



Subdivision Design Procedures and Municipal Engineering Standards for the City of Corner Brook



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Intent of Document

Readers are advised that this document is not intended to supersede or replace the City of Corner Brook Development Regulations for the City of Corner Brook, but is to be read in conjunction with that document and all applicable Provincial Acts and Regulations. All Italicized works contained within this document are defined in Schedule1, Section 1.0.

Defining a Subdivision

New Subdivision means the dividing of land, whether in single or joint ownership into 2 or more pieces for the purpose of development (*Urban and Rural Planning Act, 2000*) where a new street or an extension to an existing street is to be constructed. New subdivisions shall comply with all of the requirements outlined within this document.

Infill subdivision means the dividing of land, whether in single or joint ownership into 2 or more pieces for the purpose of development (*Urban and Rural Planning Act, 2000*) within an existing City of Corner Brook street. The City of Corner Brook shall assess the level of development occurring and specify which requirements within this document shall apply.

SCHEDULE 1

SUBDIVISION DEVELOPMENT GUIDELINES – GENERAL

1.0 DEFINITIONS

- (a) **As-Builts** means *Drawings* submitted in both paper and digital format compiled to the standards outlined within this document.
- (b) **Contractor** means the construction party hired by the *Developer* to install the Infrastructure works as designed by the *Developers Engineer*.
- (c) **Consultant** means the Engineer/Inspector hired by the City of Corner Brook to conduct full time inspection for the subdivision.
- (d) **Developer** means a person or company who has applied for and has been granted approval to subdivide or service an existing parcel of land.
- (e) **Developers Engineer** means an engineer licensed to practice in Newfoundland and Labrador who has been hired by the developer to complete the requirements outlined in this document.
- (f) **Developers Inspector** means an onsite construction inspector who must complete the construction inspection requirements outlined in this document. The Developers Inspector in many situations may be the *Developers Engineer*.
- (g) **Development Area** means the area outlined within the developers survey of land to be subdivided.
- (h) **DMA** means Department of Municipal Affairs, Government of Newfoundland and Labrador.
- (i) **DOEC** means the Department of Environment and Conservation, Government of Newfoundland and Labrador.
- (j) **Drawings** means both paper copy, as well as digital. All CAD drawings shall be drawn full size in the 3 Degree MTM Zone Three (NAD83) coordinate system as currently published by the province of Newfoundland and Labrador.
- (k) **Easement** means an interest in land owned by another person, consisting in the right to use or control the land, or an area above or below it, for a specified purpose as agreed to by the by the dominant tenement and servient tenement, which includes but not limited to, the City of Corner Brook, a Utility Company or other party.
- (l) **Manual** means the Transportation Association of Canada “Manual of Geometric Design Standards for Canadian Roads” (latest edition).
- (m) **Municipal Specifications** means the Municipal Water, Sewer and Road Specifications as published by the Province of NL, Department of Municipal Affairs.
- (n) **Site Grading** means the laying out of all lots within a proposed subdivision as outlined within this document.
- (o) **Stage I Work** means all work relating to installation of water, sanitary and storm sewer systems, construction of all street right-of-ways including base course asphalt, curb and gutter as per submitted plans.
- (p) **Stage II Work** means all work related to the construction of above ground work, including but not limited to surface course asphalt, sidewalks, landscaping etc. as per submitted plans.
- (q) **Subdivision Permit** means a permit giving the developer approval to proceed with construction work as per the Subdivision Agreement
- (r) **Survey** means the determination of any point or the direction or length of any line required in measuring, laying of, or dividing land for the purpose of establishing boundaries or title to land.
- (s) **TAC Manual** means the Transportation Association of Canada’s, Geometric Design Guide for Canadian Roads (latest edition).
- (t) **The City** means the City of Corner Brook.

- (u) **Water and Sewer Guidelines** means Guidelines for the Design, Construction and Operation of Water and Sewerage Systems as published by the Government of Newfoundland and Labrador, Department of Environment and Conservation.
- (v) **Water Service Pipe** means a pipe which branches off the main water distribution system and conveys potable water to the building or property served.
- (w) **Water System** means the City's Water Distribution System which is composed of an assembly of pipes, fittings, control valves and appurtenances which convey water to water service pipes and hydrants.

Please refer to the Department of Municipal Affairs Water, Sewer and Roads Master Specifications for additional definitions.

2.0 AGREEMENTS

2.1 Subdivision Agreement

1. The Developer shall sign a Subdivision Agreement with the City (copy included in Appendix G), and it shall name the approved plan(s) and conditions as required by the City for its development.
2. The Subdivision Agreement may at the discretion of the City be registered at the Registry of Deeds and Companies for the Province of Newfoundland and Labrador.
3. The Subdivision Agreement shall contain all necessary warning clauses and notices to purchasers that may be required by the City, to inform of, but not limited to, possible development restrictions, requirement to maintain site specific works and potential developments planned or being considered at the rear of any lot shown on said Plan(s).
4. *The City* reserves the right to amend, alter, change, update, cancel or revoke any Subdivision Agreements or Subdivision Permits if deemed necessary at the discretion of the City of Corner Brook.

2.2 Purchase and Sale Agreement Warning Clause

- The Developer shall include all necessary Warning Clauses in a purchase and sale agreement between the Developer and a purchaser that may be necessary to inform of any limitation(s), restriction(s) and notice(s) for any lot shown on the plan(s) referred to in the Subdivision Agreement or Subdivision Permit.
- As with Subdivision Agreement, the said Warning Clauses and notices may include but not limited to, possible development restrictions, requirement to maintain site specific works and of any potential developments planned (or are being considered) at the rear of any lot shown on the plan(s).

2.3 Clearance Letters

Prior to approval of any plan and before the signing of a Subdivision Agreement, or before the issue of a Subdivision Permit, the City will require a written response from NL Power advising that all conditions for servicing have been satisfied.

2.4 Servicing Agreement:

Where a development scheme has been adopted by the City of Corner Brook, or where a new development results in the potential for development of adjacent lands, a Developer may request to enter into a Servicing Agreement with the City that permits the Developer to recover a portion of its development costs.

3.0 DEVELOPMENT APPROVAL

3.1 Application

The applicant will be required to submit a Development Application for the Subdivision of Land on the appropriate form to the City of Corner Brook, Community Services Division. A Development application fee of \$50.00 must accompany the application form.

3.2 Requirements

The application must be accompanied by the following:

- (a) A legal survey of the property confirming the development is contained within the limits of property.
- (b) Written consent from the property owner for the development of the subdivision.
- (c) Three sets of detailed plans showing the proposed subdivision plan. The plans shall include, but not be limited to, street and lot layout, identification of services and connections, (water, storm sewer and sanitary sewer), water courses, open space and street connections. The plans shall be at a scale of 1:500 with 1 meter contour intervals.
- (d) Two copies of a location plan at a scale of 1:2500 shall also be submitted indicating the proposed street layout and the location of the proposed development within the municipal boundaries of the City of Corner Brook.
- (e) The preliminary drawings for the subdivision must be sealed and signed by a professional engineer licensed to practice in the Province of Newfoundland and Labrador, otherwise known as the *Developers Engineer*.
- (f) Land Use Assessment Report

3.3 Process

The preliminary plans will be reviewed by *The City* for the following: Land Use Zoning, Development Regulations, Access, Water Supply, Sanitary Sewer Generation, Storm Sewer Generation, Internal Street Layout, and Open Space. Upon review of the above, if a deficiency is determined to exist then:

- (a) The applicant may be required to undertake further studies to determine the extent of any problems and corrective action required.
- (b) The application may be recommended for Development Approval subject to the applicant taking the necessary corrective action as determined by the City.
- (c) Where a Municipal Plan Amendment (zoning change) is required and recommended by staff, the amendment process as outlined in Appendix B must be resolved prior to any further processing taking place.
- (d) The application may be recommended for rejection.
- (e) The application will be recommended for Development Approval if there have not been any problems noted during the review.

3.4 Approval

Development Approval shall be valid for a period not exceeding One year from the date of granting by the City. An extension period of one year may be allowed by the authority upon written request and a satisfactory explanation provided by the applicant as to the reason why the extension is required. During this time, the final construction drawings and documentation shall be submitted for construction approval and issuance of the subdivision permit. The Regulations in effect at the time of issuance of the subdivision permit will apply.

4.0 CONSTRUCTION DESIGN AND APPROVAL

4.1 General

The subdivision is to be designed and constructed in accordance with the following:

- (a) City of Corner Brook Development Regulations and Municipal Plan.
- (b) Government of Newfoundland and Labrador Municipal Water, Sewer and Road Specifications, (Government Master Specifications).
- (c) Guidelines for the Design, Construction and Operation of Water and Sewage Systems, Government of Newfoundland and Labrador Department of Environment and Lands, latest edition.
- (d) The Transportation Association of Canada's, Geometric Design Guide for Canadian Roads (TAC).

4.2 Requirements

The applicant will be required to submit 3 copies of the complete subdivision construction drawings. A Development Subdivision fee of \$50.00 per lot must accompany the submission. All construction drawings and supporting documentation submitted for approval must be sealed by a professional engineer licensed to practice in the province of Newfoundland and Labrador. Submission for Construction Approval shall be made within two years of the granting of Development Approval and must be accompanied by the following:

- (a) Subdivision Plan – The submitted plans shall show the following:
 - (i) Water, sanitary and storm sewer layout and details
 - (ii) Street alignment information (vertical and horizontal curve information)
 - (iii) Lot layout and numbering
 - (iv) Right-of-ways, easements and carriageways
 - (v) Open space areas
 - (vi) Bench mark locations and elevations
 - (vii) Directions of sanitary and storm system flows
- (b) Master Plan Survey – The plan shall show the following:
 - (i) Street alignment information
 - (ii) Lot meets and bounds, areas and lot numbers
 - (iii) Right-of-ways and easements
 - (iv) Driveway locations
 - (v) Open space areas
 - (vi) Bench mark locations and elevations
- (c) Plan and Profile Drawings – Plan and profile drawings showing streets, including horizontal and vertical curve information and layout; water mains and sewers, including invert information, pipe sizes, pipe materials and grades.
- (d) Lot Grading Plan – plans must include an overall subdivision grade plan for approval which shall include the following:
 - (i) Existing elevations
 - (ii) Proposed finished elevations at the four corners of each lot
 - (iii) Finished grade point elevations for the first floor of each proposed dwelling on individual lots.
 - (iv) Drainage patterns for the properties within the subdivision and connections to the storm system.
- (e) Sanitary Sewer Calculations – Calculations are to be submitted on standard forms and accompanied by a detailed drainage plan.

- (f) Storm Sewer Calculations – Calculations are to be submitted on standard forms and accompanied by a detailed storm drainage plan.
- (g) Department of Environment and Conservation – Copies of any permits required for works under the Water Resources Act (Permit to Construct).
- (h) Fire Flow Test results
- (i) Newfoundland Power/Aliant Telephone – Legal plan and description for required easements.
- (j) Geotechnical Report (to be required at the discretion of the City of Corner Brook).
- (k) Traffic Impact Study (to be required at the discretion of the City of Corner Brook).
- (l) Environment Site Assessment (to be required at the discretion of the City of Corner Brook).
- (m) Landscape Plan (to be required at the discretion of the City of Corner Brook).
- (n) Designated mailbox location area (to be required at the discretion of the City of Corner Brook).

4.3 Process

The detailed subdivision design will be reviewed for conformance with the guidelines outlined within this document. Where problems are noted, the *Developer* will be required to make the necessary revisions and resubmit the drawings for approval. If no problems are noted, then Construction Approval will be recommended, the Subdivision Agreement executed and the Subdivision Permit issued. The *Developer* will be required to submit copies of the approved construction drawings in digital format at this time.

The Subdivision Permit is valid for a two year period but may be renewed once for a period not exceeding one year. Renewals will be subject to the regulations in effect at the time of renewal. The granting of the Subdivision Permit shall not prevent *The City* from thereafter requiring the correction of any errors not noted at the time of application. Revisions to the aforementioned drawings subsequent to approval for construction shall not be made without the prior approval of *The City*. Upon approval of any revision, a digital copy of the revised drawing shall be submitted.

4.4 Construction Inspection

The City shall retain the services of a professional engineer licensed to practice in the Province of Newfoundland and Labrador (herein after referred to as the *Consultant*) to provide full time onsite inspection and consulting services for the City to check on the contractors compliance with the approved documents. Generally the *Consultant* will be the *Developers Engineer*. The *Developers Engineer* shall ensure that the *Developers Inspector* is present at all times during the construction of the Subdivision. All fees and charges associated with the *Consultant* shall be paid by the *Developer*. The *Consultant* shall not relieve the *Developers Engineer* of the responsibility for any design changes required to accommodate field conditions. The responsibilities of the *Developers Inspector* to the City of Corner Brook shall include, but is not limited to the following:

1. Continuous general and technical (resident) inspection of the work while it is in progress.
2. Arranging for, witnessing and carrying out routine field testing of equipment and materials.
3. Surveying to check line and grade.
4. Recording work progress.
5. Preparing and issuing certificates as required by the contract documents for the work and as required by the City.
6. Submission of reports to the *Developers Engineer* covering the work inspected with details of deficiencies discovered.

With respect to this section of these guidelines the *Developers Engineer* and *Consultant* may be the same entity if approved by *The City*. *The City* may in its discretion choose to hire a *Consultant* or who is an independent body from the *Developers Engineer* if deemed necessary by *the City*. All cost of the independently hired *Consultant* shall be paid for by the *Developer*.

4.5 *Authority of Consultant*

The *consultant*, in the course of carrying out its responsibilities, shall have the authority to order discrepancies or alterations to be rectified in accordance with the approved plans. Where discrepancies cannot be resolved to the satisfaction of the *Consultant* the *Developers* work shall be stopped by the *Consultant* under the power vested from the City of Corner Brook until such time as discrepancies or alterations have been resolved. All costs incurred to make the necessary corrections in accordance with the approved drawings shall be borne by the *Developer* and not recoverable from the City of Corner Brook.

4.6 *Approval*

Upon construction approval, the Subdivision Agreement will be executed and the Subdivision Permit will be issued. The granting of the Subdivision Permit shall not prevent *The City* from thereafter requiring the correction of errors or omissions not noted at the time of approval. Revisions to the drawings shall not be made without the prior approval of *The City*.

5.0 FINANCIAL REQUIREMENTS

5.1 Fees and Assessments

Capital Recovery/ Local Improvement Assessments -

All outstanding assessments on the property to be developed as recorded by *The City* must be paid prior to the Subdivision Permit being issued. The assessments will be for items such as:

- (a) Street Improvements;
- (b) Water, Sanitary and Storm Systems;
- (c) Over sizing;
- (d) Recreational or Open Space and as otherwise required by the City.
- (e) Outstanding Property Taxes

5.2 Construction Securities

The City will determine the amount of any securities required. All securities must be in the form of cash, certified cheque, or an irrevocable letter of credit from an approved surety company. *The City* reserves the right to apply any security that is released to any outstanding taxes, levies, interests or expenses outstanding by the developer.

The following two types of securities are retained by the City of Corner Brook;

1. Subdivision Completion Security,

Prior to building permits being issued, security shall be posted, satisfactory to the City to ensure completion of the subdivision in accordance with the conditions of the Subdivision Permit and the City's Development Regulations. Based upon the approved plans, the Engineering Division shall prepare an estimate of the City of Corner Brook cost to complete the work, upon which the security shall be based.

Subdivision Completion Securities shall be compiled as follows:

- | | |
|------------------------|--|
| Asphalt Surface Course | - Fee will be based on asphalt rates paid by the City during the current years asphalt paving program. |
| Concrete Sidewalks | - Fee will be based on sidewalk rates paid by the City during the current year. |
| Testing | - Flat fee of \$10,000. |

Securities for the below items shall only be required when:

- The developer requests that building permits be issued for new homes prior to materials testing being submitted and approved by the City of Corner Brook.

- | | |
|---------------------|--|
| Asphalt Base Course | - Fee will be based on asphalt rates paid by the City during the current years asphalt paving program. |
| Concrete Curbs | - Fee will be based on curb rates paid by the City during the current year. |

The security can be released on a proportional basis as work is completed. Securities will be released by the City of Corner Brook within 7 days of receipt of written request from the developer provided all required documentation has been received and work is accepted. The City reserves the right to retain an amount from the subdivision completion security, a sum of not less than the subdivision warrant security when required.

2. Subdivision Warranty Security,

Security equal to the value of ten per cent (10%) of the value of Stage I and II work being submitted prior to the issuance of building permits. In no case shall it be less than \$1000.00 per lot. This security shall be retained by the City of Corner Brook for 1 year after acceptance of Stage II work. When the developer is in a position to receive a refund on the Subdivision Completion Security the city will refund this security minus the amount required for the Subdivision Warranty Security.

5.3 *Open Space*

Prior to a development commencing, the developer shall fulfill the requirements for land for public open space. Before a development commences, the developer shall dedicate to the *City*, at no cost , an area of land equivalent to not more than 10% of the gross area of the subdivision or 25 sq.-m for every dwelling unit permitted in the subdivision, whichever is greater, for public open space.

The following conditions shall apply when considering appropriate land for open space dedication:

- (a) If in the opinion of the City, no public open space is required, the land may be used for such other public use as the City may determine;
- (b) The location and suitability of any land dedicated under the provisions of this regulation shall be subject to the approval of the City, but in any case, the City shall not accept land which, in its opinion, is incapable of being developed for any purpose;
- (c) The City may accept from the developer, in lieu of such areas of land, the payment of a sum of money equal to the value of the land which would otherwise be required to be dedicated;
- (d) The City may require a strip of land to be reserved and remain undeveloped along the banks of any river, brook or pond, and this land may, at the discretion of the City, constitute the requirement of land for public use. The City of Corner Brook is not obligated to keep land donated for open space use as open space use and reserves the right to use it and or rezone it for any use considered appropriate by the City.

6.0 STAGE I WORKS

6.1 *Schedule*

Stage I works shall not commence until construction approval has been issued, all financial requirements have been met and the Subdivision Agreement and the Subdivision Permit has been issued and executed.

6.2 *Acceptance of Stage I Work*

Stage I works will be accepted upon completion of the following.

- (a) Stage I *As-Builts* as per City Standards.
- (b) Subdivision Plan as per City Standards, Master legal survey plan of development, both plan and description
- (c) *Site Grading* plans (both plan and profile for individual lots).
- (d) Test results as required for the water, sanitary and storm sewer systems
- (e) Inspection of the water, sanitary, and storm sewer systems by the City
- (f) Correction of all noted deficiencies
- (g) Fire flow tests as required by the City of Corner Brook
- (h) Concrete test results for curb and gutter work (Batch Reports)
- (i) Asphalt test results for base course asphalt
- (j) Compaction test results for sub-grade works to the limits of the right of way
- (k) Video Inspection of sanitary and storm sewers

6.3 *Building Permits*

Building permits will not be issued until *Stage I Works* have been accepted by *The City*. At no time will building permits be issued prior to the base course of asphalt being placed and the Subdivision Completion Security being posted.

The *Developer* is cautioned that no occupancy permits will be issued until such time as the *Stage I Works* have been completed and accepted by *The City*. The *Developer* shall be responsible to advise perspective builders, clients and owners of the above noted conditions regarding building and occupancy permits.

Where it is demonstrated by the *Developer*, and confirmed by *The City*, that base course asphalt is unavailable, the City may consider issuing building permits. Work shall be completed as soon as asphalt becomes available. The City shall reserve the right to utilize any or all the base course asphalt security to complete the work. All other work and securities shall be approved, confirmed and in place as set out in the standards. Securities shall be in accordance with Schedule 1, Section 5.2 of this document.

6.4 *Temporary Turning Areas*

If the subdivision is staged in such a manner that a proposed street network is not completed in one season, *The City* will require that turning areas be constructed at points where the streets temporarily terminate. These turning areas must be constructed to a minimum of Class "A" standards and capable of four- season use.

7.0 STAGE II WORKS

7.1 *Schedule*

Stage II Works shall not commence until *Stage I Works* have been accepted. Base course asphalt and curb and gutter must be placed prior to the City undertaking any snow clearing operations. All manholes must be ramped. The City will not accept responsibility for damage to, and maintenance of, any *Stage I Works* until all *Stage II Work* has been completed and accepted by the City. The surface course asphalt and concrete sidewalks shall not be placed without the approval of the Director of Operational Services or designate. Approval will not be granted for surface course asphalt and sidewalk until 75% of the lots have been issued an Occupancy Permit.

7.2 *Acceptance of Stage II Works*

Upon completion of the subdivision, the *Developers Engineer* shall issue a certificate of completion to *The City* of Corner Brook stating that the subdivision is constructed in accordance with the approved *Drawings* and specifications and in accordance with good engineering design and practice.

The City will accept *Stage II Works* when all work has been completed and the following submitted and approved (Paper and Digital form for drawings):

- (a) Concrete test results for sidewalks
- (b) Asphalt tests for surface course asphalt
- (c) As-built information for benchmark installations
- (d) Legal plans and descriptions for all land to be transferred to the City (i.e., street right-of-ways, easements and open space)
- (e) Inspection of Stage II works by the City of Corner Brook
- (f) Proctor Densities for Sub-grade
- (g) Correction of all deficiencies
- (h) Master legal survey plan of development, both plan and description
- (i) As-Built Engineering Drawings as per City Standards that include plan and profiles of the streets, manhole and valve ties, sewer lines etc.
- (j) *Developers Engineer* sign-off on the completion of subdivision.

7.3 *Warranty Period*

The *Developer* shall, at his own expense, rectify and make good any defect or fault (to the satisfaction of *The City*) however caused, appearing within a one year period from the date of acceptance of the *Stage II Works*.

Failure of the *Developer* to comply shall give *The City* the right to utilize any or all of the Subdivision Warranty Security to complete the outstanding work. The Subdivision Warranty Security, less funds utilized by *The City* to complete or rectify deficiencies, will be released at the end of the warranty period (one year) providing that all noted deficiencies have been corrected, all conditions of the subdivision permit have been met the subdivision is 100% complete and all work has been accepted by the City of Corner Brook.

8.0 SITE GRADING

8.1 General

The purpose of this section is to ensure consistency in development, eliminate extremes in elevations reduce the requirement for retaining walls. *Site Grading* plans and finished floor elevations are required to be established for new construction within *The City* and the responsibility to ensure compliance with the site grading plan will be outlined on the home owners Occupancy Permit. All relevant information will be required prior to occupancy.

At the location certificate, footing stage, prior to concrete being placed and in addition to confirmation of the location of the footings on the site as per the approved plan, the elevation of the dwelling must also be confirmed by a Land Surveyor licensed to Practice in the province of Newfoundland and Labrador and submitted to *The City* for approval on the Real Property Report of Location Certificate. This will be a condition of the building permit.

8.2 Process

The *Developers Engineer* is required to submit a plan view drawing for the entire development as well as a plan and profile view for each individual lot. The plan view drawing for the entire development must be submitted at the subdivision approval stage. The plan and profile view drawings for individual lots shall be submitted before building permits can be issued for new homes. Below is a general description of what is required to be submitted within these drawings.

1. Plan view drawing for entire development

The *Developers Engineer* will be required to develop a general overview of site grading that must include all lots to be developed within a subdivision. This drawing must be submitted and approved by the City of Corner Brook before a subdivision permit will be issued.

2. Plan and profile view drawing for individual lots

Secondly, at the building permit stage a copy of new home building plans will be submitted by the City to the *Developers Engineer*. The *Developers Engineer* will compile the Site Grading Plan for the lot and these drawings will be attached to the building permit.

Once the site grading drawings are approved at the construction design and approval stage the *Developer* is responsible to complete the rough site grading to within 6 to 8 inches below the final approved grading before building permits will be issued for new homes. Prior to an Occupancy Permits being issued site grading must be completed by the home builder and confirmed by a licensed Newfoundland and Labrador surveyor.

The City reserves the right to confirm the elevations by its own forces at its discretion. Variances will only be considered where the site conditions prohibit the placement of a dwelling in accordance with the site grade plan, i.e. rock. The approval of variances will be at the discretion of the Development Inspector who has issued the building permit.

8.3 Plan View Drawing For Entire Development

8.3.1 Plan view drawing for entire development shall include

The *Site Grading* for the entire development shall include a plan draw that indicates:

1. Scale
2. Surveyed boundaries
3. Cross-sectional profiles with elevations
4. Individual lot boundaries
5. Lot numbering
6. Easements
7. Street right-of-way limits with elevations
8. General building locations with finished floor elevations
9. Driveway locations
10. Curb stop with elevations
11. Major and Minor side-yards
12. Limits and elevation of any site grading elements such as drainage control ditching, etc.
13. Catch-basins and manholes
14. Four corner lot elevations
15. Setback distance
16. Engineered Rock-pad, limits and four corner elevations (If applicable)
17. Terracing elevations, both top and toe of slope
18. Legend indicating all line types and hatched areas
19. Project Title Block
20. Drawing # title block
21. Engineers Stamp
22. Date
23. Building placed on lot
24. Lot/Civic address numbering

8.4 Plan And Profile View Drawing For Individual Lots

The *Site Grading* for each building lot will include 2 drawings, a plan view and a profile view of the lot. These drawings will contain all relevant site information to be met by the builder to ensure that the new home is constructed to an acceptable standard required by *The City*. It is the responsibility of the owner/contractor to ensure the building is constructed at the proper elevation. Benchmark information will be provided on the copy of the *Site Grading* plan for the lot to enable the owner/contractor to establish the proper elevation.

8.4.1 Plan View Drawing:

The *Site Grading* plan view drawing shall include but not be limited to the following:

1. Scale
2. Finished floor elevation
3. Four corner lot elevations
4. Driveway location
5. Setback distance

6. Major and Minor side-yard distances. Neighboring lots shall not have two minor side-yards adjacent to on another. All neighboring lots shall have a major and minor sideyard adjacent to one another.
7. Engineered Rock-pad, limits and four corner elevations (If applicable)
8. Survey boundaries
9. Terracing elevations, both top and toe of slope
10. Easements (pole line, water line, etc.)
11. Curb stop elevation
12. Legend indicating all line types and hatched areas
13. Project Title Block
14. Drawing # title block
15. Engineers Stamp
16. Date
17. Building placed on lot
18. Lot/Civic address numbering
19. Closest hydrant elevation

8.4.2 Profile View Drawing:

The Site Grading profile view drawing shall include but not be limited to the following:

1. Scale
2. Finished floor elevation
3. Setback distance
4. Engineered Rock-pad limits and elevation (If applicable)
5. Terracing Locations
6. Terracing Elevations both top and toe of slope
7. Sanitary and storm service elevations
8. Waterline service elevation
9. Elevations listed on the y-axis of drawing
10. Stations listed on the x-axis of drawing
11. Curb stop elevation
12. Boundary lines
13. Existing lot elevation
14. Proposed new lot elevations
15. Legend indicating all line types and hatched areas
16. Project Title Block
17. Drawing # title block
18. Engineers Stamp
19. Date
20. Building placed on lot
21. Lot/Civic Address numbering
22. Closest hydrant elevation

9.0 DUTIES OF PARTIES INVOLVED

9.1 *General*

Throughout the design and contract inspection phases of a subdivision the services of a *Developer, Developers Engineer, Developers Inspector* and *Consultant* are required. The duties of all parties involved in a subdivision are outlined below. This section will serve to outline all of the items that each party will be responsible to complete. This section has been compiled to be a general overview of these documents guidelines and shall not limit the responsibilities of parties involved.

9.1.1 **Developers Duties**

1. Follow Development Approval *section* outlined within this document.
 - a. Survey of land owned by the Developer or;
 - b. A written consent form from all property owners outlined within the *Development Area*.
 - c. 3 sets of detailed plans as outlined in the requirements for Development Approval.
2. Apply for a plan amendment/rezoning if necessary.
3. Submit an application complete with application fee.
4. Hire the *Developers Engineer*.
5. Ensure that the *Developers Engineer* compiles drawing in conformance with the Schedule 2 - Municipal Engineering Standards outlined within this document.
6. Ensure that the *Developers Engineer* compiles drawing in conformance with Schedule 3 outlined within this document.
7. Ensure that the *Developers Engineer* completes all requirements of the Construction Design and Approval section of this document.
8. Comply with the financial requirements section outlined within this document.
9. Ensure that the requirements outlined within the Stage I Works section of this document are completed.
10. Ensure that the requirements outlined within the Stage II Works section of this document are completed.
11. Ensure that the requirements outlined within the Site Grading section of this document are completed.
12. Shall comply with all conditions outlined within the Subdivision Agreement and Subdivision Permit.

9.1.2 **Developers Engineer**

1. Compile and submit drawings as required by the development approval process outlined within this document.
2. Compile and submit drawings as required by the Construction Design And Approval process outlined within this document.
3. Compile and submit testing results as required by the Stage I Works process outlined within this document.
4. Compile and submit testing results as required by the Stage II Works process outlined within this document.

5. Supply an inspector to carry out Construction Inspection as outlined within this document.
6. Compile and submit drawings as required by the Site Grading process outlined within this document.
7. Compile drawings in conformance with the Schedule 2 - Municipal Engineering Standards outlined within this document.
8. Compile drawings in conformance with Schedule 3 outlined within this document.
9. Sign-off on completion of Subdivision.
10. Complete and submit Addendum's A to L. Please note, Addendum J will be submitted to the *Developers Engineer* by the *Developers Inspector* for sign-off

9.1.3 Developers Inspector

1. Ensure that the requirements outlined within the Construction Inspection section of this document are completed.
2. Provide Continuous/fulltime technical inspection while work is in progress.
3. Ensure that asphalt testing meets the requirements as outlined within this document.
4. Ensure that concrete testing meets the requirements of the Department of Municipal Affairs Water, Sewer and Road Master Specifications.
5. Ensure that compaction testing meets the requirements as outlined within this document.
6. Ensure that surveying to check line and grade is completed.
7. Record work progress
8. Ensure that subdivision is being completed as per the *Developers Engineers* design.
9. Ensure that service elevations are recorded for all lots and submitted to the *Developers Engineer* to be included in the As-Built and Site Grading drawings.
10. Complete Addendum J – Weekly Inspector's Log and submit to the Developers Engineer.

SCHEDULE 2

MUNICIPAL ENGINEERING STANDARDS

1.0 SURVEYING

1.1 *Definitions:*

1.1.1 Survey:

The determination of any point or the direction or length of any line required in measuring, laying off or dividing land for the purpose of establishing boundaries or title to land.

1.1.2 Newfoundland and Labrador Provincial Co-ordinate Survey System:

A system established for referencing land surveys projection.

1.1.3 Co-ordinate Monument:

Any marker established for the Provincial Co-ordinate Survey System.

1.2 *Master survey plan:*

A Survey plan shall include:

- (k) the name of the owner of all abutting lands;
- (l) the length and bearing of each line of any transverse which connects any point on the boundary of the subdivision with a Provincial Co-ordinate Monument;
- (m) the radius, central angle, the length of arc, the point of curve and the point of tangency shall be given for each curved line and clearly indicated on the survey plan.
- (n) each street, walkway and easement;
- (o) each lot and its number;
- (p) the length, bearing and internal angle of each line of the boundary of, and the area in square metres of;
- (q) the land being subdivided;
- (r) each street, walkway and easement;
- (s) each lot;
- (t) The land, if any, which is reserved for park, playground, buffers and public purposes;
- (u) the geometry of connections between existing streets and streets of the subdivision;
- (v) the location of any existing structure which is to remain;
- (w) every water course and its direction of flow;
- (x) all information necessary for the calculation and laying out of any curved line;
- (y) the date of compilation;
- (z) the date and description of revision, if any;
- (aa) the name of the subdivision;
- (bb) all existing streets, roads, lanes and intersections in the immediate area and their official names as designated by the City;
- (cc) the location and extent of rock outcrops;
- (dd) the location and results of any test borings;
- (ee) at least two (2) centre line points of known chainage related to the Provincial Co-ordinate Survey System; and
- (ff) the location and elevation of the benchmark used.

Manhole numbers shall be assigned by using the last four whole numbers of the easting and the suffix, "S" for sanitary sewer manholes and "R" for storm sewer manholes.

1.2.2 Size of Plan

The master survey plan shall be of a size within the following limits:

MAXIMUM - Size designation, B1, which represents 707 mm wide x1000 mm long;

MINIMUM – SI Size designation A1, which represents 594 mm wide x 841 mm long;

LEGAL SIZE - Size designation, P4 which represents 21.5 cm wide x 35.5 cm long;

NOTE: Refer to National Standards of Canada, CAN2- 9.60 M and CAN 2-9.61M for paper size designation.

1.2.3 Master survey plan shall be drawn to scale;

1.2.4 Master survey plan shall have a Key Plan to locate the subdivision as it relates to adjacent streets of the City.

1.2.5 Master survey plan shall be certified by a Newfoundland Land Surveyor.

1.3 Survey details and accuracy:

1.3.1 All traverses are to be plotted by either the actual calculated "Latitude and Departures" method or by the "Tangent Off-Set Method".

1.3.2 All boundary line dimensions to be shown to at least two decimal places with all angles shown to the nearest 30 seconds or better.

1.3.3 More or less distances shall only be accepted along a water boundary.

1.3.4 Contours shall be shown to determine the elevations for all streets, roads, easements and walkways in relation to the proposed lot layout.

1.3.5 For proposed streets, the existing vertical alignment conditions (contours) shall be obtained from actual field surveys.

1.3.6 All Vertical Control shall be related to the Province of Newfoundland Approved Datum.

1.3.7 Information shown on a survey plan shall be sufficiently detailed to permit any point on any surveyed line to be accurately located in the field.

1.3.8 The accuracy of closure shall be not less than 1 metre in 10,000 metres.

1.4 Street, walkway and lot identification:

1.4.1 Right of way

When the right of way and street have been constructed and the subdivision or area involved is ready for acceptance, each public lot, easement, walkway and street shall be identified by an iron or steel pin driven into the ground at each corner, beginning of curve, and end of curve, unless these points fall upon solid rock. In such cases, an "X" shall be cut into the rock.

1.5 Survey information:

1.5.1 Prior to Stage I work acceptance, a copy of all information, regarding permanent subdivision survey monuments, street lines, boundary lines, easements, and walkway locations will be presented to the City;

1.5.2 Survey information shall be clear, concise, neat and accurate, properly labeled and signed by a registered Newfoundland Land Surveyor.

2.0 SUBDIVISION DESIGN GUIDELINES - Drafting

2.1 Preparation of Drawings

2.1.1 CAD Drawings Required:

Computer-aided design and drafting (CAD) shall be used in the preparation of construction and as-built drawings for all developments. Manually drafted drawings will not be accepted.

2.1.2 Submission of Drawings in Digital Format

The City of Corner Brook presently uses AutoCAD for drafting and archival storage of its own digital drawings. Wherever this specification requires the submission of digital drawings, they shall be in AutoCAD dwg format, or dxf format, where the consultant uses a CAD platform other than AutoCAD. Prior to submission of digital drawings the consultant shall enquire as to the version of AutoCAD presently being used by the City and shall submit his drawings in a compatible format. Storage Media – Throughout the Design process individual drawings may be submitted on compact disk (CD). As-built or record drawings shall be submitted in complete sets on compact disk (CD). Electronic File Transfer – During the design process, electronic file transfer through e-mail or internet will be considered on a case by case basis.

2.1.3 Physical Size of Drawings

All drawings in any one development shall be of the same physical size. The prime consultant shall coordinate the drawing size with any/all sub-consultants, i.e., surveyors, etc. Maximum size: the maximum size designation shall be "B1" which represents a 707 mm wide by 1000 mm long sheet. Minimum size: the minimum size designation shall be "A1" which represents a 594 mm wide by 841 mm long sheet.

2.1.4 Scales

All CAD drawings shall be drawn full size and plotted at a reduced scale.

The Plotting Scale of the:

- (a) Engineering Plan or Site Services Plan shall be:
- (b) Plan - 1:500
- (c) Profile - 1:500 Horizontal 1:50 Vertical
- (d) Survey Plan/Subdivision Plan shall be:
- (e) 1:500 or
- (f) As approved by the City
- (g) Site drainage plan shall be:
- (h) 1:500 or
- (i) 1:1000 or
- (j) 1:2500 or
- (k) As approved by the City
- (l) Location plan or key plan shall be 1:2500
- (m) Site grading plan shall be 1:500
- (n) Detail plan and cross-sections shall be at a scale that will fully illustrate the subject matter.

2.1.5 Grid Reference

Drawings shall be prepared using NAD 83 (North American Datum 1983). Grid lines at 200 metres shall be shown and Northings and Eastings indicated.

2.1.6 North Arrow

A north arrow shall be placed in the upper right corner of each drawing.

2.1.7 Plan Orientation

Survey plans shall be drawn using the development's actual coordinates based upon NAD 83. Title blocks, borders and plots shall be rotated such that the top of the sheet is approximately north and text can be read left to right and/or bottom or top.

2.1.8 Symbols and Line Types

Standard City drafting symbols and line types, as shown on the sample drawing provided, shall be used on all drawings. Where symbols other than the standard ones are used, they shall be shown in the legend.

2.1.9 Lettering

Except as noted below for existing grades, all drawing notes and dimensions shall be roman simplex font and the minimum size lettering shall be Leroy 100, which represents a plotted height of 2.54 mm. For the purpose of annotating existing grades, text at a forty five degree angle to the bottom of the drawing sheet should be used. This text shall be Leroy 60 size, which represents a plotted height of 1.524 mm. With the exception of text for existing grades, it is recommended that no more than three (3) lettering heights be used on any one drawing.

2.1.10 Layering

Data on each drawing shall be fully layered according to standard engineering practice.

2.1.11 Reserved Area

An area at least 21.5 cm high shall be reserved above the title block for the key plan, notes, legend, engineer's stamp, revision data, etc.

2.1.12 Cover Sheet

A cover sheet shall be provided for each drawing set and shall contain the following information:

- (a) Project Name
- (b) Key Plan
- (c) Name of Consulting Engineer and Sub-consultants
- (d) Name of Developer
- (e) List of Drawing Names and Numbers
- (f) Date of Issue
- (g) "As-Built" or "Record Drawing" note when applicable.

2.1.13 Submission of Drawings

- (a) Design drawings shall be submitted as follows:
- (b) 3 each - White Prints
- (c) Construction drawings shall be submitted as follows:
- (d) 3 each - White Prints
- (e) 1 only – Digital Copy
- (f) As-built drawings shall be submitted as follows:
- (g) 1 only - Mylar Reproducible
- (h) 1 only - White Print
- (i) 1 only – Digital Copy
- (j) 1 only - Listing of screen color/pen weight designations.

2.2 Preparation of Drawings – General Conditions

2.2.1 Street Names

All streets shall be identified and names printed within street lines. The developer will be advised of approved street names.

2.2.2 Intersection Identification

At intersection streets or where the continuations of the streets are on other plans, the following note shall be shown on the Plan: "For Continuation see plan no. "

2.2.3 Traverse Plotting

All traverses shall be plotted by either:

- (a) the "Tangent Off-Set Method; or
- (b) the calculated "Latitude (Lats) and Departure (Dep)s" Method

2.2.4 Percent (%) Grade

Percent (%) grades (slopes) shall be shown for all appropriate services to two (2) decimal places.

2.2.5 Accuracy of Measurements

All distances shall be measured to the nearest centimeter.

2.2.6 Geodetic Datum

Elevations shown on any plan shall be referred to the Provincial Geodetic Datum and the reference Benchmark (B.M.) along with its location and description shall be shown in the area above the Title Block.

2.2.7 Irregular Boundary Line Measurements

More or less distances shall not be accepted except along a water boundary or other irregular boundaries in which case a "tie line" between the adjoining boundary end points shall show the bearing and the distance.

2.2.8 Revisions to Plan

If plans are revised, amended or altered, the revision number, date and a brief description of the revision shall be noted in the revision area of the Title Block.

2.2.9 Signing Of Plan

All plans shall be stamped and signed by a professional engineer licensed in the Province of Newfoundland and Labrador.

2.2.10 Procedure Revision

This procedure is subject to change without notice, and the onus lies with the user to ensure that he is in possession of the latest revision.

3.0 SUBDIVISION DESIGN GUIDELINES - EASEMENTS

3.1 *General*

3.1.1 **Easement** means an interest in land owned by another person, consisting in the right to use or control the land, or an area above or below it, for a specified purpose as agreed to by the by the dominant tenement and servient tenement, which includes but not limited to, the City of Corner Brook, a Utility Company or other party.

3.1.2 When sewers, surface drainage or water system pipes are to be installed other than in a street or walkway, an easement shall be provided over such installations.

3.1.3 The owner of the easement land shall not construct any type of structure or place backfill material over such easement area.

3.2 *Design*

3.2. The width of any easement shall be based upon the type, depth and number of services proposed to be installed.

3.2.2 The minimum width of an easement shall be six metres.

3.2.3 The alignments for any easement shall be dependent upon the type of service to be installed.

3.3 *Acceptance*

3.3.1 Acceptance of services within an easement shall be carried out as outlined under the requirements for Stage I acceptance.

3.3.2 All easements shall be covered by legal agreement as approved by the City.

3.3.3 All easements shall be transferred (at no cost) to the City of Corner Brook.

3.4 *Restoration*

3.4.1 When the City carries out work within an easement, it shall be responsible for restoring the area as close as practical to its original condition or as otherwise stipulated in the Easement Agreement.

3.4.2 This procedure is subject to change without notice, and the onus lies with the user to ensure that he is in possession of the latest revision.

4.0 SUBDIVISION DESIGN GUIDELINES – STORM SEWERS

4.1 *Design Drainage Area:*

The design drainage area may be determined from contour plans, and shall include any fringe areas not provided for, in adjacent storm drainage areas, as well as other areas, which may become tributary by reason of regrading.

4.2 *Drainage Plan:*

The drainage plan shall be based on design elevations and to a scale as indicated in the drafting section of this specification and shall show generally:

- (a) Streets;
- (b) Lots;
- (c) Water courses and direction of flow;
- (d) Proposed storm sewers with manholes numbered using the last four digits of the Easting and the suffix "R",
- (e) Tributary areas to each manhole, size of the area in hectares and the runoff coefficient clearly shown therein;
- (f) Contour lines having an interval not exceeding one metre;
- (g) Proposed surface drainage.
- (h) Design elevations.

4.3 *Runoff:*

Computations shall be based on the Rational Method formula:

$Q = R.A.I.N.$ where:

Q = maximum rate of runoff, in litres per second

R = runoff coefficient

A = area tributary to the point of design, in hectares

I = average rainfall intensity, having duration equal to the time of concentration of drainage area, in millimeters per hour

N = Constant = 2.778

Standard design forms shall be used for all calculations. (See Appendix A)

4.4 *Runoff Coefficient:*

The value of the coefficient shall be obtained by correlating the ratio of impervious to pervious surfaces. The minimum coefficients for fully developed areas shall be as follows:

- (a) Parks & Undeveloped Areas 0.10 - 0.30
- (b) Single Family Residence 0.30 - 0.50
- (c) Semi-Detached 0.40 - 0.60
- (d) Row Housing 0.60 - 0.75
- (e) Apartments 0.50 - 0.70
- (f) Parking Lot Areas (paved) 0.90 - 1.00
- (g) Light Industrial 0.50 - 0.80
- (h) Heavy Industrial 0.60 - 0.90
- (i) Hospitals 0.70
- (j) Light Commercial 0.50 - 0.70
- (k) Commercial Core 0.70 - 0.95
- (l) Heavily developed areas 0.80 - 0.95

4.5 **Rainfall Intensity:**

The rainfall intensity shall be based on a 1 in 10 year return period and a duration of ten (10) minutes for suburban residential areas. Trunk Sewers, bridges and other critical structures as determined by the City shall be on a 1 in 100 year return period with a duration equal to the time of concentration. The design intensity must be obtained from the most up-to-date data available from Environment Canada for the Corner Brook area.

4.6 **Capacity of Pipe:**

Manning's Formula:
$$V = \frac{R^{2/3} \times S^{1/2}}{n}$$

shall be used to compute the capacity of storm sewers. The following roughness coefficient shall be used:

- (a) Concrete box culverts 0.013
- (b) P.V.C. ribbed pipe 0.011
- (c) HDPE - refer to manufacturer for roughness coefficient
- (d) C.S.P. - Refer to C.S.P. manual for roughness coefficient based on particular pipe size and corrugation type.

4.7 **Minimum Size/Type**

Storm Sewers 450 mm
Catch Basin Leads Single 375 mm
Building Sewer 100 mm

Storm sewer main shall be HDPE or PVC with a 320 KPA Rating.

4.8 **Velocity: (for design flow)**

Minimum 1 m/s
Maximum 5 m/s for diameter up to and including 825 mm and 6 m/s for diameters larger than 825 mm.

4.9 **Change of Size:**

No decrease of pipe size from a larger size upstream to a smaller pipe downstream shall be allowed regardless of the increase in grade.

4.10 **Location:**

- (a) Storm sewers shall be located such that manholes are placed in the centre of driving lanes, wherever possible.
- (b) Manholes shall be located at every change of horizontal and vertical alignment, size and material of the sewer.

4.11 **Earth Load:**

Shall be calculated by using the Marston Formula

4.12 **Superimposed Load:**

The effect of concentrated and distributed superimposed loads shall be evaluated by generally accepted formula.

4.13 **Manholes:**

- (a) All manhole chamber openings must be located on the upstream side of the manhole.
- (b) Special manholes shall be fully designed and detailed.

- (c) Maximum distances between manholes unless otherwise specified shall be 90 m for 700 mm pipe or smaller, and 120 m for pipe greater than 700 mm.
- (d) All storm sewer manholes shall be benched.

4.14 Special Structures:

Inlet and outfall structures including headwalls, stilling chambers, etc. shall be fully designed and submitted in detail. In each case, topography shall be shown as well as the protective works necessary to counteract erosion of the site at the structure. Grates shall be provided on all inlet structures and outlet structures greater than 600 mm in diameter and shall be fully designed, detailed and approved by the City.

4.15 Outfalls:

All storm outfalls, which empty into a ditch or water course, must receive approval from Fisheries and Oceans Canada and the Provincial Department of Environment.

4.16 Catch Basins:

- (a) The lead shall have a minimum 2% grade and shall discharge directly to an existing or proposed manhole located within 30 m of the catch basin.
- (b) Unless otherwise approved.
- (c) Recess catch basin shall not be used.
- (d) Catch basins shall be located and spaced in accordance with conditions of design and shall provide for expected maximum flow.
- (e) Standard location for catch basins at street intersections shall be immediately upstream of sidewalk or pedestrian crosswalks and between intersections at all low points.
- (f) Spacing shall not exceed 95 m for road grades up to 3%. On steeper roads, this spacing shall be reduced.
- (g) Catch basins are to be depressed 30 mm with respect to the gutter grade.

4.17 Headwalls:

Headwalls shall be designed for inlet control with:

$$\frac{HW}{D} \leq 1.0$$

4.18 Revisions of Procedure:

This procedure is subject to change without notice and the onus lies with the Consulting Engineer to ensure that he is in possession of the latest revision.

5.0 SUBDIVISION DESIGN GUIDELINES – SANITARY SEWERS

5.1 *Design Drainage Area:*

The design of Sanitary Sewer Systems shall incorporate methods and guidelines found in the “Guidelines for the Design, Construction and Operation of Water and Sewerage Systems (latest edition) produced by the Department of Environment and Conservation, Government of Newfoundland and Labrador.

The following sections will be required in addition to what is found in the DOEC Guidelines.

5.2 *Manholes*

- (a) Manholes shall be spaced a maximum of 90 m apart for sewers smaller than 700 mm diameter and 120 m apart for sewers over 700 mm diameter.
- (b) All manhole chamber openings must be located on the upstream side of the manhole.
- (c) All pipes turning at a greater angle than 45 degrees in a manhole require a 150 mm drop.
- (d) Special Manholes shall be fully designed and detailed.

5.3 *Building Sewers*

- (a) Separate and independent building sewers shall be provided for every single family house, each unit in a semi-detached, and each apartment building, office building, factory or similar building.

5.4 *Storm Water*

Storm water drains, roof drains, or foundation drain, shall not be connected to any part of the sanitary sewer.

5.5 *Revisions of Procedure:*

This procedure is subject to change without notice and the onus lies with the Consulting Engineer to ensure that he is in possession of the latest revision.

TABLE #2

ITEM	COMPUTATION	UNIT	AMOUNT	REMARKS

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Remarks and Computations:

6.0 SUBDIVISION DESIGN GUIDELINES – WATER SYSTEMS

6.1 Definitions:

- (a) **Water system** means an assembly of pipes, fittings, control valves and appurtenances, which convey water to water service pipes and hydrants.
- (b) **Water service pipe** means a pipe that conveys water from a water system to the inner side of the wall through which the pipe enters the building.

6.2 Design Criteria and Location:

6.2.1 Size of Water Pipe:

The size of all water lines shall be a minimum of:

Transmission Main - 300 mm.

Distribution Main – 200 mm.

Service Line – 19mm.

6.2.2 Depth of Cover:

All water pipe shall have a minimum cover of 1800 mm in relation to the final finished street grade.

For streets not paved prior to December 1 of any year, a sufficient depth of fill shall be placed to give a minimum cover of 1500 mm.

6.2.3 Location of Water Pipes:

- (i) All water pipes shall normally be laid on the quarter point of the street right of way and in a separate trench from the sanitary and storm sewers. Horizontal separation between water main and sewer main shall be a minimum of 3000mm unless otherwise approved.
- (ii) Where a water pipe is to be laid in a trench, other than in a street, the developer shall grant to the City by deed and plan, at his cost, title to the Easement. Such Easement shall be not less than six (6) metres in width and the City shall approve its location.
- (iii) The design of Water Systems shall incorporate methods and guidelines found in the “Guidelines for the Design, Construction and Operation of Water and Sewerage Systems (latest edition) produced by the Department of Environment and Conservation and the following sub-sections.

6.2.4 Location of Valves:

- (i) Valves at street intersections shall be located in the roadway at street carriageway.
- (ii) Four (4) valves shall be required at each four-way street intersection. If there are more or less than four (4) streets meeting at any intersection, the appropriate number of valves shall be installed to allow complete isolation of the system.
- (iii) On straight runs in a residential area, the maximum distance between valves shall be 180 m.

6.2.5 Valve Chambers:

- (i) All valves larger than 300 mm diameter shall be geared.
- (ii) All valves of 400 mm and larger shall be installed in a chamber constructed of reinforced concrete or made from a 1500 mm diameter pre-fabricated concrete manhole.
- (iii) Access frames and covers for these chambers shall be cast iron, providing a clear opening of 750 mm in diameter with two (2) countersunk lifting rings in the cover. The term "WATER" shall be imprinted on the cover. Access ladders shall be provided in the chamber.

6.2.6 Hydrants:

- (i) Hydrants shall be placed at the centre of lots, minimum 2m behind the curb line and spaced not more than 140 m apart. No dwelling unit shall be located more than 70m from a hydrant.
- (ii) Hydrants shall be installed so that the top of the standpipe flange will be from 100 mm - 150 mm above the finished curb grade.

- (iii) The branch pipe to the hydrant shall be 150 mm in diameter and shall include a 150 mm branch valve located 1 (one) metre from the centre line of the water pipe in the street. Where the hydrant valve is less than 3.0m from hydrant, the valve shall be restrained to the main. Hydrant valves shall be located within the street carriageway. And within dead ends located a minimum 6(six) metres from the end.
- (iv) All joints on hydrant leads, including the mainline Tee, shall be equipped with joint restraining fittings.
- (v) Hydrants shall be installed at all high points in profile.

6.2.7 Dead Ends:

The water system shall be so designed to exclude any dead-ended pipe, so far as is reasonably possible. If unusual conditions exist and warrant the installation of a dead-end pipe, then a hydrant shall be installed in its proper location off the dead-end pipe. An automatic flushing unit shall be installed unless the Developer can show to the satisfaction of the City that sufficient chlorine residuals will be maintained.

At the end of any phase of a development, a hydrant shall be installed on all dead end water lines. If these temporary dead ends are not to be addressed during the next construction season, then an automatic flush unit will also be added unless the Developer can show that sufficient chlorine residuals will be maintained.

The type of automatic flushing unit shall be approved by the Director of Operational Services or designate

6.3 *Connections to Existing Water Systems:*

6.3.1 Service Interruption:

A connection of the developer's water system to any part of the existing water system must be carried out in such a way as to cause the least interruption to existing service and the City must approve each such connection. A connection of 100mm diameter pipe or greater shall be by a tapping sleeve and valve. All connections shall be pressure connections.

6.3.2 Scheduling of Connection:

The City will assist in the scheduling of any such connection and will install the tapping sleeve and valve at the Developer's expense. If the Developer is permitted to make the actual connection the work must be done under the supervision of the City at the Developer's expense.

6.3.3 Other Connections:

Whenever the existing water system is within reasonable distance from a proposed subdivision, and an interconnection is practical, the developer shall be required, at his cost, to install the necessary pipe and interconnect the water system in his subdivision to the existing water system.

6.4 Tapping Sleeves and Valves:

Tapping sleeves and valves shall be used for all ductile iron connections to existing water mains.

7.0 SUBDIVISION DESIGN GUIDELINES – Streets

7.1 Street classification:

Streets shall be classified as shown in the following table:

CHARACTERISTICS OF STREET CLASSES

	ARTERIAL	COLLECTOR	LOCAL
Street grade maximum	10.0%	10.0%	10.0% (1)
Street grade minimum	1.0%	1.0%	1.0%
Street Reservation width	30 m	18 m	15 m
Minimum C/I Radius	90 m	90 m	50 m (2)
Maximum Super Elevation	0.06 m/M	0.06 m/M	0.02 m/M
Minimum Stopping Site Distance	As per TAC Geometric Design Guide for Canadian Roads		
Pavement widths	(3)	9.5 m	8 m
Minimum “K” value	7	7	7
Vertical curve	11	11	11
Crest -----			
Sag -----			
Minimum length of Vertical Curve	L = length in meters should not be less than design speed in kilometers per hour. With exception of local intersections approved by the City of Corner Brook.		
Vertical curve maximum (Length for drainage)	Crest: K = 40 Sag: K = 30		
(4) Minimum distance between intersections	400 m	60 m	60 m
Minimum face of curb radius at intersections	15 m	9 m	8 m
Sidewalks (sides)	Both	Both	Both
Street lighting (minimum requirements)	1.5 cd/m or 22x	1.0 cd/m or 15x	1.0 cd/m or 15 x

(1) Unless otherwise approved.

(2) Crescent and Cul-de-Sacs may have a minimum centerline radius of 35 m.”

(3) As per TAC Manuel

(4) Distance measured between intersection centerlines

7.2 Design Criteria

7.2.1 Streets shall be designed to provide the safest and smoothest traffic flow possible. The criteria in Table 1 consist of the minimum requirements for flat vertical alignments. Specific vertical and horizontal alignments may dictate a variance in these requirements.

7.2.2 For specific situation that are not covered by this section, users are referred to the latest editions of the Geometric Design Guides for Canadian Roads and the Manual of Uniform Traffic Control Devices for Canada, produced by the Transportation Association of Canada.

7.3 Cul-De-Sacs:

- (a) Cul-de-sacs should only be used where approved by the City. They shall have the following additional minimum requirements:
- (b) Face of curb line, turning circle, radius of 15.25 m.
- (c) Maximum exit grade of +5%
- (d) Low back curb and gutter to extend around the bulb
- (e) Transitional street line radius of 15.25 m into street line turning circle.
- (f) Maximum length of 200 m - measured along the street centerline from the street line of the intersecting street to the start of the turning bulb.
- (g) Right of way at turning circle should be 18m radius.

7.4 Intersections:

7.4.1 Intersections shall:

Be of "T" type design;

- (a) Have a vertical alignment within the intersection approach of not more than 2% grade for a minimum distance of 10 m from the curb line of the major street;
- (b) have an intersecting angle of 90 degrees where possible. The minimum angle shall be 85 degrees;
- (c) have a minimum centre line distance of 60m between adjacent and/or opposite intersections.

7.4.2

When two (2) streets (or more) intersect, only one (1) street may have a curved horizontal alignment; all other streets at this intersection shall have a minimum tangent section of 30 m as measured from the point of street line intersection to the first point of horizontal curvature on each approached street line.

7.5 Driveways: Location and Design

7.5.1 Private driveways shall be designed to the following standards:

The following definitions apply to the below standards when calculating driveway measurements and design criteria:

- Residential – Development consisting of single family residences or residential complexes containing up to 4 units.
- Commercial – Office, retail, institutional, or multiunit residential (5 or more dwelling units) development primarily serving passenger vehicles but occasionally accommodating service trucks.
- Industrial – Development that primarily serves truck traffic, such as warehousing and truck terminal facilities.

	Residential (m)	Commercial (m)	Industrial (m)
One-way access width (minimum)	3.0	4.5	5.0
Two-way access width (minimum)	3.0	7.2	9
Required number of driveways / accesses	1	1	1
Curb radius (R) (minimum)	3	4.5	9
Intersection Type	"T"	"T"	"T"

Minimum separation from street line of street intersection	10*	10*	10*
Minimum Separation between driveway and property boundary.	1	3	3

	Arterial	Collector	Local
Maximum driveway grade within street right-of-way	HV: 1.0% L-M: 1-3%	L-M: 1.0-4.0%	min. use: 1.0-6.0%
Maximum driveway grade on-site	HV: +4.0% / -2.0% L-M: +8.0% / -4.0%	L-M: +10.0% / -4.0%	min. use: +12.0% / -7.0%

Notes: High volume (HV) : >1500v/d, moderate (M) : >750 to 1500 v/d, low (L): 25 to 750 v/d, min. use (mu): ≤ v/d.

*The separation from street line of street intersections may be greater as determine by the *TAC Manual*.

Driveways on neighboring lots shall not be placed adjacent to one another. Driveways shall be located on the opposite side of lots to reduce snow clearing issues. Furthermore, all driveways shall be located 1meter from the property boundary. A secondary driveway may be permitted at the discretion of the *Development Inspector* if it is meant to accommodate access to a shed, garage or similar. This driveway shall not be used as a primary driveway. (The only driveways that are permitted to be adjacent to one another are driveway located on a duplex lots.)

Driveways shall not be placed at the corner of an intersection. Any corner lot shall have the driveway located on the opposite side of that lot to ensure that the driveway is a safe distance from the intersection.

7.6 Other general requirements:

7.6.1 Tangent distances between horizontal reverse curves shall not be less than 50 m.

7.6.2 Horizontal alignment of streets shall be such that the centre line and curb lines shall be symmetrical with their street lines.

7.6.3 Vertical alignments of streets shall be considered as symmetrical about the centre line unless otherwise approved by the City.

7.6.4 All streets shall have a minimum 150 mm crowned roadway cross section and in no case should the crowned roadway cross-section be less than 2%.

7.6.5 Curb and gutter is required.

7.6.6 All streets shall have a minimum of 300 mm Class “B” and 200 mm Class “A” granular, 50 mm base course and 50 mm surface course asphalt. Additional Granular and asphalt may be specified as determined by the City Engineer.

SCHEDULE 3

PART 1

SUPPLEMENT TO: GOVERNMENT OF NEWFOUNDLAND AND LABRADOR MUNICIPAL WATER, SEWER AND ROADS MASTER CONSTRUCTION SPECIFICATION

Note: This section details areas where the City of Corner Brook's Municipal Engineering Standards differ from the Provincial Government's Master Specification.

1.1 SECTION 01001 DEFINITIONS (Added)

1.1.1 ENGINEER

Shall mean Consulting Engineer registered in the Province of Newfoundland and Labrador, retained by the Developer to be responsible for design and supervision of the work.

1.1.2 OWNER

Owner, where used in the Master Specifications, refers to the Developer, a person or company who has applied for and has been granted approval to subdivide or service an existing parcel of land.

1.2 SECTION 01005 GENERAL INSTRUCTIONS (Reference to City Engineer added)

1.2.1 Storm Sewer

Where a Contractor is required to install storm or sanitary sewer mains beginning at an existing manhole or section of existing main, the Contractor shall install a temporary 6 mm mesh screen over the outlet pipe of the first downstream existing manhole to prevent silt and gravel from entering the existing system from the new work. If this location is not appropriate, the Engineer may choose a more suitable location, to be approved by the City Engineer.

1.3 SECTION 01570 TRAFFIC REGULATIONS (Added)

1.3.1 Traffic detours Traffic detours shall not be implemented unless the owner receives the prior written approval of the City. The owner shall request approval at least 7 days in advance of the proposed implementation of the detour.

1.3.2 Traffic detours shall be applicable to through traffic movements only. The owner shall provide adequate means whereby access is maintained to properties fronting on closed sections of streets.

2.1 SECTION 02601 MANHOLES, CATCHBASINS & DITCH INLETS

1. Item 2.1.14.4 add the following:

2.1.14.4 All manhole frames and covers must be BM2 type unless authorized otherwise by the City of Corner Brook.

2. Item 2.1.15.5 add the following:

2.1.15.5 All Catch Basin frames and covers must be BM17 type unless authorized otherwise by the City of Corner Brook.

2.2 SECTION 02702 PIPE SEWER CONSTRUCTION

2.4.1 All house/building sewer service pipe to be SDR 28. All PVC storm mains to be perforated with two rows of 13 mm diameter holes, 400 mm on centre, 45 degrees and 315 degrees from the pipe invert. All mainline sewer pipe must be SDR-35 type unless authorized otherwise by the City of Corner Brook.

3. Delete item 3.4.1 as shown in the Government Master Specification and substitute the following:

3.4.1 Place Type 1 granular bedding materials on all storm and sanitary services.

4. 3.7.13 Delete the items as shown in the Government Master Specification and substitute as follows:

11. Scope of work:

The work covered by this specification consists of furnishing all materials, labour, supervision, equipment and plant; to perform all work necessary for the television inspection of the gravity sewer lines as specified.

12. When Television Inspection Required:

A Television inspection will be required:

- (a) for all new sewers (sanitary and storm). Sewers are to be inspected prior to acceptance of Stage I works and ten months from the date of acceptance or before placing of surface course asphalt, whichever occurs first.
- (b) When any proposed construction project may conceivably damage, disrupt or otherwise disturb any portion (or an appurtenance) of the municipality's sewerage system, a preconstruction and post-construction inspection of the system will be required. Inspection requirements shall be determined based on the following criteria:
- (c) Any sewer running parallel to the proposed construction area and within 5m of same, shall be inspected if blasting is required or anticipated.
- (d) When blasting is not required, any sewer running parallel to the proposed construction and is within 3m of same shall be inspected.

13. Arrangement for inspections:

The Contractor will arrange all pre-construction and post-construction television inspections.

14. Pre-Construction Inspection of Sewers:

In the area of the proposed construction, all building services connected to the sewer main shall be assumed to be in reasonable structural condition if they have been functioning properly in the past. If a malfunction of a building service is caused, the contractor will be held responsible for any repairs. As an alternate to the previously outlined pre-construction inspection requirements, the Contractor may accept the sewer line conditions noted in a previous TV inspection report for the affected area, which may be presently on file, however, to permit utilization of a past report, the following criteria must be met:

- (a) The TV inspection report shall be less than 3 years old;
- (b) No major construction works shall have been undertaken in the immediate area since this inspection.

15. Post-construction inspection of sewers:

The post-construction inspection must be completed within thirty days of completion of the works, and in any case before the work is accepted. The TV inspection contractors shall record both the pre-construction and post-construction inspections on video tape, as outlined. Upon completion of the post-construction inspection, the tapes will be submitted to the Engineer.

16. Evaluation of inspection results:

The results of the TV inspection will be evaluated by the Engineer for determination of any damage as a result of the construction project. The sewer system and its appurtenances will be assumed to be damaged by a construction project under the following conditions:

- (a) The excavation is of sufficient proximity and depth;
- (b) In bedrock, to cause damage to sewers by blasting tremors or rock movement.

17. Repair of damaged sewers:

All damage incurred by the sewer system due to the construction project shall be repaired by the contractor in accordance with the City standards. Upon completion of these repairs, a subsequent verification inspection shall be undertaken to assess the quality of the repairs.

18. Definitions:

- (vi) "Clean" shall mean the removal of all sand, grease and all other solid or semi-solid material from the length of pipe connecting two manholes.
- (vii) "Building service" shall mean the sewer line (lateral) extending from the building to the sewer main.

19. Television Equipment:

Television equipment shall consist of a self-contained camera and a monitoring unit connected by a 3 wire coaxial cable. The camera shall be small enough to ensure passage through a 150 mm sewer, shall be water proof, and shall have a self-contained remotely controlled lighting system capable of varying the illumination of the interior of the sewer line for inspection and photographic purposes. Picture quality shall be such as to produce a continuous 600 line resolution picture showing the entire periphery of the pipe. All video tapes submitted must be VHS Colour format, SP mode. An audio description of the inspection must also be provided, as well as a written report.

20. Television inspection:

The television inspection shall be performed on one sewer line section at a time. Each sewer line section being inspected shall be isolated where necessary from the remainder of the line by the use of a line plug to ensure total viewing of the periphery of the pipe. The inspection shall be performed in the direction of the flow, where possible. An inspection record prepared by the Engineer shall be kept, showing the exact location of each point of infiltration, fault and building service observed by the camera. The Engineer reserves the right to take pictures of the television monitor, as long as such photographing does not interfere with the Contractor's operations and work. Sewer lines 1050 mm in diameter or greater may be inspected by walking through the pipe. Video pictures shall be recorded with a hand held television inspection camera. In addition, still pictures may be taken with a 35 mm camera. Sections found to have deficiencies are to be retaped after deficiencies have been rectified, therefore, taping of new work will show no deficiencies.

21. Accommodation for Viewing:

The Contractor shall provide the accommodation for no less than two people, for the purpose of viewing the monitor, while the inspection is in progress.

22. Records:

An Inspection Record, in log form, shall be maintained during the television inspection by the Engineer. This log shall show the exact location of each leak, fault and building service. The location shall include the distance away from the referenced manhole and also the position as referenced to the axis of the pipe. Further, a detailed technical description shall be accompanied with photographs as supporting data for each leak or fault noted in the Inspection Report. The term leak or fault is hereinafter defined as:

- (a) Any sewer pipe joint which displays a gap or spread, offset, or signs of infiltration.
- (b) Any building service which has water entering around the junction of the lateral to the sewer line section or a steady flow entering the line section through the sewer lateral.
- (c) Any building service exhibiting a pronounced protrusion into the sewer line section.
- (d) Any section of the sewer which is crushed, broken or displays cracks which are either parallel or perpendicular to the axis of the pipe (longitudinal cracks or shears).
- (e) Any variance in the grade of the sewer line section.

The final TV inspection report for each section will be submitted by the Engineer in the format as noted in item 201.16 - Standards for Television Inspection Records. In addition to the normal inspection report format, the Contractor shall record all the television inspection on video tape. These tapes shall be submitted to the City. The written inspection report will be prepared by the Engineer. All photos and video pictures shall be of excellent quality and resolution. They should present a clear picture of the condition of the pipe with a precise and distinct definition of all observations, i.e., leaks, faults, cracks, obstructions, etc.

23. Threading of Sewers:

A 6mm nylon rope or equivalent may be installed in the sewer not more than one day in advance of the inspection, in order that the camera traction cable may be drawn through the sewer. The rope shall be tightly secured to the manhole ladders, making sure the line is taut, leaving no slack in the sewer line.

24. Site Safety:

Manhole barricades are required around all open manholes, in addition to Traffic Control, as per Division 7. Manhole barricades shall be as per Form 741. Prior to entering manholes and sewer lines, the contractor shall ensure that dangerous gases are not present. The Contractor shall keep a gas meter and air blower at the site to ensure the safety of the workmen when they are working inside the manholes and sewer lines.

25. Flow Control:

When sewer line flows are above the minimum requirements (1/4 of the pipe diameter) to effectively conduct the inspection, one or more of the following methods of flow control shall be used:

Plugging or Blocking

A sewer line plug shall be inserted into the line at a manhole upstream from the section to be inspected. The plug shall be designed so that all or any portion of the sewage flows can be released. During the inspection portion of the operation, flows shall be shut off or substantially reduced in order to properly inspect the pipe at the invert. After the inspection is complete, flows shall be restored to normal. Pumping or By-passing When adequate flow control cannot be obtained by the plugging method, pumps or siphons shall be used to divert all or a portion of the flows as may be necessary to perform the inspection, as approved by the Engineer. Excess sewage flows shall be transported through a pipe or by tank trucks to the nearest or most economical disposal area.

26. Standards for Television Inspection Reports:

Within ten working days following completion of a T.V. inspection on a section of sewer, a final television inspection video on this section shall be submitted by the Contractor to the Engineer. The Engineer shall prepare and submit a final television inspection report to the City.

The 10" x 11 1/2" enclosure for the final report will meet the following specifications:

- (i) the report shall be suitably bound;
- (ii) only letter-sized paper (8 1/2 x 11) will be used;
- (iii) the title page of the final report will be as follows, with the appropriate substitution where required: (see following page)
- (iv) An Index Page is to be included with each report and will state: "Street names from manhole #__ to manhole #__.

Whether inspected at the same time or not, the complete sewer inspection report will be presented together, from upstream to downstream manhole.

All pages will be numbered in the upper right hand corner of the right hand page. Thus, only every second page will be numbered with the same number referring to both the left and right hand page.

A standard form for documenting the television and manhole inspection findings is provided in Item 202. The form must show:

- (a) For TV. inspection results the heading will state:
- (b) the street name
- (c) the manhole numbers applicable to this section
- (d) the reference drawing number
- (e) the date of the inspection
- (f) The key plan will consist of a small drawing (not to scale) showing the appropriate locations of the two manholes in relation to any nearby reference points such as houses (with corresponding civic numbers), telephone poles (with corresponding pole numbers) etc. This drawing will denote:
 - (g) The manhole numbers
 - (h) the horizontal distance between the two manholes
 - (i) the direction of sewer flow

2.2 SECTION 02702 PIPE SEWER CONSTRUCTION (CONTINUED)

5. Delete the item 3.7.15 as shown in the Government Master Specification and substitute as follows:

3.7.15 Deflection Test for PVC Sanitary Sewers

- .1 A deflection test shall be carried out on all sections of the sewer. The maximum allowable deflection under fully backfilled and compacted trench conditions shall not exceed 5% before 30 days and 7.5% after 30 days.
- .2 Locations with excessive deflection shall be repaired and/or pipe shall be replaced at the Owner's expense. The equipment used for the deflection test shall be that as recommended by the manufacturer, and may include an Electronic Deflectometer or a Rigid "Go-No-Go" Device. For the purpose of deflection measurement, the base inside diameters and the deflection mandrel dimensions are provided in Table 2. To ensure accurate testing, the lines shall be thoroughly cleared.

TABLE 2: Base Inside Diameters and Deflection Mandrel Dimensions, PVC SDR-35 (ASTM D3034)

Nominal Size	Base inside Diameter (mm)	5% Deflection Mandrel (mm)	7.5% Deflection Mandrel (mm)
200	194.69	185.0	180.00
250	242.90	230.8	224.6
300	288.57	274.0	266.9
375	353.01	335.4	326.6

2.3 SECTION 02713 - WATER MAINS

- .1 Delete item 1.1.1 as shown in the Government Master Specification and substitute the following:
 - 1.1.1 Curb stops shall be located behind the sidewalk at the edge of the street right of way and the private lot line.
- .2 Delete items 2.1.2, 2.1.3, and 2.1.4 as shown in the Government Master Specification and substitute the following under Part 2 – Products.
 - 2.1.3 Delete this section in its entirety
 - 2.1.4 Delete this section in its entirety
 - 2.2.4 All valve boxes must be 133mm diameter, two piece, total length of 1650mm and Mueller brand unless authorized otherwise by the City of Corner Brook.

2.4.2 All waterline service connections must be type K soft copper unless authorized otherwise by the City of Corner Brook.

2.4.12 All brass corporation stops must be Mueller compression type H15008 unless authorized otherwise by the City of Corner Brook.

2.4.13 All brass curb stops must be compression type H15217; A726 service box adjustable from 1500 to 1800mm; 88036 35 304SS rod and A804 lid complete with screw, all Mueller brands unless otherwise authorized by the City of Corner Brook.

.3 Item 2.4 (general) - All water service pipe to be copper tubing, Type K. Delete references to all other pipe materials.

.4 Delete item 2.6.1 as shown in the Government Master Specification and substitute the following:

2.5.1 All hydrants are to be McAvity M-67 type to City of Corner Brook standard including one pumper nozzle and two hose nozzles to the following dimensions:

Unless approved by the City of Corner Brook, all water mains shall be Ductile Iron minimum pressure Class 350 complete with polyethylene wrap

Pumper Nozzle

Male outside diameter	4 15/16"
8 threads per inch gage letter code	OH
Ring gage major	4.936"
Plug gage major	4.976"
Ring gage pitch diameter	4.855"
Plug gage pitch diameter	4.895"
Clearance fit	0.040"

Hose Nozzle

Male outside diameter	2 27/32"
8 threads per inch gage letter code	y
Ring gage major	2.843"
Plug gage major	2.861"
Ring gage pitch diameter	2.762"
Plug gage pitch diameter	2.780"

Item 2.6.1 - Granular bedding materials to be Type 3.

.5 Unless approved by the City of Corner Brook, all water mains shall be Ductile Iron minimum pressure Class 350 complete with polyethylene wrap.

2.4 SECTION 02552 ASPHALTIC CONCRETE

Unless noted in the following Special Provisions, Hot Mix Asphalt Paving Specifications shall be in accordance with the Government of Newfoundland & Labrador, Municipal Water, Sewer and Roads, Master Construction Specifications, Section 02552, Latest Revision.

To ensure compliance, the user shall confirm and obtain the most recent version of the Asphalt Specifications from the City of Corner Brook's Engineering Department

PART 2.0 PRODUCTS

2.1 Asphalt Cement

Unless otherwise specified, asphalt cement shall conform to the requirements of AASHTO MP1, Standard Specifications for Performance Graded (PG) Asphalt Binder. The performance grade of the asphalt binder shall be PG 58 – 28 unless otherwise specified by the owner.

2.2 Coarse Aggregates

.1 Coarse Aggregate shall consist of hard, durable, crushed stone particles uniform in quality throughout and free from soft or disintegrated pieces. The coarse aggregate shall be made from a quarried source or contain 95% fractured particles. A fractured particle consists of two (2) freshly fractured faces each consisting of a minimum of 20% of the surface area of the particle.

The portion of material retained on the 4.75 mm sieve shall be known as the coarse aggregate. Results are expressed as percent by mass of sample.

.3 Coarse and Fine Aggregates shall conform to physical properties shown in Table 1.

Table 1 - Physical Requirements of Fine and Coarse Aggregates

Test Name Requirement	Standard	
Los Angles Abrasion %	ASTM C131	Max. 30
Soundness (5 cycles) %	ASTM C88	Max. 15
Fractured Particles	See Item 1	
Petrographic Number		135 Max.
Stripping Test %	AASHTO T283	73% Min.
Absorption % Coarse Aggregate	ASTM C127	Max 1.75
Absorption % Fine Aggregate	ASTM C 128	Max. 2.0
Fine Aggregate Angularity % (1)	AASHTO TP33	Min. 45
Sand Equivalent %	ASTM D2419	Min 50
Flat and Elongated Particles	ASTM D4791	Max 10

(1) Applies to all fine aggregate, including blend sand.

.4 This item deleted.

.5 This item deleted. (Refer to Table 1).

.6 Irrespective of compliance with the physical requirements of Table 1, any aggregate may be rejected on the basis of past field performance.

.7 This item deleted.

2.3 Fine Aggregate

.1 Fine aggregate shall consist of clean crushed aggregate particles produced from bedrock or a natural deposit. When produced from a gravel deposit the fine aggregate shall be separated during the crushing operation such) are stockpiled separately. Any stockpiles having a mixture of crushed and uncrushed sand sizes will be rejected for use. The maximum amount of natural uncrushed fine aggregate including any imported natural blend sand shall not exceed 30% of the fine aggregate component. Fine aggregate particles shall be free of clay, loam or other deleterious materials.

.2 This item Deleted (Refer to Table 1)

.3 This item Deleted (Refer to Table 1)

.4 Irrespective of compliance with the physical requirements of Table 1, any aggregate may be rejected on the basis of past field performance.

.5 This item deleted.

2.4 Blend Sand

.2 This item deleted.

2.5 Composition of Mixture

.2 Unless otherwise specified, the aggregates shall be combined in such proportions as to produce a mixture conforming to the grading and asphalt content requirements of Table 2.

TABLE 2: Asphalt Aggregate Mixtures - Cumulative Percent Passing

Sieve Size (mm)	Base Course	Surface Course	Leveling Course
19.0	100	100	100
12.5	80-100	97-100	100
4.75	35-75	50-70	55-75
2.00	20-60	25-55	35-55
0.425	10-35	10-30	18-30
0.075	3-7	3-7	3-8
Asphalt Content*	5.0-6.0	5.5-6.5	5.5-7.5

* Basis Weight of Total Mix.

.3 Once an aggregate gradation meeting the standard gradation specifications is achieved a “job mix formula (JMF)” shall be established. The JMF must be established within the first 15% of the contracted tonnage for each product type. If the JMF cannot be established within the specified 15% tonnage, materials shall be separately stockpiled and not used for the project. Once the specified JMF is attained the aggregates shall be placed in the aggregate stockpiles designated for the project. The allowable tolerances of the JMF are as follow.

Aggregate passing 4.75 mm sieve ± 5%

Aggregate passing 2.0 mm sieve ± 4%

Aggregate passing 0.075 mm sieve ± 2%

In no case shall the gradation of the JMF fall outside the standard gradation specifications.

2.6 Physical Requirements for Mixture

.1 The aggregates and the asphalt cement shall be mixed in such proportions as to satisfy the criteria contained in Table 3. The criteria are based on the Standard Marshall Test procedure using a 75 blow compactive effort on each face of the specimen.

TABLE 3 - Physical Requirements of Asphalt Paving Mixtures

Marshall Stability (kN) @ 60oC	7.5 min.
Marshall Flow Index (mm)	2 to 4
Voids in Mineral Aggregate (VMA)	
Base Course	14 min.
Surface Course	15 min.
Leveling Course	15 min.
Percent Air Voids in Compacted Marshall Mix	
Base Course	3 – 5

Surface Course	3 – 5
Leveling Course	3 – 5

Note: Use of leveling course shall be restricted to use on low traffic areas only.

.2 If required anti-stripping agents should consist of Hydrated Lime (Ca(OH)₂) or Liquid Anti-Stripping Agent

.2.1 Lime Storage and Metering Conditions

Hydrated lime is to be stored in a dry condition and shall be capable of agitating the lime by air or other means to keep it in a uniform free flowing condition.

A uniform metering system shall be capable of metering lime in quantities between 0.5% and 2.5% by weight of dry aggregate.

The moisture content of the lime shall be determined prior to each application.

The lime may be added as a dry product or mixed in slurry based on 1 part lime to 3 parts water.

If the addition of lime is required the contractor shall submit a quality control plan for the process, which shall be subject to approval by the engineer.

.2.2 Liquid Anti-Stripping Additives

If liquid Anti-Strip additives are proposed for utilization on the project, it is the responsibility of the contractor to provide the owner with the following documentation at least one week prior to the start of the paving project:

- (i) The type and dosage proposed for use on the project.
- (ii) Current WHIMIS documents for the product.
- (iii) A written Quality Control plan for use of the product addressing proper procedures to be followed when working with asphalt containing anti-stripping agent.
- (iv) Emergency procedures to be followed in case of employee respiratory problems.
- (v) Written documentation from the supplier stating that the proposed dosage is safe for use in a municipal environment.

PART 3 - EXECUTION

3.1 Use of Pits, Quarries and Stockpiles

.2 Aggregates designated for use on City of Corner Brook projects shall be separated over a 4.75mm screen and be stockpiled separately such that intermixing of each size and type does not occur. If aggregates are being produced from natural gravel deposits, both the natural sands and the crushed chips shall be separated over a 4.75mm sieve and stockpiled separately. Refer to Part 2.3 Fine Aggregate.

Separation over any other screen size must have prior written approval of the City of Corner Brook.

.3 The course aggregate stockpile shall contain no more than 10% passing the 4.75mm screen.

3.2 Equipment – Mixing Plants

.5 Hot Aggregate Storage Bins

.1 Batch and continuous mix plants shall have sufficient capacity to store enough hot mix asphalt to ensure uniform and continuous operation.

Batch plants shall have hot aggregate bins divided into compartments arranged to ensure separate and adequate storage of appropriate fractions of aggregates.

Each compartment shall be provided with an overflow pipe of such size and at such a location to prevent any backing up of material into other bins or into contact with the screen. Adequate and convenient facilities shall be provided for obtaining aggregate samples from each bin.

3.3 Special Requirements for Drum Mixer

.1 Additional to all other requirements, the designated aggregates shall be split on the 4.75 mm screen and each material shall be stockpiled separately such that the intermixing of each material type and size does not occur.

SPECIAL CONDITIONS, ASPHALT PRODUCTION AND PAVING OPERATIONS

Prior to the start of the project, the contractor shall provide a Quality Control Plan (QCP) to the owner addressing aggregate selection and production. The QCP shall include current tests related to aggregate qualification as specified under Part 2.0 – Products.

Asphalt Mix Designs shall be provided two weeks prior to the date paving is to commence. The Contractor shall present information in writing outlining the design mix and aggregate characterization properties identified in the special provisions.

Asphalt Mix designs to be approved by the City of Corner Brook before re-profiling / milling operations commence.

During production, the asphalt aggregates shall be continuously sampled and tested for determination of gradation. If more than two (2) consecutive tests are outside the gradation established in the Job Mix Formula, aggregate production shall be stockpiled separately or wasted until such a time that conformance with the JMF is re-established.

If a batch plant is used for asphalt mix production, one (1) complete set of hot bin aggregate samples shall be recovered and tested for gradation daily.

A copy of all QC tests shall be provided to the City on a daily basis.

Removal of excessive fines in the paving aggregate may be conducted during the aggregate production or hot mix production stage with the following understanding. The ability to successfully remove excessive fines during the mix production stage must be clearly demonstrated prior to the production of asphalt pavements covered under this project. Successful removal may be demonstrated either by the production and testing of either dry run aggregate combinations or hot mix asphalt pavement trial samples. Copies of all test results must be submitted and approved by the City of Corner Brook prior to the start of HMA production.

All adjacent concrete structures (sidewalks and curb and gutter) shall be protected from over-spraying of tack coat. Any tack coat on these structures shall be removed at the contractor's expense.

The contractor will reinstate any area where the tack coat has been contaminated by weather and/or traffic.

After final compaction, each layer of the asphalt pavement shall be smooth and have the required crown and grade. Average thickness shall not exceed +/- 6mm from the specified thickness.

Traffic shall not be permitted to travel on new asphalt pavements where the mat temperature exceeds 60 degrees Celsius.

SPECIAL CONDITIONS, REPROFILING OPERATIONS

At least one week prior to the commencement of any milling operations, the contractor shall provide to the City of Corner Brook a detailed "Milling Quality Control Plan" addressing the following:

- (i) A milling schedule and strategy for individual street sections;
- (ii) The proposed milling methodology when dealing with intersections and variable asphalt thickness;
- (iii) Proposed procedures related to the "start" and "stop" of milling operations.

Excavated material, where deemed suitable by City Engineering department representative, shall be used as backfilling material for work included in the contract.

Milling of the asphalt pavement shall be closely followed by placement of hot mix asphalt pavement in accordance with the following time limits.

Collector Streets -	48 to 72 hours
Residential Streets -	72 to 96 hours

All milling operations will be conducted such that the ramps are formed from existing asphalt. Ramps shall be removed no more than two hours before paving begins. Ramps will be reinstated if work is not completed within a reasonable time frame.

Selective grinding (300mm x 50mm) areas are to be paved as soon as the milling process has been completed.

Areas where the underlying asphalt pavement was removed or damaged during the milling operation shall be patched immediately.

Any "structurally weak areas" encountered during the milling program shall be excavated and repaired in the following manner:

- (i) Excavated areas shall be backfilled with "Class B" base course gravel and compacted to applicable project specifications;
- (ii) All structures such as manholes, catch basins, and valve boxes shall be adjusted to match the finished surface traverse and longitudinal grades;

- (iii) Structures that have been set to finished grade must not be disturbed. Damage to these structures due to grading and /or asphalt operations, shall be repaired by the contractor at their expense.
- (iv) Any material that falls inside the structure shall be removed immediately.

The City retains the right, during the progress of the work, to construct, rebuild or replace substructures (manholes, catch basins, valve boxes) with as little inconvenience as possible to the contractor. The City has the right to suspend the work at any time for this purpose, without compensation to the contractor. Extension of time to complete the work will be added, equal to the amount of time delayed.

Costs resulting from any asphalt quantity placed that exceeds 110 % of the theoretical quantity, based on specified thickness, shall NOT be paid.

Water required to perform the work shall be supplied by the contractor. Use of City hydrants will not be permitted.

APPENDICIES

Appendix A – Municipal Plan Amendment

Appendix B – Development Approval Checklist

Appendix C – Subdivision Agreement and Subdivision Permit Checklist

Appendix D – Acceptance of Stage I Work

Appendix E – Acceptance of Stage II Work

Appendix F – Sample Subdivision Permit

Appendix G – Sample Subdivision Agreement

Appendix A

Municipal Plan Amendment (Rezoning)

A development application that does not conform to the current land use designation and zoning may require an amendment. An amendment to either the Municipal Plan or Development Regulations involves a change to either specific text or a specific map; i.e. the zoning map. A **text amendment** may involve changing one word or many sections of the Municipal Plan and/or Development Regulations, with no change to the land use mapping. An example of a text amendment could involve the addition or removal of a condition for a specific use; i.e. adding a condition that addresses reduced setbacks on corner lots. An **amendment to the land use zoning maps** could involve a physical change to the boundaries and designation of one, several or all zones. If a zoning amendment is successful, the land is then capable of supporting all uses, permitted and discretionary, of the new zoning designation.

In order to amend the land use designation/land use zoning of an area of land, a written request must be made to the City of Corner Brook. This request must identify the intended use (development) of the land. If the applicant is not the property owner, written consent of the property owner to process the application must be provided. The application will be reviewed by staff and any internal and external referral/comments will be carried out. In assessing the amendment, consideration must be given to the fact that although the amendment is being sought to accommodate a specific development, all permitted and discretionary uses of the new zone may be considered for the land in future if the zoning is successfully changed. For instance, after rezoning, the initial application may be withdrawn for some reason; however, the zone has been changed and other uses of the zone may be considered for the site. Council would have the ability to refuse other developments if they were not deemed appropriate for the site (which is a discretionary power of Council in any zone); therefore Council, in considering an amendment and proceeding with the process, must be satisfied that the new zone is compatible with the policies and long term goals of the Municipal Plan and community in general.

The process includes:

Council's consideration of the amendment and approval to conduct the initial public consultation process. This is done at a public meeting after all pertinent information, plans, etc. has been provided by the applicant and reviewed by staff. The nature and scale of the public consultation process is at the discretion of Council and staff, depending on the proposal. This would normally require a month to complete including public notices, notices to residents, adequate response time and writing of the report on the process.

The results of the public consultation process and all related documentation including public notices, letters to residents, submissions, amendment documents in the proper format, maps, etc. must then be submitted to the Provincial Planning Office of the Department of Municipal and Provincial Affairs. The department reviews the amendment to confirm that the appropriate type and level of consultation was carried out and to ensure conformity with the Urban and Rural Planning Act as well as assessing whether there is any conflict with provincial land use policy.

After being cleared from any further provincial review, the amendment would be brought forward for adoption at a public Council meeting. A Commissioner is appointed and the time and date set for a Public Hearing to consider objections, support or submissions to the amendment. The review period for public posting and review of the amendment is a minimum fourteen (14) days after the first newspaper publication. If no objections/submissions are received, the Hearing may be cancelled; however, if the Hearing does occur, the Commissioner will prepare a report and recommendation for Council. The Commissioner's Report is required within thirty (30) days of the Hearing.

If the Hearing does not take place, the amendment would be again brought before Council for a final decision and normally, if no concerns have been raised, the amendment would be approved by Council at a public meeting.

If a Hearing has occurred, the Commissioner may:
recommend approval of the amendment,
recommend that changes be made to the amendment
based on any changes, recommend the process be conducted again
recommend that the amendment be rejected.

The final decision rests with Council and is binding. There is no appeal process available to either the applicant for the amendment or opponent(s) of the amendment.

If approved by Council, all final documentation is submitted to the Provincial Planning Office for registration with the province and when registered, a public notice published in the Newfoundland Gazette legalizes the amendment. A public notice must also be published in a local newspaper.

Upon final publication in the Newfoundland Gazette, processing of the actual development application can resume.

This process can require up to six months to complete.

For detailed information on amendments and the amendment process please refer to City of Corner Brook document titled **Requirements and Process for Amendments**.

Appendix B

Development Approval Checklist

All items below form part of a checklist that must be completed in its entirety and submitted for approval by the designer prior to Issue a Subdivision Agreement and Subdivision Permit to the *Developer*. (Please refer to Schedule 1 Section 2.0 for further information)

Development Application and Fee.

Legal Survey outlining *Developers* ownership of all land outlined within the *development area* or a written consent form from all land owners involved in the subdivision.

Three sets of detailed plans showing the subdivision plan which shall include:

- Street and Lot Layout
- Services and Connections
- Drainage Plan
- Open Space requirement
- Location Plan
- Engineers Signature

Appendix C

Subdivision Agreement and Subdivision Permit Checklist

All items below form part of a checklist that must be completed in its entirety and submitted for approval by the designer prior to Issue a Subdivision Agreement and Subdivision Permit to the *Developer*. (Please refer to Schedule 1 for further information)

Development application and fee

Legal Survey outlining *Developers* ownership of all land outlined within the *development area* or a written consent form from all land owners involved in the subdivision.

3 sets of drawing as outlined within this document.

Drawing approval from Operational Services and the Fire Department.

Geotechnical report (if required).

Traffic Impact Study (if required).

Environment Site Assessment (if required).

Master Plan and Individual survey's

Site grading drawings for overall development.

Permit to Construct.

Fire Flow Test.

Utility Easements Identified.

Securities paid.

Open Space requirement satisfied.

Appendix D

Acceptance of Stage I Works Checklist

All items below form part of a checklist that must be completed in its entirety and submitted for approval by the designer prior to acceptance of Stage I Works. Securities will be released by the City of Corner Brook within 7 days of receipt of written request from the developer provided all required documentation has been received and work is accepted.

Stage As-Built Engineering Drawings as per City Standards to the point of substantial completion.

Test results as required for the water, sanitary and storm sewer systems.

Video inspection of the Sanitary and Storm Sewer.

Inspection of the sanitary, and storm sewer systems by the City.

Correction of all noted deficiencies.

Concrete test results for curb and gutter (Batch Reports).

Asphalt test results for base course asphalt.

Compaction test results for sub-grade works to the limits of the right of way.

Site Grading drawings for individual lots (both plan and profile).

Rock Pad Certification (if applicable).

Appendix E

Acceptance of Stage II Works Form

All items below form part of a checklist that must be completed in its entirety and submitted for approval by the designer prior to acceptance of Stage I Works. Securities will be released by the City of Corner Brook within 7 days of receipt of written request from the developer provided all required documentation has been received and work is accepted.

Subdivision Plan as per City Standards, Master legal survey plan of development, both plan and description.

Concrete test results for sidewalk (Batch Reports).

Asphalt test results for surface course.

Compaction test results for sub-grade works to the limits of the right of way.

Legal survey of land to be transferred to the City of Corner Brook (street right-of-ways, easements, open space, etc.).

Inspection of Stage II works by the City.

Correction of all noted deficiencies.

Engineers Sign off on completion of subdivision.

Appendix F

SAMPLE SUBDIVISION PERMIT

- 0) NAME OF APPLICANT
- 1) ADDRESS OF APPLICANT
- 2) NAME AND ADDRESS OF OWNER (if not (1) above)
- 3) DATE OF APPLICATION
- 4) DATE OF DECISION
- 5) LOCATION OF SUBDIVISION
- 6) NATURE OF SUBDIVISION Residential Development
- 7) Permission is hereby GRANTED for the development of the proposed subdivision outlined above, SUBJECT TO:

The development being done in accordance with the engineering drawings reviewed by the Engineering Division of the City of Corner Brook. All work to be constructed to the "Municipal Water Sewer and Road Specifications " as published by the Province of Newfoundland and Labrador Department of Municipal and Provincial Affairs; the Subdivision Design Procedure and Municipal Engineering Standards for the City of Corner Brook; all provisions of the City of Corner Brook Development Regulations all provisions of the approval to be issued by the Provincial Department of Environment and Conservation and must include but may not be limited to the following:

- (a) The development being done in accordance with the engineering drawings reviewed by the Engineering Division of the City of Corner Brook dated _____
- (b) The developer shall provide the City with as-constructed drawings in hard copy and digital format showing all as-built information prior to final release of securities associated with the subdivision.
- (c) During the course of construction of the subdivision, a lot or lots identified that may be backfilled or that require backfill will require written confirmation in the form of a subsurface investigation from an engineer licensed to practice in the province of Newfoundland and Labrador that the lot is appropriate for the building and its use. (Reference N.B.C.C. 4.2. Foundations). The developer shall provide this confirmation to the City of Corner Brook
- (d) The developer shall supply or have Newfoundland Power supply the City with drawings showing necessary utility easements and right-of-ways for street lighting.
- (e) Legal survey information is required for subdivision boundaries, lot layouts, easements and Right of Ways.
- (f) The applicant shall transfer to the City of Corner Brook at no cost to the City:
 - (1) All lands in the area proposed to be developed or subdivided which are approved and designated by the City for public use as streets, emergency access roads, utility right-of-ways, sidewalks or other right-of-ways or for other public uses and open spaces owned by the developer.
 - (2) All services or public utilities including water supply and distribution, sanitary and storm drainage systems installed in the subdivision that are normally owned and operated by the City.
- (g) No individual building permits will be issued until such time as security, satisfactory to the City, has been posted to ensure completion of the subdivision in accordance with the Subdivision Permit and Development Regulations as per 5.3.
- (h) No changes in work shall be carried out in any portion of the subdivision without prior approval from the Director of Operational Services or designate.
- (i) Occupancy permits will not be issued to new homeowners until the subdivision has reached the stage of substantial completion as per 5.3.

- (j) The sub grade shall be excavated to a minimum depth of two (2) feet below existing ground levels or a minimum of two (2) feet below finished grade, whichever, is lower. It may be necessary to excavate to greater depths if determined by the City's Engineering Division, depending on the conditions of the existing materials.
- (k) The contractor /developer must notify the City prior to commencement of work for the subdivision and is required to notify the Director of Operational Services or designate prior to any service testing taking place.
- (l) Construction of road signage, including stop signs, street names, parking, cul-de-sac signs and signs for public safety are the responsibility of the contractor/developer. All road signage shall be in accordance with the City of Corner Brook standards and the City shall approve the signage and materials prior to installation.
- (m) Environmental Approval required for water, sanitary, and storm sewer.
- (n) Street grading for connection to existing streets to be coordinated with the City of Corner Brook's Engineering Division.

(9) The reasons for the IMPOSITION OF CONDITIONS ON THE CONSENT ARE:

To comply with the 1994 Development Regulations and the Subdivision Design Procedures and Municipal Engineering Standards of the City of Corner Brook. to comply with the requirements of the Department of Environment & Conservation and the standards of the specifications for municipal services as published by the Department of Municipal and Provincial Affairs.

To comply with the requirements of the City of Corner Brook's Engineering Division.

DATED:

Chief Administrative Officer

NOTE: This permit relates only to the subdivision of land and does not permit the erection of the buildings, wells or septic tanks, etc. Details of Appeal Procedure are attached.

Signature

)
) Position
)

_____)

Position

)
)
)
)

THE COMMON SEAL of the City of) CITY OF CORNER BROOK

Corner Brook was hereunto affixed)

in the presence of:) Witness

)

_____) Position

Signature)

)
)

_____)

Position)

) Witness
)
) Position
)

ADDENDUMS

Addendum A – Soils Testing

Addendum B – Waterline Pressure Test Results

Addendum C – Water Leakage Test Results

Addendum D – Sanitary Sewer Ex-Filtration Test

Addendum E – Sanitary Sewer Infiltration Test

Addendum F – Sanitary Sewer Go or No-Go Test

Addendum G – Storm Sewer Go or No-Go Test

Addendum H – Sanitary Sewer Television Inspection Test

Addendum I – Storm Sewer Television Inspection Test

Addendum J – Weekly Log Sheet – Developers Inspector

Addendum K – Concrete Testing

Addendum L – Asphalt Testing

Addendum A

CITY OF CORNER BROOK



SOILS TESTING

This schedule hereby certifies that placement and compaction of all materials has been completed as per the requirements of the engineered design and testing standards applicable for the below identified development.

DATE: _____

PROJECT: _____

COMMENTS: _____

SIGNATURE OF APPROVAL
DEVELOPERS ENGINEER

**(Please attach testing results as submitted to the
Developers Engineer by the Developers testing firm)**

Addendum B

CITY OF CORNER BROOK



WATERLINE PRESSURE TEST RESULTS

Reference - Department of Municipal Affairs
Municipal Water, Sewer and Road Specifications – 02713 (3.11)

Date	Working Pressure Kpa	Test Pressure Kpa	Duration	# of Services and M. of pipes	Comments

This schedule hereby certifies that all water mains and services have been installed as per the requirements of the engineered design and testing standards outlined within the Department of Municipal Affairs “Municipal Water, Sewer and Road Specifications” for waterline pressure testing.

DATE: _____

PROJECT: _____

COMMENTS: _____

SIGNATURE OF APPROVAL
DEVELOPERS ENGINEER

Addendum C

CITY OF CORNER BROOK



WATERLINE LEAKAGE TEST RESULTS

Reference - Department of Municipal Affairs
Municipal Water, Sewer and Road Specifications – 02713 (3.12)

Time	Diameter of Pipe	Allowable leakage (l/hr)	Actual Leakage (l/hr)

Allowable leakage shall be calculated using the following formula:

$$L = \frac{ND(P)^{0.5}}{128}$$

L = allowable leakage in l/h

N = number of joints in the length of pipe tested

D = nominal diameter of the pipe in meters

P = the average test pressure during the leakage test in kilopascals

This schedule hereby certifies that all waterlines have been tested and conform to the standards outlined within the Department of Municipal Affairs “Municipal Water, Sewer and Road Specifications” for leakage testing.

DATE: _____

PROJECT: _____

COMMENTS: _____

SIGNATURE OF APPROVAL
DEVELOPERS ENGINEER

Addendum D

CITY OF CORNER BROOK



SANITARY SEWER EX-FILTRATION TEST RESULTS
Reference - Department of Municipal Affairs
Municipal Water, Sewer and Road Specifications – 02702 – 3.7

From Manhole #	To Manhole #	Allowable Leakage	Actual Leakage	Duration (Min 1hr)

This schedule hereby certifies that the sanitary sewer has been tested and conforms to the standards outlined within the Department of Municipal Affairs “Municipal Water, Sewer and Road Specifications” for ex-filtration testing.

DATE: _____

PROJECT: _____

COMMENTS: _____

SIGNATURE OF APPROVAL
DEVELOPERS ENGINEER

Page _____

Addendum E

CITY OF CORNER BROOK



SANITARY SEWER INFILTRATION TEST RESULTS

Reference - Department of Municipal Affairs
Municipal Water, Sewer and Road Specifications – 02702 – 3.7

Time	Diameter of Pipe	Allowable Infiltration (l/hr)	Actual Infiltration (l/hr)

This schedule hereby certifies that the sanitary sewer has been tested and conforms to the standards outlined within the Department of Municipal Affairs “Municipal Water, Sewer and Road Specifications” for ex-filtration testing.

DATE: _____

PROJECT: _____

COMMENTS: _____

SIGNATURE OF APPROVAL
DEVELOPERS ENGINEER

Page _____

Addendum F

CITY OF CORNER BROOK



SANITARY SEWER GO OR NO-GO TEST RESULTS

Reference - Department of Municipal Affairs

Municipal Water, Sewer and Road Specifications – 02702 – 3.7

Manhole #	1 st Attempt	2 nd Attempt	3 rd Attempt
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail

This schedule hereby certifies that the sanitary sewer Go or No-Go test has been performed and approved by the Developer Engineer.

DATE: _____

PROJECT: _____

COMMENTS: _____

SIGNATURE OF APPROVAL
DEVELOPERS ENGINEER

Page _____

Addendum G

CITY OF CORNER BROOK



STORM SEWER GO OR NO-GO TEST RESULTS

Reference - Department of Municipal Affairs

Municipal Water, Sewer and Road Specifications – 02702 – 3.7

Manhole #	1 st Attempt	2 nd Attempt	3 rd Attempt
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail
	Pass or Fail	Pass or Fail	Pass or Fail

This schedule hereby certifies that the sanitary sewer Go or No-Go test has been performed and approved by the Developer Engineer.

DATE: _____

PROJECT: _____

COMMENTS: _____

SIGNATURE OF APPROVAL
DEVELOPERS ENGINEER

Page _____

Addendum H

CITY OF CORNER BROOK



SANITARY SEWER TELEVISION INSPECTION TEST RESULTS

Reference - Department of Municipal Affairs

Municipal Water, Sewer and Road Specifications – 02702 – 3.7

Time	From Manhole #	To Manhole #	Pipe Length	% Grade	Pipe Size	Pipe Type	Approved

This schedule hereby certifies that the sanitary sewer television inspection test has been performed and approved by the Developers Engineer.

DATE: _____

PROJECT: _____

COMMENTS: _____

SIGNATURE OF APPROVAL
DEVELOPERS ENGINEER

Q

Page _____

Addendum I

CITY OF CORNER BROOK



STORM SEWER TELEVISION INSPECTION TEST RESULTS

Reference - Department of Municipal Affairs

Municipal Water, Sewer and Road Specifications – 02702 – 3.7

Time	From Manhole #	To Manhole #	Pipe Length	% Grade	Pipe Size	Pipe Type	Performed by	Approved

This schedule hereby certifies that the storm sewer television inspection test has been performed and approved by the Developers Engineer.

DATE: _____

PROJECT: _____

COMMENTS: _____

SIGNATURE OF APPROVAL
DEVELOPERS ENGINEER

Page_

Addendum J

CITY OF CORNER BROOK



WEEKLY LOG SHEET – DEVELOPERS INSPECTOR

Date	Hours Worked	Work Performed/Comments

This schedule hereby certifies that the storm sewer television inspection test has been performed and approved by the Developers Engineer.

PROJECT: _____

SIGNATURE OF APPROVAL
DEVELOPERS INSPECTOR

SIGNATURE OF APPROVAL
DEVELOPERS ENGINEER

Page_

Addendum K

CITY OF CORNER BROOK



CONCRETE TESTING

Reference - Department of Municipal Affairs
Municipal Water, Sewer and Road Specifications – 02528

This schedule hereby certifies that placement of all concrete conforms to the requirements of the engineered design and testing standards applicable for the below identified development.

DATE: _____

PROJECT: _____

COMMENTS: _____

SIGNATURE OF APPROVAL
DEVELOPERS ENGINEER

**(Please attach testing results as submitted to the
Developers Engineer by the Developers testing firm)**

Addendum L

CITY OF CORNER BROOK



ASPHALT TESTING

Reference - Department of Municipal Affairs
Municipal Water, Sewer and Road Specifications – 02552

This schedule hereby certifies that placement and design of all asphalt conforms to the required City of Corner Brook design mixture and testing standards as identified by the Department of Municipal Affairs “Municipal Water, Sewer and Road Specifications” for hot mix asphaltic concrete.

DATE: _____

PROJECT: _____

COMMENTS: _____

SIGNATURE OF APPROVAL
DEVELOPERS ENGINEER

**(Please attach testing results as submitted to the
Developers Engineer by the Developers testing firm)**