

## **Summary of Revisions for Update #1**

The purpose of this document is to provide a general summary of the revisions that were made to the Engineering Manual for Update #1. Not all revisions are explicitly noted in this document. Documents indicating “NO CHANGE” may have some minimal grammatical corrections or deletions but were not considered noteworthy for the purpose of this document.

### **Procedures**

Procedure 1: NO CHANGE

Procedure 2:

- Several clarifications made throughout document to better communicate the intent of each component of this process. No financial requirements were added nor any alterations to policies made.

Procedure 3: NO CHANGE

Procedure 4: NO CHANGE

Procedure 5: NO CHANGE

Procedure 6: NO CHANGE

Procedure 7:

- 2.1-2.3 – Removed unused definitions: System Extensions; Preliminary Submittal for Extension Projects; Formal Submittal for Extension Projects and renumbered subsequent paragraphs.
- 2.5 – Updated “General Description of Work” definition
- Part 3 – Revised workflow to issue check after payment of fees, rather than before

Procedure 8: NO CHANGE

Procedure 9: NO CHANGE

Procedure 10:

- Added Part 3: Dumpster Drains
- Added Part 4: Swimming Pools and Other Unpolluted Water Discharge

## Design Standards

Section 101: NO CHANGE

Section 556:

- 3.6.1.1 – Added that for residential subdivisions, the owner/developer shall coordinate the location of the water meter with the power company prior to installation.

Section 570:

- 3.4.1 – Added that all residential service laterals shall be located in the center of the property line nearest to the collection system.
- 3.4.3 – Updated requirement for installation of cleanouts.

Section 575:

This design standard was significantly re-worked for clarification and to unify the information contained within with the information contained in the Design Standard Drawings. The following provides highlights of the changes that were made. Both the Dec. 18, 2014 version and the Sep. 1, 2016 version are available on the [ecua.fl.gov](http://ecua.fl.gov) website for side by side comparison.

- PART 1 – Created new “Overall Design” paragraph and moved “Future Need” to Part 1.
  - Rewrote “Calculations” paragraph and removed the Lift Station Design Worksheet.
- PART 2 –
  - Deleted “Flow Requirements” paragraph
  - “General Location” – Added requirements for minimum elevation above 100 year flood level and the general avoidance of exposure of site to flooding and stormwater runoff.
  - Created new paragraph to address the minimum pumping rate.
  - Revised “Wetwell Sizing” and moved to Appendix
  - Deleted “Elevations” paragraph and subparagraphs
  - Created new “Anti-flotation” paragraph.
  - Created new “Top Slab” paragraph.
  - Created new “Pump Mounting Plate” paragraph.
  - Created new “Design Submittal” paragraph.
  - Created new “Antennae Height” paragraph.
  - Added the following sentence to the end of the “Bypass Pumping” paragraph:  
“Additionally, for stations with long driveways, an underground pump-out connection shall be designed and located in the connecting road ROW per ECUA’s Lift Station Design Standard Drawings.”
- Appendix – Added “STANDARD MOTOR SIZES, FULL LOAD AMPS, AND STARTER TYPE SELECTION” table. Also added “Wetwell Sizing and Liquid Level Elevation Control Guidelines” section to the appendix.

Section 576:

- 3.6.1 – Revised low pressure sewer system design requirements based on the number of connections per pipe sizes used. Added that this table is provided as a reference only.

- 3.6.2 – Created new “Low Pressure Service Laterals” paragraph and renumbered “Flushing Stations” to 3.6.3
- 3.6.2 – (Renumbered to 3.6.3) Updated to address design requirements of flushing stations.

DS-0.1 through DS-34

- These drawings are the new Lift Station Design Standard Drawings. See DS-0.1 and 0.2 for instructions on how to use these drawings to develop a set of lift station construction plans.

## Technical Specifications

Section 1000: NO CHANGE

Section 1900:

- CREATED NEW: “Building Demolition” Spec.

Section 2000: NO CHANGE

Section 2100:

- 1.6.2.1 – Specified requirement to call Sunshine811 Call Center to locate existing utilities prior to excavation operations.
- 3.10.1 - 3.10.5 – Deleted and referenced Specification Section 2221.

Section 2221:

- 3.1.2.1 - Specified requirement to call Sunshine811 Call Center to locate existing utilities prior to excavation operations.
- 3.2.2.3.1 – added new paragraph to address shape of trench bottoms
- 3.6.3.3 – Added new paragraph to address trench excavations near wall and column footings

Section 2300:

- 3.3.4 – Added requirement for pipe installations under waterways to be a minimum of 15 feet deep beneath the deepest part of the channel.

Section 2310:

- Added Spacers requirements
- Added End Seals requirements
- Added Spacer Spacing requirements
- Added End Seal grout requirements
- Added Rubber end seal requirements

Section 2320:

- 3.3.7.2 – Removed following sentence from paragraph: “Maximum temperature increase rate between ambient to 140°F shall be 1°F per minute.”

- 3.3.8 – Removed following sentence from paragraph: “For pipe liners less than 21 mm thick, maximum cool down rate shall be 0.5°F per minute. For pipe liners greater than 21 mm thick, maximum cool down rate shall be 0.3°F per minute.” and replaced with the following: “Maintain the cool down rate as recommended by the liner system Manufacturer.”

Section 2330: NO CHANGE

Section 2340: NO CHANGE

Section 2350: NO CHANGE

Section 2556:

- 2.3.3 – Removed requirement for fittings to be of the same manufacturer as the pipe being supplied.
- 2.3.3.1.2.3 – Revised to reference ECUA Pipe Material Summary Chart
- 2.4.1.6 – Removed One Bolt and JCM Industries from Approved Manufacturers table. Added SIP Inc. to Approved Manufacturers table.
- 2.4.2.1 – (Renumbered to 2.4.3.1) Updated provision related to use of valves with bevel gearing. Added Mueller to Approved Manufacturers table
- Resilient Seated Gate Valves Table – Updated size range for American Flow Control Valves.
- 2.4.2.2 – (Renumbered to 2.4.3.2) Updated provision related to use of valves with bevel gearing.
- 2.4.2.2.1 – (Renumbered to 2.4.3.2.1) Added 304 stainless steel as an acceptable material for valve stems.
- 2.4.5 – (Renumbered to 2.4.3.4) Deleted JCM as an approved manufacturer. Also removed “Contact” column and replaced with “Size Range” column.
- 2.5.1.5 – Changed AFC model to B84B
- 2.6.1 – Removed Endot Industries (Endopoly) and Chevron-Phillips Performance Pipe (Driscoplex 5100 Series Ultra-Line) from the Approved Manufacturers table.
- 2.7.1.8 – Updated Ford model to C38-XX
- 2.9 – Divided paragraph into two separate paragraphs; “2.9 – Yoke Box Assemblies” (to address 5/8” meters) and “2.10 – Meter Box Assemblies” (to address 1” and 1.5” meters).
- 3.3.8 – Added that for residential subdivisions, the owner/developer shall coordinate the location of the water meter with the power company prior to installation.

Section 2570:

- 2.4.2.2 – Clarified ConBlock MIC as the required anti-microbial concrete additive.
- 2.4.2.9 –Specified/Clarified Wrapid Seal thermo-adhesive wrap to be installed on all new manholes.
- 2.4.3.1.4 – Elaborated on requirement for inflow protecting manhole inserts.
- 2.4.3.2 – Added specification for I&I barrier to be installed on all new manholes.
- 2.5.2 – Referenced new specification Section 2573 – Manhole Rehabilitation.
- 2.7 – Added new paragraph about Flexible Transition Couplings
- 3.3.3.3.3 – Removed and replaced with new section 3.3.3.4 “Joint Wrapping”
- 3.4 – Added reference to the ECUA Pipe Material Summary Chart, added paragraph on “Cleanouts” and renumbered existing paragraphs in section to accommodate additions.

- 3.5.3.3 – Added paragraph stating “New connection shall be made in such a manner to facilitate access with sewer main CCTV systems.”
- 4.1 – Made several modifications relating to sewer main and manhole acceptance requirements including: Air Test (Pipelines); Exfiltration Test (pipelines); Infiltration Test (Pipelines); Vacuum Testing (Manholes); and Deflection (Belly) Testing.

Section 2573:

- CREATED NEW “Manhole Coatings/Rehabilitation” Spec.

Section 2575:

This specification was significantly re-worked for clarification and to unify the information contained within with the information contained in the Specifications, Design Standards, and Design Standard Drawings. Both the Dec. 18, 2014 version and the Sep. 1, 2016 version are available on the [ecua.fl.gov](http://ecua.fl.gov) website for side by side comparison.

Section 2576:

- 2.4.2.1.3.1 – Elaborated on shop surface preparation requirements and added certification requirement for shop preparation.
- 2.4.2.4.5.1 – Added requirement for manufacturer’s name to be on all fittings.
- 2.4.3 – Material Designation changed to include 4710 in addition to 3408.
- 2.5.1 – Added requirement for manufacturer’s name to be on all fittings and pipe.
- 2.5.4 – Added requirement for manufacturer’s name to be on all restraints. Added Ford, Tyler Union, SIP Inc., and Sigma to Approved Manufacturers table.
- 2.5.9.1 – Updated Approved Manufacturers table and added Mueller to table.
- 2.5.9.3.2.9 – Changed standard to AWWA/ANSI to C115 and added language about use of threaded connections
- 2.5.9.3.2.10 – Changed model # of Stainless Steel valve to “D-025-ST” and changed size to 2”
- 2.5.10 – Added “Approved Manufacturers” table.
- 2.5.11 – Removed JCM from approved manufacturers table. Also removed “Contact” column and replaced with “Size Range” column.
- 2.5.12.2 – Clarified that all valve boxes shall be slip type and that the manufacturer’s name shall be on it.
- 4.2.1 – Clarified requirements for pigging larger pipes.

Section 2577:

- This specification was significantly re-worked for clarification and to unify the information contained within with the information contained in the Specifications, Design Standards, and Design Standard Drawings. Both the Dec. 18, 2014 version and the Sep. 1, 2016 version are available on the [ecua.fl.gov](http://ecua.fl.gov) website for side by side comparison.

Section 2578:

- CREATED NEW: “Wet Well Coatings and Rehabilitation” Spec.

Section 2651: NO CHANGE

Section 2830: NO CHANGE

Section 3200:

- CREATED NEW “Cast-in-Place Concrete” Specification (created by extracting language from Section 3300)

Section 3300:

- Extracted language pertaining to cast-in-place concrete to create specification section 3300.

Section 4000

- Entire specification completely re-written

Section 16010:

- 1.4 – Added further expectations relating to workmanship.
- 1.5 – Struck last two sentences of paragraph and replaced with a directive to follow the manufacturer’s written instructions for shipment and storage
- 1.6 – Added requirement for all utility company fees to be paid by the Contractor
- 1.7.2 – Warranty increased to 2 years.
- 1.10 – Added sentence directing use of the more stringent requirement when conflicts exist between the plans and specifications.
- 1.12.1.1.1 – Added “installed per ECUA standards” to certification
- 1.12.2 – Added note that materials not submitted for approval may or may not be accepted after installation and if not accepted shall be replaced with material acceptable to ECUA at no additional cost.
- 1.14.1 – Added requirement for As-built drawings to be maintained and available on site throughout construction.
- 1.16.1 – Updated AutoCAD version to 2013.
- 1.16.3 – Changed to require the Engineer to provide electronic drawings to the contractor. Also added requirement to coordinate with ECUA staff before and during conduit installation.

Section 16050:

- 2.1.1 – Updated to reference section 3200
- 2.1.2 – Updated to reference section 3200
- 3.1.4 – Added directive to follow manufacturer’s installation instructions

Section 16055: NO CHANGE

Section 16060:

- 2.1.3.2 – Changed material to PVC conduit
- 2.3.1 – Updated requirement for ground rods to achieve a minimum for 5 ohms.
- 3.2.1 – Added requirement for ECUA staff to inspect all welded connections before they are covered.
- 3.2.2 – Updated to 5 ohms

- 3.5.2 – Updated to require top of rod to be 1 inch below final grade

Section 16073:

- 1.3.2 – Added “All hanger and support designs subject to ECUA and engineer approval.”

Section 16075: NO CHANGE

Section 16120:

- 1.2 – Added “There shall be no wire nuts in panel boards.”
- 3.2.5 – Updated to “Type TSP (in raceway-Type TC) shield Flexible Tray Cable”

Section 16130:

- 3.1.1.1 – Removed “Exposed Conduit” paragraph and sub paragraphs and replaced with “Above Grade Conduit” paragraph.
- 3.1.1.2.1 – Removed schedule 80 option from paragraph
- 3.1.1.2.2 – Paragraph reworded to state “All underground conduit shall be RNC, Type EPC-80-PVC direct buried...”
- 3.1.1.4 – Removed “Type 4X stainless steel (316L)” and replaced with “Boxes shall be Appleton FS Series or equal”
- 3.1.1.6 – Added new paragraph for “Conduit Unilet Bodies”
- 3.2.2.5 – Added new general installation instruction paragraph.

Section 16211:

- 2.3 – Added “For MCC or panel board”
- 2.3.1 – Updated list.

Section 16410:

- 2.2.1.2 – Removed “Eaton Corporation; Cutler-Hammer Products” from Available Manufacturers

Section 16521:

- 1.7.1 – Removed “or unauthorized repairs or alterations from special warranty coverage” from paragraph.
- 2.2.5 – Replaced “Stainless steel (316L)” with “Able to withstand corrosive environment exposure. Color shall match luminaire color.”
- 2.2.7 – Removed “polyester power-coated” and “utilizing a 5-stage pre-treatment and painting process” requirements from paragraph.

Section 16900:

This specification was significantly re-worked for clarification and to unify the information contained within with the information contained in the Specifications, Design Standards, and Design Standard Drawings. Both the Dec. 18, 2014 version and the Sep. 1, 2016 version are available on the [ecua.fl.gov](http://ecua.fl.gov) website for side by side comparison.

Section 16910:

- Part 1 – Completely re-written.

Section 16950: NO CHANGE

## **Construction Details**

D-1: NO CHANGE

D-2: NO CHANGE

D-3: D-67 “Lateral Connection to CIPP-Lined Pipe” renumbered. No content change.

D-10:

- Added I&I barrier to the manhole chimney
- Added notes stating requirements of joint sealing and sealing of the riser section.
- Added Typical Invert Channels from D-11.

D-11:

- Removed Vulcan models from note 1.
- Removed Typical Invert Channels and added to D-10.
- Updated dimensions of frame and cover.

D-12:

- Added I&I barrier to the manhole top.
- Added note stating requirements of joint sealing and sealing of the riser section.
- Copied general notes from D-10 and added.

D-13: NO CHANGE

D-14: CREATED NEW “Sanitary Sewer Grade Tolerance/Acceptable Sag Limits.

D-19: NO CHANGE

D-20:

- Changed box material call-out to plastic.
- Added call-out for Ford model B41-666W for the Curb Stop.

D-21: NO CHANGE

D-22:

- Added call-out for Ford model B11-444W for the Curb Stop.
- Added call-out for Ford model F1600-X for the Corporation Stop.

D-30: NO CHANGE

D-31:

- ARI model call-out updated to D-025P.

D-32:

- ARI model call-out updated to D-025P.

D-40:

- Changed material call-outs used at the stub-out termination to Hydrosert blind end stub or approved equal.

D-41: NO CHANGE

D-42:

- Updated table to reflect the correct specification for each pipe size listed.

D-43: NO CHANGE

D-44: NO CHANGE

D-45: NO CHANGE

D-46: NO CHANGE

D-47: NO CHANGE

D-48: CREATED NEW "Multiple Water Meter Service" detail.

D-50: NO CHANGE

D-51: NO CHANGE

D-52: NO CHANGE

D-59: NO CHANGE

D-60: NO CHANGE

D-61: NO CHANGE

D-62: NO CHANGE

D-63: NO CHANGE

D-64: NO CHANGE

D-65:

- Notes relating to end seals were changed to reference ECUA specifications.
- Spacer spacing note was changed to reference ECUA specifications
- Required casing pipe thickness was changed to 0.188 for 4" and 6" carrier pipes

D-66: NO CHANGE

D-67:

- Renumbered to D-3
- Replaced with NEW “Pig/Swab Launch Pit” detail.

D-68: Created NEW “Exposed Piping and Equipment Master Color Chart”

D-70:

- Updated personnel table and contact info.

D-100 and D-100+

- All lift station related drawings were completely reevaluated and a new system of developing construction plans for lift stations was created.
- The drawings listed here were not intend for construction purposes “as-is” and therefore have been moved to their rightful place in Division 2 – Design Standards.
- See the new drawings in Division 2 for information about the new drawings and instructions on how to use the new drawings to create a lift station design.

## Forms

Minor change were made to the following forms:

- Certification of Completion Form- Sewer
- Certification of Completion Form- Water
- Change Order Form
- Engineering Manual Reference Note
- Pipe Material Summary Chart
- ECUA Version of FDOT Utility Permit Special Instructions
- Lift Station Design Worksheet (DELETED)
- Lift Station Manufacturers and Sales Contacts
- Lift Station Pump Overview Chart
- Lift Station Pump Selection Worksheet
- Capacity Reservation Form
- Request for Single Service Connection
- System Extensions – Preliminary Submittal Form (RENAMED)