

SITE GRADING PLAN - CITY OF MISSISSAUGA

In Compliance with Sentence B-9.14.6.1 of the Ontario Building Code, every site is to be graded so that water will not accumulate at or near the building under construction and will not adversely affect any adjacent properties. The lot grading criteria has been primarily developed to provide guidance to residential development in subdivisions. The basic principles do however apply to properties under site plan development. It should be noted that the grading design for any residential buildings containing three or more dwelling units and for any development other than residential, shall be performed by a professional engineer. Where there is a landscape plan proposed as part of the site plan application, the professional engineer designing the site grading plan shall review the landscape plan and shall provide the [City of Mississauga](#) with a declaration advising that the proposed landscape works are in conformance with the site grading plan. Once construction is completed, the professional designing the site grading plan shall provide the [City of Mississauga](#) with a Lot Grading Certificate and any required Retaining Wall Certificates.

Separate Site Grading Plan and Stormwater Management Plans are required by the [City of Mississauga](#). While innovations by the engineer at the design stage will be considered by the City of Mississauga, any proposal to deviate from the City of Mississauga standards and requirements shall be discussed with and approved by the City of Mississauga prior to formal submission. City of Mississauga By-Laws control the dumping of fill, removal of topsoil, and the alteration of grades within the City of Mississauga.

Master Lot Grading Plan – A plan drawn to a scale not less than 1:500 for single family or semi-detached areas or 1:200 for multi-family areas, showing the overall drainage, grading, house type, etc. in a plan of subdivision. This plan must also show the directions of the minor and major storm flows within the limits of the development. The Subdivider's Professional Engineer must certify that they have reviewed the Site Grading Plan and that the proposed grading conforms to the intent of the reviewed Master Lot Grading Plan and that the proposed dwelling unit is compatible with the grading. In order to certify conformance, all proposed grades must agree with the Master Lot Grading Plan, along with house and grading type. The use of retaining walls within the lot, not reflected on the Master Lot Grading Plan, shall be discussed with and agreed upon by the City of Mississauga prior to certification.

Master Lot Grading Plans shall be submitted for all lots and blocks in new developments. The City of Mississauga shall review all grading plans with the intent of ensuring sites are suitable for the erection of buildings as well as providing satisfactory drainage for all land within the development.

Storm water flows in excess of the design capacity of the piped storm sewer system shall be accommodated as overland flow within the roadway or defined swales and in such a manner as to carry excess flow to an approved point of acceptance. The analysis should be based on a storm event with the one hundred (100) year return period. Generally major overland routes shall follow the road network.

If overland flow must be conveyed between private lots or properties, the City of Mississauga will request a block conveyance as opposed to an easement. The block must be of sufficient width to convey the 100 year flow. Upon acceptance from the City of Mississauga, Master Lot Grading Plans shall be referenced in all development agreements and remain on file with the City of Mississauga. Certification from the Subdivider's Professional Engineer, or an approved alternate, shall be submitted to the City of Mississauga ensuring that all lot grading has been completed in compliance with the Master Lot Grading Plan, within permissible tolerances.

Lot grading shall in all cases be designed and constructed to conform to the drainage pattern approved for the design and construction of the City of Mississauga's minor and major storm system.

The City of Mississauga requires the Site Grading Plan drawings must be drawn to a standard metric scale (i.e. 1:100, 1:200, 1:500). A plan required as part of a building permit application drawn to a scale not less than 1:200, for a single building lot in a subdivision, showing all proposed grading and drainage details for the site. This plan shall also include the Sub divider's Professional Engineer's Declaration of Compliance with the reviewed Master Lot Grading Plan. Declaration of Compliance by an approved alternate will also be accepted.

Engineering design criteria requirements by City of Mississauga pertaining to Site Grading Plan

The design and construction of grading is of considerable importance to the City of Mississauga. While the following criteria reflects minimum City of Mississauga requirements with respect to grading, the property owner and their consultants are responsible for designing and constructing site grading on the following objectives.

- The riparian rights of adjacent lands to be respected. No adverse impact to adjacent lands. The intent of the existing drainage pattern in the area of the site should be maintained.
- Storm drainage self-contained within the developing property. The drainage from all lands within the limits of the development must be self-contained. Drainage over abutting lands will only be permitted in situations where such drainage merely continues the existing pattern of natural overland flow and has no adverse impact to lands external to the subject development.
- Positive surface drainage directed away from all buildings. Drainage swale longitudinal slopes should not be less than 1.5%. Terrace and drainage swale side slopes should not exceed 33%.
- All existing perimeter ground elevations of the developing property to be maintained.
- Property owners to be provided with maximum use of their property.
- The use of retaining walls and/or terracing to be minimized in developing the Master Lot Grading Plan and subsequent individual Site Grading Plans. Where retaining walls are required along development limits or adjacent future public lands within the plan, the Master Lot Grading Plan shall identify the location, length, height, material and type of proposed wall. The design of any such walls shall be carried out by a Professional Engineer in conjunction with the Master Lot Grading Plan. The Master Lot Grading Plan shall also reflect the proposed location of any other retaining walls of 1 m height or greater to be constructed on lots or blocks within the plan. Detailed design of these 'internal' walls will not be required at the Master Lot Grading Plan stage. Where retaining wall(s) over 1 m high are proposed on a Site Grading Plan and the retaining wall(s) were not previously identified or designed with the Master Lot Grading Plan,, design of the wall(s) shall be carried out by a Professional Engineer.

The construction of any wall noted above shall be field reviewed and certified by the Professional Engineer upon completion of construction. Retaining walls shall be designed and constructed entirely on one property so that tie backs or wall footings do not cross boundaries. A minimum setback of 0.5 m shall be maintained from the tiebacks to the foundation of any structure. Fencing and/or a security barrier shall be required at the top of all retaining walls 1 metre high or greater that are located at property limits

General notice will be incorporated in the subdivision agreement advising the future property owners of the presence of retaining walls on the affected properties and their responsibilities for maintenance and impact on useable land within their property. The Developer shall be responsible for obtaining from the Chief Building Official, any building permits required for the construction of retaining walls associated with the development.

- Existing trees to be preserved wherever practicable.
- Ponding to be minimized.
- The use of rear lot catch basins to be minimized. If a catch basin is deemed necessary to facilitate drainage, the developer will be required to provide a 3 m wide easement in favour of the City of Mississauga. The easement shall be centered on the lot line and the storm connection and catch basin shall be offset 0.75 m from the lot line so that the service is located entirely within one lot. The City of Mississauga does not support storm connections traversing multiple lots. The use of front yard catch basins shall be avoided. The use of rear yard catch basins is permitted as a means of improving surface drainage conditions. Where the topography is steep, consideration shall be given to the need for additional catch basins. The City of Mississauga may request additional catch basins in specific situations to avoid future drainage issues. The maximum depth of ponding at a blocked catchbasin shall be 0.4 m and no ponding of water is permitted within 0.3 m of an opening of a house. Where a catch basin has been installed on private property to drain storm water from any driveway, which slopes towards any structure located on the property, the installation shall be in compliance with the City of Mississauga Sewers By-law

Front Yards

- ✓ Grades designed for front yards shall be controlled by the elevations at the property (street) line. The front yards of all residential lots shall be graded

to drain toward the street. The minimum slope for front yards shall be 2%. The maximum slope for front yards shall be 10%. Elevations at the property line fronting the street should be such that the average slope down to the top of roadway curb should be between 2% and 6%.

- Any differential between the street line and the front of the house that cannot be accommodated by a uniform slope within the range as specified above shall be designed as follows:
 - 3:1 slope of a maximum vertical height of 1.50m for each terrace.
 - a retaining wall of a maximum height of 1.50m for each terrace.
 - or a combination of the above.

Driveways

- In the case of attached garages and basement garages for one and two family dwellings, all driveways be required to slope away from the garage with a minimum driveway grade of 2%, from the garage doorsill to the finished grade at the property line, provided, however, that an exception to this policy will be permitted in those areas with low rear yards and which are not affected by storm water ponding at road low points and where a properly designed garage entrance drain with a free outfall into the rear yard can be constructed.
- The maximum design grade of driveways shall be 8%. The maximum constructed grade shall be 10%.
- Driveways should not be used as outlets for any swales. Where driveways abut each other at the property line, a shallow swale or depression between the driveways is encouraged to prevent “sheet flow” on the driveways.
- Rainfall leaders shall not discharge directly on a driveway.

Side Yards

- Side Yards should be drained, at surface slopes not less than 1.5%, to existing positive drainage outlets.
- The maximum slope in side yards shall be 3:1.
- In areas where the above objective cannot be met, steps and/or retaining walls (maximum height of 1.50m for each terrace) shall be required.
- A minimum 0.6 metre wide apron sloping 2% away from the foundation wall shall be constructed along one side of the building to allow proper access to the rear yard.
- The minimum grade for a side yard swale shall be 2%

- The maximum depth for any side yard swale shall be 500mm measured on the low side.
- The minimum depth for any side yard swale shall be 150mm measured on the low side.
- The maximum slope for a side yard swale shall be 2:1.
- The maximum flow allowable to any side yard swale shall be that from 4 rear yards (inclusive of the two lots on which the swale is located) or 0.1 hectares, whichever is less).
- Drainage swales shall be located on the common lot line between adjacent lots.
- Where the separation between buildings does not facilitate the grading of an acceptable swale, the use of rear to front drainage types shall generally not be permitted.
- Where combined side yards between two buildings are 1.2m or less a maintenance free medium, such as clear stone, rather than topsoil and sod, are required.

Rear Yards

- Rear yard slope should not exceed 10%, except where existing grades are not being altered.
- The minimum slope for rear yards shall be 2%.
- All rear yards shall be graded to maximize the useable rear yard area. The useable rear yard area shall be located within 5 metres of the rear wall of the housing unit and shall have a minimum slope of 2% and a maximum slope of 5%.
- Any proposed terracing to overcome height differentials may be accommodated by a slope which shall not be steeper than 3:1, and shall have a maximum vertical height of 1.5m or a retaining wall of a maximum height of 1.5m. Combination of slope and retaining wall is acceptable providing the combined vertical height does not exceed 1.5m for each terrace.
- All rear yard drainage shall be directed away from the houses to outlet at the curb, sidewalk or catch basin.
- The maximum flow in rear yard swales that may be discharged onto the road allowance at any one location is that from 4 back yards or 0.1 hectares, whichever is less.

- The maximum flow in rear yard swales shall be that from 6 semi-detached lots or 10 detached lots, or 16 street townhouse lots or an equivalent combination thereof. However, in no case shall the length of rear yard swale exceed 60 m.
- The maximum area contributing to the rear yard swale shall be 0.2 hectares.
- The minimum grade for a rear yard swale shall be 2%
- The maximum depth for rear yard swales shall be 750 millimeters measured on the low side.
- The minimum depth for rear yard swales shall be 230 mm measured on the low side.
- The maximum side slope for rear yard swales shall be 3:1.

General Site Grading Details Required by the City of Mississauga

- All property lines must be shown
- Ground floor plan for all buildings must be shown
- Ravine by-law limit, if applicable
- All easements, and reserves
- Site Circulation, General Parking, Accessible Parking and Driveways - All adjacent roads and sidewalks must be shown
- Public & Private Servicing Information - The location of proposed utilities, transformers, gas regulators, air intakes/exhausts, garage access stairs on the site and on adjacent road allowances must be shown
- Proposed roof control devices location, type, control release rates and corresponding storage volumes for flat roof portions
- UV treatment facilities and/or oil grit separators
- Storage facilities and dimensions/details for rainwater harvesting and reuse
- Landscaping, Grading & Retaining Walls and Lighting
- All retaining walls must be shown
- General grading information including the existing and proposed elevations at 6 metre intervals along property lines, driveways, sidewalks and walkways and trees to be preserved, including all trees on adjacent properties within 6 metres of subject site's property/lot lines
- Proposed elevation at 6 metre intervals along all building and structure perimeters and building entrances
- Storm and surface water drainage directions, site ponding limits with corresponding control volumes and control facilities, major overland and emergency overland flow routes

- Soil retention and/or replacement details
- Sediment and erosion control measures applied during construction
- Location and identification of trees protected under the City of Mississauga by-laws
- Location of tree protection zones (where trees are being retained & protected)
- Tree protection plan notes (where trees are being retained & protected)
- Buried watercourses, if applicable

Building Experts Canada Ltd prepare, seal, sign and date site-grading plans for inclusion with the building permit application, in conformance with the "[Lot Grading Criteria for Infill Housing](#)" and in a manner that will ensure that no new instances of ponding will occur on existing adjacent properties and the subject property as a result of construction.

Building Experts Canada Ltd also provides field review to ensure compliance with the Site Grading Plan, and issue a final "Lot Grading Certificate" to the City of Mississauga upon completion of the final grades.

During construction, siltation control methods should be used around the lot perimeter in order to prevent erosion or siltation on adjacent properties.

In no case shall storm drainage be directed to a sanitary sewer. In compliance with the City of Mississauga Sewers By-law roof rainwater leaders or downspouts from new dwellings with lot frontage equal to or greater than 15 m (50 ft) shall not be directly or indirectly connected to a combined or storm sewer except as approved in writing by the City of Mississauga's Commissioner of Works and Emergency Services.

Where roof rainwater leaders or downspouts are not connected to a sewer, provisions shall be made to prevent soil erosion. Downspouts shall not be directed onto adjacent property nor render any sidewalk impassable. Where possible drainage should be retained on site and disposed of through filtration into the ground. In no case should the proposed grading and drainage create ponding or erosion on the Lot or adjacent properties of rights-of-way. Roof water leaders shall be connected directly to the storm sewer system for any residential buildings containing three or more dwelling units and for any development other than residential.

Roof water leaders discharged to the surface shall be directed to front and rear yard permeable areas only and not to the side yard swale. The grading certificate shall confirm that roof water leaders have been correctly installed in accordance with Site Grading Plan submitted with the building permit application.

The following items will be addressed by the Building Experts Canada Ltd as a minimum, in preparing the Site Grading Plan to be approved by the City of Mississauga:

- ✓ The overall performance of the existing drainage system in the neighbourhood (e.g. blocked swales, upstream or downstream, malfunctioning catch basins, excessive runoff due to hard surface landscaping, etc.).
- ✓ Location of downspouts, splash pads, area drains, discharge from sump pumps, window wells, walkouts, etc. for both the infill house and houses on adjacent lots.
- ✓ Location and dimensions of hard surfaces such as, driveways, walkways, porches, retaining walls etc.
- ✓ The maximum percentage of the front yard that may be covered with hard surface materials, to be in compliance with requirements of the City of Mississauga Zoning By-laws.
- ✓ Elevations of the crown of road at the centre line of the lot, proposed finished basement, first floor, garage floor, porches, decks, curbs and sidewalks. Elevations at the intersections of the side lot lines and the minimum front yard setbacks and sufficient elevations at the front and side main walls of the building must be shown to establish Height and Basement as defined in the City of Mississauga Zoning By-law.
- ✓ All existing and proposed work on the City of Mississauga road allowance, such as, existing/proposed driveway, curbs, sidewalks, culverts, hydro poles, fire hydrants, telephone and cable equipment, etc. must be shown on the "Site Grading Plan".
- ✓ Location and dimensions of all structures on the lot, including their setbacks to all lot lines.
- ✓ The lot area and building length for irregular shaped lots must be provided.
- ✓ The ability of the soils within the site to accommodate infiltration of storm water.

Under Ontario Regulation 166/06, Conservation Authorities regulate and may prohibit work taking place within valley and stream corridors, wetlands and associated areas of interference and the Lake Ontario waterfront. If the property is regulated, a permit from the Conservation Authority is required in order to do any of the following works:

- straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream or watercourse, or for changing or interfering in any way with a wetland;
- development, if in the opinion of the authority, the control of flooding, erosion, dynamic beaches or pollution or the conservation of land may be affected by the development.

Where Development is defined as:

- the construction, reconstruction, erection or placing of a building or structure of any kind,
- any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure,
- site grading, and/or
- the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere

Regulations under the Conservation Authorities Act are enforced and developing, interfering with a wetland or altering a shoreline or watercourse without a permit may result in a fine and prosecution under the Conservation Authorities Act.

Before house construction proceeds beyond the basement level, a Professional Engineer should confirm that the foundation control elevation(s) has been checked and is in accordance with the elevation shown on the site grading plan submitted with building permit application.

The City of Mississauga's Engineering Drawing Requirements for Site Grading

- North arrow.
- Title block.
- Key Plan showing the location of the site, at a scale of approximately 1:10,000.
- Lot number and street name.
- Proposed building location.

- City of Mississauga benchmark.
- Revision table.
- All lot numbers, blocks and proposed easements shown and numbered in accordance with the proposed plan for registration.
- Existing contours shown at maximum 0.5m intervals extending a sufficient distance outside the limits of the proposed plan (minimum 15m or as required to indicate all significant features) . Contours shall be based on up-to-date survey information.
- Topographic information including the location of existing natural and/or artificial features and applicable spot elevations of on-site and surrounding lands (trees, hydrants, utility poles, driveways, buildings, culverts, easements, railway lines, pipelines, etc.)
- Proposed road grades, lengths, and elevations at 20m or 25m intervals on all streets with symbols at grade changes indicating direction of slope.
- All foundation control elevations.
- Finished first floor elevation
- Existing and proposed elevations at all lot corners and intermediate points of grade change required to illustrate the lot grading concept and drainage pattern and existing spot elevations extending to a minimum of 15m beyond the proposed plan.
- All proposed rear lot catch basins and catch basin leads (preferable) with rim and pipe invert elevations.
- Elevations and grades along proposed swales at regular intervals.
- All proposed storm sewers (preferable), manholes, and catch basins. Grate locations and elevations of all rear yard catch basins
- Any watercourse running through or abutting the proposed development including their respective Regulatory Floodplain Limits.
- Location and cross section of the overland outlet for the “ Major “ storm.
- Direction of surface water run-off by means of an arrow pointing in the direction of flow on lands both within and, as required, off the site.
- Slopes/terracing/retaining walls. Terracing, including the use of retaining wall, shown with intermediate grades and cross-sections. Where required, further details may be added on the site grading plan.
- All proposed sidewalks.
- Cross-sectional details of storm sewers on easement, if any, (other than a rear lot catch basin lead) including footing elevations for the proposed building.

- Extent of ponding limits at major sag points and/or overland flow spill areas.
- Proposed elevations at the front and rear of the building envelope of the lot.
- Location of any acoustic fence or berm.
- Proposed elevations for all lot corners, swale inverts and intermediate points of grade change at reasonable intervals along the boundaries of the lot to illustrate drainage of the lot in relation to the surrounding lands and buildings.
- Driveway grades.
- Direction of surface water runoff using arrows to show the drainage pattern for the lot.
- Location of above ground utilities.
- Locations of rain leader discharge points.
- Location of any stormwater control device.
- Location of any sump pump discharge point.
- Existing trees to be preserved.
- Proposed acoustical fencing and/or berm.
- Locations of any easements and underground services.
- Outline of the useable rear yard area

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