

WATER REVIEW CHECKLIST

Section 1. PURPOSE

This policy is an Engineering checklist of the Local Review Program for water system improvement projects by the Bedford Regional Water Authority (“Authority”).

Section 2. CHECKLIST

The checklist utilized by the Authority will be similar to that which is shown below.

Project Name: _____

Location: _____

Consulting Engineering Firm: _____

Date Plans Received:

<p><u>Project Status (Circle One)</u> Initial Review Revised Submittal (Submittal No. _____)</p>

Date on Plans:

I. Minimum Requirements to Initiate Plan Review

A. General

	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Waterline plans and road plans have been combined and submitted to VDOT simultaneously with the Authority.	_____	_____	_____
2. One complete set of plans was submitted to the Authority for review. Four (4) copies will be required for final approval.	_____	_____	_____
3. Design calculations were submitted.	_____	_____	_____
4. Original Professional Engineer seal and signature with date are on the cover sheet/title page of the plans and calculations.	_____	_____	_____
5. Original or facsimile / reproduction of P.E. seal and signature with date are on subsequent plan sheets.	_____	_____	_____
6. Plans are of adequate size (22" x 34" or 24" x 36"), scale and detail.	_____	_____	_____
7. Prints and copies are legible.	_____	_____	_____
8. The project name and date with latest revisions are clearly noted on the cover of the plans and calculations.	_____	_____	_____
9. Name and address of the Engineering/surveying firm that prepared the documents are clearly shown on the cover sheet of the plans and calculations.	_____	_____	_____
10. Developer Agreement packet has been mailed to owner.	_____	_____	_____

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11. Review and inspection fees have been paid.	_____	_____	_____
12. Waterline sizes along major roads follow the Authority's Master Plan.	_____	_____	_____
B. <u>Plans</u>	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Vicinity map on title sheet clearly shows the location of the project.	_____	_____	_____
2. Site plan of the project with topography and utilities is provided; topography is provided on plan / profile sheets.	_____	_____	_____
3. Plan and profile views are provided for all sections of waterline.	_____	_____	_____
4. For revised submittals, each item from review comments has been specifically addressed and acknowledged in a cover letter.	_____	_____	_____
5. Vertical and horizontal scales are identified.	_____	_____	_____
6. Waterline stationing is shown.	_____	_____	_____

II. Plan Review

A. <u>General</u>	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Note on plans states that the project shall be constructed in accordance with the latest copy of the Authority's Master Specifications.	_____	_____	_____
2. Only special details (those not covered in Master Specifications) are shown on plans.	_____	_____	_____
3. Profile elevations are referenced to an established elevation datum (USGS State Plane).	_____	_____	_____
4. North arrow is shown in each plan view.	_____	_____	_____
5. Street names or route numbers are noted correctly on plans.	_____	_____	_____
6. All distances, angles, offsets, and elevations are correct and drawn correctly to scale.	_____	_____	_____
7. Descriptions, stations, and appurtenance locations match between the plan and profile views.	_____	_____	_____
8. Underground and overhead utilities that may influence construction are identified in the plan and profile views and are drawn at their correct elevations in the profile.	_____	_____	_____
9. Existing waterlines, valve boxes, fire hydrants, sewer lines, manholes, clean-outs, and other physical appurtenances for water/sewer systems are identified.	_____	_____	_____
10. Boundaries of known marshes, bogs, and wetlands are identified.	_____	_____	_____

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B. <u>Property, Right-of-Ways, Easements, and Survey Control</u>	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Property, easement, and right-of-way lines are adequately defined throughout the project.	_____	_____	_____
2. Property ownership information is noted where applicable.	_____	_____	_____
3. Rods, other right-of-way markers, and any easement information such as fences, telephone/power lines, and utilities have been identified.	_____	_____	_____
4. Benchmarks are set outside of construction area.	_____	_____	_____
5. Property lines match those shown on the subdivision plat.	_____	_____	_____
6. Sufficient number of control points are located and described on the plans to provide adequate control during construction, approximately one per plan / profile sheet.	_____	_____	_____
C. <u>Valves and Blow-Offs</u>	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Valves are drawn in the plan views, valves and boxes are shown in the profile views.	_____	_____	_____
2. Air release valves are located at high points in the waterline.	_____	_____	_____
3. Blow-off valves are located at low points in the waterline.	_____	_____	_____
4. Valves, air releases, and blow-off assemblies are generally located near property lines.	_____	_____	_____
5. Ends of waterlines are terminated with a 2-inch blow-off assembly and bulkhead anchor.	_____	_____	_____
6. End of line blow-off assemblies or combination air release / blow-offs located in cul-de-sacs are located at property lines (no exceptions).	_____	_____	_____
7. Blow-offs are located at drainage easements where possible.	_____	_____	_____
8. Gate valves are spaced no more than 1,000-feet apart, and located next to hydrant assemblies where possible.	_____	_____	_____
9. Gate valve, one joint of pipe, MJ cap with blow-off, and bulkhead anchors are shown at locations suitable for future extensions.	_____	_____	_____
D. <u>Waterline</u>	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Pipe materials meet Authority requirements.	_____	_____	_____
2. Water mains are not shown to be smaller than 6 inches, with the exception of the last 500 feet of a dead end line.	_____	_____	_____

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| 3. For dead end lines, 4-inch waterline may be used to serve 12 or less residential connections; 3-inch waterline may be used to serve 8 or less residential connections; and 2-inch waterline may be used to serve 4 or less residential connections. | _____ | _____ | _____ |
| 4. Ductile iron pipe and concrete encasement is used when cover does not meet VDH and Authority minimum depth requirements. | _____ | _____ | _____ |
| 5. Regulatory requirements are met when crossing sewer line. | _____ | _____ | _____ |
| 6. Ductile iron pipe and concrete encasement are used when crossing under streams. | _____ | _____ | _____ |
| 7. Water line is a minimum distance of three feet from the edge of pavement for new subdivisions. | _____ | _____ | _____ |
| 8. Inside new subdivisions, waterlines are typically located in the street right-of-way. On primary roads, waterlines are located within dedicated waterline easements. | _____ | _____ | _____ |
| 9. Vertical bends are shown in the profile view. | _____ | _____ | _____ |
| 10. Along roads, streets, railroads, etc., the location of the waterline is described as a typical distance from the edge of pavement, right-of-way, or other appropriate physical features. | _____ | _____ | _____ |
| 11. Existing and proposed utilities that cross waterline are shown in the plan and profile. | _____ | _____ | _____ |
| 12. Minimum cover requirements (36 inches) for entire waterline installation are met and indicated in the profile view. | _____ | _____ | _____ |
| 13. Minimum cover requirements (18 inch minimum separation) are met and indicated when waterline crosses existing and proposed utilities, sanitary & storm sewers, streams, drainage ditches, roads, etc. | _____ | _____ | _____ |
| 14. Proposed concrete encasement, if applicable, is shown in the plan and profile views and length of encasement is noted. | _____ | _____ | _____ |
| 15. Length of road crossings and/or road bore are noted. | _____ | _____ | _____ |
| 16. The use of bends has been minimized. Where bends are necessary, the angle of bend has been minimized. For ninety-degree angles, the use of two (2) forty-five degree bends has been utilized. | _____ | _____ | _____ |
| 17. Concrete bulkhead anchors are provided at blow-off assemblies and at the end of lines that may be extended in the future. | _____ | _____ | _____ |
| 18. Concrete bulkhead anchors are provided prior to reducer fittings. | _____ | _____ | _____ |
| 19. Waterlines are not known to be within 30 horizontal feet of existing or proposed sanitary drain fields. (10 foot separation accepted by Sewage Handling & Disposal Regulations.) | _____ | _____ | _____ |

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20. Waterlines are not within 10 horizontal feet of existing or proposed sewer lines or sewer structures.	_____	_____	_____
21. Waterline stationing is either parallel to the waterline, or the waterline itself is stationed.	_____	_____	_____
22. Stationing of the utility line is labeled at least every 500 feet in the plan view with short lines drawn perpendicular to the centerline every 100 feet.	_____	_____	_____
23. Stations are set at each structure and angle point in line.	_____	_____	_____
24. Fitting stations are shown in the plan view along with the size and angle.	_____	_____	_____
25. Waterlines are reduced in size at end of lines to allow for deflection around cul-de-sacs.	_____	_____	_____
26. Provisions are noted on the plans to repair paved areas and sidewalks, and to restore disturbed construction areas.	_____	_____	_____
E. <u>Service Connections</u>	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Meters are shown at each new service connection.	_____	_____	_____
2. Existing and proposed lot lines are identified for proper service line and meter placement.	_____	_____	_____
3. Existing houses, septic tanks, and septic fields (which are needed to determine proper lateral placement) have been identified.	_____	_____	_____
4. Location of water meters is indicated on plans. Double meter settings are used where possible.	_____	_____	_____
5. Casing is stated for each service line under pavement.	_____	_____	_____
6. Service line crossings are minimized and consolidated where possible.	_____	_____	_____
F. <u>Fire Protection</u>	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Hydrants are located according to VDH and Bedford County water regulations which provide for adequate fire protection.	_____	_____	_____
2. Hydrants are provided such that no lot is greater than 500 feet from a hydrant.	_____	_____	_____
3. Hydrants are located to provide access and limit depth of bury.	_____	_____	_____
4. Hydrant leads are at least 6 inches in diameter.	_____	_____	_____
5. Where a minimum fire flow requirement of 500 gpm cannot be achieved under peak demand conditions, hydrants are shown to be future hydrants with only the associated valving to be constructed as part of the current project.	_____	_____	_____
G. <u>PRV's</u>	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Pressure relief valves are provided in all main line PRV assemblies.	_____	_____	_____

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2. All PRV assemblies include a low flow bypass with PRV.	_____	_____	_____
3. Isolation valves are provided for both main line and bypass PRV units.	_____	_____	_____
H. <u>Calculations</u>	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Calculations conform to VDH Water Regulations for peak design flows and minimum line sizes.	_____	_____	_____
2. Number of customers / lots and associated peak flows are noted.	_____	_____	_____
3. Both existing needs and future connections are considered in the calculations.	_____	_____	_____
4. Hydraulic justification of the selected line sizes is provided.	_____	_____	_____
5. Fire flow requirement (gpm) for the proposed development is stated and included in the hydraulic calculations.	_____	_____	_____
6. A minimum fire flow requirement is met under peak demand conditions.	_____	_____	_____
7. Residual and static pressures are provided at a point in the existing system near the point of connection to the proposed development. The location, approximate elevation, date, and time of pressure reading are provided.	_____	_____	_____
8. Minimum residual pressure for the proposed system is provided under fire flow conditions.	_____	_____	_____
9. Minimum pressure of 40 psi provided at all meter locations.	_____	_____	_____
10. Maximum static pressure & minimum static pressure for the proposed system is provided.	_____	_____	_____
11. Provisions for an in-line pressure reducing valves or pressure reducing valves at each service connection are provided in areas where the static pressure exceeds 80 psi.	_____	_____	_____

Section 3. REVISIONS

- A. This policy was approved and adopted by the Authority's Executive Director on June 27, 2013, effective July 1, 2013.