POTABLE WATER SPECIFICATION

1.1SCOPE OF WORK

1.1.1 GENERAL
All potable water and reclaimed water mains and appurtenances must be installed in accordance with the City of Cocoa Utilities Department's Technical Provisions and Standard Details, the City of Cocoa Utilities Department Utilities Handbook and the approved plans, for the Construction of the Water Distribution System and the Water Reclamation System. Contractor requirements include:
Furnishing all labor, materials, tools and equipment necessary or incidental to the construction.

Obtaining and paying for all permits, inspections, and other official fees in connection with the work.

Arranging a pre-construction conference with the Engineering Inspection Division. **All fees must be paid prior to pre-construction meeting.** It is required that the pre-construction meeting be held prior to ordering materials.

Scheduling materials inspection (24 hours notice), open ditch inspection, pressure/leakage test, and final inspection.

Provide all documents per the project requirement letter, including but not limited to As Built Drawings, Bills of Sale, Easements, etc.

Any deviation from these requirements must be approved in writing by the Utilities Director or his designee prior to commencement of construction.
Fees charged by the City are set by City Council by resolution and are listed on the appendix "Water Service Rates and Charges" made a part of the Utilities Handbook. Fees are subject to change without notice. The most current fees will be charged.
The Utilities Department and Engineering Division are located at 351 Shearer Blvd., Cocoa, Florida, 32922. The Dispatch telephone number is (321) 433-8718; facsimile number is (321) 433-8708.
1.1.2 DEFINITIONS
The term "**approved equal**" is used to mean a part or item that has been approved in writing by the Technical Provision and Standard Details Advisory Committee or the Utilities Director. A written request must be made in order to have an item accepted as an approved equal. Written specifications on the part or item must be furnished with the request.
Approved Tapping/Linestop Contractor - A Contractor who has been approved by the Engineering Division to perform taps or linestops within the Cocoa Water System. Some contractors are only allowed to perform .75" - 2.00" taps for themselves on their on Projects, they may not perform taps for anybody else.
Backflow Preventer Assembly - A Backflow assembly is an approved, testable assembly composed of two independently acting, approved check valves, including tightly closing resilient seated shutoff valves attached at each end of the assembly and fitted with properly located resilient seated test cocks.
Bonafide Tapping Contractor - Means the Contractor is in the business of doing taps or line stops.
Canal - A trench, the bottom of which is normally covered by water, with the upper edges of its two sides normally above water.
City - Means the City of Cocoa.
Collection Mains - Wastewater gravity mains.
Competent Person - A person who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
Distribution Main - Any water twelve inches (12") and smaller.
Domestic - Means made or manufactured in the USA.
Drainage Ditch or Irrigation Ditch - A man-made trench which is dug for the purpose of draining water from the land or for transporting water for use on the land and which is not built for navigational purposes.
Force Main - Wastewater main under pressure.
Manual - City of Cocoa Utilities Technical Specification and Standard Details Manual
Normal Working Day - Monday through Friday, excluding CITY holidays.
Normal Working Hours - Hours are between the hours of 8:00 a.m. to 5:00 p.m. of a NORMAL WORKING DAY.
Passivated - Treated or coated metal to reduce the chemical reactivity of its surface.
Stainless Steel - A steel alloy with a minimum of 10.5% to 11% chromium.
Substantial Completion - The point when the construction project has been finished to the point that the City of Cocoa can use the project for the purpose it was intended.
Swale - A man-made trench which:
A. Has a top width-to-depth ratio of the cross-section equal to or greater than 6:1, or side slopes equal to or greater than three feet horizontal to one foot vertical;
B. Contains contiguous areas of standing or flowing water only following a rainfall event;
C. Is planted with or has stabilized vegetation suitable for soil stabilization, stormwater treatment, and nutrient uptake;
D. Is designed to take into account the soil erodibility, soil percolation, slope, slope length, and drainage area so as to prevent erosion and reduce pollutant concentration of any discharge.
Technical Provision and Standard Details Committee - Committee whose members shall consist of the manager, or their designee, of the following UTILITIES divisions: Engineering, Inspections, WFO, Wastewater. The committee evaluates and proposes revisions for the design standards, specifications, drawings, products and procedures for the TPSD.
Transmission Main - Any water main sixteen inch (16") and larger. Fourteen inch (14") pipelines are not acceptable.
Utilities - Utilities Department of the City of Cocoa, Cocoa, Florida, and/or its designated representative(s).
Whenever a specification from a specific source is cited, the most current revision of that specification will be used. **The word "shall" is mandatory, and the word "may" is permissive.**
Unless otherwise specified, "**City**" means City of Cocoa; "**Utilities Department**" means City of Cocoa Utilities Department; "**Engineering Division**" means City of Cocoa Utilities Department, Engineering Division, "**Inspections**" means City of Cocoa Engineering Inspections Division.
1.2 MATERIAL SPECIFICATIONS
1.2.1 PIPE
1.2.1.1 Polyvinyl Chloride Pressure Pipe, 4"-12"
Polyvinyl chloride pressure pipe (sizes 4" through 12") will be cast iron pipe equivalent outside diameter Class 235 (DR 18) conforming to the American Water Works Association's (AWWA) specification C900 and will be blue or white in color. Pipe will be in standard 20-foot lengths. All joints will be of the elastomeric-gasket type with thickened, integral solid-wall bell or coupling with the same DR as the barrel. All PVC pipe and couplings will bear the UL label and NSF approval for potable water.
1.2.1.2 Fusible Polyvinyl Chloride Pipe, 4" thru 12"
Polyvinyl chloride pressure pipe (size 4" through 12") will be cast iron pipe equivalent outside diameter and a pressure rating of 235 p.s.i. (DR 18) conforming to AWWA specification C900 and will be blue or white in color. Fusible PVC pipe shall be supplied by Underground Solutions, Inc. It shall be installed in accordance with the suppliers' specifications. All PVC pipe will bear the UL label and NSF approval for potable water.
1.2.1.3 Ductile Iron Pipe
Ductile iron pipe will be cement-lined pressure Class 350 for 12-inch diameter and smaller and Class 250 for 14-inch and larger conforming to AWWA specification C151. Water main and storm drain crossing conflicts will be properly designed by the project engineer and approved by the Utilities Department prior to installation. Water mains that are less than 10 feet apart from building foundations or other permanent objects will be ductile iron pipe. In no case will water mains be located less than 5 feet from foundations. The above distances will be doubled for water mains larger than 8" in diameter. Polyethylene sleeve conforming to AWWA specification C105 will be provided for all installations. The polyethylene sleeve will be sealed with tape, and shall be blue for water mains.
1.2.1.4 High Density Polyethylene (HDPE) Pipe
HDPE pipe is generally not accepted in the City of Cocoa water system, except as a carrier pipe for a pressurized utility main.
1.2.1.5 Reclaimed Water
PVC pipe installed in reclaimed water systems will be Class 235 (DR 18) conforming to AWWA specification C900 and will be purple in color. Ductile iron pipe installed in the reclaimed water system will be pressure Class 350 for 12" and smaller and pressure Class 250 for 14" and larger, provided 3 feet of cover can be maintained. Where cover is less than 3 feet, pressure Class 350 is required. Polyethylene sleeve conforming to AWWA specification C105 will be provided for all installations. The polyethylene sleeve will be sealed with tape, and shall be purple for reclaimed water mains.
1.2.2 VALVES, VALVE BOXES AND VALVE EXTENSIONS
1.2.2.1 Resilient Seat Gate Valves, 4"- 36"
Resilient seat gate valves will have mechanical joint ends as manufactured by American Flow Control; AVK; M&H; U.S. Pipe; Clow; Mueller or an approved equal. The resilient seat gate valves must conform to AWWA specification C509 or C515 and be manufactured in the U.S.A. Resilient seats will be of natural or synthetic rubber and be fully encapsulated to gate. Valves will have 18-8 Type 304 Stainless Steel bolts and nuts. The interior and exterior of the valve body will be fusion bonded epoxy coated in accordance with AWWA specification C550 in order to provide a corrosion-resistant seat. The coating must be applied in a manner to withstand the action of line fluids and operation of the sealing gate under long-term service. Valve seats must seal by compression only. Wedging or sliding of the resilient seat is not acceptable. Valves will be supplied with 2"-square operating nuts and be designed to provide a bubble tight seal regardless of direction of flow. Opening the valve will be in the counterclockwise direction. Valves 16" and larger will have Bevel Gear Operators. For gate valves 16" and larger to be stood up straight, the 2" operating nut must have 12" of cover. Engineer of Record or Contractor must demonstrate the 12" of cover over the 2" operating nut can be achieved by showing all pertinent dimensions. Tapping valves shall have a centering ring.
1.2.2.2 Butterfly Valves, 16" and larger
Butterfly valves shall be used for above ground service. Butterfly valves shall have flanged ends, be rubber seated, 90o tight closing type, short body. The interior and exterior will be fusion bonded epoxy coated in accordance with AWWA specification C550. The valve shaft will be of 316 Stainless Steel. Body dimensions and minimum shaft diameter will be in accordance with Tables 3 and 4 of AWWA specification C504. The valve seat will be of molded natural or synthetic rubber, will be mechanically secured to the disc or to the valve body, and will mate against a stainless steel seat surface. The gear ratio will be such as to require not more than 50 foot pounds of input torque to operate the valve against the worst case of a water flow velocity of 10 feet per second at a pressure of 100 psi differential. A torque-limiting device will be supplied if the allowable operator input is less than 450 foot pounds. Butterfly valves will have a factory installed handwheel. The valve will open when the operator nut is turned counterclockwise. **Butterfly valves will not be used for buried service.**
1.2.2.3 Valves, 2"
Two-inch valves for use with the 2" blow-off gate valve will be rated at 125 SWP or 200 WOG. All 2" gate valves must meet all EPA and DEP requirements regarding lead and zinc contents. Brass fittings and 2" brass wheel valves are shall be used on blow-offs. All valves must be manufactured in the U.S.A.
1.2.2.4 Valve Boxes
Valve boxes and lids must be manufactured in the U.S.A. Boxes and lids must be structurally equal to those produced by East Jordan Iron Works or Tyler and must have 5-1/4" minimum inside diameter. Cast iron valve boxes will consist of a circular cast iron top and bottom section. The depth must be determined and the appropriate valve box must be installed. No PVC or Ductile is permitted in the valve box. Boxes must be set flush with finished ground surface in such a manner as to permit easy use of a valve wrench and to prevent surface loads from being transmitted to the valve or pipe. Box sections must be telescopic and adjustable. Valve box lids should have the word "WATER" or "SEWER" or "REUSE", as appropriate, cast on the top. A concrete pad (24" L x 24" W x 4" D) will be poured around all boxes at finished grade level unless the valve is located in a paved roadway or parking lot.
1.2.2.5 Valve Extensions
If the depth of the valve nut is greater than 48" below grade, or 30" below grade and under the water table, a valve extension stem will be required. The extension will have a centering collar and will be mechanically attached to the valve operating nut, such as extensions manufactured by the General Engineering Company, Model #4840-0001-3, or an approved equal to be determined by the Engineering Supervisor or his/her designee.
1.2.2.6 Valve Box Debris Shield
All buried valves 4-inch through 12-inch requiring a valve box shall be furnished with a valve box shield (alignment device). The device shall minimize debris infiltration and center the valve box over the operating nut. The device shall be of HDPE or plastic and colored white or black. It shall be furnished in two pieces that will lock together under the operating nut without requiring the removal of the operating nut. The device shall not affect the operation of the valve. No one-piece device will be accepted. The device shall be Box Lok, American or approved equal.
1.2.**2.7 Insert Valve Specification**
The Insert Valve shall conform to the following:
The Ductile Iron 250 p.s.i.g. Insert Valve shall be a Resilient Wedge Gate Valve designed for use in potable water, raw water, reclaimed water, wastewater and backflow control systems. The host pipe shall not be a permanent component of the Insert Valve. The ductile iron body, bonnet and wedge provide strength and a pressure rating that meets or exceeds the requirements of AWWA C515. Insert Valve shall be ductile iron construction meeting ASTM A536 Grade 65-45-12.
Sizes 12" and smaller must be capable of working on Cast/Grey Iron or Ductile Iron Class A, B, C and D, IPS PVC, C900 and C909 PVC, Steel, AC pipe diameters without changing either top or bottom portion of split valve body. The Insert Valve shall have a 250 psig maximum working pressure. The pressure rating markings must be cast into the body of the insert valve. The construction of the Resilient Wedge shall comply with AWWA C509 requirements. The ductile iron wedge shall be fully encapsulated with EPDM rubber by a high pressure and high temperature compression or injection mold process. The resilient wedge shall seat on the valve body and not the pipe to obtain the optimum seating and flow control results. The resilient wedge shall be totally independent of the carrier pipe. The resilient wedge shall not come into contact with the carrier pipe or depend on the carrier pipe to create a seal. The Resilient wedge must ride inside the body channels to maintain wedge alignment throughout its travel. The insert valve is fully epoxy coated on the interior and the exterior. Valve shall be coated with a minimum of 10 mils epoxy in compliance with AWWA C550 and certified to ANSI/NSF-61.
The stuffing box, operating stem and resilient wedge (complete bonnet and all moving parts) shall be removable, repairable and or replaceable under pressure.
See Appendix "A" Approved Materials for approved Insert gate valves.
1.2.4 FITTINGS
All fittings must be of the mechanical joint type with an approved joint restraint, or push-on joint with a gasket joint field restraint system, such as "Field Lok" as manufactured by U.S. Pipe or an approved equal. All fittings must be manufactured in the U.S.A.
1.2.4.1 Cast Iron
Cast iron fittings will be AWWA specification C110; Class 250, cement lined with inside seal coating. The fittings will be bituminous coated on the outside and be wrapped with 6 mil polyethylene (sealed with tape).
1.2.4.2 Ductile Iron, 4"-16"
Ductile iron compact fittings (sizes 4" through 16") must conform to AWWA specification C153. Ductile iron compact fittings will be mechanical joint with an interior cement lining with seal coating and an exterior bituminous coating. All fittings will be wrapped with 6 mils polyethylene (sealed with tape)
1.2.**4.3 Bolts**
All buried mechanical joint bolts and nuts must be CORTEN Steel. All above ground bolts and nuts for flanged fittings must be 18-8 Type 304 stainless steel. Never-seize/Anti-seize shall be applied to all SS bolts and nuts.
1.2.4.4 Tapping Sleeve
Tapping sleeves on mains 4" to 12" in diameter will be ductile iron body mechanical joint type or All Stainless Steel Sleeve.
The All Stainless Steel Sleeve shall be fabricated from 304 Stainless Steel. They shall have a pass through bolt design and full circumferential gasket to provide 360° seal around the pipe. The tapping sleeve is to be fully passivated to return the stainless steel to its highest corrosion resistance stage.
Sleeves on mains 16" to 24" in diameter will be fabricated steel with O-ring seal, fusion bonded, epoxy coated with 304 stainless steel nuts and bolts or M.J. ductile iron body. Sleeves on mains larger than 24" will be handled on a case-by-case basis.
Tapping Sleeves for reinforced concrete mains will be handled on a case-by-case basis. The sleeves will have a fusion bonded epoxy coating on the entire body and throat assembly. The straps and bolts shall be 18-8 Type 304 stainless steel.
The tapping valve must have centering ring and conform to Section 2.2.1 -Resilient Seat Gate Valves in these Technical Provisions.
Tapping saddles to be placed on asbestos concrete (AC) pipe shall be a JCM 432 All Stainless Steel Sleeve or equal.
1.2.4.5 Line Stop Sleeve Specifications
Sizes 4" through 12"
Sleeve/Body
The entire Line Stop sleeve shall be fabricated from 304 Stainless Steel. They shall have a pass through bolt design and provide 360° seal around the pipe. The line stop sleeve is to be fully passivated to return the stainless steel to its highest corrosion resistance stage. Outlet on sleeve will be full port, ie. on 8" sleeve, outlet will be 8", on 6" sleeve, outlet will be 6".
Bolts, Nuts & Washers
18-8 Type 304 Stainless Steel, the bolts shall be track head type and furnished with permanently lubricated heads, hex nuts and stainless washers.
Gasket
The full circumferential gasket shall be molded of synthetic rubber compounded for use with water salt solutions, mild acids, bases and sewage. The gasket shall have a gridded surface, be a full 1/4" thick with 304 stainless steel bridge plates molded flush into the gasket and have a raised hydromechanical outlet seal to seal against line surges and water hammer.
Pressure Rating
The sleeves shall be rated at 150 PSI hydrostatic with a test pressure of 200 PSI on pipe with full circumferential break.
Line Stop Sleeves shall be JCM 440 Line Stop Sleeve or approved equal.
1.2.5 FIRE HYDRANTS
Fire hydrants must be manufactured in accordance with AWWA specification C502. Hydrants must have bronze-to-bronze main seat threading surfaces. They will be traffic type with drain holes plugged at the factory. Fire hydrants will have 18-8 Type 304 Stainless Steel bolts and nuts (bonnet, traffic flange and shoe).
Hydrants will have a minimum 5-1/4" main valve opening, with one 4-1/2" pumper nozzle, and two 2-1/2" hose nozzles. Nozzles to have NST threads. Stem couplings are to be cast iron or stainless steel. The upper valve plate must be bronze. The hydrant shoe will be coated inside with fusion bonded epoxy, 6 mil minimum. All hydrants will be painted at the factory with Rustoleum high-performance epoxy 9100 system, non-lead, dry film thickness 5 to 8 mils, color #9143 Yellow. City crews will apply finish paint to each new fire hydrant after the Contractor has paid the appropriate fees.
Finish grade is to be established and the proper length hydrant installed be installed by the Contractor prior to acceptance by the City. All nozzles will be a minimum of 18" and a maximum of 24" above finished grade. A 6" mechanical joint hydrant connection will be provided using a hydrant valve-anchoring tee with integrally cast standard mechanical joint gland on 6" plain end branch. The Contractor will not be allowed to install risers on hydrants. At final inspection, if it is determined that a fire hydrant is not at grade, the Contractor shall purchase a proper length hydrant and install it under the direction of Utilities Inspection Department.
1.2.**6 SERVICE CONNECTIONS, 3/4"-2"**
All service connections will be single connections. Services that are 3/4" and 1" are to be type K annealed temper soft copper. All connections are to be of the flare type. 1-1/2" and 2" services are to be of type K drawn temper in straight lengths or annealed temper if furnished in coils. Absolutely no lead-based solder joints will be accepted. Any repairs of service lines will be by flare-to-flare coupling. No compression fittings will be accepted. Taps in the pipe will be the same nominal diameter as the service line. Service taps in PVC pipe will be drilled with a shellcutter designed to cut PVC pipe, the PVC plug will be removed.
On January 4, 2014 the following specifications will be in effect for all brass fittings in contact with potable water.
Brass goods furnished under this specification shall be new and unused. All fittings shall conform to ANSI/AWWA Standard C800, latest revision.
All brass components in contact with potable water must be made from either CDA/UNS Brass Alloys C89520 or C89833 with a maximum lead content of .25% by weight. Brass alloys not listed in ANSI/AWWA C800 Paragraph 4.1.2 are not approved. All service fittings shall be certified as suitable for contact with drinking water by an ANSI accredited organization in accordance with ANSI/NSF Standard 61. All fittings shall be stamped or embossed with a mark or name indicating that the product is manufactured from the low-lead alloy as specified above.
Brass saddles shall be made from CDA/UNS C83600 and are exempt from the "no lead" requirement.
1.2.6.1 Saddles
Saddles must be used for all connections to PVC, AC and D.I. pipe. Saddles must be all brass with "CC" threads as manufactured by Mueller Company, Ford Meter Box Company, or Smith-Blair Company. The pipe sizes for these manufacturers are noted below:
MUELLER: For pipe sizes 4" to 12", for 3/4" and 1" services, the single strap design must be used. For 1-1/2" and 2" services, the double strap design must be used.
FORD: For pipe sizes 4" to 12", for 3/4" and 1" services, the style 101B single strap design must be used. For 1-1/2" and 2" services, the style 202B double strap design must be used. For pipe sizes 16" and larger, for 3/4", 1", 1-1/2," and 2" services, the style 202B double strap design must be used.
SMITH-BLAIR: For pipe sizes 4" to 12", for 3/4" and 1" services, the 321 series single strap design must be used. For pipe sizes 4" and larger, for 1-1/2" and 2" services, the 323 series double strap design must be used. An approved equal may be used in lieu of any of the above-listed designs/models.
1.2.6.2 Curb Stops, 3/4" - 2"
Curb stops 3/4" and 1" in size will be Flare-by-Meter Coupling. **Curb stops must have locking wings and a swivel meter nut.** Curb stops that are 1-1/2" or 2" will be flare-by-flange with locking wing or an approved equal. All curb stops shall be centered in the meter box and installed in a horizontal position.
1.2.6.3 Corporation Stops, 3/4" - 2"
All corporation stops for water service ¾" thru 2" will be brass and have "CC" inlet threads and copper flare outlet. 2" Corporation stops for "jumpers" will be "CC"-by- F.I.P.
1.2.6.4 Meter Boxes
Meter boxes are to be plastic with an iron flipper lid with a full pin hinge, Service locations will be permanently cut and painted on concrete curb or the street with a blue "W" for potable water or a purple "R" for reclaimed. Reclaimed services will be located at the opposite lot corner from water services where practical or with five feet minimum separation.
For larger 1-1/2 and 2-inch meters, 17" x 30" meter boxes shall be used.
For areas that are anticipated for high traffic areas, a traffic rate H-20 meter box shall be used. Reclaimed Water services will be set in purple meter boxes per section 2.6.4 above. They are also required to have a 3" x 5" permanent plastic tag, secured to the curb stop with a nylon tie wrap, will be supplied. Tags will be inscribed, "RECLAIMED WATER DO NOT DRINK". Brass fittings used for Reclaimed Water are exempt from the "no lead" requirement.
1.3 PROTECTION OF PROPERTY AND OBSTRUCTIONS
1.3.1 PROTECTION
Temporary supports and/or adequate protection and maintenance must be provided on all underground and surface structures encountered in the progress of the work. Structures that have been disturbed will be restored to a condition equal to their original state upon completion of the work.
1.3.2 OBSTRUCTIONS
All utility owners must be notified prior to beginning construction. Any known obstructions will be shown on the plans. The utmost caution will be taken in all operations to avoid damage to existing obstructions whether or not shown on the plans. Damage to other utilities will be at the Contractors expense.
If the contractor encounters any unforeseen obstructions during construction, he shall immediately cease work in that area and notify the project engineer. The project engineer shall design and provide detailed drawings to correct the situation. The drawings shall be submitted to the Engineering Division for approval. After approval by the Engineering Division a set of approved drawings will be given to the contractor and they may resume work.
1.3.3 EXISTING ASBESTOS CEMENT WATERMAINS
In areas where existing asbestos cement water mains are existing, water main relocations or replacements may be necessary. If new construction of facilities is over, under, or near asbestos cement water mains, it shall require that the asbestos cement water main be changed out to poly vinyl chloride pipe or ductile iron pipe. New pipe material shall depend upon the type and location of the facilities being constructed. The Developers Engineer shall design the replacement and submit it for the Utilities Department approval. The Developer is responsible for all design, materials, labor, equipment, testing, and costs for the replacement. Contractor shall remove and dispose of AC pipe in accordance with FAC Codes 62-204.800 and 62-257.
1.4 TRENCH PREPARATION
1.4.1 EXCAVATION
A trench will be opened so that the pipe can be installed to the alignment and depth required. It will be excavated only so far in advance of pipe placement as necessary. The trench will be excavated to the depth required so as to provide a uniform and continuous bearing support for the pipe or undisturbed ground. Bell holes will be provided at each joint to permit jointing to be made and inspected properly. During excavation, if ashes, cinders, muck or other organic material considered unsuitable uncovered at the bottom of the trench at sub-grade, it will be removed and backfilled with approved material. This material will be compacted in layers to provide a uniform and continuous bearing characteristic of that area's soil condition. Where the bottom of the trench at sub-grade consists of unstable material to such a degree that it cannot be removed and replaced with an approved material to support the pipe properly, a suitable foundation must be constructed. Excavated material will be piled in such a manner that it will not endanger work or obstruct natural watercourses, sidewalks or driveways. Fire hydrants under pressure, valve boxes, or other utility controls will be left unobstructed and accessible at all times. Gutters will be kept clear or other satisfactory provisions will be made for street drainage.
1.4.2 SHORING AND BRACING
Open cut trenches must be sloped, shored or braced as required by all governing State law, municipal ordinances, OSHA Standards, and as may be necessary to protect life, property, or the work. Trench bracing may be removed after backfilling has been completed or has been brought up to such an elevation as to permit its safe removal. The use of a trenching box may be used in place of sheeting and bracing where appropriate. Contractor is required to have a Competent Person designated and in charge at all times while workers are in the trench.
1.4.3 DE-WATERING
Excess water must not be allowed in the trench at any time. An adequate supply of well points, headers or pumps, all in first-class operating condition, may be used to remove the water. The use of gravel and pumps will also be an acceptable means of removing the water. The trench will be excavated no more than the available pumping facilities are capable of de-watering. Discharge from pumps will be accommodated in accordance with the St. Johns River Water Management District's requirements. The Contractor is responsible for obtaining all de-watering permits such as NPDES permit.
1.5 PIPE LINE CONSTRUCTION
1.5.1 GENERAL
All water mains, service lines and appurtenances must be installed as specified on the approved plans and in accordance with the Standard Detail Sheet. Installation will conform to AWWA specification C600 except as modified herein. Domestic water service can only come from a Distribution main. When water service is requested and the only water main available is a Transmission main, a large tap and section of pipe shall be installed on the Transmission Main for the water service.
The minimum size tap on a Transmission Main shall be a six (6) inch.
1.5.2 MATERIAL HANDLING
1.5.2.1 Precautions
Every precaution will be taken to prevent injury to pipe and piping materials during transportation and delivery to the work site. Under no condition will pipe be dropped, bumped, dragged or picked up by inserting forks into end of pipe. Pipe lifted by placing forks into pipe shall be removed from job site.
1.5.2.2 Damaged Materials
If in the process of transportation, unloading or handling, any pipe or fitting is damaged, it will be rejected and removed from the site.
1.5.2.3 Storage
Pipe fittings and specials will be stored in a manner which will assure the protection of the material from damage and which will keep it clean.
1.5.3 INSPECTION OF MATERIALS
Materials delivered to the job site will be subject to inspection by the Utilities Inspection Department prior to installation. Contractor shall notify Inspections 24 hours in advance. All materials found to be defective or not meeting specifications during inspection or during the progress of the work will be rejected and removed from the job site without delay. All materials delivered to the job site will be in accordance with the materials specifications. Materials not inspected by the Utilities Department prior to installation will be uncovered by the Contractor at his/her expense to verify compliance with these specifications. The Contractor will furnish copies of the packing list(s) for materials upon demand.
1.5.4 PIPE PLACEMENT
The bottom of the trench will not be excavated below the specified grade. If undercutting occurs, the bottom of the trench will be brought up to the original grade with approved material and thoroughly compacted, as directed by the Utilities Department. Before placing pipe into the trench, the outside of the spigot and the inside of the bell will be wiped clean, dry, and free from oil and grease. Every precaution will be taken to prevent foreign material from entering the pipe. During placement operation, no debris, tools, clothing or other material will be placed in the pipe.
All mechanical joints will be made up in strict accordance with the manufacturer's specifications. Beveled ends will be removed from PVC pipe entering a mechanical joint. The bell will be carefully cleaned before the gasket is inserted. Gaskets must be evenly seated, the gland placed in position with the bolts, and evenly tightened. All slip joints will be made up in strict accordance with the manufacturer's specifications.
After placing a length of pipe in the trench, the spigot end will be centered in the bell, the pipe forced home, brought to correct alignment, and covered with an approved backfill material. Ductile iron pipe will be backfilled to the centerline of the pipe and compacted to ninety-five percent (95%) of standard Proctor T-99.
Pipe will be installed with 30" minimum cover. Maximum cover of 42" will be accepted. Cover depth will be determined from proposed finish grade as indicated on the plans. At times when pipe placement is not in progress, the open ends of pipe must be closed by a water-tight plug or other approved means. This provision will apply during the lunch hour as well as overnight. If water is in the trench, the seal will remain in place until the trench is pumped completely dry.
Pipe installed under swale shall be D.I. and have 3 feet minimum cover. D.I. pipe to be centered on swale. If more than one joint of pipe is necessary, restrained joint pipe is required. See "Swale Crossing" detail and definitions.
Pipe installed under canal or drainage ditch shall conform to all FDEP requirements. Pipe shall be restrained joint D.I. pipe with gate valves on both sides of canal/ditch. D.I. pipe shall have 5 feet minimum cover with a concrete cap. See "Canal or Drainage Ditch Crossing" detail and definitions.
1.5.5 LOCATING WIRE
A #12 Copper Clad Steel (CCS) wire that allows for the location of the pipe using an induced current line locator will be installed on all potable water, reclaimed water, and wastewater mains. The wire must be placed on the top of the pipe and taped approximately every ten feet. A run of wire must run from the main to each hydrant. Each fire hydrant must have one wrap of the wire around the barrel at final grade.
Wire color shall be blue for water, green for wastewater, and purple for reclaimed.
A run of wire will also be brought up in each valve box. The wire will have 4 feet of excess length. Wire is to be connected together using an underground wire nut with a **silicone-based sealant.**
The CCS wire shall meet the following requirements. HDPE Insulation of 30 mils, #12 AWG conductor, maximum Ohms resistance of 7.565 ohms per 1000 ft., breaking load 256 lbs.
When directional drilling is used, one continuous #12 CCS **extra high strength** locator wire shall be installed. The CCS wire shall meet the following requirements. HDPE Insulation of 45 mils, #12 AWG conductor, maximum Ohms resistance of 7.565 ohms per 1000 ft., breaking load 1150 lbs.
1.5.6 SERVICE LINE LOCATION
Service lines will be located at alternating lot lines outside the sidewalk within two feet of the right-of-way line as shown on approved plans or in a grassed area behind the curb if located in other than a subdivision.
Reclaimed service line is to be located adjacent to sewer cleanouts.
1.5.7 BACKFILLED MATERIAL AND INSPECTION
All backfilling material will be free from cinders, ashes, refuse, vegetable or organic material, boulders, rocks, stones, or other material which is considered unsuitable. When backfill material is not specified on the plans, backfilling with the excavated material may be acceptable provided that such material is suitable for backfilling. Trench should be backfilled as soon as possible to minimize the length of open trench. Pipe joints, valves, fittings, and thrust blocks will be left uncovered until inspection by the Utilities Department has been completed.
1.5.8 VALVES AND FITTINGS
All valves and fittings will be set and joined to the pipe in the proper location as shown on the plans. Valves should be installed outside of the pavement where practical. A roadway valve box will be provided for every valve. This valve box must not transmit shock or stress to the valve. Valve will have alignment ring installed, and valve box centered and plumb over the wrench nut of the valve. The box cover is to be flush with the surface of the finished pavement or grade level as specified in the plans. A 24"-square concrete pad 4" in thickness will be poured around the valve box when it is located outside of pavement. A bronze or stainless steel disc will be cast into the pad for all valves 12" or larger. Valve nomenclature to be stamped into the disc will include the valve size, type, manufacturer's initials, number of turns, and direction to open the valve. (Example: 12" G.V. U.S.P. 20 c.c.w.)
All valves will be located within two feet of the tee, see detail GATE VALVE AND FITTING DETAIL.
When solid sleeves or couplings are used to join/tie-in pipelines, a SPACER PIECE shall be installed if there is a gap in the pipeline.
1.5.9 FIRE HYDRANTS
All fire hydrants (hydrants) will be located as shown on the plans and marked on the pavement with a blue reflector. On unpaved streets, a blue reflector will be affixed to a post and placed as close to the edge of the road as feasible so as to be easily visible. The hydrants will be located in such a manner as to provide complete accessibility and in a manner so that the possibility of damage from vehicles or injury to pedestrians will be minimized. All hydrants must stand plumb and the bury line of the hydrant at the finished grade. Hydrants installed in State highway rights-of-way will be placed in accordance with any F.D.O.T. requirements. Contractors shall not turn or add risers to hydrants. All hydrants will be connected to the main in the manner shown on the Standard Detail Sheet. If the installation of the hydrant requires the hydrant to be greater than 40 ft. away from the fire hydrant valve, an additional valve shall be installed. If the fire hydrant valve ends up in asphalt of a major road (not subdivision) an additional hydrant valve regardless of distance shall be installed.
1.5.10 RESTRAINED PIPE JOINTS
The Engineer of Record shall provide a restrained joint detail on drawings submitted to the City for approval. Restraining is to apply to all new fittings installed as part of the job, including tapping saddles.
1.5.11 THRUST BLOCKS AND COLLARS
Thrust blocks may only be used with the City's prior approval at bends, fire hydrants, and as specified on the plans, in accordance with the Standard Detail Sheet. Restrained joint systems are the preferred method. Metal harnesses, tie rods, or clamps of adequate strength to prevent movement may be installed at locations where thrust blocks are not practical. Rods and clamps will be stainless steel. A 20-foot length of ductile iron pipe will be installed at all main endings and a concrete thrust collar will be poured around the pipe at a distance of 10 feet from the end of the joint. In lieu of concrete thrust collar, restrained pipe upstream of the proposed concrete thrust collar may be used.
1.5.14 BLOWOFFS
Flushing blow-offs are to be installed and constructed as shown on the Standard Detail Sheet. Blow-off materials include 2" brass for nipples, brass threaded fittings, 2" brass angle wheel valve, and plastic meter box (purple for reclaimed). The plastic meter box is to be installed at grade over the wheel valve. The angle wheel valve will be within six inches of finished grade and will be plugged with a brass plug. 4" blow-offs will be required on both potable water and reclaimed water mains 12" and larger and must be constructed as shown on the Standard Detail Sheet. A reclaimed tag will be installed on reclaimed main blow-offs in a reclaimed meter box.
Brass used in potable water shall meet the low lead requirements as set forth in Section 2.6
1.6 TIE-INS TO EXISTING SYSTEMS
1.6.1 GENERAL
The Contractor is not to operate any valve or remove any thrust block from City-owned mains except under direct supervision of an Inspector of the Utilities Department. All Contractors must follow the procedures listed below for connecting new mains to existing water systems.
1.6.1.1 Mains 8" and smaller
Tie-in valves will be operated and pressure tested to verify water tightness prior to the tie-in. Valves that are not water tight, shall have a new valve installed immediately adjacent (within 2') to the existing valve. The Contractor will provide a 2" tap on the new main and a 2" tap on the existing main at the tie-in valve. A 2" jumper equipped with a City supplied meter and contractor supplied backflow preventer (double check) will be installed. The jumper will be utilized for filling the main, flushing the main, providing water for bacteriological sampling, and maintaining pressure in the main after a successful bacteriological test. The tie-in valve is not to be operated and the jumper is not to be removed until clearance has been obtained from FDEP and the City. The Engineer of Record will be required to provide an executed FDEP certificate of completion prior to clearance. After clearance, the tie-in valve will be opened, the jumper removed, and the main thoroughly flushed under the supervision of the City Inspector. All other existing valves closed as part of the job will be opened by the contractor under the supervision of Utilities Department Inspector.
1.6.1.2 Mains 10" and larger
The same procedure as noted for mains 8" and smaller will be used for mains 10" and larger except that the jumper will be utilized only for filling the main, providing water for bacteriological sampling, and maintaining pressure in the main after a successful bacteriological test. The tie-in valve can be opened for flushing and during chlorination only under the supervision of the Engineering Inspection Division. The tie-in valve is not to be operated and the jumper is not to be removed until clearance has been obtained from FDEP and the City. After clearance, the tie-in valve will be opened, the jumper removed, and the main thoroughly flushed under the supervision of the City Inspector. All other existing valves closed as part of the job will be opened by the contractor under the supervision of Utilities Department Inspector
1.7 TESTING
1.7.1 GENERAL
All newly installed pipe and services that have been backfilled must be tested in accordance with AWWA specification C651.
1.7.2 JUMPER METER ASSEMBLY
All filling, and flushing, must be accomplished through a jumper meter assembly. The jumper meter assembly shall consist of a meter (provided by the City, paid for by the Developer/Contractor), and a double check backflow preventer and galvanized piping (provided by the Contractor). The jumper meter assembly shall be installed by the Contractor under the direct supervision of the Utilities Department Inspector. After installation the Contractor shall have the backflow preventer certified by a backflow technician, and a copy of the test report shall be provided to the Utilities Department.
1. A temporary jumper connection is required at ALL connections between existing active water mains and proposed new water main improvements, per the City of Cocoa Utilities Handbook. The only exception is the installation of a new fire hydrant involving a tap and using an anchoring/swivel nipple. In this case all fittings and fire hydrant SHALL be swabbed with a 100 ppm chlorine solution prior to installation.
2. The details to be used for filling any water main of any size from existing active water mains and for flushing of new mains up to 8" diameter (2.5 FPS minimum velocity) and for pulling bacteriological samples from any new water main of any size. The jumper connection shall be maintained until after filling, flushing, testing and disinfection of the new main has been successfully completed and clearance for use from the Florida Department of Environmental Protection (FDEP) and other pertinent agencies has been received. The jumper connection shall also be used to maintain a minimum pressure of 20 psi in the new mains all the time after disinfection and until the FDEP clearance letter is obtained. Adequate thrust blocking and/or restraints shall be provided temporarily, as required. Pipe and fittings used for connecting the new pipe to the existing pipe shall be disinfected prior to installation in accordance with AWWA C651. This tapping sleeve and the exterior of the main to be tapped shall be disinfected by spraying or swabbing per Section II of AWWA C561.
3. Flushing of 10" diameter and larger water mains may be done through the tie-in valve, in the presence of the Utility Department. The Utility Department will be notified in writing 48 hours prior to the flushing of said mains.
The following procedures shall be followed:
A. The tie-in valves shall be operated and pressure tested in the presence of the Engineering Inspection Division or Engineer to verify water tightness prior to the tie-in. Valves which are not watertight shall be replaced or a new valve installed immediately adjacent to the leaking valve.
B. The temporary jumper connection shall be constructed as detailed. The jumper connection shall be used to fill the new water main and for providing water for bacteriological sampling of the new main as required by the FDEP permit.
- Flushing shall not be attempted during peak demand hours of the existing water main.
- All downstream valves in the new system must be open prior to opening the tie-in valve.
- Provide for and monitor the pressure at the tie-in point, the pressure in the existing main must not drop below 35 psi.
- Tie-in valve shall be opened a few turns only, ensuring a pressure drop across the valve is always greater than 10 psi.
4. The contractor shall provide documentation demonstrating that the double check backflow prevention device has been tested and is in good working order at the time of installation. The test shall be performed by a qualified backflow prevention technician.
5. Except as required to flush lines of greater than 8" in diameter, the tie-in valve shall remain closed. The tie-in valve shall remain closed until the new system has been cleared for use by FDEP and all other pertinent agencies.
6. Upon receipt of clearance for use from FDEP and all other pertinent agencies, the contractor shall remove the jumper connection. The corporation stops are to be closed and plugged with 2" brass plugs.
7. All installation and maintenance of the temporary jumper connection and associated backflow prevention device fittings, valve, etc., shall be the responsibility of the contractor.
1.7.3 FLUSHING AND SWABBING
The City will provide an adequate volume of water for the filling, flushing, and testing of mains. The Contractor will notify the Engineering Inspection Division prior to flushing or filling mains.
The pressure in the City's system will be monitored during the flushing; at no time should the pressure in the City's system be allowed to drop below 40 psi. Water used during flushing will be billed to the Contractor.
The City of Cocoa Utilities Department requires all new mains regardless of size or material to be pigged/swabbed. In an effort to make sure all footages of a pipeline are pigged, the following procedures are to be used as a guide and in no way to be construed as means and methods.
The following terminology may be used in the discussion or operation of the pigging procedure.
Pigs shall be manufactured of a 2lb. per cu/ft density open cell polyurethane foam body (swab) complete with rear polyurethane drive seal.
Pig launching station may be a "wye", "tee" or simple inserting the pig at the very beginning of the pipeline. The beginning of the pipeline is defined at the jumper assembly location.
Pig retrieval point or cannon is a "wye", "tee" or open end of pipe at which point the pig will exit the pipeline.
The pipeline will be filled through the jumper assembly the day before of the pigging operation.
The pig will be advanced through the pipeline at a rate of 2 feet per second, 80 gpm for 4"; 180 gpm for 6"; 320 gpm for 8". Flow rates and jumper assemblies for mains 10" and larger will be determined by the Engineer of Record and approved by the City of Cocoa Utilities Department.
The pig retrieval point or cannon will project at least one foot above the surrounding grade. The water from the pig retrieval station discharge and its location to discharge shall be approved by the Utilities Department. The contractor will be responsible for following the National Pollutant Discharge Elimination System (NPDES) requirements to remove chlorine from discharge as well as protect retrieval area from erosion. Retrieval cannons will not be left in place. After pigging and flushing are complete, the cannon will be removed and capped below ground in accordance with Engineer of Record details or City of Cocoa Standard Details.
The contractor may insert the pig into the first section of pipe between the isolation valve and the downstream point of jumper assembly. By inserting the pig between the isolation valve and the downstream jumper assembly point it will allow the pipeline to be filled without moving the pig down the pipeline. If the pig is moved during filling operation another pig will be inserted into the pipeline. The isolation valve may be cracked open for a few seconds under the direction of Utility personnel to move the pig past the jumper assembly downstream point so the jumper assembly can advance the pig through the pipeline
When the pig exits the pipeline, the flushing will continue until the water is clear. A simple way to determine if water is running clear is to capture some water in a WHITE cup. If water is clear and no particles in cup then flushing is complete, if not flushing will continue until water is clear.
1.7.4 HYDROSTATIC TEST
A blow-off or fire hydrant will be installed at the end of the pipeline under test. The line being tested will be slowly filled with water to the specified test pressure. Before applying the specified test pressure, all air will be expelled from the test section including service connections. If fire hydrants or blow-offs are not available at high elevations, taps at points of highest elevation will be made to facilitate air removal and testing. When testing is complete, the service lines installed for air removal must be removed.
The line must hold the 150-psi test pressure for a two-hour test period and must be witnessed by Engineering Inspection Division personnel. Sufficient human resources are to be employed to insure inspection. If the line fails to meet the test, it will be repaired and re-tested until the test requirements are satisfied. Line pressure will be maintained to within 5 psi of the test pressure at all times.
1.7.5 LEAKAGE TEST
A leakage test at 150 psi will be performed on all newly installed sections of pipe in accordance with AWWA C600 or C605 after installation of all service connections. Any leakage observed must be less than the following per thousand feet of pipe:
SIZE ALLOWABLE LEAKAGE
2" 0.20 Gallons/Hour
4" 0.33 Gallons/Hour
6" 0.50 Gallons/Hour
8" 0.67 Gallons/Hour
10" 0.83 Gallons/Hour
12" 1.06 Gallons/Hour
14" 1.16 Gallons/Hour
16" 1.32 Gallons/Hour

$$L = SD\sqrt{P}/148000$$

L = testing allowance (makeup water), in gallons per hour
S = length of pipe in feet
D = nominal diameter of pipe, in inches
P = average test pressure during the hydrostatic test, in pounds per square inch (gauge). P has the square root taken.
On small main extensions where the allowable leakage loss cannot be reasonable measured (.25 gallons or less), NO LOSS OF PRESSURE shall be allowed.
1.8 DISINFECTION & BACTERIOLOGICAL TESTING
1.8.1 GENERAL
The Contractor must flush mains and arrange for complete disinfection by chlorination in coordination with the Engineering Inspection Division. Work will conform to applicable provisions of AWWA specification C651, "Disinfecting Water Mains." Water with a chlorine concentration of 50 ppm will be evenly distributed throughout the pipe system and allowed to remain in the pipe for twenty-four hours. Transmission mains may be chlorinated using the "slug method". If the slug method is used, a detailed written procedure shall be submitted for approval. The main shall be dechlorinated to [illegible] ppm chlorine before any flushing is performed. The method for dechlorination shall be approved by the Engineer of Record. After flushing, the water shall remain in the pipe for 24 hours before sampling. Service connections and tie-ins made before testing must be disinfected in accordance with AWWA specification C651. Samples will be taken by a Utilities Department approved laboratory. Two consecutive day samples are required for potable water mains. Water mains shall not be flushed between samples. The Contractor will be responsible for ALL bacteriological testing fees. Sample points are determined by the Engineer of Record and approved by FDEP. If samples taken do not demonstrate satisfactory results, re-chlorination is required.
Disinfection of reclaimed water mains is performed in the same manner as potable water mains. Bacteriological testing of the repaired reclaim water main will be performed in compliance with regulatory agencies such as the Florida Department of Environmental Protection, and requires one day of satisfactory bacteriological results. Sample points for reclaimed water mains are determined by the Engineer of Record. Samples are collected Monday through Thursday by City of Cocoa designated personnel. To schedule a sample pickup, please contact the Lab Manager at (321) 433-8707. If samples taken do not demonstrate satisfactory bacteriological results, re-chlorination and re-sampling is required. A fee will be charged by the City for additional sample collection and analysis.
CONTRACTORS WORKING ON EXISTING MAINS
When existing water mains are taken out of service by contractors, and water service to existing customers is interrupted causing a PBWN, the water main will be taken out of service on Monday or Tuesday. If for some reason the water main cannot be taken out of service on Monday or Tuesday, then the contractor at their expense shall have the laboratory perform bacteriological testing after normal working hours. This procedure is to lessen the time water customers are under a PBWN.
1.9 CONNECTION TO EXISTING SYSTEM
1.9.1 GENERAL
Connections to existing City transmission mains (16" and larger) will be made by Approved Tapping Contractor under the direction of the Engineering Inspection Division. On transmission mains, the Approved Tapping Contractor will install the tapping sleeve and valve. For all connections from 4" to 12" the Contractor may install tapping saddles under the supervision of the Engineering Inspection Division. For all water main connections, the Contractor must obtain all required permits; provide any pit area, all pit preparation including shoring and bracing, maintenance of traffic, all right-of-way restoration; and notify all utilities prior to construction. Taps on RCP, PVC, AC, or DIP mains must be made by a tapping Contractor who has been approved by the Utilities Department.
Tapping saddles and valves supplied by the Contractor will be inspected by the Engineering Inspection Division prior to installation. The installed tapping saddle and valve must be tested with water at 100 psi for 15 minutes prior to tapping to insure a watertight installation. Saddles installed on RCP mains will be tested 10% over line pressure. The pressure test will be performed by the Contractor and witnessed by the Engineering Inspector. After the pressure test of the saddle has been completed an Approved Tapping Contractor can tap the main.
1.9.2 TAPPING AND LINESTOP PROCEDURES
- ALL 0.75" - 12" TAPS & LINESTOPS on City of Cocoa potable, reclaimed and wastewater mains will be performed by an Approved Tapping Contractor (see approved list).*
- All larger TAPS & LINESTOPS on City of Cocoa Transmission Mains will be performed by bonafide tapping contractors ONLY. Contractors will be approved on a case-by-case basis. Bonafide means the Contractor is in the business of doing taps or line stops.
- Absolutely NO taps or linestops will be performed on Friday or any day preceding a holiday.
- Approved contractors to disinfect tapping machine with AWWA approved disinfectant. This will be witnessed by a City of Cocoa inspector.
- The contractors tapping or linestop machines will be in good working order with appropriate bits and shell cutters for the type of pipe being worked on (ie. shell cutter for PVC)**
- When taps or linestops are installed on Transmission Mains (> 12"), a preconstruction meeting will be held with the tapping contractor prior to ANY work being performed. The meeting maybe held at the job site.
- Taps and linestops on the Utilities reinforced concrete mains will be a two (2) day process. Day one the saddle is installed and grouted, Day two tighten straps, cut prestressing wires, install throat and valve. Pressure test on saddle is 10-15% over line pressure for 30 minutes. After successfully completing pressure test, tap can be made.
- All excavations must conform to current OSHA Trench Safety Act.
- The City of Cocoa reserves the right to remove any contractor from the approved list for any work considered substandard.

*Tap or linestop to include: Material, installation, labor, drilling and testing
**Bit, boring bar & adaptor
1.10 FINAL CLEAN-UP AND ACCEPTANCE
1.10.1 GENERAL
Upon completion of the work and before acceptance by the Utilities Department, the Contractor will meet all permit conditions, remove all debris, and complete sodding, sprigging, or seeding if required by the plans. The Contractor will leave all areas affected by his/her operations in a neat and presentable condition.
Acceptance of completed work by the City will be contingent on the following work items completed to the satisfaction of the Engineering Inspection Division.
- Pressure Test
- Bacteriological Testing
- Restoration
- Payment of fees
- Approved As-Builts
- Easements
- Bill of Sale
- Final Inspection

1.11 FIRE SERVICE
1.11.1 GENERAL
All Fire Lines shall be installed by a licensed Fire Line Contractor in accordance with Florida Statute Chapter 633 and Rule Chapter: 69A-46. Where wet pipe sprinkler service is used, an appropriate backflow prevention device will be installed in accordance with the "Cross-Connection Control and Backflow Prevention" section of the Utilities Handbook.
Fire line DCDA shall be installed in non-traffic areas. Four to six bollards maybe required.
1.12 CONNECTION OF BUILDINGS OVER FOUR FLOORS
1.12.1 GENERAL
Connection of domestic water supply systems serving buildings over four floors in height to the City's water distribution system will be subject to the following requirements:
- A fixture unit analysis will be performed by the Owner's engineer to determine peak domestic flow requirements. This analysis is to be provided to the Engineering Division.
- A water meter and a reduced pressure backflow preventer, sized in accordance with the domestic flow requirements, will be installed above ground at the developer's expense.
- Upon written request, the City will provide the site engineer with the minimum expected system pressure. The site engineer will be responsible for providing this information to the architect and building owner. Means for providing an adequate supply of domestic water and fire protection to all parts of the building during periods of minimum pressure will be the responsibility of the building Architect or Engineer of Record.
- Repair costs for damage to the water meter caused by flows exceeding its rated capacity will be charged to the customer.

1.14 RECORD DRAWINGS
1.14.1 GENERAL
Record drawings are required for all systems to be accepted by the Engineering Division. Record drawings will be prepared by a surveyor or an engineer registered in the State of Florida and will contain the following information:
- Location of all valves, service lines, fittings and fire hydrants using at least two ties to permanent points (manholes, power poles, curbs, or storm water inlets). An acceptable station and offset system may be used for service lines and fittings only.
- Location of mains from property easement lines or edge of pavement at intervals of 300 feet.
- Elevations to the top of the water line at intervals of 300 feet and at all drainage and sewer main crossings. Bench mark to be shown on record drawings.
- Separation between reclaimed water or force mains and water mains if they are installed within 10 feet of water mains.
- Water main material and distance of mains from buildings or structures within 20 feet of the water main.
- Distance from hydrant to hydrant valve.
- Pertinent easement information.
- Certification by the surveyor or Engineer of Record accepting responsibility for accuracy of information supplied on the record drawings and a statement certifying that all mains are within easements and/or public right-of-way. The name "City of Cocoa" must appear on all record drawing survey information.

Record drawings will be drawn at an engineering scale that is legible and readable as determined by city staff. Areas requiring additional detail may be enlarged as necessary. Right-of-way, easements, and lot lines will be accurately shown. After the surveyor or engineer has certified the locations, the engineer will certify on DEP Form 62-555.900(9) that the system depicted on the record drawing was constructed in substantial conformance with approved plans and will function as intended. Lot, block numbers, and street names will be included. Provide two (2) sets of signed and sealed record drawings and one (1) digital file including all reference files (XREF). AutoCAD 2010 or higher, or DXF format shall be provided to the City.

CAD drawing standards for record drawings will be available from the Engineering Division upon request. These standards will provide for isolated layer information, text height, font, line type and weight, specific standard symbols (blocks), etc. which will allow transfer of record drawing data to city as-built maps in a standardized format.

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DESIGNED	BJD
DRAWN	BJD
DATE	OCTOBER 2019
CHECKED	BAM
DATE ISSUED	5/7/2020

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AUTOMOTIVE REPAIRS
BREVARD COUNTY FLORIDA

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FLORIDA
PROFESSIONAL ENGINEER
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