MUNICIPAL ENGINEERING RESIDENTIAL SUBDIVISION STANDARDS

Revision – R1

August 2010

TOWN OF CONCEPTION BAY SOUTH
ENGINEERING DEPARTMENT

Prepared By:
Town of Conception Bay South Engineering Department

August 2010

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MUNICIPAL ENGINEERING STANDARDS

Resolution #10-320
Councillor McDonald/Councillor Rowe

Be it so resolved that the Municipal Engineering Standards be adopted as presented.

Made and adopted by the Council of the Town of Conception Bay South on this 10th day of August 2010.

Clerk

Mayor

All persons are hereby requested to take notice that anyone who wishes to view these Standards may do so at the Office of the Town Engineer of the Town of Conception Bay South. Should there be any questions or need for clarification, please contact the Town's Engineering Department at Suite 106, Villa Nova Plaza, 120 Conception Bay Highway or telephone 709-834-6522

Approved by:

Ronald Franey, P. Eng.
Town Engineer

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SCHEDULE 1

SUBDIVISION DEVELOPMENT POLICY

1.1 DEFINITIONS

1.1.1 - STAGE I Work:

Stage I work consists of 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, street lighting and development of open space areas and accesses to these areas.

1.1.2 - STAGE II Work:

Stage II work consists of all work relating to the construction of above ground work, including but not limited to, surface course asphalt, landscaping of areas other than open space areas, tree planting, privacy fencing, sidewalks and walkways.

1.1.3 - Developer:

A person or company who has applied for and has been granted approval to subdivide or service an existing parcel of land.

Approval in Principle – A permit giving the Developer approval to proceed to the final design Stage of a project.

1.1.4 - Consulting Engineer:

A professional engineer, registered in the Province of Newfoundland and Labrador, retained by the Developer to be responsible for design and supervision of the works.

1.1.5- Construction Permit - gives the Developer approval to proceed with construction work as per development agreement.

1.2 DEVELOPMENT APPROVAL

1.2.1 - Requirements:

The applicant will be required to submit three copies of the proposed subdivision plan showing the street and lot layout, water courses, buffers and public open space. This plan shall be at a scale of 1:500 and have contours at one (1) meter intervals. The applicant will also be required to submit three copies of a location plan at a scale of 1:2500. Location plan shall indicate the proposed street layout and shall locate the position of the proposed development within the municipal boundaries of the Town of Conception Bay South.

1.2.2 – Development Approval:

The preliminary subdivision plan will be reviewed for the following:

(a) Access

The plan will be evaluated for impact on traffic flows and ease of access to and from the subdivision.

(b) Water Supply

The water supply to the subdivision will be evaluated to determine if adequate pressures and flows exit in the Town's system.

(c) Sanitary Sewer Generation

The Town's system will be evaluated to determine if the current configuration has the capacity available to accommodate the calculated flows to be generated.

(d) Storm Sewer Generation

The Town's system will be evaluated to determine if the correct configuration has the capacity available to accommodate the calculated flows to be generated.

(e) Internal Street Layout

The street layout will be reviewed for general conformance to the design criteria as given in the Subdivision Design Guidelines. Approval at this Stage is preliminary and will not prohibit further changes that may become necessary during the detailed design.

(f) Public Open Space

The Town may require the applicant to convey to the Town for a nominal consideration of one dollar ($1.00) a parcel of land for public recreation purposes not to be less than five percent (5%) or to exceed ten percent (10%) of the total subdivision area.

The Town may also require a strip of land to be reserved and remain undeveloped along the banks of any significant river, brook, pond or wetland and this land may, at the discretion of Council, constitute the requirement of land for public open space.

If upon review of the above a deficiency is determined to exist, then:

1. The application may be recommended for rejection.
2. The applicant may be required to undertake further studies to determine the extent of any problems and corrective action required.
3. The application may be recommended for Development Approval subject to the applicant taking any necessary corrective action as determined by the Municipality.

The application will be recommended for development approval if there have not been any problems noted during the review. Development Approval shall be valid for one year, only, from the date of granting by the Town, during which time an application for Final Approval shall be submitted. If an application for Final review is not received within one (1) year of Development Approval, the Town shall have

the right to cancel the Development Approval and require the application process to be repeated.

1.3 CONSTRUCTION APPROVAL

1.3.1 - General:

The subdivision is to be designed and constructed in accordance with the Town's Regulations and the Government of Newfoundland's Municipal Water, Sewer and Road Specifications (Government Master Specifications). In certain instances these regulations are more stringent than, and supersede, the Government Master Specifications – these instances are detailed in the Town's Supplement to the Government Master Specifications contained in Schedule 3 of this document.

1.3.2 - Requirements:

The application for Construction Approval should be made within one year of the granting of the Development Approval, and must be accompanied by the following:

(a) Subdivision Plan - The Plan should be drafted as per the standard Subdivision Plan (Appendix C) and shall show the following items:

- (i) Water, sanitary and storm sewer layout (invert information is not required);
- (ii) Street alignment information (coordinates for PI and street intersections are not required);
- (iii) Lot layouts and numbering;
- (iv) Right-of-ways, easements and carriageways;
- (v) Canada Post locations:
- (vi) Driveway locations:
- (vii) Open space areas;
- (viii) Bench mark locations and elevations;

(ix) Direction of flow for sanitary and storm sewer systems;

(b) Master Survey Plan – The Plan should be drafted as per the standard Master Survey Plan (Appendix C) and shall show the following items:

(i) Street alignment information including coordinates for PI and street intersections;
(ii) Lot metes and bounds, areas and numbers;
(iii) Right of ways and easements;
(iv) Canada Post locations:
(v) Driveway locations:
(vi) Open space areas;
(vii) Bench mark locations and elevations;

(c) Plan and Profile Drawings - Plan and profile drawings showing all streets, watermains and sewers to be constructed. Detailed drawings are required for any items not covered by the Standard Drawings in the Municipal Water, Sewer and Roads Specification Book.

(d) Lot Grading Plan - as per the Town's Standard (Appendix D)

(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 drainage plan.

(g) Federal Fisheries and Oceans - Copies of any approvals required for works under the jurisdiction of Fisheries and Oceans.

(h) Provincial Environment and Lands - Copies of any approvals required for works under the jurisdiction of Environment and Lands, both the civil sanitary and water resources divisions.

(i) Canada Post - Copies of approval for the proposed Canada Post locations.

(j) Newfoundland Power - Legal plan and description for easements.

1.3.3 - Approval:

The detailed subdivision design will be reviewed for conformance with the Town's Regulations and the Government Master Specification. If any problems are noted the Applicant will be required to make the necessary revisions and resubmit the drawings for approval (three copies of each).

If no problems are noted, then "Construction Approval" will be recommended and the Applicant will be asked to submit three (3) copies of the aforementioned drawings and one additional copy in digital and PDF format.

Construction Approval is valid for a two (2) year period but may be renewed once upon review by the Engineering and Planning Departments for a further period not exceeding one (1) year.

The granting of Construction Approval shall not prevent the Town 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 Town. Upon approval of any revision, three (3) copies of the revised drawings and a digital and PDF copy of the revised drawings shall be submitted.

1.4 FINANCIAL REQUIREMENTS

1.4.1 - Assessments:

(a) Capital Recovery Assessments - All outstanding assessments on the property to be developed as recorded by the Town must be paid prior to the Subdivision Development Agreement being executed. The assessments will be for items such as:

- Water, sanitary and storm sewer systems;
- Street improvements;
- Sidewalks;
- Over-sizing;
- Recreational or as otherwise required by Town.

(b) Trunk Sewer Assessments - If the subdivision is within the drainage area of a Sanitary Trunk Sewer, for which there is an assessment registered, then the assessment must be paid prior to the execution of the Subdivision Development Agreement. This assessment is an area assessment and is a fixed rate per hectare for the gross area being developed. This is to be set by Council and be determined by cost of project and set at time of the development.

1.4.2 - Fees:

(a) Backland Assessment Fee - $5,000.00 hectare

(b) Development Fee - $100.00 per building lot

(c) Open Space Fee - $400.00 per building lot

(d) Where the Town has required the dedication of land for public space,it may, at its discretion, accept from the developer in lieu of such area or 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.

1.4.3 - Securities:

The amount of any securities required will be determined by the Town. All securities must be in the form of cash, certified cheque, non expiry bond or an irrevocable letter from an approved Surety Company.

(a) **Stage I Warranty Security** - This security will be equal to ten percent (10%) of the value of Stage 1 works and must be in place prior to signing of the Subdivision Agreement and remain in place for a period of one (1) year from date of first occupancy.

(b) **Stage II Security** - This security will be equal to one hundred and twenty-five percent (125%) of the estimated cost of Stage II works at signing of Subdivision Agreement. Stage II works must be completed within thirty (30) months of first permit occupancy. Upon release of Stage II securities, 10% will be retained for a period of one (1) year.

(c) **Stage II Warranty Security** - This security will be equal to ten percent (10%) of the value of Stage II works and must be in place prior to the acceptance of Stage II works 1 year and to be held by the Town for not less than one (1) year from the date of acceptance.

1.5 STAGE I WORKS

1.5.1 - Schedule:

Stage I works shall not commence until Construction Approval has been issued, all financial requirements have been met, and the Subdivision Agreement has been executed. All work shall receive continuous site supervision by the Consulting Engineer. Failure to provide supervision will result in the subdivision being shut down until proper supervision is provided.

All work shall be in accordance with this document and the Government of Newfoundland's Municipal Water, Sewer and Road Specifications and the Municipality's supplementary document (See Schedule 3). Where a conflict occurs the more stringent, as determined by the Town Engineer, shall apply.

No permits shall be issued until Stage 1 works is one hundred percent (100%) completed and accepted by the Town.

1.5.2- Acceptance of Stage I Works:

Stage I works will be accepted by the Town when all work has been 100% completed and the following submitted and approved:

1. As-built Engineering Drawings as per Town standards; digital, PDF and hard copies
2. Subdivision Plan as per Town standards; (Master Survey Plan)
3. House service information forms;
4. Lot grading plans;
5. Test results as required for the water, sanitary and storm sewer systems.
6. Inspection of the water, sanitary and storm sewer systems by the Town
7. Stage I Warranty period security;
8. Correction of all noted deficiencies;
9. Fire flow test results as required by the Town;
10. Concrete test results for curb and gutter works;
11. Asphalt test results for base course asphalt;
12. Compaction test results for sub-grade works to the full limit of street right of way.
13. Video inspection of sanitary sewers and storm sewers.
14. Survey monumentation information

15. Street / Stop Signs installed
16. Deeds of Conveyance for right-of-ways, open spaces and easements.
17. Letter of Certification from Project Engineer verifying all work is acceptable.

1.5.3 - Building Permits

Building permits will not be approved until Stage I works have been accepted by the Town. However, if the deficiencies noted are of a minor nature as determined by the Town's Engineering Department and security has been provided to the amount as determined by the Town as acceptable to cover their correction then the building permits may be approved at the discretion of the Town's Engineering Department.

1.5.4 - Warranty Period

The Developer shall at his own expense rectify and make good any defect or fault, however caused, appearing within a one year period from the date of first occupancy. The Stage I Warranty Security will be released at the end of the warranty period providing all noted deficiencies have been corrected. Should deficiencies not be corrected within sixty (60) days of the Developer being notified, the Town reserves the right to complete the work and deduct the costs from the Development securities.

1.6 STAGE II WORKS

1.6.1 - Schedule

Stage II works shall not commence until Stage I works have been accepted. The Town will not accept responsibility for damage to and maintenance of any Stage II works until all Stage II works have been completed and accepted by the Town. The surface course asphalt shall not be placed without the approval of the Town Engineer or his designate.

Stage II works shall be completed not later than thirty (30) months after the date of the first occupancy permit.

1.6.2 - Benchmarks

Benchmarks shall be installed as per the requirements detailed in the Subdivision Design Criteria.

1.6.3 - Acceptance of Stage II Works:

The Town will accept Stage II works when all work has been completed and the following submitted and approved:

1. Concrete test results for sidewalk;
2. Asphalt test results for surface course asphalt;
3. As-built information for benchmark installations;
4. Stage II warranty period security;
5. Inspection of Stage II works by the Town;
6. Correction of all noted deficiencies;
7. Completion of all Open Space site grading, privacy fencing, tree planting, etc.
8. Letter of Certification from Project Engineer verifying that all work has been completed in accordance with all plans, specifications, approvals, etc.

1.6.4 - Warranty Period

The Developer shall, at his own expense, rectify and make good any defect or fault, however caused, appearing within a one (1) year period from the date of acceptance of Stage II works.

The Stage II Warranty security will be released at the end of the warranty period providing all noted deficiencies have been corrected. Should deficiencies not be corrected within sixty (60) days of the Developer being notified, the Town reserves the right to complete the work and deduct the costs from the Development securities.

SCHEDULE 2

SUBDIVISION DESIGN GUIDELINES

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SCHEDULE 2

SUBDIVISION DESIGN GUIDELINES - SURVEYING

1.1 DEFINITIONS:

1.1.1 - Survey:

Means 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:

Means a system established for referencing land surveys and is based on 3° (degree) transverse mercator projection.

1.1.3 - Co-ordinate Monument:

Means any marker established for the Provincial Co-ordinate Survey System.

1.2. MASTER SURVEY PLAN:

1.2.1 A Survey plan shall be drawn in accordance with the requirements of the "Drafting" section of Schedule 2 and shall include:

(a) The name of the owner of all abutting lands;

(b) 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;

(c) 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.

(d) Each street, walkway and easement;

(e) Each lot and its number;

(f) The length, bearing and internal angle of each line of the boundary of, and the area in square metres of:

(i) The land being subdivided;
(ii) Each street, walkway and easement;
(iii) Each lot;
(iv) the land, if any, which is reserved for park, playground, buffers and public purposes;

(g) The geometry of connections between existing streets and streets of the subdivision;

(h) The location of any existing structure which is to remain;

(i) Every water course and its direction of flow;

(j) All information necessary for the calculation and laying out of any curved line;

(k) The date of compilation;

(l) The date and description of revision, if any;

(m) The name of the subdivision;

(n) All existing streets, roads, lanes and intersections in the immediate area and their official names as designated by the Town;

(o) The location and extent of rock outcrops;

(p) The location and results of any test borings;

(q) At least two (2) centre line points of known chainage related to the Provincial Co-ordinate Survey System;

(r) The location and elevation of the Town benchmark used.

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

(a) MAXIMUM - Size designation, B1, which represents 707 mm wide x 1000 mm long;

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

(c) 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 a scale as indicated in the "Drafting" section of Schedule 2;
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.

1.2.4 Master survey plan shall have a Key Plan to locate the subdivision as it relates to adjacent streets of the Town. Scale shall be as indicated in the "Drafting" section of Schedule 2.

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 (lats) and Departures (deps)" 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 or topographical survey elevations 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 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 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 Town, in both digital and paper formats.

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

1.6 SURVEY CONTROL MONUMENTS

1.6.1 The Developer shall supply brass plugs and wedges or other markers to be used as Monuments.

1.6.2 The Land Surveyor shall assign numbers to the Monuments, as per Town requirements.

1.6.3 The plugs with wedges shall be placed in the concrete curb flush with the concrete. Prior to setting, the plug hole will be filled with quick-set cement. Then, with the use of a mallet and a wooden block, the plug and wedge will be driven into the hole.

1.6.4 All Monuments shall be inter-visible and coordinated using the 3^0 (degree) Modified Transverse Mercator Projection. The traverse closure shall be a minimum of 1:10,000. Crown land reference monuments and their coordinates shall be listed when running the traverse.

1.6.5 The maximum distance between Monuments shall be 300 metres.

1.6.6 Monuments must be established from other Town or Provincial Control Monuments and end at the same or different Town or Provincial Monuments that have acceptable horizontal and vertical values. All Monuments must be turning points and form part of the levelling traverse loop.

1.6.7 Monuments may be established by spirit levels done to third order standards with a minimum accuracy of 24mm/k where k= the distance in kilometres between Monuments measured along the levelling route. If the misclosure or discrepancy exceeds the allowable, the line shall be re-levelled

1.6.8 The method used for levelling will be three wire method (mean of the reading for the three wires). The difference of elevation is the mean of the two running where:

$$Mean = \frac{(F)-(B)}{2}$$

The Contractor/Surveyor will perform all necessary adjustments of the level loops.

1.6.9 The description sheet shall be digital and paper in a fashion that can be reproduced in a clear and legible form. A minimum of three ties shall be shown to reference the Monument. The reference plan need not be to scale, however, all information shall be digital in a form compatible with Town software. Lettering size shall be a minimum of 2.5 mm high and line weight shall be 0.35 mm.

1.6.10 All Monuments and Monument information shall be shown on the subdivision plan according to Town standards.

1.6.11 If the work does not meet the above criteria, the contractor/surveyor's work shall be returned for corrections.

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 Town of Conception Bay South 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 Town 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). One (1) complete set of prints to be submitted with digital submission.

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:

- (i) Plan - 1:500
- (ii) Profile - 1:500 Horizontal
  1:50 Vertical

(b) Survey Plan/Subdivision Plan shall be:

- (i) 1:500 or
- (ii) As approved by the Town

(c) Site drainage plan shall be:

- (i) 1:500 or
- (ii) 1:1000 or
- (iii) 1:2500 or
- (iii) As approved by the Town

(d) Location plan or key plan shall be 1:2500

(e) Site grading plan shall be 1:500

(f) 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 to top.

2.1.8 - Symbols and Line Types

Standard Town 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:
    (i) 3 each - White Prints

(b) Construction drawings shall be submitted as follows:
    (i) 3 each - White Print
    (ii) 1 only – Digital Copy
    (iii) 1 PDF Copy

(c) As-built drawings shall be submitted as follows:

(i) 1 only - White Print

(ii) 1 only – Digital Copy

(iii) 1 only - Listing of screen colour/pen weight designations.

(iv) 1 PDF Copy

2.1 PREPARATION OF DRAWINGS – GENERAL CONDITIONS

2.2.1 Street Names

All streets shall be identified and names printed within street lines. Proposed street names to be submitted to the Town prior to incorporating in drawings. The Town will forward names to the Fire Commissioner's office for review. Upon approval by the Fire Commissioner and Council, the Developer will be advised of approved street names.

2.2.2 Intersection Identification

At intersection streets or where the continuation 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 (Deps)" 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 centimetre.

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

(a) 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.

SUBDIVISION DESIGN GUIDELINES - EASEMENTS

3.1 GENERAL

3.1.1 Easement means an incorporeal right, distinct from ownership of the soil, vested in the Town and consisting of a use of another's land for any Public service or utility.

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 over such easement area.

3.2 DESIGN

3.2.1 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 (6) metres for single or double pipe. Additional width may be required for more than two pipes. The Town's Engineering Department to determine this on an individual basis.

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 Town's Solicitor.

3.4 RESTORATION

3.4.1 When the Town 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.

STORM SEWERS

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SUBDIVISION DESIGN GUIDELINES – STORM SEWER PIPING

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 millimetres 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 Town 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 St. John's area.

4.6 CAPACITY OF PIPE:

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

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

4.7 MINIMUM SIZE:

Street Sewers	300 mm
Catch Basin Leads	Single 200 mm PVC Double 300 mm
Building Sewer	150 mm PVC

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 PIPE CROSSING CLEARANCE:

(a) Sewer crossing sewer: A minimum of 150 mm vertical clearance is required between outside barrels where sewer pipes cross.

(b) Sewer crossing waterline (vertical clearance): A minimum of 450 mm vertical clearance and where possible 3000mm in horizontal clearance is required between a sewer pipe crossing a waterline.

(c) Sewer crossing waterline (horizontal clearance): Waterlines shall be run in a separate trench from either the sanitary or storm sewers, and shall have a minimum horizontal separation of three (3) metres.

4.11 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.

4.12 EARTH LOAD:

Shall be calculated by using the Marston Formula.

4.13 SUPERIMPOSED LOAD:

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

4.14 MANHOLES:

(a) Standard types of manholes and their details are shown on Standard Drawings. (Infiltration and Exfiltration tests will be required)

(b) All manhole chamber openings must be located on the upstream side of the manhole.

(c) Special manholes shall be fully designed and detailed.

(d) 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.

(e) Manholes to be placed 5mm below base course asphalt grade for the duration that base course asphalt is on the street.

(f) Manholes to be adjusted to 5mm below finish course asphalt grade immediately prior to placement of finish course asphalt.

(g) Manhole frames and covers to be 600mm round design.

4.15 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 Town.

4.16 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.

4.17 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. Unless otherwise approved.

(b) Recess catch basin shall not be used.

(c) Catch basins shall be located and spaced in accordance with conditions of design and shall provide for expected maximum flow.

(d) Standard location for catch basins at street intersections shall be immediately upstream of sidewalk or pedestrian crosswalks and between intersections at all low points.

(e) Spacing shall not exceed 95 m for road grades up to 3%. On steeper roads, this spacing shall be reduced.

(f) Catch basins are to be depressed 50 mm with respect to the gutter grade.

4.18 HEADWALLS:

Headwalls shall be designed for inlet control with:

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

4.19 DEFLECTION TEST:

All PVC/HDPE storm pipes will be required to pass a deflection test similar to the sanitary sewer.

4.20 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.

4.21 STORM WATER DETENTION REQUIREMENTS:

For those areas not previously planned, prior to the Town's requirements for storm water detention, shall be required to incorporate storm water detention into the development.

The Town of Conception Bay South recognizes two major storm water detention systems; above and underground detention. For storm water detention the 1:100 year return rainfall event shall be used. The duration shall be the time of construction or the event which requires the greatest storage up to the 12 hour event.

SANITARY SEWER

INDEX

SUBDIVISION DESIGN GUIDELINES – SANITARY SEWERS

5.1 DESIGN DRAINAGE AREA:

The drainage area may be determined from contour plans and shall include all other areas, which may become tributary by reason of regrading or pumping.

5.2 DRAINAGE PLAN:

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

(a) Streets

(b) Lots

(c) The size and grade of the sanitary sewers with manholes numbered using the last four digits of the Easting and the suffix "S".

(d) Tributary areas to each manhole, size of the area in hectares and ultimate average population per hectare clearly shown therein.

5.3 EVALUATION OF DESIGN FLOWS:

(a) Standard design forms (Appendix B) shall be used for all calculations. A sample may be obtained from the Engineering Department.

(b) The design of all sanitary sewers shall be based on a peak flow and the 22,500 L/ha/day constant of infiltration. A typical computation of Design Flow (for distribution pipes only) is shown on attached Table 2 and some of its aspects explained in the following items.

(c) The minimum rate of infiltration for which capacity shall be provided is 22,500 L/ha/d.

(d) The design flows from developments of single family residence shall be based on an average population density of 80 people per hectare.

(e) Flow computations (for distribution pipes only) shall be based on Table I as follows:

(f) Design Elevations.

TABLE #1

LAND USE	AVERAGE DAILY SEWER FLOW	PEAKING FACTOR	PEAK SANITARY FLOW
Residential	275 L/c/d	Calculate Using Peaking Factor Formula	

Where:

Average Sewer Flow is a predicted flow based on ninety (90%) percent of water consumption.

Peaking Factor is the ratio of the peak rate of flow on the average rate of flow. It is based on the Harmon Formula,

$$M = 1 + \frac{14}{4 + \sqrt{p}}$$

Where "p" is the tributary design population in thousands for residential areas. For other than residential, the design population "p" can be termed as an equivalent population and is computed by dividing the unit non-residential sewage flow by the average unit residential sewage flow of 275 L/c/d.

5.4 CAPACITY OF PIPE:

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

shall be used to compute the capacity of sanitary sewers. The following roughness coefficient "n" shall be used:

(a) Concrete Pipe 0.013

(b) P.V.C. 0.010

(c) The values contained in 5.4 (a) and (b) for concrete pipe and PVC respectively shall no longer apply. Because of deterioration in flow conditions with time in service, the roughness coefficient *"n"* selected for design purposes shall be no less than 0.015.

5.5 MINIMUM SIZE:

Of street sewer 200 mm

Of building sewer 100 mm

5.6 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 835 mm

5.7 CHANGE OF SIZE:

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

5.8 PIPE CROSSING CLEARANCE:

(a) Sewer crossing sewer: A minimum of 150 mm vertical clearance is required between outside barrels where sewer pipes cross.

(b) Sewer crossing waterline (vertical clearance): A minimum of 450 mm vertical clearance.

(c) Where 450 mm vertical separation cannot be obtained between water lines and sewer lines, the water lines shall be run in a separate trench from either the sanitary or storm sewers, and shall have a minimum horizontal separation of three (3) metres.

5.9 LOCATION:

(a) Sanitary 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 grade, alignment, size or material of the sewers.

(c) 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.

5.10 EARTH LOAD:

Earth loads on sewers shall be calculated by using the Marston Formula.

5.11 SUPERIMPOSED LOAD:

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

5.12 MANHOLES:

(a) Standard types of manholes and their details are shown in Standard Drawings.

(b) All manhole chamber openings must be located on the upstream side of the manhole.

(c) All pipes turning at a greater angle than 45^0 in a manhole require a 150 mm drop.

(d) Special manholes shall be fully designed and detailed.

(e) Manholes to be placed 5mm below base course asphalt grade for the duration that base course asphalt is on the street.

(f) Manholes to be adjusted to 5mm below finish course asphalt grade immediately prior to placement of finish course asphalt.

(g) Manhole frames and covers to be 600mm round design.

5.13 BUILDING SEWER:

(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. (See Appendix I for House Service Trench)

5.14 STORM WATER:

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

5.15 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

LAND USE	PEAK SANITARY FLOW (FROM TABLE 1)	MINIMUM RATE OF INFLITRATION	DESIGN FLOW
Residential		22,500 L/ha/d	Peak Sanitary Flow + Minimum Rate Of Infiltration

Remarks and Computations:

WATER SYSTEMS

INDEX

SUBDIVISION DESIGN GUIDELINES – WATER SYSTEMS

6.1 GENERAL:

6.1.1 (a) Definitions:

(i) **Water system** means an assembly of pipes, fittings, control valves and appurtenances, which convey water to water service pipes and hydrants.

(ii) **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 - Dead Ends:

The water system shall be so designed to exclude any dead-ended pipe, so far as is reasonably possible.

6.2.2 Size of Water Pipe:

(i) 150 mm diameter mains may be used on cul-de-sacs and crescents less than 200 m in length. But in no case shall the total length of 150mm diameter exceed 200m. 200 mm diameter mains shall be used for all local mains.

(ii) The size of a main feeder pipe shall be a minimum of 300 mm diameter.

6.2.3 Depth of Cover:

(i) All water pipe shall have a minimum cover of 2000 mm in relation to the final finished street grade.

(ii) 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.

6.2.4 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 watermain any 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 Town 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 Town shall approve its location.

6.2.5 Location of Valves:

(i) Valves at street intersections shall be located within the 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.

(v) On straight runs in a residential area, the maximum distance between valves shall be 180 m.

(vi) Valves for hydrants shall be located within the carriageway of the street and shall be located a maximum of six (6) metres from the hydrant. Hydrant tee, lead, valve, and fitting shall have restrained joints.

(vii) Restrained joints shall be used for a minimum of eighteen (18) meters from the end of the water line.

6.2.6 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. There shall be two access covers in each chamber larger than 1800 mm in diameter and access ladders shall be provided in the chamber.

6.2.7 Hydrants

(i) Hydrants shall be placed at the centre of lots, and/or a minimum of 2m from driveway and any utility structures, 600mm behind the curb line or 400mm behind the sidewalk; whichever is greater, and spaced not more than 140 m apart.

(ii) Hydrants shall be installed so that the top of the standpipe flange will be 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. Hydrant valves shall be located within the street carriageway. When future connections are anticipated, hydrants shall be located no more than six (6) metres from the end and beyond the last service location. Therefore, all fittings shall have restrained joints for a distance of eighteen (18) meters.

(iv) All joints on hydrant leads, including the mainline Tee, shall be equipped with joint restraining fittings.

(v) Although dead-ended pipes are not desirable, if unusual conditions exist and warrant the installation of a dead-ended pipe, a hydrant shall be installed in its proper location at the dead end.

(vi) Hydrants shall be installed at all high points in profile.

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 Town must approve each such connection. A connection of 100mm diameter pipe or greater shall be by a tapping sleeve and valve unless otherwise approved by the Town's Engineering Department. All connections shall be pressure connections.

6.3.2 Scheduling of Connection:

The Town 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 Town 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.

6.3.4 Prohibited Cross-Connections:

No pipe or water service pipe, cross-connection will be made from the existing water system to a water system in a subdivision, which is connected to some other source of supply.

6.4 TAPPING SLEEVES AND VALVES:

Tapping sleeves and valves shall be used for all ductile iron connections to existing water mains unless otherwise approved by the Town's Engineering Department.

6.5 DUCTILE IRON PIPE WRAPPING

All ductile iron pipe, fittings and appurtenances are to be wrapped, unless otherwise approved by the Engineering Department, in all areas of the Town as per the following:

Tube type polyethylene encasement shall be installed on all ductile iron pipe, fittings and appurtenances in accordance with AWWA Standard C105 "Polyethylene Encasement for Ductile-Iron Pipe Systems" – latest revision, Method A.

Polyethylene encasement shall be either linear low-density polyethylene (LLDPE) film with a minimum thickness of 8-mil or high-density, cross-laminated polyethylene (HDCLPE) film with a minimum thickness of 4-mil.

SUBDIVISION DESIGN GUIDELINES – Streets

7.1 STREET CLASSIFICATION:

Streets shall be classified as shown in the following table:

	ARTERIAL	COLLECTOR	LOCAL
Traffic service	Traffic movement first consideration	Traffic movement and land access of equal importance	Traffic movement second consideration
Land service	Land access second consideration		Land access first consideration
Parking	Some parking	Parking	Parking
Design Volume (A.D.T.)	12,000 - 30,000	12,000 - 30,000	Less than 1,000
Characteristics of traffic flow	Uninterrupted except at signals and crosswalks	Interrupted flow	Interrupted flow
Vehicle type	All types but trucks may be omitted	All type with truck limitations	Passengers and service vehicles; large vehicles restricted
Connects to	Arterials, collectors, freeways & some locals	Arterials, collectors, locals	Collectors, locals

CHARACTERISTICS OF STREET CLASSES

STREET CLASSIFICATION

	ARTERIAL	COLLECTOR	LOCAL
Street grade Maximum	10.0%	10.0%	10.0%
Street grade Minimum	1.0%	1.0%	1.0%
Street right of way width	30 m	20.5 m	12.24 m
Minimum C/l Radius	90 m	90 m	*50 m
Maximum Super Elevation	0.06m/m	0.06m/m	0.06m/m
Minimum Stopping Sight Distance and Turning Sight Distance	Refer to Urban Supplement to TAC	Refer to Urban Supplement to TAC	Refer to Urban Supplement to TAC
Pavement Widths	15 m	12 m	10.5
Minimum "K" value Vertical curve			
Crest ----------	7	7	7
Sag ----------	11	11	11
Maximum K			
Crest	40	40	40
Sag	30	30	30
Minimum Length of vertical curve	L = length in metres should not be less than design speed in kilometres per hour. With exception of local intersections approved the Town.		
Vertical curve Maximum (Length for drainage)	Crest: K = 60 Sag: K = 30		
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	One
Street lighting (Minimum requirements)	1.5 cd/m or 22 lx	1.0 cd/m or 15 lx	1.0 cd/m or 15 lx

*Crescents and cul-de-sacs may have a minimum center line radius of 35mm when less than 200m in length.

than 200m in length.

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 situations not covered by this section, the latest edition of the *Geometric Design Guides for Canadian Roads* should be used as a guide.

7.3 CUL-DE-SACS:

Cul-de-sacs should only be used where approved by the Town's Planning and Engineering Departments. They shall have the following additional minimum requirements:

(a) Face of curb line, turning circle, radius of 15.25 m.

(b) Maximum exit grade of two percent (2%) for 10m from intersecting street curb line.

(c) Low back curb, gutter and sidewalk to extend around the bulb

(d) Transitional street line radius of 15.25 m into street line turning circle.

(e) Maximum length of 200 m - measured from connecting street right of way to end of bulb.

(f) Right of way should be 17.25m at bulb.

(g) Maximum grade across bulb shall be five percent (5%).

7.4 INTERSECTIONS:

7.4.1 Intersections shall:

i) Be of "T" type design;

ii) Have a vertical alignment within the intersection approach of not more than 2% grade for a minimum distance of 10 m from the roadway intersection curb line, or as approved by the Engineering Department.

iii) Have an intersecting angle of 90^0 where possible. The minimum angle shall be 75^0;

iv) Have a minimum centre line distance between adjacent and/or opposite intersections:

a) On Local streets to Collector street of 60 m,

b) On Collector streets to Collector streets 90 m.

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 30.5 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:

7.5.1 All residential lots shall have a low back curb of 6.2m in width, starting at a point 0.5m from the property line. Widths greater than this may be approved at Council's discretion.

7.5.2 Corner lots may be permitted to have a driveway access from the flanking street as per the approved subdivision plan.

7.5.3 No driveway (ramp) shall be permitted to enter onto a proposed designated limited access freeway, arterial or major street.

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 instructed by the Municipality.

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 No driveway (ramp) shall be permitted to enter onto a proposed designated limited access freeway, arterial or major street.

7.6.6 a) Curb and gutter will be required

b) Sidewalk requirement in accordance to the approved subdivision drawings.

7.6.7 All local streets shall have a minimum of 150 mm Class "B" and 75 mm Class "A" granulars, 38 mm base course and 38 mm surface course asphalt. Collector and arterial streets shall have 200 mm Class "B" and 100 mm Class "A" and 75 mm asphalt. Additional granulars and asphalt may be specified as determined by the Town Engineer.

Core sampling of all asphalt street surface shall be carried out by the developer or his designate on all placed asphalt surfaces on all subdivision streets, cul-de-sacs, etc., as per the following schedule.

1. Core sampling shall be completed within 2 to 5 days after asphalt has been placed.

2. Core sampling shall be performed on all placed asphalt including the base course and the final course.

3. The developer or his designate shall perform all coring using a one inch (1") Corer and shall be responsible for the repairs required to all cored areas.

4. The Town shall be notified a minimum of 24 hours, 72 hours when weekends are involved, in advance of coring and shall agree to be present during the coring operation. Should the Town be unable to be present during the selected time period, it shall be rescheduled to a time convenient to the Town.

5. The purpose of coring samples shall be to allow Town personnel to measure the thickness of the asphalt and determine if it is in accordance with Town standards.

6. Coring shall be in locations as determined by the Town. The maximum spacing of cores shall be 5m c/c, however, the Town reserves the right to request additional cores at any location in the asphalt surface.

7. The Town reserves the right to order the removal and replacement of any asphalt that does not meet Town standards. The extent of the removal shall be determined by the Town and its decision in this respect shall be final.

8.0 LANDSCAPING REQUIREMENTS AND URBAN FORESTRY

Refer to Town's Landscaping requirements. A copy can be obtained from the Town's Planning Department by calling (709) 834-6520. The Developer shall only remove those trees that are necessary for development and only after consultation and approval from the Town's Recreation and Leisure Services Department. Tree replacement and/or relocation may be required.

SCHEDULE 3

SUPPLEMENT TO:

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

Note: This section details areas where the Town of Conception Bay South's Municipal Engineering Standards differ from the Provincial Government's Master Specification.

1.1 SECTION 01001 DEFINITIONS

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

1.2.1 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 Town Engineer.

1.3 SECTION 01570 TRAFFIC REGULATIONS

1.3.1 Traffic detours shall not be implemented unless the owner receives the prior written approval of the Town. 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 02702 PIPE SEWER CONSTRUCTION

1) Delete item 2.4.1 as shown in Government Master Specification and substitute the following:

2.4.1 All house/building sewer service pipe to be minimum SDR 28 for 100mm sanitary lines and storm service pipe shall be minimum 150mm SDR 35. All storm mains to be PVC or HDPE with a stiffness factor of 320 or greater.

2) 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.

3) **3.7.13** Delete the items as shown in the Government Master Specification and substitute as follows:

1. **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 video inspection of the gravity sewer lines as specified.

2. **When Video Inspection Required:**

A Video 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 pre-construction and post-construction inspection of the system will be required.

Inspection requirements shall be determined based on the following criteria:

(i) Any sewer running parallel to the proposed construction area and within 5m of same, shall be inspected if blasting is required or anticipated.

(ii) When blasting is not required, any sewer running parallel to the proposed construction and is within 3m of same shall be inspected.

3. **Arrangement for inspections:**

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

4. **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 video 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 video 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.

5. **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 video 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.

6. **Evaluation of inspection results:**

The results of the video 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.

7. **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 Town standards. Upon completion of these repairs, a subsequent verification inspection shall be undertaken to assess the quality of the repairs.

8. **Definitions:**

(i) "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.

(ii) "Building service" shall mean the sewer line (lateral) extending from the building to the sewer main.

9. **Video Equipment:**

Video 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 disks submitted must be DVD or Blue Ray Colour format. An audio description of the inspection must also be provided, as well as a written report.

10. **Video inspection:**

The video 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 video 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 video 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.

11. **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.

12. **Records:**

An Inspection Record, in log form, shall be maintained during the video 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 video inspection report for each section will be submitted by the Engineer in the format as noted in item 201.16 - Standards for Video Inspection Records. In addition to the normal inspection report format, the Contractor shall record all the video inspection on video tape. These tapes shall be submitted to the Municipality. The written inspection report will 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.

13. **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.

14. **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 C.S.A. certified 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. Personnel shall be trained in confined space entry.

15. **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.

16. **Standards for Video Inspection Reports:**

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

The enclosure for the final report will meet the following specifications:

- The report shall be suitably bound;
- Only letter-sized paper (8 1/2 x 11) will be used;
- The title page of the final report will be as follows, with the appropriate substitution where required:

(see following page)

Video Inspection
of
Sanitary/Storm Sewer
Department of Engineering and Public Works

Location: _____

Video Recorded by: _____

Report Prepared by: _____

Date: _____

- 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 video and manhole inspection findings is provided in Item 202. The form must show:

  (a) For video inspection results the heading will state:
    (i) The street name
    (ii) The manhole numbers applicable to this section
    (iii) The reference drawing number
    (iv) The date of inspection

  (b) 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:
    (i) The manhole numbers
    (ii) The horizontal distance between the two manholes
    (iii) The direction of sewer flow

VIDEO INSPECTION REPORT

SUBDIVISION:_____ STREET NAME: _____MANHOLE NO. _____ TO MANHOLE NO.

DISTANCE: _____ GRADIENT:

PIPE LENGTH: _____ PIPE SIZE:_____ PIPE MATERIAL: _____DATE: _____ REF. DWG. NO. _____ SHEET NO.

DVD NUMBER	LINE FOOTAGE	PHOTO NO.	COUNTER REF. NO.	OBSERVATIONS

All photographs will appear on the left page only, opposite the corresponding description for the photo which appears on the right hand page. When there are more pictures in any run than can be placed on the first left page, these will be placed on subsequent pages with corresponding descriptions appearing opposite. All photographs will be numbered in order. This number will appear beside them and will be the same number referred to in the description. The last page of the report will consists of an area sewer plan to scale, showing the street inspected for the report and applicable manhole numbers.

17. 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	180.0
250	242.90	230.8	224.6
300	288.57	274.0	266.9
375	353.01	335.4	326.6

2.2 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 within the street right-of-way or infrastructure easements.

(2) Delete items 2.1.2, 2.1.3, and 2.1.4 as shown in the Government Master Specification and substitute the following for item 2.1.1:

- All water mains shall be ductile iron, class 52, cement lined. Seal coat to be applied to the cement-mortar lining.

(3) **Item 2.4 (general)** - All water service pipe to be copper tubing, Type K minimum 19mm or Municipex or equal as approved by the Town's Engineering Department, minimum size 25mm. Delete references to all other pipe materials.

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

Item 2.6.1 - Granular bedding materials to be Type 3.

2.3 SECTION 02724 - SEWAGE FORCEMAINS

(1) Delete item 2.2.1 as shown in the Government Master Specification and substitute the following:

Item 2.2.1 - Granular bedding materials to be Type 3.for ductile iron pipe and Type 1 for all other materials.

2.4 SECTION 05500 – METAL FABRICATIONS

2.4.1 HAND RAIL:

1. **Scope of Work:**

   Fabricate and erect pedestrian hand railing constructed of steel pipe posts. Locations shall be as shown on the drawings.

2. **Form and Dimensions:**

   The form and dimensions of the handrail shall conform to those given in the drawings, and the length shall be as required to suit the particular site conditions where necessary. The Contractor shall vary the spacing of the posts such that the spacing is uniform throughout the length of the rail.

3. **Materials and Fabrication:**

   Steel posts and rails shall consist of 50 mm inside diameter galvanized schedule 40 pipe conforming to ASTM Standard A53. The railing shall be pre-fabricated before erection, and joints between rails and posts shall be made by proper cutting and fitting to insure complete contact. The joints shall then be welded, and the welds and surrounding heat-damaged areas shall be galvanized after fabrication or otherwise suitably protected from corrosion by the use of a zinc based coating. The railing shall be delivered to the site complete and ready for erection.

4. **Installation and Finish:**

   Posts shall be bedded in non-shrink grout in accordance with the bedding detail in the drawings. Holes shall be either drilled or formed in the concrete walls, walks, steps or sidewalks as required.

After installation, the posts and rails shall be prepared and painted as follows:

i) One coat of metal primer.

ii) Two coats of rust inhibiting enamel finish paints in color as determined by the Town's Engineering Department.

SCHEDULE 4

4.1 SAMPLE SUBDIVISION DEVELOPMENT AGREEMENT

THIS AGREEMENT made at the Town of Conception Bay South, in the Province of Newfoundland and Labrador, this _____ day of _____, Anno Domino, Two Thousand and Ten.

BETWEEN **XXXXXXXX XXXXXXXXXXXX**
(hereinafter called "the Developer") of the one part

AND **THE TOWN OF CONCEPTION BAY SOUTH,**
a statutory corporation, duly incorporated under the provisions of the Municipalities Act
Of the other part

WHEREAS the Developer has applied to the Town of Conception Bay South for permission to develop XXXXXX lot subdivision, (hereinafter called the "Subdivision") in the Municipal boundaries of the Town, in the Province of Newfoundland, and which development is for the purpose of subdividing lands for the construction of XXX residential dwellings, and which location and site is located within the Town of Conception Bay South on _____ and which development plans are specified in the Engineering Plan and Profile Drawings, sheets _____ to _____ and revisions, if any, detailing the above development and forming part of this Agreement, as Schedule "A";

AND WHEREAS the Developer, as a condition of final acceptance of development plans for the lands, is required to provide certain services and works to service the said land;

AND WHEREAS the Town has set out in detail conditions which are to be adhered to by the Developer and which are to constitute the terms and conditions under which the Developer is granted a permit to carry out the development of the Subdivision as aforesaid;

AND WHEREAS the Town requires from the Developer a written agreement providing for the proper development of the lands and the installation of the services and works and the observance of the conditions with respect to the development of the said lands;

NOW THEREFORE THIS AGREEMENT WITNESSETH that for and in consideration of the Town issuing a development permit and in the further consideration of the mutual covenants herein contained, the Developer covenants with the Town to carry out the development and the work in accordance with and subject to the terms and conditions of the **"Conditions of Permit"** attached hereto, and further covenants that the Developer shall observe and perform all the said "Conditions of Permit" and complete the development pursuant to the Town's standards and conditions.

IN THE WITNESS WHEREOF the said parties to these presents have hereunto their hands and seals subscribed and set the day and year first before written.

THE COMMON SEAL OF

_____ _____

Hereunto affixed in the presence of:

_____ _____

THE COMMON SEAL OF

THE TOWN OF CONCEPTION BAY SOUTH hereunto affixed in the presence of

TOWN OF CONCEPTION BAY SOUTH

_____ _____

MAYOR

_____

TOWN CLERK

SAMPLE CONDITIONS OF PERMIT

TABLE OF CONTENTS

5. DRAINAGE, LANDSCAPING AND DESIGN

6. LANDS TO BE CONVEYED

7. FINANCIAL PROVISIONS

8. MISCELLANEOUS PROVISIONS

9. DISPUTE RESOLUTION

CONDITIONS OF PERMIT

_____ Subdivision

1. GENERAL

1.1 Developer's Responsibility

Upon approval of the plan by the Town, the Developer covenants and agrees to construct and install, at the Developer's expense and in accordance with the accepted construction practices, standards, and specifications of the Town, the development including all public works, facilities and services as shown on the plans.

1.2 Boundaries of Development

The Developer covenants and agrees, at the Developer's expense, to develop the lands to its external boundaries as shown on the plans attached to this Agreement and shown as Schedule "A" (and revisions, if any) and which form part of this Agreement. The Developer covenants and agrees that the proposed building or work specified on Schedule "A" shall be executed in conformity with those plans. No other buildings or work shall be executed on the said land other than those to be erected in conformity with Schedule "A".

1.3 Professional Engineer

The Developer covenants and agrees with the Town that engineering design and full supervision of the services and works provided for in this Agreement and Conditions of Permit and development plans will be carried out by a registered Professional Civil Engineer licensed to practice in the Province of Newfoundland and Labrador and retained by and at the cost of the Developer until final completion of development.

1.4 Developer's Liability

The Developer shall be held liable for all actions of its contractors and subcontractors and guarantees a quality of material and workmanship satisfactory to the Town. Any deficiency, which may be noted from time to time, shall be brought to the attention of the Developer and it shall be the Developer's rresponsibility to ensure that all requirements are carried out by its contractors with utmost expediency.

1.5 Proof of Property Ownership

The Developer agrees that no permit shall be issued to proceed with this development until proof of ownership of the property is provided.

1.6 Provision of Surveys and Layouts

The Developer agrees that it, or its consulting engineers, will provide the necessary surveys and layouts required to establish building lines and foundation elevations required by the building contractors to ensure that structures are properly located, all of which are to be completed by a registered land surveyor for the Province of Newfoundland and all of which shall be required prior to the issuance of a building permit. The property surveys shall be prepared in accordance with the North American Datum 1983 metric units.

1.7 Revision to Subdivision Plans

The Developer shall make any changes in the subdivision plans, as Council dictates through its Engineering and Planning Departments, and the Developer shall make all necessary changes as required as long as such changes do not result in substantial changes to the plans of the subdivision as set out in Schedule 'A' approved by the Town.

1.8 Errors or Omissions

It is hereby agreed that the approval by the Town of the plans and specifications as submitted shall not in any way make the Town liable for any errors or omissions which may from time to time become evident, nor does this Agreement or approval release the Developer from the responsibility of making all necessary changes, corrections or additions which might from time to time become necessary.

1.9 Failure to Comply

Failure to comply with any of the conditions in this Agreement may, at the discretion of the Town, constitute automatic cancellation of this permit and the Developer shall be solely responsible and liable for any and all consequences, financial and otherwise, that results from such cancellation.

1.10 Registration of the Agreement

The Developer covenants and agrees that this Agreement and the schedules attached hereto or any parts thereof may be registered upon the title of the lands, at the sole discretion of the Town. The Developer shall pay to the Municipality all legal disbursements incurred with respect to registration.

1.11 Assignment of the Agreement

The Developer covenants and agrees that this Agreement will not be assigned to a third party except with the prior written agreement of the Municipality.

2. CONSTRUCTION OF WORKS AND SERVICES

2.1 Construction of Services

The Developer covenants and agrees within the period specified in Clause 4.2 (completion date of works) hereof to construct at the Developer's expense the following services and works in accordance with the Municipalities Act, 1999 as amended and the requirements of the Town of Conception Bay South Development Regulations and Municipal Engineering Standards as adopted.

a) Streets and sidewalks to be graded, gravelled, curbed and paved and completed in all respects according to the plans and in accordance with the Town's Regulations. Turning circles of all cul de sacs to have fifteen (15) metres of paved radius and street carriageway to be 10.5 m wide.

b) The sidewalks, easements and landscaped areas to be completed in accordance with the plans and to the satisfaction of the Town Engineer;

c) Watermains, hydrants, and ancillary works;

d) Sanitary sewers, manholes, and ancillary works;

e) Storm sewers, manholes, catch basins, and ancillary works; including the construction of any drainage works and improvements outside the area of development required to accommodate drainage from lands draining through it.

f) Street lighting;

g) Traffic and Street Identification Signs.

h) Privacy fences and/or other suitable screening arrangements on the rear lot lines of any lots where such provisions are deemed necessary by the Town.

i) All areas between the lot lines and the limits of the development and beyond the limits of development which are disturbed shall be reinstated to the Town's satisfaction;

j) Site preparation of the open space area(s), including: grading in accordance with the approved site grading plan, placement of topsoil and sod, and where necessary fencing, to be completed as part of the Phase I works in the development.

k) To adequately slope, sod or otherwise stabilize all embankments resulting from the development of this subdivision.

l) All other public works as required by the plans and specifications and the Town's Regulations.

AND all of which are to be completed to the satisfaction of the Town Engineer.

2.2 Provision if Work Not Satisfactory

The Developer covenants and agrees that in the event the Developer fails to install the services covered by this Agreement or fails to proceed expeditiously or fails to install the services in accordance with the specifications and requirements of this Agreement, then, upon the Town Engineer giving seven (7) days written notice either by hand delivered service or by prepaid registered mail to the Developer, the Town through its employees, agents or contractors may without further notice enter upon the lands and proceed to supply all materials and to do all the necessary inspection and works in connection with the installation of the services,

including the repair and reconstruction of faulty work and the replacement of materials which are not in accordance with plans or specifications and to charge the cost thereof, together with the cost of engineering, to the Developer. Such entry shall not be deemed as acceptance or assumption of the services.

2.3 Authority to Inspect

The Developer agrees to permit the Town Engineer or his agents to enter on the lands at any time to inspect the work and, if necessary, to make emergency repairs, at the Developer's expense.

Such entry and repairs shall not be deemed to be an acceptance of the services or an assumption by the Municipality of any liability.

2.4 Utilities

The Developer covenants and agrees to enter into such agreements as may be necessary with the proper Authorities having jurisdiction over power, telephone, and postal services to the development, for installation and payment for the distribution system and necessary appurtences to service the development. The Town shall not be obligated to issue any building permits until provided confirmation, by these Authorities, that the Agreement provided for in this clause has been entered into or other satisfactory arrangements have been made.

2.5 Blasting

The Developer shall ensure that any blasting required to be done shall be done in compliance with the Blasting Regulations of the Province of Newfoundland. Before any blasting is commenced, the Town Engineer shall be notified at least twenty-four (24) hours in advance of any blasting taking place and shall be provided with proof of blasting insurance, blasting license and pre-blast survey that are satisfactory to the Town.

3. MAINTENANCE AND REPAIRS DURING CONSTRUCTION

3.1 Interim Maintenance of Streets

The Developer covenants and agrees to be responsible for maintaining all streets in the subdivision in reasonable driving conditions, as determined by the Town during the construction period, including all grading, dust control, snow removal and ice control, as required. In the event the Developer fails to maintain standards satisfactory to the Town, the Town shall have the right to complete the unsatisfactory works and charge the same to the expense of the Developer.

3.2 Street Lighting

The Developer covenants and agrees to provide temporary street lighting for the subdivision as requested by the Town.

3.3 Removal of Refuse and Debris

The Developer covenants and agrees that all refuse and debris arising from construction in the subdivision shall be removed from the site to an approved dump site when the substantial portion of the subdivision has been completed or when required to do so by the Town. The Developer shall ensure that all excavation carried out by individual building contractors shall be similarly removed and shall not at any stage of construction or development be pushed unto the street right of way or any adjacent properties. The Developer agrees to protect the natural ecology and covenants with the Town that no trees or natural features will be destroyed unnecessarily.

3.4 Construction Debris

The developer covenants and agrees that he will strictly control construction debris such as wrappings and cuttings so that blowing construction debris does not litter adjacent residential lots or public open space. In the event that construction debris does litter adjacent residential lots or public open space, the Developer shall be responsible to carry out the clean up as required by the Town.

3.5 Days and Hours of Construction

The Developer covenants and agrees that construction on the site, including building construction will only be conducted between the hours of 6:00 a.m. and 10:59 p.m. Monday to Saturday.

3.6 No Burning On Site

The Developer covenants and agrees not to burn material on the site.

4. ACCEPTANCE OF WORKS

4.1 Inspections and Standards

The Developer agrees to abide by inspection and testing standards set down by the Town. The Developer, at its expense, shall conduct a video inspection of all-sanitary and storm sewer mains and appurtences in the presence of the Town Engineer and/or his agent. One videotape and written report of the camera inspection shall be deposited with the Town Engineer.

The finish asphalt course shall not be placed for a minimum of 12 months following placing of base course or as approved by the Town Engineer. All sidewalk work shall be completed immediately prior to placing of finish asphalt course.

4.2 Completion Date of Works

The Developer covenants with the Town to complete the development works for total performance of the development no later than _____. Failure to complete the subdivision to the satisfaction of the Engineering Department by that date shall give the right to the Town to complete all outstanding works and/or restore the site and charge the works to the Developer or to demand from the Bonding Agent any monies necessary to complete all outstanding work up to the amount specified in the Bond, letter of credit or other approved security filed with the Town pursuant to Clause 7.5 of this Agreement.

4.3 Certification of Total Performance

Upon completion of the said services and works in accordance with this Agreement and payment of all accounts thereof, the Town shall issue to the Developer a Certificate of Total Performance stating that all such services and works have been constructed and installed in accordance with the plan, specifications and Town Regulations.

4.4 Submissions of Final Construction Drawings

Upon completion of Stage I works, the Developer shall provide to the Town a complete set of as-built drawings, detailing the final construction of all streets, curbs, water, storm, and sanitary sewer facilities, as well as all operational, maintenance, and servicing manuals and certification from the manufacturer/designer of any lift station or other related works constructed in the subdivision.. Stage I works consists of all underground water and sewer systems; communication and utility systems; and curb, gutter, granular and base course asphalt. These drawings shall also be provided in a digital file format using AutoCAD 2002 or comparable electronic format and stamped by the Project Engineer.

4.6 Services and Works Vesting in the Town

Upon the processing of a Resolution by the Town giving final acceptance to the development and upon the Town's issuance of the Certificate of Total Performance, the ownership of the services and works referred to in the said Certificate shall vest in the Town.

5. DRAINAGE, LANDSCAPING AND DESIGN

5.1 Grade Control and Surface Drainage

The Developer covenants and agrees to grade and drain all the lands in accordance with the Grading Plan required in this Agreement and as approved by the Town Engineer. The Developer further agrees that all surface drainage problems appearing prior to the issuance of a Certificate of Total Performance by the Town as referred to in Clause 4.3 shall be corrected by the Developer at his expense.

5.2 Lot Grading

The Developer agrees to advise individual lot purchasers that there is an approved grading plan in effect for this development and that the grading of each lot will be required to conform to the requirements of the subdivision-grading plan. The Developer further agrees that the purchaser will be required to submit to the Town prior to the issuance of an occupancy permit, written verification that the grading of the lot complies with the lot grading plan as approved by the Town Engineer.

5.3 Topsoil

The Developer covenants and agrees that no topsoil be removed from the lands outlined on the Plan, without the written consent of the Town. Where it becomes necessary to temporarily remove any topsoil, it shall be stock-piled and replaced on the lot to a depth of least 15 centimeters (approximately 6 inches) over the entire area not covered by buildings, driveways or paved

areas. If the existing topsoil on the site is not sufficient, additional topsoil will be supplied by the Developer to maintain the required depth over the area.

5.4 Landscaping

The Developer covenants and agrees to ensure that sod is laid on the unpaved portions of all road allowances and designated park areas after all streets, walks, curbs, driveways and buildings are completed.

6. LANDS TO BE CONVEYED

6.1 Dedication and Conveyance of Public Purpose Lands

The Developer covenants and agrees, at the Developer's expense, and prior to the issuing of building permits, to grant to the Town free from encumbrance, all lands which are required for public purposes, including recreational parks and lands, walkways and playgrounds, and the Developer covenants to provide to the Town all necessary Deeds of Conveyance as is required from time to time to confirm title of the same into the Town.

6.2 Dedication and Conveyance of Streets and Roads

The Developer covenants and agrees that the streets **when completed as per the plans** will be dedicated to the Town by the Developer free from encumbrance and the Developer covenants to provide to the Town all necessary Deeds of Conveyance as is required from time to time to confirm title of the same into the Town. Further, the Developer covenants and agrees to allow the Town to come on those lands to complete the works if the Developer fails to complete the works as per his covenant in the Development Agreement.

6.3 Easements and Right of Ways

The Developer covenants with the Town to provide all necessary easements and/or rights of way required by utility companies for the purpose of supplying electrical, communication services, street lighting, mail delivery service, and any other utility services within the subdivision and the Developer shall provide all necessary conveyances to the utility companies to complete the same. Pole and power lines shall be erected at the rear of building lots or in such other areas as may be approved by the Town or its duly authorized agent upon written request from the Developer and the utility outlining the specific reasons why alternative placement is necessary.

7. FINANCIAL PROVISIONS

7.1 Assessments

a. The Developer covenants and agrees to pay to the Town the following assessments and or fees at the time of the execution of this Agreement:

I. Backland Assessment Fee - To pay to the Town a backland assessment fee of **$5,000.00** (Five thousand dollars) per hectare for the area under development at the date of the execution of this Agreement. It should be noted that this area is approximate only and the actual area will be determined from the master survey when prepared and the assessment will be adjusted accordingly.

II. Recreational Assessment Fee – To pay to the Town a recreational assessment Fee of **$400.00** (four hundred dollars) per lot at the date of the execution of this Agreement. This reduced fee per lot is a direct result of credits for open space land as outlined on the approved site plan. For the purpose of this Clause and Clause C,

the parties hereto agree that there are _____lots in the Subdivision Development.

III. **Development Fee** - To pay to the Town a development fee of **$100.00** (one hundred dollars)per lot, at the date of the execution of this Agreement for the provision of services which are external to the subdivision but which are necessary for the development to proceed.

7.2 Taxes

The Developer covenants and agrees to pay in full all taxes in arrears.

7.3 Indemnity and Liability Insurance

The Developer covenants and agrees to indemnify and save harmless the Town and its agents from any damage resulting directly or indirectly to the Town and/or any persons upon the property or development that is a result of the negligence of the Developer, his agents or servants, contractors or subcontractors as consequence of construction taking place in the subdivision. The Developer covenants that it shall immediately rectify to the satisfaction of the Town all works necessary to be undertaken as a result of the said negligence and to be responsible to the Town for all damages of whatsoever nature or kind flowing from the acts of negligence. The Developer further covenants that upon signing this Agreement, it shall file with the Town standard policies of comprehensive liability insurance for a minimum of One Million Dollars ($1,000,000.00) which shall be maintained to the date of acceptance of the completed subdivision by the Town.

7.4 Public Liability Insurance

The Developer shall ensure that all contractors employed on the works are adequately covered by public liability insurance or other insurance as may be required by the Town. Proof of such insurance must be provided to the Town prior to the start of construction or upon request during construction.

7.5 Securities

The Developer agrees to furnish, at the date of the execution of this Agreement and thereafter maintain with the Town, acceptable Securities, as outlined in 1.4.3 of the Town's Municipal Engineering Standards, based upon the estimated cost of development and which has been determined by the Town to be _____ and which amount has been determined by the Town Engineer sufficient to cover the provisions of all public works required by this Agreement.

The Developer shall furnish a Maintenance Security for ten percent (10%) of the total estimated cost of Stage I works in the amount of _____ which Maintenance Security shall remain in force for twelve months from the date of acceptance 1.4.3(b). In addition, Stage II security equivalent to 100% of the estimated costs of this work shall be provided to the value of_____as per 1.4.3(c).

Securities provided pursuant to this clause are to be maintained by the Developer or, upon demand from the Town, extended as deemed necessary, but in any event shall be drafted to remain in force to the date of acceptance referred to in Section 4.3 of these conditions or thirty days after the date or extended date set out in Section 4.2, whichever comes first.

7.6 Municipal Right to Demand

The Developer agrees that if it fails to meet the conditions of this Agreement in any respect, the Town shall have the right to demand from the Security Agent any monies necessary to complete the public works up to the amount specified in the security.

8. MISCELLANEOUS PROVISIONS

8.1 Restriction on Dwelling Types

The Developer covenants and agrees that it will be required to ensure that contractors and builders are advised that semi-detached, duplex, triplex or row dwellings shall not be constructed within this development.

8.2 External Design of Dwelling

The Developer covenants and agrees that it will be required to ensure that contractors and builders are advised that they shall not permit more than two (2) adjacent houses containing identical facades to be constructed within the development.

8.3 Building Permits

The Developer covenants and agrees that a Building Permit is to be obtained from the Town prior to the construction of a dwelling commencing.

8.4 Building Construction at Developer's Risk

Any building construction started prior to substantial completion of underground services will be at the Developer's risk. The owner shall supply to the Town a complete lot analysis sheet for each lot as a requirement of permit. No building construction is to be started prior to obtaining a Building Permit.

8.5 Occupancy Permit

No Occupancy Permit shall be issued by the Town prior to completed installation and testing of all underground services, curb and gutter, utilities and base course asphalts.

8.6 Signs and Advertisements

The Developer agrees that it shall not erect any signs, billboards, or other advertising or notices except in accordance with The Town of Conception Bay South Development Regulations and with the approval or permit from the Town. The sign design and construction of any signs located on the property shall be to the satisfaction and prior approval of the Town and shall display only the approved plan of the subdivision as registered by the Town.

8.7 Fencing

The Developer covenants and agrees to construct and erect a privacy fence along the rear property boundary of _____ lots which back onto existing or future roads and commercially zoned properties. The design and construction of the fence shall be in accordance with the requirements of the Town.

Upon acceptance of the fence by the Town, the responsibility and ownership of the fence shall be transferred by the Developer to the individual lot owners who will be responsible for its ongoing maintenance and repair.

8.8 Street Names

The Developer covenants and agrees to provide the Town with a list of street names for consideration by the Town. The Town, after reviewing the list of names and in conduction with the Regional Emergency Service Authority will allocate names for the subdivision.

8.9 Civic Numbers

The Developer covenants and agrees to place on the subdivision plan the civic number designated by the Town for each lot. It shall be the responsibility of the Developer to furnish the subsequent purchaser of each lot with the correct civic number.

8.10 Environmental Buffers

The Developer covenants and agrees to identify on the site the location of the boundaries of any environmental buffers abutting watercourses, it's associated wetland and any streams draining through the property. It shall be the responsibility of the Developer to provide the Town with information regarding the measures which shall be taken to ensure that the environmental buffers are not impacted by the development of the property.

8.11 Walkway Construction

The Developer covenants and agrees to prepare plans for the location and construction of any walkways and/or other passive recreational facilities proposed within the environmental buffers and their construction shall be in accordance with the requirements and approvals of the Provincial Department of Environment and Labour and the Town's Director of Parks and Recreation. All walkway and/or other construction within an environmental buffer shall be undertaken in an environmentally sensitive manner and in accordance with the requirements of the Provincial Department of Environment and Conservation and the Town's Director of Parks and Recreation.

9. DISPUTE RESOLUTION

9.1 Where a difference arises between the parties bound by this Agreement, and where the difference arises out of the interpretation, application, administration or alleged violation of this Agreement, and including any questions as to whether a matter is arbitrarable, one of the parties may notify the other party in writing of its desire to submit the difference or allegation to arbitration and the notice shall contain the name of the person appointed to be an Arbitrator by the party given the notice;

9.2 Party to whom notice is given shall within 30 days after receiving the notice, name the person whom it appoints to be an Arbitrator and advise the party who gave the notice of the name of its appointee;

9.3 Arbitrators named in accordance with its provisions shall within 30 days after the appointment of the second of them, name a third Arbitrator and he shall be the Chairman of the Arbitration Board;

9.4 Each party is required to name a member of the Arbitration Board and shall pay the remuneration and expenses of that member and the parties shall pay equally the remuneration and expenses of the Chairman;

9.5 The decision of the Arbitration Board shall be given within fourteen (14) days following the appointment of the Chairman. It is understood, however, that the Arbitration Board shall not be authorized to make any decision inconsistent with the stipulation of this Agreement, nor to delete, alter, or amend any part thereof;

9.6 The Arbitration shall be conducted in accordance to the rules set out under the Arbitration Act, Chapter 8, s.n. 1985, as amended.

SCHEDULE "A"

Schedule "A" consists of the following drawings and specifications:

1) Proof of ownership of lands to be developed in the form of a legal survey, property description and Deed of Conveyance.

2) Subdivision Site Plan **number** as prepared by _____

3) Storm Drainage Plan **number** as prepared by _____

4) Sanitary Drainage Plan **number** as prepared by _____

5) Detailed Plan & Profile Drawing(s) **number(s)** as prepared by _____

6) Grade, Setback and Driveway Plan **number** as prepared by _____

Specifications as prepared by the Provincial Government and the Town of Conception Bay South for roads and water and sewer works.

SCHEDULE 5

APPROVED PRODUCTS AND MANUFACTURERS

5.1 SEWER SYSTEMS

	ITEM	PRODUCT	MANUFACTURER (Standard)
5.1.1	Sewer mains	PVC SDR 35	Ipex Rehau Royal
	PVC Ribbed	Ultra Rib or RAU Rib	Ipex Rehau Royal
5.1.2	Service Laterals Within R.O.W.	PVC SDR 28 – 100mm PVC SDR 35 – for 150mm or larger	Ipex Rehau
5.1.3(a)	Services Private Property	PVC SDR 28 – 100mm PVC SDR 35 – for 150mm or larger	Ipex Rehau
5.1.3(b)	PVC Fittings		Ipex Rehau Royal
5.1.4	Repair Couplings	Rubber Appropriate Series	Preper Fernco Mission Rubber Pipe Connects
5.1.5	Manholes	Precast	Capital Precast L.E. Shaw Atlantic Concrete Terra Nova Precast

5.1.6	Manhole Frames and Covers	BM 34 BM 2	Labco Foundry
5.1.7	Catch Basin Frames & Covers	BM 12A BM 1614	Labco Foundry
5.1.8(a)	Storm Mains	PVC Ribbed HDPE	Ipex Rehau Royal Soleno Hancore
5.1.8(b)	Structures	Structural Multi-Plate With Cement Foundations	Armtec
	Culverts	HDPE	Soleno Hancore

5.2 Water Systems

	ITEM	PRODUCT	MANUFACTURER
5.2.1	Water Main	Ductile Iron (Class 52), Cement Lined; Seal Coat To Be Applied To The Cement-Mortar Lining	Canada Pipe
5.2.2	Fittings	Ductile Iron Ductile Iron	Star Pipe Sigma
5.2.3	Sleeves	Ductile Iron Ductile Iron	Star Pipe Sigma
5.2.4	Tapping Sleeves & Valves	Cast Iron M.J.	Meuller
5.2.5	Hydrants	M67 B50B18	McAvity Darling
5.2.6	Valves	Single Resilient Seated	Clow Meuller AVK
5.2.7	Valve Boxes (Screw/Slide)	Poly Box MVB Composite Buffalo Cast Iron	Meuller Bibby
5.2.8	Copper	Copper Type K	Wolverine Cerro
.2.9	Corporation Stops – Ball Style	FB 1000 B - 25008	Muller Cambridge Brass Ford
5.2.10	Curb Stops (Flared/ Compressed) Ball Style	Oriseal H15219 Or BC44	Muller Cambridge Brass Ford

5.2.11	Couplings - Compression	138 C – 44 H – 15403 @ 14-12940	Muller Ford Dresser Cambridge
5.2.12	Curb Stop Boxes	A726 D1 - #8	Muller Clow Star Sigma
5.2.13	Curb Box Extension	A:812	Muller Clow Star Sigma
5.2.14	Curb Box Cap	800 OR 804	Muller Clow Star Sigma
5.2.15	Repair Clamp – S.S.	# 500	Muller
5.2.16	Mechanical Join Restrainers	Mega Holder	EBBA Iron Star Sigma Clow Ford
5.2.17	Water Service	Municipex	Rehau

SCHEDULE 6

APPENDICES – STANDARD FORMS AND DRAWINGS

6.1	Appendix A -	Storm Sewer Calculation Forms
6.2	Appendix B -	Standard Sanitary Sewer Calculation Forms
6.3	Appendix C -	Standard Hydrostatic Pressure Test Form
6.4	Appendix D -	Standard Bench Mark Location Form
6.5	Appendix E -	Standard House Service Information Form
6.6	Appendix F -	Standard Subdivision Plan
6.7	Appendix G -	Standard Lot Grading Plan
6.8	Appendix H -	House Service Trench Detail

Appendix A - Storm Sewer Calculation Forms

CALCULATION OF STORM SEWER FLOWS

PROJECT NAME:
PROJECT NO. :
LOCATION:

Design Data:

Q10=RAIN	where	Q10	= 10 Year Design Flow	= l/s
		R	= Runoff Coefficient	=
		A	= Watershed Area	= ha
		I	= Rainfall Intensity	= mm/hr
		N	= Constant	= 2.778

Design Calculations

Manhole Section	Design Area (ha)	Runoff Coeff (R)	Rainfall Intensity (mm/hr)	Constant (N)	Section Design Flow (cub. m/s)	Incemental Design Flow (cub. m/s)	Design Slope (%)	Manning Coeff. (N)	Design Diameter (mm)	Nominal Diameter (mm)	Nominal Diameter Velocity (m/s)	Nominal Diameter Capacity (cub. m/s)	Extra Capacity (cub. m/s)	Percent Extra Capacity (%)

Appendix B – Standard Sanitary Sewer Calculation Forms

SANITARY SEWER TEST RESULTS

LOCATION (STREET):

DATE D/M/Y	LOCATION MH No. to MH No.	DIA OF PIPE	M OF PIPE	ALLOWABLE LOSS (LITRES)	NO. BLDG SERVICES	M OF SERVICE PIPE	TEST DURATION (MIN)	MEASURED LOSS (LITRES)	PASS / REJ	TEST DURATION (MIN)	MEASURED INFLOW (LITRES)	PASS / REJ	REMARKS
LOCATION (STREET):													
LOCATION (STREET):													

ALLOWABLE EXFILTRATION 0.000023 L/MIN/mm,DIA/M
ALLOWABLE INFILTRATION 0.000003467 L/MIN/mm,DIA/M

I HEREBY CERTIFY THAT ALL TESTS HAVE BEEN CARRIED OUT ACCORDING TO CONTRACT SPECIFICATIONS AND THIS/THESE SECTION(S) OF PIPE HAS PASSED THE REQUIRED TESTS.

CONTRACTOR'S FOREMAN

SITE REPRESENTATIVE

TOWN OF CONCEPTION BAY SOUTH
SANITARY SEWER TEST RESULTS FORM
PROJECT: _____

CONSULTING
ENGINEER: _____

TOWN OF CONCEPITON BAY SOUTH - ENGINEERING DEPARTMENT

SANITARY SEWER ANALYSIS

DESIGN CAPACITIES AND FLOWS

UPSTREAM MIL	DIAMETER (MM)	CAPACITY (L	VELOCITY (part)	SPARE CAPACITY	INFLITRATION	AVERAGE FLOW	PEAK FLOW

Prepared By:
Town of Conception Bay South Engineering Department
August 2010

TOWN OF CONCEPTION BAY SOUTH - ENGINEERING DEPARTMENT

SANITARY SEWER ANALYSIS

PIPE GEOMETRY

CURRENT		CONT DOWN M	DESCRIPTION (STREET)	GRADE	#	DLA	
Up MH#	Down MH#						

TRIBUTARY AREAS

UPSTREAM M	ZONINGS						

VERTICAL & HORIZONTAL INFORMATION

UPSTREAM ME	NORTHING		EASTING	INVERT	LENGTH M	INVERT DOWN	GROUND ELEVATION

SANITARY

MANHOLE TEST RESULTS

DATE: _____

MH#	LOCATION	ALLOWABLE LEAKAGE	TEST TIME	ACTUAL LEAKAGE	PASS / FAIL	DEPTH OF TEST WATER ABV INV.	REMARKS

TOWN OF CONCEPTION BAY SOUTH
MANHOLE TEST RESULTS FORM
PROJECT: _____

CONSULTING
ENGINEER: _____
_____

Appendix C – Standard Hydrostatic Pressure Test Form

HYDROSTATIC PRESSURE TEST RESULTS

DATE	STREET NAME	CHAIN STA TO STA	PRESSURE (k Pa) WORKING	PRESSURE (k Pa) TEST	LEAKAGE (L) ALLOW	LEAKAGE (L) ACT.	TEST TIME (MIN)	TYPE OF PIPE	DIA OF PIPE	LENGTH OF TEST SECTION	REMARKS

I HEREBY CERTIFY ALL TESTS HAVE BEEN CARRIED OUT ACCORDING TO CONTRACT SPECIFICATIONS AND THIS SECTION OF PIPE HAS PASSED THE REQUIRED TESTS ON

____

____
CONTRACTOR'S FOREMAN

____
SITE REPRESENTATIVE

TOWN OF CONCEPTION BAY SOUTH
HYDROSTATIC PRESSURE TEST RESULTS FORM
PROJECT: ____________________
CONSULTING ENGINEER: ____________________

Appendix D – Standard Survey Monument Location Form

TOWN OF CONCEPTION BAY SOUTH **ENGINEERING DEPARTMENT**

SURVEY MONUMENT LOCATION FORM

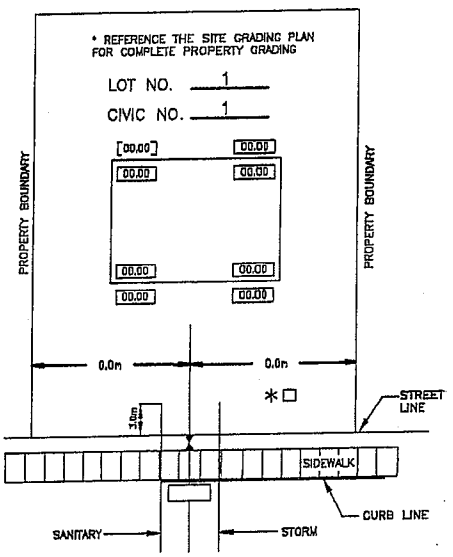
HORIZONTAL & VERTICAL CONTROL SURVEY **CONTROL MONUMENT NO.**

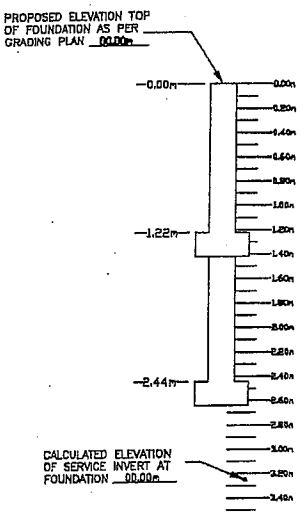
KEY PLAN	**REFERENCES**
VICINITY:	**HORIZONTAL**
	N
INSPECTION DATES:	**E**
TYPE:	**ELEVATION:**

DESCRIPTION

Appendix E – Standard House Service Information Form

NOTE:
BASED ON 2% GRADE FROM HIGH SEWER SERVICE INVERT TO HOUSE FOUNDATION AT SETBACK OF XX.00 METERS FROM PROPERTY BOUNDARY, INVERT ELEVATION OF SEWER SERVICE AT FOUNDATION WILL BE AS NOTED IN DETAIL. PRIOR TO EXCAVATION FOR FOUNDATION CONSTRUCTION THE BUILDER IS TO EXCAVATE THE STORM AND SANITARY SERVICES STUBS TO CONFIRM THE SERVICE ELEVATIONS AND PROPOSED BASEMENT AND TOP OF CONCRETE GRADES. THE CONFIRMED SEWER GRADES SHOULD BE COMPARED TO THE HOUSE STYLE TO ENSURE THE INTENDED ELEVATIONS FOR SERVICING ARE AVAILABLE.





TOP OF CURB ELEVATION AT CENTER OF LOT 00.00

SANITARY SEWER INVERT 00.00

STORM SEWER INVERT 00.00

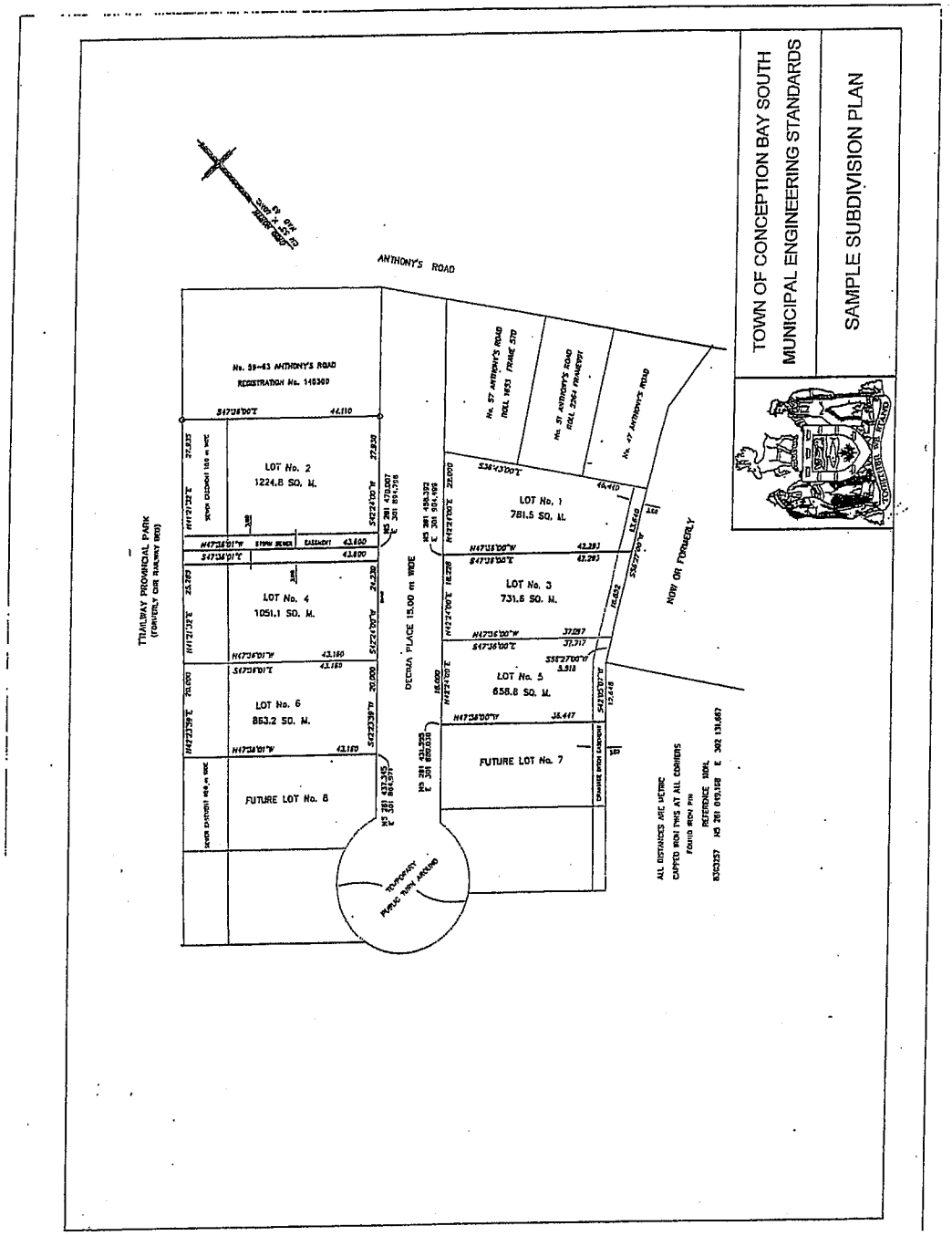
WATER SERVICE LATERAL DIAMETER size and type

CURB STOP TO BE LOCATED IN EASEMENT BETWEEN STREET LINE AND BACK OF SIDEWALK

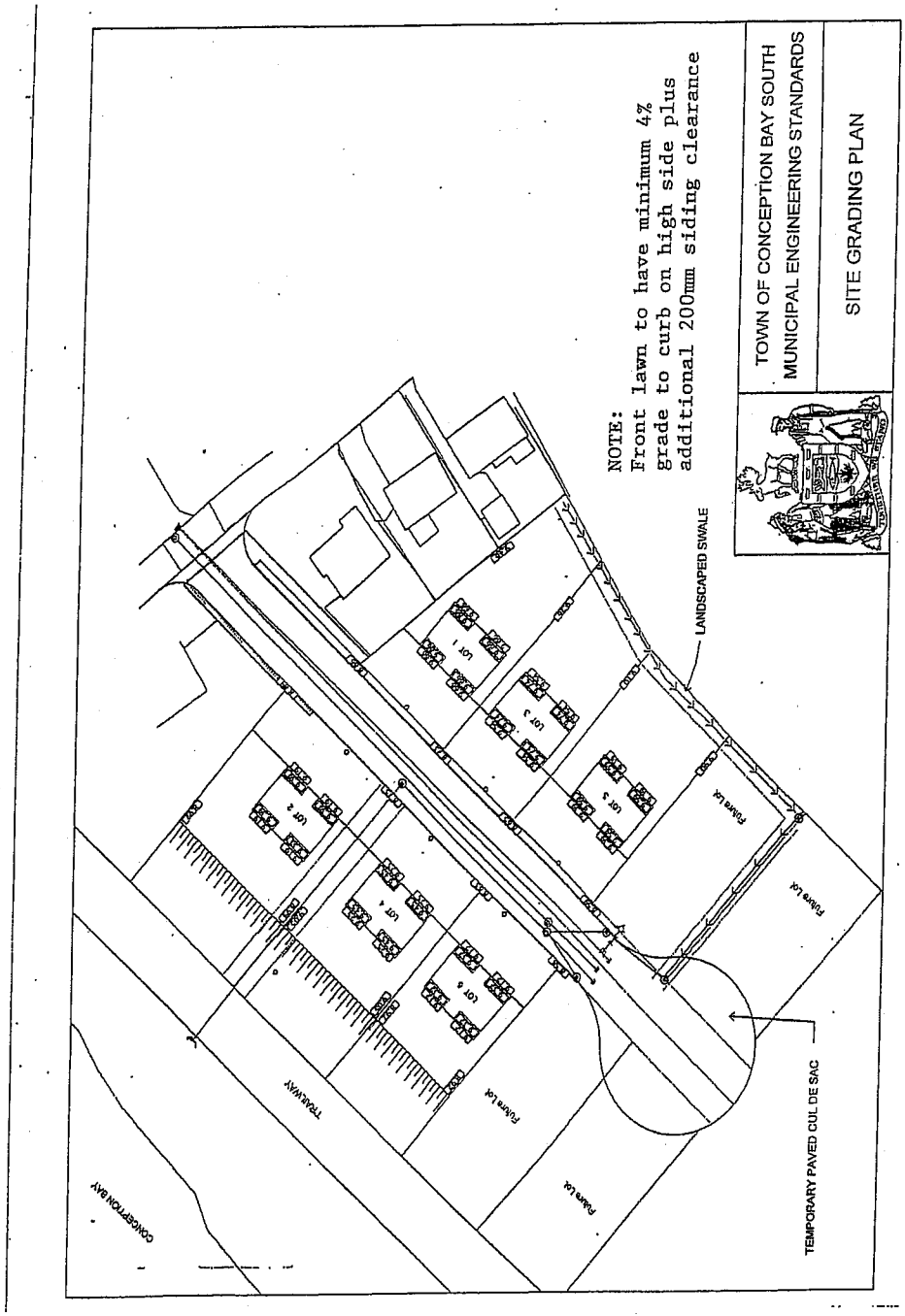
*□ DRIVEWAY LOCATION

Company information	STREET NAME XXXXXX XXXXX HOUSE SERVICE INFORMATION			
	DRAWN BY:	DATE:	SCALE:	PROJECT No:

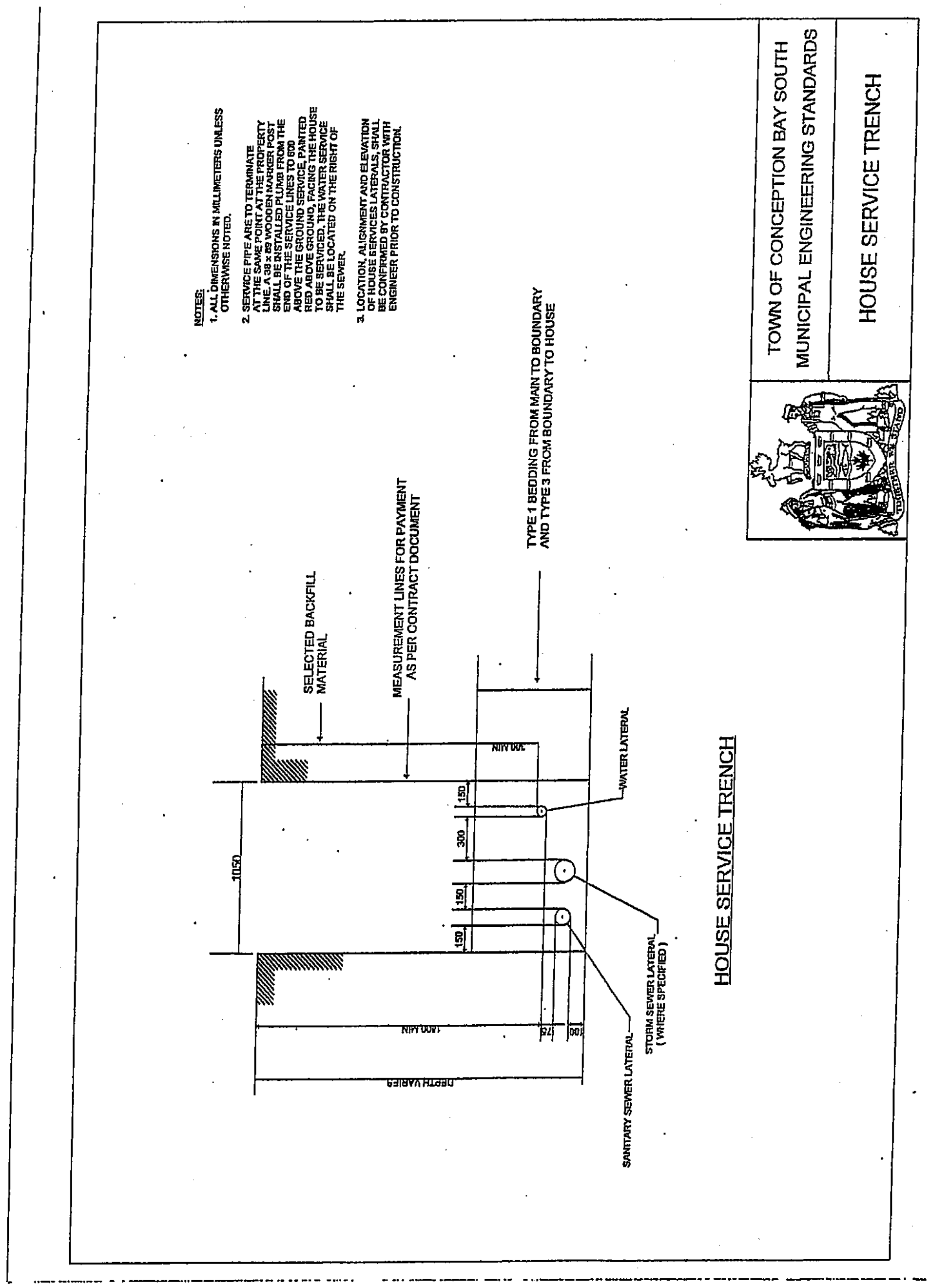
Appendix F – Standard Subdivision Plan


TOWN OF CONCEPTION BAY SOUTH
MUNICIPAL ENGINEERING STANDARDS
SAMPLE SUBDIVISION PLAN
ANTHONY'S ROAD
No. 59-63 ANTHONY'S ROAD
REGISTRATION No. 146369
LOT No. 2
1224.8 SQ. M.
LOT No. 4
1051.1 SQ. M.
LOT No. 6
863.2 SQ. M.
FUTURE LOT No. 8
LOT No. 1
781.5 SQ. M.
LOT No. 3
731.6 SQ. M.
LOT No. 5
658.8 SQ. M.
FUTURE LOT No. 7
DECHA PLACE 15.00 m WIDE
TRAILWAY PROVINCIAL PARK
(FORMERLY CNR RAILWAY BED)
NOW OR FORMERLY
TEMPORARY
PUBLIC TURN AROUND
ALL DISTANCES ARE METRIC
CAPPED IRON PINS AT ALL CORNERS
FOUND IRON PIN

Appendix G – Standard Lot Grading Plan


TOWN OF CONCEPTION BAY SOUTH
MUNICIPAL ENGINEERING STANDARDS
SITE GRADING PLAN
NOTE:
Front lawn to have minimum 4%
grade to curb on high side plus
additional 200mm siding clearance
LANDSCAPED SWALE
TEMPORARY PAVED CUL DE SAC
TRANSWAY
CONCEPTION BAY

Appendix H – House Service Trench Detail


NOTES:
1. ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE NOTED.
2. SERVICE PIPE ARE TO TERMINATE AT THE SAME POINT AT THE PROPERTY LINE. A 38 x 89 WOODEN MARKER POST SHALL BE INSTALLED PLUMB FROM THE END OF THE SERVICE LINES TO 600 ABOVE THE GROUND SERVICE, PAINTED RED ABOVE GROUND, FACING THE HOUSE TO BE SERVICED. THE WATER SERVICE SHALL BE LOCATED ON THE RIGHT OF THE SEWER.
3. LOCATION, ALIGNMENT AND ELEVATION OF HOUSE SERVICES LATERALS, SHALL BE CONFIRMED BY CONTRACTOR WITH ENGINEER PRIOR TO CONSTRUCTION.
SELECTED BACKFILL MATERIAL
MEASUREMENT LINES FOR PAYMENT AS PER CONTRACT DOCUMENT
TYPE 1 BEDDING FROM MAIN TO BOUNDARY AND TYPE 3 FROM BOUNDARY TO HOUSE
300 MIN
1050
150
300
150
150
1400 MIN
DEPTH VARIES
WATER LATERAL
SANITARY SEWER LATERAL
STORM SEWER LATERAL (WHERE SPECIFIED)
HOUSE SERVICE TRENCH
TOWN OF CONCEPTION BAY SOUTH
MUNICIPAL ENGINEERING STANDARDS
HOUSE SERVICE TRENCH