

CITY OF VAUGHAN

SCHEDULE "O"

LOT GRADING DESIGN FOR RESIDENTIAL DEVELOPMENT

CIVIC CENTRE • 2141 MAJOR MACKENZIE DRIVE • MAPLE • ONTARIO • L6A 1T1

905-832-2281

## SECTION 1 - GENERAL OBJECTIVES

To provide sites that are suitable for the erection of buildings and to provide satisfactory and environmentally sustainable drainage of lands within the development. The design and completion of lot grading is of primary concern to the municipality and the following criteria shall apply to all residential development in the City of Vaughan. Variances from these criteria may be permitted where the lot grading complies with the overall design and a reasonable balance is achieved between the provision of relatively flat amenity areas, effective drainage, the preservation of natural topography, and the environmental impact of urban runoff.

## SECTION 2 - INFORMATION TO BE SHOWN ON LOT GRADING PLANS

### 2.1 GENERAL

- 2.1.1 Drawings shall be sufficiently large to show clearly all details including relevant features beyond the property boundaries. Drawings shall be prepared at a scale of no greater than 1:250.
- 2.1.2 Symbols and conventions used on lot grading plans shall conform to the Engineering Department's "Design Standard Drawings".
- 2.1.3 Lot Grading Plans shall include the standard notes shown in Appendix "A".

### 2.2 DETAIL

- 2.2.1 Proposed elevations for lot corners, swale inverts, percentage grades and intermediate points of grade change are to be shown at reasonable intervals along the boundaries of the lot to illustrate the drainage of the lot in relation to the surrounding lands and buildings.
- 2.2.2 The proposed lot grade shall be shown at a location 6.4m from the front property line. For "split" type drainage patterns, the specified grade at the rear of the house also shall be indicated.
- 2.2.3 The direction of surface water runoff shall be shown by an arrow and percentage grades.
- 2.2.4 Elevations are to be in relation to City geodetic bench marks.

2.2.5 Catch basins, rim elevation of grate and invert of outlet pipe are to be shown on plans.

2.2.6 All above ground services including curbs, sidewalks, valves, hydrants, streetlight poles, transformers, cable tower, bell pedestals and easements shall be shown on the lot grading plans.

2.2.7 The degree and limits of slopes over 5 horizontal to 1 vertical shall be shown.

2.2.8 The lot grading plans shall indicate proposed locations for buildings, private sewage disposal systems and private water supply systems. (Dan Frank, Building Standards)

2.2.9 House connections, water, sanitary and storm sewer invert lateral elevations shall be shown on the lot grading plans.

2.2.10 Detail and show the extent of typical side yard treatments where shady yard areas exist that is less than 1.80m between dwellings that will not promote sod growth. Builder to place stone if necessary.

2.2.11 House elevations including finished first floor, basement slab and underside of footing. Sill elevations to be shown at side entrances where elevation defers from the finished first floor. The number of risers must be indicated at entrances to dwellings.

2.2.12 Road layout including curbs, sidewalks and centre line road elevations shall be shown.

2.2.13 Site grading plans shall be stamped by the developer's consulting engineer to confirm conformance with these criteria and the overall lot grading control plans.

2.2.14 Proposed retaining walls shall have proposed spot elevations indicated at top of wall and bottom of wall. The site grading plan shall indicate proposed existing

## SECTION 3 - GRADING DESIGN

3.1 Lot surfaces within 6.0m of the dwelling shall be constructed at a 2% - 5% slope.

3.2 A slope of 3 parts horizontal to 1 part vertical shall be used to accommodate any grade differential with a vertical

dimension not exceeding 600mm. Where the overall vertical dimension exceeds 600mm a retaining wall conforming to Section 4 shall be constructed.

3.3 (a) Except as provided for in (b), overland drainage swales shall be graded at a minimum 2% and a maximum 5% slope.

(b) Side yard drainage swales shall be graded at a minimum of 3% where dwellings are located less than 1.8m apart.

3.4 Boundary slopes are to be constructed on the lower property.

3.5 (a) Except as permitted in (b), front yards and driveways of residential lots shall be graded to drain towards the street.

3.6 If the distance between the main walls of adjacent units is less than 1.8m, a side yard drainage swale shall be constructed between the units and shall be surfaced with a minimum of 130mm of limestone screenings overlaid by a 600mm wide patio slab walkway.

3.7 Rear to front drainage shall not be permitted where the combined width of abutting side yards is less than 1.8m. In such cases split draining swales shall be served by rear lot catch basins.

3.9 Driveways are not permitted as outlets for drainage swales.

3.10 The maximum flow allowable to any rear or side yard swale shall be that from 4 rear yards or 750m<sup>2</sup> whichever is less.

3.11 Lot drainage shall not adversely affect adjacent properties.

3.12 Where property lines are offset more than 1m or drainage swale alignment exceeds 45 degrees, catch basins are required.

3.13 The maximum length of drainage swales between outlets shall be 90m and such outlets shall serve no more than 6 lots.

3.14 Maximum depth for swales to be 250 - 450mm.

3.15 Where architecture permits, rooftop rainwater leaders are to be located to the front of the dwelling unit to reduce the volume of runoff discharged into side yards. Eaves troughs and rainwater

leaders shall be sized to accommodate expected flows. Rainwater leaders shall not be connected to any sewer connection unless such connection is contemplated in the overall servicing design. Measures shall be taken to prevent erosion from roof runoff.

3.16 Exterior cladding and window sills shall be a minimum of .15m above finished grade. Where window wells are to be provided they shall be properly drained and connected to the foundation drains. There shall be a minimum of .15m separation provided between the specified house grade and sill elevations at house entrances.

3.17 Gas meters, hydro meters, water meters, side yard steps and landings, air conditioning units and outside water taps are not permitted within a side yard less than 1.20m wide.

3.18 Rear yard catch basins and outlet pipes shall be located so that the catch basin is entirely on one lot and the outlet pipe is on the same lot. The catch basin shall be located 1.0m clear of property lines.

3.19 Footings constructed next to a catch basin lead pipe or other municipal services shall be installed below the lead pipe excavation. Footings must be constructed on undisturbed soil with an allowable bearing pressure of 75kPa or greater.

3.20 The Property Standards By-Law shall apply to the maintenance of drainage swales serving catch basins.

#### SECTION 4 - RETAINING WALLS

4.1 Walls constructed with a face height of greater than 600mm shall be designed and certified by a professional engineer except where pre-engineered, proprietary systems are used.

4.2 Timber retaining walls will be constructed of pressure treated lumber to prevent decay.

4.3 Retaining walls with grade differential of more than 1m shall conform to Zoning By-Law 1-88.

4.4 A minimum setback of .5m shall be maintained from retaining wall tiebacks to the foundation of any structure.

4.5 Construction details of retaining walls must be noted on both overall and site plan grading drawings and approved by the City of Vaughan.

4.6 Retaining walls greater than 1m in height shall be served by guards or otherwise treated to reduce any public hazard.

#### SECTION 5 - DRIVEWAYS

5.1 Houses shall be sited and driveways located to provide for maximum on-street parking.

5.2 Wherever possible, driveways are to be straight and perpendicular to the curb and garage door. Driveway deflection shall not be permitted to provide clearance to street utilities.

5.3 The maximum grade for driveways shall be 8% and the minimum grade shall depend upon the nature of the surface but never be less than 1.5%. Driveway grades are to be compatible with approved sidewalk grades.

5.4 Wherever possible, a 500mm sodded strip shall be provided between the edge of driveway (including boulevard portions) and property lines to maintain driveway separation.

5.5 Driveways to be set back a minimum of 1.0m, from any tree or street hardware (hydro vaults, light standards, hydrants, etc.).

#### SECTION 6 - CERTIFICATION

6.1 The lot grading shall be inspected by the developers' consulting engineer prior to fine grading and during lot certification. Twenty-four hour notice must be given to the so that their Engineering participation may be arranged.

6.2 Prior to final grading approval a grading plan is to be submitted to the Engineering Department. The plan will show both proposed and "as built" lot corner elevations.

6.3 The developer's consulting engineer shall notify the Engineering Department prior to proceeding with construction or grading where grade deviations of greater than 150mm from the approved plans are identified.

6.4 The as constructed lot grading certificates prepared by the developers' consultant are to be in the form shown in the subdivision agreement and forwarded to the lot grading co-ordinator.

6.5 A foundation control certificate shall be issued for each lot by the subdivision consulting engineer as per the subdivision agreement. This certificate shall be provided to the Building Standards Department before house construction proceeds beyond basement level.

#### SECTION 7 - INFL. REFERENTIAL CONSTRUCTION

##### 7.1 SCOPE

7.1.1 New residential development of lands not governed by a current subdivision agreement.

7.1.2 Additions having a ground floor area greater than 40m<sup>2</sup>.

7.1.3 Accessory buildings having a ground floor area greater than 40m<sup>2</sup>.

7.1.4 Subject to the provisions contained in this Section, infill construction shall comply with the criteria contained in Section 1 through Section 6.

##### 7.2 OBJECTIVES

7.2.1 To ensure that positive storm drainage is achieved on infill sites according to City standards.

7.2.2 To ensure that the proposed grading and drainage scheme will not adversely affect abutting properties or cause water to accumulate around the proposed dwelling unit.

##### 7.3 INFORMATION TO BE SHOWN ON LOT GRADING PLANS

7.3.2 Notwithstanding 2.2.4 proposed elevations shall relate to a geodetic benchmark if site is within 300m of a set known benchmark or related to a fixed point (centre line of road) outside the subject property.

7.3.3 A 600mm wide undisturbed area shall be provided along property lines to ensure adjacent existing elevations remain.

7.3.4 An application must be made to the Public Works Department for culverts, curb cuts, water, sanitary and storm connections.

7.3.5 Wherever possible, the existing and proposed elevations shall be indicated beyond property boundaries to illustrate the drainage of the lot in relation to the surrounding lands and buildings.

7.3.6 The builder must perform all necessary works to ensure that no surface drainage problems are created on adjacent to private or public lands because of their development.

#### 7.4 LOT GRADING DESIGN

7.4.1 Except as provided in this Section, grading associated with infill construction shall comply with Section 3.

7.4.2 The maximum rear yard grade shall be 5% within 6.0m of dwelling unit. The remaining grade may be 3:1 slope not exceeding 600mm in grade differential.

7.4.3 Grading shall be performed so as to preserve existing trees where possible.

7.4.4 During infill construction, siltation control methods shall be used around lot perimeter to prevent erosion or siltation on adjacent properties.

7.4.5 Downspouts are to be directed to front of dwelling units where side yards are less than 1.8m.

7.4.6 Grades shall be compatible with adjacent road grades, abutting properties and pending local improvements.

7.4.7 Notwithstanding 3.12, 3.14, 3.15, and 3.16, the capacity and alignment of boundary swales shall not adversely affect adjacent properties. French drains and infiltration trenches are acceptable to promote positive drainage. Post construction flows not to exceed pre-construction.

7.4.8 Catch basins and lead pipes shall be sized and designed according to good engineering practice.

#### 7.5 RETAINING WALLS

7.5.1 Retaining walls shall be constructed in conformance with Section 4.

#### 7.6 DRIVEWAYS

7.6.1 Driveways shall be constructed in conformance with Section 5.

#### 7.7 CERTIFICATION OF GRADING

7.7.1 Owner may be required to submit a lot grading certificate prepared by OLS or P.Eng in Ontario indicating both proposed and as constructed elevations prior to Letter of Credit release.

7.7.2 The Owner is responsible for notifying the Reserves and Investments Department upon completion of the lot grading and all other construction to arrange for the release of the Letter of Credit pertaining to lot grading.

## Appendix "A"

STANDARD DRAWING NOTES

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NOTES

- 1.1 Roof drains to discharge at front of dwelling units onto grassed areas via concrete splash pads and not conflict with walkways.
  - 1.2 The contractor shall check and verify all given grade elevations prior to commencement of construction. Footings to bear on natural undisturbed soil or rock and to be a minimum of 1.22m below finished grade.
  - 1.3 All front and rear yards shall be graded at a 2% -5% grade within 6.0m of the dwelling unit.
  - 1.4 Maximum driveway slope shall be 8%.
  - 1.5 The maximum, allowable slope is 3:1 (horizontal to vertical) with a maximum elevation difference of 600mm.
  - 1.6 Driveways to be set back a minimum of 1.0m, from above ground services or other obstruction.
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- Accessory Buildings 3
- Additions 3
- Adjacent properties 2
- Air conditioning units 2
- As built plans
  - as built 3
- Catch basins 1
- Consulting engineer 1
- Drainage swales
  - maximum depth 2
  - maximum length 2
- Driveway
  - grade 3
  - separation 3
- Driveways 2
- Eaves troughs 2
- Erosion 2
- Exterior cladding 2
- Footings 2
- Foundation control certificate 3
- Foundation drains 2
- Geodetic bench marks 1
- Guards on retaining walls
  - guards 2
- House connections 1
- House elevations 1
- INFILL 3
- Letter of Credit 4
- Lot corners 1
- Lot grading certificates 3
- Maximum flow allowable 2
- Parking 3
- Property Standards By-law 2
- Rainwater leaders 2
  - sewer connection 2
- Retaining walls 1
- Risers 1
- Scale 1
- Services 1
- Side yard entrance 2
- Side yard treatments 1
- Side yards 2
- Slope 1
- Standard notes 1
- Swales inverts
  - elevations 1
- Swales
  - Slope 1
- Symbols 1
- Walkway 2
- Water tape 2
- Window sills 2