Town of
Logy Bay-Middle Cove-Outer Cove

Development Design Manual

03 January 2023

(Revision #15)

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1. DIVISION 1: DEFINITIONS

1.1 Definitions

Construction Approval: A permit which gives the Developer approval to proceed with construction work as per the development agreement.

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.

Council: Council of the Town of Logy Bay-Middle Cove-Outer Cove.

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

Development Approval: A permit giving the Developer approval to proceed to the final design stage of a project.

Development Regulations: The Town of Logy Bay-Middle Cove-Outer Cove Development Regulations.

Stage I Work: Stage I Work consists of all work relating to the installation of storm systems, construction of all street right-of-ways including base course asphalt, street lighting, and development of open space areas and accesses to these areas.

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 and walkways.

Town: The Town of Logy Bay-Middle Cove-Outer Cove as the corporation and its associated lands.

1.2 Developmental Approval

1.2.1 Requirements

The Developer will be required to submit three (3) 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) metre intervals. The Developer will also be required to submit three (3) 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.

1.2.2 Development Approval

The preliminary subdivision plan will be reviewed for the following:

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

2. **Storm System:** 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.

3. **Internal Street Layout**: The street layout will be reviewed for general conformance to the design criteria as given in the Development Regulations. Approval at this stage is preliminary and will not prohibit further changes that may become necessary during the detailed design.

4. **Public Open Spaces:** The provision for open space within a residential subdivision development shall be the responsibility of the developers. Council shall require either the dedication of 10 percent of suitable land in new residential areas for open space or the developer to pay a fee equal to the value of land to be conveyed prior to the issuance of any building permit for any approved lot in the residential subdivision and/or the conveyance of any public works such as roads. Alternatively, Council may accept a combination of both land and cash value equivalent to the aforementioned requirements. The assessed value shall be determined by the Municipal Assessment Agency. All required infrastructure for stormwater management, water courses, water buffer zones and wetland areas identified by the Department of Environment in conjunction with the Town and in consultation with the Town's engineer, shall not be included and/or constitute lands negotiated under the Town's open space requirements.

   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. A Development Permit shall be valid for one year only from the date of granting of the permit, during which time an application for final approval shall be submitted. If an application for final review is not received within two (2) years 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 most recent Development Design Manual and the most recently updated version of the Government of Newfoundland and Labrador's *Municipal Water, Sewer, and Road Specifications*.

1.3.2 Requirements

The application for Construction Approval should be made within two (2) years of the granting of the Developmental Permit and must be accompanied by the following:

1) Subdivision Plan

The Plan should be drafted as per the standard Subdivision Plan and shall show the following items:

1. Storm system layout (invert information is not required);
2. Well, septic tank and disposal field location;
3. Street alignment information (coordinates for PI and street intersections are not required);
4. Lot layouts and numbering;
5. Right-of-ways, easements and carriageways;

6. Canada Post locations;
7. Driveway locations;
8. Open space areas;
9. Benchmark locations and elevations;
10. Direction of flow for storm systems;
11. Detention pond location;
12. Dry hydrants; and
13. Trailways.

2) Master Survey Plan

The Plan should be drafted as per the standard Master Survey Plan and shall show the following items:

1. Street alignment information including coordinates for PI and street intersections;
2. Lot metes and bounds, areas, and numbers;
3. Right-of-ways and easements;
4. Canada Post locations;
5. Driveway locations;
6. Open space areas; and
7. Benchmark locations and elevations.

3) Plan and Profile Drawings

Plan and profile drawings shall show all streets and stormwater systems to be constructed. Detailed drawings are required and must be approved for any items not covered by the Standard Drawings in the Town's Development Design Manual or the *Municipal Water, Sewer, and Roads Specification*.

4) Lot Grading Plan

The lot grading plan shall be designed as per Dwg. 2020-0001 in Appendix A.

All approved development applications will have the following conditions with respect to Lot Grading Plans:

1. After receipt of Service NL approval for the septic design, which will indicate dwelling and septic system locations, a Lot Grading Plan shall be developed and submitted to the Town using the Town's Lot Grading Plan criteria (see Lot Grading Plan Criteria below). The Lot Grading Plan shall be prepared by a certified Newfoundland Land Surveyor, a Professional Engineer

(licenced to practice in NL), an Architect (licenced to practice in NL, or by an Engineering Technician/ Technologist (AETTNL certified). For those lots located in approved subdivisions, the individual Lot Grading Plan shall be prepared based on, and in keeping with, the overall approved subdivision Lot Grading Plan. **The Lot Grading Plan must be received by the Town before any conditional approval to develop can be issued.**

2. Prior to any landscaping (sodding) of the lot, a Lot Grading Plan Certificate of Completion must be submitted to the Town and stamped by a professional engineer, surveyor, architect or engineering technician as outlined above. The development security deposit will not be released until the Certificate of Completion is received by the Town. Any permits issued for outbuilding, fence, patio, walkways, swimming pools etc., shall be constructed without disruption to the Lot Grading Plan so as to not adversely affect the drainage patterns within the lot or adjacent and/ or nearby properties.

3. Lot Grading Plan Criteria:

    1. A title block containing:
        - Name of subdivision
        - Name of building permit owner
        - Name of firm or individual and address of the professional preparing the plan, scale and date;
    2. Legend;
    3. North Arrow;
    4. Dimensioned property limits and house location;
    5. Finished floor elevation;
    6. Finished garage floor elevation;
    7. Top of foundation wall elevations (all locations) ;
    8. Finished basement floor elevation;
    9. Proposed lot elevations for each lot corner, front and back of house, and 3m from the back of the house;
    10. Driveway location, length, width, and proposed grades;
    11. Driveway to be paved from the edge of the roadway to the property line when any part of the

driveway grade is greater than 7%. Driveway must be paved when there is sidewalk;

12. Arrows indicating the direction of all surface drainage;
13. Location and elevation of swales;
14. Location of garages, decks, porches, patios, etc. ;
15. Location of terraces and retaining walls;
16. Location of well and septic system;
17. Floor area;
18. Building line setback;
19. Side yard width;
20. Rear yard depth;
21. Lot frontage.

The appropriate tolerances are as follows:

- 0 to 150mm below final grade before topsoil

- Within 150mm above or below final grade after topsoil

Elevations not within tolerance may be accepted at the discretion of Council when the landscaping is graded to match existing conditions or infrastructure and positive drainage is maintained.

5) Storm System Calculations:

Storm system calculations are to be accompanied by a detailed drainage plan, as per Division 7, Stormwater System.

6) Fisheries and Oceans Canada

The Developer shall provide, to the Town, copies of any approvals required for works under the jurisdiction of Fisheries and Oceans Canada.

7) Municipal Affairs and Environment

The Developer shall provide, to the Town, copies of any approvals required for works under the jurisdiction of the Government of Newfoundland and Labrador Department of Environment and Conservation.

8) Service NL

The Developer shall provide, to the Town, copies of any

approvals required for works under the jurisdiction of the Government of Newfoundland and Labrador, Service NL.

9) Canada Post

The Developer shall provide copies of approval for the proposed Canada Post locations.

10) Newfoundland Power

The Developer shall provide a legal plan and description for easements.

11) Other Governing Agencies or Authorities

The Developer shall provide approvals deemed necessary by the Town.

1.3.3 Approval

The detailed subdivision design will be reviewed for Manual conformance with the Development Design and the *Municipal Water, Sewer, and Roads Specification*. If any problems are noted, the Developer will be required to make the necessary revisions and resubmit the drawings for approval.

If no problems are noted, then Construction Approval will be recommended and the Developer will be asked to submit copies of the aforementioned drawings in digital format.

Construction Approval is valid for a one (1) year period but may be renewed once 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 the 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, a digital copy of the revised drawing shall be submitted.

1.4 Financial Requirements

1.4.1 Assessments

1) Capital Recovery Assessments: All outstanding assessments to 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:

1. Storm Sewer Systems;
2. Street improvements;
3. Walkways;
4. Over-sizing;
5. External improvements;
6. Recreational or as otherwise required by Town;
7. Dry hydrants.

2) **Development Fee:** This fee is to be addressed with the Town prior to review of the proposed development.

3) **Securities:** The Town will determine and approve the amount of any securities required. All securities must be in the form of cash, certified cheque or letter of credit from an approved surety company.

4) **Stage I Warranty Security:** This security will be equal to ten percent (10%) of the estimated cost of Stage I Work and must be in place prior to the issuance of construction approval by Council. The estimated cost must be validated by the Town's Engineer. The Stage I Warranty Security shall remain in effect until all requirements for acceptance of Stage I Works are met and all required documentation is submitted. Following the acceptance of Stage I Works, the Stage I Warranty Security shall be returned to the owner.

5) **Stage II Security:** This security will be equal to the estimated cost of Stage II Works and must be in place prior to issuance of construction approval by Council. The estimated cost must be validated by the Town's Engineer. The Stage II Security will be released upon acceptance of Stage II Works with ten percent (10%) of the value of Stage II Works, and one thousand dollars ($1000.00) for each undeveloped lot retained, as a security. Stage II Works must be completed when eighty percent (80%) of lots are developed or, failing this, within thirty (30) months after the acceptance of Stage I Works.

6) **Stage II Warranty Security:** Ten percent (10%) of the value of Stage II work will be retained from the Stage II Security prior to Stage II acceptance. The Stage II Warranty Security will remain in effect for one (1) year following the date of the letter of total performance for Stage II Works. One thousand dollars ($1,000.00) of the

Stage II Security will be retained for each undeveloped lot prior to Stage II acceptance to cover possible damages to the walkways and surface course asphalt. The $1000.00 retained for each undeveloped lot shall be released to the developer as each individual lot is developed in accordance with the lot development policy approved by the Town.

The Developer shall initiate in writing, the review of all securities held.

1.5 Stage 1 Works

1.5.1 Schedule

Stage I Works: Stage 1 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 Developer's Consulting Engineer. The Developer's Consulting Engineer must provide weekly reports during construction. These weekly reports will identify the project, contractor and owner, and provide information on the work progress percentage, work completed during the period, any difficulties that were encountered, the work scheduled for the next period and any other notable items. The Developer is to ensure these weekly reports are submitted to the Town within five (5) business days following the reporting period, and must be signed off on by a site representative working for the Developer's Engineer.

Acceptance of Stage I Works: Stage I Works will be accepted by the Town when all work has been completed and the following submitted and approved:

1. As-built Engineering Drawings as per Town standards;
2. Subdivision Plan as per Town standards;
3. Lot Grading Plans;
4. Test results as required for the storm sewer systems;
5. Stage I warranty period security;
6. Correction of all noted deficiencies;
7. Concrete test results (if applicable) for any curbs or sidewalks'
8. Asphalt test results for base course asphalt;
9. Street/Stop Signs installed;
10. Deeds of conveyance for existing or future right-of-ways, open spaces, and easements, including transfer to the Town;

11. Compaction test results for sub-grade works to the full limit of street right-of-way;
12. Letter from a Professional Engineer certifying that all works have been completed in accordance with the approved plans and specifications;
13. Legal plans and descriptions for all lands to be transferred to the Town;
14. Street lights installed.

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 or security has been provided to cover the cost of the Stage I and Stage II Works, then the building permits may be approved. The Developer is cautioned that no occupancy permits will be issued until completion and acceptance of Stage I Works.

Warranty Period: The Developer shall, at his own expense, rectify and make good any defect or fault, however caused, appearing during the Stage I Warranty period. The Stage I Warranty will be released at the end of the warranty period providing all noted deficiencies have been corrected. The Town reserves the right to complete the deficiency work and deduct the costs from the Development securities.

1.6 Stage II Works

Schedule: Stage II Works shall not commence until Stage I Works have been accepted. Base course asphalt must be placed prior to the Town undertaking any snow-clearing operations. The Town will not accept responsibility for damage by others to any Stage I Works until all Stage II work has been completed and accepted by the Town. The surface course asphalt shall not be placed without the approval of the Town.

Benchmarks: Benchmarks shall be installed as per the requirements detailed in Section 2.6 Benchmarks.

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

1. Asphalt test results for surface course asphalt;
2. As-built information for benchmark installations;
3. Stage II warranty period security;
4. Inspection of Stage II Works by the Town;
5. Correction of all noted deficiencies;

6. Master survey of development, both plan and description; and
7. Certification from Professional Engineer that work has been done in accordance with approved plans and specifications.

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 the 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. The Town reserves the right to complete the deficiency work and deduct the costs from the Development securities

1.7 Lot Development Policy: Requirements

The Town requires that the front of all new lots be landscaped. Front landscaping includes the sideyard area to the rear wall of the dwelling, and the front building line to the bottom of the inner ditch slope in the right-of-way or the curb line if curb is present. Landscaping shall be completed on both the facing and flanking streets for corner lots. The rearyard of the dwelling must be brought to rough grade.

The building on the lot must be weather tight including the completion of roofing, siding, windows and doors. The building must also be serviced with a well and complete septic system including disposal field prior to starting landscaping.

The private driveway entrance must be brought up to grade and conform to the *Municipal Water, Sewer, and Roads Specifications.* A properly sized culvert complete with end finishes must be installed as per the approved construction drawings (Dwg. 2020-0004 and/or Dwg. 2020-0005, Appendix A).

A security of one thousand dollars ($1000.00) must be paid, at the time of obtaining a building permit, to the Town for each lot to ensure all work is completed in accordance with the conditions of this policy. This security will be held until all work relating to this policy is completed and the Town has inspected and approved the work.

Lots to be developed in accordance with FireSmart principles. The full lot must be fully landscaped within two (2) years of receiving Occupancy Permit.

FireSmart Principals are a solution for wildfire safety as outlined on the website www.firesmartcanada.ca.

2. DIVISION 2: SURVEYING

2.1 Definitions

2.1.1 Survey

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

2.1.2 Newfoundland and Labrador Provincial Coordinate Survey System

A system established for referencing land surveys and based on 3° Modified Transverse Mercator Projection.

2.1.3 Coordinate Monument

Any marker established for the Provincial Coordinate Survey System.

2.2 Master Survey Plan

A Survey plan shall be drawn with reference points using the NAD83 coordinate system. Any documents submitted using the old NAD27 coordinate system shall be converted prior to submittal. The survey plan shall also be in accordance with the requirements of Division 3 and shall include:

1. The name of the owner and Registry of Deeds number of all abutting lands;
2. The length and bearing of each line of any transverse which connects any point on the boundary of the subdivision with a Coordinate Monument;
3. The radius, central angle, length of arc, point of curve and point of tangency shall be given for each curved line and clearly indicated;
4. Each street, walkway, right-of-way, easement, stormwater detention and dry hydrant;
5. Each lot, and corresponding lot number;
6. The length, bearing and internal angle of each line of the boundary of, and the area in square metres to the nearest centimetre of:
    1. The land being subdivided;
    2. Each street, walkway, and easement;
    3. Each lot;
7. The land, if any, which is reserved for park, playground, buffers and public purposes;

8. The width to the nearest centimetre of each street;
9. The geometry of connections between existing streets and streets of the subdivision;
10. The location of any existing structure which is to remain;
11. Every watercourse and its direction of flow;
12. All information necessary for the calculation and layout of any curved line;
13. The date of compilation;
14. The date and description of revision, if any;
15. The name of the subdivision;
16. All existing streets, roads, lanes and intersections in the immediate area and their official names as designated by the Town;
17. The location and extent of rock outcrops;
18. The location, point description and results of any test borings;
19. At least two (2) centerline points of known chainage related to the Provincial Coordinate Survey System;
20. The monument location, number and elevation of the Town benchmark used; and
21. Manhole numbers to be assigned by using the last four whole numbers of the easting and the suffix "R" for storm sewer manholes.

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

1. MAXIMUM - SI Size designation, B1, which represents 707 mm wide x 1000 mm long;

2. MINIMUM - SI Size designation A1, which represents 594 mm wide x 841 mm long;

3. LEGAL SIZE - SI Size designation, P4 which represents 2 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.*

The master survey plan shall be drawn to a scale as indicated in Division 3 Drafting.

The master survey plan shall have a Key Plan to locate the subdivision as it relates to adjacent streets of the Town. The scale shall be as indicated in Division 3 Drafting.

The master survey plan shall be certified by a Newfoundland and Labrador Legal Land Surveyor.

2.3 Survey Details and Accuracy

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

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

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

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.

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

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

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.

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

2.4 Street, Walkway and Lot Identification

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.

2.5 Survey Information

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.

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

2.6 Benchmarks

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

The Land Surveyor shall assign numbers to the benchmarks as per Provincial requirements.

All benchmarks shall be inter-visible and coordinated using the 3˚ 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. The maximum distance between benchmarks shall be 300 metres.

Benchmarks must be established from other town benchmarks or geodetic benchmarks and end at the same or different town benchmarks that have acceptable elevation values. All lines beginning and ending in existing benchmarks with known elevations and all lines forming self-closing loops will be levelled one way. All benchmarks must be turning points and form part of the levelling loop.

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

The method used will be the 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.

The description sheet shall be digital and in a format that can be reproduced in a clear and legible form. A minimum of three ties shall be shown to reference the benchmark. 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.

All benchmarks and benchmark information shall be shown on the Subdivision Plan according to the Town standards.

If the work does not meet the above criteria, the Contractor/Surveyor's work shall be returned for corrections.

3. DIVISION 3: DRAFTING

3.1 Preparation of Drawings

3.1.1 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.

3.1.2 Submission of Drawings in Digital Format

The Town of Logy Bay-Middle Cove-Outer Cove 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 PDF and AutoCAD *dwg* format, or *dxf* format where the consultant uses a CAD platform other than AutoCAD.

Throughout the design process, individual drawings may be submitted on an acceptable multimedia storage device. These shall include SD memory card, external hard drive or USB flash drive. As-built or record drawings shall be submitted in complete sets in the same manner using the same storage devices previously mentioned

During the design process, electronic file transfer through email or internet will be considered on a case-by-case basis.

3.1.3 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 subconsultants, 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.

3.1.4 Scales

All CAD drawings shall be drawn full size and plotted at a reduced scale as indicated. Other drawing types not listed shall be at an appropriate scale to read the drawing fully.

Engineering Plan or Site Services Plan Scale shall be:

1. 1:500 for Plan drawings; and
2. 1:500 Horizontal and 1:100 Vertical for Profile drawings.

Survey Plan/Subdivision Plan Scale shall be:

1. 1:500; or
2. As approved by the Town.

Site Drainage Plan Scale shall be:

1. 1:500;
2. 1:1000;
3. 1:2500; or
4. As approved by the Town

Location Plan or Key Plan shall be:

1. 1:2500

Site Grading Plan shall be:

1. 1:500

3.1.5 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. NAD27 will no longer be accepted and any coordinates using these reference points must be converted to NAD83 prior to submittal.

3.1.6 North Arrow

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

3.1.7 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.

3.1.8 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 24 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.

3.1.9 Layering

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

3.1.10 Reserved Area

An area at least 2 cm high shall be reserved above the title block for the key plan, notes, legend, Engineer's stamp, revision data, etc.

3.1.11 Cover Sheet

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

1. Project Name;
2. Key Plan;
3. Name of Consulting Engineer and Sub-consultants;
4. Name of Developer;
5. List of Drawing Names and Numbers;
6. Date of Issue, revisions; and
7. "As-Built" or "Record Drawing" note when applicable.

3.1.12 Submission of Drawings

Design drawings shall be submitted as follows:

1. 3 - White Prints; and
2. 1 - Digital Copy.

Construction drawings shall be submitted as follows:

1. 3 - White Prints; and
2. 1 - Digital Copy.

As-built drawings shall be submitted as follows:

1. 1 - White Print;
2. 1 - Digital Copy; and
3. 1 - Listing of screen colour/pen weight designations.

3.2 Preparation of Drawings: General Conditions

3.2.1. Street Names

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

Street names shall be submitted in accordance with the Town's Street Naming Policy.

3.2.2. Traverse Plotting

All traverses shall be plotted by either:

1. The "Tangent Off-Set" Method; or
2. The calculated "Latitude (Lats) and Departure (Deps)" Method

3.2.3. Percent (%) Grade

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

3.2.4. Accuracy of Measurements

All distances shall be measured to the nearest centimetre.

3.2.5. 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, which shall be shown in the area above the Title Block.

3.2.6. Irregular Boundary Line Measurements

No deviation will 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.

3.2.7. Revisions to Plan

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

3.2.8. Signing Of Plan

All plans shall be stamped and signed by a Professional Engineer licenced in the Province of Newfoundland and Labrador.

3.2.9. Procedure Revision

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

3.3 As-Built Drawings

3.3.1 General Requirements for As-Built Drawings

PDFs of the revised original construction drawings are acceptable. The as-built drawings must be restamped by a Professional Engineer, signed and dated to indicate the as-built information.

3.3.2 Submission of CAD Files

In addition to the requirements of Section 2.3.1, CAD files of the as-built construction drawings may be required in AutoCAD DWG format which are georeferenced in the City's NAD83 coordinate system.

3.3.3 Submission of As-Built Drawings

As-built drawings will be required in two (2) stages:

a. With the Phase 1 acceptance package with the following note added to the drawings:

   "This drawing indicates as-built information for Phase 1 work."

b. With the Phase 2 acceptance package with the following note added to the drawings:

   "This drawing indicates as-built information for Phase 2 work."

3.3.4 Required As-Built Information

The following as-built information is required:

a. Revisions to finished street, centerline elevations, if the difference between design and as-built information is greater than 25 mm;

b. Revisions to type of sidewalk and/or curb and gutter;

c. Revisions to street cross-sections;

d. Revisions to lengths, grades, inverts and alignment for sanitary, storm and water mains;

e. The location of all hydrants, valves, manholes; catch basins and other appurtenances shall be referenced to the front survey pins of the nearest building lot by means of two ties measured to the nearest 0.1 m;

f. A table containing NAD83 northings and eastings for each manhole, catch basin, ditch inlet, headwall or chamber;

g. All cover and invert elevations shall be noted for manholes, catch basins, ditch inlets, headwalls or chambers;

h. The month and year of completion of construction shall be shown on each plan for Phase 1 and Phase 2 work.

4. DIVISION 4: LOT GRADING

4.1 General

Lot grading shall be designed to conform in principle to the site Stormwater Management Plan.

Lot grading and resulting drainage pattern shall not adversely affect either adjacent or downstream lands.

All existing perimeter ground elevations of the subject property shall remain undisturbed unless otherwise approved.

All runoff entering the subject property from adjacent lands shall be accommodated by the grading and drainage plan submitted for approval.

The Lot Grading Plan shall be designed in accordance with Dwg. 2020-0001 in Appendix A.

4.2 Lot Grading Design Criteria

Minimum front and rear lot gradient is 2%. Maximum gradient is 33% on all grassed surfaces.

Maximum gradient within 6 m radius from house is 6%.

Minimum gradient for driveways is 2%. Maximum gradient for driveways is 8% unless otherwise determined by the Town Engineer.

Council may, at their discretion, issue a Doorstep Grade Exemption when a lot falls downward from the road on a case-by-case basis. A Lot Grading Plan should address runoff even if the doorstep is below road grade due to the natural landscape.

Retaining walls are to be designed for gradients in excess of the maximum or where the allowable maximum slope (33%) exceeds 1 m in height. Retaining walls are to be designed and stamped by a Consulting Engineer registered to operate in Newfoundland and Labrador, and approved by the Town.

4.2.1 Swales

Rear yard or side yard swales shall be permitted in instances where grading alone is not sufficient to divert water to the street stormwater system. Swales should be identified on the Subdivision Plan and Grading Plan, shall have a maximum depth of 0.3 m and shall have a minimum slope of 1%.

5. DIVISION 5: EASEMENTS

5.1 General

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

The owner of the easement land shall not construct any type of structure over such an easement.

Drawing should indicate purpose of easement.

5.2 Design

The width of any easement shall be based upon the type of services proposed to be installed. A minimum width of 3 m must be provided between the edge of the easement and the centerline of the pipe or ditch nearest the edge.

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

5.3 Acceptance

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

All easements shall be covered by a legal agreement as approved by the Town’s Solicitor.

5.4 Restoration

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 better, or as otherwise stipulated in the Easement Agreement.

6. DIVISION 6: STREETS

6.1 Street Classification

Streets are classified based on service function, geometric design and in accordance with the *Geometric Design Guide for Canadian Roads*. Table 5.1 presents the street classification for the Town of Logy Bay-Middle Cove-Outer Cove.

Table 6.1 - Street Classification

	Collector	Local
Traffic Service	Traffic movement and land access of equal importance	Traffic movement is of secondary consideration
Land Service Function	Traffic movement and land access are equal consideration	Land access first consideration
Parking	On-street parking is usually permitted	On-street parking is usually permitted
Typical ADT Range	1,000 - 12,000	< 3,000
Flow Characteristics	Interrupted flow	Interrupted flow
Vehicle Type	All types with trucks limitations	Passengers and service vehicles; large vehicles restricted
Connections	Arterials, collectors, locals	Collectors, locals

6.2 Design Criteria

6.2.1 General

Streets shall be designed in accordance with the latest version of the *Geometric Design Guide for Canadian Roads* published by the Transportation Association of Canada (TAC).

Streets shall be constructed in accordance with the latest *Municipal Water, Sewer and Roads Specifications* published by the Government of Newfoundland and Labrador.

In the instance that the design and construction criteria listed in this document contradicts the two listed references above, the criteria within this document will take precedence.

Streets shall be designed in accordance with Dwg. 2020-0002 for local streets and Dwg. 2020-0003 for Collector in Appendix A.

The criteria shown in Table 6.2 are the minimum requirements for flat terrain. Specific combinations of horizontal and vertical alignments may dictate a variance in the noted criteria.

Where development fronts Marine Drive or Marine Lab Road, the Developer must meet the requirements of the Department of Transportation and Infrastructure.

Table 6.2 - Street Design Criteria

	Collector	Local
Street Grade (Max)	10%	10%
Street Grade (Min)	0.5%	1%
Street Right-of-Way Width	20 m	18 m
Minimum C/L Radius	90 m	35 m (15 m on cul-de-sac)
Maximum Super Elevation	0.06 m/m	0.02 m/m
Minimum Stopping Sight Distance	Refer to Section 2.5 of the TAC Geometric Design Guide for Canadian Roads	65 m
Pavement Widths	7.3 m	7 m
Minimum “K” Value: Vertical Curve Crest Sag	 7 11	 7 11
Minimum “K” Value: For Drainage Crest Sag	 40 30	 40 30
Minimum Length of Vertical Curve	All columns should indicate “Not less than the design speed in km/h and no less than 60m except on local streets where a vertical curve is required at the approach to a stop-controlled intersection to make the transition to the maximum approach grade of 2% (6.3.4). In this instance, the length of the vertical curve may be reduced to 20 m.	
Minimum Distances between Intersections	60 m	60 m
Minimum Edge of Asphalt Radius at Intersections	9 m	8 m

6.2.2 Vertical Alignment

Vertical curves are not required where the algebraic difference in grade is less than 1.5%.

For inverted vertical curves, a minimum grade of 0.5% shall be maintained along the gutter line.

6.2.3 Horizontal Alignment

Roadway alignment shall be centered within the right-of-way.

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

6.2.4 Local Standard Development

Pavement Structure

Pavement structure for local and collector streets shall consist of:

1. 200 mm Class “B” Granulars;
2. 100 mm Class “A” Granulars;
3. 38 mm Base Course Asphalt; and
4. 38 mm Surface Course Asphalt.

Additional granular material may be required as per Town.

All streets shall have a minimum 3% transverse grade or crown.

Cul-De-Sacs

Cul-de-sacs are restricted and used only where land access is not possible by through streets. The use of a cul-de-sac shall be approved by the Town.

The measurement of the length of a cul-de-sac shall be from the road ROW to the beginning of the bulb.

Cul-de-sacs shall have the following additional minimum requirements:

1. Maximum length of cul-de-sac is 300 m;
2. Maximum exit gradient for cul-de-sacs shall be 5%;
3. The right-of-way turning circle radius shall be 17 m;
4. The edge of asphalt turning circle radius shall be 15 m; and

5. Bulb surface shall be crowned or cross sloped for drainage, at a minimum grade of 1% and maximum grade of 5%, outward from the center of the bulb.

Turning circle bulb turnarounds are to be used for roads that are temporarily dead-ended and will be extended in the future

Temporary turning circles are to be conveyed to the Town as opposed to providing an easement to the Town.

6.3 Intersections

Intersections shall adhere to the following criteria:

1. Maximum number of street approaches to any one intersection shall be four (4);

2. As far as possible, intersections should be aligned at 90^0. Maximum permitted deviation is 10˚ (i.e., 80˚ to 100˚).

3. Secondary streets intersecting a main street shall have a vertical alignment within the intersection approach of not more than 2% for a minimum distance of 15 m from the roadway intersecting center lines; and

4. When two or more streets intersect, only one street shall have a curved horizontal alignment. All other streets at this intersection shall have a minimum tangent section of 30.5 m measured from the point of street line intersection to the first point of horizontal curvature (BC) on each approach street line.

5. Where roundabouts are required, roundabouts shall be designed in accordance with the Transportation Association of Canada (TAC) Roundabout Design Guide.

6.4 Driveways

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

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

Line of vision for driveways shall be 85 m for collector roads and 65 m for local roads.

6.5 Street Lights

Lighting for collector and local roadways shall conform to the following: one street light at each intersection, one street light at cul-de-sac bulbs, one street light on sharp turns, one street light on every third pole.

Lighting for collector and arterial roadways shall conform to *Guide for the Design of Roadway Lighting*, Transportation Association of Canada, latest edition.

Lighting at intersections shall conform to the design criteria for the higher classified road.

6.6 Canada Post

Design of Canada Post Super Mailboxes shall adhere to Canada Post's *Deliver Planning Standards Manual*, available from Canada Post's website. In addition to Canada Post's Standard, Super Mailboxes shall meet the following criteria:

1. Super Mailbox sites shall be located on the flanking side of corner lots;
2. Super Mailbox sites can be located adjacent to open spaces or Tot Lots but shall not impede access by Town maintenance vehicles;
3. Super Mailbox sites shall be located on the predominantly homecoming side of the street to ensure that the majority of users can retrieve their mail without crossing the street;
4. Super Mailbox sites shall not be located along street frontage where parking restrictions apply;
5. Super Mailbox sites shall not be located closer than 10 m from a fire hydrant or transit stop;
6. Super Mailbox sites shall not be located in close proximity to utility poles or street lighting standards;
7. Super Mailbox sites shall not be located on greenspace or adjacent to greenspace, walking paths, walkways, parks, playgrounds, municipal assets or tot lots without prior written approval from the Town; and
8. Super Mailbox sites shall not be located in such a way that they do not constitute sight distance restrictions to either pedestrians or motorists.

A copy of the subdivision plan indicating the location of Canada Post Super Mailboxes sites must be submitted to both the Town of Logy Bay-Middle Cove-Outer Cove and Canada Post for approval. A copy of the approval from Canada Post shall be submitted to the Town.

7. DIVISION 7: STORMWATER SYSTEM

7.1 General

Upon completion of the stormwater system installation, and prior to acceptance by the Town, as-built drawings must be submitted to the Town for record purposes. The as-builts must be stamped by a Professional Engineer registered to practice in the Province of Newfoundland and Labrador.

Storm runoff must be managed for new developments through ditching, retention/detention ponds or as determined by Council through underground storm sewers. All shall be designed as per the conditions stated herein.

Storm runoff calculations shall be completed for all downstream stormwater systems, regardless of ownership, until the flood peak reaches a stream determined by ground truthing and/or mapping.

7.2 Determination of Storm Runoff

7.2.1 Design Drainage Area

The drainage area shall be determined from topographical mapping contour lines having an interval not exceeding one metre. The design drainage area shall encompass surrounding areas currently draining into the study area which have not been previously accounted for, as well as other areas which may become tributary through regrading.

7.2.2 Drainage Plan

A plan of the drainage area must be submitted for review and approval. The scale of the drainage plan shall be 1:500 or as approved. The following information should be identified on the drainage plan:

1. Streets;
2. Building lots;
3. Easements;
4. Property boundaries;
5. Elevation contours;
6. Watercourses, showing direction of flow;
7. Proposed drainage system layout and direction of flow, including manholes, catch basins, storm sewers, ditching, culverts, headwalls, outfalls and detention ponds;

8. Tributary drainage areas to catch basins, manholes, and culverts; and
9. Direction of flow for proposed surface drainage.

7.2.3 Runoff Calculation

Storm runoff for tributary areas shall be calculated using the Rational Method:

$$Q = 2.778CiA$$

Where:

Q = Storm runoff, L/s;
C = Runoff coefficient, dimensionless;
i = Rainfall intensity, mm/hr; and
A = Drainage area, ha.

The calculation for runoff shall be submitted to the Town for review.

7.2.4 Return Period/Basis of Design

The return period shall be as follows:

1. For the design of local storm sewers:
   - Return period of 25 years; and
   - Minimum duration of 10 minutes.

2. For the design of major culverts (road crossings) and waterway crossings:
   - Return period of 100 years; and
   - Minimum duration of time of concentration of the drainage basin.

3. For the design of minor culverts (driveways) and roadside ditches:
   - Return period of 25 years; and
   - Minimum duration of time of concentration of the drainage basin.

7.2.5 Runoff Coefficient

The values in the following table shall be minimum values for runoff coefficient for use in the Rational Method based on the required return period.

Table 7.1 - Runoff Coefficient

Land Use	Return Period (Years)	
	25	100
Parks and Undeveloped Areas	0.22	0.25
Single Family Residential	0.44	0.50
Semi-detached Residential	0.55	0.63
Row Housing/Apartment Residential	0.75	0.75
Parking Lots	0.91	0.95
Industrial	0.75	0.85
Institutional	0.66	0.75
Light Commercial	0.66	0.75
Commercial Core	0.91	0.95

7.2.6 Rainfall Intensity

Rainfall intensity shall be based on the return period and the time of concentration. The following table has values for rainfall intensity to be used in the Rational Method.

Table 7.2 - Rainfall Intensity

Time of Concentration (mins)	Rainfall Intensity (mm/hr)	
	25 Year	100 Year
0 - 9.9	73.9	89.6
10 - 14.9	63.6	77.4
15 - 29.9	46.9	57.1
30 - 59.9	33.6	41.0
60 - 119.9	24.3	30.0
≥ 120	24.3	30.0

7.2.7 Time of Concentration

The time of concentration shall be calculated using the SCS Curve Number method:

$$T_c = L^{0.8} \frac{(S' + 25.4)^{0.7}}{4{,}238 \cdot S^{0.5}}$$

$$S' = \frac{25{,}400}{CN} - 254$$

Where:

tc = Time of concentration, hrs;
L = Maximum length of travel from the most remote part of the basin to outlet, m;
CN = Curve Number (as per table 7.4); and
S = Mean slope of the main drainage basin, %.

7.3 Storm System Design

7.3.1 Hydraulic Capacity

Manning's formula shall be used to determine the capacity of pipes and ditching (open channel flow):

$$Q = \frac{AR^{2/3}S^{1/2}}{n}$$

Where:

Q = Capacity, m^3/s;
A = Cross sectional area of flow, m^2;
R = Hydraulic radius, m;
S = Slope, m/m; and
n = Coefficient of roughness, dimensionless.

7.3.2 Culvert Capacity

Capacity of culverts shall be determined assuming inlet control, with HW/D = 1. Minimum culvert size shall be 450 mm diametre.

Culvert material shall be HDPE or as otherwise approved by the Town.

Downstream culverts in any ditch must be equal to or greater than the nearest upstream culvert. Under no circumstance shall a downstream culvert be permitted to be smaller than the upstream culvert.

7.3.3 Coefficient of Roughness

The coefficient of roughness to be used in Manning's formula shall be selected from the following table based on pipe material. In no case shall the roughness coefficient selected for design purposes be less than 0.015.

Table 7.3 - Manning's 'n' Coefficient

Pipe Material	Roughness Coefficient
Concrete, PVC, or HDPE pipe	0.015
Ditch – Rip Rap Bottom	0.040

Manning's 'n' values for other materials and ditch treatments shall be selected based on material and generally-accepted values from reputable references.

7.3.4 Minimum Pipe Size

The minimum diametre of storm sewer pipes shall be as follows:

1. Storm Sewers = 300mm
2. Single Catch Basin Leads = 200mm
3. Double Catch basin Leads = 300mm
4. Storm Sewer Service Pipe = 100mm

7.3.5 Pipe Velocity

The minimum acceptable pipe velocity at design peak flow shall be 0.75 m/s.

The maximum acceptable pipe velocity at design peak flow shall be as follows: 4.5 m/s for all pipe sizes.

7.3.6 Minimum Pipe Gradient

In no case shall the minimum gradient be less than 0.5%.

7.3.7 Change of Pipe Size

No decrease of pipe size from a larger size upstream to a small size downstream shall be allowed under any circumstances.

7.3.8 Pipe Location

Pipes shall be located in accordance with the latest version of the *Guidelines for the Design, Construction, and Operation of Water and Sewerage Systems, as published by the Government of Newfoundland and Labrador, Department of Environment and Conservation, Water Resources Management Division*.

7.3.9 Earth Load

Shall be calculated by using the Marston Formula.

7.3.10 Superimposed Load

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

7.4 Manholes and Structures

7.4.1. Manhole Location

Manholes shall be located at every change of horizontal and vertical pipe alignment, at every change of pipe size and/or material, and at dead ends.

7.4.2. Manhole Spacing

The maximum allowable spacing for storm manholes shall be 90m.

7.4.3. Drop Manholes

Vertical drop pipe shall be provided at manholes where the vertical distance between the invert of the inlet pipe and the invert of the outlet pipe is greater than 1.0m. The drop manhole should be used only when more acceptable alternatives cannot be incorporated into the design.

7.4.4. Invert Drop

All manhole inverts shall be smoothly benched to the springline of the pipe. The minimum invert drop across a manhole shall be the greater of:

1. The difference in the diameters of the upstream and downstream pipes, or

2. 50mm for straight run, and 150mm for bends greater than 23° and tees.

The obvert elevation of the lowest upstream pipe shall be equal to or higher than the obvert of the downstream pipe.

7.4.5. Manhole Design

Manholes shall be designed, constructed, and tested in accordance with the latest version of the Government of Newfoundland and Labrador's *Master Municipal Water, Sewer and Roads Specifications*.

7.4.6. Special Manholes

Special manholes shall be permitted when no standard manholes are appropriate. These special manholes must be fully detailed and approved by the Town.

7.4.7. Special Structures

Special drainage structures shall conform to the following:

1. Special inlet and outfall structures such as headwalls, tailwalls, stilling chambers and energy dissipaters shall be fully designed and detailed. Designs shall be submitted for review and approval.

2. Details of protective and erosion control works must be submitted for review when discharge velocities exceed 80% of the limiting velocity of the material that lines the receiving water body.

3. Grates shall be provided on all inlet structures to a piped storm sewer system and shall be fully designed, detailed, and approved by the Town. Culverts may require grates and will be assessed on a case-by-case basis.

4. Copies of approval from the appropriate authorities must be forwarded to the Town for all storm sewer outfalls.

7.4.8. Special Catch basins

Special catch basins shall be permitted when no standard catch basins are appropriate. These special catch basins must be fully detailed and approved by the Town.

7.4.9. Catch Basin Location

Catch basins shall be located and spaced in accordance with conditions of design and shall provide for the expected maximum flow. Catch basin locations shall be adequate to prevent on-street ponding of storm water during storms having a 1 in 25 return period.

All catch basins located in low points shall be double catch basins.

7.4.10. Catch Basin Leads

Catch basin leads shall:

1. Have a minimum diametre of 200 mm.
2. Have a minimum grade of 2%.
3. Have a maximum length of 30m.
4. Connect directly to a storm manhole.

Double catch basin leads shall:

1. Have a minimum diametre of 300 mm.
2. Minimum grade of 2%.
3. Have a maximum length of 30 m.
4. Connect directly to a storm manhole.

7.5 Stormwater Management

7.5.1 General

The construction of impervious surfaces such as roads, driveways and roofs associated with development increases surface runoff and decreases infiltration. These increases in surface runoff can impact downstream development and infrastructure, and could result in the initiation and/or aggravation of flooding and erosion. In order to equitably share the costs of controlling surface runoff and mitigate the risks of flooding and channel erosion between existing, proposed and future developments, the Town requires all new developments to incorporate best practices to restore the post-development rainfall-runoff response of the development as close as practicable to predevelopment conditions. This matching of runoff to predevelopment conditions would maintain the hydrologic integrity of the development with the intention of maintaining the hydrologic integrity of the entire watershed. The developer shall provide infrastructure and methodologies to ensure there is no increase in the rate of stormwater flow from the site for any of the design storm events listed in Section 7.5.3 with return periods from

2 years to 100 years and durations from 1 hour to 24 hours, i.e., Net Zero Runoff. The design shall be submitted and reviewed by the Town, in consultation with the Town's Engineer and the Water Resources Division of the Department of Environment, Climate Change and Municipalities, and Conservation, and the Federal Department of Fisheries and Oceans.

The hydrology and hydraulics of the facility, and any connecting storm sewer infrastructure, must be modelled using proven design software. The Town's preferred modelling software is XPSWMM. Other models selected by the designer will require approval by the Town before commencing the design. The Developer shall provide a functioning electronic model for review that demonstrates the planned stormwater detention facility can meet the Town's net-zero-runoff requirement. A demonstration to the Town of the operational model may be required.

The designer shall (a) determine the required volumes of storage for the 24-hour events for each of the return periods listed in Tables 1 through 6; (b) select an outlet control device or group of devices that controls the post-development flows to their respective predevelopment flow condition (while ensuring that the emergency overflow device is not engaged); and (c) route the post-development runoff from the remaining rainfall design events for each return period through the detention facility and adjust the volume/outlet control accordingly until net-zero-runoff is achieved.

7.5.2 Hydrology

In order to standardize the hydrologic analyses, the following methodologies and variables are specified.

Hydrographs shall be generated using the RUNOFF routing method.

Infiltration shall be calculated using the Green-Ampt method.

Evaporation shall be set at 3mm per day.

Ground conditions shall be simulated as non-snow covered and unfrozen.

Antecedent moisture conditions shall be simulated as AMCII (average).

Soil conditions shall be simulated as Hydrologic Soil Group C.

Simulation times must be long enough to produce the complete hydrograph for each model.

7.5.2.1 Land Use

The various coefficients and variables used in the different runoff modelling software shall conform to the following.

Rational Method runoff coefficients with minimum values as shown in Table 7.1 (section 7.2.5) shall be used.

Percent impervious values shall be calculated as the total (rather than the directly connected) impervious area over the total (sub)watershed area.

Soil Conservation Service (SCS) Curve Numbers with minimum values shall be as follows.

Table 7.4 - SCS Curve Numbers

Land Use	CN
Parks and Undeveloped Areas	75
Single Family Residential	80
Semi-detached Residential	85
Row Housing/Apartment Residential	87
Parking Lots	98
Industrial	91
Institutional	87
Light Commercial	87
Commercial Core	95

Manning “n” resistance coefficients with maximum values shall be as follows

Table 7.5 - Manning n Values

Land Use	N
Parks and Undeveloped Areas	0.070
Single Family Residential	0.055
Semi-detached Residential	0.045
Row Housing/Apartment Residential	0.035
Parking Lots	0.015
Industrial	0.020
Institutional	0.025
Light Commercial	0.025
Commercial Core	0.017

Subcatchment areas must be identified and defined in the model for each structure that will direct runoff into the stormwater management system (i.e., catch basins, ditch inlets, headwalls, aboveground storage ponds, culverts, diversions, etc.). The designer shall provide, to the Town for review, all input parameters and assumptions made in the model development. The designer shall take into account the catchment area being developed plus all upstream areas that may contribute to the system in the foreseeable future.

7.5.3 Design Storm Events

The following tables (from the City of St. John's data) list the cumulative rainfall hyetographs for storm events of 2, 5, 10, 25, 50 and 100 year frequency of occurrence. Each storm event shall be modelled to determine the maximum required storage for detention to produce zero net runoff.

TABLE 1: 100-Year Design Cumulative Hyetographs

Time (min)	1hr Rain (mm)	Time (min)	2hr Rain (mm)	Time (hr)	6hr Rain (mm)	Time (hr)	12hr Rain (mm)	Time (min)	24hr Rain (mm)
0	0.0	0	0.0	0.0	0.0	0	0.0	0	0.0
5	3.0	10	4.3	0.5	6.0	1	7.3	2	8.9
10	7.4	20	10.8	1.0	15.0	2	18.3	4	22.4
15	13.2	30	19.1		26.5	3	32.5	6	39.7
20	20.7	40	30.0	2.0	41.7	4	51.1	8	62.4
25	29.6	50	42.9	2.5	59.7	5	73.1	10	89.3
30	36.5	60	52.9	3.0	73.6	6	90.1	12	110.1
35	38.9	70	56.3	3.5	78.3	7	95.8	14	117.1
40	40.6	80	58.8	4.0	81.8	8	100.2	16	122.5
45	42.1	90	60.9	4.5	84.7	9	103.7	18	126.8
50	43.1	100	62.3	5.0	86.7	10	106.2	20	129.8
55	43.5	110	63.0	5.5	87.7	11	107.4	22	131.2
60	43.8	120	63.4	6.0	88.2	12	108.0	24	132.0

TABLE 2: 50-Year Design Cumulative Hyetographs									
Time (min)	1hr Rain (mm)	Time (min)	2hr Rain (mm)	Time (hr)	6hr Rain (mm)	Time (hr)	12hr Rain (mm)	Time (min)	24hr Rain (mm)
0	0.0	0	0.0	0.0	0.0	0	0.0	0	0.0
5	2.7	10	3.8	0.5	5.5	1	6.7	2	8.3
10	6.7	20	9.7	1.0	13.7	2	16.9	4	20.8
15	11.9	30	17.1		24.3	3	30.0	6	36.8
20	18.7	40	27.0	2.0	38.3	4	47.2	8	57.9
25	26.8	50	38.6	2.5	54.8	5	67.6	10	82.8
30	33.0	60	47.5	3.0	67.6	6	83.3	12	102.1
35	35.1	70	50.6	3.5	71.9	7	88.6	14	108.6
40	36.7	80	52.9	4.0	75.2	8	92.7	16	113.6
45	38.0	90	54.7	4.5	77.8	9	96.0	18	117.6
50	38.9	100	56.0	5.0	79.6	10	98.2	20	120.3
55	39.4	110	56.7	5.5	80.5	11	99.3	22	121.7
60	39.6	120	57.0	6.0	81.0	12	99.9	24	122.4

TABLE 3: 25-Year Design Cumulative Hyetographs									
Time (min)	1hr Rain (mm)	Time (min)	2hr Rain (mm)	Time (hr)	6hr Rain (mm)	Time (hr)	12hr Rain (mm)	Time (min)	24hr Rain (mm)
0	0.0	0	0.0	0.0	0.0	0	0.0	0	0.0
5	2.4	10	3.4	0.5	5.0	1	6.2	2	7.5
10	6.0	20	8.6	1.0	12.5	2	15.5	4	18.7
15	10.7	30	15.2		22.2	3	27.5	6	33.2
20	16.8	40	23.9	2.0	34.9	4	43.2	8	52.2
25	24.0	50	34.2	2.5	49.9	5	61.8	10	74.7
30	29.6	60	42.2	3.0	6	6	76.2	12	92.1
35	3	70	44.9	3.5	65.5	7	81.1	14	98.0
40	32.9	80	47.0	4.0	68.5	8	84.8	16	102.5
45	34.1	90	48.6	4.5	70.9	9	87.8	18	106.0
50	34.9	100	49.7	5.0	72.5	10	89.8	20	108.5
55	35.3	110	50.3	5.5	73.4	11	90.9	22	109.8
60	35.5	120	50.6	6.0	73.8	12	91.4	24	110.4

TABLE 4: 10-Year Design Cumulative Hyetographs									
Time (min)	1hr Rain (mm)	Time (min)	2hr Rain (mm)	Time (hr)	6hr Rain (mm)	Time (hr)	12hr Rain (mm)	Time (min)	24hr Rain (mm)
0	0.0	0	0.0	0.0	0.0	0	0.0	0	0.0
5	2.0	10	2.8	0.5	4.3	1	5.4	2	6.5
10	5.1	20	7.2	1.0	10.9	2	13.6	4	16.3
15	9.0	30	12.7		19.3	3	24.0	6	28.8
20	14.1	40	20.0	2.0	30.4	4	37.8	8	45.4
25	20.2	50	28.5	2.5	43.4	5	54.1	10	64.9
30	24.9	60	35.2	3.0	53.5	6	66.6	12	80.1
35	26.5	70	37.4	3.5	57.0	7	70.9	14	85.2
40	27.7	80	39.2	4.0	59.6	8	74.1	16	89.1
45	28.7	90	40.5	4.5	61.7	9	76.7	18	92.2
50	29.4	100	4	5.0	63.1	10	78.5	20	94.4
55	29.7	110	42.0	5.5	63.8	11	79.4	22	95.4
60	29.9	120	42.2	6.0	64.2	12	79.9	24	96.0

TABLE 5: 5-Year Design Cumulative Hyetographs									
Time (min)	1hr Rain (mm)	Time (min)	2hr Rain (mm)	Time (hr)	6hr Rain (mm)	Time (hr)	12hr Rain (mm)	Time (min)	24hr Rain (mm)
0	0.0	0	0.0	0.0	0.0	0	0.0	0	0.0
5	1.7	10	2.4	0.5	3.8	1	4.8	2	5.7
10	4.3	20	6.1	1.0	9.6	2	12.0	4	14.3
15	7.7	30	10.8		16.9	3	21.2	6	25.2
20	12.1	40	16.9	2.0	26.7	4	33.4	8	39.7
25	17.3	50	24.2	2.5	38.2	5	47.8	10	56.8
30	21.4	60	29.9	3.0	47.0	6	58.9	12	70.1
35	22.7	70	31.8	3.5	50.0	7	62.6	14	74.5
40	23.8	80	33.2	4.0	52.3	8	65.5	16	78.0
45	24.6	90	34.4	4.5	54.2	9	67.8	18	80.7
50	25.2	100	35.2	5.0	55.4	10	69.4	20	82.6
55	25.5	110	35.6	5.5	56.1	11	70.2	22	83.5
60	25.6	120	35.8	6.0	56.4	12	70.6	24	84.0

TABLE 6: 2-Year Design Cumulative Hyetographs									
Time (min)	1hr Rain (mm)	Time (min)	2hr Rain (mm)	Time (hr)	6hr Rain (mm)	Time (hr)	12hr Rain (mm)	Time (min)	24hr Rain (mm)
0	0.0	0	0.0	0.0	0.0	0	0.0	0	0.0
5	1.3	10	1.8	0.5	3.0	1	3.8	2	4.5
10	3.3	20	4.5	1.0	7.5	2	9.6	4	11.4
15	5.8	30	8.1		13.3	3	17.0	6	20.2
20	9.2	40	12.7	2.0	21.0	4	26.8	8	31.8
25	13.1	50	18.1	2.5	30.0	5	38.3	10	45.5
30	16.2	60	22.4	3.0	37.0	6	47.2	12	56.0
35	17.2	70	23.8	3.5	39.4	7	50.2	14	59.6
40	18.0	80	24.9	4.0	41.2	8	52.5	16	62.4
45	18.6	90	25.7	4.5	42.6	9	54.4	18	64.5
50	19.1	100	26.3	5.0	43.6	10	55.6	20	66.1
55	19.3	110	26.6	5.5	44.1	11	56.3	22	66.8
60	19.4	120	26.8	6.0	44.4	12	56.6	24	67.2

8. DIVISION 8: WATER SUPPLY AND SANITARY SEWERAGE SYSTEMS

8.1 General

Currently, the Town has no municipal water or sanitary servicing.

Private water and sanitary sewerage systems for developed lots shall be reviewed and approved by Service NL and may require an engineering study prepared by a Professional Engineer registered to practice in Newfoundland and Labrador. Approval for these systems shall be in accordance to the following documents published by the Government of Newfoundland and Labrador:

1. *Private Sewage Disposal and Water Supply Standards*; and

2. *Groundwater Assessment and Reporting Guidelines for Subdivisions Serviced by Individual Private Wells.*

Private water and sanitary sewerage systems for developed lots shall be designed and constructed in accordance with the Government of Newfoundland and Labrador's *Private Sewage Disposal and Water Supply Standards* by an approved designer. In the case of water and sewerage systems supporting multiple residences, or if the sewage flows are larger than 4546 L/day, then the water and sewerage works shall be designed and constructed in accordance with the Government of Newfoundland and Labrador's *Guidelines for the Design, Construction, and Operation of Water and Sewerage Works.* The developer must submit to the Town, approvals from Service NL prior to awarding Construction Approval.

9. DIVISION 9: LANDSCAPING

9.1 General

All areas to be landscaped shall be treated with 150mm of topsoil and finished with nursery sod and/or hydroseed.

10. DIVISION 11: ENVIRONMENTAL

10.1 General

The Town of Logy Bay-Middle Cove-Outer Cove recognizes environmental protection as one of the guiding principles and a key component of any development within the Town to help minimize our impact on the environment. All contractor(s) and developer(s) shall take the necessary steps to ensure all construction activities within the development and surrounding areas are monitored for any environmental impacts during construction.

10.2 Design

It is the responsibility of the developer to submit an environmental plan outlining the steps that will be undertaken to address the potential environmental impacts on existing wetlands, waterbodies, waterways, coastline or any other significant natural asset as identified by the Town. The Contractor and Subcontractors' personnel shall not harass wildlife, migratory birds or fish, and shall do all that is reasonably practicable to protect any species.

Conditions should be observed and noted prior to any work commencing within the development area, during all aspects of the construction phasing, and once the development has been substantially completed.

It is the sole responsibility of the developer to obtain any relevant permits from departments within the Government of NL and/or Federal Government. Proof that these permits have been acquired will be required prior to any construction startup.

10.3 Silt Control

Silt control measures shall be in place, as required by the Town, to prevent eroded soil on a construction site, so that it does not wash off and cause water pollution to a nearby stream, river, lake or ocean. Measures to minimize and prevent the aforementioned shall be in the form of, but not limited to:

1. Filter fabrics, fencing, hay bales, or some other equivalent method directed towards prevention and/or control of runoff associated with a disturbed area before it enters a watercourse.
2. Using an appropriate hydraulic mulch;
3. Spreading hay over exposed soils;
4. Spreading a thin layer of brush over disturbed areas.

Spacing intervals of any such control measures shall be determined on a case-by-case basis and may be required to be modified during construction should silt problems occur or worsen.

10.4 Spills

All spills are to be reported to the appropriate federal and/or provincial authorities. In the event of the detection of a fuel or hazardous material spill of 50 litres or more, the Contractor and Subcontractors shall:

1. Make every effort to stop leakage and contain contaminant flow;
2. Immediately, upon detection, report spill location and size to the appropriate authority and/or governing body.
3. Remove all contaminants from the spill site by whatever method is appropriate and acceptable by the province. Clean up the affected area in accordance with the requirements of the Provincial Government and then dispose of contaminated debris at an approved waste disposal site.
4. Take all necessary action to ensure the incident does not recur.

It is required for all spills, regardless of volume, that may enter waters frequented by fish, to be reported to the Department of Fisheries and Oceans.

10.5 Dust Control

The Contractor shall ensure that dust does not become a problem for workers on the project or residents living in a nearby residential area.

Water shall be used by the Contractor to control dust when necessary or as requested by the site inspector and/or Town.

10.6 Watercourse Crossings

All watercourse crossings shall be in accordance with provincial regulations and designed to the appropriate storm frequency event.

The size, type and all pertinent details of the actual crossing will be determined, designed and stamped by a Professional Engineer registered to practice within the province of Newfoundland and Labrador, with all supporting documentation, including calculations.

10.7 Noise

No construction work is permitted between the hours of 8:00 PM and 7:00 AM. Construction to take place between the hours of 7:00 am and 8:00 pm daily except for Statutory Holidays (New Year's Day, Good Friday, Memorial Day, Labour Day, Armistice Day and Christmas Day). No construction activity is permitted during the Statutory Holiday from 12:00 am in the morning of the Statutory Holiday until 7:00 am the day following the Statutory Holiday."

Allowances may be accepted in extenuating circumstances and must be approved by the Town, given ample notice, to forward to residents to give a minimum 24-hour notice period.

In the event of an emergency, where no notice is practicable, allowances will be made to accommodate the work being undertaken.

All effort should be taken to eliminate work outside the normal hours listed above.

10.8 Restoration

Once a development has been substantially completed and confirmed by the Town, the contractor shall remove any and all control measures mentioned above.

Areas that have been disturbed and/or modified for environmental reasons shall be returned to its normal state prior to construction. Should the disturbed area be required to be left permanently, an Engineer shall provide a relevant plan and all associated details regarding the area(s) in question.

10.9 Acceptance

Environmental controls for all developments shall be developed and relayed to the Town for approval and recommendations, where necessary, prior to any construction startup.

The contractor will then be responsible to implement all necessary measures before any work begins.

11. DIVISION 11: SAFETY

11.1 General

All contractors and subcontractors have a responsibility to ensure the safety of themselves, their employees and the general public through various courses of action when working on or around a work site.

11.2 Site Specific Safety Plan (SSSP)

A Site Specific Safety Plan shall be developed and submitted prior to any construction taking place.

All employees shall be made aware of the document and reviewed with them so they are aware of any hazards that may be present. If, at any time, conditions throughout the site are altered and new hazards are presented, it is the duty of the site supervisor to document those hazards, relay the information to all employees take the necessary precautions to minimize or eliminate the hazard, and submit to the Town,

Whenever possible, every effort should be made to eliminate the hazard, rather than minimizing.

11.3 Personal Protective Equipment (PPE)

All contractors and subcontractors shall ensure that anyone who enters the work area, including Town staff, engineers, owners, employees and visitors, don the proper PPE.

Minimum requirements shall include;

1. CSA approved safety footwear
2. CSA approved safety vest
3. CSA approved hard hat
4. Safety eyewear

In the event of any special work on a site surrounding heights and confined spaces, additional PPE will be required in the form of gas detection equipment, harnesses and required training from an approved institution.

11.4 Signage

Contractors shall ensure that proper signage is erected, wherever possible, before beginning any work.

Signage shall be proper coloring and size as per provincial government regulations.

11.5 Traffic Plan

Whenever work takes place on or near an existing roadway, the contractor shall complete daily traffic plans, as seen in Fig. 0001, Appendix B, that display the work area, signage used, signage locations, work location and signed off by traffic controllers working in the area, as well as the site supervisor.

The Town will require this document to be submitted daily, prior to work commencing, by the contractor to the site inspector, which shall remain on site for a period of one (1) week, then submitted to the Town electronically.

Failure to complete this document, as required, may result in a work stoppage until the documents are completed and satisfactory to the site inspector.

Contractors shall refer to the provincial government's most recent Traffic Control manual for signage setups. The City of St. John's Traffic Control Manual is also an acceptable document for reference as well. In the event that neither manual displays a similar traffic situation, a plan shall be developed by the contractor and submitted to the Town for approval prior to beginning any work.

In the event that traffic disruptions are imminent, or driving lanes will be reduced, the contractor shall give the Town a minimum of 24 hours' notice so the public can be informed.

In the event that a total road closure is required, the contractor shall give the Town a minimum of 72 hours' notice to alert the public.

If lane closures are required to continue, outside of normal working hours, leaving only one (1) lane of access, the contractor shall:

1. Be responsible to provide flagspersons (equipped with high-visibility clothing) to provide traffic control until all lanes are reopened, or;

2. Supply and install temporary traffic lights as required. Please note that this option will require a 24 hour notice period so the public can be alerted in a timely manner.

Exceptions will be made in emergency situations.

11.6 Fencing

Where required by the Town, safety fencing will be erected around the perimeter of the work site to prohibit public access onto the work site.

11.7 Documentation

Various documents, depending on the construction activity, that may be required, but not limited to, include;

1. Site Specific Safety Plan (SSSP)
2. Toolbox Talks
3. Hazard Assessments
4. Training Certificates
5. Equipment Inspections
6. Vehicle Inspections
7. COR Certification
8. Letter of Good Standing (NLCSA)
9. Workplace NL Clearance Letter
10. Certificate of Insurance (COI)
11. Traffic Plans
12. Environmental Plan
13. Fencing Plan

APPENDIX A

DRAWINGS

DWG: 2020-0001 Typical Lot Grading Plan

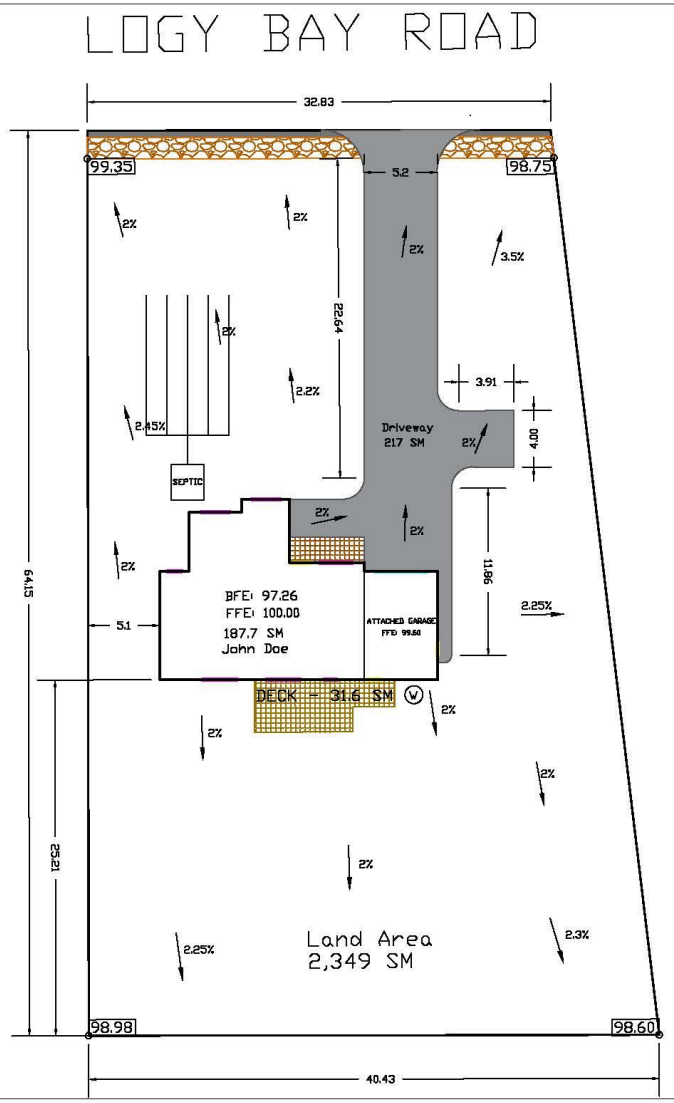
DWG: 2020-0002 Cross Section: Local Street 18 m ROW

DWG: 2020-0003 Cross Section: Collector Street 20 m ROW

DWG: 2020-0004 Typical Concrete Headwall Maximum Height 1400 (Max. 600 Pipe)

DWG: 2020-0005 Culvert End: 300 mm Flat Stone / Block Rip Rap with Sod

DWG: 2020-0006 Typical Cross Section and Design for Granular Walkways



NOTES:
1. All dimensions in metres unless otherwise specified.

Shoulder
Asphalt
Ditch
Patio/Deck

NO.	REVISIONS	DATE

PROFESSIONAL STAMP

PROJECT NO.
DDD-0001-12072020

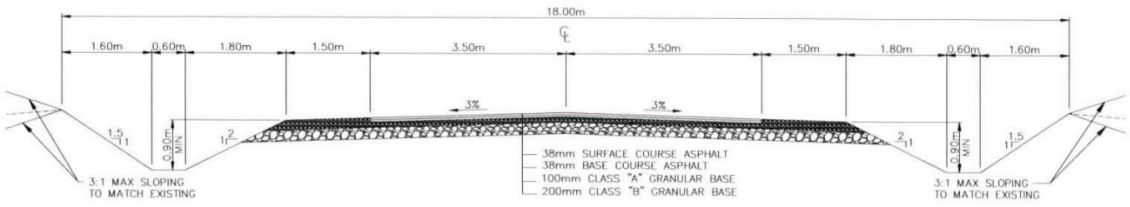
CLIENT
JOHN DOE

PROJECT TITLE
DEVELOPMENT DESIGN MANUAL

SHEET TITLE
LOT GRADING PLAN

PROJECT NO.
DEVELOPMENT DESIGN MANUAL

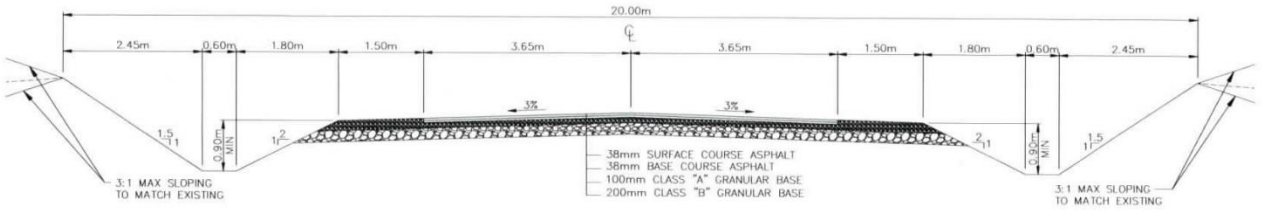
DRAWN BY	CHECKED BY
JG	JG
DATE: DEC. 7, 2020	DRAWING NO.: 2020-0001
SCALE: N.T.S.	



Logy Bay
Middle Cove
Outer Cove

CROSS SECTION - LOCAL STREET 18m R.O.W.

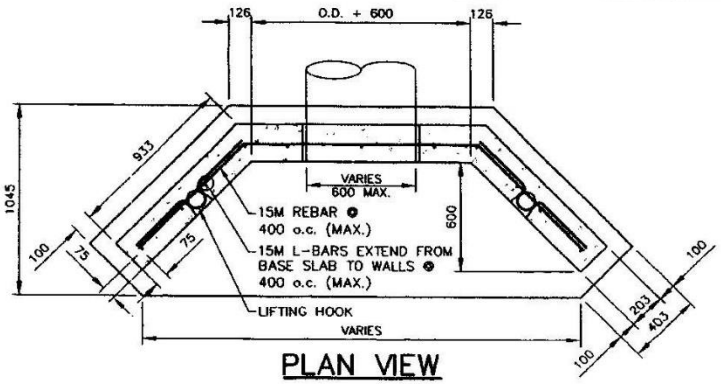
DATE:	SCALE:	REFERENCE:	DWG:
AUG 2020	N.T.S	DIVISION 6	2020-0002



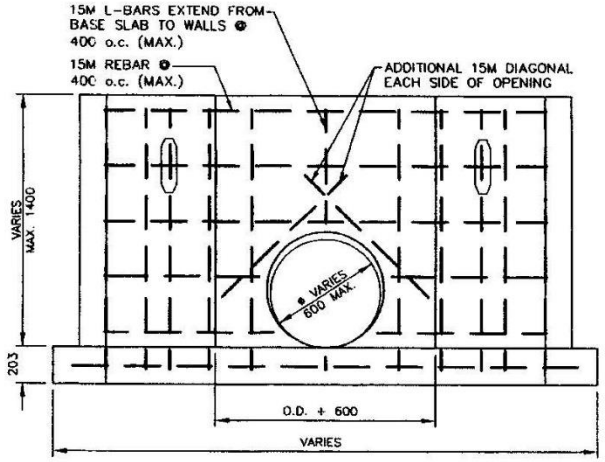
Logy Bay
Middle Cove
Outer Cove

CROSS SECTION - COLLECTOR STREET 20m R.O.W.

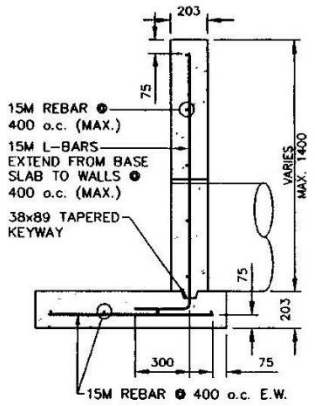
DATE: AUG 2020	SCALE: N.T.S	REFERENCE: DIVISION 6	DWG: 2020-0003



PLAN VIEW



ELEVATION VIEW



SECTION VIEW

NOTES:

1. HAND RAIL TO BE PLACED ON WALLS THAT ARE EQUAL TO OR GREATER THAN 1200mm HIGH.

GENERAL CONCRETE NOTES:

2. CONCRETE TO HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 35 MPa. MAXIMUM AGGREGATE SIZE OF 19mm, AIR ENTRAINMENT 5-8% AND SLUMP OF 75mm ± 19mm. EXPOSURE CLASS C1.
3. ALL CONCRETE TO CAN/CSA - A23.4-05.
4. ALL EXPOSED CORNERS ON CONCRETE WORK SHALL BE CHAMFERED 25mm.

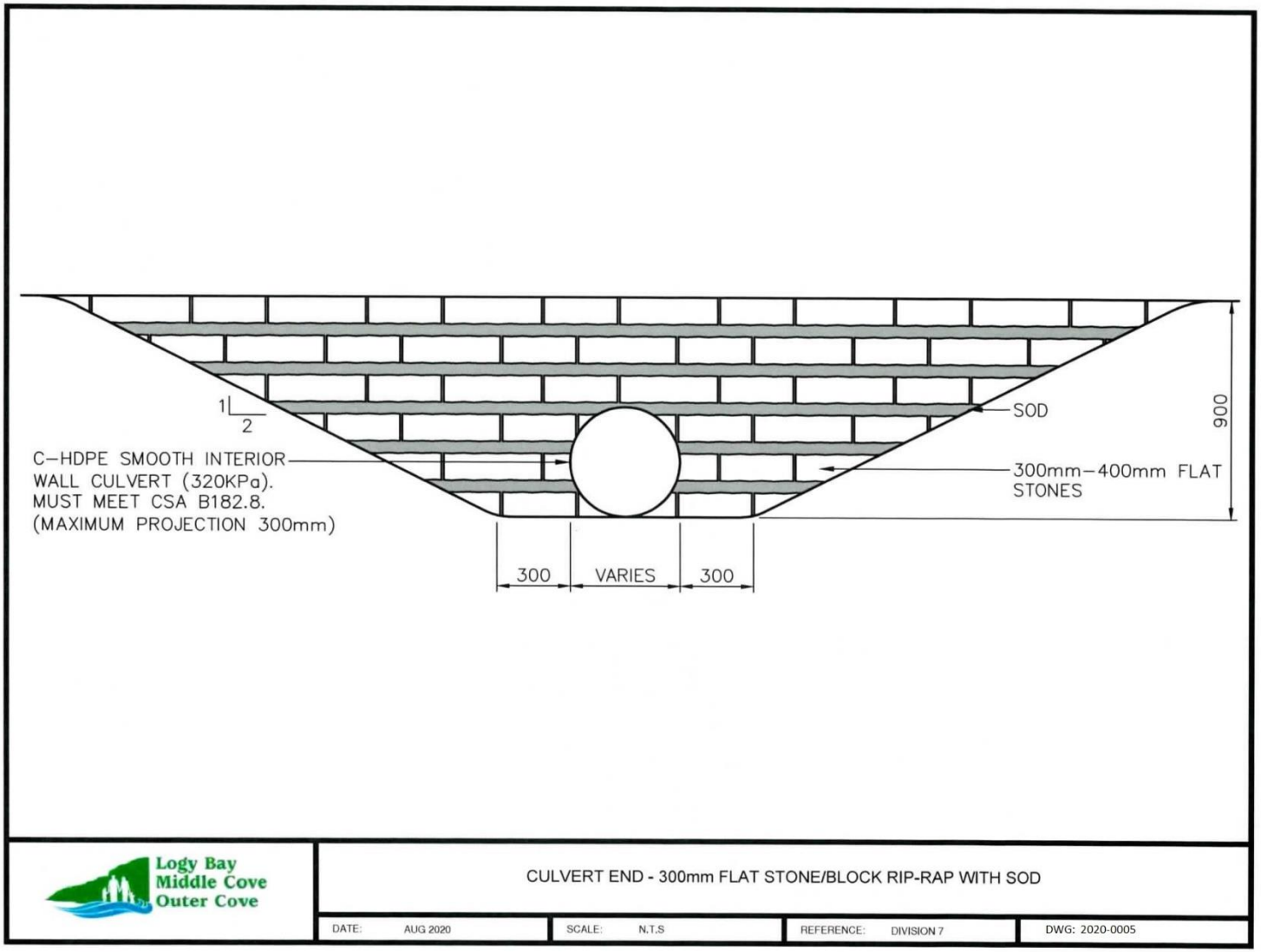
GENERAL STEEL/REINFORCEMENT NOTES:

5. MINIMUM COVER FOR STEEL REINFORCEMENT IN CONCRETE PERMANENTLY EXPOSED TO EARTH - 75mm ± 5mm. OTHERWISE, MINIMUM COVER 50mm ± 5mm.
6. REINFORCING STEEL MINIMUM YIELD STRENGTH 400 MPa.
7. WELDED DEFORMED WIRE REINFORCEMENT TO ASTM A497-07.
8. WELDED STEEL REINFORCEMENT TO ASTM A185-07.
9. BILLET STEEL BARS FOR CONCRETE REINFORCEMENT TO CSA G30.18-M92(R2007).
10. MINIMUM REINFORCEMENT SPLICES:
    - DEFORMED REBAR UP TO AND INCLUDING 20M: 32 BAR DIAMETERS
    - DEFORMED REBAR 25M AND OVER: 40 BAR DIAMETERS
    - DEFORMED WIRE FABRIC: 32 BAR DIAMETERS: MINIMUM 300mm
    - SMOOTH WIRE FABRIC: 40 BAR DIAMETERS BETWEEN THE OUTERMOST WIRES OF EACH FABRIC SHEET

Logy Bay
Middle Cove
Outer Cove

TYPICAL CONCRETE HEADWALL MAXIMUM HEIGHT 1400
(MAX. 600 PIPE)

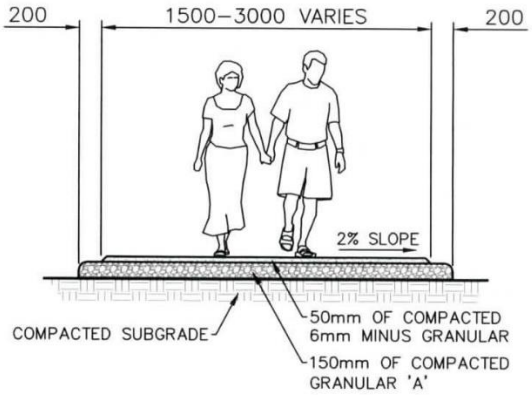
DATE	SEPTEMBER 2020	SCALE	N.T.S	REFERENCE	DIVISION 7	DWG:	2020-0004



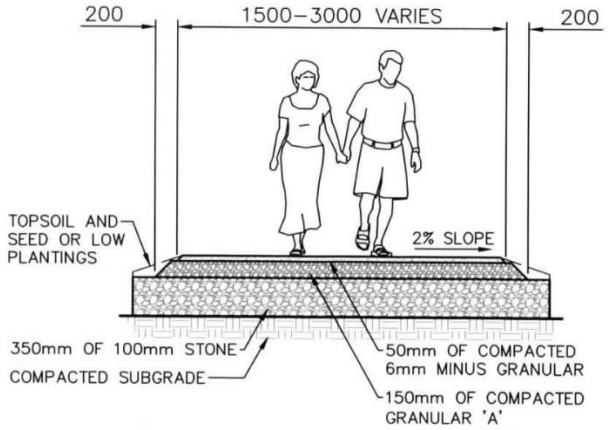
Logy Bay Middle Cove Outer Cove

CULVERT END - 300mm FLAT STONE/BLOCK RIP-RAP WITH SOD

DATE: AUG 2020	SCALE: N.T.S	REFERENCE: DIVISION 7	DWG: 2020-0005



SECTION – TYPICAL GRANULAR WALK



SECTION – TYPICAL GRANULAR WALK
FOR WET LOCATIONS

Logy Bay
Middle Cove
Outer Cove

TYPICAL CROSS SECTION AND DESIGN FOR GRANULAR WALKWAY

DATE: AUG 2020	SCALE: N.T.S	REFERENCE: DIVISION 9	DWG: 2020-0006

APPENDIX B

DOCUMENTS

Fig. 0001 Field Level Traffic Control Plan

FIELD LEVEL TRAFFIC CONTROL PERMIT

INFORMATION	SECTION 1
Site Location:	
Description of Work Activity:	
Supervisor:	
Date:	

*** Supervisor or designate to complete and review with employees daily.**
*** Copy to remain on site at all times.**
*** Copy to be submitted to the Project Manager or Site Inspector .**
*** Traffic Control Person Signage to be removed or turned away at the end of each day.**

RISK ASSESSMENT — **SECTION 2**

Location of Work		Work Duration / Type		Type of Road			
	Off Shoulder		Mobile		Divided		
	Shoulder		Very Short		Undivided		
	Partial Lane Closure		Short				
	Lane Closure		Long				

Site Factors		Traffic Volume		Intersections	
	Speed Limit (km/h)		Low		Yes
	Site Length (m)		Medium		No
	Sight Distance (m)		High		

Night-Time Operations		Safe Work Practices (Check ALL That Apply)			
	Yes		Signage		Traffic Control Persons
	No		Training		Cones / Pylons / Barricades

Can Emergency Vehicles Pass Through?		Yes		No

FIGURES — **SECTION 3**

Figures Used:	

** In the event that no specific figure from an approved traffic control manual is used, sketch worksite on the back of this sheet identifying placement of signs, flagspersons, and work zone.*

CONFIRMATION — **SECTION 4**

Employee Name:		Signature	
Employee Name:		Signature	
Employee Name:		Signature	
Employee Name:		Signature	
Employee Name:		Signature	

Logy Bay
Middle Cove
Outer Cove

Form last updated 2020-10-16