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COMMUNICATION
COUNCIL – June 28, 2022
CW (WS) - Report No. 29, Item 1

DATE: June 28, 2022

TO: Mayor and Members of Council

FROM: Vince Musacchio, Deputy City Manager, Infrastructure Development
Zoran Postic, Deputy City Manager, Public Works

RE: **COMMUNICATION - COUNCIL - June 28, 2022**

**CITY APPROACH TO UNDERGROUND STORMWATER
MANAGEMENT SYSTEMS**

Report #29, Item #1

Purpose

The purpose of this Communication is to provide further information as it relates to the City's current interim approach to approving and accepting proposed underground stormwater management systems in response to the resolution that was brought forward by Members of Council during Committee of the Whole Working Session on June 8, 2022. This Communication will provide additional information related to the life cycle costs (operation, maintenance, rehabilitation, and replacement costs) associated with both existing and future stormwater infrastructure.

Background

Stormwater management strategies have been incorporated as part of the installation of municipal services within new development sites across the City since the early 1980s which has resulted in the assumption of nearly 150 stormwater management ponds.

Stormwater management ponds were constructed as an effective means of providing water quality improvements and flood mitigation measures in watersheds across the City. As a result of increasing land costs, the development community is looking at alternative options to best utilize their developable land.

The City has approved underground stormwater management systems in the past in response to site-specific constraints.

Oversized pipes and box culverts were installed in the past, typically in areas where the installation of a stormwater management pond would not have been feasible such as in infill/intensification developments or in response to site specific constraints. Box culverts were constructed under Thornhill Green Park in 2010 and assumed by the City in 2014.

Although underground stormwater management systems were novel to the City of Vaughan at the time, \$218,370 was accepted as cash in lieu of stormwater quality controls for 7.53 hectares of drainage area. In accordance with the City's approved Asset Management Plan for core assets, staff are in the process of inventorying all oversized pipes and box culvert systems to evaluate the condition of this infrastructure and ensure suitable maintenance programming is undertaken.

More recently, staff have observed a noticeable increase in development applications proposing underground stormwater management systems in both greenfield and infill/intensification developments since 2020. This has resulted in the recent approval of 13 underground stormwater storage systems (mainly oversized pipes and typically not in lieu of stormwater management ponds), all of which are unassumed at the time of this Communication.

Given the increased number of development applications proposing underground stormwater management tank systems, staff, the development community, consultants, and neighbouring municipalities have been collaborating on how to standardize the development review process and mitigate potential risks.

The development community submitted a Dual Use Stormwater Facilities Management Policy Paper for the City to review in January 2022. The policy paper was peer reviewed by an external consultant in consultation with several other City stakeholder departments which resulted in the recommendations that were brought forward to Committee of the Whole Working Session on June 8, 2022. Recent developments also show that neighboring GTA municipalities have done similar work and the City's recommendations appear to align with other industry stakeholders which results in a consistent approach to managing stormwater.

A scan of neighbouring municipalities in the region indicates that most are managing them on a case-by-case basis. None of the municipalities within the Greater Toronto Area (GTA) have created a formal approved policy that outlines the design criteria and financial contributions for proposed underground stormwater management tank systems on public lands. Accordingly, City staff are currently managing new development proposals with underground stormwater management systems on a case-by-case basis. The City has adopted an approach that is similar to the policy framework proposed by staff at the City of Markham that requires the cost differential between conventional stormwater management ponds and underground stormwater management tank systems be calculated and paid by the developer.

Analysis and Options

Recognizing that underground stormwater management tank systems are still relatively new from a public sector implementation perspective, there is a need to manage potential risks while also embracing design innovations to ensure the City is prepared to assume underground stormwater management systems from a life cycle perspective.

Moving forward there is a need to secure technical expertise in developing design criteria standards for underground stormwater management tank systems, manage the complexities of coordinating a high number of varying stakeholders, evaluate a number of socio-economic factors, and assess life cycle costs early in the development application

process to ensure responsible and timely city building. It remains important that while the developer benefits from additional developable land and park land dedication, the municipality does not remain burdened with the operation, maintenance, rehabilitation, and replacement costs of these underground stormwater management tank systems in perpetuity.

To ensure fiscal responsibility, staff are proposing that the owner provide a one-time cost contribution for underground stormwater management systems 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 life cycle.

As the City has been operating and maintaining conventional stormwater management infrastructure, including ponds and linear infrastructure, since the 1980s, staff have a history of actual costs to reference. Although, underground stormwater management tank systems have been used for many years on private properties, they remain a new and evolving concept for municipalities. The operation and maintenance activities can be more complicated and costly due to the confined nature of the infrastructure and specialized training requirements and there remains inherently higher replacement costs when compared to conventional stormwater management infrastructure.

Most recently, staff began the cost comparison process associated with a 2,200 cubic metre underground stormwater storage tank that is proposed for a greenfield development which resulted in a \$750,000 letter of credit and a commitment from staff and the owner to refine the cost comparison through continued collaboration.

The proposed underground stormwater storage tank was proposed to replace a conventional stormwater management pond. Although the cost comparison process is ongoing, staff recognized the need to ensure timely development approvals and proceeded with a \$750,000 letter of credit based on the general cost breakdown provided below, subject to further refinement.

Conventional Stormwater Management Infrastructure: Stormwater Management Pond	
Item	Cost per Year
Sediment Clean-Out	\$9,250.00
Operations, Maintenance, and Rehabilitation	\$4,350.00
Replacement	\$4,150.00
Total:	\$17,750.00
Underground Stormwater Management System: Underground Stormwater Storage Tank and Upstream Treatment	
Item	Cost per Year
Sediment Clean-Out	\$8,350.00
Operations, Maintenance, and Rehabilitation	\$3,250.00
Replacement	\$17,950.00
Total:	\$29,550.00
Cost Comparison	
Difference in Cost per Year:	\$11,800.00
Potential Cost per Year Difference for Items Requiring Further Refinement:	\$3,200.00
Total Difference in Cost per Year:	\$15,000.00
50-Year Cost Difference, Subject to Further Refinement:	\$750,000.00

Conclusion

Land use optimization and the evolving trends in stormwater best management practices has resulted in staff recommending an interim approach for the design and cost recovery of underground stormwater storage systems. This approach is recommended to manage potential risks, facilitate fiscal responsibility, and provide a consistent approach to managing stormwater.

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

Respectfully submitted by

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Vince Musacchio, Deputy City Manager, Infrastructure Development

A handwritten signature in blue ink, appearing to read "Z. Postic".

Zoran Postic, Deputy City Manager, Public Works