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INTRODUCTION

The Utilities Commission, City of New Smyrna Beach, Florida (“UCNSB”) makes every effort to provide high quality, reliable reclaimed water service to all Customers. Providing such service requires that these Specifications be established, administered consistently and clearly understood by all concerned. This publication has been prepared with this in mind and should be used by Customers, Developers, Engineers and Contractors relative to the installation of new reclaimed water facilities and the upgrade or retrofitting of existing facilities.

If these Specifications do not cover exact project components, or if questions arise as to the application of these Specifications, contact the UCNSB Engineering Department prior to design and construction.

These Specifications complement those of the Florida Administrative Code (FAC), Florida Department of Environmental Protection (FDEP), Volusia County Health Department (DOH), Recommended Standards for Water Works by the Great Lakes – Upper Mississippi River Board (GLUMRB) a.k.a. 10 State Standards, American Water Works Association (AWWA), Trench Safety Act, Occupational Safety and Health Administration (OSHA), the Florida Department of Transportation (FDOT), Sunshine State One-Call of Florida and all other applicable City, County and State codes. In the event of a conflict, the more stringent rule shall apply.

All construction shall be performed by a Certified Underground Utility and Excavation Contractor licensed in the State of Florida. The Contractor is responsible for all tools, labor, equipment and materials to perform all work necessary to complete work per the approved Construction Drawings to the UCNSB Engineering Department’s satisfaction, as expressed herein by the Engineering Manager.

If any Engineer, Developer or Contractor has intent to construct any part of a reclaimed water system planned to be accepted by the UCNSB Engineering Department with exceptions to these Specifications, all such exceptions shall be listed on the first detail plan sheet signed and sealed by the Engineer of Record.

If the UCNSB accepts the exceptions, the Engineering Manager will sign and date a space immediately below the exceptions. No other exceptions will be accepted.

All exceptions will be warranted by the Engineer of Record signing and sealing the exceptions.

DEFINITIONS

ALIGNMENT

Refers to a pipe's location, direction and slope.

APPURTENANCE

An accessory part of reclaimed water mains and services necessary for operation.

AVERAGE DAILY FLOW (ADF)

The statistical average amount of water used each day by one ERU.

BACKFILL

(1) The operation of refilling an excavation, usually after some structure has been placed therein. (2) The material placed in an excavation in the process of backfilling.

BEDDING

The prepared base or bottom of a trench or excavation on which a pipe or other underground structure is supported.

BELL AND SPIGOT JOINT

A form of joint used on pipes which have an enlarged diameter or bell on one end and a spigot at the other which fits into the bell. The joint is then made tight by a gasket or other jointing compounds or materials.

COMMERCIAL

An establishment that exchanges goods or services.

COMPACTION

Tamping or rolling of a material to achieve density that is able to support predicted loads.

CUSTOMER

Any entity that receives reclaimed water through a meter and pays UCNSB rates.

DEVELOPMENT

Residential and/or commercial property(ies) with new or renovated infrastructure, e.g., building expansions, remodels requiring new meter sets or meter set upgrades, subdivision of land, new buildings or as determined by the UCNSB Engineering Department.

DIRECTIONAL DRILLING

A steerable trenchless method of installing pipe underground in a prescribed bore path by using

a surface launched drilling rig causing minimal impact on the surrounding area.

ERU – RECLAIMED WATER

Equivalent Residential Unit is one ¾” meter, or as otherwise expressed in the Developer’s Agreement and Addendum.

JACK AND BORE

A trenchless method of installing pipe underground using pneumatic percussive blows to drive a casing through the ground for a carrier pipe.

MANIFOLD

A pipe fitting with numerous branches to convey fluids between a large pipe and several smaller pipes or to permit choice of diverting flow from one of several sources or to one of several discharge points.

RECLAIMED WATER

Wastewater (used liquids or solids) that receives secondary treatment at a Wastewater Treatment Plant and is reused for irrigation. Reclaimed water is non-potable (not approved for domestic consumption).

RECLAIMED WATER DISTRIBUTION SYSTEM

Pipes used to distribute reclaimed water to Customers.

RECLAIMED WATER SERVICE

Pipe used to connect a meter to the reclaimed water distribution system.

RESIDENTIAL/RESIDENCE

An establishment used for living accommodations for a single family.

VALVE

A device used to isolate sections of the reclaimed water distribution system for testing, repair and maintenance.

VALVE BOX

A two part, screw type, cast iron box which is height adjustable with a cover to allow access to the operating nut.

VALVE COLLAR

Concrete set around a valve box lid at finished grade outside of paved areas.

WATER TABLE

The level below which the ground is completely saturated with water.

SECTION 1 - GENERAL

1.01 Developers

Owners of commercial or residential developments are required to enter into a Developer's Agreement and Addendum with the UCNSB. Contact the UCNSB Engineering Department's New Business Specialist for further details and assistance. The Developer's Agreement and Addendum is available for download on the UCNSB website under [Engineering](#).

The UCNSB reserves the right to require a Memorandum of Understanding (MOU) if a Developer's Agreement and Addendum is not required to help delineate the responsibility of each party.

1.02 Customers

The UCNSB purchases and installs meters, including all appurtenances, for reclaimed water services provided a proper account is established and all payments are made to the UCNSB Billing Department.

The UCNSB ownership terminates at the back side of the meter and is not responsible for any reclaimed water facilities beyond this point.

Duly authorized agents of the UCNSB shall have access to UCNSB facilities on the Customer's premises.

Water purchased from the UCNSB shall be used by the Customer only for the intention specified in the application for service and shall not be re-metered for the purpose of selling.

Customers shall reference the UCNSB's [Rates, Charges and Fees](#), current edition, for more information.

SECTION 2 – DESIGN

Flow demands shall be calculated on the build-out of the proposed and any known future development. The UCNSB Engineering Department and Engineer of Record shall agree to reclaimed water main size.

Easements required for reclaimed water mains shall be 15' wide centered on the pipe.

2.01 Reclaimed Water Mains

Reclaimed water mains, at a minimum, shall have a 6" diameter and 30" of cover.

Reclaimed water mains 24" or less shall have gate valves. Reclaimed water mains 26" or larger shall have butterfly valves.

Valves shall be spaced no more than 750', at all branch connections, terminal ends or as required to provide an operable, easily maintained and repairable reclaimed water distribution system. Two valves shall be placed at each tee and three at each cross.

High points in the reclaimed water mains shall have an air release valve with vault enclosure.

Reclaimed water main inside diameter must be maintained regardless of material used, e.g., 6" HDPE is not the equivalent of 6" PVC and must be upsized.

Reclaimed water mains shall be shown in plan view and designed to minimize crossings with other underground systems.

If a reclaimed water main is not looped, a blow off valve assembly shall be placed at the terminal end of the main 10', minimum, from the terminal valve.

Reclaimed water mains shall be adequately restrained against movement due to the resultant thrust at the specified test pressure per the [Ductile Iron Pipe Research Association \(DIPRA\)](#) or per the Engineer of Record's table. Thrust blocks require UCNSB Engineering Department approval.

2.02 Reclaimed Water Services

The Engineer of Record is responsible for determining the adequate size of each reclaimed water service. One reclaimed water service and meter are required for each proposed Customer. Condominiums over three stories may have a master meter and requires UCNSB Engineering Department approval. All services shall extend from the reclaimed water main to the right-of-way line or easement line with clear unobstructed access to the meter. New services installed on existing reclaimed water mains require UCNSB Engineering Department approval.

Services 1" or 2" shall be designed with a service saddle, polyethylene tubing, a corporation stop and a curb stop. Underground meter sets will require a minimum 3' x 2' reserved area. Above ground meter sets will require a minimum 5' x 3' reserved area. All long side services will require a 4" diameter casing; however, two 2" long side services will require a 6" diameter casing.

Services 3" and larger shall be designed with a tee, 2 valves (one on the main and one on the service) and piping. Meters for reclaimed water services 3" or greater are above ground and require a minimum 8' x 5' reserved area with a concrete pad.

2.03 Vaults

Vaults are square, concrete structures used for air release valves in reclaimed water applications. Vaults shall be designed per ASTM C913. Vaults shall be reinforced, precast and monolithically poured to include all openings, made from Type II sulfate-resistant Portland cement with a minimum compressive strength of 4,000 psi at 28 days and capable of withstanding AASHTO H-20 vertical, dynamic wheel load rating.

Vaults shall have, at a minimum, a 5' x 5' inside area and 6" base thickness. The maximum height shall be 5.5' from top of base slab to finished grade.

Joints shall be sealed with flexible plastic joint sealer for a watertight seal manufactured by Ram-Nek or Rub'R Nek, or approved equal, per ASTM C990.

Vaults shall have US Foundry 667 ring and CR (outer) and CE (inner), vented cover, with UCNSB specific casting per ASTM A48.

2.04 Aerial or Subaqueous Crossings

Aerial and subaqueous crossings require UCNSB Engineering Department approval.

SECTION 3 - MATERIALS

All materials used in reclaimed water facilities, or that come into contact with reclaimed water, shall:

- Be adequately identified by the color purple;
- Be lead-free brass;
- Be marked with the manufacturer, batch number and strength designation;
- Conform to Ductile Iron Pipe Size (D.I.P.S.) Standards and
- Have stainless steel nuts and bolts per ASTM F593, where applicable.

3.01 Pipe

A. Ductile Iron

Ductile iron pipe, including fittings and restraints, shall conform to ASTM A536 and AWWA C104, C110, C111, C115, C116, C153 and C600. Ductile iron pipe shall be Pressure Class 350.

B. Polyvinyl Chloride (PVC)

PVC pipe shall conform to ASTM D1784 and AWWA C900, C905 and C605 and shall have minimum dimension ratio (DR) 18. PVC pipe must be capable of connecting to standard ductile iron valves and fittings using mechanical joints.

C. High Density Polyethylene (HDPE)

HDPE pipe shall have minimum standard dimension ratio (SDR) 11. HDPE shall match the inside pipe diameter to which it is connected.

D. Fusible PVC

Fusible PVC may be used with UCNSB Engineering Department approval as shown in drawings approved by the Engineering Manager.

E. Steel

Black or Galvanized Steel (GS) pipe is prohibited.

3.02 Valves

The valve type, size, rating, flow direction arrow and manufacturer shall be clearly marked on each unit, as applicable. Valves shall open in the counterclockwise direction with an arrow cast on the operating nut in the open direction. Hand wheels require UCNSB Engineering Department approval. Valve boxes shall be cast iron with a square cover labeled RECLAIMED.

A. Gate Valves

Gate valves shall be used for reclaimed water mains 24" or less and conform to AWWA C509 and C515. Gate valves shall have a ductile iron body, non-rising stem type, resilient seat and shall be equipped with 2" square cast iron wrench nuts.

B. Butterfly Valves

Butterfly valves shall be used for reclaimed water mains 26" or larger and conform to AWWA C504. Valves shall be cast or ductile iron body, alloy cast iron or ductile iron disc, body mounted seat, one-piece stainless steel shaft (short or long body type) and the valve class, shaft size and other special requirements selected in accordance with the specific design. Valve operation shall be by approved gear actuators, with sealed enclosures for buried or submerged service. Position indicators shall be furnished, as required. Units shall be equipped with actuating nuts, cast iron hand-wheels or chain operators, with galvanized steel chains, as appropriate for the installation. Appurtenances shall be furnished by the valve manufacturer.

C. Air Release Valves

Air release valves shall be [A.R.I. Flow Control Accessories D-040 2" Combination Air Valve](#), or approved equal.

D. Tapping Valves and Sleeves

Tapping sleeves shall be full length, stainless steel, mechanical type, with test port, and suitable for either wet or dry installation. Tapping valves shall be resilient seat gate valves.

E. Blow Off Valves

Blow off valves shall be a 2" lock type valve (curb stop) and shall be installed in an 11" x 18" flared wall meter box with Tier 22 rating.

3.03 Reclaimed Water Services

Services 1" or 2" shall be polyethylene (PE) tubing, PE4710 pressure pipe and conform to AWWA C901, ASTM D2737 & ASTM D2239. Service saddles shall be double banded with epoxy coated ductile iron body with stainless steel straps and bolts.

Corporation stops shall conform to AWWA C800 and be ball valve type with a compression outlet and a CC threaded inlet.

Curb stops shall conform to AWWA C800, be ball valve type and have padlock wing and compression connections.

Services 3" and Larger shall conform to [Sections 3.01 and 3.02](#).

3.04 Vaults

See [Section 2.03](#).

3.05 Casings

A. Ductile Iron

See [Section 3.01](#).

B. PVC

PVC casings for 1" or 2" potable water services shall be Schedule 40.

PVC casings for water mains shall be DR 25, minimum.

C. HDPE

HDPE casings shall be DR 13.5, minimum.

D. Fusible PVC

Fusible PVC casings require UCNSB Engineering Department approval.

E. Steel

Steel shall conform to ASTM A139 Grade B and have a black protective bituminous coating, minimum of 5 mils thick, inside and out.

SECTION 4 - CONSTRUCTION

Prior to construction:

- A preconstruction meeting shall be scheduled by the Developer or Engineer of Record. In attendance shall be the UCNSB, the licensed Contractor, including all Sub-Contractors, the Developer and the Engineer of Record.
- Shop drawings shall be submitted to and approved by the UCNSB Engineering Department. Shop drawings will not be accepted unless stamped with approval by the Engineer of Record and the Contractor.
- A minimum notice of 48 hours shall be provided to the UCNSB Engineering Department Inspector.

During construction:

- All permits, shop drawings and construction plans shall be retained by the Contractor on-site. Failure to produce such items on-site will result in work stoppage.
- The Contractor, under no circumstances, shall operate an existing UCNSB reclaimed water valve and/or allow flow into an existing reclaimed water main without Final Acceptance and approval from the UCNSB Engineering Department.
- The Contractor is responsible for all water used during construction and setting up an account to use a UCNSB construction meter. The Contractor will be responsible for the construction meter until returned to the UCNSB and the deposit is refunded. Use of a private meter is prohibited.
- The Contractor is responsible for all utility locates.

4.01 Installation

A. Reclaimed Water Mains

Pipe shall remain free of dirt and foreign materials during construction. When work is stopped, for any reason, the Contractor shall securely seal the open ends of the pipe. Bell and spigot surfaces shall be wiped free of debris prior to applying lubricant sealer and jointed within 5 minutes of application. The spigot end shall be centered into the bell and properly seated by moderate force by hand or push bar with a cushion block.

Over-homed pipes will be rejected. It is recommended that human force be used to home bell and spigots for pipe sizes 12" or less. If mechanical equipment is used to home bell and spigot pipe, an insertion limiting device will be required at each joint to prevent over-homing, e.g., [EBBA Mega Stop Series 5000](#) or approved equal.

Concrete encasement at utility crossings must be approved by the UCNSB Engineering Department.

The Contractor shall install purple coated copper 14 gauge locate wire adhered to the top of all new pipe and appurtenances. The wire shall be bundled in each valve box to extend 2' above finished grade and 6' within vaults. A duplicate wire shall be installed on all pipe directionally drilled. Upon construction completion, the Contractor will be required to test the locate wire for continuity.

The Contractor shall install detectable underground utility marking tape 18" below finished grade labeled *CAUTION RECLAIMED WATER MAIN BELOW*.

The Contractor shall install purple valve markers, 3' above and 3' below finished grade, where required by the UCNSB Engineering Department.

Fittings and appurtenances must not bear on the pipe when installed and must be fully and independently supported on the trench bedding. The maximum deflection of pipes and fittings shall not exceed the manufacturer's recommendations. Fittings shall be installed in accordance with AWWA C600 and C605, along with the manufacturer's recommendations.

The Contractor shall install electronic markers at each:

- Main connection;
- Fitting;
- In-line valve and
- Blow off valve assembly.

B. Valves

Valves shall be cleared of all foreign matter before installation and installed to prevent debris from becoming lodged in the seat. Valves shall be installed with stems vertically above the centerline of the pipe. Under each valve and at the pipe connection 6" of FDOT #57 stone shall be installed. Valves shall be inspected in the opened and closed position.

Valve boxes shall be centered over the operating nut. Valve boxes shall not transmit surface loads directly to either the pipe or valve. Valve box extensions shall be PVC SDR 35.

Valve boxes in paved areas shall be flush with finished grade. In unpaved areas, valve lids shall be 2" above finished grade and have precast concrete collars.

Valve covers shall be painted purple. After Final Acceptance, terminal valves shall be permanently closed with the cover painted red.

C. Reclaimed Water Services

1" or 2" services shall terminate with a curb stop stubbed 2' to 3' above finished grade supported by a 6' long 4" diameter PVC pipe secured with cable tie straps, be marked with a 'T' in curbs or at edge of pavement painted purple and be installed in a casing under roadways.

Services 3" and larger shall conform to [Sections 3.01 and 3.02](#).

D. Vaults

Vaults shall be installed plumb on 6" of FDOT #57 stone. Rings and covers in paved areas shall be flush with finished grade. In unpaved areas, rings and covers shall be 4" above finished grade.

See [Section 2.03](#) for supplemental information.

4.02 Delivery and Handling of Materials

The UCNSB Engineering Department Inspector has the right to refuse any damaged or dropped materials. All materials shall be delivered and distributed at the site by the Contractor. All pipe, fittings, valves and appurtenances shall be loaded and unloaded by hoists or skidding so as to prevent shock or damage to the material. Under no circumstances shall material be dropped. Pipe that is misshaped and/or has lining/coating damage will be rejected. Concrete structures with holes or honeycombs will be rejected.

4.03 Excavation and Trenching

Trenches shall be a depth which will provide cover from top of pipe to finished grade as shown on approved construction drawings. Excess excavated material, unsalvageable material, and debris shall be wasted and disposed of by the Contractor.

All excavated material retained for backfill shall be piled in such a manner as not to endanger the work or obstruct sidewalks, driveways or drainage. Fire hydrants, valve covers, vault hatches and other utility controls shall not be obstructed and shall remain accessible at all times during construction.

The Contractor shall exercise sound construction practices in excavating and maintaining the pipe trench to prevent damage to any foundation, structure, pole line, pipeline or other facility. If, as a result of the excavation, a foundation, structure, pole line, pipeline or other facility is endangered, the Contractor shall immediately take remedial action at his own expense. No act of the UCNSB shall in any way affect the

liability of the Contractor for damages, expenses or costs that may result from trench excavation.

Sheet piling, shoring, sheeting, bracing or other supports required for construction shall be designed, furnished, placed, maintained and removed by the Contractor. Sheet piling and timbers used in trench excavations shall be withdrawn in such a manner so as to prevent subsequent settlement of the pipe or additional backfill loadings which might overload the pipe.

All existing underground utilities, whether or not they are shown on the approved Construction Drawings or their locations are made known to the Contractor prior to excavation, shall be protected from damage and, if damaged, shall be repaired to equal the prior serviceability or replaced in kind at the Contractor's expense. The UCNSB does not assume responsibility for the correctness of the approved Construction Drawings. Repairs or replacements shall be made at the earliest practicable time and in no case shall the Contractor leave the job at the end of the day without making all such repairs or satisfactory arrangements for subsequent repairs.

Wherever excavation exposes unsuitable materials such as muck, the Contractor shall remove and replace with suitable bedding and backfill material. Muck shall be removed full depth, from trench limits. Trees, stumps and roots within the limits of the trench excavation shall be removed to a depth of at least 12" below the bottom of the trench. Stump and root holes shall be refilled to existing grade and compacted. No stumps, roots, or organic matter of any description shall remain. Rock excavation shall be carried to a depth of at least 6" below the required pipe invert. Blasting is prohibited.

No pipe or structures shall be installed in a wet trench. All bedding material must be dry and firm. The free water surface shall be lowered to at least 6" below the bedding surface before installing pipe or structures. The UCNSB Engineering Department Inspector's judgement shall be used to determine if the trench is acceptable, which includes requiring rock or stopping work.

The bottom of the trench shall be shaped to give sufficient uniform circumferential support to the lower one-fourth of each pipe. In addition, bell holes shall be excavated so that after placement only the barrel of the pipe receives bearing pressure from, and is uniformly supported by, the bottom of the trench.

The use of horizontal struts below the barrel of the pipe or the use of the pipe as support for trench bracing will not be permitted. In pipeline construction the use of the soldier pile and horizontal lagging method of support or the use of a traveling shield shall require UCNSB Engineering Department approval.

4.04 Backfill

All backfill and bedding material shall be in accordance with ASTM D422 and shall meet UCNSB Engineering Department approval. Bedding material in areas above the natural ground water table shall be fine sand or shell, or a mixture of both. Bedding material in areas where trench bottom is below natural ground water table shall be FDOT #57 stone.

Backfill material from trench bottom to 12" above top of pipe shall be select granular material free of organic matter. Backfill material from 12" above top of pipe to finished grade shall be common fill material free of organic matter. Backfill material shall not be obtained from the trench walls.

After the pipe has been properly laid and inspected, backfill material shall be compacted in 12" lifts to prevent settlement. The Contractor shall achieve the specified maximum dry density/optimum moisture content per the approved Construction Drawings. The Contractor shall submit all field density tests to the UCNSB Engineering Department prior to final acceptance. Any depression that forms adjacent to or within the trench line will be rejected.

4.05 Groundwater

The Contractor shall furnish, install and operate all necessary machinery, appliances, and equipment to keep excavations free from water during construction and shall dewater and dispose of the water so as not to cause injury to public or private property or to cause a nuisance or a menace to the public. The Contractor shall at all times have on hand sufficient pumping equipment and machinery in good working condition for emergencies.

The control of groundwater shall be such that softening of the bottom of the excavations or formation of quick conditions or boils shall be prevented. Dewatering systems shall be designed and operated so as to prevent the removal of the natural soils. The static water level shall be drawn down below the bottom of the excavation so as to maintain the undisturbed state of the natural soils and allow the placement of backfill to the required density.

The UCNSB Engineering Department will not accept pipe that floats due to lack of groundwater control and shall require the Contractor to reinstall any pipe that is rejected.

4.06 Maintenance of Traffic (MOT)

MOT must follow the Manual on Uniform Traffic Control Devices (MUTCD), the FDOT Design Standards (current edition) and all applicable Right-of-Way Use Permit requirements.

4.07 Restoration

A. Pavement Restoration

Road surfaces, curb and gutter, driveways, sidewalks, parking locations and any other type of surface materials that require removal for the purpose of installation of underground utilities shall be replaced as soon as practicable after compaction of the backfill and in accordance with City, County or Florida Department of Transportation standards or as indicated on the respective permit. These surface materials shall be separated from other excavated materials and will not be permitted to be included in the backfill but shall be satisfactorily disposed of by the Contractor. Surface material to be removed shall be cut, if necessary, vertically with a power-driven friction saw prior to removal. The surface shall be scored in sufficient depth to provide uniform straight break lines.

Under no condition shall pavement be cut with a trenching machine, power shovel or backhoe. The width of cut of the pavement or sidewalk shall be the width of the trench plus one-half the trench width, or a minimum of 2' on either side. In the event that the trench excavation becomes wider than the initial cut, the pavement or sidewalk shall be re-cut to at least 2' back from all edges of the actual excavation by the Contractor at his own expense. Utility crossing and installations along state highways shall be made in full compliance with Florida Department of Transportation (FDOT) requirements.

B. Open Space Restoration

The Contractor shall sod or seed and mulch the disturbed work area per the approved Construction Drawings and shall protect road shoulders, ditch banks, and other natural or artificial slopes subject to rapid erosion.

C. Clean-Up

The Contractor is responsible to present a clean work area to the UCNSB Engineering Department Inspector prior to Final Acceptance.

4.08 Boring Methods

The Contractor shall manage and control all drilling practices to prevent damage to existing utilities. The Contractor shall make a diligent effort to locate evidence of any other potential subsurface obstructions, e.g. piles. Subsidence and heave within the construction limits of the project shall be limited to values that avoid damage. The Contractor shall be responsible for all damage and repairs as a result of drilling operations.

The Contractor shall be responsible for all underground utility locates via soft digs prior to boring so that adjustments can be made if necessary.

Bore logs shall be provided to the UCNSB Engineering Department in 10-foot segments. During construction, any deviations greater than 5' in any direction shall immediately be reported to the UCNSB Engineering Department. Pipe testing shall follow the requirements of these Specifications.

A. Jack and Bore

The casing pipe shall have the nominal diameter and wall thickness as shown on the approved Construction Drawings.

Field and shop welds of the casing pipes shall conform to the American Welding Society standard specifications. Field welds shall be complete penetration, single-vee groove or single-bevel groove type joints.

The carrier pipe shall be ductile iron pipe per these Specifications. Carrier pipes to be installed within the specified casings shall be equipped with restrained joint connectors.

The casing shall be jacked in one continuous operation at the locations specified. In no event shall jacking be discontinued for sufficient period to cause the partially jacked sleeve to freeze in place. Proper alignment and elevation of the sleeve shall be consistently maintained throughout the jacking operation.

Jacking pits shall be shored with sheeting or other such materials as required. Sheeting shall be driven to a sufficient depth below the invert of the casing to resist any pressure developed by the soil outside the jacking pit. Sheeting shall terminate not less than 3.5' above existing grade. At the completion of the jacking operations, the Contractor will be required to leave all sheeting in place; however, the top of the sheeting shall be cut off 30" below finished grade upon completion of the jack and bore.

The Contractor shall be responsible for preventing the occurrence of voids outside the casing and if they do occur, the Contractor may be directed to fill them with grout in a

method approved by the UCNSB Engineering Department. The Contractor shall constantly exercise care in the removal of the earth from within the sleeve sufficiently close to the forward end to prevent voids.

The Contractor shall be responsible for removing any type of material or equipment used for backing up the jack.

A masonry bulkhead 8" wide shall be placed in the ends of the casing.

The carrier pipe shall be supported by spacers as shown on the approved construction drawings and per manufacturer's recommendations.

B. Directional Drilling

Prior to drilling, the Contractor shall utilize all verified locate information to determine the drill pathway in conjunction with the approved Construction Drawings.

The entry and exit point shall be within 5' of the location shown on the approved Construction Drawings. After successfully reaming the bore hole to the required diameter, the pipe shall be pulled with a swivel and reamer in front of the pipe to compact the bore hole walls.

The pullback section of the pipe shall be supported during pullback operations so that it moves freely and does not damage the pipe. The Contractor shall cease operations if the pipe is damaged and shall remove the pipe from the bore hole and repair the pipe using the manufacturer's recommended procedure or replace the damaged pipe before resuming installation.

4.09 Asbestos

Any asbestos-cement pipe identified shall be reported to the UCNSB Engineering Department Inspector immediately.

A Contractor that disturbs, maintains, repairs or demolishes shall comply with:

- Environmental Protection Agency's (EPA) 40 CFR Part 61, Subpart M and 40 CFR Part 763, Subpart E
- Florida Administrative Code (FAC) 62-257
- Occupational Safety and Health Administration (OSHA) Standard 1910.1001 and 1926.1101

The following are UCNSB guidelines for asbestos-cement pipe disposal:

- 1) Notify the UCNSB Engineering Project Manager:
 - a. Location of job site.
 - b. Pipe size.
 - c. Proposed operation.
- 2) File a FDEP [Notice of Demolition or Asbestos Renovation](#) form.
- 3) Mark area to minimize the number of persons exposed.
- 4) Post warning signs demarcating the area that reads “DANGER – ASBESTOS – CANCER AND LUNG DISEASE HAZARD”.
- 5) Put on personal protective equipment such as coveralls, gloves, eye wear, etc.
- 6) Put on face mask or respirator.
- 7) Adequately wet pipe during and after removal operation.
- 8) Use equipment least likely to cause pipe to crumble and/or fray, such as snap cutters, carbide-tipped blade cutters or wheel-type cutters. See 12b.
- 9) Remove entire section of pipe:
 - a. Wet coupling.
 - b. Cover pipe with drop cloth.
 - c. Use hammer, chisel and pry bar to break coupling.
 - d. Replace pipe using compression, coupling, sleeve or repair clamp.
- 10) Contain all waste:
 - a. Wrap in 6 mil plastic bags or polyethylene sheets.
 - b. Large pieces shall be double wrapped.
 - c. Duct tape all open seams and edges.
 - d. Label waste with “DANGER ASBESTOS-CONTAINING MATERIAL”.
- 11) Transport waste in approved, closed truck.
- 12) At no time shall asbestos-containing material:
 - a. Be disturbed in any way when dry.
 - b. Cut with a chain or circular saw, grinder, jack hammer, drills, etc.
 - c. Crushed in place.
- 13) UCNSB will have a continuing contract arrangement for asbestos handling, transport and disposal.

SECTION 5 - TESTING

The Contractor shall perform all tests on newly constructed pipe and appurtenances in the presence of the UCNSB Engineering Department Inspector, including a locate wire continuity test.

All required tests shall be satisfactorily completed prior to Final Acceptance. All labor, equipment and materials required to complete tests shall be furnished by the Contractor and approved by the UCNSB Engineering Department Inspector.

Testing shall not proceed until new construction is complete, including adequate cover (pipe in paved areas will require base material) and pipe is thoroughly cleaned of all foreign matter.

Cracked or defective pipes, fittings or valves, leaks, bellies, etc. will not be accepted and the repair or replacement shall be at the Contractor's expense.

All temporary connections, approved by the UCNSB Engineering Department, necessary to test pipe and appurtenances shall be installed by the Contractor.

New construction and existing facilities shall not be interconnected until Final Acceptance. The Contractor is responsible for plugging/capping pipe and appurtenances, where necessary.

5.01 Flushing

Reclaimed water pipe and appurtenances shall be thoroughly flushed to remove all sand, debris, and other foreign material which may be in the pipe. Flushing shall continue until clean, clear water flows from a blow off or curb stop. The Engineer of Record shall submit a plan for flushing to obtain 2.5 feet per second to the UCNSB Engineering Department for review and approval. Flushing water shall be discharged in a manner that will not cause erosion or structural damage on-site or off site, nor cause pollution as determined by State Water Quality Standards in receiving surface waters. The Contractor shall provide adequate extension pipe, sedimentation basins and/or diffusion devices necessary to prevent such damage.

5.02 Pressure Test

Pipe shall be hydrostatically leak (pressure) tested at 150 psi for a minimum duration of two hours. Unless otherwise specified, the allowable leakage rate shall not exceed that required by AWWA Standard C600 or C605, calculated by the following equation:

$$L = (S \times D \times P^{1/2}) \div 148,000$$

L = Allowable leakage rate in gallon per hour (gph)

S = Length of pipe tested in feet

D = Nominal diameter of the pipe in inches

P = Average test pressure in pounds per square inch (psi)

Not more than 1,000' of pipe, or as directed by the UCNSB Engineering Department Inspector, shall be pressure tested at one time.

There shall be no additional leakage allowance made for bends, fittings or valves. If a leak is visible or if the allowable leakage is exceeded, the Contractor shall make the necessary repairs and repeat the pressure test until the result is acceptable to the UCNSB Engineering Department Inspector.

SECTION 6 - PERMITS

All applicable permits shall be obtained and submitted to the UCNSB Engineering Department prior to construction. The UCNSB is not responsible for any fees required by permitting agencies.

6.01 Florida Department of Transportation (FDOT)

An FDOT permit must be obtained for any work within the FDOT right-of-way.

One (1) original [FDOT Utility Permit Form 710-010-85](#) and one (1) set of approved Construction Drawings, signed/sealed by a Florida registered Professional Engineer, shall be submitted to the UCNSB Engineering Department for UCNSB's approval and endorsement. Then digital files of the permit application and drawings will be required for issuance of an FDOT construction permit through [FDOT One-Stop Permitting](#).

6.02 Volusia County

A [Volusia County Use Permit](#) must be obtained for any work within the County right-of-way.

6.03 City of New Smyrna Beach

A [City Right-of-Way Use Permit](#) must be obtained for any work within the City right-of-way. An archaeological permit may be required.

6.04 Florida East Coast (FEC) Railway

A permit is required when a reclaimed water main is installed in the [FEC](#) right-of-way. Work adjacent to the right-of-way may require an FEC Flagger.

SECTION 7 - FINAL ACCEPTANCE

The following shall be completed in order to obtain Final Acceptance and place new reclaimed water facilities in service:

7.01 AS-BUILT RECORD DRAWINGS

As-built record drawings shall be signed/sealed by a Florida registered Professional Engineer and Surveyor and submitted to the UCNSB Engineering Department for UCNSB's approval.

The as-built record drawing submittal shall include one (1) bond copy, a multi-page Adobe PDF file and an AutoCAD DWG file (AutoCAD 2000 or later version) with plot style table file.

As-built record drawings shall comply, at a minimum, with the following:

- Identify the vertical and horizontal datum used;
- Show a north arrow and scale in each viewport;
- List the horizontal and vertical scales in profile view;
- Show a legend on each sheet;
- Freeze, or show with gray line types, all layers that are not the subject of the as-built;
- Show and label all street names, right-of-way lines, lot lines, and lot numbers with black lines having a line weight thinner than that of new construction;
- Show and label all pipe, valves and fittings with length, size, type, degree of bend and location (by using tie dimensions or stationing) with deflections clearly indicated, e.g., 500 LF of 8" PVC RCLM WM, (2) 8" GV (gate valve) or (1) 2" BOV (blow off valve) and
- Show and label all diameters of reducers, tees and crosses (by calling out the run diameter first and the branch diameter second), e.g., 12" x 8" tee indicates a 12" run with an 8" branch, with reducers and crosses noted similarly.

7.02 INSPECTION

A final inspection shall be scheduled, once all tests have been passed, with the UCNSB Engineering Department Inspector and Engineer, a representative from the UCNSB Water Resources Department, the Engineer of Record and the Contractor.

All operation and maintenance manuals shall be submitted to the UCNSB Engineering Department prior to the final inspection and shall include two (2) hard copies and an Adobe PDF file.

The Contractor shall make all necessary corrections noted during the final inspection prior to Final Acceptance.

7.03 TRANSFER OF FACILITIES

The following documentation shall be submitted in order to transfer the reclaimed water facilities to the UCNSB's ownership:

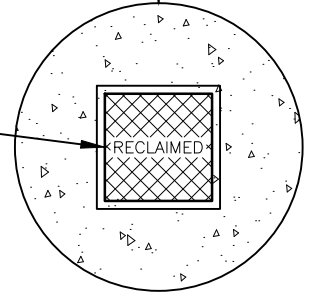
- A Bill of Sale accompanied by an itemized cost including labor, materials and equipment.
- All recorded plat(s) and easement(s), or proof thereof.
- A Maintenance Bond with a one (1) year warranty period against all defects in material and workmanship. The Maintenance Bond shall be 25% of the total itemized cost and begin upon the date of Final Acceptance, specified by the UCNSB.

SECTION 8 –DETAILS

Reclaimed Water <u>Detail Title</u>	AutoCAD Block <u>Insertion Scale</u>
Gate Valve	1.000
Valve Layout at Tees and Services	0.500
Valve Marker	1.000
Tapping Sleeve and Valve	0.500
Blow Off Valve Assembly	0.500
Pipe Locating Wire and Tape	1.000
Utility Separation	0.333
Air Release Valve in Concrete Vault.....	0.500
Joint Sealant.....	1.000
Vault Structure Ring and Cover.....	0.500
1" or 2" Short Side Reclaimed Water Service Stub Out.....	0.333
1" or 2" Long Side Reclaimed Water Service Stub Out.....	0.200
Reclaimed Water Advisory Signs	2.000

18" DIA. x 6" THICK, 3000 PSI (MIN.)
CONCRETE PAD IN UNPAVED AREAS

CAST IRON VALVE
BOX & COVER
(PAINTED PURPLE)



SET TOP OF VALVE BOX
TO FINISHED GRADE IN
PAVED AREAS

SET TOP OF VALVE BOX
2" ABOVE FINISHED GRADE
IN UNPAVED AREAS

FINISHED GRADE (PAVED)

FINISHED GRADE (UNPAVED)

VALVE STEM GUIDE PLATE

ADJUSTABLE SCREW TYPE CAST
IRON VALVE BOX, LENGTH
AS REQUIRED

6"
MIN.

LOCATING WIRE THAT EXTENDS
2 FT. ABOVE FINISHED GRADE
SHALL BE BUNDLED WITHIN
THE VALVE BOX; WIRE SHALL
BE TAPED TO THE MAIN

BOX SHALL REST ON BEDDING
ROCK, NOT ON VALVE OR PIPE,
AND SHALL BE CENTERED ON
OPERATING NUT

GATE VALVE - SIZE AS SPECIFIED
OR INDICATED ON PLANS

NOTE:

A 24" VALVE NUT EXTENSION
SHALL BE REQUIRED IF
OPERATING NUT IS MORE THAN
36" BELOW FINISHED GRADE.

ELECTRONIC MARKER
(IN-LINE VALVES ONLY)

RECLAIMED WATER MAIN

6"

FDOT #57 STONE

8" MIN.

8" MIN.

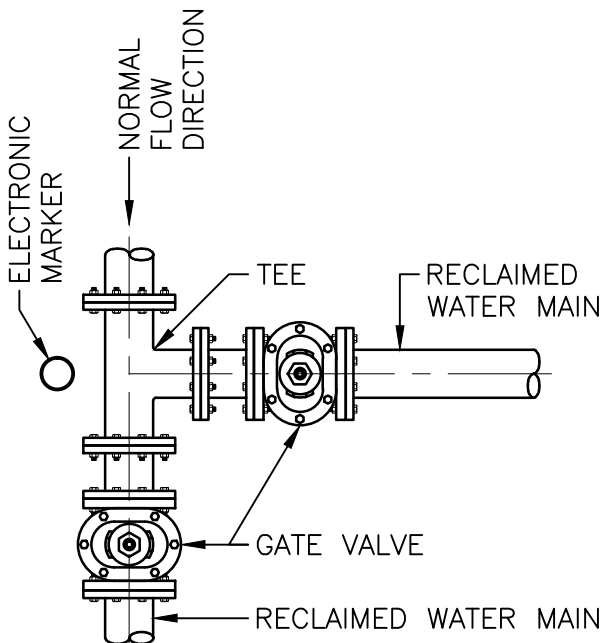
GATE VALVE

NTS UCNSB 6/15

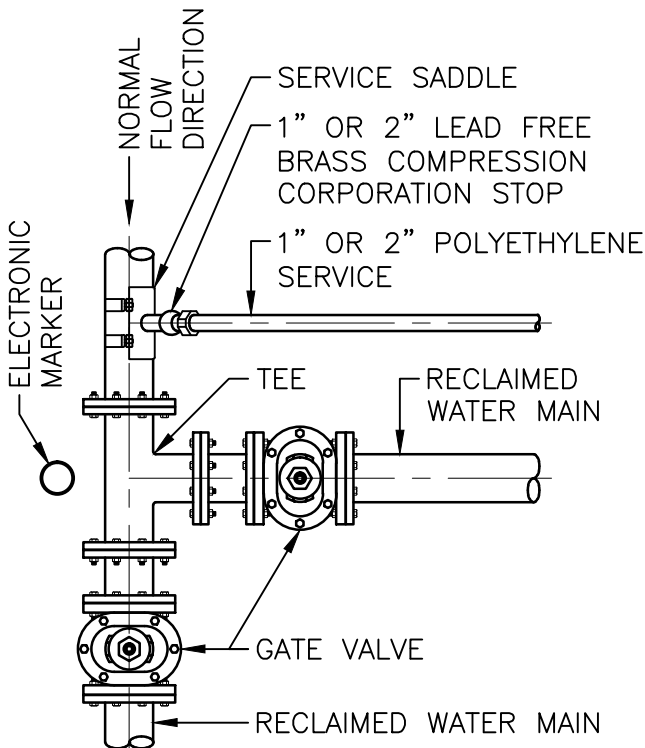
UTILITIES COMMISSION
CITY OF NEW SMYRNA BEACH, FL

GATE VALVE

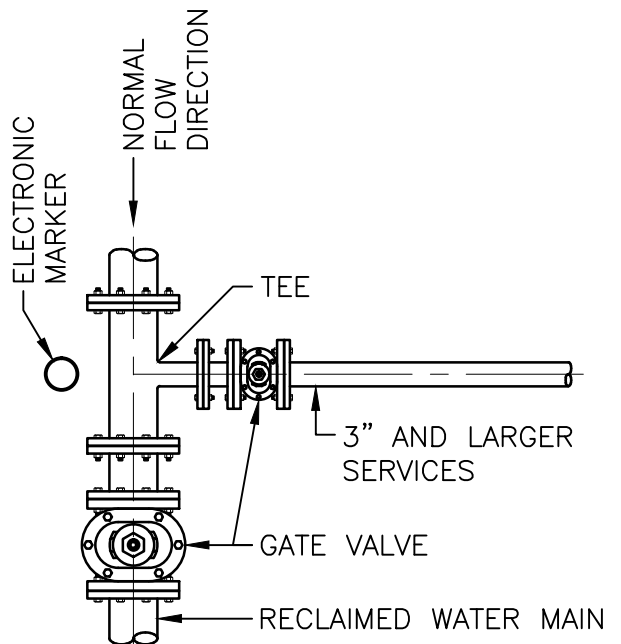
DWN. A. WISHART	SCALE: 1"=1'	REV.	SHEET 1 OF 1
CKD. D. HALE	DATE: 6/2015		
APP. D. WAINSCOTT	FILE: RW-01		RW-01



BRANCH CONNECTION



1" OR 2" SERVICES



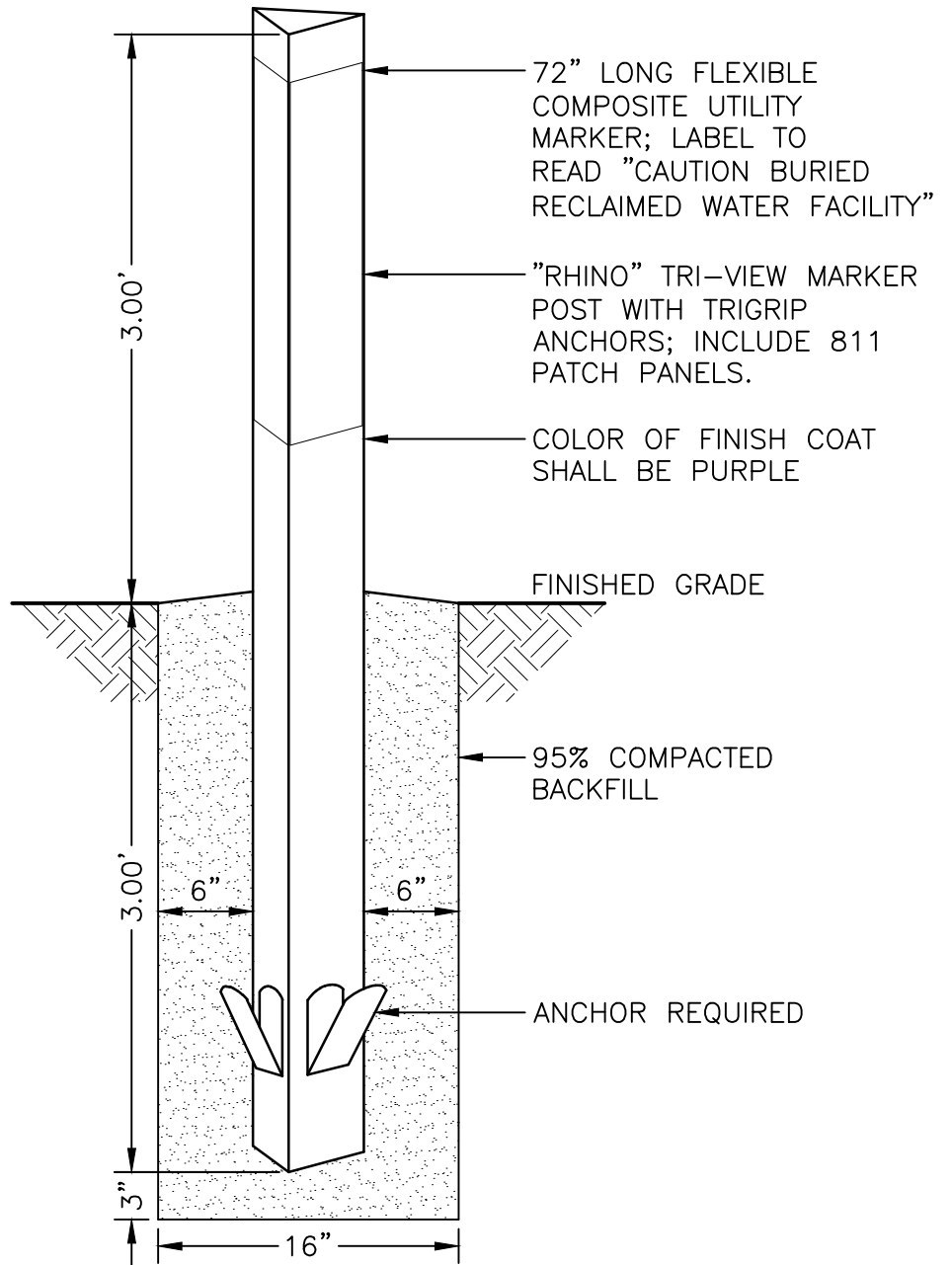
3" AND LARGER SERVICES

VALVE LAYOUT AT TEES AND SERVICES

NTS

UCNSB 6/15

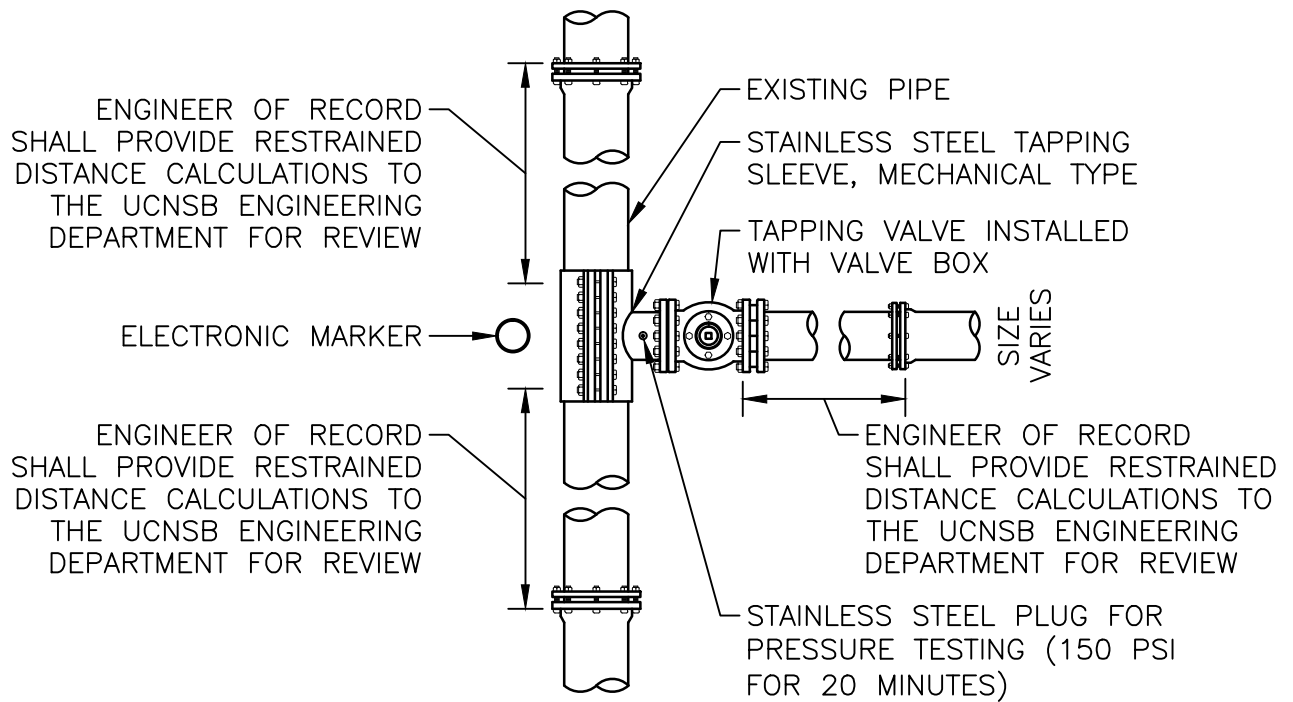
UTILITIES COMMISSION CITY OF NEW SMYRNA BEACH, FL			
VALVE LAYOUT AT TEES AND SERVICES			
DWN. A. WISHART	SCALE: 1"=2'	REV.	SHEET 1 OF 1
CKD. D. HALE	DATE: 6/2015	RW-02	
APP. D. WAINSCOTT	FILE: RW-02		



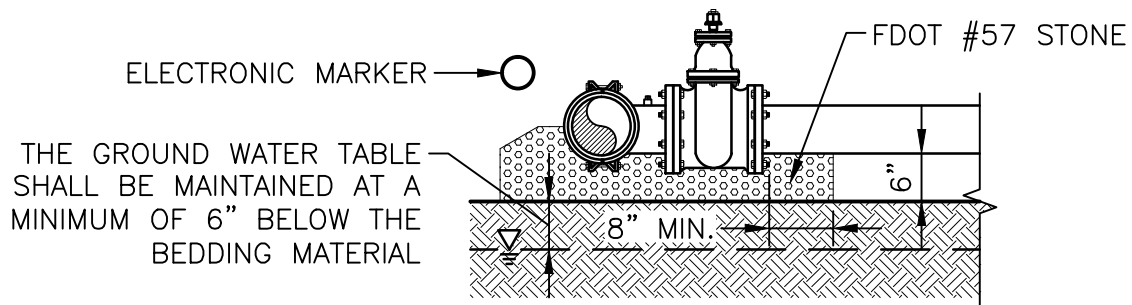
VALVE MARKER

NTS UCNSB 6/15

UTILITIES COMMISSION CITY OF NEW SMYRNA BEACH, FL			
VALVE MARKER			
DWN. A. WISHART	SCALE: 1"=1'	REV.	SHEET 1 OF 1
CKD. D. HALE	DATE: 6/2015	RW-03	
APP. D. WAINSCOTT	FILE: RW-03		



PLAN VIEW



SECTION VIEW

NOTES:

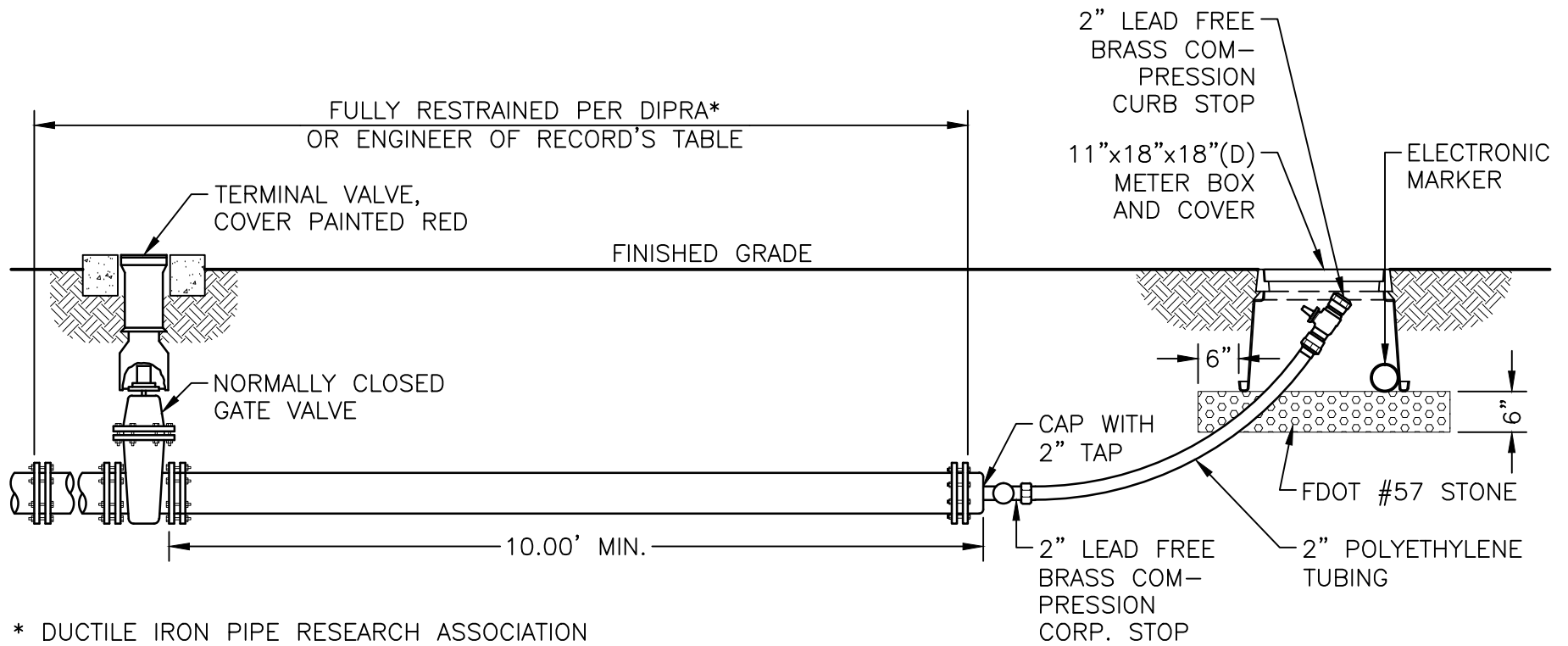
1. FULL LENGTH TAPPING SLEEVE REQUIRED.
2. STAINLESS STEEL TAPPING SLEEVES ARE REQUIRED FOR ALL TYPES OF PIPE MATERIALS.
3. INSTALLATION REQUIRES RESTRAINED JOINTS. IN NO INSTANCE SHALL THRUST BLOCKS BE PERMITTED.
4. REVERSE SIDE AND VERTICAL TAPPING REQUIRES UCNSB ENGINEERING DEPARTMENT APPROVAL.

TAPPING SLEEVE AND VALVE

NTS

UCNSB 6/15

UTILITIES COMMISSION CITY OF NEW SMYRNA BEACH, FL			
TAPPING SLEEVE AND VALVE			
DWN. A. WISHART	SCALE: 1"=2'	REV.	SHEET 1 OF 1
CKD. D. HALE	DATE: 6/2015	RW-04	
APP. D. WAINSCOTT	FILE: RW-04		



BLOW OFF VALVE ASSEMBLY

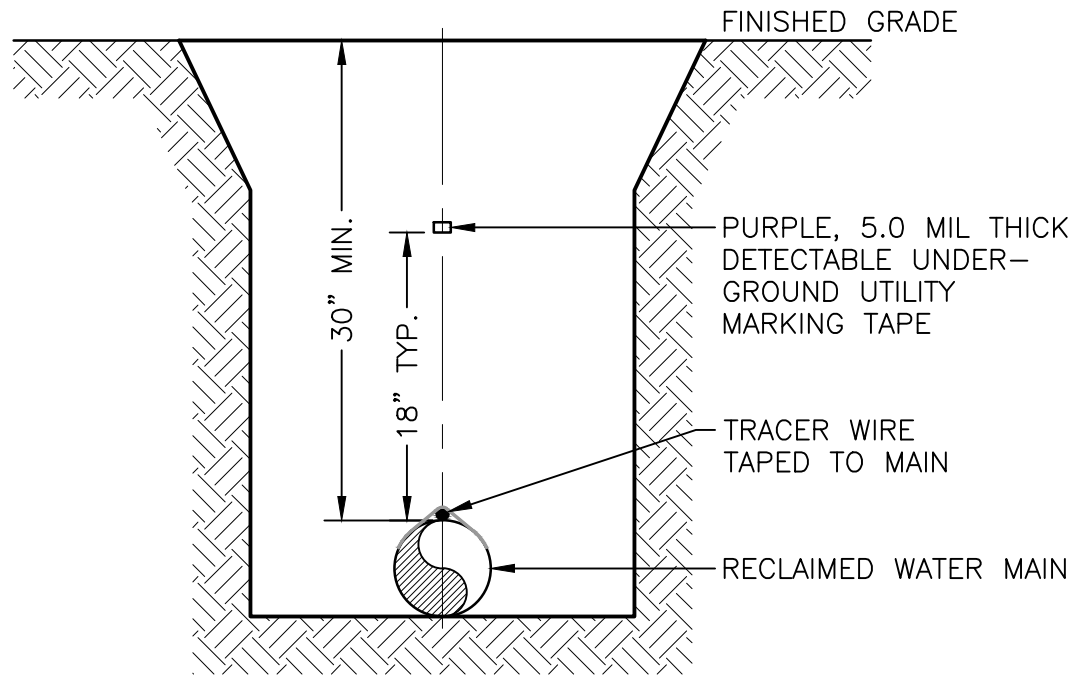
NTS

UCNSB 6/15

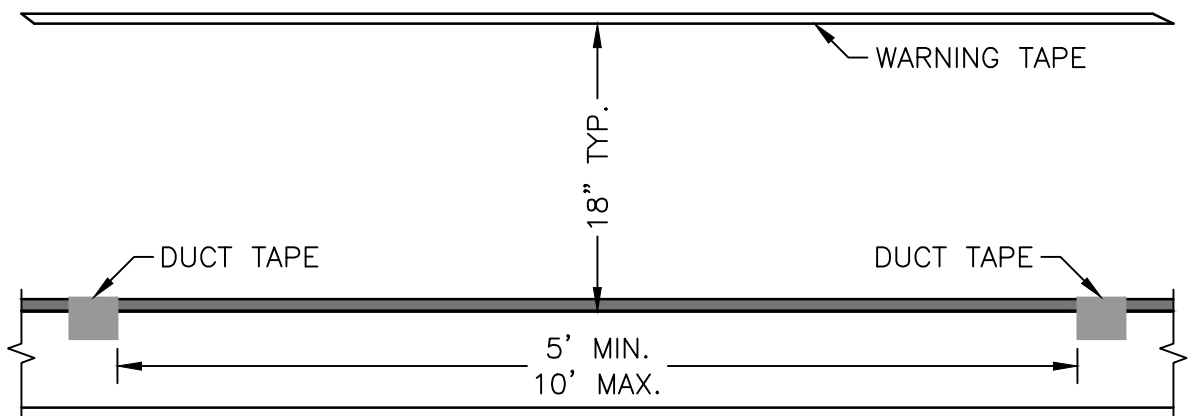
UTILITIES COMMISSION
CITY OF NEW SMYRNA BEACH, FL

BLOW OFF VALVE ASSEMBLY

DWN. A. WISHART	SCALE: 1" = 2'	REV.	SHEET 1 OF 1
CKD. D. HALE	DATE: 6/2015	RW-05	
APP. D. WAINSCOTT	FILE: RW-05		



SECTION VIEW



ELEVATION VIEW

NOTES:

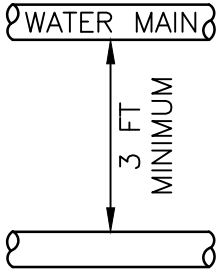
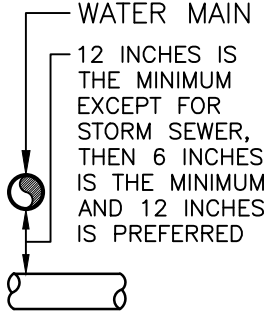
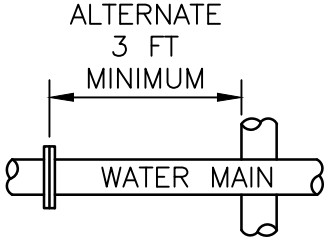
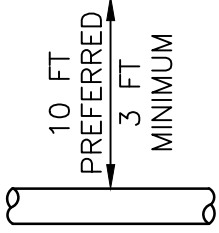
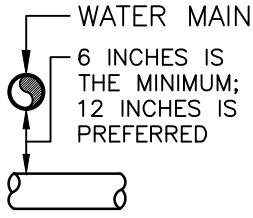
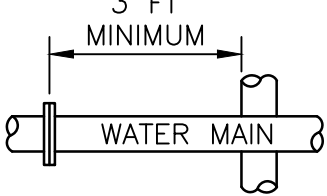
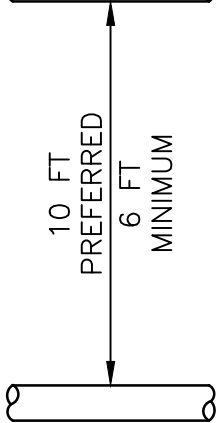
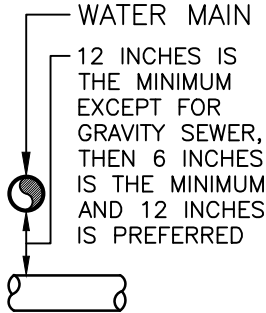
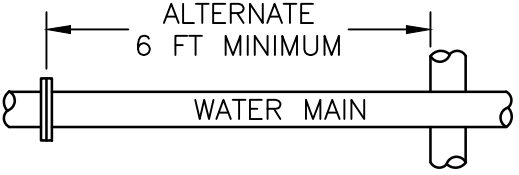
1. ALL PIPE SHALL REQUIRE #14 GAUGE (AWG) HIGH-STRENGTH COPPER CLAD STEEL CONDUCTOR (HS-CCS) TRACER WIRE COATED WITH A 30 MIL THICK, HIGH DENSITY POLYETHYLENE (HDPE) INSULATION, AND RATED FOR DIRECT BURIAL USE AT 30 VOLTS LOCATED DIRECTLY ABOVE THE CENTERLINE OF THE PIPE AND TAPED TO THE PIPE AT 5 FT. TO 10 FT. INTERVALS.
2. AT RESTRAINED JOINTS, WRAP TRACER WIRE AROUND ONE LUG.

PIPE LOCATING WIRE AND TAPE

NTS

UCNSB 6/15

UTILITIES COMMISSION CITY OF NEW SMYRNA BEACH, FL			
PIPE LOCATING WIRE AND TAPE			
DWN. A. WISHART	SCALE: 1"=1'	REV.	SHEET 1 OF 1
CKD. D. HALE	DATE: 6/2015	RW-06	
APP. D. WAINSCOTT	FILE: RW-06		

OTHER PIPE	HORIZONTAL SEPARATION	CROSSING	JOINT SPACING AT CROSSINGS (FULL JOINT CENTERED)
STORM SEWER, STORMWATER FORCE MAIN, RECLAIMED WATER REGULATED UNDER FAC 62-610 PART III			
VACUUM SANITARY SEWER			
GRAVITY OR PRESSURE SANITARY SEWER, SANITARY SEWER FORCE MAIN, RECLAIMED WATER NOT REGULATED UNDER FAC 62-610 PART III			

NOTES:

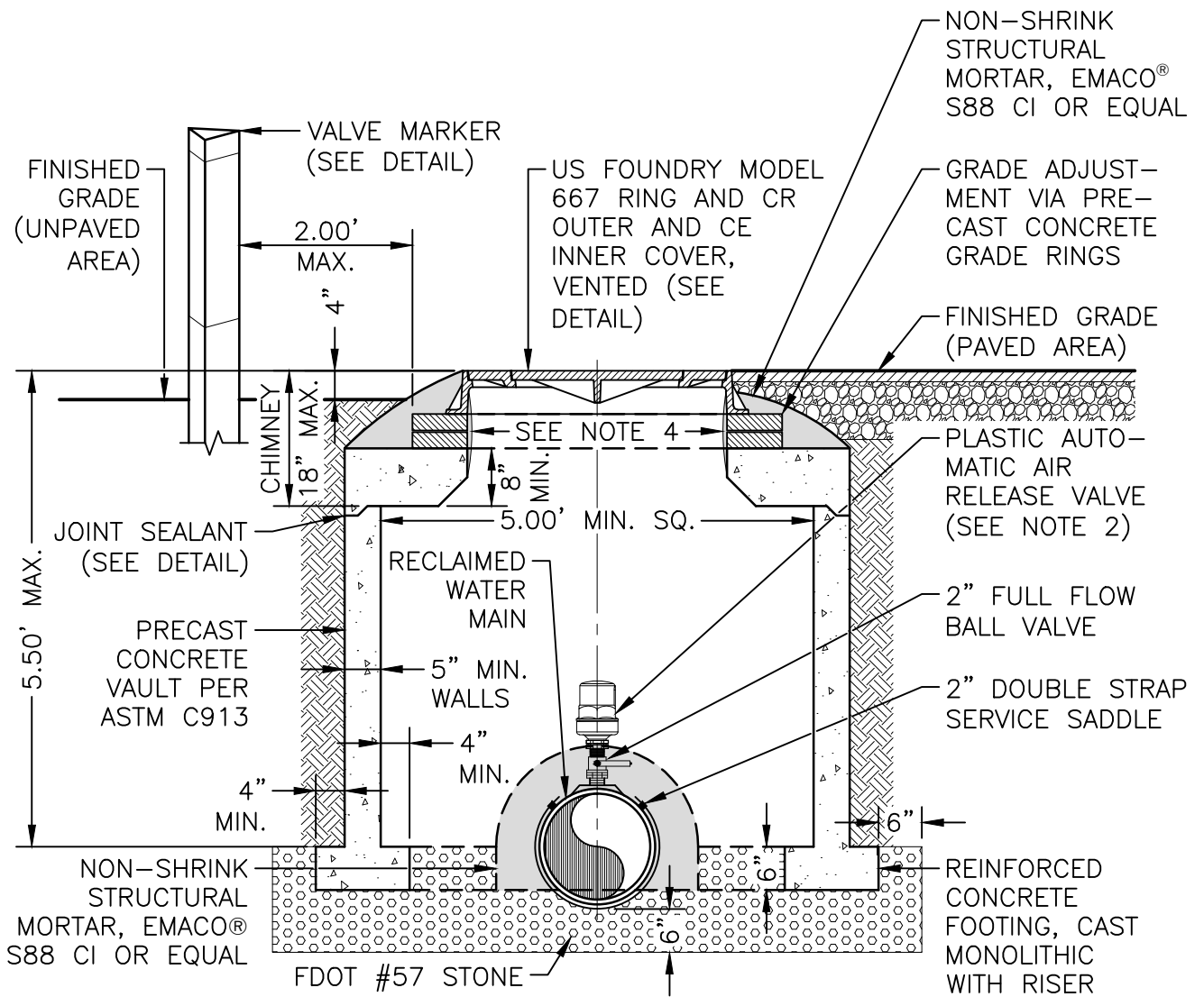
1. LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH FAC RULE 62-555.314.
2. WATER MAIN SHOULD CROSS ABOVE OTHER PIPE. WHEN WATER MAIN MUST BE BELOW OTHER PIPE, THE MINIMUM SEPARATION IS 12 INCHES.
3. IN ADDITION TO FAC RULE 62-555.314, THE UCNSB REQUIRES THAT ALL OTHER UTILITY SEPARATIONS SHALL BE 1 FOOT VERTICALLY ON CROSSINGS AND 3 FEET PARALLEL.

UTILITY SEPARATION

NTS

UCNSB 6/15

UTILITIES COMMISSION CITY OF NEW SMYRNA BEACH, FL			
UTILITY SEPARATION			
DWN. A. WISHART	SCALE: 1"=3'	REV.	SHEET 1 OF 1
CKD. D. HALE	DATE: 6/2015	RW-07	
APP. D. WAINSCOTT	FILE: RW-07		



NOTES:

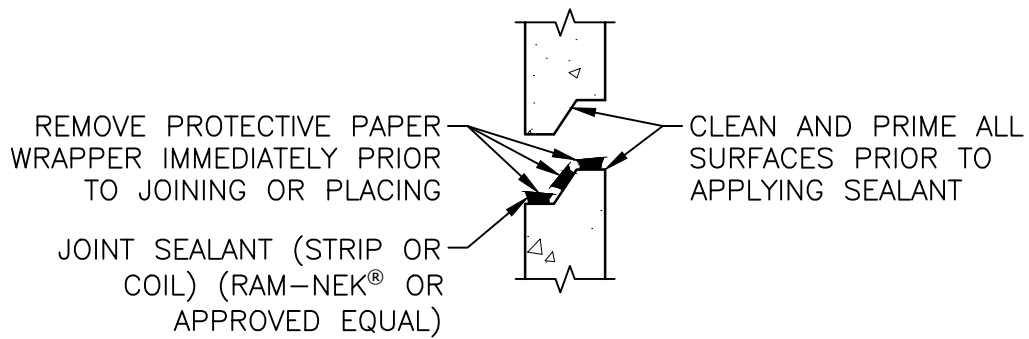
1. RINGS AND COVERS IN PAVEMENT OR SIDEWALK SHALL BE FLUSH WITH FINISHED GRADE. RINGS AND COVERS SHALL BE 4" ABOVE FINISHED GRADE IN UNPAVED AREAS.
2. SEE A.R.I. FLOW CONTROL ACCESSORIES CATALOG FOR D-040P, 2" THREADED AUTOMATIC AIR RELEASE VALVE CONFIGURATION, OR APPROVED EQUAL.
3. COIL 6 FT. OF TRACER WIRE WITHIN VAULT; WIRE SHALL BE TAPED TO THE MAIN.
4. EPOXY MORTAR INSIDE OF CHIMNEY/PRECAST CONCRETE GRADE RINGS FOR A SMOOTH FINISH.

AIR RELEASE VALVE IN CONCRETE VAULT

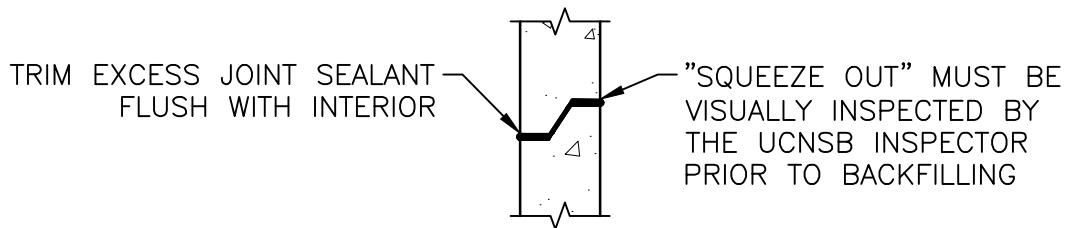
NTS

UCNSB 6/15

UTILITIES COMMISSION			
CITY OF NEW SMYRNA BEACH, FL			
AIR RELEASE VALVE IN CONCRETE VAULT			
DWN. A. WISHART	SCALE: 1"=2'	REV.	SHEET 1 OF 1
CKD. D. HALE	DATE: 6/2015	RW-08	
APP. D. WAINSCOTT	FILE: RW-08		



APPLICATION OF SEALANT

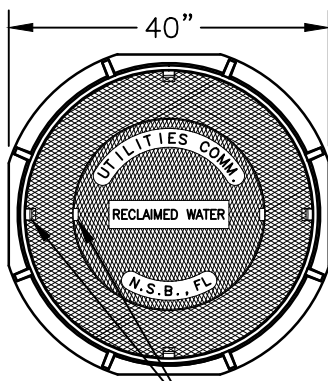


CLOSED JOINT

JOINT SEALANT

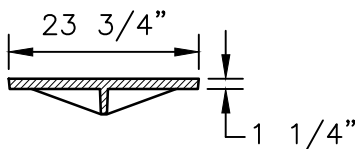
NTS UCNSB 6/15

UTILITIES COMMISSION CITY OF NEW SMYRNA BEACH, FL			
JOINT SEALANT			
DWN. A. WISHART	SCALE: 1"=1'	REV.	SHEET 1 OF 1
CKD. D. HALE	DATE: 6/2015	RW-09	
APP. D. WAINSCOTT	FILE: RW-09		



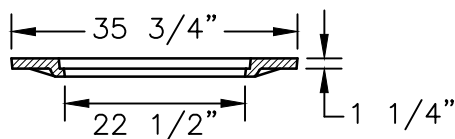
(6) NON-PENETRATING PICK HOLES

TOP VIEW



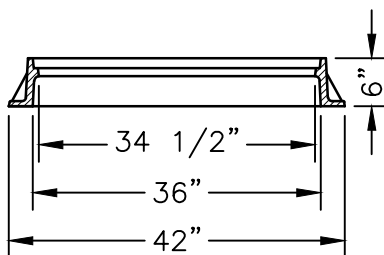
COVER WT: 145 LB

U.S. FOUNDRY CE INNER COVER



COVER WT: 220 LB

U.S. FOUNDRY CR OUTER COVER



RING WT: 220 LB

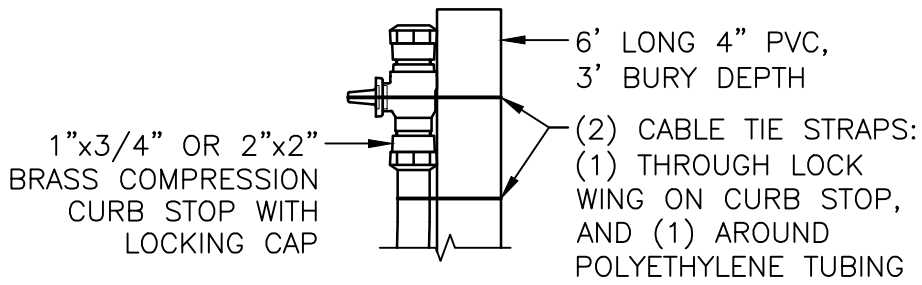
U.S. FOUNDRY 667 RING

VAULT STRUCTURE RING AND COVER

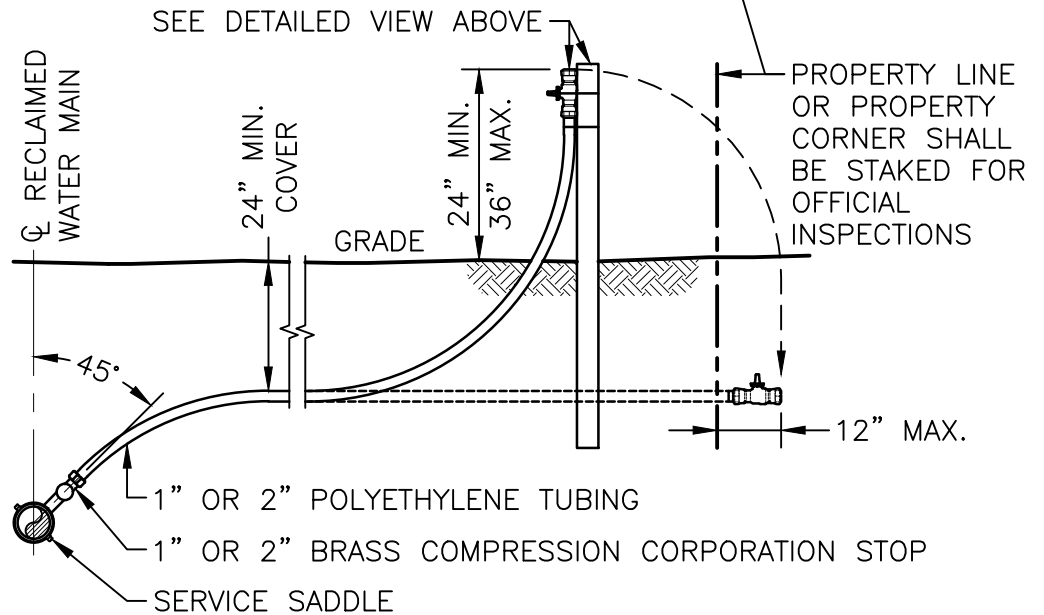
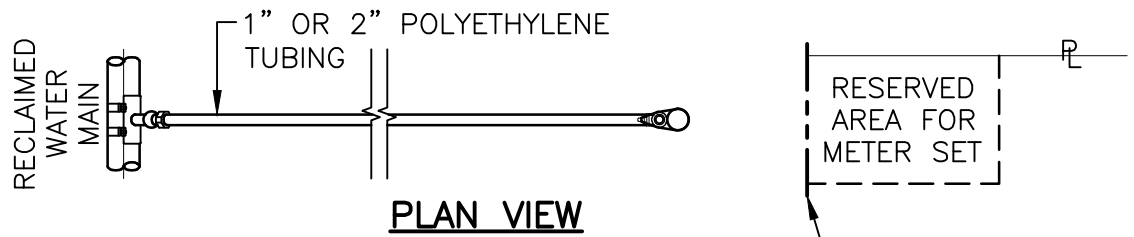
NTS

UCNSB 6/15

UTILITIES COMMISSION CITY OF NEW SMYRNA BEACH, FL			
VAULT STRUCTURE RING AND COVER			
DWN. A. WISHART	SCALE: 1"=2'	REV.	SHEET 1 OF 1
CKD. D. HALE	DATE: 6/2015	RW-10	
APP. D. WAINSCOTT	FILE: RW-10		



DETAILED VIEW



NOTES:

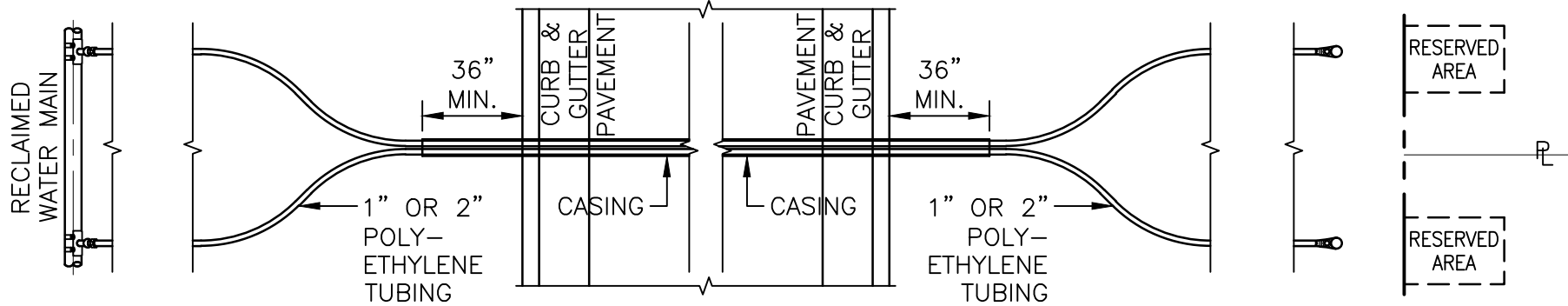
1. APPLIES TO NEW CONSTRUCTION ONLY.
2. ALL FITTINGS SHALL BE LEAD FREE BRASS.
3. ATTACH RECLAIMED WATER SERVICE TO POST AS SHOWN ABOVE.

1" OR 2" SHORT SIDE RECLAIMED WATER SERVICE STUB OUT

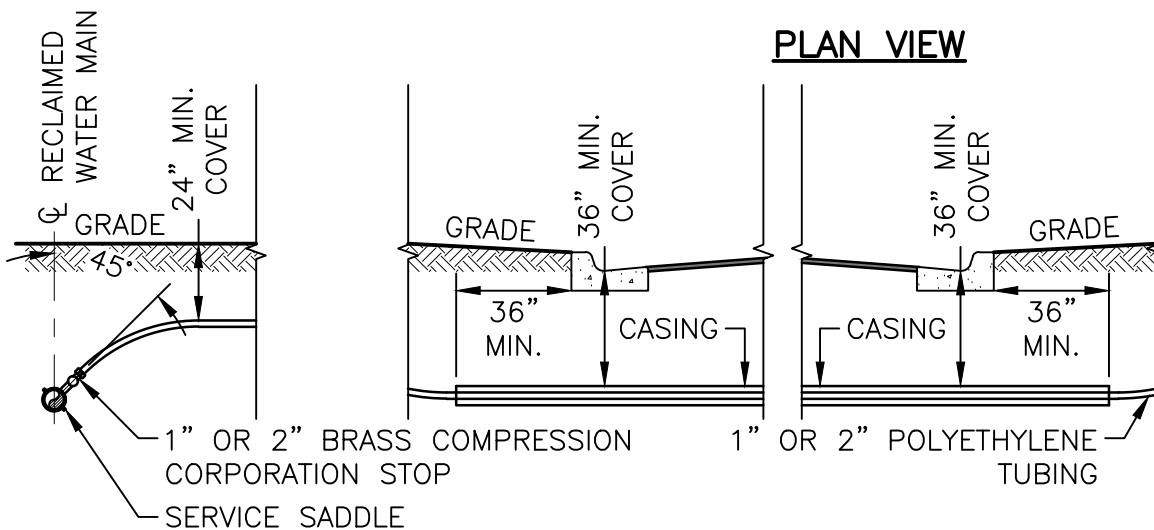
NTS

UCNSB 6/15

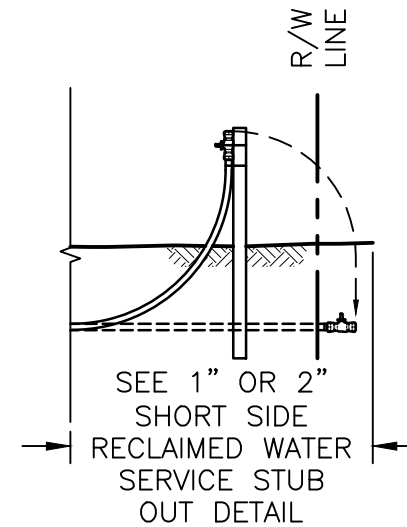
UTILITIES COMMISSION CITY OF NEW SMYRNA BEACH, FL			
1" OR 2" SHORT SIDE RECLAIMED WATER SERVICE STUB OUT			
DWN. A. WISHART	SCALE: 1"=3'	REV.	SHEET 1 OF 1
CKD. D. HALE	DATE: 6/2015	RW-11	
APP. D. WAINSCOTT	FILE: RW-11		



PLAN VIEW



SECTION VIEW



NOTES:

1. APPLIES TO NEW CONSTRUCTION ONLY.
2. ALL UNDER ROAD SERVICES IN NEW DEVELOPMENTS SHALL BE IN 4" SCHEDULE 40 PVC CASINGS WITH THE EXCEPTION OF DOUBLE 2" SERVICES WHICH REQUIRE A 6" CASING.
3. ALL FITTINGS SHALL BE LEAD FREE BRASS.

1" OR 2" LONG SIDE RECLAIMED WATER SERVICE STUB OUT

NTS

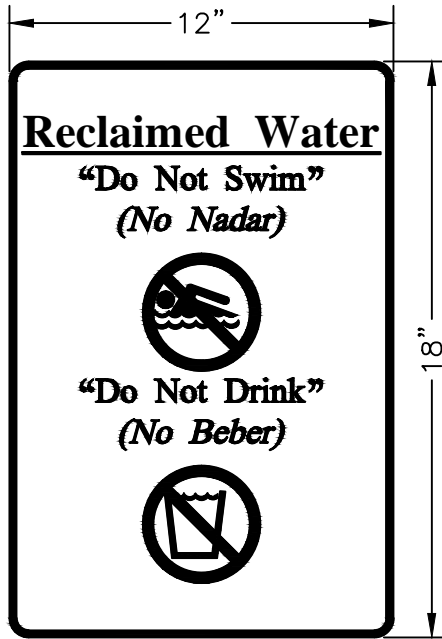
UCNSB 6/15

UTILITIES COMMISSION
CITY OF NEW SMYRNA BEACH, FL

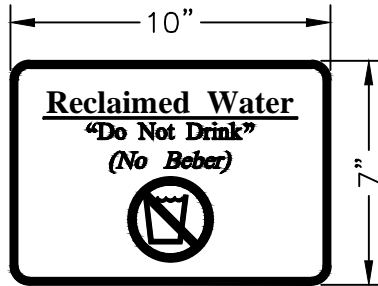
**1" OR 2" LONG SIDE
RECLAIMED WATER
SERVICE STUB OUT**

DWN. A. WISHART	SCALE: 1" = 5'	REV.	SHEET 1 OF 1
CKD. D. HALE	DATE: 6/2015		
APP. D. WAINSCOTT	FILE: RW-12		

RW-12



ENTRANCE AND POND/LAKE SIGNS



ALL OTHER LOCATIONS (E.G., FOUNTAINS)

NOTES:

1. AREAS IRRIGATED BY RECLAIMED WATER, SUCH AS RESIDENTIAL NEIGHBORHOODS AND GOLF COURSES, SHALL HAVE ADVISORY SIGNS POSTED AT THE ENTRANCES ALERTING THE PUBLIC. ADDITIONAL SIGNS SHALL BE POSTED AT THE FIRST AND TENTH TEES OF GOLF COURSES. SIGNS SHALL INCLUDE THE TEXT "DO NOT DRINK" IN BOTH ENGLISH AND SPANISH TOGETHER WITH THE EQUIVALENT STANDARD INTERNATIONAL SYMBOL.
2. ADVISORY SIGNS SHALL BE POSTED ADJACENT TO LAKES OR PONDS USED TO STORE RECLAIMED WATER AND DECORATIVE WATER FEATURES THAT USE RECLAIMED WATER. SIGNS SHALL INCLUDE THE TEXT "DO NOT DRINK" AND "DO NOT SWIM" IN BOTH ENGLISH AND SPANISH TOGETHER WITH THE EQUIVALENT STANDARD INTERNATIONAL SYMBOLS.
3. ALL SIGNAGE SHALL FOLLOW REQUIREMENTS OF FAC 62-610.468.

RECLAIMED WATER ADVISORY SIGNS

NTS

UCNSB 6/15

UTILITIES COMMISSION CITY OF NEW SMYRNA BEACH, FL			
RECLAIMED WATER ADVISORY SIGNS			
DWN. A. WISHART	SCALE: 1"=0.5'	REV.	SHEET 1 OF 1
CKD. D. HALE	DATE: 6/2015	RW-13	
APP. D. WAINSCOTT	FILE: RW-13		