

SECTION 01 78 39

PROJECT DESIGN DRAWING REQUIREMENTS

PART 1 GENERAL

1.1 DESIGN DRAWING COMPLIANCE

- A. This section includes design plans for sewer main extensions, water main extensions, including construction, alteration, or rehabilitation of CFPUA water and sewer facilities to serve commercial, industrial, or multi-family residences other than a single-family duplex residential structure on a single lot of record.
- B. Design plans sealed by a North Carolina licensed Professional Engineer are required to be submitted and approved by CFPUA.
- C. Plans in compliance with CFPUA Master Plans, CFPUA Standards, and NC Department of Environmental Quality (NC-DEQ) design criteria may be approved by Engineering Director for CFPUA or his/her designee.
- D. When plans require approval from other local, State, and Federal permitting agencies, additional information beyond this section may be required. Should these requirements vary, the more restrictive requirement(s) shall apply.

1.2 DESIGN DRAWING CONTENT CHECK LIST

- A. GENERAL
 - 1. Project name and address.
 - 2. Engineer of Record seal and surveyor's seal as applicable or required.
 - 3. Engineer of Record contact information to include name, address, phone number, and email is optional.
 - 4. Surveyor's name, address, and phone number.
 - 5. Owner's name, address, and phone number.
 - 6. Include the appropriate CFPUA water and sewer detail sheets.
 - 7. Provide a list of CFPUA details that are not appropriate and propose substitute details.
 - 8. Propose custom details for situations that are not addressed adequately by the CFPUA details.
 - 9. Dates of original drawings and revisions.
 - 10. North arrow and location map.
 - 11. For multi-sheet plans, provide a cover sheet with an index planning map at a scale of 1 inch = 200 feet showing the organization of the plan sheets, sheet numbers and a legend for all line work and symbols to identify proposed and existing conditions. On the legend include an open circle for sanitary sewer cleanouts and an open box for water service meters.
 - 12. Submit digital plan review submittals via:
<https://www.cfpua.org/FormCenter/Engineering-3/Engineering-Plan-Review-103>.
Your project manager may require hard copies on a case-by-case basis.

13. Show proposed water and sewer layers bolder line type than drainage, streets, etc.
14. Plan text shall be at least 0.10-inches height.
15. Scale:
 - a. Scale for plan views shall be 1-inch = 50 feet.
 - b. Supplementary, inset detail, or pump station site plan drawings should be shown at a larger scale for readability.
 - c. Scale for profiles shall be 1-inch = 50-feet in the horizontal direction.
 - d. Scale for profiles shall be 1-inch = 5-feet in the vertical direction.
 - e. In cases where larger scaling is necessary to legibly show existing features and proposed work, provide justification to CFPUA for use and pre-approval of larger scale.
16. Survey Control:
 - a. Elevations shall be tied to North American Vertical Datum of 1988 (NAVD 88) and horizontal coordinates shall be tied to the North Carolina Grid System.
 - b. Include at least 2 coordinated horizontal control points and vertical benchmarks within project area and provide the offsite benchmark reference when applicable.
17. Existing Information:
 - a. Display all existing storm pipes, sewer pipes, water pipes, underground utilities, water services, fire hydrants, manholes, monitoring wells, sewer services, drainage features, topography, roadways and all other information relevant to the proposed utility design.
18. Total linear feet on cover sheet listed separately for proposed water lines, gravity sewer, and force main.
19. Utility Services:
 - a. Commercial, multifamily, and industrial site plans shall indicate all water and/or sewer services proposed, existing, to be relocated and/or to be abandoned.
 - b. Water service will include location and size of the water meter, backflow, service line and tap.
 - c. Sewer service will include location and size, cleanout and tap.
 - d. Indicate the use of each service (i.e., irrigation, domestic, or fire line).
 - e. Subdivision plans prepared for CFPUA review are not required to show the service locations on the plans submitted for review prior to construction.
 - f. Service locations for subdivision plans are recommended to be finalized in the construction phase.
20. Drawings shall indicate water/sewer phases(s).
21. Show approximate vertical and horizontal separations of water mains, storm drains, sewer mains, and force mains to proposed and or existing utilities. Scaled profile drawings are required for.
 - a. each crossing of water and sewer mains,
 - b. each crossing of water mains and storm drains,
 - c. each crossing of sewer mains and storm drains.
22. Show all subsurface boring with associated excavations, transitions, and casings.
23. Show Existing surface elevations and Proposed finish grades.
24. Show the 100-year flood zone when it is present on the property.
25. Show lot numbers, lot addresses, property lines, property owners names, property owner address, and county parcel identification numbers within the project and adjacent to the project parcels.

26. Indicate source of property lines shown (i.e. survey date and surveyor, plotted from record, map book page number, GIS tax data).
27. Show right-of-way with street name, state road number, street owner information, right-of-way width, pavement material, and pavement width.
28. Show existing easements, including width, deed/map book and page number, property owner, and county parcel identification number.
29. Show proposed easements including width and their relationship to the proposed utilities.
30. Indicate proposed ownership of the proposed utilities (public or private).
31. Plans shall indicate compliance with CFPUA Specifications and Standards.
32. Variances from CFPUA Specifications and Standards shall be requested in writing along with the plan submittal.
33. Include a general sequence of construction.

B. SEWER AND FORCE MAINS

1. Provide the plans and the applications in conformance with all NC-DEQ requirements. Indicate if the plan will require a variance from any NC-DEQ requirement. If so, then provide a variance request letter to with all relevant information addressed to NC-DEQ.
2. Provide a continuous plan and profile drawing of all gravity and force mains. For sewer mains, stationing is to begin at the proposed main that connects to an existing manhole, or sewer main. For force mains, stationing is to begin at the pump station or connection to existing force main.
3. Inverts into and out of manholes are to be shown at 0.01- feet accuracy.
4. For each sewer reach, show pipe diameter, length between manholes, material, and slope.
5. Show station or distance to beginning and end of change in pipe material.
6. Show manhole size and indicate proposed or existing. Indicate material of existing manholes.
7. Show all water supply wells within 100-feet of proposed sewer mains and water mains within 10-feet of proposed sewer mains.
8. Show all wetlands and/or surface waters classified as WS-II, WS-III, B, SA, ORW, HGW, or SB. Show the separation distance to sewer manholes and mains with all wetlands, surface waters and/or areas of environmental concern per NC-DEQ definitions. If no such areas affect the design, then note plans accordingly.
9. Show top (rim) elevation & flood elevation or surface water flow levels at each manhole.
10. Show location of air release valves, valves, and fittings along force mains in plan and profile.
11. Indicate pipe thrust restraint in plan and profile. Concrete thrust blocking will be allowed only for special conditions and subject to approval by the CFPUA.
12. Indicate size and material of existing and proposed services.
13. Indicate manhole service taps, main line taps, service casing, and or material transition.
14. Include the CFPUA standard sewer notes on all plan & profile sheets.

C. SEWER PUMP STATIONS

1. Civil and electrical site plans shall be at a scale of 1-inch = 10-feet, unless approved otherwise.

2. Civil and electrical site plans shall include all relevant information required on the CFPUA pump station detail sheets including the following:
 - a. Existing and proposed property and easement lines
 - b. Existing and proposed contours
 - c. Existing and proposed utilities, underground and overhead, including;
 - 1) water, sewer, electrical, gas, and communication.
 - d. Existing and proposed site features including;
 - 1) manholes, wet wells, vaults, equipment pads and panels, control building, security fencing, utility poles, pavement areas, gravel areas, and landscape areas.
3. Submit calculations required by NC-DEQ Minimum Design Criteria and CFPUA Standards.

D. WATER MAINS

1. Provide the plans and the applications in conformance with all NC-DEQ, Public Water Supply Section (PWSS) requirements.
2. Indicate if the plan will require a variance from any PWSS requirement. If so, then provide a variance request letter to with all relevant information addressed to PWSS.
3. Show pipe diameter, length, and approved material.
4. Show all sewer mains within 10-feet of proposed water mains.
5. Show all septic systems within 50-feet of proposed water mains.
6. Show location and type of shut off valves, air release valves, blow off valves and fittings in plan and profile.
7. Indicate pipe thrust restraint in plan and profile. Concrete thrust blocking will be allowed only for special conditions and subject to approval by the CFPUA.
8. Show the backflow prevention devices including type, size, manufacturer and model number.
9. Indicate fire hydrants and hydrant shut off valves.
10. Provide a continuous plan and profile drawing of all water mains. Stationing is to begin at the connection to existing water main.

E. WATER BOOSTER STATIONS AND STORAGE TANKS

1. Civil and electrical site plans shall be at a scale of 1-inch = 10-feet, unless approved otherwise.
2. Civil and electrical site plans shall include all relevant information required on the CFPUA pump station detail sheets including the following:
 - a. Existing and proposed property and easement lines
 - b. Existing and proposed contours
 - c. Existing and proposed utilities, underground and overhead, including;
 - 1) water, sewer, electrical, gas, and communication.
 - d. Existing and proposed site features including;
 - 1) manholes, wet wells, vaults, equipment pads and panels, control building, security fencing, utility poles, pavement areas, gravel areas, and landscape areas.
3. Submit calculations required by NC-DEQ PWSS and CFPUA Standards.

END OF SECTION