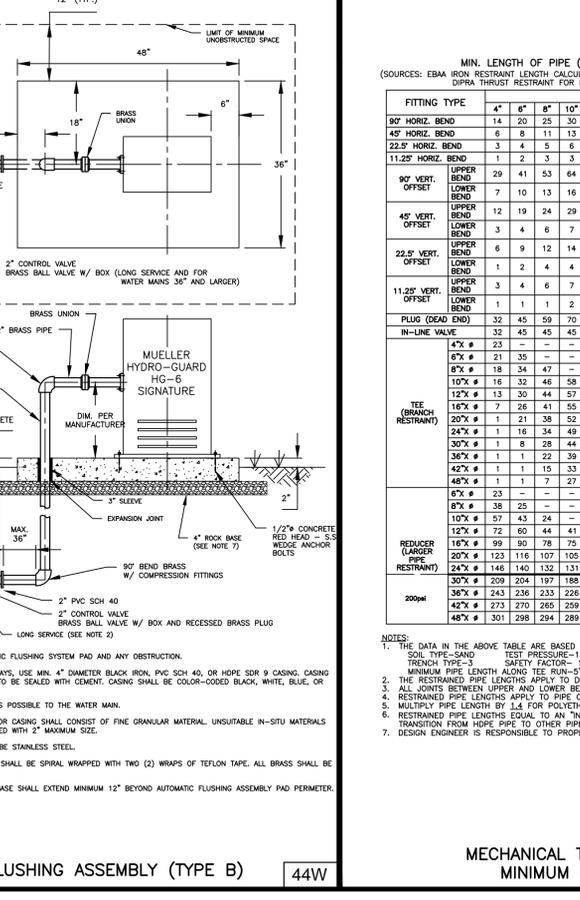
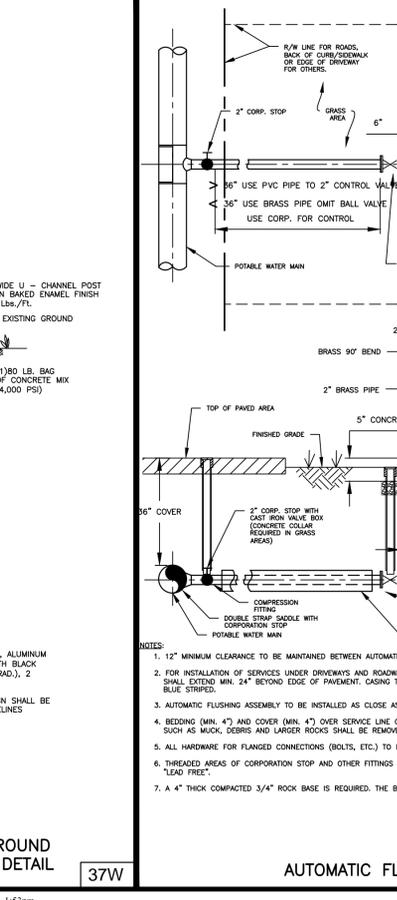
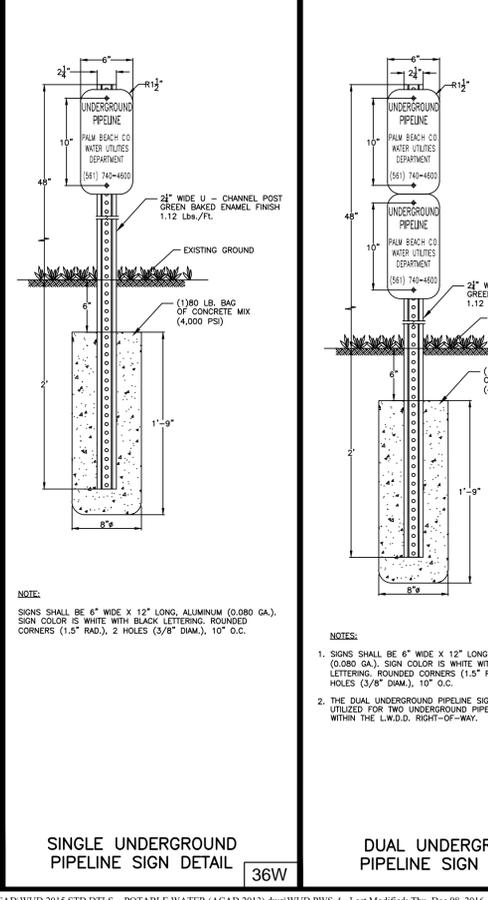
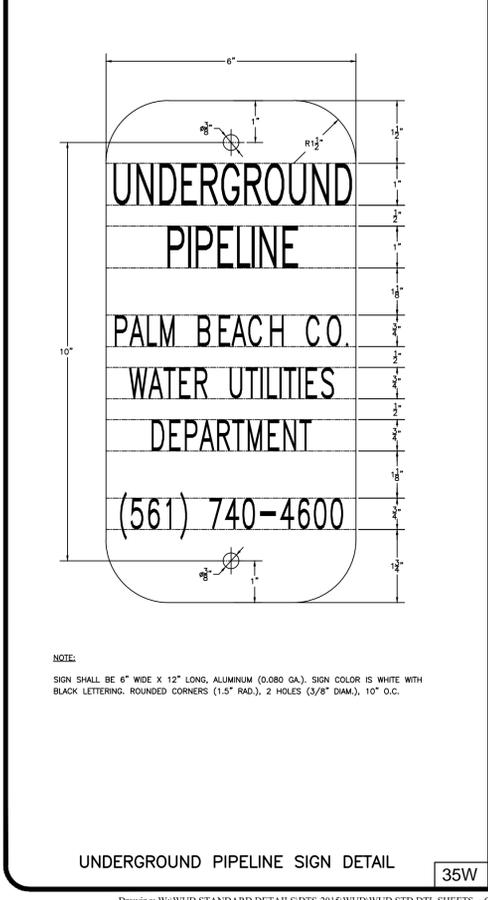


- NOTES:
1. ALL PIPE AND FITTINGS UP TO THE D.C.D.A. SHALL BE DUCTILE IRON CEMENT LINED.
 2. THE INITIAL TEST OF THE BACKFLOW PREVENTION ASSEMBLY SHALL BE PERFORMED BY THE DEPARTMENT PRIOR TO SERVICE ACTIVATION.
 3. THE DOUBLE CHECK DETECTOR ASSEMBLY SHALL BE APPROVED BY THE UNIVERSITY OF SOUTHERN CALIFORNIA (U.S.C.) OR THE A.S.S.E. (WITH ONE YEAR FIELD TESTING).
 4. THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR THE PROPER OPERATION, MAINTENANCE AND SUBSEQUENT TESTING OF THE DOUBLE CHECK DETECTOR ASSEMBLY BY A CERTIFIED BACKFLOW TECHNICIAN.
 5. WHEN FIRE LINE LENGTH IS OVER ONE PIPE LENGTH, LINE SHALL BE TERMINATED WITH A GATE VALVE (=POINT OF SERVICE), AND PIPE JOINTS / CONNECTIONS ARE PERMITTED BETWEEN POINT OF SERVICE AND VERTICAL 90° BEND.
 6. THE DESIGN SHALL MINIMIZE ANY POTENTIAL FOR WATER MAIN WITH NO FLOW. A FIRE HYDRANT LOCATED NEAR THE DOUBLE CHECK DETECTOR ASSEMBLY MAY BE REQUIRED FOR LONG, DEAD ENDING DEDICATED FIRE LINES.
 7. AN APPROVED REDUCED PRESSURE PRINCIPLE DETECTOR ASSEMBLY SHALL BE REQUIRED FOR ALL FIRE SYSTEMS WITH STORAGE TANKS AND/OR AUXILIARY WATER SUPPLY.
 8. TAMPER SWITCHES MAY BE REQUIRED BY THE FIRE MARSHALL.
 9. PIPE MATERIAL ON THE CUSTOMER SIDE OF POINT OF SERVICE SHALL COMPLY WITH FIRE MARSHALL REQUIREMENTS.
 10. 3" WIDE 6" THICK CONCRETE SLAB IS RECOMMENDED FOR ASSEMBLY SMALLER THAN 4".

- NOTES:
1. ENSURE PROPER RESTRAINT OF EXISTING VALVE AND EXISTING PIPE PRIOR TO NEW PIPE CONNECTION.
 2. ENSURE PROPER OPERATION OF EXISTING VALVE.
 3. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL BE USED AS A WATER RESTRAINT FOR CONNECTIONS.
 4. USING BY-PASS AND CHLORINE INJECTOR PUMP, DISINFECT NEW WATER MAIN (MIN. 50 CHLORINE PPM IS REQUIRED FOR CONNECTIONS).
 5. COMPLETE FILLING OF THE NEW WATER MAIN AND PERFORM BACTERIOLOGICAL TESTING.
 6. REMOVE DISTINGUISH BLOW OFF (IF APPLICABLE) AND EXISTING PUMP, CONNECT NEW MAIN TO EXISTING VALVE.
 7. CRACK OPEN EXISTING VALVE AFTER INITIAL DISINFECTION AND FLUSH THE NEW WATER MAIN (PROVIDE PRESSURE IS REQUIRED).
 8. REMOVE BY-PASS PIPING, CAP CORPORATION STOPS WITH BRASS CAPS.
 9. PRESSURE TESTING IS REQUIRED AFTER SUCCESSFUL COMPLETION OF BACTERIOLOGICAL TESTING AND DEPARTMENT RELEASE FOR CONSTRUCTION WATER IF APPLICABLE. PRESSURE TEST TO BE PERFORMED AFTER BACKFILL/ROAD BASE AND ROAD ROCK BASE INSTALLATION/COMPLETION.
 10. AN ALTERNATIVE TIE-IN PROCEDURE (PRESSURE TESTING PRIOR TO BACTERIOLOGICAL TESTING) MAY BE CONSIDERED WITH PRIOR APPROVAL, USE REMAINS DETAIL.
 11. RECORD DRAWINGS TO SHOW DATA FOR ALL TEST TAPS.
 12. ALL BRASS SHALL BE "LEAD FREE".

- NOTES:
1. THE "ALTERNATIVE" PROCEDURE MUST BE APPROVED BY WUD IN ADVANCE. IT ALLOWS THE NEW PIPE TO BE PRESSURE TESTED PRIOR TO BACTERIOLOGICAL TESTING.
 2. BOTH VALVES SHALL BE KEPT CLOSED EXCEPT FOR FILLING AND FLUSHING.
 3. WUD SHALL BE NOTIFIED BEFORE FILLING AND FLUSHING.
 4. PRESSURE TEST PUMP MAY BE CONNECTED TO SERVICE LINE, FIRE HYDRANT OR BLOWOFF IN THE TESTED WATER MAIN. NO EXTRA TAPS ARE PERMITTED UNLESS UNAVOIDABLE.
 5. GAUGE AND PIPER TO BE REMOVED AFTER PRESSURE TEST. HOLE TO BE PLUGGED AT SADDLE WITH BRASS PLUG; A BRASS CAP IS REQUIRED.
 6. THREAD AREAS OF CORPORATION STOP SHALL BE SPIRAL WRAPPED WITH TWO WRAPS OF TEFLON TAPE.
 7. ENSURE PROPER RESTRAINT OF EXISTING VALVE(S) AND PIPE PRIOR TO NEW CONNECTION.
 8. SEE ALSO DETAIL FOR "STANDARD POTABLE WATER MAIN TIE-IN PROCEDURE"
 9. RECORD DRAWINGS TO SHOW DATA FOR ALL TEST TAPS.
 10. ALL BRASS SHALL BE "LEAD FREE".

- DEFINITIONS
1. DEPARTMENT - THE PALM BEACH COUNTY WATER UTILITIES DEPARTMENT.
 2. CONTRACTOR - CONTRACTOR AND ALL UTILITY SUBCONTRACTORS.
 3. ENGINEER - ENGINEER RESPONSIBLE FOR INSPECTION AND CERTIFICATION.
- GENERAL NOTES
1. A PRE-CONSTRUCTION MEETING IS TO BE HELD PRIOR TO DELIVERY OF MATERIALS AND INITIATION OF ANY POTABLE WATER, RECLAIMED WATER AND/OR WASTEWATER SYSTEM CONSTRUCTION. THE MEETING SHALL BE ATTENDED BY THE DEPARTMENT, CONTRACTOR, ENGINEER AND OTHER INTERESTED PARTIES.
 2. ANY REVISIONS TO THE APPROVED PLANS SHALL BE CALLED TO THE ATTENTION OF THE DEPARTMENT PRIOR TO THE PRE-CONSTRUCTION MEETING. REVISED PLANS MUST BE APPROVED PRIOR TO THE MEETING.
 3. FIVE (5) COPIES OF THE CURRENT APPROVED MATERIAL LIST AND ALL NECESSARY SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO SCHEDULING OF THE PRE-CONSTRUCTION MEETING.
 4. ALL APPLICABLE PERMITS MUST BE OBTAINED PRIOR TO RECONSTRUCTION MEETING. (DOT, HEALTH DEPARTMENT, COUNTY ENGINEER, ETC.).
 5. THE CONTRACTOR SHALL MAINTAIN A CURRENT APPROVED SET OF CONSTRUCTION PLANS ON JOB SITE.
 6. ALL MATERIALS SUPPLIED SHALL CONFORM TO PRODUCT LIST AND SHOP DRAWINGS AS APPROVED PRIOR TO CONSTRUCTION. SUBSTITUTE MATERIALS SHALL NOT BE APPROVED AFTER DELIVERY TO THE JOB SITE. ALL REQUESTS FOR MATERIAL SUBSTITUTION SHALL BE APPROVED PRIOR TO DELIVERY OF THESE MATERIALS TO THE JOB SITE.
 7. THE LOCATIONS OF EXISTING UTILITIES SHOWN ON THE APPROVED PLANS ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR. APPROVAL OF DEVELOPMENT PLANS OR FEATURES DEPICTED HEREON, ANY DISCREPANCY IN OR VARIATION FROM THE APPROVED PLANS IS TO BE BROUGHT TO THE ATTENTION OF THE DEPARTMENT BY THE ENGINEER AND CONTRACTOR. THE CONTRACTOR SHALL CONFIRM AND INSTALL (IF NECESSARY) ADEQUATE MECHANICAL PIPE / JOINT RESTRAINT ON EXISTING PIPES PRIOR TO CONNECTION.
 8. THE CONTRACTOR SHALL BE RESPONSIBLE AT ALL TIMES THROUGHOUT THE DURATION OF CONSTRUCTION FOR THE PROTECTION OF EXISTING AND NEWLY INSTALLED UTILITIES FROM DAMAGE OR DISRUPTION OF SERVICE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING SUCH MEASURES AS NECESSARY TO PROTECT THE HEALTH, SAFETY AND WELFARE OF THOSE PERSONS HAVING ACCESS TO THE WORK SITE.
 9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING LOCATIONS FROM ALL OTHER UTILITY UTILITIES.
 10. THE CONTRACTOR OR ENGINEER SHALL SCHEDULE INSPECTIONS AND TESTS A MINIMUM OF 24-48 HOURS IN ADVANCE.
 11. NO CONNECTION TO OR ANY OTHER CONSTRUCTION SHALL BE PERFORMED ON AN EXISTING DEPARTMENT OWNED OR MAINTAINED MAIN OR STRUCTURE WITHOUT THE PRESENCE OF A DEPARTMENT INSPECTOR.
 12. FACILITIES PROPOSED HEREIN SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS AND THE DEPARTMENT'S MINIMUM STANDARDS. CONFLICTS BETWEEN THE PRECEDING DOCUMENTS SHOULD BE CALLED TO THE ATTENTION OF THE DEPARTMENT FOR RESOLUTION. DEVIATIONS FROM THE APPROVED PLANS MUST BE APPROVED IN ADVANCE BY THE DEPARTMENT.
 13. UPON COMPLETION OF CONSTRUCTION, A FINAL INSPECTION SHALL VERIFY PROPER ADHERENCE TO ALL FACETS OF THE PLANS AND SPECIFICATIONS.
- PRESSURE PIPE NOTES
1. THERE SHALL BE 36" MINIMUM COVER FROM FINISHED GRADE TO TOP OF PIPE.
 2. DUCTILE IRON PIPE (DIP) THICKNESS SHALL CONFORM TO THE DEPARTMENT'S APPROVED MATERIAL LIST. POTABLE WATER AND RECLAIMED WATER MAIN DIP SHALL BE CEMENT LINED. FORCE MAIN DIP SHALL BE CERAMIC EPOXY LINED.
 3. PVC PRESSURE PIPE SHALL BE C-900, SDR-18, 150 PSI.
 4. ALL FITTINGS SHALL BE DUCTILE IRON WITH MECHANICAL JOINTS AND CEMENT OR APPROVED EPOXY LINING.
 5. POTABLE WATER, RECLAIMED WATER AND WASTEWATER FORCE MAIN VALVES 10 INCHES AND SMALLER SHALL BE RESILIENT SEAT GATE VALVES. TWELVE-INCH (12") OR LARGER FORCE MAIN VALVES SHALL BE RESILIENT SEAT GATE VALVES OR ECCENTRIC PLUG VALVES (IF APPROVED IN ADVANCE BY DEPARTMENT). POTABLE WATER AND RECLAIMED WATER MAIN VALVES LARGER THAN 10 INCHES SHALL BE BUTTERFLY VALVES.
 6. ALL TRENCHING, PIPE-LAYING, BACKFILL, PRESSURE TESTING, AND DISINFECTION MUST COMPLY WITH ALL APPLICABLE FEDERAL, STATE, COUNTY AND HEALTH DEPARTMENT STANDARDS AND REGULATIONS.



MIN. LENGTH OF PIPE (FEET) TO BE RESTRAINED

(SOURCES: EBAM IRON RESTRAINT LENGTH CALCULATION PROGRAM FOR PVC PIPE, RELEASE 3.1, AND DIPRA THRUST RESTRAINT FOR DUCTILE IRON PIPE, RELEASE 3.2)

FITTING TYPE	PIPE SIZE											
	4"	6"	8"	10"	12"	16"	20"	24"	30"	36"	42"	48"
90° HORIZ. BEND	14	20	25	30	35	45	54	62	98	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	5	10	11	12	13
90° VERT. OFFSET	UPPER BEND	29	41	53	64	74	95	115	134	214	246	276
	LOWER BEND	7	10	13	16	19	25	30	35	57	66	74
45° VERT. OFFSET	UPPER BEND	12	19	24	29	34	39	48	56	89	102	114
	LOWER BEND	3	4	6	7	8	10	12	15	23	27	31
22.5° VERT. OFFSET	UPPER BEND	6	9	12	14	17	19	23	27	43	49	55
	LOWER BEND	1	2	4	4	5	6	7	11	13	15	16
11.25° VERT. OFFSET	UPPER BEND	3	4	6	7	8	9	11	13	21	24	27
	LOWER BEND	1	1	2	2	3	3	3	6	6	7	8
PLUG (HEAD END)	32	45	59	70	83	107	129	151	214	246	276	304
IN-LINE VALVE	32	45	45	45	45	55	65	80	110	125	140	155
4" x 3" TEE (BRANCH RESTRAINT)	16" x 3"	21	35	-	-	-	-	-	-	-	-	-
	18" x 3"	18	34	-	-	-	-	-	-	-	-	-
20" x 3" TEE (BRANCH RESTRAINT)	20" x 3"	1	21	38	52	65	88	109	-	-	-	-
	24" x 3"	1	16	34	49	62	85	108	129	-	-	-
30" x 3" TEE (BRANCH RESTRAINT)	30" x 3"	1	8	28	44	58	83	106	127	208	-	-
	36" x 3"	1	1	22	39	54	80	103	124	206	240	-
42" x 3" TEE (BRANCH RESTRAINT)	42" x 3"	1	1	15	33	49	77	100	122	205	239	270
	48" x 3"	1	1	7	27	44	73	97	120	203	238	269
8" x 3" TEE (BRANCH RESTRAINT)	8" x 3"	38	25	-	-	-	-	-	-	-	-	-
	10" x 3"	57	43	24	-	-	-	-	-	-	-	-
12" x 3" TEE (BRANCH RESTRAINT)	12" x 3"	72	60	44	41	-	-	-	-	-	-	-
	14" x 3"	89	80	78	75	45	-	-	-	-	-	-
20" x 3" REDUCER (LARGER PIPE RESTRAINT)	20" x 3"	123	116	107	105	81	45	-	-	-	-	-
	24" x 3"	146	140	132	131	111	82	45	-	-	-	-
30" x 3" REDUCER (LARGER PIPE RESTRAINT)	30" x 3"	209	204	197	188	177	153	116	75	-	-	-
	36" x 3"	243	236	233	226	217	196	168	135	74	-	-
42" x 3" REDUCER (LARGER PIPE RESTRAINT)	42" x 3"	273	270	265	259	252	234	211	183	133	72	-
	48" x 3"	301	298	294	288	283	268	249	228	183	131	71

MAXIMUM QUANTITY OF WATER (GALLONS PER HOUR) THAT MAY BE SUPPLIED TO MAINTAIN PRESSURE WITHIN 5 P.S.I. OF THE SPECIFIED TEST PRESSURE (MECHANICAL OR PUSH-ON JOINT, 18 FT. NOMINAL LENGTHS, PER 1000 FT. OF PIPE)

AVG. TEST PRESSURE (PSI)	PIPE DIAMETER (INCHES)															
	2	3	4	6	8	10	12	14	16	18	24	30	36	42	48	
150	0.10	0.14	0.18	0.27	0.37	0.46	0.55	0.64	0.73	0.83	0.92	1.10	1.38	1.65	1.83	2.20
200	0.10	0.15	0.21	0.31	0.42	0.53	0.63	0.74	0.84	0.95	1.06	1.27	1.59	1.91	2.22	2.54

FORMULA BASIS: $L = \frac{(S) \times (D) \times (D)^{1/2} \times 1/2}{148,000}$

NOTES:

1. TO OBTAIN THE MAXIMUM QUANTITY OF WATER FOR PIPE WITH 20 FT. NOMINAL LENGTHS, MULTIPLY THE QUANTITY CALCULATED FROM THE TABLE BY 0.8.
2. THE MAXIMUM QUANTITY OF ADDED WATER FOR A PIPELINE IS CALCULATED BY MULTIPLYING THE QUANTITY PER HOUR AS OBTAINED FROM THE ABOVE TABLE, BY THE DURATION OF THE TEST IN HOURS AND BY THE TOTAL LENGTH OF THE LINE BEING TESTED DIVIDED BY 1,000. IF THE LINE UNDER TEST CONTAINS SECTIONS OF VARIOUS DIAMETERS, THE MAXIMUM QUANTITY ADDED WILL BE THE SUM OF THE COMPUTED QUANTITIES FOR EACH SIZE.
3. MAXIMUM TEST LENGTH IS 2,500 FEET PER SECTION.
4. THIS STANDARD SHALL REFLECT ANY REVISION OF AWWA C-600, HOWEVER, THE MAXIMUM QUANTITY OF WATER ADDED SHALL NOT EXCEED 50% OF THE RECOMMENDED LIMIT PER APPLICABLE AWWA C-600 STANDARD.
5. STANDARD TEST PRESSURE = 150 P.S.I.; 200 P.S.I. FOR MAINS LARGER THAN 24"
6. PRESSURE TEST DURATION TO BE MIN. 2 HOURS.

POTABLE WATER MAIN PRESSURE TEST CRITERIA 31W

POTABLE WATER #4 STANDARD DETAILS

CONSULTANT:

DESIGNED BY: WUD

DRAWN BY: WUD_CADD

CHECKED BY: A. GALICKI

APPROVED BY: WUD

IT'S THE LAW!
CALL 48 HOURS BEFORE YOU DIG
1-800-432-4770
SUNSHINE STATE ONE CALL OF FLORIDA, INC.
UTILITIES NOTIFICATION CENTER

Palm Beach County Water Utilities Department
P.O. Box 16097
West Palm Beach, FL 33416-6097

SHEET NUMBER 0 OF 0 SEAL