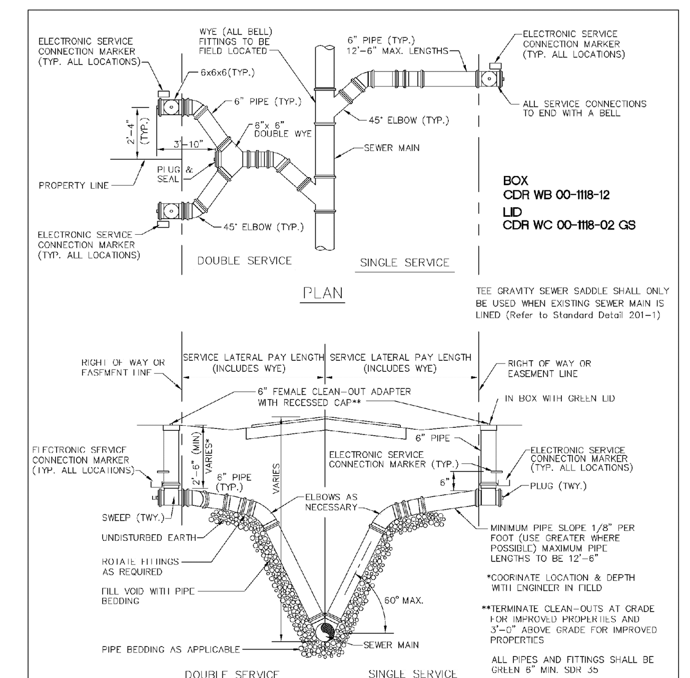
   WHERE THE HORIZONTAL CAN BEING LOCATED LESS THAT THE REQUIRED MINIMUM DISTANCES FROM JOINTS IN THE OTHER PIPELINE OR THE HORIZONTAL IS LESS THAT THREE FEET FROM ANOTHER PIPELINE OR THE UNDER GROUND WATER MAIN IS CROSSING ANOTHER PIPELINE AND IS LESS THAN THE REQUIRED MINIMUM VERTICAL DISTANCE FROM THE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

PROTECTION OF POTABLE WATER SUPPLY NOTES

ENGINEERING STANDARDS 2022

REVISIONS BY DATE S.S. 01/12 | ENGINEERING DIVISION CITY OF POMPANO BEACH | POTABLE WATER SUPPLY NOTES | DATE: JAN. 2022 DWG. NO. 122-3 | SCALE: N.T.S.

200-1 — SERVICE LATERALS

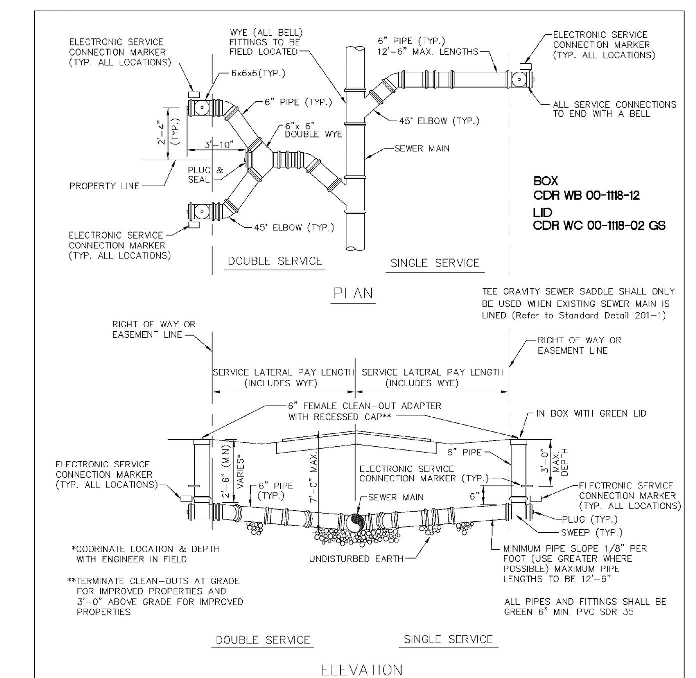


SERVICE LATERALS WITH RISERS

ENGINEERING STANDARDS 2022

REVISIONS BY DATE T.W. 11–2007 S.S. 01/27/12 S.S. 07/10/12 S.S. 02/05/16 | ENGINEERING DIVISION CITY OF POMPANO BEACH | SERVICE LATERALS | DATE: JUNE 2022 DWG. NO. 200-1 | SCALE: N.T.S.

200-2 — SERVICE LATERALS



SHALLOW SERVICE LATERALS

ENGINEERING STANDARDS 2022

REVISIONS BY DATE T.W. 11–2007 S.S. 01/27/12 S.S. 07/10/12 S.S. 02/10/16 | ENGINEERING DIVISION CITY OF POMPANO BEACH | SERVICE LATERALS | DATE: JUNE 2022 DWG. NO. 200-2 | SCALE: N.T.S.

202-1 — ADJUSTABLE REPAIR COUPLING

Adjustable Repair Coupling

NOTES

- Synthetic rubber gasket is strong, durable and resilient to ultraviolet rays, ozone, fungus growth and normal sewer gases. More pliable and easier to install in cold weather applications than an Elastomeric PVC gasket.
- Sealing "O" rings under the clamp prevent pipe slippage and create a more positive seal.
- More transition couplings for dissimilar pipe types and sizes are comprised of a one-piece transition gasket, eliminating the use of bushings that are difficult to install and easy to lose on the job site.
- Surgical Grade 316 stainless steel Nut & Bolt clamps are corrosion resistant, providing outstanding protection in severe environments such as marine applications, poorly aerated or moist soils, contaminated ground conditions (particularly industrial fill sites) and where the ground water contains chloride, sulfates or bicarbonates. Increased band tension of the Nut & Bolt clamp ensures a leak-proof, root-proof seal that is resistant to both infiltration and exfiltration.
- Series 300 stainless steel shear band is the heaviest in the industry, over 33% thicker than the competition.
- Broadest range of couplings on the market in sizes ranging from 1½" to 96" in diameter. Used for the alteration and rehabilitation of gravity-flow sewage pipes made of clay, cast iron, plastic, concrete, ductile iron, asbestos cement, fiber cement and truss pipe.

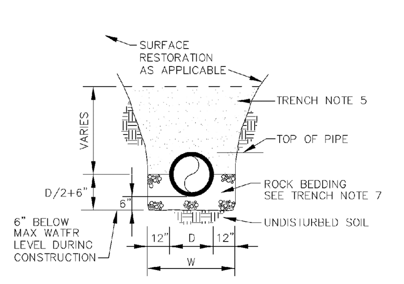
Specification:
Furnish and install stainless steel shielded sewer couplings, as manufactured by Mission Rubber Company. Coupling to meet ASTM C 1173. Gasket to meet ASTM C 425 Table 2, to be rubber and be environmentally certified. Series 300 stainless steel shear band with a minimum thickness of .012", surgical grade 316 stainless steel clamps with nut & bolt take up, shear ring and clamps to meet all requirements of ASTM A 240. All stainless steel parts and clamping mechanisms to be **manufactured in the U.S.A.** Transitional sizes to utilize a one piece gasket.

ADJUSTABLE REPAIR COUPLING PVC/CLAY NOTES

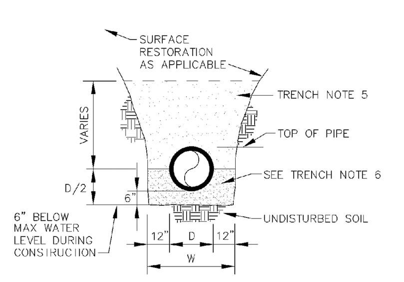
ENGINEERING STANDARDS 2022

REVISIONS BY DATE | ENGINEERING DIVISION CITY OF POMPANO BEACH | ADJUSTABLE REPAIR COUPLING | DATE: MAY 2022 DWG. NO. 202-1 | SCALE: N.T.S.

203-1 — TRENCH BACKFILL / BEDDING



TRENCH BACKFILL / BEDDING CLASS " B "

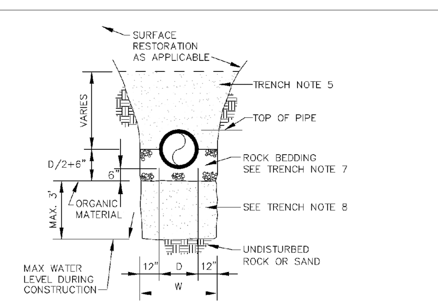


TRENCH BACKFILL / BEDDING CLASS " A "

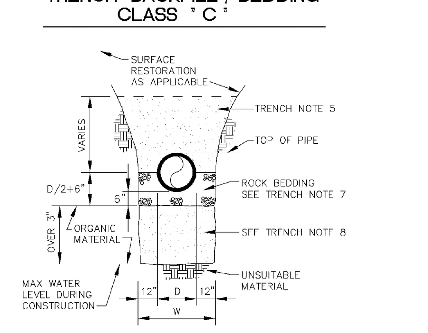
ENGINEERING STANDARDS 2022

REVISIONS BY DATE S.S. JUNE 2005 | ENGINEERING DIVISION CITY OF POMPANO BEACH | TRENCH BACKFILL / BEDDING | DATE: JUNE 2022 DWG. NO. 203-1 | SCALE: N.T.S.

203-2 — TRENCH BACKFILL / BEDDING



TRENCH BACKFILL / BEDDING CLASS " C "



TRENCH BACKFILL / BEDDING CLASS " D "

ENGINEERING STANDARDS 2022

REVISIONS BY DATE S.S. JUNE 2005 | ENGINEERING DIVISION CITY OF POMPANO BEACH | TRENCH BACKFILL / BEDDING | DATE: JUNE 2022 DWG. NO. 203-2 | SCALE: N.T.S.

203-3 — TRENCH BACKFILL / BEDDING

1. OUTLINE OF TRENCH EXCAVATION IS FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL TRENCH WIDTH AND SHAPE WILL VARY WITH SOIL CONDITIONS. TRENCH EXCAVATION SHALL BE IN ACCORDANCE WITH THE "FLORIDA TRENCH SAFETY ACT" AND OSHA TRENCH SAFETY STANDARDS.
2. TYPICAL TRENCH BACKFILL/BEDDING FOR WATER MAIN AND FORCE MAIN INSTALLATIONS SHALL BE CLASS "A" AS SHOWN IN DETAIL.
3. TYPICAL TRENCH BACKFILL/BEDDING FOR GRAVITY SEWER INSTALLATION SHALL BE CLASS "B" AS SHOWN IN DETAIL.
4. TRENCH BACKFILL/BEDDING CLASS "C" AND CLASS "D" SHALL BE USED FOR PIPE INSTALLATIONS WHERE UNSITABLE TRENCH MATERIALS ARE ENCOUNTERED.
5. TRENCH ZONE BACKFILL SHALL BE MATERIAL TYPE 1 OR TYPES A THRU H, OR ANY MIXTURE THEREOF, WHERE SURFACE RESTORATION TYPE "1" IS APPLICABLE, TRENCH ZONE BACKFILL SHALL BE PLACED IN 12" LIFTS, COMPACTED TO 90% OF THE MATERIAL'S MAXIMUM DENSITY AS DETERMINED BY ASTM D–697 (AASHTO T–99). WHERE SURFACE RESTORATION TYPES "2", "3" AND "4" ARE APPLICABLE, TRENCH BACKFILL SHALL BE PLACED IN 8" LIFTS COMPACTED TO 98% OF THE MATERIAL'S DENSITY AS DETERMINED BY ASTM D–698 (AASHTO T–99).
6. BEDDING MATERIAL FOR TYPICAL WATER MAIN AND FORCE MAIN INSTALLATION SHALL BE TYPE C. BEDDING SHALL BE COMPACTED TO 95% OF THE MATERIAL'S MAXIMUM DENSITY AS DETERMINED BY ASTM D–1557 (AASHTO T–180).
7. BEDDING MATERIAL FOR TYPICAL GRAVITY SEWER INSTALLATION AND ANY INSTALLATION WHERE UNSUITABLE TRENCH BOTTOM CONDITIONS ARE FOUND SHALL BE TYPE E. BEDDING SHALL BE PLACED IN LIFTS NOT TO EXCEED 6" AND COMPACTED TO 95% OF THE MATERIAL'S MAXIMUM DENSITY AS DETERMINED BY ASTM D–1557 (AASHTO T–180).
8. UNSUITABLE MATERIAL SHALL BE REMOVED TO UNDISTURBED ROCK OR SAND OR TO DEPTH AS SPECIFIED BY ENGINEER. BACKFILL MATERIAL SHALL BE TYPE C. BACKFILL SHALL BE PLACED IN 8" LIFTS COMPACTED TO 95% OF THE MATERIAL'S MAXIMUM DENSITY AS DETERMINED BY ASTM D–1557 AASHTO T–180).

TRENCH BACKFILL / BEDDING NOTES

ENGINEERING STANDARDS 2022

REVISIONS BY DATE | ENGINEERING DIVISION CITY OF POMPANO BEACH | TRENCH BACKFILL / BEDDING | DATE: JUNE 2022 DWG. NO. 203-3 | SCALE: N.T.S.

203-4 — TRENCH BACKFILL / BEDDING

9. BEDDING TYPES – THE FOLLOWING TYPES OF SUITABLE MATERIALS ARE DESIGNATED AND DEFINED AS FOLLOWING:

   TYPE A: CRUSHED LIMEROCK OR SAND WITH 100 PERCENT PASSING A 1 INCH SIEVE AND A SAND EQUIVALENT VALUE NOT LESS THAN 50.
   TYPE B: CRUSHED LIMEROCK OR SAND WITH 100 PERCENT PASSING A 1/2 INCH SIEVE AND A SAND EQUIVALENT VALUE NOT LESS THAN 50.
   TYPE C: SAND WITH 100 PERCENT PASSING A 3/8 INCH SIEVE, AT LEAST 90 PERCENT PASSING A NUMBER 4 SIEVE, AND A SAND EQUIVALENT VALUE NOT LESS THAN 30.
   TYPE D: CRUSHED LIMEROCK WITH 100 PERCENT PASSING A 1 INCH SIEVE AND NOT MORE THAN 10 PERCENT A NUMBER 4 SIEVE.
   TYPE E: CRUSHED LIMEROCK OR SAND WITH 100 PERCENT PASSING A 3/4 INCH SIEVE AND NOT MORE THAN 10 PERCENT PASSING A NUMBER 4 SIEVE.
   TYPE F: CRUSHED LIMEROCK MEETING THE FOLLOWING GRADATION REQUIREMENTS.

SIEVE SIZE	PERCENTAGE PASSING
2 INCH	100
1–1/2 INCH	90–100
1 INCH	20–55
3/4 INCH	0–15
NO. 200	0–3

TRENCH BACKFILL / BEDDING NOTES

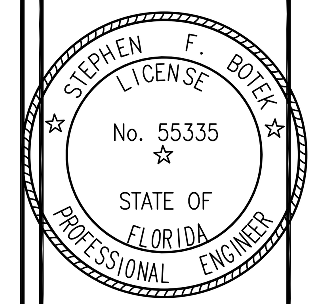
ENGINEERING STANDARDS 2022

REVISIONS BY DATE | ENGINEERING DIVISION CITY OF POMPANO BEACH | TRENCH BACKFILL / BEDDING | DATE: JUNE 2022 DWG. NO. 203-4 | SCALE: N.T.S.

Title Block

BTE REF DATE: 2-21-2024

#	DATE	REVISIONS



February 27, 2024

THIS DOCUMENT HAS BEEN DIGITALLY SIGNED AND SEALED BY STEPHEN F. BOTEK, P.E. ON THE DATE ADJACENT TO THE SEAL.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

2006 2021 Celebrating 15 Years

WATER AND SANITARY SEWER DETAILS

POMPANO HOTEL
101 SOUTH OCEAN BOULEVARD
POMPANO BEACH, FL

Botek Thurlow Engineering, Inc.
3409 NW 9th Avenue, Suite 1102, Ft. Lauderdale, FL 33309
www.botekthurlow-eng.com p: 954-568-0888 f: 954-568-0757

BTE PROJECT #: 23-0701

PROJECT DATE: 09-05-2023

SHEET #: C-4