KSGS ENGINEERING

BEACON ENVIRONMENTAL

ETOBICOKE CREEK EROSION CONTROL --- BLOOR STREET TO PONYTRAIL DRIVE PUBLIC INFORMATION CENTER

June 27, 2022

MISSISSAUGA

WELCOME

THE PURPOSE OF THE VIRTUAL PUBLIC INFORMATION CENTRE IS TO:

- Identify the project purpose and objectives
- Detail the work area and proposed works
- Seek input and comments from the public for input and consideration in the design
- Establish channels of communication with the public and stakeholders

THE PUBLIC INFORMATION CENTER PRESENTATION WILL:

- Introduce the Study
- Outline the Municipal Class Environmental Assessment process
- Summarize the problems and opportunities within the Study Area
- Describe the natural and built environmental conditions
- Identify the alternative solutions under consideration
- Obtain community input to assist in
  - Identifying the preliminary recommended solution(s)
  - Alternative evaluation criteria
  - Selection of preferred alternative
- Outline the planned next steps in the Study

BACKGROUND

- Etobicoke Creek is a watershed with the headwaters in Caledon and Brampton draining through Mississauga and bordering on Toronto before outletting to Lake Ontario
- Etobicoke Creek is under the jurisdiction of the Toronto Region Conservation Authority (TRCA)
- Urbanization over the years has increased flow rates within the creek and beyond its banks
    - This has increased erosion in certain areas putting property, infrastructure and public safety at risk. Erosion can occur quickly, or progressively over time

STUDY AREA

- Study area extends from the downstream side of Bloor Street upstream to existing golf course creek crossing (about 500m upstream of Bloor Street)
- Residential lots are located on the west side of the study area
- Existing golf course is located on the east side of the study area
- Bloor Street crosses the study area

OBJECTIVE

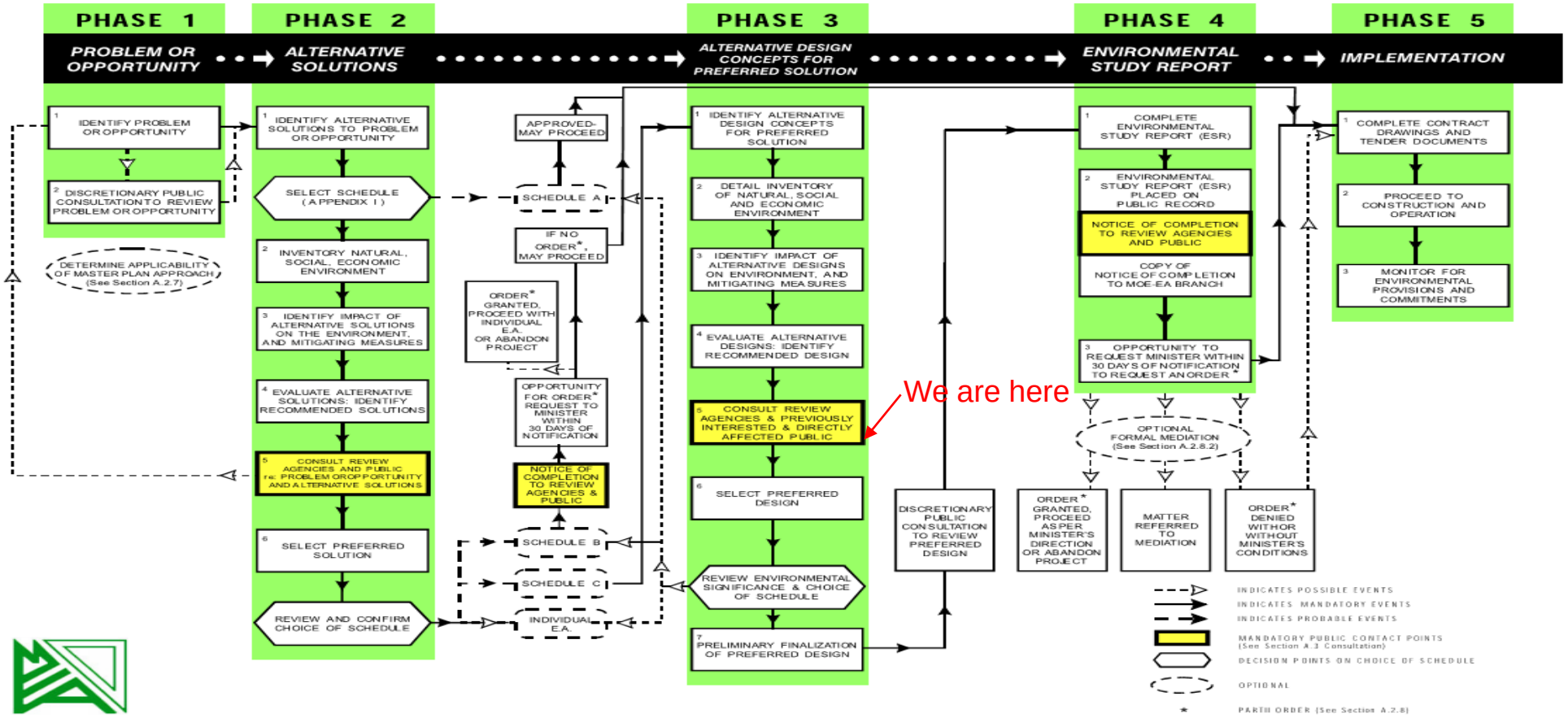
- Improve existing erosion protection along the west side of the creek
  - Proposed works will improve erosion protection along the base of the slope
  - Will enable future erosion control works to stabilize top of bank
  - Eventually provide improved protection along entire slope
- Provide erosion protection for Bloor Street abutments
- Provide continued protection of Region of Peel Sanitary Trunk sewers that runs across and adjacent to the creek by replacing existing drop structure
- Improve channel stability and aquatic habitat through drop structure replacement design and minor creek alignment adjustments
- Study and design will follow the Municipal Class Environmental Assessment process

TOP OF EMBANKMENT (WEST SIDE)

- Propose works deals with erosion within creek and base of embankment
  - Works along top of embankment will be addressed as part of another project
- For lands at top of embankment, landowners are encouraged to:
  - Keep structures away from edge of embankment
  - Reduce the amount of drainage that drains to the embankment
  - For drainage travelling to embankment do not concentrate flows but encourage “sheet” flow
  - Keep area vegetated to discourage erosion and increase stability.

CLASS ENVIRONMENTAL PROCESS

- The City of Mississauga is undertaking this Study in accordance with the requirements as set out in Schedule B of the Municipal Engineers Association's flow chart outlined below.



FLUVIAL GEOMORPHIC ASSESSMENT

- Fluvial geomorphology is the study of river processes (e.g., erosion and sedimentation)
- Data collection for the study included:
  - General assessment of channel stability (rapid assessments)
  - Detailed topographic survey to confirm existing watercourse dimensions
- Field data was used to guide the development of design alternatives to ensure:
  - Restored sections of Etobicoke Creek will improve existing conditions
  - Erosion protection measures remain stable under a range of flow conditions (e.g.,base flows to flood flows)

ENVIRONMENTAL IMPACT STUDY

- The Etobicoke Creek valley lands are identified in the City of Mississauga's Official Plan as Significant Natural Areas and Natural Green Spaces
- Field data collected for the study included:
  - Assessment of fish habitat conditions
  - Inventory of existing vegetation communities
  - Tree inventory and assessment for all trees with a diameter of 10 cm or greater
  - Breeding bird surveys
- Consultation with the Ministry of Environment, Conservation and Parks confirmed no Species at Risk in the study area
- Field data was used to guide the development of design alternatives to ensure:
  - Restored sections of Etobicoke Creek would provide improved fish habitat conditions
  - Removal of existing trees and natural vegetation would be minimized where possible
  - Restoration plantings would reflect existing vegetation communities

STAGE 1 AND 2 ARCHAEOLOGICAL ASSESSMENT

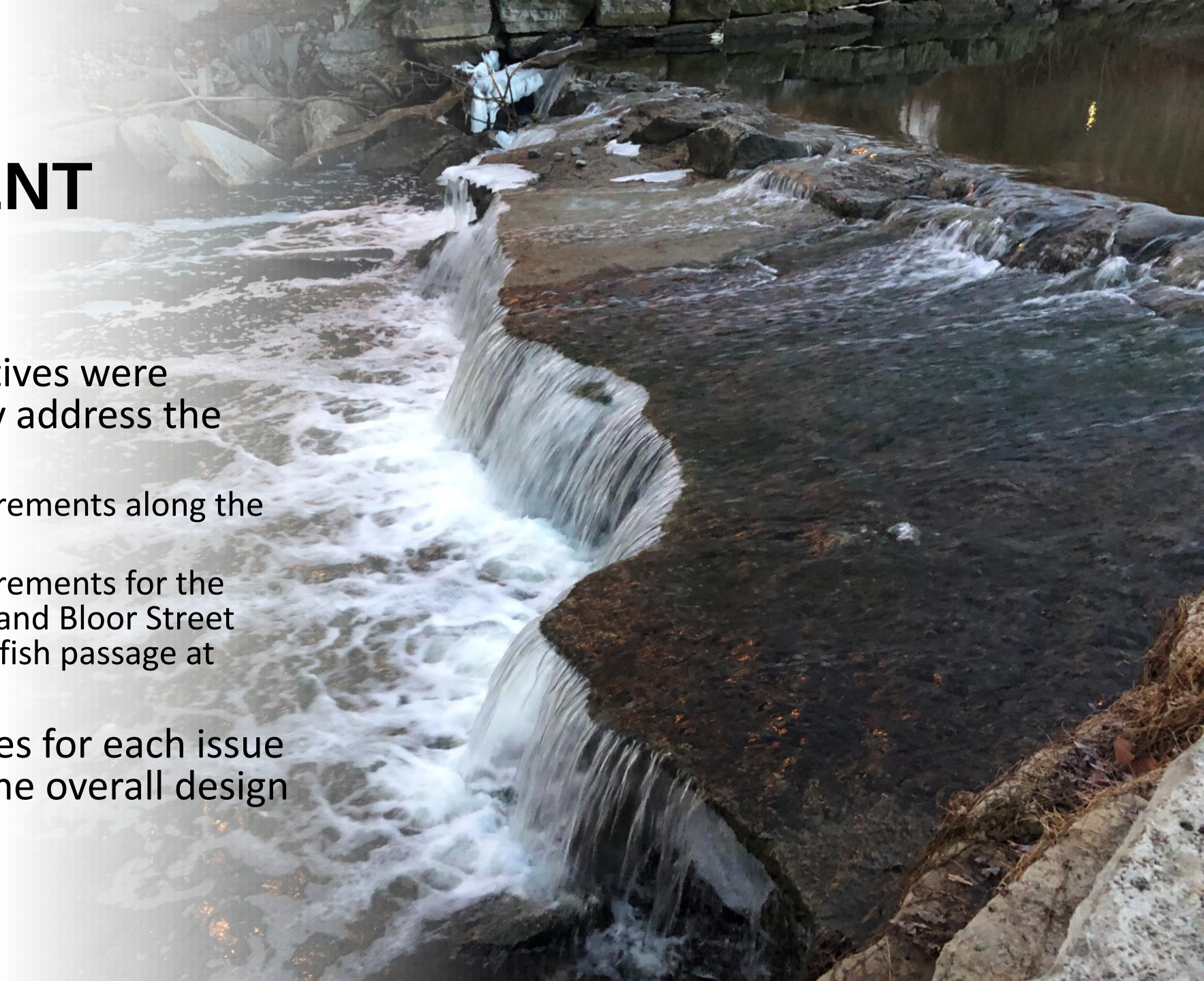
- Stage 1 Background Study
  - Provides information about the site’s geography, history, previous archaeological fieldwork, and current land condition
  - To evaluate and document the property’s archaeological potential
  - Recommend appropriate strategies for Stage 2 survey
  - Stage 1 background study determined potential for recovery of archaeological resources of cultural heritage value
- Stage 2 Detailed Property Assessment
  - Detailed property assessment identified no Archaeological resources or sites as part of Stage 2 works
  - Recommends that no further archaeological assessment of site required
  - Report has been submitted for review and approval to the Ministry of Heritage, Sports, Tourism and Culture Industries

HYDROLOGIC AND HYDRAULIC ASSESSMENT

- Hydrologic information was obtained from TRCA for the Etobicoke Creek
  - Flows were obtained for the 2-year to Regional Storms
  - Bankfull flows were generated based on fluvial geomorphic assessment
- Hydraulic (HEC-RAS) model was also obtained from TRCA.
  - Additional cross sections were added to reflect the study area and cross sections adjusted based on field obtained topographic survey information
  - Existing floodlines were generated from the 2-year to Regional Flows
  - Hydraulic check of bankfull flows closely reflected what was generated via fluvial geomorphic assessment.
  - Proposed works were hydraulically assessed to determine impact on upstream and downstream floodlines as well within the study area

EROSION IMPROVEMENT OPTIONS

- Separate design alternatives were developed to specifically address the two identified issues:
  - Erosion protection requirements along the west side of the creek
  - Erosion protection requirements for the Region’s Sanitary Sewer and Bloor Street abutments and improve fish passage at Bloor
- The preferred alternatives for each issue will be integrated into one overall design solution



SECTION NORTH OF BLOOR STREET

1) Do Nothing
   - Status quo (do not undertake erosion protection works)
   - Creek erosion would continue and eventually affect private property west of creek
2) Implement erosion protection
   - Provide erosion protection on east and west sides of creek
   - Protect creek while minimizing impacts to natural features and property
3) Realign creek and implement erosion protection
   - Realign creek to move it away from the slope and provide erosion protection on east and west sides of creek
   - Potential for enhanced erosion protection along west side of creek but will impact property east of creek (golf course) and impact sanitary trunk sewer

EVALUATION MATRIX

Criteria	Impacts and Opportunities
Functionality	• Opportunity to improve conveyance of watercourse • Opportunity to decrease erosion of watercourse • Opportunity to improve functionality of adjacent lands
Social Environment	• Ability to improve public safety • Impacts to private properties • Impacts to public properties
Economic Environment	• Capital Costs • Maintenance Costs • Risk Management/Future Cost
Natural Environment	• Impacts on aquatic habitat • Impacts to terrestrial habitat • Impacts on channel stability and hydraulics
Constructability	• Ease of construction and accessibility • Expected disturbance to private/public property • Erosion/sedimentation concerns during construction

Evaluation of Alternative Solutions North of Bloor Street

CRITERIA	Option 1 – Do Nothing	Option 2 – Hard Armouring	Option 3 – Channel Realignment
Functional			
Opportunity to improve conveyance of watercourse	🟡	🟡	🟢
Opportunity to decrease erosion of watercourse	🔴	🟢	🟢
Opportunity to improve functionality of adjacent lands	🔴	🟢	🟡
Social Environment			
Ability to improve public safety	🔴	🟢	🟢
Impacts to private properties	🔴	🟢	🔴 Encroaching on existing golf course
Impacts to public properties	🔴	🟢	🟢
Economic Environment			
Capital Costs	🟢	🔴 High cost of armourstone structure	🔴 High cost of acquiring land from golf course
Maintenance Costs	🟢	🟢	🟢
Risk Management/Future Costs	🔴 Continued erosion will increase mitigation costs	🟢	🟢
Natural Environment			
Impacts on aquatic habitat	🔴 Continued erosion and sediment deposition	🟢 Minor disturbance during construction	🟡 Greater temporary disturbance due to realignment
Impacts to terrestrial habitat	🔴 Loss of riparian vegetation	🟢 Minimal loss of vegetation	🟡 Localized tree removals
Impacts on erosion/channel stability and hydraulics/flooding	🔴	🟡 Slight increase in water elevation in frequent storms	🟢
Constructability			
Ease of construction and accessibility	🟢	🔴	🔴
Expected disturbance to private/public property	🟢	🟡 construction access through golf course, impacts minimized through winter construction	🔴 significant land loss to golf course, closure may be longer
Erosion/sedimentation concerns during construction	🟢	🔴	🔴

BLOOR STREET CROSSING

1) Do nothing
   - Status quo (do not undertake erosion protection works)
   - Creek erosion would continue and eventually drop structure would fail, affecting Regional Trunk Sewer and Bloor Street bridge

2) Implement erosion protection
   a) Repair drop structure
      - Reinforce drop structure and provide erosion protection for Bloor Street abutments and Regional sewer
   b) Replace drop structure
      - Remove existing drop structure and provide erosion protection for Bloor Street abutments and Regional sewer

3) Implement enhanced erosion protection
   - Remove existing drop structure, provide erosion protection for Bloor Street abutments and enhanced erosion protection for Regional sewer

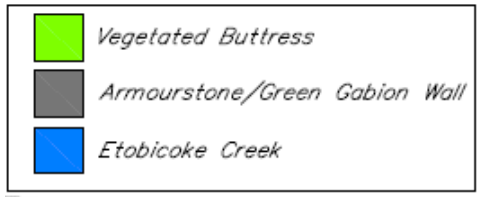

Drop Structure Jan 2022

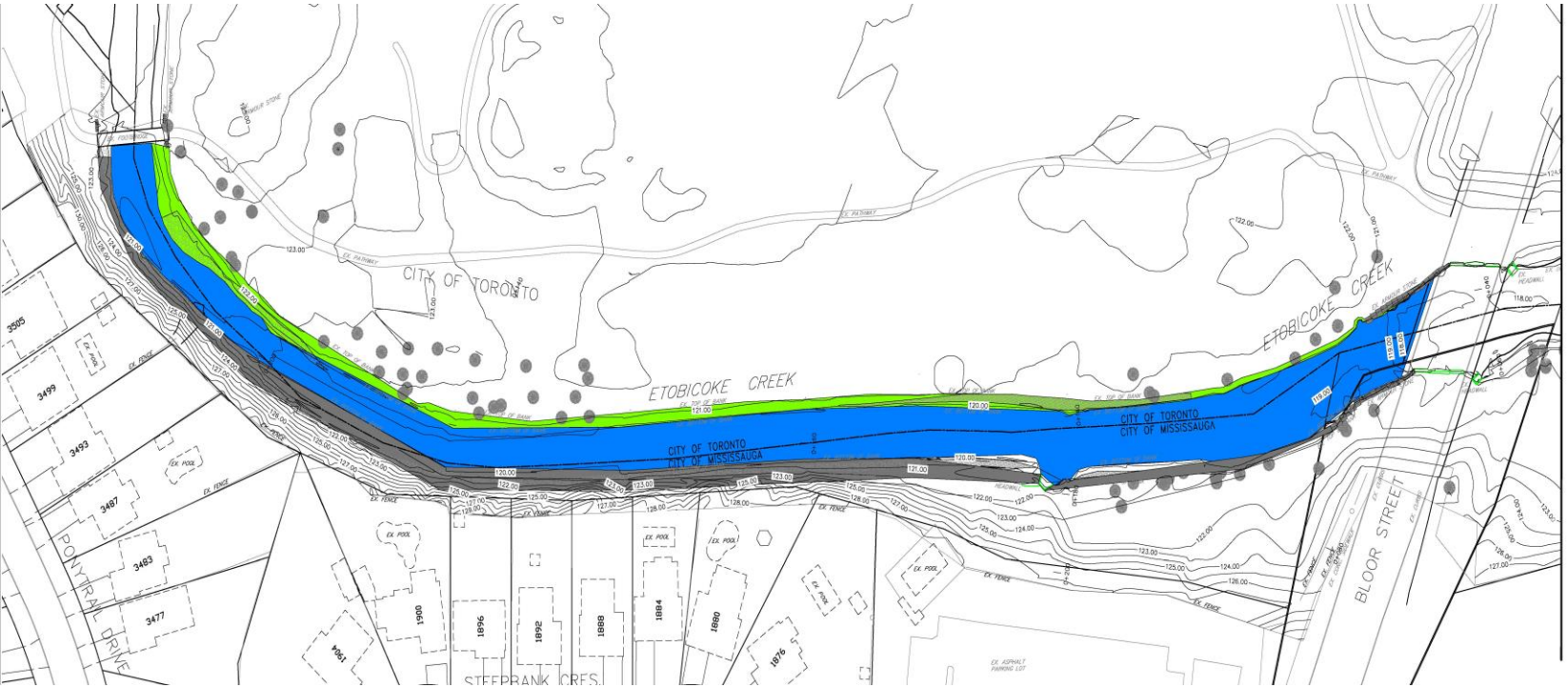

Drop Structure 2019

Evaluation of Alternative Solutions Bloor Street Grade Control Structure

CRITERIA	Option 1 – Do Nothing	Option 2a – Control Structure Repair	Option 2b – Control Structure Replacement	Option 3 – Control Structure Replacement and Extend Upstream Remediation
	Functional			
Opportunity to improve conveyance of crossing	🟡	🟡	🟡	🟢 Provides better protection of upstream sanitary trunk crossing
Opportunity to decrease erosion of crossing	🔴	🟢	🟢	🟢
Opportunity to improve functionality of adjacent lands	🔴	🟢	🟢	🟡
	Social Environment			
Ability to improve public safety	🔴	🟡	🟢	🟢
Impacts to private properties	🔴	🟢	🟢	🟢
Impacts to public properties	🔴	🟢	🟢	🟢
	Economic Environment			
Capital Costs	🟢	🔴 High cost for Repair of existing Structure	🔴 High cost of armourstone structure	🔴 High cost of armourstone structure
Maintenance Costs	🟢	🟡 Control structure repairs could result in addition future maintenace	🟢	🟢
Risk Management/Future Costs	🔴 Continued erosion will increase mitigation costs	🟡 Control structure repairs could prove difficult	🟢	🟢 Provides greatest protection for upstream trunk sanitary sewer
	Natural Environment			
Impacts on aquatic habitat	🔴 Continued erosion and sediment deposition	🟡 Need for Flow diversion during construction	🟡 Need for Flow diversion during construction	🟡 Need for Flow diversion during construction
Impacts to terrestrial habitat	🔴 Loss of riparian vegetation	🟢 Minimal loss of vegetation	🟢 Minimal loss of vegetation	🟢 Minimal loss of vegetation
Impacts on erosion/channel stability and hydraulics/flooding	🔴	🟡 Slight increase in water elevation in frequent storms	🟡 Slight increase in water elevation in frequent storms	🟡 Slight increase in water elevation in frequent storms
	Constructability			
Ease of construction and accessibility	🟢	🔴	🔴	🔴
Expected disturbance to private/public property	🟢	🟡 construction access through golf course lands and need for flow diversion	🟡 construction access through golf course lands and need for flow diversion	🟡 construction access through golf course lands and need for flow diversion
Erosion/sedimentation concerns during construction	🟢	🔴	🔴	🔴

PRELIMINARY PREFERRED SOLUTION

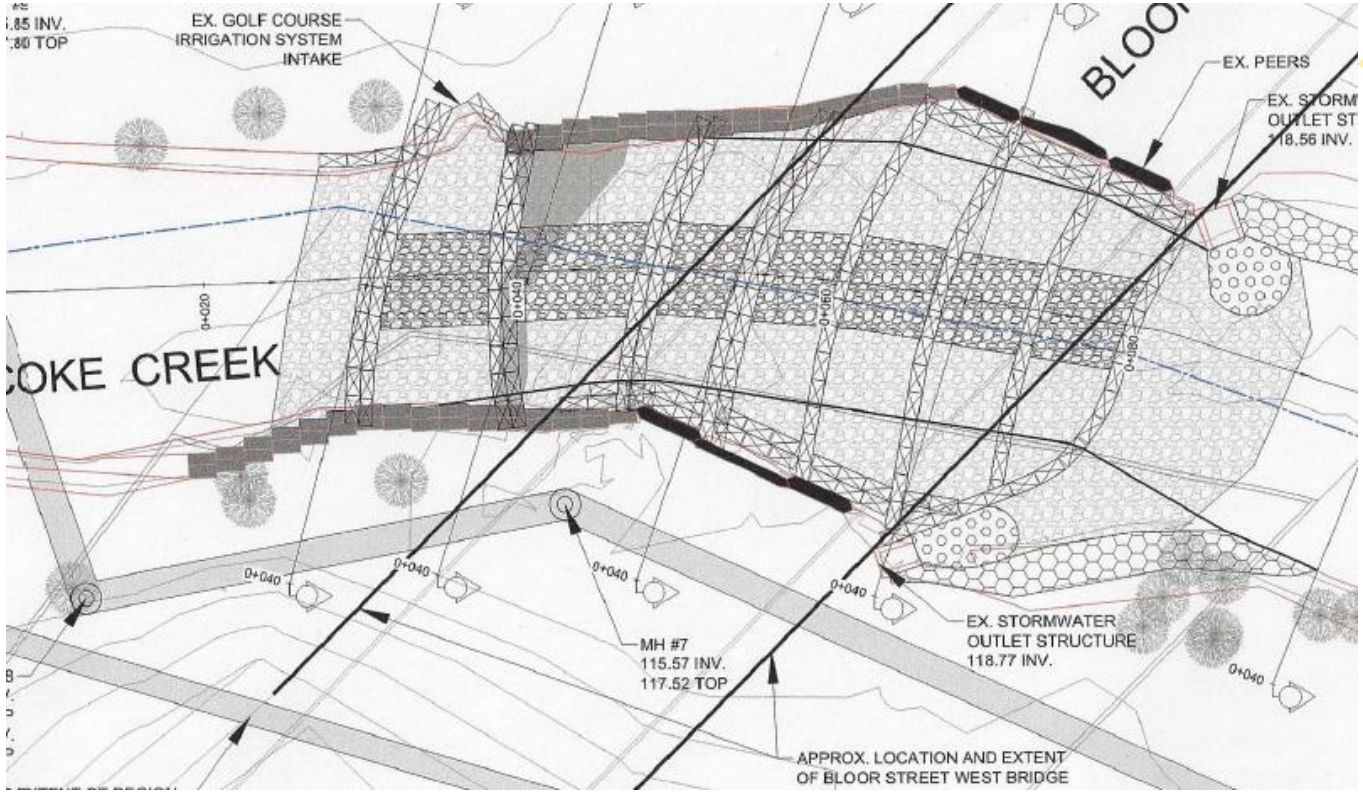


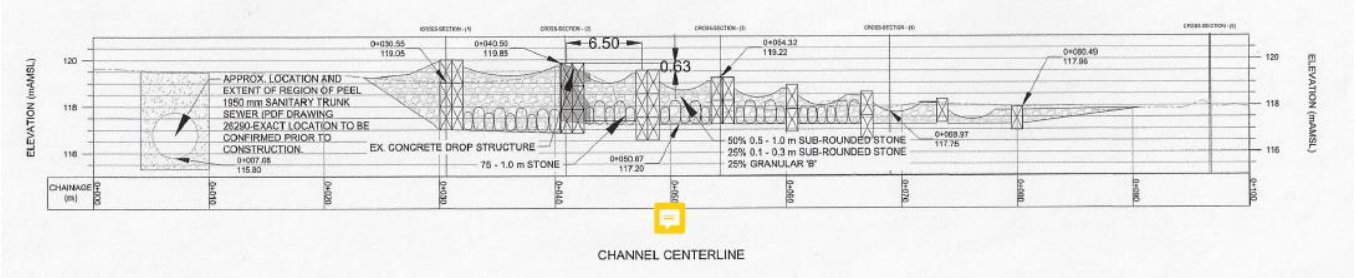


- **North of Bloor Street**
  - ➢ Implement erosion protection
    - Provide erosion protection on east and west sides of creek
    - Protects creek while minimizing impacts to natural features and property
  - ➢ Main benefits are:
    - Lower impact to natural environment during construction
    - Less impact on terrestrial habitat overall
    - Minimizes impact to public property
    - Least impact to private property

PRELIMINARY PREFERRED SOLUTION Con’t

- **Bloor Street Crossing**
  - **Drop Structure Replacement and Extend Upstream Remediation**
    - Remove existing drop structure, provide erosion protection for Bloor Street abutments and enhanced erosion protection for Regional sewer
  - Main benefits are:
    - Improve conveyance of crossing
    - Improve protection of upstream Trunk Sanitary Sewer
    - Minimal Loss of Vegetation
  - Small additional benefits compared to Option 2b





CONSTRUCTION ACCESS

- Access is restricted and difficult. Three access point will need to be used
  1. From west side of creek and north side of Bloor Street with one westbound lane partially closed
     - To unload Armourstpns and other material
  2. From west of creek and south side of Bloor Street
     - To do works under Bloor Street
     - To bring material in and out
     - Low clearance under bridge will limit type of equipment that can be move
  3. From Markland Woods Golf Course
     - To bring equipment and material in and out of site

NEXT STEPS

- Take into consideration input from the Public Meeting
- Finalize Preferred Solution
- Finalize Environmental Assessment Report and post it for public record as per EA requirements
- Prepare Detail Design and obtain all required approvals