CITY OF COQUITLAM

SUBDIVISION AND DEVELOPMENT SERVICING

BYLAW NO. 3558, 2003

Original Adoption – July 24, 2003

1. **Amended – May 2004**
2. **Amended – September 2008**
3. **Amended – January 2012**
4. **Amended – September 2012**
5. **Amended – October 2012**
6. **Amended – March 2015**
7. **Amended – March 2016**
8. **Amended – November 2017**
9. **Amended – February 2019**
10. **Amended – June 2020**
11. **Amended – March 2021**
12. **Amended – October 2021**
13. **Amended – June 2025**

Coquitlam

LIST OF AMENDMENTS TO BYLAW NO. 3558, 2003

Bylaw No.	Adoption Date	Comments
3637, 2004	May 3, 2004	Housekeeping amendments: add "trail", replace "roads" with "highways"
3921, 2008	September 8, 2008	Definition Holding Tank; Section 8.09 Sewage Regulations
4264, 2011	January 16, 2012	Housekeeping amendments: accessibility (road standards and record documentation
4341, 2012	September 17, 2012	Housekeeping amendments: delete and replace section 15.0 Inspection and Administration Fees
4343, 2012	October 15, 2012	Addition of Section 8.1 Provision of Parkland
4494, 2015	March 30, 2015	Housekeeping amendments, update road design criteria and standard drawings, update streetlight design criteria and changes related to Multi-Modal Street Design Guidelines and Standards
4620, 2016	March 14, 2016	Replacing "Schedule C: Specifications and Detailed Drawings" with "Schedule D: Supplementary Specifications and Standard Detail Drawings"
4752, 2017	November 6, 2017	Addition of Cash Payment alternative (Frontage Works Program)
4894, 2018	February 4, 2019	Addition of Cost Recovery Section, Manager Evaluation of existing conditions, LED Lighting and Housekeeping amendments
5049, 2020	June 1, 2020	Replacing Schedule D: Security Deposits, Section 2.0 Form of Security to accept alternate forms of security for off-site works
5098, 2021	March 15, 2021	Replacing Schedule D, Sections 1.0 Security Deposits and 2.0 Form of Security, to expand the use of Letters of Assurance as an alternative to standard forms of security; and housekeeping amendments
5143, 2021	October 18, 2021	Update the City's Supplementary Specifications and Design Criteria, and authorize the General Manager Engineering and Public Works to update the City's Supplementary Specifications, and to update the City's Stormwater Management Manual

LIST OF AMENDMENTS TO BYLAW NO. 3558, 2003 - CONTINUED

Bylaw No.	Adoption Date	Comments
5462, 2025 and 5463, 2025	June 23, 2025	Housekeeping updates further to Provincial Bills 44 and 16 including updated definitions of Works and Services, Servicing Officer, and Small-scale residential

CITY OF COQUITLAM

SUBDIVISION AND DEVELOPMENT SERVICING BYLAW NO. 3558, 2003

CONTENTS

CITY OF COQUITLAM

SUBDIVISION AND DEVELOPMENT SERVICING BYLAW NO. 3558, 2003

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

WHEREAS pursuant to provisions of the *Local Government Act*, R.S.B.C. 2015, c. 1, the Council may by bylaw:

- require an applicant for subdivision to submit fees to cover the costs of administering works and services;
- regulate and require the provision of works and services in respect of the subdivision of land and as a condition of issuing a building permit;
- make other requirements in connection with the provision of works and services for subdivision and development of land; and
- designate as a servicing officer a person who comes within a class of persons prescribed by regulation;

AND WHEREAS pursuant to the provisions of the Community Charter, S.B.C. 2003, c. 26, Council may delegate powers, duties and functions to its officers and employees;

NOW THEREFORE the Council of the City of Coquitlam enacts as follows:

1.0 TITLE

This Bylaw may be cited as "City of Coquitlam Subdivision and Development Servicing Bylaw No. 3558, 2003".

2.0 DEFINITIONS

In this Bylaw,

Approving Officer means the person appointed by Council in accordance with the *Land Title Act*;

City means the City of Coquitlam;

Consulting Engineer means the professional engineer retained by the Owner in accordance with Section 9.02.;

Council means the Council of the City of Coquitlam;

Development means any construction for which a building permit is required;

Excess or Extended Services means excess or extended services as defined in the *Local Government Act*;

Frontage means that length of a parcel boundary which abuts a Highway;

2.0 DEFINITIONS cont'd/

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

Holding tank means a watertight container for holding domestic sewage until the domestic sewage is removed for treatment.

Manager means the Director of Development Services or authorized representative;

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

Parcel means any lot, block, or other area into which land is subdivided;

Regional District means the Greater Vancouver Regional District;

Small-scale residential means a low-density residential use as defined in the City of Coquitlam Zoning Bylaw No. 3000, 1996 as may be amended from time to time;

Subdivision means
(a) subdivision as defined in the *Land Title Act*, and
(b) subdivision under the *Strata Property Act*;

Works and Services means highways, sidewalks, boulevards, boulevard crossings, transit bays, street lighting, and underground wiring; amenities including benches, bollards, bicycle parking facilities, directional signage, parklets, street lamps, street signs, transit shelters or waste disposal and recycling containers; transportation infrastructure that supports walking, bicycling, public transit or other alternative forms of transportation, including traffic calming measures; sustainable design features that provide for energy and water conservation, reduction of greenhouse gas emissions and climate resilience; water distribution systems, fire hydrant systems, sewage collection systems, sewage disposal systems, drainage collection systems and drainage disposal systems.

3.0 PROHIBITION

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

4.0 AUTHORIZATION FOR ENTRY

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

5.0 PARCEL FRONTAGE ON A HIGHWAY

Unless exempted by the Approving Officer, the minimum frontage on a Highway of a parcel created by subdivision must be the greater of the minimum frontage required by the Zoning Bylaw or 10 percent of the perimeter of the parcel.

6.0 PAYMENT OF TAXES, RATES AND CHARGES

6.01 Every Owner seeking approval of a subdivision must pay all outstanding property taxes, rates and charges assessed and levied in relation to the property to be subdivided. If the outstanding charges do not include the current year's property taxes, rates and charges, the Owner must also pay an amount estimated by the City Collector in respect of the current year prior to receiving final approval of the subdivision. An estimated amount paid in respect of the current year will be applied to the Owner's tax account, and any adjustments will be levied or credited during the City's regular tax collection process.

6.02 Where application for final approval of a subdivision is made at any time between the first business day of September and the last business day of December in any given year, the Owner shall pay the property taxes, rates and charges for the following year as estimated by the City Collector. This estimated amount paid in respect of the following year will be applied to the Owner's tax account, and any adjustments will be levied or credited during the City's regular tax collection process.

7.0 WORKS AND SERVICES REQUIRED

7.01 Works and Services must be provided, designed, located and constructed in accordance with this Bylaw and the Schedules to the Bylaw and with design drawings and specifications accepted by the Manager.

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

7.03 If fire hydrants are required within a Development site intended for multi-family residential use, the Owner must locate and install fire hydrants and water mains connecting the fire hydrants to the City waterworks system, together with other necessary appurtenances in accordance with this Bylaw.

7.0 WORKS AND SERVICES REQUIRED cont'd/

7.04 The Owner must install Works and Services directly attributable to a Subdivision or Development, unless the Development is exempted under this or another bylaw, on that portion of a Highway immediately adjacent to the site being subdivided or developed, up to the centre line of the Highway.

7.05 If all or part of the Works and Services required under Section 7.04 would be disconnected from adjacent Works and Services if constructed by the Owner at the time of Subdivision or Development, the Owner may request and the Manager may agree to accept payment for the Works and Services at such rates and on such terms and conditions as may be determined by the City from time to time under the terms of a servicing agreement.

7.06 Where installation of the Works and Services as described in Section 7.04 is required, the Manager may accept installation to a standard consistent with the prevailing standard of the street or with the standard of the street abutting adjacent properties, if in the opinion of the Manager, it is desirable to preserve consistent streetscape and servicing levels by not introducing, or increasing, discontinuities.

7.07 Where a portion or all of the Works and Services described in 7.04 were completed by the City after January 5, 2018, the Owner shall be subject to a frontage Works and Services fee, and provide payment to the City for the completed Works and Services, at rates as determined by the City Fees and Charges Bylaw as amended.

7.08 The Owner must connect Works and Services in a Development or Subdivision site to the water distribution, sanitary sewer and storm sewer systems operated by the City or the Regional District.

7.09 Notwithstanding Section 7.01 and the requirements set out in the Schedules to this Bylaw, the minimum width of Highway dedication is 12.0 m, if sufficient width of statutory right-of-way is also provided for utility corridors, for the following streets:

Alama Avenue	Hansard Crescent	Solar Court
Bole Court	Keets Drive	Tech Street
Bowen Drive	Oxtoby Place	Vanessa Court
Cutler Street	Quadling Avenue	Whiting Way
Guiltner Street	Quadra Court	Wickham Avenue
Grover Avenue	Redonda Drive	Windrum Avenue
Hachey Avenue	Selma Street	

7.0 WORKS AND SERVICES REQUIRED cont'd/

7.10 Notwithstanding Section 7.08, lots within a subdivision are not required to be connected to the City waterworks system if no part of the land being subdivided is less than 200m from a City water main with adequate capacity to serve the Subdivision and if each parcel in the subdivision is provided with a well in accordance with Schedule E and meets the appropriate requirements of the Zoning Bylaw.

7.11 Notwithstanding Section 7.08:

(a) lots within a subdivision are not required to be connected to the City or Regional District sanitary sewerage system, if no part of the land being subdivided is less than 200 m from a City sanitary sewer main with adequate capacity to serve the subdivision, and provided the owner supplies written evidence that the *Medical Health Officer* has accepted for filing, plans for on-site disposal of sewerage on all lots within the subdivision;

(b) notwithstanding sub-section 7.11 (a), holding tanks will not be permitted for on-site disposal of sewerage on any lot;

(c) requirements of this section shall not apply to any lot not intended for occupancy, and not zoned for any use permitting occupancy;

(d) where application is made for construction on an existing lot, no part of which is less than 200 m from a City sanitary sewer main with adequate capacity to serve the lot, provided that:

(i) in the case of new construction where the lot is vacant, the Owner shall supply written evidence that the *Medical Health Officer* has accepted for filing, plans for on-site disposal of sewerage on the lot, prior to issuance of a building permit;

(ii) in the case of reconstruction, relocation or substantial extension of an existing building served by an on-site system for disposal of sewerage, the owner shall provide a report certified by an engineer with expertise in sewerage disposal systems, who shall determine whether the proposed reconstruction, relocation or extension will require alteration or replacement of the existing system; and if alteration or replacement is recommended, the owner shall provide written evidence that the *Medical Health Officer* has accepted for filing, plans to alter or replace the existing system, prior to issuance of a building permit.

and in the case of either (i) or (ii) where a plan to construct a new on-site sewerage disposal system, or to alter or replace an existing system, has been accepted for filing, no occupancy permit shall be issued until the owner has provided written evidence that certification of the completion of the system has been accepted for filing by the *Medical Health Officer*".

7.1 PROVISION OF PARKLAND

The Approving Officer is delegated the authority by Council under Section 510 of the *Local Government Act* to determine whether an Owner must provide:

(a) parkland not exceeding 5% of the land being proposed for subdivision and in a location acceptable to the Approving Officer, or

(b) money in an amount that equals the market value of the land required for parkland purposes referred to in subsection (a).

7.2 SERVICING OFFICER DESIGNATION

A person appointed by Council as an Approving Officer is designated as a Servicing Officer of the City.

8.0 EXCESS OR EXTENDED SERVICES

8.01 The Manager may require the Owner to provide excess or extended services to provide access to, or service land, other than the land being subdivided or developed.

8.02 If the City considers its costs to provide all or part of the excess or extended services to be excessive, the Owner must pay those costs and the City will enter into an agreement with the Owner concerning the period of payment of charges to the Owner.

9.0 RESPONSIBILITY FOR DESIGN AND CONSTRUCTION

9.01 The Owner will be responsible for undertaking and bearing the cost of all design, inspection, testing, construction and installation of Works and Services required under this Bylaw and must pay on demand all costs and charges for any work undertaken by the City connected with the construction of Works and Services for the Subdivision or Development.

9.02 The Owner must retain a professional engineer registered in the Province of British Columbia, a Consulting Engineer, experienced in municipal engineering and land development, to undertake the design, inspection, testing and record keeping for the Works and Services, and all plans of Works and Services are to be signed and sealed by a professional engineer and submitted to the City for approval. The Consulting Engineer is responsible for the design, and City approval of the design and drawings does not confirm their accuracy, and the City is not responsible for costs or damages incurred due to errors, omissions or deficiencies in design.

9.0 RESPONSIBILITY FOR DESIGN AND CONSTRUCTION cont'd/

9.03 The Owner must retain a Landscape Architect to undertake the design, inspection, testing and record keeping of landscaping trail and street trees must be signed and sealed by the Landscape Architect and submitted to the City for acceptance.

9.04 The City will manipulate valves and hydrants and control pumps on existing City systems, and the Owner or the Owner's contractor must not do such work unless the General Manager Engineering and Public Works provides written permission.

10.0 WORK ON A SUBDIVISION OR DEVELOPMENT SITE

No land clearing, stripping of top soil, excavation, placement of fill, construction or installation of any kind may be undertaken on a subdivision or development site until all required construction plans are approved and the Manager provides the Owner with written permission to proceed with construction in accordance with Schedule B.

Subdivision or Development sites requiring rezoning, a minimum 3rd reading and development permit (if applicable) approval by Council is required and preliminary subdivision approval granted by the City.

For Development sites under building permit application, partial approvals may be granted by the Manager for erosion and sediment control works in accordance with the City's Stream and Drainage Protection Bylaw as amended.

11.0 SIGNAGE

Traffic control signs and street name signs will be installed by the City at the Owner's expense. The cost of the signage will be determined by the Manager and must be paid by the Owner prior to approval of the subdivision or issue of the building permit.

12.0 CITY RIGHTS-OF-WAY AND UTILITY AND ACCESS EASEMENTS

12.01 The Owner must grant, or acquire, statutory rights-of-way in favour of the City in such locations and with such dimensions as necessary to accommodate Works and Services required to serve a Subdivision or Development and the right-of-way must be in a form acceptable to the City's solicitor.

12.0 CITY RIGHTS-OF-WAY AND UTILITY AND ACCESS EASEMENTS cont'd/

12.02 Rights-of-way and easement documents must be deposited and registered in the Land Title Office before the Subdivision plan is signed or the building permit issued. Alternatively, the Owner may provide a solicitor's undertaking, satisfactory to the City's solicitor, that the Subdivision plan and rights-of-way documents will all be deposited in the sequence required by the City's solicitor and that, if that is not possible, the Subdivision plan will immediately be returned directly to the Approving Officer.

13.0 PRE-EXISTING EASEMENTS AND RIGHTS-OF-WAY

If Works and Services required in accordance with this Bylaw will cross an established easement or other right-of-way, the Owner must, at their own expense before permission to proceed with construction is granted, obtain any amendments necessary to permit the construction, reconstruction, inspection, operation, repair, maintenance and use of the Works and Services under conditions acceptable to the Manager.

14.0 INSPECTION AND ADMINISTRATION FEES

The Owner must pay an inspection and administration fee before permission to proceed with construction is granted. The inspection and administration fee is the following percentage of either the value of the required Works and Services calculated by the Manager or the value of a contract for the construction of the Works and Services, plus 10%.

Construction Value	Fee
First $100,000	5 %
Next $150,000	4.5 %
Next $250,000	4.25%
Next $500,000	3.75%
Remainder	3.5%

The minimum fee shall be $100 and the Manager may reduce fees up to 50% if the consulting engineer is undertaking the majority of inspection for unique infrastructure and an inspection program with professional certification is provided to the satisfaction of the Manager.

15.0 INSURANCE

The Owner must provide insurance in connection with the construction and installation of Works and Services on land that is, or is to be, dedicated as highway or park, owned by the City or granted as a right-of-way to the City. The Owner must provide Public Liability Insurance and Third Party Public Liability Insurance (Automobile) both for at least $5,000,000. The effective date shall be prior to the commencement of work, and the policies shall be maintained in force until at least twelve (12) months after the date of a letter of substantial completion issued by the Manager for the Works and Services. Certificates of insurance must be submitted to, and accepted by, the Manager prior to granting permission to proceed with construction.

16.0 DAMAGE TO WORK

The Owner shall be responsible to the City for repairing or replacing any loss or damage whatsoever which may occur from whatever cause on, or to, the Works and Services, completed or otherwise, until such time as all Works and Services have been completed and written Notice of Acceptance has been issued to the Owner by the City. In the event of any loss or damage occurring prior to the issuance of *Notice of Acceptance* by the City, the Owner shall, on written notice from the City, immediately put the project into the condition it was immediately prior to such loss or damage, all at the Owner's expense.

17.0 LIABILITY OF OWNER

Neither the providing of insurance by the Owner to the City of Coquitlam in accordance with the Section 15.0, nor the insolvency, bankruptcy or failure of any insurance company to pay any claim accruing, shall be held to waive any provisions with respect to the liability of the Owner.

18.0 RESPONSIBILITY FOR PROTECTION OF WORK, PERSONS AND PROPERTY

The Owner and all persons employed under the Owner’s control, and all employees and subcontractors of the Owner shall use due care that no person or property is injured and that no rights are infringed in the execution of the Works and Services.

19.0 COMPLETION OF WORKS AND SERVICES

All Works and Services required to be constructed and installed at the expense of the Owner on the land being subdivided or developed must be constructed and installed to the standards set out in this Bylaw and in accordance with drawings approved for construction by the Manager and all fees and debts owing to the City must be paid before the subdivision plan is signed or the building permit issued unless the Owner:

19.0 COMPLETION OF WORKS AND SERVICES cont'd/

(a) deposits with the City performance security in accordance with Schedule D; and

(b) enters into an agreement with the City, in a registrable form acceptable to the City's solicitor, to construct and install the required Works and Services by a specified date or dates, and to fulfill all obligations of the Owner under this Bylaw or to forfeit the deposit which may be used by the City at its sole discretion to complete the Works and Services required.

All site regrading involving cuts or fills in excess of a height or depth of 1.2m, other than for road construction, must be completed before the subdivision plan is signed and no security will be accepted in that regard.

20.0 MAINTENANCE SECURITY

When a Letter of Substantial Completion has been issued, the Owner must provide the City with maintenance security in accordance with Schedule D. The Subdivision will not be approved or the building permit issued until the maintenance security has been provided unless security has been provided in accordance with Section 19.0 in which case an amount equal to the required maintenance security will be withheld from the balance of that security.

21.0 RECORD DOCUMENTATION

21.01 Prior to City issuance of Substantial Completion for required subdivision and development works and services, the Owner must provide the City with a complete set of marked-up check prints. The check prints shall be marked up in red ink and include all as-constructed information that will be used for providing the record drawings.

21.02 Within two months of substantial completion of the Works and Services, except for boulevards, trails and street trees, the Owner must provide record drawings prepared in accordance with Schedule A by a professional engineer, together with the professional engineer's certification that the Works and Services have been constructed to the line and grade indicated on the drawings and any operation and maintenance manuals, test results or video tapes required for the Works and Services have been submitted to the City.

21.0 RECORD DOCUMENTATION cont'd/

21.03 The Subdivision will not be approved or the building permit issued until the record documentation required in 21.02 has been provided to the satisfaction of Manager unless security has been provided in accordance with Section 19.0 in which case 5 percent of the contract value or $5,000 of the balance of that security, whichever is greater, will be withheld until the record documentation is provided. This amount is in addition to any amount retained in accordance with Section 20.0.

If the record documentation is not submitted within two (2) months, the Owner's performance security will be utilized by the City to acquire the required record documentation.

21.04 Within two (2) months of completion of boulevards, trails and tree planting, the Owner must provide record drawings prepared in accordance with Schedule A by a Landscape Architect together with the Landscape Architect's certification that all boulevards, trails and planting has been completed in accordance with this bylaw and the approved drawings.

22.0 RESTORATION SECURITY

If installation of Works and Services requires work on existing City services or streets, or, in the opinion of the Manager, may result in disturbance to City property, and is to be commenced before the subdivision plan is signed or building permit issued, the Owner must deposit restoration security prior to permission to proceed with construction being granted. The purpose of restoration security is to ensure restoration of City services and property to the standards set out in the Bylaw should the Owner fail to do so. The amount of restoration security shall be 10 percent of the cost of the Works and Services to be performed on existing City services or streets and shall be for a minimum amount of $10,000. Sections 2.0, 6.0 and 7.0 of Schedule D of the Bylaw shall also apply to restoration security.

23.0 DIGITAL SUBDIVISION PLANS

Immediately following registration of a subdivision plan, the Owner must supply the City with the legal plan in digital format compatible with the City's current geographic information system.

24.0 EXEMPTIONS

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

25.0 SEVERABILITY

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

26.0 SCHEDULES

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

Schedule A: Design Criteria
Schedule B: General Construction Requirements
Schedule C: Supplementary Specifications and Standard Detailed Drawings
Schedule D: Security Deposits
Schedule E: Private Water Supplies.

The Specifications and Standard Detail Drawings of the Platinum Edition of the Master Municipal Construction Document, as amended from time to time, are incorporated by reference into this Bylaw.

The Supplementary Specifications and Detail Drawings, as described in Schedule C, are incorporated by reference into this Bylaw as prescribed, replaced or amended from time to time by the City's General Manager of Engineering and Public Works.

27.0 VIOLATION AND PENALTIES

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

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

28.0 REPEALS

Subdivision Control Bylaw 2038, and subsequent amendments thereto, are hereby repealed.

READ A FIRST TIME this 20th day of May , 2003.

READ A SECOND TIME this 21st day of July , 2003.

READ A THIRD TIME this 21st day of July , 2003.

GIVEN FOURTH AND FINAL READING and the Seal of the Corporation affixed this 24th day of July , 2003.

_____
Mayor

_____
City Clerk

CITY OF COQUITLAM

SUBDIVISION AND DEVELOPMENT SERVICING BYLAW NO. 3558, 2003

SCHEDULE A

DESIGN CRITERIA

Doc#267594.v4 Original Adoption – July 24, 2003
Amended: May 03, 2004, September 08, 2008, January 16, 2012, October 15, 2012, March 30, 2015, March 14, 2016, November 06, 2017, February 04, 2019, June 01, 2020, March 15, 2021, October 18, 2021, June 23, 2025

SCHEDULE A

DESIGN CRITERIA

SCHEDULE A

DESIGN CRITERIA

PART 1

DESIGN SUBMISSIONS AND RECORD DOCUMENTATION

1.0 GENERAL

This schedule sets out the criteria to be used for the design of works and services in connection with subdivisions and other developments. Design details are to be in accordance with the Supplementary Specifications for Contract Documents and MMCD as set out in Schedule C unless otherwise approved by the Manager. Design criteria for works and services not covered by this schedule or design criteria for special circumstances must be submitted to the Manager before detailed design is commenced.

1.01 PRELIMINARY DESIGN MEETING AND PRE-DESIGN REPORTS

The Consulting Engineer must arrange a preliminary design meeting if required by the Manager on completion of conceptual design and before starting detailed design.

The Consulting Engineer must submit a pre-design report for approval prior to preceeding to detailed design if required by the Manager. The pre-design report will describe procedures to be used to prepare plans and specifications that will at least meet the minimum design standards set out in this Bylaw and the criteria to be used where there are no appropriate standards in the Bylaw. Pre-design reports may be required for pump stations, reservoirs, pressure reducing stations, trunk pipelines, stream crossings, bridges, retaining walls, storm water management and other items as determined by the Manager.

Stormwater Management Plans must be submitted in accordance with the City of Coquitlam Stormwater Management Manual prior to proceeding with detailed design of stormwater management systems.

1.02 SIZE AND FORMAT FOR DESIGN DRAWINGS

All design plans shall be prepared on Al metric 594 mm x 841 mm sized sheets. Plan and profile views shall be shown on plan profile paper for all drawings listed under Article 1.03.03 through 1.03.06.

1.03 DESIGN DRAWING AND CALCULATION SUBMISSION

On small subdivision proposals some or all of the following plans may be combined:

- Site Plan at 1:500 to 1:5000
- Key Plan at 1:250, 1:500 or 1:1000
- Road Works Plan, including design speed
- Waterworks Plan
- Storm Sewer Plan
- Sanitary Sewer Plan
- Streetlighting and Signal Plans
- Road Marking and Signage Plans
- Road Works Cross sections 1:250H 1:50V (1:100H 1:20V for existing roads)
- Lot Grading Plan at 1:500 or 1:1000
- Stormwater Management drawings in accordance with the City of Coquitlam Stormwater Management Manual;
- Sediment Control Plan in accordance with the Stream and Drainage System Protection Bylaw;
- Pump station and reservoir drawings including key plans and location plans together with two sealed copies of design calculations;
- Special Detail Plans as required including tree protection plans, trail plans and street tree and boulevard plans;
- Irrigation details and specifications if applicable.

Except as otherwise shown, plans will be to a horizontal scale of 1:500 or 1:250 and a vertical scale of 1:50 or 1:25.

The key plan shall show all existing and proposed services including drainage, water, sanitary, road, ornamental streetlighting, gas and hydro, on a legal base plan. The City file number, and the project title should be shown in the lower right-hand corner.

Storm and sanitary sewer plans must show existing lot elevations at 10m behind the front lot line, minimum basement floor elevations for each new lot and basement floor elevations of all existing buildings.

Road cross sections shall be provided at 10m intervals when widening existing roads and at 20m intervals for new road construction.

1.03 DESIGN DRAWING AND CALCULATION SUBMISSION cont'd/

The Street Tree and Boulevard Plan must include:

- the location of the plant material with respect to curb, sidewalk, underground utilities, driveway locations, corner sight lines, mailbox locations and streetlights;
- planting detail in accordance with the City's design criteria and supplementary specifications and detail drawings pertaining to street tree and boulevard plantings;
- plant list showing quantity, botanical name, common name and size of proposed trees;
- surface treatment of proposed boulevard strip;
- notation that final location and species selection shall be to the satisfaction of the Manager Parks and Open Space Services.

Trail plans must include details and specifications as outlined in the City of Coquitlam Master Trail Plan and any other relevant information including locations of existing trees, arborist recommendations and topography, to the satisfaction of the Manager Parks and Open Space Services.

1.04 INCOMPLETE SUBMISSIONS

Design drawing submissions may be rejected in entirety for lack of critical information, conflicts, unresolved design problems or incomplete submissions.

1.05 LEGEND

The City's legend for design drawings shall be in accordance with the City's standard.

1.06 LOCATION OF EXISTING SERVICES

Existing service information may be acquired from the City. Records will be made available on the understanding that the City accepts no responsibility for their accuracy.

Design drawings should extend beyond the limits of the development work to show any necessary transitions, connections and the effect of development work on existing City highways and utilities.

Road drawings must include centreline stationing, curb return geometrics and profiles, and cul-de-sac geometrics and profiles. Catch basin frame elevations and stationing must be provided on storm drawings. Storm and sanitary manholes must have stationing and main elevations. Lot frontage dimensions must be shown on all drawings.

1.07 LOCATIONS OF MAIN AND SERVICE CONNECTIONS

Locations of services within Highway Rights of Way are detailed in the Supplementary Detail Drawings for each classification and section of road. Variations from these locations must be referred to Manager before completion of design drawings.

Preferred locations of service connections for single-detached residential and small-scale residential lots are: water at the centre of the lot, storm drain at 2.0m from the downhill corner and sanitary sewer 2.6m from the downhill corner.

1.08 FIRST DESIGN SUBMISSION REQUIREMENTS

The first submission shall consist of:

- complete set of engineering design drawings;
- storm sewer tributary area schematic and storm sewer calculations;
- street lighting / signalization drawings;
- complete sets of street tree, boulevard plans and trail plans; and
- all in an electronic PDF format submitted through the City's QFile Transfer System.

1.09 FINAL DESIGN SUBMISSION

When the Manager is satisfied that all design requirements are complete, one full set of drawings will be returned to the Consulting Engineer signed and marked 'Accepted'.

1.10 MAKEUP OF A COMPLETE SET OF RECORD DRAWINGS

The Consulting Engineer is responsible for compiling drawings from specialist and other consultants for presentation as a complete set. The Consulting Engineer, or other professional engineer responsible for specific components of the project, is to certify the accuracy of the record drawings. The Landscape Architect shall certify the accuracy of the record Street Tree and Boulevard Plans.

A complete set of record drawings shall consist of:

- Road Works Plans
- Storm Sewer Plans
- Sanitary Sewer Plans
- Waterworks Plans
- Ornamental Streetlighting Plans

1.10 MAKEUP OF A COMPLETE SET OF RECORD DRAWINGS cont'd/

- Street Tree and Boulevard Plans
- Traffic Signal Plans
- Methane Protection Plans
- Trail Plans.

Duplicate sets shall be submitted where any of the above is shown on the same drawing.

Each project shall include a drawing index that lists all drawing sheets for the project.

The complete set of record drawings must be submitted. Partial submissions will not be accepted. Record drawings must include:

- Manhole: Show rim elevation, barrel size and offset from property line.
- Pipe: Indicate gradient, length, material, invert elevations, diameter, offset from property line. Pipe offset must be clearly indicated from property line and offset from road centerline is not acceptable.
- Service Connections: All offsets from property line, invert elevations, depth at property line from finished ground level, service material and diameter must be indicated. Typical offsets or statements claiming that all connections are in the centre of the lot are not acceptable.
- Wye Distances: All wye distances from the downstream manholes to new storm and sanitary service connections and new catch basins are to be shown.
- Catch Basins: Show rim elevations, offsets from property line and catch basin lead lengths.
- Streetlighting and Fibre Optic Conduits: Show offsets of conduits from property lines.
- Street Names: All street names must be indicated and labeling of streets as "Road A" is not acceptable. Each plan sheet must contain all the notes that pertain to that sheet. Separate note sheets are not acceptable.

1.11 STANDARDS FOR RECORD DRAWINGS

Design Drawings and Record Drawings must comply with the current City's CAD Standards and Record Documentation requirements. Electronic files are required in Acrobat PDF file and Autodesk DWG format.

1.12 OPERATION AND MAINTENANCE MANUALS

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

1.13 OPERATION AND MAINTENANCE MANUALS cont'd/

Four (4) copies of each Operation and Maintenance Manual must be provided and contain as appropriate:

- description of facility and major mechanical, ventilation, electrical and monitoring systems;
- status and location of facility within overall utility system or service;
- geographic location and photographs;
- design criteria including flows and pressures;
- record construction and shop drawings;
- test reports;
- equipment layout drawings;
- equipment manufacturers data and service manuals;
- electric power distribution single line diagram and service details;
- electrical, control and alarm wiring diagrams (laminated);
- PLC ladder diagram (laminated);
- control telemetry details with inputs and outputs identified;
- additional instrumentation;
- operating instructions for all equipment;
- routine and preventative maintenance schedule;
- routine and preventative maintenance diary;
- equipment data sheets;
- spare circuit cards for critical components;
- certified head/capacity curves for pumps;
- equipment part lists and list of suppliers;
- emergency operating procedures.

The maintenance manuals must be in D type, sturdy three ring binders with the name of the facility embossed on the cover. Manuals must contain a table of contents with each section identified by a plasticized, labeled divider.

SCHEDULE A

DESIGN CRITERIA

PART 2

STORMWATER MANAGEMENT

2.01 Stormwater Management Manual

2.02 Stormwater Management Plan and Design Criteria

2.01 STORMWATER MANAGEMENT MANUAL

Stormwater management policies, goals, objectives, guidelines and design criteria are set out in the City of Coquitlam Stormwater Management Manual as amended from time to time by the City's General Manager Engineering and Public Works.

2.02 STORMWATER MANAGEMENT PLAN AND DESIGN CRITERIA

The Owner will be responsible for hiring a Professional Engineer, experienced in hydrology, to prepare a Stormwater Management Plan in accordance with Section B, Part 5, of the Stormwater Management Manual and with the Citywide Master Drainage Plan and any watershed studies that have been completed and approved by the City for the area of proposed subdivision or development.

The watershed studies will supplement the Master Drainage Plan and Section B of the Stormwater Management Manual in providing detailed design criteria for Best Management Practices for stormwater management and for the design of major drainage systems.

SCHEDULE A

DESIGN CRITERIA

PART 3

SANITARY SEWERS

3.01 GENERAL

Sanitary sewer systems shall be designed in accordance with the concepts and requirements of any applicable master sewerage plans that have adopted by Council.

3.02 DESIGN FLOWS

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

Average Daily Dry Weather Flow

Land Use	
Residential	330 1/capita/day
Commercial and Institutional	34,000 l/day/ha
Minimum Industrial	34,000 l/day/ha

Residential densities are to be based on information provided by the City Planning Department.

Industrial flow greater than the minimum is to be based on actual or expected land use.

3.02.01 Peak Dry Weather Flow

Peak flow shall be calculated using a peaking factor of 3.5 for populations of less than 500 and 3.0 for populations from 500 to 2,000.

For populations greater than 2,000, 80 percent Harmon peak factor shall be used:

$$0.80\left(1+\frac{14}{4+\sqrt{P}}\right)$$

where P = equivalent contributing population in thousands.

For non-residential districts the Peaking Factor shall be calculated by a method approved by the Manager.

The Peaking Factor shall be applied to the sanitary contribution only and not to the infiltration and inflow allowance.

3.02.02 Infiltration and inflow

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

3.03 GRAVITY SEWERS

3.03.01 Pipe Capacity

The Manning formula shall be used for calculating flow in gravity sewers using a "C" factor of 0.012 for PVC pipe. Gravity sewers will be designed such that the Peak Wet Weather Flow depth does not exceed 50 percent of the depth of the pipe.

3.03.02 Velocities

The minimum velocity in gravity sewers is 0.6m/sec with peak dry weather flow.

3.03.03 Minimum Pipe Diameter

1. The minimum gravity sewer main diameter is 200mm.
2. Downstream mains must not have a smaller diameter than those upstream regardless of grade.

3.03.04 Curvilinear Sewers

Curvilinear sewers may only be used as approved by the Manager for Special Conditions and Conflicts. If approved, the following criteria apply:

1. Curvilinear sewers must be on a constant simple curve and only one horizontal or vertical curve is allowed between manholes.
2. Horizontal curves must parallel the street centre line. The midpoint and quarter points of a curve must be located by survey and the offset shown on as-built plans. Elevations must be shown at 5.0m stations for vertical curves.
3. Minimum grades must be 50 percent greater than for straight runs of sewer.

3.03.05 Depth of Mains

Sewer mains must have a minimum 1.0m cover. The depth must be sufficient to allow gravity connections from 0.6m below the existing or proposed basement floor elevation on lots abutting the main, and potentially on upstream lands in the catchment area, at a 2 percent grade to the crown of the main.

3.03 GRAVITY SEWERS cont'd/

3.03.05 Depth of Mains cont'd/

Where it is not practical to service lots by gravity from a street sewer, statutory rights-of-way must be provided. Sewer depths are generally not to exceed 3.5m.

Sewers in excess of 3.5m will require site-specific review including operational, access and maintenance requirements, and subject to approval of the Manager.

3.03.06 Sewer Location

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

2. Sewers within public streets or lanes must be located in accordance with the Supplementary Detail Drawings for each classification and section of road. Sewers on private property must be centered in a registered statutory right-of-way. The minimum right-of-way width is 3.0m, with the sewer centered within the right-of-way, unless the sewer depth exceeds 3.0m, in which case a greater width must be provided. Sanitary and storm sewers located 1.0m apart centered within the right-of-way may share a 3.0m right-of-way if no deeper than 2.0m but otherwise require a 4.5m right-of-way.

3. If a sewer is located within a statutory right-of-way, the owner must provide access for maintenance vehicles and equipment. Maintenance access shall be constructed to support 9.0 tonne loading.

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

3.04 MANHOLES

1. Manholes shall be provided at all changes in grade, pipe size, and horizontal alignment on non-curvilinear sewers. For curvilinear sewers, manholes shall be provided at the beginning and end of the pipe curvature. The maximum distance between manholes shall be:

Pipe Size (mm diameter)	Maximum Distance (m)
375 and smaller	125
450 and 750	155
900 and larger	185

Cleanouts with diameter of 200 mm may be used as an alternative to a manhole at the upper end of a sewer where it is within 45 m of an existing manhole and the depth of the sewer is less than 2.0 m.

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

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

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

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

The crown of the inlet pipe must be not be lower than the crown of the outlet pipe.

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

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

3.04 MANHOLES cont'd/

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

2. Where a future sewer will be extended from a manhole, a capped stub will be placed with the grade, size and location suitable for future extension.

3.05 SERVICE CONNECTIONS

Service connections of adequate size, but not less than 100mm diameter, and not less than 150mm for multi-family developments, shall be provided from the main to 2.0m beyond the property line for each new lot or to the property line for each existing lot. In industrial areas, service connections shall be placed to serve each side of the road at 45m intervals. Where possible, service connections shall be located adjacent to storm drainage service connections. The cover from finished surface at the property line or edge of right-of-way must be a minimum of 1 m.

Where a half or partial road is constructed, service connections may need to be extended toward the opposite of the road such that completion of servicing will not involve trenching in the completed portion of the road. Extensions of service connections will require ultimate lot patterns of opposite lands to be established and subject to direction and approval of the Manager.

Inspection chambers shall be provided for each connection with the inlet side either connected to an existing building sewer or capped. Inspection chambers must be centered precisely at a 300 mm offset from property line to allow gas mains to be laid between the inspection chamber and sidewalk without damage to either.

3.06 SANITARY FORCE MAINS AND SEWAGE LIFT STATIONS

3.06.01 Pre-Design Requirements

Lift stations will only be permitted where other options are unavailable or impractical. The Consulting Engineer shall obtain approval from the Manager for the siting of a lift station.

Prior to commencing detailed design of a lift station, the Consulting Engineer shall submit a pre-design report that addresses all design considerations. Approval of the pre-design concepts must be obtained prior to commencing detailed design.

3.06 SANITARY FORCE MAINS AND SEWAGE LIFT STATIONS cont'd/

These criteria cover all submersible sewage lift stations. Larger capacity sewage lift stations or lift stations with special design or siting requirements may require additional assessment and review of criteria.

3.06.02 Location and Layout

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

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

3.06.03 Requirements for Submersible Lift Station Design

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

2. Minimum barrel size shall be 1,500mm in diameter.

3. Pumps shall be:
   - capable of passing solids up to 75mm in size;
   - equipped with hour meters;
   - easily removed for maintenance;
   - operated with a motor running at 1750 RPM;
   - operated on a 347/600 volt electrical source (pump motors over 5 HP are to be 600 volt 3 phase type);
   - able to operate alternately and independently of each other;

3.06 SANITARY FORCE MAINS AND SEWAGE LIFT STATIONS cont'd/

- able to meet maximum peak weather flow condition with one pump in failure mode;
- designed so that each pump does not cycle more than the manufacturers recommended maximum starts per hour, with one pump in failure mode;
- one pump shall include an automatic flush valve.

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

5. Minimum storage between the high level alarm and the start of overflow prior to entering private property or the environment must be provided for the more critical of:
   - minimum half hour in wet well at average wet weather flow.
   - minimum one hour in wet well and influent pipes at peak wet weather flow.

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

7. A gate valve is required on the influent line and a plug valve on each pump discharge. The valves must be outside of the station and be complete with square operating nut and nelson box. Forcemains from the pump station must also be provided with a valved connection to permit bypass of the station and flexible couplings at connection to pump station.

8. Check valves will be ball lift check valves.

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

3.06 SANITARY FORCE MAINS AND SEWAGE LIFT STATIONS cont'd/

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

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

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

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

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

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

16. The station must have an Uninterruptible Power Supply (UPS) to serve all alarms and controls.

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

18. The panel must have a lamp test button.

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

20. An ammeter must be provided for each pump.

3.06 SANITARY FORCE MAINS AND SEWAGE LIFT STATIONS cont'd/

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

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

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

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

25. Metal stations will not be permitted.

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

3.06 SANITARY FORCE MAINS AND SEWAGE LIFT STATIONS cont'd/

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

28. A 38mm diameter water connection for wash down purposes must be provided together with an approved backflow preventer located in a separate compartment in the kiosk.

29. The area around the station and all associated equipment or building, must be asphalted or approved equivalent with sufficient strength to handle heavy trucks and with enough space to turn around. The size of the area is to be determined by the requirements for maintenance.

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

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

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

33. Where vandalism or safety is a concern, 2m high perimeter fencing is to be provided. The fence must be black chain link unless otherwise approved.

34. Landscaping, acceptable to the City, is to be provided and include irrigation.

35. Noise levels for the pump station facilities must not exceed City standards or 65 dB at the property line.

36. Odour control may be required.

3.07 FORCE MAINS

Hydraulic Analysis

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

3.07.01 **Velocity**

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

3.07.02 **Air Relief Valve**

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

3.07.03 **Termination**

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

3.07.04 **Size**

The minimum size for mains discharging raw sewage shall be 100mm diameter.

3.07.05 **Flush Out Chambers**

Flush out chambers shall be provided at the end of the force main and installed complete with a separate water connection, pressure reducer and backflow preventer.

3.07.06 **Force Main Service Connections**

Force main service connections shall be a minimum 75mm diameter and have a check valve and gate valve at the property line.

3.07 FORCE MAINS cont'd/

Hydraulic Analysis cont'd/

3.07.07 Materials

Materials selected for force mains shall meet MMCD standards section for water mains modified for local conditions such as character of industrial wastes, soil characteristics, exceptionally heavy external loadings, abrasion and similar considerations. An encasing pipe shall be used for force mains under creeks.

A tracer wire shall be installed for the purpose of locating a force main other than ductile iron pipe.

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

3.08 CORROSION AND ODOUR CONTROL

Corrosion and odour controls may be required by the Manager.

SCHEDULE A

DESIGN CRITERIA

PART 4

WATERWORKS

SCHEDULE A

DESIGN CRITERIA

PART 4

WATERWORKS

4.01 GENERAL

Waterworks systems shall be designed in accordance with the concepts and requirements of any applicable master waterworks plans that have adopted by Council.

Prior to construction of any water supply or distribution works, a Construction Permit must be issued for the works by the regional Public Health Engineer.

4.02 PER CAPITA CONSUMPTION

Per Capita Demands by Land Use		
Land Use and Lot Sizes	**Demand (l/cap/day)**	
	Maximum Day	**Peak Hour**
Small-scale residential with four or fewer principal dwelling units:		
>4000m^2	2500	4000
700 ~ 4000m^2	2000	3000
500 ~ 700m^2	1500	2500
<500m^2	1200	1600
Townhouses	825	1100
Apartments and Mixed Use	450	600
Commercial	72	72
Schools/Institutional	60	48

Population equivalents are to be based on 1 person/20m^2 for commercial use. For other land uses population equivalents must be determined on a site specific basis and approved by the Manager.

4.03 FIRE FLOW

Required fire flow shall be determined using the most recent edition of the Fire Underwriters' Survey publication entitled "Water Supply for Public Fire Protection".

4.04 OPERATING PRESSURES

Pressure zones must be consistent with those in the existing City system. The minimum dynamic residual pressure with flows at the peak flow rate shall be 345 kPa measured at any point in the system. The minimum dynamic residual pressure under fire conditions is 140 kPa measured at the main.

The maximum static pressure to any user in the system shall be 1050 kPa. In areas where static pressure in the existing municipal system exceeds this limit, materials and fittings used shall be consistent with the anticipated pressures.

4.05 PIPE PARAMETERS

Hydraulic Analysis

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

Looping of Pipelines

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

Pipe Diameters

Distribution pipelines serving residential developments with more than four principal dwelling units, commercial, industrial or institutional properties and transmission pipelines must be a minimum of 200mm diameter. Distribution pipelines serving small-scale residential developments with four or fewer principal dwelling units and serving fire hydrants must be a minimum of 150mm diameter. Unlooped pipelines serving single-detached residences on cul-de-sacs where no pipeline extension is planned and with no fire hydrants may be 100mm diameter.

Pipeline Grades

Water mains 200mm and larger must be installed to a designed grade to minimize high points. Anchor blocks on all mains shall be installed in accordance with MMCD Drawing number G 8.

Depth of Cover

Minimum cover of 1.0m must be provided over all water mains.

4.06 WATER AND SANITARY AND STORM SEWER SEPARATION

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

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

Water mains crossing other pipelines must be at angle greater than 20°.

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

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

Standards: ANSI/AWWA C214 (factory applied)
ANSI/AWWA C209 (field applied)
ANSI/AWWA C217-90 (petrolatum tape)
All materials used are to have zero Health Hazard.

4.07 HYDRANT SPACING

Hydrants

Fire hydrants shall be located:

- in residential zones, at a maximum centreline spacing along the road of 150m and within 75m of all possible building sites;
- in commercial, industrial and institutional zones, at a maximum centreline spacing along a street of 95m;
- where possible, at the end of curb returns at road intersections; or
- in mid-block locations, at the boundaries between properties; and
- at least 3m away from an ornamental lamp standard, utility pole or driveway and 1m from service connection pipes and ditches;
- within the furnishing or landscape boulevard zone where parking prohibitions are generally located and not to conflict with the pedestrian movement zone.

All fire hydrants are to be fitted with Storz quick connection fittings.

4.08 SPACING OF GATE VALVES

Gate valves shall be spaced not more than 250m apart and, wherever possible, immediately upstream of hydrant tees. Normally three valves shall be required at a cross intersection and two at a tee intersection. Valves at intersections shall be flanged to the tee. Mid-block valves shall be located on a projected lot line. Valves shall be located so that each main may be isolated without affecting adjacent mains and so that not more than one hydrant is isolated by a valve.

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

4.09 BLOW-OFFS

Blow-offs shall be provided at the ends of all dead end mains. For 200mm and larger mains, blow-offs require special design.

4.10 AIR VALVES

Air release valves shall be provided:

- at all summit points on mains 250mm diameter and larger except where the difference in grade between the summit and low point is less than 600mm;
- on any main on steep slopes where changes in grade or diameter would produce a vacuum pressure upon sudden heavy flow of water; and
- at the summit of any main where service connections are more than 100m apart.

4.11 BLOW DOWNS

Blow down chambers shall be provided at all low points on water mains 250mm diameter or larger.

4.12 CHAMBERS

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

4.13 TEST POINTS

For the purpose of hydrostatic pressure testing and chlorination, at least one test point shall be installed on each section of main beside a line valve. If available, the corporation stop installed for an air valve or a service connection may be used as a test point.

4.14 THRUST BLOCKS

The Consulting Engineer shall indicate the size and location of thrust blocks required in the system on the design drawings. All fittings shall rest on pre-cast concrete blocks.

Where soil conditions preclude the use of conventional thrust blocks, the Consulting Engineer shall specify joint restraints required to prevent movement of the main and separation of joints.

4.15 CATHODIC PROTECTION

Where ductile iron mains and fittings are placed in corrosive soil or where they run parallel to high tension hydro transmission lines, the Consulting Engineer shall evaluate and report on cathodic protection and specify on the plans the protection to be provided.

4.16 SERVICE CONNECTIONS

Service connections shall be provided to each lot and sized to suit water demands but, in any case, shall be a minimum of 19mm diameter for single-detached residences and not less than 50mm for residential developments with three or more principal dwelling units. Small-scale residential lots with two principal dwelling units shall be provided with two separate 19mm connections appropriately located.

Curb stops must be centered precisely at a 300mm offset from property line to allow gas mains to be laid between the curb stop and sidewalk without damage to either.

Where a half or partial road is constructed, service connections may need to be extended toward the opposite of the road such that completion of servicing will not involve trenching in the completed portion of the road. Extensions of service connections will require ultimate lot patterns of opposite lands to be established and subject to direction and approval of the Manager.

4.17 PIPELINE LOCATION

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

2. Water mains within public streets must be located in accordance with the Supplementary Detail Drawings for each classification and section of road. Where a water main crosses private property it must be protected with a registered statutory right-of-way at least 3m wide.

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

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

4.18 RESERVOIRS

4.18.1 Pre-Design Requirements

A pre-design report must must be submitted and must be approved by the Manager before detailed design is commenced. The pre-design report must address the following issues and provide schematics as appropriate:

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

4.18 RESERVOIRS cont'd/

4.18.2 Reservoir Capacity

Reservoir capacity shall be not less than the greater of:

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

4.18.3 Reservoir Design

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

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

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

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

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

4.18 **RESERVOIRS** cont'd/

4.18.3 **Reservoir Design** cont'd/

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

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

7. Floors are to slope to a sump at a minimum 2 percent grade and an FRP grating provided over the drain sump.

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

9. An interior wall ladder is required from roof access to floor. Any exterior ladder is to be completely vandal-proof and no unauthorized personnel allowed onto the roof. All ladders must meet WCB regulations and have fall-arrest equipment where required.

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

4.18 **RESERVOIRS** cont'd/

4.18.3 **Reservoir Design** cont'd/

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

12. Telemetry is to be installed to be compatible with and to the same standards as the City's system. Telemetry information is to be transmitted by a programmable logic controller and radio modem to the water source (pump station or inlet valve). An intrusion alarm system must also be connected to the City system by SCADA.

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

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

15. The Consulting Engineer is to review the need for re-chlorination based on demand forecasts.

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

4.18 RESERVOIRS cont'd/

4.18.3 Reservoir Design cont'd/

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

17. The reservoir must be cleaned and disinfected to AWWA standards.

18. Access roads less than 0.5 km long must be paved.

19. Grated black chain link perimeter fencing is required.

20. Landscaping acceptable to the Manager shall be provided.

4.19 PUMP STATIONS

4.19.1 General

Pump stations shall be designed with no fewer than two duty pumps to meet peak maximum day demand with the largest pump out of service and balancing storage on line. Alternatively, if balancing storage is not on line, pump station capacity shall meet peak hour demand with the largest pump out of service, and stand-by power shall be provided to allow the greater of maximum day demand plus fire flow or peak hour demand during a power outage.

Utility services to the station will be underground. Auxiliary power for emergency use will be provided.

4.19.2 Pre-Design Requirements

A pre-design report must must be submitted and must be approved by the Manager before detailed design is commenced. The pre-design report must address the siting of the pump station and all design considerations and provide schematics as appropriate.

4.19 PUMP STATIONS cont'd/

4.19.3 Pump Station Design

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

1. Pump stations shall be reinforced concrete, block work or brick construction, painted inside and, if required, outside, and aesthetically pleasing. Access doorways are to be sized so the largest single piece of equipment may be safely removed and replaced. Lifting hooks or rails with pulley blocks are to be provided as required.

2. Three-phase power is required for 10 HP, or larger, pumps.

3. Electrical phase loss protection is required.

4. Power factor correction is to be provided as required by Power Authority.

5. Motor controls are to be of "soft start" type.

6. Motors are to be energy efficient.

7. Hour meters are required on each pump.

8. Ammeters are required on each pump.

9. Pumps are to start and stop individually. Start and stop to be based on water levels in control reservoir; automatic alternation of pump sequence.

10. A Programmable Logic Controller (PLC) and telemetry system, compatible with the City's Supervisory Control and Data Acquisition (SCADA) system are required. The controller shall be an Allen-Bradley Model 5/03 PLC, or approved alternate, and shall be capable of communicating utilizing Modbus protocol.

11. A complete range of pressure flow, temperature and entry sensors with telemetry consistent with the City's SCADA system shall be provided.

4.19 PUMP STATIONS cont'd/

4.19.3 Pump Station Design cont'd/

12. Control valves are required to minimize starting and stopping surges.

13. Globe type control valves are to have rising stem indication.

14. All hydraulic control valves are to have duplex pilot filter systems.

15. A recording flow meter is required at each pump station to record instantaneous and total flows; 4-20 mA connected to PLC

16. Recording suction and discharge pressure gauges are required at each pump station and 4-20 mA transmitters connected to the PLC.

17. The station will be provided with a high pressure (discharge) override stop plus alarm, and low pressure (discharge) override stop plus alarm. All alarms are to interface with the SCADA system.

18. The control panel is to have a lamp test button and include an alarm bypass button.

19. Station piping shall be cement or AWWA epoxy lined ductile iron or AWWA epoxy lined steel pipe and fittings.

20. Station piping is to include a sample point for water quality testing.

21. Internal and external lighting, and automatic heating and ventilating systems are required.

22. Noise control may be required by the Manager.

23. Drainage is to be provided for all pump stations.

    If a chamber is used, it must be sized to allow adequate room for operation and maintenance.

4.19 PUMP STATIONS cont'd/

4.19.3 Pump Station Design

24. Adequate labelling is required.

25. Paved access is required for a hoist truck with a 1.8m boom for removal of equipment.

26. Landscaping acceptable to the City is to be provided and include irrigation where necessary.

27. Two metre high perimeter fencing is required, black chain link or privacy slats unless otherwise approved.

28. A security system and alarm for protection against vandalism and theft will be provided.

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

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

4.20 PRESSURE REGULATING VALVE STATIONS

4.20.1 General

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

2. The need for, and siting of, a pressure reducing station must be reviewed by the Manager.

4.20 PRESSURE REGULATING VALVE STATIONS cont'd/

4.20.2 Pre-Design Requirements

A pre-design report must must be submitted and must be approved by the Manager before detailed design is commenced. The pre-design report must address the following issues and provide schematics as appropriate:

- location outside of the traveled portion of a street if possible;
- pressure zones, water main looping and maximum pressures;
- proposed and ultimate flows;
- energy efficiency;
- back up supply to each zone;
- fire flows;
- location of existing utilities including proximity of sewer for drain connection and telephone connection point for telemetry communication, if required;
- schematic for monitoring and control instrumentation;
- schematic showing access for personnel, vehicles and service and retrieval equipment;
- schematic for landscaping, and security; and
- floor and top elevations.

4.20.3 Approval

Specific equipment proposed for the facility shall be reviewed with the Manager to confirm acceptance of the equipment, or specific model of equipment required by the City.

4.20.4 Design Requirements

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

4.20 PRESSURE REGULATING VALVE STATIONS cont'd/

4.20.4.1 Chamber

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

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

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

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

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

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

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

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

4.20 PRESSURE REGULATING VALVE STATIONS cont'd/

4.20.4.1 Chamber cont'd/

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

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

The chamber is to be drained with a 150mm diameter drain by gravity to an approved storm system. Provide external full size bypass.

4.20.4.2 Access Hatch

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

4.20.4.3 Access Ladder

The access ladder shall be a heavy duty industrial grade aluminum ladder, complete with an extend pole. The ladder shall be attached

to the chamber wall with aluminum brackets and Hilti type concrete anchors, complete with plastic washers.

4.20.4.4 Pressure Regulating Valves

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

4.20 PRESSURE REGULATING VALVE STATIONS cont'd/

4.20.4 Design Requirements cont'd/

4.20.4.4 Pressure Regulating Valves cont'd/

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

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

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

4.20.4.5 Controls

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

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

Controls shall be:

a) Singer Model 160 Pressure Reducing Pilot or approved equal;
b) Model 26 Flow SiabiEzu or approved equal;
c) Model 81 RP Surge Pilot or approved equal;
d) Model J 1521 -M Strainer or approved equal;
e) Fixed restriction.

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

4.20 PRESSURE REGULATING VALVE STATIONS cont'd/

4.20.4 Design Requirements cont'd/

4.20.4.6 Pipe Support

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

4.20.4.7 Air Valves

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

4.20.4.8 Pressure Gauges

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

4.20.4.9 Miscellaneous Equipment

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

4.20.10 SCADA Requirements

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

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

SCHEDULE A

DESIGN CRITERIA

PART 5

ROADS AND LANES

5.01 GENERAL

Highways shall be designed in accordance with the concepts and requirements of the City of Coquitlam Strategic Transportation Plan, the City of Coquitlam Citywide Official Community Plan, the City of Coquitlam Master Trail Plan, and appropriate neighbourhood plans, highway plans, traffic studies or other applicable plans that have been adopted by Council.

Except as required by the foregoing and this Bylaw, design shall conform to the most recent edition of Geometric Design Guide for Canadian Roads published by the Transportation Association of Canada (TAC).

Where highways are located on steep slopes, as determined by the Manager, the Owner must have an evaluation completed by a geotechnical engineer of slope stability, surface run off and potential changes to the groundwater regime together with appropriate recommendations and designs for mitigating any negative geotechnical or hydro-geotechnical impacts of highway construction and for management of stormwater from uphill slopes.

5.02 CLASSIFICATIONS, SECTIONS AND PAVEMENT WIDTHS

Prior to commencing detailed design, the Consulting Engineer must consult the Manager with respect to classification, section and bicycle lane requirements for all streets in or adjacent to the subdivision or development.

CLASSIFI-CATION	SECTION	RIGHT-OF-WAY WIDTH - m (minimum)*	CURB-TO-CURB WIDTH - m (minimum)*
Arterial	City Arterial/MRN (with bike route)	27.0	14.0 – 16.1
	City Arterial (w/o bike route)	27.0	14.0
Collector	Community Collector (Urban/Higher Density)	25.2	13.4 11.0 (w/bike facility in boulevard)
	Community Collector (Lower Density)	20.0	11.0
	City Collector (with bike route)	23.0 (parking both sides) 20.9 (parking one side)	14.0 12.0
	City Collector (w/o bike route)	20.0	11.0
	Industrial/Service Commercial Collector/Local	20.0	11.0
Local	Local – Higher Density	20.0	10.5
	Local – Low Density	17.4	8.5
	Hillside Local	13.2	8.5
	Narrow Street	10.0	6.7 (incl. roll over curb)
	Rural Street	20.0	6.7 (pavement width)
Lane	Standard Lane	6.0	4.6 (incl. roll over curb)
	Primary Access Lane	8.0	6.7 (incl. roll over curb)

*Representative of mid-block sections, auxiliary lanes at intersections are not included. Up to 5.0m of additional ROW may be required. Refer to detailed drawings for cross sectional dimensions and boulevard/sidewalk/multi use pathway details.

5.03 CRITERIA FOR SELECTION OF STREET SECTIONS

Detailed dimensions of street elements and locations of utilities for all streets are included in the Supplementary Detail Drawings.

Arterial and collector streets must be constructed in general accordance with the alignments shown in the maps included in the Citywide Official Community Plan.

Selection of the specific type of arterial, collector or local street shall follow the following:

1. Citywide Official Community Plan;
2. Area and Neighbourhood Plans;
3. City of Coquitlam Strategic Transportation Plan;
4. City of Coquitlam Master Trail Plan; and,
5. Council-adopted plans and guidelines as appropriate.

A Local – Low Density Street used as a cul-de-sac may be provided with a sidewalk on one side of the street only, and the right-of-way width reduced by 1.5m, in accordance with a Neighbourhood Plan or at the discretion of the Manager where the street is no longer than 90m.

Hillside Local Streets may be utilized in place of a standard Local with the approval of the Manager where steep topographic conditions exist and detailed design can demonstrate reduced impact and grading works.

A Narrow Street may be constructed with the approval of the Manager in place of:

(a) a Local Low Density Street in an infill subdivision in exceptional circumstances, *or*
(b) a Hillside Local Street in areas of steep slopes.

Parking will be restricted to one side only on narrow streets.

All streets east of Fox Creek and east of Partington Creek south of the confluence of Fox Creek shall be constructed as Rural Streets.

Lanes will be Standard Lanes except that Primary Access Lanes shall be constructed where lots front on Arterial Streets.

5.03 CRITERIA FOR SELECTION OF STREET SECTIONS cont'd/

Notwithstanding any Citywide Official Community Plan policies regarding lanes, alternative access arrangements will be considered where physical constraints make lanes impractical.

Ravine crossings shall only be permitted on Arterial and Collector Streets unless approved by the Manager for other classes of street. There will be no boulevards or trees at ravine crossings. Sidewalks and any required bicycle facilities on approach roads will continue across the ravine and abut the curb. Underground wiring and gas mains will be under the sidewalk or pavement. Ravine crossing geometry over a watercourse shall incorporate minimum widths considering the adjacent road geometry. No allowance shall be provided for parking on the structure.

5.04 BICYCLE LANES

Class 1, 2, or 3 bicycle facilities as defined by the City's Strategic Transportation Plan shall be included within street designs on bicycle routes as shown within the Official Community Plan, Area and Neighbourhood Plans, and the City's Strategic Transportation Plan.

TYPE OF BICYCLE LANE	MINIMUM WIDTH (m)
Conventional Bicycle Lanes	2 x 1.5
Shared Wide Curb Lanes	2 x 4.3
Multi-Use Pathways	3.0
Separated Bicycle Path	2 x 1.5
Paved Shoulder	2 x 2.0

5.05 MULTI-USE PATHWAYS

Multi-use pathways shall be included within the street designs on routes shown in the Citywide Official Community Plan, Area/Neighbourhood Plans, and the City's Strategic Transportation Plan. Multi-use pathways shall be a minimum 3.0m (preferred 4.0m) in width and in some cases on one side of the street in place of the sidewalk.

5.06 GREENWAYS

Greenways shall be included within street designs on routes shown in the Citywide Official Community Plan, Area/Neighbourhood Plans, and the City's Strategic Transportation Plan. Both Citywide and Neighbourhood Greenway designs shall be completed in consultation with the Manager.

5.07 HALF ROAD CROSS SECTIONS

5.07.01 Where a road is to be constructed on an existing, unopened, full width, road allowance on the perimeter of the subdivision or development, the Consulting Engineer must complete the design for the full width road and indicate on the design drawings the portion that is to be completed by others as a future separate project as well as including any temporary features necessary for the half road. The half road will include at least the sidewalk, boulevard, curb and gutter, gas main and underground wiring on one side of the street as required in the standard cross sections together with 6.0m of pavement as well as temporary provisions for structural support, drainage and grade differences on the opposite side. Where gas mains are normally only required on one side of the street, opposite the underground wiring, the half road design must make special provision for including all services.

5.07.02 Where a road is proposed to be dedicated along the perimeter of a parcel and may in future provide access to land on the opposite side, the Manager shall determine if it is to be constructed as a half road or as a full width road. If the Manager permits a half road to be constructed, the design and construction must be in accordance with 5.07.01.

5.08 EXISTING HIGHWAYS

Where existing pavement, curbs, gutters, sidewalks and boulevards adjacent to land being subdivided or developed do not meet the Bylaw standards for horizontal or vertical alignment, cross section or thickness design, the Manager may order their replacement to the Bylaw standard. Where replacement is not required, defects must be corrected up to the centre line of the road.

A cross fall of between 2 percent and 5 percent shall be provided from the edge of existing pavement to a new gutter. An asphalt taper transition shall be provided between new and existing cross sections. Where traffic flow is toward a decreasing pavement width, the taper shall be 15:1 minimum and, in the opposite direction, 5:1 minimum.

5.09 CUL-DE-SACS

Cul-de-sacs shall end in bulbs with the following minimum diameters:

	Curb-to-Curb	Right-of-Way
Residential, Commercial and Institutional	21m	25.5
Residential 90m or less in length	18m	22.5
Industrial	28m	32.5

A hammerhead design may be provided in industrial land use areas and turnaround provisions may be required at the termination of lanes including temporary conditions.

5.10 DESIGN SPEED

The minimum design speeds for horizontal and vertical curves shall be:

CLASSIFICATION	DESIGN SPEED (km/h)
Arterial Street	50
Collector Street	50
Local Street	50*
Narrow Local Street	50
Lane	20

* In exceptional circumstances and due to topographic conditions, the Manager may permit Local streets with a design speed of 40 km/h in volume conditions and where adequate design accommodations have been made.

5.11 VERTICAL ALIGNMENT

Maximum gradients shall be:

CLASSIFICATION	MAXIMUM GRADE PERCENT
Arterial	10
Collector	12
Local	12
Cul-de-sac Bulb	6
Lane	12

5.11 VERTICAL ALIGNMENT cont'd/

In exceptional circumstances, due to the topography and the alignment of existing roads, grades on local streets in excess of 12 percent to a maximum of 15 percent are permitted for a maximum distance of 100m.

The minimum gradient for roads and lanes with curbs and gutters shall be 0.5 percent and for other roads and lanes shall be 1.0 percent.

At intersections, the grade of the higher classification shall apply. The grade of the minor road will normally be changed to conform to the cross section of the major road. The grade shall not exceed 8 percent at intersections. Maximum grade change at an intersection in any direction shall be 6 percent.

The K value of vertical curves shall be:

DESIGN SPEED km/h	MINIMUM LENGTH OF CURVE FOR EACH ONE PERCENT CHANGE OF GRADE	
	SAG	CREST
40	4	4
50	6	7
60	10	15
Stop Sign Condition	2.5	2.5

5.12 HORIZONTAL ALIGNMENT

The minimum centreline radii of curvature shall be:

DESIGN SPEED (km/h)	RADIUS (m)
20	10
30	25
40	55
50	105

Horizontal curves for arterial and collector streets shall be calculated in accordance with the Geometric Design Guide for Canadian Roads. Refer to the most up-to-date guidelines. The maximum permissible super elevation permitted on arterial and collector streets is 6 percent.

5.13 CROSS SLOPES

Other than where super elevation is provided, cross slopes shall be 2 percent with the crown in the centre of the pavement except that under adverse topographic conditions, cross slopes of 1 percent to 4 percent and offset crowns or one way cross slopes may be permitted.

5.14 INTERSECTION DESIGN

Intersections on Arterial Streets will be subject to site specific design and normally require offset left-turn lanes and raised medians.

Property corners at intersections shall be truncated as necessary to accommodate boulevards, sidewalks and underground services with operational safety and adequate sight lines provided. Corner truncations are to be as per the City Supplementary Specifications and Detailed Drawings as attached to this document or as directed by the Manager in non-standard or unique conditions.

5.15 CURBS

Barrier curb is required for all streets within the Village Area of the Citywide Official Community Plan-Northeast Area Plan and for all streets elsewhere in the City except in the RS-4 One-Family Compact Residential zone and on Narrow Streets where rollover curb may be used and except in areas designated for rural roads with gravel shoulders.

Lanes shall have rollover curbs on both sides.

Perforated drain tile shall be provided behind curbs wherever, in the opinion of the Manager, conditions may require the interception of groundwater to protect the structural integrity of the road base.

Where barrier curbs join rollover curbs at an intersection, the curb return must be barrier type. The transition from barrier to rollover shall be formed in a distance of 1.0m.

5.16 CURB RETURNS

Standard Local, Standard Collector and Community Collector Streets shall construct curb returns in accordance with applicable Supplementary Detail Drawings.

5.16 CURB RETURNS cont'd/

Curb returns at all other intersections are to be in accordance with the following:

INTERSECTION	RADIUS (m)
Collectors with Hillside Locals	8
Hillside Locals with Hillside Locals	5
Intersections with Lanes	5*

* Lanes in residential areas shall have driveway let-downs and no curb returns.

5.17 EXISTING CURBWALKS

Curbwalk is only to be used for short extensions of existing curbwalk or between existing curbwalks and only when permitted by the Manager.

5.18 PAVEMENT DESIGN

The structural design of the base and pavement shall be for a 20-year life under the expected traffic conditions for the class of road.

Road reconstruction and pavement design shall be based on the results of Benkleman Beam tests and test holes carried out on existing pavements, or unimproved road allowance, by an independent, qualified soils testing company in conjunction with a professional engineer with expertise in geotechnical engineering.

The maximum seasonally adjusted Benkleman Beam rebound values of the completed pavement surface shall be 0.75mm for arterial and industrial streets, 1.25mm for collector streets and 2.0mm for local streets and lanes.

The minimum thickness of the elements of the road structure shall be 75mm of asphaltic concrete placed in one single lift for lanes, local and collector streets, and 100mm of asphaltic concrete placed in two 50mm lifts (50mm base and 50mm surface) for arterial streets. All streets are to have a minimum 100mm granular base and 200mm select granular sub base. All streets within industrial zones shall use a minimum arterial road structure.

Where exceptions permitted and paving completed in two lifts, the surface course shall not be completed before building construction on the adjacent lots is 80% complete or for one year from completion of the base course, whichever is earlier. Asphalt deflectors shall be installed to direct surface runoff into catch basins until the surface course is laid.

5.18 PAVEMENT DESIGN cont'd/

If the Manager determines that it is not practical to install the asphalt in one lift on a local or collector road due to an impending adjacent development, then the minimum pavement thickness must be 85mm (50mm base, 35mm surface). If only the base course of asphalt is placed then all manhole frames and coves must be set to the base asphalt and raised prior to the placement of the surface lift.

5.19 EXTENDED ROAD DESIGN AND CONSTRUCTION

Survey, bearing capacity, drainage and road design shall be extended at least 60m beyond the subdivision limits to a distance that enables the Manager to ensure that future extensions will meet the requirements of these design criteria.

Where road construction or reconstruction is required beyond the limits specified for perimeter roads, the owner may claim compensation for excess capacity. The amount and value of excess capacity, will be determined by the Manager.

5.20 END OF ROAD BARRIERS

End of road barriers shall be provided where required by the Manager.

5.21 TRAFFIC NOISE MITIGATION

Sound barriers will be required for all residential developments immediately abutting elevated bridges and viaducts, City truck routes, and provincial arterial highways. Sound barriers shall be located on private property, designed in accordance with BC Ministry of Transportation and Highways guidelines and by a professional Consulting Engineer with specific expertise in sound analysis and attenuation. Legal agreements will also be required between the property owners and the City to ensure future maintenance of the sound barriers.

5.22 TRAFFIC CONTROL

Traffic control signs will be installed by the City at the Owner's expense. The Owner will be responsible for design and installation and placement of traffic signals and pavement markings.

5.22 TRAFFIC CONTROL cont'd/

Traffic control devices must be designed and installed in accordance with the *Motor Vehicle Act* and:

- Manual of Uniform Traffic Control Devices for Canada - Transportation Association of Canada; and
- Electrical and Traffic Engineering Manual – most recent edition.

The geometric design plans should include proposals for pavement markings, which will be reviewed by the Manager prior to drawing approvals.

SCHEDULE A

DESIGN CRITERIA

PART 6

SIDEWALKS, CROSSINGS, TRAILS AND WALKWAYS

6.01 SIDEWALKS

Concrete sidewalks shall be contained within dedicated road allowances. Sidewalks are required on both sides of all streets in, and abutting, residential, and commercial subdivisions and developments except for:

- cul-de-sacs shorter than 90m may have a sidewalk on one side if approved by the Manager,
- rural streets with gravel shoulders, and,
- the RS-2 One-Family Suburban Residential or A-3 Agricultural and Resource zones where sidewalks shall only be provided for highways designated as collector or arterial.

Sidewalks shall be constructed on cul-de-sac bulbs.

Sidewalks abutting schools and community centres shall be a minimum of 1.5m with a preferred width of 1.8m where road dedication exists.

6.02 WHEELCHAIR RAMPS

Wheelchair ramps shall be provided at all intersections and at all other designated crosswalks:

At locations where curb ramps are installed or reconstructed, street design will be reviewed to minimize the pedestrian crossing distance and permit all pedestrians to be able to negotiate the curb ramp perpendicular to its slope.

Curb ramps will need to be located to direct users into the crosswalk and in the desired direction of travel.

Curb ramps shall be free of obstacles that limit movement including catch basins. When a lip is present due to lack of road surface course, an interim asphalt ramp shall be provided to ensure smooth transition for the road surface.

In high density and commercial zones, curb ramps shall be finished at the lower edge with a cane detectable flush edge, be in a contrasting colour to the road surface and different textured material to allow easy identification.

6.03 DRIVEWAY CROSSINGS

All subdivision and development plans shall specify proposed and existing driveway crossing locations. Driveways for development shall be required to connect to an on-site parking structure or pad as indicated on the approved development plans. Driveway crossings of boulevards for single-detached residential and small-scale residential lots with six or fewer dwelling units shall be a minimum of 4.5m in width, but may be increased to a maximum of 6.0 m in width at the approval of the Manager. Driveway crossings of boulevards for other multi-unit residential lots, including small-scale residential lots with more than six dwelling units, shall be 6.0m, but may be increased at the approval of the Manager if site constraints dictate in order to accommodate truck maneuverability (e.g. loading, garbage and fire trucks). Boulevard crossings shall be flared 1.2m between the sidewalk and curb and maintain maximum two percent sidewalk cross-fall across the driveway width.

No driveways will be permitted from Arterial Streets where access is feasible from lanes or from other streets except for corner service stations with driveway access to both intersecting streets or otherwise at the discretion of the Manager. Access shall generally be taken from the lowest hierarchy street (i.e. local before collector, etc.) unless otherwise approved by the Manager.

Driveway crossings for commercial, industrial and institutional properties will be installed as a condition of building permit only and shall be a maximum width of 11.0m unless otherwise permitted by the Manager.

Driveway crossings for corner lots shall be located a minimum of 10m from the general alignment of the curb of the intersecting road.

Driveway profiles shall not be steeper than 20 percent at any point. Specification of maximum and minimum carport elevations may be required for lots in steep areas. Profiles should be designed to provide unrestricted access.

6.04 LANE CROSSINGS

Curb let downs will be provided at intersections of lanes with streets, and curb returns will not be permitted. Boulevard crossings shall be flared 1.5m between sidewalk and curb. Curbs and gutters in lanes will extend to the back of the sidewalk of the intersecting street with the gutter at the grade of the sidewalk and a curb let down transition over 1.0m.

6.05 WALKWAYS AND TRAILS

Walkways shall be dedicated and shown as path or walkway on the subdivision plan. Trails shall be dedicated as trails on the subdivision plan. Walkways and trails are defined as paved or gravel paths for pedestrians, bicycles or other non-motorized traffic within dedicated road or rights-of-way that is not adjacent to a roadway.

Urban walkways for higher density/greenway areas are to be provided within 6.0m dedication and lower density area walkways are to be located within a minimum 3.0m dedication.

The maximum gradient for walkways is 12 percent. Concrete stairs are to be installed where required to suit the terrain of the site and a minimum 150mm concrete bicycle ramp shall be provided on one side of the stairs.

Retaining walls shall be installed for walkways and trails required to suit the site. The design shall be specific to the situation and must be certified by a professional engineer.

Walkways and trails shall be designed to provide minimal elevation interference with adjacent lots.

Walkways, including stairways if necessary, shall be provided where pedestrian links can be made to adjacent streets from the mid-block of any block exceeding 200m in length and from the ends of cul-de-sacs.

Trails shall be provided as designated by the City of Coquitlam Master Trail Plan and consistent with the trail classifications, design guidelines and construction details outlined within the Master Trail Plan.

6.06 SURFACE TREATMENT

A sidewalk/walkway surface shall be firm, stable, slip resistant, smooth and free of rough textures and gaps.

All pathways and sidewalks should be asphalt, broom-finish concrete or saw-cut concrete.

6.07 CROSSWALKS

Crosswalks will be designed in accordance with the Pedestrian Crossing Control Manual for British Columbia. The crosswalk type and location will be in accordance with the manual or as specified by the Manager.

6.07 CROSSWALKS cont'd/

Crosswalks located between intersections shall include curb ramps at each end and be located so that there is a clear view of traffic, in each direction and sufficient distance from adjacent intersections to permit safe crossing.

6.08 STAIRS, STEPS AND HANDRAILS

Exterior steps shall be firm, non-slip materials with a maximum rise of 175mm and maximum tread length of 300mm.

Tread nosing shall be clearly marked with either a brightly painted non-slip finish or include an integrated non-slip nosing that clearly contrasts in tone/colour from the tread.

Paving surfaces at the top and bottom of all flights of stairs or steps shall include a cane detectible and textured walking surface as an early warning of an impending level change.

Continuous handrails shall be provided on both sides of all exterior flights of stairs or steps which include three or more risers.

For all flights of stairs or steps that are 2200mm wide or greater an intermediate handrail shall be installed.

A level section of handrail shall extend a minimum of 300mm beyond the top and bottom risers of all flights of stairs and shall not be located within 1.0m of any roadway.

Where a grade drop adjacent to a sidewalk is 460mm or more, a handrail shall be provided.

6.09 PEDESTRIAN ACCOMMODATION AT TRAFFIC ISLANDS

Traffic islands shall be built of materials and finishes that are easily distinguishable from surrounding paving as an aid to persons with visual limitations.

Pedestrian crosswalks should be kept out of the traffic island, however where necessary, cross walks shall be level or have curb ramps. Traffic islands shall be a minimum 1500mm wide to provide a safe pedestrian resting zone.

If a traffic island is located at a controlled intersection, pedestrian-activated control (push button) may be required on the island to ensure pedestrian activation of signal.

6.10 PEDESTRIAN ACCOMMODATION AT ROUNDABOUTS

Detectable warning surfaces shall be installed at the curb ramps and at the entrances/exits of the pedestrian refuges in the splitter islands.

Sidewalks shall be set back a minimum of 0.6m from back of curb approaching the roundabout with a preferred distance of 1.5m for landscaping. Where 0.6m is used, a coloured and stamped concrete finish is required for this zone. Signage shall not conflict with the roadway or sidewalk.

Pavement markings and signage shall conform to the BC Ministry of Transportation Roundabout Design Guidelines.

Roundabouts shall be landscaped, however, landscaping shall be self sustaining, located to maintain pedestrian sightline sand must not cast shadows (e.g. Trees) across pedestrian crossing areas.

6.11 TRAFFIC AND ACCESSIBLE PEDESTRIAN SIGNALS

No obstacles, poles, bins, signs, etc. shall be located on the level approach area or within 1.0m of the pedestrian approach zone to the pedestrian push button location.

All new signals shall include:
- Audible pedestrian signals – assessable pedestrian signals may be required
- Pedestrian signal displays
- Countdown timers
- UPS
- Illuminate street name signs
- Emergency Pre-emption
- Electronic communications equipment.

Design guidelines are provided by the:
- Electrical and Traffic Engineering Manual – Guidelines for the Design of Lighting, Signal, and Sign Installations - BC Ministry of Transportation;
- Manual of Uniform Traffic Control Devises for Canada - Transportation Association of Canada;
- Guidelines for the Understanding, Use, and Implementation of Accessible Pedestrian Signal, Transportation Association of Canada.

The City will provide the traffic control cabinet and all the internal cabinet equipment at the developer's expense. An approved product list will be provided by the City for all other equipment. All signal designs must be approved by the City.

6.12 RETAINING WALLS

Retaining structures may be required within street or lane rights-of-way or on private property to support roads, utilities, buildings or structures, or to create a useable building envelope. The requirement for retaining structures shall be determined on the basis of a Site Grading Plan submitted for each development.

Design drawings for retaining structures must be prepared and certified by the Consulting Engineer. Building permits are required for structures in excess of 1.2 metres in height and located on private property. Certification of inspection by the Consulting Engineer may be required by the Manager, as a condition of approval.

Handrails shall be installed on all retaining walls. Poly-coated wire mesh may be required to be attached to handrails where adjoining hazards are deemed significant by the Manager.

Exposed concrete surfaces of an aesthetically pleasing appearance shall be specified for retaining walls.

Block walls, bin walls, cribbing and reinforced earth structural designs shall be sealed by a professional engineer and must have an attractive, weatherproof concrete or coated metal finish.

SCHEDULE A

DESIGN CRITERIA

PART 7

STREET LIGHTING

7.01 GENERAL

This section provides lighting and electrical design criteria to aid in the design of street lighting in the City. Street lighting generally refers to lighting of public roads and walkways. All new street lights shall be Light Emitting Diodes (LED), unless approved by the City.

Street lighting designs shall be prepared under the direction of a design professional registered with the Engineers and Geoscientists BC. A site visit is required to identify existing utility locations, sensitive tree root zones and other potential conflicts.

The electrical systems denoted under this section must be installed at the Developer's expense.

The Developer is required to obtain all applicable permits.

7.02 VISUAL AND ENVIRONMENTAL ISSUES

Obtrusive light, light trespass, light pollution and environmental zones are key project design issues that will be considered. The engineer will utilize luminaire specifications that will mitigate these issues.

7.03 LIGHT DESIGN

For subdivisions and developments within established neighbourhoods and infill situations, the street light design will be based on an ultimate design for the block as approved by the City. These areas may also be subject to the City's Frontage Works Construction Programs for future completion by the City, and a cash payment alternative for these situations may be acceptable as approved by the Manager.

Designs shall meet the lighting requirements of the current edition of the applicable Illuminating Engineering Society of North America (IESNA) standards as the primary source and the Transportation Association of Canada (TAC) Guide for the Design of Roadway Lighting as the secondary reference source and applicable except where noted in this section. Designs shall also meet the requirements within the Master Municipal Construction Documents Association (MMCD), as well as the City's Supplemental Specifications and Standard Drawings, and Approved Products List.

7.03 LIGHT DESIGN cont'd/

The road classifications, luminance and illuminance levels, ratios, road and pedestrian activity areas proposed for each roadway and pedestrian walkway/bikeway shall be listed by the engineer in a table format on the design drawings. Minimum maintained vertical sidewalk illuminance levels are recommended, but not mandatory.

The engineer shall confirm electrical infrastructure requirements with the City in regards to bus shelters, at existing or proposed bus stops.

Luminaire wattage, distribution type and voltage shall be noted on the engineering drawings. Overdesigning shall be avoided.

Street lighting systems are to be controlled with a lighting contactor and photocell. The photocell shall be located on the luminaire nearest the service panel.

The preferred operating voltage for the new street lighting system is 120/240V.

Lighting calculations shall use the factor shown on Table 7.1:

TABLE 7.1 – TOTAL LIGHT LOSS FACTOR

Lamp Lumen Depreciation (LLD)[1]	Lamp Dirt Depreciation (LDD)[1]	Ambient Temperature Factor [2]	Total Light Loss Factor (TLLF)
0.9	0.9	1.04	0.84

Notes:
[1] Based on a 10-year luminaire optical cleaning cycle

[2] Based on nighttime temperature of 10 degrees C
TLLF = LLD x LDD x ATF

Where parking lanes exist or are proposed, they shall be calculated as full-time general purpose lanes.

7.03 LIGHT DESIGN cont'd/

Where on-street bike lanes are present they shall be calculated as part of the roadway. The bike lane width shall be added to the adjacent lane and then the sum shall be divided into two equal lanes for the calculations (ie; 3.6m wide lane + 2m bike lane =5.6m/2 = therefore use 2.8m wide lanes for calculations). This will provide a suitable number of calculation grid points on the roadway and bike lane.

For single-sided spacing with two way traffic, a separate calculation grid shall be undertaken for the lane(s) in each direction of travel.

7.04 LIGHT POLE SPACING

Street lights shall meet minimum clearance to overhead and underground utilities set out by BC Hydro, Telus, Shaw, Fortis and other utilities that may be in conflict. Where possible, street lights shall be placed in line with the boundary separating 2 properties.

Street lights shall have minimum clearances as shown in Table 7.2:

TABLE 7.2 – LIGHT POLE MINIMUM CLEARANCES	
Trees	6m
Driveways	2m
Hydrants	3m
Manholes, valve boxes, service connections	2m
Junction boxes	2m
Kiosks	2m

Poles will be generally arranged in a staggered or opposite spacing based on the road classifications listed in Table 7.3. In circumstances where overhead lines are in conflict with street light poles, one-sided spacing is preferred. If City street lights currently exist on the side of the street with overhead lines (within the same block), the engineer shall contact the City to determine a suitable pole arrangement.

Pathway lights are required at the entrances and exits of walkways and pathways. Walkways and pathways with stairs shall have lighting at each landing.

7.04 LIGHT POLE SPACING cont'd/

Street light poles shall be offset from the curb face or road edge as shown on the City's "Typical Road Cross Section Supplementary Standard Drawings".

TABLE 7.3 LIGHT POLE ARRANGEMENT	
Road Classification	**Light Pole Arrangement**
Major (Arterial)	Staggered/Opposite/Median
Collector	Staggered
Local	Staggered/One Sided
Pedestrian (Walkways/Bikeways)	One Sided

7.05 POLES AND LIGHT SOURCE

Mounting heights and pole types shall be as follows:

- Arterial Roads – 9m or 11m davit
- Collector Roads –7.5m, 9m, or 11m davit
- Local Roads – 7.5m davit
- Walkways or Stairways – 5m pole without flange (Type 2 – MMCD)

Poles will be designed to the most current edition of AASHTO Standard Specifications for Structural Supports for High Signs, Luminaires and Traffic Signals with a wind pressure of 430 Pascals.

In general, the City requires 3000K LED street lighting on local roads, and 4000K on Collectors, Arterials and bus routes. Final colour temperature requirements are to be confirmed with the City.

7.05 POLES AND LIGHT SOURCE cont'd/

TABLE 7.4 – LIGHT COLOUR TEMPERTURE	
Classification	**Colour Temperature**
Local (except bus routes) (except bus routes)	3,000 K
Collector	4,000 K
Arterial	4,000 K
Pathways	4,000 K

7.06 DECORATIVE STREET LIGHTING

Areas such as Burquitlam, Maillardville, City Town Centre and others, have decorative lighting specific to their neighborhood. The City shall provide the Developer with generic details of the decorative lighting requirements.

Decorative street lighting shall have stand-alone service bases.

7.07 CONDUIT

There shall be a maximum four (4) 90° bends in a conduit run. Where this cannot be avoided, junction boxes will be used.

All empty conduits shall have a 6mm nylon pull string installed with capped ends. Multiple-use conduits may be installed in common trenches. Street lighting conduits shall be minimum 35mm diameter rigid polyvinyl chloride (RPVC).

Traffic signal interconnection and fibre optic conduit design shall be prepared in conjunction with street lighting designs for major arterial and collector classified roadways as determined by the City.

Fibre optic conduits shall be a minimum of four (4) 78mm RPVC, and are generally common trenched with the street lighting and/or traffic signal system conduit.

7.07 CONDUIT cont'd/

The engineer shall coordinate the design with the City to ensure the conduit system is consistent from intersection to intersection.

BC Hydro service conduit shall be per MMCD (current edition) and City of Coquitlam standards.

7.08 JUNCTION/PULL BOXES

Junction boxes should generally be avoided, due to possible wire theft. If required, designs shall incorporate the following:

.1 Junction/pull boxes will generally be used:

a. Where the maximum number of 90° bends in a conduit run is exceeded.
b. In conduit runs over 200m in length.
c. For bus shelter tie-ins.

.2 Junction/pull boxes within grassed or landscape areas must have a 200mm wide x 150mm deep concrete collar installed flush with the top of the junction box for mower protection.

.3 Junction/pull boxes will be reinforced concrete or poly-mold type.

.4 Junction/pull boxes shall not be installed in roadways or driveways. If required, load rated lids/covers (Tier 22) shall be used in driven driveways, pathways and sidewalks.

.5 Junction boxes may be required at traffic signals.

7.09 SERVICE PANELS

.1 The engineer shall contact BC Hydro to confirm service locations, and whether specific BC Hydro designs are required.

.2 Where possible, traffic signal and street lighting systems shall be fed from the same service panel. Refer to the MMCD Standard Detail Drawings, as well as the City's Supplementary Specifications and Standard Detailed Drawings.

7.09 SERVICE PANELS cont'd/

.3 Receptacles shall be fed from the same service panel that contain sub-breakers, 60 Amp contactor(s) and photocell HOA receptacles by-pass switch. Receptacles will have separate circuits from street lighting, and shall be separately fused.

.4 Existing street lighting services shall be used for new street lighting, unless approved by the City.

.5 If a new BC Hydro service is required, the Developer shall be responsible for paying the fees set out in the City's Engineering and Public Works - Fees & Charges Bylaw.

7.10 CONCRETE BASES

The engineer shall select a concrete base to suit the required pole from those shown in the MMCD Standard Detail Drawings, as well as the City's Supplementary Specifications and Standard Detailed Drawings. Where a customized base is required, the design shall be prepared by an engineer, and must be approved by the City.

7.11 DESIGN SUBMISSIONS

In addition to the requirements listed within Part 1 General, designs shall fully define the proposed installation, as well as the existing lighting and electrical information.

Design drawings shall be **1:250** and show civil base plan drawing information such as curbs, sidewalks, driveways, property lines, trees, all physical features that may impact the lighting design, as well as the proposed lighting poles, service/control equipment, conduit and wiring.

The engineer is required to submit the following pole and luminaire information as part of the lighting design:

.1 Shop drawings (in digital format) of the light poles proposed, complete with pole design criteria, and sealed by a qualified engineer.

7.11 DESIGN SUBMISSIONS cont'd/

.2 Lighting Design Criteria Table – list specific products, such as luminaires by manufacture, make and model. The engineer shall refer to the City's Supplemental Specifications and Standard Detail Drawings.

.3 Detailed product sheets, information and specifications of the luminaires and lamps proposed.

.4 Detailed product sheets and information on pole accessories (banner arms, receptacles, decorative castings, etc.).

SCHEDULE A

DESIGN CRITERIA

PART 8

BOULEVARDS

8.01 GENERAL

Boulevards and, where required by a Neighborhood Plan, medians, including street trees, are to be provided on all streets except Narrow Streets and Rural Streets in accordance with this Schedule and the Supplementary Detail Drawings.

8.02 BOULEVARDS AND MEDIANS

The area between the curb and sidewalk and between the curb or sidewalk and the property line (boulevard area) and road medians shall be levelled, drained and seeded with grass, or sodded, depending on weather conditions, at the discretion of the Manager. The Manager may require the seeding or sodding and other landscaping of boulevards to be delayed until building construction on the development, or on the lots created by the subdivision, is 90 percent complete or such earlier time as the Manager may determine. Low level shrubs and groundcover may be planted in medians if approved by the Manager.

8.03 TREE SPECIES

The species of trees shall be from the list in the Supplementary Specifications and shall be reviewed and approved by the City. Large tree species shall be planted on Arterial and Community Collector Streets. Medium size species shall be planted on Standard Local, Standard Collector, Hillside Local and Hillside Collector Streets. Should the specified tree not be available, the Manager shall be notified so that an alternate choice can be made. The Owner shall not make substitutions without approval of the Manager.

8.04 MINIMUM SPACING AND CLEARANCES

Large tree species shall be planted at 10m (centerline) intervals and medium size species shall be planted at 8m intervals. These intervals may be varied slightly with the approval of the Manager depending on species and to accommodate the following clearances.

Trees shall have minimum clearances as shown from the following:

streetlights	6m;
catch basins	2m;
street intersections	8m (from the curb return);
hydrants	3m;
manholes, valve boxes, service connections	2m;
driveways	2m;
electrical junction boxes	3m;
kiosks	2m.

8.05 TREE PLANTING TRENCHES

Tree planting trenches will be provided within boulevards in accordance with the Supplementary Detail Drawings. Tree planting trenches will be continuous except at streetlights, transformers and other utility structures in the boulevard. Trenches will be filled with soil in accordance with the Supplementary Specifications.

Where trenches must be offset from the boulevard centre line, the trench must be widened to plant trees on the centre line. The trench widening will be no more than 300mm on each side of the root ball to minimize the reduction in compacted fill supporting curbs and sidewalks.

8.06 ROOT RESTRAINT

An approved root restraint mechanism shall be provided in situations where geotechnical conditions or severely constrained planting areas do not allow for provision of adequate volumes of acceptable growing medium and tree roots may interfere with service corridors for underground utilities or sidewalks. The restraint mechanism will be designed such that the major root structure will be restrained from extending into other utility corridors and under curbs and sidewalks, but still allow for the normal growth of the tree.

8.07 IRRIGATION

Where necessary for the maintenance of trees, grass or other landscaping located in boulevards or medians, an underground sprinkler system shall be provided by the Owner. The system must be capable of providing the necessary irrigation as required and shall be automatically activated through a timed control system.

8.08 DECORATIVE FEATURES

The Owner may apply to construct decorative arches, columns, decorative signs, special lighting or other amenities on the median or boulevard to enhance the subdivision or development. Such amenity structures must be approved as to siting, design and appearance by the Manager. The developer must provide a cash deposit adequate to remove the amenity structure and restore the land should it become necessary or desirable after the full occupancy of the development.

SCHEDULE A

DESIGN CRITERIA

PART 9

UNDERGROUND WIRING AND GAS DISTRIBUTION

9.01 General

9.01 GENERAL

Underground wiring is required to serve all properties except those fronting onto rural streets. Underground wiring and gas pipelines must be located in accordance with the Supplementary Detail Drawings.

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

Construction drawings approved by the utility company must be submitted to the General Manager Engineering and Public Works for approval.

CITY OF COQUITLAM

SUBDIVISION AND DEVELOPMENT SERVICING BYLAW No. 3558, 2003

SCHEDULE B

GENERAL CONSTRUCTION REQUIREMENTS

Doc#267594.v4 Original Adoption – July 24, 2003
Amended: May 03, 2004, September 08, 2008, January 16, 2012, October 15, 2012, March 30, 2015, March 14, 2016, November 06, 2017, February 04, 2019, June 01, 2020, March 15, 2021, October 18, 2021, June 23, 2025
File #: 09-3900-20/3558/1 Doc #: 267594.v5

SCHEDULE B

GENERAL CONSTRUCTION REQUIREMENTS

1.0 PREREQUISITES FOR PERMISSION TO CONSTRUCT

Before the Manager of Development Services issues permission to proceed with construction, the design drawings must be approved and the following provided.

Except where indicated, applications to agencies other than the City must be made by the Consulting Engineer. These agencies may have specific requirements for clearance, carrier pipes, methods of construction, types of drawings, and format of application.

- registered rights-of-way for works and services across lands owned by other parties;
- amendments to existing, registered, rights-of-way and easements in favour of other parties to permit works and services in accordance with the Bylaw;
- a copy of the notification by the Owner's contractor to the Workers' Compensation Board of the proposed construction and installation of the Works and Services;
- approvals for crossings of railway tracks, high pressure gas distribution mains, oil pipelines, or BC Hydro rights-of-way;
- approval of GVRD for direct connections to GVRD sewers and for expansion of the Sewerage Area (application will be made by the City);
- a Construction Permit from the Regional Public Health Engineer for the installation of any waterworks;
- documentation to confirm that the Owner submitted a Notification application as required under the *Water Act* to the Ministry of Water, Land and Air Protection (MWLAP) at least 45 days prior to any scheduled instream work (ISW) such as installation of bridges, culverts, pipeline crossings and storm water outfalls;
- a Notification response letter from MWLAP including any project specific terms and conditions if received during the 45-day waiting period;
- an Approval pursuant to Section 8 of the *Water Act* issued by the Ministry of Sustainable Resource Management (MSRM) for any project involving the temporary use or diversion of water from a stream;
- a License pursuant to Section 7 of the *Water Act* issued by MSRM for any project involving the permanent use, storage or diversion of water from a stream;
- documentation to confirm that the Owner has notified MWLAP that work is proposed in an Environmentally Sensitive Area (ESA), other than in or near a stream;
- the response (if any) from MWLAP regarding proposed work in an ESA;

1.0 PREREQUISITES FOR PERMISSION TO CONSTRUCT cont'd/

- a Permit for disposal, including burying or dumping, of any solid or liquid wastes on-site issued under Section 10 of the *Waste Management Act* by MWLAP;
- an authorization under Subsection 35(2) of the *Fisheries Act* issued by Fisheries and Oceans Canada for projects which have the potential to cause harmful alteration, disruption or destruction (HADD) of fish habitat or to cause harm to fish, such as installation of a culvert, removal of streamside vegetation or other works in or about a stream;
- a Permit issued under Section 10 of the *Waste Management Act* by the GVRD for any air emissions or discharges to the atmosphere of prohibited materials and particulates, which may not meet applicable provincial or regional criteria, or which require pollution control works in order to meet applicable criteria; and
- any other approvals, licences, authorizations, permits or equivalent required by the Manager of Development Services.

2.0 DRAWINGS AND SCHEDULES

All works carried out, and all materials supplied by the Owner, shall be in accordance with the Bylaw and its schedules and with the design drawings approved by the Manager of Development Services.

If there is any inconsistency between the requirements, they shall govern and take precedence in the following order:

- this Bylaw including its Schedules;
- design drawings and specifications approved by the Manager of Development Services;
- City of Coquitlam Supplementary Specifications or Contract Documents, 2002;
- Master Municipal Specifications of MMCD published in 2000; and
- Master Municipal Standard Detail Drawings of MMCD published in 2000.

These documents are collectively referred to in this Schedule as the Bylaw and approved drawings.

The decision of the General Manager Engineering and Public Works as to the true intent and interpretation of the Bylaw and approved drawings shall be final and binding.

2.0 DRAWINGS AND SCHEDULES cont'd/

The Owner shall provide the General Manager Engineering and Public Works, at proper times, with all shop and setting drawings or diagrams which the General Manager Engineering and Public Works considers necessary in order to clarify the work intended or to show its relation to adjacent work of other trades. The Owner shall make any changes in such drawings or diagrams which the General Manager Engineering and Public Works may require, consistent with the Bylaw, and shall submit sufficient copies of the revised prints to him for review, all but three (3) of which shall be returned to the Owner. When submitting shop and setting drawings, the Owner shall notify the General Manager Engineering and Public Works, in writing, of changes from the Consulting Engineer's drawings or specifications. The General Manager Engineering and Public Works' review of such drawings, or of the revised drawings, shall not relieve the Owner from responsibility for errors or for changes made to the drawings or specifications not covered by the Owner's written notification.

Any discrepancies, errors or omissions found in the Bylaw and approved drawings shall immediately be reported to the Consulting Engineer who shall promptly correct such errors or omissions in writing and request approval of the General Manager Engineering and Public Works. Any work done after discovery of such discrepancies, errors or omissions and prior to correction and approval shall be at the Owner's risk.

3.0 SUPPLY OF MATERIALS

3.01 All materials required for the works shall be supplied by the Owner and shall conform to the requirements of the Bylaw and approved drawings. The Owner shall notify the General Manager Engineering and Public Works of the source, or sources, of materials to be supplied. Such notification shall be given sufficiently far in advance of delivery to enable the General Manager Engineering and Public Works to make inspection of the materials at the source of supply.

3.02 Any materials which, in the opinion of the General Manager Engineering and Public Works, do not conform to the requirements of the Bylaw and approved drawings, or are unsuitable for the purpose for which they are intended, shall be rejected. Rejected materials shall be replaced by the Owner at his expense with materials approved by the General Manager Engineering and Public Works.

4.0 RESPONSIBILITY FOR AND STORAGE OF MATERIALS AND EQUIPMENT

The Owner shall be responsible for all materials and shall safely store and guard them until incorporated in the works and the works are completed. The Owner shall not unreasonably encumber the site with materials or equipment. The Owner shall keep road and lane allowances free of all materials and unlicensed equipment and maintain public access as required by the General Manager Engineering and Public Works.

5.0 HOURS OF WORK

The hours of work shall generally be between 7:00 a.m. and 6:00 p.m., Monday to Friday. The contractor shall schedule his work within these hours and will not be permitted to work outside of these hours except as authorized by the General Manager Engineering and Public Works.

If the contractor wishes to work outside of these hours, he shall notify the General Manager Engineering and Public Works 48 hours in advance stating the location and the work to be conducted. The actual cost of inspection on these occasions will be paid by the contractor. No work shall take place if the contractor fails to give such notice or is denied permission.

No work will be permitted on a Sunday or statutory holiday except in case of emergency and then only with the written permission of the General Manager Engineering and Public Works and to such extent as he deems necessary. If an emergency arises outside of regular City office hours, the work may proceed without permission, but every attempt should be made to contact the General Manager Engineering and Public Works.

6.0 INSPECTION

The General Manager Engineering and Public Works will inspect the installation of the works, except for street trees, to determine conformance with the Bylaw and approved drawings. The City does not assume responsibility for survey control and collection of record information. The Owner must provide sufficient on site control to ensure the accuracy of these items. The City does not accept responsibility for requirements of other City Bylaws or whether the work is adequately controlled and supervised in the Owner's interests.

The Owner shall allow the General Manager Engineering and Public Works access, and shall provide adequate facilities for access, to any part of the works at all times. The Owner shall give advance notice of being ready for a test or inspection required by the General Manager Engineering and Public Works, the Bylaw and approved drawings or other authority and, if the inspection is by an authority other than the General Manager Engineering and Public Works, of the date fixed for such inspection. The General Manager Engineering and Public Works shall inspect the work promptly and without causing unreasonable delay to the Contractor.

Any part of the works covered by the Owner in contravention of the General Manager Engineering and Public Works' instructions shall, at the request of the General Manager Engineering and Public Works, be uncovered for inspection. If the Owner refuses to comply, the General Manager Engineering and Public Works may employ other persons to uncover the work. The costs of uncovering and recovering the work shall be borne by the Owner.

6.0 INSPECTION cont'd/

The acceptance, or the lack of comment, on the part of the General Manager Engineering and Public Works, of methods of construction employed by the Owner shall not relieve the Owner of his responsibility for any errors and shall not be regarded as an acceptance of responsibility for the work done by the Owner.

Inspection of, and requirements with respect to, street trees or other boulevard planting shall be in accordance with MMCD Specifications and the Supplementary Specifications.

7.0 TESTING

The Owner shall be responsible for all testing as required to meet the minimum standards detailed below and any additional tests required for compliance with geotechnical reports and recommendations or other tests as required or recommended by the Owners Engineer. All tests must be completed by a CSA certified laboratory and technicians with copies of all test results being sent directly to the City's Engineering Inspector.

Test rates and frequencies (excluding failed tests), when not defined in the MMCD or Detail Specifications Sections shall be at the following frequencies:

1. Trench Backfilling and Compaction
1.1 Compaction: 1 test/50 lineal metre/300mm lift
1.2 Sieve: 1 test / placed material/100m^3
2. Granular Base and Subbase, Roads, Sidewalk and Curb
2.1 Compaction: 1 test/250m^2/0.10m depth of granular base
1 test/250m^2/0.20m depth of granular subbase
1 test/50 lineal metre of curb base
1 test/75 square metres for sidewalk base
2.2 Sieve: 1 test placed material/100 m^3
2.3 Proof Rolling: In accordance with MMCD and City's Supplementary Specifications
3. Embankment (Subgrade)
3.1 Compaction and Moisture: 1 test/250m^2/0.30m depth of fill
3.2 Sieve: 1 test/placed material/250m^3
4. Asphalt
4.1 Marshall test: test per 500 tonnes placed
4.2 Superpave: test per 500 tonnes placed
4.3 Cores: 1 per 250 m^2/lift
4.4 Continuous asphalt density testing during paving
5. Concrete Tests
5.1 Air, Slump and 1 Set Cylinders: 1 test/200 lineal metres of curb, min. 1 set/day (for Roadwork only) 1 test/150 lineal metres of sidewalk, min. 1 set/day".

8.0 REJECTED WORK AND MATERIALS

All materials which do not conform to the requirements of the Bylaw and approved drawings, are not approved by the General Manager Engineering and Public Works, or are in any way unsatisfactory or unsuited to the purpose for which they are intended will be rejected.

If there is evidence of any fault, defect or omission, from any cause whatever, which may adversely affect the strength, durability or appearance of any section of the works, the Owner shall, at his own expense, satisfactorily correct them, or if required, shall replace so much of the works as the General Manager Engineering and Public Works may deem necessary.

The fact that the General Manager Engineering and Public Works may have previously overlooked defective work shall not constitute an acceptance. The removal of work and its re-execution shall be at the expense of the Owner who shall pay the cost of replacing the work including materials and work of others destroyed or damaged by the removal of the rejected work or materials and the subsequent replacement with acceptable work. The Owner shall also reimburse the General Manager Engineering and Public Works for any additional engineering inspection or testing costs incurred in respect of rejected work or materials.

9.0 GENERAL MANAGER ENGINEERING AND PUBLIC WORKS' RIGHT TO CORRECT DEFICIENCIES

Upon failure of the Owner to perform the work in accordance with the Bylaw and approved drawings and after ten (10) days written notice to the Owner, or without notice if an emergency or danger to the work or public exists, the General Manager Engineering and Public Works, without prejudice to any other remedy, may correct such deficiencies. The cost of work performed by the General Manager Engineering and Public Works in correcting deficiencies shall be borne by the Owner.

10.0 SUSPENSION OF WORK BY GENERAL MANAGER ENGINEERING AND PUBLIC WORKS

The General Manager Engineering and Public Works may, at any time, suspend the work or any part of it on providing the Owner or contractor written notice of such suspension. The work may be suspended for reasons of public health or safety; non-compliance with federal, provincial or other laws, codes, bylaws or regulations; or failure to comply with the requirements of this Bylaw.

11.0 ORAL AGREEMENTS

No oral instruction, objection, claim or notice by any party to the others shall affect or modify any of the terms or obligations contained in the Bylaw or approved drawings and none shall be held to be waived or modified by reason of any act whatsoever other than by a waiver or modification in writing.

12.0 SUPERVISION AND LABOUR

The Owner shall keep on the work, at all times during its progress, a competent superintendent who is acceptable to the General Manager Engineering and Public Works. The superintendent shall represent the contractor and Owner in his absence, and directions given to him shall be held to be given to the contractor and Owner. The superintendent shall give efficient supervision to the work until its completion.

13.0 CHARACTER OF WORKMEN

All workmen must have sufficient knowledge, skill and experience to properly perform the work assigned to them. Any foreman or workman employed by the contractor or a subcontractor who, in the opinion of the General Manager Engineering and Public Works, does not perform his work in a skillful manner or appears to be incompetent or to act in a disorderly or intemperate manner shall, at the written request of the General Manager Engineering and Public Works, be removed from the site of the work immediately and shall not be employed again in any portion of the work without the approval of the General Manager Engineering and Public Works.

14.0 OWNER TO PROVIDE ASSISTANCE

The Owner shall provide, at his own expense, any competent labour required by the General Manager Engineering and Public Works in connection with the survey, design, measurement, checking, inspection and testing of the works. This labour shall be made available upon request during normal working hours.

15.0 PROTECTION OF MONUMENTS, BENCH-MARKS AND STAKES

The Owner shall take adequate precautions to protect all monuments, property stakes and iron pins set by BC Land Surveyors from being damaged, removed or displaced as a result of his operations. The Owner shall pay all charges, including fees payable to Land Surveyors, for re-establishing all monuments, stakes and iron pins removed or displaced on account of the Owner's act or neglect. All stakes so removed shall be replaced by a BC Land Surveyor engaged by the Owner and approved by the General Manager Engineering and Public Works.

16.0 SETTING OUT

16.01 The Owner shall be responsible for the true and proper setting out of the works in relation to original points, lines and bench-marks as laid out by a BC Land Surveyor and be responsible for the accuracy of the dimensions of all parts of the works and for the correctness of their positions, elevations and alignment.

16.0 SETTING OUT cont'd/

16.02 The Owner shall, at his own cost, provide all necessary instruments, appliances, material and labour required for the setting-out and positioning of the works.

17.0 ADJACENT PROPERTIES

All work shall be done in a manner that will avoid damage to adjacent properties. The Owner shall not enter upon lands owned by others without obtaining prior written permission of the property owners and occupiers. If work is done on adjacent property, restoration shall be to a condition as near as possible to that existing prior to construction. The Owner shall obtain a written release from the owner of the property to the effect that the owner is completely satisfied with the restoration made to his property. A copy of the signed release shall be deposited with the General Manager Engineering and Public Works prior to release of the Performance Bond.

18.0 CONSTRUCTION SIGNS, BARRIERS AND FENCES

The Owner shall provide, erect and maintain all required barriers, fences or other proper protection and must provide, keep and maintain such flag persons, watch persons and lights as may be necessary, or as may be ordered by the General Manager Engineering and Public Works, in order to ensure safety to the public and to those engaged about the premises or works. The Owner must, where in the General Manager Engineering and Public Works' opinion it is practical, keep sidewalks and the complete width of streets open for the public unless restricted public use is approved by the General Manager Engineering and Public Works.

All signing and traffic control shall conform to the City's "Work Area Traffic Control Manual" available from the City Engineering and Public Works Department.

The Owner shall provide the number and type of traffic control devices required by the Manual which he must place and maintain in good order in conspicuous places wherever any roadway, sidewalk or thoroughfare is restricted in use, unsafe or unfinished. The Owner shall accept liability in regard to the provision, erection and maintenance of all traffic control devices for the protection of the work and of the public.

19.0 EMERGENCY SITUATIONS

In emergency situations resulting from the construction operation where life or property are endangered, the Owner shall immediately take whatever action is possible to eliminate the danger and shall notify the appropriate authorities of the situation. Any costs incurred by the City in rectifying emergency situations caused by neglect of the Owner or his Contractor shall be borne by the Owner.

20.0 SITE MAINTENANCE AND CLEANUP

The working area shall be maintained in an orderly manner and shall not be encumbered with equipment, materials or debris. Cleanup shall be a continuing process from the start of the work to final acceptance of the project. The Owner shall, at all times, keep property on which work is in progress free from accumulations of waste materials or rubbish caused by employees or by the work. Accumulations of waste materials which might constitute a fire hazard will not be permitted. Spillage from the contractor's vehicles on travelled public or private roads shall be promptly cleaned up. On completion of construction, the Owner shall remove all temporary structures, rubbish and waste materials resulting from his operations.

The Owner shall keep roads and walks adjacent to the proposed works clean at all times. Debris and mud, which is tracked or otherwise deposited onto areas outside the construction limits, must be promptly cleaned up.

The Owner shall ensure that no mud, silt or any prohibited substances as outlined in the City Stream and Drainage Protection Bylaw enters the storm system via manholes or catch basins.

Dust preventatives shall be used on temporary haul roads when a dust nuisance is being created. Water may be used to control dust when a road is open to provide local access, when vehicular traffic is light, and sediment control measures are in place.

All costs to keep dust, mud and other debris under control shall be borne by the Owner. If the control measures are not carried out to the satisfaction of the General Manager Engineering and Public Works, the City will take the necessary steps to control dust, mud and other debris and all costs incurred will be charged to the Owner.

The Owner is responsible for the control of dust, mud and other debris from the time that work of any description is commenced until work is completed and approved by the General Manager Engineering and Public Works.

21.0 DRAINAGE AND SEDIMENT CONTROL

Existing, temporary and new drainage facilities which are affected by the work must be maintained by the Owner during the installation of the works. Any damage resulting from lack of maintenance, obstruction, inadequate preparation or design of the drainage system will be rectified by the Owner to the satisfaction of the General Manager Engineering and Public Works.

21.0 DRAINAGE AND SEDIMENT CONTROL cont'd/

The Owner shall take all necessary steps to have all existing catch basins, manholes and sewers cleaned and made free from all granular, asphaltic and concrete material and other debris immediately after the required work has been completed.

All existing catch basins, manholes and sewers affected by the work must be cleaned to the satisfaction of the General Manager Engineering and Public Works.

Works for sediment control must be provided, inspected, maintained and completed in accordance with the Stream and Drainage System Protection Bylaw.

22.0 EXISTING SERVICES

22.01 Damage

Existing services, whether inside or outside of the right-of-way, and road surfaces, sidewalks, curbs, boulevards or other works which are damaged or disturbed by the Owner as a result of his operations or those of his workmen, agents or sub-contractors shall be reinstated by the Owner to the complete satisfaction of the General Manager Engineering and Public Works or other authorities having jurisdiction. Reinstatement includes that portion of the service that is damaged and the supply and installation of special backfill materials, where this is required, retesting of the service, re-chlorination and any other work that requires to be done, in the opinion of the General Manager Engineering and Public Works, for restoration to a condition at least equivalent to that which existed prior to construction.

22.02 Disruption

Where it is necessary to interrupt existing services to complete the works, approval of the City and/or utility company is required. When water supply must be interrupted, the waterworks foreman and the City Service Centre must be notified twenty four (24) hours in advance. Written notice shall also be given to all affected residents a minimum of twenty-four (24) hours in advance. Existing hydrants within the development area must be accessible at all times to the Fire Department.

23.0 DAMAGE TO HAUL ROADS

The Owner shall be responsible for extraordinary maintenance and the repair of public roads leading to and from the site which are used as haul roads during construction. The route of the haul road may be designated by the General Manager Engineering and Public Works. The General Manager Engineering and Public Works shall determine the extent of responsibility of the Owner. Gravel roads are to be maintained by grading, gravelling, ditching and are to be kept free of dust. The Owner shall be responsible for paved streets, catch basins and sewer cleaning, removal of debris and housekeeping activities on the street adjacent to, or affected, by the construction.

24.0 WEATHER CONDITIONS

The General Manager Engineering and Public Works may decide that adverse weather conditions do not permit certain portions of the work to be completed according to the Bylaw and approved drawings, and he may order the Owner to discontinue work on these portions of the work. The Owner shall comply with the General Manager Engineering and Public Works' order and shall stop work on these portions until he has received permission from the General Manager Engineering and Public Works to proceed. The Owner shall have no claim against the City for any delays due to stoppage of work by the General Manager Engineering and Public Works due to adverse weather conditions.

25.0 INJURY OR DAMAGE TO PERSONS OR PROPERTY

The Owner shall use due care and take all necessary precautions to ensure the protection of persons and property and shall comply with the provisions of the *Workers' Compensation Act*. The Owner shall be liable for any and all injury or damage which may occur to persons or to property due to any act, omission, neglect or default of the Owner or of his employees, workmen or agents.

Notwithstanding other provisions of the Bylaw, in an emergency affecting the safety of life or of the work or of adjoining property, the Owner, without the necessity of authorization from the General Manager Engineering and Public Works, shall act in a reasonable manner to prevent loss or injury.

Work shall be carried out in a manner that will cause the least interruption to vehicular and pedestrian traffic. Where work is to be carried out on highways or land other than those of the Owner, the Owner shall familiarize himself with the requirements of the owner of these highways or lands pertaining to traffic control and safety or which place limitations on the work and shall comply with these requirements.

26.0 USE OF COMPLETED PORTIONS

The City shall have the right to use any completed, or partially completed, portions of the work. Such use shall not be deemed an acceptance of any work not completed in accordance with Bylaw and approved drawings.

27.0 COMPLETION

On completion of construction, except for street trees or other boulevard planting, all portions of the work shall be inspected by the Owner, who will satisfy himself that every item has been completed and that the whole works are in a clean and tidy condition and ready in all respects for acceptance by the City. The Owner shall then request that a final inspection of the works be carried out.

A Letter of Substantial Completion will be issued by the General Manager Engineering and Public Works following the final inspection of the works and the rectification by the Owner of all job deficiencies.

If the Owner considers that, for reasons beyond his control, all job deficiencies cannot be properly rectified, he may request a partial release of the Security Deposit. A written request must be submitted to the General Manager Engineering and Public Works.

Upon the expiry of the maintenance period, the maintenance security, excluding that for street trees or other boulevard planting, will be released provided all defects and deficiencies, except for normal wear and tear, have been remedied to the General Manager Engineering and Public Works' satisfaction.

Final inspection and release of security for street trees or other boulevard planting shall be as set out in MMCD Specifications and the Supplementary Specifications.

CITY OF COQUITLAM

SUBDIVISION AND DEVELOPMENT SERVICING BYLAW No. 3558, 2003

SCHEDULE C

SUPPLEMENTARY SPECIFICATIONS AND STANDARD DETAIL DRAWINGS

1.0 INTRODUCTION

The Specifications and Standard Detail Drawings of the Platinum edition of the Master Municipal Construction Document (MMCD) are incorporated into the City of Coquitlam Subdivision and Development Servicing Bylaw as prescribed, replaced or amended from time to time by the City's General Manager of Engineering and Public Works.

MMCD and CCSS&SDD are designed to form part of a contract between an owner and a contractor, and the specifications in both documents, either directly or by reference to their respective General Conditions, include references to the responsibilities of an owner, contractor and contract administrator. The applicability of MMCD and CCSS&SDD in connection with this Bylaw is with respect to technical specifications and construction details only, and does not involve the City in the contractual relationship that the Owner has with the contractor(s) hired by the Owner or that the Owner has with professional staff, consultants or other agents. Except as specified elsewhere in this Bylaw, for the purposes of the Bylaw, the City places full responsibility for design, construction, installation, inspection, testing and record keeping of Works and Services on the Owner who is required to hire the Consulting Engineer to undertake duties in accordance with the Bylaw, and MMCD and CCSS&SDD must be interpreted in this way.

In order to give effect to the forgoing, the following global supplementary specifications form part of this Bylaw.

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

In case of inconsistency, any design drawings and specifications approved by the Manager for a specific project take precedence over CCSS&SDD, which in turn takes precedence over MMCD.

2.0 GLOBAL SUPPLEMENTS TO MMCD AND CCSS

Delete and replace the following:

(a) delete references to "General Conditions";

(b) delete references to "payment" and "measurement and payment";

(c) replace "Contract Administrator" with "Owner's Engineer" except for MMCD Specification 32 91 21, 32 92 19, 32 92 20, 32 92 23, and 32 93 01

(d) For MMCD Specifications 32 91 21, 32 92 19, 32 92 20, 32 92 23, and 32 93 01 replace "Contract Administrator" with "the Landscape Architect referred to in Section 10.03 of the City of Coquitlam Subdivision and Development Servicing Bylaw No. 3558, 2003";

(e) replace "Contractor" with "Owner";

(f) replace "Contract Documents" with "City of Coquitlam Subdivision and Development Servicing Bylaw No. 3558, 2003 and design drawings and supplementary specifications approved for construction by the Manager";

(g) replace "Contract Drawings" with "design drawings approved for construction by the Manager";

(h) replace "Supplementary Specifications" with "City of Coquitlam Supplementary Specifications and Standard Detail Drawings, and supplementary specifications approved for construction by the Manager".

CITY OF COQUITLAM

SUBDIVISION AND DEVELOPMENT SERVICING BYLAW No. 3558, 2003

SCHEDULE D

SECURITY DEPOSITS

SCHEDULE D

SECURITY DEPOSITS

1.0 SECURITY DEPOSITS

This Schedule sets out the security required if the Owner requests that a subdivision plan be signed, or a building permit issued, prior to completion of Works and Services in accordance with Section 19.0 of the Bylaw or prior to the expiry of any related maintenance period in accordance with Section 20.0 of the Bylaw.

2.0 FORM OF SECURITY

A security deposit must be in the form of cash or a clean, unconditional, irrevocable letter of credit or other financial instrument issued by a financial institution, or a surety bond or another form that is alternative to security that is acceptable to the General Manager Finance, Technology and Police Services and the General Manager Planning and Development.

3.0 PERFORMANCE SECURITY

The amount of performance security shall be 110 percent of the cost to supply material for, and to complete the Works and Services including engineering, inspection, testing, construction, installation, planting and taxes and to provide record documents. This amount is to be estimated based on approved servicing design drawings.

4.0 SECURITY REDUCTIONS

The City will provide reductions, except for the landscaping, in accordance with the following:

4.1 Reductions will be based on the proportion of the work completed, inspected and, if required, tested in accordance with certified, detailed progress reports submitted by the Consulting Engineer and approved by the General Manager Engineering and Public Works.

4.2 Reductions will not be made more frequently than once every month.

4.3 Reductions are only permitted to a maximum of 90 percent of the value of the work completed.

4.4 Any costs incurred by the City which are recoverable from the owner, or otherwise, will be deducted from any reduction irrespective of whether or not the recoverable amount relates to the same work as the reduction.

5.0 MAINTENANCE SECURITY

The amount of maintenance security shall be 10 percent of the cost of the Works and Services, excluding street trees, plus 20 percent of the cost of landscaping.

6.0 COST ESTIMATES

The amount of security required in 3.0 and 5.0 is to be based on estimated costs provided by the Consulting Engineer as agreed to by the General Manager Engineering and Public Works with respect to the Works and Services excluding landscaping and by the Landscape Architect as agreed to by the Manager Parks and Open Space Services with respect to landscaping.

7.0 RETURN OF SECURITY

No security deposited under the provisions of this Bylaw shall be returned unless and until all of the requirements for which the security has been deposited have been completed to the satisfaction and approval of the General Manager Engineering and Public Works except with respect to landscaping and of the Manager Parks and Open Space Services, with respect to landscaping. Security deposited under the provisions of this Bylaw shall be returned to the Owner only.

CITY OF COQUITLAM

SUBDIVISION AND DEVELOPMENT SERVICING BYLAW No. 3558, 2003

SCHEDULE E

PRIVATE WATER SUPPLIES

1.0 SOURCE AND YIELD

If, in the opinion of the Manager, it is not practical to connect the land in a subdivision to the City waterworks system, each parcel in the subdivision must be provided with a well in accordance with this schedule.

Wells must be drilled, tested and certified for each proposed lot within a subdivision prior to the approval of the subdivision plan. Private wells for single-detached residential lots must be capable of a year round sustained yield of 2,500 litres per day with not less than 10 litres per minute for a minimum of four hours. Private wells for other uses must have a sustained yield appropriate to the expected use.

2.0 WATER QUALITY

As a condition of subdivision approval, water quality must be tested by a laboratory approved by the Provincial Health Officer for the bacteriological testing of potable water supplies and by a laboratory accredited by the Ministry of Water, Land and Air Protection for testing of chemical and physical parameters. Testing must be undertaken in accordance with the latest edition of the Guidelines for Canadian Drinking Water Quality Standards for microbiological parameters and for those chemical and physical parameters required for community waterworks systems by the Medical Health Officer having jurisdiction.

3.0 LOCATION AND PROTECTION OF WELLS

Private wells are restricted to supplying water to one lot and must be situated on that lot unless the Approving Officer believes that there are exceptional circumstances. If the source is not located on the lot which it supplies, the source, access suitable for the passage and maneuvering of appropriate equipment, connecting pipeline, electrical connection and any appurtenances must be protected by an easement.

All wells must be drilled and cased in steel with a well cap tack welded in place pending a permanent pump being installed and constructed in such a way as to prevent surface water from entering the well.

4.0 CERTIFICATION

A Professional Engineer with experience in well drilling and testing must submit certification and test results and a sketch plan for each well, in the form provided in Appendix A, showing that the well meets the quality, quantity and design criteria in this Schedule.

4.0 CERTIFICATION cont'd/

If the test results are considered marginal (+/- 10 percent) by the certifying engineer or there are more than two lots in the proposed subdivision, an evaluation of the year-round availability of groundwater must be made by a professional engineer specializing in the hydrology of groundwater. The evaluation must consider the impact of each proposed well on the existing or possible future groundwater supply on neighbouring lots, the long term impact of wells in the proposed subdivision on the aquifer and the potential for degradation of well quality resulting from septic tank effluent, agricultural operations or other cause.

5.0 WAIVER

The requirements for testing well yield and water quality may, at the discretion of the Approving Officer, be waived for a proposed lot on which there is an occupied dwelling served by a well or licenced surface source that yields water which meets the quality criteria in Section 2.0 and the owner submits a notarized statement that it has provided an adequate year round quantity of water for at least the last two years.

PRIVATE WELL CERTIFICATION

Separate certification is required for each well.

LEGAL DESCRIPTION: _____

Well #:_____

I certify the following information applies to a steel cased, drilled well intended as the source of potable water for one lot in a proposed subdivision on the above property and that it is suitable for the use intended. The well location is shown by approximate distances (+/- 2m) from existing legal boundaries marked on the attached, signed and dimensioned sketch plan.

I have certified the attached well pump drawdown and recovery test and summary reports and certify that the well has a sustained yield of not less than 2,500 litres per day and 10 litres per minute for a four-hour period.

I certify that water quality tests have been conducted by a laboratory approved by the Provincial Health Officer for the bacteriological testing of potable water supplies and by a laboratory accredited by the Ministry of Water, Land and Air Protection for testing of chemical and physical parameters as required for community waterworks systems by the Medical Health Officer having jurisdiction, all in accordance with the latest edition of the Guidelines for Canadian Drinking Water Quality.

I certify the well has been constructed in such a way as to prevent surface water from entering the well.

I am a professional engineer registered in the Province of British Columbia with experience in well drilling and testing.

Certified by:

_____

_____
Signature and Name of Professional Engineer

_____
Company Name

_____

_____
Address

_____
Date

Engineer's Seal