

DESIGN STANDARDS FOR STREETS & SUBDIVISIONS

TOWN OF GANDER ENGINEERING DEPARTMENT
100 ELIZABETH DRIVE, GANDER, NL, A1V 1G7

March 4, 1993 – Revision 18, January 2020



Intent of Document

Readers are advised that this document is not intended to supersede or replace the Town of Gander Development Regulations for the Town of Gander but is to be read in conjunction with that document and all applicable Provincial Acts and Regulations.

Defining a Subdivision

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

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

Compliance

All work must be completed as per the “Standard Specification for Municipal Water, Sewer and Roads” as published by the Province of Newfoundland and Labrador, Department of Municipal Affairs and Environment.

All work must comply with the “Guidelines for the design construction and operation of water and sewage systems” as published by the Department of Municipal Affairs and Environment.

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PART 1 DEVELOPMENT APPROVAL

Section: 1.1 – Application and Development Approval

1.2 – Subdivision Design Plans

1.3 – Final Approval

Section 1.1 – Application and Development Approval

1.1.1 Application

The applicant will be required to submit a Subdivision Development Application for the subdivision of land on the appropriate form (Appendix A.1) to the Town of Gander, Engineering Department. The initial Subdivision Development Application Fee will be \$200.00, which includes the preliminary plan reviews and the initial and secondary plan review, of the construction drawings, if required. If subsequent revisions are made and it is deemed necessary by the department that an additional plan review is required, the applicant would be subject to a \$200.00 fee for each additional plan review.

1.1.2 Requirements

The application must be accompanied by the following:

- i. A legal survey of the property confirming the development is contained within the limits of property.
- ii. Written consent from the property owner (if not the applicant) for the development of the subdivision.
- iii. Two copies of the preliminary layout for approval to the Town of Gander. Minimum time for review, one week. The preliminary layout shall include the following information:
 - a) Each street right of way and walkway including the proposed street designation as per section 4.2.4 i and ii, and the associated width of the right of way.
 - b) Each individual lot including the lot type (single, double, row etc.)
 - c) Identify areas of open space.
 - d) The Town of Gander’s zoning boundaries. (Supplied to the developer by the Town of Gander)
 - e) Every existing water course, ditch and swale.
- iv. The preliminary drawings for the subdivision must be sealed and signed by a professional engineer licensed to practice in the Province of Newfoundland and Labrador, otherwise known as the *Developers Engineer*.
- v. All drawings submitted to be Geodetic referred.
- vi. If the required Open Space is not provided in the Phase of development being applied for and there is not enough surplus Open Space in previously developed phases to maintain the required minimum, the developer will provide pledged land. Prior to reviewing an application for development of a Phase with insufficient Open Space the developer must

- a. Submit for Council's approval a Master Plan of the entire development which clearly defines the individual areas of Open Space and the total developed lot area. Areas to be provided in hectares to the third decimal point. Open Space shall be evenly distributed throughout the development and not concentrated in one specific area.
- b. Once approved by Council the developer will be required to sign an Open Space agreement which references the approved Master Plan.
- c. Any deviation in the alignment of the proposed Phase from the approved Master Plan will require a resubmission of a Master Plan to council for approval.

1.1.3 Process

The preliminary plans will be reviewed by the *Town* to ensure general compliance. If a deficiency exists, then:

- i. The application may be recommended for Development Approval subject to the applicant taking the necessary corrective action as determined by the Town.
- ii. Where a Municipal Plan Amendment (zoning change) is required and recommended by staff, the amendment process must be resolved prior to any further processing taking place.
- iii. The application may be for rejected

Once all conditions have been met, the application will be recommended for Development Approval and forwarded to Council for final approval, if there have not been any problems noted during the review.

1.1.4 Approval

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

Section 1.2 –Subdivision Design Plans

1.2.1 After the application and preliminary plans are approved by Council, the Developer shall submit 2 copies each of the Construction Drawings and of the Grading Plan, approved by a Professional Engineer, and a lot survey plan, stamped and signed by a registered Newfoundland and Labrador Surveyor. The minimum time for review is 2 weeks.

1.2.2 Also, to be included in the submission, are approvals and permits from all applicable Government Agencies including but not limited to the Provincial Department of Municipal Affairs and Environment, Natural Resources, Transportation and Works, Water Resources

Management, Wetland Stewardship, Crown Lands and Federal Department of Fisheries and Oceans.

- 1.2.3** The detailed subdivision design will be reviewed for conformance with the guidelines outlined within this document and the Town of Gander 's Municipal Plan and Development Regulations. Where problems are noted, the Developer will be required to make the necessary revisions and resubmit the drawings for approval. Revisions shall be noted in the title sheet with an accompanying detailed list of the changes made.

Section 1.3 – Final Approval

- 1.3.1** If no problems are noted, then Construction Approval will be recommended, the Subdivision Agreement executed and the Subdivision Permit issued. The Developer will be required to submit copies of the approved construction drawings in digital format (Autocad) at this time.

The Developer shall submit 5 paper copies of the approved Construction Drawings

- i. 2 copies for the Development Agreement (One for the developer and one for Town of Gander) to be retained at the Engineering office.
- ii. 1 for the Construction Inspector
- iii. 2 to be stamped and signed by the Town of Gander and returned to the Developer for office and field use.

1.3.2 Survey Plan

- i. Two copies to the Town of Gander
- ii. Distribute copies to other agencies for required easements
 - NL Power
 - Rogers Cable (dianne.hawkins@rci.rogers.com)
 - Bell Aliant

1.3.3 Grading Plan

- i. Two copies to the Town of Gander
- ii. Distribute copies to other agencies as required

****Note – All plans submitted for review must meet the required criteria as outline in this document and failure to include all requirements will result in plans being returned for completion. Incomplete plans will not be reviewed. All plans for field use must be stamped and approved by the Town of Gander's Engineering Department.**

PART 2 – ENGINEERING REQUIREMENTS

- Section:**
- 2.1 – Survey Plan**
 - 2.2 – Construction Drawings**
 - 2.3 – As Built Drawings**

Section 2.1 – Survey Plan

2.1.1 General – The Survey plan shall include:

- i. The name of the owner of all abutting lands where applicable.
- ii. The length and bearing of each line of any traverse which connects any point on the boundary of the subdivision with a Department of Forestry and Agriculture Control Monument
- iii. Each street right of way, walkway and easements.
- iv. Each lot and its number
- v. The length and bearing of
 - Each line of the boundary
 - Every line subdividing the individual lots
 - The centre line of all streets
- vi. The area, in square meters of
 - The full subdivision
 - Each individual lot
 - Each open space area
- vii. Every water course and the direction of flow
- viii. The radius, central angle, the length of the arc, the point of curvature and the point of tangency shall be given for each curved line and clearly indicated on the survey plan.
- ix. A standard title block including,
 - Subdivision name
 - Date
 - Scale
 - The dates of any revisions
- x. The stamp and certification of a registered Newfoundland Land Surveyor
- xi. The northing and easting of all points along the perimeter of the subdivision to be either indicated on the plan or noted in a table.

2.1.2 Survey Details and Accuracy

- i. All boundary line dimensions to be shown to the nearest millimeter, and all bearings and angles to the nearest second. All survey information to be NAD 83, three-degree transverse Mercator.
- ii. More or less distances shall only be accepted along a water boundary

- iii. Information shown on the survey plan shall be sufficiently detailed to permit any point on any surveyed line to be accurately located in the field.
- iv. Where there is a change in direction of the street alignment, all lots with property lines common to the right of way must have a radius with same centre point as that of the road centre line.
- v. All corner lots must have a radius tangent to both right of way property lines.
 - 12m R – Bounding on Collectors
 - 8m R – All others

2.1.3 Water and Sewer Main/Minimum Easement Requirement

- i. Single Pipe Trench-Minimum 5.0m wide for pipe invert depth up to 2.5 metres.
- ii. Multiple Pipe Trench- Minimum 2.5m outside the centre line of the outer most pipes on both sides for pipe invert depth of up to 2.5 metres.
- iii. Deeper Pipes-An additional 1.0m of easement width is required for each 0.5m (or part thereof) increase in pipe depth.
- iv. Pipes must be centered in the easement.
- v. Ditch easements shall be top of bank to top of bank plus 3.5m on one side for access.
- vi. All easements shall be covered by legal agreements as approved by the Town.
- vii. All easements shall be transferred (at no cost) to the Town of Gander

2.1.4 Street, Walkway and Lot Identification

- i. When the roadway and street have been constructed to curb and base asphalt stage and the subdivision or the area involved is ready for building construction, each lot, easement, walkway and street shall be identified by an iron pin driven into the ground at each corner, beginning of curve and end of curve.
- ii. Each building lot shall be identified by a 150 mm x 300mm weather resistant/sign bearing the lot number in black 100 mm numbers on a white background attached to a tree or post near the center of the lot 2 meters from the ground.

2.1.5 Grading Plan:

- i. Shall indicate existing land elevations
 - At rear corner pins
 - At front building line
 - Of existing adjacent properties 5 meters outside the subdivision boundary line at 10 meter intervals

- Of ditches and swales
 - Adequate grades to be provided to clearly show that drainage issues (either excessive run off or ponding) will not be caused by the new development to existing areas
 - Other information as required due to local conditions.
- ii. Shall indicate finished land elevation at:
 - Rear corner pins
 - Established front building line (Contact Town of Gander)
 - Rear building line (10m back from front building line)
 - Any location where there is a grade change
 - The base of ditches and swales
 - The back of the curb/sidewalk at the extension of the side boundaries
 - Adjacent property which is proposed to be reshaped or filled
 - iii. Shall meet the following slope requirements:
 - Minimum slope of 1.5%
 - Within 1.5m of building minimum slope of 5%
 - Between front building line and back of curb/sidewalk maximum slope of 10%
 - Maximum slope of 50% (1 vertical to 2 Horizontal)
 - iv. Must be designed so that no lot shall receive any surface drainage from more than three other residential lots.
 - v. Cut off ditches and swales shall be provided between the new development and adjacent vacant lands unless hydraulic calculations prove otherwise.
Ditches, if required, shall be located on legal easements. Hydraulic calculations to determine ditch design. Minimum depth 0.6m.
 - vi. Swales shall be indicated in areas where required to divert water away from buildings and along property boundaries as deemed necessary by the design. Minimum depth 0.4m
 - vii. Maximum cross slope section on a ditch and swales to be 1 vertical to 2 horizontal with a minimum base width of 0.6m.
 - viii. When dealing with grade differential on lots (either left and right or front and rear) which exceed 1.2m but less than 2.4m, the designer should keep in mind that typical house construction is either, level foundation at the top, stepped 1.2m knee walls, or 2.4m high (walk out) knee walls with stepped foundations. Typical house designs should be reviewed with the developer and grading adjusted accordingly to accommodate such elevations. Whenever there is a grading differential less than 1.2m (either left and right or front and rear), the designer should keep in mind that frost walls, below normal footing elevation, may be necessary to maintain frost protection while maintaining the grading of the Lot.
 - ix. Revisions to the grading plan made prior to the issuance of a building permit for the affected lot must be submitted to the Town of Gander for approval.

- 2.1.6** All elevations must be correlated with the Government of Newfoundland and Labrador Geodetic Monuments.
- 2.1.7** The top of the operating nut of the closest existing fire hydrant and any new fire hydrants in the subdivision must have a bench mark elevation established and noted. Prior to issuing permits, the developer shall provide these elevations to the Town. If the developer adjusts the hydrant, the onus is on the developer to provide a new bench mark elevation to the Town immediately upon changing the elevation.
- 2.1.8** After acceptance by the Town of Gander, the approved grading plan will be forwarded to Newfoundland Power by the Developer.
- 2.1.9** All plans must be stamped and signed by a registered professional engineer. Both paper and digital copies, in current Town of Gander AutoCad format, shall be submitted to the Town of Gander.

Section 2.2 – Construction Drawings

2.2.1 General

The Construction drawings shall include:

- i. Title sheet indicating the title of the project, list of all drawing sheets complete with a brief description and all engineering firms involved in the project design.
- ii. Master Plan (If Applicable) showing proposed future phases.
- iii. Control Plan – Showing the centre line alignment including all angles, distances and curve data for each of the streets of the subdivision.
- iv. Plan and Profile – showing all underground pipe work including pipe sizes, invert elevations, grades and the location of all curb stops, bends, valves, hydrants, catch basins and manholes. A profile of the existing ground and proposed finished grade.
- v. Vertical Control Plan- showing the plan view of the area and a profile indicating the original ground and the finished grade complete with the percentage of slope and location of vertical point of intersection and length of vertical curves. Can be included with Plan and Profile drawings.
- vi. Detail Sheet –showing:
 - Cross sections of streets, water and sewer trenches, curbs, sidewalks, walkways, manholes and catch basins
 - Typical water and sewer service connections
 - Details of all special features and equipment including lift stations, gabions, headwalls, guard railing, bridges, etc, not referenced in the Municipal Water Sewer and Roads Specifications.

- vii. Elevations – All elevations must be correlated with Government of NL & Labrador Geodetic Monuments.

2.2.2 Degree of Accuracy

- i. Dimensions – Shall be given to the nearest millimeter
- ii. Elevations – Shall be to the nearest centimeter.
- iii. Percent Grades – Shall be to the nearest second decimal point.

2.2.3 Revisions to Plans

If plans are revised, amended, or altered, the revisions must be noted in the designated area of the title block. Copies, both paper and digital, shall be forwarded to the appropriate individuals, departments and agencies for approval. A detailed list of revisions shall be submitted, if required, on a separate sheet outlining each specific change with a general revision noted on the drawings.

Section 2.3 – As Built Drawings

2.3.1 General

- i. As built drawings shall include all information as presented in the Construction Drawings, updated and showing exact tie-ins, invert elevations, elevations and grades of all sewer lines, service line tee's, water lines (including service laterals), manholes, catch basins, curb stops, corporations stops, main line valves, hydrant valves, and end caps.
- ii. All information pertaining to the main lines and roadway including the plan and profile to be shown on one drawing. All information related to the service lines to be shown on a separate drawing.
- iii. The developer shall provide a technician on site to collect all As Built data during the construction phase on each day that infrastructure is being installed.

2.3.2 Tie – Ins

All items noted in the subsection 2.3.1 must be either tied into a baseline running from sanitary manhole cover to sanitary manhole cover at 15.0 meter stations or Geodetic referenced with X,Y,& Z coordinates.

2.3.3 Drawings Required

- i. Hard Copies – A complete set of As-builts shall be delivered to the Director of Engineering prior to issuance of building permits.
- ii. Digital Format – A complete set of Digital As-builts shall be presented at the same time as the hard copies.

These files must be saved in current Town of Gander AutoCad format.

PART 3 -TESTING REQUIREMENTS

- Section:**
- 3.1 – WATER AND SEWER**
 - 3.2 – GRANULARS AND FILL**
 - 3.3 – CONCRETE**
 - 3.4 – ASPHALT**
 - 3.5 – GENERAL**

Section 3.1 – Water and Sewer

3.1.1 Water

- i. General - All testing and procedures to be completed as per the Department of Municipal Affairs Master Construction Specification, Municipal, Water, Sewer and Roads Section 02713.
- ii. Water Mains - After the pipe has been laid and backfilled it shall;
 - Be flushed and swabbed
 - Have both pressure and leakage tests conducted
 - Be disinfected and tested for residual
 - Be flushed
- iii. Flushing - After flushing, the contractor shall arrange for a representative from the Town of Gander to collect water samples and have it tested for bacteriological qualities according to the requirements of the Municipal Master Specifications and the permit to construct as issued by the Department of Municipal Affairs and Environment. Test results, along with confirmation indicating who collected the sample shall be forwarded to the Director of Engineering. Systems shall not be put into service until all requirements of the applicable regulations have been met and approval to do so has been granted by the Director of Engineering.

3.1.2 Sewer

- i. General

All testing and procedures to be completed as per the Master Construction Specification, Sections 02702 and 02724.

- ii. Sanitary Sewer Mains

After all field tests (i.e. ex-filtration, in-filtration, deflection, etc.) have been completed, a CCTV inspection shall be conducted using equipment which, in addition to providing main line video, has the capability to pivot the camera and inspect lateral connections. Upon completion of the inspection and prior to acceptance by the town a copy of the video on either a DVD or USB flash drive along with a written report which indicates all pertinent data including distances to connections shall be presented to the Director of Engineering. This work shall comply with section 2702-3.8 of the Municipal Water, Sewer and Roads Specifications.

iii. Sanitary Force Mains

After the pipe has been laid and backfilled, hydrostatic tests, leakage tests, and swabbing must be conducted.

iv. Storm Sewer Mains and Catch Basin Leads

A CCTV inspection shall be conducted to the same specifications as required for sanitary sewer mains

v. Video Camera Inspection

All video camera inspections as noted in Section 3.1 must be completed prior to the placement of asphalt pavement. At least 24-hour notice shall be given to the Director of Engineering, so the construction inspector may be on site during video process.

Section 3.2 – Granulars and Fill

3.2.1 Granular “A” and “B”

- i. An independent lab must provide written certification that all Granulars meet the requirements of the Master Construction Specification Section 02233. Stockpile must be approved prior to trucking to site.
- ii. All Class “A” and “B” Granular Base Material to have compaction tests completed by an independent laboratory. Written certification confirming compliance with the Master Construction Specifications must be provided to the Town of Gander prior to placement of the next layer of material.

3.2.2 Borrowed Fill and Rock Fill

As approved by the Director of Engineering or designate.

Section 3.3 – Concrete

3.3.1 Testing

An independent lab must provide written certification that all concrete poured meets the requirements of the Master Construction Specification. All necessary tests must be

performed and samples taken at least once per day. Sample selection will be at the discretion of Town Officials.

3.3.2 Concrete Production

The Town of Gander will only accept “cast-in-place” concrete which has been produced by a facility supplying ready mixed concrete. Volumetric mixing trucks (commonly referred to as on-site concrete) will not be permitted to supply concrete for municipal infrastructure work.

Section 3.4 – Asphalt

3.4.1 Composition of Mixture

Hot mix asphaltic concrete mix to be tested by an independent laboratory prior to commencement of placement.

3.4.2 Testing

The same independent laboratory must provide;

- i. A technician on site during paving operations
- ii. Written test results, indicating whether or not asphalt meets all specified requirements, as per the Municipal Water, Sewer and Roads specifications.

Section 3.5 – General

3.5.1 Professional Fees

The Developer is responsible for paying all costs associated with testing and certifying all materials and workmanship

PART 4 – PRIMARY SERVICES

- Section:**
- 4.1 – GENERAL**
 - 4.2 – STREETS**
 - 4.3 – WATER**
 - 4.4 – SANITARY SEWER**
 - 4.5 – STORM SEWER**
 - 4.6 – MANHOLES/CATCH BASINS**
 - 4.7 – CONNECTING TO EXISTING SERVICES**

Section 4.1 – General

- 4.1.1** All services and road work must connect to existing. In the instance of side street stubs, all services must extend 4.0 m beyond the subdivision boundary and all road work, to the subdivision boundary (the rear of the adjacent building lot). If lots are fronting on a side street stub the development of a temporary turn around will be required. If lots are oriented so that the side of the lot is bounded on the side street stub then a temporary turn around is not required.
- 4.1.2** Temporary Turn around bulbs having a minimum 11.5m radius and surface construction consisting of a minimum 150mm thickness of Class “B” shall be completed in the area of a future road extension. The developer shall be responsible for the maintenance of the temporary turn around.
- Within 2 years of the issuance of Stage 1 completion if the street in the area of the Temporary Turn Around is not extended, or if a development agreement for that next phase has not been signed the developer shall at their cost supply and place a 100mm layer of Class “A” and a 50mm layer of Asphalt. Rock subgrade material will be required if the developer intends to retain some of this asphalt in the design of the future road construction. The developer will be required to provide security for the value of the Asphalt turn around prior to the issuance of Stage 1 completion unless the development agreement for the adjacent Phase has been signed.
- 4.1.3** All materials and installation procedures used in the construction of the road, road bed and all underground services must be approved by the Town of Gander and meet the requirements of Municipal Water, Sewer, and Roads Specifications as published by the Department of Municipal Affairs and Environment and must also comply with the requirements of the Department of Municipal Affairs and Environment.
- 4.1.4** All manholes, mainline valves, curb stops, hydrants and hydrant valves shall be either installed at or adjusted to the finished grade of the surrounding area prior to issuance of building permits.
- 4.1.5** See Part 6 “Drawings” for specific Town of Gander standards regarding primary and secondary services.
- 4.1.6** Prior to commencement of construction, the contractor must submit a detailed list, for approval, of all products to be used in the project. This list must specify brand names, type, model or identifying number, and the specific use.
- 4.1.7** A letter from the contractor or his supplier must also be included stating that their product meets or exceeds the requirements set forth.

4.1.8 The Town reserves the right to refuse products that meet the master specifications but for other good reasons are not permitted for use in the Town of Gander.

Section 4.2 – Streets

4.2.1 Sub Base

- i. Excavate and fill any unsuitable bedding material, replace with approved fill, lower than 725-750 mm from the finished street grade.
- ii. A minimum of 400mm of 100mm minus rock fill must be placed and compacted.

4.2.2 Base

A minimum of 150mm of certified Granular “B “must be placed and compacted before a minimum of 100mm Granular “A” is placed and compacted.

4.2.3 Asphalt

A minimum of (2) two 50 mm lifts of approved asphalt to be placed on Local 2 and all Collector 1 and 2 streets and one 50mm base course plus one 38mm surface course lifts on all other streets. Asphalt shall comply with the requirements of section 5.11.

4.2.4 Street

- i. Street Requirements

		<i>Asphalt Width (m)</i>	<i>Street Width (m)</i>	<i>ROW Width (m)</i>	<i>Minimum centerline Radius</i>	<i>Sidewalk (Qty)</i>
	<i>Cul-de-Sac</i>	<i>7.7 m</i>	<i>8.5 m</i>	<i>15.0 m</i>	<i>35m</i>	<i>n/a</i>
	<i>Local 1</i>	<i>8.2 m</i>	<i>9.0 m</i>	<i>18.0 m</i>	<i>50m</i>	<i>n/a</i>
	<i>Local 2</i>	<i>9.2 m</i>	<i>10.0 m</i>	<i>20.0 m</i>	<i>50m</i>	<i>1</i>
	<i>Collector 1 (Res)</i>	<i>9.7 m</i>	<i>10.5 m</i>	<i>20.0 m</i>	<i>90m</i>	<i>1</i>
	<i>Collector 2 (Com)</i>	<i>9.7 m</i>	<i>10.5 m</i>	<i>22.0 m</i>	<i>90m</i>	<i>2</i>

ii. Definitions

Cul-de-Sac: Road with one exit/entry point

Local 1: Road which only serves abutting properties and no other properties.

Local 2: Road which serves abutting properties and may have other local 1 roads adjoining.

Collector 1 & 2: Road that distributes traffic and within different parts of the built-up Town to major arterials.

iii. The minimum acceptable grade on the road shall be 0.6%

iv. The maximum street grade shall be 10%

v. Minimum K value for vertical curve to be 7m for a crest and 11m for a sag. Minimum length of vertical curve in metres should not be less than the design speed in km/hr.

vi. Street designation to be determined by the Town of Gander.

4.2.5 Street Length

The maximum length of any cul-de-sac shall be 200 meters. Length is measured along the centerline from the curb of the intersecting street to the center of the bulb radius.

4.2.6 Alignment

- i. All street intersections shall be constructed within 5° of a right angle and this horizontal alignment shall be maintained for 30 meters from the intersection.
- ii. Vertical alignment within the intersection approach of not more than 2% grade for a minimum distance of 20m from the curb line of the major street.

4.2.7 Location

- i. No street intersection shall be closer than 60 meters to any other street intersection.
- ii. No more than four (4) streets shall join at any intersection
- iii. No residential street block shall be longer than 490 meters between street intersections. Overall design shall meet the minimum requirements of the Town of Gander's Development Regulations and TAC Standards.

4.2.8 Radius

- i. Minimum center line radius shall be 90m for collector and arterial, 50m for local, 35m for crescent and cul-de-sac.

- ii. Minimum face of curb radius at intersections to be 12m for collectors and arterials and 8m for others.

Section 4.3 – Water

4.3.1 General

- i. Minimum burial below finished grades to be 1.8 meters for water mains and service lines. Service lines to be no deeper than 2.0m from finished grade.
- ii. In rocky locations, as determined by the Engineer, minimum burials must be increased by 0.30 meters.
- iii. Where possible all water mains must be connected to existing services at both ends to form a loop. In situations where this cannot be achieved, a fire hydrant must be placed at the end of the line.

4.3.2 Materials

- i. Mains – Water mains may be either cement lined Ductile Iron or PVC C-900 class 150, sized as required, with a minimum diameter of 200mm for primary distribution mains and 150mm for distribution mains.
- ii. Service Lines – Each building lot and/or each dwelling unit to be serviced with a separate 19mm minimum diameter Type K copper or cross-linked polyethylene or composite cross linked polyethene and aluminum water line complete with curb stop, stainless steel rod, brass cotter pin and water service box placed at the property line and corporation stop at the main.

When connecting cross linked polyethylene, stainless steel inserts shall be used. Inserts shall be Ford, Mueller or approved equal.

All joins, curb stops and corporation stops to be compression type. Curb stop to be located on the lot line close to the centre of the lot but maintaining at least 9.0 meters from the side boundary designated as the driveway side of the lot. Curb stops to be at least 3 meters from Fire Hydrants.

- iii. Fire Hydrants – to the “Darling B-50-B” or “McAivity M67” complete with STRORZ quick connector on the steamer port and Town of Gander treads on both hose connections. Hydrants to be spaced a maximum of 150 meters and in no instance shall a hydrant be

farther than 75 meters from a property. Shut off valves to be placed on all hydrant leads.

Hydrants to be located: ***(Reference Drawing 19-1004)***

- Minimum 3m from the non-driveway side property boundary
- Minimum 3m from any curb stop
- Maximum 7m from an adjacent street curb alignment on a corner lot
- Minimum 2.0m from the back of curb/sidewalk
- Maximum 4.0m from the back of curb/sidewalk

Fire Hydrants to be identified using a “Pretzel Hydrant Marker as manufactured by Wachs Canada LTD. Flow rate, pressure and hydrant number information to be supplied by the Town of Gander.

4.3.3 Valves

Main line valves to be placed at both ends of all new streets. Any new “T” connections to have three (3) valves. Maximum valve spacing to be 150m in commercial/industrial districts and not more than 240m intervals in other areas.

Section 4.4 – Sanitary Sewer

4.4.1 Gravity Sewer

- i. Minimum burial below finished grades to be 2.4 meters for sewer mains servicing properties, 1.8 meters for mains not servicing properties and service lines.
- ii. Sewer mains must be PVC SDR-35, with a minimum diameter of 200 mm and a minimum slope of 0.6%.
- iii. Each building lot and/or each dwelling unit to be serviced with a 100mm diameter PVC SDR-28 sewer line capped at property line and connected to the main line with a saddle or tee complete with a 45° long radius bend. Minimum slope of service lateral to be 2%.
- iv. Manholes to be either poured in place concrete or precast with a maximum spacing of 110 meters center to center. Refer to section 4.6.7 for application of membrane.
- v. Manhole covers to be complete with inflow protector.

4.4.2 Force Main

- i. Minimum burial in developed area to be 2.4 meters minimum below finished grade and 1.8 meters in all others.
- ii. Force main must be SDR-26 IPS PVC 1120, 100 KPA, minimum 7.0Kg/cm² (100 PSI), sized as required
- iii. Cleanouts shall be provided every 110 m in developed areas accessible by means of a concrete chamber with a minimum inside diameter of 1200mm. Chamber to have a solid standard manhole cover complete with inflow protector.

4.4.3 Lift Stations

- i. Wet well chambers to be pre-cast or cast in place concrete complete with a prefabricated sump floor bottom supplied by and installed as per the requirement of the manufacturer. Interior walls of the chamber to be coated with an epoxy paint covering all exposed concrete surfaces.
- ii. Lift station pumps may be either submersible or above ground self-primary suction type.
- iii. Manufacturers' representatives must be located and operating on the island portion of the Province, with available technician support.
- iv. Manufacturers' representatives should stock replacement parts at their Newfoundland office or have sources to provide the parts for Gander within 24 hours of notification. Pump manufacturer must have a proven history in the region of providing reliable products.
- v. Lift station commissioning to be completed by representatives of the manufacturer.
- vi. Developers shall provide "Best "Locks keyed as per the requirements of the Town of Gander prior to issuance of building permits. Number of locks may vary depending on the manufacturer of the lift station. Each compartment & panel required to be locked must have a lock supplied.

Section 4.5 – Storm Sewer

4.5.1 General

- i. Minimum burial below finished grades to be 2.4 meters for main lines servicing properties and 1.8 meters for service lines and mains not servicing properties and service lines. Catch basins leads shall have 1.5m minimum burial. The invert elevation of the storm main shall be below the invert elevation of the sanitary main.
- ii. Storm drainage systems shall be designed to convey runoff from a
 - 1 in 10 year 24 hour rainfall event for local systems in residential areas
 - 1 in 100 year event for Trunk mains and other critical structures

4.5.2 Materials

- i. Storm sewer main lines and offset catch basin lines to be corrugated metal spiral pipe, ribbed solid poly vinyl chloride or corrugated double wall High Density Polyethylene pipe with a smooth inner wall. The minimum acceptable diameter as per section 4.5.3 i.
- ii. Minimum wall thickness for the CSP to be 2.0 mm where the diameter is less than 500 mm and 2.8mm for all other CSP pipes. HDPE pipes to have a minimum strength of 320 Kpa.
- iii. Each building lot and/or each dwelling unit to be serviced with a 150mm diameter PVC SDR-28 connected to the main line with saddles or tees and capped at the property line. Minimum slope of service lateral to be 2%

4.5.3 Pipe Size and Grade

- i. The minimum acceptable pipe size and slope shall be

	<u>Min. Size</u>	<u>Min. Slope</u>
<i>Lines</i>	375	0.5%
<i>Catch Basin leads Serving one basin</i>	250	1.0%
<i>Catch Basin leads serving two basins</i>	300	1.0%
<i>Rear Yard catch basin</i>	300	1.0%

- ii. In areas where the slope of the land from the building line to the curb exceeds 7% and the rear yard of the lot drains towards the street, under curb drainage shall be provided.

A 150mm diameter perforated pipe with filter sock shall be installed and connected to the closest downgrade catch basin (See detailed drawing 13-1036.)

- iii. Catch basins located in the street may be connected to the main line storm sewer with a manufactured tee and bend, provided the maximum length of the cumulative runs do not exceed 12m. (See drawing 13-1037). All other catch basins must be piped to a main line storm manhole.

Section 4.6 – Manholes/Catch basins

- 4.6.1** Manholes to be either poured in place concrete or precast with a maximum spacing of 110 meters center to center. Manholes must be installed at the end of each sewer, at all changes in sewer size, grade or alignment and at all junctions.
- 4.6.2** Catch basins to be either poured in place concrete or precast located with a maximum spacing of 110m and located upstream of all sidewalks crossing a road and pedestrian crosswalks. Catch basins shall not be located in front of a driveway, generally a maximum of 9m from the boundary on the designated driveway side of the lot.
- 4.6.3** Catch basins and ditching may be required behind curbs, at the rear of properties, and in open spaces as determined by the slope of the land and the grading plan.
- 4.6.4** Catch basins shall be located at street intersection and upstream of all sidewalk extensions, crossing a road, pedestrian mid-block crosswalks, and curb ramps.
- 4.6.5** All main line manholes must be inspection type with a minimal inside diameter of 1200mm complete with benching. Manhole sizing as per the municipal master specification, other configurations to be specifically designed.
- 4.6.6** Mainline storm manholes are not permitted to have grates for storm water collection. Catch basins maybe deep sump non –inspection type with a minimum insides dimension of 600mm x 600mm. All catch basins in the storm system to have a minimum 300mm sump.
- 4.6.7** All precast manholes to have a 24 mil HDPE Wrap (Platon) around the entire exterior perimeter extending down a distance of 2 meters and attached at the top using manufacturer supplied clips, Clips to be spaced a maximum of 200mm on center and attached using Tapcon Screws.
- 4.6.8** A maximum of 150mm of grading rings to be used to adjust the frame and cover/grate to the required grade. These rings may be either concrete or HDPE. If the manhole/basin is located in the driving area or on the sidewalk, a minimum 50mm HDPE must be placed directly beneath the frame and cover/grate. Concrete grade rings less than 50mm thick are not acceptable. Grading rings shall be sealed to the manhole, each other, and the frame using a continuous bead of an approved sealant.

- 4.6.9** The finished grades of all catch basin frames and grates are to be 25mm below the asphalt grade. Asphalt is to be tapered to the frame for a distance of 1.5m from the frame.
- 4.6.10** Catch basin frames and grates located adjacent to curbs to be placed so that the flange of the frame is not located beneath the curb.
- 4.6.11** Manholes are generally located between the back of the curb/sidewalk and the Right of Way boundary. In instances where this is not practical or will result in the need for intermediate manholes a design which has minimal manholes in the street or sidewalk will be accepted. Manholes which are located in any hard surface such as asphalt roadway, or driveway or sidewalk shall have a frame and cover which is an adjustable auto-stable type unit with a tapered frame installed so that the top section of frame moves with the adjacent surface. Manhole covers shall not be located in the wheel path.

Section 4.7 – Connecting to Existing Services

- 4.7.1** Contractor is responsible for connecting all services and road work to the existing. In many instances, this may include work outside the limits of the subdivision’s boundary and onto existing road reservations and roadways.
- 4.7.2** Developer is responsible for the reinstatement of all property damaged during connection process, back to the original condition. This may include, but is not limited to, curb, sidewalk, asphalt, and seeded areas.
- 4.7.3** Temporary asphalt reinstatement to be placed within 14 days of the excavation. This is to include all sub-grade materials consisting of 400mm of 100mm minus rock, 150mm Class “B” and 150mm Class “A” asphalt to be placed at a thickness of 50mm.
- 4.7.4** Developer is responsible for maintaining the street cut until the new street is paved or for a period of 12 months, whichever is greater.
- 4.7.5** At the time the street is paved, the contractor shall make a square cut at least 0.5m beyond the limit of temporary patch and remove all asphalt and granular within the limits of the cut down to either 75mm or 100mm (depending on the street classification) below the grade of the existing road. Granulars to be compacted and tested prior to placing the two lifts of asphalt.

PART 5 SECONDARY SERVICES

- Section:**
- 5.1 – CURB AND GUTTER**
 - 5.2 – SIDEWALKS**
 - 5.3 – CURB RAMPS**
 - 5.4 – WALKWAYS**
 - 5.5 – SODDING**
 - 5.6 – OPEN SPACES AND PLAY LOTS**
 - 5.7 – POSTAL BOXES**
 - 5.8 – CROSSWALKS**
 - 5.9 – SCHOOL BUS STOPS**
 - 5.10 – SIGNAGE**
 - 5.11 – ASPHALT**
 - 5.12 – DRIVEWAYS**

Section 5.1 – Curb and Gutter

- 5.1.1 The concrete curb and gutter shall have a cross sectional shape and dimension as illustrated in drawing 20-1001.
- 5.1.2 The curb and gutter must have a minimum of 150mm compacted granular base material and 400mm of subgrade roadbed material.

Section 5.2 – Sidewalks

- 5.2.1 Concrete sidewalks shall be installed and located as shown on the attached drawings 12-1025 12-1026, 12-1027, 12-1028, 20-1002, and 12-1035. Sidewalks to be located on the side of the street which will result in the least amount of surface run off from lots flowing over the surface.
- 5.2.2 Sidewalk grade shall follow the top of the curb elevation, with a cross sectional slope of 2 % towards the street.
- 5.2.3 Standard size slabs of 1500mm x 2000mm shall be separated by control joints.
- 5.2.4 A minimum of 100mm class “A”, 150mm class “B” compacted base course granular materials, and 400mm of subgrade roadbed material shall be placed beneath the concrete slab.
- 5.2.5 Sidewalk repairs or connection to existing shall be made with a minimum of 2-300 mm 15 m dowels with a slip joint on one side.

Section 5.3 – Curb Ramps

5.3.1 Location

At all locations where a pedestrian is required to cross, enter onto, or exit the street, (i.e. intersections, mid-block crosswalks, walkways and postal stations) a corner curb ramp or curb ramp with flared sides with a maximum curb lip of 13mm is required for access by the physically disabled. See attached drawing 12-1035.

5.3.2 Features

The sloped portion of curb ramps shall have a slip-resistant finish texture contrasted with the adjacent surfaces.

5.3.3 Grade

Curb ramps shall have a gradient of not more than 1 in 10.

Section 5.4 – Walkways

5.4.1 Location

A walkway right of way must be provided;

- i. At or near the bulb of every Cul-de-Sac.
- ii. At a minimum of two locations to each open space.
- iii. In any other obvious area as determined by the lot layout of the subdivision.

5.4.2 Size

- i. Walkway right-of-ways shall be 3 meters wide.
- ii. A 1.5-meter-wide asphalt walkway centered in the right-of-way shall be completed from the back of the curb or sidewalk to the boundary line of the subdivision or adjacent street.
- iii. Curb cut down must be provided for walkway access. See drawing 12-1035.

5.4.3 Grades

- i. The grade of the walkway shall not be greater than 1 in 20 where ever possible. If the existing land contour does not permit this, every effort shall be made to maintain a slope not greater than 1 in 12. If the slope does exceed 1 in 20, then a level rest area must be provided every 9 meters. A maximum side slope of 2% is required.

Section 5.5 – Landscaping

5.5.1 Location

- i. In an area where a new street is bounded by an existing privately owned lot, sod must be placed between the curb/sidewalk of the new street and its right-of-way and blend into existing grade.
- ii. The sod shall be placed so that they are at an elevation no higher than the adjoining surface.

- iii. Areas which have been disturbed by construction shall be reinstated including clearing, grubbing, removal of debris and graded with original or better material by the developer prior to the issuance of substantial completion.

5.5.2 Quality

Sod shall be of a uniform thickness (minimum 50mm) free from weeds, in good condition, and placed on a 100mm thick bed of fertilized topsoil. The topsoil must have a ph level of 6.5 with a tolerance of +/-0.3.

Section 5.6 – Open Spaces and Neighbourhood Parks

- 5.6.1** Depending on the layout and size of the subdivision, an area of not less than 10% of the gross area of the subdivision or 25m² per dwelling unit (whichever is greater) must be allotted for open spaces, neighbourhood parks and green belts.
- 5.6.2** Areas for play lots must be designated in the open spaces and the subdivision contractor may, in lieu of a portion of the subdivision permit fee, have the play lot designed and installed, as per the Town of Gander’s general plan.
- 5.6.3** The extent of open space development shall be indicated in the design. Areas which are not designated as being a developed area shall be identified, protected with flagging or fencing and remain in the original undisturbed condition. In areas where infrastructure, easements or ditches are required to be located, disturbance is to be kept to minimum. All disturbed trees, grubbing and fill are to be removed from the site.
- 5.6.4** The Following are conditions that shall apply when considering appropriate land for open space dedications:
 - i If in the opinion of the Town, no public open space is required, the land may be used for such other public use as the Town may determine;
 - ii The location and suitability of any land dedicated under the provisions of this regulation shall be subject to the approval of the Town, but in any case, the Town shall not accept land which, in its opinion, is incapable of being developed for any purpose;
 - iii The Town may accept from the developer, in lieu of such areas of land, the payment of a sum of money equal to the value of the land which would otherwise be required to be dedicated;
 - iv The Town may require a strip of land to be reserved and remain undeveloped along the banks of any river, brook or pond, and this land may, at the discretion of the Town, constitute the requirement of land for public use. The Town of Gander is not obligated to keep land donated for open space use as open space use and reserves the right to use it and or rezone it for any use considered appropriate by the Town.

- 5.6.5** Open space means space that is open to the sky and suitable for active or passive recreation or gardens; this space shall be free of automotive traffic, parking and undue hazard, and readily accessible by all those for whom it is intended.
- 5.6.6** A neighbourhood park is defined as land to accommodate the needs of local or neighbourhood residents and include parkettes, tot-lots, playgrounds, sitting areas and small sports fields. The standard provision of neighbourhood parks is 1.0 hectare per 1000 population with a catchment area of 0.8km radius. Housing density is considered to be 2.5 persons per dwelling.
- 5.6.7** In small scale residential developments, less than 400 dwelling units, developers may be required to reserve a block of land having a minimum street frontage of 40m with a minimum area of 2400m² to form part of the minimum neighbourhood park requirement. If a neighbourhood park is deemed unnecessary by Town Officials the developer will be required to contribute towards the cost of a previously allocated neighbourhood park to which their subdivision is availing.

In large scale comprehensive residential developments which when are fully built out will contain more than 400 dwelling units developers shall reserve a block of land having a minimum street frontage of 40m with a minimum area of 2400m² to form part of the minimum neighbourhood park requirement. This park area must be defined in the approved overall concept plan of the development and shall be located in an area which satisfies the needs of the Town of Gander. This area will normally be available for construction by the Town of Gander in a stage at or before the stage in which 200 dwelling units are constructed. Additional parcels of park land with street frontage may be required to fulfill the requirements depending on the overall size and layout of the development.

- 5.6.8** Developers of small scale residential developments who are required to allocate a neighbourhood park will be reimbursed a pro-rated fee from the developer of an adjacent property who utilizes that neighbourhood park. The Town of Gander will calculate, collect and distribute those funds.

Section 5.7 – Postal Boxes

5.7.1 Location

Areas for postal boxes must be designated as determined by officials of Canada Post and approved by the Town of Gander. Postal boxes to be located no closer than 1.5m from the curb or sidewalk.

5.7.2 Requirements

Curb cut down must be provided for access to the postal box. See drawing 12-1035.

Section 5.8 – Crosswalks

5.8.1 Location

- i. Crosswalks are to be located,
 - Where sidewalks are interrupted by street intersections
 - Where pedestrians are required to cross a street to continue on a sidewalk.
 - Any other obvious location as determined by the layout of the subdivision.

5.8.2 Requirements

Curb cut down must be provided at the location of all crosswalks. See drawing 12-1035.

Section 5.9 – School Bus Stops

The Developer shall contact the local school busing authority to discuss the designation of potential bus stop locations.

Section 5.10 – Signage

5.10.1 Location

Prior to issuance of Building Permits, regulatory and warning signs shall be placed in locations as determined by the Town of Gander in accordance with the current edition of the Manual of Uniform Traffic Control Devices for Canada. Two- way street names signs to be placed at the locations of all intersections on the same post as the Stop sign. The bottom of the sign to be mounted 2.0m from finished ground. Refer to Drawing 12-1078.

5.10.2 Requirements

- i. Regulatory and Warning Signs - All signs to be manufactured using Retro Reflective sheeting material (minimum engineer grade) mounted on aluminum backing material not less than 12 gauge thick. Sign to be secured to steel post using two pieces of 3” channel measuring 4” long for each attachment bolt.
- ii. Street Name Signs – Street name signs to be standard reflective street blank stock, 150mm high, 064 thick aluminum with 75mm to 100mm high black letters, height to depend on the length of name. Sign to be a minimum of 60cm long or as required depending on the street name.

- iii. Posts- Sign posts to be 2 ½ “pipe” (2.875 O.D.) galvanized steel, schedule 40, complete with galvanized steel cap and 50mm x 50mm x 6mm galvanized steel tee, measuring 60 cm, welded to the bottom of the post . Sign post to be buried a minimum of 1.2m.

Section 5.11 – Asphalt

5.11.1 Asphalt Streets

- i. Asphalt paving specifications and asphalt mix design to be as per specifications detailed in Form 330 of “The Department of Transportation and Works Specifications Book”, with the exceptions as noted in the Municipal Water, Sewer and Roads Specifications. This publication is available on the Department of Transportation and Works’ Website under publications as the following link: <http://www.tw.gov.nl.ca/publications>.
- ii. Asphalt ramp or tapered milling is to be used to transition from existing surface course asphalt to new base course asphalt. Ramp or tapered milling to be removed prior to placement of surface course asphalt.
- iii. Prior to placement of surface course asphalt, the base asphalt shall be inspected by the Director of Engineering or designate. Sectional repairs to damaged asphalt identified and repaired by the developer prior to the placement of surface course asphalt.
- iv. Entire asphalt area to be cleared, removing all debris including gravel and silt prior to the application of Tac coat followed by surface course asphalt.

5.11.2 Asphalt (Walkways)

- i. Sub Base
Excavate or fill with approved material to obtain desired grade. Scarify and reshape to a depth of 150mm below Class B and remove any objects exceeding 150mm in diameter. Compact remaining granular.
- ii. Base
Supply place and compact 100mm of certified Granular “A” and 150mm Granular “B”.
- iii. Asphalt
A minimum of 50mm of approved asphalt to be placed. In areas 2.4 meters or wider, asphalt to be placed with an asphalt spreader.

Section 5.12 – Driveways

- i. Driveways shall generally be located on the high side of the lot.

- ii. On a corner lot, a second driveway may be approved off the secondary street. Both driveways should be on the side away from the intersection.
- iii. Adjacent driveways on adjoining building lots shall be avoided as much as possible. In the case of duplex lots, double driveways may be unavoidable.
- iv. Creation of a driveway adjacent to an existing developed driveway is not permitted.

PART 6 – APPENDICES

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Appendix A

Development Approval Checklist

All items below form a part of a checklist that must be completed in its entirety and submitted for approval by the designer prior to submission of construction plans for approval.

- Development Application and Fee
- Legal Survey indicating *Developers* ownership of all land outlined within the *development area* or written consent from all land owners involved in the subdivision
- Two sets of drawings showing the subdivision which shall include:
 1. Overall location plan (if required)
 2. The preliminary lot layout as per section 1.1.2. iii. This may be required to be submitted on more than one drawing depending on the size of the development and the density of the information presented in the plan.

All plans shall be stamped and signed by a professional engineer.

Appendix A.1

Subdivision Development Application

**Town of Gander
Subdivision Development Application
Planning & Control**

Date: _____ Permit # _____ Fee \$200.00

Agent: _____

Mailing Address: _____

Email Address: _____ Phone Number: _____

Developer: _____ Consultant: _____

Application Information (Attach Preliminary Layout, Survey, Consent, Fee, (See section 1.1))

Location of Development: _____ Land Ownership: _____

Development Name and Phase: _____ Drawing # _____

Description of Proposed Development:

DECLARATION: I hereby submit this application and confirm that the information supplied is correct and complete to the best of my knowledge. I agree to comply with all Municipal Regulations and applicable codes, and not to commence development without written approval and permits from the Town of Gander

Office use only

The area applied for is zoned _____

The proposed use is ___ Permitted ___ Discretionary ___ Not Permitted

Approved

Approved (Subject to conditions)

Not Approved

Comments _____

Signed (Planning & Control Technician)

Date

Appendix B

Construction Plan Approval Checklist

All items below form part of a checklist that must be completed in its entirety and submitted for approval by the designer prior to final approval and completion of subdivision development agreement.

- Completed and approved Development Application
- Legal Survey of Land
- Two sets of completed construction drawings which comply with all applicable regulations
- Open Space requirements satisfied
- Legal Lot Plan Layout stamped and signed by a Newfoundland land surveyor.
- All drawings are stamped and signed by a registered professional engineer which confirms that they have reviewed the plans and are certifying compliance with all applicable regulations.
- If this is a second or subsequent review, a detailed list of all corrections, as well as, any changes must be provided.

NOTE: Review will stop and plans will be returned to consultant /designer once more than five errors are noted on the plans.

Appendix B.1

To be completed by Plan Review Technician

Subdivision Plan Review Checklist

Name of Subdivision:	_____
Project Number:	_____
Date Plan Received:	_____
Date Plan Reviewed:	_____
Reviewed By:	_____

Is this the first review? Yes No 2nd 3rd after 4 and no approval, consultant to meet with the Director of Engineering.

Are the drawings stamped and signed? Yes No
If no, return to consultant.

Are there more than five errors? Yes No
If yes, stop review and return to consultant.

Check drawings for content including:

- Title Sheet
- Master Plan
- Control Plan
 - Bearing and distance around perimeter
 - Center line alignment of streets
- Plan and Profile
 - Underground pipework
 - Pipe size
 - Invert elevations
 - Location of all curb stops, bends, valves, hydrants, catch basins, manholes
 - Profile of existing and proposed finished grade
- Vertical Contour Plan
 - Percent slope
 - Vertical PI

- Length of curve
- Detail Sheet
 - Cross sections
 - Water and sewer trench
 - Curb/sidewalk
 - Walkways
 - Manholes and catch basins
 - Typical service connection
 - Details of special features

Check the following specific items:

Water Systems

- Size of main
- Valve locations
- Water main looped
- Curb stops indicated
- Depth of bury (1.8m min.)
- Hydrant spacing (150m max)
- Hydrant 3m (min.) from driveway and curb stop
- Hydrant min 2m max and max 4m from sidewalk/curb
- Bend sizes

Storm Sewer System

- Manhole/catch basin spacing (110m max.)
- Manhole location (off street, not in driveway or sidewalk)
- Catch basin location (not in driveway)
- Minimum sump requirement
- Invert in and invert out (5cm or 15cm min.)
- Depth of bury (2.4 min.)
- Slope of pipe (0.5% min.)
- Membrane noted on detail

Sanitary Sewer System

- Manhole spacing (110m max.)
- Manhole location (off street, not in driveway or sidewalk)
- Depth of bury (2.4 min.)
- Slope of pipe (0.6% min.)
- Invert in and invert out (5cm or 15cm min.)
- Membrane noted on detail

Street

- Road width
- Curb/sidewalk details
- Radius at intersections (12m collector and Arterial), 8m for all others)
- Cul-de-Sac bulb design
- Road slope (0.6% min. and 10% max.)

- Centre line radius (90 collector and arterial, 50m local, 35m cul-de-sac and crescent)
- Vertical curve minimum (7k or 11k, mm l = speed in metres)
- Walkways indicated with grass
- Crosswalk curb cut downs
- Paraplegic Ramp locations

General

- Connect to Existing services details
- Postal box location
- Bus stop location
- Driveway location
- Utility easements identified

COMMENTS:

PLAN REVIEW COMPLETED BY: _____

Date

Signature

Approved _____

Approved as noted _____

Return for Revisions _____

Appendix C

Subdivision Agreement and Final Approval Checklist

All items below form part of a checklist that must be completed in its entirety and submitted for approval by the designer prior to completion and issuing of a Subdivision Permit

- Development Application Approval
- Legal Survey indicating *Developers* ownership of all land outlined within the *development area* or a written consent from all land owners involved in the subdivision.
- Construction plan approval
- Five sets of construction drawings as outlined within this document
- Two copies of the approved survey plan
- Two copies of the approved grading plan
- Geotechnical report (if required)
- Traffic Impact Study (if required)
- Environment Site Assessment (if required)
- Permit to construct from the Department of Environment and Conservation
- Utility Easements Identified
- Securities Paid
- Development fee paid
- Open space requirement satisfied
- Development agreement signed

Appendix D

Acceptance of Stage I Works Form

All items below form a checklist that must be complete in its entirety and submitted for approval by the developer prior to acceptance of stage I work and issuance of building permits. Building permit will be able to be issued by the Town of Gander within 10 days of receipt of written request from the developer provided all required documentation has been received and the work is accepted.

- The work completed as per the approved plan to a stage where Town officials can inspect and approve the work checklist as attached as Appendix D.1
- Sewer system tests are complete and copies of video inspection recordings and reports are in the possession of the Engineering Department.
- Concrete test results for curb and gutter received and approved
- Asphalt test results for base course asphalt received and approved
- Written confirmation received from Department of Health indicating two consecutive satisfactory water samples at all tests locations
- As built elevations of service laterals and fire hydrants operating nuts
- All other items as indicated on the checklist and referenced in the contract documents

Appendix D.1

Acceptance of Stage 1 (Partial Completion) Checklist

Subdivision

Partial Completion Checklist

CHECKLIST

Name of Subdivision: _____

Project Number: _____

Phase of Subdivision: _____

Area Requesting Partial Completion Status: _____

Date Checklist Completed: _____

By: _____

UNDERGROUND SERVICE COMPLETED

Yes	No	N/A	Initial	<u>Sanitary Sewer</u>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Sanitary Sewer Mains
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Manholes installed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Manhole covers adjusted to grade
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Manhole benching in place
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Manhole ladders installed and aligned
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Manhole covers installed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Manhole covers adjusted to finished grade
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Platon Membrane around Manholes
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Sanitary Sewer Service lines c/w marker
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Infiltration/Exfiltration test of main line

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Lift Station installed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Forcemain main pressure tested
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Lift station commissioned and approved
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	"Best" locks installed on Lift Station
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Video Tape Inspection Received
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Inflow Protectors Installed

Yes	No	N/A	Initial	<u>Storm Sewer</u>
-----	----	-----	---------	---------------------------

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Storm Sewer Mains
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Manholes installed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Catch Basin installed (Street)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Catch Basin (off Street)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Grouting Inside
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Ladders installed and aligned
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Grouting outside
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Storm Sewer Service lines
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Platon around Manhole/Catch Basin
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Inlet Rip Rap/Headwall
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Outfall Rip Rap/Headwall
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Railing on headwalls
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Debris racks installed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Camera Inspection completed and approved
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Video Tape Inspection Received
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Camera Inspection completed and approved

Yes	No	N/A	Initial	<u>Water Lines</u>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Water Main Installed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Valves and Valve Boxes Installed to finished grade
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Thrust Blocks
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Fire Hydrants and Valves adjusted to finished Grade
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Service Lines Installed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Curb Stops adjusted to finish grade
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Swab and flush main line
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Pressure Leakage Testing completed and passed
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Disinfection (test results separate form)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Flushing complete
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Bacteriological Testing (sample collection as per Master Specifications by Dept of Health Officials) two consecutive
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Approval from Dept. of Health to Activate Line

ABOVE GROUND WORK

Yes	No	N/A	Initial	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Newfoundland Power Easement Drawings reviewed and approved
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Letter of Approval from Canada Post
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	Letter of Approval from School Board

- _____ Drainage and Grading Plan Approved
- _____ Ditching and swales completed as per construction drawings and grading Plan
- _____ Subgrade Elevation Approved for Placement of Class "B"
- _____ Letter from Independent Lab Confirming Class "B" Meets Specifications
- _____ Class "B" elevation approved for placement of Class "A"
- _____ Hydrant Markers Installed (Town approved type)
- _____ AS BUILT elevations of laterals at property boundary
- _____ Street and stop signs installed
- _____ Curb profile approved for placement
- _____ Curb alignment and elevation as per approved plan
- _____ Curb Backing in place
- _____ Concrete testing completed air and slump meet MMS
- _____ Concrete strength meets minimum requirements
- _____ Class "A" tested and approved
- _____ Class "A" elevation approved for placement of asphalt
- _____ Asphalt mix design submitted and approved
- _____ Base Course asphalt placed as per specifications and app'd plan
- _____ Paved Temporary Turn around installed 11.5m radius min

Appendix E

Acceptance of Stage II Works Form

All items below form a checklist that must be completed in its entirety and submitted for approval by the developer prior to acceptance of Stage II Works and issuance of substantial completion. Securities will be released by the Town of Gander within 10 days of receipt of written request from the developer provided all required documentation has been received and work is accepted.

- Subdivision Plan as per Town Standards, Master legal survey plan of development, both plan and description
- Concrete test results for sidewalk received and approved
- Base asphalt inspected prior to surface placement
- Asphalt test results for surface course received and approved
- Compaction test results for sub-grade works to the limits of the right of way received and approved
- Legal survey of land to be transferred to the Town of Gander (street right-of-ways, easements, open space, etc.)
- Inspection of Stage II works and approval by the Town
- As built drawings received and approved
- Correction of all noted deficiencies in excess of limits as outlined in the development agreement

Appendix F

Sample Subdivision Permit

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

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

- a) The development being done in accordance with the engineering drawings reviewed by the Engineering Department of the Town of Gander Drawing Number _____ Revision Number _____ Dated _____
- b) The developer shall provide the Town with as built drawings in hard copy and digital format showing all as-built information prior to final release of securities associated with the subdivision.
- c) During the course of construction of the subdivision, a lot or lots identified that may be backfilled or that require backfill will require written confirmation in the form of a subsurface investigation from an engineer licensed to practice in the Province of Newfoundland and Labrador that the lot is appropriate for the building and its use. (Reference N.B.C.C4.2. Foundations). The developer shall provide this confirmation to the Town of Gander.
- d) The developer shall supply or have Newfoundland Power supply the Town with drawings showing necessary utility easements and right-of-ways for street lighting.
- e) Legal survey information is required for subdivision boundaries, lot layouts, easements and Right of Ways.
- f) The applicant shall transfer to the Town of Gander at no cost to the Town:
 - 1) All lands in the area proposed to be developed or subdivided which are approved and designated by the Town for public use as streets, emergency access roads, utility right-of-ways, sidewalks or other right-of-ways or for other public uses and open space owned by the developer.
 - 2) All services or public utilities including water supply and distribution, sanitary and storm drainage systems installed in the subdivision that are normally owned and operated by the Town.

- g) No individual building permits will be issued until such time as security, satisfactory to the Town, has been posted to ensure completion of the subdivision in accordance with the Subdivision Permit and Development Regulations.
- h) No change in work shall be carried out in any portion of the subdivision without prior approval from the Director of Engineering or designate.
- i) Occupancy permits will not be issued to new homeowners until the subdivision has reached the "stage I" completion phase.
- j) The sub grade shall be excavated to a minimum depth of 0.65m below existing ground levels or a minimum of 0.75m below finished grade, whichever, is lower. It may be necessary to excavate to greater depths if determined by the Town's Engineering Department in consulting with the developer's engineer, depending on the conditions of the existing materials.
- k) The contractor/developer must notify the Town prior to commencement of work for the subdivision and is required to notify the Director of Engineering or designate prior to any service testing taking place.
- l) Construction of road signage, including stop signs, street names, parking, cul-de-sac signs and signs for public safety are the responsibility of the contractor/developer. All road signage shall be in accordance with the Town of Gander standards and the Town shall approve the signage and materials prior to installation.
- m) Environment approval required for water, sanitary, and storm sewer.
- n) Street grading for connection to existing streets to be coordinated with the Town of Gander's Engineering Division.

(9) The reasons for the IMPOSITION OF CONDITIONS OF THE CONSENT ARE:
 To comply with the current Development Regulations and the Design Standards for Streets and Subdivisions of the Town of Gander. To comply with the requirements of the Department of Environment and Conservation and the standards of the specifications for municipal services as published by the Department of Municipal Affairs and Environment. To comply with the requirements of the Town of Gander's Engineering Division.

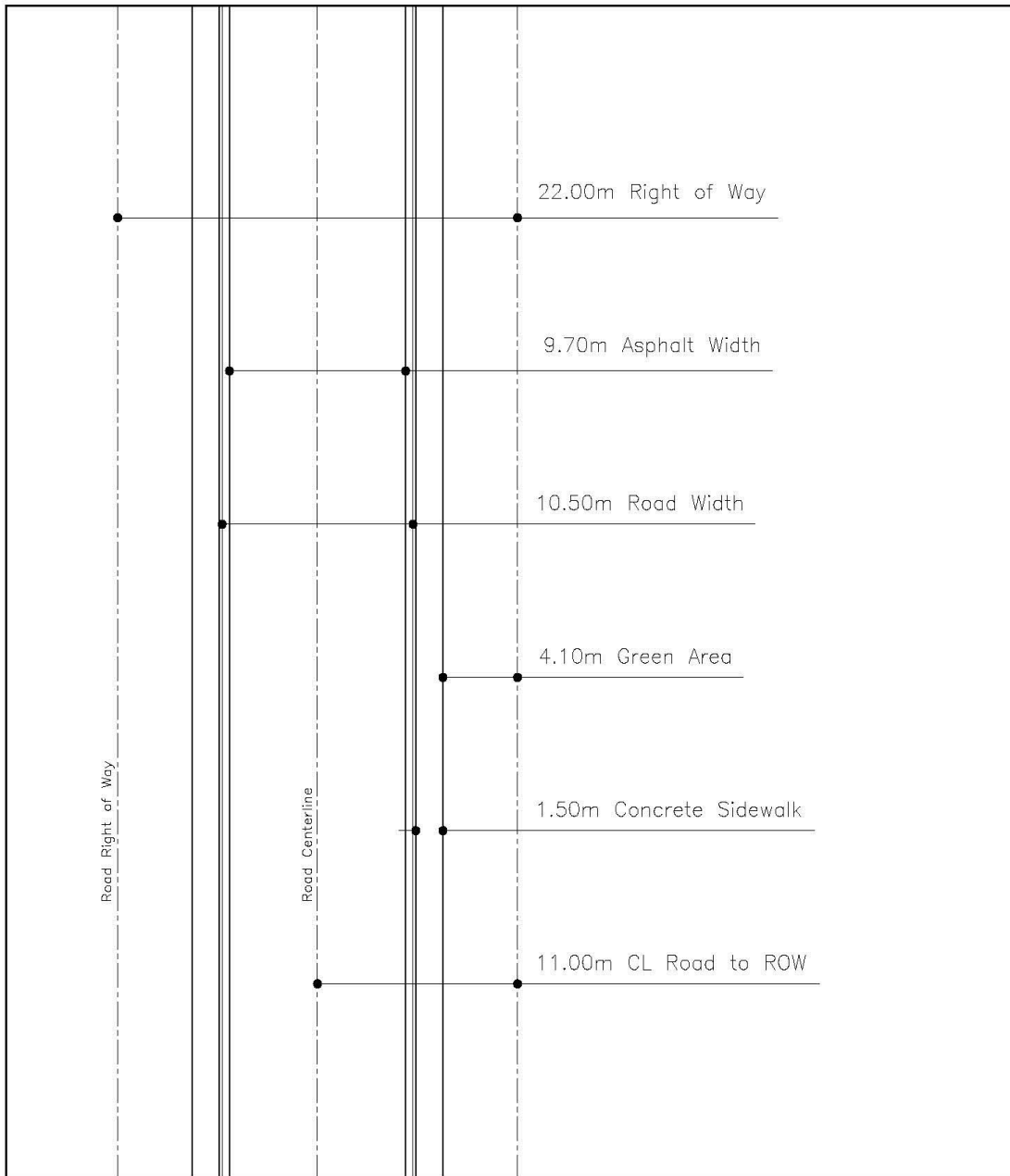
DATED: _____

 Chief Administrative Officer

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

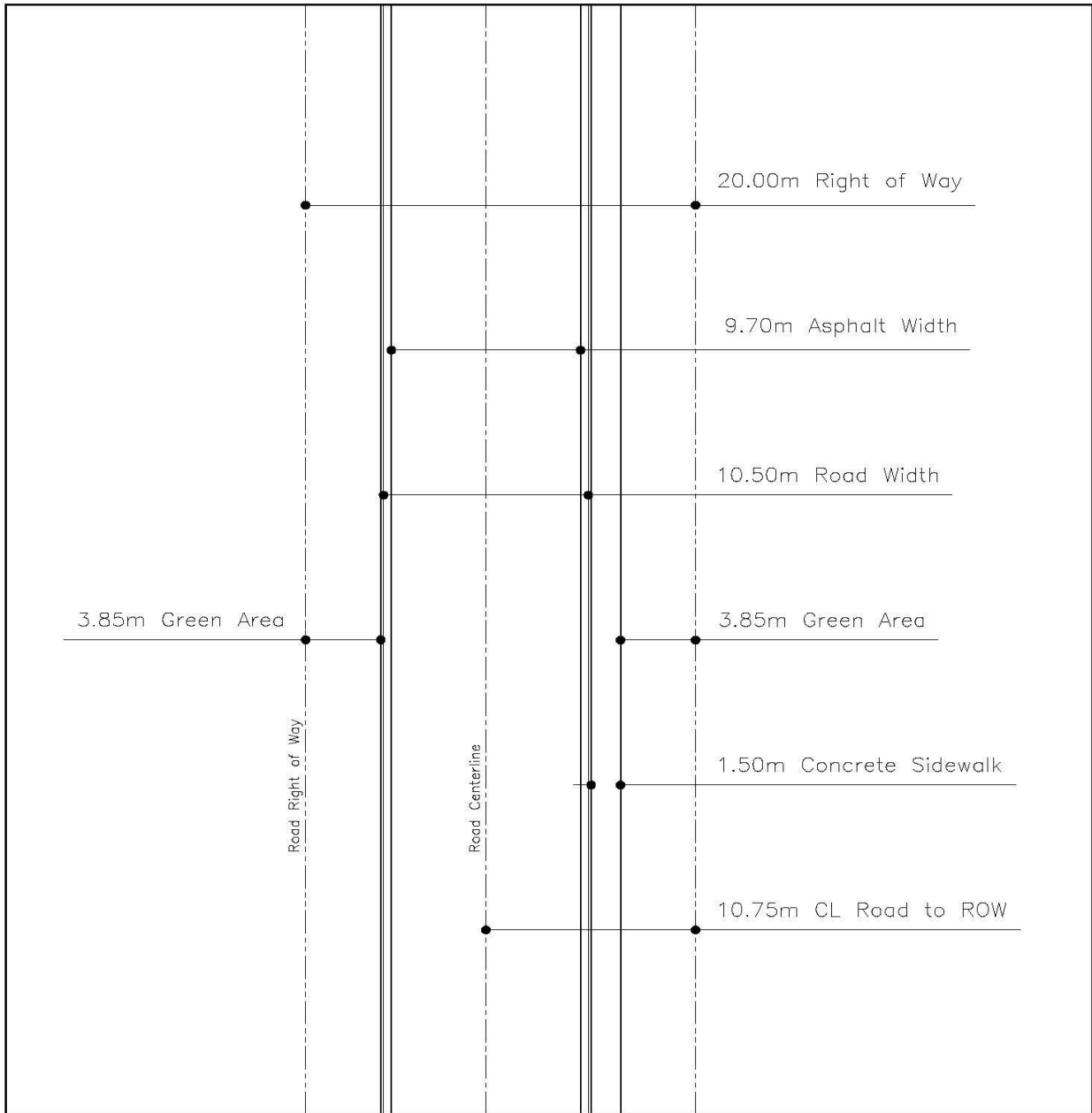
PART 7 -DRAWINGS

12-1025	COLLECTOR 2 - PLAN VIEW (Commercial)
12-1026	COLLECTOR 1 - PLAN VIEW
12-1027	LOCAL 2 - PLAN VIEW
12-1028	LOCAL 1 - PLAN VIEW
12-1031	ASPHALT WALKWAYS
12-1032	CUL-DE-SAC - PLAN VIEW (OFFSET BULB)
12-1033	CUL-DE-SAC -PLAN VIEW (CENTERED BULB)
12-1035	CURB RAMPS
12-1078	STOP SIGN PLACEMENT
13-1029	ROADWORK – TYPICAL CROSS SECTION
13-1030	WATER & SEWER – TYPICAL CROSS SECTION
13-1036	CURB DRAINAGE
13-1037	CATCH BASIN TEE CONNECTION
19-1004	FIRE HYDRANT LOCATIONS
20-1001	CURB DETAIL
20-1002	CONCRETE SIDEWALK



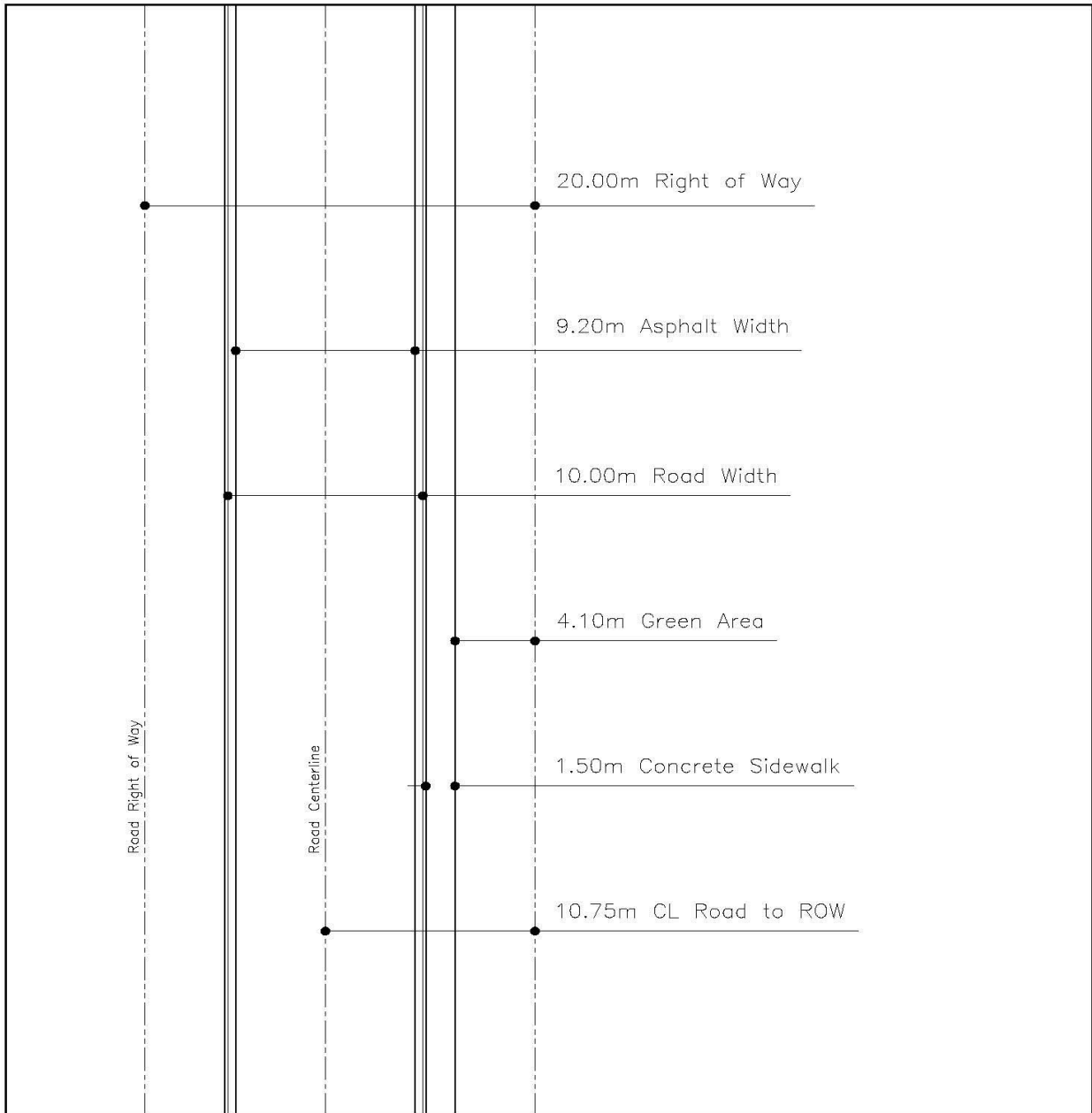
Project Plan View Collector 2 (Commercial)	Drawn By S. Blundon	Scale 1 : 300
	Date Jan. 07, 2020	Drawing No. 12-1025R1

Town of Gander – Design Standards For Streets and Subdivisions 2020(R18)



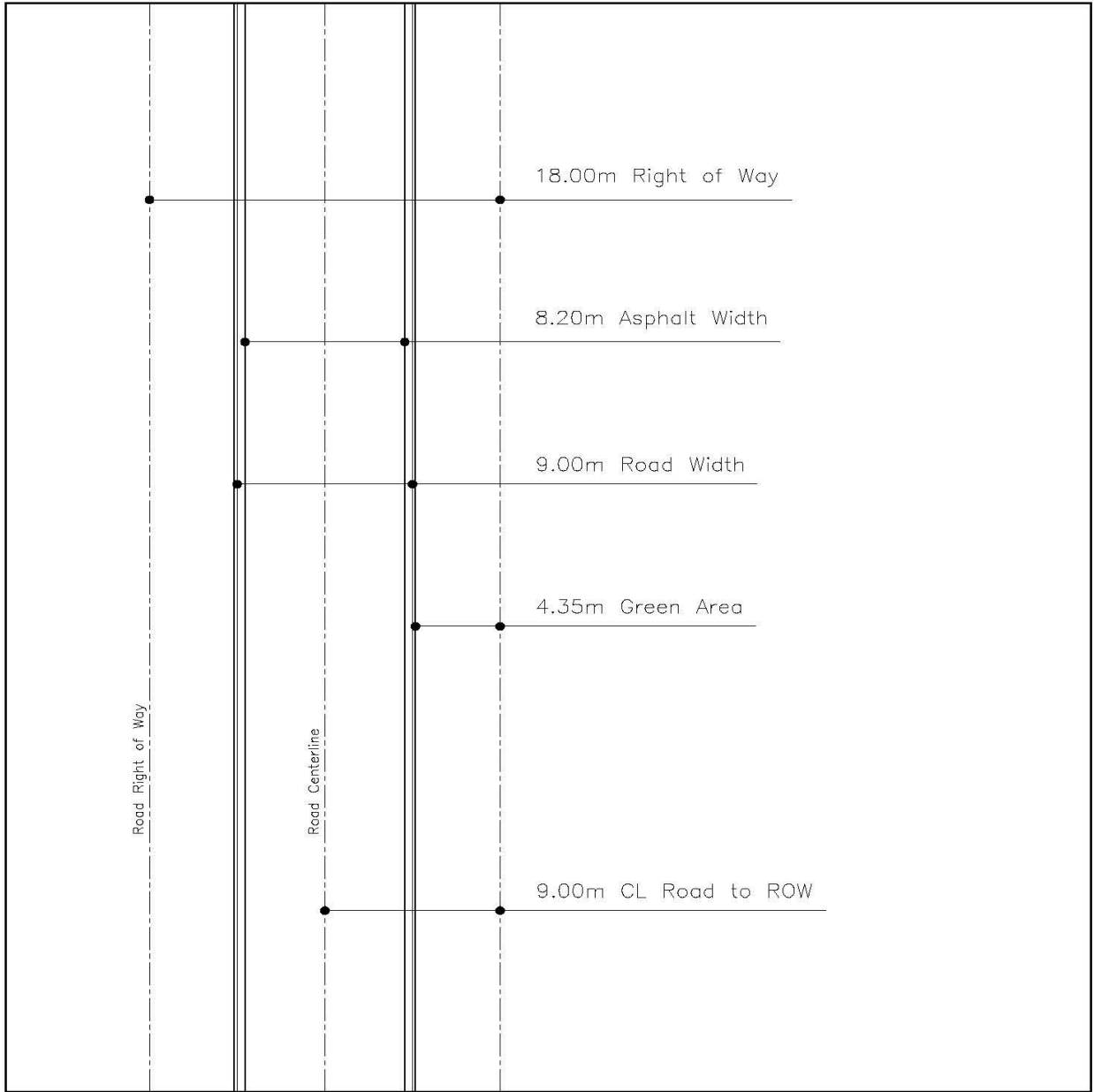
Project Plan View Collector 1 (Residential)	Drawn By S. Blundon	Scale 1 : 300
	Date Jan. 07, 2020	Drawing No. 12-1026R1

Town of Gander – Design Standards For Streets and Subdivisions 2020(R18)



Project Plan View Local 2	Drawn By S. Blundon	Scale 1 : 300
	Date Jan. 07, 2020	Drawing No. 12-1027R1

Town of Gander – Design Standards For Streets and Subdivisions 2020(R18)

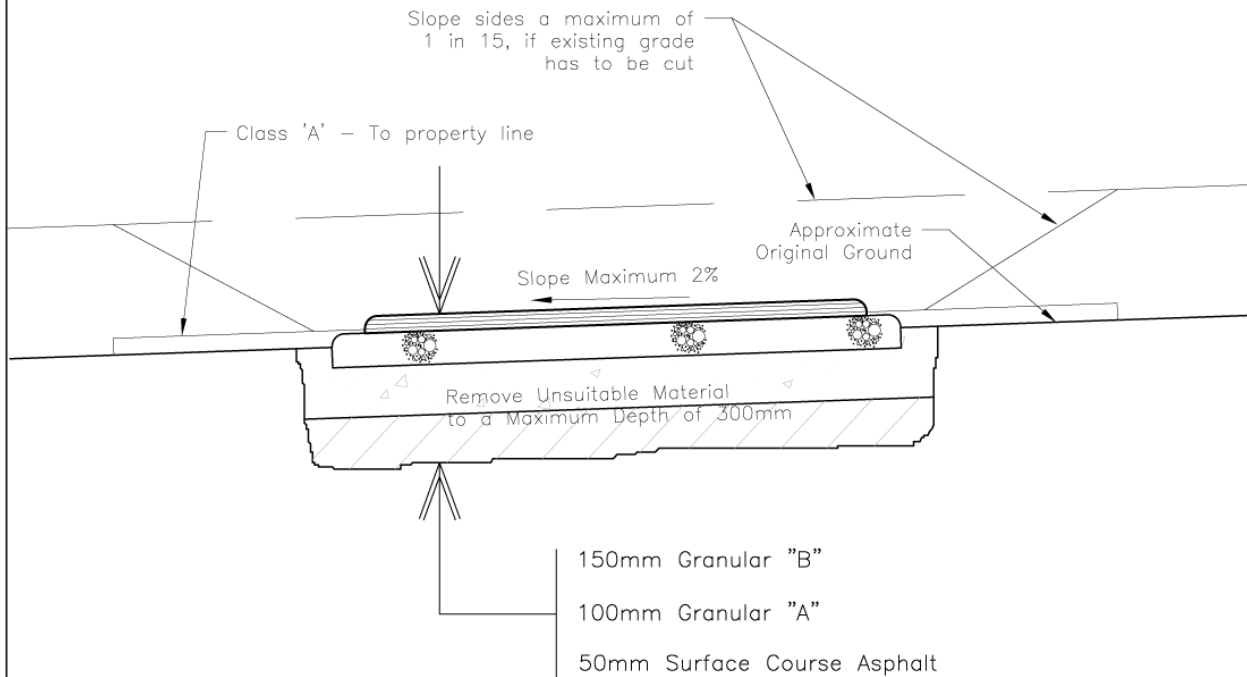


Project <p style="text-align: center;">Plan View Local 1</p>	Drawn By S. Blundon	Scale 1 : 300
	Date Jan. 07, 2020	Drawing No. 12-1028R1

Town of Gander – Design Standards For Streets and Subdivisions 2020(R18)

NOTE:

1. All walkways must be graded to follow the existing land contour. If the existing contour exceeds a slope of 1 in 20 then every effort must be made to maintain a maximum slope of 1 in 12.
2. A level rest area (minimum 1500 x 1500mm) must be provided every 9 meters where the slope exceeds 1 in 20.



Project

Section - Asphalt Walkway

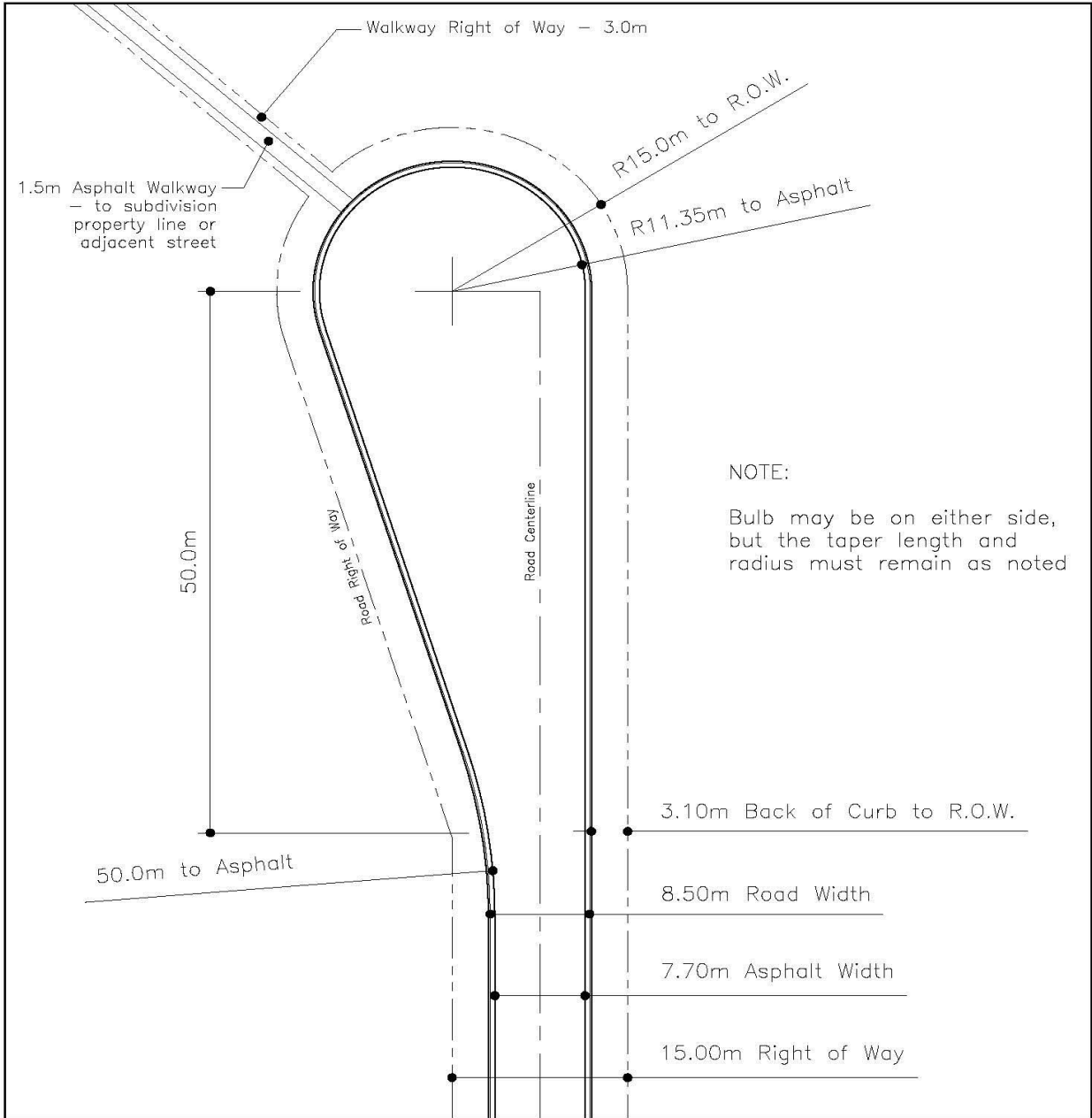
Drawn By
J. Ball

Date
Jan. 29, 2013

Scale
1 : 20

Drawing No.
12-1031R1

Town of Gander - Design Standards For Streets and Subdivisions 2015(R14)



Project
 Plan View
 Cul-de-Sac – Offset Bulb

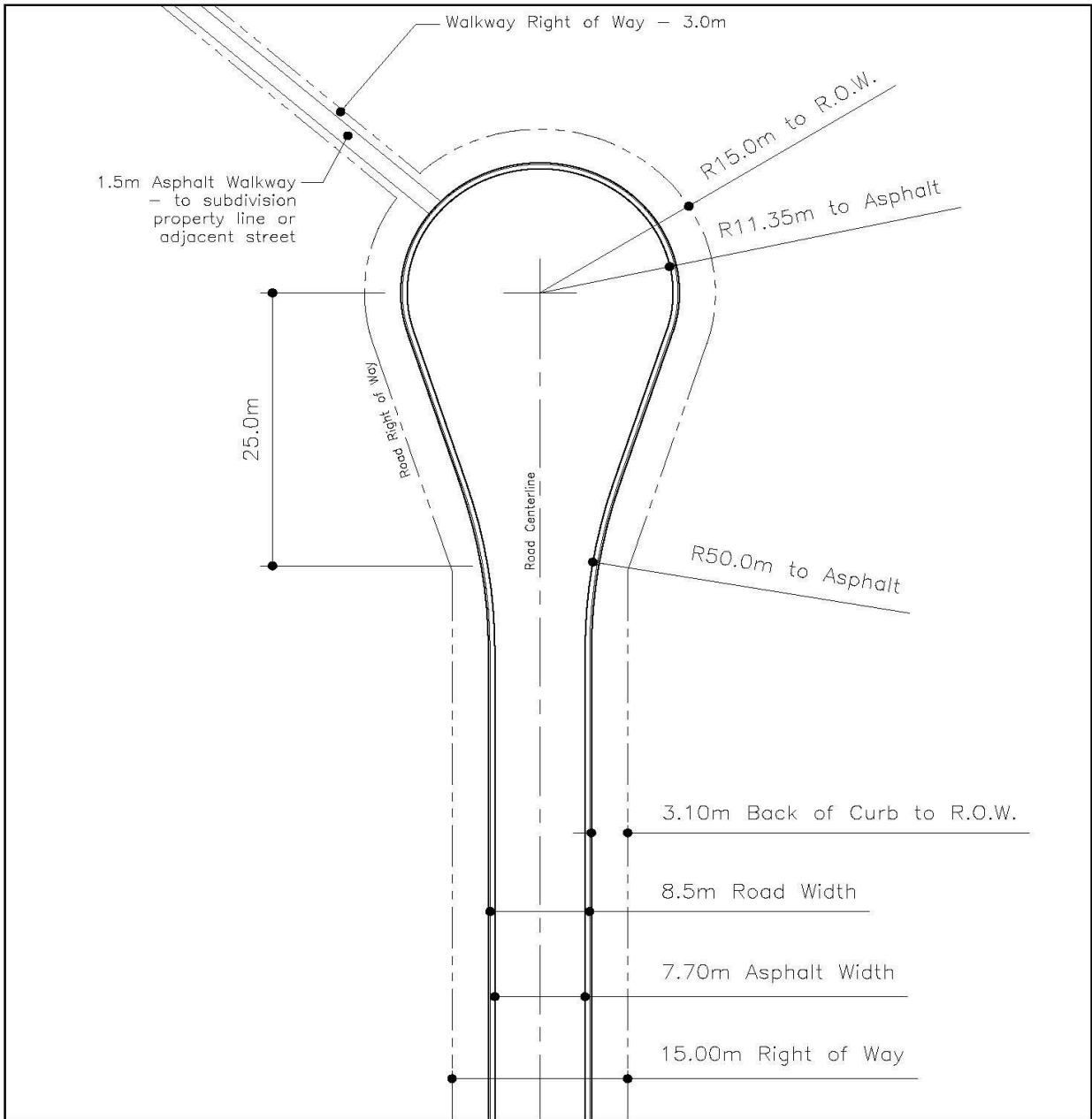
Drawn By
 S. Blundon

Scale
 1 : 500

Date
 Jan. 07, 2020

Drawing No.
 12-1032R2

Town of Gander – Design Standards For Streets and Subdivisions 2020(R18)



Project
 Plan View
 Cul-de-Sac – Centered Bulb

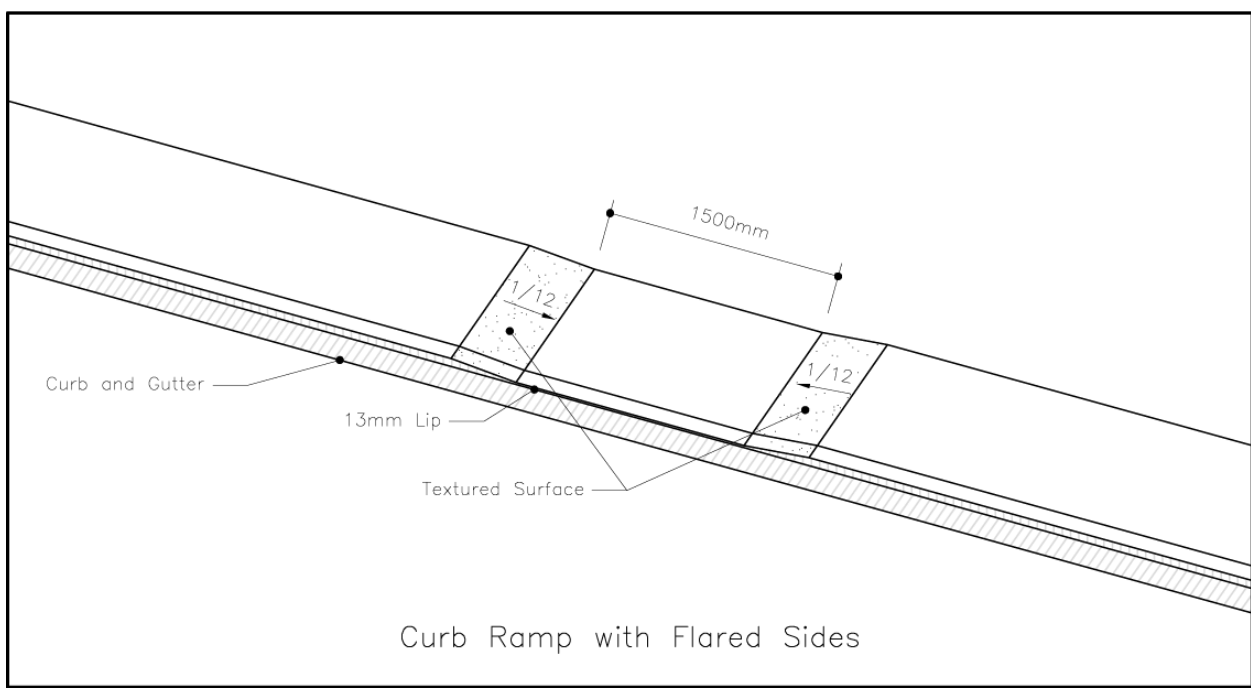
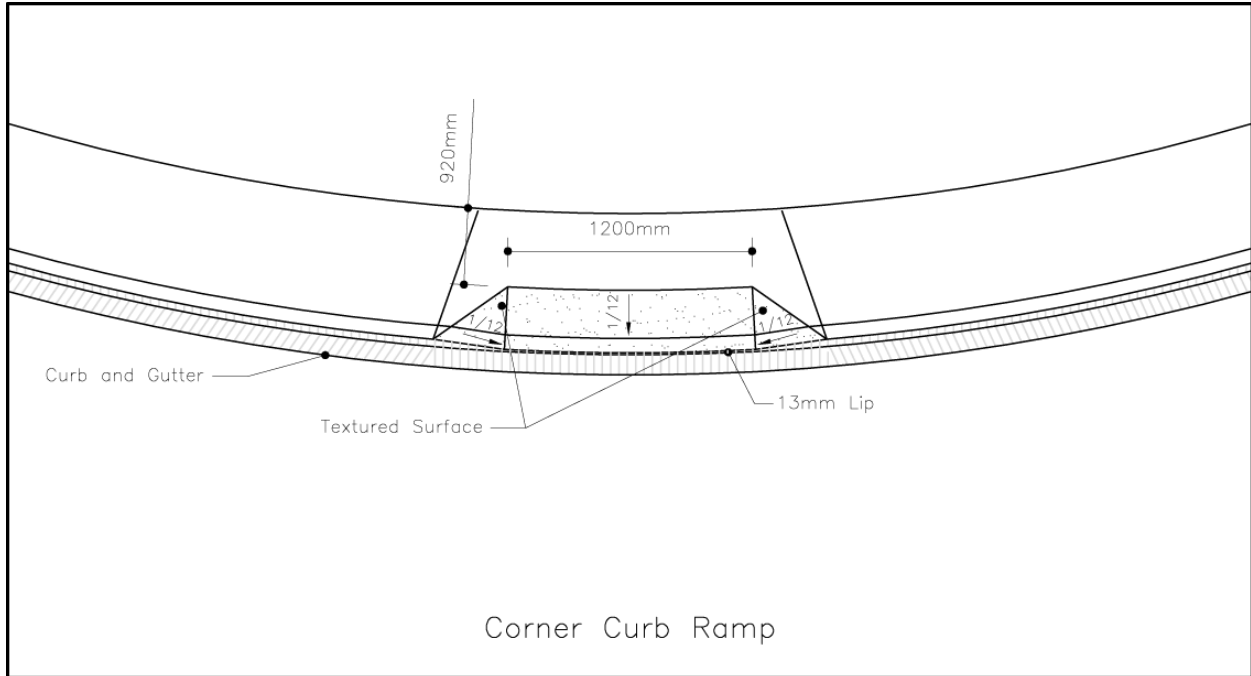
Drawn By
 S. Blundon

Scale
 1 : 500

Date
 Jan. 07, 2020

Drawing No.
 12-1033R2

Town of Gander – Design Standards For Streets and Subdivisions 2020(R18)



Project
Curb Ramp Details

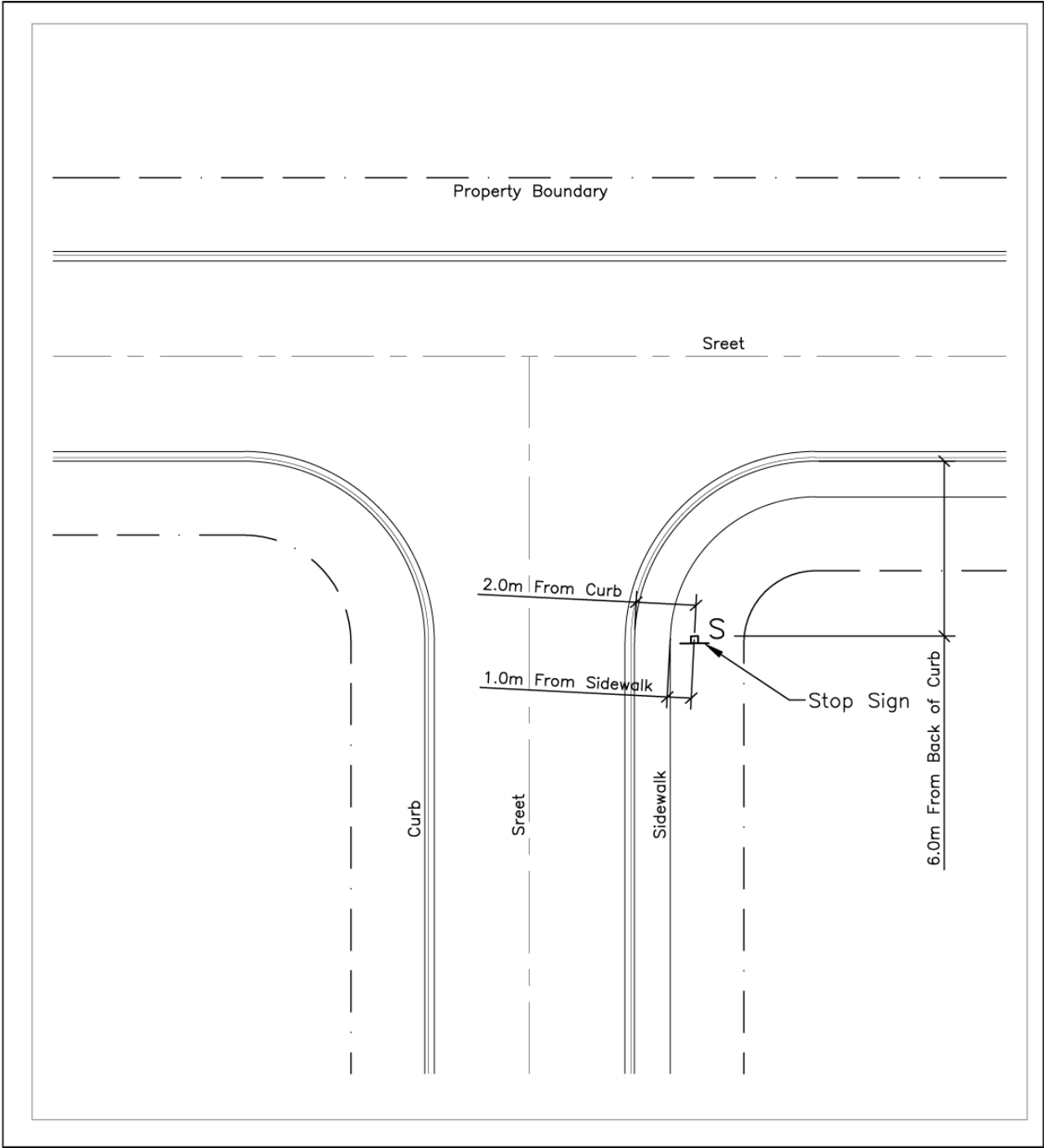
Drawn By
S. Blundon

Scale
N.T.S.

Date
April 2, 2012

Drawing No.
12-1035

Town of Gander – Design Standards For Streets and Subdivisions 2015(R14)



Drawing Title:
 Typical Stop Sign Placement

Drawn By:
 S. Blundon

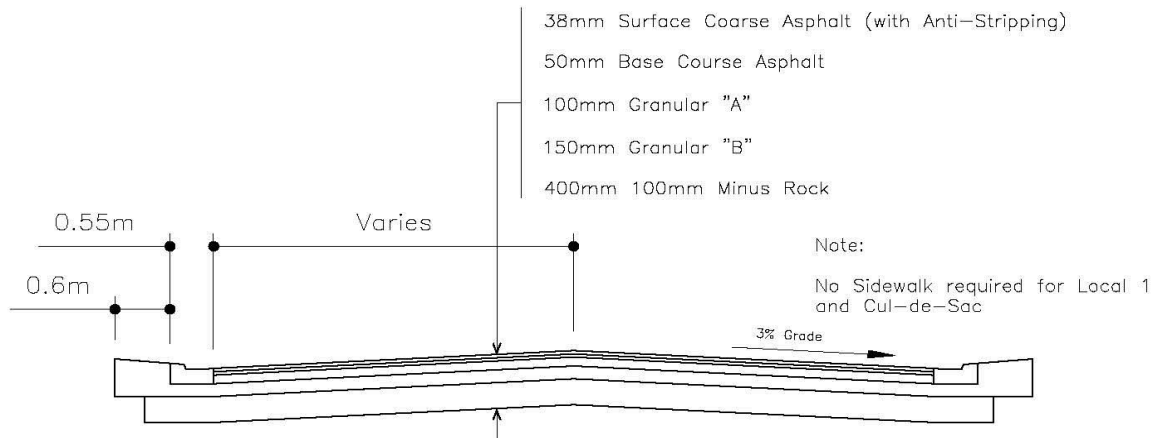
Scale:
 N.T.S.

Date:
 August 24, 2012

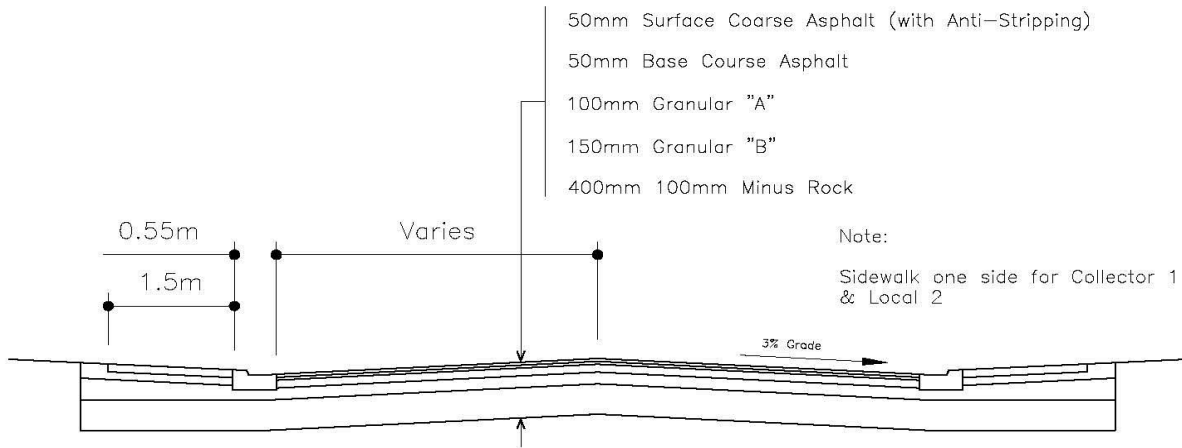
Drawing Number:
 12-1078

Town of Gander – Design Standards for Streets and Subdivision 2015(R14)

Local 1 & Cul-de-Sac



Collector 1 (Residential), Collector 2 (Commercial) & Local 2



Project

Road Work
 Typical Cross Sections

Drawn By
 S. Blundon

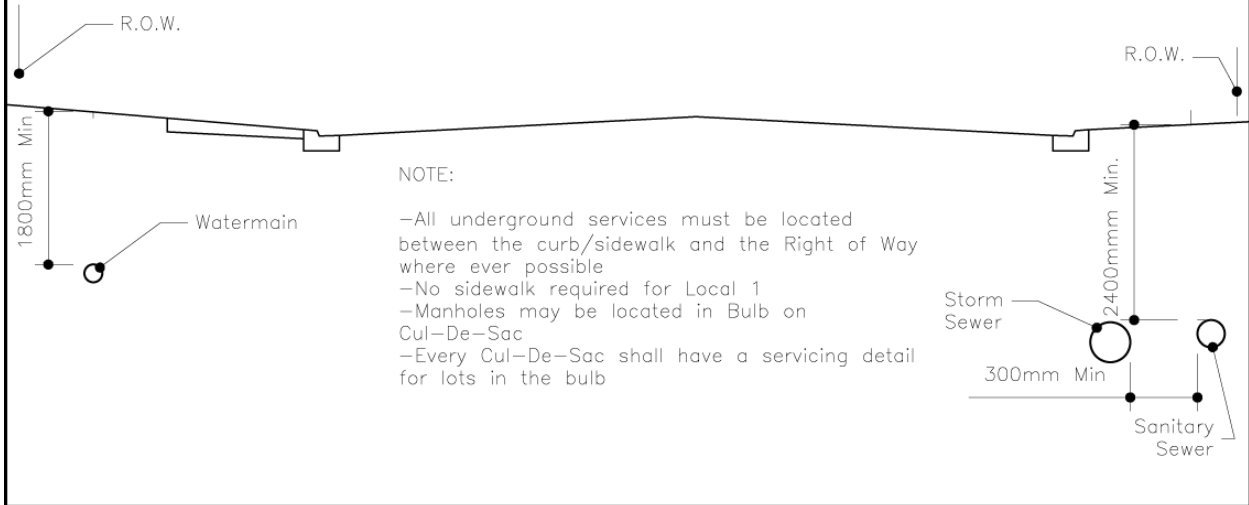
Scale
 N.T.S.

Date
 Jan. 07, 2020

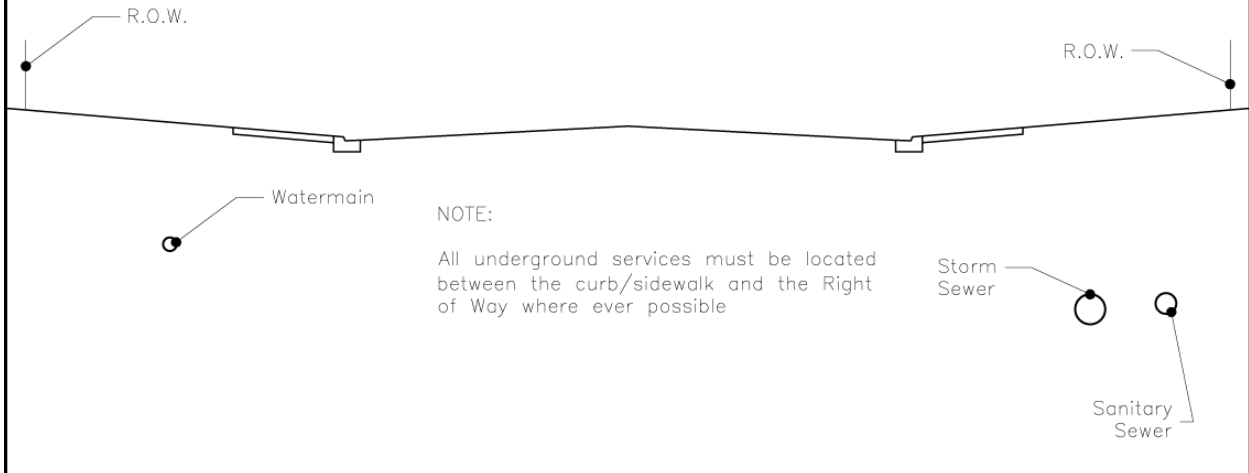
Drawing No.
 13-1029R2

Town of Gander – Design Standards For Streets and Subdivisions 2020(R18)

Collector 1 (Residential), Local 1 & Local 2

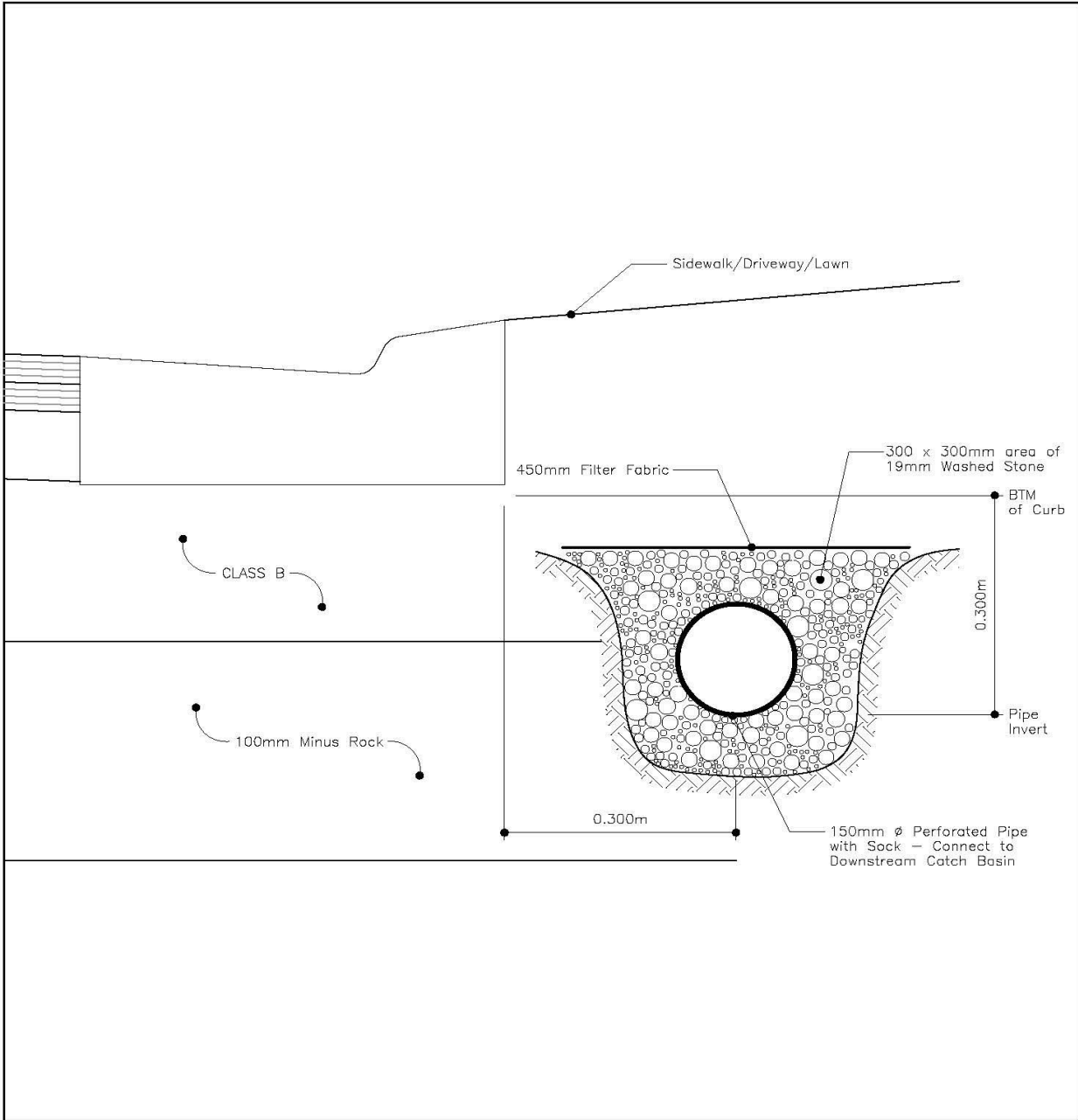


Collector 2 (Commercial)



Project Water and Sewer Typical Cross Sections	Drawn By J. Ball	Scale N.T.S.
	Date Dec. 12, 2012	Drawing No. 13-1030

Town of Gander – Design Standards For Streets and Subdivisions 2015(R14)



Project
 Curb Drainage
 Perforated Pipe with Sock

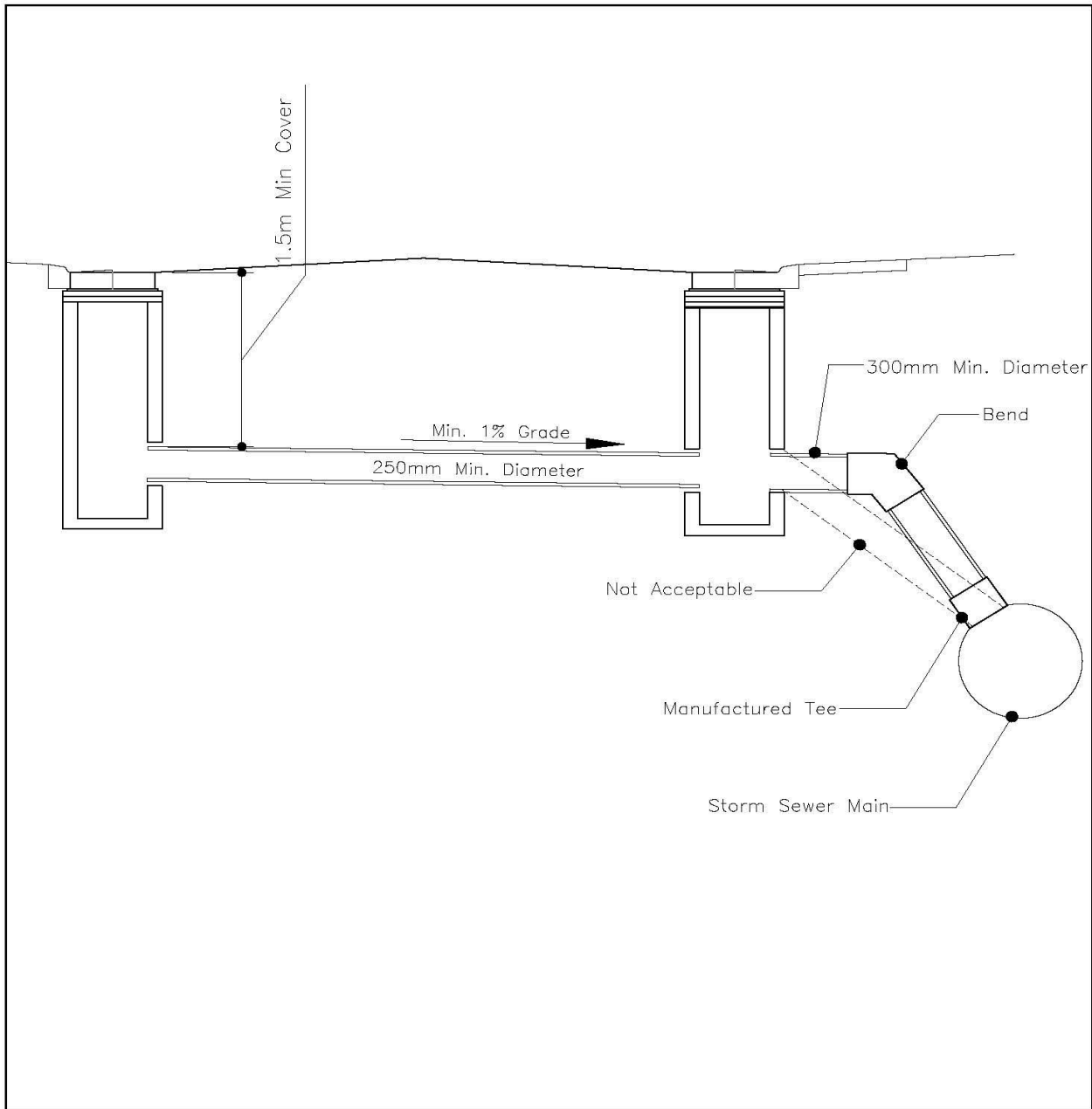
Drawn By
 S. Blundon

Scale
 1 : 7.5

Date
 Jan. 07, 2020

Drawing No.
 13-1036R1

Town of Gander – Design Standards For Streets and Subdivisions 2020(R18)



Project
Catch Basin Tee Connection Detail

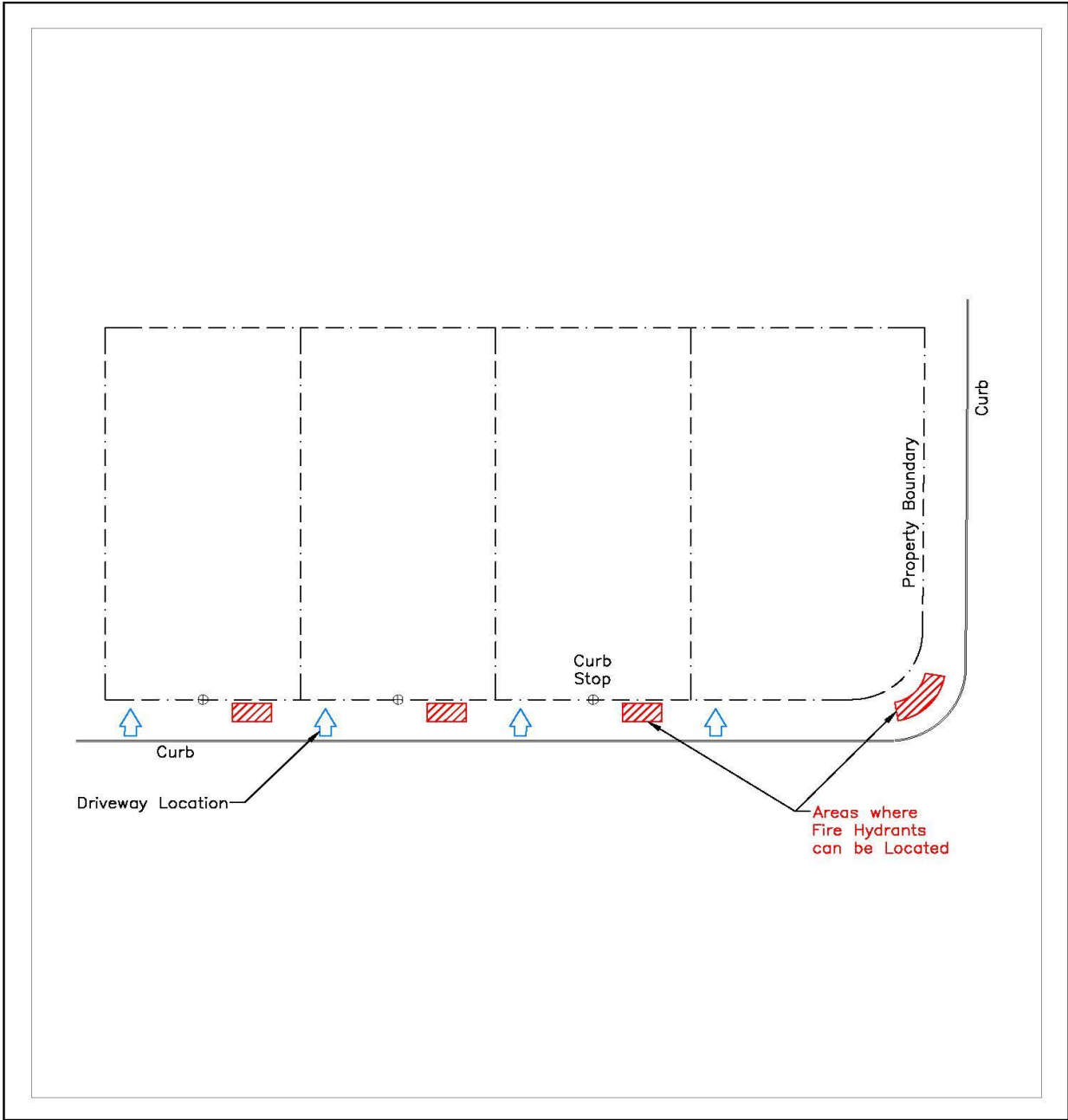
Drawn By
S. Blundon

Scale
N.T.S.

Date
Jan. 07, 2020

Drawing No.
13-1037R1

Town of Gander – Design Standards For Streets and Subdivisions 2020(R18)



Drawing Title:
 Fire Hydrant Locations—
 Design Standards

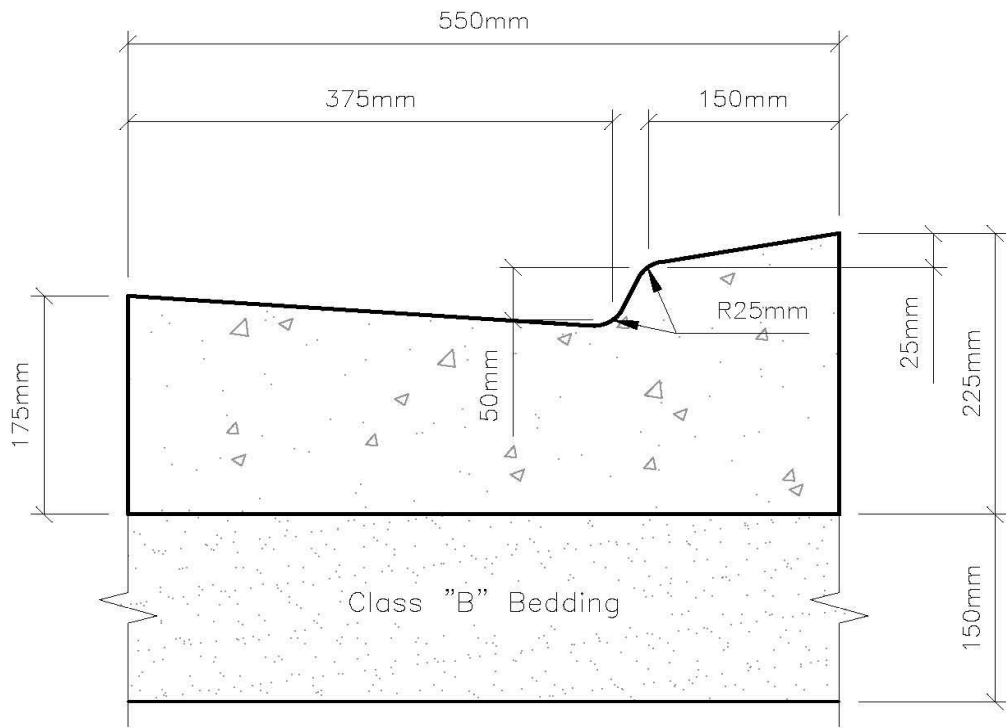
Drawn By:
 S. Blundon

Scale:
 N.T.S.

Date:
 Jan. 23, 2019

Drawing Number:
 19-1004

Town of Gander – Design Standards for Streets and Subdivision 2019(R17)



Project

Curb and Gutter Detail – 2020

Drawn By

S. Blundon

Scale

1 : 5

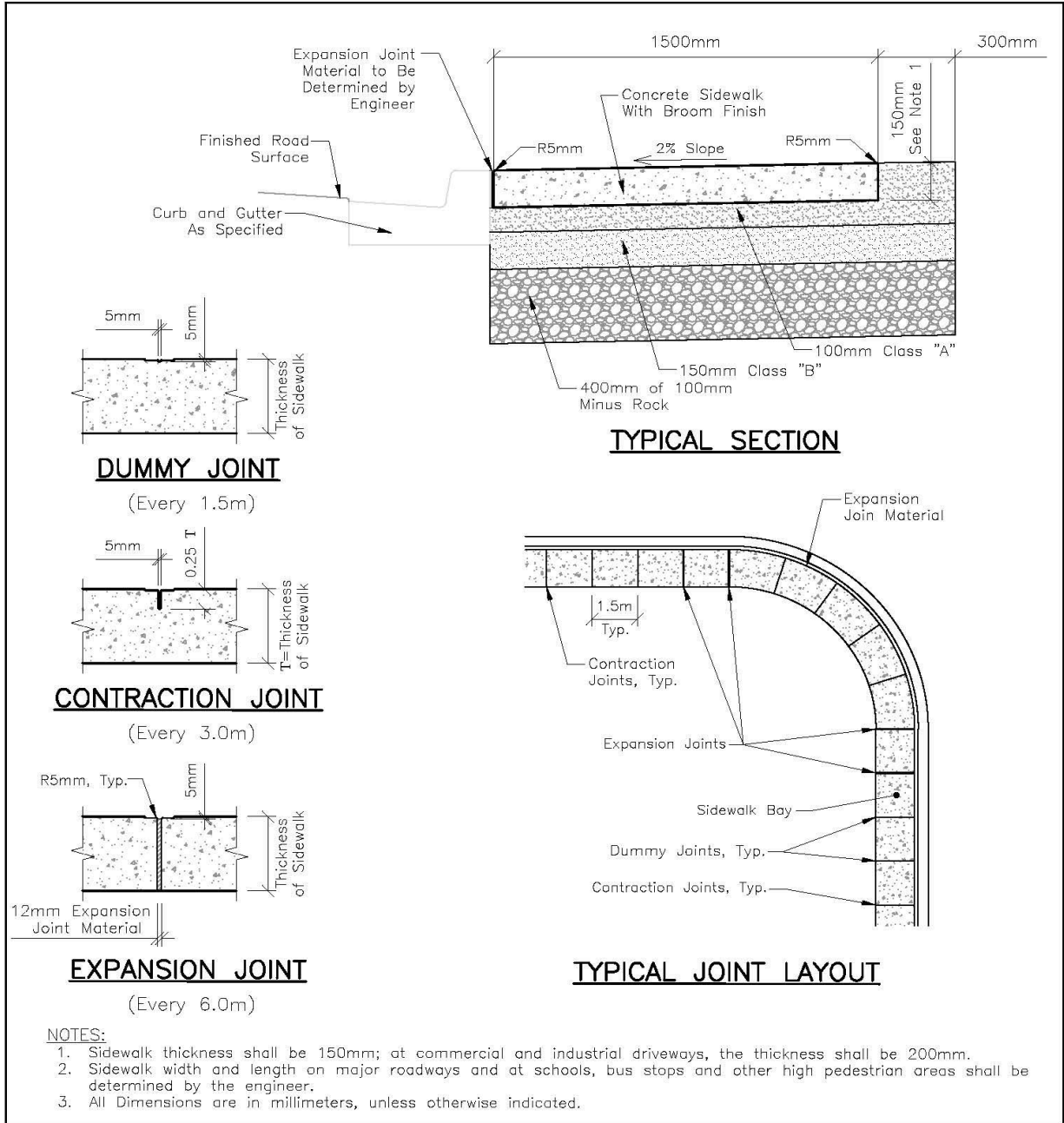
Date

Jan. 06, 2020

Drawing No.

20-1001

Town of Gander – Design Standards For Streets and Subdivisions 2020(R18)



Project
Concrete Sidewalk,
Adjacent to Curb and Gutter

Drawn By
S. Blundon

Scale
N.T.S.

Date
Jan. 06, 2020

Drawing No.
20-1002

Town of Gander – Design Standards For Streets and Subdivisions 2020(R18)