DEVELOPMENT STANDARDS MANUAL

TOWN OF CALEDON

Version 5.0

2019

Table of Contents

FOREWARD

This Development Standards Manual has been prepared by the Town of Caledon to reflect subdivision and site plan application through the development processes as they exist in 2019. Collaborative efforts from experts in multiple Town Departments/Disciplines, were obtained to provide the most accurate and current information as possible.

It is recognized that this manual cannot consider or provide direction for all circumstances encountered. The Town reserves the right to apply discretion in the interpretation of these guidelines and that the use of other applicable guidelines and good engineering judgement will be required when reviewing each project.

DISCLAIMER

The Town of Caledon has supplied this manual with the express understanding that it shall not be liable in any manner whatsoever to any person, corporation or organization for damages, injuries or costs, resulting from the use of the information supplied.

It should be understood, that changes and revisions to these standards will be necessary over time and that it is the responsibility of the applicant/designer to obtain the latest version available at the time of design. Users shall refer to the Town of Caledon Website to ensure they are following the most recent version of the manual and that current revisions are being considered. Current Legislation shall be followed at all times.

Manual Update Record

Revision No.	Date Approved	Comments
Version 4.0	2009	
Version 5.0	2019	

LIST OF APPENDICES

Appendix A - Outdoor Lighting Standard Manual (2018)

Appendix B - Development Digital Submissions Requirements Manual (2017)

Appendix C - Standard Forms and Letters

INTRODUCTION

The purpose of this manual is to provide guidance to Developers, Consultants and the general public through the Town of Caledon's development approval process.

The design information contained in this manual is intended to provide direction beyond legislative and standard design practices for use in the Town of Caledon (the Town). There will be site specific situations where the design will depart from these practices as it is not possible nor is it the intention of the Town to anticipate every situation.

The appropriate Town Manager (hereon in referred to as the Manager) must approve technological or economical changes that improve or maintain the quality of the design.

These standards are to be read in conjunction with Ontario Provincial Standards (OPS) and Drawings (O.P.S.D.), Region of Peel standards/manuals and any other applicable regulations. However, in the case of a discrepancy the Town Standards shall prevail.

The Town of Caledon maintains its right to accept or refuse any design submissions and requires an acceptable design for any given circumstance.

All construction & maintenance activities shall conform to the Occupational Health and Safety Act.

1. ENGINEERING

1.1. Design References

This Manual applies to all new subdivisions, condominiums, site plans, and where deemed applicable by the Town, will apply to capital projects, and reconstruction projects. Note, that all Town policies, procedures, master plans and By-laws are also applicable. This manual is to be read in conjunction with the following Town of Caledon manuals:

- Outdoor Lighting Manual
- Site Plan Control Manual
- Subdivision Manual: Information Package
- Development Digital Submissions Requirements

These specifications and drawings may be revised from time to time as considered necessary by the Town of Caledon. It is the applicant's responsibility to obtain and check with the Town of Caledon for new revisions. Copies are available from the Town of Caledon or can be downloaded from the web site at: https://www.caledon.ca/en/index.asp#

1.2. Design Submission Requirements

1.2.1. Overview

The following requirements cover submissions to be made to the Town of Caledon's Planning Services Department. All submissions are to be coordinated by the Consulting Engineer, unless otherwise directed by the Town.

Separate submissions are to be made to the Regional Municipality of Peel in accordance with their requirements. Second and Final submissions are not to be made until the Town's and Region's comments regarding the first and second submission, respectively, have been received and incorporated.

Prints of drawings for all subdivisions shall be in accordance with Town standards and each print shall be stamped with the submission number (1, 2, or 3) and date of submission.

This document covers the requirements of the Engineering Services Department, as well as the Planning Services Department however, it should be noted that preparation of the Subdivision Agreement is through the Corporate Services Department. The applicant or their representative, must deal directly with the Legal Services Department on this matter.

It is highly recommended that the Consulting Engineer arrange a pre-consultation meeting with the Town prior to the first submission to understand the submission procedure/expectations of the Town and to receive copies of checklists, templates etc. If a Landscape Architect has been engaged, it is recommended that he/she also attend the pre-consultation meeting.

1.2.2. Submissions to Conservation Authorities

Credit Valley Conservation Authority (C.V.C.) – Toronto and Region Conservation Authority (T.R.C.A.) – Nottawasaga Valley Conservation Authority (N.V.C.A.) – Lake Simcoe Regional Conservation Authority (L.S.R.C.A.) – Niagara Escarpment Commission (N.E.C.) are the Conservation Authorities having interest within the boundaries of the Town of Caledon.

The Developer's Engineering Consultant shall deal directly with the Conservation Authority for works that fall within their jurisdiction, until he/she has received his/her conditions of approval from the Town for a Draft Plan of Subdivision, Rezoning or Land Severance Application. The works that will be of interest to the local Conservation Authority will be noted in their requirements.

When the Conservation Authority has sent preliminary approval in writing, to the Town, the Developer shall submit subsequent, more detailed submissions directly to the Conservation Authority. It is the Developer's Engineering and Landscape Consultant's responsibility to ensure that all correspondence and comments are provided to the Town of Caledon at the appropriate submission time.

1.2.3. Procedures for Applications Containing Municipal Structures

When a new roadway structure (bridge, culvert, etc.) is required in a subdivision, the second engineering submission shall include two (2) copies of the following material for Ministry of Transportation review:

1. General Arrangement drawing(s). This drawing is to be prepared in accordance with the Ontario Ministry of Transportation (M.T.O.) Structural Manual. It includes the roadway structure plan, profile, elevation and cross sections.

2. Design Report. The design report includes but is not limited to, the description of the works, how the detail was arrived, different options and cost analysis/least expensive alternate to construct and maintain.

3. Design Criteria Sheet. General type/class of roadway, volume of traffic, geometric information and cost estimate.

4. Foundation Report.

5. Hydrology Report (when applicable).

6. Letter from the Engineer who certifies the design that Canadian Highway Bridge Design Code (C.H.B.D.C.) requirements are met. M.T.O. approval will only be required for General Arrangement drawings. The General Arrangement drawing will be reviewed together with items 2 to 5 above to ensure that:

    - The bridge type, length and width are appropriate
    - C.H.B.D.C. requirements are met
    - Ministry standards have been followed
    - The most economical life cycle cost solution has been selected for the site

The structural design drawings and details included as part of the Subdivision Agreement shall be stamped and signed by the two professional engineers who designed the roadway structure and by the professional engineer who checked the structural design drawings.

Although the M.T.O. will not be approving the final designs, they will be monitoring, on a selected basis, some final designs and hence will require submission of one complete set of final plans.

The final engineering submission shall include the consultants' covering letter to the M.T.O. confirming that the final drawings have been sent to the M.T.O.

1.2.4. Palgrave Estate Residential Community

The Town of Caledon's Official Plan allows for the orderly development of an estate residential community known as the Palgrave Estates Residential Community (PERC). This community is located wholly within the Oak Ridges Moraine Conservation Protection Area therefore many environmental and grading restrictions apply to protect the unique natural landform features and functions of the Oak Ridges Moraine.
As such, as part of the Draft Plan Approval process, each applicant must:

1. Satisfy provisions set forth in Sections 7.1 and 7.10 of the Official Plan;

2. Satisfy the requirements of various agencies; and

3. Meet the requirements of the Town's Development Standards Manual.

The process requires the applicant to prepare numerous environmental, planning and engineering reports and plans that require extensive review by the Town and other agencies. Prior to Draft Approval, a typical engineering review would be similar to what the Town requires in a First Engineering Submission as noted in Section 1.2.5. It is common that prior to Draft Approval, some reports will be peer reviewed at the applicant's expense.

To encourage environmental protection, proposals within PERC should investigate utilizing low impact development techniques as this initiative is supported by both the Town and the Conservation Authorities. Depending on the site, soil conditions within PERC generally have favourable infiltration rates and this may provide an excellent opportunity to install infiltration galleries and soak away pits.

1.2.5. First Submission to Manager

Submissions to the Manager shall include, as a minimum, all items listed under Engineering Submissions as well as Open Space Design / Landscaping Submissions (please refer to Section 2.2 for requirements).

Engineering Submission

The following documents shall be submitted in accordance with the Town's current fee By-Law. This processing fee is credited towards the total Engineering fee which is due at time of Registration of the Plan of Subdivision. Only complete submissions will be accepted. The Consulting Engineer can reference Standard No. 106 - 108 to ensure minimum submission requirements are met.

The Consulting Engineer and Landscape Architect are required to meet with the Planning Services department's review team to provide an overview of the development proposal and to show how they are in keeping with the Department's Development Guidelines.

Three complete rolled sets of the following engineering drawings are required:

- Proposed Plan for Registration
- Cover Sheet/Legend Sheet
- General Above Ground Services Plan(s)
- General Below Ground Services Plan(s)
- Town Asset Plan(s)
- Storm Drainage Plan(s)
- Erosion and Sediment Control Plan(s)
- Plan/Profile Drawings
- Miscellaneous Plans and Detail Drawings
- Grading Plan(s) (including lot grading, parks and school block)
- Topsoil Management Plan
- Detail Drawings for Outlets and Watercourse Improvements
- Street Light Plan(s) and Photometrics
- Cost Schedule
- Cut/Fill Drawings

Two complete copies of the following documents are required:

- Stormwater Management Report
- Storm Sewer Design Sheets
- Acoustic Report
- Soils Report
- Environmental Site Assessment (Phase 1 & Record of Site Conditions)

- Traffic Impact Study (if required)
- Topsoil Management Report
- Detailed Engineering and Landscaping Cost Estimates

The following letters are also to accompany the First Submission:

- Civil Engineer Letter of Retention
- Two copies of Ontario Land Surveyor (OLS) letter certifying no Changes to M-Plan since Zoning
- Electrical Engineer Letter of Retention
- Geotechnical Consultant Letter of Retention
- Letter regarding the Conditions of Draft Approval
- Consulting Engineer's Letter regarding Drawing Submission requirements

Note:

Sample letters can be found in Appendix C – Standard Forms and Letters.

1.2.6. Second Submission to Manager

As with the first submission, the second submission to the Manager is to include the Engineering Submission as well the Open Space Design / Landscaping Submission (see Section 2.2).

1.2.6.1. Environmental Compliance Approval

At its discretion, the Town will Transfer Review MECP's Environmental Compliance Approval Applications for storm sewers, ditches, culverts, grassed swales and oil grit separators. The engineering consultant is to provide 2 complete copies of the following documents along with the Transfer Review payment (refer to the Town's Fee By-law for updated amount):

- Completed, signed and dated Environmental Compliance Approval Application Form and any documents required by the form;
- If the stormwater works discharge to a location or works that are not owned by the applicant, proof of consent from the owner of the receiving works;
- Confirmation that the local Ministry District Office was sent a copy of the complete application package; and
- If Conservation Authority clearance or a Niagara Escarpment Planning and Development Act permit is required, a copy of the approval, permit or clearance letter.

Environmental Compliance Approval for stormwater management ponds, engineered channels, storm sewers and conveyance systems within industrial subdivisions require a direct submission to MECP. The engineering consultant is to provide the Town with 2 copies of the Environmental Compliance Approval Application Form for review and signing.

Note:

The Town will not Transfer Review ECA applications for storm sewers until satisfied with the engineering design. The Developer's Consulting Engineer is responsible for forwarding the complete application to the MECP as applicable

Engineering Submission

Marked-Up Drawings from Review of First Submission - or copies of covering letters from the Manager indicating requested changes due to non-conformance.

Two complete rolled sets of the following drawings are required:

- All Revised Drawings;
- Proposed M- and R- Plan(s);
- Composite Utility Plan(s) (including Street Lighting Plan);
- Revised Topsoil Management Plan (indicating pre-development quantity of topsoil and depth of topsoil to be placed);
- Hydro One Servicing Plan(s);
- Topsoil Management Plan(s);
- Traffic Management Plan;
- Parking Plan.

Two complete copies (hard copies only) of the following documents are required:

- Acoustical Report (if required);
- Revised Stormwater Management Report;
- Revised Storm Sewer Design Sheets;
- Revised Soils Report (if required);
- Revised Topsoil Management Report;
- Revised Traffic Impact Study;
- Revised Schedules of Subdivision Agreement;
- Revised detailed Engineering Cost Estimates;
- Schedules to be included in the Subdivision Agreement:
    - Legal description of the property
    - List of all drawings and reports
    - Summary of Cost Estimates
    - List of lands to be deeded or conveyed

The following letters are also to accompany the Second Submission:

- Consulting Engineer's Letter regarding addressed comments
- Two copies of all other Agency Comments (CVC, TRCA, Region, MECP, MTO etc.)

1.2.7. Final Submission to Manager

The following plans and documents are required for the final submission to the Manager (This shall include both Engineering and Open Space Design / Landscaping in one complete package):

- One copy of Proposed M-Plan(s) and R-Plan(s);
- Marked-Up Second Submission drawings (Engineering and Landscape) - or copies of covering letters from the Manager indicating requested changes due to non-conformance;
- Consulting Engineer Letter regarding addressed comments;
- Landscape Architect Letter regarding addressed comments;
- One (1) hard copy, one (1) .pdf copy of all Final reports;
- One (1) complete set of all Engineering drawing originals as listed in the appropriate Schedule of the Development Agreement (stamped and signed by the Consulting Engineer);
- One (1) complete set of all Landscape drawing originals as listed in the appropriate Schedule of the Development Agreement (stamped and signed by the Landscape Architect);
- One (1) complete copy of all drawings listed in Schedule 'C' of the Development Agreement;
- Two (2) sets of storm sewer design sheets labelled final design. These are to be included in a Detail Drawing with the Final Submission;
- One (1) copy of the consultant's letter to the M.T.O. confirming that the final set of drawings for a roadway structure have been sent for M.T.O.'s files (if applicable);
- Copies of required approvals – i.e. MECP, C.V.C., etc.;
- Detailed cost breakdown of all proposed works;
- Two (2) copies of the Insurance Certificate as per the Subdivision Agreement;
- The Developer must submit evidence in writing to the Director that they have made arrangements with the Bell Telephone Company, the Cable TV, and the Hydro One for the installation of their cables in a common trench in the prescribed locations on road allowances within the plan of subdivision;
- The Developer must submit evidence, in writing, to the Director that they have made satisfactory arrangements with Hydro One for the installation of hydro services;
- The Developer must submit evidence, in writing, to the Director that they have made satisfactory arrangements with Canada Post for the location of mailboxes;
- Consulting Engineer Letter regarding conformance.

Note 1:

Submissions are to include the items listed above and are to be submitted in their entirety by one (1) agent of the Developer in one (1) complete package. Any incomplete submissions, delivered to the Town, shall be returned immediately.

Note 2:

All final drawings shall contain the following text in the title block for signing by the Manager:

Town of Caledon
APPROVED
AS NOTED

This approval constitutes a general review and does not certify dimensional accuracy.

This approval is subject to further certification of the "as recorded" works by a Professional Engineer of the Province of Ontario.

Date: _____
Approved By: _____
Print Name: _____

Note 3:

Once the drawings have been signed by the Manager, the original signed drawings as well as, one (1) complete copy set of full sized drawings, two (2) complete sets of reduced drawings, and one (1) electronic copy of all drawings are to be submitted to the Town, in accordance with the Development Digital Submissions Requirements Manual. See Section 1.3.1 Specifications for Engineering and Open Space Design / Landscaping Drawings for specific details on drawing requirements.

1.2.8. Subdivision Pre-Servicing or Pre-Grading

Pre-Servicing and Pre-Grading is permitted, however no construction of any kind (including topsoil stripping, tree removal or any other works) shall commence until the Engineering Drawings have been approved, all necessary Permits (Region of Peel, MTO, or Conservation Authority) MECP Certificate of Approval have been received. In addition, the appropriate agreement has been approved and executed. Each Agreement has an associated fee, this fee is subject to the Town's fee By-law and may be revised on an annual basis.

1.2.9. Subdivision Agreement Schedules

The following is a brief outline of some of the Schedules that accompany the Subdivision Agreement. For full information regarding Schedules, the Legal Services Department should be contacted.

- A reduced copy of the Plan of Subdivision;
- A description of the lands in the Agreement, which are the lands for which application for approval of a Plan of Subdivision has been made;
- A list all drawings and reports that are applicable to the development;
- A list of all conveyances of land and easements as required by the Subdivision Agreement;

- All special conditions to be met by the Developer as required by the Subdivision Agreement;
- A summary spreadsheet of estimated costs for security purposes, cash contributions, and special notes as per the following example:

COST SCHEDULE

SUBDIVISION:

DEVELOPER:

CONSULTING ENGINEER:

DATE OF ESTIMATES:

SUMMARY

A. Town Works

Rough Grading of Roads	$_____
Roads to Base Asphalt	$_____
Storm Drainage Works	$_____
Stormwater Management Facilities	$_____
Top Curb and Sidewalk	$_____
Driveway Construction and Paving	$_____
Boulevard Topsoil and Sodding	$_____
Top Asphalt	$_____
Street Lights	$_____
Streetscape and Landscaping	$_____
Fencing	$_____
Driveway Aprons	$_____
Other:	$_____
Sub-Total	$_____
Contingencies and Engineering 10%	$_____
Total Town Works	**$**_____

B. Region Works

Sanitary Sewers	$_____
Watermain	$_____
Regional roads	$_____
Sub-Total	$_____
Contingencies and Engineering 10%	$_____
Total Region Works	**$**_____
Grand Total Town and Region Works	**$**_____

Note:

All cost schedule estimates to be updated prior to Registration to reflect current prices, if more than twelve (12) months old. Updated pricing to be stamped and signed by the Engineer.

Note:

10% of the Grand Total for all completed works, including Contingencies & Engineering, will be held by the Town until Assumption of the Subdivision.

1.3. Design

1.3.1. Specifications for Engineering and Open Space Design/Landscaping Drawings

Size:	Full sized drawings to be Arch D (610mm x 914mm) (24" x 36"). Reduced drawings are to be (279.4mm x 431.8mm) (11" x 17").
Format:	Same as Town of Caledon Engineering Services Department standard sheets unless otherwise approved.
CAD Standards:	Typical Plan Profile sheet complete with required Symbol and Layering in AutoCAD 2017 (or latest) format.
Material for Preliminary and Second Submissions:	Bond Black Ink (permanent)
Materials for Final Submission:	Bond Black Ink (permanent) USB
Material for As-Recorded Drawings:	USB containing all Digital Drawings and Full Set/Stamped – PDF Drawings All AutoCAD Dwg. 2017 or latest *Refer to Appendix B – Development Digital Submissions Requirements Manual (01/10/2017 or latest version)

General Drawing Requirements

The following basic information shall apply in preparation of the drawings:

- All plans shall include a north arrow in the mid to upper right-hand quadrant. All east-west streets shall generally be drawn with the north arrow pointing to the top, north-south streets with the north arrow generally pointing to the right, and all cul-de-sacs or other roads where this does not apply shall be drawn with the stations numbered from left to right;
- All drawings must have a Key Plan;
- Engineering drawings are to include the signature and seal of the Professional Engineer responsible for the design;
- Landscaping drawings are to include the signature and seal of the Professional Landscape Architect responsible for the design. Engineer stamp and signature may be required when requested by the Town;
- Elevations are to be geodetic and related to the Town of Caledon datum. The description of the benchmarks used shall be annotated on the drawings;
- All drawings to reflect 21T Number;
- All drawings must contain a revision submission name and date.

1.3.2. Computer Assisted Drawings (CAD)

All Drawings shall be prepared using the Town of Caledon Standard AutoCAD 2017 (or latest) Format. Template Drawings for Plan-Profile and Plan-View are available in AutoCAD 2017 (or latest) format and shall be used unless otherwise approved. The Town's Typical Symbol, Line Type, Line Thickness and Layering Scheme shall be in accordance with The Peel Group's Development Digital Submissions Guidelines - January 2017 Manual for all drawings.

Electronic files shall be submitted for review and acceptance and all file names shall reflect the drawing numbers in the Engineered Drawing Set. The Final submission and "As Recorded" submission shall also include an AutoCAD file that meets the Towns format; if layering, line type & thickness or format is not adhered to, the submission shall be deemed incomplete. Development drawing submissions, specifically tailored to the digital submission requirements shall be in accordance with "The Peel Group's Development Digital Submissions Guidelines" - January 2017 Manual.

1.3.3. General Plans

See section 2.0 for further landscape requirements.

1.3.3.1. Aboveground Plans

General plans showing aboveground services and appurtenances are to be drawn to a scale of 1 to 1,000 or larger and shall indicate but not be limited to the following:

- School signs;
- Street signs;
- Future land use signs;
- Barricades;
- Fencing (existing and proposed);
- Retaining walls;
- Rear lot/block catch basins;
- Screen planting;
- Existing trees within 10 meters of the proposed development property boundary and trees to be preserved;
- Any required easements including dimensions and descriptions;
- Driveway locations (existing and proposed);
- Building envelopes for detached dwellings less than 12 meters, semi-detached dwellings and townhouse dwellings;
- A typical detail showing building envelopes, driveway location and widths;
- Driveway curb cut and dimension for detached dwellings less than 12 meters, semi-detached dwellings and townhouse dwellings;
- Bus stop platforms;
- Community mailbox;
- Hydro Vaults, streetlights, street light pedestals, sidewalks;
- Manholes (c/w numbers) and catch basins;
- Existing structures adjacent to the proposed development limit

1.3.3.2. Below Ground Plans

General plans showing all below ground services and appurtenances are to be drawn to a scale of 1 to 1,000 or larger and are to include any required easements, as well as:

- Street names;
- Watermain and appurtenances;
- Manholes (c/w numbers);
- Sewer size, slope and material;
- Directions of flow in the sewers;
- Driveway locations;
- All service connection locations to lots or blocks.

1.3.3.3. Composite Utility Plan

The Composite Utility Plan shall include all the requirements of the Aboveground Plans as well as the proposed location of deep service locations to lots or blocks, Bell, Hydro, Gas, Cable TV, streetlights, manholes/catch basins, Canada Post facilities, all crossings and driveway locations. All locations must be established and resolved by the Developer's Engineer in conjunction with the utility companies and following the locations shown on the typical cross-section.

1.3.4. Town Asset Plans

The Town Asset plans shall include all aboveground and belowground services and appurtenances to be drawn to a scale of 1 to 1,000 or larger and shall indicate the location of, but not be limited to the following:

- Street Names;
- Streetlights, street light pedestals;
- Storm Sewer System:
  - Sewer Sizes;
  - Pipe Classifications;
  - Manhole Locations (c/w numbers);
  - Catch basin Locations; and
  - Culverts
- Stormwater Management Facility;
- Fences;
- Pedestrian Ways:
  - Sidewalks;
  - Walkways;
  - Multi-use Trails.

1.3.5. Storm Drainage Plans

Storm drainage plans are to be drawn to a scale of 1 to 1,000 or larger (a scale not exceeding 1 to 5,000 will be accepted for large external drainage areas) and using available grading information are to show the total area to be drained by the proposed storm sewers. The storm drainage plan is to be compatible with the grading plan and the Town's latest contour mapping. The storm drainage plan shall indicate but not be limited to the following:

- Existing contours including elevations @ 0.5 intervals;
- Drainage patterns of adjacent lands;
- Runoff coefficients and areas (ha) of tributary areas outside the development and for each section of the storm sewers within the development;
- Direction of runoff;
- Street names;
- Manhole locations (c/w numbers);
- Catch basin locations;
- Sewer sizes and slope;
- Directions of flow in the sewers;
- Any catch basins or swales, on the lots or blocks, required to pick-up the runoff;
- Temporary or permanent quantity and quality stormwater management facilities;
- Overland flow route;
- Culverts and other drainage appurtenances

1.3.6. Grading Plans

Grading plans for lots and blocks are to be drawn to a scale of 1 to 500 or larger, clearly showings existing contours with corresponding elevations established from field information.

The grading plans shall indicate but not be limited to the following:

- Existing contours (c/w elevations);
- Proposed elevations at the following locations:
  - Along the center line of any existing or proposed roads (max. 20m apart);
  - Centre line or break point of each lot;
  - At the front and rear building line;
  - At the corners of each lot and block; and
  - At frequent intervals along large block property lines;
- Proposed elevation contours for grading within large blocks and parks;
- Any other points necessary to give proper picture of the proposed drainage scheme including tops of catch basins, bottoms of swales and top and bottom of retaining walls;
- Existing contours and elevations within the plan and at least 30 meters externally. The external contours are to be extended far enough to determine the existing drainage pattern. In addition to the above, grading plans for parks are to indicate existing contours at 0.5m intervals along with all existing trees, structures, watercourses, etc.;
- Percent street grades for all roads within the development and the distance of the particular grade shall also be included;
- Overland flow routes;

- Easements/blocks including dimensions and descriptions;
- Retaining walls;
- Drainage types in accordance with typical details;
- Cut off swales and catch basins to intercept interim block drainage and external drainage;
- Areas of engineered fill;
- Proposed driveway entrances, street light poles, hydro transformers, underground utility vaults, Cable TV and Bell pedestals;
- Fencing both existing and proposed. A note is required on this drawing indicating that all proposed fencing is to be located on private property.

1.3.7. Plan – Profile Drawings

Plan-profile drawings are to be drawn to a horizontal scale of 1 to 500 and vertical scale of 1 to 50 and are to conform to the following:

- Where two or more drawings are required for one street, match lines must be used and tied into the nearest full station and such station shall be indicated. Right-of-way, road and boulevard widths for all roads and partial legs must be indicated at the match line;
- Where intersecting streets are shown on a plan-profile, only the diameter of the pipe and direction of flow of the intersecting sewers are to be shown. This also applies to easements for which a separate plan-profile has been drawn;
- On plan-profile drawings the type of sewer (sanitary or storm), the diameter, length, grade and class of pipe are to be shown on the profile portion of the drawings only. Only the type and diameter are to be shown in the plan portion;
- Where possibility of conflict with other services exists, connections are to be plotted on the profile;
- Pavement/road base designs for the particular roadway are to be indicated on all plan-profile drawings;
- The detail information from all borehole logs is to be plotted on the profile drawings and located on the plan. If this interferes with some other detail such as a manhole, the exact location may be altered sufficiently for clarity. Borehole information should contain a borehole plot plus a brief description of soils and the water level. The borehole log must extend a minimum of one (1) meter below the lowest manhole in the vicinity;
- Gutter drainage details for temporary turning radii and cul-de-sacs;
- Storm sewers shall be shown as solid lines on both the plan and profile view. Directional arrows must be used throughout the plan drawings to show the direction of flow;
- Sumps of sanitary manholes are to be hatched to distinguish them from storm manholes;
- Centerline curve data information must be shown on the plan view;
- The profile view must show the bottom of granular road base/sub grade elevation;
- All manhole invert elevations shall be indicated below the profile view in the appropriate blocked space provided.

1.3.8. Erosion and Sediment Control Plans

The erosion and sediment control plans are to be prepared in accordance with the Town of Caledon and the Conservation Authorities requirements. These plans shall be in accordance with the latest Erosion and Sediment Control Guidelines for Urban Construction - 2006 and shall as a minimum show:

- Light duty and heavy-duty silt fencing;
- Mud mats;
- Rock check dams;
- Topsoil stockpiles with appropriate protection measures;
- Temporary sediment control ponds or basins;
- Swales;
- Staked straw bales;
- Existing Trees

Note:

Erosion and Sediment Control Plans are to be considered a living document which may require ongoing revisions/changes to the Plan.

1.3.9. Access/Haul Route Plan/Information Stage

A detailed map indicating the access/haul route to be used by the suppliers, contractors and other agents during construction is required to be submitted to the Town for approval. Location of informational/directional signage, route arrows and road patterns and all other pertinent information that will be needed to satisfy the Town that the access/haul routes are limited and maintained to cause the least amount of disturbance to the adjacent land-owners. Information signs are required at every access point to the subdivision and shall conform to Town standards.

The Developer is responsible to maintain the directional/informational signage until assumption by the Engineering Services Department or otherwise directed by the Town.

1.3.10. As-Recorded Drawings

1.3.10.1. General

Upon completion of the construction of the services, the Developer's Consultants' shall obtain the 'As-Recorded' field information and revise the original drawings accordingly. Any changes to the approved drawings by the Consulting Engineer, Electrical Engineer or Landscape Architect are subject to approval by the Town.

Prior to assumption of the subdivision by the Town, the Developer's Engineers' and Landscape Architect shall provide a complete set of revised drawings (engineering, streetlight and landscaping) for the development to the Project Manager for review. Upon acceptance, the Developer's Engineer .and Landscape Architect shall provide a complete – stamped set of PDF drawings and AutoCAD digital drawings (Georeferenced) in accordance with Section 1.3.1. of these Guidelines for the Town of Caledon. All digital and PDF

drawings submitted to the Town, will be named and numbered to match the Title Page Drawing Index.

Note:

All drawings are to be accompanied by a Certification Letter from the Engineer (on company letterhead) bearing his/her stamp, signature and date, attesting that the drawings being submitted are “As-Recorded Drawings”.

In addition, a complete set of PDF drawings, named to match Region of Peel’s drawings number, shall be prepared from the ‘As-Recorded’ originals, as well as CAD compatible with Microstation v8/v8i digital copies. These will be supplied to the Public Works Department of the Regional Municipality of Peel, in accordance with the Region’s requirements. All As-Recorded drawings submitted must meet the requirements of “The Peel Group’s Development Digital Submissions Guidelines” - January 2017 Manual.

These drawings shall show the location both horizontally and vertically of everything, which is on, and under the lands to be accepted by the Town.

The Composite Utility Drawing is to show the final location of all utilities, service connections, as well as driveway locations.

The engineering drawings shall be sealed and signed by a Registered Professional Engineer and stamped ‘As-Recorded’ and dated in the revisions box.

The streetlight drawings shall be sealed and signed by the Electrical Engineer and stamped ‘As-Recorded’ and dated in the revisions box.

The Landscape drawings shall be sealed and signed by a Registered Professional Landscape Architect and stamped “As-Recorded” and dated in the revisions box.

The Town may perform a spot check of elevations and locations. If the Town finds major differences, the ‘As-Recorded’ drawings will be returned to the consultant to be corrected.

1.3.10.2. Storm Sewers

All sewer invert elevations, if different than proposed, are to be indicated on the ‘As-Recorded” drawings. If the difference is greater than 50mm, affected portions of sewer (in profile) will be required to be redrawn. Hydraulic calculations are to be provided, reflecting these changes, for review and approval.

Any manhole or catch basin locations, which differ by more than 1.50m from the proposed locations, are to be redrawn in both plan and profile.

The following shall be indicated on the ‘As-Recorded' drawings, if different than proposed:

- Type of manhole;
- Pipe size;
- Grade of sewer;
- Type of sewer material;

- Class of pipe;
- Type of bedding;
- Proposed and “As Recorded” information is to be provided for such information as length of pipes, slope, inverts etc.

Note 1:

If the ‘As-Recorded’ grade of sewers differs by more than 1% of the design grade, the Consultant will be required to submit the revised hydraulic calculations.

Note 2:

Q_{ACTUAL} and Q_{DESIGN} will also be required on ‘as-recorded’ and recorded design sheets.

1.3.10.3. Sanitary Sewers

As-Recorded information is to be provided to the Region of Peel in accordance with their requirements as set out in the latest version of the Region of Peel’s Public Works Design, Standards, Specifications & Procedures Manual.

1.3.10.4. Watermains

As-Recorded information is to be provided to the Region of Peel in accordance with their requirements as set out in the latest version of the Region of Peel’s Public Works Design, Standards, Specifications & Procedures Manual.

1.3.10.5. Stormwater Management Facilities

All sewer sizes, sewer inverts, control structure inverts, control structure sizes, access roads, road grades, contouring of the pond if different than proposed are to be indicated on the ‘As-Recorded’ drawings.

Hydraulic calculations and volume calculations of the pond are to be provided reflecting these changes for review and approval.

Any control structure locations which differ by more than 1.5 meters from the proposed location, are to be redrawn in both plan and profile.

An as-built survey as well as a bathymetric survey are to be completed, in order to ensure that the facility was built and maintained according to the Certificate of Approval, and that the full volume, per the original design requirement is available. This volume includes the permanent pool volume beneath the surface.

Digital pictures of all components plus digital information of the Stormwater Management Facility are to be submitted to the Town for inclusion in the Town’s electronic database.

1.3.10.6. Noise Attenuation/Retaining Walls

All 'As-Recorded' drawings shall include but is not limited to:

- Top & bottom elevations of the retaining wall;
- Top & bottom elevations of berms;
- Top & bottom elevations of noise attenuation structure.

1.3.10.7. Roads

'As-Recorded' drawings will require centerline elevations, as well as show any changes in road profile and make-up, if different from proposed.

1.3.11. GIS Submission Standards

1.3.11.1. Accuracy

All features will be drawn with positional absolute accuracy or drawn accurately positioned with respect to its true position on the ground as opposed to conceptually drawn. All feature classes provided will be topologically correct within themselves and free of any overlaps, gaps, slivers, and duplications. All feature classes provided will be topologically correct with Town of Caledon GIS layers used as a reference including coincidence and shared boundaries (parcels/city boundary etc.). Curves will be represented as true arcs not segmented lines.

1.3.11.2. GIS Deliverables

An electronic copy of all GIS information is created in a digital GIS database. Data can be submitted to the Town of Caledon in a compressed format on an external hard drive, email, USB or FTP site. The Town of Caledon has standardized their GIS on the ESRI platform, currently leveraging version 10.7.1. All deliverables will be compatible with this platform and version.

1.3.11.3. File Format

All GIS data layers will be provided in a file geodatabase (.gdb) or Shapefile (.shp).

1.3.11.4. Coordinate System

The standard coordinate system for the Town of Caledon is Universal Transverse Mercator (UTM) Zone 17 North with the North American Datum 1983 - "NAD83 (Original)".
All submitted geodatabase or shapefile layers will use this coordinate system:
Projected Coordinate System: **UTM NAD 1983 Zone 17N (Original)**
Projection: **Transverse Mercator**
Geographic Coordinate System: **GCS North American 1983**
Datum: **North American 1983**
Linear Unit: **Metre**
WKID: **EPSG 26917**

1.3.11.5. Required Layers

Layer	Description	Feature Type
Storm – Catch Basin	Catch basin locations for the storm water management system	Point
Storm – Manhole	Manhole locations for the storm water management system	Point
Storm – Pipe	Pipe locations for the storm water management system	Line
Storm – Pond	Pond locations for the storm water management system	Polygon
Culvert	Culvert locations along proposed/existing road, railroad, trail, or similar obstruction.	Point or line
Bridge	Bridge structure locations that span an obstacle such as a body of water, valley, or road.	Point or line
Streetlight	Streetlight locations of raised source of light on the edge of a road or path.	Point
Sidewalk	Sidewalk locations along the side of a road.	Line
Guardrail	Guardrail structure locations along the side of a road.	Line
Sound Wall	Sound Wall structure locations along the roadway.	Line
Road	Locations of proposed road centreline	Line
Trail	Locations of proposed trails and multiuse paths.	Line

1.4. Stormwater Management Design Requirements

1.4.1. Overview

The purpose of this section is to outline the general design requirements for the construction of Municipal Services in the Town of Caledon. These requirements, however, are only general and do not relieve the Developer of the responsibility for submitting a finished product of competent engineering design and construction.

For the approval of any deviation from minimum Town Standards and requirements, the applicant shall specifically refer to such deviation(s) and/or their agent with a copy of written approval to the Town attached.

1.4.2. Storm Drainage System

1.4.2.1. Sewer System

Storm sewers designed and constructed in accordance with the most recent requirements and specifications of the Town of Caledon are required on every street within all proposed plans of subdivision. Inverts of service connections at the property line shall be surcharge free and be above the 100-year hydraulic grade line of the municipal storm sewer system. Storm sewers shall be of adequate size and depth to provide service for the development of lands within the upstream watershed and/or for the drainage of any areas designated by the Town. Storm drainage shall be directed to an outlet considered adequate in the opinion of the Town and applicable agencies.

Channel works, bridges, culverts and all other drainage structures or works shall be designed and constructed in accordance with the most recent drawings and specifications. Approvals by the Town and all other applicable agencies such as the Ministry of the Environment, Conservation and Parks (MECP), the Toronto Regional Conservation Authority (TRCA), Credit Valley Conservation (CVC), the Ministry of Natural Resources and Forestry (MNRF), Department of Fisheries and Oceans (DFO) and the Niagara Escarpment Commission (N.E.C) etc. are required.

1.4.2.2. Storm Sewer Design

1.4.2.2.1. Run-off Calculations

Storm sewers shall be designed on Town Standard 104 Design Sheets. Storm sewers shall be designed to drain all lands based on the Rational Method. The Rational Method calculations must be checked using a model approved by the Town, where the drainage area is greater than 5 hectares. The larger of the flows is to be used in the design of the sewer system.

$Q = 0.0028\ CIA$

Q = Flow in cubic meters per second (m^3/s)
A = Area in hectares
C = Run-off coefficient
I = Intensity in mm/hr

Intensity of Rainfall

The intensity of rainfall is to be determined from the most recent Town of Caledon standard INTESITY – DURATION – FREQUENCY RAINFALL CURVES in accordance with Town Standard Drawing No. 103. The equations for the I.D.F. curves are listed in Town Standard Drawing No. 103 and section 1.4.7. Meteorology.

Time of Concentration

The minimum initial time of concentration is to be 10 minutes.

Pre-Development

To calculate the initial time of concentration (t_c) for upstream, undeveloped lands, the following formulae may be used: Bransby Williams, H.Y.M.O./O.T.T.H.Y.M.O., S.C.S. Upland Method, etc. The most appropriate method will be determined at the discretion of the Town.

Post-Development

To calculate the initial external time of concentration (t_c) for external lands that are scheduled for future development, a straight line is to be drawn from the furthest point within the watershed to the proposed inlet. The top 50 meters shall have an initial t_c of 10 minutes and the remainder shall have a t_c as the velocity in the sewer is 2m/s. The summation of the two t_c's will give the future external time of concentration. If the upstream area has adequate storm sewers, channels or culverts the velocity of the flow through the sewers, channels or culverts shall supersede the 2m/s calculation.

Run-off Coefficient

Run-off coefficients are to be determined from the Town of Caledon standard INTESITY – DURATION – FREQUENCY RAINFALL CURVES (Town Standard Drawing No. 103).

A minimum run-off coefficient of 0.70 is to be used for undeveloped upstream area where future residential development is expected and 0.85, where future industrial, medium to high density residential or commercial development is expected, or as requested by the Town.

Drainage Area

Drainage systems must be designed to accommodate all upstream drainage areas for interim and ultimate conditions, as determined by contour mapping and drainage plans.

Note:

All drainage generated by the development shall be captured and treated within the limits of the development area.

1.4.2.2.2. Storm Sewer Requirements

Storm Sewer System

A storm sewer system shall be defined as the upper part of a drainage system draining areas less than 100 ha of land. Storm sewer systems shall be designed to accommodate a 10-year storm where foundation drains are to be connected. For systems that do not allow for foundation drains, a 5-year design will be allowed.

In Estate Residential designated subdivisions, a 2-year design is allowed. Overland flow routes will be utilized more frequently and flood proofing will have to be demonstrated if a 2-year design is proposed.

Trunk Sewer System

A trunk sewer system shall be defined as part of a drainage system that drains an area of 100 ha of land or greater. Trunk storm sewer systems shall be designed to accommodate a 25-year storm.

Pipe Capacities

Manning's formula shall be used in determining the capacity of all storm sewers. The capacity of the sewer shall be determined on the basis of the pipe flowing full. Design flow shall not exceed 90% pipe flow capacity. The value of the roughness coefficient 'n' used in the Manning's formula shall be as follows:

Concrete Pipe	0.013
Concrete Box Culvert	0.013
Corrugated Metal 68 x 13mm corrugations	0.024
Corrugated Metal 25% paved invert	0.021
PVC Pipe	0.013

Design flow calculations must be completed on Town of Caledon forms.

Flow Velocities (Flowing Full)

For circular pipes the:

- Minimum acceptable velocity is 0.75m/s and the
- Maximum acceptable velocity is 4.0m/s
- Super critical flows will not be accepted

Note:

The slope of the pipe shall not be less than 0.40%; however, if conditions require a slope of less than 0.40%, then self-cleaning velocities must be maintained.

Minimum Sizes

The minimum size for an on-street storm sewer shall be 300mm.

Depth of Storm Sewers

Storm sewers shall be located a minimum of one (1) meter below basement floor elevations to allow for the installation of foundation connections. In areas of no storm sewer connection, the sewers shall have a minimum frost cover of 1.5m.

Location

The storm sewers shall be located as shown on the standard Town of Caledon road cross section drawings. This standard location is generally 1.5 meters south or west of the center line of the right-of-way.

A minimum clearance of 500mm between the obvert of the sanitary sewer and the bottom of the storm sewer must be provided. The sanitary sewer connections are required to go under the storm sewer where possible.

Radius Pipes

Radius pipe shall be allowed for storm sewers 975mm in diameter and larger provided that a manhole is located at the beginning or at the end of the radial section. The minimum center line radius allowable shall be in accordance with the minimum radii table as provided by the manufacturer.

Limits of Construction

Sewers shall be terminated with a manhole at the subdivision limits when external drainage areas are considered in the design. The design of the terminal manholes must allow for the future extension of the sewer. When external areas are not included in the sewer design, the sewer shall extend at least halfway across the frontage and/or flankage of any lot or block in the subdivision.

Sewer Alignment

Storm sewers shall be laid in a straight line between manholes unless radius pipe has been designed. Joint burial (common trenching) with sanitary sewers will be considered when supported by the recommendations of a soils report prepared by a qualified Geotechnical Engineering Company.

Changes in Pipe Sizes

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

Standard Easement and/or Drainage Blocks Requirements

The minimum width of easements and/or drainage blocks for municipal storm sewers shall be in accordance with the following guidelines:

Size of Pipe	Depth of Invert	Minimum Width of Easement
250 to 375mm	3.0m maximum	3.0m
450 to 675mm	3.0m maximum	3.0m
750 to 1500mm	3.0m maximum	5.0m
1650mm and up	4.0m maximum	4.0m plus 3 times OD of Pipe

For easements containing more than one pipe or underground service the minimum width will be based on the above chart for the maximum pipe size plus 4.0m. Regardless of the above, all situations will be reviewed and judged on individual cases at the discretion of the Town.

Pipe Classification and Bedding

The type and classification of storm sewer pipe and the sewer bedding type shall be clearly indicated on all profile drawings for each sewer length.

All storm sewer pipes shall conform to the requirements of the Canadian Standards Association (CSA).

The class of pipe and the type of bedding shall be selected to suit loading and proposed construction conditions. Details are illustrated in the OPSD Standard Bedding and Backfill Details. In general, the Type “B” bedding (Granular A bedding with granular over the sewer) shall be used for storm sewers in new developments, and the class of pipe will be selected to suit this bedding detail.

In areas where it is difficult to control the infiltration of water into sewer trenches a clear stone such as HL8 stone may be used. All clear stone must be completely wrapped in a suitable geotextile selected and installed in accordance with the manufacturer’s requirement.

The width of trench at the top of the pipe must be carefully controlled to ensure that the maximum trench width is not exceeded unless additional bedding or higher strength pipe is used.

Polyvinyl Chloride (PVC)

Maximum allowable deflection of main line sewer is 5%. Deformation gauge (PIG) test will be required prior to acceptance, in accordance with OPSS 410.

Pipe shall meet the Canadian Standard Association requirement as noted within OPSS 1841. The basic material used in manufacturing this pipe shall have a cell classification of 12454-B or 12454-C or ASTM Standard D-3034 and OPSS 1841. Pipe Manufacturer must be approved by the Planning & Development Services Department.
Note:

Maximum PVC pipe size that will be allowed to be installed in the Town of Caledon shall be 600mm diameter.

The compaction of all bedding and cover material shall be 95% Standard Proctor or better. Maximum cover shall be in accordance with OPSD 806.04 and 806.06. Special care must be given to contouring the bedding material to conform with the pipe bottom and projecting bells, along with proper compaction of the haunches in order to provide even support throughout the pipe. Backfill of manufacturer's specifications and all flexible pipes shall be in accordance with the Town standards and OPSS 514.

1.4.2.2.3. Maintenance Hole Requirements

Maintenance holes may be either precast or poured in place and shall be designed and constructed in accordance with the most recent Ontario Provincial Standard Drawings and Specifications.

Location and Spacing

Maintenance holes shall be located at each change in alignment, grade or pipe material, at all pipe junctions, at the beginning or end of radius pipe sections and at intervals along the pipe to permit entry for maintenance to the sewer.

Maximum spacing of maintenance holes shall be 120m for sewers 600mm or less in diameter and 150m for sewers 675mm or greater in diameter.

Manhole Types

Town of Caledon and OPSD Standard Maintenance Hole Details shall be used for maintenance hole design. Although these standard drawings provide details for manholes up to certain maximum depths and sizes, the Consulting Engineer shall analyze, individually, each application of the standard related to soil conditions, loading and other pertinent factors to determine structural suitability. In all cases where the standard drawings are not applicable, the maintenance holes shall be individually designed and detailed. A reference shall be made on all profile drawings to the type and size of storm maintenance holes.

Maintenance Hole Details:

- Maintenance hole chamber openings shall be located on the side of the maintenance hole parallel to the flow for straight run maintenance holes, or on the upstream side of the maintenance hole at all junctions.

- Change in direction of flow in any maintenance holes shall not be greater than 90 degrees perpendicular to the flow.

- Safety gratings shall be provided in all maintenance holes when the depth of the maintenance hole exceeds 5m. The maximum spacing between safety gratings shall not exceed 4.5m.

- The obverts on the upstream side of maintenance holes shall not be lower than the obvert of the outlet pipe.

- Where the difference in elevation between the obvert of the inlet and outlet pipes exceed 0.6m, a drop pipe as indicated on OPSD 1003.010 shall be placed on the inlet pipe.

- Storm sewer maintenance holes shall be benched to the obvert of the outlet pipe on a vertical projection from the spring line of the sewer.

- Maintenance holes shall be located, wherever possible, a minimum of 1.5m away from the face of curb and/or any other service.

Head Losses and Drops

Suitable drops shall be provided across the maintenance holes to compensate for the loss in energy due to the change in flow velocity and for the difference in the depth of flow in the sewers.

In order to reduce the number of drops required, the designer shall, wherever possible, restrict the change in velocity between the inlet and outlet pipes to 0.6m/s.

Hydraulic calculations shall be submitted for junction and transition maintenance holes on sewers where the outlet is 1050mm diameter or greater. In addition, hydraulic calculations may be required for maintenance holes where the outlet pipe is less than 1050mm diameter if, in the opinion of the Town, there is insufficient invert drop provided across any maintenance hole.

Regardless of the invert drop across a maintenance hole as required by calculations, the obvert of the outlet pipe shall not be higher than the obvert of the inlet pipe at any maintenance hole location.

The minimum drops across maintenance holes shall be as follows:

Change of Direction	Minimum Drop (mm)
0^o	20
1^o to 45^o	50
45^o to 90^o	80

1.4.2.2.4. Catch Basin Requirements

Catch basins may be either precast or poured in place and shall be designed and constructed in accordance with the most recent OPSD and OPSS requirements.

Location and Spacing

Catch basins shall be selected, located and spaced in accordance with the conditions of design.

The design of the catch basin location and type shall take into consideration the lot areas, the lot grades, pavement widths, road grades and intersection locations.

The maximum area to be served by any catch basin shall be 2,000m^2 of paved area or 4,000m^2 of sodded area.

Maximum spacing for catch basins shall be as follows:

Road Grade @ 0.75%	=	70m
Road Grade @ 0.76% to 3%	=	90m
Road Grade Greater than 3%	=	70m

Note:

For cul-de-sacs the distance is to be measured along the gutter. Catch basins shall be generally located upstream of sidewalk crossings at intersections and upstream of all pedestrian crossings. Catch basins shall not be located in driveway curb depressions.

For rural estate subdivisions, catch basins may be spaced at greater intervals, however depth of flow shall not exceed gutter depth. In addition, volume of flow shall not exceed capture capacity of catch basin openings.

Catch Basin Types

Typical details for the single, double and rear lot catch basins are shown in the OPSD Standards.

Any special catch basins and inlet structures proposed must be fully designed and detailed by the Consulting Engineer for approval by the Town.

Double catch basins are to be installed at the low point of any road.

Catch Basin Connection

For single catch basins including rear lot catch basins, the minimum size of connection shall be 250mm and the minimum grade shall be 2.0%.

For double catch basins, the minimum size of connection shall be 300mm and the minimum grade shall be 2.0%.

In general, catch basins located in close proximity to a downstream manhole shall have their leads connected to the storm sewer. Long catch basin connections (in excess of 20m) shall be connected to a manhole.

Rear lot catch basin leads shall be installed as follows:

- All pipes are to be concrete encased the entire length, from the property line to the rear lot catch basin.

Frame and Grate

The frame and cover for catch basins shall be as detailed in the OPSD 400.100 (Perforated) Standards.

Catch basins located within the travelled portion of a roadway, shall have the frame elevation flush with the surface of the base course asphalt. The adjustment and setting of the frame and cover shall be completed in accordance with the details provided in the OPSD Standards.

Catch basins located within the rear lot shall have the Beehive Type Frame and Grate per Town of Caledon Standard No. 503.

Catch basins located within a park shall reference Section 2.3.5. of this manual.

Catch basins located within Greenway Corridors and Naturalized Areas shall reference Section 2.3.3. of this manual.

1.4.2.2.5. Roof Leaders, Foundation Drains and Storm Connections

Roof Leaders

Roof leaders must not be connected directly to the storm sewer system, and the following conditions must be complied with:

- Roof leaders must discharge onto concrete splash pads which direct the water into side yard swales. These swales must discharge to the front of the lot, no roof leaders shall drain to the rear of the lot, unless approved by design.

- It is recommended not to discharge onto driveways or walkways.

- For walkouts, a note is to be added to the drawings that all roof drainage is to be directed to the front of the lot, unless otherwise approved by the Town.

- Houses located on corner lots have roof leaders located at the corner(s) of the house, closest to the street lines.

- Roof leader down spout locations are to be indicated on site grading plans.

Note:

"Add-on" roof conditions, such as extended kitchens or sunrooms, which are drained separately and do not receive drainage from the main roof, may discharge to the ground, with flows directed to the side yard swale.

Foundation Drains

It is the Town's policy to permit the connection of foundation drains by gravity to the storm sewer system provided that the elevation of the basement floor is at least 1.0 meter above the elevation of the storm sewer obvert at that point.
Multi-unit Blocks: Freehold developments shall be provided with individual unit service connections to the foundation drainage system. Condominium Shared Ownership developments shall be provided with a minimum of two (2) connections per block.

Where the above provisions for gravity connection of foundation drains cannot be met, a sump pump system must be installed in the building and discharge to an acceptable location, which is satisfactory to the Town.

Storm Connections

Storm connections are to be sized in accordance with the following sizes:

	Minimum Pipe Size
• Single Family • Semi-Detached • Town House	Single Service – 125mm; or Double Service – 150mm
• Multiple Family Residential Block • Commercial and Industrial Areas	All Service(s) – 300mm

Note:

The table above reflects pipe sizes within the Town R.O.W. only and may be design specific beyond the property line. Storm connections shall be designed in accordance with the following Town of Caledon Standards:

Standard 500	Storm Sewer Service Connection for Flexible Pipe
Standard 501	Storm Sewer Service Connection for Rigid Pipe
Standard 502	Storm Sewer Service Connection for Services in Common Trench

Joints and Bedding

Joints and bedding for connections are to be equivalent to joints and bedding as specified for storm sewer pipes.

Connections of Services to Main Sewer

Double connections may be acceptable in residential areas where all other utilities can be accommodated and where the difference in the two connecting basement elevations does not exceed 600mm.

Manufacture of service tees at the main sewer shall be as follows:

- For storm main sewer pipe sizes 600mm or smaller, factory made tees from the manufacturer shall be utilized;

- For all other main sewer pipe sizes, either factory made tees, strap on saddles or other approved saddles may be used. All saddles shall be inspected by the Consulting Engineer at time of installation;

In the cases above, the storm sewer shall either be drilled or scribed at the plant or field fit, using an approved cut-in tool. Field fit tees may not be installed by breaking through or saw cutting the pipe wall.

38mm x 89mm (2 x 4) wooden markers placed from the invert of the service to a minimum 600mm above ground level shall be placed at the ends of each residential connection (1.5m beyond street line). Markers are to be labelled as “storm” and a depth to invert provided.

1.4.2.2.6. Channel, Culvert and Overland Flow

- For channel, culvert, bridge and/or erosion control projects, the Developer is responsible for retaining all necessary approvals from the governing agencies, such as the Toronto Region Conservation Authority (TRCA), Credit Valley Conservation (CVC), Ministry of Natural Resources and Forestry (MNRF), Department of Fisheries and Oceans (DFO) and/or the Niagara Escarpment Commission (N.E.C).

.

1.4.2.2.7. Culverts and Bridges

Road Classification	Design Flood Frequency
Arterial	1:100 year to Regional
Collector	1:50 year
Urban Local	1:25 year
Rural Local	1:25 year
Temporary Detour	1:10 year
Driveway	1:5 year

Headwalls are not permitted on driveway culverts. All culverts must be of sufficient length to provide for a minimum 4:1 slope off the driving surface to the ditch invert. All driveway culverts require entrance approval on assumed Municipal roads.

Bridges and the other major drainage structures shall require special designs as determined by the Town. Hydraulic calculations will be required.

The frequency and magnitude of flooding or erosion should not be increased on upstream or downstream properties.

1.4.2.2.8. Open Channels

The proposed criteria for an open channel design shall be submitted to the Town for approval prior to the actual design being undertaken. Open channels shall be defined as major system overland flow channels, minor system outfall channels or natural channels. Major system overland flow channel designs may be required to accommodate the Regional storm or the 100-year storm for new development.

“Natural” channel design criteria will be determined on a site by site basis. The following guidelines must be considered:

Open Channels	Minimum Velocity	Maximum Velocity
Grass lined – Natural	0.7m/s	1.5m/s
Grass lined – Maintained	0.7m/s	1.5m/s
Gabion lined	0.7m/s	2.5m/s
Concrete lined	0.7m/s	4.0m/s

1.4.2.2.9. Watercourse Erosion and Bank Stability

Where erosion or bank instability is already evident in an area to be developed or redeveloped, the Town of Caledon requires that the situation be stabilized by appropriate remedial measures. Where development will cause significantly increased downstream erosion, the Town also requires the Developer to mitigate further damage by appropriate remedial measures.

When designing remedial erosion or bank stabilization works; preservation of the watercourse dynamics and natural valley aesthetics must be secondary only to achieving a sound technical solution. A normal bank flow channel has a capacity of about 1:2-year flood.

Protection to this level will be adequate provided care is taken to prevent any damage by higher floods and provided that the channel bank is not coincident with a higher valley. In this latter case, it may be necessary to protect the bank to a level as high as the 1:100-year flood or even the flood resulting from the Regional Storm.

The proposed criteria for an erosion or bank stability design shall be submitted to the Town and to the appropriate Conservation Authority for approval, prior to the actual design being undertaken.

1.4.2.2.10. Overland Flow Routes

An overland flow route which continues to the nearest major channel must be established through all areas and shall be contained within either the road right-of-way or by Town properties used for lineal passive parks/walkways. Overland flow routes shall not cross private property.
The depths of flooding permitted on streets and at intersections during the 1:100-year storm are as follows:

- No building shall be inundated at the ground line, unless the building has been flood proofed.
- For all classes of roads, the product of depth of water (m) at the gutter times the velocity of flow (m/s) shall not exceed 0.65m²/s.

Flow across road intersections shall not be permitted for minor storms (generally 1:10 year). To meet the criteria for major storm run-off, low points in roads must have adequate provision for the safe overland flow.

The depths of flooding permitted in lineal passive parks/walkways during the 1:100-year storm are as follows:

- No building shall be inundated at the ground line, unless the building has been flood proofed.
- The depth of water shall not exceed 0.6m and/or flood outside of the Towns property.

1.4.2.2.11. Inlet/Outlet Structures

General:

Inlet and outlet structures shall be fully designed on the engineering drawings and receive local Conservation Authority approval where required. The details provided shall include the existing topography, proposed grading and the works necessary to protect against erosion of channels and undermining of any structures.

Adequate structural means such as rip-rap or concrete shall be provided at all inlets to protect against erosion and to channel the flow to the inlet structure.

Gabion, rip-rap, concrete or other erosion protection shall be provided at all outlets to prevent erosion of the watercourse and to the area adjacent to the headwall. The extent of the erosion protection shall be indicated on the engineering drawings and shall be dependent upon the velocity of the flow in the storm sewer outlet, the soil conditions, the flow in the existing watercourse and site conditions.

The inlets and outlets must be protected to prevent unauthorized access and debris accumulation. Safety grates are required where pipes exceed 300mm diameter. Large culverts may not require grates where the system is open at both ends and the length is determined to be acceptable. Safety fencing is required on structures where a vertical face exists greater than 1.0m in height.

Outfall structures to existing channels or watercourses shall be designed to minimize potential erosion or damage in the vicinity of the outfall from the maximum design flows.

The obvert of the outlet pipe is to be above the 25-year flood elevation of the receiving channel.

Barrier Hedge plantings must be used to deter persons from accessing or protect persons from accidentally falling onto thin ice or into turbulent waters within 10m of any inlet or outlet structures.

1.4.2.3. Stormwater Management

1.4.2.3.1. Reporting and Legislative Framework

The policies and criteria documented herein are intended to guide the user as to:

- Complementary Federal and Provincial policies and legislation,
- Town of Caledon's policy, criteria and role in implementation of the foregoing policies and legislation,
- Application of stormwater management techniques or practices unique to the Town of Caledon.

Although stormwater management planning and design is influenced by the mandate of various Ministries and public agencies, the Town of Caledon plays a central role in integrating the objectives of each policy into new development and associated stormwater management works, as well as bearing ultimate responsibility for operation, ownership and maintenance of such works. Hence, the Town primary objectives must include ensuring the economic sustainability and functional effectiveness of stormwater management works within the Town.

1.4.2.3.2. Stormwater and Environmental Management Studies

1.4.2.3.2.1. General/Criteria

Any proposed changes in land use will affect the mechanics of storm runoff. Regardless of the status of land use planning, any proposed change in land use will need to be accompanied by stormwater and environmental management studies.

Design

Typically, stormwater management planning and design occurs through a multi-phase process which is completed in concert with the land use planning process. The following preferred hierarchy of planning studies in the Town of Caledon has been identified:

- Watershed Plans;
- Subwatershed Plans;
- Subwatershed Impact Studies;
- Stormwater Management Plans:
  - Functional Servicing Report;
  - Detailed Design

In some instances where there are limited numbers of landowners, and drainage areas are discrete, there may be an opportunity to combine the Subwatershed Impact Study with the Functional Stormwater Management Plan. Prior to initiating such a process, the proponent is required to review specifics with the Town and either the CVC or TRCA or applicable Conservation Authority.

1.4.2.3.2.2. Specifications/Terms of Reference

Watershed and Subwatershed Plans

The Town of Caledon supports the implementation of Watershed and Subwatershed Planning Studies in concert with the land use planning process. Watershed and Subwatershed planning plays an important role in the development of Official Plan Land Use Designations and Secondary Planning.
The determination as to whether a Watershed or Subwatershed Planning Study is necessary for Official Plan Amendments, Secondary Plans or individual developments will be determined in consultation between the Town of Caledon, the development proponent(s), CVC and TRCA and other Ministries or public agencies having jurisdiction.

Rationale and justification to undertake Watershed or Subwatershed Planning Studies must include consideration of:

- Type and extent of proposed land use changes;
- Area of land use change with respect to the total watershed/subwatershed area;
- Physical sensitivity/significance of the receiving watercourse;
- Existing downstream conditions and land use (i.e. flood and erosion hazards, water usage); and
- Location and characteristics of the development area with respect to the potential to provide integrated servicing and stormwater management which would minimize long term maintenance and operation cost incurred to the Town.

It is important to recognize that each Watershed or Subwatershed plan will have widely varying goals and objectives specific to the issues within each area. For these reasons, the study objectives, organization, and funding arrangements will necessarily differ for each study.

Subwatershed Impact Study

This intermediate level of study may be required in areas where multiple land ownership within the subwatershed occurs. This level of study would focus on integrating servicing and stormwater management of adjacent development to a greater level of detail than is normally achieved through the Subwatershed Plan. Typically, this study would be required if the Subwatershed Plan has been completed prior to the development of preferred land use and lot plans. The objectives of this level of study will be to determine:

- Preferred servicing plan;
- Road layout;
- Integration of stormwater management facilities;
- Opportunities to integrate recreation opportunities with stormwater management;
- Phasing and cost sharing in areas of multiple ownership.

The decision as to whether a Subwatershed Impact Study is warranted would be determined through consultation between the various development proponents, the Town of Caledon, CVC and TRCA, and would depend on:

- Level of planning information completed in the Secondary Plan process such as road layout, facility locations and multiple servicing concept;
- Number of development proposals/proponents involved in the study area and opportunity to integrate facilities and phase developments.

Stormwater Management Plans

Stormwater Management Plans are prepared in support of individual development applications. The plans complement the planning process associated with Draft Plans of Subdivision or individual Site Plans. Stormwater management reporting associated with this planning stage would be the “Functional Design” plan. Subsequently, in support of final subdivision design a “Detailed Design” plan is required.

Functional Design

This level of design typically involves demonstrating the feasibility of providing stormwater management for a particular development. In areas where no Subwatershed Plan has been completed, the Stormwater Management Plan will be required to address additional issues such as environmental baseline conditions and screening of various stormwater management strategies and techniques.

Detailed Design

The detailed design submission shall demonstrate how the required information, outlined in Functional Design report, has been integrated as well as addressing details related to minor system design details, landscaping, safety and maintenance aspects of facility design, and monitoring requirements.

Low Impact Development (LID)

Low Impact Development (LID) technologies are to be incorporated into the stormwater management design. See "Low Impact Development Stormwater Management Planning and Design Guide" Version 1.0 by the CVC and TRCA. The Town will consider the use of technologies that utilize efficient design of features such as roof drain collectors, soak away pits, lot level controls, etc. wherever they are deemed appropriate and acceptable.

1.4.3. Stormwater Quantity, Quality and Erosion Control

Stormwater management is required to control increases in storm runoff due to development. Typical methods of quantity control are temporary storage of water on flat roof tops and parking lots, discharging rainwater leaders onto grassed areas or infiltration galleries, and downstream stormwater retention or detention ponds. Stormwater quantity controls are to be implemented on all applications in accordance with any applicable master drainage or subwatershed plan.

1.4.3.1. Quantity Control

A. Flood Management

Criteria

All newly developing or redeveloping areas must assess their potential impacts on local and regional flooding and mitigate accordingly.

Design

In areas where no Watershed or Subwatershed Planning or Subwatershed Impact Study has been completed, it is the policy of the Town of Caledon to require that runoff peak flows are controlled to pre-development levels, unless the proponent can demonstrate through appropriate modelling and analysis that uncontrolled flow will not cause detrimental impacts on flood conditions on downstream properties and watercourse systems. Before the Town will accept any increase in runoff rates, it must also receive endorsement from the agencies having jurisdiction.

Where the Subwatershed Plans or Subwatershed Impact Studies have been completed, the development proponent will be required to comply with the recommendations of the specific plan. Any variations will need to be appropriately supported by detailed analysis and also be approved by any agencies having jurisdiction. Refer to Section 1.4.8. for analytical methodologies.

B. Erosion Control

Criteria

Depending on the downstream water level and the nature of the soil strata affected, streambanks can be subject to increased erosion potential. In these cases, the proponent(s) will be required to provide appropriate protection in accordance with the Watershed or

Subwatershed Plans or with the Subwatershed Impact Study, as well as policies of the appropriate Conservation Authority.

In areas where no Subwatershed Plan exists, it shall be the responsibility of the development proponent to provide adequate erosion protection in accordance with Provincial Guidelines, unless it can be demonstrated through appropriate modeling and/or analysis that erosion processes will not be adversely affected by the proposed development.

Design

Erosion Control and management involves:

- Extended Detention storage for the 25 mm rainfall event as outlined in the Provincial Guidelines (ref. SWM Planning & Design Manual, MOECC, 2003), in the absence of specific direction from a Subwatershed or Watershed Plan.

- Assessment of downstream erosion susceptibility and critical flow values in conjunction with event modelling.

- Assessment of downstream erosion critical velocity or shear forces in conjunction with continuous simulation techniques (duration analysis).

In areas where the downstream receiving watercourse is determined to be unstable, or where control/over control of flow rates is ineffective or not feasible, design of channel alterations may be considered, subject to design in accordance with natural channel design principles (refer to "Adaptive Management of Stream Corridors in Ontario", Ministry of Natural Resources, 2001).

Storm sewer outfalls in natural channels should be provided with proper protection against erosion which includes appropriate bank scouring protection on either side of the outfall and creek. Where storm sewer outfalls outlet to steep and/or deep valleys, drop structures should be designed in such a manner as to provide integral bank stability. Such local erosion protection measures should be designed so as not to interfere with the natural channel forming processes of the receiving watercourse system. Refer to Section 1.4.8. for analytical methodologies.

1.4.3.2. Quality Control

Criteria

Water quality treatment will be required for all new development within the Town of Caledon. Water quality treatment performance shall conform to Provincial requirements (refer to Stormwater Management Planning and Design Manual, MOECC, 2003).

In areas of existing development where re-development is proposed, provisions for water quality measures will be evaluated on a site-specific basis, based on the feasibility of implementation. Where on-site measures are considered infeasible, the Town of Caledon may consider the potential for contributions to off-site improvements (i.e. cash-in-lieu), subject to agency concurrence.

In areas where a Subwatershed Plan has been prepared and approved, the guidelines and criteria cited within the plan shall be adopted by the Development Proponent.

Design

Specific guidelines for SWMP application have been developed by the Province based on the type of fisheries habitat downstream of the proposed development.

Three levels of protection are given, with the goal to maintain or enhance existing aquatic habitat, based on the suspended solids removal performance for the different end-of-pipe stormwater management facilities developed in the continuous simulation modelling. These levels of protection are based on a general relationship between the end-of-pipe stormwater management facilities long-term suspended solids removal and the lethal and chronic effects of suspended solids on aquatic life. The levels of protection correspond to the following long-term suspended solids removal:

- **Enhanced** protection corresponds to the end-of-pipe storage volumes required for the long-term removal of 80% of suspended solids;
- **Normal** protection corresponds to the end-of-pipe storage volumes required for the long-term removal of 70% of suspended solids; and
- **Basic** protection corresponds to the end-of-pipe storage volumes required for long-term removal of 60% of suspended solids.

As a general consideration, maintenance of the natural hydrologic cycle including infiltration is encouraged where soil conditions permit. Therefore, the use of stormwater management practices which enhance or maintain infiltration should be considered for each development. Generally active infiltration measures will be applicable in permeable soils areas only and their use will require supporting soils documentation. Passive measures such as disconnection of roof leaders have been historically utilized in many areas and should be implemented as a matter of course in all areas unless specific constraints preclude these measures.

In all cases, the potential for groundwater contamination shall be considered, particularly where infiltration of road runoff is contemplated.

In areas where hydrogeological concerns are identified and/or critical linkages to fisheries habitat are present, additional study and analysis may be required to determine the appropriate level of mitigation.

1.4.4. Stormwater Quantity/Quality Erosion Techniques

1.4.4.1. General

Current stormwater management practice advocates the consideration of SWMP's on a hierarchical basis, whereby more pro-active techniques are considered first. The SWMP's are grouped under the following headings in order of preferred application:

A. Lot Level Techniques and Source Controls and Alternative Development Standards

B. Transport or Conveyance Controls

C. End-of-Pipe Management Techniques

The philosophy behind this hierarchy is that stormwater management techniques are usually more effective when applied at the source. Table 1.1 constitutes a comprehensive list of currently available techniques associated with each of the foregoing categories. It is recognized that stormwater management remains an emerging science; hence this list will change over time. It will be the responsibility of the proponent to demonstrate that any technique, not currently approved by the Town, will address the intended function within expected maintenance and cost parameters, to the satisfaction of the Town of Caledon.

Stormwater management solutions should take into account multi-uses for the site. Integrated pathways, trails and passive recreational uses must be integrated in all designs. Stormwater management facilities shall be designed as an amenity and an asset and not as a rear yard, out of sight, piece of infrastructure. The use of Stormwater management facilities for passive recreational uses is not considered in lieu of parkland dedication, this is just considered good engineering principles.

During construction of the stormwater management facility, over excavation of the stormwater management pond cells is not allowed.

TABLE 1.1
COMPREHENSIVE LIST OF AVAILABLE STORMWATER MANAGEMENT PRACTICES

Stormwater Management Technique	Town of Caledon Perspective[1]
Source Controls	
• reduced lot grades	Not currently endorsed
• roof leader discharge to surface at front of dwelling	Endorsed
• roof leader and sump pumps discharge to soakaway pits	Not currently endorsed
• rear yard ponding	Not currently endorsed
• rooftop storage	Applicable for peak flow control only in industrial/commercial applications
• parking lot storage	Applicable for peak flow control only in industrial/commercial applications
• porous pavement	Will be considered for rural sites and driveway/parking lot applications
Conveyance Controls	
• pervious pipe systems	Will be considered at Town's discretion
• pervious catch basins	Not currently endorsed
• grassed swales (semi-urban road sections)	Encouraged where applicable (ref. Official Plan) ref. Hybrid Roadway Cross-section
• oversized pipes (Superpipes)	Appropriate in redevelopment of existing areas only

[1] The use of any of the foregoing SWMP's is subject to appropriate soil conditions.

TABLE 1.1 COMPREHENSIVE LIST OF AVAILABLE STORMWATER MANAGEMENT PRACTICES	
Stormwater Management Technique	Town of Caledon Perspective[1]
Low Impact Development (LID) Practices	
• buffer strips	Only considered appropriate for low density, small drainage areas
• infiltration basins	Will be considered for rural and industrial sites
• infiltration trenches	Will be considered for rural and industrial sites
• vegetated filter strips	Only considered appropriate for low density, small drainage areas
End-of-Pipe Facilities[2]	
• dry ponds	Applicable for water quantity control only
• wetlands	Applicable for water quality/quantity treatment
• wet ponds	Applicable for water quality/quantity treatment
• oil/grit separators and equivalent systems	Applicable; most appropriate for Commercial/Industrial land use; require consideration of treatment train philosophy

1.4.5. Sediment and Erosion Control During Construction

Criteria

In all cases, it is required that sediment loading be controlled as per the guidelines "Erosion and Sediment Control Guidelines for Urban Construction" published by the Greater Golden Horseshoe Area Conservation Authorities (including the Credit Valley Conservation and Toronto Region Conservation Authority) December 2006, and the "Ontario Guidelines on Erosion and Sediment Control for Urban Construction Sites" 1987. All Erosion and Sediment Control facilities shall be inspected and maintained until the site is stabilized to the satisfaction of the Town. Inspection reports must be submitted to the Town as per the requirements of the "Erosion and Sediment Control Guidelines for Urban Construction" published by the Greater Golden Horseshoe Area Conservation Authorities (including the Credit Valley Conservation and Toronto Region Conservation Authority) December 2006.

Note:

All Erosion and Sediment Controls will follow the most recent updates (if any) to the guidelines provided above.

Design

[2] The Town requires appropriate signage for all surface end-of-pipe techniques.

As a minimum all Erosion and Sediment Control Plans should incorporate recommendations and protection measures pertaining to:

- Construction Scheduling/Development phasing
- Minimizing soil exposure and re-establishment of vegetative cover
- Minimizing unnecessary clearing
- On-site sediment and erosion techniques
- Site Supervision
- Monitoring and Maintenance
- Submission of Inspection Reports
- Site Restoration
- Special Considerations (i.e. in-stream construction/crossings, fisheries timing constraints)

1.4.6. Storm Facility Maintenance

Storm facility designs shall consider future maintenance requirements and accesses shall have a minimum width of 5.0 meters. A Maintenance Report is required that meets the latest MECP guidelines and shall outline maintenance and monitoring requirements. The Maintenance Report shall determine which method of cleaning the facility of accumulated materials is economically feasible, either in the wet or in the dry.

Storm Facility Cleaning in the Dry

Storm facilities that are designed to be cleaned in the dry shall have a bypass storm sewer system and a diversion structure constructed that will divert a 2-year storm event around the facility to the outfall. Any storm intensity greater than the 2-year event shall be directed into the facility when the diversion is in operation.
The facility shall be designed to allow for gravity draining. There will be no pumping of facilities allowed for maintenance purposes. It is recognized that in some instances, unique circumstances may arise where this requirement cannot be accommodated. In these cases, pumping of the facilities shall be kept to a minimum. Accesses shall be designed to enable excavating equipment to reach all areas of the facility such as outfalls, discharge pipes. If during cleaning of the facility in the dry requires equipment to enter the facility, then the bottom of the facility shall be designed to withstand heavy equipment where it is necessary for this equipment to work.

For Stormwater Management Facilities designed to be cleaned in the dry without the use of a by-pass, a drying area must be provided and indicated on the appropriate drawings.

Storm Facility Cleaning in the Wet

Storm facilities that are designed to be cleaned in the wet shall have access capable of withstanding the weight and size of the equipment and will enable equipment to reach all areas of the facility without having to enter the pond with the equipment.

1.4.7. Meteorology

Town of Caledon intensity-duration frequency curves were originally derived from the rainfall data taken from the Guelph O.A.C. (Town Standard Drawing No. 103). The equations for these curves are as follows:

Return Period (Yrs.)	A	B	C
2	1070	0.8759	7.85
5	1593	0.8789	11
10	2221	0.9080	12
25	3158	0.9335	15
50	3886	0.9495	16
100	4688	0.9624	17

$$I = \frac{a}{(t + c)^b}$$

Where: a, b, c = above
I = intensity (mm/hr)
t = storm duration (min)

Based on these I.D.F. curves, the Consultant is to develop the proper design storms for use in hydrologic studies. In general, the S.C.S. design storms should be used for determining the hydrographs for undeveloped watersheds and for checking detention storage required for quantity control. The Chicago design storms should be used for determining hydrographs in urban areas and also for checking detention storage. In many cases, the consultant will be required to run both sets of design storms to make sure that the more stringent is used for each individual element of the drainage system (pipe flow, street flow, channel flow, detention storage).

The time step for discretization of the design storm can vary according to the size of the subwatershed but must not exceed the estimated time of concentration. The maximum rainfall intensity should be compatible with that of real storms on record.
In detailed design of storage structures, the operation must be checked for spring flood conditions due to combined snowmelt and rain. Wet ponds are to be checked for spring flood conditions due to combined snowmelt and rain. Wet ponds are to be checked for evaporative losses. Temperature data is to be submitted with these calculations. Operation of storage facilities must also be checked in order to verify that a sequence of storms is not more critical than a design storm.

1.4.8. Stormwater Management Analytical Methods

1.4.8.1. Rational Method

The Rational Method of determining design flows should only be used as an approximation of flows for relatively small drainage areas (i.e. less than 5 ha) due to the conservativeness of the approach. Flows determined using the Rational Method are typically higher than those resulting from complex hydrologic models.

The Rational Method can be used for storm sewer design regardless of the total contributing area, using the Town of Caledon storm sewer design sheet and IDF relationship.

1.4.8.2. Even Based Hydrologic Models

Both the Flood Plain Management in Ontario Technical Guidelines, Ontario Ministry of Natural Resources, 2001 and the Drainage Management Manual Parts 3 and 4, Ministry of Transportation, 1997 provide general guidelines on the selection of hydrologic models. The Ministry of Transportation document lists the characteristics of each model, from which the proponent can evaluate the appropriateness of certain event based hydrologic models.

Sound hydrologic modelling standards of practice should be followed in developing an event based hydrologic model. The following standards of practice are intended to guide general model preparation for most hydrologic programs and techniques, however, this list should not be considered exhaustive:

1. The modeler should provide the purpose for developing the hydrologic model, such as determining flow rates, runoff volumes, flow routing effects for proposed development, existing land use conditions etc.;

2. The modeler should provide the study objectives and how they relate to the hydrologic modelling;

3. The modeler should provide the model selection criteria and how the model matches the criteria;

4. The modeler should provide the basis for the storm design information, outlining how the design storm has been selected;

5. The modeler should provide drainage area plans outlining both internal and external catchments, modeling schematics and tables providing drainage area parameters.

6. Background information on the selection of the drainage area parameters should be provided to assist the Town in understanding on the assumptions leading to the drainage area parameters;

7. Background data on overland and minor storm systems should be provided with plans clearly presenting and labelling both systems;

8. Data should be provided on routing through natural and manmade storage systems, with detailed plans and calculations outlining how the stage/discharge relationship has been developed;

9. Sensitivity analysis should be conducted on a minimum number of parameters which varies with model complexity;

10. Verification or validation of results should be provided through various methods such as calibration to recorded streamflow, unit flow rates and runoff volume comparisons

using the techniques such as the MTO index method or equivalent. The application of the validation technique (number and type) will depend on the availability of data and the sensitivity of the analysis.

The modeler should provide all input and output details in a logical manner, with an explanation for potential errors.

1.4.8.3. Continuous Models

Continuous models differ from event based hydrologic models in that rather than using a synthetic design storm based on IDF data, a long-term time series of historical meteorological data is used for the input driving function. In addition to historical rainfall data, continuous models typically require seasonal state variables. Continuous models are usually more complex than event based hydrologic models, as typically the models consider more processes including temperature, evapotranspiration, snow conditions and groundwater. Notwithstanding, the modeling standards of practice for event based hydrologic models also apply to continuous models. Continuous models are typically used but are not limited to higher level studies such as watershed and subwatershed studies. Continuous modeling may also be used for studies with a scope requiring historical data inclusion.

In addition to the standards of practice for event based hydrologic models, the proponent should demonstrate that the historical meteorological time series selected has been obtained from the nearest rainfall gauge to the proponent's study area. This will often lead to a trade-off between duration of record and proximity. Typically, the minimum duration for meaningful continuous simulation is 20 to 25 years. Historical rainfall data is available from the Conservation Authorities and Environment Canada.

The proponent in selecting a continuous hydrologic model usually intends to develop frequency flows for the historical data period. The proponent should specify the assumptions and methodology for determining the frequency flows and typical year hydrographs. The proponent should provide validation of the selected probability distribution by using statistical tests.

The proponent should select the continuous model giving consideration to development and/ or redevelopment characteristics to the satisfaction of the Town. In addition, approval agencies (i.e. Conservation Authorities, MNRF, MTO and others) other than the Town should be consulted to determine modeling requirements.

1.4.9. Hydraulic Capacity

Drainage systems can be subdivided into both closed and open systems. The hydraulic capacity of the receiving minor and major storm system is to be determined to verify that drainage can be safely conveyed as proposed. For each system various analytical techniques can be employed. Discussions with the Town and review agencies (Conservation Authorities, MNR, MTO and others) would be required to confirm the appropriateness of using selected hydraulic analytical techniques.
The hydraulic capacity of a storm system can be determined through hydraulic modeling and for certain applications through the use of standard 'hand calculations'. As for hydraulic modeling, standards of practice relate to the use of various techniques. The following standards of practice are intended to provide direction:

1. The proponent should clearly identify the study objectives and how they relate to the hydraulic modeling;

2. The proponent should provide the purpose for the hydraulic modeling;

3. The modeler should provide the model selection criteria and how the model matches the criteria;

4. The proponent should provide plans clearly presenting the closed and/or open hydraulic system;

5. For plans describing open systems, the proponent should note cross-sections, study limits, land use, crossing details, spill areas, ineffective flow areas, and flooding limits and elevations for the appropriate design event(s);

6. For plans describing open systems, the proponent should note cross-sections, study limits, land use, crossing details, spill areas, ineffective flow areas, and flooding limits and elevations for the appropriate design event(s);

7. For combined hydrologic/hydraulic models such as SWMM, the proponent should provide plans that not only describe the closed system but also the contributing drainage areas and overland flow system;

8. For all hydraulic models, the proponent should provide the downstream and, if applicable, the upstream boundary conditions for each storm modeled and the assumptions used to define the boundary conditions;

9. For all hydraulic models, the proponent should document the parameters established for hydraulic losses such as Manning's 'n', inlet and outlet losses and other appropriate losses;

10. The proponent should summarize the selection of procedures for determining the computed energy grade line and water surface elevations;

11. The proponent should document the hydraulic results in summary form for the relevant storm events;

12. The proponent should prepare the model of an open system such that it fully contains the modeled flows without exceeding the hydraulic cross-section. Should it not be possible to contain the flows within the defined geometry of the open storm system, the proponent should provide details on the spill characteristics. In the event of a spill, a rationale should be provided on whether or not to include a flow loss in the calculation;

13. The proponent should document potential impacts on existing infrastructure and possible mitigative measures;

14. Sensitivity analysis should be conducted on a limited number of parameters depending on the model type and complexity;

15. The proponent should, if possible, verify hydraulic results for an existing closed/open storm system by documenting historical flood elevations for specific storm events and comparing the hydraulic modeling results to the historical data; calibration of losses should be included, if sufficient data exists;

16. The proponent should provide the input and output data in a logical manner with an explanation of the potential error.

The hydraulic capacity of storm sewers is to be determined using the Town of Caledon Storm Sewer Design Sheet. The proponent is required to abide by the relevant hydraulic modeling codes of practice (i.e. specifically No.'s 1, 3, 6, 8 and 9). In addition, the proponent should document in both plans and text, the hydrology for the storm sewer design. The storm sewer design should be conducted using the Town's 10-year IDF storm data of the Town's approved storm event for the study area (regardless of the return period used previously to size downstream storm sewers).

1.4.10. Stormwater Management Facilities

1.4.10.1. General

All new SWM facilities shall be designed to meet the Enhanced (Level 1) level of protection per the MECP SWM manual as a minimum requirement unless otherwise specified in this document. An Operation and Maintenance Manual for the SWM facility shall be submitted to the Town for the site and shall be implemented by the owner to ensure that the continued performance of the facility as designed is achieved.

New development shall be designed to mitigate impacts to the watercourse including erosion, flooding and water quality. Existing watercourses shall be left in their natural state as much as possible.

Stormwater quantity control is required to mitigate the detrimental impacts of flooding and erosion on the watercourse due to increased stormwater runoff from new development. Stormwater quality controls are to be implemented based on all approved Subwatershed or Master Drainage Plans.
Source controls are encouraged where soil conditions allow infiltration. Owners are required to maintain and monitor the operation of quality ponds and shall ensure the facility meets current Ministry of the Environment criteria prior to the Town assuming control of the facility. The length of period required before the Town assumes responsibility of the facility depends upon the timeframe of housing completion.

1.4.10.2. General Design Considerations

Generally, a SWM facility will need to be located at or near the lowest point of the site to ensure that both the major and minor system flows are conveyed to the facility from the entire site. In certain circumstance, due to site topography, it may not be possible for all site drainage to be conveyed through the SWM facility before leaving the site. In these cases, it may be necessary to provide additional SWM facility storage so that the post-development flows are equal to pre-development (i.e. provide overcontrol). For greenfield development sites, however, the proponent must provide reasons and supporting documents as to why a single SWM facility cannot meet the MECP's development criteria. This will be required,

prior to proposing additional SWM measures (i.e. Superpipes and OGS) to satisfaction of the Town.

SWM facilities must not be located adjacent to kindergartens, elementary schools, walkway routes leading to kindergartens, elementary schools or other active recreating areas frequented by young children.

1.4.10.3. Design Guidelines

Length to Width Ratio

The length-to-width ratio of a pond is a key factor of the pond's overall removal efficiency. The minimum length-to-width ratio shall be 4:1. Baffles and berms should be used to maximize the length-to-width ratio.

Grading and Retaining Walls

The maximum slope requirements for the various components of the facility are as follows:

- 4:1 (H:V) from the bottom of the permanent pool to up to 0.5m below the normal water level (NWL)
- 7:1 above the 4:1 sloping zone up to the berm/maintenance access road.
- 4:1 where the slope backs on to the rear yard lot line, adjacent road system or valley.

Note:

Retaining walls are not permitted within SWM facilities.

Overland Drainage Routes

Overland drainage routes that direct flows from the 100-year storm event to the pond area shall be provided. Under any circumstances, overland drainage route cannot be established over retaining walls. Sufficient design calculations and erosion control measures shall be provided for the Town's review.

Permanent Pool, Quality and Quantity Storage Requirement

The SWM facility sizing, including the permanent pool volume, quality and quantity volume shall be designed in accordance with the governing guidelines which are currently documented in the MECP SWM manual.

For greenfield development sites a detailed erosion control analysis based on a geomorphic assessment to determine critical erosion flow thresholds shall be completed. The erosion analysis shall be completed using a continuous hydrology model with a specified precipitation data set as per governing conservation authority requirements.

Forebay

The forebay, including dispersion length, minimum required bottom width and forebay berm, shall be designed in accordance with in the MECP SWM manual.

A berm shall be constructed with appropriate erosion protection to enable, at a minimum, the flow of the water quality event (25 mm, 4 hour event using the Chicago Storm distribution) without inundating any other part of the forebay into the main cell of the facility. The minimum top width of the berm shall be 1.0 m with a forebay spillway invert at the normal water level (NWL).

Where feasible, the forebay sump shall be connected to the pond outlet structure with a control valve to drain by gravity. Where draining by gravity is not feasible, a dewatering sump shall be constructed to enable the drawdown of the permanent pool for maintenance and sediment removal by pump.

If possible, a maintenance pipe should be installed in the forebay to allow drawdown of the forebay for maintenance purposes. The maintenance pipe should be connected to a bypass pipe around the pond. Otherwise, the forebay will have to be pumped out. If only the forebay is to be pumped out or drawn down during maintenance, the forebay berm must be designed as a small dam since the rest of the pond will not be drained. Care must be taken not to compromise the structural integrity of the berm or liner during drawdown conditions.

The bottom of the forebay shall be lined with 300 mm of 50 mm diameter crusher run limestone, or as recommended by a geotechnical engineer, to enable the use of maintenance equipment during sediment removal. Unstable native soils may warrant the use of geotextile lining under the limestone as per geotechnical recommendations. A geotechnical engineer shall certify that the forebay lining will provide adequate support for maintenance equipment.

A minimum of 1.0m thick compacted clay liner shall be placed under the crusher run limestone liner and shall be min. 0.5m extended to the permanent pool or season high groundwater table whichever is greater.

Berming

Berms around wetlands and wet ponds shall be designed with a minimum top width of 2.0 m (where trails and access roads are not located) with a 4:1 maximum side slope on the outside. The core of the berms shall be constructed with engineered fill on the basis of the recommendations of a licensed geotechnical engineer. Topsoil is not permitted for berm construction except as a dressing to support vegetation on the top of the core.
If pond berms exceed 2.0 m in height, the berm must be designed and stamped by a geotechnical engineer with experience in the related field.

The length of pipe through the embankment should be minimized to the greatest degree possible and engineering designs will need to select the appropriate pipe material and bedding, determine if the pipe needs to be encased in concrete, minimize the number of pipe joints to ensure water tightness, design filters and/or anti-seepage collars.

Note:

The top of berm elevation shall be established at a minimum 0.3m above the 100-year water level or highest water level within the facility. Retaining walls within the stormwater block are not acceptable to the Town.

Hydraulics

The 100-year elevation will be established taking into consideration the adjacent footing elevations. When the SWM Facility is at the 100-year elevation, water should not back up through the storm sewer and weeping tile connections to create hydraulic pressure on foundations. Areas affected by the High Water Level (HWL) and resulting hydraulic grade line should be kept to a minimum. Free flow conditions are preferable; this is achieved when the crown of the closest incoming storm sewer(s) is at or above the HWL. All hydraulic conditions must be approved by the Town and must consider the requirements of Section 1.4.2. as applicable.

When free flow conditions are not achieved based on the HWL, hydraulic grade line (HGL) elevations in the storm sewers must be determined based on the wetland at HWL and the appropriate losses taken into account (ie. junction losses, pipe losses, etc.). **Surrounding footing (or slab) elevations must be a minimum of 0.3 m above the HGL.** Other options to protecting weeping tile connections include a separate weeping tile system connected downstream of the wetland, or sump pump to surface.

Surcharging to ground surface will **not** be permitted.

Maintenance Access

Maintenance access roads are required to all inlets, outlet structures, spillways, sediment forebays, sediment drying areas and outfall channels associated with SWM facilities. Co-location of access roads with trails shall be implemented wherever possible. Access roads for emergency spillway outfall channels shall be incorporated into the design of the spillway where feasible (i.e., the access road is the outfall channel from the emergency spillway). Where feasible, two access points shall be provided from the municipal road allowance such that the access road is looped to key hydraulic features. In situations where this is not practical, dead end access roads shall be designed with a hammerhead turning area consisting of a minimum hammerhead width of 17.0 m and a 12.0 m centerline turning radius.

Maintenance access for ponds must be min. 5.0m wide with a maximum grade of 8% with 2% cross fall. Maintenance access roads shall be paved with the following minimum pavement thickness:

- 40mm HL3;
- 50mm HL8; and
- 200mm 20mm Crusher Run Limestone

Note:

Maintenance access ramp into the forebay or pond bottom shall be constructed with cable concrete matting.

Warning Signs

If pedestrian traffic routes or walkways are located within or adjacent to the stormwater management block, warning signs are to be installed. The number of signs required will be

determined by the Town on a site specific basis. Signs are to conform to the Town's standard and shall be supplied and installed by the developer.

1.4.10.4. Maintenance Costs

The maintenance costs represent the costs to ensure the proper operation, longevity and aesthetic functioning of the stormwater control measures. The necessary tasks to achieve these objectives include sediment removal, trash removal, maintenance of the vegetation and inspections of the inlet and outlet. The Consulting Engineer shall provide a report to the Town detailing maintenance recommendations based on the approved stormwater management plan. The report shall include the following recommendations:

- Inspection of all structures and how frequently (minimum of once annually);
- Removal of all sediments and how frequently;
- Method of re-stabilizing of all disturbed areas;
- Sediments to be tested to determine method of disposal;
- Effluent sampling protocol.

The required maintenance interval and unit price for each of the required maintenance activities shall be in accordance with the "Ministry of Environment Stormwater Management Planning and Design Manual" (March 2003, or as amended).

1.5. Roadways

1.5.1. Road Works

Asphalt roadways complete with concrete curbs and gutters designed and constructed in accordance with the most recent requirements and specifications of the Town and the Ontario Provincial Standards are required on all road allowances within the plan of subdivision. The balance of the road allowance not occupied by the roadway, driveways, splash pad or sidewalks shall be graded, top soiled and sodded (estate subdivisions may be seeded where appropriate) to the satisfaction of the Town.

1.5.2. Geometric Design

1.5.2.1. Roadways

Roadway geometric design will be in accordance with the Town of Caledon Geometric Design Standards and Road Sections as outlined in Town Standard Drawings.

A traffic distribution analysis is needed for all applications; this is in addition to a traffic impact study, if one is required. This analysis is to be completed by a qualified traffic engineer and the analysis must indicate the estimated two-way AADT for *all road sections* (road sections are segments of roadway between intersections) within the plan of subdivision. Several decisions are based on AADT and Engineering Services Department needs this information to properly process an application.

Road widths and Right-of-Ways are to be in accordance with the most recent Town of Caledon Standards (see Table 1.2):

TABLE 1.2
TOWN OF CALEDON
GEOMETRIC ROAD DESIGN STANDARDS

	ADT	Posted Speed (km/h)	Hor. Curve Rad. (m)	Vert. Curve (Min. k)		Road Grade		Grade at Intersections		R.O.W Width (m)	Pav't Width (m)	Inter-section Angle	Cul-de-sac	
				Sag	Crest	Max. (%)	Min. (%)	Stop	Through				Radius Pav (m)	Max Grade
Local Residential	<1000	50	90	12	8	6.0%	0.75%	2.0%	3.0%	18	7.9	85->95	15	3.0%
Local Industrial	<1000	50	115	18	15	4.0%	0.75%	2.0%	3.0%	22.5	10.4	85->95	20	3.0%
Residential Collector	1000 to 3000	60	130	18	15	6.0%	0.75%	2.0%	3.0%	20	8.9	85->95	N/A	N/A
Industrial Collector	1000 to 3000	70	190	25	25	6.0%	0.75%	2.0%	3.0%	26	13.9	85->95	N/A	N/A
Arterial	> 6000	80	250	30	35	6.0%	0.75%	2.0%	3.0%	30	7.0-15.0	85->95	N/A	N/A

1. Climb Lane	Add where grade is more than 4%
2. Widen R.O.W.	Through Intersection as Required
3. Hor. Curve Radii	Given at Centerline
4. Max. Cul-de-sac	150m Without Emergency Access
5. Dual Carriageway	Where 2nd. Access Not Available
6. Min. Fire Route	6.1m for One Way Traffic 9.0m for Two Way Traffic
7. Min. Lane Width	3.8m for Through of Right Turn 3.25m for Left Turn 2.5m for Curb Side Parking
8. Min. Sight Distance	30.0m for industrial driveway setback
9. Corner Lot Rad.	5.0m Min. Property Radius
10. Cul de Sac	Min. 0.75% Grade at Gutter
11. Driveway Grade	2.0% Min. 6.0% Max. 4.0% Preferred
12. Vertical Curves	When there are grade changes in excess of 1.5%
13. Minimum Intersection Curve Radii (measured at Edge of Pavement)	
• Arterial to Residential Collector	12.0m
• Arterial to Industrial Collector	15.0m
• Industrial Collector to Residential Collector	15.0m
• Industrial Collector to Local Industrial	15.0m
• Local Industrial to Local Industrial	15.0m
• Residential Collector to Local Residential	10.0m
• Local Residential to Local Residential	10.0m
• Residential Road to Laneway	10.0m

1.5.2.2. Rear Lanes

The function of rear lanes is to provide vehicular access to parking garages/areas located to the rear of a house/development that have frontages on another public street.

Rear lanes shall be in accordance with the Town of Caledon Standard Drawing 200 and shall have 5.4m of paved surface for an 8.0m ROW. Double loaded driveways to be avoided where possible.

Storm sewers shall be required along the length of the rear lanes, but all other municipal infrastructure is prohibited along rear lanes. Catch basins shall be spaced a maximum of 100m apart.

Streetlight easements are required where streetlights are located on private property for maintenance purposes.

Install an asphalt or concrete strip (as directed by the Town) from the back of curb to the property line, where residential rear yards abut laneways.

1.5.2.3. Driveway Entrances

Driveway entrances and drop curbs shall be in accordance with the Town of Caledon Standard Drawing 402 and the most recent standard drawings for this purpose.

Special designs are required for commercial, industrial and industrial commercial driveways, dependent on the expected use and anticipated loads.

All new residential driveways must be paved with two (2) lifts; one (1) lift to a minimum 40mm HL8 and one (1) lift to a minimum 40mm HL3 from the curb to the property line on a base of a minimum of 150mm granular 'A' or 150mm of 19mm crusher run limestone. In Rural Estate subdivisions the driveway is to be paved a minimum of 1.0m behind the curb to provide support for the curb. In Estate Residential subdivisions, paving of driveway entrances may not be required for final assumption if the lot has not yet been developed.

Boulevard driveway slopes should be a maximum of 6% and a minimum of 2% wherever possible. Town policy will dictate the widths of curb depressions for driveways.

A minimum 0.6m separation at the curb shall be provided between driveways. Joint driveways are permitted in Semi-detached and Townhouse type developments. All driveway locations are to be indicated on the Aboveground General Plan and the Composite Utility Plan.

A minimum clearance distance of 1.0m is required between the edge of the driveway and a utility structure or hydrant.

1.5.2.4. Road Patterns

All new streets shall have regard for the following:

1. All new Town streets shall provide access, where possible, from two connecting directions to every private property, with qualified exception as shown in point 3 below. Connecting pedestrian ways may be required by secondary plan policy, despite exceptions for streets.

2. Existing non-conforming streets are permitted to continue as an exception:
   a. Unless indicated otherwise by secondary planning process, or
   b. Where infrastructure has been configured for continuity, or
   c. The access is required to bring adjacent development into conformity.

3. An exception to 1 may be considered where:
   a. The second access is only available in future development – in which case such access should be planned for and pre-serviced with a temporary cul-de-sac, or
   b. Extenuating natural topographic features prevent the reasonable design of road and related services in connecting patterns, or
   c. Environmental Policy Areas or other environmentally regulated areas prevent second access, or
   d. The necessary lands cannot be acquired, or
   e. A one-way street or link is accepted as a preferred traffic solution, or
   f. The Director s of Engineering Services, Planning & Development and Fire & Emergency Services shall make the determination of whether an application is eligible for one of the exemptions. The proponent may be required to submit documentation to support an exemption.

4. Where a terminal road is permitted under 3 it must not exceed an average annual daily traffic (AADT) of 400 or a gradient of 4%.

5. Proposed patterns for lands around significant intersections should develop road patterns, which support reasonable alternate emergency routes around the intersection. Such intersections are identified to be intersections of streets of a collector/arterial nature:
   a. Alternate routes can be laid over private lands by way of permanent easements for unobstructed vehicular access in favour of the Town. These easements must be maintained in good condition, and kept clear of obstruction, by the Owner.
   b. Points of local commercial and/or institutional interest which front on arterial roads should have secondary access to/from the adjacent local and/or collector road pattern. Exemptions may be required or considered with regards to historical development patterns and land use compatibility.

1.5.2.5. Special Road Designs

Special road designs not covered by the Town of Caledon Standards, shall conform with the most recent provisions of the geometric design standards manual and urban street geometrics, as adopted by the Transportation Association of Canada (TAC).

Special designs will be required in high density residential, commercial and industrial areas.

Pavement design shall be in accordance with the most recent Town of Caledon Standards and the Ontario Provincial Standards Drawings and Specifications.

Complete mechanical analyses of the proposed sub-grade are to be taken at a minimum of 150m intervals along proposed roads. On small sites a minimum of two mechanical analyses will be required.

1.5.2.6. Pavement Design (Roadways)

A soil analysis must be conducted by a recognized and licensed Geotechnical Engineering Firm that is acceptable to the Town of Caledon. The proposed road designs, along with copies of the soil analysis will be submitted to the Town.

Note:

The minimum thickness of asphalt and granular material make-up shall be designed in accordance with applicable Town Standard Drawings.

In all cases:

- Base course of asphalt:
  - Local Roads- O.P.S.S. HL8
  - Arterial, Collector & Industrial Roads - O.P.S.S. HDBC

- Wearing course of asphalt:
  - Local Roads - O.P.S.S. HL3
  - Industrial Roads & Collector Roads - O.P.S.S. HL3 HS
  - Arterial Roads – HL1

- Asphalt job mix designs, approved by the Owner's Geotechnical Engineering consultant, shall be submitted to the Town for review a minimum of 5 working days prior to the commencement of paving for review.

- O.P.S.S. Granular 'A' and Granular 'B' materials are to be used in roadway construction in the Town of Caledon as per the Geotechnical Consultant.

- Crusher Run materials are an acceptable alternative to the approved O.P.S.S. Granular 'A' and Granular 'B' materials for the use in roadway construction.

- Roadways containing four or more paved lanes require an increase to the curb lane roadway pavement specification:

- Binder course (base) asphalt under the bus route or curb lane must be increased by 50mm.

- Four lane roadways, bus routes and industrial roads require the base course asphalt to be Heavy Duty Binder Course (H.D.B.C.), OPSS.MUNI 1150 and the wearing course shall be HL 3 HS.

1.5.2.7. Placement of Top Course Asphalt within the Subdivision

The following must be completed and approved by the Town, before the placement of top course asphalt can commence:

- Complete all sidewalk works;
- Complete driveway works;
- Complete all curb works;
- Complete boulevard works;
- Grading Certifications submitted to the Town;
- Falling Weight Deflectometer (FWD) Test;
- All manhole and catch basin frames and grates must be raised and the rims painted with orange fluorescent paint to make them visible to drivers. Warning signs must be placed at all entrance points to the subdivision, indicating the raised manhole and catch basin frame covers ahead. Placement of the top course asphalt must be completed within two weeks of raising the frames and grates;
- Install any delineation required for raised manholes and catch basins that are in excess of the 40mm top course asphalt lift. Delineation is required on any road with a posted speed limit of 60km/hr or greater;
- Flush and sweep surface and evenly apply tack coat;
- Base course asphalt padding as required in accordance with OPSS;
- Place top course asphalt in accordance with OPSS;
- Written confirmation from the Region of Peel that all Regional infrastructure deficiencies have been repaired to the Region's satisfaction.

Note:

All wearing course of asphalt shall be placed using a Material Transfer Vehicle (Shuttle Buggy). In combination with OPSS MUNI 310, during placement of asphalt on roads greater than 200m in length, a 12m ski shall be used to ensure smooth placement of asphalt, unless otherwise approved by the Town.

Note:

Under no circumstances will top course paving between October 15th and May 1st be accepted no matter the weather conditions unless approved by the Director of Engineering Services. Any paving done between these months without the approval of the Director, must be removed and replaced at the owner's expense;

Note:

The owner shall not request permission to place the top layer of asphalt until Lot Grading Certificates have been issued for:

1. 80% of the lots or blocks on the Plan, in respect of a rural subdivision located beyond a Settlement Area;
2. 80% of the lots or blocks on the Plan, in respect of an industrial subdivision; or
3. 100% of the lots or blocks on the Plan, in respect of a subdivision located within a Settlement Area.

1.5.3. Curbs and Gutters

All new Town streets are to be constructed with a concrete barrier curb with a standard gutter in accordance with OPSD 600.040. In locations where an Impressed Concrete Splash Pad (STD 221) is required, a 50mm concrete ledge will also be required along back of curb. Roads with an AADT less than 100 and a minimum lot frontage 30m and greater will be constructed with semi-mountable curbs with a standard gutter in accordance with OPSD 600.060.

A driveway entrance is required for each lot as detailed within Town Standard No. 402. Curb depressions are required at all pedestrian road crossings.

Curb and gutter is to be designed and constructed to the most recent Town Standards and Ontario Provincial Standards.

Single-stage curb installation must be in accordance with OPSD 600.040.

Two-stage curb installation must be in accordance with OPSD 600.070.

Minimum curb grade is 0.75%, including cul-de-sacs and outside road elbows.

1.5.4. Concrete Specifications

The concrete shall meet the requirements of the most current OPSS MUNI 1350; shall have a minimum compressive strength of 32 MPa at 28 days (CSA A23.1); air content of 6.5% ± 1.5%; a maximum slump of 80mm ± 30mm for handwork, 40mm ± 20mm for machine work.

1.5.5. Cul-de-Sacs

Permanent Cul-de-Sacs and Allowances

All local roads which permanently terminate at one end (dead end streets) shall be provided with a turning circle (cul-de-sac) of sufficient area to enable the turning of garbage trucks, snow removal equipment, school buses and other emergency vehicles. Residential cul-de-sacs shall have a maximum allowance of 150 m in length, unless there is emergency access. Cul-de-sacs shall have a minimum radius of 13m at the edge of pavement, as per Town Standard No. 216

Temporary Cul-de-Sacs and Allowances

Temporary cul-de-sacs shall be required for all temporary dead end streets, when incremental road construction and/or phasing is requested by the Owner for future extension. Should the Owner fail to extend the roadway, the property within the temporary allowance shall then be permanently dedicated to the Town.

Extent of works to be determined on a site specific basis and approved by the Town.

All underground servicing works to be extended to the limits of the temporary cul-de-sacs to avoid damage to the roadway once phasing works resume.

Temporary cul-de-sacs shall conform to all of the criteria of permanent cul-de-sacs and Town Standard No. 217.

All lots adjacent to a temporary cul-de-sac shall be frozen until the road is extended.

1.5.6. Traffic Calming

Proper disbursement of traffic should be inherently built into the road pattern of the development, having many alternative routes through a community is the best way to disburse traffic and reduce the impact on the surrounding land uses. Having long lineal tangent road lengths must be avoided to reduce the potential of aggressive driving behaviour. A Traffic Management Plan (TMP) is required for all subdivision development applications. If it is determined through the TMP that traffic calming measures will be required in specific locations; then the principles contained in this section will be applied when selecting and implementing traffic calming measures. This will ensure that the measures are compatible with the community's needs, and that any potential negative impacts are minimized. While each situation is unique, the principles of traffic calming are relevant to each situation. Application of these principles will maximize effectiveness of the traffic calming plans and help build community acceptance and support of the final traffic calming plans.

Prior to considering traffic calming, any potential negative impact on adjacent streets will be considered. Impacts may include traffic diverted to another street, or changes in turning movements with increase delays with other intersections. These effects will be considered in advance of approval, so traffic calming solutions do not create or exacerbate existing problems.

Since traffic calming measures should not be applied to all types of roadways, for a variety of operational and public safety reasons, traffic calming designs will be limited to installation on roadways that have been identified in the TMP as having potential cut through traffic, or in areas of school zones, parks or where vulnerable roadway users could be negatively impacted. Traffic calming designs that involve vertical alignment shifts will not be permitted on arterial roads and primary routes for emergency response agencies. Traffic calming designs should not be required on roads that carry local traffic only with less than 500 ADT, such as, short cul-de-sacs and short crescents. Traffic calming will not be supported on roadways that do not have more than 200m of uncontrolled length, i.e. 200m between stop conditions or from a curve in a road greater than approximately 70 degrees.

The design of all traffic calming measures shall be subject to the guidelines of the Institute of Transportation Engineers (ITE), Canadian Guide to Neighbourhood Traffic Calming, TAC's urban traffic calming guidelines as well as the Town of Caledon's Traffic Calming Strategy. Designs will strive to improve the "quality of life" in the neighbourhood but must always be respectful of the safety of the motorists and have regard for operational matters.

Traffic calming usually involves the installation of or a combination of the following roadway design characteristics or features:

- Installation of special pavement markings and/or signage;
- Installation of visual treatments that may include entrance or gateways features, roadside trees, and/or ground cover;
- Changes to the roadways surface texture and/or colour;

- Changes to the vertical and/or horizontal alignment of the roadway;
- Changes to the travelled portion of the roadway through pavement and/or lane narrowing;
- Restricting directional flows of traffic (one-way streets);
- Traffic circles

Through well planned road patterning and proper disbursement of traffic the need for extreme traffic calming measures should not be necessary, however if proven through a TMP that traffic calming measures are required it should be noted that it has proven to be effective in the management of neighbourhood vehicular traffic. The behaviour of motorists can be safely altered through the successful design and installation of a well thought out plan that meets the needs of neighbourhood residents, roadway users and emergency response agencies.

At the discretion of the Director of Engineering Services and Engineering, traffic calming enhancements may be implemented in high pedestrian usage areas and the design shall be to the satisfaction of the Director.

1.5.7. On Street Parking in Settlement Areas

When requested by the Town, a street parking plan shall be prepared in accordance with the following:

- Where development density exceeds 12 residential units/100m of street, the Town requires detailed plans illustrating the capability of providing 3.5 regular parking spaces per residential unit; including garages, driveways, “on street” parking, parking strips, parking zones, and parking lots. If a development cannot meet the rate above or current Zoning By-law standards; a Parking Utilization/Justification Study shall be submitted to the Town for review and approval:
- Detailed plans must show curb drops for all driveway entrances. Changes to entrance locations shown on an approved plan require permit application;
- Required parking spaces should be located within 100m of the residential lot serviced;
- Parking spaces on public lands will not be designated to individual users;
- Parking spaces will not be required to meet handicapped requirements;
- Related infrastructure must be constructed according to acceptable geometric and design, standards and specifications;
- All parking spaces on or adjacent to Town streets will be surfaced with a permanent pavement on sub-grade comparable with the adjacent roadway;
- A parking space envelop shall be no less than 3m x 6m, rectangular, applying also to car ports and garage interiors. Fractions of spaces will not be recognized. Access is required to at least one side of each parking space from a travelled road, except in private driveways. Measurements may be made from face of barrier curb, center line of a guttered curb, the edge of sidewalks, buildings and the edge of pavements;
- No parking space can overlap a municipal sidewalk, extend into the travelled street, or overlap a driveway entrance. Fire hydrant setbacks must be respected;
- No designated parking space can be along the curb on the sidewalk side unless the sidewalk has a clearance from the barrier curb face of at least 6m.

As per the Town's on-street parking policy, the developer is required to meet the following criteria:

- Review the parking supply on each side of the road;
- Function of the roadway;
- Review the proximity to school;
- Review to consider snowplow routes and maneuverability; and
- Consider pavement width (curb to curb):
  - Less than 8.6 meters – no parking will be allowed at any time;
  - 8.6 meters to 10.6 meters – parking may be permitted on one side only;
  - Greater than 10.6 meters – parking may be permitted on both sides of road

Note:

It is important to consider that emergency access needs to be maintained at all times. Therefore, there will be no exceptions to the above.

Note:

It is preferred that parking is placed on the side opposite the fire hydrants.

1.5.8. Roundabouts

Whenever a new intersection is planned that warrants or may warrant a traffic signal or an all-way stop, a roundabout should be considered as a preferred option of traffic control unless justified as unsuitable. Roundabouts are easier to construct initially rather than retrofitting an existing intersection. Having a roundabout evaluation as part of the planning and development approval process will ensure that appropriate right of way is protected and construction staging is considered.

While warrant procedures and requirements are used to determine when stop and signal controls are justified, there is no similar warranting procedure for roundabouts. As such, engineering judgment and traffic analysis shall be the basis into the decision making process when roundabouts are being considered, not simply policy. Careful study is required to identify the most appropriate traffic control method at any given location. However, experience with modern roundabouts suggests that some traffic situations are more suitable for roundabout construction whereas other situations are not.

Generally speaking, roundabouts are suitable at intersections having:

- High number of head-on, right angle, and left turn across path collisions, if applicable;
- High collision severity due to excessive speed, if applicable;
- Heavy delay expected on the minor street;
- Traffic signals that would result in greater delay;
- High left turning volumes, especially those with single lane approaches;
- ”T” and “Y” shapes where there are high left turn volumes;
- Limited storage capacities for signalized intersections;
- Changing traffic patterns;
- U-turns are desirable;

- A benefit for slower speed and/or lower traffic volume.

By contrast, roundabouts are generally unsuitable at intersections:

- Where satisfactory geometric design cannot be provided. These could include right of-way limitations, utility conflicts, drainage issues, etc.;
- Where there are insufficient gaps in the major flow to allow vehicles from the minor flow into the roundabout, creating unacceptable delays for the minor flow;
- Where queuing would frequently back up traffic into the roundabout or adjacent traffic control, such as nearby signals, freeway entrance ramps, etc.;
- Along a coordinated signalized corridor, where signalization would provide a better level of service;
- Where traffic control devices or services require preemption, such as railroad tracks, LRT tracks, police & fire stations, etc.;
- With approach grades of 4% or more;
- Steep grades pose sight distance concerns, lead to collision issues in icy weather and may pose issues during construction;
- Along routes where large combination vehicles or over-dimensional vehicles will frequently use the intersection and insufficient space is available;
- With heavy pedestrian movements that would have trouble crossing the street because of high traffic volumes. This includes unique pedestrian areas (areas with a large number of children, elderly people, people with disabilities, etc.);
- Where a large number of cyclists are expected.

Designing the geometry of a roundabout involves choosing between trade-offs of safety and capacity. Roundabouts must operate safely when their geometry forces traffic to enter and circulate at slow speeds. Horizontal curvature and narrow pavement widths are used to produce this reduced-speed environment. Conversely, the capacity of roundabouts is negatively affected by these low-speed design elements. As the widths and radii of entry and circulatory roadways are reduced, the capacity of the roundabout is also reduced. Furthermore, many of the geometric parameters are governed by the maneuvering requirements of the largest vehicles expected to travel through the intersection. Thus, designing a roundabout is a process of determining the optimal balance between safety provisions, operational performance, and large vehicle accommodation.
While the basic form and features of roundabouts are uniform regardless of their location, many of the design techniques and parameters are different, depending on the speed environment and desired capacity at individual sites. In rural environments where approach speeds are high and bicycle and pedestrian use may be minimal, the design objectives are significantly different from roundabouts in urban environments where bicycle and pedestrian safety are a primary concern. Additionally, many of the design techniques are substantially different for single-lane roundabouts than for roundabouts with multiple entry lanes.
Figure 1, (An informational guide. Transportation Research Board; 2010.), provides a review of the basic geometric features and dimensions of a roundabout.

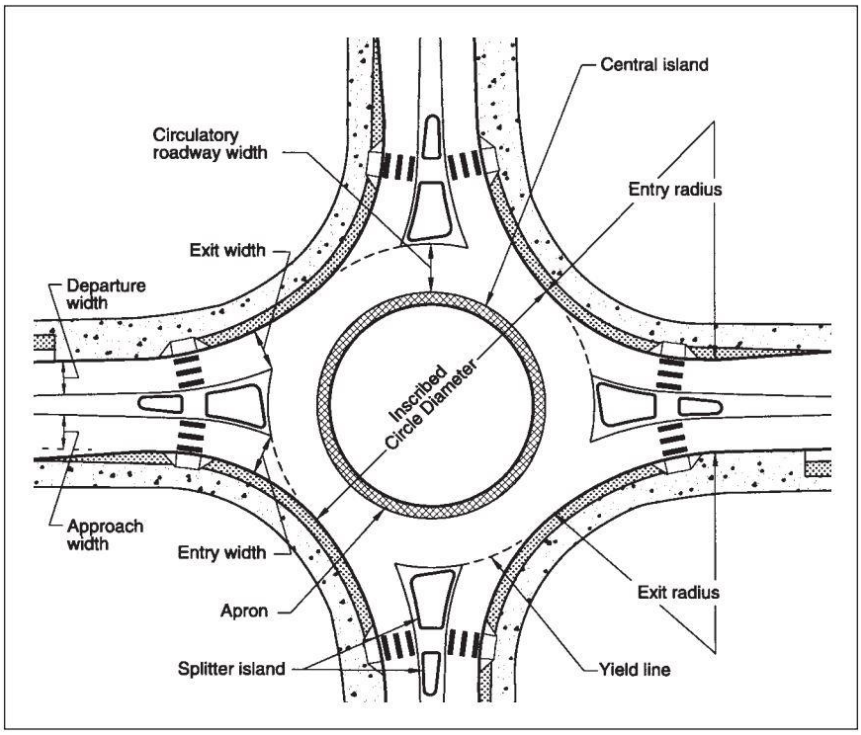


Figure 1: Basic Geometric Elements of Roundabouts

FHWA publication Roundabouts: An Informational Guide and Facilities Development Manual published by Wisconsin Department of Transportation provide more recent information on roundabout geometric design.

1.5.9. Sight Triangles

On a corner lot within the sight triangle, the following provision shall apply:

- The distance from the point of intersection of the street lines and forming the sight triangle shall be 9 meters, except where one of the street lines is a Regional Road, the distance shall be 15 meters.

Within any area defined as a Sight Triangle, the following uses shall be prohibited:

- A building structure or use which would obstruct the vision of drivers;
- A fence, tree, hedge, bush or other vegetation to which the top exceeds 1 meter in height above street elevation;
- Any portion of a parking space;
- A berm or other ground surface which exceeds 0.5m in height above street elevation;
- A sign, to which the body is less than 4 meters above street elevation.

Note:

The provisions of the above, shall not apply at any intersection controlled by traffic light signals.

1.6. Pedestrian Ways

1.6.1. Sidewalks and Walkways

Sidewalks are required in subdivisions where specified by the Town and in accordance with Town Standards and Guidelines and OPS Standards. This will include the use of tactile plates at road crossings.

Where the development generates the need, in the opinion of the Town, sidewalks may be required on existing streets external to the plan or streets where reverse frontage is proposed.

Walkways shall be constructed as required for adequate circulation of pedestrian traffic and shall be in accordance with the most recent requirements and specifications of the Town of Caledon and in accordance with the Caledon Transportation Master Plan, Community Design Plan and The Town of Caledon Trails Master Plan.

Note:

Exterior travel routes (sidewalks and walkways) shall comply with the technical requirements of the Design of Public Spaces of the Integrated Accessibility Standards (IASR) of the Accessibility for Ontarians with Disabilities Act, 2005. (AODA)

1.6.1.1. Location

Sidewalks shall be constructed on Town of Caledon streets as shown on the Town's Road Cross-section Standards.

Concrete sidewalks are required:

A. Along only one (1) side of local streets, with an AADT of approximately 100 or greater;

B. Along both sides of a Local Road with a Right of Way (R.O.W.) of 18 meters or greater, as per the Town’s direction

C. Along both sides of a Local Road that is on a main school route or provides access to a community center, park or commercial;

D. Along both sides of collector and arterial streets;

E. Along the inside of crescents or as determined by the Town;

F. On one (1) side of cul-de-sacs if:
   - cul-de-sac is longer than 100 m to the bulb;

- cul-de-sac leads to a pedestrian node (i.e. a park, a school, a commercial area, an apartment building); or
- cul-de-sac is of such a design within the subdivision that through pedestrian travel is required; or

G. On one (1) side up to the built section of cul-de-sacs. The terminus of the sidewalk shall not conflict with driveways and services and the exact location shall be determined by the Town prior to construction.

Note:

Concrete sidewalks are not required in the "Bulb" section of cul-de-sacs or along the longer side of crescents, unless otherwise specified by Town.

Placement of the sidewalk shall generally be in the following priority:

- Same side as schools, parks and other areas that are pedestrian generators;
- North and east-side of road to take advantage of the sun;
- Minimum driveway crossings;
- Reduced road crossings;
- Inside side of Road Elbows.

1.6.1.2. Specification

Sidewalks shall be designed and built according to the specifications below, as well as OPS Standards where applicable:

- Sidewalk widths vary depending on the road designation (see standard drawings for widths);
- Concrete shall have a minimum compressive strength of 32 MPa at 28 days (CSA A23.1); air content of 7.0% ± 1.5% measured prior to placement;
- Concrete sidewalks shall normally be a minimum of 125mm thick, 150mm thick across residential driveways and 200mm thick across commercial or industrial driveways respectively;
- The sidewalk shall be constructed 25mm higher than the finished sod on the downstream side and flush to the finish sod on the upstream side;
- Sidewalks shall comply with OPSD 310.010 and 310.030 on a minimum of 150mm Granular “A” material compacted to 95% Standard Proctor Density;
- Sidewalks shall not be constructed on organic soils.

1.6.2. Walkway Block, Bike Lanes and Trails

Sidewalks, walkway blocks, bicycle lanes and multi-use trails shall be shown on the Traffic Control Plan(s) drawn to a scale of 1:1000 or larger.

The Developer may be required to develop trail systems, coordinating walkways and linkages to existing trail systems. Pedestrian/bike linkages shall be implemented according to the Town of Caledon Trails Master Plan, any relevant secondary plans, and/or Community Design Plans. All Trail access points shall be gated according to Caledon

Trailway Standards. All trail and walkway developments shall be shown on the landscape plans.

Refer to section 2.3.4. for trail standards.

All street to street walkway blocks are to follow the Town's Standard Drawing No. 911. Alternate walkway block widths and design features may apply at the discretion of the Town.

Bicycle lanes shall have the same structural standard as the road base with a 1.5 m lane in addition to the normal road cross-section designated by appropriate markings, as per the Traffic Control Plan. The final design, timing of bicycle circulation signage and markings will be determined by the Town.

The Developer is responsible for supplying and installing all traffic, pedestrian and bicycle control signs where required by the Town.

1.6.2.1. Walkway Block (street to street) Lighting

Walkway block lighting may be required upon a photometric analysis or as directed by the Town. If required, the consultant is to complete the walkway block lighting design in complete accordance with Section 1.11 of this document. Light posts within the walkway block shall be proposed within a location that will not interfere with equipment access for snow removal and/or general maintenance purposes.

1.7. Regional Services

1.7.1. Sewer System

Sanitary sewers designed and constructed in accordance with the most recent requirements and specifications of the Region of Peel are required in all residential subdivisions designated for sanitary servicing. Sanitary sewers shall be of adequate size and depth to service the adjacent external lands where so required by the Region of Peel Engineering Services Commissioner. A sewer connection from the sewer main to the edge of the road allowance shall be constructed for each lot or building block in the plan of subdivision.

1.7.2. Water System

Watermains and appurtenances shall be constructed on all streets within the plan of subdivision and shall be designed and constructed in accordance with the most recent requirements and specifications of the Region of Peel.
A separate water service connection shall be provided to the edge of the road allowance for each lot or building block within the plan of subdivision. Water services shall be constructed in accordance with the most recent requirements and specifications of the Region of Peel.

All fire hydrants are to be located on the same side as the watermain.

1.8. Street Name and Traffic Signs

1.8.1. Plan

A Traffic Control Plan is to be prepared showing the location of all signs and markings to be installed in the subdivision.

All traffic and pedestrian control signs are to be made with High intensity type reflective sheeting approved by the Ministry of Transportation Ontario. All signs shall be mounted on galvanized steel “U” channel posts 3.6 m in length. Signs and markings shall be manufactured and installed in accordance with the current Ontario Traffic Manual (OTM) and the Highway Traffic Act Regulation for Ontario.

All stop signs at Regional intersections and arterial roads are to be per O.T.M. Stop signs at ‘all way’ stop intersections are to be mounted with an ‘all way’ tab and a red and white horizontal hazard marker.

Stop signs are to be installed on all minor approaches to intersections.

Parking will be prohibited on both sides of laneways and roads with a width of less than 8.5 meters, curb face to curb face.

Parking will be prohibited on one side of the road (adjacent to fire hydrants) with a width of less than 8.5 meters to 10.6 meters, curb face to curb face.

“No Parking” signage must be 15 to 20 meters from each intersection with additional signs every 45 to 50 meters and shall not conflict with street tree planting.

Parkland and park facilities will be designated to provide barrier free access to wheelchair users and others with mobility limitations. Each park will contain a pedestrian system of walkways, trails, bridges and ramps to provide continuous direct access from the access or entry point at the edge of the park or parking lot to the park facilities.

The Aboveground Plan and Pavement Marking Plan shall show the proposed location of signs to be installed in the subdivision. The plans shall be part of the engineering drawings, which must be approved by the Town. The signs must be clearly shown without cluttering other details.

1.8.2. Street Name Signs

Street name signs shall be placed at every intersection and shall be double sided. These signs shall be placed in the locations and shall be of the type shown on Town Standard Drawing No. 400.

Temporary street name signs, approved by the Town, must be erected at intersections upon completion of base asphalt on roadways. These signs must be maintained in legible condition until such time as the permanent street name signs are in place.

Street name and traffic signs shall be supplied and erected by the Developer. Temporary street name signs shall be supplied, erected and maintained by the Developer in order to facilitate deliveries during the construction period.

Temporary regulatory signs must be reflective. All permanent signs must be to Town Standard.

Once the proper traffic signs and street name signs have been installed, the Town will inspect the installations.

Traffic control signs shall be located as shown on Town Standard Drawing No. 400. Where the standard drawing does not cover the positioning, the location must conform to the most recent versions of the Ontario Traffic Manual (OTM) for Ontario or the Highway Traffic Act Regulations for Ontario.

Signs shall be located on the right-hand side of the roadway. Signs in any other position will be considered only as supplementary to the signs in the normal position.

Signs shall be mounted at right angles to the direction of and facing the traffic they are intended to serve.

Signs are to be aluminum, anodized on both sides, and comply with the following requirements:

Sizes

600mm –	1.6mm utility series
600mm to 900mm –	2.0mm No. 6T6
Over 900mm –	3.2mm No. 655T6

All traffic control signs are to be made with high intensity type reflective sheeting approved by the Ministry of Transportation Ontario, the current standard of the OTM, the Highway Traffic Act Regulation for Ontario and the Town, including colours.

1.9. Roadway Markings

The Developer will design pavement markings for all roadways in accordance with the Ontario Traffic Manual (OTM) and in accordance with the Town Standards or approved by the Town. These pavement markings will be installed on the topcoat of asphalt, or at the discretion of the Town, in accordance with OPSS 710.

1.9.1. Stop Bars and Pedestrian Crossing Lines

The Developer shall be responsible for stop bars at all stop signs. All roadway markings shall use either Thermoplastic Pavement or Field Reacted, Polymeric Pavement Marking Materials.

1.9.2. Lane Delineation

The Developer shall be responsible for pavement lane delineation markings on Collector Roads, Arterial Roads, on roads with more than 2 lanes and on Local Roads as directed by the Town. All roadway markings shall use Thermoplastic Pavement Marking Materials.

1.10. Traffic Signals

Traffic Signals are to be designed on individual site-specific bases and must conform to Region of Peel Standards. The signals shall include *Opticom* Pre-emption Devices as per Region of Peel Standards

1.11. Street Lighting

Streetlights are to be designed by an Electrical Consultant and installed along all streets and most public walkways in accordance with the most recent lighting requirements and Town of Caledon's Outdoor Lighting Standard Manual (2018) *(Appendix A)*. Electrical work is to be designed, certified, and constructed in accordance with the most recent requirements and specifications of the Town and Hydro One.

All street lighting poles shall have a one foot stripe located 1.5m above the ground identifying the wattage of the luminaire from the ground.

1.11.1. Lighting Levels and Uniformity Ratio

Street lighting shall be supplied and installed on all streets and pedestrian walkway blocks in the subdivision as per the Town of Caledon's Outdoor Lighting Standard Manual (2018) (Appendix A).

Estate Residential development lighting shall be based on an average pole spacing of 100 meters and at key locations such as intersections, horizontal and vertical curves.

1.11.2. Approval and Construction

Approval of plans for street lighting must be obtained from the Planning and Development Department. The Developer must guarantee and maintain the lighting until assumption of the development. The Developer is required to provide an extra pole for every 50 required in a subdivision.

1.11.3. Energization

Approval by the Electrical Safety Authority (ESA) is required before any street lighting will be energized and assumed into the Town's streetlight inventory. The Developer must guarantee and maintain the lighting until Assumption. Payment of initial energization fees and ongoing streetlight energy charges will be the responsibility of the Developer in accordance with the Subdivision Agreement.

Energization of streetlights occurs once the subdivision has been registered. Once registered, the Developer will submit a completed *"New Subdivision Street Light Connection Questionnaire",* to the Town's Analyst, Capital Assets with the following information:

- Streetlight Connection Summary and Load Calculator
- Electrical Safety Authority – Certificate of Inspection

Town of Caledon staff will forward all information to Hydro One Business Centre requesting a New Connection.

Hydro One will coordinate the site visit in order to complete the *Electronic Layout* for each transformer. Once site visits have been completed and Hydro One provides Town with the "*5 Steps to Critical Connection Package"*, staff will sign the package and submit payment to Hydro One.

1.12. Residential Lot Drainage and Sodding

1.12.1. General

The Owner shall endeavor to retain all topsoil on site; the Topsoil Management Report shall address how much topsoil is located on the site and where the topsoil will be placed at what depths. Written permission from the Town is required to remove any topsoil from the site.

Lots, including drainage ditches and swales, as well as road boulevards are to be completely topsoiled and sodded with 300mm of topsoil for lot or boulevard grading and 600mm of topsoil for stormwater management facilities (to a maximum depth of 1.0 meters) and No. 1 Nursery Sod. Rural Estate residential lots rear yards may be seeded on a site-specific basis (except areas such as front yards/boulevards, septic systems, ditches, swales, slopes and tile beds which must be sodded).

- Grade areas to:
  - Provide proper surface drainage and maximum usable land area.
  - Preserve existing trees where possible.
  - Direct flows away from houses;

- Minimum yard slope shall be 2.0% for split lots and walkouts and 3.0% for back to front side swale drainage;

- Minimum driveway slope 2.0% and all driveways must slope away from the dwelling;

- Maximum driveway slope 6.0% (from standard sidewalk location);

- Maximum slope between houses in any direction:
  - 4 horizontal: 1 vertical for urban areas, use steps and/or retaining walls or low maintenance landscaping if this requirement cannot be met.

- Provide a 0.6m gently sloping area (at 2.0%) away from the house on at least one side of the building where side yard setback permits. (Usually the garage side or side door entrance.);

- A minimum of 100mm of clear stone rather than topsoil and sod is required for combined side yards between two buildings which are 1.80m or less. If the combined side yard on the other side of the same building is 2.4m or more, then back-to-front drainage may be considered through that side.

1.12.2. Type of Drainage Pattern

Back to front grading is preferred where feasible. Where this is not feasible the high point where the drainage is split from back to front should be located at the rear of the dwelling. If a lineal park/walkway is located at the rear of the dwellings, then the drainage split is to be located at the front of the dwelling and all roof leaders are to be directed to the rear of the lot or infiltration trench.

Rear yards which drain through abutting lower back-to-front type lots are permitted where:

- Sufficient fall is available between the adjacent streets to achieve desired grades for swales and yards;
- Cut-off swales at the rear of the upper lots direct runoff into the lower lot side yard swales;
- Downspouts on the upper lot do not direct flow to the lower lots;
- Lower lot frontages are of sufficient width to provide side yard swales;
- If roof water cannot be directed to the front, rear lot LID system will be required.

1.12.3. Rear Yard

A minimum of 7.5m of the rear lot area is to be sufficiently level (2% to 5% slope) to be usable or at the discretion of the Town.

Rear yards in urban development areas must have a minimum of 75% of the yard area sufficiently level (2% to 5%) to be usable. This useable area shall be adjacent to the rear of the house.

1.12.4. Swales

Longitudinal slope:

- minimum 2.0% for split lots and walkouts and 3.0% for back to front side swale drainage
- Side slopes – 4 horizontal to 1 vertical or less.

Rear Yard Swale to Rear Yard Catch basin:

- Maximum length of rear yard swale in an urban area:
  - On lots less than 12m in frontage – five lots
  - On lots 12m and greater in frontage – three lots
  - Rural areas will be determined on a site specific basis

Location of centerline:

- 1.0m maximum offset from the rear lot line

Maximum swale depth:

- Preferred 250mm
- Absolute 450mm

- Minimum 150 mm

Cut-off Swales:

- Minimum gradient of 2.0%

Maximum upstream lot area added to drain to a side yard swale is 500m$^{2.}$

Flows carried around houses are to be confined to defined swales located as far from the home as possible.

1.12.5. Rear Yard Catch Basins

Requirements:

- Rear yard catch basins and outlet pipes shall be located entirely on one lot;
- The edge of a rear yard catch basins shall be located 1.0m clear of property line;
- Rear yard catch basins shall have a maximum drainage area of 1000m^2;
- Leads shall be a minimum diameter of 250mm and shall be encased in concrete up to the property line;
- Cross sections are required where pipes go between houses;
- All rear yard catch basin frame and grates shall be as per Town Standard Detail 503 Beehive Catch Basin, Frame & Grate.

1.12.6. Retaining Walls

Requirements:

- Retaining walls are not encouraged but may be employed where necessary to achieve the required useable rear yard areas;
- Retaining walls are generally required where the difference in elevation between lots exceeds 0.60m;
- Construct retaining walls entirely on the upper lot so that tie-backs do not cross property boundaries;
- Certification by the Engineer stating that the retaining wall has been constructed to meet the approved design is required;
- For walls 0.9m and shorter in height: lightweight prefabricated concrete retaining wall products are to be utilized. For retaining walls greater than 0.9m in height, lightweight slab or stone component prefabricated walls are not permitted, heavy block or ready-mix concrete are to be utilized;
- Fencing or railing will be required where retaining wall height exceeds 0.6m. Structural stability of this wall must be such that it can withstand the force exerted on the fence as well as earth loads;
- Screen fencing will generally be placed on top of the retaining wall; however consideration should be given to the aesthetic impact of the combined wall/fence height;
- Design details of walls over 0.6m are to be submitted with grading plans and stamped by a Professional Engineer. It is preferable that the Engineer who stamped the plans certifies the wall construction;
- Building permits, in accordance with the Ontario Building Code may be required;

- The maximum allowable height for a retaining wall shall be 2.5m;
- Only Engineered Product (concrete, masonry, and armour stone) shall be permitted as retaining wall material.

1.12.7. Roof Leaders

Roof drain connections to the storm service connection are prohibited. Roof leaders shall discharge on ground via splash pads and shall be directed away from the building foundation walls, without causing any erosion or inconvenience to adjacent property. Roof leaders may also be directed to infiltration trenches or rain collection facilities such as rain barrels or cisterns.

1.13. Erosion and Sediment Control

1.13.1. General

All Erosion and Sediment Control Facilities are to be inspected by the Consulting Engineer once a week and after each rainfall of 10 mm or greater or a significant snow melt. Daily inspections are required during extended rainfall or snow melt periods. These inspections are to ensure that the facilities are in proper working condition and all damaged ESC facilities are to be repaired and/or replaced within 48 hours of the inspection. A permanent record of these inspections must be forwarded to the Town's Engineering Services Department within five (5) days of the inspection.

All erosion and sediment controls are temporary applications constructed prior to any land grading or disruption activities on the site. They are to be inspected and maintained by the Developer throughout the duration of the construction period, including building construction, until the site is stabilized.

All activities on the site shall be conducted in a logical sequence to minimize the area of bare soil exposed at any one time.

All disturbed ground left inactive shall be stabilized by seeding, sodding, mulching or covering, or other equivalent control measure. The period of time of inactivity shall not exceed 30 days, unless otherwise authorized by the Town.

1.13.2. Sediment Control Facilities/Basins

All Sediment Control Facilities/Basins are to be designed and constructed in accordance with Appendix "C" of the Erosion and Sediment Control Guidelines for Urban Construction published by the Greater Golden Horseshoe Conservation Authorities in December 2006, as amended and as per Section 1.4.5. of this manual.

Construction safety fence shall be securely erected along the perimeter of any sediment pond/basin. A warning sign shall be attached to the security fencing stating that the area is off limits to the general public and advising that the pond/basin is used for sediment control purposes and that the enclosed area is subject to flash flooding.

1.13.3. Catch Basin Sediment Control

During construction, all catch basins shall be provided with sediment control, in accordance with the following requirements:

Catch Basin Sediment Trap

Catch basin sediment traps shall be provided for unpaved areas draining 2 hectares or greater and less than 4 hectares and shall be constructed in accordance with Town Standard Drawing No. 302.

Sediment removal is required when the depth from the underside of frame to top of the accumulated sediment is reduced to 300mm.

Catch Basin Sediment Barrier

All rear lot catch basins or catch basins within unpaved areas draining less than 2 hectares shall be provided with a sediment control barrier in accordance with Town Standard Drawing No. 303.

Roadside Catch Basin Sediment Protection

Under appropriate drainage circumstances, all non-low point roadside catch basins shall be provided with sediment protection by double wrapping the catch basin grate with a woven geotextile. All low point catch basins must utilize alternative sediment control measures so that the drainage outlet is not completely blocked. Regular weekly cleanings of the sump or the use of sediment bags shall be considered for these catch basins. All sediment controls must be inspected and maintained on a regular basis.

1.13.4. Sediment Control Fence

Sediment control fences shall be placed along all down-slope sides of a site along the edges of a drainage channel passing through the site, and along the perimeter of all other areas sensitive to sediment accumulation. All heavy-duty sediment control fences shall be constructed in accordance with Town Standard No. 304 or approved equal.

1.13.5. Vegetative Buffer Strips

A minimum 3m wide vegetative buffer strip shall be provided along the limits of the development adjacent to existing road boulevards and existing residential properties. Where a sediment control fence is required, it shall be constructed in front of the buffer strip.

1.13.6. Topsoil Stockpile Protection

All topsoil stockpiles containing more than 100m^3 of material shall be located a minimum of 10m away from the roadway, drainage channel or an occupied residential lot. The maximum side-slopes for topsoil stockpiles shall be 1.5 horizontal to 1.0 vertical or at the angle of repose whichever is less, and the maximum height shall not exceed 5.0 meters.

Location of Topsoil Stockpiles on lands to be dedicated to the public is prohibited. Topsoil Stockpiles should be located where possible on private lands between houses and on rear yards.

Runoff from all topsoil stockpiles shall be controlled by a sediment control fence or other approved devices.

1.13.7. Stone Pad Construction Entrance – Construction Access

In order to reduce the tracking of mud onto a paved street, a pad of crushed stone shall be constructed at the site entrance and exit leading onto any existing road. The stone pad shall be a minimum of 450mm thick, 30m long and 5m wide. The first 15m from the entrance/exit shall be constructed with 50mm clear stone. The remaining 15m shall be constructed with 150mm rip rap.

This stone pad must be maintained as required given the site conditions to ensure mud tracking is kept to a minimum.

1.13.8. Rock Check Dam

Rock check dams are to be installed in ditches and swales in accordance with OPSD 219.210 or 219.211.

1.13.9. Mud and Dust Control

The Town of Caledon requires all owners and builders in new subdivisions to take an active effort in controlling mud and dust deposited on neighbouring streets by vehicles exiting sites under development:

1. Once any house has been occupied, the adjacent streets adversely affected by mud and dust build-up shall be cleaned at least twice a week. If cleaning is not completed to the satisfaction of the Town, the Town of Caledon has the rights to clean the neighbouring streets at the expense of the Owner.

2. Once homes have been occupied, neighbouring streets shall be kept clear of building materials and dirt or mounds of soil.

3. Construction access routes shall be scraped and flushed daily.

Owners and Builders are required to have all internal and external roads scraped daily, as well as flushed and swept twice weekly or as deemed necessary by the Town. This work shall be completed every Tuesday and Friday of each week and continue until all lots are sodded.

1.14. Utilities

The appropriate utility company or their approved Contractor shall install the services for Tele-communications, Hydro, Gas and Cable TV. The Developer must bear the cost of any surcharges for underground installation made and must grant any necessary easements for their services.

Utility crossings for new roads shall be placed prior to placement of granular road base material and curbs. Utility crossings for existing roads shall have the asphalt surface saw cut and removed for the width of the trench plus a minimum of 0.5m out from each side of the trench walls.

Compaction of backfill for utility trenches shall be 95% Standard Proctor Density within boulevards and 100% for driveways and under travelled roads.

1.14.1. Direct Buried – Joint Use Trench

For Direct Buried – Joint Use Trenches, a spare duct will be required for future use by the Town. Reference Standard Drawing No. 219 for location of conduit within trench.

Note:

Standard Drawing No. 219 is only a guideline. Contractor must follow all applicable regulations and requirements for utility installation in a joint use trench.

Joint Use trenches providing service to a proposed Town of Caledon Facility (ie. Library, Community Centre, Fire Hall, etc.), shall have an additional duct available for future use by the Town's IT Department.

Requirements:

1. Standard across all locations:

    a. Conduit Type – HDPE Conduit;
    b. Conduit Size – 100mm (4");
    c. Conduit Colour;
        i. Peel Service Network (PSN) – Blue
        ii. All other conduit – Grey preferred (any colour that isn't Blue)
    d. Conduit Requirements Internally:
        i. Tracerwire – for locating purposes;
        ii. Fish Rope (Recommended "Flatline" 1600lbs) – must be placed in each conduit to facilitate "pulling" of the fibre optic cable through the duct.

2. Arterial Roads:

    a. Distance between access points (Electrical Handhole – OPSD 2112.020) of 300m, where appropriate with road design;
    b. Conduit Quantity – four (4), can be on one side of road. One duct to be dedicated to PSN (Blue).

3. Local and Collector Roads:

    a. Distance between access points (Electrical Handhole – OPSD 2112.020) of 60-90m is preferred, where appropriate with road design;
    b. Conduit Quantity – two (2), on each side of road. One duct on each side to be dedicated to PSN (Blue).

1.15. Canada Post

The number and locations of community mailboxes must be approved by Canada Post and the Town. Design and layout must comply with Canada Post standards for postal facilities. The permanent and temporary location shall be clearly shown on the approved engineering drawings. Warning clauses are required in the purchase and sale agreements for lots adjacent to Canada Post facilities.

1.16. Fencing

Fencing shall be in accordance with the most recent requirements and specifications of the Town of Caledon and series 600 drawings.

Note:

For Highway Fencing installation, use (O.P.S.D. 971.101).

Fencing is required:

- Where public property abuts private property;
- Along public walkways;
- Parks, SWM Facilities, Open Space Blocks and Reforestation Blocks;
- Acoustic fencing per approved acoustic report;
- Fencing of property lines along non-developed bordering properties must be done with a minimum of Post and Wire Fence Highway Fence. To allow independent future upgrading of the fence, the wood posts must be placed at every rear lot corner to allow individuals to remove the Highway Fence and not disturb the neighbouring fence, “T” bars must be placed at a spacing in accordance between O.P.S.D. 971.101;
- Fencing along property lines of active agricultural properties must be done with a minimum Town standard chain link fence;
- As designated by the Town.

The minimum requirement for residential chain link fence is 1.5m high and screen fencing is 1.8m. Existing and proposed fencing is to be shown on the Above Ground Engineering Drawings.

1.17. Noise Attenuation Measures

Noise Attenuation Measures are required in site specific situations to mitigate existing or anticipated noise levels which exceed the MECP Criteria for acceptable noise levels for specific land uses. Typical locations where Noise Attenuation Measures may be required occur where residential land uses are adjacent to arterial roads, expressways, freeways, industrial lands, and railway lines. Noise Attenuation Measures can be setbacks, building orientation, earthen berms, noise walls, or any combination necessary to achieve an acceptable noise level, based on MECP Criteria.

A noise attenuation investigation shall be required to be carried out by a competent Consulting Engineer to assess noise attenuation with respect to the proposed infrastructures and building construction.
The Town of Caledon requires two (2) reports on noise attenuation. The first (preliminary) Acoustical Report shall be submitted with the draft plan and indicate whether or not noise attenuation is required. The second report shall be submitted with the Subdivision Design Plan and indicate the design details of the proposed noise attenuation measures. All costs associated with the noise attenuation report are the responsibility of the Developer. All noise attenuation reports are to be peer reviewed.

1.17.1. Assessing Traffic Noise

The following information is obtained when assessing the road traffic noise impact on planned sensitive land uses.

- The Average Daily Traffic Volume (AADT) and when available the Summer Annual Daily Traffic Volume (SADT), the higher of the two is used.
- Composition of traffic in terms of the percentages of cars, medium trucks and heavy trucks.
- Traffic Speed, use 10 km/h over the posted speed.

When assessing the noise impact, traffic volumes must be based in future traffic projections of at least 20 years after the completion of the planned project, or the ultimate capacity of the road as determined by the road authority.

1.17.2. Allowable Levels

The most common sound level descriptor used by the MECP is the energy equivalent continuous sound level (LEQ) also known as equivalent sound level.

The Town of Caledon will NOT accept sound levels in excess of the following levels, unless approved by the Town:

- For outdoor areas the equivalent sound level LEQ from 7:00 am to 11:00 PM is 55 dB;
- For indoor areas such as living rooms during the day the LEQ is 45 dB for roads and 40 dB for rail;
- For bedrooms at night the LEQ is 40 dB for road and 35 dB for rail.

1.17.3. Control Measures

Noise control measures usually fall into the following categories:

Barriers:	berms, walls, favourable topographical features and other intervening structures.
Architectural Design:	room and corridor arrangement, blank walls, the placement of windows, balconies and courtyards, building height.

Building Construction:	acoustical treatment of the dwellings walls and ceilings, selection of acoustical materials and other control devices, provision or installation of air conditioning.
Mitigation at Source:	noise control applied directly to the noise source.
Site Planning:	orientation of buildings and Outdoor Living Areas with respect to noise sources, spatial separation such as the insertion of noise insensitive land uses between source and receiver, appropriate setbacks, and the use of intervening service roads.
Windows/Doors:	acoustically designed windows or doors that provide the required noise reduction, in order to allow for the windows and doors to remain closed, air conditioning units must be installed in the dwelling.

A qualified Professional Engineer must certify implementation of noise control measures with experience in environmental acoustics.

1.17.4. Noise Barriers

To ensure attractive streetscape appearance, the Town discourages development layouts that require noise barriers. The need for noise attenuation is identified in the Acoustical Report prepared and submitted in support of the Draft Plan. The heights of walls will be minimized through the use of fence/berm combinations. All aspects of installation must conform to Town policy and MECP Guidelines.

Noise barrier fences are to be constructed on private property unless approved otherwise by the Town. The Developer shall guarantee the noise barrier wall, until Assumption of the subdivision by the Town. The construction of the noise barrier wall shall be inspected and certified by the Engineering Consultant.

Note:

Construction and installation of all noise attenuation barriers will be as per the drawings, plans, reports and specification approved by the Town or Region of Peel. Installation of the barriers must be completed prior to the occupancy of any building constructed or erected on any lot or block adjacent thereto.

Where a noise barrier wall is required adjacent to a Town roadway, all aspects of the barrier shall be placed 150mm on the private property side of the property line.

Requirements:

- A survey drawing, stamped and signed, from an Ontario Land Surveyor (OLS) to the satisfaction of the Town, confirming that the fence posts, including any associated footings are completely located on private property, prior to installation of any fence board materials.

- A Structural Certification of all column or post footings will be required from a Geotechnical Consultant, to confirm that all aspects of the footing have been constructed to the approved design drawings and specifications.

- A Construction Certification from the Civil Engineering Consultant will be required, certifying that the noise attenuation barrier has been constructed to the approved design drawings and specifications.

Where the wall is on private property adjacent to public property, the Developer shall enter into an Agreement with the Town of Caledon which shall be registered on title of Lots immediately upon registration of the subdivision. Said agreement shall implement the following clause with respect to the noise barrier wall located on these lots and must be included in all offers of purchase/sale and tenancy agreements.

“Purchasers/tenants are advised that a noise barrier wall is located at the rear/side of this property. The owner of this property also owns his/her section of the noise barrier wall. The noise barrier wall is not in public ownership. Monitoring, maintenance, inspection, repair and replacement of this noise barrier wall, including any associated costs, are the sole responsibility of the property owner. The Town of Caledon is in no way responsible for this noise barrier wall. Should this noise barrier wall fail, it is the property owner’s responsibility to repair or replace his/her section of the wall, at his/her cost. If the property owner fails to maintain the noise barrier wall, the Town of Caledon will notify the requirement to repair in writing. If the property owner does not comply with the Town’s request, the Town will correct the deficiency and bill the property owner accordingly”.

It is important that continuity of appearance be achieved within neighborhoods’. Noise barrier walls shall be constructed as per Town Standards 614 - 617 or approved equivalent. However, the design of any acoustic barriers to be constructed along Region of Peel roads, must comply with Regional Standards.

Note:

The maximum barrier wall height shall be 2.4 m. Should a greater height be required, the difference in height may be achieved with the use of a berm.

Barrier walls and footings, shall be installed entirely on private property. No part of the berm will be allowed within the Right of Way.

Grading and berm construction associated with the barrier installation shall be completed to within 5 mm below the bottom of the barrier prior to constructing the barrier footings.

A. There shall be no visible gaps between any barrier panels or beneath the bottom panels after completion of the barrier, unless approved by the Acoustic Consultant for drainage purposes.

B. Where footings are to be installed on or within 1.0 m from a downward slope of 3:1 or steeper, the embedment depth shall be increased a minimum of 0.5m greater than the requirements of the Canadian Highway Bridge Design Code. The design of the depths may be altered based on the design by a Consulting Engineer.

C. The minimum density of the noise barrier wall shall be 20 kg/m2 with no holes or gaps.

1.18. Construction, Preliminary Acceptance & Maintenance Period, Assumption Requirements

1.18.1. Construction

1.18.1.1. Geotechnical Engineering

In new developments, the Owner shall engage a Geotechnical Engineering Consultant who shall prepare a report that deals with the requirements for road and municipal services construction, to the satisfaction of the Town. The Geotechnical Engineering Consultant must have their own site representative on site full time, during any grading and/or construction works including house construction

1.18.1.2. Beginning of Construction

Construction of services shall not commence until the Developer has entered into the necessary agreements with the Town of Caledon and the Region of Peel. The Developer must also have obtained any required approvals from the Ministry of Transportation Ontario, the Ministry of Environment and Climate Change, Ministry of Natural Resources and Forestry, applicable Conservation Authorities or any other organization that may be affected by the plan of subdivision.

1.18.1.3. Commencement Notice

The Engineering Services Department of the Town of Caledon and the Engineering Department of the Region of Peel must be given forty-eight (48) hours written notice prior to the commencement of construction. Should there be a cessation of construction of more than a week, the Developer must again supply forty-eight (48) hours written notice before recommencing the work. The Developer shall include with his first Notification to Commence Work, the number of the respective Registered Plan or T number of subdivision and approval from the Director. A copy of theNotification to Commence Work shall be sent to the Town and Region of Peel. Failure to comply with any portion of the requirement will lead the Town to increase maintenance periods in addition to field investigation. Before the Town will accept the Commencement Notice, the Developer must submit a copy of the contract or indicate the equipment that the Contractor will be using for street sweeping and flushing. The Town must be satisfied that proper arrangements have been made to assure that all nuisance dust, mud and debris will be properly cleaned on a regular basis and in accordance with Section 1.18.1.7.

1.18.1.4. Directional/Informational Signage

The Developer is responsible to erect and maintain the directional/informational signage as per Section 1.2.10 prior to any works commencing and until assumption by the Engineering Services Department or otherwise directed by the Town. An information sign shall be placed at every access point to the subdivision detailing who the Developer is, who the Builders are and who the Civil Consultant is. Phone numbers for each of these companies

shall be posted on this sign. The sign shall meet the minimum requirements of Town Standard 401.

1.18.1.5. Site Office

The Developer is required to provide a site office trailer for the Engineer, his inspector and the Town's Inspector's use. Two weeks prior to the commencement of the contract work, the Contractor shall provide a temporary lock-up office complete with all fixtures for the sole use of the Engineer and the Town. The location of the building shall be as directed by the Engineer. The Contractor shall maintain the building with heat, light and telephone service and it shall be kept in a clean condition at all times. The Contractor shall provide for its removal upon completion of the Contract.

The office shall be at least two rooms 3.6 meters x 3.0 meters x 2.5 meters high each, fully weatherproofed, insulated, heated, air conditioned, ventilated, painted and lighted to the satisfaction of the Engineer. The floor shall be above ground level. The office shall be provided at least two (2) opening windows of no less than 1.2 meters by 0.75 meters, complete with fly proofing.

Should construction on site not commence immediately, the Engineer may defer this requirement, but the office shall be erected and fully equipped before any materials are brought to the site or any construction work commences. Temporary sanitary facilities adjacent to office must be supplied and maintained for sole use of the Engineer's and Town staff.

1.18.1.6. Inspection – Consultants

The applicant shall engage the services of a consultant who is a Registered Professional Engineer with the Professional Engineers Ontario (P.E.O.). In addition to fulfilling a supervisory role for construction, the Consulting Engineer (General Consultant) will serve as liaison between the Developer and the Contractor(s) and other consultants, as well as between the Developer and the Town. They are to ensure the approved design intent is implemented, to expedite design decisions on site, and to deal with Homeowner enquiry's and concerns.

The Consulting Engineer *must* have their own site representative on site full time, during any grading and/or construction works including house construction. If at any time, in the opinion of the Town, the site representative(s) is under qualified the Engineer shall replace the site representative(s) with someone to the satisfaction of the Town. The site representative shall have a minimum of 3 years of related construction experience.

At the pre-construction meeting, the General and Geotechnical Consultant are required to provide the Town with a schedule of the works, together with the names & emergency phone numbers of all inspectors to be on site during the construction of the various phases of the works.

The Geotechnical Consultant must ensure that OPSS.MUNI 401 regarding backfilling and compaction within road allowances and lots where fill exceeds 1.0m in thickness is strictly adhered to. The Geotechnical Consultant's certification must make reference to this.

1.18.1.6.1. Inspection Report

Daily inspection reports from the Consulting Engineer may be requested by the Engineering Services Department prior to certification of works. The diary must at a minimum contain the following information:

- Weather Conditions;
- General Progress of work; where the Contractor is working and what he is doing;
- Equipment being moved or arriving on the job site and its purpose;
- Visits to the site by the Town or Regional Officials and any specific instructions they may have given;
- Instructions given to the Contractor;
- Contractor's claims or complaints;
- Compaction efforts for trench backfill, granular road bedding and asphalt;
- Trench conditions;
- All discussions or dealings with Property Owners;
- Work performed on the site involving the installation of public utilities;
- Stoppage of work by Contractor for whatever reasons with full description of why the work stopped;
- Extra works and miscellaneous happenings;
- Complete descriptions of how excavations were executed, type of equipment used and difficulties due to either improper equipment or nature of material;
- Indicate where all fill materials came from, such as the lot or station of the cut or name of the borrow site;
- Number of loads of material where possible without consulting with the Weighman or the Contractors records;
- All equipment that is on site must be recorded;
- The actual hours worked;
- The actual hours not worked;
- The actual area of work;
- Location and length of time of any stoppages;
- Particular attention must be taken with watering equipment and the number of loads of water applied per day must be recorded as well as the number of hours the equipment worked;
- The time of arrival and departure of the Consultant's Inspector;
- All pertinent information relating to Quality Assurance of the works.

All erosion and sediment control devices are to be inspected by the Consulting Engineer once per week and after each rainfall of 10 mm or greater or significant snow melt to ensure that they are in proper working condition. Copies of the inspection report are to be received at the Engineering Services Department within two (2) working days of the inspection.

1.18.1.6.2. Approvals

The Engineer is required to give the Town forty-eight (48) hours' notice to inspect the following stages of work prior to proceeding to the next stage:

Preliminary Approval of Roads to Base Asphalt and Drainage Facilities – After installation of sewers and drainage facilities and prior to base asphalt, the Engineer must arrange an inspection with the Town and the Region to witness a mandrel test to determine if there are any deflections or obstructions in the sewers. Prior to base asphalt being installed, CCTV of all sewers are to be delivered to the Town and the Region 10 working days prior to proceeding to the next stage. CCTV submissions must comply with OPSS.MUNI 409. The Engineer is required to receive approvals of the sanitary and watermain from the Region in writing and copy the Town, prior to the Town giving approval to proceeding to the next stage work.

Core Sample Testing of the base asphalt must also be conducted and followed by a Pavement Structure Assessment Report (PSAR) for review by the Town, prior to Preliminary Acceptance being provided.

If greater than ten percent (10%) of the Core Sample Tests fail to meet the minimum road design thickness requirements, the Town will not provide Preliminary Acceptance until the deficient areas are replaced or reconstructed to the Town's satisfaction.

Requirements for Placement of Top Asphalt – Prior to second stage curb and top course pavement being installed the Engineer is required to arrange an inspection with the Town. Prior to placement of top asphalt, all Lot Grading Certificates, completion of boulevards and driveway aprons must be finalized. Submission of CCTV for all sewers are to be delivered to the Town and the Region 10 working days prior to proceeding to the next stage.

Certificate of Assumption – The Engineer is required to arrange a final inspection of the infrastructure once the works are all compliant and prior to the Town granting final approval of the works. Should the CCTV of sewers submitted prior to the placement of top asphalt and time of assumption exceed two (2) years, the Town will require the submission of new CCTV of all sewers.

The Town's representative does not inspect the work to determine what is non-compliant; the Town's representative gives approvals for proceeding to the next stage of work once the Infrastructure is compliant. It is the Engineer that is responsible to determine what repair work is needed to meet compliance. If the Town is required to re-inspect a site for approval to proceed to the next stage of work, because the original inspection did not meet all compliance then a penalty of $500.00 may be assessed for each occurrence. Any works that proceed prior to approval from the Town to proceed to the next stage of work will not be accepted and may be required to be removed and replaced or additional warrantee periods may be added.

1.18.1.7. Mud, Dust, Stock Pile & Debris Control

The Developer shall be responsible for all mud and debris that is tracked onto the roadways from vehicles entering or leaving construction sites and dust generated during full course of construction. The Developer shall, upon verbal and/or written request by the Town, immediately proceed with clean-up operations at his expense. Should the Developer fail to clean as directed, the Town will have the cleaning carried out, draw on the Developer's L/C for costs and/or lay additional charges.

The Developer will be responsible for ensuring that all of the subdivision streets will be scraped at a minimum of twice (2) daily or when mud accumulates, whichever is greater. The roads are to be flushed and swept a minimum of twice (2) a week during the construction season. If on-site building activity warrants, the streets may need to be scraped before they can be swept, and cleaning may be required on a daily basis. The Developer will also ensure that abutting streets affected by the subdivision activity are also cleaned when they have been impacted. Town staff will inspect on a periodic and on a complaint basis.

Roadways may not be used for stockpiling materials once the road is open to public use. If a road is to be blocked for more than 2 minutes in duration with construction equipment, then an alternative signed detour route must be established and approved by the Town for the public. All signing and detours must conform to the latest version of the Ontario Traffic Manual.

1.18.1.8. Blasting or Tunneling

No blasting or tunneling will take place without written approval of the Town.

1.18.1.9. Construction on Existing Roads

Whenever it is necessary to cut through an existing Town or Regional road, the Contractor will be responsible for properly compacting the backfill material and replacing the original surface. Road Occupancy and Road Closure permits, and P.U.C.C. approval must be obtained prior to undertaking work on an existing road allowance. Notification to Fire and Emergency Services and School Boards is required 48 hours prior to commencing work.

Note:

The road must be maintained to a minimum of one lane for emergency access as per the O.T.M. Guidelines.

Unshrinkable fill is to be utilized as the backfill material from top of cover material to the bottom of subgrade in all trench excavations within all Town road allowances; in accordance with the Right of Way Occupancy Permit.

Note:

Subdrains must remain intact and at grade during these restorations.

Top asphalt cold joints must be sealed with either T-Bond Hot Mix asphalt joint Tape from McAsphalt or Denso Band by Denso or approved equivalent. These sealants are to be installed in accordance with the manufacturer’s specifications.

Where overlaying or constructing new road works, a diagonal joint must be utilized across the travelled portion of the roadway.

Where proposed, any road granulars that differ from existing road granulars, requires that a frost taper be utilized to minimize the effects of the different granular characteristics.

1.18.1.9.1. Standards and Maintenance

Work shall be to the satisfaction of the Town or their representatives.

Work shall be designed and constructed in accordance with the most recent requirements, standards, specifications and by-laws of the Town of Caledon and Ontario Provincial Standards (OPS). All Works constructed shall be guaranteed for such period of maintenance as required hereinafter.

1.18.1.9.2. Trench Backfilling on Roads

The use of excavated inorganic native subsoil is generally permissible for trench backfilling purposes by means of standard consolidation procedures subject to the following provisions:

- Backfilling operations are to be carried out in strict conformance with the requirements of OPSS.MUNI 401 using earth compaction equipment of appropriate size and weight.
- The minimum compacted density within 1.0 meter of final sub-grade is increased to 98% Standard Proctor Density with moisture content with 2% of the optimum value.
- Soil moisture content high of optimum value is better suited for trench backfilling 1.0 meter below the sub-grade. The addition of water will be required particularly during dry summer conditions subject to the discretion of the Geotechnical Consultant.

The Geotechnical Consultant shall be present during any trench backfilling and consolidation operations ensuring that OPSS.MUNI 401 regarding backfilling and compaction is strictly adhered to. The Geotechnical Consultant is to certify that he or his designate has witnessed all backfill and compaction operations including lot service and that all works were constructed in accordance with OPSS.MUNI 401.

Adequate trench widths must be maintained to give compaction equipment being utilized adequate room to operate. Trenches must be at least the width of the compaction equipment plus 0.5m.

- Backfill with shale will be allowed provided a proper mix of shale and filler material, i.e. sand or clay is integrated onto the backfill material to eliminate voids. The Geotechnical Consultant must carefully monitor the backfilling operation to ensure this mix is maintained and that OPSS.MUNI 401 is complied with. Maximum dimension of any shale backfill particle is 150mm.
- Granular backfill will be used around the perimeter of all manholes and catch basins. Granular backfill is to extend 1.0m out from the outside edge of the

manhole and is to be compacted using a vibratory means or approved alternatives. OPSS.MUNI 401 and 402 must still apply.
- Each service connection and trenches must be monitored and certified to ensure that OPSS.MUNI 401 is complied with.
- Narrow trenches for water service connections are prone to post construction settlement. The Contractor must defer backfilling of the upper 1.0 meter sub-grade zone until completion of all sewer and water service connections to promote uniformity of backfilling and compaction in the sub-grade zone.

The Geotechnical Consultant must maintain a plan and profile drawing indicating the location of each compaction test to ensure compliance with OPSS.MUNI 401. Both failed and satisfactory results are to be indicated along with consolidation layer thickness. A compaction test list or legend may be required to keep the drawing legible. These drawings and other pertinent data must be kept on site within the Consultants trailer and available for Town reviews, at all times.

If, in the opinion of the Town, excessive trench settlements have occurred at base or top asphalt levels, a road review will be required to determine the structural integrity of the road. The cost of this testing will be borne by the Developer. A review of the condition of the roads will determine whether the maintenance period of the road should be extended or if reconstruction is required.

Road construction will not be permitted until trenches have been backfilled and compacted in accordance with the most recent Town of Caledon requirements and specifications. Proof rolling at the sub-grade level must be completed and certified by the Geotechnical Consultant. Certificate must indicate structural integrity of the sub-grade and the adequacy of the structural road design. Sub-grade cross fall shall be 3%, while all granular materials and base course asphalt cross fall shall be 2%.

The following are actions required prior to the placement of granular materials:

- A formal proof rolling test by means of a loaded tandem truck or equipment of equivalent wheel loading must be carried out for approval of the completed sub-grade and prior to placement of granular materials. The sub-grade must exhibit a firm and stable behaviour without rutting and/or flexing under wheel travel;
- Additional granular depth will be required to compensate for sub-grade which cannot pass the proof rolling and/or the removal and re-compaction of any “soft spots”;
- Placements of granulars prior to the Town issuing approvals may result in complete removal of all granulars and proof rolling undertaken in the presence of Town personnel and the Geotechnical Consultant;
- The following special conditions are subject to review on a case-by-case basis including consideration of non-standard consolidation procedures.

Note:

Winter construction of roads is not permitted by the Town.

Additional Requirements of the Geotechnical Consultant

In addition to the parameters set out above, the following criteria are required:

- Soil reports must state specifics of soils indigenous to the development and must emphasize requirements for trench backfilling and compaction and consolidation;
- Only experienced Geotechnical Consultant personnel who have demonstrated their competence to the satisfaction of Town are required to be on site. One Geotechnical Consultant personnel must be on site at all times with no more than two sewer or watermain or service crews under their direct supervision. Where there are more than two crews, additional Geotechnical Consultant personnel are required;
- The Town requires a compaction test on every layer and every 50m^2 for mainline work and a compaction test per layer on lateral service trenches as minimum. Plot field density tests on plan and profile drawings.

The locations of the field density tests are also to be plotted on the plan and profile drawings. The plots should indicate the test number and the results.

1.18.1.10. Policy for Holiday Work by Contractors

Shall be in accordance with the Town's Noise Bylaw.

1.18.1.11. Access to Town Roads

Every individual property finds its legal access to public roads by means of sufficient frontage on an assumed public roadway or by deeded access over property having frontage.

A. An Improved property, fronting on an assumed Town Road, must have at least one entrance, approved prior to a building permit being issued.

B. An encroachment permit onto a Town road must be secured by means of, a permit application, a site plan or by plans for a plan of subdivision.

C. Vehicular entrance onto or egress from an assumed Town road is not permitted except at an approved entrance.

D. Temporary access may be granted under permit application.

E. Additional entrances may be granted under permit application.

F. The Owner must maintain all entranceway improvements on Town property in a safe condition. The Town may, with appropriate notice, make improvements to or remove unsafe entrance features at the cost of the Owner.

G. Where the Town makes improvements to road infrastructure, affected entrances will be restored to equal or better conditions. Non-conforming entrances will not be restored.

H. All entrances onto curbed streets must be of a hard surfaced nature at least to property line, be of a gradient not greater than 6% for the first 6m behind the curb, and have a curb cut of no less than 4m and not greater than 8m unless specifically approved otherwise. For Rural Estate Subdivisions a hard surfaced area of at least

one meter in width is required behind curb at the driveway entrance to provide structural support to the curb.

1.18.2. Preliminary Acceptance & Maintenance Period

1.18.2.1. Roads to Base Asphalt

The Town will grant Preliminary Acceptance of Roads to Base Asphalt when all underground servicing, first stage curb, base asphalt, rough grading of the lots to 0.6m of final grades (or as alternatively identified by the consultant and approved by the Town) and all other essential infrastructure that the Town deems necessary is constructed to Standards as set out in the Subdivision Agreement. The Owner will be required to maintain this infrastructure in good condition, to Town Standards, to Manufacturers Specifications and to safe conditions for a period of not less than two (2) years, from the date of Preliminary Acceptance of Roads to Base Asphalt issuance.

1.18.2.2. Top Course Asphalt

The Town will grant Preliminary Acceptance of the top course asphalt once all material testing results have been received and approved the Town. The Engineer of Record is required to arrange an inspection of the top course asphalt once placed and all deficiencies identified must be addressed. The owner will be required to maintain this infrastructure in good condition, to Town Standards, to Manufacturer's Specifications and to safe conditions for a period of not less than one (1) year from the date of preliminary acceptance of Top Course Asphalt issuance.

1.18.2.3. Stormwater Management Facility

The Town will grant Preliminary Acceptance of the Stormwater Management Facility when all stormwater infrastructure has been installed and functioning.

A deformation gauge test is required on all flexible storm sewers (e.g. polyvinyl chloride, High-density Polyethylene etc.) prior to maintenance and acceptance. A representative from the Town as well as the Engineering Consultant must be present. All pipe works shall have video inspections.

The Owner is responsible for providing the Town with video inspection of all storm sewer pipes including manholes, catch basin leads, and rear lot catch basins.

Storm sewer video inspections shall include a written report by the Consultant, which will include their recommendations, based on their review and assessment of the storm sewer video and the contractors' report.

The Consultant must provide written confirmation stamped by an Engineer that the stormwater management facility has the required full storage capacity as per the requirements of the Certificate of Approval.

The Owner shall guarantee the storm sewers and all above ground appurtenances for a minimum period of two (2) years after the Town has issued preliminary acceptance of base asphalt. Notwithstanding, the storm sewers and all above ground appurtenances will not be released from the maintenance period until assumption has been granted for the subdivision.

Channel works (including headwall structures) shall be maintained until assumption of the subdivision.

1.18.2.4. Winterizing of Subdivision

The Consultant shall schedule a meeting with the Town of Caledon's Operations and Parks Departments to review work to be competed in advance of the winter season. In order to minimize repairs to new subdivision roads and snow plowing equipment, the Town requires the following works to be carried out prior to November 15th of each year:

- Manhole tops, catch basin frames and valves on roads with base asphalt shall be set at the level of the base course asphalt;
- Settlements in roadways shall be repaired, particularly adjacent to manhole tops and catch basin frames;
- Sidewalk bays which have settled and created a lip greater than 10mm shall be repaired;
- Asphalt roads shall be cleared of mud and debris and maintained in this manner throughout the maintenance period;
- Inlet manholes, catch basins, ditches or channel shall be cleared of debris to prevent blockages during winter and spring thaws.

1.18.2.5. Regional Services

Regional requirements shall be guaranteed per the Regional Requirements.

1.18.3. Assumption

1.18.3.1. Lot Site Grading and Drainage Plans

1.18.3.1.1. Lot/Block Grading and Sodding

It is the Developer's responsibility to correct any drainage problems during the term of the Subdivision Agreement. The Developer is also responsible for certification of each lot's grading and sodding as required by the Town of Caledon. Lot grading certificates are only valid for 1 year. The Developer is responsible to assure that all materials used (including materials used by the Builder) to alter the land and grading conforms to the Town Bylaw 2007-059. No construction debris of any kind will be acceptable for fill material except as noted in Bylaw 2007-059 for the purpose of the construction of a driveway.

The Town will not accept a Lot Grading Certificate from a Consulting Engineer without the following having taken place:

- The Consulting Engineer has advised the Engineering Services Department, in writing, that he has visited the site. The Consulting Engineer is assured that the lots which he proposes to certify have been graded and sodded in accordance with the grading plan and the house has been built and the ground elevation adjacent to the house are compatible with the lot grading which has been carried out;
- The Consulting Engineer will then arrange for themselves and/or their representative, the builder and/or his representative to visit the site and review each lot in the plan which is to be certified, and to agree on those lots which can be certified by a visual inspection. Further, this inspection is also to reveal those lots that require more surveying or work to determine how they can be certified. The Consulting Engineer will immediately certify all lots where the parties in the field have reached an agreement;
- The Consulting Engineer will re-survey those lots which cannot be certified by a visual inspection, or, if necessary, require the builder to do further work in order that such lots can be made certifiable. It should be noted that if the Builder will not correct the work as instructed by the Consulting Engineer, this responsibility will fall directly upon the Developer;
- Lots, which cannot be certified due to poor grading or due to changes in the type of house, which was built on the lot, will be brought to the attention of the Town, in writing, by the Consulting Engineer. The Consulting Engineer, on behalf of the Developer, will prepare a new grading plan(s) for the lots, which have not been built according to plan and will submit the revised plan to the Town, to the Builder, and to the Homeowner (if applicable).
- The foregoing is an attempt to establish a system which will likely cover 98% of the lot grading problems presently being experienced; however, it is acknowledged that there are going to be problems that cannot be covered by this procedure. These problems will be dealt with between the Town, the Consulting Engineer, the Developer and the Builder, as they arise.
- Prior to assumption, if the residing Homeowner modifies grades within his own lot causing adverse effects to neighbouring lands, the Developer will be required to rectify the grading infraction to the satisfaction of the Town.

It is recommended that the Developer's Consultant file the actual grades being certified. This will allow a record to be kept for the duration of the Subdivision Agreement. This record will be available to resolve disputes involving changing or certified grades between certification and the Town's assumption of the subdivision.

Builders' site grading plans are to show underside of footing elevations and top of foundation wall elevations. Where multi-level footings and/or foundation walls are intended, all levels are to be shown. Engineered fill level is to be shown where applicable. Downspout locations are to be indicated on Builder's site plans.

The Developer is responsible for the correction of all drainage problems on the blocks during the term of the Subdivision Agreement and for sodding/seeding undeveloped blocks prior to assumption.

1.18.3.1.2. Submission Procedure

Two (2) certified copies of the proposed lot grading plan are to accompany all building permit applications.

The proposed and final grading certificates and drawings are to be certified by the Engineering Consultant responsible for the original design of the Subdivision and required prior to the certificate of assumption.

The submission to the Building and Enforcement Department for preliminary lot grading certification will require the appropriate grading plan. The grading plan is to continue the following wording: “I hereby certify that the proposed grading, building type and appurtenant drainage and stormwater management works comply with sound engineering design and that the proposed grading is in conformity with those of the adjacent lands for drainage and relative elevations”.

The wording is to be followed by the Professional Engineers stamp and signature.

Drawings are to be 210mm by 297mm or folded to that size with title blocks visible.

1.18.3.1.3. Standard Grading Certification and Letter

This letter, found in Appendix C - Standard Forms and Letters, is to be sent to Engineering Services. Under the Subdivision and Development Agreements of the Town of Caledon, the letter is required for the certification of building and lot grading. The date of the Town’s approval of the variance must be inserted in the space provided.

1.18.3.2. Surveyors Certificate

1.18.3.2.1. Standards Iron Bars (S.I.B. Property Bars)

Prior to the assumption by the Town of the services constructed in a development, it is required that the Developer re-establish all Control Standard Iron Bars and a Registered Ontario Land Surveyor must make confirmation of re-establishing these iron bars in writing to Engineering Services.

A. Where registered lots of both the subject land and an existing registered plan are abutting and where these lots have been occupied and fenced, it shall not be a requirement to have these S.I.B.’s replaced.

B. Where the boundaries of the plan involve either sewer or watermain easements, Town owned lands, Region owned lands, Public or Separate School Board lands, Hydro lands, etc., S.I.B.’s shall be required.

C. If it is not possible along the road allowances within a development to place S.I.B.’s, because of above ground works, (i.e. paved driveways), it will be satisfactory to have the closest lot corner monumented with a S.I.B. When such a situation arises at the beginning or at the end of a curvilinear section, it is required that the closest lot corner on a straight street line portion be monumented.

The planting of Standard Iron Bars (S.I.B.’s) is to be done after the Preliminary Acceptance of Top Course Paving.

The Surveyor's certificate required prior to assumption of the subdivision shall confirm that the Surveyor has either found in its original position or replaced each S.I.B. shown on the registered plan. The Certificate shall also confirm that the limits of all sewer and watermain easements have been barred, and that the tops of all S.I.B.'s are within 150mm of final grade. The Certification shall state the date of field verification.

1.18.3.3. Benchmarks

Prior to the assumption by the Town of the services constructed in a development, it is required that the Developer establishes permanent geodetic benchmark(s) and provides the information to the Town. A Registered Ontario Land Surveyor shall establish benchmarks such that the location is assessable, identifiable, permanent and free from vertical movement. The Town, prior to installation, shall approve the type and location of the benchmarks. The benchmarks are to be of the Third Order, made of brass, engraved with "Town of Caledon Benchmark No.". The Benchmark number will be provided by the Town.

Number of Benchmarks Required:

- 1 to 250 lots - 1 benchmark
- 251 to 500 lots - 2 benchmarks
- 501 to 750 lots - 3 benchmarks
- 751 to 1000 lots - 4 benchmarks

1.18.3.4. As-Recorded Drawings

Prior to assumption of the subdivision by the Town of Caledon, the Developer's Engineer and Landscape Architect shall submit "As-Recorded Drawings" for review, in both hard copy and digital format to reflect the 'As-Recorded' conditions of the development. For engineering, these drawings shall show the location both horizontally and vertically of everything that is on or under the lands that are to be accepted by the Town. This includes, but is not limited to, storm sewers, sanitary sewers, watermains and noise attenuation. These drawings shall be sealed and signed by a Professional Engineer, stamped 'As-Recorded', and dated. For the Landscape Architect, these drawings shall show the location both horizontally and vertically of everything that is on or under the lands that are to be accepted by the Town. This includes, but is not limited to, plantings, service connections, entry features, fencing and trails. These drawings shall be sealed and signed by a Professional Landscape Architect, stamped 'As-Recorded', and dated.

2. OPEN SPACE DESIGN/LANDSCAPE

2.1. Introduction

The goal of this manual is to provide technical information for the design and implementation of open spaces within the Town of Caledon. To obtain the most recent requirements for Open Space Design/Landscape, follow:

https://www.caledon.ca/en/townhall/open-space-design.asp

2.1.1. General Overview of Open Space Design

Open Spaces are an essential component of a successful community, integrating natural features and cultural heritage resources while facilitating a wide range of recreation experiences for the general public. Open Spaces typically include stormwater management facilities, greenway corridors, parks, trails and naturalized areas.

2.1.2. Park Classifications

The location and programming of parks will be determined by Town Staff and will meet the needs of each unique development.

The following is a list of key characteristics common to all park types:

- A pedestrian circulation system consisting of a paved walkway network connecting all points of entry to each proposed facility feature shall be provided;
- Where feasible, the park shall be linked to a greenway corridor or trail system;
- Seating and/or gathering areas shall be provided;
- Planting to provide shade and adequate buffers between adjacent land uses shall be provided;
- Provide a minimum of one (1) maintenance vehicular access point for ongoing park maintenance which may require a curb cut;
- Provide a minimum 50% lot frontage onto adjacent street(s) for maximum visibility and safety;
- Parks shall be proposed on table lands where the overall grade of the property does not exceed 6.6%. Parkland to be conveyed to the Town, shall not be in Environmental Policy Areas (EPA) lands;
- The shape and configuration of the park shall be in a useable form and centrally located within a residential neighbourhood;
- Park and school blocks, where deemed appropriate, should be close in proximity to maximize opportunities for facility sharing (i.e. parking, playfields etc.)

2.1.2.1. Type 1 – Neighbourhood Parks (ranging from 0.5ha to 2ha)

Neighbourhood parks are intended to serve residents of the local community within walking distance. They should be centrally located in areas of urban settlement with a service radius of 800 meters or less, uninterrupted by major roadways or other physical barriers, and have street frontage on one or more sides. The design should combine active and passive elements with amenities such as but not limited to, junior and senior play equipment, paved hard court, paths, seating and gathering areas, as well as open space for unstructured field sports. Park facilities may require lighting and should be separated by suitable buffers and be designed such that they are visible from the street.

2.1.2.2. Type 2 – Community Parks (ranging from 2 ha to 6 ha)

Community parks are typically centrally located and adjacent to a school site if proposed. They should have street frontage on two or more sides, be a flat, well drained site with varied vegetation to create an attractive setting. The design should provide a focus for active recreation with amenities such as but not limited to, junior and senior play equipment, playing fields for organized sports, hard courts, splash pads, skate park elements and typically include covered pavilions, picnic areas and parking. Washroom facilities shall be determined on a site by site basis as determined by the Town. Paths shall be a loop system connecting active transportation networks. Park facilities should be separated by suitable buffers, with appropriate vegetation, or fencing buffers to ensure safe setbacks from roads. There may be an opportunity for shared use of facilities and parking areas at the discretion of the Town of Caledon and/or school board.

2.1.2.3. Type 3 – District Parks (size varies due to specialized nature)

District parks are typically located on a major arterial or collector roadway to serve the entire community and offer a specialized service. They are often designed as multi-purpose facilities which apply to arenas, pools, specialty parks and multi-field sport parks, and are typically lit and irrigated. The design should serve multiple users with amenities such as covered pavilions, picnic areas, washroom facilities and parking areas. Paths shall be a loop system connecting parking areas to adjacent park facilities, and active transportation networks.

2.1.2.4. Type 4 – Greenway Corridors and Naturalized Areas

Greenway corridors form open space links between existing natural open spaces and parks. These blocks are typically not lit, and contain naturalized plantings, upgraded entrance nodes, seating opportunities and multi-use paths connecting active transportation networks. Storm ponds shall be considered naturalized areas.

2.1.3. Accessibility and Safety

All public open space facilities shall be designed with accessibility and safety in mind. Every new park or trail shall comply with the technical requirements of the Design of Public Spaces of the Integrated Accessibility Standards (IASR) of the Accessibility for Ontarians with Disabilities Act, 2005. (AODA) as well as applying principles of Crime Prevention Through Environmental Design. https://www.ontario.ca/laws/regulation/110191

All of Ontario's new or significantly redeveloped existing public spaces are required to comply with AODA Standards as of January 1, 2016. Areas covered by this standard include, but are not limited to:

- Recreational trails
- Beach access routes
- Outdoor public use eating areas
- Outdoor play spaces
- Exterior paths of travel (e.g., sidewalks, walkways)
- Accessible parking area
- Obtaining services (e.g., service counters)
- Maintenance of accessible elements

Town of Caledon's Accessibility Advisory Committee shall be consulted during the design process. A meeting with the Accessibility Advisory Committee will be arranged internally by the Town's Landscape Architect in conjunction with the consulting Landscape Architect. The Accessibility Advisor Committee will review and comment on plans and drawings. Their comments must be addressed prior to final approval of the landscape drawings.

https://www.aoda.ca/
http://cptedontario.ca/

2.2. Drawing Submission Requirements

2.2.1. General

Landscape Architects submitting technical drawings to the Town are expected to submit high quality landscape plans that conform to all Town of Caledon standards and guidelines, as well as industry best practices. The consulting Landscape Architect will be responsible for the conceptual design, detailed design, construction drawings, cost estimates, certifications and all other related documents to the satisfaction of the Town.

For the purposes of section 2.0 of this document, plans of condominium shall use site plan standards.
For all future Town owned park facilities, the consulting Landscape Architect will also be responsible for providing the Town with a tender ready construction package including a unit price schedule, specifications and all associated construction drawings.

When preparing the landscape drawings for submission, please note the following:

- All landscape plans are required to be designed and stamped by a full member of the Ontario Association of Landscape Architects (OALA) in good standing;
- All vegetation analysis reports, tree preservation plan(s) and inventory plan(s) are to be executed by a full registered member of the International Society of Arborists (ISA) or a Registered Professional Forester (RPF) with the Province of Ontario;
- All landscape submissions shall be prepared in accordance with Section 1.2.1, 1.2.2 & 1.2.3.; and
- Landscape cost estimates will be required for Letter of Credit purposes.

2.2.1.1. Submission to the Conservation Authority

The developer's consultants are responsible for the submission of any required drawings directly to the conservation authority or applicable governing agency. The Conservation Authorities governing the Town of Caledon are:

- The Credit Valley Conservation Authority (C.V.C.)
- Toronto and Region Conservation Authority (T.R.C.A.)
- Nottawasaga Valley Conservation Authority (N.V.C.A.)
- Lake Simcoe Regional Conservation Authority (L.S.R.C.A.)
- Niagara Escarpment Commission (N.E.C)

Stormwater management ponds, greenway corridors and valley land plans may require the applicable Conservation Authority's review and approval prior to final sign off by the Town of Caledon and implementation of the plans.

2.2.1.2. Submission to Region of Peel

Streetscape plans may require Region of Peel approval prior to final Town sign off and implementation of the plans. The developer's consultant(s) are required to submit any required drawings directly to the Region of Peel.

2.2.2. First Submission – Subdivisions

Two (2) complete sets (reverse rolled) of the following drawings and documents are required for the first Town of Caledon, Open Space Design submission:

- Landscape Letter of Conformance (see template in Appendix C - Standard Forms and Letters);
- Vegetation Analysis Report (Arborist Report);
- Tree Preservation Plan and Inventory List;
- Streetscape Buffer Planting and Layout Plan(s);
- Streetscape Buffer Planting Details;
- Greenway Corridor Planting and Layout Plan(s);
- Greenway Corridor Details;
- Stormwater Management Pond Planting and Layout Plan(s);
- Stormwater Management Pond Details;
- Itemized Landscape Cost Estimate;
- Park Concept and Facility Fit Plan;
- A separate landscape drawing set for lands conveyed to the applicable Conservation Authority;
- A separate cost estimate for landscape items on lands conveyed to the applicable Conservation Authority.

2.2.3. Additional Submissions – Subdivisions and Site Plans

Two (2) complete sets (reverse rolled) of the documents listed above in **Section 2.2.2. First Submission**, revised based on Town comments are required. The following drawings are also required; please note that all park drawings shall be separated out into their own independent set:

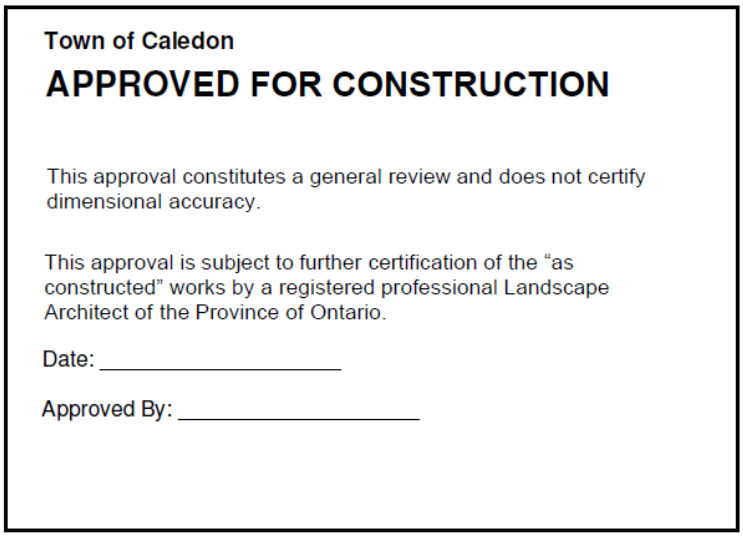
- Letter from the consulting Landscape Architect outlining how previous submission comments/revisions were addressed;
- Landscape Letter of Conformance;
- Park Grading Plan;
- Park Engineered Fill Plan;
- Park Planting & Layout Plan(s);
- Park Details;
- Park Photometric and Electrical Plan(s);
- Park Cost Estimate (separate from subdivision items).

Additional drawings may be requested by the Town including but not limited to:

- Stamped, structural engineering details and drawings;
- Items listed in 2.2.2. and 2.2.3. that apply.

2.2.4. Final Submissions – Subdivisions and Site Plans

The final set of rolled drawings, letter of conformance and cost estimate(s) shall be submitted to the Town. Each drawing sheet is to be stamped, signed and dated by a full member of the Ontario Association of Landscape Architects (OALA) in good standing. Please note that an OALA digital stamp is acceptable, provided it is originally signed. For all subdivision drawings, the following signature box is required within the title bar of all landscape drawings and reports.



2.3. Landscape Design Requirements

The following chart outlines the **minimum** planting specifications:

	Subdivision	**Site Plan: Industrial & Commercial**	**Site Plan: Non-Industrial & Commercial**	**Stormwater Management Ponds**	**Greenway Corridors**
Deciduous Trees	60mm cal.	70mm cal.	60mm cal.	60mm cal.	60mm cal.
Flowering (Specimen Trees)	50 mm cal.	50mm cal.	50mm cal.	50mm cal.	50mm cal.
Coniferous Trees	225cm ht.	200cm ht.	180cm ht.	200cm ht.	200cm ht.
Shrubs	60cm ht.	80cm ht.	60cm ht.	60cm ht.	60cm ht.
Whips	N/A	N/A	N/A	150cm ht.	150cm ht.

2.3.1. Streetscape

Requirements:

- Please contact the Town of Caledon Open Space Design department for the most current street tree species list;
- All boulevards are required to have a minimum 300 mm depth of topsoil and sod. Boulevard seeding will not be accepted by the Town;
- To avoid a monoculture situation, a variety of tree species should be used and have no more than 4 – 8 of the same tree species grouped along a single street;
- No more than 20% of any one tree species should be used within any given streetscape to avoid monoculture situations;
- Tree species shall be diverse and hardy to withstand urban conditions;
- Tree root protection systems may be required at the discretion of the Town of Caledon.

2.3.1.1. General Street Tree Planting

The following are recommended street tree spacing for public boulevards along residential frontages. This is excluding Palgrave Estate Residential Areas.

A. < 9 meters between driveways:

Where there is less than 9 meters between driveways, one 60mm caliper, large high branching deciduous tree shall be planted centrally between the driveways. Adjustments may be required due to utility and signage conflicts;

B. 9 – 12 meters between driveways:

Where there is more than 9 meters and less than 12 meters between driveways, two 50 mm caliper small high branching deciduous trees shall be planted at even intervals. Adjustments may be required due to utility and signage conflicts; and

C. ≥ 12 meters between driveways:

Where there is more than 12 meters between driveways, two 60mm caliper large high branching deciduous trees shall be planted at even intervals between the driveways. Adjustments may be required due to utility and signage conflicts.

Note:

- Where spacing between the sidewalk and back of curb is 2.0 meters or less, only 50 mm caliper small high branching deciduous trees are permitted;
- Additional tree planting may be required where extra-large lot frontages are proposed, at the discretion of the Town;
- Where street trees are proposed along non-residential frontages such as buffer blocks, park blocks, road extensions or widenings; 60mm caliper large high branching deciduous trees are required at 10 – 12 meter intervals on center;
- Where utilities are proposed within the boulevard, refer to standard 700 – General Landscape Notes for clearance information;
- Adjustments to street tree planting locations may be required due to utility and signage conflicts, at the discretion of the Town.

Double Row of Street Trees (excluding Palgrave Estate Residential):

- A double row street tree requirement will be determined by Town staff prior to Draft Plan Approval;
- Where a double row of street trees is required, one street tree shall be located on the public boulevard and one tree will be located on private property;
- All trees proposed on private residential front yards shall be planted in a location that meets a minimum 3.5m x 3.5m unobstructed- no driveways, walkways, porches, stairs, awnings or other encumbrances as determined by the Town;
- The private side street tree shall be a minimum 50mm caliper small species deciduous tree and planted a minimum of 1 meter away from the front and side property lines measured from property line to edge of trunk;
- One private street tree per lot shall be required;
- Larger tree species may be permitted where space allows at the discretion of the Town;
- Where utilities are proposed within the boulevard, refer to Standard No. 700 – General Landscape Notes for clearance information;
- Where residential lots flank (side) onto streets requiring a double row of street trees, street tree shall not be installed in rear yards.

Road Extensions and Road Widening:

- For road widening and/or extensions, an arborist report from an ISA Certified arborist or Registered Professional Forester (RPF) may be required at the

discretion of the Town. Consult with Town of Caledon Open Space Design staff for clarification;
- Every effort should be made to maintain and protect all existing trees, fence lines and vegetation, utilizing arboricultural best practices. Refer to Town of Caledon Tree Preservation Standard Notes 606, 710, 711;
- Replacement and/or new deciduous trees shall be a minimum of 60mm caliper street trees spaced at 10-12m on center;
- Consult with Town of Caledon Open Space Design staff for appropriate tree and shrub species;
- For road widenings and extensions crossing hydrological areas, wetlands and conservation areas refer to governing conservation authority best practices.

2.3.1.2. Buffer and Window Planting

Requirements:

- Planting requirements in these areas will vary based on site specific conditions and any applicable guidelines, at the discretion of the Town
- A mix of coniferous trees, deciduous trees and shrubs are required.
- All planting is to be in continuous mulched plant beds with weed barrier fabric.

2.3.1.3. Roundabout Planting

Requirements:

- Raised planting is required in the center of roundabouts with armour stone or concrete curb edging;
- A 4.0 meter wide stamped and coloured concrete splash strip is required along the perimeter of the central planting area to allow for safe maintenance;
- The minimum depth of topsoil and planting mix shall be 750 mm deep;
- Plant material shall be low maintenance or xeriscape including a combination of ornamental grasses, shrubs, small multi-stem deciduous trees and coniferous trees;
- The entire plant bed shall be mulched to a minimum depth of 100mm with weed biodegradable barrier fabric throughout;
- See Town of Caledon Engineering staff for lighting or utility requirements, if applicable.

2.3.1.4. Palgrave

Street Trees:

- There is no requirement for boulevard or street trees within Palgrave Estates;
- All proposed trees are to be installed on private property and shall be a minimum of 1 meter inside the front and side property lines, measured property line to edge of trunk. If applicable, this shall be addressed through the site plan application process;
- All trees shall be 60 mm caliper or larger, high branching deciduous trees planted at 10 – 12 meter intervals on center. If applicable, this shall be addressed through the site plan application process;

- Native species planting is strongly encouraged.

Visual Impact Planting:

- Visual impact planting on private property may be required as outlined in the Town of Caledon Official Plan;
- Visual impact plantings shall consist of groupings of deciduous and coniferous trees;
- Native species planting is strongly encouraged.

Restoration and Reforestation:

- Refer to local Conservation Authorities for restoration requirements, standards, guidelines and warranties.

2.3.2. Storm Ponds

General:

- All planting plans shall follow the governing Conservation Authority planting density and species requirements. Planting density charts shall be illustrated in a chart form on the planting plans as required by the governing Conservation Authority. A minimum of 75% caliper trees shall be provided;
- Urban treatment features such as lookouts, seating areas, buffers and nodal planting may be required in addition based on site specific conditions and any applicable design guidelines at the discretion of the Town;
- Bio-swales and Low Impact Development (LID) planting will be considered on a site by site basis;
- For trail requirements, refer to section 2.3.4.;
- For signage requirements, refer to section 2.3.6.;
- See Town of Caledon Engineering staff for grading, lighting and fencing requirements, if applicable;
- Chain link fencing is required wherever private property abuts public property such as storm pond blocks.

2.3.3. Greenway Corridors and Naturalized Areas

General:

- Show all trails within greenway corridors as outlined in section 2.3.4.;
- All soft landscape areas within the greenway corridor shall be a minimum of 2% slope and a maximum of 25% slope;
- Greenway corridors are required to have a minimum topsoil depth of 300mm;
- A minimum 2.0m wide plateau may be required along the edge of the property line where the greenway corridor or naturalization blocks abut private lots, at the

discretion of the Town. This area is to be finished with a low maintenance, naturalized seed mix;
- Half meter (0.5m) contour intervals shall be shown on all grading plans;
- Spot elevations at critical areas including but not limited to, low points, high points, hard surface areas and catch basin rim elevations shall be provided;
- All planting plans shall follow the governing Conservation Authority planting density and species requirements. This information shall be illustrated within a planting table on the planting plan. A minimum of 75% caliper trees shall be provided;
- All planting is to be installed within continuous mulched plant beds with biodegradable weed barrier fabric;
- A 2.0 meter no planting zone for trees and shrubs is required from the edge of all trails;
- Greenway corridors shall be seeded with a native wildflower seed mix with the exception of the following areas:
  - Trails require 1 meter of sod along all edges;
  - Center points of swales shall be sodded and a minimum of 1.5 meters wide;
  - All catch basins shall be surrounded by a 1.5 meter wide sodded strip;
  - All Greenway Corridors shall utilize Beehive Catch Basins. See Town Standard Detail 503;
- Specialized entrance treatments are required at trail intersections including, but not limited to, accent paving, armour stone, site furniture, bollards, p-gates, shrubs and ornamental grasses;
- Armour stone seating and accessible curb stops are required along trails within greenway corridors as per the AODA. See section 2.1.3.;
- All catch basins shall be installed in soft landscape areas;
- Bio-swales and Low Impact Development (LID) planting will be considered on a site by site basis;
- Chain link fencing is required wherever private property abuts public property such as greenway corridors and naturalized blocks. All fencing to be installed entirely on private property unless otherwise directed by the Town.
- For signage requirements, refer to section 2.3.6.;
- Lighting within greenway corridors is not typically required but will be determined at the discretion of the Town. If applicable, refer to the Town of Caledon's Outdoor Lighting Manual Standard (2018);
- Weeper drainage tiles may be required within the proposed swales at the discretion of the Town; and
- See Town of Caledon Engineering staff for fencing requirements if applicable.

2.3.4. Trails

General:

- All trails are to be implemented according to the Town of Caledon Trails Masterplan, applicable Secondary Plans and/or applicable Community Design Plans and Guidelines. Trails proposed on Town owned lands shall be a minimum of 3.0 meters wide, paved with asphalt as per Standard No. 901. The width and surface material may vary based on site specific conditions, at the discretion of the Town;
- Trails require 1 meter of sod along all edges;

- All trails shall have a maximum side slope of 3% and a maximum run of 6.66% (1:15) where feasible;
- All trails must adhere to the most current AODA standards, see section 2.1.3.
- Where organic soil is present after the proposed trail has been excavated, additional excavation shall take place to below the organic layer at the developers cost. The proposed granular base depth shall be increased to compensate for the difference;
- No cross flow of water is permitted over any trail;
- Soft surface areas shall not drain onto trails or any other hard surfaces, a culvert with apron ends is required where there is no alternative design solution;
- For signage requirements, refer to section 2.3.6;
- Chain link fencing is required wherever private property abuts public property such as trail blocks. All fencing to be installed entirely on private property unless otherwise directed by the Town.

2.3.5. Parks

General:

- Parks shall be designed in accordance with the Town of Caledon Parks Master Plan, any applicable Secondary Plans and Community Design Plans and Guidelines;
- All park designs shall meet or exceed the most recent technical requirements of the Design of Public Spaces of the Integral Accessibility Standards (IASR) of the Accessibility for Ontarians with Disabilities Act, 2005. (AODA);
- Prior to draft plan approval, the Town may require a facility fit plan to be submitted for review and approval;
- Prior to any detailed design, a pre-consultation meeting shall be scheduled with the landscape consultant and the Town's Open Space Design department, to ensure that all necessary park components are included;
- A vegetation analysis report shall be provided and identify any existing vegetation that is suitable for preservation within park blocks;
- Tree protection fencing shall be installed in accordance with Standard No. 606, 710, 711.;
- Any required tree protection measures shall be implemented prior to the commencement of rough grading and remain in place until advised by the Town;
- All parking lots shall be designed with two points of access from the adjacent street. In the event only one access point can be achieved, dead ends are not permitted. Where possible, the access points should line up with the center line of any adjacent T-intersections. Driveway entrances are to meet Town requirements as per Section 1.5.2.3.;
- Accessible parking spaces shall be included in the parking lot design as per the most current Town's By-Law and in keeping with the parking requirements of the Accessibility for Ontarians with Disabilities Act, 2005. (AODA);
- For signage requirements, refer to section 2.3.6.;
- All Parks shall utilize OPS.400.020 Catch Basins unless otherwise directed by the Town;
- The consulting Landscape Architect shall consult with Parks and Open Space staff for site specific washroom building, zurn hydrant and/or splash pad requirements. In the event that any water services are required in a park, a

Region of Peel approved, appropriately sized meter chamber shall be proposed within the park block with a shut off valve.

2.3.5.1. Parks – Hardscape

General:

- All walkways within park blocks will vary in width between minimum 1.5 and 3 meters depending on facility requirements;
- All walkways shall have a maximum side slope of 3% and a maximum run of 6.66% slope (1:15) or as required by the AODA;
- Walkway surfaces shall be asphalt or concrete. Stamped and/or coloured concrete may be required at the Town's discretion;
- All hard surfaces shall meet the most current OPSS requirements;
- All park access points more than 1.5m wide and less than 3.0 meters wide will require bollards, at the discretion of the Town;
- Where a 3.0 meter wide (maximum) walkway that doubles as a maintenance vehicle access route is required into the park from the main parking lot or road, a curb cut must be provided at the access/egress;
- A P-gate is required following Town Standards to restrict access to maintenance vehicles only for all 3.0 meter wide walkways and access routes. See Standard No. 608 – Walkway P-Gate or Standard No. 609 – Walkway P-Gate with Support Brace, unless otherwise directed by the Town;
- If a multi-use trail system is proposed, refer to section 2.3.4.;
- Masonry columns or wooden features may be required and will be determined on a site specific basis. Structural stamp and certificate shall be required at the discretion of the Town;
- In the event, the Town wishes to flood a hard surface play court to act as a skating rink during the winter months, the court surface shall be concrete or as directed by the Town. A centrally located catch basin with an approved cover shall be provided;
- Decorative metal fencing may be required along park frontages locations at the discretion of the Town;
- Chain link fencing is required wherever private property abuts public property such as park blocks;
- For site furniture and installation requirements, see Section 2.3.7.

2.3.5.2. Parks – Softscape

General:

- Refer to Town standard details for specific technical planting requirements. See Standard No. 800 – 805;
- All soft surface slopes and swales are to be designed to a minimum of 2% and maximum 25% slope (1:4);
- Crossflow of water from soft to hard surfaces and play courts are to be avoided;

- Where hydro and/or terraseed is proposed adjacent hard landscape areas, trails and walkways, a minimum 1.0m wide strip of sod is to be installed adjacent the hard surface;
- Site grading and catch basin locations are to be designed such that top of grate elevations allow water not to exceed 30cm above the grate if obstructed, before the water is redirected to another catch basin;
- Swales shall be sodded to a minimum of 1.5 meters wide, on either side of the center line of swale;
- All catch basins shall be surrounded by a minimum of 1.5 meters wide sodded strip, from the outer edge of the catch basin;
- Where side or rear residential lots are adjacent an organized or passive play field within a park block, a minimum 4.0m wide planting buffer of predominately coniferous planting adjacent the residential lots shall be proposed within a continuous mulch bed;
- Some park entrances may contain upgraded landscape features such as grasses, shrubs, armour stone or structures at the discretion of the Town;
- An enhanced planting bed shall be included in all parks to accommodate a future address sign by the Town. The final locations will be confirmed by Town of Caledon, Parks and Open Space staff;
- Best practices for design should be applied to all parks and open space.

2.3.5.3. Playgrounds

General:

- All parks shall include a junior and senior play pit and must conform to current CAN-CSA Z614 standards including Annex H requirements. It is the responsibility of the consulting Landscape Architect to recommend the manufacturer and supplier of playground equipment for review and approval by the Town.
- All play pits shall contain a concrete curb border or alternative as directed by the Town, with concrete ramp(s) to allow access to the play area. See Standard No. 1000 – Playground Concrete Border and Standard No. 1002 – Playground Access Ramp.
- The hard surface surrounding the perimeter of the play pit shall be of contrasting colour or include accessible markings such as a 200mm wide painted line to delineate the edge of the play area.
- All play pit surfaces shall be IPEMA certified engineered wood fiber mulch, rubber surface or approved equal. The play pit base shall contain a weeping tile system outletting to a local catch basin or soft surface at a lower elevation.
- All outdoor play spaces shall comply with the consultation and design requirements of the Design of Public Spaces of the Integrated Accessibility Standards of the Accessibility for Ontarians with Disabilities Act, 2005. (AODA)
- Play equipment and protective safety zone information shall be include on all appropriate landscape drawings.

2.3.5.4. Sports Fields

General:

- The type of sports field for each park classification shall be determined on a site by site basis, at the discretion of the Town;
- Refer to the Town standard technical details for further information on layout and sizes. See details as applicable:
  - Basketball Full Court Layout (Standard No. 1003)
  - Basketball Half Court Layout (Standard No. 1004)
  - Junior Soccer Field Layout (Standard No. 1006)
  - Senior Soccer Field Layout (Standard No. 1007)
  - Football Field Layout (Standard No. 1008)
  - Baseball Field Layout (Standard No. 1014)

2.3.5.5. Water Play and Washroom Facilities

General:

- All servicing drawings shall be designed and stamped by a certified Mechanical Engineer;
- New water service, storm and sanitary connections shall be identified by the consultant on all applicable plans for parks and open spaces;
- Size and location for all proposed splash pads shall be identified on a site by site basis, at the discretion of the Town;
- Where required, washroom facilities shall be provided and designed to meet current Town of Caledon and Region of Peel standards, most recent edition;
- All Community Parks shall require a washroom facility;
- A new water service shall be sized appropriately for the proposed amenities. The design shall be a complete service with appropriately sized waterproof water meter chamber or accessible meter room location in a proposed building facility, backflow device, shut-off valve or curb stop to meet current Region of Peel Water and Sanitary connection standards. Oversized meter chambers may be required and will be determined on a site by site basis;
- Storm and sanitary connections, including cleanouts, service or sampling manholes shall be required and identified on all applicable plans;
- It is the Developer's responsibility to ensure that the design specifications meet the current design criteria outlined by the Region of Peel. Proof of submission to and approval by the Region of Peel Water Connections Department is to be provided to the Town of Caledon.

2.3.5.6. Lighting and Electrical

General:

- All electrical and lighting drawings are to be designed and stamped by a certified Electrical Engineer;
- All electrical work is to be designed, certified and constructed in accordance with most recent requirements of the Town of Caledon and Hydro One;
- Lighting is typically not required along trails. It is typically reserved for Neighbourhood, Community and District parks, parking areas and organized sports fields. The Town shall confirm lighting requirements on a site by site basis;
- Light posts adjacent all playcourts shall be Stresscrete, at 6.5m height. Light posts around other amenities shall be Stresscrete at 5.0m height. Ensure all light

posts are installed in soft landscape areas, a minimum of one (1) meter from any hard surface or trail edge;
- Approval in writing from the Electrical Safety Authority (ESA) is required prior to energizing and final acceptance by Town;
- All lighting is to be LED and controlled via photocell and digital timer to meet park hours of operation;
- If a shelter or gazebo structure is proposed, the consultant is to ensure that one of the posts is designed to internally carry an electrical supply to lights and/or GFIs at the discretion of the Town;
- All electrical pedestals shall be metered and unobtrusive. SLM series by Pedestal Solutions accompanied with pedestal foundation by Utilicon are preferred; alternates are subject to Town approval;
- Consult with Town of Caledon, Parks and Open Space Design staff for the latest park lighting requirements, prior to first submission from the electrical consultant.

2.3.5.7. Park Base Conditions

Prior to the Town constructing a park, the developer will be fully responsible for implementation of the park base conditions at the sole cost of the developer. The base conditions require general seed establishment and engineering certification prior to registration. Park base conditions include the following items:

- Installing and/or maintaining vegetation preservation fencing in accordance with the Town approved plans, and reports;
- Rough and fine grading of all proposed soft landscape areas with a minimum of 150mm (6”) topsoil. The elevations should be 150mm below proposed finished, final approved grade. The entire park base condition is to be then seeded as per the approved seeding mix;
- Compacted engineered fill shall be installed under all proposed hard surfaced areas. The engineered fill is to be installed to bottom of granular sub-base elevation of the future hard surface. The remaining difference should be topsoil and seeded to 150mm (6”) below proposed finished, final approved grade. See Standard No. 912. Compaction testing shall be conducted at key locations as determined by the Town. All testing reports are to be submitted to the Town of Caledon;
- All proposed culverts, catch basins and pipe connections shall be installed;
- All catch basin top of grates shall be installed within 150mm below the proposed finished, final grade. All catch basin pipe connections shall be installed below frost level. Pipe connections shall be insulated where installation below frost level cannot be obtained within the design;
- All proposed perimeter chain link fencing shall be installed. The remaining perimeter of the park block shall be enclosed with page wire fencing (T-bar posts) and where chain link fencing is not proposed, in order to prevent encroachments and/or illegal dumping of debris. See Standard No. 603 – Page Wire Fencing;
- All required Region of Peel approved site services (water, hydro and sanitary) are to meet or exceed the most up to date Region of Peel standards and shall be installed up to the park block property line;
- All utilities shall be properly staked and labelled above ground for ease of location during construction by the Town. Where water services are required (eg.

splash pad, washroom, zurn hydrant), a Region of Peel approved, appropriately sized meter chamber with shut off valve shall be installed within the park block as per the approved plan;

- Upon completion, a stamped and signed certification letter from the consulting engineer shall be submitted to the Town verifying that the park base conditions have been implemented as per the approved park drawings. The certification letter is to note as-built top of grate elevations for all catch basins and manholes. In addition, an AutoCAD (AutoCAD 2017 or newer) drawing is to be submitted showing the as-built grading and servicing information overlayed on top of the proposed grading information. The drawing is to include 0.5m contour intervals and spot elevations at key points on site (eg. catch basin rim elevations, high point swales and ridges);
- A minimum of 5 core samples per site shall be conducted by the Developer, at their expense, and reports submitted to the Town of Caledon to verify topsoil depths within park blocks. Additional core samples may be required at the discretion of the Town;
- The Developer shall provide at their expense, an As Recorded survey of all finished (compacted) sub-grades and finished (topsoil) grades. Survey information shall be provided to the Town of Caledon in electronic and paper format, along with a .dwg AutoCAD file;
- The Developer shall provide at their expense, adequate record of topsoil testing to the Town for all topsoil placed on park sites. If amendments are required of the topsoil, a pre- and post-test analysis report will be required.

Note:

In instances where severe grade changes are naturally occurring upon the proposed park site, if deemed necessary by the Town of Caledon Open Space Design Department, all non-decorative (structural) retaining wall systems shall be designed and installed as part of the park base conditions. Detailed construction drawings, certified and stamped by a licensed, registered professional engineer, are to be provided to the Town for review and acceptance prior to wall construction. The associated cost of all coordination, design and construction works shall be at the sole cost of the Developer.

2.3.6. Signage

Appropriate signage is to be installed within parking area and at all entry points within greenway corridors, park blocks, stormwater management blocks and where trail connections are proposed. Signage may include, but not limited to:

- Accessibility Trail Signage (Standard No. 1100);
- Storm Pond Signage (Standard No. 1101);
- No Winter Trail Maintenance Signage (Standard No. 1102);
- Accessible Parking Signage (Standard No. 1103);
- Stoop and Scoop Signage (Standard No. 1111);
- Naturalization Signage (Standard No. 1112)

In site specific instances, where historical, ecological or educational features are present, additional signage may be required.

2.3.7. Site Furniture

General:

- A hard surface (typically concrete) shall be provided under all proposed site furniture including, but not limited to, benches, garbage receptacles, recycling receptacles, bike racks, picnic tables, bleachers and shade structures. Accessible seating options shall be required at the discretion of the Town;
- Consult with Town staff to verify manufacturer, model, colour and additional specification that may be required;
- All site furnishings shall be installed as per manufacturer's specifications;
- All footings for shade structures, gazebos, etc. are to be reviewed, approved and stamped by a structural engineer for coordination of future building permit(s);
- Metal fencing may be required entirely or partially along the frontage of the park block. Consult with Town staff for verification.

2.3.8. Irrigation

Irrigation is not a Town service level standard. The Town will request the design of an irrigation system on an individual, site specific basis.

Landscape drawings are to identify all proposed irrigation lines and heads where applicable.

2.3.9. Entry Features

General:

- Entry features shall contain low maintenance or xeriscape plant material in continuous mulch beds with biodegradable weed barrier fabric. The proposed planting shall not obstruct signage on the wall. Coniferous and deciduous trees should be considered as a backdrop;
- The design shall consider local themes or heritage features. Wall features shall require structural stamp and certification at the discretion of the Town;
- Reclaimed heritage components are encouraged and may be included in the design and construction of the wall at the direction of Heritage staff.

2.4. Construction, Warranty Period and Assumption Requirements

2.4.1. Process Overview

General:

- All construction drawings shall be approved and signed by the Town prior to implementation;

- An initial pre-construction meeting is required prior to the execution of any landscape works with the Town's Landscape Architect. If required, regular site meetings may be scheduled at this time;
- It is the responsibility of the consulting Landscape Architect to take accurate and detailed meeting minutes of all meetings, providing a written record of the meeting minutes to the Town.

2.4.2. Developer's Responsibilities

General:

- The Developer shall work with a consulting Landscape Architect in good standing with the Ontario Association of Landscape Architects (OALA) to oversee the implementation of the required landscape works, by a qualified landscape contractor;
- The Developer shall be responsible for coordination of routine grass mowing along all trail edges within greenway corridors, non-residential boulevards, undeveloped park blocks, vacant lands and stormwater management pond areas until the subdivision is assumed;
- The Developer shall be responsible for providing the Parks and Open Space Design Division with a tender ready, complete set of construction drawings and technical specifications for all neighborhood, community and/or district parks;
- An itemized, unit rate cost estimate shall accompany the construction drawings and technical specifications, at the cost of the Developer. All documents are to be stamped and signed by a registered member of the Ontario Association of Landscape Architects (OALA) in good standing;
- Completion of any and all repairs/replacements within the required warranty period or until assumption is granted by the Town.

2.4.3. Consulting Landscape Architect Responsibilities

Where the consulting Landscape Architect is obtained by the Developer to install general landscape works as per the Town approved landscape plans, the Landscape Architect shall certify and inspect each of the following:

Overall:

- Supervise all landscape works;
- Be the direct contact for the contractor completing the landscape works;
- Be the direct contact for all resident and /or stakeholder inquiries relating to the landscape works;
- Provide residents with notification letters (door knockers) prior to street tree planting. Refer to Appendix C – Standard Forms and Letters;
- Report issues or conflicts to the Town;
- Complete routine site inspections;
- Provide the Town with the required documentation throughout the construction and warranty period;
- Make the contractor aware of the complete scope of work and maintenance requirements;

- Coordinate updates to as-recorded drawings, utilizing red line drawings from contractors.

Tree Preservation:

- Supervise and routinely inspect installation and ongoing maintenance of all tree preservation measures as per Standard No. 710 & 711 and Town approved tree inventory reports and plans.

Greenway Corridors / Naturalization Buffers:

- Provide the Town and contractor with a certification letter from the consulting engineer verifying that all catch basin rim elevations have been installed as per the Town approved grading drawings. No construction can occur until the Town accepts this certification;
- Schedule a pre-consultation meeting with the Town's Open Space Design department;
- Update the Town's approved landscape plans based on as-recorded site conditions and provide updated copies to both the contractor and the Town;
- Inspect and certify planting is complete.

Stormwater Management Ponds:

- Verify all engineering grading and seeding is complete;
- Verify all seeding is fully germinated;
- Verify that the proposed high water level around the perimeter of the stormwater management pond is staked prior to planting;
- Verify that all planting is complete;
- Coordination of a pre-consultation meeting with the Town's Parks and Open Space Design division to verify the staking and planting locations;
- Coordination of updates to the Town approved landscape plans based on as-recorded site conditions and provide updated copies to both the contractor and the Town.

Street Trees:

- Coordinate locates prior to installing street trees;
- Mark the tree locations and contact the Town's Open Space Design department to schedule an on-site meeting. This meeting will verify street tree planting locations which should be marked with white spray paint prior to installation;
- Inspect and certify tree planting is complete;
- Issue notification letters (door knockers) to residents informing them of the street tree planting (see Appendix C – Standard Forms and Letters);
- Update the Town approved landscape plans based on as-recorded site conditions and provide updated copies to both the contractor and the Town.

2.4.4. Contractors

Where a contractor is obtained by the Developer to install general landscape works outlined in these guidelines and as per the Town of Caledon approved landscape plans, the contactor shall:

Overall:

- Provide the Town with the operating manual;
- Coordinate inspections and submit to the Town of Caledon all relevant documentation from the required agencies (eg. Electrical Safety Authority (ESA), and Hydro One);
- Completion of all site works to the satisfaction of the Town;
- Abide by all relevant legislations, codes and best practices (e.g. Ministry of Labour).

2.4.5. Subdivisions - Warranty and Assumption

2.4.5.1. Greenway Corridors, Stormwater Management Ponds and Naturalized Areas (Town Owned Lands)

The warranty period for greenway corridors, stormwater management ponds and naturalization areas is minimum three (3) years. If assumption is not applied for or granted after the warranty period is complete, the developer will be responsible to provide additional warranty until assumption is granted.

Timing of assumption shall coincide with streetscape works if applicable. Assumption will not be granted separately.

Prior to initiating a site inspection with Town of Caledon staff for any of the three stages listed below, the consulting Landscape Architect is to ensure that all dead plantings are replaced, leaning trees are rectified, all pruning has been completed, all tree saucers and/or plant beds have been weeded and mulched (for greenway corridors only) and grass cutting along trails or access roads is complete. All rodent protection and T-bars for staking and guying must be removed prior to Assumption.

In areas that are to be conveyed to the applicable Conservation Authorities, please contact the agency directly to verify approval processes.

The warranty and Assumption period is subject to a three stage process as follows:

In areas that are to be conveyed to the applicable Conservation Authorities, please contact the agency directly to verify approval processes.

The warranty and Assumption period is subject to a three-stage process as follows:

Stage 1 - Preliminary Acceptance

Once all naturalization works are completed, the landscape consultant shall submit the following items to the Town of Caledon for review:

- A 'Certificate of Completion for Preliminary Acceptance' (see Appendix C – Standard Forms and Letters);
- Submission of a proposed maintenance schedule for the duration of the warranty period;
- A complete set of As-Recorded drawings, only applicable there are any deviations from the approved drawings;
- Structural engineering certification verifying that the built features have been constructed as per the approved drawings (if applicable);
- All granular base and/or concrete cylinder testing to be submitted (if applicable).

Once received, the landscape consultant shall arrange a meeting with the Town of Caledon staff between **May 15th and October 15th** to verify the site conditions and determine if there are any discrepancies with the submitted documents. If any discrepancies are noted, the consulting Landscape Architect shall update all applicable submission items and resubmit accordingly. Any noted onsite deficiencies shall be corrected within **30 calendar days** of the initial site meeting in order to receive Preliminary Acceptance.

Preliminary Acceptance verification by the Town of Caledon will be emailed directly to the landscape consultant. Where Town of Caledon staff are required to complete more than two (2) site visits for preliminary acceptance, additional fees are required in accordance with the Town's current fee by-law.

Once Preliminary acceptance has been granted the following can occur:

- The warranty period can commence;
- The Town of Caledon will release up to 50% of the overall naturalization area securities, at the discretion of the Town of Caledon staff.

Stage 2 - Interim Acceptance

A minimum of one (1) year after Preliminary Acceptance is granted, the landscape consultant shall submit the following items to the Town of Caledon for review:

- A 'Certificate of Completion for Interim Acceptance' (see Appendix C – Standards Documents);
- Submission of maintenance schedule records completed to date;
- Any updates or revisions to the maintenance schedule for the duration of the warranty period;
- A revised set of As-Recorded drawings, only applicable there are any deviations from the approved drawings.

Once received, the landscape consultant shall arrange a meeting with the Town of Caledon staff between **May 15th and October 15th** to verify the site conditions and determine if there are any discrepancies with the submitted documents. If any discrepancies are noted, the consulting Landscape Architect shall update all applicable submission items and resubmit accordingly. Any noted onsite deficiencies shall be corrected within **30 calendar days** of the initial site meeting in order to receive Interim Acceptance.

Interim Acceptance verification by the Town of Caledon will be emailed directly to the landscape consultant. Where Town of Caledon staff are required to complete more than two (2) site visits for interim acceptance, additional fees are required in accordance with the Town's fee by-law.

Once interim acceptance has been granted the following can occur:

- The Town of Caledon will release up to an additional 40% of the overall naturalization securities, at the discretion of the Town of Caledon.

Stage 3 - Assumption

A minimum of two (2) years after Interim Acceptance is granted, the landscape consultant shall submit the following items to the Town of Caledon for review:

- A 'Certificate of Completion for Assumption' (see Appendix C – Standard Forms and Letters);
- Submission of maintenance schedule records completed to date;
- A revised bond set of As-Recorded drawings (bound and reverse rolled), only applicable there are any deviations from the approved drawings.

Once received, the landscape consultant shall arrange a site meeting with the Town of Caledon staff to verify the site conditions and determine if there are any discrepancies with the submitted documents. Assumption inspections will be performed between **May 15th and October 15th**, while plant material is in full leaf. In order to meet the **October 15** inspection deadline, all site inspection requests shall be made prior to **September 15th.**

Any noted onsite deficiencies shall be corrected within **30 calendar days** of the initial site meeting in order to receive assumption. If any discrepancies are noted, the consulting Landscape Architect shall update all applicable submission items and resubmit accordingly. Where the Town of Caledon staff are required to complete more than two (2) site visits for assumption, additional fees are required in accordance with the Town's fee by-law.

Once the submission items are given final approval by Town of Caledon staff, the landscape consultant shall submit the following:

- A final set of As-Recorded drawings in PDF and Auto-CAD (AutoCAD 2017 or newer) format on a USB key.

Once Assumption has been granted, the following can occur:

- The warranty period ends with the exception of replacement trees performed the same year assumption is granted. These trees are subject to an additional one (1) year warranty unless alternate arrangements are negotiated with Town of Caledon, Parks and Open Space Design staff (see Section 2.4.5.3.).
- The Town will release up to 10% of the remaining overall naturalization securities.

Disclaimer: If the developer is not granted assumption until after **June 1** of the following year, the approval for assumption of all greenway corridors, stormwater management ponds and naturalization areas will be null and void and subject to additional inspections. Additional inspection fees as outlined in the Town of Caledon fees by-law will apply.

2.4.5.2. Streetscape

Streetscape landscape works typically include boulevards, front yards, buffer blocks and window street planting. The warranty period for all streetscape works is a minimum of two (2) years. If assumption is not applied for or granted after the warranty period is complete, the developer will be responsible to provide additional maintenance and warranty until assumption is granted.
Timing of assumption shall coincide with greenway corridors and stormwater management pond works if applicable. Assumption will not be granted separately for streetscape and naturalization areas.

Prior to initiating a site inspection with Town staff for any of the three stages listed below, the consulting Landscape Architect is to ensure that all dead trees are replaced, leaning trees are corrected, all pruning has been completed, all boulevard tree saucers and/or plant beds have been weeded, mulched and any grass cutting has been completed. All rodent protection and T-bars for staking and guying must be removed prior to assumption.

The warranty and assumption period are subject to a three stage process as follows:

<u>Stage 1 - Preliminary Acceptance</u>

Once all streetscape works are completed, the landscape consultant shall submit the following items to the Town for review:

- A 'Certificate of Completion for Preliminary Acceptance' (see Appendix C – Standard Forms and Letters);
- A complete set of As-Recorded drawings with civic street address information included at every residential lot and block;
- A tree planting summary chart outlining lot/block planting, installation timing, substitutions and modifications. (see Appendix C – Standard Forms and Letters).

Once received, the landscape consultant shall arrange a meeting with the Town staff **between May 15th and October 15th** to verify the site conditions and determine if there are any discrepancies with the submitted documents. If any discrepancies are noted, the consulting Landscape Architect shall update all applicable submission items and resubmit accordingly. Any noted onsite deficiencies shall be corrected within **30 calendar days** of the initial site meeting in order to receive Preliminary Acceptance.

Preliminary Acceptance verification by the Town will be emailed directly to the landscape consultant. Where Town staff are required to complete more than two (2) site visits for preliminary acceptance, additional fees are required in accordance with the Town's current fee by-law.

Once Preliminary acceptance has been granted the following may occur:

- The warranty period will commence;
- The Town will release up to 50% of the overall streetscape securities, at the discretion of Town staff.

Stage 2 - Interim Acceptance

A minimum of one (1) year after Preliminary Acceptance is granted, the landscape consultant shall submit the following items to the Town for review:

- A 'Certificate of Completion for Interim Acceptance' (see Appendix C – Standard Forms and Letters);
- A revised set of As-Recorded drawings;
- A revised tree planting summary chart (see Appendix C – Standard Forms and Letters).

Once received, the landscape consultant shall arrange a meeting with the Town staff between **May 15th and October 15th** to verify the site conditions and determine if there are any discrepancies with the submitted documents. If any discrepancies are noted, the consulting Landscape Architect shall update all applicable submission items and resubmit accordingly. Any noted onsite deficiencies shall be corrected within **30 calendar days** of the initial site meeting in order to receive Interim Acceptance.

Interim Acceptance verification by the Town will be emailed directly to the landscape consultant. Where Town staff are required to complete more than two (2) site visits for interim acceptance, additional fees are required in accordance with the Town's current fee by-law.

Once Interim Acceptance has been granted the following can occur:

- The Town will release up to an additional 40% of the overall streetscape securities, at the discretion of Town staff.

Stage 3 - Assumption:

A minimum of one (1) year after Interim Acceptance is granted, the landscape consultant shall submit the following items to the Town for review:

- A 'Certificate of Completion for Assumption' (see Appendix C – Forms and Letters);
- Structural Engineering certificate verifying that the built features have been constructed as per the approved drawings (if applicable);
- All granular base and/or concrete cylinder testing to be submitted (if applicable);
- A revised set of As-Recorded drawings bound and reverse rolled; and
- A revised tree planting summary chart (see Appendix C – Standard Forms and Letters).

Once received, the landscape consultant shall arrange a site meeting with the Town staff to verify the site conditions and determine if there are any discrepancies with the submitted documents. Assumption inspections will be performed between **May 15th and October 15th**,

while plant material is in full leaf. In order to meet the **October 15th** inspection deadline, all site inspection requests shall be made prior to **September 15th.**

Any noted onsite deficiencies shall be corrected within **30 calendar days** of the initial site meeting in order to receive assumption. If any discrepancies are noted, the consulting Landscape Architect shall update all applicable submission items and resubmit accordingly. Where Town staff are required to complete more than two (2) site visits for preliminary acceptance, additional fees are required in accordance with the Town's current fee by-law.

Once the submission items are given final approval by Town staff, the landscape consultant shall submit the following:

- A final copy of the tree planting chart;
- A final set of As-Recorded drawings in PDF and AutoCAD format (AutoCAD 2017 or newer) on a USB key.

Once Assumption has been granted, the following can occur:

- The warranty period ends with the exception of replacement trees performed the same year assumption is granted. These trees are subject to an additional one (1) year warranty unless alternate arrangements are negotiated with Town of Caledon, Parks and Open Space Design Staff;
- The Town will release up to 10% of the remaining overall streetscape securities.

Disclaimer: If the developer is not granted assumption until after **June 1** of the following year, the approval for assumption of all streetscape work will be null and void and subject to additional inspections. Additional inspection fees as outlined in the Town's fees bylaw will apply.

2.4.6. Site Plans – Securities Holdback and Release

For the purposes of Site Plan Approval, landscape securities shall be released upon fulfillment of the following four conditions:

1. on site installation of all landscape works as per the approved landscape drawings;

2. acceptance by the Town of a Landscape Completion Certification from the Consulting Landscape Architect. The Landscape Completion Certification template can be found in Appendix C- Standard Forms and Letters, and is to be stamped, dated and signed by a full member of the Ontario Association of Landscape Architects in good standing. Upon receipt of the Landscape Completion Certification, the Town shall conduct a site inspection confirming no deficiencies to the sole satisfaction of the Town. Should deficiencies be noted by Town staff at the site inspection, these deficiencies shall be required to be rectified and an additional certification provided by the Consulting Landscape Architect;

3. the end of a period of one (1) year from the date of acceptance by the Town of the Landscape Completion Certification;

4. acceptance by the Town of a Landscape Plant Warranty Certification from the Consulting Landscape Architect. The Landscape Plant Warranty Certification template can be found in Appendix C- Standard Forms and Letters, and is to be stamped, dated and signed by a full member of the Ontario Association of Landscape Architects in good standing. Upon receipt of the Landscape Plant Warranty Certification, the Town shall conduct a site inspection confirming no deficiencies to the sole satisfaction of the Town. Should deficiencies be noted by Town staff at the site inspection, these deficiencies shall be required to be rectified and an additional certification provided by the Consulting Landscape Architect.

With respect to Site Plans, the Town does not permit the partial release of the landscape securities.

A statutory declaration is required to be submitted with both the Landscape Completion Certification and the Landscape Plant Warranty Certification confirming that there are no outstanding liens or other claims with respect to the site works.
Site inspections for landscape security release are normally conducted between May 15th and October 15th of any given year. Requests for site inspections are required to be made to the Town in writing prior to October 1st of any given year.

2.4.7. Warranty Buy-Out Option (for subdivision development only)

The Town may opt for a warranty buyout at a rate as specified by the Town, for any trees replaced or in marginal condition prior to Assumption, at the discretion of the Town.

3. ADMINISTRATION FEES, SECURITIES AND DEVELOPMENT LEVIES

3.1. Administration Fees

3.1.1. Calculation of Fees

Fees for services provided by the Town's Administration, Planning Services and Engineering Services Departments are to be determined as a percentage of the total estimated value of services to be assumed by the Town, including engineering and contingency fees. All fees shall be in accordance with the latest fee by-law.

3.1.2. Payment Procedure

Requirements:

- Included with the first engineering submission shall be the Engineering and Landscape Architecture Processing Fee in the form of a cheque to the Town of Caledon in an amount equal to 3% of the total estimate of the Town Works;
- Prior to execution of the Subdivision Agreement, 100% of total Engineering and Landscape Architecture fee (less processing fee made with first submission) is to be paid; and
- Prior to registration or any work commencing on site the Planning Services and Engineering Services Department's fee is to be paid in full.

3.1.3. Cheques Submitted with the Various Submissions

All cheques submitted with submissions of the subdivision process must be CERTIFIED and made out to the Town of Caledon or to The Regional Municipality of Peel, depending on the concerned item.

3.1.4. Additional Fees for Non-compliance or Variances from the Subdivision Agreement, Plans or Standards

In the event that submissions of Engineering or Landscape drawings exceed the three allowable submissions, a fee based on the following schedule shall be assessed. These fees shall accompany the drawing submission:

- 0-20ha $1,500.00 per submission
- 20-40ha $2,000.00 per submission
- Over 40ha $3,000.00 per submission

If it decided by the applicant to phase the development after initial submissions of drawings have being reviewed, then fees based on the following schedule shall be assessed:

- 0-20ha $1,500.00 per submission for each phase
- 20-40ha $2,000.00 per submission for each phase
- Over 40ha $3,000.00 per submission for each phase

Variances to block grading in industrial/commercial or multiple family areas after approval of development agreement:

- $500.00 per request

Investigating complaints or inspections where work is found to be non-compliant with approved plans or specifications:

- Where the Town has requested to investigate a complaint or inspect works and the works are found to be not in compliance with the approved plans, standards or the subdivision agreement - $500.00 per occurrence

Additional inspections above the two (2) for Site Plans and three (3) for Subdivisions would be charged as per the current Fee By-law.

3.2. Securities Prior to Registration of the Subdivision Agreements

A cash deposit or a Letter of Credit as approved by the Town Treasurer in the amount of 100% of the estimated cost of the works to be installed, plus 10% of completed Town Works, including 10% for Contingency & Engineering and 100% Region Works, as listed in the Subdivision Agreement.

3.3. Development Charges

Development Charges shall be paid to the Town of Caledon, in accordance with the Town's Development Charges By-law.

3.4. Reduction to Securities Post Registration

General:

- Following registration and completion and acceptance of works the Consulting Engineer may request, in writing, a reduction to the letter of credit.
- The Consultant shall supply amended quantities as shown in the Schedules attached to the subdivision Agreement.
- The Town will reduce the Letter of Credit to the amount of the actual remaining work plus 10% of the work completed, up to a maximum of five (5) reductions.
- The consultant shall include with his request a Declaration that stipulates that all liens and liabilities have been paid and that all outstanding accounts with the Town have been paid.
- A letter from the Region of Peel shall be received stipulating the amount of securities to be retained for Region Infrastructure.

- After all work has been completed, the Town shall hold back 10% of the actual contract costs, excluding storm sewer work, until an assumption by-law has been passed by Town Council.
- The Town will not release the securities for retaining walls and acoustical barriers until certification of walls and barriers have been received from the appropriate consultant and that the O.L.S. has confirmed wall or barrier location and elevations.

4. SITE PLAN DESIGN GUIDELINES

4.1. General

The following section outlines the engineering design and submission requirements for site plan applications in the Town of Caledon. The applicant must also refer to the most current version of the Town of Caledon's current Site Plan Control Manuals for additional requirements.

See Section 2.0 for landscape requirements.

The applicant may also be required to make submissions to the following agencies in addition to the Town and should be familiar with any additional requirements:

- Region of Peel
- Conservation Authorities
- CNR or CPR
- Ministry of Transportation
- Ministry of the Environment
- Niagara Escarpment Commission
- Utilities Companies.

4.2. Site Plan Process Information

4.2.1. General

Submission procedures for Site Plan Applications (SPA) are provided in the latest version of the Town of Caledon Site Plan Control Manuals. Complete site plan application submission requirements including engineering requirements will be provided by Town Staff through the SPA process.

4.2.2. Fees and Securities

The applicant and owner will be required to pay various fees and submit various securities and deposits to the Town of Caledon as part of the SPA process.

Site Plan Fees will be consistent with the latest version of the Town Site Plan Control Manuals and Town Fees Bylaw and will be confirmed by Town Staff during the SPA process.

Engineering Securities are required by the Town prior to Final Site Plan Approval. An Engineering Cost Estimate, prepared by and bearing the stamp and signature of a Professional

Engineer, is to accompany the site plan drawings. The Engineering Cost Estimate is to include an estimate for all proposed site works internal to the subject property and a separate estimate for works in the municipal ROW. The required amount of Engineering Securities will be based on the Engineering Cost Estimate.

4.2.3. Review by Subdivision Consultant

When a site plan is located within an unassumed subdivision the consulting engineer for the subdivision developer is required to review and approve the site grading and servicing plans and the Stormwater Management Report in addition to the Town. The subdivision engineer will be required to certify that the proposed site grading and servicing conforms to the approved subdivision plans, the site maintains the approved overland flow routes and the previously approved stormwater release rates are not exceeded. It is the responsibility of the applicant to submit any required materials to the subdivision consultant.

4.2.4. Utilities

Gas, hydro, the provision of telecommunications etc., shall be constructed underground and in accordance with the applicable utility company's requirements. The developer's consultant will arrange for the necessary design co-ordination with the various utility companies and receive acceptance/approval from each utility company. It shall be the responsibility of the developer to follow up with the utility to ensure there is sufficient infrastructure in place to service the site. Utilities in new developments should be installed in a Joint Use Utility Corridor as per Town standards.

Site plans which include works within the Town ROW greater than 20m in length require the applicant, their consultant, or the utility company to complete the PUCC process. Contact the Town of Caledon Engineering Services Department for more information.

The Contractor shall be responsible to undertake utility locates prior to construction.

4.2.5. Right-of-Way Occupancy Permit

A Right-of-Way Occupancy (ROW) Permit must be obtained from the Town of Caledon's Website for all works to be completed within the Town ROW as part of the Site Plan works. The developer shall comply by all the requirements included in the ROW permit in addition to the requirements of the site plan application. The Engineering Services Department is to be notified 48 hours in advance of the commencement of any construction within the Town ROW.

The Owner/Applicant shall restore all disturbed areas within the municipal right of way to original or better conditions in accordance with the ROW Occupancy Permit or otherwise approved on the Site Plan and to the satisfaction of the Town of Caledon.

No planting, berming or landscaping will be permitted within the Town ROW unless otherwise approved through the Site Plan.

It is the Owners and Contractors responsibility to ensure that any mud or material tracked onto the road or left within the ROW is removed immediately. If the Town ROW is not kept free and clear of mud and debris the Town may draw from the securities held through the ROW permit or SPA agreement and perform the necessary work at the owners' expense.

More information on ROW permitting requirements at the Town of Caledon can be found at: https://www.caledon.ca/en/townhall/roads.asp.

4.3. Drawing Requirements

4.3.1. General:

1. All plans, drawings, specifications, details, descriptions, notes, or any other terms included in the engineering drawings, are to use the Metric system of measurement and are to be prepared using a standard metric scale.

2. All engineering plans must include the stamp and signature of a Professional Engineer.

3. A Key Plan shall be included on all plans showing the location of the property in relation to provincial, regional and municipal roads, complete with a north arrow and bar scale.

4. Title block including the project name, date, municipal address and legal description (i.e. lot and concession number, Town site plan number and/or registered plan number with applicable lot/block number) shall be included.

5. A Geodetic Benchmark from which the topographic survey was derived shall be included.

6. A legend including, but not limited to: symbols for existing/proposed grades, major system/overland flow routes, drainage direction, underground services, above ground services, surface treatments, retaining walls, catch basins and manholes, and abbreviations shall be provided as required.

7. Bearings and dimensions of the subject property shall be delineated.

8. Private and Municipal easements, municipal ROWs, sight triangles, 0.3m reserves, road widenings, or any other property limits or land dedications within or adjacent to the property shall be delineated and dimensioned as required.

9. The location of adjacent watercourses including top of bank and Regional floodline are to be delineated. (The layout of the site shall adhere to the appropriate setbacks dictated by the Town Planning Department and applicable Conservation Authority.)
10. All existing and proposed buildings and structures within and adjacent to the subject property shall be delineated including existing and proposed building entrance locations.

4.3.2. Erosion and Sediment Control Drawings

1. ESC Drawings are to include Town Standard Notes as per Appendix C

2. All Silt and Sediment Controls are to be located within the subject property limits and shall reflect the latest Town of Caledon, Conservation Authority and OPS Standards.

4.3.3. Grading and Servicing Drawings

1. Grading and Servicing Drawings are to include Town Standard Notes as per Appendix C
2. Existing and proposed spot elevations within the project site and on adjacent properties are to be indicated on the grading plan. Spot elevations are to be provided in sufficient detail so that drainage patterns can be readily identified (including: % grades, slope ratios and directional arrows). Include spot elevations and slopes for all berms, swales, and significant grade changes. Existing elevations at least 10m beyond limits of site are required. External elevations are to be extended far enough to determine the direction of existing drainage.

3. Existing and proposed manhole and catch basin top of grate elevations are to be provided along with the existing centerline of road elevations.

4. Top of foundation wall (T.F.W.) and finished floor elevation (F.F.E.) of the ground floor for any proposed structures are to be shown. A minimum of 150mm of foundation wall is to be exposed above the finished grade.

5. Retaining wall top of wall (T.W.) and bottom of wall (B.W.) elevations are to be provided on the grading plan where retaining walls are proposed.

6. The location of existing or proposed retaining walls shall be shown including any required details. (Note: any retaining walls in excess of 1.0 meters (3.2 feet) must be accompanied by an Engineer's stamp taking ownership of the proposed retaining wall design)

7. All existing and proposed underground servicing information shall be provided including, but not limited to: watermains, storm and sanitary sewers including pipe size, slope, materials, invert elevation, and connection details. Pipe setbacks, spot elevations, and vertical and horizontal clearances shall be dimensioned as required. Wells, septic tanks, septic lines and tile beds, shall be included where required.

8. The location of all existing and proposed utilities on the subject property, within the municipal ROW, and on adjacent properties shall be provided including, but not limited to fire hydrants, streetlight poles, hydro poles, transformer vaults, Bell pedestals, guy wires, hydro lines, gas lines, valves, and street signs.

9. Details of all stormwater management control features are to be provided including but not limited to roof top controls, on-site storage including ponding limits, orifice tubes or plates, curb cuts, SWM pond plans and details, and LID measures are to be provided.

10. The location of existing or proposed fencing shall be shown. Details are to be provided for proposed fencing.

11. The location of existing and proposed site entrances shall be provided including but not limited to curb depressions, ditches, and culverts. Dimensions for the proposed entrances shall be indicated including driveway width, radius, and setbacks. Adjacent existing driveway entrances on both sides of the road shall be shown.

12. The location and dimensions of all existing and proposed sidewalks, multi-use trails, and any other pedestrian walkways shall be provided. Extent of any sidewalk removal and replacement at entrances is to be delineated. Complete details of replacement or new sidewalk at entrances are required including all relevant Town standard or OPSS drawing numbers.

13. All factors affecting on-site traffic movement shall be clearly defined on the plan and include: proposed access points, fire routes and turning radii around buildings, and any items that may impact vehicle access onto the site (i.e. traffic signals, turning lanes, center medians, sidewalks, etc.).

14. Adequate snow storage areas are to be shown on the site plan. Snow storage locations shall have consideration for traffic sight lines both internal to the site and at site entrances.

4.4. Design Criteria and Standards

4.4.1. Erosion and Sediment Control

Erosion and sediment control measures shall be implemented as part of all proposed site works to prevent silt and sediment from leaving the site and entering waterways, wetlands, or environmentally significant features.

All erosion and sediment must be controlled in accordance with the latest requirements of the Town of Caledon, the Region of Peel, and the applicable conservation authority. Refer to the latest version of the "Erosion and Sediment Control Guideline for Urban Construction" prepared by The Greater Golden Horseshoe Area Conservation Authorities for additional requirements.

Silt fence is typically required for all proposed site works at property limits unless otherwise advised by the Town. Silt fence is to conform to Town Standard Drawings and the requirements of the local conservation authority.

Mud mats are required at construction access points to limit the amount of silt and dirt onto the roadway. Mud mats are to conform to the lasted Town Standard.

Additional ESC measures including but not limited to check dams, catch basin sediment traps, and temporary sedimentation ponds or basins will be required as needed on a site specific basis, at the discretion of the Town, Region, and the Conservation Authority.

4.4.2. Grading Design

The following grading and drainage criteria is applicable for site plan design:

1. Site storm drainage to be self-contained and shall not adversely affect adjacent properties. Existing property line grades are to be matched. Where a subdivision

grading plan exists, proposed site plan grades are to match the subdivision grading plan. Grading shall not extend onto adjacent properties without prior written consent from the adjacent property owner.

2. Street line grades are to be set to ultimate road elevations. Landscape berms shall not encroach onto the municipal right of way.

3. Allowable Minimum/Maximum Site Grades are as follows:

   Landscaped Areas: 1.5% to 6%
   Driveways: 2.0% to 6%
   Asphalt Areas: 0.5% to 6%

4. The minimum grade for swales and ditches is 2.0%. All swales or steep slopes are to be sodded. Maximum side slopes for grass swales and ditches is 3:1.

   Note:

   Maximum stormwater flow velocities in ditches and swales should be checked and maintained below 1.5m/s to protect against erosion.

5. No internal earth slopes are to be greater than 3:1. No earth slopes in the Towns Right-of-Way are to be greater than 4:1.

6. Proposed building elevations are to be indicated for the building finished floor elevation and top of foundation wall, at all changes in grade, at building corners, at building entrances, at top and bottom of curbs, and for top of catch basins and manholes.

7. The consultant shall ensure that in the event of mechanical failure or during a major storm event that all structures are protected against flooding.

8. A major system overland flow route shall be incorporated into the design to safely convey flows associated with the 100 year storm. The overland flow route must be clearly shown on the engineering plans and is to be directed to an acceptable outlet to be approved by the Town, Region, and/or Conservation Authority.

9. Drainage shall not pass over retaining walls and a suitable outlet is to be provided for the retaining wall subdrain. Proposed elevations are to be given at both the top and bottom of the retaining wall. Additional design criteria can be found in Section 1.12.6.

10. All curb heights are to be 150mm unless otherwise noted.

11. Roof leaders which discharge to grade shall not be directed on or near asphalt or pedestrian travelled areas.

12. Catch basins shall be located in the driving lane of the parking lot and outside of designated parking areas.

13. Entrance curb returns to the municipal right of way are to be constructed to the relevant Town, Regional, or OPS Standard.

14. All parking areas shall be paved with asphalt or similar hard surface in accordance with the standards of the Town, unless otherwise prescribed by Town Staff.

15. In situations where granular parking areas are permitted by the Town, the Construction Notes should include the following note (from the Town of Caledon Zoning Bylaw 3.4.4):

    The granular parking area shall be maintained with a stable surface which is treated so as to prevent the raising of dust or loose particles.

16. The applicant shall review any existing development agreements to determine their effects upon the subject site.

4.4.3. Servicing Design

The following site servicing criteria is applicable for site plan design:

1. All external drainage should be considered and accounted for in the storm drainage design.

2. Storm sewers are to be designed in accordance with Town Standards and the Ontario Building Code.

3. All piping shall be clearly labelled with the pipe size, length, slope, flow direction, material and invert elevations.

4. A storm sewer inspection manhole is to be located 0.3m inside the property line.

5. Service connections must conform to OPSS, Town Standard Drawings, and Section 1.4.2.2.5 of this manual. Connection type and details at the municipal sewer is to be noted or detailed in plan. (i.e. saddle, tee, or MH connection). The diameter of the receiving sewer must be twice the size of the proposed connection or else a manhole must be installed or an existing manhole connected into. Benching details are to be provided

6. In situations where a minimum of 1.2m cover is not provided for, the pipe must be insulated and concrete encased from junction to junction. No spot concrete encasing is permitted to avoid potential shearing of the pipe. The extent of this treatment must be delineated on the site plan and a detail provided.

7. All catch basins within the site shall have 0.3m deep sumps.

8. The availability and adequacy of the existing water supply and sanitary sewer system shall be determined by contacting the Region of Peel.

4.4.4. Stormwater Management

This section outlines the criteria for stormwater management (SWM) design for site plan applications within the Town of Caledon and is to be read in conjunction with the requirements provided in Section 1.4 of this manual. Every applicant proposing development in the Town is responsible for the quantity and quality treatment of storm drainage to mitigate the impacts of development.

A Stormwater Management Report is typically required as part of all site plan applications in the Town of Caledon. The Stormwater Management Report is to be signed and stamped by a Professional Engineer licensed to practice in the Province of Ontario.

The developer or their consultant shall consult with the Town and the local Conservation Authority to confirm the site specific SWM criteria including whether there are master environmental or drainage studies approved for the area where the site is situated.

It is the responsibility of the developer to obtain all permits and approvals associated with the development including but not limited to MECP ECA's and Conservation Authority permits. If final ownership of any portion of the SWM system is to be transferred to the Town, the MOE ECA will be required prior to site plan approval.

Site Plan Specific SWM Criteria**:**

1. Stormwater Management design must incorporate the latest version of the Town of Caledon IDF curve (Standard Drawing No. 103).

2. Sites will use an inlet time of 10 minutes. Specific sites may have higher inlet times which must be demonstrated with appropriate calculations.

3. Where municipal infrastructure is proposed to be constructed as part of site plan works it is to be constructed in conformance with the requirements provided in section 1.4 of this manual.

4. The SWM Report must clearly state which method is being used to determine the peak flow and storage required (i.e. Rational method, OTTHYMO, etc.) Provide calculations indicating what the allowable discharge from the site is, what volume of storage is required, and what volume of storage is provided.

5. Site areas less than 5 hectares may use the Rational Method to determine runoff quantities. For locations where a master environmental or drainage plans have been approved and where the runoff was previously calculated by some other means, it will be necessary to substantiate any deviation from the original plan by using the same model for comparison purposes.

6. SWM reports that utilize computer modeling must use computer models acceptable to the Town of Caledon. Models are to use a 2 to 4 hour duration storm and a maximum 10-minute time step.

7. Orifice Control Criteria:

    - Orifice is the primary means of SWM control for Site Plans.
    - The minimum allowable orifice size is 75mm.

- The minimum contributing impervious area to the storage location serviced by an orifice is 0.375ha.
- The orifice size, control chamber and location must be clearly detailed upon the plans. Orifice sizing calculations are to be provided in the SWM report.
- Where OGS units are proposed, the orifice is to be installed in the control manhole upstream of the OGS unit.
- Where no OGS unit is proposed, the orifice is to be installed in the control manhole.

8. Town of Caledon policy is to limit roof drainage to 42 L/s/ha of roof area.

9. Proposed ponding areas are to be shown on plan and are to indicate the ponding volume and elevation.

10. Parking areas where stormwater is proposed to be ponded are to be paved and not left as gravel surfaces which can be easily modified.

11. Maximum allowable ponding depths are as follows:

    - Rooftops: 150mm
    - Paved Areas and Parking Lots: 300mm
    - Landscape Areas: 500mm

12. Ponding depths are to be reviewed under the following conditions:

    - SWM system functioning under normal conditions
    - SWM system failure, where the system has become surcharged or blocked.

13. No foundation drains are to be connected to the storm sewer on sites with stormwater management control.

14. Quality control for all site plans shall be designed to the enhanced level of protection (Level 1) as described in the MOE Stormwater Management Planning and Design Manual 2003.

15. Oil Grit Separators (OGS) Criteria:

    - OGS units are to be installed on sites where a water quality control pond/wetland or other quality treatment measures are not feasible.
    - Town policy is to consider OGS units mandatory for sites storing fuels or chemicals.
    - Town policy is for OGS units to be installed as part of a treatment train approach in conjunction with other SWM options approved by the Town.
    - OGS units are to be installed on the downstream side of control MHs
    - Ensure OGS units are shown and properly detailed in plans. Specify the name of manufacturer and model number.
    - OGS design sheets are to be provided in the SWM report to confirm quality treatment.

16. SWM Ponds are typically applicable for sites larger than 5 hectares as per the MOE SWM Manual (2003). Ponds are to be designed as per Town criteria and the criteria provided in the MOE SWM Manual.

17. Water balance criteria is to be provided by the local conservation authority. Town and conservation authority are to review and approve any proposed infiltration trenches or chambers. Soil conditions are to be considered when implementing infiltration measures.

18. The Owner is responsible for operating, maintaining, and repairing all SWM infrastructure installed on private property.

4.4.5. Site Lighting

All site plans shall have consideration for the effect on night sky and regard for residential areas. No light for the site shall cast onto adjoining properties unless otherwise approved.

All on-site exterior lighting is to be directed downward and internal to the site and shall in no way infringe on adjacent properties. Exterior lighting at the main entrances and accessible parking spaces shall be at a lighting level not less than 35 lux.

The maximum height of all lighting fixtures is 9.0m with Type II fixtures and a note shall appear on the drawings to this affect.

4.4.6. Traffic Analysis

4.4.6.1. Site Access and Circulation

1. Site accesses shall be located in such a manner as to reduce traffic conflict on the municipal roadway. Site accesses are to be located with sufficient distance from the intersection of roads, be in alignment with other accesses and may be restricted to right-in and right-out as necessary. The Town will review the site access locations on a case-by-case basis based on Town, Regional, TAC, and other industry standard guidelines.

2. Commercial, Industrial and Institutional driveway entrances shall be in conformance with Town Standard Drawing No. 402, OPSD 350.010 and the Town's Zoning requirements.

3. Street accesses and major internal aisles shall have minimum widths as follows:

    - One-way Traffic: 4.5m
    - Two-way Traffic: 6.0m
    - Industrial, Commercial or Municipal: 9.0m

4. Access roads for fire fighting vehicles shall be provided in accordance with the most current requirements of the Ontario Building Code.

5. Access curbs should have a minimum of 1.5m clear setback from hydrants or utility poles.

6. At all entrances to the site, the road curb and sidewalk will be continuous through the driveway. The driveway grade will be compatible with the existing sidewalk and a curb depression will be provided for at each entrance.

7. Traffic circulation on the site shall be provided with a simple and functional pattern.

8. Dead-end driveways shall be avoided for commercial developments.

9. Internal one-way driveways shall be clearly indicated on the Site Plan and clear signage on site shall be provided.

10. Delivery and servicing traffic should be separated as much as possible from passenger cars.

11. At the discretion of the Town and consistent with the Town's Traffic Calming Strategy Manual, implement active traffic calming measures such as rumble strips, raised intersection, crosswalks, on-street parking, public laneways, and traffic circles, as well as passive traffic calming such as tree planting to reduce internal vehicular traffic speeds and to ensure safe walking and cycling environments.

12. All cars and trucks shall move in and out from the site in a forward motion and no backward maneuvering shall be allowed on Town roads.

13. On-site sign installations and pavement markings are to be maintained by the Owner and/or modified or refreshed at the Town's request.

4.4.6.2. Parking

1. Access to parking areas shall be well defined.

2. Dedicate priority parking spaces for carpool, ride sharing, and ultra-low emission vehicles.

3. Parallel parking spaces are generally discouraged for site plan developments except for certain site specific circumstances.

4. Parking on to a major on-site driveway is discouraged.

5. The design of parking areas shall promote safe and efficient traffic flow.

6. Subject to sound transportation planning practices, parking should be located to the interior of a site, on the side or rear of buildings and not between buildings and streets.

7. Parking should be visually separated into smaller sections by curbing, landscaping or similar elements.

8. Provide convenient, comfortable and safe pedestrian movement both to the site and within it. Town recommends the use of different paving materials to highlight pedestrian areas and crosswalks.

9. Hammerheads should be installed on a dead end parking aisle. Hammerheads are as wide as the aisle and a minimum of 1.2 meters deep.

10. Adequate mechanisms shall be provided within parking lots to protect buildings and landscaping treatment. Such mechanisms shall be fastened to the ground so that they cannot be moved by vehicles.

11. Unless specified in the Zoning By-law, parking spaces and aisles shall comply with the following minimum dimensions:

    - Spaces have a minimum width of 2.75m with 6.0m length;
    - Parking Aisles shall have a minimum with of 6.0m, except in the case of angled off-street parking accessed by a one-way aisle, which shall have a minimum width of 4.5m.

12. Accessible Parking Requirements:

    - Accessible parking spaces are to be in conformance with the requirements of the Accessibility for Ontarians with Disabilities Act (AODA).
    - Ensure the accessible spaces are located on the shortest possible circulation route to the accessible facility entrance. Where possible, locate accessible spaces to permit users access without having to cross any parking aisles.

4.4.6.3. Pedestrian and Non-Vehicular Movement

1. All sites shall have regard for the safety of pedestrians.

2. A pedestrian walkway shall be provided to all main entrances for commercial development. The walkway is to be connected to public sidewalks, walkways and bus pad/shelter areas where available.

3. The pedestrian walkway shall be separated from vehicle traffic.

4. A pedestrian walkway shall have a minimum width of 1.5 meters clear from the overhang of vehicles.

5. Sites shall have regard for the provision of bike racks and bike storage.

4.4.6.4. Traffic Impact Study (TIS) Requirements

Whenever a TIS is requested during a Site Plan Review it must adhere to the following requirements:

1. Must follow the most current version of the Caledon Transportation Impact Study Guidelines.

2. Must be completed by a qualified/recognized traffic/transportation engineering consultant.

3. Must include a forwarding letter with the author's signatures, and when applicable, include the engineering seal of the author or authors.

4. The terms of reference for the TIS are to be approved by the Town (and the Region of Peel when required) prior to submission. The TIS appendices should include letters from the Town and the Region acknowledging their acceptance of a terms of reference.

5. Must identify roadways jurisdiction. If development lands are adjacent to any Regional roads the Region's terms of reference are to be used with the municipal road included.

6. If subsequent submissions are required, the original review comments from the Town and/or Region should be included within the appendices, in their original form.

4.4.7. Noise Attenuation

Town staff will confirm if a Noise Study is required in support of the site plan application based on review of the site plan proposal. The Noise Study is to be prepared by an engineer firm qualified in acoustical engineering. The study is to be prepared based on Town of Caledon and Region of Peel requirements, and the requirements noted in MECP Environmental Noise guideline – Stationary and Transportation Sources – Approval and Planning document (NPC-300). The noise study may require peer review at the applicant's expense. Peer review requirements are at the sole discretion of the Town.

Noise Attenuation measures including noise barriers may be required in site specific situations to mitigate existing or anticipated noise levels that exceed the MECP NPC-300 Criteria. Town specific criteria for noise barriers are provided below:

1. The maximum barrier wall height is 2.4m as per Town Standard No. 613. Greater heights can be obtained using a combination of wall and berm.

2. Barrier walls shall be constructed entirely on private property. No part of the berm will be allowed in the Town ROW.

3. There shall be no visible holes or gaps between any barrier panels or beneath the bottom panels after completion of the barrier.

4. The minimum density of the noise barrier wall shall be 20 kg/m2.

Refer to Town Standards No. 613 - 617 for design specifications for noise barriers.

4.5. Construction, Certification and Securities Release

4.5.1. Construction

During the construction phase the Owner completes the project according to the approved plans, conditions, and requirements stipulated in the registered site plan agreement or undertaking. All works are to comply with OHSA, Town, Regional and any other applicable requirements.

The Owner is required to retain qualified consultants to supervise all aspects of the work. The Town of Caledon may, at its discretion, inspect the work from time to time and report any deficiencies to the consultant.

4.5.2. Engineering Certification and Securities Release

A qualified engineering firm shall monitor construction of the site grading and servicing through all phases of construction. Once construction is complete a certificate stamped and signed by a Professional Engineer stating that the completed works are in conformance with the approved plans, reports, and studies is to be provided to the Town. Additional certifications may be required for Condominium developments as noted in Section 4.6.5.

The Town will hold engineering securities as part of site plan approval based on the engineering cost estimate for the site works. Securities will be released according to the requirements noted in the site plan agreement or undertaking and according to Town standard policies and procedures.

All site works are to be completed prior to securities release unless otherwise noted in the site plan agreement. Engineering Certification is to be accepted by the Town prior to securities release.

Site inspection by Town staff will be required in conjunction with the review of the above-noted certifications.

4.6. Condominium Standards

The following section outlines additional design criteria and requirements to address the development of private condominiums and multi-family type developments in the Town of Caledon. The below condominium standards are in addition to any other relevant standards, policies, and guidelines provided in this manual.

4.6.1. General Design Requirements

1. Engineering drawings shall be prepared to the satisfaction of the Town of Caledon, to illustrate the locations of all underground services together with the locations of all roadways, sidewalks, boulevards, parking areas and driveways.

2. Proper waste collection areas must be provided throughout the development so that the waste haulers vehicles can enter the development and collect waste efficiently and safety. Such arrangements shall be in accordance with the standards and guidelines as established by the Regional Municipality of Peel.

3. Multi-family developments shall be signed so as to easily identify the location of all blocks.

4.6.2. Internal Private Roadways

1. Internal private roadways shall be designed in accordance with the latest version of the Town of Caledon Standard Drawings for roads (including curbs, curb and gutters, subdrains and sidewalks).

2. Minimum width of the roadway shall be 6.0m from edge-of-pavement to edge-of-pavement.

3. Designated fire access routes shall be provided throughout the development to the satisfaction of Caledon Fire and Emergency Services and in accordance with sound engineering practice.

4. Lengths of driveways for condominium townhouse type developments must be a minimum of 6m measured from the back of the sidewalk, where a sidewalk exists or 6m from the back of curb where no sidewalk exists.

5. Roadways shall not be considered to form any part of the required parking.

6. The minimum pavement structure for the internal condominium roads is as follows. Pavement and granulars are to conform to the applicable OPS standards. The pavement structure may vary depending upon site soil conditions. For site conditions or any specific uses which require extra strength pavement, the pavement structure shall be substantiated by a report from the applicant's geotechnical consultant:

    - 40mm HL3
    - 65mm HL8
    - 150mm Granular 'A'
    - 300mm Granular 'B'

7. Parking lots shall be structurally designed to the equivalent of the internal road design.

8. The minimum pavement structure for driveways to individual, single, semi or townhouse units is as follows:

    - 25mm HL3A
    - 50mm HL8
    - 150mm Granular 'A'

9. Minimum overhead clearance shall be 5.0m

10. An internal 1.5m wide sidewalk shall be installed at one or both sides of all internal roadways. Sidewalk construction is to conform to the applicable Town and OPS standards.

11. For Common Element Condominiums, a 3.0m utility easement is to be provided from the back of the curb or sidewalk on both sides of the condominium roadway.

4.6.3. Servicing

1. Watermains and water services shall be designed and constructed in accordance with the most recent requirement of the Regional Municipality of Peel and the OBC.

2. The storm and sanitary sewers, drains and appurtenances shall be designed and constructed in accordance with the most recent requirements of the Regional Municipality of Peel, the Town of Caledon, and the OBC.

3. Storm sewers, sanitary sewers and watermains shall not be permitted to be constructed under any building except in special circumstances as permitted in the OBC.

4. Upon completion of the site servicing work, building construction and landscaping; the storm sewer system, including catchbasins and leads shall be cleaned and flushed. Flushing operations shall comply with all applicable guidelines and regulations.

5. Gas, hydro, the provision of telecommunications etc., shall be constructed underground and in accordance with the applicable utility company's requirements.

4.6.4. Street Lighting

1. Luminaires shall be chosen to distribute the light away from residential buildings and onto roadways, pathways or parking lots.

2. Every residential unit shall be provided with exterior lighting fixtures located near all entrances.

3. Luminaires and poles shall have an average life expectancy of 20 years and shall be vandal resistant.

4. All lighting installations shall conform to the requirements of the Canadian Standards Association, Electrical Code of Ontario.

5. All installations shall be subject to The Electrical Safety Authority (ESA) inspection.

6. All wiring shall be underground.

4.6.5. Certificates Required Prior to Registration

1. Prior to condominium registration, the Owner will be required to provide the following certifications:

   - Final Lot Grading Certification (including certification of retaining walls)
   - Pavement Certification for all roadways, driveways and parking areas
   - Site Servicing Certification (including sewer flushing, water valve box adjustments, etc.)
   - Acoustical Certification (as required)

2. Site inspection by Development Engineering Services' staff will be required in conjunction with the review of the above-noted certifications.

4.6.6. Condominium Conversion Standards

1. An existing and proposed Site Grading Plan is to be provided with condominium conversion application. Plans are to demonstrate existing site grading proposed to be maintained conforms to the current Town grading criteria and standards.

2. The internal roads and parking areas for the proposed condominium conversion site shall be rendered in compliance with Section 4.6.2 of this manual.

3. A geotechnical consultant will be required to provide an evaluation of the existing and proposed asphalt pavement structure, including recommendations as to any remedial works required to achieve the minimum design standard.

4. The consultant is to provide the Town an evaluation of existing curbs, sidewalks, retaining walls, and any other existing hardscape site works. All cracked, spalled, or otherwise damaged works are to be repaired or replaced as required. Standard curb is required on both sides of access roads and parking areas.

5. DESIGN DRAWINGS INDEX

100 GENERAL

100 Typical Title Pages
101 General Notes Storm Sewers
102 General Notes Roadworks
103 Rainfall Intensity Curves
104 Storm Design Sheet
105 Standards for Plan & Profile Drawings
106 First Submission Minimum Requirements
107 Second Submission Minimum Requirements
108 Final Submission Minimum Requirements

200 ROADS

200 8.0m Laneway 6.0m Roadway (5.4m Pavement)
201 16.0m Local Window Street 8.5m Roadway (7.9m Pavement)
202 18.0m Local Road 8.5m Roadway (7.9m Pavement)
203 20.0m Local Urban/Rural 9.3m Roadway (8.7m Pavement)
204 20.0m Neighbourhood Collector 9.5m Roadway (8.9m Pavement)
205 22.0m Local Through Urban 10.4m Roadway (9.8m Pavement)
206 22.5m Local Industrial Road 11.0m Roadway (10.4m Pavement)
207 24.0m Urban Local Divided Road 10.4m Roadway (9.8m Pavement)
208 24.0m Local Industrial Road 11.6m Roadway (11.0m Pavement)
209 26.0m Local Industrial Road 10.4m Roadway (9.8m Pavement)
210 26.0m Urban - Collector Full/Part Services 10.4m Roadway (9.8m Pavement)
211 26.0m Industrial Collector 14.5m Roadway (13.9m Pavement)
212 30.0m Arterial Road 7.6m-15.6m Roadway (7.0m-15.0m Pavement)
213 30.0m Urban-Collector 4 Lanes 15.6m Roadway (15.0m Pavement)
214 Local Residential Road Elbow Design
215 Industrial Cul-de-sac
216 Residential Cul-de-sac
217 Temporary Cul-de-sac
218 Typical 100mm Subdrain Detail
219 Joint Use Utility Corridor
220 3.0m Multi-Use Recreational Pathway
221 Impressed Concrete Splash Pad
222 Standard Condo Road Section

223 CEC Road Section
224 Location of Future Road Sign

300 GRADING

300 Minimum Requirements for Lot Grading Plans
301 Lot Grading and Drainage
302 Catch Basin Sediment Trap
303 Catch Basin Sediment Barrier
304 Sediment Control Fence

400 TRAFFIC CONTROL

400 Standard Street Name and Regulatory Signs
401 Entry Point Information Signs
402 Driveway Entrance Detail

500 STORM SEWERS

500 Storm Sewer Service Connection for Flexible Pipe
501 Storm Sewer Service Connection for Rigid Pipe
502 Service Connection in Common Trench
503 Beehive Catchbasin, Frame & Grate

600 FENCING

600 Chain Link Fence
601 Chain Link Fence Single Gate Detail
602 Chain Link Fence Double Gate Detail
603 Page Wire Fencing
604 Post and Rail Fence Detail
605 Wood Screen Fence
606 Tree Preservation Fencing
607 Emergency Access, Maintenance Access Road and Walkway Gate
608 Walkway P-Gate
609 Walkway P-Gate (With Support Bracing)
610 Swing Bollard Access
611 Wood Bollard
612 Removable Bollard
613 Noise Attenuation Barrier and Berm
614 Acoustic Fence Detail
615 Acoustic Fence Detail
616 Acoustic Fence Detail
617 Acoustic Fence Detail
618 Trailway Entry Gate
619 Trailway Entry Gate Hinge Detail
620 Trailway Entry Gate Frame / Gate Section

700 PARKS AND OPEN SPACE DESIGN SPECIFICATIONS AND STANDARD NOTES

700 General Landscaping Notes
701 Streetscape Specs Notes Part 1
702 Streetscape Specs Notes Part 2
703 Streetscape Specs Notes Part 3
704 Naturalization Specs Notes Part 1
705 Naturalization Specs Notes Part 2
706 Naturalization Specs Notes Part 3
707 Stormwater Management Facility Planting Notes
708 General Park Planting Notes
709 Sod Installation Detail
710 Tree Preservation Std Notes - Part 1
711 Tree Preservation Std Notes - Part 2

800 PLANTING

800 Deciduous Tree Planting (80mm or less)
801 Coniferous Tree Planting
802 Shrub Planting
803 Groundcover and Perennial Planting Detail
804 Tree and Shrub Naturalization
805 Topsoil / Subgrade Preparation Detail

900 PAVING AND HARD SURFACES

900 Limestone Screenings Walkway Detail
901 Asphalt Paving Walkway Detail or Multi-Use Court
902 Poured in Place Concrete
903 Landscape Unit Pavers - Light Duty
904 Landscape Unit Pavers - Heavy Duty
905 Permeable Unit Pavers
906 Unit Pavers Over Concrete Slab
907 Granular Parking Lot
908 Precast Concrete Bumper
909 Pathway Culvert
910 0.5-1.0m Single/Preferred Use Trail
911 Concrete Pedestrian Walkway
912 Park Base Engineered Fill Detail

1000 PLAYGROUNDS AND SPORTS FIELDS

1000 Playground Concrete Border
1001 Playground Drainage
1002 Playground Access Ramp
1003 Basketball Full Court Layout
1004 Basketball Half Court Layout
1005 Basketball Post & Net
1006 Junior Soccer Field Layout
1007 Senior Soccer Field Layout
1008 Football Field Layout
1009 Senior Softball With Line Fencing (Field Layout)
1010 Senior Softball Backstop (Infield & Backstop Layout)
1011 Senior Softball Backstop (Front Elevation)

1012 Baseball/Softball Outfield & Line Fence
1013 Baseball Backstop (Infield & Backstop Layout)
1014 Baseball Field Layout
1015 Baseball Backstop (Front Elevation)

1100 SIGNAGE AND SITE FURNISHINGS

1100 Accessibility Trail Signage
1101 Storm Pond Signage
1102 No Winter Trail Maintenance Signage
1103 Accessible Parking Signage
1104 Accessible Parking Layout - Type A
1105 Accessible Parking Layout - Type B
1106 Park Sign Detail P1-2
1107 Park Sign Detail P2-2
1108 Bench Node Layout
1109 Greenway Corridor Signage
1110 No Dumping By - Law Signage
1111 Stoop and Scoop Signage
1112 Naturalization Signage
1113 Detail of Benchmark Ground Installation