



ALL D.I.P. TO BE PAINTED  
BLUE ON TOP HALF OF PIPE.

DATE: JUNE 1995  
DWG. NO. 100.4



ENGINEERING DIVISION



USE MEGALUGS AT ALL PIPE JOINTS

DATE	ENGINEERING DIVISION	RESTRAINED JOINT INFORMATION
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1. WATER MAIN TO BE PRESSURE TESTED AND DISINFECTED ACCORDING TO BROWARD COUNTY PUBLIC HEALTH UNIT REGULATIONS, AWWA, AND MUNICIPAL SPECIFICATIONS IN EFFECT.
2. BACTERIOLOGICAL TESTS ARE TO BE PERFORMED BY THE CONTRACTOR AND AN APPROVED TESTING LABORATORY.
3. REMOVE TEMPORARY CONNECTION AT SADDLE ON NEW MAINS AFTER FILLING AND FLUSHING HAS BEEN COMPLETED AND REPLACE WITH BRASS PLUG.
4. PROVIDE ALL NECESSARY THRUST BLOCKS OR OTHER RESTRAINTS.
5. FILLING AND FLUSHING LOCATIONS SHALL BE COORDINATED BY THE CONTRACTOR, ENGINEER, AND CITY.
6. VENT TO ATMOSPHERE SHALL REMAIN OPEN DURING ALL PHASES OF TESTING.
7. AFTER COMPLETION FILL AND FLUSH CONNECTION
8. USE MEGALUGS AT ALL PIPE JOINTS

## FILLING AND FLUSHING CONNECTION

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ENGINEERING DIVISION



METER BOX INSTALLATION



ENGINEERING DIVISION	TYPICAL METER
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USE MEGALUGS AT ALL PIPE JOINTS 3" AND LARGER  
PLEASE SEE METER INSTALL DIMENSION LIST ON STANDARD NO. 106-4  
SMALL UNITS UNI-STRUT SUPPORT

ENGINEERING DIVISION	BACKFLOW PREVENTER
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ENGINEERING DIVISION



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ENGINEERING STANDARDS 2019	
	REGIONAL CONFLICT (WATER)



ENGINEERING STANDARDS 2019	
	FIRE HYDRANT ASSEMBLY



1. VALUES IN TABLE ARE BASED ON 3" OF COVER, 100 PSI INTERNAL PRESSURE, FOR FORCE MAINS, 150 PSI REUSE WATER LINES.  
ANS/AWWA C605 & C502/A152-05 LAYING CONDITION 3, ASTM D2487 SAND, 10% FINE SAND, 5% SILT AND CLAY, AND ENDOCR. RESTRAINED LENGTHS WERE COMPUTED PER DIPRA "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE" AND "PVC PIPE THRUST RESTRAINT DESIGN HANDBOOK".
2. CONFIRM THE EXACT LENGTH OF RESTRAINING REQUIRED FOR REDUCERS, PIPE ENCASED IN POLYETHYLENE AND ENDOCR. 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 DRAWINGS AND THE RESTRAINED LENGTHS DETERMINED BY THE DESIGN ENGINEER, THE LONGEST RESTRAINED LENGTH SHALL BE USED.

### RESTRAINED JOINT INFORMATION

RESTRAINED JUNE INFORMATION

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

RESTRAINED JUNE INFORMATION

SOURCES: DATA FROM RETIREMENT LUMP-SUM CALCULATION PROGRAM FOR PRR, RPLC, RSLC, AND RSLC-2; DATA FROM RETIREMENT FLOWING FUND PROGRAM FOR PRR, RPLC, RSLC, AND RSLC-2.

FITTING TIME		HPRC PERCENT										2006pp						
		4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"
90° ROUNDOFF	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
45° ROUNDOFF	6	8	11	13	15	17	19	21	23	25	28	31	41	46	51	56	61	66
30° ROUNDOFF	10	14	18	22	26	30	34	38	42	46	50	54	58	62	66	70	74	78
11.25° ROUNDOFF	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
90° VERT. OFFSET	1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
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### RESTRAINED JOINT INFORMATION

ENGINEERING STANDARDS 2019	
	RESTRAINED JOINT INFORMATION

1. ALL MATERIALS, INSTALLATION, TESTING AND SPECIFICATIONS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF POMPAD BEACH, THE FLORIDA DEPARTMENT OF TRANSPORTATION AND ANY OTHER AGENCIES HAVING JURISDICTION. WHERE DISCREPANCIES DO EXIST, THE MODIFICATIONS MUST BE BETWEEN THE PLANS, THE SPECIFICATIONS AND THE STANDARDS. THE PLANS SHALL GOVERN.
2. LOCATION OF EXISTING UNDERGROUND UTILITIES HAS BEEN PREPARED FROM THE MOST RELIABLE INFORMATION AVAILABLE TO THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY LOCATION AND DEPTH OF ALL PERTINENT UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK.
3. DUCTILE IRON PIPE AND FITTINGS SHALL CONFORM TO ANSI A2151/AWWA C151-02 WITH WALL THICKNESS CLASS 30 FOR 8" AND ABOVE; CLASS 52 FOR 4" AND 6" AND SHALL B A2151/AWWA C151-02 WITH WALL THICKNESS CLASS 52 FOR 4" AND 6" AND SHALL B A2151/AWWA C151-02. EPOXY LININGS SHALL BE USED FOR FORCE MAINS AND GRAVITY SEWERS. PIPE, FITTINGS AND APPURTENANCES IN NETER VAULTS SHALL BE FLANGED. ALL FLANGED DUCTILE IRON PIPE SHALL BE CLASS 53.
4. P.V.C. NON-PRESSURE PIPE (GRAVITY SEWER PIPE) SHALL CONFORM TO ASTM D3034 WITH A MINIMUM WALL THICKNESS OF SDR 35.  
P.V.C. PRESSURE PIPE 4" THROUGH 12" SHALL CONFORM TO ANSI/AWWA C-900-07 WITH A MINIMUM WALL THICKNESS OF SDR 18
5. MINIMUM COVER FOR ALL WATER PIPES SHALL BE 36", EXCEPT WHERE NOTED.
6. ALL PRESSURE MAINS SHALL BE HYDROSTATICALLY PRESSURE TESTED FOR A PERIOD OF NOT LESS THAN 2 HOURS AT 150 PSI WITH AN ALLOWABLE LEAKAGE NOT TO EXCEED THE FORMULA:  
$$L = SD \sqrt{P/149,000}$$
  
IN WHICH "L" = QUANTAL ALLOWABLE LEAKAGE IN GALLONS/HOUR,  
"S" = EQUALS LENGTH OF PIPE  
"D" = EQUALS NOMINAL DIAMETER OF PIPE IN INCHES,  
"P" = EQUALS AVERAGE TEST PRESSURE DURING TEST IN LBS/SQ IN.  
ALL TESTING SHALL BE MADE IN ACCORDANCE WITH ANSI/AWWA C600-10 (HYDROSTATIC TESTS) AND C651-05 (WATER MAIN BACTERIOLOGICAL TESTS).
7. COMPLETE "AS-BUILT" INFORMATION RELATIVE TO MANHOLES, VALVES, FITTINGS, LENGTH OF PIPE AND THE LIKE, SHALL BE ACCURATELY RECORDED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER PRIOR TO ACCEPTANCE OF THE WORK.  
ALL ELEVATIONS SHALL BE TAKEN BY AN INDEPENDENT REGISTERED SURVEYOR AND INCLUDED IN THE "AS-BUILT" INFORMATION FURNISHED BY THE CONTRACTOR. FINAL APPROVAL OF THE PROJECT IS SUBJECT TO THE FINAL REVIEW AND APPROVAL OF THE "AS-BUILT" INFORMATION FURNISHED TO THE REGULATORY AGENCIES AND BODIES.
8. ALL MECHANICAL JOINTS SHALL BE RESTRAINED IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS AND IN COMPLIANCE WITH AWWA STANDARDS.
9. WHERE AN EXISTING WATER OR FORCE MAIN REQUIRES DEFLECTION TO CONNECT WITH PIPE, PROPOSED UTILITY, OR PROPOSED UTILITY, THE DEFLECTION PER PIPE JOINT SHALL CONDU WITH THE STANDARD UTILITY CROSSING DETAIL. THE LENGTH OF EXISTING PIPE TO BE DEFLECTED SHALL BE APPROVED BY THE ENGINEER.
10. ALL PIPE DENIED "ABANDON, PLUG AND GROUT" MUST BE EMPTIED, FLUSHED OUT AND COMPLETELY FILLED WITH GROUT. THE CONTRACTOR MUST COMPLY WITH ALL APPLICABLE LOCAL, FEDERAL AND STATE ENVIRONMENTAL REQUIREMENTS.
11. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, QUANTITIES AND DETAILS SHOWN ON THE DRAWINGS, SUPPLEMENTARY DRAWINGS, SCHEDULES OR OTHER DATA RECEIVED FROM THE ENGINEER AND SHALL NOTIFY HIM OF ALL OMISSIONS, ERRORS, CONFLICTS, AND DISCREPANCIES FOR THEREIN, FAIRLY AND SOONEST AFTER DISCOVERY. IT IS INTENDED MERELY TO ESTABLISH A STANDARD, UNLESS IT IS FOLLOWED BY WORDS INDICATING THAT NO SUBSTITUTION IS PERMITTED BECAUSE OF FORM, FIT, FUNCTION AND QUALITY. ANY MATERIAL, ARTICLE, OR EQUIPMENT OF OTHER MANUFACTURERS AND VENDORS WHICH DOES NOT MEET THE STANDARD OF THE GENERAL DESIGNER, SHALL BE CONSIDERED EQUALLY ACCEPTABLE, PROVIDED THE MATERIALS, ARTICLE OR EQUIPMENT SO PROPOSED IS IN THE OPINION OF THE ENGINEER, EQUAL IN SUBSTANCE, QUALITY AND FUNCTION.
12. COMPLIANCE TO "TRENCH SAFETY ACT" IS REQUIRED FOR ALL EXCAVATIONS IN EXCESS OF 5 FEET DEEP.
13. ALL WATER MAIN INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF CHAPTER 62-555.320 OF THE F.A.C.

Neal B. Janov, State of Florida, Professional Engineer, License No. 21998. This item has been digitally signed and sealed by Neal B. Janov, P.E. on July 17, 2020 using a Digital Signature. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Neal B. Janov

NEAL B. JANOV #21998 **PZ20-12000005** OF 6  
**1/5/2021**