

Development Process and Procedures Manual



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Preface

The purpose of this manual is to provide guidelines for the planning, design, and installation of water and sewer systems in an effort to meet the growing needs of the development community in the CFPUA service area. These guidelines were written to accommodate the individuality of each project, while maintaining high standards and consistent procedures. These guidelines are to be used in conjunction with CFPUA specifications, design details, ordinances, and the CFPUA Design Guidance Manual. These Technical Standards can be found at <https://www.cfpua.org/763/CFPUA-Technical-Standards>. Each project must be handled in a professional manner such that system design and construction standards are met. Adherence to these standards is imperative to ensure that the infrastructure installed will provide years of low-cost maintenance and un-interrupted service to our customers.

These procedures shall be followed by CFPUA staff, engineers, and developers who plan, design and construct water and/or sewer services that will be conveyed to CFPUA upon completion of the associated work within a development. Depending upon the size and scope of the proposed project, some procedures may be modified by CFPUA. Administrative fees will be charged in accordance with the fee rates and charges outlined in the CFPUA Rates & Fees Schedule current at the time of permitting.

The developer's Professional Engineers of Record is responsible for complying with CFPUA Standards, inspections, and certifications.



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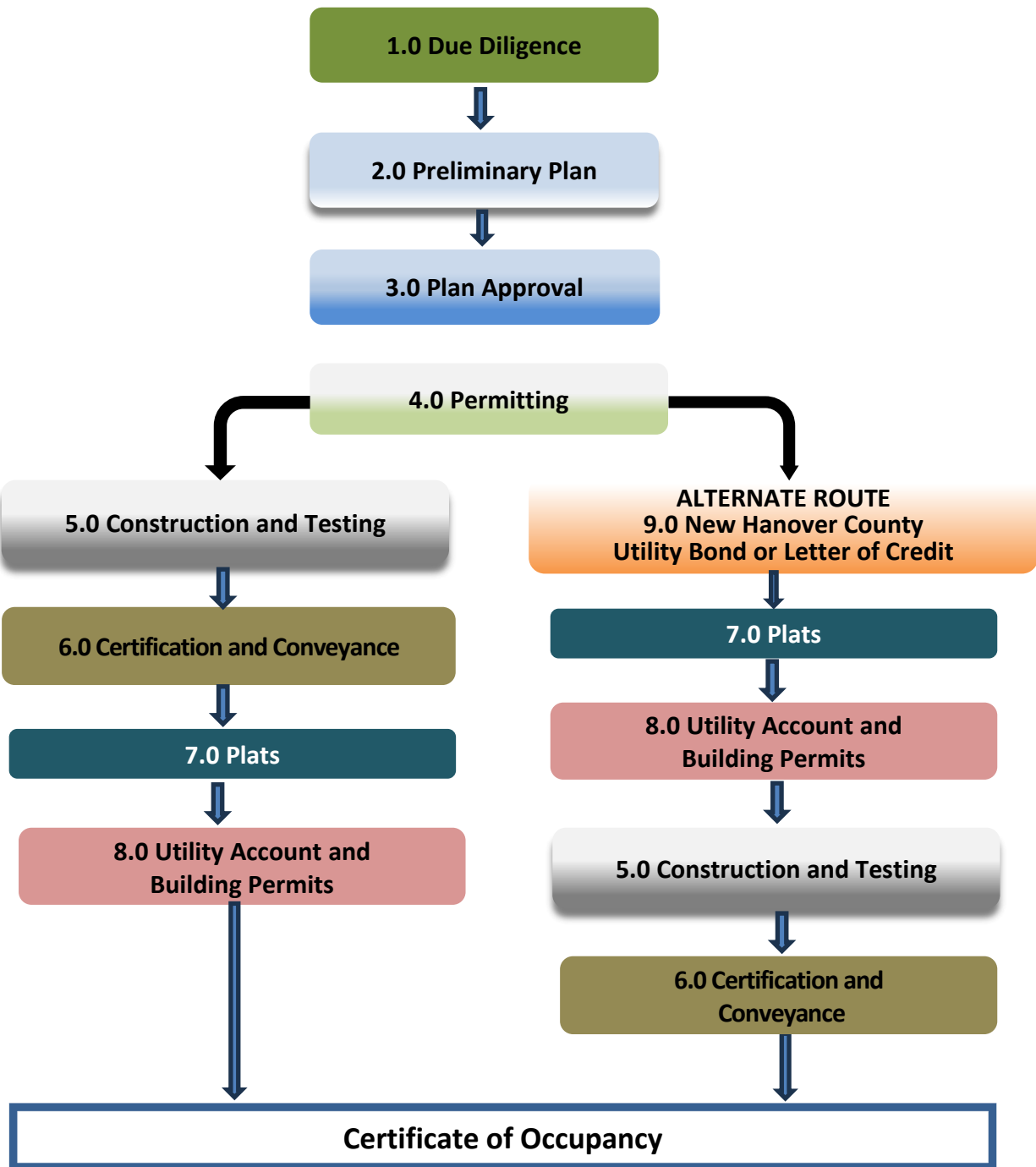


Figure 1: Development Flow Chart



1.0: DUE DILIGENCE

Figure 1 shows the overall Development Flow Chart. The Due Diligence Phase is the first step in the process and is described below.

Realtors, investors, developers, and engineers are encouraged to contact CFPUA through master.planning@cfpua.org during the due diligence phase of any land purchase for residential or commercial development. Detailed information on CFPUA's Master Planning for water and sewer service is typically provided on a scaled map with master planned connection points to the existing water and sewer system. This process provides potential buyers with the most current and accurate information available.

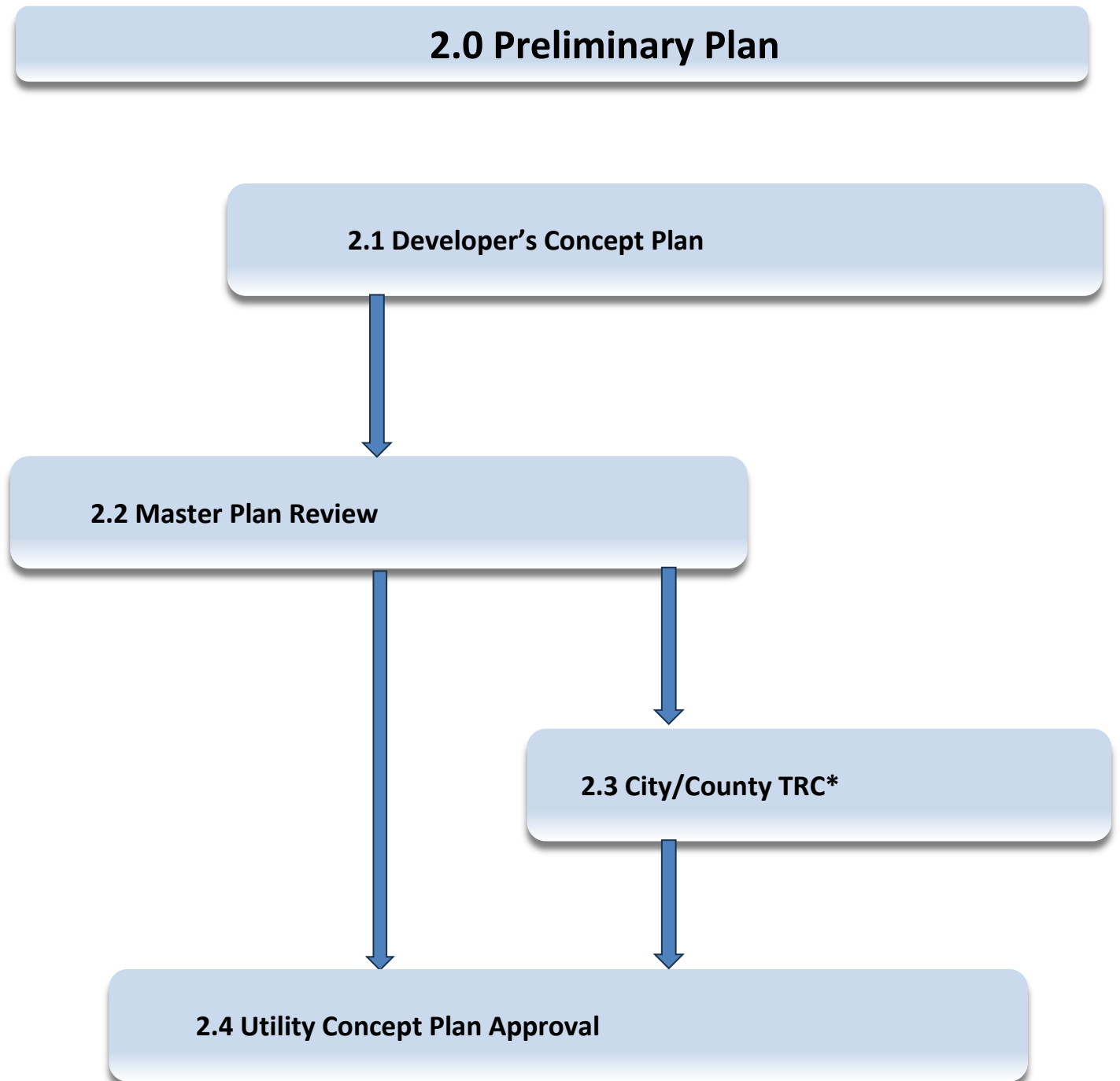
Obtaining this information in advance of project commitment is highly beneficial since the cost of providing water and sewer service to any given tract of land depends upon distance from existing mains, topography, and capacity available in the system. Land which appears to be easy to serve with a sewer extension may actually require installation or upgrade of a sewer pump station. It is best for all involved that these factors be known as far in advance as possible. Capacity cost recovery fees may apply and have a significant effect on the cost of development.

Master Planning information from CFPUA is no substitute for land surveys, engineered design plans, and the permitting process. This process informs real estate professionals, investors, developers, and engineers so that water and sewer infrastructure requirements for any given tract are better understood prior to purchase.

A decision must be made at this time whether the water and/or sewer utilities will be a public (CFPUA) or a private system. Guidelines for this decision are available in the CFPUA Design Guidance Manual.

The completion of a Request for Information (RFI) Form for existing building lots referenced in Section 2.5.2 is recommended, in lieu of a master planning inquiry.

Inquiries to master.planning@cfpua.org as described in Section 2.2 Master Plan Review have a typical turnaround time up to ten (5) business days depending upon project complexity and staff workload.



**Please Note: Technical Review Committee (TRC) is independent of Utility Plan Review*

Figure 2: Preliminary Plan Phase



2.0: PRELIMINARY PLAN

The required steps during the Preliminary Plan phase are shown in Figure 2 and described below.

2.1 - Developer Concept Plan

2.1.1 Concept Plan

Provide a concept plan to CFPUA, City of Wilmington (City) and/or New Hanover County (County). Include:

- Vicinity map
- Parcel Identification Numbers
- Addresses
- Buildings
- Number of residential units and/or employees with estimated 2T sewer flows
- Must be emailed as a PDF file to [Engineering Plan Review Portal](mailto:Engineering_Plan_Review_Portal@cfpua.org) at <https://www.cfpua.org/FormCenter/Engineering-3/Engineering-Plan-Review-103>
- Identify public and private utilities.

2.2 - Master Plan Review

2.2.1 Master Planning and Capacity Management

For detailed information on CFPUA's Master Planning to accommodate a parcel or a group of parcels email master.planning@cfpua.org or submit your request online at <https://www.cfpua.org/FormCenter/Engineering-3/Master-Planning-43>. Include:

- Your Name
- Your Company Name
- Phone Number
- Email Address
- A screenshot or .pdf map that identifies the subject parcel(s)
- The Parcel ID Number(s), i.e. R02200-001-001-000
- Type of Development
- Anticipated Sewer Flows (for available capacity)

Typical turnaround time is up to five (5) business days, depending on project complexity and staff workload. If you are presently working with a CFPUA Development Services Project Manager, copy them on your email to master.planning@cfpua.org.

Request can also be made online at: <https://www.cfpua.org/FormCenter/Engineering-3/Master-Planning-43>.



2.3 - City/County TRC (Technical Review Committee)

2.3.1 Technical Review Committee (TRC) – Independent of CFPUA Utility Plan Review

The City and County Planning Departments are available to review preliminary plans for large and small projects. A formal process known as the “TRC” is utilized by each planning department for the purpose of providing written review comments from multiple agencies. For more information, contact the City Planning, Development & Transportation Department at 910-254-0900 and County Planning Department at 910-798-7165.

2.4 - Utility Concept Plan Approval

2.4.1 Utility Plan Concept

Comments will be emailed to the applicant, including any concerns and conditions of the approval. Allow up to ten (10) business days for a single lot residential parcel. More time may be necessary for commercial, large (greater than one acre), and multiple parcel developments. TRC is not a pre-requisite for the Utility Concept Plan.

2.5 - Capacity and Available Letters

(Upon request at any point during the Preliminary Planning Stage)

CFPUA owns, operates, and maintains over a thousand miles of water and sewer pipelines throughout the City of Wilmington and New Hanover County. However, there are some areas where service is not yet available. Potential purchasers should request information on the availability of water and/or wastewater while performing due diligence, (Section 1.0) prior to purchasing a parcel or tract of land for development.

2.5.1 Water and Sewer Availability Request

Some sources of finance for development require that a Water and Sewer Availability Letter be provided prior to the approval of a loan. This letter identifies whether there is water and/or sewer available to the project site. Per the CFPUA Ordinances, utilities are considered available if a lot that abuts a right-of-way where CFPUA facilities can be found or have legal access to said right-of-way via a private utility easement, if within five hundred (500) feet of CFPUA facilities that can be accessed, as defined by CFPUA’s Technical Standards and Master Planning.

This letter only advises you that water and/or sewer mains are available to service this project. This is not an approval to connect to these facilities or a certification that there is adequate capacity in the



system to serve the proposed development. Capacity is issued on a first-come, first-service basis. Therefore, capacity cannot be guaranteed until a complete set of plans has been received and approved by CFPUA and a permit is approved by the State.

2.5.2 Water and Sewer Availability Letter

Those requesting water and sewer availability for individual building lots must submit a CFPUA Water and Sewer Request for Information (RFI) form. Please send your letter request to residential.requests@cfpua.org or CFPUA Engineering Department, 235 Government Center Drive, Wilmington, NC 28403. There are no fees for this service.

2.5.3 Water and Sewer Availability Request Response

CFPUA will issue a Water and Sewer Availability Letter on CFPUA letterhead indicating water and/or sewer availability within five (5) business days of receipt of the completed RFI form.

2.5.4 Capacity Reservation

A standard sewer allocation is 20,160 gallons per day for a residential subdivision. This equates to 90 three-bedroom single family homes. When building permits have been obtained for 50% of the homes (45 three-bedroom single family homes) then the next allocation may be obtained. Large subdivisions are typically phased to receive the allocations necessary for completion.

CFPUA may, through the provisions of a Capacity Reservation Agreement, accept payment for System Development Charges, to reserve sewer capacity for large residential subdivisions located in eligible sewer basins for an amount that is more than the standard residential sewer allocation. The payment is based on the System Development Charges that apply to each of the homes in the proposed subdivision. See Ordinance – Sec. 4-122.

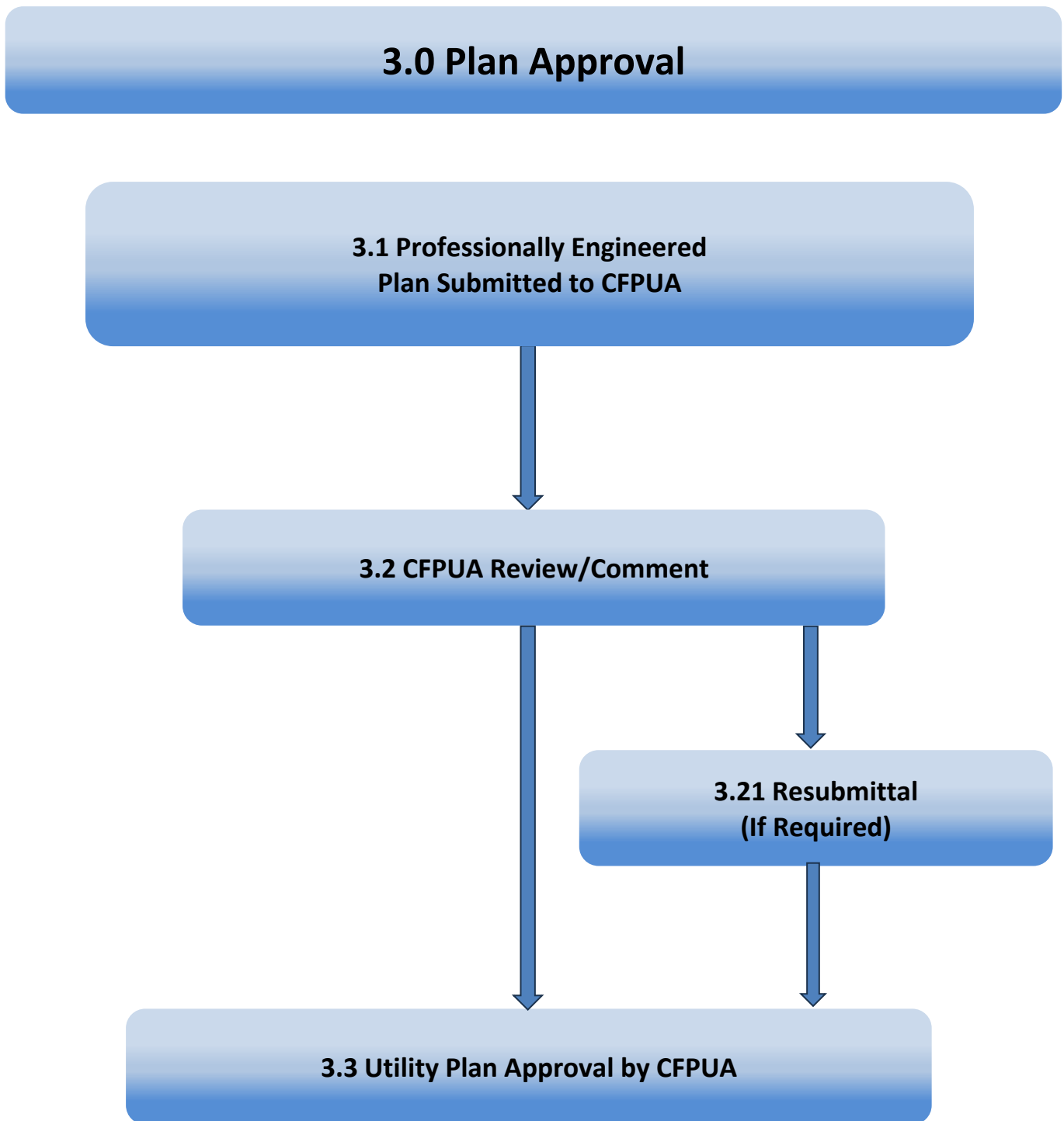


Figure 3: Plan Approval Phase



3.0: PLAN APPROVAL

The required steps during the Plan Approval Phases are shown on Figure 3 and described below.

3.1 - Professionally Engineered Plans Submitted to CFPUA

3.1.1 CFPUA Specifications

All projects within the jurisdiction of CFPUA shall be designed in accordance with CFPUA Specifications, 01 78 39—Design Drawing Submittals, and the Design Guidance Manual.

3.1.2 Design Plan Conditions

The requirements of Section 01 78 39 apply to design plans for sewer main extension plans, watermain extension plans, and utility plans to serve commercial, industrial, or multifamily residences. This does not include single family duplex/residential structure on a single lot of record.

3.1.3 Approval of Sealed Plans

Design plans sealed by a North Carolina Licensed Professional Engineer are required to be submitted, reviewed, and approved by CFPUA when compliant. The site plan drawings shall be drawn on a standard sheet size of twenty-four (24) by thirty-six (36) inches. Please see the Design Checklist in the CFPUA Design Guidance Manual. A checklist for plans shall be submitted when plans are submitted through the Engineering Plan Review Portal for review. Incomplete submission will be returned without review.

3.1.4 Additional Information

When plans require approval from local, state, and federal permitting agencies, additional information may be required by these entities.

3.1.5 Design Drawing Content Checklist

The Design Drawing Content Checklist generally conforms with CFPUA Specifications Section 01 78 39 and the CFPUA Design Guidance Manual. The design engineer shall be familiar with this checklist and review the plans for conformance with Section 01 78 39 before submitting plans to CFPUA for review and approval.



3.2 - CFPUA Review

3.2.1 Compliance

Design plans submitted to the CFPUA Engineering Department will be reviewed for compliance with all CFPUA Technical Standards.

3.2.2 Timetable

The plan review will be done in order that plans are received. The review time of the plans is generally, up to twenty (20) business days, but will depend on the complexity of the project, the size of the project, quality of the plans, etc.

3.2.3 Comments and Corrections

The CFPUA Engineering Department will mark comments and corrections on the plans. Separate written comments (in addition to the comments made on the plans) may be provided. Plans will be returned electronically to the engineer of record, stamped, and marked as one of the following:

1. Approved
2. Approved as noted.
3. Revise and resubmit.

CFPUA will retain an electronic copy of the stamped and marked plans.

3.2.4 Meeting All Requirements

Plans that are marked as “Revise and Resubmit” must be corrected to meet all requirements and resubmitted for review.

3.3 - Utility Plan Approval by CFPUA

3.3.1 Approved Plans

Plans that are marked as “Approved” or “Approved as Noted” can proceed to Section 4.0—Permitting. All corrections must be made to the plans prior to pre-con request. Final design plans shall be submitted with the permit application(s).

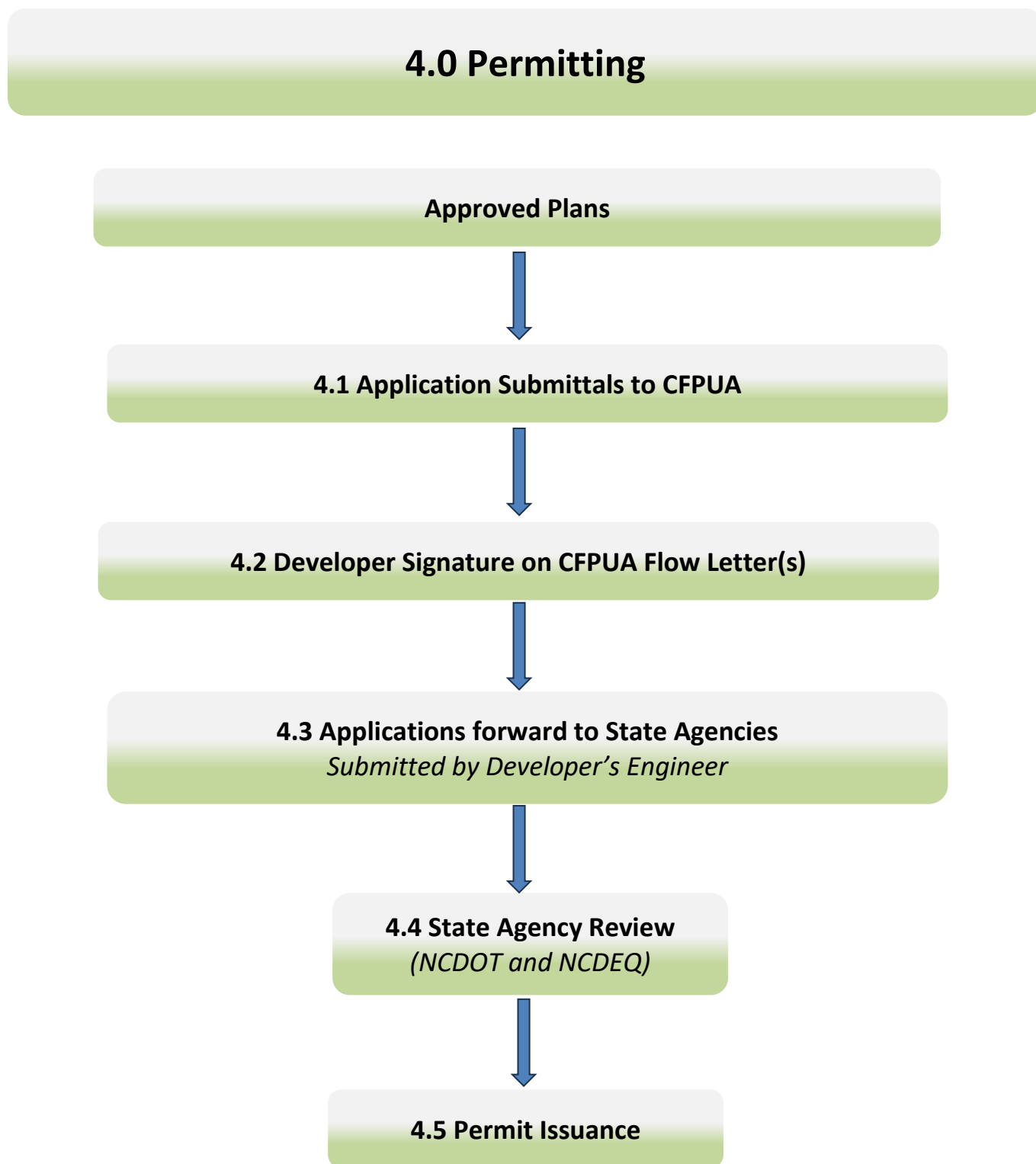


Figure 4: Permitting Phase



4.0: PERMITTING

The required steps during the Permitting Phase are shown in Figure 4 and described below.

4.1 - Application Submittal to CFPUA

4.1.1 Plan and Permit Approvals

Prior to commencing construction, all plan approvals and permits for water and/or sewer infrastructure from agency having jurisdiction shall be obtained:

1. Developers must obtain all State and Local permits, as applicable (i.e. Public Water Supply Authorization to Construct, NCDEQ Wastewater Collection System Extension Permit, etc.).
2. NCDOT Encroachment Permit and/or City Street Cut Permit will be required from any contractor or developer wishing to excavate or install utilities in public rights-of-ways.

4.2 - Developer Signature on CFPUA Flow Letters

4.2.1 Flow Letters

CFPUA flow letters for water and/or sewer infrastructure must be signed by the owner/developer and returned to CFPUA prior to permit applications being signed.

4.3 - Applications forwarded to State Agencies

(Submitted by Developer's Engineer)

4.3.1 State Permit Submittals

CFPUA will sign the NC Division of Water Resources (DWR), NC Public Water Supply Section (PWSS), and NC Department of Transportation (NCDOT) applications as the “permittee” and/or “owner” when public water and/or sewer mains are being extended. CFPUA also is required to sign as the “water supplier” when private water mains are extended. Applications will be signed when the required plans, details, specifications, flow letters, and have been provided and approved and all CFPUA review fees have been paid. **The developer's engineer is required to submit the applications and application fees directly to the state agency.**



4.4 - State Agency Review (NCDOT and NCDEQ) *(Submitted by Developer's Engineer)*

4.4.1 State Review

The state agencies review the applications for compliance with their rules. Although CFPUA makes a good faith attempt to confirm that requirements are met prior to submittal, the state agencies often have additional comments and concerns that must be addressed by the developer's engineer. The developer's engineer may need additional information from the CFPUA Project Manager to respond to the state agency comments. **The developer's engineer shall copy the CFPUA Project Manager on all responses to the state agency review comments.**

4.5 - Permit Issuance

4.5.1 Permit Issuance

The public State sewer permit issued by DWR, public State water permit issued by PWSS, and public State water authorization to construct will be in the name of CFPUA. The NCDOT encroachments will be in the name of all parties involved in the installation of CFPUA utilities. State agencies typically provide a copy of the public permits to CFPUA and the developer's engineer. The state permits are required prior to requesting a pre-construction meeting.



5.0 Construction and Testing

5.1 Construction Document Submittal
(Plan, Specifications, Permits)



5.2 Pre-Construction Conference



5.3 Construction Period



5.4 Inspections



5.5 Testing and Gravity Sewer Video



5.6 Draft As-Built Drawings



5.7 Final Construction Completion

Figure 5: Construction and Testing Phase



5.0: CONSTRUCTION AND TESTING

The required steps during the Construction and Testing Phase are shown in Figure 5 and described below.

5.1 - Pre-Construction Submittal Requirements

(Plan, Specifications, Permits)

5.1.1. Construction Drawing & CFPUA Specifications Submittal

Mainline extension projects will require three (3) hardcopy sets of the final design plans and should be submitted by the project's engineer. Commercial Service taps will require a pdf submittal of the final design plans. All submittals should be submitted to the project manager.

5.1.2 Submittals (refer to Submittal Specifications)

Submittals for materials should be made in accordance with CFPUA Specification Section 01 33 00. Material shop drawing submittals are required for all physical assets to ensure they comply with CFPUA technical specifications and details. These submittals are project-specific and must include or highlight only the specific materials to be used in the project. The submittal approval process is generally as follows:

1. Please refer to CFPUA's Material's Specification Manual which can be found at: <https://www.cfpua.org/764/Material-Specification-Manual>.
2. Material vendor furnishes submittals to the contractor based on the project requirements.
3. Contractor reviews the submittals for compliance with the approved construction drawings, CFPUA Technical Standards, and forwards to the developer's engineer-of-record when complete.
4. The Developer's engineer-of-record verifies compliance, seals, and signs the submittal, and forwards the package to the CFPUA Construction Manager. If it is determined that the material shop drawing submittal is not in compliance, the engineer shall return it to the contractor for correction and resubmission as noted above.
5. CFPUA's Construction Manager reviews the submittal from the developer's engineer-of-record, verifies compliance and notifies the engineer that the materials are approved for construction. If it is determined that the material shop drawing submittal is not in compliance, the submittal will be returned to the engineer for correction and resubmission as noted above.



5.1.3 Permit Submission Requirements

1. State agency permits.
 - a) NCDOT Encroachment Permit
 - b) NC DWR Sewer Extension Permit
 - c) NC PWSS Water Extension Plan Approval and Authorization to Construction
2. Local Permits
 - a) City Right of Way Permit
3. Easements
 - a) Public Utility Easements for public utility installation offsite of the development property.

5.2 - Pre-Construction Conference

5.2.1 Pre-Construction Conference

A pre-construction conference (pre-con) shall be required for every development project that involves the construction of water and/or sewer facilities. No construction will begin until CFPUA gives authorization to proceed. The pre-con must be scheduled through the CFPUA Construction Manager with at least **two (2) business days' notice and after receipt of all applicable permits, approval of the final construction drawings and material shop drawings, verification of contractor licensing and payment of all outstanding fees.**

The purpose of the pre-con is as follows:

1. Discuss the approved drawings.
2. Discuss the general construction sequence and schedule.
3. Review general construction inspection procedures and requirements.
4. Discuss lines of communication.
5. Discuss typical project pitfalls and time savers.
6. Discuss project challenges. The contractor is encouraged to review the project ahead of the pre-con, ask for clarifications, and introduce any particular challenges that he/she anticipates in the construction of the project.
7. Other topics per the pre-con checklist included in the Supplemental Documents Section of this guidance manual.

5.2.2 Pre-Con Attendance

CFPUA's Construction Manager will specify the time and place of the pre-con, which should include the following project stakeholders:

1. Licensed Utility Contractor and sub-contractor(s), if applicable, are required to attend.
2. The Engineer of Record is encouraged to attend.
3. The Project Owner is encouraged to attend.



5.2.3 Plans

Three (3) copies of the plans and specifications per Section 5.1.1, shall be required at least two (2) business days prior to the pre-con.

5.2.4 Pre-Con Completion

At the end of the pre-con, the developer will receive a copy of the sign-in sheet, signed pre-construction checklist, and stamped approved for construction plans.

5.2.5 Construction Water Needed from a CFPUA Approved Fire Hydrant – Special Water Use

Construction water from a CFPUA fire hydrant must have a Special Water Use Account, which can be found on the CFPUA website: www.cfpu.org (*Choose My Business, Inspections & Permits, Apply for the following permits online with Community Compliance, Special Water Use Permit*). This requires owning an approved meter assembly and an approved high hazard backflow preventer. All fees for the water use must be paid according to the CFPUA Fee Schedule. The meter assembly and backflow prevention must be approved by CFPUA Community Compliance Section at 628 Groundwater Way, Wilmington, NC 28411, 910-332-6558, Community.Compliance@cfpu.org.

5.3 - Construction Period

5.3.1 Points of Contact

During the construction period, the CFPUA Construction Manager will be the primary contact point for the developer and engineer. The CFPUA Inspector will be the primary contact point for the construction contractor.

5.3.2 Changes to CFPUA Stamped Approval Plans

Any request for deviations from the stamped drawings and material submittals must be submitted to the CFPUA Project Manager by the Engineer-of-Record (EOR). The deviation will be reviewed by CFPUA staff. The Engineer, Contractor and CFPUA Inspector will be notified if it is approved, needs to be revised and resubmitted, or rejected. The CFPUA Inspector cannot approve changes to the stamped construction documents.



5.4 - Inspections

5.4.1 Material Inspection

Before any work is started on the project, the Contractor shall make submittals to the Engineer in accordance with the requirements of CFPUA Specification Section 01 33 00. The CFPUA Inspector shall be notified when any material is delivered to the job site. The CFPUA Inspector will verify that all materials meet CFPUA specifications, details, and/or approved submittal. The CFPUA Inspector will notify the Contractor and the CFPUA Construction Manager of any unapproved material, and that the unapproved material must be removed from the project site.

5.4.2 General Inspection – Construction Phase Review

Routine and unscheduled inspection of ongoing projects will be made by CFPUA personnel during the construction phase to ensure conformance with the approved plans, CFPUA Technical Standards, as well as compliance with this guidance manual.

Projects approved for construction by CFPUA automatically authorizes CFPUA inspection personnel access to the construction site at all times for the purpose of inspecting constructed facilities or observing construction operations in progress. CFPUA Inspectors will take appropriate action, as outlined herein, when improper material or unacceptable workmanship is detected on the project and will notify the CFPUA Construction Manager, Contractor, Engineer and/or Developer. The Engineer of Record or, his or her designee, is responsible for completing periodic inspections as required by the State, as necessary.

CFPUA Inspectors shall make periodic checks during all phases of construction to ensure that the contractor is complying with the CFPUA Technical Standards as well as the policies and procedures herein established.

1. CFPUA valves are not to be operated without a CFPUA Inspector or CFPUA Water Quality personnel present (Notice of Violations will be given if failure to comply). Damage responsibility of the Contractor.
2. Any work after normal working hours (Monday – Friday 7:00 AM – 3:30 PM) must be pre-approved and scheduled with the CFPUA Construction Manager and Inspector.
3. All shutdowns must be pre-approved and scheduled with the CFPUA Construction Manager and Inspector (they will coordinate with the proper CFPUA departments).
4. Water or sewer force main tie-ins or shutdowns will not be conducted on Friday through Monday unless pre-approved by CFPUA Operations.
5. Contractor is to give two (2) business days notification for scheduling to the assigned CFPUA



Inspector for each of the following:

- a) Operating any CFPUA valve (includes tapping valves).
- b) When beginning construction and if the contractor pulls off the site.
- c) Laying out of any connection in existing manholes.
- d) Cutting in any new manholes on existing lines.
- e) Coring any manholes.
- f) Connecting onto an existing sewer force mains.
- g) Connecting onto existing water lines.
- h) Any bores and threading carrier pipes.
- i) All camera work, testing, chlorination, and water sampling.
- j) All testing.

5.5 - Testing and Gravity Sewer Video

All structures, pressure piping and gravity sewer piping shall be tested by the contractor as specified in the CFPUA Specifications in accordance with applicable regulations and as directed by the CFPUA Inspector. All testing must be conducted in the presence of the CFPUA Inspector. The Contractor is to give two (2) business days notification for scheduling, to the assigned CFPUA Inspector for all testing.

5.5.1 Water Main and Force Main Hydrostatic Pressure Testing

To schedule testing, the Contractor shall give two (2) business days notification to the assigned CFPUA Inspector. All pressure pipelines must be subjected to hydrostatic testing in accordance with the appropriate CFPUA Specification. These pipelines shall be tested to 150 psi for a period of two (2) hours while utilizing a two (2) PSI increment gauge. If the pressure drops more than three (3) psi, the test fails. Refer to Section 33 05 05.31 of the CFPUA Specifications for more information on the procedure.

5.5.2 Flushing, Chlorination and Water Sampling

The Contractor shall give two (2) business days notification, for scheduling, to the assigned CFPUA Inspector. All water mains and services must be flushed, chlorinated, and sampled in accordance with the CFPUA Specification 33 14 20 and as directed by the CFPUA Inspector.

5.5.3 Gravity Sewer Testing

To schedule testing, the Contractor shall give two (2) business days notification to the assigned CFPUA Inspector. The Contractor shall be responsible for providing all equipment necessary for tests of



displacement, deflection, leakage, and camera inspection. All tests shall be performed by the Contractor and observed by the CFPUA Inspector. Testing shall be in accordance with CFPUA Specification 33 14 22.

1. **Sewer Line Segment Testing**—each sewer line segment (*the sewer main between manholes*) shall be tested:
 - a) Thirty (30) days after installation and prior to final acceptance of the project, all sewer line segments, and all services shall be camera inspected and video recorded. The CFPUA inspector will review the video recording for acceptance.
 - b) As an alternative to waiting thirty (30) days to permit stabilization of the soil-pipe system, the CFPUA will accept certification from a soil testing firm verifying that the backfill of the trench has been compacted to at least 95% maximum density, in 2 feet lifts.
 - c) After two (2) paper copies of the as-builts have been submitted to the CFPUA Inspector.
2. **Video inspection Testing** – the Contractor shall provide a DVD(s) of each sewer line segment and service line to ensure that the lines meet minimum standards. The DVD(s) will be reviewed in the order they are received. The typical review time is generally ten (10) to fifteen (15) business days but will depend on the complexity of the project, size, quality of the DVD(s), etc. All inspections shall meet NASSCO standards.
 - a) The main line camera inspection must have project name, footages, manhole numbers, and dates of inspection.
 - b) The service line camera inspection must include project name, footages, address and/or lot number, and date of inspection.
 - c) The camera inspection must show the full diameter of the pipe.
 - d) The camera lighting must be sufficient to see a minimum of two (2) feet in front of the camera.
 - e) The camera inspection must be performed upon completion of cleaning and potable water.
 - f) introduced into the system to be tested. All defects in the pipeline and appurtenances shall be remedied by the Contractor at no additional expense to the CFPUA and will be re-inspected as outlined above.
3. **Air Test** – Air testing shall be required by CFPUA if conditions are such that infiltration measurements may be inconclusive. The test shall be conducted in the presence of the CFPUA Inspector and shall conform to the following requirements:
 - a) Test pressure shall be 3.5 psi increased by the ground water pressure above the top of the sewer.
 - b) Pressure loss from 3.5 psi shall not exceed 0.5 psi during the required testing time.
 - c) Testing time in minutes shall be calculated as $0.625 \times \text{nominal pipe size (inches)}$.



4. **Pipe Deflection Test** (mandrel test) – CFPUA to determine if conditions warrant Mandrel Testing. The mandrel must be sized to no less than 95 percent of the inside pipe diameter. The mandrel test may be performed on all sections of pipe and must be witnessed by the CFPUA Inspector. The maximum allowable deflection shall be five (5) percent in any direction. Any section of main not meeting the five (5) percent maximum deflection shall be repaired and retested after thirty (30) days, services after 14 days.

5.5.4 Manhole Testing

CFPUA to determine if conditions warrant Manhole Testing. Manholes shall be tested with vacuum of ten (10) inches of mercury (5 psig). The time for the vacuum to drop to 9 inches of mercury shall be measured. The manhole shall pass if the time is greater than 60 seconds for a 48-inch diameter manhole or 75 seconds for a 60-inch diameter manhole. If a manhole fails the vacuum test, it shall be repaired and retested until a satisfactory test result is obtained.

5.5.5 Pump Station Start-up Testing

Pump station start-up testing shall be in accordance with Section 33 32 15. The contractor for the project will schedule the start-up test with the CFPUA Inspector and all required project representatives. Following the startup, the test results will be compiled by the CFPUA Inspector and forwarded to the project Engineer-of-Record and Contractor.

5.6 - As-Built Drawings

The purpose of the as-built record drawings is to verify that the water and sewer system serving the project were installed per CFPUA Technical Standards, in accordance with the approved construction permit, and recorded to show the actual locations of the water and sewer assets to be conveyed to CFPUA for ownership, operation and maintenance.

5.6.1 Paper Draft As-built Drawings

Two (2) sets of paper draft as-built record drawings and PDF shall be submitted to the CFPUA Inspector in accordance with CFPUA Specification Section 01 70 00 for review. The as-built checklist and an example of the plan's cover sheet are provided in Section 5.0 of the Supplemental Documents Section of this manual for reference. It shall be the engineer's responsibility to assure that the most current as-built checklist is used and to check the as-builts for conformance with this checklist before submitting the as-builts.

1. Sewer projects— Prior to the review of the camera inspection of the installed infrastructure.
2. Water projects— After the infrastructure has been installed and pressure testing has been completed.



5.6.2 Plans and Checklist

Certified, surveyed record drawings (as-built plans), sealed by a North Carolina Licensed Professional Land Surveyor or Professional Engineer (engineer seal required for profiles), shall be furnished to CFPUA by the Engineer of Record (or Developer, where applicable) prior to completion and acceptance of the infrastructure by CFPUA. The as-built plans shall conform to the as-built checklist.

5.6.3 CFPUA Inspector's Review

The CFPUA Inspector will review the as-built drawings for compliance with the CFPUA As-built Checklist. The CFPUA Inspector will field verify the location of all water and sewer items on the as-builts. Comments will be provided to the contractor and engineer up to twenty (20) business days for large and complex projects, and up to five (5) business days for minor subdivisions (a single plan sheet).

5.6.4 Final Sealed As-Built Drawings

Once the CFPUA Inspector approves the as-built drawing, for mainline extensions, a final copy is to be submitted on original base Mylar sheets (24" X 36"). A PDF digital copy must be provided to CFPUA. Final Sealed as-built drawings should be submitted per Section 6.1 of this document.

For service installations, a PDF digital copy shall be provided.

5.7 - Final Construction Completion

5.7.1 Items Required for Completion

1. Construction is considered complete when the following items are successfully satisfied:
 - a) Testing (hydro, water samples, air, vacuum, mandrel, and pump station).
 - b) Final Sealed As-Built Drawings.
 - c) Camera Inspection.
 - d) Walk thru acceptance inspection.

Once complete, the project is ready to move towards certification and conveyance.



6.0 Certification and Conveyance

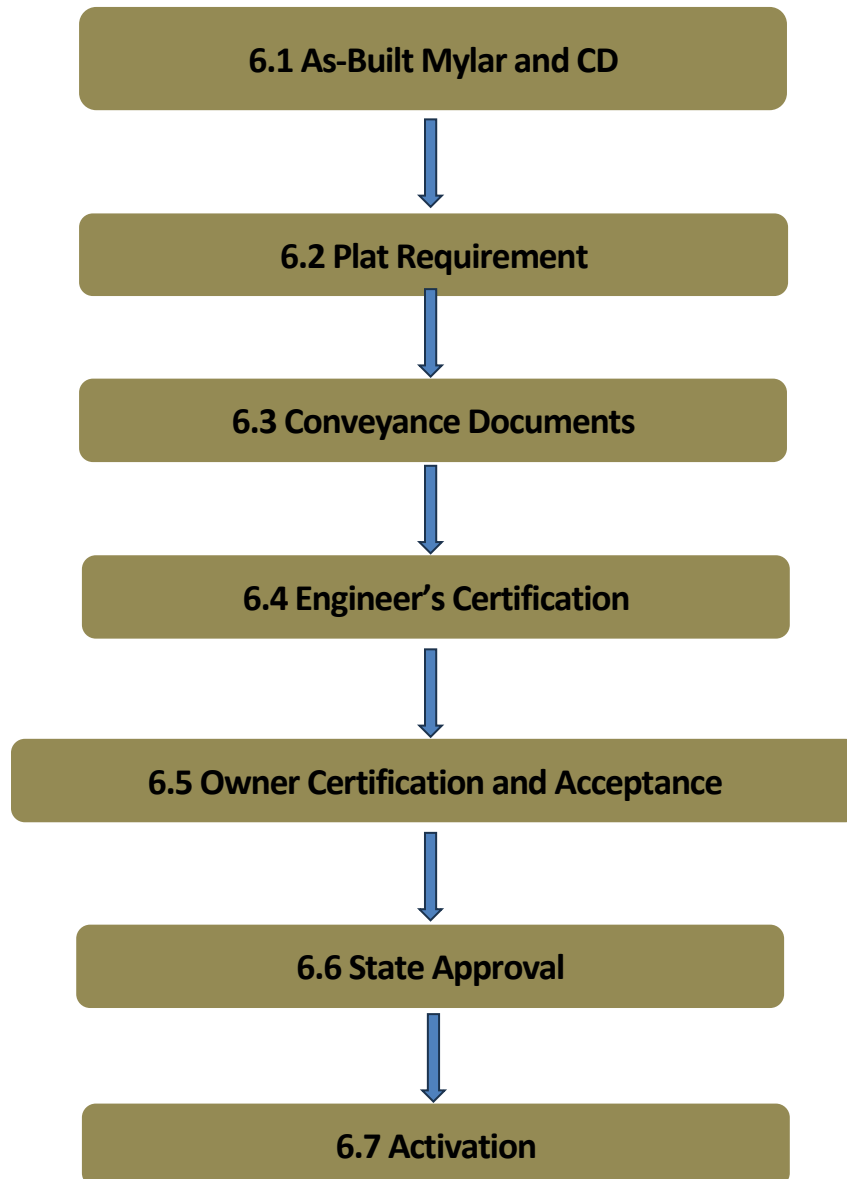


Figure 6: Certification and Conveyance Phase



6.0: CERTIFICATION AND CONVEYANCE

The required steps during the Certification and Conveyance Phase are shown in Figure 6 and described below.

6.1 - As-Built Mylar and CD

6.1.1 Final Sealed As-Built

1. Final sealed as-built drawings should be submitted as follows:
 - a) One (1) set of Mylars—For mainline extension projects only.
 - b) One (1) electronic copy of the as-built drawings in Auto CAD format and PDF.

6.2 - Plat Requirement

6.2.1 Subdivision Plat Review

The developer's surveyor prepares the plat based on the property lines and easements that are necessary to establish the development. Plats are submitted to the various agencies for review, including CFPUA Engineering Department. The jurisdictional governing body (COW or NHC) takes the lead on plat review. See Plat Inspection Checklist.

6.3 - Conveyance Documents

6.3.1 Conveyance documents to be provided by the Developer

CFPUA staff will request the conveyance information from the developer. CFPUA will assemble the Conveyance Deed and forward it to the developer for signature. This document must be returned for execution and recordation. For questions, call [910-332-6633](tel:910-332-6633).

Additional items required:

1. **Parent Tax Parcel Number(s)** of the property(ies) where the utilities are installed. If utilities are installed in the right-of-way, then CFPUA will need the adjacent property Parcel ID Number.
2. **Warranties and Releases** (see Supplemental Documents Section of this guidance manual)
 - a) Assignment of all Warranties and Guarantees (to be signed by conveyance grantor and all contractors).
 - b) Grantor's Agreement (to be signed by conveyance grantor).
 - c) Contractor's Release of Liens. Each Contractor and all Sub-Contractors shall complete this document.
3. **Legal Name of Signing Authority** — [Company Name, Name of Signatory, and Title](#)
(provide documentation of signing authority if not listed with Secretary of State)
 - a) If corporation—must be President, Vice President, or Corporate Secretary.



- b) If Partnership—must be a partner.
- c) If Limited Liability Corporation (LLC) - must be member/manager or registered agent.
- 4. **Map Book and Page Number(s)** of recorded plats where utilities are installed.
 - a) If plats have not been recorded, please provide a plat map signed by the owner and surveyor.
 - b) Deeds and plats may be found at <http://www.nhcgov.com/Pages/GIS.aspx>.
- 5. **Description of Utilities Being Conveyed**
 - a) Examples: 100 lf 8" gravity sewer, 50 lf 24" sewer force main, 1 pump station, and 100 lf 8" water main.
- 6. **Cost of the Water and Sewer Improvements**
 - a) List water, sewer, force main, and pump station separately.
- 7. **If Easement is Required:**
 - a) Provide:
 - Parent Tax Parcel Number(s) where utilities are installed, and easements are located. Parent tax parcels can be found at <http://www.nhcgov.com/Pages/GIS.aspx>.
 - Map Book and Page Number(s) of recorded plats displaying all on-site and off-site easements to be recorded.

The utilities must be transferred to the ownership of CFPUA to become operational. The conveyance documents are necessary for the ownership transfer. The developer provides documents (See Section 6.4) that CFPUA will use to create the conveyance deed. CFPUA sends the deed to the developer for signature. Once returned, CFPUA signs and records the deed.

6.4 - Engineer's Certification

6.4.1 Required Documents

- 1. The following documentation must be submitted by the developer's engineer and approved by CFPUA to process the Engineer's Certification.
 - a) Engineer's Certification stating that the project was constructed as designed in accordance with the NCDWR and/or NCPWSS approved construction permit.

6.5 - Owner Certification and Acceptance

6.5.1 Certification by System Permittee

CFPUA signs the owner certifications of public utilities upon receipt of the developer's engineer's certification and the completion of conveyance documents.

- Sewer—The owner's certification is returned to the engineer for submittal to NCDEQ.



- Water—CFPUA submits certifications to Public Water Supply (PWS) with a copy to the engineer.

6.5.2 Acceptance

Acceptance of the new public utility system is indicated when CFPUA records the conveyance deed then signs the owner's certification.

6.6 - NCDEQ and NCPWS

6.6.1 NCDWR and NCPWSS

The Engineer of Record (EOR) is required to notify CFPUA of the State approvals. The State approvals are necessary to activate any public water or sewer utility.

6.7 - Activation

6.7.1 Main Activation and Warranty

CFPUA will activate the approved mains. Only CFPUA personnel can open valves and/or activate CFPUA mains and equipment. The warranty period begins when the conveyance deed is recorded.



7.0 Plats

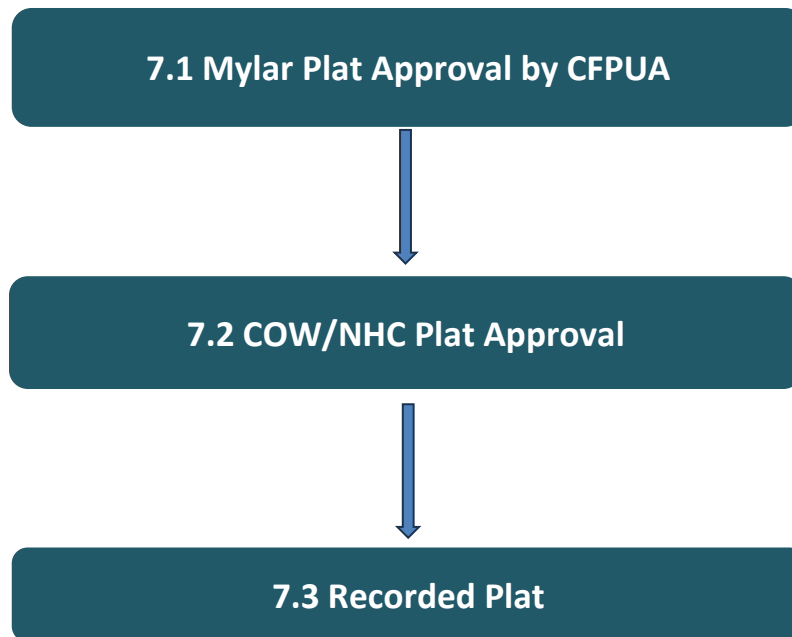


Figure 7: Platting Phase



7.0: PLATS

The required steps during the Platting Phase are shown in Figure 7 and described below.

7.1 - Mylar Plat Submission

Mylar plats are submitted to City or County once CFPUA and all agencies approve the preliminary plat.

7.2 - City/County Plat Approval

7.2.1 Requirements

CFPUA is required to review plats to determine if signature is needed.

7.3 - Recorded Plat

7.3.1 Recordation

The developer's surveyor records the plat upon final approval by the City or County.



8.0 Utility Account and Building Permits

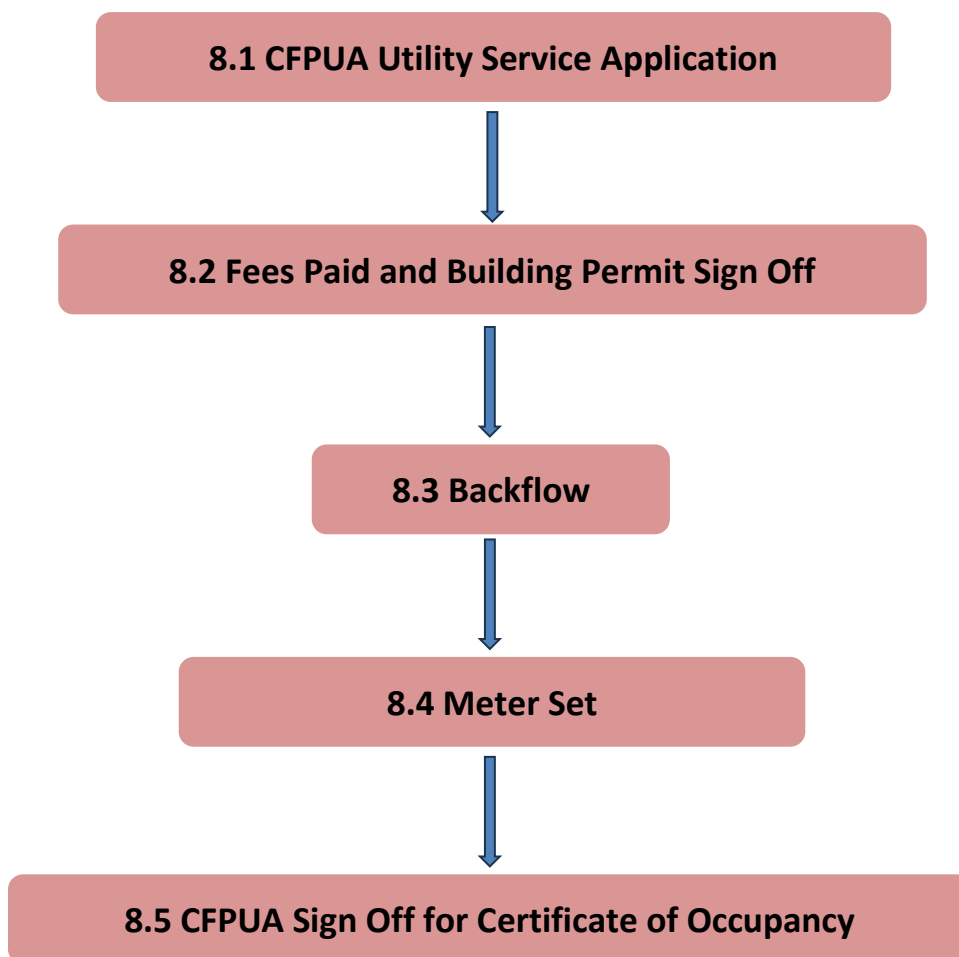


Figure 8: Utility Accounts and Building Permit Phase



8.0: UTILITY ACCOUNTS AND BUILDING PERMITS

The required steps during the Utility Accounts and Building Permits Phase are shown in Figure 8 and described below.

8.1 - CFPUA Utility Services Application

New lots are created when the plat is recorded. Once a lot has been created, the City or County will assign an address and a parcel identification number. Then, a utility account may be established.

8.1.1 Application and Fees

An application is available online at www.cfpu.org or at one of our Customer Service Centers at 235 Government Center Drive and 929 N. Front Street. You can reach our Customer Service Department by phone at [910-332-6550](tel:910-332-6550). The fees necessary to set up the account and connect will be provided by the customer service representative when the application is completed.

8.2 - Fees Paid and Building Permit Sign off

8.2.1 Fees Paid

Once the fees are received by CFPUA, the applicable work order(s) will be generated in the system; for example, setting a water meter. Once the request form is received, CFPUA will perform a Certificate of Occupancy inspection. Allow up to two (2) business days to complete the Occupancy sign off.

8.2.2 Building Permit Program

New Hanover County administers the building permits program (910-798-7308) for projects within the City of Wilmington and unincorporated areas. CFPUA reviews the building permit application as part of the process once an application is received by the New Hanover County Building Inspections Department.

Once the CFPUA utility account is established (see Section 8.1), and the applicable fees are paid, CFPUA will sign off on the building permit. Typically, this sign-off occurs within ten (10) business days, electronically. The contractor may check/track the status on the New Hanover County permit system.

8.2.3 Inspection Fee

If a meter set has been requested and all work is not to CFPUA standards or the plumbing work is not complete, the meter set cannot occur. The meter set will have to be rescheduled once the work is



complete. A premise visit fee will be assessed to the account for each additional visit that CFPUA staff must make to set the meter. Please refer to the Schedule of Fees and Charges for the applicable premise visit fee.

8.2.4 Tamper Fee

Per Section 1.9 (a) of the CFPUA Regulations & General Provisions, “The Authority Utility Facilities shall be under its exclusive control, and no Person other than those authorized by the Authority shall install, tap into, repair, change, tamper, or interfere with them in any way.” Once a meter has been set at a location for a particular service, only authorized CFPUA employees shall relocate or remove the meter. If the contractor, builder, plumber, etc., is found to have relocated the meter, a tampering fee shall be assessed to the account. Please refer to the Schedule of Fees and Charges for the applicable tampering fee.

8.3 - Backflow

8.3.1 Backflow

The plumber and/or landscaper shall submit a backflow installation permit to CFPUA Community Compliance Section at 628 Groundwater Way, Wilmington, NC 28411 or Community.Compliance@cfpua.org. All information related to the backflow and location shall be included. Community Compliance reviews the installation permit for approval. Meter Services inspects the backflow preventer and completes the “Backflow Prevention Assembly Inspection” form for all backflows 2” or smaller. Community Compliance enters the asset into Maximo which is then tracked to make sure it is tested annually. If Meter Services discovers that the backflow preventer is not in compliance, they notify Community Compliance who will ensure compliance before the meter is set. All backflow preventers 3” and greater are inspected by Community Compliance.

8.4 - Meter Set

8.4.1 Water and Sewer Connections

1. It will be necessary for the plumbing contractor to coordinate the plumbing connections for water and sewer. To schedule a meter set contact CFPUA’s Customer Service Center at (910) 332-6550 or online via the Customer Service Request Form at:
https://signnow.com/s/QSDmiyP1?name_formula=Customer%20Service%20Request%20Form%7CText%207CText%209.



2. The following information must be provided:
 - a) Address
 - b) Name of requestor and contact information.
 - c) Once the request has been submitted, CFPUA will make every attempt to provide inspections and/or install meters within two (2) business days.

8.5 - CFPUA Sign Off for C.O.

8.5.1 CFPUA Certificate of Occupancy (C.O.) Request

To obtain a CFPUA signoff for a NHC Certificate of Occupancy (CO), a request must be submitted through the NHC permit system. Once this request form is received, CFPUA will perform a CFPUA Cleanout Inspection within two (2) business days.



ALTERNATE ROUTE
9.0 Utility Bond or Letter of Credit
New Hanover County

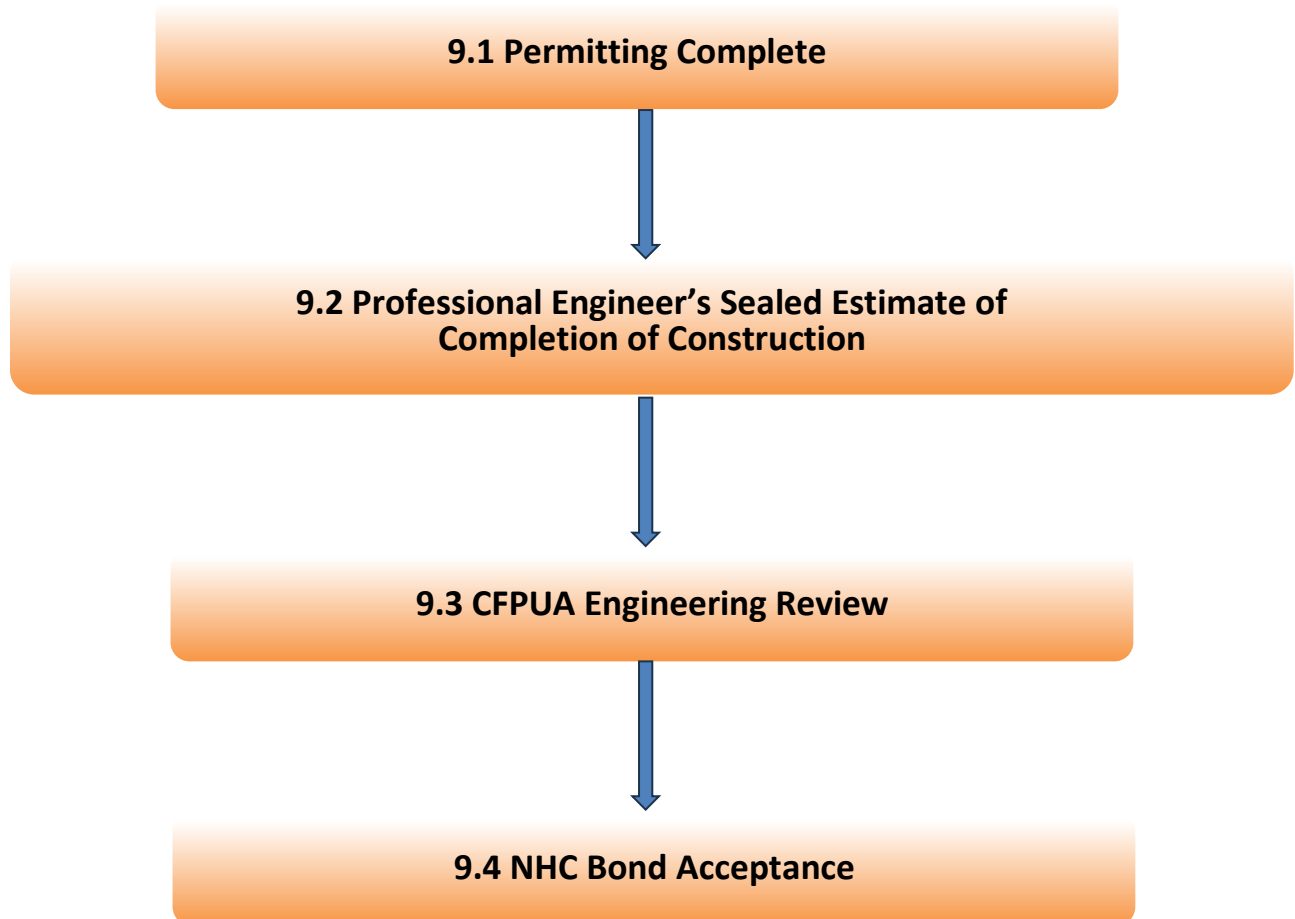


Figure 9: Utility Bond or Letter of Credit Phase



9.0: UTILITY BOND OR LETTER OF CREDIT – ALTERNATE ROUTE (New Hanover County Only)

The required steps during the Utility Bond or Letter of Credit Phase are shown in Figure 9 and described below.

Within NHC, a plat may be conditionally approved prior to construction of the improvements required to serve the development. The plat may be approved once the developer provides a financial guarantee acceptable to NHC and the applicable agencies, such as NCDOT, CFPUA, etc. Financial guarantees typically take the form of a bond, letter of credit, or certified check meeting the county requirements. Contact New Hanover County Planning for details. Structures may not be occupied, but in some cases, the building permits and construction may begin parallel to the construction of required improvements. Through this process, the construction time of the project may be shortened. A CFPUA Acknowledgement Letter may be required in order for CFPUA to sign off on the building permit(s). CFPUA will not issue a release for C.O. to NHC until a means of water and/or sewer are available.

9.1 - Permitting Complete

9.1.1 Utility Permitting Complete

To proceed along this process, the water and sewer utility plans must first be approved and permitted by the respective local, state, and federal agencies.

9.2 - Professional Engineer's Sealed Estimate of Completion of Construction

9.2.1 Engineer's Estimate of Probable Costs

The developer obtains the services of a professional consulting engineer who prepares a sealed opinion of probable cost of water and sewer construction based on the approved permitted public water and sewer utility plans.

9.3 - CFPUA Engineering Review

9.3.1 CFPUA Estimate Approval

The engineer submits the water and/or sewer cost estimate to the CFPUA Engineering Project Manager for review. The CFPUA engineering staff informs the NHC Engineering staff and the consulting engineer when the cost estimate is approved.



9.4 - County Bond Acceptance

9.4.1 County Bond Acceptance

County staff accept the engineer's cost estimate once they receive confirmation from CFPUA and any other applicable agencies. Then, county staff and/or the developer route the plat for all agency approvals.



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