

Municipality of the District of Lunenburg POLICY

Title: General Specifications and Design Requirements for Water and Sewer Systems	
Policy No. MDL-84	
Effective Date: September 24, 2018	Amended Date:

The policy forms Schedule "G" of the Subdivision By-law.

SCHEDULE "G" GENERAL SPECIFICATIONS AND DESIGN REQUIREMENTS FOR WATER AND SEWER SYSTEMS

GENERAL

1. (1) All water and sewer systems shall be designed in accordance with the specifications included in this schedule. These specifications shall be read in conjunction with the latest edition of "Standard Specifications for Municipal Services" which may be obtained from the Joint Committee on Contract Documents, 18 Laurier Street, Dartmouth, NS, B3A 2G7; Telephone: (902) 233-9362 or email at nsmunicipalservices@gmail.com. The wastewater system design shall also comply with the latest edition of the "Atlantic Canada Standards and Guidelines Manual for the Collection, Treatment, and Disposal of Sanitary Sewage" and the water system design shall comply with the latest edition of the "Atlantic Canada Guidelines for the Supply, Treatment, Storage, Distribution and Operation of Drinking Water Supply Systems" prepared by Nova Scotia Environment.
- (2) The specifications stated in this schedule shall govern over the "Standard Specifications for Municipal Services".
- (3) In the case where the Developer proposes to substitute an equivalent product or procedure departing from these specifications a description of the proposed substitute with sufficient supporting documentation shall be submitted to the Municipality for approval.
- (4) All engineering work under this By-Law must be undertaken and stamped by a Registered Professional Engineer of the Province of Nova Scotia.

- (5) The Developer shall comply with the *Environment Act*, the *Municipal Government Act*, *Water and Wastewater Facilities and Drinking Water Supplies Regulations*, and with *Municipal By-Laws and Policies*. The Developer shall obtain an approval to construct and operate a sewerage system from Nova Scotia Environment. The Developer shall obtain approval to construct, modify, and operate (as applicable) from Nova Scotia Environment to establish or extend a public water system.
- (6) The Developer shall notify the Municipality of work or tests to be started a minimum of two (2) working days in advance of such work being started. Work or tests completed without prior notice shall not be accepted by the Municipality.
- (7) Upon completion of construction the Developer shall complete all deficiencies within thirty (30) days of notification from the Municipality. Deficiencies or work not rectified shall be completed under the direction of the Municipality on a cost plus basis. The cost of such work shall be deducted from the Developer's bonds or securities posted under the Subdivision By-Law.
- (8) These standards may be varied by the Municipal Engineer in exceptional circumstances and in accordance with accepted Engineering Practice.

2. The following abbreviations shall be used in these specifications:

- (1) A.S.T.M. means American Society for Testing Materials.
- (2) CSA means Canadian Standards Association.
- (3) AWWA means American Waterworks Association.
- (4) ASA means American Standards Association.

SANITARY SEWERS - CONNECTING TO AN EXISTING WASTEWATER SYSTEM

3. The drainage area may be determined from contour plans and shall include all other areas that may become tributary.
4.
 - (1) The design of all sanitary sewers shall be based on the Peak Wet Weather Flow.
 - (2) Average daily sewage flow shall be 340 L/cap.d. If a home is serviced by an on-site well, the average daily sewage flow shall be 225 L/cap.d.
 - (3) The peaking factor shall be determined by the Harmon Formula.

- (4) Design flow calculations shall be submitted to the Municipal Engineer for review.
5. Pipe slopes shall be selected so that sanitary sewer velocities shall not be less than 0.6 m/sec nor greater than 4.5 m/sec.
6.
 - (1) A minimum of 75 mm clearance is required between the outside of pipes at all sewer pipe crossings.
 - (2) A minimum of 450 mm clearance in vertical and horizontal direction is required between sewer pipes and water pipe crossings without sleeving.
 - (3) Sanitary sewer forcemains and watermains shall be installed in separate trenches and be 1.0m apart except at crossings, where clause 7(2) of this schedule applies.
7.
 - (1) Sanitary sewers shall be located, wherever possible, either within, or close to the hard shoulder of the road. No sanitary sewer shall be installed in a location such that in the event of repairs having to be carried out, both road lanes would have to be closed.
 - (2) Manholes shall be located at every intersection of mains; change of grade; alignment change greater than pipe specified limits for curves, size, or material of the sewers; and shall not be greater than 90 m apart, or as approved by the Municipal Engineer.
8. Gravity sanitary sewer pipe, joints, fittings, and service saddles shall be of the following material and shall be manufactured to the "Standard Specifications for Municipal Services", or as otherwise approved:
 - (1) Pipe
 - a. Reinforced concrete pipe to A.S.T.M. Specifications c-76.
 - b. Polyvinyl chloride pipe to CSA B182.1-M and CSA B182.2-m.
 - c. Polyethylene pipe to CSA B182.6-06 - Profile Polyethylene Sewer Pipe and Fittings for Leak-proof Sewers.
 - (2) Pipe Joints, Fittings, and Services Saddles
 - a. Joints and fittings shall be as specified in the "Standard Specifications for Municipal Services".
 - b. On existing concrete mains, a PVC saddle shall be used.
9. (1) Standard precast concrete manholes shall be used within the public right of way complete with frame and cover, IMP R10. The manhole cover is to include a 50 mm

high manhole riser as manufactured by IMP. The manhole cover is to be grouted to the manhole chimney.

- (2) All changes of direction in sewer pipe greater than 60 degrees inside a manhole requires a 150 mm drop.
- (3) A vertical drop pipe shall be provided at manholes, where the vertical distance between the invert of the outlet and the invert of the inlet pipe is 600 mm or more. However, drop manholes should be avoided and used only when it is not economically feasible to increase the slope of the incoming sewer.
- (4) Precast concrete manholes shall be 1 m diameter minimum, with the top diameter minimum of 0.7 m. The 0.7 m diameter manhole chimney shall be a maximum of 0.6 m high.
- (5) Asphalt-topped roads shall have manhole covers placed flush with finish grade. Gravel-topped roads shall have manhole covers placed 25 mm below finish grade.
- (6) All manholes shall be wrapped in watertight material.

BUILDING SEWERS

10. (1) Building sewer "laterals" shall be connected to the main with tees, saddles or approved equivalent as per the "Standard Specifications for Municipal Services". Breaking into a street sewer shall not be permitted. Connecting to a manhole or wetwell shall only be considered under exceptional circumstances.
- (2) Separate and independent sewer laterals shall be provided for every single unit house, each unit in a semi-detached, each apartment building or other building.
- (3) Laterals shall be constructed as per the terms and conditions of the Municipality's "Sewer Work Permit". Laterals shall be PVC SDR 28 or match the material of the main where new systems are being constructed concurrently.
- (4) Place bell-end or coupling at the property line end of the lateral.
- (5) Place laterals perpendicular to the main, wherever possible.
- (6) Laterals shall be 100 mm diameter for single unit houses and sized accordingly for apartments, restaurants, factories and such, with a minimum non-residential lateral diameter of 150 mm.

PRESSURE SEWERS

11. Pressure sewer pipes or forcemains shall conform to the following specifications.
 - (1) Polyvinyl chloride pipe to CSA 137.3-M. Minimum SDR 26. Minimum diameter 50 mm.
 - (2) The forcemain shall be connected into a specially designed manhole properly benched and channelled. The drop between the inverts of the forcemain outlet and the outgoing pipe shall be a maximum of 450 mm.

PUMPING STATIONS

12.
 - (1) The minimum diameter of any pumping station wetwells shall be 1.8 m. The pumping station structure shall be designed for external earth and water pressure and for uplift caused by floatation.
 - (2) Drywells of pumping stations shall be complete with galvanized ladders and landings.
 - (3) Pumping stations shall be capable of automatic switch-over.
 - (4) Wetwells shall be designed so that confined space entry is not required to conduct maintenance and repairs of the equipment inside the wetwell.
 - (5) All wetwells shall have a safety grate installed.

SANITARY SEWERS – NEW WASTEWATER FACILITIES

13.
 - (1) Small diameter gravity sewers and septic tank effluent pump (STEP) pressure sewer systems and conventional gravity systems are permitted. Vacuum systems shall not be considered.
 - (2) For STEP systems, each building or, in the case of duplexes or townhomes, each unit, shall be connected to a septic tank. Grinder pumps shall not be considered.
 - (3) The Municipality shall not be responsible for the maintenance of STEP septic tanks.
 - (4) The wastewater treatment plant design shall be of a low maintenance system as approved by the Municipal Engineer.
 - (5) Supervisory control and data acquisition (SCADA) systems as approved by the Municipal Engineer shall be installed.

SEWER TESTING

14. (1) The developer shall pay the cost of all tests which shall be carried out in the presence of the Municipal Engineer or designate.
- (2) Sanitary sewers shall be tested as per "Standard Specifications for Municipal Services".
- (3) Pressure sewers shall be tested as per "Standard Specifications for Municipal Services".

PUBLIC DRINKING WATER SERVICES – WATERMAIN SERVICES EXTENSIONS

15. The Municipality shall only consider extensions to existing water transmission and distribution mains.
16. The water system shall conform to the standard of the water utility or service commission that operates the public drinking water supply.

ENGINEERING DRAWINGS

17. Engineering drawings shall include a plan, profile, cross sections, right-of-way limits, details and specifications, duly stamped and signed by a Registered Professional Engineer of the Province of Nova Scotia. They should be drawn using a CAD drafting software. Survey and design shall reference UTM NAD83 Zone 20 and CGVD 2013 coordinate systems for ease and accuracy of transfer to the Municipality's GIS system (ESRI ArcGIS).

SCALE

18. The scale of drawings shall be:
 - (1) Horizontal - 1:500.
 - (2) Vertical - 1:50.
 - (3) Cross sections and detail plans to be scaled as required to illustrate the subject.

PLAN

19. The engineering plan shall include, but not be limited to, the existing and proposed location and horizontal alignment of:

- (1) Sanitary sewers with lengths, sizes, types and all related appurtenances.
- (2) Water system with lengths, sizes, types and all related appurtenances.
- (3) Sanitary and water services for buildings to street line.
- (4) All other utilities.
- (5) Culverts.
- (6) All horizontal street line curves, the beginning of the curve, the end, the tangent distance, intersecting angle.
- (7) Power poles and all other utilities.
- (8) Road shoulders and ditches.
- (9) Cross references to the other plans including existing plans of any adjacent subdivision.
- (10) Property lines, right-of-ways, and easements.

PROFILE

20. The profile shall include the existing and proposed vertical alignment of:
 - (1) The centre line and street lines.
 - (2) The sanitary sewer and appurtenances.
 - (3) The water system and appurtenances.
 - (4) The soil profile.
 - (5) Underground utilities.
 - (6) Culverts.

CROSS SECTION

21. The cross section shall include:

- (1) Existing conditions.
- (2) Existing and proposed services.

DESIGN AND CONSTRUCTION DETAILS

22. Design and construction details shall include, but not be limited to, the relevant products and execution procedures for:

- (1) Earthwork
 1. excavation
 2. backfilling (maximum lifts and compaction)
 3. side slopes
 4. dewatering
 5. gradation of materials

- (2) Water Services
 1. main
 2. lateral
 3. appurtenances
 4. hydrant
 5. installation
 6. testing
 7. chlorination and flushing

- (3) Sanitary Sewer
 1. main
 2. lateral
 3. appurtenances
 4. installation
 5. testing

LATERAL CARDS

23. (1) The Developer shall complete lateral cards for all services installed.
- (2) Blank lateral card formats shall be obtained from the Municipal Office.

- (3) Lateral cards shall include all information relating to the lateral including, length, location, inverts, and lot features, i.e. power poles, culverts and property pins.

RECORD DRAWINGS

- 24. (1) The Developer shall complete Record Drawings (As-builts) that accurately reflect the construction system.
- (2) Survey and design shall reference UTM NAD83 Zone 20 coordinate system for ease and accuracy of transfer to the Municipality’s GIS system (ESRI ArcGIS).
- (3) Drawings are to be completed in AutoCAD. All data must be in AutoCAD format .dwg. Bind all raster images to the document.
- (4) As-built digital data submissions shall comply with the following specifications:
 - 1. All work shall be referenced using UTM NAD83 Zone 20 coordinate system.
 - 2. All coordinates and dimensions shall be supplied in metric units to an accuracy of ±50 mm.
 - 3. Real world coordinates shall be shown correctly with no front-end truncation of the coordinate values.
 - 4. Data and text files shall be delivered in ASCII format (comma delimited).
 - 5. ASCII files shall contain fields in the following order: Point, Northing, Easting, Elevation, Code, Size (mm). Example: 5271,4913409.875,382817.901,9.92000,SSP,200
 - 6. If the data point indicates a pipe or fitting, then the size of the fitting shall be indicated in mm as well. See above.
 - 7. The data point for all infrastructure of the same type shall receive the same Code as per the following Table:

SEWER – Collection and Treatment Facilities			
Feature Code	Feature Description	Shape Type	Grouping
Pipes and Wires			
SEL	Underground Electrical	Polyline	Electrical
SFM	Force Main	Polyline	Pressure Pipe
SG	Gravity Pipe	Polyline	Gravity Pipe
SL	Lateral	Polyline	Lateral
SELA	Underground Elec. - Abandoned	Polyline	Abandoned
SFMA	Force Main – Abandoned	Polyline	Abandoned
SGA	Gravity Pipe – Abandoned	Polyline	Abandoned
SLA	Lateral - Abandoned	Polyline	Abandoned
Instruments and Fittings			

SARV	Air Release Valve	Point/Block	Instruments & Fittings
SAOV	Automatically Operated Valve	Point/Block	Instruments & Fittings
SCAP	Cap/Blank Flange	Point/Block	Instruments & Fittings
SCO	Cleanout	Point/Block	Instruments & Fittings
SF	Fitting – coupling, bend, etc.	Point/Block	Instruments & Fittings
SI	Inlet	Point/Block	Instruments & Fittings
SO	Outlet	Point/Block	Instruments & Fittings
Structures			
SMH#	Manhole	Point/Block	Manholes
SPS#	Pumping Station	Point/Block	Pump Stations
SBG	Building	Point/Block	Structure
STK	Tank/Wetwell	Point/Block	Structure
STP	Treatment Plant	Point/Block	Treatment Plant

8. The code used for water systems shall conform to the standards of the operators of the water utility or service commission.
9. Digital record drawing files shall be delivered in a format compatible with AutoCAD. If drawing files contain images and/or externally referenced drawing files the use of AutoCAD 'Sheet Set' or 'ETRANSMIT' is required for assembling a usable CAD submittal package. Include any plot style files (STB or CTB) for plotting purposes.
10. Record drawing sheets shall also be submitted in PDF format. PDF files shall be submitted for each single drawing. Layer information shall be included in the final PDF files. The PDF file for each drawing shall be actual size (1:1) and not scaled to fit a page size.

COMMISSIONING, OPERATING AND MAINTENANCE

25. Commissioning records, standard operating procedures and a detailed maintenance plan shall be submitted to the Municipal Engineer for approval.

EROSION AND SEDIMENTATION CONTROL

26. All work associated with the installation of water and sanitary services shall be shown on a separate plan and include allowances for work progression, the time of year (climate) the work that will be done, instructions for removal of erosion and sediment control materials where required, and in general should comply with the goals and direction in the Nova Scotia Environment's "Erosion and Sedimentation Control, Handbook for Construction Sites".

Clerk's Annotation for Official Policy Book

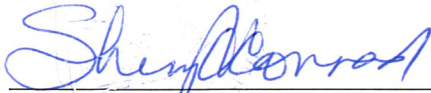
Date of Notice to Council Members: August 28, 2018

Date of Passage of Current Policy: September 24, 2018

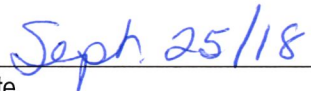
Date of Notice to Council Members
of Intent to Consider Amendments:

Date of Passage of Amendments:

I certify that this "Policy MDL-84" was adopted by Council as indicated above.



Municipal Clerk



Date