

3.3 Design & Drawing Requirements

3.3.1 General

The following is a list of general requirements for the engineering drawings:

- 1:200; 1:250; 1:400; 1:500 or other common metric scale
- legible and clear
- north arrow/legend
- geodetic contour and elevations
- geodetic bench mark reference data used
- municipal address and legal description including lot and concession, "M" Plan and lot/block number or "R" Plan and part number(s), including 0.3 m reserves
- a key plan indicating site location and nearest roads
- planning file number either DA (complex) or BP (simple)
- name of applicant
- name and address, telephone and fax number of firm preparing the site plan
- name and address of noise consultant who prepared report for this site plan (if applicable)
- general notes as detailed in Section 3.3.7
- site statistics including parking spaces required and provided
- summary of relevant information and statistics

3.3.2 Existing & Proposed Services

All existing utilities and structures as well as proposed services within the site and adjacent boulevards shall be detailed on the site servicing drawings(s) and grading plan(s). Prior to any construction, the owner and/or his representative shall determine the location of all under/aboveground utilities and structures by consulting the appropriate authorities or utility companies concerned. During construction, the owner shall prove the location of all such utilities and structures and assume all liability for and including restoration to original conditions/adjustment to finished grade to the satisfaction of the City and the affected authorities.

The site servicing drawing(s) and grading plan(s) shall include the locations and details of the following existing and proposed utilities, structures and services:

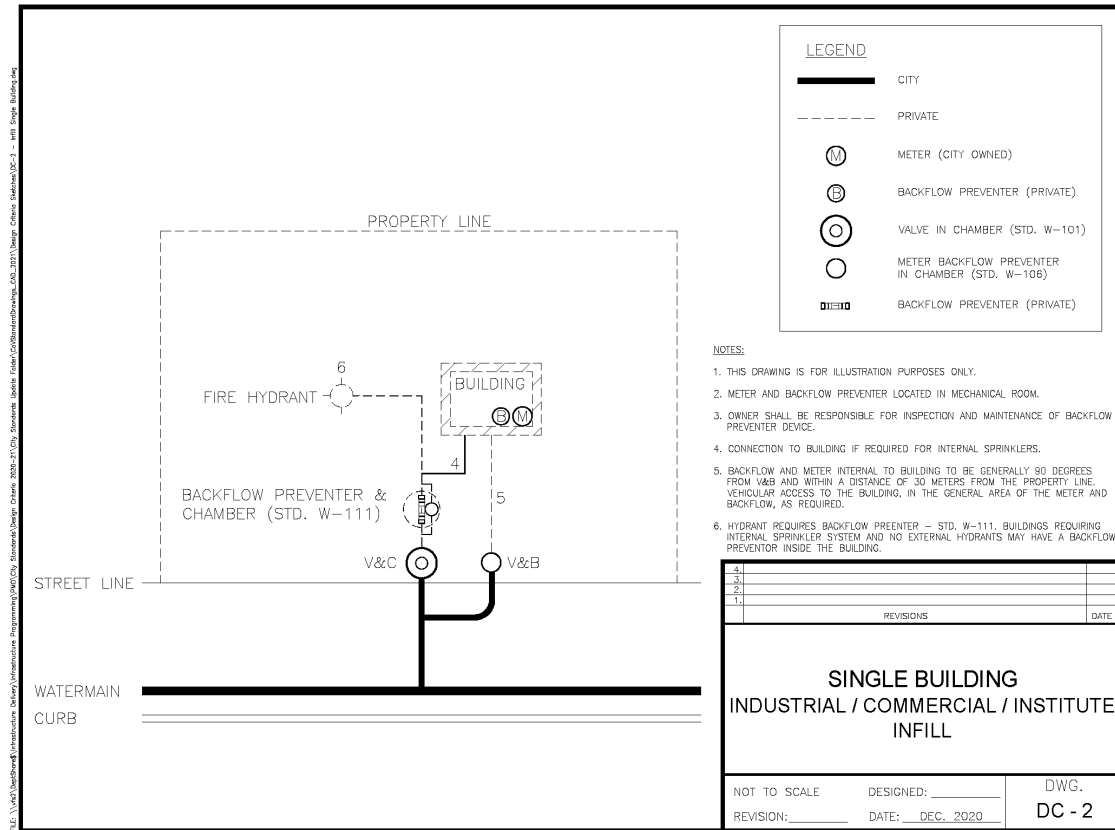
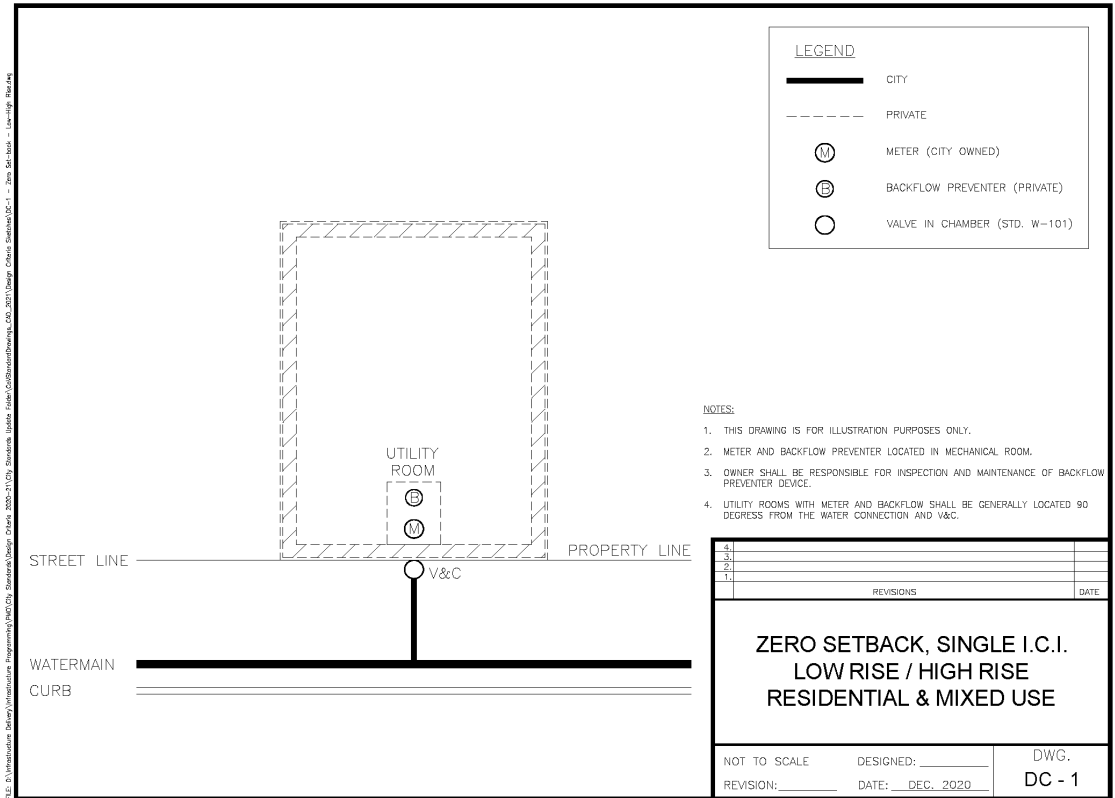
3.3.2.1 Aboveground Services

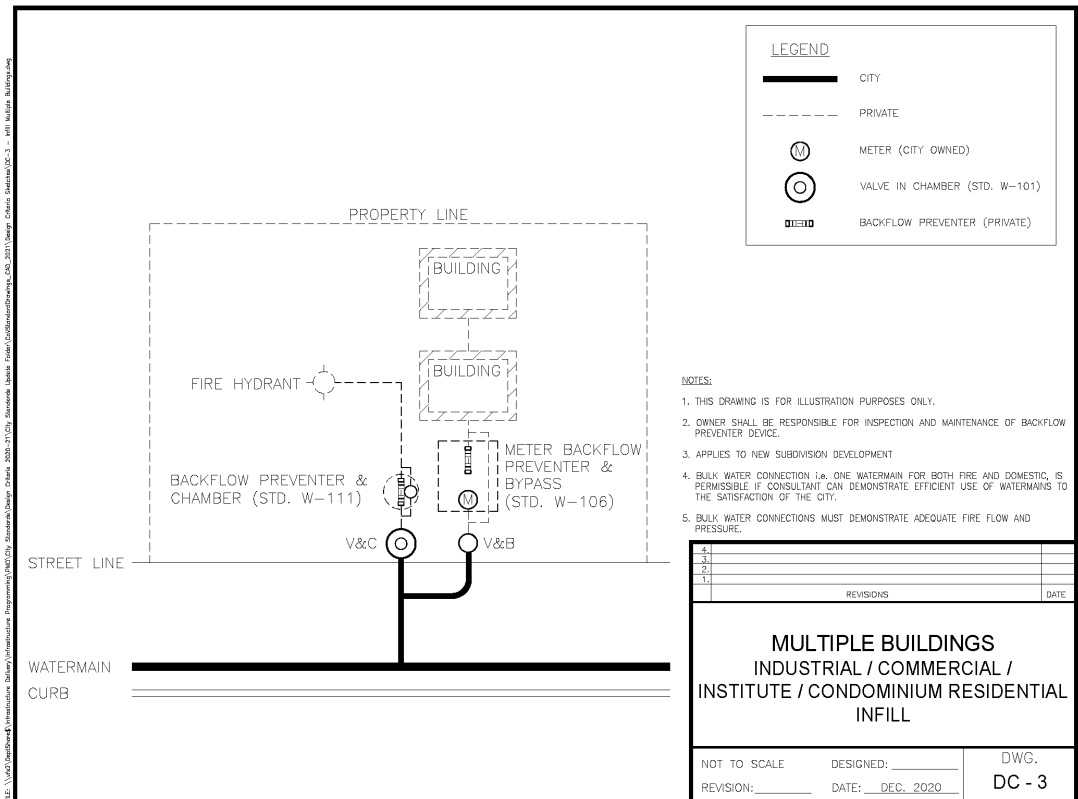
- municipal roads - to show full road allowance widths
- sidewalks and walkways
- maintenance hole tops
- catchbasins and ditch inlets/outlets
- headwall(s) with safety grate and handrail
- hydrants and secondary valves
- valve boxes/chambers including domestic water boxes
- curbs, curb depressions and driveway curb cuts including opposite side (i.e., show all nearby driveways and site accesses, including those across from, or adjacent to, the subject site)
- light standards, hydro and utility poles
- nearby signs, traffic signs
- easements and reserves
- retaining walls with handrails if greater than 600 mm, slopes and berms
- fences and handrails

- transformer boxes, vaults, utility chambers, pedestals and conduits
- trees, bushes and hedges
- existing structures to be demolished and/or retained

3.3.2.2 Underground Services

- Each lot, block or severed lot/block shall be serviced with one set of connections (i.e., maintenance holes and valve chambers) to be located 1.0 m off the street line on private property as per Standard C-102. Shared connections are discouraged.
- Second water connection may be considered subject to the review of the Water Supply Analysis prepared for the subject land. The analysis shall demonstrate the flow demand and water pressure as well as adequate service levels (in case of breaks and fire event) to determine the need of second feed.
- Service connections to mainline sewers shall be made in accordance with MECP Design Guidelines for Sewage Works (2008 or successor thereof; Section 5.7.11.2). The springline of the connection pipe shall not be lower than the springline of the mainline sewer; in such cases, a maintenance hole is required to ensure appropriate benching for flow.
- For buildings 84 m or more high, two sources of supply from the municipal water supply shall be provided in accordance with the Ontario Building Code (OBC 3.2.9.7). Other large multi-unit apartment complexes may similarly require two sources of supply, at the discretion of the City. The sources of supply must be separated by valve(s) such that a continuous supply of water is available should the municipal supply not be available at either of the connection points. It is the City's preference that these connections be derived from more than one adjacent roadway, if possible. Backflow prevention is required on both connections in accordance with Standard Drawing W-111.
- For sites with more than one building, a meter chamber including backflow preventer is required as per Standard Drawing W-106, W-109, or other applicable standard and is to be located between the service connections and the buildings. A backflow preventer is required on the Fire Service in accordance with Standard Drawing W-111.
- Sanitary and storm sewers, maintenance holes and catchbasins, showing the pipe materials, lengths, diameters, slopes, connection inverts and ground or rim elevations.
- Watermain services (domestic and fire lines) to the building with pipe materials, lengths, diameters, overt elevations and crossing elevations at sewers and maintenance holes.
- Curb boxes and service valve boxes to be located outside the limits of the driveway.
- Profile sections showing proposed new services on City's right of way.
- Location of water meter and square footage of building.
- Backflow prevention to be in accordance with Backflow Prevention By-law 004-2018 or updated Backflow prevention By-law.
- Service connection configuration including backflows and meters to be in accordance with the following examples:





3.3.3 Site Uses

Identify the proposed use for the site and abutting property use, such as:

- warehouse storage and distribution
- process industries
- office space
- restaurants and banquet facilities
- retail and wholesale commercial
- automotive service station
- residential condominium developments with private roads and services
- drive-thru for car washes, banks, fast food, etc.

3.3.4 Access & Circulation

The access to and within the site shall be designed to the City's requirements to ensure adequate traffic movement. In order to permit organized, well-spaced and coordinated access points onto collector and arterial roads, the use of single mutually shared access points at property limits is encouraged. The following requirements shall be detailed on the drawing(s):

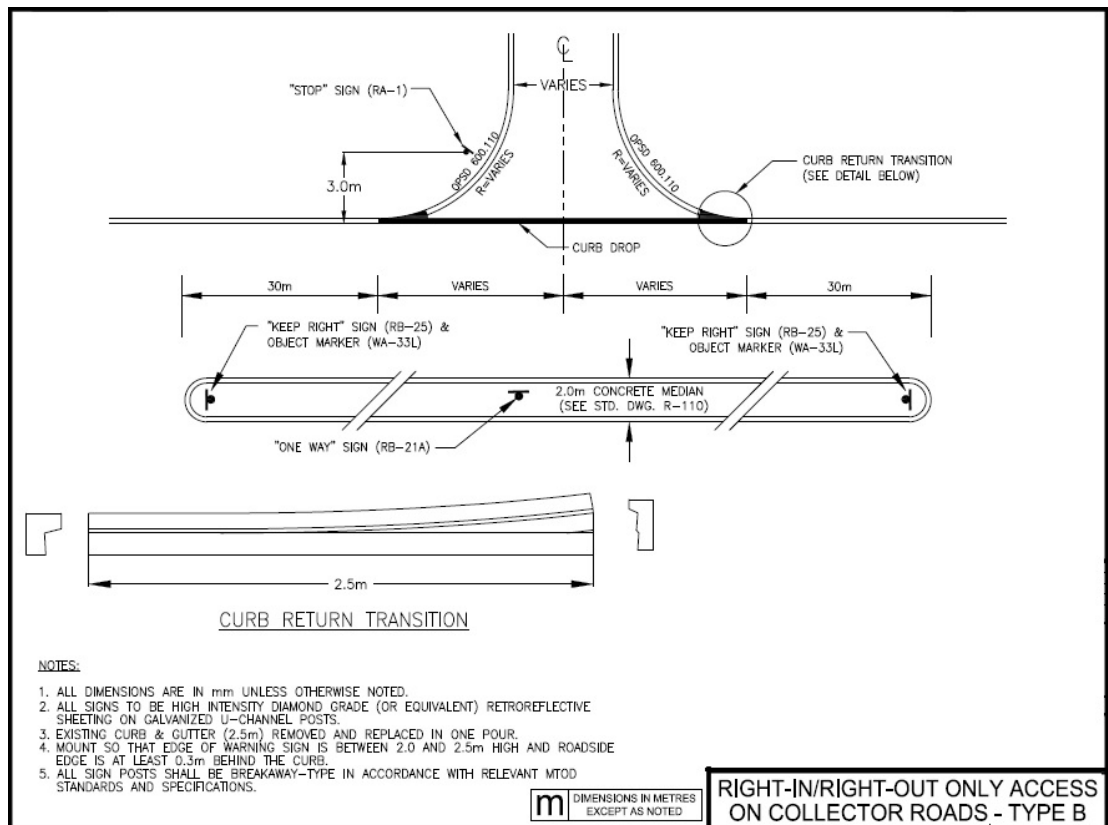
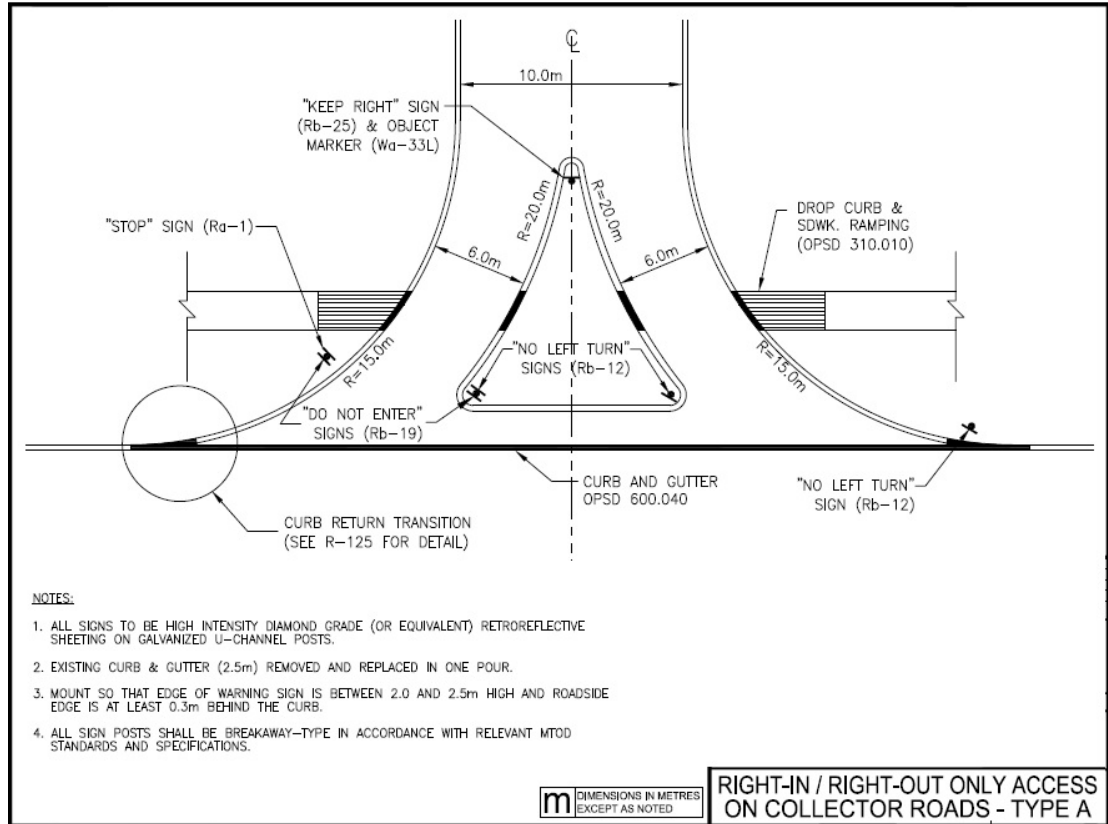
3.3.4.1 Residential Condominium, Industrial and Commercial Site Plans

3.3.4.1 (a) Entrance driveway widths:

3.3.4.1 (a) (i) ingress and egress driveways to be 7.5 m minimum or 9.0 m for large truck use; or

3.3.4.1 (a) (ii) to be in accordance with the recommended entrance design of the approved traffic impact study (if applicable), to the satisfaction of the City.

- 3.3.4.1 (b) Entrance driveway radii: minimum 7.6 m; or 9.0 m for large truck use.
- 3.3.4.1 (c) Entrance driveways shall be constructed with heavy duty asphalt paving from back edge of the municipal curb or edge of pavement to the property line (area to be highlighted on the drawing) in accordance with the following minimum specifications, or as recommended by geotechnical engineer:
 - 3.3.4.1 (c) (i) 50mm compacted depth of HL3 asphalt - top course
 - 3.3.4.1 (c) (ii) 75mm compacted depth of HL8 asphalt - binder course
 - 3.3.4.1 (c) (iii) 150mm compacted depth of 20mm diameter crusher-run limestone - granular base
 - 3.3.4.1 (c) (iv) 300mm compacted depth of 50mm diameter crusher-run limestone - granular sub-base
- 3.3.4.1 (d) Driveway entrance shall have a minimum of 1.0 m clear setback from all aboveground services or other obstructions.
- 3.3.4.1 (e) Driveway entrance curbs are to be discontinuous at the municipal sidewalk and tapered back 600mm minimum. Entrance curb connections shall be OPSD 350.010
- 3.3.4.1 (f) Existing roadway curb (to be depressed) and gutter to be continuous through the proposed new driveway entrance(s) along with the municipal sidewalk. For treatment of curb at driveway entrance, refer to Standard Drawing R-123.
- 3.3.4.1 (g) Existing municipal sidewalk through a driveway shall be removed and replaced with a 200 mm thick sidewalk as per City Standard Drawing R-128 and to include tactile indicators in accordance with York Region standard. For driveway entrances to arterial roads without curbs, the municipal sidewalk shall stop at the driveway.
- 3.3.4.1 (h) Right-In/Right-Out driveways on Major Collector Roads shall be controlled per details below:



- 3.3.4.1 (i) Shared/mutual driveways may be implemented where both parties agree to share the access. Mutual access agreement shall be provided with the application prior to approval. A 3 m wide centre median/curb island is to be provided to the satisfaction of the City. The median/curb island is to extend to the street line as a minimum.
- 3.3.4.1 (j) Pedestrian walkways shall be provided from within the site and connected to the existing municipal sidewalks.
- 3.3.4.1 (k) Show fire routes and turning radii, indicate sufficient manoeuvring area for access to front loading doors by semi-trailer truck or smaller shipping trucks, as appropriate. Verify with CAD based software such as AutoTURN or equivalent. Designers should consult the Transportation Association of Canada's Geometric Design Guide for Canadian Roads, among other suitable or relevant references, for typical design vehicles and related design matters.
- 3.3.4.1 (l) Parking layout design and stall size (include barrier-free spaces). List required and proposed parking supply.
- 3.3.4.1 (m) Pick-up/drop-off zones shall be shown when required.
- 3.3.4.1 (n) Show garbage disposal/loading area (drive-in or external). Refer to City's Waste Collection Design Standards Policy for additional information.
- 3.3.4.1 (o) Show the proposed snow storage locations.
- 3.3.4.1 (p) Townhouse unit driveway minimum width 3.0 m or as per By-law 1-88 of City of Vaughan.
- 3.3.4.1 (q) Show parking layout.
- 3.3.4.1 (r) Internal roads in condominium complex to be designed and constructed to the latest City specifications to the satisfaction of the Development Engineering Department.
- 3.3.4.1 (s) For sites with greater than forty units, two access points to the site are required.
- 3.3.4.1 (t) Show traffic sign(s) and street name signage.
- 3.3.4.1 (u) Show street lighting for private road.
- 3.3.4.1 (v) Show traffic sign(s) and pavement markings such as stop bars or directional arrows. Busy internal driveway junctions must be controlled by signs and markings.
- 3.3.4.1 (w) Show driveway curb cuts.

3.3.4.2 [Bicycle Parking](#)

- 3.3.4.2 (a) Provide suitable parking where cyclists stop, with racks that maximize convenience for short-duration stops (e.g., stores, bank entrance, etc.) and storage facilities that maximize security for longer-duration stops (e.g., schools, worksites, transportation terminals, etc.).
- 3.3.4.2 (b) Locate bicycle parking where it is convenient to use, secure, visible, protected from weather, and has adequate clearance. Short-term bicycle parking should be provided within 15 m of the building entrance that cyclists use. Where there is more than one building on a site, or where buildings have more than one entrance, the parking must be distributed to serve all buildings or main entrances. If more than 10 short-term spaces are required, at least 50% should be covered.

- 3.3.4.2 (c) Do not locate bicycle racks where they are in the way of, or are otherwise a hazard to, pedestrian or other traffic.
- 3.3.4.2 (d) Bicycle racks and lockers should be made of heavy-duty, durable, vandal-resistant materials that are securely anchored.
- 3.3.4.2 (e) Racks should be designed to accommodate commonly used bicycle locks (U-locks and cable locks).
- 3.3.4.2 (f) Bicycle parking requirements are to be in accordance with the report titled Measuring the Sustainability Performance of New Development (Brampton, Vaughan and Richmond Hill) and any applicable By-Laws.

3.3.5 Grading

Site grading to be in accordance with the overall approved subdivision grading plans when applicable. The following items must be addressed and detailed on the drawing(s):

- 3.3.5.1 (a) All elevations including slope (%) and finished elevations at property line. Grades are to match the adjacent properties and/or approved subdivision grading plans.
- 3.3.5.1 (b) Overland drainage grass swales shall be graded at a minimum 2% and a maximum 5% slope.
- 3.3.5.1 (c) Underground/aboveground ramps that exceed 5% slope to be heated and contoured, subject to a maximum slope of 15%. Grade differentials on-site must be 7.5% maximum over a minimum 3.65 m transition length.
- 3.3.5.1 (d) Pavement shall be graded at min. 0.5% and max. 5% slope (may be greater at loading bays).
- 3.3.5.1 (e) Slopes in landscaped areas and on berms shall not exceed 3 horizontal to 1 vertical (3:1).
- 3.3.5.1 (f) Landscape berms shall not encroach onto the boulevard (i.e., municipal right-of-way).
- 3.3.5.1 (g) Indicate the elevations on all points of grade change at reasonable intervals.
- 3.3.5.1 (h) Indicate centre line of road elevations abutting the site.
- 3.3.5.1 (i) Indicate existing elevations and features a minimum 20 metres beyond the site.
- 3.3.5.1 (j) Indicate external storm drainage areas.
- 3.3.5.1 (k) All drainage to be self-contained on site, discharged to approved outlets and to not adversely affect abutting properties. Positive drainage is to be provided on all developing and existing properties.
- 3.3.5.1 (l) Any retaining walls shall be in accordance with Section 2.4 wherever possible.

3.3.6 Stormwater Management

All stormwater runoff is to be controlled to the specified runoff rate adopted for the original development (if applicable), or to the City's current design criteria. In addition, the runoff resulting from a 5 mm rainfall must be retained on site for reuse, infiltration or evapotranspiration.

Proponents are encouraged to consult with the City and any other relevant agencies having authority prior to commencing design. The information and documents listed below shall be included as part of the application.

A stormwater management report signed, sealed and dated by a Professional Engineer which details:

- Techniques used to control storm runoff to the allowable runoff rate, including any LID measures (see Section 1.3.6).
- Method and volume of storm water storage (e.g., Modified Rational Method, simulation, other).

The site servicing and grading drawing(s) shall include details as follows:

- 3.3.6.1 (a) The stormwater runoff coefficient(s).
- 3.3.6.1 (b) The proposed methods of stormwater storage, identifying the rooftop controls, orifice controls, and on-site storage areas including volume and high water elevations.
- 3.3.6.1 (c) Provide cross-sectional detail of the control structure identifying the orifice size, connection inverts, and high water level as per City Standard Drawings C-104. Only one control maintenance hole is permitted and internal controls are generally not permitted.
- 3.3.6.1 (d) Flexibility with respect to allowing internal controls may be warranted if it can be demonstrated that there is very low likelihood or ability of property owners to remove or otherwise modify controls adversely.
- 3.3.6.1 (e) Minimum 50 mm freeboard above the top water elevation.
- 3.3.6.1 (f) Maximum ponding depth:
- 3.3.6.1 (g) Residential: 150mm at catchbasins
- 3.3.6.1 (h) Industrial or Commercial: 300 mm at catchbasins and 600 mm at loading bays
- 3.3.6.1 (i) Backflow preventers are not permitted to be used as control devices in storm sewers.
- 3.3.6.1 (j) Orifice plates are not permitted to be used as control devices. Orifice tubes are permitted for onsite controls.
- 3.3.6.1 (k) Identify all rim elevations on service lids and covers.
- 3.3.6.1 (l) Identify top of curb elevations and all accesses (i.e., ramps, finished floors, loading bays).
- 3.3.6.1 (m) Storm sewer design sheets.
- 3.3.6.1 (n) Oil-grit separators, if any, shall be installed downstream of the control maintenance hole and influent flow velocity to comply with manufacturer's specifications. Oil-grit separators shall be designed for 80% TSS removal based on manufacturer's specifications, however, will only receive credit for 50% TSS removal. Oil-grit separators are not permitted within the municipal right-of-way.

3.3.7 Standard Notes

The following notes shall be shown on the site servicing and grading drawing(s) without alteration. Additional notes to be provided under a separate heading titled "Additional Notes".

GENERAL

- Standard drawings of the City of Vaughan constitute part of these drawing(s).
- All construction work to be carried out in accordance with the requirements of the Occupational Health and Safety Act and Regulations for construction projects.
- The Owner shall retain the services of his consultants to ensure required inspection reports and or certification requirements are submitted to the Development Engineering Department and other affected City Departments.
- The Owner and/or his representative shall rectify all disturbed areas to original condition or better and to the satisfaction of the City.
- The location of all under/above ground utilities and structures is approximate only and where shown on the drawing(s) the accuracy of the location of such utilities is not guaranteed. The Owner and/or his representative shall determine the location of all such utilities and structures by consulting the appropriate authorities or utility companies concerned. The Owner shall prove the location of such utilities and structures and shall assume all liability for damage or restoration or adjustment for the same.
- Any conflicts with existing services shall be rectified at the Owner's expense.
- Appropriate construction details should be provided for retaining walls higher than 1.0 m. Details shall be designed and certified by a Professional Engineer upon approval. Handrail/guard/fence is required when height exceeds 0.60 m (as per City Standard Drawing FRW-105 or approved equal). Upon completion, retaining walls greater than 1.0 m to be certified by a structural and geotechnical engineers.
- Landscaping work shall not encroach on boulevard nor shall boulevard grades be altered.
- Slopes in landscaped areas and on berms shall not exceed 3 horizontal to 1 vertical.
- Grassed drainage swale grades: min. 2%; max 5%.
- Outside lighting shall be directed downward and inward and designed to maintain zero cut-off light level distribution at the property line.
- Silt fence(s) and other erosion control measures to be installed and maintained to prevent silt flowing onto adjacent lands until the completion of sodding activities.
- Construction access shall be constructed with a minimum depth of 450 mm crushed stone base from the municipal curb or edge of pavement to the property line, to the satisfaction of the City.
- All proposed barrier-free parking spaces to include "Rb-93 BY PERMIT ONLY" traffic sign and barrier-free pavement symbol marking.

SEWER & WATER

- Sanitary and storm control maintenance holes shall be in accordance with all applicable OPSD details. Frame and cover shall be OPSD 401.010 Type A or approved equal. The maintenance holes shall be benched to the obvert (top) of pipes.
- All sanitary maintenance hole covers in the ponding areas to be water tight sealed covers.
- All catchbasins shall be installed in accordance with City Standard Drawing S-103. All catchbasin frames and grates shall be OPSD 400.010 or OPSD 400.110 or approved equal.
- Watermain shall have a minimum vertical separation of 0.5 m and horizontal separation of 2.5 m between any sewer or maintenance hole unless otherwise noted.
- Hydrants to be installed as per City Standard W-104 with 1.0 m minimum clear from all obstructions.
- All industrial/commercial/condominium watermain connections shall be constructed in accordance with City Standard Drawings C-102, C-103, W-106, W-109 and related Standard Drawings.
- Sanitary, storm and water service connections which are not in place on the municipal road allowance to the property line shall be arranged for installation by the City on payment of installation costs by the Owner. To initiate the installation of the service connection(s), the Owner shall file an application with the Construction Services Division of the Development Engineering Department which includes 2 copies of the approved site servicing and grading drawing(s) with Department's

approval seal and, if required, a copy of the Region of York Approval Schedule as per the executed Site Plan Agreement.

ROADWORKS

- Entrance driveways shall be constructed with heavy duty asphalt from the back of the municipal curb or edge of pavement to the property line (area highlighted on drawing(s) in accordance with the following specifications:
 - 50 mm compacted depth of HL3 asphalt - top course
 - 75 mm compacted depth of HL8 asphalt - binder course
 - 150 mm compacted depth of 20 mm crusher-run limestone - granular base
 - 300 mm compacted depth of 50 mm crusher-run limestone - granular sub-base
- The surface of all loading spaces and related driveways, parking spaces, and maneuvering areas within the site shall be paved with a hard surface. The minimum depth requirements are as follows, or as specified by geotechnical engineer:
 - 40 mm compacted depth HL3 asphalt - top course
 - 50 mm compacted depth HL8 asphalt - binder course
 - 150 mm compacted depth 20 mm crusher-run limestone - granular base
 - 200 mm compacted depth 50 mm crusher-run limestone - granular sub-base
- For condominium unit driveways, the minimum depth requirements are as follows, or as specified by geotechnical engineer:
 - 25 mm compacted depth HL3 asphalt top course
(Top course asphalt shall not be placed until the base course asphalt has been in place for one winter season. Other hard surfaces may be installed as approved by the City.)
 - 50 mm compacted depth HL8 asphalt base course
 - 200 mm compacted depth 20 mm crusher-run limestone base
- All concrete curb from existing road curb to street line shall be barrier curb OPSD 600.110. All concrete curb heights shall be 150 mm unless otherwise noted. Entrance driveway curb to be discontinuous at sidewalk and tapered back 600 mm minimum.
- All required curb cutting at entrance driveway and curb depressions at sidewalk crossings shall be installed to the satisfaction of the City.
- Existing roadway curb and gutter to be continuous through the proposed new driveway entrance(s) along with the municipal sidewalk.
- Sidewalk to be 200 mm thick through driveway entrance per City Standard R-128 and to include tactile indicators in accordance with York Region standard.
- Entrance driveways shall be setback a minimum clearance of 1.0 m from all aboveground services or other obstructions.
- Pavement grades: min. 0.5%; max 5%.

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