Orange Water and Sewer Authority
Checklist for New Development Projects
August 27, 2021

Note – This checklist is intended to help developers and engineers with some of the most common problems leading to delayed approval and does not take the place of thorough knowledge and adherence to the OWASA Manual of Specifications, Standards, and Design (Manual). It has been updated to reflect changes to the Manual in July 2021.

1. Preliminary project review

- ☐ **Concept meeting** recommended OWASA Engineering and Planning staff.
- ☐ **Project Fact Sheet** is completed and submitted.
- ☐ **Potable water distribution and sanitary sewer collection system impacts** are evaluated. This may require further analysis by OWASA should OWASA deem it necessary to do so. Developer may be required to pay for distribution system and/or sewer capacity model run for large projects.

2. Interim Review

- ☐ **Interim project meeting** is recommended with OWASA Development Services Team staff and/or partial plan review (e.g., cloud comments identifying what is ready for review).
- ☐ **Phased projects** – Projects needing phased implementation, such as to provide fire flow for construction or the need for sewer bypass pumping, require proper planning.
- ☐ **Deviation from OWASA policy or Standard Specifications** – Requests for variances should come early. No variance is approved if not specifically referenced in the approval letter.
- ☐ **Decisions needed from OWASA** to complete the design are discussed.

3. Construction drawings: Some general Information required, if applicable:

Labeling – Show and label

- ☐ Water, sewer, and reclaimed water line: type, size, material and location for existing lines, new lines, and lines to be abandoned. Color coding with water=blue, sewer=green, and reclaimed =purple helps speed review.
- ☐ Manholes - manhole number and station, manhole top and invert elevations, benchmark reference (elevations must be tied to mean sea level reference datum)
- ☐ Separations from all utilities – horizontal and vertical
- ☐ Valves
- ☐ Air release valves
- ☐ Tees
- ☐ Crosses
- ☐ Tapping sleeves
- ☐ Meter sizes and locations, vaults to scale.
- ☐ Irrigation and other water-only services – cooling towers etc., if applicable to project
- ☐ Blow up view of hydrants, fire lines/domestic service branches, and backflow devices, in addition to anything that cannot be conveyed at scale
- ☐ Easements and rights-of-way
- ☐ Post indicator valves for fire systems: RPDA location, remote read box location, valve

- ☐ Service line size and connection to main
- ☐ Service lateral locations and clean-outs
- ☐ OWASA detail sheets for all relevant components
- ☐ OWASA Construction Notes, including notations of any and all approved variances from the OWASA *Manual of Specifications, Standards, and Design*.
- ☐ Summary of changes and clouded notes from prior submittal to identify all changes from prior submittal.

Water Lines

- ☐ **Horizontal clearances** are adequate for water/sewer/other utilities/light poles/signs/structures.
- ☐ **Profile views** are included and show adequate vertical clearances for all utilities and structures.
- ☐ **Separations**
    - Horizontal – 10 ft. sanitary sewer or manhole, 5 ft. AC pipe and reclaimed water lines, 3 ft. other utilities, 15 ft. for buildings (including roofs and foundations) or other permanent structures
    - Vertical – 18” sewer and reclaimed water, 12” other utilities
    - Appurtenances (horizontal)
        - 10 feet for meter vaults, fire hydrants, and air release valves
        - 5 feet for meter boxes, blowoff assemblies, and other appurtenances
- ☐ **Ductile iron pipe and fittings**, mechanically restrained, used for public water mains 4” and larger.
- ☐ **Bury Depth**: Public mains shall be buried 42-inches or deeper w/ 72-inch maximum.
- ☐ **Frontage**: Lines must extend along entire road frontage to provide for orderly future development.
- ☐ **Dead-end mains**
    - Maximum length: 600-ft for 6-inch and 1200-ft for 8-inch mains
    - 2-inch mains are subject to OWASA review and approval
    - Include hydrant or blow-off assembly
- ☐ **Manholes** for valves on larger mains (16” and larger) needed; 6 ft. minimum diameter.
- ☐ **Restraint** included at all changes in pipe direction. Concrete thrust blocking is not the primary means.
- ☐ **Ductile iron casings** spanning under road crossing or where lines are below other utilities that limit excavation required.
- ☐ **Air release valves** are required where mains are subject to air entrapment; typically, when elevation of high and low portions are >= 25 feet, unless otherwise directed by OWASA.

Water Services

- ☐ Structures/buildings are **individually metered**
- ☐ 1 inch and smaller services can be split in two behind the tap but before the meters
- ☐ Services installed **perpendicular** to main
- ☐ Service lines shall be ¾”, 1”, 2”, 4”, or 6”. Larger sizes approvable.

Valves

- ☐ All pipe tees and crossed shall be **fully valved.**
- ☐ **Insertion valves** or **tapping sleeves and valves** may be approvable on a case-by-case basis to prevent a water outage to existing customers.

- ☐ Use **gate valves** up to 16 inch and **butterfly valves** for 16 inch and larger valves. Gate valves on 16+" pipe may be requested.
- ☐ **Maximum distance** between valves: 450 ft. for 4-8" pipe, 600 ft. for 12" pipe, and 1000 ft. for 16+" pipe.
- ☐ **Air release valves** are required at crests in a water main as directed by OWASA and are mandatory when the elevation change from crest to sag > 25 feet.

Fire Hydrants

- ☐ **Distance from structures**: Fire hydrant locations shall be as directed by local fire department having jurisdiction over this project and shall be:
    - o greater than 40-ft from structure,
    - o less than 300-ft from commercial structure,
    - o less than 500-ft from residential structure, and
    - o less than 75-ft from Fire Department Connection.
- ☐ **Tap hydrants** into 6+ inch water lines, but 8+ inch lines in Chapel Hill.
- ☐ **Locate** in a street right-of-way or OWASA public utility easement.
- ☐ **Phasing plan** required for construction if fire flow is needed for combustible materials during construction.

Fire Systems

- ☐ **Post Indicator Valves** are shown
- ☐ **Fire flow analysis** for fire hydrants is provided
- ☐ **RPDA, valves,** and **remote read box** are included

Backflow Prevention

- ☐ **Backflow**: All connections other than single family residential with no pool or inground irrigation require an RPZ meeting current standards.
- ☐ **Exterior Installation**: Backflow prevention devices must be installed outside behind the meter. Exception to install within the first exterior wall and close to meter only granted due to inability to install outside.
- ☐ **Reduced pressure detector assembly** included for fire lines.

Sewer Lines

- ☐ **Horizontal clearances** shown and adequate for water/sewer/other utilities
- ☐ **Separations**
    - o Horizontal – 10 ft. water, 3 ft. other utilities, 15 ft. buildings (including roofs and building foundations) or other permanent structures
    - o Vertical – 18 inch for water and reclaimed water lines, 24 inch for storm, 12 inch for other utilities
    - o Appurtenances (horizontal)
        - 10 ft. for manholes, vaults, and air release valves
        - 5 ft. for other appurtenances.
- ☐ **Profile views** included, and show adequate vertical clearances for all utilities.
- ☐ **Depth**: Public sewer mains must be installed 36-inches or deeper, with a maximum depth of 20 feet.
- ☐ **Size**: Public sewer mains shall be 8 inch or larger; private lines shall be 4 inch or larger.

- ☐ **Slope**: Minimum slope for 8-inch line is 0.4% (other sizes listed in Section 3-1.3.C(10)). Add 0.1 % to the design for a slope of 0.5 % to allow for slight installation variation. Maximum slope is 20 %.
- ☐ **Outside drop** is required if invert-in is 18-inches or greater than manhole bottom or base elevation.
- ☐ OWASA **easement** is required to the property line for future orderly expansion.
- ☐ **Combination air vacuum air release valves are** required when elevation of high and low portions of a sewer force main are >= 15 feet.

Sewer Manholes

- ☐ **Manholes** are required for all changes in pipe direction or size.
- ☐ **Spacing**: Sewer manholes shall be no farther than 400 feet apart.
- ☐ **Diameter** for sewer manholes is 4 feet, except a 5-foot diameter is required if depth exceeds 10 feet or the main is 16-inch diameter or greater.
- ☐ **Extended base** with appropriate reinforcing is required for manholes > 12 feet deep
- ☐ **Outside drop**: All inverts >= 18 inches are constructed as an outside drop.
- ☐ **Invert separation**:
    - o **Vertical** - Upstream invert must be a minimum 0.1 foot above downstream invert. 0.2 feet is strongly recommended to allow for slight installation variation.
    - o **Horizontal** – The angle between the invert in and invert out shall be >= 90 degrees. No more than 3 mains or services shall enter one manhole, and the pipes shall be spaced to maintain manhole stability.

Sewer Services

- ☐ **Separate services**: Each building has its own sewer service that connects to the main through easement or public right-of-way and does not cross another lot.
- ☐ Direct connection to manholes (within 18 inches of invert) for 6-inch or larger sewer services. Outside drops are required if greater than an 18-inch drop is necessary.
- ☐ Tap into sewer main for 4-inch services, except for a cul-de-sac, where direct connection to manhole is allowed.
- ☐ Taps located minimum 5 feet from manholes
- ☐ **Ductile iron pipe** required from the main through the first cleanout, but can be PVC from the cleanout to the house.
- ☐ **Cleanouts** are ductile iron, are <= 75 feet apart along one service line, and are located just off the easement or right-of-way.
- ☐ **Food handling facilities** must include adequately sized grease interceptors or traps.
    - o Submit Grease and Oil Control Fact Sheet and sizing calculations.
    - o Obtain approval for specific unit to be installed.

Easements/Rights-of-Way

- ☐ All mains must be in **dedicated street rights-of-way** (ROW) or publicly **dedicated OWASA easement.**
- ☐ If adjacent and parallel to a right-of-way, sufficient easement added so the right-of-way plus easement provides the minimum public easement width required.
- ☐ **Slope** is less than 4 % cross-slope.
- ☐ **Grade**: maximum of 4:1
- ☐ **Water or sewer lines**: 30 feet centered on pipe
- ☐ **Combination** (two of three: water, sewer and storm drainage): 40 feet
- ☐ **Surrounding Meter Vault**: minimum 10 feet

- ☐ **Beyond fire hydrant**: minimum 10 feet
- ☐ **Three Party Right-of-Way Encroachment Agreement** provided if in NCDOT roadway.
- ☐ All easements shall be acquired by the developer and **dedicated to OWASA** by recorded map and by deed of easement. Easements must be provided **prior to approval of the project for construction**.
- ☐ Easements are recorded as "Orange Water and Sewer Authority Water, Sanitary Sewer, and/or Reclaimed Water Easement," labeled to match the relevant utility(ies).

Other

- ☐ **Trash dumpster, HVAC, swimming pool filter backwash, elevator sump, parking deck**: Indicate whether or not any will be included with the project for sewer service. Parking decks and trash dumpsters include **oil/water separators.**
- ☐ **Rainwater harvesting** - provide a rainwater harvesting plan and description if applicable to project
- ☐ **Food establishments** have provided calculations for grease interceptors or traps.
- ☐ **Landscape plan** included if applicable to project. No woody vegetation in easements.
- ☐ Sewer Use Ordinance (SUO) compliance is required for all waste discharges. Compliance is documented in the Project Fact Sheet, or requested exception explained.

4. Process

- ☐ Submit Project Fact Sheet.
- ☐ Submit electronic construction drawings for review (paper copies if requested).
- ☐ Submit calculations for fire flow and grease traps.
- ☐ Receive comments from OWASA.
- ☐ Address comments and submit revised drawings. The submittal of final drawings for approval shall include both electronic and paper copies.
- ☐ Submit Meter Request Form for 1.5 inch or larger meters.
- ☐ Obtain plan approval from OWASA.
- ☐ Submit Certificate of Compliance to OWASA.

5. Plan Review and Approval / Permitting – Note: Public water and/or sewer main extensions must be approved and permitted by the North Carolina Department of Environmental Quality's Division of Water Resources (DWR) before OWASA will issue a Permit to Construct (PTC). OWASA will handle the submittal to DWR when the package is complete. Separate plan review fees for state review are required. All projects which include water meters 1.5 inch or larger, main extensions, backflow devices, or grease interceptors or traps must receive a PTC from OWASA. Stand-alone backflow devices or grease interceptors/traps require OWASA review and approval but will not require a PTC.

- ☐ Pay Plan Review and Construction Observation fee to OWASA.
- ☐ Submit four (4) hard copies of construction drawings – 3 full size and 1 set reduced (hard copy) – and 2 compact discs with the design drawings in pdf format, unless otherwise directed by OWASA.
    - o If project does not include public main extension, submit only 4 sets of drawings and no CDs.
- ☐ Submit Three Party Right-of-Way Encroachment Agreement if NCDOT roadway.
- ☐ Submit project-specific Engineer's Report for water main extension to OWASA,
    - o include fire flow report, if applicable, and
    - o include check for fee to NCDEQ-Public Water Supply Section ($150 for extensions up to 5000 feet, $200 if longer).

- ☐ Submit Fast Track Sewer Extension Application form and supporting documentation:
  - o use the current form from NCDEQ, Division of Water Resources, and
  - o include check for fee to NCDEQ ($480).
- ☐ Obtain all approvals required by other entities having regulatory oversight or jurisdiction over the project.
- ☐ Obtain Project Plan Approval and Permit to Construct from OWASA.

6. Construction

- ☐ **Preconstruction Conference** with OWASA Inspector and utility contractor.
- ☐ **Post the Authorization to Construct** on site – for public water main extensions
- ☐ Sewer bypass pumping plan submitted to OWASA for approval (if applicable), a minimum of 3 weeks in advance of expected need.
- ☐ Request for a **planned water outage** submitted a minimum of 10 days in advance.
- ☐ Inspection of water main installation – restraint, bedding, blocking, depth, material, backfill, service connections, abandonment of mains or services, utility crossings.
- ☐ Water main testing –pressure test; purity test.
- ☐ Backflow assemblies must be tested within 10 days of installation.
- ☐ Inspection of sewer mains – gravel bedding to spring line, service connections, cleanouts, backfill, materials, utility crossings, abandonment of mains or services.
- ☐ Sewer main testing – low pressure; vacuum test manholes; main alignment.
- ☐ Pre-final inspection by OWASA Inspector.
- ☐ Construction observation by Engineer of Record or their knowledgeable representative.

7. Close Out

- ☐ Complete punch-list items
- ☐ Final Inspection by OWASA Inspector
- ☐ Tentative Acceptance
- ☐ Engineer's Certifications
- ☐ Letter of Dedication
- ☐ Final Easement
- ☐ Asset Valuation form
- ☐ Record Drawings
- ☐ Receipt of final certifications and drawings by NCDWR – before mains/services can be accepted

8. Final warranty inspection by OWASA Inspector

NLP/JCG