



## STANDARD DETAILS

Revised April 2019

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BACKFLOW DETAILS:

- BF-1 STANDARD METER/BACKFLOW ASSEMBLY DETAIL
- BF-2 3" OR LARGER COMPOUND METER  
AND BACKFLOW PREVENTER  
(ONLY WITH BSU PRIOR APPROVAL)
- BF-3 BACKFLOW PREVENTION DEVICE 3/4", 1", 2"  
(NEW INSTALLATIONS BY BSU, EXCEPT  
FOR BACKFLOWS ON FIRE LINES)
- ~~BF-4 PRESSURE VACUUM BREAKER~~
- BF-5 CONTRACTOR'S TEMPORARY HOSE BIBB  
BACKFLOW PREVENTION DEVICE 3/4", 1", 2"  
(INSTALLED BY BUILDER)

**BONITA SPRINGS  
UTILITIES, INC.**

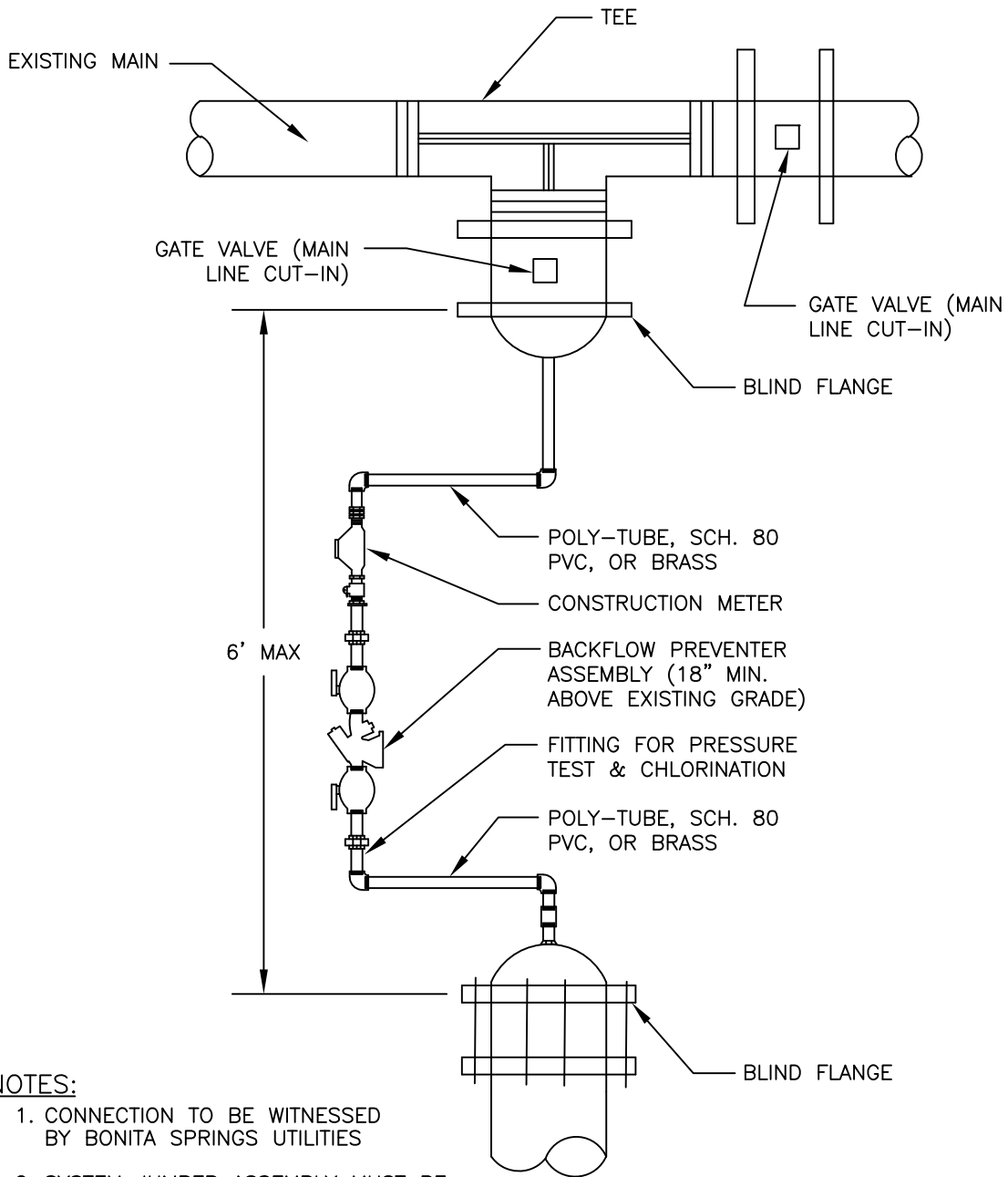
11900 E. TERRY STREET  
BONITA SPRINGS, FLORIDA 34135

SCALE: NOT TO SCALE

DATE: APRIL 2019

DWG #: DSI.DWG

**WATER DETAILS**



**NOTES:**

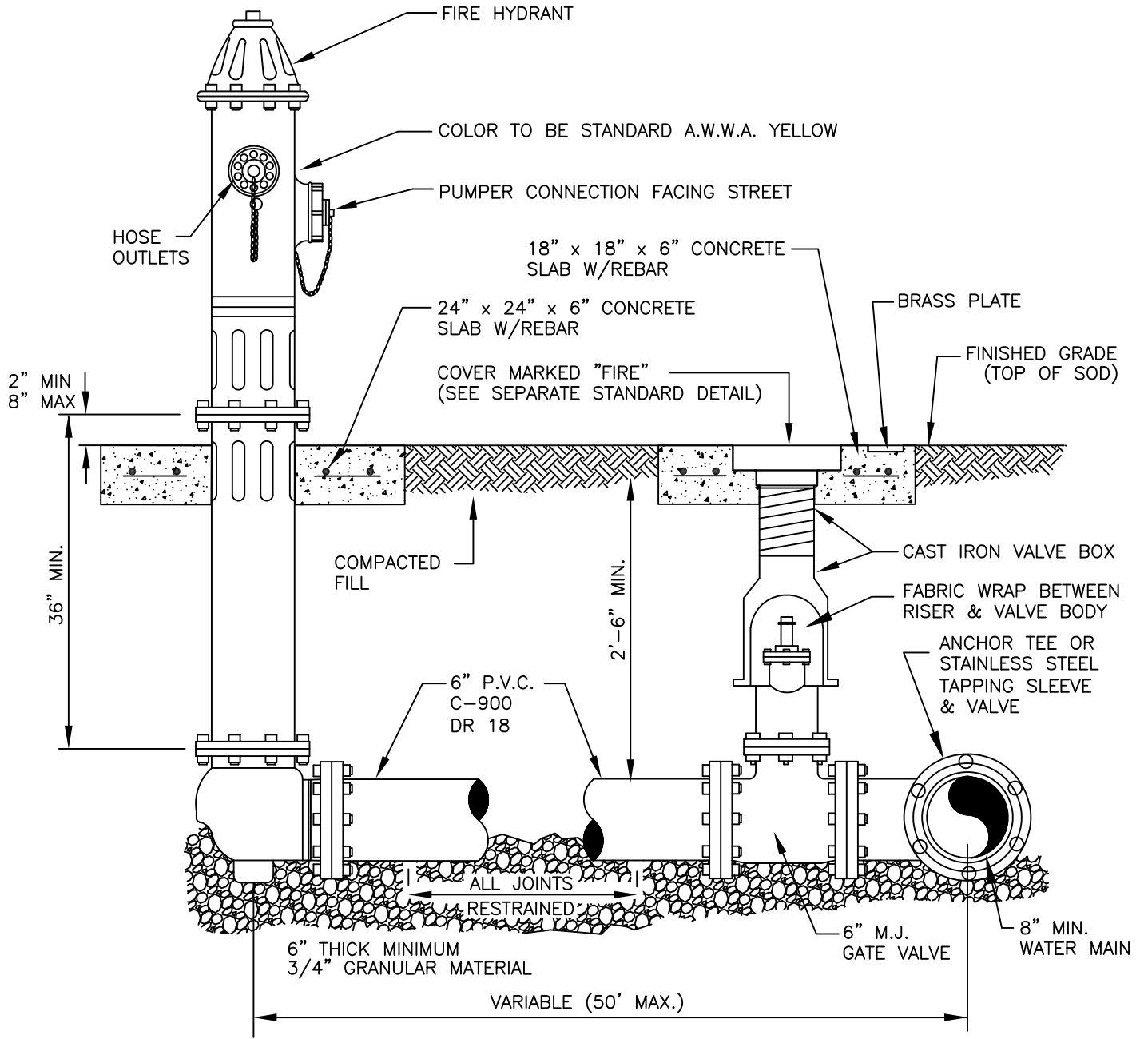
1. CONNECTION TO BE WITNESSED BY BONITA SPRINGS UTILITIES
2. SYSTEM JUMPER ASSEMBLY MUST BE INSTALLED WITHIN 48 HOURS AFTER FULL BORE FLUSH

**CONSTRUCTION JUMPER ASSEMBLY**

W-1

**BONITA SPRINGS UTILITIES, INC.**  
 11900 E. TERRY STREET  
 BONITA SPRINGS, FLORIDA 34135

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DWG #: W-1.DWG



***FIRE HYDRANT ASSEMBLY***  
W-2

**BONITA SPRINGS UTILITIES, INC.**  
 11900 E. TERRY STREET  
 BONITA SPRINGS, FLORIDA 34135

SCALE: NOT TO SCALE  
 DATE: APRIL 2019  
 DWG #: W-2.DWG











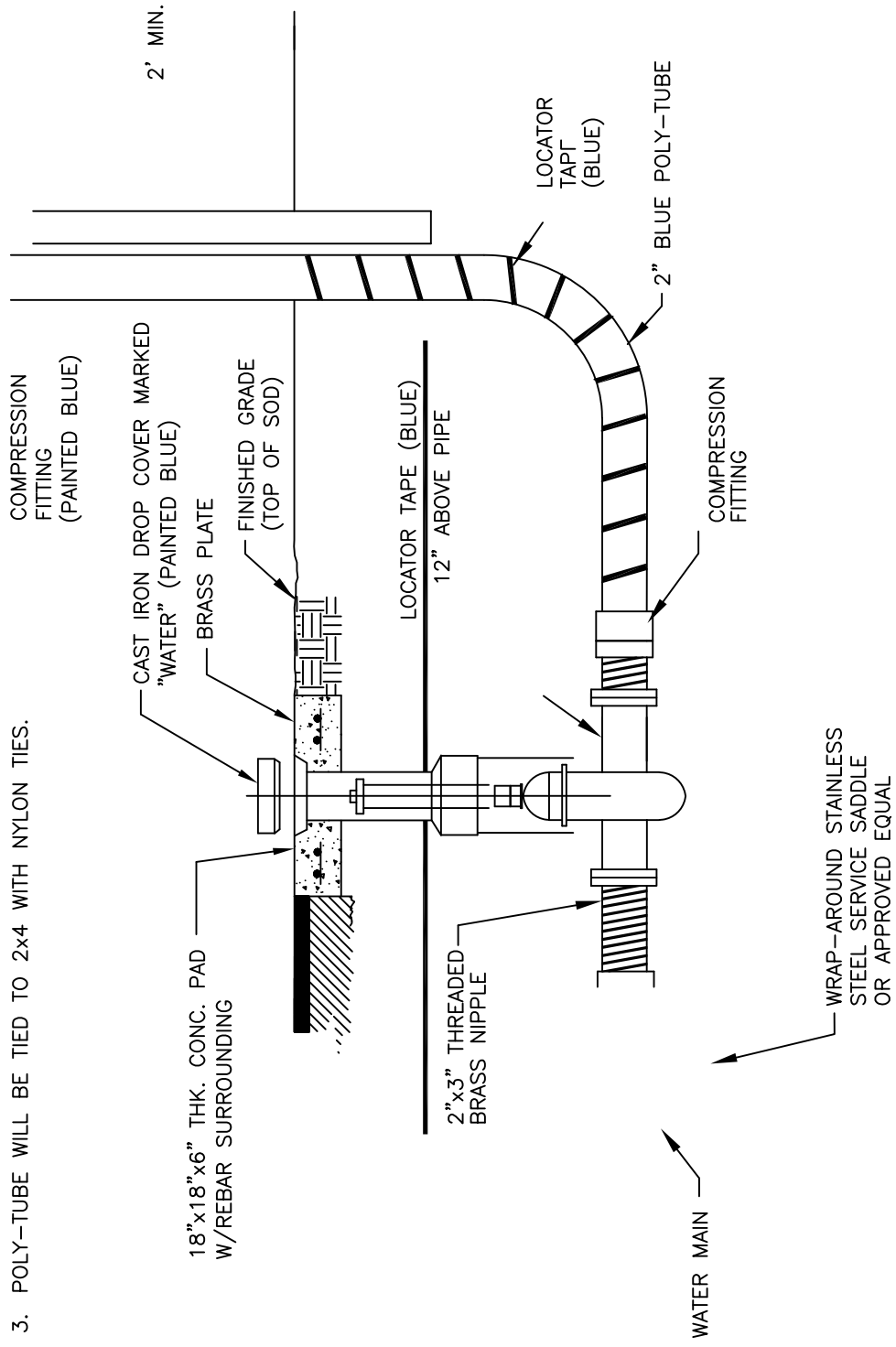


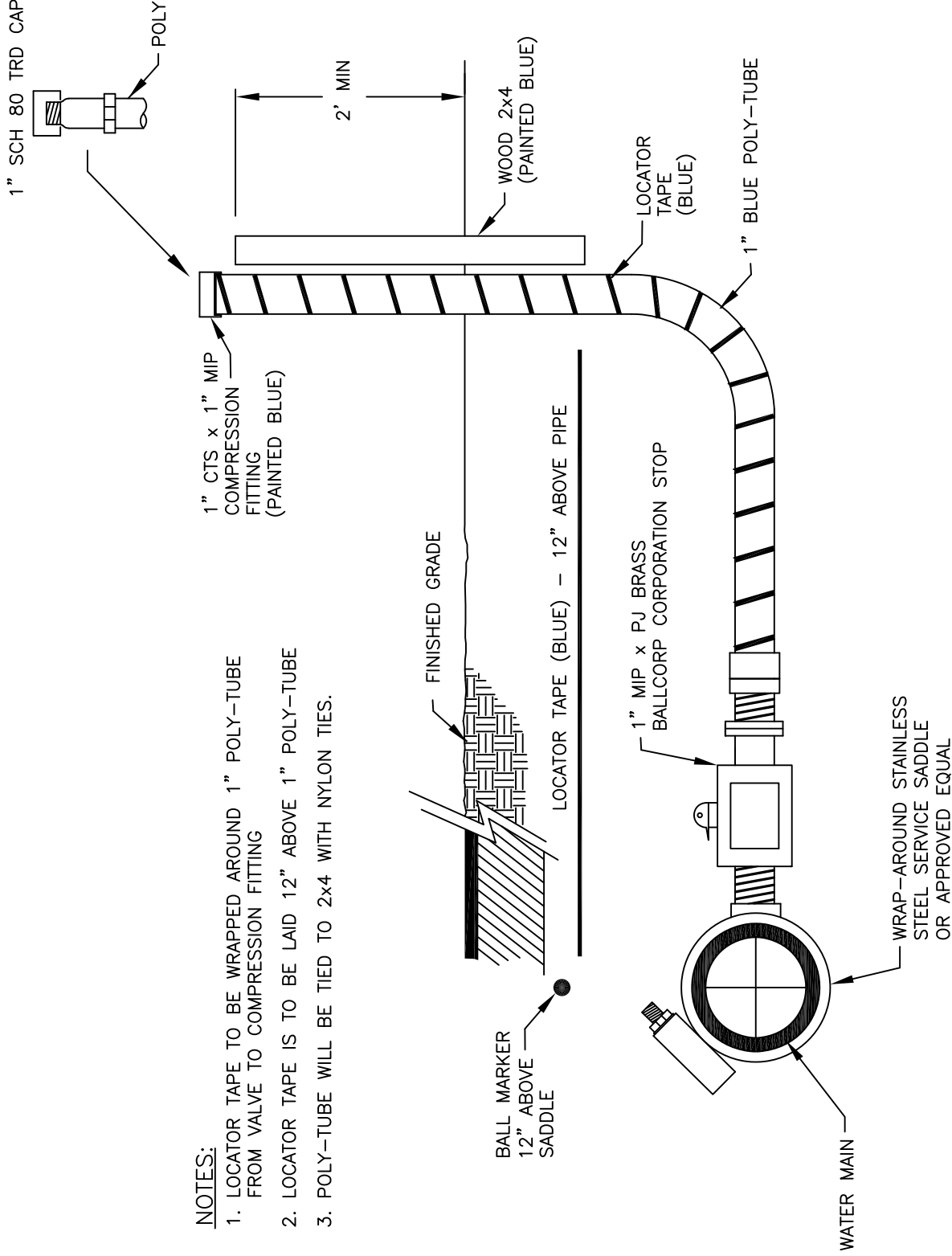




NOTES:

1. LOCATOR TAPE TO BE WRAPPED AROUND 2" POLY-TUBE FROM VALVE TO COMPRESSION FITTING
2. LOCATOR TAPE IS TO BE LAID 12" ABOVE 2" POLY-TUBE
3. POLY-TUBE WILL BE TIED TO 2x4 WITH NYLON TIES.





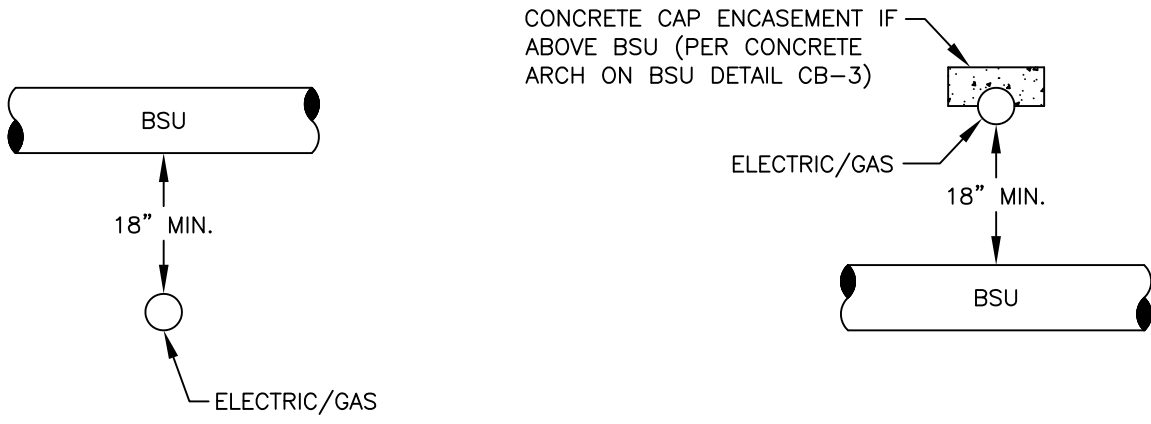
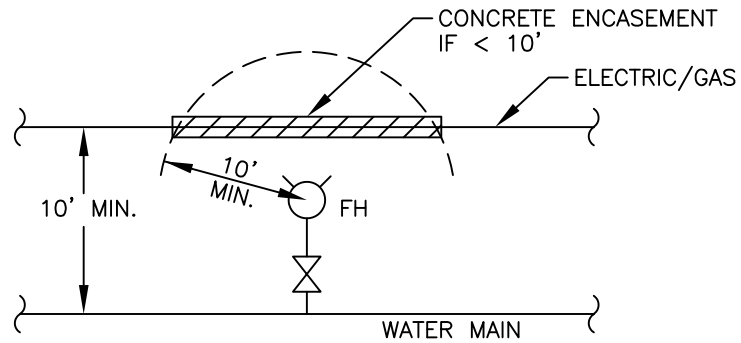
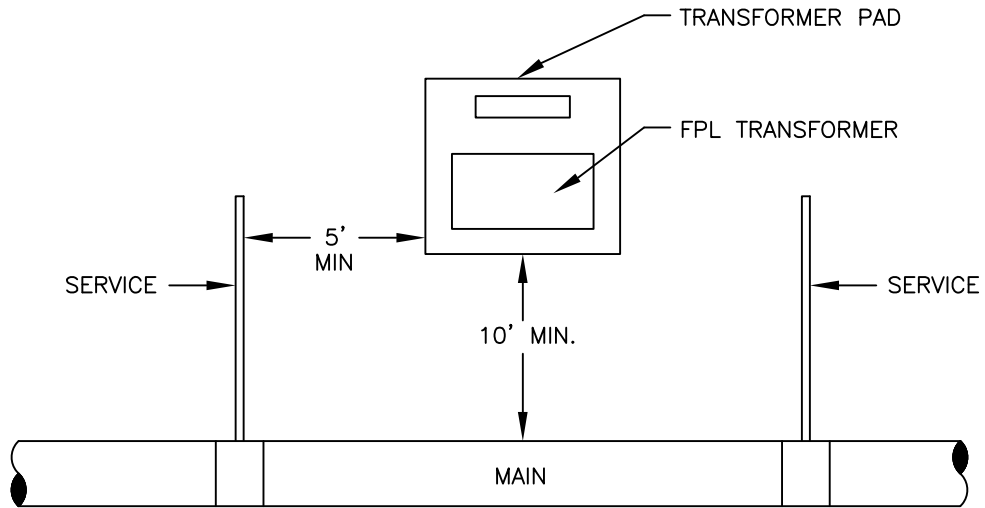
**NOTES:**

1. LOCATOR TAPE TO BE WRAPPED AROUND 1" POLY-TUBE FROM VALVE TO COMPRESSION FITTING
2. LOCATOR TAPE IS TO BE LAID 12" ABOVE 1" POLY-TUBE
3. POLY-TUBE WILL BE TIED TO 2x4 WITH NYLON TIES.

**1" POTABLE WATER SERVICE**  
W-13

**BONITA SPRINGS UTILITIES, INC.**  
11900 E. TERRY STREET  
BONITA SPRINGS, FLORIDA 34135

SCALE: NOT TO SCALE  
DATE: APRIL 2019  
DWG #: W-13.DWG



**ELECTRICAL / GAS CLEARANCE**  
W-15

<b>BONITA SPRINGS UTILITIES, INC.</b> 11900 E. TERRY STREET BONITA SPRINGS, FLORIDA 34135	SCALE: NOT TO SCALE
	DATE: APRIL 2019
	DWG #: W-15.DWG

**COMBINATION WATER/WASTEWATER DETAILS**



## RESTRAINT TABLE

PIPE SIZE	HORIZONTAL BENDS				VERTICAL OFFSETS		DEAD ENDS Lr (FT.)	TEES				REDUCERS (SEE NOTES)				
	90° BENDS Lr (FT.)	45° BENDS Lr (FT.)	22.5° BENDS Lr (FT.)	11.25° BENDS Lr (FT.)	45° BENDS (SEE NOTE 2)			RUN SIZE	BRANCH SIZE	Lrn (FT.)	Lbr (FT.)	SIZE	L(A) (FT.)	L(B) (FT.)		
					Lhs (FT.)	Lls (FT.)										
4"	27	11	5	3	31	8	60	4"	4"	10	11	6 x 4	64	43		
6"	37	15	7	4	43	11	84	6"	6" 4" OR LESS	10 10	34 FITTING ONLY	8 x 6	60	46		
8"	48	20	10	5	57	15	110					8"	8" 6" 4" OR LESS	10 10 10	59 17 FITTING ONLY	8 x 4
10"	57	24	11	6	68	17	131	10"	10" 8" 6" OR LESS	10 10 10	80 45 FITTING ONLY					10 x 8
12"	57	24	11	6	68	19	131					12"	12" 10" 8" 6" OR LESS	10 10 10 10	79 49 15 FITTING ONLY	10 x 6
16"	58	24	12	6	55	19	106	16"	16" 12" 10" 8" OR LESS	10 10 10 10	73 38 16 FITTING ONLY					12 x 10
20"	70	29	14	7	67	23	129					20"	20" 16" 12" 10" OR LESS	10 10 10 10	95 63 24 FITTING ONLY	12 x 8
24"	81	33	16	8	78	27	150	24"	24" 20" 16" 12" 10" OR LESS	10 10 10 10 10	116 87 53 10 FITTING ONLY					16 x 12
														20 x 16	58	45
														20 x 12	139	81
														24 x 20	55	45
														24 x 16	128	82

### NOTES:

- LENGTHS SHOWN ON THIS TABLE ARE TO BE INTERPRETED FOLLOWS :  
 Lhs = RESTRAINED LENGTH FROM HIGH SIDE FITTING OF A VERT. BEND  
 Lls = RESTRAINED LENGTH FROM LOW SIDE FITTING OF VERT. BEND  
 Lr = RESTRAINED LENGTH ON BOTH SIDES FROM FITTING  
 Lrn = MINIMUM LENGTH TO FIRST JOINT OF RUN ON BOTH SIDES  
 Lbr = RESTRAINED LENGTH REQUIRED ON BRANCH FROM FITTING  
 L(A) = LENGTH OF PIPE ON SMALL SIDE FREE OF FITTING  
 L(B) = RESTRAINED LENGTH ON LARGE SIDE OF REDUCER
- A SAFETY FACTOR = 2.5 IS USED FOR VERTICAL OFFSETS TO COMPENSATE FOR SATURATED SOIL CONDITIONS. A SAFETY FACTOR = 2.0 IS USED FOR ALL OTHER CASES.
- L(A) AND L(B) ABOVE ARE TWO OPTIONS FOR PROVIDING THE REQUIRED THRUST RESTRAINT FOR THE FITTING. EITHER L(A) LENGTH OF PIPE FREE OF FITTINGS (BENDS, TEES, REDUCERS OR VALVES) ON THE SMALL SIDE OF THE REDUCER WILL PROVIDE THE REQUIRED RESTRAINT OR L(B) LENGTH CAN BE RESTRAINED ON THE LARGE SIDE OF THE FITTING.
- THE FOLLOWING ARE ASSUMED :  
 4" - 10" PIPE HAS 30" MIN. COVER  
 12" - 24" PIPE HAS 36" MIN. COVER  
 4" - 24" PIPE IS PVC
- VALVES SHALL BE RESTRAINED ON EITHER SIDE OF THE FITTING AS A MINIMUM. IN LINE VALVES SHALL HAVE NO FITTINGS WITHIN THE LENGTHS SHOWN ON THIS TABLE FOR THE SAME SIZE DEAD END. IN CASES WHERE THIS LENGTH CAN NOT BE PROVIDED FREE OF FITTINGS, ADDITIONAL RESTRAINT SHALL BE REQUIRED AS APPROVED BY ENGINEER.
- ALL DEAD END LINES, PERMANENT OR TEMPORARY, SHALL BE RESTRAINED PER THE ABOVE RESTRAINT TABLE.
- ALL VALVES SHALL BE RESTRAINED AS DEAD ENDS, IN BOTH FLOW DIRECTIONS, PER THIS TABLE.

## RESTRAINT TABLE

CB-1

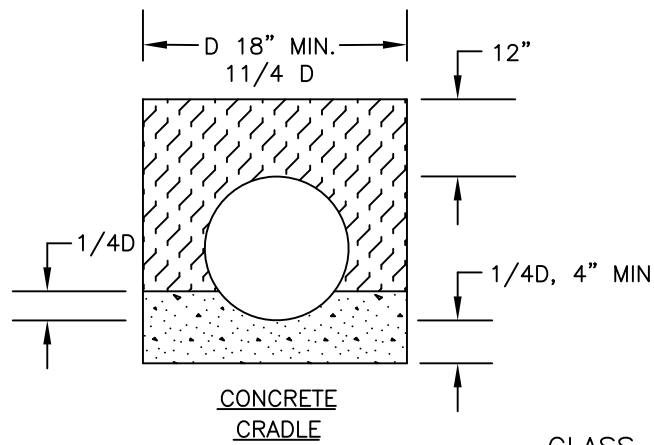
**BONITA SPRINGS  
UTILITIES, INC.**

11900 E. TERRY STREET  
BONITA SPRINGS, FLORIDA 34135

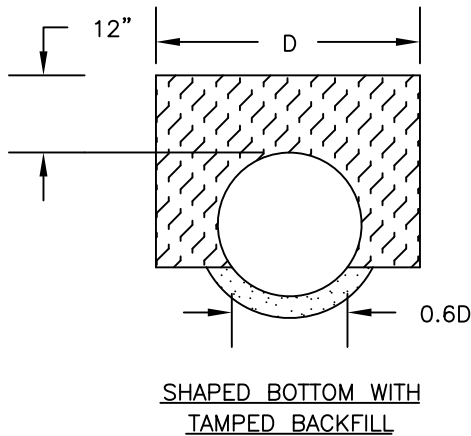
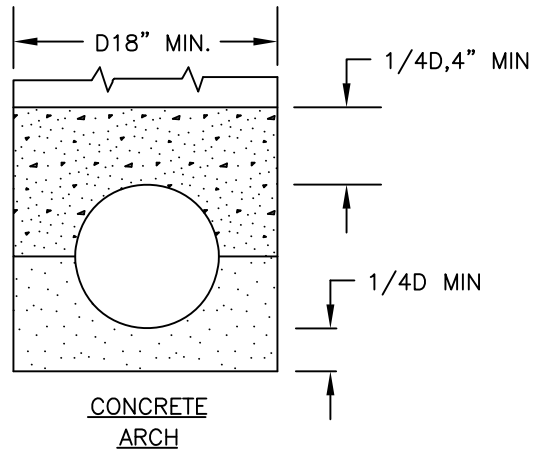
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DATE: APRIL 2019

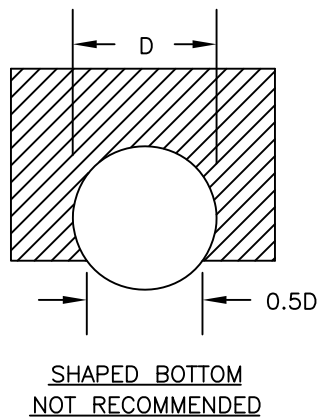
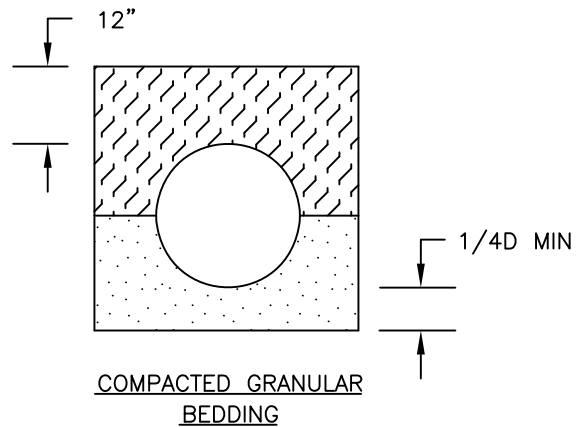
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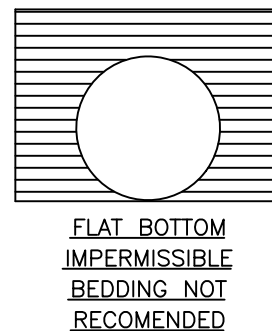
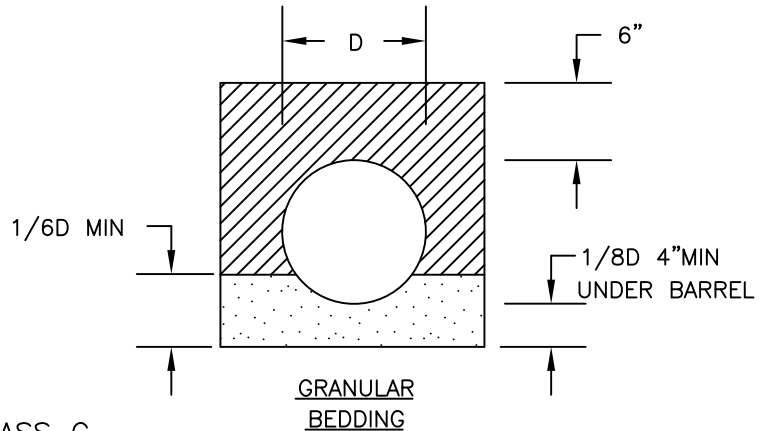
CLASS A



CLASS B









CLASS C



CLASS D

LEGEND

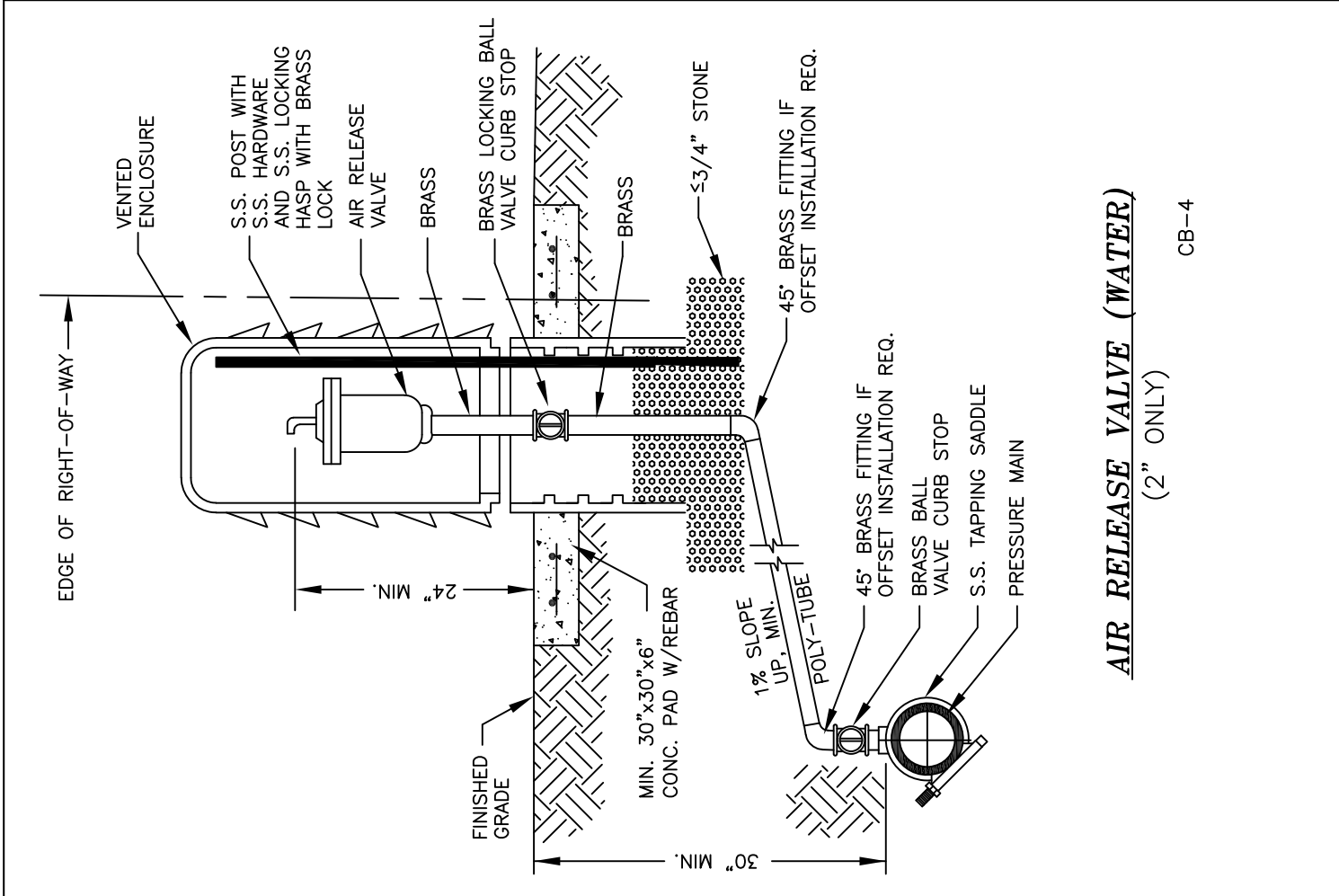
-  CAREFULLY TAMPED BACKFILL
-  PLAIN OR REINFORCED CONC.
-  FINE GRANULAR FILL
-  COMPACTED GRANULAR MATERIAL
-  LIGHTLY COMPACTED BACKFILL
-  LOOSE BACKFILL

SOURCE: ASCE MANUAL NO.37  
(WPCF MANUAL OF PRACTICE NO.37)

**PIPE BEDDING**  
CB-3

**BONITA SPRINGS  
UTILITIES, INC.**  
11900 E. TERRY STREET  
BONITA SPRINGS, FLORIDA 34135

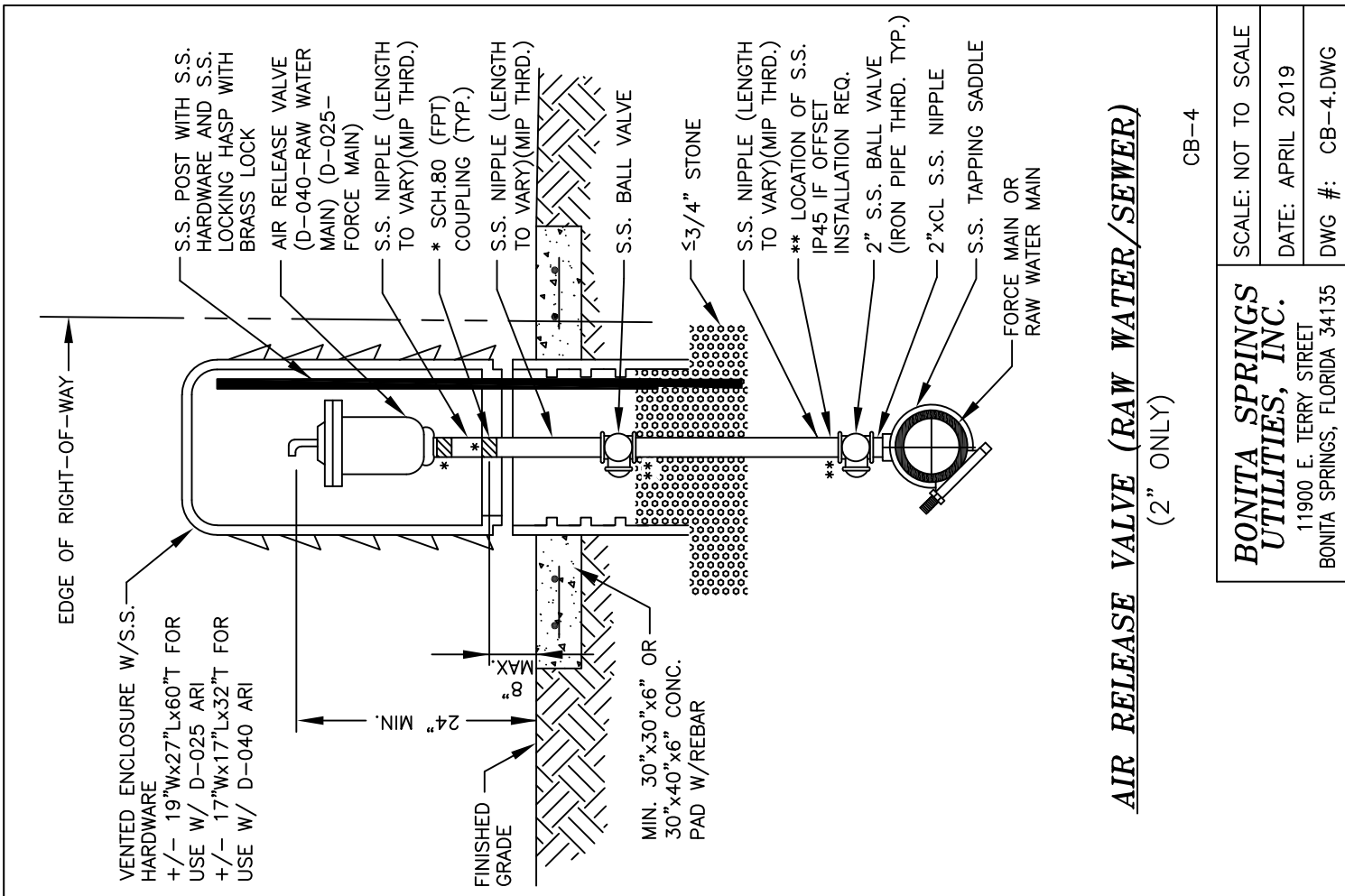
SCALE: NOT TO SCALE  
DATE: APRIL 2019  
DWG #: CB-3.DWG



**AIR RELEASE VALVE (WATER)**

(2" ONLY)

CB-4



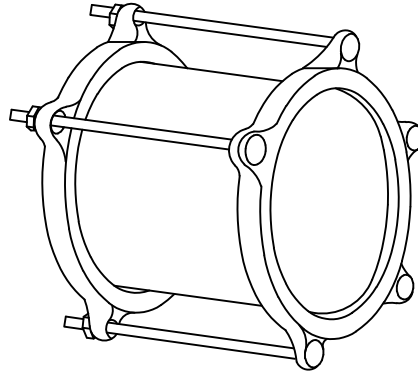
**AIR RELEASE VALVE (RAW WATER/SEWER)**

(2" ONLY)

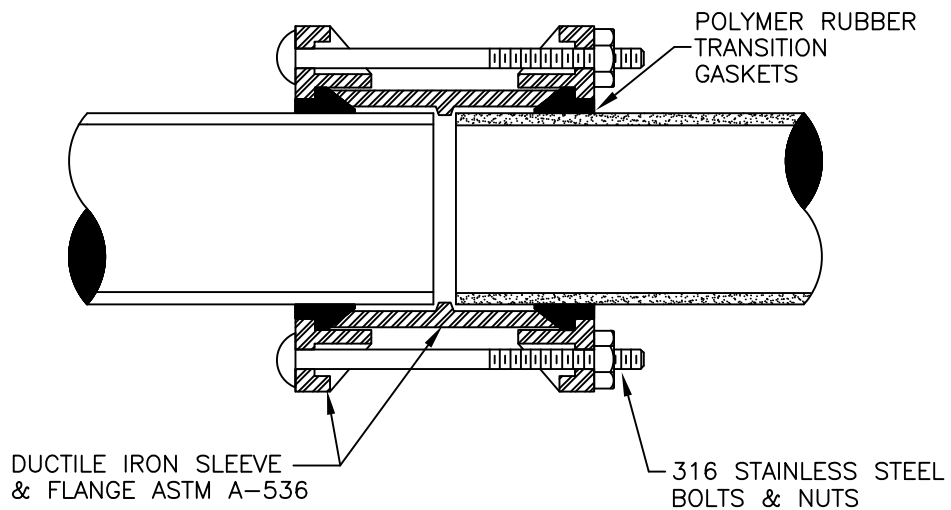
CB-4

SCALE: NOT TO SCALE
DATE: APRIL 2019
DWG #: CB-4.DWG

**BONITA SPRINGS UTILITIES, INC.**  
 11900 E. TERRY STREET  
 BONITA SPRINGS, FLORIDA 34135



DUCTILE IRON TRANSITION  
COUPLING OR APPROVED EQUAL



JOINS CAST IRON, DUCTILE IRON, ASBESTOS-CEMENT, C-900  
BY MECHANICAL JOINT COMPRESSION PRINCIPAL

**DUCTILE IRON**  
**TRANSITION COUPLING**  
CB-5

**BONITA SPRINGS  
UTILITIES, INC.**

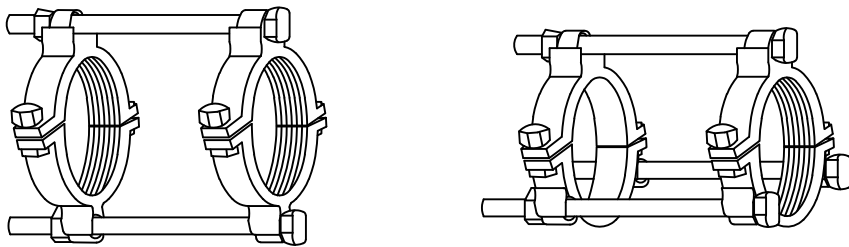
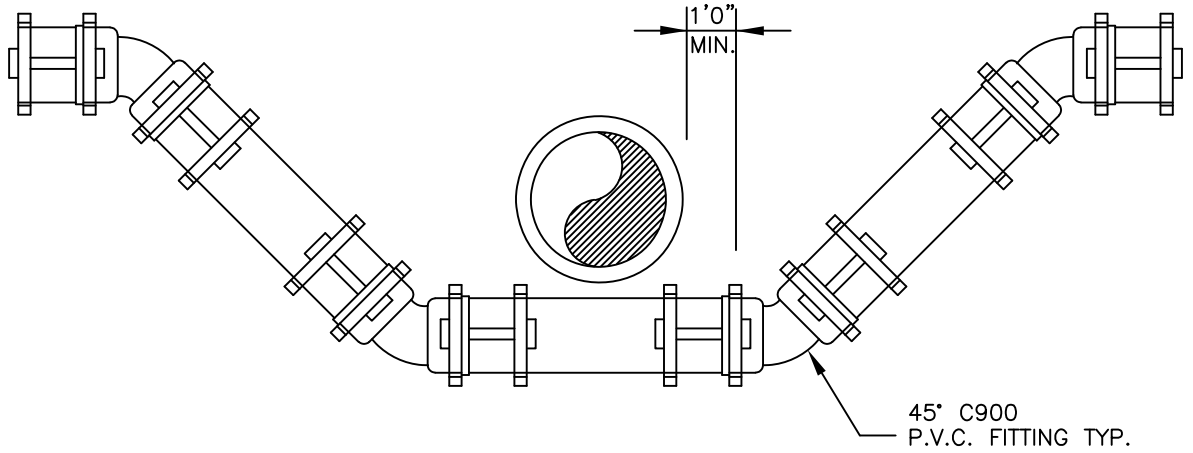
11900 E. TERRY STREET  
BONITA SPRINGS, FLORIDA 34135

SCALE: NOT TO SCALE

DATE: APRIL 2019

DWG #: CB-5.DWG

RESTRAINT SYSTEM FOR PUSH ON  
P.V.C. FITTINGS & PIPING SIZE AND  
TYPE AS SPECIFIED ON PLAN



RESTRAINT DETAIL FOR ADJUSTING  
PVC PRESSURE LINE DUE TO CONFLICTS

**PVC PRESSURE LINE CONFLICT**  
**ADJUSTMENT FITTINGS**

CB-6

**BONITA SPRINGS  
UTILITIES, INC.**

11900 E. TERRY STREET  
BONITA SPRINGS, FLORIDA 34135

SCALE: NOT TO SCALE

DATE: APRIL 2019

DWG #: CB-6.DWG

# LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH F.A.C. RULE 62-555.314

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)	<p style="text-align: center;">Water Main 3 ft. minimum</p>	<p style="text-align: center;">Water Main 12 inches is the minimum, except for storm sewer, then 6 inches is the minimum and 12 inches is the preferred</p>	<p style="text-align: center;">Water Main Alternate 3 ft. minimum</p>
Vacuum Sanitary Sewer	<p style="text-align: center;">Water Main 10 ft. preferred 3 ft. minimum</p>	<p style="text-align: center;">Water Main 12 inches preferred 6 inches minimum</p>	<p style="text-align: center;">Water Main Alternate 3 ft. minimum</p>
Gravity or Pressure Sanitary Sewer Sanitary Sewer Force Main, Reclaimed Water (4)	<p style="text-align: center;">Water Main 10 ft. preferred 6 ft. minimum (3)</p>	<p style="text-align: center;">Water Main 12 inches is the minimum, except for gravity sewer, then 6 inches is the minimum and 12 inches is the preferred</p>	<p style="text-align: center;">Water Main Alternate 6 ft. minimum</p>
Sanitary Sewer Force Main, Reclaimed Water (4)	10 ft. minimum	---	---

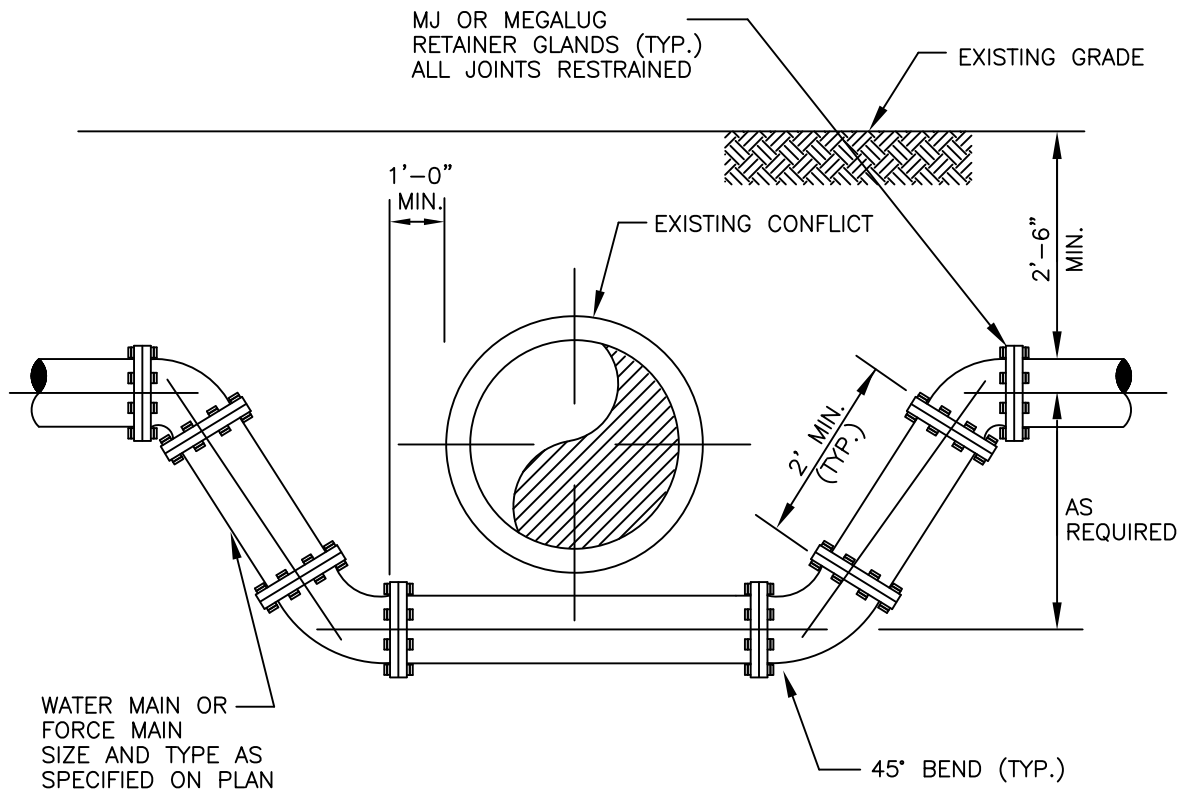
- (1) Water main should cross above other pipe. When water main must be below other pipe, the minimum separation is 12 inches.
- (2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.
- (3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.
- (4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

Disclaimer - This document is provided for your convenience only. Please refer to F.A.C. Rule 62-555-314 for additional construction requirements.

## CROSSING DETAIL CB-7

**BONITA SPRINGS  
UTILITIES, INC.**  
11900 E. TERRY STREET  
BONITA SPRINGS, FLORIDA 34135

SCALE: NOT TO SCALE  
DATE: APRIL 2019  
DWG #: CB-7.DWG



**CONFLICT ADJUSTMENT MJ**

CB-8

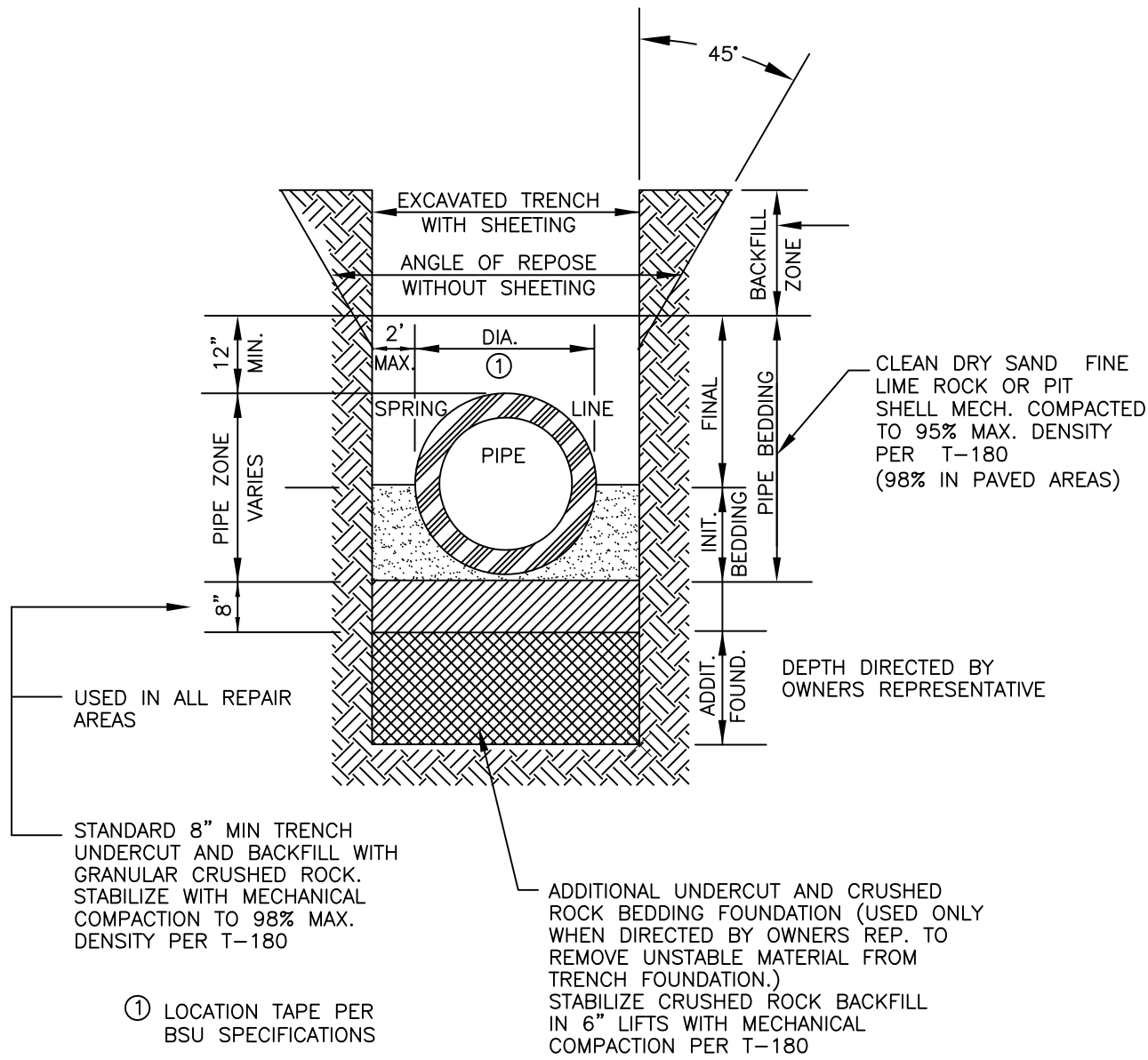
**BONITA SPRINGS  
UTILITIES, INC.**

11900 E. TERRY STREET  
BONITA SPRINGS, FLORIDA 34135

SCALE: NOT TO SCALE

DATE: APRIL 2019

DWG #: CB-8.DWG



**TRENCH CROSS SECTION**

CB-9

**BONITA SPRINGS UTILITIES, INC.**

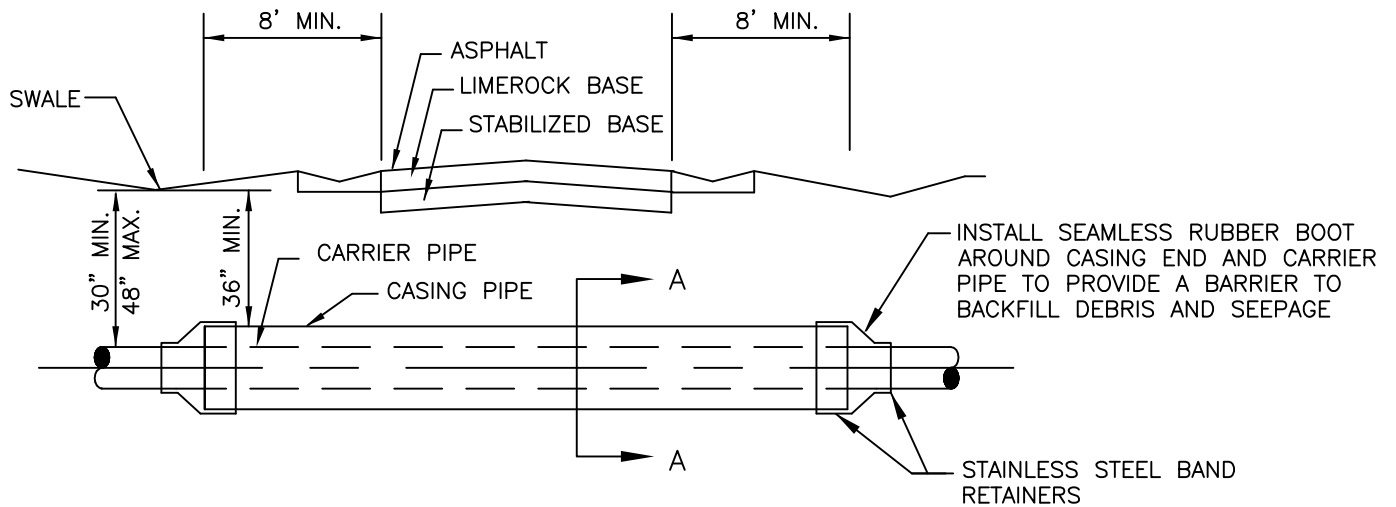
11900 E. TERRY STREET  
BONITA SPRINGS, FLORIDA 34135

SCALE: NOT TO SCALE

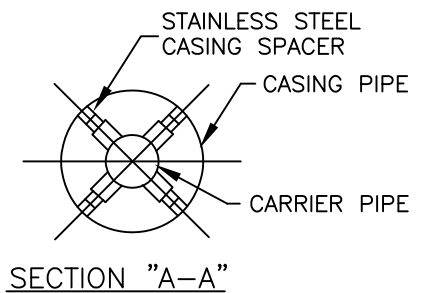
DATE: APRIL 2019

DWG #: CB-9.DWG



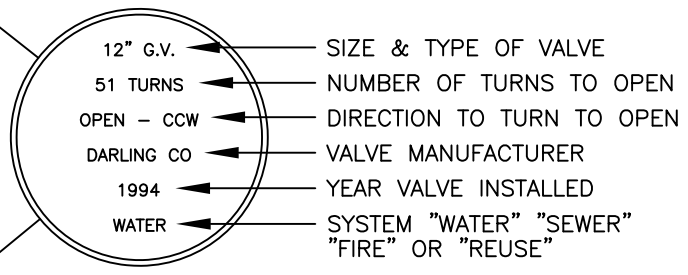
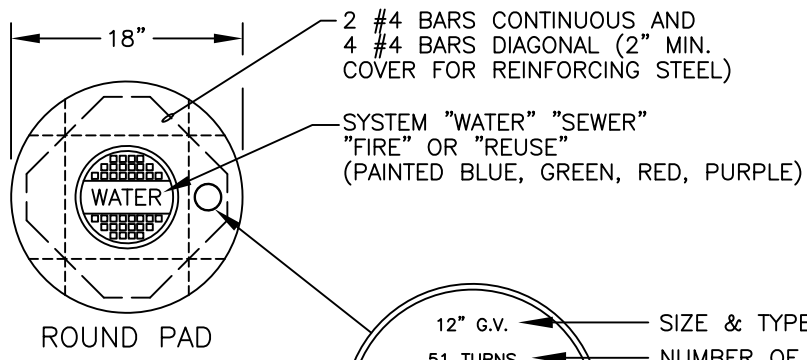


**NOTE:**  
 UNDERGROUND CROSSING REQUIRES A MINIMUM VERTICAL CLEARANCE OF 48" BELOW PAVEMENT SURFACE FOR FREEWAYS, 36" FOR OTHER HIGHWAYS OR 30" BELOW UNPAVED GROUND INCLUDING DITCH GRADE PER F.D.O.T.

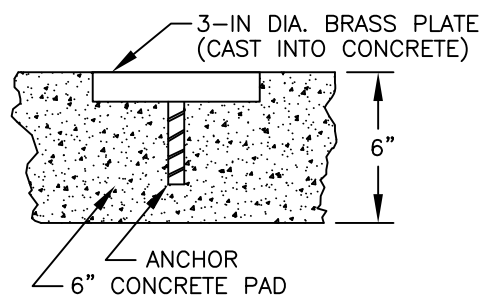
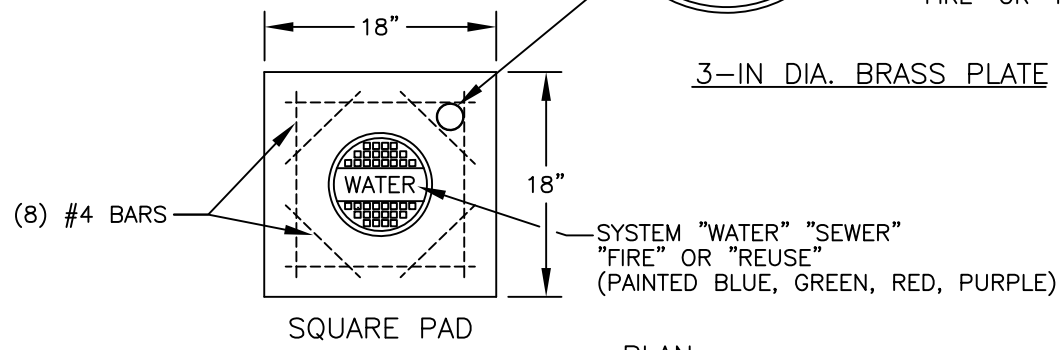


**JACK AND BORE**  
 CB-10

<b>BONITA SPRINGS UTILITIES, INC.</b> 11900 E. TERRY STREET BONITA SPRINGS, FLORIDA 34135	SCALE: NOT TO SCALE
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	DWG #: CB-10.DWG



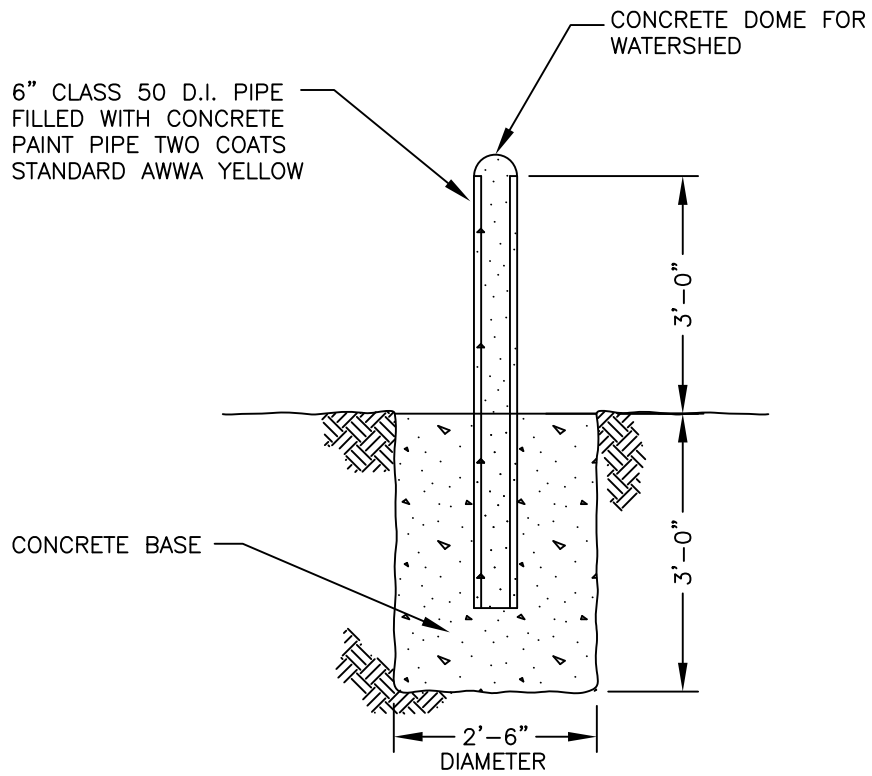
3-IN DIA. BRASS PLATE



SECTION

VALVE PAD  
CB-11

<b>BONITA SPRINGS UTILITIES, INC.</b> 11900 E. TERRY STREET BONITA SPRINGS, FLORIDA 34135	SCALE: NOT TO SCALE
	DATE: APRIL 2019
	DWG #: CB-11.DWG



**GUARD POST DETAIL**

CB-12

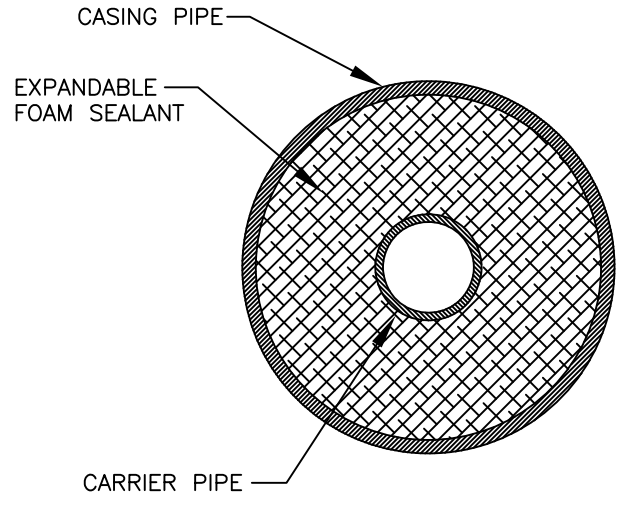
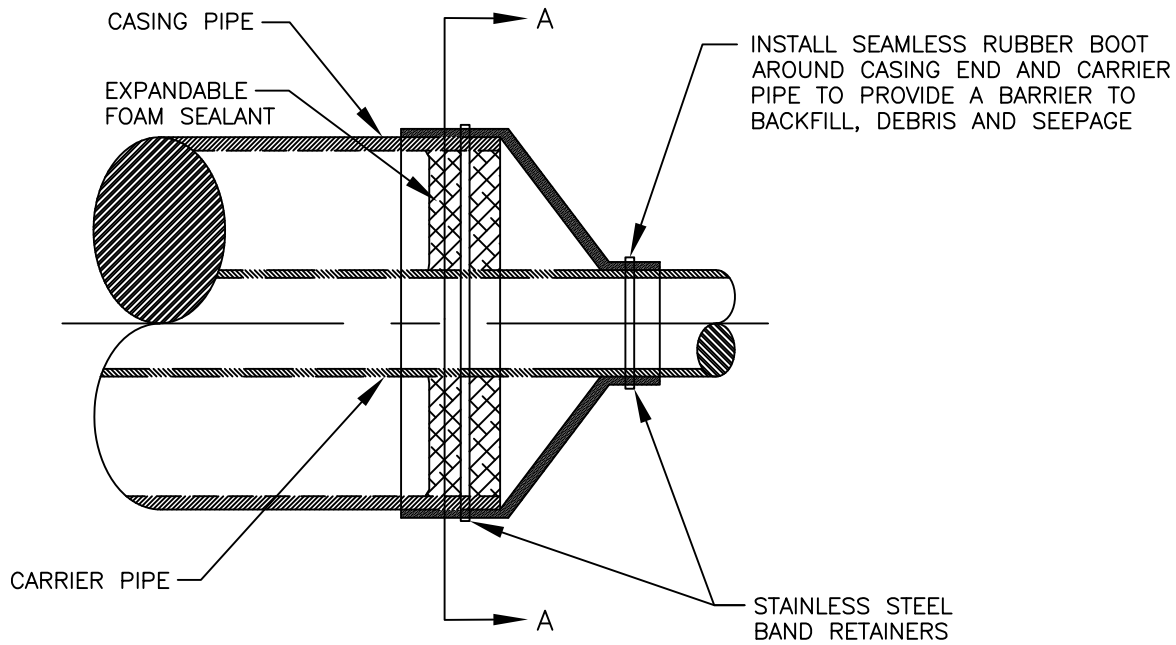
**BONITA SPRINGS  
 UTILITIES, INC.**

11900 E. TERRY STREET  
 BONITA SPRINGS, FLORIDA 34135

SCALE: NOT TO SCALE

DATE: APRIL 2019

DWG #: CB-12.DWG

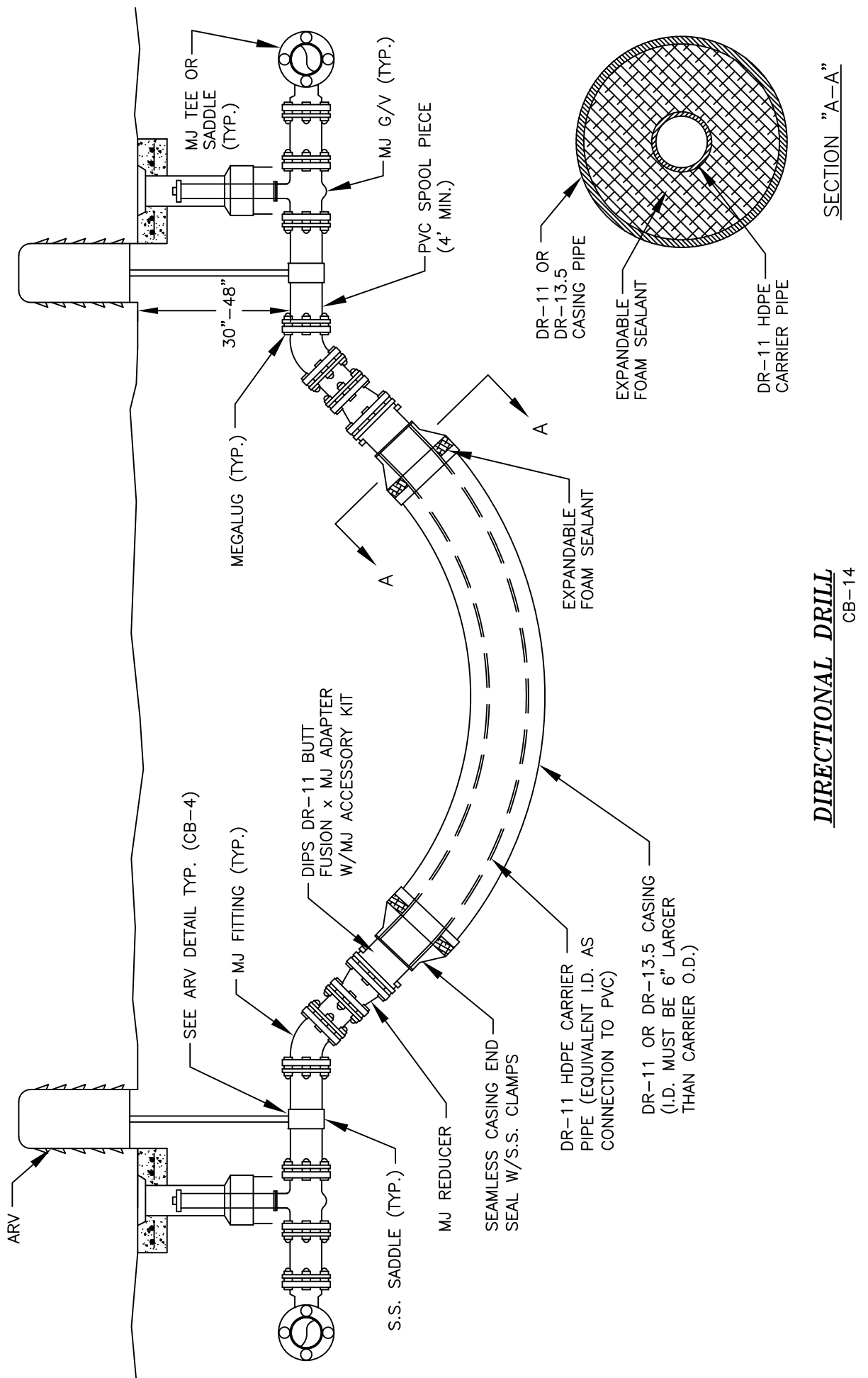


SECTION "A-A"

**END SEAL/CASING PIPE**

CB-13

<b>BONITA SPRINGS UTILITIES, INC.</b> 11900 E. TERRY STREET BONITA SPRINGS, FLORIDA 34135	SCALE: NOT TO SCALE
	DATE: APRIL 2019
	DWG #: CB-13.DWG



**DIRECTIONAL DRILL**  
CB-14

**BONITA SPRINGS UTILITIES, INC.**  
11900 E. TERRY STREET  
BONITA SPRINGS, FLORIDA 34135

SCALE: NOT TO SCALE  
DATE: APRIL 2019  
DWG #: CB-14.DWG

**WASTEWATER DETAILS**

**PUMP STATION DETAILS**

**BACKFLOW DETAILS**