

Section 14



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14 LOT GRADING

14.1 General Requirements

This section outlines the recommended requirements for the design and implementation of lot grading for residential, industrial and commercial developments, as well as infill lots and municipal infrastructure renewal/rehabilitation projects.

The grading of all lots and blocks in new development must be carefully monitored by the Consultant to provide grades that are suitable for the erection of buildings and to provide satisfactory drainage from all lands within and outside the development. In this regard, the design of the grading for all developments will be of primary concern to the municipality and the following criteria shall be used in preparation of all lot grading plans for new developments. In applying the criteria, while maximum limits are specified, the main objective is to ensure that the property owner (i.e. Resident) will have maximum usage of their property while still providing good drainage. Consequently, the Town wishes to avoid designing to the maximum or minimum limits as specified unless all other options have been exhausted.

14.2 Other Reference Documents

Lot grading shall be designed and constructed in accordance with the latest version of this manual as well as other industry standards and best practices, including but not limited to:

- Guidelines on Erosion and Sediment Control for Urban Construction Sites, prepared by Ontario Ministry of Natural Resources
- Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Drawings (OPSD) prepared by the Ministry of Transportation
- Ontario Building Code (OBC)
- Applicable Town of Tillsonburg By-Laws
- Accessibility for Ontarians with Disabilities Act (AODA)

14.3 Grading Requirements

14.3.1 New Subdivision Developments

Subdivisions created by a draft plan of subdivision shall conform to the lot grading standards within this section. The design will be implemented as to not negatively affect the drainage or usability of the abutting or adjacent properties.

14.3.2 Infill Lots

Developments created by severance or infill lots for residential lots shall conform to the lot grading standards and are not to negatively affect the abutting and/or adjacent properties.



14.3.3 Town Capital Projects

When grading is required, the Consultant or Designer shall determine match points that naturally blend proposed design grades with existing topography. Consideration shall be given to the following:

- Intersection streets
- Existing driveway profiles
- Existing drainage patterns
- Utilities structures
- Retaining wall structures
- Impacts on municipal and/or private trees (and other landscaping features)

Where ever possible the consultant or designer shall reduce the size or completely eliminate retaining wall structures owned or maintained by the Town.

Considerations shall be given to the maintenance and aesthetics of grassed areas such as lawns and boulevards.

14.4 Design Considerations

Lot drainage is to be self-contained within the limits of the subdivision. All medium and high density residential, commercial, and industrial drainage shall be contained within the block.

The boulevard and a minimum of 7.5m at the front of any residential lot must drain towards the abutting road.

All surface runoff shall be directed away from the house into defined swales which outlet to the street or rear yard swales.

Drainage from single dwelling lots may drain between other single dwelling lots in the same development when the drainage is contained in swales. (either rear or side yard).

14.5 Drainage Surfaces

All lot surfaces shall be constructed to a 1.7% minimum grade and a maximum of 8.0%.

Hard surfaces (i.e. patio and pool decks) within the rear yard of residential developments may be constructed to a 0.5% minimum grade.

The grade of driveways and walkways shall not exceed 8% maximum. Driveways shall not have a negative slope from the streetline to the building and shall have a minimum grade of 2% to provide positive drainage away from the building.



Berms and side slopes on swales and ditches shall have a maximum slope of 3 horizontal to 1 vertical.

Use of 3 horizontal to 1 vertical slopes shall be limited on residential properties and side yards to maximize functionality for the end user.

A 0.9m wide path sloping between 2% to 8.0% away from the building wall shall be constructed along one side of the building to allow proper access to rear yards.

A minimum distance of 0.6m from property line to remain unimpeded where a swale is located.

Within Industrial site a minimum grade of 1% for hard surface (Concrete, Asphalt) will be accepted within parking, storage and loading dock areas.

14.6 Major Overland Flow

Storm sewers are designed to accommodate storm runoff from a 5-year storm event, the lot grading design shall be designed to accommodate runoff from a major storm event that exceeds the capacity of the storm sewer system. This runoff shall be provided for in an effective major overland flow route from residential areas to an acceptable outlet location such as a storm water management facility.

Major overland flow routes shall follow low areas in subdivision grading.

All major overland flow shall be directed into storm water management facilities or appropriate outlet.

Ponding on roadways will not be allowed unless all other road grading options have been demonstrated to the Town and exhausted. Maximum allowable ponding at gutterline is 300mm. Ponding on sidewalk will not be allowed.

Building opening elevations adjacent to major overland flow routes through lots or blocks within a subdivision shall be at least 450mm above the major overland flow route elevation (i.e. no window wells).

The overland flow for major Regional design storm event (Hurricane Hazel) shall be accommodated in road cross-sections and/or on blocks of land dedicated to the municipality. The direction of the overland flow route shall be identified on all grading and/or drainage plans.

14.7 Swales

Drainage flows which are carried around houses are to be contained in defined swales located as far away from the foundation as feasible.

Driveways shall not be used as outlets for swales.

14.7.1 Slope

The minimum grade on all swales shall be 1.7%.



14.7.2 Swale Lengths/Flows

Maximum flow length for a rear yard swale is recommended to be 90m.

Side yard swales shall accommodate the flow from the contributing area.

14.7.3 Swale Depth

The minimum swale depth is recommended to be 0.15m and maximum swale depth is recommended to be 0.5m.

An average swale depth of 0.225m is recommended to be maintained throughout the development.

14.7.4 Plan Requirements

Swales shall be clearly identified on the design drawings including location, swale percentage and direction of flow (by means of arrows).

14.8 Elevations

Contours are to be shown on all master grading plans at an interval of 0.5m. Contours shall extend a minimum of 30m beyond the proposed development onto existing land.

Existing spot elevations shall be shown at all lot/block corners along the boundary of the development, and overland flow routes.

Centerline of road elevations shall be shown at 20m intervals, break points, beginning of the vertical curve (BVC), end of the vertical curve (EVC), low points and high points for all proposed roads within the development and existing roads around perimeter of site.

Proposed grades shall be shown at all lot corners, break points, high points, building corners, and the top and bottom of swales, ditches, slopes, and retaining walls.

Proposed curb and gutter grades shall be shown at edge of asphalt for all beginning of curves (BC), end of curves (EC), and breakpoints at intersection radii, elbows and cul-de-sacs. Additional grades shall be shown at 15m intervals (minimum) for elbows and cul-de-sacs.

For Infill lots elevations shall extend a minimum of 5m beyond the property line and pick up any and all structures within that.

14.9 Retaining Walls

Where a slope is greater than 3:1 (horizontal to vertical) a retaining wall will be required to make up the grade change between the two elevations. All design and specifications for retaining walls shall be in accordance with the Ontario Building Code.

All retaining walls 1.0m in height and greater shall be designed by a registered professional engineer in accordance with the Ontario Building Code.



Retaining walls 0.6m in height and greater shall have a railing installed along the top of the retaining wall in accordance with the Ontario Building Code.

All retaining walls within or adjacent to a road allowance shall be concrete material or engineered retaining wall systems, approved in writing by the Town.

All retaining walls within the lot or block may be concrete, engineered retaining wall systems or pressure treated wood material.

All retaining walls over 0.3m in height shall be offset a minimum of 1.0m from property lines.

14.10 Erosion and Sediment Control

14.10.1 Plan Requirements

An Erosion and Sediment Control Plan (ESCP) is required for all Capital Works and Development projects within the Town and shall address all requirements as outlined in this section.

Sediment and erosion control measures and notes are to be identified on all lot grading drawings, storm water management facility drawings, channels, outlet structure drawings and plan and profile drawings where applicable. If sediment and erosion control measures are extensive a separate drawing may be required at the request of the Town.

14.10.2 Considerations

The ESCP should address and consider all potential construction issues on any given project, including, but not limited to:

- Proximity to an open watercourse
- Proximity to woodlands, environmental sensitive area (ESA), naturalize areas
- Proximity to exiting drainage infrastructure
- Steep slopes susceptible to failure
- High groundwater levels

14.10.3 Erosion and Sediment Control Design

Erosion and Sediment Control Design shall comply with the Guidelines on Erosion and Sediment Control for Urban Construction Sites, prepared by the Ministry of Natural Resources. As well, the Proponent shall address all requirements set forth by the LPRCA (where applicable).

14.10.4 Drawings Notes

The following sediment control measure notes are to be shown on the construction drawings, either on the plan that details the sediment and erosion control measures, or on the notes and



details drawing. Please note that the following sediment control measure notes are examples only, and may be altered to suit the individual project:

- Protect all exposed surfaces and control all runoff during construction
- All erosion control measures are to be in place before starting construction and remain in place until restoration is complete
- Maintain erosion control measures during construction
- All collected sediment must be disposed of at an approved location
- Minimize area disturbed during construction. All dewatering must be disposed of in an approved sedimentation basin
- Protect all catch basins, maintenance holes and pipe ends from sediment intrusion with non-woven geotextile (Terrafix 270R or approved equivalent)
- Keep all sumps clean during construction
- Prevent wind-blown dust
- Straw bales to be used in localized areas as shown and as directed by the engineer during construction for works which are in or adjacent to floodlines, fill lines and hazardous slopes
- Straw bales to be terminated by rounding bales to contain and filter runoff
- Obtain approval from LPRCA prior to construction for works which are in, or adjacent to floodlines, fill lines and hazardous slopes
- All silt fencing and details are at the minimum to be constructed in accordance with the Ministry of Natural Resources Guidelines on Erosion and Sediment Control for Urban Construction Sites
- All of the above notes and any sediment & erosion control measures are at the minimum to be in accordance with the Ministry of Natural Resources Guidelines on Erosion and Sediment Control for Urban Construction Site

14.11 Approval and Certification

14.11.1 Lot Grading Approval

Prior to application for building permit, individual site grading plans for each lot shall be design by a Registered Professional Engineer (P.Eng.) or Ontario Land Surveyor (OLS) and approved by the Engineer of Record for the development and submitted to the Town for review. The Consulting Engineer or OLS shall ensure the site grading plan submitted for review by the Town is in conformance with the approved subdivision lot grading plan approved by the Town.



Where an infill or severed lot exists and there is no active developer of the subdivision then the site grading plans designed by a Registered Professional Engineer or OLS will be accepted by the Town.

The proposed site grading plan shall include the following:

- The name of the subdivision (if available)
- Include both municipal number and lot number if applicable
- Shall be to scale 1:250, on an 8.5x14 or 11x17 sheet
- All units in metric, dimensioned property limits, building location with ties to property lines
- All proposed easements required for registration
- Elevations for the following:
 - finished floor elevation
 - top of foundation
 - o basement slab and underside of footing elevation
 - o proposed grades at all lot corners
 - front and rear of building
 - o break points
 - side yard and rear yard swale grades
 - o grades at building corners
 - catch basin lid elevation
 - o percent grades for driveways
 - o garage finished floor and underside of garage foot elevations (FFE, USGE)
- All slopes labelled (3:1)
- Surface flow arrows with percent grades
- Retaining walls
- Door Locations
- Number of Risers



- Above ground utilities (streetlights, pedestals, etc.)
- Existing grades along all property limits of development
- Existing grades for all limits if for infill lot
- Existing and proposed vegetation/trees
- Underground utilities
- Stamped by a Professional Engineer or Seal from OLS

The approved site grading plan shall be submitted in triplicate with the building permit application, or as required by electronic submission.

14.11.2 Foundation Control Certificate

A Professional Engineer or OLS shall provide the Town of Tillsonburg Building Division with a foundation control certificate (see Appendix 14-1) confirming the foundation grade and layout is in conformance with the approved site plan/grading plan.

The foundation control certificate shall be reviewed by the Town of Tillsonburg Building Division before house construction proceeds beyond the basement level. Placement of finished floor prior to backfill only will be allowed to reduce potential for foundation cracking from backfilling.

This certificate shall include the following:

- The Professional Engineer or OLS shall confirm the footing and foundation elevations are in conformance with the approved lot grading plan and zoning bylaw
- An OLS shall provide the town with a building location survey confirming the foundations are in conformance with applicable zoning by-law

Any non-conformance of the foundation or site elevations shall be brought to the Town's attention for further direction prior to proceeding with any further construction. Exposed foundation heights are to be in accordance with the Ontario Building Code.

14.11.3 As-Constructed Site Grading Plan/Final Grading Certificate

An "As-Constructed" site grading plan shall be prepared, after final lot grading has been completed (preferably prior to sod/seed) and shall be submitted to the Consulting Engineer of record for approval to confirm the lot has been graded in conformance with the approved lot grading plan and shall be submitted to the Town. Final "As-Constructed" lot grades shall conform to the approved lot grading plan and shall be within the 100mm grading tolerance for all lot grading. All swale and lot surface gradients are required to be within the minimum and maximum allowable limits set forth in these guidelines or else may be rejected by the Town.



A final lot grading certificate (see Appendix 14-2) shall be prepared by the Consulting Engineer of record, certifying the lot grading has been checked and found to be in conformance with the approved site grading plan, overall subdivision lot grading plan and the Town's Guidelines.

Deck, shed and pool permits shall not be issued for individual lots until a final lot grading certificate has been certified and approved by the engineer of record and submitted to the Town or an amended lot grading plan is submitted to the Town showing the proposed changes for review/approval.

One (1) copies and PDF of the approved "As-Constructed" site grading plan and final lot grading certificate shall be forwarded to the Town immediately upon completion. The final lot grading certificate shall follow the format as provided by the Town.

14.11.4 Municipal Infrastructure Deposit

A refundable municipal infrastructure deposit as per the Rates and Fees By-law shall be submitted with the approved site grading plan at the time of building permit application where the builder is separate from the developer. Where multiple building permit applications by a single builder have been issued, the refundable municipal infrastructure deposit for the second and additional applications shall be half the municipal infrastructure deposit. The municipal infrastructure deposit for the first application will be held until the deposit can be released and there is at least one outstanding building permit issued to the builder.

In the event a builder is found to be in non-compliance of one of the items below then the Town has the right to require the full municipal infrastructure deposit per building permit application for the second and all additional building permit applications.

This municipal infrastructure deposit will be held by the Town until the following are incompliance:

- Curbs have been repaired in the event of damage caused by the builder; for infill lots or lots not within a current subdivision agreement.
- Sidewalks have been repaired in the event of damage caused by the builder; for infill lots or lots not within a current subdivision agreement.
- Water curb stop has been repaired adjusted to finished grade in the event of damage caused by the builder
- The builder shall provide confirmation the property bars are undisturbed and at/or within 0.2m below finished grade or the OLS provide a written undertaking to locate buried property bars for all lots within the new subdivisions at no cost to the home owner
- Foundation control certificate has been received
- All mud tracking issues are addressed
- An approved "As-Constructed" site grading plan has been received, reviewed and approved by the Town



- Surveyors Real Property Report, (Building Location Survey, B.L.S.) has been completed by an OLS and a copy submitted to the Town Building Division for review
- Damage to municipal infrastructure has been rectified (if applicable)

The municipal infrastructure deposit, or any portion of, is refundable when the deficiencies have been corrected and given final approval from the Town. All deficiencies shall be corrected within one year from the date of occupancy.

The municipal infrastructure deposit, or any portion remaining after all the above-mentioned issues have been satisfied shall be refunded to the builder upon request. Portions of the deposit not claimed after all issues have been satisfied, after one year, shall be forfeited to the Town.

In the event a municipal infrastructure deposit must be used to correct any of the above items and the actual costs exceed the deposited amount, then the builder will be invoiced the difference.



Section 14 - Appendix "14-1" Foundation Control Certificate

FOUNDATION CONTROL CERTIFICATE

Town of Tillsonburg

| Date: | | | | |
|-----------------------------------|--|--|--|--|
| Subdivision Name (if applicable): | | | | |
| Civic Address | | | | |
| Lot #: | | | | |
| Developer: | | | | |
| Builder: | | | | |
| Date Surveyed: | | | | |
| | | | | |

10 Lisgar Ave Tillsonburg, ON N4G 5A5

This letter will certify that the top of foundation wall and garage sill have been checked by the undersigned and found to be in general conformity with the approved lot grading plan within the 0.1m tolerance.

This letter will further confirm that the foundation location including all setback distances (front, rear, and sides, as well as lot coverage), have been verified and are in our opinion in compliance with the Municipality's applicable by-laws.

This foundation control certificate in no way relieves the builder/developer from other requirements of the Town of Tillsonburg Design Criteria By-Law in obtaining an approved Final **Grading Certificate**

| └ Proper |
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ty Sodded

Property not yet Sodded

Yours truly,



Section 14 - Appendix "14-2" Final Grading Certificate

FINAL LOT GRADING CERTIFICATE

Town of Tillsonburg

| Date: | | | |
|-----------------------------------|--|--|--|
| Subdivision Name (if applicable): | | | |
| Civic Address | | | |
| Lot #: | | | |
| Developer: | | | |
| Builder: | | | |
| Date Surveyed: | | | |

To: Chief Building Official 10 Lisgar Ave Tillsonburg, ON N4G 5A5

This letter will certify that the lot grading has been checked by the undersigned and found to be in general conformity with the approved lot grading plan within the specified 0.10m tolerance. A stamped copy of the as-constructed plan showing both proposed and finished elevations is attached.

odded

Property not yet Sodded

Yours truly,









NOTES

- 1. BUILDING OFFSETS FROM PROPERTY LINE AS PER ZONING BY-LAW.
- 2. THIS STANDARD IS FOR URBAN LOTS AND GENERAL IN NATURE. CERTAIN LOTS MAY REQUIRE CHANGES.
- 3. THIS STANDARD IS MEANT TO BE READ IN CONJUNCTIONS WITH THE TOWN OF TILLSONBURG LOT GRADING AND DRAINAGE STANDARDS AND DESIGN MANUAL.
- 4. HOUSE STYLES ARE TO BE USED TO SUIT LOT GRADING.
- 5. REAR TO FRONT YARD DRAINAGE IS DISCOURAGED FOR STREET TOWNHOUSE DEVELOPMENT TO AVOID MID-YARD SWALES ACROSS THE UNITS.
- 6. BELOW GRADE WALKOUTS AND REVERSE GRADED DRIVEWAYS WILL NOT BE PERMITTED.

