



Acceptance Criteria for Municipal Non-Conventional Stormwater Management Facilities

March 2026



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CITY OF MARKHAM

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1. Purpose Statement

While conventional stormwater management facilities, including stormwater management ponds, remain the standard approach in the City of Markham, Non-Conventional Stormwater Management Facilities (NCSWMFs) can offer an alternative suite of practices that broaden the range of stormwater management solutions available to support the growing demand for housing. Where viable, the City may accept and consider the implementation of NCSWMFs, provided they are demonstrated to be technically feasible and offer benefits to surrounding communities, including but not limited to flood protection. These acceptance criteria establish the framework for the evaluation, review, acceptance, and implementation of NCSWMFs intended for municipal ownership, operation, and maintenance.

2. Applicability and Scope Statement

These acceptance criteria establish a clear, transparent, and consistent framework to guide decision-making related to the implementation of NCSWMFs intended for municipal assumption.

The overall objectives of these acceptance criteria are to:

- Establish a clear and consistent framework for when NCSWMFs may be proposed, evaluated, and accepted, ensuring alignment with applicable legislation, City policies, technical feasibility, as well as planning and environmental objectives.
- Define the technical, design, construction, operational, and performance criteria and requirements that NCSWMFs need to meet in order to be considered suitable for municipal ownership and long-term management.
- Outline the full lifecycle expectations for NCSWMFs, including required documentation, monitoring, maintenance planning, and conditions for acceptance and assumption by the City.

These acceptance criteria apply to all parties involved in the planning, design, acceptance, implementation, operation, maintenance, rehabilitation, and replacement (where applicable) of NCSWMFs intended for municipal ownership and assumed through land development processes.

These acceptance criteria shall be revisited on an as-needed basis, which shall be at the City's discretion. The acceptance of these facilities is the responsibility of the Director of Engineering of the City of Markham and/or a delegate acting on their behalf. It is noted that these acceptance criteria do not apply to Capital Projects undertaken by the City of Markham.

3. Background

Applicable Legislation and Reference Documents:

1. Planning Act, R.S.O. 1990, c P.13
2. Provincial Planning Statement, 2024
3. Bill 23, More Homes Built Faster Act, 2022, S.O. 2022, c. 21
4. Ontario Water Resources Act, R.S.O. 1990, c. O.40
5. Clean Water Act, 2006, S.O. 2006, c. 22
6. Environmental Protection Act. R.S.O. 1990, c. E.19



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7. Alternative Infrastructure Policy, City of Markham, 2019

8. Official Plan, City of Markham, 2014

4. Definitions

Capital Projects: Large scale and/or high-cost construction projects completed by the City of Markham, that aim to maintain or improve City assets such as infrastructure.

City: The Corporation of the City of Markham, including all departments, employees, and administrative divisions.

Clean Condition: Without visual accumulation of sediment or debris.

CLI-ECA: The City of Markham's Consolidated Linear Infrastructure Environmental Compliance Approval.

Commercial (land use): Land designated for the commercial activities of buying, selling or trading of merchandise or services.

Constructed Wetland: An engineered wetland that is designed to provide stormwater treatment.

Conventional Stormwater Management Facility (SWMF): End-of-pipe stormwater management practice that is limited to a wet or dry Stormwater Management Pond (including constructed wetlands), that provides water quantity control and/or quality treatment, and/or erosion control of tributary area runoff.

Council: Council of the City of Markham.

CSA: Canadian Standards Association.

Development Application (or Development): Proposal put forward by a Landowner to the City for review and decision, pertaining to a change of land use, construction of a new building, or the creation of a parcel of land, as governed under the *Planning Act*. The applicable types of Development Applications which only apply to this procedure are Block Plan, Secondary Plan, Official Plan Amendment, Zoning By-law Amendment, and Draft Plan of Subdivision.

ETV: Environmental Technology Verification. A Canadian process that provides independent evaluation of new technologies to validate environmental claims.

Greenfield Development: The development of a property, site, or area on undeveloped land in an urban or rural area.

Greenway: Greenway System lands as shown on Official Plan Map 1.

Industrial (land use): Land designated for economic activities related to manufacturing, production, and the handling of goods, or other similar facilities.

Intensification Development: The development or redevelopment of a property, site, or area with a new development at a higher density or building height than is currently permitted by the Official Plan (as amended or superseded) within an area that is already developed.

Initial Submission: The stage of a Development Application process whereby an applicant submits documents for the first time to the City for staff review, which is typically, but not always the PLAN stage.



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Landowner: The party who owns the property or is the representative of the party who owns the land.

LID: Low Impact Development. A stormwater management strategy that seeks to mitigate increased runoff and pollution by treating and managing stormwater as close to its source as possible. It preserves natural hydrological functions through site design and distributed small-scale practices that mimic pre-development conditions (e.g., infiltration, filtration, evapotranspiration, etc.), while also providing an ecological function.

Manufactured Treatment Devices (MTD's): Devices used to target the treatment and removal of pollutants from stormwater runoff from development sites, to achieve regulatory water quality objectives, such as OGS units as defined below.

NCSWMF: All end-of-pipe stormwater management facilities outside the Conventional SWMF, as defined above, that are designed to provide quantity control and extended detention and can be designed to provide water quality treatment, subject to conditions. NCSWMF's are not permitted to provide infiltration.

Open Space Lands: Open Space Lands that provide benefit to the parks and open space system beyond those provided by City Parks; however, the primary function of these lands is environmental protection and natural heritage conservation. These lands are not suitable as parkland dedication under the Planning Act.

O&M: Operations and Maintenance.

OGS: Oil-Grit Separator is a treatment unit that will provide pre-treatment prior to runoff entering the NCSWMF. Is an example of a Low Impact Development (LID) strategy.

Parkland Dedication: The requirement for developers to convey land or provide cash-in-lieu to the City to support public park and recreational space as a condition of development or redevelopment. The amount is determined based on the type and scale of the proposed development, in accordance with the Planning Act, and By-Law 2022-102, as amended or superseded.

Park Programming: Planned activities, events, and experiences offered within a park to enhance its use, appeal, and engagement for the public

Park: Any area of land under the jurisdiction of a public authority that is designed and, or, maintained for recreational purposes and is open to the public.

PEO: Professional Engineers Ontario.

Permanent Pool: A volume of water that is retained within a SWMF to provide for the settling of sediments and pollutants; provides water quality control.

Pre-treatment: Treatment of stormwater to remove sediment upstream of/prior to entering the quantity control/extended detention area of a NCSWMF or a Conventional SWMF via a single or multiple measures in series.

Privately Owned Publicly Accessible Spaces: Open spaces, often integrated into private developments, that are available for public use.

Qualified Engineer: Licensed Professional Engineer, licensed to practice in Ontario, and competent to practice in the specified engineering discipline.



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Qualified Engineer of Record: Licensed Professional Engineer who has sealed any submitted drawings or reports.

Quality Control: The management of pollutant load in stormwater runoff to protect the receiving water system, aquatic life, and public health.

Quantity (Flood) Control: The management of the volume and flow rate of stormwater runoff from a site to prevent flooding, erosion and downstream impacts.

ROW: Right-of-way.

Sealed: Documents that have been stamped using the rubber stamp/impression of the rubber stamp issued by Professional Engineers Ontario (PEO) to all license holders. The seal (or stamp) identifies the Engineer taking personal and professional responsibility for the content of the documents. The seal must be signed and dated by the license holder.

SWMF: Stormwater Management Facility.

Treatment Train Approach: Providing stormwater treatment first, at the lot level, then in conveyance, followed by “end-of pipe” (where stormwater gets discharged). A treatment train is required to meet the multiple objectives of water balance, water quality, erosion control and flood control in an overall stormwater management strategy.

TSS: Total Suspended Solids.

5. Acceptance Criteria

1. GENERAL CONSIDERATIONS

- 1.1** A Stormwater Management solution applying the use of a NCSWMF, as required through the development process, may be accepted by the City through the Director of Engineering or acting delegate if:

1.1.1 Sufficient justification for the use of a NCSWMF has been provided in a Justification Report, which shall be submitted at the time of the Initial Submission to the City, which may include but is not limited to a Master Environmental Servicing Plan, Block Plan, Secondary Plan, Official Plan Amendment/Zoning By-law Amendment or Draft Plan of Subdivision. The City may retain a qualified external Peer Reviewer to assist with technical review as needed, to be paid for by the Landowner. The Justification Report shall:

- 1.1.1.1** Be prepared by a licensed Qualified Engineer;
- 1.1.1.2** Provide sufficient evidence that NCSWMF can be implemented while remaining in conformance with applicable Municipal, Regional and Provincial legislation, by-laws (as amended or superseded), policies and design criteria;
- 1.1.1.3** Identify the conceptual design of the proposed NCSWMF and prove technical feasibility;



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programming and is sufficiently setback from natural heritage and hydrologic features, as defined by existing criteria;

- 1.3.2** Documentation provides sufficient evidence that all existing and applicable criteria (parks, greenways) have been met;
- 1.3.3** Frequent inspections, operations and maintenance of the proposed facility shall not conflict with planned City programming, operations, and maintenance;
- 1.3.4** The anticipated park programming disruptions associated with rehabilitation or replacement of NCSWMFs, or O&M activities on an infrequent basis; and
- 1.3.5** Traffic considerations for accepted applications in ROW's are sufficiently documented in the O&M Manual.

2. TECHNICAL CONSIDERATIONS

2.1 A stormwater management solution that includes the use of a NCSWMF may be accepted by the City if:

- 2.1.1** The proposed solution, defined in the detailed Stormwater Management Report, achieves all required water quantity, water quality, water balance and erosion control targets for the development, as defined by the City of Markham's Engineering Design Criteria and Standards, City of Markham Stormwater Management Guidelines, and the 2003 MECP Stormwater Management Planning and Design Manual (as amended or superseded).
- 2.1.2** The proposed NCSWMF shall only be used for water quantity control, water quality control and extended detention, and shall not be used to address water balance criteria through infiltration in the same NCSWMF. Water balance criteria shall be achieved by SWM infrastructure provided independently from the proposed NCSWMF, for the overall SWM scheme to be accepted by the City.
- 2.1.3** Water quality treatment shall be provided. An upstream Treatment Train approach is recommended for all NCSWMFs. The Treatment Train may include pre-treatment for captured runoff prior to the runoff discharging to the quantity control portion of the NCSWMF. The strategy may include the use of OGS units or treatment cells (such as isolator/separator rows), or other technology accepted by the City, which shall be sized to provide a minimum of 80% TSS removal on 90% of the site runoff volume, using the particle size distribution as defined by the City or Canadian ETV standards, whichever is more stringent. The design, selection, and placement of all proposed quality treatment shall be consistent with guidelines provided in the City's Low Impact Development Guidelines, Engineering Standards and Stormwater Management Guidelines (as amended or superseded). The City will only provide quality control credit for upstream controls that align with the types of facilities already accepted under the City of Markham Low Impact Development Guidelines and Stormwater Management Guidelines (as amended or superseded) and meet the criteria for municipal assumption.

2.2 Permanent pools within the NCSWMF may be accepted by the City if the following conditions are met:



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- 2.2.1** Adequate justification for the inclusion of a permanent pool instead of other means of quality control is provided at all stages of development, to the satisfaction of the City;
 - 2.2.2** The NCSWMF has been designed to be corrosion and rust resistant using anti-chloride protection measures (e.g. anti-chloride corrosion concrete mixture) to the satisfaction of the City;
 - 2.2.3** A Structural Design Assessment completed by a qualified Professional Engineer has been provided at the time of Detailed Design Submission and then verified again at Assumption, that adequately verifies the structural integrity and stability of the SWMF and shows it has not been compromised through the inclusion of a permanent pool to the satisfaction of the City; and
 - 2.2.4** A detailed plan for sediment removal from the SWMF over a 100-year period has been provided in the Operations & Maintenance Manual, and shall outline maintenance requirements, frequencies, required equipment, required certifications, and access plans to the satisfaction of the City. The sediment removal plan shall prioritize ease of execution to prevent cleanout from becoming excessively burdensome on City resources.
- 2.3** All NCSWMFs shall be gravity draining during normal operations.
- 2.4** All NCSWMFs shall be designed with an emphasis on the City's existing operation and maintenance regime (e.g., available resources, capabilities and practices) to ensure the longevity of the facility.
- 2.5** An O&M Manual for the proposed NCSWMF and pre-treatment systems is required for review and acceptance by the City's Director of Engineering or acting delegate. The O&M Manual shall include, at minimum:
 - 2.5.1** Requirements for inspections and monitoring over a 100 year period;
 - 2.5.2** Sediment loading estimates over a 100 year period and frequency of sediment clean out;
 - 2.5.3** A life cycle inspection and maintenance assessment for the proposed stormwater infrastructure over a 100 year period; and
 - 2.5.4** Identification of any required staging areas for anticipated maintenance operations to ensure park accessibility, right-of-way functionality, and natural heritage and hydrologic feature preservation during maintenance activities.
- 2.6** The design of the NCSWMF must adhere to the requirements outlined in the City's Technical Requirements for Municipal NCSWMF, CLI-ECA, other applicable Environmental Compliance Approvals, or other legislative requirements.
- 2.7** The proposed location of the NCSWMF components shall meet applicable guidelines and setbacks provided by the City's Stormwater Management Facility Location Guidelines (as amended or superseded), the City's SWM Guidelines (as amended or superseded) and the City's Official Plan (as amended or superseded) for implementation of SWM/LID techniques in relation to natural heritage and hydrologic features.
 - 2.7.1** Grading and site alteration within natural heritage features and their vegetation protection zones shall be avoided or minimized. Where grading cannot be avoided, restoration and planting of native species shall be required.



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2.7.2 Where a NCSWMF is proposed within or abutting the Greenway System or Greenbelt Plan Area, an Environmental Impact Study shall be required to demonstrate conformity with the applicable policies of the Official Plan (as amended or superseded) and/or Greenbelt Plan.

3. PARKLAND CONSIDERATIONS

- 3.1** Provisions of parkland dedication credit for dual-use park/NCSWMF may be considered by the City in accordance with the Parkland Conveyance By-law 2025-101, as amended, or any successor thereof. The extent of credit will be evaluated based on factors including the extent and nature of encumbrances, compatibility with park programming, maintenance access requirements, and the overall usability of the parkland.
- 3.2** For parkland dedication to be considered and assessed by the City, the design of the dual-use park block with proposed park space above a NCSWMF must meet the following criteria:
- 3.2.1** The SWMF does not impact or restrict the City's ability and obligation for park space or ability to include active and/or passive public programming of the park space. The SWMF also must not restrict the permit-readiness of the park;
 - 3.2.2** The SWMF has been designed to minimize encumbrance on the park programming during operation and maintenance activities. Expected programming disturbances have been described in detail in the O&M Manual;
 - 3.2.3** The park space and NCSWMF must be designed, developed, and maintained to City standards;
 - 3.2.4** The park space must meet applicable criteria in the City's Official Plan (as amended or superseded) and Secondary Plans;
 - 3.2.5** The design of the NCSWMF (e.g., SWMF footprint within the park block etc.) must be driven by the Park's needs and the two designed in conjunction (e.g., desired facilities etc.), while also satisfying all applicable stormwater management requirements, including the City of Markham Engineering Design Criteria and Standard Drawings, Stormwater Management Guidelines, and Technical Requirements for Municipal NCSWMF (all as amended or superseded). The implementation of a NCSWMF in the park block shall not cause the lands to be encumbered with poor drainage, increased risk of flooding, erosion issues, or extreme slopes; and
 - 3.2.6** NCSWMF design, landscaping and park feature placement shall consider future facility replacement, rehabilitation, and major maintenance requirements, to minimize mature tree removal in the future.
- 3.3** The design of NCSWMFs located below proposed parkland blocks shall comply with the technical design requirements defined in the City's Parks Planning Terms of Reference, as well as the City's Technical Requirements for NCSWMFs, which may include but are not limited to minimum facility cover depth, static and dynamic loading conditions, and access requirements.
- 3.4** To be accepted as programmed park space, inspections, operations, and maintenance of the proposed SWMF shall not conflict with, prohibit, or restrict planned park programming, operations, and maintenance. Major maintenance, rehabilitation, or replacement of NCSWMFs, resulting in disruption to park programming, operations, and maintenance, may be accepted on an infrequent (>25-year period) basis.



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Accessibility to the park by the public will not be infringed on by frequent operations and maintenance of the NCSWMF, except for staging areas identified in the Operations and Maintenance Manual. Impacted areas from staging and stockpiling is to be minimized to the extent possible and must be approved by the City.

- 3.5** To be accepted for parkland use, the Landowner shall enter into a Parks and Open Space and Developer Build Parks Agreement. The Landowner shall be responsible for the costs associated with park development over and above standard development charges, determined by the Development Charge Background Study.

4. RIGHT-OF-WAY CONSIDERATIONS

- 4.1** NCSWMF's will not be permitted within right-of-way's (ROW), except in exceptional circumstances, where site constraints do not allow for any other facility type. The City will review sites on a case-by-case basis, and final acceptance of the proposed design must be signed off by the Director of Engineering. If permitted, proposed NCSWMF's within the ROW will be subject to the following:

- 4.1.1** NCSWMFs proposed for implementation in ROWs shall only be designed to provide quantity control; all other applicable stormwater criteria must be met through the Treatment Train approach upstream of the proposed SWMF. Guidelines from the City's Low Impact Development Guidelines (2017, as amended or superseded) shall be adhered to in the design of Treatment Train components;
- 4.1.2** The proposed NCSWMF must be a concrete facility;
- 4.1.3** The use of NCSWMFs within the ROW does not require modification of the overall ROW width to accommodate the facility within acceptable offsets per existing criteria, or to ensure that other existing or planned services within the standard ROW are not infringed on; and
- 4.1.4** Major O&M or rehabilitation activities resulting in disruption to traffic may be accepted on an infrequent basis (> 25 year period). In anticipation of major maintenance, traffic and construction staging considerations shall be included in the O&M Manual for the facility for the City's consideration.

- 4.2** The ROW shall be designed and constructed by the Landowner to the satisfaction of the City.

5. CONSTRUCTION CONSIDERATIONS

- 5.1** The NCSWMF shall be constructed in accordance with City-approved engineering drawings, with all work to be certified by a Professional Engineer. The Landowner shall be responsible for documenting construction progress, verifying compliance at each phase, and maintaining erosion and sediment controls throughout construction. This shall include, but not be limited to:
- 5.1.1** Construction completed in accordance with approved engineering drawings;
 - 5.1.2** Record Drawings prepared and sealed by a Qualified Engineer, as defined by PEO guidelines;
 - 5.1.3** Phase-by-phase observation reports confirming compliance with approved installation methodology;



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5.1.4 ESC measures maintained and the facility kept isolated during construction; and

5.1.5 For complete details on construction considerations, refer to the *Technical Requirements for Municipal NCSWMF* (Section 4).

6. OPERATIONS AND MAINTENANCE

6.1 An O&M Manual for all components of the Stormwater Management solution that are to be assumed by the City, which includes pre-treatments units or measures, shall be provided to the City for review and acceptance. The O&M Manual shall detail the required operation and maintenance procedures and efforts, required equipment and certifications, maintenance frequency for all related infrastructure, and anticipated associated costs. At a minimum, the O&M Manual shall include the following:

6.1.1 Sediment clean-out frequency of the facility, which shall be provided based on the sediment loading rate from the development and the treatment efficiency of the facility;

6.1.2 A detailed breakdown of procedure, method, effort and anticipated cost for each inspection and maintenance item for the entire Stormwater Management solution;

6.1.3 A list of equipment needed to complete the required inspection and maintenance, as well as any required certifications for staff completing both frequent and infrequent inspections and maintenance;

6.1.4 A detailed outline of maintenance procedures and associated disruptions to the intended land use;

6.1.5 A delineation of the area of disturbance required for maintenance and/or rehabilitation of NCSWMFs, including access and staging areas;

6.1.6 Any additional information requested by the City related to operations, maintenance, rehabilitation, and replacement is to be provided by the Landowner; and

6.1.7 For complete details regarding Operations and Maintenance, refer to the *Technical Requirements for Municipal NCSWMF* (Section 3).

6.2 After facility becomes operational, the Landowner shall complete a monitoring and reporting program in accordance with the accepted monitoring plan, to the satisfaction of the City. For complete details on monitoring, refer to the *Technical Requirements for Municipal NCSWMF* (Section 3).

7. ACCEPTANCE FOR MAINTENANCE

7.1 At Acceptance for Maintenance, the Landowner shall provide Record Drawings for the NCSWMF, sealed by the Qualified Engineer of Record. Record drawings are to be in accordance with the PEOs guidance document on Preparing As Built and Record Documents and provided in a format that is acceptable to the City. The Landowner must also demonstrate that the NCSWMF is clean, functioning as designed, compliant with all applicable requirements, and acceptable to relevant City departments. Required submissions include, but not limited to:

7.1.1 Record Drawings (as per PEO Guidelines);



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- 7.1.2** Confirmation of clean facility;
- 7.1.3** Operational performance verification;
- 7.1.4** Maintenance Records;
- 7.1.5** Structural Inspection;
- 7.1.6** CLI-ECA Compliance documentation (where applicable);
- 7.1.7** Monitoring Records;
- 7.1.8** Vegetation and landscaping acceptance from the City's relevant department;
- 7.1.9** Park design acceptance from City's relevant department; and
- 7.1.10** Any additional information requested by the City.

7.2 For complete details and requirements on Acceptance for Maintenance, refer to the *Technical Requirements for Municipal NCSWMF* (Section 5).

8. ASSUMPTION

- 8.1** Prior to the facility assumption, the Landowner shall submit updated engineering documentation confirming the NCSWMF has been constructed, inspected, and maintained in accord with City requirements. All final submissions must be sealed by a Qualified Professional Engineer. Any additional details requested by the City shall be provided. Required documentation includes but is not limited to:
- 8.1.1** Revised Record Drawings (as per PEO Guidelines) identifying all modifications, if applicable;
 - 8.1.2** Clean facility confirmation;
 - 8.1.3** Structural Inspection as outlined below;
 - 8.1.4** Monitoring Records;
 - 8.1.5** Extended warranty documentation (where applicable);
 - 8.1.6** O&M Manual with up-to-date activity records; and
 - 8.1.7** Any additional information requested by the City.
- 8.2** For complete details and requirements on Assumption, refer to the *Technical Requirements for Municipal NCSWMF* (Section 6).
- 8.3** Prior to assumption, the Landowner shall prove that all other requirements for assumption outlined in the Subdivision Agreement have been met, if applicable.
- 8.4** Prior to assumption, the Landowner shall retain a third-party consultant to verify the Structural Design Assessment completed at the Detailed Design Submission. The City shall reserve the right to retain qualified people to inspect and certify the works to the City's satisfaction, the costs for which will be the responsibility of the Landowner.



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- 8.5** The Landowner shall provide record of meeting all applicable CLI-ECA/ECA requirements and provide all completed CLI-ECA/ECA documents prior to assumption.
- 8.6** Prior to Assumption, the Landowner shall ensure that all park features, including vegetation and landscaping, have been built and implemented. Where the City is delivering the park, this construction requirement does not apply. However, any additional costs for park feature implementation outside those identified through the Development Charge Background Study shall remain the responsibility of the Landowner, including where the City is constructing the park.

9. FINANCIAL CONSIDERATIONS

- 9.1** These acceptance criteria shall align with the City's current prevailing financial framework (Alternative Infrastructure Policy or superseded) for NCSWMFs, until further financial analysis is completed.