CITY OF NORFOLK
DEPARTMENT OF UTILITIES
Appendix F1 – Site Plan Submission Design Checklist

Prior to the submission of a site plan, review and complete the checklist below. All items must be considered compliant for final site plan approval.

Site Plan Number and Title:_____

1. Virginia registered engineer's stamp, signature, and date.
2. Plan and profile sheets are on 24" x 36" paper. Drawing organization and format comply with Section 7 of the Department of Utilities Design and Construction Standards.
3. Department of Utilities Standard Site Plan Notes and applicable standard details are shown on the drawings.
4. Domestic water meter calculations are provided in submittal documents where applicable in accordance with A.W.W.A. Manual 22 and Manual 31.

   _____" diameter line is required to adequately serve this project in accordance with City Standards.

   a. Average Domestic Design Flow _____
   b. Peak Hour Domestic Flow _____
   c. Design Fire Flow _____
   d. Total Design Peak Flow _____
   e. Residual Pressure at Total Design Peak Flow (last hydrant) _____
5. Sanitary Sewer Analysis is shown.

   _____" diameter line is required to adequately serve this project in accordance with the City Standards.

   a. Average Daily Flow** _____
   b. Design Peak Flow _____

   ** If the average daily flow is greater than or equal to 40,000 GPD, an HRSD Flow Acceptance Certificate application shall be submitted with the site plan. Application information can be found at https://www.hrsd.com/project-requests-hampton-roads
6. If this is a phased project, overall water and sewer plans have been submitted for approval.
7. The utility drawings include stationing, pipe size, material, bearings, direction of flow, deflection angles, grade, distance between centerline of manholes, and rim and invert elevations. Benchmarks are shown. The type and class of pipes with supporting calculations are noted as needed.
8. I.S.O. Fire Flow computations are included (where applicable). Note: The maximum velocity through a pipe shall be no greater than 9 fps, Hazen-Williams coefficient (c-factor) shall be 110 for new and 100 for existing mains, and a minimum residual pressure of 20 psi shall be maintained in the City system.
9. Adequate fire hydrant spacing and fire hydrant water supply.
10. Where all proposed sewer and/or water mains cross other utilities, these crossings are profiled, and the means for crossing and resolving any conflicts are clearly shown.
11. All existing sewer and water connections to the property are shown on plans.
12. All proposed utility easements deemed necessary have been identified and an exhibit plat has been submitted with the plans.
13. A list of the Approximate Material Quantities to be used and the latest Material Notes are shown on the plans.
14. A backflow prevention device is provided on domestic and fire service connections; the device shall be installed on private property.
15. All minimum finished floor elevations and basement elevations are shown on the drawings, where applicable.
16. Cover Sheet

☐ The proposed domestic water demand is listed in GPM
☐ The proposed fire flow demand is listed in GPM
☐ The proposed wastewater flow is listed in GPD
☐ The receiving sewer pump station is listed or a request for information is included in this submittal

17. Standard Notes and Details

☐ The applicable standard details (Appendix D) are included in the plans
☐ The applicable version of Appendix E (general notes for private or public sector development) is included in the plans

18. Easements

- ☐ Where impacts are proposed on existing utilities located within existing public utility easements, relocation has been considered to allow for the vacation of the existing easement
- ☐ Where new easements are proposed, all alternatives have been considered and documented to demonstrate that the need for an easement is unavoidable
- ☐ Easements are labeled with their dimensions and purpose (e.g., “Public Utility Easement” or “Private Utility Easement”)
- ☐ Proposed public utility easements are compliant with the minimum size requirements set in the Design and Construction Standards
- ☐ The applicant has prepared an easement submission description and sealed exhibit plat with their submittal to begin the application process
- ☐ The applicant acknowledges that site plan approval is contingent upon the City’s receipt of the recorded easement plat and executed deed

19. General Utility Design and Calculations

- ☐ A narrative is provided with the submittal and provides detailed information about the existing and proposed utilities, including size, material, location, slope (for gravity sewer), and flows (existing and proposed). State if the plans propose no utility impacts
- ☐ Where multiple structures are proposed, calculations are provided on a structure-by-structure basis as well as for the combined site. Where multiple water or sewer connections are proposed, combined calculations should be separated by connection
- ☐ Domestic, fire, and irrigation water service lines are shown as separate and individual
- ☐ The separation of proposed utilities and existing or proposed structures are shown
- ☐ A graphic scale is shown on the plans

20. Water Mains

- ☐ Nearby existing water mains are labeled with size and material
- ☐ Proposed water mains are labeled with size and material
- ☐ Proposed water mains are a minimum of 8” in diameter
- ☐ Hydraulic modeling is provided to demonstrate that the public water system will maintain a minimum pressure of 40 PSI at peak flows
- ☐ Head loss equations use a Hazen-Williams coefficient of 110 for new pipe and 100 for existing pipe
- ☐ Joint restraint calculations are provided for proposed water mains
- ☐ Proposed water mains (including extensions) are shown in plan and profile views, including the labeling of all horizontal and vertical bends

21. Domestic Water Service

- ☐ Existing domestic water service lines serving the site are labeled with size and material
- ☐ Existing domestic water meters serving the site are labeled with size
- ☐ Proposed domestic water service lines are labeled with size and material
- ☐ Proposed domestic water meters are labeled with size and material
- ☐ Proposed domestic water service lines are a minimum of 1” in diameter and, for meters larger than 1”, match the size of the meter
- ☐ Service lines 4” or greater in diameter are shown in plan and profile view
- ☐ Water demand calculations are provided in the submittal, if any demand is proposed
- ☐ Proposed meters are sized in accordance with AWWA Manual of Practice M-22, latest edition
- ☐ Table 6.1 AWWA Meter Standards is included in the submittal
- ☐ Figures 4-2 and 4-3, water flow demand per fixture value (low and high range) are included in the submittal

22. Irrigation Service

- ☐ Existing irrigation water service lines serving the site are labeled with size and material
- ☐ Existing irrigation water meters serving the site are labeled with size
- ☐ Proposed irrigation water service lines are labeled with size and material
- ☐ Proposed irrigation water meters are labeled with size and material
- ☐ Proposed irrigation water service lines are a minimum of 1" in diameter and, for meters larger than 1", match the size of the meter
- ☐ A backflow preventer is existing or proposed for all irrigation services lines
- ☐ Service lines 4" or greater in diameter are shown in plan and profile view
- ☐ Irrigation demand calculations are provided, if any demand is proposed

23. Fire Service

- ☐ Existing fire service lines serving the site are labeled with their size and material
- ☐ Proposed fire service lines are labeled with their size and material
- ☐ Existing detector checks serving the site are labeled with their size and material and match the size of their fire service line
- ☐ Proposed detector checks are labeled with their size and material and match the size of their fire service line
- ☐ Backflow prevention is existing or proposed for all fire service lines
- ☐ Service lines 4" or greater in diameter are shown in plan and profile view

24. Proposed Crossings

- ☐ There is a minimum of a ten-foot horizontal separation shown between drinking water utilities and raw, storm, or wastewater utilities
- ☐ There is a minimum of a five-foot horizontal separation edge to edge between water or wastewater utilities and wires, cables, and utility poles shown
- ☐ There is a minimum of an 18-inch vertical separation between drinking water utilities and raw, storm, or wastewater utilities shown

25. Fire Hydrants

- ☐ The nearest fire hydrants are shown and labeled. Hydrants must be within 350 feet (for properties zoned multi-family residential, commercial, or industrial) or 500 feet (for properties zoned single-family residential)
- ☐ If the nearest hydrant is beyond the limits of the plans, there is an indicator arrow showing the direction and distance to the nearest hydrant
- ☐ Nearby City-owned hydrants have been tested by City staff. Tests can be requested on the City of Norfolk Department of Utilities webpage
- ☐ No more than one hydrant is proposed on a dead-end main
- ☐ Mid-block hydrants have isolated valves on both sides of the tee
- ☐ Fire flow demand calculations are provided in the submittal, if fire protection is required
- ☐ Fire flow calculations are based on ISO standards
- ☐ The available flow from nearby hydrants is noted to demonstrate the site's ability to meet fire protection requirements

26. Gravity Sewer Mains

- ☐ Nearby existing gravity sewer mains are labeled with size, material, and slope
- ☐ Proposed gravity sewer mains are labeled with size, material, and slope
- ☐ The slope of proposed gravity sewers complies with SCAT regulations. Arbitrarily increasing pipe size to allow for flatter slopes is not permitted
- ☐ Changes in direction or slope occur only at a manhole or cleanout

27. Sewer Laterals

☐ Existing sewer laterals serving the site are labeled with size, material, and slope

☐ Proposed sewer laterals serving the site are labeled with size, material, and slope

☐ Sewer laterals smaller than 8" may not connect directly to a manhole except on dead-end streets where the distance between the proposed lateral invert and manhole invert is less than two feet

☐ Where an 8" or larger sewer lateral is required, a manhole is proposed at the property line and sewer main. These laterals are shown in plan and profile view

☐ The material of the sewer lateral matches that of the sewer main, except where the sewer main is clay, asbestos cement, or concrete, in which case the lateral shall be PVC

☐ Where existing laterals are called for re-use, a condition assessment has been performed, and the lateral has been designated suitable for reuse by City staff.

28. Sewer Force Mains

☐ Existing force mains are labeled with their size and material

☐ Proposed force mains are labeled with their size and material

☐ Flow velocity calculations are included to demonstrate that a minimum velocity of 2 feet-per-second is maintained

29. Cleanouts and Manholes

☐ Nearby existing cleanouts and manholes are labeled with size and rim and invert elevations

☐ Proposed cleanouts and manholes are labeled with size and rim and invert elevations

30. Major Developments/Redevelopments

If projected water consumption or wastewater generation greater than 10,000 GPD ADF:

☐ Provide proof of a request for pump station capacity analysis.

If projected wastewater generation equal to or greater than 40,000 GPD ADF or has more than 100 residential units:

☐ Provide an Approved Flow Certificate from HRSD.

31. Within 100' of Norfolk Reservoirs

Norfolk Reservoirs include Lake Prince, Lake Burnt Mills, Western Branch Reservoir, Ennis Creek, Lake Lawson, Little Creek Reservoir, Denny's Canal, Lake Smith, Lake Whitehurst & Lake Wright.

General:

☐ Include the note: "The contractor shall notify the City of Norfolk Department of Utilities at least three (3) business days prior to commencement of any work within 100 feet of the City of Norfolk Reservoirs."

Plan View:

☐ Show top of bank elevation.

☐ Show a minimum Buffer Zone of 100' from the top of the bank.

☐ Show edge of water extents.

☐ Show tree line locations.

☐ Show wetland locations.

☐ Show outfall points.

☐ Show associated property lines.

32. Within vicinity of Raw Water Mains and/or Transmission Mains (>12")

Profile View:

☐ Provide recent test hole information using NAVD88 datum.
☐ Provide finished grade elevations (within one (1) inch accuracy)
☐ Provide crown of existing pipe elevations (within one (1) inch accuracy)
☐ Provide burial depth elevations for existing and proposed pipes.
☐ Mains are drawn to scale, accurate location and pipe size indicated.
☐ Provide a joint support plan.
☐ Provide a minimum of 24" of cover over crown of existing pipe.
☐ For grade changes resulting in less than three (3) feet between the crown of the existing pipe and the bottom of the proposed pavement subgrade including the base course, provide a "concrete bridge submittal."
☐ Provide a detail of the pipe crossing, if applicable.

Standard Raw Water and Transmission Main Notes:

The following notes are to be included on the drawings if the project is within the vicinity of a raw water main or transmission main.

☐ Contractor to limit the amount of construction activity and construction traffic over the top of the existing pipe.
☐ Contractor shall exercise extreme care while demolishing existing street pavement around existing pipes.
☐ Construction equipment shall cross water mains at one location, which shall be protected by timber matting.
☐ No materials shall be stored within fifteen (15) feet of the water mains.
☐ At least 72 hours prior to open-cutting over an existing pipe, contact the Utilities Field Engineering Office (telephone 823-1012) to schedule inspections.
☐ Wire and cable shall not be installed within five (5) feet of the existing pipe. For crossings over the existing pipe, hand digging is required in the vicinity of the existing pipe.
☐ There shall be at least 24" of separation maintained between the top of the existing pipe and the pavement subgrade or undercut excavation during construction.

I have reviewed this Checklist and certify that the drawings of water, wastewater, or both facilities as submitted have been designed in accord with the latest City standards, *Waterworks Regulations,* and the *Sewage Collection and Treatment Regulations* (whichever is more restrictive). The drawings have been reviewed for completeness and accuracy and are submitted for approval. It is understood that the submittal is incomplete without this review and certification.

_____, P.E. _____

Signature License Number

_____ _____

Name Typed or Printed Date