

**SECTION UC-800**  
**Reclaimed Water System Design and Construction Specifications**

**PART 1 GENERAL**

**1.01 Background and General Information**

- A. These specifications cover the design, plans, specifications, installation, inspection, testing and acceptance of reclaimed water distribution systems, reclaimed water transmission main extensions, and all appurtenant items which are to be owned and maintained by the Miami-Dade Water and Sewer Department. This includes developer-built on-site reclaimed water distribution systems in residential subdivisions and commercial developments, off-site transmission main extensions to development sites, and on-site requirements for large reclaimed water users.
- B. Reclaimed water shall be used, when available, to accomplish irrigation needs and other approved uses that do not require potable water. Use of reclaimed water shall be in accordance with the most current edition of "Chapter 62-610, Reuse of Reclaimed Water and Land Application, Part III, FAC" and the Miami-Dade Water and Sewer Department's "Design and Construction Standard Specifications and Details". Reclaimed water facilities shall be completely independent of all potable water, raw water supply, wastewater, and storm water systems.
- C. Please refer to the General Notes in RGN-1.0 .

**1.02 Requirements for Use**

- A. Based on property location, surrounding utilities, available capacity, future reclaimed water system expansion plans, and the criteria contained herein, the County will evaluate all new developments to determine if the use of reclaimed water is appropriate. The Miami-Dade Water and Sewer Department (hereafter; the "Department" or "MDWASD") will review the existing and the proposed reclaimed water system characteristics to determine if the new connection to the reclaimed water system represents a benefit to the community as a whole.
- B. Upon completion of the evaluation, Miami-Dade County (hereafter; the "County") shall have the authority to require the development, including all individual lots and tracts therein, to connect to the reclaimed water system for all landscaped and sodded areas of the development that are planned to be irrigated by the Developer. The Developer shall be responsible for all costs necessary to provide onsite distribution and offsite transmission required to serve the irrigation needs of the development.
- C. Reclaimed water use shall be a condition of all development approvals granted as of the publicly published date of these standards provided that service is available, and adequate capacity (flow and pressure) will exist in the County's reclaimed water facilities to service the development, as determined by the Director of MDWASD and as set forth by the following criteria.

1. For residential properties, reclaimed water shall be considered available if the County's reclaimed water facilities are located at a distance of 100 feet or less from the property line.
2. For non-residential properties, reclaimed water service shall be considered available if the County's reclaimed water facilities are located at a distance of 1000 feet or less from the property line.
3. For all new construction or development, reclaimed water shall be considered available if the proposed development/projects are in an area designated by the Department's Director to have reclaimed water available within two years following the completion of construction. Such properties shall install complete and separate potable and reclaimed water systems, with a single above ground connection between the potable water source and the future reclaimed water distribution system. This connection shall provide a temporary means to provide potable water supply to the irrigation systems until the reclaimed water system is constructed in that area. The connection shall be protected by a reduced pressure zone type backflow prevention device. When the reclaimed water main construction is completed in that area, the potable water main connection to the reclaimed water system shall be completely removed, entirely disconnecting the reclaimed water system from the potable water source, and then the reclaimed water source shall be connected to the reclaimed water distribution system. The master flow meter shall remain in place. There shall not, under any circumstance be a simultaneous physical connection of a potable water source and a reclaimed water source to a common piping system, and in no case shall a reclaimed water source be connected to a potable water piping system. At the time of disconnection, a dye test shall be run in the presence of an MDWASD inspector to assure that no cross connection exists between the reclaim system and the potable water system.

### 1.03 Plan Requirements and Design

- A. Three complete sets of accurately scaled plans shall be submitted for review. Plans shall include the following minimum information requirements in addition to the building permit requirements:
  1. Reclaimed water supply source main size, material, location, depth, point of connection and pressure.
  2. All easements, property lines, right of ways and structures.
  3. All reclaimed water piping, including location, size, restraint type and distance, material, class and pressure rating.
  4. Area of irrigation per parcel and total project irrigated area.
  5. Estimated weekly reclaimed water usage and rate.

6. Irrigation zones, demand and flow rates for all non-residential properties.
  7. Location of irrigation system programmable controller. Note: Controller shall be mounted on outside of building adjacent to electrical power meter.
- B. Any modification to the MDWASD Standard Details, other than completing required information specific to the project, will require written notification to and prior to approval from the Department. Any changes to the drawings shall be listed in the text, and noted inside of a revision cloud on the drawing to call specific attention to the changes.
- C. Following completion of construction and testing, the Developer's Engineer of Record shall submit "Record" drawings on the original design. Information required on a "Record" drawing shall include all items listed in section 1.03A above, and State plane coordinates of each valve and bend or branch in the reclaimed piping system including service taps, strainers and isolation valves.
- D. Location
1. Reclaimed water mains shall be located within dedicated rights-of-way or utility easements. When installed in rights-of-way, mains shall maintain a consistent alignment with respect to the centerline of the road. In residential developments mains shall be installed on the south and east side of the right-of-way. In all cases, mains shall be installed along one side of the road, with crossings kept to a minimum. A minimum 20-foot wide utility easement shall be provided if it is not adjacent to the road right-of-way. However, if a main is located outside and adjacent to an existing road right-of-way, a minimum of a 15-foot utility easement shall be provided. Piping within an easement shall be located within 1 foot of the centerline of the easement and centerline of the pipe.
  2. Additional easement width, as determined by the County, shall be required under the following conditions.
    - a. Pipe sizes greater than 12 inches.
    - b. Pipe cover greater than 4 feet.
    - c. More than one parallel pipe within the easement.
    - d. Pipe is not centered in the easement.
  3. Reclaimed water mains shall not be placed under trees, buildings, retention ponds, tennis courts, swimming pools, fountains or other structures. Landscape and privacy wall and foundations shall not be placed parallel over mains. Placement of mains under pavement shall be kept to a minimum. Mains shall not be located along interior side or rear lot lines, unless approved by the Department. Placement of mains along interior side or rear lot lines or storm water retention pond berms may be

allowed on a case by case basis if such a configuration results in efficient placement, utilization and maintenance of the system, as determined by the Department.

4. Services, air release valves and other valves shall not be placed along interior side or rear lot lines.
5. Proposed commercial and residential development offsite mains shall be extended a minimum of 10 feet beyond the furthest entrance to the development.
6. Separation of Reclaimed Water Mains and Potable Water and Sewer Systems:
  - a. Separation of reclaimed water mains from potable water and sewer systems shall comply with FDEP regulations and Miami-Dade Water and Sewer Department Standards.
  - b. A minimum horizontal separation of three feet face to face shall be maintained between reclaimed water mains and potable water mains, sanitary sewers or sanitary force mains. In cases where it is not practical to maintain this separation, consult the MDWASD for approved method.
  - c. Reclaimed water mains shall cross below water mains and above sanitary sewers or sanitary force mains. Where a reclaimed water main crosses a force main, a minimum of 12 inches vertical clearance shall be maintained. The crossing shall be arranged so that the reclaimed water joints will be equidistant and as far as possible from the force main joints. Where 12 inches of vertical clearance cannot be maintained, consult the MDWASD for approved method.
  - d. Separation criteria are subject to change and the Engineer shall verify this information by contacting the Florida Department of Environmental Protection to review the current criteria. See Standard Detail GS 1.5 for details.

#### E. Design Basis

1. The reclaimed water systems shall be designed to promote efficient reclaimed water usage. Reclaimed water mains shall be designed for the estimated ultimate irrigation demand, based on planned development build-out. The developer is responsible for sizing of the mains, only for his development. When a distribution main will serve existing or future developments beyond the borders of the proposed site, the MDWASD may require over sizing. Individual single-family homes are exempt from providing design calculations for irrigation systems with meters that are two inch or smaller.

2. Average Daily Flows and Peak Flows for Single-Family Residential and Other Developments:
  - a. The reclaimed water to be used shall be based on one inch of water per irrigated area per week.
  - b. Irrigation zones shall be provided to uniformly distribute flows over a time period acceptable to the MDWASD. Alternate irrigation system designs will be evaluated on a case-by-case basis.

3. Minimum Main Sizing for Single-Family Residential Developments:

The peak hourly demand of reclaimed water shall be based on 50 percent of the lots irrigating simultaneously using a demand of 25 GPM per inch meter diameter, up to two inch, per lot.

4. Irrigation System Design Calculations:

The Developer's Engineer or Landscape Architect shall submit signed, sealed and dated design calculations with the final construction plans for all reclaimed water distribution projects. Calculations shall show that reclaimed water mains will have sufficient hydraulic capacity to transport peak hourly flows. All head losses and minor losses shall be included in calculations.

5. Pressure:

All reclaimed water mains shall be designed to maintain a minimum pressure of thirty-five psi at the required meter connection.

6. Diameter:

Pipe sizing for the distribution system piping is the responsibility of the design engineer. The design engineer shall be responsible for obtaining any additional or updated design criteria from the MDWASD and FDEP. The Department will advise the design engineer as to whether or not local main pressures are available, or else the design engineer will be responsible to install a pressure tap and pressure recorder to determine the local available reclaimed water pressure. AWWA C900 and C905, DR18, PC235 (was 150) PVC together with AWWA C906, HDPE, DR11, PC160, pipe shall be allowed up to 24-inch diameter. All pipes larger than 24-inch diameter shall be PC150 ductile iron pipe. Direct tapping of PVC and HDPE pipe is prohibited. Full width tapping sleeves shall be used on all PVC and HDPE taps. Ductile iron pipes may be direct tapped at 10-inch and larger diameter. Below 10-inch diameter a tapping sleeve is required. Four-inch dead end reclaimed water mains shall be permitted with a maximum length of 750 feet of pipe. As a minimum, 6-inch looped systems shall be required. Larger size mains shall be required if necessary to allow the withdrawal of the required flow while maintaining the minimum residual pressure of 35 psi. Four-inch reclaimed water

mains may be used in small looped systems having less than 30 houses, as approved by the MDWASD on a case-by-case basis.

In areas with or near particular problems such as for example, hydrocarbon contamination, the use of PVC and HDPE pipe may not be allowed and ductile iron pipe with, at times, special gasket materials may be required at the discretion of the Chief, Engineering Division, MDWASD, whose decision shall be final.

7. Velocity:

The maximum velocity at design flow rates should not exceed eight feet per second for DIP and five feet per second for PVC pipe.

8. Design Friction Losses:

Friction losses through reclaimed water main shall be based on the Hazen and Williams formula. In the use of Hazen and Williams formula, the value for "C" shall be 110 for ductile iron and 130 for polyvinyl chloride and HDPE pipe. "C" values greater than 130 shall not be allowed.

9. Design Pressure and Restraint:

The transmission and distribution mains and fittings, including all restrained joint fittings shall be designed to withstand combined pump operating pressures and pressure surges, of not less than 150 psi. The restrained joint lengths shall be calculated consistent with the format shown in the Standard Detail GS 2.0 Sheets 1 through 5.

10. Dead Ends:

In order to provide increased reliability of service and reduce head loss, dead ends shall be minimized by making appropriate tie-ins whenever practical, as determined by the MDWASD. Where dead end mains occur, they shall be provided with a 2-inch flushing valve outlet as shown in Standard Detail WS 1.61.

11. Valves:

- a. Isolation valves shall be MJ x MJ resilient seat gate valves or eccentric plug valves.
- b. Valves shall be placed so that the maximum allowable length of reclaimed water main required to be shut down for repair work shall be no more than 2,000 feet on off-site transmission mains; 1,000 feet in commercial, industrial or multi-family residential districts; and 600 feet on distribution systems in residential subdivisions. Designer shall consider and incorporate maintenance considerations when placing isolation valves. The Department reserves the right to require additional isolation valves

where necessary for efficient operation and maintenance. Sufficient valves shall be provided on reclaimed water mains to provide ease of operation, maintenance and isolation. In-line valves shall be located generally at all branch connections, tees, crosses, etc. Valves shall also be provided at all areas where reclaimed water mains intersect to ensure effective isolation of reclaimed water lines for repair, maintenance or future extension.

- c. All branch or service connections larger than 2" to the reclaimed mains shall use flange x MJ (or MJ x MJ if tapping sleeve has an MJ tap outlet) resilient gate valves. All tapping valves size 16-inch and larger, shall be installed in the horizontal position with bevel gearing between horizontal valve shaft and vertical operating shaft.
- d. Valves and roadway boxes shall be provided for all branch connections (ie 2 valves on a tee, 3 valves on a cross) and other locations, as required to facilitate operation of the distribution system. Reclaimed water main extensions or mains extending at a project phase line shall include a line size valve and one additional standard length of pipe with a cap and a temporary blow-off assembly.
- e. At high points in reclaimed water mains where service connections are limited and where elevation changes exceed five feet, provisions shall be made to remove the air by manual air release valves.

12. **Booster Pumps:**

In-line booster pumps are not permitted on reclaimed water mains. However, booster pumps may be utilized for such things as large sprinkler systems on the property. Such pump systems shall only be used with complete review and written approval of the Chief, Engineering Division, MDWASD.

13. **Restrained Joints:**

Pressure piping, fittings and other items requiring restraint shall be restrained by assemblies or devices designed for a minimum of 150 psi pressure.

14. **Service Connections:**

Service connections shall be included as a part of the distribution system and shall consist of all components from the main to and including the meter box. Meter shall be supplied and installed by the Department when all construction and testing has been successfully completed.

**PART 2 PRODUCTS**

**2.01 Pipes, Fittings and Appurtenances****A. General:**

Reclaimed water distribution mains 3 to 24 inches in diameter shall be polyvinyl chloride (PVC), high density polyethylene (HDPE) or ductile iron. Any main larger than 24 inches in diameter shall be ductile iron.

**B. PVC Pressure Pipe and Fittings:**

1. PVC pressure pipe 3 inches through 24 inches in diameter shall meet the requirements of AWWA C900 and C905 and shall have cast iron pipe equivalent outside diameter.
2. The pressure class and dimension ratio (DR) of PVC pressure pipe to 12-inch shall be 150 psi AWWA C900-97 rating (rated 235 psi per AWWA C900-07), and minimum wall thickness of DR 18.
3. The pressure class and dimension ratio (DR) of PVC pressure pipe to 14-inch through 24-inch shall be 235 psi per AWWA C905-97 rating, and minimum wall thickness of DR 18.
4. Fittings for PVC pressure pipe shall be ductile iron with mechanical joints having, at a minimum, the same pressure rating as the pipe and shall be as specified for ductile iron pipe and fittings.
5. Push-on joints for PVC pressure pipe shall be of the compression rubber gasket type. The assembly of the joint shall be as recommended by the pipe manufacturer.
6. Restrained joints for PVC pipe shall be Uni-Flange Series 1350 for PVC-PVC joints and Uni-Flange Series 1300 or EBBA PV2000 fittings for PVC-DIP joints, or approved equal. The length of pipe to be restrained shall be noted on the drawings. Shop drawings from the manufacturer shall be submitted to and approved by the Department prior to actual construction.

**C. Ductile Iron and Cast Iron Pipe and Fittings**

1. Ductile and cast iron pipe and fittings shall be exterior asphaltic coated and cement mortar lined and conform with the specifications provided in Section 15060 "Piping and Fittings".

**D. High Density Polyethylene (HDPE) Pipe shall be as specified in Section 15060.**

1. HDPE pressure pipe 4 inches through 24 inches in diameter shall meet the requirements of AWWA C906-99 and shall have iron pipe size or ductile iron pipe equivalent outside diameter.



2. The pressure class and dimension ratio (DR) of HDPE pressure pipe from 4 through 24-inch shall be 160 psi AWWA C906-99, rating with minimum wall thickness of DR 11.
  3. Fittings for HDPE pressure pipe shall be ductile iron with flanged joints having, at a minimum, the same pressure rating as the pipe and shall be as specified for ductile iron pipe and fittings.
- E. High Density Polyethylene (HDPE) for Use in Reclaim Water Services 2-Inch Nominal Diameter and Less
1. Mechanical fittings shall be as specified in Section 15060.
  2. HDPE Pipe for reclaim water services shall be as specified in Section 15060 with exceptions that the outer shell shall be colored Pantone Purple 522C and the material need not conform with NSF 61 or 14.
  3. HDPE tubing for reclaim water services shall be as specified in Section 15060 with exceptions that the outer shell shall be colored Pantone Purple 522C and the material need not conform with NSF 61 or 14.

## 2.02 Valves and Appurtenances:

- A. General requirements for valves shall be as specified in Section 15100 "Valves, General".
- B. Air release valves shall be as specified in Section 15130 "Miscellaneous Valves".
- C. Ball valves shall be as specified in Section 15105 "Ball Valves".
- D. Butterfly valves shall be as specified in Section 15110 "Butterfly Valves".
- E. Check valves shall be as specified in Section 15115 "Check Valves".
- F. Flushing valve outlets shall be as specified in Section 15130 "Miscellaneous Valves".
- G. Gate Valves shall be resilient seat gate valves as specified in Section 15120 "Gate Valves".
- H. Plug valves shall be as specified in Section 15125 "Plug Valves".
- I. Service saddles shall be as specified in Section 15130 "Miscellaneous Valves".
- J. Tapping valves shall be resilient seat tapping valves as specified in Section 15120 "Gate Valves". If a tapping sleeve with mechanical joint tapping outlet, is utilized, a mechanical joint resilient seat gate valve meeting the specifications of the same section may be utilized.

- K. Tapping sleeves shall be as specified in Section 15102 "Tapping Sleeves".
- L. Valve boxes for all valves shall be MDWASD No. 3 (Std. Detail WS 3.11) or No. 2 (Std. Detail WS 3.10) with lid modified by removal of the letter "W" and replaced with the letter "R". Lids and Valve Box are to be colored Pantone 522C purple. Castings shall be delivered without paint and just prior to installation shall be painted on all surfaces both interior and exterior.

### **PART 3 EXECUTION**

#### **3.01 Signage and Public Notice**

- A. For all systems, there shall be readily identifiable "Reclaimed Water"/"Do Not Drink" notices, marking or coding on application/distribution facilities and appurtenances. Notification shall be accomplished by the posting of advisory signs designating the nature of the reclaimed project area where reclaimed is practiced, notes on scorecards or by other methods. "Notification methods used include posting of advisory signs at entrances to residential neighborhoods, medians, right of ways, at the entrance to a golf course and at the first and tenth tees. Advisory signs shall be posted adjacent to lakes or ponds used to store reclaimed water with a minimum of four signs or as determined by the County. Advisory signs shall be color-coded Pantone Purple 522C and include the following text in English and Spanish, "Reclaimed Water" and "Do Not Drink, No Beber", together with the equivalent standard international symbol. Advisory signs shall be posted at decorative water features that use reclaimed water and shall include the following text; "Do Not Drink" and "Do Not Swim". See drawing R 1.0 for details.
- B. Signage shall be placed, as appropriate, at entrances to residential neighborhoods where reclaimed water is used for landscape irrigation and prominent locations at all commercial sites, including multi-family developments, office parks, schools, churches, condominiums, residential common areas, recreational developments and golf courses.
- C. The Developer shall be responsible for all cost incurred and installation of reclaimed water signage in accordance with FDEP regulations and the MDWASD standards. The Owner shall be responsible for operation and maintenance of the private irrigation system and shall also be responsible for the maintenance of the signage.
- D. The MDWASD will be responsible for inspection of signage for reclaimed water systems in the County. It shall be the owner's responsibility to maintain all signage in an un-deteriorated condition.

#### **3.02 Services and Connections**

- A. All connections to existing reclaimed water mains shall be made by the contractor only in the presence of a MDWASD inspector and with the approval of the Department. No tap or valved connection to the reclaimed water system shall be made without prior approval of the Plans by the MDWASD. The Department

shall be notified of the request to tap at least five business days in advance. All valves on existing systems shall be operated by Department personnel. Under no circumstances shall the Contractor's personnel operate such valves.

- B. Services and connections shall conform to the applicable provisions of this specification and the Standard Details. Only 1-inch, 1 ½ -inch, 2-inch, 3-inch, 4-inch, 6-inch and 8-inch services will be permitted. All services greater than eight inches will be evaluated on a case-by-case basis, by the County. Services and connections to new or existing reclaimed water systems shall be installed by the Developer's/Owner's licensed contractor.
- C. Direct tapping of PVC and HDPE pipe is prohibited. Full width tapping sleeves shall be used on all PVC and HDPE taps. Ductile iron pipes may be direct tapped at 10-inch and larger diameter. Below 10-inch diameter a tapping sleeve is required. Direct taps 1-1/2-inch and smaller are permitted in ductile iron pipe. One and one half -inch tapping saddles with 1 ½ X 2-inch bronze corporation stops are required for all threaded 1 1/2-inch taps. MJ run x Flanged branch or MJ run x MJ branch ductile iron or stainless steel tapping saddles are required for 3-inch and larger. All 3-inch and larger taps shall be installed with a Flange x MJ or MJ x MJ resilient seat gate valve. See drawings R-3.0, WS 1.60, WS 2.16 and WS 4.11 for details.
- D. Prior to the Tap:
  - 1. The contractor shall assemble all materials, tools, equipment, labor and supervision necessary to make the connection.
  - 2. The contractor shall excavate a dry and safe working area pit of sufficient size to enable Department personnel to perform the necessary work. The area to receive the tapping machine shall be excavated and blocked to the correct elevation. Blocking elevation and strength shall properly support the machine during the tap such that no load shall be placed on the tapping sleeve. He shall also unload and, after the tap, reload the Department tapping machine.
  - 3. The contractor shall pressure test the tapping sleeve and valve installation in the presence of the MDWASD inspector. The test pressure shall be 100 psi.
- E. Reclaimed water mains shall be tapped in such a manner as to avoid disturbance or disruption to the operation of the main in service and to protect the reclaimed water supply from contamination.
- F. Valves on existing mains shall be operated only by Department personnel
- G. The contractor shall be responsible for properly backfilling the work area pit after the work is completed. See Standard Detail GS 1.9 for details.
- H. When service must be interrupted to existing customers during construction of a tap or addition of appurtenances:

1. The contractor shall have previously reviewed his plans and sequence of construction with the MDWASD to obtain their approval that said interruption of service is actually necessary. Thereafter, he shall provide seven calendar days notice to the Department.
  2. The contractor or developer shall be required to provide prior notification to existing customers as directed by the Department
  3. The contractor shall be ready to proceed with as much material pre-assembled as possible at the site to minimize the length of service interruption. Such connections may be made at night to minimize effects. No customer shall be without service for more than six hours.
  4. The MDWASD will postpone a service cut-off if the contractor is not ready to proceed on schedule.
- I. The Developer or Contractor shall furnish and install the individual service box. The Department will furnish and install the meter when all construction, cleaning and testing have been successfully completed and conveyance has been made.

During construction the location of the end of the service shall be identified with a 2-inch x 2-inch x 18-inch wood stake with the top painted purple and marked the lot(s) number to be served. See drawings R-3.0, WS 2.16 and WS 4.11 for details.

- J. Hose bib connections are allowed for hand watering of lawns and other limited outdoor activities. These connections may be used independently or in conjunction with an underground irrigation system. The hose bib shall be located in a locked box with hinged lid as shown in the Detail titled, "Backflow Preventer with Hose Bib" shown on Sheet M-1 in Appendix E of these specifications.
1. The hose bib connection assembly shall consist of a lock box assembly with padlock and Key, a hose unit at least 50 feet in length, and hose bib assembly which shall utilize  $\frac{3}{4}$ -inch brass schedule 40 for risers and above grade components .
  2. A hose bib assembly used with an existing in-ground irrigation system shall be placed downstream of the curb stop. Use a  $\frac{3}{4}$ -inch tee to connect the hose bib assembly to the existing in-ground irrigation system. A hose bib assembly that is not used in conjunction with an in-ground irrigation system shall use a  $\frac{3}{4}$ -inch elbow.
  3. The rubber hose unit shall consist of a  $\frac{3}{4}$ -inch lavender (Pantone Purple 522C rubber hose, marked "Caution-Recycled/Reclaimed Water Do not Drink/No Beber 150 psi W. P ", Flex-Tech Hose and Tubing  $\frac{3}{4}$ " I.D. NPW Reclaim Water Hose or approved equal.
  4. Concrete pad, lock box and hose bib assembly height above grade shall be as shown in the detail on M-1. Box material shall again be stainless

steel of ¼" thickness but box, pad and all above grade elements shall be painted on all surfaces with the standard lavender color.

5. The Lock Box and Hose Bib Assembly shall be located within the owner's property boundary, visible from the street and shall not be located in the public right-of-way.

**3.03 Reclaimed Water Metering**

A. General:

All reclaimed water service connections shall be metered. In general, the method of metering will follow the guidelines listed below. A master metering system is required when reclaimed water flow dictates installation of a 4-inch or larger meter. However, the Developer's Engineer must obtain approval before finalizing the metering system design. Unless specifically approved by the MDWASD, meter boxes shall not be installed in driveways or areas subject to vehicular traffic. All below ground meters subject to vehicular traffic shall be installed in a traffic rated meter box. See Standard Detail WS 2.19. Based on AWWA Standards, the maximum flow for continuous operation will be 50 percent of rated maximum capacity or as specified in the following table.

**Reclaimed Water Master Meter Sizing**

Turbine Meter Size Inches	Maximum Flow GPM
4	300
6	625
8	900
10	1,450
12	2,150

B. Single Family, Duplex and Multi-Family Subdivisions with Public Rights of Way:

Each unit shall be individually metered. Meters shall be in individual meter boxes, in the sidewalk. See drawing R 2.0 and WS 2.10 for details.

C. Single Family and Multi-Family Subdivisions with Private Streets:

If easements are dedicated over the entire private street common areas, individual meters may be permitted in accordance with the preceding paragraph. If these criteria cannot be met, the subdivision shall be master metered pursuant to the following paragraph. See drawing R 2.0 for details.

D. Commercial, Industrial, Institutional, Shopping Centers, Apartments and Condominium Projects:

In general, all such projects shall require installation of meter to service the entire development. If the average daily demand is 25,000 GPD or greater, a reclaimed

water agreement shall be required and special provisions as outlined in Section 1.02 "Requirements for Use" may be required. In general, shopping centers and associated out parcels shall require installation of a single meter to service the entire development unless out parcels are adjacent to public right of way or otherwise approved by the County.

E. Meter Installation:

Meters shall be supplied and installed by the Department after all construction and testing has been satisfactorily completed and conveyance has been made. All meters two inches or smaller in size will be installed underground in an approved meter box. Meters larger than two inches shall be installed above ground. Meters larger than two inches shall be located in an easement located adjacent to but outside of the public right of way, on the customer's property.

F. Meter Sizing:

The Developer/Owner's Engineer shall determine the size of all meters. The Developer's Engineer shall provide sufficient information on estimated average daily and peak flows to determine meter size. Sizing must be approved by the Chief, Engineering Division, MDWASD.

G. Meter Test Ports:

A capped tee with a 2-inch threaded plug shall be installed immediately downstream of the meter for use as a test port.

H. Meter Bypass Loops:

Although bypass loops are typically not required because reclaimed water delivery is not essential to the public health and safety, the MDWASD reserves the right to require a bypass design on a case-by-case basis.

I. Meter Supports:

The pipe supports used in the meter assemblies shall be adjustable.

J. Temporary Installation:

When required by the Department, a spacer pipe shall be installed in the meter the position to be occupied by the meter. The spacer shall be as required by the Department, supplied and installed by the Developer/Contractor.

### 3.04 Irrigation Wells

A. General:

Existing or proposed wells may be utilized as a back up supply of irrigation water in the case of an interruption of service from the County's reclaimed water system.

B. Ground Water Protection:

Existing or proposed wells must be protected from reclaimed water entering the well by either an air-gap or must be outfitted with an approved double check valve assembly or reduced pressure zone backflow prevention device.

### 3.05 Golf Courses and Other Major Users

- A. Golf courses and other major water users (over 100,000 gallons per day annual average) may be required to install a pond or tank(s), meter and equipment to monitor and control the flow entering the property. Prior to connection to the reclaimed water system, the major water user must enter into a service agreement with the County. The pond or tank(s) must completely isolate the reclaimed water from the potable water system and the Biscayne Aquifer.

The following is general description of each of the required components.

1. Receiving Pond Level Sensor:

The golf course owner is responsible for installing and maintaining in good operating condition, one or more pond/tank level sensors. The type of sensor shall be approved by the MDWASD. The volume of the on-site storage ponds or tanks shall be equal to or greater than the peak daily demand during a 24-hour period.

2. Control Valve, Operator and Electronic Controller:

A control valve shall be installed at the metering station and shall be configured to sustain upstream pressure and shall shut off when commanded from a remote location. In conjunction with an electronic controller, the valve shall maintain a flow rate set point.

3. Pressure Gauges and Pressure Transmitter:

Pressure gauges shall be installed on the supply side and distribution side of the metered connections.

4. Real-Time Monitoring and Control Panel with PLC:

The real-time monitoring and control field panel shall be installed at the metering station. The field panel shall contain all components necessary for both local and remote monitoring and control of the metering stations, including a programmable logic controller (PLC), radio, operator interface unit (OIU), electronic interface controller, flow meter, antenna, open/close/remote hand switch, power supplies to control circuitry and surge suppression. Provide all programming necessary for operating system.

5. Radio Survey:

Conduct a radio survey for each site in which the MDWASD elects to communicate via a radio link. The objective of the radio survey is to demonstrate that radio signal strength is sufficient to support reliable communications. The radio survey shall consist of two parts – a radio propagation computer model and a field survey where actual radios are used. The radio propagation computer model must include a path profile that clearly shows terrain and obstructions between both the remote and central sites.

### 3.06 Protection of Potable Water System

#### A. General:

1. Backflow prevention is required in accordance with PL 93-623, the Federal Safe Drinking Water Act, Florida Administrative Code (FAC) 62-555.360 for the protection of the potable water system.
2. At all locations where reclaimed water service is provided, the public potable water supply shall be protected by installation of an approved backflow prevention device (directly downstream of the potable water meter).
3. No cross connection between the reclaimed water system and the potable water system shall be allowed under any circumstances.

#### B. Residential Cross Connection Control:

1. Prior to receiving reclaimed water service, the Developer/Contractor shall install a reduced pressure principal backflow preventer assembly conforming with the standards of AWWA C911 on each residential customer's potable water meter in order to protect the potable water system.

#### C. Multi-Family and Commercial Property Cross Connection Control:

1. Multi-family complexes and commercial properties with master-metered potable water service and master-metered reclaimed water service shall be required to install a Reduced Pressure Principal type backflow prevention device downstream of the master potable water meter.
2. The Reduced Pressure Principle type backflow prevention assembly shall include two independently acting check valves; a hydraulically operating, mechanically independent pressure differential relief valve located both between the check valves and below the first check valve, properly located resilient-seated test cocks, and tightly closing resilient-seated shut-off valves attached at each end of the assembly. Shut-off valves 2-inches and smaller shall be ball type; valves larger than 2-inches shall be gate or plug type.



3. Immediately after the reduced pressure principle device is installed, the contractor shall request an inspection by the MDWASD. Within thirty days following installation, the contractor shall send a certified "Test and Maintenance Report" to the MDWASD.

### 3.07 Protection of Reclaimed Water System

#### A. General:

To protect the County reclaimed water system from contamination due to cross connection with a private system utilizing a chemical injection and/or storm water augmentation systems, the Developer/Contractor shall install a MDWASD approved backflow prevention device on the Reclaimed Water piping.

1. Developments that use reclaimed water with chemical injection and/or storm water augmentation systems that add potential contaminants such as fertilizer, pesticides, algacides, etc., shall as a minimum, require installation of an approved double check valve assembly. Projects with a higher degree of hazard, such as saline solutions, etc., may be required to install an approved reduced pressure backflow preventer assembly or other device.

#### 2. Location and Installation:

All backflow prevention devices are to be located directly following the reclaimed water meter serving the customer's property. All backflow prevention devices shall be installed by a licensed contractor. It shall be the customer's responsibility to pay for devices, installation, maintenance and inspection of all backflow prevention devices. It shall be the Owner's responsibility to maintain all backflow prevention devices, including repairs, replacements and annual inspections.

### 3.08 System Identification

- A. All reclaimed water piping and appurtenances shall be clearly identified as reclaimed water facilities.
- B. The standard color is Pantone Purple 522C for all reclaimed water system piping and above ground appurtenances including valves, meter assemblies and backflow prevention devices.
  1. PVC and HDPE distribution mains: color shall be an integral part of the pipe materials.
  2. Ductile iron distribution mains. Buried pipes shall be color coded with a purple tape with adhesive backing. Adhesive tape shall be at least 5 mils in thickness, at least of width called out in the Standard Details and made of an aluminum material sandwiched between two layers of polyethylene

or vinyl. See drawing R 4.0 . Above ground piping shall be painted Pantone Purple 522C.

3. Polyethylene (PE) service pipe or tubing shall have an outer cover of the standard purple color.
  4. Locator balls shall be installed 2 feet below grade directly over the pipe and fittings at every 100-foot interval along the pipes and at every branch, bend deflection, valve and crossing as shown in drawing R 5.0.
- C. Covers for all valve boxes, meter and service boxes and other below ground devices on the reclaimed water system shall be painted Pantone Purple 522C and shall be permanently embossed "R" on valve boxes and on meter and service boxes marked "RECLAIMED WATER" and bear the words in English and Spanish "DO NOT DRINK, NO BEBER".
- D. All HDPE services require the use of a 10-gage stranded purple tracer wire.

### **3.09 Excavation, Pipe Installation, Backfill and Compaction, Testing**

- A. These activities shall be performed as specified in the following sections. Since this is reclaim water, ductile iron pipe will be cement lined and no disinfection will be required.

UC-075-"Water Service Installation"  
UC-750-"Donation Force Mains"  
15060 -"Piping and Fittings"