



Review and Acceptance Procedure for Municipal Non-Conventional Stormwater Management Facilities

March 2026



Review and Acceptance Procedure for Municipal Non-Conventional Stormwater Management Facilities

CITY OF MARKHAM

MARCH 2026



PROCEDURE TITLE: REVIEW AND ACCEPTANCE PROCEDURE FOR MUNICIPAL NON-CONVENTIONAL STORMWATER MANAGEMENT FACILITIES

PROCEDURE 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 to support development. The City's review and acceptance process for Non-Conventional Stormwater Management Facilities (SWMFs) is a comprehensive guidance document that can be used by City Staff for the review, acceptance, and implementation of Non-Conventional SWMFs within lands intended for municipal ownership, in support of the development planning applications.

PURPOSE

The purpose of this procedure is to outline requirements for the evaluation, approval, and implementation of Non-Conventional SWMFs.

The objectives of this procedure are to:

1. Establish a transparent process for internal and external stakeholders to evaluate acceptable Non-Conventional SWMF requests.
2. Define where Non-Conventional SWMFs can and cannot be implemented within City lands, parkland, and right-of-ways.
3. Provide framework for Operations & Maintenance procedures and documentation, to ensure long term facility integrity and functionality.

SCOPE

This procedure applies to internal and external stakeholders involved in the design, review, acceptance, implementation, and operation/maintenance of municipally owned and operated Non-Conventional SWMFs, assumed through the land development process for Development Applications which may include but are not limited to Block Plan, Secondary Plan, Official Plan Amendment, Zoning By-law Amendment, and Draft Plan of Subdivision.

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 this Procedure does not consider or pertain to Capital Projects undertaken by the City of Markham. This procedure document shall be used in conjunction with the Technical Requirements for Municipal Non-Conventional SWMF.

LEGISLATIVE REQUIREMENTS

1. Planning Act, R.S.O. 1990, c P.13
2. Greenbelt Act, 2005, S.O. 2005 C. 1
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
7. Official Plan, City of Markham, 2014.

DEFINITIONS

1. **Active Storage:** The storage volume provided within a SWMF to satisfy quantity control requirements only.
2. **City:** The Corporation of the City of Markham, including all departments, employees, and administrative divisions.
3. **Clean Condition:** Without visual accumulation of sediment or debris.
4. **CLI-ECA:** Consolidated Linear Infrastructure Environmental Compliance Approval.
5. **Conventional SWMF:** End-of-pipe stormwater management practice consisting of a constructed wetland or a wet or dry Stormwater Management Pond to provide water quantity control and/or water quality treatment, and/or erosion control of tributary area runoff.
6. **Council:** Council of the City of Markham.
7. **CSA:** Canadian Standards Association.
8. **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 apply to this procedure may include but are not limited to Block Plan, Secondary Plan, Official Plan Amendment, Zoning By-law Amendment, and Draft Plan of Subdivision.
9. **Greenfield Development:** The development of a property, site, or area on undeveloped land in an urban or rural area.
10. **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.
11. **Infrastructure:** Physical assets developed and used by a municipality to support its social, cultural, and economic services (Source: FCM, 2017)
12. **Initial Submission:** The stage of a Development Application process whereby an applicant submits documents for the first time to the City for staff review.
13. **Landowner:** The party who owns the property or is the representative of the party who owns the land.
14. **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.
15. **Life Cycle Cost:** The total cost of an asset over its full life cycle, including capital cost, operation, maintenance, rehabilitation, and disposal.
16. **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.
17. **Non-Conventional SWMF:** 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. Non-Conventional SWMF's are not permitted to provide infiltration.
18. **O&M:** Operations and Maintenance.

19. **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.
20. **Park Recreation Facility:** A public facility designed and equipped for the conduct of sports, leisure activities, and other customary and usual recreation activities, used by the public for active and/or passive recreation.
21. **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.
22. **Pre-treatment:** Treatment of stormwater to remove sediment upstream of/prior to entering the quantity control/extended detention area of a Non-Conventional SWMF or a Conventional SWMF via a single or multiple measures in series.
23. **Qualified Engineer:** Licensed Professional Engineer, licensed to practice in Ontario, and competent to practice in a specified engineering discipline.
24. **Qualified Engineer of Record:** Licensed Professional Engineer who has sealed any submitted drawings or reports.
25. **Quality Control:** The management of pollutant load in stormwater runoff to protect the receiving water system, aquatic life, and public health.
26. **Quantity (Flood) Control:** The management of the volume and flow rate of stormwater runoff from a site to prevent flooding, erosion and downstream impacts.
27. **ROW:** Right-of-way.
28. **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.
29. **SWMF:** Stormwater Management Facility.
30. **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 meets the multiple objectives of water balance, water quality, erosion control and flood control in an overall stormwater management strategy.

PROCEDURE

The following steps provide comprehensive guidance and information on the review of acceptable Non-Conventional SWMFs proposed as part of a Development Application. Refer to appended flow charts and checklists for each step for additional guidance on this process.

Procedural Steps

1 Step 1: Pre-Application Consultation Request (PRCN) Submission

- 1.1 The Landowner shall identify if a Non-Conventional SWMF is proposed in any documentation or conceptual plans that are submitted to the City as part of the PRCN Submission. The Landowner shall refer to the City's Pre-Application Consultation Reference Guide to ensure all applicable documents are provided.
- 1.2 In addition to standard application review departments, the City's Parks Planning department and Environmental Services/Operations department shall be included and circulated on the PRCN Submission and coordination regarding the NCSWMF. This allows for consultation on park planning and development requirements if a NCSWMF is proposed in future park (or other City lands). It also allows for consultation on future

O&M requirements with the Environmental Services/Operations department. Early consultation with these departments allows the proposed Park Design to be developed in parallel with the proposed NCSWMF.

Refer to **Appendix 1** for the PRCN Submission Flow Chart and Checklist for additional guidance.

2 Step 2: Draft Plan of Subdivision (PLAN) / Functional Servicing

2.1 Justification of Non-Conventional SWMF

- i. A Non-Conventional SWMF Justification Report must be submitted by the Landowner to the City for review and acceptance, at the next stage of the development process following the PRCN Submission and Meeting. The Justification Report shall be included in any submission to the City for development that includes, but is not limited to, Master Environmental Servicing Plans (MESP), Block Plans, Secondary Plans, or Official Plan Amendment/Zoning By-law Amendments and Draft Plan submission if none of the above apply, where a NCSWMF is proposed within lands intended for municipal ownership in support of the development planning. The Non-Conventional SWMF Justification Report must clearly demonstrate the benefits to the City of implementing a Non-Conventional SWMF solution compared to a Conventional SWMF. The Non-Conventional SWMF Justification Report must be reviewed and accepted by the City before a Recommendation Report for Draft Plan Approval is submitted to the Development Services Committee and before Technical Review (TEC) can be initiated.
- ii. At the discretion of the Director of Engineering and/or their delegate acting on their behalf, submitted Non-Conventional SWMF Justification Report may be subject to an external peer review, with costs to be paid for by the Landowner. The option to undertake an external peer review will be assessed on a case-by-case basis, based on factors including but not limited to, the size and type of the Non-Conventional SWMF, the complexity of its incorporation into the proposed development, and availability of City resources. When deemed appropriate, a defined list of deliverables will be provided by the City to the peer reviewer to ensure design compliance and technical feasibility of the proposed facility. All comments received as part of this peer review process are to be addressed to the satisfaction of the City.
- iii. The Non-Conventional SWMF Justification Report must, at minimum, meet the following requirements:
 - Must be prepared and sealed by a Qualified Engineer;
 - Must provide sufficient evidence that the Non-Conventional SWMF can be implemented to meet SWM criteria for the site, without infringing on other design criteria or site-specific constraints;
 - Must identify the conceptual design of the proposed Non-Conventional SWMF, including but not limited to, the proposed location and functions over the Non-

Conventional SWMF, surface grades, sub-surface infrastructure elevations, outlet location and elevations, potential impacts to natural heritage, overview of existing underground utilities, and Non-Conventional SWMF product type;

- Must identify if the Non-Conventional SWMF will be designed to include a permanent pool for quality control and must provide adequate justification for inclusion, with consideration to minimize the required operation and maintenance including corrosion-protection within the SWMF;
- Must provide overview of existing site-specific conditions such as soil type and group, existing topography, and any known groundwater concerns or historical groundwater data, to be later confirmed through Geotechnical and/or Hydrogeological Investigations at the appropriate submission stage (FSR or other) to ensure adequate subsurface conditions for the conceptual design;
- Must document the social, environmental, and economic benefits of implementing a Non-Conventional SWMF within the development, as well as any potential impacts to above ground programming;
- Must provide a high-level overview of the anticipated operation and maintenance (O&M) requirements to maintain the facility, including the equipment required and impacts to park space;
- Must outline how the proposed design will consider and prioritize park programming and location needs, to the satisfaction of the City.

2.2 City Review and Acceptance of Stormwater Management Strategy and Non-Conventional SWMF Technology

- i. At this stage, the Landowner shall determine whether the proposed Non-Conventional SWMF meets the requirements of Schedule D in the CLI-ECA and is qualified for pre-authorization.
- ii. Should the SWMF not be pre-authorized per the City's CLI-ECA, the Landowner is to prepare and submit a direct ECA application, including all required documentation, to the MECP for review and approval of the facility at the detailed design stage (TEC submission).
- iii. Review of the overall SWM scheme for the proposed development is to be completed in accordance with the City of Markham's standard engineering review process, ensuring that all SWM control targets are achieved by the stormwater infrastructure proposed for the development. The FSR in support of the Draft Plan of Subdivision submitted to the City for review and acceptance shall include details on the Non-Conventional SWMF proposed for the development site. City Staff shall be in general agreement with the overall SWM scheme prior to issuing the Recommendation Report to the Development Services Committee for Draft Plan Approval.
- iv. The City shall consider the proposed Non-Conventional SWMF to achieve only the water quantity, water quality and extended detention control criteria. Water balance criteria shall be achieved by SWM infrastructure provided independently

from the Non-Conventional SWMF, for the overall SWM scheme to be accepted by the City.

- v. If applicable, a treatment train approach is required as per CLI-ECA requirements.
- vi. Captured runoff must be treated to a minimum 80% TSS removal prior to runoff discharging from the Non-Conventional SWMF or prior to runoff entering the quantity control portion of the Non-Conventional SWMF where isolator/separator rows are used. The quality control portion of the Non-Conventional SWMF shall be sized using the ETV Canada particle size distribution, or as defined by current City standards, whichever is more stringent. All pre-treatment measures must be easily maintained by the City. Infrastructure that may be considered acceptable by the City for treatment train implementation include:
 - OGS Units;
 - Permanent Pools within Non-Conventional SWMF's;
 - Separated forebays within Non-Conventional SWMFs;
 - Pre-Treatment Cells (isolator/separator row) or other technology accepted by the City; and
 - Public LID measures consistent with the City of Markham's LID Guidelines (2018, as amended or superseded), to be reviewed on a case-by-case basis.
- vii. A list of City of Markham Acceptable Technologies for Non-Conventional SWMFs is available within the City of Markham Technical Requirements for Municipal Non-Conventional SWMF. The proposed technology for the subject development must adhere to these standards.
 - Once the proposed Non-Conventional SWMF technology type (e.g., cast-in-place modular system, pre-cast concrete superpipes, plastic arch chambers etc.), has obtained Draft Plan Approval, substitution for an alternative form of technology will not be accepted, unless it is at the request of the City. If the proponent proposes to substitute the accepted Non-Conventional SWMF technology with an alternative, it may require a full resubmission of the Draft Plan of Subdivision or Site Plan application.
- viii. The following information related to the proposed Non-Conventional SWMF must be included within the FSR in support of the Draft Plan of Subdivision Submission for the City's review and acceptance prior to City staff bringing forward a Technical Report to the Development Services Committee:
 - The proposed Non-Conventional SWMF product type, brand, and model;
 - Confirmation that the proposed volume of the facility meets the defined targets for water quantity control and extended detention, including preliminary design of any proposed flow control structure(s);

- Confirmation that the proposed water quality control strategy adheres to the specified TSS removal rate prior to runoff entering the quantity control component of the Non-Conventional SWMF;
- Confirmation that all water balance requirements are satisfied independently from the Non-Conventional SWMF;
- MECP review and approval (where applicable) will be required at the detailed design stage (TEC submission) with sufficient information to show that it has been designed to adequately facilitate sediment clean-out, per criteria and conditions outlined in the City of Markham's Technical Requirements for Municipal Non-Conventional SWMF;
- Confirmation that pre-treatment has been provided for any storm runoff conveyed from the public ROW into a separate infiltration facility located within public lands, if applicable. This does not apply to Non-Conventional SWMF;
- Per existing development application procedures, supporting Geotechnical and Hydrogeological Investigations to demonstrate adequate conditions for the Non-Conventional SWMF and any upstream Treatment Train facilities, and any recommendations for implementation based on investigation findings;
- A Parks Grading Plan, Facility Fit Plan, and facility access locations to confirm adequate O&M access for City crews;
- All supporting calculations and/or models for the design of the Non-Conventional SWMF;
- Preliminary O&M requirements for maintenance of the facility, including clean out methodology and frequency, preliminary access locations and methodology as well as required equipment;
- Outlet controls must be of gravity type. No pumping will be accepted; and,
- Confirmation that all components of SWM strategy meeting existing City, Conservation Authority and MECP Stormwater Management Design Criteria, where applicable.

2.3 Coordination of Park Requirements

- Where Non-Conventional SWMFs are proposed under a park, coordination is required between the City of Markham Parks Planning Department, Engineering Review Department, and the Landowner's consulting team. The Landowner shall identify the required Park features and programming on submitted plans, that shall be developed through coordination with Parks Planning at the FSR / Draft Plan of Subdivision submission stage and carried through to Detailed Design. The drawings shall be prepared by a Landscape Architect, a full member of the Ontario Association of Landscape Architects. Coordination between Parks Planning and Engineering Review Department should take place prior to any formal submissions made to the City by Landowner.

The City of Markham Parks Planning Division shall provide direction to Landowner as to the needs of the park block, based on location, demographic, and the size of the proposed park block, as guided by existing City Policies, any relevant Master Plans, and existing City Guidelines. Landowner shall demonstrate in writing and through illustrations in a formal Memo that all efforts to minimize land encumbrance have been made; that park criteria can be met based on the proposed park design; and that the proposed Non-Conventional SWMF, inclusive of maintenance, will not impact the intended function of the park and outdoor recreational facilities.

- ii. The Landowner is to reference the City's Technical Requirements for Municipal Non-Conventional SWMF to ensure all applicable criteria are achieved, including but not limited to, minimum cover depth, offset distances, static and dynamic loads, access requirements, etc.
- iii. Parkland dedication credit for dual-use park/NCSWMF facilities will be determined by the City in accordance with the Parkland Conveyance By-law 2025-101, as amended, or any successor thereof. The evaluation will consider factors such as layout, design, encumbrances, maintenance requirements, and infrastructure compatibility with park programming. This assessment will be completed prior to City staff bringing a Recommendation Report on the proposed Draft Plan of Subdivision to the Development Services Committee.
- iv. The Planning and Parks Departments, together with the Landowner shall be responsible for the design and construction of the dual-use Park proposed to be located on top of an underground SWMF and enter into an agreement with the City to design and construct the dual-use park.

2.4 Coordination of Greenway Requirements

- i. Where Non-Conventional SWMFs are proposed within 120 metres of lands designated as "Greenway", natural heritage feature or hydrologic feature, the following information must be included within the Environmental Impact Study (EIS) / Draft Plan of Subdivision Submission for the City's review and acceptance prior to City staff bringing forward a Technical Report to the Development Services Committee:
 - Must identify any natural heritage and/or hydrologic features within the vicinity of the development and Non-Conventional SWMF; and
 - Must identify any applicable setbacks and vegetation protection zones (VPZ) and ensure the location of the Non-Conventional SWMF and/or its components are in compliance with the City's Stormwater Management Facility Location Guidelines (as amended or superseded) and Official Plan.
- ii. Recommendations of the Environmental Impact Study / Draft Plan of Subdivision Submission shall be implemented in the Stormwater Management Report and design for the Non-Conventional SWMF, to the satisfaction of the City and relevant approval authorities.

Refer to **Appendix 2** for the Draft Plan of Subdivision / FSR Flow Chart and Checklist for additional guidance.

3 Step 3: Technical Review of Plan of Subdivision (TEC)/ Detailed Design Submission

3.1 City Review and Acceptance of SWM Report and Design Drawings

- i. Review of the detailed design of the Non-Conventional SWMF and all pre-treatment water quality / water balance measures are to be completed in accordance with the City of Markham's standard engineering review process. Following Draft Plan of Subdivision Approval, a detailed Stormwater Management (SWM) Report is to be submitted by the Landowner to the Engineering Review Department for review and acceptance, in addition to detailed design and shop drawings for the proposed facility prior to the execution of a Subdivision Agreement or other Development related Agreement, as applicable.
- ii. A Structural Design Assessment with supporting investigations for the proposed site-specific design of the SWMF technology or product shall be completed and paid for by the Landowner and submitted to the City. The Assessment shall verify that the proposed SWMF technology or product is appropriate for its proposed use. The list of documents and drawings to be submitted to the City as part of the Structural Design Assessment shall be confirmed with City staff. The City will retain the right to request a change in the proposed Non-Conventional SWMF technology, type, or design if the Assessment deems the proposed SWMF unsuitable for its intended use. The Report will also be subject to third party peer review at the request of the City, to be paid for by the Applicant.
- iii. The replacement or substitution of Non-Conventional SWMF technology, or a change to the use of Conventional SWMF's, shall not be acceptable during review of the detailed design submission, unless requested by the City. Should the Landowner propose a replacement or substitution for the proposed Non-Conventional SWMF technology or product, including the use of Conventional SWMF's, they may be required to resubmit a new Draft Plan of Subdivision.
- iv. Landscape Plans and Park Design Drawings completed by a Landscape Architect, a full member of the Ontario Association of Landscape Architects with seal and certificate shall be provided to the Planning and Urban Design Department for review and acceptance.

3.2 City Review and Acceptance of Operations & Maintenance Manual for the Non-Conventional SWMF

- i. An Operation and Maintenance (O&M) Manual detailing the requirements of the Non-Conventional SWMF and any pre-treatment systems that are to be assumed by the City shall be submitted by the Landowner to City of Markham Engineering Review Department for circulation to Environmental Services and Operations Department for review and acceptance prior to the execution of a Subdivision or other Development related Agreement as applicable.

- ii. The O&M Manual shall detail the required operation and maintenance procedures and efforts, required equipment and certifications, the maintenance frequency on all related infrastructure, and associated costs to perform the required operation and maintenance.
- iii. Maintenance procedures with a high disruption level (i.e., Multi-day operations, earth moving, noise, ground disturbance, traffic impacts, etc.) to the public must be highlighted during the preparation of this manual and considered during development of the annual O&M costs.
- iv. The O&M Manual is to be prepared in accordance with the requirements of the Consolidated Linear Infrastructure Environmental Compliance Approval (CLIECA), or other applicable Environmental Compliance Approvals, including development and implementation of any required monitoring program.
- v. At a minimum, the O&M Manual shall include:
 - Maintenance procedure and frequency of the facility and treatment devices based on the sediment loading rate from the development and the design treatment efficiency;
 - Detailed breakdown of the time, equipment required and estimated cost for each inspection/maintenance item with cost, as well as any expected disruption to surface and subsurface features; and,
 - O&M costs that include provisions for the current Regulations, based on removal and disposal quantities of sediment from the Non-Conventional SWMF.

Refer to **Appendix 3** for the Detailed Design Review Flow Chart and Checklist for additional guidance.

4 Step 4: City Acceptance for Maintenance

4.1 City Review of Acceptance for Maintenance Documentation

- i. In addition to the requirements in Appendix 21 of the City's Municipal Inspection and Construction Guideline and the City's Stormwater Management Guidelines, the Landowner shall submit the following information to the City for review and acceptance:
 - Record Drawings prepared and sealed by the Qualified Engineer of Record, as per PEO guidelines;
 - Evidence of a clean facility, including cleanout and sediment disposal documentation, where applicable;
 - Proof of operational performance, including but not limited to flow monitoring results and rating curve development, as per the accepted quantity and quality monitoring plan;

- All maintenance records confirming activities completed per the approved O&M manual and/or applicable CLI-ECA requirements;
 - Structural inspection report confirming all components are in good condition and compliant with the Structural Design Assessment;
 - Documentation confirming compliance with applicable CLI-ECA requirements;
 - Monitoring program records demonstrating implementation of the accepted monitoring plan;
 - Confirmation of acceptance of Landscaping Plan from the City's Urban Design Department;
 - Confirmation of park design acceptance from the City's Parks Planning, Design and Construction Department; and
 - Any additional information requested by the City.
- ii. Director Notification of the CLI-ECA should be completed by the City and submitted to MECP following Acceptance for Maintenance;
 - iii. For complete details and requirements on Acceptance for Maintenance, refer to the *Technical Requirements for Municipal NCSWMF* (Section 5).

5 Step 5: City Assumption

- 5.1 Steps for assumption should be read in conjunction with the Subdivision Agreement, where applicable. The City may request any other details and information required by the Development Services Committee.
- 5.2 In addition to the requirements in Appendix 21 of the City's Municipal Inspection and Construction Guideline and the City's Stormwater Management Guidelines, the Landowner shall submit the following information prior to Assumption to the City for review and acceptance:
 - i. Revised Record Drawings sealed by the Qualified Engineer of Record, identifying all modifications made since the facility began operation;
 - ii. Evidence of a clean facility, including cleanout and sediment disposal documentation, where applicable;
 - iii. Confirmation of Subdivision Agreement compliance, where applicable;
 - iv. Structural inspection report confirming all components are in good condition and compliant with the Structural Design Assessment;
 - v. Extended warranty documentation for any rehabilitated NCSWMF components, where applicable;
 - vi. Updated O&M manual incorporating lessons learned, operational recommendations, and revised maintenance requirements; and
 - vii. Any additional information requested by the City.

5.3 For complete details and requirements on Assumption, refer to the *Technical Requirements for Municipal NCSWMF* (Section 6).

Refer to **Appendix 4** for the Assumption Review Flow Chart and Checklist for additional guidance.

6 Related Policies

City of Markham Acceptance Criteria for Municipal Non-Conventional SWMFs, 2026
City of Markham Technical Requirements for Municipal Non-Conventional SWMFs, 2026
City of Markham Parkland Conveyance By-Law 2025-101
City of Markham Pre-Application Consultation By-Law 2023-107

7 References

MECP Stormwater Management Planning and Design Manual, March 2003
MECP Low Impact Development Stormwater Management Guidance Manual (Draft), January 2022
TRCA Stormwater Management Criteria, August 2012
CVC/ TRCA Low Impact Development Stormwater Management Planning and Design Guide, 2010
City of Markham Low Impact Development Guidelines, November 2018
City of Markham Engineering Design Criteria
City of Markham Official Plan, June 2014
City of Markham Secondary Plan Policy
City of Markham Stormwater Management Facility Location Guidelines, November 2017
City of Markham Stormwater Management Guidelines, October 2016
City of Markham Parkland Conveyance By-Law 2025-101
City of Markham Parks Plan - 2022
City of Markham Terms of Reference Parks Planning and Development

Appendix

Each reviewer from the Engineering, Planning & Urban Design and Park's Department shall assess the submission for completeness based on the items outlined below (where applicable for each department). Each reviewer shall provide their sign-off that all relevant material has been provided and is deemed acceptable. If only one Department is responsible for the approval of a listed item, the required Department approval is indicated by the key below.

☐ = Approval required for Sign-Off

☐ = Approval not required for Sign-Off, review recommended.

- = Approval not required for Sign-Off.

Pre-Application Consultation Request (PRCN) Submission

	Engineering	Planning & Urban Design	Parks Planning	Environmental Services & Operations
General				
Submission includes all required documentation per the Pre-Application Consultation Reference Guide.	☐	☐	☐	☐
The landowner has identified intent to use a Non-Conventional SWMF.	☐	☐	☐	☐
Proposed NCSWMF is on City's Acceptable Technology List	☐	-	-	-
The conceptual design includes: - Proposed location, - SWM function - Surface grading - Sub-surface elevations - Outlet location.	☐	☐	☐	☐
Proposed SWMF location is in accordance with Acceptance Criteria, Technical Requirements and location requirements (i.e., Stormwater Management Facility Location Guidelines)	☐	☐	☐	-
If in a park block, Parks Planning and Planning & Urban Design has been circulated and has reviewed preliminary site suitability.	☐	☐	☐	-
Engineering Sign-off:				
Planning & Urban Design Department Sign-off:				
Parks Planning Department Sign-off:				
Environmental Services & Operations Sign-off				

Draft Plan of Subdivision (PLAN) / Functional Servicing

	Engineering	Planning & Urban Design	Parks Planning	Environmental Services & Operations
Justification Report				
Social benefits have been identified. These may include, but are not limited to: - Additional recreational space (i.e., Parkland Dedication) - Reduce risks of safety hazards	☐	☐	☐	☒
Environmental benefits have been identified. These may include, but are not limited to: - Reduction in pests/bugs - Reduction in presences of invasive species	☐	☐	☐	☒
Economic benefits have been identified. These may include: - Economic growth - Lifecycle cost efficiencies	☐	☐	☐	☒
Location screening requirements are met.	☐	☐	☐	☒
Conceptual design has been provided, showing that SWM criteria can be met.	☐	☐	☐	☒
Overview of site-specific conditions has been provided.	☐	☐	☐	☒
High-level overview of O&M requirements has been provided, documenting potential park programming impacts.	☐	☐	☐	☐
Functional Servicing Report / Design				
Design is in compliance with CLI-ECA requirements (where applicable)	☐	☒	☒	☐
The Non-Conventional SWMF drains through gravity drainage and does not require a pump.	☐	☒	☒	☒
NCSWMF product type, brand and/or model meets criteria	☐	☒	☐	☒
Stormwater Management (SWM) criteria are satisfied per current City standards.	☐	☒	☒	☒
IF APPLICABLE: Permanent pool design meets criteria, design supports	☐	☒	☐	☐

sediment removal, and does not inhibit park programming				
Pre-treatment measures, if applicable (e.g., OGS, isolator row) upstream, and 80% TSS removal achieved.	☐	☒	☐	☐
No conflict with surface features/utilities/park programming	☐	☒	☐	☐
Facility component locations in compliance with Stormwater Facility Location Guidelines.	☐	☐	☒	☒
If in park block, preliminary encumbrance percentage provided.	☐	☐	☐	-
If in park block, Park Facility Fit Plan has been provided and is in compliance with Parks Planning Requirements.	☐	☐	☐	☒
Design reflects recommendations of Environmental Impact Study (if applicable).	☐	☐	☐	☒
Operation and Maintenance Requirements				
Anticipated O&M requirements of the Non-Conventional SWMF have been identified.	☐	-	☒	☐
Requirements are in accordance with the City's existing O&M requirements per City of Markham SWM Guidelines.	☐	-	☒	☐
Conceptual design of Non-Conventional SWMF allows for easy access for frequent O&M.	☐	-	☒	☐
Engineering Sign-off:				
Planning & Urban Design Department Sign-off:				
Parks Planning Department Sign-off:				
Environmental Services & Operations Sign-off				

Technical Review of Plan of Subdivision (TEC) / Detailed Design Submission

	Engineering	Planning & Urban Design	Parks Planning	Environmental Services & Operations
General Submission				
Detailed SWM Report and sealed design drawings submitted, including	☐	☐	☐	☐
• SWM Report;	☐	☐	☐	☐
• Detailed Engineering drawings;	☐	☐	☐	☐
• Structural Design Assessment; and	☐	☐	☐	☐
• Shop Drawings.	☐	☐	☐	☐
Complete Environmental Services & Operations & Maintenance Manual has been received.	☐	☐	☐	☐
SWM Report & Detailed Design Drawings				
Proposed technology unchanged since draft approval.	☐	☐	☐	☐
Design aligns with SWMF Criteria and EIS recommendations (if applicable)	☐	☐	☐	☐
HGL provided per City Standard	☐	☐	☐	☐
Bypass strategy included for major maintenance.	☐	☐	☐	☐
Geotechnical and Hydrogeological reports confirm feasibility of proposed design.	☐	☐	☐	☐
Facility design accommodates dual drainage and emergency flow routing.	☐	☐	☐	☐
Proposed design complies with SWM Criteria and CLI-ECA requirements.	☐	☐	☐	☐
All quality and quantity controls, including extended detention, are met.	☐	☐	☐	☐
Park grading, access, and programming confirmed not to be impacted.	☐	☐	☐	☐
Park grading and design meet Parks Planning Department criteria.	☐	☐	☐	☐
The applicant has provided a detailed estimate of parkland encumbrance (if applicable), in the form of a percentage of the total park area.	☐	☐	☐	☐
Encumbrance percentage finalized and applied to Parkland Dedication.	☐	☐	☐	☐
Structural Design Assessment				
Structural Design Assessment submitted and reviewed, includes the following components:	☐	☐	☐	☐

Sufficient design redundancy to support loading, in compliance with the CHBDC;	☐	☒	☒	☒
Adequately outlines how impacts of local groundwater conditions are mitigated;	☐	☒	☒	☒
Adequate design of sub-base, bedding and compaction per geotechnical requirements; and	☐	☒	☒	☒
Adequate mitigation for potential impacts of hydraulic energy of storm flows.	☐	☒	☒	☒
Operations & Maintenance Requirements				
Complete Operations & Maintenance (O&M) Manual has been submitted for Non-Conventional SWMF and any pre-treatment technology, which includes:	☐	-	☐	☐
Any required equipment and certifications for O&M.	☐	-	☒	☐
Maintenance frequency and costs on all structures involved in SWM solution, based on development's sediment loading rate.	☐	-	☐	☐
Consideration and planning for high disruption maintenance activities.	☐	-	☐	☐
Consideration and planning for frequent inspection and maintenance.	☐	-	☐	☐
An annual maintenance cost based on detailed breakdown of inspection/maintenance and associated time and costs.	☐	-	☐	☐
Costing and sediment disposal in line with regulations.	☐	-	☒	☐
If applicable, O&M manual meets requirements outlined in CLI-ECA.	☐	-	☐	☐
Engineering Sign-off:				
Planning & Urban Design Department Sign-off:				
Parks Planning Department Sign-off:				
Environmental Services & Operations				

City of Acceptance for Maintenance

	Engineering	Planning & Urban Design	Parks Planning	Environmental Services & Operations
Acceptance for Maintenance				
Record drawings sealed by the Qualified Engineer of Record documenting as-constructed conditions.	☐	☒	☒	☒
Evidence of a clean facility, including cleanout records and sediment disposal documentation, where applicable.	☐	☒	☒	☐
Proof of operational performance, including flow monitoring results and rating curve development, in accordance with the accepted monitoring plan.	☐	☒	☒	☐
Maintenance records confirming activities completed in accordance with the approved O&M Manual and applicable CLI ECA requirements.	☐	☒	☒	☐
Structural inspection report confirming all components are in good condition and consistent with the approved Structural Design Assessment.	☐	☒	☒	☐
Documentation confirming compliance with applicable CLI-ECA requirements.	☐	☒	☒	☐
Monitoring program records demonstrating implementation of the accepted monitoring plan.	☐	☒	☒	☐
Confirmation of acceptance of Landscaping Plan from the Urban Design Department.	☐	☐	☒	☐
Confirmation of park design acceptance from Parks Planning, Design and Construction.	☐	☒	☐	☒
Any additional information requested by the City.	☐	☐	☐	☐
Engineering Sign-off:				
Planning & Urban Design Department Sign-off:				
Parks Planning Department Sign-off:				

City Assumption

	Engineering	Planning & Urban Design	Parks Planning	Environmental Services & Operations
Assumption Requirements				
Sealed record drawings of the Non-Conventional SWMF documenting the as-constructed condition have been provided, in accordance with PEO Guidelines on Preparing As-builts and Record Documents.	☐	☒	☒	☒
Records of inspection and maintenance have been provided.	☐	☒	☒	☐
Records in in compliance with practices outlined in approved O&M Manual.	☐	☒	☒	☐
Infrastructure confirmed clean and functional.	☐	☒	☒	☐
Records for monitoring program as agreed upon by the City have been provided.	☐	☒	☐	☐
Monitoring program records (per CLI-ECA if applicable) indicate infrastructure is functioning as designed.	☐	☒	☐	☐
Park features installed; additional costs tracked.	☐	☒	☐	☒
Engineering Sign-off:				
Planning & Urban Design Department Sign-off:				
Parks Planning Department Sign-off:				

Required Submission Material Summary

The following document package must be submitted for review as part of the overall application package. In accordance with the NCSWMF Acceptance Criteria, some documents may be subject to third-party review where applicable. This review may proceed in parallel with the ePlan submission.

1. Stormwater Management Report
2. Detailed Design Engineering Drawings
3. Applicable Shop Drawings
4. Applicable Background Reports including but not limited to:
 - a. Geotechnical Investigations
 - b. Hydrogeological Investigations
 - c. Soil Investigation Report

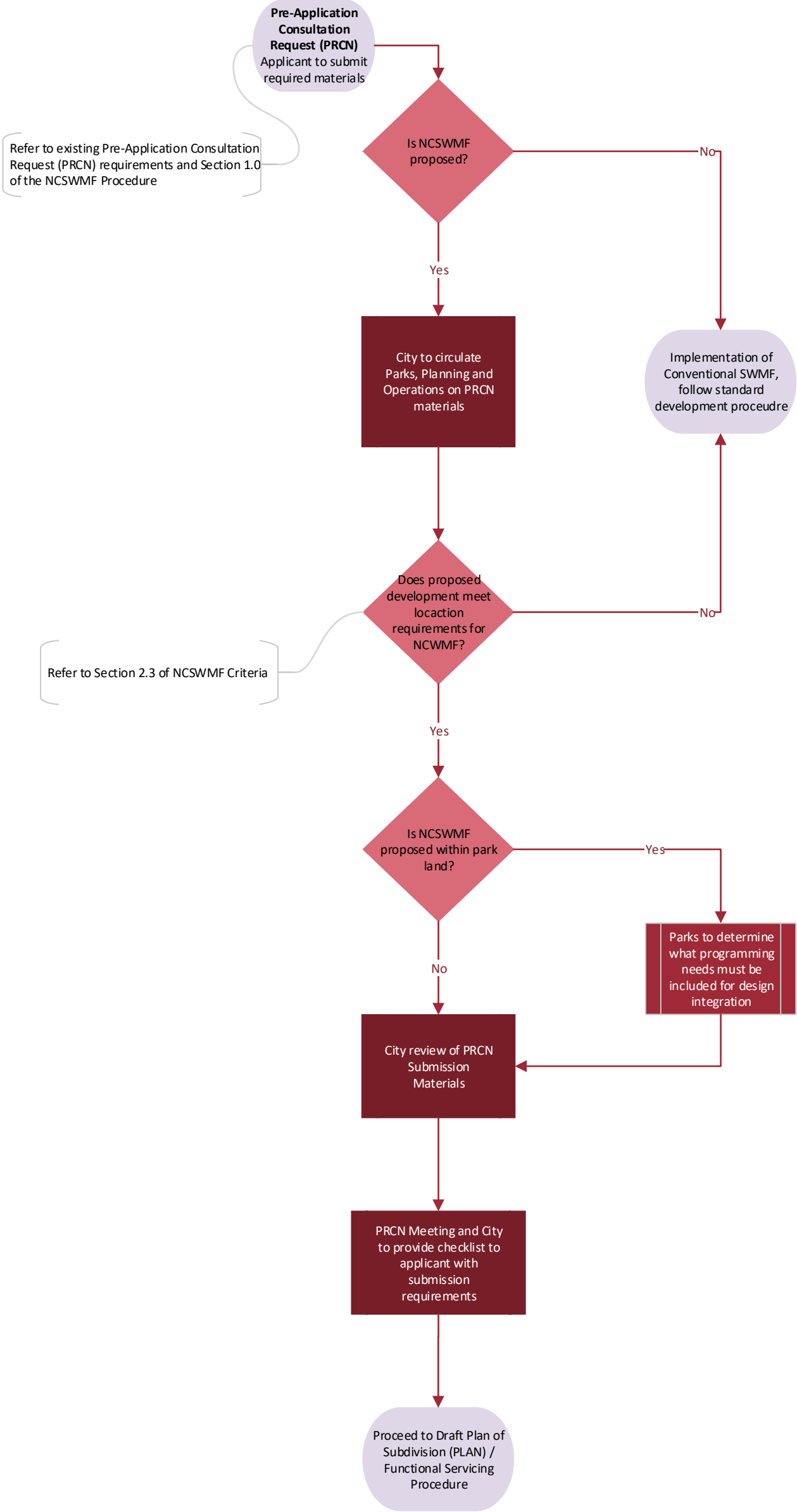
- d. Dewatering Assessment Report
- 5. Structural Design Assessment that demonstrates that:
 - a. The NCSWMF has been designed with sufficient design redundancy to support the applicable loading, in compliance with CHBDC;
 - b. The NCSWMF design adequately demonstrates impacts of local groundwater conditions are mitigated, including evaluation of hydrostatic pressure and buoyancy where applicable;
 - c. The NCSWMF design meets geotechnical requirements (sub-base, bedding material, compaction etc.); and
 - d. The NCSWMF design has been assessed for potential hydraulic energy effects, and mitigation measures have been recommended (if required).
- 6. Applicable Manufacturer Documents for Proposed Facility including but not limited to:
 - a. Production/Fabrication Documentation
 - b. Product Installation Documentation
 - c. Product Inspection Documentation

Peer Review Scope

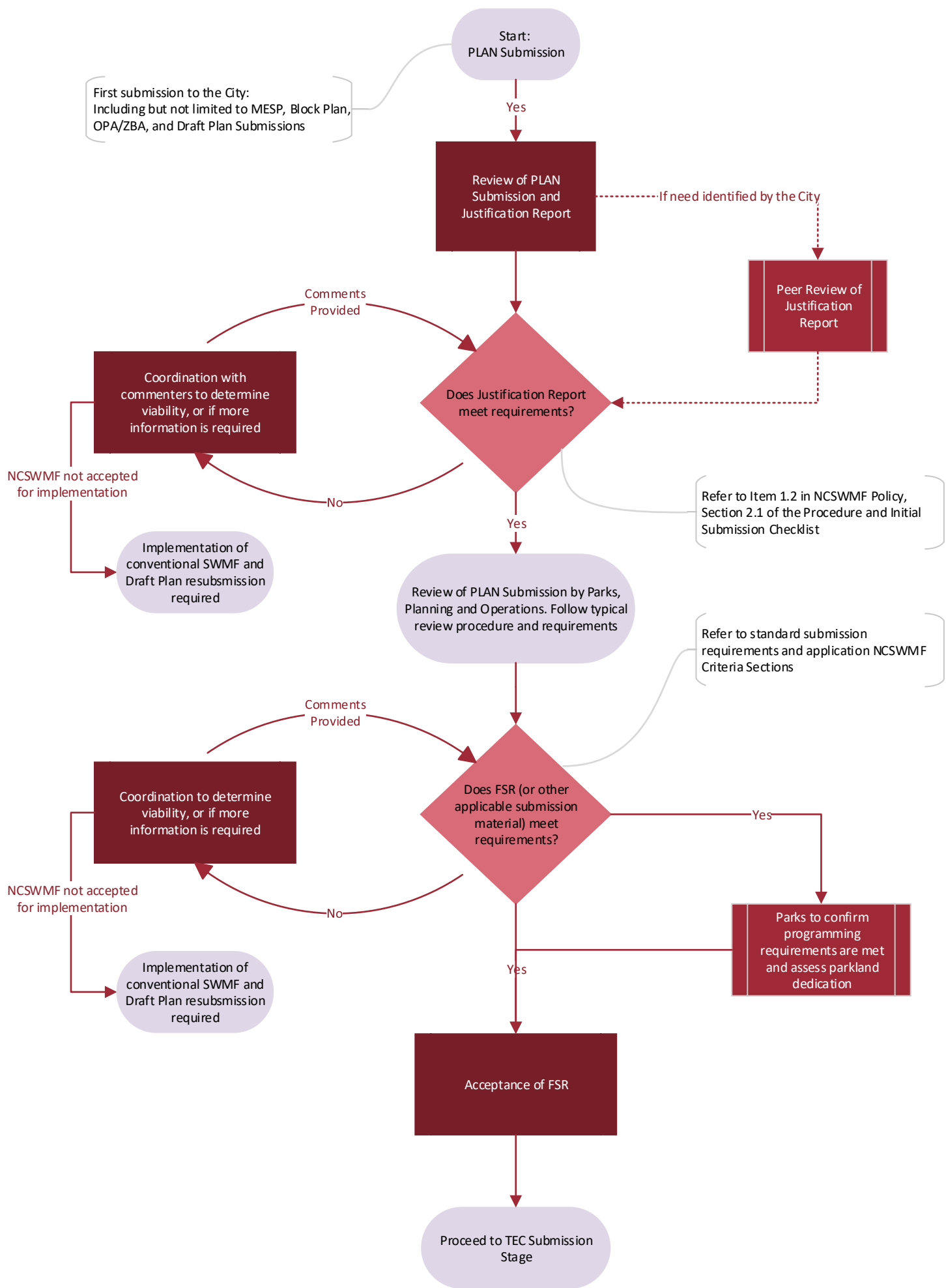
The scope of the peer review may include but is not limited to:

- 1. Structural design and design redundancy, and compliance with the Canadian Highway Bridge Design Code
- 2. Impact of Local Groundwater Conditions including any potential settlement
- 3. Hydraulic Energy of Storm Flows including analysis of the resultant forces applied to the SWM tank due to the varying stormwater flows
- 4. Geotechnical and Hydrogeological Assessment
- 5. Production and Fabrication Review
- 6. SWM Tank Delivery Procedure Review
- 7. Installation Inspection Procedure Review

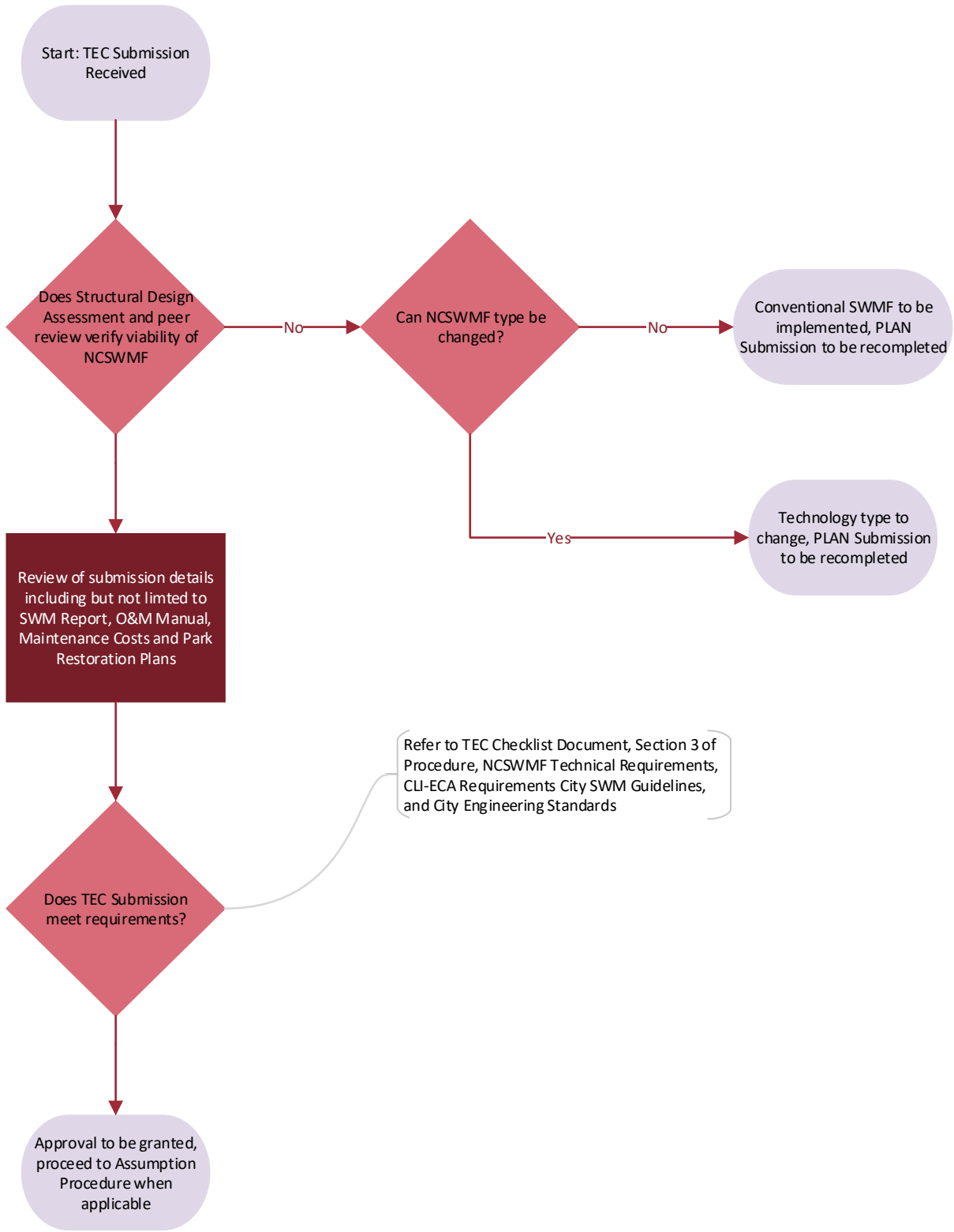
City of Markham
Review and Acceptance Procedure for Municipal NCSWMFs Flow Chart
Step 1: Pre-Applicaion Consultation Request (PRCN) Submission



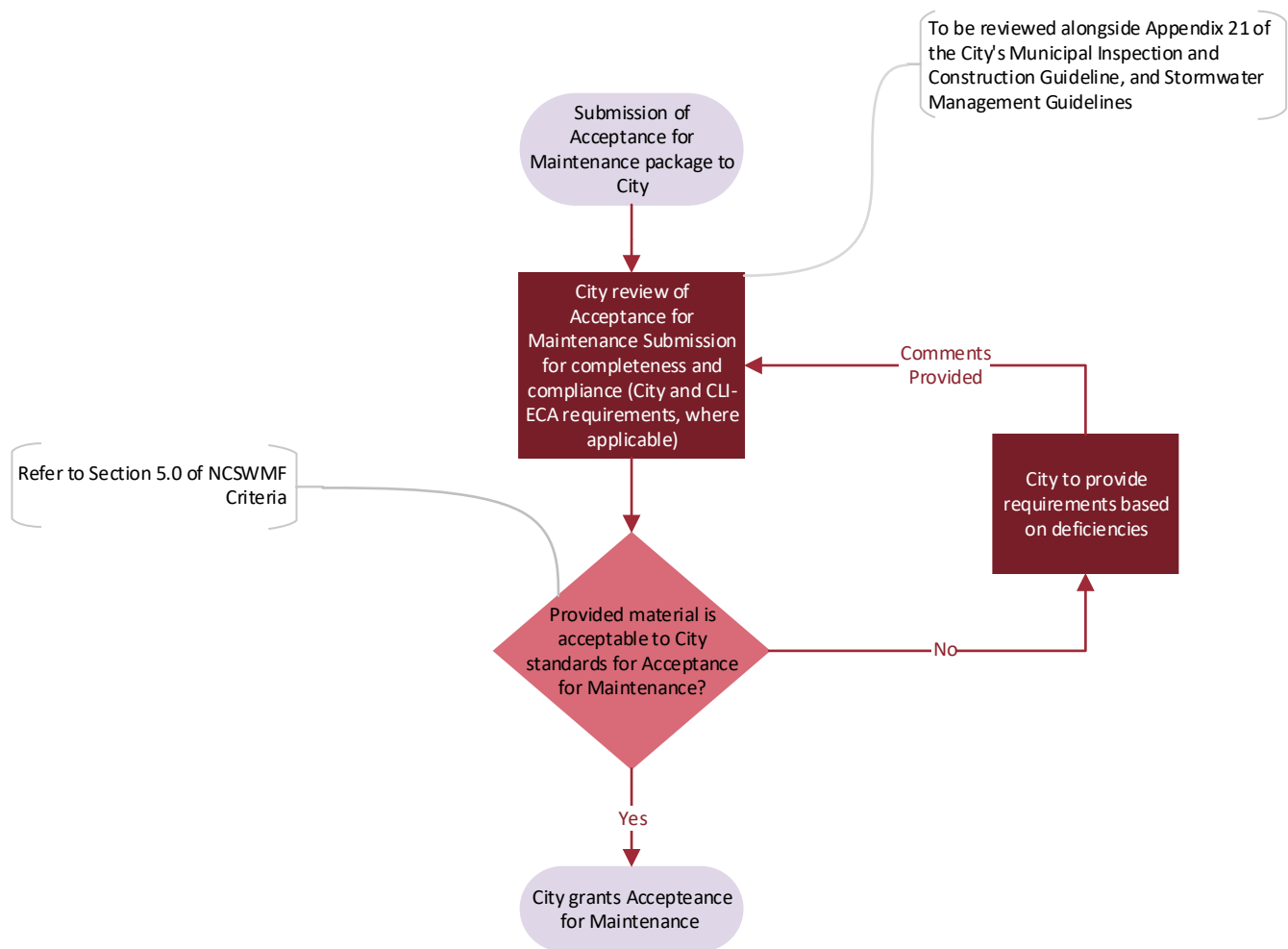
City of Markham
Review and Acceptance Procedure for Municipal NCSWMFs Flow Chart
Step 2: Draft Plan of Subdivision (PLAN) / Functional Servicing



City of Markham
Review and Acceptance Procedure for Municipal NCSWMFs Flow Chart
Step 3: Technical Review of Plan of Subdivision (TEC) / Detailed Design
Submission



City of Markham
Review and Acceptance Procedure for Municipal NCSWMFs Flow Chart
Step 4: City Acceptance for Maintenance



City of Markham
Review and Acceptance Procedure for Municipal NCSWMFs Flow Chart
Step 5: City Assumption

