DEVELOPMENT REQUIREMENTS MANUAL

Development Engineering & Construction

Sections 1-8

Effective October 2026

Table of Contents

Section 1 Development General Servicing Requirements 3

Section 2 Development Design Requirements 16

Section 3 Engineering Submission Requirements for Municipal Infrastructure 61

Section 4 Engineering Policies and Procedures 96

Section 5 Environmental Requirements 126

Section 6 Condominium Development Requirements 143

Section 7 Site Plans, Rezoning and Land Division Submission Requirements 162

Section 8 Storm Drainage Design Requirements 179

Page numbers refer to the combined PDF, including the title page and table of contents.

SECTION 1 – DEVELOPMENT GENERAL SERVICING REQUIREMENTS

Table of Contents

1.0 Introduction 1
1.1 Storm Drainage 2
1.1.0 Sewer System 3
1.1.1 Maintenance 3
1.1.2 Municipal Roadways 3
1.1.2.0 Road Works 3
1.1.2.1 Maintenance 3
1.1.2.2 Sidewalk and Walkway 4
1.2 Regional Services 4
1.2.0 Sanitary Sewers 5
1.2.0.0 Sewer System 5
1.2.0.1 Maintenance 5
1.2.1 Watermains 5
1.2.1.0 Water System 5
1.2.1.1 Maintenance 5
1.3 Municipal Street Name & Traffic Signs 5
1.4 Roadway Markings 6
1.5 Traffic Signals 7
1.6 Streetlighting 8
1.7 Fencing 9
1.8 Trees 10
1.9 Grading & Surface Restoration/ Treatment 11
1.10 Erosion & Sediment Control 12

1.0 Introduction

This section includes the general requirements of the City of Mississauga with respect to the provision of municipal services for development infrastructure. More detailed requirements, policies and procedures are found throughout this manual under the respective sections.

Unless otherwise indicated, construction within the City of Mississauga will conform to the standards and requirements of the Ontario Provincial Standards.

1.1 Storm Drainage

1.1.0 Sewer System

Storm sewers designed and constructed in accordance with the most recent requirements and specifications of the City of Mississauga are required on every street within all plans of residential subdivision. 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 Development Engineering & Construction - Storm Planning section shall be directed to an outlet considered adequate in the opinion of the Development Engineering & Construction section.

All stormwater related infrastructure including but not limited to; channel works, culverts, inlets/outlets, headwalls, quality control and volume control structures, LIDs, SWMFs etc. and other site specific works shall be designed and constructed in accordance with the most recent drawings and specifications and are to be approved by the Development Engineering & Construction section and all other applicable agencies such as the Ministry of Environment Conservation and Parks the local Conservation Authority and the Ministry of Natural Resources and Fisheries, etc...

1.1.1 Maintenance

Storm infrastructure shall be guaranteed for a minimum period of one year after the City has issued preliminary inspection approval. Notwithstanding the storm sewers will not be released from the maintenance period until base asphalt approval has been granted for the development. All above ground storm sewer appurtenances shall be maintained until the assumption of the development.

1.1.2 Municipal Roadways

1.1.2.0 Road Works

Asphalt roadways complete with concrete curbs and gutters including splash pads where designated shall be designed and constructed in accordance with the most recent requirements and specifications of the City and the Ontario Provincial Standards are required on all road allowances within the development. The geometric standard of the roadway shall be as stipulated in the City Standards and Drawings designated by the Development Engineering & Construction section. The balance of the road allowance not occupied by the roadway (boulevard) requirements will be developed in coordination with City staff during the development application process.

1.1.2.1 Maintenance

Above ground services shall be guaranteed for a period of three years after base asphalt approval, or three months after the issuance of top course of asphalt approval, whichever comes later.

1.1.2.2 Sidewalk and Walkway

Sidewalk requirements will be identified by City staff in accordance with City standards and guidelines and where specified by the Development Engineering & Construction section.

Where the development generates the need, at the direction of the Development Engineering & Construction section, sidewalks may be required on existing streets external to the plan or streets where reverse frontage is proposed.

Where existing or proposed transit stops are located within or adjacent to a development, convenient and accessible pedestrian linkages are to be provided between the existing municipal sidewalk network and MiWay services/stops to ensure accessibility, reduce walking time and encourage transit use.

Walkways shall be constructed as required within the plan for the proper circulation of pedestrian traffic and shall be in accordance with the most recent requirements and specifications of the City of Mississauga.

1.2 Regional Services

All sanitary infrastructure and watermain infrastructure including appurtenances shall be constructed in accordance with *the Region of Peel design Criteria and Development Procedures Manual*, latest edition. Through the design and approval process Region of Peel comments will be made available to applicants. Comments, questions or concerns regarding regional services are to be directed to Region of Peel staff.

1.2.0 Sanitary Sewers

1.2.0.0 Sewer System

Sanitary sewers shall be of adequate size and depth to service the adjacent external lands where required by the Regional 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 development.

1.2.0.1 Maintenance

Sanitary sewers shall be guaranteed for a minimum period of two (2) years after preliminary inspection approval by the Region but shall not be released from the maintenance period until at least the base course of asphalt has been constructed on all roads within the development. Above ground sewer appurtenances shall be maintained until the assumption of the development.

1.2.1 Watermains

1.2.1.0 Water System

A separate water service connection shall be provided to the edge of the road allowance for any lot, block or parcel of land within the development. Water services shall be designed and constructed in accordance with the *Region of Peel design Criteria and Development Procedures Manual*, latest edition.

1.2.1.1 Maintenance

Watermains, appurtenances and services shall be guaranteed for a minimum period of two (2) years after preliminary inspection approval by the Region of Peel but shall not be released from the period of maintenance until base asphalt approval has been granted for the development. All above ground watermain appurtenances shall be maintained for a period of three (3) years from the date of preliminary acceptance, or one (1) year after the issuance of top course asphalt approval, whichever is the latter.

1.3 Municipal Street Name & Traffic Signs

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 to facilitate deliveries during the construction period.

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

Once the proper traffic signs and street name signs have been installed, the Traffic Section will inspect the installations. Upon approval by the City, maintenance will be completed by the City with costs charged to the developer until assumed by the City.

1.4 Roadway Markings

Interim (where applicable) and ultimate pavement markings will be installed on all roadways greater than two lanes in width by the City at the developer's cost or on other roads as required by the Development Engineering & Construction - Traffic Planning Section. The Developer shall be responsible for stop bars on roadways that are up to two lanes in width.

These pavement markings will be installed by the City at the developer's cost on the topcoat of asphalt (in some circumstances on the base coat of asphalt).

1.5 Traffic Signals

The traffic signals including conduit, handwells, traffic signal power service pedestals, poles, arms and all necessary appurtenances are to be installed at the Developer's cost.

Written approval of traffic signals design and materials to be received from of City of Mississauga and Alectra. Coordination with the City's Traffic signals team will be addressed via the development application and review process (when required). The conductors and grounding are to be installed at the time of installation of the pedestals. The Developer must guarantee and maintain the pedestals and their connections until the end of the above ground maintenance period.

1.6 Streetlighting

Streetlights are to be installed along all streets and public walkways in accordance with the most recent lighting requirements and standards of the City of Mississauga. Coordination with the City's Streetlighting team will be addressed via the development application and review process (when required).

Electrical work is to be designed and constructed in accordance with the most recent requirements and specifications of Alectra. Approval by Alectra is required before any streetlighting will be assumed into the City's streetlight inventory. The Developer must guarantee and maintain the lighting until one year after assumption. Energy charges will be paid by the City upon energization of the streetlighting.

1.7 Fencing

Fencing shall be in accordance with the most recent requirements and specifications of the City of Mississauga.

Fencing is required:

- Along side-yard flankage and/or rear yards backing onto major collector and arterial roadways unless noise attenuation barriers are required.
- Along public walkways, in accordance with City standards and design guidelines
- Acoustic fencing may be required where applicable. See standards (2850.031, 2850.030)
- Headwalls and retaining walls greater than 0.6m in height
- Construction/ staging fencing (see also ESC requirement)
- Additional fencing requirements per Community Services may apply
- As coordinated by City review staff through development application

1.8 Trees

Trees are required on road allowances and are to be planted in accordance with the requirements of the City's Recreation and Parks Section of the Community Services Department.

Fencing, screening and landscaping works required within the development shall require approval through coordination with City review staff as part of development application.

1.9 Grading & Surface Restoration/ Treatment

The grading and drainage of lots, blocks or parcels of land as part of developments must be in accordance with the most recent requirements and specifications of the City of Mississauga. The sodding/seeding/surface treatment/ restoration of disturbed lots, blocks or parcels of land in a development must be in accordance with the most recent requirements and specifications of the City of Mississauga. Details can be found in the Development Engineering & Construction *Development Requirements Manual* | *Section 2.*

1.10 Erosion & Sediment Control

Erosion and sediment controls shall be designed, constructed and maintained in all developments in accordance with the most recent requirements and specifications of the City of Mississauga.

In accordance with the City of Mississauga Erosion and Sediment Control By-law No. 512-91, as amended, an Erosion and Sediment Control Permit must be obtained prior to undertaking any land disturbing activities on development sites greater than half (0.5) a hectare in size or on development sites of any size that are adjacent to a body of water.

Applications for an Erosion and Sediment Control Permit are submitted to the Development Engineering & Construction – Environmental Services Section. The permit application consists of an application form, an erosion and sediment control plan and an application fee. Prior to a permit being issued a cash deposit, irrevocable Letter of Credit or surety bond, (details can be found in the Development Engineering & Construction *Development Requirements Manual | Section 3*) covering 100% of the approved estimated cost including engineering and contingencies of the erosion and sediment control measures shall be submitted. Upon issuance, the permit is valid for a period of 180 days. The permit may be extended one or more times for an additional 180 days each time. Additional erosion and sediment control measures and a renewal fee may be required as a condition of the extension, if they are necessary to meet the requirements of the By-law.

Copies of the By-law and the permit application package are available through Development Engineering & Construction.

SECTION 2 – DEVELOPMENT DESIGN REQUIREMENTS

Table of Contents

2.0 Introduction 1
2.1 Right-of-ways 2
2.1.0 Geometric Design 2
2.1.0.0 Roadways 2
2.1.0.1 Boulevards 3
2.1.0.2 Driveway Entrances 4
2.1.0.3 Special Designs 5
2.1.0.4 Pavement Design (Roadways) 5
2.1.0.5 Placement of Top Course Asphalt 7
2.1.0.6 Curbs and Gutters 7
2.1.0.7 Sidewalks 9
2.1.0.7.0 Location 9
2.1.0.7.1 Specification 9
2.1.0.8 Transit Concrete Pads & Platforms 10
2.1.1 Street Name & Traffic Signs 11
2.1.2 Plan 11
2.1.3 Street Name Signs 11
2.1.4 Traffic Control Signs 12
2.1.5 Roadway Markings 13
2.1.6 Traffic Signals 13
2.2 Streetlighting 14
2.2.0 Lighting Levels and Uniformity Ratio 14
2.2.1 Light Source 14
2.2.2 Light Fixtures 14
2.2.3 Approval and Construction 14
2.2.4 City Street Lighting – Partial Acceptance Criteria 14

2.3 Residential Lot Drainage & Sodding 17
2.3.0 General 17
2.3.1 Type of Drainage Pattern 18
2.3.2 Rear Yard 18
2.3.3 Swales 19
2.3.4 Retaining Walls 19
2.4 Erosion & Sediment Control 21
2.4.0 General 21
2.4.1 Sediment Basins 22
2.4.2 Catchbasin Sediment Control 23
2.4.3 Sediment Control Fence 24
2.4.4 Vegetative Buffer Strips 24
2.4.5 Environmentally Sensitive Area Requirements 24
2.4.6 Stockpile Protection/ Onsite Material Management 25
2.4.7 Stone Pad Construction Entrance - Construction Access 25
2.4.8 Rock Check Dam 25
2.4.9 Site Conditions/Inspection 25
2.5 Drawings 26
2.5.0 General Drawing Requirements 26
2.5.1 General Plans 26
2.5.1.0 Aboveground Plans 26
2.5.1.1 Underground Plans 27
2.5.1.2 Storm Drainage Plans 27
2.5.1.3 Grading Plans 28
2.5.2 Plan-Profile Drawings 28
2.5.3 As-Constructed Drawings 29

2.5.3.0 General 29
2.5.3.1 Drafting Requirements for "As-Constructed" Drawings 30
2.5.3.2 Storm Sewers 31
2.5.3.3 Sanitary Sewers 31
2.5.3.4 Watermains 32
2.5.3.5 Erosion and Sediment Control Plans 32
Appendix A – Grading Plan Terms of Reference 34
Appendix B – As Constructed Storm Sewer Summary 40
Appendix C – Agreement Streetlighting Infrastructure Certification Letters 41

2.0 Introduction

The purpose of this section is to outline the general design requirements for the construction of Municipal Services in the City of Mississauga. 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.

All development applications must adhere to all City standards and requirements, recommended/ proposed deviation(s) shall be specifically addressed during the development review process.

2.1 Right-of-ways

2.1.0 Geometric Design

2.1.0.0 Roadways

Roadway geometric design will be in accordance with the City of Mississauga Geometric Design Standards as outlined on City Standard Drawing. Road widths and Right-of-Ways will be in accordance with the most recent City of Mississauga Standards:

2211.060 - Minor Local Residential Road (8.0m pavement on 17m road allowance)

2211.070 - Local Residential Road (new subdivisions) (8.0m pavement on 20m road allowance)

2211.080 - Minor Residential Collector Road (10m road on 22m road allowance)

2211.090 - Local Industrial Road (12.5m road on 24m road allowance)

2211.100 - Industrial and Residential Collector Road (14.5m road on 26m road allowance)

2211.110 - Minor Arterial Road (15.5m road on 30m road allowance)

2211.120 - 4 Lane Divided Arterial Road (2-8m lanes, 7.0m island on 35m road allowance)

2211.130 - 6 Lane Arterial Road (23m road on 35m road allowance)

2211.140 - Buffer Road (8.0m road on 17m road allowance)

2211.150 - 5 Lane Residential Collector Road (17m road on 30m road allowance)

2211.151 - Local Residential Road (Pavement offset, 8.0m road on 18m road allowance)

2211.152 - Local Residential Road (Pavement offset, 8.0m road on 20m road allowance)

2211.153 - City Centre Specific (14.5m road on 25m road allowance)

NOTE: Any development proposal that has nonstandard widths or -crosssections should be- referred to a P.U.C.C. meeting prior to a first engineering submission being made.

2.1.0.1 Boulevards

- Lay-bys

2230.031- Parking Lay by Detail

2230.030- Mountable Concrete Curb with Standard Gutter at Bus & Parking Laybys

- Bus Pads

NOTE: Where future transit service is planned or anticipated, road geometrics, lane widths, curb radii, and other transportation infrastructure shall accommodate transit vehicle operations to MiWay requirements. Turning movement analyses may be required to demonstrate accommodation of standard and articulated transit vehicles. To support MiWay transit service, lane widths of 3.50m are recommended, excluding curb and gutter. The minimum lane width is 3.35m, excluding curb and gutter. The applicant shall consult with MiWay regarding planned routing on new roadways. Final service plans are to be determined by MiWay based on a number of factors, including projected ridership and available resources.

- Applicants shall contact MiWay.Infrastructure@mississauga.ca to obtain the current transit infrastructure standards and requirements

2240.083 – Raised Cycle Track at Nearside & Farside Bus Stops - Constrained
2240.085 – Raised Cycle Track at Nearside & Farside Bus Stops - Preferred
2240.086 – Bike Lane Transition to Cycle Track at Nearside Bus Stops - Preferred
2240.087 – Bike Lane Transition to Cycle Track at Farside Bus Stops - Preferred
2240.088 – Bike Lane Transition to Cycle Track at Nearside Bus Stops - Retrofit
2240.089 – Bike Lane Transition to Cycle Track at Farside Bus Stops - Retrofit
2240.090 – Bike Lane at Nearside & Farside Bus Stops - Constrained
2240.091 – Multi-use Trail set behind Nearside & Farside Bus Stops - Preferred
2240.092 – Multi-use Trail set in front of Nearside & Farside Bus Stops - Constrained
2250.010 – Concrete Bus Stop Platform
2250.030 – Standard Concrete Shelter Pad
2250.040 – Accessible Bus Stop - Sidewalk in front of Bus Shelter
2250.050 – Accessible Bus Stop - Sidewalk behind Bus Shelter
2250.060 – 16m Enhanced Shelter Concrete Pad
2250.061 – 12m Enhanced Shelter Concrete Pad
2250.062 – 8 m Enhanced Shelter Concrete Pad
2250.080 – Concrete Bus Pad

2260.010 – Bus Stop Nearside
2260.020 – Bus Stop Farside
2260.030 – Bus Stop Midblock
2270.050 – Typical Cross Section Concrete Bus Bay
2270.060 – Concrete Bus Bay Nearside, Farside, Midblock
2271.010 – Terminal Bus Stop Configurations for Standard 40 Bus
2271.020 – Terminal Bus Stop Configurations for Articulated 60 Bus

- Public Uses
    - Greenfield – Streetscape design by default
        - Urban Design Guidelines and Reference Notes
        - Green Development Standard
    - Infill – Streetscape commitments based on existing community needs and development application requirements
        - Infill Housing Design Guidelines

2.1.0.2 Driveway Entrances

Driveway entrances and curb cuts shall be in accordance with the most recent standard drawings for this purpose.

Special designs, dependent upon the expected usage, will be required for commercial and industrial driveways (see also Section 6 – Condominium Development Requirements).

All new residential driveways must be paved with 50mm OPSS 1150 HL8 and topped with 25mm OPSS 1150 HL3F from curb to garage on a base of a minimum of 150mm Granular 'A' or 19mm crusher run limestone meeting the requirements of OPSS 1010.

Paving of the driveway is to be undertaken in two separate phases. Phase 1 being the grading of the granular, and the placing of 50mm of HL8 is to be completed at the time of sodding the lot. Phase 2, being the placing of the 25mm HL3F, which will be completed at the time of top course asphalt pavement on the roadway.

The grade of asphalt cement in residential and industrial driveways is to be PG 64-28.

Boulevard driveway slopes should not exceed 8% and should not be less than 2%. Widths of curb depressions for driveways are to be in accordance with the following.

- semi-detached and townhouses 3.8m (12.5 ft)
- detached dwellings under 12m (40 ft) frontage 5m (16.4 ft)

- detached dwellings over 12m (40 ft) frontage 6.5m (21.3 ft)
- Dual driveway access (e.g., circular driveways or multiple curb cuts) may require special approval and is subject to site-specific zoning and boulevard access modification.
- You must request a curb cut permit if modifying the boulevard portion of the driveway.

A minimum 0.6m separation at the curb shall be provided between driveways within cul-de-sacs and elbows along with corner lots and lots abutting walkways. Driveways are to be indicated on the above ground general plan.

The minimum clear distance between the edge of driveway and a utility structure or hydrant shall be 1.2m.

All new industrial driveways shall consist of a minimum of 40mm HL-3, 85mm HL-8 and 350mm of OPSS 1010 Granular 'A'.

For industrial commercial driveways, specific designs based on anticipated loads are required.

2.1.0.3 Special Designs

Special road designs, which are not covered by City of Mississauga Standards, shall be in accordance with the most recent provisions of the geometric design standards manual and urban street geometrics, as adopted by the Municipal Engineers Association.

i.e. Special Design will be required in high density residential, commercial and industrial areas.

Pavement design shall be in accordance with the most recent City of Mississauga Standards and the Ontario Provincial Standard Drawings and Specifications.

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

*Note: See Fire route requirements for reference (By-law 1063-81 as amended)

2.1.0.4 Pavement Design (Roadways)

Soil analysis must be conducted by a licensed Geo-technical Engineering firm that is acceptable to the City of Mississauga. Digital copies of the soil analysis, along with proposed road designs, shall be submitted to the City Development Engineering & Construction team via ePlans.

Minimum thicknesses of asphalt and granular materials shall be as indicated on City Standard Drawing No. 2220.010.

The Granular "B" Type 1, shall have a maximum of 65% passing the 4.75mm sieve.

In all cases:

- Proof rolls on subgrade material must be completed ahead of granular placement.
    - Base course asphalt shall be OPSS 1150 HL8 on residential roads and heavy-duty binder course (HDBC) in accordance to OPSS 1150 and/or 1154 for industrial and arterial roads.
- The wearing course of asphalt shall be:

Local Roads	OPSS 1150	HL3
Collector Roads	OPSS 1150	HL3
Industrial Roads	OPSS 1150	HL3
Arterial Roads	OPSS 1150	HLI

    - Asphalt job mix designs, approved by the developer's Geo-technical consultant, shall be submitted to the City of Mississauga (link to email/ contact) for review a minimum of 5 working days prior to the commencement of paving for review.
    - The asphalt mix designs shall have a minimum asphalt cement content of 5.00% for H.L-8 asphalt's, and 5.3% for H.L-3 asphalt.
    - The grade of asphalt cement for HL-8 and HL-3 asphalt on residential roads shall be PG 58-28J. HL-8 asphalt may contain up to a maximum of 20% RAP mixes containing more than 15% RAP, will have PG 58-34 asphalt cement.
    - No RAP is allowed in any Heavy Duty Binder Course (HDBC) high stability mixes, including H.L-1 and is limited to 10% RAP on H.L-3 surface course asphalt mixes. The average A/C content of all tests must be no lower than the A/C content specified in the JMF.
    - The grade of asphalt cement for industrial and arterial road mixes shall be PG 64-28XJ.

- O.P.S.S.1010 Granular "A" and Granular "B" materials are to be used for road construction in the City of Mississauga. The granular materials must not contain any crushed concrete or recycled asphalt pavement.
- The depth of Granular 'B' as indicated is applicable to situations where subgrade material and all trench backfill material had been placed and compacted as per OPSS and the water content is within 2% of optimum moisture content. Where the moisture content is above 2% of optimum within 1m of subgrade crusher run limestone shall be utilized for the granular 'A' and 'B'. If the water content is greater than 7.5% above optimum moisture content, road construction is to be revaluated or deferred.

2.1.0.5 Placement of Top Course Asphalt

A. Subdivision

Top Course Asphalt Requirements:

- Complete all sidewalk works.
- Complete all curb works.
- Complete all boulevard works.
- Complete top course asphalt driveway paving or as approved.
- Raise manhole frame and grates as well as catchbasin frame and grates and paint rims with orange, fluorescent paint to make them visible to drivers. Warning signs are to be placed at all access points to the subdivisions indicating that there are raised manholes and catchbasin frame covers ahead. Placement of top course asphalt shall be completed within two weeks of raising the frames and grates.
- Flush and sweep surface prior to evenly applying tack coat.

B. Other Development Applications

Top Course Asphalt requirements to be outlined by City of Mississauga in conjunction with applicable Development Agreement.

2.1.0.6 Curbs and Gutters

All new streets shall have curb and gutter construction.

Curb and gutter is to be designed and constructed to the most recent City Standards and Ontario Provincial Standards where applicable.

Curb depressions and AODA standards are applicable to each intersection or pedestrian road crossing.

A driveway entrance is required for each lot as detailed within Section 2.01.01.02.

A minimum of 150mm of OPSS 1010 granular material compacted to 98% Standard Proctor Density will be required as a base for all types of curb installations.

Concrete job mix designs, approved by the developer's Geo-technical consultant, shall be submitted to the City of Mississauga (link to email/ contact) for review a minimum of 5 working days prior to the commencement of pouring for review.

Two-stage curb installation must be in accordance with City standard 2230.010

Minimum grade on curb is 0.75% on cul-de-sac bulbs and outside road elbows.

Concrete Specification

The concrete sidewalk shall be constructed according to OPSS 353, 904 & 1350. The concrete shall meet the most stringent requirements of OPSS or the contract documents. The concrete shall meet the requirements of the most current OPSS 1350, be a C-2 mix (32 MPA, 5 – 8% air content), as described in the most current CSA 23.1.

The expansion joints shall be constructed at locations described within the OPSS.

Expansion joints shall be constructed where the newly poured concrete meets a rigid object such as previously poured concrete, street poles, retaining walls, etc. The expansion material shall extend the full depth of the concrete.

The concrete shall be cured as per OPSS 904. The rate of application of the curing compound shall be as per the manufactures recommendation or at a minimum rate of 0.2 l/m² if not noted.

All surfaces not sprayed with curing compound shall be covered shortly after finishing works are complete and when the surface will not be affected by the cover material (initial set). Uncured or uncovered concrete as per OPSS will be rejected.

2.1.0.7 Sidewalks

2.1.0.7.0 Location

Sidewalks shall be constructed on City of Mississauga streets as shown on the City's Road Cross-Section Standards and should be located on the same side as the streetlight poles.

In areas of infill/redevelopment applications, City staff will provide site specific requirements for sidewalk

2.1.0.7.1 Specification

Sidewalks shall be designed and built according to the most recent City of Mississauga Standards and specifications, which include:

- 2211.158 - Sidewalk Driveway Entrance Detail for a Private Condominium Road
- 2240.010 - Concrete Sidewalk
- 2240.011 - Alternative Standard Concrete Sidewalk
- 2240.012 - Sidewalk Non-Key Curb Detail
- 2240.030 - Commercial Industrial Driveway Curb Returns at Street Curb
- 2240.040 - Concrete Sidewalk Abutting Curb or Curb and Gutter
- 2240.041 - Concrete Splash Pad
- 2240.050 - Concrete Walkway

Concrete sidewalks shall normally be a minimum of 130mm thick and 180mm thick across commercial or industrial driveways respectively.

No special bedding requirements are normally necessary where sidewalks are constructed upon earth which has been properly consolidated to 98% Standard Proctor and has a bearing capacity of at least 75 kPa.

Sidewalks shall not be constructed on organic soils.

Where fill is required to bring the sidewalk to approved grade, the fill shall be OPSS-1010 Granular 'A' material compacted to a minimum of 95% Standard Proctor Density.

The concrete sidewalk shall be constructed according to City standard drawings, and OPSS 351, 904 & 1150. The concrete shall meet the requirements of OPSS 1350, be a C-2 mix (32 MPA, 5 – 8% air content), as described in the most current CSA 23.1.

Expansion joints shall be installed as per City standard drawings and the expansion joint material shall extend to the full depth of the sidewalk with no concrete extending to the other each side of the joint.

The expansion joints shall be constructed at locations described within the OPSS. Expansion joints shall be constructed where the newly poured concrete meets a rigid object such as previously poured concrete, street poles, retaining walls, etc.

All utility structures are required to be isolated from the main concrete by "boxing out" the structure with forms. The formwork shall form a square box and be no closer than 150mm from any point of the utility structure as determined by the City representative. The area inside the box, surrounding the structure shall be filled with C-2 concrete, or concrete that matches the concrete mix of the main concrete pour. The finish within the box shall match the design finish. Expansion joint material shall be placed between the main concrete and the concrete surrounding the pole, as well as around the utility structure itself, or be constructed as per the detail shown in City Standard 2240.010.

The concrete shall be cured as per OPSS 904. The rate of application of the curing compound shall be as per the manufactures recommendation or at a minimum rate of 0.2 l/m² if not noted.

All surfaces shall be covered shortly after finishing works are complete and when the surface will not be affected by the cover material (initial set). Uncured concrete will be rejected. See curb notes.

2.1.0.8 Transit Concrete Pads & Platforms

Transit infrastructure including bus stops, boarding and landing pads, shelters, shelter pads, transit lay-bys, bus bays, operator facilities, and related appurtenances shall be designed and constructed in accordance with current MiWay standards. applicants shall contact MiWay.Infrastructure@mississauga.ca to obtain the current transit infrastructure standards, drawings, and requirements. Final location and design of all transit infrastructure shall be approved by MiWay and the City of Mississauga.

Existing transit infrastructure and transit operations shall be maintained during and following construction unless otherwise approved by MiWay. Where transit infrastructure is present and is to be maintained or is approved for relocation or modification, the applicant shall update all

applicable engineering drawings to reflect the approved conditions. If a transit terminal is present at or adjacent to the subject site, transit service and infrastructure shall be maintained. Should plans propose a permanent impact on the existing terminal, a terminal shall be accommodated elsewhere on the site. The applicant shall consult with MiWay to confirm infrastructure is designed to meet current and future transit needs.

Where construction activities impact transit infrastructure or transit service, temporary transit facilities and operational measures may be required as determined by MiWay. Temporary measures may include temporary bus stop locations, temporary pedestrian landing pads, temporary shelters and temporary signage. Temporary transit facilities shall remain in place until permanent infrastructure has been reinstated and accepted by MiWay. Transit infrastructure shall not be removed, relocated, or closed without prior approval from MiWay. The applicant shall contact MiWay.Infrastructure@mississauga.ca for "MiWay's Infrastructure Requirements and Notification Schedule" document, which outlines required notification timelines and temporary infrastructure.

All works associated with transit infrastructure required as a result of a development, including installation, relocation, temporary facilities, restoration, and replacement, shall be completed at the Developer's sole cost and to the satisfaction of the City and MiWay.

2.1.1 Street Name & Traffic Signs

2.1.2 Plan

A separate plan(s) shall be submitted via ePlans showing the proposed location of signs to be installed as part of development applications. The plan shall be part of the engineering drawings which must be approved by the Development Engineering & Construction team. The above ground plan may be used for this purpose provided the signs can be clearly shown without cluttering other details.

2.1.3 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 City Standard Drawings Manual.

Temporary street name signs, approved by the Development Engineering & Construction team, must be erected at intersections upon completion of base asphalt. These signs must be maintained in legible condition until such time as the permanent

street name signs are in place, permanent signage is to be in place prior to topworks assumption.

All traffic signage installed in the boulevard are to include traffic sleeves following STD 2430.160.

2.1.4 Traffic Control Signs

Traffic control signs shall be located as shown in City Standard Drawing Manual. Where the positioning is not covered by the standard drawing, the location must conform to the most recent versions of the Uniform Traffic Control Devices for Ontario or the Highway Traffic Act Regulations for Ontario. Placement of signage in nonstandard locations are subject to field fit in coordination with City of Mississauga staff.

Signs are to 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 aluminium, anodized both sides, according to the following requirements:

Sizes:

600mm	1.6mm utility series
600mm - 900mm	2.0mm No. 65ST6
over 900mm	3.2mm No. 65ST6

All traffic control signs are to be made with high intensity type reflective sheeting approved by the Ministry of Transportation Ontario, the current standards of the Manual of Uniform Traffic Control Devices for Ontario, the Highway Traffic Act Regulation for Ontario and the Development Engineering & Construction team, including colours.

Additional Information:

Ontario Traffic Manual – Ontario Traffic Council

City of Mississauga Transportation and Works Standard Drawings

2.1.5 Roadway Markings

The Developer will design pavement markings for all roadways over two lanes in width or as required by the Development Engineering & Construction team. The design shall be in accordance with the Manual of Uniform Traffic Control of Ontario and as approved by the Development Engineering & Construction team.

Developments may be subject to temporary road marking requirements at the City's discretion.

> NOTE: Developments may be engaged to coordinate with City of Mississauga for urban improvement initiatives in areas subject to heavy public exposure (i.e. artistic road crossings) Please see OTM Book 11 – Pavement, Hazard and Delineation Markings (PDF) for additional details.

2.1.6 Traffic Signals

Proposed traffic signal handwells, power service pedestals and conduit are to be designed in accordance with City of Mississauga Standard Drawings Manual and OPSD. Ministry of Transportation Ontario PHM-125 base plans are to be supplied to the City via ePlans showing intersection geometrics, conduits and power service pedestals. Traffic signal power service pedestals are also to be indicated on the subdivision electrical drawing.

Following development approval and agreement review/ execution, Traffic Operations/ Signals team will coordinate with development teams to provide development requirements.

2.2 Streetlighting

2.2.0 Lighting Levels and Uniformity Ratio

Project specific streetlighting requirements will be provided through the development application review process. Detailed design criteria and standards are contained within the City's most recent Streetlighting Design Manual and is to be completed by qualified person (QP).

2.2.1 Light Source

Refer to Streetlighting Design Manual.

2.2.2 Light Fixtures

The light luminaire and pole shall be per the approved list of City of Mississauga Streetlight standards and Alectra.

2.2.3 Approval and Construction

Approval of plans for streetlighting must be obtained from City of Mississauga Streetlighting team and Alectra. The Developer must guarantee and maintain the lighting for one year after the electrical system assumption in accordance with the development agreement with Alectra Energy charges will be paid by the City upon energization of the streetlighting.

2.2.4 City Street Lighting – Partial Acceptance Criteria

1. Purpose

This document outlines the requirements for partial acceptance of street lighting infrastructure installed by a developer or applicant prior to the city assuming monitoring and energy consumption responsibilities for the lighting system.

Partial acceptance allows the city to monitor the street lighting system while the developer/applicant remains responsible for maintenance, repairs, and warranty obligations until final acceptance is granted.

2. Submission Requirements

Prior to requesting partial acceptance, the developer/applicant must provide the following information to the City Street Lighting Unit: a) Asset Inventory A complete inventory of all street lighting assets, including:

- Pole information
- Luminaire type

• Associated adaptive control node numbers

b) As-Built Drawings Final as-built drawings showing the installed street lighting system, including pole identification numbers, circuiting, luminaire types, and associated adaptive control nodes.

c) Electrical Inspection and Clearance Confirmation that all street lighting infrastructure has received Electrical Safety Authority (ESA) inspection and clearance, or approval from the applicable electrical authority.

d) Lighting Control System Commissioning Confirmation that the adaptive lighting control system has been fully commissioned, and that all luminaires are properly communicating with the lighting control network.

3. Operational Verification

Prior to granting partial acceptance, the City Street Lighting Unit will conduct operational testing and verification to confirm:

- All luminaires are operational
- Adaptive control nodes are functioning correctly

• Communication with the lighting management system is established

- The developer/applicant must provide all necessary information and system access required for this verification.

4. Integration into City Monitoring System

Following successful verification, the street lighting assets will be integrated into the City's lighting management system for monitoring purposes, including energy consumption tracking, in accordance with the Ontario Minimum Maintenance Standards (MMS) and the City's standard maintenance monitoring practices.

5. Maintenance Responsibilities

During Partial Acceptance During the partial acceptance period:

- The developer/applicant remains responsible for all maintenance and repair of the street lighting infrastructure.
- If the City identifies operational issues, the developer/applicant will be notified and required to restore the lighting system to full operational condition.

All repairs must comply with the minimum response and repair timelines outlined in the Ontario Minimum Maintenance Standards (MMS).

6. Repair Notification and Verification

Upon completion of repairs, the developer/applicant must notify the City Street Lighting Unit so that City staff may verify that corrective work has been completed and the lighting system is operating properly.

7. Warranty Requirements

All street lighting infrastructure must remain under the applicable warranty period during the partial acceptance stage. Any defective equipment or components must be repaired or replaced by the developer/applicant as required.

An Energization certification and a final streetlighting certification is to be provided to the Streetlighting department and certified by the utility engineering consultant to obtain preliminary and final acceptance.

Certification letters can be found in Appendix C below.

2.3 Residential Lot Drainage & Sodding

2.3.0 General

Lots (including drainage ditches or swales) are to be completely topsoiled and sodded with a minimum depth of 100mm of topsoil and Nursery Sod in keeping with City of Mississauga standards. Grading Plan. Refer to site grading plan terms of reference in Appendix A.

Grade areas to:

- Provide proper surface drainage and maximize usable land area.
- Preserve existing trees where possible.
- Direct drainage away from houses
- Minimum yard slope 2%
- Minimum driveway slope 2% and all driveways are encouraged to slope *away* from the dwelling.
    - Maximum driveway slope 8% (from standard sidewalk location)
    - Any drainage from a reversed from a reversed slope driveway must be connected to the municipal storm sewer and establish high point at property line
    - Maximum grade between houses in any direction:
    - 3: 1 (Horizontal: Vertical), use steps and/or retaining walls if this requirement cannot be met.
    - Provide a 0.60 m wide flat access strip (at 2%) along at least one side of the building where side yard setback permits. (Usually along the garage side or side door entrance).
    - Clearstone rather than topsoil and sod are required for combined side yards between two buildings which are 1.20m or less. For side yards greater than 1.2m clear stone may be required at the discretion of the Development Engineering & Construction team.

Overland Flow Route:

- Maximum ponding depth is 0.35m
- Where overland flow is directed between two dwellings, the depth and width of the swale must be such that the 100 year flow does not come in contact with the dwelling.

Basement windows will not be permitted on the side of the dwelling abutting the overland flow route swale.

- French drains may be considered for infill developments in areas where the 2% minimum slope cannot be achieved, subject to approval by the Development Engineering & Construction team. Their use must ensure proper drainage and not compromise adjacent properties or infrastructure.

2.3.1 Type of Drainage Pattern

Back to front drainage may be considered if the side yard building setback is a minimum of 1.2m for each lot totalling 2.4m of open space between the dwellings, should the existing grading necessitate this as the most practical solution.

Standards:

2851.010 – grading detail lots greater than 12 meters
2851.020 – grading detail for lots less than 12m width
2851.030 – typical split lot grading detail (backsplit)
2851.040 – typical split lot grading detail
2851.050 – typical split lot grading detail (walkout)

2851.090 – Townhouse on rear lane lot grading

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 along the rear lot lines are to direct run-off from the upper lots into the lower lot side yard swales.
- Downspouts on the upper lot do not direct flow to the lower lots.
- No more than one upper lot shall drain into the lower lot side yard swales.

2.3.2 Rear Yard

- A minimum of 75% of the rear yard area is to be usable (2% to 4% slope) as per (Standard 2851.060)
- Retaining walls are to be employed where necessary to achieve the required rear yard areas.

2.3.3 Swales

A) Longitudinal slope Minimum 2%
B) Side slopes - Maximum 3: 1 (Horizontal: Vertical)
C) Rear Yard Swale to rear Lot Catch Basin:
   - Maximum length of rear yard swale
   - On lots less than 12 m in frontage - three lots
   - On lots 12m and greater in frontage - two lots
   - Location of Centreline of Swale 1.0m maximum offset from rear lot line
   - Maximum swale depth - 450mm
   - Minimum swale depth 150mm
D) Sideyard Swale Details:
   - Maximum 250mm (450 allowable if combined side yard in more than 3.6m)
   - Minimum 150mm
   - Refer to detail 2851.080 Cross- Section

Refer to City Standard 2851.060 Lot Grading and Drainage Notes.

2.3.4 Retaining Walls

- Retaining walls are generally required where reconciliation between grades exceeds the specified maximum of 3:1 slope.
- Details of retaining walls over 0.60m are to be submitted with grading plans and stamped by a Professional Engineer. It is preferable that the Engineer who stamped the plan certifies the wall construction. Walls less than 0.6m in height must adhere to OPSD (Ex. STD 3120.100, 3121.150 and 3190.100)
- Proposed retaining walls are generally scrutinized within City/ Region owned right-of-way. Where deemed necessary walls located in the ROW like all other City assets will be subject to a maintenance period of no less than one year. Retaining wall maintenance will not commence until receipt of wall certification outlined above. In some cases this may also require supplementary certification confirming the footing block is founded on grounds with adequate baring capacity as observed by a geotechnical engineer.
- Construct retaining walls entirely on the upper lot so that tie backs do not cross property boundaries.

- Certification by the consultant stating that the retaining wall is designed and constructed to meet the most recent design standards as to granular backfill, structural integrity, materials, tie backs, line and grade is required.
- For retaining walls 0.6m to 1.0m in height light weight pre-fabricated concrete retaining wall products may be utilized. For retaining walls greater than 1.0m in height, heavy block or wet walls are to be utilized.
- Fencing is required where retaining wall height exceeds 0.6m as Per standard No.2851.060.

2.4 Erosion & Sediment Control

2.4.0 General

In accordance with the City of Mississauga Erosion and Sediment Control By-law No. 512-91,, as amended, an Erosion and Sediment Control Permit must be obtained prior to undertaking any land disturbing activities on development sites greater than one (1) hectare in size or on development sites of any size that are adjacent to a body of water. Copies of the By-law and the permit application package are available through the Development Engineering & Construction Environmental Services team.

All erosion and sediment controls are temporary applications constructed prior to any land disturbing activities on the site and shall be maintained throughout the duration of the construction period. *Permits can be issued based on Stage 1 - Earthmoving Operations and Stage 2 - Servicing Works.*

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 Development Engineering & Construction team, prolonged exposure of disturbed site surfaces require documentation of site controls be coordinated with the City for stormwater management in ponding areas and dust control measures during dryer seasonal conditions .

All erosion and sediment controls should comply with the requirement of “The Erosion and Sediment Control Guidelines from Urban Construction,” issued by the Greater Golden Horseshoe Area Conservation Authorities.

2.4.1 Sediment Basins

Temporary sediment basins shall be constructed on sites having a disturbed drainage area of greater than 2 hectares or having an average slope greater than 12%.

The basin shall be designed to settle out soil particles that are 0.04mm in diameter or larger from surface water runoff and/or storm sewer flows, and shall meet the following requirements:

- The minimum basin volume shall be 125 m3 per hectare of contributing drainage area.

  NOTE: The total basin volume consists of storage zone volume and the settling zone volume.

- The surface area of the basin shall be designed using the following equation:

$$A = 1.2\,Q$$

where Vs = Settling velocity

(0.0021 m/s for 0.04mm diameter soil particle)

A = Surface area of basin (m^2)

Q = Peak inflow rate (m^3/s)

  NOTE: The peak inflow rate shall be calculated using a 1:10 year return period based on the City of Mississauga Standard Intensity Duration Frequency Rainfall Curves (City Standard Drawing No. 2111.010) *(Q=C x i x A)*

  The basin length to width ratio shall be greater than 2 and, if less than 10, a baffling system is required to be used to prevent "short circuiting" and to minimize "dead zones".

- The storage zone depth shall allow for one year of estimated sediment yield based on the Universal Soil Equation.

  The Universal Soil Equation is:

$$E = 2.24\,R\,K\,Ls\,Vm$$

where E = Amount of soil loss per unit area for the time interval represented by the factor R (tonnes/ha)

R = Rainfall factor (Joule/ha)

K = Soil Erodibility Factor (tonnes/Joule)

Ls = Topographic factor (dimensionless)

Vm = Erosion control factor (dimensionless)

NOTE: Factors used in the Universal Soil Loss Equation shall be in accordance with the most recent Ontario Ministry of Transportation published data.

To determine the volume of soil loss per unit area assume a soil density of 1 tonne/m^3.

The minimum storage zone volume of the basin shall be 50m^3 per hectare of contributing drainage area.

- The ratio of the basin length to the settling zone depth is to be less than 40 to prevent scouring of the storage zone. The minimum settling zone depth shall be 0.6m.
- The outlet of the basin shall be designed to provide a minimum of 24 hours of detention time and to prevent turbulence and re-suspension of settled particles.
- The basin shall have a maximum side slope of 3:1.
- The basin shall have a minimum freeboard of 0.3m.
- The basin shall be provided with an emergency spillway.
- 1.8m high chain link fence shall be erected along the perimeter of any sediment 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 basin is used for sediment control purposes and that the enclosed area is subject to flash flooding.

  See City Standard drawings 2940.010,2940.020,2940.021

- For Subdivision the temporary sediment basins are not to be removed until 80% of the development has been developed and sodded.

2.4.2 Catchbasin Sediment Control

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

Catchbasin Sediment Trap

Catch basin (CB) sediment traps shall be provided for CBs located adjacent to and within active construction site areas draining 2 hectares or greater and less than 4 hectares and shall be constructed in accordance with City Standard Drawing No. 2930.010

Regular maintenance of sediment traps is required, 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 City Standard Drawing No.'s 2930.020 or 2930.030

Roadway Catch Basin Sediment Control Device

Under appropriate drainage circumstances, all roadside catch basins shall be provided with sediment protection in accordance with City Standard Drawing No. 2930.040 or 2930.050

2.4.3 Sediment Control Fence

Sediment control fences shall be placed along all downslope 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. The sediment control fence shall be constructed in accordance with City Standard Drawing No. 2940.010, fence is required to be properly keyed in place, failure to do so may result in breach of sediment material from the containment area. Such circumstances are often (depending on severity) subject to investigation and may even be subject to fines by environmental authorities.

2.4.4 Vegetative Buffer Strips

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

2.4.5 Environmentally Sensitive Area Requirements

In areas that have been identified as sensitive and confirmed such by either City staff or other applicable municipal agency additional ESC requirements may be required. These additional requirements will be addressed as part of the development application review process.

2.4.6 Stockpile Protection/ Onsite Material Management

All stockpiles containing more than 100m^3 of material shall be located a minimum of 10m away from a roadway, drainage channel or an occupied residential lot. The maximum side slopes for stockpiles shall be 1.5 horizontal to 1.0 vertical. Shear slopes (1:1) have been found to be a suitable nesting ground for Cliff Swallows a known protected species in Ontario. The City advises that stockpiles should be worked to avoid being left with shear faces to mitigate unwanted settlement of the protected species.

Runoff from all topsoil stockpiles shall be controlled by a sediment control fence or other approved devices. If remaining for more than 30 days, topsoil stockpiles shall be stabilized by vegetative cover, or other means.

2.4.7 Stone Pad Construction Entrance - Construction Access

To reduce the tracking of mud onto a paved street, a mud mat *in accordance with City Standard Drawing* No.2970.010 shall be constructed at the site entrance and exit leading onto any existing road. . This stone pad must be maintained as required given the site conditions to ensure mud tracking is kept to a minimum.

2.4.8 Rock Check Dam

Rock check dams are to be installed in ditches and swales in accordance with City Standard Drawing No. 2980.010, to be constructed during earthworks and maintained until construction is:

A. Substantially complete OR

B. The drainage area's surface is restored

2.4.9 Site Conditions/Inspection

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 City staff.

All erosion and sediment control devices are to be inspected by the Owner(s)/designate once per week and after each rainfall of 1 cm or greater to ensure that they are in proper working condition. City staff reserve the right to audit development team staff for ESC reports and must be provided with requested records within 48 hours of the initial request.

2.5 Drawings

Specifications for Engineering Drawings

Size: ARCH A-E | (594mm x 84lmm)

Format: PDF

Materials for Final Submission: PDF

“As-Constructed” drawings: PDF

Materials for Preliminary: PDF

Submissions: PDF

2.5.0 General Drawing Requirements

Work on the drawings is to be done neatly and legibly and maintained as plan readable.

All PDF drawings are to include the signature and digital seal of the Professional Engineer responsible for the design.

The applicant is to relate all wording to a current and existing City of Mississauga benchmark value without applying any shift. Any submissions that show elevation values related to a datum other than the 1928 Canadian Geodetic Datum (i.e. The Mississauga Datum) will not be accepted.

All drawings must include a revision block which must contain a note indicating the submission phase to which they apply, and a space must be provided for the initials of the city staff who reviewed the submission. The caption for this space should read “reviewed by”.

2.5.1 General Plans

2.5.1.0 Aboveground Plans

General plans showing aboveground services and appurtenances are to be drawn to a scale of 1 to 1000 or larger and shall indicate but not be limited to the following:

- School signs
- Street signs
- Future land use signs
- Barricades

- Fencing
- Retaining walls
- Rear lot/block catchbasins
- Screen planting
- Any required easements including dimensions and descriptions
- Driveway location for corner lots
- Driveway locations and building envelopes for detached dwellings less than 12 metres, 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 metres, semi-detached dwellings and townhouse dwellings
- Bus stop platforms - Existing and proposed transit infrastructure including bus stop platforms, pedestrian landing pads, shelters, shelter pads, bus bays, and accessible pedestrian connections.
- Community mail box

2.5.1.1 Underground Plans

General plans showing all below ground services and appurtenances are to be drawn to a scale of 1 to 1000 or larger and are to include any required easements. Plans shall clearly identify and number all maintenance holes, catch basins, rear lot catch basins, ditch inlet catch basins, and related storm structures in accordance with the applicable City of Mississauga standard drawings and drawing specifications. Structure numbering shall be consistent across all underground plans, storm drainage plans, plan-profile drawings, and as-constructed drawings.

2.5.1.2 Storm Drainage Plans

Storm drainage plans are to be drawn to a scale of 1 to 1000 or larger (a scale not exceeding 1 to 5000 will be accepted for large external drainage areas) and are to indicate 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 City's latest contour mapping. The storm drainage plan shall indicate but not be limited to the following:

- Existing contours
- 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 (overland flow)
- Street names
- Manhole/ catch basin numbers
- Sewer sizes and slope
- Directions of flow in the sewers
- Any stormwater control structures such as catchbasins or swales, on the lots, blocks or land parcels required to collect/ capture runoff
- Temporary or permanent quantity and quality storm water management facilities
- Overland flow route
- Culverts and other drainage appurtenances

Note: Refer to section 8 of the Development Requirement Manual

2.5.1.3 Grading Plans

Requirements for grading plan see Grading Plan Terms of Reference.

2.5.2 Plan-Profile Drawings

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

- Where two or more sheets are required for one street, match lines must be used and there is to be no overlap or duplication of information
- 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 elevation band of the profile portion of the drawings only. Only the sewer type, pipe type, diameter and flow direction 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 section of the drawings and located sample locations are to be drafted on the plan section. 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 (1) metre below the lowest manhole in the vicinity.
- Gutter drainage details for temporary turning radii and cul-de-sacs

2.5.3 As-Constructed Drawings

2.5.3.0 General

Prior to final acceptance of a subdivision by the City of Mississauga, the Developer's Engineer shall provide a complete set of ”As-Constructed” (AC) drawings for the review by Development Construction of the City of Mississauga. Digital submissions to be coordinated with City staff following C-Plan guidelines

With the submission of the As-Constructed drawing set, an As-Constructed Sewer Summary sheet is to be filled out and submitted to Development Construction for review.

Sample A - As Constructed Sewer Summary Template

In addition to the above, the Region of Peel has additional requirements that consist of, “As-Constructed” digital files which can be found in the Region of Peel Design Criteria and Development Procedures Manual, latest edition.

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

These drawings shall be sealed and signed by a Registered Professional Engineer and stamped "As-Constructed" and dated.

2.5.3.1 Drafting Requirements for "As-Constructed" Drawings

Storm Sewers, Sanitary Sewers, Watermains, Streetscape and perimeter park grades be "As-Constructed" in all cases. Other additional "As-Constructed" information may be required in certain instances. Direction will be given by the Construction staff on an individual project basis, as required.

2.5.3.2 Storm Sewers

All sewer invert elevations, if different than proposed, are to be indicated on the “As-Constructed” (AC) drawings, where invert elevations differ the proposed invert is to remain in place with a ~~strikethrough~~ and the as-constructed invert should be added to the left or right of the original proposed invert in the profile banding where possible and leaders may be utilized when necessary to maintain drawing legibility.

> **NOTE:** If the difference is greater than 150mm affected portions of sewer (in profile) to be redrawn. Hydraulic calculations must be revised and are to be provided, reflecting these changes, for review and approval.

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

Any material substitutions or field fit changes shall be indicated on the AC drawings, if different than approved proposed:

1. Type of manhole
2. Pipe size
3. Grade of sewer
4. Type of sewer material
5. Class of pipe
6. Type of bedding

Stormwater Management

A topography survey is to be provided for the storm water management pond prior to servicing approval and/or prior to assumption of the swim pond.

Also refer to Section 8- Storm Drainage Design Requirements

2.5.3.3 Sanitary Sewers

All sewer invert elevations, if different than proposed. If difference is greater than 150mm affected portions of sewer (in profile) to be redrawn.

Any manhole location which differs by more than 1.50m from proposed to be redrawn both in plan and profile.

The following shall be indicated on the "as-constructed" drawings, if different than proposed:

1. Type of manhole
2. Pipe size
3. Grade of sewer
4. Tee chainage from downstream manhole
5. Type of sewer pipe material
6. Class of pipe
7. Type of pipe bedding
8. Original ground at centre profile to remain on all plans
9. Lateral ties and elevations

2.5.3.4 Watermains

All watermain elevations, if different than proposed. If difference is greater than 150mm, affected portions of watermain (in profile) to be redrawn.

All alignment changes greater than 150mm to have offsets revised in plan. If alignment changes exceed 1.5 metres, watermain to be redrawn in plan as well as indicating revised offsets.

All main valves are to be tied to permanent features, such as buildings, manholes, catchbasins, etc...

Ties and elevations to all stubs.

The following shall be indicated on the "as-constructed" drawings, if different than proposed:

1. Pipe size
2. Type and class of pipe
3. Type of bedding
4. All fitting changes (bends, reducers, blocking, etc...)
5. Type and manufacturer of valves and hydrants
6. Original ground profile over watermain (if applicable) to remain

2.5.3.5 Erosion and Sediment Control Plans

The erosion and sediment control plans are to be prepared in accordance with the requirements of Erosion and Sediment Control By-law No. 512-91, as amended. Copies of the By-law *and*

permit application package can be obtained from the *Development Engineering & Construction – Environmental Services team*.

Appendix A – Grading Plan Terms of Reference

Terms of Reference
Grading Plan

MISSISSAUGA

City of Mississauga
Planning & Building Department
Building Division
Development Engineering & Construction
www.mississauga.ca

What is it?

A Grading Plan is a drawing that shows the existing elevations/grades on both the lands being developed and adjoining lands along with the proposed grading changes to the site. The plan is to reflect existing and proposed drainage patterns (existing and adjoining lands), all new structures, existing & proposed easements, access points/driveways and parking areas. Existing and proposed elevations demonstrate the topography to help ensure that the proposed site development drainage pattern will not impact existing lands/drainage patterns and that the grading is subject to sound engineering design.

Who prepares it?

The Grading Plan is to be prepared by a Professional Engineer licensed in Ontario or a licensed Ontario Land Surveyor (OLS). The drawing must be stamped, dated and signed by the licensed professional qualified to design site grading/drainage plan.

When is it required?

A Grading Plan may be required in support of an Official Plan Amendment, Rezoning, Draft Plan of Subdivision / Condominium, Site Plan Control, Consent to Sever applications and infill lands not subject to site plan control and/or development Agreements. A site Grading Plan may also be required for Building Permit applications.

How to prepare it?

A Grading Plan should include, but not be limited to the following:

GENERAL INFORMATION (to be included on all grading plans)

1) City standard title block including address or legal description
2) Metric scale of 1:250, 1:300, 1:500 or similar. Bar scale to be included.
3) North arrow
4) Key Plan for site location, at a scale of approximately 1:10,000
5) Legend identifying existing and proposed site grading information, sump pump discharge location, roof leaders/downspouts discharge location and direction, areas/limits of surface ponding, hard and soft surface materials, window wells, fences, retaining walls, catch basins, etc.
6) Property lines (existing/ultimate), street names, registered plan numbers and parts
7) Locations of all doors and proposed grades outside and abutting each building entrance
8) Street centerline elevations along and beyond the frontage of the site
9) Location and details of all existing man-made or natural features on or adjacent to the site, including:
   - Natural features such as trees and watercourses;

- Easements and public utilities;
- Embankments and catch basins;
- Curbs, hydro poles, light standards, fire hydrants, transformers and fences, etc.

10) Existing driveway width along the lot line, as well as existing/proposed widths at the street line where modifications are required
11) Differentiate between existing and proposed works by using lighter/greyed print to show existing features, text, and line work; and darker/black print to show proposed works
12) Location and identification of trees being protected and their associated hoarding zones

DETAILED GRADING INFORMATION (to be included on all grading plans)

1) **Show existing grades within the site and beyond the property limits** at a sufficient distance (including existing building line elevations) to clearly define the existing drainage pattern for the area. Elevations along and beyond the property limits on adjoining lands are to be carefully examined to ensure the impact of external drainage is considered in the design.

2) **Provide proposed grades around the perimeter and within the site**, labelling drainage swale percentages, slope ratios, swale inverts and directional flow arrows. Proposed grades must be compatible with those existing on adjacent lands. Indicate how drainage/runoff as a result of new construction will be managed and self-contained within the site to ensure the adjacent properties are not adversely affected. Indicate the limits wherein the existing grades and drainage pattern will be maintained.

3) **Differentiate between existing and proposed works** by using lighter/greyed print to show existing features, text, and line work; and darker/black print to show proposed works.

4) **Proposed swales** are to be supported with invert elevations at regular intervals and percentages of slope with a minimum of 2.0% where achievable. Swales are to be sodded and well defined in relation to the existing adjacent grades. Allowable driveway slopes shall be between 2.0 % and 8.0%. Provide cross sections to clarify the proposed grading, particularly in relation to the adjacent private lands and municipal right-of-ways.

5) **Cross sections** are to show all relevant information required to properly assess the proposal. Label slopes "3:1 Max" where applicable. The proposed grading shall be in accordance with the City of Mississauga, Development Requirement Manual: https://www.mississauga.ca/file/COM/Section7Revised2010.pdf

6) **Show all roof water leaders and sump pump discharge location(s)**, including direction of discharge, and how it will be managed within the subject property boundaries. Discharge shall not adversely affect abutting and/or City-owned lands and infrastructure, including ditches and sidewalks. Applicants are encouraged to design the weeping tile elevation to be at least 1.0 meter above the seasonal groundwater elevation so that sump pumps do not operate continuously. In cases of high ground water table where a sump pump could run

continuously if a sump pump was implemented, the applicants should consider raising the basement elevation to be at least 1.0 metre above the elevation of the storm sewer obvert.

7) **Ponding limits** and depths are to be depicted on the drawing, and the maximum ponding depth in parking areas is not be exceed 250mm.

8) **Identify the areas to be sodded and/or hard-surfaced** including artificial turf. Label all surface materials on the drawing. Hard surfacing and artificial turf must be Zoning compliant. For additional info, contact Zoning at 311 or 905-615-4311.

9) **Indicate any proposed retaining walls**, along with the type of material, top and bottom of wall elevations at each end at 10 m intervals along its length or where a change in height occurs. Provide cross sections to support proposed retaining walls. Retaining walls near a lot line and greater than 0.6m in height require certified structural details, cost estimates, and structural certification upon completion. The retaining wall in its entirety including footing, must be constructed within the subject lands.

10) **Where municipal storm sewer is available for connection**, an internal storm system may be required to drain the site. A Storm Connection Approval from the Storm Drainage Section is required for any direct connection to the municipal storm sewer. Show location of abutting municipal storm sewer where the internal storm sewer connects. For additional information, contact the Storm Drainage Section at ENV.Approvals@mississauga.ca.

11) **Include a note referencing the specific City of Mississauga Benchmark** number, elevation, and location/description used to establish the elevations on the plan. See Standard Note #1 below. The established benchmark elevation can be found at: http://www.mississauga.ca/portal/services/maps

    All existing and proposed elevations are to relate to an active, local (within close proximity) and existing published City of Mississauga benchmark value, without adjustments. Submissions that show elevations values related to a datum other than the 1928 Canadian Geodetic Datum (i.e. the Mississauga Datum) will not be accepted.

GRADING PLAN STANDARD NOTES – LANDS COVERED BY A DEVELOPMENT AGREEMENT

1) "Elevations are referred to the City of Mississauga Benchmark No. ___, located (insert description on benchmark sheet), having a published elevation of ____ metres."

2) "I hereby certify that the proposed grading for the building, appurtenant drainage and storm water management works comply with sound engineering design, and that the proposed grading is in conformity for drainage and relative elevations with the overall grading and drainage plans for this development."
   _____ (Signature and Stamp)

3)

a. "Driveway surfaces must be zoning compliant. The portions of the driveway within the municipal boulevard will be paved by the applicant."

b. "At the entrances to the site, the municipal curb and sidewalk will be continuous through the driveway and a curb depression will be provided for each entrance."

c. "All proposed curbing within the municipal boulevard area for the site is to suit as follows:
   i. All curbing must be compliant with City standards within the municipal right of way.
   ii. All entrances to the site are to be in accordance with City of Mississauga Standards 2240.030/2240.031 (as applicable) and 2230.20. Driveway and entrance curb radii dimensions shall be in accordance with OSPD 350.010. 2240.010 to match current condition or 2240.011 (as applicable)."

d. "All excess excavated material will be removed from the site."

e. "The applicant will be required to contact all utility companies to obtain all required locates prior to the installation of hoarding within the municipal right-of-way."

f. "The applicant will be responsible for the cost of any utility relocations necessitated by the site plan."

g. "Prior to commencing construction, all required hoarding in accordance with the Ontario Occupational Health & Safety Act and regulations for construction projects, must be erected and then maintained throughout all phases of construction."

h. Should any work be required within the municipal right-of-way, a Road Occupancy Permit will be required. PUCC approval will be required. For further information, please contact the PUCC/Permit Technologist, at 905-615-4950 or by email at tw.pas@mississauga.ca. See the website link below."
https://www.mississauga.ca/services-and-programs/transportation-and-streets/roads-andsidewalks/apply-for-a-road-occupancy-permit/

GRADING PLAN STANDARD NOTES – LANDS NOT COVERED BY A DEVELOPMENT AGREEMENT

1) "Elevations are referred to the City of Mississauga Benchmark No. ___, located (insert description on benchmark sheet), having a published elevation of _____ metres."

2) "I have reviewed the plans for the construction of _____ located at _____ and have prepared this plan to indicate the compatibility of the proposal to existing adjacent properties and municipal services. It is my belief that adherence to the proposed grades as shown will produce adequate surface drainage and proper facility of the municipal services without any detrimental effect to the existing drainage patterns or adjacent properties."

_____ (Signature and Stamp)

3)

a. "All surface drainage will be self-contained, collected and discharged at a location to be approved prior to the issuance of a building permit."

b. "Driveway surfaces must be zoning compliant. The portions of the driveway within the municipal boulevard will be paved by the applicant."

c. "At the entrances to the site, the municipal curb and sidewalk will be continuous through the driveway and a curb depression will be provided for each entrance."

d. "All proposed curbing within the municipal boulevard area for the site is to suit as follows:
   i. All curbing must be compliant with City standards within the municipal right of way.
   ii. All entrances to the site are to be in accordance with City of Mississauga Standards 2240.030/2240.031 (as applicable) and 2230.20. Driveway and entrance curb radii dimensions shall be in accordance with OSPD 350.010. 2240.010 to match current condition or 2240.011 (as applicable)."

e. "All excess excavated material will be removed from the site."

f. "The existing drainage pattern will be maintained except where noted."

g. "The applicant will be required to contact all utility companies to obtain all required locates prior to the installation of hoarding within the municipal right-of-way."

h. "The applicant will be responsible for the cost of any utility relocations necessitated by the site plan."

i. "Prior to commencing construction, all required hoarding in accordance with the Ontario Occupational Health & Safety Act and regulations for construction projects, must be erected and then maintained throughout all phases of construction."

j. "Should any works be required within the municipal right-of-way, a Road Occupancy Permit will be required. PUCC approval will be required. For further information, please contact the PUCC/Permit Technologist, at 905-615-4950 or by email at tw.pas@mississauga.ca or see the website link below."

https://www.mississauga.ca/services-and-programs/transportation-and-streets/roads-andsidewalks/apply-for-a-road-occupancy-permit/

ADDITIONAL RESOURCES

See link to City of Mississauga, Development Requirements Manual for further information: https://www.mississauga.ca/publication/transportation-and-works-development-requirements-manual/

Appendix B – As Constructed Storm Sewer Summary

DEVELOPMENT ______________________ DATE ______________________

CITY FILE NO. ______________________ CONSULTANT ______________________

AS CONSTRUCTED STORM SEWER SUMMARY

Location/Street Name	From Upstream	To Downstream	Designed Upstream Invert	As Constructed Upstream Invert	Designed Downstream Invert	As Constructed Downstream Invert	Designed Type of Pipe	As Constructed Type of Pipe	Designed Slope	As Constructed Slope	Designed Nominal Diameter	As Constructed Nominal Diameter	Designed Length of Section	As Constructed Length of Section	Designed Velocity of Flow with Pipe Flowing Full	As Constructed Velocity of Flow with Pipe Flowing Full	Designed Capacity of Pipe Flowing Full	As Constructed Capacity of Pipe Flowing Full	Designed Time of Flow in Section	As Constructed Time of Flow in Section
	MH#	MH#	Inv (m)	Inv (m)	Inv (m)	Inv (m)			s (%)	s (%)	D (mm)	D (mm)	L (m)	L (m)	V (m / s)	V (m / s)	Q (m^3 / s)	Q (m^3 / s)	$t = {}^{L}/_{V*60}$ (min)	$t = {}^{L}/_{V*60}$ (min)

Appendix C – Agreement Streetlighting Infrastructure Certification Letters

FIRM LETTERHEAD
(ELECTRICAL CONSULTANT)

SAMPLE AGREEMENT STREETLIGHTING INFRASTRUCTURE PRELIMINARY ENERGIZATION CERTIFICATION LETTER

To: City of Mississauga
Planning and Building Department
Development Engineering & Construction
300 City Centre Drive
Mississauga, ON L5B 3C1

Date:

Attn: **Development Construction**

Re: **Preliminary Energization Certification of Agreement Streetlighting Infrastructure**
Municipal Address and Property Description
City File Number
Registered Plan Number (if applicable)

This letter is to certify that the Streetlighting Infrastructure have been installed in accordance with the drawings and specifications for City File/Agreement _____[*Insert City File Number*]_____.

The associated streetlighting node numbers (Adaptive Controls) were provided to the City's Street Lighting Unit on _____[*Insert Date*]_____ and were received by _____[*Insert Name or Group*]_____.

Sincerely,

Stamp and **Signature** of Professional Engineer

For: (Name of Certifying Firm)

FIRM LETTERHEAD
(ELECTRICAL CONSULTANT)

SAMPLE AGREEMENT STREETLIGHTING INFRASTRUCTURE FINAL CERTIFICATION LETTER

To: City of Mississauga **Date:**

Planning and Building Department
Development Engineering & Construction
300 City Centre Drive
Mississauga, ON L5B 3C1

Attn: Development Construction

Re: Final Certification of Agreement Streetlighting Infrastructure
Municipal Address and Property Description
City File Number
Registered Plan Number (if applicable)

This letter is to certify that all/current Streetlighting Infrastructure have been completed in accordance with the drawings and specifications, as may be amended from time to time under City approval and authority and which form part of the Agreement for City file *[Insert City File Number]*.

Streetlighting was energized on *[Insert Date]*. The associated streetlighting node numbers (Adaptive Controls) were provided to the City's Street Lighting Unit on *[Insert Date]* and were received by *[Insert Name or Group]*. The Street Lighting Unit has since completed an inspection, and all identified deficiencies were resolved by *[Insert Date]*.

Sincerely,

Stamp and **Signature** of Professional Engineer

For: (name of Certifying Firm)

SECTION 3 - ENGINEERING SUBMISSION REQUIREMENTS FOR MUNICIPAL INFRASTRUCTURE

Table of Contents

3.0 Introduction 1
3.1 Engineering Fees 2
3.1.0 Total Engineering Fee 2
3.1.1 Preliminary Engineering Fee 2
3.1.2 Interim Engineering Fee 2
3.1.3 Final Engineering Fee 3
3.2 Municipal Infrastructure Schedules (Subdivision Agreement) 4
3.3 Municipal Infrastructure Schedules (Development/Site Plan Agreement) 5
3.4 Engineering Submissions for Municipal Infrastructure 6
3.4.0 First Engineering Submission 6
3.4.1 Second Engineering Submission 7
3.4.2 Interim Engineering Submission 8
3.4.3 Final Engineering Submission 8
Appendix A: Schedule ‘G’ Format 9
Appendix B: Engineering Submission Letter Templates 10
Consultant Letter of Retention (Sample Letter) 10
Geotechnical Engineers' Letter of Retention (Sample Letter) 11
Indemnification Letter and Undertaking - Sample 12
Ontario Land Surveyors Certification Re: Final M-Plan (Sample Letter) 14
Appendix C: Terms of Reference 15
Utility Plan (Terms of Reference) 15
Storm Design Template Reference 15
Appendix D: Title Block Template 16

3.0 Introduction

The purpose of this section is to outline the general engineering submission requirements for municipal infrastructure works to support a development applications including Plans of Subdivision, Rezoning, Lifting of the “H” Holding Zone, Site Plan and Consent applications.

These municipal infrastructure works are contained within schedules of a Subdivision Agreement, Development Agreement or Site Plan Agreement.

Standard templates for these agreements can be obtained from the Planning and Building Department.

3.1 Engineering Fees

City of Mississauga (City) Engineering Fees are calculated in accordance with the current City Fees and Charges By-law provided on the City's website under "Fees and Charges By-law: Schedule C 1 Planning Act Processing Fees".

City Engineering Fees are to be paid to the Development Engineering & Construction Permits Administration Services located at 3185 Mavis Road, Mississauga, Ontario, L5C 1T7.

All City Engineering Fees are to be submitted by certified cheque, bank draft or money order along with the accompanying security form. All cheques are to be made out to the City of Mississauga

Region of Peel Engineering Fees are to be paid directly to the Region of Peel. For the Region's portion of engineering fees, please contact the Development Services Section of the Public Works Department at planninginfo@peelregion.ca

3.1.0 Total Engineering Fee

The Total Engineering Fee is a requirement prior to finalizing the Municipal Infrastructure Schedules of the Agreement. This fee is calculated in accordance with the Current Fees and Charges By-law noted above. To calculate the City's Total Engineering Fee, the total cost of all servicing works is used to determine the fee bracket. Once the fee bracket is determined, the Total Engineering Fee is a percentage of the City's portion of the servicing works or a minimum of, based on the fee bracket. The Preliminary Engineering Fee is credited towards this fee.

3.1.1 Preliminary Engineering Fee

A Preliminary Engineering Fee of $1,500.00 must be paid prior to review and circulation of the First Engineering Submission. This non-refundable fee will be credited towards the Total Engineering Fee required for the municipal infrastructure works and is payable online via the City's eStore.

3.1.2 Interim Engineering Fee

An Interim Engineering Fee is a requirement of an Interim Engineering Submission (when applicable). This fee is calculated in accordance with the Current Fees and Charges By-law noted above. This non-refundable fee is not credited towards the Total Engineering Fee required for the municipal infrastructure works.

3.1.3 Final Engineering Fee

A Final Engineering Fee is a requirement of a Final Engineering Submission. This fee is calculated in accordance with the Current Fees and Charges By-law noted above as the Total Engineering Fee minus the Preliminary Engineering Fee.

3.2 Municipal Infrastructure Schedules (Subdivision Agreement)

- **SCHEDULE "D"– Works and Servicing**
  Servicing works and additional terms, provisions, conditions and notes for the municipal infrastructure are placed in this schedule.

- **SCHEDULE "D-1" – Drawings, Plans and Specifications of the Engineering Works**
  List of survey and engineering plans that are applicable to the municipal works.

- **SCHEDULE "D-2" – Drawings, Plans and Specifications of the Landscaping Works**
  List of survey and landscape plans that are applicable to the municipal works.

  SCHEDULE "D-3" – Timing of Municipal Infrastructure
  The Owner agrees to complete the engineering works as listed in Schedule "G", in accordance with the timing provisions outlined in Schedule "D-3" of this Agreement. Any extension of these completion dates is to be approved by the Development Engineering & Construction Section and/or the Regional Commissioner of Public Works.

- **SCHEDULE "D-4" – Land Dedications, Easements and Conveyances**
  Land dedications, easements and conveyances required for the development.

- **SCHEDULE "D-5" – Development Charge Credits**

- **SCHEDULE "E"– Region of Peel Conditions (Subdivision Agreement)**
  The Owner is to consult with the Region of Peel for inclusion of their conditions within this schedule.

- **SCHEDULE "G"– Cost Estimate/Securities**
  The cost of all municipal infrastructure works, including cash contributions, is to be included in this schedule. Detailed cost estimates must be prepared using the City's online tool. Refer to Appendix A for a copy of the City's Schedule G Estimate Tool Manual.

3.3 Municipal Infrastructure Schedules (Development/Site Plan Agreement)

- **SCHEDULE "D"– Municipal Infrastructure**
  Servicing works and additional terms, provisions, conditions and notes for the municipal infrastructure are placed in this schedule.

- **SCHEDULE "D-1" – Drawings, Plans and Specifications of the Municipal Infrastructure Works**
  List of survey, engineering and landscape plans that are applicable to the development.

- **SCHEDULE "D-2" – Financial Contributions of the City and the Region to the Municipal Infrastructure Works**
  Details of the participation, if any, of the City and/or Region with respect to the financing of
  the Works, are shown in this schedule of the Agreement.

- **SCHEDULE "D-3" – Timing of the Municipal Infrastructure Works**
  The Owner agrees to complete the engineering works as listed in Schedule "G", in accordance with the timing provisions outlined in Schedule "D-3"/"C-3" of this Agreement. Any extension of these completion dates is to be approved by the Development Engineering & Construction Section and/or the Regional Commissioner of Public Works.

- **SCHEDULE "D-4" – Land Dedication and Conveyances**
  Land dedications and conveyances required for the development.

- **SCHEDULE "E"– Region Conditions**
  The Owner is to consult with the Region of Peel for inclusion of their conditions within this schedule.

- **SCHEDULE "G"– Cost Estimate/Securities**
  The cost of all municipal infrastructure works, including cash contributions, is to be included in this schedule. Detailed cost estimates must be prepared using the City's online tool. Refer to Appendix A for a copy of the City's Schedule G Estimate Tool Manual.

3.4 Engineering Submissions for Municipal Infrastructure

All engineering submissions are to be submitted to the City/Region via eplans portal unless otherwise directed by City review staff/ Planning department.

Schedules are to be legal size paper, drawings for all submissions shall be pdf size ARCH A-E and placed in numerical order. The title block shall follow the City's title block template requirements (Refer to Appendix D). Each sheet in the submission set shall be stamped with the cycle number and date of submission.

3.4.0 First Engineering Submission

PRIOR TO THE FIRST ENGINEERING SUBMISSION, PLEASE CONTACT DEVELOPMENT ENGINEERING & CONSTRUCTION SECTION TO ARRANGE A MEETING (IF NECESSARY) TO REVIEW THE FIRST ENGINEERING SUBMISSION REQUIREMENTS IN DETAIL. PLEASE ENSURE ALL ITEMS IDENTIFIED IN THE ENGINEERING SUBMISSION CHECKLIST ARE UPLOADED TO EPLANS.

The following material is typically required for the First Engineering Submission (via eplans):

- Reference Plans
- General Above Ground Services Plan
- General Underground Services Plan
- Storm Drainage Plans
- Storm Sewer Design Sheets
- Stormwater Management Report
- Stormwater Management Facility design drawings (e.g. facility design, planting plans, Operation & Maintenance Manual, etc.)
- Plan and Profile Drawings
- Miscellaneous and Special Detail Drawings (i.e. detailed drawings for outlets and watercourse improvements)
- Grading Plans
- Pavement Marking Plan
- Signage Plan
- Utility Plan
- Streetscape/Landscape Plans
- Geotechnical Soils Report
- Hydrogeological Report
- Phase One Environmental Site Assessment

- Traffic Impact Study
- Draft Agreement Schedules
- Noise Report
- Streetlight and Public Service Network Plans
- Proposed Plan for Registration (M-Plan)
- Tree Survey Plan
- Arborist Report
- Detailed Drawings for Outlets and Watercourse Improvements

(1) A Letter of Retention from the Consulting Engineer stating that they have been engaged for the design and complete general construction supervision of all municipal services (Refer to Appendix B).

(2) A Letter of Retention from the Geotechnical Engineer stating that they have been retained to supervise, in total, the installation of bedding and the backfilling of all trenches within road allowances and easements, and to certify to the Owner and the City that they have supervised the backfilling operations, carried out sufficient tests to obtain a representative report as to the compaction of the backfill and that they find the backfill installation to be in compliance with the City's specifications (Refer to Appendix B).

(3) Proof of payment (receipt) of the Preliminary Engineering Fee from the City.

➢ **For Draft Plans of Subdivisions, please also include the following material:**

(4) A letter from the Ontario Land Surveyor confirming that the Development and Design Division of the Planning and Building Department is in receipt of the proposed plan for registration (M-Plan).

3.4.1 Second Engineering Submission

The following material is required for the Second Engineering Submission (via eplans):

(1) Revised Engineering Submission Materials.
(2) A response matrix explaining how each outstanding comment has been addressed.
(3) Completed Form SW1 (for storm sewers) and/or SW2 (for stormwater facilities) for City's records in regard to Consolidated Linear Infrastructure Environmental Compliance Approval.
(4) If approvals from External Agencies are required, Development Engineering & Construction Section will forward the required review material to the appropriate authorities.

- **PLEASE BE ADVISED THAT THE CITY WILL NOT CIRCULATE TO PUCC UNTIL THE CITY IS SATISFIED WITH THE ENGINEERING AND OR STREETSCAPE PLANS**

SUBMISSION PLANS. PRIOR TO THE SECOND ENGINEERING SUBMISSION, PLEASE CONTACT DEVELOPMENT ENGINEERING & CONSTRUCTION SECTION PRIOR TO PREPARING THE PUCC PACKAGE FOR THIS COMFIRMATION AND SUBMISSION REQUIREMENTS.

3.4.2 Interim Engineering Submission

An Interim Engineering Submission is required when the current submission does not meet the City's requirements per 3.4.1.1. This includes but is not limited to: lack of submission material for review, missing information, major outstanding conditions that have not been addressed, improperly submitted material or major design changes.

(1) Provide all outstanding/revised materials per arrangements with Development Engineering & Construction.
(2) Proof of payment of the Interim Engineering Submission Fee from the City.

3.4.3 Final Engineering Submission

The following material is required for the Final Engineering Submission:

(1) An original Letter of Credit or Surety Bond for the approved securities as per Schedule "G" of the Agreement.
(2) Proof of payment from the City for (a) the Final Engineering Fee and, (b) any required cash contributions.
(3) Certificate of Insurance as per Article 'IV' or 'V' of the Agreement.
(4) Written confirmation from the Region of Peel that includes a final approval letter for municipal works and payment confirmation of required Regional cash contributions and Region Engineering Fees.
(5) The Owner must submit evidence, in writing, to the Development Engineering & Construction Section that arrangements have been made with the Telecommunication and Hydro providers for the installation of their cables in a common trench in the prescribed locations on road allowances.
(6) The Owner must submit evidence, in writing, to the Development Engineering & Construction Section that satisfactory arrangements have been made with the City's Streetlighting team and Alectra Mississauga for the installation of streetlighting.
(7) C-Plans for design and as-constructed drawings. Note: Please contact Development Engineering & Construction Section for details on C-numbering process.

Appendix A: Schedule ‘G’ Estimate Tool Manual

Schedule G web tool summary walkthrough including detailed sample screen shots.

CITY OF MISSISSAUGA

Schedule G Estimate Tool Manual

Abstract

An instructional guide to utilizing Mississauga's Schedule G Estimate Tool application

Development Engineering

DEVENG@mississauga.ca

Schedule G Estimate Tool

Getting Started

What is the purpose for this tool?

- The tool was designed for applicants submitting development applications for rezoning, subdivision, severance, or site plan file requiring an *“engineering submission”* and cost estimate for municipal works. This requirement is identified in ePlans City staff comments. The application was developed to provide delivery of consistent standardized formatting as outlined in the City’s Development Requirements Manual. Once completed and approved by staff, a PDF produced by the application is to be appended to the development agreement. The development of this application was implemented to assist the applicant and staff reviewers by streamlining and standardizing the review process for all stakeholders.

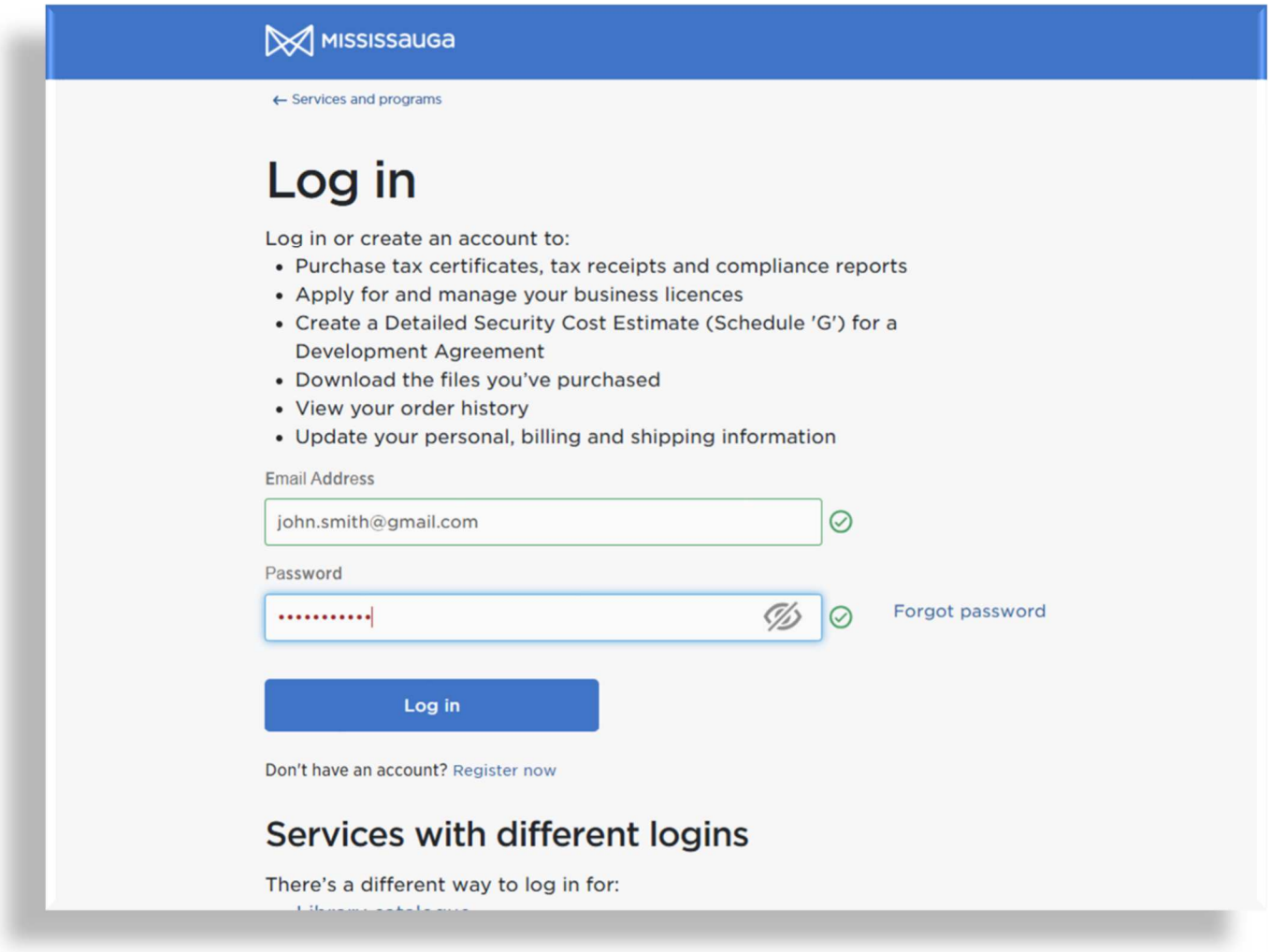
- The *“engineering submission” cost estimate* for municipal works must include a summary page and detailed cost breakdown schedules, which this program will **automatically generate** in the accepted City legal agreement format. The application makes use of formulas, conditional formatting and filters.

- The applicant can log in to the City’s website portal to access the estimate tool application to itemize the securities required for the municipal works associated with the development application.

Contents

Log in....3
Project information & setup page....4
Step 1....4
Step 2....5
Municipal Item list....6
What is the “Municipal Item list” / how does it work?....6
Custom item list....8
Streetscape item list....9
Step 4....10
Detailed Estimate Page....10
Step 5....12
Summary Page....12
Step 6....14
Print Preparation....14
Step 7....14
Printing & Submitting....14
Step 8....15
Agreement Schedules (preparation for ePlans submission)....15
Step 9....16
Dashboard....16
Fees....17

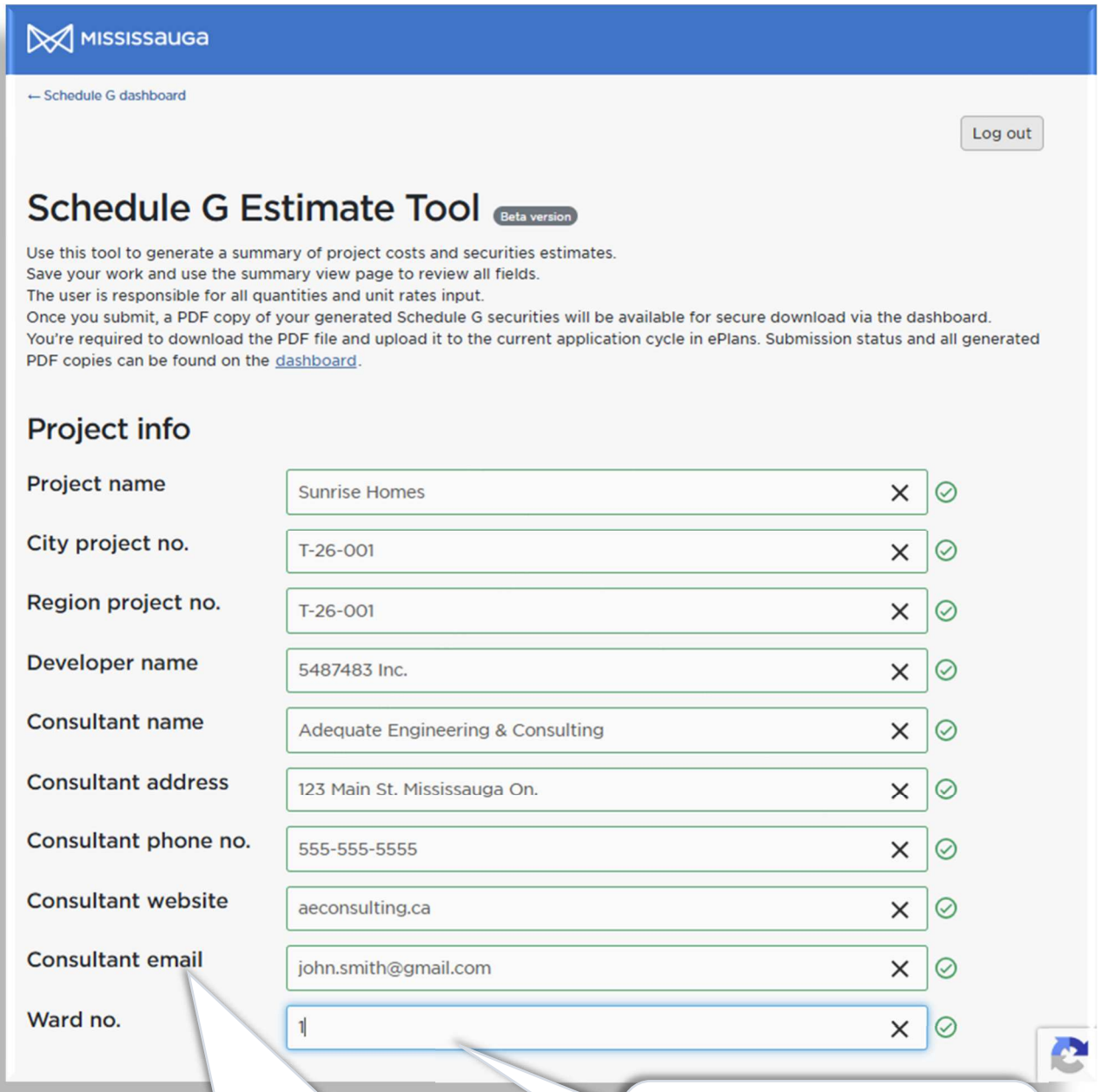
Log in


MISSISSAUGA
← Services and programs
Log in
Log in or create an account to:
• Purchase tax certificates, tax receipts and compliance reports
• Apply for and manage your business licences
• Create a Detailed Security Cost Estimate (Schedule 'G') for a Development Agreement
• Download the files you've purchased
• View your order history
• Update your personal, billing and shipping information
Email Address
john.smith@gmail.com
Password
Forgot password
Log in
Don't have an account? Register now
Services with different logins
There's a different way to log in for:

Project information & setup page

Step 1

User must fill in all required **“Project info”** below and then proceed to **“Project setup”** table on same page. See sample below.



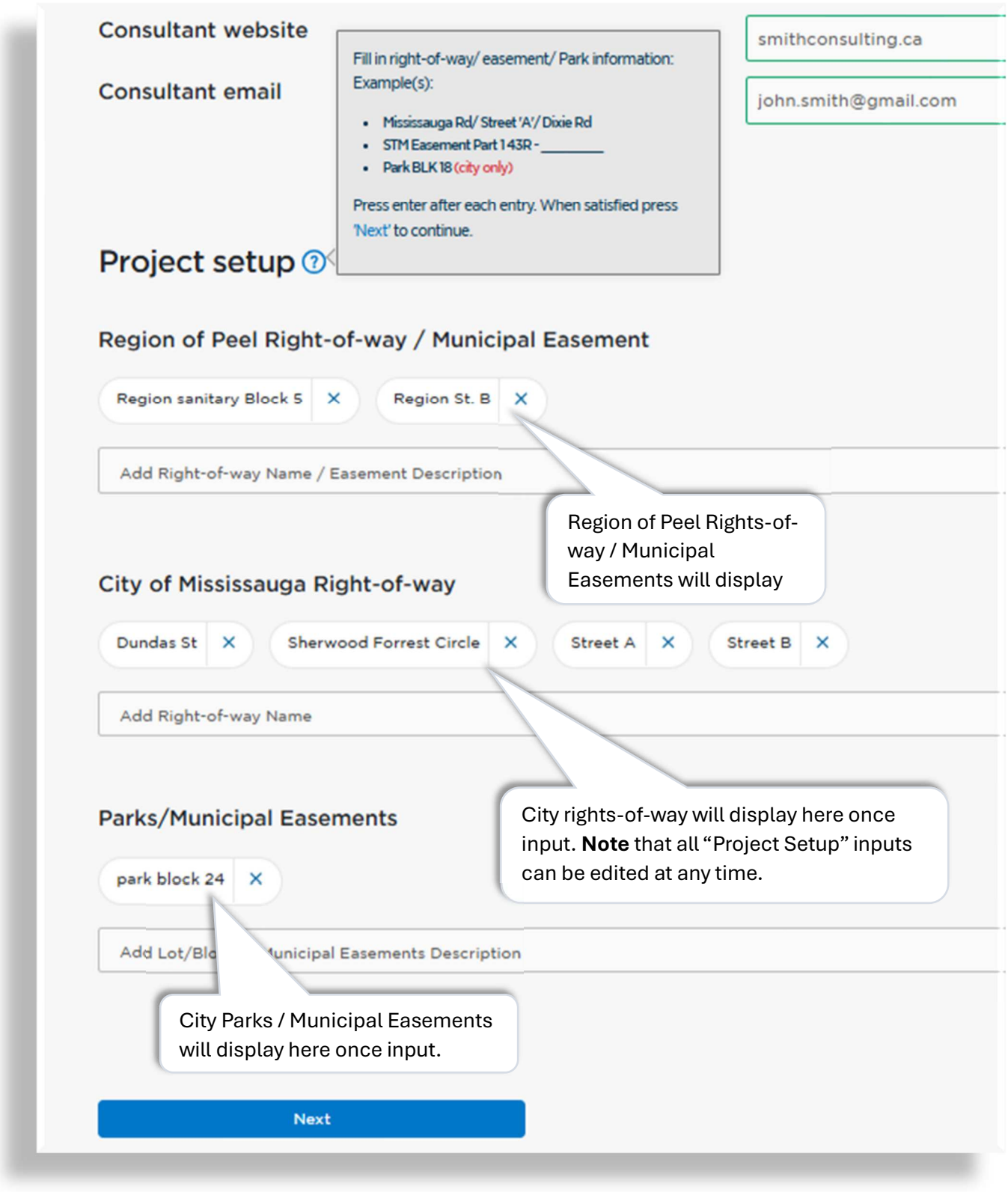
This email will be used for formal submission confirmation correspondence back to the applicant. The City email will also include a link to the application “Dashboard”.

Ward number to be filled out, Project information is promoted to generated detailed estimate headers and footers.

Step 2

User must then fill in **"Project setup"** information table. Note that "Project Info" and "Project Setup" can be edited at any point in cycle 1, before the cost estimate is submitted for review by city staff.

When completed, press "Next" which will take you the **"Municipal Item Index"** page.



Step 3

Municipal Item list

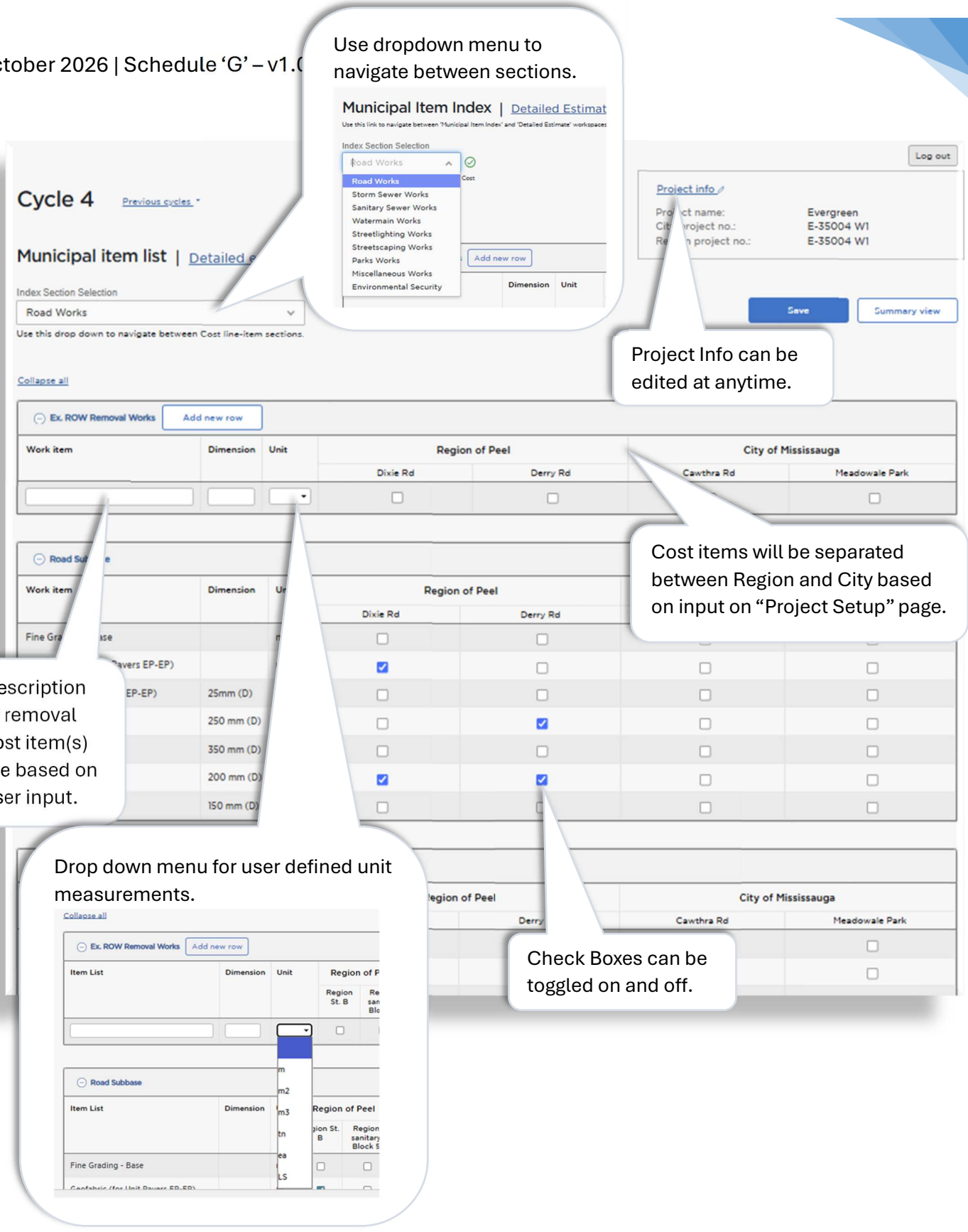
What is the "Municipal Item list" / how does it work?

- The "Municipal Item list" illustrates common servicing construction contract line items down the left side of the worksheet, users select the items relative to Right -of-way (ROW) names covered in the **"Project Setup"** section, which are now populated across the top of the Items List
    - The items list of Municipal Infrastructure contract line items have been grouped into categories under the **"Index Section Selection"** box for easy reference:
        - Road Works
        - Storm Sewer Works
        - Sanitary Sewer Works
        - Watermain Works
        - Streetlighting Works
        - Streetscaping Works
        - Parks Works
        - Environmental Security
        - Miscellaneous Works
    - Many categories include subcategories which further divide and group the line items
    - The items included in the application cover a very broad spectrum of standard construction works and includes space for both user defined line items and the ability to add items should the user find it necessary to do so.
        - Users are encouraged to confirm all necessary items are selected ahead of proceeding to complete the Unit Rates and Quantities input of each of the applicable detailed estimate tabs.

Fill in all applicable **"Municipal Item list"** checkboxes. See sample below.
See instructions for "custom" items below.
Refer to notes on page for navigation assistance.

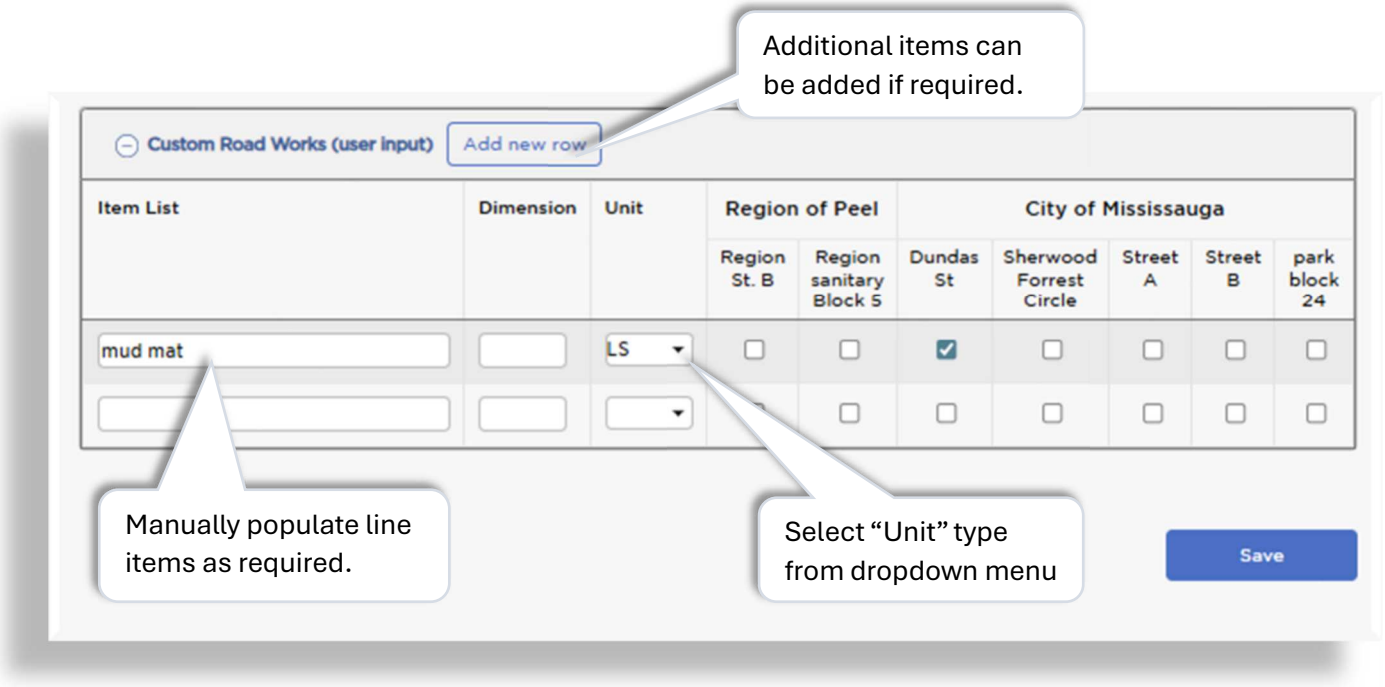
Applicant should use the **"Save"** button function when navigating between sections and pages. Note: the refresh/reload function may need to be used on occasions when input data appears to be missing.

Once all applicable items have been checked, navigate to the **"Detailed Estimate"** page. Selected items for each ROW/Easement/Park are automatically added to the corresponding detailed estimate(s) of those individual ROW/Easement/Park.


Use dropdown menu to navigate between sections.
Municipal Item Index | Detailed Estimat
Index Section Selection
Road Works
Road Works
Storm Sewer Works
Sanitary Sewer Works
Watermain Works
Streetlighting Works
Streetscaping Works
Parks Works
Miscellaneous Works
Environmental Security
Cycle 4
Previous cycles
Municipal item list | Detailed e
Index Section Selection
Road Works
Use this drop down to navigate between Cost line-item sections.
Log out
Project info
Project name: Evergreen
City project no.: E-35004 W1
Region project no.: E-35004 W1
Save
Summary view
Project Info can be edited at anytime.
Collapse all
Ex. ROW Removal Works
Add new row
Work item
Dimension
Unit
Region of Peel
Dixie Rd
Derry Rd
City of Mississauga
Cawthra Rd
Meadowale Park
Cost items will be separated between Region and City based on input on “Project Setup” page.
Description of removal cost item(s) are based on user input.
Fine Grading - Base
Geofabric (for Unit Pavers EP-EP)
25mm (D)
250 mm (D)
350 mm (D)
200 mm (D)
150 mm (D)
Check Boxes can be toggled on and off.
Drop down menu for user defined unit measurements.
Item List
Road Subbase
m
m2
m3
tn
ea
LS

Custom item list

NOTE: User has option to include custom item(s) for each section of works that do not appear on pre-populated item list. Custom table is found at bottom of section page.
When all items have been checked press **“Save”** and proceed to the **“Detailed Estimate”** page.



Streetscape item list

NOTE: This table has an additional feature that further automatically defines associated items (Linked Works) for the 5 unique streetscape conditions ‘A’ through ‘E’ shown on the table below. Once the user completes the checkbox selection process, all the “Linked Works” cost items will automatically be carried over to the detailed estimate page.

Once the user selects the proposed streetscape treatment design (A to E), the “Linked Works Matrix” will automatically populate the following tables as shown below.

Collapse all

Street Tree Corridors

Item List	Dimension	Unit	City of Mississauga				
			Dundas St	Sherwood Forrest Circle	Street A	Street B	park block 24
A | Street Tree Corridor - Soil Cells (02950-24)			☑	☐	☐	☐	☐
B | Street Tree Corridor - Trees in Sod			☐	☑	☐	☐	☐
C | Street Tree Corridor - Trees in Planter			☐	☐	☑	☐	☐
D | Street Tree Corridor - Trees in Planter Linked (Soil Cells)			☐	☐	☐	☑	☐
E | Boulevard - No Trees			☐	☐	☐	☐	☑

Street Tree Corridor - Linked Works Matrix

Item List	Dimension	Unit	City of Mississauga				
			Dundas St	Sherwood Forrest Circle	Street A	Street B	park block 24
Decidulous Tree - 60mm		ea	A	B	C	D	
Subdrain Installation incl. geofabric and connections		m	A	B	C	D	
Connection to CB		ea	A	B	C	D	
Connection to STM pipe		ea	A	B	C	D	
Granular ‘A’ layer (150mm depth, paving granular base inc)		m²	A		C	D	
Unit paving (SPEC PAVER) x80mm (incl. bedding and jointing sand)		m²	A		C	D	

Step 4

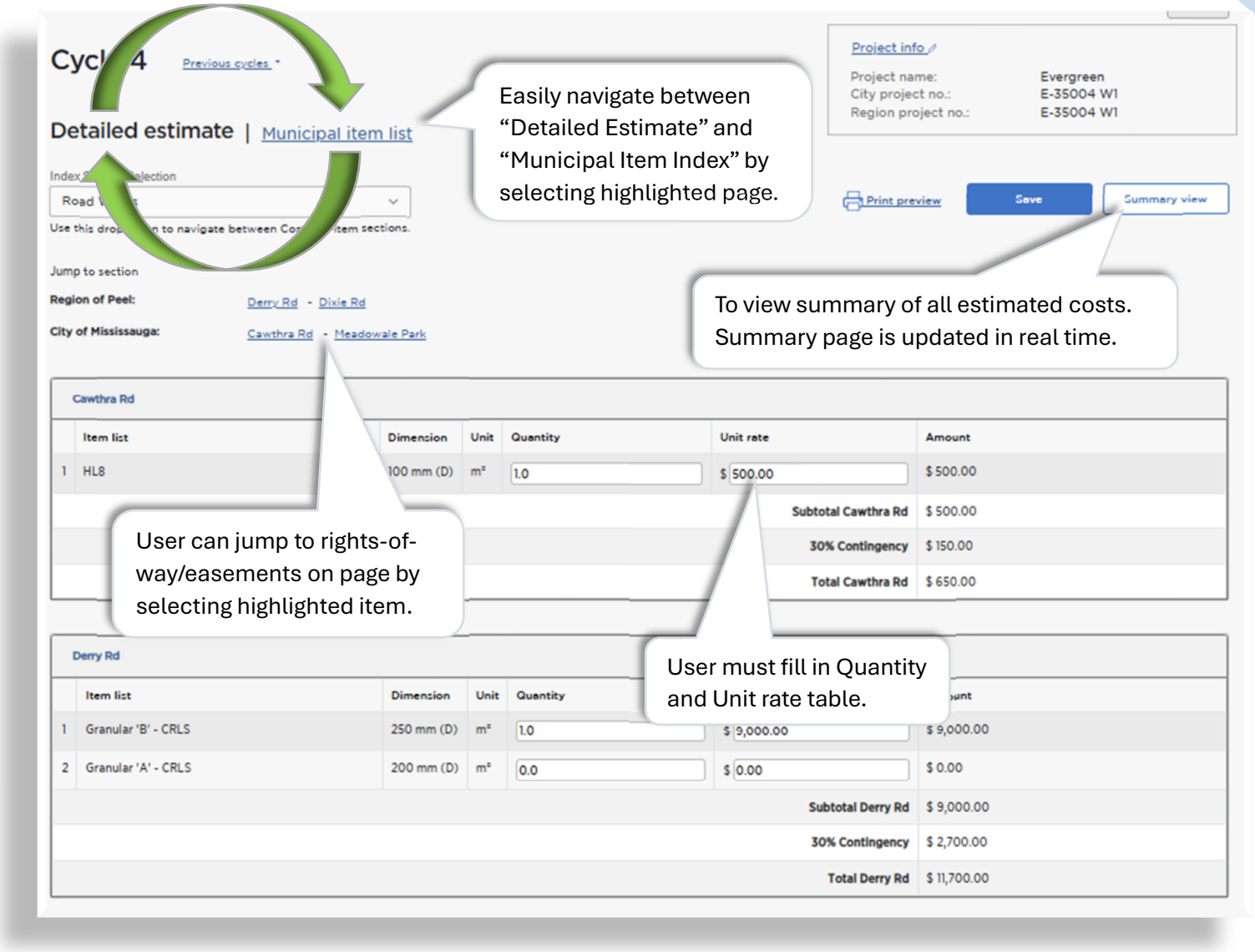
Detailed Estimate Page

User must fill in “Quantity” and “Unit rate” for each item.

User can navigate to other sections anytime by using the **“Index Section Selection”** box. Ie “Storm sewer works” “watermain works” …etc. Use the “Save” button function when navigating between sections and pages.

User can also navigate back to **“Municipal Item list”** at any time to revise/delete input data. Use “Save” function often when navigating to different sections or pages in application.

NOTE: Total amounts including contingency are automatically tabulated on detailed estimate and carried forward to “Summary” page. To view summary of estimated costs, press **“Summary preview”** button at any time as shown in the sample below.



Cawthra Rd

	Item list	Dimension	Unit	Quantity	Unit rate	Amount
1	HL8	100 mm (D)	m²	1.0	$ 500.00	$ 500.00
					Subtotal Cawthra Rd	$ 500.00
					30% Contingency	$ 150.00
					Total Cawthra Rd	$ 650.00

Derry Rd

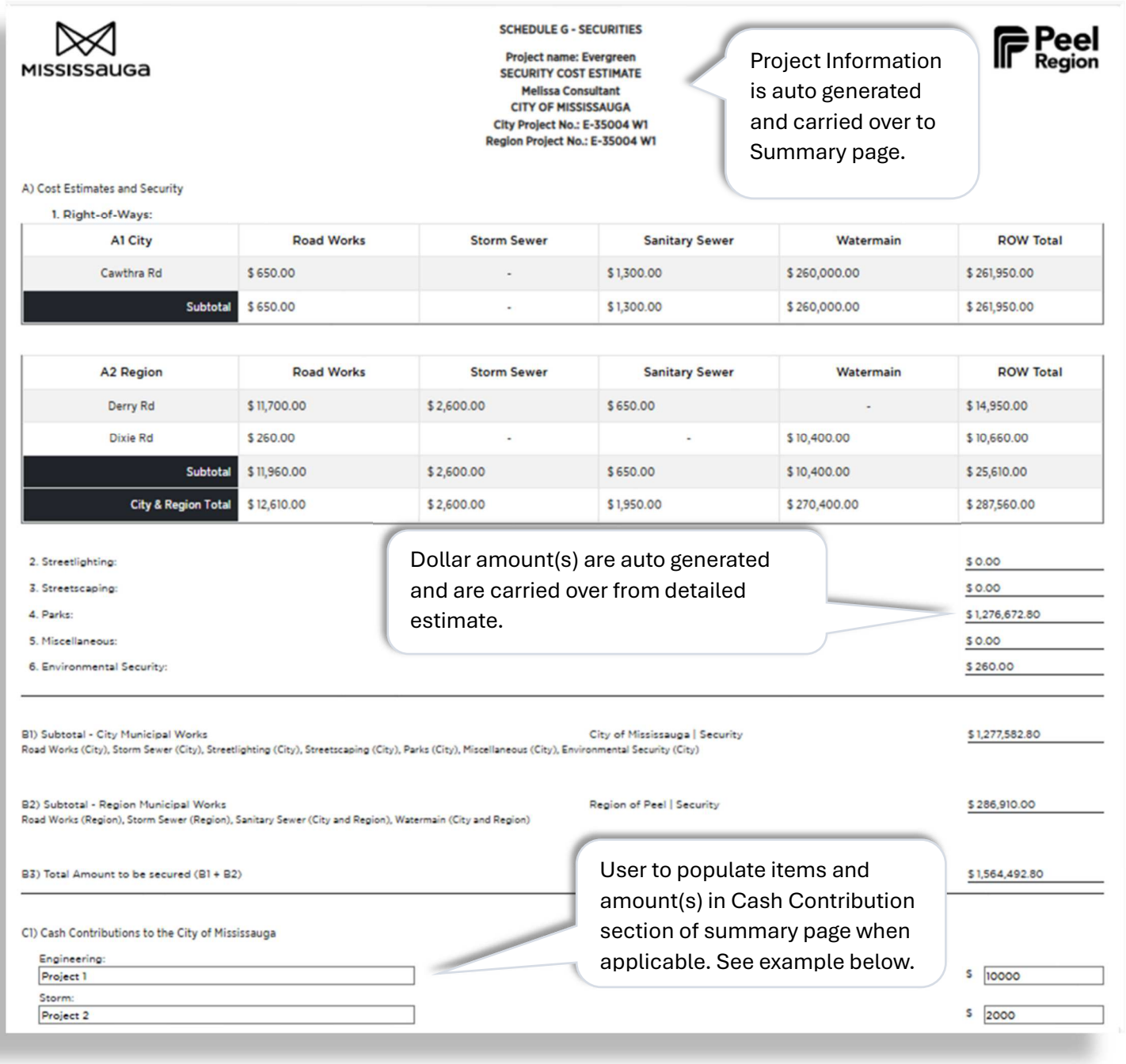
	Item list	Dimension	Unit	Quantity	Unit rate	Amount
1	Granular 'B' - CRLS	250 mm (D)	m²	1.0	$ 9,000.00	$ 9,000.00
2	Granular 'A' - CRLS	200 mm (D)	m²	0.0	$ 0.00	$ 0.00
					Subtotal Derry Rd	$ 9,000.00
					30% Contingency	$ 2,700.00
					Total Derry Rd	$ 11,700.00

Step 5

Summary Page

Note that there is no manual input required or allowed on this page except for the cash contribution amounts (if applicable) at bottom of page.

User has options to print to pdf, close the page or submit finished estimate to the City.



MISSISSAUGA

SCHEDULE G - SECURITIES

Project name: Evergreen
SECURITY COST ESTIMATE
Melissa Consultant
CITY OF MISSISSAUGA
City Project No.: E-35004 W1
Region Project No.: E-35004 W1

Peel Region

Project Information is auto generated and carried over to Summary page.

A) Cost Estimates and Security

1. Right-of-Ways:

A1 City	Road Works	Storm Sewer	Sanitary Sewer	Watermain	ROW Total
Cawthra Rd	$ 650.00	-	$ 1,300.00	$ 260,000.00	$ 261,950.00
Subtotal	$ 650.00	-	$ 1,300.00	$ 260,000.00	$ 261,950.00

A2 Region	Road Works	Storm Sewer	Sanitary Sewer	Watermain	ROW Total
Derry Rd	$ 11,700.00	$ 2,600.00	$ 650.00	-	$ 14,950.00
Dixie Rd	$ 260.00	-	-	$ 10,400.00	$ 10,660.00
Subtotal	$ 11,960.00	$ 2,600.00	$ 650.00	$ 10,400.00	$ 25,610.00
City & Region Total	$ 12,610.00	$ 2,600.00	$ 1,950.00	$ 270,400.00	$ 287,560.00

Dollar amount(s) are auto generated and are carried over from detailed estimate.

2. Streetlighting:	$ 0.00
3. Streetscaping:	$ 0.00
4. Parks:	$ 1,276,672.80
5. Miscellaneous:	$ 0.00
6. Environmental Security:	$ 260.00

B1) Subtotal - City Municipal Works — City of Mississauga | Security — $ 1,277,582.80
Road Works (City), Storm Sewer (City), Streetlighting (City), Streetscaping (City), Parks (City), Miscellaneous (City), Environmental Security (City)

B2) Subtotal - Region Municipal Works — Region of Peel | Security — $ 286,910.00
Road Works (Region), Storm Sewer (Region), Sanitary Sewer (City and Region), Watermain (City and Region)

B3) Total Amount to be secured (B1 + B2) — $ 1,564,492.80

User to populate items and amount(s) in Cash Contribution section of summary page when applicable. See example below.

C1) Cash Contributions to the City of Mississauga

Engineering: Project 1	$ 10000
Storm: Project 2	$ 2000

User to input description of cash contribution and dollar amount as required.

B3) Total Amount to be secured (B1 + B2) $1,564,492.80

C1) Cash Contributions to the City of Mississauga

Engineering: Project 1	$	10000
Storm: Project 2	$	2000
Environmental: Project 3	$	3000
Traffic:	$	0
Subtotal	$	15,000.00
Parks:	$	0
Forestry:	$	0
Urban Design:	$	0
Subtotal	$	0.00
Bus Rapid Transit (BRT)	$	0
Subtotal	$	0.00
Total cash contribution for City of Mississauga	$	15,000.00

C2) Cash Contributions to the Region of Peel

Cash Contrib	$	10000
Subtotal	$	10,000.00
Total cash contribution for for Region of Peel	$	10,000.00

Disclaimer

If the above security is not sufficient to rectify any default, the City may recover from the Owner all costs and expenses incurred by the City, whether directly or indirectly, with respect to the default or the remedy thereof.

Note: The estimates contained in this Schedule are for information purposes only, and shall not restrict the rights of the City, as set out in this Agreement, to draw on the security up to the full remaining balance thereof, to rectify any default, nor to require any increase in said security.

Step 6

Print Preparation

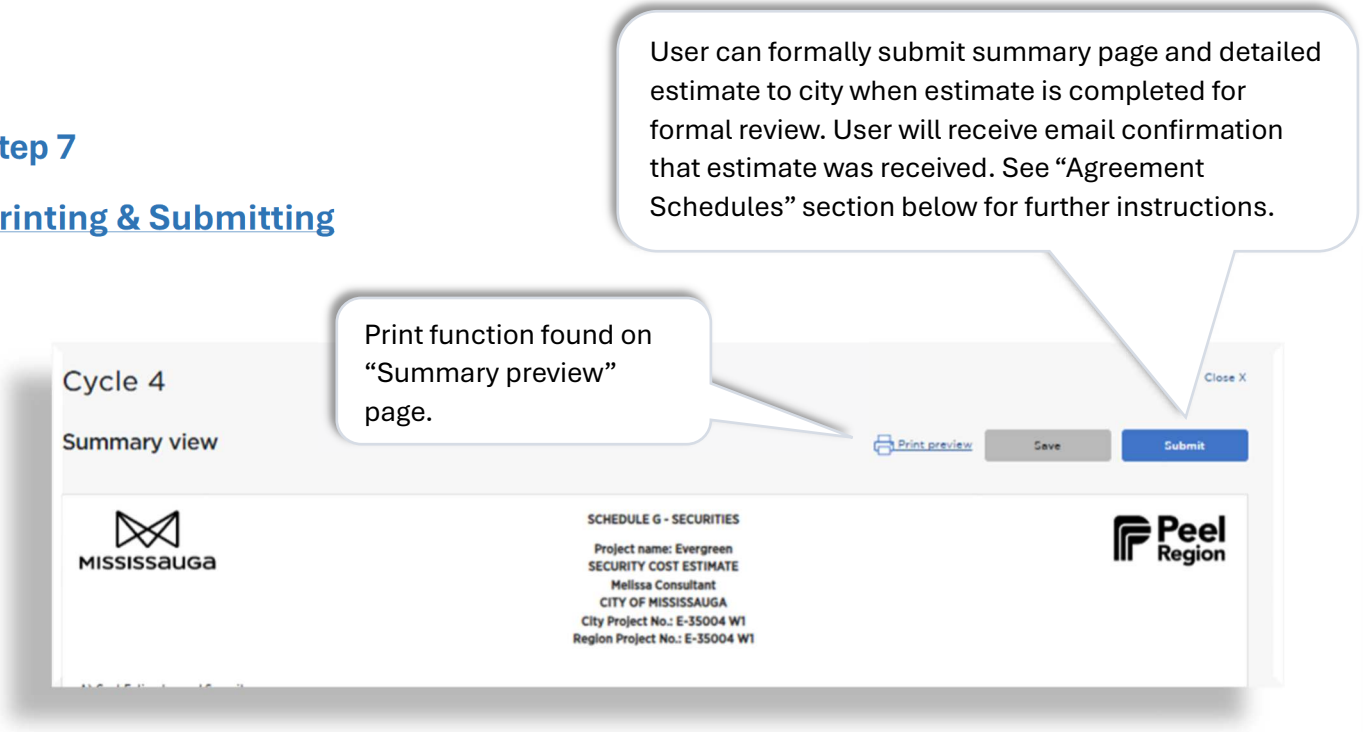
User is encouraged to fully review the item selections and confirm they are satisfied. Following which, users are encouraged to review and audit their quantity and unit rate inputs and audit the calculations, sub-totals and totals and confirm they are satisfied.

a. Any anomalies or calculation errors need to be communicated to the City so we can assist in resolution ahead of upload to ePlans.

Please save your file often and keep a copy of the completed Schedule G Detailed Cost Estimate document containing your input data, as you may need to revise input data based on staff comments throughout future ePlans cycles of the application review process.

Step 7

Printing & Submitting



Note: Please ensure when assembling all the schedules that will be appended to the legal agreement the order of appearance must follow the list as shown below.

Step 8

Agreement Schedules (preparation for ePlans submission)

1. Schedules ‘A” to “F” inclusive, then;
2. *Summary* Schedule ‘G’
   Detailed estimate as applicable
   a. *Roads (City ROW)*
   b. *Storm (City ROW)*
   c. *Streetlighting (City)*
   d. *Miscellaneous (City)*
   e. *Roads (Region ROW)*
   f. *Storm (Region ROW)*
   g. *Sanitary (Region ROW)*
   h. *Sanitary (City ROW)*
   i. *Watermain (Region ROW)*
   j. *Watermain (City ROW)*
   k. *Streetscape City*
   l. *Parks City*
   m. *Environmental*
3. Remaining Schedules as applicable

- Combine “Summary” sheet followed by individual Schedule ‘G’ PDF pages into one document. The “Summary page” and “Detailed Cost Estimate” sheets are to be printed to PDF for Schedule G of the agreement.

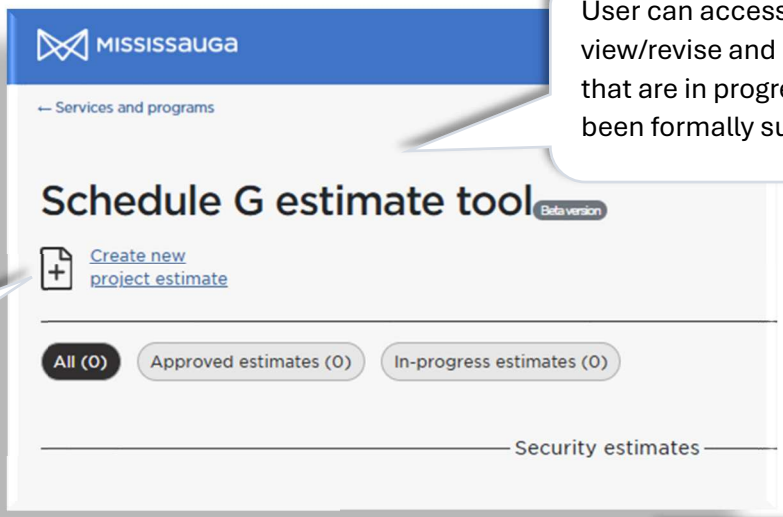
- The draft Legal agreement must include the following schedules in order (1 through 12 as shown above when engineering submission is required).

- Upon final approval of cost estimate from City and Region staff (if applicable), the user is to upload the final version of the populated estimate document as well as the draft agreement containing the completed Schedule ‘G’ PDF to ePlans for staff review.

Step 9

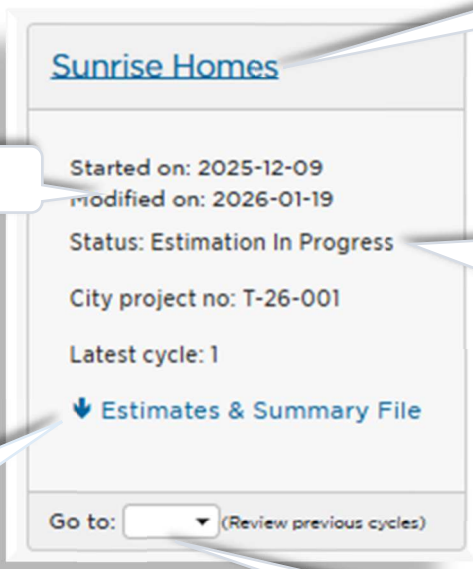
Dashboard

User can review status of files and access or review any development file application that they have submitted or currently working on.
There are several functions the user has access to, as noted below.



User can access the dashboard portal to view/revise and download cost estimate files that are in progress or review files that have been formally submitted/approved.

User can create new file at any time.



Open link to existing file.

Date stamp

Status will read “Estimation in Progress”, “Estimation Submitted” or “Estimation Approved”.

Download available under “Estimation Submitted”

User can access previous submission cycle information as needed.

Fees

Details below are for information only and are not part of this application. Contact reviewers responsible for fee submission process for directions.

1) Transportation & Works "Engineering Fee" (City)

Amount of "engineering fee" required is to be confirmed by the Development Engineering reviewer.

- This fee is based on the City of Mississauga 2026 "Fees and Charges" bylaw that can be viewed at:

https://www.mississauga.ca/wp-content/uploads/2026/01/05114007/Schedule-C-1-Planning-Act-Processing-Fees-Applications.pdf

Note: If applicant has paid a preliminary engineering fee, the amount will be deducted from the total amount payable (City).

2) "Streetscape" Processing fee (City)

Amount of "processing fee" required for streetscape is to be confirmed by the Planning Dept. reviewer.

- This fee is based on the City of Mississauga 2026 "Fees and Charges" bylaw that can be viewed at:

https://www.mississauga.ca/wp-content/uploads/2026/04/17082245/Schedule-D-Parks-Forestry-and-Environment-Fees-and-Charges.pdf

3) Region of Peel "Engineering Fee"

Amount of engineering fees required is to be confirmed by the Region of Peel reviewer.

The applicant/ applicant's representative is responsible for ensuring the accuracy of all figures within the completed Schedule 'G' estimate document. Please contact the City's Development Engineering reviewer if you require assistance.

Appendix B: Engineering Submission Letter Templates

Consultant Letter of Retention (Sample Letter)

(Company Letterhead)

(Engineering Firm)

Date:

File: _____ (Ward __)

City of Mississauga
Development Engineering & Construction
300 City Centre Drive, 8th Floor
Mississauga, Ontario, L5B 3C1

Attn.: Development Engineering & Construction (Reviewer)

Re: **LETTER OF RETENTION (CONSULTING ENGINEER)**
(Development Name), Phase __ (*if applicable*)
(Developer Name)
(Municipal Address)

This is to state that our firm has been retained by the Owner for the purpose of carrying out those functions as outlined in Schedule D of the proposed Subdivision / Development / Site Plan Agreement for (File Number: _____) including the full-time supervision of all grading and drainage works.

Sincerely,

(A Professional Engineer with signing authority for the consulting engineering firm)

(Engineer's stamp)

Geotechnical Engineers' Letter of Retention (Sample Letter)

(Company Letterhead)

(Engineering Firm)

Date:

File: _____ (Ward __)

City of Mississauga
Development Engineering & Construction
300 City Centre Drive, 8th Floor
Mississauga, Ontario, L5B 3C1

Attn.: Development Engineering & Construction (Reviewer)

Re: **LETTER OF RETENTION (GEOTECHNICAL ENGINEER)**
(Development Name), Phase __ (*if applicable*)
(Developer Name)
(Municipal Address)

This is to state that our firm has been retained by the Owner to supervise, in total, the installation of the bedding and backfilling of all trenches within the road allowances and easements within the above noted Development.

We understand that we are to certify to the Owner and the City that we have carried out sufficient testing to obtain a representative report as to the compaction of the backfill, and that we find the backfill to be in compliance with City Specifications and requirements.

We shall also confirm that final subgrade conditions are equal or better than those anticipated in the preparation of the pavement design.

Sincerely,

(A Professional Engineer with signing authority for the Geotechnical Firm)

(Engineer's stamp)

Indemnification Letter and Undertaking - Sample

(For Pre-servicing Subdivisions)

[Company Letterhead]

Date: _____

File: _____ (Ward __)

The Corporation of the City of Mississauga
Development Engineering & Construction
300 City Centre Drive, 8th Floor
Mississauga, Ontario L5B 3C1

Attn.: Development Engineering & Construction (Reviewer)

Re: **INDEMNIFICATION LETTER AND UNDERTAKING (PRE-SERVICING)**
(Development Name), (Phase __)
(Developer Name)
(Municipal Address)

In consideration of The Corporation of the City of Mississauga (the "City") allowing services to be installed in the proposed subdivision, prior to registration of the plan of subdivision, we as the Owners **[Name of Owner]**, undertake and agree as follows:

1) The Owner acknowledges, agrees and undertakes that by proceeding with these services in advance of registration of a plan of subdivision, the Owner is doing so totally at their own risk.

2) To allow the City, its employees, servants and agents, to enter the lands at all reasonable times and for all reasonable purposes, including and without limiting the generality of the foregoing, for all necessary inspections, and to correct any drainage problems and to correct or eliminate any other nuisance, such as dust, garbage and debris, excavations, old buildings, etc. and the cost incurred by the City in so doing shall be charged to the Owners.

3) To submit a security as required by the Development Engineering & Construction section in the amount of $_____ representing 100% of the value of Schedule G of the Subdivision Agreement.

4) The Owner shall indemnify, defend and hold the City, its elected officials, councillors, employees, contractors, sub-contractors, agents and any other persons for whom the City may be responsible in law (the "Indemnified Persons") harmless from and against any and all direct or indirect damages, incidental damages, and special damages, or any suits, claims, actions and judgements for damages or losses sustained or incurred by other persons, in relation to death, injury or damage to property including without limitation, court costs, arbitration fees, penalties, fines, amounts paid in settlement of claims and legal fees and expenses of investigation ("Losses") as may be incurred or sustained by the Indemnified Persons, or which may be commenced or brought against the Indemnified Persons or which any of them may suffer or become liable for, as result of, or in relation to any matter arising from the City allowing services to be installed in the proposed subdivision prior to registration of the draft plan, the enforcement or non-enforcement of the Owner's obligations hereunder, the condition or state of repair of any and all of the works carried out in accordance with this indemnification letter, or in consequence of any breach of any term, obligation or undertaking of the Owner contained herein.

The Owner hereby absolutely and unconditionally releases the Indemnified Persons from any and all claims, suits, liability or responsibility for any Losses which may now or at any time hereafter be incurred or sustained directly or indirectly by the Owner as a result of, or in connection with, the enforcement or non-enforcement of the terms of this indemnification letter and undertaking or any matter arising under the terms of this indemnification letter and undertaking, including but not limited to any Losses in relation to the design, installation, use, maintenance or repair by the Owner of the works and facilities contemplated hereunder.

5) To fully execute the Subdivision Agreement. Proceed with the development in accordance with the schedules of performance as set out in the Subdivision Agreement and should active development of the land come to a termination, to smooth, grade and seed the site to renew vegetation, and prevent erosion problems, and upon any failure in performing this obligation, to allow the City to enter the lands and carry out the work deemed necessary by the Development Engineering & Construction Section, with the costs incurred by the City to be a charge to the Owners.

6) To allow the City to draw on the cash deposit under clause 3 above for the completion of any works considered necessary by the Development Engineering & Construction Section including those indicated under clauses 2 and 5 and other works such as rectification of drainage problems and clean up of existing roads, upon verbal notification to the consulting engineer. Should the securities be insufficient to cover costs incurred by the City, resulting from action taken to deal with a problem caused by the Owner, any such costs incurred will be added to the property tax roll and may be collected in like manner as municipal taxes.

7) To limit the hours of work associated with the development from 7:00 a.m. to 7:00 p.m. Furthermore, to prohibit work from occurring on Sundays and Statutory Holidays.

8) To require these undertakings and covenants to be assumed by any successor in title, to the effect that the obligations and covenants herein shall be binding upon the executor's administrators, successors and assigns.

9) To acknowledge that references to “Pre-servicing” as relates to this indemnification letter and undertaking shall account only for the preparation and installation of belowground municipal services required to support the proposed subdivision, up to base asphalt or base of curb.

10) To identify ‘Schedule A’ as attached, being a legal description of the subject lands.

Sincerely,

_____

Per:

I have the authority to bind the Corporation.

CONTACT INFORMATION

Name of **OWNER**:

Company: Office Tel: Email:

Name of **ENGINEER**:

Company: Office Tel: Email:

Ontario Land Surveyors Certification Re: Final M-Plan
(Sample Letter)

(Company Letterhead)

(Engineering Firm)

Date:

File: _____ (Ward __)

City of Mississauga
Development Engineering & Construction
300 City Centre Drive, 8th Floor
Mississauga, Ontario, L5B 3C1

Attn.: Development Engineering & Construction (Reviewer)

Re: **OLS CERTIFICATION**
(Development Name), Phase __ (*if applicable*)
(Developer Name)
(Municipal Address)

I hereby certify that the Final M-Plan submitted as part of the Final Engineering Submission has not been changed since the Zoning By-Law came into effect.

Yours Truly,

(The Ontario Land Surveyor who signs the Surveyors Certificate on the M-Plan)

(The OLS Stamp)

NOTE: If the certificate cannot be provided because of changes to Draft M-Plan, then three Draft M-Plans and three sets of lots schedules are to be included with final submission for approval by the Zoning Section of the Building Division of the Planning and Building Department. A letter is to be included from the OLS outlining where the changes on the M-Plan have occurred.

Appendix C: Terms of Reference

Utility Plan (Terms of Reference)

A Utility Plan is to be submitted as part of a complete Development Application (Rezoning / OPA / H-OZ / Site Plan / Draft Plan / Subdivision Agreement / Shoring Excavation and Engineering Clearance, where applicable).

The Utility Plan is to be based on the physical locates of all existing utilities/services within the municipal boulevard along the frontage(s) of the site. The physical locates must be obtained from test pits at reasonable intervals and/or by surface geophysics. A link to the city Utility Plan Terms of Reference can be found HERE.

Storm Design Template Reference

STORM SEWER DESIGN CHART FOR CIRCULAR DRAINS FLOWING FULL

Project Name: < Project Name >
Project Number: < Project Number >
Date: < Month DD, YYYY >

CONC. n = 0.013
PVC n = 0.013
CSP n = 0.024

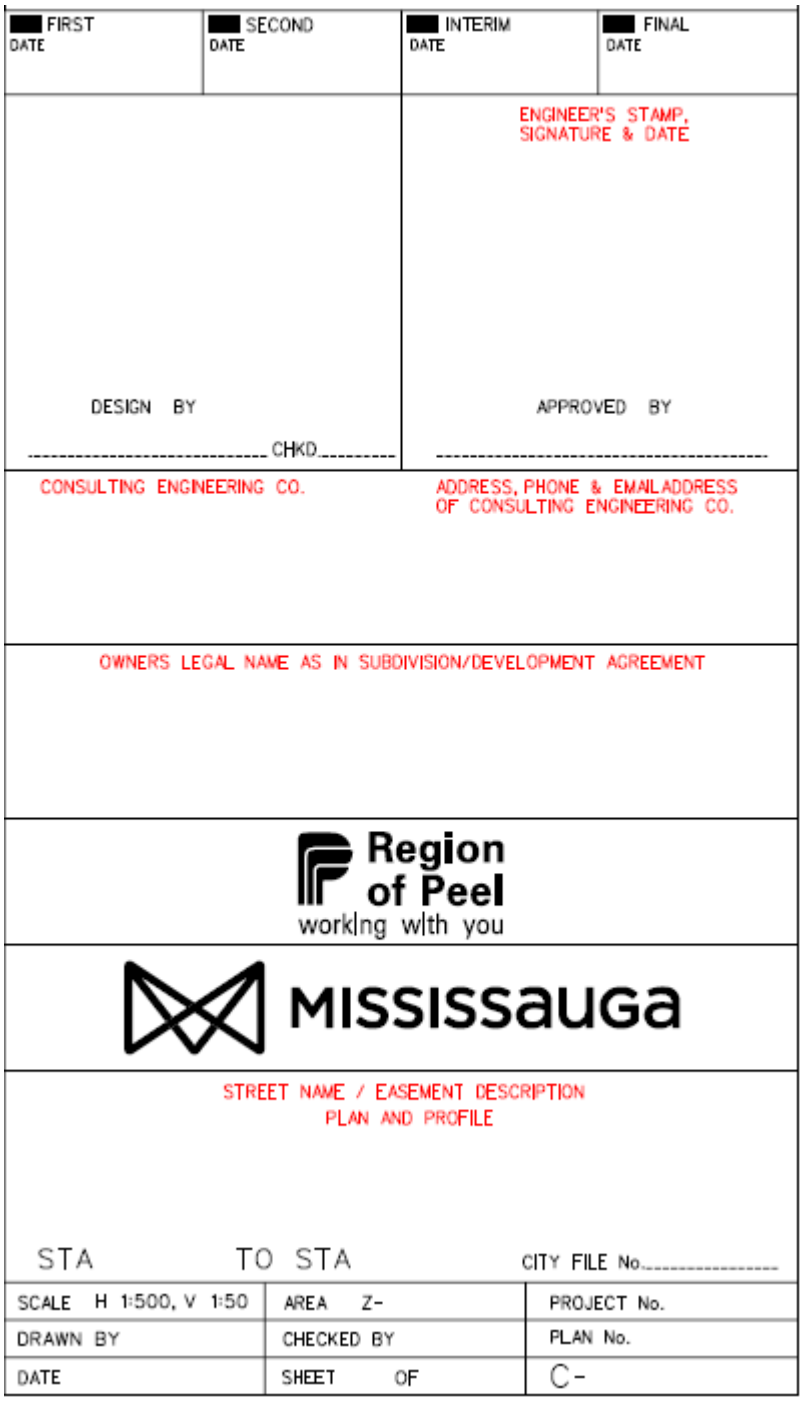
Initial Time of Concentration: 15 min.
IDF: CoM Std. 2111.010

Storm Return Period (years) = 10

MISSISSAUGA

Location								Design Flow - Hydrology						Sewer Parameters - Hydraulics										Sewer Verification		
Catchment Area	Street	From MH	To MH	Sub-Areas for C = 0.90 (ha)	0.65 (ha)	0.20 (ha)	Total (ha)	Runoff C	Indiv. AC (ha)	Accum. AC (ha)	Time of Conc. (min)	Rainfall Intensity I (mm/h)	Peak Flow q (L/s)	Length (m)	Nominal Pipe Diameter (mm)	Actual Pipe Diameter (mm)	Pipe Material	Manning's n	Slope (%)	Pipe Cap. Full Q (L/s)	Velocity V (m/s)	Travel Time (min)	q/Q	Capacity Check	Velocity Check
Street 'B' to Street 'C'																										
C1	Street 'A'						0.00					307.16				--										
C1	Street 'A'						0.00	--				307.16				--										
C1	Street 'A'						0.00	--				307.16				--										
Street 'C' to Street 'D'												307.16				--										
C2	Street 'A'						0.00	--				307.16				--										
C2	Street 'A'						0.00	--				307.16				--										
C2	Street 'A'						0.00	--				307.16				--										
Street 'D' to Street 'E'												307.16				--										
C3	Street 'A'						0.00	--				307.16				--										
C3	Street 'A'						0.00	--				307.16				--										
C3	Street 'A'						0.00	--				307.16				--										

Appendix D: Title Block Template



SECTION 4 –ENGINEERING POLICIES & PROCEDURES

Table of Contents

4.0 Engineering Policy & Procedure Letters 1
4.1 Submission Procedure 2
4.1.0 Standard Grading Certification and Letters 3
4.1.0.0 General 3
4.1.0.1 Sample Certifications 3
4.2 Policy Statements 4
4.2.0 Inspection Consultants 5
4.2.1 Blasting or Tunnelling 5
4.2.2 Construction on Existing Roads 5
4.2.3 Standards & Maintenance 6
4.2.4 Trench Backfilling on Roads 6
4.2.5 Development Winterization 9
4.2.6 Stormwater Management 9
4.2.7 Geotechnical Engineering 9
4.2.8 Policy for Holiday Work by Contractors 11
4.3 Procedures 12
4.3.0 Beginning of Construction 13
4.3.1 Lot Grading and Sodding 13
4.3.2 Block Grading 14
4.3.3 Security Reduction 14
4.3.4 Security Reduction Request 15
4.4 Surveyor Certificate 15
4.5 Easements 16
Appendix 1 – Drawing Certifications 17
Appendix 2A – Sample Security Reduction Letter 24
Appendix 2B – Draft Security Reduction Format 25
Appendix 2C – Statutory Declaration 29

4.0 Engineering Policy & Procedure Letters

This section covers the submission procedures for formal letters, certifications and notices to the City on behalf of the developer lands covered under a development agreement. Examples are provided for reference.

4.1 Submission Procedure

A digital/PDF certified copy of the proposed lot grading plan(s) and one (1) certification letter is required by the Development Engineering & Construction Section of the Planning and Building Department for review and approval prior to the issuance of any building permits.

For sites covered by a development Agreement, the original design Engineering Consultant is responsible for certification of the proposed drawings. The Engineering Consultant is also responsible for the issuance of preliminary and final grading certificates.

The submission for lot grading will require the applicable/certified grading plan which is to contain the following wording:

> *I hereby certify that the proposed grading for the building, appurtenant drainage and storm water management works comply with sound engineering design, and that the proposed grading is in conformity for drainage and relative elevations with the overall grading and drainage plans for this development.*

A Professional Engineers **stamp and signature** is to be applied to the wording on the certified drawing**.**

4.1.0 Standard Grading Certification and Letters

4.1.0.0 General

There are three (3) sample letters for the certification of building and lot grading as required under the City of Mississauga Subdivision and Development agreements, for condominium certification letters see *Section 6 – Condominium Development Requirements*.

4.1.0.1 Sample Certifications

Sample A Drawing Certification – Preliminary Lot/Block Grading (see Appendix 1)

Sample B – Drawing Certification (Stamp) Preliminary Lot/Block Grading Variance (see Appendix 1)

Sample Letter C – Final Lot/Block Grading Certification Letter (see Appendix 1)

Sample Letter D - Final Lot/Block Grading Variance Certification Letter (see Appendix 1)

Sample Letter E – Retaining Wall Certification Letter (see Appendix 1)

Sample Letter F – Servicing Works Certification Letter (see Appendix 1)

Sample Letter G – Subgrade Certification Letter (see Appendix 1)

Sample Letter H – Road Construction and Municipal Site Servicing Certification Letter (see Appendix 1)

4.2 Policy Statements

4.2.0 Inspection Consultants

Prior to the preconstruction meeting, Development Construction will require the site contact information from the Civil Consultant and Geotechnical Consultants.

The Consultant must have their own site representative on site during any grading and/or construction works.

The Geotechnical Consultant must ensure that OPSS 514.07.08 regarding backfilling and compaction within road allowances and lots where fill exceeds 1.0m in thickness is strictly adhered to. The Geo-technical Consultant's certification must make reference to this.

4.2.1 Blasting or Tunnelling

No blasting or tunnelling will take place without written approval of Development Engineering & Construction Section and review by the Commissioner.

4.2.2 Construction on Existing Roads

Whenever it is necessary to cut through an existing City or Regional road, the contractor will be responsible for properly compacting the backfill and surface restoration in accordance with the Road Occupancy Permit. Existing subdrains must remain intact.

Road closure and open cut permits must be obtained prior to undertaking work within an existing road allowance/right-of-way.

Unshrinkable fill is to be utilized as the backfill material for service trench installation within all city road allowances. The unshrinkable fill is to be placed as per City Standard 2220.030. Alternate backfill material is to be approved by Development Construction.

Top asphalt cold joint must be sealed with hot-poured rubberized asphalt joint sealing compound (OPSS 1212).

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

4.2.3 Standards & Maintenance

Work shall be to the satisfaction of the Development Engineering & Construction Section, or their representatives.

Work shall be designed and constructed in accordance with the most recent requirements, standards, specifications and bylaws of the City of Mississauga.

Work constructed shall be guaranteed for a maintenance period as identified within the Agreement and/or in accordance with the Road Occupancy Permit.

4.2.4 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:

- The use of native backfill material must be approved by Development Construction.

  - Backfilling operations are to be carried out in strict conformance with the requirements of OPSS 514.07.08 using earth compaction equipment of appropriate size and weight.
  - The minimum compacted density within 1.0 metres of final subgrade is increased to 98% Standard Proctor Density with moisture content within 2% of the optimum value.
  - Soil moisture content high of optimum value is better suited for trench backfilling below the 1.0 metre subgrade. The addition of water will be required particularly during dry summer conditions subject to the discretion of the Geotechnical Consultant and/or City inspector.

During construction, the owner is to retain the original geo-technical consultant to supervise the installation of bedding and the backfilling of all trenches within road allowances and easements. The Geotechnical Consultant shall be present during any trench backfilling and consolidation operations ensuring that OPSS 514.07.08 is strictly adhered to. The Geotechnical Consultant's is to certify that he or his designate has conducted a sufficient number of tests to obtain a comprehensive summary of the degree of compaction and has witnessed **all** backfill and compaction operations including lot service and that all works were constructed in accordance with OPSS 514.07.08. Compaction reports are to be provided to Development Construction.

Only experienced Geotechnical Consultant personnel who have demonstrated their competence to the satisfaction of the Development Engineering and Construction are permitted to conduct field testing. All field technicians shall be CSA certified in concrete testing. All field technicians must have excellent oral and written communication skills. Geotechnical consultant’s personnel *must be on site at all times* for mainline and service construction crews under the direct

supervision of one Geotechnical Consultants technician. Where there are more than two crews, additional personnel may be required.

The City of Mississauga requires a compaction test on every layer and every 50m^2 for mainline work and a compaction test every layer on lateral service trenches as minimum. Plot field density test on plan and profile drawings.

The final subgrade certification is to confirm that the final subgrade conditions are equal to or better than those anticipated in the preparation of the pavement design. The above certification(s) are to display the Professional Engineer Stamp for the Geotechnical Consultant. The certification is to include the following wording:

"This certification has been made to the best of the Geotechnical Consultant's knowledge and information. This certification, however does not relieve the Contractor, the Owner or any other parties of their respective responsibilities pertaining to maintenance or otherwise."

The findings of the compaction reports together with certification, in a form acceptable to the City, are to be forwarded to and acknowledged by the City prior to placement of the granular road material. The Geotechnical consultant shall also confirm that the final subgrade conditions are at least equal to those anticipated in his preparation of the pavement design. If these conditions are less than what was anticipated, the owner and the City are to be **immediately** advised with a new pavement design recommendation.

Adequate trench widths must be maintained to give compaction equipment being utilized sufficient space to adequately compact the material, i.e. the minimum width of the trench 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 into the backfill material to eliminate voids. The Geotechnical Consultant **must** carefully monitor the backfilling operation to ensure this mix is maintained and that OPSS 514.07.08 is complied with. **Maximum** dimension of any shale backfill is 150mm.

- Granular backfill will be used around the perimeter of all mainline service structures (i.e. Manholes and Catchbasins). 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 514.07.08 and OPSS 516 must still apply

- Each service connection and trench must be monitored and certified to ensure that OPSS 514.07.08 is complied with.

- Trench widths for lateral connections must be sufficient to accommodate compaction equipment without bridging of the compactor drum, i.e. width of equipment plus 0.5m.

- Narrow trenches for water service connections may be prone to settlement. The Contractor must defer backfilling of the upper 1.0 metre subgrade zone until completion of all sewer and water service connections to promote uniformity of backfilling and compaction in the subgrade zone.

The Geotechnical Consultant must maintain a plan and profile drawing indicating the location of each compaction test to ensure compliance with OPSS 514.07.08. 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 consultant's trailer and available for City review at all times.

If, in the opinion of the City, excessive trench settlements have occurred at base course or top course 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 determines 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 City of Mississauga requirements and specifications. Proof rolling at the subgrade level must be completed and certified by the Geotechnical Consultant. Certificate must indicate structural integrity of the subgrade and the adequacy of the structural road design. Subgrade cross-fall is to be 3%.

The following actions are required prior to the placement of granulars:

- 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 subgrade and prior to placement of granular materials. The subgrade must exhibit a firm and stable behaviour without rutting and/or flexing under wheel travel.

- Additional granular depth may be required to compensate for subgrade which does not pass the proof rolling test and/or the removal and re-compaction of any 'soft-spots'.

Placement of granulars prior to the City issuing approvals may result in **complete removal** of all granulars.

Special conditions such as winter construction or construction in wet conditions, etc. may require full depth granular backfill and/or crusher run limestone for road granulars at the discretion of the City.

4.2.5 Development Winterization

To minimize repairs to new roads and snow ploughing equipment, the City requires the following works to be carried out prior to November 15 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.

4.2.6 Stormwater Management

If the post development runoff could adversely affect downstream lands, on site storm water detention may be required.

The City, in conjunction with the conservation authorities, may restrict some development of land in or near natural flood plain areas to maintain sufficient storage capacity to avert downstream flooding.

See City of Mississauga *Development Requirements Manual Section 8 - Storm Drainage Design Requirements* for additional stormwater management details.

4.2.7 Geotechnical Engineering

In new developments, the owner shall engage a licensed geotechnical engineering consultant to prepare a report on the existing soil conditions which is to include:

- The identification, description and limits of the existing soil strata, including the extent of topsoil and its suitability for reuse.
- The suitability of native materials for trench backfill.
- The conditions under which the native material may be used as trench backfill.
- The procedures to be used for high moisture contents and water table levels which may affect the proposed servicing or structural works of the area as well as the surrounding lands.

- The extent of native material which is unsuitable for trench backfill. A procedure for dealing with the unsuitable native material should be provided in order that the structural stability of the proposed municipal services will not be compromised.
- The limit of areas where blasting may be required. Due consideration is to be given to the surrounding structures and services. The report should include sufficient information to determine blasting procedures.
- The road material depths and material types for pavement design.
- Recommendations for infrastructure placement and road construction.
- Potential chemical issues that may affect services or structures (e.g. high sulphates) and the method of resolving such issues.
- Recommendations in dealing with filling procedures within; the road allowances, building lands and berm construction.
- Identifying potential areas of slope instability as well as the extent of the unstable soil and/or conditions. The report shall also provide procedures to stabilize the slope.
- Any recommendations regarding the design and construction of building foundations.
- The engineering properties of the native material including frost susceptibility, natural moisture content, compaction characteristics, relative density and structural integrity.
- Recommendations for achieving proper compaction
- A sufficient number of environmental tests to determine the likelihood of any soil contamination. The Geotechnical Consultant must supply procedures to dispose of, or reclaim, any contaminated soil.
- Recommendations for dealing with deep excavation of trenches
- Recommendations in dealing with septic or well systems that may be affected by the proposed building and servicing works.
- Sufficient boreholes to establish definite requirements and recommendations for the servicing and building works. Maximum spacing between boreholes along the proposed roadway is to be 150m. The soils report must identify minimum bearing capacity of the native soil, preferably on a hole-by-hole basis. Boreholes located in the area of proposed underground municipal services are to be taken to a depth of at least one (1) metre below the bottom of the deepest trench.

Requirements and recommendations contained within this report along with borehole logs and grain size analysis of the native soils are to be incorporated by the engineering consultant into his first submission to the Development Engineering & Construction Section. Any such requirements and recommendations that are not so incorporated are to be drawn to the City's attention with specific reasons. See other City of Mississauga *Development Requirements Manual* sections for additional geotechnical requirements/ guidelines.

Where grading operations require the placement of "engineered fill" the Geotechnical Consultant must certify that the fill located at 1.0m below finished grade and deeper has been sufficiently

compacted to assure a minimum bearing capacity of 75 MPa and a 98% Standard Proctor Density.

The material testing of any major structure, as determined by the City, is to be carried out by an independent testing firm retained by the owner. Such testing is to be carried out in accordance with the latest revision of the OPSS and CSA requirements. All test results are to be forwarded to the owner, the engineering consultant, and the City, with the appropriate comments and recommendations. Upon completion of the material testing, the testing firm is to certify to the owner and the City that the Engineering Agreement material requirements for the concerned structure have been achieved.

4.2.8 Policy for Holiday Work by Contractors

No work will be permitted in Mississauga on the following days: NEW YEARS DAY; FAMILY DAY; GOOD FRIDAY; VICTORIA DAY; CANADA DAY; CIVIC HOLIDAY; LABOUR DAY; TRUTH AND RECONCILLIATION DAY; THANKSGIVING DAY; CHRISTMAS DAY; BOXING DAY.

Permission to work on the holiday will be considered upon receipt of a written request from the contractor at least two (2) business days (minimum 48 hours) in advance of the holiday.

4.3 Procedures

4.3.0 Beginning of Construction

Construction of services shall not commence until the Developer has entered into the necessary agreements with the City of Mississauga and the Region of Peel. The Developer must also have obtained any required approvals from the Ministry of Transportation Ontario, the Ministry of Environment, or any other organization which may be affected by the plan of subdivision.

Construction may not commence until:

1. The Development Agreement has been registered in the Land Titles Office of the Region of Peel
   OR
2. As provided by the City of Mississauga's Subdivision preservicing policy.
3. Clearance by Development Engineering must be given prior to a preconstruction meeting being held.

Following the preconstruction meeting being held, Development Construction of the City of Mississauga and the Public Works Department of the Region of Peel must be given forty-eight (48) hours notification prior to the commencement of construction. Should there be a cessation of construction of more than a week, notification must again be provided forty-eight (48) hours before recommencing the work. Notification to commence work shall be sent to the Development Construction (devcon@mississauga.ca). Failure to comply with any portion of the requirement will lead the City to action being taken and increase in maintenance timelines.

4.3.1 Lot Grading and Sodding

It is the Developer's responsibility to correct any drainage problems during the term of the Development Agreement. The Developer is also responsible for certification of each lot's grading and sodding as required by the City of Mississauga.

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

- After the Consulting Engineer has visited the site to assure themselves that the lots which they've proposed to certify have been graded and sodded in accordance with the grading plan, the Consulting Engineer may arrange a site inspection by emailing devcon@mississauga.ca.
- The Consulting Engineer will then arrange a site inspection with the builder and/or his representative, and a representative from Development Construction 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 which may require confirmation of grades by surveying or additional works to meet

the requirements for certification. The Consulting Engineer will immediately certify all lots where an agreement has been reached by the parties in the field.

- The Consulting Engineer will resurvey 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 building, which was built on the lot, will be brought to the attention of the Development Engineering & Construction Section, via email to devcon@mississauga.ca 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 City with the *required current fee and charges bylaw*.
- Prior to assumption, if a homeowner modifies the grades within their own lot, causing adverse effects to neighbouring lands, the Developer may be required to make necessary arrangement to rectify the grading infraction to the satisfaction of the Development Engineering & Construction Section.

The site grading plans are to show underside of footing elevations and top of foundation wall elevations. Where multilevel footings and/or foundation walls are intended, all levels are to be shown.

4.3.2 Block Grading

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

4.3.3 Security Reduction

- The City will review the request of a Security Reduction of the Letter of Credit/ Surety Bond/ Bank Draft or certified cheque to the amount of the actual remaining works, plus 10% of the work already completed, plus the required Schedule ‘G’ holdbacks.

- The Consultant is to submit the request in Draft Security Reduction format (see Appendix 2B) which is to include completed/uncompleted quantities, in the approved Schedule ‘G’ of the Development Agreement.

- The Consultant, with each request shall include a Statutory Declaration (see Appendix 2C).

- When all work is completed, the City shall hold a minimum of 10% of the completed works until Final Acceptance/Assumption has been issued or as to be determined by Development Construction.

- Prior to the release of securities for any noise wall, the City must receive certification from the Consultant that the walls are structurally sound and constructed in

accordance with the approved engineering drawings. In addition to the structural certification, an OLS must certify that the locations of the noise walls are in accordance with the approved engineering drawings. The location of all fences adjacent to municipal lands shall be verified in accordance with the approved engineering drawings.

- The City will reduce the Letter of Credit/ Surety Bond/ Bank Draft and certified cheque for retaining walls once the City has received certification of the walls structural integrity and confirmation from an OLS that the wall is in the correct location as designed (see also 4.1.0.1. of this section).

4.3.4 Security Reduction Request

Instructions For Use Of This Letter

This form shall be used in requesting reductions of securities.

Please note the last line of this letter and be advised that all requests for these reductions must be accompanied with the Developer's Statutory Declaration with respect to outstanding accounts, or the request will be directly returned. See Appendix 2A.

4.4 Surveyor Certificate

Prior to the Final Acceptance/Assumption by the City of the services constructed in a development, it is required that the Developer reestablish all Control Standard Iron Bars (S.I.B.). Where Control Standard Iron Bars cannot be established/reestablished cross cut into concrete is permissible. Confirmation of reestablishing these iron bars must be made to Development Engineering & Construction Section by a Registered Ontario Land Surveyor via email to devcon@mississauga.ca (see also *Development Requirements Manual Section 3 – Appendix B*).

Where SIB cannot be established/reestablished cross cut into concrete.

- 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.

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

- 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 is to be done after the preliminary acceptance of roads and at least six months before final acceptance of the subdivision.

The Surveyor's certificate is required prior to the Final Acceptance/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 which shall be no earlier than one month prior to the end of the above ground maintenance period.

4.5 Easements

Easement requirements to be addressed through the development review process.

Appendix 1 – Drawing Certifications

SAMPLE A DRAWING CERTIFICATION – PRELIMINARY LOT/BLOCK GRADING

The following certification is to be applied to all drawings for site grading review and approval:

"I hereby certify that the proposed grading for the building, appurtenant drainage and storm water management works comply with sound engineering design, and that the proposed grading is in conformity for drainage and relative elevations with the overall grading and drainage plans for this development.

We also hereby certify compliance with the Agreement conditions associated with City file no._____".

SAMPLE B DRAWING CERTIFICATION – PRELIMINARY LOT/BLOCK GRADING VARIANCE

The following certification is to be applied to all drawings for site grading review and approval:

"I do hereby advise that the proposed site grading of the subject lands is not in accordance with the overall grading plan. However, I am able to certify that the variance of grades for the building comply with sound engineering design, appurtenant drainage and storm water management works.

Purpose of variance: _____

We also hereby certify compliance with the Agreement conditions associated with City file no._____."

COMPANY LETTERHEAD
(ENGINEERING FIRM)

SAMPLE LETTER C - FINAL LOT/BLOCK GRADING CERTIFICATION LETTER

To: City of Mississauga
Development Engineering & Construction
300 City Centre Drive
Mississauga, ON L5B 3C1
Attn: Development Construction

Date: Enter Date

Re: Final Lot/Block Grading Certification
Site Address
City File Number
Registered Plan Number (if applicable)
Lot/Block No.

Certification of Final Lot/Block Grading

I have conducted a site inspection on Enter Date with respect to the final grading of the subject lands and have viewed the finished lot grading and building thereon.

I hereby certify that the building(s) constructed with relationship to the elevations and the grading of the lands are in general conformity with the **Enter Date** *(*)* certification of the "Proposed Building and Grading" previously submitted.

We also hereby certify compliance with the Agreement conditions under Schedule "C-2" Item 1 (confirm in agreement).

Sincerely,

Stamp and **Signature** of Professional Engineer

c: Developer

SAMPLE

SIGNED and STAMPED Certificate to be E-mailed to: DEVCON@mississauga.ca

COMPANY LETTERHEAD
(ENGINEERING FIRM)

SAMPLE LETTER D - FINAL LOT/BLOCK GRADING CERTIFICATION LETTER VARIANCE

To: City of Mississauga
Development Engineering & Construction
300 City Centre Drive
Mississauga, ON L5B 3C1
Attn: Development Construction

Date: Enter Date

Re: Final Lot/Block Grading Certification
Site Address
City File Number
Registered Plan Number (if applicable)
Lot/Block No.

Certification of Final Lot/Block Grading Variance

I have conducted a site inspection on **Enter Date** with respect to the final grading of the subject lands and have viewed the finished lot grading and building thereon.

I hereby advise that the building(s) constructed with relationship to the elevations and the grading of the lands varies/not in accordance with the approved "Proposed Building and Grading" certification dated **Enter Date**. However, I am able to certify that the variance of grades for the building comply with sound engineering design, appurtenant drainage and storm water management works.

We also hereby certify compliance with the Agreement conditions under Schedule "C-2" Item 1 (confirm in agreement).

Purpose of Variance:

Sincerely,

Stamp and **Signature** of Professional Engineer

c: Developer

SIGNED and STAMPED Certificate to be E-mailed to: DEVCON@mississauga.ca

SAMPLE

COMPANY LETTERHEAD
(ENGINEERING FIRM)

SAMPLE LETTER E - RETAINING WALL CERTIFICATION LETTER

To: City of Mississauga
Development Engineering & Construction
300 City Centre Drive
Mississauga, ON L5B 3C1
Attn: Development Construction

Date: Enter Date

Re: (Name of Subdivision)
Lots/Block No.
City File No.
Registered Plan No.
Retaining Wall Constructed of Maximum Height _____ m

This letter is to certify that the above described retaining wall was adequately designed, and subsequently constructed, in accordance with the design to support the dead and live loads applied on the structure.

This is also to certify that the above retaining wall has been designed and constructed in accordance with all the applicable standards and regulations.

Sincerely,

Stamp and **Signature** of Professional Engineer

c: Developer

SAMPLE

SIGNED and STAMPED Certificate to be E-mailed to: DEVCON@mississauga.ca

COMPANY LETTERHEAD
(ENGINEERING FIRM)

SAMPLE LETTER F – AGREEMENT SERVICING WORKS CERTIFICATION LETTER

To: City of Mississauga
Development Engineering & Construction
300 City Centre Drive
Mississauga, ON L5B 3C1
Attn: Development Construction

Date: Enter Date
File: (Registered Plan No.)

Re: Certification of Agreement Servicing Works
Municipal Address and Property Description
City File Number
Registered Plan Number (if applicable)

This letter is to certify that all/current Servicing Works have been completed in accordance with the drawings and specifications, as may be amended from time to time under City approval and authority and which form part of the Agreement for City file _____.

Sincerely,

Stamp and **Signature** of Professional Engineer

c: Developer

SAMPLE

SIGNED and STAMPED Certificate to be E-mailed to: DEVCON@mississauga.ca

COMPANY LETTERHEAD
(ENGINEERING FIRM)

SAMPLE LETTER G – ROADWAY SUBGRADE CERTIFICATION LETTER

To: City of Mississauga
Development Engineering & Construction
300 City Centre Drive
Mississauga, ON L5B 3C1
Attn: Development Construction

Date: Enter Date

Re: Certification of Roadway Subgrade
Site Address
City File Number
Registered Plan Number (if applicable)

This letter is to certify that the roadway subgrade has been inspected, and proof rolled on the following date(s)_____. I can certify that any required remediation of the subgrade has taken place and is deemed acceptable for the placement of roadway granulars.

Sincerely,

Stamp and **Signature** of Professional Engineer

c: Developer

SAMPLE

SIGNED and STAMPED Certificate to be E-mailed to: DEVCON@mississauga.ca

COMPANY LETTERHEAD
(ENGINEERING FIRM)

SAMPLE LETTER H – ROAD CONSTRUCTION & MUNICIPAL SITE SERVICING CERTIFICATION LETTER

To: City of Mississauga
Development Engineering & Construction
300 City Centre Drive
Mississauga, ON L5B 3C1
Attn: Development Construction

Date: Enter Date

Re: Certification of Road Construction and Municipal Site Servicing
Site Address
City File Number
Registered Plan Number (if applicable)

Insert company name has served as the geotechnical consultant for the above noted development, encompassing inspection, compaction and testing of sewer trench backfilling, road construction. This letter will confirm that we have monitored the quality and placement of all materials during municipal site servicing and roadway construction for the above noted development.

I hereby certify that the 'as constructed' **final pavement structure** has been completed to top course asphalt and has met or exceeded the City of Mississauga's minimum design standard for developments and has been provided as follows:

As-Constructed Pavement Structure

Municipal Roadway (Name Roadway)	Driveways (as applicable)

Should you have any questions or concerns regarding the letter please do not hesitate to contact this office at .

Sincerely,

Stamp and **Signature** of Professional Engineer

c: Developer

SIGNED and STAMPED Certificate to be E-mailed to: DEVCON@mississauga.ca

SAMPLE

Appendix 2A – Sample Security Reduction Letter

COMPANY LETTERHEAD
(ENGINEERING FIRM)

SAMPLE – SECURITY REDUCTION REQUEST LETTER

To: City of Mississauga
Development Engineering & Construction
300 City Centre Drive
Mississauga, ON L5B 3C1
Attn: Development Construction (DEVCON@mississauga.ca)

Date: Enter Date

Re: Development Name
Site Address
City File Number
Registered Plan Number (if applicable)

On behalf of the owners of the above development, we would appreciate your consideration and approval of the attached Reduction Request of the Agreement Security currently held by the City.

Also attached is a Statutory Declaration that all outstanding accounts relative to the work in this development have been paid.

Sincerely,

Stamp and **Signature** of Professional Engineer

c: Developer

SIGNED and STAMPED letter to be E-mailed to: DEVCON@mississauga.ca

SAMPLE

Appendix 2B – Draft Security Reduction Format

Security Reduction Summary Sheet

City File:		Developer:		Security #:	
Region File:		Agreement Date:		Original Security Amount:	

Reduction #	Date	Retained Securities	Securities Reduced	New Retained Securities
1		$ -		
2		$ -		
3	-	$ -		$ -
4	-	$ -		$ -
5	-	$ -		$ -
6	-	$ -		$ -

Notes & Remarks:

City File: Developer: Reduction No.
Region File: Agreement Date: Date:

NO.	Item	Original Securities (incl 10%)	Value of Work Completed - Sch 'G' Markup	10% of Work Completed	Value of Work Outstanding	Required Securities (Based on Clearance)
		A	B	C = (B x 10%)	D = (A-B)	F = (C + D)
	STREET NAME					
1	Sanitary Sewers					
2	Watermains					
3	Storm Sewer					
4	Roads					
	Sub Total	$ -				$ -
	CITY OF MISSISSAUGA					
45	Miscellaneous					$ -
46	Parks					$ -
47	Landscaping					$ -
48	Environmental					$ -
49	Streetlighting					$ -
	Sub Total City	$ -				$ -
	REGION AND CITY TOTAL SECURITY	$ -				
	HOLDBACKS					
50			*Holdbacks do not require 10%. Check agreement in all situations.			
	TOTAL HOLDBACKS	$ -				

Required Securities = F + Holdbacks Value of Reduction = Original Securities - Required Securities	ORIGINAL RETAINED SECURITIES	$ -
	SECURITIES REDUCED	$ -
	NEW RETAINED SECURITIES	$ -

Project Name
City Project No.
Region Project No.

SCHEDULE 'G'
City of Mississauga
Detailed Estimate - Summary

SCHEDULE "G" - SECURITIES

PROJECT NAME
SECURITY COST ESTIMATE
CONSULTANT NAME
CITY OF MISSISSAUGA
CITY PROJECT No.
REGION PROJECT No.

1) Cost Estimates and Security

A1 City - Right of Way(s)	Road Works	Storm Sewer	Sanitary Sewer	Watermain	ROW Total
1) Street A	$ -	$ -	$ -	$ -	$ -
2) Street B	$ -	$ -	$ -	$ -	$ -
Subtotal	$ -	$ -	$ -	$ -	$ -

A2 Region - Right of Way(s)	Road Works	Storm Sewer	Sanitary Sewer	Watermain	ROW Total
1) Region Rd. A	$ -	$ -	$ -	$ -	$ -
Region Subtotal	$ -	$ -	$ -	$ -	$ -
Total	$ -	$ -	$ -	$ -	$ -

2) Miscellaneous (City)	$ -
3) Streetlighting	$ -
4) Streetscape	$ -
5) Parks	$ -
6) Environmental	$ -
B1) Subtotal - City Municipal Works: Road Works (Item A1), Storm Sewers (Item A1), Miscellaneous (City) (Item 2), Streetlighting (Item 3), Streetcape (Item 4), Parks (Item 5), Environmental (Item 6)	$ -
B2) Subtotal - Region Municipal Works: Road Works (Item A2), Storm Sewer (Item A2), Sanitary Sewers (Item A1+A2), Watermains (Item A1+A2) ***Miscellaneous (Region) capture within Region works items*	$ -
B3) Total Amount to be secured (B1 + B2)	$ -
C1) Cash Contributions to the City of Mississauga i) Transportation & Works	$ -
Sub total Item C (i):	$ -
ii) Community Services	$ -
Sub total Item C (ii):	$ -
C2) Cash Contributions to the Region of Peel	$ -

Project Name
City Project No.
Region Project No.

SCHEDULE 'G'
City of Mississauga
Detailed Estimate - Roads (City ROW)

Street A

	Item		Units	Quantity	Unit Rate	Amount
	Road Works					
1)	0	0	0			$ -
2)	0	0	0			$ -
					Subtotal	$ -
					10% Contingency	$ -
					Total	$ -

SECURITY COST ESTIMATE - BREAKDOWN
DEVELOPER NAME
CITY OF MISSISSAUGA

ROAD WORKS

Street Name		Quantities & Unit Prices				Completed		Remaining		Reduction 1	
Item	Description	Qty	Unit	Unit Price	Amount	Qty	Amount	Qty	Amount	Qty	Amount
a)					$ -		$ -		$ -		$ -
b)					$ -		$ -		$ -		$ -
	Subtotal Street Name				$ -		$ -		$ -		$ -
	Plus 10% Engineering & Contingency				$ -		$ -		$ -		$ -
	Total Street Name				$ -		$ -		$ -		$ -
	TOTAL ROAD WORKS				$ -		$ -		$ -		$ -

STORM SEWER

Street Name		Quantities & Unit Prices				Completed		Remaining		Reduction 1	
Item	Description	Qty	Unit	Unit Price	Amount	Qty	Amount	Qty	Amount	Qty	Amount
a)					$ -		$ -		$ -		$ -
b)					$ -		$ -		$ -		$ -
	Subtotal Street Name				$ -		$ -		$ -		$ -
	Plus 10% Engineering & Contingency				$ -		$ -		$ -		$ -
	Total Street Name				$ -		$ -		$ -		$ -
	TOTAL STORM SEWER				$ -		$ -		$ -		$ -

SANITARY SEWER

Street Name		Quantities & Unit Prices				Completed		Remaining		Reduction 1	
Item	Description	Qty	Unit	Unit Price	Amount	Qty	Amount	Qty	Amount	Qty	Amount
a)					$ -		$ -		$ -		$ -
b)					$ -		$ -		$ -		$ -
	Subtotal Street Name				$ -		$ -		$ -		$ -
	Plus 10% Engineering & Contingency				$ -		$ -		$ -		$ -
	Total Street Name				$ -		$ -		$ -		$ -
	TOTAL SANITARY SEWER				$ -		$ -		$ -		$ -

WATERMAIN

Street Name		Quantities & Unit Prices				Completed		Remaining		Reduction 1	
Item	Description	Qty	Unit	Unit Price	Amount	Qty	Amount	Qty	Amount	Qty	Amount
a)					$ -		$ -		$ -		$ -
b)					$ -		$ -		$ -		$ -
	Subtotal Street Name				$ -		$ -		$ -		$ -
	Plus 10% Engineering & Contingency				$ -		$ -		$ -		$ -
	Total Street Name				$ -		$ -		$ -		$ -
	TOTAL WATERMAIN				$ -		$ -		$ -		$ -

SECURITY COST ESTIMATE - BREAKDOWN
DEVELOPER NAME
CITY OF MISSISSAUGA

MISCELLANEOUS

		Quantities & Unit Prices				Completed		Remaining		Reduction 1	
Item	Description	Qty	Unit	Unit Price	Amount	Qty	Amount	Qty	Amount	Qty	Amount
a)							$ -		$ -		$ -
b)											
c)											
	Total Miscellaneous:				$ -		$ -		$ -		$ -
	TOTAL MISCELLANEOUS				$ -		$ -		$ -		$ -

SECURITY COST ESTIMATE - BREAKDOWN
DEVELOPER NAME
CITY OF MISSISSAUGA

STREETLIGHTING

Streetlighting		Quantities & Unit Prices				Completed		Remaining		Reduction 1	
Item	Description	Qty	Unit	Unit Price	Amount	Qty	Amount	Qty	Amount	Qty	Amount
a)					$ -		$ -		$ -		$ -
b)					$ -		$ -		$ -		$ -
c)					$ -		$ -		$ -		$ -
	Total Streetlighting				$ -		$ -		$ -		$ -
	TOTAL TOP WORKS				$ -		$ -		$ -		$ -

SECURITY COST ESTIMATE - BREAKDOWN
DEVELOPER NAME
CITY OF MISSISSAUGA

LANDSCAPING

Street Name		Quantities & Unit Prices				Completed		Remaining		*Reduction 1*	
Item	Description	Qty	Unit	Unit Price	Amount	Qty	Amount	Qty	Amount	*Qty*	*Amount*
a)				$ -		$ -		$ -		$ -	
b)				$ -		$ -		$ -		$ -	
c)				$ -		$ -		$ -		$ -	
	Subtotal Street Name			$ -		$ -		$ -		$ -	
	Total Street Name			$ -		$ -		$ -		$ -	
	TOTAL LANDSCAPING			$ -		$ -		$ -		$ -	

SECURITY COST ESTIMATE - BREAKDOWN
DEVELOPER NAME
CITY OF MISSISSAUGA

PARKS

Block		Quantities & Unit Prices				Completed		Remaining		*Reduction 1*	
Item	Description	Qty	Unit	Unit Price	Amount	Qty	Amount	Qty	Amount	*Qty*	*Amount*
a)				$ -		$ -		$ -		$ -	
b)				$ -		$ -		$ -		$ -	
c)				$ -		$ -		$ -		$ -	
	Subtotal Block			$ -		$ -		$ -		$ -	
	Total Block			$ -		$ -		$ -		$ -	
	TOTAL PARKS			$ -		$ -		$ -		$ -	

SECURITY COST ESTIMATE - BREAKDOWN
DEVELOPER NAME
CITY OF MISSISSAUGA

ENVIRONMENTAL

Environmental		Quantities & Unit Prices				Completed		Remaining		*Reduction 1*	
Item	Description	Qty	Unit	Unit Price	Amount	Qty	Amount	Qty	Amount	*Qty*	*Amount*
a)				$ -		$ -		$ -		$ -	
b)				$ -		$ -		$ -		$ -	
c)				$ -		$ -		$ -		$ -	
	Subtotal			$ -		$ -		$ -		$ -	
	Total Environmental			$ -		$ -		$ -		$ -	
	TOTAL ENVIRONMENTAL			$ -		$ -		$ -		$ -	

Appendix 2C – Statutory Declaration

STATUTORY DECLARATION

(SECURITY REDUCTION/ RELEASE)

CANADA) IN THE MATTER OF CITY FILE NUMBER _____

Province of Ontario) on REGISTERED PLAN NO. _____, CITY OF

) MISSISSAUGA in the REGIONAL MUNICIPALITY

) OF PEEL, being in the subject of an agreement

) dated _____

) between _____(**developer name**)

) and the City of Mississauga and The

) Regional Municipality of Peel

TO WIT:

I, _____of the City of _____, within

the Region of _____ , in the Province of

_____, SOLEMENLY DECLARE THAT

1. I am the _____(position) of _____

   _____(company) and as such have knowledge of the matters herein declared to.

2. There are no lien claims and that all outstanding accounts have been paid with respect to the work completed as required under the above-mentioned Agreement between the said company _____(name) and the City of Mississauga.

AND I make this solemn Declaration conscientiously believing it to be true and knowing that is of the same force and effect as if made under oath and by virtue of the CANADA EVIDENCE ACT.

DECLARED before me _____(name))

at the of **CITY** _____)

In the Region of _____)

In the Province of _____)

On this ____day of _____**(month)**_____ **(year)**)

I have the authority to bind the corporation.

_____

(name)

A Commissioner, etc.
(stamp/signature)

SECTION 5 – ENVIRONMENTAL REQUIREMENTS

Table of Contents

5.0 Introduction 1
5.0.1 Overview 2
5.1 Environmental Site Screening Questionnaire and Declaration Form 3
5.1.1 Above Ground Storage Tanks 4
5.1.2 Water Wells 4
5.1.3 Septic Systems 4
5.1.4 Debris 4
5.1.5 Demolition 5
5.2 Phase One Environmental Site Assessment 5
5.3 Phase Two Environmental Site Assessment 7
5.4 Remedial Action Plan 8
5.5 Risk Assessment Report 9
5.6 Remediation Report 11
5.7 Record of Site Condition 12
5.8 Requirements for Land Dedications 13
5.9 Storm Sewer Discharge Authorization 15
Appendix 1: Environmental Reliance Letter Template 15
Appendix 2: Risk Management Measure Cap Requirements 17

5.0 Introduction

The following are the City's environmental requirements for all applications. Under the City's Corporate Policy and Procedure entitled, "Applications for Development of Contaminated or Potentially Contaminated Sites" (Policy No. 09-08-02, or as amended), the City reviews all development applications for potential contamination of the site and requires that sites comply with Provincial environmental regulations and guidelines prior to development proceeding and prior to conveyance of any land dedications.

5.0.1 Overview

The City's environmental requirements apply to the following types of applications:

- Official Plan Amendments;
- Rezoning;
- Draft Plan of Subdivision;
- Site Plan *(only with land dedications to City)*;
- Condominium (only with land dedications to City);
- Minor Variances;
- Consents;
- Building/Occupancy Permits *(where there is a change in use to a more sensitive use)*.

The development team is tasked with the responsibility to ensure that there is either no contamination on the site and has not migrated onto adjacent properties; or that the contamination is not causing, or is not likely to cause, and adverse effect. The City requires specific environmental information and reporting (to be outlined during the application review process), prior to final approval of development applications, to ensure that identified contamination was addressed appropriately in accordance with applicable law and guidelines including receipt of certification acknowledging compliance.

It is strongly recommended that applicants of an impacted site connect with Environmental staff (under the Planning and Building Department) as early as possible to screen the proposed new land use to assess whether or not environmental reports (as outlined below) and potentially a Record of Site Condition (RSC) may be required, in accordance with Ontario Regulation (O. Reg.) 153/04, or as amended.

The process involved in filing a Record of Site Condition (RSC) with the provincial Ministry of the Environment, Conservation and Parks ("MECP") may require a minimum of several months and potentially over 1-2 years to complete and can involve significant costs to complete the necessary supporting studies, the timing required to complete the necessary environmental studies and remedial actions should be taken into account during project planning as it could potentially impact submission of a development application, including zoning certificates.

For more information on RSC and related environmental report requirements, please refer to the MECP website page on Brownfields Redevelopment: https://www.ontario.ca/page/brownfields-redevelopment. ***[NOTE:*** It is the applicant's responsibility to ensure compliance with all current applicable law. *The provincial environmental regulations are subject to change over time, The City wishes to note that the environmental requirements in this manual may not have been updated to reflect the most recent regulation changes.*

5.1 Environmental Site Screening Questionnaire and Declaration Form

A completed ***Environmental Site Screening Questionnaire and Declaration (ESSQD)*** form must be submitted with every development application (as noted above). The ESSQD must be signed by a Commissioner of Oaths or a lawyer who is licensed to practice law in Ontario. This form can be obtained through the Planning & Building Department and on the City's website.

5.1.1 Above Ground Storage Tanks

Where above ground storage tanks (ASTs) and/or underground storage tanks (USTs) are indicated on the ESSQD, the proponent must provide documentation signed by a Qualified Person that the ASTs/USTs have been or will be properly decommissioned in accordance with applicable laws and regulations. This documentation is required prior to approval of the development application (*i.e.,* prior to recommendation, prior to by-law, or as a condition in a development agreement with financial securities).

5.1.2 Water Wells

Where the presence of one or more water wells is indicated on the ESSQD, the proponent must provide documentation signed by a Qualified Person that the well(s) has/have been properly decommissioned in accordance with applicable laws and regulations. This documentation is required prior to approval of the development application (*i.e.,* prior to recommendation, prior to by-law, or as a condition in a development agreement with financial securities).

5.1.3 Septic Systems

Where the presence of a septic system on the property is indicated on the ESSQD, the proponent must provide documentation signed by a Qualified Person that the septic system has been or will be properly decommissioned in accordance with applicable laws and regulations. This documentation is required prior to approval of the development application (*i.e.,* prior to recommendation, prior to by-law, or as a condition in a development agreement with financial securities).

5.1.4 Debris

Where the presence of debris is indicated on the ESSQD, the proponent must provide documentation signed by a Qualified Person that the debris has been or will be properly disposed off-site in accordance with applicable laws and regulations. This documentation is required prior to approval of the development application (*i.e.,* prior to recommendation, prior to by-law, or as a condition in a development agreement with financial securities).

5.1.5 Demolition

Where the demolition of existing buildings is required prior to proceeding with the demolition works required by the proposed development, the proponent must first acquire and provide copy

of demolition permits approved by the governing body. Following works completion documentation signed by a Qualified Person certifying that the demolition debris and foundation materials have been properly removed/remediated and disposed of off-site in accordance with applicable laws and regulations. This documentation is required prior to approval of the development application (*i.e.,* prior to recommendation, prior to by-law, or as a condition in a development agreement with financial securities).

5.2 Phase One Environmental Site Assessment

In accordance with the Corporate Policy, "Applications for Development of Contaminated or Potentially Contaminated Sites, 09-08-02", the City may require that a Phase One Environmental Site Assessment (ESA) report that meets requirements of O. Reg. 153/04 be submitted to the City for review and shall be prepared to their satisfaction. The Phase One ESA report must be signed and sealed by a Qualified Person (as defined under O. Reg. 153/04).

Note:

- For development applications, the City will confirm with developers where a Phase One ESA report is required to be submitted concurrently with the ESSQD during the first submission
- In a few instances, such as where the development involves an existing single residential dwelling and single lot, then only the ESSQD would be required at the first submission
- If the ESSQD indicates that there is a potential for contamination, then a Phase One ESA will be requested upon the second submission (except for Site Plan applications without a land dedication)

The Phase One ESA report will be required to form a complete development application for the following:

- Official Plan Amendments;
- Rezoning;
- Draft Plan of Subdivision;
- Consents;
- Site Plan (only with land dedications to City);
- Condominium (only with land dedications to City).

In general, the purpose of a Phase One ESA is to determine whether there are any Areas of Potential Environmental Concern on the subject property resulting from past or present Potentially Contaminating Activities.

For any proposed land dedications to the City, the Phase One ESA report must include a clause, or be accompanied by a letter signed by a Qualified Person, or a Principal of the Consulting Firm, which allows the City of Mississauga to make reliance on the findings and conclusions presented to the same extent as to the Property Owner. A **reliance letter template** approved by the City is available online on the City's website and is included in **Appendix 1** of this section.

5.3 Phase Two Environmental Site Assessment

Should the Phase One ESA determine that further investigation is warranted, a Phase Two ESA will be necessary in accordance with O. Reg. 153/04. In general, a Phase Two ESA involves the collection of soil and groundwater samples and installation of a minimum of three (3) groundwater monitoring wells to determine the physical and chemical characteristics of the subject property and assess whether any Contaminants of Concern are present relative to the estimated Areas of Potential Environmental Concern as identified in the Phase One ESA.

The Phase Two ESA report must either include a clause, or be accompanied by a letter signed by a Qualified Person, or a Principal of the Consulting Firm, which allows the City of Mississauga to make reliance on the findings and conclusions presented to the same extent as to the Property Owner.

Any and all contaminated areas of the site that are identified through the Phase Two ESA investigation that exceed applicable Site Condition Standards under O. Reg. 153/04 ((“generic standards”) must be remediated and/or risk assessed with risk management measures implemented to the satisfaction of the City (except for Site Plan applications without land dedications to the City). The property owner must file a RSC acknowledged by the MECP either prior to approval of the development application or as a condition of approval.

5.4 Remedial Action Plan

A Remedial Action Plan (RAP) must be prepared where the property owner intends to remediate contaminated areas of the property that exceed applicable generic Site Condition Standards. The RAP must be prepared, signed and sealed by a Qualified Person and submitted to, and acknowledged by, the City prior to remediation taking place. The RAP must clearly describe the remedial approach and provide timelines and schedules to complete remedial activities, including the plan for confirmation sampling of soil and/or groundwater and post-remedial monitoring (where applicable) to demonstrate that the site meets applicable standards for the intended land use. Sample volume requirements must meet OPSS guidelines and O.Reg. 153/04 regulation, documentation that the testing requirements meet guidelines is the responsibility of the developer by way of the retained Qualified Person.

5.5 Risk Assessment Report

It is required that contaminated/impacted lands be fully remediated and certified prior to dedication to the City, unless otherwise negotiated. Should a risk assessment and risk management approach (see **Appendix 2** for explanation about risk assessments and risk management measures) be the most practical approach to address contamination on such lands (or a combination of remediation and risk assessment), then a MECP approved Risk Assessment approach, per O. Reg. 153/04 (as amended) may be acceptable to the City, pending review by City staff and the following requirements:

- A Risk Assessment Report must be prepared by a Qualified Person as defined under s. 5 and 6 of O. Reg. 153/04, where the Property Owner intends to apply property-specific standards and risk management measures to either any part of, or for the whole of the property that exceeds applicable generic standards.
- A Risk Assessment may be accepted for any lands being dedicated to the City, subject to review and approval by the City prior to formal submission to the MECP. The proposed risk management measures must meet minimum requirements that allow safe working conditions for construction workers performing subgrade maintenance, repair or replacement work of roads and subsurface utilities and that allow sufficient un-impacted soil depth for the planting of trees. The City's risk management measure requirements may be greater than the MECP's minimum requirements.

All Risk Assessments will require a Peer Review retained by the City at the applicant's expense. City staff will provide further instructions on how payment amount and arrangements are to be made when required, following the tender and award exercise.

The City will NOT accept any of the following restrictions on any lands being dedicated to the City:

- Additional Personal Protective Equipment or specialized health and safety plans above and beyond *Occupational Health and Safety Act* requirements in non-contaminated areas;
- Prohibition of construction of enclosed permanent buildings or other structures on park lands (except for potable wells);
- Requirements for any on-going monitoring and reporting (except for annual cap inspection);
- Any active on-going remediation systems (requiring power system connection);
- Prescribed construction specifications above and beyond the Ontario Building Code requirements or applicable City standards for road allowances; and

- Any other restrictions that may be later identified by the City or by the Region of Peel.

The following are minimum City requirements for risk management measures for any lands being dedicated to the City (however, other site specific requirements may be deemed necessary by City staff as part of the review of the application and environmental reports):

- The total thickness of Soil Caps and beneath Hard Caps shall be at least. 1.5 m beneath top soil or paved surface (see **Appendix 2** for further details);
- Un-impacted soil or fill material must surround all subgrade infrastructure assets with a minimum of 0.5 m thick below and 1.0 m horizontally parallel to subgrade infrastructure up to grade within utility trenches, and to the satisfaction of the City and the Region of Peel, as applicable (see **Appendix 2** for further details);
- Any reuse or import of soils or backfill materials onto the development property shall comply with the On-Site and Excess Soil Management Regulation, O. Reg. 406/19, as applicable, including tracking, reporting and quality control requirements by a Qualified Person and in accordance with best management practices; the City maintains the right to audit the tracking and reporting of Soil Management at their discretion in keeping with the regulations;
- Any Certificates of Property Use that will be registered on lands being dedicated to the City must first be reviewed and approved by the City prior to registration;
- Any risk management measure proposed to be installed shall be designed to limit the City's liability and future costs and must receive written approval by the City prior to submission to the MECP for approval.

5.6 Remediation Report

Upon completion of all remedial activities, a final Remediation Report, that is signed and sealed by a Qualified Person, must be submitted to the City for review. The report must confirm the subject property now conforms to the appropriate MECP criteria and is suitable for the intended land use.

Additionally, the Remediation Report must include a clause, or be accompanied by a letter signed by a Qualified Person or a Principal of the Consulting Firm, which allows the City of Mississauga to make reliance on the findings and conclusions presented as if it were the Property Owner.

The following documentation must also be provided to accompany the Remediation Report:

- A certified statement by the Qualified Person regarding the potential for groundwater migration of contamination from the development lands that may enter onto the lands being dedicated to the City and confirmation that the applicant shall maintain responsibility for any ongoing monitoring and/or remediation of the development lands, if required, to prevent migration of contamination onto the lands being dedicated to the City;
- As-Built drawings stamped by a Professional Engineer in good standing that clearly and explicitly show the cross-sections of final grades, depths of clean unimpacted fill material or imported fill material, invert elevation and thicknesses (where applicable) of any risk management measures installed for any lands being dedicated to the City (for examples see **Appendix 2**).

5.7 Record of Site Condition

It is important to note that a Record of Site Condition (RSC) will be required where the following situations occur (Site Plan Applications without land dedications to the City excluded):

(1) A Phase Two ESA report indicates that the subject lands have been identified as having a contaminant that exceeds applicable Site Condition Standards; and/or,
(2) The proposed future use(s) on the subject property constitutes a "change of use" to a more sensitive use as per O. Reg. 153/04, s. 14.

PLEASE NOTE: **Land use classifications under O. Reg. 153/04 may differ from those defined under the City of Mississauga's Official Plan and/or Zoning By-laws.**

> *For example, where the applicable zoning by-law for a new business in an existing building may be permitted without requiring a minor variance or zoning by-law amendment, the proposed new use may still be considered to represent a change to a more sensitive use as defined under O. Reg. 153/04 and thus may require the filing of a Record of Site Condition.*

The most sensitive types of land uses under O. Reg. 153/04 include agricultural, residential, parkland and institutional uses, as well as certain types of community uses (as defined in s. 14). Please refer to O. Reg. 153/04 under the definitions for land uses in section 11 and section 14 of the regulation for full descriptions of these land use types.

5.8 Requirements for Land Dedications

Applicants are advised that if lands will be dedicated to the City, the lands shall be in a condition acceptable to the City in its sole and unfettered discretion that such land is environmentally suitable for the proposed use(s), as determined by the Planning and Building Department, and shall be certified as such by a Qualified Person, as defined in Ontario Regulation 153/04 (as amended).

Environmental report(s) submitted to the City must specifically reference the lands to be dedicated to the City (with legal description and surveyed reference plan) and must be signed and sealed by a Qualified Person (as defined in Ontario Regulation 153/04). At minimum, a Phase One ESA report will be required.

Additionally, the ESA and related reports must also include a **letter of reliance, or a clause within each report**, which allows the City of Mississauga to rely on the findings and conclusions presented in the report(s) as if it were the owner of the property and shall be dated, signed and sealed by a Qualified Person, as defined in O. Reg. 153/04 and to the satisfaction of the City.

All ESA report(s) must include a clear statement by the Qualified Person regarding the suitability of the site for the intended land use and a statement that no public lands abutting the site, nor any lands to be conveyed to the City of Mississauga, Region of Peel and the Conservation Authority having jurisdiction, exceed the appropriate full-depth Site Condition Standards.

Should off-site impacts to public lands be indicated by the Phase Two ESA investigation, further investigation and remediation and/or risk assessment with implementation of risk management measures (that have been approved by the MECP), if necessary, will be required.

Where a risk assessment and risk management measures are intended to be applied on the subject property to address contamination, the City must review and approve of the proposed risk management measures prior to submission to the MECP. The City may require risk management measures above and beyond the minimum requirements set out by the MECP on land dedications for protection of municipal infrastructure, protection of the health and safety of its workers and the public, and to minimize the long-term contingent liability to the City associated with the presence of contaminants.

Upon completion of the remediation and/or MECP approval of a risk assessment of the site or abutting public lands, the proponent may be required to file a complete Record of Site Condition (RSC) on the MECP Environmental Site Registry, pending recommendation by City staff. The RSC shall include a copy of acknowledgment of receipt of the RSC by the MECP and all other supporting documents.

5.9 Storm Sewer Discharge Authorization

For any construction project requiring dewatering works, any water being discharged into the City's storm sewer system must comply with the Storm Sewer Use By-law No. 0046-2022 a and the applicant must contact the City's Environmental Coordinator, Storm Sewers to obtain approval prior to discharge.

For further information, please send an e-mail to Env.Inquiries@mississauga.ca and include full contact information for a response.

Note: The above list of requirements is provided to assist in the preparation of development applications, in accordance with Corporate Policy entitled, "Applications for Development of Contaminated or Potentially Contaminated Sites (which may be amended from time to time). Please be advised that it is the property owner's responsibility to ensure they are in compliance with all governmental and quasi-governmental authorities, including federal, provincial and municipal legislative enactments, by-laws and other regulations pertaining to contaminated sites and other environmental matters.

Appendix 1: Environmental Reliance Letter Template

(INSERT COMPANY LETTERHEAD/LOGO)

(INSERT DATE)

Executive Manager, Development Engineering and Construction

Planning and Building Department

City of Mississauga

201 City Centre Drive, 3rd Floor

Mississauga, ON L5B 2T4

RE: Reliance Letter for *(INSERT FULL SITE ADDRESS OR LEGAL DESCRIPTION)*

Executive Manager, Development Engineering and Construction:

It is understood that **[*INSERT NAME OF PROPERTY* OWNER]** (the "Owner") is seeking approval of a development application from the Corporation of the City of Mississauga ("City") regarding the above-referenced property (the "Site"). **[*INSERT LEGAL NAME OF CONSULTING FIRM]*** has prepared the following report(s) on behalf of the Owner, ***[INSERT NAME OF PROPERTY OWNER]***:

- **[*Insert title, date and file number of the report(s)*]**

On behalf of **[*INSERT LEGAL NAME OF CONSULTING FIRM],*** I confirm that I am a Qualified Person within the meaning of Sections 5 and 6 of O.Reg.153/04 of the *Environmental Protection Act, R.S.O. 1990, c.19,* that I have prepared the environmental reports referenced herein on behalf of ***[INSERT LEGAL NAME OF CONSULTING FIRM]***, and I have the requisite authority to bind the corporation and make this representation and warranty.
I hereby represent and warrant to the City that the work performed and completed, as described in the above report(s) is in accordance with the level and skill exercised by a reasonable environmental professional and is consistent with the requirements under O. Reg. 153/04, as amended. I further represent that the City and its Peer Reviewers (where applicable) may rely on the reports listed herein as if the reports had been prepared for the use and benefit of the City.

_____ _____

Signature of Qualified Person, as defined under O. Reg. 153/04

Print name / Professional Designation

_____/_____/_____ _____

Day *Month* *Year*

Print Position/Title

The undersigned warrants and represents to the Corporation of the City of Mississauga that the foregoing provisions, including the warranties and representation of the Qualified Person, are true and accurate and binding on the undersigned corporation.

[*INSERT LEGAL NAME OF CONSULTING FIRM]*

Per: _____ (signature) _____

I have the authority to bind the Corporation

Print name

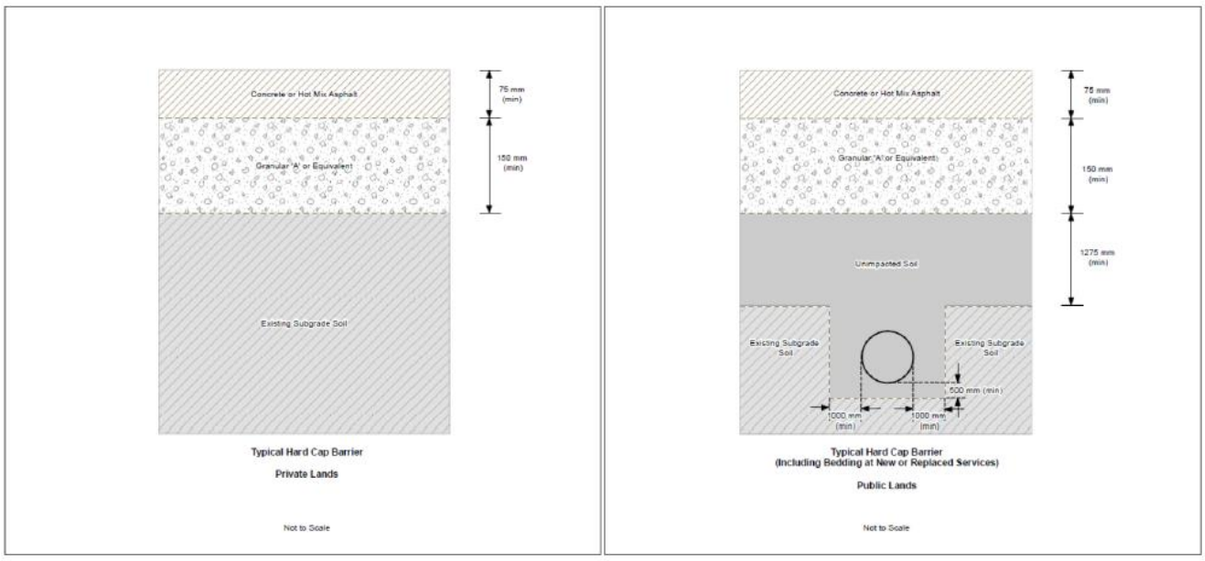
_____/_____/_____ _____

Day Month Year

Print Position/Title

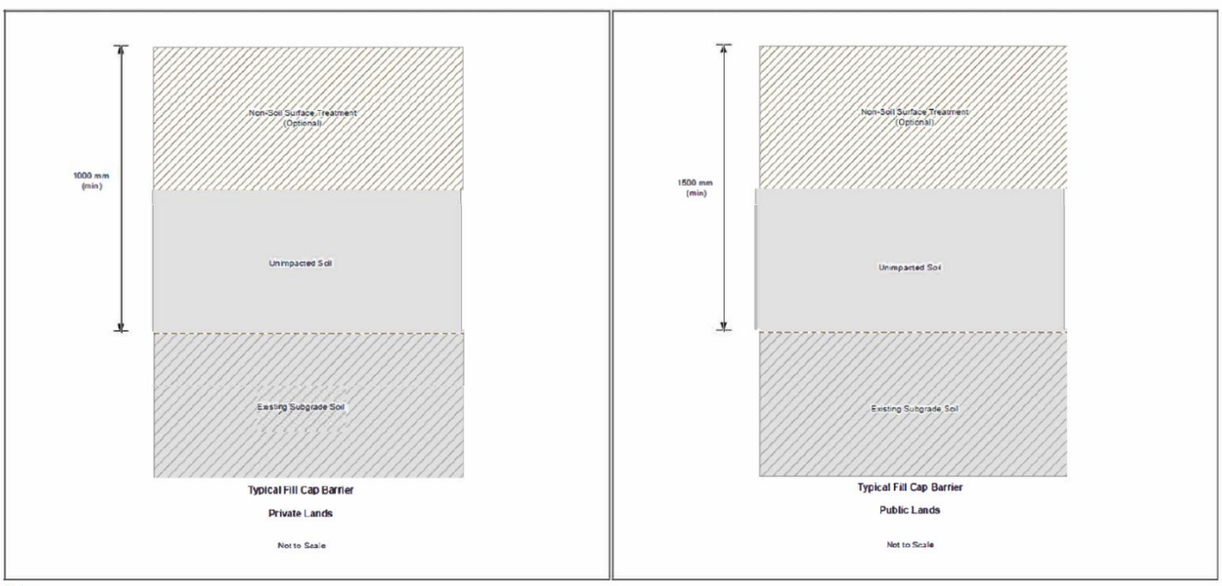
Appendix 2: Risk Management Measure Cap Requirements

Figure 1. Typical Hard Cap Diagrams



Notes:
Unimpacted Soil:
a) Soil found on, in or under the Property in which no Property Specific Contaminants of Concern are present, or
b) Soil that meets the applicable Site Condition Standards (per O. Reg. 154/04) for the Property, and does not contain any contaminant for which no applicable Site Condition Standard for soil is prescribed under Part IX (Site Condition Standards and Risk Assessment) and which is associated with any potentially contaminating activity described in the Risk Assessment.

Figure 2. Typical Soil or Fill Cap Diagrams



Notes:
Optional non-soil surface treatment: Suitable materials include asphalt, concrete, concrete stone pavers, brick or aggregate.
Unimpacted Soil:
a) Soil found on, in or under the Property in which no Property Specific Contaminants of Concern are present, or
b) Soil that meets the applicable Site Condition Standards (per O. Reg. 154/04) for the Property, and does not contain any contaminant for which no applicable Site Condition Standard for soil is prescribed under Part IX (Site Condition Standards and Risk Assessment) and which is associated with any potentially contaminating activity described in the Risk Assessment.

Figure 3. Example Cross-Section Diagram of Capping within Right-of-Way for Road Dedications

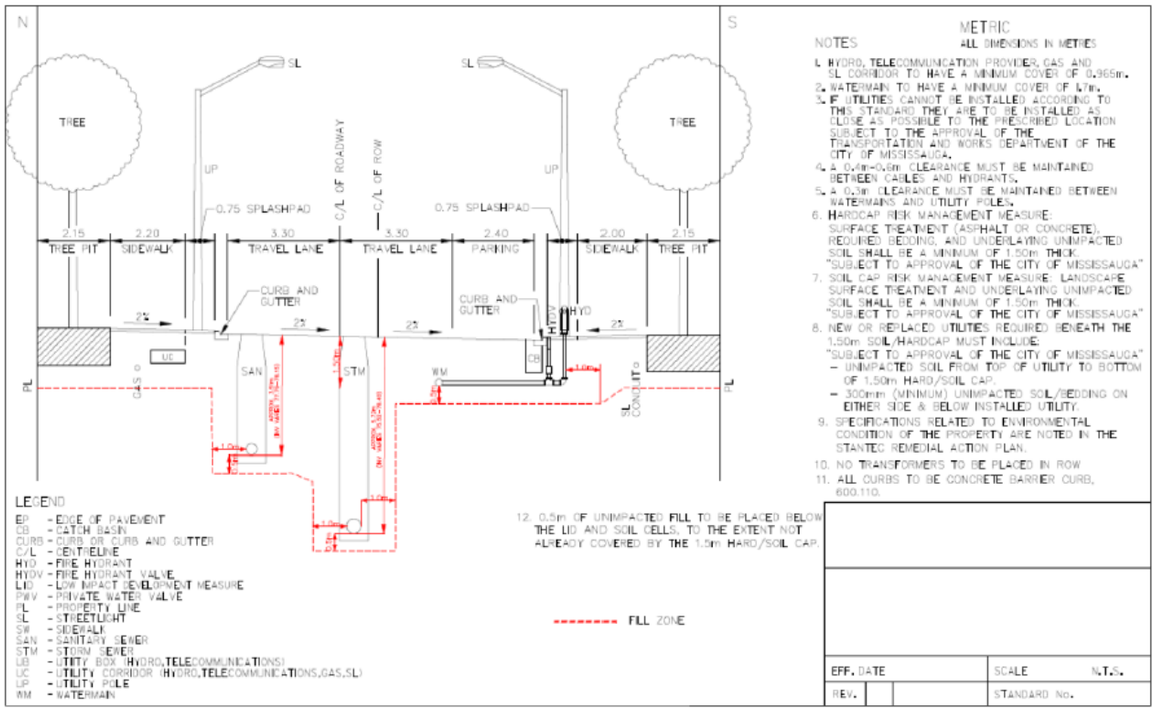
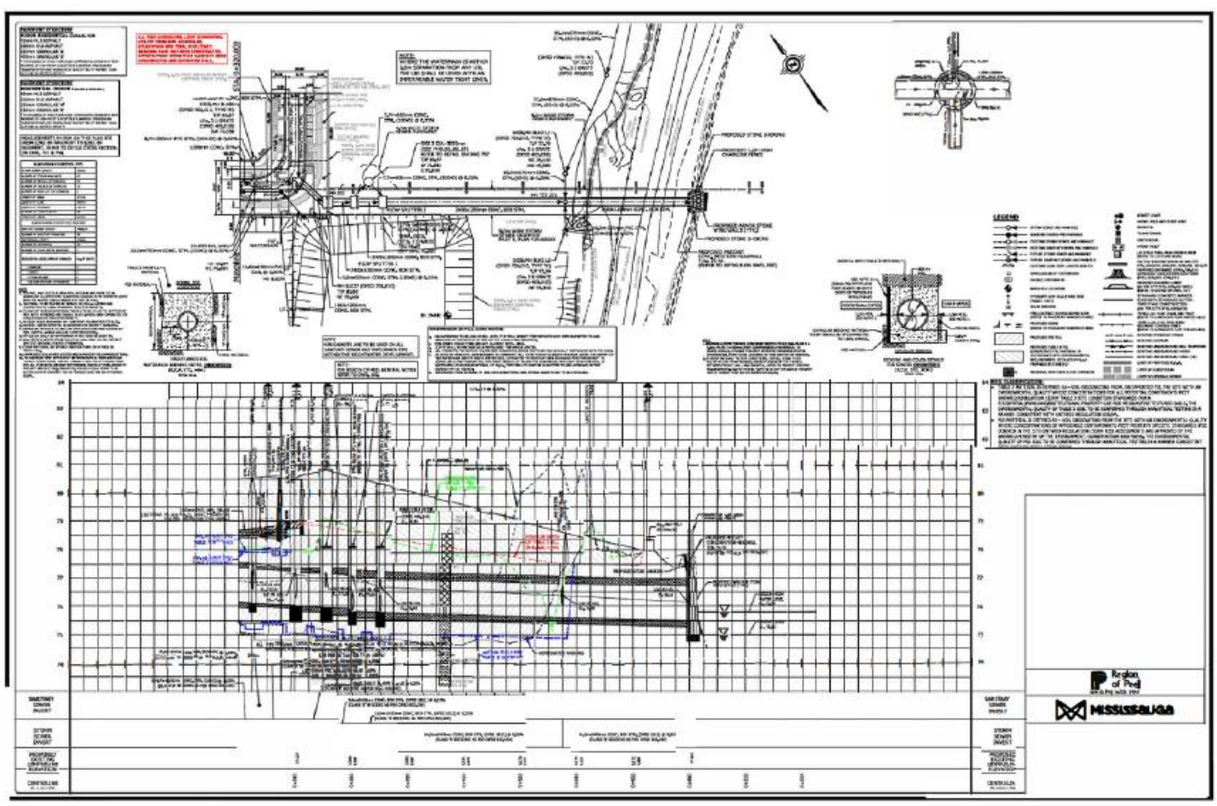


Figure 4. Example of As-Built / As-Constructed Drawing with RMM Capping Depths



SECTION 6 – CONDOMINUM DEVELOPMENT REQUIREMENTS

Table Of Contents

6.0 Introduction 1
6.1 Design Standards & Servicing Policy for Condominium Developments 2
6.1.1 General Requirements 3
6.1.2 Internal Private Roadways 5
6.1.3 Watermains and Water Services 6
6.1.4 Storm and Sanitary Sewers, Drains and Appurtenances 6
6.1.5 Streetlighting 7
6.1.6 Individual Unit Services 7
6.1.7 Utilities 7
6.1.8 Erosion and Sediment Control 7
Appendix 1: City of Mississauga Standard Drawings for Private Roads 8
Appendix 2: Condominium Certification Letter Templates 9
Environmental Reliance Letter Template 10
Interim Grading Certification Template 11
Final Grading Certification Template 12
Interim Pavement Certification Template 13
Final Pavement Certification Template 15
Condominium Services Certification Template 17
Surveyor Certification Template 18
Retaining Wall Certification Template 19
Engineer Certification Template 20

6.0 Introduction

The following are the City's Multi-Family and Residential/Industrial Condominium design requirements for all development applications. A list of standard drawings and required sample letters are included within Appendices.

If you're planning a condominium development, you must first determine what category of condo you're applying for:

- Standard or phased
  - Standard conversion residential/ commercial
- Common element
- Vacant land
- Leasehold

You must also make sure you comply with any requirements related to zoning, parking, existing building permits or land transfer.

If you have a related site plan application, it may need to be approved before you apply for condominium registration. We'll confirm exactly which requirements you need during the pre-application process.

6.1 Design Standards & Servicing Policy for Condominium Developments

6.1.1 General Requirements

Types:

- Standard condominium

  Consists of buildings that are subdivided into units that include exclusive use areas and common elements. Exclusive use areas can include patios, balconies, driveways associated with a unit. Common elements include hallways, recreational facilities, exterior lighting, walkways and visitor parking areas.

- Phased condominium

  Phased condo developments are standard condominiums that are registered in phases under one condominium corporation. These types of condos are developed in stages, and increase in size until the project is complete.

    - Requirements and approvals

      Standard or phased condominiums include brand new builds, as well as buildings that are converted from other uses. Standard condominiums can be used for residential or non-residential purposes.

  Check these guides for detailed information about the documents you need to submit for each type of standard condominium:

- Standard conversion residential requirements
- Standard new build residential requirements
- Standard conversion non-residential requirements
- Standard new build non-residential requirements
- Phased new build residential requirements

- Common element

  A common element condominium is comprised only of common elements such as a road, visitor parking spaces, grounds and walkways that belong to all owners. The units are attached to the condominium as parcels of tied land (POTLs) but don't form part of the condominium corporation.

  For detailed information about the documents you need to submit for this type of condominium development, check the common element condominium guide.

- Vacant land

These type of condominiums are vacant lots upon which residential units are built. They share common elements like roads.

For detailed information about the documents you need to submit for this type of condominium development, check the vacant land condominium guide.

- Leasehold

  Leasehold condominiums are built on long term leased land. They share common elements including hallways, recreational facilities, exterior lighting, walkways, driveways, and visitor parking areas.

Engineering drawings shall be prepared to the satisfaction of the City, to show location of all underground services, including Sanitary, Storm, Watermains, Hydro, Telecommunications, Gas, etc., together with the location of all roadways, sidewalks and boulevards, certified and stamped by a registered Professional Engineer of the Province of Ontario.

Roadways shall not be considered to form any part of the required parking.

Designated fire access routes shall be provided throughout the development to the standards of the Fire Department and Emergency Services Division and in accordance with good engineering practise. (Refer also to fire routes By-law No. 1036-81, as amended)

A. 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 safely. Such arrangements shall be in accordance with standards as set down by the Regional Municipality of Peel. **Multi-family developments** shall be signed so as to easily identify the location of all blocks. Such signs shall be approved by the Urban Design Section of the Planning and Building Department.
B. A certified statement signed and stamped by a registered Professional Engineer of the Province of Ontario stating that all services have been designed and constructed in accordance with the City of Mississauga Standards and Servicing Policy for **Multi-family and Condominium Developments** is required prior to registration of the development.

For more information regarding the Condominium application process visit the link below: https://www.mississauga.ca/services-and-programs/planning-and-development/development-applications/condominum-applications/

6.1.2 Internal Private Roadways

Internal private roadways shall be designed in accordance with the current City of Mississauga design criteria for a minor residential street (including curbs, curb and gutters, subdrains and sidewalks where applicable) in accordance with the latest Ontario Provincial Standard Drawings

and Specifications or City Standards and Requirements as applicable; with the following modifications:

- Minimum width of roadway to be in accordance with current City Condominium Standard Drawings (Appendix 1).
- Condo road cross section(s) (Common Element) shall illustrate allowances for a MIN 3.0m utility servicing corridor within the boulevard(s) Condo Road cross section(s) (Standard) shall illustrate allowances for utility servicing within the boulevard(s)
- Minimum centre line turning radius shall be 12m (fire truck) for any development which has no buildings over three stories.
- Lengths of driveways must be a minimum of 6m measured from the back of the sidewalk/ curb.,
- Minimum overhead clearance shall be 5.0m.
- The minimum pavement structure for the roads will be as follows, but 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.

Minimum Pavement Structure for Roads and Parking Areas	
250mm	OPSS Granular 'B'
200mm	OPSS Granular 'A'
65mm	OPSS H.L.8
40mm	OPSS H.L.3

- Parking lots shall be structurally designed to the equivalent of the internal road design standards.
- The minimum pavement structure for driveways to individual, single, semi or townhouse units will be as follows:

Minimum Pavement Structure for Driveways	
150mm	OPSS Granular 'A'
50mm	OPSS H.L.8
25mm	OPSS H.L.3F

Minimum Pavement Structure for Roads and Parking Areas Industrial Condominium	
250mm	OPSS Granular 'B'
200mm	OPSS Granular 'A'
65mm	OPSS H.L.8
40mm	OPSS H.L.3

6.1.3 Watermains and Water Services

- Watermains and water services shall be designed and constructed in accordance with the most recent requirements of the Region of Peel, the Ontario Building Code and in accordance with municipal by-laws.
- Trench backfill for the watermain and water service installations shall consist of native or granular material, free of organics and contaminants, placed and compacted in lifts as required to achieve a minimum compaction of 95% of the Standard Dry Density. (OPSS 514.07.08)
- Shall be designed and constructed in accordance with the Region of Peel Design Criteria and Development Procedures Manual, latest edition.
- Upon completion of the site work and services and prior to registration, a certified statement signed and stamped is required from a registered/licensed Professional Engineer of the Province of Ontario confirming that all water boxes have been raised to final grade, uncovered and in a clean condition.
    - For any questions regarding this certification please contact the Region of Peel contact associated with the application.

6.1.4 Storm and Sanitary Sewers, Drains and Appurtenances

- The storm and sanitary sewers, drains and appurtenances shall be designed and constructed in accordance with the most recent requirements of the Ontario Building Code and in accordance with the appropriate municipal By-laws.
- Trench backfill for the storm and sanitary sewer and drain installations shall consist of native or granular material, free of organics and contaminants, placed and compacted in lifts as required to achieve a minimum compaction of 95% of the Standard Proctor Density. (OPSS 514.07.08)
- Upon completion of the site servicing works building construction and landscaping; the storm sewer system, including catchbasins and leads shall be cleaned and flushed.
- Flushing operations shall comply with the current Storm Sewer Use By-Law adopted by Council and be certified by a registered Professional Engineer from the Province of Ontario upon completion.

6.1.5 Streetlighting

- Private lighting must minimize light trespass onto municipal rights-of-way, as glare or spill light can interfere with the municipal roadway lighting design and performance. Any private lighting within the private lands must not negatively impact the municipal right-of-way.

- All electrical installations must comply with ESA requirements, (applies universally to any electrical system).

- Lighting should be underground fed where applicable, in accordance with City requirements.
- The lighting system to be fully operational prior to occupancy.
- If the lighting forms part of developer-installed infrastructure on City property, then the City Street Lighting Design Manual must be followed as the minimum design standard.
- Contact the City's streetlighting team to obtain the City Street Lighting Design Manual.

6.1.6 Individual Unit Services

Storm sewers, sanitary sewers and watermains shall not be permitted to be constructed under any building except in special circumstances as permitted in the Ontario Building Code.

6.1.7 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, prior to the issuance of Building permits.

6.1.8 Erosion and Sediment Control

Condominium developments which are within 30m of a watercourse and/or which are comprised of an area in excess of 1 hectare shall be subject to the provisions of the current Erosion and Sediment Control By-law adopted by Council. The developer will be required to apply for an Erosion and Sediment Control Permit prior to undertaking any land stripping or regrading activities within the lands.

Appendix 1: City of Mississauga Standard Drawings for Private Roads

- COM Standard Drawing No. 2211.154
  Roadway cross section specific to private common element condominium road (with on-street parking)

- COM Standard Drawing No. 2211.155
  Roadway cross section specific to private common element condominium road (with off-street parking)

- COM Standard Drawing No. 2211.156
  Private road cross section for a standard condominium with on-street parking.

- COM Standard Drawing No. 2211.157
  Private road cross section for a standard condominium with off-street parking.

- COM Standard Drawing No. 2211.158
  Sidewalk driveway entrance details for a private condominium road

Appendix 2: Condominium Certification Letter Templates

Environmental Reliance Letter Template

(INSERT COMPANY LETTERHEAD/LOGO)

(INSERT DATE)

Manager, Development Engineering & Construction

Planning & Building Department

City of Mississauga

300 City Centre Drive,

Mississauga, ON

L5B 3C1

RE: Reliance Letter for *(INSERT FULL SITE ADDRESS OR LEGAL DESCRIPTION AND APPLICATION REFERENCE NUMBER)*

To *Manager, Development Engineering & Construction Section*:

It is understood that ***(INSERT NAME OF PROPERTY OWNER)*** (the "Owner") is seeking approval of a development application from the City of Mississauga (the "City") regarding the above-referenced property (the "Site"). **[*INSERT LEGAL NAME OF CONSULTING FIRM]*** has prepared the following report(s) on behalf of the Owner:

- **[*Insert title, date and file number of the report(s)*]**

On behalf of **[*INSERT LEGAL NAME OF CONSULTING FIRM],*** I confirm that I am a Qualified Person within the meaning of Sections 5 and 6 of O.Reg.153/04 of the *Environmental Protection Act, R.S.O. 1990, c.19* and have the requisite authority to make this representation and warranty.

I hereby represent and warrant to the City that the work performed and completed, as described in the above report(s) is in accordance with the level and skill exercised by a reasonable environmental professional and is consistent with the requirements under O. Reg. 153/04, as amended. I further represent that the City and its Peer Reviewers (where applicable) may rely on the reports listed herein as if the reports had been prepared for the use and benefit of the City.

Signature of Qualified Person, as defined under O. Reg. 153/04	*Print name / Professional Designation*
Day | *Month* | *Year*	*Print Position/Title*

Interim Grading Certification Template

(INSERT COMPANY LETTERHEAD/LOGO)

(INSERT DATE)

Supervisor/Coordinator, Development Construction
Development Engineering & Construction Section
City of Mississauga
300 City Centre Drive,
Mississauga, ON
L5B 3C1

File: CDM - (Ward)
SP -

RE: INTERIM GRADING CERTIFICATION
DEVELOPMENT NAME, Phase (*if applicable*)
DEVELOPER NAME
DEVELOPER'S MUNICIPAL ADDRESS

Insert company name has served as the engineering consultant for the above noted residential/ commercial/ industrial condominium development. This letter will confirm that I have inspected the interim grading on date of the above-noted lands and the buildings thereon and do hereby certify that the buildings constructed and the existing grades, including internal roadways and driveways are in general conformity with the previously approved preliminary “Building and Grading Certificate”.

I hereby certify that the final grading of the lands can be completed to conform with the previously approved preliminary “Building and Grading Certificate” and that the complete final grading will not alter the overall drainage on adjacent lands.

Should you have any questions or concerns regarding the letter please do not hesitate to contact this office at CONSULTANT CONTACT INFO.

Sincerely,

P.Eng Signature & P.Eng. Stamp

Print name
Engineering Firm

Interim grading certification may be used for condominium registration, prior to the issuance of a Final Grading Certification.

Final Grading Certification Template

(INSERT COMPANY LETTERHEAD/LOGO)

(INSERT DATE)

Supervisor/Coordinator, Development Construction
Development Engineering & Construction Section
City of Mississauga
300 City Centre Drive,
Mississauga, ON
L5B 3C1

File: CDM - (Ward)
SP -

RE: FINAL GRADING CERTIFICATION
DEVELOPMENT NAME, Phase (*if applicable*)
DEVELOPER NAME
DEVELOPER'S MUNICIPAL ADDRESS

I have conducted a site inspection on Enter Date with respect to the final grading of the subject lands and have viewed the finished lot grading and building thereon and do hereby certify that the building(s) constructed with relationship to the elevations and the grading of the lands are in general conformity with the Enter Date *(*)* certification of "Proposed Building and Grading" previously submitted.

Sincerely,

P.Eng Signature & P.Eng. Stamp

Print name

Engineering Firm

The date of the certification of "Proposed Building and Grading" shall be indicated on this Certificate should the Professional Engineer or Ontario Land Surveyor issuing it be different than the original Professional Engineer, or Ontario Land Surveyor.

Interim Pavement Certification Template

(INSERT COMPANY LETTERHEAD/LOGO)

(INSERT DATE)

Supervisor/Coordinator, Development Construction
Development Engineering & Construction Section
City of Mississauga
300 City Centre Drive,
Mississauga, ON
L5B 3C1

File: CDM - (Ward)
SP -

RE: INTERIM PAVEMENT STRUCTURE CERTIFICATION

DEVELOPMENT NAME, Phase (*if applicable*)
DEVELOPER NAME
DEVELOPER'S MUNICIPAL ADDRESS

GEOTECHNICAL CONSULTANT INFO has served as the geotechnical consultant for the above noted condominium development, encompassing inspection, compaction and testing of sewer trench backfilling, road
construction and building foundations. This letter will confirm that we have monitored the quality and placement of all materials during pavement construction at the above noted development.

I hereby certify that the 'As-Constructed' interim pavement structure has been completed up to base course asphalt and is capable of supporting heavy emergency vehicle traffic, including fire trucks.

I understand the top course asphalt will be placed at a later date and hereby certify that the final pavement
structure can be completed in compliance with the City of Mississauga's minimum design standard for condominium developments.

As-Constructed Pavement Structure

Internal Roadway and Parking Areas	**Driveways**
mm GRAN 'B'	mm GRAN 'B'
mm GRAN 'A'	mm GRAN 'A'
mm BASE COURSE	mm BASE COURSE

Should you have any questions or concerns regarding the letter please do not hesitate to contact this office
at CONSULTANT CONTACT INFO.

Sincerely,

P.Eng Signature & P.Eng. Stamp

Print name

Engineering Firm

Final Pavement Certification Template

(INSERT COMPANY LETTERHEAD/LOGO)

(INSERT DATE)

Supervisor/Coordinator, Development Construction
Development Engineering & Construction Section
City of Mississauga
300 City Centre Drive,
Mississauga, ON
L5B 3C1

File: CDM - (Ward)
SP -

RE: FINAL PAVEMENT STRUCTURE CERTIFICATION

DEVELOPMENT NAME, Phase (*if applicable*)
DEVELOPER NAME
DEVELOPER'S MUNICIPAL ADDRESS

GEOTECHNICAL CONSULTANT INFO has served as the geotechnical consultant for the above noted condominium development, encompassing inspection, compaction and testing of sewer trench backfilling, road
construction and building foundations. This letter will confirm that we have monitored the quality and placement of all materials during pavement construction at the above noted development.

I hereby certify that the 'As-Constructed' final pavement structure has been completed to top course asphalt and has met or exceeded the City of Mississauga's minimum design standard for condominium developments and has been provided as follows:

As-Constructed Pavement Structure

Internal Roadway and Parking Areas	**Driveways**
mm GRAN 'B'	mm GRAN 'B'
mm GRAN 'A'	mm GRAN 'A'
mm BASE COURSE	mm BASE COURSE
mm TOP COURSE	mm TOP COURSE

Should you have any questions or concerns regarding the letter please do not hesitate to contact this office
at CONSULTANT CONTACT INFO.
Sincerely,
P.Eng Signature & P.Eng. Stamp

Print name

Engineering Firm

Condominium Services Certification Template

(INSERT COMPANY LETTERHEAD/LOGO)

(INSERT DATE)

Supervisor/Coordinator, Development Construction

Development Engineering & Construction Section
City of Mississauga
300 City Centre Drive,
Mississauga, ON
L5B 3C1

File: CDM - (Ward)
SP -

RE: CONDOMINIUM SERVICES CERTIFICATION

DEVELOPMENT NAME, Phase (*if applicable*)
DEVELOPER NAME
DEVELOPER'S MUNICIPAL ADDRESS

CONSULTANT INFO has served as the engineering consultant for the above noted condominium development, encompassing the inspection of the installation of the underground and aboveground services I hereby certify that all underground and aboveground services have been designed and constructed in accordance with the City of Mississauga Standards and Policies for Servicing of Condominium Developments.

Further, I hereby confirm that CONTRACTOR INFO has completed the flushing of the sewer systems on
insert date and certify that we have found the lines to be deficient free, clear of debris and operational.

I further certify that all granular, asphalt and concrete materials utilized for the construction of the private roads, curbs, sidewalks, walkways, driveways and parking areas meet the applicable O.P.S./City
of Mississauga standards and specifications.

Should you have any questions/ concerns please contact this office at CONSULTANT CONTACT INFO.

Sincerely,
P.Eng Signature & P.Eng. Stamp
Print name
Engineering Firm

Surveyor Certification Template

(INSERT COMPANY LETTERHEAD/LOGO)

(INSERT DATE)

Supervisor/Coordinator, Development Construction

Development Engineering & Construction Section
City of Mississauga
300 City Centre Drive,
Mississauga, ON
L5B 3C1

File: CDM - (Ward)
SP -

RE: SURVEYOR CERTIFICATION

DEVELOPMENT NAME, Phase (*if applicable*)
DEVELOPER NAME
DEVELOPER'S MUNICIPAL ADDRESS

OLS INFO has served as the Ontario Land Surveyor for the above noted condominium development. We hereby certify that a Reference Plan has been deposited that describes the necessary and appropriate utilities, services and location of easements, and right-of-way required for the use and maintenance of all internal utilities, services and access ways among and between the various parcels of land, buildings or parts thereon which may be capable of separate ownership.

(Include for Phased Condo scenario):
I further certify that the limits for this phase of development comprise the necessary roads and services within the adjacent phase lands required to sustain this development and that the easements and right-of-
way shall be more precisely described and created with the declaration and/or easement and cost sharing
agreement, upon condominium registration.

Should you have any questions/ concerns please contact this office at OLS INFO.

Sincerely,

OLS Signature & OLS Stamp

Print name

OLS Firm

Retaining Wall Certification Template

(INSERT COMPANY LETTERHEAD/LOGO)

(INSERT DATE)

Supervisor/Coordinator, Development Construction
Development Engineering & Construction Section

City of Mississauga
300 City Centre Drive,
Mississauga, ON
L5B 3C1

File: CDM - (Ward)
SP -

RE: RETAINING WALL CERTIFICATION

DEVELOPMENT NAME, Phase (*if applicable*)
DEVELOPER NAME
DEVELOPER'S MUNICIPAL ADDRESS

GEOTECHNICAL CONSULTANT INFO has served as the geotechnical consultant for the above noted condominium development, whose services include inspection of retaining wall construction *and foundation bearing capacity* (*include if wall exceeds 0.6m in height*). This letter will confirm that we have monitored the quality and placement of all materials during retaining wall construction at the above noted development.

This letter is to certify that the above described retaining wall was adequately designed, and subsequently constructed, in accordance with the design to support the dead and live loads applied on the structure.

This is also to certify that the above retaining wall has been designed and constructed in accordance with all the applicable standards and regulations.

Should you have any questions or concerns regarding the letter please do not hesitate to contact this office at

CONSULTANT CONTACT INFO.

Sincerely,
P.Eng Signature & P.Eng. Stamp

Print name

Engineering Firm

Engineer Certification Template

(INSERT COMPANY LETTERHEAD/LOGO)

(INSERT DATE)

Supervisor/Coordinator, Development Construction

Development Engineering & Construction Section

City of Mississauga
300 City Centre Drive,
Mississauga, ON
L5B 3C1

File: CDM - (Ward)
SP -

RE: ENGINEER CERTIFICATION

DEVELOPMENT NAME, Phase (*if applicable*)
DEVELOPER NAME
DEVELOPER'S MUNICIPAL ADDRESS

INSERT COMPANY NAME has served as the engineering consultant for the above noted condominium development. I hereby certify that the Servicing Plans and Engineering Drawings describe the necessary and appropriate utilities, services and location of easements and right-of-way required for the use and maintenance of all internal utilities, services and access ways among and between the various parcels of land, buildings or parts thereon which may be capable of separate ownership.

I further hereby certify that the roads and services within the adjacent phase lands required to sustain this development shall be completed and operational in accordance with City of Mississauga standards and specifications.

Should you have any questions or concerns regarding the letter please do not hesitate to contact this office at

CONSULTANT CONTACT INFO.

Sincerely,

P.Eng Signature & P.Eng. Stamp

Print name

Engineering Firm

SECTION 7 - SITE PLANS, REZONING, LAND DIVISION SUBMISSION REQUIREMENTS

Table of Contents

7.0 Introduction 1
7.1 Site Grading & Site Servicing ePlans Submission Requirements 2
7.1.0 Erosion & Sediment Control Permit Application 2
7.2 Site Grading Certification Requirements 3
7.2.0 Site Grading Certification (For Lands Not Covered By A Development Agreement) 3
7.2.1 Grading Plan Requirements & Guidelines 4
7.2.2 Servicing Plan Requirements & Guidelines 4
7.2.3 Erosion & Sediment Control Plans 4
Appendix A – Grading Plan Terms of Reference 5
Appendix B – Certification Sample Letters 11

7.0 Introduction

Submission requirements through ePlans application for approval of site grading and drainage plans and drawings for lands not covered under a development agreement that includes municipal works (Site Plan / In-fill, Rezoning, and Land Division).

7.1 Site Grading & Site Servicing ePlans Submission Requirements

The following is an outline of procedures and requirements for preparation and submission of site grading and site servicing plans to be submitted through ePlans.

Upload into ePlans the following:

- Copy of the Site Plan 'approved' site grading plan as applicable.
- Grading plan(s) stamped and approved by the consulting engineer responsible for the original design of the overall grading.
- Servicing plan(s) showing storm servicing, particularly storm connection(s). This plan(s) are to be stamped and marked approved by the consulting engineer responsible for the original overall design.
- For lands not covered by a development agreement, the grading is to be certified by an Ontario Land Surveyor or Professional Engineer.

7.1.0 Erosion & Sediment Control Permit Application

Should the provisions of the Erosion and Sediment Control By-law No. 512-91 (*as amended*) apply to lands not covered under a development agreement, then an Erosion and Sediment Control Permit must be obtained prior to any land disturbing activities being undertaken. An Erosion and Sediment Control Permit Application is to be made directly to Development Engineering & Construction - Storm Planning Section as outlined in the *Development Requirements Manual* Section 3.

7.2 Site Grading Certification Requirements

7.2.0 Site Grading Certification (For Lands Not Covered By A Development Agreement)

The following are to be uploaded into ePlans:

- A certified copy of a lot grading plan(s) indicating existing elevations of the lot, and sufficient elevations of **adjacent properties** to indicate existing drainage patterns. All grading plans are to be shown in metric units.
- An original stamp on the site grading plan(s), executed by a licensed Professional Engineer, or an Ontario Land Surveyor, shall be in the following form (see sample language below from Section 4 of *the Development Requirements Manual*):

I have reviewed the plan(s) for the construction of _____ located at _____ and have prepared this plan(s) to indicate the compatibility of the proposal to existing adjacent properties and municipal services. It is my belief that adherence to the proposed grades as shown will produce adequate surface drainage and proper facility of the municipal services without any detrimental effect to the existing drainage patterns or adjacent properties.

Signature and Stamp

- The owner of the property is to provide a deposit in accordance with the current Fees and Charges By-law.

  Securities shall be in the form of a Certified Cheque, Bank Draft, Letter of Credit, or Certified Surety Bond. The Owner must further acknowledge that should they not achieve the intent of the above, the funds on deposit will not be released until the grades are rectified to the satisfaction of Development Construction Section and /or City officials or that the funds will, instead, be used to rectify any problems which may have been created and they further consent to allow the City to enter upon the property to rectify any problems. A lot grading variance certificate and a lot grading variance fee may be considered on a site-specific basis

- Following the completion of the work including sodding, it shall be the responsibility of the Professional Engineer or Ontario Land Surveyor (indicated on the original plan(s) and certificate) to carry out the site inspection and take required elevations to verify that the grading has been completed in accordance with the plan(s) submitted, and that the finished project does not adversely affect drainage on adjacent properties. A final lot grading certification letter from the Professional Engineer or Ontario Land Surveyor shall be required prior to the release of the security deposit and shall be in the following form (See Templates in appendix).

7.2.1 Grading Plan Requirements & Guidelines

Refer to site grading plan terms of reference in appendix.

7.2.2 Servicing Plan Requirements & Guidelines

Refer to site servicing plan terms of reference.

7.2.3 Erosion & Sediment Control Plans

The erosion and sediment control plan(s) are to be prepared in accordance with the requirements of the Erosion and Sediment Control By-law No. 512-91 as amended. Copies of the By-law and permit application package can be obtained from the Development Engineering & Construction - Storm Planning Section.

Appendix A – Grading Plan Terms of Reference

Terms of Reference
Grading Plan

MISSISSAUGA

City of Mississauga
Planning & Building Department
Building Division
Development Engineering & Construction
www.mississauga.ca

What is it?

A Grading Plan is a drawing that shows the existing elevations/grades on both the lands being developed and adjoining lands along with the proposed grading changes to the site. The plan is to reflect existing and proposed drainage patterns (existing and adjoining lands), all new structures, existing & proposed easements, access points/driveways and parking areas. Existing and proposed elevations demonstrate the topography to help ensure that the proposed site development drainage pattern will not impact existing lands/drainage patterns and that the grading is subject to sound engineering design.

Who prepares it?

The Grading Plan is to be prepared by a Professional Engineer licensed in Ontario or a licensed Ontario Land Surveyor (OLS). The drawing must be stamped, dated and signed by the licensed professional qualified to design site grading/drainage plan.

When is it required?

A Grading Plan may be required in support of an Official Plan Amendment, Rezoning, Draft Plan of Subdivision / Condominium, Site Plan Control, Consent to Sever applications and infill lands not subject to site plan control and/or development Agreements. A site Grading Plan may also be required for Building Permit applications.

How to prepare it?

A Grading Plan should include, but not be limited to the following:

GENERAL INFORMATION (to be included on all grading plans)

1) City standard title block including address or legal description
2) Metric scale of 1:250, 1:300, 1:500 or similar. Bar scale to be included.
3) North arrow
4) Key Plan for site location, at a scale of approximately 1:10,000
5) Legend identifying existing and proposed site grading information, sump pump discharge location, roof leaders/downspouts discharge location and direction, areas/limits of surface ponding, hard and soft surface materials, window wells, fences, retaining walls, catch basins, etc.
6) Property lines (existing/ultimate), street names, registered plan numbers and parts
7) Locations of all doors and proposed grades outside and abutting each building entrance
8) Street centerline elevations along and beyond the frontage of the site
9) Location and details of all existing man-made or natural features on or adjacent to the site, including:
   - Natural features such as trees and watercourses;

October 2025 Page 1 of 6

- Easements and public utilities;
- Embankments and catch basins;
- Curbs, hydro poles, light standards, fire hydrants, transformers and fences, etc.

10) Existing driveway width along the lot line, as well as existing/proposed widths at the street line where modifications are required
11) Differentiate between existing and proposed works by using lighter/greyed print to show existing features, text, and line work; and darker/black print to show proposed works
12) Location and identification of trees being protected and their associated hoarding zones

DETAILED GRADING INFORMATION (to be included on all grading plans)

1) **Show existing grades within the site and beyond the property limits** at a sufficient distance (including existing building line elevations) to clearly define the existing drainage pattern for the area. Elevations along and beyond the property limits on adjoining lands are to be carefully examined to ensure the impact of external drainage is considered in the design.

2) **Provide proposed grades around the perimeter and within the site**, labelling drainage swale percentages, slope ratios, swale inverts and directional flow arrows. Proposed grades must be compatible with those existing on adjacent lands. Indicate how drainage/runoff as a result of new construction will be managed and self-contained within the site to ensure the adjacent properties are not adversely affected. Indicate the limits wherein the existing grades and drainage pattern will be maintained.

3) **Differentiate between existing and proposed works** by using lighter/greyed print to show existing features, text, and line work; and darker/black print to show proposed works.

4) **Proposed swales** are to be supported with invert elevations at regular intervals and percentages of slope with a minimum of 2.0% where achievable. Swales are to be sodded and well defined in relation to the existing adjacent grades. Allowable driveway slopes shall be between 2.0 % and 8.0%. Provide cross sections to clarify the proposed grading, particularly in relation to the adjacent private lands and municipal right-of-ways.

5) **Cross sections** are to show all relevant information required to properly assess the proposal. Label slopes "3:1 Max" where applicable. The proposed grading shall be in accordance with the City of Mississauga, Development Requirement Manual: https://www.mississauga.ca/file/COM/Section7Revised2010.pdf

6) **Show all roof water leaders and sump pump discharge location(s)**, including direction of discharge, and how it will be managed within the subject property boundaries. Discharge shall not adversely affect abutting and/or City-owned lands and infrastructure, including ditches and sidewalks. Applicants are encouraged to design the weeping tile elevation to be at least 1.0 meter above the seasonal groundwater elevation so that sump pumps do not operate continuously. In cases of high ground water table where a sump pump could run

continuously if a sump pump was implemented, the applicants should consider raising the basement elevation to be at least 1.0 metre above the elevation of the storm sewer obvert.

7) **Ponding limits** and depths are to be depicted on the drawing, and the maximum ponding depth in parking areas is not be exceed 250mm.

8) **Identify the areas to be sodded and/or hard-surfaced** including artificial turf. Label all surface materials on the drawing. Hard surfacing and artificial turf must be Zoning compliant. For additional info, contact Zoning at 311 or 905-615-4311.

9) **Indicate any proposed retaining walls**, along with the type of material, top and bottom of wall elevations at each end at 10 m intervals along its length or where a change in height occurs. Provide cross sections to support proposed retaining walls. Retaining walls near a lot line and greater than 0.6m in height require certified structural details, cost estimates, and structural certification upon completion. The retaining wall in its entirety including footing, must be constructed within the subject lands.

10) **Where municipal storm sewer is available for connection**, an internal storm system may be required to drain the site. A Storm Connection Approval from the Storm Drainage Section is required for any direct connection to the municipal storm sewer. Show location of abutting municipal storm sewer where the internal storm sewer connects. For additional information, contact the Storm Drainage Section at ENV.Approvals@mississauga.ca.

11) **Include a note referencing the specific City of Mississauga Benchmark** number, elevation, and location/description used to establish the elevations on the plan. See Standard Note #1 below. The established benchmark elevation can be found at: http://www.mississauga.ca/portal/services/maps

All existing and proposed elevations are to relate to an active, local (within close proximity) and existing published City of Mississauga benchmark value, without adjustments. Submissions that show elevations values related to a datum other than the 1928 Canadian Geodetic Datum (i.e. the Mississauga Datum) will not be accepted.

GRADING PLAN STANDARD NOTES – LANDS COVERED BY A DEVELOPMENT AGREEMENT

1) "Elevations are referred to the City of Mississauga Benchmark No. ___, located (insert description on benchmark sheet), having a published elevation of ____ metres."

2) "I hereby certify that the proposed grading for the building, appurtenant drainage and storm water management works comply with sound engineering design, and that the proposed grading is in conformity for drainage and relative elevations with the overall grading and drainage plans for this development."
_____ (Signature and Stamp)

3)

a. "Driveway surfaces must be zoning compliant. The portions of the driveway within the municipal boulevard will be paved by the applicant."

b. "At the entrances to the site, the municipal curb and sidewalk will be continuous through the driveway and a curb depression will be provided for each entrance."

c. "All proposed curbing within the municipal boulevard area for the site is to suit as follows:
   i. All curbing must be compliant with City standards within the municipal right of way.
   ii. All entrances to the site are to be in accordance with City of Mississauga Standards 2240.030/2240.031 (as applicable) and 2230.20. Driveway and entrance curb radii dimensions shall be in accordance with OSPD 350.010. 2240.010 to match current condition or 2240.011 (as applicable)."

d. "All excess excavated material will be removed from the site."

e. "The applicant will be required to contact all utility companies to obtain all required locates prior to the installation of hoarding within the municipal right-of-way."

f. "The applicant will be responsible for the cost of any utility relocations necessitated by the site plan."

g. "Prior to commencing construction, all required hoarding in accordance with the Ontario Occupational Health & Safety Act and regulations for construction projects, must be erected and then maintained throughout all phases of construction."

h. Should any work be required within the municipal right-of-way, a Road Occupancy Permit will be required. PUCC approval will be required. For further information, please contact the PUCC/Permit Technologist, at 905-615-4950 or by email at tw.pas@mississauga.ca. See the website link below."
https://www.mississauga.ca/services-and-programs/transportation-and-streets/roads-andsidewalks/apply-for-a-road-occupancy-permit/

GRADING PLAN STANDARD NOTES – LANDS NOT COVERED BY A DEVELOPMENT AGREEMENT

1) "Elevations are referred to the City of Mississauga Benchmark No. ___, located (insert description on benchmark sheet), having a published elevation of _____ metres."

Terms of Reference
Grading Plan

MISSISSAUGA

City of Mississauga
Planning & Building Department
Building Division
Development Engineering & Construction
www.mississauga.ca

2) "I have reviewed the plans for the construction of _____ located at _____ and have prepared this plan to indicate the compatibility of the proposal to existing adjacent properties and municipal services. It is my belief that adherence to the proposed grades as shown will produce adequate surface drainage and proper facility of the municipal services without any detrimental effect to the existing drainage patterns or adjacent properties."

_____ (Signature and Stamp)

3)

a. "All surface drainage will be self-contained, collected and discharged at a location to be approved prior to the issuance of a building permit."

b. "Driveway surfaces must be zoning compliant. The portions of the driveway within the municipal boulevard will be paved by the applicant."

c. "At the entrances to the site, the municipal curb and sidewalk will be continuous through the driveway and a curb depression will be provided for each entrance."

d. "All proposed curbing within the municipal boulevard area for the site is to suit as follows:
   i. All curbing must be compliant with City standards within the municipal right of way.
   ii. All entrances to the site are to be in accordance with City of Mississauga Standards 2240.030/2240.031 (as applicable) and 2230.20. Driveway and entrance curb radii dimensions shall be in accordance with OSPD 350.010. 2240.010 to match current condition or 2240.011 (as applicable)."

e. "All excess excavated material will be removed from the site."

f. "The existing drainage pattern will be maintained except where noted."

g. "The applicant will be required to contact all utility companies to obtain all required locates prior to the installation of hoarding within the municipal right-of-way."

h. "The applicant will be responsible for the cost of any utility relocations necessitated by the site plan."

i. "Prior to commencing construction, all required hoarding in accordance with the Ontario Occupational Health & Safety Act and regulations for construction projects, must be erected and then maintained throughout all phases of construction."

j. "Should any works be required within the municipal right-of-way, a Road Occupancy Permit will be required. PUCC approval will be required. For further information, please contact the PUCC/Permit Technologist, at 905-615-4950 or by email at tw.pas@mississauga.ca or see the website link below."

https://www.mississauga.ca/services-and-programs/transportation-and-streets/roads-andsidewalks/apply-for-a-road-occupancy-permit/

ADDITIONAL RESOURCES

See link to City of Mississauga, Development Requirements Manual for further information: https://www.mississauga.ca/publication/transportation-and-works-development-requirements-manual/

Appendix B – Certification Sample Letters

FIRM LETTERHEAD

FINAL LOT GRADING CERTIFICATION LETTER

To: City of Mississauga
Development Engineering & Construction
300 City Centre Drive
Mississauga, ON L5B 3C1

Date: Enter Date

Attn: Development Construction

Legal Description: _____
APPROVED DRAWING NAME/NO.: _____

Certification of Final Lot Grading

I have conducted a site inspection on Enter Date with respect to the final grading of the subject lands and have viewed the finished lot grading and building thereon.

I hereby certify that the building(s) constructed with relationship to the elevations and the grading of the lands are in general conformity with the Enter Date *(*)* certification of "Proposed Building and Grading" previously submitted. I also acknowledge that checklist items Enter Numbers from checklist below meet with City standards and requirements.

Checklist:

1) Downspouts splash at grade and not directed to City ditch or to adjoining properties.
2) Sump pump discharge maintained within private lands, and not directed to City ditch or adjoining properties.
3) Swales are well defined.
4) All excess materials removed from site and property line grades are matched.
5) Driveway surfaces and width complies with approved grading plan and zoning requirements.
6) Catch basin has been installed and been connected to the City storm sewer.
7) Downspouts connected to the City storm as required.
8) Certify or acknowledge that the drywell/soak away pit has been appropriately constructed.
9) Retaining wall(s) has been constructed solely on the subjects lands.

(*) Note: *The date of the certification of "Enter APPROVED DRAWING NAME/No." shall be indicated on this Certificate should the Professional Engineer or Ontario Land Surveyor issuing it be different than the original Professional Engineer, or Ontario Land Surveyor.*

Signature: _____

P. Eng. / OLS ORIGINAL STAMP OR SEAL

SIGNED and STAMPED Certificate to be E-mailed to: DEVCON@mississauga.ca

SAMPLE

FIRM LETTERHEAD

FINAL LOT GRADING CERTIFICATION LETTER VARIANCE & REVISED DRAWING

To: City of Mississauga
Development Engineering & Construction
300 City Centre Drive
Mississauga, ON L5B 3C1
Attn: Development Construction

Date: Enter Date

Re: Municipal Address: _____
Legal Description: _____
APPROVED DRAWING NAME/NO.: _____

Certification of Lot Grading Variance

I have conducted a site inspection on Enter Date with respect to the final grading of the subject lands and have viewed the finished lot grading and building thereon and do hereby state that the grading of the lands is not in accordance with the approved grading plan. However, it is satisfactory with revisions to the original plan as indicated on the attached drawing and as noted below.

I hereby certify that a variance will not alter or impact the drainage of the developed or adjoining lands. I also acknowledge that checklist items enter numbers from checklist below meet with City standards and requirements.

Checklist:

1) Downspouts splash at grade and not directed to City ditch or to adjoining properties.
2) Sump pump discharge maintained within private lands, and not directed to City ditch or adjoining properties.
3) Swales are well defined.
4) All excess materials removed from site and property line grades are matched.
5) Driveway surfaces and width complies with approved grading plan and zoning requirements.
6) Catch basin has been installed and been connected to the City storm sewer.
7) Downspouts connected to the City storm as required.
8) Certify or acknowledge that the drywell/soak away pit has been appropriately constructed.
9) Retaining wall(s) has been constructed solely on the subject lands.

Purpose of Variance:

_____

_____

_____

SIGNED and STAMPED Certificate to be E-mailed to: DEVCON@mississauga.ca

SAMPLE

FIRM LETTERHEAD

Signature: _____

P. Eng. / OLS ORIGINAL STAMP OR SEAL

(*) Note: *The date of the certification of "Enter APPROVED DRAWING NAME/No " shall be indicated on this Certificate should the Professional Engineer or Ontario Land Surveyor issuing it be different than the original Professional Engineer, or Ontario Land Surveyor.*

SAMPLE

SIGNED and STAMPED Certificate to be E-mailed to: DEVCON@mississauga.ca

FIRM LETTERHEAD

FINAL LOT GRADING CERTIFICATION LETTER VARIANCE

To: City of Mississauga
Development Engineering & Construction
300 City Centre Drive
Mississauga, ON L5B 3C1
Attn: Development Construction

Date: Enter Date

Re: Municipal Address: _____
Legal Description: _____
APPROVED DRAWING NAME/NO.: _____

Certification of Lot Grading Variance

I have conducted a site inspection on Enter Date with respect to the final grading of the subject lands and have viewed the finished lot grading and building thereon and do hereby state that the grading of the lands is not in accordance with the approved grading plan. However, it is satisfactory with the revisions to the original approved lot grading plan as indicated and noted below.

I hereby certify that a variance will not alter or impact the drainage of the developed or adjoining lands. I also acknowledge that checklist items enter numbers from checklist below meet with City standards and requirements.

Checklist:

1) Downspouts splash at grade and not directed to City ditch or to adjoining properties.
2) Sump pump discharge maintained within private lands, and not directed to City ditch or adjoining properties.
3) Swales are well defined.
4) All excess materials removed from site and property line grades are matched.
5) Driveway surfaces and width complies with approved grading plan and zoning requirements.
6) Catch basin has been installed and been connected to the City storm sewer.
7) Downspouts connected to the City storm as required.
8) Certify or acknowledge that the drywell/soak away pit has been appropriately constructed.
9) Retaining wall(s) has been constructed solely on the subject lands.

Purpose of Variance:

_____

_____

_____

_____

SIGNED and STAMPED Certificate to be E-mailed to: DEVCON@mississauga.ca

SAMPLE

FIRM LETTERHEAD

Signature: _____

P. Eng. / OLS ORIGINAL STAMP OR SEAL

(*) Note: *The date of the certification of "Enter APPROVED DRAWING NAME/No " shall be indicated on this Certificate should the Professional Engineer or Ontario Land Surveyor issuing it be different than the original Professional Engineer, or Ontario Land Surveyor.*

SAMPLE

SIGNED and STAMPED Certificate to be E-mailed to: DEVCON@mississauga.ca

FIRM LETTERHEAD

RETAINING WALL CERTIFICATE

To: City of Mississauga
Development Engineering & Construction
300 City Centre Drive
Mississauga, ON L5B 3C1
Attn: Development Construction

Date: Enter Date
File: (Registered Plan No.)

Re: (Name of Subdivision)
Lots/Block No.
Registered Plan No.
Retaining Wall Constructed of Maximum Height _____ m

This letter is to certify that the above described retaining wall was adequately designed, and subsequently constructed, in accordance with the design to support the dead and live loads applied on the structure.

This is also to certify that the above retaining wall has been designed and constructed in accordance with all the applicable standards and regulations.

Sincerely,

Company Name

Signature & Stamp of Engineer

c: Developer

SAMPLE

SIGNED and STAMPED Certificate to be E-mailed to: DEVCON@mississauga.ca

SECTION 8 – STORM DRAINAGE DESIGN REQUIREMENTS

Table of Contents

8.0 Introduction 1
8.1 Storm Sewer Design 2
8.1.1 Run-off Calculations 2
8.1.2 Storm Sewer Requirements 4
8.1.3 Manhole Requirements 9
8.1.4 Catchbasin Requirements 11
8.1.5 Roof Leaders, Foundation Drains and Storm Connections 13
8.2 Channel, Culvert and Overland Flow 16
8.2.1 Culverts and Bridges 16
8.2.2 Outfall Channels 16
8.2.3 Watercourse Erosion and Bank Stability 17
8.2.4 Overland Flow Routes 17
8.2.5 Inlet/Outlet Structures 18
8.3 Stormwater Management Requirements 19
8.3.1 Stormwater Quality Control 20
8.3.2 Stormwater Runoff Volume Reduction 21
8.3.3 Storm Water Quantity Control 23
8.3.4 Stormwater Management Reports 36
8.3.5 Low Impact Development 37
8.4 Groundwater Management 39
8.4.1 Requirements 39
8.4.2 Groundwater Quality 39
8.4.3 Groundwater Quantity 40
8.5 Storm Sewer Discharge Authorization 41
Appendix 1 – Watershed Boundaries 42

List of Tables

Table 1: Stormwater Quantity Control Requirements 26
Table 2: Stormwater Quantity Control Requirements (continued) 28
Table 3: Stormwater Quantity Control Requirements (continued) 30
Table 4: Stormwater Quantity Control Requirements (continued) 32
Table 5: Stormwater Quantity Control Requirements (continued) 34
Table 6: Etobicoke Creek Unit Flows 35

8.0 Introduction

The following are the City's storm drainage design requirements for all applications. The following subsections cover the topics of stormwater management, groundwater management, storm sewer design and channel/ overland flow. While this design criteria outlined in this document can be used to apply for Stormwater Charge Credit, it does not cover details on the application process; to see additional details please see our Stormwater Charge webpage.

8.1 Storm Sewer Design

8.1.1 Run-off Calculations

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 Development Engineering & Construction team where the drainage area is greater than 10 hectares. The larger of the flows is to be used in the design of the sewer system.

$$Q = 0.0028CIA$$

Where: Q = Flow in cubic metres per second (m^3/s)

A = Area in Hectares (ha)

C = Run-off coefficient

I = Intensity in millimetres per hour (mm/hr)

Intensity of Rainfall: The intensity of rainfall is to be determined from the most recent City of Mississauga standard INTENSITY – DURATION – FREQUENCY – RAINFALL CURVES. These curves were originally derived from rainfall data taken from the Pearson International Airport (City Standard Drawing No. 2111.010). The equations for these curves are as follows:

2 Year Storm $I = \frac{610}{(T.C. + 4.6)^{0.78}}$

5 Year Storm $I = \frac{820}{(T.C. + 4.6)^{0.78}}$

10 Year Storm $I = \frac{1010}{(T.C. + 4.6)^{0.78}}$

25 Year Storm $I = \frac{1160}{(T.C. + 4.6)^{0.78}}$

50 Year Storm $I = \frac{1300}{(T.C. + 4.7)^{0.78}}$

100 Year Storm $I = \frac{1450}{(T.C. + 4.9)^{0.78}}$

Time of Concentration: The minimum initial time of concentration is to be 15 minutes.

Pre-Development: To calculate the initial time of concentration (t_c) for upstream, undeveloped lands, the following formulae may be used: Bransby Williams, HYMO/OTTHYMO, SCS Upland Method, etc. The most appropriate method will be determined at the discretion of the Development Engineering & Construction team.

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 metres shall have an initial (t_c) of 15

minutes and the remainder shall have a (t_c) as if 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 these sewers, channels, or culverts shall supersede the 2m/s calculation.

Runoff Coefficient: Unless otherwise demonstrated, the runoff coefficients noted below are to be used.

	Runoff Coeff
• Residential – single family, semi-detached	0.55
• Compact or dense housing (e.g. townhouses)	0.65
• High-rise residential	0.90
• Industrial and Commercial	0.90
• Neighbourhood Park	0.30
• Permeable Pavements	0.50
• Sodded Area	0.25
• All Other Surfaces	0.90

A minimum runoff coefficient of 0.55 is to be used for undeveloped upstream area external to the subdivision where future residential development is expected and 0.90, where future industrial or commercial development is expected.

To account for the increase in runoff due to saturation of the catchment surface that would occur for larger, less frequent storms, the adjustment factor below shall be used for pre and post development conditions:

	Adjustment Factor
• 10 – Year	1.0
• 25 – Year	1.1

- 50 – Year 1.2
- 100 – Year 1.25

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.

Climate Change: Where storm sewers are being planned inclusive of a direct outlet to a receiving stream or watercourse, the City may consider an adjustment to the design flows (e.g. a +20% adjustment for IDF curves) to account for future climate change scenarios.

Hydraulic Grade Line: In infill scenarios the City may require a hydraulic grade line analysis (e.g. spreadsheet analysis based on sewer design). The purpose would be to demonstrate that existing properties and the subject development would not be impacted by any proposed changes.

8.1.2 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.

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.

Inlets

The designed storm sewers inlets must model conditions of no inlet restriction, and a 50% inlet restriction at any depressions or roadway sags.

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.

The value of the roughness coefficient 'n' used in the Manning's formula shall be as follows:

- Concrete Pipe 0.013
- Concrete Box Culverts 0.013

- Corrugated Metal 68 x 13mm corrugations 0.024
- Corrugated Metal 25% paved invert 0.020
- PVC Pipe 0.013

Design flow calculations must be completed on City of Mississauga forms shown on City Standard Drawing No.'s 2112.020 and 2112.030, for this purpose.

Flow Velocities (Flowing full)

For circular concrete pipes the:

- Minimum acceptable velocity is 0.75m/s and the
- Maximum acceptable velocity is 4.0m/s.

For velocities that exceed 3m/s, additional protection against erosion, scouring, and pipe displacement must be provided by a licensed Engineering Practitioner. Slopes greater than 20 percent shall include concrete anchors or an equivalent tool and will vary by sewer material and size. This shall be verified by a Licensed Engineering Practitioner.

In certain circumstances, velocities less than 0.75m/s may be accepted if site conditions do not allow for deepening of the storm sewer. Special measures such as frequent flushing must be considered and would be responsibility of the property owner.

Minimum Sizes

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

Depth of Storm Sewers:

The obvert of the storm sewer shall be located a minimum of one (1) metre below basement floor elevations to allow for the installation of foundation and weeping tile connections. Maximum depth should be obtained as per manufacturer recommendations.

Storm Sewers shall be installed at sufficient depth 1.2m (greater than frost penetration). If install is not available at this depth, pipes should be insulated to protect from freezing. Insulation must be designed/verified by a Licensed Engineering Practitioner.

Unless the Consultant is sure of the types of buildings to be incorporated along a street, it is suggested that storm sewers be placed with 3.2 metres of cover below the centre line of the road to ensure compliance with City requirements 8.1.5.

For Storm Sewers that are subject to traffic loading, a loading factor must be considered. This shall be in accordance with regulations, codes and by-laws of authorities having jurisdiction, which may include but is not limited to: Highway Bridge Design Code (for vehicular traffic), Railway Safety Act, and Transport Canada Act.

Location

The storm sewers shall be located as shown on the standard City of Mississauga road cross section drawings. This standard location is generally 1.5 metres south or west of the centre line of the right of way.

A minimum setback of 500mm between the obvert of the sanitary sewer and the invert of the storm sewer must be provided if the sanitary sewer connections are required to go under the storm sewer.

A minimum 0.5m vertical setback, and 2.5m horizontal setback must be maintained from other utility services.

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 centre line radius allowable shall be in accordance with the minimum radii table as provided by the manufacturers.

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 Size

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

Easement Requirements

The minimum width of easements for storm sewers shall be in accordance with the following guidelines:

Size of Pipe	Depth of Invert	Minimum Width of Easement
250 to 375mm	3.0 m maximum	3.0 m
450 to 675mm	3.0 m maximum	4.5 m
750 to 1500mm	3.0 m maximum	6.0 m
1650mm and up	4.0 m maximum	4.0 m plus 3 times O.D. of Pipe

Regardless of the above, all situations will be reviewed and judged on individual cases at the discretion of the Development Engineering & Construction team.

In some cases, development may be proposed adjacent to an existing storm sewer easement. Depending on the development's design and proximity to the easement limit, the City may request a geotechnical engineer to certify the proposed excavation limit, slope of excavation and line of influence.

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 material used in the addition, modification, replacement, or extension of Storm Sewers including pipes, fittings, valves, devices and materials used for the rehabilitation shall meet all applicable quality adopted by the Ontario Provincial Standards for Roads and Public Works. The class of pipe and the type of bedding shall be selected to suit loading and proposed construction conditions. Details are illustrated in the City of Mississauga Standard Drawings 2112.040. In general, the Type "B" bedding (crushed stone base 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.

The use of City of Mississauga Standard No. 2112.110 “Sewer Bedding (6mm Washed Crushed Gravel)” is allowed on a per project basis. Approval in writing is required in advance before this material may be used.

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) Pipe

Manning's 'n' that will be used for the sizing of PVC pipes shall be 0.013. The Manning's 'n' that will be used to determine velocity and time of concentration is 0.009.

Pipe Manufacturer must be approved by the Development Engineering & Construction team.

Maximum allowable deflection of main line sewer is 5% Deformation gauge (Pig) test may be required prior to acceptance.

Pipe shall meet the Canadian Standard Association requirement as noted within OPSS 1841. The basic material used in manufacturing of this pipe shall have a cell classification of 12454-B or 12454-C or ASTM Standard D-3034 and OPSS 1841.

Maximum PVC pipe size that will be allowed to be installed for the City of Mississauga shall be 450mm diameter. This maximum pipe size may increase based upon result of CSA test or CSA certification and City approval.

Bedding for all PVC pipes shall be in accordance with City Standard Drawing No. 2112.080, Detail A-A with the exception of material above the pipe, will be 19mm stone sewer bedding as well, not concrete. Sewer bedding shall conform with OPSS 1010 for Granular ‘A’ or City Standard Drawing No. 2112.110 or 2112.140 and sand cover shall conform with City Standard Drawing No. 2112.100. The compaction of all bedding and cover materials shall be a minimum of 95% Standard Proctor. 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. The use of any bedding material or backfill material with diameters larger than 4 cm will not be permitted around any flexible pipe. Backfill of all flexible pipes shall be in accordance with the manufacturers’ specifications and City standards and OPSS 514.07.08.

Sewer service connection shall be in accordance with OPSD 1006.02.

Engineering Consultants are to provide the City with calculations and a certificate that an analysis has been completed, given:

(a) The site conditions
(b) Water table elevation

(c) Trench width
(d) Proposed bedding
(e) Manufacturer H.D.B. rating identifying that pipe materials are stress rated

To ensure that all forms of flexible pipe failure have been addressed and that a factor of safety of 1.75 has been achieved. The typical types of pipe failure are as follows:

(i) Wall thrust, i.e., buckling of walls at spring line
(ii) Ring buckling - caused by hydrostatic pressures, normally identified as collapsing in the bottom quadrants of the pipe
(iii) Joint failure
(iv) Wall distress, i.e., strain cracking
(v) Wall deformation
    a. Ring deflection, i.e., 5% elliptical deflection
    b. Irregular distortion normally identified as inverse curvature within the top of the pipe

8.1.3 Manhole Requirements

Manholes may either be 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

Manholes 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.

Pipe Diameter	Maximum Maintenance Manhole Spacing
600mm or less	120m
675mm or grater	170m

Maximum spacing of manholes shall be 120m for sewers 600mm or less in diameter and 170m for sewers 675mm or greater in diameter.

Manhole Types

O.P.S.D. standard manhole details shall be used for manhole design. Although these standard drawings provide details for manholes up to certain maximum depths and sizes, the Consulting Engineer shall analyse, individually, each application of the standards related to soil conditions, loading and other pertinent factors to determine structural suitability. In all cases where the standard drawings are not applicable, the manholes shall be individually designed and detailed.

A reference shall be made on all profile drawings to the type and size of storm manholes.

Manhole Details

- Manhole chamber openings shall be located on the side of the manhole parallel to the flow for straight run manholes, or on the upstream side of the manhole at all junctions.
- The change in direction of flow in any manhole shall not be less than 90 degrees.
- Safety gratings shall be provided in all manholes when the depth of the manhole exceeds 5m. The maximum spacing between safety gratings shall not exceed 4.5m.
- The obverts on the upstream side of manholes 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 1.2m, a drop pipe as indicated on City Standard Drawing No. 2113.010 shall be placed on the inlet pipe.
- Granular backfill material shall be placed to a minimum thickness of 300mm all around the manhole structure.
- Storm sewer manholes shall be benched to the obvert of the outlet pipe on a vertical projection from the spring line of the sewer.
- Manholes 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 manholes 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 amount of drop 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 manholes on sewers where the outlet is 1050mm diameter or greater. In addition, hydraulic calculations may be required for manholes where the outlet pipe is less than 1050 mm diameter if, in the opinion of the Development Engineering & Construction team, there is insufficient invert drop provided across any manhole.

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

The minimum drops across manholes shall be as follows:

Change of Direction	Minimum Drop (mm)
0°	20
1° to 45°	50
46° to 90°	80

8.1.4 Catchbasin Requirements

Catchbasins may be either precast or poured in place and shall be designed and constructed in accordance with the most recent O.P.S.D. and O.P.S.S. requirements.

Location and Spacing

Catchbasins shall be selected, located and spaced in accordance with the conditions of design. The design of the catchbasin 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 catchbasin shall be 2000m^2 of paved area or 5000m^2 of sodded area.

Maximum spacing for catchbasins shall be as follows:

Road grade @ 0.5%	70m
Road grade @ 0.5% to 3%	90m
Road grade greater than 3%	70m

NOTE: For cul-de-sacs the distance is to be measured along the gutter.

Catchbasins shall be generally located upstream of sidewalk crossings at intersections and upstream of all pedestrian crossings. Catchbasins shall not be located in driveway curb depressions.

Catchbasins Types

Typical details for the single, double and rear lot type catchbasins are shown on City standard 2851.07, and in the O.P.S.D. Standards.

Any special catchbasins and inlet structures proposed must be fully designed and detailed by the Consulting Engineer for approval by the Development Engineering & Construction team.

Double catchbasins are to be installed at the low point of any road as a minimum but the design should demonstrate sufficient protection to ensure the 100-year storm is contained within the municipal right-of-way.

Catchbasin Connection

For single catchbasins including rear lot catchbasins, the minimum size of connection shall be 250mm and the minimum grade shall be 1.0%.

- Where storm mainline sewer sizes are such that a connection of the 250mm lead can not be achieved, alternative means of stormwater mitigation are to be proposed for review. Acceptance of alternatives are at the city's sole discretion.

For double catchbasins, the minimum size of connection shall be 300mm and the minimum grade shall be 1.0%.

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

Rear lot catchbasin leads shall be installed as follows:

- Where the concrete pipe lead goes between houses, concrete encase the lead between the front building line and the rear building line.
- Where PVC pipe is used, concrete encase the entire line from the main sewer to the rear lot catchbasin.

Frame and Grate

The frame and cover for catchbasins shall be as detailed in the O.P.S.D. Standards. In general, the "bicycle proof" catchbasin grate shall be required for catchbasins located in roadway or walkway areas.

Catchbasins located within the travelled portion of a roadway, shall have the frame elevation wet flush with the surface of the future course asphalt. The adjustment and setting of the frame and cover shall be completed in accordance with the details provided in the O.P.S.D. Standards.

Catchbasins in urban areas may be subject to nonstandard frame and grate use as part of community initiatives. Coordination of this nature will be initiated as part of development application review process.

8.1.5 Roof Leaders, Foundation Drains and Storm Connections

Roof Leaders

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

(1) Roof leader down spout locations are to be indicated on site grading plans.
(2) Roof leaders are to discharge onto concrete splash pads.
(3) Split drainage lots are not permitted to discharge through adjacent lots which have back to front drainage. The roof leader must be located at the house corner closest to the catchbasin.
(4) Houses located on corner lots have roof leaders(s) located at the corner(s) of the house, closest to the street lines.
(5) The appropriate clauses for the conditions listed below are to be included in Schedule C of the Servicing Agreement, under Consulting Engineer.
    a. The Consultant is to certify, as part of the preliminary lot grading certificate, that the roof leader(s) are not connected directly to the storm sewer and are located in accordance with City of Mississauga standards.
    b. The Consultant is to certify as part of the final lot grading certificate, that the roof leader(s) have been installed in accordance with the preliminary lot grading certificate.
(6) For further consideration on managing runoff volume on a site, please reference Section 8.3.2 – Stormwater Runoff Volume Reduction.

Foundation Drains

It is the City's policy to connect foundation drains by gravity to the storm sewer system provided that the elevation of the basement floor is at least 1.0 metre above the elevations of the storm sewer obvert at that point. If a gravity connection meeting the City's requirements is available it must be utilized.

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 surface at a location which is satisfactory to the City. The method of managing sump pump discharge is to be noted on all site/ grading plans. The Applicant shall acknowledge on the plans (i.e. provide a note) that the sump pump discharge will be managed within the site without a detrimental effect to adjoining lands including City ditches.

In cases of high ground water table where a sump pump could run continuously if a sump pump was implemented, the applicants should consider raising the basement elevation to be at least 1.0 metre above the elevation of the storm sewer obvert.

Storm Connections

Storm connections for foundation drains are to be sized in accordance with the following:

Sizes:	
Single family and semi-detached residential areas	Minimum size 150mm diameter
Multiple family residential block, commercial areas and, industrial areas	To be designed in accordance Section 8.1.2 Min. size 300mm diameter

Joints and Bedding:

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

Connections of Services to Main Sewer:

A storm connection may be mandated under the discretion of a City Reviewer. Connections to storm sewers may be mandated due to various criteria such as site size, capacity of receiving infrastructure. If you are required to connect to a City sewer, then a drainage proposal will be required.

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 600 mm or smaller, pre fabricated tees from the plant shall be utilized.
- For storm main sewer pipe sizes 675 mm to 900 mm, tees shall be manufactured in the field on top of the trench with the proper saddles and shall be inspected by the Consulting Engineer prior to installation.
- For storm main sewer pipe sizes 975 mm and larger, tees shall be manufactured in the trench with proper saddles.
- All connections are to be made between springline and pipe obvert

In the cases above, the storm sewer shall be drilled or scribed at the plant rather than breaking through the pipe wall on site.

50mm x 50mm wooden markers placed from the invert of the service to 600mm above ground level shall be placed at the ends of each residential connection (at the street line).

The top 600mm of the markers are to be painted white.

Connection Application Requirements:

The connection application must be submitted electronically.

The following are to be depicted on the site servicing drawings:

- Inverts of the connection at the street (property) line and at the main storm sewer system.
- The connection size, slope and class of pipe
- Information on the main storm sewer system (invert, obvert, size, slope and direction of flow).
- Municipal address, lot and registered plan number.
- A Key Plan
- A North Arrow
- Existing street services, sanitary, storm, water, manholes, etc. (obtainable from plan and profile drawings available in the Drafting section).
- A professional engineer must approve and stamp the design of the storm sewer connection.

If development infrastructure has not been assumed by the City, the consulting engineer for the development must certify the site servicing drawings.

Any basement elevation of a site **must** be one metre above the obvert of the adjacent municipal sewer system. If this criterion is not met, the installation of a sump pump will be required.

Connection invert(s) at the street/ property line **must** be equal to or greater than the obvert of the main sewer.

If the diameter of the connection exceeds one-half the diameter of the main sewer, then the connection must go into a new manhole or existing one if available and suitable to the City.

All storm connections are to be designed to City of Mississauga storm sewer standards.

8.2 Channel, Culvert and Overland Flow

For channel, culvert, bridge and/or erosion control projects the proponent is responsible for obtaining all necessary approvals from the governing agencies, such as the Conservation Authority, Ministry of Natural Resources and/or the Ministry of the Environment, Conservation and Parks (MECP).

8.2.1 Culverts and Bridges

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

Driveway culverts must have a minimum size of 200mm PVC (or approved equivalent) with headwall.

Bridges and other major drainage structures shall require special designs as determined by the Development Engineering & Construction team. Hydraulic calculations will be required.

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

8.2.2 Outfall Channels

The proposed criteria for an open channel design shall be submitted to the City for approval prior to the actual design being undertaken.

Outfall channels shall be defined as major system overland flow channels, minor system outfall channels or natural channels.

Major system overland flow channel designs should accommodate the greater of the Regional storm or the 100 year storm for new development.

8.2.3 Watercourse Erosion and Bank Stability

Where erosion or bank instability is already evident in an area to be developed or re-developed, the City of Mississauga requires that the situation be stabilized by appropriate remedial and restoration measures and include proposed preventative measures as part of the application's engineering review process. Where a proposed development will increase downstream erosion, the City requires the Developer to propose efforts to mitigate further damage by incorporating remedial improvement details as part of the development design.

Watercourse dynamics and natural valley aesthetics govern, and the recommended scope of works must be minimized/ localized to the area such that achievement of a sound technical solution is at a reduced or eliminated impact to the surrounding naturalized area. Natural channel design principles and bio engineering should be used wherever feasible. A normal bank flow channel has a capacity of about the 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 bank. 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 City for consideration and approval prior to the actual design being undertaken.

8.2.4 Overland Flow Routes

An overland flow route continuous to the nearest major channel must be established through all areas and shall be contained within either the road right-of-way or by easements. Positive major system overland flow is a paramount consideration to ensure a safe conveyance route is provided away from buildings.

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 0.65 m^2/s.
- For arterial roads, the depth of water shall not exceed the crown of the road.

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.

Analysis shall be submitted that demonstrates the above criteria have been met. Examples of this analysis include:

- a spreadsheet style overland flow analysis such as that shown on City Standard Drawing No. 2112.031
  or
- in more complicated situations, a dual drainage modelling approach.

Dependent on the condition of the downstream drainage system, the City may also require smaller developments to submit a dual drainage analysis. In all cases, the analysis is to be fully documented, prepared and signed by a Professional Engineer.

8.2.5 Inlet/Outlet Structures

Inlet and outlet structures shall be fully designed on the engineering drawings. The details provided shall include the existing topography, proposed grading and the works necessary to protect against erosion.

Adequate structural details and details outlining erosion control features to mitigate erosion and direct overland flow impact may include but is not limited to; baffle blocks, surficial treatments, cable concrete, gabions, rip-rap, plunge pools, other calming measures etc. shall be provided at all inlets/ outlets to protect against erosion and to sufficiently channel/ direct the flow at the inlet/ outlet structure.

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. In addition, backwater valves should be considered to prevent impacts of high-water levels impacting sewer function.

Outfall structures to existing channels or watercourses shall be designed to minimize impact/damage in the vicinity of the outfall from maximum flows in peak flow conditions, as a result of potential erosion.

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

All basements and/or parking lot structures must be situated above the 100 year storm elevation of the watercourse.

8.3 Stormwater Management Requirements

Stormwater management is required to control the changes in the pattern of runoff that occur after development to mitigate urban impacts to receiving watercourses. The measures adopted to achieve these requirements have advanced through the years. A development site that may have used a simple flow control device to meet quantity control requirements in the 1980's may now incorporate a number of measures such as enhanced grassed swales and infiltration galleries to meet runoff volume reduction requirements. An integrated design approach is now more prominent whereby engineers collaborate with landscape architects and other professionals from the onset. This collaboration makes it possible for small changes in site design to allow for larger benefits.

This evolution reflects the state of stormwater management and the importance of the treatment train approach where stormwater runoff is captured and treated at the source, in conveyance and at the end-of-pipe. The City's stormwater management requirements have also evolved in response to the changing industry standards as well as for consideration of other matters such as:

- Stormwater management criteria updates by the City's partner Conservation Authorities
- Coordination with the City's requirements outside of the Conservation Authority regulated areas
- Climate change and associated extreme weather events
- Infrastructure resiliency
- Ongoing maintenance considerations
- Introduction of the Stormwater Charge
- Consolidated Linear Infrastructure Environmental Compliance Approval
- SWMF Operations & Maintenance Manual from the Designing Engineer

In the context of development, these criteria are pertinent to provision of practices at the site level, in other words, at the source. The sub-sections that follow outline the City's stormwater management requirements which are summarized under the following elements:

- Stormwater Quality Control
- Stormwater Runoff Volume Reduction
- Stormwater Quantity Control
- Low Impact Development Practices
- Stormwater Management Reports

Applicants are advised that while these requirements are necessary for implementation at the site development stage, there is leverage for applications toward future credit on the stormwater

charge that would be applicable to non-residential and multi-residential sites. The stormwater charge does acknowledge requirements on non-residential and multi-residential sites that are imposed by the City's development process.

The City will continue to review the stormwater management requirements in light of the above considerations on an ongoing basis. For clarifications on the requirements applicable to a particular site, call 311 to be directed to the Environmental Services Section with respect to stormwater management requirements.

8.3.1 Stormwater Quality Control

CONTEXT

The discussion of stormwater quality control in this section relates to the traditional definition which addresses total suspended solids (TSS) removal. Urban runoff carries surficial sediments and debris into receiving streams and watercourses which degrades water quality and impacts aquatic habitat conditions. In addition, metals and other pollutants adhere to particulate matter found in the stormwater runoff column which further degrades water quality. The importance of stormwater runoff quality in Mississauga is underscored by the fact that it quickly finds its way to Lake Ontario which is the source of our drinking water.

REQUIREMENT

At a site level, applicants are required to provide a minimum treatment of 80% total for the removal of TSS for the 90th percentile rainfall event. Treatment devices must be Canadian ETV Program Verified.

If a site drains to an existing downstream stormwater management facility designed to provide enhanced (Level 1) protection and has capacity to treat flows from the proposed site, treatment would not be required and on-site control measures are voluntary. Should a site drain to an existing facility that provides less than enhanced protection or the facility does not have capacity to treat the flows, then some on-site best management practice (BMP) is/are required to contribute to improving overall water quality. Where a site could involve potential spill (e.g. gas station, fulling station) then an on-site device shall be provided for spill control regardless of any existing downstream stormwater management facility. If the development site is within a Conservation Authority's regulated area the applicant is to confirm their requirements are also met. A depiction of the areas covered by existing municipal stormwater quality control facilities is shown on Appendix 1.

The exemption to this requirement is for individual single-family dwellings, in these cases the applicants are encouraged to provide best efforts to improve stormwater quality from their development runoff.

CONSIDERATIONS

The city will not recognize Oil Grit Separators (OGS) performance claims greater than 50% total suspended solids (TSS) removal. A maximum credit of 50% TSS Removal will be provided to OGS units with claims created the 50% TSS removal.

The City encourages the applicant to ensure the site's tenant or property manager is aware of any stormwater quality control measures installed on-site and where possible, are provided with an operation and maintenance document outlining the protocols for upkeep.

8.3.2 Stormwater Runoff Volume Reduction

CONTEXT

Stormwater runoff from developed sites impacts streams and watercourses by introducing erosive forces during frequent storms. In addition, the alteration of the hydrologic regime from raw land reduces the amount of water that would naturally evaporate, transpire or infiltrate essentially generating more runoff volume. These impacts are the target of the requirement outlined within this section with the goal being to reduce stormwater runoff volume from developing sites, which is separate from quantity control volume requirements. Practices implemented to address this criterion may assist in mitigating erosion and water balance to address Conservation Authority requirements.

REQUIREMENT

The first 27mm of runoff, or the 90th percentile storm for the geographical area (whichever is greater), shall be managed on site by way of on-site retention (infiltration, evapotranspiration, or reuse), filtration or detention. Applicants must prioritize on site retention measures, however, if site conditions do not allow for adequate retention, filtration may be considered as a secondary measure. If the retention and filtration measures are not adequate in achieving the runoff volume requirement, detention can be considered as a final alternative. The total runoff volume is calculated as the product of impervious site area times 27mm excluding initial abstraction. It is not permitted to use 1mm abstraction in the calculations.

Reuse measures are subject to Building Code Compliance and can include, but are not limited to, grey water reuse such as toilet flushed or laundry, cooling towers, car washes, or irrigation. Proposed measures are subject to planner approval. Please see below section 8.3.5 'Low Impact Development' for specific criteria regarding LID practices.

The 90th percentile storm is a minimum retention requirement, whereas applicable Master Drainage Plans or Subwatershed Plans may carry a higher minimum requirement. The exemption to this requirement is for individual single-family dwellings, although even in this case the applicants are encouraged to do best efforts to reduce stormwater runoff from their

lands. Recognizing that the City requires roof leader downspouts to be disconnected, other measures that can be implemented include:

- Incorporation of rain barrels at the roof leader downspouts or rain gardens to absorb flows
- Use of infiltration galleries, if soil conditions are conducive, located on the property considering Ontario Building Code requirements
- Incorporation of permeable materials within the driveway where permitted by applicable zoning by-law
- Increase of topsoil depth around the property to 300mm to allow for greater absorption

CONSIDERATIONS

LONG TERM OPERATION

To re-iterate the introductory statement relating to the stormwater charge, it is noted here that the credit process considers requirements on the site that are imposed by the City's development process. However, the category of runoff volume reduction allows for credit even greater than 5mm. In other words, despite the City's requirement for 5mm the applicant may wish to look at opportunities for designing in larger on-site retention volumes as there is potential financial benefit in the longer-term life cycle for the site tenant or property manager.

DESIGN

When considering the engineering design of the site to meet the runoff volume reduction requirements, the applicant will consider the following:

- Fundamental drainage principles continue to apply so "self-containing" site drainage is still required to meet standard City grading and drainage requirements. Within the site itself, the conventional drainage system may be adjusted to integrate the low impact development measures utilized to meet the runoff volume reduction requirement so there remains the potential for infrastructure reduction dependent on the site grading and configuration
- The need for cost-effective back-ups should be included to ensure failure of the system would not create a drainage concern. A notable example would be an overflow pipe in a bottomless infiltration catchbasin or simply a safe overland flow route in case of blockage
- For design requirements that are not included in this document, the City endorses the Low Impact Development Stormwater Management Planning and Design Guide (CVC & TRCA, 2010) as a design guidance document and would recommend its use by applicants in keeping with the commentary provided here

- While rain gardens are encouraged, particularly as noted above for individual residential properties, the City discourages draining large impervious surfaces (e.g. parking lot from commercial property) to any measure that promotes surficial ponding immediately adjacent to residential dwellings. In this instance, infiltration and other systems should be considered as an alternative

APPROVAL PROCESS & "VOLUMETRIC" CREDIT POTENTIAL

- Surficial works (e.g. "soft" treatments such as ground cover, shrubs, plants, etc.) on any low impact development measure on private lands are subject to the approval of Planning and Building – Development & Design. "Hard" elements of proposed low impact development measures (e.g. piping, soil medium, gravel/granular, etc.) are approved by Development Engineering & Construction – Environmental Services team. The City circulates submissions internally in order that the appropriate parties provide comment.
- Securities are typically informed through the provision of an estimate by the applicant and taken by the City to ensure measures are suitably installed. "Soft" treatments would be secured by Planning & Building. "Hard" elements relating to low impact development measures would be taken by Development Engineering & Construction as part of a grading deposit. Certification is required upon request for release of securities.

An integrated design approach involving multiple disciplines (e.g. civil engineer & landscape architect) is considered beneficial to facilitating design decisions from the onset of a project which could allow stormwater management criteria to be more easily met. With respect to optimizing the infrastructure if site grading and configuration allow, there may be the potential to replicate the stormwater quantity control storage typically provided by way of "superpipes" within the low impact development measures. If this is the case, the City would consider a "volumetric" credit if:

- Engineering design demonstrates technical adequacy and sufficient storage such that pipe or surface storage are redundant, and;
- A stormwater charge credit application is submitted which obliges the site tenant or property manager to maintain the infrastructure and allows the City ability to inspect and enforce should there be any concerns particularly since the credit discussed here links back to flood resiliency.

8.3.3 Storm Water Quantity Control

CONTEXT

Flooding that occurs through the storm drainage network, whether it be through a surcharged storm sewer or excess of flows backing up a creek, can cause impacts to large areas of public and private property. To help mitigate this and reduce the risk that this may occur the City

imposes stormwater quantity control requirements, which echo the Conservation Authority flood control requirements in many cases, in efforts to reduce stormwater peak flow runoff from developing sites impacting surrounding systems.

REQUIREMENT

The stormwater quantity control requirement varies depending upon the watershed; all pertinent watersheds within Mississauga and corresponding requirement is found below in Tables 1 to 5 (Stormwater Quantity Control Requirements) and an illustration of the watershed boundaries is found within Appendix 1 (Watershed Boundaries). These requirements account for the most recent updates adopted by the Toronto Region Conservation Authority (TRCA), Conservation Halton (CH) and Credit Valley Conservation (CVC).

CONSIDERATIONS

The following points are to be considered in conjunction with the quantity control requirement:

- In all cases, the storm sewer capacity constraints or downstream concerns may govern. In some instances the City may request analysis of the downstream sewer capacity to verify any constraints for quantity control
- Where “pre-development” is listed as part of the requirement, it is implied as raw land for which the run-off co-efficient is equal to 0.25 but will not exceed 0.50 for a site that may already be developed
- The “unit rates” prescribed to calculate pre-development flows for the pertinent branches of Etobicoke Creek are excerpted in Table 6 from TRCA’s Hydrology Study: Etobicoke Creek Hydrology Update (MMM Group, 2013)
- Runoff coefficients utilized for the development shall be justified based on impervious cover (as noted earlier in the Storm Drainage Section 8.1.1)

DESIGN

In undertaking the engineering design of the site to meet the stormwater quantity control requirement, the applicant will consider the following:

- The modified rational method, or equivalent, is to be used for the analysis
    - A coefficient of 0.8 for orifice tubes, or 0.6 for orifice plates. The City will prefer the use of orifice tubes or pipes where appropriate. If site constraints require the use of an orifice plate, it shall be inspected annually to ensure it is operating as designed.
- A control device (orifice) must have a diameter of no less than 75mm in order to prevent clogging of the opening and shall preferably be an orifice tube or pipe. Ponding limits and available storage are to be depicted on the engineering drawings, and the maximum ponding depth in parking areas is not to exceed 250mm

An overland flow route shall be clearly marked and the grading of parking lots and landscaped areas must provide a safe overland flow path to the surrounding municipal right of way during storms exceeding the design storm event

FOR INSTITUTIONAL/COMMERCIAL/INDUSTRIAL SITES

- Flow control devices shall be installed on the upstream side of the manhole
- Storm connections from the building roof and foundation drains must be made downstream of the manhole and/or catchbasin inlet controls
- Roof drains should be selected to give a maximum discharge of 42 L/s/ha of roof area.

Table 1: Stormwater Quantity Control Requirements

Subwatershed Name (Conservation Authority)	Quantity Control Criteria	References & Notes
Applewood Creek (CVC)	100 Year Post to 2 Year Pre-development Control	-
Avonhead Creek (CVC)	100 Year Post to 2 Year Pre-development Control	Southdown District Master Drainage Plan (Totten Sims Hubicki, 2000)
Birchwood Creek (CVC)	100 Year Post to 2 Year Pre-development Control	-
Carolyn Creek (CVC)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year)	Master Drainage Study (Winter Associates, 1987)
Cawthra Creek (CVC)	100 Year Post to 2 Year Pre-development Control	Drainage diversion to Cooksville Creek and a very small area draining to creek.
Chappell Creek (CVC)	10 Year Post to 2 Year Pre-development Control	-
Clearview Creek (CVC)	100 Year Post to 2 Year Pre-development Control	Southdown District Master Drainage Plan (Totten Sims Hubicki, 2000)
Cooksville Creek (CVC)	100 Year Post to 2 Year	Revised development standards via Mississauga Staff report to City Council

	Pre-development Control	
Credit River - Norval to Port Credit (CVC)	No control required	Subwatershed Study in progress (partially complete)
Cumberland Creek (CVC)	No control required	-
Etobicoke Creek - Main Branch & Lower Etobicoke (TRCA)	No control required in the City of Mississauga	Hydrologic Model: VISUAL OTTHYMO- Return period peak flows based on the AES - 12-hour design storm Hydrology Study: Etobicoke Creek Hydrology Update (MMM Group, 2013)
Etobicoke Creek - West Branch (TRCA)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year) using unit rates	Hydrologic Model: VISUAL OTTHYMO- Return period peak flows based on the AES - 12-hour design storm Hydrology Study: Etobicoke Creek Hydrology Update (MMM Group, 2013)

Note 1: In all cases, storm sewer capacity constraints or downstream concerns may govern

Note 2: Where “pre-development” is listed as part of the requirement, it is implied as raw land for which the run-off co-efficient=0.25 but will not exceed 0.50 for a site that may already be developed

Note 3: CVC-Credit Valley Conservation, TRCA-Toronto Region Conservation Authority, CH-Conservation Halton

Table 2: Stormwater Quantity Control Requirements (continued)

Subwatershed Name (Conservation Authority)	Quantity Control Criteria	References & Notes
Fletcher's Creek (CVC)	No control required in the City of Mississauga	Fletchers Creek Subwatershed Study Report (Paragon Engineering Limited, 1996) Subwatershed Management Strategy and Implementation Plan (AMEC Earth & Environmental, 2012)
Joshua Creek (CH)	100 Year Post to 2 Year Pre-development Control	Commentary from Conservation Halton in lieu of 1992 Watershed Plan
Kenollie Creek (CVC)	10 Year Post to 2 Year Pre-development Control	-
Lakeside Creek (CVC)	100 Year Post to 2 Year Pre-development Control	Southdown District Master Drainage Plan (Totten Sims Hubicki, 2000)
Levi Creek (CVC)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year) & Regional Storm	Hydrologic Model: GAWSER Model- Return period peak flows based on 24-hour SCS Type II distribution Gateway West Subwatershed Study (Gartner Lee Limited & Cosburn Patterson Mather, 1999)

		Gateway West Subwatershed Study Update by Kidd Consulting (Update in Progress)
Little Etobicoke Creek (TRCA)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year) using unit rates	Hydrologic Model: VISUAL OTTHYMO- Return period peak flows based on the AES - 12-hour design storm Hydrology Study: Etobicoke Creek Hydrology Update (MMM Group, 2013)
Lornewood Creek (CVC)	100 Year Post to 2 Year Pre-development Control	-

Note 1: In all cases, storm sewer capacity constraints or downstream concerns may govern

Note 2: Where “pre-development” is listed as part of the requirement, it is implied as raw land for which the run-off co-efficient=0.25 but will not exceed 0.50 for a site that may already be developed

Note 3: CVC-Credit Valley Conservation, TRCA-Toronto Region Conservation Authority, CH-Conservation Halton

Table 3: Stormwater Quantity Control Requirements (continued)

Subwatershed Name (Conservation Authority)	Quantity Control Criteria	References & Notes
Loyalist Creek (CVC)	East of Winston Churchill Blvd - Provide post to pre control for only 10-year design storm	Loyalist Creek Watershed Study (CBCL Limited, 1980)
	West of Winston Churchill Blvd - Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year)	Erin Mills West Loyalist Creek Drainage Report (Proctor & Redfern Group, 1985)
Mary Fix Creek (CVC)	10 Year Post to 2 Year Pre-development Control	-
Mimico Creek (TRCA)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year)	Hydrologic Model: VISUAL OTTHYMO- Return period peak flows based on the AES - 12-hour design storm Hydrology Study: Mimico Hydrology Update (Marshall Macklin Monaghan, 2009)
Moore Creek (CVC)	No control required	-
Mullet Creek (CVC)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year) & Regional storm	Hydrologic Model: GAWSER Model- Return period peak flows based on 24-hour SCS Type II distribution

	Consider storm sewer constraints outlined in Streetsville Area Drainage Study (Dillon, 1994)	Gateway West Subwatershed Study (Gartner Lee Limited & Cosburn Patterson Mather, 1999) Gateway West Subwatershed Study Update by Kidd Consulting (Update in Progress)

Note 1: In all cases, storm sewer capacity constraints or downstream concerns may govern

Note 2: Where “pre-development” is listed as part of the requirement, it is implied as raw land for which the run-off co-efficient=0.25 but will not exceed 0.50 for a site that may already be developed

Note 3: CVC-Credit Valley Conservation, TRCA-Toronto Region Conservation Authority, CH-Conservation Halton

Table 4: Stormwater Quantity Control Requirements (continued)

Subwatershed Name (Conservation Authority)	Quantity Control Criteria	References & Notes
Sawmill Creek (CVC)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year)	Hydrologic Model: GAWSER Model- Return period peak flows based on 24-hour SCS Type II distribution Sawmill Creek Subwatershed Study (Proctor & Redfern Limited, 1993)
Serson Creek (CVC)	100 Year Post to 2 Year Pre-development Control	Large number of buildings (> 150) in the regulated flood plain
Sheridan Creek (CVC)	100 Year Post to 2 Year Pre-development Control	-

Sixteen Mile Creek (CH)	East of Ninth Line, north of CN Rail (North 16 District) – Flows draining to a North 16 District stormwater quality/erosion control facility (Ponds Q1 & Q2) are to be controlled on-site to 75 l/s/ha for the 5-year storm event	North 16 District Scoped Subwatershed Study and Ninth Line District Floodplain Mapping (Philips, 2004); recommended Scenario 2B (Recommendation (v) on page 50)
	East of Ninth Line, north of CN Rail (North 16 District north-west quadrant) – Flows draining to Ponds Q3a & Q3b are required to provide storage for 25mm and 2-year storms at 300m3/imp.ha and 380m3/imp.ha, respectively, as well as release rates of 1.5L/s/imp.ha for the 25mm storm and 5L/s/imp.ha for the 2-year storm	Master Servicing Study for the Mississauga Fire and Emergency Services Training Centre (Sernas, 2008) Detailed Design – Sanitary, Water & Storm Services, Mississauga Fire and Emergency Services Training Centre (Sernas, 2009); recommendations in Section 4.2 (page 13)

Note 1: In all cases, storm sewer capacity constraints or downstream concerns may govern

Note 2: Where “pre-development” is listed as part of the requirement, it is implied as raw land for which the run-off co-efficient=0.25 but will not exceed 0.50 for a site that may already be developed

Note 3: CVC-Credit Valley Conservation, TRCA-Toronto Region Conservation Authority, CH-Conservation Halton

Table 5: Stormwater Quantity Control Requirements (continued)

Subwatershed Name (Conservation Authority)	Quantity Control Criteria	References & Notes
Sixteen Mile Creek (CH)	East of Ninth Line between CN Rail and Britannia (Lisgar and surrounding area) - Provide post to pre flow control for all storms (i.e. 2,5,10,25,50 & 100 year) and volume control to pre-development conditions. No connections to FDC permitted.	-
	East of Ninth Line, south of Britannia Road (Churchill Meadows) - No connections to FDC permitted. No controls otherwise	Stormwater Management Design Report – Churchill Meadows Stormwater Management Facilities – Sixteen Mile Creek Watershed (RAND Engineering, 1997)
	West of Ninth Line - to be established through Ninth Line Lands-East Branch Subwatershed Study (ongoing)	-
Spring Creek (TRCA)	Provide post to pre control for all storms (i.e. 2,5,10,25,50 & 100 year) using unit rates	Hydrologic Model: VISUAL OTTHYMO- Return period peak flows based on the AES - 12-hour design storm Hydrology Study: Etobicoke Creek Hydrology Update

		(MMM Group, 2013)
Stavebank Creek (CVC)	10 Year Post to 2 Year Pre-development Control	-
Tecumseh Creek (CVC)	100 Year Post to 2 Year Pre-development Control	-
Turtle Creek (CVC)	10 Year Post to 2 Year Pre-development Control	-
Wolfedale Creek (CVC)	10-year post to 2-year pre	-

Note 1: In all cases, storm sewer capacity constraints or downstream concerns may govern

Note 2: Where “pre-development” is listed as part of the requirement, it is implied as raw land for which the run-off co-efficient=0.25 but will not exceed 0.50 for a site that may already be developed

Note 3: CVC-Credit Valley Conservation, TRCA-Toronto Region Conservation Authority, CH-Conservation Halton

Table 6: Etobicoke Creek Unit Flows

Subwatershed Name	**Unit Flow Rates** *($m^3/s/ha$)*					
	2-year	**5-year**	**10-year**	**25-year**	**50-year**	**100-year**
Etobicoke Creek – West Branch	0.03241	0.04412	0.05220	0.06250	0.07021	0.07799
Spring Creek	0.03168	0.04318	0.05114	0.06135	0.06903	0.07679
Little Etobicoke Creek	0.03575	0.04746	0.05546	0.06559	0.07315	0.08075

8.3.4 Stormwater Management Reports

CONTEXT

The stormwater management report accompanying the submission may be provided as a letter brief but must be stamped and signed by a licensed Professional Engineer. The engineering drawings that accompany the report must similarly be stamped and signed by a licensed Professional Engineer.

REQUIREMENT

The report itself should, at a minimum, document the following:

- Description and illustration of existing and proposed conditions including a figure showing drainage areas, existing storm drainage infrastructure and justification for the proposed runoff coefficient values being utilized
- Summarize the City's stormwater management requirements
- Provide a section outlining how each requirement has been met
- For Stormwater Runoff Volume Reduction: describe the measure(s) being proposed to meet the requirement and include supporting calculations and documentation
- For Stormwater Quantity Control: specify what criteria governs (e.g. storm sewer constraints or stormwater quantity control requirements), document the required stormwater storage and compare to the storage provided
- Describe how external flows will be accommodated, if applicable
- Hydraulic Grade Line and Overland Flow analyses
- Include or reference the engineering plans that depict the proposed measures

CONSIDERATIONS

In some instances, the City may request a Drainage Proposal to identify an appropriate outlet for the development. The Drainage Proposal should identify the proposed drainage scheme and its effects on the downstream sewer capacity. The analysis of the downstream sewer capacity must be performed for pre and post development conditions.

When required, hydrologic studies shall employ an appropriate modelling technique with defensible parameter values. The study shall describe the modelling parameters and the criteria for their selection as well as input and output data. The consultant is to assume full responsibility for the proper application of the hydrologic models. The City recommends that the Consultant follow the *M.T.O. Drainage Management Technical Guidelines*.

In general, the SCS design storms should be used for determining the hydrographs for undeveloped watersheds and for checking detention storages 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. The time step for discretization of the design storm can vary according to the size of the sub-watershed but must not exceed the estimated time of concentration. To aim for consistency, ideally the models used in site design would be the same platform and use the same storm distribution as the watershed model.

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 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.

8.3.5 Low Impact Development

Low Impact development (LID) measures can be used in a variety of scenarios to help meet criteria identified in Sections 8.3.1-8.3.4. All LID's must be designed in accordance with the identified design criteria in Section 8.3. The City of Mississauga has identified guidelines for applicants on both private and public property when designing LID's on their properties.

Private LID's

All LID's on private property must be designed/ stamped by a professional engineer. Through the ECA process, private property owners are expected to meet their legislated requirements and/or maintain their infrastructure.

If a private property applies for a Stormwater Charge credit (for more details on this please see relevant Stormwater Charge Credit reports), the site will be subject to inspections from the city to ensure the LID is operating as designed.

Reuse measures are subject to Building Code Compliance and can include, but are not limited to, grey water reuse such as toilet flushed or laundry, cooling towers, car washes, or irrigation.

Public LID's

If an LID is to be assumed by the City of Mississauga , the following conditions must be met.

- The LID must be designed and stamped by a professional engineer
- The LID must be designed in accordance with the latest industry standards and guidelines such as STEP LID Stormwater Management Planning and Design Guide or MECP LID Stormwater Management Guidance Manual.
- The designer must confirm that the local soil and groundwater conditions are acceptable for the purpose of the proposed LID

- All LID pipes should have a minimum diameter of 250mm with access points and/or clean out points installed at each change of alignment, grade, material and at the start and end of each radius pipe
- LID's should be located in such an area that it meets the following conditions
    - Should not be located on top of buried infrastructure, unless otherwise approved
    - Should have a minimum setback of 1m from private properties and 4m from any buildings or structures
    - LID setbacks should align with other buried utility such as storm sewers mentioned in Section 8.1.2
- All caps and access lids used in the design should accommodate equivalent generic alternatives (i.e. no exclusive patents/ name-brand products to be used), unless otherwise approved
- The city is **not** in favour of permeable pavements within the municipal Right-of-Way, unless otherwise approved
- All vegetation in an LID must: drought tolerant species and comply with current traffic safety guidelines
- Any manufactured treatment devices (e.g. OGS) should be designed such that maintenance is not required more than once a year and are in locations with good access for inspections and maintenance; preferred locations would also have minimal traffic control measures
- Any manufactured treatment devices should not have a unit depth greater than 6m
- Drainage area to LID footprint must range between 5:1 to 20:1 for optimal performance.

8.4 Groundwater Management

In recent years, many municipalities have adopted groundwater management standards, due to the increase of high-density development. Many buildings now extend below the water table, and therefore need to manage groundwater through all stages of the project. Foundation drainage systems are installed below the foundation of a structure to move water away from the structure, often to storage or reuse systems for the site.

Once the specified conditions for groundwater are met, the water is discharged into the municipal storm sewers. The sections below provide detail regarding our groundwater quantity and quality criteria; failure to meet the conditions will withhold the approval of an application.

8.4.1 Requirements

If the proposed development includes an underground parking structure, then a Hydrogeological report must be completed and submitted for review. All foundation drainage systems must be equipped with a sampling port, and a flow meter within the building. If a foundation drainage system is constructed without a sampling port and flow meter, then it must have the possibility of adding one at a later date, if requested by the City.

For specifics regarding groundwater dewatering to the municipal storm sewer during construction, please refer to Section 8.5 below.

8.4.2 Groundwater Quality

Groundwater entering the municipal storm sewers must be compliant with the City of Mississauga Storm Sewer Use By-Law 0046-2022, Schedule A, '*Limits for Storm Sewer Discharge*' criteria. A representative sample must be compared to the criteria outlined in the By-law by the City. This sample must be taken from a well that is located within the footprint of the proposed structure and the well screen must intersect the depth at which the foundation drain collector for the structure will be located. The sample must be analyzed at an accredited laboratory for all the parameters outlined in the By-law.

If any of the criteria exceed the values outlined in the by-law, then a Groundwater Treatment Plan, completed by a consultant, must be submitted. The recommendations from the city approved Groundwater Treatment Plan must be included in the Building Permit Mechanical Drawings of the proposed building.

Once construction commences and dewatering measures are in place, there will be an opportunity for applicants to resubmit the groundwater found in the foundation collector system for lab testing. If the groundwater quality is found to differ from the pre-construction testing to support the hydrogeological report, amendments can me be made to the proposed

Groundwater Treatment Plan, which also must be amended on the applicable Mechanical Drawings.

8.4.3 Groundwater Quantity

Each site will have a maximum allowable flow rate of groundwater that can be discharged. The maximum allowable discharge of groundwater combined with stormwater should not exceed the stormwater quantity target for the site. Stormwater quantity targets can be found in Tables 1-5. During wet weather events, temporary storage of groundwater may be required on site if the allowable amount of discharge from the site is less then the discharge during that particular storm event. Other reuse solutions such as grey water or irrigation will be considered.

8.5 Storm Sewer Discharge Authorization

For any construction project requiring dewatering works, any water being discharged into the City's storm sewer system must comply with the Storm Sewer Use By-law No. *0046-2022* and the applicant must obtain approval prior to discharge. For further information, please submit the application from the City's Storm Sewer Temporary Discharge Approval webpage and submit it to Env.Inquiries@mississauga.ca.

Appendix 1 – Watershed Boundaries

