

COLUMBIA SHUSWAP REGIONAL DISTRICT SUBDIVISION SERVICING BYLAW NO. 641

THIS CONSOLIDATED BYLAW IS NOT INTENDED TO BE USED FOR LEGAL PURPOSES

CONSOLIDATED FOR CONVENIENCE ONLY WITH:

Bylaw No. 641-1

February 3, 2014

**INFORMATION SHEETS ON THE BYLAWS WHICH WERE CONSOLIDATED
INTO BYLAW NO. 641**

BYLAW NO. 641-1 – Adopted January 16, 2014

- text amendment
 - added a Schedule "F" Sewage Collection, Treatment and Effluent Disposal Design Guidelines and Standards (for Sanitary Systems)
 - added a Schedule "I" Sample Latecomer Agreement
 - added new definition for Latecomer Agreement
 - amend **PART 5 SERVICING REQUIREMENTS FOR SUBDIVISIONS** to reflect the authority of the Manager of Operations Management to determine items on the approved product list and to enter into a Latecomer Agreement, and to establish interest rate in regard to Latecomer Agreement
 - amend **PART 6 SANITARY SEWAGE DISPOSAL** in regard to on-site disposal requirements and by inserting a new section specific to community sewer system requirements
 - amend **PART 7 ACCESS TO PROPERTY**
 - amend **PART 8 ASSESSMENT AND DEMONSTRATION OF *POTABLE WATER***
 - amend **PART 9 GENERAL PROVISIONS** (for community water and sewer systems)
 - amend **PART 11 SUBDIVISION COMPLETION REQUIREMENTS**

COLUMBIA SHUSWAP REGIONAL DISTRICT

SUBDIVISION SERVICING BYLAW NO. 641

**A bylaw to regulate and require the provision of services in
respect of subdivision within the Columbia Shuswap Regional District.**

WHEREAS the *Board* of the Columbia Shuswap *Regional District* wishes to repeal and replace Subdivision Servicing Bylaw No. 592;

AND WHEREAS a local government may, by bylaw, regulate and require the provision of *Works and Services* in respect of the subdivision of land, and may delegate, to the *Approving Officer* appointed under the Land Title Act its authority to exempt a *Parcel* of land from the minimum highway *Frontage*;

NOW THEREFORE the *Board* of the Columbia Shuswap Regional District, in open meeting assembled, HEREBY ENACTS as follows:

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Schedule "A"	Levels of Service
Schedule "B"	Assessment and Demonstration of Water Availability and Quality Guidelines
Schedule "C"	Water System Design Guidelines and Standards
Schedule "DB"	List of Eligible Sources
Schedule "E"	Standard Works and Services Agreement Document
Schedule "F"	Sewage Collection, Treatment and Effluent Disposal Design Guidelines and Standards (for Sanitary Systems)
Schedule "G"	Completion Documentation
	Schedule "G.1" Certificate of Provisional Completion
	Schedule "G.2" Certificate of Completion
	Schedule "G.3" Certificate of Final Acceptance
Schedule "H"	Standard Drawings
Schedule "I"	Sample Latecomer Agreement

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PART 1 ADMINISTRATION

APPLICATION

- 1.1 This bylaw applies to all land within Electoral Areas 'A', 'B', 'C', 'D', 'E' and 'F' of the Columbia Shuswap Regional District.

INCORPORATION

- BL641-1 1.2 Schedules "A", and "B", "~~C", "D", "E", "F", "G", "H" and "I"~~ attached hereto form part of this bylaw.

STANDARDS OF MEASURE

- 1.3 Any equivalent imperial units of measure shown, in parentheses, after metric units in any portion of this bylaw are for information purposes only and do not form part of this bylaw.

SEVERABILITY

- 1.4 If any section, subsection, sentence, clause or phrase of this bylaw is for any reason held to be invalid by the decision of any court of competent jurisdiction, the invalid portion shall be severed and the decision that it is invalid shall not affect the validity of the remainder of this bylaw.

DUTY OF CARE AND CAUSE OF ACTION

- 1.5 This bylaw does not create any duty at law on the part of the *Regional District*, its *Board*, Officers, employees, or other representatives concerning anything contained in this bylaw. All works, services, improvements, and all matters required pursuant to this bylaw are the responsibility of the *Owner* and all persons acting on their behalf. No approval of any kind, certificate, permit, review, inspection, or other act or omission by the *Regional District* or any of its representatives, including any enforcement or lack of enforcement of the provisions of this bylaw, shall relieve the *Owner* and all persons acting on their behalf from this duty pursuant to this bylaw and shall not create any cause of action in favour of any person.

SUBDIVISIONS NEAR AGRICULTURE

- 1.6 Where subdivision may be proposed near farming operations or the Agricultural Land Reserve, CSRD staff may advise the *Approving Officer* to consider that the proposal include provisions for adequate buffering or separation of the development from farming, and that the location of highways or highway allowances do not unreasonably or unnecessarily increase access to the land in the Agricultural Land Reserve in accordance with Sections 86(1)(c)(x) and (xi) of the Land Title Act.

OTHER AGENCIES

- 1.7 This bylaw outlines the minimum requirements and regulations pertaining to the subdivision of property. Water Utilities, the Ministry of Transportation and Infrastructure, the Interior Health Authority and other agencies have additional requirements, regulations and approval procedures not contained in this bylaw. It is the applicant's responsibility to ensure that the requirements, regulations and approval procedures of all agencies having jurisdiction are met. Where requirements and regulations of other agencies are inconsistent with this bylaw, the more stringent requirements and regulations shall apply.

TIME LIMITS ON SUBDIVISION REFERRALS

- 1.8 The *Regional District's* final comments on subdivision applications are valid for 18 months, after which time, the *Owner* must obtain current comments from the *Regional District* prior to subdivision approval.

PART 2 INTERPRETATION

2.1 DEFINITIONS

Approved Products List means a list of products approved, and as regularly updated for use by the ~~Manager, Environment and Engineering Services~~ Manager, Operations Management and that is current at the time of construction or installation.

Approved Standard Drawings means the standard drawings approved by the *Regional District* that are current at the time of construction or installation.

Approving Officer means the person appointed under the Land Title Act to deal with applications to subdivide land in the *Regional District*.

ASTM Standards means the applicable standards established by ASTM (American Society for Testing and Materials) International that are current at the time of construction or installation.

AWWA Standards means the applicable standards established by the American Water Works Association that are current at the time of construction or installation.

Board means the Board of Directors of the *Regional District*.

Certificate of Completion means a certificate, in the form approved by the Manager, Operations Management ~~provided in Schedule "C.2", attached to and included in this bylaw~~, issued by the *Owner's Qualified Professional* stating that all *Works and Services* have been completed, including any deficiencies listed on the *Certificate of Provisional Completion*.

Certificate of Final Acceptance means a certificate, in the form approved by the Manager, Operations Management ~~provided in Schedule "C.3", attached to and included in this bylaw~~, issued by the *Regional District* in respect of *Works and Services* required by this bylaw verifying that all requirements of this bylaw have been met by the *Owner*.

Certificate of Provisional Completion means a certificate, in the form ~~provided in Schedule "G-4"~~approved by the Manager, Operations Management, attached to and included in this bylaw, issued by the Owner's *Qualified Professional* stating that:

Works and Services are ready to be used for their intended purpose;

- a) The total cost of addressing incomplete, defective and deficient *Works and Services*, as estimated by the *Qualified Professional* and verified by the *Regional District*, is not more than 3% of the total cost of the *Works and Services*; and,
- b) Fire protection has been approved to the satisfaction of the ~~Manager, Environment and Engineering Services~~Manager, Operations Management, or his designate.

A description of the *Works and Services* that remain to be completed must be included as part of this certificate.

Community Drainage System means a system of works owned, operated and maintained by the Ministry of Transportation and Infrastructure, *Regional District* or a Strata Corporation, designed and constructed to control the collection, conveyance and disposal of surface and other water.

Community Sewer System means a system of works owned operated and maintained by the *Regional District*, Strata Corporation, Improvement District, Utility or Corporation (Private or Public) and which is established and operated under the Public Health Act and regulations, or Environmental Management Act and regulations or any other provincial legislation that may apply, for the collection, treatment and disposal of sanitary sewage, which serves more than one *Parcel*, or *Dwelling Unit*.

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Community Water System means a *Water Supply System* owned, operated and maintained by the *Regional District*; a *Water Supply System* operated by a water utility holding a certificate of Public Convenience and Necessity under the Water Sustainability Act in respect of which no compliance issues under the Drinking Water Protection Act are outstanding as of the date of subdivision application; or a *Water Supply System* operated by a strata corporation, in accordance with the Strata Properties Act, in respect of which no compliance issues under the Drinking Water Protection Act are outstanding as of the date of subdivision application.

Comptroller means the Comptroller of Water Rights under the Water Sustainability Act

C.S.A. Standards means the applicable standard established by the Canadian Standards Association that is current at the time of construction or installation of the *Works and Services*.

Domestic Purposes has the same meaning as in the Drinking Water Protection Act, and more specifically describes Potable Water for a *Dwelling Unit*.

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Domestic Water System has the same meaning as in the Drinking Water Protection Act, but excludes a tank truck, vehicle water tank or other similar means of transporting drinking water, whether or not there are any related works or facilities.

Drilled Well means a well that is greater than 15.0 m in depth installed tested, and reported to the Comptroller of Water Rights in accordance with the Water Sustainability Act, by a *Qualified Well Driller*, in accordance with the Ground Water Protection Regulation.

Dwelling Unit means a use of 1 or more habitable rooms in a building that constitute a single self-contained unit with a separate entrance, and used together for living and sleeping purposes for not more than one family, and containing a kitchen with a sink and cooking facilities and a bathroom with a water closet, wash basin and a bath or shower.

Engineer means a person who is registered in good standing, or duly licensed as such, under the provisions of the Engineers and Geoscientists Act of British Columbia.

Frontage means that length of lot boundary which immediately adjoins a *Highway*, other than a *Lane*. Also a walkway, trail, bridge, or statutory right-of-way granted to the *Regional District* would not be included.

Groundwater has the same meaning as in the Water Sustainability Act.

Health Officer means an officer designated in accordance with- the Public Health Act.

Highway has the same meaning as in the Transportation Act, and any statutory right-of-way granted to the *Regional District* for the provision of public access or the provision of utility services.

Independent On-site Water System means a Domestic Water System that serves only one *Dwelling Unit*.

Lane means a narrow *Highway* which provides secondary vehicular access to any abutting *Parcel*, so that the *Parcel* may be serviced or reached by vehicles using that *Highway*.

Latecomer Agreement means an agreement regarding Excess or Extended Services between the *Owner* and the *Regional District*, in the form approved by the Manager, Operations Management ~~provided by the sample document in Schedule "I" attached to and forming part of this Bylaw~~, and as referred to in Section 939-507 of the Local Government Act.

List of Eligible Sources means a document submitted to the *Regional District* from time to time, and attached to and included with this bylaw as Schedule "~~DB~~", provided by the Comptroller of Water Rights, the Regional Water Manager, or the Assistant Regional Water Manager of the Ministry of Environment that identifies surface water sources in the *Regional District* that are considered by the Ministry of Natural Resource Operations to be capable of providing sustainable domestic water supplies.

MMCD means the latest revised issue of standards as published by the Master Municipal Construction Documents Association.

~~**Manager, Environment and Engineering Services**~~ **Manager, Operations Management** means the person holding that position with the *Regional District*, or a person designated to act in his or her absence.

Mapping for Areas of Groundwater Concern means mapping prepared from time to time by the *Regional District* that shows areas of concern for *Groundwater*.

Owner has the same meaning as in the Land Title Act and includes a person authorized by an *Owner* to make a subdivision application in respect of the *Owner's* land.

On-site Sewage Disposal means the onsite disposal of sewage effluent, ~~that serves only one Dwelling Unit~~ approved pursuant to the Public Health Act.

Parcel has the same meaning as in the Land Title Act and includes a bare land strata lot.

Potable Water has the same meaning as in the Drinking Water Protection Act, in reference to the standards described in Schedule A of the Drinking Water Protection Regulation. For the purposes of this Bylaw, Potable Water also includes any water which after treatment becomes Potable Water.

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Public Utility means a system, work, building, plant, equipment or resource owned by a municipality, regional district, the Province of British Columbia, an improvement district or other government agency or utility company for the provision of water, sewer, drainage, gas, electricity, transportation or communication services, including public and private cemeteries.

Qualified Professional means a person who is registered or duly licensed as a Professional Engineer or a professional geoscientist under the provisions of the Engineers and Geoscientists Act.

Qualified Pump Installer means a person who has been accepted and registered as a *Qualified Pump Installer* by the Comptroller of Water Rights, under the Ground Water Protection Regulation.

Qualified Well Driller means a person who has been accepted and registered as a Qualified Well Driller by the Comptroller of Water Rights, under the Ground Water Protection Regulation.

Regional District means the Columbia Shuswap *Regional District*.

Security Deposit means cash, a certified cheque or an automatically renewable unconditional Irrevocable Letter of Credit drawn on a chartered bank or credit union in Canada.

Shallow Well means a *well* that is either drilled or excavated to a depth of less than or equal to 15.0 m, and which has been installed, tested, and reported to the Comptroller of Water Rights in accordance with the Water Sustainability Act by either a *Qualified Well Driller* or a *Qualified Pump Installer*, in accordance with the Ground Water Protection Regulation.

Site Preparation means any clearing of plant material, grubbing, excavation or disturbance of existing soil, or placement of fill material.

Underwriters Laboratories Standards means the applicable standards established by the Underwriters Laboratories that is current at the time of construction or installation.

~~**Unrecorded Water** has the same meaning as in the Water Act.~~

Water Supply System has the same meaning as in the Drinking Water Protection Act.

Well has the same meaning as in the Water Sustainability Act.

Works and Services means the design, construction, installation and certification of improvements required to be constructed, erected or installed in accordance with the standards established under this bylaw on or adjacent to land under subdivision including, but not limited to earthworks, roadways, trails, sidewalks, boulevards, boulevard crossings, transit bays, street lighting, wiring, water distribution systems other than *Independent On-site Water System*, fire hydrants, sewage collection and disposal systems, drainage collection and disposal systems, other than those *Works and Services* that fall under the jurisdiction of the Ministry of Transportation and Infrastructure.

Works and Services Agreement means a written agreement, pursuant to Section 940-512 of the Local Government Act, in the form approved by the Manager, Operations Management provided in Schedule "E", attached to and included in this bylaw, that describes the terms and conditions agreed upon between the *Regional District* and the *Owner* relative to the provision of *Works and Services* associated with a subdivision.

2.2 LIST OF ACRONYMS

AWWA	American Water Works Association
MDD	Maximum day demand
PRV	Pressure reducing valve
SCADA	Supervisory control and data acquisition
MMCD	Master Municipal Contract Documents

PART 3 MINIMUM HIGHWAY FRONTAGE

3.1 The **Board** delegates to the **Approving Officer** the power to exempt a **Parcel** from the minimum **Frontage** requirement specified in Section 944 of the Local Government Act or in any bylaw adopted under that Section.

PART 4 CONNECTION TO WATER SYSTEMS

4.1 If Schedule "A" requires a Community Water Supply System and it is, in the opinion of the ~~Manager, Environment and Engineering Services~~ Manager, Operations Management, or his designate, feasible to connect the system to a Community Water Supply System owned by the *Regional District* then the proposed subdivision shall be connected to the *Water Supply System* owned by the *Regional District* in accordance with the standards established by this bylaw.

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4.2 If an *Owner* proposes to connect to a *Regional District Community Water System*, existing water sources for an *Independent On-site Water System* must be abandoned in such a way as to prevent cross-connection as per the applicable *Regional District* bylaw.

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4.3 If an *Owner* is connecting to a *Community Water System* documentation must be provided from the operator of the *Public Utility* indicating that all conditions for connection to the *Community Water System* have been met, and that such connection is permitted under the *Public Utility's* operating permits or authorizations. Documentation from the operator of the *Public Utility* is required to be provided to the *Regional District* that the *Community*

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Water System is operating under current authorization from the Authority having jurisdiction.

PART 5 CONNECTION TO SEWER SYSTEMS

5.1 If Schedule "A" requires a *Community Sewer System* and it is, in the opinion of the *Manager, Operations Management*, or his designate, feasible to connect the system to a *Community Sewer System* owned by the *Regional District* then the proposed subdivision shall be connected to the *Community Sewer System* owned by the *Regional District* in accordance with the standards established by this bylaw.

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5.2 If an *Owner* proposes to connect to a *Regional District Community Sewer System*, existing works and services associated with ***On-site Sewage Disposal*** must be abandoned in accordance with the following:

- a) Locate the septic tank and remove the lid;
- b) Have the effluent pumped out by an approved sanitary septic hauler;
- c) Fill in the septic tank with sand or gravel and put the lid back in place, or remove the tank from the ground and fill in the hole; and,
- d) backfill in the soil around the tank to slightly higher than adjacent ground level to allow for settling.

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5.3 If an *Owner* is connecting to a *Community Sewer System* or proposing to utilise an existing *Community Sewer System*, documentation must be provided from the operator of the *Public Utility* indicating that all conditions for connection to the *Community Sewer System* have been met and that such connection is permitted under the *Public Utility's* operating permits or authorizations. Documentation from the operator of the *Public Utility* is required to be provided to the *Regional District* that the *Community Sewer System* is operating under current authorization from the Authority having jurisdiction.

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PART 56 SERVICING REQUIREMENTS FOR SUBDIVISIONS

SERVICING REQUIREMENTS

56.1 Prior to subdivision approval, the *Owner* must provide:

- a) *Highways* within a proposed subdivision and *Highways* immediately adjacent to a proposed subdivision subject to the review, approval and standards of the Ministry of Transportation and Infrastructure;
- b) *Works and Services*, on *Highways* within a proposed subdivision and on *Highways* adjacent to a proposed subdivision as allowed and to the standards of the Ministry of Transportation and Infrastructure, and to the level described in Schedule "A" of this bylaw;
- c) *Works and Services* not within a *Highway* within a proposed subdivision to the level described in Schedule "A" of this bylaw; and,
- d) excess or extended services as described in Section ~~939-507~~ of the Local Government Act.

56.2 The ~~Board~~ delegates to the ~~Manager, Environment and Engineering Services~~ Manager, Operations Management, or his designate the authority to:

- a) determine items included on and revise as necessary, the *Approved Products List*;
- b) determine, and from time to time update the form of documents associated with this Bylaw, including, but not limited to the following:
 - I. Standard Works and Services Agreement Document;
 - II. Sample Latecomer Agreement;
 - III. Certificate of Provisional Completion;
 - IV. Certificate of Completion; and,
 - V. Certificate of Final Acceptance.
- c) establish and update from time to time Design Guidelines and Standards associated with this Bylaw, including, but not limited to, the following:
 - I. Water System Design Guidelines and Standards;
 - II. Sewage Collection, Treatment and Effluent Disposal Design Guidelines and Standards; and,
 - III. Other Standard Drawings, as required.
- ~~a)d)~~ establish, and update from time to time, Guidelines for Assessment and Demonstration of Water Availability and Quality
- ~~b)e)~~ determine what requirements for *Works and Services* are directly attributable to a subdivision in any particular case;
- ~~e)f)~~ determine what excess or extended services are required in connection with a subdivision;
- ~~e)g)~~ determine whether the cost of such excess or extended services is excessive such that the *Owner* must pay the costs;
- ~~e)h)~~ identify, in accordance with Section ~~939-508~~ of the Local Government Act the benefiting properties in relation to excess or extended services;
- ~~f)i)~~ determine what proportion of the costs associated with the excess or extended services is associated with each benefiting property; and,
- g) enter into a *Latecomer Agreement* for the excess or extended services with the *Owner* in the form approved by the Manager, Operations Management ~~prescribed in Schedule "I" of this bylaw.~~

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56.3 All *Works and Services* shall be provided to the standards required in ~~Schedules "C", "F" and "H"~~ the Design Guidelines and Standards, and Drawing Standards, as approved by the Manager, Operations Management, as noted in Section 6.2 (c), of this bylaw."

56.4 Notwithstanding Section ~~56.1~~, the *Owner* may obtain subdivision approval prior to the provision of *Works and Services* if the *Owner* provides a *Security Deposit* in accordance

with Section ~~40~~11.2 and enters into a *Works and Services Agreement*, as approved by the Manager, Operations Management substantially in the form of Schedule "E" and described in Section 6.2(b) of this bylaw, with the *Regional District*.

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56.5 The interest rate applicable to excess or extended services and latecomer charges under Section ~~939-508(4)~~ of the Local Government Act will be equivalent to the Bank of Canada Prime Business rate plus two percent (2%) calculated from the date on the Certificate of Completion of the Excess or Extended Services as certified by the engineering firm utilized by the *Regional District* to the date of connection by the benefitting parcel. Interest shall be compounded annually on the anniversary date of completion.

EXEMPTIONS

56.6 Section ~~56~~.1 does not apply if:

- a) the subdivision creates only parkland or natural areas, a *Parcel* for the installation of *Public Utilities* and related structures and equipment, or a *Parcel* to be used only for the parking of motor vehicles;
- b) a covenant restricting the use of the *Parcel* to a park, natural area conservation or *Public Utilities* purpose has been registered on title under s. 219 of the Land Title Act in favour of the *Regional District*; or,
- c) The proposed subdivision involves common lot accesses, as contemplated in BC Reg 334/79, part 12~~,-~~

PART ~~67~~ SANITARY SEWAGE DISPOSAL

GENERAL REQUIREMENTS

67.1 Proof must be supplied by the *Owner* to the *Regional District* that an adequate sanitary sewage disposal method for each *Parcel* can be provided. The *Regional District* reserves the right to forward any documentation received to the jurisdiction having authority over the proposed sanitary sewage disposal system, whether it be an On-site Disposal system or a Community Sewer System.

ON-SITE DISPOSAL

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67.2 The *Owner* must submit to the *Regional District* documentation from an Authorized Person, as defined in the Public Health Act, that confirms that the *On-site Sewage Disposal* requirements of the Sewerage System Regulations of the Public Health Act, and any other requirements imposed by the *Health Officer* can be satisfied. Such documentation must include a site assessment and recommendations for design and construction of the *On-site Sewage Disposal* system, or a Permit to Construct issued by a *Health Officer*.

7.3 Where a lot contains a *dwelling unit* serviced by an existing *On-site Sewage Disposal* system, the *Owner* must provide documentation that the *On-site Sewage Disposal* system has either:

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a) been approved by the Interior Health Authority; or,

b) been inspected by an Authorized Person, who confirms that the existing septic system is functioning in accordance with the *On-site Sewage Disposal* requirements of the *Sewerage System Regulations of the Public Health Act*.

67.34 Notwithstanding the above, in no case shall a *Parcel* be serviced by *On-site Sewage Disposal* if a *Community Sewer System* is available to service the property. The ~~Manager, Environment and Engineering Services~~ Manager, Operations Management, or his designate, at his discretion will determine if a system is available for a connection, in accordance with Subsections 5.1 and 5.3.-

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COMMUNITY SEWER SYSTEM

67.45 If a proposed subdivision requires installation of a new *Community Sewer System*, the *Owner's Engineer* is required to design the system in accordance with *Sewage Collection, Treatment and Effluent Disposal Design Guidelines and Standards, as approved by the Manager, Operations Management, in accordance with Section 6.2(c) Schedule "F" of this bylaw, MMCD standards, the Public Health Act and regulations, or Environmental Management Act and the Municipal Sewage Regulation (BC Reg 129/99) or any other provincial legislation that may apply, for the collection, treatment and disposal of sanitary sewage, the Municipal Sewage Regulation (BC Reg 129/99)* and good engineering practice.

7.6 If a proposed subdivision proposes connection to an existing Community Sewer System, the requirements of Part 5 apply.

DISCHARGE RESTRICTIONS

67.56 *Community Sewer Systems* shall not discharge effluent directly to a watercourse, except as approved by the Ministry of Environment, or as supported in an Electoral Area Liquid Waste Management Plan.

PART 78 ACCESS TO PROPERTY

BUILDING SITES

78.1 An *Owner* must supply a diagram with an application for subdivision that shows adequate building sites for *Parcels* proposed to be subdivided. For the purpose of this bylaw an adequate building site, where on-site sewer and water servicing is proposed, ~~is an identified contiguous area of 1,000 m², having average natural (pre-development) slopes in the identified area of less than 20%,- in-In~~ the case of proposed parcels smaller than 1.0 Ha., at least 40% of the lot area must be under 30% average natural slope.

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ACCESS DRIVEWAYS

78.2 An *Owner* must provide a diagram indicating access driveways to any existing and proposed building site, as indicated in **78.1**, above. Access Driveways, to single *Dwelling Units* must be a minimum of 4.0 m wide and have a maximum grade on the property of less than 15%. Access Driveways, where multiple *Dwelling Units* are proposed must be a

minimum of 6.9 m wide and have a maximum grade of 12.5%. All Access Driveways must conform to Ministry of Transportation and Infrastructure requirements for private access within the Ministry of Transportation and Infrastructure Right-of-Way area.

8.3 Access driveways must be contained within the parcel they are intended to service. If an Owner intends to gain access to a parcel through another parcel, that access driveway, including any works required to support it, must be contained within an easement approved for registration by the Parcel's Owner.

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8.4 If a subdivision proposes alternative access as contemplated in BC Reg 334/79, part 12, such access must conform to Section 8.2, above, and the Owner must enter into a Statutory Right-of-Way agreement with the Regional District under Section 218 of the Land Title Act for access of Emergency Services vehicles, in a form acceptable to the Regional District and in accordance with Sections 10.10 and 10.11 of this Bylaw.

PART 89 ASSESSMENT AND DEMONSTRATION OF POTABLE WATER (for Independent On-site Water System)

APPLICATION AND EXEMPTIONS

89.1 Sections 89.2 through 89.20 do not apply:

- (a) to a parcel being created:
 - i. to provide highway access by common lot;
 - ii. for installation of Public Utilities and related structures and equipment;
 - iii. for use as a surface parking lot, provided that a covenant in favour of the Regional District restricting the use to that purpose is registered against the land under section 219 of the *Land Title Act*;

- (b) to a parcel being created solely for use as an unserviced park; ~~or~~

~~(c) to a parcel being created that contains a pre-existing residential dwelling unit that is connected to and using a water source, provided that:~~

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~~i. the water source meets current setback requirements, established by an enactment, from sources of contamination, and~~

~~ii. the water source is either:~~

~~A. located on the same parcel as the pre-existing residential dwelling unit; or~~

~~B. located on Crown land along with all water system components, which have been approved or permitted by the Provincial authority.~~

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INDEPENDENT ON-SITE WATER SYSTEM

89.2 Where no ~~Water Supply~~ Community Water System is available, and the proposed parcels comply with Schedule 'A' Levels of Service requirements, all new *Parcels* created by subdivision must be provided with an *Independent On-site Water System*.

89.3 The water source for an *Independent On-site Water System* must be:

a) surface water from an intake in a water source that either has an existing license issued by the Water Rights Branch or has Unrecorded Water and is included on the List of Eligible Sources of the Ministry of Forests, Lands and Natural Resource Operations that is current as of the date of application for subdivision, or as provided in Schedule "B" attached to this Bylaw;

b) *Groundwater* from a Drilled Well; or,

c) *Groundwater* from a Shallow Well.

89.4 All Wells ~~other than those identified in Section 8.1 (c)~~ and related components of the *Independent On-site Water System* using *Groundwater* sources must be on the same *Parcel* as the residential *Dwelling Unit* in respect of which they are required.

89.5 All components, including the intake, for *Independent On-site Water System* using surface water sources must be:

a) located on the same *Parcel* as the residential *Dwelling Unit* in respect of which they are required; or

b) located within easements ~~or rights-of-way that are a minimum of 6.0 m in width meeting the requirements of Section 9.11~~, provided that the delivery system from the surface water source to the *Dwelling Unit* is only for a single residential *Dwelling Unit*.

89.6 A person must not proceed to develop any water source or construct any water system until documentation for all information required under subsections 89.11 through 89.12 has been received and approved by the ~~Manager, Environment and Engineering Services~~Manager, Operations Management or his designate.

89.7 If the Owner is required under this bylaw to engage a *Qualified Professional*, a person must not commence any work, study or analysis related to the proposed development of an *Independent On-site Water System* without the involvement of a *Qualified Professional*.

89.8 Each *Independent On-site Water System* must be capable of providing, year round, at least ~~2,275-273~~ litres of *Potable Water* per day for each *Parcel* that includes, or can be reasonably expected in future to include, a residential *Dwelling Unit*.

89.9 Each *Independent On-site Water System* must meet each of the water quantity and water quality requirements for the relevant subdivision type set out in Table 1.

89.10 ~~For each proposed Independent On-site Water System and especially where testing of the Independent On-site Water System indicates that treatment is required, the Owner must enter into a covenant under section 219 of the Land Title Act in favour of the Regional District, in accordance with subsection 89.20, acknowledging that all water sources change over time and where treatment is required, to ensure suitable treatment systems are installed and maintained so that each Dwelling Unit is provided with Potable Water, and must register the covenant against the property title concurrently with the deposit of the plan of subdivision.~~

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DOCUMENTATION REQUIREMENTS

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89.11 The *Owner*, where proposing to develop an Independent On-site Water System, shall submit to the *Regional District* the following information:

- a) agent contact information if the *Owner* has hired an agent to develop an *Independent On-site Water System* on the *Owner's* behalf;
- b) general information about the proposed subdivision or current phase of subdivision, as well as information about any plan for future phases of subdivision;
- c) information about water supplies and sewage systems and any other potential sources of contamination (including, but not limited to underground storage tanks, car wrecks, manure piles, dead animal pits, privies, holding tanks, and on-site sewerage systems, whether or not permitted or currently lawful) and plans showing these situated within 30 meters of the land being subdivided that could affect either the quantity or quality of water available to the subdivision;
- d) information regarding the proposed water source for the subdivision or current phase of subdivision; and
- e) plans showing, proposed water sources for the subdivision, and proposed subdivision layout.

89.12 All documentation submitted to the *Regional District* in connection with subsection **89.11**, above must reflect conditions prevailing at the time of application for the subdivision.

89.13 The *Regional District* reserves the right to require information on a larger area than 30.0 meters, as specified in paragraph (c) of subsection **89.11**, above, at the discretion of the ~~Manager, Environment and Engineering Services~~ *Manager, Operations Management*, or his designate. If the ~~Manager, Environment and Engineering Services~~ *Manager, Operations Management*, or his designate considers that soil conditions, aquifer sensitivity and potential sources of contamination warrant further consideration, the ~~Manager, Environment and Engineering Services~~ *Manager, Operations Management*, or his designate may require further or additional information, including about an area beyond that specified in paragraph (c) of subsection **89.11** of up to 60 meters.

PROFESSIONAL-DIRECTED APPROACH (QUALIFIED PROFESSIONAL)

89.14 The *Owner* shall engage a *Qualified Professional* to manage all aspects of developing an *Independent On-site Water System* (this approach is referred to as the "Professional-Directed Approach") if any of the following conditions apply:

- a) the proposed subdivision will result in three or more *Parcels*;
- b) any of the proposed *Parcels* are ~~each~~ less than 2 hectares in area;
- c) the proposed subdivision is not located within an area indicated as being within a known aquifer, as identified on the *Mapping for Areas of Groundwater Concern*;

- d) the proposed subdivision is located within an area of concern for *Groundwater* issues as identified on the *Mapping for Areas of Groundwater Concern* that is current at the time of subdivision application;
- e) any proposed *Groundwater* source is within 30.0 m of any other existing groundwater source or source of potential contamination;
- f) the proposed water source is surface water;
- g) the proposed water source is a *Shallow Well* that the *Owner* intends to install without hiring a *Qualified Well Driller* or a *Qualified Pump Installer*;
- h) prior to commencing construction or testing, the *Qualified Well Driller* or *Qualified Pump Installer* engaged to provide a *Well* expects that drawdown interference, or water quality issues are likely to occur based on their personal knowledge of the area the *Well* is proposed; or
- i) the *Regional District* has requested a review of the information provided, as required in 8.12 above, by a *Qualified Professional*, and that professional recommends a professional-directed approach.

OWNER-DIRECTED APPROACH

BU641-1

89.15 If conditions described in subsection 89.14 do not apply, the *Owner* may direct the development of an *Independent On-site Water System* without engaging a *Qualified Professional* (this approach is referred to as the "Owner-Directed Approach") by hiring either a *Qualified Well Driller* or a *Qualified Pump Installer*. Having been retained by the *Owner* for this purpose, the *Qualified Well Driller* or *Qualified Pump Installer* must submit a copy of all *Well* reports together with the water quality analysis, indicating a ~~potable~~ *Potable Water* source, as required in the ~~Water Act~~ *Water Sustainability Act* to the ~~Comptroller of Water Rights~~ and to the ~~Manager, Environment and Engineering Services~~ *Manager, Operations Management*, or his designate.

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89.16 Notwithstanding Section 89.15, the *Regional District* may require the *Owner* to engage, at the *Owner's* cost, a *Qualified Professional* at any point during the testing and development of an *Independent On-site Water System* if any of the conditions described in Section 89.14 become apparent in the course of the procedures set out in this Bylaw.

89.17 If a *Qualified Professional's* involvement is required, the *Qualified Professional* retained to undertake the project shall provide written confirmation to the *Regional District* that:

- a) they have suitable training and experience in the discipline of Engineering or Geosciences including documentation that their registration with the Association of Professional Engineers and Geoscientists of BC is in a relevant area;
- b) they are a member in good standing of the Association of Professional Engineers and Geoscientists of BC; and
- c) they are familiar with this bylaw and in particular, without limitation, Schedule "B"; and will perform their work in accordance with the procedures set out in Schedule "B".

89.18 If the *Owner* appoints a substitute *Qualified Professional* during the process of developing required *Independent On-site Water System*, the substitute *Qualified Professional* must immediately provide to the *Regional District* the written confirmation required by Section 8.17.

89.19 If a *Qualified Professional* is required, the *Qualified Professional* must supervise all components of developing the *Independent On-site Water System* and the *Owner* must not commence any work, study or analysis related to the water system without the involvement of the *Qualified Professional*.

Table 1: Requirements for Independent On-site Water System

BL641-1	Groundwater Sources					
	Subdivision Type	Source Yield	Proof of Water Quantity Well Recovery	Drawdown Interference	Proof of Water Quality	Covenant
	Subdivisions qualifying for the Owner-Directed Approach as per Section <u>89</u> .15.	A <i>Qualified Well Driller</i> or <i>Qualified Pump Installer</i> has performed a <i>Well</i> test and determined that the <i>Well</i> yield is 2, 275 <u>273</u> liters/day.	To be indicated on required <i>Well</i> logs.	N/A	A <i>Qualified Well Driller</i> or <i>Qualified Pump Installer</i> has sampled the <i>Well</i> water and submitted a sample to an authorized water testing laboratory for analysis of water quality which has then provided written confirmation that the water will be <i>Potable Water</i> as defined in this bylaw.	A covenant as per Section <u>89</u> .20 has been placed on the property.

Table 1: Requirements for Independent On-site Water System (cont'd)

Groundwater Sources Subdivision Type	Proof of Water Quantity			Proof of Water Quality	Covenant
	Source Yield	Well Recovery	Drawdown Interference		
Subdivisions requiring a Professional-Directed Approach as per Section 89 .14	A <i>Qualified Professional</i> has submitted written confirmation that the sustainable <i>Well</i> yield is at least 2, 275 <u>273</u> liters/day.	A <i>Qualified Professional</i> has submitted written confirmation that <i>Well</i> recovery is adequate to support the intended use of the <i>Well</i> (minimum 2, 275 <u>273</u> L/day).	A <i>Qualified Professional</i> has submitted written confirmation that the operation of the proposed <i>Well</i> at the desired rate (minimum 2, 275 <u>273</u> L/day) will not: reduce the amount of available Water for any <i>Well</i> , within 250 m of the tested <i>Well</i> ; or result in changes to the water balance of the aquifer, considering cumulative impacts that could result in long-term environmental changes and/or reduced yield on a regional scale.	A <i>Qualified Professional</i> has reviewed the water quality results, prepared a water system design, including treatment and disinfection system components if required, and provided written confirmation that the water will be <i>Potable Water</i> as defined in this bylaw when the recommended system is properly installed and operated.	A covenant as per Section 89 .20 has been placed on the property

Table 1: Requirements for Independent On-site Water Systems (cont'd)

Surface Water Sources (only those included on the List of Eligible Sources)

Subdivision Type	Water Quantity	Water Quality	Covenant on Title
All types of subdivision.	The Owner submits, either: A copy of an application for a water license for at least 2,275 L/d for domestic purposes for each Parcel created by the subdivision; or, An <i>an</i> undertaking from a solicitor that a suitably worded Section 219 covenant will be registered on title, at the Owners cost, that any lots created with a surface water source will not be used for residential purposes until the owner has provided a copy of an issued license to the <i>Regional District</i> .	A <i>Qualified Professional</i> has reviewed the water quality results, prepared a water system design, including treatment and disinfection system components if required, and provided written confirmation that the water will be <i>Potable Water</i> as defined in this bylaw when the recommended system is properly installed and operated.	A covenant as per Section 89 .20 has been placed on the property.

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SECTION 219 COVENANT

89.20 ~~Where a~~ *An* Owner is required to enter a covenant under this Part pursuant to section 219 of the *Land Title Act*, ~~for all *Independent On-site Water Systems*. The~~ the covenant must be registered in the Land Title Office against the title to the land subject to the ~~covenant proposed subdivision~~. The covenant may include such prohibitions, restrictions and requirements as a condition of subdivision, use, building, or, in relation to a parcel, transfer, as required by the ~~Manager, Environment and Engineering Services~~ *Manager, Operations Management*, or his designate; provisions for conditions for reimbursement by the Owner for any expenses that may be incurred by the *Regional District* as a result of any breach of the covenant; and without limitation, any or all of the following conditions:

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- (a) proper installation and maintenance of a pump by a *Qualified Pump Installer*;

- (b) submission of a *Well* report and water quality analysis by a *Qualified Pump Installer* to the ~~*Manager, Environment and Engineering Services*~~*Manager, Operations Management*, or his designate and to the *Comptroller* of Water Rights;
- (c) construction and maintenance of any and all water system infrastructure in a safe and sanitary manner and in compliance with applicable enactments of the *Regional District*, Province of British Columbia, and Canada;
- (d) installation and maintenance of effective cross-connection control;
- (e) completion of system disinfection prior to use and as may be necessary or recommended for safety and sanitation;
- (f) installation of a water system and any components of a water system as may be recommended by the *Qualified Professional*, to ensure that the water supplied through the system and its components is *Potable Water*;
- (g) confirmation through water quality testing that the water is *Potable Water*;
- (h) a water licence for surface water sources;
- (i) irrigation conditions, restrictions and requirements; and
- (j) obligations of the *Owner* to ensure ongoing monitoring, maintenance, inspection, repair and replacement of water systems and components so that the water supplied is *Potable Water*.

PART 910 GENERAL PROVISIONS (for community water and sewer systems)

PROFESSIONAL ENGINEER

910.1 The *Owner*, at its expense, shall retain an *Engineer* to design, inspect, test and certify all *Works and Services*.

COST OF SERVICES

910.2 All *Works and Services* required by this bylaw shall be designed, reviewed, constructed and inspected at the expense of the *Owner*. All costs of documentation and fees required by this bylaw or any other bylaw of the *Regional District*, or any other authority having jurisdiction must be paid by the *Owner*.

910.3 The ~~*Manager, Environment and Engineering Services*~~*Manager, Operations Management*, or his designate, may direct that tests of materials, equipment, devices, construction methods, assemblies or soil conditions be made, or sufficient evidence or proof be submitted, at the expense of the applicant, to determine whether the materials, equipment, devices, construction methods, assemblies or soil conditions meet the requirements of this bylaw, or any other bylaw of the *Regional District*, or any other authority having jurisdiction.

ENGINEERING DRAWINGS

910.4 Where *Works and Services* are to be constructed, Engineering drawings and other required reports and documentation certified by an *Engineer* shall be submitted to the *Regional District* for approval. –The Engineering drawings shall contain at least the information set out in ~~Schedules "C" and "F"~~applicable Design Guidelines and Standards, as approved by the Manager of Operations Management and be accompanied by the following:

- a) a letter from the *Owner* confirming the relationship between the *Owner* and the *Owner's Engineer*; and
- b) a letter from the *Owner's Engineer* confirming their engagement with the *Owner* and that they will be providing professional services to the *Owner* to ensure that the *Works and Services* are designed and constructed in accordance with the approved plans and this bylaw.

910.5 A person must not prepare a site, or proceed with construction, alteration or extension, until:

- a) the *Owner* has been advised in writing by the ~~Manager, Environment and Engineering Services~~Manager, Operations Management, or his designate that the engineering drawings have been approved by the *Regional District*, and
- b) approval is obtained by any Provincial or Federal agency whose approval is required.

910.6 Where a *Water Supply System* is required by this bylaw, the *Regional District* shall not approve the detailed design until the *Owner's Engineer* has:

- a) submitted design drawings to the regional health authority and provided to the *Regional District* a copy of the approved construction permit; and
- b) submitted design drawings to the Ministry of Transportation and Infrastructure and provided to the *Regional District* a copy of the permit issued by the Ministry of Transportation and Infrastructure allowing works within the Ministry's right-of-way.

PROJECT SUPERVISION AND CERTIFICATION

910.7 The *Owner* of lands being subdivided shall engage an *Engineer* to carry out all necessary field reviews and inspections during the construction of *Works and Services* required as a condition of subdivision approval.

910.8 The *Owner's Engineer* shall submit a *Certificate of Completion*, in the form approved by the Manager of Operations Management~~attached to and included in this bylaw as Schedule "C-2"~~, to the *Regional District* prior to the commencement of the maintenance period. The *Certificate of Completion* shall briefly describe the work and any material changes during construction and certify that the *Works and Services* have been constructed in compliance with the standards of the jurisdiction having authority and this bylaw, and the approved plans, drawings and supporting documents. The report shall contain copies of all inspection reports and test results upon which the *Certificate of Completion* is based.

RECORD DRAWINGS, OPERATIONS AND MAINTENANCE MANUALS AND SAFETY PROCEDURES

910.9 A minimum of two sets of sealed hard copy drawings certified "as constructed" by the *Engineer* and one digital copy of the "as constructed" drawings in an AutoCad format specified by the *Regional District*, two sets of operations and maintenance manuals, and two sets of safety procedures documentation, together with digital copies of each of these requirements in a .pdf format, shall be provided to the *Regional District* prior to the commencement of the maintenance period and where applicable, at provisional completion. The "as-constructed" drawings shall include the information shown on the detailed design drawings as outlined in Section **910.4**.

RIGHTS-OF-WAY AND EASEMENTS

910.10 Prior to final approval of a subdivision plan, all required Rights-of-Way, Easements and Section 219 Covenants shall be registered against or appurtenant to the title of the land being subdivided or their registration against the title of the land shall be the subject of an undertaking by the *Owner's* solicitor, provided the undertaking is acceptable to the *Regional District* or its solicitor.

910.11 No *Parcel* may be served by *Works and Services* that are not located on that *Parcel* or within a *Highway* unless the *Works and Services* are located within a registered easement or statutory right-of-way that:

- a) authorizes the construction, operation, maintenance, replacement, and repair of the *Works and Services*;
- b) has a width of at least 6 metres and meets the requirements of applicable Design Guidelines and Standards as approved by the Manager of Operations Management Schedules "C" and "F";
- c) prohibits the placement within the easement or right-of-way area of all structures or improvements that would interfere with or impair the operation or maintenance of the *Works and Services*;
- d) creates rights in respect of a specific easement area shown on a reference or explanatory plan;
- e) in the case of an easement, if such an easement is deemed acceptable to the ~~Manager, Environment and Engineering Services~~ Manager, Operations Management, or his designate; a Covenant, under Section 219 of the Land Title Act is registered concurrently with the easement in a form acceptable to, and in favour of the *Regional District* prohibiting the uses of the *Parcel* that are dependent on the *Works and Services* unless the easement is in place, or has been replaced by a statutory right-of-way in favour of the *Regional District*; and
- f) in the case of a statutory right-of-way, is in favour of the person or entity responsible for operating and maintaining the *Works and Services*.

THIRD PARTY REVIEW

| **910.12** The *Regional District* may engage a third party (chosen by the *Regional District*) to review any document, design, report, or analysis related to servicing that the *Owner* has submitted to the *Regional District*. The *Owner* will be responsible for the full cost of any required third party review.

PART ~~4011~~ FEES AND SECURITY

APPLICATION AND INSPECTION FEES

~~4011~~.1 Application for subdivision must be made on a form provided by the *Regional District* and applicable fees paid. Prior to final approval of the subdivision, the *Owner* shall pay to the *Regional District* any additional amounts of money owed and *Works and Services* administration and inspection fees specified in the applicable *Regional District* bylaw.

WORKS AND SERVICES SECURITY DEPOSIT – COMMUNITY WATER AND SEWER SYSTEMS

~~4011~~.2 Where a *Community Water System* or *Community Sewer System* is proposed to be constructed, final approval of a subdivision, shall not be granted prior to the provision of *Works and Services* required by this bylaw unless the *Owner* provides to the *Regional District* a *Security Deposit* in an amount equal to one hundred and twenty five percent (125%) of the *Owners Engineer's* estimate of the cost of the *Works and Services* (including contingencies and as approved by the ~~Manager, Environment and Engineering Services~~ *Manager, Operations Management*, or his designate) required for the proposed subdivision to meet the requirements of this bylaw.

~~4011~~.3 The *Regional District* may, at the *Owner's* expense, confirm the cost estimate of the *Works and Services* by consulting with an *Engineer* of the *Regional District's* choosing.

~~4011~~.4 If the required *Works and Services* have not been completely installed in accordance with the approved design drawings within the time specified in the *Works and Services Agreement*, the *Regional District* may draw on the *Security Deposit* in order to complete the required *Works and Services*. If the cost of installation exceeds the amount of the *Security Deposit*, the balance shall be a debt due from the *Owner* to the *Regional District*, recoverable in any court of competent jurisdiction or by any other means available to the *Regional District*.

~~4011~~.5 The *Owner* shall be solely responsible for the actual cost of the *Works and Services* regardless of the adequacy of the *Security Deposit* with the *Regional District*.

~~4011~~.6 Nothing in this bylaw obliges the *Regional District* to complete *Works and Services* on the default of an *Owner*.

PROVISIONAL COMPLETION

~~4011~~.7 Provisional completion shall occur upon receipt of the following from the *Owner*:

- a) A *Certificate of Provisional Completion*, in the form ~~approved by the Manager of Operations Management~~ *provided in Schedule "G.1"*, issued by the *Owner's Engineer*, together with the supporting documentation upon which it is based, including relevant quality assurance test results and inspection reports;
- b) Record drawings of completed work to date, operations and maintenance manuals, and safety procedures documents required under Section ~~910~~.9, prepared by the *Owner's Engineer* and approved by the ~~Manager, Environment and Engineering Services~~ *Manager, Operations Management*, or his designate; and,

c) Results of a field inspection by the *Regional District* of all *Works and Services*.

4011.8 The *Regional District* shall return any remaining *Security Deposit* upon provisional completion in accordance with this bylaw and the applicable *Works and Services Agreement*, less ten percent (10%) of the original *Security Deposit*.

4011.9 The *Regional District* has the discretion to separate provisional completion into two (2) components, such that any asphalt and landscaping requirements may be completed using the same process, but with a different timeline.

COMPLETION

4011.10 Completion shall occur upon receipt of the following from the *Owner*:

- a) A Certificate of Completion, issued by the *Owner's Engineer*, in the form approved by the Manager of Operations Management provided in Schedule "G-2", together with the supporting documentation upon which it is based, including relevant quality assurance test results and inspection reports;
- b) Receipt of record drawings of completed work, operations and maintenance manuals, and safety procedures documentation required under Section 910.9, prepared by the *Owner's Engineer* and approved by the ~~Manager, Environment and Engineering Services~~ Manager, Operations Management, or his designate; and,
- c) Maintenance *Security Deposit*, in the form prescribed in subsection 4011.12.

4011.11 The *Regional District* shall return the remainder of the *Security Deposit* upon completion in accordance with this bylaw and an applicable *Works and Services Agreement*.

MAINTENANCE SECURITY

4011.12 The *Owner* shall provide to the *Regional District* maintenance *Security Deposit* in an amount equal to ten percent (10%) of the actual cost of the *Works and Services* required by this bylaw.

4011.13 The *Regional District* may, at the *Owner's* expense, confirm the cost of the *Works and Services* by consulting with an *Engineer* of the *Regional District's* choosing.

4011.14 The maintenance period shall be a one year period commencing on the date established by the *Regional District* under subsection 4011.15, except that the ~~Manager, Environment and Engineering Services~~ Manager, Operations Management, or his designate may extend that maintenance period if the *Works and Services* are deficient or otherwise not performing as intended.

4011.15 The *Regional District* shall:

- a) Establish the date of commencement of the maintenance period, which shall be no earlier than the date of completion;

- b) Advise the *Owner* of the date of commencement of the maintenance period and of any defects or deficiencies in the works of which the *Regional District* ~~is~~ aware, to be addressed by the *Owner* during the maintenance period; and,
- c) Advise the *Owner* if the maintenance period has been extended, in accordance with ~~subsection 10~~ subsection 11.14, above.

4011.16 The *Owner* shall maintain the works and repair or replace any defective works and correct any deficiencies during the maintenance period. If the *Owner* fails to maintain, repair or replace the works, the *Regional District* may do so and may draw upon the maintenance *Security Deposit*, after having provided the *Owner* at least ten days' notice. In the case of defects in the works creating a safety or health hazard, the *Regional District* will act in the public interest to resolve the hazard

4011.17 The *Owner* shall be responsible for the actual cost of maintaining the works and repairing or replacing any defective works and correcting any deficiencies in the *Works and Services* regardless of the adequacy of the maintenance *Security Deposit* held by the *Regional District*. If the cost of maintaining the works and repairing or replacing any defective works and correcting deficiencies exceeds the amount of the maintenance *Security Deposit*, the balance shall be a debt due from the *Owner* to the *Regional District*, recoverable in any court of competent jurisdiction or by any other means available to the *Regional District*.

FINAL ACCEPTANCE

4011.18 Final acceptance shall occur when all conditions of this bylaw and an applicable *Works and Services Agreement* have been met

4011.19 All *Works and Services* required to be constructed or provided pursuant to the provisions of this bylaw shall remain the sole responsibility of the *Owner* until a *Certificate of Final Acceptance* has been issued, in the form approved by the Manager of Operations Management provided in Schedule "G-3", and in accordance with subsection 4011.20 by the *Regional District*.

4011.20 The *Regional District* shall issue a *Certificate of Final Acceptance* only upon:

- a) Completion of the maintenance period;
- b) Correction of all deficiencies in the required *Works and Services*; and,
- c) Receipt of record drawings of completed work to date, prepared by the *Owner's Engineer* and approved by the ~~Manager, Environment and Engineering Services~~ Manager, Operations Management, or his designate.

4011.21 The *Regional District* shall return any unused portions of the maintenance *Security Deposit* to the *Owner* upon issuance of a *Certificate of Final Acceptance*.

4011.22 *Works and Services* constructed and installed under this bylaw become the property of the *Regional District* or the agency having jurisdiction subject to no encumbrances, on issuance of the *Certificate of Final Acceptance*. Except that, *Works and Services* that are required for on-site servicing of bare land strata subdivisions only,

and that do not extend to properties beyond, remain the property of the Strata Corporation, unless the system is subject to CSRD acquisition under the *Regional District's Water Acquisition Strategy*.

INSURANCE

4011.23 The Owner must carry insurance for the subject of a subdivision and development under this bylaw, at a minimum as set out in Schedule "E" Standard Works and Services Agreement document as approved by the Manager of Operations Management

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PART 4412 SUBDIVISION COMPLETION REQUIREMENTS

DOCUMENTATION REQUIREMENTS

4412.1 Prior to the *Regional District* advising the *Approving Officer* that the *Owner* has fulfilled any conditions of subdivision, the *Regional District* will require that the *Owner* provides the following documentation:

- a) A paper copy of the proposed plan of subdivision as submitted to the *Approving Officer* for final approval;
- b) A plan from the *Owner's* BC Land Surveyor showing the proposed subdivision and showing the location on each *Parcel*, and distance to existing and proposed property lines of the following:
 - i. Any existing and proposed *On-site Sewage Disposal* works;
 - ii. Any *Wells*, existing and proposed;
 - iii. Location of the water intake and all water system components, existing and proposed; and,
 - iv. Any pre-existing buildings or structures.
- c) Any Easement, Statutory Right-of-Way, or Section 219 Covenant documents, together with reference plans—required to be registered on behalf of the *Regional District*, against the title of the *Parcels*, to be subdivided. Such documents are to be approved by *Regional District* staff prior to registration in the Land Title Office;
- d) A diagram must be provided illustrating existing and proposed building areas, together with the location, grades and dimensions of access driveways;
- e) Any other documentation required under this or another bylaw or other enactment.

PART 4213 ENFORCEMENT

AUTHORIZATION TO ENTER

4213.1 The Chief Administrative Officer, Manager - Development Services, ~~Manager – Environment and Engineering Services~~Operations Management, bylaw enforcement officers, and other officers and employees of the *Regional District* designated by those officers to administer this bylaw are authorized to enter, at all reasonable times, upon any property in order to inspect and determine whether the regulations, prohibitions and requirements of this bylaw are being met.

VIOLATION AND OFFENCE

4213.2 Any person who;

- a) Violates bylaw provisions;
- b) Causes or permits any act in contravention or violation of bylaw provisions;
- c) Neglects or omits bylaw requirements;
- d) Carries out, causes, or permits to be carried out any subdivision in a manner prohibited by or contrary to bylaw provisions;
- e) Fails to comply with bylaw orders, directions, or notices;
- f) Prevents, obstructs or attempts to prevent or obstruct the authorized entry of any officer authorized under Section **4213.1** to enter upon lands;

commits an offence, and each day that the offence continues constitutes a new and separate offence.

PENALTY

4213.3 On being convicted of an offence under this Bylaw, a person is liable to pay a fine of up to \$10,000.00 per offence, and the costs incurred by the Regional District for prosecuting each offence.

4213.4 A penalty imposed under subsection **4213.3** is separate from and in addition to any requirement in this bylaw to pay fees and costs to the Regional District.

PART ~~4314~~ REPEAL

4314.1 Subdivision Servicing Bylaw No. 592 and amendments thereto, are hereby repealed.

PART 4415 CITATION

4415.1 This bylaw may be cited as "Subdivision Servicing Bylaw No. 641".

READ a first time this 20th day of May, 2010.

READ a second time as amended this 17th day of March, 2011.

READ a third time as amended this 20th day of July, 2011.

RECEIVED THE APPROVAL of the Minister of Transportation and Infrastructure this 25th day of August, 2011.

RECEIVED THE APPROVAL of the Minister of Community, Sport and Cultural Development
this 2nd day of February, 2012.

ADOPTED this 16th day of February, 2012.

MANAGER OF CORPORATE
ADMINISTRATIVE SERVICES (SECRETARY)

CHAIR

CERTIFIED true copy of Bylaw No. 641 as read
a third time

CERTIFIED true copy of Bylaw No.
641 as adopted

Manager of Corporate Administrative
Services (Secretary)

Secretary/ Manager of Corporate
Administration Services

**Columbia Shuswap Regional District
Subdivision Servicing Bylaw No. 641**

**Schedule "A"
Levels of Service**

Schedule "A"

Levels of Service

All properties to be subdivided for single family residential use proposed to be serviced with an On-site Sewage Disposal System and an Independent On-site Water System ~~must~~ are to be a minimum of 1.0 Ha. in size, unless a smaller parcel size is permitted in Zoning regulations.

Level of Service Table

OCP Designation	Water Requirement	Sewer Requirement
<u>Village Centre</u>	<u>Community Water System</u>	<u>Community Sewer System*</u>
Primary Settlement	Water <u>Supply</u> <u>Community</u> Water System	Community System*
Secondary Settlement	Water <u>Supply</u> <u>Community</u> Water System	Community System*
Town Centre Commercial	Water <u>Supply</u> <u>Community</u> Water System	Community Sewer System
<u>Commercial Designations</u>	<u>Community Water System</u>	<u>Community Sewer System*</u>
<u>Industrial Designations</u>	<u>Community Water System</u>	<u>Community Sewer System*</u>
All other designations	Independent On-site Water System/ Water Supply System	On-site Sewage Disposal System

| * - If proposed lots are less than 1.0 Ha. in size. If proposed lots are 1.0 Ha. or larger, an *On-site Sewage Disposal* System may be utilised if approved pursuant to the Public Health Act.

**~~Columbia Shuswap Regional District
Subdivision Servicing Bylaw No. 641~~**

**~~Schedule "B"
Assessment and Demonstration of Water Availability and Quality
Guidelines
(for Independent On-site Water Systems)~~**

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**~~PART 1—GUIDELINES FOR THE ASSESSMENT AND DEMONSTRATION OF WATER
AVAILABILITY—GROUND-WATER SOURCES~~**

~~Qualified Contractors~~

~~1.1~~—The testing and development of **~~Independent On-site Water Systems~~** should be completed by **~~Qualified Well Drillers~~**, or **~~Qualified Pump Installers~~**, as applicable.

~~Assessment and Demonstration of Water Availability Program for Ground Water~~

~~Part A—Well Construction and Siting~~

~~1.2~~—All **~~Wells~~** should be constructed in accordance with Figure B.1 and all applicable Provincial and Federal legislation.

~~1.3~~—All **~~Wells~~** should be sited in accordance with Figure B.2 and all applicable Provincial and Federal legislation.

WELL CONSTRUCTION REQUIREMENTS
APPLY TO ALL WELL DEPTHS

LEGEND

- (A) ARTESIAN WELL CONTROL
– AS PER PROVINCIAL
REGULATIONS AND GUIDELINES
- (B) SURFACE COMPLETION AND
WELL SEAL AS PER PROVINCIAL
REGULATIONS
- (C) DRILLED VERTICAL STEEL CASING
- (D) PROPERLY INSTALLED AND
ADEQUATELY DEVELOPED STAINLESS
STEEL WIRE WOUND SCREEN
- (E) PROPERLY FLUSHED BORE HOLE.
PROPERLY INSTALLED AND
ADEQUATELY DEVELOPED PERFORATED
WELL LINER (PVC OR STEEL)
- (F) DRILL SHOE ADVANCED INTO
BEDROCK TO ASSURE PROPER SEAL

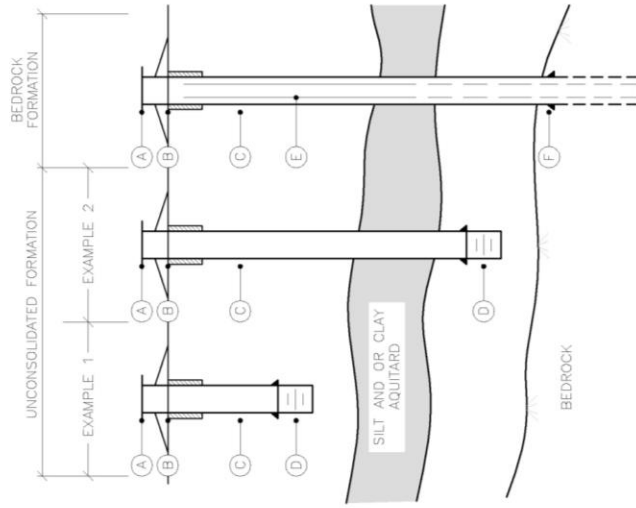


Figure B.1

COLUMBIA SHUSWAP REGIONAL DISTRICT

- (A) PROPERTY LINE SETBACK
MUST BE AT LEAST:
- 10m FOR WELLS MORE THAN 15m DEEP
 - 25m FOR WELLS LESS THAN OR EQUAL TO 15m DEEP
- PROPERTY LINE
● WELL
↔ SETBACK

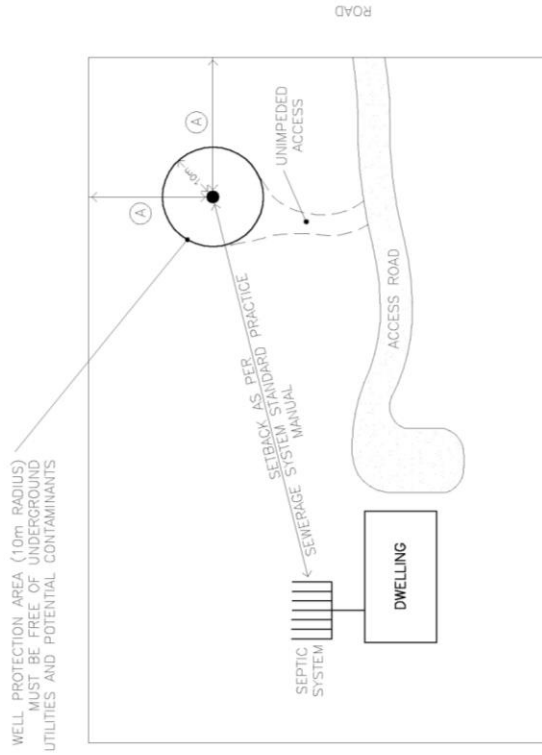


Figure B.2

Part B – General Requirements for Pump Test

1.4 The yield of each proposed independent on-site **Ground Water** source should be tested as follows:

- a) the yield of the **Well** should be tested by a **Qualified Well-Driller** or a **Qualified Pump Installer**, who will be required to submit **Well** reports and water quality results to the **Regional District** and to the Comptroller of Water Rights
- b) testing should be conducted at the location labeled "Point of Testing" on Figure B.3;
- c) testing should occur during the period from August of one year to April of the following year;
- d) all tests should be performed at a rate of at least 3.8 litres per minute for a period of at least 24 hours and a minimum of 2,275 litres per day, unless a **Qualified Professional** specifies a greater or lesser rate, or for a longer period, that reflects **MDD** and duration in order to adequately assess the sustainability of the source for the intended use of the proposed subdivision and to evaluate long-term drawdown interference, in which case testing must be performed at the rate and duration specified by the **Qualified Professional**; and
- e) where a subdivision will result in the development of three or more **Parcels** that are not each at least 2 hectares in area, the **Qualified Professional**, if required, should undertake a brief stop test at each **Well** prior to undertaking 24-hour constant-discharge tests.

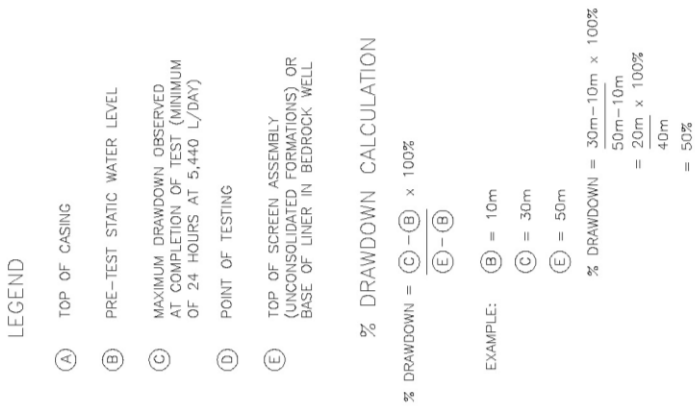


Figure B.3

Part C – Pump Test Monitoring for the Proposed Well

1.5 Drawdown of **Ground Water** levels in the **Well** being tested should be monitored during the test as follows:

- a) drawdown of **Ground Water** levels in the **Well** being tested should be monitored at a frequency and duration no less than that specified in the following table, unless a **Qualified Professional** specifies a greater monitoring frequency and duration in order to adequately determine maximum drawdown and recovery, in which case monitoring must be done at the frequency and duration specified by the **Qualified Professional**.

Frequency	Duration
Pre-test water level	
• Once	n/a
Water level during pump test	
• Every 1 minute during pumping	0 to 10 min. elapsed time
• Every 5 minutes during pumping	to 1 hour elapsed time
• Every 10 minutes during pumping	to 4 hours elapsed time
• Every 60 minutes during pumping	to 24 hours elapsed time
Maximum drawdown prior to shutting the pump off	
• Once	n/a
Water level after pump shut off	
• Every 1 minute during recovery	0 to 10 min. total elapsed time
• Every 5 minutes during recovery	to 1 hour elapsed time
• Every 10 minutes during recovery	to 4 hours elapsed time
• Every 60 minutes until full recovery of the Well has occurred	As required

- b) If drawdown in the **Well** being tested is observed during testing to be more than 50% of the available drawdown, calculated in accordance with Section 1.9, or the **Well** being tested did not fully recover within 8 hours in the case of unconsolidated formations or 24 hours in the case of consolidated formations, then the **Owner** must retain a **Qualified Professional** to complete the remainder of the water source development and testing program if a **Qualified Professional** has not already been retained.

Part D – Pump Test Monitoring for Adjacent Wells

1.6 Drawdown of **Ground Water** levels in all **Wells** within a 250-m radius of each **Well** being tested, including existing **Wells** drilled on adjacent **Parcels** and **Wells** drilled for the proposed subdivision, must be monitored during the test as follows:

- a) drawdown of **Ground Water** levels in **Wells** within a 250-m radius should be monitored at a frequency and duration no less than that specified in the following table, unless a **Qualified Professional** specifies a greater monitoring frequency and duration in order to adequately detect drawdown interference, in which case monitoring must be done at the frequency and duration specified by the **Qualified Professional**.

Frequency	Duration
Pre-test water level	
• Once	n/a
Water level during pump test	
• Every 1 hour during pumping	to 24 hours elapsed time
Maximum drawdown prior to shutting the pump off	
• Once	n/a
Water level after pump shut off	
• Every 60 minutes during recovery	Until full recovery of the Well or to a maximum of 24 hours elapsed time
• Every 24 hours during recovery	to full recovery of the Well

1.7 If any drawdown interference is detected in any **Well** within 250-m of the **Well** being tested, then the **Owner** must retain a **Qualified Professional** to complete the remainder of the water source development and testing program if a **Qualified Professional** has not already been retained.

1.8 The **Owner** or **Qualified Professional** should advise the **Regional District** in writing of any inability, despite their best efforts, to obtain access to any **Well** to monitor drawdown interference for the purposes of this Schedule, and the **Regional District** may require the **Owner** to engage a **Qualified Professional** to prescribe and fulfill, in accordance with sound **Ground Water** engineering practice, alternative measures to determine whether the proposed **Independent On-site Water System** will cause drawdown interference.

Part D – Interpretation of Results

~~1.9~~ Determination of drawdown percentage for the ~~Owner~~ Directed Approach should be calculated in accordance with Figure B.3. Where a **Qualified Professional** is involved in ~~Well~~ development and testing, the ~~Qualified Professional~~ should determine the appropriate methodology to determine drawdown percentage.

~~1.10~~ To determine impacts on the aquifer, the **Qualified Professional** should consider the following:

- ~~a)~~ potential surface water depletion;
- ~~b)~~ potential changes in water quality;
- ~~c)~~ potential reductions in water availability for nearby users;
- ~~d)~~ potential that the source is ground water under the direct influence of surface water, with reference to current Provincial/Federal best practices; and
- ~~e)~~ any other factor the **Qualified Professional** considers pertinent to the determination of impact on the aquifer.

~~1.11~~ Sustainable ~~Well~~ yield should be calculated based on a projected 100 day yield with a 30% safety factor.

Assessment and Demonstration of Water Availability Report for Ground Water

~~1.12~~ The ~~Owner~~ should submit a report upon completion of the assessment and demonstration of water availability requirements in a form acceptable to the ~~Regional District~~, which should contain, at a minimum, the following information for each proposed **Independent On-site Water System**:

- ~~a)~~ identification of water sources tested;
- ~~b)~~ results of all required testing and monitoring;
- ~~c)~~ construction details and as-built plans for each water source;
- ~~d)~~ legal survey showing the location of the ~~Well~~, all water system components, setbacks from property lines, sewage systems, and any other information pertinent to the ~~Independent On-site Water System~~;

- e) ~~copies of any licenses or permits as required by Provincial legislation;~~
- f) ~~**Well** report(s) from each **Qualified Well Driller** and **Qualified Pump Installer**, which are also required to be submitted to the Comptroller of Water Rights in all cases,~~
- g) ~~if a **Qualified Professional** has been involved in the water source development and testing, reports from a **Qualified Professional** containing, at a minimum, the following information:~~
 - i. ~~a determination of whether or not the operation of the proposed **Well** at **MDD**, which should be at least 3.8 litres per minute, will reduce the amount of available water for any **Well** within 250 m of the tested **Well**;~~
 - ii. ~~a determination of whether or not the operation of the proposed **Well** at the approved rate would result in changes to the water balance of the aquifer, which would result in long-term environmental changes or reduced yield on a regional scale;~~
 - iii. ~~a determination of whether operating the **Well** at a rate higher than the approved rate would result in changes to the water balance of the aquifer, which would result in long-term environmental changes or reduced yield on a regional scale;~~
 - iv. ~~calculation of sustainable **Well** yield in accordance with Section 1.11; and~~
 - v. ~~a determination of whether **Well** recovery is adequate to support the intended use of the **Well**, at a rate of at least 3.8 litres per minute;~~
- h) ~~a summary regarding outcomes of the testing program, indicating whether the water sources meet the requirements of this bylaw, which sources are being withdrawn from the application, and which **Wells** have been closed or deactivated; and~~
- i) ~~in cases where test **Wells** will not be brought into production, **Well** closure records confirming that they have been properly closed in accordance with any applicable Provincial and Federal regulations.~~

PART 2 — PROCEDURES FOR ASSESSMENT AND DEMONSTRATION OF WATER AVAILABILITY — SURFACE WATER SOURCES

Qualified Professionals and Contractors

2.1 — The development and testing of ***Independent On-site Water Systems*** should be completed by persons having appropriate qualifications to perform the work described in this Part.

Assessment and Demonstration of Water Availability Program for Surface Water

2.2 — The **Owner** should comply with applicable Provincial and Federal legislation regarding the development and approval of any surface water source.

2.3 — The **Owner** should apply for a surface water license for at least 2,275 litres per day in respect of each **Parcel** proposed to be created by the subdivision.

Assessment and Demonstration of Water Availability Report for Surface Water

2.4 — The **Owner** should submit a report completed by a **Qualified Professional** upon completion of the assessment and demonstration of water availability requirements in a form acceptable to the **Regional District**, which should contain, at a minimum, the following information for each proposed **Independent On-site Water System**:

- a) — identification of the proposed water source;
- b) — design details and as-built plans for each water source to be developed;
- c) — legal survey showing the location of the water intake, all water system components, setbacks from property lines, sewage systems, and any other information pertinent to the **Independent On-site Water System**;
- d) — a copy of the water license application;
- e) — a copy of any other relevant permits and approvals; and
- f) — a summary regarding outcomes of assessment and demonstration of water availability investigation, indicating whether the proposed water source meets the requirements of this bylaw, and whether any changes are being made to the application.

PART 3 — PROCEDURES FOR ASSESSMENT AND DEMONSTRATION OF WATER AVAILABILITY — SURFACE WATER SOURCES

Qualified Professionals and Contractors

~~3.1 The development and testing of **Independent On-site Water Systems** should be completed by persons having appropriate qualifications to perform the work described in this Part.~~

Assessment and Demonstration of Water Availability Program for Surface Water

~~3.2 The **Owner** should comply with applicable Provincial and Federal legislation regarding the development and approval of any surface water source.~~

~~3.3 The **Owner** should apply for a surface water license for at least 2,275 litres per day in respect of each **Parcel** proposed to be created by the subdivision.~~

Assessment and Demonstration of Water Availability Report for Surface Water

~~3.4 The **Owner** should submit a report completed by a **Qualified Professional** upon completion of the assessment and demonstration of water availability requirements in a form acceptable to the **Regional District**, which should contain, at a minimum, the following information for each proposed **Independent On-site Water System**:~~

- ~~a) identification of the proposed water source;~~
- ~~b) design details and as-built plans for each water source to be developed;~~
- ~~c) legal survey showing the location of the water intake, all water system components, setbacks from property lines, sewage systems, and any other information pertinent to the **Independent On-site Water System**;~~
- ~~d) a copy of the water license application;~~
- ~~e) a copy of any other relevant permits and approvals; and~~
- ~~f) a summary regarding outcomes of assessment and demonstration of water availability investigation, indicating whether the proposed water source meets the requirements of this bylaw, and whether any changes are being made to the application.~~

PART 4—GUIDELINES FOR ASSESSMENT AND DEMONSTRATION OF WATER QUALITY—GROUND-WATER AND SURFACE-WATER SOURCES

Qualified Professionals

4.1—The **Owner** should engage **Qualified Professionals** having appropriate qualifications to complete the testing, analysis, and interpretation requirements of this Part.

Assessment and Demonstration of Water Quality Program

4.2—Water quality should be tested against the following parameters:

Parameter	Required Testing Parameters for Ground Water	Required Testing Parameters for Surface Water
Microbiological and Related		
Escherichia Coli*	✓	✓
Total and Faecal Coliforms*	✓	✓
Heterotrophic Plate Count	✓	✓
Cyanobacterial toxins—microcystin-LR*		✓
Chemical and Physical		
Alkalinity	✓	✓
Ammonia	✓	✓
Colour**	✓	✓
Conductivity	✓	✓
Total and Dissolved Organic Carbon	✓	✓
Hardness	✓	✓
Nitrate*	✓	✓
Nitrite*	✓	✓
pH**	✓	✓
Sulphate**	✓	✓
Sulphide (as H ₂ S)**	✓	✓
Total dissolved solids (TDS)**	✓	✓
Total Kjeldahl Nitrogen	✓	✓
Total Suspended Solids (TSS)	✓	✓
Turbidity***	✓	✓
UV Transmittance	✓	✓

Parameter	Required Testing Parameters for Ground Water	Required Testing Parameters for Surface Water
Metals – Total and Dissolved		
Aluminum**	✓	✓
Antimony*	✓	✓
Arsenic*	✓	✓
Barium*	✓	✓
Beryllium	✓	✓
Boron*	✓	✓
Cadmium*	✓	✓
Calcium	✓	✓
Chloride**	✓	✓
Chromium*	✓	✓
Cobalt	✓	✓
Copper**	✓	✓
Cyanide*	✓	✓
Fluoride*	✓	✓
Iron**	✓	✓
Lead*	✓	✓
Magnesium	✓	✓
Manganese*	✓	✓
Mercury*	✓	✓
Molybdenum	✓	✓
Nickel	✓	✓
Phosphorus	✓	✓
Potassium	✓	✓
Selenium*	✓	✓
Silver	✓	✓
Sodium**	✓	✓
Uranium*	✓	✓
Zinc**	✓	✓

* As of October, 2009, parameter has a maximum acceptable concentration identified in the Guidelines for Canadian Drinking Water Quality.

** As of October, 2009, parameter has an aesthetic objective or operational guidance value identified in the Guidelines for Canadian Drinking Water Quality.

*** As of October, 2009, parameter has a health-based guideline identified in its Guideline Technical Document supporting the Guidelines for Canadian Drinking Water Quality.

4.3 The water quality testing parameters set out in this bylaw should, at the **Owner's** discretion, be supplemented with additional parameters based on local knowledge or recommendations from the **Qualified Well Driller** or other qualified person, including hydrocarbons, pesticides, herbicides, radiological, or other parameters.

~~4.4~~ Samples collected for testing must be representative of the water quality to be expected once the proposed system is in service, and in particular

- ~~a)~~ if a **Ground Water** source is proposed, then the samples must be collected at the end of the pump test; and
- ~~b)~~ if a surface water source is proposed, then the samples must be collected at a depth and location that is representative of the proposed intake location.

~~4.5~~ At a minimum, the following sampling sets must be completed:

- ~~a)~~ for a surface water source, at least one sampling set taken during the period May to August must be completed;
- ~~b)~~ for a **Ground Water** source, a minimum of one sample set must be taken in conjunction with the pump test, during the period from August of one year to April of the following year; and
- ~~c)~~ for both **Ground Water** and surface water sources, additional sampling sets must be taken at appropriate times as recommended by the **Qualified Professional** to determine pre-treatment requirements.

~~4.6~~ All samples should be collected, preserved, stored, handled, and analyzed in accordance with the Standard Methods for the Examination of Water and Wastewater, published by the American Public Health Association, the American Waterworks Association and the Water Environment Federation, as amended or replaced from time to time.

~~4.7~~ Testing for pH, temperature, oxidation-reduction potential (ORP) and turbidity must be completed in the field.

~~4.8~~ The following data should be recorded at the time of sampling:

- ~~a)~~ date;
- ~~b)~~ time;
- ~~c)~~ weather conditions;
- ~~d)~~ name of person completing sampling;

e) ~~location and how sampling was completed;~~

f) ~~sample clarity and colour; and~~

g) ~~sample odour.~~

~~4.9 Testing must be completed by a laboratory certified by the Canadian Association for Laboratory Accreditation for chemical analysis, and a laboratory accredited by the Provincial Health Officer for bacteriological analysis.~~

~~4.10 A laboratory chain of custody document must be submitted to the **Regional District** with all test results.~~

~~4.11 If the testing results are conflicting or inconclusive, then additional testing must be completed.~~

Interpretation of Results

~~4.12 The **Owner** should engage a **Qualified Professional** to determine how the **Independent On-site Water System** will comply with the water quality requirements of this bylaw. This assessment should include the following:~~

~~a) review of the general information for the proposed subdivision;~~

~~b) review of the assessment and demonstration of water availability requirements and report;~~

~~c) review of the water quality results, and determination of whether adequate information has been collected to complete the assessment; and~~

~~d) preparation of water system design, including but not limited to treatment and disinfection components, and guidelines to the owner for a future testing regimen.~~

Assessment and Demonstration of Water Quality Report

~~4.13 Upon completion of the assessment and demonstration of water quality requirements, the **Owner** should submit a report completed by a **Qualified Professional** in a form satisfactory to the **Regional District**, which should contain, at a minimum, the following information:~~

~~a) description of the water system proposed for each **Parcel**;~~

~~b) a summary of the water quality testing including:~~

- i. ~~a copy of the field sampling notes and results;~~
- ii. ~~a copy of the laboratory chain of custody document;~~
- iii. ~~a comparison of the results to the definition of **Potable Water** contained in this bylaw and any additional parameters for which the water has been tested;~~
- iv. ~~any tested quality parameter which falls outside of either health or aesthetic limitations;~~
- v. ~~any recommended treatment methodologies or equipment required to achieve potability requirements, together with maintenance programs for treatment methods; and,~~
- vi. ~~any suspected deficiencies with the sampling or testing;~~
- e) ~~design details and plans for each **Independent On-site Water System**, signed and sealed by a **Qualified Professional**;~~
- d) ~~copies of relevant permits and approvals;~~
- e) ~~a determination of whether the **Potable Water** is expected to comply with the definition of that term contained in this bylaw when the recommended system is installed and operated; and~~
- f) ~~a summary regarding outcomes of the assessment and demonstration of water quality investigation, indicating whether the proposed water source meets the requirements of this bylaw, and whether any changes are being made to the application.~~

**Columbia Shuswap Regional District
Subdivision Servicing Bylaw No. 641**

**Schedule "C"
Water Supply System Design Guidelines and Standards**

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PART 1 — General

Standards

- 1.1** — ~~All Works and Services shall be designed in accordance with this Bylaw and the Approved Standard Drawings, and constructed in accordance with the most current version of the MMCD and Standard Drawings. Unless otherwise specified, the most recent version available to the Regional District at the time of approval of all referenced standards, shall apply.~~
- 1.2** — ~~In addition to the requirements of this bylaw, the applicant is required to obtain approval for designs and authorization to construct from the Ministry of Transportation and Infrastructure on any proposed Highway crossings or works proposed within its rights of way. Well location approval and construction permits for all water works will also be required from the regional health authority having jurisdiction.~~

Submissions Required Prior to Application for Subdivision

Conceptual Water Servicing Plan

- 1.3** — ~~A subdivision for which a Water Supply System is required or proposed will not be approved until a Conceptual Water Servicing Plan has been prepared by the Owner's Engineer and accepted by the Manager, Environment and Engineering Services, or his designate, the Ministry of Transportation and Infrastructure, and the regional health authority. A Conceptual Water Servicing Plan must show the alignment, location and size of water mains, intakes, pump stations, reservoirs, and treatment plant in sufficient detail to demonstrate the feasibility of the proposal. The Conceptual Water Servicing Plan shall be submitted to the Regional District's Engineer for review and comment. The Owner shall edit the Conceptual Water Servicing Plan as required and shall resubmit it to the Regional District for approval. The fee for the Regional District's Engineer shall be paid for by the Owner.~~
- 1.4** — ~~The Owner's Engineer shall consult the Regional District to determine the ultimate population to be served and water use assumptions.~~
- 1.5** — ~~Prior to the design of an extension of an existing water system, the capacity of the supply and of the source, pumping, treatment, distribution and storage systems, and the potential effects of the extension on pre-existing Parcels and other properties within the original service area shall be reviewed by the Owner's~~

~~Engineer. This review shall identify and account for any intakes, outfalls, or other features that may affect, or be affected by, the proposed development.~~

~~1.6 — The Conceptual Water Servicing Plan shall include a water treatment schematic, including the capacity of each treatment train and the operating philosophy.~~

~~1.7 — As part of the Conceptual Water Servicing Plan, a network analysis showing the following is required: reservoir location/volume/water level, pipe locations/sizes, hydrant locations, and for each hydrant, the ground elevation/static pressure and available fire flows under MDD plus fire conditions (with 140 kPa residual).~~

~~1.8 — If a water system master plan has been completed for the community in which the subdivision is proposed, or from which it will be serviced, then the Conceptual Water Servicing Plan shall conform to the master plan.~~

Submissions Required at Time of Application for Subdivision

Regulatory Approvals

~~1.9 — The Owner shall provide copies of applications for all relevant regulatory approvals to the Regional District.~~

Design Drawings

~~1.10 — Detailed design drawings shall be submitted to the Regional District at the time of subdivision application. The detailed design drawings shall, at a minimum, show the following:~~

- ~~a) — Location, elevation and construction details of surface water intakes or Wells;~~
- ~~b) — Location, size, capacity, component details, configuration, controls and alarms for all water treatment and disinfection works;~~
- ~~c) — Location, alignment, diameter, material and elevation of all pipes;~~
- ~~d) — Location, elevation and material of hydrants, valves, service connections and appurtenances;~~
- ~~e) — Corrosion control systems for pipes, services and fittings, where required;~~
- ~~f) — Location, elevation and details of pump stations;~~
- ~~g) — Location, elevation and details of reservoirs;~~

- ~~h) Trench details including material for pipe bedding, backfill and surface restoration;~~
- ~~i) Structural details for reservoirs and pump stations;~~
- ~~j) Location of geotechnical test pits or boreholes;~~
- ~~k) Location and component details for all system electrical, control and monitoring equipment (supply, instrumentation, controls, SCADA, water quality analyzers, telemetry/communication systems);~~
- ~~l) Location, size, component details, construction details for all water metering equipment; and~~
- ~~m) Location, grades and alignment of maintenance vehicle access and rights-of-way.~~

Plans, Reports and Supporting Information

~~1.11 The Owner shall provide all Geotechnical (including soil corrosiveness), hydrological, hydrogeological, structural, electrical, pilot testing reports and any additional information concerning the proposed Works and Services to the Regional District.~~

~~1.12 Detailed design and all reports shall be submitted to the Regional District for review and approval. The Regional District may retain the services of a third party Engineer to undertake this review. The cost of this review shall be paid by the Owner.~~

Submissions Required Prior to Construction

Regulatory Approvals

~~1.13 The Owner shall provide copies of all relevant regulatory approvals to the Regional District prior to starting construction.~~

PART 2 — Design Criteria

General

~~2.1 — These standards are not intended to be a substitute for sound engineering knowledge and experience. The design of water systems and the various system components shall be prepared under the direction of and sealed by an *Engineer*.~~

Overall Configuration and Sizing

~~2.2 — All *Water Supply Systems* shall be configured to ensure continuity and consistency of sizing/capacity between components for simplified control and operation of the system. System configuration shall also consider expansion/future phases of the system. The system configuration shall be designed in consultation with the *Regional District*.~~

~~2.3 — All major system components shall have a minimum of two trains of the same size that can be operated independently and together. When all trains are in service, they must be able to supply MDD over 18 hours.~~

~~2.4 — For critical components, in particular source works (such as intake pumps and *Wells*) and chlorination equipment, a higher level of redundancy must be provided by sizing the components to supply MDD over 18 hours with the largest train out of service (see Sections 3.1, 3.9, 4.17, and 7.3).~~

~~2.5 — All pressure zones shall have reservoir storage capable of providing balancing storage and fire flow by gravity or as approved by the *Manager, Environment and Engineering Services*, or his designate.~~

Design Flows

~~2.6 — Design flows shall be based on the ultimate population and full development as anticipated in the Official Community Plan, other land use regulations, or as determined in consultation with the *Regional District*.~~

~~2.7 — MDD to be used for design shall be developed in consultation with the *Regional District*, and shall be based on reliable relevant water consumption records, occupancy rates where available, the *Regional District's* water conservation and system reliability goals, and treatment plant and other system losses, such as backwash, filter-to-waste, and leakage.~~

Where relevant records are not available, the following may be used as a guideline:

Residential Demand

4500 L/lot/d based on 2.5 people/lot

Non-Residential Demand

To be determined on a case by case basis

- 2.8** — The design may allow for phasing of system components if development is also to be phased and the *Manager, Environment and Engineering Services*, or his designate, approves the design.

PART 3 — Source Components

Surface Water Intakes

- 3.1** — Intakes shall be sized and designed to supply MDD in 18 hours with the largest pump out of service.
- 3.2** — Surface water intakes having single phase pumps, or pumps of 7.5 HP or less, shall, at a minimum, conform to the general requirements outlined in the *Approved Standard Drawings*.
- 3.3** — Surface water intake pumps of greater than 7.5 HP capacity shall be designed by an *Engineer* in consultation with the *Regional District* and must be approved by the *Manager, Environment and Engineering Services*, or his designate and all other relevant agencies. Intakes shall be configured to have pumps convenient to access as approved by the *Manager, Environment and Engineering Services*, or his designate.
- 3.4** — All surface water intakes on navigable waters shall be marked in accordance with Transport Canada regulations. In addition, all intakes on navigable waters shall be marked with a Cautionary Buoy in accordance with the Canada Shipping Act Private Buoy Regulation, and with the Transport Canada best practices. The Cautionary Buoy shall have signage indicating the presence of the intake and that no anchoring is allowed.
- 3.5** — The Owner shall conduct a limnology or hydrology study and consider this information when choosing the intake site.

Lake intake siting: — Minimum depth 20 m or below thermocline,
whichever is greater

River intake siting: — Sited for safety, intake protection, and water quality

- 3.6** — Infiltration galleries are not approved for use in the *Regional District*.

Ground Water Wells

- 3.7** — Wells must be drilled and cased. Minimum casing diameter 200 mm.
- 3.8** — Wells shall be constructed in accordance with the *Approved Standard Drawings*.
- 3.9** — If the Ground Water source is for a Water Supply System then at least two Wells shall be developed, each capable of meeting the water quantity and quality

~~requirements of the system. The Ground Water source must be capable of supplying MDD in 18 hours with the largest pump/Well out of service.~~

3.10 ~~All Wells shall be tested under the supervision of a Qualified Professional who shall prepare a report on the results. The test results and report shall be submitted to the Regional District and the Comptroller of Water Rights and shall include, at a minimum:~~

- ~~a) Pumping test for at least 72 hours at a rate greater than or equal to the proposed Well pumping rate. The test shall continue until an equilibrium response occurs, where there is no drawdown in one log cycle. If an equilibrium response is not observed, then the Qualified Professional must clearly state what the limitations of the Well may be.~~
- ~~b) At least one monitoring Well is required to enable aquifer interpretation, the monitoring Well may be the backup Well.~~
- ~~c) Testing for interference with neighbouring Wells and the combined effect on the aquifer of pumping from all Wells within a 500 m radius simultaneously shall be conducted. The Qualified Professional shall advise the Regional District in writing of any inability, despite their best efforts, to obtain access to any Well to monitor drawdown interference for the purposes of this Schedule, and the Regional District may prescribe, in accordance with sound Ground Water engineering practice, alternative measures to determine whether the proposed Water Supply System will cause drawdown interference.~~
- ~~d) 100 day forecast for drawdown. Determine Well yield using the method described by the BC Ministry of Environment guidance document titled "Evaluating Long-Term Well Capacity for a Certificate of Public Convenience and Necessity".~~
- ~~e) Confirm that Well recovery is predictable and adequate to support the intended use of the Well.~~
- ~~f) Confirm that the sustainable Well yield is adequate to support the intended use of the Well.~~
- ~~g) Ground Water Under Direct Influence of Surface Water assessment in accordance with current BC legislation and guidelines.~~
- ~~h) Water quality and treatability assessment.~~
- ~~i) Regional health authority testing and reporting requirements.~~

- j) ~~A Well protection plan as per current BC legislation and guidelines.~~
- k) ~~Special recommendations that should be implemented during design, construction, operation, or maintenance of the Well.~~

PART 4 — Treatment and DISINFECTION System Components

General

4.1 — ~~All new Water Supply Systems shall provide treatment and disinfection to meet or exceed applicable legislation and requirements of the regional health authority. Extensions or connections to existing Water Supply Systems may not be required to provide additional treatment and/or primary disinfection beyond that provided by the system to which the subdivision is being connected if the capacity of the existing system is adequate to incorporate the new lots to meet the criteria in this Bylaw. Secondary disinfection may be required for extensions to existing Water Supply Systems.~~

4.2 — ~~Only those products on the Approved Products List shall be used unless otherwise approved by the Manager, Environment and Engineering Services, or his designate.~~

4.3 — ~~All system components in contact with Potable Water shall be NSF certified.~~

Washroom Facilities

4.4 — ~~A single washroom with dual flush toilet and sink shall be installed in the water treatment plant, unless this requirement is waived by the Manager, Environment and Engineering Services, or his designate.~~

Aesthetic Parameters

4.5 — ~~The Manager, Environment and Engineering Services, or his designate may require treatment for aesthetic parameters.~~

Filtration

4.6 — ~~Process efficiency to be at least 90% (where process efficiency = treated water volume/raw water volume x 100%) where filtration is deemed appropriate by the Regional District and/or required by the regional health authority.~~

Primary Disinfection

- ~~4.7 All Water Supply Systems shall have sodium hypochlorite disinfection providing a minimum of 4 log (99.99%) virus inactivation.~~
- ~~4.8 Surface water and Ground Water under the direct influence of surface water shall have ultraviolet disinfection providing a minimum of 3 log (99.9%) Cryptosporidium and Giardia inactivation. The system shall be designed in accordance with the United States Environmental Protection Agency Ultraviolet Disinfection Manual.~~
- ~~4.9 The ultraviolet system supplier shall provide third party validation and system certification satisfactory to the Manager, Environment and Engineering Services, or his designate.~~

Secondary Disinfection

- ~~4.10 Secondary disinfection shall be provided for all distribution systems.~~
- ~~4.11 Sodium hypochlorite shall be used for secondary disinfection.~~
- ~~4.12 The secondary disinfection system shall be capable of providing a free chlorine residual of not less than 0.2 mg/L throughout the entire water distribution system.~~

Equipment/Instrumentation

- ~~4.13 All process systems shall be capable of turndown to one-third of MDD.~~
- ~~4.14 Sodium hypochlorite equipment shall be located in a separate dedicated room that has sufficient positive ventilation to prevent the flow of chlorine gas vapours from entering other areas of the treatment building.~~
- ~~4.15 The disinfection system shall comply with current occupational health and safety requirements and recommendations. Operator safety equipment shall be designed in consultation with the Regional District. The equipment shall include at a minimum a combination eyewash/shower with tempered water, equipment for safe handling of sodium hypochlorite, and appropriate ventilation.~~
- ~~4.16 Sodium hypochlorite dosing shall be flow paced.~~

- ~~4.17 Sodium hypochlorite dosing pump systems shall be sized to satisfy chlorine demand and residual requirements for water supplied at a rate of MDD over 18 hours, with the largest dosing pump out of service.~~
- ~~4.18 Ultraviolet disinfection systems shall incorporate automatic mechanical and/or chemical cleaning systems unless it is demonstrated that the water quality is not likely to cause significant fouling in the system at any time of year.~~
- ~~4.19 Ultraviolet disinfection systems shall include continuous monitoring of ultraviolet transmittance and ultraviolet dose and shall communicate data to the main SCADA system.~~
- ~~4.20 Ultraviolet disinfection systems shall be designed to incorporate supplier recommendations for cooling water, warm-up times, and system on-off cycling limits, in order to ensure that safe drinking water is provided and a minimum lamp life of 1 year is attained.~~
- ~~4.21 Treatment systems shall be designed to minimize process residuals and solids handling.~~
- ~~4.22 An online turbidimeter shall be installed for raw water and for filtered water at each filter and at the combined filter line. Measure continuously and report at intervals of no more than five minutes and connect meters to the SCADA system.~~
- ~~4.23 Free chlorine, pH and temperature shall be measured at a contact time of approximately 12 min (using good engineering practice to design chlorine contact basin to minimize hydraulic short circuiting). Free chlorine, pH and temperature shall be measured continuously with an online meter and reported at intervals of no more than five minutes, and the meter shall be connected to the SCADA system.~~
- ~~4.24 Electromagnetic flow meters shall be installed to measure raw, treated, backwash and filter to waste water. Flow shall be measured continuously and meters shall be connected to the SCADA system.~~
- ~~4.25 Pressure transducers shall be installed before and after each major system component, and shall be connected to the SCADA system.~~
- ~~4.26 All pumps shall be equipped with hour meters and on/off signals that are connected to the SCADA system.~~

~~4.27 — Water sampling ports shall be installed in the raw water, after each filter and each backwash wastewater line, on each filter-to-waste line, and after each disinfection facility.~~

Corrosion Control/Balancing of Finished Water

~~4.28 — The chemistry of the finished water shall be assessed to determine whether it may be corrosive to equipment and products in contact with the water. The chemistry shall be reviewed with the Manager, *Environment and Engineering Services*, or his designate who may require treatment to balance the finished water.~~

PART 5 — Distribution System Components

- 5.1** — The water distribution system shall be designed to provide adequate fire flow at a minimum residual pressure of 140 kPa, to all service areas during conditions of MDD, or to provide peak hour flow, whichever is greater.
- 5.2** — Fire flow requirements shall be determined based on the latest edition of "Water Supply for Public Fire Protection — A Guide to Recommended Practice", which is published by the Fire Underwriters Survey.
- 5.3** — Where possible, all water mains shall be looped. Where unavoidable, dead end mains may be allowed but must be approved by the *Manager, Environment and Engineering Services*, or his designate. All dead end mains shall be fitted with a blow off or hydrant at its terminus to enable flushing.

Minimum blow off sizes are:

Watermain Size (mm)	Blow-off Size (mm)
Less than 200	50
200 and larger	100

Hydraulic Design

- 5.4** — Hydraulic design calculations shall be based on the Hazen-Williams formula:

$$Q = \frac{CD^{2.63}S^{0.54}}{278780}$$

- Where: — Q = Flow rate (L/s)
— D = Internal pipe diameter (mm)
— S = Slope of hydraulic grade line (m/m)
— C = Roughness coefficient — use 125 for all pipes

Design fire flow calculations or a network analysis computer model shall be provided.

Maximum Pipe Velocities

- 5.5** — The maximum allowable velocity in the pipes shall be:
- MDD ————— 2 m/s
Fire flow conditions (max day plus fire) ————— 3.5 m/s

Water Pressure in Distribution System

5.6 Pressures in the distribution system shall meet the following requirements:

Maximum allowable pressure	850 kPa*
Minimum pressure at peak hour demand	300 kPa
Minimum pressure at MDD plus fire	140 kPa

*Where the pressure at the curb stop or building exceeds 515 kPa (under static conditions), service connections shall be individually protected by pressure reducing valves located in the buildings being served.

5.7 ~~A minimum normal operating pressure of 241 kPa must be available at the assumed main floor elevation of each residential building. Pressure limits shall be determined based on consideration of property and house elevations relative to street level.~~

Minimum Pipe Diameters

5.8 Minimum pipe diameters are:

Distribution mains	200 mm
Fire hydrant connections	150 mm

5.9 Notwithstanding Section 5.8, for looped distribution mains that are less than 500 m long in residential subdivisions, the diameter may be reduced to 150 mm if fire flow requirements can be met (must be confirmed by the system water model), and if approved by the *Manager, Environment and Engineering Services*, or his designate.

Materials

5.10 ~~All water works materials, including coatings and linings, must conform to applicable AWWA Standards and C.S.A. Standards. All materials contacting Potable Water must conform to NSF 61.~~

5.11 ~~Pipe or water mains shall be polyvinyl chloride, or ductile iron and shall conform to AWWA Standards.~~

5.12 ~~Fittings and valves shall conform to AWWA Standards and to the Approved Products List.~~

~~5.13 All electrical material equipment must conform to C.S.A. Standards and Underwriters Laboratories Standards.~~

~~5.14 All service pipe and fittings must conform to AWWA Standards or ASTM Standards.~~

Depth of Cover

~~5.15 The minimum depth of cover shall be either 1.8 m or depth of frost penetration, whichever is greatest.~~

~~5.16 Where it is not possible to achieve depths required by 5.15 due to rock or other impediment then the Owner's Engineer shall:~~

- ~~a) Provide adequate insulation that conforms to the Approved Products List, and ensure it is installed in accordance with the manufacturer's recommendations or the Dow Chemical Canada Utility Line Installation Guidelines; and~~
- ~~b) Provide a minimal depth of cover or other means sufficient to provide mechanical protection from external loads and vandalism.~~

~~5.17 Water mains and services shall be of sufficient depth to clear other underground utilities.~~

Water Main Alignment and Location

~~5.18 Water mains shall be located in the road right of way as approved by the Ministry of Transportation and Infrastructure. Water mains within Statutory Right of Ways, or other than the Highway right of way shall be located as approved by the Manager, Environment and Engineering Services, or his designate.~~

~~5.19 If it is not practical to locate a water main in a road right of way, and if approved by the Manager, Environment and Engineering Services, or his designate, then water mains shall be located in a utility or Regional District right of way. The utility right of way shall have a width of 6 m, or twice the depth of the deepest pipe, whichever is greater.~~

~~5.20 On straight roads, water mains shall have straight alignments with uniform offsets between intersections. Curved alignments parallel to property lines may be used, but joint deflections must be limited to half the maximum deflection specified by~~

the pipe manufacturer. The locations of short lengths, or field cut pipes must be recorded during construction.

~~5.21 Water mains shall be located such that each property served has at least one side facing the water main.~~

~~5.22 All water mains, services, valves and appurtenances that require maintenance shall be provided with access from a public road. The maintenance access must be sufficiently wide and structurally sound to support maintenance vehicles and must meet Ministry of Transportation and Infrastructure requirements, including requirements related to location.~~

Proximity to Sanitary and Storm Sewers

~~5.23 Where a sanitary sewer or storm sewer crosses a water main the installation shall be made in accordance with regional health authority requirements.~~

~~5.24 At least 1 m horizontal separation shall be maintained between a water main and any existing or proposed ditch or underground utility. At least 3 m horizontal separation shall be maintained between a water main and a sanitary or storm sewer.~~

~~5.25 Where a sanitary sewer or storm sewer crosses a water main, the sewer must be at least 0.5 m below the water main, and for 3 m on each side of the sewer, the joints of the water main shall be wrapped with heat shrink wrap in accordance with the *Approved Products List*. Crossings shall be as close to perpendicular as possible and shall not be at an angle of less than 20°. Crossings shall be laid such that the crossing is made midway between the joints on a full length of water main.~~

Grade

~~5.26 Grades shall be straight between deflection points and elevations shall be recorded.~~

~~5.27 Minimum grade of water mains shall be 0.1%. Grading shall minimize the number and severity of high points.~~

~~5.28 Where the grade exceeds 20% provide anchorage, joint restraints, trench dams and trench drainage based on the recommendations of an *Engineer* registered~~

as a geotechnical engineer with the Association of Professional Engineers and Geoscientists of British Columbia.

Service Connections

~~5.29~~ Service connection size shall be calculated based upon designated land use, predicted demands, sprinkler systems and on-site hydrants. For long services or in steep terrain, the service diameter shall be determined using a water model. The following minimum pipe sizes shall apply:

Service connections with fire sprinklers _____ 50 mm
Service connections without fire sprinklers _____ 19 mm

~~5.30~~ Service connections 50 mm and larger shall be connected to the water main with a tee and gate valve complete with 50 mm square operating nut and valve box assembly.

~~5.31~~ Unless otherwise approved by the *Manager, Environment and Engineering Services*, or his designate, service connections shall be perpendicular to the front property line and located opposite the centre of the lot. Service connections shall not be located under driveways or under travelled areas. Curb stops shall be located within 300 mm of the property line on the public side.

~~5.32~~ The Owner shall have the necessary soils tests conducted by a *Qualified Professional* to determine whether soils are corrosive. Polyethylene service pipes shall be used in corrosive soils. In non-corrosive soils, copper service pipes may be used.

Valves

~~5.33~~ Valves shall be located in a cluster at pipe intersections or at projected property lines to avoid conflicts with existing or planned curbs and sidewalks.

~~5.34~~ The following criteria shall be used to determine the number and location of valves:

3 valves at "X" intersection
2 valves at "T" intersection
Not more than 200 m apart
Not more than 1 hydrant isolated
Not more than 20 service connections isolated

~~5.35~~ Valves shall be selected as follows:

- a) ~~Gate valves shall be used on mains 300 mm diameter and smaller.~~
- b) ~~Butterfly valves shall be used on mains larger than 300 mm diameter.~~

Fire Hydrants

5.36 ~~Fire hydrants shall be dry barrel, compression type to *AWWA Standards (AWWA C502)*.~~

5.37 ~~The inlet connection shall be 150 mm nominal diameter.~~

5.38 ~~Each hydrant shall have two hose ports and one pump port.~~

- a) ~~Hose nozzles shall be 65 mm nominal diameter with British Columbia Standard Hose Thread.~~
- b) ~~Pump nozzles shall be 100 mm nominal diameter with 117.475 mm outside diameter and 6 threads per 25.4 mm.~~
- c) ~~Opening direction shall be counter clockwise.~~
- d) ~~Operating nut and cap nuts shall be to BC standard.~~

5.39 ~~Fire hydrants shall be red.~~

5.40 ~~All hydrant leads shall have isolation valves.~~

5.41 ~~All hydrants shall be pressure tested to 2070 Kpa (300 psi) in accordance with *AWWA Standards (AWWA C502)*.~~

5.42 ~~Fire hydrants shall be located at street intersections and as follows:~~

- a) ~~Not further than 150 m apart and not more than 90 m from a building or potential building site. This distance is to be measured along an unobstructed path;~~
- b) ~~2 m back from curbs, or 0.5 m back from sidewalks where applicable;~~
- c) ~~At property lines in mid-block locations;~~
- d) ~~If a ditch runs between a hydrant and the emergency right-of way, then a level path to the hydrant must be provided in accordance with the *Approved Standard Drawings*; and~~
- e) ~~At least 1 m from any other utility structure.~~

Air Valves

~~5.43 — Combination air valves shall be installed at the high points of all water mains except as follows:~~

- ~~a) — Where the difference in elevation between the high point and the valley is less than 600 mm; and~~
- ~~b) — Where active service connections are suitably located to dissipate entrapped air.~~

~~5.44 — Air valves shall be sized as follows:~~

<u>Water main size</u>	<u>Valve size</u>
Up to 200 mm	19 mm
250 — 300 mm	25 mm

Chambers

~~5.45 — Chambers or manholes containing valves, blow-offs, meters or other appurtenances shall allow adequate space for maintenance, including headroom and side room. Access openings must be suitable for removing and replacing the largest piece of equipment therein.~~

~~5.46 — Any chamber that is a "Confined Space" under British Columbia Occupational Health and Safety Regulations shall be designed to facilitate ventilation, and safe entry and egress using the methods prescribed in the Regulations. A written hazard assessment is required, at the Owner's expense with the safe entry/egress procedures outlined in accordance with the hazard assessment.~~

~~5.47 — Each chamber shall be provided with a drain to daylight, storm sewer or ditch; drains shall have backflow prevention to prevent flooding of the chamber. Where soil and Ground Water conditions are favourable, rock pits are acceptable. Drains open to daylight shall have fittings to prevent entry by insects and animals. A pumping system shall be used for drainage, where gravity drainage is impractical.~~

Thrust Blocks

~~5.48 — Concrete thrust blocks shall be provided at all crosses, tees, reducers, plugs, caps, bends, blow-offs and hydrants unless thrust blocks are not practical, in which case adequate mechanical restraints may be permitted as approved by the Manager, Environment and Engineering Services, or his designate.~~

~~5.49 — Restraint system design shall consider soil conditions, fitting type and size, water pressure and velocity, and potential future excavations proximal to the water main.~~

Corrosion

~~5.50 — Geotechnical soils analysis on the alignment of proposed metallic pipes, services and fittings shall be conducted to determine the corrosiveness of the soil. If soils are found to be corrosive, corrosion protection measures to the approval of the Manager, Environment and Engineering Services, or his designate shall be incorporated in the design. Corrosion protection measures shall be designed by an Engineer having expertise in water main corrosion protection.~~

PART 6 — PRV Station Components

General

6.1 — ~~Pressure-reducing valve station design parameters shall be reviewed by the Owner's Engineer and approved by the Manager, Environment and Engineering Services, or his designate before detailed design proceeds. This review shall include:~~

- ~~a) Design flows — peak hour and MDD plus fire;~~
- ~~b) Location, elevation and hydraulic grade; and~~
- ~~c) Continuous, emergency and fire flow operation.~~

6.2 — ~~Only those system components included on the Approved Products List shall be used, unless otherwise approved by the Manager, Environment and Engineering Services, or his designate.~~

Design Features

6.3 — ~~Unless otherwise approved by the Manager, Environment and Engineering Services, or his designate, pressure-reducing valve stations must incorporate, at a minimum, each of the following design features:~~

- ~~a) Housed above ground in a permanent structure compliant with the BC Building Code, with a minimum building footprint 2.4 m x 2.4 m;~~
- ~~b) External bypass provisions;~~
- ~~c) Parallel pressure-reducing valves sized for peak hour flow and for MDD plus fire flow;~~
- ~~d) Isolating valves for each PRV;~~
- ~~e) Basket strainers upstream of each pressure-reducing valve;~~
- ~~f) Flow meter with connection to SCADA;~~
- ~~g) Upstream and downstream pressure gauges for each pressure-reducing valve with connection to SCADA;~~
- ~~h) Air release valves;~~
- ~~i) All piping to **AWWA Standards**.~~
- ~~j) Heating, lighting, and ventilation.~~

PART 7 — Pump Station Components

General

~~7.1 — Each pump station shall be individually designed. The Owner's Engineer shall submit a Predesign Report. The Predesign Report shall be approved by the Manager, Environment and Engineering Services, or his designate, before detailed design proceeds. The report shall address, at a minimum, each of the following items:~~

- ~~a) — Location and elevation;~~
- ~~b) — Capacity;~~
- ~~c) — Number and type of pumps;~~
- ~~d) — Preliminary piping layout;~~
- ~~e) — Type and appearance of structure;~~
- ~~f) — Foundation conditions;~~
- ~~g) — Maintenance requirements and access;~~
- ~~h) — Energy requirements;~~
- ~~i) — Heating, lighting and ventilation;~~
- ~~j) — Instrumentation and controls; and~~
- ~~k) — Overall system configuration.~~

~~7.2 — Only those system components included on the Approved Products List shall be used, unless otherwise approved by the Manager, Environment and Engineering Services, or his designate.~~

Capacity

~~7.3 — Redundancy of major system components shall be achieved by sizing the components to supply MDD over 18 hours with all trains in service. A higher level of redundancy is also acceptable. Where pumps require a diver for servicing, the system must supply MDD in 18 hours with the largest pump out of service. Each pump station shall comprise at least two equally sized pumps in parallel.~~

Design Features

~~7.4 Unless otherwise approved by the Manager, Environment and Engineering Services, or his designate, pump stations must incorporate, at a minimum, each of the following design features:~~

- ~~a) All stations shall be above ground;~~
- ~~b) Reinforced concrete, block or brick construction, with an aesthetically pleasing appearance consistent with the character of nearby structures. Doors, vents and hatches located, designed and secured for vandal resistance;~~
- ~~c) Access sized to allow the maintenance and removal of the largest piece of equipment;~~
- ~~d) Adequate lighting, heating and ventilation;~~
- ~~e) Minimum insulation in walls: R20; and in roof: R40;~~
- ~~f) Electric motors above 7.5 Hp to be connected to a 3 phase power source;~~
- ~~g) Motors to be premium efficiency, with thermal protection;~~
- ~~h) Pump motor drives shall be variable frequency drives;~~
- ~~i) Pump system to be programmable logic controller controlled, and connected to the SCADA system;~~
- ~~j) Air relief discharge and pilot lines to piped to floor drains;~~
- ~~k) Flow meter connected to a SCADA system;~~
- ~~l) Hour meters and ammeters for each pump connected to a SCADA system;~~
- ~~m) Mechanical pump seals;~~
- ~~n) Suction and discharge pressure gauges, with isolation valves for each pump;~~
- ~~o) Spring return, "silent" check valves;~~
- ~~p) All pipe works to AWWA Standards including coating and lining;~~
- ~~q) Water quality sampling ports;~~
- ~~r) Maintenance vehicle access and parking;~~
- ~~s) Compatible with SCADA system;~~
- ~~t) Heavy Duty chain link perimeter fencing with 3 strand barbed wire on top; and,~~
- ~~u) Heavy Duty gate to accommodate vehicular access.~~

PART 8 — Reservoir Components

General

8.1 — ~~Structural design of reservoirs shall be undertaken by an *Engineer* who is registered as a structural engineer with the Association of Professional Engineers and Geoscientists of British Columbia.~~

Conceptual Design

8.2 — ~~Prior to undertaking detailed design work, the *Owner's Engineer* shall submit a Predesign Report to the *Regional District* for approval. The report must address, at a minimum, the following:~~

- ~~a) — Location and elevation;~~
- ~~b) — Selection of materials;~~
- ~~c) — Design standards;~~
- ~~d) — Existing and future capacity requirements;~~
- ~~e) — Shape;~~
- ~~f) — Number of cells;~~
- ~~g) — Circulation, mixing, water quality, cleaning, and ventilation;~~
- ~~h) — Existing and future pressure zone configurations;~~
- ~~i) — Site and reservoir access;~~
- ~~j) — Overflow and drainage;~~
- ~~k) — Controls;~~
- ~~l) — Geotechnical report on foundation conditions;~~
- ~~m) — Appearance;~~
- ~~n) — Security; and~~
- ~~o) — Separate inlet and outlet pipes designed to promote complete mixing shall be provided. The *Owner's Engineer* shall confirm that adequate mixing will occur and review water quality to assess the need for rechlorination, before any reservoir design will be accepted.~~

Capacity

~~8.3~~ Reservoir capacity shall be calculated as follows:

$$\text{Total storage volume} = A + B + C$$

Where: ~~A = Fire Storage (Calculated as per Fire Underwriters Survey)~~

~~B = Equalization Storage = 0.25 x MDD~~

~~C = Emergency Storage = 0.25 x (A + B)~~

Structural Design Codes

~~8.4~~ Reservoirs shall be constructed of reinforced concrete and shall be designed in accordance with the BC Building Code and one of the following specialty codes:

- ~~a) American Concrete Institute 350/350R: Code Requirements for Environmental Engineering Concrete Structures, and Commentary.~~
- ~~b) Portland Cement Association (PCA): Circular Concrete Tanks Without Prestressing.~~
- ~~c) American Concrete Institute 350.3/350.3R: Seismic Design of Liquid Containing Concrete Structures, and Commentary.~~
- ~~d) AWWA D110: AWWA Standard for Wire and Strand-Wound Circular Prestressed Concrete Water Tanks.~~
- ~~e) AWWA D115: AWWA Standard for Circular Prestressed Concrete Water Tanks with Circumferential Tendons.~~

Reservoir Design Features

~~8.5~~ Unless otherwise approved by the *Manager, Environment and Engineering Services*, or his designate, reservoirs must incorporate, at a minimum, each of the following design features:

- ~~a) Remain watertight and fully operational following 475 year return period seismic loading and be repairable with no uncontrolled release of water following a 2500 year return earthquake;~~
- ~~b) Reservoirs shall have two equally sized cells, each capable of being filled and drained independently. Each cell shall have an access opening in the roof for cleaning and maintenance. The hatch shall be large enough to provide access and to remove the largest piece of equipment in the cell (900 mm x 900 mm minimum) located for visibility of overflow;~~

- c) ~~Hatches constructed of watertight aluminum, complete with hinges and related hardware, perimeter drain, and lock;~~
- d) ~~Ventilation pipes to allow intake and exhausting of air during filling and draining of the reservoir. Pipe vents shall be secure, vandal proof, and preclude the entry of rain, snow, animals or insects;~~
- e) ~~A drain sump at least 1000 mm x 1000 mm X 400 mm; invert of drain pipe to be flush with sump floor; grating to be installed over sump;~~
- f) ~~Reservoir floor to slope down to drain sump;~~
- g) ~~Wall ladder at each access hatch from ceiling to floor. All ladders must meet British Columbia Occupational Health and Safety Regulations including attachment points for fall arrest equipment. Where required, exterior ladders shall be made of stainless steel or aluminum, shall be vandal proof and shall incorporate security features to prevent unauthorized access to the reservoir roof;~~
- h) ~~Above ground reservoir roofs shall have railings as required by British Columbia Occupational Health and Safety Regulations;~~
- i) ~~All pipe work within the reservoir shall be Polyvinyl Chloride Schedule 80, Stainless Steel Schedule 10, or Steel Schedule 40, conforming to AWWA Standards. Steel shall be coated to AWWA Standards;~~
- j) ~~All miscellaneous metal parts, including, fasteners, anchors, etc. shall be stainless steel;~~
- k) ~~The overflow drain shall be sized to convey the maximum pump discharge;~~
- l) ~~Reservoir controls shall consist of level transmitters in each cell indicating 0-100% level. Level sensors shall be pressure transducers, ultrasonic, or radar level transmitters included on the *Approved Products List*, unless otherwise approved by the *Manager, Environment and Engineering Services*, or his designate. This information shall be connected to a SCADA system;~~
- m) ~~All valves associated with reservoir operation shall be located in a separate chamber designed in accordance with this Bylaw;~~
- n) ~~All reservoirs shall be provided with permanent, all weather maintenance vehicle access. Easements or Statutory Rights of Way shall be registered in favour of the *Regional District*;~~
- o) ~~Reservoirs shall be cleaned and disinfected to *AWWA Standards* (AWWA C652) prior to placing into service; and~~

p) ~~All reservoirs shall be protected by a gated chain-link fence (1.8 m high minimum), and provided with vandal proof locks and other security measures deemed necessary by the Manager, Environment and Engineering Services, or his designate.~~

PART 9 — Electrical, Control, and SCADA Systems Components

- 9.1** — ~~Only those system components included on the Approved Products List are acceptable for use, unless otherwise approved by the Manager, Environment and Engineering Services, or his designate.~~
- 9.2** — ~~All control, communication and SCADA systems must be compatible with the Regional District SCADA system.~~
- 9.3** — ~~Standby power is required to ensure water is produced and treated during a power outage. Generators used are to be consistent with the Approved Products List.~~
- 9.4** — ~~All electrical work shall comply with all adopted revisions, editions and versions, of codes and standards applicable to the location of work including:~~
- ~~a) — C22.1, Canadian Electrical Code Part 1;~~
 - ~~b) — British Columbia Building Code;~~
 - ~~c) — Work Safe BC, Occupational Health and Safety Regulations;~~
 - ~~d) — Local By-laws and Regulations; and~~
 - ~~e) — Specified reference standards.~~
- 9.5** — ~~The Owner's electrical contractor must ensure that:~~
- ~~a) — all required approvals and permits are obtained from the local inspection authorities and utility providers for electrical work;~~
 - ~~b) — all work is done in accordance with good practice and by tradesman accredited and skilled in the performance of electrical work;~~
 - ~~c) — all personnel working on or around electrical equipment are able to do so in a safe manner; and~~
 - ~~d) — all electrical equipment installed bears an approval label acceptable in the Province of British Columbia.~~

**Columbia Shuswap Regional District
Subdivision Servicing Bylaw No. 641**

**Schedule "DB"
List of Eligible Sources**

Schedule "DB" – List of Eligible Sources

The following eligible sources for surface water was produced by the Water Stewardship Division, and provided to the CSRD in a memorandum dated October 21, 2011. It is reproduced here for the purpose of Subdivision Servicing Bylaw No. 641, as amended.

For consideration by CSRD in application of their bylaws regarding single residence domestic purpose water use, the Kootenay and Thompson Regions of Water Stewardship Division provides the following list of eligible sources.

- | | | |
|-------------------|-----------------------------|---------------------------------------|
| 1. | Adams Lake | 34-30. Beaver River |
| 2. | Upper Adams River | 32-31. Blaeberry River |
| 3. | Scotch Creek | 33-32. Kicking Horse River |
| 4. | Fransen Creek | 34-33. Trout Lake |
| 5. | Seymour River | |
| 6. | Shuswap Lake | |
| 7. | Little Shuswap Lake | |
| 8. | White Lake | |
| 9-8. | Eagle River | |
| 10-9. | Owlhead Creek | |
| 11-10. | Yard Creek | |
| 12-11. | Malakwa Creek | |
| 13-12. | Loftus Creek | |
| 14-13. | Legerwood Creek | |
| 15-14. | Willis Lake | |
| 16-15. | Craigellachie (Gorge) Creek | |
| 17-16. | Perry River | |
| 18-17. | Griffin Lake | |
| 19-18. | Three Valley Lake | |
| 20-19. | South Pass Creek | |
| 21-20. | Victor Lake | |
| 22-21. | Victor Creek | |
| 23-22. | Clanwilliam Lake | |
| 24-23. | Ratchford River | |
| 25-24. | Wiseman Creek | |
| 26-25. | Columbia River | |
| 27-26. | Upper Arrow Lake Reservoir | |
| 28-27. | Jordan River | |
| 29-28. | Revelstoke Lake Reservoir | |
| 30-29. | Kinbasket Lake Reservoir | |

**Columbia Shuswap Regional District
Subdivision Servicing Bylaw No. 641**

**Schedule "E"
Standard Works and Services Agreement Document**



STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

~~STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT~~

~~THIS AGREEMENT~~ made this _____ day of _____ A.D, 20 _____

~~BETWEEN: THE COLUMBIA SHUSWAP REGIONAL DISTRICT, having an office at 781 Marine Park Drive NE, in the City of Salmon Arm, Province of British Columbia V1E 4P1.~~

~~(hereinafter call the "CSR D")~~

~~OF THE FIRST PART~~

~~AND: (hereinafter call the "Owner")~~

~~OF THE SECOND PART~~

~~WHEREAS:~~

~~A. The Owner is the registered Owner or holder of a Registered Right to Purchase lands and premises situate, lying and being within the CSR D, Province of British Columbia, and more particularly known and described as:~~

~~(hereinafter called the "Land")~~

~~B. The Owner wishes to subdivide and/or develop the Land, or part thereof, in the manner shown on a Plan of Subdivision which has been submitted by the Owner to the Approving Officer of the CSR D for approval, a copy of which such plan is attached hereto as Appendix "A", and is hereinafter call the "Subdivision Plan".~~

~~C. The Owner is desirous of entering into this Agreement with the CSR D pursuant to the provisions of Section 940(2) of the Local Government Act, in order to obtain approval from the Approving Officer of the Subdivision Plan prior to completion of the construction and installation on and/or off the Land of all works and services required by the CSR D to be constructed and installed on the Land and/or on any highway immediately adjacent to the Land by the Owner.~~

~~D. The Owner is also desirous to voluntarily provide works and services beyond the Land and the highway immediately adjacent to the Land in order to obtain approval from the CSR D of the subdivision and/or development, as the CSR D deems it to be too costly to provide those works at the expense of the ratepayers.~~

~~E. The Owner understands that the Works and Services referred to in this Agreement do not include those works and services which are as required by the Ministry of Transportation and Infrastructure.~~

~~AND in consideration of the Regional District entering into this Agreement to allow the construction and installation of Works and Services prior to approval of subdivision or development, the mutual promises contained herein, and other good and valuable consideration, the sufficiency of which is acknowledged by~~

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STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

the parties, ~~THIS AGREEMENT WITNESSES that the Owner covenants and agrees with the Regional District as to the following:~~

~~Appendices~~

- ~~1. The following Appendices are to be initialed by each Party for identification and will be read with and form part of this Agreement.~~

~~Appendix "A" A copy of the subdivision plan for the Lands.~~

~~Appendix "B" A list of the Works and Services and an estimate of their respective construction costs.~~

~~Appendix "C" Construction drawings to be used for the construction of the Works and Services.~~

~~Appendix "D" Performance Security.~~

~~Owner to Do Work~~

- ~~2. The Owner covenants and agrees to design, construct and provide all the Works and Services listed and shown on Appendices "A", "B" and "C" hereto, as approved by the CSRD, in accordance with the standards contained in the CSRD Subdivision and Development Servicing Bylaw No.641. The Owner shall employ only bonded and qualified contractors to carry out and complete the Works and Services.~~

Transfer of Interest in Works

- ~~3. The Owner covenants and agrees with the CSRD to assign, transfer and convey to the CSRD all of its right, title and interest in the Works and Services, upon their completion, (as witnessed by the issuance of a Certificate of Substantial Completion). The Owner will from time to time and at all times so long as it exercises any rights of ownership in the Lands upon request of the CSRD, make, do and execute or cause or procure to be made, done and executed, all such further acts, deeds, right(s) of way, easements and assurances for the more effectual carrying out of this Agreement.~~

Permission to Do Work

- ~~4. The CSRD covenants and agrees to permit the Owner to construct the Works and Services, including that portion of the Works and Services to be constructed on dedicated highways and other right(s) of way controlled by either the CSRD or MoTI, on the terms and conditions herein, and in the manner required by and at the places specified in Appendix "C" of this Agreement and Specifications contained and forming part of the Standard Works and Services Agreement Document; provided that nothing in this Agreement shall be construed as an undertaking, promise or covenant on the part of the CSRD to make available the use of or access to the Works and Services for any purpose, and without limiting the foregoing for the purpose of servicing the Lands or any other real property whatsoever either owned or controlled by the Owner or its associates or~~



STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

~~otherwise, but rather the CSRD reserves the right in its sole and absolute discretion to make available, operate, alter, use, extend, diminish, discontinue, tear up, sell, rent or otherwise dispose of the Works and Services as its Board from time to time deems fit.~~

~~5. Completion of Work~~

~~The Owner shall complete the construction of the Works and Services, specified in Appendix "C" of this Agreement as Project No. _____ of the CSRD, to the satisfaction of the CSRD, within One (1) year from the date of this Agreement.~~

~~Changes to Bylaws~~

- ~~6. The Owner covenants and agrees to comply with any changes in subdivision requirements or standards enacted by the Standard Works and Services Agreement Document prior to the actual commencement of the Works and Services contemplated by the Agreement.~~

~~Design by Professional Engineer~~

- ~~7. The Owner covenants and agrees that all Plans, Specifications and Works and Services required herein shall be prepared, designed, and sealed by a Professional Engineer, who shall be registered with the Association of Professional Engineers and Geoscientists of British Columbia and retained by the Owner as the Owner's Engineer. Plans and specifications for the Works and Services shall be prepared by or under the direct supervision of the Owner's Engineer and all plans shall bear his/her professional seal and signature.~~

~~The Owner covenants and agrees to ensure that the Owner's Engineer maintains professional liability, errors and omissions insurance to a value of \$ _____ per occurrence during the term of the Owner's Professional Engineer's engagement.~~

~~The Owner covenants and agrees to retain the Professional Engineer during the construction period for the purposes of inspection to ensure compliance with the approved design, to ensure sufficient materials testing, and to provide certification of the as-built records.~~

~~Engineering Drawings~~

- ~~8. The Owner covenants and agrees that the intent of this Agreement is that the Owner shall construct fully completed Works and Services, and grant all necessary statutory right(s) of way as shown in the Drawings and Specifications prepared by:~~

~~Under Drawing Nos:~~



STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

and as approved in principle for the purposes of this Agreement by the CSR D Manager of Environment and Engineering Services on the _____ day of _____, 20____.

Changes to Design by the CSR D

9. ~~The CSR D Manager of Environment and Engineering Services may alter the drawings, because of the conditions at the site, so that the Works and Services function and operate in a manner satisfactory to the CSR D Manager of Environment and Engineering Services. Should the Works and Services, as provided herein, prove to be in any way defective or should they not operate to the satisfaction of the CSR D Manager of Environment and Engineering Services, then the Owner shall, at his own cost modify and reconstruct the Works and Services so that the Works and Services shall be fully operative and function to the satisfaction of the CSR D Manager of Environment and Engineering Services.~~

Administration, Design Review and Inspection Fees

10. ~~The Owner covenants and agrees to reimburse the CSR D for all fees incurred by the CSR D for Administration, Design Review and Inspection of the Works and Services. Fees shall be based on actual costs incurred by the CSR D.~~

Start of Work

11. ~~The Owner covenants and agrees not to commence work until the CSR D Manager of Environment and Engineering Services provides the Owner with written permission to proceed with the construction.~~

Provisional Completion

12. ~~A Certificate of Provisional Completion shall be authorized by the CSR D Manager of Environment and Engineering Services on the completion of the construction of the Works and Services, listing all the deficiencies. This Certificate of Provisional Completion shall not be construed as acceptance of the Works and Services. Provisional Completion shall occur when the Owners Engineer has provided written notice to the CSR D, under seal and signature, that not less than ninety eight (98%) percent of the value of the works and services specified in Appendix 'B' of this document has been completed in accordance with the plans and specifications included in Appendix 'C' of this document.~~

Certificate of Completion

13. ~~A Certificate of Completion shall be authorized by the CSR D Manager of Environment and Engineering Services on the completion of the construction and correction of all deficiencies.~~

As Built Submission



STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

14. ~~The Owner covenants and agrees to submit to the CSR the final as-built/record drawings and records of construction, and test results, as required by the CSR Manager of Environment and Engineering Services, within 60 days of the date of the Certificate of Provisional Completion.~~

Maintenance Period and Responsibility

15. ~~The Owner covenants and agrees to maintain every part of the Works and Services in perfect order and in complete repair for a period of one (1) year from the date shown on the Certificate of Completion in accordance with the requirements of this Agreement and Standard Works and Services Agreement Document.~~

~~Should the Owner, for any reason, fail to maintain when ordered, then the CSR Manager of Environment and Engineering Services, at the Manager's option, after giving the Owner seven (7) days written notice (or without notice if an emergency or danger to the public exists), may do so, and the whole costs, charges and expenses so incurred by the CSR will be payable by the Owner, as provided for herein. The decision of the CSR Manager of Environment and Engineering Services will be final with respect to the necessity for repairs, or the adequacy of any work done.~~

~~Once any water mains covered by this Agreement are connected to the CSR water system, only CSR workers or contractors under the direct supervision of the CSR may undertake work on such water mains. As such, CSR workers or contractors retained by the CSR will correct any defects, imperfections, acts of vandalism, settlements and/or re-chlorination and flushing of such water mains which is deemed by the CSR Manager of Environment and Engineering Services to be necessary, during the one (1) year period from the date shown on the Certificate of Completion, and the whole of such costs, charges and expenses so incurred by the CSR in undertaking such work including but not limited to contractor costs will be payable by the Owner as provided for herein. Any re-chlorination and flushing work on any water main, or water main break, shall be considered to be "emergency work" and as such the Owner may not receive prior notice that such work is being undertaken by the CSR.~~

~~Prior to the release of the Performance Security for the works and services the Owner will deliver to the CSR a maintenance security in accordance with Standard Works and Services Agreement Document.~~

Certificate of Final Acceptance

16. ~~The CSR covenants and agrees that upon satisfactory completion by the Owner of all the covenants and conditions in this Agreement, including the maintenance of the Works and Services in complete repair for a period of one (1) year, to provide the Owner with a Certificate of Final Acceptance of the Works and Services, signed by the CSR Manager of Environment and Engineering Services. Notice of Final Acceptance of the Works and Services will be issued by the CSR Manager of Environment and Engineering Services when all deficiencies have been corrected, as built drawings and service record cards received, and the maintenance period outlined herein has expired.~~

~~All such Works and Services remain at the risk of the Owner until the Certificate of Final Acceptance for the Works and Services has been issued.~~

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STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

Final Building Inspection Withheld

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17. ~~The Owner acknowledges and agrees that the CSR D will withhold the granting of a Final Inspection for the use of any building or part thereof, constructed upon the Lands until all the Works and Services required herein have been completed to the satisfaction of the CSR D Manager of Environment and Engineering Services.~~

Owner Indemnifies CSR D

18. ~~The Owner covenants and agrees to save harmless and indemnify the CSR D against:~~

- ~~(a) all actions and proceedings, costs, damages, expenses, claims, and demands whatsoever and by whomsoever brought by reason of the construction, installation, maintenance or repair of the Works and Services;~~
- ~~(b) all expenses and costs which may be incurred by reason of the construction, installation, maintenance or repair of the Works and Services resulting in damage to any property owned in whole or in part by the CSR D for which the CSR D by duty or custom is obliged, directly or indirectly, in any way or to any degree, to construct, install, maintain or repair;~~
- ~~(c) all expenses and costs which may be incurred by reason of liens for non payment of labour or materials, Work Safe BC assessments, Employment Insurance, Canada Pension Plan, Federal and Provincial Tax, Property Reinstatements or encroachments owing to mistakes in survey.~~
- ~~(d) all expenses and costs which may be incurred by the CSR D as a result of faulty workmanship and defective material in any of the Works and Services installed by the Owner.~~

~~The above sub clauses shall not be construed as to extinguish any rights which the CSR D would have, were it not for the inclusion of this Clause 18 (eighteen) of this Agreement.~~

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Insurance Coverage by Owner

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19. ~~The Owner covenants and agrees to provide the following insurance coverage, and to provide the CSR D with a copy of the insurance policy prior to the commencement of any construction of the Works and Services.~~

- ~~(a) To protect the Owner and the CSR D against all claims arising out of:~~

- ~~(i) Death or injury to persons and,~~



STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

~~(ii) Damage to or loss of any CSR D buildings, structures, stores, equipment and materials included in or required for the carrying out of the Works and Services.~~

~~(b) Every policy of insurance required shall:~~

~~(i) Name "THE CSR D " as an 'Additional Insured' and,~~

~~(ii) State that the policy applies to each insured in the same manner and to the same extent as if a separate policy had been issued to each Insured and,~~

~~(iii) State that the policy cannot be canceled, lapsed or materially changed without at least thirty (30) days written notice to the CSR D, delivered to the CSR D Manager of Environment and Engineering Services.~~

~~The Owner shall at his sole expense throughout the currency of this Servicing Agreement carry Comprehensive Liability Insurance acceptable to the CSR D in the amount of at least Five Million Dollars (\$5,000,000.) with insurance companies licensed to carry on business in the Province of British Columbia in partial discharge of the Owners obligation under Clause 18 (eighteen) of this Agreement.~~



STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

WCB Designated Prime Contractor

20. ~~Where the Owner constructs Works and Services on dedicated highways and other right(s) of way controlled by either the CSR D or MoTI, on the terms and conditions herein, and in the manner required by and at the places specified in Appendix "C" of this Agreement and Specifications contained and forming part of the Standard Works and Services Agreement Document, the Owner shall, seven (7) days prior to the start of the construction works and services, complete and submit to the CSR D, a completed WCB Designated Prime Contractor form. (Appendix E)~~

Performance Security

21. ~~As Security for the due performance of all of the covenants and promises contained in this Agreement, the Owner will on signing this Agreement deposit with the CSR D a Performance Security Deposit, calculated in Appendix 'D' (Item D.1 & D.2), of this Agreement, in the amount of \$ _____ in the form of Cash or an Irrevocable Letter of Credit acceptable to the CSR D (herein called the Performance Security).~~

Forfeiture of Performance Security

22. ~~In the event that the Owner fails to construct and install the Works and Services prescribed herein within the time specified in Clause 5 (five) of this Agreement, the said Performance Security of \$ _____ will be forfeited to the CSR D.~~

Consent to Forfeiture of Performance Security for Deferred Works

23. ~~The Owner acknowledges that construction of the following Works and Services are premature and/or may give rise to risk of public safety and agrees therefore to forfeit the amount of the Performance Security indicated. The CSR D will retain this amount and will use it to construct the said Works and Services at a future _____ time of its choosing. The CSR D will not claim any further compensation from the Owner and the Owner will have no entitlement to return any part of the forfeited amount.~~

~~Proposed Works and Services _____ Security Amount Forfeited~~

~~_____

_____~~



STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

Use of Performance Security

24. ~~The Owner agrees that if all the Works and Services or obligations are not completed, installed or performed pursuant to this Agreement, the CSR D may complete or fulfill the Works and Services or obligations at the cost of the Owner and deduct from the Performance Security held by the CSR D the cost of such completion, and the balance of the deposit shall be returned to the Owner, less any unpaid Administration, Design Review, and Inspection fees or costs incurred. If there is insufficient money on deposit with the CSR D, then the Owner will pay such deficiency to the CSR D immediately upon receipt of the CSR D's bill for completion. It is understood that the CSR D may do such Works and Services either by itself or by contractors employed by the CSR D. If the Works and Services are completed as herein provided, then the deposit shall be returned to the depositor.~~

Release of Security and Provision of Two Year Maintenance Security

25. ~~If the CSR D Manager of Environment and Engineering Services is of the opinion that the Works and Services or any portion thereof have been adequately completed, and the Owner's covenants performed in compliance with this Agreement, and if there is no litigation pending or threatened by any third party against the CSR D as a result of, or arising from, the construction of the Works and Services, the CSR D Manager of Environment and Engineering Services may return all, or any portion of the Performance Security to the Owner at such times and in such amounts as the CSR D Manager of Environment and Engineering Services may deem proper, provided only that the CSR D Manager of Environment and Engineering Services will retain an amount equal to Ten (10%) Percent of the Performance Security Deposit, with a minimum of One Thousand (\$1,000.) to secure the performance of the maintenance required of the Owner (hereinafter called the Maintenance Security).~~

Return of Maintenance Security

26. ~~If at the end of the one (1) year maintenance period the CSR D Manager of Environment and Engineering Services is satisfied that the Owner has complied with the covenants contained in this Agreement and if there is no litigation pending or threatened by any third party against the CSR D as a result of, or arising from, the construction of the Works and Services, the CSR D Manager of Environment and Engineering Services may direct that the Maintenance Security or any portion thereof, be returned to the Owner and thereafter the Owner's responsibility for the Works and Services shall cease.~~



STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

Payment of Administration, Design Review, and Inspection Fees

27. ~~The Owner covenants and agrees to pay to the CSRD, Administration, Design Review and Inspection Fees at full cost, as referred to in Clause 10 (ten) of this Agreement. Fees are payable by cash or cheque and will be invoiced monthly by the CSRD. Any unpaid fees shall be covered by reducing the Refundable Performance Security by the amount equal to the unpaid fees.~~

No Other Representations

28. ~~It is understood and agreed that the CSRD has made no representations, covenants, warranties, guarantees, promises or agreements (verbal or otherwise) with the Owner other than those in this Agreement.~~

Compliance with Bylaws

29. ~~Subject to this Agreement, the proposed Works and Services and the development herein shall comply with all of the Bylaws of the CSRD.~~

No Waiver

30. ~~The Owner covenants and agrees that nothing contained or implied herein shall prejudice or affect the rights and powers of the CSRD in the exercise of its functions under any public and private statutes, bylaws, orders and regulations, all of which may be fully and effectively exercised in relation to the said Lands as if the Agreement had not been executed and delivered by the Owner.~~

Notice to Owner

31. ~~Any demand or notice required or permitted to be given under the provisions of this agreement shall be in writing and may be given by mailing such notice by prepaid registered post to the party concerned at the address of such party first above recited, and any such notice or demand mailed as aforesaid shall be deemed to have been received by the party to whom it is addressed on the second business day after the date of posting thereof.~~

~~THIS CONTRACT~~ shall enure to the benefit of and be binding upon the parties hereto, their respective successors and assigns.

~~IN WITNESS WHEREOF~~ the parties hereto have executed this Agreement the day and year first above written.

FOR _____ SIGNED, SEALED AND DELIVERED)
_____ The Corporate Seal of _____)

_____ Was hereunto affixed in the presence of _____)

_____ Signature _____)

_____ Name _____)

_____ Title _____) **SEAL**

FOR _____ SIGNED, SEALED AND DELIVERED)
_____ By the above named in the presence _____)
_____ Of (witness): _____)

_____ Signature _____) _____
_____ Owner's Signature
_____ Name _____)

_____ Occupation _____)

_____ Address _____) _____
_____ Owner's Signature
_____)
_____)

FOR THE _____ SIGNED, SEALED AND DELIVERED)
CSRD _____ The Corporate Seal of the CSRD _____)
_____ was hereunto affixed in _____)
_____ The presence of: _____)

_____ MANAGER OF CORPORATE
ADMINISTRATION SERVICES (SECRETARY)

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STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

APPENDIX "A"

~~A copy of the subdivision plan of the Lands.~~

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STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

APPENDIX "B"

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**~~A list of the Works and Services and Engineers
Construction Estimate of their respective construction costs
(On-site and Off-site Works)~~**

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APPENDIX "C"

**Construction drawings to be used for
construction of the Works and Services
(On-site and Off-site Works)**

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STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

APPENDIX "D"

Refundable Performance Security

Refundable Performance Security – On Site Works

D.1 Total cost for Construction of On Site Works and Services
as per Appendix "B" \$ _____

On Site Performance Security \$ _____ X 1.25 = \$ _____
(Cash or Irrevocable Letter of Credit)

Refundable Performance Security – Off Site Works

D.2 Total cost for Construction of Off Site Works and Services
as per Appendix "B" \$ _____

Off Site Performance Security \$ _____ X 1.25 = \$ _____
(Cash or Irrevocable Letter of Credit)

Note: A Maintenance security in the amount of 10% of the total Performance Security amount for both On Site and Off Site works shall be retained for a period of two years from the date shown on the Certificate of Completion.

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STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

APPENDIX "E"

WCB DESIGNATED PRIME CONTRACTOR

Designation of Contractor as Prime Contractor for CSRD Project

CSRD Information

Contract Number: _____

Description: _____

Contact Person: _____

Prime Contractor Information

Name of Prime Contractor: _____

Address: _____

Phone: _____

Prime Contractor WCB Account Number: _____

Person in Charge of Project: _____

Person Responsible for Coordinating Health and Safety Activities: _____

Prime Contractor's Declaration as per Workers' Compensation Act

~~I/we acknowledge, in accordance with the Workers' Compensation Act (RSBC 1996) Chapter 492, Part 3, Division 3, Sections 115, 116, 117, 118, 119, 120, 121, 122, 123, and 124 that I/we are the "Prime Contractor" and are qualified to act as the "Prime Contractor". I/we accept the duties and responsibilities for coordination of health and safety in accordance with the Workers Compensation Act. And further that I/we will do everything that is reasonably practicable to establish and maintain a system or process that will insure compliance with the Workers Compensation Act and the Occupational Health and Safety Regulations.~~

Prime Contractor's Signature

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STANDARD WORKS AND SERVICES AGREEMENT DOCUMENT

Date: _____

**COLUMBIA SHUSWAP REGIONAL DISTRICT
SUBDIVISION SERVICING BYLAW NO. 641**

**SCHEDULE "F"
SEWAGE COLLECTION, TREATMENT AND EFFLUENT DISPOSAL
DESIGN GUIDELINES AND STANDARDS
(for Sanitary Systems)**

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PART 8 Electrical, Control, and SCADA System Components..... 22

PART 1 — GENERAL

Standards

- 1.1 — All ~~Works and Services~~ shall be designed in accordance with this bylaw and the ~~Approved Standard Drawings~~, and ~~Approved Products List~~, and constructed in accordance with the most current version of the ~~MMCD~~ and Standard Drawings. Unless otherwise specified, the most recent version available to the ~~Regional District~~ at the time of approval of all referenced standards, shall apply.
- 1.2 — The ~~Owner~~ shall also ensure all ~~Works and Services~~ are designed in accordance with the requirements of the most current edition of the ~~Environmental Management Act~~, ~~Municipal Sewage Regulation~~, the ~~Public Health Act~~, ~~Sewerage System Regulation~~, and the ~~Sewerage System Standard Practice Manual~~.
- 1.3 — In addition to the requirements of this bylaw, the applicant is required to obtain approval for designs and authorization to construct from the ~~Ministry of Transportation and Infrastructure~~ on any proposed ~~Highway~~ crossings or works within its rights-of-way.

Submissions Required Prior to Application for Subdivision

Conceptual Sewage Servicing Plan

- 1.4 — A subdivision for which a ~~Community Sewage System~~ is required or proposed will not be approved until a Conceptual Sewage Servicing Plan has been prepared by the ~~Owner's Engineer~~ and accepted by the ~~Manager, Environment and Engineering Services~~, or his designate, the ~~Ministry of Transportation and Infrastructure~~, and ~~Ministry of Environment~~. A Conceptual Sewage Servicing Plan must show the alignment, location and size of sewer mains, manholes, lift stations, treatment facilities and disposal methods in sufficient detail to demonstrate the feasibility of the proposal. The Conceptual Sewage Servicing Plan shall be submitted to the ~~Regional District's Engineer~~ for review and comment. The ~~Owner~~ shall edit the Conceptual Sewage Servicing Plan as required and shall resubmit it to the ~~Regional District~~ for approval. The fee for the ~~Regional District's Engineer~~ shall be paid for by the ~~Owner~~.
- 1.5 — The ~~Owner's Engineer~~ shall consult the ~~Regional District~~ to determine the ultimate population to be served and disposal rate assumptions.
- 1.6 — Prior to the design of an extension of an existing sewer system owned by the ~~Regional District~~, the capacity of the collection, pumping, treatment and disposal systems, and potential effects of the extension on pre-existing parcels and other properties within the

~~original service area shall be reviewed by the **Owner's Engineer**. This review shall identify and account for any features that may affect, or be affected by the proposed development.~~

~~1.7 The Conceptual Sewage Servicing Plan shall include a sewage treatment schematic, including the capacity of each treatment process and operating philosophy.~~

~~1.8 If an Electoral Area Liquid Waste Management Plan has been completed for the community in which the subdivision is proposed, or from which it will be serviced, then the Conceptual Sewage Servicing Plan shall conform to the Liquid Waste Management Plan.~~

Submissions Required at Time of Application for Subdivision

Regulatory Approvals

~~1.9 The **Owner** shall provide copies of all applications for all relevant regulatory approvals to the **Regional District**.~~

Design Drawings

~~1.10 Detailed design drawings shall be submitted to the Regional District at the time of subdivision application. The detailed design drawings shall, at a minimum, show the following:~~

- ~~a) Location, size, capacity, component details, configuration, controls and alarms for all sewage treatment works;~~
- ~~b) Location, alignment, diameter, material, and elevation of all pipes and manholes;~~
- ~~c) Location, elevation and material of all service connections and appurtenances;~~
- ~~d) Location, elevation and details of lift stations;~~
- ~~e) Trench details including material for pipe bedding, backfill and surface restoration;~~
- ~~f) Structural details for treatment facilities;~~
- ~~g) Location of geotechnical test pits or boreholes;~~
- ~~h) Location and component details for all system electrical, control and monitoring equipment (instrumentation, controls, SCADA, effluent quality analyzers, telemetry/communication systems);~~

- i) ~~Location, size, component details, construction details for all sewage effluent metering equipment; and~~
- j) ~~Location, grades and alignment of maintenance vehicle access and rights-of-way.~~

~~Plans, Reports and Supporting Information~~

1.11 ~~The **Owner** shall provide all environmental, geotechnical, hydrological, hydrogeological, structural, electrical, and any additional information concerning the proposed **Works and Services** to the **Regional District**.~~

1.12 ~~Detailed design and reports shall be submitted to the **Regional District** for review and approval. The **Regional District** may retain the services of a third party **Engineer** to undertake this review. The cost of this review shall be paid by the **Owner**.~~

~~Submissions Required Prior to Construction~~

~~Regulatory Approvals~~

1.13 ~~The **Owner** shall provide copies of all required approvals to the **Regional District** prior to starting construction.~~

PART 2 — REGULATIONS

General

- 2.1 — All sewage systems with daily flows of less than 22,700 L/day are regulated by the Public Health Act and the associated British Columbia "~~**Sewerage System Regulation (SSR)**~~". Written confirmation is required from the ~~**Environmental (Medical) Health Officer**~~, confirming that all requirements of the ~~**SSR**~~ have been met.
- 2.2 — All sewage systems with daily flows that exceed 22,700 L/day are regulated by the Environment Management Act and the associated "~~**Municipal Sewage Regulation (MSR)**~~". A compliant ~~**Ministry of Environment**~~ registration and approval is required for sewage systems constructed under the ~~**MSR**~~.
- 2.3 — Where a parcel or proposed subdivision is ~~**NOT**~~ required to be served by a ~~**Community Sewer System**~~, such parcels shall be served by individual on-site sewerage disposal systems meeting the requirements of the ~~**Sewerage System Regulation (SSR)**~~.
- 2.4 — Where a parcel or proposed subdivision is to be served by a ~~**Community Sewer System**~~, the design of the ~~**Community Sewer System**~~ shall be in accordance with the requirements of this bylaw, the ~~**Municipal Sewage Regulation (MSR)**~~, and Electoral Area Liquid Waste Management Plan where applicable.

PART 3 — DESIGN CRITERIA

General

- 3.1 — These standards are not intended to be a substitute for sound engineering knowledge and experience. The design of sanitary sewage systems and the various system components shall be prepared under the direction of and sealed by a **Professional Engineer**.

Design Flows

- 3.2 — Design flows shall be based on ultimate population and full development as anticipated in the Official Community Plan, other land use regulations, or as determined in consultation with the **Regional District**.
- 3.3 — Average daily flows to be used for design shall be developed in consultation with the **Regional District**, and shall be based on reliable relevant water consumption records, and occupancy rates where available.

Where relevant records are not available, the following may be used as a guideline:

Residential
450 L/capita/day

Non-Residential
To be determined on a case by case basis

- 3.4 — All sanitary sewers shall be designed to carry the peak wet weather flow.

Peak Flows shall be calculated using a Peaking Factor determined by the Harmon Formula:

$$\text{Peaking Factor} = \frac{18 + P^{0.5}}{4 + P^{0.5}}, \text{ where } P = \text{Population in thousands.}$$

An infiltration allowance of 0.1 L/s/ha shall apply.

$$\text{Peak wet weather flow} = \text{Average Daily Flow} \times \text{Peaking Factor} + \text{Infiltration}$$

PART 4 — COLLECTION SYSTEM COMPONENTS

Hydraulic Design

Gravity Sewers

4.1 Gravity Sewer design shall be based on the Manning's Formula, for 3/4 depth,

$$Q = \frac{AR^{0.667}}{n} \times S^{0.5}$$

where, Q = Design flow in m³ per second
 A = Cross sectional area in m²
 R = Hydraulic radius in metres
 S = Slope of hydraulic grade line in m/m
 n = Roughness Coefficient

Force Mains

4.2 Force Mains shall be designed using the Hazens-Williams Formula,

$$Q = \frac{CD^{2.63} \times S^{0.54}}{278 - 780}$$

where, Q = Rate of flow in L/S
 D = Internal pipe diameter in mm
 S = Slope of hydraulic grade line in m/m
 C = Roughness coefficient

4.3 Force mains shall enter receiving manholes at crown to crown elevation and direct the flow into the receiving channel without excessive spray and in the direction of the receiving sewer flow.

4.4 Air release and vacuum valves, suitable for sewage flow, shall be installed at high points in force main installations. Air release and vacuum valve chambers shall be designed in accordance with the **Approved Standard Drawings**.

Pipe Velocities

Gravity Sewers

4.5 The allowable velocity for gravity sewer pipes shall be:

Minimum 0.76 m/s.
Maximum none

4.6 Although there is no specified maximum velocity for gravity sewer mains, where velocities exceed 3.65 m/s consideration shall be given to scour and shock hydraulic problems.

4.7 Where upstream sections of sewers require steeper grades to ensure self cleansing velocity under partial flow conditions. The following design alternatives are acceptable:

- a) The grade of the terminal section of main servicing 6 or less sanitary connections shall be 1% greater than the minimum grade specified in 4.35.
- b) The grade of a sewer main servicing the 7th to 12th sanitary connections shall be 0.5% greater than the minimum grade specified in 4.35.
- c) The grade of a sewer main servicing the 13th sanitary connection, or more, shall be dictated by the minimum grade specified in 4.35.

Force Mains

4.8 The allowable velocity for sewer force mains shall be:

Minimum (cleansing)	0.9 m/s
Maximum	3.65 m/s

Minimum Pipe Diameters

Gravity/Force Mains

4.9 The minimum pipe diameters are:

Gravity collection mains	200 mm
Force mains	100 mm

Materials

4.10 All sanitary sewer works materials must conform to applicable ~~ASTM Standards~~ and ~~C.S.A. Standards~~.

4.11 Pipe or sanitary mains shall be polyvinyl chloride and shall conform to ~~ASTM Standards~~ and ~~C.S.A. Standards~~.

4.12 Fittings and valves shall conform to ~~ASTM Standards~~ and to the ~~Approved Products List~~.

4.13 All electrical material and equipment must conform to ~~C.S.A. Standards~~ and ~~Underwriters Laboratories Standards~~.

4.14 — All service pipe and fittings must conform to ~~ASTM Standards~~ and ~~C.S.A. Standards~~.

Depth of Cover

4.15 — The minimum depth of cover shall be either 1.5 m or depth of frost penetration, whichever is greatest.

4.16 — Where it is not possible to achieve depths required by 4.15 due to rock or other impediment then the **Owner's Engineer** shall:

- a) — Provide adequate insulation that conforms to the Approved Products List, and ensure it is installed in accordance with manufacturer's recommendations or Dow Chemical Canada Utility Line Installation Guidelines; and
- b) — Provide a minimum depth of cover or other means sufficient to provide mechanical protection from external loads or vandalism.

4.17 — Sewer mains and services shall be of sufficient depth to clear other underground utilities.

4.18 — All new installation must be deep enough to provide gravity service to standard basement elevations.

Sewer Main Alignment and Location

4.19 — Sewer mains shall be located in the road rights-of-way as shown on the **Approved Standard Drawings** unless otherwise approved by the **Manager, Environment and Engineering Services**, or his designate.

4.20 — If it is not practical to locate a sewer main in a road right-of-way, and if approved by the **Manager, Environment and Engineering Services**, or his designate, then sewer mains shall be located in a utility or **Regional District** right-of-way. The utility right-of-way shall have a width of 6 m, or twice the depth of the deepest pipe, whichever is greater.

4.21 — On straight roads, sewer mains shall have straight alignments with uniform offsets between intersections.

4.22 — Curved alignments parallel to property lines may be used, but joint deflections must be limited to half the maximum deflection specified by the pipe manufacturer. The radius of curvature shall be not less than 50 m, the pipe grade shall not be less than 1.0% and the design velocity shall not exceed 0.91 m/s.

4.23 — Sewer mains shall be located such that each property served has at least one side facing the sewer main.

4.24 ~~All sewer mains, services, manholes and appurtenances that require maintenance shall be provided with access from a public road. The maintenance access must be sufficiently wide and structurally sound to support maintenance vehicles and must meet the Ministry of Transportation and Infrastructure requirements, including requirements related to location.~~

Manholes

4.25 ~~Manholes are required at all changes in grade, alignment, size and dead-end main.~~

4.26 ~~Maximum manhole spacing shall be as follows:~~

375 mm diameter pipe and smaller	125 m
450 mm to 900 mm	155 m
1050 and larger	185 m
Any size pipe exceeding 10%	60 m

4.27 ~~The crown of the incoming pipe must be the same elevation as the crown of the outgoing pipe where a change in pipe diameter occurs.~~

4.28 ~~The minimum drop in invert levels across a manhole are:~~

Straight run	minimum grade
Deflections up to 45°	50 mm drop
Deflections 45° to 90°	65 mm drop

Drop Manholes

4.29 ~~An outside drop manhole shall be installed where the elevation of the inlet invert is 600 mm or greater, above the invert elevation of the centre of the manhole channel. Drop manholes shall be designed in accordance with the **Approved Standard Drawings** and shall only be used when incoming sewers grades cannot be steepened or where site conditions do not permit otherwise.~~

4.30 ~~Inside ramps may be utilized when incoming sewer grades cannot be steepened and the elevation of the inlet invert is less than 600 mm above the invert elevation of the centre of the manhole, and if approved by the **Manager, Environment and Engineering Services**, or his designate.~~

Clean-outs

4.31 ~~Clean-outs are not permitted in place of manholes except where the sanitary main will be extended for future subdivision/development.~~

Proximity to Water Mains

4.32 — Where a water main crosses a sewer main the installation shall be made in accordance with regional health authority requirements.

4.33 — At least 1 m horizontal separation shall be maintained between a sewer main and any existing or proposed ditch or underground utility. At least 3 m horizontal separation shall be maintained between a sewer main and a water main.

4.34 — Where a sanitary sewer crosses a water main, the sewer must be at least 0.5 m below the water main, and for 3 m on each side of the sewer, the joints of the water main shall be wrapped with heat shrink wrap in accordance with the **Approved Products List**. Crossings shall be at close to perpendicular as possible and shall not be at an angle of less than 20°. Crossings shall be laid such that the crossing is made midway between the joints on a full length of water main.

Grade

4.35 — Pipes grades shall be at a constant between manholes.

4.36 — The minimum pipe grades are:

<u>Pipe Size (mm)</u>	<u>Grade (%)</u>
150	2.00
150	1.00
200	0.45
250	0.33
300	0.25

4.37 — Where the pipe grade exceeds 20% provide anchorage, joint restraints, trench dams and trench drainage based on the recommendations of an Engineer registered as a geotechnical engineer with the *Association of Professional Engineers and Geoscientists of British Columbia*.

Service Connections

4.38 — Service connections size shall be calculated based on designated land use, and as required by the current edition of the *British Columbia Plumbing Code*.

4.39 — The minimum service size shall be 100 mm diameter.

4.40 — Service connections shall be installed with an inspection chamber at property line for sizes up to 150 mm and with a manhole at the sewer main for sizes greater than 150 mm.

~~Inspection chambers shall be installed in accordance with the **Approved Standard Drawings**.~~

~~4.41 Sanitary sewer services shall be designed to permit standard basement service to all proposed lots. In all cases, the minimum service grade is 2%.~~

~~4.42 A service connection entering a manhole shall have its invert elevation at the crown of the highest pipe entering the manhole. The service connection shall discharge in the same direction as the benched flow.~~

~~4.43 Unless otherwise approved by the **Manager, Environment and Engineering Services**, or his designate, service connections shall be perpendicular to the front property line and located on the low side of the lot. Service connections shall not be located under driveways or under travelled areas. Inspection chambers shall be located within 300 mm of the property line on the public side.~~

PART 5 LIFT STATION Components

General

- 5.1 — The objective is to minimize the number of sanitary lift stations. All options to avoid the implementation of lift stations must be thoroughly considered. Any proposed use of lift stations must receive prior approval from the ***Manager, Environment and Engineering Services***.
- 5.2 — Each sanitary lift station shall be individually designed. The ***Owner's Engineer*** shall submit a pre-design report. The pre-design report shall be approved by the ***Manager, Environment and Engineering Services***, or his designate, before detailed design proceeds. The pre-design report shall address, but not be limited to the following items:
- a) — Location and elevation, include vehicular access;
 - b) — Design shall accommodate flows from the overall catchment area;
 - c) — Impact on neighbouring properties, in particular odour and noise control;
 - d) — Number and type of pumps, include expansion where applicable;
 - e) — Geotechnical investigation, including uplift restraints based on maximum groundwater levels, and dewatering requirements where applicable;
 - f) — Location and capacity of power supply, including energy requirements;
 - g) — Heating, lighting and ventilation;
 - h) — Instrumentation and controls;
 - i) — Backup emergency power supply;
 - j) — Overall system configuration;
 - k) — Maintenance requirements and access;
 - l) — Work safe BC compliance; and
 - m) — Capital costs, operation and maintenance costs.
- 5.3 — Only those system components included on the ***Approved Products List*** shall be used, unless otherwise approved by the ***Manager, Environment and Engineering Services***, or his designate.

Capacity

- 5.4 — Sanitary sewer lift stations shall, at minimum, be designed and sized to accommodate the ultimate flows of the designated overall catchment area(s) for all the major

components including the wet well, pumps, electrical, station layout, gravity mains and force mains.

5.5 Minimum storage within the wet well between the high level alarm and the start of overflow storage capacity shall be:

Average wet weather flow	2 hours
Peak wet weather flow	1 hour

5.6 Pumps shall be sized to pump maximum flow conditions with one pump in failure mode. Pump start/stop times shall be as per manufacturer's specifications.

Design Features

5.7 Lift stations shall be designed in accordance with the ***Approved Standard Drawings***.

5.8 Unless otherwise approved by the ***Manager, Environment and Engineering Services***, or his designate, lift stations design shall include, but not be limited to the following considerations and design features:

Location

5.9 The lift station design location shall take into consideration the following:

- a) Maximize the catchment area and allow for future service area expansion;
- b) Topography and vehicular access;
- c) All components shall be above the 200-year + 0.6 m floodplain;
- d) Odour, aesthetics and noise;
- e) Land use and ownership;
- f) Security against vandalism and theft;
- g) Safety for operators and public; and
- h) Overflow potential and environmental impact assessment.

Site Layout

5.10 The lift station design site layout shall take into consideration the following:

- ~~a) Vehicular access to lift station hatch and parking for two maintenance vehicles;~~
- ~~b) Hydro and Tel services to be underground to structures;~~
- ~~c) Site lighting to adequately light all structures;~~
- ~~d) Acceptable location of SCADA antenna mast;~~
- ~~e) Acceptable landscaping and irrigation plan;~~
- ~~f) Perimeter security fencing around all structures;~~
- ~~g) Concrete apron for a minimum of 2 m around all structures;~~
- ~~h) 50mm water service c/w backflow, shut off and a self draining stand pipe located near the wet well;~~
- ~~i) Force main emergency bypass;~~
- ~~j) Gravity mains shall connect into a common manhole located within 30m of the force main emergency bypass; and~~
- ~~k) Force main flow meter chamber.~~

Pumps

5.11 The lift station pumps shall meet the following criteria:

- ~~a) Minimum 2 pumps capable of operating alternately and independent of each other, with each capable of pumping max flow conditions with one pump in failure mode and operate while one pump is removed for maintenance;~~
- ~~b) 3 phase 600 volt where possible;~~
- ~~c) Maximum 1800 RPM;~~
- ~~d) 1 pump must include a mix flush valve;~~
- ~~e) Motors to be premium efficiency, equipped with thermal protection and leak detection.~~
- ~~f) Pump motor drives shall be variable frequency drives;~~
- ~~g) Pumps shall be non-clogging submersible pump c/w open two vane self cleaning impeller, guide claw, discharge connection and data plate;~~
- ~~h) Pumps shall be automatically and firmly connected to a watertight discharge connection by a machined metal to metal contact, guided by no less than two guide bars extending from the top of the station to the discharge connection;~~
- ~~i) No portion of the pump shall bear directly on the sump floor; and~~
- ~~j) Pumps shall be factory tested prior to delivery.~~

Lift Station Tank & Appurtenances

~~5.12 The lift station tank and appurtenances shall be designed in accordance with the **Approved Standard Drawings and Approved Products List.**~~

~~Valve Chamber~~

~~5.13 Lift stations shall be equipped with an insulated above ground valve chamber designed in accordance with the **Approved Standard Drawings and Approved Products List.**~~

~~Emergency Backup Generator~~

~~5.14 Lift stations shall be equipped with an emergency backup generator capable of running the entire system at 100% loading for 36 hours.~~

~~5.15 Backup generator shall be mounted on a reinforced concrete slab 100mm above finished grade. All mounting shall incorporate theft protection.~~

~~5.16 Backup generator shall be equipped with digital controller, batteries/charger/rack/cables, circuit breaker, solenoid valve, muffler, weather proof enclosure/sound attenuation foam and vibration isolator pads.~~

~~5.17 Where Natural Gas supply is available, N/G generator shall be provided. Where N/G is not available a diesel generator shall be provided. Where fuel storage tanks are required, they shall be double walled c/w leak detection monitor, installed in a safe convenient location for refuelling. Fuel lines shall be installed underground through a conduit from the tank to the generator.~~

Commissioning and Acceptance

~~5.18 Prior to acceptance by the **Regional District** of the completed lift station, a thorough inspection and operational check of the lift station is required. **The Owner's Engineer** shall submit a commissioning plan, including a system check list, personnel required to attend, and proposed schedule to the **Manager, Environment and Engineering Services**, or his designate for approval.~~

~~5.19 Only upon the completion and final acceptance of the completed lift station, as per the requirements of this bylaw, will the **Regional District** acquire and operate the completed lift station.~~

PART 6 — TREATMENT AND DISPOSAL SYSTEM COMPONENTS

General

- 6.1 — All new ***Sewage Disposal Systems*** shall provide treatment to meet or exceed the requirements of the ~~*Public Health Act*~~ and ~~*Environmental Management Act*~~.
- 6.2 — Extensions or connections to existing ***Community Sewage Treatment and Disposal Systems*** may not be required to provide additional treatment provided the capacity of the existing system is adequate to incorporate the new lots to meet the criteria in this bylaw.
- 6.3 — All ~~***Community Sewage Treatment and Disposal Systems***~~ shall be individually designed. The ~~***Owner's Engineer***~~ shall submit a pre-design report. The pre-design report shall be approved by the ~~***Manager, Environment and Engineering Services***~~, or his designate, before detailed design proceeds. The pre-design report shall address, but not be limited to the following items:
- a) ~~Location, elevation, vehicular access, security fencing and signage;~~
 - b) ~~Design flow calculations from the overall catchment area, surge loading;~~
 - c) ~~Treatment, disposal process, analysis and supporting documentation;~~
 - d) ~~Impact on neighbouring properties, in particular odour and noise control;~~
 - e) ~~Future expansion and/or phased implementation plan where applicable;~~
 - f) ~~Geotechnical and environmental requirements;~~
 - g) ~~Location and capacity of power supply, including energy requirements;~~
 - h) ~~Heating, lighting and ventilation;~~
 - i) ~~Instrumentation and controls;~~
 - j) ~~Backup emergency power supply;~~
 - k) ~~Overall system configuration and site plan;~~
 - l) ~~Maintenance and sludge disposal requirements;~~
 - m) ~~Work safe BC compliance; and~~
 - n) ~~Capital costs, operation and maintenance costs.~~
- 6.4 — Only those system components included on the ~~***Approved Products List***~~ shall be used, unless otherwise approved by the ~~***Manager, Environment and Engineering Services***~~, or his designate.

Washroom Facilities

6.5 — A single washroom with dual flush toilet and sink shall be installed in a **Community Sewage Treatment and Disposal Facility**, unless this requirement is waived by the **Manager, Environment and Engineering Services**, or his designate.

Capacity

6.6 — **Community Sewage Treatment and Disposal Systems** components shall, at minimum, be designed and sized to accommodate the ultimate flows of the designated overall catchment area(s) for all the major components including treatment, disposal, emergency storage, pumps, electrical, piping and future expansion connection ability.

6.7 — Treatment facilities for the equalization of flows and organic shock load shall be considered and addressed at all plants which are critically affected by surge loadings. The sizing of the flow equalization facilities should be based on the maximum design flow volumes.

6.8 — The shock effects of high concentrations and daily peaks for short periods of time on the treatment process must be addressed.

Approved Treatment Options

6.9 — Unless otherwise approved by the **Manager, Environment and Engineering Services**, or his designate, only the following treatment options will be approved for a **Community Sewage Treatment and Disposal Systems** for which the **Regional District** will retain ownership.

Aerated Lagoon

6.10 — The design of an Aerated Lagoon Treatment System shall meet the requirements of the **Municipal Sewage Regulation**. All treatment design, construction, management and operation standards as regulated by the **MSR** shall apply.

Packaged Treatment System

6.11 — The Membrane Bio Reactor (MBR) Packaged Treatment system, is an approved method of sewage treatment. The design shall meet the requirements of the **Municipal Sewage Regulation**. All treatment, design, construction, management, and operation standards as regulated by the **MSR** shall apply.

~~6.12 Only those Packaged Treatment systems included on the **Approved Products List** shall be used, unless otherwise approved by the **Manager, Environment and Engineering Services**, or his designate.~~

~~6.13 MBR Treatment Systems disposing effluent to ground shall be designed to meet Class 'A' effluent quality requirements as defined in the **MSR**.~~

~~6.14 The rated treatment capacity shall be specified by the manufacturer.~~

~~6.15 Sludge storage shall be designed to provide a minimum of 21 days of sludge produced at maximum daily flows. A centrifuge shall be installed to reduce pumping frequencies and reduce water content of the sludge.~~

Emergency Backup Generator

~~6.16 Treatment facilities shall be equipped with an emergency backup generator capable of running the entire system at 100% loading for 36 hours.~~

~~6.17 Backup generator shall be mounted on a reinforced concrete slab 100mm above finished grade. All mounting shall incorporate theft protection.~~

~~6.18 Backup generator shall be equipped with digital controller, batteries/charger/rack/cables, circuit breaker, solenoid valve, muffler, weather proof enclosure/sound attenuation foam and vibration isolator pads.~~

~~6.19 Where Natural Gas supply is available, N/G generator shall be provided. Where N/G is not available a diesel generator shall be provided. Where fuel storage tanks are required, they shall be double walled c/w leak detection monitor, installed in a safe convenient location for refuelling. Fuel lines shall be installed underground through a conduit from the tank to the generator.~~

Effluent Disposal

~~6.20 All treated effluent disposal shall meet the requirements of the **Municipal Sewage Regulation**.~~

~~6.21 Where pumping of treated effluent is required, the pumping facility shall conform to Part 5 of this bylaw.~~

Discharge Restrictions

6.22 — A ~~Community Sewage Treatment and Disposal System~~ shall not discharge effluent directly to a watercourse, except as approved by the Ministry of Environment, and as supported in an Electoral Area Liquid Waste Management Plan.

Commissioning and Acceptance

6.23 — Prior to acceptance by the ~~Regional District~~ of the completed treatment facility, a thorough inspection and operational check of the treatment facility is required. The ~~Owner's Engineer~~ shall submit a commissioning plan, including a system check list, personnel required to attend, and proposed schedule to the ~~Manager, Environment and Engineering Services~~, or his designate for approval.

6.24 — Only upon the completion and final acceptance of the completed treatment facility, as per the requirements of this bylaw, will the ~~Regional District~~ acquire and operate the completed treatment facility.

PART 7 — NOISE AND ODOUR CONTROL

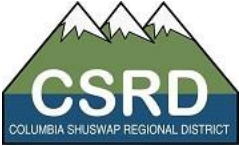
- 7.1 — Noise levels for facilities must not exceed 65 dB at property line or 20 m away whichever is closer.
- 7.2 — Corrosion and Odour controls must be considered in all designs. Analysis for potential odour and sulphides is required. Odour criteria shall be:
- a) — At 10m from any gravity main, force main, manhole, and lift station or other sewer facility (summer conditions, wind between 2-10 km/h), 1.0 odour units.
 - b) — Where sewer facilities are close to houses, parks or walkways, 0.0 odour units.
- 7.3 — Dissolved sulphide maximum limit at any point in the system is to be 0.5 mg/l. however, for new tie-ins to an existing **Regional District** system, the maximum limit is 0.3 mg/l.

~~PART 8 — ELECTRICAL, CONTROL, AND SCADA SYSTEM COMPONENTS~~

- ~~8.1 — Only those system components included on the **Approved Products List** are acceptable for use, unless otherwise approved by the **Manager, Environment and Engineering Services**, or his designate.~~
- ~~8.2 — All control, communication and SCADA systems must be compatible with the **Regional District SCADA system**.~~
- ~~8.3 — Standby power is required to ensure sewage is pumped and treated during a power outage.~~
- ~~8.4 — All electrical work shall comply with all adopted revisions, editions and versions, of codes and standards applicable to the location of work including:~~
- ~~a) — C22.1, Canadian Electrical Code Part 1;~~
 - ~~b) — British Columbia Building Code;~~
 - ~~c) — Work Safe BC, Occupational Health and Safety Regulations;~~
 - ~~d) — Local By-laws and Regulations; and~~
 - ~~e) — Specified reference standards.~~
- ~~8.5 — The **Owner's** electrical contractor must ensure that:~~
- ~~a) — All required approvals and permits are obtained from the local inspection authorities and utility providers for electrical work;~~
 - ~~b) — All work is done in accordance with good practice and by tradesman accredited and skilled in the performance of electrical work;~~
 - ~~c) — All personnel working on or around electrical equipment are able to do so in a safe manner; and~~
 - ~~d) — All electrical equipment installed bears an approval label acceptable in the Province of British Columbia.~~
-

**Columbia Shuswap Regional District
Subdivision Servicing Bylaw No. 641**

**Schedule "G"
Completion Documentation**



Columbia Shuswap Regional District Subdivision Servicing Bylaw No. 641
SCHEDULE G.4

CERTIFICATE OF PROVISIONAL COMPLETION

OWNER: _____

CONTRACTOR: _____

PROJECT
NO.: _____

FILE
NO.: _____

Works and Services Agreement
No.: _____

DATE: _____

This certificate is issued pursuant to Part 10, Clause 10.7 of the Columbia Shuswap Regional District Subdivision Servicing Bylaw No. 641 and approved for construction drawing numbers:

Drawing No.	Date	Drawing No.	Date
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

~~The Certificate of Completion will be issued when all deficiencies have been corrected. The Certificate of Final Acceptance will be issued when the maintenance period expires and all deficiencies that have arisen over the maintenance period have been corrected, and the CSRD has been satisfied all conditions of the Works and Services Agreement have been fulfilled.~~

~~This Certificate has been made to the best of the CSRD's knowledge, information and belief. It does not constitute acceptance of any work not in accordance with the requirements of the Columbia Shuswap Regional District Subdivision Servicing Bylaw No. 641, and not listed as a deficiency or not such defect(s) could have been observed or discovered during construction.~~

The following is a **List of Deficiencies** related to the Work:

Manager, Environment and Engineering Services



Columbia Shuswap Regional District Subdivision Servicing Bylaw No. 641 SCHEDULE G.2

CERTIFICATE OF COMPLETION

OWNER: _____

CONTRACTOR: _____

PROJECT
NO.: _____

FILE
NO.: _____

LOCATION: _____

DATE: _____

This certificate is issued pursuant to Part 10, Clause 10.10 of the Columbia Shuswap Regional District Subdivision Servicing Bylaw No. 641 and approved for construction drawing numbers:

Drawing No.	Date	Drawing No.	Date

Formatted Table

The final construction inspection was held on _____ and all deficient items have been addressed to Columbia Shuswap Regional District's satisfaction.

I, _____, Professional Engineer of _____ hereby certify that all works and services reflect Columbia Shuswap Regional District standards and specifications, and that all works and services have been completed in accordance with the approved construction design drawing numbers:

The Columbia Shuswap Regional District's acknowledgment of this certificate does not represent acceptance of the work, nor shall this act by the Columbia Shuswap Regional District prejudice any requirements of the agreement with the Owner, nor operate to relieve the Owner of any of his/her responsibilities thereunder.

The Maintenance Period for the Works and Services will begin on: _____

The Maintenance Period for the Works and Services will end on: _____

~~Owner~~

~~Professional Engineer~~

~~Manager, Environment and Engineering~~

Services



Columbia Shuswap Regional District Subdivision Servicing Bylaw No.
641 SCHEDULE G.3

CERTIFICATE OF FINAL ACCEPTANCE

OWNER: _____

CONTRACTOR: _____

PROJECT
NO.: _____

FILE
NO.: _____

WORKS _____ AND _____ SERVICES _____ AGREEMENT
NO.: _____

DATE: _____

All deficiencies, defects or faults in the Works and Services Observed or discovered with the period preceding the date of the Certificate have been rectified, this Certificate is issued pursuant to Clause 10.19 of the Columbia Shuswap Regional District Subdivision Servicing Bylaw No. 641 and certified record drawing numbers:

Drawing No.	Date	Drawing No.	Date
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

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This Certificate has been made to the best of the Columbia Shuswap Regional District's knowledge, information and belief. It does not constitute acceptance of any work not in accordance with the requirements of the Works and Services Agreement, whether or not such defect(s) could have been observed during construction.

~~cc: Owner~~

**Columbia Shuswap Regional District
Subdivision Servicing Bylaw No. 641**

**Schedule "H"
Standard Drawings**