

NOTE

1. WHERE SOIL CONDITIONS CAN NOT BE MAINTAINED AS SHOWN ABOVE, PROVIDE APPROVED METHOD OF CONSTRUCTION.
2. SHEETING WILL BE REQUIRED AS DETERMINED IN THE FIELD.
3. COMPACTION PERCENTAGES SHOWN REFER TO AASHTO T-180.
4. MECHANICAL COMPACTION NOT ALLOWED BELOW THIS LEVEL.
5. SEE WATER NOTES # 13 FOR BACKFILL MATERIAL.

**TRENCH DETAIL (UNPAVED AREAS)**

REVISIONS		
No.	Date	Remarks

Date: 4/20/09

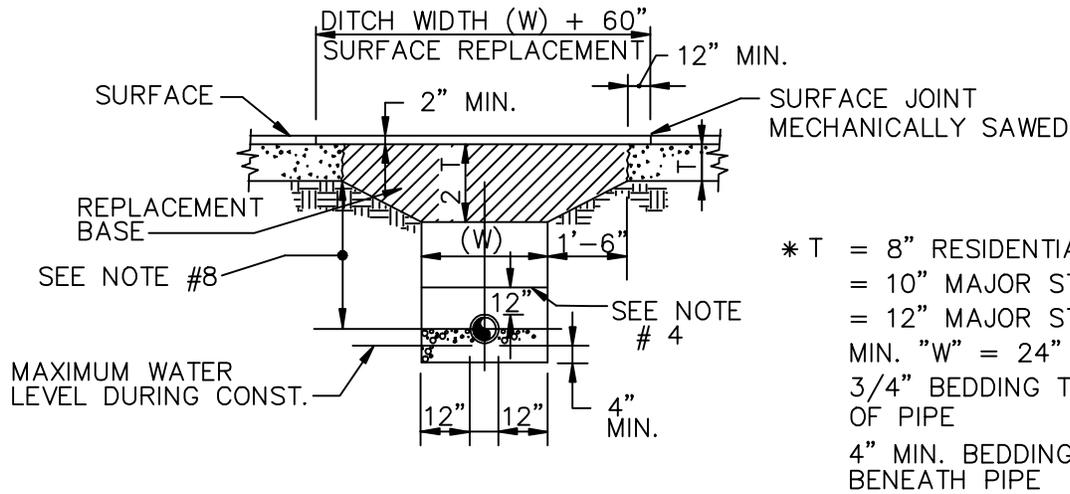
Seal:

TRENCH DETAIL-WATER  
(UNPAVED AREAS)

**STANDARD DETAILS**

FIGURE WAT-1

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA



NOTE

1. REPLACED BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL BASE, BUT NO LESS THAN SCHEDULE T, ABOVE.
2. BASE MATERIAL SHALL BE PLACED IN LAYERS AND EACH LAYER THOROUGHLY ROLLED AND TAMPED TO MAXIMUM DENSITY (98 %).
3. ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED.
4. MECHANICAL COMPACTION NOT ALLOWED BELOW THIS LEVEL.
5. NEW SURFACE MATERIALS WILL BE CONSISTENT WITH THE EXISTING SURFACE.
6. PERMIT REQUIRED FROM BUILDING DEPARTMENT/PUBLIC WORKS TO CUT PAVEMENT.
7. IF DITCH IS FILLED TEMPORARILY IT SHALL BE COVERED WITH A 2" ASPHALTIC CONC. PATCH UNTIL REPLACED WITH A PERMANENT PATCH.
8. 12" MAX. LAYERS OR OTHER APPROVED METHOD TO ACHIEVE 98% COMPACTION.
9. SEE WATER NOTES # 13 FOR BACKFILL MATERIAL.
10. COMPACTION PERCENTAGES SHOWN REFER TO AASHTO T-180.

**TRENCH DETAIL (PAVED AREAS)**

REVISIONS		
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TRENCH DETAIL-WATER  
 (PAVED AREAS)

**STANDARD DETAILS**

FIGURE WAT-2

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA



Laying condition: Type 4 (Pipe bedded in sand, gravel, or crushed stone to the depth of 1/8 pipe diameter, 4 inches minimum. Backfill compacted to top of pipe).

Depth of cover: 2.5 feet

Working Pressure: 150 p.s.i.

Soil Bearing 2,000 p.s.f. against undisturbed soil.

PIPE DIA. (IN.)	11.25d (FT.)	22.5d (FT.)	45d (FT.)	90d (FT.)	DEAD END (FT.)	TEE (FT.)	45d VERT BEND (FT.)	22d VERT BEND (FT.)
6	5	9	16	31	60	35	20	12
8	6	11	20	42	80	50	25	14
10	7	14	24	52	100	60	26	18
12	8	16	28	63	120	65	30	20
14	10	18	32	73	130	80	35	23
16	11	20	35	84	140	90	40	26
18	12	22	39	94	150	100	45	28
20	13	24	42	105	180	120	55	32
24	14	27	49	126	220	150	65	35

Note that in actual installations, the restrained length will be in multiples of length of one piece of pipe (normally 18 to 20 feet). Thus, for example, if the restrained length for 6 inch pipe leading up to a 90 degree bend is 30 feet, two full lengths of restrained pipe will result in 36 to 40 feet of restraint, providing an additional safety factor. Where short connecting or closure pieces are needed to position fittings, they should, when possible, be placed outside the restrained section for maximum economy.

The above schedule is only a guideline.  
 The engineer of record must verify and revise calculations to meet installation requirements.

**RESTRAINED PIPE JOINT SCHEDULE**

REVISIONS		
No.	Date	By

Date: 4/20/09

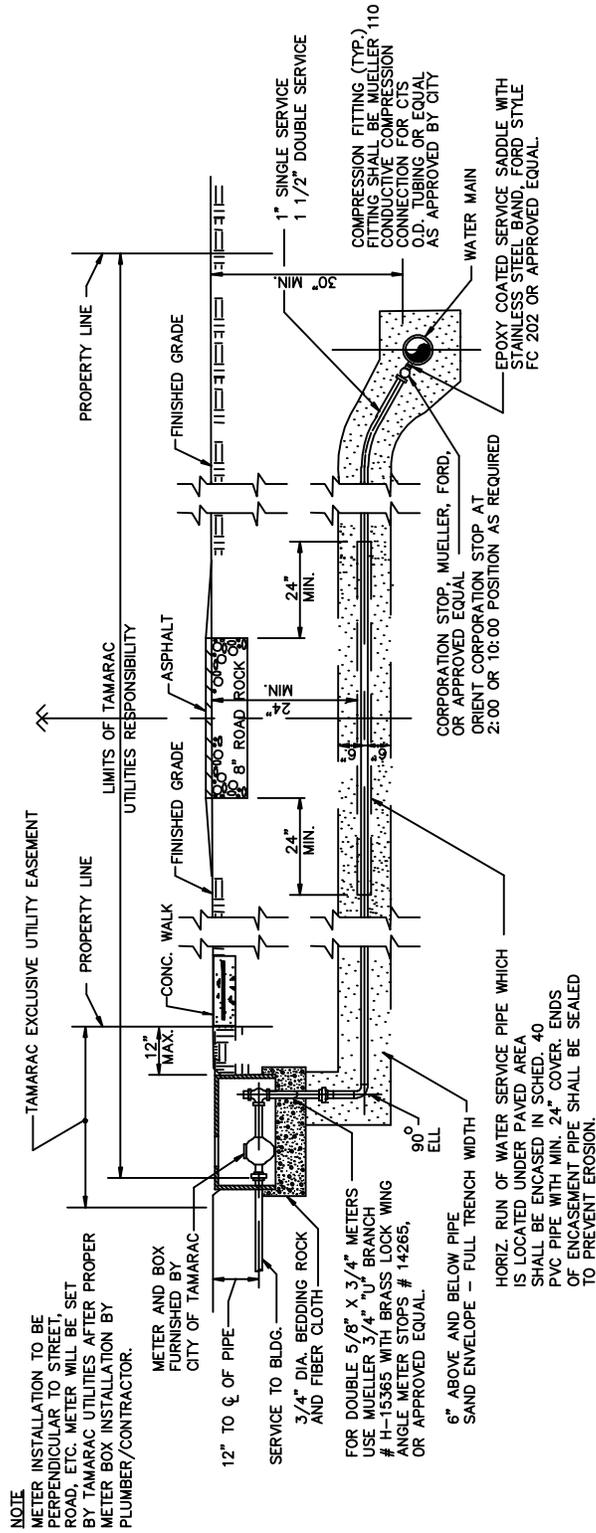
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**RESTRAINED PIPE JOINT  
 SCHEDULE - WATER**

**STANDARD DETAILS**

*FIGURE WAT-3*

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA



**TYPICAL 1" & 1 1/2" SERVICE**

REVISIONS	
No.	Date

Date: 4/20/09

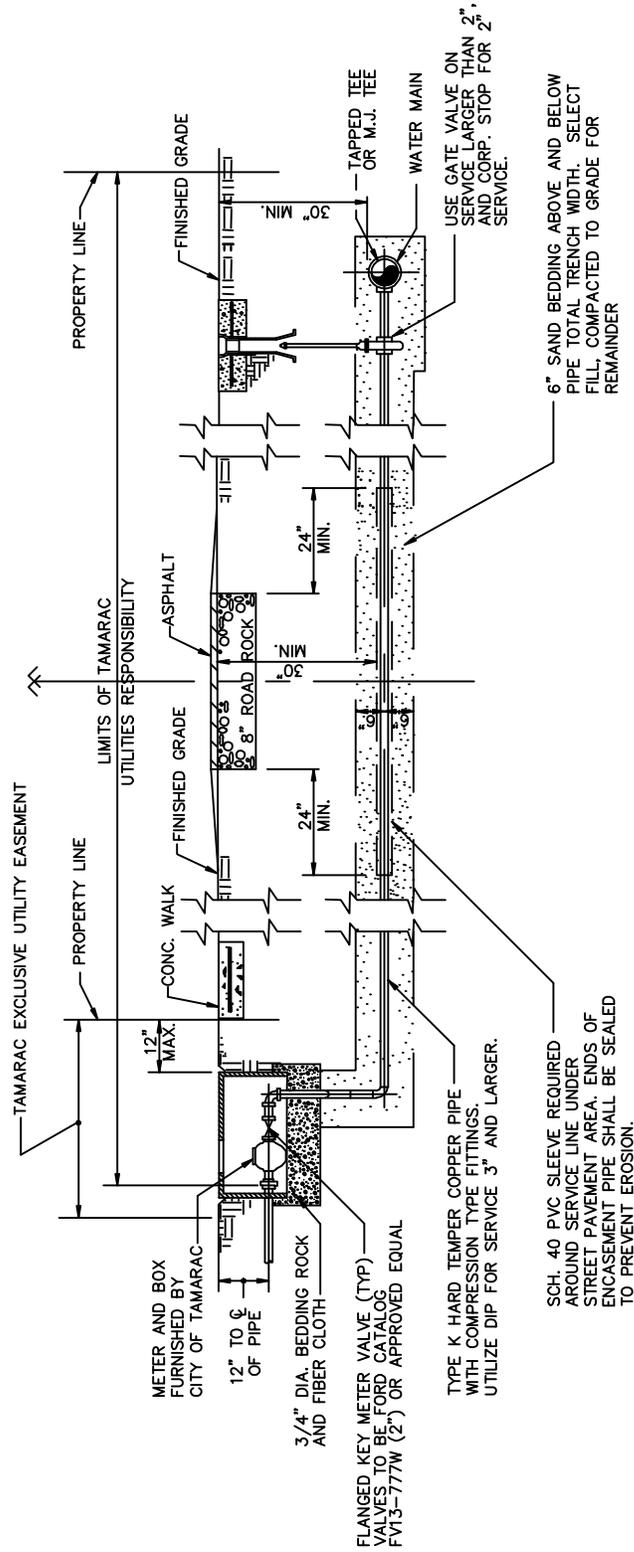
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TYPICAL 1" AND 1 1/2" SERVICE - WATER

Seal:

**STANDARD DETAILS**

FIGURE WAT-4



**TYPICAL 2" & UP SERVICE**

REVISIONS		
No.	Date	Description

Date: 4/20/09

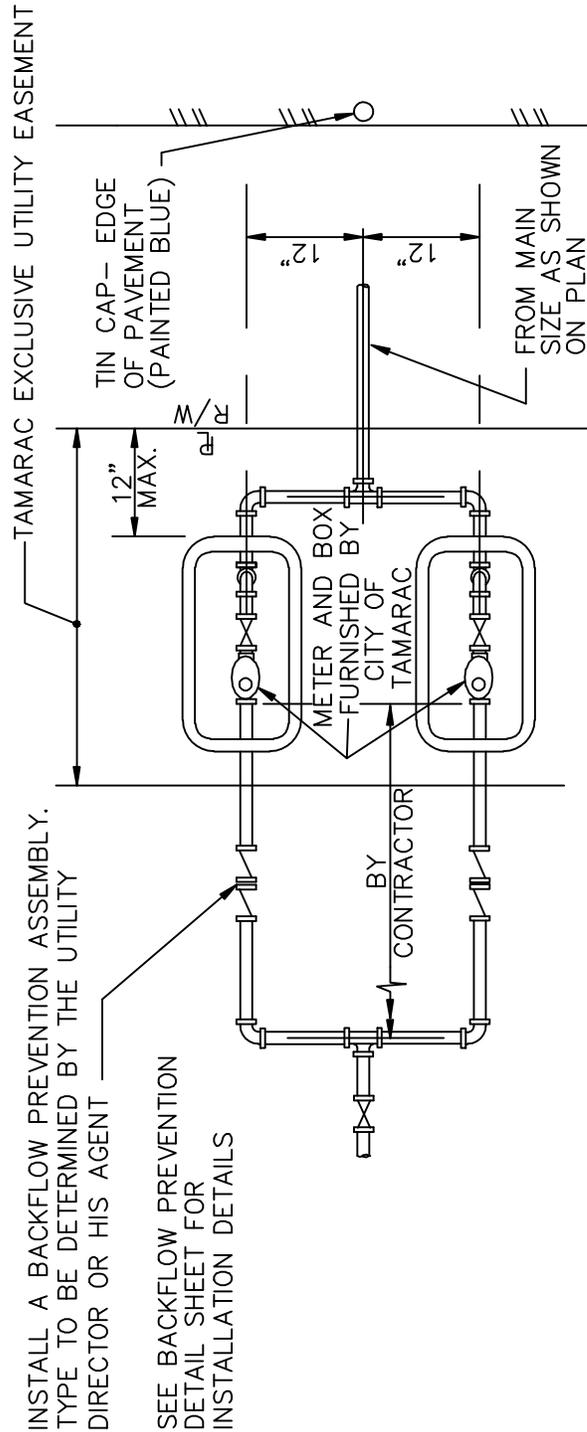
Seal:

TYPICAL 2" AND/OR LARGER SERVICE - WATER

**STANDARD DETAILS**

FIGURE WAT-5

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA



**TYPICAL MULTIPLE SERVICE**

INSTALL A BACKFLOW PREVENTION ASSEMBLY.  
 TYPE TO BE DETERMINED BY THE UTILITY  
 DIRECTOR OR HIS AGENT

SEE BACKFLOW PREVENTION  
 DETAIL SHEET FOR  
 INSTALLATION DETAILS

REVISIONS		
No.	Date	Description

Date: 4/20/09

**TYPICAL MULTIPLE  
 SERVICE - WATER**

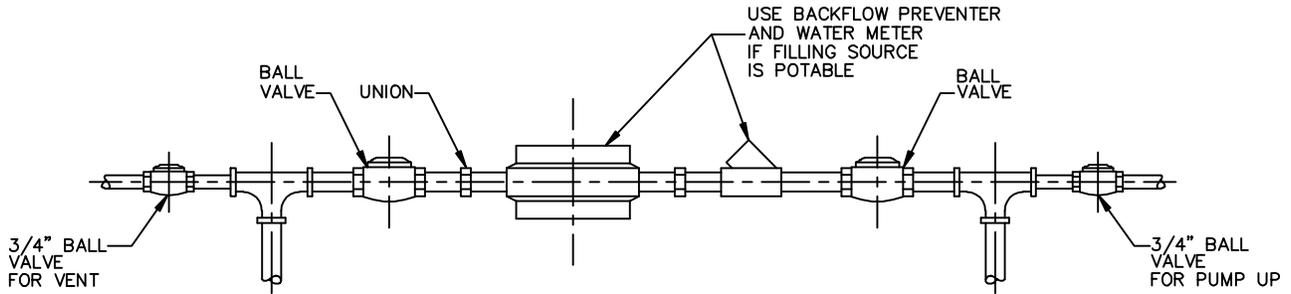
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**STANDARD DETAILS**

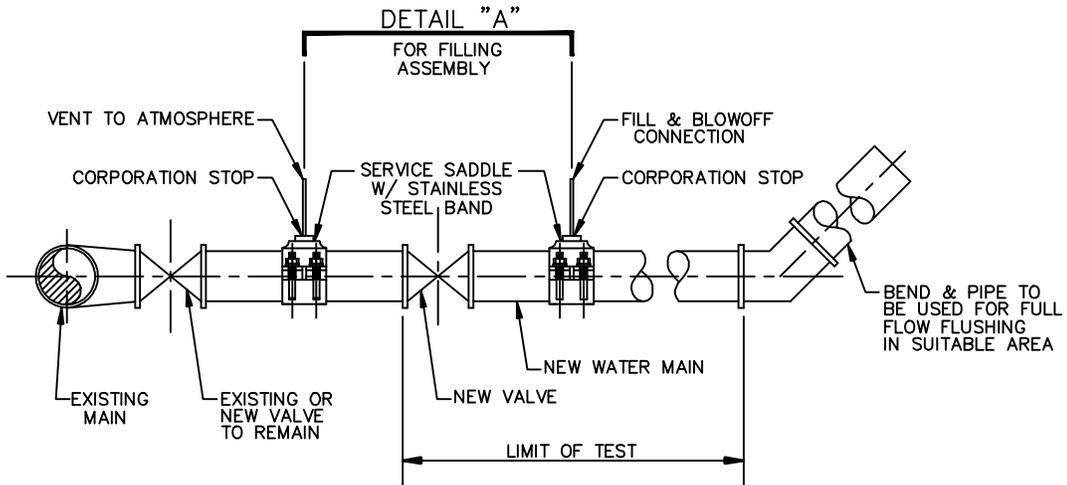
FIGURE WAT-6

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA





**DETAIL "A"**



**NOTES :**

1. REMOVE TEMPORARY CONNECTION AT CORPORATION STOPS ON NEW MAIN AFTER FILLING, FLUSHING, AND TESTING HAS BEEN COMPLETED.
2. COMPLY WITH ALL BROWARD COUNTY PUBLIC HEALTH UNIT REGULATIONS.
3. PROVIDE ALL NECESSARY RESTRAINED JOINTS.
4. NEW VALVE MAY BE REMOVED AT THE UTILITY'S OPTION.

**FILLING & FLUSHING CONNECTION**

REVISIONS			
No.	Date	Description	By

Date: 4/20/09

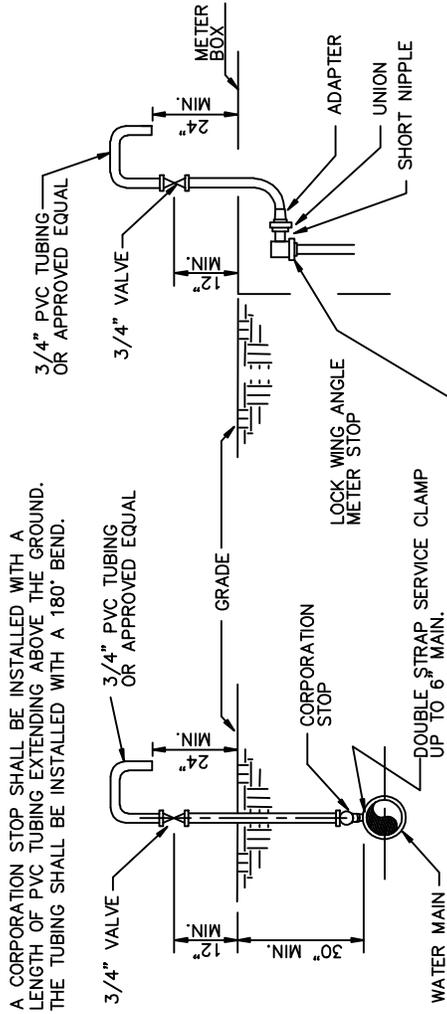
FILLING AND FLUSHING CONNECTION

Seal:

**STANDARD DETAILS**

FIGURE WAT-8

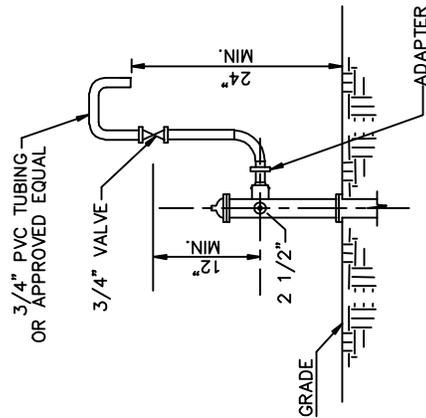
CITY OF TAMARAC, BROWARD COUNTY, FLORIDA



**BACTERIOLOGICAL SAMPLING POINT**

**NOTE**

SAMPLING POINTS SHALL BE INSTALLED AND LATER REMOVED BY THE CONTRACTOR AFTER CLEARANCE OF WATER SAMPLES BY BROWARD COUNTY HEALTH DEPARTMENT.



REVISIONS		
No.	Date	Remarks

Date: 4/20/09

Seal:

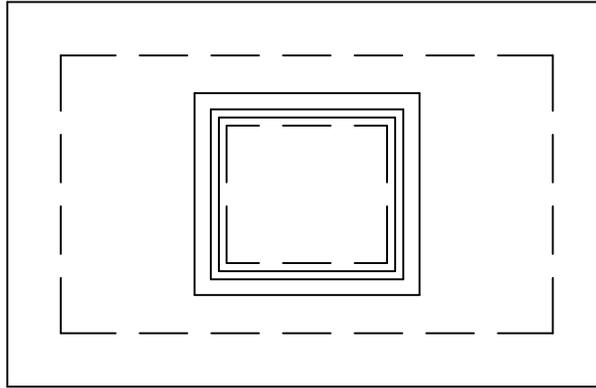
BACTERIOLOGICAL SAMPLING POINT

**STANDARD DETAILS**

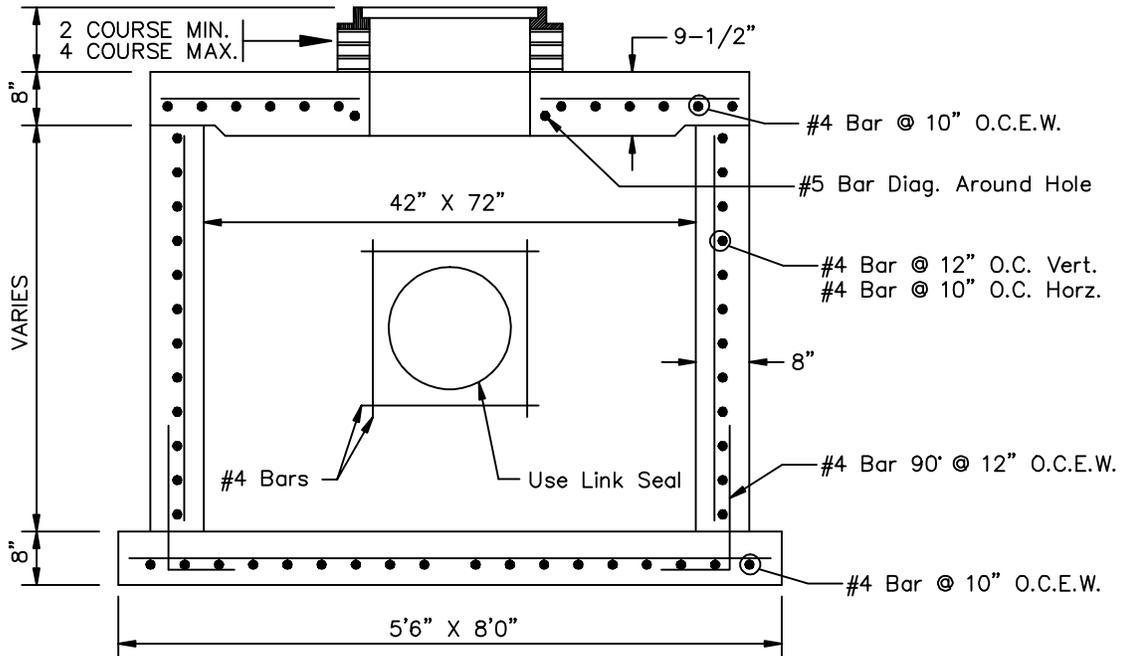
FIGURE WAT-9

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA





CASTING: USF 4130 W/SOLID COVER  
 BRICK: 2 COURSE MIN. 4 COURSE MAX.



ALL CONCRETE 4000 PSI IN 28 DAYS  
 ALL REBAR GRADE 60

INCLUDE PIPE IN DRAWING

NOTE: USE DIP CASING ADEQUATELY SIZED TO ALLOW A BELL TO PASS THROUGH IT.  
 PIPE LINER FOR DIP CASING SHOULD BE COMPATIBLE WITH THE PIPE BEING CROSSED.

**TYPE "J" CONFLICT BOX**

REVISIONS		
No.	Date	Remarks

Date: 4/20/09

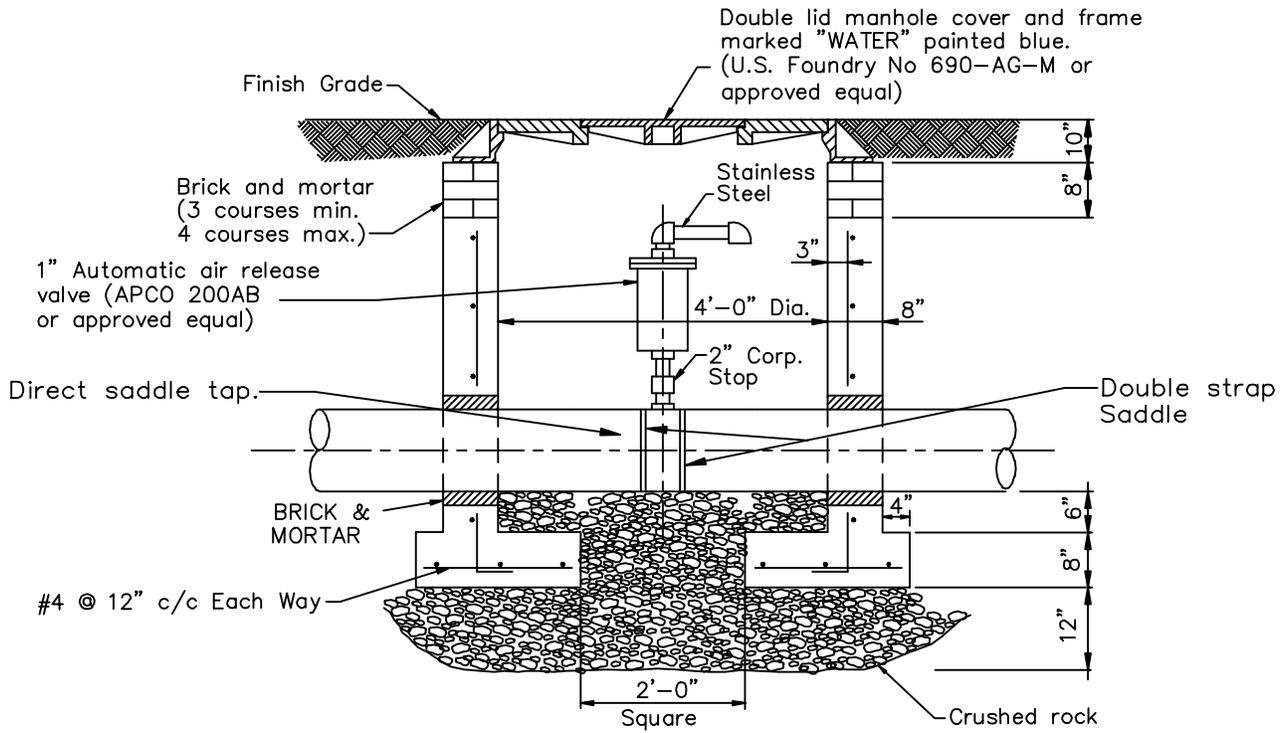
Seal:

TYPE "J"  
 CONFLICT BOX

**STANDARD DETAILS**

FIGURE WAT-11

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA



SECTION

WATER AIR RELEASE VALVE  
WITH MANHOLE

REVISIONS		
No.	Date	Description

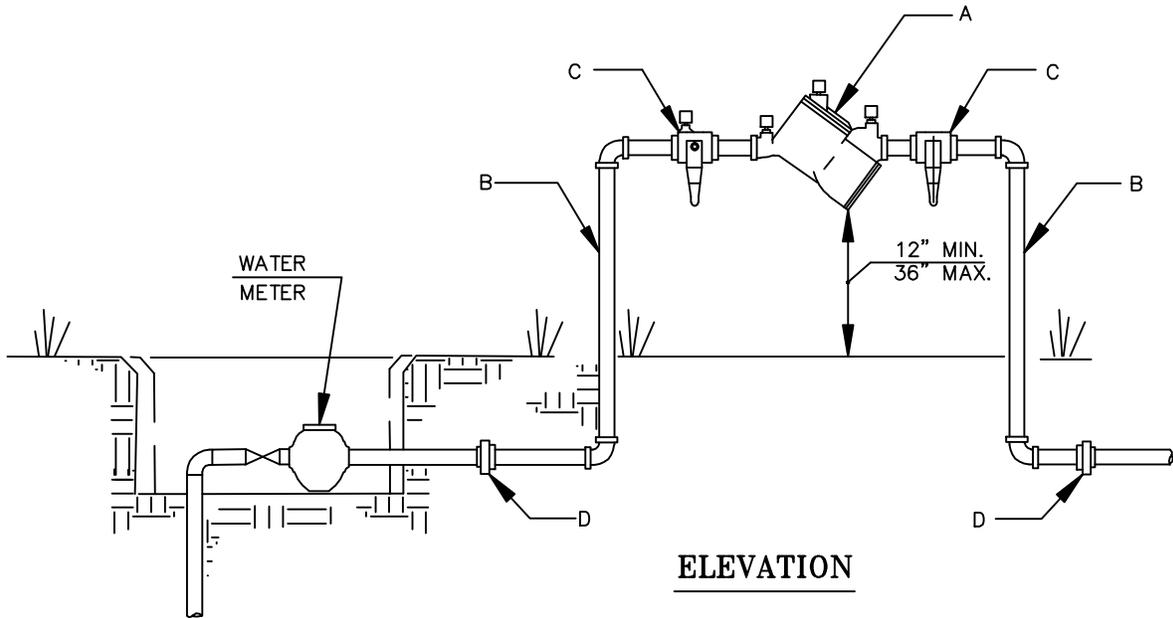
Date: 4/20/09

Seal:

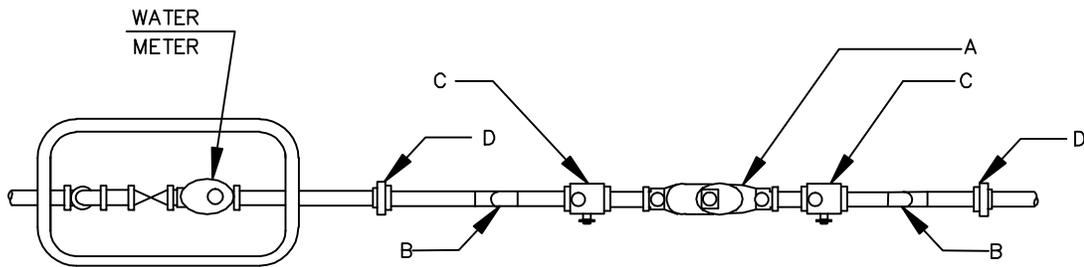
WATER AIR RELEASE VALVE WITH MANHOLE

**STANDARD DETAILS**

FIGURE WAT-12  
 CITY OF TAMARAC, BROWARD COUNTY, FLORIDA



**ELEVATION**



**PLAN**

**DOUBLE CHECK VALVE ASSEMBLY**  
3/4" TO 2"

- A = REDUCED PRESSURE OR DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY, WITH BALL VALVES, AS PROVIDED BY MANUFACTURERS.
- B = RISER SHALL BE COPPER PIPE, TYPE K – HARD TEMPER, OR AS APPROVED BY THE CITY PLUMBING INSPECTOR OF APPROPRIATE SIZE.
- C = SHUT-OFF VALVES
- D = COPPER RISERS SHALL BE JOINED TO THE WATER LINE ON THE HORIZONTAL RUN. IF THE WATER LINE IS OTHER THAN PVC OR COPPER, A DIELECTRIC COUPLING WILL BE USED TO PREVENT ELECTROLYSIS.

REVISIONS		
No.	Date	Description

Date: 4/20/09

DOUBLE CHECK VALVE ASSEMBLY  
 3/4" TO 2"

Seal:

**STANDARD DETAILS**

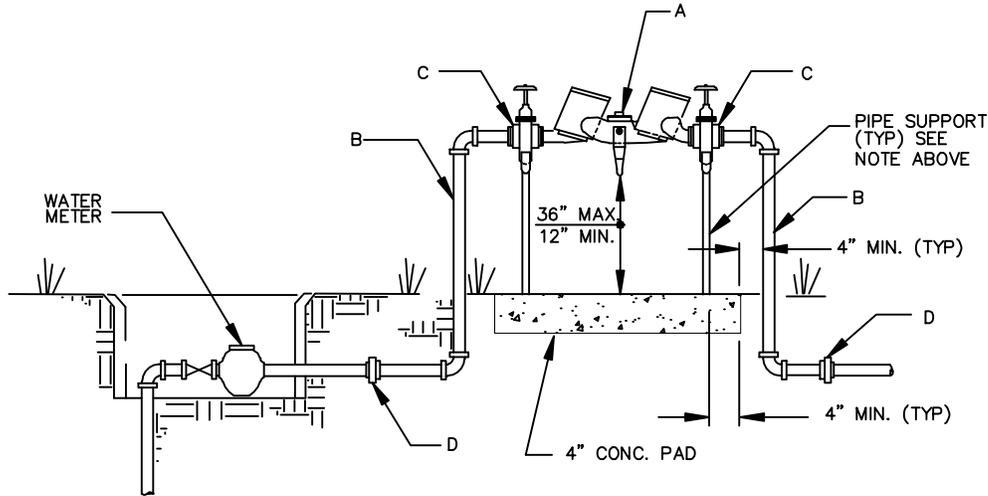
FIGURE WAT-14

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA

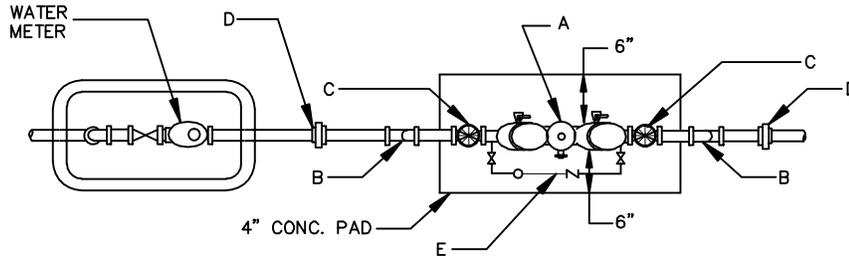


BACKFLOW PREVENTION ASSEMBLIES LARGER THAN 2" DIAMETER SHALL BE SUPPORTED BY PIPE SUPPORTS EMBEDDED IN A CONCRETE PAD. CONCRETE PAD WILL BE SIZED TO COVER THE GROUND AREA BETWEEN THE RISERS, FOUR (4) INCHES FROM EACH RISER, AND SIX (6) INCHES BEYOND THE VERTICAL LINE OF THE ASSEMBLY ITSELF.

PIPE SUPPORTS WILL BE MADE TO CRADLE THE VALVE ON EACH SIDE OF THE CHECK VALVES, WITHOUT INTERFERING WITH THE INSERTION OR REMOVAL OF THE BOLTS ON THE FLANGES.



**ELEVATION**



**PLAN**

**REDUCED PRESSURE ASSEMBLY**  
**DETECTOR REDUCED PRESSURE ASSEMBLY**  
**2 1/2" AND ABOVE**

- A = REDUCED PRESSURE ASSEMBLY OR DOUBLE CHECK VALVE ASSEMBLY, WITH OS & Y VALVES AS PROVIDED BY MANUFACTURER.
- B = RISER SHALL BE COPPER PIPE, TYPE K - HARD TEMPER, DUCTILE IRON, OR AS APPROVED BY THE CITY PLUMBING INSPECTOR.
- C = SHUT-OFF VALVES
- D = RISER SHALL BE JOINED TO THE WATER LINE ON THE HORIZONTAL RUN. IF DISSIMILAR METALS ARE INVOLVED, A DIELECTRIC COUPLING WILL BE USED TO PREVENT ELECTROLYSIS.
- E = METER ASSEMBLY ONLY FOR USE ON DETECTOR DOUBLE CHECK VALVE ASSEMBLY AND DETECTOR REDUCED PRESSURE ASSEMBLY USED FOR FIRE PROTECTION BACKFLOW PREVENTION.

REVISIONS		
No.	Date	Description

Date: 4/20/09

Seal:

REDUCED PRESSURE ASSEMBLY  
 DETECTOR REDUCED PRESSURE ASSEMBLY  
 2 1/2" AND ABOVE

**STANDARD DETAILS**

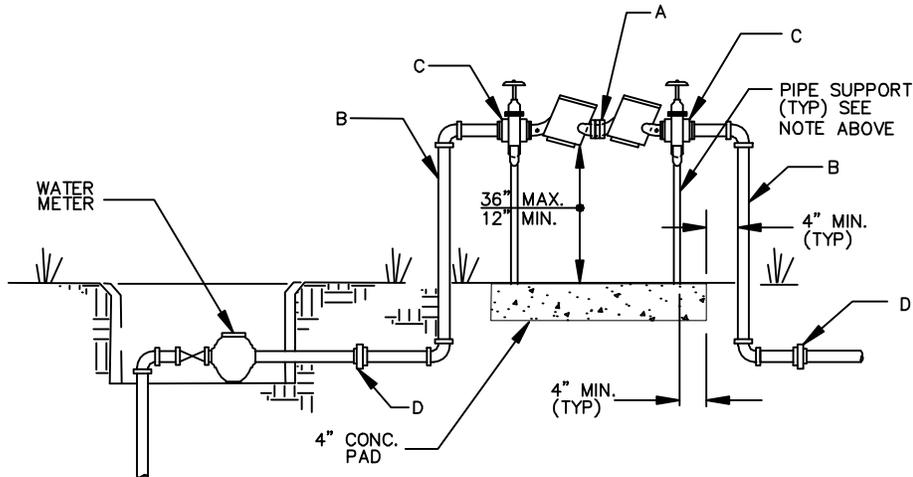
FIGURE WAT-15

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA

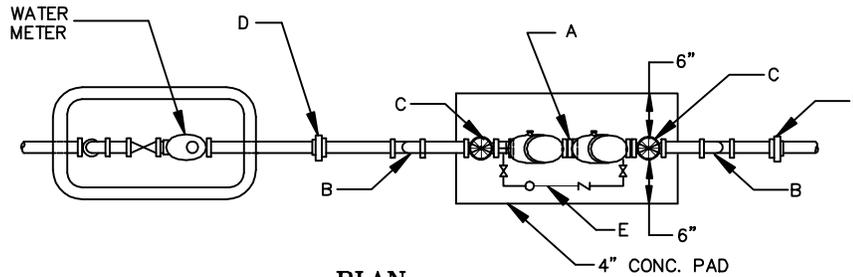


BACKFLOW PREVENTION ASSEMBLIES LARGER THAN 2" DIAMETER SHALL BE SUPPORTED BY PIPE SUPPORTS EMBEDDED IN A CONCRETE PAD. CONCRETE PAD WILL BE SIZED TO COVER THE GROUND AREA BETWEEN THE RISERS, FOUR (4) INCHES FROM EACH RISER, AND SIX (6) INCHES BEYOND THE VERTICAL LINE OF THE ASSEMBLY ITSELF.

PIPE SUPPORTS WILL BE MADE TO CRADLE THE VALVE ON EACH SIDE OF THE CHECK VALVES, WITHOUT INTERFERING WITH THE INSERTION OR REMOVAL OF THE BOLTS ON THE FLANGES.



**ELEVATION**



**PLAN**

**DOUBLE CHECK VALVE ASSEMBLY**  
**DETECTOR DOUBLE CHECK VALVE ASSEMBLY**  
**2 1/2" AND ABOVE**

- A = REDUCED PRESSURE ASSEMBLY OR DOUBLE CHECK VALVE ASSEMBLY, WITH OS & Y VALVES AS PROVIDED BY MANUFACTURER.
- B = RISER SHALL BE COPPER PIPE, TYPE K - HARD TEMPER, DUCTILE IRON, OR AS APPROVED BY THE CITY PLUMBING INSPECTOR.
- C = SHUT-OFF VALVES
- D = RISER SHALL BE JOINED TO THE WATER LINE ON THE HORIZONTAL RUN. IF DISSIMILAR METALS ARE INVOLVED, A DIELECTRIC COUPLING WILL BE USED TO PREVENT ELECTROLYSIS.
- E = METER ASSEMBLY ONLY FOR USE ON DETECTOR DOUBLE CHECK VALVE ASSEMBLY AND DETECTOR REDUCED PRESSURE ASSEMBLY USED FOR FIRE PROTECTION BACKFLOW PREVENTION.

REVISIONS		
No.	Date	Remarks

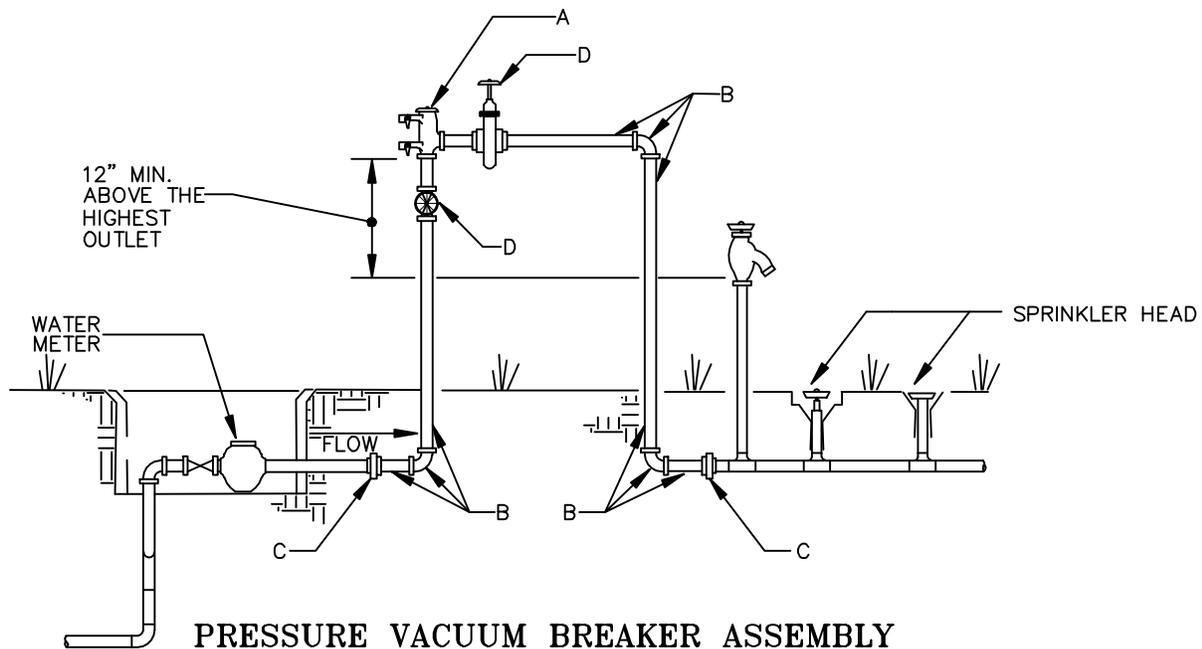
Date: 4/20/09  
 Seal:  
 DOUBLE CHECK VALVE ASSEMBLY  
 DETECTOR CHECK VALVE  
 2 1/2" AND ABOVE

Seal:

**STANDARD DETAILS**

FIGURE WAT-16  
 CITY OF TAMARAC, BROWARD COUNTY, FLORIDA

- A = PRESSURE VACUUM BREAKER OR ATMOSPHERIC VACUUM BREAKER.
- B = RISER SHALL BE COPPER PIPE, TYPE K – HARD TEMPER, OR AS APPROVED BY THE CITY PLUMBING INSPECTOR OF APPROPRIATE SIZE.
- C = COPPER RISER SHALL BE JOINED TO THE WATER LINE ON THE HORIZONTAL RUN. IF THE WATER LINE IS OTHER THAN PVC OR COPPER, A DIELECTRIC COUPLING WILL BE USED TO PREVENT ELECTROLYSIS.
- D = SHUT-OFF VALVES



**PRESSURE VACUUM BREAKER ASSEMBLY**  
**ALL SIZES**

PRESSURE VACUUM BREAKER ASSEMBLIES SHALL BE INSTALLED SO THAT THE LOWEST END OF THE ASSEMBLY WILL BE NO LESS THAN TWELVE (12) INCHES ABOVE THE HIGHEST DOWNSTREAM OUTLET.

ATMOSPHERIC VACUUM BREAKER ASSEMBLIES SHALL BE INSTALLED SO THAT THE LOWEST END OF THE ASSEMBLY WILL BE NO LESS THAN SIX (6) INCHES ABOVE THE HIGHEST DOWNSTREAM OUTLET

NO VALVE OR OTHER MEANS OF SHUT-OFF WILL BE PERMITTED DOWNSTREAM OF ANY ATMOSPHERIC VACUUM BREAKER ASSEMBLY.

SHUT-OFF VALVES MAY BE INSTALLED DOWNSTREAM OF A PRESSURE VACUUM BREAKER ASSEMBLY.

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Date: 4/20/09

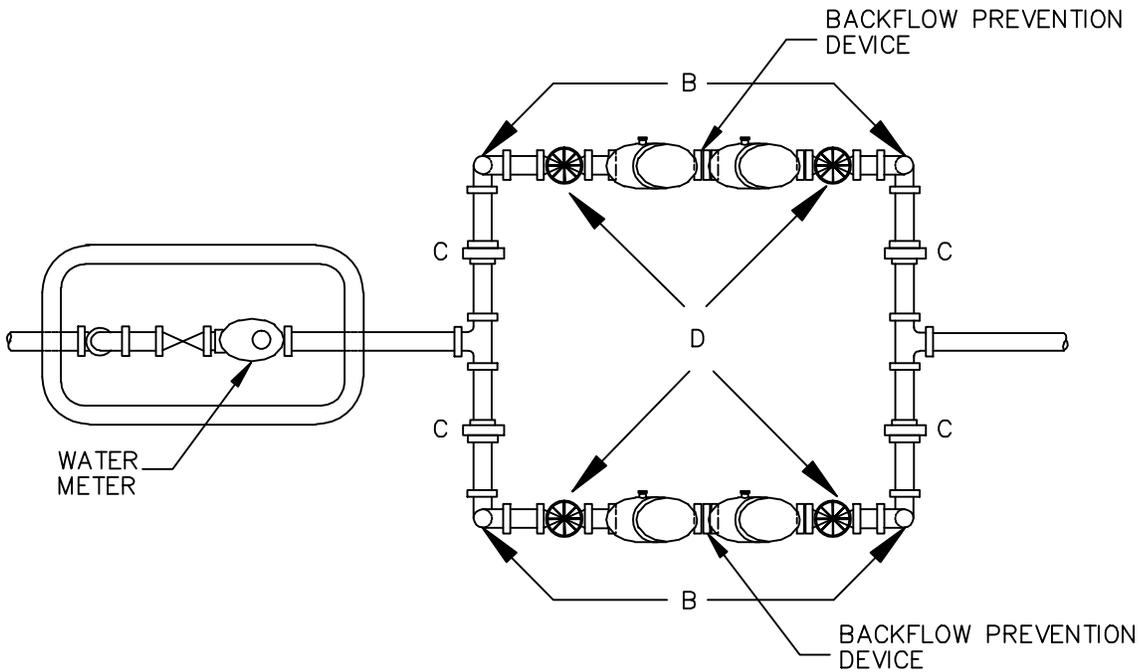
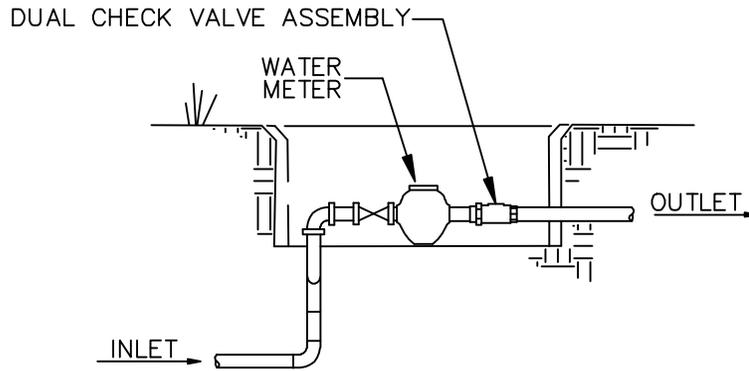
**PRESSURE VACUUM  
 BREAKER ASSEMBLY**

Seal:

**STANDARD DETAILS**

*FIGURE WAT-17*

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA



**DUAL CHECK VALVE ASSEMBLY**

DUAL BACKFLOW PREVENTION ASSEMBLIES ARE RECOMMENDED FOR THOSE ESTABLISHMENTS THAT CANNOT AFFORD TO BE WITHOUT WATER WHILE BACKFLOW PREVENTION ASSEMBLIES ARE BEING TESTED OR REPAIRED. (MEDICAL OFFICES, BEAUTY PARLORS, LAUNDROMATS, CAR WASHES, DRY CLEANERS, HOSPITALS, AND DENTAL OFFICES).  
 DUAL BACKFLOW PREVENTION ASSEMBLIES (DC OR RP) SHALL BE COMPRISED OF DEVICES WITH THE SAME MANUFACTURER, MODEL AND SIZE.

REVISIONS		
No.	Date	Description

Date: 4/20/09

**DUAL CHECK VALVE ASSEMBLY**

Seal:

**STANDARD DETAILS**

*FIGURE WAT-18*  
 CITY OF TAMARAC, BROWARD COUNTY, FLORIDA



**BACKFLOW  
 GENERAL NOTES**

1. THE TYPE OF BACKFLOW PREVENTION ASSEMBLY TO BE INSTALLED AT ANY GIVEN LOCATION WILL BE DETERMINED AT THE BUILDING PLAN REVIEW, IN ACCORDANCE WITH THE GUIDELINES SET DOWN BY THE AMERICAN WATER WORKS ASSOCIATION. INSTALLATION OF BACKFLOW PREVENTION ASSEMBLIES ON THE NEW CONSTRUCTION WILL BE ACCOMPLISHED AT TIME OF METER INSTALLATION.
2. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE INSTALLED DOWNSTREAM OF AND IMMEDIATELY ADJACENT TO THE WATER METER, VARIANCES TO THIS RULE WILL BE GRANTED ONLY BY THE DIRECTOR OF UTILITIES OR HIS DESIGNATED REPRESENTATIVE.
3. ON THE SERVICE LINE THERE MUST BE NO OUTLET, TEE, TAP, OR CONNECTION OF ANY SORT TO OR FROM THE SUPPLY PIPE LINE BETWEEN THE METER AND THE PROTECTIVE ASSEMBLY.
4. ALL REDUCED PRESSURE ASSEMBLIES SHALL CONFORM TO AWWA STANDARD C511, LATEST REVISION. DOUBLE CHECK VALVE ASSEMBLIES SHALL CONFORM TO AWWA STANDARD C510, LATEST REVISION.
5. DETECTOR DOUBLE CHECK VALVE ASSEMBLIES AND DETECTOR REDUCED PRESSURE ASSEMBLIES USED FOR FIRE PREVENTION SHALL CONFORM TO ASSE STANDARD 1048, LATEST REVISION.
6. PRESSURE VACUUM BREAKER ASSEMBLIES SHALL CONFORM TO ASSE STANDARD 1020, LATEST REVISION.
7. DUAL CHECK VALVE ASSEMBLIES SHALL CONFORM TO ASSE STANDARD 1024, LATEST REVISION.
8. DUAL CHECK VALVE ASSEMBLIES WILL BE INSTALLED IN THE METER BOX ON THE DOWNSTREAM SIDE OF ALL 5/8" AND 1" METERS FOR NEW SINGLE FAMILY SERVICES. ALL BACKFLOW PREVENTER ASSEMBLIES SHALL BE INSTALLED BY OWNER'S PLUMBER WHO MUST HAVE A TAMARAC BUILDING DEPARTMENT PERMIT.
9. ALL PERMANENT INSTALLATIONS, OTHER THAN THE DUAL CHECK VALVE SHALL HAVE A MINIMUM OF TWENTY-FOUR (24) INCHES HORIZONTAL CLEARANCE ON THE TESTING SIDE OF THE ASSEMBLY, AND TWELVE (12) INCHES ON THE OPPOSITE SIDE, FROM ANY WALL OR STRUCTURE, TO FACILITATE TESTING, MAINTENANCE, OR REMOVAL.
10. NO TREES, SHRUBS, BUSHES, ETC., SHALL BE PLANTED WITHIN THREE (3) FEET OF ANY BACKFLOW PREVENTION ASSEMBLY. BRANCHES OR LIMBS OF NEARBY PLANTINGS WILL NOT BE ALLOWED TO GROW WITHIN THREE (3) FEET OF ANY BACKFLOW PREVENTION ASSEMBLY.
11. DIMENSIONS AND WEIGHTS OF VARIOUS ASSEMBLIES CAN BE OBTAINED FROM MANUFACTURER'S SPECIFICATIONS.
12. WHERE MORE THAN ONE METER IS REQUIRED FOR SERVICE, A BACKFLOW PREVENTION ASSEMBLY SHALL BE REQUIRED FOR EACH METER.
13. INSTALLATION SHALL BE IN ACCORDANCE WITH FLORIDA BUILDING CODE AND MANUFACTURER'S RECOMMENDED INSTALLATION INSTRUCTIONS.
14. ALL REDUCED PRESSURE AND DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLIES SHALL BE SUPPORTED AND SECURED PROPERLY ACCORDING TO FLORIDA BUILDING CODE AND MANUFACTURER'S STANDARDS.
15. 4" G.S.P. GUARD POSTS FILLED WITH CONCRETE ARE REQUIRED WHEN AN ASSEMBLY IS WITHIN 5' OF ANY PAVED SURFACE. MULTIPLE POSTS ARE TO BE SPACED NO MORE THAN 5' APART.

REVISIONS			
No.	Date	Remarks	By

Date: 4/20/09

**BACKFLOW  
 GENERAL NOTES**

Seal:

**STANDARD DETAILS**

*FIGURE WAT-19*

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA



**GENERAL NOTES**

1. THE CITY OF TAMARAC WILL HOLD A PRE-CONSTRUCTION MEETING PRIOR TO THE START OF ANY PROJECT. IT SHALL INCLUDE A REPRESENTATIVE OF THE CITY OF TAMARAC UTILITIES ENGINEERING DIVISION, THE ENGINEER OF RECORD, THE CONTRACTOR, AND ANY OTHER APPLICABLE AGENCY.
2. ALL MATERIAL, INSTALLATION, TESTING AND SPECIFICATIONS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF TAMARAC CURRENT STANDARDS. WHERE DISCREPANCIES OMISSIONS OR MODIFICATIONS EXIST BETWEEN THE PLANS AND THE CITY OF TAMARAC MINIMUM CONSTRUCTION SPECIFICATIONS, THE CITY OF TAMARAC SPECIFICATIONS SHALL GOVERN.
3. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. ALL INSTALLATIONS SHALL BE MADE IN SUCH A MANNER AS NOT TO INTERFERE WITH EXISTING OR FUTURE UTILITIES, DRAINAGE OR ROADWAY CONSTRUCTION.
4. ALL DIP SHALL BE PRESSURE CLASS 350 OR HIGHER. ADEQUATE PROTECTIVE MEASURES AGAINST CORROSION SHALL BE USED AS DETERMINED BY THE ENGINEER OF RECORD OR IN ACCORDANCE WITH GOOD ENGINEERING PROCEDURES.
5. ALL PAVEMENT RESTORATION TO BE MADE IN ACCORDANCE WITH THE CITY, COUNTY OR STATE OF FLORIDA DOT SPECIFICATIONS, WHERE APPLICABLE.
6. COMPLETE "AS-BUILT" INFORMATION RELATIVE TO MANHOLES, VALVES, SERVICES, FITTINGS, LENGTH OF PIPE, AND THE LIKE, SHALL BE ACCURATELY RECORDED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE OF THE WORK. ALL ELEVATIONS SHALL BE TAKEN BY AN INDEPENDENT LICENSED STATE OF FLORIDA REGISTERED SURVEYOR AND SHOWN ON "AS-BUILT" PLANS SEALED BY SURVEYOR AND ENGINEER OF RECORD.  
 BASE LINES FOR "AS-BUILTS" SHALL BE TAKEN FROM PERMANENT, EASY TO LOCATE, PHYSICAL STRUCTURES, SUCH AS MANHOLES, CATCH BASINS, ETC.
7. TRENCH TO BE DE-WATERED TO ENABLE PIPE AND APPURTENANCES TO BE INSTALLED FREE OF WATER AND DEBRIS. IF PIPE BED IS ROCK, PIPE BED SHALL BE EXCAVATED AN EXTRA 6" AND BACKFILLED WITH 3/4" WASHED ROCK. AT THE END OF THE DAY ALL PIPE ENDINGS MUST BE PROPERLY SECURED TO PREVENT ANY MUD, ANIMALS, OR DEBRIS FROM ENTERING.
8. ALL REFLECTORS TO BE PLACED IN THE CENTER OF THE LANE CLOSEST TO THE FIRE HYDRANT AND/OR VALVE. USE BLUE REFLECTORS FOR FIRE HYDRANT AND WHITE FOR VALVES.
9. NO VALVES, METERS, FIRE HYDRANTS, CLEANOUTS, MANHOLES OR OTHER UTILITY APPURTENANCES ARE TO BE PLACED IN, OR ADJACENT TO, SIDEWALKS, CURBS, PARKING SPACES OR OTHER SUCH SITE FEATURES SO AS TO PRESENT A HAZARD OR RESTRICT THE MAINTENANCE OR OPERATION OF THE UTILITY INFRASTRUCTURE.
10. HEAVY LANDSCAPE, WALLS, FENCES, SIDEWALKS, ENTRANCE FEATURES, BERMS AND SIGNS, ETC. THAT MAY INTERFERE WITH THE INSTALLATION AND MAINTENANCE OF UTILITIES SHALL NOT BE PLACED WITHIN A UTILITY EASEMENT OR WITHIN 7 1/2 FEET OF A WATER MAIN, FIRE HYDRANT OR FORCEMAIN , OR WITHIN 10 FEET OF A SANITARY OR STORM SEWER.
11. WORK PERFORMED UNDER ALL PROJECTS WILL NOT BE CONSIDERED AS COMPLETE UNTIL THE FOLLOWING DOCUMENTS/AGREEMENTS ARE RECEIVED AND APPROVED BY THE CITY OF TAMARAC UTILITIES ENGINEERING DIVISION.
  - A) ALL EASEMENT DOCUMENTS; TO INCLUDE:
    - a. PUBLIC UTILITY EASEMENT
    - b. BLANKET PUBLIC SAFETY INGRESS/EGRESS EASEMENT
    - c. TAMARAC EXCLUSIVE WATER AND SEWER UTILITY EASEMENT
    - d. UTILITY EASEMENT ENCROACHMENT AND HOLD HARMLESS AGREEMENT
  - B) HRS CLEARANCE CERTIFICATIONS
  - C) DPEP CLEARANCE CERTIFICATIONS
  - D) CERTIFIED ACTUAL COST
  - E) BILL OF SALE ABSOLUTE
  - F) ACCEPTANCE OF WARRANTY BOND (25% OF CERTIFIED ACTUAL COST)
  - G) AS-BUILT DRAWINGS (ONE MYLAR COPY AND TWO PAPER COPIES)  
 AS-BUILT DRAWINGS TO INCLUDE FLORIDA STATE PLANE COORDINATES NAD-1983 WITH 1990 ADJUSTMENT.
  - H) AS-BUILT DRAWINGS ON CAD DISK.

REVISIONS		
No.	Date	Remarks

Date: 4/20/09

**WATER  
GENERAL NOTES**

Seal:

**STANDARD DETAILS**

FIGURE WAT-20

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA



**WATER NOTES**

1. PIPE:

WATER MAINS AND/OR SEWER FORCE MAINS SHALL BE EITHER POLYVINYL CHLORIDE (PVC) C-900 OR DUCTILE IRON PIPE (DIP).

A. 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 12454-A OR 12454-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.

B. DUCTILE IRON PIPE (DIP) SHALL CONFORM TO ANSI/AWWA C151/A21.51-02 (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.

2. ALL WATER MAIN INSTALLATIONS SHALL COMPLY WITH THE REQUIREMENTS OF CHAPTER 62-555.320, FAC.

A.- ALL WATER MAIN PIPE, INCLUDING FITTINGS, INSTALLED ON OR AFTER AUGUST 28, 2003, EXCEPT PIPE INSTALLED UNDER A CONSTRUCTION PERMIT FOR WHICH THE HEALTH DEPARTMENT RECEIVED A COMPLETE APPLICATION BEFORE AUGUST 28, 2003, SHALL BE COLOR CODED OR MARKED USING BLUE AS A PREDOMINANT COLOR TO DIFFERENTIATE DRINKING WATER FROM RECLAIMED OR OTHER WATER. UNDERGROUND PLASTIC PIPE SHALL BE SOLID-WALL BLUE PIPE, SHALL HAVE A CO-EXTRUDED BLUE EXTERNAL SKIN, OR SHALL BE WHITE OR BLACK PIPE WITH BLUE STRIPES INCORPORATED INTO, OR APPLIED TO, THE PIPE WALL; AND UNDERGROUND METAL OR CONCRETE PIPE SHALL HAVE BLUE STRIPES APPLIED TO THE PIPE WALL. PIPE STRIPED DURING MANUFACTURING OF THE PIPE SHALL HAVE CONTINUOUS STRIPES THAT RUN PARALLEL TO THE AXIS OF THE PIPE, THAT ARE LOCATED AT NO GREATER THAN 90-DEGREE INTERVALS AROUND THE PIPE, AND THAT WILL REMAIN INTACT DURING AND AFTER INSTALLATION OF THE PIPE. IF TAPE OR PAINT IS USED TO STRIPE PIPE DURING INSTALLATION OF THE PIPE, THE TAPE OR PAINT SHALL BE APPLIED IN A CONTINUOUS LINE THAT RUNS PARALLEL TO THE AXIS OF THE PIPE AND THAT IS LOCATED ALONG THE TOP OF THE PIPE; FOR PIPES WITH AN INTERNAL DIAMETER OF 24 INCHES OR GREATER, TAPE OR PAINT SHALL BE APPLIED IN CONTINUOUS LINES ALONG EACH SIDE OF THE PIPE AS WELL AS ALONG THE TOP OF THE PIPE. ABOVEGROUND PIPE AT DRINKING WATER TREATMENT PLANTS SHALL BE COLOR CODED AND LABELED IN ACCORDANCE WITH SUBSECTION 62-555.320(10), F.A.C., AND ALL OTHER ABOVEGROUND PIPE SHALL BE PAINTED BLUE OR SHALL BE COLOR CODED OR MARKED LIKE UNDERGROUND PIPE.

3. ALL MECHANICAL JOINT DUCTILE IRON FITTINGS SHALL BE AS PER ANSI/AWWA C153/A21.53-00 (LATEST REVISION) WITH A 350 PSI RATING.

ALL FITTINGS SHALL BE CEMENT LINED AND SEAL COATED THE SAME AS DUCTILE IRON PIPE.

4. ALL POTABLE WATER SERVICE LINES UP TO 1 1/2 INCH 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 C901-02 (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.

REVISIONS		
No.	Date	Remarks

Date: 4/20/09

By

WATER NOTES

Seal:

**STANDARD DETAILS**

FIGURE WAT-21

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA



**WATER NOTES**

- 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, MUELLER, 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. TAG 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.

- WHERE 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.

- THE 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).

- THE 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  $L=SD \sqrt{P} / 133,200$ ; 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).

REVISIONS			
No.	Date	Remarks	By

Date: 4/20/09

WATER NOTES

Seal:

**STANDARD DETAILS**

*FIGURE WAT-21a*

CITY OF TAMARAC, BROWARD COUNTY, FLORIDA

