

GREEN ROOFS FOR STORMWATER MANAGEMENT *Toronto*

Toronto Specific Stormwater Calculations and Details

Columbia Green Technologies provides AutoCAD details and stormwater calculations that are specifically designed with Toronto's stormwater regulations in mind. Through our technical support we strive to make designing and implementing a green roof in the Toronto area as easy as possible. Toronto specific details can be downloaded from <http://columbia-green.com/resources/regional-stormwater-information/> along with Stormwater Regulation Sheets for other areas.

Policies and Regulations in Toronto

Wet Weather Flow Management

The Wet Weather Flow Master Plan (WWFMP) was implemented by the City of Toronto to neutralize the negative environmental impacts of runoff from storms and snowmelt.

Water Balance Management in order to preserve the pre-development hydrology the WWFMP requires capturing and managing rainfall onsite, with a target of retaining all runoff onsite to pre-developed levels and retaining all runoff from a small design rain event of 5mm.

Water Quality Management the WWFMP limits the levels of Total Suspended Solids (TSS) and other contaminants that can enter water bodies by requiring developments to remove 80% of all TSS from all runoff leaving the site.

Water Quantity Management flood flows and erosion must also be controlled. Allowable flow rates are based on locations and are available from the TRCA.

Toronto recognizes green roofs as a Water Balance control and they can be used to effectively capture stormwater runoff. Columbia Green offers tray and layer based green roof solutions that can retain up to 70% of annual rainfall, limiting runoff and helping to fulfill the WWFMP requirements.

Green Roof Bylaw

The Green Roof Bylaw requires new building permit applicants for residential, commercial, institutional, and industrial developments to include a green roof. Developments are exempt if they have less than 2,000m² of Gross Floor Area. The required coverage area is dependent on the size of the development and ranges from 20% to 60%. Industrial developments must cover the lesser of 2,000m² or 10% of the roof area Residential developments under 6 stories, or 20m are exempt.

Toronto Green Roof Construction Standard sets minimum requirements for the design construction and maintenance of green roofs. The standard requires growing medium with a depth over 100mm (3.9"), a root barrier, drainage system, filtration layer, wind uplift calculation, adequate irrigation, and a maintenance plan along with other safety and design requirements. For a full list of requirements see Chapter 492 Article IV of the Toronto Municipal Code.

All Columbia Green green roof products are available with over 100mm of growing medium, root barriers, filtration and drainage systems, and integrated drip irrigation is available in our Planted-in-Place system. Additionally we can help with weight and wind uplift calculations and offer comprehensive maintenance guidelines.

Local Green Roof Incentive Programs

The City of Toronto offers the Eco-Roof Incentive Program to developers installing green and cool roofs on buildings not subject to the Green Roof Bylaw. Developers can receive \$75 per square meter of green roof installed, up to \$100,000.

For more information go to http://www.toronto.ca/livegreen/greenbusiness_greenroofs_eco-roof.htm

About Columbia Green Technologies

At Columbia Green Technologies we offer a variety of comprehensive green roof solutions; from extensive to intensive green roofs, available with both tray based and layered systems. Designers appreciate the flexibility our systems offer and the technical support that accompanies any project we undertake. Building owners love the single-source 'Roof to Green Roof' warranty options provided through our roofing partners.



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Note: This summary has been prepared and compiled by Columbia Green Technologies for informational purposes only. The information contained herein is accurate to the best of our knowledge as of Spring/Summer 2014. Please consult the regulatory agency and/or a licensed engineer before using this information for the purposes of facility design or permitting.