Water, Wastewater & Reclaimed Water Design Guidelines

Revised January 2019

Section 1.0 General Information 8
1.1 General 8
1.1.1 Definitions 9
1.1.1.1 Developer 9
1.1.1.2 Development 9
1.1.1.3 Infill 9
1.1.1.4 Lot of Record 9
1.1.1.5 New Development 9
1.2 Getting Started 10
1.2.1 Service Availability Request 10
1.2.1.1 Verification of JEA Points of Service 10
1.2.1.2 Project Phasing 11
1.2.2 Water, Wastewater and Reclaimed Water As-Built Drawing Request 11
1.2.3 Special Service Considerations 12
1.2.3.1 Additional Costs for Special Service Conditions 12
1.2.3.2 Alternative Connection Committee 12
1.2.3.3 Reclaimed Water Service Area 13
1.3 Pre-Design Meeting 13
1.4 Modifications to Existing JEA Systems 13
1.5 Master Plan Requirements 14
1.6 Project Acceptance Requirements 14
Section 2.0 Design Guidelines 15
2.0 General 15
2.1 Order of Precedence 16
2.2 JEA Plan Approval Effective Dates 16
2.3 JEA Review Time Frames 17
2.3.1 Preliminary Plan Submittal Review Time 17
2.3.2 Subsequent Plan Submittal Review Time 17
2.3.3 Revision Plan Submittal Review Time 17
2.3.4 Preliminary As-Built Plan Submittal Review Time 17
2.3.5 Subsequent As-Built Final Plan Submittal Review Time 17

2.4 Design Review 17
2.4.1 Infill Development 17
2.4.1.1 Infill Layouts – Required for Sewer Services 18
2.4.1.2 JEA Installed Services 18
2.4.1.3 Builder Installed Services 18
2.4.2 General Plan Submittal Requirements for New Development 19
2.4.3 Water Plan Submittal Requirements 21
2.4.4 Wastewater Plan Submittal Requirements 21
2.4.5 Reclaimed Water Plan Submittal Requirements 22
2.4.6 Utility Construction Notes 22
2.5 Preliminary Plan Review 24
2.6 Subsequent Plan Review 25
2.7 Plan Revisions 26
2.7.1 Revision to Approved Plans with no Permit 26
2.7.2 Revision to Approved Plans with Permit 26
2.8 Permits 27
2.9 Pre-Construction Meeting 27
2.10 Construction and Inspection 28
2.11 Shop Drawings 28
2.12 As-Built Drawings 29
2.13 JEA Construction Substantial Completion Walk Through Field Meeting 29
2.14 JEA Final Inspection and Acceptance of the System 30
2.15 System Warranty 30
2.16 JEA Connection and Fees 30
2.17 Dedication of Existing Privately-Owned Systems 31
2.18 Public and Private Point of Service 32
2.19 Utility Easements 32
2.20 Revision to Dedicated Infrastructure 34
2.20.1 Water and Reclaimed Water Services 35
2.20.2 Fire Hydrants 35
2.20.3 Wastewater Services 36

2.20.4 Construction and Dedication of Redesigned Infrastructure 37
2.21 Revisions to Infrastructure Pre-Dedication 37
Section 3.0 Potable Water and Reclaimed Water Design Guidelines 38
3.0 General 38
3.1 Design Flows 38
3.1.1 Average Daily Flow (ADF) 38
3.1.2 Single Family Residential 38
3.1.3 Multi-Family Residential 38
3.1.4 Commercial and Industrial 38
3.1.5 Flow Comparison Analysis 39
3.1.6 Reclaimed Water 39
3.2 Fire Flow 39
3.2.1 Single Family Residential 39
3.2.2 Multi-Family Residential 39
3.2.3 Manufactured Home Communities 40
3.2.4 Commercial 40
3.2.5 Institutional and Industrial 40
3.2.6 Fire Hydrant Test Data 40
3.3 Sizing Water and Reclaimed Water Mains 41
3.3.1 Major Transmission Mains 41
3.3.2 Distribution Mains 41
3.3.3 Velocities 42
3.3.4 “C” Factor 42
3.4 Water Main and Reclaimed Water Main Materials 42
3.5 Water Main and Reclaimed Water Main Bury Depths 42
3.6 Water Main and Reclaimed Water Main Locations 43
3.7 Water Main and Reclaimed Water Main Separation Requirements 44
3.8 Swabbing Launching Stations 45
3.9 System Connections 45
3.10 Fire Hydrant Locations 46
3.10.1 General 46

3.10.2 Single-Family Residential 46
3.10.3 Multi-Family Residential, Commercial and Industrial 47
3.10.4 Open Rural Areas 47
3.11 Water and Reclaimed Water Valves 47
3.12 Flushing Hydrants and Sample Points on Water Mains 48
3.13 Flushing Hydrants on Reclaimed Mains 48
3.14 Air Relief Valves 48
3.15 Water and Reclaimed Water Services 48
3.16 Water Meters 49
3.16.1 General 49
3.16.2 Water Meter Sizing 50
3.16.3 Temporary Water Meters 51
3.16.4 Portable Fire Hydrant Meters for Construction Activities 51
3.16.5 Multi-Family, Commercial or Industrial Development Metering 51
3.17 Backflow Preventers 52
3.18 Water Treatment Plants 53
3.19 Stub-Outs and Terminal Point 53
Section 4.0 Wastewater Design Guidelines 54
4.0 General 54
4.1 Design Flows 54
4.1.1 Average Daily Flow (ADF) 54
4.1.2 Equivalent Dwelling Units 54
4.1.3 Peak Flow 54
4.2 Gravity Wastewater Mains 55
4.2.1 Sizing Gravity Wastewater Mains 55
4.2.2 Gravity Wastewater Slope Requirements 56
4.2.3 Gravity Wastewater Main Materials 57
4.2.4 Gravity Wastewater Main Depth 57
4.2.5 Gravity Wastewater Main Location 57
4.3 Wastewater Main Separation Requirements 58
4.4 Gravity Services 59

4.4.1 Single Family Residential Services 60
4.4.2 Multi-Family Residential, Commercial and Industrial Services 60
4.4.3 Wastewater Service Locates 61
4.5 Wastewater Meters 61
4.6 Wastewater Manholes 61
4.6.1 Invert and Rim Elevations 62
4.6.2 Drop Connections 62
4.6.3 Lining 62
4.7 Force Mains 63
4.7.1 Pipe Diameter 63
4.7.2 Depth of Bury 63
4.7.3 Material and Fittings 64
4.7.4 Location 64
4.7.5 Dual Directional Drilling 65
4.7.6 Swabbing Launching Stations 65
4.7.7 Force Main Separation Requirements 66
4.7.8 Valves 67
4.7.9 Force Main Connections to Existing Force Mains 68
4.7.9.1 Taps 68
4.7.9.2 To Existing Force Mains >12-inch diameter 68
4.8 Access Road 68
Section 5.0 Pump Station Design Guidelines 69
5.0 JEA Dedicated Pump Stations 69
5.0.1 General 69
5.0.2 Site Plan 69
5.0.3 Junction Manhole 70
5.0.4 Class One and Class Two Lift Stations 70
5.0.5 Wet Well-Class Three Lift Station 71
5.0.6 Pumps 73
5.0.7 Electrical Control Panel 74
5.0.8 Emergency Operations 75

5.0.8.1 Class One Pump Stations 75
5.0.8.2 Class Two, Three and Four Pump Stations 76
5.0.9 Water Service 76
5.1 Private Pump Stations 76
5.2 Low-Pressure Systems (LPS) 78

Section 1.0

General Information

1.1 General

The JEA Development Team consists of the JEA Director, Manager, Engineers, Technicians, and Coordination staff.

JEA team members are trained to assist in the project management, coordination with planning, system availability, hydraulic analysis, design review, construction inspection, as- built review, and acceptance processes of developer installed utility systems.

This section provides a summary of the processes included in the initial stages of project development and the JEA personnel involved in coordination of new developer installed utility system projects.

Typical development infrastructure investment centers around developers being solely responsible for the survey, engineering design, permitting, and construction for both on-site and off-site water/wastewater/reclaim utility infrastructure to meet the needs of their specific development.

All hard copy submittals can be delivered to:

JEA

Water/Wastewater Development Department, T-4
21 West Church St.
Jacksonville, FL 32202

1.1.1 Definitions

For the purposes of these Design Guidelines, the following definitions are provided to further clarify JEA's application of these guidelines.

1.1.1.1 Developer

Any person or entity who improves a parcel of land which may include the extension of the offsite utilities system from the existing point of connection to the proposed improvements for the purpose of providing service to said development.

1.1.1.2 Development

Any parcel of land upon which improvements are being made that require utility infrastructure to serve said improvements as defined by the City of Jacksonville, St Johns County, Nassau County or Clay County planning departments or any other appropriate local or federal entity having jurisdiction over said parcel of land.

1.1.1.3 Infill

A specific residential development category where immediately prior to development or redevelopment of land, property was vacant or, existing property divided to its prior platted development.

1.1.1.4 Lot of Record

A lot that is part of a subdivision recorded on or before September 21, 1990, in the Office of the Circuit Court of Duval County or a lot or parcel described by metes and bounds, which was lawfully created and the description for which was recorded on or before September 21, 1990. In the City Ordinance 656.704, the City of Jacksonville may not subject properties identified as "lot of record" to minimum lot size requirements.

1.1.1.5 New Development

Open land that is subdivided and platted into individual parcels upon which improvements are being made that requires utility infrastructure to serve said improvements.

1.2 Getting Started

1.2.1 Service Availability Request

Prior to submitting for a building permit with local county agencies, an Availability Request Form shall be submitted to JEA. This form can be completed on-line at www.jea.com. Service availability requests are reviewed by JEA's Water and Wastewater System Planning Team to determine the nearest points of connection. Requests are normally completed within 10-business days. Responses from JEA are in the form of an availability letter. The availability has an expiration of one year from the date written and contains a tracking number known as the availability number. This number will be the reference number used throughout the project's lifecycle. If you need to submit any back-up documentation supporting your request (layouts, easement documents, etc.) please submit them to availabilityreq@jea.com. If your availability letter has expired and you have no other changes needed, please email your update request to availabilityreq@jea.com.

1.2.1.1 Verification of JEA Points of Service

In its evaluation of availability requests, JEA will rely upon JEA utility system records for the accuracy of existing JEA utilities. It shall be the sole and exclusive responsibility of the applicant and/or its affiliated parties to determine the suitability and accuracy of the record information and locate through field verification (including but not limited to sub-surface utility investigations, open excavation, ground penetrating radar etc.) during the design process. Should field verification of existing utilities not match the availability response, the applicant shall notify JEA immediately so a new point of connection can be identified.

1.2.1.2 Project Phasing

For projects that will be constructed in more than one phase, JEA shall be provided with a phased master plan. JEA will require projects be broken into logical phases. Each phase will be a separate project and may require a separate plan review. JEA Planning will review, and if applicable, assign separate JEA availability numbers to each construction phase.

If any of the following conditions apply, then the project will be required to be submitted in phases:

a. If parcels are non-contiguous. Each non-contiguous parcel shall be a separate phase;
b. If construction completion or JEA acceptance will occur at different times. Each parcel with schedules for construction completion and acceptance differing by more than 4-months will be separate phases;
c. Construction will not be completed on the entire phase within 2-years from JEA plan approval. Parcels will be broken into smaller sizes so that construction can be completed within 2-years of plan approval;
d. Parcels contain a combination of new infrastructure and reworking of existing infrastructure. Parcels with new infrastructure will be phased separately from parcels with existing infrastructure being re-worked.

1.2.2 Water, Wastewater and Reclaimed Water As-Built Drawing Request

For best available information on existing water, wastewater and reclaimed water mains or locations of water, wastewater, and reclaimed taps, an As-Built drawing request may be obtained from JEA's Record Department. Generally, requests for water, wastewater, and reclaimed water tap locations are completed within 2-business days and all other requests are completed within 5-business days. These requests must be submitted in writing.

Here are the ways that you can submit your request:

- Complete and submit an "As-Built Drawing Request" form via online records request at www.jea.com.
- Verification of as-built information can be determined by the applicant through the JEA "locate" process.
- The applicant is also strongly encouraged to locate underground utilities through "soft digs" to confirm location of utilities.

1.2.3 Special Service Considerations

1.2.3.1 Additional Costs for Special Service Conditions

During the plan review process, JEA may observe unusual conditions (ex. additional costs due to FDOT right-of-way requirements, a conflict with City of Jacksonville resurfacing schedule, or other unusual connection requirements) and add comments to the submitted drawing set so to alert the applicant that (for JEA to install requested utilities) JEA must ascertain the magnitude of cost for the tap construction. The additional cost will be the responsibility of the developer.

JEA has the right to refuse to install complex services, in which case the construction of the connection will be accomplished by the developer and the project must complete the design review and dedication process.

1.2.3.2 Alternative Connection Committee

For water or wastewater requests which are not in accordance with the JEA Water, Wastewater and Reclaimed Design Guidelines and/or Water and Wastewater Standards Manual and/or JEA Rules and Regulations for Water, Sewer and Reclaimed Water Services, the applicant may request a pre-design meeting with the JEA Development Team to discuss conceptual solutions which may be forwarded to the Alternative Connection Committee for consideration.

The committee consists of representatives of design, operation, and maintenance. A representative from the JEA development group will present the request to the committee for consideration. The applicant may be asked to provide information and/or exhibits to support this presentation. The applicant does not meet with the committee.

The committee generally meets each month, if there are any requests to be heard. After the committee makes a decision on any request, the applicant will be notified within 5-business days.

If you wish to submit a project for ACC consideration, please forward the availability letter, the project layout, and an explanation for your request to wsedevprojrequests@jea.com, **attention ACC Request**. Please include any field information that will support your request. A representative from the development group will be in contact with you regarding your request.

1.2.3.3 Reclaimed Water Service Area

Reuse Service Area is the geographic area within JEA's Utility Service Area where the reclaimed water system exists or shall be expanded, to provide reclaimed water service. Where the distance from the reclaimed water distribution system and the property line is within the guidelines of the JEA Rules & Regulations for Water, Sewer and Reclaimed Water Services, Appendix A, Section A-3.02, Table 1, the owner shall connect or cause to be connected the new development to the reclaimed system. Where the distance from the reclaimed water distribution system and the property line is more than the distances in Table 1, the owner shall include reclaimed water distribution mains within their development for future connection to the system by JEA, and install a potable water jumper connection to the reclaimed water system until reclaimed water becomes available.

1.3 Pre-Design Meeting

It is strongly recommended that the applicant schedule a pre-design meeting with the JEA Development Team to discuss conceptual water and Wastewater requirements for any project other than simple tap projects. For large (greater than 200-lots), complex, or phased projects, a pre-design meeting shall be mandatory. To schedule a pre-design meeting, please email your request to wsedevprojrequests@jea.com, **attention Pre-Design Meeting**. Please include in your request the following:

- Available dates/times for meeting
- Valid JEA Availability Letter
- Draft Master Utility Plan (if applicable)
- Draft Preliminary Site and Utility Plans
- Draft Phasing Plan (if applicable)
- Any special project requests you foresee
- Any additional JEA teams you may need (Electric, Real Estate, etc.)

1.4 Modifications to Existing JEA Systems

Unless approved by JEA's Development Manager, once a project has been accepted by JEA, no further revisions are allowed and the applicant must resubmit for a new availability number to make changes. See Section 2.20: Revision to Dedicated Infrastructure.

1.5 Master Plan Requirements

A Master Development Plan shall be required for all development projects being constructed in multiple phases. The Master Development Plan shall include, but not be limited to:

- Project boundary - The Project Boundary shall match the project boundary approved by the local Planning and Zoning Department.
- Identification and Scheduling of all Phases.
- A description of the Type and Quantity of development (example: 300-Single Family Homes) within each phase.
- Routing for all piping (Water, Wastewater and Reclaimed) along with proposed pipe sizes and connection points.
- Identify whether piping will be located in public right of way, easements, or other.
- Preliminary locations of all pump stations and/or master lift stations

The Master Development Plan Shall be submitted prior to or concurrently with the first phase of construction. Approval of the Master development plan does not override the requirements of the design and construction standards.

1.6 Project Acceptance Requirements

Once plans and permits (if applicable) are approved, a pre-construction meeting may be requested, during which an inspector will be assigned to your project. After completion of all acceptance requirements, including as-built drawings approval, permit COC and the project acceptance package has been received, JEA will set up a final walk-through. Once all punch-list items have been addressed, JEA will accept the project and release meters.

All utilities that will be constructed and dedicated to JEA, within the ROW and/or JEA easements, will be required to be completed by a Florida licensed underground contractor.

Section 2.0

Design Guidelines

2.0 General

This section applies to all new residential, commercial, and industrial developments, as well as roadway construction requiring or requesting a new or modified water, reclaimed water, and/or sanitary wastewater service or main construction. For these new developments, a JEA Plan Review is required. To initiate a JEA Plan Review, the developer must first obtain a JEA Water and Wastewater Availability, which defines the JEA point of service. The availability number is utilized for tracking the project from start to finish. The applicant submits proposed construction plans, permits, and other applicable data to JEA's Plan Review Department for JEA water and wastewater utility review. The Plan Review process typically involves two submittals (a preliminary and final plan review) as described below.

JEA, in coordination with the Developer's Engineer, reserves the right to specify the point of service, the size of service, the type of service, and the general layout of the overall system within the guidelines established in this manual.

Water, reclaimed water, and wastewater distribution and collection systems shall be designed and constructed according to the most current editions of the following publications:

- JEA Water, Wastewater & Reclaimed Water Design Guidelines
- JEA Rules & Regulations for Water, Sewer and Reclaimed Water Services
- JEA Water and Wastewater Standards Manual
- The Recommended Standards for Sewage Works (Ten State Standards)
- FDEP and other applicable federal, state and local requirements
- JEA Self-Permitting

For utility work outside of Duval County, the location of water valves, meter boxes and the type and location of fire hydrants shall comply with the local (County) design and construction utility standards.

The engineer shall coordinate the location of water, reclaimed water and wastewater facilities with other utilities (electric, gas, telecommunication, drainage and cable) to minimize conflicts. Facilities shall be designed such that conflicts with driveways and sidewalks are minimized. In the event of conflict with a future driveway or sidewalk, the Developer and/or Builder shall be responsible to resolve the conflict at its expense.

For private water distribution systems involving two or more units that are connected to the JEA water distribution system (such as a master meter arrangement), the applicant, shall ensure that the above rules and standards are complied with during the design and construction phase of the project. Although a JEA Plan Review and/or a regulatory permit may not be required, it is the responsibility of the applicant to maintain the public drinking water standards by complying with the above applicable rules and standards including, but not limited to utility separation requirements, pressure and leakage testing and private bacteriological clearance testing. It should also be noted, in some cases, the private water distribution system might require a plumbing permit from the City or County having jurisdiction.

2.1 Order of Precedence

JEA will use the following order of precedence in resolving any conflict, error, or discrepancy for all installed systems:

1. Approved regulatory permits (JEA, FDEP)
2. Approved County/FDOT agency permit requirements
3. Approved final design plans
4. JEA Water and Wastewater Standards Manual
5. JEA Rules & Regulations for Water, Sewer and Reclaimed Water Services
6. JEA Water, Wastewater and Reclaimed Water Design Guidelines

2.2 JEA Plan Approval Effective Dates

JEA approved plans will be effective for 2-years from the date of JEA Plan Approval. For projects that include a JEA environmental construction permit, Plan Approval will be effective for the same dates as the permit. The date of JEA Plan Review Approval will be provided on the cover sheet of the approved construction plans. After the 2-year period has expired, JEA may grant up to one, 2-year time extension and subsequently, one, one-year time extension for a maximum of a 5-year construction time period. At each request for extension, a copy of the existing approved JEA plans, identifying any construction that has occurred, will be submitted for approval. Any construction not completed and accepted by JEA will adhere to the JEA standards in effect at the time the extension and plans are approved.

2.3 JEA Review Time Frames

2.3.1 Preliminary Plan Submittal Review Time

Preliminary plan reviews will typically be completed within 15-business days.

2.3.2 Subsequent Plan Submittal Review Time

Final plan reviews will typically be completed within 10-business days.

2.3.3 Revision Plan Submittal Review Time

Revision plan reviews will typically be completed within 5-business days.

2.3.4 Preliminary As-Built Plan Submittal Review Time

Preliminary As-Built plan review will typically be completed within 10-business days.

2.3.5 Subsequent As-Built Final Plan Submittal Review Time

Final As-Built plan review will typically be completed in 5-business days.

2.4 Design Review

2.4.1 Infill Development

To add a new water and/or sewer service to a lot a letter of availability first must be requested from jea.com. The availability letter will provide the nearest water and sewer point of connection. If the point of connection is not abutting the property in question, a line extension will be required. Please see Section 2.4.2 for plan set requirement.

If the point of connection abuts the property, a layout of the property will need to be submitted if requesting sewer service. As instructed in the availability letter, submit a request to specialestimates@jea.com for the cost to connect to the JEA system. Costs are dependent primarily on depth of sewer. Customer may choose to contract with a licensed utility contractor as detailed in Section 2.4.1.3.

2.4.1.1 Infill Layouts – Required for Sewer Services

As applicable, infill layouts will need to include the following information:

a. Street Name
b. Addresses of proposed and adjacent lots
c. Right-of-way lines
d. Existing Utilities (water, sewer, storm, etc.)
e. Existing sewer and storm manholes with TMH and Invert elevations
f. Finished floor elevation (Based upon Vertical Datum NAVD 1988)
g. Building footprints
h. Driveway locations
i. Existing water meters (if any)

To request a pre-application meeting or to submit layouts for in-fill lots, email wsedevprojrequests@jea.com, **attention Infill Development Team.**

2.4.1.2 JEA Installed Services

Submit applicable new service application to the water pre-service counter with payment. Most taps will be installed within 15 business days.

2.4.1.3 Builder Installed Services

For infill water and sewer taps only, a builder may install water and/or gravity sewer services on existing infrastructure without engineered plans under the following conditions:

1. Availability Letter from JEA identifies a point of connection that is abutting the property (no main line extension required);
2. Infill layout has been approved by JEA Development;
3. Water and sewer services must be installed by a Florida licensed underground utility contractor;
4. Utility work must adhere to the latest JEA Design Guidelines and Water and Wastewater Standards;
5. A JEA inspector must be onsite, observe, and approve the installation of water and/or sewer services;
    a. Builder submits As-Built drawings to JEA within 5-Business days of work completion, including the location and depth of water and/or sewer service at tap and termination point;
6. Submit Project Acceptance package within 5-Business days of

approval of As-Built drawings;

7. Submit Pre-pave service application to the Water Pre-Service counter when ready for meter installation.

To utilize this process, email requests to: wsedevprojrequests@jea.com, attention Development Manager.

2.4.2 General Plan Submittal Requirements for New Development

Dedicated water/sewer/reclaim plan sheets are required. Drainage infrastructure may be shown on these plan sheets, but it will need to be shaded back. As a minimum requirement, the following shall be included on the design drawings:

a. Cover sheet with a vicinity map, JEA availability number, city development number (if applicable), and a note referring to the applicable Standards year for which the plans were designed. Example: Plans Designed under YYYY Standards;
b. A north arrow with scale indicated;
c. Lot numbers, street names and street address (if available - especially for in- fill areas) on all applicable sheets;
d. A permanent benchmark or temporary benchmark (referenced to a permanent benchmark) referenced to State Plane Coordinates as well as topography depicted as 1-foot contours;
e. The engineer's name, project name and all phases to be planned, designed, and constructed on all sheets;
f. Developer's name and contact number;
g. All materials shown and clearly labeled (pipe, valves, fire hydrants, fire sprinkler lines, water meters, fittings-including all horizontal and vertical bends, manholes, services) with associated elevations, sizes, types, composition, slopes, and appurtenances;
h. Location of existing utilities within the right-of-way including water mains, reclaimed water mains, force mains, gravity sewer mains, storm sewers, electric, gas, fiber optic, cable, and telephone. Label as existing and include the size and material;
i. Where connecting to an existing utility line, both horizontal and vertical field verification of the main location;
j. Elevations (manhole tops and inverts) of all existing wastewater facilities within the right-of-way and easements;
k. Pipe Crossing Information shall be provided in either a table or callouts per sheet. Include the FG elevation, bottom elevation of the top pipe and the top elevation of the bottom pipe at the crossing. If you find it necessary to deflect pipe to meet minimum clearances you must show and call out the required fittings;
l. A site plan indicating any required grease, oil, sand, or lint separators and/or other required pretreatment systems such as dumpster pad run off;

m. A master paving and drainage plan showing all storm water facilities, retention or detention ponds with elevations, the design high water and 100-year flood elevations and site contours shown at 2-foot maximum intervals;
n. All drainage design plan sheets with profiles depicting proposed water, reclaimed water and wastewater systems;
o. Utility Master Site Plan drawn with proposed phases clearly indicated. Updates provided as revisions are made;
p. Matchlines, when applicable, shall be indicated on all plan sheets. Do not cut sheets through intersections. Label all matchlines with corresponding sheets and provide a 10-foot overlap;
q. When available, preliminary plat shall be submitted on all platted projects in order for JEA to provide electric, water, or wastewater services to the development;
r. Design plan shall include station numbers along proposed roadways for all projects;
s. Plan and Profile Sheet Scale: Please be sure that the scale is consistent from sheet to sheet and that the scale is such that the plans are legible. For commercial or residential subdivisions, plan only sheets drawn at a maximum horizontal scale of 1-inch = 40-feet. For commercial and residential subdivisions, plan and profile sheets drawn at a maximum horizontal scale of 1-inch = 40-feet and a maximum vertical scale of 1-inch = 5-feet;
t. Roadway cross sections with all proposed and existing utilities depicted, road crossing details for open cuts, profiles for jack and bores and directional drills showing all existing utilities with actual surveyed elevations and field verified locations where possible;
u. Plan and profile sheets shall include all wastewater design information including pipe size, length, material, slope, manhole top and invert elevations, existing and proposed grades, the location of new gravity sewer mains and force mains, all crossings (storm water and water mains) and all additional pertinent information such as trench details, manhole details, joint details, and material specifications. Profiles are required for all force mains, and all other pressure pipe greater than 12-inch diameter;
v. Landscaping plans with location of proposed utilities shown;
w. All existing and proposed utility easements and rights-of way with dimensions, locations and grantee;
x. All proposed or existing structures within the separation requirements laid out in Section 3.7: Separation Requirements;
y. All existing or proposed drainage easements with dimensions, locations and grantee;
z. When available, building footprints (for commercial projects), minimum finished floor elevations and number of floors, decorative brick walls and paving, entrance signs, fountains, fences, and landscape buffers shown;
aa. Ownership of the proposed utility system shall be clearly designated as “JEA” or “Private”;

bb. Stabilized access road shown in easements crossing wetlands or limited access areas which include manholes;
cc. The limits of joint deflection for vertical and horizontal offsets must be reflected on the drawings. It could be "start vertical joint deflection" and "stop vertical joint deflection" or a dimensional line at each end labeled "limits of deflection." Joint deflection must conform to JEA Standards.

2.4.3 Water Plan Submittal Requirements

In addition to the general plan submittal requirements discussed above. Water design plans shall include the following:

a. Signed and sealed hydraulic Analysis supporting pipe and meter size selection and or fire flow;
b. All backflow prevention required in accordance with the JEA cross connection control program;
c. Location of all points of connection to the existing water distribution system;
d. Water service and meter locations for all applicable lots;
e. Location of all sample points;
f. Profiles for all waterlines greater than 12-inch diameter;
g. Profiles for all waterlines installed via horizontal direction drilling (HDD).

2.4.4 Wastewater Plan Submittal Requirements

In addition to the general plan submittal requirements discussed above, wastewater design plans shall include the following:

a. Signed and Sealed Pump Station Analysis (See Section 5.0: Pump Station Design Guidelines);
b. Sewer service locations for all applicable lots;
c. Profiles for all forcemains installed;
d. Pump station drawings shall include: cross sectional view of pump station showing pump station piping and fittings and wet well elevations, pump information including model, impeller diameter, horsepower, motor speed, operating voltage, control panel, and operating point;
e. For JEA pump station sites, a Standard Penetration soil boring shall be performed at each wet well location and submitted prior to final plan approval. The soil boring shall be a minimum of 15-feet deeper than the wet well bottom or extend until suitable soil is located up to a maximum of 25-feet below the wet well bottom;
f. JEA pump station standard detail sheets where the pump station is to be dedicated to JEA. Where required, the standard site layout may be modified, as necessary, provided the minimum site dimensions are maintained and all standard general notes are included.

2.4.5 Reclaimed Water Plan Submittal Requirements

In addition to the general plan submittal requirements discussed above, reclaimed water design plans shall include the following:

a. Location of all potable water wells within 500-feet;
b. Reclaimed water service and meter locations for all applicable lots;
c. All existing and proposed reclaimed water storage ponds including any connection to the storm water management system and/or waters of the State;
d. All backflow prevention required in accordance with the JEA cross connection control program;
e. A plan sheet(s) showing a reclaimed water signage plan consistent with JEA Rules and Regulations for Water, Sewer and Reclaimed Water Services;
f. Profile of all reclaimed water lines greater than 12-inch diameter.

2.4.6 Utility Construction Notes

The following notes, at a minimum, shall be included on all plan submittals. Any deviation from the standards shall be requested by the Developer's Engineer and shall be approved, in writing, by JEA:

1. All water, reclaimed water, and sanitary wastewater work shall be constructed in accordance with the latest JEA Water and Wastewater Standards Manual, all applicable local and state regulatory rules & regulations and other applicable JEA rules.
2. All water, reclaimed water, and wastewater construction shall be provided by a contractor qualified, as required under the current Florida Statute, or by an underground utility contractor, licensed under the provisions of Chapter 489 FS.
3. The applicant shall be responsible for obtaining City or County Right-Of-Way permits for work in the City R/W, County R/W or a FDOT permit for work in the FDOT R/W.
4. The applicant shall contact the JEA, and schedule a Pre-Construction Meeting, to be held prior to initiating the JEA water and wastewater utility work, including all utility main taps by the contractor.
5. JEA water and wastewater tap fees, JEA water and sewer capacity fees, and JEA meter fees shall be paid prior to the water meter installation. Water meters will not be installed prior to the issuance of required acceptance (transfer of ownership) documents, which may include the issuance of a regulatory clearance letter (COC) for the water and wastewater improvements, completion, and approval of Final Inspection and approved As-Built drawings.
6. Final connection to the JEA system may be contingent upon the construction, dedication, and final acceptance (transfer of ownership/maintenance) of the JEA off-site utilities.

7. The minimum horizontal and vertical separation requirements for the water, reclaimed water, and wastewater improvements shall conform to the latest JEA and FDEP rules. The minimum horizontal separation requirements between the proposed water and wastewater utilities and ponds or structures shall conform to the latest JEA Water and Wastewater Standards Manual.
8. Water and wastewater pipes less than 24-inches in diameter shall be constructed with a minimum 30-inches cover in unpaved or sidewalk areas and a minimum of 36-inches cover in paved areas. The maximum cover for utilities, both open cut and utilizing Horizontal Directional Drill methods, shall comply with the latest JEA Water and Wastewater Standards Manual.
9. Water and wastewater pressure mains and services shall pass a JEA pressure and leakage test at 150-psi minimum, or two times operating pressure, for 2-hours. In addition, water mains shall be disinfected and pass a bacteriological analysis. All tests shall conform to JEA and FDEP rules, regulations, and AWWA C-651. The JEA Inspector shall be notified 72-hours (min) prior to performing these tests. No final connection(s) to existing potable water mains shall be made until the new main is pressure tested, disinfected, and cleared for service.
10. In the areas where solvent contamination is found in the trench, work shall be stopped and the proper regulatory authorities notified. A revised construction plan shall be approved by JEA and FDEP that complies with all regulatory rules. The revised construction plan for the JEA water main system, including water service lines, may involve galvanized or ductile iron pipe with special solvent resistant (fluorocarbon type) gaskets that extend 100-feet beyond the contaminated areas.
11. The contractor shall minimize service interruptions to existing JEA water and wastewater customers. If JEA approves a service interruption, then the contractor will be responsible for notifying the affected customers in accordance with the latest JEA rules.
12. Residential services using reclaimed water for irrigation must have a JEA approved backflow preventer installed on each potable water service prior to the installation of a JEA reclaimed water meter. The installation of a backflow preventer shall be in accordance with the JEA Rules and Regulations for Water, Sewer, and Reclaimed Water Services, Appendix B, Cross Connection Control Policy.
13. For developments utilizing reclaimed water, a JEA approved reclaimed water signage plan shall be implemented prior to the installation of the reclaimed water meters.
14. All backflow preventers shall be in accordance with JEA cross connection program. Backflow preventers must be tested after installation by a certified tester and annually thereafter.
    JEA Contact: Permitting 904-665-7988.
15. Backflow preventers on fire lines or combination fire/potable mains shall have freeze protection.

2.5 Preliminary Plan Review

Required Documents to be submitted:

a. Two sets of clear and legible design plans that have been signed and sealed for review only by a registered Professional Engineer licensed to practice in the state of Florida submitted on 24-inch by 36-inch sheets;
b. One copy of hydraulic analysis, gravity system storage analysis (Class One Pump Stations only), calculations supporting meter size selection, and/or pump station calculations as applicable, signed and sealed for review only by a registered Professional Engineer licensed to practice in the state of Florida;
c. A pdf copy of the entire plan set (in one file);
d. A pdf copy of hydraulic analysis, gravity system storage analysis (Class One Pump Stations only), calculations supporting meter size selection, and/or pump station calculations as applicable;
e. Drawing file containing all applicable .dwg or .dwf files for project, compatible with AutoCAD 2013 or earlier;
f. Two copies, with original signatures, of any applicable project permits;
g. Current copy of Service Availability (make sure requested flow matches the permit application and the pump station calculations, if applicable);
h. Phasing Plan (if applicable);
i. Connection Pressure Letter (if applicable);
j. Soil Boring Report for new Subdivision and/or JEA Pump Station (if applicable);
k. Copy of existing JEA easements (if applicable);
l. JEA Agent Authorization Form – Original form only, copies are not accepted;
m. Copy of Division of Corporation Report (Sunbiz);
n. Property Appraiser's map defining property and property owner.

Required electronic files can either be submitted via cd, included with the hard copy submittal and delivered to the JEA Mail Room, or emailed to wsedevprojrequests@jea.com, **attention Plan Submittal (include project name and availability number)**.

Applicable JEA forms can be found at www.jea.com.

Plan review submittals that are missing required information will be returned as incomplete submittals.

2.6 Subsequent Plan Review

Required Documents to be submitted:

a. Four sets of clear and legible design plans that have been signed and sealed by a registered Professional Engineer licensed to practice in the state of Florida submitted on 24-inch by 36-inch sheets;
b. Two sets of hydraulic analysis, gravity system storage analysis (Class One Pump Stations only), flow comparison analysis, calculations supporting meter size selection, and/or pump station calculations as applicable, signed and sealed by a registered Professional Engineer licensed to practice in the state of Florida;
c. A pdf copy of the entire plan set (in one file);
d. A pdf copy of hydraulic analysis, gravity system storage analysis (Class One Pump Stations only), flow comparison analysis, calculations supporting meter size selection, and/or pump station calculations as applicable (if any changes were requested from the original submittal);
e. Drawing file containing all applicable .dwg or .dwf files for project, compatible with AutoCAD 2013 or earlier;
f. Two copies, with original signatures, of any applicable project permits (if any changes were requested from the original submittal);
g. Current copy of Service Availability (if any changes were requested from the original submittal);
h. Two copies, with original signatures, of the JEA Application to Construct and Dedicate Water & Sewer Facilities.

Required electronic files can either be submitted via cd, included with the hard copy submittal and delivered to the JEA Mail Room, emailed to wsedevprojrequests@jea.com, **attention Plan Submittal (include project name and availability number)**, or via JEA's FTP site. Applicable JEA forms can be found at www.jea.com.

Plan review submittals that are missing required information will be returned as incomplete submittals.

2.7 Plan Revisions

Any changes to the plan following final plan approval, prior to or during construction, will require a revision submittal and may require a permit modification. Depending on the level of the changes, a meeting with JEA's Development Team may be required. Revised hydraulic analysis may also be required.

2.7.1 Revision to Approved Plans with no Permit

a. Cloud and number the revision on each applicable sheet;
b. Number and describe the nature of the revision on each applicable sheet in the revision block;
c. Reference the revision number and the date on the cover page;
d. Provide four copies of the revision (cover sheet and revised pages only) that have been signed and sealed by a registered Professional Engineer licensed to practice in the state of Florida submitted on 24-inch by 36-inch sheets;
e. Provide a pdf copy of the revision (cover sheet and revised pages only) in one file;
f. Provide a drawing file containing all applicable .dwg or .dwf files for the revision, compatible with AutoCAD 2013 or earlier.

2.7.2 Revision to Approved Plans with Permit

a. Cloud and number the revision on each applicable sheet;
b. Number and describe the nature of the revision on each applicable sheet in the revision block;
c. Provide a copy of the latest approved cover page and update it with the applicable revision number;
d. Provide four copies of the revision (cover sheet and revised pages only) that have been signed and sealed by a registered Professional Engineer licensed to practice in the state of Florida submitted on 24-inch by 36-inch sheets;
e. Provide a pdf copy of the revision (cover sheet and revised pages only) in one file;
f. Provide a drawing file containing all applicable .dwg or .dwf files for the revision, compatible with AutoCAD 2013 or earlier.

Required electronic files can either be submitted via cd, included with the hard copy submittal and delivered to the JEA Mail Room, emailed to wsedevprojrequests@jea.com, **attention Plan Revision (include project name and availability number)**, or via JEA's FTP site.

Plan review submittals that are missing required information will be returned as incomplete submittals.

2.8 Permits

The Developer and Engineer are responsible for ensuring that all permits, permit criteria, permit fees, forms, and other permitting requirements are met for the proposed project.

The Engineer shall submit all completed permit applications with original signatures. The Developer's Engineer shall fill out the permit checklists and submit with all pertinent data on the permit forms, found at www.jea.com.

Water and/or wastewater mains 12-inch inside diameter and smaller located in Duval County may be permitted through JEA's Self-Permitting process.

All water and wastewater mains located outside of Duval County must be permitted through the FDEP. In addition, all water and/or wastewater mains within Duval County exceeding 12-inch in diameter will require a FDEP permit. All private wastewater facilities shall be permitted through FDEP or, if applicable, the Environmental Quality Division of the City of Jacksonville.

Right of Way permits are required for work within the city, county and state rights-of-way. Contact the appropriate agency for R/W permitting requirements.

If a FDOT permit is required, the applicant (aka Permittee) is required to complete a FDOT Utility Permit Application within the FDOT One Stop Permitting database, https://osp.fdot.gov/#/login. Include the Special FDOT Instructions form, signed by both the permittee and JEA. Reference the JEA availability number either in the project name or in the attached documents file name. Do not submit the FDOT permit application for review until you have received approved JEA plans. Any revision change FDOT requests will need to go back to JEA for review prior to being approved and transmitted to FDOT.

2.9 Pre-Construction Meeting

Upon final plan approval, the applicant shall schedule a pre-construction meeting to be held at JEA's downtown office located at 21 W Church Street.

Email completed Pre-Construction Meeting Request form to:
wsedevprojrequests@jea.com, **attention Pre-Construction Meeting**

(include project name and availability number), to request a preconstruction meeting.

2.10 Construction and Inspection

With distribution of the final design drawings, the project will be turned over to the Developer's Engineer for coordination of construction. JEA will assign a representative from JEA Construction Support Services who will be responsible for JEA's inspection activities of any facilities constructed for dedication to JEA. The representative will maintain communication with all applicable parties throughout the project construction.

The utility system shall be installed by a Florida licensed underground contractor, as depicted on the approved project drawings and in accordance with the JEA Water and Wastewater Standards Manual. Any changes will need to be evaluated by JEA's Development Team for revision determination.

Any utility adjustments resulting from finish grade changes made after plan approval must be approved by JEA Construction Support Service and shall be the sole responsibility of the Developer. In no case shall maximum or minimum slopes or depth of bury be exceeded because of the field finish grade changes.

The actual field locations of utility appurtenances (i.e. fire hydrants, line valves, services, flushing hydrants) shall be approved by JEA Construction Support services prior to construction.

JEA certified "Record of Pressure and Leakage Test" and "Locate Wire Test" must be completed within 90-calendar days prior to the line being cleared for service by the regulatory agencies. If these tests are older than 90-days, the tests are considered not acceptable and must be re-done. Water bacteriological test results are acceptable for a period of 60-days from date of issuance.

For additional details, refer to JEA Water, Wastewater, and Reclaimed Water Inspection Guidelines.

2.11 Shop Drawings

Any specialty pump station structures, pumps, panels, or materials not included in the JEA Water and Wastewater Standards Manual will require a complete set of shop drawings, in pdf format, to be submitted to JEA's Development Team for review and approval prior to ordering materials. The JEA availability number associated with the project shall be shown on the shop drawings. The Developer's Engineer shall review and approve shop drawings prior to submittal to JEA for review and approval. For additional details, refer to JEA Water, Wastewater, and Reclaimed Water Inspection Guidelines.

Drawings can be submitted by email to wsedevprojrequests@jea.com, **attention Shop Drawing Submittal (include project name and availability number)**, or via JEA's FTP site.

2.12 As-Built Drawings

Upon completion of the project, and prior to dedication of utilities to JEA, or final payment under a contract with JEA, the Contractor shall furnish to JEA a completed JEA As-Built Submittal Requirements Checklist (found in section 501 of the JEA Water and Wastewater Standards Manual), an electronic file containing the drawings in pdf and AutoCAD dwg format, and two sets of the As-Built drawings, 24-inch by 36-inch sheets, revised in accordance with the JEA Water and Wastewater Standards Manual Section 501. The Contractor shall deliver initial As-Built drawings within 30-days of substantial completion.

Required electronic files need to be submitted via cd.

JEA shall review the documents to ensure accuracy with respect to actual construction and JEA Standards.

As-Built drawings must include recording document numbers for all utility work located within easements.

In the event data is missing, the Contractor will be notified and provided a marked-up copy showing the required changes. Upon approval, an as-built approval letter shall be issued to the contractor, with copies distributed to the appropriate representatives within JEA.

A copy of the JEA Water and Wastewater Standards Manual can be found at www.jea.com.

As-Built submittals that are missing required documents will be returned without review.

All construction must be completed before as-builts will be reviewed. Exceptions can be made where potable water COC's are required to move forward with water main construction.

2.13 JEA Construction Substantial Completion Walk Through Field Meeting

Upon substantial completion of the project, JEA will perform a walk through with JEA's Operations and Maintenance personnel, the developer's engineer and the contractor. The purpose of the walk through is to generate a punch list of items that need to be addressed to meet JEA standards, to field verify As-Built drawings submitted, test run pumping equipment for proper operation and to operate all valves.

2.14 JEA Final Inspection and Acceptance of the System

Upon as-built approval, the engineer will need to clear their project permits. Links to the applicable permit COC forms can be found at www.jea.com. Upon receipt of all permit COC's, the engineer will submit the complete acceptance package to wsedevprojrequests@jea.com, **attention Project Acceptance Package (include project name and availability number)**. A hard copy of the Acceptance Checklist, as well as all required forms, with original signatures, will need to be delivered to the JEA Mail Room to the attention of W/WW Development-Project Acceptance. A list of required documents can be found at www.jea.com. Final Inspection Requests that are missing required submittals will not be scheduled.

Once the package has been reviewed and verified to be complete, all parties will be notified to conduct a final inspection. Upon completion of a final inspection and all punch-list items, the project will be accepted by JEA.

The transfer of ownership and maintenance of the constructed infrastructure per approved plans is required prior to rendering of service.

Unless approved otherwise by JEA, the applicant must submit and obtain JEA's approval of all project acceptance documents within 90-days after the date of FDEP "Certification of Construction Completion" for the associated water, wastewater, and/or reclaim utilities. Otherwise, JEA reserves the right to require the developer to up-grade the utilities to current JEA rules and/or construction standards. The system cannot be placed into service without the FDEP "Certification of Construction Completion."

2.15 System Warranty

All portions of the installed utility system shall be unconditionally guaranteed, in accordance with the JEA Water and Wastewater Standards Manual, against material defects or improper workmanship. The Developer shall repair and/or replace defective material and/or installations to JEA standards, at no cost to JEA. In the event of failure by the Developer to provide complete replacement, delivery to the site of materials and installation of same to replace defective materials or defective workmanship with new materials/workmanship conforming to the JEA Water and Wastewater Standards Manual, or during emergency events or in the event of imminent danger to JEA facilities or customers, repairs may be made by JEA at the Developer's expense.

If any facilities, including service lines that are installed, do not conform to the final lot layout, it shall be considered a misplacement of the installed system, and all costs incurred by JEA for relocation shall be paid in advance by the Developer, or its successor.

2.16 JEA Connection and Fees

Prior to connection to JEA's utility systems and/or issuance of meters, all applicable fees must be paid and project acceptance must be obtained.

2.17 Dedication of Existing Privately-Owned Systems

A. JEA will not accept existing privately owned, operated, and maintained systems for dedication. These systems include, but are not limited to, the following:
    a. Existing master metered onsite water distribution systems;
    b. Existing private pump stations;
    c. Existing private onsite gravity wastewater collection systems.

B. On a case-by-case basis, JEA may consider exceptions to the above given one or more of the following criteria are met.
    a. JEA's system reliability or capacity may be improved or increased as a result of system dedication;
    b. Additional customers who currently are not served will be provided service via the dedicated facilities;
    c. Dedication of the system is warranted to eliminate or prevent potential environmental damage.

C. In the event JEA agrees to accept a privately-owned system, the following events shall occur:
    a. JEA will evaluate the system, at the Owner's expense, to determine repairs and/or upgrades needed to bring the system into compliance with current JEA standards and regulatory requirements;
    b. System owner shall, at no cost to JEA, repair or improve the system accordingly;
    c. Repairs or improvements shall be designed and permitted in accordance with all Local and State rules and regulations;
    d. Repairs and improvements shall be inspected by JEA during construction;
    e. System shall be tested by owner's contractor and witnessed by JEA. This includes, but is not limited to; water and wastewater pressure tests, gravity wastewater television inspection, and pump station start up testing;
    f. The system owner shall prepare an As-Built of the system and submit to JEA for approval;
    g. The system owner shall submit a dedication package to JEA;
    h. The system owner shall provide or obtain any easements required for JEA to own and operate the system.

Once these items are complete, JEA will submit a written letter of system acceptance to the owner informing them that JEA has accepted the system for ownership and maintenance.

2.18 Public and Private Point of Service

A customer's point of service is defined by JEA as the location of the connection points identified in the JEA Water and Wastewater Availability response. Points of connection provided by JEA are located in the Right-of-Way at a utility owned by JEA.

From the customer's point of service, JEA is obligated to own, operate, and maintain only those utilities that will be constructed in existing or proposed Right -of-Way. Proposed utilities which will be constructed in an approved JEA utility easement must be located adjacent to or abut existing or proposed Right-of-Ways.

With the exception of proposed dedicated Right-of-Ways, JEA is under no obligation to accept ownership, operations, or maintenance responsibilities associated with utilities that will be constructed on private property and in those cases, developers and their engineers should design their projects with private utilities that meet or exceed their service requirements.

2.19 Utility Easements

Utilities shall not be located in easements unless approved by JEA's Development Manager. Approval shall be requested at the pre-application meeting (prior to plan review submittal). Cross-property easements or utilities located within easements between lots are discouraged and will be allowed only with JEA Development Director approval. Blanket easements are not permitted.

If not parallel to the right-of-way, easements must be on separate tracts owned by the community operation and maintenance entity, not an individual owner.

Easements, where allowed, shall be identified as unobstructed and shall have a minimum width of 20-feet for water only or as shown in Table 2.1. Refer to JEA Water and Wastewater Standards for additional requirements, as applicable.

Landscaping, other than grass, is considered an obstruction.

A Hold Harmless Agreement may be required when installing special landscaping, special paving, and/or other specialties in right-of-way or easements over JEA utilities.

Table 2.1: Minimum Easement Width

Pipe Depth (FT)	Minimum Easement Width (FT)		
	One Utility	Two Utilities	Three Utilities
<6	20	25	30
≥ 6 < 8	25	35	40
≥ 8 < 10	30	40	45
≥10 < 12	35	45	50
> 12	N/A	N/A	N/A

Gravity wastewater mains greater than 12-feet deep shall not be located within easements.

When easements are adjacent to and parallel to a public right-of-way, the minimum easement width shall be 10-feet for a single utility, or 20-feet for both water and wastewater mains. If an electrical easement is proposed adjacent to the right-of-way and a water, reclaimed water or wastewater easement is also proposed adjacent to the right-of-way, then a water, reclaimed water or force main easement with a minimum width of 5-feet each is required adjacent to and in addition to JEA electric easements.

If a proposed electrical easement is not JEA owned, the water, reclaimed water, or wastewater easement must be 10-feet wide adjacent to and in addition to the electric easements.

2.20 Revision to Dedicated Infrastructure

JEA may allow construction revisions to water and wastewater utilities for developments that have already been fully dedicated to JEA. This may occur in special cases where the applicant intends to modify property lines within an existing development in which water, wastewater, and/or reclaim utilities have been recently constructed and fully dedicated to JEA. JEA reserves the right to require that all construction revisions to dedicated utilities be performed by JEA forces.

a. All revisions to existing JEA water, wastewater, and/or reclaim utilities must be reviewed and approved by JEA prior to any construction. The developer/engineer must submit the following support documentation to JEA's Development Team: Copy of Approved Addressing Map for the original design;
b. Copy of Recorded Plat for the original design;
c. Copy of JEA Approved As-Built drawings for the original design;
d. Proposed re-designed drawings;
e. Purpose of re-design;
f. COJ/County development Services Approval Correspondence;
g. COJ/County development Proposed Re-addressing Map.

Required electronic files can either be submitted via cd, included with the hard copy submittal and delivered to the JEA Mail Room, emailed to wsedevprojrequests@jea.com, **attention Plan Revision (include project name and availability number)**, or via JEA's FTP site.

Plan review submittals that are missing required information will be returned as incomplete submittals.

The City/County will require a Right-of-Way permit for all work in the R/W. The City/County will define the limits of road re-construction or overlay limits. JEA will not be responsible for any repairs to asphalt, sidewalk, or other non-JEA infrastructures.

The following subparagraphs provide general design guidance for redesign of existing dedicated facilities; however, site conditions may dictate variants to these guidelines as provided and approved by JEA on a case-by-case basis. All construction work shall be in accordance with the JEA Water, Wastewater and reuse Inspection Guidelines for New Development Projects and JEA Water and Wastewater Standards.

2.20.1 Water and Reclaimed Water Services

a. Water meter boxes shall be constructed in accordance with JEA Water Construction detail W-1 (see JEA Water and Wastewater Standards Manual). As shown in this standard detail, meter boxes shall be located 2-feet from the property line (P/L), unless there is an electric box on the P/L, in which case the water meter box will be 5-feet from the P/L;
b. Meter boxes shall not be located in an existing or future driveway (D/W) or sidewalk (S/W);
c. If the applicant wants to move the P/L (see special case description above), JEA will require the meter box to be relocated to meet the above standard (i.e. 2-feet from the new P/L);
d. JEA may allow relocation of an existing meter box up to 3-feet horizontally;
e. If the relocation of the water service exceeds 3-feet, then the existing water service will be removed or abandoned including shutting-off and capping existing corporation stop at the water main and a new water service will be constructed;
f. Locate wire will be required on all new or modified water services (Along the poly service lines) and only one water service will be allowed for each lot;
g. The meter box and brass fittings may be reused if in excellent condition, as determined by JEA;
h. Existing curb shall be re-marked accordingly including the grinding and removal of existing curb markings as required;
i. JEA will require re-submittal of As-Built drawings, which must be approved by JEA;
j. If no additional services are installed JEA will only require a new 12-month warranty to be provided for the affected area;
k. If any additional or removal of services occur, an executed JEA Application to construct and dedicate form and revised schedule of values in addition to the new 12-month warranty will be required.

2.20.2 Fire Hydrants

Generally, fire hydrants will be located at the property lines (P/L) between two lots. If developer or engineer moves property lines then:

a. JEA will require fire hydrants to be relocated to the property line between two lots;
b. JEA will allow extension of the existing fire hydrant branch main up to 15-feet (locate wire is required);
c. If more than 15-feet is required, than a new 6-inch tap and valve is required. In this case, the existing hydrant branch will be plugged at the valve; the valve box shall be removed from the plugged valve since it will not serve any future use. For maintenance reasons, this plugged valve should remain on the water As-Built drawings;

d. Fire hydrant may be reused if in excellent condition, as determined by JEA;
e. Existing curb shall be re-marked accordingly including the grinding and removal of existing curb markings as required;
f. JEA will require re-submittal of As-Built drawings, which must be approved by JEA;
g. If no additional hydrants are installed, JEA will only require a new 12-month warranty to be provided;
h. If any additional hydrants or removal of hydrants occur, an executed JEA Application to Construct and Dedicate form and revised schedule of values in addition to the new 24-month warranty will be required.

2.20.3 Wastewater Services

Normally, one 6-inch wastewater service shall be provided for each single-family lot. The wastewater service shall generally be perpendicular to the main and terminate in the center portion of the lot. To allow field modifications, to minimize tree and other conflicts and to allow general flexibility in the construction, the center portion of the lot shall be defined to include the center 50% of the lot width. That is, if the lot is 100-feet wide, then the wastewater service may be located inside the 50-linear feet center portion of the lot. Wastewater service laterals within the right-of-way shall avoid being located under an existing or future D/W. If the applicant wants to move property lines then:

a. In rare instances, JEA may allow more than one 6-inch wastewater service to remain for each residential lot and not enforce the above center 50% rule;
b. No horizontal adjustments will be allowed to the existing wastewater service lateral;
c. The applicant shall refrain from abandoning any existing 6-inch wastewater service. If absolutely required, the abandonment of an existing 6-inch wastewater service would include permanently capping the 6-inch pipe (capped within 2-feet back of curb). Existing curb markings for all existing wastewater laterals shall not be removed, but shall remain for locate purposes. Curb marking shall be amended for "abandoned" services by adding an "A" in front of the "S" to designate abandonment;
d. JEA will require re-submittal of As-Built drawings, which must be approved by JEA. As-Built drawings will include any abandoned infrastructure left in place;
e. If no additional wastewater services are installed JEA will only require a new 12-month warranty to be provided for the affected area;
f. If any additional wastewater services or removal occurs, an executed JEA Application to Construct and Dedicate form and revised schedule of values in addition to the new 24-month warranty will be required.

2.20.4 Construction and Dedication of Redesigned Infrastructure

Upon JEA preliminary approval, the applicant will submit all applicable required documents as outlined in these guidelines. Once JEA reviews final plan submittal and issues approval, the applicant will proceed with the project as outlined in the JEA Water, Wastewater, and Reclaimed Development Design Guidelines. In other words, a redesign of dedicated infrastructure is considered a new project and any changes to existing infrastructure requires As-Built drawings, dedication and warranty of any additional assets or notification of any removed assets.

2.21 Revisions to Infrastructure Pre-Dedication

For projects long idled by economic conditions or other factors, much of the provisions of 2.20 (a) through (g) and 2.20.1 through 2.20.3 will apply. When, in the opinion of JEA, the modifications to previously constructed infrastructure would compromise system integrity, JEA will require complete replacement rather than modification.

Section 3.0

Potable Water and Reclaimed Water Design Guidelines

3.0 General

This section provides the minimum guidelines for the design of potable water and reclaimed water transmission and distribution systems. The method of design and/or construction shall be according to accepted engineering practices, this manual, the most current JEA Water and Wastewater Standards Manual, the American Water Works Association (AWWA), Chapter 62-555 and 62-610 of the Florida Administrative Code and all applicable Sections of the Florida Department of Environmental Protection Rules and Regulations for Water and Sewer Systems as well as all applicable federal, state, and local requirements.

3.1 Design Flows

All systems should be sized to provide at least maximum day domestic requirements plus fire flow at residual pressures of not less than 20-psi at all points in the system.

3.1.1 Average Daily Flow (ADF)

The developer's submittal to JEA should clearly state the basis for the design flows.

3.1.2 Single Family Residential

An Equivalent Dwelling Unit (EDU) is the equivalent flow that can be anticipated from one residential connection. Design flows for new water distribution systems shall be based upon 350-gpd/EDU in areas where reclaim water is not available. In areas served by reclaim water, design flows for new water distribution systems may be based upon 280-gpd/EDU with the approval of the Manager of Development.

3.1.3 Multi-Family Residential

Design flows for new water distribution systems may be based upon 80 gpd/bedroom, Table 1 of the State of Florida Department of Health (FDOH), Chapter 64E-6.008 F.A.C., Standards for Onsite Sewage Treatment and Disposal Systems, Section 1a and 1b (requirements for flow comparisons), or fixture counts.

Flow by fixture count must include final plumbing plans with fixture summary.

3.1.4 Commercial and Industrial

Design flows for new water distribution systems may be based upon fixture counts, the State of Florida Department of Health (FDOH), Chapter 64E-6.008 F.A.C., Standards for Onsite Sewage Treatment and Disposal Systems: Table 1, or Sections 1a and 1b (requirements for flow comparisons).

Flow by fixture count must include final plumbing plans with fixture summary.

3.1.5 Flow Comparison Analysis

If not utilizing Table 1, a flow comparison analysis will need to be submitted. The analysis must include backup documentation; monthly bills with address and flow, number of units, percent occupancy (if applicable), for the properties in which the comparison is being made, and be signed and sealed by a registered Professional Engineer licensed to practice in the State of Florida.

Included shall be a summary of each month of use, per address, as well as an overall summary supporting the flow recommendation for the property in question.

The analysis must be submitted with final plans.

3.1.6 Reclaimed Water

The design daily water demand for a typical residential reclaimed water service shall be 600-gpd minimum. Water mains shall be sized utilizing 2.5-gpm/residential units (at a minimum). This water main design rate shall be utilized for all residents in the development, which already takes into consideration the even-odd day irrigation schedule. Multifamily residential, commercial, and industrial flow demand shall be estimated on an individual case-by-case basis. A minimum average daily irrigation rate of 3,900-gpd per acre of irrigable areas during Daylight Savings Time is acceptable unless deemed otherwise by State WMD, FDEP, or JEA.

3.2 Fire Flow

The Developer shall furnish calculations that have been signed and sealed by a registered Professional Engineer licensed to practice in the State of Florida supporting fire protection requirements in accordance with applicable county codes. The applicable County Fire Marshall's Office shall perform its own review. At a minimum, the following fire flow requirements shall be provided.

3.2.1 Single Family Residential

For fire protection purposes, single family residential is defined as detached buildings of no more than one living unit. In single-family residential developments, the developer's engineer shall design for fire flows of at least 1,000-gpm at a minimum residual pressure of 20-psi at the hydrant. If automatic sprinklers are used, then 500-gpm at a residual pressure of 20-psi is acceptable.

3.2.2 Multi-Family Residential

Buildings containing two or more units are defined as multi-family. In multi-family developments, the developer's engineer shall design for fire flows of at least 1,500-gpm from two fire hydrants (750-gpm minimum at each hydrant) with a residual pressure of at least 20-psi at the hydrant.

3.2.3 Manufactured Home Communities

In Manufactured Home Communities, design for fire flows of at least 750-gpm at a residual pressure of at least 20-psi at the hydrant.

3.2.4 Commercial

Minimum fire flow requirements for commercial developments are the same as for multi-family residential developments. The developer's engineer shall design for fire flows of at least 1,500-gpm from two fire hydrants (750-gpm minimum at each hydrant) with a residual pressure of at least 20-psi at the hydrant.

3.2.5 Institutional and Industrial

The developer's engineer shall design for fire flows of at least 2,000-gpm from two fire hydrants (1,000-gpm minimum at each hydrant) with a residual pressure of at least 20-psi at the hydrant.

3.2.6 Fire Hydrant Test Data

JEA will perform a fire hydrant test on an existing JEA fire hydrant for a fee.

Fill out the Flow Test Application found at www.jea.com and drop it off or mail it with payment to:

JEA Pre-Service, CC-1
21 W. Church St.
Jacksonville, FL 32202

The results of hydrant flow tests are used primarily to evaluate the distribution system's capacity to provide water for fighting fires. The standard formula for converting the test flow to the distribution capacity at some desired residual pressure – usually 20-psi – was developed by the Insurance Services Office (1963), and is given on AWWA M-17 (1989) as:

$$Q_r = Q_t \left[\frac{(P_s - P_r)}{(P_s - P_t)}\right]^{0.54}$$

Q_r = fire flow at residual pressure Pr (gpm)

Q_t = hydrant discharge during test (gpm)

P_s = static pressure (psi)

P_r = desired residual pressure (psi)

P_t = residual pressure during test (psi)

The value of Q_r is referred to as the distribution main capacity in that location, and is used in evaluation of water systems for JEA and insurance purposes. This Q_r value is provided in all JEA fire hydrant test reports. This equation can also be rearranged to provide a rough estimate of residual pressure for some future flow (typically 1500-gpm), given hydrant flow test results according to:

$$P_r = P_s - \left[(P_s - P_t) \left(\frac{Q_r}{Q_t} \right)^{1.85} \right]$$

Q_r = the estimated flow (usually 1,500-gpm)

P_r = the pressure that will exist at that flow rate, given that all other conditions remain the same.

Minimum fire flow requirements for commercial and industrial developments are the same as for multi-family residential developments. The developer's engineer shall design for fire flows of at least 1,500-gpm from two fire hydrants with a residual pressure of at least 20-psi at the hydrant.

3.3 Sizing Water and Reclaimed Water Mains

The pipe sizes as listed herein represent the approximate inside diameter (ID). For HDPE piping, the pipe size will require "up-sizing" to maintain the ID.

3.3.1 Major Transmission Mains

Size of major transmission mains shall conform to JEA Water Master Plan and JEA Water and Wastewater Standards Manual, where applicable.

3.3.2 Distribution Mains

In non-residential areas, distribution mains shall be a minimum of 12-inch diameter, unless they are in a closely interconnected grid, in which case they shall be a minimum of 8-inch diameter.

It is preferred that residential subdivisions are designed with two feeds from distribution mains external to the subdivision to increase hydraulic reliability. Without two feeds from distribution mains external to the project, water mains serving hydrants in residential developments shall be a minimum of 8-inch diameter arranged so that they form a closely interconnected grid.

Single main extensions supplying a looped grid or long lengths of dead end mains (greater than 1,000-feet) serving more than one hydrant shall not be less than 8-inch diameter.

The use of dead end mains shall be minimized where possible. When necessary, a 2-inch dead-end water main shall be a maximum of 600-feet and shall serve no more than five EDU's.

The maximum number of services on a looped or interconnected 2-inch water main that is interconnected with a minimum of 6-inch water mains shall be limited to 10 EDU's. Any deviation shall be up to the discretion of the JEA W/WW Planning and Development Director, or designee.

All reclaimed water mains shall be sized after hydraulic analysis based upon estimated flow demands and available system pressures. The reclaimed water distribution system shall be designed to maintain 3-psi at a minimum.

Dead end water mains shall terminate with a JEA standard stub-out and a 2-inch flushing hydrant or 6-inch fire hydrant.

3.3.3 Velocities

Velocities shall be a minimum of 2.5-fps and less than 5-fps at peak hour.

3.3.4 "C" Factor

Use the following Hazen-Williams roughness coefficients for new construction:

Pipe Size / Type	Coefficient of Roughness
Less than 16-inch diameter cement-lined ductile iron pipe	120
16-inch diameter and larger cement-lined ductile iron pipe	130
PVC (all sizes including HDPE)	140

3.4 Water Main and Reclaimed Water Main Materials

Materials for potable water mains and reclaimed water mains shall be in accordance with the most recent JEA Water and Wastewater Standards Manual Sections 350 and 351. For 6-inch and larger HDPE pipe, the pipe size shall require up sizing to maintain a consistent inside diameter of the main.

Water and Reclaimed Water Mains shall have restrained joints for changes in direction. Bends 45-degrees or less should be used in lieu of 90-degree bends.

3.5 Water Main and Reclaimed Water Main Bury Depths

All water mains less than 24-inch diameter shall be designed meeting minimum depth of cover requirements of 30-inches in unpaved areas and 36-inches in paved areas with a maximum of 60-inches in arterial or collector roadways where reconstruction is anticipated. Water mains of 24-inch diameter or greater shall be designed meeting minimum depth of cover requirements of 36-inches (paved and unpaved areas) unless approved otherwise by JEA. Cover for pipe under pavement shall be measured from finished grade.

For 12-inch and larger mains, the proper installation and depth requirements for gate valves may require additional depth of cover. In cases of a 16-inch or larger water main, side actuated valve operators may be required to minimize the depth of bury of the main.

If a utility conflict is encountered and is located in a non-traffic area (no traffic loads), and the new pipe is Ductile Iron, the minimum cover may be reduced to 24-inches, only in the area of the conflict.

In FDOT and railroad rights-of-way, the minimum cover shall be established by the FDOT and railroad respectively.

3.6 Water Main and Reclaimed Water Main Locations

Preferred utility locations within the City of Jacksonville, St Johns County, Nassau County, or Clay County rights-of-ways are to be as established by the City/County Department of Public Works. Water mains shall be designed to be a minimum of 3-feet from right-of-way lines depending on size and depth and a minimum of 3-feet from outside of edge of pavement (or back of curb), and a minimum of 4-feet from gas mains. Exceptions may be granted as appropriate by JEA, provided the City/County agencies are in agreement with the proposed location.

Unless otherwise defined below in Section 3.7 Water Main and Reclaimed Water Main Separation Requirements:

a. Water mains shall have a minimum of 3-feet of horizontal distance between the outside of the water main and the outside of any other parallel underground utility;
b. Water mains shall have a minimum horizontal separation as defined by Section 350 III.4. Water Main and Non-Water Main Separation Requirements of the JEA Water and Wastewater Standards Manual.

Where possible, water mains shall not be designed below open ditch bottoms due to difficulties with utility access and potential damage from future dredging of the ditch.

Water mains shall be designed to be located above box culverts & drainage pipes. As approved by JEA on a case-by-case basis, Ductile Iron Pipe (DIP) will be required if the minimum cover is not possible.

Parallel water mains are not allowed. If a proposed water main is to be constructed in a right-of-way or easement where there is an existing JEA water main, the existing main must be abandoned for the length of the new main being installed. All affected services and fire hydrants shall be transferred to the new main, and the remaining portion of the existing main shall be connected to the new main.

Water mains shall be located outside of paved areas, except at roadway crossings. Exceptions to this requirement may be considered within town home, multi-family or commercial development projects, provided the mains do not lie under parking areas.

Proposed development main extensions required to achieve connection to the point of service identified in the JEA Availability response shall be designed within existing or proposed public right-of-way.

3.7 Water Main and Reclaimed Water Main Separation Requirements

Water main separation (from, structures and hardwood trees) shall be in accordance with Sections 350, 428 and 429 of the JEA Water and Wastewater Standards Manual (including JEA Standard Construction Details W-10, W-11, S-26 and S-27).

Pressure Main (Water & Wastewater) Nominal Size (inches) (See Note 1)	Horizontal Separation Requirements (Min)
up to 6-inches	10 feet
8-inches	14 feet
10-inches and 12-inches	18 feet
14-inches and larger	See Note 4
For gravity wastewater mains, see Note 2.	

NOTES:

1. The table above provides the minimum horizontal separation requirements between the proposed JEA maintained utilities (including water mains, reclaimed water mains, meter boxes and wastewater force mains) and existing, proposed and future structures (including above ground structures, concrete footers and top of bank of ponds).
2. For gravity wastewater mains, the horizontal separation from existing, proposed, and future structures (including above ground structures, concrete footers, and top of bank of ponds) shall be a minimum of 3 times the vertical depth of the deepest portion of the manhole-to-manhole wastewater run.
3. Pressure mains with pipe cover greater than 36-inches will require additional horizontal separation as reviewed and approved by JEA O&M Manager.
4. Pressure mains 14-inch and larger may require structural analysis as requested by JEA Development Manager, and will require additional horizontal separation as reviewed and approved by JEA O&M Manager.
5. All depth measurements will be based upon final finished grade elevations, unless approved otherwise by JEA.

3.8 Swabbing Launching Stations

When determined necessary by the design engineer, and in conjunction with the JEA Planning Team, swabbing launching stations will be required on forcemains as per the details in the latest JEA Water and Wastewater Standards Manual, Plate W-45 and W-45A-D.

3.9 System Connections

After permit COC has been issued, connections and ties to the JEA Water System and transfer of services shall be performed by a licensed master plumber or underground utility contractor under supervision of JEA. Taps shall be scheduled at least 72-hours in advance by contacting the JEA inspector.

JEA will install a permanent meter, upon project acceptance, application, and payment of all fees by the requestor at:

JEA Preservice Counter
21 West Church Street
1st Floor, Customer Service Building
Phone #904-665-5260
Email: waterpreservice@jea.com

Unless approved by JEA, size-on-size taps are limited on PVC mains to 12-inch and smaller. Size-on size taps are acceptable on DIP (all sizes). For size-on-size taps on 8-inch and larger mains, the actual tap hole size shall be reduced by 1-inch.

No taps shall be made within 5-feet of a joint. When connecting a 2-inch main to an existing main, a minimum 4-inch gate valve shall be used with a 4-inch plug with a 2-inch tap. No 2-inch main valves will be allowed.

Taps requiring meter installations of size 2-inch and smaller shall include the service pipe, meter box, and corporation stop sized ready to accept the meter installation by JEA. (JEA Water Standard Construction Detail W-2). Service tap and line size must match the meter size.

Taps requiring meter installation of size 3-inch and larger must include the service pipe and meter vault. For meters 3-inch and larger, JEA will build and install the meter assembly. After installation, JEA will install the meter vault (furnished by the developer's contractor) to grade. (JEA Water Standard Construction Detail W-6). For reclaimed water meters 3-inch and larger, the construction requirements will be similar to Detail W-6, but without the bypass piping. Service tap and line size must match the meter size.

Taps shall be piped straight through where the meter is to be set according to the following laying lengths as measured between the control valve and the backflow prevention device:

- Meters size 3-inch and 4-inch shall have a laying length of at least 14-feet
- Meters size 6-inch and 8-inch shall have a laying length of at least 20-feet
- Meters size 10-inch shall have a laying length of at least 24-feet

3.10 Fire Hydrant Locations

3.10.1 General

Hydrants shall be painted and installed in accordance with the applicable county fire codes. Private fire hydrants shall be painted red unless otherwise specified in the local county's standards. (See JEA Water Standard Construction Details W-12, W-13 and W-14).

Fire hydrants shall not be connected to reclaimed water mains.

Fire hydrants shall be constructed on the same side of the road as the water main. Exceptions may be approved depending on a specific situation.

Fire hydrants shall be located in easily visible and accessible locations. They should be located at entrances and intersections whenever possible, or fire hydrants should be located at property corners just inside the right-of- way. Fire hydrants should not be located at the same corners as water meters or electric transformers.

Fire hydrants should have a minimum clearance of 3-feet from the edge of pavement or the back of curb.

New or relocated fire hydrants shall be located so that the hydrants are at least:

a. 3-feet from any existing or proposed storm sewer, or reclaimed water main;
b. At least 6-feet, and preferably 10-feet, from any existing or proposed gravity, vacuum-type, or pressure-type wastewater main or wastewater force main.

Fire hydrants shall be located with the steamer nozzle (largest opening) directed towards the street or parking area.

There shall be no trees or permanent structures within 10-feet of any hydrant.

There shall be no obstructions (fences, landscaping, signs, etc.) within 5-feet of any hydrant.

3.10.2 Single-Family Residential

Single-family residential areas shall have fire hydrants located not more than 500-feet apart when measured along streets or acceptable access ways, except in a cul-de-sac or dead-end street where a fire hydrant shall be located not more than 600-feet from the center of the turnaround. Single-family detached residential property shall have a fire hydrant located within 500-feet of each building location. No more than one fire hydrant shall be provided on a dead end 6-inch water main.

3.10.3 Multi-Family Residential, Commercial and Industrial

Fire hydrants in commercial, industrial, or multi-family residential areas shall be located not more than 500-feet apart when measured along streets or acceptable access ways, and shall be within 500-feet of the most distant corner of each commercial or multifamily structure.

All fire hydrants and independent valves are to be located within the street right-of-way or easement.

Multiple fire hydrants within commercial and multi-family residential projects shall be served with a minimum 8-inch water main.

If the proposed project is to be served by a well, fire protection must be addressed and approved per the Fire Marshal's requirements and indicated on the design plans. The Fire Marshal will require an on-site water storage tank or alternate water source.

All fire hydrant spacing must be approved by the Fire Marshal or authority having jurisdiction.

3.10.4 Open Rural Areas

For open rural areas with few services (excluding the service areas described above), water mains larger than 6-inch shall include a fire hydrant every 1,000-linear feet (max) for JEA line maintenance, unless otherwise approved by JEA.

3.11 Water and Reclaimed Water Valves

There shall be a sufficient number of valves designed such that single mains in the network can be isolated from the remainder of the system thereby providing flexibility for operation and maintenance while minimizing number of customers out of service.

Valves shall be provided at 800-foot (maximum) intervals within single-family residential areas.

Valves shall be provided at 500-foot (maximum) intervals within multi-family residential projects as well as industrial and commercial areas.

On transmission mains less than or equal to 16-inch diameter, with a limited number of service connections, valves shall be installed at a maximum of 1,000-foot intervals, and at distribution branches. On transmission mains greater than 16-inch diameter, valves shall be located at a maximum of 2,500-foot intervals, and at distribution branches. Where applicable, valves on transmission mains should be located next to the fire hydrant tees to facilitate field location.

Valves shall be installed on all water main branches as follows: two directions on a tee.

Valves should be located so as not to conflict with curb and gutter or be in the normal path of tires and should be located near the tee fitting.

Valves shall be marked with a "V" scribed in the curb closest/adjacent to the below grade valves. The "V" cut shall be painted blue for potable water or pantone purple for reclaimed water.

3.12 Flushing Hydrants and Sample Points on Water Mains

A 2-inch flushing hydrant assembly or a 6-inch fire hydrant shall be provided at the end of all dead-end, non-circulating water mains and stub-outs.

1-inch temporary sample points shall be provided, at minimum:

- At the end of all water mains and stub-outs of 40-feet or greater;
- At 1,000-foot maximum intervals on long main extensions;
- On all looped mains;
- In accordance with permit conditions;
- At the point of connection to the existing water main.

Fire hydrants shall not be used as sample points. The contractor shall remove all temporary sample points after clearance from JEA and DEP.

3.13 Flushing Hydrants on Reclaimed Mains

A 2-inch flushing hydrant assembly shall be provided at the end of all dead-end, non-circulating reclaimed mains and stub-outs.

Must use reclaimed (purple) poly.

Curb stop must have the reclaimed emblem.

Reclaimed meter box must be used.

3.14 Air Relief Valves

When necessary, at high points in water mains where air can accumulate, provisions shall be made to remove the air by means of air relief valves.

3.15 Water and Reclaimed Water Services

Water services shall be provided to each lot, building, or parcel requiring a separate water meter.

Single long and short side water services shall be 1-inch for single-family residential subdivisions, and shall be located at adjacent property lines along the front of the property to be served as shown in JEA Water Standard Construction Detail W-1 of the JEA Water and Wastewater Standards Manual.

Single 2-inch long side service serving two services, or gang water services may be utilized and shall terminate with a 1-inch service for each adjacent lot per JEA Water Standard Construction Detail W-1 of the JEA Water and Wastewater Standards Manual. Gang water services (three or more services in one area) are discouraged if property lines may be modified in the future.

Gang services are acceptable if constructed in accordance with JEA Water Standard Construction Detail W-1 of the JEA Water and Wastewater Standards Manual.

No more than five domestic service connections are allowed on a 2-inch water or reclaimed water main in a new subdivision.

The service size shall be smaller than or equal to the main size to which it is connecting. Domestic service size shall not exceed meter size.

No service shall be allowed beyond the valve on a phase line water or reclaimed water main stub-out.

No 2-inch or smaller service taps shall be permitted on water or reclaimed water mains which are greater than or equal to 20-inch diameter.

The maximum length of a water or reclaimed water service (distance from the connection at the main to the water meter) shall be 100-feet, unless approved otherwise by JEA.

Water service locations shall be marked with a "W" scribed in the curb and painted blue.

Reclaimed water service locations shall be marked with a "R" scribed in the curb and painted purple.

Residential services using reclaimed water for irrigation must have a JEA approved backflow preventer installed on each potable water service, per detail W-15, prior to the installation of a JEA reclaimed water meter. The installation of a backflow preventer shall be in accordance with the JEA Rules and Regulations for Water, Sewer, and Reclaimed Water Services, Appendix B, Cross Connection Control Policy.

3.16 Water Meters

3.16.1 General

All water meters shall be located in accordance with the JEA Water and Wastewater Standards Manual, unless otherwise approved. For typical residential layout, refer to JEA Water Standard Construction Detail W-1. This location varies in St. Johns and Nassau Counties. Contact the appropriate County Engineering department for correct water meter location criteria.

Water meter installation shall be in accordance with the JEA Rules and Regulations for Water, Sewer, and Reclaimed Water, Chapter 3. (In accordance with these Rules and Regulations, the installation of two or more meters in lieu of one large meter serving a single service is prohibited (potable or reclaimed water meters).

For non-active services, the meter box shall be located adjacent to the right of way at the property, lot, or parcel that it is serving, and clearly marked with a 2-in X 2-in X 4-ft pressure treated post.

Water meter boxes shall not be located within driveways or sidewalks. Exceptions may be approved by JEA on a case-by-case basis.

A separate water supply meter and a separate fire service is required for projects with on-site fire protection. JEA policy does not allow the installation of wastewater deduct meters. In order to achieve a metering/billing arrangement that would reduce wastewater charges when less sewage enters the JEA system than water consumed, the site can be designed with irrigation or water only meters or a separate wastewater flow meter to correctly establish metering/billing service. Examples of this type of service include cooling tower evaporation, industrial process water, etc.

3.16.2 Water Meter Sizing

Design Engineer shall supply calculations, signed and sealed by a registered Professional Engineer licensed to practice in the state of Florida, supporting meter size selection for all meters sized 1-inch and larger.

JEA utilizes SENSUS meters (www.sensus.com) and Master Meter meters (www.mastermeter.com) for both potable and reclaimed water use. The meter size shall be selected by the design engineer based upon many design factors including the maximum continuous 24-hour flow rate (MCFR) (1/2 the safe maximum operating capacity) as listed below:

	MCFR (gpm)				
Meter Size	**Master Meter Positive Displacement**	**Sensus SR II**	**Sensus OMNI C2**	**Sensus OMNI T2**	**Sensus OMNI F2**
3/4"	15	15	n/a	n/a	n/a
1"	25	25	n/a	n/a	n/a
1.5"	n/a	n/a	80	80	n/a
2"	n/a	n/a	80	100	n/a
3"	n/a	n/a	200	250	n/a
4"	n/a	n/a	400	500	500
6"	n/a	n/a	800	1000	1000
8"	n/a	n/a	1350	1750	1750
10"	n/a	n/a	2000	2750	2750

3.16.3 Temporary Water Meters

If fire protection is required for vertical structure projects to continue prior to JEA project acceptance, a temporary water meter may be allowed, as approved by the Development Manager. Portable fire hydrant meters will not be allowed for these purposes. If the project has a water permit, a partial COC must be issued, prior to a temporary water meter being released, on the applicable water line. JEA Capacity fees, meter fees and service special fees for both water and wastewater must be paid in full, prior to installation of temporary or permanent water meters.

The minimum base charge and usage fees will be assessed upon installation of the temporary construction meter in accordance with JEA's Water and Wastewater Tariff. The monthly charges will include water consumption (determined by regular meter readings and based on meter size), a monthly base fee (determined by meter size), utility tax, and late fees (if incurred). Temporary Construction Meters will be allowed until the customer completes the project. Immediately following "FINAL" COC, the service is converted to reflect permanent service and usage fees will be assessed accordingly. Failure to comply with the Temporary Water Meter policy may result in disconnection of the water supply.

3.16.4 Portable Fire Hydrant Meters for Construction Activities

Portable fire hydrant meters will not be issued for building construction sites where the water system has not been accepted for operation and maintenance by JEA. A portable fire hydrant meter provided by JEA consists of a 2-inch meter and backflow device.

Fire hydrant meters shall be issued to the specific party who will utilize the meter and who will be responsible for the meter and payment for water usage. Hydrant meters are issued by JEA and can be used in:

- Duval County;
- Parts of St. Johns County to include Ponte Vedra, and some parts of St. Augustine around the area of CR-210;
- Nassau County (JEA Service Territory).

Meters are issued for periods of 6-months. At the end of the 6-month period, the meter must be returned and a new meter issued. Failure to exchange the backflow assembly within the specified time period is a violation of JEA's Cross Connection Control Program Policy(JEA Rules and Regulations for Water, Sewer, and Reclaimed Services, Appendix B) (JEA shall have the authority to refuse service to customers who are found to be chronic violators of the Fire Hydrant Meter Policy. Violations include the failure to report meter readings, exchange the meters on time and make regular invoice payments.

3.16.5 Multi-Family, Commercial or Industrial Development Metering

Unless otherwise approved, multi-family developments and commercial developments serving multiple tenants where the entire project is to remain

under single ownership, the entire site will be master metered with all on-site utilities remaining under private ownership and operation unless otherwise approved by JEA. If the site is master metered, the property owner must provide for sub-metering of individual units as a condition of water service from JEA.

When pre-approved by JEA's Development Manager, on-site utilities for projects under single ownership serving multiple tenants (individually metered) may be accepted for operation and maintenance provided that, the dedicated on-site utilities are contained within an acceptable, dedicated right-of-way or similar quality, dedicated, unobstructed, exclusive JEA utility easement sized as per these guidelines.

For multi-family and commercial projects, water meters shall be located in:

- Accessible areas;
- Outside of landscaped and paved areas;
- A minimum of 5-feet from buildings;
- Behind sidewalks;
- Generally adjacent to parking areas or roadways;
- A minimum of 3-feet from the edge of pavement.

For water meters 1-inch and larger, the engineer shall submit a detailed water demand estimate with the average daily flow and peak hourly demand indicated for review (signed and sealed by registered Professional Engineer licensed to practice in the State of Florida) and approval by JEA.

A 3-inch or larger meter shall be located in a 15-foot by 20-foot minimum easement provided adjacent to the right-of-way line.

3.17 Backflow Preventers

A metered detector check backflow preventer shall be required on all projects requiring automatic sprinkler (AS) system services and/or the use of on-site private fire hydrants for fire protection.

Backflow preventers shall be in accordance with JEA Rules and Regulations for Water, Sewer and Reclaimed Water Services, Appendix B, Cross Connection Control Policy and shall be located on private property within 10-feet of the meter. Alternative locations must be approved by JEA prior to installation.

A backflow device is required on all potable water services installed on private property after the meter where reclaimed water is available. (See JEA Water Standard Construction Detail W-15).

Freeze protection may be required on a backflow device associated with fire mains. The design engineer shall consult with the local Fire Marshall to determine if freeze protection is required. JEA recommends freeze protection on all backflow devices.

A backflow device is not required on any reclaimed water service unless deemed otherwise by JEA.

In the event that reclaimed water is not yet available in a required reclaimed water area, a jumper line will be designed and installed between the potable and the reclaimed line. JEA will provide the required backflow device for this jumper line; the developer's contractor will install it.

3.18 Water Treatment Plants

JEA requires water treatment plants to be dedicated on an individual basis. It is the developer's responsibility to contact JEA in the planning stage for direction.

3.19 Stub-Outs and Terminal Point

All proposed water main extensions shall terminate with a JEA standard stub-out past the proposed project connection and shall consist of a minimum of 40-feet of pipe, a resilient seat gate valve or plug valve installed adjacent to the last tee or tapping sleeve and a plug. The plug fitting shall be tapped and include a 2-inch (bronze) corporation stop (MIP) on the dead end. If there is potential for future development at the upstream property, the proposed water main may be required to extend past the project connection point to the upstream property line or other suitable location. In the event that the line extends past the property or phase line, a temporary access easement will be granted. The length of the stub-out may be reduced to a minimum of 20-feet, if approved by JEA, to avoid installation conflicts in the right-of-way. See JEA Standard Construction Detail W-37.

Section 4.0

Wastewater Design Guidelines

4.0 General

This section provides the minimum guidelines for the design of wastewater collection and force main systems. The method of design and/or construction shall be according to accepted engineering practices, this manual, the most current JEA Water and Wastewater Standards Manual, the latest edition of the Recommended Standards for Sewage Works (Ten State Standards), and all applicable Sections of the Florida Department of Environmental Protection Rules and Regulations for Water and Wastewater Systems.

Wastewater hydraulic design notes (signed and sealed) shall be submitted to JEA for review and approval and will be submitted to the regulatory agencies for permit approval. The hydraulic design notes submittal shall include the hydraulic design, catalog data for the pumps, electrical system, controls, and up-lift calculations for the wet-well.

4.1 Design Flows

4.1.1 Average Daily Flow (ADF)

Design flows for new sewer collection systems shall be based on Table 1 of the State of Florida Department of Health (FDOH), Chapter 64E-6.008 F.A.C., Standards for Onsite Sewage Treatment and Disposal Systems, or on Flow Comparison Analysis as identified in Section 3.1.

4.1.2 Equivalent Dwelling Units

An Equivalent Dwelling Unit (EDU) is the equivalent flow that can be anticipated from one residential connection. In all JEA sewage treatment areas, assume 100-gallons per capita per day (gpcd) to calculate the average daily flow (ADF). To calculate the ADF from a single EDU, multiply the gpcd by an occupancy factor of 3.5.

4.1.3 Peak Flow

Wastewater systems and facilities shall be designed for peak flows calculated in accordance with the Recommended Standards for Sewage Works, latest edition (Ten State Standards), and as shown below.

$$Peaking\ Factor = \frac{18 + \left(\sqrt{\frac{Population}{1000}}\right)}{4 + \left(\sqrt{\frac{Population}{1000}}\right)}$$

Peak Flow = Peaking Factor $*$ Average Daily Flow (ADF)

4.2 Gravity Wastewater Mains

4.2.1 Sizing Gravity Wastewater Mains

Design all wastewater mains to carry peak design flow when flowing full (no hydraulic head allowed). Peak design flow may not exceed pipe capacity.

Gravity wastewater mains shall be a minimum 8-inch diameter in the JEA right-of-way (R/W) and/or private R/W (easements).

Gravity wastewater mains shall be installed on a uniform alignment and grade between manholes.

Collection systems serving more than two buildings, lots, or parcels shall be 8-inch gravity mains with manholes.

Upsizing of sewer gravity lines for purposes of a flatter slope design will not be permitted.

4.2.2 Gravity Wastewater Slope Requirements

All sewers shall be designed and constructed to give mean velocities, when flowing full, of not less than 2.0-feet per second, based on Manning's Equation using a "n" value of 0.013. The following are the recommended minimum slopes that should be provided for sewers 42-inches or less. However, slopes greater than these may be desirable for construction, to control sewer gases, or to maintain self-cleansing velocities at all rates of flow within the design limits. The maximum slope for all pipe diameters shall be such that the velocity in the pipes does not exceed 5-fps when calculated using Manning's Equation. Maximum slope may be used on terminal pipe runs only, unless otherwise approved by JEA. In the event that an applicant wishes to use a slope less than the minimum listed below, they will require written approval from the Development Manager. JEA reserves the right to require specific slopes as needed to insure future service and maintenance needs.

Pipe Diameter (Inch)	Minimum Slope (ft/ft)
8	0.004
10	0.0028
12	0.0022
15	0.0015
16	0.0014
18	0.0012
21	0.001
24	0.0008
30	0.0006
36	0.0005
42	0.0004

Sewers 48-inches or larger should be designed and constructed to give mean velocities, when flowing full, of not less than 3.0-fps, based on Manning's Equation using a "n" value of 0.013.

Prior to preliminary review, the applicant must obtain JEA Development Manager pre-approval, in writing, for any deviation from the minimum slope.

4.2.3 Gravity Wastewater Main Materials

Materials shall be in accordance with the most recent JEA Water and Wastewater Standards Manual, Section 428.

The type, class, grade, and alignment of wastewater pipe may be changed only at manholes.

All gravity mains must be PVC SDR-26 heavy wall wastewater pipe.

DIP pipe is not allowed for gravity wastewater.

Where the mains or laterals are above ground or otherwise exposed as in bridge crossings or ditch crossings, wastewater mains shall be stainless steel.

4.2.4 Gravity Wastewater Main Depth

Gravity wastewater mains shall be designed for minimum depth requirements of 30-inches in unpaved areas and 36-inches in paved areas.

No gravity wastewater main with wastewater service laterals shall be constructed with a greater than 12-foot depth of cut from finished grade. Wastewater service laterals associated with gravity wastewater mains that are deeper than 12-feet must be routed to a gravity wastewater main high-line, a manhole, or other JEA approved method (see JEA Wastewater Standard Construction Details S-4 and S-5 for manholes with highline connections).

No gravity wastewater main shall be constructed with greater than 15-feet depth of cut from finished grade.

4.2.5 Gravity Wastewater Main Location

Gravity wastewater mains shall be designed for installation on the centerline of roadways where possible. On curved roads, the wastewater main and manholes shall be located such that the pipe and manholes remain within the limits of the paved area.

Install gravity wastewater mains with a straight alignment between manholes.

Locate gravity wastewater manholes a minimum distance of 4-feet from the face of the curb to the edge of the manhole.

Locate trunk wastewater 24-inch and larger 5-feet west of, or 5-feet south of the centerline of the public rights-of-way or private rights-of-way (easements), unless approved otherwise by JEA.

Gravity main stub-outs shall:

a. Be extended to the property line, plat line or phase line;
b. Shall extend a minimum of 10-feet past the edge of pavement or a distance of 1.5 times the wastewater main depth, whichever is greater;
c. Terminate with a manhole, to allow for future wastewater main extension.

All proposed gravity wastewater mains, located in easements that cross wetlands, must be approved in writing by JEA's Development Manager prior to design. If approved by JEA, the following design features shall be included:

a. Long runs of gravity wastewater main located in easements that cross wetlands, which are restored as wetlands, shall be encased in a steel casing;
b. Those runs which include manholes, located across wetlands or limited access areas, shall be accessible to vehicles and heavy equipment;
c. A stabilized access road 12-feet wide with a minimum of 12-inch deep subbase with a minimum Limerock Bearing Ratio of 40 shall be provided over the gravity pipe and shall be indicated on the drawings;
d. The access road should be designed to provide adequate drainage and to prevent erosion from storm runoff;
e. A truck turnaround area may be required at the end of all access roads;
f. In some cases, JEA will require the addition of 6-inch thick gravel or crushcrete along the 12-foot wide access road.

4.3 Wastewater Main Separation Requirements

A horizontal distance of 6-feet shall be maintained from all gravity wastewater mains to drainage structures, telephone duct banks, electrical transformers, signal relays, power poles, and other structures in the right-of-way as well as any other parallel underground utility with the exception of water mains, unless approved by JEA's Development Manager in writing. Where gravity mains cross other underground utilities with the exception of water mains, a vertical separation of 12-inches shall be maintained, unless approved by JEA's Development Manager in writing. (See below for water main and gravity wastewater main separation requirements.) All distances shall be measured from the outside edge of the pipes.

Distance from building foundations, or tops of banks, to gravity wastewater mains must be a minimum distance of three times the vertical depth of the deepest portion of the manhole-to-manhole wastewater run.

In locations where gravity wastewater mains cross under a box-culvert, or 48-inch diameter and larger storm water main, JEA will require an approved flowable fill material surrounding the wastewater main. In these cases, provide 12-inches of excavatable flowable fill around the outside of the wastewater main, approximately 10-feet in each direction from the crossing point.

Gravity wastewater mains located adjacent to retention pond areas shall be designed with sufficient distance from pond to avoid side slope collapse based on three to one side slopes, anticipated pond water elevations and depth of bury. JEA reserves the right to require casing pipe as necessary to maintain the utility.

4.4 Gravity Services

In areas where on-site sewage disposal systems exist, new gravity service termination at the right-of-way shall be established by the designer to accommodate rerouting of yard piping to the service termination elevation via gravity flow; otherwise, an on-site permitted private pump station will be required.

JEA shall not connect any customer that does not abut Water, Wastewater, or Reclaimed Water mains without requiring the construction of a main line extension. Single gravity services shall be provided to each lot, building, or parcel, provided that adequate and unobstructed easements are dedicated to JEA for maintenance. Easements must be approved by JEA.

New 6-inch wastewater service laterals which tap into existing JEA manholes or existing JEA wastewater collection mains shall be constructed by JEA only, unless approved otherwise by JEA.

No 6-inch gravity wastewater service connection is permitted on JEA gravity wastewater mains which are 16-inch or larger. A high-line may be acceptable for these situations.

If a project site is currently served by a private well for potable water supply, a JEA approved water meter, reading in gallons must be installed on the service side of the well for the purpose of wastewater billing. Upon receipt of a Private Well Meter Application along with payment of fees, the JEA approved meter will be delivered and installed by a licensed plumber contracted by the property owner. Upon completion of the installation, JEA shall be contacted to perform an inspection of the installation to ensure compliance with JEA standards.

Single gravity services shall not exceed the size of the gravity main. For 8-inch connections to an 8-inch main, provide manhole at connection to main.

Saddle/Doghouse manholes are not allowed.

Single services shall be a minimum of 6-inch diameter at 1/8-inch per foot minimum slope.

Stub-outs for services shall be marked with a 2-in X 2-in X 4-ft pressure treated pine post painted green. Services shall be marked with a "S" scribed in the curb and painted green.

Double services or multiple connected wastewater services (gang services) are not acceptable. However, they may be used for privately owned and maintained commercial and multi- family systems under single ownership. Double or multiple services may be allowed in the case of a condominium project where the onsite wastewater systems are the property of the condominium association (see JEA Standard Construction Detail S-51).

Private clean-outs shall not be installed in the R/W or JEA easement. Private clean-outs, if installed, must be installed on private property and shall be maintained by the customer.

Services shall be designed with a 30-inch minimum cover and shall terminate 30-inches to 60-inches deep at the R/W line where not in conflict with water mains, drainage pipes, and other existing utilities or buried electric.

A service shall be designed to connect to the gravity main with a tee fitting rotated 45-degrees up. The invert elevation of the service at the main shall be at or above the crown of the mainline pipe. (See JEA Standard Construction Details S-19 and S-20).

Gravity wastewater service laterals shall be provided to all undeveloped property and future phases of the project in accordance with the wastewater master plan. The location and length of wastewater service lateral shall be designed to minimize future maintenance of traffic, roadway repairs, and restoration work.

4.4.1 Single Family Residential Services

Single services shall be installed at the center of the lot and front the property being served. Services shall be installed perpendicular to the wastewater main. Deviations from this criterion must be pre-approved in writing by JEA. The center portion of the lot shall be defined to include the center 50% of the lot width. That is, if the lot is 100-feet wide, then the wastewater service may be located inside the 50-linear foot center portion of the lot.

6-inch single services shall be limited to 60-foot maximum length (length between wastewater main or manhole and the customer's property line).

Terminal manholes located in residential cul-de-sacs are allowed three service connections (6-inch diameter maximum) provided the service connection inverts are a minimum of 3-inches above that of the manhole.

4.4.2 Multi-Family Residential, Commercial and Industrial Services

6-inch services shall serve no more than six multi-family units as shown on JEA Standard Construction Detail S-51.

All 8-inch and larger wastewater services shall be connected into manholes, not the wastewater main.

Wastewater inflow from a general dumpster area less than 250-SF is acceptable to enter JEA wastewater system, if a grease trap is installed.

Service Connections to manholes are allowed as follows:

a. Inline manhole connections (8-inch diameter and larger) are limited to 2-services, one from each side of the street.
b. Services shall not be connected to stub-outs without a manhole.

4.4.3 Wastewater Service Locates

JEA will perform a physical locate of a wastewater connection point for a fee. For locate services, submit a completed application and applicable fee to JEA at:

JEA Preservice Counter
21 West Church Street
1st Floor, Customer Service Building
Phone #904-665-5260
Email: waterpreservice@jea.com

If no connection point is located, the fee may be credited towards the installation cost of a wastewater connection, as approved on a case-by-case basis.

4.5 Wastewater Meters

JEA policy does not allow the installation of wastewater deduct meters. In order to achieve a metering/billing arrangement that would reduce wastewater charges when less sewage enters the JEA system than water consumed, the site can be designed with irrigation or water only meters or a separate wastewater flow meter to correctly establish metering/billing service. Examples of this type of service include cooling tower evaporation, industrial process water, etc. All wastewater flow metering designs shall conform to JEA Commercial Meter Services, and Sewer Flow Metering Design Guidelines. Contact Meter Services O&M with any questions at mgrs40700@jea.com.

4.6 Wastewater Manholes

Manholes shall be installed at the end of each main and at all changes in grade, pipe size, pipe material, alignment, and at all pipe intersections.

Manholes where main pipe size changes occur shall place the 0.8-depth point of both wastewater mains at the same elevation.

The maximum spacing of manholes shall be 400-feet for wastewater mains less than or equal to 16-inch diameter and 500-feet for wastewater mains greater than 16-inch diameter. A gravity main exceeding the maximum length may be allowed, with prior written approval from JEA's Development Manager, if it is required to complete a terminal run. If this occurs, a note shall be added instructing the contractor "not to exceed the additional length required to complete the run".

Manholes shall be located:

a. Along the centerline of city or private roadways (including parking lots);
b. Out of the tire lane;
c. A minimum of 4-feet from the edge of the manhole to the face of curb and gutter.

Manholes shall not be installed in the flow line of inverted crown roads or within the design high water limits of gutters, swales, storm water ditches, or retention/detention areas.

Terminal manholes may be required on stub-outs for the purpose of inspection and maintenance, or future extension of the system.

Manholes shall be assigned an ID number, beginning at the junction or deepest manhole as number one, and subsequent manholes being numbered consecutively up to the shallowest manhole.

4.6.1 Invert and Rim Elevations

All manhole rings and covers shall be installed at the final grade level.

Design depth for all terminal manholes is to be at no less than 4-feet from the final elevation of the top of the manhole ring and cover to the pipe invert, and must include at least one course of manhole adjustments.

4.6.2 Drop Connections

Outside drop connections are only allowed for 12-inch drop pipe size and larger per JEA Standard Construction Detail S-7.

Inside drop construction is required for 2-foot or greater drops, and shall be constructed per JEA Standard Construction Detail S-4.

4.6.3 Lining

At a minimum, all junction manholes (manholes located closest to the pump station wet well), manholes which include a 24-inch or larger pipe, and manholes receiving a force main shall be coated internally as outlined in Section 446 of JEA Water and Wastewater Standards Manual. In addition, for new construction projects, additional manholes downstream of the point of connection of a 6-inch or larger force main may be required to be lined based on flow quantities and/or velocities.

4.7 Force Mains

4.7.1 Pipe Diameter

Force mains shall be a minimum of 4-inch diameter in the right-of-way, or within JEA easement if the main is to be dedicated. Exceptions may be granted for low-pressure systems, which discharge directly into a gravity wastewater system.

Force mains shall be sized for peak flow at a minimum velocity of 2.0-fps (feet per second) and a maximum velocity of 5.0-fps. If approved by JEA, 4-inch force mains may be initially sized at less than 2-fps. Exceptions may be made, by the Development Manager in writing, on a case-by-case basis during the plan review process.

A plan and profile shall be provided for all horizontal directional drill (HDD) pipe and for all force main (open-cut) extensions. The plan and profile shall contain information including, but not limited to: elevations, size and location of entry/exit pits, entry/exit angles, conflicting utilities and separations, pipe material, MJ adapters and any other information pertinent to the installation of the force main and shall be in accordance to JEA Water and Wastewater Standards Sections 750 and 755.

4.7.2 Depth of Bury

Force mains less than 24-inch diameter shall be designed meeting minimum depth requirements of 30-inches in unpaved areas and 36-inches in paved areas, with a maximum of 60-inches in arterial or collector roadways where reconstruction is anticipated, unless approved otherwise by JEA. Force mains of 24-inch or greater diameter shall be designed with minimum depth requirements of 36-inches (paved and unpaved areas) unless approved otherwise by JEA. Cover for pipe under pavement shall be measured from finished grade.

For 12-inch and larger mains, the proper installation and depth requirements for gate valves may require additional depth of cover.

If a utility conflict is encountered and is located in a non-traffic area, using DR18 PVC, the minimum cover may be reduced to 24-inches only in the area of conflict. Any reduction in pipe cover will require written approval from JEA Development Manager.

In FDOT and railroad rights-of-way, the minimum cover shall be established by the FDOT and railroad respectively.

Force mains shall be designed to reduce or minimize the number of high points. Changes in elevation, which exceed 2-feet, will require an air release valve. (See JEA Standard Construction Detail S-29 and S-29A).

4.7.3 Material and Fittings

Materials shall be in accordance with the most recent JEA Water and Wastewater Standards Manual Section 429 and 430. For 6-inch and larger HDPE pipe, the pipe size shall require up sizing to maintain a consistent inside diameter of the main.

Force mains shall have restrained joints for changes in direction. Bends 45-degrees or less should be used in lieu of 90-degree bends.

All proposed force main extensions shall terminate with a JEA standard stub-out past the proposed project connection and shall consist of 40-feet of pipe, a resilient seat gate valve or plug valve installed adjacent to the last tee or tapping sleeve and a plug. The plug fitting shall be tapped and include a 2-inch (bronze) corporation stop (MIP) on the dead end. If there is potential for future development at the upstream property, the proposed force main may be required to extend past the connection point to the upstream property line or other suitable location. In the event that the line extends past the property or phase line, a temporary access easement will be granted. The length of the stub-out may be reduced to a minimum of 20-feet, if approved by JEA Development Manager in writing, to avoid installation conflicts in the right-of-way. See JEA Standard Construction Detail S-43 and S-44.

4.7.4 Location

Install force mains, where feasible, on the opposite side of the street from the water main, unless otherwise approved by JEA. Force mains shall be designed to be a minimum of 4-feet from the right of way line and a minimum of 3-feet from the edge of pavement or back of curb. Larger pipes and greater depths of cover may require greater distances from the right of way line and edge of roadway.

A minimum horizontal distance of 6-feet, unless approved in writing by JEA's Development Manager, shall be maintained from all force mains to drainage structures, telephone duct banks, electrical transformers, signal relays, power poles, and other structures in the right-of-way as well as any other parallel underground utility with the exception of water and reclaimed water mains. Where mains cross other underground utilities with the exception of water and reclaimed water mains, a minimum vertical separation of 6-inch shall be maintained. See Section 4.7.7 for Force Main Separation Requirements. All distances shall be measured from the outside edge of the pipes.

Force main connections to manholes shall connect at the bottom of the manhole matching the crown of the existing pipe as shown in JEA Standard Construction Detail S-18. Manholes that forcemains are discharging in to shall be lined with a protective coating as specified in Section 446 of the Water and Wastewater Standards Manual. The angle between influent force main and effluent gravity pipe shall be between 135-degrees and 225-degrees unless approved otherwise by JEA. The flow from the force main should be directed into the effluent gravity pipe of the manhole in an effort to reduce turbulence.

Force mains shall not be constructed below open ditch bottoms unless no other location is available due to crowded corridor conditions caused by other utilities.

Wastewater force mains shall be located outside of paved areas except at roadway crossings. Exceptions to this pavement rule may be considered within commercial development projects provided the mains do not lie under parking areas.

4.7.5 Dual Directional Drilling

When determined necessary by the JEA Planning Team, dual forcemain directional drills will be required as per the layout in the latest JEA Water and Wastewater Standards Manual, Plate S-21A.

4.7.6 Swabbing Launching Stations

When determined necessary by the design engineer, and in conjunction with the JEA Planning Team, swabbing launching stations will be required on forcemains as per the details in the latest JEA Water and Wastewater Standards Manual, Plates S-54 and S-54A-D.

4.7.7 Force Main Separation Requirements

Force main separation (from structures and hardwood trees) shall be in accordance with Sections 350 and 429 of the JEA Water and Wastewater Standards Manual including JEA Standard Construction Details W-10, W-11, S-26 and S-27.

The table below provides the minimum horizontal separation requirements between the proposed utility and structures (see notes).

Pressure Main (Water & Wastewater) Nominal Size (inches) (See Note 1)	Horizontal Separation Requirements (Min)
up to 6-inches	10 feet
8-inches	14 feet
10-inches and 12-inches	18 feet
14-inches and larger	See Note 4
For gravity wastewater mains, see Note 2.	

NOTES:

1. The table above provides the minimum horizontal separation requirements between the proposed JEA maintained utilities (including water mains, reclaimed water mains, water service laterals, meter boxes and wastewater force mains) and existing, proposed and future structures (including above ground structures, concrete footers and top of bank of ponds).
2. For gravity wastewater mains, the horizontal separation from existing, proposed, and future structures (including above ground structures, concrete footers, and top of bank of ponds) shall be a minimum of 3 times the vertical depth of the deepest portion of the manhole-to-manhole wastewater run.
3. Pressure mains with pipe cover greater than 36-inches will required additional horizontal separation as reviewed and approved by JEA O&M Manager.
4. Pressure mains 14-inch and larger will require additional horizontal separation as reviewed and approved by JEA O&M Manager.
5. All depth measurements will be based upon final finished grade elevations, unless approved otherwise by JEA.

4.7.8 Valves

Wastewater valves and appurtenances shall conform to JEA Water and Wastewater Standards Manual, Section 430.

Valves shall be marked with a "V" scribed in the curb closest/adjacent to the below grade valves. The "V" cut shall be painted green.

Resilient seat gate valves shall be installed at a maximum of 1,000-foot intervals and at branches of intersecting force mains on tees and wyes, and at force main stubs.

A resilient seat gate valve shall be provided on the force main in the right-of-way adjacent to the discharge manhole. (See JEA Standard Construction Detail S-18).

Generally, resilient seat gate valves are preferred on wastewater force mains (main valves and tapping valves), but must be in the vertical position (stem in vertical position). If a gate valve must be in the horizontal position (stem horizontal), then a double disc gate valve must be utilized. Horizontal valves are to be utilized only in extreme cases and as approved by JEA. When gate valves are not practical, plug valves may be utilized. Plug valves 8-inches and larger must be equipped with worm-gear actuators.

Valves shall be located so as not to conflict with curb and gutter, not be located in the tire tracks and shall be located outside of pavement when possible.

For private pump stations with JEA dedicated off-site force mains, a JEA pump-out box is required per JEA Standard Construction Detail S-46. A 4-inch (minimum) gate valve is required at the right-of way-line, adjacent to the pump out box. The gate valve is not required on force main piping where the connection at the JEA main is located on the same side of the street as the pump-out box and consists of 15-feet or less within the City right-of-way area. This gate valve defines the "JEA Point of Service". If no gate valve exists, the right-of-way line defines the "JEA Point of Service".

Air release valve assemblies (2-inch) with manholes shall be provided at all force main high points and when change of elevation is 2-feet or greater. The design engineer shall size the air release valves. If an air release valve larger than 2-inch is required, multiple 2-inch assemblies shall be provided. Air release valves on force mains hung from bridges should be manual if accessible. Air release valves shall be constructed as per JEA Standard Construction Detail S-29. Combination valves (air release and vacuum valves) shall only be utilized if a major vacuum condition exists as specified by the design engineer.

4.7.9 Force Main Connections to Existing Force Mains

4.7.9.1 Taps

Unless approved otherwise by JEA, size-on-size taps are limited on PVC mains to 12-inch size and smaller. Size-on-size taps are acceptable on DIP (all sizes). For size-on-size taps, on 8-inch and larger mains, the actual tap hole shall be reduced by 1-inch.

4.7.9.2 To Existing Force Mains >12-inch diameter

Taps on existing JEA force mains larger than 12-inch diameter must be pre-approved by JEA. In these cases, some restrictions may apply. Approval is based on each individual development project. Developer shall request a pre-application meeting. JEA will perform a site visit to determine upstream and downstream mainline valve locations, and to verify the mainline can be isolated by operating the valves. If valves are unable to be located, are inoperable, or spacing is not a reasonable distance (depends on number of manifold stations, size of main, location, etc.), Developer may be required to provide an insert a-valve(s), as required by JEA, to make the connection.

4.8 Access Road

Long runs of force mains or gravity wastewater located in easements that cross wetlands, which shall be restored as wetlands, shall be encased in a steel casing. Those runs that include manholes located across wetlands shall be accessible. A stabilized access road, 12-foot wide with a minimum Limerock Bearing Ratio (LBR) of 40 shall be provided and indicated on the drawings for easements requiring multiple manholes. The access road should be designed to provide adequate drainage and to prevent erosion from storm runoff. A truck turnaround area should be provided at the end of all access roads.

Section 5.0

Pump Station Design Guidelines

5.0 JEA Dedicated Pump Stations

5.0.1 General

Design wastewater pump stations in accordance with applicable sections of the Department of Environmental Protection Rules and Regulations, Recommended Standards for Sewage Works (Ten State Standards), JEA Water and Wastewater Standards Manual, latest editions, and as specified herein.

See Section 433 of JEA Wastewater Pump Stations Standards Manual for specific design requirements.

Pump stations shall be designed specifically to pump domestic sewage containing solids and fibrous materials.

Pump stations shall be designed and located on the site to minimize the effects resulting from odor, noise, and lighting.

Pump stations shall be designed to pump, at a minimum, the anticipated peak hourly flow with one pump out of service.

The engineer must submit buoyancy calculations for the wet well to demonstrate design precludes flotation.

A master pump station shall be utilized if multiple pump stations are required for the proposed development.

5.0.2 Site Plan

The pump station site is to be located outside of the street right-of-way (R/W) and/or private R/W (easement) on a parcel of property indicated on the record plat or dedicated to JEA by Warranty Deed. Prior to recording, the applicant must submit the plat and/or Warranty Deed to JEA Real Estate for review and signature. Upon JEA signature, the applicant shall then proceed with recording the document.

The pump station site plan shall conform to the latest JEA Pump Station Site Plan Detail Sheet, unless otherwise approved. See www.jea.com for detail sheets.

On-site elevations shall be indicated to establish that the concrete on-site is sloped between 1/8-inch per foot (minimum) and 1/2-inch per foot (maximum) to allow for drainage toward the public R/W. The site elevation shall be set at a minimum of 1-foot above the design high water level, or 100-year flood elevation of adjacent storm water areas, whichever is the higher elevation. The driveway shall be designed with a tee for turning around when, in the opinion of JEA, the station location and the roadway traffic conditions prohibit backing in and out of the site safely. The paved driveway should have a uniform elevation along the wet well and, if possible, shall slope at 1/8-inch per foot away from the station.

The trees and ground cover to be used at the site shall be identified on the site landscape plan and shall conform to the JEA Water and Wastewater Standards Manual. For sites within Duval County, landscape and irrigation design shall conform to the JEA Standard Pump Station Landscape Plan (see www.jea.com).

No catch basin shall be located within the pump station site.

5.0.3 Junction Manhole

Pump stations shall be equipped with a junction manhole with only one influent main to the wet well to facilitate bypass pumping. The junction manhole shall be 5-foot diameter (minimum).

The junction manhole shall be located on the same side of the driveway as the pump- out connection, and within 60-feet of the wet well as accessed from the entrance gate.

At a minimum, there should be 1-foot of separation for every 1-foot of wet well depth between the junction manhole and the wet well to avoid disturbing both structures if construction work on either is necessary in the future.

The junction manhole shall be located in the grass area and not located in the driveway or in the traffic lane of the street.

An approved JEA liner shall be installed on junction manhole.

5.0.4 Class One and Class Two Lift Stations

The wet well shall have a minimum inside diameter of 8-feet.

No wet well shall exceed 27-feet in depth unless pre-approved in writing by JEA. The wet well shall have only one influent main, 8-inch diameter minimum, known as “control elevation”.

The wet well’s operating water levels shall be arranged to insure pump operation without cavitation, and insure the gravity wastewater system is not surcharged.

The wet well’s storage volume shall be calculated assuming a 12-minute cycle time, without considering pump alternation, for the pump rate at design flow condition.

If JEA has approved an "initial/ultimate" station design, the storage volume must be sized for the ultimate pumps and flows. Minimum storage volume depth shall be 24-inches.

The storage height (distance between "Lead Pump On" and "Pumps Off" elevations) should be calculated and rounded up to the next highest increment divisible by 0.25-feet. If JEA has approved an "initial/ultimate" station design, the storage height should be designed for the ultimate pumps.

The Mercoid Operating Level (emergency high-level alarm) should be set at 0.5-feet above the invert elevation.

The operating levels for High Water Level, Lag Pump On, and Lead Pump On are established in 0.5-feet increments as follows:

High Water Level Alarm = Control Elevation – 0.5 feet

Lag Pump On = High Water Level Alarm – 0.5 feet

Lead Pump On = Lag Pump On – 0.5 feet

Both Pumps Off = Lead Pump On – Storage Height

The wet well bottom elevation should be set at a minimum of 3-feet below the "Pumps Off" elevation.

An approved JEA liner shall be installed on all wet well concrete surfaces exposed to sewage or wastewater gases, including the underside of the concrete top slab.

5.0.5 Wet Well-Class Three Lift Station

The wet well shall have a minimum inner diameter of 10-feet for 8-inch and smaller pump discharge size and 12-feet for greater than 10-inch pump discharge size, unless otherwise approved.

No wet well greater than 27-feet deep shall be allowed unless approved otherwise by JEA.

The wet well shall have only one influent main, set at the "control elevation."

The wet well's operating water levels shall be arranged to insure pump operation without cavitation, provide cycle times not less than the manufacturer's recommendations, and insure the gravity wastewater system is not surcharged.

The wet well's storage volume should be calculated assuming a 12-minute cycle time, without considering pump alternation, for the pump rate at design flow condition. The storage volume is determined as shown below:

$$SV_1 = Q_1 \left[\frac{Cycle\ Time}{4}\right] = Q_1\,(3\ min)$$

$$SV_2 = (Q_2 - Q_1)\left[\frac{Cycle\ Time}{4}\right] = (Q_2 - Q_1)(3\ min)$$

Where:

SV_1 = Volume between pumps off and lead pump on

SV_2 = Volume between lead pump on and #1 lag pump on

Q_1 = Flow of One Pump at design flow Condition

Q_2 = Flow of Two Pumps at design flow Condition

The "Storage Height 1" (distance between "Lead Pump On" and "Pumps Off" elevations) should be calculated by dividing the SV_1 by the wet well area and rounding up to the next highest increment divisible by 0.25-feet.

The "Storage Height 2" (distance between "Lead Pump On" and "#1 Lag Pump On" elevations) should be calculated by dividing the SV_2 by the wet well area and rounding up to the next highest increment divisible by 0.25-feet.

The Mercoid Operating Level (emergency high water level alarm) should be set at 0.5-feet above the influent invert elevation.

The operating levels are established in 0.5-foot increments as follows:

High Water Level Alarm = Control Elevation – 0.5-feet

#2 Lag Pump On = High Water Level Alarm – 0.5-feet

#1 Lag Pump On = #2 Lag Pump On -0.5-feet

Lead Pump On = #1 Lag Pump On – Storage Height 2

All Pumps Off = Lead Pump On – Storage Height 1

The wet well bottom elevation should be set at 3-feet below the "Pumps Off" elevation.

If two pumps are to be installed initially (third pump to be installed in the future), piping and valves for the third pump must still be installed complete through the base elbow.

An approved JEA liner shall be installed on all wet well concrete surfaces exposed to sewage or wastewater gases, including the underside of the concrete top slab.

5.0.6 Pumps

Pumps shall be in accordance with the latest version of the JEA Water and Wastewater Standards Manual and as listed in Wastewater Approved Materials (AS-603).

Pump curve should be downward sloping throughout the entire operating range.

Pump shut-off head shall be a minimum of 15% greater than the pump design head for the "all pumps on" condition, such that a pump with a design point of 500-GPM at 100-FT-TDH must provide a shut-off head greater than 115-FT-TDH.

The pump impeller shall be a non-clog design, capable of passing a nominal 3-inch solid.

Screw impellers are not acceptable.

Pump motors shall be of sufficient horsepower to be non-overloading throughout the curve.

Pump motors shall be a minimum 3-Hp unless otherwise approved by JEA.

Pump motors shall be 3600-rpm or less, unless approved by JEA.

All JEA dedicated pump stations shall be rated at 80-gpm (minimum).

All motors shall be suitable for operation with a 3-phase electric supply. Any special exception for single-phase motors must be pre-approved through JEA.

Shutoff and check valves shall be provided on the discharge main of each pump. The check valve shall be between the shutoff valve and the pump's discharge elbow. The check valve shall not be placed in the vertical position. Valves shall be accessible above ground. No valves shall be located inside the wet well.

All pump stations shall be equipped with an easily accessible pump out connection assembly, on the driveway side, for use with portable pumps to allow bypass operation of the pump station.

Where JEA has approved the station to be designed as "initial/ultimate", the pump's base elbow should be sized for the ultimate pumps. The pump manufacturer shall provide an adapter plate for the initial pumps. The minimum pump base shall be 4-inch x 4-inch.

Pump access covers shall be suitably sized to provide adequate clearances for installation and removal of the pumping units.

The access hatch shall be designed for a minimum width of 42-inches, or 6-inches beyond the manufacturer's minimum required width, whichever is greater.

The minimum hatch length should be:

- 48-inches for standard duplex stations;
- 96-inches for triplex stations or the sum of the pump width, centerline pump separation, and 12-inch, whichever is greater;
- If JEA has approved an "initial/ultimate" pump station design, the hatches shall be sized for the "ultimate" pump design.

5.0.7 Electrical Control Panel

The panel and all electrical components shall be in accordance with the latest version of the JEA Water and Wastewater Standards Manual, Section 433.

The enclosure shall be sized to enable all breakers and controls to be located not more than 5-feet above the walkway.

If the chosen pump has a motor greater than or equal to 20-Hp, a 480-volt service must be used. If a pump motor is less than 20-Hp, but the kilo-volt-amps (kVA) is greater than 150, a 480-volt service may be used. Kilo-volt-amps can be determined by the equation:

$$kVA = \frac{(1.73)(Total\ Load)(Voltage)}{1000}$$

If JEA has approved the station to be designed as an "initial/ultimate" station, the pump breakers should be sized for the initial pumps, but a note should be added to the drawings stating: "Pump breakers shall be spaced to accommodate future pump breakers."

The Main breaker size is determined by adding the pump breaker size, the full load amperage (FLA) of additional pump motors (beyond the one), and any auxiliary loads and rounding down to the nearest breaker size. If the total load for a 240-volt service is less than or equal to 200-Amps, 200-Amp emergency and main breakers should be used. If the total is greater than 200-Amps, the service size shall be the same as the main breaker size. Where JEA has approved an "initial/ultimate" station, the main breaker, as well as service size shall be designed for ultimate design conditions.

Starter type should be sized in accordance with JEA Water and Wastewater Standards Manual, Section 433.

If JEA has approved the station to be designed as an "initial/ultimate" station, the starters shall be sized for the ultimate pumps with a note added to the drawings stating: "Heater coil shall be sized to protect the initial pumps."

5.0.8 Emergency Operations

5.0.8.1 Class One Pump Stations

For Class One pump stations that receive flow from one or more pump stations through a forcemain (re-pump) or pump stations discharging through pipes 12-inches or larger, the design requires uninterrupted pumping capability to be provided, either by a generator or pony pump.

For all other Class One pump stations, to meet emergency operation requirements, either emergency storage of wastewater, or pumping of wastewater via generator power or auxiliary diesel pump will be required to ensure continued service to JEA's customers during extreme weather events resulting in power outages.

A. Emergency Storage

If utilizing emergency storage, the gravity system shall be designed such that a minimum three (3) hour hold time, based on peak hourly flow, is provided. The analysis, will provide calculations to show that the required storage can be achieved using the wetwell, gravity mains and manholes, without increasing the pipe size or the depth of the gravity system. Storage shall be calculated up to the lowest top elevation of the gravity system. Sufficient hold time will afford JEA time to rotate its portable equipment and maintain service to its customers. Pump stations shall be equipped with a manual transfer switch for use with a portable generator. Manual transfer switches shall be in accordance with JEA Water and Wastewater Standards. JEA reserves the right to require a generator or auxiliary diesel pump when reviewing the potential impact of a sanitary sewer overflow.

The analysis shall be signed and sealed by a registered Professional Engineer licensed to practice in the State of Florida and submitted during the plan review submittal.

B. Generators/Pony Pump

Pump stations to be dedicated to JEA that cannot meet the emergency storage requirement shall include a generator/ pony pump system for continued pumping operations during a power outage/failure. JEA prefers a pony pump system as means for lift station emergency operation. The emergency generator system and emergency pump engine shall be in accordance with JEA Water and Wastewater Standards Manual, Sections 472 and 470 respectively.

5.0.8.2 Class Two, Three and Four Pump Stations

Shall be emergency powered as specified in the JEA Water and Wastewater Standards Manual.

5.0.9 Water Service

The pump station site shall include a 1.5-inch Commercial Irrigation meter to be utilized for the hose station. Where allowed, the water from this irrigation meter may be utilized for irrigation use. Associated fees shall be paid by the Developer/Owner.

Water service piping for the pump station site shall be 1.5-inch diameter (minimum) and shall meet material and installation standards for water service construction as detailed in JEA Water and Wastewater Standards Manual.

For other water service information, see Water and Wastewater Standards, Section 433, paragraph XVI.3.

5.1 Private Pump Stations

All private pump stations discharging to the collection or treatment systems owned by JEA must be designed in accordance with FDEP Regulations and EPB Rule 3 criteria (in Duval County).

Pump stations shall be designed specifically to pump domestic sewage containing solids and fibrous materials.

Pump stations shall be designed and located on the site to minimize the effects resulting from odor, noise, and lighting.

Pump stations shall have a minimum of two pumps, with each pump being of the same capacity.

Pump stations should be designed to pump the design peak hourly flow with one pump out of service.

Pump stations must be designed to withstand floatation when empty.

Pump stations shall be equipped with an audible and visible high water level alarm. A 24-hour emergency contact number shall be posted at the station.

Pump stations shall have a locked fence or other appropriate features (such as locking hasps for wet well, control panel, and valve box) to discourage unauthorized entry.

Control panel shall be equipped with lightning arrestors, surge capacitors, and phase protection.

For pump stations that receive flow from one or more pump station through a forcemain or pump stations discharging through pipes 12-inches or larger, the design requires uninterrupted pumping capability to be provided, including an in-place emergency generator.

Where portable pumping and/or generating equipment or manual transfer is used, the design includes sufficient storage capacity with an alarm system to allow time for detection of pump station failure and transportation and connection of emergency equipment.

A shut-off and check valve shall be provided in the discharge main of each pump. The check valve shall be between the shut-off valve and the pump's discharge. The check valve shall not be placed in the vertical position. Valves shall be accessible either above ground or in a dry valve pit.

No valves shall be located inside the wet well.

A pump out at the station shall be required. A pump out is an appropriate coupling device and valving to the discharge pipe to allow for connection of portable pumps.

Private pump stations manifolding with force mains owned or to be owned by JEA shall require a JEA pump-out box consisting of the installation of a check valve, pump out tee, and shut-off valve in a valve pit located on the property adjacent to the right-of-way as per Detail No. S-46 of the JEA Water and Wastewater Standards Manual. This pump out shall be accessible to JEA at all times. Operation and Maintenance of this pump out shall be the private owner's responsibility.

The JEA pump-out box is not required if the private pump station is within 25-feet of the right of way. In the case where the JEA pump-out box is not required, a 4-inch minimum gate valve at the property line/right of way line shall be provided.

All pump out assemblies shall be accessible to JEA at all times.

5.2 Low-Pressure Systems (LPS)

The Environmental Protection Agency defines a Pressure Sewer as an alternative wastewater collection system in which household wastewater is pretreated by a septic tank or grinder and pumped through small plastic sewer pipes buried at shallow depths to either a conventional gravity sewer or a treatment system. For the purposes of this document, Pressure Sewer Systems will be referred to as Low-Pressure Sewer Systems, and shall be for residential customers only and shall be constructed in accordance with the JEA Water and Sewer Standards Manual.

Low-pressure sewer systems are not allowed for new developments. Exceptions may be approved on a case-by-case basis by JEA's Alternative Connection Committee (ACC).

It is the policy of JEA to construct gravity wastewater collection systems to serve customers within the JEA's service territory. Low-Pressure Sewer Systems shall only be allowed when the project meets all of the following criteria:

a. A gravity wastewater collection system, designed in accordance with JEA standards, will be placed at a depth greater than 12-feet with service laterals or at a depth greater than 15-feet without service laterals.
b. Less than 20 customers will be served by the low-pressure system.
c. The surrounding land is fully developed or cannot be developed due to environmental constraints and a gravity sewer system would not be economically feasible.
d. An on-site sewage treatment system can be constructed but would not be in the best interest of JEA.

A low-pressure pump station shall not be allowed to connect into a JEA force main per FDEP and EPB Rule No. 3. No exceptions will be allowed.

Upon approval of the LPS by the ACC committee, the following steps will need to take place prior to sewer service being established:

1. A signed and witnessed "JEA ALTERNATIVE SEWER SYSTEMS (NON-GRAVITY) CUSTOMER OWNED, OPERATED AND MAINTAINED" agreement will need to be submitted to the JEA Development Manager by the customer or their representative, for approval and signature.
2. The fully executed document will need to be recorded by the customer.
3. The customer will submit a copy of the recorded document to the JEA Development Manager prior to submitting an application to set up sewer service.