Public Information Materials

Stormwater Management Improvements in Gallanough Park and Surrounding Area

Municipal Class EA Update
City of Vaughan

Published: August 1, 2020

RESILIENT CONSULTING

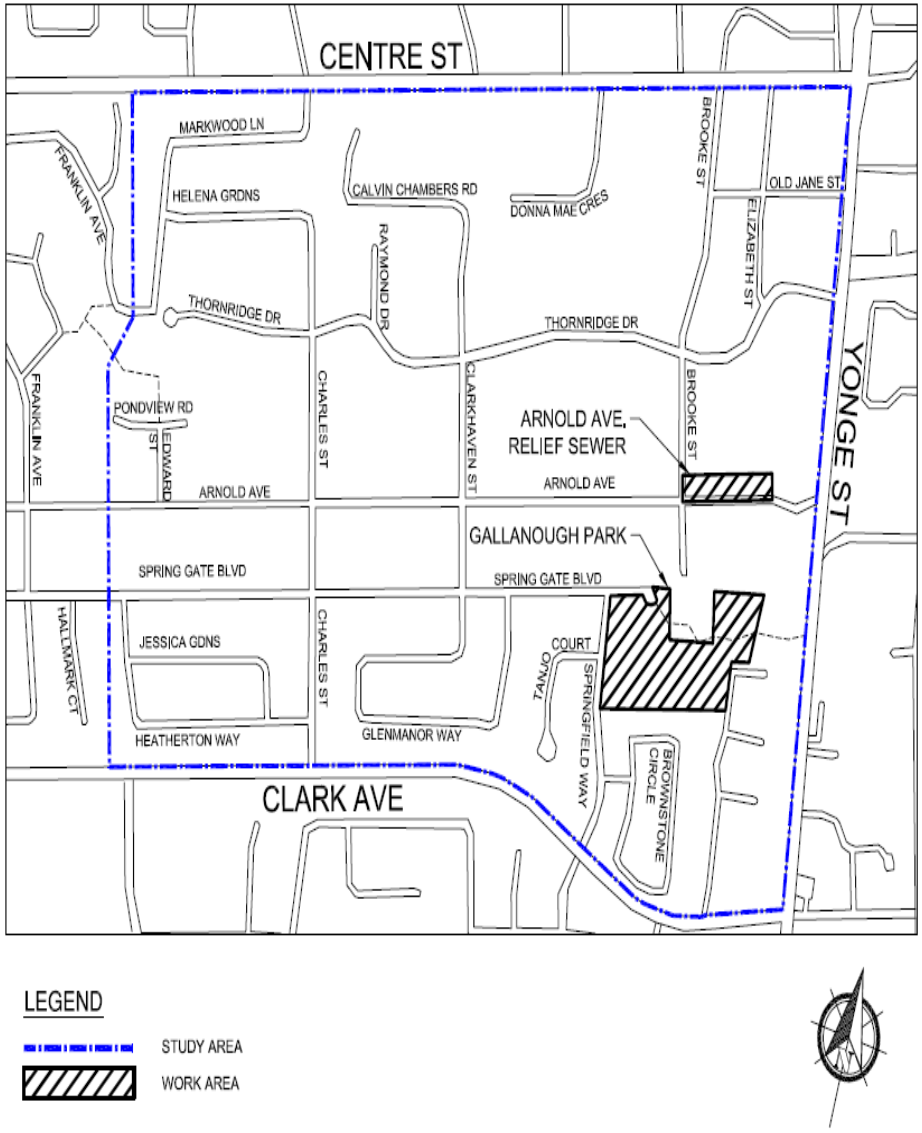
PLANMAC ENGINEERING INC.

Introduction

- Please review the following slides.
- We encourage your input and feedback.
- If you have any comments please complete the comment sheet provided with these slides and send via email to the following address on or before **August 31, 2020: gallanough@resilientconsulting.ca**
- There is an opportunity at any time during the Detailed Design process for interested persons to provide written input.
- Any comments received will be collected under the Environmental Assessment Act and, with the exception of personal information, will become part of the public record.

Background

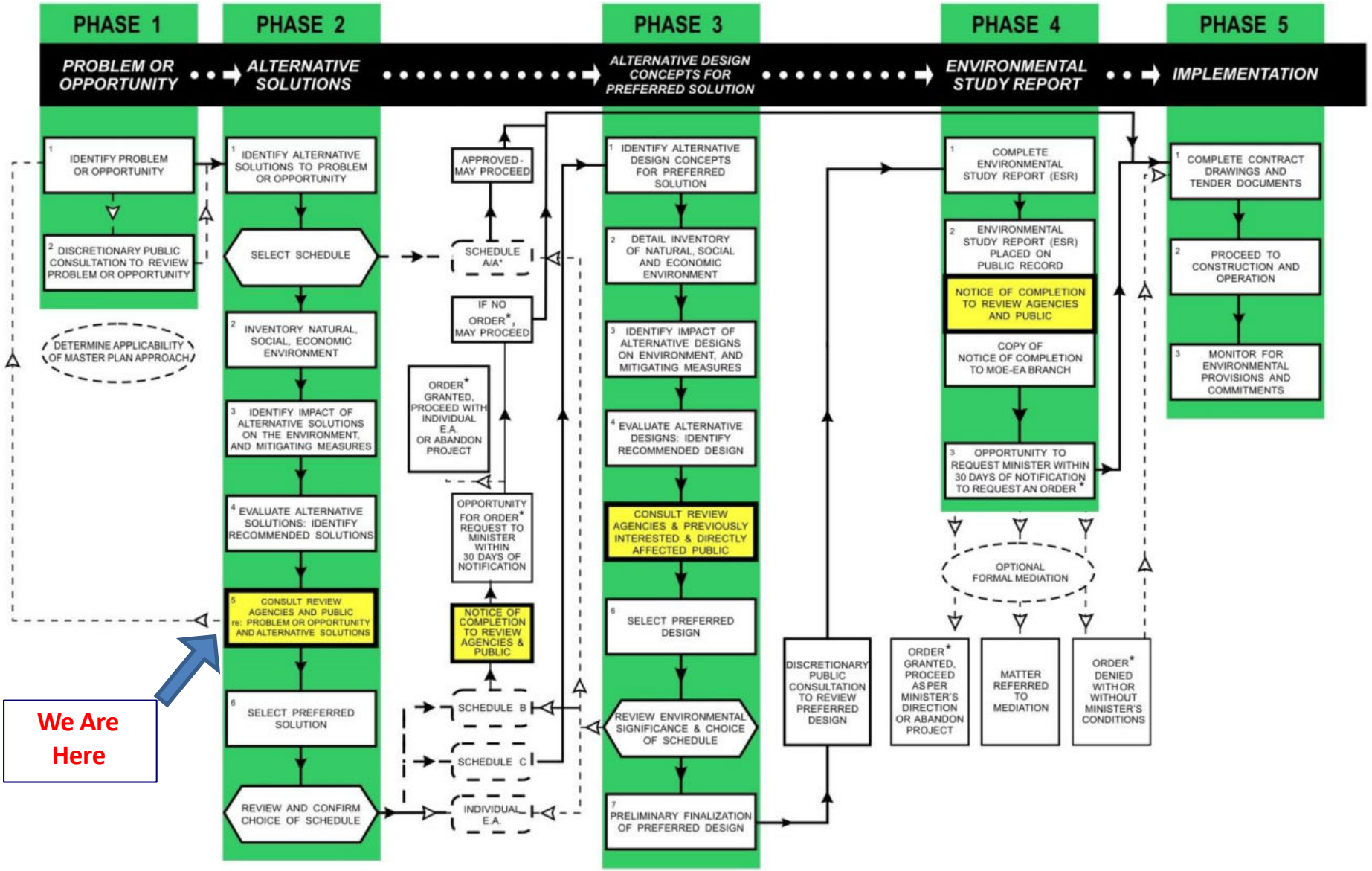
- In 2009, the City of Vaughan initiated a Municipal Class EA to develop plans and strategies to implement a stormwater management facility (SWMF) within Gallanough Park. The EA was completed November 2010 with the recommendation of incorporating a dry pond within Gallanough Park.
- Detailed design for the dry pond was initiated in September 2013. Based on community feedback received prior to the finalization, it was determined that a review of the original hydrologic/hydraulic stormwater modelling would be prudent to validate the current course of action.
- In 2019, the City's Environmental Services division completed further hydrologic/hydraulic stormwater modelling. It was confirmed that the proposed SWMF is still required and that alternative storage options should be considered.
- In April 2020, the City re-initiated the Schedule 'B' Municipal Class EA and retained Resilient Consulting and Planmac Engineering to complete the EA update.



What is a Municipal Class EA Study?

- The Municipal Class EA process is a decision-making and planning process that ensures that potential effects of a project are identified and managed prior to implementation.
- The Class EA process applies to routine public sector projects that have predictable and manageable environmental effects, such as municipal road, water and wastewater projects.
- The process requires the evaluation of possible solutions, design concepts, and recommends the best approach based on an evaluation of environmental effects and how to minimize them.
- The Class EA study is undertaken in accordance with the requirements of the Ontario Environmental Assessment Act, as prescribed by the Municipal Engineers Association Municipal Class Environmental Assessment process, 2000, as amended in 2007, 2011 and 2015)
- This study has been undertaken as a Schedule 'B' project which addresses Phases 1, 2 and 5 of the Class EA process (refer to the next slide).

Stormwater Management Improvements in Gallanough Park and Surrounding Area



Phase 1: Problem/Opportunity Statement

Problem

- The residential properties located north of Gallanough Park that front onto Brooke Street, Thornridge Drive, Clarkhaven Street, and Arnold Avenue have been frequently affected by flooding during heavy storms over the years. The City has investigated the drainage infrastructure in and around the affected area and has determined that flooding is partly caused by the surcharged Trunk Sewer along Brooke Street. Other causes are from deficient/deteriorated culverts and poor drainage practices resulting from residential redevelopment in the Thornhill Neighbourhood area.

Opportunity

- The project presents an opportunity to provide social and environmental benefits. Through stormwater management implementation at Gallanough Park, improvements (reduction) in the risk of flooding can be realized. The reduced risk of flooding will benefit the safety of the public and private properties. The enhancement will include the latest stormwater management technologies that will improve the drainage characteristics and result in reduced flooding downstream, reduced erosion potential in the receiving creeks and reduced pollution input to the environment.

Existing Conditions

Natural Environment

- The site consists of mostly open grassed areas with paved trails and large diameter trees along the perimeter. Gallanough Park has a bowl like appearance and a depressed shape because it was initially designed as a water holding area during development of the area.
- The area along Springfield Way on the west side of the Park is prone to frequent ponding due to the existing topography and previous modifications to the Park features.
- Overall, the drainage area has been modified over the years in a way that impedes drainage. Drainage ditches and swales have been filled by residents to create swimming pools or increase construction area.

Social Environment

- The surrounding area consists mainly of residential properties and has direct access to the Park. A library and a public school are also located adjacent to the Park with direct access.
- Gallanough Park is used by surrounding residents in all seasons, including tobogganing in the winter, picnics, sports and camps in the summer, as well as for walking throughout the year. The Park's additional uses include those by the public library and school. A small soccer field is also present, which is uneven and drains poorly after rainfalls.

Existing Conditions

Existing Infrastructure

- The 3.0 m diameter Brooke Street Trunk sewer begins at the north end of Gallanough Park and discharges to the Don River north of Centre Street.
- A 600 mm diameter concrete encased sanitary sewer is located inside in the trunk sewer conveying flows from sanitary sewers following the same alignment as the storm sewers.
- Chamber #9 is the starting manhole of the trunk sewer, collecting flows from three storm and three sanitary networks:

Incoming	Storm Diameter (mm)	Sanitary Diameter (mm)
West	2100	450
East	1500	300
South	600	200

- North of Gallanough Park, the sewer receives drainage at several low points along Brooke Street.

Background Studies

Previous Hydrologic and Hydraulic Analysis

- **December 2006** – Genivar undertook a Storm Drainage Improvement study in the Thornhill area following the process for a Schedule 'B' EA and concluded that the Brooke Street trunk sewer surcharges during major rainfall events.
- **May 2009** – W.G. Clarke completed hydrologic and hydraulic modelling downstream of Gallanough Park to assess flooding extents in support of the Thornhill Road Reconstruction study.
- **November 2010** – Clarifica, a division of Cole Engineering, completed the previous Gallanough Park EA including updated hydrologic/hydraulic modelling for existing and proposed conditions.
- **March 2014** – Cole Engineering create a comprehensive and discrete hydrologic / hydraulic model for the study area as part of the Vaughan City-Wide Drainage Study, Flood Vulnerable Site Report.
- **June 2016** – Cole's model was imported into PCSWMM as part of the Gallanough Park Stormwater Management Facility Modelling Review conducted by Amec Foster Wheeler.

Phase 2: Alternative Solutions

1. **Do Nothing**: this option involves no changes to the existing infrastructure. It is used as a benchmark comparison for the other options.

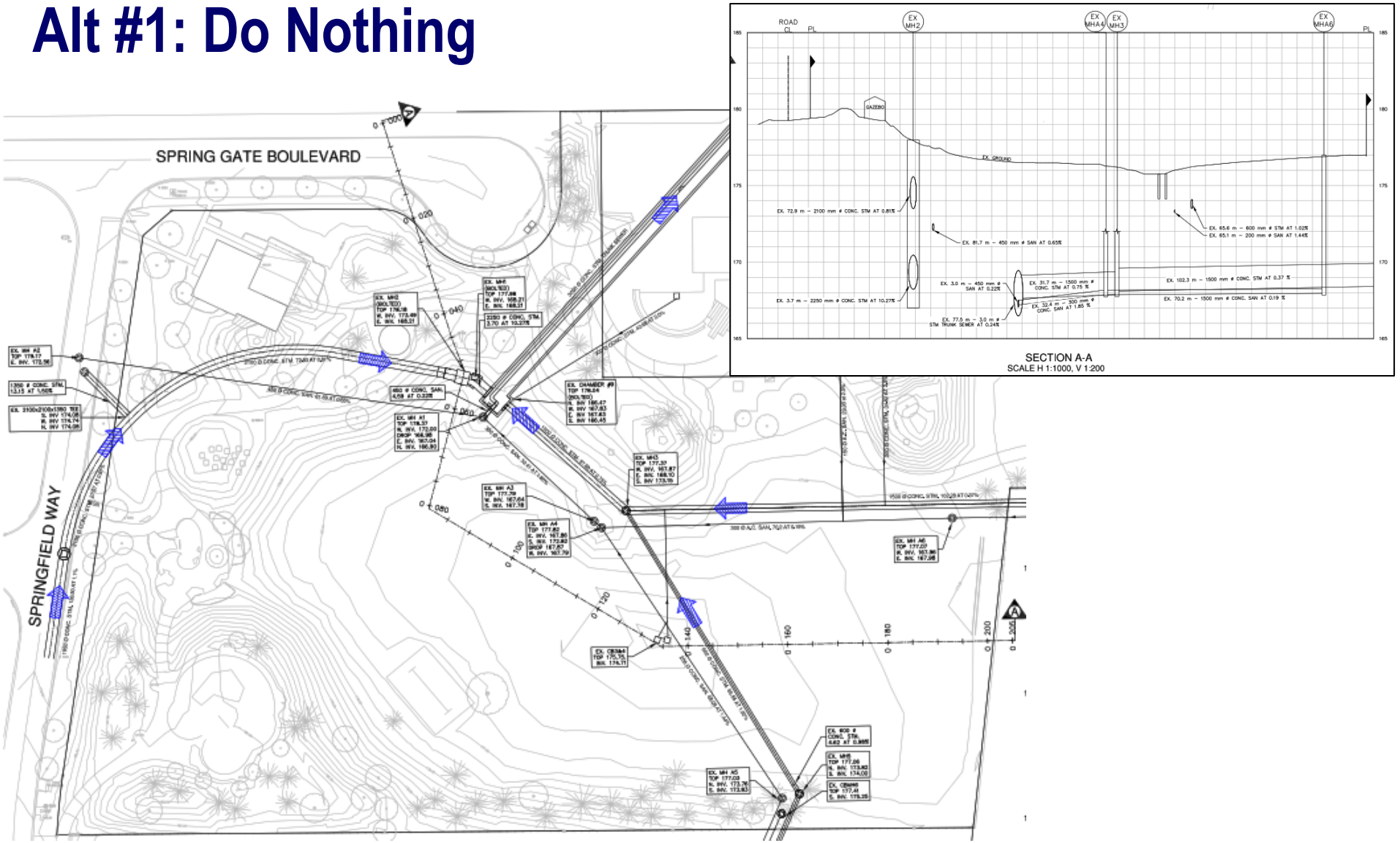
2. **Surface Storage**: this option involves excavations and infrastructure modifications to install inlet/outlet control structures to temporarily detain stormwater within the re-graded low point of the Park.

3. **Underground Storage**: this option involves infrastructure modifications to install inlet/outlet control structures to temporarily detain stormwater within the underground storage facility. Excavations will be required for installation of the tank system, however existing topography will be generally maintained.

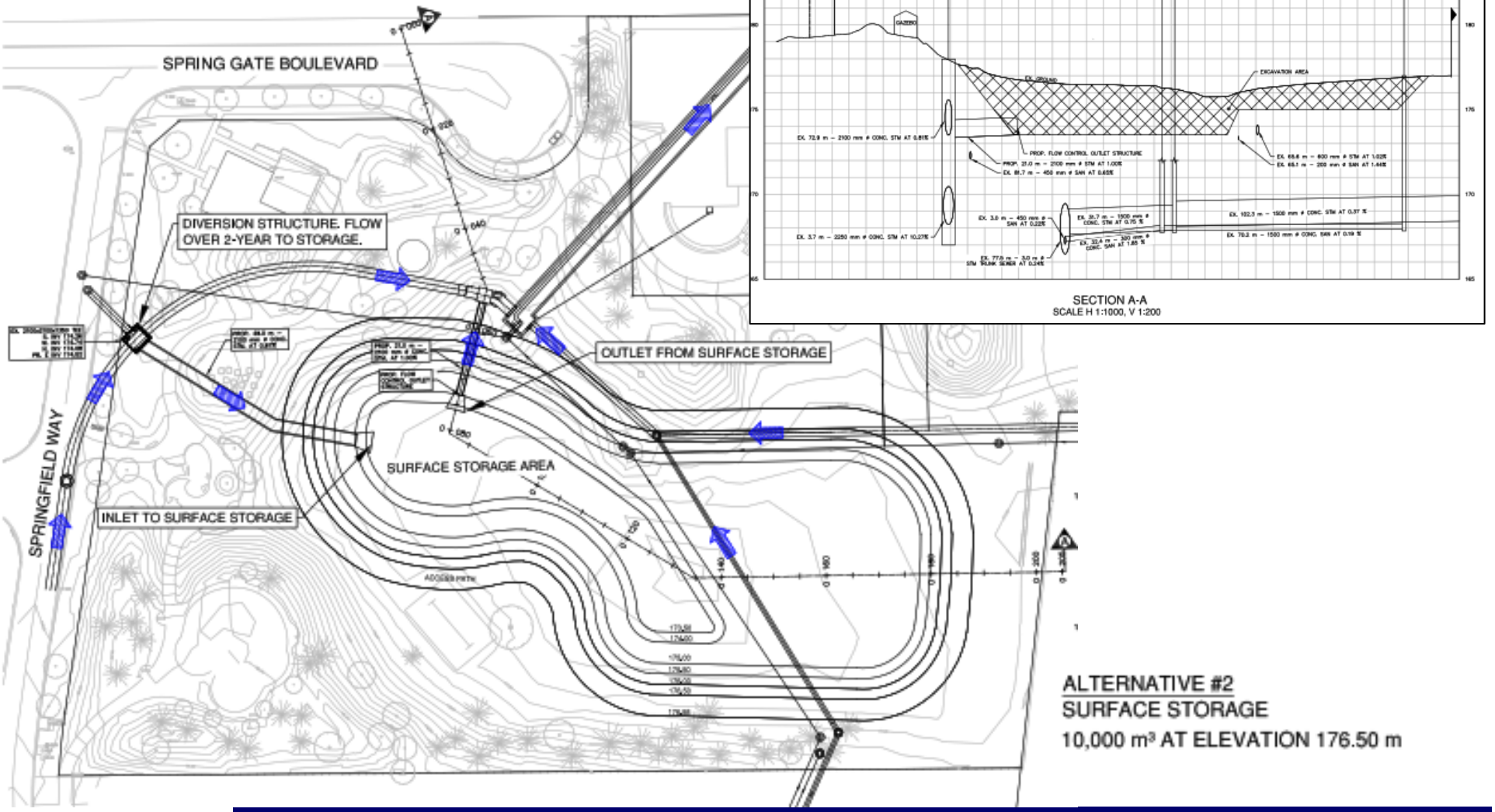
4. **Hybrid Storage**: this options involves both excavations and infrastructure modifications to temporarily detain stormwater underground and at the surface. Inlet/outlet control structures will be installed to detain stormwater underground for events under the 10-year. Surface storage will only be utilized during events larger than the 10-year.

Please refer to the following drawings for illustrations of each alternative.

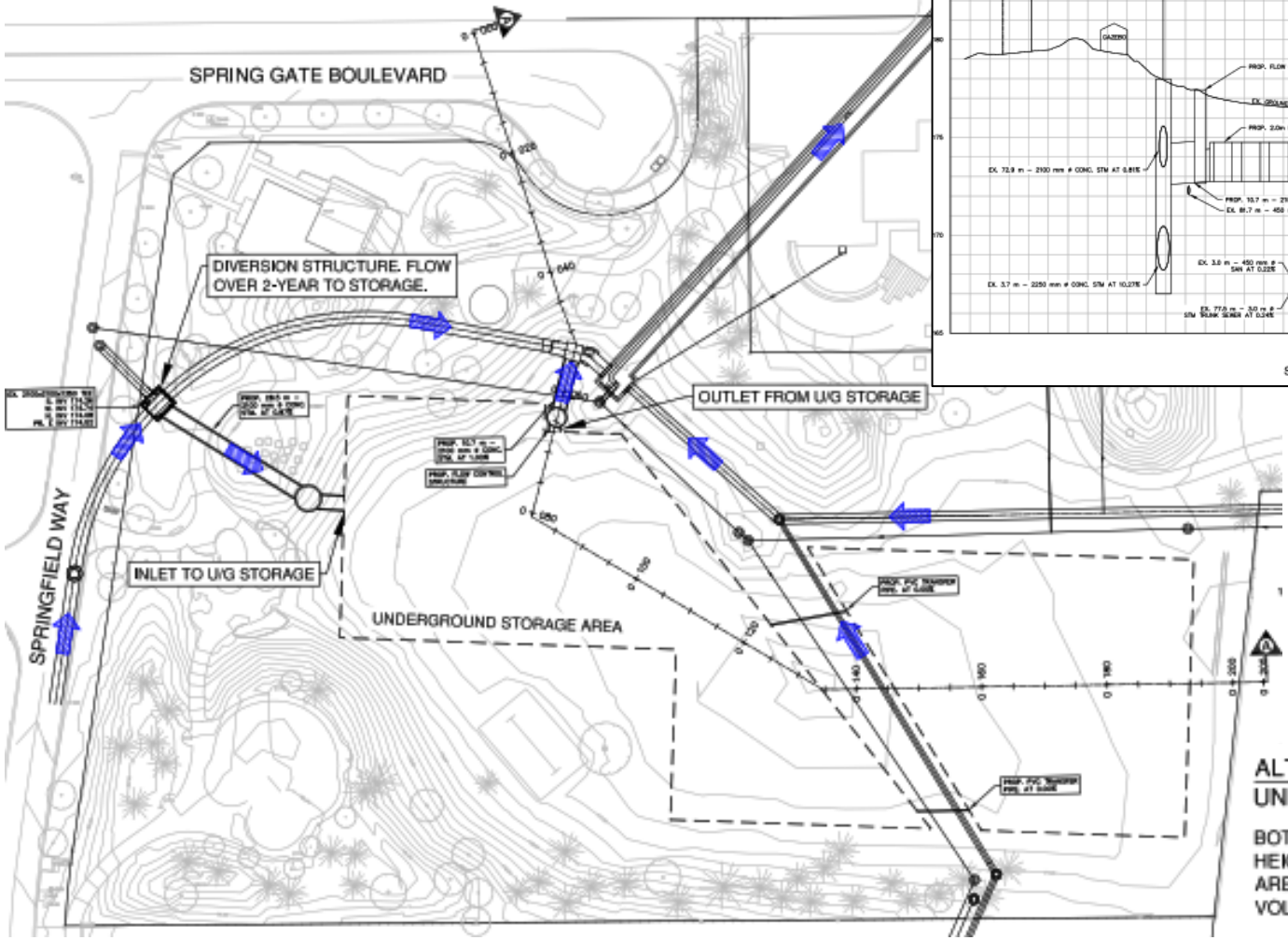
Alt #1: Do Nothing

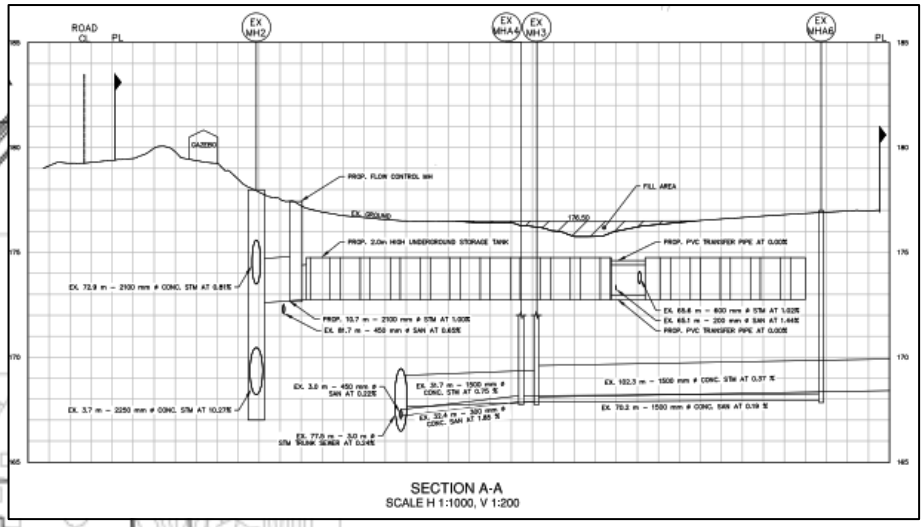


Alt #2: Surface Storage



Alt #3: Underground Storage



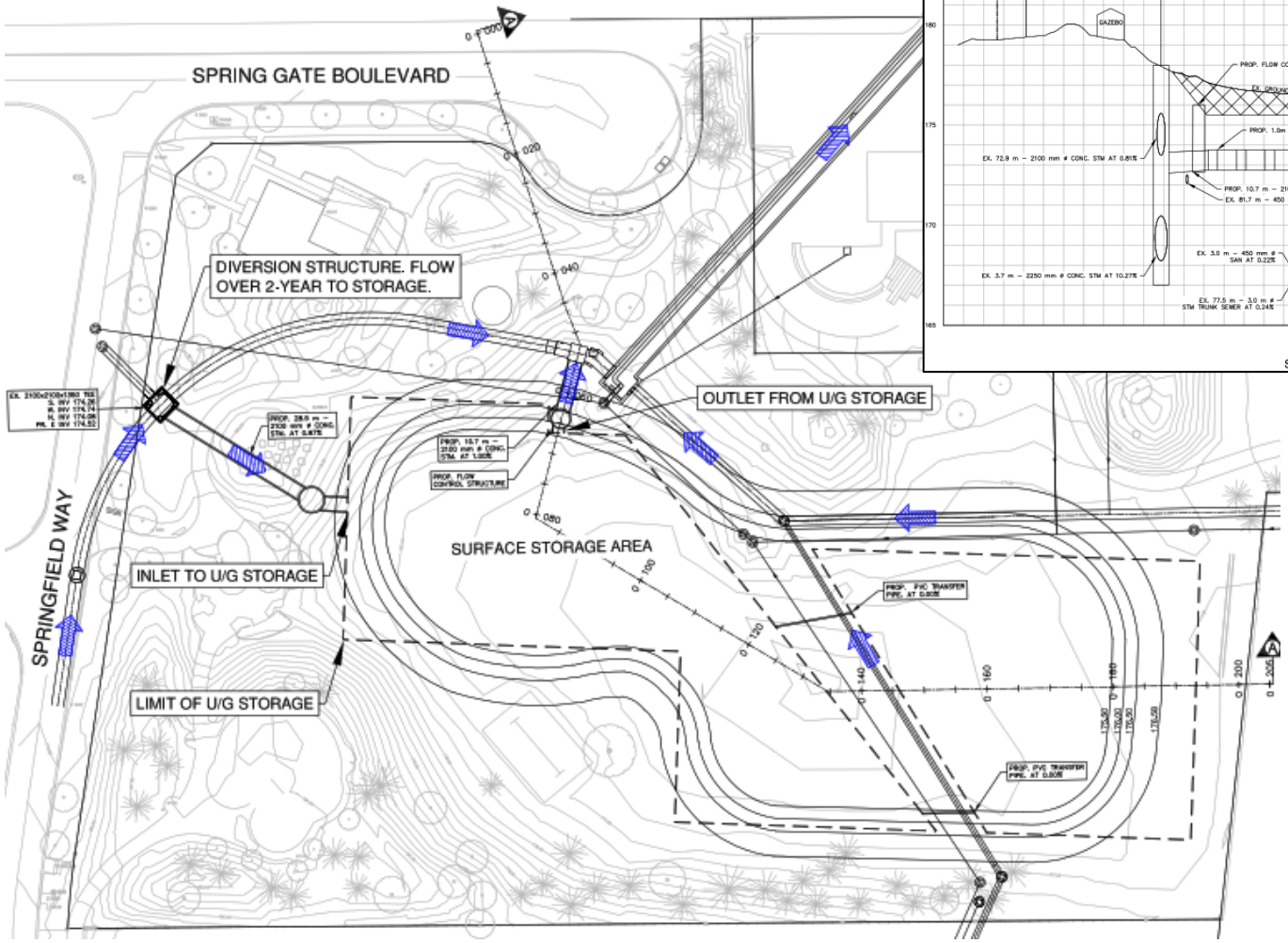


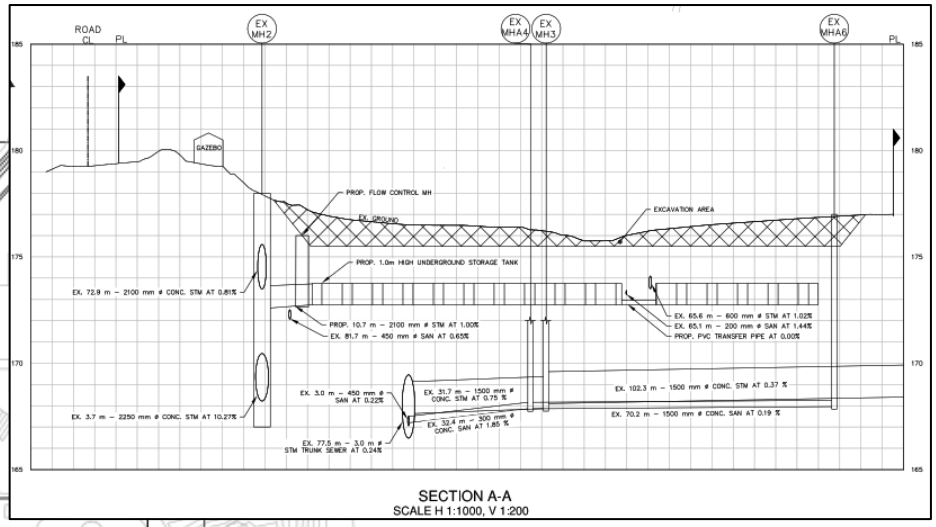
SECTION A-A
SCALE H 1:1000, V 1:200

ALTERNATIVE #3
UNDERGROUND STORAGE SUMMARY

BOTTOM ELEV. = 172.75 m
HEIGHT = 2.0 m
AREA = 5,087 m²
VOLUME = 9,559 m³

Alt #4: Hybrid Storage





SECTION A-A
SCALE H 1:1000, V 1:200

ALTERNATIVE #4
HYBRID STORAGE SUMMARY

UNDERGROUND:
BOTTOM ELEV. = 172.75 m
HEIGHT = 1.0 m
AREA = 5,087 m²
VOLUME = 4,782 m³

SURFACE:

ELEV (m)	AREA (m²)	VOLUME (m³)
175.50	4171.5	0
176.00	4750.1	2238
176.50	5406.9	4785

Evaluation Criteria

Social

- Impacts to existing Park uses
- Creation of new Park uses
- Potential of standing water
- Impacts to adjacent properties during and after construction

Natural Environment

- Impacts on general water quality
- Impacts to existing vegetation

Economic

- Capital construction cost
- Operation and maintenance cost
- Reduction in flood damages

Functional

- Ease of construction
- Ease of operations and maintenance
- Risk to adjacent or upstream properties
- Risk to downstream properties

High Negative Effect	Moderate Negative Effect	No Effect	Moderate Positive Effect	High Positive Effect
				

Evaluation Matrix

Blue shading denotes Preferred Alternative

Criteria	Do Nothing	Surface Storage	Underground Storage	Hybrid Storage
Social				
Impacts to existing Park uses	≠	✗	+	✗
Creation of new Park uses	✗	=	+	=
Potential for standing water	=	✗	+	✗
Impacts to adjacent properties during & after construction	≠	=	+	=
Economic				
Capital construction cost	+ $0	= $1.7 million	✗ $4.4 million	✗ $3.2 million
Operation & maintenance cost	=	+	✗	=
Reduction in flood damages	✗	+	+	+
Natural Environment				
Impacts on general water quality	✗	+	+	+
Impacts to the existing vegetation	+	✗	✗	✗
Functional				
Ease of construction	≠	=	=	=
Ease of operations & maintenance	=	=	✗	✗

Preferred Alternative

Based on the results of the evaluation, the Study Team believes the underground storage facility best satisfies the Problem/Opportunity Statement and provides the best long term solution for the City of Vaughan. The reasons for recommending this alternative are as follows:

- Water will be stored underground during all events up to and including the 100 year storm;
- The underground storage facility maintains and improves existing park uses and provides opportunity for additional uses;
- The underground facility provides an opportunity for park enhancements including collaboration with TRCA and the Sustainable Neighbourhood Action Program (SNAP);
- Alleviates downstream flood frequency and extents while not increasing flooding risk upstream; and,
- Preliminary resident input suggests the underground facility will be best received.

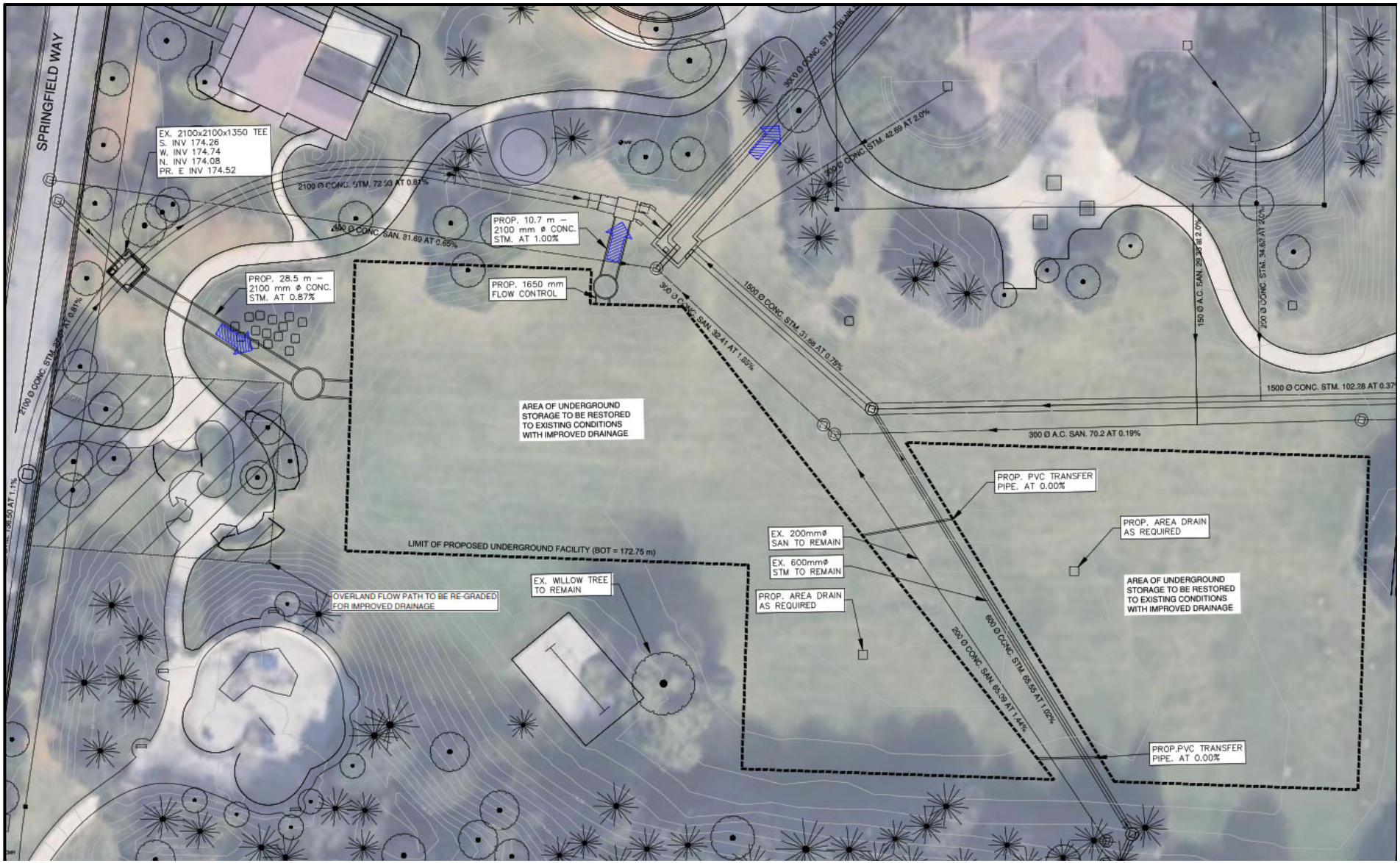
Preferred Alternative - Preliminary Design

- The main components of the Preferred Preliminary Design, as illustrated in the following image, are as follows:

  - Underground cast-in-place concrete stormwater storage tank, using a forming system to reduce costs. The volume of water stored is enough to fill about 4 Olympic sized swimming pools;
  - 2100 mm diameter concrete storm inlet pipe;
  - 1650 mm outlet control structure; and,
  - 2100 mm diameter concrete storm outlet pipe.

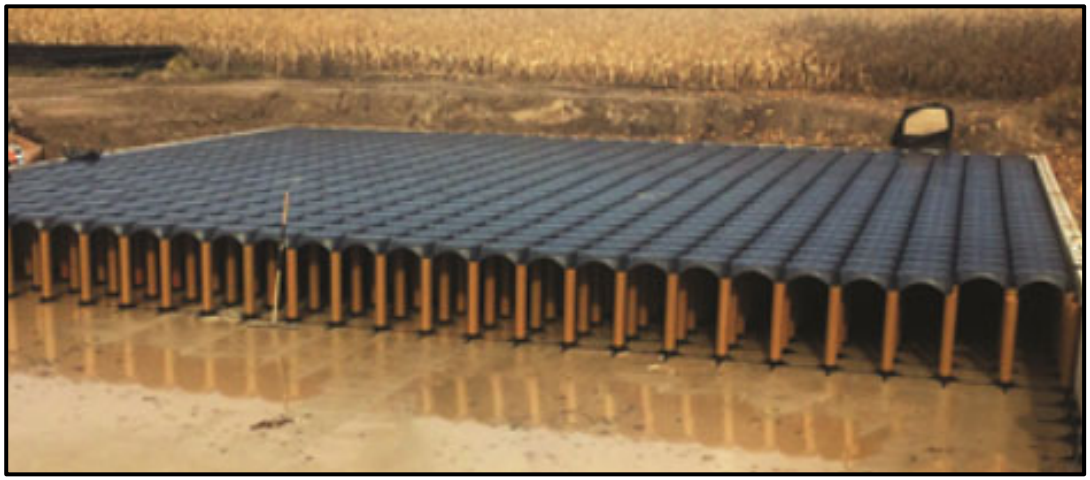
- The Detailed Design, commencing in December 2020, will revisit the above components through further consultation with stakeholders and members of the general public to ensure the design minimizes environmental impact and meets the needs of the project. The form of underground storage may change depending on the detailed design process, but will maintain water levels below grade for at least the 100 year storm.

Preferred Alternative – General Plan



Underground Facility Options

STORMTECH CHAMBER



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STORMTRAP

Change in Preferred Alternative

- The Preferred Alternative selected during the 2010 EA was a dry pond and the Preferred Alternative selected as part of this EA Update is an underground storage facility.
- The reason for the change in Preferred Alternative was based upon community feedback received during the detailed design commencement in 2013.
- Upon completion of further hydraulic analysis/modelling and from undertaking this EA Update it is apparent that the underground storage facility offers additional benefits over the dry pond option that include:

  - Health & Safety: during heavy rainfall periods the dry pond would result in temporary standing water that may result in safety issues. This would not be the case with an underground facility.

  - Social Benefits: the underground storage facility maintains existing park uses, provides an opportunity for park enhancements and has no adverse impacts on the soccer fields or other park amenities given no infrastructure will be present above ground with the exception of the small drains.

- Additionally, technology in underground facility options, as presented on the previous slide, has progressed significantly since the original EA in 2010 resulting in more efficient stormwater systems, easier maintenance and operation, and an overall reduction in operational costs.

Environmental Considerations and Protection Measures

- Some mature trees growing along the perimeter of the Park will need to be removed to create an access route for the construction equipment. To avoid disturbance to breeding birds, vegetation removal will be scheduled prior to April 1 or after August 15 in line with the breeding bird season.
- A comprehensive erosion and sediment control plan will be developed during detailed design to mitigate the potential release of sediments from the site and into the storm sewer or catch basin.
- Excess fill will be generated during installation of the underground facility. During the design phase the existing material in the Park will be assessed for its disposal requirements. If any hazardous/biological waste is discovered, the appropriate agencies will be notified and the waste will be directed to the required facility. To reduce truck traffic in the area, excess fill will be re-used on site as appropriate.
- Affected property owners will be notified in advance by the Contractor (e.g. signage, notices), as to construction schedule/duration.
- The Contractor will be required to comply to local noise by-laws that restrict working hours.
- The Contractor will control dust using water and not chemical suppressants.

Detailed Design and Implementation

- Resilient Consulting and Planmac Engineering have been retained by the City of Vaughan to complete Phase 5 (Implementation) of the Municipal Class EA Process.
- This includes detailed design, production of contract drawings, complete any outstanding technical studies/surveys and obtain permitting, prepare contract documentation, and Construction Administration/Inspection.
- Studies and surveys either underway or pending include the following:
  - Geotechnical investigation;
  - Topographic survey;
  - Subsurface utilities investigation; and,
  - Tree inventory.
- At the completion of construction of the facility, disturbed areas will be restored with topsoil and sod to existing conditions. Future park enhancements by City, with input from SNAP, will be completed after the facility is in operation.

Next Steps

- Review and consider public comments.
- Finalize the Preliminary Design and Project File Report (PFR) Update, which documents the EA planning and consultation process.
- Publish the Revised Notice of Study Completion for a 30-day public review period of the PFR. Pending no “Part II Order” requests after 30 days, the project will progress to Detailed Design.
- Undertake additional studies, receive permitting and complete the Detailed Design.
- Prepare Construction Tender Document.
- Initiate Construction and Contract Administration.

Tentative Construction Schedule

- Contract Awarded: late Summer 2021*
- Construction Start: early Fall 2021
- Construction Completion: late Spring 2022

The construction schedule has been developed to allow park amenities to be available during the summer months when the park is most used throughout the year.

*Pending Capital Budget Approval by City Council