**SECTION 11.00**
**RECLAIMED WATER DISTRIBUTION SYSTEM**

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## 11.00 GENERAL

A. All aspects of the design and construction of any portion of the reclaimed water distribution system shall, at a minimum, meet the requirements of the North Carolina Department of Environmental Quality (NCDEQ) Division of Water Resources (DWR). Requirements presented in the Town of Holly Springs Standard Specifications hereunder that are more restrictive or go above and beyond the requirements of DWR are required by the Town of Holly Springs.

B. All Reclaimed water systems must be designed per North Carolina Administrative Code 15A NCAC 02U – Reclaimed Water, latest revision, the governing regulations.

C. Extensions of the existing reclaimed water distribution system must adhere to any and all Policy Statements and/or Master Plans pertaining to the reclaimed water distribution system, and receive prior approval from the Executive Director of Utilities and Infrastructure Services, prior to consideration.

D. Reclaimed water main extensions may require a detailed hydraulic report, signed and sealed by a North Carolina Professional Engineer, be submitted to the Executive Director of Utilities and Infrastructure Services and receive approval prior to construction drawing submittal.

E. Reclaimed Water main extensions shall be submitted to the Executive Director of Utilities and Infrastructure Services for notification only. Engineering will forward to NCDEQ for review and approval.

F. Any reclaimed water that leaves the reclaimed water distribution system other than by means of a properly permitted use must be disposed of into the Town of Holly Springs sanitary sewer system. This includes any reclaimed water line flushing, and/or line breaks unless otherwise allowed by NCDEQ rules. De minimus runoff from distribution air relief valves and blow-off is deemed permitted per NCDEQ rules. Any reclaimed water that is not a properly permitted use or sent to a sanitary sewer must be reported and handled as if it were a wastewater spill.

## 11.01 RECLAIMED WATER DISTRIBUTION PIPE

All new irrigation systems located within the Town's reclaimed service area desiring to obtain water service for such system from the Town must connect to the reclaimed water system, if reclaimed water is available to the property. Design must be in accordance with Chapter 16 Article IV of the Holly Springs Town Code of Ordinances. These areas are shown on the Reclaimed Water Distribution Service Area Map located on the Town's website.

## A. DESIGN

1. Location: Reclaimed water lines shall be extended along the roadway to the adjacent property line. All public reclaimed water mains shall be located within dedicated right of way or dedicated easements with a minimum width of 20 feet. See Section 2.10 for allowable landscape plantings within a Town of Holly Springs easement.

2. Sizing: Reclaimed water mains shall be sized in accordance with good design procedures to provide adequate pressures throughout the system or as directed by the Executive Director of Utilities and Infrastructure Services. The minimum pipe size for reclaimed water mains shall be 4 inches in accordance with the reclaim hydraulic model.

3. Installation: All utility extension permits must be obtained prior to construction utilizing appropriate application forms from NCDEQ. All reclaimed water mains shall have a minimum cover of 4 feet measured from the top of the pipe to the finished grade. When reclaimed water mains are installed along a roadway which does not have curb and gutter, the reclaimed water main shall be installed at sufficient depth to prevent conflict with future road improvements or vertical alignment changes.

4. Relation to Potable Water Mains and Other Utilities

   a) Reclaimed water mains shall be laid with at least 5 feet horizontal separation from existing potable water mains or sanitary sewer mains, measured laterally edge to edge.

   b) Where a reclaimed water main and potable water main cross, and the vertical separation is less than 18 inches or the reclaimed water main passes above the potable water main, both the potable water main and the reclaimed water main shall be ductile iron pipe at least one whole pipe length from the crossing point with joints equivalent to water main standards.

   c) Reclaimed water mains should only cross sanitary sewer mains or potable water mains at an approximate 90 degree angle.

   d) The minimum separation between reclaimed water mains and storm sewer mains must be either 5 feet horizontal or 2 feet horizontal with a vertical separation of 24 inches unless otherwise approved by the Executive Director of Utilities and Infrastructure Services. Where storm sewers cross reclaimed water with a vertical separation of less than 24 inches the segment of reclaimed water pipe shall be ductile iron pipe at least one whole pipe length from the crossing point with joints equivalent to water main standards.

e) Where reclaim water main crosses under storm sewer main with a vertical separation less than 24 inches then reclaim water must be ductile iron minimum of 10 feet each side of crossing and properly marked as reclaim.

f) Where sanitary sewer crosses reclaimed mains, a vertical separation of 18 inches must be maintained.

g) Reclaimed water distribution lines shall not be less than 50 ft from a well unless the piping and integrity testing procedures meet water main standards, but in no case shall they be less than 25 feet from a private well or 50 ft from a public well.

5. Identification of Reclaimed Piping

a. General:

i. All new distribution piping in the reclaimed water system, including service lines, valves and other appurtenances should either be colored purple (Pantone 522 or similar) and embossed or be integrally stamped/marked "CAUTION: RECLAIMED WATER – DO NOT DRINK," or be installed with a purple identification tape, and a purple polyethylene vinyl wrap.

b) Polyethylene Wrap: Buried ductile iron pipe and fittings shall be wrapped with a purple colored polyethylene membrane conforming to ANSI A21.5, and installed in accordance with AWWA C105. The polyethylene sheets shall be 8 mils thick, minimum, and be colored purple (Pantone 522 or similar).

c) Tracer Wire: Tracer wire shall be installed along those portions of reclaimed water main located outside existing or future street pavement. Tracer wire shall be installed as shown in the Details.

d) Identification Tape:

i. Identification tape should be prepared with white or black printing on a purple field (Pantone 522 or similar) having the words "CAUTION: RECLAIMED WATER – DO NOT DRINK." The overall width of the tape should be at least 3 inches.

ii. Identification tape should be installed on the top of the distribution piping longitudinally and should be centered over the pipe. The identification should be continuous in its coverage on the pipe and should be fastened to each pipe length no more than 10 feet apart. Tape

attached to sections of pipe before they are placed in the trench should have flaps sufficient for continuous coverage. Other satisfactory means of securing the tape during backfill of the trench may be used if suitable for the work, as determined by the Executive Director of Utilities and Infrastructure Services.

iii. The identification tape differentiating the reclaimed water piping from other utility lines should be consistent throughout the service area.

e) Signage:

i. The public shall be notified of the use of reclaimed water.

ii. Advisory signs shall be posted around reclaimed water irrigation activities in public areas, adjacent to ponds used to store reclaimed water in public areas, and at decorative water features that use reclaimed water.

## B. MATERIALS

1. Material: All reclaimed water main distribution pipe 4" thru 12" diameter shall be C900 PVC pipe. All reclaimed water main distribution pipe greater than 12" diameter shall be C905 PVC. Ductile Iron Pipe shall only be used in special cases and with the Executive Director of Utilities and Infrastructure Services approval. New manufacturers must submit requests for approval to the Executive Director of Utilities and Infrastructure Services. Additional information such as catalogs, list of installations in the area or material samples may be required. A written response will be mailed to the applicant accepting or rejecting the product within 90 days of the receipt of all necessary information.

2. Ductile Iron Pipe:

a) This material shall only be used for reclaimed water lines with Executive Director of Utilities and Infrastructure Services' approval.

b) Buried ductile iron pipe and fittings shall be wrapped with a purple colored polyethylene membrane conforming to ANSI A21.5, and installed in accordance with AWWA C105. The polyethylene sheets shall be 8 mils thick, minimum, and be colored purple (Pantone 522 or similar).

c) Ductile iron pipe shall be designed and manufactured in accordance with AWWA C150 and C151. The minimum required pressure ratings for ductile iron pipe installed at a Type 2 laying condition are tabulated below. For all other installations other than specified, the laying condition or the minimum pressure class rating shall be increased in accordance with AWWA C151.

| Pipe Diameter | Depth of Cover | Pressure Class |
|---|---|---|
| 6-8 -inch | 3-20 feet | 350 psi |

| | | |
|---|---|---|
| 10-12 -inch | 3-14 feet | 350 psi |
| 14-20 -inch | 3-10 feet | 250 psi |
| 24-64 -inch | 3 - 8 feet | 150 psi |

d) Pipe joints shall be of the push-on type as per AWWA C111. Pipe lining shall be cement mortar with a seal coat of bituminous material in accordance with AWWA C104. Galvanized steel pipe will not be allowed as a material for reclaimed water mains or reclaimed water service lines.

3. PVC Pipe:

a) PVC pipe (4" to 12") shall be designed and manufactured in accordance with AWWA C900. PVC pipe larger than 12" shall be designed and manufactured in accordance with AWWA C905. The PVC pipe shall be made of virgin PVC resin that provides chemical and physical properties that meet or exceed cell class 12454-B as defined in ASTM D1784. All PVC pipe shall be supplied in standard laying lengths of 20 feet. Pipe shall be furnished in factory packaged units, with each joint plainly marked with the manufacturer's name, pressure class, size, etc. PVC pipe shall have integral wall, bell and spigot joints fabricated with elastomeric gaskets that meet or exceed the performance requirements of ASTM D3139 and F477. Fittings used on PVC pipe shall be AWWA C153 compact ductile iron fittings.

b) All PVC pipe supplied for reclaimed water applications shall be color coded purple (Pantone 522 or similar) as required by15A NCAC 02U – Reclaimed Water).

c) Furnish pipe for the following minimum pressure classes as indicated. Diameter 4"-12", C900 Pressure Class 150, SDR 18 Diameter 14" and larger, C905 Pressure Class 165, DR18.

4. Steel Encasement for reclaimed water pipes are required for the following Street Classifications to avoid traffic disruption in the future:

- Controlled Access Highway

For carrier pipes that employ cathodic protection anticorrosion systems, the carrier and casing pipes shall be effectively insulated from one another. Carrier and casing shall be cathodically protected as a unit.

See Section 5.03 Boring and Jacking for more casing pipe size requirements.

## C. INSTALLATION

1. Ductile iron pipe shall be installed in accordance with the requirements of AWWA C600 and the Ductile Iron Pipe Handbook published by the Ductile Iron Pipe Research Association. At a minimum, all ductile iron pipe shall be installed at a Type 2 laying condition as specified by AWWA C600.

2. PVC pipe shall be installed in accordance with AWWA C605. At a minimum, all PVC pipe shall be installed at a Type 3 laying condition as specified by AWWA C605.

3. Materials at all times shall be handled with mechanical equipment or in such a manner to protect them from damage. At no time shall pipe and fittings be dropped or pushed into ditches.

4. Pipe and fitting interiors shall be protected from foreign matter and shall be inspected for damage and defects prior to installation. In the event foreign matter is present in pipe and fittings, it shall be removed before installation. Open ends of pipe shall be plugged or capped when pipe laying is not in progress.

5. All pipes shall be in nominal lengths of eighteen or twenty feet and shall be installed with at least 48 inches of cover below the finished subgrade. Pipe shall be laid on true lines as directed by the Executive Director of Utilities and Infrastructure Services. Trenches shall be sufficiently wide to adjust the alignment. Bell holes shall be dug at each joint to permit proper joint assembly. The pipe shall be laid and adjusted so that the alignment with the next succeeding joint will be centered in the joint and the entire pipeline will be in continuous alignment both horizontally and vertically. Pipe joints shall be fitted so that a thoroughly watertight joint will result. All joints will be made in conformance with the manufacturer's recommendations for the type of joint selected. All transition joints between different types of pipe shall be made with transition couplings approved on shop drawings showing the complete assembly to scale.

6. Prior to beginning construction, the Contractor shall contact local utility companies and verify the location of existing utilities. The Contractor shall be completely and solely responsible for locating all existing buried utilities inside the construction zone before beginning excavation. The Contractor shall be solely responsible for scheduling and coordinating the utility location work. When an existing utility is in conflict with construction, it shall be exposed prior to beginning construction to prevent damage to the existing utility.

7. Valves in the existing Town of Holly Springs water system shall not be operated without a minimum notice of 24 hours to the Executive Director of Utilities and Infrastructure Services and the Director of Public Utilities. The Contractor shall operate valves only in accordance with Town of Holly Springs Engineering Design and Construction Standards.

## 11.02 VALVES AND APPURTENANCES

## A. VALVES

1. General

   a) Valves shall be installed on all branches from feeder reclaimed water mains according to the following schedule: 4 valves at crosses; 3 valves at tees. When a loop section of reclaimed water line is connected back into the feeder reclaimed water main within a distance of 200 feet or less, only one valve will be required in the feeder reclaimed main. Reclaimed water main extensions or mains extending at a project phase line shall include a valve and one additional standard length of pipe with a cap and a temporary blow-off assembly.

   b) Where no reclaimed water line intersections are existing, a main line valve shall be installed at every 100 feet per 1-inch diameter main up to a distance of 1000 feet between valves. In addition, the Town of Holly Springs reserves the right to require additional isolation valves where necessary for efficient operation and maintenance.

   c) Valves shall be properly located, operable and at the correct elevation. All valves and reducers shall be rodded to the tee or cross if one is located within 10 feet as shown in the Details. If reducers cannot be rodded, concrete blocking or other restraining methods will be required. The maximum depth of the valve nut shall be 5 feet. When valve extension kits are used, they must be manufactured by the same company which manufactured the valve.

2. Combination Air Valves

   a) Combination air valves shall be installed at all high points of reclaimed water lines 12" inches in diameter or larger and at other locations as directed by the Town of Holly Springs. The reclaimed water main shall be installed at a grade which will allow the air to migrate to a high point where the air can be released through an air valve. A minimum pipe slope of 1 foot in 500 feet should be maintained. The valve shall have a minimum two (2) inch NPT inlet and 200-PSIG working pressure. Combination air valves shall be sized by the Engineer and approved by the Town of Holly Springs.

   b) Combination air valves shall be of the single housing style that combines the operation of both an air/vacuum and air release valve. The valve must meet the requirements of AWWA C512 and be installed in accordance with the Details.

   c) Manholes installed for the combination air valves shall meet all requirements of Section 7.00.

3. Gate Valves

a) Gate valves 2 inches and greater shall meet all requirements of AWWA C500 for a working pressure of 200 psi. All gate valves shall be mechanical joint with iron body, bronze mounting double disc parallel seat type with a non-rising stem and open left with a double O-ring seal.

b) Gate valves, up to and including 12 inches, shall be installed in a vertical position.

c) Gate Valves 16 inches and larger must be approved by the Executive Director of Utilities and Infrastructure Services. They may be installed horizontally and equipped with bevel gears, grease case, rollers, tracks scrapers, and a bypass located on the side of the body (fully revolving disc valves shall not require rollers), or vertically and be equipped with spur gears enclosed in a grease case and with a bypass located on the side of the body. In either case, the roller and scraper operators shall be installed in a manhole that meets all requirements of Section 7.00.

4. Resilient Seat Wedge Gate Valves: Resilient seat wedge gate valves shall be manufactured in accordance with AWWA C509 for a working pressure of 200 psi. All shall be mechanical joint with iron body, open left with a non-rising stem and two O-ring stem seals. All ferrous surfaces, both inside and outside, shall be protected by a fusion-bonded epoxy coating.

5. Butterfly Valves: Butterfly Valves may be installed in reclaimed water mains 24 inches or greater with the permission of the Executive Director of Utilities and Infrastructure Services. All butterfly valves shall meet the requirements of AWWA C504 with mechanical joints, 2 inch open left operating nut. Valves installed on reclaimed waterlines at depths greater than 6' (measured to top of pipe) shall be installed in a manhole (see Section 7.00) as shown in the Details. Valves designated by the Town of Holly Springs to potentially have a remote actuator shall be installed in a manhole (see Section 7.00) as shown in the Details.

6. Valve Boxes

a) Valve boxes shall be cast iron, screw or telescopic type, with a 5-inch opening. Valve box ring adjustments will not be allowed. All valve boxes shall be furnished with an approved operating key which shall allow operation by authorized personnel only.

b) Valve box covers shall be square in shape (NOT round) and shall be designed for AASHTO H-20 truck loadings. All valve box covers shall be of non-interchangeable shape with potable water covers, and cast on the top surface with a recognizable inscription indicating "Reclaimed Water". All valve box covers shall be painted purple (Pantone 522 or similar).

c) The valve box shall be centered over the wrench nut and seated on compacted backfill without touching the valve assembly. All valve boxes shall be encased in a trowel finished 2' x 2' x 6" pad of 3000-psi concrete beneath the asphalt with the cover flush with the top of the pavement or flush with the finished grade. Precast concrete valve box encasements may not be used for valve box encasement outside of paved areas. The maximum depth of the valve nut shall be 5 feet. When valve extension kits are used, they must be manufactured by the same company that manufactured the valve.

## B. APPURTENANCES

1. Pipe Fittings: Pipe fittings shall be cast or ductile iron designed and manufactured as per AWWA C110. Sizes of fittings up to and including 12 inches shall be designed for an internal pressure of 250 psi, and larger size fittings shall be designed for an internal pressure of 150 psi. Compact ductile iron mechanical joint fittings designed and manufactured as per AWWA C111 are also acceptable. Joints for fittings shall be mechanical and lined with cement mortar with a seal coat of bituminous material, all in accordance with AWWA C104.

2. Blowoffs

a) Blowoffs installed at the end of cul-de-sacs shall be a minimum of 2 inches. Blowoffs installed on transmission and distribution mains shall be a minimum of 2 inches. Where there is not sufficient pressure to thoroughly flush the system, a larger blowoff will be required.

b) Blowoff assemblies shall be constructed as shown in the Details. The valves shall be gate type with a non-rising stem and a 2-inch operating nut, O-ring seals and screwed ends. A full-size valve is required on mains that are planned to be extended.

c) Blowoffs shall be directed in a non-erosive manner to a stabilized grassed area at least 50 ft. from a jurisdictional feature or directed into the closest sanitary sewer manhole. Blowoffs installed at the end of cul-de-sacs should be tied into a sanitary sewer manhole where available.

3. Thrust Restraint: Reaction blocking for all fittings or components subject to hydrostatic thrust shall be securely anchored by the use of concrete thrust blocks poured in place or restrained joint piping as described below

a. Concrete thrust blocks shall be poured in place with reaction areas as shown in the Details. No concrete shall interfere with the removal of fittings. Material for reaction blocking shall be 3000 psi concrete. A minimum 4 mil plastic shall cover the fitting to ensure that no concrete will interfere with removal of the fitting.

b. PVC Bell Joint Restraint - All PVC bell joints shall be restrained for both C900 and C905 PVC pipe. The bell joint restraint shall consist of either an approved restrained PVC joint provided by the same manufacturer of the PVC pipe or an approved bell joint restraint harness. All bell joint restraint harness assemblies shall be made of ductile iron pipe (DIP), coated with a manufacturer applied epoxy coating or polyester powder coating, including stainless steel bolts, nuts and rods. The bell joint restraint harness shall be manufacturer approved for use with PVC pipe and rated for at least 200-psi with a 3:1 safety factor.

c. All valves and fittings shall be restrained to C900 or C905 pipe with an approved wedge action retainer gland or other approved restraining method. All DIP fittings for reclaimed water use shall be identified by purple painting or wrapping with polyethylene wrap (Pantone 522 or similar). Alternative restraining methods and mechanical joint restraints may be used upon approval by the Executive Director of Utilities and Infrastructure Services.

## 11.03 RECLAIMED WATER SERVICE TAPS

## A. DESIGN

1. Individual reclaimed water services, and multiple branch services, shall be provided from the reclaimed water main to each reclaimed water meter for single customer locations in accordance with the Details. All connections shall be made by wet taps. Service connections shall be made perpendicular to the reclaimed water main and shall run straight to the reclaimed water meter.

2. All reclaimed water meter boxes and vaults shall be located at the edge of the serviced lot's right of way or easement. Reclaimed water meter boxes shall not be placed in streets, sidewalks, parking areas or obstructed by fencing or buildings. Exceptions to these conditions will be at the direction of the Executive Director of Utilities and Infrastructure Services.

3. Service taps to existing reclaimed water mains shall be made by the Town of Holly Springs. Service taps to new reclaimed water mains shall be made by the Contractor in accordance with the Specifications.

4. Water meters shall be sized based on applicant water budget calculations using the approved method. Water meter size shall be determined from the following table; or as otherwise specified by the Executive Director of Utilities and Infrastructure Services. Multiple branch services size shall be determined by the designer.

| METER SIZING GUIDE | | |
|---|---|---|
| Meter Size (inches) | Flow Range (GPM) | |
| 3/4" PD | 0 - 20 | |
| 1" PD | 20 - 50 | |
| 1½" PD | 50 - 100 | |
| 2" C | 100 - 200 | |
| 3" C | 200 - 400 | |
| 4" C | 400 - 600 | |
| PD = Positive Displacement<br>T = Turbine (may be required on a case-by-case basis)<br>C = Compound (must be sized on a case-by-case basis) | | |

5. Service taps greater than 2 inches shall be made by a Contractor of the Developer.

## B. MATERIALS

1. Taps:

   Direct taps shall not be allowed on C900 or C905 PVC mains. The maximum allowable size for saddle taps is 2". All taps larger than 2-inches shall be installed by inline fittings or tapping sleeves. All tapping of C900 or C905 PVC mains shall be implemented with shell type cutting tools classified for use with PVC pipe that retains the coupon cut while penetrating the pipe wall, use of twist drill bits and auger bits shall be prohibited.

   The maximum size of direct taps without a fitting, tapping sleeve or saddle for ductile iron mains shall be as follows:

| Main Size (inches) | Tap Size (inches) |
|---|---|
| 4" main | 3/4" tap |
| 6" main | 1" tap |
| 8" main | 1 1/4" tap |
| 10" main | 1 1/2" tap |
| 12" main | 2" tap |

2. Tapping Sleeves: Tapping Sleeves shall be made of either cast iron or stainless steel. The sleeve shall be two-piece with mechanical joint to the main line and

flanged to the tapping valve. Cast iron shall meet AWWA C110 specifications. Stainless steel shall meet AWWA C223 specifications. All sleeves shall require full circumferential gasket. All tapping sleeves shall be manufactured and approved for installation on the specific main line pipe material (DIP, C900, C905).

3. Tapping Saddles: Tapping Saddles shall be used on reclaimed water mains 16 inches and larger. Saddles shall be made of ductile iron providing a factor of safety of 2.5 with a working pressure of 250 psi. Saddles shall be equipped with an AWWA C110 flange connection on the branch. Sealing gaskets shall be O-ring type, high quality molded rubber having an approximate 70 durometer hardness, placed into a groove on the curved surface of the saddles. Straps shall be alloy steel. The maximum size saddle outlet for each size of pipe to be tapped shall be as follows:

| Size pipe to be tapped | Maximum size Saddle Outlet |
|---|---|
| 16” | 8” |
| 18” | 8” |
| 20” | 10” |
| 24” and larger | 12” |

4. Corporation Stops: Corporation Stops shall be ball type, made of brass and complete with a compression or flared coupling and AWWA Standard threads as per AWWA C800. Taps shall be located at 10:00 or 2:00 o'clock on the circumference of the pipe. Service taps shall be staggered alternating from one side of the reclaimed water main to the other and at least 12 inches apart. The taps must be a minimum of 24 inches apart if they are on the same side of the pipe. No burned taps will be allowed and each corporation stop will be wrapped with Teflon tape for ductile iron pipe reclaimed water mains. No tapping shall be made where rodding is placed.

5. Service Saddles: Service saddles shall be bronze body (85-5-5 waterworks brass) and double strap for taps with silicon bronze nuts conforming to ASTM A98 and factory installed grade 60 rubber gaskets. Service saddles shall be approved by the manufacturer for use on C900/C905 PVC mains.

6. Service Tubing: Copper service tubing shall be type K soft copper tubing per ASTM B88. No union shall be used in the installation of the service connection of 100-feet or less. The longest available length of service line shall be used with no unions (e.g. for 3/4 inch, only 1 union will be allowed for each 100 foot section). Unions shall be made with flare type couplings. Copper service tubing shall be installed with a purple colored polyethylene wrap.

7. Coppersetters for ¾ and 1-inch Reclaimed Water Services: All ¾ and 1-inch reclaimed water services shall be installed with coppersetters as shown in the Details. All coppersetters shall be as manufactured by Mueller or Ford at the dimensions shown in the Details. All coppersetters shall be installed with a lockable angle ball valve assembly and outlet angle check valve on all size setters. Coppersetters shall be installed with flare fittings and all coppersetter assemblies shall be provided as shown in the Details with galvanized brace pipes for additional stability. All installations shall provide the coppersetter properly aligned with the meter box reader lid such that the meter is clearly visible below the reader lid.

8. Meter Boxes for ¾-inch services: ¾-inch meter boxes shall be light weight polymer concrete as shown in the Details. Meter boxes for ¾-inch reclaimed water services shall provide a cover opening of 11 X 18 inches and boxes shall measure at least 18-inches in depth. Meter boxes and covers shall be rated for "heavy duty" uses, such as alleys, driveways, parking lots, etc. Standard meter box covers shall not bolt down to the box. The box interior walls and covers shall be consistently color-coded purple (Pantone 522 or similar). All covers shall include a 4 X 6 inch cast iron reader lid with the words "RECLAIMED WATER – DO NOT DRINK" cast into the lid in 1-1/2" tall lettering. The Town of Holly Springs reserves the right to require all meter box covers to include brackets and housing for "ITRON" compatible transponders for automated meter reading systems. All meter boxes and covers shall be installed as shown in the Details.

9. Meter boxes for 1-inch services: 1-inch meter boxes shall be light weight polymer concrete as shown in the Details. Meter boxes for 1-inch reclaimed water services shall provide a cover opening of 11 X 18 inches and boxes shall measure at least 18-inch in depth. Meter boxes and covers shall be rated for "heavy duty" uses, such as alleys, driveways, parking lots, etc. Standard meter box covers shall not bolt down to the box. The box interior walls and covers shall be consistently color-coded purple (Pantone 522 or similar). All covers shall include a 4 X 6 inch cast iron reader lid with the words "RECLAIMED WATER – DO NOT DRINK" cast into the lid in 1½" tall lettering. The Town of Holly Springs reserves the right to require all meter box covers to include brackets and housing for "ITRON" compatible transponders for automated meter reading systems. All meter boxes and covers shall be installed as shown in the Details.

10. Meter boxes for 1½ and 2-inch services: 1 1/2" and 2" meter boxes shall be light weight polymer concrete as indicated in the Standard Details. All meter box interiors and covers shall be consistently color-coded purple (Pantone 522 or similar). Covers shall be marked on the top surface with a recognizable inscription indicating "RECLAIMED WATER – DO NOT DRINK" in 1-1/2" tall lettering. Piping for 1 1/2 and 2 inch reclaimed water meters shall be constructed from brass and copper tubing and shall be equipped with angled check valve outlets and by-pass flanged valve or by-pass flanged ball valve inlets. The box shall have an open bottom to allow drainage through stone.

11. Meter Vaults: Meter vaults and access doors within street right of way shall meet HS-20 loading requirements and shall be located outside of travel areas. The access double doors shall be aluminum with a flush drop lift handle, stainless steel hinges and bolts, a stainless steel slam lock, an automatic hold open arm, and compression springs to allow for easy opening. Covers shall be marked on the top surface with recognizable inscription indicating "Reclaimed Water-Do Not Drink"

12. Reclaimed Water Meters: Reclaimed water meters for ¾" to 2" services will be provided by the Town of Holly Springs. Larger meters shall be provided by the developer as directed by the Executive Director of Utilities and Infrastructure Services. Reclaimed water meters, registers and covers shall be purple (Pantone 522 or similar).

## 11.04 RECLAIMED WATER IRRIGATION SYSTEMS

### A. GENERAL

All reclaimed water irrigation systems within public street right of way require an encroachment agreement from the Town of Holly Springs or NCDOT prior to installation. Plans designating the location, size, material, and depth shall be submitted with the agreement application to the Engineering Department.

Pipe material for the irrigation mainline proposed to be used within the public right of way shall be Schedule 40 PVC or greater. All pipe, fittings, and appurtenances shall be purple (Pantone 522 or similar). A minimum depth of 2 feet of cover shall be provided.

A soil evaluation is necessary in order to determine the loading rate for irrigation permits. All development within the reclaim service area will need to complete an independent soil evaluation prior to submitting a reclaim irrigation permit.

All reclaimed water irrigation systems are required to secure permits from the Code Enforcement Department and the Utilities and Infrastructure Services prior to installation and shall be inspected after installation. A separate meter is required for irrigation systems.

For single family irrigation design, a CID, PE, or LA is required to develop the plan. For non-single family irrigation system designs, a PE must develop the plan.

Impoundments for reclaimed water storage for large scale irrigation systems or aesthetic/decorative water features shall be designed in accordance with 15A NCAC 02U – Reclaimed Water.

Service lines from mainline tap to the meter are installed and identified per the Town of Holly Spring's Standard Details. There shall be no direct cross-connection between potable and reclaimed water supplies.

B. **DESIGNS**

Sprinklers chosen and located to maintain the following setbacks from the irrigation area to the following features:

1.25 feet from surface waters [perennial and intermittent streams, wetlands] not classified as tidal salt waters or high-quality water (SA).

2.100 feet from surface waters [perennial and intermittent streams, wetlands] classified as tidal salt waters or high-quality water (SA).

3.100 feet from any water supply well (not including monitoring wells).

4.Sprinklers located on a steep slope have check valves installed on all the heads on that irrigation zone.

5.No mainlines or valves shall be allowed within the utility/devil strip. Laterals will be allowed and shall be placed within 1 ft of sidewalk.

6.The zoning of the irrigation system must allow that plants with different water requirements (such as grass and shrubs) are on separate zones. In addition, the irrigation design should consider the different microclimates found in most landscapes (such as north facing grass areas vs. south facing grass areas) and separate those microclimates into zones. These zoning practices may add slightly to the installation cost of an irrigation system, but can have a dramatic effect on system efficiency.

7.Guidelines on pressure at the head/emitter: Spray Heads 20 to 35 psi; gear rotors 60 psi or less; impact rotors 60 psi or less; drip emitters 40 psi or less.

8.Large commercial systems which have the potential to place undue burdens (demand or pressure requirements) on the Town of Holly Springs' public reclaimed distribution system must include on-site storage and/or pumping facilities. This determination will be made by the Executive Director of Utilities and Infrastructure Services. Design, operation, and maintenance of such on-site facilities shall be the sole responsibility of the applicant. These additional facilities must be designed in accordance with 15A NCAC 02U – Reclaimed Water.

9.Rain sensors must be installed to reduce the likelihood of overwatering. Rain sensors are required to remain in service at all times to prevent overwatering and/or ponding of reclaimed water.

C. **STREET CROSSING**

All irrigation line street crossings shall be contained within a ductile iron or steel casing pipe. The Town of Holly Springs may, in some instances, permit irrigation systems installed in the medians of Town-maintained roadways. These systems must also have french drains installed behind the curb and gutter and piped to a storm drainage collection system. These systems shall be allowed only when some permanent mechanism is established for the private perpetual maintenance of the system(s).

D. **HOSE BIDS**

Hose bibs are not permitted for the reclaimed water system.

E. **RAIN SENSORS**

Rain sensors must be installed to reduce the likelihood of overwatering. Rain sensor must remain in operation to prevent ponding or runoff.

## 11.05 TESTING AND INSPECTION

### A. GENERAL

1. All reclaimed water used in testing and inspection must be disposed of properly as described in Section 11.00.

2. All materials must be approved by the Inspector prior to installation. Materials rejected by the Town of Holly Springs' Inspector shall be immediately removed from the job site.

3. Under no circumstance shall any waterline system valve be operated without prior approval by the Construction Inspector. Damage to Town of Holly Springs infrastructure resulting from illegal operation of valves shall be the responsibility of the Contractor. In addition, the Contractor shall be subject to a fine for operating a valve without prior approval.

4. The Contractor shall furnish all materials, labor, equipment, and shall pay for the water used to perform all testing and inspections to the satisfaction of the Construction Inspector. The Contractor shall obtain a Blowoff Permit from the Town of Holly Springs Engineering Department for use when blowing off reclaimed water mains.

5. Reclaimed water service taps shall not be made until after all main testing is completed, and bacteriological testing is satisfactory.

### B. TESTING

1. Hydrostatic Testing

a) All valves in the Town of Holly Springs reclaimed water system shall be operated by the Town of Holly Springs. A section of reclaimed water main which is to be hydrostatically tested shall be slowly filled with water at a rate which will allow complete evacuation of air from the line. Hand pumps shall not be used for the pressure testing of reclaimed water mains. Taps used for testing purposes shall be removed after testing. The corporation stops shall be removed and a threaded tapered plug shall be installed on the line.

When approved by the Town of Holly Springs, the Contractor may utilize potable water or reclaimed water via an approved hydrant meter and RPZ assembly for testing and disinfection of new reclaimed mains which are not physically connected to a live reclaimed water supply. Once reclaimed water has been introduced into the system no direct connection to potable water will be allowed and an approved air gap assembly must be used.

b) Any measured leakage not within the allowable limits as specified in the following table shall require repair of the reclaimed water main and additional testing until the standards are met. For pipe sizes other than those shown, the Contractor shall test within the allowable leakage amounts as specified by AWWA C600-99. All visible leaks shall be repaired regardless of the amount of leakage.

| Pipe Size (Inches) | Allowable Leakage at 200-psi (Gal./Hr. per 1000 feet of pipe) |
|---|---|
| 4 | 0.43 |
| 6 | 0.64 |
| 8 | 0.85 |
| 12 | 1.28 |
| 16 | 1.70 |
| 20 | 2.12 |
| 24 | 2.55 |

2. Chlorination

a) All additions or replacements to the reclaimed water system shall be chlorinated before being placed in service under the supervision of the Town of Holly Springs' Inspector in the following manner:

i. Taps shall be made at the control valve at the upstream end of the reclaimed water main and at all extremities of the line including valves.

ii. A solution of water containing 70% HTH available chlorine shall be introduced into the reclaimed water main by regulated pumping at the

control-valve tap. The solution shall be of such a concentration that the reclaimed water main shall have a uniform concentration of 50 ppm total chlorine immediately after chlorination. The chart below shows the required quantity of 70% HTH compound to be contained in solution in each 1,000 feet section of line to produce the desired concentration of 50 ppm.

| Pipe Size (inches) | Pounds High Test Hypochlorite (70%) per 1000 feet of line |
|---|---|
| 6 | 1.76 |
| 8 | 3.12 |
| 10 | 4.84 |
| 12 | 7.00 |
| 14 | 9.52 |
| 16 | 12.44 |
| 20 | 19.52 |
| 24 | 28.00 |

iii. The HTH Solution shall be circulated in the reclaimed water main by opening the control valve and systematically manipulating blowoffs and taps at the reclaimed water main extremities. All reclaimed water leaving the system during this test must be disposed of through either an approved use or sent to the sanitary sewer. The HTH solution must be pumped in at a constant rate for each discharge rate so a uniform concentration will be produced in reclaimed water mains.

iv. HTH solution shall remain in reclaimed water mains for no less than 24 hours or as directed by the Town of Holly Springs' Inspector.

v. Extreme care shall be exercised at all times to prevent the HTH solution from entering existing reclaimed water mains.

3. Bacteriological Sampling

a) Free residual chlorine after 24 hours shall be at least 10 ppm or the Town of Holly Springs' Inspector will require that the lines be rechlorinated.

b) Flushing of reclaimed water mains may proceed after 24 hours, provided the free residual chlorine analysis is satisfactory. Reclaimed water leaving the system because of line flushing must be returned to a sanitary sewer. Flushing shall be continued until an orthotolidine check (or other method approved by the Town of Holly Springs) shows that the reclaimed water mains contain only the normal chlorine residual. Samples for bacteriological analysis shall be collected by the Town of Holly Springs' Inspector 24 hours after flushing is completed. The Contractor shall furnish the sample bottles, the testing agency and such help as may be required to secure these samples. The Contractor shall

also submit the test results to the Town of Holly Springs' Development Inspector.

c) If test results are unsatisfactory, the Contractor shall immediately rechlorinate reclaimed water mains and proceed with such measures as are necessary to properly sterilize those reclaimed water mains.

d) The new reclaimed water system shall be valved off from the existing reclaimed water system until a satisfactory bacteriological sample has been obtained and the Town of Holly Springs' Inspector has authorized the use of the new reclaimed water system.

## C. INSPECTIONS

1. Approved plans and permit must be issued and available on-site before any inspections are performed.

2. Underground Inspections – before work is covered up/back filled:
   a) Inspection of main line tap and piping to meter box;
   b) Inspection of underground piping from meter box through irrigation system from meter to end of system to insure compliance with approved plan and standards;

3. Final Inspection
   a) Includes inspection of the location of all heads, type of heads, spacing of heads and throw pattern of each head and correct pressure;
   b) Testing the system to ensure compliance with approved plans and Town of Holly Springs Ordinance;

4. A map of the approved valve and head layout shall be provided by the Contractor to the property owner and a copy placed near or with the timer.

5. All zones shall be clearly labeled in the timer cabinet.

6. Responsible entity shall be listed on inner door of timer (for emergency contact purposes).

7. Verification of required setbacks (reclaimed water).

## D. CROSS CONNECTION CONTROL

1. Backflow prevention on potable water services serving any property that is also served with reclaimed water is required in accordance with the Federal Safe Drinking Water Act. 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.

a. For Residential Properties: prior to receiving reclaimed water service, a dual check valve shall be installed on each residential customer's potable water meter in order to protect the potable water system. A Reduced Pressure Principal (RPZ) type backflow prevention device downstream of the potable water meter is not required when the only reclaimed water use is landscape irrigation.

b. For Multi-family complexes and commercial properties: master-metered potable water service and master-metered reclaimed water service shall be required to install a Reduced Pressure Principal (RPZ) type backflow prevention device downstream of the master potable water meter.

## 11.06 REPAIR OF RECLAIMED WATER SYSTEM

Reclaimed water that leaves the system due to a leak or break in the system must be reported and handled as if it were a wastewater spill.

A. Reclaimed Water Main Line Repairs

1. Joint leaks of Cast Iron Pipe, Ductile Iron Pipe, and PVC pipe shall be repaired by use of a bell joint leak repair clamp as manufactured by Rockwell, or other approved equal.

2. Line Breaks or Punctures shall be repaired by a full circle repair clamp as manufactured by Rockwell, Mueller, or other approved material.

3. Line Splits or Blow Outs shall be repaired by replacing the damaged section with ductile iron pipe with a cast iron coupling at each end. The following cast pipe couplings shall be used for each pipe material indicated:

    a) Ductile Iron Pipe - Rockwell 431 cast coupling or other approved equal.
    b) PVC Pipe – Rockwell 411 cast coupling or other approved equal.

B. Reclaimed Water Service Line Repairs

1. A reclaimed water service line severed between the reclaimed water main and the reclaimed water meter shall be repaired using new type K copper tubing and bronze or brass 3-piece flared unions.

2. A corporation stop pulled out of a reclaimed PVC pipe water main shall have a new service saddle and a new corporation stop installed on the reclaimed water main.

3. A corporation stop pulled out of a ductile iron pipe shall have a full circle repair clamp placed over the old tap hole. A new tap shall be made and a new corporation stop installed on the reclaimed water main.

**END OF SECTION 11.00**