

## ARTICLE 32

### RECLAIMED WATER SYSTEM

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The City will approve plans for reclaim water supply mains and extensions (herein this article referred to as “reclaim mains”) only when such mains are designed and constructed in accordance with the criteria set forth in this Manual.

32.01.02	<u>Design Period</u>
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Reclaim mains shall be designed for the estimated ultimate tributary population, as derived for the City’s approved future land uses and/or historical flows. Reclaim mains shall not include considerations for flows for fire protection demand and shall be subject to system or area shut downs. In the event the latest edition of an approved City of Ocoee Reclaim Master Plan or Study identifies components of the reclaim system that are under consideration, the largest capacity consideration shall be used in the design.

32.01.03      Location

Reclaim mains shall be located in dedicated rights-of-way or utility easements. When installed in rights-of-way, reclaim mains shall, in general, maintain a consistent alignment with respect to the centerline of the road. All reclaim mains located outside of dedicated rights-of-way shall require a minimum 20-foot easement. If a reclaim water main is located adjacent to a right-of-way, a minimum 10-foot easement shall be provided. Additional easement widths shall be provided when the pipe size or depth of cover so dictates. Reclaim mains shall not be placed under retention ponds, tennis courts, and other structures or within 75 feet of public or private potable water supply wells. In general, reclaim mains shall not be located alongside rear lot lines or pond berms unless approved by the City.

**Section**      **32.02**      **DESIGN BASIS**

32.02.01      Average Daily Flow and Peak Flow

Reclaim peak hourly flow shall be used as the design basis for the neighborhood and commercial (local) reclaim systems. Reclaim peak-hour flow shall be based on the application of a 1” depth of irrigation per week applied over two days a week from 5 P.M. to 7 A.M. (15 hours), multiplied by a factor of safety. The factor of safety shall be 3 divided by any alternating irrigation days per address for the area to be serviced.

32.02.02      Reclaim System Hydraulic Modeling

The City of Ocoee maintains a reclaim hydraulic model (Bentley WaterCAD) which is used for but not limited to determining system performances, offsite impacts and residual times. For developments that may substantially add to or impact the City’s reclaim system, the Owner/Developer shall initiate the incorporation of the development’s elements into the City’s model, and the simulation/analysis of the model. Unacceptable operating conditions and/or offsite impacts created by the proposed development shall be remediated by the Owner/Developer.

This effort to be undertaken by the Owner/Developer can be accomplished by either the developer’s engineer performing the model work with a City review or by electing to have the City undertake the work. Electing to have the City to perform the work shall require City approval. All costs incurred by the incorporation of and outside reviews by the City shall be at the Owner/Developer’s expense. All final products shall become property of the City.

**Section 32.03 DETAILS OF DESIGN AND CONSTRUCTION**

**32.03.01 Pressure**

All reclaim mains shall be designed in accordance with Section 30.02.01 above. The system shall be designed to maintain a minimum pressure of 40 psi 98% of the time. The normal working pressure in the distribution system should be approximately 60 psi. For pressures points greater than 90 psi, special provisions may be required. Design Friction Losses for reclaim mains shall be determined using the Hazen-Williams friction coefficient of C=120. Peak flow shall not exceed 5 fps.

**32.03.02 Diameter**

Only 4", 6", 8", 12", 16", 20", 24", 30", 36", 42", 48" and 54" diameter reclaim mains shall be permitted. Reclaim mains with a 4" diameter shall be permitted in cul-de-sac areas with a maximum length of 800 feet of pipe. As a minimum, 6" looped systems shall be required in low density residential projects. Where looping of mains is not practical, 8" minimum mains shall be required, unless detailed calculations are submitted to substantiate the sufficiency of a 6" main. In commercial, industrial, and high density residential areas, minimum 8" looped mains shall be required.

**32.03.03 Dead Ends**

In order to provide increased reliability of service and reduce head loss, dead ends shall be minimized by making appropriate tie-ins wherever practical, as determined by the City. System looping is required wherever possible to increase overall capacity and service. Where dead-end mains occur, they shall be provided with a hydrant or if approved blow-off for flushing purposes. Flushing devices shall be sized to provide flows which will give a velocity of at least 2.5 feet per second in the reclaim main being flushed. No flushing device shall be directly connected to any sewer.

**32.03.04 Valves**

Valves shall be provided for all branch connections, loop ends, fire hydrant stubs, or other locations as required to provide an operable, easily maintained, and repairable reclaim distribution system. Valves are to be placed so that the maximum allowable length of reclaim main required to be shut down for repair work shall be 500 feet in commercial, industrial or multi-family residential areas, or 800 feet in other areas.

32.03.05 Air Relief Valves

At high points in reclaim mains where air can accumulate, provisions shall be made to remove the air by means of hydrants or automatic air relief valves. Automatic air relief valves shall not be used in situations where flooding of the manhole or chamber may occur. Refer to the Typical City Details attached as part of this Manual.

32.03.06 Chamber Drainage

Chambers, pits or manholes containing valves, blow-offs, meters, or other such appurtenances to a distribution system shall not be connected directly to any storm drain or sanitary sewer, nor shall blow-offs or air relief valves be connected directly to any sewer.

**Section** **32.04** **RECLAIM METERING**

32.04.01 General

All reclaim service connections shall be metered. In general, the method of metering shall follow the guidelines listed below. However, the Owner's/Developer's Engineer must obtain approval before finalizing the design of the metering system. Master metering for irrigation for common grounds shall be reviewed and approved by the City Engineer on a case-by-case basis.

32.04.02 Single Family, Duplex, and Multi-Family Subdivisions

Each unit's private irrigation areas shall be individually metered. Joint common irrigation areas shall be master metered. Single and double services shall be installed at property lines as specified in the Typical City Details attached as part of this Manual.

32.04.03 Commercial, Industrial, and Institutional Projects

In general, each building shall be individually metered. Meter(s) shall be located in the public rights-of-way at the property line.

32.04.04 Shopping Centers

Common irrigation areas shall be master metered. Each unit's private irrigation area shall be individually metered. The meters shall be located either in the right-of-way or within a Utility Easement. The meters shall be located within an unpaved area to facilitate removal, repair and/or replacement without damage to paved surfaces.

32.04.05      Meter Installation

All meter boxes shall be installed by the Contractor at finished grade and level. All meters 2” in size and smaller will be installed by the City after payment of applicable fees and charges. All meters 2” in size and smaller shall be installed underground in an approved meter box. Meters larger than 2” shall be installed aboveground. In general, meters larger than 2” shall be located in a meter easement located adjacent to the public right-of-way.

32.04.06      Meter Sizing

Size of all meters shall be determined by the Owner's/Developer's Engineer and approved by the City Engineer. The Owner's/Developer's Engineer shall provide sufficient information on estimated peak flows and low flows so that meter size can be evaluated. The Owner's/Developer's Engineer shall include head-losses through metering device when designing the reclaim system.

**Section      32.05      RECLAIM SERVICES AND CONNECTIONS**

Reclaim services and connections shall conform to the applicable provisions of this Manual and the Typical City Details attached as part of this Manual. Only 1", 1 ½", 2", 3", 4", 6", 8", 10" and 12" services shall be permitted. Where reclaim services greater than 12" are required, dual services shall be provided. New services and connections to the reclaim system, either new or existing, shall be made by the Contractor.

Reclaim service piping and connection shall be installed as specified in the Typical City Details attached as part of this Manual. The location of all service lines shall be as specified in the Typical City Details attached as part of this Manual and shall be either single or dual service. On curbed streets, the exact location for each installed service shall be marked by etching or cutting a “W” in the concrete curb. Where no curb exists, locations shall be adequately marked by a method approved by the City.

**Section      32.06      SERVICE PIPES, STOPS, FITTINGS, AND SERVICE SADDLES**

32.06.01      Service Pipes

All service lines shall be 1”, 1 ½” or 2” standard AWWA C-901-88 PE 3406 (purple) polyethylene tubing, 200 psi rating. Single and double residential service lines shall be 1” diameter. Double service lines shall use 1" x 1" x 1" wye branch (Ford No. Y44-264) or equivalent.

32.06.02      Stops

Corporation stops shall be 1", 1 ½" or 2" brass, equipped with connections compatible with polyethylene tubing and threaded in accordance with specifications in AWWA C-800 and AWWA C-901. Curb stops shall be sized to match the meter size and conform to the specifications in AWWA C-800 and AWWA C-901.

32.06.03      Fittings

Fittings shall be brass, cast and machined in accordance with specifications in AWWA C-800 and AWWA C-901, with compatible polyethylene tubing connections.

32.06.04      Service Saddles

A service saddle may be used for all service line taps. Service saddles shall be double strap, anchored by a minimum 4 bolt pattern on a ductile iron saddle body. The City may require a stainless steel strap and fusion epoxy or nylon coated ductile iron body with stainless steel hardware in areas designated as corrosive.

**Section      32.07      RECLAIM MAIN MATERIALS**

32.07.01      General

These Specifications cover the pipe, fittings, and accessory items used for reclaim distribution systems.

Pipe used in reclaim distribution systems shall be generally Polyvinyl Chloride Pipe (PVC) with direct burial applications. For directional drill applications High Density Polyethylene Pipe (HDPE) shall be required.

The Contractor shall be responsible for all materials furnished and storage of same, until the date of substantial completion. The Contractor shall replace, at the Contractor's expense, all materials found to be defective or damaged in handling or storage. The Contractor shall, if requested by the City, furnish certificates, affidavits of compliance, test reports, or samples for check analysis for any of the materials specified herein. All pipe delivered to project site for installation is subject to random testing for compliance with the designated specifications.

32.07.02      Pipe Material

All PVC mains of nominal diameter 4" through 12" shall be AWWA C900 SDR18 and mains greater than 12" shall be C905 SCR18. Refer to ARTICLE 33 Horizontal Directional Drilling for HDPE material requirements.

### 32.07.03 Fittings

Any fittings required shall be mechanical joint ductile iron or gray iron conforming to ANSI/AWWA A-21.10/C-110, 250 psi minimum pressure rating, or ductile iron compact fittings 4” through 12” in accordance with ANSI/AWWA A-21.53/C-153.

### 32.07.04 Joints

Joints for ductile iron pipe and fitting joints shall be push-on or mechanical joints conforming to ANSI/AWWA A-21.11/C-111. Where called for in the plans, restrained or flanged joints shall be provided. Flanged joints shall conform to ANSI Standard B-16.1-125 lb. Restrained joints shall conform to ARTICLE 26 of this Manual.

### 32.07.05 Resilient Seat Gate Valves

All gate valves 12” and smaller shall be resilient seat gate valves. Such valves shall be resilient seated, manufactured to meet or exceed the requirements of AWWA C-509, latest revision, and in accordance with the following Specifications. Valves shall have an unobstructed waterway equal to or greater than the full nominal diameter of the valve. (See approved Manufacturer's List attached as part of this Manual.)

The valve body, bonnet, and bonnet cover shall be cast iron ASTM A-126, Class B. All ferrous surfaces inside and outside shall have a fusion-bonded epoxy coating. A 2” wrench nut shall be provided for operating the valve. All valves are to be tested in strict accordance with AWWA C-509. The valve shall be operated opening counterclockwise.

The valves shall be non-rising stem with the stem made of cast, forged, or rolled bronze as specified in AWWA C-509. Two stem seals shall be provided and shall be of the O-ring type. The stem nut must be independent of the gate.

The resilient sealing mechanism shall provide zero leakage at the working pressure when installed with the line flow in either direction.

All shut-off valves 16” and larger shall be resilient seat gate with horizontal mechanical gearing and clear passage for pigging devices. Valve shall be American Flow Control Series 2500 NRS “Bevel Gearing Dimensions” or equal.

### 32.07.06 Valve Boxes

All buried valves shall have cast-iron three-piece valve boxes. Valve boxes shall be provided with suitable heavy bonnets and shall extend to such elevation at, or slightly above, the finished grade surface as directed by the City. The barrel shall be a 2-piece, sliding type, having 5¼” shaft. The upper section shall have a flange at the bottom having sufficient bearing area to prevent settling and shall be complete with cast iron covers. Covers shall be 5¼” square and shall have “RECLAIM” cast into the top for all reclaim mains. The actuating nuts for deeper valves shall be extended to come up to a 4’ depth below finished grade.

Care shall be taken while constructing valve boxes to ensure that valve stems are vertical and the cast iron box has been placed over the stem with base bearing on compacted fill and top flush with final grade. Boxes shall have sufficient bracing to maintain alignment during backfilling. Contractor shall remove any sand or undesirable fill from valve box prior to final inspection.

#### 32.07.07 Air Release Valves

The air release valves for use in reclaim mains shall be installed as specified in the Typical City Details attached as part of this Manual and the make and model per the approved Manufacturer's List. Valves shall be provided with a vacuum check to prevent air from reentering the line. The fittings shall be threaded.

### **Section 32.08 RECLAIM MAIN INSTALLATION**

#### 32.08.01 General

Pipe shall be installed in accordance with the manufacturer's specifications and instructions for the type of pipe used and applicable AWWA Standards, such as C-600 and C-603, unless otherwise stated in these Specifications. A 2" jumper connection shall be provided for purposes of filling and testing the installed reclaim line prior to clearance for use. The jumper is to be installed per the Typical City Details attached as part of this Manual.

#### 32.08.02 Pipe Storage and Staging

All types of pipe shall be handled in such a manner as will prevent damage to the pipe or coating. Accidental damage to pipe or coating shall be repaired to the satisfaction of the City or be removed from the job. When not being handled, the pipe shall be supported on timber cradles or on properly prepared ground, graded to eliminate all rock points and to provide uniform support along the full length. When being transported, the pipe shall be supported at all times in a manner which will not permit distortion or damage to the lining or coating. Any unit of pipe that, in the opinion of the City, is damaged beyond repair by the Contractor shall be removed from the site of the work and replaced with another unit. Joint gaskets shall be stored in a clean, dark, dry location until immediately before use.

Dirt or other foreign material shall be prevented from entering the pipe or pipe joint during handling or laying operations, and any pipe or fitting that has been installed with dirt or foreign material in it shall be removed, cleaned and re-laid. At times when pipe-laying is not in progress, the open ends of the pipe shall be closed by a water-tight plug or by other means approved by the City to ensure absolute cleanliness inside the pipe.



**Section 32.09 VALVE INSTALLATION**

All valves shall be inspected upon delivery in the field to insure proper working order before installation. They shall be set and jointed to the pipe in the manner as set forth in the AWWA Standards for the type of connection ends furnished. All valves and appurtenances shall be installed true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the City before they are installed. Valves shall be installed in a vertical position and be provided with a standard valve box so arranged that no shock will be transmitted to the valve. The box shall be vertically centered over the operating nut, and the cast iron box cover shall be set flush with the road bed or finished surface. After installation, all valves shall be subjected to the field test for piping as outlined in these Specifications. Should any defects in materials or workmanship appear during these tests, the Contractor shall correct such defects to the satisfaction of the City.

Flanged joints shall be made with hot dipped galvanized bolts, nuts and washers. Mechanical joints shall be made with mild corrosion-resistant alloy steel bolts and nuts. All exposed bolts shall be painted the same color as the pipe. All buried bolts and nuts shall be heavily coated with 2 coats of bituminous paint.

**Section 32.10 IDENTIFICATION**

In order to preclude possible interconnections and/or improper use of reclaim water, all reclaim lines, tubing, meter boxes and locate wire/tape shall be purple Pantone 522c in color. PVC or HDPE reclaim mains shall be marked with a continuous stripe within the top 90° of the pipe. Said stripe shall be a minimum of 2" in width and shall be light purple in color. Backfill shall not be placed for 30 minutes if field painting is required. In addition, all pipe shall be buried with identification tape above the top of the pipe, see the Typical City Details attached as part of this Manual. The tape shall indicate the presence of the reclaim main plainly on the tape face. Indicator tape buried with PVC pipe shall be able to be detected by standard metal detection equipment.

All new reclaim usages shall include the proper placement of signage notifying the public of the use of reclaim. Subdivisions shall require signs located at each entrance and all common/landscape areas. Commercial sites shall have signs located where public could come in contact with reclaim water. See Typical City Details as part of this Manual for sign details.

**Section 32.11 SEPARATION OF WATER MAINS AND SEWERS**

**32.11.01 General**

No reclaim main shall pass through or come in contact with any part of a sewer manhole. Individual septic tanks must be located and avoided. Reclaim mains shall be laid such as to ensure no cross-connection, line confusion and/or improper connection will occur with potable water mains and facilities. Water main shall have a minimum of 3' vertical and 18" horizontal separation, outside to outside, or the separation requirements of F.A.C. Rule 62-555.314 shall be met as a minimum, whichever is greater.

**Section 32.12 TRENCH PREPARATION AND PIPE BEDDING**

**32.12.01 Trench Preparation and Pipe Bedding**

Applicable provisions of ARTICLE 6 of this Manual shall apply. Also refer to the Typical City Details attached as part of this Manual.

**32.12.02 Pipe Preparation, Handling and Laying**

All pipe and fittings shall be inspected prior to lowering into trench to ensure no cracked, broken, or otherwise defective materials are being used. Contractor shall clean ends of pipe thoroughly and remove foreign matter and dirt from inside of pipe and keep clean during and after laying.

Contractor shall use proper implements, tools, and facilities for the safe and proper protection of the work. Contractor shall lower pipe into the trench in such a manner as to avoid any physical damage to the pipe and shall remove all damaged pipe from the job site. Care shall be taken to not drop or dump pipe into trenches under any circumstances.

Contractor shall prevent foreign material from entering the pipe while it is being placed in the trench. Contractor shall remove all foreign material from the pipe or joint ring before the next pipe is placed. If the pipe laying crew cannot put the pipe into the trench and in place without getting earth into the pipe, the City may require that snugly-fitted, tightly-woven canvas bags be placed over each end before lowering the pipe. The bags shall be left in place until the connection is to be made to the adjacent pipe. During laying operations, Contractor shall keep debris, tools, clothing, or other materials out of the pipe.

All pipe shall be installed in accordance with AWWA C-600 unless such Standards conflicts with this Manual, in which case this Manual shall apply. Contractor shall cut pipe only as necessary to comply with alignment shown on the plans. Flame cutting of pipe shall not be allowed. Contractor shall provide special tools and devices, such as special jacks, chokers, and similar items required for proper installation. Lubricant for the pipe gaskets shall be furnished by the pipe manufacturer, and no substitutes shall be permitted under any circumstances.

**32.12.03 Trench Dewatering and Drainage Control**

Contractor shall prevent water from entering the trench during excavation and pipe laying operations to the extent required to properly grade the bottom of the trench and allow for proper compaction of the backfill. Pipe shall not be laid in water.

32.12.04      Survey Line and Grade

Pipe shall be laid to the lines and grades shown on the plans. The Contractor shall provide line and grade stakes at a 100' maximum spacing and at all lines and/or grade change locations. Contractor shall provide Temporary Bench Marks at maximum 1,000' intervals. The minimum pipe depth shall be 3' below the finished grade surface or 3' below the elevation of the edge of pavement of the road surface, whichever is greater.

32.12.05      Laying of Pipes on Curves

Long radius curves, either horizontal or vertical, may be laid with standard pipe by deflections at the joints. Maximum deflections at pipe joints and laying radius for the various pipe lengths shall be as recommended by the pipe manufacturer.

32.12.06      Pipe Restraining and Thrust Block

Requirements specified in ARTICLE 26 of this Manual shall apply.

32.12.07      Bedding and Backfill for Pipes

Requirements specified in ARTICLE 6 of this Manual shall apply.

**Section**      **32.13      HYDROSTATIC TESTS**

32.13.01      General

Hydrostatic tests shall consist of pressure test and leakage tests. Hydrostatic tests shall be conducted on all newly laid pressure pipes, joints and valves including all service lines to the curb stops. Air testing of pressure pipes shall not be permitted under any circumstances. Tests shall not be made on sections exceeding 2,000'. Contractor shall furnish all necessary equipment and material, make all taps, and furnish all closure pieces in the pipe as required. Equipment to be furnished by the Contractor shall include graduated containers, pressure gauges, hydraulic force pumps, and suitable hoses and piping. The City will monitor and approve a satisfactory test.

The Contractor may conduct hydrostatic tests after the trench has been partially backfilled with the joints left exposed for inspection for informational purposes only. The hydrostatic tests for acceptance shall only be conducted after the trenches have been completely backfilled and compacted as specified. Where any section of pipe is provided with concrete thrust blocking, pressure tests shall not be made until at least 5 days have elapsed after the thrust blocking is installed. If high-early cement is used for the concrete thrust blocking, the time may be reduced to 24 hours if the City concurs that the concrete has cured and reached adequate strength.

32.13.02      Testing Criteria

All pipe sections to be pressure tested shall be subjected to a hydrostatic pressure of 150 psi. The duration of each pressure test shall be for a period of 2 hours. If during the test, the integrity of the tested line is in question, the City may require a 6 hour pressure test. The basic provisions of AWWA C-600 shall be applicable.

32.13.03      Procedure for Pressure Test

Each section of pipe to be tested, as determined by the City, shall be slowly filled with water and the specified test pressure shall be applied by means of a pump connected to the pipe in a satisfactory manner. Before applying the specified test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made and appropriate valves installed to ensure bleeding of all air from the main. If defective pipes, fittings, valves, or hydrants are discovered in consequence of this pressure test, all such items shall be removed and replaced by the Contractor with sound material and the test shall be repeated until satisfactory results are obtained. Provisions of AWWA C-600, where applicable, shall apply.

32.13.04      Procedure for Leakage Test

After completion of the pressure test, a leakage test shall be conducted to determine the quantity of water lost by leakage under the specified test pressure. Applicable provisions of AWWA C-600 shall apply.

Allowable leakage in gallons per hour for pipeline shall not be greater than that determined by the formula:

$$L = \frac{SD(p)^{1/2}}{133,200}$$

Note: L = Allowable leakage in gallons per hour.

S = Length of pipe tested, in feet.

D = Nominal diameter of the pipe in inches.

P = Average test pressure during leakage test in pounds per square inch gauge.

Leakage is defined as the quantity of water to be supplied in the newly laid pipe or any valved section under testing, which is necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled. Should any of the test pipe laid disclose leakage greater than that allowed, Contractor shall locate and replace or repair the defective joints, pipe or valve until the leakage from subsequent testing is within the specified allowance.

**Section 32.14 FINAL FLUSHING AND TESTING**

All material, sediment and debris shall be thoroughly removed from the newly laid pipe at its extremity until the replacement water throughout its length is clear, including all mains and services. Repeating of the cleaning procedures shall be required in the event that material, sediment and/or debris is observed or system continuity is interrupted.

**32.14.01 Pigging/Swabbing Procedures**

- a. All new reclaimed water mains shall be hydraulically or pneumatically cleaned with a polypropylene swabbing device to remove dirt, sand, and debris from main.
- b. If swabbing access and egress points are not provided in the design drawings, it will be the responsibility of the CONTRACTOR to provide temporary access and egress points as required for the cleaning.
- c. Passage of cleaning poly swabs through the system shall be constantly monitored, controlled and all poly swabs entered into the system shall be individually marked and identified so that the exiting of the poly swabs from the system can be confirmed.
- d. Cleaning of the system shall be done in conjunction with the initial filling of the system for its hydrostatic test.
- e. The CONTRACTOR shall insert flexible polyurethane foam “swabs” (2 pounds per cubic foot density) complete with rear polyurethane drive seal, into the first section of pipe. The “swabs” shall remain there until the pipeline construction is completed.
- f. The line to be cleaned shall only be connected to the existing distribution system at a single connection point.
- g. Locate and open all new in-line valves beyond the point of connection on the pipeline to be cleaned during the swabbing operation.
- h. At the receiver or exit point for the poly swab, the CONTRACTOR is responsible for creating a safe environment for collection of debris, water and the swab. Considerations shall be made for protecting surrounding personnel and property and safe retrieval of the swab.
- i. Only City personnel shall operate the supply valve from the existing distribution system. Cleaning and flushing shall be accomplished by propelling the swabbing swab down the pipeline to the exit point. Flushing shall continue until the water is completely clear and swab is retrieved.
  - 1. Re-apply a series of individual swabs in varying diameters and/or densities as required, to attain proper cleanliness of pipeline.

2. Swabbing speed shall range between two and five feet per second.
- j. After the swabbing process, pressure testing of the pipe shall be completed in accordance with this ARTICLE.

**Section 32.15 SYSTEM BLOWOFFS AND SUPPLY HYDRANT**

**32.15.01 Spacing**

System blow offs shall be required on each reclaim main run with a maximum spacing of 3,000'. Where reclaim mains are 12" or greater, or system blow offs are at extreme ends of the reclaim system, the system blow off shall be replaced with supply hydrants. The City Engineer shall approve the replacement of a system blow off with supply hydrant. Fire hydrants as specified in ARTICLE 31 shall be used as supply hydrants and shall be painted purple.