

SCHEDULE 8 - WATER SUPPLY

8. Water Supply General

- 8.1. Each parcel in a subdivision within the City of Langford shall have a water supply provided by the City or Capital Regional District Water Service (CRDWS) as determined by the City Engineer.
- 8.1.1. All designs for extensions of the City or CRDWS water system shall be reviewed and approved by a drinking water officer in accordance with the *Drinking Water Protection Regulations* under the *Drinking Water Protection Act*.
- 8.1.2. Individual wells may be permitted in areas outside the CRDWS service area provided that each parcel shall have a proven source of potable water of not less than 4000 litres per day.
- 8.1.3. Individual wells are permitted for non-potable water uses on City owned land.
- 8.1.4. Where water is to be supplied by the CRDWS, the CRDWS specifications shall have precedence. If CRDWS specifications are silent on any issue, the specifications in this schedule shall apply.
- 8.1.5. Each parcel in a subdivision or development which is provided with a water supply from the City or CRDWS shall have sufficient pressure in the water supply at the property line to meet the requirements of the BC Building Code and shall be shown to have sufficient pressure to meet the requirements of the BC Building Code for water pressure at the faucet at the highest point at which a plumbing fixture could be installed on the parcel having regard to the restrictions in the City Zoning Bylaw and in any Covenants registered on the property. A Professional Engineer shall approve and certify the required pressures.

8.2. Water Supply Facilities

- 8.2.1. Where water supply facilities (pump station or PRV station) are located within a road right of way or a statutory right of way in favour of the CRDWS and/or the City of Langford within private property, the facility meet the following landscape requirements:
- 8.2.1.1. A landscape plan shall be provided.
- 8.2.1.2. All utility boxes, including generators to be wrapped with anti-graffiti wrap (all sides and top of box). Anti-graffiti wrap images shall be approved by the City Parks Manager.
- 8.2.1.3. 1800mm (6'-0") high cedar wooden fencing along property lines adjacent to residential housing.
- 8.2.1.4. Fully automatic irrigation system to City of Langford specifications.

8.2.1.5. Shrub, tree and groundcover planting to City of Langford Parks department approval.

8.3. Services and Fittings

8.3.1. 20mm and 25mm water service tubing shall be copper.

8.3.2. 39 mm and 50 mm water service tubing shall be type K soft copper tubing or approved alternative.

8.4. Network Requirements

8.4.1. Where a final road pattern of a subdivision creates a watermain network with excessive dead ends, a supplementary connection of a minimum of 150 mm diameter shall be required to an existing main and may necessitate the provision of a Right-of-Way over private property in favour of the City.

8.5. Pipe Capacity

8.5.1. Minimum Sizes

8.5.1.1. Watermains shall be a minimum of 150mm diameter.

8.5.1.2. In a cul-de-sac with ultimate length not over 90 metres and no fire hydrants, where the watermain dead ends, the watermain size may be reduced to 100mm diameter.

8.5.1.3. Water services for single family residential or duplex shall be minimum 19mm. The size may be increased at the direction of the City Engineer to 25mm to reduce potential headlosses through the service.

8.5.2. Friction Factors

8.5.2.1. Flow calculations should be done using the Hazen-Williams formula, using the following roughness coefficients:

8.5.2.1.1. PVC pipe C = 150

8.5.2.1.2. Ductile Iron pipe C = 130

8.6. Maximum Headloss

8.6.1. Watermains shall be sized such that under maximum day flows, the head loss is no more than 5 metres per 1000 metres.

8.7. Locations

- 8.7.1. Watermains shall extend at least 1.25 m beyond the pavement for extendible roads but shall terminate 1.25 m inside the curb line of the extreme end of a permanent cul-de-sac.

8.8. Minimum Cover

- 8.8.1. All watermains and services shall have a minimum cover of 1 metre.
- 8.8.2. All watermains 200 mm diameter and larger shall be installed to a designed grade.

8.9. Separation to Other Services

- 8.9.1. At any location there shall be a minimum horizontal clearance of 3m between a watermain and a sanitary sewer or storm drain. The Consulting Engineer shall first obtain approval of the Regional Public Health Engineer if an alternative is to be proposed.
- 8.9.2. At any location there shall be a minimum horizontal clearance of 1m between a watermain and any other existing or proposed underground services or open ditches.
- 8.9.3. Watermains shall not be located within 1 m of any utility pole.
- 8.9.4. Where it is necessary for a watermain to cross other underground services the crossing shall be made at an angle greater than 20°. The vertical clearance between sanitary sewers or storm drains and the watermain at the crossing point shall be not less than 450mm. For all other services, the vertical clearance shall be not less than 150mm.

8.10. Replacement of A.C. Pipe at Crossings of Other Services

- 8.10.1. When another service (e.g., sewer or drain) is installed such that it crosses below an existing asbestos cement (AC) watermain, the existing watermain material shall be replaced with ductile iron pipe for a distance of at least two metres beyond each edge of the trench of the service crossing the watermain.

- 8.11. The watermain replacement work shall be done by the City or CRDWS at the Applicant's expense, and this shall be indicated on the Design Drawings.

8.12. Thrust Blocks, Joint Restraints

- 8.12.1. Thrust blocks or joint restraint fittings shall be specified at all tees, bends, and caps.

- 8.13. Vertical/horizontal Curves
- 8.13.1. Watermain pipe may be deflected at each joint in accordance with the manufacturer's recommendations. PVC pipe is not to be bent.
- 8.14. Valves (Approved gate valves, CRD Spec 2009/1.2.6)
- 8.14.1. Valves shall be as per MMCD W3, except that the operating nut shall be 32mm square and the valve shall open clockwise.
- 8.14.2. Valves shall be located so as to direct the flow of water to the required areas and to minimize the portion of the distribution system affected by a single water main break or shut down.
- 8.14.3. There shall be at least two valves at a "tee" (other than for hydrants) and three valves at a "cross", although the preference is to have three and four valves respectively. Valves shall be attached directly to fittings on the downstream sides and shall be of the same diameter as the fittings.
- 8.14.4. Line valves shall be not more than 350 m apart. For convenience of operations, line valves should be located adjacent to a hydrant tee if there are no connecting mains within 120 metres.
- 8.14.5. Line valves or hydrant valves shall not be located closer than 600 mm to a curb line, in a ditch, or above another service.
- 8.14.6. On service connections greater than 25 mm, a valve shall be placed on the connection adjacent to the main.
- 8.15. Fire Hydrants
- 8.15.1. For one and two family residential development, the centre of the building envelope as identified in Bylaw 300 for the appropriate zone shall be within 150 metres of a fire hydrant, measured along the access route as defined in Building Bylaw No. 1160 and along the highway to which the access route connects. For all other building types fire protection shall be as prescribed by Building Bylaw 1160.
- 8.15.2. For Commercial, Industrial, Institutional and Multi Family Zones, as identified in Bylaw 300, fire hydrants are required every 90 metres.
- 8.15.3. In addition to the requirements of this bylaw, fire hydrants shall be located at 150 metre intervals along all collector and arterial roads regardless of the density of development adjacent. For 4 lane arterial roads with, or designated to be constructed with a raised median, fire hydrants shall be located on both sides of the road at 250 metre spacing per side.
- 8.15.4. Fire flow demand shall be in accordance with the current "Water Supply for Public Fire Protection", by the Fire Underwriters Survey (FUS) for the existing or anticipated land use. Residual pressure at the flow rate shall not be less than 140 kPa (20 psi).

- 8.15.5. If FUS recommended fire flows are not available, or subject property is outside the Capital Regional City Water Services service area, a reduction to the prescribed fire flows may be permitted providing the property is charged with a s.219 of the *Land Title Act* covenant that requires all buildings over 300 square feet in area to be serviced with residential fire sprinklers in accordance with NFPA 13D.
- 8.15.6. Fire Hydrants on private property shall be protected by a statutory right-of-way in favour of the City or CRDWS for maintenance.
- 8.15.7. Hydrants shall be as per MMCD W4.
- 8.15.8. Hydrants shall be located in the boulevard and should preferably be located at or near a street intersection; otherwise they may be located on the projection of the property line dividing two lots. In selecting the location for a hydrant, the probable route of the fire engine shall be considered.
- 8.15.9. A hydrant shall not be located within 3 m of a utility pole or light standard, within 1 m horizontally of underground service pipes or open ditches, or within 2.2 m of the curb line.
- 8.15.10. Whenever practical, hydrants shall be near the highest and/or lowest point of the watermain.
- 8.15.11. The design drawings shall indicate the final elevation to which the hydrant flange is to be set. Any adjustments required after the system is in service will be made by the City at the Applicant's expense.
- 8.16. Air Relief Valves
- 8.16.1. Air relief valves shall be as per MMCD W6.
- 8.16.2. Provision shall be made for expelling air by the installation of air relief valves where necessary.
- 8.16.3. Double acting air valves shall be installed at all high points on watermains 200mm and larger.
- 8.17. Flush Valves
- 8.17.1. Flush valves shall be as per Drawing W8SS.
- 8.17.2. Flush valves shall be installed at all dead ends.
- 8.17.3. Provision shall also be made for expelling air during filling by the installation of double acting air valves or test points where necessary. The initial flush shall be through a port which shall be a minimum of ½ the diameter of the main.

8.18. Service Connections

- 8.18.1. Service connections shall be installed to each proposed lot in a development or to each duplex dwelling unit, shall be connected to the main in a road allowance, and shall be installed at right angles to the main, within the boundaries of the lot being served, except in the turning area of a cul-de-sac. No service connection is to be provided to a lot by way of a private easement over another property.
- 8.18.2. Service connections shall be separated from other services as per watermains.
- 8.18.3. Traffic islands with planting areas shall be provided with a 19mm water service.
- 8.18.4. On a panhandle lot, service connections shall be extended from the meter location along the access strip to the main body of the lot at the time of subdivision development.
- 8.18.5. If a development requires a private fire line as well as a domestic water service, the fire line shall be completely separate from the domestic service.

8.19. Backflow Prevention

- 8.19.1. There shall be no physical connection between a public and a private potable water supply system, nor between either a water system and a sewer or appurtenance thereto, which would permit the passage of private water or any sewage or polluted water into the potable public supply.
- 8.19.2. No pipe, valve or fitting which has been exposed to raw sewage shall thereafter be included in a potable water system, either temporarily or permanently.