MINIMUM CONSTRUCTION STANDARDS AND SPECIFICATIONS

FOR

WATER DISTRIBUTION SYSTEMS AND WASTEWATER COLLECTION SYSTEMS

Palm Beach Park of Commerce Association, Inc.

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MINIMUM CONSTRUCTION STANDARDS AND SPECIFICATIONS

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SECTION I - GENERAL

A. INTRODUCTION

The Palm Beach Park of Commerce ("PBPOC | the "Park") Board has adopted these specifications, requirements and administrative protocol so that facilities dedicated to the utility are of a quality which will minimize future maintenance and replacement costs. The procedures contained herein provide a detailed description of the utility's administrative requirements. This allows projects to be completed timely and permits The Park to treat all new projects/customers in a uniform and non-discriminatory manner.

The PBPOC Utility System is a registered Public Water System (PWS). For all permitting, test results/lab results, the following should be used:

PWS Name: Palm Beach Park of Commerce Association, Inc.
PWS ID: 4504516

It is imperative that all developers or their representatives desiring to connect to the Park's water, and wastewater systems familiarize themselves with these specifications and procedures. Construction plans prepared without regard to the Park's requirements will not be accepted for review.

The requirements presented in this document represent the minimum standards necessary to assure the uniformity and quality of construction of potable water mains, fire lines, gravity collection systems, force mains, lift stations, and any appurtenances associated with the same, which fall within the service area of the Park. These specifications shall be binding in all cases where facilities are being constructed, or which will be constructed, shall be owned and/or maintained by the Park, or any construction which will be or may be directly affecting facilities owned and/or maintained by the Park. All wastewater systems connecting directly or indirectly to the Park's collection system shall be bound by these specifications, regardless of ownership.

Any planned deviation from these specifications shall be clearly identified in the plans and shall be submitted for approval.

These specifications are binding as a minimum standard; however, the Park reserves the right to require a more stringent standard be met when unusual circumstances or conditions exist on a particular site. The PBPOC further reserves the right to revise these specifications from time to time as new information and products become available. The requirements of the most recent edition shall apply to all projects except where revisions were approved after the preconstruction meeting for that project.

B. ADMINISTRATION

Plan review and project approval shall follow the administrative process outlined in The PBPOC's prevailing Uniform Service Policy and all other directives of the Park's Governing Board.

C. WORKMANSHIP

All contractors performing any work on a portion of facilities which will ultimately be dedicated to the Park for ownership or which directly interacts with the Park's system shall be properly licensed to do such work and shall be able to demonstrate through past work history that the contractor is regularly engaged in such construction activities. All work materials and equipment shall be installed in strict accordance with the manufacturers' printed instructions.

D. GUARANTEE

All materials and equipment to be furnished and/or installed on water and wastewater facilities by the contractor on any project for which a developer intends to dedicate said facilities to the Park, shall be new

and shall carry a complete, indisputable guarantee against defective materials and equipment and faulty workmanship for a period of at least one (1) year from the date of final completion. In the event that any defective material and/or equipment is discovered within the one-year period, the Park will require the Developer/Contractor or his successors or assigns to replace and/or repair said defects at no cost to the Park and said materials and equipment shall be further warranted for a period of one year from the date of written acceptance of said replacement and/or repair.

All roads/rights-of-ways within the Park are owned and maintained by the Northern Palm Beach Improvement District (NPBID). Any road restoration or work within the NPBID will need to adhere to their standards.

E. APPLICABLE CODES, STANDARDS AND SPECIFICATIONS

All design, material and work shall be in strict accordance with all the applicable governmental, regulatory, and testing organizations including, but not limited to, the following:

ANSI – American National Standards Institute

ASTM – American Society of Testing and Materials

AWWA – American Water Works Association

DOH – Department of Health

EOR – Engineer of Record

FDEP – Florida Department of Environmental Protection

FDOT – Florida Department of Transportation

Florida Building Code and Companion Codes as amended. (Latest Edition)

NPBID – North Palm Beach Improvement District

NSF – National Sanitation Foundation

OSHA – Occupational Safety and Health Administration

PBCDERM – Palm Beach County Department of Environmental Resources Management

PBCED – Palm Beach County Engineering Department

PBCFR – Palm Beach County Fire Rescue

PBCHD – Palm Beach County Health Department

PBCWUD – Palm Beach County Water Utilities Department

PBPOC – Palm Beach Park of Commerce

TSSS – Recommended Standards for Sewage Works (Ten State Standards)

TSSW – Recommended Standards for Water Works (Ten State Standards)

USEPA - United States Environmental Protection Agency

Where conflicts exist between governing agencies, the more stringent shall apply.

F. PLANS AND SPECIFICATIONS

Copies of plans and specifications for all water and wastewater projects that will be constructed within the Park's service area shall be submitted to the Park for approval and in accordance with Exhibit "A" (Project Documentation and Submittal Guidelines) as outlined within these standards.

Plans and certain other documents may be accepted by the Park for review provided they meet the following criteria:

- May be sent via email (6MB max) which must contain the name of the project, name and address of the company making the submittal, name and phone number of the person making the submittal, and a listing of attachments that are being submitted.
- Attachments must be regular PDF files.
- Plans to print out to 24" x 36" max and include a graphical scale.
- Calculation, reports and Construction Phase Documents
- Draft water and wastewater permit applications (unsigned)

Any changes made subsequent to final approval of plans by the Park shall be resubmitted to, and approved by the Park (stamped "Approval" on the plans) prior to commencement of work.

These specifications shall take precedence over any conflicts which may occur between the approved plans and these specifications or supplemental specifications which the EOR may issue.

If a contractor in the course of his work finds any discrepancy between the approved plans and these specifications or supplemental specifications which the EOR may issue, it shall be his duty to inform the Park, as well as the EOR, in writing. Until authorized in writing by the Park, any work performed in variance of these specifications shall be performed at contractor's risk. It is the EOR's responsibility to ascertain adherence to these specifications.

One copy of the PBPOC approved plans and shop drawings/approved product list shall be kept on site at all times during construction.

G. PERMITS

No work shall commence until all necessary permits are obtained as required by the following agencies, including but not limited to:

1. Florida Department of Environmental Protection
2. Florida Department of Transportation
3. Palm Beach County Department of Environmental Resources Management
4. Palm Beach County Engineering Department
5. Palm Beach County Health Department
6. South Florida Water Management District
7. Northern Palm Beach County Improvement District

H. PRECONSTRUCTION MEETING

It shall be the responsibility of the EOR to call for, arrange and coordinate a preconstruction meeting prior to commencement of any work on a project. The EOR shall invite the following parties to this meeting (in addition to themselves): a representative of the utility construction contractor, Property Owner or their designated Representative and any other interested or necessary parties. The purpose of this meeting is to discuss and outline construction procedures, scheduling, specific project concerns, maintenance of traffic and related items pertaining to the installation of water and wastewater facilities. All preconstruction meetings will be held at the PBPOC Office, 15132 Park of Commerce Blvd. Suite 101, Jupiter, FL. See Exhibit B "Prerequisite Checklist for Preconstruction Conference".

I. SHOP DRAWINGS

Prior to the preconstruction meeting, it shall be the responsibility of the EOR to obtain and review the Park's Shop Specifications List (See Exhibit D). After reviewing, the EOR shall forward the forms to the utility contractor for review and signature. The contractor shall than return them to the EOR for the EOR concurrence and signature. Once executed the EOR shall then return to the Park the originally signed forms.

As stated on the Shop Specifications List, shop drawings need not be submitted for Park approval if the contractor uses products on this list. Any product anticipated to be used that is not on this list must be approved in advance by the Park. Such approval requires the submission of sufficient copies (four minimum) of a shop drawing for each product. Shop drawings must be approved by the contractor and EOR prior to submittal to the Park and are required for all non-standard items including, but not limited to, manholes, wet wells, castings, pumps and control panels and telemetry.

J. EASEMENTS

Easements of sufficient width to guarantee unhindered access and proper maintenance to all dedicated facilities and mains shall be granted or obtained by the Developer at no cost to the Park. Easements shall be granted via plat or by instrument. When provided by instrument the easement description and sketch shall be based on the State Plane Coordinate System, Florida East Zone, and North American Datum 1983 with 1990 correction. Minimum easement sizes are as follows:

1. Lift station sites - 40' x 40'
2. Standard easements - 12' wide

K. CONSTRUCTION SAFETY

The Park's signing as the applicant for any required permit does not and will not in any way release the contractor from liability for any injuries, accidents, property damage or losses resulting from said construction.

All work shall be accomplished in a safe and workmanlike manner. The contractor shall comply with all applicable laws and regulations of any public and/or private body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. The responsibility for project safety rests solely and specifically with the contractor. The PBPOC and its employees and agents are specifically indemnified and held harmless from any actions of the contractor relating to the safety procedures implemented during construction and from any claims brought by any persons regarding safety, personal injury or property damage.

L. CONSTRUCTION DEWATERING

Construction dewatering activities shall meet all Federal, State and Local requirements. If permits are

required, the applicant shall obtain and provide copies to the Park of the appropriate permit(s) from the regulatory agencies prior to dewatering operation.

A Stormwater Pollution Prevention Plan (PPP) must be prepared prior to submitting a Notice of Intent (NOI) to the FDEP/EPA. Forms can be obtained from the appropriate agency. To obtain State forms visit the Florida Department of Environmental Protection website at: www.dep.state.fl.us/water/stormwater/npdes.

M. EXISTING UTILITY NOTIFICATION AND LOCATION

The contractor shall notify Sunshine State One-Call of Florida, Inc. in accordance with Florida Statute 556 prior to actual commencement of work. The contractor must specifically request any necessary staking of the Park's facilities. The contractor shall also notify all the utilities in the area of impending construction prior to actual commencement of work to allow for utility locations. Moving or securing of existing utilities for the convenience of the contractor shall be paid for by the contractor. Drainage pipes are not located through Sunshine State One-Call of Florida, Inc. Contractor is responsible to locate all drainage facilities prior to start of construction and should contact NPBID.

N. SERVICE LINE LOCATIONS

Contractors and plumbers requesting water and/or wastewater service line locations shall provide the Park with minimum of 48 hours advance notice. The Park will identify the general location of the water/ wastewater services utilizing its electronic service marker locator along with any available "record drawing" information. Developer/customer shall be responsible for all other activities required to locate service lines.

O. RESTORATION POLICY

Upon completion of maintenance or repairs of water and wastewater lines, the affected area is backfilled, compacted and re-graded to match the original grade. Sod, asphalt and concrete sidewalks damaged by the excavation activities are replaced in kind provided their placement over the water and wastewater lines was originally permitted by the Park.

P. UNAUTHORIZED CONNECTIONS AND OPERATIONS OF EXISTING FACILITIES

Connections to the Park's; water and wastewater systems for any purpose whatsoever are to be made only in the presence of a PBPOC representative. Unauthorized connections are subject to immediate disconnection, without notice, and such connections shall not take place until it has been approved and settlement is made in full for all penalties, damages and connection charges, etc. caused by reason of such unauthorized connection. Only Park representation shall operate valves in the water distribution or wastewater systems which the Park owns and maintains. All contractors requiring valves to be opened or closed shall contact the Park 48 hours in advance. Connections to facilities owned by the Park will not be allowed until contractor has demonstrated to the Park that a sufficient number of competent personnel, all necessary materials, proper equipment and tools are on hand and the site has been properly prepared.

Q. AUTHORITY OF INSPECTORS

Park representatives may inspect all construction and materials and may also inspect preparation, fabrication or manufacture of components, materials and supplies. The representative is not authorized to revoke, alter or waive any requirements of the specifications, but may call to the attention of the EOR and/or contractor any failure of work or materials to conform to the plans or specifications. The representative shall have the authority to reject materials or suspend the work until questions regarding the specific issue can be referred to and decided upon by all concerned parties. Park representatives shall in no case act as, or perform duties of the EOR and/or the contractor, nor interfere with the management of the work, and any advice which the representative may give shall in no way be construed as binding on

the Park or releasing the Developer, the EOR or the contractor from performing the work according to the intent of the plans and specifications.

R. INSPECTIONS

The Park must be provided with a minimum of 48-hours notice for scheduling inspections.

Inspections will be scheduled during regular working hours only, except for weekends or nights when preapproved service interruptions are involved. A minimum of 48-hours notice shall be given to the Park by the EOR to schedule a required service interruption. These interruptions shall be scheduled on a Wednesday whenever possible. Work will not be scheduled for weekends or holidays without the Park's authorization. Representatives will make routine passes on call to inspect such items as materials on site and clearances between conflicting lines. Scheduled inspections will be required for jack and bore/directional drill operations, connection to existing facilities, pressure tests, sanitary sewer lamping, sanitary sewer lateral televising, and any other part of construction as deemed necessary by the Park. It shall be the EOR's responsibility to coordinate inspections and their qualified representative shall be present when required by the Park.

A scheduled inspection will be canceled if said representative is not present. The EOR's representative shall arrange and observe pretesting of water mains, force mains and prelamp sanitary sewer mains to verify that these facilities are sound and ready for final testing. It shall be the contractor's responsibility to provide the necessary equipment and personnel for all inspections, including televising the sanitary sewer laterals.

This shall include all safety equipment necessary to meet OSHA requirements. Inspections will be canceled if proper testing or safety equipment is not on site and readily available at the time of the inspection.

Access to the work shall be provided by the contractor for all required inspections. In cases where the contractor has proceeded with work which the Park had requested to inspect or witness without said requested inspection, the contractor shall bear all costs associated with uncovering, retesting, additional testing, or any other means necessary to provide physical evidence as to the acceptability of the work performed by the contractor. Such costs shall be the responsibility of the contractor regardless of whether the work is found to be defective or acceptable to the Park.

S. CONSTRUCTION WATER

Contractor/Developer shall apply for and pay the necessary installation cost and deposits to obtain a temporary water meter from the Park for use during construction activities. This allows metering of all water used during construction of the facilities. Any contractor found to be bypassing said meter provided will be subject to the penalties as determined by the Park. All construction water used shall be billed at the rate approved by the Park and paid for prior to new service being provided.

T. RECORD INFORMATION

Record drawings, certified by a professional surveyor and mapper (land surveyor) registered in the State of Florida, shall be submitted to the Park 48 hours prior to the request for inspection and testing. Disclaimer statements on record drawings by the surveyor or EOR are prohibited. Record drawings submitted with disclaimers will be returned to EOR and no further inspections or testing will be performed until proper record drawings are submitted. See Exhibit E "Required Information on Record Drawings" for the information required on record drawings. The land surveyor who prepares the record drawings is required to certify on the record drawings that the constructed facilities are located in easements or rights-of-way as applicable.

Once record drawings are approved by the Park, EOR shall submit record drawings in electronic PDF format.

U. REPAIR TO NEW FACILITIES

The Park will not accept any type of repair including, but not limited to, bell repair clamps, wrap around repair clamps, sleeves (except at tie-ins) or fire hydrant extensions on new facilities being dedicated to the Park. Sanitary sewer structures must be new and undamaged. Connections and structures shall be leak free upon initial installation.

V. LANDSCAPE GUIDELINES

The Park requires landscape plans to be submitted as part of the construction plan review process for all projects. New water and wastewater service shall not be activated if plantings are installed within the specified area of the Park's facilities without the approval of the Park.

SECTION II - DESIGN/CONSTRUCTION PLAN REQUIREMENTS

A. GENERAL DESIGN REQUIREMENTS

The EOR shall comply with the following prior to making a utility construction plan submittal to the Park:

1. Main Extensions Required

    a. Developer/Property Owner shall extend water and wastewater mains to the project boundaries most remote from the current system terminus, or to a point which best facilitates service to properties as yet unconnected. The specific size and location of service extensions shall be determined by the Park. Properties requesting water or wastewater service shall be required to extend water and wastewater mains based on the developer criteria set forth above. The use of long service lines to avoid extending mains is prohibited.

2. Piping Orientation

    All water and wastewater facilities shall be designed in accordance with these specifications. To the greatest extent possible, all water mains shall be designed to cross over all other pipelines i.e.: storm drainage, gas, sanitary sewer and force mains. Water mains crossing under the above referenced mains will warrant special design consideration based on actual circumstances. Force mains must be designed to be full of liquid under all operating conditions to avoid areas of gas accumulation. Special corrosion resistant linings on all ductile iron gravity sewer and force main pipe, fittings and valves are required.

3. Separation Requirements

    a. The Palm Beach County Health Department's requirements for design, construction, clearance and separation of water and wastewater facilities shall be strictly observed in addition to those as outlined in these Standards.

    b. When storm drainage piping > 15 inches is to be installed parallel to gravity sewer lines, a minimum of 10 feet of separation as measured from the outside edge of the pipes is required. Large storm drainage pipe (> 24 inch) to be located parallel to deep sanitary sewer lines (> 8 foot cut) requires separation 12 feet.

    c. When drainage piping runs parallel to force mains the minimum separation shall be 6 feet. When running parallel to water mains, the minimum separation shall be 6 feet. Greater separation may be required from drainage pipe larger than 48 inches. When storm drainage piping crosses over or under sanitary sewer lines a minimum of 9 inches of separation as measured from the outside edge of the pipes is required. The sanitary sewer must be designed with a full length of Protecto 401 lined ductile iron pipe (DIP) centered on the crossing.

    d. Sanitary sewer mains less than 100 feet in length or runs with multiple drainage crossings require Protecto 401, or Permox CTF lined DIP from manhole to manhole.

    e. Gas mains shall be 12” below water and wastewater lines and have 6-foot clearance from fire hydrants. Gas mains running parallel to water and wastewater lines are required to have 6-foot clearance. Conduits, irrigation, gas, or other dry utilities larger than 2” and any size conduits in a bank consisting of more than 2 conduits shall cross below water and

wastewater lines with 12" clearance. Conduits 2" and smaller, either singular or double are encouraged to be under the water and wastewater lines with a minimum of 12" and in no case shall be less than 6" either below or above the water and wastewater lines. Conduits, irrigation main, FPL, or other dry utilities 2" and larger, running parallel to water and wastewater lines are required to have 6 feet minimum clearance. Conduits, irrigation main, FPL, or other dry utilities 2" and smaller, running parallel to water and wastewater lines are required to have 4 feet minimum clearance.

f. All streetlights and poles 20 feet in height or less shall be 4 feet minimum clearance from water and wastewater and appurtenances.

4. Cover Requirements

Water and force mains shall have a minimum cover of 30 inches and a maximum cover of 48 inches unless otherwise specifically approved by the Park in writing. Sanitary sewer mains shall have a minimum of 4 feet of cover. Roadway crossings shall conform to requirements of the applicable permitting agency.

5. Setback Requirements

a. Mains (water, gravity sewer, and force) which are less than 8 feet deep, as measured from the pipe invert to finished grade, shall be installed a minimum of 12 feet horizontally from structures. This setback requirement also applies to new structures being constructed in the vicinity of existing Park facilities. The 12-foot horizontal setback shall be as measured from the outside edge of the pipe to the nearest point of the structure, including underground (e.g. footers) or aboveground (e.g. roof overhangs) features. In addition, the 12-foot setback applies only to mains adjacent to a single structure. Where deep mains are installed between structures, setbacks greater than 12 feet will be required on each side.

Mains deeper than 8 feet shall have a minimum horizontal setback calculated in accordance with the following equation:

S = 1 foot + (D/0.67)

S = Required horizontal set back from edge of main or structure to edge of pipe

D = Depth from bottom of structure to pipe invert

b. In general, sanitary sewer manholes shall be located in the center of roadway pavement. Manholes and sewer mains shall not be located closer than five feet to the curb line or the right-of-way line; whichever is closer, as measured from the outside edge of the manhole or pipe.

6. Improvements Installed Over Water and Wastewater Facilities

a. No paving or sidewalks shall be permitted within 4 feet of existing water mains or force mains. No paving, sidewalk, landscaping, berms, or other improvements will be permitted over any portion of an existing utility easement (by plat or instrument), which has existing water and wastewater lines.

b. Water mains and force mains shall not be constructed under existing or proposed structures, sidewalks, concrete slabs, roadways, parking lots or other paved areas, unless specifically noted on the plans and approved by the Park. Areas to be covered with either

concrete or paving, parking garages, walls, landscape berms, etc. shall be clearly noted on the plans. All utility easements must be clearly depicted on the landscaping plans. The EOR shall coordinate layout of water and wastewater facilities with the landscaping plans for the project such that landscaping is minimized over water and wastewater lines and their respective easements. In general, easements shall preclude structures, trees, shrubs, berms, etc. so that unhindered access to all such facilities and mains is available at all times. Landscaping placed within a utility easement, with or without the Park's approval, is at property owner's risk.

c. When a Developer causes grade changes at or near existing valve boxes, fire hydrants, manholes, backflow preventers, cleanouts, meter boxes or any other water or wastewater facility the Developer shall adjust the affected facilities to finish grade in accordance with the Park's standards.

7. Subaqueous Crossing

Design for subaqueous crossings requires the use of special materials. Class 56 DIP with ball and socket joints is required for pressure pipe (polyethylene or Protecto 401 lining is required for sewer force mains). Gravity sewer crossings of water bodies such as canals, lakes, water management tracts, etc. require the use of Class 56 polyethylene or Protecto 401 lined DIP for the entire tract (i.e. boundary line to boundary line). Manholes are not allowed in drainage easements, water management tracts or canal rights-of-way. Any gravity sewer pipe crossing of a water body will require the gravity sewer pipe to be installed within a steel casing and installed, at a minimum, 20 feet beyond the top of each bank.

8. Directional Drills:

a. Horizontal Directional Drilling (HDD)

General: Water main and force main design and construction standards shall apply unless noted otherwise. The Park reserves the right to disapprove a horizontal directional drilling installation if the conventional open trench or jack and bore type installation is preferred by the Park because:

- Excessive number of high/low points
- Excessive depth of pipe is of concern
- A casing is required by the Park to protect the utility pipe
- Future service and main connections to the utility pipe will be negatively impacted by a horizontal directional drilling

Pipe sizes and material: The horizontal directional drilled utility main shall be manufactured approved restrain joint DIP, PVC AWWA C-900 DR14, 200 psi, NSF 61 (4" - 12") or HDPE pipe (SDR 11). If the directional-drilled pipe is to be used as a casing for a small diameter service line (up to 2" diameter), PVC DR 17 pipes are acceptable. Pipe and system components shall be free from voids, cracks, inclusions and other defects and shall be uniform in color throughout the installation.

Design Requirements: The Engineer of Record shall inquire with the Park about approval of a horizontal directional drilling procedure for a pipe installation. With the Park's concurrence, the Engineer of Record shall submit a signed and sealed pilot bore plan for review and approval.

The plan shall be submitted on a 24" x 36" sheet to a maximum 1" = 20' horizontal and 1" = 2' vertical scale (1" = 10' horizontal, 1" = 10' vertical scale preferred). The plan must show:

- Finished grade and surface improvements
- Locations of drill set-up (bore pit and receiving pit)
- Length of bore
- Deflection and radiuses of the pilot bore
- Field verified locations of existing utilities and underground structures
- Minimum horizontal and vertical clearances from underground structures, conduits, piping systems.
- Pipe size and specifications
- Proposed pilot bore pipe defection limits shall not exceed 75% of the maximum deflection allowed by the pipe manufacturer
- The drill radius of the final HDD pipe shall be minimum 30 pipe diameters, not exceeding 80% of the max. bending radius as recommended by pipe manufacturer
- Limits of directional bore installation
- Limits of pressure testing
- Connection to existing utilities
- Rights-of-way limits, utility easements and temporary construction easements
- Minimum pipe joint restrains at each end of pipe material transition from HDPE pipe
- Tracer wires
- Isolation valves and/or transition fittings/adapters

b. Pilot Bore

The Engineer of Record shall schedule the beginning of work with the Park a minimum of 3 days in advance. The drill path shall be accurately surveyed and plotted to create an "as-built" drawing (same scale as the pilot drill plan).

A high accuracy MGS (Magnetic Guidance System) shall be capable to provide vertical pipe data with a max. + 2% deviation and horizontal pipe location data with a max. + 2 foot deviation. The data shall be collected at max. 25' intervals. Deviation of more than + 2 feet vertically or horizontally from the approved pilot bore plan shall be reported immediately to the project engineer for evaluation. The Engineer of Record shall evaluate the as-built data and confirm the compliance with the design parameters. Deviation beyond approved parameters (depth, deflection radius, and separation to other utilities or structures) shall be brought to the attention of the Park.

The signed and sealed pilot bore "as-built" drawing shall be submitted to the Park for review and approval if the "as-built" location differs substantially from the design plan.

Pull back of carrier pipe: Upon approval of the pilot bore location by the Park, the pullback operation of the required carrier pipe shall begin. The Contractor shall select the proper reamer type with the final hole opening to be a maximum of 1.5 times the outside diameter of the largest component system.

The open borehole shall be stabilized by means of bentonite drilling slurry. The slurry shall be contained at the entry or the exit side of the bore in pits or holding

tanks.

The pipe sections shall be butt fused/joined together in accordance with the manufacturer's specifications. The ends of the pipe, gaskets and couplings shall be inspected for cleanliness. Chipped, scratched, scraped, cracked or excessive deformed pipe or couplings shall be rejected. Two approved APWA color-coded HDD tracer wires shall be pulled along the sides of the product pipe and extended to nearest valve boxes (coil min. 3' wire near the surface inside valve box).

The installation of the tracer wires is an essential part of the Horizontal Directional Drill process and the Contractor shall use all reasonable means and methods to insure that the tracer wires are pulled without breakage. However, accidental tracer wire breakage shall not be a reason to require a repeat directional drill unless specifically required in the project specifications.

The pipe shall be elevated to the approximate angle of entry and supported by roller arms or equivalent. Any field welding/fusion of HDPE pipe and fittings may be performed only by personnel certified through a pipe/fitting manufacturer approved training program.

Testing: Pipe installed using HDD method shall be flushed and pressure tested using Potable Water. The pressure within the HDPE Pipe test section shall be raised to approximately 160 psi and then allowed to idle for approximately 3 hours in order to allow to stabilize. Additional make-up water/pressure shall be applied during the 3-hour stabilization period only to maintain a minimum of 140-psi pressure.

The final phase of the pressure test shall involve applying make-up water/pressure to achieve a test pressure of 150 psi or higher (as required). The test section is then allowed to idle (no make-up water pressure is added) for a period of 2 hours. After this 2-hour period, make-up water/pressure is applied and measured to reestablish the test pressure. If the measured and added quantity of water is greater than the allowable amount, the pressure test fails. NO leakage is acceptable.

Installed services, tees and sub-outs shall be pressure tested together with the main. Pressure test is not required if the installed pipe is intended to be used as a casing.

If the pipe successfully passed the pressure test, a connection to the existing pipe system may be performed. Bacteriological testing is required for water main applications.

9. Service Connections

Each customer is required to have a dedicated service connection to the Park's facilities and meter. Wastewater customers are not permitted to connect to the Park facilities if their flow is piped through facilities not owned by the Park. Turbine meters are not permitted for any uses where low flows may occur. Permanent installations shall be metered in a manner acceptable to the Park. The Park requires that fire service lines be installed in conformance with requirements of the fire service agency of jurisdiction. Each such agency shall determine the appropriate fire flow requirements for each application and note the required fire flow in gallons per minute with their approval of the construction plans.

10. Prohibited Discharges to Wastewater System

    a. Projects handling or generating any toxic/hazardous substances shall be identified and their methods of pretreatment specified. Untreated discharges are not permitted into Park facilities. Pretreatment procedures shall be acceptable to the Park and shall conform to all State and Federal regulations. Affected businesses include, but are not limited to, all commercial and industrial users of Park facilities for which Federal and/or State pretreatment standards have been promulgated. This includes businesses such as plating and metal finishing operations.

    b. Storm water, roof drains, air conditioning and refrigeration condensate, cooling tower, blowdown, softener brine, reverse osmosis reject water, treated groundwater or other "nondomestic sewage" are not permitted to discharge into the Park's wastewater system.

B. CONSTRUCTION PLAN PREPARATION REQUIREMENTS

1. Prepare plans on 24-inch X 36-inch sheets using a scale no smaller than 1 inch = 40 feet, unless specific approval for a smaller scale is obtained from the Park. Plans shall be drawn to scale using a scale that appears on a standard engineer's box scale. Like scales shall be used on plan & profile submittals with correct grids. (i.e. 1-inch = 40 feet hor., 1 inch = 4 feet vert.) Scales and grid count must be consistent. Computer generated scales that cannot be read with a standard engineer's box scale will not be accepted for review.
2. Plans must indicate proposed finish floor/slab elevations and finished grade for roads, catch basins and other pertinent items. Elevations must be in NAVD 1988 Datum with conversion table to NGVD 1929 noted on plan sheets. Place sanitary sewer data, including manhole invert and rim elevations, on plan sheets at each manhole; rim and invert elevations shown in tabular form only will be rejected. Profiles are required for gravity sewers and force mains (show all crossings). Profiles are also required for water mains with significant grade changes, including, but not limited to, aerial crossings, jack and bore, directional bores and subaqueous crossings. When separate profile sheets are used all sewer lines must be depicted from manhole to manhole, pipe breaks between manholes will not be accepted. In addition, invert elevations must be clearly shown on profile sheets at each manhole. All profiles shall utilize the grid format. Plans utilizing the datum format shall be rejected.

Other information pertinent to the project such as roadway, lakes, buildings, drainage system, etc. shall also be shown.

3. All piping crossings must be clearly identified on the plan sheets (this includes but not limited to, water mains, force mains, gravity mains, storm sewers, gas mains, underground electric, telecommunication lines and cable TV lines showing elevations of each). Clearance between the outside walls of the pipes/conduits, as well as pipe materials, must be clearly indicated on the drawings for each crossing.

    Examples:

    - Bottom 6-inch DIP WM = 14.73
    - Top 24-inch RCP = 13.18

All wastewater service crossing water mains and drainage lines shall be clearly identified on plan sheet with elevations called out in tabular form on the construction plans and on the record drawings.

4. If the project will be built in phases the limits of each phase must be clearly indicated with the initial submittal; phasing must be decided prior to review. Each phase shall be separated by a valve and/or manhole.

5. Facilities which will ultimately be dedicated to the Park which are installed on private property shall be in easements dedicated to the Park. Plans must show proposed easements by shading or otherwise easily distinguishable on plans.

6. All projects shall clearly indicate proposed driveway locations, streetlights and location of other utilities (electric, telephone, cable TV and gas). Particular emphasis must be given for proposed structures such as switch cabinets, transformers Bellsouth splice boxes and signal booster stations.

7. Provide a cover sheet showing the applicable project name and project number, sheet index, category of improvements, and vicinity sketch.

8. Provide all applicable detail drawings, including special profile sheets as required to show special or unique situations.

9. The Park's details must be used where applicable and shall include Board approved date. If details are found to have been altered without the knowledge of the Park or without specifically stating in the transmittal which details are altered, the plans will be returned without review.

10. Obtain Fire Marshall approval of water system plans (approving fire hydrant placement and wet fireline requirements) prior to plan submission to the Park. The Fire Marshall approved set shall indicate the minimum fire flow requirement for the project.

11. Submit Fire Marshall approved set, paving and drainage plan, preliminary plat or utility easement plan at scale matching potable water, reclaimed water, and/or wastewater plans, landscaping plan, master plan, survey, cover sheet and all plan sheets with relevant and easily readable location sketch, completed wastewater survey for projects with potential pretreatment requirements, lift station calculations, canal and road permits, including preliminary FDEP forms.

12. Prior to making plan submittal to the Park, verify all items on prerequisite checklist have been completed, (see Exhibit "B").

C. INSTALLATION PROTOCOL (to be incorporated in construction drawings or project specifications)

1. All pipe is to be laid in a clean dry trench.

2. All muck and unsuitable materials encountered in trench bottom shall be removed and replaced with compacted granular material to 95% of maximum density per AASHTOT-180. Proctor and density test results shall be submitted to the EOR with a copy to the Park.

3. All backfill within road rights-of-way shall be placed in 12-inch lifts and compacted by mechanical means to 98% of maximum density per AASHTOT-180 or as otherwise required by the permitting agency. Proctor and density test results shall be submitted to the EOR with a copy to the Park. Flowable fill or controlled low strength material (CLSM) shall be an alternative to a compacted backfill with the approval of the permitting agency and the Park. These materials shall be used for general backfill applications for trenches and abutments. Flowable fill shall be excavatable and have a compressive strength that shall be less than 200 psi at twenty-eight (28) days.

4. Utilities crossing road rights-of-way shall be installed prior to road construction and backfilled and compacted within right-of-way limits in strict accordance with the directions of the EOR and requirements of all agencies of jurisdiction.

5. Embedment materials below pipe shall conform to Unified Soil Classification System (U.S.C.S.) Soil Classification Class I or II as noted in ASTM D2321.

6. All lines under construction shall be plugged with a wing plug, and all pressure pipes are to be plugged with a mechanical plug or cap at the end of the working day to prevent ground water and potential contaminants from entering completed lines and lines under construction.

7. Above ground piping, including but not limited to, aerial crossings, lift station piping, fire lines, meter/backflow prevention device assemblies, etc. shall be flanged and be coated in the following manner:

Sandblast and remove all paint and any loose material in accordance with SSPC-SP10 or NAPF 500-03 (ductile iron surfaces). Sandblasting shall be performed using non-silcia media. Paint all exterior ferrous metal surfaces. The manufacturer's recommendations for surface preparation, priming, recoating, etc. shall be strictly followed. Do not paint or coat any nameplates, brass or stainless steel material. Contractor shall use the following paint system or approved equal.

TNEMEC

a. Primer: TNEMEC CHEMBUILD- MODIFIED POLYAMIDOAMINE EPOXY #135 (3.0 to 5.0 mils DFT) aluminum color.
b. Intermediate Coat: TNEMEC CHEMBUILD-MODIFIED POLYAMIDOAMINE EPOXY #135 (3.0 to 5.0 mils DFT) off white color
c. Finish Coat: Series 1074 Endura-Shield II with 644 UV Blocker (2.0 to 3.0 mils)

The finished coat of paint shall be black in color for sanitary sewer, safety purple (5C08) for reclaimed appurtenances and delft (6B03) blue for potable water appurtenances.

Inspections by the Park are required after sandblast and before primer, after primer and after intermediate coat.

8. All flanged pipes shall be caulked between each flange and threads with Sika 1 A urethane caulk.

9. All tie rods, bolts, nuts, etc. installed underground must be Cor Ten and shall be painted with Sherwin Williams TarGuard – Coal Tar Expoxy or a Park approved equal. Brass and stainless-steel hardware is exempt from this requirement.

10. Coatings and linings damaged during construction due to field cutting, mishandling or otherwise must be repaired in strict accordance with the manufacturer's recommendations.

    This includes, but is not limited to; cement mortar and polyethylene pipe linings, Protecto 401, galvanized coatings, PVC fence coatings and other paint type coatings. Specific approval must be obtained from the Park prior to performing coating and lining repairs.

11. All stainless-steel nuts, bolts and hardware referenced in these standards, shall be SS 316 grade and shall be so stamped by the manufacturer to verify alloy. The use of any other stainless-steel alloy will require specific approval by the Park. In general, stainless-steel nuts, bolts and hardware are required in and around lift stations and for facilities installed over or under brackish or marine waters. This requirement applies to flange bolts and nuts on flanged piping, mounting brackets, all thread rod, anchor bolts, washers, clamps and other miscellaneous hardware. Anti-galling compound anti-seize lubricant shall be applied to the threads of all stainless-steel bolts prior to installation. Anti-seize lubricant shall be graphite 50 anti-seize by Loctite Corporation, 1000 anti-seize paste by Dow Corning, 3M Lube and anti-seize by 3M.

12. All rubber and synthetic elastomeric components of products that come in contact with potable water shall be manufactured with chloramine resistant elastomers and shall bear NSF approval.

13. All mains, including fittings, shall be easily identifiable as to their contents and shall be color coded or marked using the universal color code of blue for water, green for sewer and lavender for reclaimed. Pipe striped during manufacturing of the pipe shall have continuous stripes that run parallel to the axis of the pipe, that are located at no greater than 90-degree intervals around the pipe, and that will remain intact during and after installation of the pipe. If tape is used to stripe pipe during installation of the pipe, the tape shall be applied in a continuous line that runs parallel to the axis of the pipe and that is located along the top of the pipe; for pipes with an internal diameter of 24 inches or greater, tape shall be applied in continuous lines along each side of the pipe as well as along the top of the pipe. Tape shall be vinyl plastic adhesive back with a minimum width of 6 inches. Field application of paint shall not be acceptable.

14. Fire hydrants shall be clearly identified as out of service until mains have been released for service and the Park has verified the system is fully operational.

15. Any lines taken out of service shall be either removed or grouted in place as required. Those lines grouted in place shall be grouted full with an excavatable flowable grout mixture. Shop drawings of the mixture shall be submitted and approved prior to placement.

SECTION III - WATER DISTRIBUTION SYSTEM

A. BASIS OF DESIGN - Approval for construction, extension, expansion or use of any community water supply shall be based on the criteria as outlined in Palm Beach County Environmental Control Rule II and the references included therein as well as the following requirements:

1. There shall be no physical connection between a potable water supply and a questionable water supply, or a sanitary or storm sewage system by direct pressure, vacuum, gravity or any other means. All potable water services serving properties with a sewage pump station or an auxiliary water supply shall be provided with an approved reduced pressure backflow prevention device. Permanent dead ends in water mains will not be approved unless it can be demonstrated that looping the system is not feasible. When dead ends are necessary, the Park requires that a flush hydrant be installed on the terminal end.

2. All water distribution systems shall be looped to the greatest extent possible. Water mains shall have a minimum nominal inside diameter of 6 inches. Water mains having an inside diameter of less than 6 inches will not normally be considered. Oversized water distribution piping which causes water quality problems are prohibited. If a project requires excessive fire flow, the design of the water distribution system will require either dual systems or separate onsite private fire storage and pumping systems.

3. All buildings over two stories in height or requiring a consistent operating pressure above 40 PSI shall be provided with a domestic water service booster pump which may be located within the building. Drawings of pump and building must be submitted along with the pump calculations.

4. Building fire sprinkler systems shall be equipped with booster pumps as may be required to comply with applicable fire protection codes.

5. Approved backflow prevention devices are required on all water services connections (domestic, commercial, fire, irrigation, etc.) in accordance with Park specifications shown in standard details in this manual. Backflow devices shall be installed on the outlet side of the water meter; no tees or other branch fittings are allowed between the water meter and backflow device. In the absence of special circumstances, which would cause a great degree of hazard for cross connections, the following list covers the general backflow device required by customer type;

    - Non-Residential……...Reduced pressure zone device
    - Irrigation……..Reduced pressure zone device
    - Fireline…….Double detector check valve
    - Temporary Water…….Reduced pressure zone device

6. Valving of all systems shall be designed to facilitate the isolation of each section of pipeline between intersections of the grid system. Generally, the number of valves at an intersection shall be one less than the number of pipes forming the intersection. All valves shall be right hand closed operation; valves 12 inches or greater shall be butterfly valves. Valves shall generally be installed at intervals of not more than 1,500 LF on transmission mains and on all primary branches connected to these lines.

7. Meter Location:

    a. Meters shall be set in green area generally at a common property line. Meters and control valves shall be accessible and unobstructed for 4 feet in all directions. This shall include but not be limited to transformers, telephone junction boxes, walls, trees, etc.

    b. Meters shall not be placed in areas that can be fenced, such as backyards. Meters shall not be placed in any asphalt or concrete surfaced areas (sidewalks, curbs, driveways, etc.).

c. In commercial areas when no other alternative is available, meters will be allowed in asphalt provided all of the following conditions are met:

i. The top of box shall be flush with asphalt surface and located outside of any drainage flowline (i.e. dry surface area).

ii. The box shall not be located within parking stalls.

iii. The box and lid shall be traffic bearing and shall be placed away from common traffic area. Pipe stanchions may be required under certain conditions.

iv. The curb valve box must be installed on main line connection.

8. Service lines shall not exceed 75 feet from the main to the meter. Where possible, meter shall be placed in green areas as close to the water main as possible. Service lines covered by paving between the water main and meter will not be acceptable where avoidable.

9. Polyethylene service lines shall be solid-wall blue pipe, shall have a co-extruded blue external skin, or shall be white or black pipe with blue stripes incorporated into, or applied to, the pipe wall.

10. Water mains including fittings shall be color coded or marked with blue strips or tape. Pipe striped during manufacturing of the pipe shall have continuous stripes that run parallel to the axis of the pipe, that are located at no greater than 90-degree intervals around the pipe, and that will remain intact during and after installation of the pipe. If tape is used to stripe pipe during installation of the pipe, the tape shall be applied in a continuous line that runs parallel to the axis of the pipe and that is located along the top of the pipe; for pipes with an internal diameter of 24 inches or greater, tape shall be applied in continuous lines along each side of the pipe as well as along the top of the pipe. Tape shall be vinyl plastic adhesive back with a minimum width of 6 inches. Field application of paint shall not be acceptable.

B. HYDRAULIC DESIGN

Hydraulic designs shall be based on pressure data relative to the water pumping facilities which will service the proposed system. Water mains shall be sized such that the maximum velocity of water in the main will not exceed 10 feet per second under fire flow conditions and 15 feet per second in fire hydrant leads without water service connections.

C. INSTALLATION OF WATER MAINS

1. Contractor shall comply with Palm Beach County Health Department Technical Memoranda regarding all water main connections to existing system or lines already bacteriologically cleared.

2. Installation and testing of water system pipe and fittings shall be in accordance with AWWA Specification C-600 Latest Revision and the Park's Construction Standards and Specifications.

3. Any pavement cut shall be replaced in accordance with requirements of the NPBID and in accordance with all other applicable governing agency's permitting requirements.

4. Omni Marker #75025 or 3M 1403-1266 blue magnetic markers shall be placed above all fittings, changes in alignment, grade and water services and at the discretion of the Park's representative.

5. All loading or unloading of pipe, fittings, valves and accessories shall be done in such a manner so as to avoid damage. The pipe shall not be skidded or rolled against pipe already unloaded. Special precautions should be taken to avoid damage to cement lined fittings and pipe. The interior of all pipes, fittings and other appurtenances shall be kept free of dirt and foreign matter at all times.

6. All mains, valves, bends, tees, crosses, and dead ends shall be restrained with an approved PBPOC restraint joint system. On mains greater than 12 inches, all valves, bends, tees, crosses and dead ends shall be restrained with 2 forms of an approved PBPOC thrust restraint system. Where proprietary restrained joint are not used, tie rods and megalugs are the recommended system. Where adequate space exists, PBPOC may approve the use of thrust blocks.

7. Tie rods used as a method of joint restraint shall be by means of steel tie back bolts, nuts, washers and all thread rods meeting ASTM A-242 requirements (CorTen steel or equal) and painted in accordance with the procedures described herein. Tie rods and nuts shall be equal in diameter to the tee bolts and nuts which were supplied with the applicable fittings. Two tie rods per joint are required for sizes 4 inches diameter through 10 inches diameter, four tie rods per joint for sizes 12 inches diameter through 16 inches and 6 tie rods per joint for sizes 18 inches through 24 inches.

8. Air relief valves shall be installed at the design high points. Installation of air release valves to correct high points caused by improper installation of pipe (not at design grade) will not be permitted.

9. All pipes shall be laid to line in a clean dry trench on line and grade with valves and hydrant stems plumb. All pipes shall have a minimum cover of 30 inches and a maximum cover of 48 inches unless otherwise noted on the plans or required by permit.

10. The trench at the top of the pipe shall be kept to a maximum width of 24 inches plus the pipe diameter. The trench shall have a flat bottom, cut true and even, so that the barrel of the pipe shall bear its full length. Pipe bells will be placed in small pockets specifically excavated to receive the bell. All excavations must be in compliance with OSHA regulations.

11. No rocks larger than 2 inches in diameter or other items that may damage the pipe will be permitted over the pipe. In the event pipe is installed in rock excavation, 6 inches of granular material will be provided for bedding under the pipe. All pipe joints, thrust blocks, conflicts and service connections shall be left exposed until visually inspected and approved by a Park representative.

12. Tapping Sleeves

    a. Tapping sleeves and tapping crosses shall be of the heavy body ductile iron, mechanical joint type or stainless steel wrap around type as approved.

    b. All tapping assemblies installed on existing water mains shall be pressure tested and witnessed by the Park's representative prior to the actual tap of the main. The pipe coupon shall be carefully preserved and submitted to the Park's representative. All tapping sleeves shall be installed a minimum of 6 feet from pipe joints.

    c. All field cuts and tapping operations on pipe shall require careful repair of the particular lining damaged in strict accordance with the manufacturer's recommendations. All materials utilized shall be NSF 61 approved.

13. Fire hydrants shall be dry barrel type without drain installed true and plumb. Hydrant extensions shall not be permitted in new construction.

14. A lightweight high density polyethylene pipe plug shall be required to be on all pipes delivered to the site. The plugs shall remain on both sides of the pipe until pipe is installed to ensure that the pipe will not be contaminated.

D. CLEANING AND FLUSHING

1. Upon completion of the pipe installation for any section, the mains shall be cannon flushed to remove dirt and any other foreign matter by achieving a minimum velocity of 5 feet per second on pipe sizes up to and including 12 inches and 2.5 feet per second on pipe greater than 12 inches. The duration of the flushing shall be sufficient to provide a minimum flush volume equal to three times the internal volume of the pipeline being flushed. Temporary fittings, pipe, etc. may be used to facilitate cannon flushing.

    a. Prior to the actual line flushing operation, the contractor shall notify the Park's representative of such intended water use. No flushing shall take place without a Park representative present.

    b. No flushing shall take place until after the 2 inch bypass line and meter is installed and the mains have been filled utilizing the 2 inch meter.

    c. Flushing will not be scheduled until the Park has approved preliminary record drawings, unless it is required to facilitate construction of water mains.

    d. The contractor shall exercise due care so as to ensure that the water used in flushing does not cause a nuisance or inflict property damage.

2. Pigging is required for all water mains 16 inches and greater in diameter. The Park may require water mains less than 16 inches in diameter be pigged if the Park or the EOR's representative observes mains being installed under substandard conditions.

3. No existing valves shall be operated, except by Park personnel.

E. TESTING

1. Unless otherwise approved, all hydrant connections, service connections to the curb stop at the meter, and all joints in the water mains shall remain uncovered for visual inspection by a Park representative. The contractor shall only backfill after approval by the Park's representative.

2. The contractor shall provide all necessary equipment such as pumps, gauges and water measuring tanks and shall perform all work required for pipe pressure and leakage test. Pressure and leakage tests shall be made between valves and/or connections for each section tested using the procedure outlined in ANSI/AWWA C-600 Latest Revision and Park requirements. Record drawings in accordance with Exhibit E "Required Information on Record Drawings" must be accepted by the Park prior to scheduling a pressure test. A pretest shall be successfully completed by the contractor and observed by a representative of the EOR prior to scheduling the pressure test with the Park. All other tests shall be made in accordance with these specifications and observed by the EOR and the Park's representative.

3. 1,500 LF shall be the maximum length of main to be pressure and leakage tested at any one time. Testing of isolated portions between valves within the test section may be required by the Park if a portion of that line appears questionable.

    a. PRESSURE AND LEAKAGE TEST - A hydrostatic pressure of 150 psi shall be developed by the contractor, within the section of pipeline to be tested and this pressure (150 psi) shall be held for a minimum time period of one hour.

    After successfully completing the pressure test, pressure in the pipeline being tested shall be reduced to 100 psi and that pressure shall be held for an additional one-hour time period. All visible leaks, including damp spots shall be corrected regardless of the results of the pressure and leakage tests.

b. ALLOWABLE LEAKAGE - Leakage during both the pressure and leakage test shall not exceed the following formula for gasketed pipe:

$L = (SDP^{½}/148{,}000) \times 0.5$

L= Allowable Leakage (gallons per hour). S = Length of Pipe to be Tested (feet)

D = Nominal Diameter of Pipe (inches) P = Average Test Pressure (PSIG)

No allowable leakage for polyethylene pipe

c. A loss of 5 psi or more during the 150 psi, regardless of the amount of leakage shall be considered a failing test. A loss of 5 psi or more during the 100 PSI, regardless of the amount of leakage shall be considered a failure. A total loss of 10 psi or more for both test combined shall be considered a failing test.

d. A gain in pressure during the test shall be considered a failing test.

e. The pressure test shall be considered not acceptable unless all valves servicing hydrants, services, etc. in test section are in the open position.

The system must be completed to the full extent of the approved plans on that portion being tested. The contractor shall provide a 1/2 inch ball valve adjacent to the test pressure gauge for installation of the Park's "check gauge". The use of PVC pipe and fittings for temporary piping for pressure testing is not permitted. Test gauge shall be in 2 pound increments with a minimum 3 inch face.

f. Failure of the test gauge to zero out upon completion of testing shall be cause for rejection.

g. The contractor shall, at his own expense, adjust or replace, at the discretion of the EOR, any component of the pipeline which fails the prescribed tests. The pipeline shall then be tested as described above until is successfully conforms to said tests.

h. All water utilized for the pressure and leakage test shall be potable water with an adequate chlorine residual.

i. The Park will not schedule the pressure test until pipe has been properly backfilled, compacted and established final grade and as-builts accepted.

F. DISINFECTION

1. Disinfection of mains shall be in compliance with Rules 62-555.340 Florida Administrative Code (F.A.C.) and applicable American Water Works Association (AWWA) disinfection standards (AWWA Standards C651, C652, C653, and C654), which are incorporated by reference in Rule 62-555.330(4), F.A.C.. Each unit of completed supply line and distribution system shall be thoroughly flushed and then disinfected with chlorine. Chlorine may be applied by the following method: Liquid chlorine or a completely dissolved hypochlorite and water mixture. Flushing shall be at sufficient velocity (min. 2.5 ft/sec., where possible) to remove dirt and other foreign matter through fire hydrants or other approved blow-offs. The amount of chlorine then applied shall be sufficient to provide a dosage of not less than 50 mg/l. The chlorine material shall be introduced to the water lines and distribution systems in a manner approved by the EOR and the Park. After a contact period of not less than eight hours, the system shall be flushed with clean water until the residual chlorine content is not greater than 0.2 mg/l free chlorine. All valves in the lines being disinfected shall be opened and closed three times during the contact period. Where necessary, the contractor shall neutralize chlorinated water which has a total chlorine residual of 0.5 mg/l or greater prior to discharging to swales, ponds, canals, storm drains, etc. to prevent environmental damage.

2. The contractor shall install sampling taps required to take all necessary water samples at points designated by the EOR, the Park, Palm Beach County Health Department and FDEP.

3. The contractor shall make all arrangements with a certified testing laboratory to take all water samples required for bacteriological tests and shall maintain continuous running bacteriological sample taps, through a Park approved jumper which will maintain a combined chlorine residual of not less than 0.6 mg/l. Water mains being tested must remain under line pressure, through the approved jumper, after the sample taps are turned off. This procedure shall be followed until the Palm Beach County Health Department issues a release for service of the water lines and distribution system being disinfected. Bacteriological test results will be considered invalid if the results are for samples collected more than 30 days before the results are received by the Palm Beach County Health Department and/or the pressure in the mains is not maintained at 20 psi or greater after the samples are collected.

4. The bacteriological test result report shall include results demonstrating initial chlorine dosage of not less than 50 mg/l (unless witnessed by PBPOC personnel) and two consecutive days of satisfactory bacteriological tests.

5. Palm Beach County Health Department approval including EOR's certification shall be accomplished at the full expense of the contractor/developer and shall be submitted through PBPOC for approval.

6. After release for service is received from the Palm Beach County Health Department and with approval from the Park, the contractor shall remove the approved jumper and cap both saddles with brass plugs. The construction meter utilized for main clearance purposes shall be returned to the Park.

G. WATER SERVICE LINE/METER INSTALLATION

1. Meter curb stops shall be 8 inches below final finished grade.

2. Meter services shall be exposed and ready for the meter to be installed.

3. Service line identification

   a. All water service line valves shall be exposed by the contractor. One 4 foot high 2 inch X 2 inch pressure treated wood stake shall be put in the earth against the plug when the service connection is backfilled. The stake shall extend 18 inches minimum above grade and shall be broken off only after authorization from the Park. The top 6 inches of the stake shall be painted blue.

   b. A magnetic marker for water service shall be tied to the terminal end of each water service. Markers shall be Omni Marker #75025 or 3M 1403-1266 blue water marker, or equivalent.

   c. All magnetic markers shall be returned to the Park at the time of the meter being set.

4. No meter shall be put in service until the appropriate backflow preventer has been installed and is successfully tested by the Park.

5. No meter shall be put in service in areas formerly on a private water supply system until the Park’s representative verifies proper physical disconnection from the private system.

H. INSTALLATION - VALVES AND APPURTENANCES

1. Valving of all systems shall be designed to facilitate the isolation of each section of pipeline located between intersections of the grid system.

2. If a distribution system is to be constructed in phases, valves and plugs with a suitable blow-off or hydrant shall be installed at the end of each line that is to be extended.

3. All mains, valves, bends, tees, crosses, and dead ends shall be restrained with an approved Park restraint joint system. On all mains greater than 12" in diameter, 2 forms of thrust restraints or an approved Park restrained joint system shall be utilized at each joint. Where adequate spaces exist thrust blocks may be allowed with Park approval. Thrust blocks shall be used behind all hydrants.

4. When tie rods are used as a method of joint restraint all tie back bolts, nuts, washers and threaded rods shall be constructed of materials that meet ASTM A-242 requirements (Cor-Ten steel or equal) and painted in accordance with the procedures described herein. Tie rods and nuts shall be equal in diameter to the tee bolts and nuts which were supplied with the applicable fittings. Two tie rods per joint are required for sizes 4" through 10" diameter, four tie rods per joint for sizes 12" through 16" diameter and 6 tie rods per joint for sizes 18" through 24" diameter.

5. All valves installed for future connections shall be restrained in accordance with Park specifications.

6. Prior to installation, all butterfly valves shall be tested on site, above ground at 150 PSI. Both sides of disk shall be tested in the presence of an PBPOC representative.

I. MATERIALS (Also Refer To Exhibit D "Shop Specifications List")

1. Pressure Pipe - Water Mains
   a. All materials, fittings and appurtenances intended for use in pressure pipe systems shall be designed and constructed for a minimum working pressure of 150 psi unless the specific application dictates a higher working pressure requirement. All brass including, but not limited, to valves, fittings, backflow preventors, corporation stops, and curb stops shall be "no lead" type less than 0.25% lead content. All rubber parts, gaskets, etc shall be chloramine resistant pipe:
      i. Pressure pipe in sizes 4 inch inside diameter and larger shall be ductile iron pipe.
      ii. Ductile iron pipe shall be Pressure Class 51 for sizes up to and including 12 inch and Pressure Class 350 for pipe sizes larger than 12 inch and shall conform to ANSI A21.51 and AWWA C-151. Pipe interior shall have a cement mortar lining.
      iii. Spool pieces for MJ connections shall be a minimum of 18 inches long, outside flange to outside flange.
      iv. Flanged pipe shall have a minimum wall thickness of 0.32 for 4 inch pipe and incremental increases of 0.02 in thickness for each increase in pipe size up to and including 14 inch. Flanged pipe over 14 inches shall require shop drawing submittal to the Park for approval.

   b. Fittings:
      i. All pressure pipe fittings of size 4 inch inside diameter and larger shall be ductile iron fittings with mechanical joints, unless the plans specifically call for flanged joints, restrained joints, etc. Mechanical joint fittings shall be used for buried installations. Flanged joints shall be used for aboveground service only.
      ii. Mechanical joint fittings shall conform to ANSI/AWWA C-153/A 21.53. Glands for MJ fitting shall be ductile iron and tee bolts shall be Cor-Ten steel unless otherwise specified. Flanged fittings shall conform to ANSI/AWWA C-110/A21.10 and lined inside and outside as specified for the pipe.
      iii. Full face neoprene gaskets shall be used on all flanged connections. The use of other materials is prohibited.

c. Thrust Blocks are not allowed.

2. Pressure Pipe - Water Service

a. The minimum size for single services shall be 1 inch.

b. The minimum size for double services shall be 1½ inch.

c. Polyethylene tubing, SDR 9, ASTM D-2737, PE 3408, Cell Classification 355434 C - Latest Revision, copper tube size, with appropriate "Pack Joint" fittings is authorized for 1 inch, 1½ inch and 2 inch services.

d. Copper tubing shall be type "K" roll copper and fittings shall be of the compression type.

e. Copper services must be used if organic solvents are likely to be present (i.e. gasoline stations, etc).

3. Water Service - Fittings

a. All fittings shall be NSF certified lead free.

b. Only lead free solder and flux shall be used on all soldered joints.

c. Both double strap tapping saddles and corporation stops shall have AWWA threads.

d. "Pack Joint" fittings for use with polyethylene pipe shall be provided with stainless steel stiffeners.

e. Both polyethylene and copper tubing shall be run in one continuous piece, from corporation stop to curb stop (i.e. no fittings between these points).

f. Curb stops shall be 1 inch (minimum) in size. One inch curb stops with 3/4 inch valves shall not be allowed.

g. Curb stops at the meter shall be provided with locking wings and an appropriate sized drilled swivel meter nut.

h. Only lead free solder and flux shall be used on all soldered joints.

i. Where service taps are made under paving or sidewalks special requirements apply which will permit access to the connection to the water main (curb valve boxes, 90° tap orientation).

4. Tapping Sleeves and Saddles

a. Tapping sleeves and tapping crosses shall be of the heavy body ductile iron, mechanical joint or stainless steel wrap around, as approved by the Park.

b. Tapping Saddles: No direct taps shall be allowed. All service line taps shall be supplied with corporation stops. Water service taps on the main shall be spaced at a minimum distance of 18 inches. All service taps must be at least 18 inches from a bell or fitting. (90° taps are required for services under paving or sidewalks). Brass double strap tapping saddles shall be used.

c. All tapping assemblies installed on existing water mains shall be pressure tested and witnessed by the Park’s representative prior to the actual tap of the main. The pipe coupon shall be carefully preserved and submitted to the Park’s representative. All tapping sleeves shall be installed a minimum of 6 feet from pipe joints.

d. Connection to existing water mains shall be double valved as approved by the Palm Beach

County Health Department.

e. Connection to existing water mains requires the approval and direct observation of the Park's representative.

J. FIRE HYDRANTS

1. Fire hydrants shall conform in all respects to AWWA C-502 (Latest Revision) and shall be of the dry barrel breakaway type with two 2½ inch hose nozzles and one 4½ inch pumper nozzle without drains. All nozzles shall be brass with National Standard hose threads. The hydrant shall be provided with an interior valve opening of 5¼ inch with a brass to brass threaded stationary seat. The centerline of the nozzles shall be 18 inches above the finish grade. In addition, the hydrant shall be fitted with a mechanical joint connection per ANSI A 21.11/AWWA C-111 (Latest Revision) with a minimum cover of 30 inches.

2. Each fire hydrant shall be capable of delivering a flow of 1,000 gallons per minute with a residual pressure of not less than 20 psi. Fire hydrant branches (from main to hydrant) shall be not less than 6 inches in diameter. Each branch shall be provided with a gate valve located as close as possible to the main and the hydrant shall be suitably restrained. Separate fire lines shall be valved as close as possible to the main and restrained with adequate thrust blocks. Hydrants shall be located at or near road right- of-way lines with pumper discharge nozzle facing the roadway. No obstruction shall be placed near the hydrant which would prevent maintenance or access. Hydrants that are installed in a vulnerable area shall be protected by 4-inch cement filled DIP stanchions.

3. All fire hydrants shall be free of corrosion and all working parts shall be properly lubricated and the hydrant painted as required by the Park.

4. The contractor shall provide and install only fire hydrants which conform to the above specifications and are specified in Exhibit D "Shop Specifications List".

5. Fire hydrants may be inspected in the field for conformance to the above specifications by the Park and/or other regulatory agencies.

6. Fire hydrant extensions shall not be used in new construction.

7. A 7 ½ foot clear zone around the front and sides, and a 5 foot clear zone around the rear of the fire hydrant shall be maintained.

8. Maintain 15 feet minimum from fire hydrant to all structures.

K. VALVES AND VALVE BOXES

1. Valves smaller than 3 inches shall be bronze ball valves and conform to Federal Specification WW-V-35B, Type II, Class A. Valve must be rated at 600 psi WOG.

2. Valves up to and including 10 inch shall be iron body, bronze mounted, gate valves conforming to AWWA C-500 (Latest Revision) being resilient wedge, non-rising stem type and appropriate ends for horizontal position in line, and shall open left (counter- clockwise) with 2-inch square operating nut. The coating on resilient wedges shall be chloramine resistant.

3. Gate valves shall be carefully inspected, opened wide, and then tightly closed, and all the various nuts and bolts thereon shall be tested for tightness. Special care shall be taken to prevent joint material, stones, or other substances from becoming lodged in the valve seat. Gate valves, unless shown otherwise, shall be set with their stems vertically above the centerline of the pipe.

4. All valves 12 inch and larger used in water mains shall be factory tested and labeled as bi-

directional butterfly valves unless otherwise specified. The valves shall conform to AWWA Standard C-504, Latest Revision and shall be Class 150. All 12-inch and larger butterfly valves shall be tested on site prior to install. Each side shall be tested at 150 PSI in the presence of a Park representative.

5. Check valves shall have a ductile iron body with a bronze or stainless steel to red rubber silicone seating arrangement, non-corrosive shaft. Fireline checks shall have a 300 psi hydrostatic test pressure rating. Check valves smaller than 4 inches shall be bronze, bronze disc, conforming to Federal Specification WW-V-51E, Type 4, Class A, 125 pressure rating.

6. Air release valves installed below grade shall be of the manual type unless otherwise specified by the Park. Air release valves shall be installed in a concrete manhole as shown in the detail and conform to manhole requirements as outlined in Section IV D.

7. Cast iron valve boxes shall be provided for all valves installed underground. The boxes shall be adjustable to fit the depth of earth cover over the valve and shall be designed and installed so as to prevent the transmission of surface loads directly to the valve or piping.

8. Valve boxes shall be carefully centered over the operating nut of the gate valves so as to permit a valve key to be easily fitted to the operating nut. The tops of valve boxes shall be set flush with finished grade, with allowance made for the settlement of surrounding backfill or surface. An 8-inch thick concrete collar shall surround the top of the valve box, as shown on the Park's Underground Valve Installation Construction Detail Drawing.

L. METER AND METER BOX

1. All meters shall be obtained from the Park and remain the property of the Park.

2. A meter fee shall be collected by the Park from the Developer/Customer requesting the desired service prior to the actual installation of the meter.

3. The Park shall furnish and install all meters and meter boxes for meter sizes up to and including 2 inch.

4. The Developer/Customer shall be responsible for resetting the meter box after the meter has been set initially by the Park. Any damage to the meter box or meter set shall be paid for by the Developer/Customer.

5. The design of all 3 inch and larger domestic, fire line and irrigation water meter/backflow prevention device installations shall be handled on a case by case basis. Compound water meters must be utilized for all projects that will have variable water demands. All installations shall conform to the Park's Construction Standards and Specifications. The EOR shall submit detailed drawings covering the proposed installation.

6. The above grade piping of the metering and backflow devices larger than 2 inch shall be coated as outlined in Section II.

M. BACKFLOW PREVENTION DEVICES

The contractor shall provide and install the appropriate type backflow prevention device as specified in Exhibit D "Shop Specifications List".

N. ON-SITE MORTAR/CONCRETE/GROUT MIX

1. All concrete and/or mortar mixed on site (field mixed) for use on any component of the water distribution system shall be made with Type II Portland cement, masonry sand, clean properly

sized aggregate (if required) and clean potable water. In no case shall local on-site sand/dirt, rock or stones or non-potable water be used.

2. When cement asbestos pipe is to be abandoned in place, the pipe must be grouted full by pumping in an approved grout mix. The procedure must comply with all applicable regulations and shall be the Developer's responsibility.

SECTION IV - SANITARY SEWER SYSTEM

A. BASIS OF DESIGN

1. Sizes of gravity sewers, pumping stations and force mains will depend upon industrial and commercial requirements and peak domestic load. Sewage systems shall be designed on the basis of an average per capita daily flow of not less than 100 gallons of sewage or 275 gallons per day per ERC as defined in the Park's Uniform Extension Policy. On this basis, sewers shall be designed with capacities when running full of not less than 2.5 times the average flow. Special allowance shall be made in each case for sewage from industrial plants and other large non-residential projects.

2. Force mains shall be designed to be full of liquid under all operating conditions whenever possible. Special linings will be required on all piping.

3. Force mains shall be designed utilizing 45 degree bends in lieu of 90 degree bends wherever possible.

4. Industrial wastes from any source, including but not limited to, service station wash-racks, lubrication racks and shop floor drains shall not be connected into the sanitary sewer system without pretreatment specifically approved by the Park.

5. Sanitary sewers shall be designed to flow into the nearest possible Park owned gravity sewer system. Private lift stations and private force mains will not be acceptable unless gravity sewer systems are not available. Availability of gravity sewer will be determined by the PBPOC on a case by case basis.

6. Valving of force mains shall be designed to facilitate the isolation of each section of pipeline. Generally, the number of valves at an intersection shall be one less than the number of pipes forming the intersection. All below grade valves shall be side actuated. Valves shall generally be installed at intervals of not more than 1,500 LF on transmission mains and on all primary branches connected to these lines.

7. Service laterals shall not exceed 75 feet.

8. Clean outs shall not be placed in areas that will be fenced, or where they will be inaccessible.

B. HYDRAULIC DESIGN

1. Size: The minimum allowable size for a gravity sewer main shall be 8 inch.

2. Slopes: All sewers shall be constructed with hydraulic slopes sufficient to give mean velocities, using average day flow through the sewer, of not less than 2.0 feet per second, based on Manning's Formula. For 8 inch to 24-inch sewers, velocities shall be determined using a value of "manning's" of not less than 0.013. The design of oversized gravity sewer pipe to obtain additional reach to avoid deeper cuts or lift stations is strictly prohibited. The following minimum grades are required.

8-inch sewers	0.40%
10-inch sewers	0.28%
12-inch sewers	0.22 %
15-inch sewers	0.15 %
18-inch sewers	0.12 %
21-inch sewers	0.10%
24-inch sewers	0.08 %

3. Increasing Size: When sewers are increased in size, or when a smaller sewer joins a larger one, the invert of the larger sewer shall be lowered sufficiently to maintain the same energy gradient. Change in pipe size requires a manhole.

4. Alignment: Sewers of all sizes shall be laid with uniform slope and alignment between manholes. Design slopes shall be kept constant from manhole to manhole except where design considerations such as conflicts require deviating slopes. The standard design slope for 8-inch gravity sewers shall be 0.42%. Designs which incorporate excessive slopes to avoid drop manholes will not be approved.

5. Drop Through Manholes: The minimum drop through all manholes shall be 0.1 foot.

6. Minimum manhole depth from invert to finish grade shall be 4 feet. Maximum depth from invert to finish grade shall be 18 feet.

7. Ductile Iron Pipe Lining: Whenever the use of DIP is required for gravity sewers, the pipe shall be lined with polyethylene or Protecto 401, with attention paid to repairs to the lining caused by field cutting the pipe.

8. Transition from SDR 18 C-900 to SDR 26 PVC is not permitted between manholes. The total run of sanitary sewer line must be of the same class PVC pipe from manhole to manhole.

9. Gravity sewer fittings used within the SDR 26 PVC mains shall be PVC injected molded conforming to ASTM 3034 SDR 26 or SDR 35 and shall provide a smooth flow line.

10. Force Mains:

    a. Design Friction Losses: Friction losses through force mains shall be based on the Hazen and Williams Formula and a "C" factor of 120 shall be used for design unless otherwise justified by the EOR.

    b. Main Sizes: Force mains shall not be less than 4 inches inside diameter and designed with a flow velocity of not less than 2.0 feet per second (fps) where possible. Maximum velocity shall not exceed 10 feet per second.

    c. Air Release Valve: An air release valve shall be placed at high points in the force main to prevent air accumulation. The force main must be designed with as few high points as possible to consistently maintain a full pipe. This must be carefully considered when designing profile for force mains.

    d. Plug Valves: Below grade plug valves shall be side actuated gear operator type.

    e. Force Mains Discharging into Gravity Systems: Connections to gravity lines shall require a design such that the force main remains full of liquid at all times, including when pumps are off, wherever possible. Polyethylene or Protecto 401 or Permox CTF lined DIP force mains and fittings will be required.

    f. Where private force mains tie to the Park’s force main an approved check valve shall be installed on Developer's side of the plug valve.

    g. Pigging is required for all force mains 16" and greater in diameter. The Park may require the force mains less than 16" in diameter to be pigged if the Park or the EOR's representative observes mains being installed under substandard conditions.

C. INSTALLATION OF GRAVITY SEWER MAINS

1. All sewer pipes shall be true to line and grade with bells facing upstream. The sections of the pipe shall be so laid and fitted together that when complete, the sewer shall have a smooth and uniform invert. All pipe shall be free from defects. Trenches shall be kept dry while the pipe is being laid.

2. Bedding of the pipe shall be on stable materials. Bell holes shall be deep enough to insure proper bearing of the pipe barrel on the bedding.

3. All joints shall be carefully fitted together in the trench in strict accordance with the manufacturer's instructions, so as to ensure a watertight joint. Joints shall not be covered until released by the EOR's representative.

   The exposed end of all pipe shall be properly plugged so as to prevent dirt or other debris from entering the pipe.

4. Backfill shall be placed in accordance with the standard trenching detail and all other permitting requirement and compacted to a level 12 inches above the top of the pipe, at which time the completed sections will be visually observed by the EOR's representative. Those portions found acceptable may then be backfilled in accordance with these specifications.

5. Upon completion of the entire system (or a large enough portion to warrant separate testing and approval of record drawing) the contractor shall perform and witness by EOR exfiltration tests, as required by FDEP. EOR shall provide the Park with the test results prior to scheduling a lamping with the Park. All completed sections must meet the minimum requirements shown on these specifications.

6. The contractor shall ensure that all sewer mains and laterals installed are free of grit, sand, rocks, and other debris. As a minimum, all sewer lines shall be flushed clean by the high velocity water jetting method. Velocities of not less than 10 feet per second shall be generated and maintained until each section of main is visibly clear of all debris, at which time the EOR's representative will release all portions of the system which meet all visual and leakage specifications. Contractor shall also be required to vacuum all accumulated deposits from lift station wet well(s) and sewer manholes generated by the cleaning operations.

7. All PVC sewer pipe & fittings shall be green in color.

D. MANHOLES

1. Location: Manholes shall be installed at the end of each sewer; at every change in grade, size or alignment; at all sewer intersections; and at distances not greater than 400 feet for sewers of 15 inches diameter or less, and 500 feet for sewers 16 inches to 30 inches. Manholes shall be placed in accessible locations, preferably in pavement, always flush to the surface. A concrete collar shall be placed around manholes in grassed areas.

2. Drop Manholes: An outside drop pipe shall be provided for a sewer entering a manhole at an elevation of 24 inches or more above the manhole channel invert. In cases where the elevation difference between the inverts is less than 24 inches, a channel shall be constructed to prevent solids deposition in the manhole. Concrete encasement pad for drop connection shall be poured integrally with both manhole base slab and wall.

3. Diameter: All manholes shall be a minimum interior diameter of 48 inches for pipe sizes up to and including 12 inches and a minimum interior diameter of 60 inches for pipe sizes larger than 12 inches with a 30-inch opening at the top of the concentric corbel.

4. Flow Channel: The manhole floor shall have a flow channel made to conform in shape and carrying capacity to that of the sewers. The minimum drop between inverts in all manholes shall be 0.1 foot.

5. Depth: The minimum depth allowed for sanitary manholes shall be 4 feet from finish grade elevation to invert elevation.

6. Pipe Connections: Pipe connections to manholes shall be by couplings, rubber ring water stop cast directly into manhole, or other approved method. Shop drawing of the device shall be submitted to the Park for approval.

7. Openings in the structure shall be either cast in place or core drilled and shall be a minimum of three (3) inches from any joint in the structure.

8. Existing Manholes: After connecting to an existing manhole, the existing manhole interior surface shall be properly prepared and coated with Sewper Coat Calcium Aluminate or Strong Seal High Performance Mix in accordance with manufacturers' instructions.

9. Protection Against Surface Water Inflow: When manholes are placed in areas prone to surface water ponding (e.g. roadway swales, depressed landscape areas, roadway curb areas, low spots on inverted crown roadways or parking lots), the Park will require watertight manhole inserts such as SEWER GUARD or approved equivalent to be installed in these manholes.

10. The interior of all new manholes shall be lined with Agru Sure-Grip HDPE Liner with 3M sealant type 5354 and ADEKA P-201 water stop in strict accordance with manufacturer's instructions. The surface area of the lining shall be checked for pinholes with a high voltage holiday detector at the precast yard prior to job site delivery and shall have notations on the liner the date of spark test and person performing the tests. Prior to placing manholes into service, the lining shall be retested by a certified tester. The lining shall be free of any pinholes. All linings shall have a minimum five (5) year labor and materials warranty including all costs necessary and related to the repair or replacement of the defective application. All testing shall be performed by a tester certified by Agru Liner. Test report for each manhole shall be submitted to the Park prior to acceptance. The report shall include date of testing, equipment used, manhole location, pass or fail, project name, certified tester's name and number along with tester address and contact information. If failed, what corrective measures were taken.

E. LIFT/PUMPING STATION DESIGN

1. If required, the lift/pump station shall meet the criteria/design stipulated in the Seacoast Utility Authority standards.

F. INSTALLATION OF FORCE MAINS

1. Contractor shall comply with Palm Beach County Health Department Technical Memoranda and FDEP.

2. Installation and testing of force main pipe and fittings shall be in accordance with AWWA Specification C-600 Latest Revision and the Park's Construction Standards and Specifications.

3. Any pavement cut shall be replaced in accordance with requirements of the Park's Pavement Replacement Construction Detail Drawing and in accordance with all other applicable governing agency's permitting requirements.

4. Omni Marker #75027 green or 3m 1404-XR green shall be placed above all fittings, changes in alignment, grade, sewer services and at the discretion of the Park's representative.

5. All loading or unloading of pipe, fittings, valves and accessories shall be done in such a manner so as to avoid damage. The pipe shall not be skidded or rolled against pipe already unloaded. Special precautions should be taken to avoid damage to linings and coatings of fittings and pipe. The interior of all pipe, fittings and other appurtenances shall be kept free of dirt and foreign matter at all times.

6. Force main pipe shall have green stripes applied to the pipe wall at the time of manufacturing.

   Pipe striped during manufacturing of the pipe shall have continuous stripes that run parallel to the axis of the pipe, that are located at no greater than 90-degree intervals around the pipe, and that will remain intact during and after installation of the pipe. If tape is used to stripe during installation of the pipe, the tape shall be applied in a continuous line that runs parallel to the axis of the pipe and that is located along the top of the pipe; for pipes with an internal diameter of 24 inches or greater, tape shall be applied in continuous lines along each side of the pipe as well as along the top of the pipe. Field application of paint shall not be acceptable. Tape shall be vinyl plastic adhesive back with a minimum width of 6 inches. Field application of paint shall not be acceptable.

7. All mains, valves, bends, tees, crosses, and dead ends shall be restrained with an approved Park restrained joint system. On mains greater than 12 inch diameter, 2 forms of an approved Park thrust restraint system shall be utilized at each joint per restraint table. Where adequate spaces exist thrust blocks may be allowed with the Park's approval.

8. When tie rods are used as a method of joint restraint they shall be by means of steel tie back bolts, nuts, washers and all thread rods meeting ASTM A-242 requirements (Cor-Ten steel or equal) and painted in accordance with the procedures described herein. Tie rods and nuts shall be equal in diameter to the tee bolts and nuts which were supplied with the applicable fittings. Two tie rods per joint are required for sizes 4 inch diameter through 10 inch diameter, four tie rods per joint for sizes 12 inch diameter through 16 inch and 6 tie rods per joint for sizes 18 inch through 24 inch.

9. Air release valves shall be installed at the designed high points. Installation of air release valves to correct high points caused by improper installation of pipe (not at design grade) will not be permitted.

10. All pipe shall be laid in a clean dry trench and on line and grade with valves plumb. All pipe shall have a minimum cover of 30 inches and a maximum of 48 inches unless otherwise noted on the plans or required by permit.

11. The trench at the top of the pipe shall be kept to a maximum width of 24 inches plus the pipe diameter. The trench shall have a flat bottom, cut true and even, so that the barrel of the pipe shall bear its full length. Pipe bells will be placed in small pockets specifically excavated to receive the bell. All excavations must be in compliance with OSHA regulations.

12. No rocks larger than 2 inches in diameter or other items that may damage the pipe will be permitted over the pipe. In the event pipe is installed in rock excavation, 6 inches of granular material will be provided for bedding for under the pipe. All pipe joints, thrust blocks, conflicts and service connections shall be left exposed until visually inspected and approved by a Park representative.

13. All joints, thrust blocks and conflicts in the force mains shall remain uncovered for visual inspection by the Park's representative. The contractor shall only backfill after approval by the Park's representative.

14. Tapping Sleeves

    a. Tapping sleeves and tapping crosses shall be of the heavy body ductile iron, mechanical joint type or 316 stainless steel wrap around type as approved.

    b. All tapping assemblies installed on existing force mains shall be pressure tested and witnessed by the Park's representative prior to the actual tap of the main.

       The pipe coupon shall be carefully preserved and submitted to the Park's representative. All tapping sleeves shall be installed a minimum of 6 feet from pipe joints.

    c. All field cuts and tapping operations on pipe shall require careful repair of the particular lining damaged in strict accordance with the manufacturer's recommendations.

15. Prior to installation, plug valves 10 inch and larger shall be tested on site above ground at 150 PSI. Both sides of plug valve shall be tested individually in the presence of a PBPOC representative.

G. TESTING

1. Gravity Sewer

    a. Required tests for gravity sewers are: Density Test; Lamp mains; Laser Profile mains that are deemed questionable; Televise laterals; Exfiltration tests. The maximum allowable exfiltration rate measured by test shall be 50 gallons per inch of pipe diameter per mile per 24 hours for gravity sewer pipe: Infiltration test. Any infiltration or visible leakage, including damp areas on the walls of manholes, will be cause for rejection of these facilities. The infiltration test can be accomplished at the same time as the lamping. All sections of gravity sewer mains and laterals, not meeting these specifications shall be repaired by the contractor and retested at his expense to assure full compliance with these specifications. The repair method to be used shall be approved, in advance, by the Park.

2. Force Main

    a. The contractor shall provide all necessary equipment such as pumps, gauges and water measuring tanks and shall perform all work required for pipe pressure and leakage test. Pressure and leakage tests shall be made between valves and/or connections for each section tested using the procedure outlined in ANSI/AWWA C-600 Latest Revision and Park requirements. A pretest shall be successfully completed by the contractor and observed by a representative of the EOR prior to scheduling the pressure test with the Park. All tests shall be made under the supervision of the EOR and the Park's representative. The use of PVC pipe and fittings for pressure testing is not permitted.

    b. 1,500 LF shall be the maximum length of main to be pressure and leakage tested at any one time. Testing of isolated portions between valves within the test section may be required by the Park, if a portion of that line appears questionable after testing.

3. PRESSURE AND LEAKAGE TEST - hydrostatic pressure of 150 psi shall be developed by the contractor, within the section of pipeline to be tested and shall be held for a minimum time period of one hour.

   After successfully completing the 150 psi pressure test, pressure in the pipeline being tested shall be reduced to 100 psi and that pressure shall be held for an additional one hour time period. All visible leaks, including damp spots shall be corrected regardless of the results of the pressure and leakage tests.

4. ALLOWABLE LEAKAGE - Leakage during both the pressure and leakage test shall not exceed the following formula for gasketed pipe:

   $L = (SDP^{½}/148{,}000) \times 0.5$

   L= Allowable Leakage (gallons per hour). S =

   Length of Pipe to be Tested (feet).

   D = Nominal Diameter of Pipe (inches). P =

   Average Test Pressure (PSIG).

   No allowable leakage for polyethylene pipe or glued joint pipe.

   a. Private low pressure residential force main shall be tested at a minimum of 100 PSI for one hour with no loss in pressure.

   b. A loss of 5 psi or more during the 150 psi testing, regardless of the amount of leakage shall be considered a failing test. A loss of 5 psi or more during the 100 psi testing, regardless of the amount of leakage shall be considered a failure. A total loss of 10 psi or more for both test combined shall be considered a failing test.

   c. A gain of pressure during the test shall be considered a failing test.

   d. The pressure test shall be considered not acceptable unless all valves in test section are in the open position. The system must be completed to the full extent of the approved plans on that portion being tested. The contractor shall provide a 1/2 inch ball valve adjacent to the test pressure gauge for installation of the Park's "check gauge". The use of PVC pipe and fittings for temporary piping for pressure testing is not permitted. Test gauge shall be in 2-pound increments with a minimum 4-inch face, Class A1 glycerin filled.

   e. Failure of the test gauge to zero out upon completion of test shall be cause for rejection.

   f. The contractor shall, at his own expense, adjust or replace, at the discretion of the EOR, any component of the pipeline which fails the prescribed tests. The pipeline shall then be tested as described above until it successfully conforms to said tests.

   g. Special testing requirements in accordance with FDEP and Palm Beach County Health Department will be necessary for force mains and gravity sewer systems installed within potable water well zones of influence.

   h. Water for testing force main shall be clean fresh water. In no case shall it be tested with saline, brackish or turbid water.

   i. The Park will not schedule the pressure test until pipe has been properly backfilled, compacted, finish grade established, and as-builts accepted.

H. SERVICE LATERALS

1. Sanitary service laterals shall have a slope of 1.0%.

2. No sanitary services shall connect directly into a manhole.

3. Service laterals shall be no longer than 75 feet from main to property line.

4. Clean outs will be required at the property line. Additional clean outs will be required at changes in direction over 45°, every 75 feet or as required by the appropriate plumbing code or applicable agency.

5. All lateral connections which are for future use shall be properly capped.

6. Clean out stacks shall be continuous pipe with no joints from wye to clean out cap.

7. The upper end of residential service connections shall be laid at a depth not less than 30 inches or more than 48 inches below the finished grade elevation.

8. Service line identification:

    a. One 4-foot high 2-inch X 2- inch pressure treated wood stake shall be put in the earth against the plug when service connection is backfilled. The stake shall extend 18 inches minimum above grade and shall be broken off only by authorization from the Park. The top 6 inches of the stake shall be painted red.

    b. A magnetic marker for sewer service shall be tied to the terminal end of each sanitary service. Markers shall be either Omni Marker #75027 or 3M 1403-1265 green sanitary marker, or equivalent.

    c. EMS markers shall be returned to the Park at the time of sewer tie-in inspections.

9. Minimum size pipe for a single residential service lateral is 4 inch and the minimum size pipe for a double residential service lateral is 6 inch. Minimum size pipe for non-residential service lateral shall be 6 inch.

10. Sewer Tie-in connections - Flexible rubber type connectors (Fernco Couplings with stainless steel stiffener) are permitted only on existing VCP laterals and mains.

11. Clean out at property line shall be accessible and unobstructed for 4 feet in all directions. This shall include but not be limited to transformer, telephone junction box, wall, trees, etc.

I. MATERIALS - (ALSO REFER TO "SHOP SPECIFICATIONS" LIST)

1. Precast Manholes

    a. Precast manholes shall conform to ASTM C478 and ASTM C-76, Latest Revision, Class II, Wall B, Type II Portland Cement, 4,000 PSI.

    b. Steel reinforcement shall conform to ASTM A185. Wall thickness shall be 8- inch minimum.

    c. Precast manholes shall have a minimum 7-day cure time before delivery to the site.

    d. Any visible reinforcing wire, steel or honeycombs on precast structures shall be cause for rejection.

    e. The base slab and first ring of the precast manhole shall be cast monolithically and have a minimum height of 26 inches.

    f. Only concentric corbels shall be used on manholes.

    g. The minimum diameter of manholes shall be 48 inches with an opening of 30 inches at the top of the corbel.

h. The exterior walls of manholes, which do not have the interior lined with Agru- Sure – grip, shall have the exterior walls coated with two coats of an approved coal tar epoxy (Kop-Coat 300-M or equivalent) applied in strict accordance with the manufacturer's instructions. Each coat shall be a different color, with the final coat being black and each shall be a minimum of 10-mils D.F.T.

2. Manhole Cover and Frame

The frame shall have a 30-inch opening. The cover shall be two pieces and shall have the words "sanitary sewer" cast into it. Cover and frame shall be U.S. Foundry & Mfg. Corp. Model #230-AB-M; Vulcan Foundry Model #VM-101 or approved equivalent.

3. Gravity Sewer Main and Services

a. PVC pipe shall conform to ASTM D-3034, SDR 26 (Latest Revision) and shall also meet the requirements of ASTM D-3212 (Latest Revision) on joints for drain and sewer pipe using flexible elastomeric seals.

b. For finish pipe depths greater than 12 feet utilize AWWA SDR 18 C-900 pipe.

c. Ductile iron pipe shall conform to ANSI A21.51 and AWWA C-151 Class 51 for sizes up to and including 12 inch and Pressure Class 350 for pipe sizes larger than 12 inch and shall conform to ANSI A21.51 and AWWA C-151. Pipe interior shall have polyethylene lining. Wherever polyethylene, Protecto 401 or Permox CTF lined ductile iron pipe is field cut or tapped the damaged lining shall be repaired in strict accordance with the manufacturer's recommendation. The Park’s representative shall be notified when repairs are to be made and shall have the option of being present during repairs.

d. Fittings shall be compatible with the type of pipe used.

e. PVC fittings with welded or clamped connections are not permitted.

f. Flexible rubber type connectors (Fernco Couplings) are permitted only on existing VCP, Cast Iron, Ductile Iron, or other non-PVC laterals and mains.

g. Clean outs are required at the property line. Where clean outs fall in paving, parking lots or sidewalks a 9 inch cast iron ring and cover is required with the letter "S" cast into it.

h. All PVC pipe and fittings shall be factory color coded green.

4. On Site Mortar/Concrete/Grout Mix

a. All concrete and/or mortar mixed on site (field mixed) for use on any component of the sanitary sewer collection/transmission system shall be made with Type II Portland cement conforming to ASTMC 150, clean, uniformly graded, ASTMC33 or ASTMC404, masonry sand, clean properly sized aggregate (if required) and clean potable water. In no case shall local on-site sand/dirt, rock, stones or water be used.

b. Prior to placing any mortar/concrete/grout mix the new/repaired opening shall first be thoroughly prepared.

c. No Portland cement accelerators shall be used without written approval from the Park.

5. Pressure Pipe - Force Main

All materials, fittings and appurtenances intended for use in pressure pipe systems shall be designed and constructed for a minimum working pressure of 150 psi unless the specific

application dictates a higher working pressure requirement.

a. Pipe:

i. All pipe under paved areas (roadway, parking lots, etc.); within public rights-of-way or privately dedicated roadway easements shall be ductile iron pipe.

ii. Ductile iron pipe shall be Class 51 for sizes up to and including 12 inch and Pressure Class 350 for pipe sizes larger than 12 inch and shall conform to ANSI A21.51 and AWWA C-151. Pipe and fittings must have polyethylene Protecto 401 or Permox CTF lining. Whenever lined ductile iron pipe is field cut or tapped the damaged lining shall be repaired in strict accordance with the manufacturer's recommendations. The Park's representative shall be notified when repairs are to be made and shall have the option of being present during repairs.

iii. Flanged pipe shall be polyethylene, Protecto 401, or Permox CTL lined and shall have a minimum wall thickness of 0.32 for 4-inch pipe and incremental increases of 0.02 in thickness for each increase in pipe size up to and including 14 inch.

iv. Flanged pipe over 14 inches shall require shop-drawing submittal to the Park for approval. Pipe shall not be stored in an outside yard more than 1 year from the date the lining was installed.

v. Spool pieces for MJ connections shall be a minimum of 18 inches long, outside flange to outside flange.

b. Fittings:

i. All pressure pipe fittings of size four inch inside diameter and larger shall be ductile iron fittings with mechanical joints, unless the plans specifically call for flanged joints, restrained joints, etc. Mechanical joint fittings shall be used for buried installations. Flanged joints shall be used for wet well and above ground service only. Fittings shall conform to requirements or ANSI A21.20 and AWWA C-110 and lined inside and outside as specified for the pipe. Fittings shall not be stored in an outside yard more than 1 year from the date the lining was installed.

ii. Full-face neoprene gaskets shall be used on all flanged connections. The use of other materials is not permitted.

c. Thrust Blocks (not allowed).

6. Valves:

a. Adjustable cast iron valve boxes with covers marked "sewer" shall be provided for all valves installed underground.

b. Plug valves for pipe 4 inches and greater shall have a ductile iron body with a minimum 80% port opening and bi-directional pressure rating.

i. Below grade installation shall be mechanical joint only with side actuated gear operator with 2 inch operating nut and standard valve box.

ii. Above grade installations shall be flanged with standard 1/4 turn operators.

iii. Resilient seat (wedge) valves shall be used with all tapping tees on existing force main installations.

iv. Wet taps on polyethylene lined DIP will not be permitted.

c. Air release valves shall be of the automatic type as specified by the Park.

d. Check valves and swing check valves shall have a ductile iron body with a bronze or stainless steel to neoprene seating arrangement, a non-corrosive shaft with attachment of an outside lever and weight, and a 300-psi hydrostatic test pressure rating.

e. The valve boxes shall be adjustable to fit the depth of earth cover over the valve and shall be designed and installed so as to prevent the transmission of surface loads directly to the valve or piping.

f. Valve boxes shall be carefully centered over the operating nuts of the plug valves so as to permit a valve key to be easily fitted to the operating nut. The tops of valve boxes shall be set flush with finished grade, with allowance made for the settlement of surrounding backfill or surface. An 8-inch thick concrete collar shall surround the top of the valve box, as shown on the Park's Underground Valve Installation Construction Detail Drawing.

EXHIBIT "A"

PROJECT DOCUMENTATION AND SUBMITTAL GUIDELINES

A. SERVICE AVAILABILITY

1. Property Questionnaire.
2. Boundary survey of property.
3. Site plan.
4. Fee simple titleholder authorization letter

B. INITIAL SUBMITTAL

1. Documents are not required to be signed and sealed at this time.
2. Preliminary plat with dedication sheet (2 sets).
3. Landscape plans (2 sets) utility easements and water and wastewater facilities must be shown.
4. Fire Marshall approval (1 set) including desired fire flow rate must be shown.
5. Fire flow calculations.
6. Construction Drawings:
    a. Paving and Drainage (2 sets).
    b. Water and Wastewater (2 sets).
7. Plumbing, mechanical & HVAC plans for multi-story buildings and non-residential buildings.
8. F.D.E.P. Permit Applications - Water and Wastewater (2 each-draft copies).
9. Right-of-Way Utility Permit Applications (2 each-draft copies).
10. Topographical survey of property.
11. Utility Plan

C. FINAL PLAN SUBMITTAL FOR PBPOC FILES (All documents shall be fully executed, signed and sealed. Number of sets noted below reflects number of sets which will be retained by PBPOC. Additional sets required for permitting).

1. Water and Wastewater Permit Applications - (1 each).
2. Paving and Drainage Plans (1 set)
3. Water and Wastewater Plans (3 sets)
4. Proposed plat with dedication sheet (1 each).
5. Off site easements and Title Insurance Commitment or Title Insurance Policy.

6. Provide survey of existing facilities (above & below ground) within the parameters of the project including but not limited to water, wastewater, drainage, electric, telephone, cable, etc.

7. Developers Agreement and associated items.

8. Landscape plans with municipal approval (2 sets).

D. PRIOR TO PRECONSTRUCTION MEETING (see Exhibit "B" for detailed description of requirements)

1. Right-of Way utility permit(s).

2. Contractor's licenses.

3. Water and Wastewater system Permits.

4. Shop Drawings and Shop Specifications

E. FINAL DOCUMENTATION

1. Reproducible mylar of recorded plat and a digital copy of the plat rotated and translated to State plane coordinates NAD 83, Florida east zone in a DWG and PDF format.

2. Request for Release - Water System with Bacteriological Results (2 sets of originals) less than 30 days from first sample, including two sets of record drawings highlighting all sample points.

3. Certification of Completion (2 sets) - Wastewater System.

4. Two sets record drawings prints signed and sealed by PLS (see Exhibit "E").

F. PRIOR TO CONSTRUCTION METER BEING SET

1. Release for service by Health Department

2. Inspection of water and wastewater system.

3. Submittal of construction meter application.

G. PRIOR TO PERMANENT METER BEING SET OR WASTEWATER SERVICE PROVIDED

1. Inspection of water and wastewater system to verify punch list items were properly corrected.

2. Inspection of sewer lateral tie in and backflow preventer installation.

3. Submittal of meter application and payment of required fees.

4. DWG and PDF file of Record Drawing

H. PROJECT CLOSEOUT

1. Inspection of concrete collars on sewer cleanouts and meter set.

2. Final inspection of water and wastewater system.

3. Once all the above have been completed then service approval will be released to the appropriate building department.

EXHIBIT “B”

PRECONSTRUCTION MEETING PREREQUISITE CHECKLIST

No preconstruction meeting may be scheduled until all of these items are in hand and approved by the Park.

1. FDEP, PBCHD, NPBID and all other applicable permits and approved plans
2. Four (4) copies of the Park’s "Shop Specifications" (see Exhibit "D") with selected items highlighted and acknowledged/approved by the Contractor and Engineer.
3. Four (4) copies of shop drawings for manholes and any other appurtenances not covered by "Shop Specifications" requiring submittals approved by the Contractor and Engineer.
4. Completed Contractor's License Verification form (see Exhibit "C") along with copy of license.
5. Contractor's work history, if applicable.
6. All other applicable permits, including but not limited to road right-of-way construction permits, railroad crossing permits, and dewatering permits.

The EOR shall notify in writing and forward a copy of said notification to PBPOC, all applicable utilities and agencies of jurisdiction whose presence will be required at the meeting. A copy of this notice must be received by the Park 72 hours prior to the pre-construction meeting.

EXHIBIT "C"

CONTRACTOR'S LICENSE VERIFICATION

DATE: _____

PROJECT NAME: _____

Name of Company: _____

Address: _____

_____

_____

Telephone No.: _____

Fax No.: _____

The undersigned does hereby certify that the above-named company is licensed by the State of Florida **TO PERFORM UNDERGROUND WATER AND WASTEWATER UTILITY INSTALLATIONS** as required by Florida Statutes and as defined in Florida Administrative Code.

Licensee_____ President_____
(Signature) (Signature)

Name_____ Name_____
Please Type Please Type

State License No._____

Attach copy of license:

EXHIBIT "D"

PALM BEACH PARK OF COMMERCE
15132 PARK OF COMMERCE BLVD
JUPITER, FL 33478

APPROVED MATERIAL LIST
("SHOP" SPECIFICATIONS)

Project Name: _____

Concurrence of Utility Contractor: _____
Signature Date

_____
Firm

Concurrence of the Engineer: _____
Signature Date

_____
Firm

By signature above, the utility contractor and engineer for referenced project agrees to adhere to both the following product specifications and the Park's Construction Standards and Specifications (latest edition). It is understood that the Park will reject construction not in accordance with this document.

Basis: The following products and specifications have been found to be acceptable and/or desirable in their respective groups. Shop drawings need not be submitted for the Park's approval if the contractor uses products on this list. Any product that is not on this list must be approved in advance by the Park. Such approval requires the submission of sufficient copies (Park will retain two copies) of a shop drawing for each product that has been approved by the EOR. Shop drawings will also be required for all non- standard items including, but not limited to all precast concrete structures, manholes. All material for use in a potable water system shall be NSF61 certified.

CIRCLE ITEMS OF CHOICE.

I. MAIN LINE CONSTRUCTION

A. Pipe - All pipe must be properly labeled.

i. Water Main/Reclaimed Water Main

a. Push on and mechanical joint-DIP, Class 51 through 12" over 12" Class 350, Cement mortar lining AWWA C-151 and C-104. MJ pipe shall require ductile iron glands and Cor-Ten tee bolts.

1. American 2. U.S. Pipe 3. Griffin 4. Clow 5. McWane

b. Flanged DIP Class 53, Cement mortar lining AWWA C-151 and C-104, flanges must be ductile iron.

1. American 2. U.S. Pipe 3. Griffin 4. Clow 5. McWane

c. Push on Joint PVC pipe, AWWA C-900, SDR-18 min., 235 psi min., NSF-61:

1. JM Manufacturing Company*
2. Diamond Plastic Corporation*
3. Certain Teed*
4. North American Pipe Corp.; NAPCO*
5. IPEX, Inc.**
6. National Pipe and Plastics**
7. Sanderson Pipe**

[*No pipe deflection at joint allowed.]
[**Up to two (2) degrees deflection at pipe joint is allowed]

d. Restrained Joint PVC Pipe, AWWA C-900, SDR-18 min., NSF-61:

D1. Non-metallic Modular Joint Restraint Design
1. CertainTeed Certalok
D2. Belle Integrated Metallic Ring Restraint Design
1. JMM Eagle Lok

e. HDPE Pipe (Fusable HPDE, PE 4710, AWWA C-906); minimum 40 ft standard lengths, DR-11 minimum, 3" or larger

1. CP Chem
2. JM Manufacturing Company
3. IPEX, Inc.
4. Polypipe by Dura-Line
5. KWH Pipe by Uponor Infra Ltd.

ii. Sanitary Force Main

a. Push on and mechanical joint-DIP, Class 51 through 12" over 12" Class 350, polyethylene or Protecto 401 lined, AWWA C-151 and C-104. MJ pipe shall require ductile iron glands and Cor-Ten Tee Bolts.

1. American 2. U.S. Pipe 3. Griffin 4. Clow 5. McWane

b. Flanged DIP Class 53, Polyethylene Protecto 401, or Permox CTF lined AWWA C-115 and C-104. Flanges must be ductile iron. (The lining must be installed at pipe manufacturing plant.)

1. American 2. U.S. Pipe 3. Griffin 4. Clow 5. McWane

c. Push-on Joint PVC pipe, AWWA C-900, SDR-18 min., 235 psi min., NSF-61:

1. JM Manufacturing Company*
2. Diamond Plastic Corporation*
3. CertainTeed*
4. North American Pipe Corp.; NAPCO*
5. IPEX, Inc.**
6. National Pipe and Plastics**
7. Sanderson Pipe**

[*No pipe deflection at the joint allowed. **Up to two (2) degrees deflection at pipe joint is allowed.]

d. Restrained Joint PVC Pipe, AWWA C-900, SDR-18 min., NSF-61:

D1. Non-metallic Modular Joint Restraint Design
1. CertainTeed Certalok
D2. Belle Integrated Metallic Ring Restraint Design
1. JMM Eagle Lok.

e. HDPE Pipe (Fusable HPDE, PE 4710, AWWA C-906); minimum 40 ft standard lengths, DR-11 minimum, 3" or larger

1. CP Chem
2. JM Manufacturing Company
3. IPEX, Inc.
4. Polypipe by Dura-Line
5 . KWH Pipe by Uponor Infra Ltd.

iii. Gravity Sewer Main

a. Pipe

1. PVC - ASTM D-3034, SDR 26, For 12' and deeper cut or where plans require use SDR18 AWWA C-900. Transition from SDR 18 to SDR 26 not permitted in run between manholes, Factory color coded green.

2. DIP - Class 51 through 12" over 12" Class 350 AWWA C-151 polyethylene, Protecto 401, or Permox CTF lined must be used in areas requiring special structural integrity.

1. American 2. U.S. Pipe 3. Griffin 4. McWane

b. Manhole Cover (Double Cover Type)

1. U. S. Foundry Model #230-AB-M

2. Vulcan Foundry Model #VM-101

B. High Density Polyethylene Pipe (HDPE) Water Main / Force Main

i. High Density Polyethylene Pipe (HDPE), greater than or equal to 3”

a. CP Chem – Performance Pipe
b. JM Manufacturing Company
c. WL Plastics
d. ISCO
e. ENDOT
f. Charter Plastics

ii. HDPE/DIP Electro-Fusion Couplings and Fittings

a. GT/Central Plastics Company
b. Ipex Friatec
c. Integrity Fusion Products

iii. HDPE/DIP MJ Adapter

a. Improved Piping Products, Inc.
b. GF/Central Plastics Company
c. Integrity Fusion Products

iv. Stainless Steel Stiffening Inserts for HDPE Pipe Restraint, greater than or equal to 3”

a. Cascades
b. JCM 231

C. Valves and Fittings - All rubber and synthetic elastomeric components of products that come in contact with potable water shall be manufactured with chloramine resistant elastomers.

i. Resilient Seat Gate Valves AWWA C-509, C-515 (Wedge material to be EPDM. EPDM to be clearly stamped on wedge)

a. American
b. U.S. Pipe
c. Mueller
d. Clow
e. Kennedy

ii. Butterfly Valves C-504 12 inch and larger (Ductile iron body, bi-directional, and seat material shall be EPDM. Valve shall clearly identify that seat material is EPDM and is bi-directional)

a. Mueller Lineseal
b. Pratt
c. M&H 4500 12”-24” 1450-30”
d. GA Series 800

iii. OS & Y Valves (Flanged - Above ground fire line use only – wedge material to be EPDM. EPDM to be clearly stamped on wedge)

a. Valves shall be resilient seat and equipped with bronze follower packing gland and bronze follower studs and nuts. (Cast iron and/or cadmium-plated steel are not acceptable). AWWA C-509.

1. U. S. Pipe 2. American 3. Kennedy 4. Clow

iv. Plug Valves (Minimum 80% port opening, bi-directional Ductile Iron Body)

a. Below grade - mechanical joint, side actuated with 2" square operating nut

1. Kennedy 2. GA Eco-Centric

b. Above grade - flanged 4" to 8" - top activated with 2" square operating nut. Ten inch and larger, wheel operated

1. Kennedy 2. GA Eco-Centric

v. Insertion Valves

a. Team Insert Valve
b. Hydra-Stop Insert Valve 250 Patriot Series

vi. Tapping Sleeve and Valve

a. Tapping sleeves for water mains.

1. For use on 4” to 24” cast iron, ductile iron, and PVC. 316 stainless steel construction required, including outlet flange.
   a. Ford FTSS
   b. JCM 432
   c. Mueller H304
   d. Cascade CST-EX
   e. JCM 452

2. For use on 12” and larger cast iron or ductile iron mains.

   a. Mueller H-615

b. American Series 2800-C

3. Sanitary Sewer Force Main (316 stainless steel body, bolts and outlet).

a. JCM 432
b. Tapping Valves

1. Water (Resilient seat - Wedge material to be EPDM. EPDM to be clearly stamped on wedge).

a. Mueller
b. American
c. Kennedy
d. Glow

vii. Check Valves

a. Meter assembly bypass ≥ 3 inches (spring loaded) with red silicone rubber seats

1. Ames 2000 SS

viii. Air Release Valves

a. Potable main 1" inlet

1. Val-Matic Model #25 2. Crispin Model # PL10 3. APCO Model #200A

b. Force Main 2" Inlet

1. Val-Matic Model #48 A with 316 SS internal hardware
2. APCO Model #400

ix. Fittings, AWWA C-104 AWWA C-110, Mechanical joint fitting to be compact ductile iron (Class 350 AWWA C-153) only. Glands for MJ fittings shall be ductile iron and tee bolts shall be Cor-Ten steel. Flange fittings AWWA C104 AWWA C110. Epoxy control fittings shall also meet or exceed ANSI/AWWA C550 and C116/AZI 116.

c. Cement lined for water main use
d. Polyethylene, Protecto 401, or Permox CTF lined for force main use
e. Full face neoprene gaskets shall be required on all flanged fittings.
f. Flange bolts on flanged connections inside lift station wet wells shall be 316 stainless steel.

1. Tyler/Union 2. Sigma 3. SIP 4. Star 5. Griffin

x. Transition Couplings - Ductile iron body and glands only with ductile iron or stainless-steel nuts and bolts and EPDM gaskets.

a. Ford FC2A-EPDM-SH
b. Mueller Maxi-Range

xi. Fire Hydrants (AWWA C-502 "traffic type" break away flange, no cut bolts, non-rising stem dry barrel; 5-1/4 inches main valve opening; bronze to bronze seating) no drain.

a. Mueller Super Centurion
b. Kennedy K-81 D (Guardian)
c. American Flow Control B-84-B
d. Clow Medallion F-2545 No Drain

xii. Tie Rods - all valves, hydrants, tees, joints and other appurtenances which are restrained by means of tie back bolts, nuts, washers and all thread rods shall meet ASTM A-242 requirements (Cor-Ten steel or equivalent) and painted in accordance with Authority's specifications. Tie back bolts shall be Star Model SST 753 of Cor-Ten steel or approved equivalent. All tie rods shall be a minimum 3/4" diameter; the use of rebar with welded thread is prohibited. Two tie rods are required per joint for pipe sizes 4" through 10". A minimum of four tie rods are required per joint for pipe sizes 12" and larger.

xiii. Self-restraining gaskets for push on PVC

a. U.S. Pipe - "Field Lok"
b. American - "Fast Grip"
c. McWane – "Sure Stop 350"

xiv. Restrained mechanical joint gland

a. Ebaa Iron - "Megalug" (all sizes)
b. Sigma – One Lok (all sizes)
c. Star Pipe – Stargrip 3000 (sizes through 24")
d. TUF Grip (4" through 12")
e. American

xv. Casing Pipe Spacers

a. Cascade MFG. Co.

II. SERVICE LINE CONSTRUCTION

A. Pipe

i. Water Service – ¾", 1", 1 ½", or 2"

a. JM Eagle PE4710, SDR9 Copper Tube Size Polyethylene tubing
b. Type "K" copper tubing

ii. Sanitary Sewer Service Lateral – factory color coded green

a. PVC (conforming to ASTM D3034, SDR 26)
b. SDR 18 AWWA C-900 PVC pipe shall be required for services connecting to deep sanitary sewer main.

B. Fittings

i. Water Service - Standard (Service under paving requires shop drawing submittal on corporation stop, and curb valve box, curb and corporation stop shall be same manufacturer).

a. Polyethylene tubing - "Pack-Joint" fittings, or equal with stainless steel inserts.
b. Type "K" copper tubing

1. Cast brass solder joint fittings, or equal for above ground backflow prevention device installation.

2. Both lead free solder and flux shall be used on all solder joints.
3. Ford Compression fittings

i. Ball Valve Branch - Ford UVB43-42W-65
ii. "Y" Branch - Ford Y44-264 NL 65 (Brass)

c. Service Saddles (Brass double strap saddle only, AWWA Threads)

1. Mueller
2. Ford 202B
3. Romac Style 202B
4. A.Y. McDonald 3825 Series
5. Smith-Blair 325

d. Corporation Stops (AWWA Inlet Threads x compression, lead free)

1. A.Y. McDonald Mfg. Co. Model #4101B-22
2. Ford - FB 1000 – 4 NL for 1" inlet & outlet

i. FB 1000 - 6 NL for 1 ½"
ii. FB 1000 - 7 NL for 2"

3. Mueller Co. Model # P2500

e. Curb Stops (Locking wings & drilled meter nut, lead free)

1. Ford Straight Ball Meter Valves
2. Mueller Model #300
3. McDonald Model 6100 MW-22

ii. Gravity Sewer Service Fittings – factory color coded green or white

a. PVC injection molded conforming to, and compatible with ASTM 3034 SDR 26 or SDR 35 PVC pipe
b. SDR 18 AWWA C-900 PVC pipe shall be required for services connecting to deep sanitary sewer mains
c. Miscellaneous

1. Sanitary clean-out cover – cover to be cast with "S" in the center.
i. US Foundry No. 7621 Reversible Handhole ring and cover

III. BACKFLOW PREVENTION DEVICES - All backflow prevention devices shall be USC approved.

A. Reduced Pressure Backflow Preventer – Non-residential, multi-family, or residential with three or more units. Supply with chloramine resistant elastomers lead free brass with silicone rubber seal rings or disks.

i. ¾" to 2"

a. Watts Model LF919
b. Ames Model LF400B
c. Wilkins 975 XL2
d. Apollo Model RPLF 4A

ii. 4" and larger

a. Apollo Model RPL 4A, 4" to 12"
b. Ames Model 4000 SSSR, 4" to 10"

c. Ames Model 4000 SSI, 4” to 10”

iii. Apollo Model RPL 4A 4” to 12”

B. Dual Reduced Pressure Backflow Preventer – supply with chloramine resistant elastomers, lead free brass.

i. Apollo 4ALFO4 – union ball valves ¾” – 2”
ii. Zurn Wilkins 975 XL2U – union ball valves ¾” – 2”
iii. Zurn Wilkins 975XL2V – union swivel elbows ¾” – 1”

C. Double Detector Check Valve with Bypass Valve, Check Valve and Meter Assembly – Firelines only. Supply with chloramine resistant silicone rubber seal rings or disks lead free brass, OSY x Flg OSY.

i. Watts Model 774 DCDA Series 994
ii. Apollo Model DCDA LF 4A (4”-12”)
iii. Ames Model 3000 SSR
iv. Ames Model 3000 SSI

D. Double check valve assembly for emergency master meter bypass assembly with chloramine resistant silicone rubber seal rings or disks, Flg NRS x Flg NRS

i. Ames 2000 SS

IV. PIPELINE MARKING TAPE

A. Vinyl plastic tape PVC backing material with rubber based adhesive, minimum 6 inch width, 0.006 inches in thickness, 20.0 lb inch Tensile strength. Wording, minimum 5/8 inch in height. Wording and color according to application.

i. Proline Safety

B. Adjustable cast iron tracer wire access box with stainless steel terminal connectors.

i. Valco, Model TWABADJ18

V. MAGNETIC MARKERS

A. OMNI 75027

B. 3M 1404-1265

VI. ADJUSTABLE VALVE BOX (2 piece – 5’ 4”)

A. Tyler

B. Proselect

EXHIBIT "E"

The PBPOC

RECORD DRAWING SUBMITTAL GUIDE

The following shall be used as a guide for submittal of record drawings to Seacoast Utility

1. Two (2) sets of prints shall be submitted by the EOR to the Park for review prior to scheduling inspections such as, but not limited to, pressure test, sanitary sewer lamping or any other element of the system which is determined necessary by the Park. The drawings shall have been reviewed by the EOR for deficiencies.

2. The drawings will be reviewed by the Park for deficiencies. Deficiencies will be indicated on one (1) set of prints which will be returned to the EOR for necessary corrective action.

3. Elevations shall be provided in NAVD 1988 Datum. A conversion table to NGVD 1929 shall be provided on each plan sheet of the drawing set.

4. After final inspection and upon acceptance of as-built data, two (2) prints (signed and sealed by a Florida registered land surveyor) a PDF file of the record drawing rotated and translated to state plane coordinates to the nearest hundreth's (2 decimal places) NAD 83, Florida East Zone.

5. No disclaimers on drawings will be accepted.

The attached list of required information is to be used as guide for submittal of Record Drawings to the Park. Additional information may be required by the Park if it is determined by the Park that the information supplied would be insufficient for a utility worker, with no surveying experience, to be able to locate mains, fittings, etc. The submittal record drawings shall meet Chapter 61 G17-6 Minimum Technical Standards. As noted in Section 61 G17-6.003, the public must be able to rely on the accuracy as noted in Section 61 G17-6.005

(a) When performing as-built or record surveys, the surveyor and mapper shall obtain field measurements of vertical or horizontal dimensions of constructed improvements so that the constructed facility can be delineated in such a way that the location of the construction may be compared with the construction plans, and when the surveyor and mapper prepares as- built maps they will clearly show by symbols, notations, or delineations, those constructed improvements located by the survey. All maps prepared shall meet applicable minimum technical standards.

(b) The vertical and horizontal accuracy shall be such that it may be determined whether the improvements were constructed consistent with planned locations.

(c) Northerly and Easterly coordinates on all field obtained measurements and provided on all record drawing submittals.

REQUIRED INFORMATION ON RECORD DRAWINGS

GENERAL

1. Drawings on 24" x 36" that will reproduce legibly.
2. Label drawings "Record Drawings" with date.
3. Complete title block with current file name.
4. Location sketch.
5. Correct Street/Road names.
6. GPS collected as-built information to be in DFX file format.
7. All record information shall be denoted by either a cloud or bold print. Design information shall be crossed out.
8. Profile as-builts required on projects where profiles were part of approved construction plans.
9. Utility Easements – with ties of facilities to easement lines.

GRAVITY SEWER

1. As-built distance of gravity main from centerline of road or easement right-of-way line, buildings, or as determined by the PBPOC. Extensions of an imaginary line will not be acceptable as reference points.
2. Type of materials installed - mains and services.
3. Stationing of each manhole.
4. Stationing of each sewer service wye from sewer nearest manhole and off set distance and stationing of cleanout from sewer main.
5. As-built elevations - each invert.
6. As-built rim elevation.
7. As-built sewer slope.
8. As-built sewer inverts and finished grade at clean outs.
9. As-built crossing elevations including sewer service lines.
10. As-builts information shall include plan and profile.

PRESSURE PIPE

1. As-built distance of mains at 100' intervals from centerline of paved road, easement, right-of-way, buildings, wastewater main or as determined by the PBPOC. Extensions of an imaginary line will not be acceptable as reference points.

2. As-built elevations at 100' intervals as well as any change in direction and/or elevation. Elevations shown at these intervals and changes must show top of pipe elevation and finished grade elevation at that location.

3. Stationing offset, top of pipe, and finished grade of each valve, fitting, air release valve, service line, taps, plugs, etc. and radial dimensions from a nearby permanent object.

4. Type of materials installed - pipe and appurtenances. Indicate all locations of change of material including joint type (MJ, slip, restrained).

5. Valve type (butterfly, gate, and plug).

6. As-built length of all jack and bore casings or directional mores indicating distance from centerline of paving to each end of casing. As-built invert and top of casing elevation of each end of casing as-built finish grade of each end of casing. As-built distance from each end of casing to limits of mechanical joint pipe is also required.

7. As-built all crossing information between utilities including bottom of pipe, top of pipe, size and type.

8. Provide as-built information on plan and profile when profile is included in original plans.

9. As-built lengths of water service lines.

10. As-built fire hydrant locations and type of hydrant used including flange grade.

11. As-built all flush hydrants and size, if any.

12. Size of mains, service lines, backflows, meters, etc.

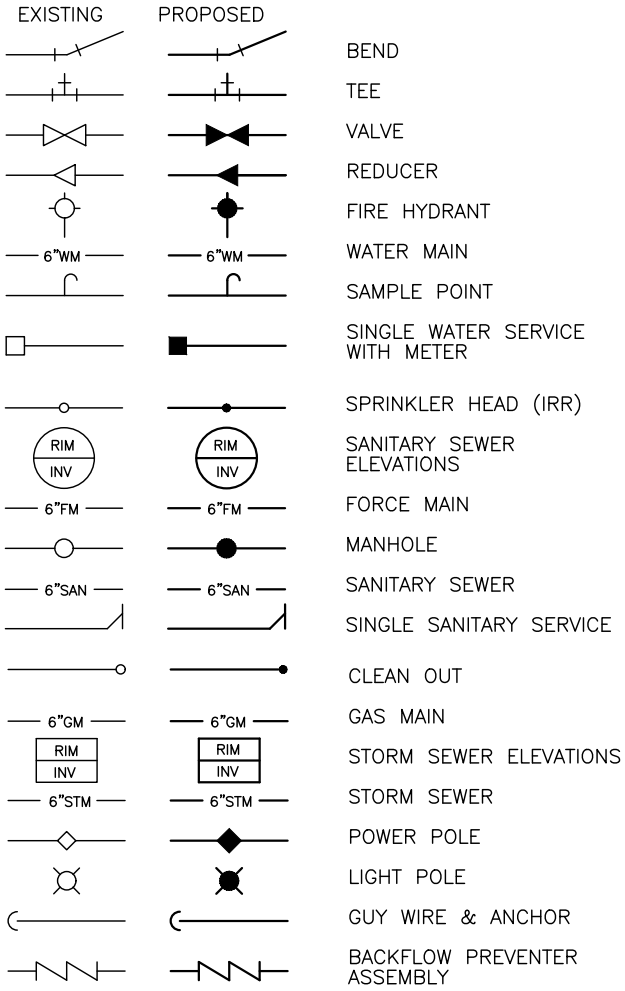
13. As-built blow up detail may be required of congested areas to ensure readability.

EXHIBIT "F"

CONSTRUCTION DETAILS
GENERAL DETAILS

WATER DETAILS

SEWER DETAILS



PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

Symbols

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 1

STANDARD WATER AND SEWER SEPARATION STATEMENT

1. STORM SEWER, GRAVITY WASTEWATER AND FORCE MAINS CROSSING UNDER POTABLE WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF TWELVE (12) INCHES BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE CROWN OF THE LOWER PIPE. WHERE THIS MINIMUM SEPARATION CANNOT BE MAINTAINED BETWEEN GRAVITY SEWER OR STORM SEWER, THE CROSSING SHALL BE ARRANGED SO THAT THE STORM/GRAVITY SEWER PIPE JOINTS AND POTABLE WATER MAIN JOINTS ARE EQUIDISTANT FROM THE POINT OF CROSSING WITH NO LESS THAN SIX (6) FEET BETWEEN ANY TWO JOINTS, BOTH PIPES SHALL BE D.I.P., AND THE MINIMUM VERTICAL SEPARATION SHALL BE SIX (6) INCHES. WHERE THERE IS NO ALTERNATIVE TO STORM/WASTEWATER/FORCE MAIN MAINS CROSSING OVER A POTABLE WATER MAIN, THE CRITERIA FOR MINIMUM TWELVE (12) INCH VERTICAL SEPARATION BETWEEN LINES AND JOINT ARRANGEMENT, AS STATED ABOVE, SHALL BE REQUIRED, AND BOTH PIPES SHALL BE D.I.P. IRRESPECTIVE OF SEPARATION, IN ALL OF THE ABOVE CASES D.I.P. IS NOT REQUIRED FOR STORM SEWER PIPE.

2. FORCE MAINS CROSSING STORM SEWER SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF TWELVE (12) INCHES BETWEEN THE OUTSIDE OF THE FORCE MAIN AND THE OUTSIDE OF THE STORM SEWER.

3. AT THE UTILITY CROSSING DESCRIBED IN ITEMS 1 AND 2 ABOVE, ONE FULL LENGTH OF DUCTILE IRON WATER MAIN PIPE SHALL BE CENTERED SO THE WATER MAIN JOINTS WILL BE AS FAR AS POSSIBLE FROM THE OTHER PIPELINE JOINTS. WHERE THIS IS NOT POSSIBLE, JOINTS SHALL BE AT LEAST THREE (3) FEET FROM STORM SEWERS AND SIX (6) FEET FROM GRAVITY SEWER MAINS AND FORCE MAINS.

4. SEWER SERVICE LATERALS SHALL CROSS UNDER WATER MAINS WITH A MINIMUM VERTICAL SEPARATION OF TWELVE (12) INCHES. IF 12" VERTICAL SEPARATION CANNOT BE MAINTAINED, THEN THE WATER MAIN SHALL BE D.I.P. AND THE SEWER SERVICE LATERAL SHALL BE C-900 SDR 18 OR BETTER AND THE MINIMUM SEPARATION SHALL BE SIX (6) INCHES. WHEN IT IS NOT POSSIBLE FOR THE WATER MAIN TO CROSS OVER THE SEWER SERVICE LATERAL A MINIMUM VERTICAL SEPARATION OF AT LEAST TWELVE (12) INCHES MUST BE MAINTAINED, THE WATER MAIN SHALL BE D.I.P. AND THE SEWER LATERAL SHALL BE C-900 SDR 18 OR BETTER.

5. MAINTAIN MINIMUM TEN (10) FEET HORIZONTAL DISTANCE BETWEEN POTABLE WATER MAIN OR FORCE MAIN, STORM SEWER OR GRAVITY SEWER MAIN OR ON SITE SEWAGE DISPOSAL SYSTEMS. ADDITIONAL SEPARATION MAY BE REQUIRED AS DETERMINED BY THE LDRB.

NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. THIS METHOD SHALL BE COMPLIED WITH WHEN CONNECTING TO AN EXISTING WATER MAIN, (ONE THAT HAS ALREADY BEEN BACTERIOLOGICALLY CLEARED OR IS IN USE) WHETHER BY TEE AND VALVE OR BY CONTINUATION OF A PLUGGED STUB OUT WITH AN EXISTING GATE VALVE.

2. THESE REQUIREMENTS ARE BASED ON PALM BEACH COUNTY HEALTH DEPARTMENT REQUIREMENTS.

3. WHEN A TAPPING TEE AND VALVE IS INSTALLED, A PRESSURE/LEAKAGE TEST SHALL BE PERFORMED ON THE ASSEMBLY IN THE PRESENCE OF AN AUTHORIZED POAPWS REPRESENTATIVE PRIOR TO PERFORMING THE ACTUAL TAP.

4. ALL TAPS ON PIPE SIX (6) INCH IN DIAMETER AND LARGER SHALL BE INSTALLED AT THE CENTER/MIDDLE OF A LENGTH OF PIPE.

5. DOUBLE VALVING PERMITS PHYSICAL CONNECTION TO AN EXISTING WATER MAIN WHEN USED IN CONJUNCTION WITH A BYPASS LINE.

6. A 2" BYPASS LINE (MAXIMUM) SHALL BE INSTALLED AS SHOWN BELOW PRIOR TO CANNON FLUSHING.

7. THE 2" TEE SHALL BE USED FOR FEEDING CHLORINE SOLUTION AND FOR ATMOSPHERIC VENT DURING PRESSURE/LEAKAGE TESTS.

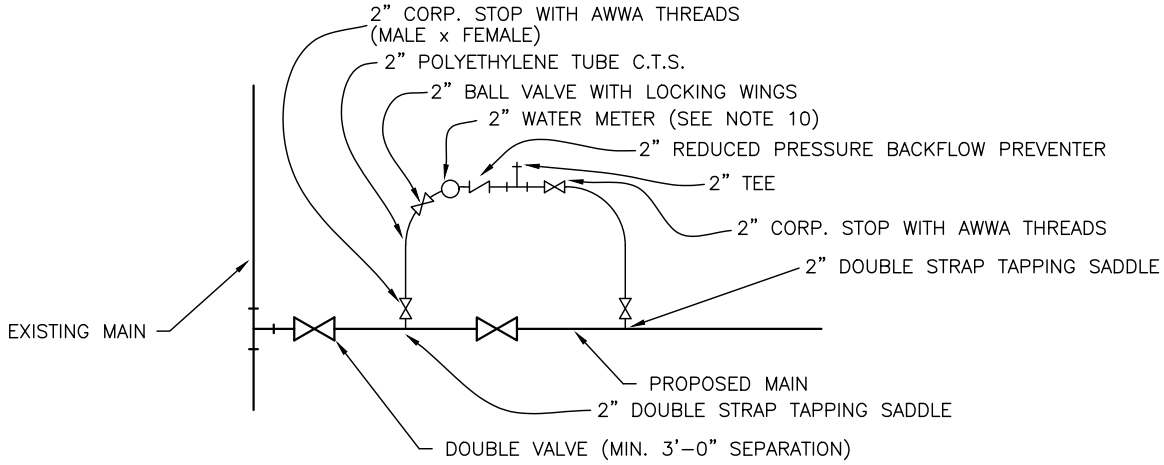
8. UNDER NO CIRCUMSTANCES SHALL VALVES BE OPERATED WITHOUT AN AUTHORIZED POAPWS REPRESENTATIVE PRESENT.

9. ALL WATER MAINS SHALL BE FILLED WITH WATER UTILIZING JUMPER METER AND THEN BE THOROUGHLY CANNON FLUSHED IN ACCORDANCE WITH PBPOC POA SPECIFICATIONS PRIOR TO PRESSURE/LEAKAGE TESTING. THE PROCEDURE SHALL BE DONE ONLY IN THE PRESENCE OF AN AUTHORIZED POAPWS REPRESENTATIVE.

10. FOLLOWING INITIAL CANNON FLUSHING, ALL WATER FOR PRESSURE/LEAKAGE TESTING AND BACTERIOLOGICAL CLEARANCES MUST BE DRAWN FROM THE BYPASS LINE WITH METER AND REDUCED PRESSURE BACKFLOW PREVENTER IN PLACE. THE WATER METER SHALL BE PROVIDED BY THE PBPOC POA. ALL WATER USED FOR CONSTRUCTION PURPOSES SHALL BE IN ACCORDANCE WITH THE PBPOC POA UNIFORM SERVICE POLICY. METER, BALL VALVE, REDUCED PRESSURE BACKFLOW PREVENTER AND TEE SHALL INSTALLED AT LEAST 18" ABOVE EXISTING GRADE, SUPPORTED, AND PROTECTED FROM DAMAGE. ANY DAMAGE SHALL BE APPLICANT'S RESPONSIBILITY AND SHALL BE CHARGED ACCORDINGLY.

11. EXCEPT DURING CANNON FLUSHING VALVES SHALL NOT BE OPENED UNTIL AFTER AN APPROVED PRESSURE/ LEAKAGE TEST, BACTERIOLOGICAL CLEARANCE, CERTIFICATION BY THE ENGINEER OF RECORD, RELEASE FROM THE PALM BEACH COUNTY HEALTH DEPARTMENT AND APPROVAL BY POAPWS.

12. DISINFECTION AND BACTERIOLOGICAL CLEARANCES SHALL COMPLY WITH CURRENT AWWA PROCEDURES, PALM BEACH COUNTY HEALTH DEPARTMENT, AND FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION REQUIREMENTS.



Tapping and Main Clearing Procedure

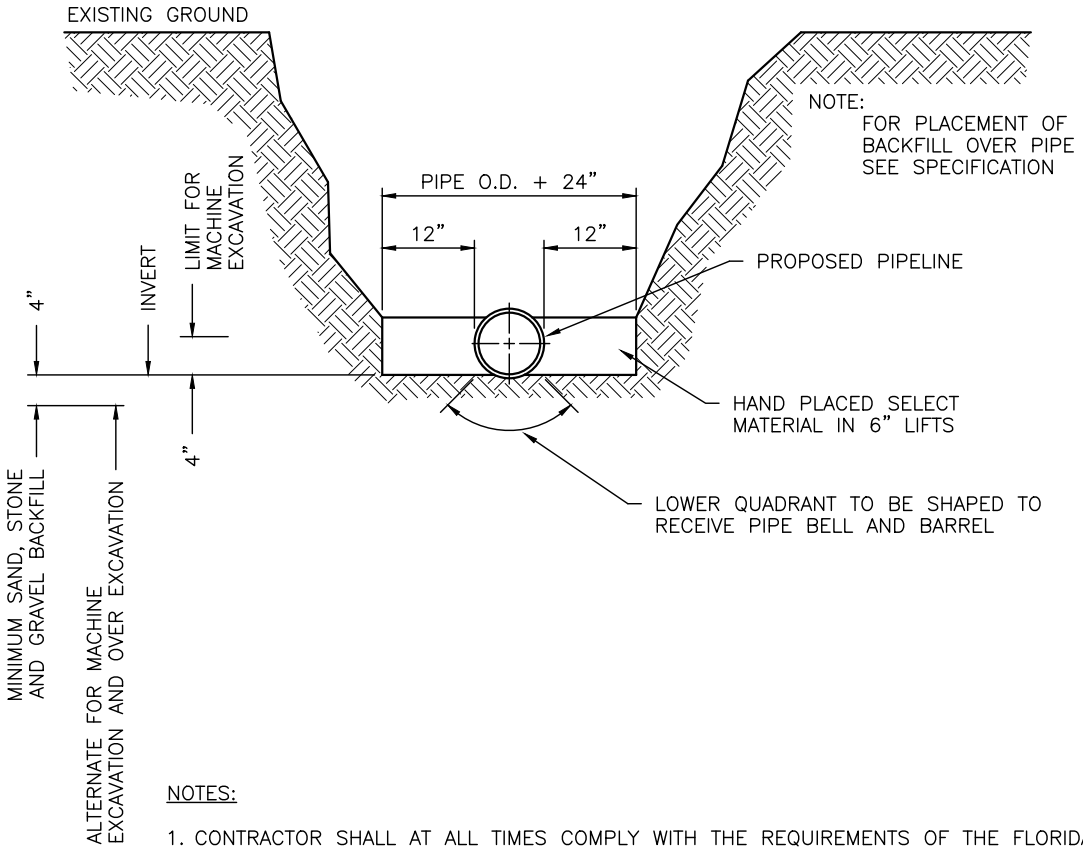
PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 3

(PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)



NOTES:

1. CONTRACTOR SHALL AT ALL TIMES COMPLY WITH THE REQUIREMENTS OF THE FLORIDA TRENCH SAFETY ACT.
2. EXCAVATION, SIDE SLOPE SHORING, ETC. SHALL CONFORM TO O.S.H.A. STANDARDS. COMPACT TRENCH BACKFILL TO 98% OF MAXIMUM DENSITY IN ACCORDANCE WITH AASHTO T-180. DENSITY TESTS SHALL BE TAKEN AT TWELVE (12) INCH LIFTS EVERY 100' IN PUBLIC RIGHT-OF-WAY AND 200' IN EASEMENTS
3. FOR PLACEMENT OF BACKFILL OVER PIPE SEE SPECIFICATION

Standard Trenching Procedure

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 4

PUSH ON JOINT PIPE RESTRAINT REQUIREMENTS AT FITTINGS, VALVES AND DEAD ENDS

PIPE SIZE	90° BEND	45° BEND	22½° BEND	11¼° BEND	REDUCER	VALVE	DEAD END	TEE
4"	54'	54'	36'	36'	54'	72'	72'	72'
6"	54'	54'	36'	36'	54'	72'	72'	72'
8"	54'	54'	36'	36'	54'	72'	72'	72'
10"	54'	54'	36'	36'	54'	108'	108'	108'
12"	72'	72'	54'	54'	72'	108'	108'	108'
14"	72'	72'	54'	54'	72'	108'	108'	108'
16"	72'	72'	54'	54'	72'	154'	154'	154'
18"	72'	72'	54'	54'	72'	154'	154'	154'
20"	90'	90'	54'	54'	90'	154'	154'	154'
24"	90'	90'	54'	54'	90'	172'	172'	172'
30"	90'	90'	54'	54'	90'	180'	180'	180'
36"	90'	90'	54'	54'	90'	270'	270'	270'
42"	108'	108'	54'	54'	108'	270'	270'	270'
48"	108'	108'	54'	54'	108'	270'	270'	270'
54"	108'	108'	54'	54'	108'	270'	270'	270'

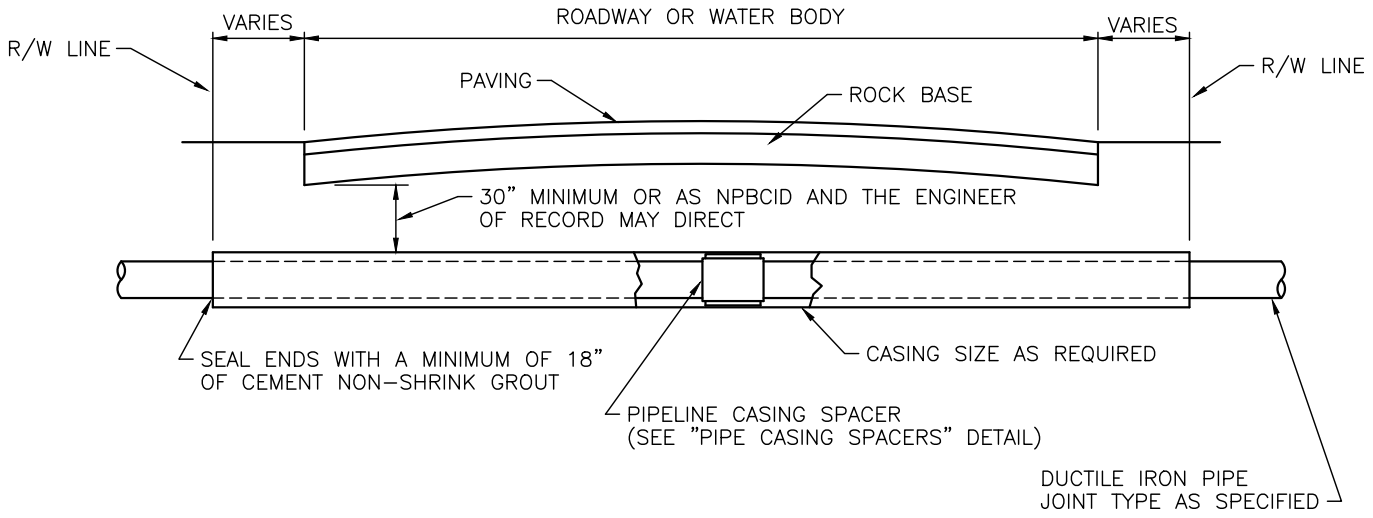
MINIMUM LENGTH OF PUSH ON JOINT PIPE WITH SPECIAL RESTRAINING GASKETS

NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. ALL BURIED PRESSURE MAINS SHALL INCLUDE A RESTRAINED JOINT SYSTEM. THE CONTRACTOR SHALL USE A DUCTILE IRON RESTRAINING SYSTEM AS MANUFACTURED BY EBAA IRON, INC. (MEGALUG) OR APPROVED EQUAL FOR ALL MECHANICAL JOINT FITTINGS AND LOCKING GASKETS FOR PUSH–ON JOINT PIPE.

2. RESTRAINING LENGTHS SHOWN ARE THE MINIMUM LENGTH REQUIRED BASED ON A TEST PRESSURE OF 150 P.S.I.G. WITH A MINIMUM COVER OF 30".

3. IF LENGTH BETWEEN MECHANICAL JOINT FITTINGS AND/OR VALVES IS LESS THAN THE MINIMUM LENGTHS SHOWN IN THIS TABLE, THE CONTRACTOR SHALL RESTRAIN THE ENTIRE LENGTH.



	NOMINAL PIPE SIZE	STEEL CASING	THICKNESS SCHEDULE
FAST GRIP OR FIELD LOK GASKET	4"	12"	.375
	6"	16"	.375
	8"	18"	.375
	10"	20"	.375
	12"	24"	.375
	14"	24"	.375
	16"	30"	.375
	18"	30"	.375
	20"	36"	.375
	24"	42"	.500
RESTRAINED MECHINICAL JOINT	30"	48"	.500
	36"	54"	.500
	42"	60"	.500
	48"	72"	.500

(PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

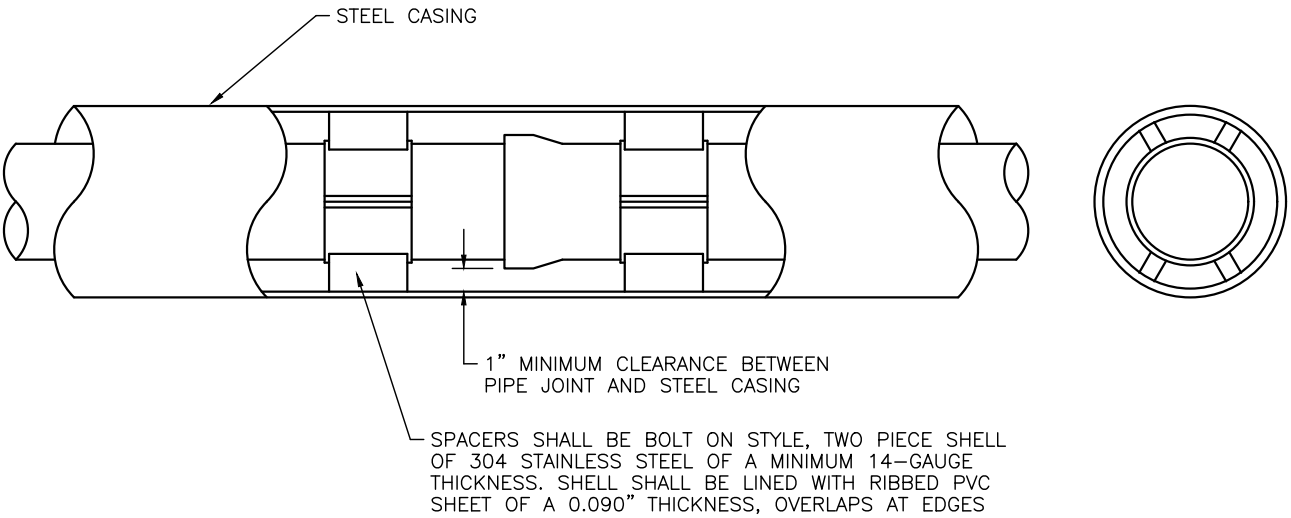
Steel Casing Installation

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 6



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. CARRIER PIPE FOR 4" THROUGH 24" DIAMETER PIPE WITHIN CASING SHALL BE RESTRAINT GASKET.
2. RESTRAINED MECHANICAL JOINTS SHALL BE USED FOR PIPE 30" DIAMETER AND ABOVE AND SHALL HAVE FACTORY WELDED RETAINING RINGS. AMERICAN RESTRAINED JOINT PIPE OR APPROVED EQUAL MAY BE USED.
3. FOR PIPE DIAMETERS 4" THROUGH 12" INSTALL STAINLESS STEEL PIPE CASING SPACERS 5' OR LESS FROM EACH END OF PIPE BUT NOT MORE THAN 10' APART (2 PER PIPE). FOR PIPE DIAMETERS 14" AND LARGER INSTALL STAINLESS STEEL PIPE CASING SPACERS 5' OR LESS FROM EACH END OF PIPE AND ONE CENTERED ON PIPE (3 PER PIPE)(CASCADE MFG. CO. OR APPROVED EQUAL).
4. PIPE CASING SPACERS SHALL BE CENTER POSITIONED.
5. ALTERNATE METHODS OF PIPE SUPPORT WITHIN THE CASING MUST BE APPROVED BY POAPWS PRIOR TO INSTALLATION.

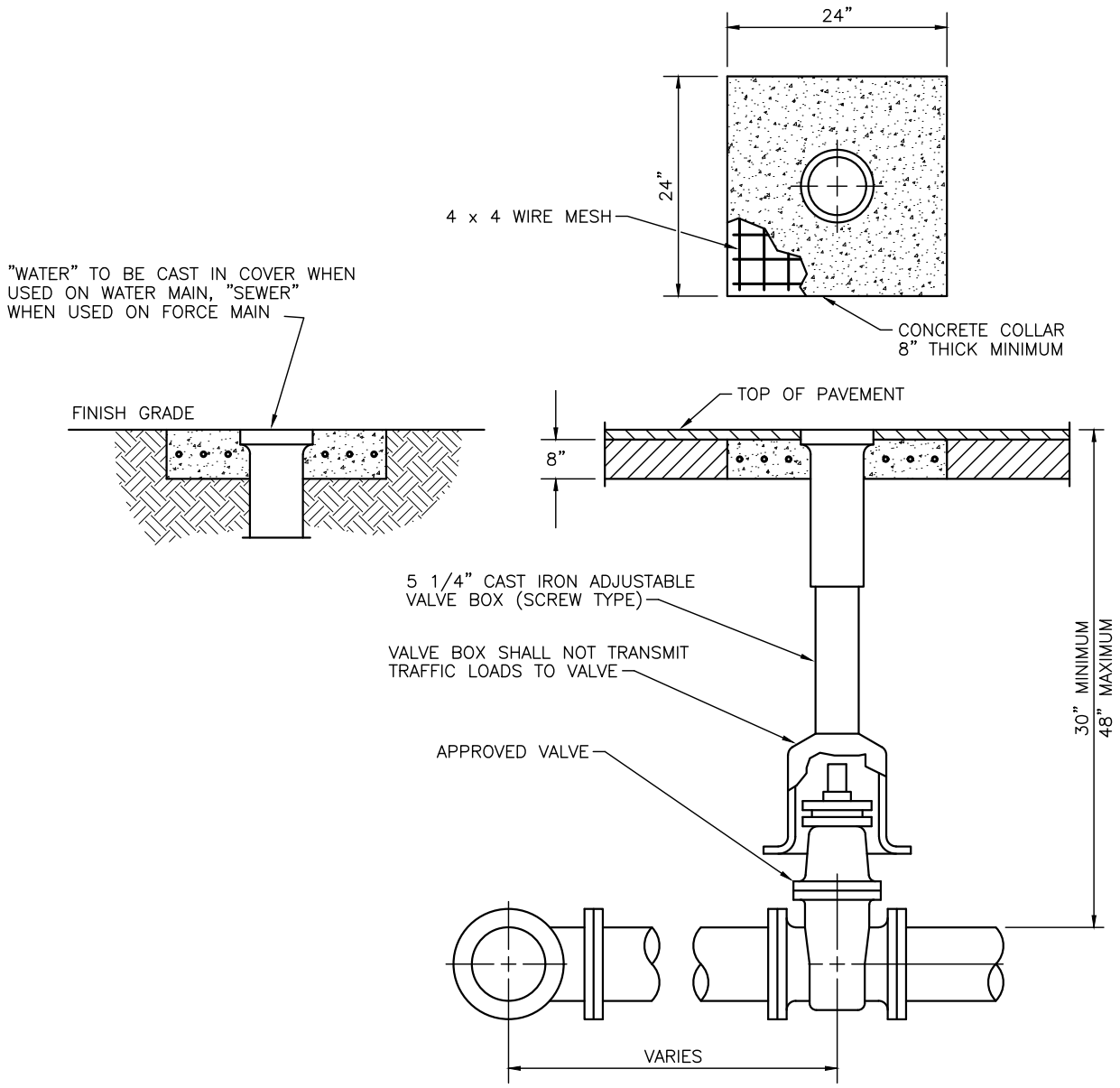
Pipe Casing Spacers

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 7



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. CONCRETE COLLAR MAY NOT BE REQUIRED IN PAVED AREAS IF PAVEMENT SURFACE IS FINISHED PRIOR TO FINAL INSPECTION AND VALVE BOX LID IS AT FINISHED GRADE.

2. WHEN VALVE IS DEEPER THAN 48" AN EXTENSION WILL BE REQUIRED TO BRING OPERATING NUT TO 24" OF FINISHED GRADE.

3. TWO OF THE FOLLOWING FORMS OF RESTRAINT SHALL BE USED WHEN PIPE IS GREATER THAN 12".
   A) APPROVED MECHANICAL JOINT RESTRAINT (i.e. MEGALUG)
   B) TIE RODS AND NUTS EQUAL IN DIA. TO TEE BOLTS AND NUTS, COATED WITH KOP–COAT 300–M OR APPROVED EQUAL.

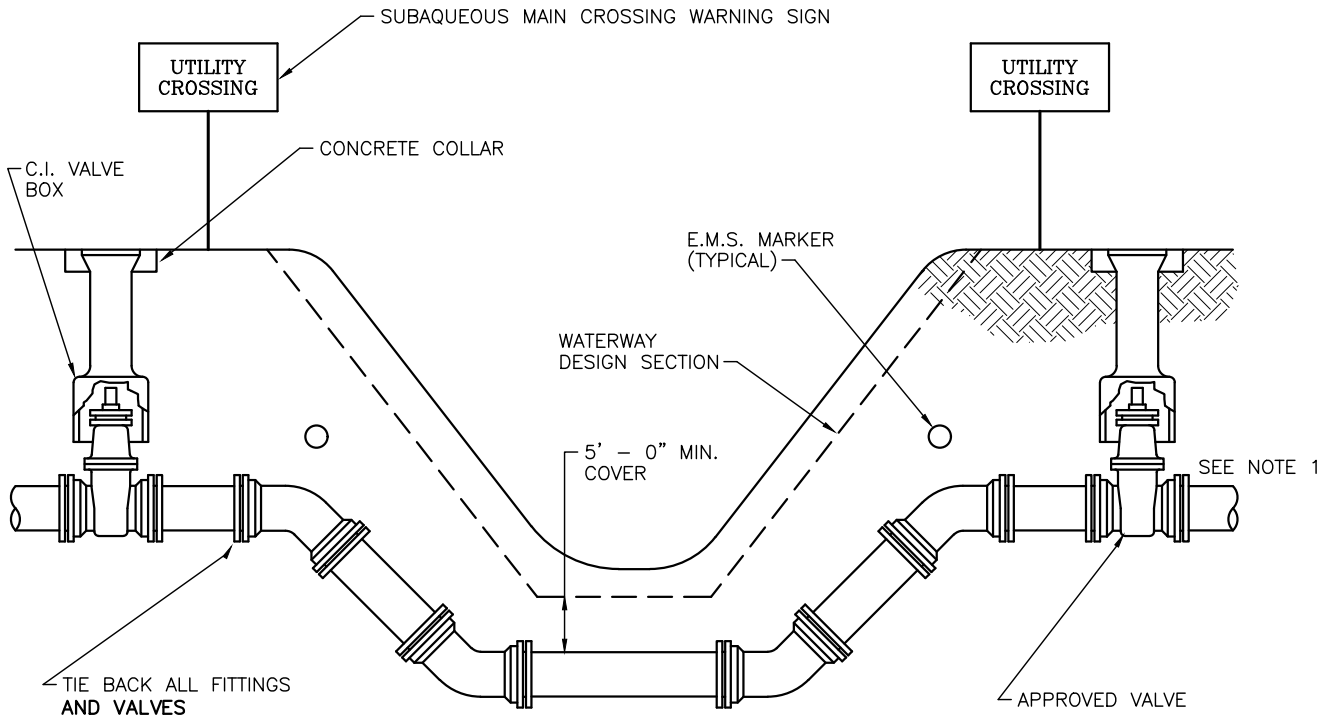
Typical Underground Valve Installation

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 8



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. DIRECT BURY ALLOWED ONLY IF DIRECTIONAL BORE METHOD IS NOT FEASIBLE.
2. VALVES TO BE TIED BACK TO NEAREST FITTING ONE EACH SIDE PER POAPWS STANDARDS. ALL TIE RODS AND BOTS SHALL BE COATED WITH KOPPERS 300–M OR APPROVED EQUAL.
3. VALVE EXTENSIONS AND BOXES SHOULD NOT BE LOCATED IN THE MAINTENANCE EASEMENT WITHOUT NPBCID APPROVAL.
4. MEGALUG RESTRAINTS REQUIRED. (TYPICAL)
5. FLOW THROUGH CANAL SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.
6. FLOW DIVERSION WILL NOT BE PERMITTED DURING WET SEASON.
7. IN SOME CASES AIR RELIEF VALVES MAY BE REQUIRED.

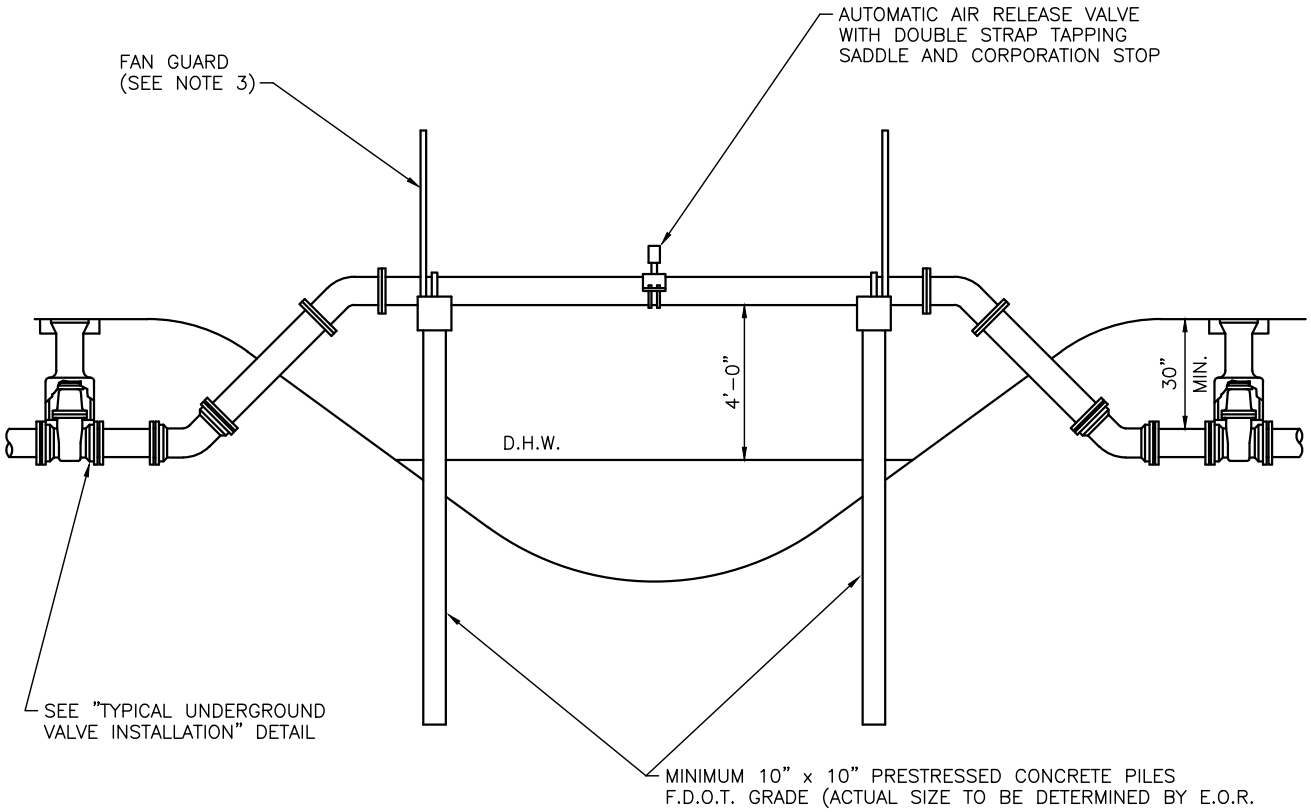
Subaqueous Crossing - Direct Bury

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 9



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. ALL EXPOSED PIPE SHALL BE DUCTILE IRON WITH FLANGED FITTINGS. RETAINER GLANDS AND UNIFLANGE TYPE FITTINGS ARE NOT TO BE SUBSTITUTED FOR FLANGED FITTINGS.
2. SPAN LENGTHS AS REQUIRED BY PERMITTING AGENCY.
3. FAN GUARDS ARE REQUIRED. SEE "TYPICAL FAN GUARD" DETAIL.
4. PIPE SHALL BE CRADLED ON NEOPRENE, 1/2" THICK MINIMUM.
5. TIE-DOWN STRAPS SHALL FIT PROPERLY AND SECURE PIPE IN CRADLE.
6. PIPE CRADLE IN CAP SHALL CONTACT 1/2 CIRCUMFERENCE OF PIPE.
7. SHOW ULTIMATE CANAL SECTION AND RELEVANT ELEVATIONS AND DISTANCES ON PLANS.
8. PIPE SHALL BE RESTRAINED FOR A MINIMUM DISTANCE OF 60' FROM EACH BOTTOM DEFLECTION. SEE "PIPE RESTRAINT TABLE" DETAIL FOR ADDITIONAL RESTRAINT DISTANCES FOR PIPE 12" AND LARGER.
9. TWO OF THE FOLLOWING FORMS OF RESTRAINT SHALL BE USED ON ALL BELOW GRADE FITTINGS.
   A) APPROVED MECHANICAL JOINT RESTRAINT. (i.e. MEGALUG)
   B) TIE ROD AND NUTS EQUAL IN DIA. TO TEE BOLTS AND NUTS, COATED WITH KOP-COAT 300-M OR APPROVED EQUAL.
10. STAINLESS STEEL (316) REQUIRED FOR ALL STRAPS, SADDLES, FLANGE BOLTS, AND OTHER HARDWARE FOR INSTALLATIONS OVER BRACKISH OR MARINE WATERS (ANTI-GALL COMPOUND TO BE USED WHEN ASSEMBLING STAINLESS STEEL NUTS AND BOLTS.)
11. PILES SHALL BE SET A MINIMUM OF 10' INTO FIRM SOIL. LENGTH OF SPAN WILL DETERMINE NUMBER OF PILES REQUIRED.
12. AERIAL CROSSING TO BE FIELD COATED PER SPECIFICATIONS. COLOR SHALL BE PER SPECIFICATIONS.
13. ENGINEER SHALL BE REQUIRED TO DESIGN AND PROVIDE A DETAILED DRAWING OF PROPOSED PILE AND PILE CAP. THE DESIGN AND INSTALLATION SHALL MEET MANUFACTURERS RECOMMENDATION.

Canal Crossing

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

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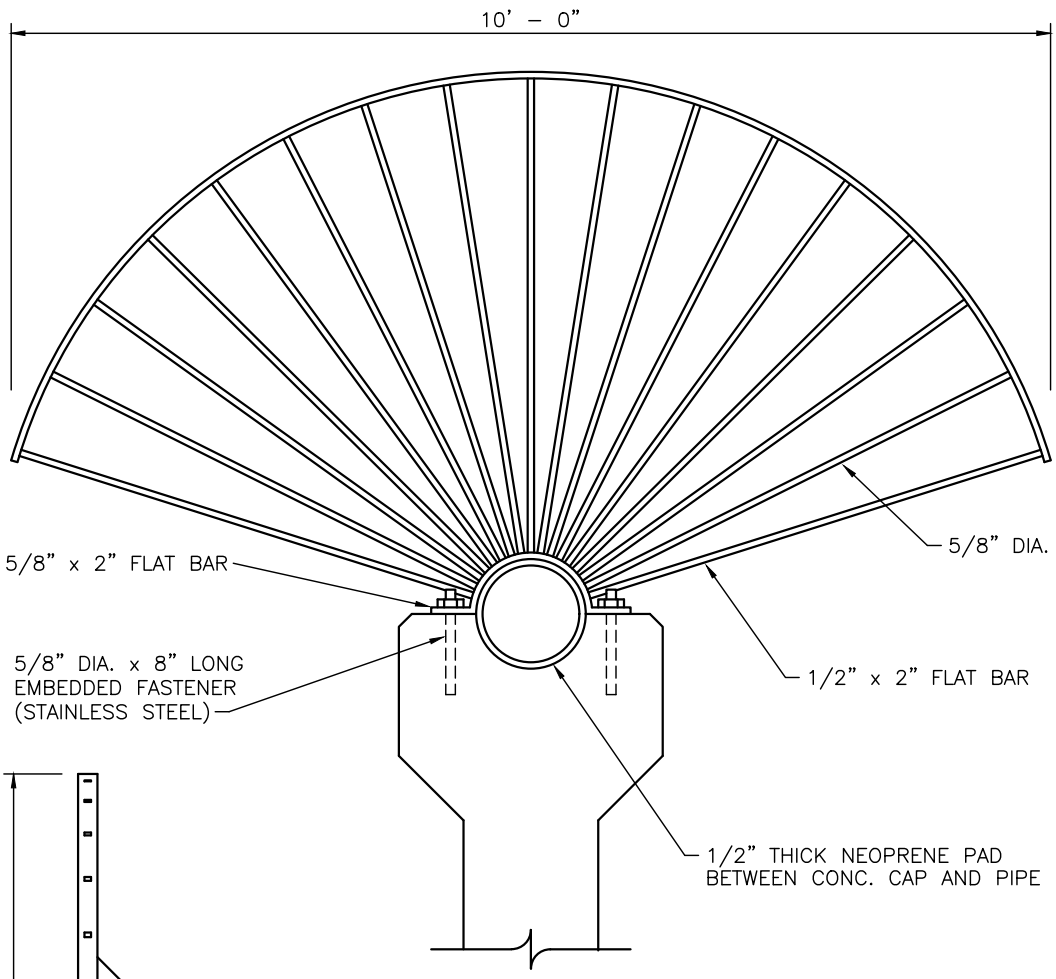
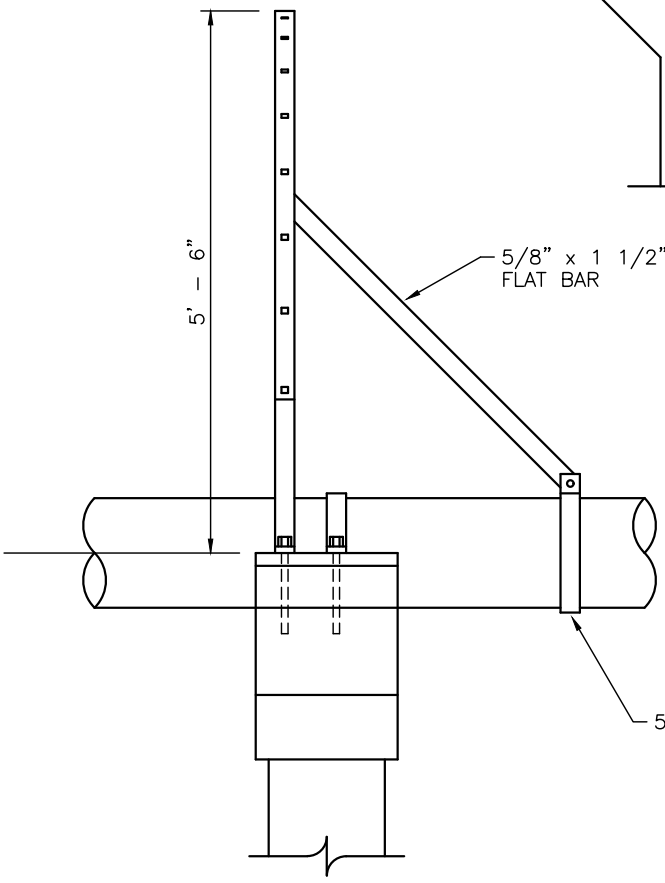




NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. FAN GUARDS SHALL BE PLACED AT EACH END OF CANAL CROSSING.
2. FAN GUARD AND ALL MOUNTING BRACKETS TO BE HOT DIP GALVANIZED AFTER FABRICATION AND MOUNTING HARDWARE TO BE STAINLESS STEEL.
3. 1/2" THICK NEOPRENE PAD TO INSULATE PIPE FROM CONTACT WITH ALL MOUNTING HARDWARE, FAN GUARD HARDWARE, AND CONCRETE SURFACES.

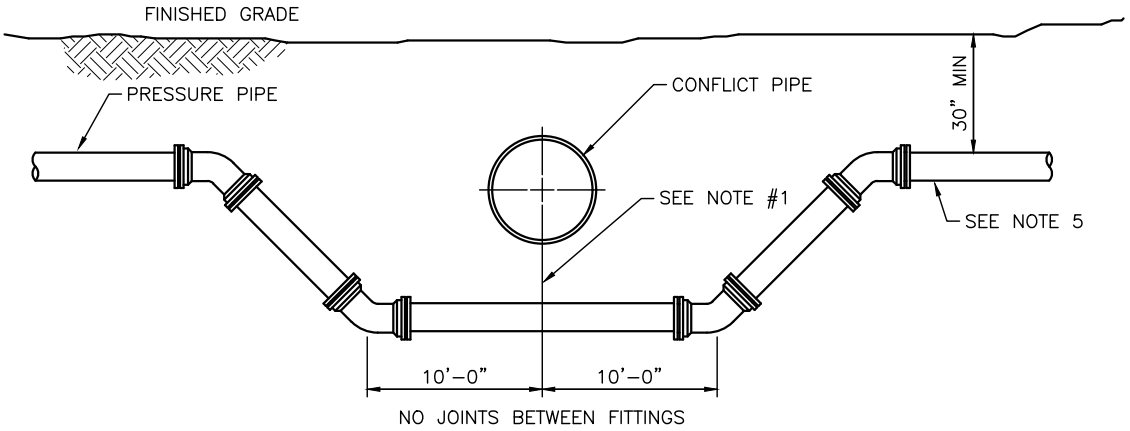
Typical Fan Guard

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

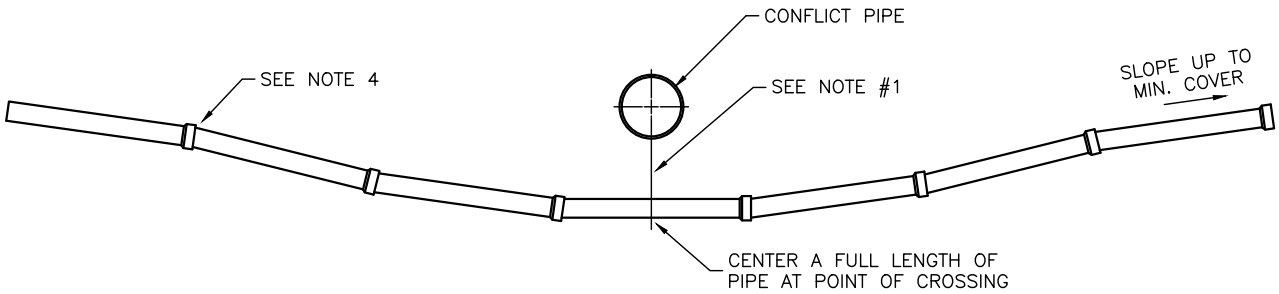
CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 11



FITTING TYPE



DEFLECTION TYPE

NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. FOR VERTICAL SEPARATION SEE "WATER AND SEWER SEPARATION STATEMENT" DETAIL.
2. ONE OF THE FOLLOWING FORMS OF RESTRAINT SHALL BE USED FROM FITTING TO FITTING FOR PIPE SIZES UP TO AND INCLUDING 12", FOR PIPE SIZES GREATER THAN 12" BOTH FORMS OF RESTRAINT SHALL BE USED.
   A) APPROVED MECHANICAL JOINT RESTRAINT. (i.e. MEGALUG)
   B) TIE RODS AND NUTS EQUAL IN DIA. TO TEE BOLTS AND NUTS, COATED WITH KOP–COAT 300–M OR APPROVED EQUAL.
3. THE DEFLECTION TYPE CROSSING IS PREFERRED, BUT IN INSTANCES WHERE THE FITTING TYPE DEFLECTION IS USED, 22 1/2° BENDS ARE PREFERRED.
4. DO NOT EXCEED 75% OF MANUFACTURERS RECOMMENDED MAXIMUM JOINT DEFLECTION.
5. PIPE SHALL BE RESTRAINED FOR A MINIMUM DISTANCE OF 60' FROM EACH TOP DEFLECTION. SEE "PIPE RESTRAINT TABLE" DETAIL FOR ADDITIONAL RESTRAINT DISTANCES FOR PIPE GREATER THAN 12".

Pressure Pipe Deflection

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 12

INSTALLATION PROTOCOL

1. All pipe is to be laid in a clean dry trench.

2. All muck and unsuitable materials encountered in trench bottom shall be removed and replaced with compacted granular material to 100% of maximum density per AASHTO T–180. Proctor and density test results shall be submitted to EOR with a copy to PBPOC POA.

3. All backfill shall be placed in 12 inch lifts and compacted by mechanical means to 98% of maximum density per AASHTO T–180 or as otherwise required by the permitting agency.

4. Utilities crossing road right–of–way shall be installed prior to road construction and backfilled and compacted within right–of–way limits in strict accordance with the directions of the EOR and requirements of all agencies of jurisdiction.

5. Embedment materials below pipe shall conform to Unified Soil Classification System (U.S.C.S.) Soil Classification Class I or II as noted in ASTM D2321.

6. All lines under construction shall be plugged with a wing plug, and all pressure pipes are to be plugged with a mechanical plug or cap at the end of the working day to prevent ground water and potential contaminants from entering completed lines and lines under construction.

7. Above ground piping, including but not limited to, aerial crossings, lift station piping, fire lines, meter/backflow prevention device assemblies, etc. shall be flanged and be coated in the following manner:

   Blast clean and remove all paint and any loose material in accordance with NADF 500–3. Blasting Cleaning shall be performed using non–silcia media. Paint all exterior ferrous metal surfaces. The manufacturer's recommendations for surface preparation, priming, recoating, etc. shall be strictly followed. Do not paint or coat any nameplates, brass or stainless steel surfaces. Contractor shall use the following paint system or approved equal. TNEMEC
   a. Primer: TNEMEC–MODIFIED POLYAMIDOAMINE EPOXY #135 (3.0 to 5.0 mils DFT) aluminum color
   b. Intermediate Coat: TNEMEC–MODIFIED POLYAMIDOAMINE EPOXY (3.0 to 5.0 mils DFT) off white color
   c. Finish Coat: Series 1074 Endura–Shield, DFT.

   The finished coat of paint shall be green in color for sanitary sewer and blue for potable water appurtenances.

8. All flanged pipe shall be caulked between each flange and threads with Sika 1 A urethane caulk.

9. All tie rods, bolts, nuts, etc. installed underground must be Cor Ten and shall be painted with Koppers 300–M or an approved equal. Brass and stainless steel hardware is exempt from this requirement.

10. Coatings and linings damaged due mishandling or otherwise, must be replaced. Coating and linings damaged due to field cutting shall be repaired in strict accordance with the manufacturer's recommendations. This includes, but is not limited to, cement mortar and polyethylene pipe linings, Protecto 401, galvanized coatings, PVC fence coatings and other paint type coatings. Specific approval must be obtained from POAPWS prior to performing coating and lining repairs. The POAPWS will require inspections of all repairs.

11. All stainless steel nuts, bolts and hardware referenced in these standards, shall be SS 316 grade and shall be so stamped by the manufacturer to verify alloy. The use of any other stainless steel alloy will require specific approval by the POAPWS. In general, stainless steel nuts, bolts and hardware are required in and around lift stations and for facilities installed over or under brackish or marine waters. This requirement applies to flange bolts and nuts on flanged piping, mounting brackets, all thread rod, anchor bolts, washers, clamps and other miscellaneous hardware. Anti–galling compound anti–seize lubricant shall be applied to the threads of all stainless steel bolts prior to installation.

    Anti–seize lubricant shall be graphite 50 anti–seize by Loctite Corporation, 1000 anti–seize paste by Dow Corning, 3M Lube and anti–seize by 3M.

12. All rubber and synthetic elastomeric components of products that come in contact with potable water shall be manufactured with chloramine resistant elastomers and shall bear NSF approval.

13. All main, including fittings, shall be easily identifiable as to their contents and shall be color coded or marked using the universal color code of blue for water and green for sewer. Pipe striped during manufacturing of the pipe shall have continuous stripes that run parallel to the axis of the pipe, that are located at no greater than 90–degree intervals around the pipe, and that will remain intact during and after installation of the pipe. If tape is used to stripe pipe during installation of the pipe, the tape shall be applied in a continuous line that runs parallel to the axis of the pipe and that is located along the top of the pipe; for pipes with an internal diameter of 24 inches or greater, tape shall be applied in continuous lines along each side of the pipe as well as along the top of the pipe.

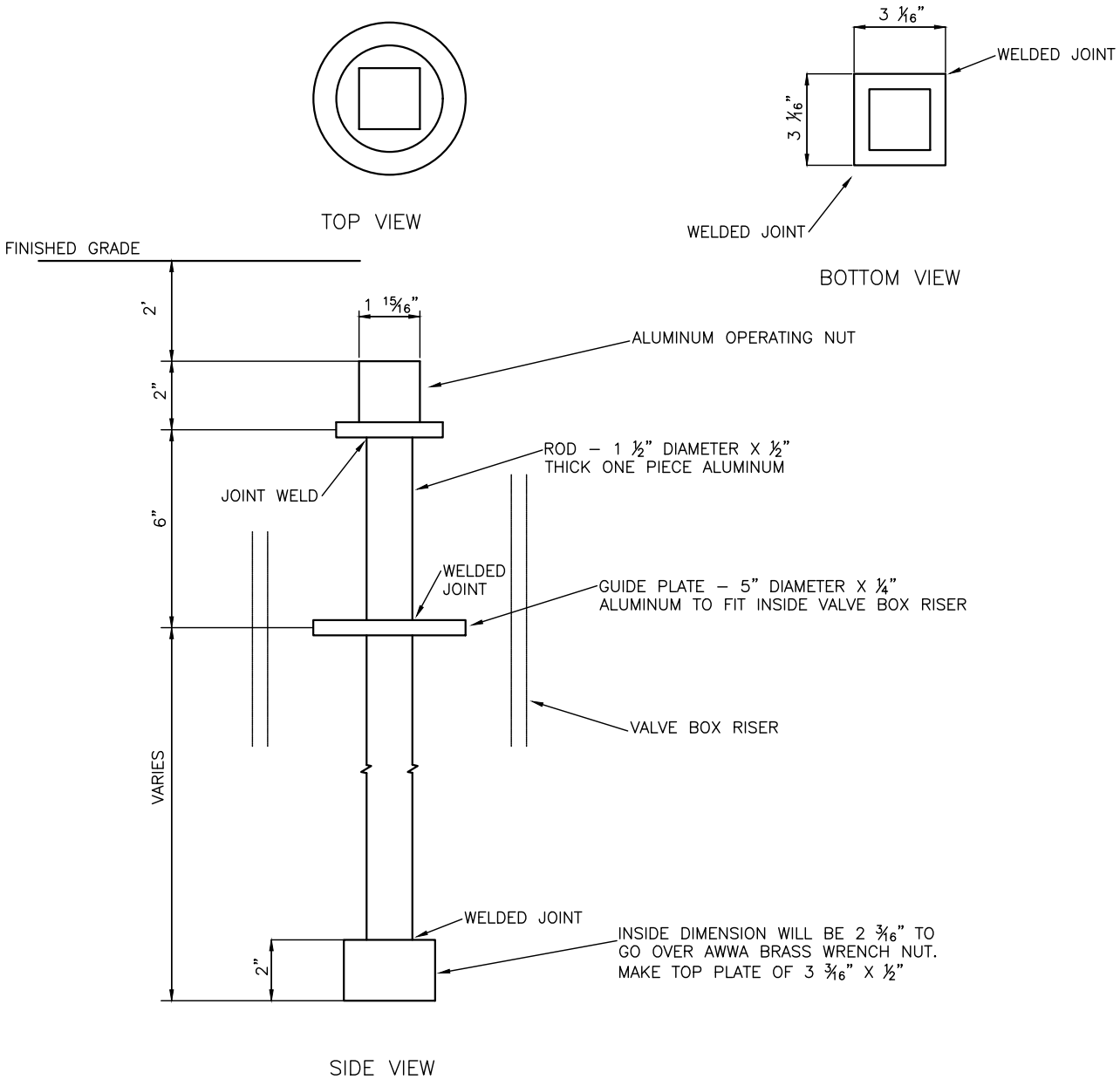
Pipe Installation Protocol

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 13



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. EXTENSIONS ARE REQUIRED FOR VALVES EXTENDING FOR MORE THAN 4 FEET BELOW FINISHED GRADE.
2. ALL MATERIALS SHALL BE 6061 T–6 ALUMINUM.

Valve Extension

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

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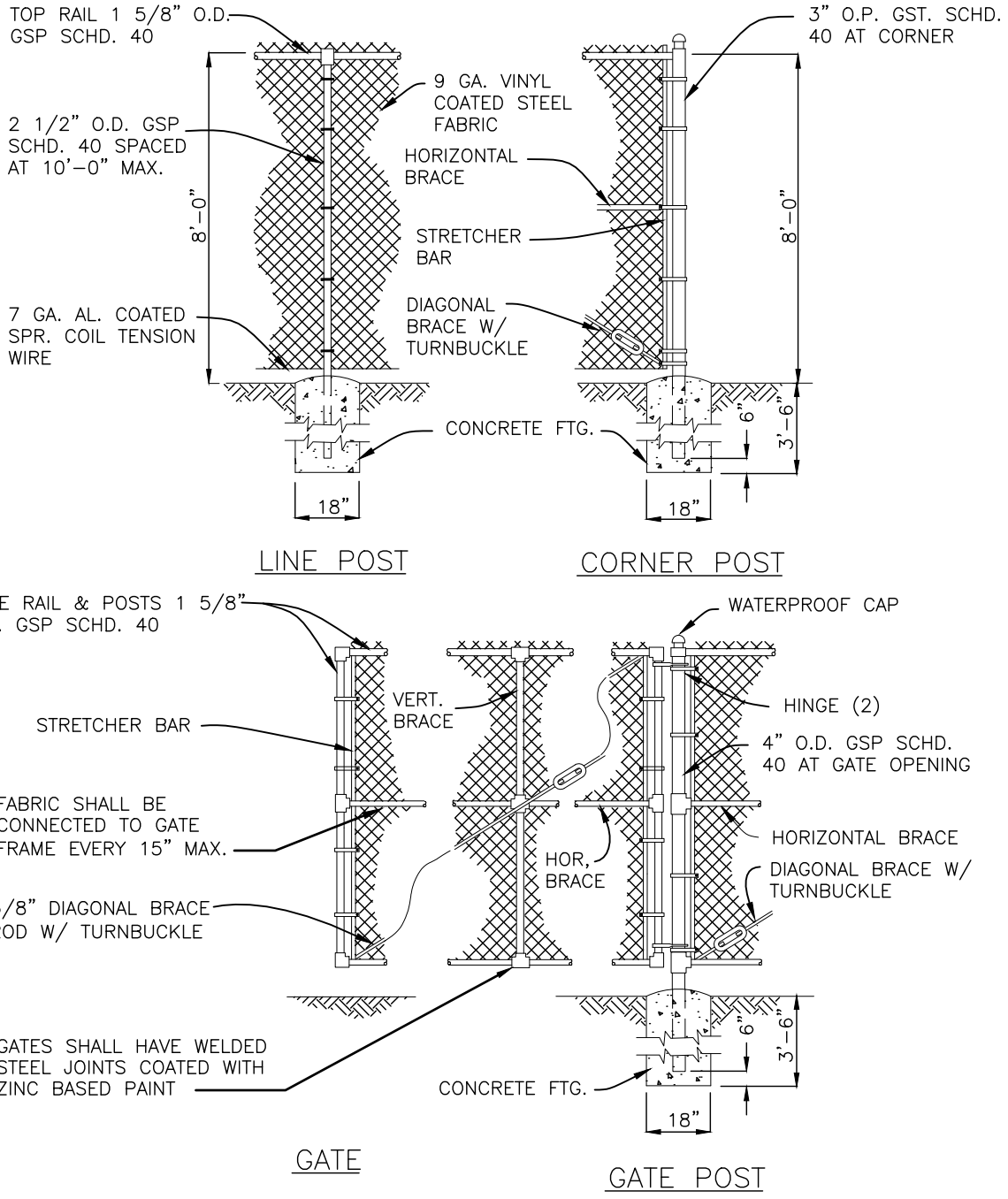


NOTES:

1. GATE TO BE SIZED PER REQUIREMENTS
2. VINYL COATED STEEL WOVEN WIRE FABRIC TO BE STRETCHED TAUT W/ STRETCHER BARS AND STRAPS AND FASTENED TOP & BOTTOM AND AT LINE POSTS WITH GALV. PIG RING TIES.
3. GATE TO BE SECURED OPEN WITH GATE STOP SET IN CONCRETE.
4. ALL RAILS, POSTS AND HARDWARE TO BE BLACK VINYL COATED.
5. WHERE POSTS COME IN CONTACT WITH CONCRETE THEY SHALL BE COATED WITH KOPPERS 300M OR APPROVED EQUAL.
6. GA. CALL-OUTS ARE FOR WIRE BEFORE VINYL COATING.
7. VERTICAL BLACK PVC FENCE SLATS REQUIRED.

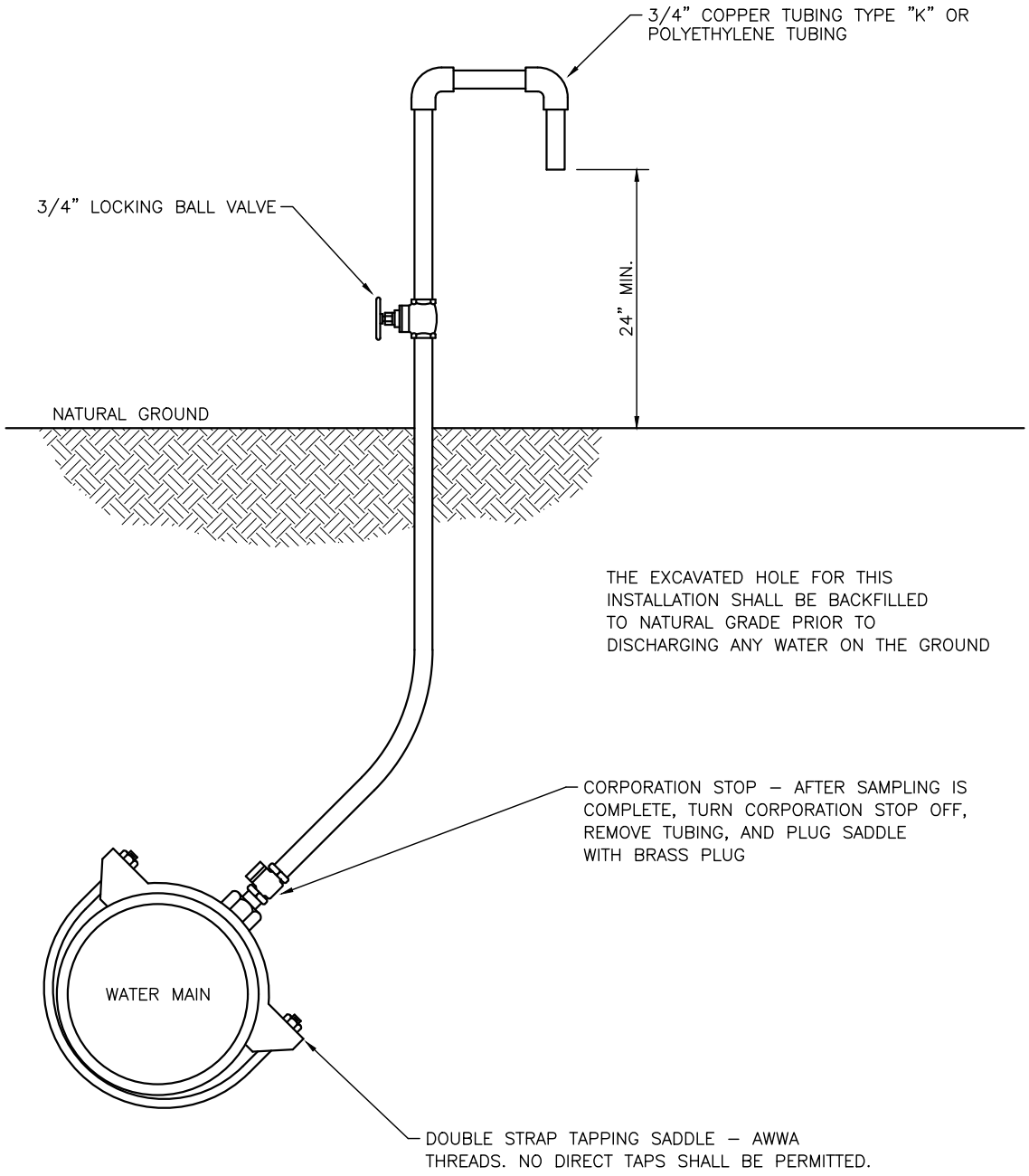
Fence Detail

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 15



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. WHERE POSSIBLE, SERVICE TAPS OR FIRE HYDRANTS (SEE "SAMPLE POINT – FIRE HYDRANT" DETAIL) SHALL BE USED AS SAMPLING POINTS.

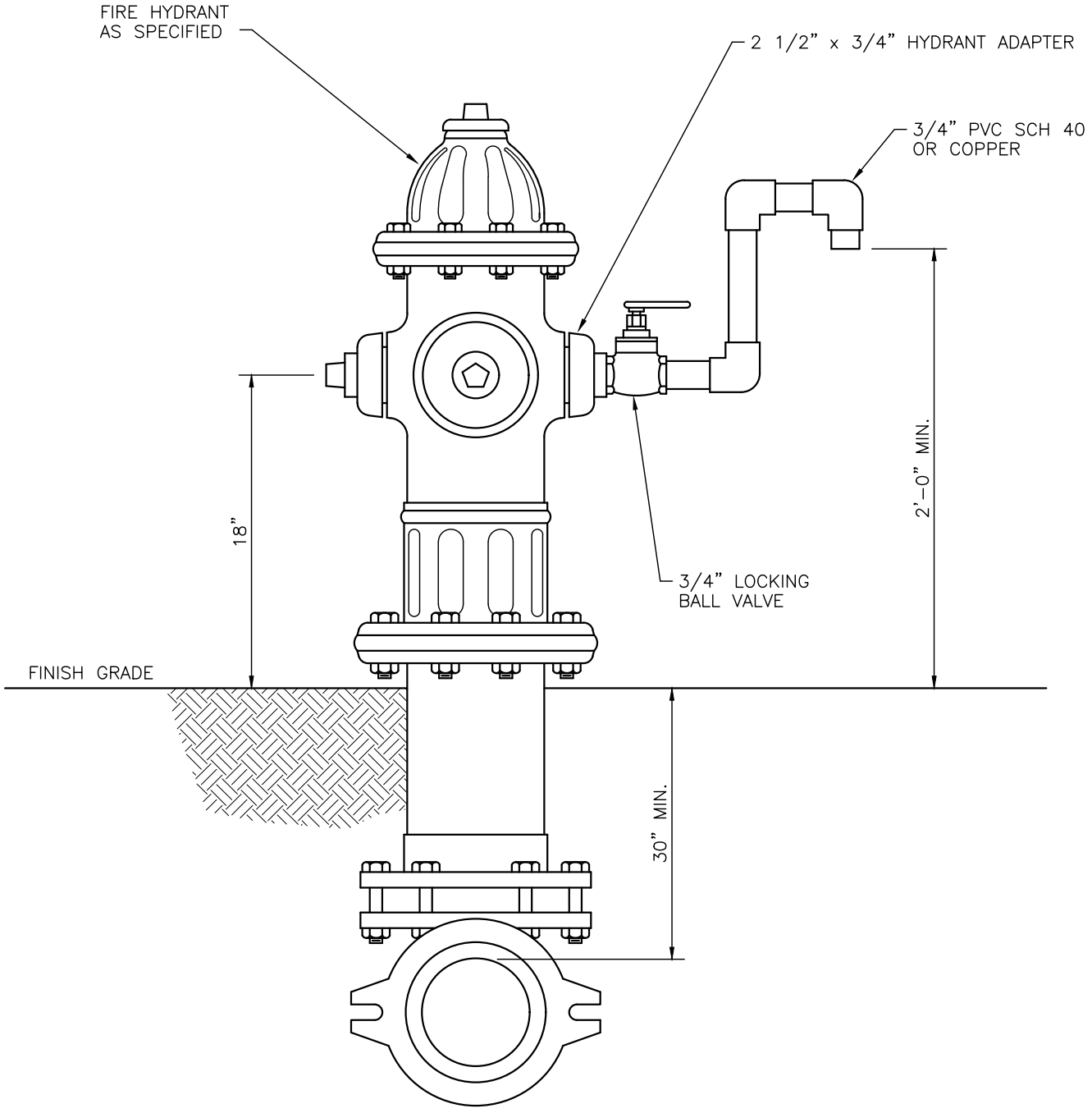
Sample Point - In Line

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 19



PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

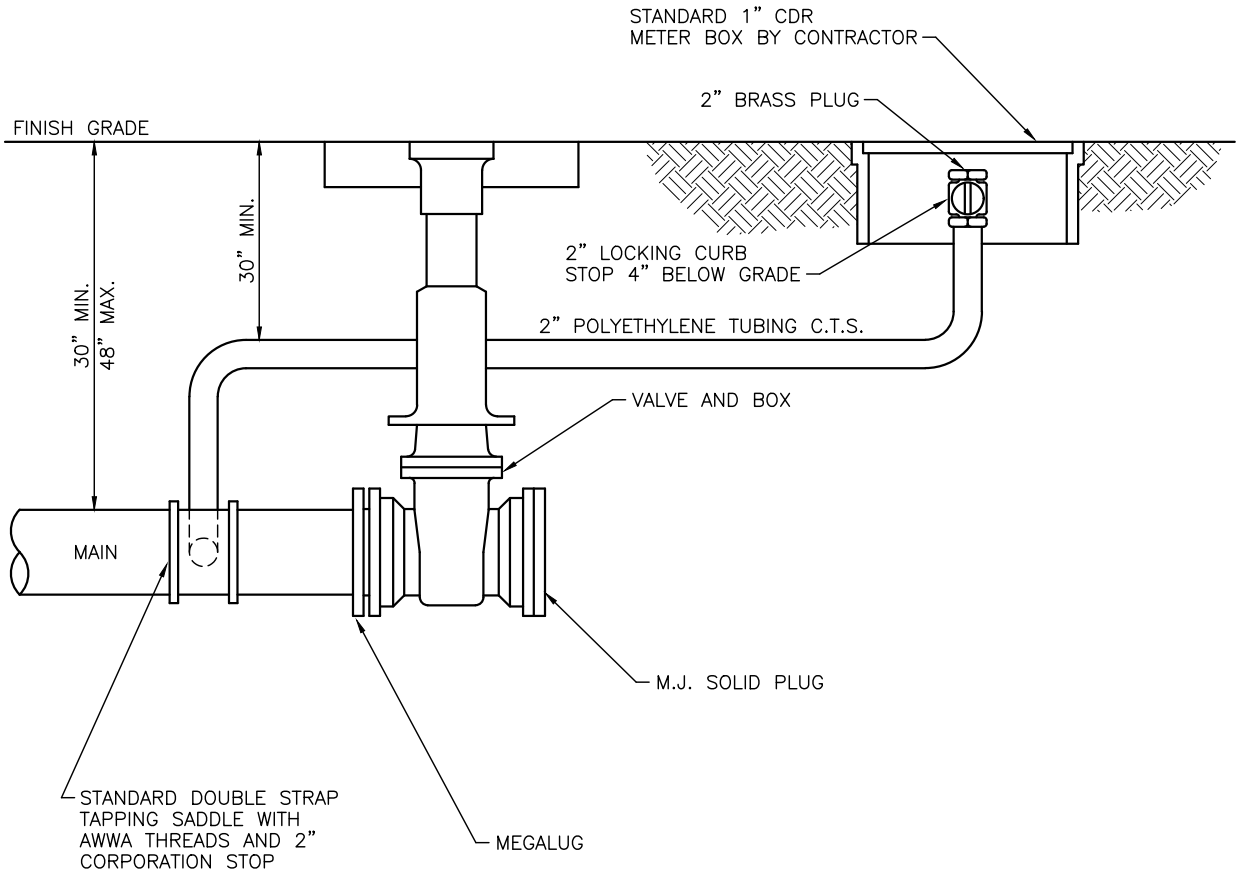
Sample Point - Fire Hydrant

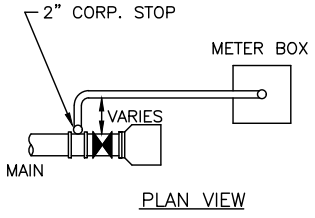
PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 20





PLAN VIEW

NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. TRAFFIC BEARING METER BOXES WILL BE REQUIRED IN ALL PAVED AREAS AND AREAS WHICH MAY BE PAVED IN THE FUTURE.
2. TUBING SHALL BE CONTINUOUS FROM CORPORATION STOP TO CURB STOP, NO FITTINGS SHALL BE PERMITTED.
3. PREVIOUS JOINTS SHALL BE RESTRAINED IN ACCORDANCE WITH "PIPE RESTRAINT TABLE" DETAIL.

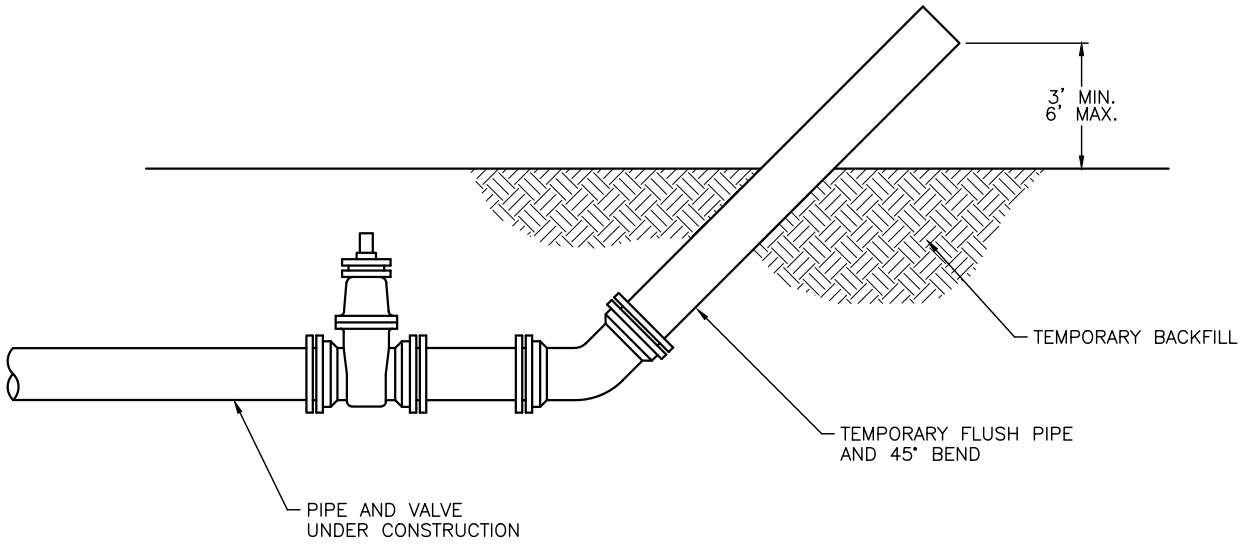
Temporary Blow Off

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 21



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. UPON COMPLETION OF THE PIPE INSTALLATION FOR ANY SECTION, THE MAINS SHALL BE CANNON FLUSHED TO REMOVE DIRT AND ANY OTHER FOREIGN MATTER BY ACHIEVING A MINIMUM VELOCITY OF 2.5 FEET PER SECOND IN THE PIPE. TEMPORARY FITTINGS, PIPE, ETC. MAY BE NEEDED TO FACILITATE CANNON FLUSHING.
2. INSTALL A 45° BEND AND ASSOCIATED PIPING AS SHOWN TO DIRECT THE FLUSHING WATER AWAY FROM THE IMMEDIATE WORK AREA, EXERCISE DUE CARE TO ENSURE THAT THE WATER USED IN FLUSHING DOES NOT CAUSE A NUISANCE OR CAUSE PROPERTY DAMAGE.
3. BENDS AND PIPING SHALL BE THE SAME SIZE AS THE LINE TO BE FLUSHED.
4. PRIOR TO THE ACTUAL LINE FLUSHING OPERATION, THE CONTRACTOR SHALL PROPERLY NOTIFY PBPOC POA OF SUCH INTENDED WATER USE.
5. NO EXISTING VALVES SHALL BE TURNED ON OR OFF, EXCEPT BY AUTHORIZED POAPWS PERSONNEL.
6. FLUSHING SHALL NOT BE ACCOMPLISHED WITHOUT THE ACTUAL PRESENCE OF A POAPWS REPRESENTATIVE.
7. AFTER THE LINE UNDER CONSTRUCTION HAS BEEN SUCCESSFULLY FLUSHED THE CONTRACTOR SHALL REMOVE THE TEMPORARY PIPING ARRANGEMENT AND PROCEED WITH THE REMAINING CONSTRUCTION AS SPECIFIED.
8. THERE ARE SPECIAL REQUIREMENTS FOR CLEANING AND FLUSHING PIPE LARGER THAN 12".

Cannon Flushing Procedure

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

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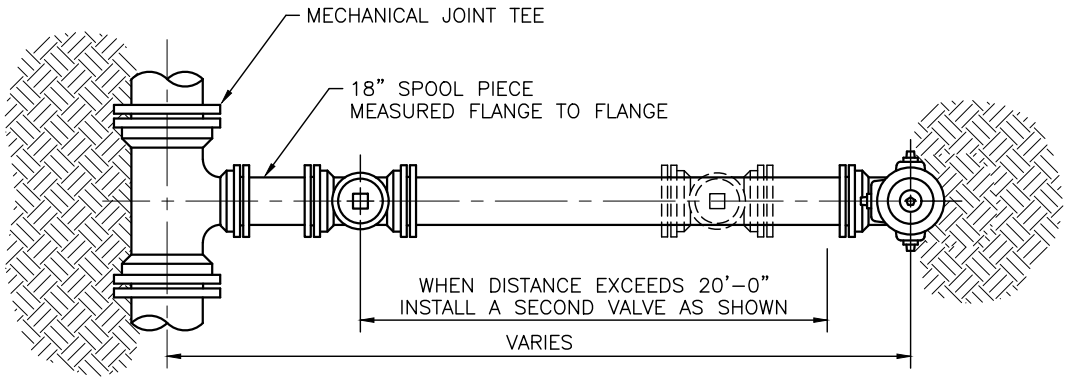
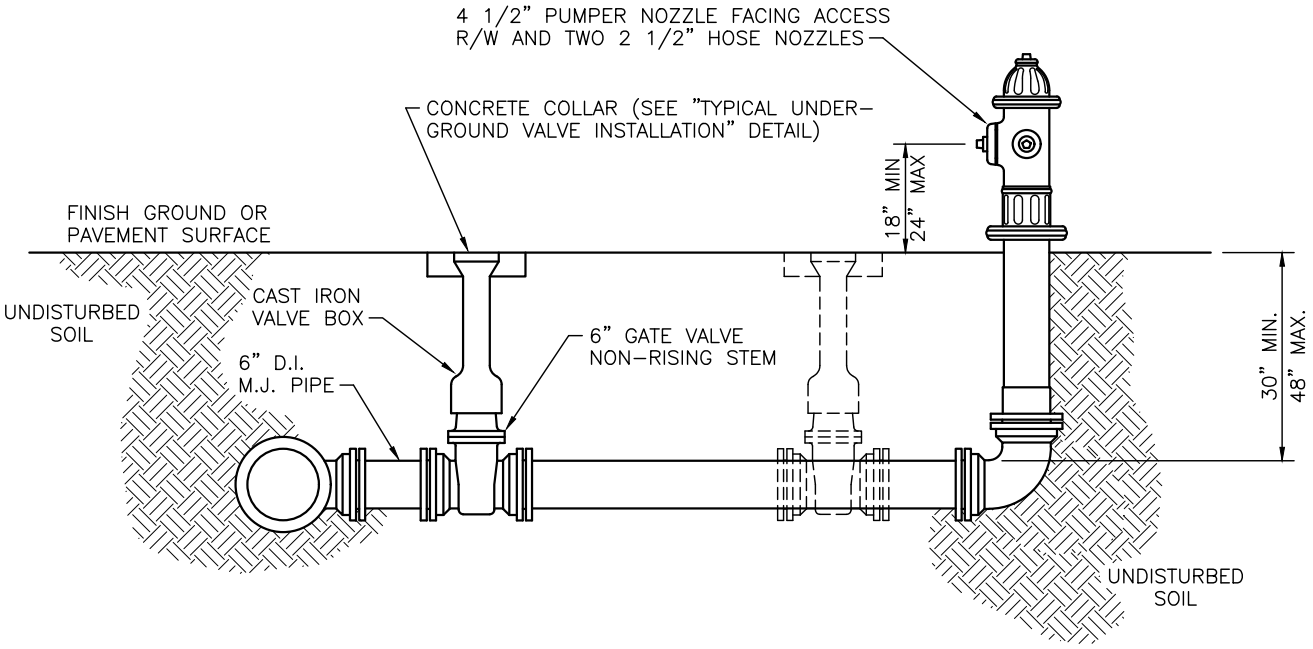




NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. DRAINS OR WEEP HOLES ON HYDRANT BARREL SHALL BE PLUGGED.
2. FIRE HYDRANT SHALL BE INSTALLED PLUMB AND TRUE.
3. REFER TO SHOP SPECIFICATION LIST FOR ACCEPTABLE FIRE HYDRANTS.
4. TWO OF THE FOLLOWING FORMS OF RESTRAINT SHALL BE USED WHEN PIPE IS GREATER THAN 12".
   A) APPROVED MECHANICAL JOINT RESTRAINT (i.e. MEGALUG)
   B) TIE RODS AND NUTS EQUAL IN DIA. TO TEE BOLTS AND NUTS, COATED WITH KOP-COAT 300-M OR APPROVED EQUAL.

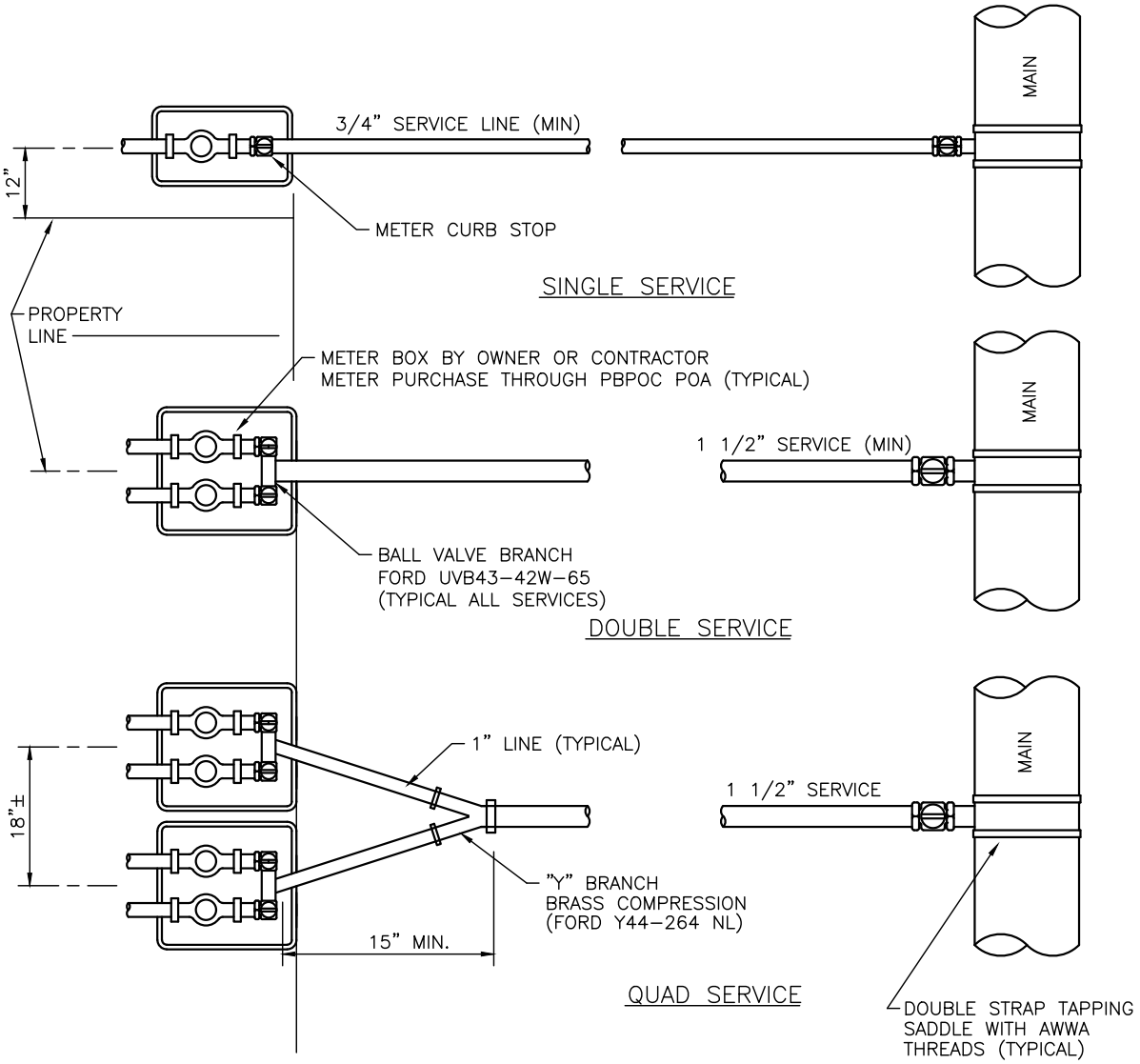
Typical Fire Hydrant Installation

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 23



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. REQUIRED LOCATION OF METER AND METER BOX MAY VARY DEPENDENT UPON SITE CONDITIONS.
2. AUTHORIZED SERVICE LINE MATERIAL:
   A) TYPE "K" COPPER TUBING WITH COMPRESSION FITTINGS.
   B) POLYETHYLENE TUBING SDR 9, COPPER TUBE SIZE.
3. METER CURB STOP SHALL BE 1" MINIMUM.
4. 1" METER CURB STOPS WITH 3/4" VALVES SHALL NOT BE PERMITTED.
5. MULTIPLE SERVICE/METER INSTALLATIONS OF MORE THAN 4 METERS PER SERVICE AND SERVICE LINES LARGER THAN 2" IN DIAMETER SHALL BE HANDLED ON AN INDIVIDUAL BASIS.
6. METER CURB STOPS 1 1/2" AND 2" IN SIZE SHALL BE PROVIDED WITH BOTH A LOCKING CAP AND METER FLANGE.
7. NO FITTINGS BETWEEN CORP STOP AND METER CURB STOP ALLOWED WHEN USING POLYETHYLENE TUBING.

Typical Water Service

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

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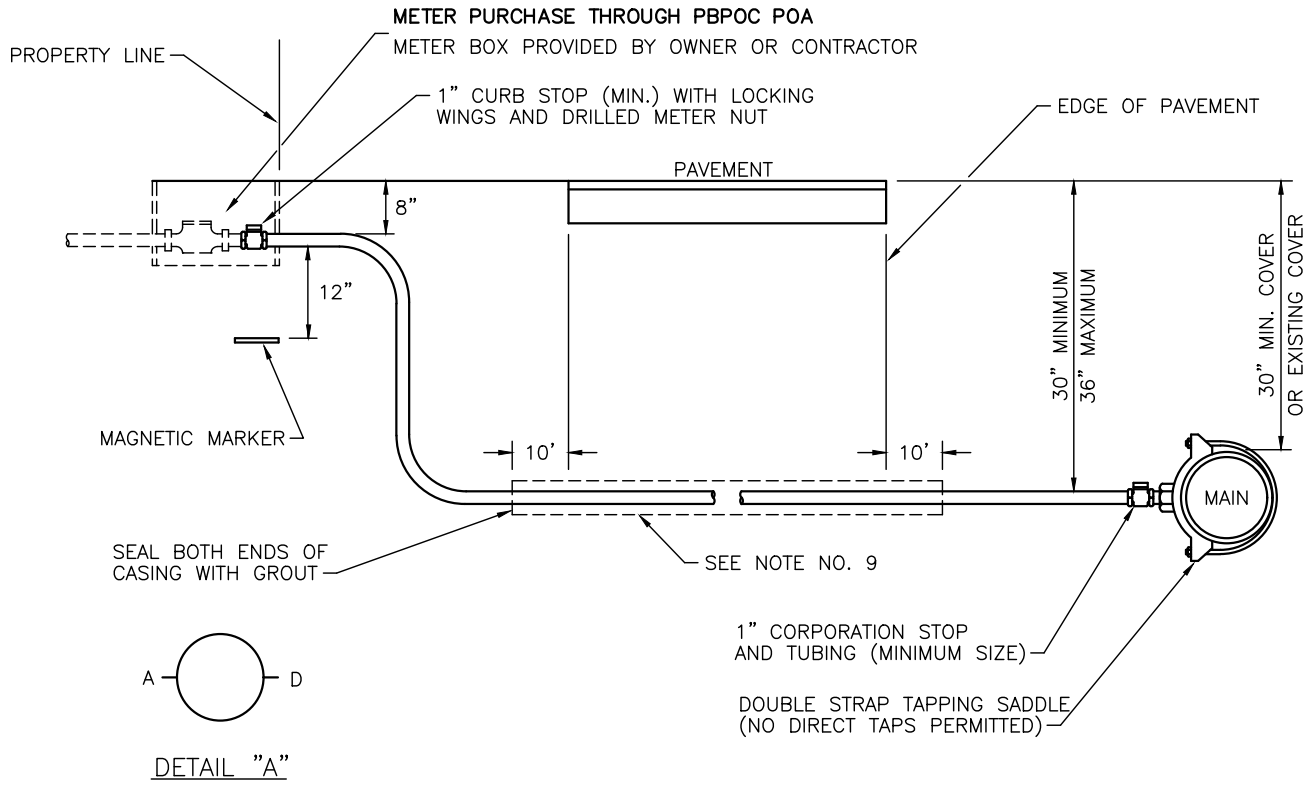

NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. CASINGS SHALL BE REQUIRED FOR ALL LONG SIDE SERVICES.
2. SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED A MINIMUM OF 18" OFFSET AND AT 90° FROM THE CENTERLINE AS SHOWN ON DETAIL "A".
3. WHERE NO SIDEWALK EXISTS, METER BOXES SHALL BE SET TO CONFORM TO FINISH GRADE.
4. COPPER TUBING SHALL BE TYPE "K" WITH COMPRESSION FITTINGS.
5. POLYETHYLENE TUBING SHALL BE SDR 9, COPPER TUBE SIZE.
6. ROTATE THE CORPORATION STOP SO THAT THE OPERATING NUT IS ACTUATED FROM THE VERTICAL POSITION RATHER THAN THE HORIZONTAL.
7. BOTH COPPER AND POLYETHYLENE TUBING SERVICE LINES SHALL BE CONTINUOUS FROM CORPORATION STOP TO CURB STOP WITH NO FITTINGS IN BETWEEN.
8. TAPPING SADDLES AND CORPORATION STOPS SHALL HAVE AWWA INLET THREADS.
9. SERVICE CASING SHALL NOT BE INSTALLED BY WATER JETTING UNDER ROADWAY.
10. GALVANIZED SCHEDULE 40 CASING REQUIRED FOR ANY INSTALLATION REQUIRING A JACK AND BORE , SCHEDULE 40 PVC MAY BE USED FOR AN OPEN CUT INSTALLATION WITH THE APPROVAL OF PBPOC LDRB, CASING SHOULD EXTEND TEN (10) FEET BEYOND EDGE OF PAVEMENT AND SIZED AS FOLLOWS:
    A.) 1" SERVICE USE 2" CASING
    B.) 1 1/2" SERVICE USE 3" CASING
    C.) 2" SERVICE USE 4" CASING

Typical Water Service Installation

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

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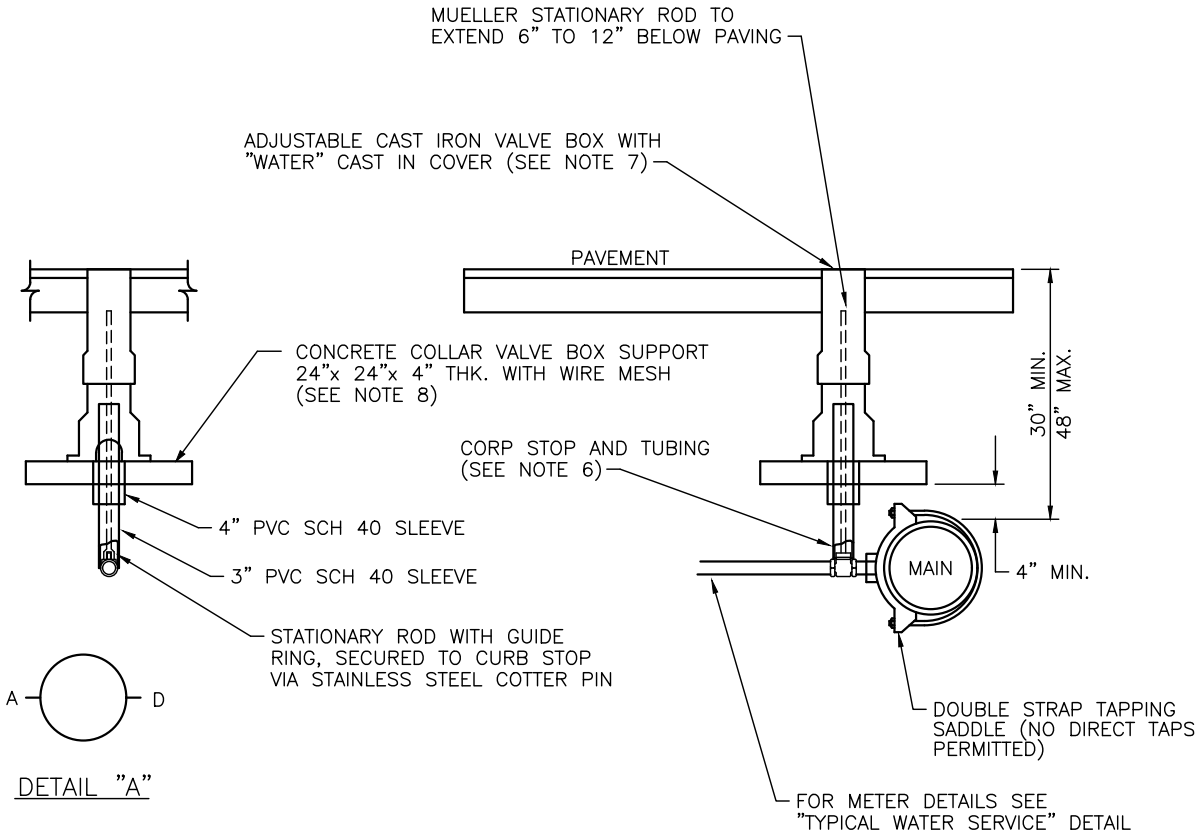

NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED A MINIMUM OF 18" OFFSET AND AT 90° FROM THE CENTERLINE AS SHOWN ON DETAIL "A".
2. COPPER TUBING SHALL BE TYPE "K" WITH COMPRESSION FITTINGS.
3. POLYETHYLENE TUBING SHALL BE SDR 9, COPPER TUBE SIZE.
4. BOTH COPPER AND POLYETHYLENE TUBING SERVICE LINES SHALL BE CONTINUOUS FROM CURB STOP TO ANGLE METER STOP WITH NO FITTINGS IN BETWEEN.
5. TAPPING SADDLES TO HAVE AWWA THREADS.
6. CORPORATION STOP AT THE MAIN TO HAVE MALE AWWA THREADS ON ONE SIDE AND BE COMPRESSION ON THE OTHER SIDE.
7. VALVE BOX SHALL BE 5 1/4" CAST IRON SCREW TYPE ADJUSTABLE.
8. CONCRETE COLLAR VALVE BOX SUPPORT TO BE PLACED ON COMPACTED SOIL TO SUPPORT VALVE BOX SO THAT A MINIMUM OF 4 INCHES EXISTS BETWEEN THE BOTTOM OF THE CONCRETE COLLAR AND THE TOP OF THE WATER MAIN.

Water Service Tap Under Pavement

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

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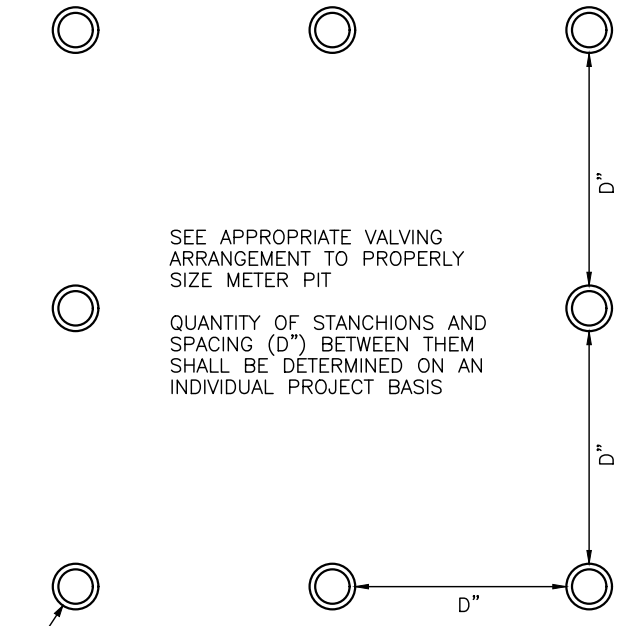
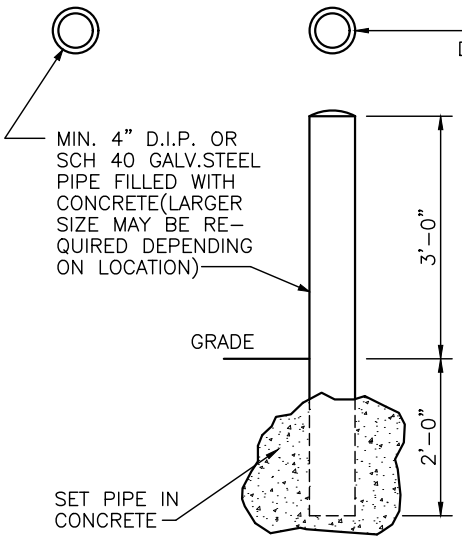


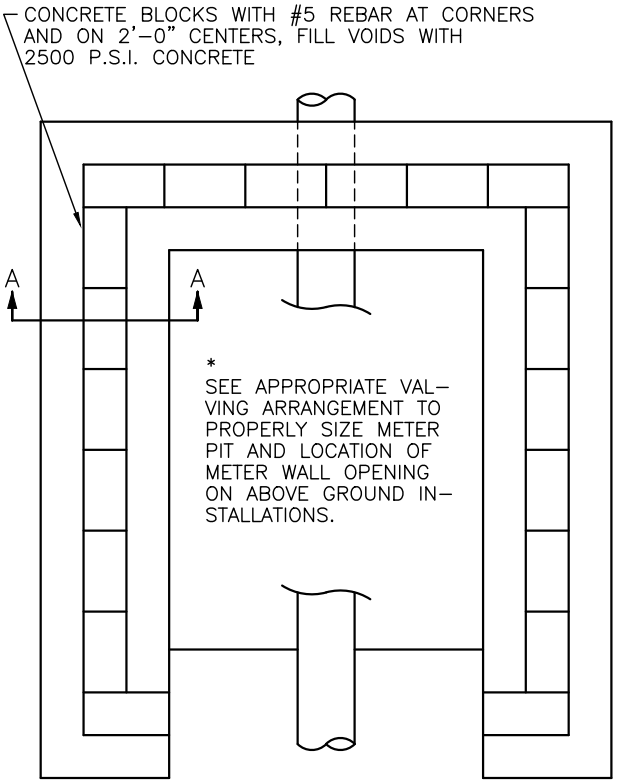
SEE APPROPRIATE VALVING ARRANGEMENT TO PROPERLY SIZE METER PIT

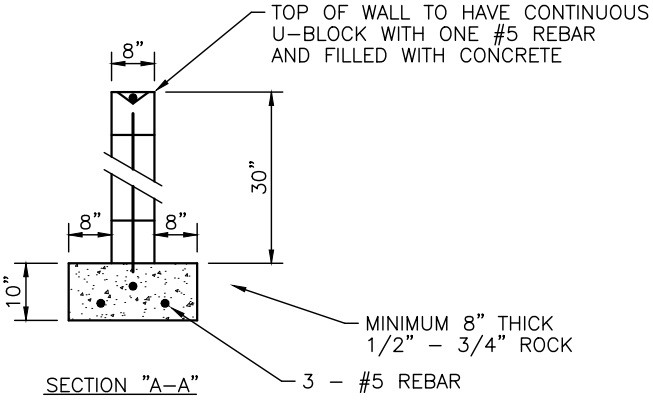
QUANTITY OF STANCHIONS AND SPACING (D") BETWEEN THEM SHALL BE DETERMINED ON AN INDIVIDUAL PROJECT BASIS



OPTION "A"

PROTECTIVE PIPE STANCHIONS





OPTION "B"

SCREENING WALL

* BACK FOOTER TO BE A MINIMUM OF 12" FROM PIPE ASSEMBLY AND SIDE WALLS TO BE A MINIMUM OF 36" FROM PIPE ASSEMBLY

PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

Protective Enclosures for Above Ground Devices

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

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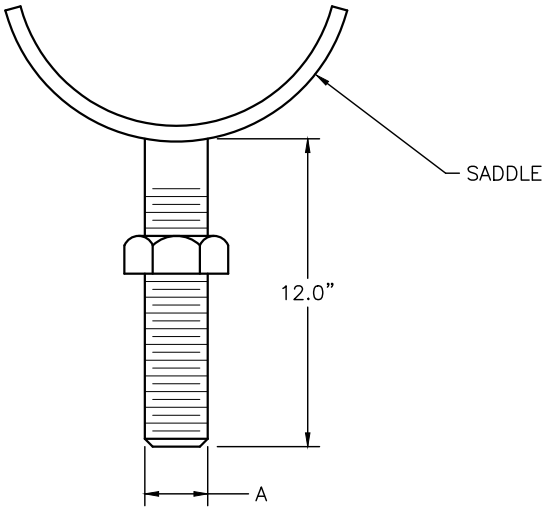
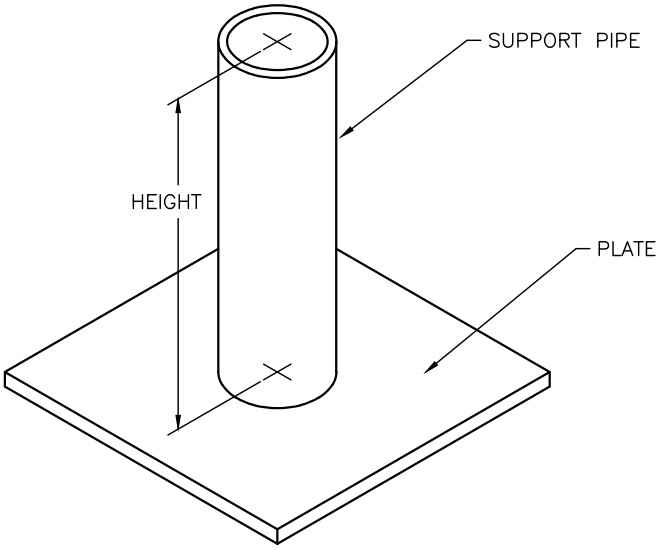
DRAWING No. 27





PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

PIPE SIZE	A	SUPPORT PIPE	SADDLE	PLATE	HEIGHT
3"	3/4"	1"	1/4" x 2"	4" x 4"	1' – 0"
4"	3/4"	1"	1/4" x 2"	4" x 4"	1' – 0"
6"	3/4"	1"	1/4" x 2"	4" x 4"	1' – 0"
8"	3/4"	1"	1/4" x 2"	4" x 4"	1' – 0"
10"	1"	1 1/4"	3/8" x 3"	6" x 6"	1' – 0"
12"	1"	1 1/4"	3/8" x 3"	6" x 6"	1' – 0"
14"	1"	1 1/4"	3/8" x 3"	6" x 6"	1' – 0"
16"	1 1/4"	1 1/2"	1/2" x 3"	6" x 6"	1' – 0"
18"	1 1/4"	1 1/2"	1/2" x 3"	6" x 6"	1' – 0"

NOTE: ALL MATERIAL SHALL BE 316 STAINLESS STEEL

Pipe Support

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

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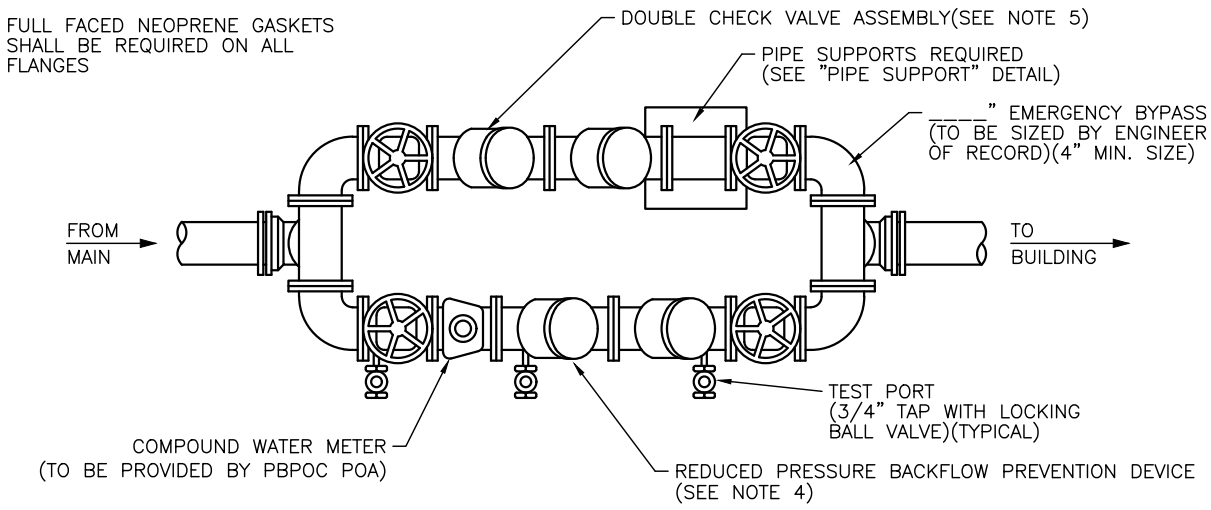

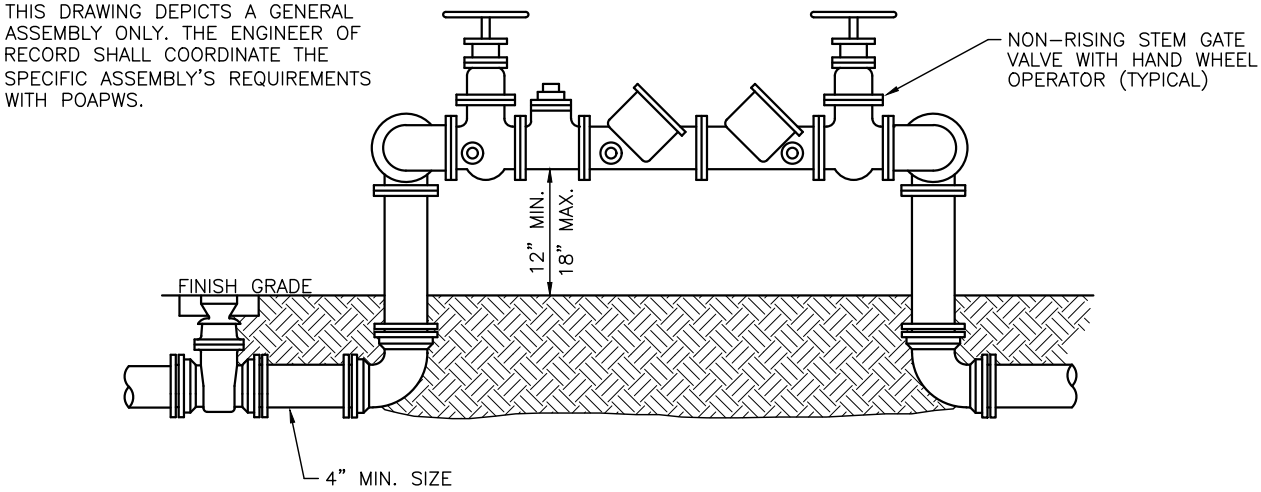

NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. MECHANICAL JOINT FITTINGS SHALL BE REQUIRED UNDERGROUND AND FLANGED FITTINGS FOR ABOVE GROUND USE, NO UNIFLANGES PERMITTED.
2. PAINT THE ABOVE GROUND ASSEMBLY IN ACCORDANCE WITH STANDARDS AND SPECIFICATIONS, AFTER MANUFACTURERS RECOMMENDED SURFACE PREP IS COMPLETED. DO NOT PAINT OVER NAME/SERIAL PLATE, STAINLESS STEEL OR BRASS FITTINGS.
3. WHEN PROTECTIVE PIPE STANCHIONS OR A SCREEN WALL IS REQUIRED, SEE "PROTECTIVE ENCLOSURES FOR ABOVE GROUND DEVICES" DETAIL.
4. APPROVED REDUCED PRESSURE BACKFLOW PREVENTER WITH SILICONE RUBBER SEAL RINGS OR DISKS:
   A.) APOLLO MODEL RPL 4A, 4" TO 12"
   B.) AMES MODEL 4000 SSSR, 4" TO 10"
   C.) AMES MODEL 4000 SSI, 4" TO 10"
5. APPROVED DOUBLE CHECK VALVE ASSEMBLIES WITH SILICONE RUBBER SEAL RINGS OR DISKS.
   A.) AMES 2000 SS
6. 3" METER REQUIRES 4" BACKFLOW ASSEMBLY AND PIPING.
7. ALL TEST PORTS SHALL BE PLUGGED WITH BRASS PLUGS.

Meter and Backflow Assembly (3" and Larger)

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

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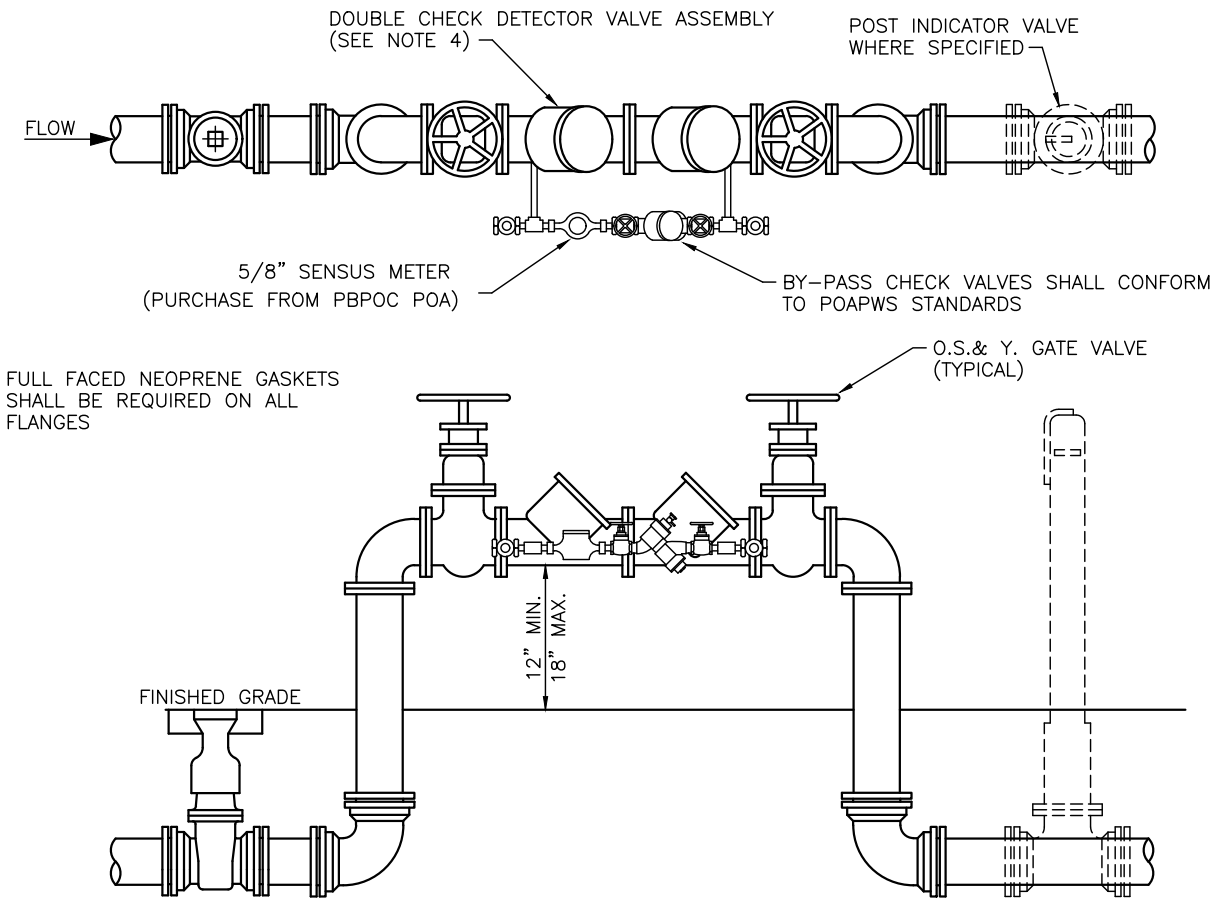
DRAWING No. 29



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. MECHANICAL JOINT FITTINGS SHALL BE REQUIRED UNDERGROUND AND FLANGED FITTINGS FOR ABOVE GROUND USE, NO UNIFLANGES PERMITTED.
2. PAINT THE ABOVE GROUND ASSEMBLY, INCLUDING ENTIRE LENGTH OF TIE RODS, IN ACCORDANCE WITH STANDARDS AND SPECIFICATIONS, AFTER MANUFACTURERS RECOMMENDED SURFACE PREP IS COMPLETED. DO NOT PAINT OVER NAME/SERIAL PLATE, STAINLESS STEEL OR BRASS FITTINGS.
3. WHEN PROTECTIVE PIPE STANCHIONS OR A SCREEN WALL IS REQUIRED, SEE "PROTECTIVE ENCLOSURES FOR ABOVE GROUND DEVICES" DETAIL.
4. APPROVED DOUBLE CHECK DETECTOR VALVE ASSEMBLIES WITH SILICONE RUBBER SEAL RINGS OR DISKS:
   A.) AMES MODEL 3000 SSI
   B.) AMES MODEL 3000 SSR
   C.) WATTS MODEL 774 DCDA SERIES 994
   D.) APOLLO MODEL DCDA LF4A
5. SPECIAL FIRE PROTECTION SYSTEMS USING INTERNAL PUMPS, TANKS, ETC. SHALL BE REQUIRED TO USE AN APPROVED REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY.
6. ALL TEST PORTS SHALL BE PLUGGED WITH BRASS PLUGS.
7. TWO OF THE FOLLOWING FORMS OF RESTRAINT SHALL BE USED WHEN PIPE IS GREATER THAN 12".
   A) APPROVED MECHANICAL JOINT RESTRAINT (i.e. MEGALUG)
   B) TIE RODS AND NUTS EQUAL IN DIA. TO TEE BOLTS AND NUTS, COATED WITH KOP-COAT 300-M OR APPROVED EQUAL.

Above Ground Fireline

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

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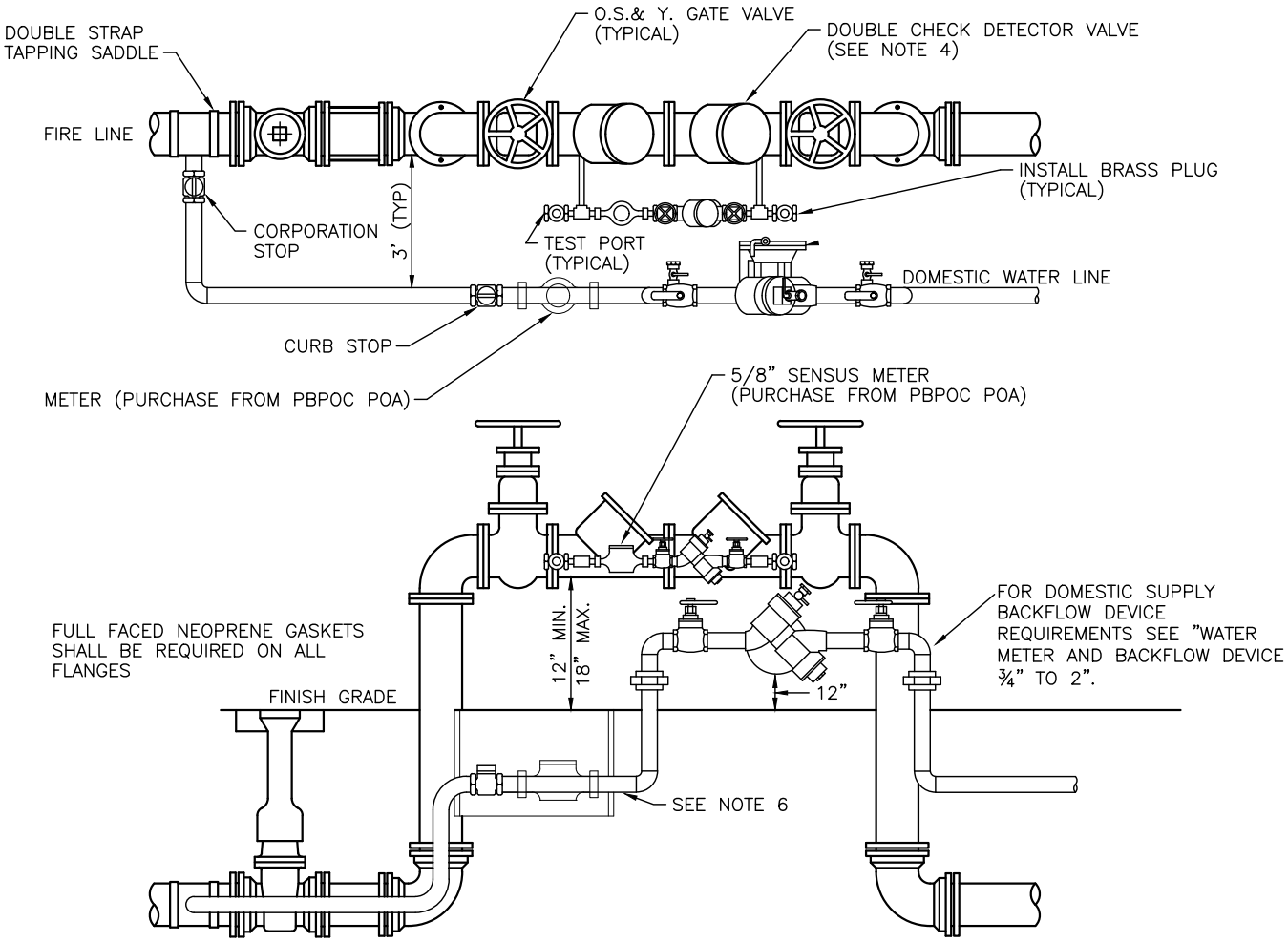

NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. MECHANICAL JOINT FITTINGS SHALL BE REQUIRED UNDERGROUND AND FLANGED FITTINGS FOR ABOVE GROUND USE, NO UNIFLANGES PERMITTED.

2. PAINT THE ABOVE GROUND ASSEMBLY, INCLUDING ENTIRE LENGTH OF TIE RODS, IN ACCORDANCE WITH STANDARDS AND SPECIFICATIONS, AFTER MANUFACTURERS RECOMMENDED SURFACE PREP IS COMPLETED. DO NOT PAINT OVER NAME/SERIAL PLATE, STAINLESS STEEL OR BRASS FITTINGS.

3. WHEN PROTECTIVE PIPE STANCHIONS OR SCREEN WALL IS REQUIRED, SEE "PROTECTIVE ENCLOSURES FOR ABOVE GROUND DEVICES" DETAIL.

4. APPROVED DOUBLE CHECK DETECTOR VALVE ASSEMBLIES WITH SILICONE RUBBER SEAL RINGS OR DISKS:
   A.) AMES MODEL 3000 SSI
   B.) AMES MODEL 3000 SSR
   C.) WATTS MODEL 774 DCDA SERIES 994
   D.) APOLLO MODEL DCDA LF4A 4" – 12"

5. TYPE "K" COPPER TUBING (SOFT DRAWN) OR POLYETHYLENE TUBING SDR 9 COPPER TUBING SIZE. (UNDERGROUND USE ONLY) IF DISTANCE BETWEEN METER AND RISER IS LESS THAN 6 FEET ONLY COPPER TUBING SHALL BE PERMITTED.

6. TWO OF THE FOLLOWING FORMS OF RESTRAINT SHALL BE USED WHEN PIPE IS GREATER THAN 12".
   A) APPROVED MECHANICAL JOINT RESTRAINT (i.e. MEGALUG)
   B) TIE RODS AND NUTS EQUAL IN DIA. TO TEE BOLTS AND NUTS, COATED WITH KOP–COAT 300–M OR APPROVED EQUAL.

Fireline with 1" to 2" Domestic Supply

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

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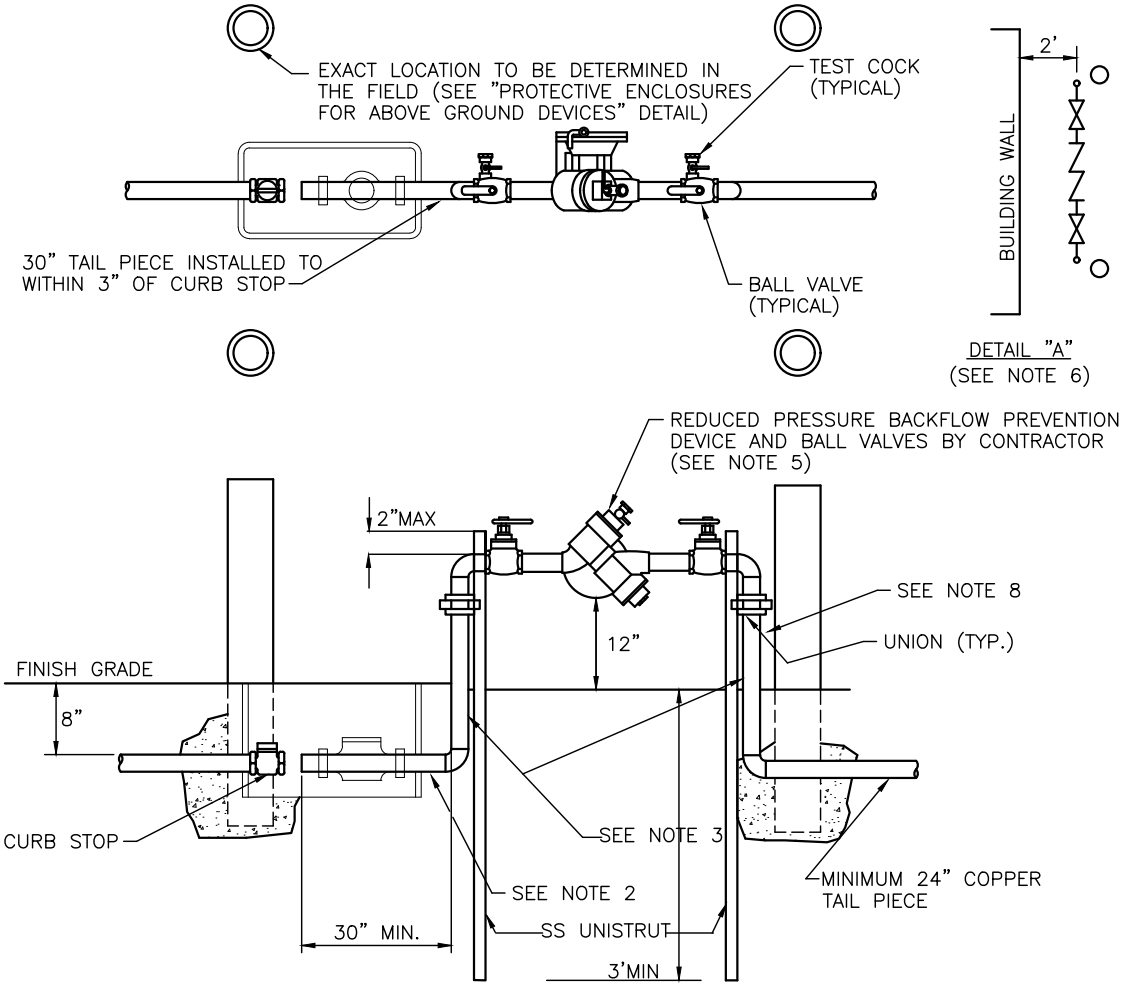
DRAWING No. 31



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. TYPE "K" COPPER TUBING (SOFT DRAWN) OR POLYETHYLENE TUBING SDR 9 COPPER TUBE SIZE.

2. IF THIS DISTANCE IS LESS THAN 6 FEET ONLY COPPER TUBING SHALL BE PERMITTED.

3. BOTH RISERS SHALL BE TYPE "K" COPPER TUBING (HARD DRAWN) WITH COPPER/BRASS SOLDER FITTINGS AND ADAPTERS. ONLY LEAD FREE SOLDER AND FLUX SHALL BE PERMITTED.

4. 1 1/2" AND 2" METER STOPS SHALL BE EQUIPPED WITH LOCKING CAPS AND METER FLANGES.

5. APPROVED BACKFLOW PREVENTION DEVICES WITH SILICONE RUBBER SEAL RINGS OR DISKS:
   A.) WATTS MODEL LF919 3/4" TO 2"
   B.) AMES MODEL LF400B 3/4" TO 2"
   C.) WILKINS 975 XL2 3/4" TO 2"
   D.) APOLLO MODEL RPLF 4A 3/4" TO 2"

6. WHEN THE DEVICE IS INSTALLED PARALLEL TO A BUILDING WALL THERE SHALL BE A MINIMUM OF 2' BETWEEN THE EDGE OF THE DEVICE AND THE BUILDING WALL.

7. BACKFLOW PREVENTION DEVICE SHALL BE EQUIPPED WITH BALL VALVES.

8. BACKFLOW PREVENTION DEVICE SHALL BE SUPPORTED AT BOTH RISERS WITH A MINIMUM OF 2 – 1⅝" STAINLESS STEEL UNISTRUTS. RISERS TO BE SECURED TO UNISTRUT WITH 304 STAINLESS STEEL MOUNTING HARDWARE AND ¼" NEOPRENE INSULATORS BETWEEN ALL DISSIMILAR METALS.

9. BACKFLOW DEVICES SHALL BE A MINIMUM OF 3' FROM BACK OF CURB.

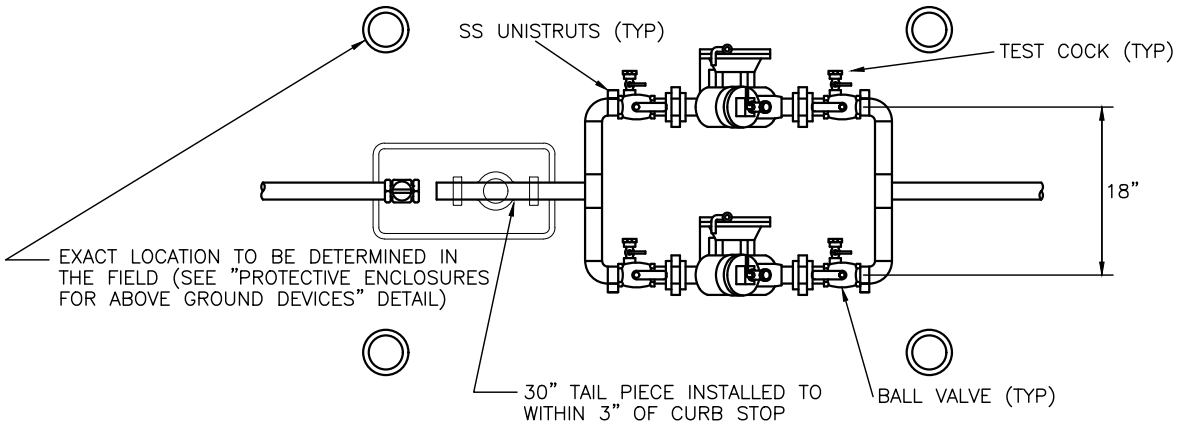
Water Meter and Backflow Device 3/4" to 2"

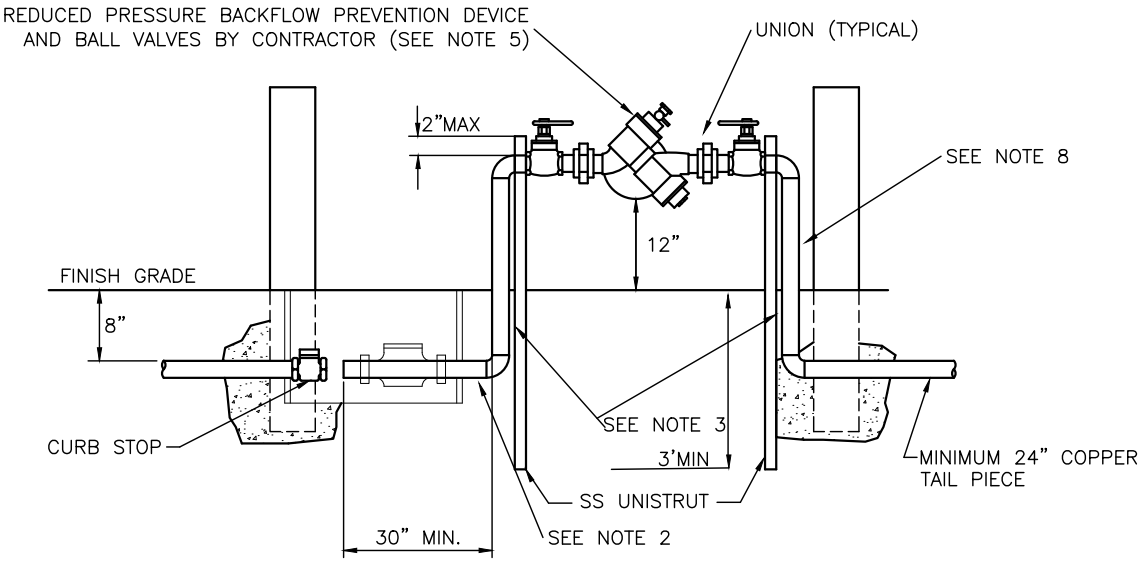
PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 32





NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

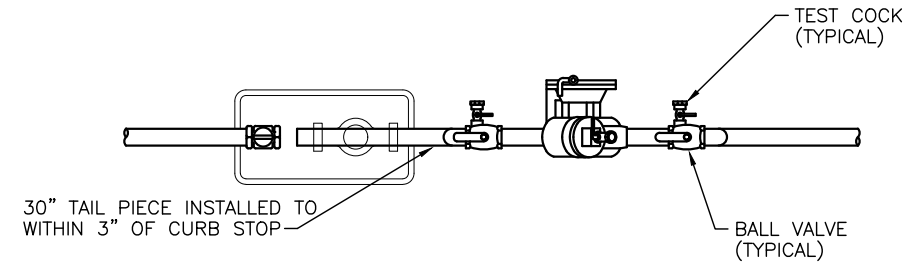
1. TYPE "K" COPPER TUBING (SOFT DRAWN) OR POLYETHYLENE TUBING SDR 9 COPPER TUBE SIZE.
2. IF THIS DISTANCE IS LESS THAN 6 FEET ONLY COPPER TUBING SHALL BE PERMITTED.
3. BOTH RISERS SHALL BE TYPE "K" COPPER TUBING (HARD DRAWN) WITH COPPER/BRASS SOLDER FITTINGS AND ADAPTERS. ONLY LEAD FREE SOLDER AND FLUX SHALL BE PERMITTED.
4. 1 1/2" AND 2" METER STOPS SHALL BE EQUIPPED WITH LOCKING CAPS AND METER FLANGES.
5. APPROVED BACKFLOW PREVENTION DEVICES WITH SILICONE RUBBER SEAL RINGS OR DISKS:
   A.) WATTS MODEL LF919 3/4" TO 2"
   B.) AMES MODEL LF400B 3/4" TO 2"
   C.) WILKINS 975 XL2 3/4" TO 2"
   D.) APOLLO MODEL RPLF 4A 3/4" TO 2"
6. WHEN THE DEVICE IS INSTALLED PARALLEL TO A BUILDING WALL THERE SHALL BE A MINIMUM OF 2' BETWEEN THE EDGE OF THE DEVICE AND THE BUILDING WALL.
7. BACKFLOW PREVENTION DEVICE SHALL BE EQUIPPED WITH BALL VALVES.
8. BACKFLOW PREVENTION DEVICE SHALL BE SUPPORTED AT BOTH RISERS WITH A MINIMUM OF 4 – $1\frac{5}{8}$" STAINLESS STEEL UNISTRUTS. RISERS TO BE SECURED TO UNISTRUT WITH 304 STAINLESS STEEL MOUNTING HARDWARE AND ¼" NEOPRENE INSULATORS BETWEEN ALL DISSIMILAR METALS.
9. BACKFLOW DEVICES SHALL BE A MINIMUM OF 3' FROM BACK OF CURB.

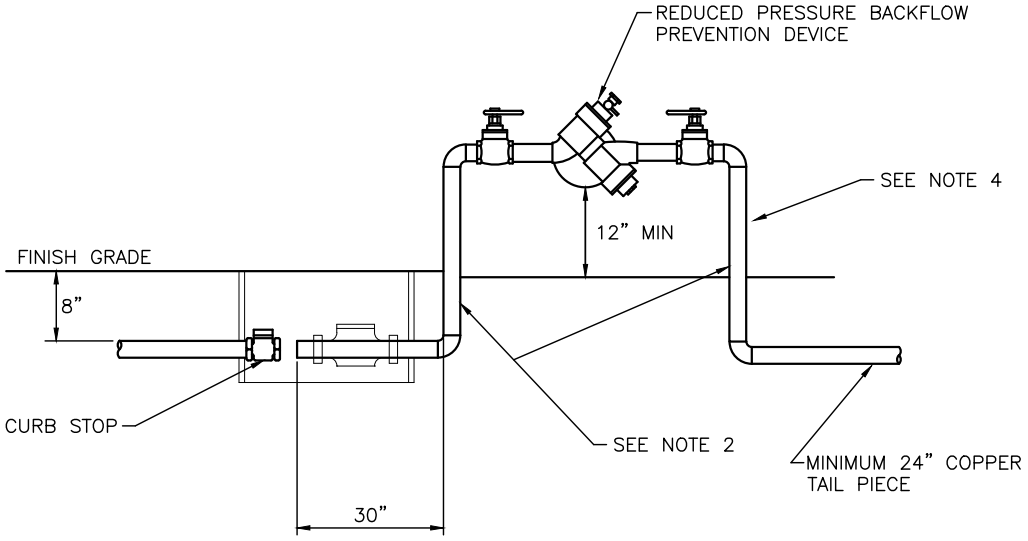
Water Meter and Dual Backflow Device 3/4" to 2"

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.
CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 33





NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. TYPE "K" COPPER TUBING (SOFT DRAWN) OR POLYETHYLENE TUBING SDR 9 COPPER TUBE SIZE.

2. BOTH RISERS SHALL BE TYPE "K" COPPER TUBING (HARD DRAWN) WITH COPPER/BRASS SOLDER FITTINGS AND ADAPTERS. ONLY LEAD FREE SOLDER AND FLUX SHALL BE PERMITTED.

3. BACKFLOW PREVENTION DEVICES SHALL BE USC APPROVED WITH SILICONE RUBBER SEAL RINGS OR DISKS:

4. BACKFLOW PREVENTION DEVICE SHALL BE SUPPORTED AT BOTH RISERS WITH STAINLESS STEEL UNISTRUT. RISERS TO BE SECURED TO UNISTRUT WITH 304 STAINLESS STEEL MOUNTING HARDWARE AND ¼" NEOPRENE INSULATORS BETWEEN ALL DISSIMILAR METALS.

5. BACKFLOW DEVICES SHALL BE A MINIMUM OF 3' FROM BACK OF CURB AND SIDEWALKS

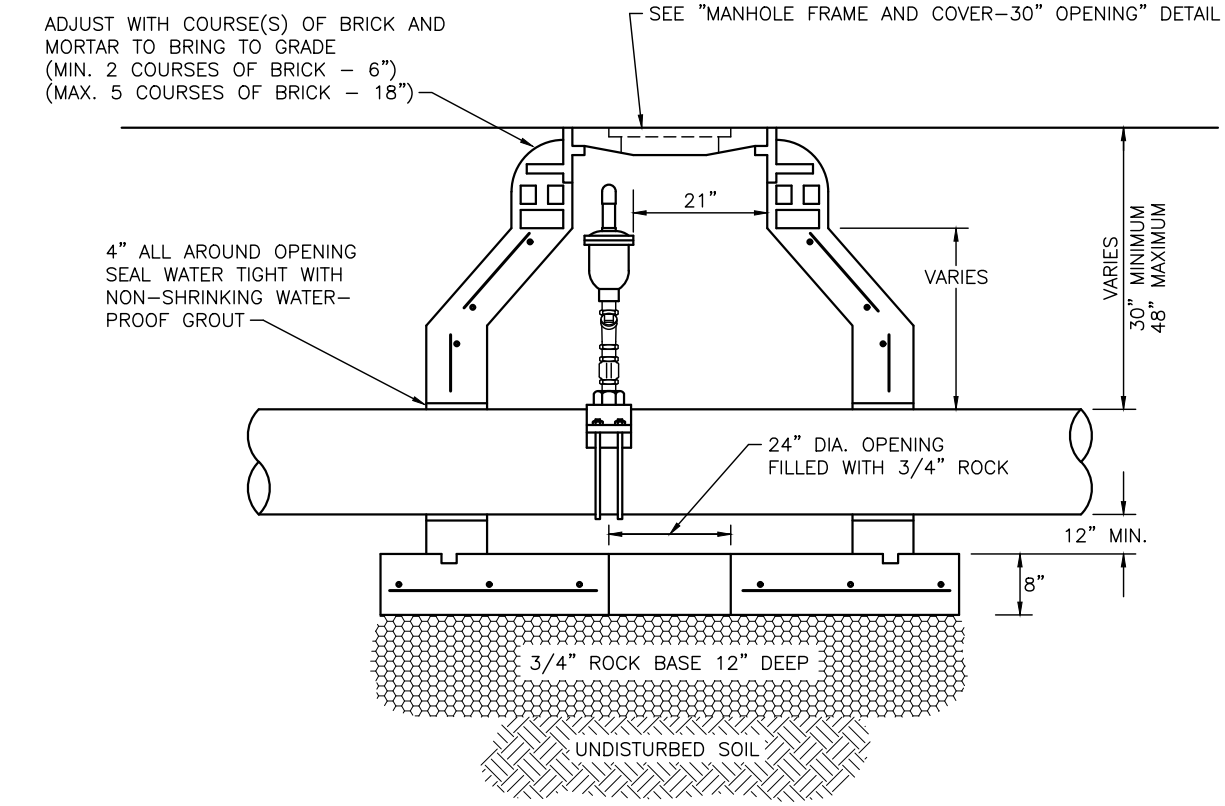
Private Auxiliary Water Supply Backflow Device

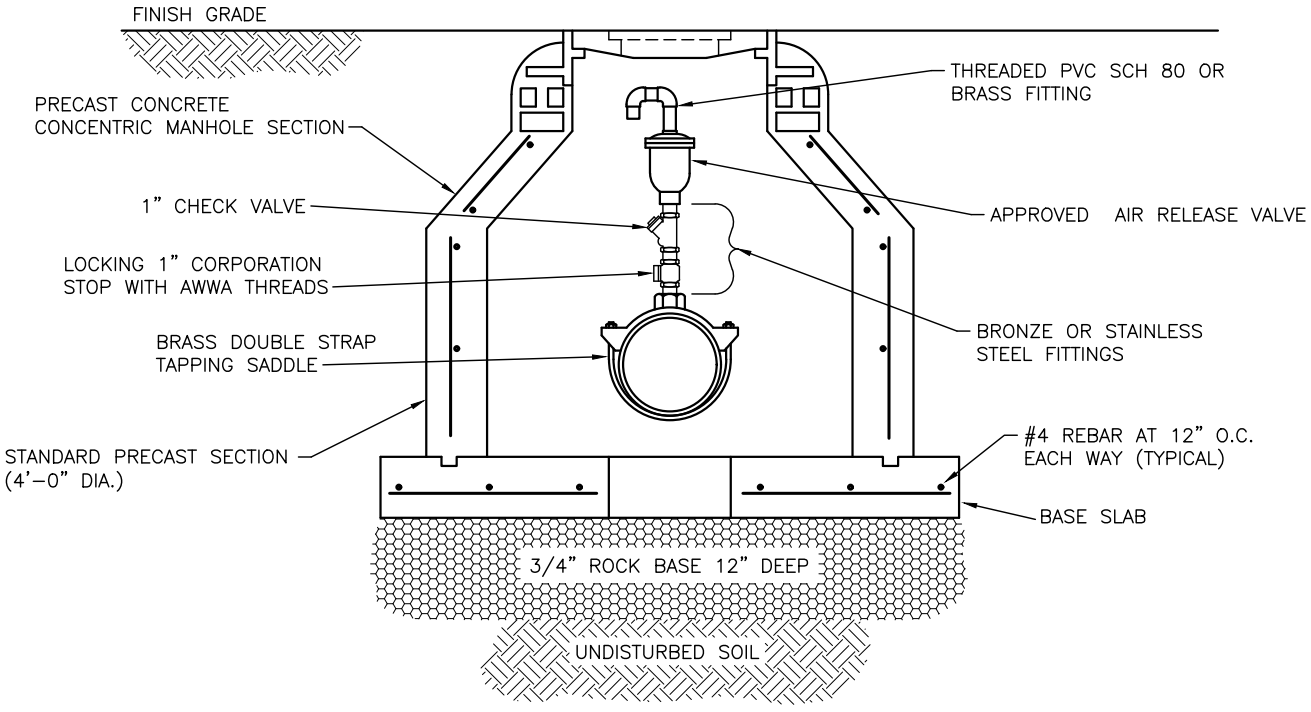
PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 34





PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

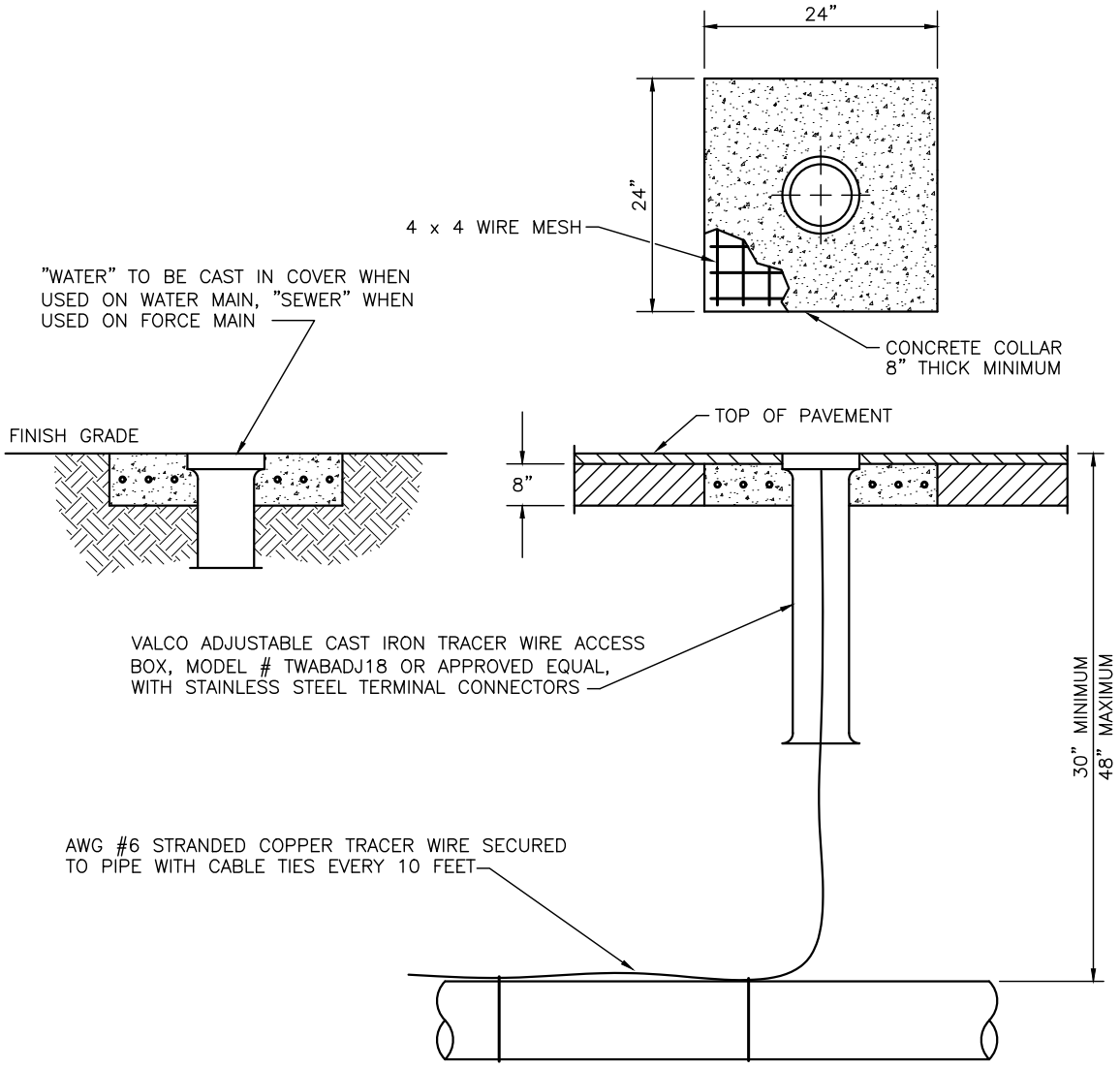
Automatic Air Release Valve (Underground Water Main)

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 35



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. REQUIRED FOR HDD OR AS DIRECTED BY PBPOC.

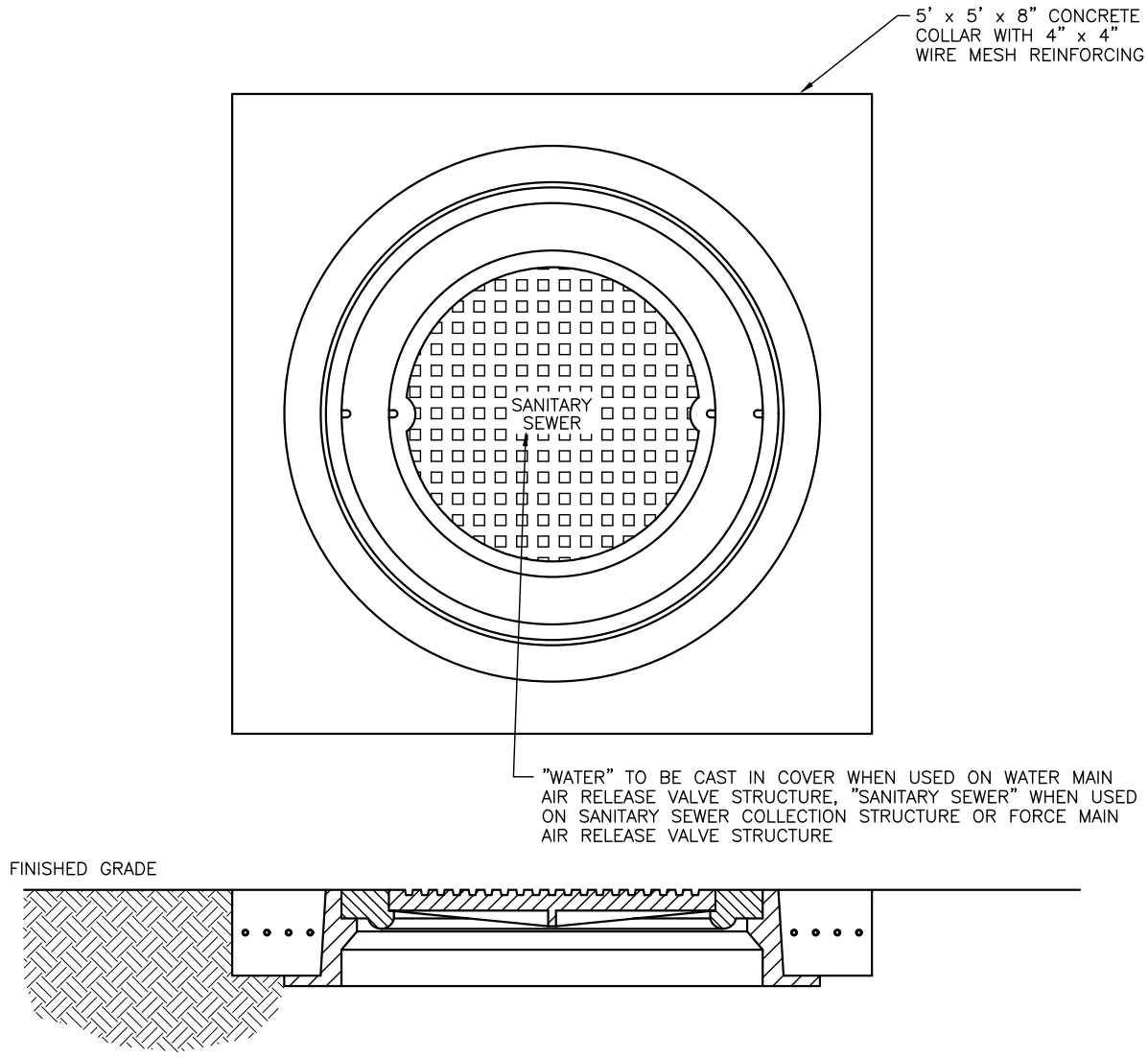
Tracer Wire Access Box

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 36



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. IN GREEN AREAS OR ANY AREA DEEMED TO HAVE QUESTIONABLE DRAINAGE, A WATER TIGHT MANHOLE INSERT SUCH AS "SEWER GUARD" OR APPROVED EQUAL WILL BE REQUIRED.

2. APPROVED MANHOLES (DOUBLE COVER TYPE):
   A) U.S. FOUNDRY MODEL No. 230-AB-M
   B) VULCAN FOUNDRY MODEL No. VM-101

3. CONCRETE COLLAR IS REQUIRED ONLY WHEN MANHOLE IS OUT OF PAVEMENT.

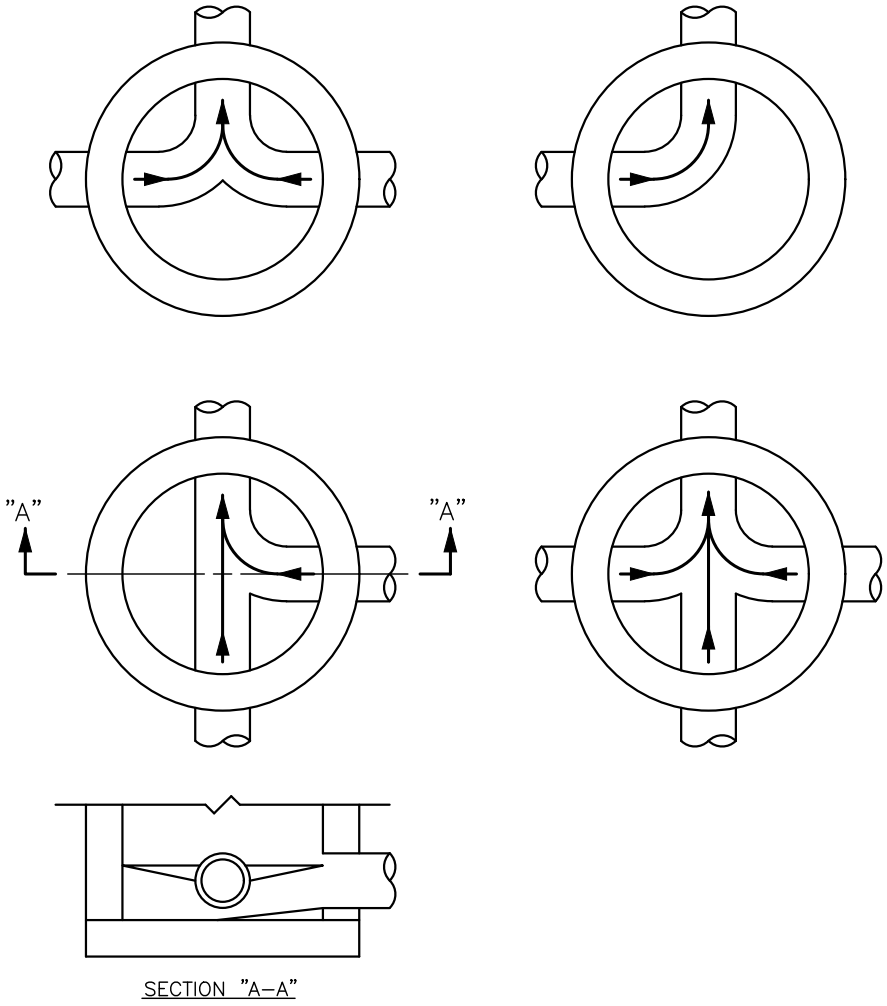
Manhole Frame and Cover (30" Opening)

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 40



SECTION "A–A"

NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. INVERT CHANNELS TO BE CONSTRUCTED FOR SMOOTH FLOW WITH NO OBSTRUCTIONS.
2. SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS PROVIDING FOR SMOOTH FLOWS.
3. CHANNELS FOR FUTURE CONSTRUCTIONS (STUBS) SHALL BE CONSTRUCTED, FILLED WITH SAND, AND COVERED WITH 1" OF MORTAR.
4. SLOPE MANHOLE ITSELF WITH A 1:2 SLOPE FROM MANHOLE WALL TO CHANNEL.
5. INVERT SHALL BE A MINIMUM OF 1/2 THE DIAMETER OF THE LARGEST PIPE OR 4" DEEP.

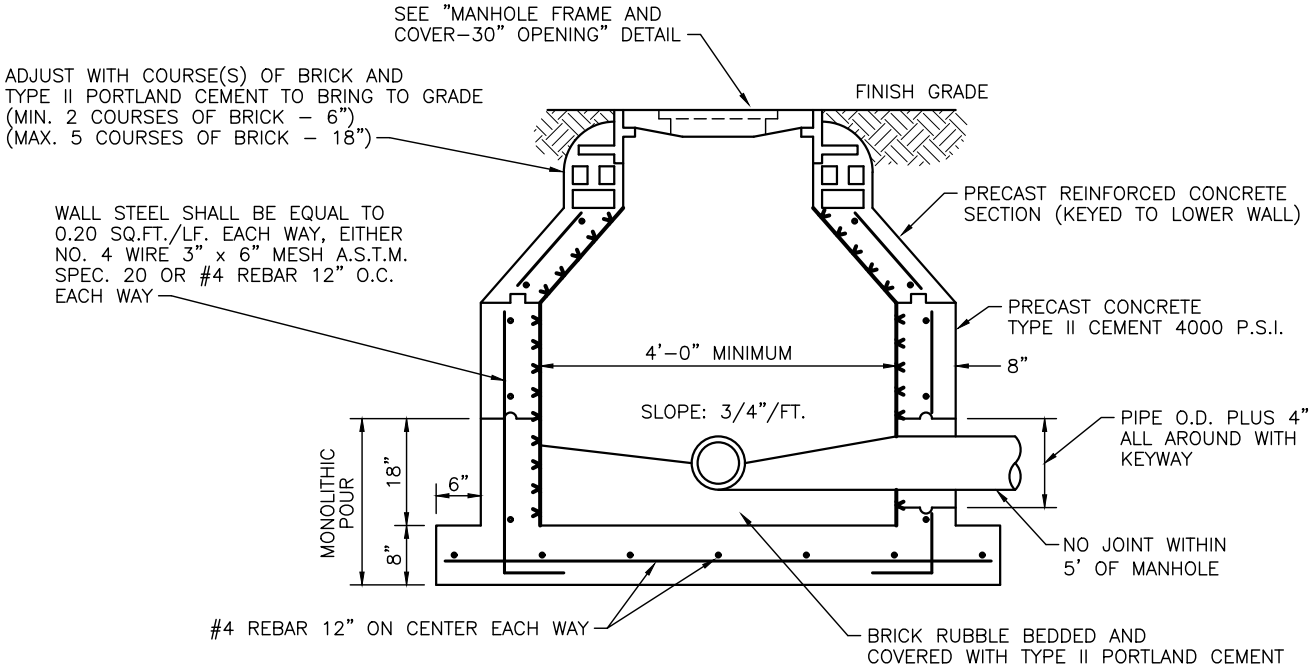
Flow Patterns for Invert Channels

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 41



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. MANHOLES SHALL CONFORM TO A.S.T.M. C478.(MIN.)
2. WALL REINFORCEMENTS A.S.T.M. DESIGNATION A185–64.(LATEST REVISION)(MIN.)
3. IF TWO CAGES OF WIRE MESH ARE USED, ONE SHALL BE POSITIONED 3" FROM THE INSIDE SURFACE AND ONE 3" FROM THE OUTSIDE SURFACE. IF A SINGLE CAGE OR REBAR IS USED, IT SHALL BE CENTERED WITHIN WALL THICKNESS. NO EXPOSED STEEL SHALL BE PERMITTED.
4. LIFT HOLES THROUGH PRECAST STRUCTURE ARE PERMITTED.
5. A MINIMUM OF SEVEN DAYS CURE TIME IS REQUIRED PRIOR TO DELIVERY.
6. ALL PIPE HOLES SHALL BE PRECAST OR CORE DRILLED. OVERSIZED HOLES WILL BE REJECTED.
7. ANY VISIBLE REINFORCING WIRE, STEEL OR HONEYCOMBS SHALL BE CAUSE FOR REJECTION.
8. SEE TECHNICAL SPECIFICATIONS FOR BEDDING REQUIREMENTS.
9. "RAM–NEK" OR APPROVED EQUAL AT ALL RISER JOINTS (1/2" THICK WITH WIDTH AT LEAST 1/2 THE WALL THICKNESS) WITH GROUT ON INSIDE AND OUTSIDE.
10. ALL OPENINGS SHALL BE SEALED USING ONLY TYPE II PORTLAND CEMENT/SAND MORTOR AND POTABLE WATER FOR MUD WORK ON JOINTS, LIFTING HOLES, INVERTS, ETC. WHEN AN ACCELERATOR IS NECESSARY, "ANTI HYDRO" IS THE ONLY PRODUCT APPROVED.
11. BRICK MASONRY CONSTRUCTION TO BE STUCCOED WITH 3/4" TYPE II CEMENT INSIDE AND OUTSIDE, AND INSIDE TO BE COATED WITH TWO COATS OF KOPPERS 300 OR APPROVED EQUAL.
12. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO FLOW STREAM, AND COATED WITH TWO COATS OF KOPPERS 300 OR APPROVED EQUAL
13. INTERIOR OF ALL SANITARY MANHOLES SHALL HAVE AGRU SURE GRIP CONCRETE PROTECTIVE LINER INSTALLED AT THE TIME OF MANUFACTURING. SEE "AGRU SURE GRIP LINER DETAILS" DRAWING FOR ADDITIONAL AGRU SURE GRIP REQUIREMENTS.

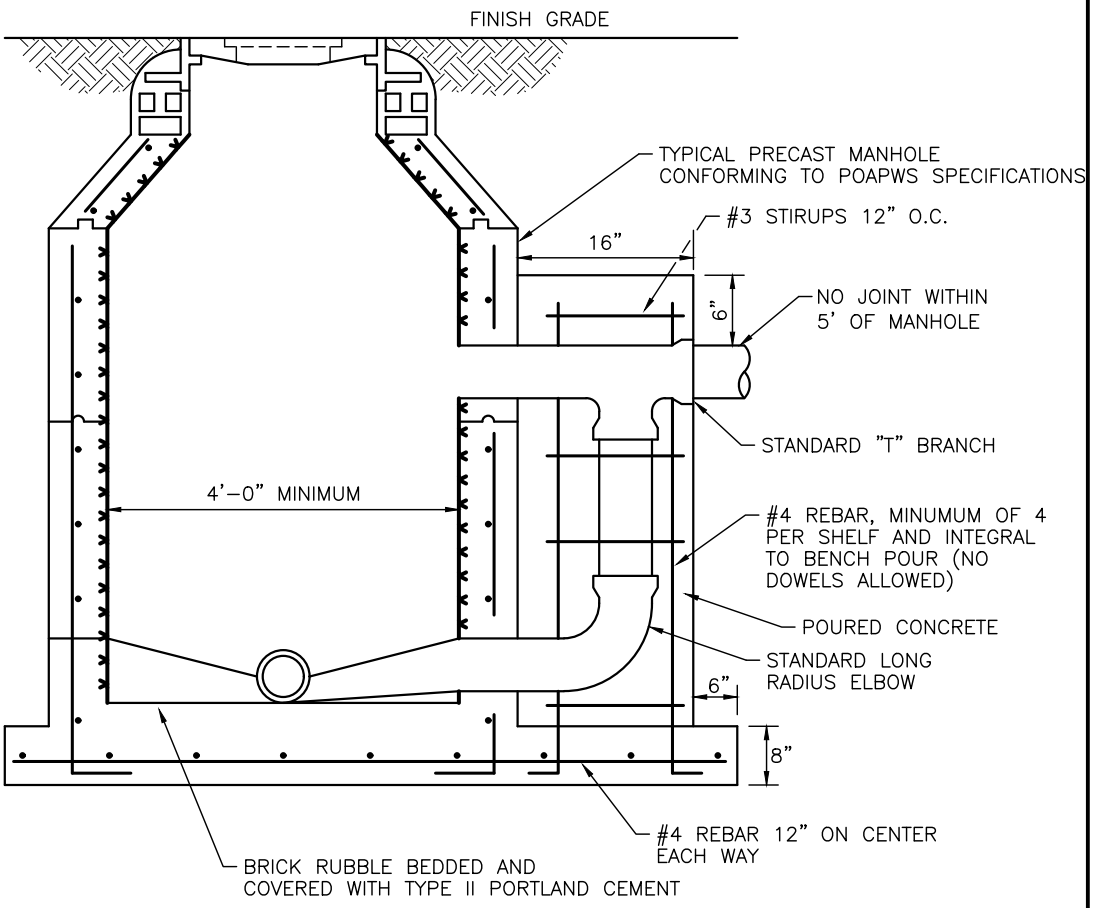
Standard Precast Manhole

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 42



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. CONCRETE ENCASEMENT FOR DROP CONNECTION TO BE FIELD POURED.
2. DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT SEWER IS LOCATED TWO (2) FEET OR MORE ABOVE THE MAIN INVERT CHANNEL.
3. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO FLOW STREAM.
4. WHEN PVC IS USED IN SANITARY SEWER LINES, SOLVENT TYPE JOINT PVC FITTINGS MAY BE UTILIZED IN THE DROP ASSEMBLY ONLY.
5. MINIMUM PIPE SIZE FOR DROP IS 8".
6. SEE "STANDARD PRECAST MANHOLE" DETAIL FOR ADDITIONAL REQUIREMENTS.

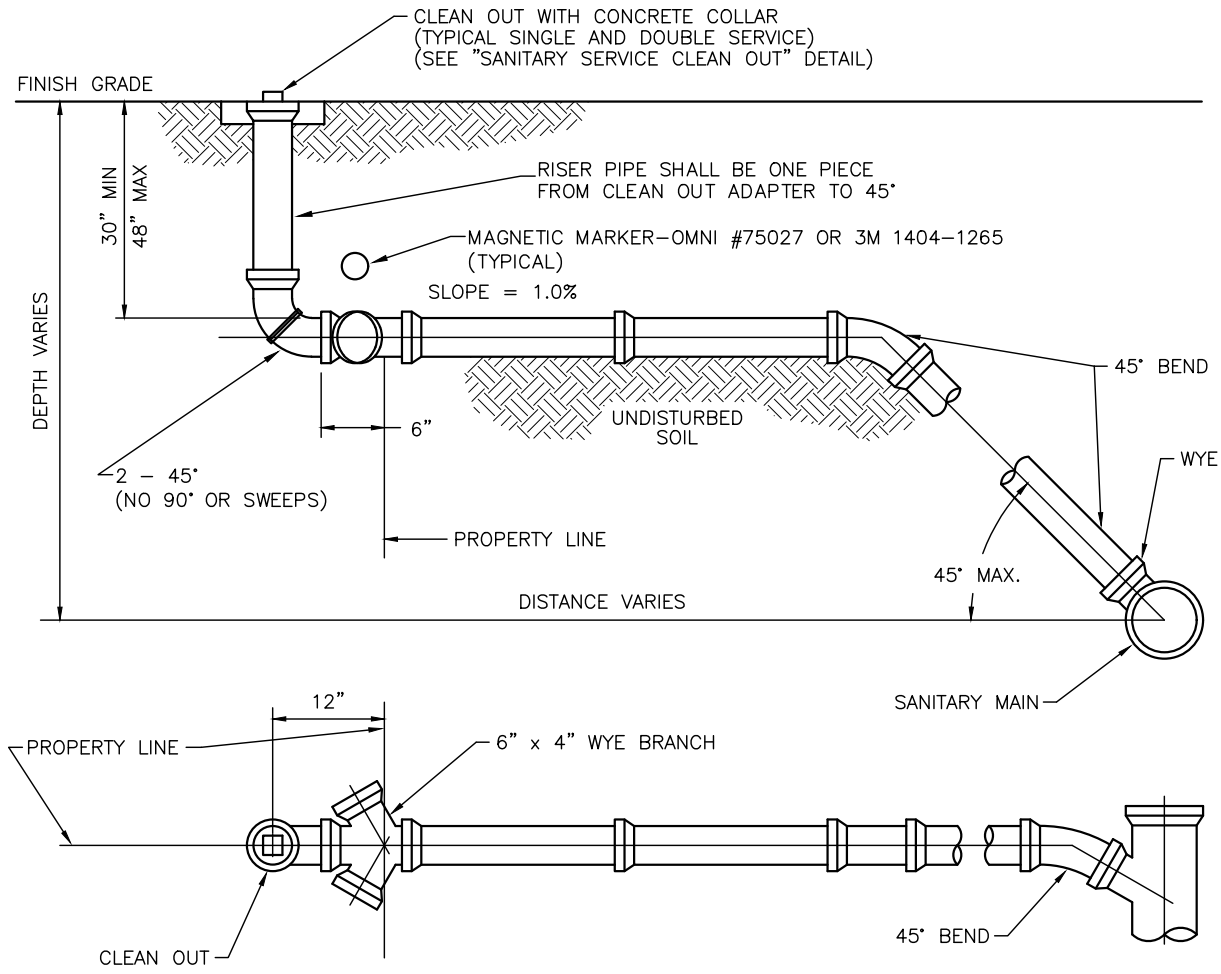
Precast Manhole - Drop Connection Type A

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 43



NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. THE END OF EACH SERVICE CONNECTION SHALL BE MARKED WITH A 2" x 2" TREATED WOOD STAKE AND AN E.M.S. SANITARY SEWER MARKER.
2. EACH SERVICE CONNECTION SHALL BE PLUGGED WATERTIGHT WITH AN APPROVED CAP OR PLUG.
3. FOR PVC INSTALLATIONS, CONNECT TO EXISTING "BELL END" AND CONNECT OPPOSITE END WITH PVC TO PVC KNOCK ON SLEEVE.
4. SOLIDLY TAMP BACKFILL AT LEAST ONE FOOT ABOVE TOP OF PIPE. SERVICES UNDER PAVED AREAS SHALL BE BACKFILLED TO THE SAME SPECIFICATIONS AS SHOWN ON "PAVEMENT REPLACEMENT" DETAIL.
5. CONTRACTOR SHALL MARK ON A CLEAN SET OF PLANS THE FINAL STATIONING OR DISTANCE AND DIRECTION FROM MANHOLE TO EACH SERVICE LATERAL AND GIVE TO ENGINEER FOR RECORD DRAWING PURPOSES.
6. ANY DEVIATION FROM THESE METHODS MUST BE APPROVED BY PBPOC.
7. THE USE OF UNNECESSARY FITTINGS ON THE CUSTOMERS LINE TO REDUCE EXCAVATION EFFORTS WILL BE CAUSE FOR REJECTION.
8. THE USE OF 90° SWEEPS ON THE CUSTOMERS LINE IN LIEU OF 45° BENDS WILL REQUIRE AN ADDITIONAL CLEAN OUT AS SHOWN ON "SANITARY SERVICE CLEAN OUT DETAIL". THE CLEAN OUT SHALL BE ON THE HOUSE SIDE OF THE TOP SWEEP WITHIN 2' OF THE SWEEP.

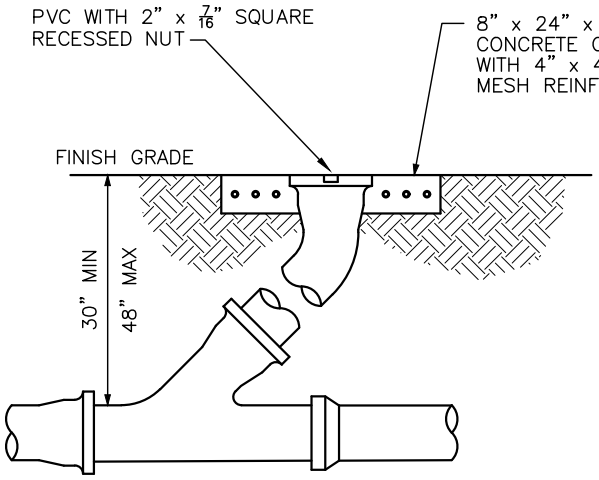
Sewer Service Connection (Wye Branch)

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

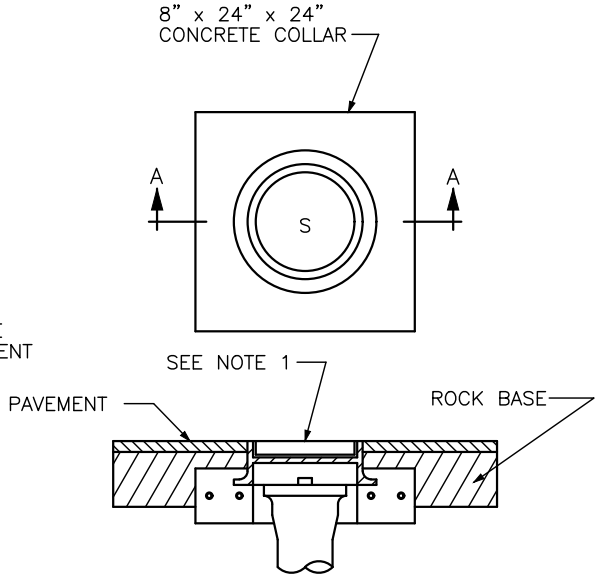
DATE APPROVED: NOVEMBER 2022

DRAWING No. 44



SECTION "A–A"

CLEAN OUT IN GREEN AREA



SECTION "A–A"

CLEAN OUT IN VEHICULAR OR
PEDESTRIAN TRAFFIC AREA

NOTES: (PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS)

1. U.S. FOUNDRY NO. 7621 REVERSIBLE HANDHOLE RING AND COVER OR APPROVED EQUAL SHALL BE USED, COVER TO BE CAST WITH "S" IN THE CENTER.

2. CLEAN OUT REQUIRED ON ALL SERVICES AT PROPERTY LINE OR EASEMENT LINE WHERE APPLICABLE.

3. STANDARD WYE SHALL BE USED AT CLEAN OUT.

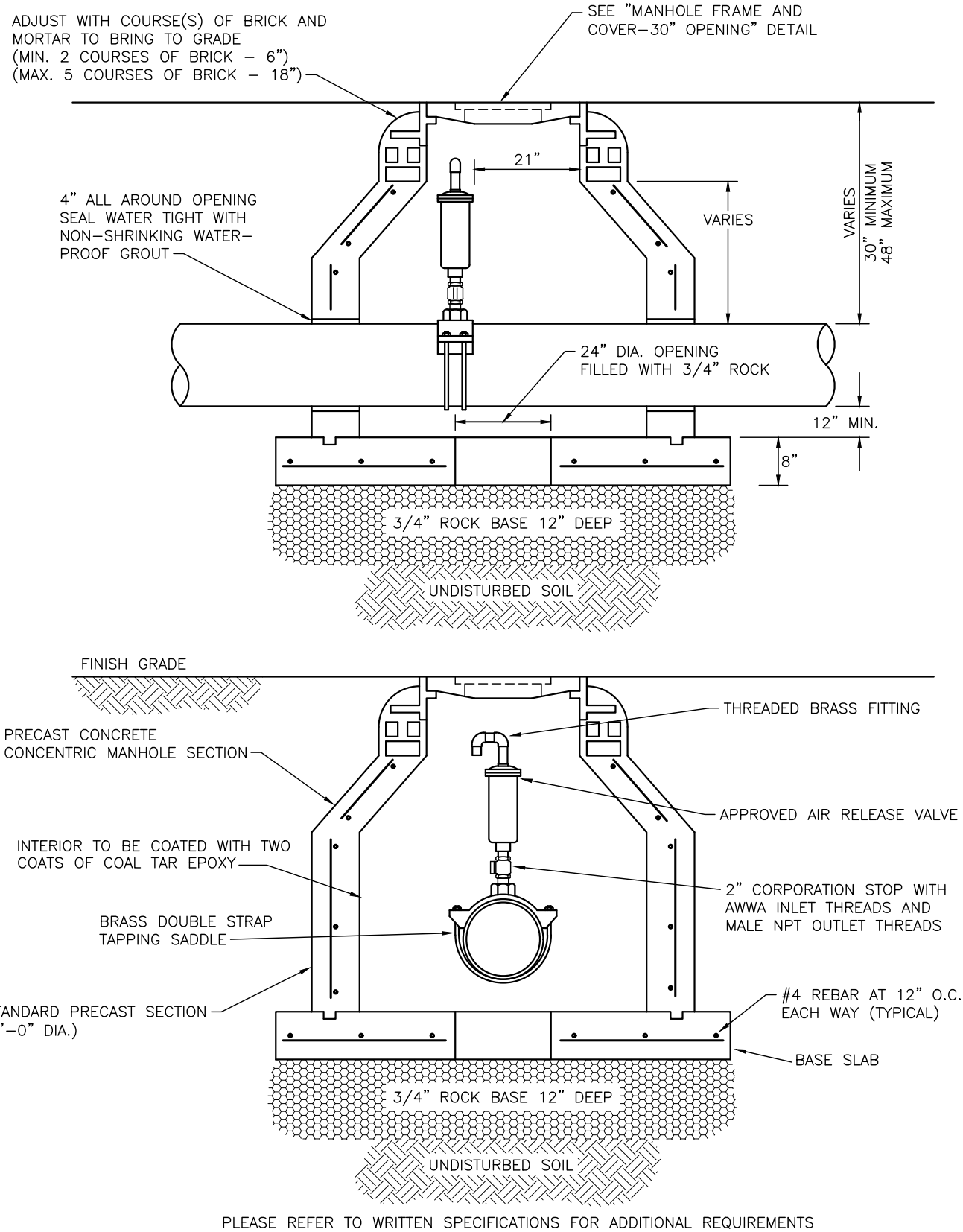
Sanitary Service Clean Out

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 45



PLEASE REFER TO WRITTEN SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS

Air Release Valve (Underground Force Main)

PALM BEACH PARK OF COMMERCE ASSOCIATION, Inc.

CONSTRUCTION STANDARDS AND DETAILS

DATE APPROVED: NOVEMBER 2022

DRAWING No. 46