

BROWARD COUNTY PUBLIC WORKS DEPARTMENT	STREET & WATERWORKS DIVISION 1000 WEST GARDEN BLVD SUITE 200 WEST PALM BEACH WEST PALM BEACH, FL 33411 PHONE NO. 561-835-6501 FAX NO. 561-835-6502	<div style="text-align: center; font-size: 2em; font-weight: bold; margin-bottom: 10px;">811</div> <div style="text-align: center; font-size: 1.5em; font-weight: bold; margin-bottom: 10px;">Know what's below. Call before you dig.</div> <div style="text-align: center; font-size: 0.8em;"> <p>1. PRIOR TO BEGINNING ANY WORK, CONSTRUCTION SHALL CONTACT ALL UTILITY COMPANIES THAT HAVE FACILITIES WITHIN THE PROJECT AREA.</p> <p>2. THE ABOVE NOTICE SHALL APPEAR ON THE COVER SHEET OF ALL CONSTRUCTION PLANS SUBMITTED TO THE COUNTY.</p> </div>
REPLACES FORMER DWG NO. 101 REVISED 5/14/2018	<div style="font-size: 1.5em; font-weight: bold; margin-bottom: 10px;">UTILITY LOCATES</div> <div style="font-size: 2em; font-weight: bold; margin-bottom: 10px;">FIGURE</div> <div style="font-size: 3em; font-weight: bold;">101</div>	

BROWARD COUNTY
PUBLIC WORKS DEPARTMENT

STANDARD TRENCH BACKFILL
2003 WITH CURRENT BOARD
REVISIONS
PAGE NO. PER E&S 0045
DATE: 04/01/2008

STANDARD TRENCH

The diagram illustrates a cross-section of a trench. At the top, a horizontal line represents the 'BOTTOM OF ROADWAY BASE COURSE (LIMESTOCK) OR EXISTING GROUND'. Below this, a 'PIPE (6" O.D. PLUS 2" MINIMUM TRENCH WIDTH MINIMUM)' is shown. The trench walls are labeled 'VERTICAL'. The backfill material is shown in two layers: a top layer of 'ROUTABLE BACKFILL PLACED AND COMPACTED TO AT LEAST 100% OF MAXIMUM DENSITY, 4" MAXIMUM SIZE, 6" LIFTS, PER AASHTO SPEC. NO. 7' and a bottom layer of 'SELECT BACKFILL PLACED AND COMPACTED TO AT LEAST 100% OF MAXIMUM DENSITY PER AASHTO T-99C IN LAYERS NOT TO EXCEED 4" THICKNESS WITH 2" MAXIMUM PARTICLE SIZE'. To the right of the trench, a note says 'REFER TO PAVEMENT RESTORATION DETAILS'. Below the trench, a hatched area represents 'BEDDING MATERIAL, SEE NOTE NO. 1', and below that, another hatched area represents 'FOUNDATION REQUIRED IN UNSTABLE SOILS, SEE NOTE NO. 3'.

NOTES:

1. UNLESS OTHERWISE SPECIFIED, BEDDING MATERIAL SHALL CONSIST OF SELECT BACKFILL MATERIAL, 2" MAXIMUM PARTICLE SIZE, COMPACTED TO AT LEAST 100% OF MAX. DENSITY, 6" LIFTS, PER AASHTO SPEC. NO. 7, IN ACCORDANCE WITH SPEC. REQUIREMENTS.
2. WHERE REQUIRED, SHEETING AND SHORING SHALL BE IN ACCORDANCE WITH SPEC. REQUIREMENTS.
3. WHERE UNSTABLE SOILS ARE ENCOUNTERED, INCLUDING PEAT, MUCK OR OTHER ORGANIC SOILS, EASST, SILT AND CLAYS, A FOUNDATION IS REQUIRED AS DETERMINED BY THE ENGINEER OF RECORD.

REPLACES FORM
DWG NO. 180
REVISED
5/14/2018

TYPICAL TRENCH BACKFILL

FIGURE
180

BROWARD COUNTY
PUBLIC WORKS DEPARTMENT

THIS IS A STANDARDIZED SPECIFICATION
FOR THE CONSTRUCTION OF
ROADWAY CUTS AND EXCAVATIONS
FOR THE PURPOSE OF
INSTALLING PERPENDICULAR UTILITY
STRUCTURES

STANDARD DETAIL

The diagram illustrates a cross-section of a roadway cut and replacement base. At the top, a dimension line indicates the 'DITCH WIDTH (MIN 4' SURFACE REPLACEMENT)' with a width of 4'. Below this, the 'ASPHALT' layer is shown with a thickness of 4'. The 'STRUCTURAL COURSE' is indicated by a dashed line. The 'SAW CUT EXISTING ASPHALT (TYP)' is shown on the right side. The 'EXISTING ASPHALT (THICKNESS VARIES) TYP' is shown on the left side. The 'REPLACEMENT BASE (NEW MATERIAL)' is shown in the center, with a width of 1.5' on each side of the ditch. The 'DITCH (W)' is shown in the center, with a width of 12'. The 'DITCH VARIES' is indicated at the bottom. The 'DIAMETER VARIES' is indicated at the bottom. The 'REPLACEMENT BASE (NEW MATERIAL)' is shown with a width of 1.5' on each side of the ditch. The 'DITCH (W)' is shown in the center, with a width of 12'. The 'DITCH VARIES' is indicated at the bottom. The 'DIAMETER VARIES' is indicated at the bottom.

NOTES:

1. BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL.
2. BASE MATERIAL SHALL BE PLACED IN 6" MAXIMUM LAYERS (LOOSE MEASUREMENT) AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 90% OF MAXIMUM DENSITY, PER MASTO'S 1.00.
3. ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAW CUT.
4. ASPHALT SURFACE SHALL HAVE A COMPACTNESS WITH THE SURROUNDING SURFACE MATERIAL.
5. BASE MATERIAL SHALL HAVE A MINIMUM COMPACTION OF 70%.
6. SUB GRADE MATERIAL SHALL BE GRANULAR AND ANGULAR AND SHALL HAVE A MINIMUM LL OF 40.
7. IF THE DITCH IS FILLED THOROUGHLY, IT SHALL BE COVERED WITH A 2" THICK ASPHALT CONCRETE PATCH TO KEEP THE FULL MATERIAL FROM RAVELLING, UNTIL REPLACED WITH A PERMANENT PATCH.
8. FOR EXTER ROADWAYS REFER TO SPECIFICATIONS AND REQUIREMENTS.

T = EXISTING LOWEST BASE THICKNESS.

REPLACES FORMER
DWG NO. 190

REVISED
5/14/2018

RESTORATION OF ROADWAY CUT
FOR
PERPENDICULAR UTILITY INSTALLATION

FIGURE
183

GENERAL NOTES

- VALUES IN TABLE ARE BASED ON 3" OF COVER, 100 PSI INTERNAL PRESSURE, 100°F DESIGN, 100 PSI MAXIMUM WATER OIL, AND/ANNA (D25, & C150)/A151 5 LAYER COUPLER, 3" ASTM A284/420, 100 PSI 500 TYPE A151 AND SAFETY FACTOR OF 1.5. RESTRAINED LENGTHS WERE COMPUTED PER DIPRA THRU-PUT RESTRAINT DESIGN FOR DUCTILE IRON PIPE AND TWO PIPE THRUST RESTRAINT DESIGN: HANDBOOK, EBAN IRON, INC.
- CONFIRM THE EXACT LENGTH OF RESTRAINT REQUIRED FOR REDUCERS, PIPE ENLARGED IN A TEE, WYE AND INDOORING RESTRAINED LENGTHS WITH THE DESIGN FIRM.
- THE CONTRACTOR IS RESPONSIBLE FOR PROPER INSTALLATION OF THE RESTRAINED UNITS TO PREVENT VOIDING OF THE PIPE & FITTINGS.
- IN THE EVENT OF A COLLAPSE RESTRAINED LENGTHS SHOWN ON THE TABLE ARE RESTRAINED LENGTHS SHOWN ON THE DRAWINGS, THE LONGEST RESTRAINED LENGTH SHALL BE USED.

REVISIONS		ENGINEERING STANDARDS 2022	
BY	DATE	ENGINEERING DIVISION CITY OF POMFANO BEACH	RESTRAINED JOINT INFORMATION
SCALE: N.T.S.		DATE: MAY 2025	116-1

PVC HORIZONTAL BENDS AND VERTICAL U ⁹⁰ BENDS					
RESTRAINED JOINT LENGTH - L		BENDS		MINIMUM DISTANCE IN FEET FROM FITTING - (EAGL REQS)	
PIPE SIZE (IN.)	90°	45°	22.5°	11.25°	ONDS WITH 20° MIN. BENDS
6	26	11	6	3	23
8	33	14	7	4	30
12	46	19	10	5	35

PVC VERTICAL DOWN BEND					
RESTRAINED JOINT LENGTH - L		BENDS		MINIMUM DISTANCE IN FEET FROM FITTING - (EAGL REQS)	
PIPE SIZE (IN.)	90°	45°	22.5°	11.25°	ONDS WITH 20° MIN. BENDS
6	26	11	6	3	23
8	33	14	7	4	30
12	46	19	10	5	35

DIP HORIZONTAL BENDS AND VERTICAL U ⁹⁰ BENDS					
RESTRAINED JOINT LENGTH - L		BENDS		MINIMUM DISTANCE IN FEET FROM FITTING - (EAGL REQS)	
PIPE SIZE (IN.)	90°	45°	22.5°	11.25°	ONDS WITH 20° MIN. BENDS
6	26	11	6	3	23
8	33	14	7	4	30
12	46	19	10	5	35

DIP VERTICAL DOWN BEND					
RESTRAINED JOINT LENGTH - L		BENDS		MINIMUM DISTANCE IN FEET FROM FITTING - (EAGL REQS)	
PIPE SIZE (IN.)	90°	45°	22.5°	11.25°	ONDS WITH 20° MIN. BENDS
6	26	11	6	3	23
8	33	14	7	4	30
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6	26	11	6	3	23
8	33	14	7	4	30
12	46	19	10	5	35

DIP VERTICAL DOWN BEND					
RESTRAINED JOINT LENGTH - L		BENDS		MINIMUM DISTANCE IN FEET FROM FITTING - (EAGL REQS)	
PIPE SIZE (IN.)	90°	45°	22.5°	11.25°	ONDS WITH 20° MIN. BENDS
6	26	11	6	3	23
8	33	14	7	4	30
12	46	19	10	5	35

[illegible]

The diagram illustrates a cross-section of a utility pipe installed in the ground. The ground surface is indicated by a horizontal line with diagonal hatching on either side. The pipe is shown as a horizontal cylinder. Key features and dimensions are labeled:

- GROUND LEVEL:** Indicated by an arrow pointing to the top surface of the ground.
- SEE NOTE (2):** A callout pointing to the ground surface.
- MARKING BALLS:** Two small circles on the ground surface, one on each side of the pipe.
- 4" MIN:** Dimension indicating the minimum distance from the pipe to the marking balls.
- 24" (6") MIN:** Dimension indicating the minimum distance from the pipe to the marking balls, with a note "SEE NOTE (2)".
- 40° MAX:** Dimension indicating the maximum angle of the marking balls relative to the vertical.
- 30% MIN:** Dimension indicating the minimum slope of the ground surface.
- TYPICAL UTILITY PIPE:** Label for the pipe itself.

GENERAL NOTES:

- ALL UTILITY PIPE SHALL BE INSTALLED WITH 4" MIN MARKING BALLS PLACED EVERY 40° AND AT EVERY FITTING. FOR IDENTIFICATION AND MARKING PURPOSES, BURIED ABOVE THE PIPE AT A MAXIMUM DEPTH OF 24 INCHES OR AS APPROVED BY THE OWNER. IT SHALL BE COLOR CODED AND WORKED AS FOLLOWS:
 - POTABLE WATER
 - A. COLOR: BLUE PER 62-555.302(21)(a)(i) C.F.R.
 - B. LETTERING: WATER
 - C. FREQUENCY OF MARKER BALLS SHALL BE 14.3° KNOT
 - 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 OF 28 LOCALITY STREET 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

ENGINEERING STANDARDS 2022	
<div> <div> <div>REVISIONS</div> <div> <div>BY</div> <div>DA</div> </div> <div> <div>DATE</div> <div>05/17/22</div> </div> </div> <div> <div> <div>U.S.S.</div> <div>06/16</div> </div> </div> </div> <div> <div>ENGINEERING DIVISION</div> <div>CITY OF POMPAPO BEACH</div> </div> <div> <div>WATER PIPE IDENTIFICATION</div> <div>DATE: 06/16/2022</div> <div>119-1</div> </div>	

POTABLE WATER MAIN

3' (OUTSIDE TO OUTSIDE)

REUSE WATER MAIN OR STORMWATER SEWERS

A MINIMUM HORIZONTAL SEPARATION: 3' (OUTSIDE TO OUTSIDE). SHALL BE MAINTAINED BETWEEN POTABLE WATER MAINS AND EXISTING OR PROPOSED VACUUM-TYPE SANITARY SEWER MAINS AND REGULATED REUSE WATER MAINS.

POTABLE WATER MAIN

3' (OUTSIDE TO OUTSIDE)

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 (C)(3).

POTABLE WATER MAIN

8' (OUTSIDE TO OUTSIDE)

SANITARY OR STORMWATER SEWERS AND WATER MAINS

A MINIMUM HORIZONTAL SEPARATION OF 8' (OUTSIDE TO OUTSIDE). SHALL BE MAINTAINED BETWEEN POTABLE WATER MAINS AND EXISTING OR PROPOSED VACUUM-OR PRESSURE-TYPE SANITARY SEWER, WASTEWATER PIPE MAIN OR NOT REGULATED REUSE WATER MAIN. SEE NOTE (C)(3).

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

SPECIAL UTILITY CROSSING - FITTING TYPE

- * 1" MINIMUM CLEARANCE REQUIRED FOR PRESSURE TYPE SANITARY SEWER, WASTEWATER OR STORMWATER FLOW OR FOR REUSE WATER MAIN CROSSINGS. IF MINIMUM CLEARANCE CANNOT BE OBTAINED, REFER TO "PROTECTION OF POTABLE WATER SUPPLY" FOR WATER MAIN CROSSINGS.
- SEE NOTE ON E-ANNO FOR 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. THE DEFLECTION TYPE CROSSING OF THE ENGINEER SHALL BE THE FITTING TYPE CROSSING BE ALLOWED.
2. CONDUIT/STANDARD CROSSINGS EXCEEDING 36" OR MORE, SHALL HAVE 75% OF MANUFACTURER'S MAXIMUM JOINT DEFLECTION.
3. FOR POTABLE WATER MAINS, REFER TO "PROTECTION OF POTABLE WATER SUPPLY."

UTILITY CROSSINGS

ENGINEERING STANDARDS 2022

REVISIONS	ENGINEERING DIVISION	UTILITY CROSSINGS
BY DATE	CITY OF POMPAU BEACH	DRAWN DATE 2022
E.S. 03/13		

SCALE: N.T.S.

122-1

[illegible]

D NEW OR RELOCATED UNDERGROUND WATER MAINS
SHALL BE LAID TO PROVIDE A UNDERGROUND, RESTRAINED OF
AT LEAST TEN FEET BETWEEN THE OUTSIDE OF THE
WATER MAIN AND ALL ADJACENT EXISTING OR PROPOSED
FACILITIES "ON-SITE SEWAGE TREATMENT AND DISPOSAL
SYSTEMS".

E. VERTICAL SEPARATION

a. NEW OR RELOCATED UNDERGROUND WATER MAINS
UNDERGOING ANY LAYOUT OR ALIGNMENT CHANGE OR
VACUATE-TYPE SANITARY SEWER OR STORM SEWER
SHALL BE LAID SO THAT THE CENTER OF THE WATER MAIN IS
AT LEAST SIX INCHES, AND PREFERABLY IS INCHES,
ABOVE OF AT LEAST SIX INCHES BELOW THE OUTSIDE OF
THE OTHER PIPELINE. HOWEVER, IT IS PREFERABLE TO
BE AT LEAST TWO FEET ABOVE OR BELOW THE OTHER PIPELINE
IF THE WATER MAIN IS TO BE CONNECTED TO THE OTHER
NEW OR RELOCATED UNDERGROUND WATER MAIN
UNDERGOING ANY LAYOUT OR ALIGNMENT CHANGE OR
VACUATE-TYPE SANITARY SEWER OR STORM SEWER.
FORCE MAIN OR PIPELINE CONVEYING SEWER WATER
MAY BE LAID SO THAT THE WATER MAIN IS AT LEAST SIX
INCHES ABOVE, AND PREFERABLY INCHES ABOVE, BELOW THE
OUTSIDE OF THE OTHER PIPELINE. HOWEVER, IT IS
PREFERABLE TO LAID THE WATER MAIN ABOVE THE OTHER
PIPELINE IF AT THE UTILITY DISCREPANCIES DESCRIBED IN PARAGRAPHS
A AND B OR ABOVE THE OTHER PIPELINE IF THE WATER MAIN
PIPE CAN BE COVERED ABOVE OR BELOW THE OTHER
PIPELINE TO SUCH DEGREE AS TO BE THE CLOSEST AS
POSSIBLE FROM THE OTHER PIPELINE. ALTERNATIVELY,
IF SUCH CROSSING, THE WATER MAIN SHALL BE LAID
SO THAT THE WATER MAIN JOINTS ARE AT LEAST THREE FEET
FROM THE JOINTS IN THE OTHER PIPELINE. THE OTHER
PIPELINE MAY BE SANITARY SEWER, STORM WATER FORCE MAIN, OR
PIPELINES CONVEYING SEWER OR POTABLE WATER.
THESE REQUIREMENTS SHALL NOT APPLY TO THE OTHER
PIPELINE IF IT IS LAID AT LEAST TEN FEET FROM ALL JOINTS IN GRAVITY-OR PRESSURE-
TYPE SANITARY SEWER OR STORM SEWER OR FORCE MAIN OR
PIPELINES CONVEYING SEWER WATER NOT RELOCATED
UNDER PART II OF CHAPTER 65-05, P.A.


WHERE THE HORIZONTAL CAN BEING LOCATED LESS THAN THE
DESIRED MINIMUM DISTANCE FROM JOINTS IN THE OTHER
PIPELINE OR THE JOINTS IN THE OTHER PIPELINE ARE NOT
FROM ANOTHER PIPELINE, THE OTHER PIPELINE SHALL BE
CONSTRUCTED AND/OR RELOCATED UNDER PART II OF CHAPTER
65-05, P.A. THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY FOR
ADDITIONAL GUIDANCE TO AVOID THE FLUORIDE REMOVAL
DEPARTMENT OF ENVIRONMENTAL PROTECTION REQUIREMENTS
UNDER CHAPTER 65-05, P.A.

PROTECTION OF POTABLE WATER SUPPLY NOTES

ENGINEERING DEPARTMENT 2022

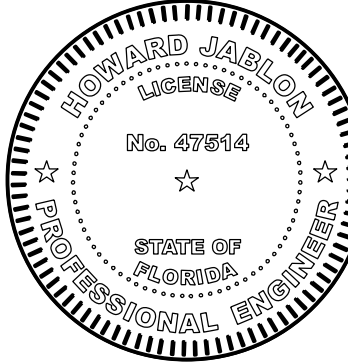
POTABLE WATER SUPPLY NOTES

REVISIONS	ENGINEERING DIVISION	DATE
BY DATE	SCALE	DATE
S.S. 07/17	SCALE: N.T.S.	122-2



Call 811 or www.sunshine811.com two full business days before digging to have utilities located and marked.

Check positive response codes before you dig!



THIS ITEM HAS BEEN ELECTRONICALLY SIGNED AND SEALED BY HOWARD E. JABLON ON THE DATE NOTED ABOVE USING A SHA AUTHENTICATION CODE.

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

[illegible]

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TEL (954) 347-3397
AJHYDRO@BELLSOUTH.NET

PROJECT: C

COASTAL WASTE & RECYCLING 18

TITLE: WATER DISTRIBUTION
SYSTEM STANDARD DETAILS #1

SEAL :	DATE:
DRC	03/15/25
	DRAWING NO.
	25-0300
SHEET NO.	
HOWARD JABLON, PE #475 P225-12000WS	02 OF 5