

Committee of the Whole (Working Session) Report

DATE: Wednesday, June 8, 2022

WARD(S): ALL

TITLE: CITY APPROACH ON NON-CONVENTIONAL STORMWATER
MANAGEMENT INFRASTRUCTURE

FROM:

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ACTION: DECISION

Purpose

This Report updates Council on the status of the City's current interim approach to approving and accepting proposed non-conventional stormwater management infrastructure for greenfield and infill/intensification developments in the City of Vaughan. In addition, staff are seeking Council approval to proceed with the development of a formal City policy and procedure for proposed non-conventional stormwater management infrastructure. This will require the procurement of an external consultant to develop a policy and procedure as extensive consultation with internal and external stakeholders, and technical expertise of non-conventional storm water technologies will be required to assess all aspects of non-conventional stormwater infrastructure in the development planning approval process.

Report Highlights

- Status of the City's current interim approach for reviewing and accepting non-conventional stormwater infrastructure and the associated financial contribution required to offset operation, maintenance, and replacement costs of the new infrastructure.
- The City retained a stormwater engineering consultant to undertake a peer review of a Dual-Use Stormwater Management Facilities Policy Paper and provide responses to City staff inquiries on non-conventional stormwater management infrastructure.
- Recommendation for the development of a formal City policy and procedure on proposed non-conventional stormwater management infrastructure.

Recommendations

1. THAT the City's current interim approach of reviewing and accepting proposed non-conventional stormwater infrastructure continue to be accepted until such time that a formal City policy and procedure is developed by the City; and
2. THAT Council direct staff to retain a consultant to develop a formal City policy and procedure for reviewing and accepting non-conventional stormwater infrastructure and that funding in the estimated amount of \$250,000 be provided from the City-Wide Engineering DC reserve for the 2023 budget year.

Background

Stormwater management techniques are necessary to mitigate the effects of urbanization on the hydrologic cycle and have been incorporated as part of the installation of municipal services for new development sites in the City since the early 1980s. Stormwater management facilities (SWMFs) are designed to help maintain the existing hydrologic cycle while protecting water quality and preventing increased erosion and flooding.

Currently, the City owns approximately 150 conventional stormwater management facilities (SWMFs), which encompass both wet and dry stormwater management ponds. With the increased demand for housing and development within the City, additional SWMFs will be required to be constructed over the next years. More recently, SWMFs have been integrated as focal naturalized features in new communities.

As a result of increasing land costs, developers are looking at alternative options to best utilize their developable land. The City has recently approved non-conventional stormwater infrastructure such as underground storage tanks (UGSTs) and superpipes to provide inline storage which provide similar functionality as SWMFs for a limited number of sites. However, based on the City's and other municipalities' experience, UGSTs are costly to install, operate, maintain, and replace and require specialized inspection requirements such as confined space entry. As such, for previously approved non-conventional stormwater infrastructure, the City has been collecting a one-time cost contribution from the developer, calculated on a case-by-case basis through an evaluation of the stormwater characteristics and design requirements specific to a site.

Recent pilot projects and studies completed in Ontario by the Toronto Region Conservation Authority (TRCA) are supportive of UGSTs to provide stormwater management controls, especially where temperature mitigation is a concern.

Although, UGSTs have been used for many years on private properties to provide stormwater management controls, they remain a new and evolving concept for municipalities, as the operation and maintenance activities can be complicated, costly and inherently carry a higher replacement cost. Due to this evolving shift from conventional SWMFs to publicly owned non-conventional stormwater infrastructure such

as UGSTs, municipalities are trying to ensure the financial cost differential from the commonly installed conventional stormwater infrastructure is secured.

A scan of neighbouring municipalities in the region indicate that most have limited experience with the implementation of non-conventional stormwater infrastructure and are managing them on a case-by-case basis. None of the municipalities within the Greater Toronto Area (GTA) have created a formal approved document or policy that outlines the design criteria and financial contributions for proposed non-conventional stormwater infrastructure on public lands. The only municipality where City staff have identified a document addressing non-conventional stormwater infrastructure is the City of Markham who has implemented an Alternative Infrastructure Policy (not Council approved) to collect contributions for the cost differential should non-conventional stormwater management infrastructure be proposed by the developer. City of Vaughan staff are recommending that a similar approach be adopted on an interim basis to overcome evolving stormwater best management practices.

Previous Reports/Authority

N/A

Analysis and Options

Current interim non-conventional stormwater infrastructure approval process

City staff are currently managing new development proposals for non-conventional stormwater infrastructure on a case-by-case basis. The City has adopted an approach that is similar to the policy framework implemented by the City of Markham that requires a cost differential be calculated and paid by the developer from the conventional SWMFs to non-conventional SWMFs over a 50 year timeframe.

Specifically, staff are recommending the implementation of the following interim policy and procedure for the evaluation of proposed non-conventional stormwater infrastructure:

- The proposed development should provide reasons for the non-compliance of the City approved OP policies for the proposed stormwater infrastructure.
- A recommendation report shall be prepared by a qualified storm water engineer identifying and documenting the benefits of the proposed non-conventional stormwater infrastructure. The report should address items such as the protection of the environment, the social and economic benefits, technical design factors, operation & maintenance requirements, cost implications and replacement costs, etc. This report shall be submitted to the City for review and approval prior to a development application proceeding to a technical report to the Committee of the Whole. Should City staff disagree with the rationale or not have the technical

expertise on the proposed non-conventional stormwater infrastructure, the City shall retain a peer review consultant to provide their professional opinion, with costs of the peer review paid for by the developer.

- For greenfield development situations, consideration of non-conventional stormwater infrastructure will not be supported unless a compelling argument outlining the overwhelming benefits to the City and to the environment can be demonstrated and, if required, the City's peer reviewer agrees with it.
- For specific growth areas and intensification/infill developments, consideration of non-conventional stormwater infrastructure may be considered based on factors such as a development proposal's land constraints and the proposed density.
- Prior to final approval of the plan, the owner shall provide a one-time cost contribution in present value for non-conventional stormwater management infrastructure to compensate for any increase in costs when compared to conventional stormwater management infrastructure, based on operation, maintenance, rehabilitation, and replacement costs over a 50 year lifecycle.
- Non-conventional stormwater infrastructure proposed under the road right of ways should be avoided due to the potential of future encumbrances to City roads, particularly when rehabilitation is required.
- For park development on top of non-conventional stormwater infrastructure, due consideration and review should address:
 - Park programming flexibility and design restrictions;
 - Technical details such as but not limited to soil depths, structure footings, tree canopy requirements;
 - Disruption due to routine operation and maintenance;
 - Long term life cycle costs on park replacement due to structure renovations;
 - Additional capital costs due to structural constraints; and
 - The requirements for the developer to build the park to ensure warranties are not voided with the introduction of future 3rd party contractors.
- Provision of parkland credits for dual-use parks/underground storm water management facilities is being considered through the Parkland Dedication By-law update currently underway for enactment by September 18, 2022.

The above noted interim approach can be effective in ensuring stormwater management is achieved and for securing appropriate cost differential contributions, but it ignores important social, economic, environmental factors and overall integration within future communities. For example, the cost of major repairs and replacement of non-conventional stormwater infrastructure is not well known due to the relative infancy of this non-conventional stormwater infrastructure which may pose a potential financial risk for municipalities.

There is a need of updating City Official Plan Policies to account for non-conventional stormwater infrastructure and to fully assess the community benefits and drawbacks of

the proposed infrastructure for future residents and the City. As such, the development of a formal City policy and procedure for non-conventional stormwater infrastructure is recommended which provides assessment for social, economic, technical and environmental components and ensures all development planning matters are considered in the approval process.

Industry review on Dual-Use stormwater management facilities (Dual-use SWMFs)

The City received an unsolicited submission on Dual-use SWMFs policy paper dated December 2021, prepared by Malone Given Parsons (MGP) on January 17, 2022 (the “policy paper”) included as Attachment No.1. This policy paper focused on the implementation of dual-use SWMFs by providing underground stormwater management storage under the City’s future parks to achieve land use efficiency to facilitate more development areas. The MGP policy paper cited recent examples of dual-use SWMFs in Vaughan and other neighbouring municipalities, such as City of Toronto, Town of Caledon, City of Markham, etc.

To assist in the review of the policy paper, the City retained the engineering consulting services of WSP Canada (WSP) to undertake a peer review of the MGP policy paper and to produce a peer review memorandum report. In addition, the feedback, comments and questions received from City departments were addressed by WSP and incorporated in WSP Engineering Consultant peer review memorandum report, dated May 24, 2022 included as Attachment No.2.

The WSP peer review report, in general, agreed with the findings of the MGP report in that Dual-use SWMFs can be technically and financially feasible as land values continue to increase in the GTA and recommended they can be considered as a valid stormwater management approach for land development applications. In consideration of Dual-use SWMFs, WSP recommended certain technical design requirements (e.g., closed bottom UGST and no permanent pool) that should be considered to ensure proper functioning and effectiveness of the stormwater management facility. As such, the City’s interim approach when considering a proposed non-conventional stormwater infrastructure design will include ensuring conformance to the recommended WSP technical design requirements.

WSP generally foresees advantages in adopting Dual-use SWMFs over conventional SWMFs. However, additional research will be required to address the uncertainties in adapting to Dual-use SWMFs, including major capital works repair costs during the life span of the infrastructure. The capital cost to install a Dual-use SWMFs are significantly higher when compared with conventional SWMFs. Although WSP has estimated that the lifecycle cost between a conventional SWMF and an UGST appear to be more or less equivalent, they do not take into consideration the eventual replacement cost of the UGST which would result in a higher overall lifecycle cost to the City when compared to conventional SWMFs. WSP has noted that given the relative infancy and limited number of examples of UGSTs implemented in municipalities at the moment, the overall lifecycle comparative costs between SWMFs and UGSTs are still yet to be accurately determined

and can be considered highly variable depending on a number of factors including but not limited to the location, the size of the drainage area, major repairs, replacement costs, regulatory impacts, etc. WSP recommends a full detailed analysis of life cycle costs between traditional SWMFs and UGSTs be included in future policy development.

Development of a formal policy and procedure for non-conventional stormwater infrastructure

A formal City policy and procedure to assess future proposals for a non-conventional stormwater infrastructure is necessary to mitigate financial and operational risk to the City. The policy and procedure should consider social, environmental, economic, and technical design factors in addition to cost differential contributions to ensure all development planning matters are considered in the approval process.

A stakeholder consultation plan will be critical to complete this undertaking in order to capture input from all parties that would be impacted by non-conventional stormwater infrastructure. It should be comprised of internal City departments such as Development Engineering, Environmental Services, Development Planning, Parks Infrastructure Planning and Development, Parks, Forestry, and Horticulture Operations, Infrastructure Planning and Corporate Asset Management, etc. and external stakeholders, such as the Toronto & Region Conservation Authority (TRCA), The Building Industry and Land Development Association (BILD), Ministry of the Environment, Conservation and Parks (MECP), Engineering Consultants, etc.

Given that non-conventional stormwater infrastructure is still relatively new from a public sector implementation perspective; the need for technical expertise in developing design criteria standards for non-conventional stormwater infrastructure; the complexities of coordinating a high number of varying stakeholders; and the need to evaluate a number of socio-economic factors, it is recommended that the City retain an external consulting engineering firm with the appropriate expertise in stormwater engineering, municipal development, stakeholder engagement, and policy development. Internal City departments will consult with the external consulting firm to develop the policy which is expected to take approximately 18 months to complete.

Financial Impact

The proposed development of a policy and procedure for non-conventional stormwater management infrastructure was not foreseen in the last DC update and therefore, no budget was allocated for it. It is anticipated that the financial impact for the development of a formal City policy and procedure for reviewing and accepting non-conventional stormwater infrastructure would be estimated at approximately \$250,000. The funding for this work is expected to be provided through the City-Wide Engineering DC reserve for the 2023 budget year.

Broader Regional Impacts/Considerations

N/A

Conclusion

The land use optimization and the evolving changes in stormwater best management practices has resulted in staff recommending an interim approach for the design and cost recovery of non-conventional stormwater management infrastructure.

Staff further recommend that a formal City policy and procedure be developed for non-conventional stormwater infrastructure and that the City retain a consulting engineering firm to assist in completing the policy and procedure, with an anticipated timeline of completion of 18 months. The funding for this work is suggested to come from the City-Wide Engineering DC reserve for the 2023 budget year.

For more information, please contact Frank Suppa, Director, Development Engineering, Ext.8255.

Attachments

1. Dual-use SWMFs policy paper dated December 2021, prepared by Malone Given Parsons (MGP) on January 17, 2022.
2. WSP Engineering Consultant peer review memorandum report, dated May 24, 2022.

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