TOWN OF GIBSONS

SUBDIVISION AND DEVELOPMENT SERVICING AND STORMWATER MANAGEMENT BYLAW No. 1175, 2012

Adopted: February 5th, 2013

Consolidated for convenience March 26, 2016 to include amendment No. 1175-01

This version of this bylaw is a consolidation of amendments to the original bylaw as of the date specified. This consolidation is done for the convenience of users and accurately reflects the status of the bylaw as of the specified date but must not be construed as the original bylaw and is not admissible in Court unless specifically certified by the Director of Corporate Administration for the Town of Gibsons. Persons interested in the definitive wording of this bylaw and its amendments should view the original sealed bylaws at the Town of Gibsons.

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TOWN OF GIBSONS
BYLAW NO. 1175

A Bylaw to require works and services
within the Town of Gibsons

WHEREAS it is deemed desirable to regulate and require the provision of works and services in respect of the subdivision and Development of land in order to promote the orderly development of the Town; and

WHEREAS it is deemed desirable to require that owners of land carrying out construction of paved and roof areas manage and provide for the ongoing disposal of surface runoff and storm water without fouling, obstructing or impeding the flow of any stream, creek, waterway, watercourse, ditch or stormwater drainage system; and,

THEREFORE, the Municipal Council of the Town of Gibsons, in open meeting assembled, enacts as follows:

SECTION 1 GENERAL PROVISIONS

1.1 SHORT TITLE

This Bylaw may be cited for all purposes as "Subdivision and Development Servicing and Stormwater Management Bylaw No. 1175".

1.2 REPEAL

Subdivision and Development Bylaw No. 733 and Bylaw No. 1088 are repealed.

1.3 PURPOSE

The purpose of this Bylaw is to establish the standard for and to require the construction of Works and Services and the provision of stormwater management works in connection with the subdivision and Development of land.

1.4 PARCEL FRONTAGE

Council delegates to the Approving Officer the authority to exempt a Parcel from the minimum Parcel Frontage requirements in the Local Government Act.

1.5 BYLAW SCHEDULES

Attached as integral parts of the Bylaw are the following Schedules:

Schedule "A"	Design Criteria and Specifications
Schedule "B"	Servicing Agreement: *Works on Town-Owned Lands and Rights-of-Way*
Schedule "C"	Servicing Agreement: *Works on Private Lands Undergoing Subdivision or Development*
Schedule "D"	Standard Drawings
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SECTION 2 DEFINITIONS AND APPLICATION OF BYLAW

2.1 DEFINITIONS

In this Bylaw unless the context requires otherwise, the following words and terms shall have the meanings hereinafter assigned to them:

ACCEPTANCE	means the final Acceptance of the Works and Services as certified in writing by the Town.
APPLICANT	means a person applying for the approval of a subdivision or a person applying for a building permit in relation to any Development.
APPROVING OFFICER	means the person so designated from time to time by the Council in accordance with the Land Title Act.

ARTERIAL	means a Highway designated as Arterial in Schedule "E" to this Bylaw.
BOULEVARD	means an improved portion of land, within a Highway dedication adjacent to a Road surface, sidewalk or Parcel.
COLLECTOR ROAD	means a Highway designated as Collector in Schedule "E" to this Bylaw.
COMMUNITY SANITARY SEWAGE SYSTEM	means a system for the collection and disposal of sanitary sewage which is owned, operated and maintained by the Town.
COMMUNITY WATER SYSTEM	means a domestic water supply system which is owned, operated and maintained by the Town or the Sunshine Coast Regional District.
CRAWLSPACE	means a space between a floor of a building and the underlying surface of the ground having a maximum height of 1.2 metres measured to the underside of the joists and not used for the storage of goods or equipment damageable by moisture.
CUL-DE-SAC	means a Highway, other than a walkway, with a single point of vehicle access or egress.
DESIGN AREA RATIO	means the value used to calculate the hydraulic capacity associated with individual Stormwater BMPs as referenced in the ISMP.
DEVELOPER	means an Applicant, an Owner of land for which an application for subdivision or Development is made, or an agent of the Owner authorized in writing.
DEVELOPMENT	means an activity which requires a building permit under Town of Gibsons Building and Plumbing Bylaw, No. 822, 1996.
DEVELOPMENT APPLICATION PROCEDURES AND FEES BYLAW	means the Town of Gibsons Development Application Procedures and Fees Bylaw No. 1166, 2012.

DIRECTOR OF ENGINEERING	means the person appointed by the Town as Director of Engineering, their deputy, or a person authorized by the Director to perform duties of the Director under this bylaw.
DISTURBED AREA	means all or part of a Parcel from which trees or other vegetation have been removed, or on which native soil has been compacted by heavy equipment, such that its ability to absorb rain water is reduced.
DRAINAGE COLLECTION SYSTEM	means a system of works, which may include pipes, ponds, open channels, swales and ditches, designed and constructed to collect and manage the flow of storm water or run-off.
DRIVEWAY	means a paved or unpaved strip of land providing vehicle access between the Highway dedication and a parking space, garage, dwelling or other structure located on private property.
DRIVEWAY CROSSING	means an area of the Highway dedication located between the edge of the paved Road surface and the property adjacent to it intended to provide vehicle access to a Driveway.
ESTIMATED CONSTRUCTION COST	means the cost, estimated by the Professional Engineer, of constructing all Works and Services including (1) the cost of any underground wiring and related conduits, vaults and ducts including the cost of wiring and infrastructure to be provided by BC Hydro; (2) a minimum 10% allowance for engineering fees; (3) a minimum 10% construction contingency allowance; and (4) all applicable taxes.
FRONTAGE	means that length of the lot boundary which abuts a Highway.

HIGHWAY	means a public Road, Lane, walkway, or bridge, and any other way open to public use, but does not include a Private Road or a private easement on private property.
INTEGRATED STORMWATER MANAGEMENT PLAN (ISMP)	means any plan adopted by bylaw or Council resolution providing for the analysis of stormwater runoff for the purpose of identifying options for collecting and managing stormwater runoff in order to reduce flows to the Drainage Collection System and the environment, while improving water quality and protecting groundwater supplies.
INTEGRATED SURVEY AREA	means the Integrated Survey Area referenced in the Land Survey Act.
LANDSCAPE PLAN	means a plan prepared by a Professional Landscape Architect which addresses stormwater management and traffic calming objectives within a Highway dedication and Town rights of way.
LOCAL HEALTH AUTHORITY	means the official appointed under the Public Health Act having jurisdiction over the area in which the subdivision or Development is located.
LOCAL ROAD	means a Highway other than an Arterial, Collector, Lane, or walkway designed to provide direct access to Parcels and to provide for circulation of traffic within subdivisions.
LOW-IMPACT DEVELOPMENT	means Works and Services which allow stormwater to be naturally absorbed into the soil, provide Local and Collector Roads with lower design speeds, and provide Boulevard landscaping, all designed to benefit and minimize the impact of any Development or subdivision on the environment.
MASTER MUNICIPAL CONSTRUCTION DOCUMENT (MMCD)	means the Platinum Edition of the Master Municipal Construction Document, Specifications and Standard Detail Drawings and Design Guideline Manual and any subsequent amendment to that Edition or any replacement Edition.

MINIMUM BUILDING ELEVATION (MBE)	means the elevation of the upper surface of the lowest floor slab in a building or the underside of the floor joists where the lowest floor is construction over a Crawlspace.
MUNICIPAL PLANNER	means the person appointed by the Town as the Municipal Planner, their deputy, or person authorized by the Municipal Planner to perform duties of the Municipal Planner under this bylaw.
MUTCD	means the Transportation Association of Canada (TAC) Manual of Uniform Traffic Control Devices for Canada, 4th Edition, and any subsequent amendment to that Edition or any replacement Edition.
NOTICE TO PROCEED	means a letter or notice issued by the Director of Engineering authorizing the commencement of the construction of Works and Services.
OFFICIAL COMMUITY PLAN	means the Town's Official Community Plan, Bylaw No. 985, 2005.
OFF-SITE	means on or in an existing Highway or Town right-of-way or a Highway or right-of-way which is proposed to be dedicated to the Town as a requirement of the approval of the subdivision or Development.
ON-SITE	means on the Parcel or lands being subdivided or Developed, but not including any Highway or right-of-way which is proposed to be dedicated to the Town.
ORNAMENTAL STREET LIGHTS	means Town-owned street lights supplied and installed on a Highway according to this Bylaw.
OWNER	means any person registered in the Land Title Office as Owner of the land being subdivided or Developed and includes the registered holder of the last registered agreement for sale.

PARCEL	means any lot, block or other area in which land is held or into which land is subdivided.
PARTIAL FRONTAGE WORKS	means Works on a Highway abutting land being subdivided or developed but not including Sidewalks, curbs and gutters, parking stalls, Boulevard landscaping, Ornamental Streetlights, or underground distribution wiring.
PRELIMINARY SUBDIVISION APPLICATION	means an application provided to the Approving Officer with information regarding a proposed Subdivision.
PROFESSIONAL ENGINEER	means a person licensed to practice in British Columbia as a Professional Engineer by the Association of Professional Engineers and Geoscientists of B.C. and engaged by the Applicant to design or prepare drawings for the construction of Works and Services or to inspect such Works and Services in relation to a subdivision or Development, and may include a Professional Hydro-geologist.
PROFESSIONAL GEOTECHNICAL ENGINEER	means a person licensed to practice in British Columbia as a Professional Engineer by the Association of Professional Engineers and Geoscientists of B.C. with expertise in geotechnical matters and engaged by the Applicant to design or prepare drawings for the construction of Works and Services or to inspect such Works and Services in relation to a subdivision or Development.
PROFESSIONAL LANDSCAPE ARCHITECT	means a member of the B.C. Society of Landscape Architects engaged by the Applicant to design or prepare drawings for the construction and installation of landscaping and the inspection of such work in relation to a subdivision or Development.
QUALIFIED ENVIRONMENTAL PROFESSIONAL	has the meaning set out in the Riparian Area Regulations under the *Fish Protection Act*.

ROAD	means an improved travelled portion of land within a Highway dedication, excluding private roads or private easements.
SECURITY DEPOSIT	means cash or an unconditional, irrevocable and automatically renewing Letter of Credit issued by a chartered bank or credit union.
SEDIMENT AND EROSION CONTROL PLAN	means a plan which demonstrates how Works and Services will be undertaken and completed so as to prevent the release of silt, concrete, concrete leachate and other environmentally deleterious substances into any ditch, storm sewer, Watercourse or ravine.
SERVICING AGREEMENT	means an agreement substantially to the form of Schedule “B” or Schedule “C” of this Bylaw.
SIDEWALK	means a portion of a Highway that is improved for the use of pedestrian and non-vehicular traffic adjacent to a Road or Boulevard.
STANDARD DRAWINGS	means the drawings prepared in accordance with the standards specified in the MMCD and in Schedule “D” of this Bylaw.
STOP WORK ORDER	means written notice issued by the Town, under this Bylaw, which requires the contractor, Professional Engineer, Applicant or Developer to stop all construction activities specified in the notice until further notice from the Town.
STORM WATER BEST MANAGEMENT PRACTICES (SWBMPs)	means providing storm water detention/retention, source control, infiltration or other forms of storm water flow control that minimize or eliminate reliance on municipal storm drainage works.
STORM WATER MANAGEMENT PLAN	means a plan and/or written report which indicates means by which stormwater and other surface water will be managed within, through and downstream of the land or Parcel to which the plan and report pertain.

SUBSTANTIAL COMPLETION	means completion of the construction of Works and Services to the point that a Professional Engineer has certified them as being designed and substantially complete in compliance with Schedule "A" of this Bylaw, and either ready for use or are being used for the purpose intended, and the Works and Services have been accepted in writing by the Town as being substantially complete.
SURVEYOR	means a British Columbia Land Surveyor (BCLS) licensed in the Province of British Columbia.
WASTEWATER COLLECTION PLAN	means any plan adopted by bylaw or Council resolution providing for the analysis of wastewater collection for the purpose of identifying servicing options for the collection and disposal of sanitary sewage.
WATER SERVICE CONNECTION BYLAW	means the Town of Gibsons Water Service Connection Bylaw No. 1090, 2008.
WATERCOURSE	means any natural or artificial stream, river, creek, ditch channel, canal, swale, conduit, culvert, drain, waterway, gully or ravine in which water flows, either continuously or intermittently.
WORKS AND SERVICES or **WORK(S)**	means any Works or Services required by this Bylaw in connection with a subdivision or Development, and without restricting the generality of the foregoing, includes: the supply and distribution of water; collection, management and disposal of sewage; collection, management and disposal of storm water; street lighting; roadways including retaining structures, curbs, gutters, Boulevards and Sidewalks; walkways and trails; site or lot grading and clearing for stormwater management; and the supply and distribution of underground electrical power, telephone, and cablevision.
ZONING BYLAW	means the Town of Gibsons Zoning Bylaw No. 1065, 2007.

2.2 APPLICATION OF BYLAW

2.2.1 In this Bylaw whenever words are used denoting the subdividing or subdivision of land, those words shall be deemed to refer to the division of land into two or more Parcels, whether by plan, apt descriptive words, or otherwise, and to include the adjustment of lot lines whether or not such adjustment of lot lines results in an increase in the number of Parcels.

2.2.2 This Bylaw shall apply to all lands within the boundaries of the Town.

2.2.3 Partial Frontage Works only are required for the following:

2.2.3.1 Any subdivision that meets any of the following conditions:

.1 the subdivision creates a Parcel to be used solely as park land or the installation of public utilities and related equipment and structures and the Applicant grants to the Town a covenant restricting the use of the Parcel to that purpose; or

.2 the subdivision consolidates two or more Parcels without increasing the number of dwelling units that can lawfully be constructed on the land or adjusts a lot line without increasing the number of Parcels or increasing the number of dwelling units that can lawfully be constructed on the land.

2.2.3.2 The Frontage of any Parcel being subdivided and Zoned R1, R2 or R3 at the time of the adoption of this Bylaw that abuts any Highway as indicated in Schedule “F” as requiring Partial Frontage Works.

2.2.4 Modifications to the design criteria and specifications contained in Schedule “A”, may be permitted by the Director of Engineering in respect of any subdivision or Development where connections to existing municipal infrastructure are being made and,

2.2.4.1 where a subdivision creating one or two additional lots is being approved within an area where Works and Services of all types required by this Bylaw are in existence but have not been constructed to the standard required in Schedule “A”; or

2.2.4.2 where a building permit authorizes the construction of a building within an area where Works and Services of all types required by this Bylaw are in existence but have not been

constructed to the standard required in Schedule "A",

and in such cases the Director may permit new Works and Services to be constructed at a standard that is consistent with that of the existing works and services.

2.2.5 Frontage Works are not required for the following Developments, with the exception of Stormwater Best Management Practices, Driveway and Driveway Crossing requirements according to this Bylaw:

2.2.5.1 A Development comprising the construction of or addition to a single family dwelling in a Single-Family or Two-Family Residential zone as established in the Zoning Bylaw; or

2.2.5.2 The construction or alteration of a building for any purpose or use in an Agricultural zone as established in the Zoning Bylaw.

SECTION 3 ADMINISTRATION

3.1 COMPLIANCE WITH BYLAW

No person shall subdivide, or undertake Development of land, or commence construction of Works and Services required by this Bylaw except in compliance with the provisions of this Bylaw.

3.2 DEVELOPER'S RESPONSIBILITY

3.2.1 Nothing in this Bylaw shall relieve the Developer or the Professional Engineer from the responsibility to seek out and comply with legislation applicable to their undertaking.

3.2.2 The approval of a subdivision, the issuance of a building permit, the issuance or approval of plans, specifications or documents, the execution and delivery of a Servicing Agreement and any inspection made by any Town employee shall not in any way relieve the Developer or Professional Engineer from full responsibility for complying with all requirements applicable to their undertaking.

3.3 SEVERABILITY

The provisions of this Bylaw are severable. If any provision is for any reason held to be invalid by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining provisions of this Bylaw.

3.4 VIOLATION

Every person who:

a) Violates any of the provisions of this Bylaw;

b) Causes or permits any act or thing to be done in contravention or violation of any of the provisions of this Bylaw;

c) Neglects or omits to do anything required under this Bylaw;

d) Carries out, causes or permits to be carried out any subdivision or Development in a manner prohibited by, or contrary to, any of the provisions of this Bylaw;

e) Fails to comply with an order, direction or notice given under this Bylaw; or

f) Prevents or obstructs or attempts to prevent or obstruct the authorized entry of the Approving Officer or Director of Engineering on property pursuant to section 16 of the *Community Charter*;

shall be deemed to be guilty upon summary conviction of an offence under this Bylaw.

3.5 STOP WORK ORDER

3.5.1 The Director of Engineering may issue a Stop Work Order in the event that work is proceeding in contravention of this Bylaw.

3.5.2 All Works and Services, with the exception of emergency Works and Services or Works and Services required to protect the environment, shall cease upon issuance of a Stop Work Order and shall not re-commence until written authorization is provided by the Director of Engineering.

3.6 CONTINUING OFFENCE

Each day's continuance of an offence under this Bylaw constitutes a new and distinct offence.

3.7 PENALTY

Any person who violates any of the provisions of this Bylaw shall, on summary conviction in a court of competent jurisdiction, be liable to a penalty not exceeding $10,000 for each offence, plus the cost of prosecution.

SECTION 4 WORKS AND SERVICES REQUIRED

4.1 GENERAL

4.1.1 The Master Municipal Construction Documents, subject to any changes expressly set out in this Bylaw, are adopted as the standard for the design and construction of Works and Services under this Bylaw.

4.1.2 Where a conflict occurs between this Bylaw, including all Schedules, and the MMCD, this Bylaw and the Schedules shall prevail.

4.1.3 Where a conflict occurs between the Standard Drawings in Schedule "D" and the text of this Bylaw or the text of Schedule "A", the text of the Bylaw or Schedule "A" shall prevail.

4.1.4 Except as herein provided, no person shall subdivide or Develop land except in conformity with the relevant requirements of this Bylaw, its Schedules, and the Master Municipal Contract Documents.

4.1.5 Except as herein specifically provided, all Works and Services required to be constructed and installed shall be completed at the expense of the Developer.

4.1.6 Works and Services shall be as set out in SECTION 4 of this Bylaw and all design, construction, installation, inspection and monitoring shall be carried out in conformity with requirements of Schedule "A" to this Bylaw.

4.1.7 The Developer of any Parcels, which are proposed to be subdivided or Developed, shall provide or upgrade Works and Services within and adjacent to the proposed subdivision or Development in accordance with the following:

4.1.7.1 The width of Highways dedicated upon subdivision shall be determined in accordance with Schedule "A" and Schedule "D".

4.1.7.2 The Director of Engineering shall determine the Road classification of all new Roads taking into consideration Schedule "E".

4.1.7.3 Highways immediately adjacent to lands being subdivided or Developed and all new Highways within or required in connection with the subdivision or Development shall be constructed in accordance with the standards contained in

Schedule “A”, Schedule “D” and Schedule “F”.

4.1.7.4 Highways shall be laid out with due regard to the topography so as to avoid excessive cuts and fills within the public Road, as well as within Parcels.

4.1.7.5 Curbs, gutters, Sidewalks, Boulevards and street lighting shall be installed on all Highways immediately adjacent to lands being subdivided or Developed and all new Highways within or required in connection with the subdivision or Development shall be constructed in accordance with the standards contained in Schedule “A”, Schedule “D” and Schedule “F”.

4.1.7.6 The minimum area that is necessary for Road and utility construction, including cuts and fills, shall be cleared and graded in accordance with standards contained in Schedule “A”.

4.1.7.7 Trails and Sidewalks immediately adjacent to lands being subdivided or Developed and all new trails and Sidewalks within or required in connection with the subdivision or Development shall be constructed in accordance with the standards contained in Schedule “A” and Schedule “D”.

4.1.7.8 A water distribution system, including service connections, shall be constructed in accordance with the standards contained in Schedule “A“ and Schedule “D”, and shall be connected to an existing Community Water System.

4.1.7.9 A sanitary sewage collection system, including service connections, shall be constructed in accordance with the standards contained in Schedule “A“ and Schedule “D”, and shall be connected to an existing Community Sanitary Sewage System.

4.1.7.10 A Stormwater Management system shall be constructed in accordance with standards contained in Schedule “A” and Schedule “D”.

4.1.7.11 Landscaping and environmental protection measures related to the construction of Works and Services required by this Bylaw shall be constructed in accordance with the standards contained in Schedule “A” and Schedule “D”.

4.1.7.12 Conduit and wiring for the supply and distribution of underground electrical power, telephone and cablevision,

including upgrading or construction on adjacent or Frontage Highways, shall be provided to bring such infrastructure to the standards specified in Schedule "A", Schedule "D" and Schedule "G".

4.1.8 Despite 4.1.7, in the circumstances described in 4.1.9 the Director of Engineering may permit a Developer applying for approval of a Development to provide such components of the Works and Services required by 4.1.7 as the Director may specify, having a value not exceeding 5% of the value of the work authorized by the building permit less the value of any fire suppression sprinkler system required by the permit, and not exceeding the Estimated Construction Cost.

4.1.9 The Director of Engineering may exercise discretion under 4.1.8 only where:

4.1.9.1 the building permit authorizes only the alteration of an existing building;

4.1.9.2 any increase in the gross floor area of the building is equal to or less than 10% of the pre-existing gross floor area, calculated in accordance with the Zoning Bylaw;

4.1.9.3 the building being altered could, in the opinion of the Town's building inspector, have been occupied safely within the 12 month period prior to the building permit application being made, by a use permitted in the building by the Zoning Bylaw; and

4.1.9.4 the parcel on which the building is located has not been rezoned on the application of the parcel owner within the 36 month period prior to the building permit application being made, or the parcel has been rezoned on the application of the parcel owner during that period and the owner has constructed a building on the parcel that would not have been permitted had the parcel not been rezoned.

4.1.10 The Director of Engineering may require a Developer to provide third party verification by a qualified person of the value of the work authorized by a building permit or the value of any fire suppression sprinkler system required by the permit, for the purposes of 4.1.8.

4.1.11 The Developer shall retain a Professional Engineer and, where necessary in view of the nature and location of the Works and Services, a Qualified Environmental Professional and Professional Landscape Architect, to prepare, sign and seal design drawings, and to provide

general and resident engineering and inspection services during construction in the manner prescribed by the Association of Professional Engineers and Geoscientists of B.C. and the British Columbia Association of Landscape Architects.

4.1.12 Where service connections only are required, the Director of Engineering may determine that the services of a Professional Engineer are not required.

4.1.13 Where Works and Services are installed on the land undergoing Development or subdivision, or on the land of third parties, the Developer shall provide:

4.1.13.1 A statutory right-of-way in favour of the Town for any infrastructure intended for municipal ownership or maintenance, in the Town's standard form, if the land is not being dedicated as Highway; and,

4.1.13.2 An easement for any infrastructure intended for use by third parties.

SECTION 5 SERVICING AGREEMENT AND SECURITY

5.1 SERVICING AGREEMENT

5.1.1 A Servicing Agreement is required for all Works and Services required by this Bylaw.

5.1.2 The Director of Engineering and the Corporate Officer are authorized to sign any Servicing Agreement that is substantially in the form of Schedule "B" or Schedule "C".

5.2 SECURITY DEPOSIT

5.2.1 A Security Deposit for Works and Services will be required according to Schedule "A".

5.2.2 The Director of Engineering may authorize Town staff, agents or contractors to enter onto the Developer's lands or adjacent public lands to complete the Works and Services, or any portion thereof, on the failure of the Developer to perform its obligations under the Servicing Agreement, and may use the Security Deposit for that purpose. Should the Security Deposit be insufficient to complete the Works and Services, the Town may recover such additional amounts from the Developer.

5.2.3 In the case of Works and Services constructed on land other than a Highway, the Town may apply the Security Deposit to the cost of discharging any builder's lien that may have been filed in respect of the Works and Services, including payment of the funds into court in order to obtain a discharge of the lien.

5.3 CASH-IN-LIEU OF CONSTRUCTION

5.3.1 Where in the opinion of the Director of Engineering:

a) the required Works and Services are likely to be part of a future project encompassing the Frontage of adjacent or nearby properties;

b) the construction of the Works and Services would be more efficiently and practically undertaken as part of such future project; and

c) the Works and Services are not immediately required for the subdivision or the Development,

the Developer may be permitted to provide the Town with cash-in-lieu of construction in the amount of the Estimated Construction Cost.

5.3.2 Where cash-in-lieu of construction is permitted, the Town shall deposit the funds in a reserve fund to be used to construct the Works and Services.

5.4 SECURITY DEPOSIT RELEASES

5.4.1 As the Works and Services progress, the Professional Engineer may provide a reduction request in a form acceptable to the Director of Engineering based on the percentage of the Works and Services that have been completed.

5.4.1.1 Reductions will be made at 75% of the value of the Works and Services completed, as estimated by the Professional Engineer and accepted by the Director of Engineering.

5.4.1.2 The Director of Engineering may consider reduction requests at a frequency not exceeding one release for every 30 days.

5.4.2 Final release of the Security Deposit shall occur with issuance of the Acceptance in writing by the Town.

5.4.3 The Director of Engineering may require the Developer to provide, prior to the release of any portion of the Security Deposit, confirmation

acceptable to the Director of Engineering, which may be in the form of a statutory declaration, that full payment has been made to all contractors, suppliers, agents and consultants in respect of Works and Services constructed on land other than a Highway.

TOWN OF GIBSONS

SUBDIVISION AND DEVELOPMENT SERVICING
AND
STORMWATER MANAGEMENT
BYLAW No. 1175, 2012

SCHEDULES

Consolidated for convenience only to include amendment No. 1175-01

~SCHEDULES~

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~SCHEDULE A~

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1.0 GENERAL INFORMATION

1.1 INTRODUCTION

The design criteria, specifications and Standard Drawings contained herein are intended to provide a minimum design and construction standard for the Works and Services required under this Bylaw. The Professional Engineer must ensure their designs meet accepted engineering principles and practices, and the Works and Services are sufficient and adequate for the site conditions and their intended uses. Unless otherwise specifically provided within this Bylaw, all design and construction shall comply with the latest edition of the MMCD.

1.2 OTHER APPROVING AUTHORITIES

The Developer shall remain responsible for compliance with all the statutory requirements of other relevant authorities which are mandated to regulate and approve such Works and Services and shall arrange for and secure all approvals from the appropriate authorities having jurisdiction.

Where due to amendments of statutory requirements, conflicts, or inconsistencies with this Bylaw arise, the Developer/Professional Engineer shall refer the issue to the Director of Engineering for direction.

1.3 DEVELOPER/CONTRACTOR PERFORMANCE

1.3.1 Preamble

1.3.1.1 The Owner or Applicant shall provide a letter to the Town confirming engagement of a Professional Engineer and, where required, a Landscape Architect, including a description of the scope of services to be provided.

1.3.1.2 Prior to commencement of preliminary engineering design the Professional Engineer shall contact the Director of Engineering to arrange for a pre-design meeting with the Town.

1.3.1.3 Prior to commencement of Works and Services the Professional Engineer shall contact the Director of Engineering to arrange for a pre-construction meeting with the Town.

1.3.2 Developer's Professional Engineer

1.3.2.1 The Developer's Professional Engineer, or their duly authorized representative, shall be responsible for

ensuring that construction is completed according to Town bylaws and generally accepted civil engineering practices during the construction period, shall observe the work in progress, and provide certification and inspection reports to the Director of Engineering.

1.3.2.2 The Developer's Professional Engineer shall submit to the Town a Letter of Assurance of Professional Design and Commitment for Field Review.

1.3.2.3 The Developer's Professional Engineer shall submit copies of all inspection and testing reports, unless otherwise directed by the Director of Engineering.

1.3.3 Variation of Work(s)

1.3.3.1 Any variations or deviations from the approved engineering drawings and reports shall require approval of the Director of Engineering.

1.3.3.2 All or any requests for variations or deviations to the Works and Services shall be made in writing by the Developer's Professional Engineer, and shall include a signed and sealed revision to the previously accepted drawing(s).

1.3.4 Unforeseen Conditions

1.3.4.1 If at any time after the drawings have been accepted for construction, unforeseen conditions or circumstances become known which make it necessary that changes in the design or extra works be done in order to complete the project in an acceptable manner, the Director of Engineering shall have the right to order such changes or extra work as the Director of Engineering deems necessary to complete the work in an acceptable manner.

1.3.4.2 All costs of such extra work shall be borne by the Developer.

1.3.5 Verbal Agreements

1.3.5.1 No verbal instruction, objection, claim or notice by any party to the other shall change or modify any of the terms

or obligations contained in any of the accepted drawings and specifications.

1.3.5.2 None of the accepted drawings or specifications shall be held to be waived or modified by reason of any act whatsoever, other than by an agreed waiver or modification thereof in writing, signed by the Director of Engineering.

1.3.6 Damage to Work

1.3.6.1 The Developer/contractor shall bear the risk of and shall bear all loss or damage which may occur on the Works and Services until the same has been delivered to and accepted by the Town as specified in 1.5.11 and, if any loss or damage occurs before such Acceptance by the Town, the Developer/contractor shall immediately, at their own expense, repair, restore or re-execute the work so damaged or which may have been destroyed.

1.3.6.2 All such repair, restoration or re-execution of the work so damaged or which may have been destroyed, shall be to the Acceptance of the Director of Engineering and performed at no cost to the Town.

1.3.7 Responsibility

1.3.7.1 The Developer shall be held fully responsible to the Town for the acts and omissions of their agents and of persons directly or indirectly employed by the Developer.

1.3.7.2 The Developer will bind all agents or employees to the specifications and drawings applicable to their work.

1.3.8 Payment of Accounts

1.3.8.1 The Developer shall pay all accounts for labour, services and materials incurred by the Town and specified in the Servicing Agreement and Town bylaws, as and when such accounts become due and payable:

.1 should payment of such accounts not be made when they become due, the Town shall deduct the payment from the Security Deposit; and

.2 in the event that the amount is greater than the Security Deposit the Town shall charge the Developer the difference.

1.4 CONDUCT OF WORK

1.4.1 Materials and Workmanship

All Works and Services shall be done in a substantial and workmanlike manner with materials, articles and workmanship of the best quality and description and as required by and in strict conformity with this Bylaw. All materials shall be new unless otherwise permitted by the Director of Engineering.

1.4.2 Legal Postings

1.4.2.1 All legal posts, stakes and monuments within and outside the area of the Work, and all legal posts, monuments, construction stakes and marks on adjoining works/Parcels, shall be preserved undisturbed and visible.

1.4.2.2 In the event any of the above are disturbed, lost or destroyed they shall be replaced to the satisfaction of the Director of Engineering prior to Acceptance at the cost of the Developer.

1.4.2.3 All surveys within the integrated areas of the Town shall be tied to the monument system based on the Surveyor General's instructions. The Developer shall install a sufficient number of UTM monuments suitable for an Integrated Survey Area as determined by the Surveyor.

1.4.3 Work of Others

1.4.3.1 The Town, its servants, and its agents shall be at liberty to enter upon the site of the Work with all necessary labour and materials to complete Town related work and/or work required to be performed under the provisions of this Bylaw, and the Developer/contractor shall afford the Town, its employees, servants, and its agents all reasonable facilities to the acceptance of the Director of Engineering.

1.4.3.2 The Developer/contractor shall arrange their work and dispose of their materials in such a manner as will not

interfere with the work or storage of materials of others upon the site of the work.

1.4.3.3 The Developer/contractor shall join their work to that of others and perform their work in proper sequence in relation to that of others to the acceptance of the Director of Engineering.

1.4.4 Existing Structures and Utilities

1.4.4.1 Any plans or descriptions, verbal or otherwise, of existing piping or structures that are given to the Developer/contractor or Professional Engineer are intended only as an aid in the location of these items, and must be verified by the contractor prior to proceeding with construction.

1.4.4.2 The Town accepts no responsibility for the accuracy of any plans, descriptions, maps or elevations provided to the Professional Engineer/Owner/Developer/contractor.

1.4.5 Work to Fit With Others

1.4.5.1 The Developer/contractor shall do all cutting, fitting or patching of their work that may be required to properly fit or receive existing surface and sub-surface structures, improvements, infrastructure and utilities.

1.4.5.2 The Developer/contractor shall not endanger any existing work by cutting, digging or otherwise and shall not cut or alter the work of any other except with the written consent of the Director of Engineering.

1.4.6 Town's Right to Repair, Restore or Re-execute the Works

1.4.6.1 Should the Developer/contractor fail to perform the Work in a manner satisfactory to the Director of Engineering within a period of 14 days from sending of a Town notice in writing to do so, the Town shall become empowered, but not obligated, to do the Work itself or to employ such person or persons to repair, restore or re-execute the Works. The entire expense of repair, restoration or re-execution shall be charged to the Developer/contractor.

1.4.6.2 The repair, restoration or re-execution shall not affect the Developer's/contractor's duties and liabilities nor in any way relieve them from the performance and fulfilment of any or all of their obligations and duties.

1.4.7 Stormwater Runoff

1.4.7.1 The Developer/contractor shall keep all portions of the site properly and efficiently drained during construction and until Acceptance by the Director of Engineering.

1.4.7.2 The Developer/contractor shall be held responsible for all damage which may be caused or result from water backing up or flowing over, through, from or along any part of the Work, or which any of their operations may cause to flow elsewhere.

1.4.7.3 Existing culverts, drains and ditches affected by the Work shall be kept clear of excavated material at all times during construction.

1.4.7.4 When it is necessary to temporarily remove an existing structure from the Town's Drainage Collection System, the Developer/contractor shall provide suitable temporary ditches or other accepted means of handling the drainage.

1.4.7.5 At all times, during the course of construction and until the Certificate of Acceptance has been issued by the Director of Engineering, the Developer/contractor shall ensure that there is no discharge of any silt, dirt or debris into any existing or new facility in the Drainage Collection System or watercourse. The Developer shall clean Roads, catch basins, manhole sumps and maintain siltation controls as often as the Professional Engineer and/or Director of Engineering deems necessary during construction.

1.4.8 Public Convenience, Access, Clean-Up

1.4.8.1 In carrying out the Work, or any portion thereof, the safety and convenience of the public must always be considered and provided for by the Developer/contractor, who must not obstruct any Highway, thoroughfare or Sidewalk longer or to any greater extent that is necessary in the Director of Engineering's opinion. In no case shall

the Developer/contractor tear up or open more of any Highway, or public place than is shown on the accepted design drawings in the Servicing Agreement.

1.4.8.2 The Developer/contractor shall provide safe access to driveways, buildings and property, both for vehicles and pedestrians, whenever necessary, and for passing along all Highways and Sidewalks and for crossing the same where it is practicable to do so, both during the execution of the Works and at other times.

For this purpose the Developer/contractor shall construct and maintain, in good order and serviceable condition, suitable and convenient platforms, approaches, structures, bridges, crossings or other works as required by the Professional Engineer.

1.4.8.3 The Developer/contractor shall not deposit any material upon any Highway, Sidewalk, Boulevard, or other public property without approval in writing from the Director of Engineering.

1.4.8.4 During all phases of the Works and Services the Developer/contractor shall take daily precautions to abate nuisance caused by mud or dust by clean-up, sweeping, dust abatement, or other means as necessary to accomplish results acceptable to the Director of Engineering.

1.4.8.5 The Town may carry out the clean-up at the Developer's expense in the event of emergency or non-compliance. Any associated costs will be charged against the Security Deposit.

1.4.9 Traffic Control, Barriers, Lights

1.4.9.1 All vehicular or pedestrian traffic warning, control or barrier devices shall be subject to the acceptance of, or conditions of the Director of Engineering. All full or partial Road and Sidewalk closures require a Traffic Management Plan acceptable to the Director of Engineering.

1.4.9.2 As provided in the Traffic Management Plan, when required, the Developer/contractor must, at their own expense and at the direction of the Professional Engineer,

responsibly provide, erect and maintain all required barriers, fences or other proper protection, and must provide, keep and maintain operating lights or provide security personnel as may be necessary, in order to ensure safety to the public as well as to those engaged about the premises or Works, and must keep any Road open for the use of the public for such width as the Director of Engineering may direct.

1.4.10 Disposal and Recycling of Construction Debris

1.4.10.1 The Professional Engineer shall provide contract document requirements detailing the disposal and recycling of construction debris acceptable to the Director of Engineering.

1.4.10.2 The Professional Engineer shall be responsible for monitoring disposal and recycling of construction debris.

1.4.10.3 On-Site disposal shall be prohibited, unless otherwise directed by the Director of Engineering.

1.5 DOCUMENTATION, PROCESS AND CERTIFICATION

1.5.1 General

1.5.1.1 All documentation must note the Town-provided subdivision and Servicing Agreement numbers to which they apply, e.g. SD-YYYY-## and SA-YYYY-##.

1.5.2 Application for Subdivision

1.5.2.1 A pre-application meeting or a conference call with the Municipal Planner, the Director of Engineering, and the Approving Officer prior to submission of any Preliminary subdivision Application is strongly encouraged to ensure that the Applicant is familiar with the requirements of this Bylaw.

1.5.2.2 Preliminary subdivision Application and Application for Registration requirements shall be determined by the Approving Officer.

1.5.2.3 The Developer shall submit with any Preliminary subdivision Application the application fees imposed under the Development Application Procedures and Fees Bylaw.

1.5.3 Application for Development

1.5.3.1 The Developer shall provide the following to the satisfaction of the Director of Engineering at the time application is made for a Servicing Agreement in relation to any Development application:

.1 proof that the Developer is the Owner of the lands proposed for Development, or the Owner's duly authorized agent;

.2 a State of Title Certificate dated within 30 days of application;

.3 copies of all covenants, easements and rights of way on title;

.4 copies of any landscape plans approved by Council through the issuance of a Development Permit with any potential conflicts between the design of Works and Services required by this Bylaw and the approved landscape plans identified;

.5 a letter of engagement of the Professional Engineer;

.6 requirements set out in the Development Application Procedures and Fees Bylaw; and

.7 three printed copies and one digital copy in portable document format (pdf), or similar format, of the site plan(s) drawn to scale, showing:

- the dimensions and full legal descriptions of the Parcel or Parcels to be Developed;
- the relationship of the proposed Development to adjacent Highways;
- existing buildings accurately located and identified on a legal survey plan;
- all covenant areas, statutory rights-of-way and easements located and identified;
- contour lines in two (2) metre contour

intervals for any areas of the Parcel with slopes less than 10%;

- contour lines in one (1) metre contour intervals for any areas of the Parcel with slopes equal to or greater than 10%;
- watercourses, water frontages and steep banks or slopes;
- proposed means of servicing the Development;
- any proposed phasing of the Development; and
- any other information that the Director of Engineering may require to determine whether the proposed Development complies with this Bylaw.

1.5.4 Servicing Agreement

1.5.4.1 Prior to commencement of Works and Services, the Developer shall execute a Servicing Agreement with the Town according to this bylaw.

1.5.4.2 The Developer shall execute and deliver to the Town a Servicing Agreement substantially in the form of

.1 Schedule "B" of this Bylaw for

- works to be completed On-Site as a requirement of this Bylaw and where the Developer desires to make application for subdivision approval or for a building permit prior to the Works being completed; and/or
- works to be completed Off-Site as a requirement of this Bylaw and where the Developer desires to make application for subdivision approval or for a building permit prior to the Works being completed; and/or

.2 Schedule "C" of this Bylaw for

- works to be completed On-Site where the Developer desires to construct the Works or a portion thereof on the lands being subdivided or developed prior to application for subdivision or building

permit; and/or

- works to be completed Off-Site where the Developer desires to construct the Works or a portion thereof prior to application for subdivision or building permit

1.5.4.3 The Developer shall execute and deliver to the Town a Servicing Agreement substantially in the form of Schedule "B" or Schedule "C" of this Bylaw prior to:

.1 the construction of any Works and Services;

.2 the approval of any subdivision requiring any Works and Services under this Bylaw; and

.3 the issuance of any building permit requiring any Works and Services under this Bylaw.

1.5.4.4 The Town will prepare the Servicing Agreement(s) for execution of all parties. The Agreements must be signed by the Developer and returned to the Engineering Department along with the following:

.1 approved design drawings;

.2 a security deposit in the amount specified in the Servicing Agreement;

.3 a cash-in-lieu of construction payment when permitted by the Director of Engineering in accordance with this Bylaw;

.4 a non-refundable administration and inspection fee based on the sum of the Estimated Cost of Construction and the estimated cost of any cash-in-lieu construction payments, if any;

.5 service connection and water main tie-in charges, where the connection is to be performed by the Town. A cost estimate shall be provided by the Town; and

.6 letter(s) of engagement of Professional Engineer and Landscape Architect according to 1.3.1.1.

1.5.5 Security Deposit

1.5.5.1 Every Security Deposit shall be the greater of $5,000 and

.1 120% of the Estimated Construction Cost, where the Developer desires to make application for subdivision approval or for a building permit prior to the Works being completed; or

1.5.5.2 Where the Developer desires to construct the Works or a portion thereof prior to application for subdivision or building permit:

.1 the sum of

- 20% of the Estimated Construction Cost of the On-Site Works; and
- 20% of the Estimated Construction Cost of works on any Highway or Town right-of-way which is proposed to be dedicated to the Town as a requirement of the Development or subdivision, and
- 120% of the Estimated Construction Cost of any Works being constructed on Highways, rights-of-way or other lands controlled by the Town.

1.5.6 Notice to Proceed

1.5.6.1 The construction of the Works and Services shall not commence until a Notice to Proceed has been issued by the Town of Gibsons.

1.5.6.2 The following documentation will be required in order for a Notice to Proceed to be issued:

.1 fully executed Servicing Agreement;

.2 valid Town of Gibsons business licence for any and all contractors working On-Site;

.3 WorkSafe BC clearance letter for the prime contractor;

.4 copy of the prime contractor's WorkSafe BC Notice of Construction;

.5 copy of a Construction Permit issued by the Local Health Authority where the extension or alteration of the Town's water distribution system is part of the required Works and Services;

.6 a certificate of insurance in accordance with the requirements of the Servicing Agreement;

.7 a Traffic Management Plan, if required by the Director of Engineering; and

.8 contract document requirements detailing the disposal and recycling of construction debris in accordance with 1.4.10.

1.5.7 Inspection of the Works and Services

1.5.7.1 All or any part of the Works and Services and all workshops or other places where material for the Work is being prepared or stored, may be inspected by the Director of Engineering when and as often as the Director of Engineering shall deem it necessary, and the Developer/contractor shall afford the necessary access and shall provide any and all information requested.

1.5.7.2 The contractor shall open for inspection any part of the Works and Services that have been covered up without inspection by the Professional Engineer.

1.5.7.3 The Professional Engineer shall provide survey, measurements, inspections and testing of the Works and Services in accordance with MMCD and AWWA requirements. Testing results shall be immediately forwarded to the Professional Engineer and Director of Engineering. No payment shall be made for any labour, material, work or delay occasioned by this requirement.

1.5.7.4 All storm sewers and sanitary sewers shall be video tested with copies in an acceptable digital format provided to the Town.

1.5.7.5 The Town may conduct independent testing of any Works and Services. If the testing results indicate the Works and Services do not comply with this Bylaw, or the accepted drawings, the Developer shall bear the costs of testing and reconstruction.

1.5.7.6 Inspections by the Director of Engineering are limited to ensuring that the Work is in compliance with this Bylaw and that the finished product will be in general conformity with the intent of the accepted drawings and in a

condition acceptable to the Town. They do not constitute supervision or co-ordination of the Work, and neither are they intended to serve in place of proper engineering supervision of the Work by the Professional Engineer.

1.5.7.7 The Professional Engineer is responsible for making arrangements to ensure proper engineering supervision and co-ordination of the Work, processing progress payments to the contractor, and for ensuring that all requirements of the Town are performed and completed to a satisfactory conclusion within the stipulated time limits.

1.5.8 Releases at Completion of Works and Services

1.5.8.1 The Director of Engineering may require the Developer, upon completion of any portion of the Works and Services on or fronting private property, to obtain and provide from each affected property owner a formal release in writing, verifying the property has been restored to the same condition or better that it was before construction began.

1.5.8.2 As the Works and Services progress, the Professional Engineer may provide Security Deposit reduction request(s) to the Director of Engineering in accordance with this Bylaw.

1.5.9 Use of Completed Portions

1.5.9.1 The Town shall have the right to take possession of and use any completed or partially completed portion of the Works and Services, but such possession and use shall not be deemed an Acceptance of such Work.

1.5.9.2 If such prior use increases the cost of uncompleted Work or causes refinishing of completed Work beyond normal wear and tear, the Developer/contractor shall be entitled to such compensation as the Director of Engineering may determine.

1.5.10 Substantial Completion of Works and Services

1.5.10.1 When the Professional Engineer is of the opinion that Substantial Completion of the Works and Services has

been achieved, they shall provide written notice to the Director of Engineering.

1.5.10.2 The Director of Engineering shall, on receipt of such notice, inspect the Works and Services with the Professional Engineer and, if necessary, the Professional Engineer, in consultation with the Director of Engineering:

.1 must issue a list of deficiencies that must be corrected prior to the issuance of a Certificate of Substantial Completion, including estimated costs; and

.2 must issue a list of any remaining deficiencies in addition to those identified in 1.5.10.2.1, including estimated costs.

1.5.10.3 The following must be submitted to the satisfaction of the Director of Engineering in order for issuance of a Certificate of Substantial Completion to be considered for the Development:

.1 certification from the Professional Engineer that the deficiencies listed in 1.5.10.2.1 have been corrected;

.2 the list of remaining deficiencies according to 1.5.10.2.2;

.3 record drawings and records;

in exceptional circumstances, the Director of Engineering may consider issuing a Certificate of Substantial Completion upon receipt of service cards and partial record drawings which record all underground utilities and services;

.4 confirmation of registration or release of all required legal encumbrances such as rights of ways, easements and covenants;

.5 Statutory Declaration;

.6 a copy of the letter sent to the property owner(s) detailing their responsibilities for the operation and maintenance of any on-site SWBMPs; and

.7 a copy of the letter sent to the property owner(s) detailing their responsibilities for the operation and maintenance of any low-pressure sewage systems, as detailed in the Town's Sanitary and Storm Sewer Connection Bylaw.

1.5.11 Certificate of Substantial Completion

1.5.11.1 Upon completion of 1.5.10, a Certificate of Substantial Completion shall be issued by the Director of Engineering and all securities held by the Town shall be released, less the sum of the following:

.1 a maintenance holdback equal to five percent (5%) of the cost of the total Works and Services as calculated according to clause 2.4.3 (minimum maintenance holdback = $5,000);

.2 a deficiency holdback of two hundred percent (200%) of the value of deficiencies as detailed according to 1.5.10.3.2; and

.3 an additional fifteen percent (15%) of the construction estimate of the Works and Services if final record drawings have not been received according to the terms detailed in 1.5.10.3.3.

1.5.12 Issuance of Building Permits

1.5.12.1 Any subdivision where Works and Services are being installed, the Certificate of Substantial Completion for the Works must be issued and registration of the subdivision with the Land Title office must have occurred prior to the issuance of building permits for any lots created in addition to the parent parcel.

1.5.12.2 A Servicing Agreement must be executed prior to issuance of a building permit for any Industrial, Commercial, Institutional or Multi-family Developments which are subject to the application of this Bylaw.

1.5.12.3 Building permits may be issued for show home construction prior to issuance of the Certificate of Substantial Completion according to the following:

.1 a maximum of four (4) lots or ten percent 10% of the subdivision Parcels, whichever is less, may be released for show home building permits provided the subdivision has been registered;

.2 a maximum of one home can be constructed prior to subdivision registration, providing no other structure exists on the parcel;

.3 in all cases, all water, storm sewer (where applicable), and sanitary sewer servicing, including service connections, must be installed;

.4 hydro distribution lines must be available to service the show home(s); and

.5 no show homes shall be occupied prior to the issuance of a Certificate of Substantial Completion.

1.5.13 Maintenance Period

The maintenance period shall commence on the date shown on the Director of Engineering's Certificate of Substantial Completion.

1.5.13.1 The maintenance period shall be for a one year period for all Works and Services unless otherwise noted in 1.5.13.2 and 9.2.7.

1.5.13.2 The maintenance period shall be for a two year period for stormwater management SWBMP installations.

1.5.13.3 If deficiencies remain at the end of the maintenance period, the Director of Engineering may, at their discretion, extend the maintenance period for three-month increments or, after providing the Developer with seven (7) day's written notice, be entitled to make alternative arrangements for addressing the deficiencies and to recover the costs from the Developer pursuant to this Bylaw.

1.5.14 Final Acceptance Certificate

1.5.14.1 Twelve months after issuance of a Certificate of Substantial Completion the Professional Engineer or Professional Landscape Architect shall request the Director of Engineering to conduct a final inspection.

1.5.14.2 If the Director of Engineering deems that an extension of the Maintenance Period is not required, he or she shall issue a Certificate of Final Acceptance and release the maintenance holdback, less the cost of any repair or correction of deficiencies, as determined by the Director of Engineering.

~SECTION TWO~
SURVEY AND DESIGN SUBMISSION

INDEX

2.0 SURVEY INFORMATION AND DESIGN SUBMISSION

2.1 INTRODUCTION

It is the intent of the Town to require quality standardized submissions for the design of Works and Services. All drawing and report submissions shall reflect and comply with the following:

- All applicable requirements of this Bylaw;
- All applicable requirements of the Town of Gibsons' bylaws, including but not limited to the Zoning Bylaw and the Building and Plumbing Bylaw.

Where there is a conflict between various Town Bylaws, this Bylaw shall take precedence with respect to design and construction of subdivision and Development Works and Services.

Incomplete or sub-standard drawing submissions will be returned to the Professional Engineer/Landscape Architect without full review and comments on the drawings and with a short explanation as to why the drawings are being returned. Any subsequent re-submission which remains incomplete or sub-standard will result in a request to meet with the Professional Engineer/Landscape Architect, the Developer, and the Director of Engineering. Drawing submissions requiring more than two (2) reviews by the Town will be subject to additional administration fees.

2.2 GENERAL

All plans and drawings are to be submitted with metric (SI) measurements.

2.3 SURVEY

2.3.1 Survey Information

2.3.1.1 All surveys and plans for subdivision and Development applications shall be prepared by a BC Land Surveyor unless the Town agrees otherwise.

2.3.1.2 All surveys shall be conducted in a safe manner so as not to create a nuisance to traffic or the public at large. The permission of the registered Owners is required before entering private property.

2.3.1.3 All elevations shall be from geodetic datum (NAD 83, CSRS).

2.3.1.4 Information regarding the location and elevation of existing benchmarks or monuments may be obtained from the Engineering Department.

2.3.1.5 Originating benchmarks and integrated survey monuments shall be noted on all plans, as well as those to be established in the Work.

2.3.1.6 Copies of legible field notes shall be made available to the Town upon request.

2.3.1.7 Centre lines or offset lines are to be marked and referenced in the field and all chainage shall be keyed to the legal posting.

2.3.1.8 All existing items such as manholes, catch basins, fire hydrants, poles, existing dwellings, fences, trees, hedges, watercourses, top of bank, environmental features and unusual ground/natural formations shall be noted on the plans.

2.3.1.9 Where applicable, cross sections will be required. The section shall include centreline, edge of pavement or gutter line, edge of shoulder or curb, ditch/swale invert, top of ditch/swale, property line, cut/fill slopes and existing ground elevations inside the property line.

2.4 DESIGN

2.4.1 Design Requirements

All drawings shall be signed and sealed by the Professional Engineer and Professional Landscape Architect, as required. The Professional Engineer's/Landscape Architect's seal and signature shall be noted on all sheets of all design submissions. Failure to do so may result in the plans being returned without comment.

A complete set of Engineering and Landscape Design drawings shall include, where applicable, in the following sequence:

2.4.1.1 Cover Sheet:

The cover sheet shall including the following information:

.1 the Professional Engineer's and Developer's name address and phone number;

.2 the Town subdivision number to which they apply, e.g. SD-YYYY-##;

.3 the legal description of the lands involved;

.4 a site plan at a 1:5000 scale;

.5 a drawing index;

.6 the site plan shall note all proposed Highways and the proposed subdivision layout;

.7 the cover sheet may be utilized to show the Drainage catchment area(s); and

.8 general notes should be located on this sheet.

2.4.1.2 Preliminary Subdivision Plan(s):

Preliminary Subdivision Plans shall be prepared by a Surveyor and shall form part of the drawing submission.

2.4.1.3 Key Plan:

The key plan shall be at a 1:500 or 1:1000 scale, and note all proposed Works and Services.

2.4.1.4 Environmental Protection, Sediment & Erosion Control Plan:

Environmental Protection, Sediment & Erosion Control Plans shall be at a 1:500 or 1:1000 scale. Depending on the complexity of the plan, the Director of Engineering may accept this information in the Stormwater Management Plan. The plan(s) shall include:

.1 extent of tree clearing;

.2 location of On-Site sediment and erosion control features to restrict the migration of sediments during construction, including silt fencing, sediment basins, construction vehicle access points, construction vehicle wash facilities, material stockpile storage locations, etc.;

.3 details and notes describing the installation and maintenance of all features;

.4 delineation, with appropriate construction notes, of any environmentally sensitive areas and features;

.5 works and services required to mitigate environmental impacts identified through any Development Permits, or requirements of any other regulatory body; and

.6 other approval authorities' requirements.

2.4.1.5 Site and Lot Grading Plan:

The site and lot grading plan shall be at 1:500 or 1:1000 scale and include:

.1 proposed contour lines in two (2) metre intervals for any areas of the Parcel with slopes less than 10%. This topography shall extend a minimum of 30 m outside the subdivision/Development site;

.2 proposed contour lines in one (1) metre intervals for any areas of the Parcel with slopes equal to or greater than 10%. This topography shall extend a minimum of 30 m outside the subdivision/Development site;

.3 existing corner lot elevations (not circled);

.4 proposed corner lot elevations (circled);

.5 proposed building envelope with the minimum building elevation (M.B.E.) noted;

.6 slope of the lot (directional arrow), noting a minimum of 1% grade on the lots;

.7 drainage swales, ditches, watercourses;

.8 catch basins and lawn basins;

.9 proposed retaining walls; and

.10 cut/fill slopes greater than 4:1.

2.4.1.6 Stormwater Management Plan(s):

Stormwater Management Plans shall be at a 1:500 or 1:1000 scale, calculated using the Intensity-Duration-Frequency (IDF) Curves in Schedule "L" and the Hyetographs in Schedule "M". The information included in Schedule "L" and Schedule "M" may be used unless more recent data is available from Environment Canada, in which case the more conservative data must be used.

Plans shall include:

.1 minor (10 year return) storm sewer system with the flows noted per section and the accumulated flows from all upstream sections, where applicable. Provision must be made for upstream development potential when directed by the Town;

.2 major (100 year return) storm sewer system. The Professional Engineer shall note wherever the major system is not in the pipe or the Road, showing the routing, flows and velocities for the 100 year return storm;

.3 legend noting all items proposed in the Stormwater Management Plan, proposed SWBMPs and applicable 'General Notes';

.4 proposed means of providing storm water detention, source control, infiltration or other forms of flow control using SWBMPs, complete with details of the proposed control facility and sizing computations, and requirements to mitigate impacts on the receiving environment; and

.5 upgrading of the Drainage Collection system in other parts of the catchment area, where required, including engineering plans for upgrade of the receiving system.

2.4.1.7 Storm and Sanitary Sewers Plan/Profile Drawing(s):

Storm and Sanitary Sewers Plan/Profile Drawings shall be 1:500 scale for plans and 1:50 scale for profile, and include:

.1 service connection elevation at the property line of each Parcel;

.2 size, class, type, length and slope of each continuous pipe reach;

.3 existing ground elevation, proposed plan/profile location for Roadworks, design grades, rim elevations, invert elevations, and stationing for all storm and sanitary sewer Works and appurtenances;

.4 cross over points for all other utilities;

.5 location of minor (1:10 year) and major (1:100 year) hydraulic grade lines for each profile of the storm drainage system, shown on the profile;

.6 design flow rates and pipe full capacities of each reach, shown on the profile; and

.7 locations and capacities of each SWBMP, including swales, rockpits and lawnbasins.

2.4.1.8 Road and Water Plan/Profile Drawing(s):

The scale for Road and Water Plan/Profile drawings shall be 1:500 for plans and 1:50 for profile, and include:

.1 plan and profile drawings showing existing ground elevations, plan geometry for horizontal curves and curb returns, vertical curves and "k" values, design speeds and grades, design elevations, retaining structures, traffic calming measures, water main appurtenances, depth of bury, stationing, etc.;

.2 full pipe (size, class, type, length and slope) shown for the water main on the profile;

.3 all crossover points with sewers and other utilities shall be noted and where the separation between the invert of the water main and the top of any storm or sanitary sewer is less than 0.5 m, or the distance specified by the Local Health Authority, whichever is greater, the water main shall be protected in accordance with Health Authority's requirements;

.4 all appurtenances, service connections and the proposed means of looping to the existing water system; and

.5 all Town pressure zone(s) and calculated pressures at key nodes of the proposed water system.

2.4.1.9 Road Cross-Sections:

Cross section drawings shall be scaled at 1:100 horizontal and 1:50 vertical and

.1 shall note the existing ground elevation, the proposed elevations of the Road centreline, the curb and gutter (or Road edge) and property lines;

.2 shall show cross-sections are required at twenty (20) metre intervals and extend ten (10) metres

beyond the edge of the existing and/or proposed Road dedication; and

.3 additional sections may be required where excessive cuts or fills are required.

2.4.1.10 Street Lighting Plan(s):

Street Lighting plans shall be a plan view at a scale of 1:500 or 1:1000.

.1 there shall be general notes included on the plan noting reference(s) to the Town standards and specifications and the appropriate design criteria; and

.2 any Street lighting distribution plan(s) should be accompanied with the photometric calculations, lighting contours and mounting height, type of luminaire, finishing and location of proposed point of service.

2.4.1.11 Boulevard Landscape Plan(s):

Boulevard Landscaping plans shall be at a scale of 1:500 and be designed and sealed by a Professional Landscape Architect.

.1 location, offset, type, etc. of all plantings and boulevard landscaping shall be shown, including a list of species and tree retention, traffic calming measures, Street furniture, etc.;

.2 the Professional Landscape Architect shall confirm location of all existing and proposed Works and Services and confirm acceptance of the Landscape Plan with each utility provider; and

.3 the Professional Engineer shall coordinate design submissions to minimize conflicts between infrastructure components.

2.4.1.12 Utility Plan(s):

Plans for Hydro, Telephone, Cable and Gas shall be at 1:500 or 1:1000 scale and shall be co-ordinated with the Works and Services by the Professional Engineer. Utility drawings do not require an engineer's seal, provided that the design is undertaken by the utility company.

2.4.1.13 Construction Details:

Drawings shall show all proposals for construction which are not covered or specifically detailed in the MMCD. Where there is a Standard Drawing, it is expected to refer to the Standard Drawing number.

2.4.1.14 Additional Information:

Notwithstanding the previously detailed requirements, the following additional information is to be noted in design submissions:

.1 existing structures, utilities and underground Works, including poles, anchors, buildings, sheds, fences, wells, septic tanks and fields, shall be shown on the appropriate drawing(s), with a notation indicating their fate (e.g. to be removed, filled, etc.);

.2 the location of any proposed community mailboxes, including safe provision for vehicle pullouts;

.3 pavement marking/signage plan and traffic management plan, when required; and

.4 approvals from other authorities having jurisdiction.

2.4.2 Design Submissions

2.4.2.1 First Submission

The first complete design submission shall include:

.1 two complete sets of drawings of the proposed Works and Services dated and sealed by a Professional Engineer and, where applicable, a Professional Landscape Architect and Professional Electrical Engineer;

.2 a detailed geotechnical report, where required by the Approving Officer or required as a condition of any Geotechnical Permit;

.3 a detailed calculations for the design of the proposed water, sanitary and stormwater management systems, including SWBMPs; and

.4 a Stormwater Management Report, where deemed necessary by the Director of Engineering, presenting all technical information used in the preparation of the Stormwater Management Plan including, but not limited to an initial assessment of the opportunity for On-Site retention and/or discharge of rainfall and source control, the details of all hydrologic computations or modelling, sizing of storm water management facilities, and environmental and hydro-geological assessment studies.

2.4.2.2 Amended Submissions

Subsequent design/drawing submissions shall consist of:

.1 two complete sets of drawings;

.2 any changes made shall be highlighted with yellow or circled with 'clouds' by the Professional Engineer. Failure to do so will result in submissions being returned; and

.3 the administration fees allow for the review of the complete design submission and one subsequent amended submission. Each additional review subsequent to these two submissions is subject to additional fees according to the Development Application Procedures & Fees Bylaw.

2.4.2.3 Final Submission

The final submission shall consist of:

.1 three complete sets of drawings for acceptance by the Director of Engineering. Two sets will be returned to the Developer by the Town upon approval. One of the copies returned to the developer must be kept onsite at all times;

.2 one digital set of pdf drawings;

.3 a complete construction estimate according to clause 2.4.3;

.4 letters of Assurance of Professional Design and Commitment for Field Review; and

.5 letters from relevant approving authorities indicating acceptance of the design of the Works and Services.

2.4.2.4 Prior to accepting the final drawings the Director of Engineering may, at their sole discretion, request a peer review of any design submissions to ensure they meets the intent of this Bylaw.

2.4.2.5 Works and Services shall be installed in accordance with the final drawings accepted by the Town. Any and all changes to the drawings shall require written approval from the Director of Engineering.

2.4.3 Construction Estimate

The construction estimate shall be submitted in hard copy and digital copy in Excel format to the Director of Engineering for review and acceptance.

2.4.3.1 The construction estimate shall be broken down in a format which indicates all unit costs, amounts of materials, engineering, administration, contingency and applicable tax amounts.

2.4.3.2 Unit costs are to reflect local pricing and will be reviewed by the Town for consistency with unit costs from similar projects.

2.4.3.3 Individual cost items are to be identified and calculated in a manner consistent with the applicable "Measurement and Payment Items" listed in each section of the MMCD Specifications. For example, the estimate for concrete Sidewalks is to include the supply and placement of concrete as well as the granular base.

2.4.3.4 Costs of Works and Services by Town crews are to be noted as separate line items, including service connections and water main tie-ins.

2.5 RECORD DRAWINGS

2.5.1 Record Drawing Submissions

The following procedures shall be followed in the submission of record drawings for Town acceptance:

2.5.1.1 The Professional Engineer shall submit one complete set of paper prints and one digital pdf set for Town review. Cross-section drawings are not required.

2.5.1.2 The Town's ground level coordinate network shall be used for vertical and horizontal position.

2.5.1.3 All notes are to reflect “As-Built” status and are to include but not be limited to the following:

.1 property lines;

.2 contour lines in two (2) metre intervals for any areas of the Parcel with slopes less than 10%;

.3 contour lines in one (1) metre intervals for any areas of the Parcel with slopes equal to or greater than 10%;

.4 watermains, appurtenances and servicing plan and profile;

.5 storm mains/bio-swales and SWBMPs, appurtenances and servicing, plan & profile;

.6 sanitary mains, appurtenances and servicing plan and profile;

.7 Property Service Detail Sheets as per 2.5.2;

.8 street lighting and appurtenances;

.9 edge of pavement, curb, Sidewalk and sign locations; and

.10 landscape and tree retention plan(s).

2.5.1.4 One marked-up set of the record drawings will be returned to the Professional Engineer for revision if necessary. Administration fees allow for the review of two (2) record drawing submissions. Each additional review subsequent to these two submissions is subject to additional fees according to the Development Application Procedures & Fees Bylaw and Building Bylaw.

2.5.1.5 When the Town is satisfied with the record drawing submission, the Professional Engineer will be requested to submit the following:

.1 each drawing shall note the following certification:

"I certify that these record drawings represent the Works and Services that have been supplied, constructed, installed and inspected in substantial conformance with the intent of the designs as accepted by the Town of Gibsons' Director of Engineering dated _____";

.2 two sets of paper prints identified in bold letters with the words "CERTIFIED RECORD DRAWINGS" with the above certification signed and sealed by the Professional Engineer and/or the Professional Landscape Architect;

.3 digital files may be submitted by email or CD-ROM. Digital Files shall be in both AutoCAD.dwg file format and PDF. The Professional Engineer shall contact the Engineering Department for a layer list;

.4 digital files shall include all information as the submitted hard copy design; and

.5 final sign off by the Professional Geotechnical Engineer, where required.

2.5.2 Property Service Detail Sheets (Service Cards)

2.5.2.1 Property service detail sheets are to be provided for each lot and are to indicate clearly and accurately the following information:

.1 lot dimensions;

.2 north arrow;

.3 location, dimensions and other details of each Town service connection;

.4 lot grading plan with two (2) metre intervals for any areas of the Parcel with slopes less than 10% and one (1) metre intervals for any areas of the Parcel with slopes equal to or greater than 10%;

.5 building envelope;

.6 driveway location;

.7 MBE; and

.8 on-site SWBMPs.

2.5.2.2 Property Service Detail Sheets are considered part of the record drawing submission and are to be provided in

hard-copy and pdf format, suitable for printed reproduction on 8 ½ “ x 11” sheets.

~SECTION THREE~
WATER SYSTEMS

INDEX

3.0 WATER SYSTEMS

3.1 INTRODUCTION

Water main design shall conform to the requirements of the Local Health Authority, MMCD, and to this Bylaw.

The adequacy of available water supply must be confirmed with the Town prior to designing any extension of the water distribution system.

3.2 WATER DEMAND

3.2.1 Per Capita and Non-Residential Demand

3.2.1.1 Water demands shall be in accordance with MMCD requirements unless otherwise noted.

3.2.1.2 For a known water-user industry, the Director of Engineering may allow an estimate based on actual demand data.

3.2.1.3 The Professional Engineer shall confirm population projections with the Director of Engineering prior to completing designs.

3.2.2 Fire Flow Demand

3.2.2.1 Fire flow requirements shall be in accordance with MMCD requirements unless otherwise noted.

3.2.2.2 The Professional Engineer shall incorporate fire sprinkler requirements specified within the Building and Plumbing Bylaw.

3.2.2.3 If the available fire flows cannot meet MMCD criteria, the Professional Engineer shall:

.1 design existing water system upgrades; and/or

.2 specify building permit requirements to reduce fire flows (e.g. sprinklers, fire walls, building materials, separation, etc.).

3.2.3 Design Flows

3.2.3.1 Design flows shall be in accordance with MMCD requirements unless otherwise noted.

3.2.3.2 The system shall be designed to provide maximum day domestic requirements and fire protection.

3.2.4 Hydraulic Design

3.2.4.1 The analysis of the existing and proposed network system shall be determined according to the MMCD Design Guideline Manual.

3.3 WATER MAINS AND APPURTENANCES

Pipes and fittings shall be designed so as to withstand all stresses, internal as well as external, such as structural stresses caused by static pressure and by dynamic forces resulting from changes in direction of flow, thermal stresses, transient stresses from water hammer and stresses induced by vertical loads and impact of traffic.

3.3.1 Main Size

3.3.1.1 The minimum water main diameters shall be in accordance with MMCD requirements unless otherwise noted but in no case shall be smaller than 150 mm diameter.

3.3.2 Valves

3.3.2.1 Valves shall be located as follows:

.1 at locations that avoid conflicts with curbs, gutters, and Sidewalks;

.2 4 valves at a cross-intersection;

.3 3 valves at tee-intersection;

.4 not more than 200 metres apart;

.5 no more than 20 service connections isolated;

.6 not more than one hydrant isolated; and

.7 at each hydrant tee.

3.3.2.2 Valves shall be the same diameter as the main.

3.3.2.3 All valves on mains smaller than 450mm diameter shall be Mueller epoxy coated resilient wedge gate valves, or approved equal, with stainless fasteners.

3.3.3 Hydrants

3.3.3.1 Hydrant design criteria shall be in accordance with MMCD requirements.

3.3.3.2 Any hydrant that is connected to the Town's existing water distribution system shall be installed by the Town at the Developer's cost.

3.3.3.3 Hydrants shall be Terminal City equipped with a 100mm (4") Storz port.

3.3.3.4 In mid-block locations, fire hydrants shall be located at the intersecting property lines between adjacent lots.

3.3.3.5 Fire hydrants shall be located within 10 metres of fire fighting staging areas (see 7.6).

3.3.3.6 Hydrants on private property are to be avoided wherever possible.

3.3.3.7 It shall be the Professional Engineer's responsibility to ensure:

.1 that hydrant design is satisfactory for fire protection;

.2 that the locations of fire hydrants are in accordance with the Standard Drawings and will not conflict with existing or proposed Street lights, power poles, hydro kiosks, etc. and in accord with the Standard Drawings; and

.3 location and spacing will serve the needs of the subdivision/Development and adjacent properties.

3.3.4 Air Valves

Air valve design shall be in accordance with MMCD requirements.

3.3.5 Blow-Offs

Blow-off design shall be in accordance with MMCD requirements.

3.3.6 Thrust Blocking

Thrust blocking design shall be in accordance with MMCD requirements.

3.3.7 Chamber Drainage

Chambers or manholes containing valves, blow-offs, meters, or other appurtenances shall not be connected to any sanitary sewer. Such chambers or manholes shall be drained to the surface of the ground where they are not subjected to flooding by surface water, or to underground absorption pits subject to adequate soils conditions.

3.3.8 Service Connections

3.3.8.1 Subject to 3.3.8.2, a minimum 20 mm diameter service connection shall be required for all buildings.

3.3.8.2 A minimum 50 mm diameter service is required to service buildings with sprinkler systems.

3.3.8.3 Connections shall typically be located at the centreline of the lot.

3.3.8.4 A curb stop shall be installed for each service connection as shown on the Standard Drawings and installed in such a manner as to be flush with the final ground treatment.

3.3.8.5 All 20 mm and 25 mm services between the main and the property lines hall be Type K copper.

3.3.8.6 The connection of any new services into existing Town water mains must be completed by the Town.

3.3.9 Water Meters

3.3.9.1 All service connections shall be metered at the property line and shall include backflow prevention according to the Water Service Connection Bylaw.

3.3.9.2 The Developer shall install a water meter box, setter and idler for any services off mains constructed by the Developer according to the Water Service Connection Bylaw and the Standard Drawings.

3.3.9.3 Meter boxes are to be installed flush with the proposed finished ground elevation.

3.4 INFRASTRUCTURE CORRIDOR AND CLEARANCES

3.4.1 Main Locations

3.4.1.1 Water mains shall be located within the Road dedication as shown on the pertinent Standard Drawings. The Director of Engineering may consider the construction of mains across private property, providing an adequate statutory right-of-way is registered on title.

3.4.1.2 The Director of Engineering may require additional looping of the water main(s) to improve water circulation and reliability.

3.4.2 Minimum Clearances

Clearances shall meet Local Health Authority requirements.

3.4.3 Water Infrastructure Right of Way

3.4.3.1 The required water infrastructure right-of-way width and other criteria shall be in accordance with MMCD Design Guideline Manual.

3.4.3.2 When a utility is located within a Right-Of-Way and access for maintenance vehicles is required, the Developer may be required to provide a constructed access road from a public Road:

.1 when required, the maintenance access shall be constructed to a standard adequate to support the maintenance vehicles for which the access is intended; and

.2 the Director of Engineering shall determine the required surface of any maintenance access road, i.e. paved or unpaved.

~SECTION FOUR~
SANITARY SEWER SYSTEMS

INDEX

4.0 SANITARY SEWER SYSTEMS

4.1 INTRODUCTION

Sanitary sewer systems shall be designed in accordance with the requirements of Federal and Provincial regulations, as amended from time to time, and requirements of MMCD and this Bylaw. In the event of a conflict between Federal and Provincial regulations and this Bylaw, the higher standard shall prevail, unless directed otherwise by the Director of Engineering.

The adequacy of the downstream sanitary sewer system must be determined and reviewed with the Director of Engineering prior to designing any extension to the sanitary sewer system. The Professional Engineer must calculate and confirm the peaking factor and ultimate population anticipated within the catchment area with the Director of Engineering.

4.2 DESIGN FLOWS

4.2.1 Design Flow Criteria

4.2.1.1 Unless otherwise noted below, all design flows criteria shall be according to the MMCD Design Guide Manual.

4.2.1.2 The Town's Wastewater Collection Plans must be reviewed for information pertaining to design flows, including loading and inflow and infiltration.

4.2.1.3 Average day flows = 410 litres/capita/day.

4.2.1.4 Average dry weather flows (ADWF) for non-residential areas should be based on specific data related to the development or OCP zoning.

4.2.1.5 The following residential equivalent populations shall be used:

.1 Single family/duplex: 2.5 persons per unit; and

.2 Multiple residential: 2.0 persons per unit

4.2.2 Pipe Flow Formulas

Pipe flow formulas shall be in accordance with MMCD requirements.

4.3 SANITARY SEWERS AND APPURTENANCES

4.3.1 Manholes

4.3.1.1 Manholes locations shall be designed in accordance with MMCD requirements.

4.3.1.2 Sanitary sewer manhole rim elevations shall be designed to be higher than:

.1 adjacent storm manhole rim elevation, where possible; and

.2 surrounding ground in order to prevent infiltration though the manhole cover from ponding water.

4.3.1.3 Hydraulic losses across manholes shall be in accordance with MMCD requirements.

4.3.2 Clean-Outs

Clean-outs may be substituted for manholes at terminal sections of a main provided that:

4.3.2.1 in the opinion of the Director of Engineering, future extension of the main is reasonably anticipated to be constructed within five (5) years;

4.3.2.2 the length of sewer to the downstream manhole does not exceed 45 metres;

4.3.2.3 the depth of the pipe does not exceed 2 metres at the terminal point; and

4.3.2.4 the cleanout is configured so as to allow insertion of a video camera unit into the sanitary sewer.

4.3.3 Pipe

4.3.3.1 **Pipe Diameter**

Minimum pipe diameters shall be in accordance with MMCD requirements.

4.3.3.2 **Velocities**

Design velocities shall be in accordance with MMCD requirements.

4.3.3.3 **Minimum Grade**

Minimum grades shall be in accordance with MMCD requirements.

4.3.3.4 **Depth**

Design depths shall be in accordance with MMCD requirements.

4.3.4 Curvilinear Sewers

4.3.4.1 Curvilinear sewers are permitted when, in the opinion of the Director of Engineering, no reasonable alternative exists.

4.3.4.2 Design of curvilinear sewers shall be in accordance with MMCD requirements.

4.3.5 Service Connections

4.3.5.1 Design shall be in accordance with MMCD requirements.

4.3.5.2 Service connection stubs shall extend into private property one (1.0) metre or a horizontal distance equal to the depth of service at the property line, whichever is greater.

4.3.5.3 Lids for sanitary sewer inspection chambers shall be red.

4.3.5.4 Service connections shall establish the MBE at not less than 0.6 metre above the service connection invert calculated at the centre of the building envelope.

4.3.5.5 Service connections may be permitted into manholes if:

.1 the connection is not perpendicular to or against the flow in the main;

.2 the vertical alignment of the invert of the connection is not higher than 300 mm above the manhole bench;

.3 the invert of the connection extended to the centre of manhole is above the sewer main spring-line; and

.4 manhole hydraulics are met.

4.3.6 Inspections and Testing

4.3.6.1 Low pressure air tests are to be performed according to MMCD.

4.3.6.2 Video inspections shall be required for all constructed sewers according to 1.5.7 or as otherwise directed by the Director of Engineering.

4.3.6.3 Video inspections may be required to determine the condition and adequacy of existing downstream systems.

4.3.6.4 Video inspections shall be performed in accordance with the MMCD Specifications.

4.3.6.5 Supplemental to the MMCD Specifications, the contractor/Professional Engineer shall provide the Director of Engineering with a written and signed report summarizing the findings of the inspection prior to issuance of the certificate of Substantial Completion.

4.4 SANITARY PUMP STATIONS

The use of sanitary pump stations shall be avoided whenever possible; any proposed use of pump stations must receive prior approval from the Director of Engineering.

4.4.1 Design Criteria

4.4.1.1 Sanitary pump station design shall be in accordance with MMCD requirements, unless otherwise indicated in this Bylaw.

4.5 FORCE MAINS

4.5.1 Design Criteria

4.5.1.1 In conjunction with sanitary pumping facilities the following criteria shall be noted in the design of force main systems:

.1 at the lowest pump delivery rate anticipated to occur at least once per day, a cleansing velocity of at least 0.9 metres/sec should be maintained. Maximum velocity should not exceed 3.5 metres/sec;

.2 a special purpose sewage combination air valve, APCO Series 440 SCAV or approved equivalent, shall be placed at high points in the force main subject to approval of the Director of Engineering;

.3 the invert of force mains should enter the gravity sewer system at the spring-line of the receiving sewer;

.4 the minimum size for force mains shall be 100 mm diameter, unless otherwise approved by the Director of Engineering; and

.5 the material selected for force mains shall meet MMCD standards and shall adapt to local conditions, such as character of industrial wastes, soil characteristics, exceptionally heavy external loadings, abrasion and similar problems.

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

4.6 LOW PRESSURE SEWERS

In areas beyond the reach of the community gravity sewer system and not large enough to provide economic justification for a community pump station, or where soil conditions or topography are not suitable for gravity sewers, the Director of Engineering may consider approval of a low pressure sewer system, which involves private pump units discharging into a public low pressure sewage force main and/or into a gravity sewer.

Any proposed use, design and installation method of a pressure sewer system shall receive prior approval from the Director of Engineering.

4.6.1 Design Criteria

4.6.1.1 The designer of the system shall be a Professional Engineer, qualified to design such systems and shall adhere to the principles contained in the U.S. Environmental Protection Agency Manual "Alternative Wastewater Collection Systems".

4.6.1.2 Specifications must be supplied by the Professional Engineer for the selection and specification of pumps for all lots connecting to the pressure system.

4.6.1.3 The pressure sewer mains shall be sized using the rational method. Pumps shall then be selected that can discharge into the pressure sewer at an acceptable flow rate given the design discharge pressure.

4.6.1.4 Design submissions shall clearly show:

.1 calculated hydraulic grade line along the profile of the pressure sewer;

.2 present and future service connections taken into consideration in sizing the pressure sewer;

.3 typical detail of the proposed pumping system between the house and the pressure main; and

.4 design flow in l/s for each proposed service connection, and the design total dynamic head in metres for each point of connection.

4.6.1.5 Design flows for the pressure sewer shall be calculated using the following formula:

- $Q = A \times N + B$

Where:

- Q = design flow (US gpm)
- A = 0.5
- N = number of equivalent dwelling units
- B = 20

4.6.1.6 Pump selection shall be limited to brands available within the Lower Mainland at one day's notice. Pumps shall be single stage impeller type manufactured with bronze,

plastic or stainless steel impellers. Pumps shall be effluent, grinder or solids handling depending on the type of installation. Pump selection must be approved by the Director of Engineering.

4.6.1.7 Pumps shall be installed in a manufactured fibreglass sump and shall be mounted using a slide away coupling system and guide rails to facilitate servicing.

4.6.1.8 Venting shall be configured to dissipate potential odours away from adjacent properties, either by venting to above roof level or by use of sub-surface vents:

.1 sub-surface vents shall be designed to be free-draining and non-clogging;

.2 sub-surface vents shall consist of a perforated pipe bedded in gravel, underlying at least 450 mm of loam soil backfill; and

.3 drainage shall be provided if the soil bed is located in an area subject to ponding or high ground water. Water shall be drained to below the level of the perforated vent pipe.

4.6.1.9 At the discharge manhole the transition to gravity flow shall be designed to achieve laminar flow. The transition to gravity flow shall occur on a straight run with the pipe inverts on a straight uniform grade and the manhole carefully benched to taper uniformly between the inlet and outlet pipe, so any velocity transition will occur gradually across the full width of the manhole. The transition manhole shall be fitted with a sealed lid.

4.6.1.10 Each service connection shall incorporate:

.1 a corporation cock at the main; and

.2 a curb stop and check valve at property line with the check valve located upstream of the curb stop (i.e. between the pump and the curb stop).

4.6.1.11 Design of the On-Site pumping systems shall conform to the B.C. Plumbing Code and the B.C. Building Code, latest editions thereof.

4.6.1.12 Each On-Site pumping system shall incorporate:

.1 audible high liquid level alarm which can be heard from inside and outside of the building;

.2 flashing high liquid level alarm light visible from the Road;

.3 check valve on the pump discharge;

.4 shut-off valve immediately downstream of the check valve; and

.5 emergency overflow chamber of at least 1.5 cubic metres of storage.

4.6.1.13 The pressure sewer main shall be designed for:

.1 minimum cleansing velocity of 0.9 metres per second; and

.2 maximum velocity of 3.5 metres per second.

4.6.1.14 The pressure sewer main shall be tested:

.1 prior to construction of On-Site pumping systems;

.2 with all service connections installed;

.3 with all corporation cocks and curb stops open; and

.4 to a minimum pressure of 1000 kpa.

4.6.1.15 No measurable leakage over a period of 2 hours at a sustained pressure of 1000 kpa shall constitute a successful test.

4.6.1.16 The installation and testing of the pressure sewer main shall be under the direction of the Professional Engineer who shall, upon completion of testing, certify to the Director of Engineering, that the system has been properly installed and successfully tested.

4.6.1.17 The Professional Engineer shall provide the Town with record drawings, signed and sealed by the Professional Engineer or design engineer, showing the location and extent of the pressure sewer system and all connections and appurtenances thereto as required in 2.5.

4.6.1.18 A table of required flow and total dynamic head at each service connection must be submitted with the record drawings.

4.6.1.19 The commencement of construction of On-Site pumping systems shall not occur until:

.1 successful testing of the pressure sewer;

.2 acceptance of the pressure sewer system by the Town; and

.3 issuance of a building permit for the On-Site works.

4.7 INFRASTRUCTURE CORRIDORS

4.7.1 Sewer Location/Corridors

4.7.1.1 Design of sewer locations and corridors shall be in accordance with MMCD requirements.

4.7.2 Sanitary Infrastructure Right-Of-Way

4.7.2.1 The required sanitary infrastructure right-of-way width and other criteria shall be in accordance with MMCD Design Guideline Manual.

4.7.2.2 When a utility is located within a Right-Of-Way and access for maintenance vehicles is required, the Developer may be required to provide a constructed access road from a public Road.

4.7.2.3 When required, the maintenance access shall be constructed to a standard adequate to support the maintenance vehicles for which the access is intended:

.1 the Director of Engineering shall determine the required surface, i.e. paved or unpaved

~SECTION FIVE~
INTEGRATED STORMWATER MANAGEMENT

INDEX

5.0 INTEGRATED STORMWATER MANAGEMENT

5.1 INTRODUCTION

The Town of Gibsons has adopted an Integrated Stormwater Management Plan (ISMP). The Professional Engineer must consider the recommendations in the ISMP and the design approach detailed therein. Following the ISMP design approach provides environmental benefits by reducing run-off while improving storm water quality.

5.2 GENERAL

5.2.1 Option of Traditional Design

5.2.1.1 Where ISMP principles and application is unattainable or unnecessary, the Director of Engineering shall advise the Professional Engineer and may require a traditional design approach where deemed more appropriate, using the criteria described in the Bylaw.

5.2.2 Adequacy of Existing Infrastructure

5.2.2.1 The adequacy of downstream drainage infrastructure must be confirmed with the Town prior to:

.1 designing any extension to the Drainage Collection system;

.2 clearing land of vegetation; and

.3 increasing flow to the Drainage Collection system.

5.2.2.2 The Professional Engineer may be required to undertake analysis of the existing downstream infrastructure where recent reliable information does not exist.

5.2.2.3 The presence of an existing Town Drainage Collection system does not mean, or imply, that it has adequate capacity to receive the proposed design flow, nor does it indicate that the existing system is acceptable to the Town.

5.2.2.4 The cost of analysis of any downstream infrastructure is to be borne by the Developer.

5.2.2.5 Existing infrastructure, which is undersized, inadequate or inappropriate must be upgraded at the Developer's expense to accommodate the proposed subdivision and/or Development flows.

5.2.2.6 The Professional Engineer shall contact the Director of Engineering to determine existing information which may benefit the proposed design.

5.3 INTEGRATED STORMWATER MANAGEMENT

5.3.1 Integrated Stormwater Management Plan (ISMP)

5.3.1.1 A detailed review of SWBMPs is included in the ISMP. The Professional Engineer must be conversant with the findings and recommendations contained within the ISMP prior to preparing the Stormwater Management Plan.

5.3.1.2 The Director of Engineering will consider alternative SWBMPs provided performance objectives can be attained.

5.3.2 Stormwater Management Principles

5.3.2.1 The design of the stormwater management system shall incorporate techniques, on both public and private property, such as minor-major systems, appropriate site and lot grading, sub-surface infiltration (where feasible), SWBMPs, On-Site and Off-Site storage, sediment and erosion control and other acceptable methods to mitigate the runoff impacts associated with subdivision and Development.

5.3.2.2 The post-Development flow rates to the Drainage Collection System or Watercourses for storm events up to and including the 1:10 year event may not increase from the pre-Development conditions.

5.3.3 Watercourses

5.3.3.1 The Stormwater Management Plan must consider the impacts of the Development or subdivision on the Watercourses within the Town, having regard to any applicable any Environmental Development Permit

requirements. In general, natural watercourses include Charman Creek, Chaster Creek, Gibsons Creek, Goosebird Creek and all of their tributary components, including portions of such Watercourses which have been modified by urban development.

5.3.3.2 Any and all Watercourses flowing through or adjacent to the subdivision or Development, or receiving run-off therefrom, shall be protected as an open channel and left in a natural state, or enhanced in accordance with the recommendations of a Qualified Environmental Professional.

5.3.3.3 Schedule "J" Watercourse Map shows the location of each Watercourse in Gibsons:

.1 if there is any discrepancy between the classification of watercourses shown in Schedule "J" and those shown in Development Permit Area 2 of the Town's Official Community Plan, the higher classification shall prevail with Class A being highest.

- Class A Watercourses are streams that support salmonid fish and/or species at risk year-round or have the potential to do so if existing limitations are corrected. Typically, these are natural streams with year-round flow.
- Class B Watercourses are streams that do, or with access enhancement could, support salmonid fish and/or species at risk seasonally, typically in the winter, when water flow is sufficient.
- Class C Watercourses do not support fish or species at risk, nor do they have the potential to do so due to absent or insufficient flows during critical life stages, lack of fish access or absence of access enhancement potential. However, they are hydrologically connected to fish-bearing streams and therefore can be significant sources of water, nutrients or food for downstream fish and other freshwater aquatic life.
- Class D Watercourses provide no in stream

habitat nor are they significant sources food or nutrients to downstream freshwater aquatic life or sources of water supply.

5.3.4 Grading Plan

5.3.4.1 The Professional Engineer, in consultation with the Professional Landscape Architect and the Professional Geotechnical Engineer, shall prepare a site and lot grading plan acceptable to the Director of Engineering with the following outcomes:

.1 retention of the ability of the soil to retain stormwater by leaving natural soils and vegetation in place to the greatest extent possible;

.2 retention of natural drainage patterns by avoiding large cuts/fills and retaining structures;

.3 use of SWBMPs to the extent possible; and

.4 avoiding the negative impacts of point discharge.

5.3.4.2 The site and lot grading plan shall form an integral part of the Stormwater Management Plan and as such incorporate SWBMPs for accommodating stormwater run-off.

5.3.4.3 At a minimum, the site and lot grading plan shall include:

.1 existing and proposed contour lines in two (2) metre intervals for any areas of the Parcel with slopes less than 10% and one (1) metre intervals for any areas of the Parcel with slopes equal to or greater than 10% with slope analysis, where appropriate;

.2 identification of environmental, geotechnical, hydrological, tree retention and natural area constraints;

.3 identification of SWBMPs, flow routes and points of discharge;

.4 areas of cut/fill greater than one metre;

.5 cross sections where the natural or proposed grades exceed 20%;

.6 protection and restoration requirements;

.7 existing and proposed lot corner and building corner elevations;

.8 retaining wall elevations and aesthetic considerations, where applicable;

.9 MBE for each lot, according to 5.3.5; and

.10 geotechnical requirements.

5.3.5 Minimum Building Elevations (MBE)

5.3.5.1 The MBE shall be established at least 0.6 m above the sanitary service connection invert, where applicable, and 0.3 m above the 100 year (major storm event) hydraulic grade line elevation.

5.3.5.2 Accepted MBE's may not be revised without referral to and acceptance by the Director of Engineering.

5.3.6 Stormwater Management Plan Submission Requirements

5.3.6.1 A Stormwater Management Plan is required for all subdivisions and Developments. Infill subdivisions creating less than three (3) additional single family lots are exempt from this requirement unless required by any other statute, bylaw or legislation. SWBMPs will still be required.

5.3.6.2 A Stormwater Management Plan, prepared and designed by the Professional Engineer, shall describe the details of how drainage servicing will be provided to the proposed subdivision or Development, indicate how the subdivision or Development will impact existing Drainage Collection infrastructure downstream, show how the proposed minor and major drainage systems meet the Bylaw requirements, and state environmental impact mitigation measures.

5.3.6.3 The Stormwater Management Plan shall consist of a written report and drawing(s), as part of the engineering drawing submission. The Stormwater Management Plan must address the following:

.1 identify, preserve and restore any areas with significant hydrologic or hydro-geologic

functions, as determined by the Professional Engineer;

.2 retention of trees and soils to contribute to stormwater management wherever possible;

.3 reduce impervious areas and provide mitigation measures for Disturbed Areas;

.4 disconnect run-off from directly discharging to the Drainage Collection system;

.5 provide On-Site SWBMPs before run-off enters the Drainage Collection system;

.6 discharge to a natural Watercourse must be via an open channel of sufficient length to:

- function effectively as a means to disperse any point discharge;
- include adequate means to slow the flow of stormwater and reduce the scouring of stormwater;
- provide adequate means to permit the settlement of sediment in order to prevent the introduction of the same into the receiving waters;
- provide adequate vegetation to assist in absorbing pollutants from the stormwater; and
- provide adequate topsoil and granular materials to assist in absorbing low flows.

.7 provide above ground SWBMPs, or, in areas with low infiltration, below-grade storage tanks or other storage solutions as permitted by the Director of Engineering; and

.8 provide sediment and erosion control on each lot and discharge point.

5.3.6.4 The Stormwater Management Plan must consider:

.1 the infiltration capacity of the soil and ground water conditions as determined by the Professional Geotechnical Engineer and Professional Hydro-geologist;

.2 additional SWBMPs, such as below ground storage, offsite detention, etc. for areas with restricted infiltration capacity;

.3 tributary areas in the catchment, including all existing and future land uses, Roads, Watercourses, culverts, storm sewers, control structures and storage facilities and Drainage Collection System capacities;

.4 environmental protection/enhancement requirements as required by any Environmental or Geotechnical Development Permits;

.5 landscape plan requirements utilizing drought tolerant plantings as well as landscaping materials that aid in water conservation where appropriate;

.6 SWBMPs for all impervious surfaces, areas with low permeability, and Disturbed Areas during and post construction;

.7 staging requirements for installation of SWBMPs (subdivision Works - installed by the Developer, and building permit Works - installed by the Builder);

.8 methods to eliminate direct discharge from individual Parcels to the Town Drainage Collection system or Watercourses;

.9 on-site and Off-Site SWBMPs and temporary SWBMPs during construction;

.10 more than one SWBMP per lot, plus overflow requirements;

.11 methods to improve stormwater quality, and construction of wetlands and habitat restoration, where applicable;

.12 check-dams in infrastructure trenches;

.13 hydrologic and hydraulic calculations;

.14 minor and major flow routing;

.15 sediment and erosion control measures; and

.16 procedures for monitoring, inspection and verification of design, long-term maintenance obligations and easement requirements.

5.3.6.5 Each design shall utilize the SWBMPs, referenced in the ISMP, where geotechnically appropriate.

5.3.6.6 A common Off-Site Stormwater Management system to permit Low-Impact Development techniques may be permitted by the Director of Engineering where:

.1 the available lot area outside of the building envelopes on individual lots is inadequate to support Low-Impact Development measures;

.2 the costs to the Town of maintaining common infrastructure would in the opinion of the Director of Engineering not be unreasonable; or

.3 a single Town-owned system will, in the opinion of the Director of Engineering, remain functioning for a longer period of time than individual privately-owned systems.

5.3.7 Environmental Protection and Sediment & Erosion Control Plan

5.3.7.1 Any environmental protection requirements identified in any Environmental or Geotechnical Development Permits or by the Stormwater Management Plan shall be designed and drawn on the Environmental Protection, Sediment & Erosion Control plan.

5.3.7.2 At a minimum the plan shall include:

.1 location of all Watercourses, and environmentally sensitive areas within 100 metres of the subdivision or Development;

.2 low-Impact Development Standards;

.3 limits of clearing/disturbance and disposal requirements;

.4 existing Drainage Collection System;

.5 direction of overland flows;

.6 capacity calculations and structural integrity of receiving infrastructure;

.7 stockpile location and protection;

.8 stabilization of Disturbed Areas and slopes/banks;

.9 construction vehicle access and vehicle wash, where necessary;

.10 street cleaning requirements and mitigation measures;

.11 inspection, monitoring and maintenance requirements; and

.12 contact information 24 hours/day and 7 days/week.

5.3.8 Erosion Controls

5.3.8.1 Soil and bank protection must be considered along existing and new Watercourses to provide adequate erosion protection in the form of armouring, soil stabilization, flow deflection or other methods applicable for the specific site conditions.

5.3.8.2 The Professional Engineer shall be responsible to assess the requirements for and suitable method of soil protection; which may include:

.1 grass lined and natural channels – most suitable for longitudinal gradients of 5% or less;

.2 Rip-Rap protection – must consider the flow velocities and scour of the underlying soil/material. The use of granular material or geo-textiles shall provide a suitable barrier to prevent the migration of fine grained soils caused by either the flow in the main channel or by flows from the channel banks due to seepage; and

.3 Bio-Engineering – bio-engineering methods of soil/bank protection shall be promoted wherever possible for the protection and stabilization of Watercourses. Bio-engineering solutions involve the use of plants and vegetation to provide bank lining and cohesion of bank materials to resist scour. The plant materials used will require anchoring to ensure long term stability. Bio-engineered solutions must be acceptable to the Qualified Environmental Professional, and completed by a contractor with demonstrated expertise.

5.3.9 Siltation Controls

5.3.9.1 Developers are required to demonstrate how Works and Services will be undertaken and completed so as to prevent the release of silt, raw concrete, concrete leachate and other deleterious substances into any Watercourse, ravine, Drainage Collection system, or restrictive covenant area.

5.3.9.2 Construction materials, excavation wastes, overburden soils, or other deleterious substances shall be disposed of or placed in such a manner as to prevent their entry into any Watercourse, ravine, Drainage Collection system, or restrictive covenant area.

5.3.9.3 All siltation control devices shall provide access for cleaning and maintenance. Siltation control structures must be maintained during the course of construction through to the end of the maintenance period (Acceptance). Changes will be required if the proposed Works are found to be inadequate.

5.3.10 Stormwater Best Management Practices (SWBMPs)

5.3.10.1 Each source control method (SWBMP) referenced in the ISMP shall use the Design Area Ratios in Table 5-2 when calculating hydraulic capacity.

5.3.10.2 The Professional Engineer shall calculate the amount of area required for each SWBMP in accordance with the Design Area Ratio table. Refer to the example in Table 5-1 as a guide when calculating the size of each SWBMP.

5.3.10.3 If infiltration is restricted to less than 25 mm/hr and/or where negative downstream affects could occur, the Professional Engineer shall focus on surface enhancements, such as topsoil, bio-swales and green roofs; or provide acceptable Off-Site detention or bio-swale facilities, or provide combinations for On-Site and Off-Site storm water management.

5.3.10.4 All SWBMPs (except topsoil) require a low flow orifice to allow appropriate discharge to the Drainage Collection System to maintain adequate stream flows and support environmental objectives.

5.3.10.5 The Professional Engineer shall certify each SWBMP constructed by the Developer prior to Substantial Completion. Where SWBMPs have not been completed by the Developer prior to Substantial Completion, the Professional Engineer shall provide a written proposal acceptable to the Director of Engineering ensuring each SWBMP will be completed in accordance with the Stormwater Management Plan.

Table 5-1 SWBMP Area Calculation - Example

- *600 m^2 single family lot*
- *Assumed 350 m^2 Low Permeable Area*

1. *Determine extent of Low Permeable Areas (buildings, driveway, patio, Disturbed Areas, other impervious surfaces). Assumptions used to determine Low Permeable Areas and Disturbed Areas MUST be accepted by the Director of Engineering prior to completing the Stormwater Management Plan; and*
2. *if geotechnical findings indicate infiltration is achievable, then an assumed 350 m^2 of Low Permeable Area requires:*
   - 39 m^2 of rain garden on the lot (350 m^2 / 9); OR
   - 117 m^2 of 300 mm of topsoil (350 m^2 / 3); OR
   - 32 m^2 of rock pit on the lot (350 m^2 / 11); OR
   - 50 m^2 of bio-swale on the lot (350 m^2 / 7); OR
   - 50 m^2 of permeable pavement on the lot (350 m^2 / 7); OR
   - combination of the above, e.g. 20 m^2 of rain garden + 57 m^2 of topsoil (20x9 + 57x3).

5.3.10.6 Design Area Ratios

Table 5-2 Design Area Ratios – SWBMPs

Source Control:	Design Area Ratio:
Topsoil (300mm)	**3**
Bio-swale	**7**
Permeable Pavement	**7**
Rain Garden	**9**
Rock pit	**11**
Green Roof	**12**

5.3.10.7 The Stormwater Management Plan may consider alternate methods of source control, provided the performance criteria identified in the ISMP is maintained.

5.3.10.8 Where a Stormwater Management Plan is not required by the Director of Engineering, the Owner/Developer shall provide the following minimum requirements, acceptable to the Director of Engineering:

- 0.33 m² of topsoil for each m² of Low Permeable Area and Disturbed Area; or
- alternate SWBMPs, where suitable.

5.3.10.9 At the direction of the Director of Engineering, SWBMPs may require a statutory right-of-way or a Section 219 *Land Title Act* covenant to allow access and monitoring to ensure the SWBMP is functioning properly.

5.3.11 Groundwater Recharge

5.3.11.1 On-Site measures for the purposes of groundwater recharge or open storage, e.g. rock pits, are generally discouraged due to shallow impermeable layers, sloping terrain and frequent occurrences of shallow groundwater in many areas within the Town.

5.3.11.2 If On-Site measures for groundwater recharge are to be considered, the Professional Engineer shall submit a report prepared by a Professional Hydro-geologist, which identifies opportunities and constraints for implementation. At a minimum, this report must present the following items:

.1 description of site condition, size and location;

.2 description of the proposed Development or subdivision and resulting design flows;

.3 description of native soils and water table conditions On-Site to a minimum depth of 3 metres and a maximum depth of 5 meters;

- Under no account may any excavation proceed beyond the surface of the aquifer-confining glacial till layer.

.4 estimated infiltration rates for each strata of material encountered (complete with a description of seasonal variability);

.5 impacts to land and development downstream of the proposed Development or subdivision; and

.6 recommendations for recharge methods suitable for the proposed subdivision or Development.

5.3.11.3 The Director of Engineering may refuse to permit groundwater recharge methods with known groundwater issues.

5.3.11.4 **Pre-Treatment**

All groundwater recharge systems must include pre-treatment measures to remove sediments, suspended solids and greases/oils and other contaminants prior to entering the infiltration zone.

5.3.11.5 **Overflow system**

Recharge systems should be designed with sufficient volume to maximize the opportunity for infiltration, however systems contained within a Town Right-Of-Way, or where the infiltration rate of the native sub soils are low, require an overflow connected to the Town Drainage Collection system which is sufficiently sized for the 1:10 year peak discharge from the subdivision or Development.

5.3.11.6 **Recharge systems**

Methods of groundwater recharge systems may be considered by the Director of Engineering on a site specific basis, according to 5.3.11. Typical systems that may be supported by the Town include the following, in accordance with the Standard Drawings:

.1 drywells;

.2 rock pits;

.3 perforated drains; and

.4 pre-manufactured modular infiltrator chambers (design as per manufacturer's specifications).

5.3.12 Vegetated Bio-Swales

5.3.12.1 Use of vegetated bio-swales to meet environmental objectives is required wherever possible. Bio-swales shall be landscaped in accordance with the Landscape Plan and the Standard Drawings and protected with erosion control measures utilizing local rock or other natural materials.

5.3.12.2 Bio-swales shall be adjacent to Roadways in accordance with Schedule “D” Standard Drawings and shall conform to the following criteria, unless directed by the Director of Engineering:

.1	minimum capacity storm	1:10 year
.2	minimum bottom width	0.3 m
.3	maximum side slope	1.3(H):1(V)
.4	minimum grade	1.0 %
.5	maximum velocity (unlined)	1.0 m/s

5.3.12.3 Where soil conditions are suitable or where erosion protection is provided, the Professional Geotechnical Engineer may accept higher velocities. If grades are excessive, erosion control structures, landscaping or ditch enclosures may be required.

5.3.12.4 The minimum Right-Of-Way width for a Town owned ditch/bio-swale located on private property shall be five metres or the width of the ditch/bio-swale plus 3.5 metres, whichever is greater:

.1 the top of the ditch adjacent to the property line shall be a minimum 0.3 m away from that property line;

.2 the bio-swale shall be offset in the Right-Of-Way to permit a 3 m wide access for maintenance vehicles; and

.3 additional Right-Of-Way may be required to facilitate the ditch construction and access, as determined by the Director of Engineering.

5.3.12.5 Swales shown on the site and lot grading plan shall be located within a three metre private easement to accept drainage from adjacent lots where necessary.

5.3.12.6 Swales are to incorporate appropriate physical barriers for safety where appropriate. Any required barrier designs are to create as minimal visual impact as reasonable.

5.3.12.7 Swales designed for major flow routing according to the requirements of 6.3.2 require prior approval from the Director of Engineering.

~SECTION SIX~
STORMWATER MANAGEMENT
TRADITIONAL DESIGN

INDEX

6.0 STORMWATER MANAGEMENT - TRADITIONAL DESIGN

6.1 INTRODUCTION

The Professional Engineer shall only use the traditional design method for managing On-Site storm flows when all requirements of Section 1.0 have been met to the fullest degree as possible. This method may also be used to determine adequacy of the downstream Drainage Collection system where required.

6.2 GENERAL

6.2.1 Adequacy of Existing Infrastructure

6.2.1.1 The adequacy of downstream drainage infrastructure must be confirmed with the Town prior to designing any extension to the Drainage Collection system, and prior to increasing flow to the Drainage Collection system:

.1 the Professional Engineer may be required to undertake analysis of the existing downstream infrastructure where recent reliable information does not exist;

.2 the presence of an existing Town Drainage Collection system does not mean, or imply, that it has adequate capacity to receive the proposed design flow, nor does it indicate that the existing system is acceptable to the Town; and

.3 the cost of analysis of any downstream infrastructure is to be borne by the Developer.

6.2.1.2 Existing infrastructure, which is undersized, inadequate or inappropriate, must be upgraded at the Developer's expense to accommodate the proposed subdivision and Development flows.

6.2.1.3 The Professional Engineer shall contact the Director of Engineering to determine existing information which may benefit the proposed design.

6.2.1.4 The post-Development flow rates to the Drainage Collection System or Watercourses for storm events up to and including the 1:10 year event may not increase from the pre-Development conditions.

6.3 MINOR AND MAJOR FLOWS

6.3.1 Minor System

6.3.1.1 The *Minor System* comprises of On-Site and Off-Site retention systems, storm sewers, culverts, channels and flow control facilities designed to collect and carry the peak runoff from storm events up to and including the 1:10 year return frequency (minor flow). Flow control facilities include detention/retention ponds, infiltration, rock pits, and other acceptable methods (SWBMPs) suitable for reducing the rate of runoff into the downstream Drainage Collection system.

6.3.1.2 The minor system shall be designed to prevent Watercourse erosion, flooding and property damage, and minimize public inconvenience.

6.3.2 Major System

6.3.2.1 To effectively manage the higher runoff during major storms, the minor system is complemented by the *Major System,* which is comprised of surface flow paths, swales, Roadways, culverts, bridges, Watercourses and flow control facilities designed to accommodate the runoff from storm events up to and including the 1:100 year return frequency (major flow).

6.3.2.2 The major system shall be designed to protect the public and prevent significant property damage:

.1 roadways, overland flow paths, channels and Watercourses shall be designed to ensure that the maximum hydraulic grade line is a minimum of 0.3 metres below the lowest existing or proposed MBE of adjacent buildings; and

.2 the maximum depth of surface flow within a Roadway shall not exceed 150 mm at any point within the Road dedication, except in bio-swales or ditches.

6.3.2.3 Surcharging at the inlet under the major flow conditions is acceptable provided the headwater profile meets the criteria of 6.3.2.2.1. Adequate protection shall be required where surcharging is proposed.

6.3.2.4 Where the surface flow cannot be managed, or an inlet facility is likely to be blocked or restricted, the Professional Engineer may request consideration be given from the Director of Engineering to sizing the Drainage Collection system to accommodate the major flow.

6.4 RUNOFF ANALYSIS

6.4.1 Post Development Flows

6.4.1.1 Downstream Drainage Collection systems shall be designed to accommodate the post-development flows using the Rational Method. All calculations pertinent to the design of the drainage system shall be signed and sealed by the Professional Engineer and submitted to the Director of Engineering for acceptance. The Professional Engineer shall confirm the drainage catchment area with the Director of Engineering prior to final design.

6.4.2 Rational Method

- Q = RAIN

Where:

- R = Runoff Coefficient
- A = Drainage area in hectares
- I = Rainfall intensity in mm/hr
- N = 0.00278
- Q = Flow in m^3/s

6.4.3 Runoff Coefficients (R)

6.4.3.1 Runoff coefficients shall be based on MMCD, taking into consideration the adjustment factor to reflect variations in soil permeability and slope.

6.4.3.2 Land use designations selected for design purposes shall be based on the Town's Official Community Plan (OCP), or as directed by the Director of Engineering.

6.4.4 Time of Concentration

6.4.4.1 The time of concentration shall be based on MMCD and shall be corrected with the actual time of flow calculated from the hydraulic properties of the selected pipe/channel.

6.4.4.2 A composite value for Tt (time of travel) shall be calculated in cases where the type of flow along the longest path varies or the slope changes.

6.4.5 Rainfall Intensity

6.4.5.1 The rainfall intensity for the Rational Method formula shall be determined from the rainfall IDF curve based on the calculated time of concentration and storm frequency.

6.4.5.2 Rainfall IDF curves are shown in Schedule "L" of this Bylaw.

6.5 TRADITIONAL STORM SEWERS AND APPURTENANCES

6.5.1 Manholes

6.5.1.1 The design of all storm manholes shall be in accordance with MMCD requirements.

6.5.1.2 The design for hydraulic losses across manholes shall be in accordance with MMCD requirements.

6.5.2 Catch Basins

6.5.2.1 Design shall be in accordance with MMCD requirements.

6.5.2.2 The Stormwater Management Plan may require discharge to open bio-swales, rather than the storm sewer.

6.5.3 Piping

6.5.3.1 Opportunities to day-light existing pipes and remove existing culverts shall be investigated by the Professional Engineer.

6.5.3.2 **Sizing of Storm Sewers**

.1 the required storm sewer capacity shall be calculated under free flow (non-surcharged) conditions using the Manning formula and criteria in the MMCD Design Guideline Manual;

.2 piping systems shall be designed to accommodate a 1:10 year return period without surcharging;

.3 the hydraulic grade line for both the 10 year and 100 year return period shall be calculated and shown on the design drawings along with the peak design flow rates and pipe capacity for each section of pipe/conveyance system; and

.4 the minimum size of storm sewers shall be 300 mm diameter, except at a terminal section of a short Cul-De-Sac with no catch basin connections, and then the size maybe reduced to 250 mm diameter.

6.5.3.3 **Minimum/Maximum Velocities**

Design for maximum and minimum velocities shall be in accordance with MMCD requirements.

6.5.3.4 **Pipe Material**

Table 6-1 Pipe Material

Application		Material
Storm sewer mains:	200 mm to 300 mm 375 mm and larger	SDR PVC SDR PVC or concrete
Catchbasin leads		SDR PVC
Service connections		SDR PVC
Perforated drains		SDR PVC
Culverts: Driveway culverts Town Road crossings		Concrete or poly Concrete or poly

.1 alternative piping materials than those listed in Table 6-1 may be considered and accepted under special circumstances, at the discretion of the Director of Engineering;

.2 poly pipe culverts are to be smooth-bore Boss2000 or approved equivalent; and

.3 use of corrugated steel pipe (CSP) will not be accepted.

6.5.3.5 **Depth**

Design depth shall be in accordance with MMCD requirements.

6.5.3.6 **Pipe Joints**

The design shall use watertight joints except where storm sewers are part of a subsurface disposal system, or where the Director of Engineering permits otherwise.

6.5.4 Curvilinear Sewers

6.5.4.1 Curvilinear sewers are permitted when, in the opinion of the Director of Engineering, no reasonable alternative exists.

6.5.4.2 Design of curvilinear sewers shall be in accordance with MMCD requirements.

6.5.5 Service Connections

6.5.5.1 Unless otherwise noted below, service connection design shall be in accordance with MMCD requirements.

6.5.5.2 All service connections require an inspection chamber as per the Standard Drawings.

6.5.5.3 Lids for storm sewer inspection chambers shall be factory blue or turquoise (not painted).

6.5.5.4 Lawn basins may be considered as inspection chambers if they act as the point of connection between the private collection system and the Town's Drainage Collection System and are located within one (1) metre of the property line adjacent to the Town system.

6.5.5.5 Service connection stubs shall extend into private property one (1.0) metre or a horizontal distance equal to the depth of service at the property line, whichever is greater.

6.5.5.6 Service connections shall establish the MBE at not less than 0.6 metre above the service connection invert calculated at the centre of the building envelope.

6.5.5.7 Unless otherwise approved by the Director of Engineering, no service shall discharge directly to a Watercourse.

6.5.5.8 The Professional Engineer shall provide a written report acceptable to the Director of Engineering justifying the need to provide any direct connection to the Drainage Collection System.

6.5.5.9 Service connections may be permitted into manholes if:

.1 the connection is not perpendicular to or against the flow in the main;

.2 the invert of the connection is not higher than 300 mm above the manhole bench;

.3 the vertical alignment of the invert of the connection extended to the centre of manhole is above the sewer main spring-line; and

.4 manhole hydraulics are met.

6.5.6 Video Inspections

6.5.6.1 Video inspections shall be required for all constructed sewers according to 1.5.7 or as directed by the Director of Engineering. Video inspections may also be required to determine the condition and adequacy of existing downstream systems.

6.5.6.2 Video inspections shall be performed in accordance with the MMCD Specifications. Supplemental to the MMCD Specifications, the contractor/Professional Engineer shall provide the Director of Engineering with a written and signed report summarizing the findings of the inspection prior to issuance of the certificate of Substantial Completion.

6.5.7 Inlet and Outlet Structures

6.5.7.1 Inlet and outlet headwalls shall be Langley Concrete #11-13, #14-15, #26-28 or approved equivalent unless otherwise noted below.

6.5.7.2 Subject to the acceptance of the Professional Engineer, stacked boulder headwalls may be used on culverts 450 mm diameter or less on Type 2 Local or Type 2 Collector Roads or in other locations where, in the opinion of the Director of Engineering, site conditions are not suitable for precast headwalls.

Boulders shall be 400 mm to 600 mm rounded rock only.

6.5.7.3 Concrete block headwalls (MMCD Standard Drawings) may be used for culverts up to 750 mm diameter.

6.5.7.4 Deltalok System® or approved equivalent may be used for driveway culvert headwalls where depth of cover or other restricting conditions warrant.

6.5.7.5 Pipes larger than 1200 mm diameter and non-circular culverts will require specially designed inlet and outlet structures.

6.5.7.6 Outlets having discharge velocities in excess of 1.0 m/s require rip rap protection and/or energy dissipating structures for erosion control.

6.5.7.7 Trash racks are required at the inlets of all pipes and culverts that are over 450 mm in diameter, or which exceed 30 metres in length. Trash racks may also be required elsewhere at the discretion of the Director of Engineering.

6.5.8 Culverts

6.5.8.1 Culverts shall be designed to convey the major flow (1:100 year storm).

6.5.8.2 All culverts shall be sized with the design headwater not to exceed 80% of the pipe diameter. The Professional Engineer shall determine whether the culvert will operate under inlet or outlet control at design conditions.

6.5.8.3 The minimum diameter of all crossing and driveway culverts is 450 mm. The Director of Engineering may consider allowing driveway culverts to be reduced to 300 mm where the depth of the ditch/swale does not permit a larger diameter.

6.5.8.4 The minimum depth of cover for culverts is 0.3 m, subject to the correct pipe loading criteria.

6.5.8.5 The maximum length of a culvert under a Driveway Crossing is to be 3.0 metres longer than the width of the Driveway Crossing unless otherwise approved by the Director of Engineering.

6.5.8.6 Inlet and outlet structures are required for all culverts according to 6.5.7.

6.5.9 Storm Outfalls:

6.5.9.1 No new/additional piped stormwater outfalls shall directly discharge into natural Watercourses.

6.5.9.2 Individual property storm drains, including point discharge from a Parcel, to natural Watercourses are not permitted, unless specific approval has been granted by the Director of Engineering and outside agencies having jurisdiction.

6.6 STORM SEWER INFRASTRUCTURE CORRIDORS

6.6.1 Sewer Location/Corridors

6.6.1.1 Design of sewer locations and corridors shall be in accordance with MMCD requirements.

6.6.2 Storm Sewer Infrastructure Right-of-Way

6.6.2.1 The required storm sewer infrastructure right-of-way width and other criteria shall be in accordance with MMCD Design Guideline Manual.

6.6.2.2 When a utility is located within a Right-Of-Way and access for maintenance vehicles is required, the Developer may be required to provide a constructed access road from a public Road.

6.6.2.3 When required, the maintenance access shall be constructed to a standard adequate to support the maintenance vehicles for which the access is intended.

.1 The Director of Engineering shall determine the desired surface, i.e. paved or unpaved.

~SECTION SEVEN~
ROADS

INDEX

7.0 ROADS

7.1 INTRODUCTION

Road designs must consider Low-Impact Development Standards having regard to the Boulevard/Landscape Plan and any environmental protection requirements identified in 5.3.7.

Table 7-1 Road Standards

ROAD CLASSIFICATION		Hwy 101	Arterial Excl Hwy 101	Type 1 Collector	Type 2 Collector	Type 1 Local	Type 2 Local	Lane/ Emerg. Access
Dedication (m)		Varies	20	20	20	20	20	8
Road Functions	Pavement Width (m)	Varies	7	7	6.4 Incl. flat curbs	6 Incl. flat curbs	6	3.5
	Min Pavement Thickness (mm)	100	100	85	85	75	75	75
	Sidewalk (#)	2	2	2	1	Shared space	Shared space	0
	Boulevard	2 metre width min	See Standard Drawings					
	Bike Lane	Yes	Multi-use path	Grade separated	Multi-use path	No	No	No
	On-Street Parking	No	No	Parking Bays	Parking Bays	Parking Bays	No	No
	Curb Type	Barrier	Barrier	As per Std. Dwgs.	Flat	Flat	None	None
	Ornamental Street Lights	See Table 10-1						
Design Speed	Min (km/h)	40	40	30	30	20	20	10
	Max (km/h)	50	50	50	50	30	30	20

Where the application of the Standard Drawings is affected by existing conditions, the Professional Engineer shall provide the Director of Engineering with an acceptable report detailing alternative design(s).

Where the subdivision or Development has Frontage on an existing Highway, modification of the Standard Drawings may be required in order to tie in to existing Roads constructed to alternate standards.

7.2 DESIGN PREMISES

7.2.1 Road Design Considerations

7.2.1.1 The Professional Engineer shall design the Roads, parking bays, curbs, Sidewalks, Boulevards and bio-swales in accordance with MMCD Design Guideline Manual unless otherwise noted in the Standard Drawings and this Bylaw.

7.2.1.2 Road designs must consider the following objectives:

.1 the creation of Local and Collector Roads which are user friendly, and where automobiles are tolerated, rather than dominate the streetscape and Road network, thereby improving liveability, social interaction and aesthetics;

.2 traffic calming which becomes an integral component of subdivision design, rather than added-on elements;

.3 interaction between various users of Roads, rather than segregated functions, thereby improving the safety of Local and Collector Roads; and

.4 roads are to be conceived around a unified design concept - one that reflects or embellishes the unique character of the site, or responds to site specific opportunities (e.g. solar access, street features, topography, stormwater mitigation, views).

7.2.1.3 All Arterial Roads in the Municipality shall be designed in accordance with the recommended practice as outlined in "Geometric Design Standards for Canadian Roads and Streets", 1999 Edition or latest as published by the Transportation Association of Canada (TAC), unless otherwise stated in this Bylaw:

.1 all Arterial Road designs are unique and require specific design considerations to suit each location, therefore the Professional Engineer must review design parameters with the Director of Engineering prior to commencing engineering drawings.

7.3 DESIGN CRITERIA

7.3.1 Classifications

7.3.1.1 The Director of Engineering will advise the Developer/Professional Engineer of the classification of each Road taking into consideration Schedule "E" Road Classification Map. The design shall be in accordance with the Standard Drawing for each Road type.

7.3.1.2 The Type 1 Local Road detail is to be used for all new Local Roads.

7.3.2 Grades

7.3.2.1 The maximum longitudinal grades generally shall be as follows:

- Arterial 10%
- Collector 12%
- Local Road 16%
- Lanes 12%
- Cul-De-Sac bulb 8%

7.3.2.2 The minimum longitudinal grade generally shall be 0.5%.

7.3.2.3 Where topographical constraints restrict the attaining of the above noted grades, special considerations may be given by the Director of Engineering:

.1 where the Director of Engineering permits Road grades greater than 10%, alternate designs or routes for walkways to accommodate non-vehicular users must be provided according to 8.2.2; and

.2 under no circumstances should any Road grades be greater than 20%.

7.3.3 Cross-Slopes

7.3.3.1 Standard cross-slopes on Roads shall be 2% minimum.

7.3.3.2 Where, in the opinion of the Director of Engineering conditions warrant, Local Roads may be constructed with cross-slopes up to 4%.

7.3.4 Design Speeds

7.3.4.1 Maximum design speeds are provided in Table 7-1 in order to assist in creating Roads and streetscapes which are comfortable for all users and where automobiles inherently drive slower. Lower design speeds allows the designer the freedom to accommodate existing terrain and improve the safety for pedestrians and cyclists, thereby eliminating costly traffic calming retrofits in the future.

7.3.4.2 A key consideration for the design of new Roads will be the preparation of the Landscape Plan, designed to improve environmental performance of new subdivisions including accommodation of appropriate maximum design speeds necessary to reduce traffic speeds. Landscape Plans must be considered during the Highway design stage and must be supported by the Professional Landscape Architect.

7.3.4.3 Options for reducing design speeds include:

.1 narrowing pavement widths for existing roads;

.2 curvilinear Roads with tight radii;

.3 heavy Boulevard landscaping to reduce sight line distances, improve aesthetics and create an environmentally sustainable streetscape design and reduce locations where sight line distances contribute to increased speeds;

.4 road signage with posted reduced maximum speed limits; and

.5 traffic calming measures, such as islands, medians, roundabouts, chicanes, and bulges, or other traffic calming devices noted in Schedule "I".

7.3.4.4 Special, unique designs are required for all Arterial Roads and design speeds greater than 50 km/h.

7.3.5 Vertical Curves

7.3.5.1 Vertical curves shall be governed by the maximum or minimum design speed of the Road.

7.3.6 Horizontal Curves

7.3.6.1 Horizontal curves shall be governed by the maximum or minimum design speed of the Road.

Figure 7-1 Example of Low-Impact Road Design

7.3.7 Cul-De-Sacs

7.3.7.1 As Cul-De-Sacs increase travel distances and Cul-De-Sac bulbs occupy large areas of land, the Town discourages their use.

7.3.7.2 The maximum length of a Cul-De-Sac shall be 200 metres.

7.3.7.3 Where in the opinion of the Director of Engineering, Cul-De-Sacs are necessary and appropriate, alternate turnaround designs may be considered, including:

.1 hammerhead type turnarounds; and

.2 dead-ends without accommodation for a designated turnaround where the road is serving fewer than 6 single family Parcels, and is no longer than 100 metres in length.

7.3.7.4 Where, in the opinion of the Director of Engineering, a Road is to be extended in the foreseeable future, temporary turnarounds may be permitted, and where necessary, be accommodated on a Town Right-Of-Way registered on private property that could be discharged when the Road is extended.

7.3.7.5 Design of Cul-De-Sac bulbs shall be in accordance with the Standard Drawing, and shall incorporate a centre island within the bulb to accept surface run-off wherever possible.

7.3.7.6 Connections for cyclists and pedestrians shall be provided at the end of each Cul-De-Sac.

7.3.8 Lanes

7.3.8.1 Lanes are to be established as the primary means of access to parcels, unless determined by the Director of Engineering that the use of Lanes is not practicable.

7.3.8.2 Lanes are to accommodate one-way traffic only.

7.3.9 Half-Road Dedication and Construction

7.3.9.1 In a subdivision or Development where the Road layout is such that a Highway or a portion thereof serves or will serve the adjoining properties outside the subdivision or Development, and the Approving Officer has allowed the dedication or construction of new half-Roads along the perimeter of the subdivision or Development, the following conditions must be satisfied:

.1 sufficient Highway dedication must be provided to permit two-way traffic flow as well as above and below ground infrastructure according to the requirements in Schedule “A”;

.2 the design of the ultimate full width of Highway demonstrates that the half-Road may be constructed without adversely affecting the overall ultimate design;

.3 the minimum width of pavement is five metres, and the minimum width of dedication is 10 metres. The full width of the asphalt surface may be sloped towards the constructed curb rather

than crowned, at the discretion of the Director of Engineering; and

.4 additional pavement width may be required at intersections at the discretion of the Director of Engineering.

7.3.10 Intersections

7.3.10.1 The maximum length of a Highway without an intersection with a Road providing an alternate means of egress shall be 400 metres, provided that a pedestrian link is available at least every 200 metres.

7.3.10.2 Channelization at intersections may require additional property dedication to be provided by the Developer at no cost to the Town.

7.3.10.3 Intersecting Roads shall meet as close to 90^{o} as possible. A Collector Road shall not intersect an Arterial Road at an angle of less than 70^{o}.

7.3.10.4 The minimum spacing between intersections shall be 80 m on Collector Roads and 60 m on Local Roads.

7.3.10.5 Spacing for intersections on Arterial Roads shall follow the latest edition of the TAC manual *Geometric Design Guide for Canadian Roads.*

7.3.10.6 Vertical curves at intersections shall terminate prior to the gutter line of the intersecting Road to ensure the crown on the intersecting Road is maintained.

7.3.10.7 At intersections, the cross fall of the minor Road should be varied to suit the profile of the major Road.

7.3.10.8 Roads with a maximum 50 km/h design speed shall have a maximum allowable grade approaching an intersection of 5% for a minimum of 30 metres.

7.3.10.9 Curb returns and corner truncations are required according to 8.1.2.4.

7.3.11 Vertical Clearances

7.3.11.1 Design in accordance with MMCD requirements.

7.3.12 Cross-Section Considerations

7.3.12.1 All cut and fill slopes greater than 4:1 (horizontal to vertical) are required to be certified as stable by a Professional Geotechnical Engineer.

7.3.12.2 All cut and fill slopes shall be contained within the Road dedication, unless additional width is required to support, protect or drain the Road, in which case the Developer shall provide additional Road dedication or register a statutory right-of-way.

7.3.12.3 The use of retaining walls in urban areas is discouraged by the Town:

.1 wherever the side slopes within 600 mm from the back of the Sidewalk or curb create a depth of vertical cut or fill at the property line in excess of 600 mm in height, a retaining wall shall be constructed, unless otherwise permitted by the Director of Engineering;

.2 retaining walls shall be constructed according to the terms and conditions of the Building Bylaw and contain appropriate vehicle and pedestrian access where necessary; and

.3 a building permit from the Town for retaining walls will be required according to the provisions in the Building Bylaw.

7.3.12.4 Where applicable, the design shall ensure that the Road cross-section designs can accommodate the major flood path routing according to 6.3.2 and 8.1.1.2.

7.4 PAVEMENT MARKING

7.4.1 General

7.4.1.1 All pavement marking materials, dimensions and procedures must be completed according to the MUTCD unless otherwise noted below.

7.4.2 Centrelines

7.4.2.1 Single centrelines are required at the following locations:

.1 all Arterial Roads under the jurisdiction of the Town;

.2 at significant changes in vertical or horizontal alignment;

.3 a 10 metre continuous centreline measured from the Stop Bar where a Stop Bar is required or exists in locations according to 7.4.3.2.2; and

.4 at any other location as determined necessary by the Director of Engineering.

7.4.3 Stop Bars

7.4.3.1 All Stop Bars are to be thermoplastic.

7.4.3.2 Stop Bars are required:

.1 on any controlled intersection on a Road with a continuous centreline; and

.2 where any Road intersects at a controlled intersection with a Road that has a continuous centreline.

7.4.4 Crosswalks

7.4.4.1 All crosswalks at controlled intersections shall be parallel style in order to provide a visual distinction from mid-block crosswalks.

7.4.4.2 All crosswalks are to be thermoplastic.

7.4.4.3 Mid-block crosswalks may be required or permitted by thee Director of Engineering subject to the following:

.1 road narrowing at the location of the crosswalk must be considered in order to improve pedestrian visibility and to reduce crossing distance;

.2 additional signage may be required;

.3 additional traffic calming must be considered approaching the crosswalk adequate to reduce the maximum design speed to 15kmh;

.4 in areas with traffic volume, speed or visibility concerns, solar powered amber advance warning lights may be required; and

.5 in no case will mid-block crosswalks be permitted on Roads with slopes greater than 8%.

7.4.4.4 Crosswalks crossing private commercial, industrial, institutional or multifamily accesses are required where the access is delineated with curb returns and does not have a Sidewalk that runs continuously through the access.

7.4.4.5 The maintenance of crosswalks crossing private accesses is the responsibility of the property owner.

7.5 PARKING BAYS

7.5.1 Design Criteria

7.5.1.1 A minimum of one on-street parking space is required for every three (3) single family and/or two-family Parcels in a subdivision. Up to three on-street parking spaces may be combined into a single parallel parking bay.

7.5.1.2 Generally parking bays shall be located in accordance with the Standard Drawings; however, consideration will be given to perpendicular parking bays capable of accommodating up to four vehicles.

7.5.1.3 Parking bays are not permitted on Arterial Roads.

7.5.1.4 The Director of Engineering may require a traffic study to determine if additional on-street parking is warranted in view of the nature or extent of the proposed subdivision or Development.

7.5.1.5 All pervious structures shall be designed with a filter and reservoir layers capable of accommodating lateral drainage according to the Standard Drawings.

7.6 EMERGENCY ACCESS

7.6.1 Design Criteria

7.6.1.1 Secondary emergency accesses may be required by the Approving Officer and/or Director of Engineering to provide alternative access to a subdivision or Development.

7.6.1.2 Any portion of any Road constructed under this Bylaw must be within 300 metres of a highway that has two routes available to emergency vehicles to access that point on the highway:

.1 these emergency access routes may be constructed on private land provided that they are protected by a statutory right-of-way for emergency access in favour of the Town; and

.2 the maximum length of road allowed past the emergency access road is 180m.

7.6.1.3 Emergency fire, police and medical access must be available to every parcel within a subdivision or Development in accordance with the following criteria and the Town of Gibsons' Building Bylaw:

.1 an emergency access plan must be shown on the construction drawings and be reviewed by the Town's Fire Chief prior to approval;

.2 the plan must show how emergency access routes will be protected and what, if any, signage will be provided by the Developer; and

.3 an emergency access road may be greater than 12% grade, but not more than 14% for 100 metres or more if, in the opinion of the Director of Engineering, a fire-fighting staging area can be reasonably provided.

7.6.1.4 Fire hydrants at staging areas are required according to 3.3.3.

7.6.1.5 The fire fighting staging area must be a minimum of 8 metres long (in the direction of travel) by 6 metres wide and have a maximum grade of 6% in any direction. The

staging area must have drive-in access for a fire truck from the adjacent road.

7.6.1.6 Where the fire-fighting staging area is located on private property it must be protected by a right-of-way. The developer must provide breakaway bollards that must not cause any delay in access, as well as signage to prohibit parking or other obstruction of the fire-fighting staging area.

7.6.1.7 The minimum width of the travelled surface for emergency accesses shall be 4.0 m.

7.6.1.8 The minimum road dedication or statutory right-of-way width for emergency access shall be 6 metres.

7.6.1.9 Removable lockable bollards are to be installed at each end of the emergency access.

1.1.1.1 The Director of Engineering may consider a gravel surface for accesses with grades 10% or less.

7.7 ROAD STRUCTURE DESIGN

7.7.1 Road Base and Pavement Design

7.7.1.1 Where the Development has Frontage on an existing Road, the Director of Engineering reserves the right to require the Developer to reconstruct the entire Road structure fronting the subdivision or Development.

7.7.1.2 The structural design of the Road pavement shall be adequate for an expected Road life of 25 years under the expected traffic conditions for the class of Road.

7.7.1.3 Where the Benkelman Beam design method is used, the maximum seasonally adjusted design deflections (mean plus two standard deviations) for asphalt shall be as follows:

.1	Local Roads & Lanes	2.0 mm
.2	Collector & industrial Roads	1.3 mm
.3	Arterial Roads	0.75 mm

7.7.2 Pavement Materials

7.7.2.1 The standard pavement material in the Town is hot mixed, machine laid, asphalt concrete (refer to MMCD).

7.7.2.2 Gravel, surface treated, or flush-coated surfaces are not acceptable for Road construction.

7.7.3 Paving Procedure

7.7.3.1 The paving of all Roads shall be done in two lifts subject to 7.7.3.3.

7.7.3.2 The following procedures for paving in two lifts are supplemental to those detailed in the MMCD:

.1 the first lift shall be a minimum 50 mm thick asphalt base course;

.2 the second lift (minimum 35 mm) shall be laid on the primed asphalt base course;

.3 temporary asphalt water diversions must be used to direct road runoff into drainage structures until the top lift of asphalt has been completed;

.4 asphalt transitions must be placed around each casting to accommodate snow ploughing. Alternatively, castings may be kept flush with the base course of asphalt and appropriate riser rings used to raise the castings at time of application of final lift;

.5 the Director of Engineering reserves the right to require cash-in-lieu of construction for the second asphalt lift;

.6 the minimum finished pavement thickness is to be according to Table 7-1;

.7 until the final lift is completed, the Developer is responsible for maintenance and cleaning of the Road; and

.8 approval must be obtained from the Director of Engineering prior to applying the second asphalt lift.

7.7.3.3 Where the required finished pavement thickness is 75 mm according to Table 7-1 and the Standard Drawings:

.1 the Director of Engineering may consider permitting the full 75 mm placement in a single lift providing all relevant MMCD specifications are met; or

.2 the finished pavement thickness is to be increased to 85 mm and placed in two lifts according to 7.7.3.2.

7.7.3.4 Asphalt repair required for road widening or patching shall have a minimum width of 600 mm to allow for mechanical compaction.

7.7.4 Initial Trench Paving Restoration

7.7.4.1 All trench crossings shall undergo initial restoration according to the following:

.1 immediately prior to paving, the pavement either side of trenches in existing Roads are to be saw cut in parallel straight lines;

.2 hot mix asphalt is to be placed flush with the finished surface according to MMCD specifications to a depth of 85 mm or to the thickness of existing asphalt up to 120 mm, whichever is greater; and

.3 unless otherwise detailed in 7.7.5.1 or 7.7.5.2, all pavement cuts are to be cracksealed according to MMCD specifications.

7.7.5 Final Trench Paving Restoration

7.7.5.1 All trench crossings with existing asphalt thickness of 75mm or greater that are between perpendicular to centreline and 60 degrees from perpendicular to centreline are to undergo final restoration according to the following:

.1 a minimum of three months after the initial asphalt restoration is complete, and no later than August of the year following construction, the trench is to be milled out to a depth of 35mm by a width equal to the sum of the trench width plus 0.5 metres either side of the edge of each trench cut;

.2 any areas of cracking that have occurred adjacent to the initial trench and subsequent to the pavement being cut are to be cut out, removed, and a base lift of asphalt placed; and

.3 the final top lift of asphalt is to be placed within 48 hours of milling.

7.7.5.2 All trench crossings with existing asphalt thickness of 75mm or greater that are greater than 60 degrees from perpendicular to centreline are to undergo final restoration according to the following:

.1 a minimum of three months after the initial asphalt restoration is complete, and no later than August of the year following construction, each travelled lane is to be milled out to a depth of 35mm by the full width of the lane for the full length of the trench, plus one metre at each end;

.2 prior to final paving, any areas of cracking that have occurred adjacent to the trench are to be cut out, removed, and a base lift of asphalt placed; and

.3 the final top lift of asphalt is to be placed within 48 hours of milling.

7.8 SIGNAGE

7.8.1 Specifications

7.8.1.1 All traffic control signage classification, size, installation and all other specifications shall be according to the current edition of the TAC Manual of Uniform Traffic Control Devices (MUTCD) unless otherwise noted below.

7.8.1.2 All Road signs and traffic advisory signs required for each project will be installed at the Developer's expense.

7.8.1.3 All proposed sign locations are to be marked in the field and approved by the Director of Engineering prior to installation.

7.8.1.4 With the exception of parking restriction signage, all warning, regulatory, and pedestrian signage is to be

"Diamond Grade". All other traffic signage including parking restriction signage may be "Engineer Grade".

7.8.1.5 Sign posts shall be 50 mm round galvanized poles to industry standard; bases are to be precast concrete.

7.9 BIKEWAYS

7.9.1 Design Requirements

7.9.1.1 Bicycles are to be accommodated as shown on the Standard Drawings. These pathways provide a refuge for all non-vehicular traffic, including pedestrians, skaters, scooters, and bicycles. As a result of multiple users, in higher volume areas, design requirements may include:

.1 additional travel width and longitudinal delineation, separating walkers from bicycles;

.2 route finding signge;

.3 "Share the Road" pavement markings;

.4 bike signage where yielding to pedestrians is required; and

.5 bicycle parking and viewing areas, where appropriate.

7.9.1.2 Multi-use pathway design must include:

.1 vertical clearance of 2.5 m;

.2 horizontal clearance of 0.6 m minimum beyond the edge of the pathway surface;

.3 drainage cross slope of 2% with a cross slope of a maximum of 5% in isolated locations directed towards the bio-swale or away from the street, and shall be constructed in such a manner so that ponding does not occur;

.4 widening at high volume intersections;

.5 bike friendly stairs where required;

.6 locations as shown on Standard Drawings; and

.7 bicycle signage, which may include Road crossing, warning, steep grade, stop sign/bar, distance markers, directional/destination signage, etc.

7.9.1.3 Alternate bikeway designs and criteria may be considered by the Director of Engineering to match existing infrastructure.

7.9.1.4 Road design considerations may include:

.1 bike crossing signage;

.2 pedestrian scale lighting at intersections; and

.3 pedestrian/cyclist intersection surface treatment.

7.9.1.5 All efforts shall be made to avoid installing utility lids/covers within bikeways.

7.9.1.6 The multi-use pathway shown on the Standard Drawings is considered a Type 1 trail (see 12.3.1) accommodating the highest volume of pedestrian and bicycle traffic.

7.10 DRIVEWAYS AND DRIVEWAY CROSSINGS

7.10.1 Application Requirements

7.10.1.1 No person shall construct, install, maintain or pave a Driveway Crossing to/on any Road without being the holder of an access permit. The Director of Engineering shall consider conditions necessary with each permit application.

7.10.1.2 Applications shall be made by the Owner.

7.10.1.3 The access permit becomes null and void when the use or density of the land accessed by the driveway/crossing changes.

7.10.2 Design Requirements

7.10.2.1 Each Driveway Crossing shall be in accordance with the Standard Drawings.

7.10.2.2 Where a property fronts more than one Lane or Road, the driveway is to access the Lane or Road which, in the opinion of the Director of Engineering, generates the least amount of traffic and provides the safest point of access and egress.

7.10.2.3 No portion of a Driveway Crossing for a corner lot shall be located:

.1 closer than 7.5 metres from the projected intersecting corner property lines, disregarding any corner truncations, for Local or Collector Roads;

.2 closer than 12.0 metres from the projected intersecting corner property lines, disregarding any corner truncations, for Arterial Roads other than Highway 101; and

.3 as far as possible from the projected intersecting corner property lines, disregarding any corner truncations, for Highway 101.

7.10.2.4 No Driveway Crossing shall be any closer than 1.5 metres from the adjoining Parcel boundary unless Driveway Crossings are combined according to 7.10.3.3 or 7.10.4.3.

7.10.2.5 Use of pervious materials for driveways is encouraged.

7.10.2.6 No clear crush gravel will be permitted for any portion of driveway within two metres of a road edge or Sidewalk edge.

7.10.2.7 Stormwater run-off from Driveways shall be retained on site wherever possible:

.1 where, in the opinion of the Director of Engineering, on-site retention of Stormwater run-off is not possible, runoff from Driveways may be directed towards the bio-swale within the Road dedication, subject to the restriction of 7.10.2.8.

7.10.2.8 In no case shall runoff from Driveways be permitted to drain onto the Road or Sidewalk.

7.10.2.9 Driveways and Driveway Crossings are to be constructed in such a manner to prevent runoff from the Road draining onto or over Sidewalks or any Parcel.

7.10.2.10 Where necessary, the crossing(s) shall be constructed with culvert pipe according to 6.5.8.

7.10.2.11 The maximum grade on a Driveway shall be 16% unless otherwise noted in 7.10.2.13 and 7.10.2.14, however, steeper grades may be considered by the Director of Engineering in order to reduce grading/retaining requirements.

7.10.2.12 Notwithstanding 7.10.2.11 the subdivision or Development plan must provide driveway grades that have a maximum 6% grade for 4 metres of driveway directly adjacent to the proposed building for emergency accessibility.

7.10.2.13 If there is no Sidewalk present and no Sidewalk is planned in the foreseeable future, the maximum grade on a Driveway Crossing shall be 2% for 3 metres from the edge of pavement.

7.10.2.14 Where a Sidewalk is constructed or is contemplated to be constructed in the foreseeable future the maximum grade on a Driveway Crossing shall be 2% from the edge of pavement to a point 1.5 metres away from the private-side edge of the Sidewalk or proposed Sidewalk alignment.

7.10.2.15 Parcels shall not be given direct driveway access to Arterial Roads, except for existing Parcels in circumstances where the configuration of the subdivision prevents the construction of either an internal Highway or a rear access Lane.

7.10.2.16 No new Driveway Crossings shall be permitted to Highway 101 unless permission has been granted by the Ministry of Transportation and Infrastructure and, in the opinion of the Director of Engineering, no reasonable alternative exists.

.1 existing and any new driveways permitted to access Highway 101 must be combined with other existing driveways wherever possible to reduce the number of access points to Highway 101.

.2 existing driveways accessing Highway 101 must be eliminated wherever possible if another means of access exists or is possible.

7.10.2.17 The Director of Engineering may consider permitting curb returns for wider driveways serving Commercial, Industrial and Institutional properties rather than constructing driveway let-downs.

7.10.2.18 Unless determined impractical by the Director of Engineer and/or if the Standard Drawings show an alternate detail, all Driveway Crossings that do not access a Road with a barrier or roll-over curb are to be paved with a minimum 50 mm thickness asphalt from the edge of the Road pavement to the furthest most point of the following:

.1 1.5 metres from edge of Road pavement; and/or

.2 across any driveway culvert and to a point 2 metres from the centreline of the driveway culvert.

7.10.3 Single and Two Family Residential Driveway Crossings

7.10.3.1 A maximum of one Driveway Crossing shall be permitted for each parcel zoned for single family or two family residential use, however:

.1 one additional Driveway Crossing for a parcel zoned for single or two family residential use may be allowed by the Director of Engineering if:

- a second Driveway Crossing is required, according to the Zoning Bylaw, to provide adequate off-street parking for a secondary suite; and
- a second Driveway Crossing is required to access an accessory building, such as a garage or carport, that meets the requirements of the Zoning Bylaw.

7.10.3.2 Any second Driveway Crossing permitted by 7.10.3.1.1 must meet the following conditions:

.1 the centrelines of the Driveway Crossings must be at least 14 metres apart;

.2 any existing Driveway Crossing must be upgraded to meet current bylaw standards; and

.3 all other provisions of 7.10.2 must be met.

7.10.3.3 Where practical the Developer/Owner shall combine driveway crossings for adjacent parcels.

7.10.3.4 No driveway serving one single family residential property shall be constructed wider than 4 metres at any point on public property.

7.10.3.5 Driveways serving more than one single family residence may be constructed to a maximum width of 5 metres on public property.

7.10.3.6 No new residential driveway/crossings shall be permitted to an Arterial Road unless, in the opinion of the Director of Engineering, no reasonable alternative exists.

7.10.4 Multi-Family, Commercial, Institutional and Industrial Crossings

7.10.4.1 The number of crossings to a Multi-Family, Commercial, Institutional or Industrial Parcel shall be not more than one for each 50 metres, or fraction thereof, of the total Parcel Frontage.

7.10.4.2 Spacing on driveways accessing a single parcel may not be any closer than 40 metres, measured from the centre of each driveway.

7.10.4.3 Where practical, the Developer shall combine driveway crossings.

7.10.4.4 No access to a Commercial, Institutional or Industrial will be permitted through any residentially zoned area.

7.10.4.5 No Multi-Family, Commercial, Institutional or Industrial Driveway Crossings shall be wider than 6 metres at any point on public property, excluding curb returns, unless otherwise approved by the Director of Engineering.

7.11 TRAFFIC CALMING

7.11.1 Design Premises

7.11.1.1 Traffic calming relies on physical and visual cues in and adjacent to the Roadway to induce drivers to travel at slower speeds. Traffic calming is self-enforcing. The design of the Roadway results in the desired effect, without relying on compliance with traffic control devices such as signals and signs.

7.11.1.2 Street Landscaping and Street Lighting can complement traffic calming devices and may be used to provide the visual cues that encourage people to drive more slowly. A list of traffic calming devices is included in Schedule “I”.

7.11.2 Design Criteria

7.11.2.1 Traffic calming is an integral component of the Road design and should be considered for all Local and Collector Roads with low traffic volumes and speeds.

7.11.2.2 Traffic calming methods may be used as a method of achieving the maximum speeds specified in Table 7-1.

7.11.2.3 Traffic calming must work in conjunction with cycling facilities and maintain a travel width for cyclists of at least one metre and a cleared zone of at least two metres.

7.11.2.4 Traffic calming is to be incorporated into existing Roads according to Schedule “H” and on any fronting Road where a reduction in design speed is required by this Bylaw.

7.11.2.5 Three options for traffic calming on existing Roads are to be presented for consideration by the Director of Engineering.

7.12 ROUNDABOUTS AND TRAFFIC CIRCLES

7.12.1.1 Roundabouts and/or traffic circles shall be considered by the designer/Professional Engineer to slow traffic speeds, improve intersection safety and attain maximum design speed requirements.

7.12.1.2 Roundabouts and traffic circles shall be configured for a single lane, but also be capable of accommodating emergency, transit, and transport vehicles.

7.12.1.3 The cross-fall of roundabouts and traffic circles should slope inwards with facilitation for drainage into a centre raingarden where grades permit:

.1 consideration should be given to creating the centre landscaped island as a bio-filter to receive and treat Local Road drainage, where grades permit (see also 5.3);

.2 a positive drainage connection via a pipe may be required from the centre raingarden to the downstream conveyance system;

.3 design shall give careful consideration to the cross-fall transition from the roundabout to the adjoining Roads; and

.4 if an inward sloping cross-fall cannot be achieved, the use of catch basins and shallow piping to redirect Road drainage into the centre raingarden may also be considered.

7.12.1.4 The centre raingarden shall be shown on the Landscape Plan, with consideration to safety and short and long-term maintenance requirements. Sod and hard surfaces are not permitted.

~SECTION EIGHT~
CURBS, SIDEWALKS AND WALKWAYS

INDEX

8.0 CURBS, SIDEWALKS AND WALKWAYS

8.1 CURBS

8.1.1 Barrier and Rollover Curbs and Gutters

8.1.1.1 Concrete curbs and gutters shall be as shown on the Standard Drawings.

8.1.1.2 Major flood path routing may require barrier type curbs to channel surface flows.

8.1.1.3 Barrier curbs may be required on Roads fronting Industrial use properties.

8.1.1.4 Where a bio-swale is present (existing or proposed) and a barrier or roll-over curb is proposed, breaks in the curb are required at a minimum of 10 metre spacing to direct surface flows to the bio-swale.

8.1.1.5 The transition between curb types shall be done through a minimum distance of 2 metres.

8.1.1.6 The Road support structure for the Road(s) shall be constructed to a minimum of 0.6 metres wider than the curb and/or Sidewalk in order to provide support for the curb and/or Sidewalk.

8.1.2 Flat Curbs

8.1.2.1 Flat curbs are required on residential Collector and Local Roads, according to the Standard Drawings, to direct surface run-off to off-road surface drainage, e.g. existing or proposed bio-swales.

8.1.2.2 Flat curbs in Industrial, Commercial or Institutional areas will be considered by the Director of Engineering on a case by case basis.

8.1.2.3 Flat curbs are not permitted on Arterial Roads or where off-road open surface drainage is not present.

8.1.2.4 Flat curb widths can be reduced to 0.5 metres adjacent to raingardens in the centre of a Cul-De-Sac.

8.1.3 Curb Returns

8.1.3.1 Curb returns are to be designed according to Table 8-1.

8.1.3.2 Alternate curb return radii for intersections may be required to suit existing conditions, subject to the approval of the Director of Engineering.

8.1.3.3 The curb return radii shall be governed by the lower classification of the intersecting streets.

8.1.3.4 Roll-over concrete curb and gutters for curb returns are required at all existing and proposed intersections of Roads without curbs.

8.1.3.5 When new Roads with curbs intersects an existing Road, curb returns shall be constructed to blend into the existing Road width, unless otherwise directed by the Director of Engineering.

Table 8-1 Curb Returns

Road Classification	Curb Return Radii	Corner Truncations (min)
Arterial	10 m	5m x 5m
Collector	8 m	5m x 5m
Local Type 1	7 m	5m x 5m
Local Type 2	8 m	6m x 6m
Lanes	4 m	3m x 3m

8.1.3.6 Property corner truncations shall be required for all intersections according to Table 8-1.

8.1.3.7 Corner truncations shall be governed by the lower classification of the intersecting Road.

8.2 SIDEWALKS AND WALKWAYS

8.2.1 Accessibility

8.2.1.1 Special designs for ease of accessibility shall be considered on a case-by-case basis where site conditions, such as

existing Road cross sections, prevent the effective application of the requirements in the Standard Drawings.

8.2.1.2 Wheelchair ramps on Sidewalks are required at all intersections and at any mid-block crossings. The design for wheelchair ramps shall be in accordance with the Standard Drawing(s).

8.2.1.3 A catchbasin must be located to intercept Road drainage in advance of the wheelchair ramp. This may influence Road grade designs or cross slopes.

8.2.1.4 Designs incorporating stairs are to be avoided wherever possible.

8.2.1.5 Surfaces and barriers (e.g. bicycle baffles) are to be constructed to accommodate wheelchair, scooter and baby stroller users.

8.2.2 Sidewalks

8.2.2.1 Sidewalks shall be provided as shown on the Standard Drawings and according to this Bylaw.

8.2.2.2 The grade of the Sidewalk(s) shall be consistent with the grade of the Road and slope towards permeable areas or open drainage, wherever possible.

8.2.2.3 Where the Sidewalk is constructed 1.5 metres or greater from the curb the Sidewalk shall be continuous grade and not drop through the driveways.

8.2.2.4 Where the Sidewalk is constructed within 1.5 metres of the curb, the Sidewalk grade shall drop an equal vertical distance over a minimum of 1.0 metres at the front and rear edges of the Sidewalk to accommodate the driveway, i.e., the crossfall on the portion of Sidewalk crossing the driveway shall be the same crossfall as the Sidewalk on either side of the driveway.

8.2.2.5 Where Road grades are greater than 10%, the Developer will be required to provide an alternate walking route with slopes not exceeding 10% unless in the opinion of the

Director of Engineering providing such alternate routing is not feasible or reasonable.

8.2.2.6 In addition to the Sidewalk requirements for each classification of road, the Sidewalk width shall increase by 25% for Sidewalks fronting schools, playgrounds, shopping centres, bus stops, trail systems, beaches and other community facilities, to facilitate proper circulation of pedestrian traffic.

8.2.2.7 Sidewalks are to meander where possible with wide sweeping curves for aesthetic purposes and to avoid existing trees, natural features, and above-ground or at-grade utility infrastructure:

.1 radii of meandering sidewalk may range from 30 to 50 metres.

8.2.2.8 All efforts shall be made to avoid installing utility lids/covers within Sidewalks and crosswalks. If not possible, utility lids may be installed in Sidewalks and crosswalks with maximum grades of 4% providing the lids are cast-in-place non-slip material (not painted on).

8.2.2.9 Sidewalks adjacent to cul-de-sacs shall terminate at the curb return at the bulb unless Sidewalks are required to provide access to amenities in or beyond the bulb.

8.2.3 Walkways

8.2.3.1 All walkways shall be in accordance with the Standard Drawing(s).

8.2.3.2 The Director of Engineering may require chain link fencing on both sides of walkways and, unless otherwise permitted by 8.2.3.3, bicycle baffles at one or both ends.

8.2.3.3 Bollards may be considered as an acceptable alternative by the Director of Engineering where there is not a high risk of conflict from cyclists entering a Road or crossing a sidewalk.

8.2.3.4 The maximum grade shall not exceed 12%, unless steps and hand rails independent of the chain link fencing are provided.

8.2.3.5 Walkways are to meander where possible with wide sweeping curves for aesthetic purposes and to avoid existing trees, natural features, and above-ground or at-grade utility infrastructure:

.1 radii of walkway curves are to range from 20 to 40 metres.

8.2.4 Handrails, Guardrails and Fencing

8.2.4.1 All handrails and guardrails shall be constructed and installed in accordance with the Standard Drawing(s).

8.2.4.2 Handrails shall be required for walkways and/or Sidewalks where steps are provided due to grades in excess of 10%.

8.2.4.3 Guardrails may also be required along the top of major storm sewer inlets and outfalls, along walkways and/or Sidewalks where steep side-slopes may be encountered, or in any location as deemed necessary by the Director of Engineering.

8.2.4.4 Where fencing is required and chainlink is the preferred option:

.1 chainlink must be a minimum of 6 gauge;

.2 chainlink must be black vinyl coated; and

.3 fence posts and rails must be powdercoated black.

~SECTION NINE~
BOULEVARD/LANDSCAPING

INDEX

9.0 BOULEVARD/LANDSCAPE

9.1 INTRODUCTION

The Boulevard Landscape Plan is required to will mitigate environmental impacts, incorporate landscape swales promoting stormwater quality and can provide a traffic calming influence for subdivisions and Developments. A Boulevard Landscape Plan can also create character and improve the aesthetics of a neighbourhood. The Boulevard Landscape Plan becomes an integral component of designing neighbourhoods, Road layout/patterns and traffic calming measures.

Figure 9-1 Example of Boulevard landscaping on a Local Road

9.2 BOULEVARD LANDSCAPING DESIGN

9.2.1 Principles

9.2.1.1 A Boulevard Landscaping plan shall be designed by a Professional Landscape Architect, in accordance with the British Columbia Landscape Standard, latest edition and this Bylaw.

9.2.1.2 The Boulevard Landscape Plan shall consider the interface between the public and private property domain.

9.2.1.3 The following design principles apply:

.1 streets serve both as pedestrian gathering places, and as pedestrian corridors;

.2 the Boulevard Landscaping Plan should integrate with the overall street design and should assist in emphasizing pedestrians and open space over other Road functions; and

.3 the Boulevard Landscape design should complement adjacent land use and blend with any Town-required On-Site landscaping.

9.2.2 Considerations

9.2.2.1 Design features of the boulevard are to consider the integration with the overall Road design in order to reduce vehicular travel speed.

9.2.2.2 As a minimum the Boulevard Landscape Plan should consider integration with:

.1 sidewalks, walkways and other pedestrian space (materials, location and dimensions);

.2 road layout including parking bays (alignment, width, curbs, etc.);

.3 tree retention;

.4 road and pedestrian lighting;

.5 signage, especially any non-standard or special signs; and

.6 transit stops, where applicable.

9.2.2.3 The Boulevard Landscape Plan must also consider:

.1 bicycle needs, including parking;

.2 street furniture description and location (e.g. benches, planters, waste receptacles); and

.3 public art or other unique features.

9.2.3 Design Requirements - General

9.2.3.1 Landscape design shall blend with existing vegetation, be nursery grown stock, and be of good health and vigour

with no signs of disease, insect pests, damage or disfigurations. All landscape designs require approval of the Director of Engineering and the Director of Parks and Cultural Services.

9.2.3.2 Unless in the Director of Parks and Cultural Services directs otherwise, landscaping shall occur when approximately 80% of the lots along a Road have been developed. Planting shall occur during normal planting seasons as determined by the Professional Landscape Architect.

9.2.3.3 Planting in frozen or saturated ground or with frozen root balls will not be accepted.

9.2.3.4 The landscape design must integrate planting materials with other Town infrastructure, including underground water and sewer mains and services. Protection of Town infrastructure may be required to prevent/mitigate roots from impacting those services.

9.2.3.5 Landscaping is to use indigenous, drought tolerant plantings as well as landscaping materials that aid in water conservation wherever possible, unless otherwise noted in this Bylaw.

9.2.3.6 The Landscape design must consider the retention of natural features and natural soils wherever possible, providing all other Bylaw requirements can be met.

9.2.4 Street Trees

9.2.4.1 Street trees are required on all Arterial, Collector and Type 1 Local Roads.

9.2.4.2 Street trees shall be selected by the Professional Landscape Architect in accordance with Table 9-1.

9.2.4.3 Other trees, including conifers, may be considered on a case by case basis subject to acceptance by the Director of Parks and Cultural Services.

9.2.4.4 Tree wells and/or grates may be required by the Town, depending on the planting situation. Tree wells must be prepared in accordance with the Standard Drawings.

9.2.4.5 A minimum of two species should be considered for each Road to avoid the spread of pests and disease.

9.2.4.6 Trees are to be installed on both sides of the road according to the following minimum requirements:

.1 maximum tree spacing to be eight metres;

.2 trees are to be placed a four metres from any Ornamental Street Light; and

.3 trees are to be placed a minimum of 8 metres from the curb of any intersecting street.

9.2.4.7 Placement of trees are to consider the overall Ornamental Street Light design and be placed in a manner to ensure that the required lighting levels are not compromised when the tree reaches mature size.

Table 9-1 Approved Street Trees

Acer griseum	Paperbark Maple
Acer palmatum	Trompenburg
Acer palmatum	Bloodgood
Cercis Canadensis	Eastern Redbud
Cornus kousa	various cultivars
Crataegus crus-galli inermis	Thornless Cockspur
C.X. lavallei	Hybrid Cockspur Thorn
Ginkgo Biloba	various cultivars
Hibiscus syriacus	Rose of Sharon
Parrotia pesica	particularly Vanessa and Inges Ruby Vase
Sorbus aria	Whitebeam
Styrax japonica	Japanese Snowbell

9.2.5 Growing Medium

9.2.5.1 The sub-grade shall be prepared to permit the installation of sufficient growing medium as determined by the Professional Landscape Architect.

9.2.5.2 Debris, roots, branches, stones, building materials, contaminated soil, weeds or anything that may interfere with plant growth shall be removed from the sub-grade prior to installing the growing medium.

9.2.5.3 The finished sub-grade elevation shall prevent ponding and allow for the natural migration of seepage away from buildings and infrastructure.

9.2.6 Structural Soil

9.2.6.1 Where required in the Landscape Plan, structural soil shall be installed at the following minimum volumes and depths prior to installation of hard surfaces:

.1 where trees are planted in hard surfaced areas, a 0.6 metre minimum depth over a minimum 14 m^2 area per tree (not including the growing medium and root ball); or

.2 where trees are planted in non-hard surfaced areas, a 0.6 metre minimum depth over a minimum 2.5 m^2 area per tree (not including the growing medium and root ball).

9.2.6.2 Upon satisfactory compaction of the structural soil, non-woven filter fabric shall be installed as a separation layer directly above the compacted structural soil mixture.

9.2.7 Maintenance and Warranty

9.2.7.1 The Developer is responsible for all necessary maintenance of planted materials for two years following issuance of Substantial Completion:

.1 in this context Substantial Completion means Works which have been certified by a Professional Landscape Architect as being designed and constructed in substantial compliance with Schedule "A" of this Bylaw and accepted in writing by the Town.

9.2.7.2 Maintenance shall include:

.1 watering, weeding, staking, pruning;

.2 treatment for disease and pests; and

.3 replacement of all damaged plant material during the two year warranty period.

~SECTION TEN~
STREET LIGHTING

INDEX

10.0 STREET LIGHTING

10.1 INTRODUCTION

The Town of Gibsons has undertaken the initiative to minimize the quantity and visual impact of street lighting pole structures while maintaining an adequate level of lighting for pedestrian, cyclist, and vehicular safety, as reflected in the following street lighting design requirements. The Town's specified standards reflect the recommendations of the International Dark-Sky Association.

10.2 DESIGN REQUIREMENTS

10.2.1 General

10.2.1.1 Ornamental Street Lighting is not required on Roads identified in Schedule "F" as requiring Partial Frontage Works.

10.2.1.2 Lighting designs shall be in accordance with the International Engineering Society of North America (IESNA), unless otherwise specified in this Bylaw.

10.2.1.3 Ornamental Street Lighting designs shall meet the requirements of the IESNA RP-8, "National Standard Practice for Roadway Lighting", latest edition, unless otherwise specified in this Bylaw.

10.2.1.4 Design of Street Lighting systems shall be prepared by a Professional Electrical Engineer, registered with the Association of Professional Engineers and Geoscientists of British Columbia.

10.2.1.5 Prior to commencement of design, the designer shall review with the Director of Engineering, opportunities to optimize the street lighting configuration to reduce capital costs and maintenance requirements.

10.2.1.6 All luminaire wattages and light distribution types must be approved by the Director of Engineering prior to design submission.

10.2.1.7 The Professional Electrical Engineer shall ensure clearances meet BC Hydro, BC Safety Authority and WorkSafe BC specifications.

10.2.1.8 Spill light is illumination falling beyond the area that is intended to be illuminated. The lighting design should minimize spill light and endeavour to meet the following criteria:

.1 For Roads, the limits of the Road dedication shall represent the boundary for spill light; and

.2 For Sidewalks, two metres beyond each edge of the path shall represent the boundary for spill light.

10.2.1.9 All street lights are to be full cut-off.

10.2.2 Material Specifications

10.2.2.1 Supplementary Ornamental Street Light specifications are available from the Town of Gibsons Engineering Department.

10.2.2.2 Materials are to be supplied according to the provided product numbers are as listed, as amended from time to time by the supplier, or approved equivalents as determined by the Director of Engineering.

10.2.2.3 All Ornamental Street Lights, Town-owned cobra-head luminaires, pole structures, kiosks, service bases and ancillary infrastructure are to be finished with powder coat Midnite Navy Blue (Protec PT312B7).

10.2.2.4 Pad mount service kiosks shall be Valid Manufacturing Ltd KSDA48-30-16-02.

10.2.2.5 All Ornamental Street Light components shall be galvanized and finished according to 10.2.2.3.

10.2.2.6 Post Top Ornamental Street Lights are to be Lumca Catalogue No. CP8423.

10.2.2.7 Side-mount Ornamental Street Lights are to be Lumca Catalogue No. CPF0406.

10.2.2.8 Post Top Ornamental Street Light poles are to be Nova NSR416.

10.2.2.9 Side-mount Ornamental Street Light poles are to be Nova NSR515-520.

10.2.2.10 Ornamental side mounting arm are to be Lumca M1A CF7 DR.

10.2.2.11 Ornamental pole base covers are to be Nova Pole NVAM.

10.2.2.12 Decorative transformer base (service base) is to be Nova Pole DTB3

10.2.2.13 Receptacles are to be Leviton CR15-W c/w Leviton M5979-W metal rain tight while-in-use and finished according to 10.2.2.3.

10.2.2.14 Photoelectric cells are to be Intermatic Button Eye Photo Control #K4021C.

10.2.2.15 Dimmers are to be Litenode® dimming system.

10.2.2.16 Timers are to be digital, 120V, CSA approved for outdoor use and must meet with the Director of Engineering's approval.

10.2.2.17 Banner arms are to be clamp on style wherever wind loading is not a factor and are to be sized to fit 600 mm x 1200 mm banners.

10.2.2.18 Clamp-on rigid banner arms to be Nova Pole LRS

10.2.2.19 Spring-loaded banner arms to be Lumca BEN-S

10.2.2.20 All conduits are to be 35mm RPVC.

10.2.3 Minimum Street Lighting Requirements

10.2.3.1 Pedestrian Conflict Areas are according to Schedule "K"

10.2.3.2 Arterial intersection illumination levels shall be per IESNA requirements using Lumca cobra head style luminaires on davit style standard poles.

10.2.3.3 Collector intersection illumination levels shall be as per IESNA requirements. For Collector intersections, the Director of Engineering may consider the use of

.1 Lumca cobra head style luminaires on davit style standard poles; or

.2 Ornamental Street Lights with increased pole heights from those listed in Table 10-1.

10.2.3.4 An Ornamental Street Light is required where a walkway or trail intersects with a Road that is not illuminated by proposed or existing Ornamental Street Light(s) installed according to the requirements of this Bylaw:

.1 The style of street light for trailheads shall be dictated by the classification of Road that they intersect with; and

.2 Unless part of a larger street lighting plan, the standard for trailhead lights shall be as per the Type 2 Local standard shown in Table 10-1 and the IESNA requirements for a Local Road with a Low Pedestrian Conflict Area.

10.2.3.5 Arterial Road lighting designs must comply with the following:

.1 Ornamental Street Lighting on Highway 101 is required for illuminating Sidewalks and Pedestrian Conflict Areas only;

.2 Lighting designs on Highway 101 must allow for additional lighting designed according to the jurisdiction having authority; and

10.2.3.1 The Director of Engineering may require new lighting designs to match existing Ornamental Street Light standard heights for sections of Arterial roads with existing Ornamental Street Lighting installed according to the Standard Drawings on any section of that Road.

10.2.3.2 Lighting calculations shall be submitted with each design submission.

10.2.3.3 The drawings shall note luminaire model number, including wattage, distribution type, and voltage to be used.

10.2.3.4 Existing Hydro davit arms shall not be considered in street light design where Table 10-1 requires removal.

Table 10-1 Street Lighting Requirements

Classification		Locations	Lamp Standard	Max. Pole Height (m)	Banner Arms & electrical outlets	Timers	Dimmers	See Notes Below
Full Frontage Works								
ARTERIAL	Incl Hwy 101	One side of all Sidewalks	Side-mount	5	✓	✓	✓	1,3,7
COLLECTOR	Type 1	Staggered Two side	Side-mount	6	✓	✓	✓	2,3,4,7
	Type 2	One side	Post Top	6		✓		2,3,4
LOCAL	Type 1	Staggered Two side	Post Top	5				4
	Type 2	Cul-de sacs & Intersections	Post Top	5				4
LANE		Intersections	varies					5, 8
Partial Frontage Works								
ALL		Cul-de sacs & Intersections	BC Hydro Davit Arm, full cut-off					6

NOTES
1. As per 10.2.3.5
2. Lighting design required to illuminate intersections and other points of pedestrian/vehicle conflict only, e.g. crosswalks, unless otherwise noted
3. Lighting design required to illuminate Sidewalks only unless otherwise noted
4. Hydro davit arm Street Lights to be removed where Ornamental Street Lights are installed
5. For Lane to Lane intersections the Ornamental Street Light shall be as per the Local Road standard
6. Specifications as per BC Hydro requirements
7. Dimmers are required on Medium Pedestrian Conflict Areas only as per 10.2.3
8. Lamp standard determined by standard for intersecting Road

10.2.4 Pole Locations

10.2.4.1 Ornamental Street Light poles are to be located according to Table 10-1.

10.2.4.2 The alignment of Ornamental Street Light poles shall be as shown on the Standard Drawings.

10.2.4.3 The Ornamental Street Light pole locations shall not conflict with proposed driveways and/or underground services.

10.2.5 Street Lighting Services

10.2.5.1 Unless otherwise noted in 10.2.5.2, pad mounted service kiosks, equipped with a BC Hydro approved meter base shall be required for all lighting installations. The designer shall confirm the requirement for metered services with the Director of Engineering prior to undertaking detailed design.

10.2.5.2 Standard MMCD service bases may be substituted for subdivisions meeting all of the following criteria:

.1 subdivisions comprised of Local and Lane street lighting installations only;

.2 street lighting designs requiring no more than ten (10) Ornamental Street Lights; and

.3 where, in the opinion of the Director of Engineering, no further extension of the Ornamental Street Lighting system is anticipated.

10.2.6 Underground Works

10.2.6.1 Junction boxes shall be limited to locations adjacent to the service pole and road crossings only.

10.2.6.2 Underground wiring for Ornamental Street Lights shall be designed in accordance with the MMCD, this Bylaw, and any Municipal codes or bylaws of any other authorities having jurisdiction.

10.2.6.3 The alignment of the underground Ornamental Street Lighting ducts in Road rights-of-way shall be determined by the Professional Electrical Engineer in consultation with the Professional Engineer.

10.2.6.4 The minimum depth for the underground ducts shall be installed as per Canadian Electrical Code Part # 2, “Requirements for Vehicular Areas”.

10.2.6.5 Where the distribution system is to be extended in the future, the design shall size wire and circuits to accommodate future additional loading. The designer shall confirm future requirements with the Director of Engineering.

10.2.6.6 Where an existing Ornamental Street Light circuit is within 100 metres of the proposed Ornamental Street Light conduit, the designer, in consultation with the Director of Engineering, shall determine the viability of connection to the existing system.

10.2.6.7 It is the Professional Engineer's responsibility to ensure that the service supply to the Ornamental Street Light system receives approval from B.C. Hydro prior to construction and the distribution system meets Provincial electrical inspection requirements.

10.2.6.8 No overhead service wiring for Street Lights is permitted.

10.3 LIGHTING TECHNOLOGY

10.3.1 Light Sources

10.3.1.1 All lighting shall be Light Emitting Diode (LED).

.1 Colour temperature to be 4500-5000k

.2 Luminaire shall be able to operate normally in temperatures from -20^{o} C to 50^{o} C

.3 LED lighting shall not contain any mercury.

.4 The rated life shall be 100,000 hours.

10.3.1.2 Operations and maintenance costs must be considered in the Street Lighting design.

10.3.2 Ornamental Street Light Standards

10.3.2.1 Ornamental Street Lights shall be provided according to 10.2.2 and Table 10-1.

10.3.2.2 Ornamental Street Lights on Arterial and Collector Roads shall be equipped with banner arms and weatherproof duplex receptacles, unless otherwise directed by the Director of Engineering.

10.3.3 Photoelectric Control

10.3.3.1 Photoelectric control shall be provided on the luminaire pole equipped with the service base or service kiosk to provide control for the all lighting circuits on the system

10.3.3.2 A filter shall be provided with the optical system to prevent the entrance of dust and corrosive atmosphere.

10.3.4 Duplex Receptacles

10.3.4.1 Duplex receptacles are to be supplied in locations according to Table 10-1.

10.4 ADAPTIVE LIGHTING

10.4.1 Dimmers

10.4.1.1 Dimmers are required to be installed on Ornamental Street Lights according to Table 10-1.

10.4.1.2 The dimmers are to be set to reduce the lighting output from a Medium Pedestrian Conflict to a Low Pedestrian Conflict as shown in Schedule “K” between the hours of 12 am and 6 am.

10.4.2 Timers

10.4.2.1 Timers are required on Ornamental Street Lights according to Table 10-1.

10.4.2.2 Timers may be required by the Director of Engineering to turn off Ornamental Street Lights in non-essential areas, e.g. parks, between the hours of 12am and 6am.

10.4.2.3 Timers are to be mounted in

.1 Kiosks where required by 10.2.5.1; or

.2 Mounted externally in a weatherproof, lockable box on the service pole where required by 10.2.5.2.

- Box is to be mounted on the side of the service base with the least amount of exposure to pedestrians;
- Box is to be painted according to 10.2.2.3.

~SECTION ELEVEN~
UNDERGROUND WIRING

INDEX

11.0 UNDERGROUND WIRING

11.1 DESIGN REQUIREMENTS

11.1.1 Premise

11.1.1.1 The purpose of this section is to prevent the addition of any new overhead wiring, poles, transformers and associated equipment at the time of any subdivision or Development.

11.1.2 Requirements

11.1.2.1 Any new distribution wiring, related hydro infrastructure and communication infrastructure shall be placed underground for any Development or subdivision.

11.1.2.2 Existing overhead distribution wiring, related hydro infrastructure and communication infrastructure shall be placed underground within the Road classifications or locations shown in Schedule “G”.

11.1.2.3 New service wiring to on-site and off-site buildings, signs, kiosks, light standards, and other structures shall be placed underground.

11.1.2.4 Existing overhead service wiring to existing on-site and off-site buildings, signs, kiosks, light standards, and other structures must be relocated underground.

~SECTION ELEVEN~
TRAILS

INDEX

12.0 TRAILS

12.1 GENERAL

Trails constructed outside of Road Right-Of-Ways (Type 2 and Type 3) must consider impact on their surroundings and be designed with consideration for specific environmental needs and the intended use of the trail.

12.2 DESIGN CONSIDERATIONS

12.2.1 General Trail Placement and Construction Considerations

12.2.1.1 The construction of trails is required in order to meet the requirements of 7.3.2.3, 7.3.7.6 , and 7.3.10.1.

12.2.1.2 Care should be taken to appropriately place trails and should consider the following design and construction requirements:

.1 minimize environmental intrusion;

.2 avoid hazards and high sensitive environmental areas;

.3 avoid routing that encourages shortcuts;

.4 minimize vegetation removal and soil disturbance;

.5 avoid or minimize use of heavy machinery;

.6 mitigate erosion;

.7 avoid the use of organic trail surfaces; and

.8 cover exposed roots.

12.2.1.3 Extended lengths of straight horizontal alignment are to be avoided.

12.2.1.4 Lighting is required according to 10.2.3.4.

12.3 TRAIL TYPES

12.3.1 Type 1 Trail – Multi-Use Hard Surfaced

12.3.1.1 A Type 1 trail is to be constructed to the standards of the multi-use pathway standards described in 7.9.

12.3.1.2 Type 1 trails are required where pedestrian linkage is required according 7.3.2.3, 7.3.7.6 , 7.3.10.1or elsewhere in this Bylaw, unless otherwise permitted according to 12.3.2.2.

12.3.2 Type 2 Trail – Multi-Use Permeable Surface

12.3.2.1 A Type 2 trail is a machine built trail where all embedded trail obstacles have been removed, and is generally located outside of Road allowances.

12.3.2.2 Type 2 trails may be substituted at the discretion of the Director of Engineering where pedestrian linkage is required according 7.3.2.3, 7.3.7.6 , 7.3.10.1, or elsewhere in this Bylaw.

12.3.2.3 Design considerations include:

.1 crushed limestone with fines or well-compacted gravel;

.2 maximum design speed for cyclists shall be 15 km/h;

.3 vertical clearance to obstacles shall be a minimum of 2.0 metres, but preferably 2.5 metres;

.4 grading to avoid ponding; and

.5 signage limited to distance markers and directional/destination.

12.3.3 Type 3 Trail – Hiking

12.3.3.1 A Type 3 trail is typically not machine built and is generally located in natural, forested areas. Trail obstacles have not been totally removed consistent with its natural setting.

12.3.3.2 Design considerations include:

.1 un-surfaced native soils, single-track trail;

.2 clear width shall be 1.0 m; trail surface width shall be 0.6 metres;

.3 vertical clearance shall be 2.0 metres minimum; and

.4 signage limited to distance markers and directional/destination.

~SCHEDULE B~

STANDARD SERVICING AGREEMENT

Works on Town-Owned Lands and Rights-of-Way

SERVICING AGREEMENT

~ Works on Town-Owned Lands and Rights-of-Way ~

No SA20XX-##

Between

TOWN OF GIBSONS

and

_____

DATE: _____

SERVICING AGREEMENT

THIS AGREEMENT made this _____day of _____, 20___

BETWEEN:

TOWN OF GIBSONS

a Municipality incorporated under the Local Government Act of the Province of British Columbia, and having its Municipal Offices at 474 South Fletcher Road, Gibsons, British Columbia.

(hereinafter called the "Town")

OF THE FIRST PART

AND:

_____

(hereinafter called the "Owner")

OF THE SECOND PART

WHEREAS:

A. The Owner holds an interest in lands and premises within the Town of Gibsons, in the Province of British Columbia, more particularly known and described as follows:

LOT _____
BLOCK _____
PLAN _____
DISTRICT LOT _____
PID _____

(hereinafter called the "Lands")

B. The Owner desires to subdivide the Land or develop the Land.

C. In the instance of a subdivision, the Approving Officer of the Town has agreed to approve the subdivision of the Lands, subject to the terms and conditions contained in this Agreement, and the posting with the Town of the security deposit described herein.

D. In the instance of a building permit, the Building Inspector of the Town has agreed to issue a building permit, subject to the terms and conditions contained in this Agreement, and the posting with the Town of the security deposit

described herein.

E. The Owner has deposited with the Municipality cash or a letter of credit in the amount of $_____, being 120% of the estimated cost of the Works as approved by the Director of Engineering (the "Security Deposit"), as security for the due performance of all of the covenants and obligations of the Owner contained in this Agreement, and to be forfeit to the Municipality in the circumstances specified in this Agreement.

NOW THEREFORE THIS AGREEMENT WITNESSETH that in consideration of the promises, covenants and agreements hereinafter set forth, the parties hereto covenant, agree, represent and promise as follows:

APPENDICES	1	The following Appendices form part of this Agreement and Appendices are referred to as the “Plans and Specifications”: Appendix "A" - A list of the Works and an estimate of their respective construction costs. Appendix "B" - Construction drawings to be used for the construction of the Works. Appendix "C" – List of required covenants, rights of wa, easements and highway dedications.
OWNER TO DO WORK	2	The Owner covenants and agrees to construct and provide all the works and services listed and shown on Appendices "A" and "B" hereto (the “Works”), as approved by the Town, in accordance with the standards contained in Schedule "A" of the Town's subdivision and Development Bylaw.
TRANSFER OF INTEREST IN WORKS	3	The Owner will, on the Town's request, do all such further acts as the Town requires for the carrying out of this Agreement including the granting of easements and rights of way. The Owner will from time to time and at all times so long as it exercises any rights of ownership in the Lands upon the request of the Town, make, do and execute or cause or procure to be made, done and executed, all such further such acts, deeds, rights-of-way, easements and easement assurances for the more effectual carrying out of this Agreement.
PERMISSION TO DO WORK	4	The Town covenants and agrees to permit the Owner to construct the Works, including that portion of the Works to be constructed on dedicated highways controlled by the Town, on the terms and

		conditions, and in the manner required by and at the places specified in the Plans and Specifications; provided that nothing in this Agreement shall be construed as an undertaking, promise or covenant on the part of the Town to make available the use of or access to the Works for any purpose, and without limiting the foregoing, for the purpose of serving the Lands or any other real property whatsoever either owned or controlled by the Owner or its associates or otherwise, but rather the Town reserves the right in its sole and absolute discretion to make available, operate, alter, use, extend, diminish, discontinue, tear up, sell, rent or otherwise dispose of the Works as its Council from time to time deems fit.
LOT GRADING	5	The Owner covenants and agrees to adhere in all respects to the contours, elevations and drainage patterns indicated on the Lot Grading Plan or Storm Water Management Plans prepared by the Engineer and/or Engineering Company indicated in Appendix "B" of this Agreement.
START OF WORK	6	The Owner covenants and agrees not to commence work until the Director of Engineering provides the Owner with written permission to commence construction.
COMPLETION OF WORKS	7	The Owner shall complete the construction of the Works, specified in Appendix "B" to the satisfaction of the Director of Engineering by the **____ day of _____, 20___**.
OWNER TO GRANT RIGHTS-OF-WAY	8	The Owner covenants and agrees to grant or cause the relevant owner to grant, prior to final acceptance, the covenants, rights of way, easements and highway dedications listed in Appendix “C”, all without cost to the Town.
DESIGN BY P.ENG	9	The Owner covenants and agrees that the Works shall be designed by a Professional Engineer, who shall be registered with the Association of Professional Engineers and Geoscientists of British Columbia and retained by the Owner. Plans and specifications for the Works shall be prepared by or under the direct supervision of the said Professional Engineer and all plans shall bear their professional seal and signature. The Owner covenants and agrees to retain a Professional Engineer during the construction period for the purposes of inspection to ensure compliance with the approved design and to provide certification of the record drawings.
DESIGN CHANGES	10	The Director of Engineering may alter the Plans and Specifications because of conditions on site so that the Works function and operate in a manner satisfactory to the Director of Engineering.

Should the Works, as provided herein, prove to be in any way defective or should they not operate to the satisfaction of the Director of Engineering, then the Owner shall, at their own expense, modify and reconstruct the Works so that the Works shall be fully operative and function to the satisfaction of the Director of Engineering.

APPLICATION FOR SUBSTANTIAL COMPLETION

11. The Director of Engineering shall, upon receipt of a written application from the Professional Engineer, inspect the Works with the Professional Engineer to verify the validity of the application and either:

11.1 issue a Certificate of Substantial Completion; or

11.2 advise the Professional Engineer of the remaining Work required to be completed in order to achieve Substantial Completion.

CERTIFICATE OF SUBSTANTIAL COMPLETION

12. When, in the opinion of the Director of Engineering, Substantial Completion has been achieved, a Certificate of Substantial Completion shall be dated and issued by the Director of Engineering where upon all the monies held by the Town shall be released, less the sum of

12.1 5% of the cost of the total Works to be held for one year as a maintenance holdback;

12.2 15% of the cost of the total Works if full record drawings have not been submitted according to the Bylaw;

12.3 200% of the value of deficiencies, if any.

This Certificate of Substantial Completion shall not be construed as acceptance of the Works.

RECORD DRAWING SUBMISSION

13 The Owner covenants and agrees to submit to the Town the final record drawings and records of construction and test results, as accepted by the Director of Engineering, pursuant to Schedule "A" of the subdivision and Development Bylaw within sixty (60) days of the date of the Certificate of Substantial Completion.

MAINTENANCE PERIOD AND RESPONSIBILITY

14 The Owner covenants and agrees to maintain every part of the Works in good order and in complete repair in accordance with, and for the duration(s) specified in, the subdivision and Development Bylaw from the date shown on the Certificate of Substantial Completion. Should the Owner, for any reason, fail to maintain the Works when ordered, then the Director of

Engineering, at their option, after giving the Owner seven (7) days written notice (emergencies excepted), may do so, and the whole costs, charges and expenses so incurred by the Town will be payable by the Owner, as provided for herein. The decision of the Director of Engineering will be final with respect to the necessity for repairs or the adequacy of any work done.

CERTIFICATE OF ACCEPTANCE

15 The Town covenants and agrees upon satisfactory completion by the Owner of all of the covenants in this Agreement to provide the Owner with a Certificate of Acceptance which will be in the form specified in Schedule "A" to the subdivision and Development Bylaw. All such works and services remain at the risk of the Owner until the Certificate of Acceptance for the work has been issued.

BUILDING OCCUPANCY PERMIT WITHHELD

16 The Owner covenants and agrees that the Town may withhold the granting of an Occupancy Permit of any building or part thereof constructed upon the Lands until all the Works have been completed to the satisfaction of the Director of Engineering.

OWNER INDEMNIFIES TOWN

17 The Owner covenants and agrees to save harmless and effectually indemnify the Town, its officers, employees and elected officials against:

17.1 all actions and proceedings, costs, damages, expenses, claims and demands whatsoever and whomsoever brought by reason of the construction of the Works, which shall be paid by the Owner, and if paid by the Town shall, together with any costs and expenses incurred in connection therewith, be charged to and paid forthwith by the Owner;

17.2 all expenses and costs which may be incurred by reason of the construction of the required works by this bylaw, resulting in damage to any property owned in whole or in part by the Town or which the Town by custom or duty is obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain, which shall be paid by the Owner, and if paid by the Town shall, together with any costs and expenses incurred in connection herewith, be charged to and paid forthwith by the Owner;

17.3 all expenses and costs which may be incurred by reason of liens for non-payment of labour or materials, Workman's Compensation assessments, unemployment insurance, federal or provincial tax, and for encroachments due to mistakes in survey, which shall be paid by the Owner, and if paid by the Town shall, together with any costs and

expenses incurred in connection therewith, be charged to and paid forthwith by the Owner; and

17.4 all expenses and costs which may be incurred by the Town as a result of faulty workmanship and defective material in any of the Works installed by the Owner.

The above clauses shall not be construed so as to extinguish any rights which the Town would have were it not for the inclusion of Clause 17 in this Agreement.

INSURANCE BY OWNER 18 The Owner shall, at their sole expense and throughout the duration of the Work, carry Comprehensive Liability Insurance acceptable to the Town in the amount of at least three million ($3,000,000) dollars with insurance companies licensed to carry on business in the Province of British Columbia.

INSURANCE COVERAGE 19 The Owner covenants and agrees to carry the following insurance coverage, and to provide the Town with a copy of the insurance policy prior to the commencement of any construction of the Works:

19.1 To protect the Owner and the Town against all claims arising out of:

19.1.1 death or injury to persons;

19.1.2 damage to or loss of use of any property of third persons, including without limiting the foregoing; the following classes of property: Real property, chattels, land, works, buildings, structures, wires, conduits, pipes, mains, shafts, sewers, tunnels, and apparatus in connection therewith, even when the damage or loss of use is caused by vibration, moving, shoring, underpinning, raising, rebuilding or demolition of any building, structure or support, or by excavation, tunnelling or other work below the surface of the ground or water; and

19.1.3 damage to or loss of all buildings, structures, stores, equipment and materials included in or required for the carrying out of the Works.

19.2 Every policy of insurance required will:

19.2.1 name the "TOWN OF GIBSONS" as an additional insured;

19.2.2 state that the policy applies to each insured in the same manner and to the same extent as if a separate policy had been issued to each insured; and

19.2.3 state that the policy cannot be cancelled, lapsed or materially changed without at least thirty (30) days written notice to the Town, delivered to the Town of Gibsons' Municipal Clerk.

19.2.3 Every policy of insurance required may at the discretion of the Town be reviewed by its insurer.

SECURITY DEPOSITS

20 As security for the due performance of all of the covenants and promises contained in this Agreement the Owner has deposited with the Town a security deposit, equal to 120% of the value of the Works, in the amount of **$**_____ in the form of cash or a Letter of Credit acceptable to the Town (herein called the "Security Deposit").

FORFEIT OF SECURITY DEPOSIT

21 In the event that the Owner fails to construct and install the Works within the time specified in Clause 7, the Security Deposit will be forfeited to the Town.

USE OF SECURITY

22 The Owner agrees that if all the Works are not completed, installed or performed pursuant to this Agreement including the correction of any deficiencies, or if record drawings required by the subdivision and Development Bylaw are not provided, the Town may complete or fulfil the Works or prepare the drawings at the cost of the Owner and deduct from the security deposit held by the Town the cost of such completion or preparation, and the balance of the deposit shall be returned to the Owner, less any additional administration fees or costs incurred. If there is insufficient money on deposit with the Town then the Owner shall pay such deficiency to the Town immediately upon receipt of the Town's bill for completion. It is understood that the Town may do such work either by itself or by the contractors employed by the Town.

SECURITY DEPOSIT REDUCTIONS

23 As the Works progress the Owner's Engineer may prepare and submit no more frequently than once per month an estimate of the quantity, value and percentage of the work completed. Upon verification of the estimate the Director of Engineering may release a portion of the security deposit held by the Town to a maximum of 75% of the value of the Works completed. Reductions may be denied by the Director of Engineering where, in the Director of Engineering’s opinion, it is required to cover the

		cost of completing the Work and preparing record drawings. Security reductions are for the convenience of the Owner and in no case shall be taken as acceptance of the material and/or work or as a release of the Owner from their responsibilities for the Works.
MAINTENANCE HOLDBACK	24	When the Director of Engineering is of the opinion that the Works have been adequately completed, and the Owner's covenants performed in compliance with this Agreement, the Director of Engineering shall return all or any portion of the Security Deposit to the Owner, provided only that the record drawings have been submitted to the satisfaction of the Town less, 5% of the estimated cost of the Works to a minimum of $1,000.00 and a maximum of $20,000.00 to ensure payment of any maintenance or repair (the “Maintenance Holdback”), plus 200% of the value of deficiencies, if any.
RETURN OF MAINTENANCE SECURITY	25	When the Director of Engineering is satisfied that the Owner has fully complied with the covenants contained in this Agreement, the Director of Engineering shall release the Maintenance Holdback, when so requested in writing by the Owner.
NO OTHER REPRESENTATION	26	It is understood and agreed that the Town has made no representations, covenants, warranties, guarantees, promises or agreements (verbal or otherwise) with the Owner other than those in this Agreement.
DEVELOPMENT COST CHARGE CREDITS	27	The Municipality hereby agrees that the following works are deemed to be "DCC Projects", and the value of these works shall be credited toward the appropriate Development Cost Charges. DCC Creditable Works: _____ _____ _____ _____
NO WAIVER	28	The Owner covenants and agrees that nothing contained or implied herein shall prejudice or affect the rights and powers of the Town in the exercise of its functions under any public and private statutes, bylaws, orders and regulations all of which may be fully and effectively exercised in relation to the Lands as if the Agreement had not been executed and delivered by the Owner.

WHENEVER the singular or the masculine is used in the Agreement it will be construed as meaning the plural or the feminine or body corporate or politic where the context or the parties hereto so require.

THIS CONTRACT SHALL INURE TO THE benefit of and be binding upon the parties hereto and their respective heirs and successors.

IN WITNESS WHEREOF the parties hereto have executed this contract the day and year first above written.

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)
_____)
AUTHORIZED SIGNATORY)
)
_____)
AUTHORIZED SIGNATORY)

SIGNED AND DELIVERED)
by the above named in the)
presence of:)
)
)
Name:_____)
)
Address:_____)
)
_____)
)
Occupation:_____)

)
_____)
DIRECTOR OF ENGINEERING)
)
_____)
CORPORATE OFFICER)

APPENDIX "A"

SERVICING AGREEMENT
NO. 20XX-##

Schedule of Works and Cost Estimate

APPENDIX "B"

SERVICING AGREEMENT
NO. 20XX-##

Design Drawings

Plans and specifications prepared by:

_____

Under Drawing Nos:

_____
_____
_____
_____

and as reviewed for the purposes of this Agreement by
the Director of Engineering

on the **___ day of _____20__**

APPENDIX "C"

SERVICING AGREEMENT
NO. 20XX-##

Schedule of covenants, rights of way, easements and highway dedications

~SCHEDULE C~

STANDARD SERVICING AGREEMENT

Works on Private Lands
Undergoing Subdivision or Development

SERVICING AGREEMENT

Works on Private Lands
Undergoing Subdivision or Development

No SA20XX-##

Between

TOWN OF GIBSONS

and

_____

DATE: _____

SERVICING AGREEMENT

THIS AGREEMENT made this _____day of _____, 20___

BETWEEN:

TOWN OF GIBSONS

a Municipality incorporated under the Local Government Act of the Province of British Columbia, and having its Municipal Offices at 474 South Fletcher Road, Gibsons, British Columbia.

(hereinafter called the "Town")

OF THE FIRST PART

AND:

_____

(hereinafter called the "Owner")

OF THE SECOND PART

WHEREAS:

A. The Owner holds an interest in lands and premises within the Town of Gibsons, in the Province of British Columbia, more particularly known and described as follows:

LOT _____
BLOCK _____
PLAN _____
DISTRICT LOT _____
PID _____

(hereinafter called the "Lands")

B. The Owner desires to subdivide the Lands or develop the Lands.

C. In the instance of a subdivision, the Approving Officer of the Town has agreed to approve the subdivision of the Lands, subject to the terms and conditions contained in this Agreement, and the posting with the Town of the security deposit described herein.

D. In the instance of a building permit, the Building Inspector of the Town has agreed to issue a building permit, subject to the terms and conditions contained in this Agreement, and the posting with the Town of the security deposit

described herein.

E. The Owner desires to construct all or a portion of the Works on the Lands being subdivided or Developed, including Highways, Parks or Town rights-of-way situated on the Parcel or Lands being subdivided or Developed, which are proposed to be dedicated to the Town, prior to making application for subdivision or building permit.

F. The Owner has deposited with the Municipality cash or a letter of credit in the amount of $_____, being 20% of the estimated cost of the portion of the Works on the Parcel or Lands being subdivided or Developed as approved by the Director of Engineering (the "Security Deposit"), as security for the due performance of all of the covenants and obligations of the Owner contained in this Agreement, and to be forfeit to the Municipality in the circumstances specified in this Agreement.

NOW THEREFORE THIS AGREEMENT WITNESSETH that in consideration of the promises, covenants and agreements hereinafter set forth, the parties hereto covenant, agree, represent and promise as follows:

APPENDICES

1 The following Appendices form part of this Agreement and Appendices are referred to as the “Plans and Specifications”:

Appendix "A" - A list of the Works and an estimate of their respective construction costs.

Appendix "B" - Construction drawings to be used for the construction of the Works.

Appendix "C" – List of required covenants, rights of wa, easements and highway dedications.

OWNER TO DO WORK

2. The Owner covenants and agrees to construct and provide all the works and services listed and shown on Appendices "A" and "B" hereto (the “Works”), as approved by the Town, in accordance with the standards contained in Schedule "A" of the Town's subdivision and Development Bylaw.

TRANSFER OF INTEREST IN WORKS

3. The Owner will, on the Town's request, do all such further acts as the Town requires for the carrying out of this Agreement including the granting of easements and rights of way.

The Owner will from time to time and at all times so long as it exercises any rights of ownership in the Lands upon the request of the Town, make, do and execute or cause or procure to be made, done and executed, all such further such acts, deeds, rights-of-

way, easements and easement assurances for the more effectual carrying out of this Agreement.

PERMISSION TO DO WORK	4.	The Town covenants and agrees to permit the Owner to construct the Works, <u>excluding</u> that portion of the Works to be constructed on dedicated highways, rights-of-way or lands controlled by the Town, on the terms and conditions, and in the manner required by and at the places specified in the Plans and Specifications; provided that nothing in this Agreement shall be construed as an undertaking, promise or covenant on the part of the Town to make available the use of or access to the Works for any purpose, and without limiting the foregoing, for the purpose of serving the Lands or any other real property whatsoever either owned or controlled by the Owner or its associates or otherwise, but rather the Town reserves the right in its sole and absolute discretion to make available, operate, alter, use, extend, diminish, discontinue, tear up, sell, rent or otherwise dispose of the Works as its Council from time to time deems fit.
LOT GRADING	5.	The Owner covenants and agrees to adhere in all respects to the contours, elevations and drainage patterns indicated on the Lot Grading Plan or Storm Water Management Plans prepared by the Engineer and/or Engineering Company indicated in Appendix "B" of this Agreement.
START OF WORK	6.	The Owner covenants and agrees not to commence work until the Director of Engineering provides the Owner with written permission to commence construction.
COMPLETION OF WORKS	7.	The Owner shall complete the construction of the Works, specified in Appendix "B" to the satisfaction of the Director of Engineering by the **____ day of _____, 20___**.
OWNER TO GRANT RIGHTS-OF-WAY	8.	The Owner covenants and agrees to grant or cause the relevant owner to grant, prior to final acceptance, the covenants, rights of way, easements and highway dedications listed in Appendix “C”, all without cost to the Town.
DESIGN BY P.ENG	9.	The Owner covenants and agrees that the Works shall be designed by a Professional Engineer, who shall be registered with the Association of Professional Engineers and Geoscientists of British Columbia and retained by the Owner. Plans and specifications for the Works shall be prepared by or under the direct supervision of the said Professional Engineer and all plans shall bear their professional seal and signature. The Owner covenants and agrees to retain a Professional Engineer during the construction period for the purposes of inspection to

ensure compliance with the approved design and to provide certification of the record drawings.

DESIGN CHANGES

10. The Director of Engineering may alter the Plans and Specifications because of conditions on site so that the Works function and operate in a manner satisfactory to the Director of Engineering. Should the Works, as provided herein, prove to be in any way defective or should they not operate to the satisfaction of the Director of Engineering, then the Owner shall, at their own expense, modify and reconstruct the Works so that the Works shall be fully operative and function to the satisfaction of the Director of Engineering.

SERVICING AGREEMENT FOR WORKS ON TOWN LANDS

11. The Owner covenants and agrees to enter into a Servicing Agreement for Works on Town-Owned lands and rights-of-way in the form of Schedule “B” after application for Substantial Completion had been made and prior to issuance of a Certificate of Substantial Completion.

APPLICATION FOR SUBSTANTIAL COMPLETION

12. The Director of Engineering shall, upon receipt of a written application from the Professional Engineer, inspect the Works with the Professional Engineer to verify the validity of the application and either:

12.1 issue a Certificate of Substantial Completion according to Clause 13; or

12.2 advise the Professional Engineer of the remaining Work required to be completed in order to achieve Substantial Completion.

CERTIFICATE OF SUBSTANTIAL COMPLETION

13. When, in the opinion of the Director of Engineering, Substantial Completion has been achieved and a signed Servicing Agreement for Works on Town-Owned lands and rights-of-way in the form of Schedule “B” has been received from the Owner, a Certificate of Substantial Completion shall be dated and issued by the Director of Engineering.

This Certificate of Substantial Completion shall not be construed as Acceptance of the Works.

RECORD DRAWING SUBMISSION

14. The Owner covenants and agrees to submit to the Town the final record drawings and records of construction and test results, as accepted by the Director of Engineering, pursuant to Schedule "A" of the subdivision and Development Bylaw within sixty (60) days of the date of the Certificate of Substantial Completion.

BUILDING OCCUPANCY

15. The Owner covenants and agrees that the Town may withhold the

PERMIT WITHHELD

granting of an Occupancy Permit of any building or part thereof constructed upon the Lands until all the Works have been completed to the satisfaction of the Director of Engineering.

OWNER INDEMNIFIES TOWN

16. The Owner covenants and agrees to save harmless and effectually indemnify the Town, its officers, employees and elected officials against:

16.1 all actions and proceedings, costs, damages, expenses, claims and demands whatsoever and whomsoever brought by reason of the construction of the Works, which shall be paid by the Owner, and if paid by the Town shall, together with any costs and expenses incurred in connection therewith, be charged to and paid forthwith by the Owner;

16.2 all expenses and costs which may be incurred by reason of the construction of the required works by this bylaw, resulting in damage to any property owned in whole or in part by the Town or which the Town by custom or duty is obliged, directly or indirectly, in any way or to any degree, to construct, repair or maintain, which shall be paid by the Owner, and if paid by the Town shall, together with any costs and expenses incurred in connection herewith, be charged to and paid forthwith by the Owner;

16.3 all expenses and costs which may be incurred by reason of liens for non-payment of labour or materials, Workman's Compensation assessments, unemployment insurance, federal or provincial tax, and for encroachments due to mistakes in survey, which shall be paid by the Owner, and if paid by the Town shall, together with any costs and expenses incurred in connection therewith, be charged to and paid forthwith by the Owner; and

16.4 all expenses and costs which may be incurred by the Town as a result of faulty workmanship and defective material in any of the Works installed by the Owner.

The above clauses shall not be construed so as to extinguish any rights which the Town would have were it not for the inclusion of Clause 17 in this Agreement.

INSURANCE BY OWNER

17. The Owner shall, at their sole expense and throughout the duration of the Work, carry Comprehensive Liability Insurance acceptable to the Town in the amount of at least three million ($3,000,000) dollars with insurance companies licensed to carry on business in the Province of British Columbia.

INSURANCE COVERAGE

18. The Owner covenants and agrees to carry the following insurance coverage, and to provide the Town with a copy of the insurance policy prior to the commencement of any construction of the Works:

18.1 To protect the Owner and the Town against all claims arising out of:

18.1.1 death or injury to persons;

18.1.2 damage to or loss of use of any property of third persons, including without limiting the foregoing; the following classes of property: Real property, chattels, land, works, buildings, structures, wires, conduits, pipes, mains, shafts, sewers, tunnels, and apparatus in connection therewith, even when the damage or loss of use is caused by vibration, moving, shoring, underpinning, raising, rebuilding or demolition of any building, structure or support, or by excavation, tunnelling or other work below the surface of the ground or water; and

18.1.3 damage to or loss of all buildings, structures, stores, equipment and materials included in or required for the carrying out of the Works.

18.2 Every policy of insurance required will:

18.2.1 name the "TOWN OF GIBSONS" as an additional insured;

18.2.2 state that the policy applies to each insured in the same manner and to the same extent as if a separate policy had been issued to each insured; and

18.2.3 state that the policy cannot be cancelled, lapsed or materially changed without at least thirty (30) days written notice to the Town, delivered to the Town of Gibsons' Municipal Clerk.

18.3 Every policy of insurance required may at the discretion of the Town be reviewed by its insurer.

SECURITY DEPOSITS	19.	As security for the due performance of all of the covenants and promises contained in this Agreement the Owner has deposited with the Town a security deposit, equal to 20% of the value of the Works, in the amount of **$**_____ in the form of cash or a Letter of Credit acceptable to the Town (herein called the "Security Deposit").
FORFEIT OF SECURITY DEPOSIT	20.	In the event that the Owner fails to construct and install the Works within the time specified in Clause 7, the Security Deposit will be forfeited to the Town.
USE OF SECURITY	21.	The Owner agrees that if record drawings required by the subdivision and Development Bylaw are not provided, the Town may prepare the drawings at the cost of the Owner and deduct from the security deposit held by the Town the cost of such completion or preparation, and the balance of the deposit shall be returned to the Owner, less any additional administration fees or costs incurred. If there is insufficient money on deposit with the Town then the Owner shall pay such deficiency to the Town immediately upon receipt of the Town's bill for completion. It is understood that the Town may do such work either by itself or by the contractors employed by the Town.
NO OTHER REPRESENTATION	22.	It is understood and agreed that the Town has made no representations, covenants, warranties, guarantees, promises or agreements (verbal or otherwise) with the Owner other than those in this Agreement.
DEVELOPMENT COST CHARGE CREDITS	23.	The Municipality hereby agrees that the following works are deemed to be "DCC Projects", and the value of these works shall be credited toward the appropriate Development Cost Charges. DCC Creditable Works: _____ _____ _____ _____
NO WAIVER	24.	The Owner covenants and agrees that nothing contained or implied herein shall prejudice or affect the rights and powers of the Town in the exercise of its functions under any public and private statutes, bylaws, orders and regulations all of which may be fully and effectively exercised in relation to the Lands as if the Agreement had not been executed and delivered by the Owner.

WHENEVER the singular or the masculine is used in the Agreement it will be construed as meaning the plural or the feminine or body corporate or politic where the context or the parties hereto so require.

THIS CONTRACT SHALL INURE TO THE benefit of and be binding upon the parties hereto and their respective heirs and successors.

IN WITNESS WHEREOF the parties hereto have executed this contract the day and year first above written.

)
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_____)
AUTHORIZED SIGNATORY)
)
_____)
AUTHORIZED SIGNATORY)

SIGNED AND DELIVERED)
by the above named in the)
presence of:)
)
)
Name:_____)
)
Address:_____)
)
_____)
)
Occupation:_____)

)
_____)
DIRECTOR OF ENGINEERING)
)
_____)
CORPORATE OFFICER)

APPENDIX "A"

SERVICING AGREEMENT
NO. 20XX-##

Schedule of Works and Cost Estimate

APPENDIX "B"

SERVICING AGREEMENT
NO. 20XX-##

Design Drawings

Plans and specifications prepared by:

_____

Under Drawing Nos:

_____
_____
_____
_____

and as reviewed for the purposes of this Agreement by
the Director of Engineering of the Town
on the **___ day of _____20__**

APPENDIX "C"

SERVICING AGREEMENT
NO. 20XX-##

Schedule of covenants, rights of way, easements and highway dedications

~SCHEDULE D~

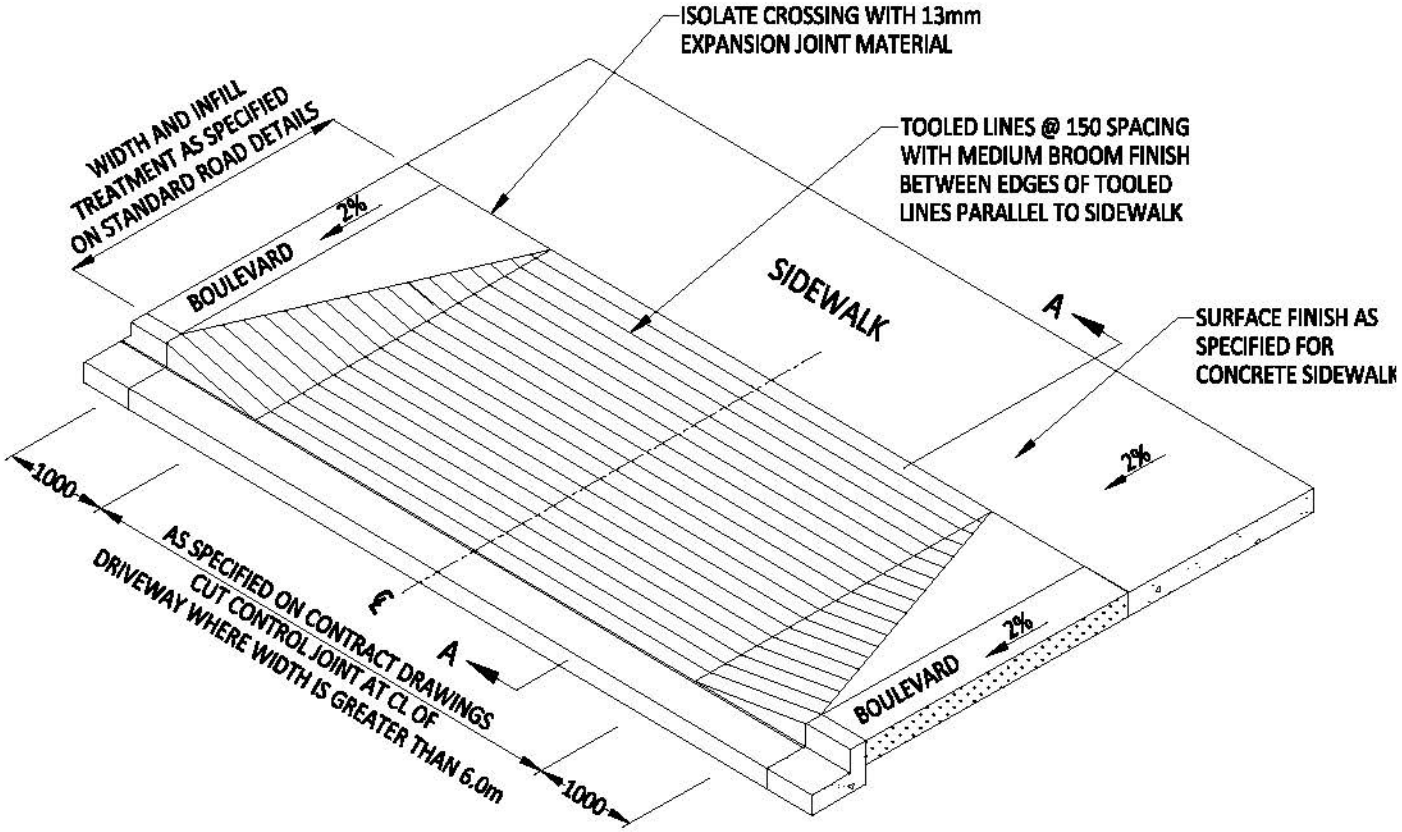
Standard Drawings

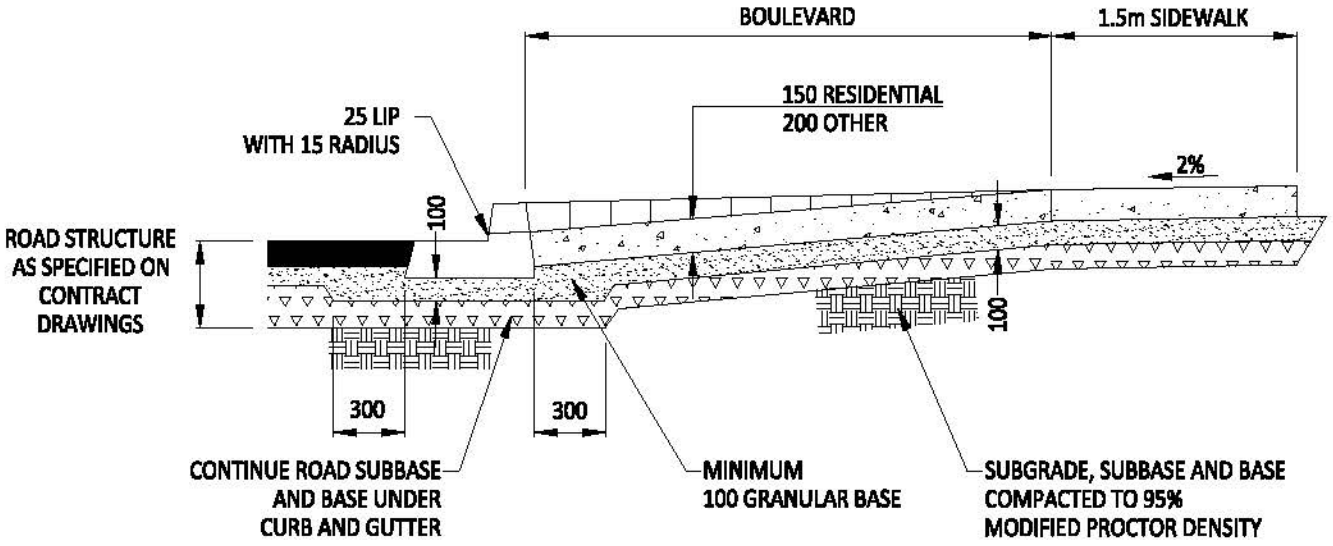
The following Standard Drawings are supplemental to MMCD and shall supersede MMCD Standard Drawings, where applicable.

Drawing Number	Drawing Name
SS-C1	Driveway Crossing for Barrier Curbs
SS-C2	Typical Driveway Crossing
SS-G1	Lot Servicing Sheet Example
SS-G2	Lot Servicing Sheet
SS-G3	Typical Lot Service Connection
SS-G4	Exfiltration Trench
SS-G5	Silt Fence
SS-G6	Conceptual Sediment Basin Layout
SS-G7	260ø Traffic Box
SS-G8	Survey Monument in Road
SS-G9	Survey Monument in Sidewalk or Curb
SS-G10	Street Tree Planting Detail
SS-G11	Pathway Emergency Access
SS-R1	Typical Arterial Road
SS-R2A	Typical Type 1 Collector Road
SS-R2B	Typical Type 1 Collector Road – Plan View
SS-R3	Typical Type 2 Collector Road
SS-R4	Typical Type 1 Local Road
SS-R5	Typical Type 2 Local Road
SS-R6	Lane
SS-R7	Parking Bay
SS-R8	Tactile Warning Strips
SS-R9	Hammerhead Turnaround
SS-R10	Typical Cul De Sac Bulb
SS-S1	Inspection Chamber for 100 to 200 Storm Sewer Connections
SS-S2	Type II Lawn Basin
SS-S3	Biofiltration Swale
SS-S4	On-Site Swale

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS





SECTION A-A

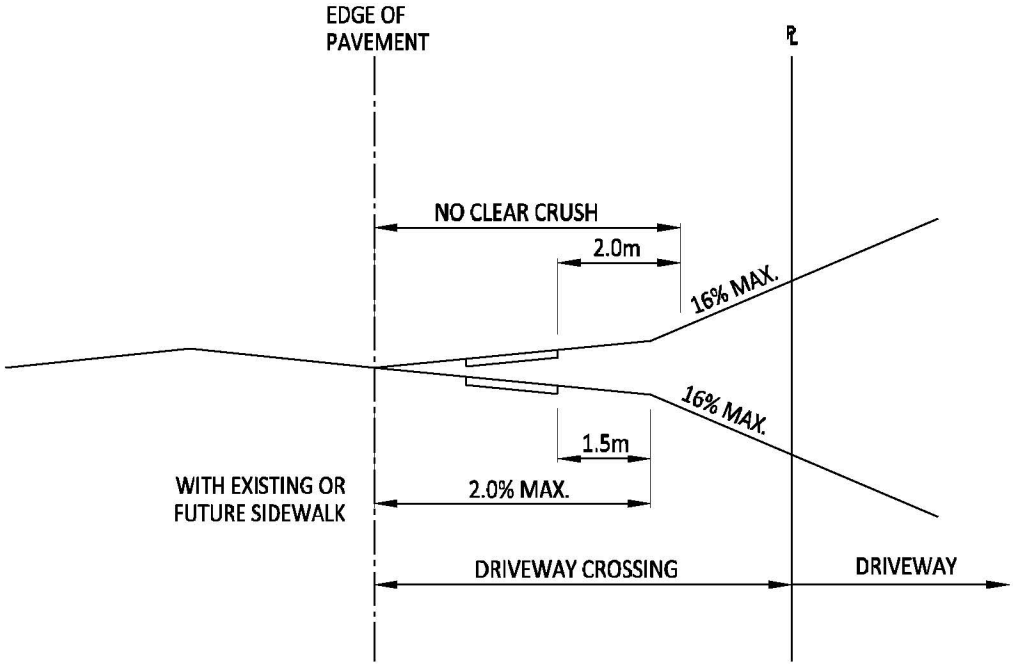
NOTES:

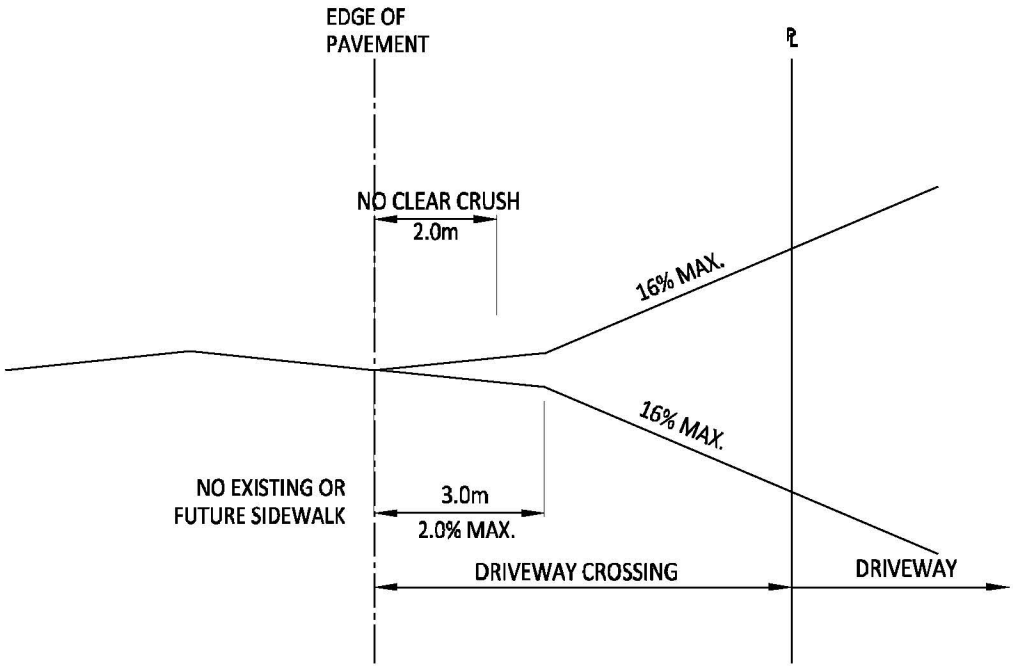
1. DRIVEWAY ORIENTED AT 90° TO CURB, UNLESS SPECIFIED OTHERWISE ON CONTRACT DRAWINGS.
2. REFER TO CONTRACT DRAWINGS AND MMCD SECTION 02523 FOR DETAILED SPECIFICATIONS.

TITLE :	DWG. No. :
DRIVEWAY CROSSING FOR BARRIER CURBS	SS-C1

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS





NOTE: ALL DRIVEWAY CROSSINGS ACCESSING ROADS WITHOUT BARRIER OR ROLLOVER CURBS ARE TO BE PAVED WITH A MINIMUM OF 50mm ASPHALT TO 1.5m FROM EDGE OF ROAD PAVEMENT OR WHERE A CULVERT IS INSTALLED UNDER A DRIVEWAY CROSSING, FROM THE EDGE OF THE ROAD ACROSS THE CULVERT TO A POINT 2.0 METERS BEYOND THE CULVERT

TITLE :

DRIVEWAY CROSSINGS

DWG. No. :

SS-C2

TOWN OF GIBSONS

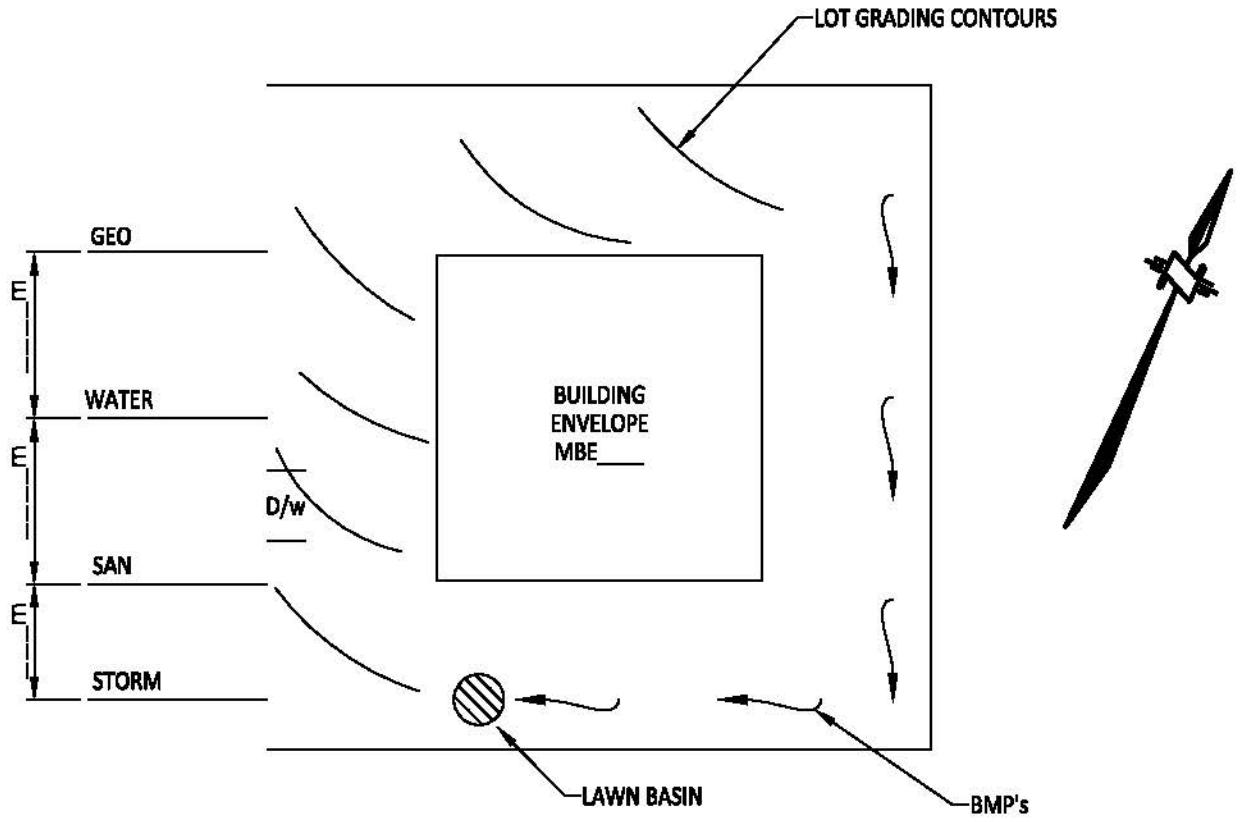
STANDARD DETAIL DRAWINGS

Street Address/Lot# _____ Folio _____

Name _____ Plan _____ Blk. _____ Lot _____ D.L. _____

Signature of Director of Engineering _____

WATER		SEWER		STORM		GEOTHERMAL	
Size of Service		Size of Service		Size of Service		Size of Service	
Fitting at Main		Fitting at Main		Fitting at Main		Fitting at Main	
Curb Stop		Bends		Bends		Bends	
Type of Pipe		Dist. From M.H. No.____ to Service		Dist. From M.H. No.____ to Service		Dist. From M.H. No.____ to Service	
Meter Size							
Dist. From Main to P.L.		Dist. From Main to P.L.		Dist. From Main to P.L.		Dist. From Main to P.L.	
Depth at P.L.		Type of Pipe		Type of Pipe		Type of Pipe	
Notes		Depth at P.L.		Depth at P.L.		Depth at P.L.	
		Notes		Notes		Notes	
Date		Date		Date		Date	



TITLE :

LOT SERVICING SHEET EXAMPLE

DWG. No. :

SS-G1

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS

Name _____ Street Address/Lot# _____

D.L _____ Lot _____ Blk. _____ Plan _____ Folio _____

Signature of Director of Engineering _____

WATER		SEWER		STORM		GEOTHERMAL	
Size of Service		Size of Service		Size of Service		Size of Service	
Fitting at Main		Fitting at Main		Fitting at Main		Fitting at Main	
Curb Stop		Bends		Bends		Bends	
Type of Pipe		Dist. From M.H. No.____ to Service		Dist. From M.H. No.____ to Service		Dist. From M.H. No.____ to Service	
Meter Size							
Dist. From Main to P.L.		Dist. From Main to P.L.		Dist. From Main to P.L.		Dist. From Main to P.L.	
Depth at P.L.		Type of Pipe		Type of Pipe		Type of Pipe	
Notes		Depth at P.L.		Depth at P.L.		Depth at P.L.	
		Notes		Notes		Notes	
Date		Date		Date		Date	

TITLE :

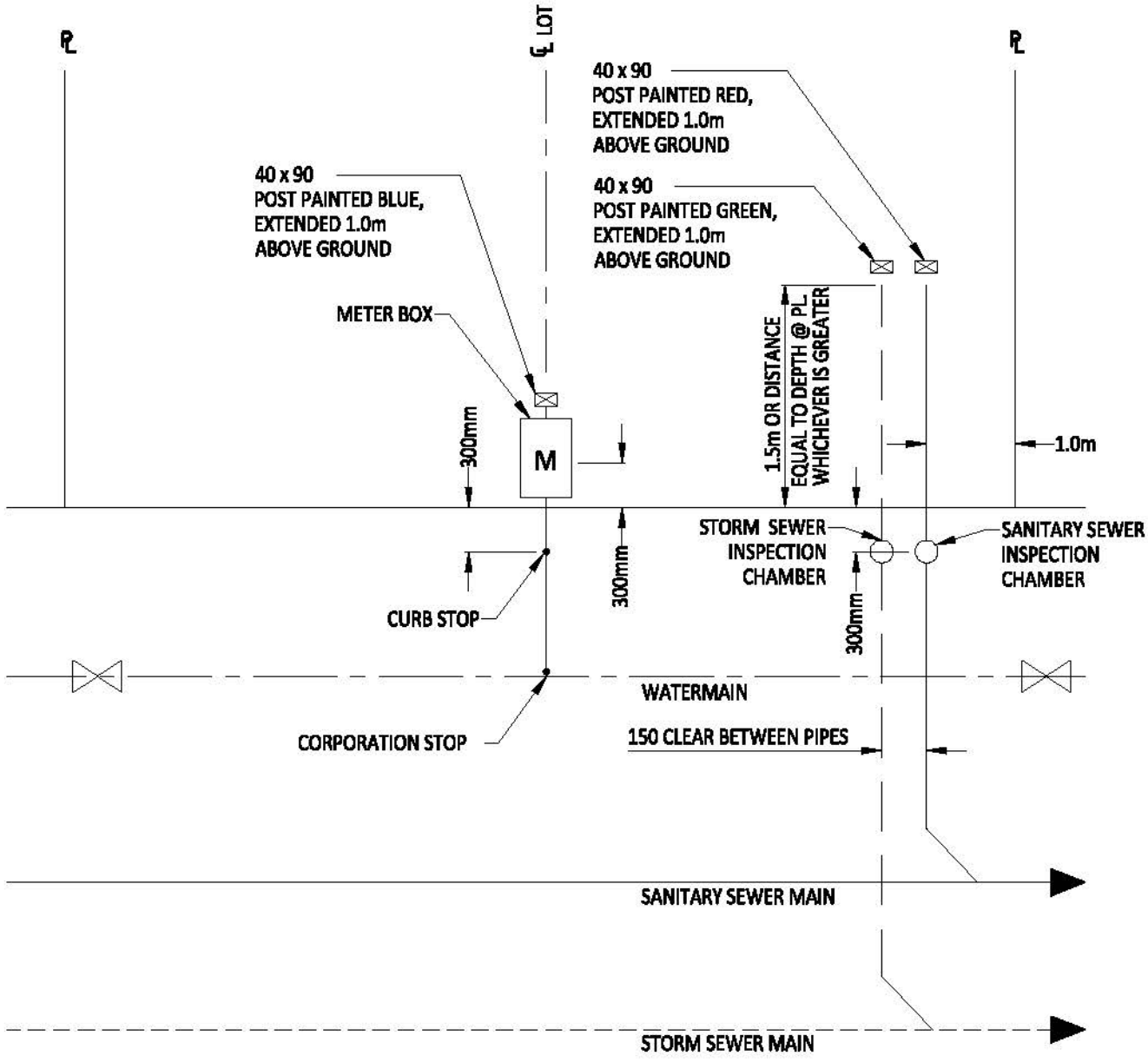
LOT SERVICING SHEET

DWG. No. :

SS-G2

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



NOTE:
FOR WATER CONNECTION, SANITARY CONNECTION AND
STORM CONNECTION SEE MMCD & TOWN SPECIFICATIONS
ALL DIMENSIONS SHOWN IN MILLIMETERS UNLESS OTHERWISE STATED.

TITLE :

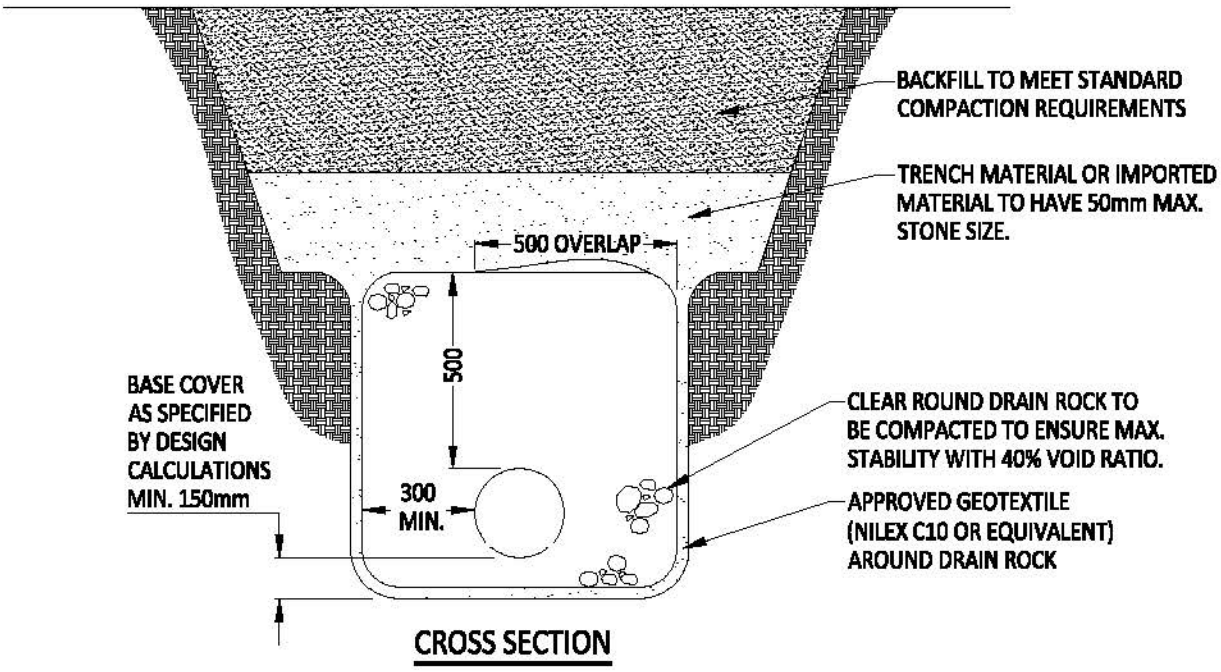
TYPICAL LOT SERVICE CONNECTION

DWG. No. :

SS-G3

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



CROSS SECTION

NOTES:

1. USE PERFORATED PVC PIPES.
2. FIELD PERFORATIONS NOT PERMITTED UNLESS SPECIFIED BY THE ENGINEER & APPROVED BY THE TOWN
3. PROVIDE 0.5m MINIMUM OVERLAP FOR LONGITUDINAL OR TRANSVERSE JOINTS IN FABRIC.
4. FILTER FABRIC TO BE APPROVED BY THE MUNICIPAL ENGINEER.
5. CLEAR DRAIN ROCK TO BE SIZED 20mm.
6. ENSURE NO SILT OR CLAY LENS ADJACENT TO TRENCH WALL.

TITLE :

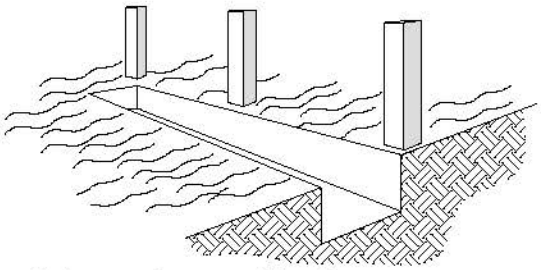
EXFILTRATION TRENCH

DWG. No. :

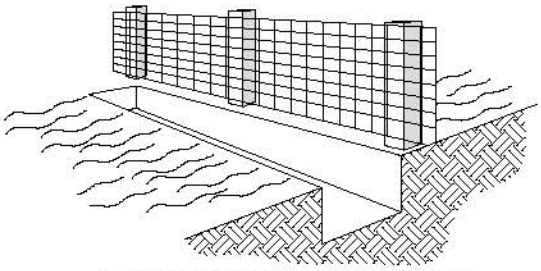
SS-G4

TOWN OF GIBSONS

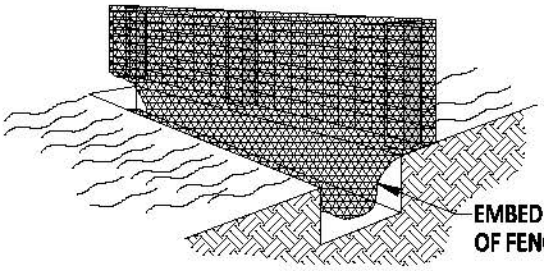
STANDARD DETAIL DRAWINGS



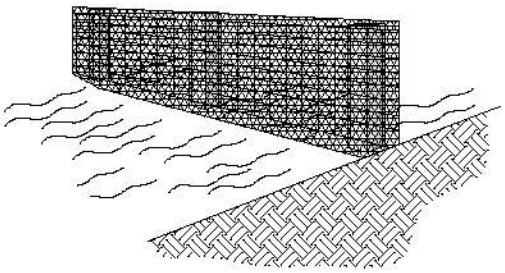
1. SET POSTS AND EXCAVATE A 100 x 100mm TRENCH UPSLOPE FROM AND ALONG THE LINE OF POSTS.



2. STAPLE WIRE FENCING TO THE POSTS.



3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE AND EXTEND IT INTO THE TRENCH.



4. BACKFILL AND COMPACT THE EXCAVATED SOIL.

INSTALLATION PROCEDURE

1. LAY OUT A SUITABLE FENCE LINE AND SET POSTS ALONG IT. ON SLOPES, ALIGN THE FENCE ALONG THE CONTOUR AS CLOSELY AS POSSIBLE. IN SMALL SWALES, CURVE THE FENCE LINE UPSTREAM AT THE SIDES TO DIRECT THE FLOW TOWARD THE MIDDLE OF THE FENCE. THE ENDS SHOULD BE HIGHER THAN THE CENTRE.

   EXCAVATE A TRENCH APPROXIMATELY 100mm DEEP ALONG THE LINE OF THE POSTS AN THE UPHILL SIDE OF THE BARRIER.

2. FASTEN WIRE MESH TO THE UPHILL SIDE OF THE FENCE POSTS, USING HEAVY-DUTY WIRE STAPLES (MIN. 25mm LONG). EXTEND WIRE AT LEAST 150mm INTO THE TRENCH, AND LEAVE APPROXIMATELY 900mm HEIGHT ABOVE THE GROUND. IF EXTRA STRENGTH FABRIC IS USED AND FENCE POST SPACING DOES NOT EXCEED 1.6m, THE WIRE MESH MAY BE OMITTED.

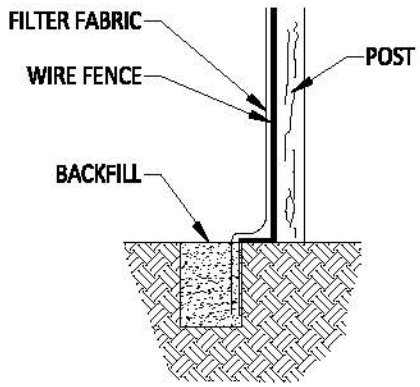
3. FASTEN THE FILTER FABRIC TO THE UPHILL SIDE OF THE FENCE POSTS USING STAPLES OR THE WIRES. EXTEND FABRIC AT LEAST 150mm INTO THE TRENCH, AND LEAVE A MAXIMUM OF 900mm HEIGHT ABOVE THE GROUND. CUT THE FABRIC FROM A CONTINOUS ROLL TO AVOID THE USE OF JOINTS. WHERE JOINTS ARE NECESSARY, SPLICE THE FABRIC AT A POST WITH A MINIMUM 150mm OVERLAP, AND SECURELY FASTEN BOTH SECTIONS TO THE POST.

4. BACKFILL THE TRENCH OVER THE TOE OF THE FABRIC, AND COMPACT THE SOIL TO MEET THE ORIGINAL GRADE.

MATERIALS

FILTER FABRIC
- NICOLAH CONTROL AND CONTROL PLUS
- AMOCO 1380
- NILEX P100 OR AS APPROVED
- EXXON GTF 150
- EXXON GTF 200

WIRE MESH
- MIN. 14 GAUGE STEEL WIRE
- MIN. 150mm MESH SPACING



FENCE POSTS
- WOOD POSTS - MIN 100 x 100 x 1500 LONG
- STEEL POSTS - MIN. 1.97kg/m x 1500 LONG

NOTE
- INSPECT AFTER EVERY RAINFALL
- REMOVE SEDIMENT BEFORE DEPTH REACHES 1/2 HEIGHT OF FENCE
- REPAIR AS REQUIRED

TITLE :

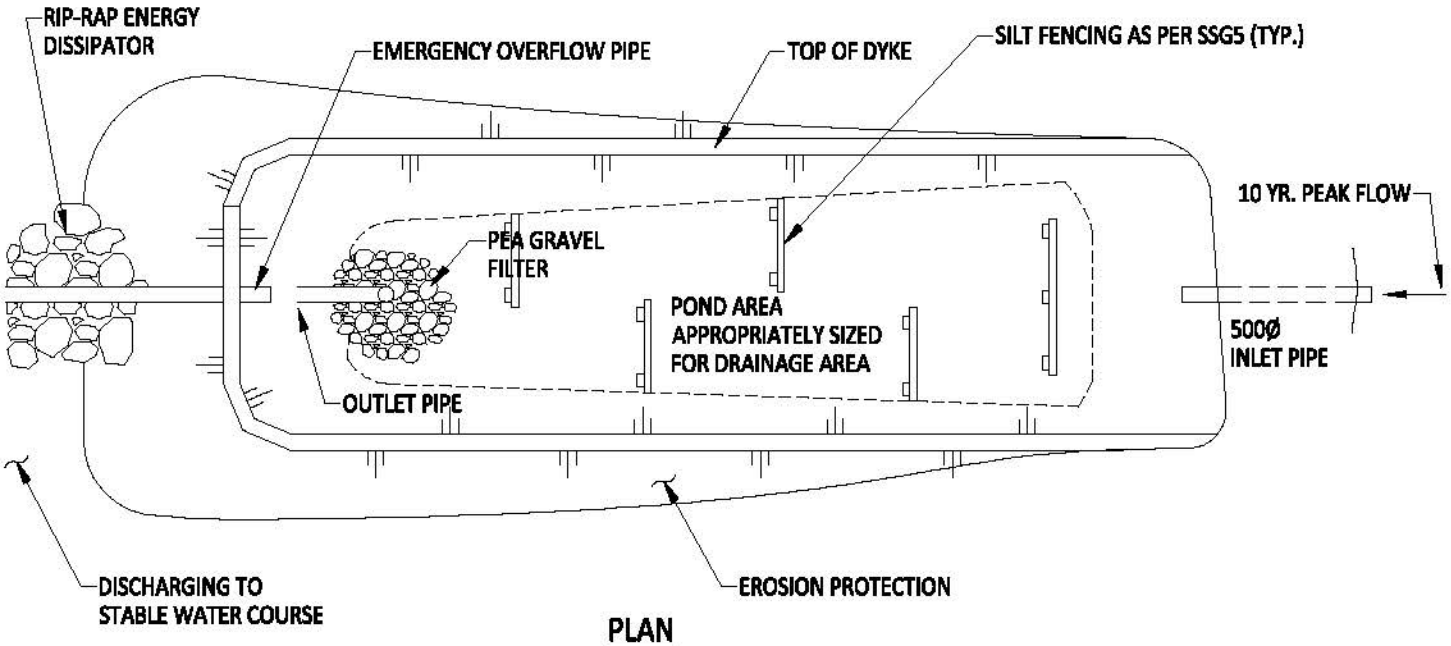
SILT FENCE

DWG. No. :

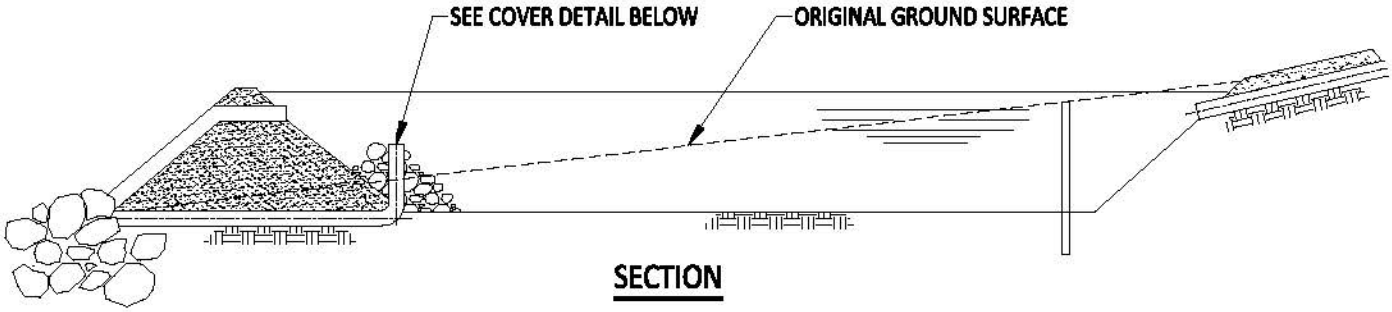
SS-G5

TOWN OF GIBSONS

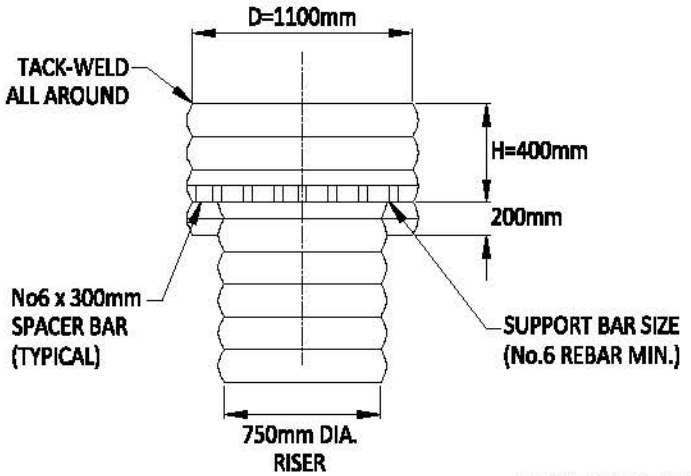
STANDARD DETAIL DRAWINGS

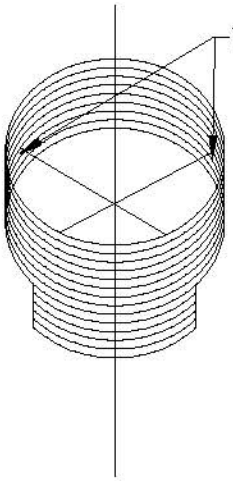


PLAN



SECTION





NOTE:
THE CYLINDER MUST BE FIRMLY FASTENED TO THE TOP OF THE RISER. SUPPORT BARS ARE WELDED TO THE TOP OF THE RISER OR ATTACHED BY STRAPS BOLTED TO TOP OF RISER.

COVER DETAIL

TITLE :

CONCEPTUAL SEDIMENT BASIN LAYOUT

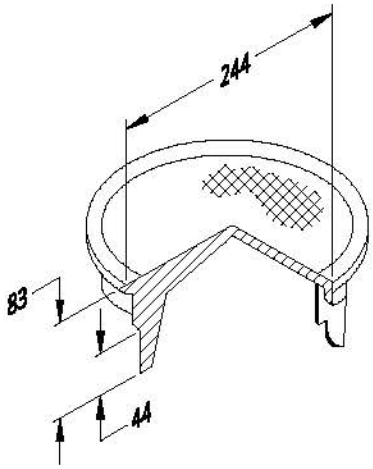
DWG. No. :

SS-G6

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS

No.3-RT CAST IRON
TRAFFIC COVER
WT. - 5.4 kg.



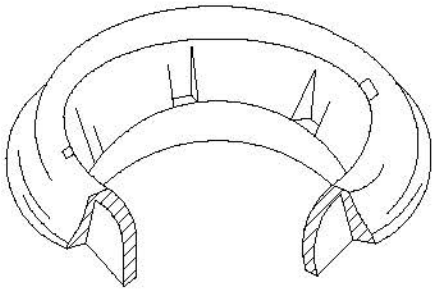
NOTES:

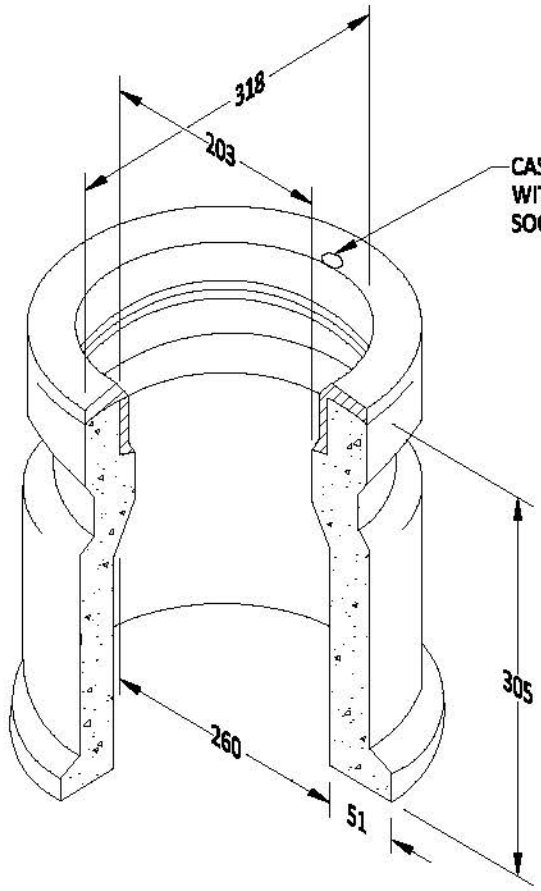
COVER TO BE MARKED "SURVEY MONUMENT".

ALL DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE STATED.

A.E. CONCRETE PRECAST PRODUCTS TYPE OR EQUIVALENT.

No.3-RT CAST IRON
RISER RING
WT. - 7.3 kg.



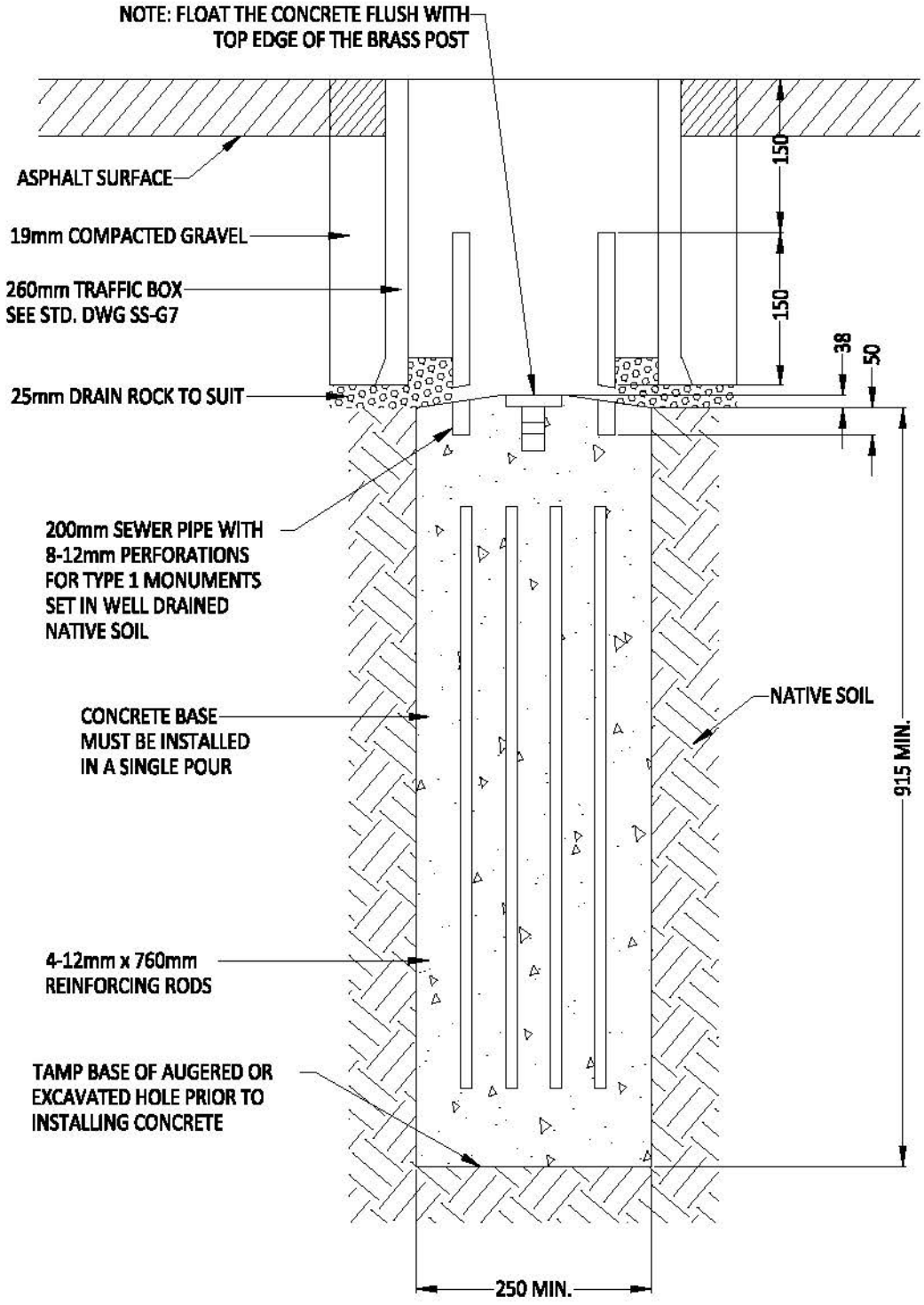


No.3-RT BODY
WT. - 24.9 kg.

TITLE :	DWG. No. :
260ø TRAFFIC BOX	SS-G7

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



TITLE :

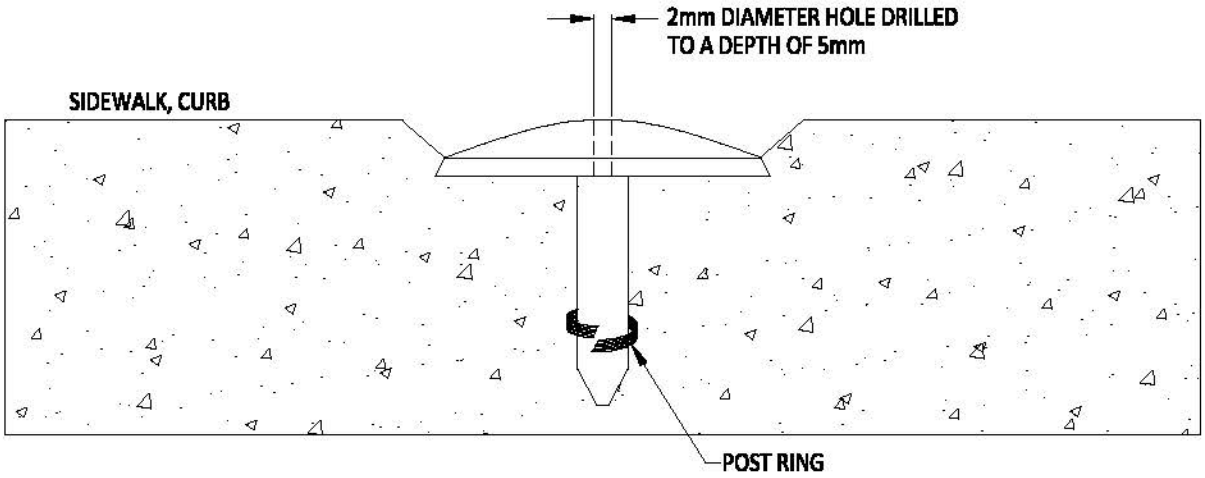
SURVEY MONUMENT IN ROAD

DWG. No. :

SS-G8

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



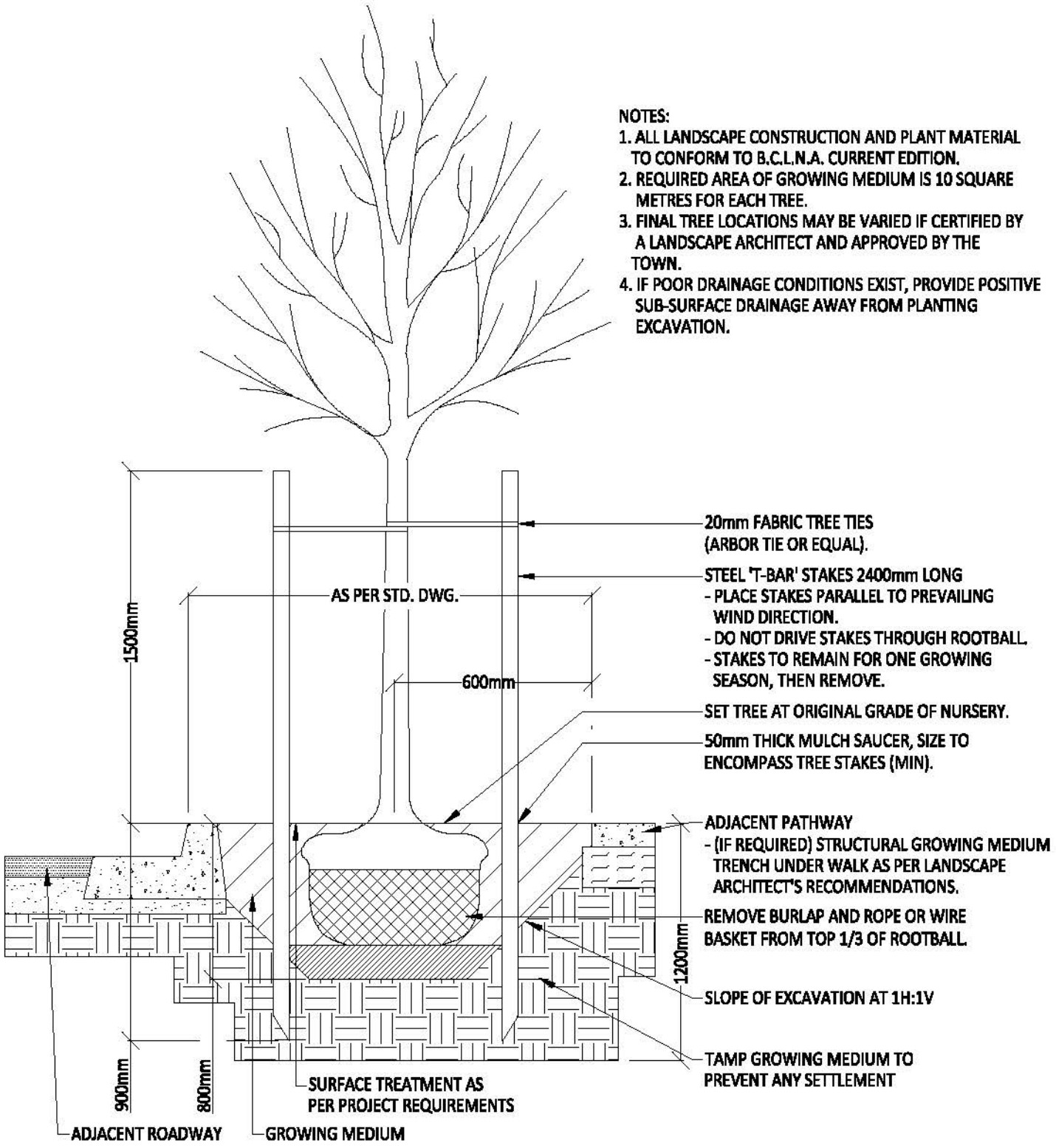
NOTES:

1. 19mm ROCK DRILL REQUIRED TO DRILL HOLE FOR STEM.
2. EDGES OF CAP SHOULD BE FLUSH WITH SURFACE AND COUNTER SUNK BELOW THE SURFACE FOR GUTTER INSTALLATIONS.
3. POST SHOULD BE SET IN FAST SETTING, NON SHRINK GROUT.
4. THE POST SHAFT MUST BE SET VERTICALLY.
5. POST TYPE AND INSTALLATION MAY VARY ACCORDING TO THE SURVEYOR GENERALS SPECIFICATIONS

TITLE :	DWG. No. :
SURVEY MONUMENT IN SIDEWALK OR CURB	SS-G9

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



TITLE :

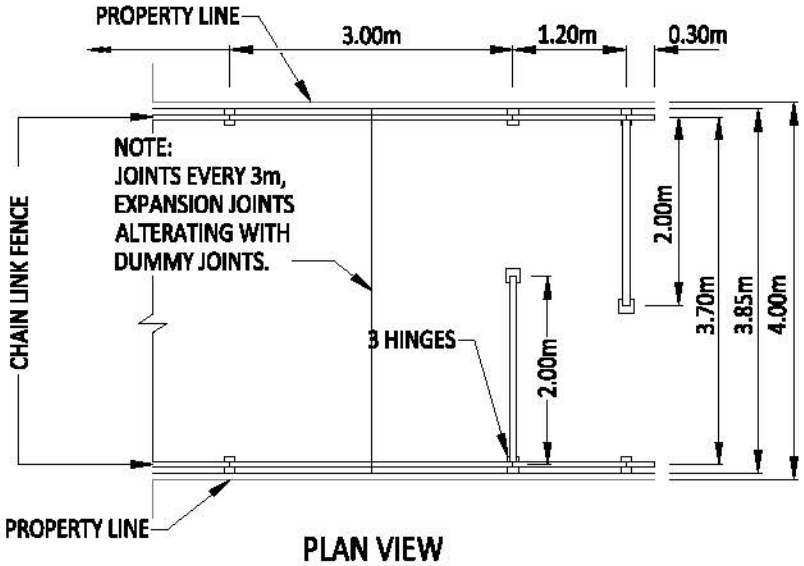
STREET TREE PLANTING DETAIL

DWG. No. :

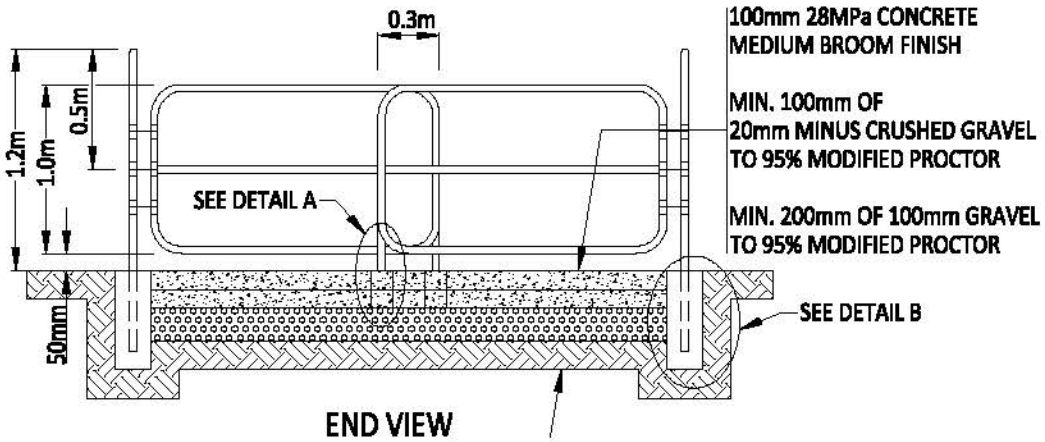
SS-G10

TOWN OF GIBSONS

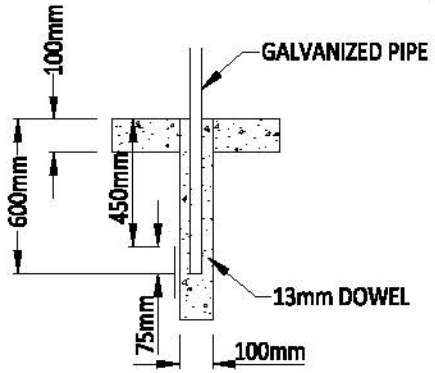
STANDARD DETAIL DRAWINGS



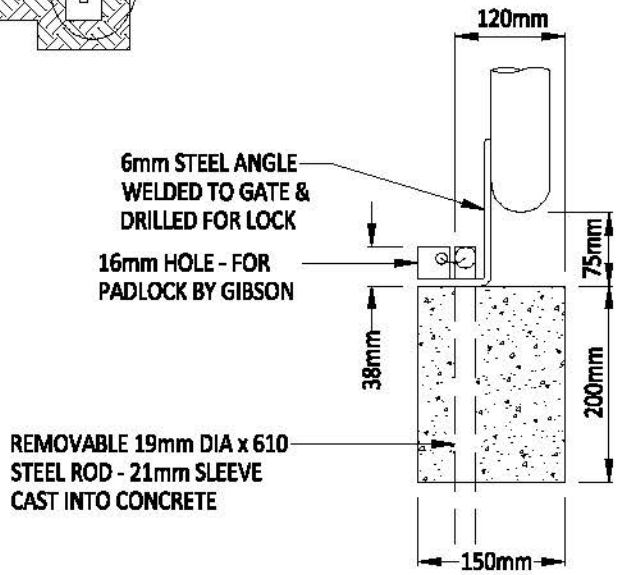
PLAN VIEW



END VIEW



DETAIL B



DETAIL A

NOTES:
1. JOINTS TO BE WELDED AND GROUND SMOOTH.
2. GATES TO BE GALVANIZED AFTER FABRICATION.
3. SWALE TO BE PROVIDED FOR DRAINAGE AS PER STANDARD DRAWING SS-S3

TITLE :

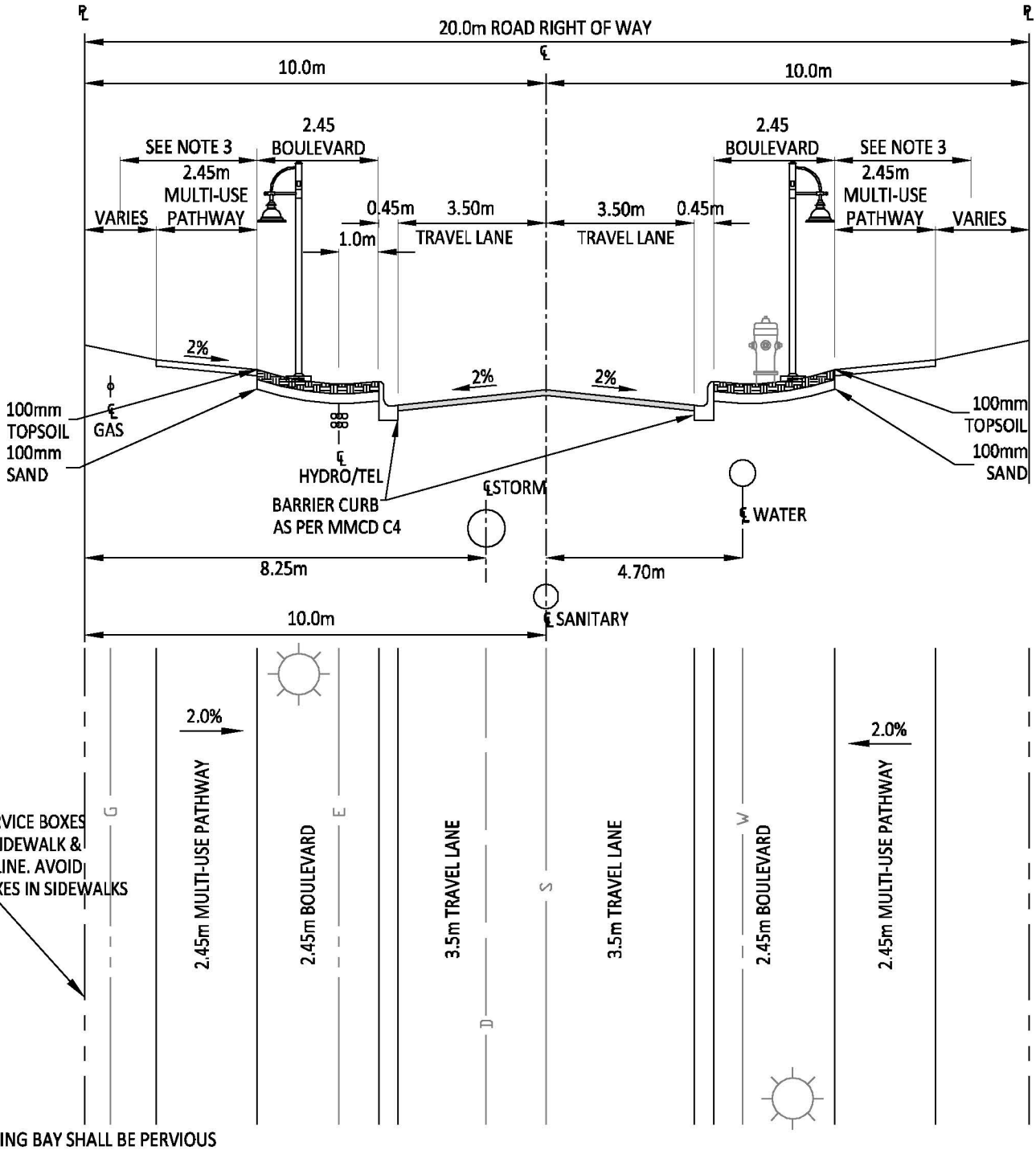
PATHWAY
EMERGENCY ACCESS

DWG. No. :

SS-G11

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



NOTES:

1. PARKING BAY SHALL BE PERVIOUS
2. BOULEVARD LANDSCAPING PER LANDSCAPE PLAN
3. GRADE OF AT SURFACE INFRASTRUCTURE TO BE SET TO PERMIT FUTURE WIDENING OF THE MULTI-USE PATHWAY TO 3.0m.
4. TYPICAL SECTION DOES NOT APPLY TO HWY 101, HWY 101 REQUIRES 1.8m SIDEWALKS, STREETLIGHTS FOR PEDESTRIANS, STREET TREES AND A MIN. WIDTH OF 2.0m FOR BOULEVARDS
5. VERTICAL OBSTRUCTIONS TO BE A MINIMUM OF 0.6m FROM THE EDGE OF THE FUTURE 3.0m WIDE MULTI-USE PATHWAY.

TITLE :

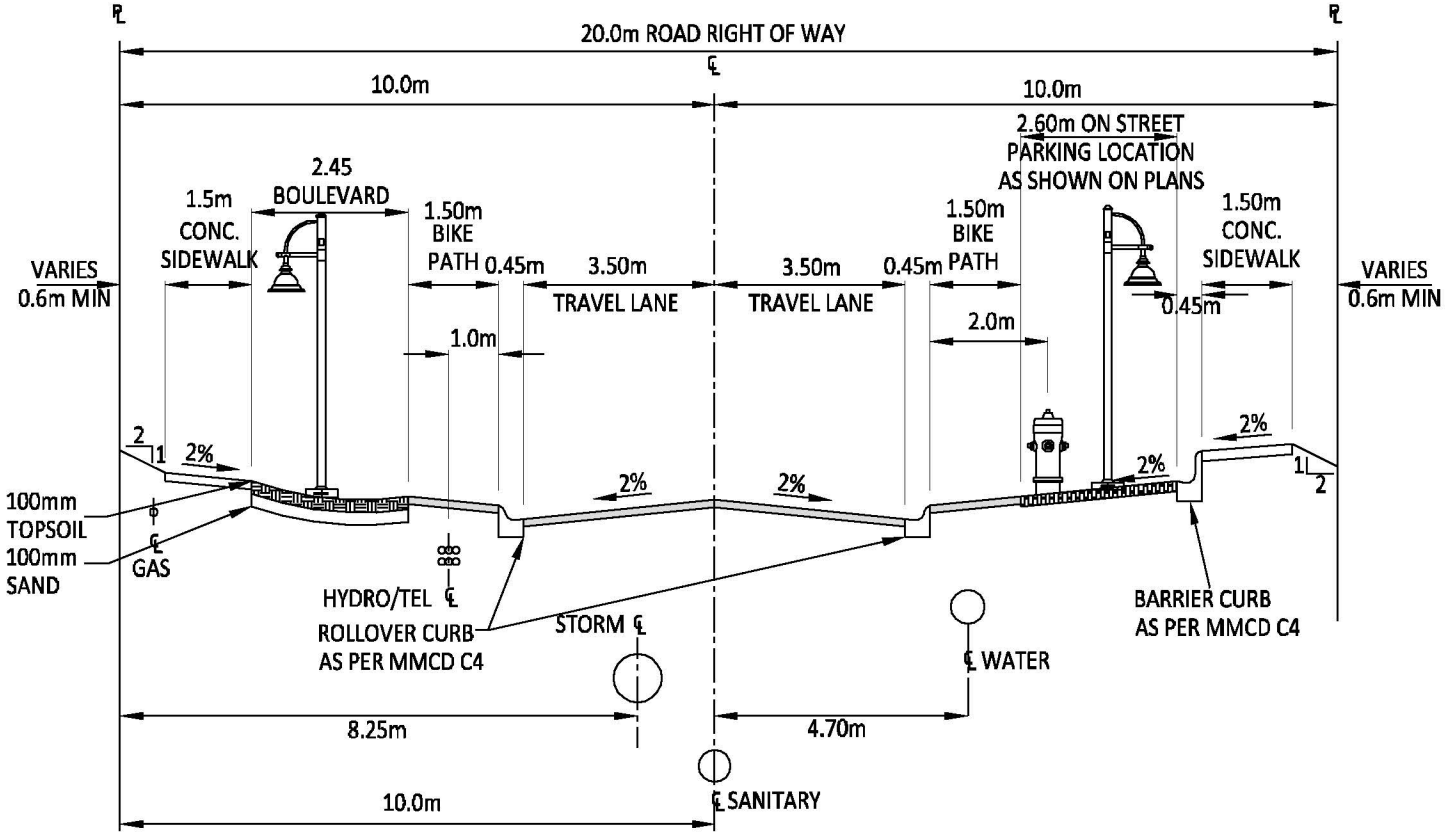
TYPICAL ARTERIAL ROAD

DWG. No. :

SS-R1

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



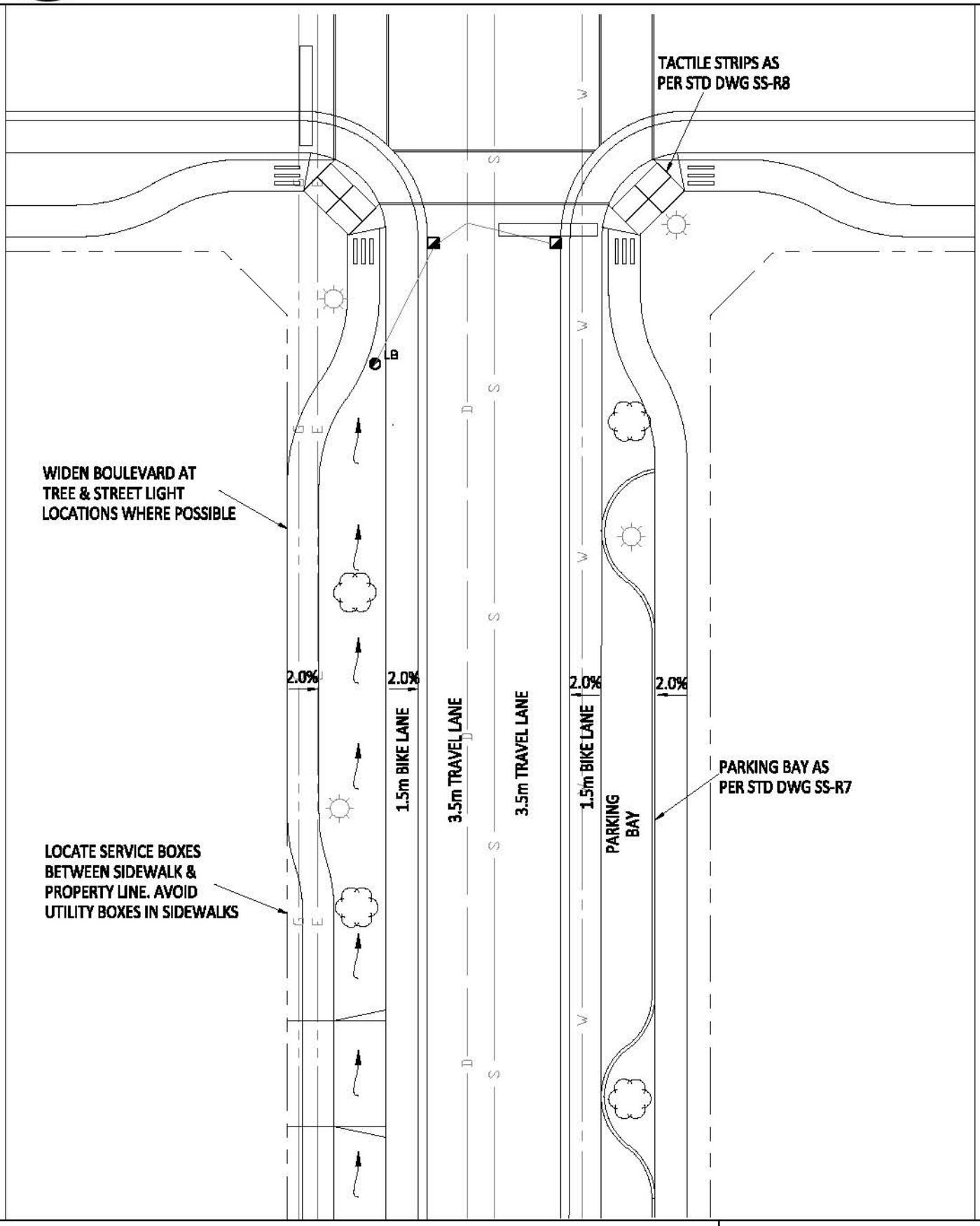
NOTES:

1. PARKING BAY SHALL BE PERVIOUS
2. BOULEVARD LANDSCAPING PER LANDSCAPE PLAN
3. ON SCHOOL ROAD BARRIER CURBS ARE REQ'D AND BIKE LANES TO BE OMITTED

TITLE :	DWG. No. :
TYPICAL TYPE I COLLECTOR ROAD	SS-R2A

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



N.T.S.

TITLE :

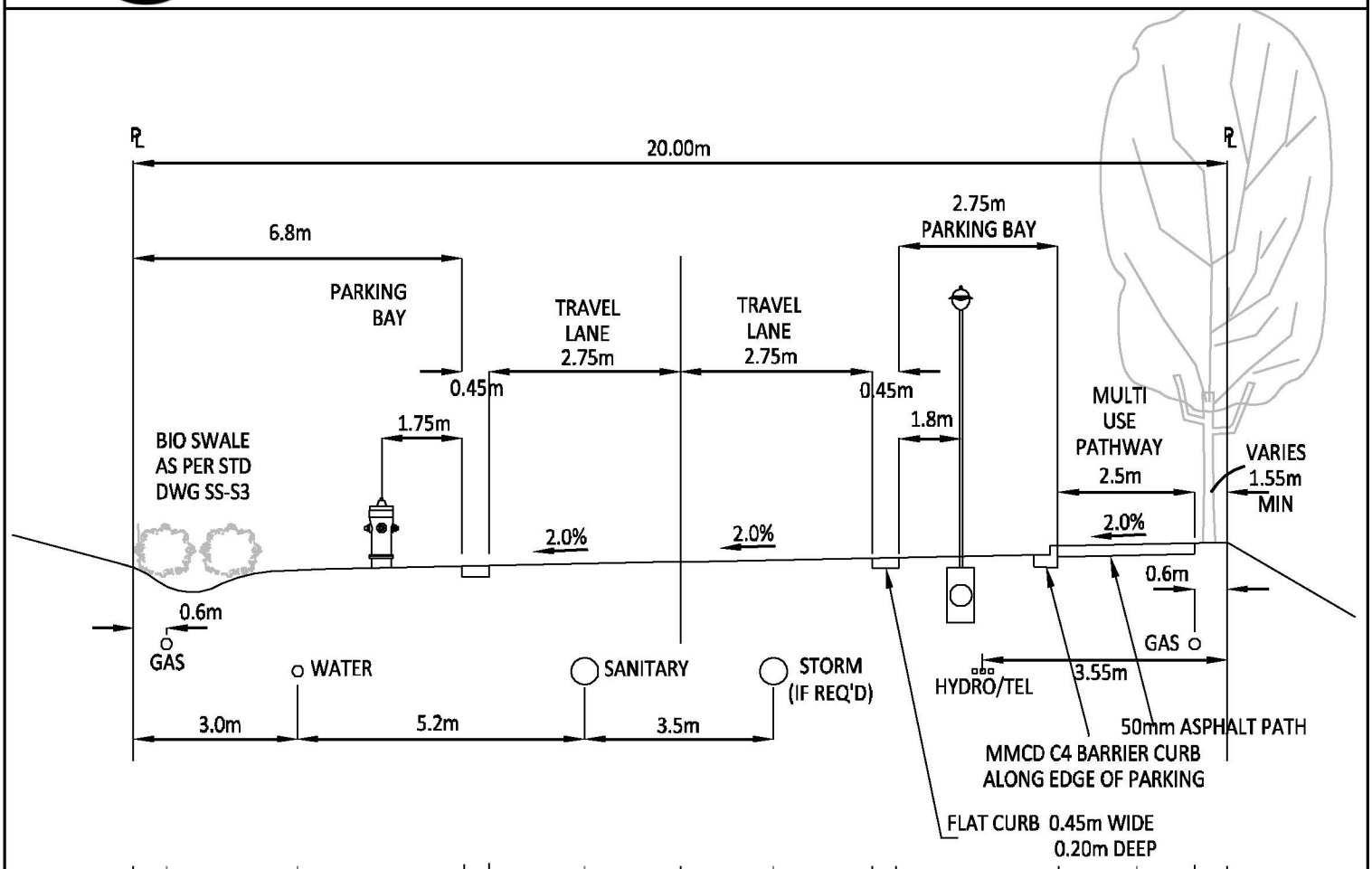
TYPICAL TYPE I COLLECTOR - PLAN VIEW

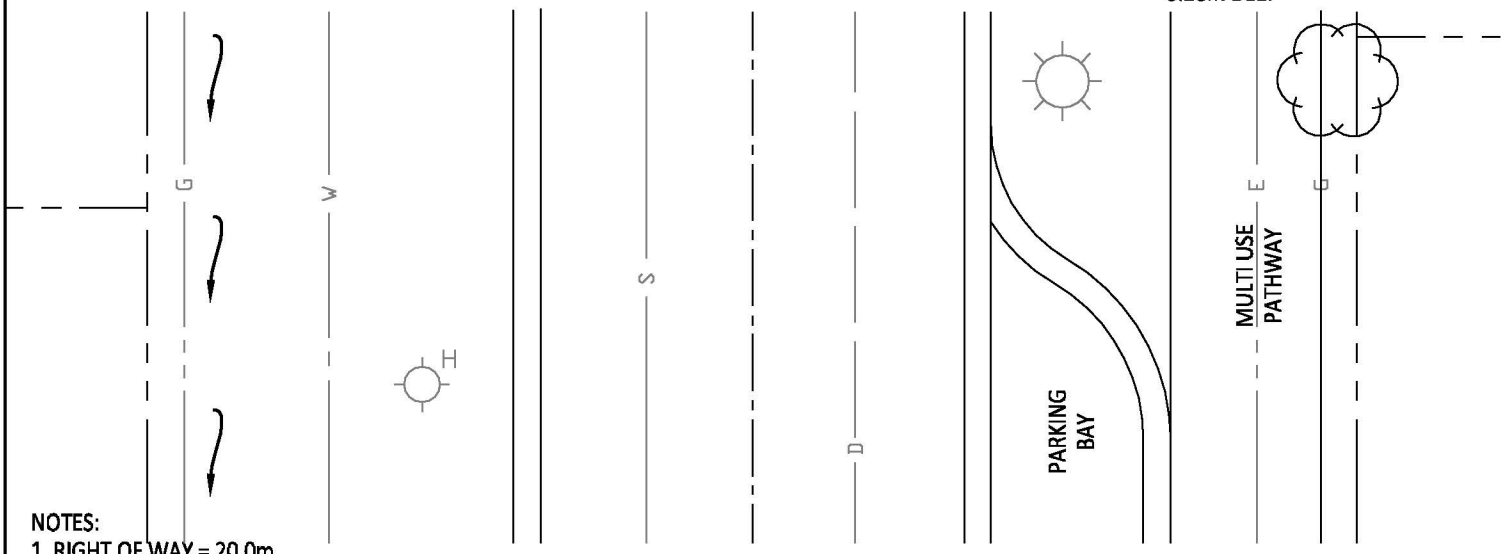
DWG. No. :

SS-R2B

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS





NOTES:

1. RIGHT OF WAY = 20.0m
2. PARKING BAY = ONE PER 3 LOTS (OR AS DIRECTED, HIGHSIDE)
3. PARKING BAY SHALL BE PERVIOUS
4. BOULEVARD LANDSCAPING PER LANDSCAPE PLAN
5. FLAT CURB SLOPED TO BIO-SWALE
6. HYDRO KIOSK SHALL BE OFFSET TO MATCH HYDRANT
7. PEDESTRIAN LIGHTING (IF REQ'D) = 3.3m FROM P/L
8. ASPHALT & CONCRETE BASE & SUBBASE AS PER CONTRACT SPECIFICATIONS

TITLE :

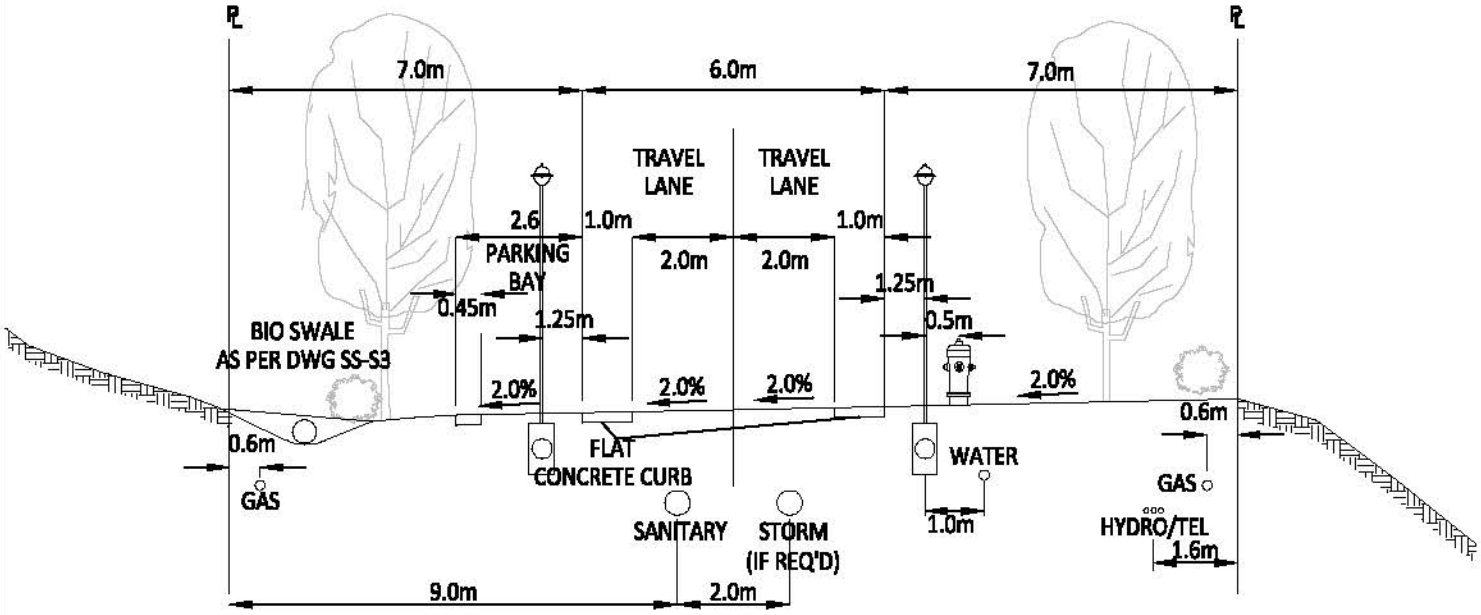
TYPICAL TYPE 2 COLLECTOR ROAD

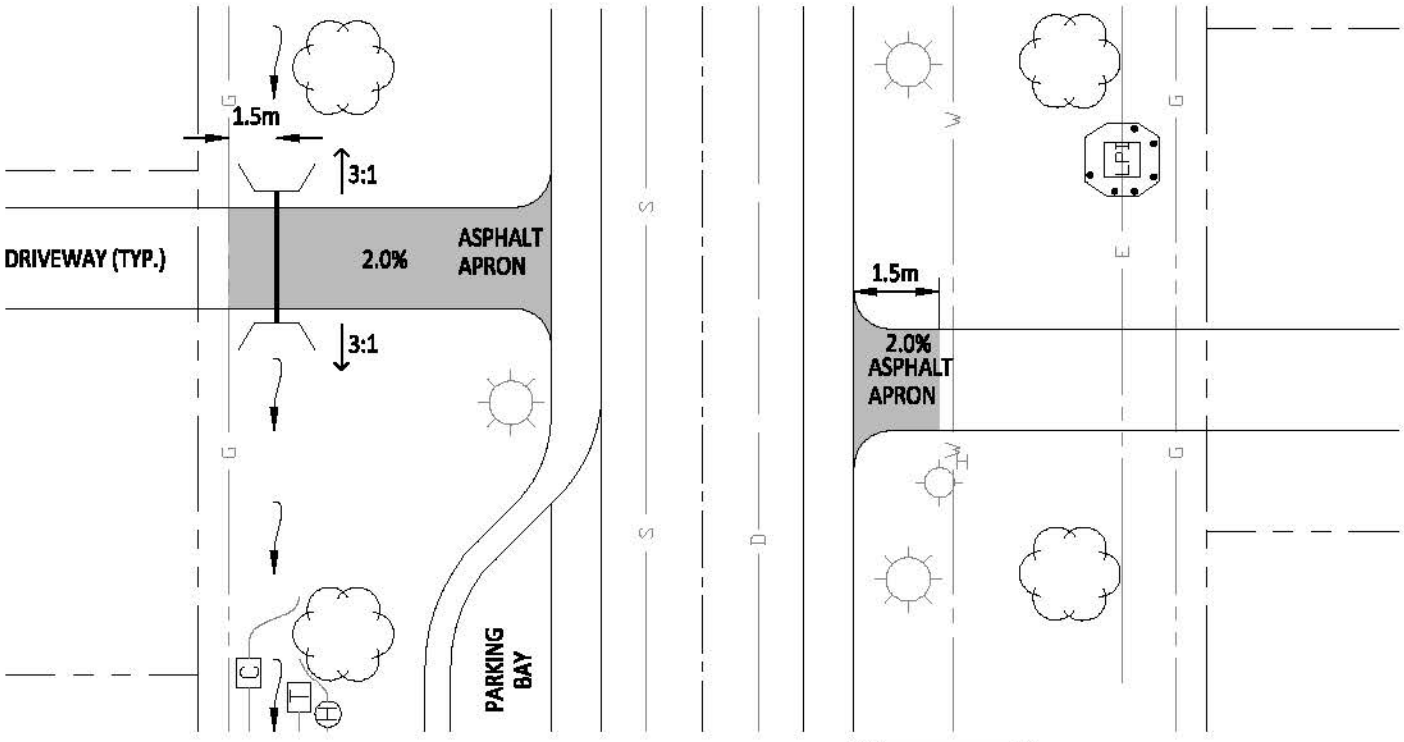
DWG. No. :

SS-R3

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS





NOTES:

1. RIGHT OF WAY = 20.0m
2. PARKING BAY = ONE PER 3 LOTS (OR AS DIRECTED)
3. PARKING BAY SHALL BE ASPHALT
4. BOULEVARD LANDSCAPING PER LANDSCAPE PLAN
5. FLAT CURB SLOPED TO BIO-SWALE
6. SWALE LOCATED ON HIGH SIDE OF ROAD

N.T.S.

TITLE :

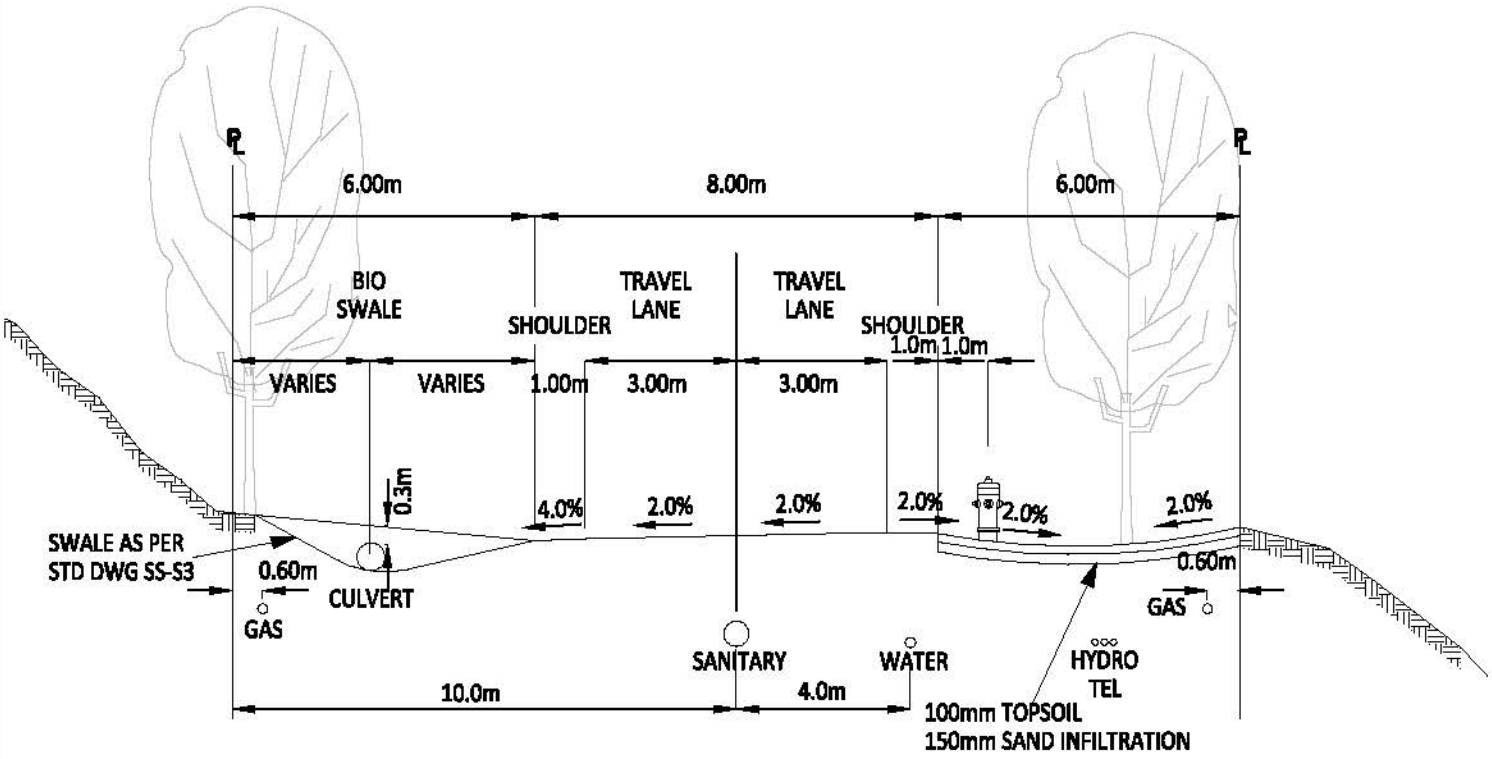
TYPICAL TYPE I LOCAL ROAD

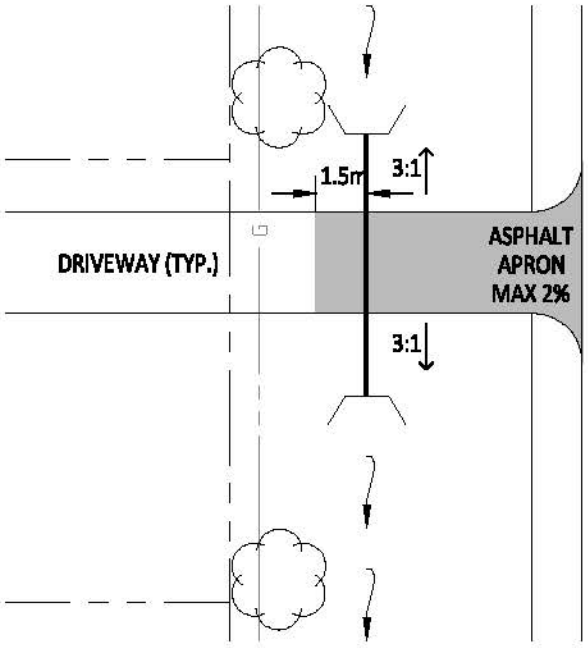
DWG. No. :

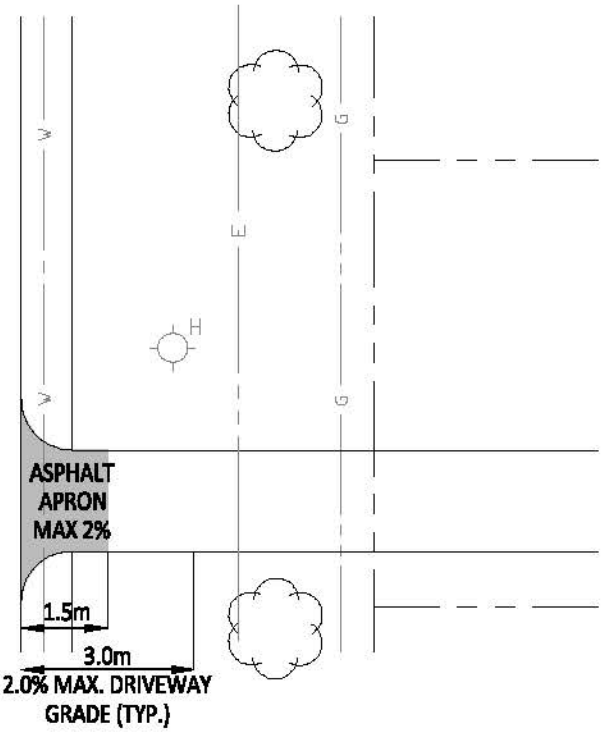
SS-R4

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS







NOTES:

1. RIGHT OF WAY = 20.0m
2. SHOULDER SHALL BE PERVIOUS
3. SWALE LOCATED ON HIGH SIDE OF ROAD

TITLE :

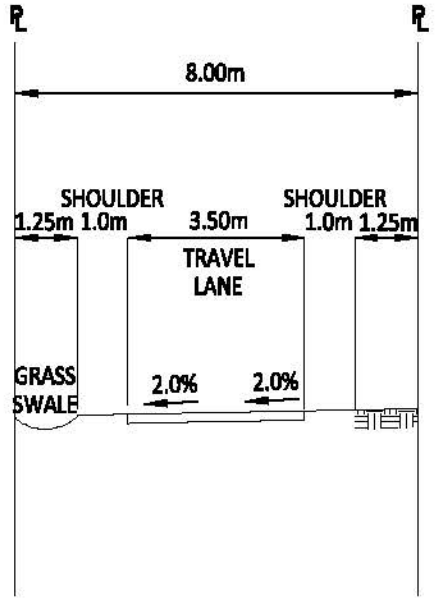
TYPICAL TYPE 2 LOCAL ROAD

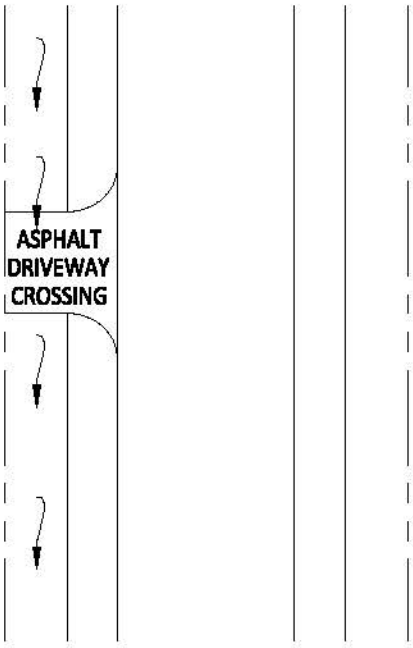
DWG. No. :

SS-R5

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS





NOTES:
1. 75mm ASPHALT THICKNESS

TITLE :

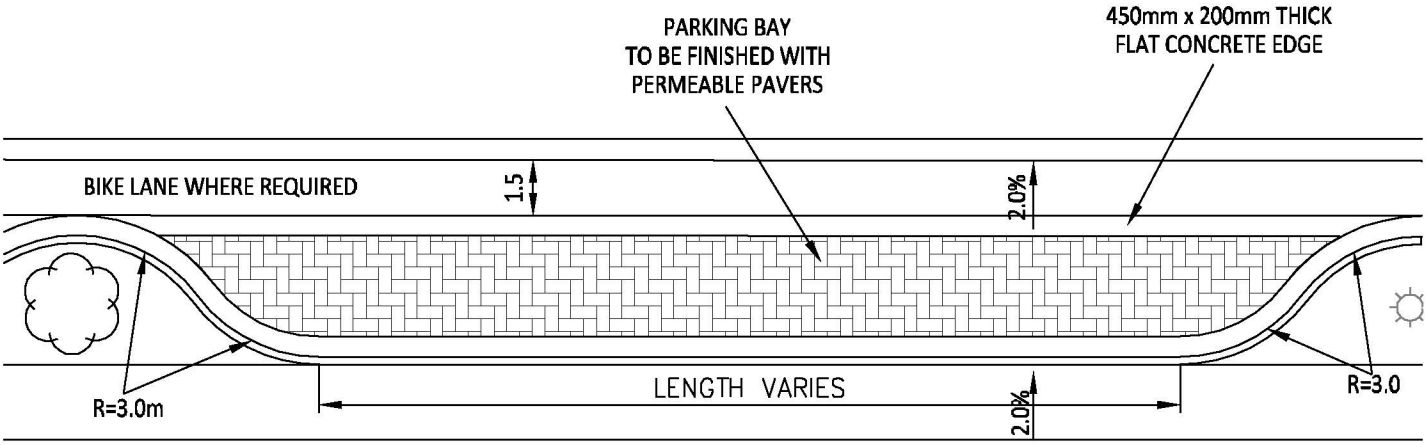
LANE

DWG. No. :

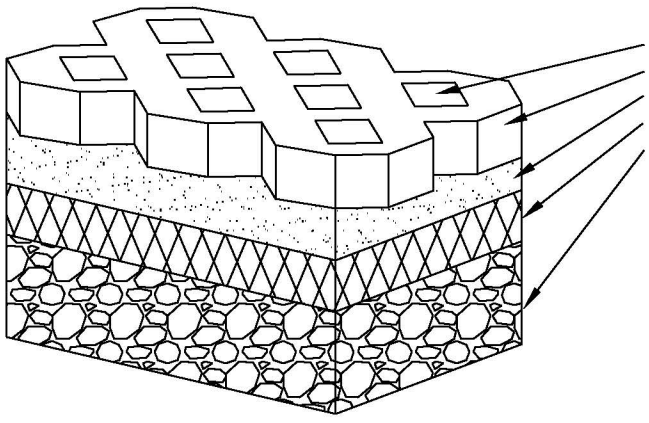
SS-R6

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



PLAN VIEW



1. ABBOTSFORD CONCRETE PRODUCTS GRASS GRID
2. FILL VOIDS WITH TOPSOIL AND SEED
3. 100mm WASHED SAND
4. 100mm – 25mm MINUS CRUSHED GRAVEL BASE COURSE
5. 250mm – 75mm MINUS SELECT GRANULAR SUB BASE COURSE.

ALL MATERIALS COMPACTED TO 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY

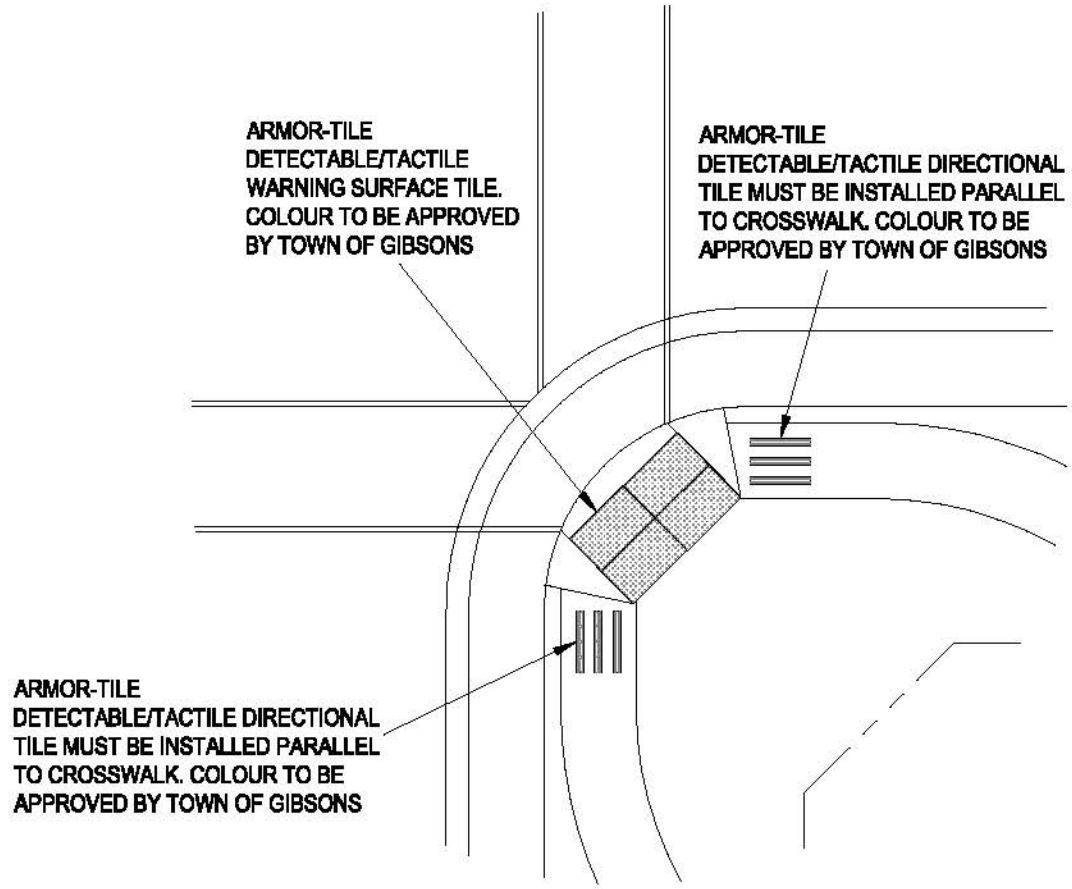
PERMEABLE CONCRETE PAVERS

N.T.S.

TITLE :	DWG. No. :
PARKING BAY	SS-R7

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



1. REQUIRED ON ALL ARTERIAL AND URBAN COLLECTOR INTERSECTIONS

N.T.S.

TITLE :

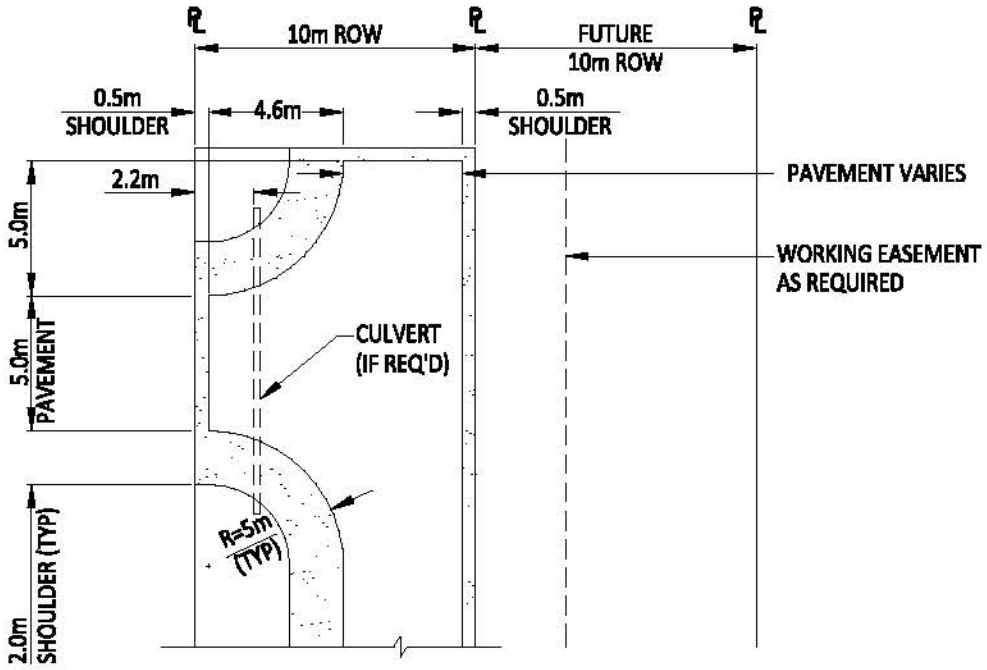
TACTILE WARNING STRIPS

DWG. No. :

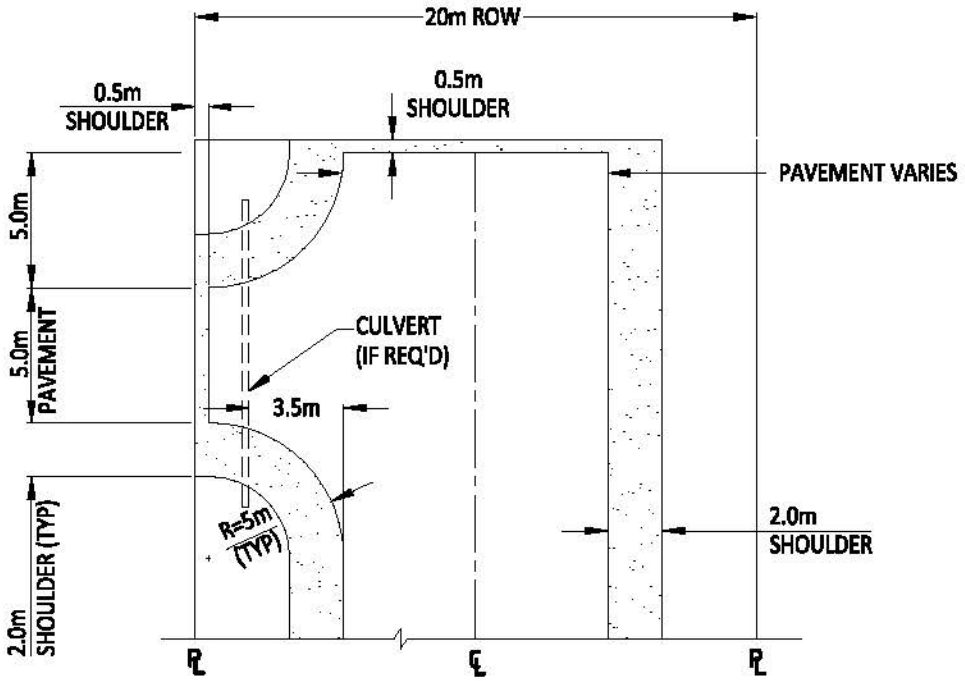
SS-R8

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



HALF ROAD



FULL ROAD

TITLE :

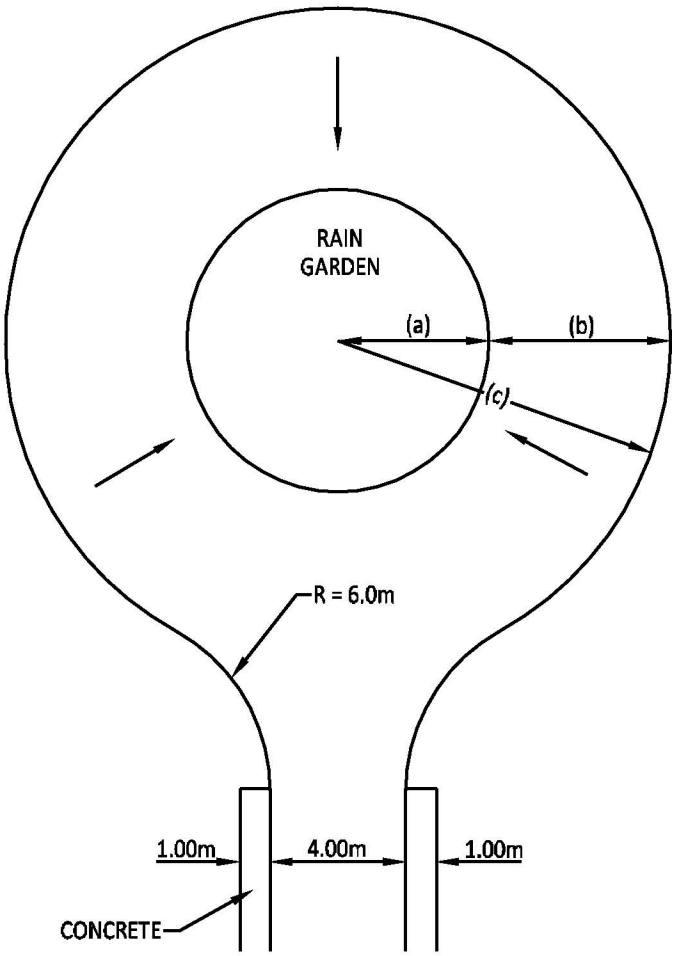
HAMMERHEAD TURNAROUND

DWG. No. :

SS-R9

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



NOTES:

CONNECT BIO-SWALE TO
RAIN GARDEN IF NECESSARY

WITH RAIN GARDEN:
TYPICAL LOCAL
a = 5.0m
b = 6.0m

WITHOUT RAIN GARDEN:
TYPICAL LOCAL
c = 11.0m*

c = 11.5m FOR
NON-RESIDENTIAL

N.T.S.

TITLE :

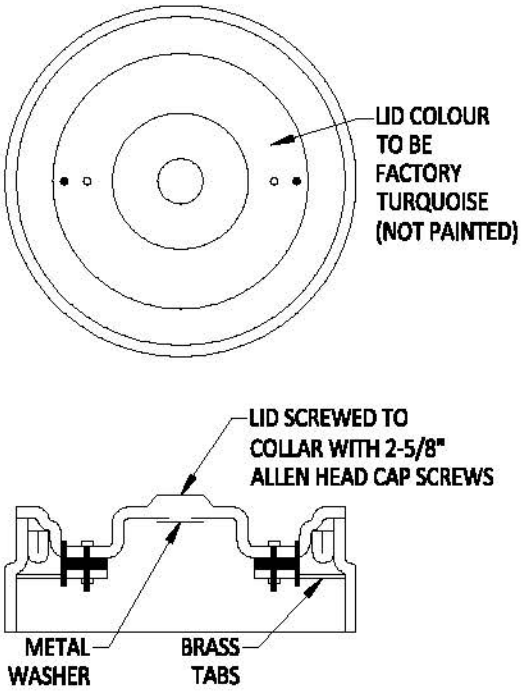
TYPICAL CUL DE SAC BULB

DWG. No. :

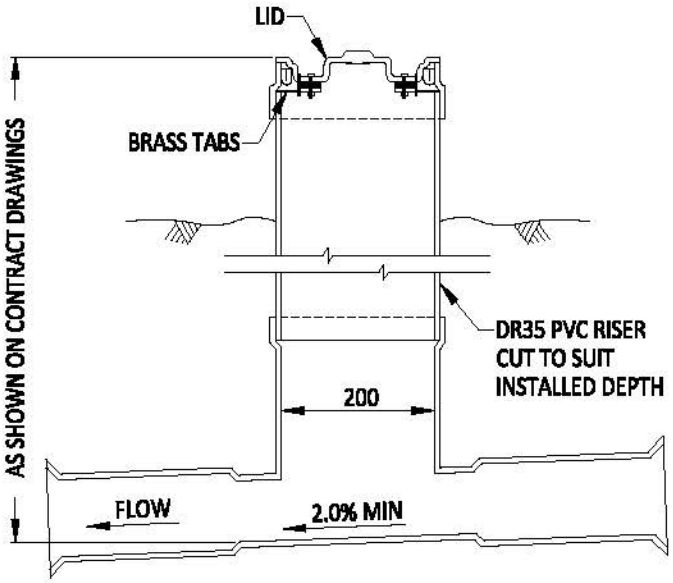
SS-R10

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS

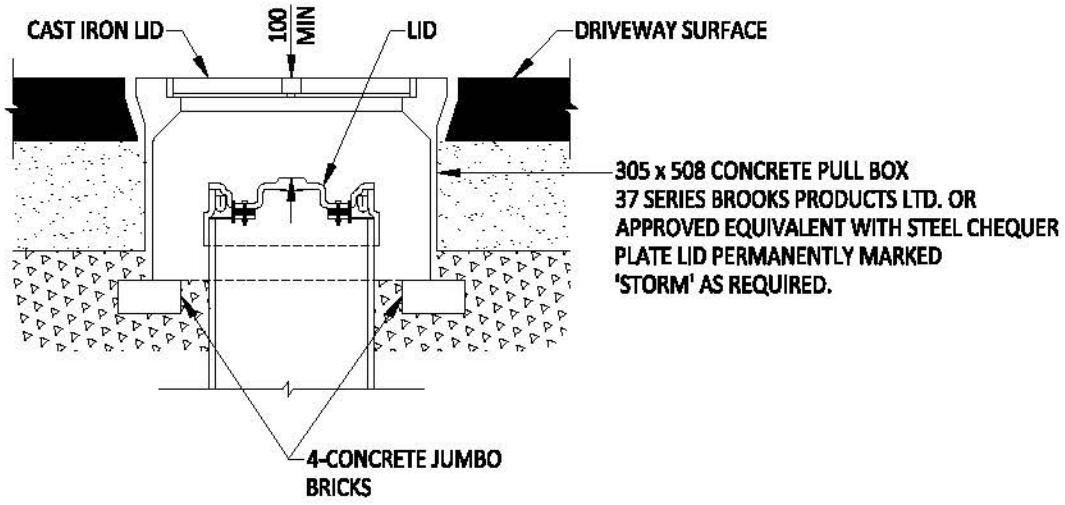


LID DETAIL



INSTALLATION IN BOULEVARD

(AT LOCATIONS GREATER THAN 1.5m FROM ANY DRIVING SURFACE)



INSTALLATION IN DRIVEWAY AND WITHIN 1.5m OF ANY DRIVING SURFACE

NOTE:

1. INSPECTION CHAMBER TO BE APPROVED MANUFACTURED FITTING.
2. REFER TO CONTRACT DRAWINGS FOR SITE SPECIFIC DIMENSIONS AND MMCD SECTION 02731 FOR DETAILED SPECIFICATIONS.

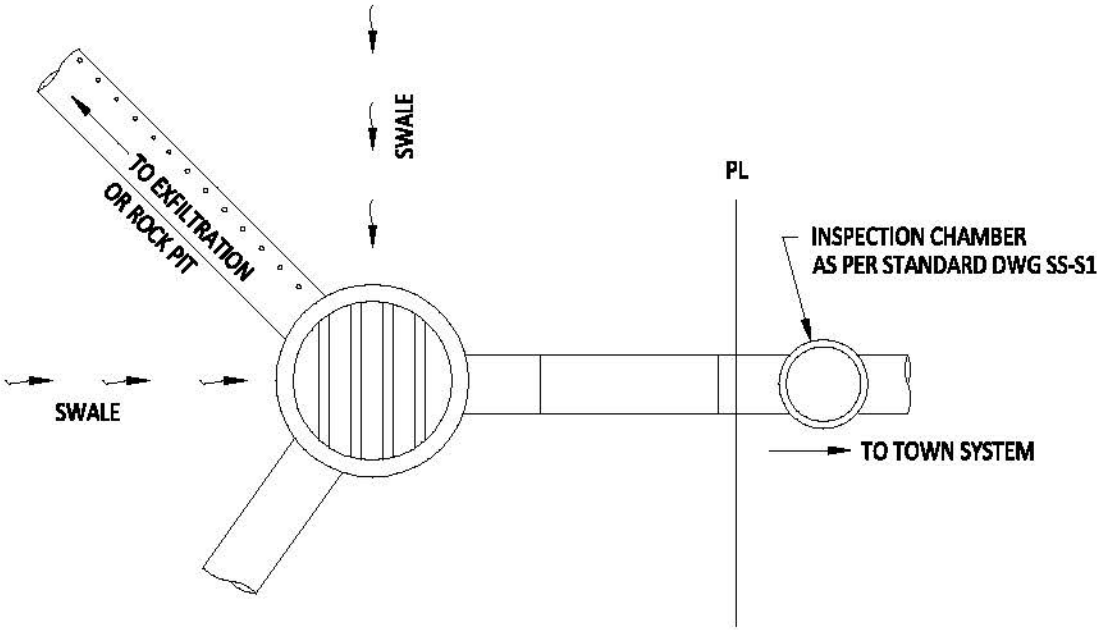
TITLE : INSPECTION CHAMBER FOR 100 TO 200 STORM SEWER CONNECTIONS

DWG. No. : SS-S1

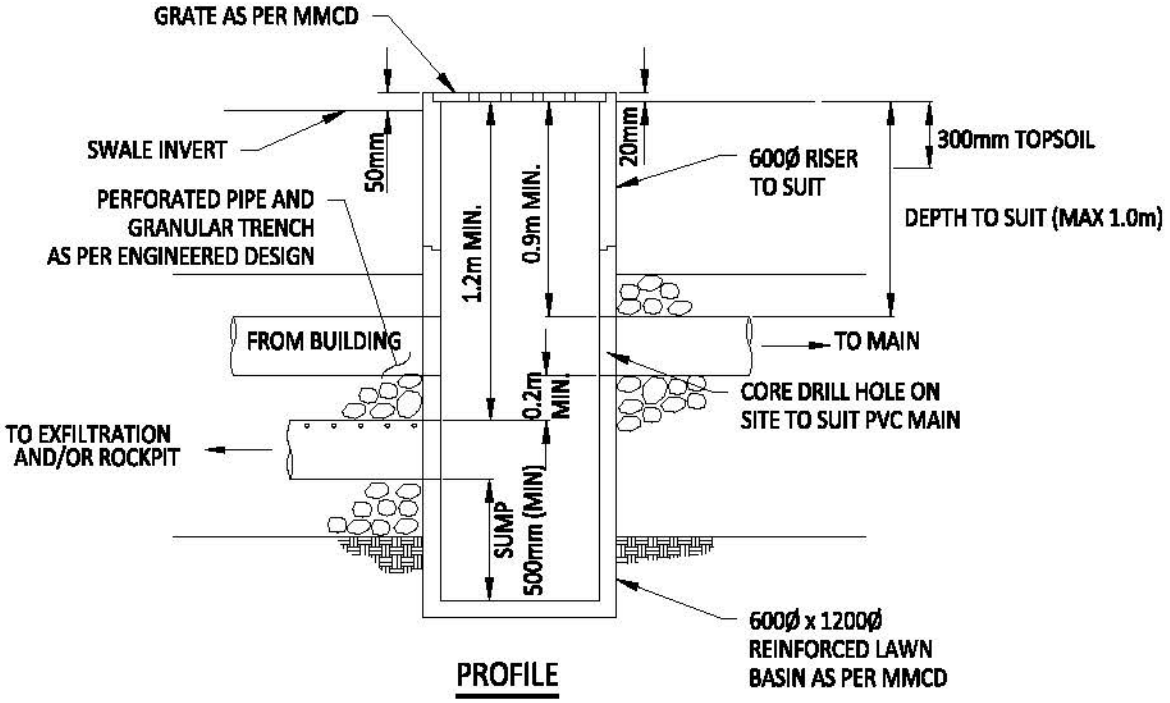
TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS

SEE ALSO FIG 4-8 ISMP



PLAN



PROFILE

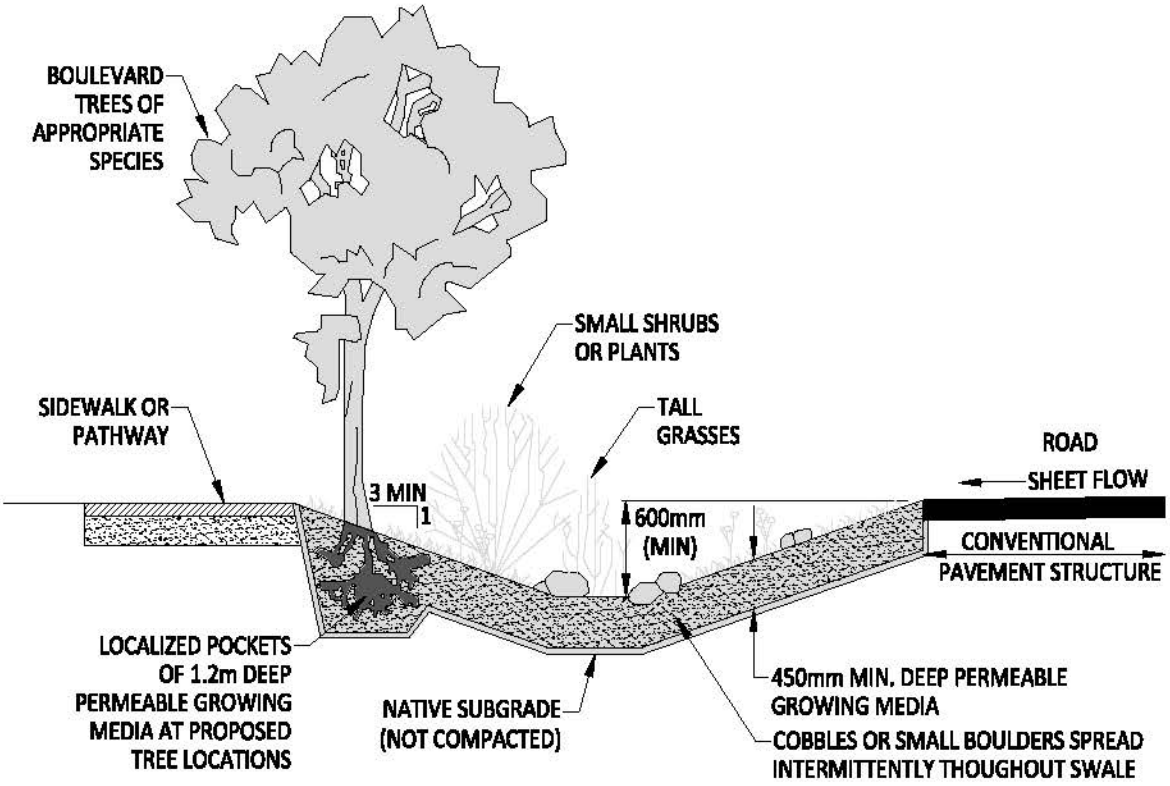
NOTES:

1. LAWN BASINS SHALL BE SPACED AT MAXIMUM 50 METERS.
2. REFER TO DRAWING SS-G4 FOR DETAILS OF PERFORATED DRAIN.

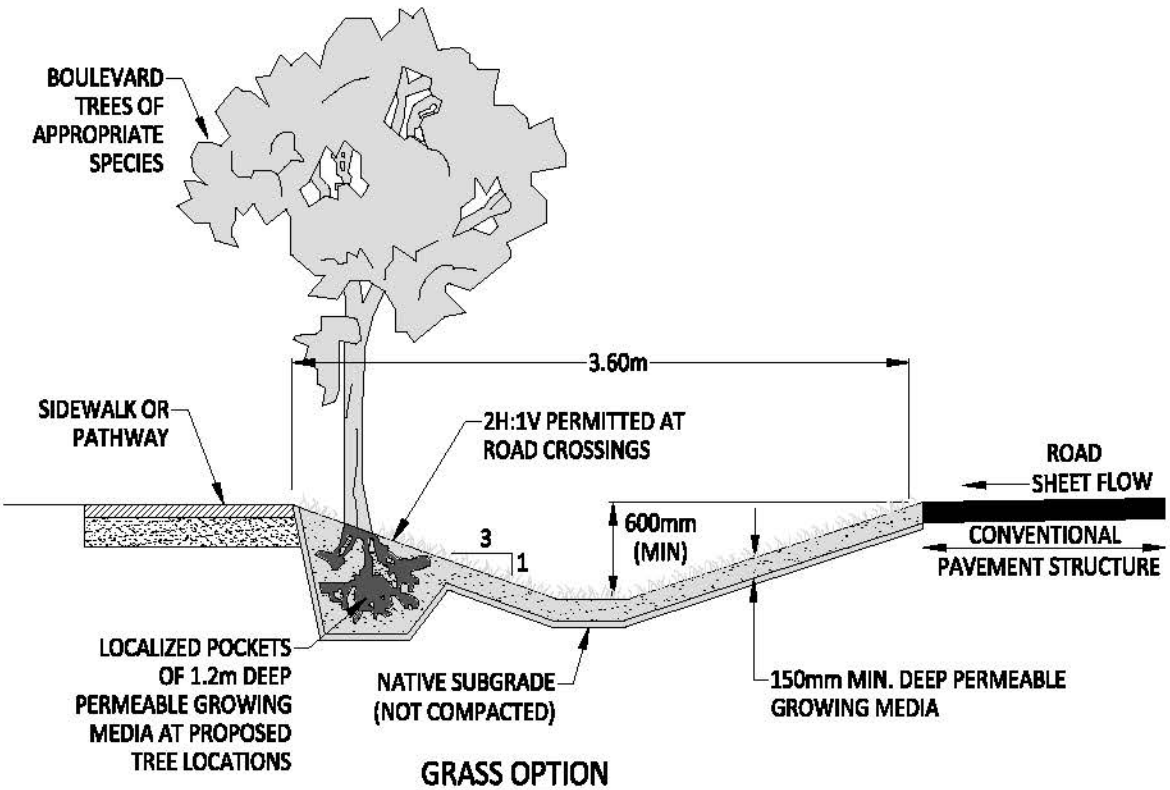
TITLE :	DWG. No. :
TYPE II LAWN BASIN	SS-S2

TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



ORNAMENTAL LANDSCAPE OPTION



GRASS OPTION

TITLE :

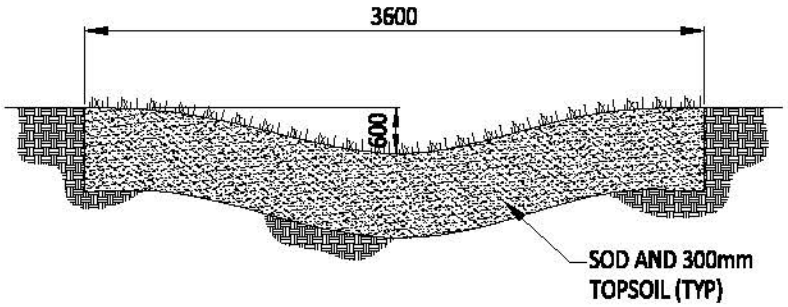
BIOFILTRATION SWALE

DWG. No. :

SS-S3

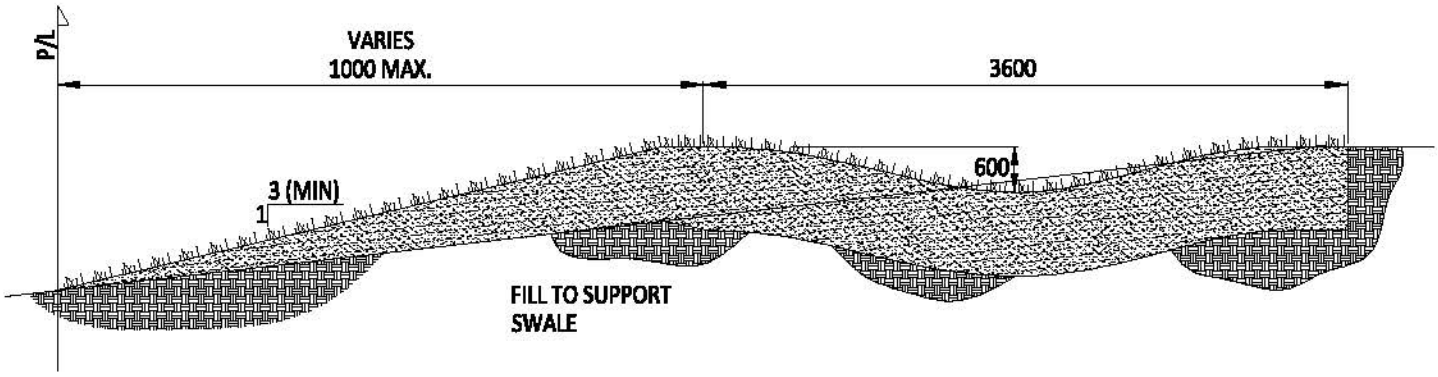
TOWN OF GIBSONS

STANDARD DETAIL DRAWINGS



NOTE:
1. SWALE TYPICALLY CENTRED ON 3.0m R.O.W.
2. SOD TO BE PLACED ON 300mm TOPSOIL.
3. ALL DIMENSIONS SHOWN ARE MILLIMETERS UNLESS OTHERWISE STATED.

TYPE 'A'



NOTE:
1. EASEMENT OR STATUTORY RIGHT OF WAY WIDTH AS REQUIRED TO SUPPORT PROPOSED SWALE.

TYPE 'B'

TITLE :

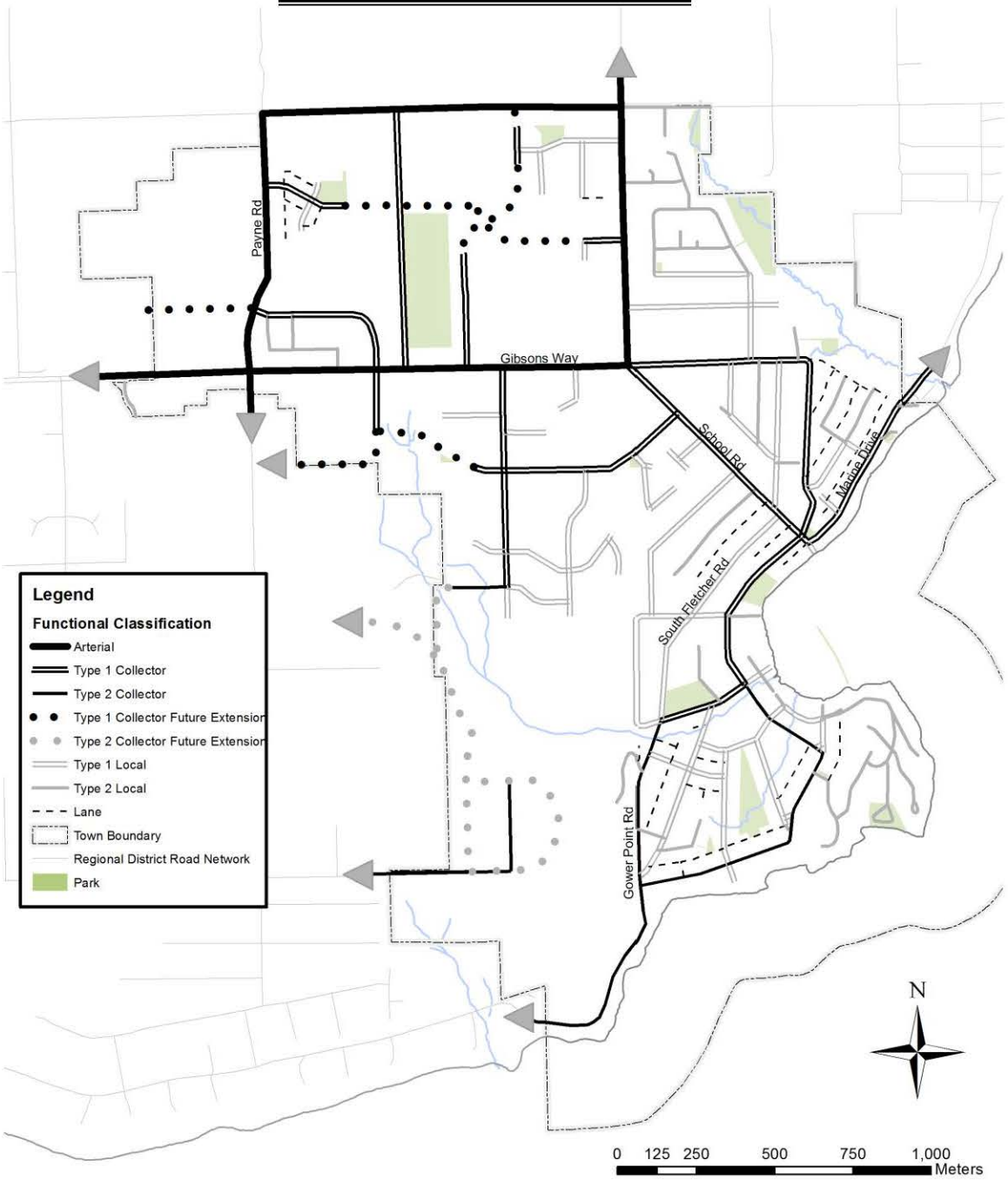
ON-SITE SWALE

DWG. No. :

SS-S4

~SCHEDULE E~

ROAD CLASSIFICATIONS



Disclaimer:
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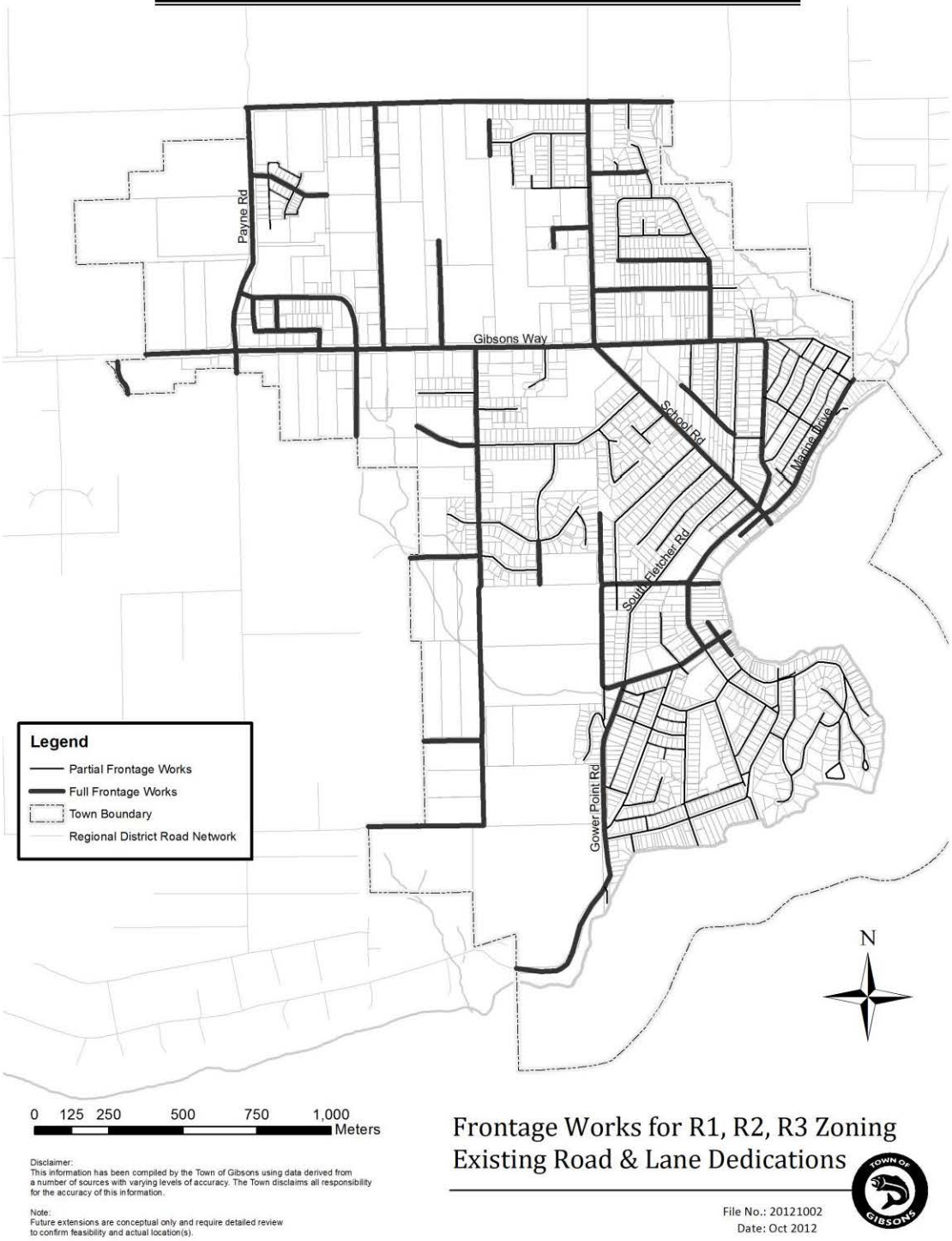
Note:
Future extensions are conceptual only and require detailed review to confirm feasibility and actual location(s).

Road Network

File No.: 20120404
Date: April 2012

~SCHEDULE F ~

FRONTAGE WORKS
EXISTING ROAD & LANE DEDICATIONS



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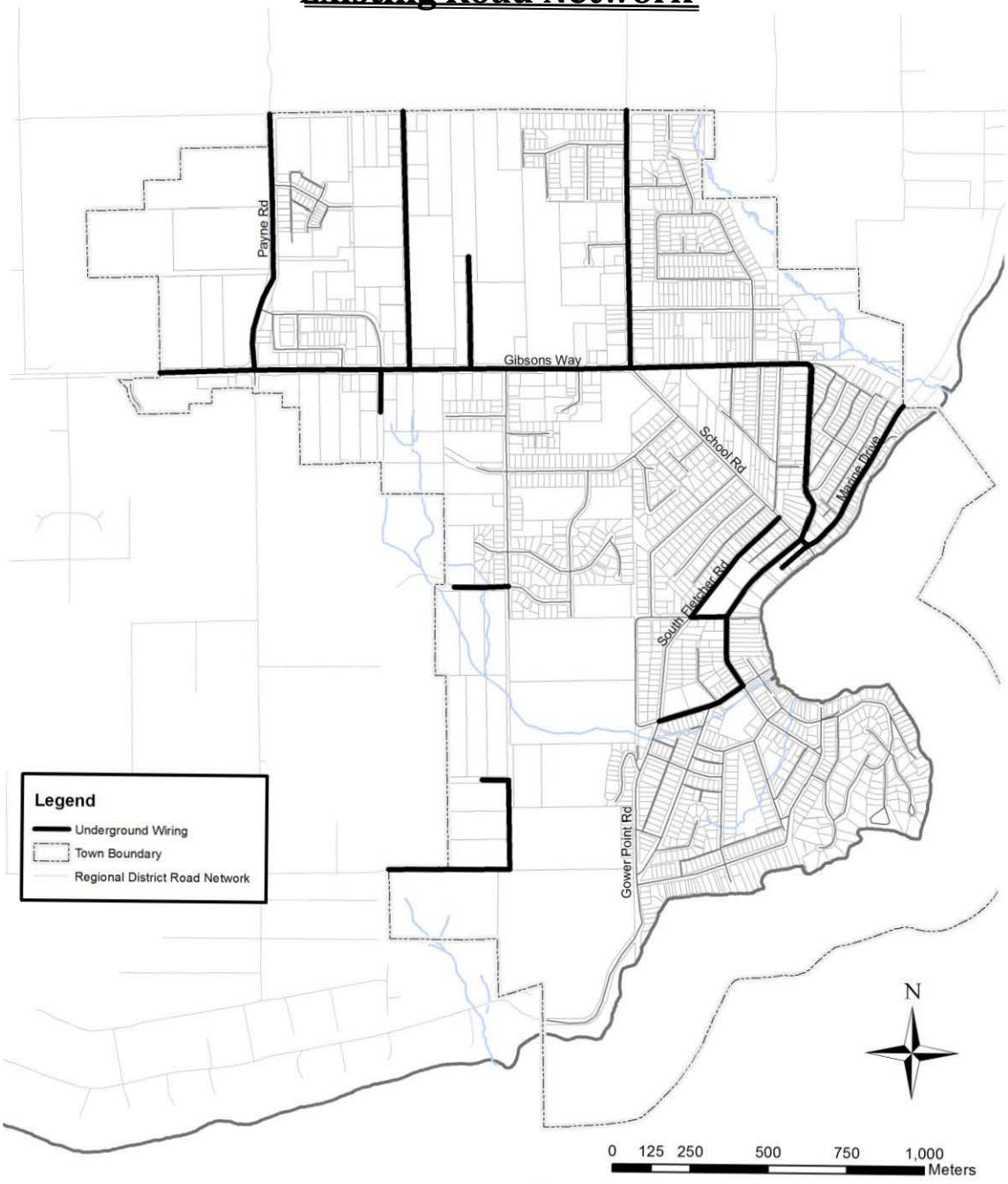
Frontage Works for R1, R2, R3 Zoning
Existing Road & Lane Dedications

File No.: 20121002
Date: Oct 2012

~SCHEDULE G~

Underground Wiring
Existing Road Network



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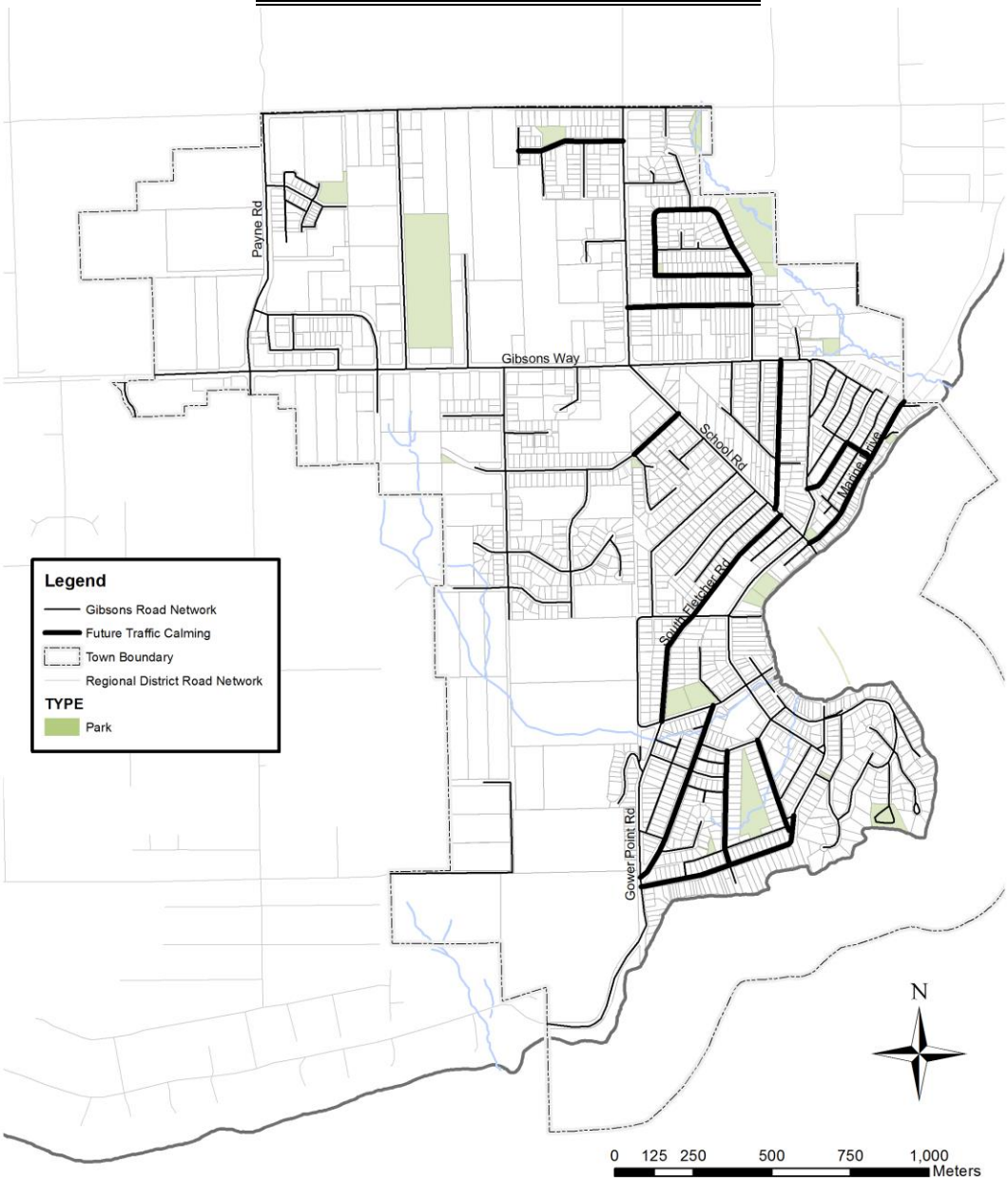
Underground Wiring
Existing Road Network

File No.: 20120905
Date: Sept 2012

~SCHEDULE H~

TRAFFIC CALMING LOCATIONS
EXISTING ROAD NETWORK



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Traffic Calming Locations
on Existing Road Network

File No.: 20120407
Date : April 2012

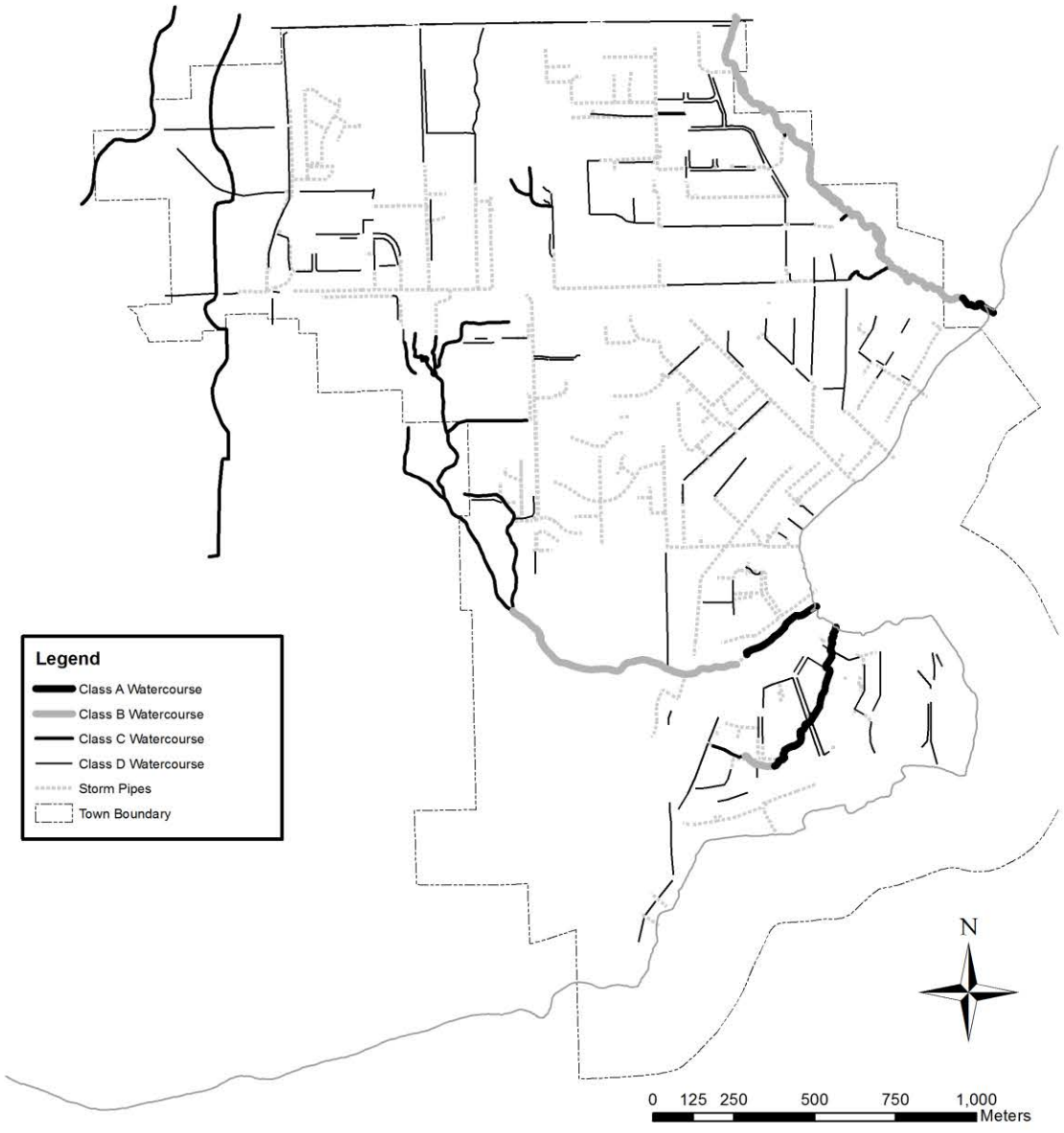
~SCHEDULE I~

TRAFFIC CALMING DEVICES

Traffic Calming Device	Typical Use
Chicanes	Managing Traffic
Chokers	Managing Traffic
Crossing islands or short medians	Pedestrian Crossing Conditions
Curb bulbs	Pedestrian Crossing Conditions
Diverters	Managing Traffic
Gateway treatments	Pedestrian Crossing Conditions
Limited access	Managing Traffic
Medians	Managing Traffic
Neighborhood speed watch program	Managing Traffic
On-Street parking (parallel, angle and perpendicular)	Conditions Along Streets
Pedestrian districts (woonerfs)	Pedestrian Crossing Conditions
Raised crosswalks	Pedestrian Crossing Conditions
Raised intersections	Managing Traffic
Signs	Managing Traffic
Speed humps/cushions/bumps	Managing Traffic
Speed limit reduction	Managing Traffic
Streetscape improvements (Street trees, lighting, Street furniture, special paving treatments)	Conditions Along Streets
Traffic circles	Managing Traffic

~SCHEDULE J~

WATERCOURSES



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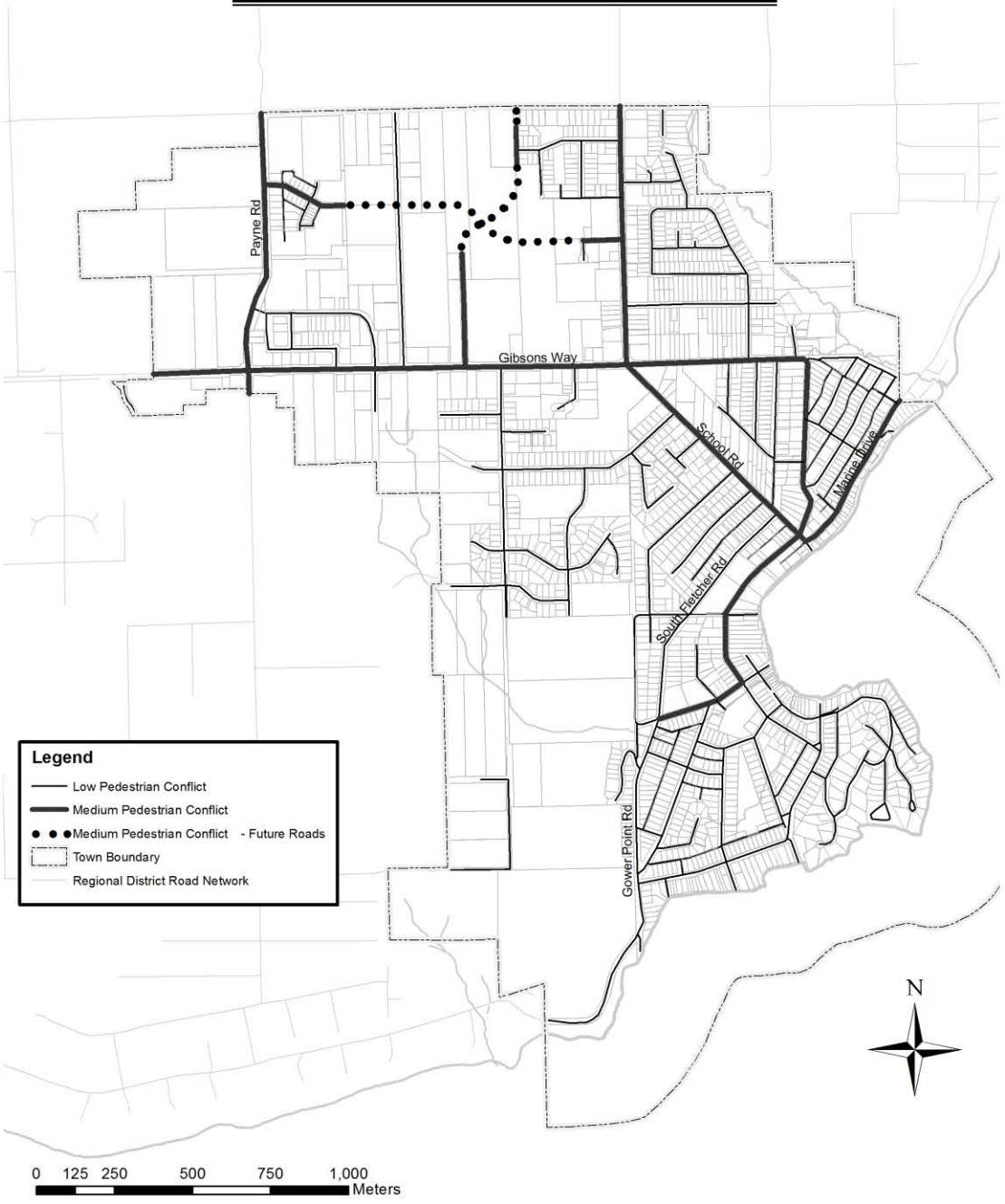
Watercourses

File No.: 20120906
Date: Nov 2012

~SCHEDULE K~

PEDESTRIAN CONFLICT AREAS



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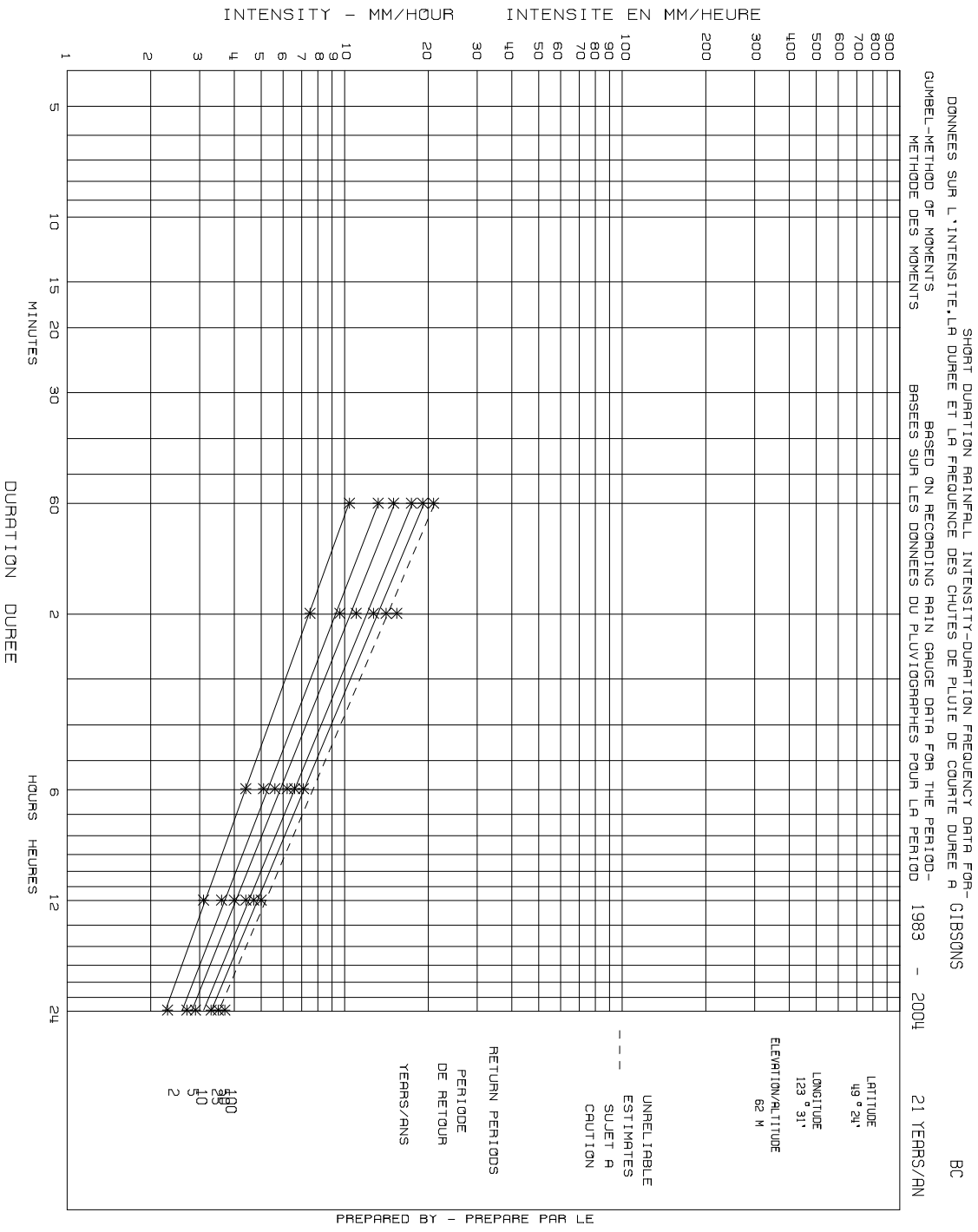
Pedestrian Conflict Areas

File No.: 20121102
Date: Nov 2012

~SCHEDULE L~

INTENSITY/DURATION/FREQUENCY CURVES



~SCHEDULE M~

Design Rainfall Hyetographs

- 1:2 Year Return Period Event
- 1:5 Year Return Period Event
- 1:10 Year Return Period Event
- 1:100 Year Return Period Event

Town of Gibsons Design Rainfall Hyetographs
1:2 Year Return Period Event (various durations)

1 HOUR STORM		2 HOUR STORM		6 HOUR STORM		12 HOUR STORM		24 HOUR STORM	
Time	Rainfall (mm)	Time	Rainfall (mm)	Time	Rainfall (mm)	Time	Rainfall (mm)	Time	Rainfall (mm)
0:00	0.0	0:00	0.0	0:00	0.0	0:00	0.0	0:00	0.0
0:05	0.0	0:05	0.4	0:15	0.7	0:30	1.2	1:00	2.0
0:10	0.6	0:10	0.4	0:30	0.7	1:00	1.3	2:00	1.4
0:15	0.9	0:15	0.4	0:45	0.8	1:30	1.4	3:00	2.2
0:20	0.9	0:20	0.4	1:00	0.8	2:00	1.5	4:00	1.9
0:25	1.0	0:25	0.7	1:15	1.2	2:30	1.6	5:00	3.0
0:30	1.1	0:30	0.7	1:30	1.2	3:00	1.7	6:00	3.0
0:35	1.5	0:35	0.7	1:45	1.2	3:30	1.7	7:00	2.4
0:40	1.1	0:40	0.7	2:00	1.2	4:00	1.8	8:00	2.1
0:45	0.8	0:45	0.7	2:15	1.3	4:30	1.8	9:00	2.3
0:50	0.7	0:50	0.8	2:30	1.3	5:00	1.9	10:00	2.9
0:55	0.6	0:55	0.8	2:45	1.5	5:30	1.9	11:00	3.1
1:00	0.4	1:00	0.8	3:00	1.5	6:00	1.9	12:00	3.1
		1:05	1.0	3:15	1.9	6:30	1.8	13:00	2.5
		1:10	1.0	3:30	1.9	7:00	1.8	14:00	3.1
		1:15	0.8	3:45	1.5	7:30	1.7	15:00	2.0
		1:20	0.8	4:00	1.5	8:00	1.6	16:00	2.4
		1:25	0.6	4:15	1.1	8:30	1.5	17:00	1.8
		1:30	0.6	4:30	1.1	9:00	1.4	18:00	1.8
		1:35	0.5	4:45	0.9	9:30	1.4	19:00	1.8
		1:40	0.5	5:00	0.9	10:00	1.3	20:00	2.5
		1:45	0.4	5:15	0.8	10:30	1.4	21:00	2.2
		1:50	0.4	5:30	0.8	11:00	1.5	22:00	1.7
		1:55	0.3	5:45	0.5	11:30	1.7	23:00	2.7
		2:00	0.3	6:00	0.5	12:00	2.0	24:00	2.7
Total (mm)	**9.9**		**15.0**		**26.7**		**38.8**		**56.7**
Intensity (mm/hr)	**9.9**		**7.5**		**4.4**		**3.2**		**2.4**

Town of Gibsons Design Rainfall Hyetographs
1:5 Year Return Period Event (various durations)

1 HOUR STORM		2 HOUR STORM		6 HOUR STORM		12 HOUR STORM		24 HOUR STORM	
Time	Rainfall (mm)	Time	Rainfall (mm)	Time	Rainfall (mm)	Time	Rainfall (mm)	Time	Rainfall (mm)
0:00	0.0	0:00	0.0	0:00	0.0	0:00	0.0	0:00	0.0
0:05	0.7	0:05	0.5	0:15	0.8	0:30	1.4	1:00	2.3
0:10	0.8	0:10	0.5	0:30	0.8	1:00	1.5	2:00	1.7
0:15	1.2	0:15	0.6	0:45	1.0	1:30	1.7	3:00	2.6
0:20	1.2	0:20	0.6	1:00	1.0	2:00	1.8	4:00	2.3
0:25	1.3	0:25	0.8	1:15	1.5	2:30	1.9	5:00	3.6
0:30	1.5	0:30	0.8	1:30	1.5	3:00	2.0	6:00	3.6
0:35	1.8	0:35	0.8	1:45	1.5	3:30	2.1	7:00	2.8
0:40	1.5	0:40	0.8	2:00	1.5	4:00	2.1	8:00	2.5
0:45	1.1	0:45	0.9	2:15	1.6	4:30	2.2	9:00	2.7
0:50	0.9	0:50	0.9	2:30	1.6	5:00	2.2	10:00	3.4
0:55	0.8	0:55	1.0	2:45	1.8	5:30	2.2	11:00	3.7
1:00	0.5	1:00	1.0	3:00	1.8	6:00	2.2	12:00	3.7
		1:05	1.3	3:15	2.3	6:30	2.2	13:00	2.9
		1:10	1.3	3:30	2.3	7:00	2.1	14:00	3.6
		1:15	1.0	3:45	1.8	7:30	2.0	15:00	2.3
		1:20	1.0	4:00	1.8	8:00	1.9	16:00	2.8
		1:25	0.7	4:15	1.3	8:30	1.8	17:00	2.1
		1:30	0.7	4:30	1.3	9:00	1.7	18:00	2.1
		1:35	0.7	4:45	1.1	9:30	1.6	19:00	2.1
		1:40	0.7	5:00	1.1	10:00	1.6	20:00	2.9
		1:45	0.6	5:15	1.0	10:30	1.6	21:00	2.5
		1:50	0.6	5:30	1.0	11:00	1.7	22:00	2.0
		1:55	0.4	5:45	0.6	11:30	2.0	23:00	3.2
		2:00	0.4	6:00	0.6	12:00	2.4	24:00	3.2
Total (mm)	**13.2**		**18.7**		**32.4**		**46.1**		**66.6**
Intensity (mm/hr)	**13.2**		**9.3**		**5.4**		**3.8**		**2.8**

Town of Gibsons Design Rainfall Hyetographs
1:10 Year Return Period Event (various durations)

1 HOUR STORM		2 HOUR STORM		6 HOUR STORM		12 HOUR STORM		24 HOUR STORM	
Time	Rainfall (mm)	Time	Rainfall (mm)	Time	Rainfall (mm)	Time	Rainfall (mm)	Time	Rainfall (mm)
0:00	0.0	0:00	0.0	0:00	0.0	0:00	0.0	0:00	0.0
0:05	0.7	0:05	0.5	0:15	0.9	0:30	1.5	1:00	2.5
0:10	0.9	0:10	0.5	0:30	0.9	1:00	1.6	2:00	1.8
0:15	1.3	0:15	0.6	0:45	1.1	1:30	1.7	3:00	2.8
0:20	1.3	0:20	0.6	1:00	1.1	2:00	1.9	4:00	2.4
0:25	1.5	0:25	0.9	1:15	1.6	2:30	2.0	5:00	3.8
0:30	1.7	0:30	0.9	1:30	1.6	3:00	2.1	6:00	3.8
0:35	2.1	0:35	0.9	1:45	1.6	3:30	2.2	7:00	3.0
0:40	1.7	0:40	0.9	2:00	1.6	4:00	2.2	8:00	2.7
0:45	1.2	0:45	1.0	2:15	1.8	4:30	2.3	9:00	2.9
0:50	1.0	0:50	1.1	2:30	1.8	5:00	2.3	10:00	3.6
0:55	0.9	0:55	1.2	2:45	2.0	5:30	2.4	11:00	3.9
1:00	0.6	1:00	1.2	3:00	2.0	6:00	2.3	12:00	3.9
		1:05	1.5	3:15	2.5	6:30	2.3	13:00	3.2
		1:10	1.5	3:30	2.5	7:00	2.2	14:00	3.9
		1:15	1.2	3:45	2.0	7:30	2.1	15:00	2.5
		1:20	1.2	4:00	2.0	8:00	2.0	16:00	3.1
		1:25	0.8	4:15	1.4	8:30	1.9	17:00	2.3
		1:30	0.8	4:30	1.4	9:00	1.8	18:00	2.3
		1:35	0.7	4:45	1.2	9:30	1.7	19:00	2.3
		1:40	0.7	5:00	1.2	10:00	1.7	20:00	3.1
		1:45	0.6	5:15	1.1	10:30	1.7	21:00	2.7
		1:50	0.6	5:30	1.1	11:00	1.8	22:00	2.1
		1:55	0.4	5:45	0.7	11:30	2.1	23:00	3.4
		2:00	0.4	6:00	0.7	12:00	2.6	24:00	3.4
Total (mm)	**15.0**		**21.0**		**35.6**		**48.5**		**71.5**
Intensity (mm/hr)	**15.0**		**10.5**		**5.9**		**4.0**		**3.0**

Town of Gibsons Design Rainfall Hyetographs
1:100 Year Return Period Event (various durations)

1 HOUR STORM		2 HOUR STORM		6 HOUR STORM		12 HOUR STORM		24 HOUR STORM	
Time	Rainfall (mm)	Time	Rainfall (mm)	Time	Rainfall (mm)	Time	Rainfall (mm)	Time	Rainfall (mm)
0:00	0.0	0:00	0.0	0:00	0.0	0:00	0.0	0:00	0.0
0:05	1.0	0:05	0.7	0:15	1.2	0:30	1.9	1:00	3.2
0:10	1.3	0:10	0.7	0:30	1.2	1:00	2.0	2:00	2.3
0:15	1.9	0:15	0.9	0:45	1.4	1:30	2.2	3:00	3.6
0:20	1.9	0:20	0.9	1:00	1.4	2:00	2.3	4:00	3.1
0:25	2.1	0:25	1.3	1:15	2.1	2:30	2.5	5:00	4.9
0:30	2.3	0:30	1.3	1:30	2.1	3:00	2.6	6:00	4.9
0:35	2.9	0:35	1.3	1:45	2.1	3:30	2.7	7:00	3.8
0:40	2.3	0:40	1.3	2:00	2.1	4:00	2.8	8:00	3.5
0:45	1.7	0:45	1.4	2:15	2.4	4:30	2.9	9:00	3.7
0:50	1.5	0:50	1.4	2:30	2.4	5:00	2.9	10:00	4.6
0:55	1.3	0:55	1.6	2:45	2.6	5:30	2.9	11:00	5.0
1:00	0.8	1:00	1.6	3:00	2.6	6:00	2.9	12:00	5.0
		1:05	2.0	3:15	3.3	6:30	2.9	13:00	4.0
		1:10	2.0	3:30	3.3	7:00	2.8	14:00	5.0
		1:15	1.6	3:45	2.6	7:30	2.7	15:00	3.2
		1:20	1.6	4:00	2.6	8:00	2.5	16:00	3.9
		1:25	1.1	4:15	1.9	8:30	2.4	17:00	2.9
		1:30	1.1	4:30	1.9	9:00	2.3	18:00	2.9
		1:35	1.0	4:45	1.7	9:30	2.1	19:00	2.9
		1:40	1.0	5:00	1.7	10:00	2.1	20:00	3.9
		1:45	0.9	5:15	1.4	10:30	2.1	21:00	3.5
		1:50	0.9	5:30	1.4	11:00	2.3	22:00	2.7
		1:55	0.6	5:45	0.9	11:30	2.6	23:00	4.4
		2:00	0.6	6:00	0.9	12:00	3.2	24:00	4.4
Total (mm)	**20.9**		**28.7**		**47.2**		**60.6**		**91.2**
Intensity (mm/hr)	**20.9**		**14.3**		**7.9**		**5.1**		**3.8**