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: _____

Project Status (Circle One)
Initial Review
Revised Submittal (Submittal No. _____)

Date on Plans: _____

I. Minimum Requirements to Initiate Plan Review

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

10. Original Professional Engineer seal and signature with date are on the cover sheet/title page of calculations.	___	___	___	
11. The project name and date with latest revisions are clearly noted on the cover of the calculations.	___	___	___	
12. Name and address of the Engineering/Surveying firm that prepared the documents are clearly shown on the cover sheet of the calculations.	___	___	___	
13. Developer Agreement packet has been mailed to owner.	___	___	___	
14. Developer Agreement has been signed and returned.	___	___	___	
15. Project Plan Review Fees have been paid.	___	___	___	
16. Project Inspection Fees have been paid.	___	___	___	
17. Waterline sizes along major roads follow the Authority's Master Plan.	___	___	___	
18. For revised submittals, each item from review comments has been specifically addressed and acknowledged in a cover letter.	___	___	___	

B. Plans	**YES**	**NO**	**N/A**	**Covered by Bedford County Planning**
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. Vertical and horizontal scales are identified.	___	___	___	
5. Waterline stationing is shown.	___	___	___	

II. Plan Review

A. General	**YES**	**NO**	**N/A**	**Covered by Bedford County Planning**
1. Street names or route numbers are noted correctly on plans.	___	___	___	___
2. Note on plans states that the project shall be constructed in accordance with the latest copy of the Authority's Master Specifications.	___	___	___	

3. If details are shown on the plans, a note is present to indicate that details are provided for convenience only and that details in the latest edition of the Authority's Master Specifications supersede any discrepancies that may be present.	___	___	___	
4. Profile elevations are referenced to an established elevation datum (USGS State Plane).	___	___	___	
5. North arrow is shown in each plan view.	___	___	___	
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.	___	___	___	

B. **Property, Right-of-Ways, Easements, and Survey Control**	**YES**	**NO**	**N/A**	**Covered by Bedford County Planning**
1. Property, easement, and right-of-way lines are adequately defined throughout the project.	___	___	___	___
2. Property identification and ownership information are 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. **Valves and Blow-Offs**	**YES**	**NO**	**N/A**
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.	**Waterline**	**YES**	**NO**	**N/A**
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.	___	___	___
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 and/or within VDOT right-of-way upon VDOT approval. Refer to the BRWA Location of Utilities Policy.	___	___	___
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.)	___	___	___
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.	**Service Connections**	**YES**	**NO**	**N/A**
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.	___	___	___

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		YES	NO	N/A
F.	**Fire Protection**			
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.	**PRV's**	**YES**	**NO**	**N/A**
1.	Pressure relief valves are provided in all main line PRV assemblies.	___	___	___
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.	**Calculations**	**YES**	**NO**	**N/A**
1.	Calculations conform to VDH Water Regulations for peak design flows and minimum line sizes.	___	___	___
2.	Number and types of connections (residential, commercial, industrial, etc.) 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 (state location) for the proposed system is provided under fire flow conditions.	___	___	___
9.	Minimum pressure of 20 psi provided at all meter locations per the VDH Regulations.	___	___	___
10.	Maximum static pressure & minimum static pressure (state locations) for the proposed system is provided.	___	___	___

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11. Provisions for an in-line pressure reducing valve or pressure reducing valves at each service connection are provided in areas where the static pressure exceeds 80 psi. Note is included on Plans where applicable.	___	___	___
12. Average Day GPD/Connection is stated for each connection type.	___	___	___
13. Flow duration in Hours/Day is stated for each connection type.	___	___	___
14. Maximum Day GPD/Connection and Maximum Day Peak Factor are stated for each connection type.	___	___	___
15. Total Average Day GPD is stated.	___	___	___
16. Total Maximum Day GDP is stated.	___	___	___
17. Total Maximum Day GPM is stated.	___	___	___
18. Total Peak Hour GPM and Peak Hour Peak Factor are stated.	___	___	___
19. Total Maximum Day + Fire Flow GPM is stated.	___	___	___
20. The greater of Total Peak Hour GPM or Total Maximum Day + Fire Flow GPM is used for calculations.	___	___	___

Section 3. REVISIONS

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

B. This policy was modified as follows:
   1. Approved October 4, 2022; effective October 4, 2022.
      a. Checklist items were modified, re-ordered and grouped to better correspond with and minimize duplication of Bedford County review requirements.
      b. Review items were revised and simplified and grouped.
      c. Section 2.I.A.14: Checklist item added for Developer Agreement signed and returned.
      d. Section 2.I.A.15 and 16: Review and Inspection Fees made separate checklist items.
      e. Section 2.I.A.15 'Review Fees' was replaced with 'Plan Review Fees'.
      f. Section 2.II.D.8: Added VDOT right-of-way as a location on primary roads upon approval.
      g. Section 2.II.H: Revised for clarification and to include items necessary for VDH reporting.