SQUAMISH - LILLOOET
REGIONAL DISTRICT

Electoral Area D Subdivision and Development Servicing (Planned Communities) Bylaw No. 741, 2002

Adopted October 28, 2002

CONSOLIDATED COPY
March 2015

IMPORTANT NOTICE

THIS IS AN UNOFFICIAL CONSOLIDATION OF BYLAW NO. 741 WHICH HAS BEEN PREPARED FOR CONVENIENCE ONLY.

Although the Squamish-Lillooet Regional District is careful to assure the accuracy of all information presented in this consolidation, you should confirm all information before making any decisions based on it. Information can be confirmed through the SLRD Planning Department.

CONSOLIDATED FOR CONVENIENCE ONLY

Consolidated bylaws are consolidated for convenience only and are merely representative. Each consolidated bylaw consists of the original bylaw text and maps, together with current amendments which have been made to the original version. Copies of all bylaws (original and amendments) may be obtained from the SLRD Planning and Development Department.

BY-LAW NO.		**DATE OF ADOPTION**
953 – 2005	Text Amendment	July 14, 2005
1011 - 2006	Map Amendment	May 23, 2006
1372 – 2015	Text Amendment	February 25, 2015

SQUAMISH-LILLOOET REGIONAL DISTRICT
ELECTORAL AREA D
SUBDIVISION AND DEVELOPMENT SERVICING (PLANNED COMMUNITIES) BYLAW No. 741, 2002

A Bylaw to regulate and require the provision of Works and Services in respect of the subdivision and development of land.

The Board of the Squamish-Lillooet Regional District enacts as follows:

TITLE

1. This Bylaw may be cited as "Electoral Area D Subdivision and Development Servicing (Planned Communities) Bylaw No. 741, 2002".

APPLICABILITY

2. This Bylaw applies to all Subdivision and Development in Planned Communities as designated in Electoral Area D Official Community Plan Bylaw No. 1135-2013 and as shown on Schedule D to this bylaw except in connection with the issue of a building permit for a single or two family dwelling or ancillary building or for a building with a building value less than $100,000. *(Amendment By-law 1372-2015)*

DEFINITIONS

3. In this Bylaw,

Approving Officer means the approving officer appointed as such pursuant to the *Land Title Act*;

Building Inspector means the Building Inspector of the Regional District or a duly appointed designate.

Develop or Development means any construction for which a building permit is required.

Excess or extended services means excess or extended services as defined in the Local Government Act.

Highway means a street, road, lane, path, walkway, trail, bridge, viaduct, thoroughfare and any other way open to public use but does not include a private right of way on private property or an access route within a subdivision under the Strata Property Act.

Manager of Utilities means the Director of Utilities and Environmental Services of the Regional District or duly appointed designate. *(Amendment By-law 1372-2015)*

Owner means an owner, as defined in the Local Government Act, who subdivides land or applies for a building permit and includes a duly authorized representative of the Owner.

Owner's Engineer means the Professional Engineer referred to in Section 18.

Regional District means the Squamish-Lillooet Regional District.

Service Area means an area established by the Board of the Regional District for the operation of any one or more of Waterworks, sanitary sewers, storm sewers, sidewalks, walkways, trails or street lighting.

Subdivision means

(a) subdivision as defined in the Land Title Act, or
(b) subdivision under the Strata Property Act.

Water Distribution System includes a fire hydrant system.

Works and Services means services including Highways, sidewalks, boulevards, boulevard crossings, transit bays, street lighting, underground wiring, Water Distribution Systems, sewage collection systems, sewage disposal systems, drainage collection systems and drainage disposal systems and includes the connection of Water Distribution Systems, sewage collection systems, drainage collection systems or drainage disposal systems to the systems operated by the Regional District.

PROHIBITION

4. No person shall subdivide or Develop land or construct Works and Services for the Subdivision or Development of land contrary to the provisions of this Bylaw.

ADMINISTRATION

5. This Bylaw will be administered by the Manager of Utilities.

AUTHORIZATION FOR ENTRY

6. All employees and appointees of the Regional District are authorized to enter, at all reasonable times, upon any property to ascertain whether the requirements of this Bylaw or the regulations in this Bylaw are being observed.

APPLICATION FOR SUBDIVISION REVIEW AND DEVELOPMENT SERVICING

7. Concurrently with an application for Preliminary Layout Approval from the Ministry of Transportation or for a building permit, an Application for Subdivision Review and Development Servicing (Schedule B) must be made to

the Manager of Utilities for all Subdivisions and Developments. Requirements for the review process are set out in Schedule A.

WORKS AND SERVICES

8. Works and Services must be provided, designed, located and constructed in accordance with this Bylaw and with the design criteria, specifications and standard detail drawings in Schedule A.

9. An Owner must provide Works and Services within a Subdivision, except for a Subdivision under the Strata Property Act, to serve every parcel within the subdivision.

10. The Board may require Works and Services to be located and installed or constructed in accordance with this Bylaw within a Development site.

11. A water distribution system, a sewage collection and disposal system, or a drainage collection and disposal system other than road ditches, culverts and outfalls maintained by the Ministry of Transportation, that serves more than one lot shall not be installed within a Subdivision, except for a Subdivision under the Strata Property Act, unless a Service Area has been established for the specific purpose.

12. Sidewalks, walkways, trails or street lighting, unless they are required by, and will be maintained by, the Ministry of Transportation, shall not be installed within a Highway unless a Service Area has been established for the specific purpose.

13. Works and Services directly attributable to a Subdivision or Development must be installed on that portion of a Highway immediately adjacent to the site being subdivided, up to the centre line of the Highway. Such Works and Services may include widening or otherwise upgrading a road which is of a lower standard than required by Ministry of Transportation design parameters and specifications for a new road or required by this Bylaw.

14. A Water Distribution System or a sewage collection system installed in a Subdivision must be connected to a system operated by the Regional District, and a drainage collection system or a drainage disposal system installed in a Subdivision may be required to be connected to a system operated by the Regional District.

RESPONSIBILITY FOR WORK

15. Subject to Sections 16 and 17 the Owner will be responsible for undertaking and bearing the cost of all design, inspection, testing, construction and installation of Works and Services required under this Bylaw and must pay on demand all costs and charges for any work undertaken by the Regional District related to work described in Sections 13 and 14 or otherwise connected with construction of Works and Services for the Subdivision or Development.

16. The Manager of Utilities will determine whether the Owner, or others, will undertake the design, construction and installation of Works and Services required in Sections 13 and 14.

17. The Manager of Utilities will determine whether connection of new Works and Services to Regional District systems and manipulation of valves or control of pumps on existing Regional District systems will be undertaken by the Owner or by others and the Owner or the Owner's contractor must not do such work unless the Manager of Utilities provides written permission.

DUTIES OF OWNER

18. The Owner must retain a Professional Engineer, as the Owner's Engineer, registered in the Province of British Columbia and experienced in municipal engineering and land development, to undertake the design, inspection, testing and record keeping for the Works and Services until a Certificate of Acceptance is issued by the Manager of Utilities. Prior to commencing design of the Works and Services, the Owner must sign and submit a Commitment by Owner and Engineer (Schedule B) which sets out the minimum duties that the Owner's Engineer is to be hired to perform and lists projects similar in scope, nature and value that have been undertaken by the Owner's Engineer, sub-consultants and individuals assigned responsibility for specific components of the Works and Services under his over-all direction.

19. If the Owner's Engineer ceases to be retained for, or is unable to carry out, the described duties, the Owner must immediately make the lands being subdivided, developed or affected by the work safe and all construction must cease until a new Commitment by Owner and Engineer has been delivered to the Manager of Utilities and he has authorized work to recommence. Maintenance of the site and drainage, erosion and sediment control must continue throughout that period.

20. The Owner must engage qualified contractor(s) to undertake the construction of the Works and Services and must provide a summary of the projects that the contractor(s) has/have completed that are similar in scope, nature and value to the Works and Services.

21. The Owner must ensure the Owner's Engineer and all sub-consultants and specialist firms and all individuals assigned responsibility for components of the Works and Services perform all work in accordance with this Bylaw.

22. The Owner must ensure its contractor(s) perform all Works and Services in accordance with this Bylaw and the plans and specifications approved for construction by the Manager of Utilities.

DUTIES OF OWNER'S ENGINEER

23. The Owner's Engineer must sign the Commitment by Owner and Engineer and carry out the duties described therein and in accordance with Schedule A.

24. The Owner's Engineer must immediately notify the Manager of Utilities if he or she ceases to be retained, or is unable to carry out, the described duties before a Certificate of Acceptance has been issued.

25. The Owner's Engineer and any sub-consultants must carry professional liability insurance of not less than $1,000,000 per claim with a maximum deductible of $5,000 during the term of his or her engagement and shall provide proof of such insurance to the Manager of Utilities before designs are submitted for approval.

COMMENCEMENT OF WORK

26. No land clearing, stripping of top soil, excavation, placement of fill, construction or installation of any kind may be undertaken on a Subdivision or Development site until Permission to Construct (Schedule B) has been issued by the Manager of Utilities in accordance with the requirements of Schedule A.

RIGHTS OF WAY AND EASEMENTS

27. The Owner must grant, or acquire, statutory rights of way in favour of the Regional District in such locations and with such dimensions as necessary to accommodate Works and Services required to serve a Subdivision and the right of way must be in the form provided in Schedule C or otherwise acceptable to the Regional District's solicitor.

28. Where it is not practical to service an individual parcel from a highway, the Owner must grant, or acquire, easements for servicing of individual parcels, if acceptable to the Manager of Utilities, in favour of the benefiting parcel and covenant with the Regional District, in a form acceptable to the Regional District's solicitor, that the easement will not be altered or discharged without the approval of the Regional District. No more than one parcel shall be served by this means across any other single parcel.

FEES

29. An Owner must pay an application fee with the Application for Subdivision Review and Development Servicing, a processing fee with the Commitment by Owner and Engineer and an inspection fee before the Permission to Construct is issued. Fees shall be in accordance with Schedule E of this bylaw.

COMPLETION OF WORKS AND SERVICES

30. All required Works and Services must be constructed and installed at the expense of the Owner and all deficiencies and defects remedied by the expiration of the maintenance period in accordance with this Bylaw as evidenced by his issuance of a Certificate of Acceptance and all fees and debts owing to the Regional District must be paid before the Approving Officer approves the subdivision plan or the Building Inspector issues the building permit unless the Owner;

(a) deposits with the Regional District security in the form of an irrevocable letter of credit in the form provided in Schedule C or otherwise acceptable to the Regional District Treasurer, and

(b) enters into an agreement with the Regional District in a registrable form acceptable to the Regional District's solicitor and substantially in conformity with the draft agreement in Schedule C to construct and install the required Works and Services by a specified date and to fulfill all obligations of the Owner under this Bylaw, or to forfeit the deposit.

31. The amount of the security required under Section 30 shall be for the greater of:

(a) 110% of the cost of the remaining Work and Services to be completed, or

(b) 15% of the total cost of the Works and Services required for Subdivision or Development *(Amendment By-law 953)*

where the cost, as estimated in detail by the Owner's Engineer and accepted by the Manager of Utilities, includes engineering, inspection, testing, construction and installation of the Works and Services and all taxes.

32. The Regional District will retain 15% of the total cost of the Works and Services required for the Subdivision or Development as calculated in Section 31 until the Certificate of Completion has been issued and paper and digital record drawings, record service cards and operation and maintenance manuals have been submitted to the satisfaction of the Manager of Utilities, and thereafter, 5% of the total cost of the Works and Services required for the Subdivision or Development until a Certificate of Acceptance has been issued by the Manager of Utilities." *(Amendment By-law 953)*

33. Rights of way and easements required in accordance with Sections 27 and 28 must be deposited and registered in the Land Title Office before the Approving Officer signs the Subdivision plan. Alternatively, the Owner may provide a solicitor's undertaking satisfactory to the Regional District's solicitor that the Subdivision plan and rights of way and easement documents will all be deposited in the sequence required by the Regional District's solicitor and that if that is not possible, the Subdivision plan will immediately be returned directly to the Approving Officer.

EXCESS OR EXTENDED SERVICES

34. The Manager of Utilities may require the Owner to provide excess or extended services to provide access to or service land other than the land being subdivided or developed. The Manager of Utilities may require the Owner to provide studies, drawings and cost estimates prepared by the Owner's Engineer that are necessary to assist the Regional District determine the charges that must be levied as a condition of an owner of a benefiting parcel of land connecting to or using the excess or extended service in accordance with the Local Government Act. If the Regional District considers its costs to provide all or part of the excess or extended services to be excessive the Owner must pay those costs and the Regional District will enter into an agreement with the Owner concerning payment of charges to the Owner.

35. A charge for connecting to or using excess or extended services will include interest at the current prime rate calculated annually and payable from the period beginning when the excess or extended service was completed, up to the date the connection is made or the use begins.

EXEMPTIONS

36. Underground wiring and street lighting will not be required on an existing Highway where overhead wiring already exists and the total length of the Subdivision or Development along the Highway is less than 200 metres.

37. Road widening, curbs, gutters, and sidewalks will not be required on an existing Highway where the total length of the Subdivision or Development along the Highway is less than 50 metres. A greater distance may be exempted at the discretion of the Manager of Utilities where it would be difficult to match the existing pavement grade and provide for adequate road drainage or if the road is scheduled to be reconstructed within one year.

38. Servicing requirements may be waived where a proposed subdivision does not create any additional parcels and only results in highway or park dedication or an adjustment of boundaries between existing parcels.

39. Servicing requirements may be waived where a parcel is to be created solely for the use of unattended equipment necessary for the operation of:

    (a) a community water or sewer system;
    (b) a gas or oil transmission or distribution system;
    (c) a radio or television receiving antenna;
    (d) a telecommunication relay station;
    (e) an automatic telephone exchange;
    (f) an air or marine navigational aid;
    (g) an electrical substation or generating station; or
    (h) a similar facility, and

    where the Owner, unless it is the Regional District, enters into a covenant with the Regional District in a form satisfactory to the Regional District's solicitor and registered in the Land Title Office that has the effect of preventing the land being used for any other purpose without the approval of the Regional District.

COMMUNICATION

40. Any notice, order, direction, request or other communication given by the Regional District to the Owner or Owner's Engineer shall be deemed to be well and sufficiently given if it is left at any office used by the Owner or Owner's Engineer, or is delivered to any of their officers, clerks or servants, or is mailed to their last known place of business.

SEVERABILITY

41. If any portion of this Bylaw is held to be invalid by a court of competent jurisdiction, such decision shall not affect the validity of the remaining provisions of this Bylaw.

SCHEDULES

42. The following schedules are attached to and form part of this bylaw:

Schedule A: Engineering And Construction;
Schedule B: Forms;
Schedule C: Documents.
Schedule D: Area of Applicability of Subdivision and Development Servicing Bylaw
Schedule E: Fees

The Specifications and Standard Detail Drawings of the April 2000 edition of the Master Municipal Construction Document, filed in the Squamish-Lillooet Regional District office are incorporated by reference into this Bylaw.

VIOLATION AND PENALTIES

43. No person may prevent or obstruct, or attempt to prevent or obstruct, the entry of authorized officials upon any property as authorized by this Bylaw.

44. A person who contravenes this Bylaw by doing an act that it forbids, or by omitting to do an act it requires to be done, commits an offence and is liable, upon summary conviction to a penalty not exceeding $10,000 and costs of prosecution. The penalties imposed under this subsection supplement and are not a substitute for any other remedy to an infraction of this Bylaw.

READ A FIRST TIME this 19th day of September , 2002.

READ A SECOND TIME this 19th day of September , 2002.

READ A THIRD TIME this 19th day of September , 2002.

ADOPTED this 28th day of October , 2002.

_____
Paul Lalli
Chair

_____
P. John Gairns
Secretary

Electoral Area D

Subdivision and Development Servicing (Planned Communities) Bylaw No. 741, 2002

SCHEDULE A

ENGINEERING AND CONSTRUCTION

SCHEDULE A

ENGINEERING AND CONSTRUCTION

TABLE OF CONTENTS

PART AND DIVISION **PAGE**

SCHEDULE A

ENGINEERING AND CONSTRUCTION

PART 1 - GENERAL REQUIREMENTS

1.1 INTRODUCTION

This section sets out requirements for the review of proposals, quality control, construction, and maintenance for Works and Services in connection with subdivisions, and for developments requiring building permits, in Electoral Area D.

1.2 QUALITY CONTROL AND ASSURANCE PLANS

1.2.1. Design and Record Keeping Quality Control and Assurance Plans

1. The Owner must submit for approval Design and Record Keeping Quality Control and Assurance Plans prepared by the Owner's Engineer before the Manager of Utilities will review a submission of design drawings.

2. The Design Quality Control and Assurance Plan must include a pre-design report which describe the procedures to be used to prepare the plans and specifications that will at least meet the minimum design standards set out in this Bylaw and the criteria to be used where there are no appropriate standards in the Bylaw.

3. The Record Keeping Quality Control and Assurance Plan must outline the procedures to be used for record keeping throughout the duration of the design, construction and maintenance phases of the Works and Services. The following records must be kept as a minimum:
   - design calculations;
   - approvals from governmental and other agencies;
   - all correspondence relating to the project;
   - documentation relating to identification and remediation of deficiencies;
   - inspection and test records;
   - field measurement records of completed Works and Services and preparation of as-built drawings, service record cards and operation and maintenance manuals.

1.2.2. Construction Quality Control and Assurance Plan

1. The Owner must submit to the Manager of Utilities for approval a Construction Quality Control and Assurance Plan prepared by the Owner's Engineer before commencing construction of the Works and Services.

2. The Plan must describe the procedures to be used during construction to achieve the requirements specified in the approved drawings and in accordance with the minimum design standards set out in this Bylaw and to confirm that they have been met. Items of the Construction Quality Control and Assurance Plan must include:
    - a proposed construction schedule showing milestone dates and the dates of substantial completion of each component of the Works and Services;
    - the nature and frequency of proposed site meetings and of proposed site inspections to determine whether the Works and Services are being constructed to conform with the plans and specifications together with the names and qualifications of the inspectors;
    - the nature and frequency of proposed field and laboratory testing, including video inspection, of workmanship, materials and equipment to determine whether these items conform with the plans and specifications together with the names of the independent inspection agencies to be used; and
    - any other information the Manger of Utilities may require from time to time.

1.3 DRAINAGE, EROSION AND SEDIMENT CONTROL PLAN

Prior to approval of construction, the Owner's Engineer must submit to the Manager of Utilities a drainage, sediment and erosion control plan which must be prepared in accordance with Schedule H: Construction Site Erosion and Sediment Control Guide of "Best Management Practices Guide for Stormwater", Greater Vancouver Sewerage and Drainage District. The plan must detail all works and protection of vegetation that will be used to control site drainage, erosion and sediment, provide a schedule for plan implementation related to the sequence of construction, and set out both routine and emergency maintenance procedures required to keep the works operating efficiently. The plan will consist of a narrative section and a drawing with requirements described in Section 2.3.2.

1.4 APPROVAL OF SERVICING PROPOSALS

1.4.1. Preliminary Review

During the review period for Preliminary Layout Approval or for a building permit, the Owner's Engineer must discuss design parameters and the adequacy of existing systems with the Manager of Utilities and may be required to submit conceptual servicing plans in accordance with Sections 3.1.2, 3.2.2 and 3.3.3 in sufficient detail to demonstrate the feasibility of the proposal. Failure to do so may result in the Approving Officer or Building Inspector being advised that the application is premature.

1.4.2. Detailed Design Review

1. Prior to the Manager of Utilities commencing detailed design review:
   - the Owner must submit fees according to Schedule E of this bylaw
   - the Owner and the Owner's Engineer must jointly submit a Commitment by Owner and Engineer in the form provided in Schedule B.
   - The Owner's Engineer must submit for detailed review as required by the Manager of Utilities:
     - the Design and Record Keeping Quality Control and Assurance Plans;
     - Design and Drawing Submissions as described in Section 2.3.

1.5 PERMISSION TO CONSTRUCT

1. Prior to the Manager of Utilities issuing Permission to Construct:

   - the Owner must submit
     - the name of the contractor(s) to be employed on the project and a summary of the projects completed by the contractor(s) that are similar in scope, nature and value to the Works; and
     - a copy of the notification by the Owner's contractor to the Workers' Compensation Board of the proposed construction and installation of the Works and Services;
     - a copy of a Permit to Construct Works in Highways.
   - the Owner's Engineer must submit:
     - the Construction Quality Control and Assurance Plan;
     - an Operating Permit from the Environmental Health Officer if a new water source will be used;
     - a Construction Permit from the Regional Public Health Engineer for the installation of any waterworks;
     - an Approval under the Water Act for any changes in and about a stream including bridges, culverts, pipeline crossings and storm water outfalls.

2. When the Manager of Utilities is satisfied with these submissions and the design drawings they will stamp the drawings as Approved for Construction and issue a Permission to Construct. *(Amendment By-law 1372-2015)*

3. No land clearing, stripping of topsoil, excavation, placement of fill, construction or installation of any kind, including for the construction of roads and highways, may be undertaken on the subdivision or development site until Permission to Construct has been issued.

1.6 CONDUCT OF WORK

1.6.1. Manager of Utilities' Authority

The Manager of Utilities, or their duly authorized representative, shall be the Regional District's representative during the design, construction, installation, and maintenance of the Works and Services. The work and the manner of its performance shall be in accordance with the standards set out in the Bylaw to the satisfaction of the Manager of Utilities, whose decision shall be final and binding. *(Amendment By-law 1372-2015)*

1.6.2. Owner's Responsibility

1. The Owner will be held responsible to the Regional District for the acts and omissions of his agents, contractors and of persons directly or indirectly employed by him. The Owner will bind all agents, contractors or employees to the standards and specifications applicable to the work.

2. The Owner's Engineer and the Owner's contractors must attend a pre-construction meeting if requested by the Manager of Utilities prior to commencement of any site work.

1.6.3. Work within Public Highways

The Owner must obtain permits from the Ministry of Transportation for any Works and Services being constructed within public highways and must conduct the work in accordance with those permits.

1.6.4. Existing Structures and Utilities

1. Plans or descriptions, verbal or otherwise, of existing utilities or structures that are given to the Owner are intended only as an aid in the location of these items. This information must be verified by the Owner prior to proceeding with construction.

2. The Regional District does not check, review or maintain the accuracy of any plans, maps or elevations in its possession. The Owner, or Owner's Engineer, must review any information received from the Regional District and verify its accuracy by field investigation.

1.6.5. Verbal Agreements

No oral instruction, objection, claim or notice by any party to the other shall change or modify any of the terms or obligations contained in any of the specifications or drawings and none shall be held to be waived or modified by reason of such oral instruction, objection, claim or notice.

1.6.6. Work by Others

1. The Regional District, its officers, employees, agents and contractors shall be at liberty to enter on the site of the work with its workers and materials to do other work, and the Owner shall afford any such workers all reasonable access and facilities.

2. The Owner shall arrange his work and dispose of his materials in such a manner as will not interfere with the work or storage of materials of others on the site of the work. The Owner shall join his work to that of others, and perform his work in proper sequence in relation to that of others to the acceptance of the Manager of Utilities.

1.6.7. Materials and Workmanship

The whole of the work shall be performed in a workmanlike manner with materials, articles, and workmanship of the best quality and description as required by, and in strict conformity with, this Schedule. Unless otherwise specified, all materials shall be new.

1.6.8. Work to Fit Existing

1. All cutting, fitting or patching of work must be done to properly fit or receive existing structures and utilities.

2. Existing works must not be disturbed, and the Owner shall not connect his Works and Services to existing Works and Services without the prior written consent of the Manager of Utilities.

1.6.9. Variation of Works and Services at Developer's Request

Any variation to the Works and Services previously approved shall be subject to review by the Manager of Utilities. All requests for variations to the Works and Services shall be made in writing to the Manager of Utilities by the Owner's Engineer. Requests for variations shall include a signed and sealed revision to the previously accepted drawing(s). The Manager of Utilities' decision as to the acceptability of any revision(s) shall be final and binding.

1.6.10. Concealed or Unknown Conditions

1. If at any time after the drawings have been approved for construction, unforeseen conditions or circumstances make it necessary to change the design or to install or construct extra Works and Services to complete the project in accordance with good engineering practice, the Manager of Utilities shall have the right to order such changes or extra work as he deems necessary to complete the Works and Services in an acceptable manner.

2. All costs of such extra Works and Services shall be borne by the Owner.

1.6.11. Survey Monuments and Legal Postings

1. All legal posts, stakes and integrated survey monuments within and outside the area of the work, and all construction stakes and marks on adjoining areas of work, shall be preserved, undisturbed and visible. If any are disturbed, lost or destroyed, they shall be replaced at the cost of the Owner. Legal posts, stakes, and monuments must be replaced by a BC Land Surveyor hired by the Owner and to the satisfaction of the Manager of Utilities who shall also decide how construction stakes and marks are to be replaced.

2. All surveys within integrated areas shall be tied to the monument system based on the Surveyor General's instructions.

3. Additional survey monuments shall be installed, at the Owner's cost, to achieve a minimum density level as areas become developed. Integrated survey monument locations will be established by the Manager of Utilities in accordance with Provincial standards.

1.6.12. Damage to Work and Property

1. The Owner will be responsible for all repair, restoration and re-execution to remedy any loss or damage which occurs to the Works and Services, however caused, until a Certificate of Acceptance has been issued by the Manager of Utilities.

2. The Owner will be responsible for correcting property damage caused by him or by his contractor. The Owner shall immediately notify the Regional District and any other owner of damage to property not belonging to the Owner.

1.6.13. Regional District's Right to Repair, Restore or Re-Execute the Works and Services

1. If the Owner fails to undertake the work to the satisfaction of the Manager of Utilities, or fails to begin work or to repair, restore, re-execute or in any manner fails to comply with this Schedule as it applies to any part of the Works and Services within 14 days of written notice to do so, the Regional District may undertake the work. The entire expense of repair, restoration or re-execution shall be paid by the Owner.

2. In an emergency, the Regional District may immediately commence repair and restoration work without prior notice.

3. Work performed by the Regional District shall not relieve the Owner from the performance and fulfilment of any of their obligations and duties.

(Amendment By-law 1372-2015)

1.6.14. Repair of Damage and Site Maintenance

1. The Owner will be responsible for maintaining any land affected by the Works and Services in a clean and tidy condition at all times.

2. The Owner must not deposit material on a roadway or other public or private property without the consent of the Ministry of Transportation, the Manager of Utilities or private property owner.

3. The Owner must ensure that all waste materials generated as a result of site preparation, construction and completion of the subdivision be dealt with in an environmentally responsible manner, and in accordance with the Regional District's Solid Waste Management Plan and any other applicable Regional District bylaws.

4. During all phases of the construction and installation of Works and Services, including the maintenance period, the Owner must take precautions to abate nuisance caused by mud, dust or erosion by clean-up, sweeping, sprinkling with water or other means, as necessary to accomplish results acceptable to the Ministry of Transportation or the Manager of Utilities.

5. The Owner shall clean up property as soon as given notice to do so. If the Owner does not clean up Regional District property and Highways within the time limits set by the Manager, the Regional District may undertake the clean up. Any clean up or repair undertaken by the Regional District shall be charged to the Owner and is payable on demand.

6. Before completion of the Works and Services, all surplus material, tools, construction machinery and equipment, waste, and debris must be removed and the lands affected by the work cleaned up to the satisfaction of the Ministry of Transportation and the Manager of Utilities.

1.6.15. Employee and Plant Safety

1. The Owner will be responsible for the safety of their employees and for the safety, adequacy and sufficiency of their plant, equipment and method of executing the design, construction and installation of Works and Services.
(Amendment By-law 1372-2015)

2. The Owner will be responsible for compliance with the Workers' Compensation Board Industrial Health and Safety Regulations.

1.6.16. Use of Completed Portions

The Regional District has the right to take possession of any completed, or partially completed, portion of the Works and Services, but such possession shall not be deemed an acceptance of Works and Services. If such use results in the need for replacement, repair or maintenance beyond that resulting from normal wear and tear or increases the cost of constructing uncompleted Works and Services, the Owner may be entitled to compensation as determined by the Manager of Utilities.

1.6.17. Releases at Completion of Works and Services

1. On completion of construction and installation of the Works and Services on private property, including rights of way and easements, the Owner must obtain from each affected property owner a formal release in writing verifying that all work and clean-up has been completed to their satisfaction and that the property owner has no further claim on the Owner or the Regional District in connection with the work. Copies of all the written formal releases shall be provided to the Regional District.

2. In the case of a dispute, the Manager of Utilities' decision shall be final.

1.7 COMPLETION AND MAINTENANCE PERIOD

1.7.1. Completion

1. Upon completion of the Works and Services, including correction of defects and deficiencies, the Owner's Engineer shall submit an Inspection and Compliance Certificate, the releases referred to in 1.6.17, all test reports and video inspection tapes required in the performance of the Works and Services and a copy of a certificate of inspection from the governing electrical authority showing that the street lighting system is unconditionally approved. If the Ministry of Transportation does not require completion of road paving before approval of the subdivision plan, deficiencies consisting of final adjustments to the elevations of any cover frames of manholes and chambers, valve boxes and catch basin grating frames within the paved surface do not need to be corrected before these submissions.

2. Within 30 days of receipt of this material, the Manager of Utilities will conduct an inspection with the Owner's Engineer.

3. If the Manager of Utilities is not satisfied that all defects and deficiencies have been corrected, they will issue his own deficiency list, and the Owner's Engineer must resubmit any additional test and video inspection results when further corrections have been made. *(Amendment By-law 1372-2015)*

4. When the Manager of Utilities is satisfied the Works and Services have been completed, with the exception only of work that must be adjusted upon completion of paving, and with the submission of record drawings and disks and service record cards and operation and maintenance manuals in accordance with Sections 2.4 and 2.5 he will issue a Certificate of Completion.

1.7.2. Maintenance Period

1. The maintenance period shall commence on the date of issuance of the Certificate of Completion except that the maintenance period for any deficiencies or defects which are corrected after the Certificate of Completion is issued will commence from the date the Manager of Utilities accepts such completion or remedial work.

2. The maintenance period will be for one year from the date of commencement or until, for works within a Subdivision, the Subdivision plan has been registered in the Land Title office, whichever is later.

3. The Owner shall promptly correct defects or deficiencies in the Works and Services that appear during the maintenance period and shall notify the Manager of Utilities when they have been corrected. The Owner shall make good all defects, imperfections, damage, acts of vandalism and settlements regardless of cause.

4. The Owner shall ensure that roadways, sidewalks and walkways are kept clean and free of dirt and debris during the maintenance period.

5. Not more than one month prior to the expiry of the maintenance period, the Owner shall flush all sanitary and storm sewers, and may be required to conduct a video inspection and repair any deficiencies which become evident.

1.7.3. Certificate of Acceptance

A Certificate of Acceptance will be issued by the Manager of Utilities upon expiration of the maintenance period provided all deficiencies and defects, except for normal wear and tear, have been remedied to their satisfaction.

(Amendment By-law 1372-2015)

SCHEDULE A

ENGINEERING AND CONSTRUCTION

PART 2 – DESIGN SUBMISSIONS AND RECORD DOCUMENTATION

2.1 INTRODUCTION

1. This section sets out requirements for submission of reports and design calculations and drawings for approval and of record drawings and disks, service record cards and operation and maintenance manuals.

2. Incomplete or substandard submissions will be returned to the Owner's Engineer without comment on the drawings.

2.2 SURVEY INFORMATION

1. All elevations shall be from geodetic datum (NAD 83, CSRS) and survey information tied to any integrated survey monuments.

2. Centrelines (or offset lines) are to be marked and referenced in the field, and all chainages shall be keyed to the legal posting.

3. All survey monuments, benchmarks, manholes, catch basins, fire hydrants, poles, existing dwellings, fences, trees, hedges, and unusual ground shall be noted on the plans.

4. Where applicable, cross-sections are required and include locations and elevations of:
   - centreline of pavement;
   - edge of pavement or gutter line;
   - top of curb;
   - back of sidewalk;
   - edge of shoulder;
   - ditch invert;
   - top of ditch banks including high and low watermark(s);
   - property line;
   - top and toe of cut and fill slopes; and
   - existing ground elevation 3 m beyond highway right of way or site property line and 5 m beyond cut or fill slopes.

5. Chainage on a drawing shall increase from left to right and from bottom to top. North should be at the top or right side of a drawing.

6. Copies of legible field notes shall be made available upon request.

2.3 DESIGN AND DRAWING SUBMISSIONS

2.3.1. Drafting and General Requirements

1. Drawings must be dimensioned in metric units.

2. Drawings must clearly identify all Works and Services in detail and be digitally produced in either AutoCAD or MicroStation format, as specified by the Manager of Utilities.

3. All new Works and Services are to be shown in bold lines.

4. Notes pertaining to the construction of a service are to be shown on the specific service drawing.

5. Baselines and chainages are to be referenced to legal boundaries on each sheet.

6. Offsets are to be shown to both sides of the highway or right of way or to one side with the highway or right of way width noted.

7. All drawings shall be dated, signed and sealed by the Owner's Engineer or sub-consultants responsible for the various aspects of the design.

8. Drawings shall include:
   - legal layout of roads and properties;
   - legal descriptions of all properties included in the subdivision or development;
   - dimensions to the nearest 0.01 m;
   - existing house numbers of lots adjacent to the proposed Works and Services; and
   - all existing and proposed registered statutory rights-of-way and easements.

2.3.2. Design Drawings Submissions

A complete set of engineering design drawings shall include, unless the Manager of Utilities specifically waives any requirement, in the following sequence:

1. Cover Sheet
   - name, address, phone and fax numbers of the Owner, the Owner's contact or agent, the Owner's Engineer and surveyor;
   - file numbers for Regional District and Ministry of Transportation;
   - index of drawings in set;
   - legal description of the land and adjacent properties;

- site plan showing proposed subdivision layout with lot numbers, proposed future phases and all adjacent existing and proposed roads at a scale to fit; and
- location plan.

2. Key Plan – at scale to fit
   - subdivision layout with lot numbers; and
   - outline boundaries of each drawing in set with drawing number;

3. Composite Utility Plan - 1:1000 or 1:500
   - lot boundaries with lot numbers, dimensions, bearings and areas;
   - control station monuments;
   - all proposed Works and Services including water, sanitary and storm sewers, electrical, telephone, gas, street lighting, service connections, appurtenances such as hydrants, valves, manholes, catch basins, transformers, and community mail boxes complete with all offsets, locations and dimensions;
   - rights of way and easements including widths, covenant boundaries; and
   - the site legal boundaries outlined with a bold line.

4. Storm Water Management Plan - 1:1000
   location plan of watershed at appropriate scale;
   - post-development contour lines at 1 m intervals for slopes less than 20%, otherwise 2.0 m intervals, showing match to pre-development contours which must extend 30 m beyond the site legal boundary;
   - directional arrow on each lot indicating the prevailing post-development slope of the land;
   - the proposed minor (10-year return) storm sewer system with inlet and outlet structures, and connections to existing, drainage systems;
   - proposed major (100-year return) post-development flood routes, with connections to existing drainage systems, shown by arrows and indicating whether piped or overland;
   - storm detention/infiltration facilities;
   - legend;
   - applicable general notes;
   - design table with information for each segment of proposed main including catchment area in hectares, run-off coefficients, time of concentration, rainfall intensity, major and minor flow volume, pipe size, slope and capacity both existing and proposed.

5. Lot Grading Plan – 1:500
   - pre-development ground contours in dashed lines extending 30 m beyond site boundary;
   - post-development ground contours in solid lines;
   - post-development elevations at corners of each proposed lot;
   - drainage swales, generally on the uphill side off downhill properties;
   - catch basins and lawn basins with rim elevations;

- retaining walls integral to lot grading design and to be built by Owner;
- areas of cut and fill deeper then 1.5 m deep;
- zoning bylaw building envelope and minimum basement elevation on each lot.

6. Road Works and Water Mains – may be on the same plan and profile, 1:500 horizontal and 1:50 vertical
   - existing and/or proposed elevations and locations of:
   - the centre line of proposed and/or existing roadways,
   - proposed and existing curbs and gutters and sidewalks,
   - all curves at appropriate arc locations,
   - all existing and/or proposed catch basins including lid elevations;
   - beginning and end of curve, arc length and design details of vertical and horizontal curves;
   - all water main appurtenances including valves, hydrants, bends, tees, tie-in points, test points, blow offs, air valves etc.;
   - full pipe on profile and all valves and fittings with chainages;
   - all water main crossover points with sewers and other utilities, including clearance and protection details; and
   - size, class, type, length and slope of each continuous water main pipe section.

7. Storm and Sanitary Sewers – may be on the same plan and profile, 1:500 horizontal and 1:50 vertical
   - all sewer main appurtenances including cleanouts, inspection chambers, manholes, catch basins, etc.;
   - symbols on profile denoting the service connection location and elevations at the property line;
   - minor and major storm system hydraulic grade lines on profile;
   - full pipe and chainages and invert of each appurtenance on profile;
   - rim elevations of all manholes, catch basins and cleanouts;
   - the size, class, type, length and slope of each continuous pipe section;
   - all crossover points with other sewers, water mains and utilities including clearance and protection details; and
   - storm detention system, information calculations and construction details, if not provided on the SWMP.

8. Road Cross-Sections - 1:100 horizontal and 1:50 vertical
   - proposed and existing cross-sections every 20 m to 10 m beyond property line;
   - proposed elevations at centre line, gutter or edge of pavement, and property lines; and
   - additional sections required for steep cuts or fills.

9. Street Lighting Plan - 1:500

    - mounting height and type of lamp standard including finish (paint, galvanized etc.);
    - make, model, wattage and type of luminaire;
    - table of photometric calculations;
    - location of proposed service base and hydro service box; and
    - offset and chainages of each lamp standard.

10. Drainage, Erosion and Sediment Control Plan – (the plan must also have a narrative section – refer to Section 1.4)
    - pre-development contours and drainage boundaries;
    - post-development contours and drainage boundaries;
    - type of existing vegetation;
    - boundaries between different soil types;
    - critical erosion areas;
    - limits of clearing and grading;
    - top and bottom of cut and fill slopes;
    - swales, interceptor trenches and ditches, cut-off trenches, storm sewers and ditches, water courses, inlets, outlets all with grades and dimensions, direction of flow and details of diverting off-site run-off around cleared and disturbed areas;
    - location of stormwater management BMPs.
    - location and details of temporary and permanent erosion control measures;
    - temporary and permanent sediment control measures including sections and details of traps, ponds, filters, inlet and outlet stabilization, silt fabric fences;
    - construction equipment and vehicle entrance locations, dimensions of rock surfaced vehicle entrances to minimize tracking of soil off site with thickness and size of rock, wash down areas;
    - proposed phasing of the plan in relation to the sequence of clearing and construction.

11. Construction Details

    Reference numbers to the appropriate Supplementary Specification, Standard Detail Drawing or MMCD 2000 specification or drawing shall be noted. If none apply, specifications or details are to be shown on the drawings pertinent to the utility.

12. Other Information - to be noted on pertinent drawings:

    - all existing underground utilities complete with size, type of material, inverts, off-sets and notes detailing connections and tie-ins, by whom, how, and at whose expense;
    - clearance between mains at all cross-over points;
    - survey monuments;

- all existing structures, including houses, sheds, fences, poles, pole anchors, overhead or underground encroachments, wells, septic tanks and septic fields, with notations indicating whether they are to be retained, demolished, removed, filled, etc.;
- the Owner's Engineer shall consult with utility companies to ensure no conflict with the proposed Works and Services. Alterations, additions, deletions, dedications, rights-of-way, easements etc. are the responsibility of the Owner.

2.3.3. Design Submission Sequence

1. First submission:
   - two complete sets of plans of the engineering design drawings;
   - two extra sets of composite utility plans;
   - two extra sets of water system drawings for the Public Health Engineer appointed in accordance with the Safe Drinking Water Regulation pursuant to the Health Act;
   - two extra sets of stormwater management plans;
   - two extra street lighting plans;
   - all applicable calculations for the design of the proposed water, sanitary and storm systems including detention/retention and sanitary sewers; and
   - a geotechnical report.

2. Subsequent revisions if required - all items "red lined" on the previous set must be addressed by the Owner's Engineer or submissions will be returned without review:
   - two complete sets of amended plans;
   - first submission, marked set, returned;
   - a complete construction estimate;
   - highlighted in yellow, changes additional to the "red line" changes required by the Regional District;

3. Final submission:
   - four complete sets of plans of the proposed Works and Services;
   - one extra set of water system drawings for Public Health Engineer;
   - one extra set of street lighting plans;
   - one extra set of lot grading plans; and
   - five extra sets of composite utility plans.

4. Construction Estimate Calculation
   The construction estimate, including power and telephone, shall be in detail as required by the Manager of Utilities.

2.3.4 Shop Drawings

Before commencement of construction of pump stations, reservoirs or PRV stations, the designer shall provide five sealed sets of mechanical shop drawings and five sealed sets of electrical line diagrams for review by the Manager of Utilities.

2.4 RECORD DRAWINGS AND CARDS

1. The Owner's Engineer shall submit two complete sets of paper prints, except for the road cross-section sheet(s), one set of photo copied Service Record Cards and one set of photo copied Hydrant Record Cards for review. Notes shall be modified to reflect actual construction. Works that have been removed or reconstructed shall be deleted from, or amended on, the drawings.

2. One red-lined set of record drawing paper prints will be returned to the Consulting Engineer for revisions if necessary. Depending on the number of notations or changes, the Owner's Engineer may be requested to resubmit two sets of revised paper prints for a second review.
3. Record drawings shall include:
   - Site plan showing offsets and locations of all Works and Services including service connections.
   - Detailed plan-profile drawings for road works, water, sanitary sewer and storm sewer systems showing elevations, inverts, off-sets, pipe materials, bedding, backfill and chainages referenced to legal boundaries.
   - Stormwater management plan.
   - Lot grading plan with finished ground elevations at all lot corners, back of curb or sidewalk, any change in grade across the lot, lawn basins and manholes, and with inverts of swales and showing zoning bylaw building envelope and minimum basement elevation on each lot and any feature that may affect the construction of a building. Uniform grades between lot corners will be assumed to a tolerance of ±150 mm;,
   - Street light plans showing make, model, type of luminaire unit, illumination levels achieved with the light spacing, locations of service bases, photocells and hydro service entrances;
   - Plans and details for which there are no MMCD or Regional District standard (pump stations etc.) complete with any operating manuals.
   - Final geotechnical report, if required, addressing all recommendations and details of the preliminary report, confirming construction techniques, applications and details including placement and compaction of fill materials in excess of 1.5 m, stability of cut and fill slopes and embankments equal to or greater than 1:2.

4. Service Record Cards
   The Regional District will provide a sufficient number of Service Record Cards for each subdivision. Services Record Cards for each lot shall show:
   - rights-of-way and easements as they pertain to the lot;
   - the location, inverts and depth of water, storm and sanitary connections;
   - minimum basement elevation;
   - elevations at back of curb, lot corners, and finished ground at the rear building envelope line;
   - dimensions of property line adjoining street or utility right of way; and
   - elevations and offset from property line of sidewalk, back of curb, street lights, power/telecommunications ducts, service boxes, water meter boxes, gas mains, hydrants and street trees.

5. When the Manager of Utilities is satisfied with the record drawing submission, the Owner's Engineer will submit:

   - one set of mylar drawings identified in bold letters with the words "CERTIFIED RECORD DRAWINGS" in the revision block. Mylars shall not be signed or sealed;
   - two sets of paper prints with the following certification noted on each drawing:

     > "I certify that this record drawing represent the Works and Services as designed, installed and inspected."

     The seal and signature shall be that of the Engineer who was personally responsible for the design and inspections and shall be on each drawing. The Manager of Utilities will return one set to the Owner's Engineer upon acceptance.
   - Completed service record cards for each lot and hydrant cards.
   - If the drawings were prepared by computer, one set of drawing files on disk supplied in a format specified by the Manager of Utilities.

2.5 OPERATION AND MAINTENANCE MANUALS

1. Operation and maintenance Manuals must be provided for all pump stations, pressure reducing stations, reservoirs, water intakes, disinfection and water treatment plants, sewage treatment plants and outfalls, stormwater management BMPs, major drainage systems and any other Works and Services for which the Manager of Utilities requires them.

2. Three copies of each Operation and Maintenance Manual must be provided and contain, as appropriate:
   - design criteria;

- as constructed shop drawings;
- test reports;
- equipment layout drawings;
- electrical, control, and alarm wiring diagrams;
- operating instructions for all equipment including manufacturers data and service manuals;
- maintenance instructions for all equipment, including frequency of maintenance tasks;
- maintenance diary;
- equipment data sheets;
- spare circuit cards for critical components;
- certified head/capacity curves for pumps;
- equipment part lists and list of suppliers;
- emergency operating procedures.

3. The maintenance manuals must be three ring bound documents with the name of the facility embossed on the cover. Manuals must contain a table of contents with each section identified by a plasticized, labeled divider.

SCHEDULE A

ENGINEERING AND CONSTRUCTION

PART 3 DESIGN CRITERIA

DIVISION 1 - WATERWORKS SYSTEMS

3.1.1 MASTER WATERWORKS PLAN

1. A subdivision will not be permitted until a master waterworks plan is first completed for the whole of the Planned Community in which the proposal is located and the Regional District Board has approved the plan.

2. If a master waterworks plan for the Planned Community has not previously been completed and been approved by the Regional District Board, the Owner will be responsible for the entire cost to the Regional District for the preparation of the plan.

3. A master waterworks plan will identify a single water source for the area of the Planned Community and include conceptual plans and design criteria for source development, water treatment, transmission pipelines, and all reservoirs and pump stations, and identify pressure zones and locations and areas of land required for waterworks facilities, all as necessary to serve the total development at build-out in accordance with the Electoral Area D Official Community Plan or other planning study. Design criteria will include aesthetic considerations for all above ground works. Where a Planned Community consists of distinct, separated parts, the identification and location of facilities which only serve separate parts may not be required until the first subdivision is proposed for those parts.

4. A subdivision application for the purpose of creating no more than one additional parcel to be used for commercial, institutional or utility purposes, is exempted from the requirement for a master waterworks plan.

3.1.2 CONCEPTUAL WATERWORKS SERVICING PLAN

1. A subdivision, for which a water distribution system is required or proposed, will not be permitted until a conceptual waterworks servicing plan has been prepared by the Owner's Engineer and accepted by the Manager of Utilities. A conceptual waterworks servicing plan must conform to the master waterworks and show the alignment of water mains and any pump stations and reservoirs in sufficient detail to demonstrate the feasibility of the proposal.

2. Prior to the design of an extension to an existing waterworks system, the adequacy of the supply and of the system capacity shall be reviewed with the Manager of Utilities who may require the Owner's Engineer to determine its capability for accommodating the proposed development.

3. The Owner's Engineer shall confirm with the Manager of Utilities the design criteria to be used and the ultimate population to be served.

3.1.3 APPROVALS UNDER THE HEALTH ACT

1. Prior to commencing design of a community waterworks system requiring a new source of water, an Operating Permit must be obtained from the Medical Health Officer and a Water Licence obtained from the Comptroller of Water Rights for the diversion or storage of surface waters.

2. Prior to proceeding with construction or extension of any waterworks system, a Construction Permit must be issued by the Regional Public Health Engineer. The Manager of Utilities will forward design drawings to the Regional Public Health Engineer after reviewing them for conformance with the Bylaw.

3.1.4 WATER DEMAND AND PRESSURE

3.1.4.1. Capacity of System

Waterworks systems shall be designed to deliver the greater of the peak hour demand or the maximum day demand plus fire flows according to the criteria in this schedule.

3.1.4.2. Domestic Demand

(a) For developments tying into existing water systems:

i)

Average Daily Demand (ADD)	600 L/capita/day
Maximum Daily Demand (MDD)	1,500 L/capita/day
Peak Hour Demand (PHD)	2,700 L/capita/day

ii) Where the average daily demand of an existing system is proven over a minimum 3 year recent history to be less than 500 lcd, the design criteria detailed in (b) can be used with the prior written approval of the Director of Utilities.

(b) For new developments with independent water systems:

Average Daily Demand (ADD)	500 L/capita/day
Maximum Daily Demand (MDD)	1,000 L/capita/day
Peak Hour Demand (PHD)	2,000 L/capita/day

The design population for calculating water demand must be based on Regional District population predictions or on the planned development in the area to be served whichever is larger.

3.1.4.3. Occupancy of residential units

single family	4 per unit
duplex	4 per unit
multifamily	3 per unit

3.1.4.4. Commercial, Industrial and Institutional Demand

Water demand for commercial, industrial and institutional uses will be based on the specific requirements of the use if known, or otherwise:

average flow over an 8 hour day	0.7 l/s/ha
maximum day demand	1.0 l/s/ha
peak hour demand	2.0 l/s/ha

3.1.4.5. Fire Flow Demand

1. Fire flow demand will be based on the latest edition of "Water Supply for Public Fire Protection - A Guide to Recommended Practice", Fire Underwriters Survey.

2. The following minimum fire flows will be provided where the development is not protected by automatic fire sprinklers:

single family and duplex	60 l/s
2 story multifamily	90 l/s
3 story multifamily	120 l/s
1 or 2 story school	90 l/s
3 story school	120 l/s
commercial and institutional	150 l/s
industrial	200 l/s

3. If buildings are provided with automatic sprinkler systems protecting the entire building, the minimum fire flow may be reduced to the greater of:

   (a) the minimum fire flow calculated in accordance with the Fire Underwrites Survey Guide allowing for automatic fire sprinklers; or

(b) the minimum flow required to support the automatic fire sprinkler systems plus all other water requirements for fire fighting purposes on the development.

4. If a water main is extended, it must be sized to provide the appropriate minimum fire flows to each existing land use fronting the extended main in accordance with the above, or, the size shall be based on the type of development permitted by the current zoning on each fronting property.

3.1.4.6. Water Pressure

maximum allowable pressure	1,035 kPa
minimum pressure at peak hour demand	300 kPa
minimum pressure with fire flow and maximum day demand	150 kPa

All service connections must be protected by individual pressure reducing valves within the building served.

3.1.5 PIPELINES AND APPURTENANCES

3.1.5.1. Hydraulic Analysis

Hydraulic analysis must be based on the Hazen-Williams formula using a "C" coefficient of 110.

3.1.5.2. Looping of Pipelines

Water mains must be looped where possible, using statutory rights of way in favour of the regional district where necessary.

3.1.5.3. Pipe Diameters

Distribution pipelines serving multifamily, commercial, industrial or institutional properties and transmission pipelines must be a minimum of 200 mm diameter. Distribution pipelines in single family residential areas serving fire hydrants must be a minimum of 150 mm diameter. Unlooped pipelines serving single family residences on short culs de sac where no pipeline extension is planned and with no fire hydrants may be 100 mm diameter.

3.1.5.4. Pipeline Grades

Water mains 200 mm and larger must be installed to a designed grade.

3.1.5.5. Depth of Cover

Minimum cover of 1.2 m must be provided over all water mains. Depth of bury from the finished ground surface of greater than 1.5 m must be approved by the Manager of Utilities.

3.1.5.6. Separation From Sanitary Sewers and Storm Drains and Sewer Crossings

1. Water mains must be a minimum of 3.0 m horizontally from, and a minimum of 0.5 m higher than, a sanitary sewer or storm drain.

2. In bedrock, or where for other reasons a 3.0 m separation is not possible, the installation must be in accordance with Ministry of Health requirements.

3. Water mains crossing other pipelines must do so at angle greater than 20°.

4. If the water main is less than 0.5 m above the sewer, it must be laid so the crossing is made midway between joints on a full length of water main. If this is not attainable the water main joints are to be wrapped with heat shrink plastic or packed with compound and wrapped with tape

5. If the water main is beneath the sewer there shall be a minimum 300 mm separation. The crossing shall be made midway on a full length of water main pipe. The water main joints are to be shrink wrapped or packed and taped as above.

Standards: ANSI/AWWA C214 (factory applied)

ANSI/AWWA C209 (field applied)
ANSI/AWWA C217-90 (petrolatum tape)
All materials used are to have zero Health Hazard.

3.1.5.7. Valves

1. Valves shall be located:

   - in a cluster at pipe intersections,
   - not more than 200 m apart in single and two family residential areas,
   - not more than 150 m apart in multifamily, industrial, commercial and institutional areas, and
   - such that not more than one fire hydrant is isolated by a valve.

2. The minimum number of valves at intersections shall be:
   - 3 valves at "X" intersections
   - 2 valves at "T" intersections

3. Valves shall be the same diameter as the main up to 300 mm diameter. For mains larger than 300 mm in diameter, valves shall be no more than one diameter size smaller.

3.1.5.8. Air and Vacuum Release Valves

1. Combination air valves shall be installed at the summits of all mains of 200 mm or larger unless the difference in grade between the summit and the valley is less than 600 mm.

2. Air and vacuum release valves shall be 25 mm for 300 mm or smaller mains and 50 mm for 300 mm to 600 mm mains.

3.1.5.9. Chambers

Chambers or manholes containing valves, blow-offs, meters or other appurtenances shall not be connected directly to a sewer or storm drain. Chambers or manholes may be drained to the surface or to absorption pits, subject to adequate soil conditions and the approval of the Manager of Utilities.

3.1.5.10. Blow-offs

Blow-offs must be provided on all dead-end mains. For 200 mm and larger mains, blow-off's require special design.

3.1.5.11. Thrust Blocks

Thrust blocks shall be provided at all crosses, tees, reducers, plugs, caps, bends, (vertical and horizontal) and blow-offs. Where thrust blocks are not possible, adequate tie-rodding is permitted at the discretion of the Manager of Utilities. All fittings shall rest on pre-cast concrete blocks.

3.1.5.12. Hydrants

Fire hydrants shall be located:

- at a maximum centre line spacing along a street of 150 m and within 75 m of all possible building sites and within 90 m, by an unobstructed path of travel, of the exterior perimeter of a building other than a single or two family residence;
- where possible, at the EC/BC of curb returns at road intersections; or
- in mid-block locations opposite a property line between two lots; and
- at least 3 m away from an ornamental lamp standard, utility pole or driveway and 1 m from service connection pipes and ditches.

3.1.5.13. Service Connections and Water Meters

1. Minimum 19 mm connections must be provided to all lots. The connection will normally be perpendicular to the front property line and located opposite the centre of the lot with the curb stop 300 mm from the property line. Two family lots will be provided with two separate 19 mm connections appropriately located.

2. Service connections shall be located so they are not in driveways or under traveled areas. Should this be unavoidable, meter chambers shall be capable of supporting H-20 loading.

3.1.5.14. Pipeline Location

1. Water mains must extend across the full width of each lot and extend to the boundaries of the subdivision plan to provide for further extension and connection beyond the subdivision where such extension is feasible.

2. Water mains within public streets must be located as shown on the Typical Sections in Part 4, Division 2, Supplementary Standard Detail Drawings. Where a water main crosses private property it must be protected with a registered statutory right of way at least 3 m wide and in accordance with standard document in Schedule C.

3. When a water main is located within a statutory right-of-way, the developer may be required to provide access for maintenance vehicles and equipment. The maintenance access shall be constructed to support 9.0 t loading. Where a pipeline is located close to the boundary of a property, the right of way and access shall be entirely on one side of the boundary.

4. A pipeline crossing under a watercourse or under a structure must be encased in concrete. A pipeline under an arterial highway or railway may be required to be inside an encasing pipe.

3.1.5.15. Corrosion

Geotechnical soils analysis on the alignment of proposed metallic pipes must 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 of Utilities must be incorporated in the design.

3.1.5.16. Test Points

A minimum of one test point for chlorination and pressure testing must be installed beside a line valve on each section of water main between adjacent valves. Test points will be corporation stops with female outlets threaded for iron pipe. A corporation stop used for an air valve may be used as a test point or as bleed point. Locations of test points must be optimized to ensure thorough sterilization.

3.1.5.17. Fire Lines

1. Connections for sprinkler systems and for hydrants on private property must be sized in accordance with the latest edition of "Water Supply for Public Fire Protection - A Guide to Recommended Practice", Fire Underwriters Survey.

2. The Owner's Engineer must ensure existing ware mains are adequate for the flow required at the point of connection.

3.1.6 RESERVOIRS

3.1.6.1. Pre-Design Requirements

The Owner's Engineer must obtain approval from the Manager of Utilities for the siting of a reservoir and for the following design considerations prior to commencing detailed design.

- existing and future pressure zone boundaries;
- existing and future service areas;
- site access;
- overflow and drainage;
- existing and future capacity requirements;
- reservoir cleaning;
- water quality;
- control and rate of filling;
- security;
- aesthetics;
- neighbourhood impact;
- geotechnical and seismic aspects.

3.1.6.2. Reservoir Capacity

Reservoir capacity shall be not less than the greater of:

- the one day average annual consumption for the service area, or
- the total Storage Requirement A+B+C where:
  A = Fire storage to meet the Fire Underwriters Survey Guidelines with not less than the fire flows for the highest fire demand in the service area as specified in these design criteria.
  B = Equalization Storage of 25% of maximum day demand of service area.
  C = Emergency Storage of 25% of A + B.

a

3.1.6.3. Reservoir Design

The following design requirements may be modified at the discretion of the Manager of Utilities.

1. Reservoirs are to be reinforced concrete designed in accordance with the American Concrete Institute's Manual of Environmental Engineering Concrete Structures ACI 350R – 2001.

2. Structures are to be below ground and covered or up to 4 m above ground, unless specifically approved otherwise.

3. If the required reservoir volume is greater than 2,300,000 litres, 2 cells are required each containing one half of the total required volume and capable of being drained and filled independently. If the reservoir volume is less than 2,300,000 litres, 1 cell is sufficient provided an adequate temporary supply can be maintained during reservoir cleaning.

4. Each cell is to have an access opening in the roof for cleaning and maintenance with minimum dimension of 900 mm x 900 mm located so the overflow pipe is clearly visible inside the reservoir when viewed from the opening.

5. A permanent bronze survey mark is to be provided at all access hatches showing the geodetic elevation.

6. Access hatches shall be reinforced for 1,465 kg/m^2 and have:
   - an aluminum 6 mm tread plate
   - a perimeter drain
   - a perimeter sealing gasket
   - a slam lock with aluminum removable sealing plug and opening tool
   - a flush lift handle
   - a gas spring assist cylinder
   - a 90 degree hard open arm
   - a flush fitting padlock tang
   - 100 mm minimum thick reinforced concrete box that can be slid over hatch as security cover
   - fasteners are to be made of 316 stainless steel

7. Ventilation pipes or openings must be sized to handle appropriate intake and exhausting volumes of air for filling and drawing the reservoir. The minimum shall be two 150 mm diameter pipe vents with secure vandal proof, baffled, "toad stool type" top and stainless insect screen.

8. Floors are to slope to a sump at a minimum 2% grade. Provide FRP grating over drain sump.

9. An outside perimeter drain and under floor sub-drain to collect and drain any leakage shall be directed in separate drain pipes to an inspection manhole (which may be connected to an overflow pipe provided suitable measures are incorporated to prevent surcharging).

10. An interior wall ladder is required from roof access to floor. Any exterior ladder is to be completely vandal proof and not allow unauthorized personnel onto the roof. All ladders must meet WCB regulations and have fall arrest equipment where required.

11. Separate inlet and outlet pipes are to be provided and designed to provide effective circulation.

12. The overflow drain is to be sized to transmit the maximum pump discharge, and connected to an acceptable point of discharge.

13. A telemetry alarm system is to be installed to the requirements of the Manager of Utilities. Telemetry information is to be transmitted by a programmable logic controller and radio modem to the water source (pump station or inlet valve).

14. Reservoir controls are to consist of 0-100% indicating level transmitters (one for each cell), either pressure or ultra sonic.

15. Backup high and low level control balls are required for each cell (not to contain lead or mercury).

16. The Owner's Engineer is to review the need for re-chlorination based on demand forecasts.

17. The reservoir valve chamber design shall incorporate:
    - all valving associated with reservoir;
    - door from grade or an access hatch of same type as reservoir roof (large enough to permit safe removal of largest single piece of equipment);
    - lifting beams and hoists where necessary to enable removal of equipment or components;
    - heat and light where necessary;
    - ventilation to meet WCB regulations;
    - all control wiring junction boxes;
    - a sump and drain with FRP grating in valve chamber floor;
    - a 50 mm valved outlet off supply line within valve chamber for water supply for cleaning reservoir;
    - piping and valves to be painted with epoxy enamel to American Waterworks Association (AWWA) standards;
    - valves and piping to be clearly labeled;
    - chamber walls to be painted white, floor grey using paint for potable water service;

- modulating control (altitude) valve if more than one reservoir is in the same zone, or if the reservoir is supplied by gravity - the altitude valve system shall be by Clayton Valve or Singer Valve and the design shall be submitted for approval.

18. The reservoir must be cleaned and disinfected to AWWA standards.
19. Access roads less than 0.5 km long must be paved.
20. Gated black chain link perimeter fencing is required.
21. Landscaping acceptable to the Manager of Utilities shall be provided.

3.1.7 PUMP STATIONS

Pump stations, where required, shall be designed to suit the particular circumstances. Pump stations shall be designed to meet maximum daily demand with the largest pump out of service and balancing storage on line. Alternatively, if balancing storage is not on line, pump station capacity shall meet peak hour demand with the largest pump out of service, and stand-by power shall be provided to allow the greater of maximum day demand plus fire flow or peak hour demand during a power outage. A dedicated fire pump must be installed if fire storage is not provided in accordance with 3.1.6.2.

3.1.7.1. Pre-Design Requirements

The Owner's Engineer must obtain approval from the Manager of Utilities for the siting of the pump station and all design considerations prior to commencing detailed design.

3.1.7.2. Pump station design

The following design requirements may be modified at the discretion of the Manager of Utilities.

1. Pump stations shall be reinforced concrete, block work or brick construction, painted inside and, if required, outside, and aesthetically pleasing. Access doorways are to be sized so the largest single piece of equipment may be safely removed and replaced. Lifting hooks or rails with pulley blocks are to be provided as required.
2. Three-phase power is required for 10 HP, or larger, pumps.
3. Electrical phase loss protection is required.
4. Power factor correction is to be provided as required by Power Authority.

5. Motor controls are to be of "soft start" type.
6. Motors are to be energy efficient.
7. Hour meters are required on each pump.
8. Ammeters are required on each pump.
9. Pumps are to start and stop individually. Start and stop to be based on water levels in control reservoir; automatic alternation of pump sequence.
10. A Programmable Logic Controller (PLC) and telemetry system, compatible with the Regional District's Supervisory Control and Data Acquisition (SCADA) system are required. The controller shall be the Allen-Bradley Model 5/03 PLC or approved alternate and shall be capable of communicating utilizing Modbus protocol.
11. If a radio linked or dial-up SCADA system is not operated by the Regional District, duplicate control cables (without splices) are required between pump stations and reservoirs.
12. Pump control valves are required to minimize starting and stopping surges.
13. Globe type control valves are to have rising stem indication.
14. All hydraulic control valves are to have duplex pilot filter systems.
15. A totalizer and recording flow meter is required at each pump station; 4-20 mA connected to PLC
16. Recording suction and discharge pressure gauges are required at each pump station and 4-20 mA transmitters connected to the PLC.
17. The station will be provided with a high pressure (discharge) override stop plus alarm, and low pressure (discharge) override stop plus alarm. All alarms are to interface with the SCADA system.
18. The control panel is to have a lamp test button and include an alarm bypass button.
19. Station piping shall be cement or AWWA epoxy lined ductile iron or AWWA epoxy lined steel pipe and fittings.
20. Station piping is to include a sample point for water quality testing.
21. Internal and external lighting, and automatic heating and ventilating systems are required.
22. Noise control may be required by the Manager of Utilities.
23. Drainage is to be provided for all pump stations.
24. If a chamber is used, it must be sized to allow adequate room for operation

and maintenance.

25. Adequate labelling is required.

26. Paved access is required for a hoist truck (2 m boom) for removal of equipment.

27. Landscaping acceptable to the Regional District is to be provided and include irrigation where necessary.

28. Two metre high perimeter fencing may be required, black chain link unless otherwise approved.

29. A security system and alarm against vandalism and theft will be provided.

30. The station is to be provided with all manufacturers' recommended spares.

31. A wall mounted spare fuse box shall contain all spares for station.

3.1.7.3. Design Review

The Owner's Engineer must provide three sealed sets of mechanical shop drawings and three sealed sets of electrical line diagrams for review by the Manager of Utilities prior to construction. Two sealed copies of design calculations shall be provided for documentation.

3.1.8 PRESSURE REDUCING STATIONS

3.1.8.1 Requirements

1. A pressure reducing station is required where the pressure in the proposed distribution system will exceed 860 kPa.

2. A pressure reducing station is required wherever a pipeline connects different pressure zones.

3. The need for a pressure reducing station will be determined by the Manager of Utilities.

4. Criteria to be considered will include:
   - maximum pressure
   - number of lots serviced and access to lower pressure zone
   - water main looping
   - energy efficiency
   - back up supply to each zone
   - fire flow

5. All service connections with pressure exceeding 550 kPa shall have an individual PRV installed in the building.

3.1.8.2. Design Criteria

Design Requirements

The following design requirements may be modified at the discretion of the Manager of Utilities.

1.4.1 Chamber

The PRV chamber shall be precast reinforced concrete of sufficient size to accommodate the required equipment.

The chamber shall be designed and fabricated for H20 loading and supplied in two sections. Internal height shall be a minimum of 2.0 metres or as specified by the Manager of Utilities. Adequate floor area must be allowed for valve and component maintenance and access to wall mounted instrumentation. A 600 mm wide aisle shall be provided. Minimum clearance of 200 mm is required between piping and chamber walls.

A 610 mm x 610 mm access riser shall be fabricated integrally with the top section and have 10M reinforcing steel dowels for on-site construction of a riser extension.

Openings shall be provided for riser pipes for isolation valve extension rods and fitted with 150 mm PVC bell ends.

Core hole openings are required for two 100mm diameter vent pipes. After vent installation, joints shall be sealed and made water tight.

Vent pipes shall be 100mm diameter schedule 40 steel pipes, hot dipped galvanized after fabrication. Vent openings shall be provided with rain protection and bird screens.

Anchor brackets are to be cast into the concrete roof above all valves as lifting devices and in adjacent walls to assist in removing equipment.

The outside of the chamber must be painted with asphalt emulsion and the inside painted white (2 coats).

The chamber is to be lit with a 4 ft. single bulb explosion proof fluorescent light connected by a standard 120V grounded electrical cord.

The chamber shall be equiped with a dehumidifier and with heating to prevent freezing;

The chamber is to be drained with a 150 mm diameter drain by gravity to an approved storm system.

1.4.2 Access Hatch

The access hatch is to be installed flush to the finished ground elevation and shall be MSU type or approved equal, complete with recessed padlock hoop locking arrangermnt or approved equivalent. The access hatch shall be cast into the concrete riser extension, which is to be fabricated in the field.

1.4.3 Access Ladder

The access ladder shall be a heavy duty industrial grade aluminum ladder, complete with an extend pole. The ladder shall be attached to the chamber wall with aluminum brackets and Hilti type concrete anchors, complete with plastic washers.

1.4.4 Pressure Regulating Valves

Pressure regulating valves will be Singer 106PRS, 206PRS complete with valve position indicator assembly or approved equal.

Two or more pressure regulating valves shall be required to serve low and high flow conditions and to provide redundancy for valve maintenance. The Manager of Utilities shall approve settings for both low flow and high flow conditions.

Each pressure regulating valve shall have approved resilient seat gate valves as mainline isolation valves. Isolation valves must have handwheels and extensions for valve operation from the surface.

Basket type strainers (Muessco Model 165 or approved equal) are to be provided at each pressure regulating valve.

1.4.5 Controls

Control lines shall be stainless steel. Control line tube fittings shall be Parker (CPI 316) stainless steel (single ferrule) fittings with Moli coated nuts or approved equals.

Control line isolating valves must be provided for pressure regulating valves which are 100 mm and larger. Isolating valves must be 304 stainless steel, full port, two piece body ball valves.

Controls shall be :

a) Singer Model 160 Pr Reducing Pilot or approved equal

b) Mod@ 26 Flow SiabiEzu or approved equal

c) Model 81 RP Surge Pilot or approved equal

d) Model J 1521 -M Strainer or approved equal

e) Fixed restriction

Victaulic couplings are to be used for easy disassembly of pipe sections without damaging gaskets,

1.4.6 Pipe Support

Pipe supports are required for easy removal of pipe sections and equipment, and be primed and painted.

1.4.7 Air Valves

Crispin or Valvematic double acting combination air/vacuum valves shall be installed both upstream and downstream of pressure regulating valves.

1.4.8 Pressure Gauges

Pressure gauges are to be stainless steel case, brass internals, liquid filled, ¼ inch MPT bottom mount or approved equal and are to be installed upstream downstream of pressure regulating valves.

1.4.9 Miscellaneous Equipment

Approved flow meters and pressure transducers, with adequate straight length sections of upstream and downstream pipe, are to be installed, if required, in accordance with the manufacturers specifications.

1.4.10 SCADA Requirements

Space and equipment may be required for accomodation of the Supervisory Control and Data Acquisition (SCADA) system.

A 75mm PVC conduit must be installed for future SCADA provisions terminating with a junction box adjacent to the PRV station.

SCHEDULE A

ENGINEERING AND CONSTRUCTION

PART 3 DESIGN CRITERIA

DIVISION 2 - SANITARY SEWAGE COLLECTION SYSTEMS

3.2.1 MASTER SEWAGE COLLECTION AND DISPOSAL PLAN

1. A subdivision will not be permitted until a master sewage collection and disposal plan is first completed for the Planned Community in which the proposal is located and the Regional District Board has approved the plan.

2. If a master sewage collection and disposal plan for the Planned Community has not previously been completed and been approved by the Regional District Board, the Owner will be responsible for the entire cost to the Regional District for the preparation of the plan.

3. A master sewage collection and disposal plan will establish a single sewage treatment plant and outfall for the Planned Community and include conceptual plans and design criteria for sewage treatment, trunk sewers and pump stations, and identify locations and areas of land required for facilities, all as necessary to serve the total development at build-out in accordance with the Electoral Area D Official Community Plan or other planning study. Design criteria will include aesthetic considerations for all above ground works. Where a Planned Community consists of distinct, separated parts, the identification and location of facilities which only serve separate parts may not be required until the first subdivision is proposed for those parts.

4. A subdivision application for the purpose of creating no more than one additional parcel to be used for commercial, institutional or utility purposes, is exempted from the requirement for a master sewerage plan.

3.2.2 CONCEPTUAL SEWERAGE SERVICING PLAN

1. A subdivision for which a sewage collection system is required or proposed will not be permitted until a conceptual sewerage servicing plan has been prepared by the Owner's Engineer and accepted by the Manager of Utilities. A conceptual sewerage servicing plan must conform to the master sewage collection and disposal plan and show depths and alignment of proposed sewers and locations of pump stations in sufficient detail to demonstrate the feasibility of the proposal.

2. Prior to the design of an extension to an existing sanitary sewer system, the adequacy of the downstream system and treatment capacity must be reviewed with the Manager of Utilities who may require the Owner's Engineer to determine its capability of accommodating the proposed development.

3. The Owner's Engineer must confirm with the Manager of Utilities the design flows and peaking factor to be used and the ultimate population expected in the catchment area.

3.2.3 PERMITS

Prior to commencing design of a new community sewerage system or of an extension to a system that will increase discharges of effluent above that permitted, a Permit must be obtained in accordance with the Waste Management Act and submitted to the Manager of Utilities.

3.2.4 SYSTEM DESIGN

3.2.4.1. Design Flow

Sanitary sewers are to be designed for Peak Wet Weather Flow (PWWF) which is the sum of the Peak Dry Weather Flow (PDWF) and infiltration.

3.2.4.2. Average Daily Dry Weather Flow

residential	350 l/capita/day
commercial and institutional	40,000 l/day/ha
minimum industrial	30,000 l/day/ha

3.2.4.3. Peak Dry Weather Flow

The peaking factor shall be 3.5 for populations of less than 500, 3.0 for populations between 500 and 2000 and 80% of the Harmon factor for larger populations.

3.2.4.4. Infiltration and Inflow

The infiltration and inflow allowance is 11,200 l/day/ha.

3.2.4.5. Pipe Flow

1. The Manning formula will be used for calculating flow in gravity sewers using a roughness coefficient of 0.013 for PVC pipe. Gravity sewers will be designed such that the Peak Wet Weather Flow depth does not exceed 75% of the depth of the pipe.

2. The Hazen-Williams formula shall be used for calculating flows in force mains using a friction coefficient of 110.

3.2.4.6. Velocities

The minimum velocity in gravity sewers is 0.6 m/sec with peak dry weather flow. Force mains must have minimum velocity of 0.9 m/s and maximum velocity of 3.5 m/s.

3.2.4.7. Minimum Pipe Diameter

1. The minimum gravity sewer main diameter is 200 mm except that 150 mm may be used for the upstream end of a sewer serving 6 homes or less that cannot be extended.

2. Downstream mains must not have a smaller diameter than those upstream regardless of grade.

3.2.4.8. Curvilinear Sewers

1. At the discretion of the Manager of Utilities, curvilinear sewers may be permitted. The main must be on a constant simple curve and only one horizontal or vertical curve is allowed between manholes.

2. Horizontal curves must parallel the street centre line. The mid point and quarter points of a curve must be located by survey and the offset shown on as-built plans. Elevations must be shown at 5.0 m stations for vertical curves.

3. Minimum grades must be 50% greater than for straight runs of sewer.

3.2.4.9. Depth of Mains

Sewer mains must have a minimum 1.5 m cover under the traveled portion of roads and 1.0 m elsewhere. The depth must be sufficient to allow service connections for basements of buildings on lots abutting the main and upstream lands in the sewer catchment area, but must not be greater than 3.0 m from the finished ground surface unless approved by the Manager of Utilities. Where it is not practical to service lots by gravity from a street sewer, statutory rights of way in accordance with the standard document in Schedule C must be provided. Sewers in rights of way should not have more than 1.0 m. cover unless approved by the Manager of Utilities.

3.2.4.10. Sewer Location

1. Sewers must extend across the full width of each lot and extend to the boundaries of the subdivision plan to provide for further extension and connection beyond the subdivision where such extension is feasible.

2. Sewers within public streets must be located in accordance with the Typical Sections in Part 4, Division 2, Supplementary Standard Detail Drawings. Sewers on private property must be centred in a registered statutory right of way in accordance with the standard document in Schedule C. The minimum right of way width is 3.0 m unless the sewer depth exceeds 3.0 m in which case a greater width may be required by the Manager of Utilities. A sanitary and storm sewer at 1.0 m depth and located 1.0 m apart may share a 3.0 m right of way.

3. Sewers at the rear of uphill lots must, if possible, be within rights of way located entirely on the adjacent downhill land abutting the rear property lines. Where this is not possible, the sewer may be installed just sufficiently deep to give satisfactory firm bedding within the rear yard of the property served and 1.0 cover placed immediately following inspection.

4. If a sewer is located within a statutory right-of-way, the developer may be required to provide access for maintenance vehicles and equipment. The maintenance access shall be constructed to support 9.0 tonne loading. Where a pipeline is located close to the boundary of a property, the right of way and access shall be entirely on one side of the boundary.

5. A pipeline crossing under a watercourse, or under a structure, must be encased in concrete. A pipeline under an arterial highway or railway may be required to be inside an encasing pipe.

3.2.4.11. Manholes

1. Manholes are required at:

   - changes in grade, direction and pipe size;
   - current, and planned future, intersecting sewers;
   - upstream ends of sewers;
   - downstream end of curvilinear sewers; and
   - no further than 125 m apart.

2. Manhole locations must not conflict with curbs, gutters or sidewalks and, where possible, shall be located outside of the wheel path of normal traffic flow.

3. Rim elevations of manholes not located in a roadway, cycle path, sidewalk, pathway or other travelled area must be set above the adjacent storm manhole rim elevation and above the surrounding ground to prevent inflow from surface ponding.

4. Rim elevations of sanitary sewer manholes on major storm drainage routes other than in a roadway, cycle path, sidewalk, pathway or other travelled area must be 100 mm above the 100-year design hydraulic grade line.

5. Manholes in roadways, cycle paths, sidewalks, pathways or other travelled areas on major storm drainage routes must be fitted with gasketted, watertight covers and frames.

6. Inside drop structures may only be used at the discretion of the Manager of Utilities.

7. The crown of the inlet pipe must be at or above the crown of the outlet pipe.

8. The minimum drop in invert levels to compensate for changes in flow direction through manholes is:

   - deflections up to 22 ½° no drop required
   - deflections up to 45° 25 mm
   - deflections up to 90° 50 mm.

9. Horizontal changes of direction greater than 90° are not permitted in a manhole.

3.2.4.12. Clean-outs

Clean-outs must be 200 mm and may be provided as an alternative to terminal manholes where a future extension of the main is proposed and where the distance to the nearest downstream manhole is less than 45 m and the depth of the sewer at the terminal point is less than 2.0 m.

3.2.4.13. Service Connections

1. Each lot abutting a sanitary sewer main must be provided with a connection with a minimum diameter of 100 mm.
2. The typical location of service connections is at the downstream side of the lot.
3. Two family residences must have two separate services appropriately located.
4. Service connections enter the main at, or above the spring-line, and the minimum slope to the property line or edge of right of way is 2%.
5. An inspection chamber is required 300 mm outside of the property line or edge of right of way for all connections.
6. The cover from the finished surface at the property line, or edge of right of way, must be a minimum of 1 m and a maximum of 2.5 m.
7. Connections to new mains are to be made using wye fittings only. Connections to existing mains may be made using pre-manufactured tees or saddles at the discretion of the Engineer.
8. Where there is an existing building, the service connection must be installed at a suitable elevation to provide a gravity service to the basement where practical to do so.
9. Vacant lots must, where possible, be provided with a service connection at a depth sufficient to provide a gravity connection to a basement of a building located at the minimum front yard setback required by the zoning bylaw.
10. Service connections for industrial properties, and from any property requiring a connection greater than two pipe sizes smaller than the main, must enter the main at a manhole.

3.2.5 SANITARY PUMP STATIONS

1. The use of sanitary lift stations is to be minimized and alternative collection system arrangements considered to avoid lift stations where it is practical to do so. Any proposed use of lift stations must receive prior approval from the Manager of Utilities. Sanitary lift stations should normally be located outside of the required road dedication.
2. These criteria cover dry well and submersible sewage lift stations. Larger capacity sewage lift stations or lift stations with special design or siting requirements may require additional assessment and review of criteria.

3.2.5.1. Pre-Design Requirements

The Owner's Engineer must obtain approval from the Manager of Utilities for the siting of the pump station and all design considerations prior to commencing detailed design.

3.2.5.2. Location and Layout

The location and layout of a lift station must include an assessment of the following basic design considerations:

- ultimate flows of the designated catchment;
- type of station and impact on neighbours;
- proximity of receiving sewers, water mains, and adequate power supply;
- soil conditions;
- maximum flood and groundwater elevations and station uplift design;
- construction dewatering requirements;
- construction access;
- maintenance access;
- aesthetics, noise, odour control and landscaping requirements;
- security against vandalism and theft;
- minimizing energy requirements;
- standby power and its compatibility;
- convenience of operation and maintenance;
- safety for operators and public;
- capital costs and operation and maintenance costs.

3.2.5.3. Pump Station Design

1. The station must be designed for uplift based on maximum groundwater or flood levels.

2. Minimum barrel size shall be 1500 mm in diameter.

3. Pumps shall be:
   - capable of passing solids up to 75 mm in size;
   - equipped with hour meters;
   - easily removed for maintenance;
   - operate with a motor running at 1750 RPM;
   - operate on a 347/600 volt electrical source (pump motors over 5 HP are to be 600 volt 3 phase type);
   - able to operate alternately and independently of each other;
   - able to meet maximum flow condition with one pump in failure mode;
   - designed so that each pump does not cycle more than the manufacturers recommended maximum starts per hour, with one pump in failure mode;
   - one pump shall include an automatic flush valve.

4. All pumps must be factory tested prior to installation.

5. Minimum storage between the high level alarm and the start of overflow must be the more critical of:
   - minimum 1 hour in wet well at average wet weather flow.
   - minimum 1 hour in wet well and influent pipes at peak wet weather flow.

5. All stations must have an automatic generator with automatic transfer switch for standby power in case of power failure. For small lift stations with an ultimate capacity less than 100 units, emergency storage may be considered in place of standby power; emergency storage is to be based on 8 hours of average day flows. Stations without standby power must include a Crouse Hindes receptacle and transfer switch for connecting a standby power source.

6. A gate valve is required on the influent line and a plug valve on each pump discharge. The valves must be outside the station and be complete with square operating nut and nelson box.

7. Check valves will be ball lift check valves.

8. Stations are to have a magnetic flow meter complete with ultrasonic cleaner or the PLC programmed to calculate and record flows based on a change in wet well levels.

9. Motors cables, power cables, etc. must be continuous from within the pump station to within the kiosk unless an adequate exterior pull pit and junction box is installed.

10. All wiring must be explosion-proof, Class 1, Division 2, and electrical design and installation is subject to the acceptance of the Provincial Safety Inspector.

11. Levels are to be controlled by ultrasonic level transmitter with emergency high and low level balls (float switches).

12. All auxiliary equipment and control panels must be mounted in a suitable kiosk adjacent to the station. The kiosk must be located a minimum of 3.0 m from the station lid.

13. The control kiosk must be designed to contain all control and telemetry equipment on the front panel and all power equipment on the rear panel.

14. A Programmable Logic Controller (PLC) and telemetering system, compatible with the Regional District's Supervisory Control and Data Acquisition (SCADA) system must be provided. The controller will be the Allen-Bradley Model 5/03 PLC, or approved alternate, and be capable to communicate utilizing Modbus protocol.

15. The station must be complete with a Uninterruptible Power Supply (UPS) to serve all alarms and controls.

16. The pump control panel must incorporate an operator interface (Allen Bradley DTAM or equivalent).

17. The panel must have a lamp test button.

18. An hour meter must be built into the panel for each pump.

19. An ammeter must be provided for each pump.

20. All stations require an explosion-proof supply fan, meeting WCB requirements for ventilation in a confined space. The fan must have an adjustable speed drive set to operate continuously at 10 air changes per hour and a high speed setting for intermittent operation to meet WCB requirements (minimum 20 air changes per hour). A screened exhaust vent must also be provided. All ventilation piping will be PVC or FRP.

21. Entrances to all stations must be waterproof and provided with a suitable lock. Access hatches must be reinforced for 1465 kg/m^2 and a minimum 900 mm x 900 mm. The access hatch shall have:
    - aluminum 6 mm tread plate;
    - perimeter drain;
    - perimeter sealing gasket;
    - slam lock with an aluminum removable sealing plug and opening tool;
    - flush lift handle;
    - gas spring assist cylinder;
    - 90 degree hold open arm;
    - flush fitting padlock tang.
    - all fasteners to be made of 316 stainless steel.

22. The entrance must be above ground level but, in no case, more than 300 mm above the ground. An explosion-proof light with a protective cover must be located in a suitable location in the station and the light is to be activated by the entrance cover.

23. Access into the station will be by an aluminium ladder. The location of the ladder must not interfere with the removal and installation of the pumps, etc. The ladder must be designed to extend and lock at least 600 mm above the station entrance. A platform is to be provided above the high water level float to permit wet well access. The platform is to be a fibreglass (FRP) grating and meet WCB standards.

24. Metal stations must be protected by impressed current cathodic protection.

25. All equipment must be CSA approved and have at least a one year guarantee for parts and labour.

26. If a lift station is to be constructed in an area that may be subject to vehicle loads, the roof and cover of the pump station must be designed to withstand a loading of H-20 (Highways Standard).

27. A 38 mm diameter water connection for wash down purposes must be provided including an approved backflow preventor located in a separate compartment in the kiosk.

28. The area around the station and all associated equipment or building, must be asphalted. The size of the area is to be determined by the requirements for maintenance.

29. The surface of all steel components and fibreglass stations must receive at least two coats of two component white epoxy enamel. All concrete stations must be designed and constructed to prevent sulphide attack.

30. The wet well bottom must be benched to direct all solids into the pump suction. The influent line must be located tangentially to the wet well to encourage scouring of the wet well.

31. Stations are to be designed to allow removal of pumps using a hoist truck with 1.8 m boom.

32. Where, in the opinion of the Manager of Utilities, vandalism or safety is a concern; perimeter fencing is to be provided. The fence must be black chain link.

33. Landscaping, acceptable to the Regional District, is to be provided.

34. Noise levels for the pump station facilities must not exceed the Regional District standards or 65 dB at the property line.

35. Odour control may be required.

3.2.5.4. Testing of Lift Stations

1. Wet well chambers must be tested for exfiltration by filling the chamber to the underside of the roof slab with water. The test duration will be a minimum of three hours. No leakage will be permitted.

2. In areas of high groundwater tables, the Manager of Utilities may require an infiltration test. No leakage is permitted.

3. Lift stations will be tested using water. Stations must be tested through the operating range to verify emergency float operation, pumps, controls, alarms, backup power and manual operation.

4. A noise level test is required to confirm pumping station and standby power are within specified acceptable limits.

3.2.6 FORCE MAINS

3.2.6.1. Hydraulic Analysis

Design computations for force mains must be made using a "C" factor of 110 (for PVC pipe) and then re-calculating the system curve using a "C" factor of 145 to ensure adequate motor horsepower and pump characteristics.

3.2.6.2. Velocity

At the lowest pump delivery rate anticipated to occur at least once per day, a minimum cleansing velocity of 1.0 m/sec must be maintained. Maximum velocity must not exceed 3.5 m/s.

3.2.6.3. Air Relief Valve

An automatic sewage air relief valve must be placed at high points in the force main to prevent air locking.

3.2.5.4. Termination

Force mains must enter the gravity sewer system at a point not more than 600 mm above the flow line of the receiving manhole. An inside drop pipe must be incorporated. If the receiving manhole design does not allow this, then a manhole drop structure to minimize turbulence and odour generation is required.

3.2.5.5. Size

The minimum size for force mains is 100 mm diameter.

3.2.5.6. Materials

The material selected for force mains must meet the standards specified for water mains and shall be modified for local conditions, such as character of industrial wastes, soil characteristics, exceptionally heavy external loadings, abrasion and similar problems.

3.2.5.7. Loads and Transient Pressures

All force mains must be designed to prevent damage from superimposed loads, or from water hammer or column separation phenomena.

3.2.5.8. Corrosion and Odour

Corrosion and odour controls may be required

SCHEDULE A

ENGINEERING AND CONSTRUCTION

PART 3 DESIGN CRITERIA

DIVISION 3 - DRAINAGE COLLECTION AND DISPOSAL SYSTEMS

3.3.1 STORMWATER MANAGEMENT

1. Electoral Area D Official Community Plan sets out Policies and Stormwater Management Guidelines for the Britannia Beach Planned Community. The Guidelines include a selection of Best Management Practices (BMPs). BMPs vary in their applicability to different objectives (e.g. protection against flooding and erosion or protection of fish habitat) and in their suitability for different levels of development and for different site conditions. Furthermore, the performance of BMPs varies widely and prescriptive performance standards are not appropriate at the current level of knowledge. The selection of BMP's and design criteria for specific circumstances is a complex process involving detailed study of the watershed, development of watershed objectives and priorities and identification of types of development and land use. For these reasons design criteria for BMP's are not given in this schedule, but reference should be made to "Best Management Practices Guide for Stormwater" published by the Greater Vancouver Sewerage and Drainage District.

2. BMPs involving detention, infiltration or roof downspouts that are not directly connected to a storm drainage system will require detailed study by, and a report from, a professional engineer specialized in groundwater hydrology, including an assessment of the impact on lands which are downhill and down gradient (with respect to groundwater) from the development and on existing and potential development on those lands and of the operational and maintenance implications of adopting specific BMPs.

3. Because site and climatic conditions vary considerably over Electoral Area D and there is a lack of data, design parameters for hydrological calculations are also excluded from this schedule.

3.3.2 INTEGRATED STORMWATER MANAGEMENT PLAN (ISWMP)

1. A subdivision will not be permitted until an ISWMP addressing engineering, planning and environmental concerns has been completed for the watershed in which the land is situated. If an ISWMP has not previously been completed for that watershed, the Owner will be responsible for the costs of preparing one for the entire watershed in which the proposed subdivision or development is situated. The process must follow that described in the GVRD publication *"Integrated Stormwater Management Planning - Terms of Reference Template"* amended appropriately to the requirements of the Squamish Lillooet Regional District.

2. The ISWMP will identify and determine approximate locations of appropriate BMPs, routing of major drainage system flows, trunk storm drains, and outfalls and develop design criteria and operational and maintenance requirements for BMP's according to their purpose and location and establish appropriate intensity-duration-frequency curves and other design parameters. Design criteria will include aesthetic considerations for all above ground works.

3. A subdivision application for the purpose of creating no more than one additional parcel to be used for commercial, institutional or utility purposes, is exempted from the requirement for an ISWMP.

3.3.3 CONCEPTUAL STORM DRAINAGE SERVICING PLANS

1. A subdivision for which a storm drainage collection system is required or proposed (other than road ditches maintained by the Ministry of Transportation), will not be permitted until a conceptual storm drainage servicing plan has been prepared by the Owner's Engineer and accepted by the Manager of Utilities. A conceptual storm drainage servicing plan must conform to the ISWMP and show depths and alignment of proposed storm sewers and major system flow paths and any stormwater management facilities in sufficient detail to demonstrate the feasibility of the proposal.

2. Prior to the design of a storm drainage system, the boundaries of catchment areas and the adequacy of the downstream system, including minor systems, major systems and natural channels, must be reviewed with the Manager of Utilities who may require the Owner's Engineer to determine their capability for accommodating the proposed development.

3. The Owner's Engineer shall confirm with the Manager of Utilities the design method and parameters to be used for storm drainage design, including stormwater management BMPs.

3.3.4 APPROVALS UNDER THE WATER ACT

All discharges to, and changes in and about, a stream must be approved in accordance with the Water Act of BC. The Owner must submit copies of provincial approvals to the Manager of Utilities prior to proceeding with construction.

3.3.5 STORM DRAINAGE DESIGN

3.3.5.1. Minor and Major Systems

1. The Minor System consists of pipes, culverts, open channels, water courses and flow control facilities designed to carry runoff caused by storm events up to a return period of 1 in 10 years.

2. The Major System consists of overland flow routes, swales, channels, watercourses, roadways, walkways, pathways, flow control facilities or other publicly owned property at the discretion of the Manager of Utilities, designed to accommodate runoff from storm events of a return period of 1 in 100 years with the maximum hydraulic grade line below the elevation of the lowest existing or proposed adjacent buildings.

3. In special conditions, where surface flood paths cannot be established, pipes and culverts of the existing or proposed Minor System may be enlarged to accommodate the major flow. Emergency overflow routes may be required by the Manager of Utilities.

3.3.5.2. Design Methods

The Rational Method will be used for drainage basins of less than 10 ha which do not include detention systems. The Runoff Hydrograph method, using an established modeling program, will be used for all other circumstances. Rainfall intensity-duration-frequency curves must be based on Atmospheric Environment Service data where such are available for the vicinity of the development or on curves established for use in the closest municipality. In either case, the curves must be reviewed by a professional engineer experienced in hydrology for their applicability to the particular site conditions.

3.3.5.4. Pipe Design

Manning's formula shall be used for calculating flow using a roughness coefficient of 0.013 for PVC pipe and concrete pipe. Storm sewers are not to be designed to surcharge.

3.3.5.5. Velocities

1. The minimum velocity in storm sewers shall be 0.75 m/sec flowing full or half full.

2. If design velocity is supercritical or exceeds 3 m/s, appropriate analysis and justification must be provided and provisions made to ensure that structural stability and durability concerns are addressed and the sewers protected from displacement by erosion or shock.

3.3.5.6. Minimum Pipe Diameter

The minimum storm sewer main diameter shall be 250 mm except that 200 mm may be used for the upstream end of a storm sewer that cannot be extended and has no catchbasins connected.

3.3.5.7. Curvilinear Sewers

1. Curvilinear storm sewers may be permitted at the discretion of the Manager of Utilities. The main must be on a constant simple curve and only one horizontal or vertical curve is allowed between manholes.

2. Horizontal curves must parallel the street centre line. The mid point and quarter points of a curve must be located by survey and the offset shown on as-built plans. Elevations must be shown at 5.0 m stations for vertical curves.

3. Minimum grades must be 50% greater than for straight runs of sewer.

3.3.5.8. Depth of Mains

Storm sewer mains shall have a minimum 1.5 m cover under the traveled portion of roads and 1.0 m elsewhere. The depth should be sufficient to allow service connections for foundation drainage of buildings on lots abutting the main and upstream lands in the storm sewer catchment area, but must not be greater than 3.0 m from the finished ground surface in public streets unless approved by the Manager of Utilities. Where it is not practical to service lots by gravity from a street sewer, statutory rights of way in accordance with the standard document in Schedule C must be provided. Sewers in rights of way should not normally have more than 1.0 m cover unless approved by the Manager of Utilities.

3.3.5.9. Sewer Location

1. Storm sewers must extend across the full width of each lot and extend to the boundaries of the subdivision plan to provide for further extension and connection beyond the subdivision where such extension is feasible.

2. Storm sewers within public streets must be located in accordance with the Typical Sections in Part 4, Division 2, Supplementary Standard Detail Drawings. Sewers on private property must be centred in a registered statutory right of way in accordance with the standard document in Schedule C. The minimum right of way width is 3.0 m unless the sewer depth exceeds 3.0 m in which case a greater width may be required by the Manager of Utilities. A sanitary and storm sewer located 1.0 m apart may share a 3.0 m right of way if no deeper than 1.0 m.

3. Storm sewers at the rear of uphill lots must, if possible, be within rights of way located entirely on the adjacent downhill land abutting the rear property lines. Where this is not possible, the sewer may be installed just sufficiently deep to give satisfactory firm bedding within the rear yard of the property served and 1.0 m cover placed immediately following inspection.

4. If a sewer is located within a statutory right-of-way, the owner may be required to provide access for maintenance vehicles and equipment. The maintenance access shall be constructed to support a minimum 9.0 tonne loading. Where a pipeline is located close to the boundary of a property, the right of way and access shall be entirely on one side of the boundary.

5. A pipeline crossing under a watercourse or under a structure must be encased in concrete. A pipeline under an arterial highway or railway may be required to be inside an encasing pipe.

3.3.5.10. Manholes

1. Manholes are required at:
   - changes in grade, direction and pipe size;
   - current, and planned future, intersecting sewers;
   - upstream ends of sewers;
   - downstream end of curvilinear sewers; and
   - no further than 120 m apart.

2. Manhole locations must not conflict with curbs, gutters or sidewalks and, where possible, shall be located outside of the wheel path of normal traffic flow.

3. Manhole rim elevations in off-road areas must be set below adjacent sanitary manhole rim elevations.

4. Inside drop structures may only be used at the discretion of the Manager of Utilities.

5. The crown of the inlet pipe must be at or above the crown of the outlet pipe.

6. For sewers 600 mm diameter or less, the minimum drop in invert levels to compensate for changes in flow direction through manholes is:

- deflections up to 22 ½° no drop required
- deflections up to 45° 25 mm
- deflections up to 90° 50 mm.

7. Detailed engineering calculation is required for head losses for larger sewers.

8. Horizontal changes of direction greater than 90° are not permitted in a manhole.

3.3.5.11. Clean-outs

Clean-outs must be 200 mm and may be provided as an alternative to terminal manholes where a future extension to the main is proposed and the distance to the nearest downstream manhole is less than 45 m and the depth of the sewer at the terminal point is less than 2.0 m.

3.3.5.12. Catchbasins

1. Catchbasins must be located at regular intervals, based on hydraulic requirements, along roadways, at the upstream end of radius at intersections and wheel chair letdowns and at low points.

2. Each catchbasin must collect a maximum of 500 m^2 of pavement runoff where gutter grades are less than or equal to 3% and a maximum of 350 m^2 of pavement runoff where gutter grades exceed 3%.

3. Leads must be 150 mm for single catchbasins and 250 mm for double catch basins and drain directly to manholes where possible. Double catch basins must not be directly connected to each other, but by a wye in the leads. The minimum grade for leads is 1% and the maximum length of catchbasin leads is 30 m.

3.3.5.13. Lawn Basins

Lawn basin leads must be a minimum of 150 mm with a minimum grade of 1% and connect directly to a manhole or be provided with an inspection chamber at the property line.

3.3.5.14. Service Connections

1. Each lot abutting a storm sewer main must be provided with a connection with a minimum diameter of 150 mm.

2. The typical location of service connections is at the downstream side of the lot.

3. Service connections enter the main at or above the spring-line and the minimum grade to the property line or edge of right of way shall be 2%.

4. An inspection chamber is required at 300 mm outside of the property line or edge of right of way for all connections.

5. The cover from finished surface at the property line or edge of right of way must be a minimum of 1 m and a maximum of 2.5 m.

6. Connections to new mains must be made using wye fittings only. Connections to existing mains may be made using pre-manufactured tees or saddles at the discretion of the Manager of Utilities.

7. Service connections from industrial properties and from other properties requiring a connection greater than two pipe sizes smaller than the main must enter the main at a manhole.

8. If the sewer is replacing an existing ditch, all existing outfalls to the ditch must be located and connected to the sewer.

9. Where there is an existing building, the service connection must be installed at a suitable elevation to provide a gravity connection where practical to do so.

10. Vacant lots must, where possible, be provided with a service connection at a depth sufficient to provide a gravity connection to the foundation drain of a building located at the minimum front yard setback required by the zoning bylaw.

3.3.5.15. Site and Lot Grading

Every lot over 0.5 ha must be graded at a minimum of 2% to drain away from building foundations and to a drainage system or natural drainage path. Lawn drains, swales and, if necessary, french drains must be installed to prevent surface water run-off flowing onto adjacent lots and connected to the storm drainage system. If lots must drain towards other parcels, swales must be provided and protected by easements.

3.3.5.16. Minimum Building Elevation

A Minimum Building Elevation (MBE) for each parcel must be established and recorded on the lot grading plans. The MBE is the lowest elevation permitted for a floor slab or underside of joists above a crawl space and must be at least 600 mm above the building service connection invert at the property line plus an allowance for the installation of a service connection from the building at a minimum grade of 2% or 150 mm above the 100 year hydraulic grade line whichever is higher.

3.3.5.17. Lot Grading Swales

1. Swales may be used in conjunction with lot grading to protect property from overland sheet flow from adjacent uphill properties by providing rear, front and side yard drainage.

2. A lot grading swale must be protected by a registered easement in favour of all upstream properties. Easements must be 1.8 m wide unless also occupied by drainage pipes in which case they must be 3.0 m wide.

3. Lot grading swales must have 150 mm minimum depth, 1.5 m width, 1% minimum grade, velocity limited to 1 m/s and be lined with turf on a minimum of 100 mm of topsoil or some other protection from erosion.

3.3.5.18. Major System Routing

1. Major System flow routing is accommodated on roadways with barrier curbs, in swales, ditches or watercourses. Major System flows can also be accommodated in the proposed storm sewer, provided the existing downstream system has adequate capacity to accept this flow.

2. The designated flow path(s) shall be protected by restrictive covenants, and/or registered statutory rights-of-way and shall be clearly identified on a Storm Water Management Plan.

3. The only flow permitted to be conveyed by a surface flow path is the total Major System flow less the Minor System flow. The design of the flow path shall ensure, to the satisfaction of the Manager of Utilities, that public safety will not be endangered and substantial property damages will not occur under Major System flow conditions.

4. Urban roadways with concrete curbs and gutters can be designed as wide shallow channels to convey Major System flows on the surface. The maximum hydraulic grade line elevation shall be at least 150 mm below the lowest MBE of adjacent existing properties. In new developments, all MBE's shall be designed at a minimum 150 mm above the Major System hydraulic grade line elevation. The maximum depth of flow within roadways shall not exceed 150 mm above the gutter.

5. Design at intersections shall ensure that surface flow can continue along the designated path crossing over lateral streets. Similar consideration is required if a change of surface flow direction is required at an intersection.

6. Swales must be designed for the capacity of the expected flows, designed with scour protection and energy dissipation, protected by a registered statutory right-of-way and designed with suitable access for continuous maintenance and inspection.

3.3.5.19. Culverts

1. Driveway culverts must be designed to carry the minor flow with the headwater not backed up above the top of the culvert.

2. Culverts located on natural watercourses and culverts under roadways must be designed to carry the major flow.

3. Inlet and outlet structures with energy dissipation, scour protection, and erosion control are required on all culverts designed to convey the major flow.

4. Surcharging at an inlet under major flow is acceptable provided that the headwater profile does not rise above the MBE of adjacent properties. The maximum elevation of standing water above existing finished ground surfaces, parking lots, street surfaces etc. caused by any surcharging shall not be greater than 300 mm. Adequate erosion protection shall be required where surcharging is evident.

3.3.5.20. Inlet/Outlet Structures

1. Outlets having discharge velocities greater than 1 m/s require evaluation of the downstream channel and riprap or an approved energy dissipating structure may be required to control erosion.

2. Structures exceeding 1 m in height and/or 2 m in width require individual structural design and shall include safety railing where specified by the Manager of Utilities.

3. Outfalls for pipes greater than 600 mm must be protected by free swinging, lockable, weighted gratings which allow passage of materials on discharge. Gratings must be sized with a hydraulic capacity of 200% of the design flow. Bars must be spaced at no more than 150 mm.

SCHEDULE A

ENGINEERING AND CONSTRUCTION

PART 3 DESIGN CRITERIA

DIVISION 4 - ROADS, SIDEWALKS, WALKWAYS AND TRAILS

3.4.1 STREETS

3.4.1.1. Roads

Roads will be constructed to Ministry of Transportation design parameters and specifications except that the finished top width must accommodate sidewalks and services required in this Bylaw and Schedule in the road shoulder in accordance with the Typical Sections in Part 4, Division 2, Supplementary Standard Detail Drawings or as required in section 3.4.1.3 or as required in section 3.4.1.3.or as required in section 3

3.4.1.2. Curbs And Gutters

1. Barrier curbs are required on all roads other than sections of road adjacent to one or two family lots.

2. Barrier curbs are required on all roads which form part of a major drainage route.

3. Barrier curbs are required within a distance of 2 m, measured parallel to the road centre line, on either side of a BC Hydro transformer that is located within 1.0 m of the back of curb or within 1.0 m of a sidewalk which abuts the curb.

4. Except as otherwise required by this section, rollover curbs are required on sections of road adjacent to one and two family residential lots.

5. Letdowns for driveway access must be incorporated into the design of barrier curbs.

6. Transitions between barrier and rollover curbs shall be over a distance of 2 m.

3.4.1.3. Sidewalks

4. A sidewalk will be provided on at least one side of all arterial and collector roads as shown on the Urban Collector – Typical Section.

5. Sidewalks will be provided adjacent to multifamily, commercial, industrial and institutional lots and parks and extend to the closest proposed bus stop or arterial or collector road unless otherwise approved by the Manager of Utilities.

3. Where local roads are to have sidewalks on the same side as underground wiring, the detail for the sidewalk and boulevard shall be the same as for the Urban Collector – Typical Section.

4. Where a sidewalk is required on the opposite side to underground wiring on a local or collector road, the boulevard shall be widened by 1.3 m.

5 Sidewalks will be provided, at least 15 m in length at proposed bus stop locations and 5 m in length at community mailboxes.

6. The Manager of Utilities may require a sidewalk to be wider than 1.5 m adjacent, and leading, to land zoned other than for one or two family use.

7. Unless otherwise approved by the Manager of Utilities, sidewalks must abut the curb.

3.4.1.4. Wheel Chair Ramps

Wheel chair ramps are required at all intersections where there are sidewalks. The maximum grade for wheel chair ramp is 10%.

3.4.2 URBAN WALKWAYS

1. Walkways connecting streets shall be dedicated 6 m wide on a subdivision plan and located as required by the Manager of Utilities to provide pedestrian loops at the end of culs de sac, and shortcuts to parks, schools, community, recreational and commercial areas and bus routes.

2. Walkways will be 3 m wide constructed with a 50 mm asphalt surface with 600 mm crushed gravel shoulders both on a 19 mm minus granular base 100 mm deep and cross, or crown, sloped at 2%. The sub-grade must be compacted to 95% modified Proctor density. Swales will be provided as necessary for drainage with the invert a minimum of 200 mm below the underside of the granular base.

3. Plastic coated chain link fences 1.2 m high, or alternative acceptable to the Manager of Utilities, must be erected on either side of walkways.

4. Bicycle baffles must be located at each end of walkways.

5. Walkways must not be steeper that 12% without the approval of the Manager of Utilities.

3.4.3 WALKING PATHS

1. Walking paths will be dedicated 6 m wide on the subdivision plan and located as required by the Manager of Utilities to conform to a Trail Network Plan adopted as part of the Electoral Area D Official Community Plan.

2. Walking paths will be built to the same standards as Urban Walkways. Where they are not adjacent to existing or proposed residential, commercial, industrial or institutional parcels or where permitted by the Manager of Utilities, walking paths may be unfenced and reduced to a minimum width of 1.8 m constructed with a 19 mm minus crushed granular surface 100 mm deep on a 75 mm minus select granular sub base 150 mm deep.

3. Bicycle baffles will be placed at the end of walking paths.

4. Signage will be provided as required by the Manager of Utilities.

5. Where a connecting walking path is not planned to be completed within one year of subdivision servicing, the Manager of Utilities may require payment in lieu of walking path construction of an amount estimated to be the cost of constructing the walking path with the money deposited in a fund for walking path completion.

6. Walking paths must not be steeper than 12% without the approval of the Manager of Utilities.

3.4.4 HANDRAILS

Handrails with horizontal pipes are required where sidewalks or walking paths are permitted to have grades steeper than 12% steps and where there is a steep drop off.

3.4.5 HIKING AND NATURE TRAIL SITING AND DESIGN CRITERIA

1. Hiking and nature trails will be dedicated 6 m wide on the subdivision plan and located as required by the Manager of Utilities to conform to a Trail Network Plan adopted as part of the Electoral Area D Official Community Plan.

2. Trail layout and construction shall be supervised by an experienced trail layout and design specialist.

3. All construction work shall be carried out in a manner that minimizes damage to trees, roots and forest floor and that does not disrupt natural drainage patterns. Culverts and bridges shall be provided where necessary. Steep grades and cross slopes shall be avoided to reduce cut-and-fill scars.

4. Trail fill and base material should contain no organic material. Swale cut material may be used as trail base if it contains no organic material.

5. Trails should have a minimum vertical clearance of 3 metres and minimum horizontal clearance of 2.4 metres. Trees should not be cut unless necessary. Only blast stumps of felled trees where the stump interferes with the tread of the trail. Do not blast stumps directly adjacent to trail or shoulder.

6. Swales are required on all trail areas having poor drainage.

7. All disturbed areas are to be regraded, organic material replaced and seeded.

SCHEDULE A

ENGINEERING AND CONSTRUCTION

PART 3 DESIGN CRITERIA

DIVISION 5 – STREET LIGHTING

3.5.1 GENERAL

Street lighting systems must be designed by a professional engineer with sound knowledge of such systems.

3.5.2 ILLUMINANCE AND CONFIGURATION

Street lighting illuminance, in lux, must be in accordance with Table 1.

TABLE 1

	ROAD CLASSIFICATION	
LAND USE	Collector	Local
Single Family and Low Density Multifamily Residential & Industrial	6	4
Local Commercial & Institutional	9	7

- maximum average to minimum uniformity ratio must be 3:1 except local residential which must be 6:1;
- luminaires must be 100 W or 150 W high pressure sodium unless approved by the Manager of Utilities;
- electrical power must be rated at 120 V;
- street lights must have polycarbonate lenses; and
- the make and model of luminaires on which the illumination levels are calculated must be specified on the drawings.

3.5.3 LUMINAIRES AND POLES

1. In service areas in which decorative street lights have previously been installed, the Owner must install the same make and style of light unless otherwise instructed by the Manager of Utilities. Except in service areas in which decorative street lights have previously been installed or in service areas for which the Regional District has determined a style of decorative light must be used, cobra head, high pressure sodium, luminaires mounted on davit poles must be used.

2. For areas where decorative street lights have been, or are to be, used the Owner may submit alternative equivalent designs for consideration.

3. The Owner must provide one spare luminaire and pole for each ten units (or part of ten) installed.

3.5.4 UNDERGROUND DUCTS

1. Underground wiring for street lights must be designed in accordance with the Canadian Electrical Code (Part 1) and all bulletins issued by the BC Electrical Safety Branch and the Provincial Electrical Inspection amendments.

2. The minimum depth of bury of underground ducts is 0.6 m in boulevards and 0.9 m below the finished grade of the road.

3. The engineer responsible for the design must ensure the supply service to the street lighting system receives connection permits from BC Hydro and provide a copy to the Manager of Utilities.

3.5.5 CIRCUIT SIZE

Service bases must service a maximum of 25 lights. Roads having staggered lighting must have separate circuits on either side of the road.

3.5.6 LIGHT AND DUCT LOCATION

Street lights must be located at intersections and along one side of streets within 0.6 m of property corners avoiding any conflict with hydrants and underground service connections. Street lights must be provided at, or opposite, the ends of walkways and on walkways where directed by the Manager of Utilities. Street lights and street lighting ducts must be located in accordance with the Typical Sections in Part 4, Division 2, Supplementary Standard Detail Drawings.

SCHEDULE A

ENGINEERING AND CONSTRUCTION

PART 3 DESIGN CRITERIA

DIVISION 6 - UNDERGROUND WIRING AND GAS DISTRIBUTION

3.6.1 GENERAL

1. Underground wiring and gas pipelines must be located in accordance with the Typical Sections in Part 4, Schedule 2, Supplementary Standard Detail Drawings.

2. Underground wiring and gas pipelines must extend across the full width of each lot and extend to the boundaries of the subdivision plan to provide for further extension and connection beyond the subdivision where such extension is feasible.

3. Construction drawings approved by the utility company must be submitted to the Manager of Utilities for approval.

SCHEDULE A

ENGINEERING AND CONSTRUCTION

PART 4 – SPECIFICATIONS AND STANDARD DETAIL DRAWINGS

DIVISION 1 – SPECIFICATIONS

INTRODUCTION

The Specifications and Standard Detail Drawings of the April 2000 edition of the Master Municipal Construction Document (MMCD) are incorporated into the Electoral Area D Subdivision and Development Servicing Bylaw.

MMCD is written to form part of a contract between an Owner and a Contractor, and the MMCD Specifications, either directly or by reference to the General Conditions, include references to the respective responsibilities of the Owner, the Contractor and the Contract Administrator. For the purposes of this Bylaw, the Regional District places full responsibility for design, construction, installation, inspection, testing and record keeping of Works and Services on the Owner who is required to hire the Owner's Engineer (the Contract Administrator) to undertake duties in accordance with the Bylaw, and MMCD must be interpreted in this way.

MMCD Specifications and Standard Detail Drawings are supplemented by this Schedule. In case of inconsistency, the Bylaw and Schedule take precedence over MMCD.

This Schedule may be further supplemented by supplementary specifications and drawings submitted in connection with a specific project and approved by the Manager of Utilities.

Ministry of Transportation requirements take precedence over MMCD with respect to trench backfill above the pipe bedding and surround (300 mm above the crown of pipe), road construction (except sidewalks), asphalt paving and traffic regulations on, or within, public roads.

The Supplementary Specifications in this Schedule include a List of Approved Materials and Products, global supplements and supplements to individual sections of MMCD.

This Schedule adopts the numbering system used in MMCD.

LIST OF APPROVED MATERIALS AND PRODUCTS

MMCD Section	Product	Modification
Section 02666 - Waterworks		
2.2.2	Polyvinyl chloride (PVC) pipe	Maximum size, 300 mm
2.2.3	High density polyethylene pipe	Not allowed
2.2.4.4	PVC injection-molded fittings	Not Allowed
2.2.4.5	PVC extruded fittings	Not Allowed
2.2.4.12	Couplings and flanged coupling adapters	Repair clamps not allowed
2.2.4.13	Joint restraint devices	Set screw type not allowed
Add 2.2.7	Joint protection tape	Trenton Tec Tape, use when minimum clearance from a sewer cannot be achieved
2.3.2	Mainline gate valves	Solid wedge, resilient seat only
2.3.3	Mainline butterfly valves	Use subject to approval
2.3.5	Air valves	Combination only
2.3.6	Mainline valve boxes	Nelson type Cover marked 'WATER'
2.4.9	Valve chamber frames and covers	Cover marked 'WATER'
2.5.3.2	Service saddles	Not allowed for ductile iron pipe Required for PVC pipe
2.6.1.1	Hydrant shut-off	Compression type only
2.6.2	Hydrant colour	Red: General Paint Signal Red #10-060 White: General Paint Marine Express #10-010
Section 02721 - Storm Sewers		
2.3	Plastic pipe, mainline ribbed profile	Not allowed
2.4	Spiral rib pipe-steel	Not allowed
2.5.4	Service connection pipe	PVC only
2.5.8	Field installed wye connections	Not allowed on new PVC mainline pipe
Add 2.5.11	Inspection chamber	Leron for 100 to 200 mm connection complete with plug bell painted green inside and outside, lid painted green
Section 02723 - Pipe Culverts		
2.4	Plastic pipe, ribbed profile	Not allowed
Section 02725 - Manholes and Catchbasins		
2.1.7	Manhole lids	Cover marked either 'STORM' or 'SANITARY'
2.1.14	Manhole joints	Use rubber gasket
3.3.9	Manhole joints	Use rubber gasket
Section 02731 - Sanitary Sewers		
2.3.4	Service connections pipe	PVC only
2.3.8	Field installed wye connections	Not allowed on new PVC mainline pipe
Add 2.3.11	Inspection chamber	LeRon complete with plug bell painted red inside and outside, lid painted red

Section 02732 - Sewage Forcemains		
2.2.2	Polyvinyl chloride (PVC) pipe	Maximum size, 300 mm
2.2.4	High density polyethylene pipe	Not Allowed
2.2.5.4	PVC injection-molded fittings	Not Allowed
2.2.5.5	PVC extruded fittings	Not Allowed
2.2.5.12	Couplings and flanged coupling adapters	Repair clamps not allowed
2.2.5.13	Joint restraint devices	Set screw type not allowed
2.3.2	Gate valves	Solid wedge, resilient seat only
2.3.4	Air valves	Combination only designed for sewage applications
2.3.5	Valve boxes	Nelson type? Cover marked 'SANITARY'
2.4.8	Valve chamber frames and covers	Cover marked 'SANITARY'
Section 16550 - Electrical		
Add 2.2.1	Conduit	Rigid PVC, CSA C22.2 No. 211.2 Rigid Steel, Hot dip galvanized conforming to CSA C22.2 No. 45
Add 2.2.2	Couplings, adapters, bends, fittings	Rigid PVC, CSA C22.2 No. 85 Rigid Steel, Hot dip galvanized conforming to CSA C22.2 No. 45
Add 2.2.3	Trench marker tape	150 mm wide, labelled "WARNING ELECTRICAL" at min 500 mm intervals
Add 2.2.4	Junction boxes and communication vaults	MoT pre-approved product
Add 2.2.5	Concrete mix	Min compressive strength 30 MPa @ 28 days Max aggregate size, 28 mm Max W/C ration by mass, 0.45 Air content, 4 to 6 % Slump, 30 to 70 mm
Add 2.2.6	Concrete pole bases	Poured-in-place as per Section 03300 or pre-cast Top of bases to be level with bevelled edges Reinforcing steel, CAN/CSA G30.18M 400R Anchor bolts, MoT pre-approved product
Add 2.2.7	Poles and related equipment	MoT pre-approved product Poles, galvanized finish
Add 2.2.8	Conductors	Single conductors, stranded copper, type RW90 XLPE insulated
Add 2.2.9	Conductor connectors	Solderless screw type
Add 2.2.10	Grounding equipment	Equipment, Canadian Electrical Code. Ground rod, 20 mm dia by 3m long steel with hot forged point, hot-dip galvanized. Conduit hub, T&B No. 3930 Ground clamp, Burndy No. GA2
Add 2.2.11	Receptacles	15A-120V corrosion resistant duplex Cover, double spring door type
Add 2.2.12	Photocells and receptacles	Photocell, Precision Multiple Controls Inc., Model No. 8690N (105-285V) Photocell receptacle, American Electric No. 99000
Add 2.2.13	HID Lamps	High pressure sodium

GLOBAL SUPPLEMENTS

Delete or replace as follows except where required otherwise in subsequent sections:

(a) delete references to General Conditions;
(b) delete references to "payment" and "measurement and payment";
(c) replace "Municipal" or "Municipality" with "Regional District";
(d) replace "Contract Administrator" with "Owner's Engineer";
(e) replace "Contractor" with "Owner".
(f) replace "Contract Documents" with "Electoral Area D Subdivision and Development Servicing Bylaw No… 2001 and design drawings and supplementary specifications approved for construction by the Manager of Utilities";
(g) replace "Contract Drawings" with "design drawings approved for construction by the Manager of Utilities";
(h) replace "Supplementary Specifications" with "Schedule A of Electoral Area D Subdivision and Development Servicing Bylaw No… 2001 and supplementary specifications approved for construction by the Manager of Utilities";

ALL SECTIONS TESTING

In all Sections, replace text in subsections titled "Inspection and Testing" with:

"Testing must be carried out in accordance with the Construction Quality and Assurance Plan submitted as required in Part 1 – General Requirements, 1.2.2 or as otherwise required by the Manager of Utilities.

"The source and material characteristics of granular products and asphalt must be approved as meeting the required specifications by an independent testing agency based on their own tests prior to receipt of the materials on site.

"Concrete mix design and constituents must be confirmed and approved prior to delivery by an independent testing agency, and periodic sampling of the mix must be carried out in accordance with CAN 3 A23.

"Testing of the compaction of fill and asphalt and the strength of in-situ concrete must be undertaken by an independent, competent agency specialized in such testing as required by the Owner's Engineer to satisfy his responsibility for review and interpretation.

"Testing carried out by the Owner's contractor must be undertaken in the presence of the Owner's Engineer who will confirm the results.

"All test and reports will be submitted to the Owner's Engineer for review and interpretation to determine if the Work has been constructed in accordance with the Bylaw and the approved design drawings and who will provide the reports to the Manager of Utilities."

01561 ENVIRONMENTAL PROTECTION

Replace 1.3 - Drainage as follows:

> "1.3 Drainage, Erosion and Sediment Control
>
> "Properly drain all portions of the site. Protect the site and the watercourses to which it drains, directly or indirectly, against erosion and siltation in accordance with the Drainage, Erosion and Sediment Control Plan referred to in Part 1, General Requirements, Section 1.3 during construction and until a Certificate of Acceptance has been issued by the Manager of Utilities. Ensure no silt, gravel, debris or other deleterious substance resulting from construction activity discharges into existing drainage systems or watercourses or onto highways or adjacent property. The Owner is responsible for all damage that may be caused by water backing up or flowing over, through, from or along any part of the work or otherwise resulting from his operations.
>
> "Keep existing culverts, drains, ditches and watercourses affected by the work clear of excavated material at all times. When it is necessary to remove or alter an existing drainage structure, provide suitable alternative measures for handling the drainage. Adequately support culverts and drainpipes across trenches to prevent displacement and interference with the proper flow of water due to trench settlement.
>
> "Sweep streets, and clean catch basins, manhole sumps, detention tanks, and maintain siltation controls as often as the Manager of Utilities deems necessary until a Certificate of Acceptance has been issued by the Manager of Utilities.
>
> "Follow all Federal and Provincial regulations and guidelines respecting protection of fish, fish habitat, and watercourses.
>
> "The Owner's Engineer is responsible for monitoring ongoing compliance with this section."

01570 TRAFFIC REGULATION

replace "Contract Administrator" and "municipal" with "Ministry of Transportation" with respect to traffic, roads, closures, detours, signage and devices on public roads and "the Manager of Utilities" in respect of access and egress to and from property and to sidewalks, footpaths and trails and to Regional District rights of way.

01721 PROJECT RECORD DOCUMENTS

replace 01721 with:

> "Provide records in accordance with Part 1 – General Requirements, Section 1.2.1.3, Design and Record Keeping Quality Control and Assurance Plan, as approved by the Manager of Utilities and Schedule A, Part 2 - Design Submissions and Record Documentation"

02666 WATERWORKS

1.7 – Scheduling of Work

in .2 and .3 add after Contract Administrator "and the Manager of Utilities".

2.2.1 – Mainline Pipe, Joints and Fittings – Ductile Iron Pipe

add: ".3 Wrap: Ductile iron pipe to be installed with a polyethylene encasement conforming to AWWA C104, unless the Owner's Engineer has arranged suitable testing by an independent agency confirming that there is no risk of accelerated corrosion due to the soil, proposed backfill or groundwater."

3.12 – Hydrants

in .5 replace "Contract Administrator" with "Manager of Utilities.

add: ".7 Hydrants located adjacent to road ditches must be on the far side and have a 3 m wide gravel pad for access with a culvert sized to meet MoT requirements."

02721 STORM SEWERS

3.10 – Service Connection Installation

replace .1 as follows:

".1 Install service connections to 3.6 and as shown as on Standard Detail Drawing S7 except for colour of 40 x 90 post.

replace .3 as follows

".3 Install inspection chamber, as shown on Standard Detail Drawing S9 for 100 to 200 mm connection or S 10 for 250 to 375 mm connection, at specified location, set plumb and to specified elevation. If inspection chamber located in driveway, lane or paved surface, install cover or lid as shown on Standard Detail Drawing S9 or S 10 as appropriate.

3.12 – Video Inspection

replace as follows:

".1 .1 Immediately upon completion of installation, including all backfilling and compaction and prior to paving, an independent contractor specialized in such work must undertake video inspection of the sewer and submit a report and the video tapes to the Owner's Engineer and the Manager of Utilities.

.2 Prior to video inspection, thoroughly clean sewers by flushing so any defects can be observed.

.3 Immediately prior to video inspection, cause water to flow through the entire length of all sewers with grades of less than 1%. Do not add water during video inspection.

.4 Video inspection must be continuous between manholes.

.5 The picture must include the entire circumference of the pipe, be in colour and of a quality and definition acceptable to the Manager of Utilities.

.6 The picture must show the depth of ponding in mm, the distance from the upstream manhole in m, and the date.

.7 An audio commentary must identify test sections, manhole numbers, location, service connections, types of defects and depth and length of ponding.

".2 The report must include:

.1 the name, address and phone number of the inspection contractor and the names of the technician in charge of the video inspection and responsible for the commentary and report and of the installation contractor, the Owner's Engineer and the Owner;

.2 a schematic plan showing sewers, manholes, manhole numbers corresponding to the design and record drawings and road names;

.3 a table of contents with upstream and downstream manhole numbers and corresponding page numbers;

.4 a log for each sewer section between manholes showing street name, manhole numbers, length of section, type and diameter of pipe, technician's name, and each service connection, defect and area of ponding with corresponding distance and tape count, description of defect, length and depth of ponding;

.5 still photos of all defects and ponding.

".3 The Manager of Utilities may require a further video inspection or other tests as specified in .1 and .2 prior to the expiry of the maintenance period for the sewers."

02731 SANITARY SEWERS

3.18 – Video Inspection

replace content as for 02721 Storm Sewers, 3.12 – Video Inspection.

SCHEDULE A

ENGINEERING AND CONSTRUCTION

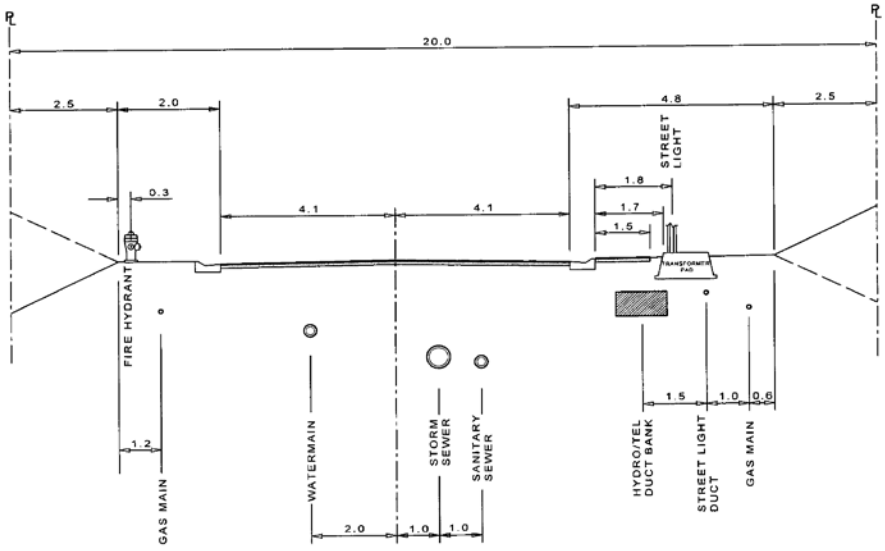
PART 4 – SPECIFICATIONS AND STANDARD DETAIL DRAWINGS

DIVISION 2 – SUPPLEMENTARY STANDARD DETAIL DRAWINGS

The following supplementary standard detail drawings are additional to those included in MMCD.

TS-U1	Urban Collector Road – Typical Section (8.2 m)
TS-U2	Urban Local Road - Typical Section (10.0 m)
TS-U3	Urban Local Road - Typical Section (8.2 m)

STANDARD DETAIL DRAWING

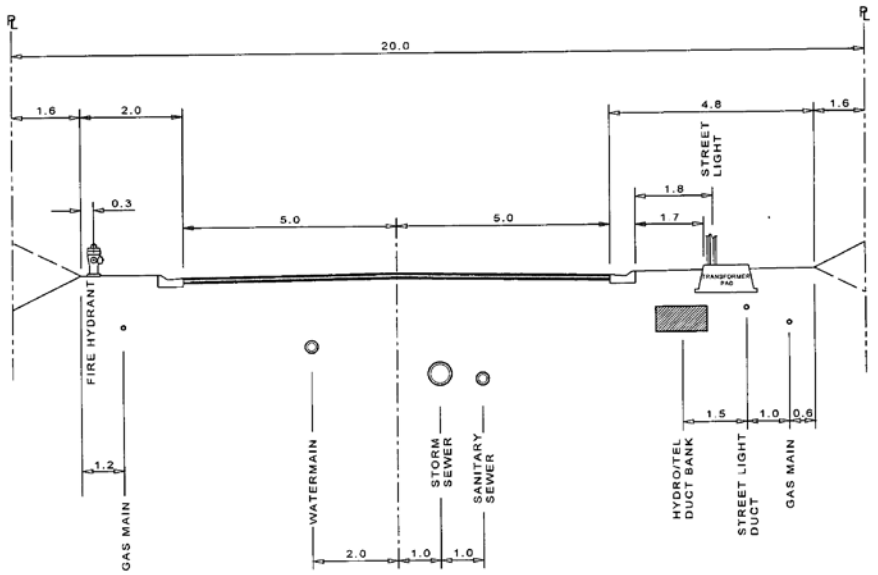


NOTES:

1. ROAD CROSS SECTION BASED ON MINISTRY OF TRANSPORTATION SUBDIVISION ENGINEERING REQUIREMENTS - JUNE 2000.
2. UTILITIES UNDER TRANSFORMER COUNTERPOISE TO BE IN PLASTIC DUCTS.
3. BARRIER CURB REQUIRED 2.0m EITHER SIDE OF TRANSFORMER.
4. IF SIDEWALK REQUIRED ON OPPOSITE SIDE FROM UNDERGROUND WIRING, BOULEVARD TO BE WIDENED BY 1.5m.

URBAN COLLECTOR - TYPICAL SECTION (8.2m)	SCALE: N.T.S
	APPD:
SQUAMISH-LILLOOET REGIONAL DISTRICT	DATE: FEB/02
	DWG. NO. TS-U1

STANDARD DETAIL DRAWING

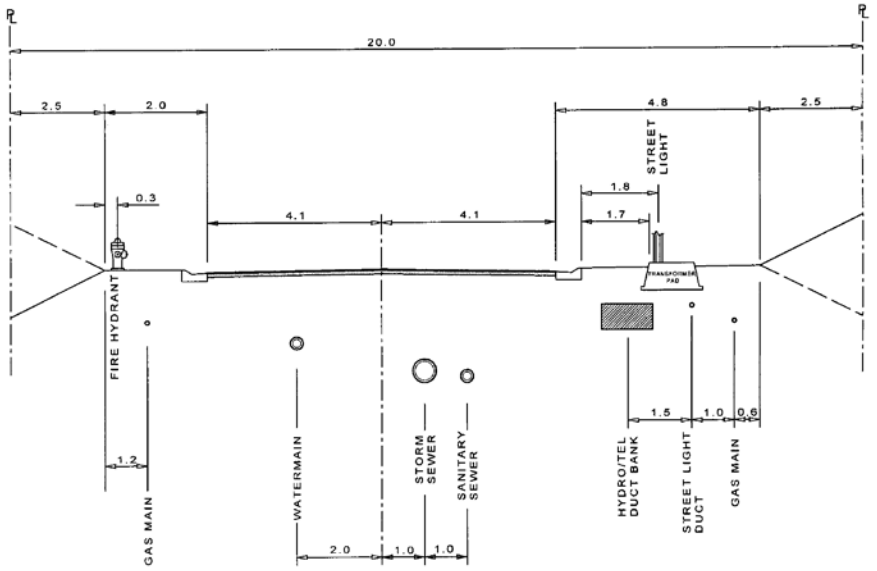


NOTES:

1. ROAD CROSS SECTION BASED ON MINISTRY OF TRANSPORTATION SUBDIVISION ENGINEERING REQUIREMENTS - JUNE 2000.
2. UTILITIES UNDER TRANSFORMER COUNTERPOISE TO BE IN PLASTIC DUCTS.
3. BARRIER CURB REQUIRED 2.0m EITHER SIDE OF TRANSFORMER.
4. IF SIDEWALK REQUIRED ON OPPOSITE SIDE FROM UNDERGROUND WIRING, BOULEVARD TO BE WIDENED BY 1.5m.

URBAN LOCAL - TYPICAL SECTION (10.0m)	SCALE: N.T.S
	APPD:
SQUAMISH-LILLOOET REGIONAL DISTRICT	DATE: FEB/02
	DWG. NO. TS-U2

STANDARD DETAIL DRAWING



NOTES:

1. ROAD CROSS SECTION BASED ON MINISTRY OF TRANSPORTATION SUBDIVISION ENGINEERING REQUIREMENTS - JUNE 2000.
2. UTILITIES UNDER TRANSFORMER COUNTERPOISE TO BE IN PLASTIC DUCTS.
3. BARRIER CURB REQUIRED 2.0m EITHER SIDE OF TRANSFORMER.
4. IF SIDEWALK REQUIRED ON OPPOSITE SIDE FROM UNDERGROUND WIRING, BOULEVARD TO BE WIDENED BY 1.5m.

URBAN LOCAL - TYPICAL SECTION (8.2m)	SCALE: N.T.S
	APPD:
SQUAMISH-LILLOOET REGIONAL DISTRICT	DATE: FEB/02
	DWG. NO. TS-U3

Electoral Area D

Subdivision and Development Servicing (Planned Communities) Bylaw No. 741, 2002

SCHEDULE B

FORMS

SCHEDULE B

FORMS

TABLE OF CONTENTS

SQUAMISH-LILLOOET REGIONAL DISTRICT

APPLICATION FOR
SUBDIVISION REVIEW AND DEVELOPMENT SERVICING

SLRD file_____
MOT file_____

I/we have made application for (*delete whichever does not apply*):

- a building permit to the Building Inspector, Squamish-Lillooet Regional District (*other than for a single or two family house, an ancillary building or a building with a value less than $100,000*)
- a Preliminary Layout Approval for subdivision to the Ministry of Transportation,

and enclose a fee of $_____

Names of all registered property owners:
Name of agent:
Address:
Telephone and fax:
Name of Owner's Engineer:
Legal description of property:
General location of property:
Present or former use of property:

For a subdivision

- conventional or bare land strata?
- proposed use of the parcels (*e.g. single family residential, commercial, etc*):
- area of property in ha.:
- number of parcels proposed (*including remainder*):
- minimum size of any parcel:

For a development requiring a building permit

- proposed use of property:
- area of parcel in m^2 or ha.:
- number of separate buildings proposed and use of each:
- number of residential units proposed:
- floor area (m^2) of non-residential (*other than ancillary to residential*):
- proposed improvements on adjacent public street (*road widening, sidewalk etc.*):

For all developments

- Describe any known potential natural hazards on, or in vicinity, of the lands (*e.g. flooding, erosion, landslide, avalanche*):

For unserviced subdivisions and all other development

- proposed source(s) of potable water:
- proposed method of sewage disposal:
- proposed method of disposal of storm water from roofs and hard surfaces

For subdivisions or other developments requiring community services

- within an SLRD Service Area?:
- if not within an existing SLRD Service Area explain how community services are proposed to be provided:

I/we declare that the above, and the attached, information is true and correct to the best of my/our knowledge.

_____ _____

Signature of Owner or Agent (*delete as appropriate*) **date**

———|||———

ATTACHMENTS REQUIRED

- Authorization letter signed by Owner, if application is made by an agent.

- State of Title Certificate and copies of all covenants, easements or rights of way on title.

- A sketch plan, drawn to scale, with a north arrow and dimensioned, showing information as follows:

  - **all applications:**
    adjacent roads and parcel boundaries; nature of the surrounding general terrain with edges of watercourses, approximate extent of flood plain, steep slopes, and forested and open areas; existing buildings to be retained and their set backs from existing and proposed property lines.
  - **all subdivisions**:
    layout with approximate lot dimensions and areas, road access to lands lying beyond the subdivision.
  - **serviced subdivisions**:
    general location of existing and proposed services, pump stations, reservoirs, outfalls.
  - **developments other than subdivisions:**
    locations of proposed buildings, their approximate overall dimensions and set backs from property lines.
  - **phased strata plans:**
    in addition to the above, the phasing and how both the strata development and any remaining land will be accessed and serviced if not all phases are completed. Any easements necessary to access or serve the earlier phases across later phases.

COMMITMENT BY OWNER AND ENGINEER

Squamish-Lillooet Regional District Date_____
Attn. Manager of Utilities
Box 219 1350 Aster Street
Pemberton BC VON 2L0

Re: Proposed Subdivision/Development of _____

This confirms that an agreement has been executed between:

Owner:_____and

Owner's Engineer_____

in connection with the above subdivision/development and provides for the Owner's Engineer to undertake, directly or through sub-consultants, until a Certificate of Acceptance has been issued by the Manager of Utilities, to:

1. review existing systems and design requirements, concepts and parameters with the Manager of Utilities;
2. arrange for topographic, pick-up and legal surveys and environmental, geotechnical, hydrogeotechnical, or other studies that may be necessary for satisfactory design or as required by the Manager of Utilities;
3. submit conceptual designs to the Manager of Utilities;
4. prepare Design and Record Keeping Quality Control and Assurance Plans to the satisfaction of the Manager of Utilities before commencing detailed design;
5. submit detailed design plans and specifications (including drainage, erosion and sediment control) in accordance with Regional District bylaws and the requirements of utility companies, government agencies and to the satisfaction of the Manager of Utilities;
6. provide initial cost estimates and periodic cost estimates of uncompleted work to the Manager of Utilities for calculation of security retention;
7. discuss 3, 4 5 and 6 with the Manager of Utilities;
8. prepare the Construction Quality Control and Assurance Plan to the satisfaction of the Manager of Utilities before construction commences;
9. undertake contract administration services during construction and the maintenance period including:
    a) survey control to permit construction layout by contractors;
    b) interpretation of plans and specifications;

c) periodic, or full time, resident inspection by qualified personnel, including but not limited to inspections and attendance during testing required by the Supplementary and MMCD Specifications, to determine if the work, including drainage, erosion and sediment control, substantially complies in all material respects with the drawings and supporting documents approved for construction by the Manager of Utilities and with Regional District bylaws and with the requirements of utility companies and government agencies;
d) review and interpretation of test and inspection reports;
e) determination of corrective action required as a result of c) and d);
f) keeping a record of site visits and any corrective action taken as a result of e);
g) attending construction progress meetings; and
h) conducting final inspection to identify deficiencies;

10. submit summary reports during construction and the maintenance period as required by the Manager of Utilities including test and inspection reports and his review and interpretation thereof;
11. submit Inspection and Compliance Certificates and other certifications required by the Bylaw;
12. conduct inspections with the Manger of Utilities or his representative;
13. submit record drawings in both reproducible mylar and Micro Station or AutoCAD format, service record cards and operation and maintenance manuals.

If sub-consultants or others with specialist responsibility are employed on components of the work, the Owner's Engineer will act as the prime consultant for co-coordinating and reviewing overall design, layout and inspection and test reports, and for communicating with the Manager of Utilities.

The following is a summary of project's the Owner's Engineer has completed that are similar in scope, nature and value to the Works and Services:

_____

_____

_____

The names and addresses of all sub-consultants and others with specialist responsibility, that the Owner's Engineer proposes to retain and a summary of projects that they have completed that are similar in scope, nature and value to the Works and Services:

_____

_____

_____

The names, curriculum vitae and employer of individuals assigned responsibility for specific components of the work together with a summary of projects that they have completed that are similar in scope, nature and value to the Works and Services:

_____

_____

_____

This confirms the Owner's Engineer will prepare the Quality Control and Assurance Plans described in Schedule A.

The Owner's Engineer and each sub-consultant carries professional liability insurance of $1,000,000 per claim with a maximum deductible of $5,000 and commit to continue the insurance throughout construction and the maintenance period.

We, the Owner and Owner's Engineer both acknowledge our separate responsibilities to each notify the Manager of Utilities as soon as possible prior to, or, if that is not possible, within one working day, if the Owner's Engineer ceases to be retained for all of the duties described or is unable to carry them out. Notification will be in writing delivered to the Regional District office or transmitted by fax.

I, the Owner's Engineer, will notify the Manager of Utilities as soon as possible prior to, or, if that is not possible, within one working day, of a decision or circumstances that result in a sub-consultant or other specialist ceasing to be retained on this project.

Name of Owner's Engineer: _____
Signature of Authorized Representative:_____ Engineer's Seal
Address: _____
_____
_____

I/we the Owner will stop construction as soon as it is safe to do so in the event the Owner's Engineer ceases to be retained, or is unable to carry out the described duties, until a new Commitment by Owner and Engineer has been delivered to the Manager of Utilities and he has authorized work to recommence. I/we will continue essential maintenance of the site and of drainage, erosion and sediment control.

I/we, the Owner, understand that the Squamish-Lillooet Regional District will rely on the expertise of the Owner's Engineer in performing services referred to in this Commitment letter. I/we acknowledge that review and inspections by staff or others on behalf of the Regional District do not relieve the Owner from complying with the requirements of the bylaws.

Name of Owner: _____
Signature of Authorized Representative:_____
Address: _____
_____
_____

SQUAMISH-LILLOOET REGIONAL DISTRICT

PERMISSION TO CONSTRUCT

All prerequisites of Electoral Area D Subdivision and Development Servicing (Planned Communities) Bylaw No. 741, 2002 having been met, permission to commence construction of Works and Services is granted to:

Name of Owner:_____

for the subdivision/development of:_____

in accordance with the design drawings numbered:_____
_____
_____
_____
_____
_____

and approved for construction by the Manager of Utilities on _____(*date*).

The Owner's Engineer is:_____

The Contractors to be employed are:_____

Special conditions: _____
_____
_____
_____
_____

Signed: _____
Manager of Utilities

Date:_____

cc: Owner's Engineer

INSPECTION AND COMPLIANCE CERTIFICATE

Squamish-Lillooet Regional District Date_____
Attn. Manager of Utilities
Box 219 1350 Aster Street
Pemberton BC VON 2L0

Re: Proposed Subdivision/Development of _____

I certify that I, or my sub-consultants, have fulfilled the obligations for inspection as required by the Regional District Bylaws and the Commitment by Owner and Engineer dated _____ in connection with the above project.

The project has been completed and complies in all material respects with the Regional District bylaws and other standards applicable to such works, and the design drawings and supporting documents approved for construction by the Manager of Utilities. There are no defects or deficiencies evident at this time.

I have submitted test reports and video inspection tapes and reports, record drawings, service record cards, operation and maintenance manuals, releases from affected property owners, and any other supporting documents prepared for this project.

Attached is proof of my professional liability insurance for a minimum of $1,000,000 with a maximum deductible of $5,000 that I commit to carry until the expiry of the warranty period.

Name of Owner's Engineer: _____
Signature of Authorized Representative:_____ Engineer's Seal
Address: _____
_____
_____

SQUAMISH-LILLOOET REGIONAL DISTRICT

CERTIFICATE OF COMPLETION

This Certificate of Completion is issued to:

Name of Owner:_____

for the subdivision/development of:

_____

the required Works and Services having had final inspection and being complete and without apparent defects or deficiencies*, the Owner's Engineer's Inspection and Compliance Report and releases from affected property owners submitted, all test reports and video inspection tapes, record drawings, service record cards and operation and maintenance manuals having been received and found acceptable and other applicable requirements of the Regional District having been met.

* The following are to be adjusted at the time of completion of paving and before issue of a Certificate of Acceptance:

_____

The Maintenance Period will commence on:_____, except that the maintenance period for items adjusted at completion of paving or defects and deficiencies which appear after final inspection, will commence from the date the Manager of Utilities accepts the completion of remedial work

The Maintenance Period will be for one year from commencement or, for Works within a subdivision, until the subdivision plan has been registered in the Land Title Office whichever is later.

Signed: _____
Manager of Utilities

Date:_____

cc: Owner's Engineer

SQUAMISH-LILLOOET REGIONAL DISTRICT

CERTIFICATE OF ACCEPTANCE

This Certificate of Acceptance is issued to:

Name of Owner:_____

for the subdivision/development of:

_____

Defects and deficiencies observed and discovered in the Maintenance Period have been corrected. This Certificate is issued on the best knowledge, information and belief of the Squamish-Lillooet Regional District and its staff. It does not constitute acceptance of any work not in accordance with the requirements of the Electoral Area D Subdivision and Development Servicing (Planned Communities) Bylaw No. 741, 2002 whether or not such defect(s) could have been observed or discovered during construction.

This Certificate is not a warranty or representation to any person that the works are without defect.

Signed: _____
Manager of Utilities

Date:_____

cc: Owner's Engineer

Electoral Area D

Subdivision and Development Servicing (Planned Communities) Bylaw No. 741, 2002

SCHEDULE C

DOCUMENTS

SCHEDULE C

DOCUMENTS

TABLE OF CONTENTS

SERVICING AGREEMENT

THIS AGREEMENT made [month, day, year].

BETWEEN: The Squamish-Lillooet Regional District

(the “Regional District”)

AND:

_____

[*name of owner*] (the “Owner”)

WHEREAS:

A. The Owner is the registered owner of those lands in the Squamish-Lillooet Regional District legally described as:

_____ [*legal description*]
(the "Lands");

B. The Squamish-Lillooet Regional District, Electoral Area D, Subdivision and Development Servicing (Planned Communities) Bylaw No. 741, 2002 (the "Bylaw") requires the provision of various works and services upon the subdivision or development of land and regulates the standards to which such works and services must be constructed and installed;

C. The Owner has applied to subdivide or develop the Lands and has under s. 940 of the Local Government Act, R.S.B.C, 1996, c.323 requested the Regional District to enter into this Agreement in order to enable the approving officer or building inspector to approve the subdivision or development before the construction and installation of all works and services to the standards required by the Bylaw including the correction of defects and deficiencies during the maintenance period.

NOW THEREFORE in consideration of the mutual promises contained in this Agreement and in consideration of the Regional District entering into this Agreement to allow the construction and installation of the works and services after the approval of the subdivision or development of the Lands, the Owner covenants and agrees with the Regional District as follows:

1. In this Agreement:

   "Complete" or "Completion" with respect to the Works means completion to the satisfaction of the Manager of Utilities of the Regional District evidenced by the Manger of Utilities' certificate under section 10(b);

   "Manager of Utilities" means the Manager of Utilities and Community Services of the Regional District and his or her duly authorized assistants and such consulting or professional engineers as may be appointed to act for the Regional District;

   "Owner's Engineer" means the professional engineer, experienced in municipal engineering and land development hired by the Owner to undertake design, cost estimates, inspection, testing and record keeping for the Works.

   "Works" means all those works and services required to be provided under the Bylaw and without limitation, those works and services described in Schedules A and B to this Agreement.

2. The Owner covenants and agrees:

   (a) to install, construct and complete the Works;

   (b) to pay to the Regional District in advance upon execution of this Agreement all fees required in connection with subdivision or development;

   (c) as security for the due and proper performance by the Owner of all of the covenants, agreements and obligations of the Owner in this Agreement, the Owner has deposited with the Regional District either by cash or letter of credit the sum of $ [*amount*] (the "Deposit") representing the greater of 110% of the cost of the remaining works to be completed at the time of entering into this agreement or 15% of the total cost of the Works required for the subdivision or development where the cost, as estimated in detail by the Owner's Engineer and accepted by the Manager of Utilities, includes engineering, inspection, testing, construction and installation of the Works including any charges by the Regional District in that connection, and all taxes; *(Amendment Bylaw No. 953)*

   (d) that the Deposit, less the amount required by section 6 to be maintained, will only be returned to the Owner upon completion of the Works in accordance with section 16; and

   (e) that no interest on the Deposit shall be paid to the Owner.

3. In carrying out the Works the Owner covenants and agrees:

   (a) not to commence the construction or installation of the Works without first obtaining a signed Permission to Contruct form (Schedule B) from the Manager of Utilities and advising the Manager of Utilities in writing at least five days before commencement;

(b) to construct, install and complete the Works in accordance with the designs, specifications and drawings approved for construction by the Manager of Utilities as set out in Schedule B (the approved works as indicated in the duly authorized Permission to Construct form) and in conformance with the Bylaw;

(c) to obtain the prior written approval of the Manager of Utilities for any changes to the approved works as indicated in the duly authorized Permission to Construct form;

(d) to comply with any changes to the Approved Works required by the Manager of Utilities as necessary to satisfy him or her that the Works will function and operate in a manner satisfactory to the him or her;

(e) to pay the cost of all necessary connections of the Works to Regional District water distribution, storm drainage and sewerage systems.

(f) not to damage any Regional District works, services or property, or remove, alter or destroy any survey pins, posts or monuments, and if in default to replace, repair and restore any damage of whatever nature to the satisfaction of the Manager of Utilities;

(g) to Comply with all statutes, laws, regulations and orders of any authority having jurisdiction and without limiting the generality of the foregoing all bylaws of the Regional District;

(h) to not deposit or permit the deposit of any material or debris upon any highways or Regional District lands;

(i) to retain the Owner's Engineer at all times to undertake design, cost estimates, inspection, testing and record keeping duties as described in the Commitment by Owner and Engineer required by the Bylaw;

(j) to advise the Manager of Utilities of the name and address of the Owner's Engineer and to ensure that the Owner's Engineer maintains professional liability and errors and omissions insurance of not less than $1,000,000 per occurrence or claim with a maximum deductible of $5,000 during the term of his or her engagement. The Owner's Engineer shall provide proof of such insurance before the Owner commences the construction and installation of the Works;

(k) not to employ any person or contractor in the construction of the Works who, in the reasonable opinion of the Manager of Utilities is unfit, incapable or unskilled, and at all times, in connection with the execution of the Works, to employ and keep on site a competent general works superintendent capable of speaking, reading and writing the English language; and

(l) not to engage any contractor in respect of the Works unless that contractor holds a valid and subsisting business license issued by the Regional District.

4. The Owner shall prosecute the Works diligently without interruptions and shall complete the construction and installation of the Works by [month, day, year].

5. Upon completion of the Works, the Owner covenants and agrees:

   (a) to assign to the Regional District, free and clear of all encumbrances, all of its right, title and interest in and to those Works that are to be owned and operated by the Regional District;

   (b) to grant or cause to be granted to the Regional District in registerable form all statutory rights-of-way reasonably required by the Manager of Utilities for the operation, maintenance, repair and replacement of the Works, on such terms as are satisfactory to the Manager of Utilities;

   (c) to execute and deliver or cause to be executed and delivered at the request of the Regional District all such further transfers, instruments, agreements, documents and plans and to perform all such acts as may be necessary to give full effect to this Agreement;

   (d) to deliver to the Regional District record drawings, disks, service record cards and Operation and Maintenance Manuals as required by and in a form satisfactory to the Manager of Utilities.

6. The Owner covenants and agrees to:

   (a) maintain the Works in complete repair for a period, the Maintenance Period, of one year from the date of commencement or until, for works within a Subdivision, the Subdivision plan has been registered in the Land Title office whichever is later. The date of commencement will be stated on the Certificate of Completion except that the Maintenance Period for any deficiencies or defects which are corrected after the Certificate of Completion is issued will commence from the time the Manager of Utilities accepts such completion or remedial work;

   (b) remedy any defects or deficiencies appearing prior to or during the Maintenance Period, make good all defects, imperfections, damage and settlement, regardless of cause, save and except for defects caused by reasonable wear and tear, pay for any damage to other work or property resulting therefrom and notify the Manager of Utilities when they have been corrected;

   (c) keep deposited with the Regional District the sum of 5% of the total cost of the Works required for the subdivision or development as calculated in accordance with Section 2 (c) until the Certificate of Completion has been issued and record drawings, disks, service record cards and Operation and Maintenance Manuals have been submitted to the satisfaction of the Manager of Utilities, and, thereafter, 5% of the cost of the entire project until a Certificate of Acceptance has been issued by the Manager of Utilities. *(Amendment Bylaw No. 953)*

7. The Owner shall release, and does hereby indemnify and save the Regional District harmless from and against:

   (a) all costs, expenses, damages, claims, demands, actions, suits and liability by whomever brought or made and however arising whether directly or indirectly, from the construction or installation of the Works and any injury or damage thereby caused to person or property (including death) except that arising from the exclusive negligence or other fault of the Regional District;

   (b) all costs and expenses incurred by the Regional District arising directly or indirectly from any engineering operation, construction, repair, replacement or maintenance by the Regional District to or on any real or personal property which is affected by the Works and which the Regional District either owns or is by duty or custom obliged, directly or indirectly to construct, repair, replace or maintain;

   (c) all expenses and costs incurred by reason of liens for nonpayment of labour or material, workers' compensation assessments, unemployment insurance, federal or provincial tax, check off in relation to Works and for unlawful encroachments by the Works.

8. The Owner shall take out and maintain at all times from commencement of construction and installation of the Works until the Manager of Utilities issues a Certificate of Acceptance, insurance at its sole expense against claims for bodily injury including death and property damage or loss arising from its operations in or about the Lands, highways or other lands in carrying out the construction and installation of the Works and in performing its obligations under this Agreement. Such insurance shall include comprehensive general bodily injury and property damage liability coverage covering premises and operations liability, contingency liability with respect to operations of contractors and subcontractors, completed operations liability, contractual liability and automobile liability for owned and non-owned units. Such insurance shall name the Regional District as a co-insured and shall contain a cross-liability or severability of interest clause so that the Regional District and the Owner may be insured in the same manner and to the same extent as if individual policies had been issued to each. Such insurance shall be for the amount of not less than $5,000,000 for each occurrence of bodily injury or property damage and any property damage deductible shall not exceed $2,500 per occurrence. The Owner shall provide to the Manager of Utilities proof in writing of such insurance before commencing the Works and again before the issuance of any certificate of Completion. The policy of insurance shall contain a provision requiring the insurer to give to the Regional District 30 days prior written notice before any alteration of or cancellation of the policy shall be effective and shall name the Regional District and its officials and employees as an additional insured.

9. The Owner acknowledges and agrees that the Owner relies exclusively on the Owner's Engineer and contractor and that the Regional District does not, by its approvals, inspections or acceptance of the Works, warrant or represent that the Works are without fault or defect and that all approvals and inspection of the Works given or made by the Regional District are for the sole benefit of the Regional District and shall in no way relieve or excuse the Owner from constructing and installing the Works in strict compliance with the provisions of this Agreement.

10. The Regional District covenants and agrees that;

    (a) it will permit the Owner to perform the Works on the terms and conditions contained in this Agreement and to occupy Regional District lands as necessary for the Works subject to such terms and conditions in any case and from time to time as the Manager of Utilities may impose;
    (b) the Manager of Utilities will issue a Certificate of Completion when the Works are completed and record drawings and disks and service record cards and operation and maintenance manuals have been submitted in accordance with the Bylaw and to his satisfaction, and all other requirements of this Agreement have been met, save and except the requirements of section 6;

    (c) upon the satisfactory completion by the Owner of all the covenants and conditions in this Agreement, and without limiting the generality of the foregoing, including the maintenance of the Works constructed under this Agreement in complete repair in accordance with Section 6, it shall provide to the Owner a Certificate of Acceptance of the Works, signed by the Manager of Utilities.

11. Nothing in this Agreement shall exempt the Owner or the Lands from the ordinary jurisdiction of the Regional District, its bylaws and regulations, and without limitation the construction of the Works shall not confer directly or indirectly any exemption or right of set-off from development cost charges, connection charges, application fees, user fees or other fee or charge, except as statutorily required.

12. Pursuant to s. 219 of the Land Title Act, R.S.B.C. 1996, c.250, the Owner covenants that no buildings or structures, except the Works, shall be placed, built or constructed upon the Lands until the Manager of Utilities has issued to the Owner the Certificate of Completion provided for in section 10(b) of this Agreement. All amounts of money due and owing to the Regional District from the Owner as provided for in this Agreement and without limiting the generality of the foregoing due and owing under section 15 of this Agreement shall constitute a rent charge charging the Lands.

13. Any letter of credit provided by the Owner to the Regional District shall be a clean, unconditional and irrevocable letter of credit in favour of the Regional District drawn on a Canadian chartered bank or such other financial institution satisfactory to the Manager of Utilities. Such letter of credit shall be maintained as good and valid security by the Owner at all times as required by this Agreement. The letter of credit shall contain a provision that it shall be deemed to be automatically extended, without amendment, for one year from the present or any future expiry date thereof..

14. The Regional District may consent to a reduction in the amount of the Deposit from time to time. The reduction will be a maximum of 85% of the value of the work completed. Credit will only be given for work for which the Owner's Engineer has submitted acceptable test results to the Manager of Utilities. The value of the work completed will be calculated in the manner described in section 2 (c) on the basis of detailed progress reports certified by the Owner's Engineer. The Deposit may not be reduced below 15% of the total cost of the Works required for the subdivision or development before the Manager of Utilities issues a Completion Certificate and then only in accordance with section 6 (c). Reductions will not be approved more frequently than once per month. Reductions will not be made if the Owner is indebted to the Regional District in connection with the subdivision or development.
(Amendment Bylaw No. 953)

15. If the Owner shall fail to observe, perform or keep any of the provisions of this Agreement to be observed, performed or kept by the Owner, the Regional District may at its sole discretion and without prejudice to any other remedy rectify the default of the owner, at the Owner's expense and without limiting the generality of the foregoing may:

    (a) enter onto the lands and do or cause to be done through its servants, contractors and others, all such things as may be required to fulfill the obligations of the Owner including without limitation, the completion of the Works;

    (b) make any payments required to be made for and on behalf of the Owner;

    and for such purposes may without notice or limitation deduct from the Deposit all costs, and expenses incurred, payment and expenditures made, and monies due and owing to the Regional District.

16. If the Regional District incurs any costs and expenses or makes payments as provided in section 14 of this Agreement or otherwise in this Agreement, or if the Owner is otherwise indebted to the Regional District under this Agreement, and the Deposit is not sufficient to fully recompense the Regional District, the Owner shall forthwith upon notice from the Regional District pay to the Regional District the amount of such deficiency together with interest thereon at [*percentage*] % per annum calculated and compounded monthly from the date such cost or expense was incurred or payment or expenditure was made by the Regional District. Such amounts required to be paid by the Owner shall constitute a debt due and owing to the Regional District and shall charge the Lands under section 12.

17. Wherever in this Agreement the approval of the Manager of Utilities is required or some act or thing is to be done to the satisfaction of the Manager of Utilities:

    (a) such provisions shall not be deemed to have been fulfilled or waived unless the approval or expression of satisfaction is in writing signed by the Manager of Utilities and no prior approval or expression of satisfaction and no condoning, excusing or overlooking by the Regional District or the Manager of Utilities on previous occasions when such approval or satisfaction was required shall be taken to operate as a waiver of the necessity for such approval or satisfaction wherever required by this Agreement; and

(b) such approval or satisfaction shall be at the discretion of the Manager of Utilities acting reasonably in conformance with sound and accepted public municipal engineering practice.

18. Unless otherwise expressly provided in this Agreement, wherever the Owner is obliged or required to do or cause to be done any act matter or thing such act, matter or thing shall be done by the Owner at its sole expense.

19. Any notice to be given under this Agreement shall be in writing, and any letter may be delivered personally or sent by prepaid mail. The addresses of the parties for the purpose of notice shall be the addresses set out in this Agreement. Any party may at any time give notice in writing to another of any change of address and from and after the third day after the giving of such notice the address specified shall be deemed to be the address of such party for the giving of notice.

20. The Owner agrees that all bylaws of the Regional District adopted under Part 26 of the *Local Government Act*, as amended shall have effect in respect of the Lands and the subdivision or development of the Lands, provided that they are adopted before commencement of the construction and installation of the Works, The Owner agrees that to the extent that such bylaws modify, alter or add to the requirements or standards for works and services of the type constituting the Works, the Owner shall comply with such modifications, alterations or additions in constructing, installing and carrying out the Works. The Owner shall not, for the purpose of this section 20, have been deemed to commence construction of the Works until five days after the notice required by section 3(a) of this Agreement. *(Amendment By-law 1372-2015)*

21. The Regional District has made no representations, warranties, guarantees, promises, covenants or agreements to or with the Owner other than those in this Agreement.

22. Subject only to section 3(d) of this Agreement, no amendment to this Agreement is valid unless in writing and executed by the parties.

23. Wherever the singular or masculine is used in this Agreement, the same shall be construed as meaning the plural or the feminine or the body corporate or politic where the context or the parties so require.

24. If any section or lesser portion of this Agreement is held invalid by a court of competent jurisdiction, the invalid portion shall be severed and the invalidity of such section or portion shall not affect the validity of the remainder.

25. Time is of the essence in this Agreement.

26. This Agreement shall enure to the benefit of and be binding upon the parties, their respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF the parties have set their hands and seals on the day and year first above written.

[*insert appropriate execution provisions*]

Schedule A - [*works and services checklist*]
Schedule B - [*design and specifications*]

STATUTORY RIGHT OF WAY

This Agreement dated for reference_____

BETWEEN:

_____

(hereinafter called the "Grantor")
OF THE FIRST PART

AND:

THE SQUAMISH-LILLOOET REGIONAL DISTRICT, having its offices at P.O. Box 219, 1350 Aster Street, Pemberton, BC, V0N 2L0

(hereinafter called the "Grantee")
OF THE SECOND PART

WHEREAS:

A. The Grantor is the registered owner of land, legally described as:

_____

(hereinafter called the "Lands")

B. The Grantee has asked the Grantor to grant to it a statutory right of way ("the Right of Way") through, under, across and upon that portion of the Lands more particularly described as:

All that portion of the Lands which contain _____ square metres, more or less, as shown outlined in heavy black line on a Reference/Explanatory Statutory Right of Way Plan prepared by _____ B.C.L.S. and dated_____, a print of which is attached hereto

(hereinafter called the "Right of Way Area")

for the purpose of constructing, maintaining and operating a utility system including water, storm and sanitary sewers and fire hydrants (hereinafter called the "Works") which right of way is necessary for the operation and maintenance of the Grantee's undertaking.

C. The Grantor has agreed to grant to the Grantee the Right of Way on the terms and conditions contained in this agreement.

WITNESSETH that in consideration of the premises and the sum of $1.00 now paid by the Grantor to the Grantee, and other good and valuable consideration (the receipt and sufficiency of which is hereby acknowledged), the Grantor and Grantee agree as follows:

1. The Grantor grants to the Grantee, its successors and assigns, the full, free and uninterrupted right, liberty and passage in perpetuity, by its servants, agents, contractors and licensees, to enter upon the Right of Way Area at any time with such vehicles, mechanical equipment or other tools as in the opinion of the Grantee's Manager of Utilities may from time to time be necessary for the purpose of constructing, maintaining or replacing the Works, and in order to accomplish the same the Grantee may do all digging, filling or refilling and all excavating or removing soil, rock, gravel, vegetation or other matter, and laying and installing pipes, mains, house connections and all necessary and usual appurtenances thereto through, under, across and upon the Right of Way Area as the Grantee thinks necessary in order to construct, use and maintain the Works, and may from time to time thereafter enter upon the Lands for the purpose of inspecting, cleaning, repairing, maintaining, placing, removing or stopping up any pipes, manholes or house connections, and for the purpose of gaining access to any contiguous Right of Way on any lands adjoining the Right of Way.

2. The Grantee shall be entitled to hold the Right of Way hereby granted by the Grantor to the Grantee, its successors and assigns, FOREVER.

3. The Grantor for himself, his heirs, successors and assigns, but not so as to be personally liable after he shall have parted with title to the Lands, covenants with the Grantee and its successors and assigns that he will not interfere with or damage any of the Works and will not at any time hereafter build or place any building or other structure upon any part of the Right of Way Area or place or remove earth or other fill material from or upon any part of the Right of Way Area or plant trees or shrubs upon any part of the Right of Way Area without the prior written consent of the Grantee.

4. The Grantor with intent to bind himself, his heirs, successors and assigns, hereby authorizes the Grantee, or its servants or agents at any time hereafter, to enter upon the Right of Way Area for the purpose of removing, at the expense of the Grantor, any building, structure, fill, earth, trees or shrubs placed thereon by the Grantor, and to charge any necessary expense thereby incurred against the Lands.

5. The Grantor reserves the right to reasonable access to the Right of Way Area and should the Grantee disturb the surface of the Right of Way Area, the surface so disturbed shall as soon as possible be restored, at the option of and expense of the Grantee, either to substantially the same condition as it was in previously or to a grassed or asphalt paved condition.

6. This Agreement shall enure to the benefit of and be binding upon the parties hereto and their respective heirs, executors, administrators, successors and assigns

7. Where the singular or masculine are used in this agreement, the same shall be construed as meaning the plural or the feminine or body corporate or politic as the context or the parties hereto so require.

8. All covenants herein shall be deemed to be joint and several covenants.

IN WITNESS WHEREOF the parties have executed this agreement as of the day and year first written above.

SIGNED, SEALED AND DELIVERED by the)
Grantor in the presence of:)
)
_____) _____
signature of witness)
_____)
) _____
_____)
address)
)
_____)
occupation

THE CORPORATE SEAL OF THE GRANTOR
Was hereunto affixed in the presence of) C/S
)
_____)
authorized signatory)
)
_____)
authorized signatory)

THE SEAL OF THE GRANTEE was)
hereunto affixed in the presence of)
)
_____)
)
)
_____)

IRREVOCABLE LETTER OF CREDIT

Name and address of Bank

Squamish-Lillooet Regional District
P.O. Box 219 Pemberton BC V0N 2L0

Dear Sirs:

At the request of _____(*name of Owner*), we hereby establish in your favour our irrevocable letter of credit for a sum not exceeding $_____ .

This credit is available to you by sight drafts drawn on _____(*name and address of bank*) when supported by your written demand for payment made upon us.

This Letter of Credit is required in connection with an undertaking by _____(*name of Owner*) to perform certain works and services required by you.

We specifically undertake not to recognize any notice of dishonour on any sight draft that you shall present to us for payment under this Letter of Credit.

You may make partial drawings or full drawings at any time.

We shall honour your demand without enquiring whether you have a right as between yourself and our customer.

This credit will expire on _____ subject to the condition hereinafter set forth.

It is a condition of this credit that it shall be deemed to be automatically extended, without amendment, for one year from the present or any future expiry date hereof, unless 30 (thirty) days prior to such expiry date, we notify you in writing, by registered mail, that we elect not to consider this credit to be renewable for an additional period. Upon receipt of such notice, you may draw hereunder by means of your written demand for payment.

Our reference for this Letter of Credit is _____ .

This credit is subject to Uniform Customs and Practice for Documentary Credits (1993 Revision) International Chamber of Commerce, Publication No. 500.

_____ _____

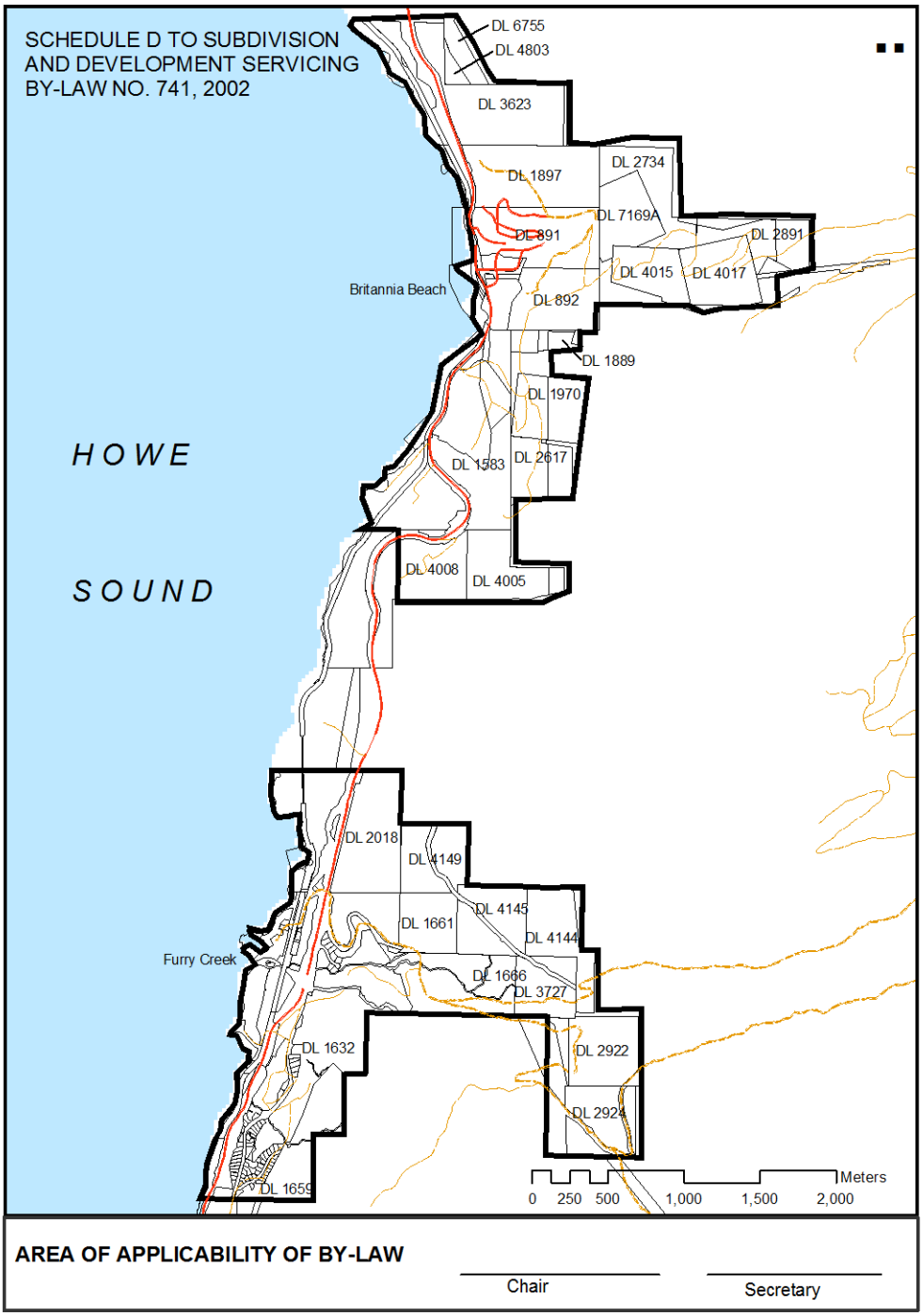
Bank signature Bank signature

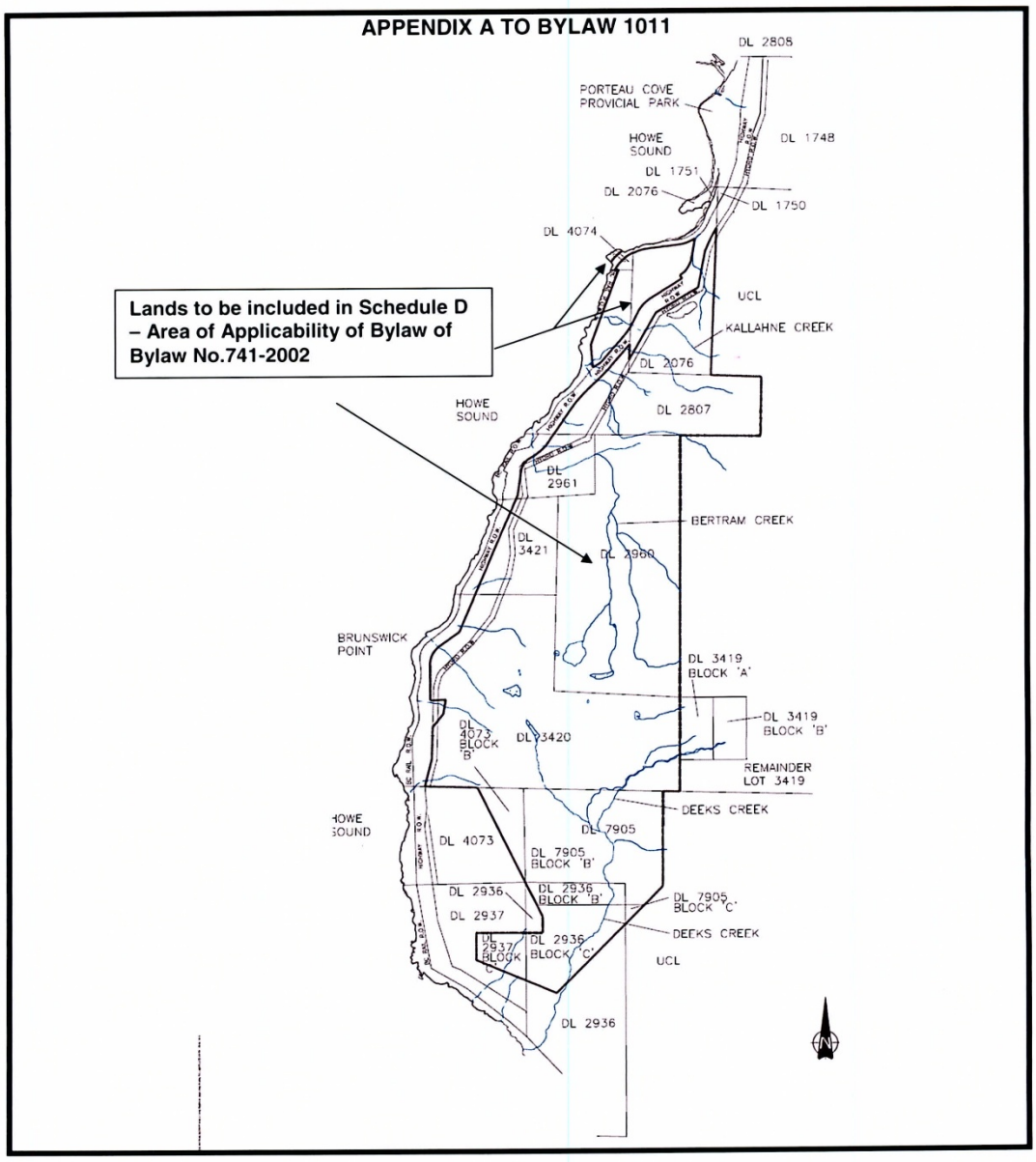
Electoral Area D

Subdivision and Development Servicing Bylaw No. 741, 2002

SCHEDULE D

AREA OF APPLICABILITY OF BYLAW


SCHEDULE D TO SUBDIVISION AND DEVELOPMENT SERVICING BY-LAW NO. 741, 2002
DL 6755
DL 4803
DL 3623
DL 1897
DL 2734
DL 7169A
DL 891
DL 2891
DL 4015
DL 4017
Britannia Beach
DL 892
DL 1889
DL 1970
DL 1583
DL 2617
HOWE
SOUND
DL 4008
DL 4005
DL 2018
DL 4149
DL 4145
DL 1661
DL 4144
Furry Creek
DL 1666
DL 3727
DL 1632
DL 2922
DL 2924
DL 1659
Meters
0 250 500 1,000 1,500 2,000
AREA OF APPLICABILITY OF BY-LAW
Chair
Secretary



(*Amendment Bylaw No.1011)*

Electoral Area D

Subdivision and Development Servicing Bylaw No. 741, 2002

SCHEDULE E

FEES

1. Prior to the processing of an Application for Subdivision Review and Development Servicing Approval, the applicant shall pay the Squamish-Lillooet Regional District an application fee of $100 for the first parcel or strata unit and $50 for each additional parcel or strata unit to be created or constructed by the proposed subdivision or development, in addition to any fees required pursuant to the Land Title Act.

2. In addition to the application fee in section 1, the applicant shall pay the Squamish-Lillooet Regional District an Administration and Inspection of Works and Services Fee where a subdivision or development involves provision of works and services under this bylaw which will have construction costs or be valued in excess of $100,000 if and when approved and completed.

3. Construction costs and values shall be based on the Owner's Engineer's or another Professional Engineer's estimate of the initial sum of costs of all servicing components based on detailed engineering estimates plus 25 percent for contingency and engineering plus 7 percent GST on the subtotal of costs, engineering and contingency.

4. The Administration and Inspection of Works and Services Fee shall be in the amount of $2500 for subdivisions or developments involving provision of works and services which will have construction costs or be valued in excess of $100,000 and $10,000 for subdivisions or developments involving provision of works and services which will have construction costs or be valued in excess of $1 million. The Administration and Inspection of Works and Services Fee shall be deposited into an SLRD reserve account to cover the cost of processing, administration and inspection on the following basis:

(a) $50/hour for SLRD Administrator, Manager of Utilities, Manager of Planning and Development, Treasurer and Building Inspector time;
(b) $35/hour for technical and clerical staff;
(c) the actual cost of engineering, legal and other consulting services required by the SLRD; and
(d) other costs such as mileage expenses as per SLRD bylaws and policy

related to processing, administering and inspections related to the application.

5. Fees under section 2 above shall be paid in instalments, with draws on the $10,000 deposit to be made by the SLRD prior to issuing Permission to Construct; prior to issuing a Certificate of Completion; prior to issuing a Certificate of Acceptance and prior to approval of the subdivision by the Approving Officer.

6. (1) If the balance in the reserve account for the application at any time prior to the setting of the public hearing falls below $1,000, the applicant shall deposit additional money to restore the reserve account balance to $10,000.
   (2) Any unexpended deposit money shall be refunded to the applicant within 30 days of approval, denial or withdrawal of the subdivision or development application.