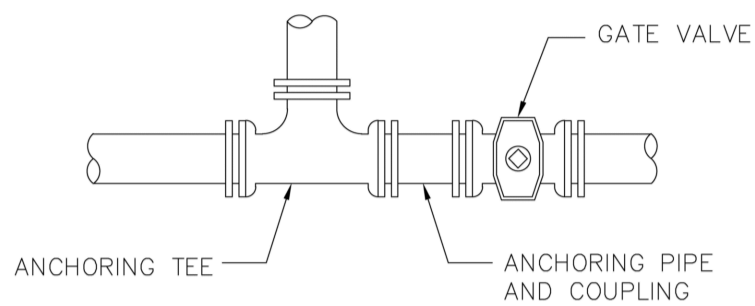


RESTRAINED VALVE AT TEE
(BRANCH)



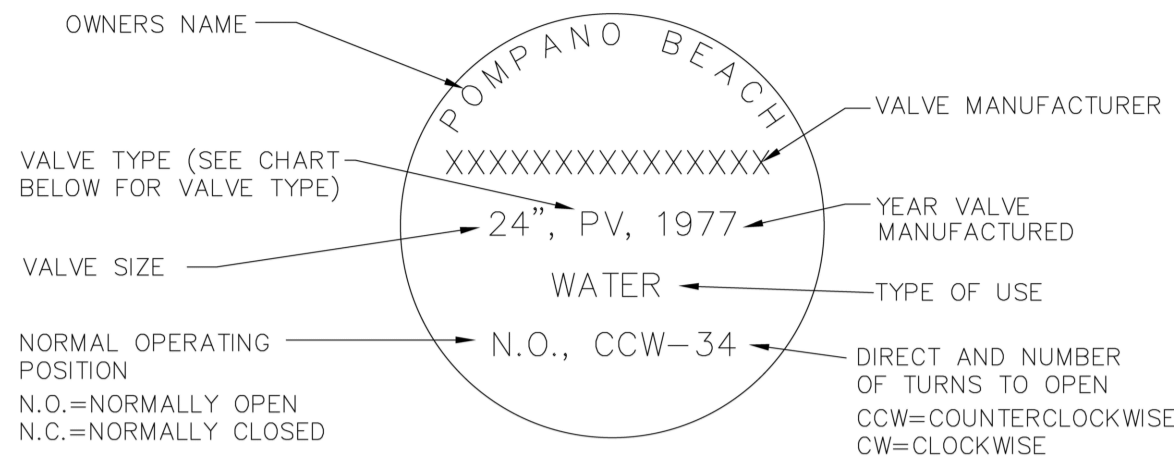
RESTRAINED VALVE AT TEE
(IN LINE)

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



VALVE TYPES

BALL VALVE--BALLY
RESILIENT WEDGE GATE VALVE--RWGV
BUTTERFLY VALVE--BY
PLUG VALVE--PV

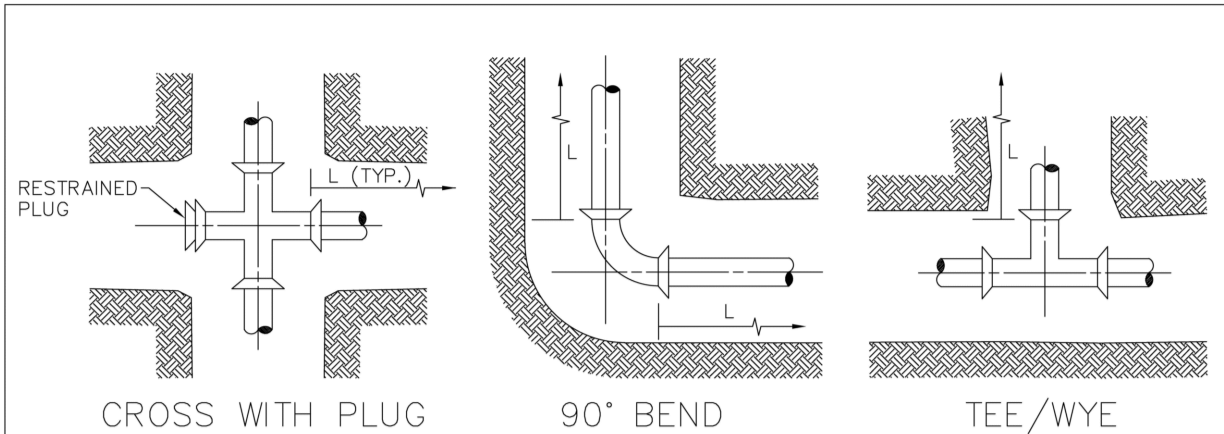
NOTES

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



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 ENCRORACHING 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 | RESTRAINED JOINT INFORMATION |
|----------------|-----------------------|----------------------------------|
| BY DATE | CITY OF POMPANO BEACH | |
| S.S. JUNE 2005 | | DATE: MAY 2022 DWG. NO. 118-1 |
| T.W. 11-2007 | | |
| T.W. 02-2008 | | |
| S.S. 1-24-12 | SCALE: N.T.S. | |

| PIPE SIZE (IN.) | RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING - EACH WAY) | | | | CROSS WITH PLUG DEAD END TEE/WYE |
|-----------------|--|-----|-------|--------|----------------------------------|
| | 90° | 45° | 22.5° | 11.25° | |
| 6 | 26 | 11 | 6 | 3 | 53 |
| 8 | 33 | 14 | 7 | 4 | 68 |
| 12 | 46 | 19 | 10 | 5 | 96 |

| PIPE SIZE (IN.) | RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING - EACH WAY) | | | | CROSS WITH PLUG DEAD END TEE/WYE |
|-----------------|--|-----|-------|--------|----------------------------------|
| | 90° | 45° | 22.5° | 11.25° | |
| 6 | 26 | 11 | 6 | 3 | 53 |
| 8 | 33 | 14 | 7 | 4 | 68 |
| 12 | 46 | 19 | 10 | 5 | 96 |

| PIPE SIZE (IN.) | RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING - EACH WAY) | | | | CROSS WITH PLUG DEAD END TEE/WYE |
|-----------------|--|-----|-------|--------|----------------------------------|
| | 90° | 45° | 22.5° | 11.25° | |
| 6 | 26 | 11 | 6 | 3 | 53 |
| 8 | 33 | 14 | 7 | 4 | 68 |
| 12 | 46 | 19 | 10 | 5 | 96 |

| PIPE SIZE (IN.) | RESTRAINED JOINT LENGTH L (MINIMUM DISTANCE IN FEET FROM FITTING - EACH WAY) | | | | CROSS WITH PLUG DEAD END TEE/WYE |
|-----------------|--|-----|-------|--------|----------------------------------|
| | 90° | 45° | 22.5° | 11.25° | |
| 6 | 26 | 11 | 6 | 3 | 53 |
| 8 | 33 | 14 | 7 | 4 | 68 |
| 12 | 46 | 19 | 10 | 5 | 96 |

RESTRAINED JOINT INFORMATION

ENGINEERING STANDARDS 2022

| REVISIONS | ENGINEERING DIVISION | RESTRAINED JOINT INFORMATION |
|----------------|-----------------------|----------------------------------|
| BY DATE | CITY OF POMPANO BEACH | |
| S.S. JUNE 2005 | | DATE: MAY 2022 DWG. NO. 118-2 |
| T.W. 11-2007 | | |
| T.W. 02-2008 | | |
| S.S. 1-24-12 | SCALE: N.T.S. | |

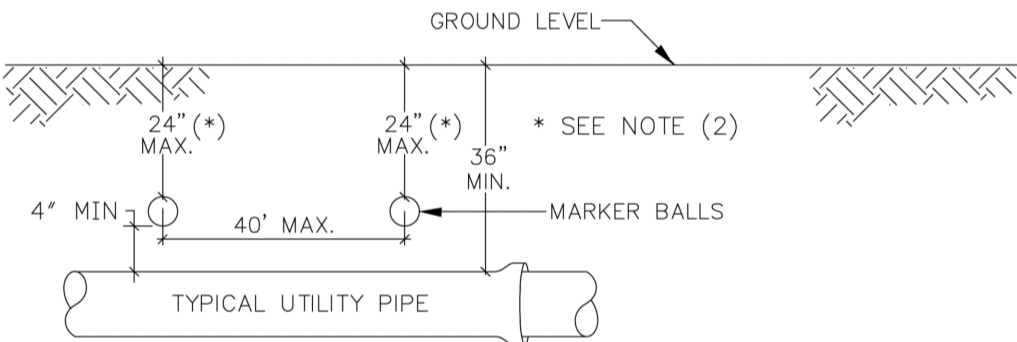
| MIN. LENGTH OF PIPE (FEET) TO BE RESTRAINED | | | | | | | | | | | | | | | | |
|---|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|--|--|--|
| (SOURCES: EBAH IRON PIPE RELEASE/CLAMP PROGRAM FOR PVC PIPE, RELEASE 3.1, AND DIPMA THRUST RESTRAINT FOR DUCTILE IRON PIPE, RELEASE 3.2) | | | | | | | | | | | | | | | | |
| FITTING TYPE | PIPE SIZE | | | | | | | | | | | | 200psi | | | |
| | 4" | 6" | 8" | 10" | 12" | 16" | 20" | 24" | 30" | 36" | 42" | 48" | | | | |
| 90° HORIZ. BEND | 14 | 20 | 25 | 30 | 35 | 45 | 54 | 62 | 86 | 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 | 29 | 41 | 53 | 64 | 74 | 95 | 115 | 134 | 214 | 246 | 276 | 304 | | | | |
| 45° VERT. OFFSET | 12 | 19 | 24 | 29 | 34 | 39 | 48 | 56 | 89 | 102 | 114 | 126 | | | | |
| 22.5° VERT. OFFSET | 6 | 9 | 12 | 14 | 17 | 19 | 23 | 27 | 43 | 49 | 55 | 60 | | | | |
| 11.25° VERT. OFFSET | 1 | 2 | 4 | 4 | 6 | 5 | 6 | 7 | 11 | 13 | 15 | 16 | | | | |
| 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 | 36 | 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 | 208 | 240 | - | | | | |
| REDUCER (LARGER PIPE RESTRAINT) | 42"x Ø | 1 | 1 | 15 | 33 | 49 | 77 | 100 | 122 | 205 | 239 | 278 | | | | |
| | 48"x Ø | 1 | 1 | 7 | 27 | 44 | 73 | 97 | 120 | 205 | 238 | 289 | | | | |
| | 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 | 89 | 90 | 78 | 75 | 45 | - | - | - | - | - | - | | | | |
| | 20"x Ø | 123 | 116 | 107 | 105 | 81 | 45 | - | - | - | - | - | | | | |
| | 24"x Ø | 148 | 140 | 132 | 131 | 111 | 82 | 45 | - | - | - | - | | | | |
| | 30"x Ø | 209 | 204 | 197 | 188 | 177 | 153 | 116 | 75 | - | - | - | | | | |
| 200psi | 36"x Ø | 245 | 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 | - | | | |
| | 60"x Ø | 351 | 346 | 341 | 336 | 330 | 315 | 295 | 271 | 231 | 191 | 141 | - | | | |

- NOTES:
1. THE DATA IN THE ABOVE TABLE ARE BASED UPON THE FOLLOWING INSTALLATION CONDITIONS:
SOIL TYPE--SAND TEST PRESSURE--100 PSI/200 PSI DEPTH OF BURY--3"
BENDON TYPE--LENGTH--SAFETY FACTOR--1.5 MINIMUM PIPE LENGTH--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

| REVISIONS | ENGINEERING DIVISION | RESTRAINED JOINT INFORMATION |
|------------|-----------------------|----------------------------------|
| BY DATE | CITY OF POMPANO BEACH | |
| S.S. 01/12 | | DATE: MAY 2022 DWG. NO. 118-3 |
| S.S. 06/16 | | |
| | SCALE: N.T.S. | |



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.

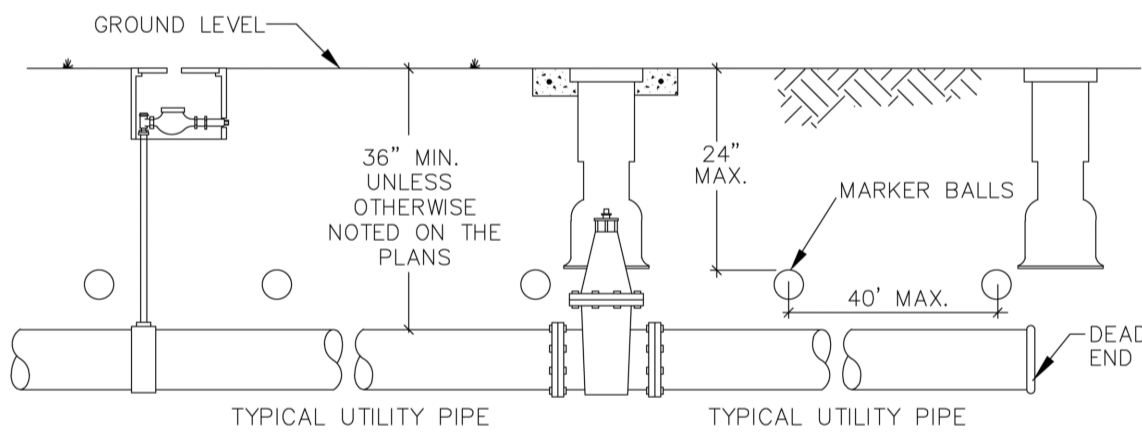
THE MARKER BALLS SHALL BE DETECTABLE BY STANDARD METAL DETECTION EQUIPMENT AND SHALL BE MANUFACTURED BY TEMPO OR 3M LOCATOR SYSTEM OR EQUIVALENT (FREQUENCY 145.7 Khz)

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



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

DRC
BETALUZ
JONES
PZ23-1200064
07/03/2024

A CIVIL ENGINEERING FIRM
EXPEDITING DEVELOPMENT

801 Brickell Avenue
Suite 800
Miami, Florida 33131

PH: 786.284.8828
FAX: 866.312.8730

FLORIDA CERTIFICATE OF AUTHORIZATION # 27431

PROJECT NUMBER: 23106

DRAWN BY: AH DESIGN BY: AH CHECK BY: LAB

ORIGINAL DRAWING DATE: 01/04/2023

REVISIONS:

| | | |
|---|--|--|
| △ | | |
| △ | | |
| △ | | |
| △ | | |
| △ | | |
| △ | | |
| △ | | |
| △ | | |
| △ | | |
| △ | | |
| △ | | |

PROJECT NAME:

**TOWNHOMES
CANAL
DRIVE
POMPANO**

LOCATION:

3233 - 3237 CANAL DRIVE
POMPANO BEACH, FL 33062

FOR:

Mr. SERGE MICHAUD

3018 NE 20TH COURT
FT. LAUDERDALE, FL 33305

PLAN STATUS:

**SUBMITTAL SET:
FOR AGENCY REVIEW
AND APPROVAL**

THIS ITEM HAS BEEN DIGITALLY SIGNED AND
SEALED BY: LUIS A. BETALLELUZ, 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
ELECTRONIC COPIES

DATE:

DEC. 7, 2023

LUIS A. BETALLELUZ, JR., P.E. FL P.E.# 65892
(NOT VALID WITHOUT SIGNATURE AND PROPER SEAL)

SHEET NAME:

CITY DETAILS

SHEET NUMBER:

C 12.0



Call 811 or visit sunshine811.com two full
business days before digging to have
buried facilities located and marked.