



# Engineering Design Criteria & Standard Drawings

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December 2020

## APPENDIX C – GENERAL NOTES FOR SUBDIVISION DRAWING SETS



## GENERAL NOTES FOR SUBDIVISION DRAWING SETS

Please note that items identified in *[square brackets and italicized]* are subject to replacement as appropriate by the proponent's Engineer.

### General Notes

1. The notes on this drawing apply to all works under this subdivision unless otherwise noted on this set of plans.
2. City of Vaughan Standard Drawings, OPSD and any applicable Standards Drawings shown on these plans constitute part of this subdivision drawing set. The revision in effect as of the date of approval of the construction drawings.
3. All construction work to be carried out in accordance with the requirements of the Occupational Health and Safety Act (OHSA) and regulations.
4. Information regarding any existing services and/or utilities shown on this set of plans is furnished as the best available information at the time of preparation and the Contractor shall verify this information in the field. The City disclaims all responsibility for its accuracy and/or sufficiency.
5. All dimensions and elevations shall be verified in the field by the Contractor prior to any construction and he shall report any discrepancies to the consulting Engineer immediately. Details shown these drawings shall not be scaled. All dimensions are shown in metres unless otherwise noted.
6. All areas disturbed by the Contractor during construction of the works shall be restored to its original condition or better. All grass- and vegetation-covered areas shall be restored by placing 150 mm of approved topsoil and sod to establish a grass cover, unless otherwise noted on the plans, to the satisfaction of the City.
7. Streetlights shall be installed as per the approved drawing locations, including intersections with Regional roads, Provincial highways and any other roads external to the Plan.
8. All construction signage must conform to the Ontario Traffic Manual (OTM), Book 7 – Temporary Conditions.
9. Concrete reinforcement shall be high bond deformed bars, intermediate of hard grade, unless otherwise noted, and shall conform to CSA G30.12M, 400 MPa. Minimum cover for reinforcement for surfaces exposed to weather and in contact with the ground shall be 50 mm and 75 mm, respectively. Variations in the design subject to the review and approval of the City.
10. Relocation of existing services and/or utilities shall be as shown on the construction drawings, at no cost to the City.
11. Prior to commencement of site grading works, all sediment and erosion control measures shall be installed by the Contractor. The Contractor shall be responsible to ensure that sediment and erosion control measures are in good working order until construction works are completed and to the satisfaction of the City.

12. The Contractor shall protect the existing roadway or underground utilities from damage by providing proper method of operations. Construction for shoring, bracing and protection measures shall conform to relevant Ontario Provincial Standard Specifications & Drawings (OPSS & OPSD).
13. Benchmark(s): *[Engineer to provide benchmark ID(s) and description(s)]*
14. Geotechnical Borehole Information: *[Engineer to provide reference(s) for relevant geotechnical report(s)]*

## Roadworks

1. Approved fill material shall be compacted to a minimum dry density not less than 95% of the Standard Proctor Maximum Dry Density (SPMDD), or required as per the geotechnical report. Soil density tests shall be conducted by a qualified geotechnical engineer to confirm compaction and the stability of the fill have been followed the report's recommendations. Test results shall be organized and submitted to the City for record.
2. Approved granular material to be compacted to a dry density of not less than 100% SPMDD. After compaction, soil density tests shall be conducted to ensure adequate compaction.
3. Road cross-sections, intersection, vertical and horizontal alignment shall conform to the Standard Drawings of the City unless otherwise noted.
4. All proposed curb shall be cast-in-place concrete barrier curb and gutter in accordance with OPSD 600.070 modified such that base asphalt to be removed for the purpose of top curb installation shall be minimum of 300 mm wide or wider to permit appropriate compaction equipment. New base asphalt shall be placed and compacted to ensure 100% SPMDD. Following placement of top curb, any excess concrete shall be removed to ensure proper thickness of asphalt and interface is achieved.
5. Construction of concrete sidewalk shall conform with Standard Drawing R-128.
6. Erection of street names and traffic signs shall be in accordance with Standard Drawing R-111.
7. All walkways shall be constructed in accordance with Standard Drawing R-129.  
  
All walkways into open spaces/parks must be 2.5 metre wide unless otherwise noted on the plans.
8. All topsoil and organic material within the road allowance shall be stripped prior to the commencement of construction.
9. Subdrains shall be installed the full length under all curb in accordance with Standard Drawing R-132. Contractor to ensure that the subgrade is graded to provide positive drainage to the subdrains and that the subdrains outlet into catchbasins.

10. Pavement Design (minimum compacted depths): Engineer to increase based on site conditions

	Top Course Asphalt HL-3	Base Course Asphalt HL-8	Base 20 mm Crusher-Run Limestone	Sub-Base 50 mm Crusher-Run Limestone
Local & Rural Residential Roads	[40] mm	[50] mm	[150] mm	[200] mm
Industrial, Collector & Arterial Roads	[50] mm	[75] mm	[125] mm	[350] mm
Residential Driveways	[25] mm	[50] mm	[200] mm	n/a

11. The maximum asphalt cement content by mass in an asphalt mixture for residential driveways shall be 7.0%.
12. Asphalt on residential driveways is to be placed with a minimum of one winter gap between two lifts. Residential driveways are to be paved from the curb to the garage door of the house.
13. Asphalt to be compacted to a minimum 97% Marshall Density or as specified by geotechnical engineer.
14. Ideal vs. Non-Ideal Conditions for Pavement Design

a. *[Engineer to provide reference(s) for relevant geotechnical report(s)]*

b. Ideal Conditions

*[The zone of subgrade within mm below the underside of granular sub-base must be compacted to at least % SPMD, with the moisture content % to % drier than optimum.]*

*[In the upper mm of the subgrade, the compaction should be increased to % SPMD.]*

c. Non-Ideal Conditions

*[If roads are to be constructed during wet conditions and subgrade is unstable then either the top mm of the subgrade should be replaced with drier, compacted, selected subgrade material or the top mm of subgrade should be replaced with granular material. To be confirmed at the time of construction.]*

*[In preparation of the subgrade prior to the placement of the granular sub-base and base materials, the subgrade must be proof-rolled to determine its stability and suitability for road construction.]*

15. Line Painting:

- a. Alkyd paints may be used on base course asphalt only and must be maintained (including repainting) prior to placement of top course asphalt.
- b. More durable thermoplastic materials are required on top course asphalt.

## Storm Sewers

1. Polyvinyl chloride (PVC) pipe and pipe joints shall conform to the following CSA standards:
  - a. 100 mm – 150 mm diameter: CSA B182.1, ASTM D3034, Min. DR 28
  - b. 200 mm to 375 mm diameter: CSA 182.2, ASTM D3034, Min. DR 35
  - c. > 375 mm (Max. 450 mm) diameter: CSA 182.2, ASTM F679 (T-1), Min. DR35
2. Concrete pipe and pipe joints shall conform to the latest revisions of OPSS 1820, CSA A257.3 and the following standards:
  - a. Non-reinforced concrete pipe: CSA A257.1, ASTM C14
  - b. Reinforced concrete pipe: CSA A257.2, ASTM C76, ASTM C655
3. Bedding and Cover requirements for all storm sewer mains shall conform to applicable Ontario Provincial Standard Drawings (OPSD) and Specifications (OPSS).
  - a. PVC pipe: bedding and cover material shall be OPSS Granular A.
  - b. Concrete pipe: bedding material shall be OPSS Granular A and cover material shall be mortar sand conforming to OPSS Granular D.
4. Catchbasins shall be in accordance with Standard Drawing S-104 with OPSD 400.010 frame and grate or approved equal. All single and double catchbasin connections shall be 200 mm or 300 mm PVC pipe, unless otherwise noted.
5. Storm sewer maintenance holes shall be in accordance with applicable OPSD details unless otherwise noted. Frame and cover shall be OPSD 401.010 Type A or approved equal. All sewer maintenance hole benching to be to the obvert of the pipe.
6. Curvilinear alignment of PVC storm sewers can be accomplished by providing bends or bending the pipe within limits as specified by the pipe manufacturer.
7. Contractor shall ensure that low point of curb occurs at catchbasin location at sag areas of proposed roads.
8. All residential connections shall be constructed in accordance with Standard Drawing C-101.
9. All industrial/commercial/institutional (ICI) connections shall be constructed in accordance with Standard Drawing C-102.
10. Rear lot catchbasins shall be as per Standard Drawing S-105 and grating as per Standard Drawing S-103. Leads shall have concrete encasement to a minimum of 150 mm above the pipe and shall extend from the catchbasin to the curb. Leads to be minimum 250 mm diameter PVC pipe .
11. Catchbasins shall be located at the extension of the side lot lines, and shall not be located within the driveway curb cut area and must be a minimum 1.0 m away from any curb depression.
12. All PVC storm lateral pipe shall be white in colour.

## Sanitary Sewers

1. Sanitary sewer pipe materials shall generally be polyvinyl chloride (PVC) pipe in accordance with the following specifications, unless otherwise noted:
  - a. 100 mm – 150 mm diameter: CSA B182.1, ASTM D3034, Min. DR 28
  - b. 200 mm to 375 mm diameter: CSA 182.2, ASTM D3034, Min. DR 35
  - c. > 375 mm (Max. 450 mm) diameter: CSA 182.2, ASTM F679 (T-1), Min. DR35
2. Concrete sanitary sewer pipe and pipe joints shall conform to OPSS 1820, CSA A257.2, CSA A257.3 and ASTM C76.
3. Minimum bedding requirements for all sanitary sewer mains shall conform to applicable Ontario Provincial Standard Drawings (OPSD) and Specifications (OPSS).
  - a. PVC pipe: bedding and cover material shall be OPSS Granular A.
  - b. Concrete pipe: bedding material shall be OPSS Granular A and cover material shall be mortar sand conforming to OPSS Granular D.
4. Sanitary sewer maintenance holes shall be in accordance with applicable OPSD details unless otherwise noted. Frame and cover shall be OPSD 401.010 Type A or approved equal. All sewer maintenance hole benching to be to the obvert of the pipe.
5. Curvilinear alignment of PVC storm sewers can be accomplished by providing bends or bending the pipe within limits as specified by the pipe manufacturer.
6. All residential connections shall be constructed in accordance with Standard Drawing C-101.
7. All industrial/commercial/institutional (ICI) connections shall be in accordance with Standard Drawing C-102.
8. All PVC sanitary sewers and lateral pipes shall be green in colour.

## Watermains

1. Watermain pipe shall be polyvinyl chloride (PVC) pipe in accordance with the following specifications, unless otherwise noted:
  - a. 150 mm – 300 mm diameter: Min. Class 150, CSA B137.3, AWWA C900, Min. DR 18
  - b. 400 mm diameter: Min. Class 150, CSA B137.3, AWWA C905, Min. DR 18Joints and fittings shall be as per AWWA C907 specifications.
2. Watermain cover to be minimum 2.0 m below ground surface or 2.1 m below road centerline, whichever is deeper.
3. Watermain bedding to be mortar sand conforming to OPSS 1004 Granular D and placed in accordance with applicable OPSD drawings. Bedding to extend a minimum of 150 mm or 1/4 of the pipe diameter, whichever is greater, around all sides of the pipe.
4. Concrete thrust blocks, where required to conform to OPSD 1103.010 & 1103.020.
5. Tracer wire (8 gauge) to be installed on all watermains.

6. All valve chambers shall be precast concrete in accordance with City Standard Drawings. All valves up to, and including, 400 mm diameter shall be mechanical joint gate valves in accordance with AWWA C500 specifications.
7. All hydrants shall be in accordance with AWWA C502 specifications and installed in accordance with City Standard Drawing W-104. Flange elevations shall be as shown on the profile drawings.
8. The Contractor shall note that the depth of the proposed watermain may vary and he shall satisfy himself as to the require height of the hydrant riser and depths of valve chambers.
9. Cathodic protection is required on all metallic fittings unless otherwise recommended in the approved geotechnical report. Size and installation shall be in accordance with City requirements or as recommended by geotechnical engineer. City minimum requirements for sacrificial anodes:
  - a. Metallic mechanical joints/fittings/restraints: 12 lb each
  - b. Service connections (i.e., curb stops): 6 lb each
  - c. Hydrants: 24 lb each
  - d. On exposed metallic piping or fittings when connecting to non-metallic pipe and/or when making repairs to breaks and/or leaks: 12 lb each
10. Domestic water service connections to be 19 mm diameter Type 'K' copper tubing and installed as per City Standard Drawing C-101 and OPSD 1104.010, unless otherwise specified. Saddles are required for service connection sizes larger than 19 mm and up to 50 mm in diameter. Curb stops are not permitted in driveways.
11. All industrial/commercial/institutional (ICI) connections shall be in accordance with Standard Drawings C-102 and C-103, unless otherwise noted.
12. No watermain or appurtenance shall be placed on previously excavated soil unless proper engineered support is in place to the satisfaction of the City.
13. Watermain within fill areas are to have restrained joints using Uni-Flange Series 1390 Restrainer (or approved equivalent) for three joints beyond the fill area and to be indicated on profile drawings.
14. Valves, bends and tees to have restrained joints in accordance with City Standard Drawing W-105.
15. Minimum curvature of any watermain shall be completed by pipe deflection in accordance with the manufacturer's radius guidelines.

## Exceptions

*List all exceptions to Design Criteria and Standard Drawings.*

*To be organized by above headings (e.g., General, Roadworks, etc.) and to also include separate Landscape and Streetlighting headings*