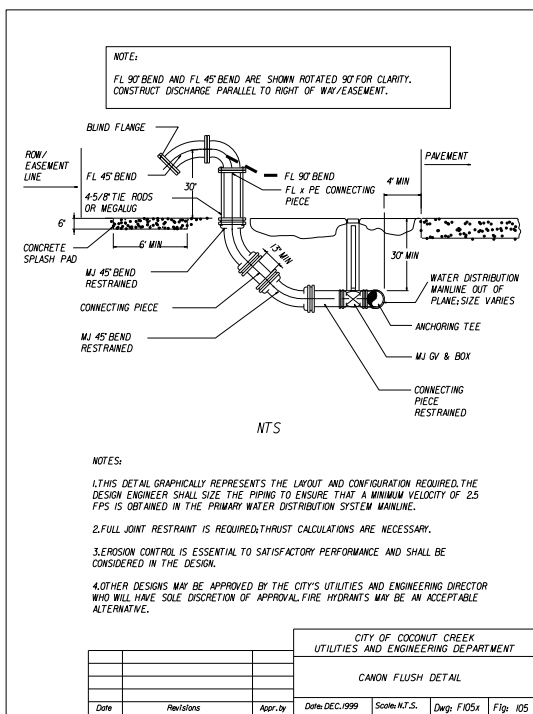
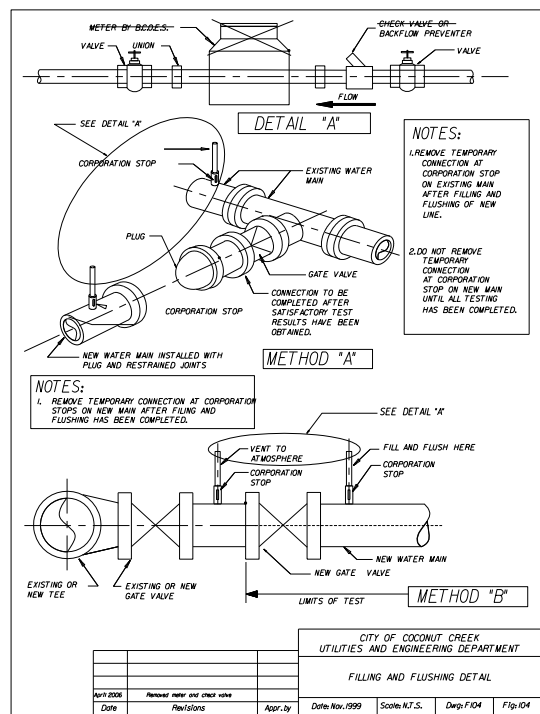


**WATER NOTES**

- PIPE:
  - WATER MAINS AND/OR SEWER FORCE MAINS SHALL BE EITHER POLYVINYL CHLORIDE (PVC) C-900 OR DUCTILE IRON PIPE (DIP). REFER TO PLAN FOR PIPE TYPE.
  - PVC PRESSURE PIPE 4" THROUGH 12" SHALL CONFORM TO ANSI/AWWA STANDARD C-900-97 (LATEST REVISION). PVC PRESSURE PIPE SHALL BE MADE FROM CLASS 1245-A OR 1245-B MATERIAL AND CONFORM TO THE OUTSIDE DIAMETER OF DUCTILE IRON PIPE WITH A MINIMUM WALL THICKNESS OF DR 18 (4" & 6" TO BE DR SERIES 14). ULTRA VIOLET DEGRADATION OR SUN-BLEACHED PIPE WILL BE CAUSE FOR REJECTION. PVC PRESSURE PIPE SHALL BE LAID WITH A THIRTY-SIX (36) INCH MINIMUM CLEAR COVER UNLESS OTHERWISE NOTED ON PLANS, AND APPROVED BY THE CITY UTILITIES DEPARTMENT.
  - DUCTILE IRON PIPE (DIP) SHALL CONFORM TO ANSI/AWWA C151/A21.5-02 (LATEST REVISION) WITH A 350 PSI RATING, UNLESS OTHERWISE NOTED. DIP SHALL BE CEMENT LINED AND SEAL COATED IN ACCORDANCE WITH ANSI/AWWA C104/A21.4-95 (LATEST REVISION). DIP SHALL BE LAID WITH A THIRTY (30) INCH MINIMUM CLEAR COVER UNLESS OTHERWISE NOTED ON PLANS, AND APPROVED BY THE CITY UTILITIES DEPARTMENT.
- MECHANICAL JOINT DUCTILE IRON FITTINGS SHALL BE AS PER ANSI/AWWA C153/A21.5-00 (LATEST REVISION) WITH A 350 PSI RATING. ALL FITTINGS SHALL BE CEMENT LINED AND SEAL COATED THE SAME AS DUCTILE IRON PIPE.
- POTABLE WATER SERVICE LINES UP TO 1 1/2" SHALL BE POLYETHYLENE TUBING, TYPE K SOFT TEMPER COPPER, OR APPROVED EQUAL. 2" SERVICE LINES SHALL BE POLYETHYLENE TUBING, HARD TEMPER COPPER OR APPROVED EQUAL. ALL SERVICE LINES SHALL CONFORM TO ANSI/AWWA STANDARDS C800-01 AND/OR C900-02 (LATEST REVISION). ALL SERVICE FITTINGS UP TO 2" SHALL BE COMPRESSION TYPE OR EQUAL AS APPROVED BY THE DIRECTOR OF UTILITIES. ALL SERVICE LINES AND FITTINGS 3" OR LARGER SHALL BE CONSTRUCTED OF D.I.P.
- VALVES 2" AND SMALLER SHALL BE ALL BRASS BI-DIRECTIONAL BALL VALVES SUITABLE FOR A WORKING PRESSURE OF 200 PSI MEETING THE REQUIREMENTS OF ANSI/AWWA C800-01 (LATEST REVISION). GATE VALVES 3" THROUGH 16" SHALL BE IRON BODY, RESILIENT SEAT, EQUIPPED WITH A 2" SQUARE OPERATING NUT, SUITABLE FOR A WORKING PRESSURE OF 200 PSI, COMPLY WITH ANSI/AWWA C509-01 (LATEST REVISION) AND BE M. & H. AMERICAN DARLING, WUELLER, OR APPROVED EQUAL.
  - ALL VALVES SHALL BE FURNISHED WITH ADJUSTABLE TYPE CAST IRON TYPE VALVE BOXES OF PROPER LENGTH FOR THE TRENCH DEPTH. ALL BOXES SHALL CONFORM TO AWWA WITH A SHAFT NOT LESS THAN 5" DIAMETER AND HAVE THE WORD "WATER" CAST IN THE COVER. BASE OF THE VALVE BOX SHALL BE CENTERED OVER THE VALVE. BE PLUMB AND BE SUPPORTED AT THE TOP WITH A 24" SQUARE CONCRETE COLLAR, EXCEPT IN PAVED AREAS. PVC (SDR 35) RISERS SHALL BE USED UNDER VALVE BOXES. USE BRASS I.D.T.V. WITH ANCHORING POST, INDICATE DIRECTION, \* OF TURNS, AND TYPE OF VALVE.
  - ALL VALVES WITH 2" OPERATING NUTS DEEPER THAN 36" BELOW FINISHED GRADE WILL BE EQUIPPED WITH A NON-SECURED NUT EXTENSION TO 18" BELOW FINISHED GRADE.
- SANITARY SEWER FORCE MAINS MUST CROSS A WATER MAIN WITH LESS THAN 18 INCHES VERTICAL DISTANCE, BOTH THE SEWER AND THE WATER MAIN SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE (DIP). A MINIMUM VERTICAL CLEARANCE OF 6 INCHES MUST BE MAINTAINED AT ALL CROSSINGS. ALL CROSSINGS SHALL BE ARRANGED USING A FULL LENGTH OF PIPE, IF POSSIBLE, SO THAT THE SEWER PIPE JOINTS AND THE WATER MAIN PIPE JOINTS ARE EQUIDISTANT 10 FEET FROM THE POINT OF CROSSING (PIPES SHOULD BE CENTERED AT THE CROSSING). WHERE NEW PIPE CONFLICTS WITH AN EXISTING PIPE WITH LESS THAN 18 INCHES VERTICAL CLEARANCE, THE NEW PIPE SHALL BE ARRANGED TO MEET THE CROSSING REQUIREMENT ABOVE.
- WATER MAIN SHALL BE LAID AT LEAST TEN FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWER LINES. SEPARATION DISTANCE SHALL BE MEASURED OUTSIDE EDGE TO OUTSIDE EDGE AND SHALL NOT INCLUDE ANY CHORD, RADIUS, OR DIAMETER OF THE PIPE. IN CASES WHERE IT IS NOT POSSIBLE TO MAINTAIN A 10-FOOT HORIZONTAL SEPARATION, THE WATER MAIN MUST BE LAID IN A SEPARATE TRENCH OR ON AN UNDISTURBED EARTH SHELF LOCATED ON ONE SIDE OF THE SEWER OR FORCE MAIN AT SUCH ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER. WHERE IT IS NOT POSSIBLE TO MAINTAIN A VERTICAL DISTANCE OF 18 INCHES IN PARALLEL INSTALLATIONS, THE WATER MAIN SHALL BE CONSTRUCTED OF DIP AND THE SANITARY SEWER OR THE FORCE MAIN SHALL BE CONSTRUCTED OF DIP WITH A MINIMUM VERTICAL DISTANCE OF 6 INCHES. THE WATER MAIN SHOULD ALWAYS BE ABOVE THE SEWER. JOINTS ON THE WATER MAIN SHALL BE LOCATED AS FAR APART AS POSSIBLE FROM JOINTS ON THE SEWER OR FORCE MAIN (STAGGERED JOINTS).
- WATER SYSTEM SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH ANSI/AWWA C600-99 (LATEST REVISION). THE PRESSURE TESTING SHALL BE FOR A PERIOD OF NOT LESS THAN TWO (2) HOURS AT 150 PSI MINIMUM AT ALL TIMES DURING THE TEST WITH AN ALLOWABLE LEAKAGE NOT TO EXCEED THE FORMULA OF  $L \leq \frac{1}{P} \sqrt{\frac{133200}{D}}$ . L = ALLOWABLE LEAKAGE IN GAL/HR.; S = LENGTH OF PIPE TESTED IN FEET; D = DIAMETER OF PIPE IN INCHES; P = AVERAGE TEST PRESSURE DURING THE TEST IN LBS./SQ. IN. THE SYSTEM SHALL BE DISINFECTED IN ACCORDANCE WITH ANSI/AWWA C651-99 (LATEST REVISION).
- NO SERVICE CONNECTIONS, METER BOXES, OR VALVES WILL BE PERMITTED IN DRIVEWAYS OR SIDEWALKS, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- ALL VALVES SHALL BE "AS-BUILT" LOCATED BY THE CONTRACTOR'S ENGINEER AND RECORDED ON THE "AS-BUILT" PLANS TO BE PROVIDED TO THE CITY UTILITIES DEPARTMENT. "AS-BUILT" PLANS MUST BE CERTIFIED BY A LICENSED STATE OF FLORIDA REGISTERED LAND SURVEYOR AND SEALED BY THE ENGINEER OF RECORD.
- ALL EXCAVATION IN EXISTING RIGHT-OF-WAY SHALL BE BACKFILLED AT END OF EACH DAY TO PERMIT PEDESTRIAN AND VEHICULAR TRAFFIC PRIOR TO CONTRACTOR LEAVING SITE.
- ALL NEWLY INSTALLED OR CONSTRUCTED PIPING SYSTEMS SHALL BE CLEANED PRIOR TO BEING PUT INTO SERVICE BY USING A PIG CLEANING SYSTEM. A MINIMUM OF TWO (2) PIGS ARE REQUIRED. AT THE DISCRETION OF THE UTILITY ENGINEER THE TEST SHALL BE REDONE TO HIS SATISFACTION.
- NO SUPPLIER OF WATER SHALL PUT INTO SERVICE OR RESUME THE USE OF ANY PLANT, PUMPING STATION, MAIN STANDPIPE, RESERVOIR, TANK OR OTHER PIPE OR STRUCTURE THROUGH WHICH WATER IS DELIVERED TO CONSUMERS FOR DRINKING AND HOUSEHOLD PURPOSES UNTIL THE STRUCTURES HAVE BEEN EFFECTIVELY DISINFECTED AND APPROVED FOR OPERATION BY THE BROWARD COUNTY HEALTH DEPARTMENT.
- BACKFILL MATERIAL FOR WATER MAINS SHALL BE NON-COHESIVE, NON-PLASTIC MATERIAL FREE OF ALL DEBRIS, LUMPS AND ORGANIC MATTER. BACKFILL MATERIAL PLACED WITHIN ONE (1) FOOT OF PIPING AND APPURTENANCES SHALL NOT CONTAIN ANY STONES LARGER THAN TWO (2) INCHES IN DIAMETER. NO STONE LARGER THAN SIX (6) INCHES IN DIAMETER WILL BE PERMITTED IN ANY REMAINING BACKFILL.
- PIPE BENDS AND FITTINGS SHALL BE OF RESTRAINED JOINT TYPE AS APPROVED BY THE CITY UTILITIES DEPARTMENT. CONCRETE THRUST BLOCKS SHALL NOT BE USED. DISTANCE TO BE RESTRAINED SHALL BE IN ACCORDANCE TO THE SCHEDULE SHOWN AND AS VERIFIED BY THE ENGINEER OF RECORD.



**POTABLE WATER-SANITARY SEWER-REUSE WATER SEPARATION NOTES**

**VERTICAL CROSSINGS**  
Sanitary sewer systems and/or reuse water mains shall cross under potable water mains whenever physically possible. Sanitary sewer systems and/or reuse water mains crossing below potable water mains shall be laid to provide a minimum vertical separation distance of 18 inches between the invert of the potable water main and the crown of the lower pipe.

**HORIZONTAL SEPARATIONS**

Wherever it is physically possible:  
Sanitary sewer systems require a minimum of a 10-foot horizontal separation distance between any potable water main parallel installations.

Reuse water mains require a minimum of a 5 foot center to center (absolute minimum of 3 foot outside to outside of pipe) horizontal separation distance between any potable water main and/or a sanitary sewer system parallel installations.

Wherever either are not physically possible, then the potable water main shall be laid at the maximum physical horizontal separation distance possible, and either laid:  
A) In a separate trench;  
B) on an undisturbed earth shelf; with a minimum vertical separation distance of 18 inches provided between the invert of the potable water main and the crown of the lower pipe, thus conforming to the minimum Vertical Crossings in paragraph 11.3)

**CONFLICTS**

Wherever it is not possible to maintain the minimum standards in 1) and 2), then all piping material shall be ductile iron pipe (DIP). All DIP shall be class 50 or higher. Adequate protective measures against corrosion shall be used as determined by the design and site conditions. Additionally, all joints on the potable water main, within 20 feet of the conflict, shall be mechanically restrained. An absolute minimum vertical separation distance of 6 inches shall be provided between the invert of the upper pipe and the crown of the lower pipe.

NO.	DATE	BY	REVISION

Designed by: CITY Date: 4/08  
 Drawn by: CITY Date: 4/08  
 Checked by: CITY Date: 4/08

Approved by: ANTONIO QUEVEDO

Registered Engineer Number 59471  
 State of Florida

Date: 10/21/2010



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**BEL LAGO**  
**WATER AND SEWER DETAILS**

PROJECT NUMBER  
 0906-14  
 SHEET NUMBER  
 13 of 18