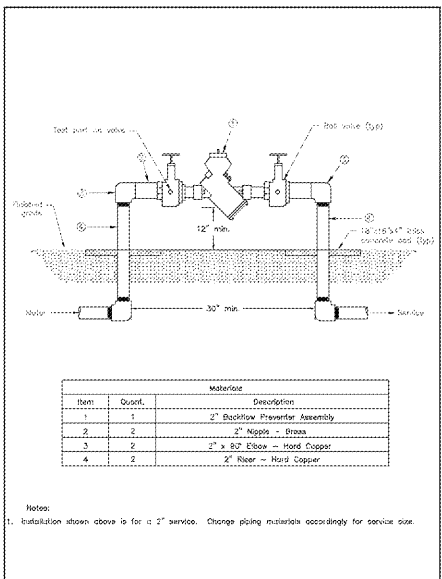
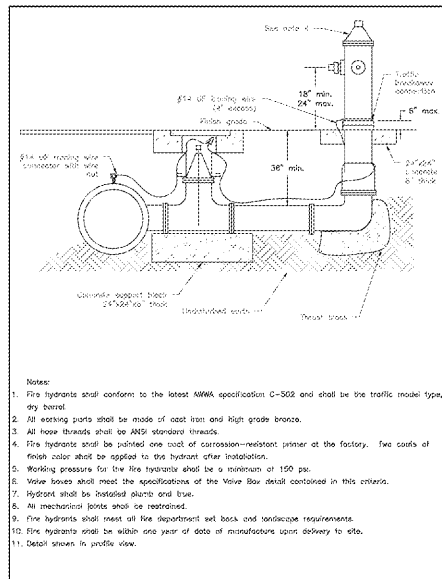
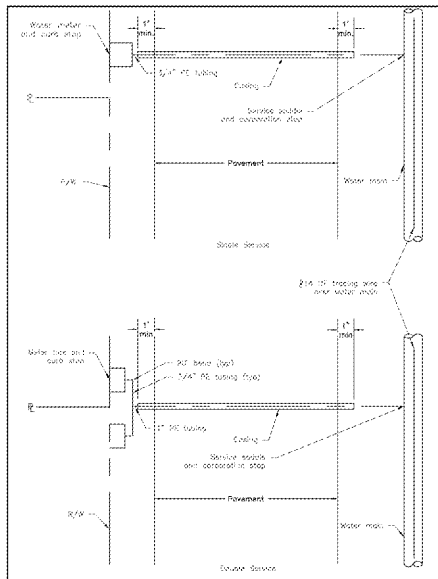


0 1 2 3 4  
Inches



Thrust Restraints For PVC and PE Pipe (maximum length (ft.) to be restrained in each direction of fitting)

Pipe Size	Pipe Size									
	4"	6"	8"	10"	12"	16"	20"	24"	30"	
90° Bend	58	82	107	128	148	180	227	282	350	
45° Bend	24	34	45	55	65	81	101	126	158	
22.5° Bend	12	17	22	28	33	40	50	63	80	
11.25° Bend	6	9	11	14	16	20	25	31	39	
Tee Branch	58	85	110	133	153	186	232	291	364	
Dead End	90	128	166	201	235	286	359	448	560	
In-Line Valve	99	138	184	221	255	315	399	498	620	

Notes:  
 1. All fittings shall be restrained joint type unless otherwise noted.  
 2. noted full pipe length joints with lateral restrained length equal to, or greater than, the length shown in the table.  
 3. Where two or more fittings are together, use the fitting that requires the greatest length of restrained pipe.  
 4. In-line valves outside the limits of restrained joints from other fittings need only be restrained at the valve, unless otherwise indicated.  
 5. Length of restrained joint piping for reducers, reducing tees, and vertical position fittings shall be designed on an individual basis, with design calculations for each being submitted for review.  
 6. Length shown in the table have been calculated in accordance with the procedure outlined in "Thrust Restraint Design For Iron Pipes" as published by DPMA, with the following assumptions:  
 Working Pressure: 72 psi  
 Design Pressure: 150 psi  
 Soil Description: SR 1  
 Laying Condition: Type 2  
 Safety Factor: 2

**RIP-RAP STONE SPECIFICATIONS:**

GENERAL NOTE:  
 IF NECESSARY, THE USE OF CONCRETE RIP-RAP PAD FOR SLOPE PROTECTION STABILIZATION GREATER THAN 2:1 MAY BE USED IN CONJUNCTION WITH THE PLACEMENT OF LARGE RIP RAP STONE.

MATERIALS:  
 A. RIP-RAP: STONE FOR RIP-RAP SHALL CONSIST OF FIELD STONE OR ROUGH UNHEWN QUARRY STONE AS NEARLY UNIFORM IN SECTION AS IS PRACTICAL. STONES SHALL BE DENSE, RESISTANT TO ACTION OF AIR AND WATER, AND SUITABLE FOR THE PURPOSE INTENDED. UNLESS OTHERWISE SPECIFIED, STONES SHALL WEIGH BETWEEN 50 AND 150 POUNDS EACH, AND AT LEAST 60 PERCENT OF STONES SHALL WEIGH MORE THAN 100 POUNDS EACH.

B. BEDDING STONE: QUARRIED AND CRUSHED ANGULAR Limestone, (DEPTH AS INDICATED), AND WITH THE FOLLOWING GRADATION:

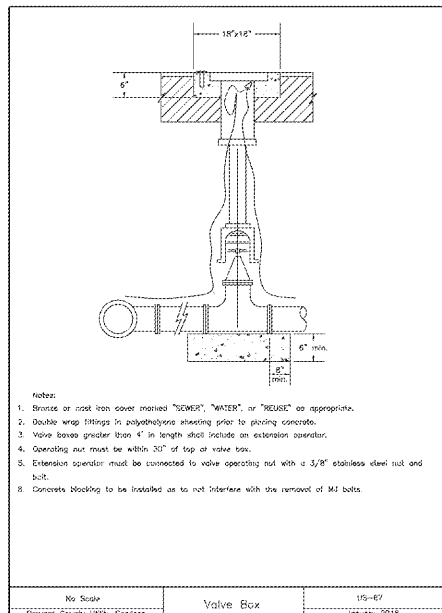
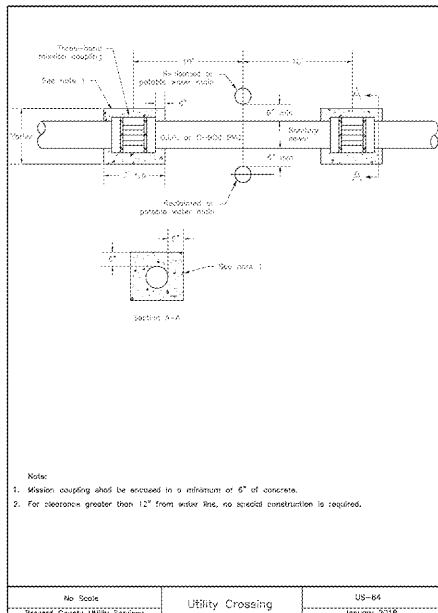
GRADATION	
SIEVE DESIGNATION	% BY WEIGHT PASSING SQUARE MESH SIEVES
3"	100
NO. 4	20 - 65
NO. 200	0 - 10

- PREPARATION:  
 1. START STABILIZATION ONLY WHEN WEATHER AND SOIL CONDITIONS ARE FAVORABLE FOR SUCCESSFUL APPLICATION OF PROPOSED MATERIAL.  
 2. NOTIFY CONSTRUCTION MANAGER / ENGINEER OF UNEXPECTED SUBSURFACE CONDITIONS. DISCONTINUE AFFECTED WORK IN AREA UNTIL NOTIFIED TO RESUME WORK.  
 3. DRESS SLOPES AND OTHER AREAS TO BE PROTECTED TO LINE AND GRADE SHOWN ON CONSTRUCTION DRAWINGS PRIOR TO PLACING OF RIP-RAP.  
 4. CORRECT AREAS OVER-EXCAVATED.  
 5. REMOVE EXCESS EXCAVATED MATERIAL FROM SITE.

- PLACEMENT:  
 1. PLACE RIP-RAP IN AREAS WHERE INDICATED ON CONSTRUCTION DRAWINGS.  
 2. INSTALL FILTER FABRIC AND BEDDING STONE PRIOR TO PLACEMENT OF RIP-RAP IF SO INDICATED ON THE DRAWINGS.  
 3. PLACE STONES SO THAT GREATER PORTION OF THE WEIGHT IS CARRIED BY THE EARTH AND NOT BY ADJACENT STONES. PLACE STONES IN A SINGLE LAYER WITH CLOSE JOINTS. UPRIGHT AREAS OF STONE SHOULD MAKE AN ANGLE OF APPROXIMATELY 80 DEGREES WITH EMBANKMENT SLOPE. PLACE STONES FROM BOTTOM OF EMBANKMENT UPWARD, WITH LARGER STONES BEING PLACED IN LOWER COURSES. FILL OPEN JOINTS WITH SPALLS. EMBED STONES IN EMBANKMENT AS NECESSARY TO PREVENT UNIFORM TOP SURFACE SUCH THAT VARIATION BETWEEN TOPS OF ADJACENT STONES SHALL NOT EXCEED 3 INCHES.

FOR FABRIC CLOTH OVER SUBSOIL SURFACE, LAP EDGES AND ENDS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS SHOWN ON THE DRAWINGS.

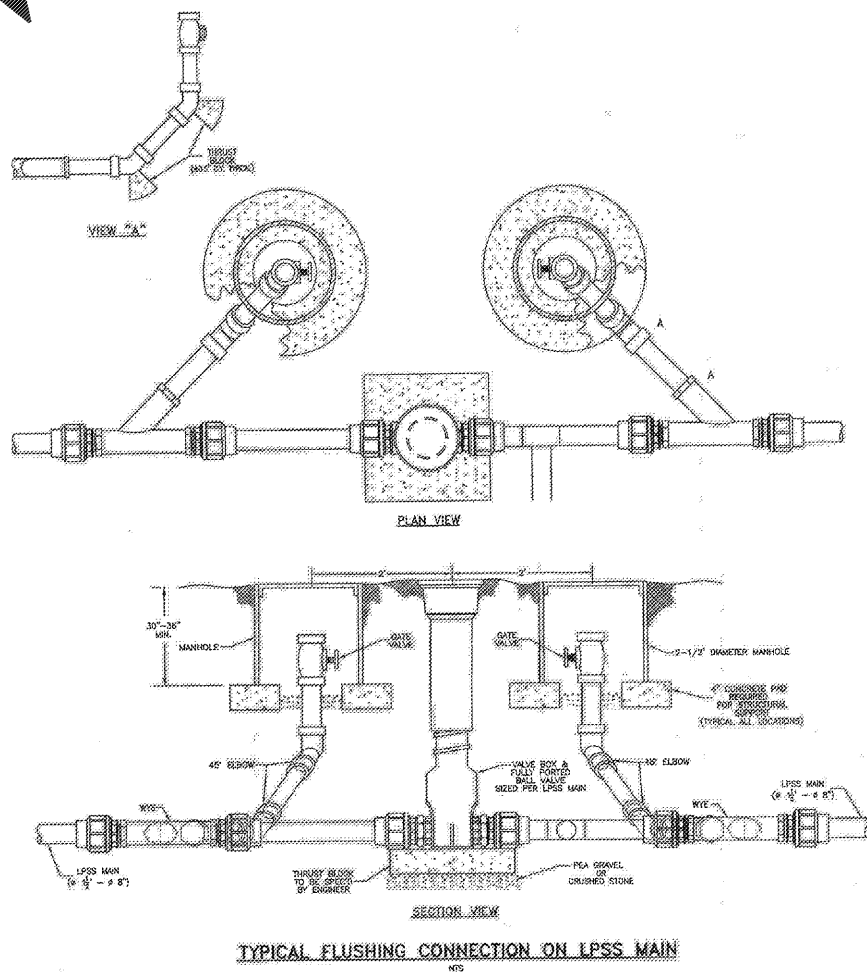
**RIP-RAP SPECIFICATIONS**



**LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH F.A.C. RULE 62-557.014**

Other Pipe	Horizontal Separation	Crossings (1)	Joint spacing @ Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)	3 ft. minimum	12 inches is the minimum, except for storm sewer, then 6 inches is the minimum and 12 inches is preferred	Alternate 3 ft. minimum
Vacuum Sanitary Sewer	10 ft. preferred 6 ft. minimum	12 inches preferred 6 inches minimum	Alternate 3 ft. minimum
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)	10 ft. preferred 6 ft. minimum (3)	12 inches is the minimum, except for gravity sewer, then 6 inches is the minimum and 12 inches is preferred	Alternate 6 ft. minimum
On-Site Sewage Treatment & Disposal System	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.



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Rev.	Date	Description	By	Checked
1	11/7/18	BREVARD COUNTY COMMENTS	CP	PL
2	12/10/18	BREVARD COUNTY COMMENTS	CP	PL
3	03/04/19	BREVARD COUNTY COMMENTS	CP	PL
4	03/24/19	BREVARD COUNTY COMMENTS	CP	PL
5	09/30/19	PER CLIENT COMMENTS	CP	PL

FOR PERMITTING \$0

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Project Title:  
**MICCO ROAD & US-1 BREVARD COUNTY, FL**  
 100060192

**UTILITY DETAILS**

Scale	Designed	Drawn	Checked	Authorized
Original Size	JL	DF		
Date	Date	Date	Date	Date
ARCH D				
Drawing Number	CFG09.5A			Revision