

UNIVERSITY ENDOWMENT LANDS

WORKS AND SERVICES BYLAW

Ministerial Order M 220, June 10, 2016
(Amended November 16, 2016 by Ministerial Order M453)

Ministerial Order M164, April 6, 2021
(Amended April 6, 2021 by Ministerial Order M164)

Ministerial Order M97, March 30, 2022
(Amended Date March 30, 2022 by Ministerial Order M97)

1. This Bylaw is made by Ministerial Order M 220 pursuant to the *University Endowment Land Act* RSBC 1996 c. 469 (“the UEL Act”).
2. Schedules “A” through “E” inclusive attached to this Bylaw form part of this Bylaw.
3. This Bylaw applies to all lands within the University Endowment Land (“UEL”) as defined in the UEL Act.
4. This Bylaw may be cited as “UEL Works and Services Bylaw 2016”.
5. References in this Bylaw to “Area A”, “Area B”, “Area C” and “Area D” refer to those areas comprising the University Endowment Lands as delineated and described in Section 2.2 of the University Endowment Lands Official Community Plan.

PART 1 - DEFINITIONS

6. (1) In this Bylaw, unless the context otherwise requires,

“**air space parcel**” means a volumetric parcel, whether or not occupied in whole or in part by a building or other structure, shown as such in an air space plan.

“**applicant**” means a person who has applied for approval of a proposed subdivision or for issuance of a building permit or a Development Permit whether as the Owner or as the authorized agent for the Owner.

“**Approving Officer**” means the person appointed pursuant to the *Land Title Act* to be the Approving Officer for the UEL and includes any Deputy Approving Officer and Alternate Approving Officer as appointed under the *Land Title Act*.

“**British Columbia land surveyor**” means a land surveyor licensed and registered as a land surveyor in the Province of British Columbia.

“**building permit**” and Development Permit have the same meaning as used in Sections 10 and 11 of the “University Endowment Lands: Land Use, Building And Community Administration Bylaw”.

“**contractor**” means a person that undertakes the installation of works and services on behalf of an applicant.

“development” means any improvement to lands within the UEL including without limitation residential, commercial, industrial, institutional and public lands, including the construction, alteration or repair of any building or structure requiring either or both a building permit or development permit.

“highway” includes a street, road, lane, bridge, viaduct, and any other way open to public use, other than a private right of way on private property.

“landscape professional” means a member of the British Columbia Society of Landscape Architects, pursuant to the *Architects (Landscape) Act* RSBC 1996 c.18.

“landscaping” means work that is generally designed by and constructed under the supervision of a landscape professional.

“Manager” means the Manager appointed by the Minister pursuant to Section 15 of the UEL Act.

“Owner” means a person registered in the records of the Land Title Office as the owner in fee simple of the land proposed to be developed or subdivided.

“parcel” means any lot, block, or other area in which real property is held or into which real property is subdivided but does not include a highway or portion thereof.

“professional engineer” or “consulting engineer” means a person who is registered or licensed as an engineer under the provisions of the *Engineers and Geoscientists Act* of the Province of British Columbia.

“public utility” means any utility company or utility service provider having facilities installed in a highway or right-of-way for the purpose of providing a service to land and shall include without limitation municipal water distribution, sewage and drainage collection, street lighting, electric power distribution, telephone, cable television, and gas distribution systems.

“right of way” means an easement, including a statutory right of way under Section 218 of the *Land Title Act*, acquired for the purpose of:

- a) public rights of passage with or without vehicles;
- b) installing, erecting, laying down and maintaining any private or public utility service;
- c) laying, placing, and maintaining drains, ditches, pipes, transmission lines, or wires for the conveyance, transmission, or transportation of water, or electric power;
- d) the transmission or disposal of sanitary sewage, storm water or drainage; or
- e) the operation and maintenance of any other undertaking of the Province on the UEL.

“roadway” means the portion of the highway that is improved, designed, intended or ordinarily used for vehicular traffic.

“Security” means a clean, unconditional, irrevocable and automatically self-renewing letter of credit issued by a Canadian Chartered Bank or such other financial institution, acceptable to the Manager in favour of the Province, and able to be presented and drawn down at a branch of the issuer situated in Vancouver to ensure completion of Works and Services as required by Sections 16 and 17 of this Bylaw and Section 20 of Schedule D to this Bylaw.

“sidewalk” means an area of highway improved for the use of pedestrian traffic.

“street” means a highway which affords the principal means of vehicular access to abutting lots, and includes a road or road allowance.

“subdivision” means a subdivision as defined in the *Land Title Act*.

“subdivision approval”, “final subdivision approval” and “final approval” each mean approval of the subdivision of land granted by the Approving Officer when all applicable requirements of this Bylaw, the *Land Title Act* and any other applicable bylaws and legislation have been fulfilled.

“survey plan” means a fully dimensioned legal subdivision plan prepared by a British Columbia land surveyor submitted to the Approving Officer for final approval and ultimate deposit in the Land Title Office.

“UEL Supplementary Specifications” means the supplementary specifications and detailed drawings that are attached to this Bylaw as Schedules “B” and “C”.

“Works and Services Agreement” means the Agreement annexed to this Bylaw as Schedule “D” as required in Sections 16 and 17 of this Bylaw.

“Works and Services” means construction of such highways, roadways, lanes, drainage systems, water and sewer systems, sidewalks, walkways, boulevards, landscaping, street lighting and underground wiring or any other works to be provided for in connection with a subdivision or development of land under this Bylaw and in addition all such other works as required by any Schedule forming part of this Bylaw all to the standards required by this Bylaw.

- (2) Unless otherwise defined herein, any word or expression in this Bylaw shall have the meaning assigned to it in the *Local Government Act* and if not therein defined then as defined in the *Land Title Act*.
- (3) A reference in this Bylaw to a Schedule is a reference to a Schedule that is attached to and incorporated as part of this Bylaw.

Inspection

7. (1) Where an Owner has made either an application pursuant to Section 8 of this Bylaw, or an application for final subdivision approval, the Manager and any employee of the Province acting under the authority of the Manager may, at all reasonable times, enter upon any property subject of the application in accordance with section 16 of the *Community Charter* for the purpose of administering and enforcing this Bylaw.
- (2) No person shall prevent or obstruct, or attempt to prevent or obstruct, the lawful entry of any officials upon any property as authorized under this Bylaw.

PART II – APPLICATIONS

Application for Preliminary Layout Approval

8. (1) Prior to the preparation of survey plans and the placing of survey posts or other survey monuments upon the land for the purpose of subdivision, an Owner may with consent of and at the discretion of the Approving Officer apply for approval of a Preliminary Layout Plan. A copy of the Preliminary Layout Plan must also be provided by the Owner to the Manager, together with the fee and all documents required by Subsection (3) of this Section 8.
- (2) Every application for Preliminary Layout Plan Approval must be made by the Owner or by the Owner's authorized agent using the forms providing all the information requested by the Approving Officer, and the payment of any fee imposed by the Approving Officer for an approval of a Preliminary Layout Plan.
- (3) An application for Preliminary Layout Plan Approval must include:
 - (a) a UEL application fee in the amount required under Schedule A which fee is in addition to any fee imposed by the Approving Officer;
 - (b) a copy of the Preliminary Layout Plan prepared by a British Columbia land surveyor which has been tendered to the Approving Officer;
 - (c) a current State of Title Certificate for all land included in the application for Preliminary Layout Approval dated within 30 days of the date of application.
- (4) All existing buildings and structures must be shown on the copy of the Preliminary Layout Plan provided to the Manager to demonstrate compliance with the setback requirements of the "UEL Land Use, Building and Community Administration Bylaw."

Subdivision Statement of Conditions

9. (1) In connection with the review of an application for a Preliminary Layout Plan, the Approving Officer may at his or her discretion consult with the Manager as the Approving Officer deems useful and may in the exercise of his or her discretion issue a written statement of conditions identifying all conditions or requirements that are necessary for the Approving Officer's consideration of any subsequent final approval of the proposed subdivision.
- (2) The Approving Officer's statement of conditions on a Preliminary Layout Plan shall not be construed as binding on any final approval of a subdivision.
- (3) If the Approving Officer's final approval of a proposed subdivision has not been granted within twelve months of the issuance of the statement of conditions:
 - (a) the approval of both a Preliminary Layout Plan and the Statement of Conditions may at the discretion of the Approving Officer expire; and thereafter:
 - (b) if the applicant wishes to proceed with the proposed subdivision, a new application for Preliminary Layout Plan may be made, but only subject to any change or amendment in conditions, bylaws or policies that may have occurred in the interim period, and which the Approving Officer considers ought to apply to the intended subdivision.

Additional Information

10. At any time, the Approving Officer may at his or her discretion request that an applicant provide further information that is necessary for either of the Approving Officer or for the Manager to continue to review and consider a Preliminary Layout Plan application.

Referral to Other Agencies

11. In the event that the Approving Officer for any reason, or the Manager for clarification relating to necessary works and services, refers an application for Preliminary Layout Approval or any other application for subdivision approval to another public authority whose review of that application is required by law, or in the opinion of the Approving Officer or Manager is necessary or desirable, the applicant shall be responsible for direct payment to that public authority of any fee charged by the public authority for that referral.
12. Subject to the proviso herein, this Bylaw applies to all of the Works and Services set out in Section 506 of the *Local Government Act* that are necessary to service lands to be subdivided or developed on UEL Lands. This Bylaw also applies to all Works and Services that are required by this Bylaw to be constructed and installed pursuant to the Works and Services Agreement, provided that the Manager may, in respect of works and services to be provided for a single -family dwelling, exempt the Owner from entering into

the Works and Services Agreement where the cost of the necessary works and services is \$25,000.00 or less.

13. All Works and Services required to be provided to service a subdivision or a development on land pursuant to this Bylaw must be designed installed and constructed strictly in accordance with the following standards and specifications:
 - a) The Master Municipal Construction Documents (MMCD) Standard Specifications and Drawings dated May, 2009 Platinum Edition and the MMCD Municipal Infrastructure Design Guideline Manual;
 - b) The UEL Supplementary Standards and Specifications annexed to this Bylaw as Schedules "B" and "C".
14. The Owner must as required by this Bylaw, not only provide Works and Services within a proposed subdivision or on lands to be developed, but also within the portion of any existing highway abutting the lands being subdivided or developed up to the centre line of each such highway.
15. An Owner may only obtain a subdivision approval or, in respect of a development, the issuance of either a building permit or development permit, prior to the provision and construction of all Works and Services required by this Bylaw, if the Owner first fully complies with the provisions of Section 16 of this Bylaw and enters into a Works and Services Agreement in the form of Schedule D to this Bylaw; provided that if the development is a single family dwelling and the cost of the works and services is \$25,000 or less the Owner may be exempted by the Manager from having to enter into a Works and Services Agreement.

Works and Services Agreements

16. (1) All Works and Services required to be constructed and installed by the Owner of the land being subdivided or developed must be constructed and installed to the standards established under this Bylaw and the Owner must:
 - (a) deposit with the Province a Security in the amount of 120% of the estimated cost of the Works and Services; and
 - (b) enter into a Works and Services Agreement with the Province in the form attached to this Bylaw as Schedule "D" to construct and install the required Works and Services by a date specified in the Agreement, which date may be extended by the Manager and absent any date in the Agreement shall be no later than twelve months from the deposit of the subdivision plan, or where no subdivision of land is intended then the date of issuance of the building permit, failing which the Owner shall forfeit the security and the Manager may expend the Security to construct the Works and Services; and,

- (c) grant all necessary statutory rights of way required by the Manager in the form and on terms satisfactory to the Manager.
- (2) For the purposes of Subsection 16 (1)(a) the estimate of the cost of the Works and Services must be prepared by a professional engineer, or by a landscaping professional in the case of any landscaping work, and each cost estimate must be acceptable to the Manager.

Maintenance Agreement for Works and Services

17. The Works and Services Agreement shall include:

- (a) the Owner's agreement to maintain and to rectify any deficiencies in design, materials or workmanship in the Works and Services, including without limitation to the foregoing, the care, maintenance and if necessary the replacement of all landscaping required by this bylaw, that may arise during the twelve months following the assumption of responsibility for the Works and Services by the Province, and to continue regular watering of all landscaping for twenty-four months from initial planting;
- (b) the Owner's agreement that the length of the warranty period under paragraph (a) may be increased at the discretion of the Manager, to a period that the Manager considers reasonable given the nature of the Works and Services, but in any event not to exceed three (3) years; and
- (c) a requirement that the Owner maintain with the Manager, Security in the amount of 15% of the amount deposited pursuant to Section 16(a), or \$10,000.00 whichever is the greater, as a guarantee of performance of the maintenance obligation referred to in paragraph (a).

Statutory Rights of Way

18. Where any Works or Services required for a subdivision or development are not located within a highway or on any lands owned by the Crown, the applicant must grant to the Province a statutory right of way pursuant to S. 218 *Land Title Act* to secure the Province's right to access, operate, and maintain those Works and Services in a manner that is acceptable to the Manager and that is substantially in the form of the statutory right of way agreement attached as Schedule E to this Bylaw.

PART III – SERVICING REQUIREMENTS

Highway Works and Services

19. (1) The Owner must construct all highways that are required within a subdivision in accordance with the standards established under Section 13 of this Bylaw that apply to the classification of highway required for that subdivision.

- (2) The Owner must reconstruct, in accordance with the standards established under section 13 of this Bylaw, all highways that are immediately adjacent to the land being subdivided, or developed as provided for in Section 14.
- (3) Without limiting the requirements of subsections (1) and (2) all highways and Works and Services required under this Bylaw to be improved or dedicated to the Province shall include, in accordance with the standards established under Section 13 of this Bylaw:
 - (a) landscaping of all portions of the highway not improved with paved road, curb and gutter or sidewalk;
 - (b) underground irrigation of all landscaped public areas, as required by the Manager;
 - (c) planting of street trees;
 - (d) street lighting;
 - (e) street name signage;
 - (f) traffic control signage.

Stormwater System

20. (1) The Owner of lands being subdivided or developed must provide within the subdivision, an erosion and sediment control plan approved by the Manager and must provide on the lands being developed, a storm drainage system that is designed and constructed in accordance with the standards established under Section 13 of this Bylaw.
- (2) As a condition of the approval of subdivision or the issuance of a building permit the Owner must provide an extension of or improvements to the UEL's storm drainage system within that portion of the highway immediately adjacent to the lands being subdivided or developed, in accordance with the standards established under Section 13 of this Bylaw, where the Manager determines that the extension or the improvements are directly attributable to the subdivision or development.
- (3) Where required by Section 13 all parcels that are created by subdivision or that are developed shall be connected to a UEL storm drainage system by means of a suitably sized connection that is designed and constructed in accordance with the standards established under Section 13 of this Bylaw.
- (4) With the approval of the Manager, bare land strata subdivisions may be connected to a UEL storm drainage system by means of a single service connection that provides service to the individual strata lots through common property.

Water Supply and Fire Control

21. (1) The Owner of land being subdivided must provide within the subdivision, a water distribution system and a fire hydrant system that shall be designed and constructed in accordance with the standards established under Section 13 of this Bylaw.
- (2) As a condition of the approval of subdivision or the issuance of a building permit, the Owner must provide an extension of or improvement to the UEL's water system and fire hydrant system within that portion of the highway immediately adjacent to the lands being subdivided or developed, in accordance with the standards established under Section 13 of this Bylaw, where the Manager determines that the extension or the improvements are directly attributable to the subdivision or development.
- (3) All parcels shall be connected to the UEL's water system by means of a suitably sized connection that is designed and constructed in accordance with the standards established under Section 13 of this Bylaw.
- (4) With the approval of the Manager, bare land strata subdivisions may be connected to the UEL's water system by means of a single service connection that provides water to the individual strata lots through common property.

Sanitary Sewer

22. (1) The Owner must provide within a subdivision, a sanitary sewer system that is designed and constructed in accordance with the standards established under Section 13 of this Bylaw.
- (2) As a condition of the approval of subdivision or the issuance of a building permit, the Owner must provide an extension of or improvements to the UEL's sanitary sewer system within that portion of the highway immediately adjacent to the lands being subdivided or developed, in accordance with the standards established under Section 13 of this Bylaw, where the Manager determines that the extension or the improvements are directly attributable to the subdivision or development.
- (3) All parcels shall be connected to the UEL's sanitary sewer drainage system by means of a suitably sized connection that is designed and constructed in accordance with the standards established under Section 13 of this Bylaw.
- (4) With the approval of the Manager, bare land strata subdivisions may be connected to the UEL's sanitary sewer system by means of a single service connection that provides service to the individual strata lots over common property.

Fees and Charges

- 23.** Prior to the Approving Officer's final approval of a subdivision plan, or the issuance of a building permit by the Manager, the Owner must pay all applicable fees and charges, including but not limited to those established under Schedule "A" of this Bylaw and the UEL Fees Bylaw. *(Amended by Ministerial Order M97, March 30 2022)*

Schedules

- 24.** The following schedules are attached to and form part of this Bylaw:

SCHEDULE A:	Fees
SCHEDULE B:	UEL Supplementary Design Manual
SCHEDULE C:	Supplementary Specifications and Standards for Boulevard Trees and Landscaping
SCHEDULE D:	Standard Form for Works and Services Agreement
SCHEDULE E:	Standard Form for Statutory Right of Way
SCHEDULE F:	Block F Public Realm Specifications <i>(Added by Ministerial Order M453, November 16, 2016)</i>

Severability

- 25.** If any section, subsection, clause, sub-clause or phrase of this Bylaw is for any reason held to be invalid by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this Bylaw.

SCHEDULE A
UNIVERSITY ENDOWMENT LANDS
FEES

For the purposes of this Bylaw, the Subdivision Application Fee, Works and Services Construction Fee, Utility Service Installations Fee and Deposit – All Districts, and Remediation / Replacement of Public Property Fee and Deposit are set out in the UEL Fees Bylaw. *(Added by Ministerial Order M97, March 30, 2022)*

INTRODUCTION

1.1 Use of this Design Guideline Manual

This Design Guideline Manual supplements the Master Municipal Construction Documents (MMCD) Standard Specifications and Drawings and the MMCD Municipal Infrastructure Design Guideline Manual referred to in Section 13 (1) (a) of this Bylaw.

All designs and construction details for the University Endowment Lands (UEL) infrastructure services shall be in accordance with this Design Guideline Manual, the MMCD Design Guideline Manual, the University Endowment Lands Supplementary Detail Drawings, and the Master Municipal Construction Documents – Volume II – Specifications and Standard Detail Drawings, as adapted by the UEL in this Bylaw.

It is the Professional Engineer's responsibility to verify that the most current criteria are being used prior to initiating and submitting detail designs.

1.2 Intent of these Standards

These supplementary design guidelines along with the MMCD Design Guidelines are intended to be the minimum design criteria and standards for the proposed works. The onus is on the professional engineer to ensure that their designs meet accepted engineering principles and are adequate for the site conditions and their accepted use.

The UEL expressly relies on the professional engineer for professional expertise and thorough review of their submissions.

1.3 Applications of these Design Guidelines

The guidelines and performance standards defined in this manual and the MMCD Design Guideline Manual shall apply to the preparation of all engineering designs and drawings for, and execution of, projects in the UEL.

These standards are set out as minimum requirements and shall not be considered rigid requirements where variations acceptable to the UEL will achieve better technical and economical solutions. Professional engineers are encouraged to seek innovative and superior solutions where appropriate. A Professional Engineer who wishes to adopt criteria not specifically included in or variant from those within this manual, shall justify the proposed changes in a letter/report prepared, signed, and sealed by a qualified professional engineer. The submission must demonstrate that the proposed change is equivalent to or better than those guidelines.

In spite of using these standards and specifications, the Developer and their Consulting Engineers remain responsible for the design and construction of municipal infrastructure utilities

according to good engineering standards adequate to address the specific needs and site conditions of their project.

The professional engineer must be satisfied that the design criteria contained herein are applicable to the project at hand, and must apply more stringent criteria where appropriate. The Developer and professional engineers are fully responsible for designing according to standards, which exceed these standards when specific site locations dictate that more stringent performance measures are required.

1.4 Interpretation of the Design Guidelines

The University Endowment Lands reserve the right to a final decision with regard to the interpretation of the intent of the Design Guidelines and standards, and with regard to acceptability of changes from the standards, or of standards proposed by the professional engineer.

1.5 Existing Services

Existing service information is available from the University Endowment Lands. These records are made available on the understanding that the UEL cannot, and does not, guarantee their accuracy. The professional engineer or user of such information shall make appropriate verification to ensure the accuracy of the critical details.

1.6 Units

The units for all design and construction shall be in SI (International System of Units), and shall conform to the Canadian Metric Practice Guide, SCA CAN3-Z234.1.

1.7 Drawing Preparation

Engineering drawings, detail sketches, and digital files prepared for submission to the UEL must conform to the MMCD Construction Drawing Standards and are required to contain the following data:

- graphics of existing utilities and services;
- graphic and annotations of proposed services;
- attributes of the proposed services; and
- information pertaining to the description of the project and the consulting engineering company.

All design and survey shall be in NAD83 Zone 10 coordinates.

SCHEDULE B
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY DESIGN MANUAL
Water Distribution

In Section 2 of the MMCD Design Guideline Manual replace or add clauses as follows:

WATER DISTRIBUTION

1.8 Corrosion Protection

Replace MMCD Clause 2.13

To protect against the potential of corroded metallic pipe lines, soil corrosivity testing and analysis shall be conducted along the proposed alignment of all metallic water mains and appurtenances to determine the corrosive nature of the soil. Testing methodology shall include measurement of electrical resistivity, soils testing for corrosiveness to metallic water main and appurtenances as per AWWA Standard C105/A21.5 10-point system, investigation and testing for stray DC electrical currents such as ICCP systems and review of available system leak records. If the soils are determined to be corrosive, cathodic protection, or other measures, shall be included to prevent the corrosion of metallic water main and appurtenances.

1.9 Valves

Replace MMCD Clause 2.14

Valves must be located as follows:

- Not more than 200m apart
- Not more than 1 hydrant isolated
- Not more than 20 service connections isolated
- In intersections, unless otherwise approved by the owner:
 - 3 valves at "X" intersection
 - 2 valves at "T" intersection
- Where a new main is connected to an existing main.

All valves are to be resilient seated gate valves unless otherwise approved by the owner.

Gate valves shall be the same diameter as the main up to 350mm diameter. For mains larger than 350mm in diameter, valves shall be no more than one diameter size smaller (with suitable reducers).

Gear operators, with risers and extension rods and a valve bypass for equalizing pressure shall be provided on gate valves 350mm in diameter and larger.

END OF SECTION

SCHEDULE B
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY DESIGN MANUAL
Sanitary Sewers

In Section 3 of the MMCD Design Guideline Manual replace clauses as follows:

SANITARY SEWERS

1.10 Sewage Flows

Replace MMCD Clause 3.2

The total design sewage flow shall be based on the ultimate population densities and land use designations as outlined in the OCP for the entire catchment area. Sanitary sewers shall be designed to convey the calculated peak sewage flow, including an allowance for inflow and infiltration.

The following densities are to be used for residential areas:

- 3.3 persons/unit (min): Single Family (detached)
- 2.9 persons/unit (min): Multi-Family (other)
- 2.1 persons/unit (min): Multi-Family (apartment)

Sanitary sewer system design must be based on an average daily dry weather flow (ADWF) as follows:

Land Use	Unit Average Dry Weather Flow	Inflow and Infiltration (litres/ha/day)
Residential	455 litres/capita/day	11,200
Commercial/ Institutional	910 litres/1000 ft ² /day	11,200

1.11 Infiltration

Replace MMCD Clause 3.5

Design flow must include an infiltration allowance to cover groundwater infiltration and system inflows. The infiltration allowance is 11,200 litres per hectare per day.

1.12 Design Flow

Replace MMCD Clause 3.6

Design flow shall be the peak wet weather flow (PWWF) and should be calculated as follows:
 $Q = (\text{population and equivalent}) \times \text{per capita flow} \times \text{peaking factor} + \text{infiltration allowance}$.

SCHEDULE B
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY DESIGN MANUAL
Sanitary Sewers

Sanitary sewers shall be designed as open channels with the depth of flow, under the maximum design flow condition not to exceed 50% of the internal diameter of the sewer (i.e., $d/D=0.5$).

1.13 Flow Velocities

Replace MMCD Clause 3.8

Minimum design velocities shall be 0.60 m/s for gravity sewers and 0.75m/s for force mains. Maximum design velocities shall not exceed 3.0 m/s.

1.14 Manhole Covers

Add MMCD Clause 3.14.3

Watertight manhole covers are to be used wherever the manhole cover may be flooded by street runoff or the top of the manhole is below the 10 year hydraulic grade line elevation.

1.15 Service Connections

Replace MMCD Clause 3.15

Every lot (existing or newly created) capable of being serviced, must be serviced by one connection, including an appropriate type of Inspection Chamber.

Duplex residential premises will be provided with independent service connections for each unit.

Connections are to serve each property by gravity. Building elevations must be established accordingly.

1.16 Size

Replace MMCD Clause 3.15.1

The size of the service connection shall be designed to accommodate the peak flow rate on the property being served. Service connections to single family dwellings shall be a minimum of 100mm diameter in size.

1.17 Location and Depth

Replace MMCD Clause 3.15.2

Connections to large lots are to be located at the lower portion of each lot. Service connections are to be installed perpendicular to the main.

Depth requirements are as indicated for sewer mains.

SCHEDULE B
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY DESIGN MANUAL
Sanitary Sewers

1.18 Grade

Replace MMCD Clause 3.15.3

Minimum grade from property line to sewer main:

- 100mm diameter pipe: 2%
- 150mm diameter pipe: 2%
- Larger size: Grades based on minimum velocity of 0.6m/s.

1.19 Details

Replace MMCD Clause 3.15.4

Use standard wye fittings for connections to new mains. For connections to existing mains, use wye saddles or, if approved, insertable tees. The service connection centreline must not be below the sewer main centreline.

Service connections may be permitted into manholes if:

- The connection is not orientated against the flow in the main.
- Manhole hydraulic requirement is met.

Inspection chambers for residential properties are required as per supplementary standard detail drawing UEL-S9.

An appropriate type of inspection chamber and/or manhole shall be provided for industrial, commercial and multi-family residential properties.

Connections exceeding 30m in length will be treated as mains.

END OF SECTION

SCHEDULE B
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY DESIGN MANUAL
Storm Sewers

In Section 4 of the MMCD Design Guideline Manual replace clauses as follows:

STORM SEWERS

Stormwater is the element of runoff that is generated by human activities. When vegetation and soils are replaced with roads and buildings, less rainfall infiltrates into the ground, less gets taken up by vegetation and more becomes surface runoff. The result is stormwater runoff that increases the flow volume and peak flow rates and cause erosion in downstream water courses.

Implementing a stormwater best management practices (BMP) strategy that will infiltrate, evapotranspire, reuse, and detain stormwater runoff will reduce the volume and rate of stormwater entering the drainage system. This tactic will subsequently reduce erosion in downstream water courses.

Stormwater runoff rates, volume and quality requirements are as follows:

- Reduce post-development flow (volume, shape and peak instantaneous rates) to pre-development levels for the 6-month, 24 hour and the 5-year, 24 hour precipitation events.
- Retain the 6-month, 24 hour post-development volume from impervious areas on-site and infiltrate into ground where it will not cause instability of steep slopes. If infiltration is not possible, the rate of discharge from the “flow reduction BMPs” will be equal to the calculated release rate of an infiltration system.
- Collect and treat the volume of the 24-hour precipitation event equaling 90% of the total rainfall from impervious areas with vehicular traffic with suitable BMPs.

1.20 Erosion and Sediment Control

An erosion and sediment control plan that has the objective of preventing deleterious substances from entering the storm system during construction must be submitted to and approved by the UEL in advance of any works.

1.21 Pipe Material

Add MMCD Clause 4.1.1

Corrugated steel pipe shall not be used.

1.22 Rainfall Intensity

Replace MMCD Clause 4.10.3

The rainfall intensity “I” shall be as indicated on the City of Vancouver’s intensity-duration table. A return period of 5 years shall be used on residential areas and 10 years on commercial areas.

SCHEDULE B
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY DESIGN MANUAL
Storm Sewers

1.23 Flow Velocities

Replace MMCD Clause 4.12.3

Minimum design velocity for maximum flow shall be 0.9 m/s. Provisions shall be made for energy dissipation when the velocity of the design flow exceeds 4.6 m/s or when the design flow exceeds 1.5 m/s and discharges into an open ditch or water course.

1.24 Service Connections

Replace MMCD Clause 4.12.14

Every lot (existing or newly created) capable of being serviced, must be serviced by one connection, including an appropriate type of Inspection Chamber.

Duplex residential premises will be provided with independent service connections for each unit.

Connections are to serve properties by gravity. Any on-site drainage that is pumped must first drain to a sump on private property which is then conveyed by gravity to the UEL connection.

Unless otherwise approved, roof drains are to be discharged to splash pads, not service connections.

The size of the service connection shall be designed to accommodate the peak flow rate on the property being served. Service connections to single family dwellings shall be a minimum of 100mm diameter in size.

Minimum grade from property line to sewer main:

- 100mm diameter pipe: 2%
- 150mm diameter pipe: 2%
- Large size: Grades based on minimum velocity of 0.9 m/s

Use standard wye fittings for connections to new mains. For connections to existing mains, use wye saddles or, if approved, insertable tees. The service connection centreline must not be below the sewer main centreline.

Service connections may be permitted into manholes if:

- The connection is not orientated against the flow in the main.
- Manhole hydraulic requirement is met.

Inspection chambers for single family residential properties must be installed as per supplementary standard detail drawing UEL – S9.

SCHEDULE B
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY DESIGN MANUAL
Storm Sewers

An appropriate type of inspection chamber and/or manhole shall be provided for industrial, commercial and multi-family residential properties.

Connections exceeding 30m in length will be treated as mains.

1.25 Combined Sewer Connections

Add MMCD Clause 14.12.14.1

In areas where dedicated storm sewers do not exist, storm services will be temporarily connected to a combined sanitary/storm sewer.

Interim storm connections, where required, are to be installed as per supplementary standard detail drawing UEL – S9a

When separate storm/sanitary sewers are constructed to replace a combined sewer, separate storm/sanitary connections must be built to the property line for each house with an existing combined connection. The existing combined connection will be tied to the new sanitary connection at the property line,

END OF SECTION

SCHEDULE B
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY DESIGN MANUAL
Roads

In Section 5 of the MMCD Design Guideline Manual replace clauses as follows:

ROADS

1.26 Minimum Asphalt Concrete Pavement Overlay

Replace MMCD Clause 5.16.7

Where existing pavements are to be overlaid, the minimum overlay thickness is two times the maximum aggregate size, but in no case less than the following:

Classification	Minimum Asphaltic Concrete Overlay Thickness
Local	35 mm
Collector	40 mm
Arterial	50 mm

1.27 Trails

Add MMCD Clause 5.19

Multi uses and single purpose use trails constructed within the Pacific Spirt Park must meet Metro Vancouver Design specifications and be constructed by a Metro Vancouver approved contractor.

Trails constructed within the UEL are to be constructed on approved subgrade material free from organics. Trail structure shall consist of a 250mm thick sub base of select granular material and 75mm thick base layer of crushed granular material with a binder additive to mitigate erosion.

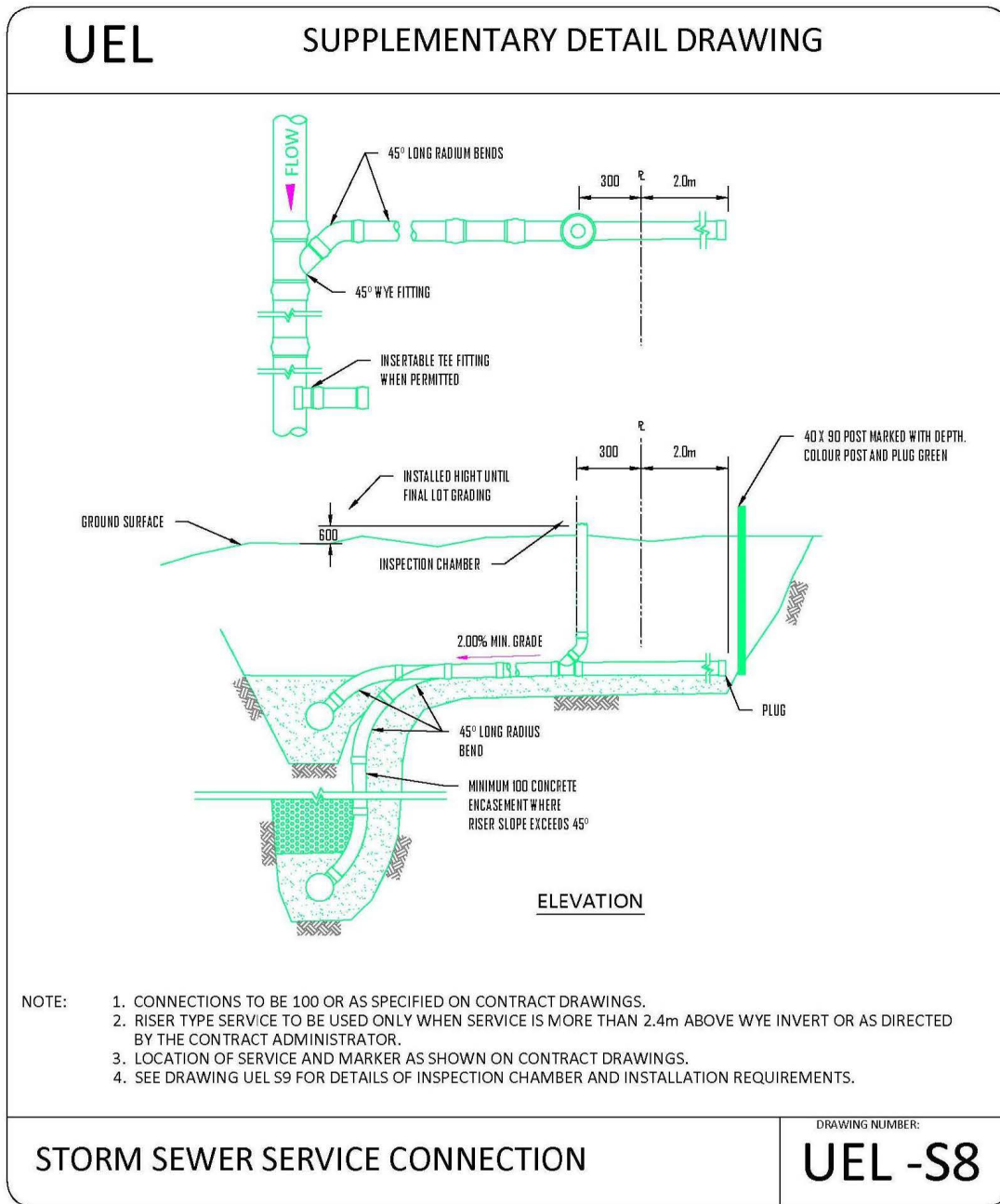
The trails shall have a minimum cross fall of 2% and a maximum of 5%. Run off from trails shall drain into swales or a stormwater management system.

END OF SECTION

SCHEDULE B
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY DESIGN MANUAL
Supplementary Detail Drawings

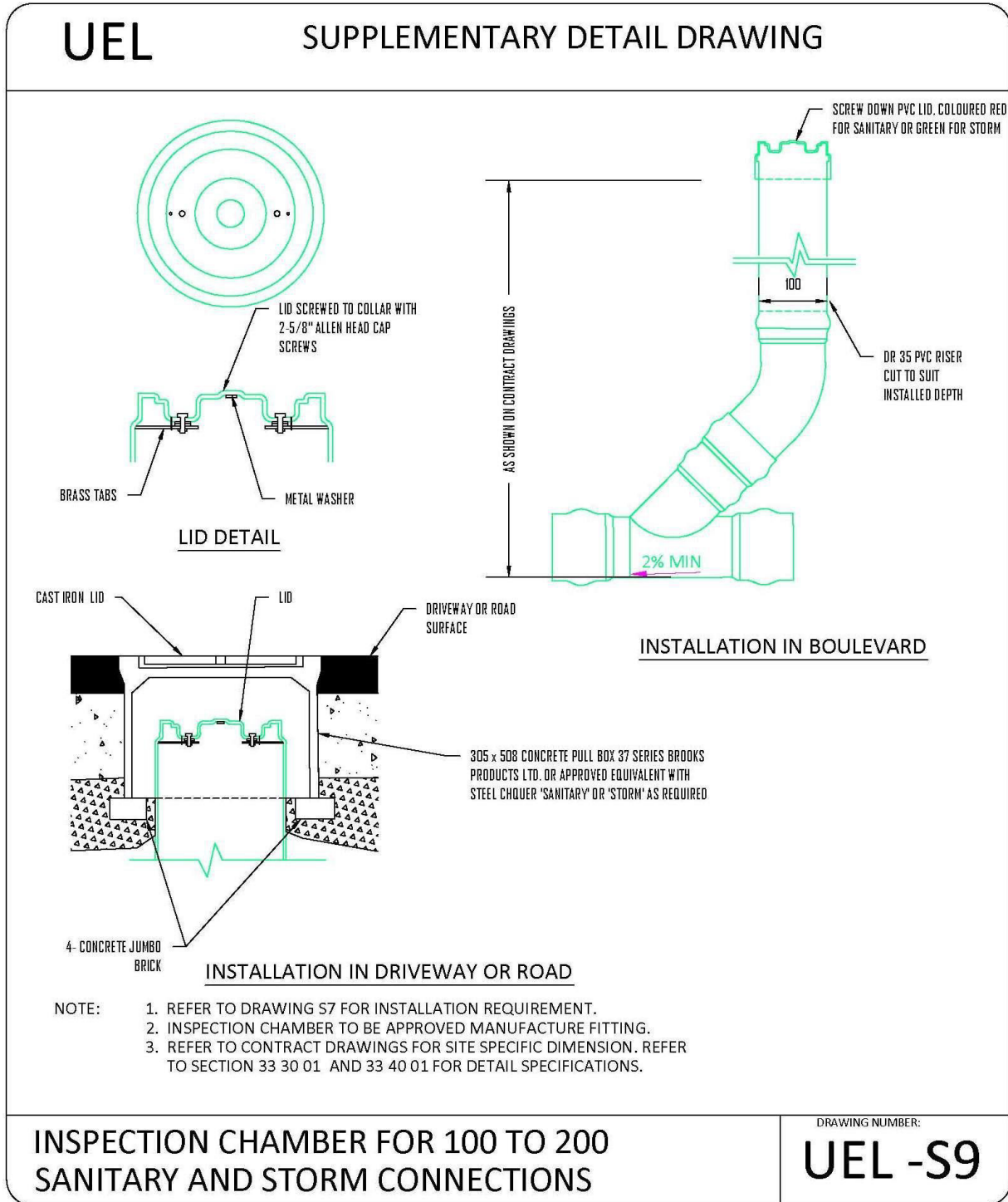
SUPPLEMENTRY DETAIL DRAWINGS

1.28 Storm Sewer Service Connection



SCHEDULE B
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY DESIGN MANUAL
Supplementary Detail Drawings

1.29 Inspection Chambers

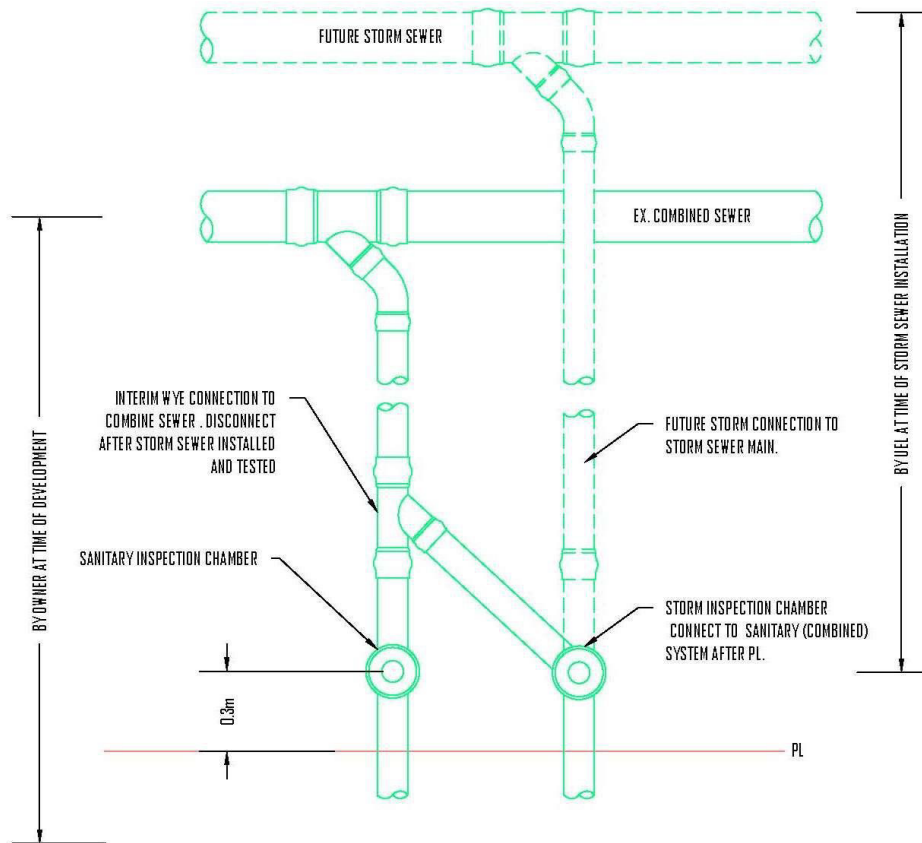


SCHEDULE B
 UNIVERSITY ENDOWMENT LANDS
 SUPPLEMENTARY DESIGN MANUAL
 Supplementary Detail Drawings

1.30 Temporary Combined Sewer Service

UEL

SUPPLEMENTARY DETAIL DRAWING



TEMPORARY STORM CONNECTION TO EXISTING COMBINED SEWER

- NOTE:
1. INSPECTION CHAMBER AND RISER PIPE SHALL BE PLUMB VERTICAL
 2. INSPECTION CHAMBER LIDS SHALL BE COLOURED "GREEN FOR STORM" AND "RED FOR SANITARY".
 3. SEE DRAWING UEL - S7 FOR DETAILS OF INSPECTION CHAMBER AND INSTALLATION REQUIREMENTS.
 4. OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UNDERGROUND UTILITIES.
 5. OWNER/DEVELOPER SHALL INSTALL INSPECTION CHAMBERS AND WYE CONNECTION WHEN CONNECTING TO EXISTING COMBINED SEWER.

TEMPORARY STORM / COMBINED SEWER SERVICE
 CONNECTION

DRAWING NUMBER:

UEL -S9a

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

PURPOSE

The following standards and specifications have been developed to preserve and promote boulevard trees and landscaping in the public realm where possible. The function of this document is to bring together and describe aspects of the boulevard tree and landscaping planting within UEL right-of-way and establish expected standards and specifications.

The urban forest contributes greatly to the quality of life of the UEL residents. It provides a wide variety of environmental, social, and economic benefits; such as air quality improvement, storm water reduction, wildlife habitat, sense of place, aesthetic beauty, and increased neighbourhood desirability.

PLANTING TREES AND LANDSCAPING ON UEL BOULEVARDS

Street tree planting proposals will be considered for new developments and redevelopments of land in the University Endowment Lands (UEL) when the street has been built to its ultimate width, finished curbs (sidewalks if planned), and utilities located underground, if any. The builder must complete homes prior to planting in order to avoid damage to trees.

Permission is to be obtained from the UEL administration before trees or other landscaping (such as rain gardens) are planted on a street boulevard. Prior to the tree planting, the actual tree locations and spacing are to be approved by the Manager. This is to ensure that the proposed tree locations do not conflict with existing or planned underground utilities.

Top soil placed in boulevards for planting shall be of a minimum thickness of 450mm. Depths of growing medium for trees, planting and turf grass shall also meet the minimum requirements as outlined in the current British Columbia Landscape Standard (BCLS) as published by the British Columbia Society of Landscape Architects (BCSLA). Tree pits are to meet the minimum area (volume) as identified in the BCLS.

TREE PLANTING STANDARDS

1.1 General Guidelines

All plant material and contractors must meet or exceed the minimum requirements as outlined in the current British Columbia Landscape Standard (BCLS) as published by the British Columbia Society of Landscape Architects (BCSLA) and Canadian Standards for Nursery Stock (CSNS), as published by the Canadian Nursery Landscape Association.

When planting a portion of a block, match existing spacing where appropriate, whether on the same or opposite side of the street.

Spacing is considered on a site's average scale, and the preference is to match existing tree spacing. Individual tree positions are subject to offsets.

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

1.2 Preparation for Planting

Trees and plants shall be grown by plant nurseries in accordance with the current edition of the BCLS and CSNS. Plants are to be delivered in appropriate sized pots and with root balls as specified in the BCLS and CSNS, while following the correct procedures for plant type and period of dormancy/non-dormancy. Tree roots should not be exposed to intense winter cold after they are lifted. Use mulch as protection.

Excavation of the subgrade below shall be only as necessary to permit the bottom of the root ball to sit on the undisturbed material or compacted fill such that the top of the root ball remains at the proper finished grade, equal to its growing condition at the nursery, while at the same time meeting the minimum depth requirements as per the BC Landscape Standard. Ensure there is positive drainage in the tree pit, provide deep scarification if required to ensure drainage.

1.3 Planting

Finished grade – the tree must be installed such that the top of the root ball is even with the surrounding soil – after settlement. If there is a chance of some settling after planting, install such that the top of the root ball is 2 to 4 cm above the surrounding grade. Trees with the trunk flare buried beneath the soil line will not be accepted.

Wherever possible, the hole must be dug with sloping sides. The preferred angle is 45 degrees. The tree must be lowered gently into position, not dropped.

Trees must be as vertical as possible. If planting in a surround, the stem must be close enough to centre that at least some part of the tree is in dead centre.

Position the tree so that lower branches will not conflict with traveled portions of the sidewalk of the street. Notwithstanding conflicts, the tree must be positioned for most attractive viewing. Pruning may be necessary in order to provide pedestrian clearance.

Backfill material in the tree pits shall be either an amended native soil mixture from the site or manufactured growing medium. The composition of the backfill material shall conform to the BC Landscape Standards with the provision of a growing medium analysis for documentation.

Where permitted by the supplier plant nursery's warranty, basket ties must be cut and the top 1/3 of the burlap and basket folded back downwards, when the backfill has been placed up to about 2/3's of the root ball height. No burlap or wire must be showing above the finished grade. Ties must be pushed back into the lower portion of the hole. Where prohibited by the nursery's warranty, the contractor is responsible to ensure the ties and basket are folded over at the first anniversary of the one (1) year warranty period.

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

A 10 cm raised saucer, of inside diameter equal to the outside diameter of the root ball, must be constructed around the perimeter of the root ball to enhance water infiltration. A mulch of organic material (other than cedar) must be placed inside the berms of the saucer, to a depth of 7 – 9 cm.

Trees must be immediately and adequately watered after planting following the requirements of the BC Landscape Standard. When planting where the UEL Manager or representative has determined that drainage correction is impossible or impractical, the root collar must be planted higher in relationship to the surrounding soil by 7.5 to 10 cm.

1.4 Root Barrier

Root barriers must be installed at the time of planting whenever a tree is installed within 2 metres of a sidewalk or other hardscape feature – excluding roads; or where specified on approved drawings.

Barriers must be made commercially, produced for the purpose of deflecting roots downward. Placement must be as per manufacturer’s instruction. The root barrier is to extend a full 2.0 m on either side of the trunk that faces a sidewalk or hard landscape feature.

1.5 Spacing

The optimum spacing of trees in the public realm is achieved by balancing aesthetic and environmental values with the physical form of the tree being used, and the carrying capacity of the site. The UEL aims for the maximum amount of tree coverage that is attainable while respecting site lines, utilities, and other important landscape elements.

Minimum Street Tree Spacing

Tree size category	Average Spacing
Large	9-11 metres
Medium	8-10 metres
Small	8-10 metres
Columnar	6-10 metres

Refer to the section Street Tree Species List for definition of tree sizing.

The following table outlines the minimum distances that trees are to be planted from the listed objects.

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

Object	Min. Distance to Tree
Steel or Wooden Poles	2.5 metres (species dependent)
Driveways	2 metres – small trees 3 metres – medium trees 5 metres – large trees
Catch Basins/Valve Boxes/Manholes	3 metres
Stop Signs	6 metres
Sewer and Storm Services	2 metres
Hydrants	2 metres
Corners (from extended P/L)	3 metres
Sidewalks	1 metre
Back of curb – Local Roads	1 metre

The curb side edge of a tree surround must be at least 0.15 metres from the back of the curb.

PLANT STOCK

Street trees are to meet the standards for trees described in the British Columbia Landscape Standards, latest edition.

Street Trees must also be:

- nursery field grown;
- be on a single leader, with the lowest branch being at least 2 meters high on the stem;
- 6 cm caliper or greater if deciduous;
- 2.5 metres in height or greater if coniferous;
- free of pest and disease;
- free of pernicious weeds in the root ball;
- free of injury, or other defects;
- free of girdling roots.

Minimum root ball diameters for coniferous trees or as updated by the BCLS:

Height	Tall and columnar	Tall and broad
200 cm	50 cm	60 cm
250 cm	55 cm	70 cm
300 cm	70 cm	85 cm

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

Minimum root ball diameters for deciduous trees or as updated by the BCLS:

Caliper	Root ball diameter
6 cm	60 cm
7 cm	70 cm
8 cm	80 cm
9 cm	90 cm
10 cm	100 cm
12.5 cm	110 cm
15 cm	120 cm

1.6 Species Selection

After the one year establishment period the UEL will be responsible for all maintenance services of street trees and landscaping therefore, the plants must:

- tolerate local growing conditions
- have adequate space to reach its natural form at maturity
- not be prone to branch failure or wind throw
- not be susceptible to pests
- not be possessing significant nuisance problems (large nuts, allergenic properties)
- not require excessive maintenance or irrigation (beyond two years)

Tree species diversity requirements:

No. of trees in Development Project	Max % of One Genus	Max % of One Species
>100	40%	25%
50-100	50%	30%
12-49	100%	50%
1-12	100%	50%

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

1.7 Street Tree Species List

a) Large Trees

Trees over 15 metres in height and 7.5 metres in width. Suitable for boulevards with no overhead obstructions and > 3 metres of width.

Botanical Name	Common Name
Acer cappadecicum	Rubrum Colliseum Maple
Acer platanoides 'Emerald Queen'	Emerald Queen Maple
Acer rubrum' Armstrong'	Armstrong Red Maple
Liquidamber styraciflua 'Worplesdon'	Worplesdon Sweet Gum
Aesculus hippocastanum	Common horsechestnut
Aesculos x carnes briotti	Ruby Red horsechestnut
Cercidiphyllum Japonicum	Katsura
Querus rubra	Red Oak
Thuja plicata	Western Red Cedar
Cornus 'Eddie's White Wonder'	White Flowering Dogwood
Metasequois glyptostroboides	Dawn Redwood
Fraxinus americana	Autumn Purple Ash

b) Medium Trees

Trees maturing between 7.5 metres and 15 metres in height are generally suitable for situating on a blockside tree lawn one metre or greater between curb and sidewalk.

Botanical Name	Common Name
Acer Campestre 'Queen Elizabeth'	Campestre Maple
Acer Pennsylvanicum	Moosewood
Amelanchier laevis	Serviceberry 'Spring Flurry' 'Snowcloud'
Acer Rubrum	Red Maple 'October Glory' 'Autumn Blaze' or 'Autumn Flame'

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

Botanical Name	Common Name
Acer Truncatum	Truncatum Maple
Carpinus Betulus	European Hornbeam
Corylus Columna	Turkish Hazel
Davidia Involucrata	Dove Tree
Fraxinus Ornus	Flowering Ash
Gleditsia Triacanthos	Honey Locust
Magnolia Kobus (Root Stock)	Japanese Magnolia
Nyssa Sylvatica	Black Tupelo
Parrotia Persica	Persian Persica
Prunus Yedoensis 'Akebono'	Yoshino Cherries
Sorbus Alnifolia	Korean Mountain Ash

c) Small Trees

Trees maturing up to 7.5 metres in height. Suitable for locating at or below overhead electrical conductors.

Botanical Name	Common Name
Acer Griseum	Paperbark Maple
Acer Palmatum (Tree Form Varieties)	Japanese Maple
Acer Platanoides 'Globosum'	Globe Maple
Amelanchier Canadensis 'Princess Dianna'	Tree Form Service Berry
Cercis Canadensis	Eastern Redbud
Cornus Nutalli 'Eddies White Wonder'	Eddies White Wonder
Cornus Kousa 'Chinesnis' 'Satomi'	Japanese Dogwood
Crataegus Phaenopyrum'treeform'	Washington Hawthorn
Crataegus Monogyna	Singleseed Hawthorn

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

Botanical Name	Common Name
Crataegus X Lavalley	Lavalley Hawthorn
Hibiscus Syriaca	Tree Form Hibiscus
Malus X Floribunda (Disease Resistant Cultivar)	Flowering Crabapple
Magnolia Stellata	Star Magnolia
Prunus Pissardii	Pissard Plum
Styrax Japonica	Japanese Snowbell
Syringae Reticulata	Tree Lilac

d) Columnar Trees

Trees exhibiting a distinct upright branch arrangement. Suitable for locating in confined situations or on tree lawns offset from overhead electrical conductors.

Botanical Name	Common Name
Acer Nigra 'Green Column'	Black Maple
Acer Rubrum varieties	Red Maple varieties
Karpick 'bohall' , 'Scarlet Sentinel'	Upright Red Maple
Acer Freemanii	Freeman's Maples 'Scarlet Sentinel' 'Armstrong'
Carpinus Betulas 'Fastigiata'	European Hornbeam
Fagus Sylvatica 'Dawycki'	Dawycki Beech
Gingko Biloba 'Sentry' 'lakeview'	Ginko Tree (Maidenhair)
Parrotia Persica 'Vanessa'	Persian Ironwood
'Inges Ruby Vase'	Upright Parrotia

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

e) Conifers

Cone bearing trees are not generally planted on boulevards due to their low branching habit when young. Nonetheless, they are a desirable type of tree plant where space allows. Traffic medians are often suitable. Below are specified species.

Botanical Name	Common Name
Calocedrus Decurrens	California Incense Cedar
Cedrus Atalntica 'Glauca'	Blue Atlas Cedar
Cedrus Deodar 'Kashmir'	Deodar Cedar
Chamaecyparris Nootkatensis	Nootka Cypress
Pinus Nigra	European Pine
Picea Omerika	Serbian Spruce
Thuja Plicata	Western Red Cedar

f) Shrub and Ground Cover Species List

Botanical Name	Common Name	Sun/Shade Conditions
Carex aquatilis var dives	Sitka Sedge	Full Sun/Part Shade
Carex obnupta	Slough Sedge	Full Sun/Part Shade
Carex rostrate	Beaked Sedge	Full Sun
Carex stipata	Sawbeak Sedge	Full Sun
Carex tumulicola	Berkeley Sedge	Full Sun/Part Shade
Deschampsia cespitosa	Tufted Hair Grass	Full Sun/Part Shade

Within two (2) metres of a walking route or open play area, shrubs and ground cover must be less than one (1) metre tall for visibility and safety concerns. The location and selection of species must consider sightlines for safety reasons. Within six (6) metres of an intersection, shrubs and ground cover must be less than 60 cm tall.

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

g) Rain Garden Plant Species List

Botanical Name	Common Name	Sun/Shade Conditions
BOTTOM CHANNEL		
Carex aquatilis var dives	Sitka Sedge	Full Sun/Part Shade
Carex obnupta	Slough Sedge	Full Sun/Part Shade
Carex rostrate	Beaked Sedge	Full Sun
Carex stipata	Sawbeak Sedge	Full Sun
Carex tumulicola	Berkeley Sedge	Full Sun/Part Shade
Deschampsia cespitosa	Tufted Hair Grass	Full Sun/Part Shade
Eleocharis palustris	Creeping spikerush	Full Sun/Part Shade
Iris douglasiana	Douglas Iris	Full Sun
Iris missouriensis	Western Blue Iris	Full Sun
Juncus acuminatus	Tapered Rush	Full Sun/Part Shade
Juncus effuses	Common Rush	Full Sun
Juncus tenuis	Slender Rush	Full Sun
Scirpus lacustris	Hard Stemmed Bullrush	Full Sun
Scirpus Microcarpus	Small Fruited Bullrush	Full Sun/Part Shade
SHRUBS - EVERGREEN		
Blechnum spicant	Deer fern Part	Sun/Shade
Ledum groenlandicum	Labrador Tea	Full Sun
Polystichum munitum	Western Swordfern	Part Sun/Shade

Within two (2) metres of a walking route or open play area, plants must be less than one (1) metre tall for visibility and safety concerns. The location and selection of species must consider sightlines for safety reasons. Within six (6) metres of an intersection, plants must be less than 60 cm tall.

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

GROWING MEDIUM

For use in all areas of trees, shrub and ground cover planting and structural growing medium.

1.8 General Specifications

Growing medium may consist of on site or imported soil, soil substitute, or mixture whose chemical and physical properties fall within the ranges of the current BC Landscape Standard. It must be prepared to be virtually free of subsoil, non-composted manure, building materials, non-composted wood, insect or fungal pest organisms, sawdust, invasive plants seeds or viable plant parts, or other extraneous materials.

The properties of the growing medium must conform to the current BC Landscape Standard following the growing medium type designations based on level of care (level 1 to 6) and intended application (low traffic lawns, high traffic lawns, planting areas, natural areas etc.). These properties include the physical properties and make up, the chemical properties and drainage capacity.

1.9 Testing

Growing medium testing is to be conducted by an accredited commercial laboratory. The testing requirements are to conform to the current BC Landscape Standard. Testing is to be based on a sample taken within three (3) weeks of delivery to the site and be representative of the entire quantity of material being used. Results must be approved prior to delivery of the material. Material delivered to site that is not in conformance with the BC Landscape Standard must be rejected and required to be removed from site.

1.10 Maintenance

The developer is responsible for maintaining the trees one year after substantial completion and for watering the trees up to two years following substantial completion. During the one year of maintenance, the contractor will replace any plant material that has died or failed to grow satisfactorily and cut back vegetation that encroaches on sidewalks, driveways, trails and roadways and prevents sightlines at intersections.

PROTECTING STREET TREES DURING DEVELOPMENT/CONSTRUCTION

1.11 Boulevard Trees

Street trees may not be removed, pruned, moved, or otherwise impaired, interfered with, or injured without prior approval from the UEL Manager. Should there be a conflict with a street tree and the normal enjoyment of one's property, or a permitted activity, the UEL Manager will determine if corrective action is warranted.

Only arborists authorized by the UEL may prune or remove street trees.

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

1.12 Site and Construction Planting

Development drawings must have all street trees marked on the site plan, as well as any street trees within 2 metres on either side of the property line. The drawing shall show which trees are to be retained, removed or replaced (where relevant) and the location of barrier fencing to protect trees.

Site access must be planned with consideration of avoiding conflicts with street trees. Alternate access routes may be required to protect street trees. All street trees adjacent to a construction zone are to be protected with barrier fencing that surrounds the root zone.

Soil compaction reducing techniques such as weight displacement plates or thick wood mulch (20 – 30 cm) may be required by the UEL if the street tree rooting area is likely to be affected by vehicular movement.

Temporary storage sites of construction material or soil must be as far from neighbouring trees as possible.

The location of all underground services must be marked on the development drawings. Alignments must be outside of the required protection zone, and as far as possible from large trees.

The applicant may not alter the existing grade within the drip line of a street tree, except to raise the grade by no more than:

- i. five centimetres within a one metre circumference around the trunk, and
- ii. a further five centimetres between the one metre circumference and the circumference of the drip line of the tree.

1.13 Pruning

If branches unavoidably obstruct work activities, or if they are in such proximity that they are likely to be damaged, then pruning can be arranged. The UEL Manager, in conjunction with a representative of the applicant, will determine the most appropriate action. Small alterations can be made at the time of visit; more significant pruning work, or tree removal work where warranted, can be arranged at that time. Work that would not otherwise be done by the UEL is charged to the applicant.

1.14 Tree Removal

Street trees are to be retained and protected during construction. Street trees may only be removed with the approval of the UEL Manager. If a developer wishes a tree to be removed an application to do so must be made to the UEL. Such an application may require, at the sole

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

discretion of the UEL Manager, a report certified by a professional arborist registered to practice in British Columbia stipulating either:

- the tree is dead, dying or diseased;
- or is of a species; or in a location determined to be a public nuisance; or
- prevents essential construction activities that cannot be completed without its removal; and
- provide recommendations for suitable replacement(s), including the stipulation of size, species, number and location.

The applicant must pay the removal and replacement costs of trees that would otherwise be retained by the Manager, as well as the appraised monetary value of the lost tree. The Plant methodologies outlined in the 'Plant Appraisers Handbook' (9th edition) and the 'Species Ratings for landscape tree appraisal' (PNW – ISA, 2007) will be the resource materials used.

1.15 Protective Barriers

Street trees can be damaged or destroyed from lack of accommodation during the demolition / construction process. The usefulness of soil to a tree can be permanently reduced by the compacting forces caused by vehicle / equipment passage or material storage – even one occurrence. One of the preventative measures to be taken, in compliance with the permitting process, is the installation of tree protection barriers. These temporary enclosures are intended to cordon off the most critical parts of the tree system - its branches, main stem, root system and surrounding topsoil from work activities.

Before a person commences demolition, excavation, or construction on a site, the owner of the site must install a protection barrier around all boulevard trees between the extension of the two side property lines across the boulevard; or within two metres on either side of these lines. The barriers must meet any relevant BCSLA standards.

1.16 Installation

A protection barrier must have the following attributes:

- is at least 1.2 metres high measured from the ground, mounted on steel or sturdy wooden posts. Fence posts must be installed no farther than 2.4m apart.
- distance of barrier from a tree trunk, measured parallel to curb and 1.4m above grade of the ground is as follows:

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

MINIMUM PROTECTION REQUIRED – parallel to curb

Trunk Diameter	Distance from Trunk
20 cm	1.2 metres
25	1.5
30	1.8
35	2.1
40	2.4
45	2.7
50	3.0
55	3.3
60	3.6
75	4.5
90	5.0
100	6.0

The distance of a barrier near the edge of a tree to near the edge of a curb, measured at right angles to the curb, is 0.6 metres. The distance of a barrier near the edge of a tree to near the edge of a sidewalk, measured at right angles, is 0.3 metres. In situations where the curb or sidewalk is absent, the roadside edge of the grass boulevard will substitute as the curb edge.

The barrier will extend back to the outer edge of the boulevard (p/l), or for the same distance as used parallel to the curb, as specified above, whichever is less. The barrier consists of snow fencing fastened securely to the metal or wood stakes spaced no more than one metre apart, or other fencing acceptable to the UEL Manager.

1.17 Exceptions

The perimeters or heights of these barriers may be adjusted, with the prior approval of the UEL Manager to ensure that site lines to fire hydrants and crosswalks are not obstructed.

SCHEDULE C
UNIVERSITY ENDOWMENT LANDS
SUPPLEMENTARY SPECIFICATIONS FOR
BOULEVARD TREES AND LANDSCAPING

1.18 Maintenance

The tree protection barrier must be in place before any land clearing/alteration, utility removal or installation, or building demolition or construction begins. It must remain in place until building completion.

The tree protection barrier may not be removed, or altered, for any period of time, no matter how short the duration, without the authorization of the UEL Manager. No vehicles may pass through this protection area, so no soil disturbance may occur.

The permittee must repair any damage to the barrier, in a timely manner.

No materials or soil, of any kind, may be stored on top of, or within the perimeter of the tree protection barrier; for any period of time no matter how short the duration.

BOULEVARD/SIDEWALK MAINTENANCE POST-CONSTRUCTION

All residents are responsible for maintaining the sidewalks, boulevards and street gutters that front their property; which includes:

- Clearing the sidewalk of snow by 10:00 a.m. on the morning following a snowfall, seven days a week;
- Mowing the grass;
- Removal of garbage/litter;
- Maintenance of any landscaped areas (i.e. planted bulges); and
- Clearing any lawn basins or catch basins of leaves and debris.

SCHEDULE D
UNIVERSITY ENDOWMENT LANDS
Standard Form for Works and Services Agreement

THIS AGREEMENT made this _____ day of _____.

BETWEEN:

THE PROVINCE OF BRITISH COLUMBIA

(Represented by the Manager of the University Endowment Lands)

OF THE FIRST PART

AND:

[NAME OF OWNER]

(the "Owner")

OF THE SECOND PART

WHERE AS:

- A. The Owner is the registered owner of those lands on the University Endowment Lands ("the UEL") legally described as *[insert legal description]* (the "**Lands**").
- B. The UEL Works and Services Bylaw 2016, 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 as generally shown on the draft subdivision *[or, development]* plan attached as Schedule "A" to this Agreement, and has under section 509 of the *Local Government Act*, R.S.B.C., 1996, c. 323 requested the Manager of the UEL ("the Manager") to enter into this Agreement in order to enable the Approving Officer to approve the subdivision *or the Manager to issue the building permit and/or a Development Permit* before the construction and installation of all works and services required by the "UEL Works and Services Bylaw 2016".
- D. The Owner has agreed to grant and transfer to the Province all its right, title and interest in and to the works and services required to be constructed and installed pursuant to the UEL WORKS AND SERVICES Bylaw 2016 and the Province has agreed to accept such transfer of the works and services and grants of statutory rights of way on the terms set out in this Agreement.

NOW THEREFORE in consideration of the mutual promises contained in this Agreement and in consideration of the Province, represented by the Manager, entering into this Agreement to

SCHEDULE D
UNIVERSITY ENDOWMENT LANDS
Standard Form for Works and Services Agreement

allow the construction and installation of the works and services after the approval of the subdivision of the Lands, [*or, after the issuance of the building permit for the development of the Lands*] the Owner covenants and agrees with the Province as follows:

Part 1 - Definitions

(1) In this Agreement:

"complete" or **"completion"** with respect to the works and services means completion to the satisfaction of the Manager evidenced by the certificate under section 18(b) of this Agreement;

"Manager" means the Manager of the UEL as appointed by the Minister pursuant to the *University Endowment Lands Act* and any Provincial employee authorized to act on the Manager's behalf;

"works and services" means all those works and services required to be provided in connection with the subdivision [*or development*] of the Lands under the "UEL Works and Services Bylaw 2016" and, without limitation, includes those works and services described in the design and construction drawings that are listed in Schedule "B" to this Agreement (the "Approved Drawings"), or at the discretion of the Manager described in text on Schedule "B".

(2) All other words and expressions used in this Agreement that have a defined meaning under the UEL Works and Services Bylaw 2016 shall have the same meaning as under that bylaw. This Agreement is Schedule "D" to, "UEL Works and Services Bylaw 2016".

Part 2 - Owner's Covenants

(3) The Owner covenants and agrees:

- (a) to install, construct and complete the works and services;
- (b) that as security for the due and proper performance by the Owner of all of the covenants, agreements and obligations of the Owner under this Agreement, the Owner has deposited with the Manager a letter of credit in the sum of \$[*amount*] (the "Security");
- (c) that the Security, less the amount required by section 12(c) of this agreement to be maintained during the Warranty Period (as defined in section 12 herein), will only be returned to the Owner upon full completion of the Works in strict conformance with this Agreement; and
- (d) that no interest on Security shall be paid to the Owner.

(4) The Owner covenants and agrees:

- (a) that the Owner, except as exempted by the Manager, has engaged a professional engineer to carry out the survey, design and field inspection of

SCHEDULE D
UNIVERSITY ENDOWMENT LANDS
Standard Form for Works and Services Agreement

the works and services (other than any landscaping work), to lay out and supervise the construction and installation of the works and services, and to prepare and certify as-built drawings of the works and services as the engineer of record, all in conformity with the standards and specifications required by the UEL Works and Services Bylaw 2016 (the "Specifications") and all other requirements of the aforesaid Bylaw; and

- (b) that the Owner, except as exempted by the Manager, has caused the professional engineer to deposit with the Manager a letter, signed by the professional engineer, outlining the scope of the professional engineer's engagement, including:
- i. the schedule of inspection of the works and services to be undertaken by the professional engineer;
 - ii. the professional engineer's assurance that the works and services have been designed in accordance with the Specifications;
 - iii. professional certification of all design and construction drawings for the works and services;
 - iv. that the professional engineer will certify and submit as-built drawings for the works and services;
 - v. a statement that the professional engineer has read and understands the requirements of all University Endowment Lands Bylaws that apply to and govern the works and services, and also including a written assurance satisfactory to the Manager that the professional engineer has and will maintain professional liability and errors and omissions insurance of not less than \$1,000,000 per occurrence.
- (5) The Owner must cause the professional engineer or if approved by the Manager, the contractor doing the work, to supervise the construction and installation of the works and services, including by way of sufficient on-site inspections, in such a manner as to ensure that the works and services are constructed and installed strictly in accordance with the Specifications. The Owner must not construct the works and services or any part of them except under the supervision of the professional engineer or under supervision of the Manager's employees.
- (6) Without limiting the generality of section 5, "sufficient on-site inspections" means a minimum of one site visit per day, or such inspections as the Manager agrees are sufficient to ensure the works and services are constructed in accordance with good engineering practice, during construction and installation of the works and services. The Owner shall cause the professional engineer or contractor as the case may be to maintain daily inspection reports and to provide such daily inspection reports to the Manager upon request.
- (7) The Owner must immediately notify the Manager of any severance of the Owner's engagement of the professional engineer or landscape professional, or any contractor

SCHEDULE D
UNIVERSITY ENDOWMENT LANDS
Standard Form for Works and Services Agreement

approved by the Manager that occurs during the course of the design or construction of the works and services, and must provide the Manager with a letter signed by the new professional engineer or landscape professional or contractor approved by the Manager retained in their place, outlining the scope of that professional's engagement pursuant to Section 4(b) of this Agreement.

- (8) The Owner further covenants and agrees that the Owner has retained a landscape professional or Contractor approved by the Manager to carry out the design and field inspection of any landscaping work that is required as part of the works and services, and that the requirements of sections 4 to 7 of this Agreement, so far as they refer to the role and function of the professional engineer, or contractor shall with the necessary changes apply to the role and function of the landscape professional in respect of the design and construction of that landscaping work.
- (9) In carrying out the works and services the Owner covenants and agrees:
- (a) not to commence the construction or installation of the works and services without first advising the Manager in writing at least five days before commencement;
 - (b) to construct, install and complete the works and services in accordance with the Specifications, the Approved Drawings or text and in conformance with all other requirements of the UEL Works and Services Bylaw 2016, all at the Owners sole expense;
 - (c) to obtain the prior written approval of the Manager for any changes to the Approved Drawings; or text describing the approved works;
 - (d) to comply with any changes to the Approved Drawings or text description of the Works required by the Manager as may be necessary to satisfy the Manager that the works and services will function and operate in a manner satisfactory to the Manager;
 - (e) to pay the cost of all necessary connections of the works and services to the University Endowment Lands water distribution, storm drainage and sewerage systems and other services as the case may be, and to pay all costs and fees incurred by the UEL to pay any other service provider whether public or private to permit the UEL to connect to existing services of such entities;
 - (f) not to damage any works, services or property of the UEL, 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 reasonable satisfaction of the Manager;
 - (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 UEL;

SCHEDULE D
UNIVERSITY ENDOWMENT LANDS
Standard Form for Works and Services Agreement

- (h) to not deposit or permit the deposit of any material or debris upon any highways or lands not owned by the Owner;
 - (i) not to employ any person or contractor in the construction of the works and services who, in the reasonable opinion of the Manager is unfit, incapable or unskilled, and at all times, in connection with the execution of the works and services, to employ and keep on site a competent general works superintendent capable of speaking, reading and writing the English language. Any explanations, directions and requests given by the Manager to the works superintendent shall be conclusively deemed to have been given to the Owner.
- (10) The Owner shall prosecute the works and services diligently without interruptions and shall complete the construction and installation of the Works and Services by [*month, day, year*].
- (11) Upon completion of the works and services, the Owner covenants and agrees:
- (a) to assign to the Province all of its right, title and interest in and to the works and services free and clear of all encumbrances;
 - (b) to grant or cause to be granted to the Province in registerable form all statutory rights-of-way reasonably required by the Manager substantially in the form provided as Schedule "E" to UEL Works and Services Bylaw 2016 for the operation, maintenance, repair and replacement of the works and services, on such terms as are satisfactory to the Manager and which must be registered in the Land Title Office in priority to all other existing charges and encumbrances charging the Lands except those in favour of the Crown;
 - (c) to execute and deliver or cause to be executed and delivered at the request of the Manager 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; and
 - (d) to deliver to the Manager final as-constructed drawings of the works and services which drawings shall be prepared by a professional engineer or by the contractor approved by the Manager in accordance with good engineering practice (and in the case of any landscaping work, which drawings shall be prepared by the landscape professional in accordance with the standards acceptable to that professional's governing body or professional association) or be in a form satisfactory to the Manager.
- (12) The Owner covenants and agrees to:
- (a) maintain the works and services by repairing any deficiencies in design, materials, operation or workmanship in the works and services that may arise for a period of one year from the issuance of the Certificate of Completion pursuant to section 18(b) of this Agreement (the "**Warranty Period**");

SCHEDULE D
UNIVERSITY ENDOWMENT LANDS
Standard Form for Works and Services Agreement

- (b) remedy any deficiencies in design, materials or workmanship appearing within the Warranty Period and pay for any damage to other works or property resulting therefrom, save and except for defects caused by reasonable wear and tear, or by the negligence of the Province, its servants or agents; and
 - (c) keep deposited with the Manager throughout the Warranty Period, the sum of 15% of the initial Security, or \$10,000.00, whichever is greater, by letter of credit which monies the Manager may expend on default by the Owner of its obligations during the Warranty Period.
- (13) The Owner agrees that the Manager may upon written notice to the Owner, given before the issuance of the Certificate of Completion under section 18(b) of this Agreement, increase the Warranty Period to a period the Manager considers reasonable, given the nature of the works and services, but in any event not to exceed three years.
- (14) The Owner shall release, and does hereby indemnify and save the Province 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 services 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 Province;
 - (b) all costs and expenses incurred by the Province arising directly or indirectly from any engineering operation, constructions, repair, replacement or maintenance by the Province to or on any real or personal property which is affected by the works and services which the Province either owns or is by duty or custom obliged, directly or indirectly to construct, repair, replace or maintain; and
 - (c) all expenses and costs incurred by reason of liens for non-payment of labour or material, workers' compensation assessments, unemployment insurance, federal or provincial tax in relation to works and services and for unlawful encroachments by the works and services.
- (15) The Owner shall take out and maintain at all times from commencement of construction and installation of the works and services until the Manager issues a Certificate of Acceptance, insurance at its sole expense. Such insurance shall include comprehensive general liability insurance 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 services and in performing its obligations under this Agreement. Such insurance shall name the Province as an additional insured and shall contain a cross-liability or severability of interest clause so that the Province 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 \$5,000,000.00 combined single limit or such other amount as the Manager may reasonably require. The Owner shall

SCHEDULE D
UNIVERSITY ENDOWMENT LANDS
Standard Form for Works and Services Agreement

provide to the Manager proof in writing of such insurance before commencing the works and services 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 Province 30 days prior written notice before any alteration of or cancellation of the policy shall be effective.

- (16) The Owner acknowledges and agrees that the Owner relies exclusively on its own professional engineers, landscape professionals and contractors and that the Province does not, by its approvals, inspections or acceptance of the works and services, warrant or represent that the works and services are without fault or defect and that all approvals and inspection of the works and services given or made by the Province are for the sole benefit of the Province and shall in no way relieve or excuse the Owner from constructing and installing the works and services in strict compliance with the provisions of this Agreement.
- (17) The Owner acknowledges and agrees that the Province makes no representation or warranty as to the subsurface soil conditions within the area in which the works and services are to be constructed, including any road allowance or road right of way (collectively, the "**Works Area**"). Without limiting the foregoing, the Province makes no representation or warranty as to whether the soil or groundwater within the Works Area contains any contaminant, waste, special waste or any other prescribed substance in a quantity or concentration that exceeds the standards permitted under the provisions of the *Environmental Management Act*, or any regulation thereunder including the *Contaminated Sites Regulation*, or any enactment or regulation that may replace municipal, regional, provincial or federal (collectively, the "**Environmental Laws**"). The Province will not be responsible for any costs incurred by the Owner as a result of the presence of any such contaminant, waste, special waste, prescribed substance or other soil or groundwater contamination within the Works Area, including without limitation any costs associated with delays in proceeding with the works and services, environmental consultants' fees, the cost of any permits for removal or disposal of contaminated soils or groundwater under the provisions of the Environmental Laws the removal, disposal or treatment of contaminated soil or groundwater that is required to be removed from the Works Area as a result of the work being undertaken, or any similar or related costs.
- (18) The Province covenants and agrees that:
- (a) it will permit the Owner to perform the works and services on the terms and conditions contained in this Agreement and to occupy and use Provincial highways and lands of the Province as necessary for the construction of the works and services subject to such terms and conditions as the Manager may impose from time to time;
 - (b) it will issue a Certificate of Completion signed by the Manager upon the Owner satisfactorily completing the works and services and performing all other requirements of this Agreement except the requirements of section 12; and

SCHEDULE D
UNIVERSITY ENDOWMENT LANDS
Standard Form for Works and Services Agreement

- (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 and services constructed under this Agreement in complete repair throughout the Warranty Period, it shall provide to the Owner a Certificate of Acceptance of the works and services, signed by the Manager, together with the return of any remaining Security provided to the Province pursuant to Section 18 of the UEL Works and Services Bylaw 2016.
- (19) Nothing in this Agreement shall exempt the Owner or the Lands from the ordinary jurisdiction of any authority having jurisdiction, and without limitation the construction of the works and services 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.
- (20) Any Security provided by the Owner to the Manager must be a clean unconditional, irrevocable and automatically self-renewing letter of credit in favour of the Province issued on a Canadian chartered bank or such other provincially regulated financial institution satisfactory to the Manager (the "Issuer"). Such letter of credit must be maintained as good and valid security by the Owner at all times as required by this Agreement. The Manager may draw down on the letter of credit at any time the owner is default under this Agreement by presenting the letter of credit at any branch in Vancouver of the issuer of the letter of credit, and the Province may make such presentment without providing any reason or proof of default of the Owner. If at any time the Issuer should decide not to renew the letter of credit on the date of its automatic renewal, the issuer must give 30 clear days written notice to the Manager of such intention.
- (21) 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 Province 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 or any highway, right of way or other place where the works and services are to be constructed, and do or cause to be done through its servants, contractors and others, all such things as may be required to fulfil the obligations of the Owner including without limitation, the completion of the works and services;
 - (b) make any payments required to be made for and on behalf of the Owner;
 - (c) retain the services of a professional engineer or landscape professional to inspect the works and services in order to determine whether they have been constructed in accordance with the requirements of this Agreement;

SCHEDULE D
UNIVERSITY ENDOWMENT LANDS
Standard Form for Works and Services Agreement

- (d) and for such purposes may without notice or limitation deduct from the Security all costs, and expenses incurred, payment and expenditures made, and monies due and owing to the Province.
- (22) If the Province incurs any costs and expenses or makes payments as either provided in section 21 of this Agreement or otherwise in this Agreement, or if the Owner is otherwise indebted to the Province under this Agreement, and the Security is not sufficient to fully recompense the Province, the Owner shall forthwith upon notice from the Manager pay to the Province the amount of such deficiency together with interest thereon at the then annual prime rate of interest charged by the Royal Bank of Canada plus 2%, calculated and compounded monthly from the date such cost or expense was incurred or payment or expenditure was made by the Province. Such amounts required to be paid by the Owner shall constitute a debt due and owing to the Province.
- (23) Wherever in this Agreement the approval of the Manager is required or some act or thing is to be done to the satisfaction of the Manager:
- (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 and no prior approval or expression of satisfaction and no condoning, excusing or overlooking by the Manager 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 sole discretion of the Manager acting reasonably in conformance with sound and accepted public municipal engineering practice.
- (24) 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.

Part 3 - Time

- (25) Time shall be of the essence of this Agreement.

Part 4 - General

- (26) Nothing in this Agreement shall be interpreted as creating an agency, partnership or joint ventureship amongst or between the parties.
- (27) The Province has made no representations, warranties, guarantees, promises, covenants or agreements to or with the Owner other than those set out in this Agreement.
- (28) No amendment to this Agreement is valid unless in writing and executed by the parties.

SCHEDULE D
UNIVERSITY ENDOWMENT LANDS
Standard Form for Works and Services Agreement

- (29) This Agreement will inure to the benefit of and be binding upon the parties and their respective heirs, administrators, executors, successors, and permitted assignees.
- (30) The waiver by a party of any failure on the part of the other party to perform in accordance with any of the terms or conditions of this Agreement is not to be construed as a waiver of any future or continuing failure, whether similar or dissimilar.
- (31) Any headings in this Agreement are inserted for convenience and reference only and in no way define, limit or enlarge the scope or meaning of this Agreement or any provision of it.
- (32) Wherever the singular, masculine and neuter are used throughout this Agreement, the same is to be construed as meaning the plural or the feminine or the body corporate or politic as the context so requires.
- (33) No remedy under this Agreement is to be deemed exclusive but will, where possible, be cumulative with all other remedies at law or in equity.
- (34) If any section or provision of this Agreement is found to be invalid by a court of competent jurisdiction, the invalid section or provision shall be severed and the invalidity of such section or provision shall not affect the validity of the remainder of this Agreement.
- (35) This Agreement is to be construed in accordance with and governed by the laws applicable in the Province of British Columbia.

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

[MANAGER] by its authorized signatories this)
_____ day of _____, 20__)
)
_____)
)
)
_____)

SCHEDULE D
UNIVERSITY ENDOWMENT LANDS
Standard Form for Works and Services Agreement

[NAME OF OWNER] by its authorized
signatories this _____ day of _____, 20____)
_____))
_____))
Name: _____))
_____))
Name: _____))
_____)

SCHEDULE D
UNIVERSITY ENDOWMENT LANDS
Standard Form for Works and Services Agreement

Schedule "A"
Subdivision [or Development] Plan

SCHEDULE D
UNIVERSITY ENDOWMENT LANDS
Standard Form for Works and Services Agreement

Schedule "B"

List of Approved Drawings
Filed by the Owner with the Manager

SCHEDULE E
Standard Form for Statutory Right of Way

WHERE AS:

- A. The Transferor is the registered owner in fee simple of the following land in the Province of British Columbia: (the "**Lands**")
- B. The Transferee is Her Majesty the Queen in the Right of the Province of British Columbia:
- C. This Right of Way is necessary for the operation and maintenance of the Transferee's undertaking as described in Recital D; and
- D. To facilitate the installation of a system of waterworks/sewerage works/drainage works including all related pipes, valves, fittings, facilities, equipment, power lines, wires, pumps, building, kiosks, treatment plants, signage, outfalls, culverts and appurtenances, and paths and vehicular access ways and (the "**Works**"), the Transferor has agreed to permit the construction by the Transferee of the Works on a portion of the Lands and to grant for that purpose the Right of Way in Section 1.1.

NOW THEREFORE, in consideration of the sum of One (\$1.00) Dollar of lawful money of Canada, now paid by the Transferee to the Transferor (the receipt and sufficiency of which is now acknowledged by the Transferor), and in consideration of the covenants and conditions agreed to be observed and performed by the parties and for other valuable consideration:

1.0 THE TRANSFEROR:

- 1.1 Pursuant to Section 218 of the *Land Title Act*, hereby grants, conveys, confirms and transfers, in perpetuity, to the Transferee the full, free and uninterrupted right, license, liberty, privilege, easement, permission and right of way to lay down, install, erect, construct, entrench, operate, maintain, repair, inspect, alter, remove, replace, bury, cleanse, string, and otherwise establish one or more systems of Works or access ways upon, over, under and across that part of the Lands shown outlined in bold on the Statutory Right of Way Plan prepared by _____ BCLS, and filed in the Land Title Office under Plan No. _____ (the "**Right of Way**");
- 1.2 Covenants and agrees to and with the Transferee that the Transferee may enter upon the Right of Way
 - (a) for itself and its agents, workers, contractors and all other licensees of the Transferee;
 - (b) together with machinery, vehicles, equipment, and materials;
 - (c) upon, over, under and across the Right of Way;
 - (d) as may be necessary, useful, or convenient for the purposes in Section 1.1;

SCHEDULE E
Standard Form for Statutory Right of Way

and

- (e) in connection with the operations of the Transferee in relation to the Works be entitled at all times to enter, use, pass and repass, labour, construct, install, remove soil or other surface, of subsurface materials and clear tress, growth, vegetation, buildings, or obstructions now or hereafter in existence upon, over, under, and across the Right of Way be entitled at all times to enter, use, pass and repass, labour, construct, erect, install, dig, carry away soil or other surface or subsurface materials, and clear of all trees, growth, buildings or obstructions now or hereafter in existence upon, over, under and across the Right of Way;
- 1.3 Grants, conveys, confirms and transfers unto the Transferee for itself, and its employees, agents, workers, contractors and all other licensees of the Transferee together with machinery, vehicles, equipment and materials, the right at all times to enter upon and to pass and repass over such of the Lands of the Transferor as may reasonably be required for the purpose of ingress to and egress from the Right of Way;
- 1.4 Transfers, assigns and conveys to the Transferee all right, title and interest in and to any Works that the Transferee, or the Transferor have prior to this Agreement established or constructed or maintained or operated within the Right of Way or in relation to any similar Works previously constructed by any party whatsoever within the Right of Way;
- 1.5 Grants unto the Transferee the license, permission, easement and Right of Way to lay down, install, erect, construct, operate, maintain, repair, inspect, alter, remove, replace, cleanse, string, and otherwise establish one or more temporary systems of works upon the Lands of the Transferor, in the event of a breakdown or malfunction of the Works.
- 2.0 THE TRANSFEROR COVENANTS:**
- 2.1 To not itself or to permit or allow any other person, to erect, place, install or maintain any building, structure, addition to a building or structure, mobile home, paved driveway or patio, pipe, wire or other conduit on, over or under any portion of the Right of Way within 3 metres of the Works;
- 2.2 Not to do anything that in any way interferes with or damages or prevents access to or is likely to cause harm to the Works installed in or upon the Right of Way;
- 2.3 Not to do, or knowingly permit or allow to be done, any act or thing which, in the opinion of the Transferee, will interfere with or injure the Works and in particular, without limitation, will not carry out any blasting on the Right of Way without the consent in writing of the Transferee, which consent shall not be unreasonably withheld;
- 2.4 Not to substantially add to or diminish the soil cover over any of the Works installed in the Right of Way and in particular, without limitation, will not construct open drains or ditches along or across any of the Works installed in the Right of

SCHEDULE E
Standard Form for Statutory Right of Way

Way without the consent of the Transferee, which consent shall not be unreasonably withheld;

- 2.5 From time to time and at all times at the reasonable request and at the cost of the Transferee to do and execute or cause to be made, done or executed any further and other lawful acts, deeds, things, devices, conveyances and assurances in law required to ensure the Transferee of its rights under this Agreement; and
- 2.6 To permit the Transferee to peaceably hold and enjoy the rights hereby granted.

3.0 THE TRANSFEEE COVENANTS:

- 3.1 As soon as weather and soil conditions permit, and as often as it may exercise this right of entry to the Right of Way, to replace the surface soil as nearly as may be reasonably possible to the same condition as it was prior to the entry, in order to restore the natural drainage to the Lands. This shall not require the Transferee to restore any trees or other surface growth, but the Transferee shall leave the Lands in a condition which will not inhibit natural regeneration of that growth;
- 3.2 As far as reasonably possible, to carry out all work in a proper and workmanlike manner so as to do as little injury to the Lands as possible;
- 3.3 To make good at its own expense damage or disturbance which may be caused to the Lands in the exercise by the Transferee of its rights under this Agreement except as permitted under this Agreement;
- 3.4 As far as reasonably possible, to restore any fences, lawns or flower beds, at its cost as nearly as may be reasonably possible to the same condition that they were in prior to any entry by the Transferee upon the Lands.

4.0 THE PARTIES COVENANT TO AND AGREE WITH EACH OTHER, as follows:

- 4.1 No right herein granted to or reserved by the Transferee shall require the Transferee to clear, repair or maintain the Works or the Right of Way unless the Transferee is expressly required herein to perform such cleaning, repairing or maintenance;
- 4.2 If the Transferor defaults in observance or performance of its obligations hereunder, the Transferee, after 10 days prior written notice to the Transferor specifying the default and at any time in case of emergency, may (but is not obligated to) rectify the default, and the Transferor shall pay to the Transferee, on demand, its reasonable costs in connection with so rectifying;
- 4.3 The Transferor shall, after execution hereof by it at the expense of the Transferor, do or cause to be done all acts necessary to grant priority to this Agreement over all financial charges and encumbrances which are registered, or pending registration, against the Title to the Lands in the Land Title Office save and except those as have been specifically approved in writing by the Transferee or have been granted in favour of the Transferee;

SCHEDULE E
Standard Form for Statutory Right of Way

- 4.4 Waiver of any default by either party shall not be deemed to be a waiver of any subsequent default by that party;
- 4.5 Whenever this Agreement creates a power or obligation of the Transferee to make a decision or to exercise any contractual right or remedy, the Transferee may do so in accordance with the provisions of this Agreement and no public law duty, whether arising from the principles of fairness or the rules of natural justice, shall have any application;
- 4.6 Notwithstanding anything herein contained, the Transferee reserves all rights and powers of expropriation otherwise enjoyed by the Transferee;
- 4.7 Nothing contained or implied in this Agreement will derogate from the obligations of the Transferor under any other agreement with the Transferee or prejudice or affect the Transferee's rights, powers, duties or obligations in the exercise of its functions under all public and private statutes, by-laws, orders and regulations, which may be as fully and effectively exercised in relation to the Lands as if this Agreement had not been executed and delivered by Transferor and the Transferee;
- 4.8 In spite of any rule of law or equity to the contrary, the Works brought on to, set, constructed, laid, erected in, upon or under the Right of Way by the Transferee shall at all times remain the property of the Transferee, even if the Works are annexed or affixed to the freehold, and the Works shall at any time and from time to time be removable in whole or in part by the Transferee;
- 4.9 In the event that the Transferee abandons the Works or any part of them, by giving written notice to the Transferor of such abandonment, the Transferee may, if it so elects, leave the whole or any part of the Works in place and if so abandoned the Works, or part thereof, shall become the property of the Transferor;
- 4.10 No part of the title in fee simple to the Lands of the Transferor shall pass to or be vested in the Transferee under or by virtue of this Agreement and the Transferor may fully use and enjoy all of the Lands of the Transferor subject only to the rights and restrictions in this Agreement;
- 4.11 If any section, subsection, sentence, clause or phrase in this Agreement is for any reason held to be invalid by the decision of a court of competent jurisdiction, the invalid portion shall be severed and the decision that it is invalid shall not affect the validity of the remainder of the Agreement;
- 4.12 This grant of statutory right of way shall attach to and run with the Lands and each and every part to which the Lands may be divided or subdivided whether by subdivision plan, strata plan or otherwise howsoever;
- 4.13 The Transferor acknowledges that (a) these Covenants are enforceable against the Transferor and his successors in title, but (b) the Transferor is not personally liable for breach of these Covenants where such liability arises by reason of an act or omission occurring after the Transferor named herein or any future owner

SCHEDULE E
Standard Form for Statutory Right of Way

ceases to have a further interest in the Lands;

- 4.14 If at the date hereof the Transferor is not the sole registered owner of the Lands of the Transferor, this Agreement shall nevertheless bind the Transferor to the full extent of his interest therein, and if he acquires a greater or the entire interest in fee simple, this Agreement shall likewise extend to such after-acquired interests;
- 4.15 Where the expression "Transferor" includes more than one person, all covenants made by the Transferor shall be construed as being several as well as joint with respect to all persons constituting the Transferor;
- 4.16 This Agreement shall continue to benefit and be binding upon the Transferor and Transferee, and their respective heirs, administrators, executors, successors and permitted assigns, as the case may be;
- 4.17 This Agreement will be governed and construed according to the laws of the Province of British Columbia.

5.0 PRIORITY AGREEMENT

- 5.1 AB*, as the registered holder of a charge by way of(mortgage, leasehold or other charge) * against the within described property, which said charge is registered in the Land Title Office at New Westminster British Columbia, under number *xxxxxxx, for and in consideration of the sum of One Dollar (\$1.00) paid by the Transferee to the said Chargeholder (the receipt whereof is hereby acknowledged), agrees with the Transferee, its successors and assigns, that the within Right of Way shall be an encumbrance upon the within described property in priority to the said charge in the same manner and to the same effect as if it had been dated and registered prior to the said charge.

The Transferor and Transferee acknowledge that this Agreement has been duly executed and delivered by the parties executing Forms C and D attached hereto.

SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
BLOCK F PUBLIC REALM SPECIFICATIONS
(Added by Ministerial Order M453, November 16, 2016)

TABLE OF CONTENTS

1. GREEN BUILDING REQUIREMENTS	2
2. ACOUSTIC REQUIREMENTS	2
3. ENVIRONMENTAL CONSIDERATIONS	2
4. WATER DISTRIBUTION AND FIRE PROTECTION	2
5. SANITARY SEWER.....	2
6. STORMWATER REQUIREMENTS.....	2
7. ROADS.....	4
7.1 Parking	4
7.2 Trails.....	4
8. STREET LIGHTING AND UTILITIES	4
9. INFRASTRUCTURE PHASING	4
10. PLANTING AND LANDSCAPING	5
10.1 Native Riparian Restoration	5
10.2 Preparation for planting.....	5
10.3 Tree Planting	6
10.4 Root Barrier	6
10.5 Protection	7
10.6 Tree Placement	7
10.6.1 Spacing.....	7
10.7 Tree and Plant Stock	8
10.8 Species List	9
10.8.1 Tree Species List	9
10.8.2 Shrub and Ground Cover Species	10
10.8.3 Rain Garden Plant Species.....	10
10.9 Growing Medium.....	11
10.9.1 General specifications.....	11
10.9.2 Testing.....	11
10.10 Maintenance	11
11. LANDSCAPING FURNITURE.....	11
12. FIGURES.....	11

SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
BLOCK F PUBLIC REALM SPECIFICATIONS

1. GREEN BUILDING REQUIREMENTS

All buildings within Block F shall be designed to be adaptable to allow for future connection to a neighbourhood energy utility. The owner may use the requirements for “District Energy-Ready Buildings” as a guide that are outlined in the UBC Neighbourhood District Energy System’s document titled Design Guide for Compatibility with District Energy. This document can be found at the following website:

<http://planning.ubc.ca/sites/planning.ubc.ca/files/images/planning-services/forms-documents/UBC%20DE%20Compatibility%20Guide%20FINAL%20v1%5B5%5D.pdf>

2. ACOUSTIC REQUIREMENTS

All buildings must be designed in accordance with the noise control considerations outlined in the Block F Design Guidelines and an acoustical study shall be completed and submitted with every development permit application.

3. ENVIRONMENTAL CONSIDERATIONS

All parcels must submit the following with any building permit application:

- Nesting survey as per the Wildlife Act (1996) and Migratory Birds Convention Act (1994);
- Construction traffic management plan;
- Erosion and sediment control plan;
- On-site survey of species at risk, including red and blue listed species as per the BC List Status and;
- Tree protection and management plan.

4. WATER DISTRIBUTION AND FIRE PROTECTION

A water distribution system must be designed and constructed by the owner as per attached **Figure CSP-3** and in accordance with the specifications outlined in the University Endowment Lands’ Works and Services Bylaw.

Buildings of combustible construction which are 5 or 6 storeys in building height are required by the Fire Department to have:

- Standpipes installed progressively; and
- A construction fire safety plan prepared by a fire protection professional and acceptable to the Fire Chief that addresses protection of adjacent buildings.

5. SANITARY SEWER

A gravity sanitary sewer system must be designed and constructed by the owner as per attached **Figure CSP-1** and in accordance with the specifications outlined in the University Endowment Lands Works and Services Bylaw.

6. STORMWATER REQUIREMENTS

Stormwater is the element of runoff that is generated by human activities. When vegetation and soils are replaced with roads and buildings, less rainfall infiltrates into the ground, less gets taken up by vegetation and more becomes surface runoff. The result is stormwater runoff that

SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
BLOCK F PUBLIC REALM SPECIFICATIONS

increases the flow volume and peak flow rates and causes erosion in downstream water courses.

Implementing a stormwater best management practices (BMP) strategy that will infiltrate, evapotranspire, reuse, and detain stormwater runoff will reduce the volume and rate of stormwater entering the drainage system. This tactic will subsequently reduce erosion in downstream water courses.

Stormwater runoff rates, volume and quality requirements must fully meet the following standards:

- Reduce post-development flow (volume, shape and peak instantaneous rates) to pre-development levels for the 6-month, 24 hour and the 5-year, 24 hour precipitation events.
- Retain the 6-month, 24 hour post-development volume from impervious areas on-site and infiltrate into ground. If infiltration is not possible, the rate of discharge from the "volume reduction BMPs" will be equal to the calculated release rate of an infiltration system.
- Collect and treat the volume of the 24-hour precipitation event equaling 90% of the total rainfall from impervious areas with suitable BMPs.

A gravity stormwater system must be designed and constructed by the owner as per attached **Figures CSP-2** and **SWMP 1** and in accordance with the specifications outlined in the University Endowment Lands Works and Services Bylaw.

Upon completion of the Development of Block F the owner must commence monitoring stormwater out of those lands on Block F identified on the Figures annexed to this Schedule "F" as "Wetlands" for flow rates and water quality pursuant to a monitoring plan approved by the Manager of the UEL, and for that purpose the owner must install flow and water quality measuring devices in and around the Wetlands of a type and manufacture approved by the Manager; and

ii) for a period of at least two consecutive years following the installation of the water flow and quality devices monitor the flow and quality of the water entering and leaving the Wetlands to ensure that flows and quality meet the design criteria and standards set out in the "University Endowment Lands Works and Services Bylaw 2016" and any applicable standards and requirements stipulated by Fisheries and Oceans Canada. Monitoring must be continued annually until the design criteria and standards for both flow and quality have been met for two consecutive years.

iii) in each year that the required monitoring of water continues, provide to the Manager records of water flows and quality certified as accurate by a Registered Professional Engineer or Biologist, and also certified by the same professional that the recording of flows and water quality were undertaken pursuant to the proper methodology required by the manufacturer of the recording devices. Monitoring shall continue until in two consecutive years the certifying professional certifies that the stormwater system on the Wetlands meets the design criteria and standards for both flow and water quality.

SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
BLOCK F PUBLIC REALM SPECIFICATIONS

The Manager of the UEL may require and hold any Security provided for the construction of the Wetlands until the performance of the Wetlands is confirmed through the monitoring outlined above in Section 6 of this Schedule F.

7. ROADS

A road network must be designed and constructed by the owner as per attached **Figures CGP1** and **CSP-XS** and in accordance with the specifications outlined in the University Endowment Lands Works and Services Bylaw.

With the application of any building permit, the owner must identify loading areas and parking areas, and provide signed agreements for any areas that are to have shared use between properties.

7.1 Parking

Public parking along Acadia Road, Road A and Road B must be constructed by the owner. Supporting infrastructure for parking meters such as concrete bases shall be installed at the time of road construction.

7.2 Trails

A trail network must be designed and constructed by the owner as per the attached figures (3.7.5 and 3.7.6); and in accordance with the UEL Block F Design Guidelines, being Appendix 3 to Land Use, Building, and Community Administration Bylaw, and the detailed landscape drawings and the specifications outlined in the University Endowment Lands Works and Services Bylaw ensuring no damage to trees identified for retention. **(Amended by Ministerial Order M164, April 6, 2021)**

Trails are to be graded with a minimum cross fall of 2% and max cross fall of 5% to allow runoff into swales or stormwater management systems as required.

8. STREET LIGHTING AND UTILITIES

The owner must cause the design and construction of a utility network and street lighting system as per the attached. **Figure CSP-4** and in accordance with the Block F Design Guidelines and specifications outlined in the University Endowment Lands Works and Services Bylaw.

New street lights along University Boulevard shall be consistent with the existing light standard along University Boulevard.

9. INFRASTRUCTURE PHASING

The sequence and timing of infrastructure requirements are outlined in the Master Development Covenant for Block F being a Section 219 Land Title Act restrictive covenant in favour of the Crown charging the Block F lands. A summary of the requirements are shown in the attached **Figure CPP-1**. If there are any discrepancies between **Figure CPP-1** and the Master Development Covenant then the requirements in the Master Development Covenant govern.

SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
BLOCK F PUBLIC REALM SPECIFICATIONS

10. PLANTING AND LANDSCAPING

Planting proposals will be considered for new developments and redevelopments of land in the University Endowment Lands (UEL) when any abutting street has been built to its ultimate width, finished curbs (sidewalks if planned), and utilities located underground, if any. All buildings must be completed prior to planting in order to avoid damage to trees.

Permission is to be obtained from the UEL Manager before trees are planted on a street boulevard. Prior to the tree planting, the actual tree locations and spacing are to be approved by the UEL. This is to ensure that the proposed tree locations do not conflict with existing or planned underground utilities.

Top soil placed in boulevards for planting shall be of a minimum thickness of 450mm. Depths of growing medium for trees, planting and turf grass shall also meet the minimum requirements as outlined in the current British Columbia Landscape Standard (BCLS) as published by the British Columbia Society of Landscape Architects (BCSLA). Tree pits to meet the minimum area (volume) as identified in the BCLS.

10.1 Native Riparian Restoration

Restoration to riparian areas of the constructed wetland must be based on natural successional strategies and involve a two-phased approach. The first phase of planting will include a simple, high-density planting strategy dominated by fast-growing native primary woody plants species, including:

- Red alder (*Alnus rubra*)
- Black cottonwood (*Populus balsamifera*)
- Red-osler dogwood (*Cornus stolonifera*)
- Willow (*Salix* sp.); and
- Bracken fern (*Pteridium aquilinum*)

The second phase of planting must occur after the primary woody plant community has successfully established (i.e. roughly three growing seasons). This phase will supplement the pioneering woody species with pioneering coniferous trees to assist the successional process, and begin to establish long-term conditions less favorable for some unwanted invasive species. Tree species to be included in the second phase of planting will include:

- Douglas-fir (*Pseudotsuga menziesii*)
- Western red cedar (*Thuja plicata*)
- Western hemlock (*Tsuga heterophylla*); and
- Sitka spruce (*Picea sitchensis*)

10.2 Preparation for planting

Trees and plants shall be grown by plant nurseries in accordance with the current edition of the BC Landscape Standard (BCLS), as published by the British Columbia Society of Landscape Architects, and Canadian Standards for Nursery Stock (CSNS), as published by the Canadian Nursery Landscape Association. Plants are to be delivered in appropriate sized pots and with root balls as specified in the BCLS and CSNS, while following the correct procedures for plant type and period of dormancy/non-dormancy.

SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
BLOCK F PUBLIC REALM SPECIFICATIONS

Excavation of the subgrade below shall be only as necessary to permit the bottom of the root ball to sit on the undisturbed material or compacted fill such that the top of the root ball remains at grade equal to its growing condition at the nursery while at the same time meeting the minimum depth requirements as per the BC Landscape Standard. Ensure there is positive drainage in the tree pit, provide deep scarification if required to ensure drainage.

10.3 Tree Planting

Finished grade – the tree must be installed such that the top of the root ball is even with the surrounding soil – after settlement. If there is a chance of some settling after planting, install such that the top of the root ball is 2 to 4 cm above the surrounding grade. Trees with the trunk flare buried beneath the soil line will not be accepted.

Wherever possible, the hole must be dug with sloping sides. The preferred angle is 45 degrees.

Trees must be as vertical as possible. If planting in a surround, the stem must be close enough to centre that at least some part of the tree is in dead centre.

Position the tree so that lower branches will not conflict with traveled portions of the sidewalk of the street. Notwithstanding conflicts, the tree must be positioned for most attractive viewing. Pruning may be necessary in order to provide pedestrian clearance.

Backfill material in the tree pits shall be either an amended native soil mixture from the site or manufactured growing medium. The composition of the backfill material shall conform to the BC Landscape Standards with the provision of a growing medium analysis for documentation.

Where permitted by the supplier plant nursery's warranty, basket ties must be cut and the top 1/3 of the burlap and basket folded back downwards, when the backfill has been placed up to about 2/3's of the root ball height. No burlap or wire must be showing above the finished grade. Ties must be pushed back into the lower portion of the hole. Where prohibited by the nursery's warranty, the contractor is responsible to ensure the ties and basket are folded over at the first anniversary of the one (1) year warranty period.

A 10 cm raised saucer, of inside diameter equal to the outside diameter of the root ball, must be constructed around the perimeter of the root ball to enhance water infiltration. A mulch of organic material meeting the BC Landscape Standard requirements shall be placed inside the berms of the saucer, to a depth of 5 cm after settlement.

Trees must be immediately and adequately watered after planting, following the requirements of the BC Landscape Standard. When planting where UEL has determined that drainage correction is impossible or impractical, the root collar must be planted higher in relationship to the surrounding soil by 7.5 to 10 cm.

10.4 Root Barrier

Root barriers must be installed at the time of planting whenever a tree is installed within 2 metres of a sidewalk or other hardscape feature – excluding roads; or where specified on approved drawings.

SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
 BLOCK F PUBLIC REALM SPECIFICATIONS

Barriers must be made commercially, produced for the purpose of deflecting roots downward. Placement must be as per manufacturer’s instruction. The root barrier is to extend a full 2.0 m on either side of the trunk that faces a sidewalk or hard landscape feature.

10.5 Protection

A protection barrier must have the following attributes:

- is at least 1.2 metres high measured from the ground, mounted on steel or sturdy wooden posts. Fence posts must be installed no farther than 2.4m apart.
- distance of barrier from near edge of tree trunk, measured parallel to curb and 1.4 m above grade of the ground is as follows:

MINIMUM PROTECTION REQUIRED – parallel to curb

Trunk Diameter	Distance from Trunk
20 cm	1.2 metres
25	1.5
30	1.8
35	2.1
40	2.4
45	2.7
50	3.0
55	3.3
60	3.6
75	4.5
90	5.0
100	6.0

Distance of barrier from near edge of the tree to near edge of the curb, measured at right angles to the curb is **0.6 metres**.

Distance of barrier from near edge of the tree to near edge of sidewalk, measured at right angles to the curb is **0.3 metres**.

In situations where the curb or sidewalks are absent the roadside edge of the grass boulevard will substitute as the curb edge.

10.6 Tree Placement

10.6.1 Spacing

The optimum spacing of trees in the public realm is achieved by balancing aesthetic and environmental values with the physical form of the tree being used, and the carrying capacity of the site. The UEL aims for the maximum amount of tree coverage that is attainable while respecting site lines, utilities, and other important landscape elements.

SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
BLOCK F PUBLIC REALM SPECIFICATIONS

On Block F, where the intent is to foster a new forest/naturalized area, the sizing and spacing of trees will need to consider the stages of a process landscape and natural succession. Tree spacing, sizing and quantities are to be determined and recommended in writing by a biologist to ensure the desired natural conditions will be provided.

Except in areas where a forest character planting is the intent, plant street trees so that the species/cultivar being planted will grow to close canopy at about the age of twenty where the trees are able to grow to a larger size, and the landscape is softened already by existing greenspace. List of acceptable species is provided in sec 10.8.1. Street trees are those trees found within the street right-of-way, not those within the public open spaces and parks.

Minimum Street Tree Spacing

Tree size category	Average Spacing
Large	9-11 meters
Medium	8-10 meters
Small	8-10 meter
Columnar	6-10 meters

Distance from Utilities for all Trees

Steel or Wooden Poles	2.5 meters (species dependent)
Driveways	2 meters – small trees 3 meters – medium trees 5 meters – large trees
Catch Basins/Valve Boxes/Manholes	3 meters
Stop Signs	6 meters
Sewer and Storm Services	2 meters
Hydrants	2 meters
Corners (from extended P/L)	3 meters
Sidewalks	1 meter
Back of curb – Local Roads	1 meter

The curb side edge of a tree surround must be at least 0.15 meters from the back of the curb.

10.7 Tree and Plant Stock

All trees are to meet the standards described in the “British Columbia Landscape Standards” (BCLS) latest edition.

Street Trees must also be:

- nursery field grown
- be on a single leader, with the lowest branch being at least 2 metre high on the stem
- 6 cm caliper or greater if deciduous
- 2.5 metres height or greater if coniferous
- free of pest and disease
- free of pernicious weeds in the root ball
- free of injury, or other defects
- free of girdling roots

SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
BLOCK F PUBLIC REALM SPECIFICATIONS

Minimum root ball diameters for coniferous trees or as updated by the BCLS:

Height	Tall and columnar	Tall and broad
200 cm	50 cm	60 cm
250cm	55 cm	70 cm
300 cm	70 cm	85 cm

Minimum root ball diameters for deciduous trees or as updated by the BCLS:

Caliper	Root ball diameter
6 cm	60 cm
7 cm	70 cm
8 cm	80 cm
9 cm	90 cm
10 cm	100 cm
12.5 cm	110 cm
15 cm	120 cm

10.8 Species List

10.8.1 Tree Species List

The following list is the specified street tree species for each street within the Block F Lands. After the two years of watering following construction, the trees must be able to survive without irrigation.

Location	Botanical Name	Common Name
Acadia Road	<i>Acer cappadocicum</i> 'Rubrum'	Coliseum Maple
	<i>Tilia tomentosa</i> 'Green Mountain'	Green Mountain Linden
	<i>Quercus coccinea</i>	Scarlet Oak
Road A - Residential	<i>Quercus palustris</i>	Pin Oak
	<i>Tilia tomentosa</i> 'Sterling'	Sterling Silver Linden
Road A – Community Centre	<i>Acer rubrum</i> 'Armstrong'	Armstrong Red Maple
	<i>Quercus palustris</i> 'Green Pillar'	Green Pillar Pin Oak
Road B	<i>Acer x freemanii</i> 'Jeffsred'	Autumn Blaze Maple
	<i>Zelkova serrata</i> 'Green Vase'	Green Vase Zelkova
	<i>Fraxinus latifolia</i>	Oregon Ash
Village Retail Frontage (Toronto, Acadia, Road A, University Blvd)	<i>Acer rubrum</i> 'Armstrong'	Armstrong Red Maple
	<i>Quercus palustris</i> 'Green Pillar'	Green Pillar Pin Oak
	<i>Carpinus betulus</i> 'Fastigiata'	European Hornbeam
University Boulevard		University Boulevard trees are to be selected from the Parks and Open Space recommended species list

SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
 BLOCK F PUBLIC REALM SPECIFICATIONS

The following list includes recommended tree species for Parks and Open Space areas. The species in the Parks and Open Space areas adjacent to the forest retention, new forest naturalized areas and rain water management zones are to be specified by the project landscape architect in conjunction with the project biologist to ensure the habitat and ecological requirements are met. Native species or cultivars of native species shall be used. The trees must be selected to survive without irrigation (i.e. drought resistant), following the two years of watering after planting.

Botanical Name	Common Name
Acer circinatum	Vine Maple
Acer douglasi	Douglas Maple
Acer macrophyllum	Big Leaf Maple
Acer rubrum varieties	Red Maple varieties
Acer x freemanii varieties	Freeman Maple varieties
Amelanchier canadensis	Serviceberry
Betula nigra varieties	Black Birch varieties
Cornus controversa	Giant Dogwood
Cornus kousa	Kousa Dogwood varieties
Picea varieties	Native Spruce varieties.
Pinus contorta 'Contorta'	Shore Pine
Pseudotsuga menziesii	Douglas Fir
Thuja plicata	Western Red Cedar
Quercus varieties	Oak varieties

10.8.2 Shrub and Ground Cover Species

The shrub and ground cover species shall be picked in consultation between a landscape architect and registered professional biologist to ensure the habitat and ecological requirements are met. A minimum 90% of plant species and quantities are to be native selections and no invasive species are to be used. The mix of species shall include both evergreen and deciduous plants. Areas of high public use may include ornamental species for colour and interest providing they do not pose an invasive mix to the adjacent naturalized areas.

The shrubs and ground cover must be selected to survive without irrigation (i.e. drought resistant), following the two years of watering after planting.

Within two metres of a walking route or open play area, shrubs and ground cover must be less than 1 metre tall for visibility and safety concerns.

The location and selection of species near intersections must consider sightlines for safety reasons. Within 6 metres of an intersection, shrubs and ground cover must be less than 60 cm tall.

10.8.3 Rain Garden Plant Species

The trees, shrubs and ground cover species shall be picked in consultation between the project landscape architect and the project biologist to ensure the habitat and ecological requirements are met and can thrive in the specific conditions of a riparian ecology. 100% of plant species

SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
BLOCK F PUBLIC REALM SPECIFICATIONS

and quantities are to be native selections and no invasive species are to be used. The mix of species shall include both evergreen and deciduous plants.

10.9 GROWING MEDIUM

For use in all areas of tree, shrub and ground cover planting including on and off slab conditions and structural growing medium.

10.9.1 General specifications

Growing medium may consist of on site or imported soil, soil substitute, or mixture whose chemical and physical properties fall within the ranges of the current BC Landscape Standard. It must be prepared to be virtually free of subsoil, non-composted manure, building materials, non-composted wood, insect or fungal pest organisms, sawdust, invasive plants seeds or viable plant parts, or other extraneous materials.

The properties of the growing medium must conform to the current BC Landscape Standard following the growing medium type designations based on level of care (level 1 to 6) and intended application (low traffic lawns, high traffic lawns, planting areas, natural areas etc.). These properties include the physical properties and make up, the chemical properties and drainage capacity.

10.9.2 Testing

Growing medium testing is to be conducted by an accredited commercial laboratory. The testing requirements are to conform to the current BC Landscape Standard. Testing is to be based on a sample taken within three (3) weeks of delivery to the site and be representative of the entire quantity of material being used. Results must be approved prior to delivery of the material. Material delivered to site that is not in conformance with the BC Landscape Standard must be rejected and required to be removed from site.

10.10 Maintenance

The developer is responsible for maintaining the trees for one year after substantial completion of the planting and for watering the trees from planting up to two years following substantial completion. Maintenance will include the cutting back of vegetation that encroaches on sidewalks, driveways, trails and roadways and prevents sightlines at intersections.

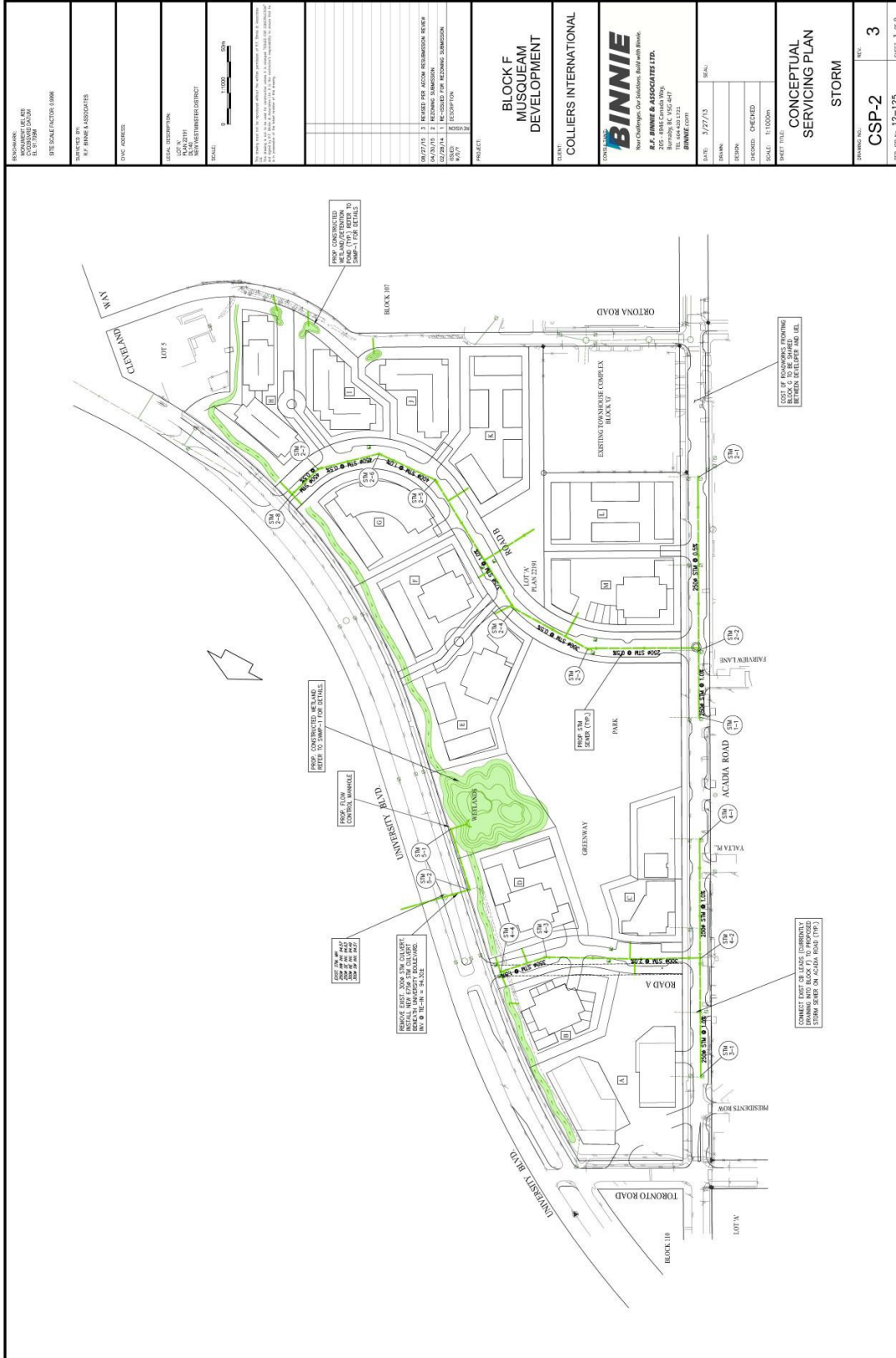
11. LANDSCAPING FURNITURE

Selection and location of furniture within the public realm is to be completed as per the Block F Design Guidelines and detailed landscape drawings.

12. FIGURES

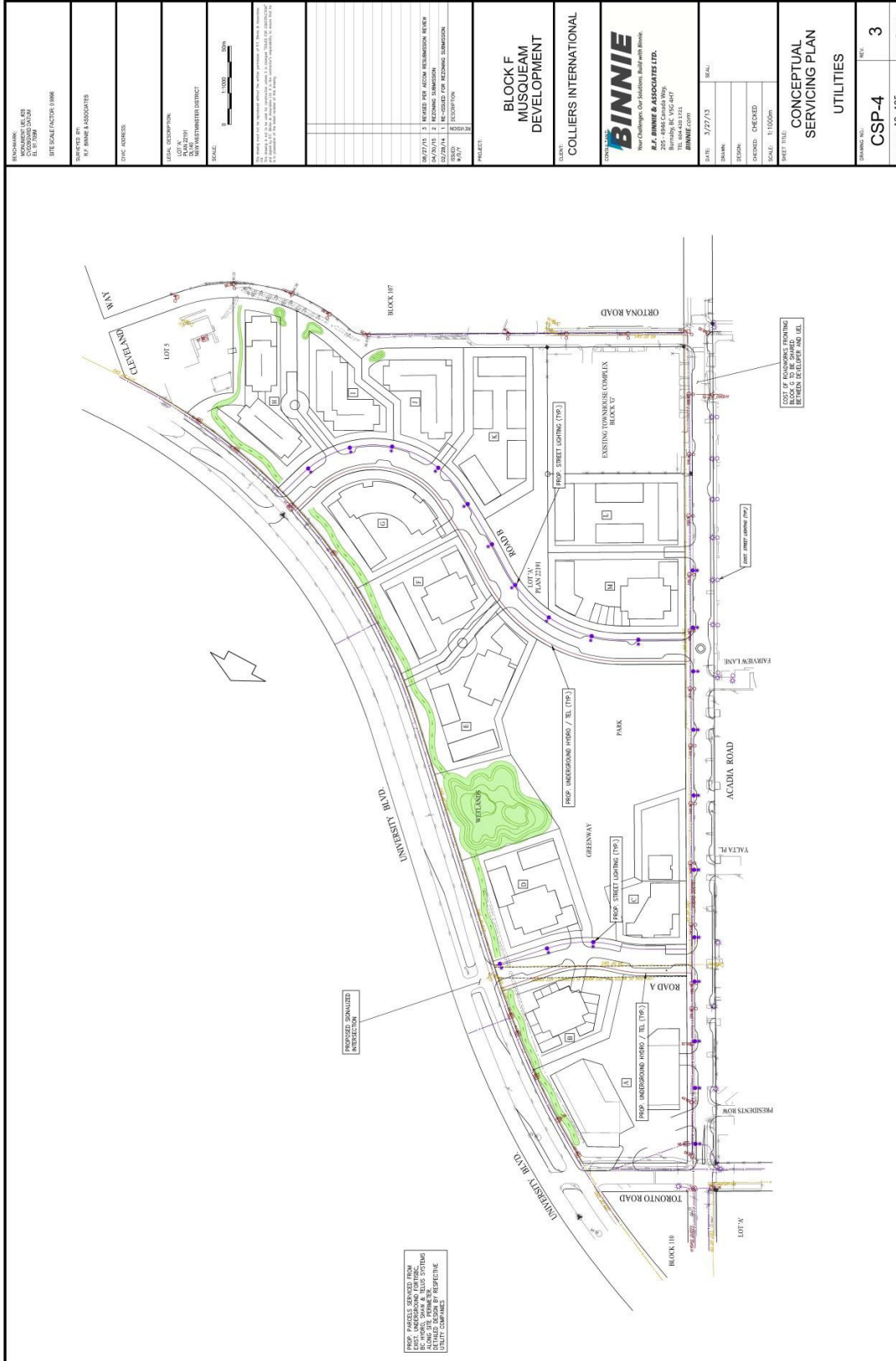
Figures: CSP 1,2,3,and 4; CGP-1;CSP-XS and SWMP-1; and CPP-1; and 3.7.5 and 3.7.6 annexed hereto all form part of this Schedule "F".

SCHEDULE F to the Works and Services Bylaw University Endowment Lands BLOCK F PUBLIC REALM SPECIFICATIONS



<p>REVISIONS:</p> <p>NOVEMBER 2014 REVISED PER PL 17-109</p> <p>SITE SCALE FACTOR: 500%</p> <p>SUPPLEMENTARY PLAN BY BINNIE & ASSOCIATES</p> <p>DATE: 3/27/13</p>	<p>LEGAL DESCRIPTION:</p> <p>LOT 10 UNIVERSITY ENDOWMENT DISTRICT</p> <p>SCALE: 1"=1000'</p>	<p>PROJECT:</p> <p>BLOCK F MUSQUEAM DEVELOPMENT</p> <p>CLIENT: COLLIERS INTERNATIONAL</p> <p>DESIGNER: BINNIE BINNIE & ASSOCIATES LTD. 250 - 600 - 1000 1000 - 1000 - 1000 TEL: 604-433-1212 BINNIE.COM</p>	<p>DATE: 3/27/13</p> <p>DRAWN:</p> <p>SCALE: 1"=1000'</p> <p>STATUS: CHECKED</p> <p>DATE: 3/27/13</p> <p>PROJECT: BLOCK F MUSQUEAM DEVELOPMENT</p> <p>CLIENT: COLLIERS INTERNATIONAL</p> <p>DESIGNER: BINNIE & ASSOCIATES LTD.</p> <p>DATE: 3/27/13</p>	<p>CONCEPTUAL SERVICING PLAN STORM</p> <p>SHEET NO. 3 CSP-2 JOB NO. 12-125 SHEET 3 OF 5</p>
---	--	--	---	---

SCHEDULE F to the Works and Services Bylaw University Endowment Lands BLOCK F PUBLIC REALM SPECIFICATIONS

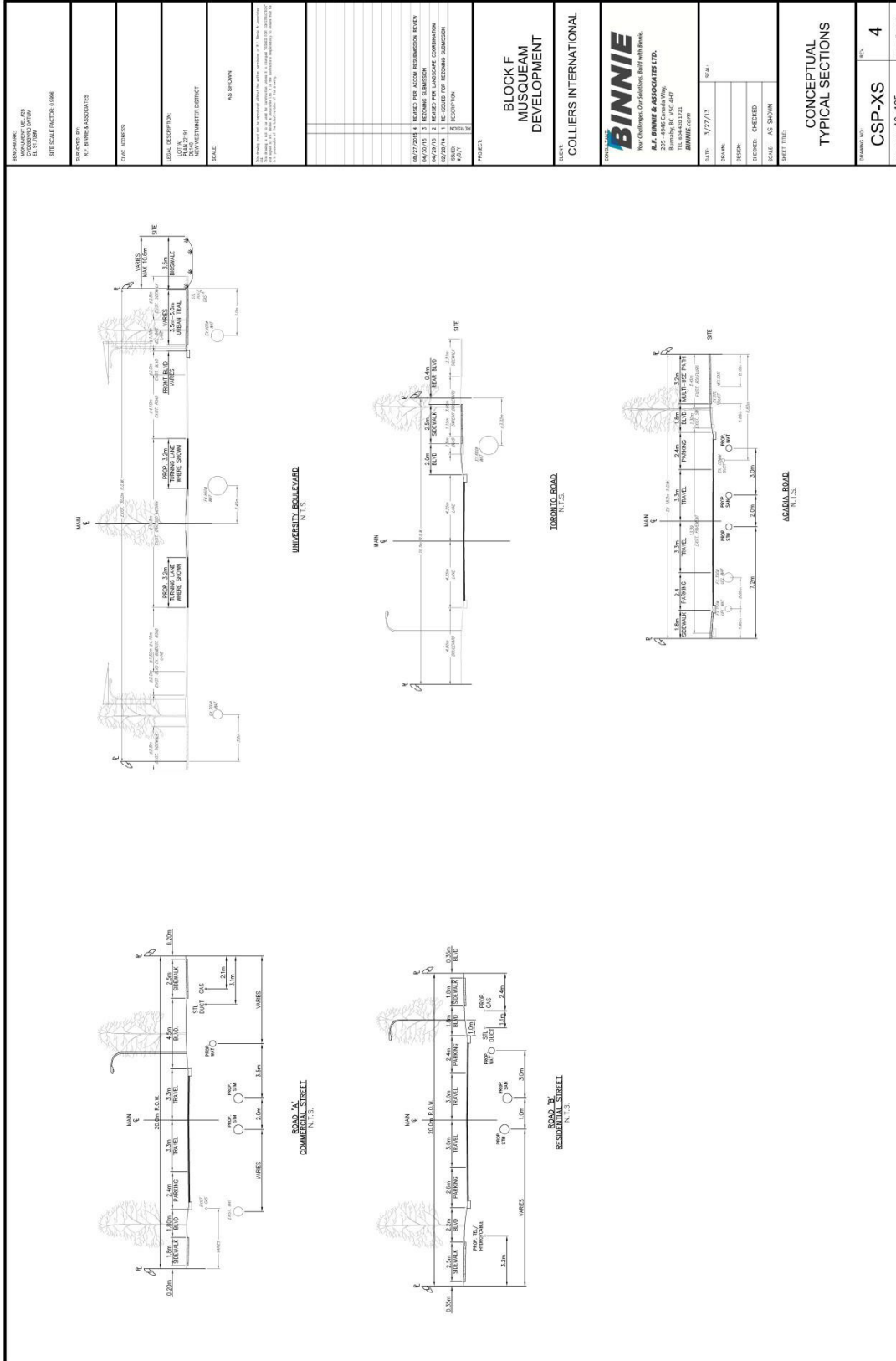


<p>REVISIONS:</p> <p>NOVEMBER 2018 REVISED I.D.L. PLAN REVISED I.D.L. PLAN</p> <p>SITE SCALE FACTOR: 500%</p> <p>SUPPLEMENTARY: BY BINNIE ASSOCIATES</p> <p>CAD NUMBER:</p>	<p>LEGAL DESCRIPTION: UNIVERSITY ENDOWMENT LANDS UNIVERSITY DISTRICT SOUTHWESTERLY DISTRICT</p> <p>SCALE: 1:1000 0m 10m 20m</p> <p><small>NOTES: 1. THIS PLAN IS A CONCEPTUAL PLAN AND DOES NOT REPRESENT A FINAL DESIGN. 2. THIS PLAN IS SUBJECT TO THE APPROVAL OF THE CITY OF VANCOUVER AND THE BC LAND TITLE OFFICE. 3. THIS PLAN IS SUBJECT TO THE BC LAND TITLE OFFICE'S REQUIREMENTS FOR SUBMISSION TO THE BC LAND TITLE OFFICE. 4. THIS PLAN IS SUBJECT TO THE BC LAND TITLE OFFICE'S REQUIREMENTS FOR SUBMISSION TO THE BC LAND TITLE OFFICE.</small></p>	<p>DATE: 3/27/13</p> <p>DESIGNER:</p> <p>CHECKED: CHECKED</p> <p>SCALE: 1:1000%</p>	<p>PROJECT: BLOCK F MUSQUEAM DEVELOPMENT</p> <p>CLIENT: COLLIERS INTERNATIONAL</p> <p>COMPANY: BINNIE New Challenges. Our Solutions. Built with Binnie. B.J. BINNIE & ASSOCIATES LTD. 255 - 6000 170th Street Richmond, B.C. V6X 1Y2 TEL: 604-273-1212 FAX: 604-273-1213 BINNIE.COM</p>	<p>SHEET TITLE: CONCEPTUAL SERVICING PLAN</p> <p>UTILITIES</p>	<p>DATE: 3/27/13</p> <p>REV: 3</p> <p>CSP-4</p> <p>REF. JOB No. 12-125</p> <p>SHEET 5 OF 9</p>
---	--	---	--	---	---

SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
BLOCK F PUBLIC REALM SPECIFICATIONS



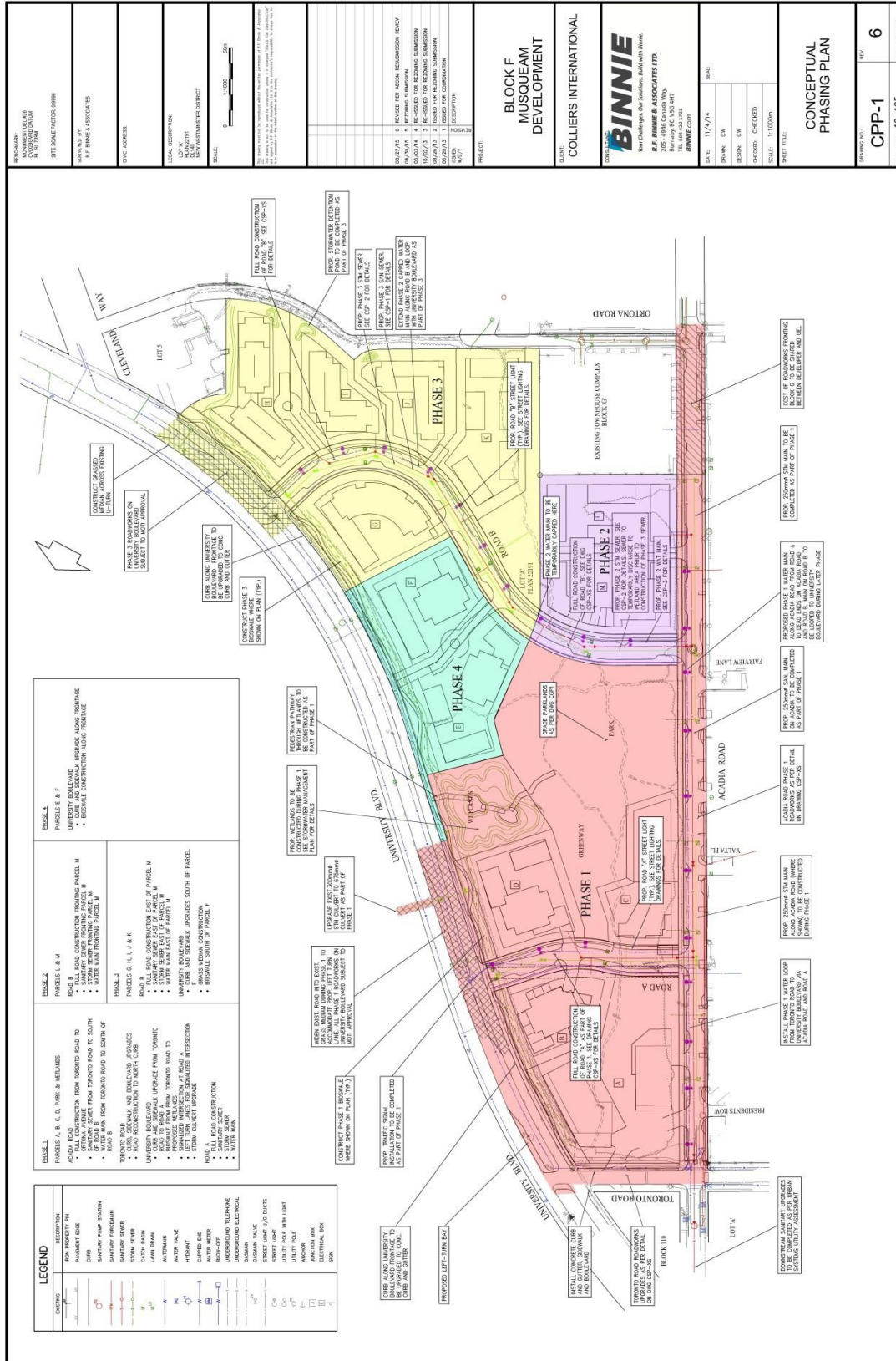
SCHEDULE F to the Works and Services Bylaw University Endowment Lands BLOCK F PUBLIC REALM SPECIFICATIONS



SCHEDULE F to the Works and Services Bylaw University Endowment Lands BLOCK F PUBLIC REALM SPECIFICATIONS



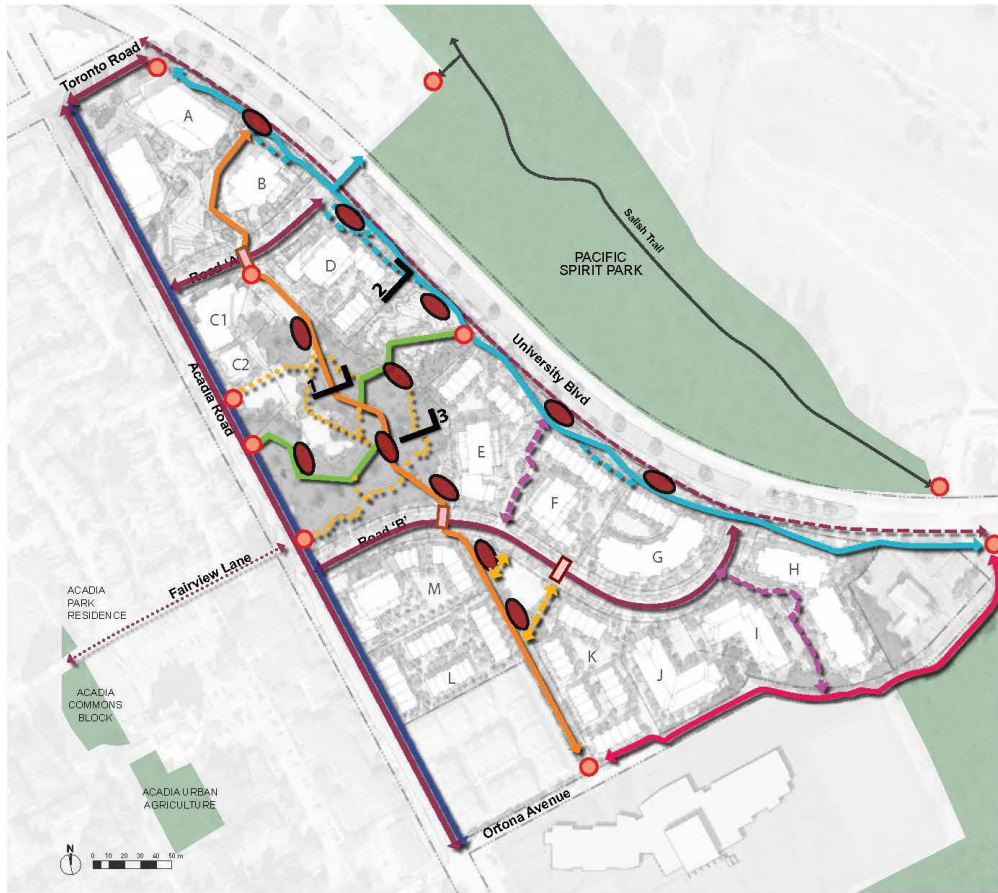
SCHEDULE F to the Works and Services Bylaw University Endowment Lands BLOCK F PUBLIC REALM SPECIFICATIONS



**SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
BLOCK F PUBLIC REALM SPECIFICATIONS**

3.7.5 Trail Hierarchy

TRAIL HIERARCHY



LEGEND

Primary Trails

- Sword Fern Trail
- Fairview Trail
- University Boulevard Trail
- Ortona Trail
- Acadia Multiuse Trail

Secondary Trails

- University Boulevard Trail (Secondary)
- Public right of way over development parcel
- On site trail

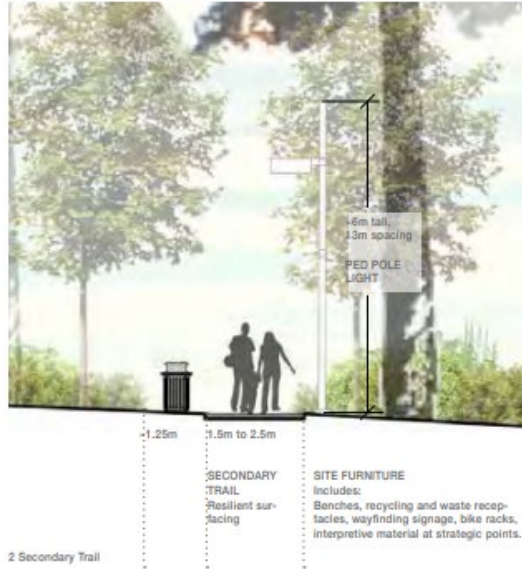
Tertiary Trails

- Tertiary nature trail

- On street shared bicycle route (Toronto Rd, Acadia Rd, Road A & B)
- On street designated bicycle route (University Blvd)
- Informal bicycle route
- Raised crosswalk
- Trail heads
- Site furniture node

**SCHEDULE F to the Works and Services Bylaw
University Endowment Lands
BLOCK F PUBLIC REALM SPECIFICATIONS**

3.7.6 Trail Sections by Type



For detailed additional sections, refer to Chapter 4.3