

City of Charlottetown – Water and Sewer Utility

The following are minimum requirements for water and sanitary sewer system development within the City of Charlottetown.

1. Sewer mains.

- The Utility strives to have new sewer systems located such that the majority of the piping is not beneath the asphalt road surface. In the future this will permit the majority of maintenance to be performed without impacting on the road surface. Every attempt is to be made to locate sewer mains and manholes sufficiently off of the asphalt portion of the right of way such that repairs and maintenance can be performed without impacting the road asphalt.
- The sanitary sewer system is to be designed and installed in conformance with the Atlantic Canada Standards and Guidelines Manual for the Collection, Treatment and Disposal of Sanitary Sewage.
- The minimum municipal sewer main diameter is 200-mm although the size will be determined based on the area to be serviced through the pipe location.
- The depth of sewer servicing for all lots within the proposed subdivision shall be sufficient to provide underfooting service to a typical full depth (2.44 metre) foundation.
- Minimum acceptable cover over sewer mains and services is 1.8 metres.
- At locations where future connector right of ways are planned to adjacent properties, manholes are to be located complete with a stub for future expansion along these future right of ways. The stub sections of pipe are to extend to the limits of the future connector right of way.
- Sanitary manholes are to be made waterproof. The Utility has recently changed the standard for manholes and requires additional measures to reduce infiltration. Internal joints in manholes are to be sealed using butyl rope (ConSeal CS-202) and then the exterior joint wrapped (ConSeal CS-212) and then the complete exterior Blueskin wrapped.
- Benching within manholes shall be well defined with a channel depth equal to the diameter of the sewer main passing through the manhole. Benching is to sloped at approximately 2% from the manhole walls to the top of the channel. Directional changes within the benching are to be gradual sweeps to ensure the flow is directed appropriately within the manhole.
- Manhole cover elevations shall be set flush with grade elevation or as is required to permit clear access and protect from damage due to vehicles, snowplows, grass cutting, etc.
- Manhole covers shall be marked “SANITARY”.
- During the period between when base asphalt is installed and the final asphalt seal is installed Developer’s shall make provision to temporarily set manhole cover elevations

such that they are slightly below the elevation of the asphalt or shoulder at the manhole. This will assist to protect the covers from damage during this period, which often extends through a winter and snow clearing operations. Following the installation of final asphalt seal the Developer shall make final adjustments to raise manhole covers to an elevation flush with and no higher than the final surrounding elevation.

- Appropriate grade rings shall be used for final elevation adjustments to manhole covers. A minimum number of appropriately sized grade rings shall be used at each manhole. The depth of grade rings at each manhole shall be between 300 mm and 600 mm. Grade rings shall be waterproofed as described for the remainder of the manhole.

2. Watermains.

- The Utility strives to have new water systems located such that the majority of the piping is not beneath the asphalt road surface. In the future this will permit the majority of maintenance to be performed without impacting on the road surface. Every attempt is to be made to locate watermains and gate valves sufficiently off of the asphalt portion of the right of way such that repairs and maintenance can be performed without impacting the road asphalt.
- The water system is to be designed to provide fire protection and general service and is to be in conformance with the Atlantic Canada Guidelines for the Supply, Treatment, Storage, Distribution and Operations of Drinking Water Supply Systems, Water Supply for Public Fire Protection – Fire Underwriters Survey and the AWWA M31 Distribution Systems Requirements for Fire Protection.
- The minimum municipal watermain diameter is 150-mm although the size will be determined based on the area to be serviced and the requirements for fire protection.
- Minimum acceptable cover over water mains and services is 1.8 metres.
- Prior to and during construction the Developer is to prevent entry of bedding material, water or foreign matter into the new pipes. The use of temporary covers during transport and watertight bulkheads when pipe laying is required. To ensure installed pipes are clean of debris, the Developer is to have pipes swabbed as they are being installed.
- Fire hydrants are to be located as per the Fire Underwriters Survey – Water Supply for Public Fire Protection, 1999. Typical spacing of hydrants within single-family residential areas is 180 meters with hydrants being placed at intersections, dead-ends and midway along long blocks. Typical spacing of hydrants within multi-family residential, commercial, industrial and institutional areas is 90 meters with hydrants being placed at intersections, dead-ends and midway along long blocks.
- Hydrants are to be supplied and installed as per the Charlottetown standard.
- Each fire hydrant shall have an individual control valve. The Utility has made recent changes to the standard for locating the fire hydrant control valve. The individual control valve is to be located no closer than 1.5 meters to the hydrant and is preferred to be located within 1 meter of the branch connection to the watermain.

- Fire hydrants shall be located within the public right of way, between 600 to 1000 mm of the edge of the proposed right of way. Fire hydrants shall be located such that they are greater than 3 meters from objects (objects such as power poles, transformers, electrical cables, telephone cables and junction boxes, TV cables and junction boxes, etc) that will interfere with snow removal, access and regular maintenance of the hydrant.
- Fire hydrants shall be tested, in conformance with the watermain testing, for pressure, leakage and proper operation.
- Hydrants are to be supplied such that they are delivered with the correct bury for the location planned for each hydrant. Bury extensions are to be avoided where possible and if required are to be installed by the manufacturers representative. As much as possible Hydrants shall be set at the appropriate elevation that permits a level approach to the hydrant from the shoulder of the road with the break away flange at the correct elevation as detailed by the manufactures recommendations. Prior to ordering fire hydrants elevations are to be obtained to confirm the correct bury for each location.
- Where fire hydrants are located beyond an open ditch the ditch shall be infilled at the hydrant complete with an appropriate diameter and length of culvert to permit level access to the hydrant from the shoulder of the road. The infilling shall result in a 6-meter wide level surface, centered on the hydrant, from the shoulder of the road out to and 2 meters beyond the hydrant.
- Unless otherwise not possible, watermains shall be looped with no dead-end pipes.
- The watermains are to be installed so that high spots are not created. In the event they cannot be avoided, provision shall be made to automatically expel air as it accumulates.
- At locations where future connector right of ways are planned to adjacent properties, an appropriately sized watermain branch is to be located complete with a gate valve and capped section of pipe, for future expansion along these future right of ways. The capped sections of pipe are to extend to the limits of the future connector right of way.
- Gate valves are to be located to provide optimal control of the water system.
- Gate valve boxes are to be set plumb and centred, using a proper guide plate, over the valve-operating nut.
- Gate valves installed deeper than 2.4 meters shall be installed complete with an operating nut extension stem to bring the operating nut within 1.6 meters of final grade.
- Valve box tops and cover elevation shall be set flush with grade elevation or as is required to permit clear access and protect from damage due to vehicles, snowplows, grass cutting, etc.
- Gate valve box covers shall be marked "WATER".
- During the period between when base asphalt is installed and the final asphalt seal is installed Developer's shall make provision to temporarily set valve box cover elevations such that they are slightly below the elevation of the asphalt or shoulder at the valve box. This will assist to protect the covers from damage during this period, which often extends

through a winter and snow clearing operations. Following the installation of final asphalt seal the Developer shall make final adjustments to raise valve box covers to an elevation flush with and no higher than the final surrounding elevation.

3. Property Services.

- The minimum water service pipe diameter is 19-mm.
- The minimum sewer lateral diameter is 100-mm. Slope on sewer laterals is 2%.
- Minimum acceptable cover over service laterals is 1.8 metres.
- Property services are to be sized and located appropriately for the planned development of each property. Typically unless otherwise determined, the location of service pipes is to be at the centre of the property frontage of the lot being serviced. Services should not be located where driveways or sidewalks are planned.
- Water service shut off valves are to be located at the edge of the street right of way and a minimum of 1.5 meters away from road asphalt, curbing, sidewalks or any other structures that will interfere with future maintenance of the service valve.
- Sprinkler services if required, are to be installed separately from domestic water services.
- Duplex lots, if included, are to be serviced with separate water and sewer services for each of the units within the duplex building. Duplex services shall be located across the property frontage such that the service pipes, to a future building unit, are located greater than 2 meters away from the center point of the property frontage and in front of the future building unit to be serviced.
- All approved building lots are to be provided water and sewer service at the time the mainline is installed along the lot frontage.
- Service laterals are to be installed completely from the main line on the proposed street to the edge of the street right of way. Upon completion the water service curb stop and capped sanitary lateral are to be marked with a wooden marker (38x89mmxdepth of lateral), which is to extend above grade at the edge of the proposed street right of way adjacent to the lot being serviced. The sanitary sewer lateral marker shall include a written measured depth from a line drawn on the marker to the pipe elevation.
- At locations where the sanitary main exceeds 3 metres depth the property laterals are to be installed such that their depth at the edge of the street right of way is no greater than what is required for a typical full depth (2.44 metre) foundation.

4. Requirements in the event the developer wishes to install underground infrastructure such as power, telephone, TV cables, heat pipes, etc are as listed below:

- A minimum horizontal separation distance of no less than two (2) meters, is to be maintained between municipal water and sewer mains and services and any other underground infrastructure;

- A vertical separation distance of no less than three hundred (300) millimeters is to be maintained between municipal water and sewer mains and services and any other underground infrastructure;
 - When other underground infrastructure is installed passing next to manholes, catch basins, gate valves, fire hydrants, service boxes, etc., a separation distance of no less than two (2) meters is to be maintained;
 - Other underground infrastructure is to be installed at an elevation that will permit, and not interfere with, future servicing from water and sewer mains;
 - All plans for the construction and installation of other underground infrastructure shall be provided to the City of Charlottetown for review and approval prior to commencement of construction.
5. Project plans and specifications shall be prepared, signed and sealed by a Professional Engineer registered or licensed to practice in the Province of Prince Edward Island.
 6. Prior to construction, the Developer's engineer shall prepare and submit a preliminary design of the proposed water and sanitary sewer systems to the Charlottetown Water and Sewer Utility. Upon completion of the Utility review applicable comments will be returned to the Developer's Engineer to identify changes that will be required to receive the Utility's approval. Upon completion of revisions to the plans, as may be required, the Developer's engineer shall submit a final design plan and specification of the proposed water and sanitary sewer systems to the Charlottetown Water and Sewer Utility. No construction shall take place until the Utility and City of Charlottetown has provided approval.
 7. Prior to construction, the Developer's engineer shall prepare and submit an application complete with a design brief to the PEI Department of Environment, Energy and Forestry, as required by the PEI Environmental Protection Act, and submit a copy of the application and design brief to the Utility. No construction shall take place until the City has received a copy of the Certificate of Approval from the PEI Department of Environment, Energy and Forestry.
 8. Prior to construction, in addition to the approvals required from the PEI Department of Environment, Energy and Forestry, the Developer shall have approval to proceed with construction from the Charlottetown Planning Department.
 9. Prior to construction the Developer/Developer's Contractor shall make an application to the Utility for services such as interconnections to existing systems, inspections, operating valves during disinfection and flushing. The Developer/Developer's Contractor shall pay the cost of this service. At the time of application, a deposit to the Utility is required. The deposit amount is determined during the review of plans and specifications. Any additional cost above the deposit amount will be billed to the Developer/Developer's Contractor and any surplus will be returned. All materials required for the interconnections to existing municipal services shall be the contractor's responsibility to supply.
 10. Easements, if required for the water and sewer installations are to be reviewed and approved by the Utility prior to final acceptance and execution/registration. The minimum easement width for Utility lines shall be 9.1 meters however the depth of the underground lines may require a wider easement. All easement documents shall include reference and provision for water and sewer lines.

11. The total cost to design, supply and install water and sewer systems along with associated mains, services, valves, hydrants, lift stations, manholes, fittings, etc is to be paid by the developer.
12. All costs associated with alterations that are required to existing municipal water and sewer systems, as a result of the proposed development, is the responsibility of the developer.
13. The developer's engineer shall be responsible to provide full time construction inspection to ensure the minimum standard of acceptability is met during construction and shall be required to provide written certification that the installed water and sewer systems are in conformance with the plans and specifications approved by the City. All water and sewer systems are to be inspected by the developer's engineer prior to being covered by the contractor. Copies of all test reports are to be provided to the Utility prior to activation of systems.
14. During construction the developer's engineer shall accurately record the information about the installed systems such that accurate as-built drawings can be created.
15. It shall be the responsibility of the developer to ensure all authorities having jurisdiction have been advised and have given necessary approvals as required.
16. Unless carried out as a single project, each phase of the development will require individual Utility approval prior to construction.
17. During construction all connections made to existing municipal water or sewer systems are to be carried out by or under the supervision of the Utility. All costs for such connections are the responsibility of the developer.
18. During construction, the contractor shall not operate any existing Utility valves, new tapping valves or services.
19. Upon receipt and review of the plans including specifications, the proposed plan for water and sewer servicing will be directed to the Utility Committee for formal Utility approval.
20. Quality Control during construction is the responsibility of the Developer. Prior to activation the Developer shall ensure that the new systems are installed in accordance with the plan and specification originally approved by the City. The Developer's Engineer and Contractor shall perform the necessary inspections and review of their work, in advance of requesting acceptance by the City/Utility, to identify installations that are not in keeping with the approvals and shall correct deficiencies prior to requesting a site inspection by the City/Utility.
21. Prior to activation and acceptance of services the developer shall make the necessary arrangements for a complete site inspection of installed water and sewer services. At the time of the inspection the developer, the developer's engineer, the developer's contractor and the Utility shall be present. The developer shall correct deficiencies prior to activation and acceptance of the systems by the Utility.
22. Prior to activation of water and sanitary sewer installations the following work must be completed: (these additional requirements are required to meet substantial completion)

- Pressure & Leakage testing of water systems must be successful and reports of the test results filed with the City/Utility. This testing is to include all water system components including an internal testing of fire hydrants.
 - Water Quality tests must be successful and reports of the test results filed with the City/Utility. Reports are to identify location (station) where samples were obtained and the Chlorine residual at the time of testing.
 - Testing of sanitary systems must be successful and reports of the test results filed with the City/Utility.
 - Flushing and sampling points must be removed from the installations.
 - Gate valves, fire hydrants and manholes must be accessible, plumb and free of debris.
 - Water and Sewer services are to have markers and depth indicator in place.
23. As built drawings and information (including final cost information) shall be provided to the City/Utility immediately following activation of the systems. Developers are advised to submit preliminary as-built drawings for review and acceptance prior to final as-built submittal.
24. As built information and drawings shall be field confirmed by the Developer's Engineer prior to submission to the City/Utility.

Requirements for As-Built Drawings and Records

All original as-built drawings and records shall be submitted in the following form:

1. Drawings and records shall be certified as being accurate by the Engineer preparing the records with the individual drawings and documents being stamped and signed by a Professional Engineer registered or licensed to practice in the Province of Prince Edward Island.
2. Drawings shall be submitted as:
 - One copy on single matte, .08 mm drafting film.
 - Two copies blue print paper
 - One complete electronic copy in AutoCAD format supported by AutoCAD 2010
 - Paper size to 762 mm x 1067mm (30" x 42")
 - NO SEPIAS
3. All drawings shall be dimensioned to be plotted at 1:250 Horizontal and 1:100 Vertical with a single plan view (on top of sheet) and single profile view (on bottom of sheet) per sheet, details sheet to be separate. Drawings are to be to scale.
4. As-built drawings shall be a true reflection of what was built and not a reissued construction plan. Drawings shall accurately reflect the location of manholes, gate valves, watermain fittings, service boxes, lateral pipes, fire hydrants, etc. If necessary to accurately depict what has been built, post construction total station or GPS surveys may be required.

5. As-built drawings shall include physical ties (measurements) to assist with locating all gate valves, manholes, fire hydrants, distance between hydrant and hydrant control valve, watermain fittings (such as bends, tees, crosses, etc), water service laterals and sanitary sewer laterals. Ties shall be referenced to permanent fixtures such as survey pins, power poles, manholes, etc.
6. As built records shall include the number of turns and direction to open for full operation of all gate valves and fire hydrants.
7. All elevations are to be geodetic with locations of all survey monuments and other benchmarks from which elevations were derived included on original as-builts. Position of all points shall be in accordance with the PEI Double Stereographic Projection, NAD83 Datum with CSRS98 Realization.
8. Operation and maintenance manuals (3 copies) to be compiled in expandable catalogue binders with hard cover, full metal hinge and spine, and three-hole slide lock mechanism. O&M Manuals are to include structural, mechanical and electrical for proposed lift station and related infrastructure.