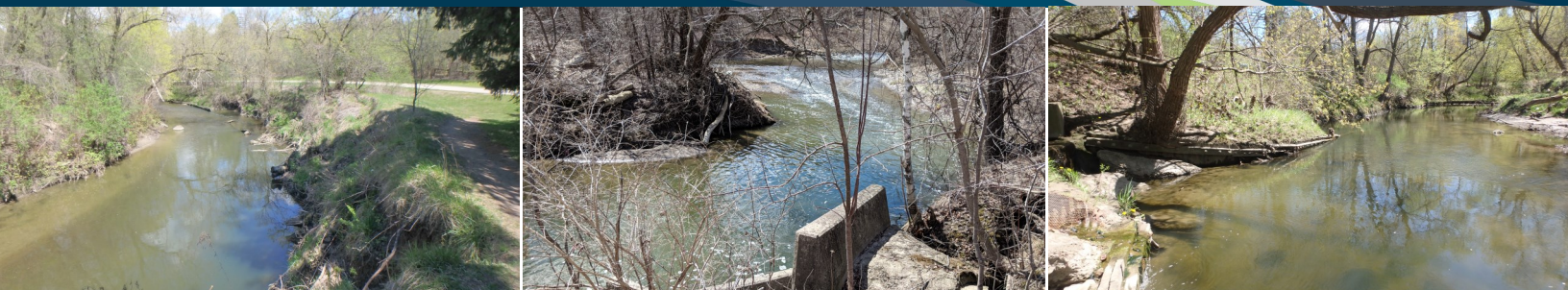


WEST DON RIVER IN E.T. SETON PARK (AREA 3) MAJOR MAINTENANCE PROJECT



PROJECT OVERVIEW

- This project has been planned as part of the **Toronto Ravine Major Maintenance** portfolio
- The West Don River in E.T. Seton (Area 3) Major Maintenance Project aims to mitigate erosion and flood risks to public and sanitary sewer infrastructure within a 330-metre long meander along the West Don River
- TRCA conducted a *Conservation Ontario Class Environmental Assessment for Remedial Flood and Erosion Control Projects* for three areas along the West Don River within E.T. Seton Park. Project Plan for this Class EA is expected to be approved in Spring 2022.
- Palmer Environmental Consulting Group Inc. was retained in early 2022 to prepare detailed designs for Area 3 based on the Preferred Concept from the Class EA: *Armourstone Rib Grade Control and Vegetated Boulder Bank Protection*
- Implementation at Area 3 is planned to commence in Fall 2022 with TRCA's internal construction crew (pending the receipt of all permits and approvals) and is expected to be completed by Spring 2023



PROJECT BENEFITS

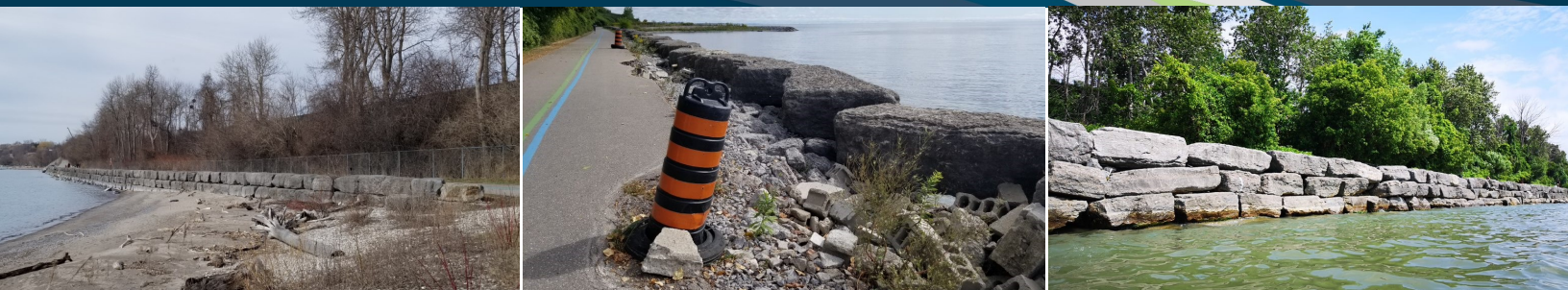
- Long-term monitoring indicates that existing erosion control structures within the project area are failing and placing the adjacent West Don Trail, parkland, a private stormwater outfall and sanitary sewer infrastructure at risk
- The project intends to provide long-term protection to the City of Toronto sanitary sewer infrastructure, address bank instability and protect public health and safety while enhancing the surrounding environment

DESCRIPTION OF PROPOSED WORKS

- Complete the ongoing Class EA with support from Palmer
- Prepare and finalize detailed designs for Area 3 as per the preferred concept: Armourstone Rib Grade Control and Vegetated Boulder Bank Protection
- Obtain all permits and approvals such that implementation can commence in Fall 2022

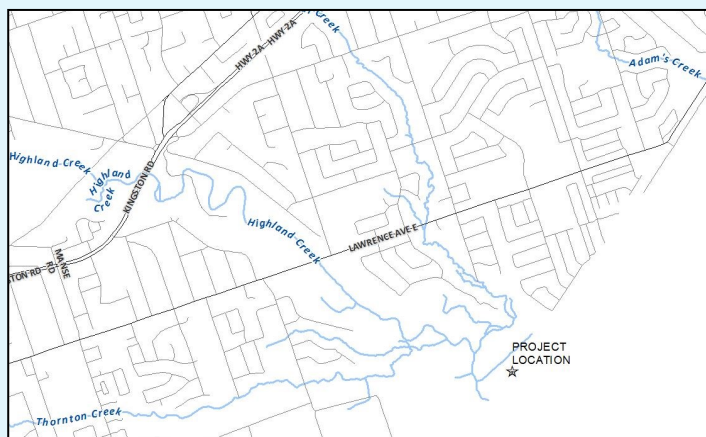
| WORK DESCRIPTION | SCHEDULE |
|--------------------------|---------------------------|
| Planning and Design | January 2022-June 2022 |
| Permitting and Approvals | January 2022-October 2022 |
| Implementation | October 2022-April 2023 |

PORT UNION PHASE 1 BEACH CURB MAJOR MAINTENANCE PROJECT



PROJECT OVERVIEW

- This project has been planned as part of the **Waterfront Major Maintenance** portfolio with funding assistance from the **Disaster Mitigation and Adaptation Fund**
- Backshore erosion and stone displacement along the beach curb structure poses risks to the general public, Waterfront Trail and Metrolinx property
- TRCA completed repairs on the beach curb structure in 2017 to address displaced stones, sinkholes and repair to the top tier of armourstones
- Due to the high water events and wind events, the sand beach in front of the beach curb (WF28.01) has washed away, reducing the ability of the beach to dissipate the wave energy which is causing erosion on the backshore of the structure and along the trail
- TRCA retained WSP to complete a coastal analysis and detailed designs in 2021 to determine mitigation measures for future high water events
- Implementation of an armourstone revetment between April 2022 and December 2022 will protect the trail and will encourage waves to dissipate



PROJECT BENEFITS

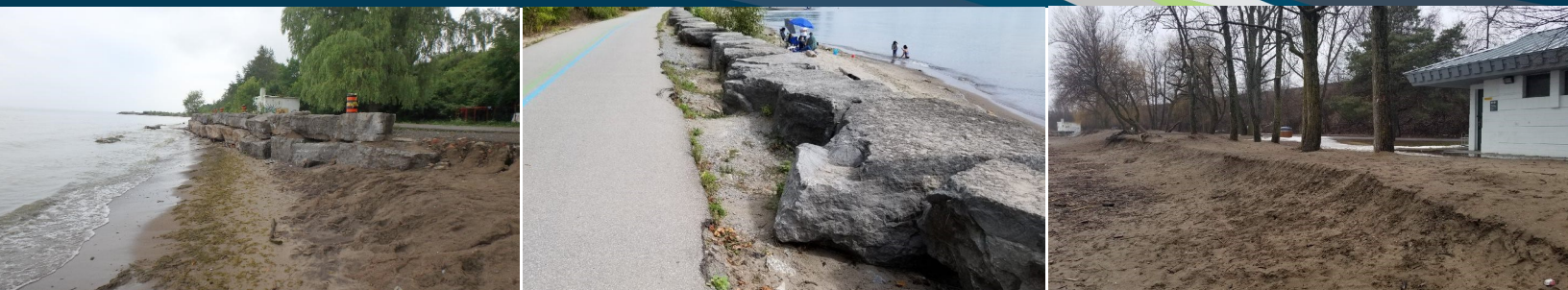
- Address backshore erosion hazards along the Waterfront Trail
- Improve public safety by protecting the Waterfront Trail and Metrolinx railway line
- Protection along the shoreline and structure to dissipate wave energy
- Enhancements to local aquatic habitat by installing submerged groynes and encouraging substrate variation

DESCRIPTION OF PROPOSED WORKS

- Secure all necessary permits and approvals to proceed with implementation
- Construction of armourstone revetment and submerged groynes in 2022 to repair the beach curb and provide continued protection to the Waterfront Trail
- Restore the site with trees and shrubs and repaving trail where damages have occurred, if required

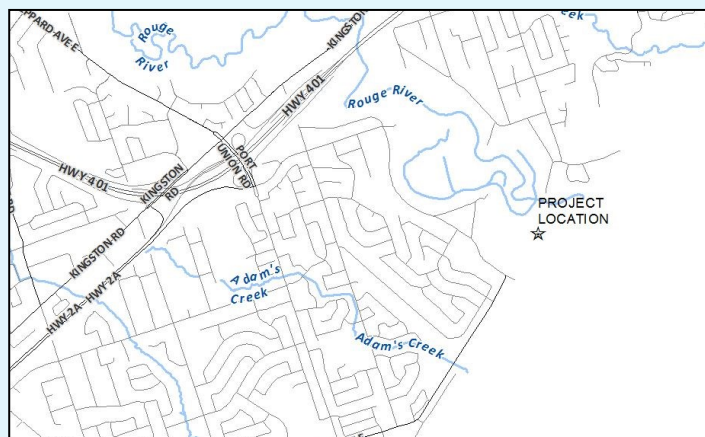
| WORK DESCRIPTION | SCHEDULE |
|--------------------------|---------------------------------|
| Planning and Design | December 2020-December 2021 |
| Permitting and Approvals | September 2021-April 2022 April |
| Implementation | 2022-December 2022 |

ROUGE BEACH SHORELINE ANALYSIS AND PROTECTION PROJECT



PROJECT OVERVIEW

- This is a cost-recoverable **Fee-for-Service** project with **Parks Canada** to support the Rouge National Urban Park
- Reports of erosion and flooding along the shoreline, trail and parking lot of Rouge Beach during the high water events in 2017 and 2019 and the wind event in 2018
- The sand beach in front of the beach curb (WF29.01) has washed away, reducing the ability of the beach to dissipate the wave energy. This has caused erosion on the backshore of the structure and along the trail
- Emergency repairs were completed in 2020 to fill voids and provide temporary protection
- TRCA will be soliciting proposals for a coastal engineer to design conceptual designs through 2022 based on the long-term goals of Parks Canada
- Preservation of the sand beach for continued recreational use is a key component of this project



PROJECT BENEFITS

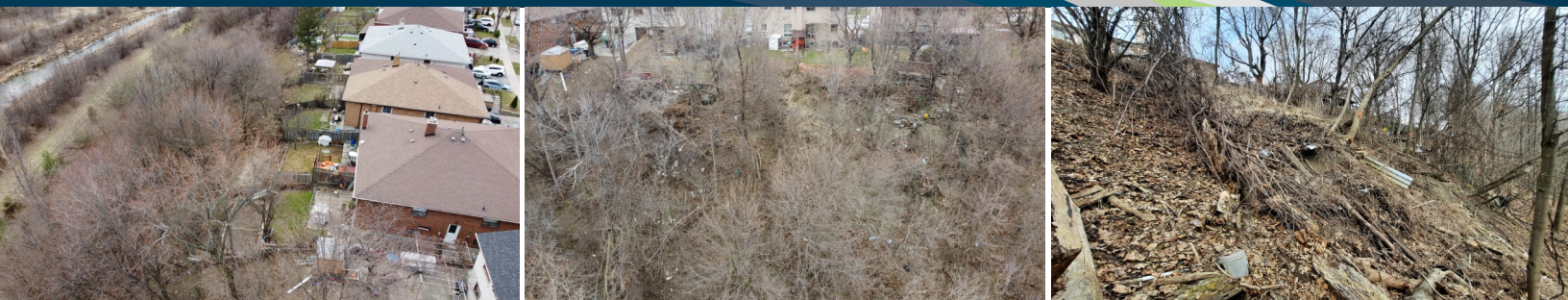
- Long term and low maintenance protection to reduce flooding and erosion along the beach and trail
- Promote sediment retention to maintain a sand beach for public recreational use
- Erosion protection for Parks Canada infrastructure and Metrolinx railway property
- Improve public safety within Rouge National Urban Park

DESCRIPTION OF PROPOSED WORKS

- Retain coastal engineer for design development and coastal analysis
- Develop basic and enhanced concept designs for protection
- Detailed designs developed through 2022
- Implementation to be scheduled in the next Phase of work

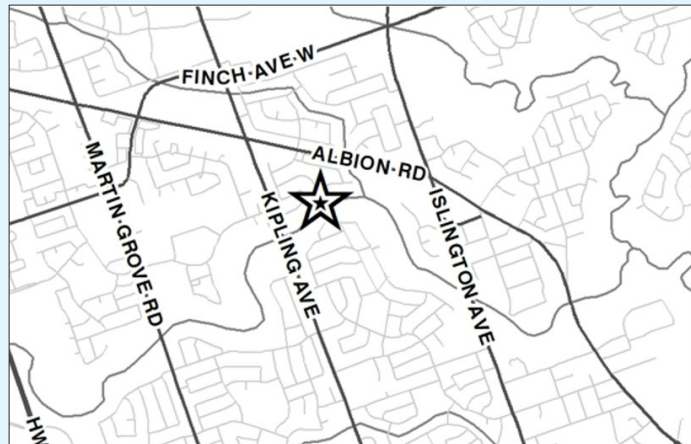
| WORK DESCRIPTION | SCHEDULE |
|--------------------------|------------------------------|
| Planning and Design | September 2021-December 2022 |
| Permitting and Approvals | August 2022-March 2023 TBD; |
| Implementation | 2023+ |

LAKELAND DRIVE MAJOR MAINTENANCE AND SLOPE STABILIZATION PROJECT



PROJECT OVERVIEW

- This project has been planned as part of the **Valley Erosion Hazards** portfolio
- In 1973, a homeowner expressed the first documented concerns of slope instability in the area. From 1975-1976, TRCA obtained easements and implemented a major slope stabilization treatment behind 37-43 Lakeland Drive (earth fill)
- The results of a 2019 slope stability and erosion risk assessment indicate long term risk to the residential homes at 33, 35, & 37 Lakeland Drive
- From 2021—2022, Environmental Site Assessments were completed confirming no presence of contaminants in exceedance of Regulatory standards
- Proposed construction of a Reinforced Soil Slope (RSS) to provide long term, low maintenance protection to at-risk residential dwellings
- TRCA will be securing Erosion Control Agreements (ECA) with participating properties including conveyance of RSS to TRCA ownership



PROJECT BENEFITS

- Long term, low maintenance protection of five residential homes on Lakeland Drive which were confirmed as at-risk from slope instability
- Homeowners are contributing to this project in accordance with TRCA policies through conveyance of impacted lands
- TRCA to acquire and protect lands at-risk from erosion hazards through ownership of the Reinforced Soil Slope to foster resilient ravine systems

DESCRIPTION OF PROPOSED WORKS

- Finalization of detailed designs for the proposed Reinforced Soil Slope behind five private residential properties
- Preparation and execution of Erosion Control Agreements (ECAs) for participating properties
- Secure all required permits and approvals, including Permit to Injure or Remove Trees
- Secure contractor through competitive Request for Tender for tentative construction in fall and winter 2022

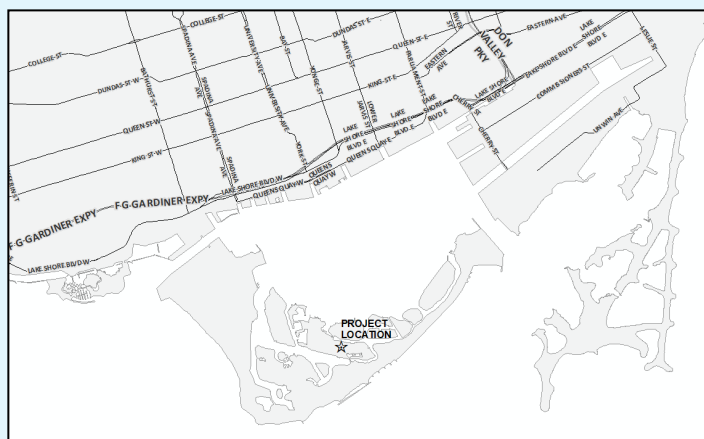
| WORK DESCRIPTION | SCHEDULE |
|--------------------------|-----------------------------|
| Planning and Design | March 2021-June 2022 |
| Permitting and Approvals | January 2022-July 2022 |
| Implementation | September 2022-January 2023 |

TORONTO ISLAND PARK FLOOD AND EROSION MITIGATION PROJECT



PROJECT OVERVIEW

- This project is being planned on a **Fee-for-Service** basis in partnership with the City of Toronto (Parks, Forestry & Recreation)
- Record high Lake Ontario water levels in 2017 and 2019 resulted in flooding across Toronto Island Park
- Despite the deployment of short-term mitigation measures, shoreline flooding led to millions in damages with significant impact to park visitors, businesses, and residents
- Following the high lake level events, emergency works were implemented in 2020 to maintain safe and essential operations until a solution for the full park can be developed
- TRCA has initiated a Class Environmental Assessment (EA) to develop flood protection initiatives in consultation with the public and other stakeholders
- The goal of the project is to develop long-term flood mitigation measures to protect the park from shoreline flooding



PROJECT BENEFITS

- Ensure continued use and access to an important natural and cultural feature of Toronto
- Mitigate safety risk to park users and protect critical park infrastructure
- Improve aquatic habitat through the incorporation of habitat enhancement features into shoreline designs
- Enhance park user experience through the integration of recreational features into flood protection structures in coordination with the Toronto Island Park Master Plan

DESCRIPTION OF PROPOSED WORKS

- Baseline data collection and background review to identify at-risk study areas for long-term flood protection
- Develop conceptual designs and select preferred alternatives in consultation with the public and other stakeholders through the Class EA engagement process
- Develop detailed designs and implement long-term solutions in phases based on site priority and funding

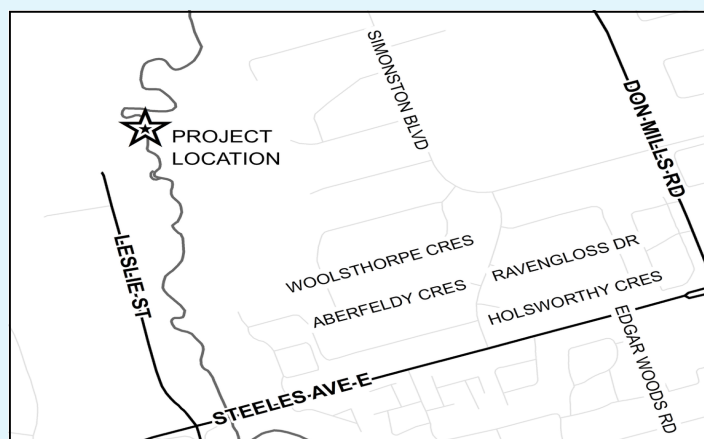
| WORK DESCRIPTION | SCHEDULE |
|---|----------------------------|
| Class Environmental Assessment | Spring 2021-Fall 2022 Late |
| Environmental Study Report and Project Approval | Fall 2022 |
| Detailed Design Development | Winter 2023-Summer 2023 |
| Permits and Approvals | Summer 2023-Fall 2023 |
| Implementation | 2023 + |

GERMAN MILLS SETTLERS PARK SANITARY INFRASTRUCTURE PROTECTION PROJECT



PROJECT OVERVIEW

- The project is being planned in coordination with York Region Environmental Services under the **Streambank Infrastructure Erosion Control Management Program (SIECMP)** and in partnership with the City of Markham
- Channel erosion has placed the Region's Leslie Collector sewer at risk of exposure in six locations along a 260 metre section of German Mills Creek in German Mills Settlers Park
- A Schedule B Municipal Class Environmental Assessment was completed in 2019 and determined the preferred alternative for a major channel realignment and pedestrian bridge extension
- The Lake to Lake multi-use trail and pedestrian bridge are also at risk from erosion within the project area. The City of Markham is partnering with TRCA and York Region to replace the pedestrian bridge and protect the trail through this initiative



PROJECT BENEFITS

- Protect the Leslie Collector Sewer from exposure and secure long-term sewer maintenance access
- Protect and enhance Lake to Lake Trail infrastructure
- Mitigate safety risks to the general public
- Enhance aquatic habitat through the creation of two new online wetlands and terrestrial habitat through native riparian plantings

DESCRIPTION OF PROPOSED WORKS

- Finalize permits & approvals, including a Fisheries Act Authorization from the Department of Fisheries and Oceans Canada
- Implementation of a 300 metre major channel realignment, including sewer protection works, pedestrian bridge extension, and partial trail realignment
- Aquatic and terrestrial restoration, including the installation of woody debris fish habitat, wetland connections, bat boxes, more than 11,500 native shrub cuttings along the riverbanks, and more than 2,250 native trees and shrubs.
- Post-construction regulatory approval monitoring

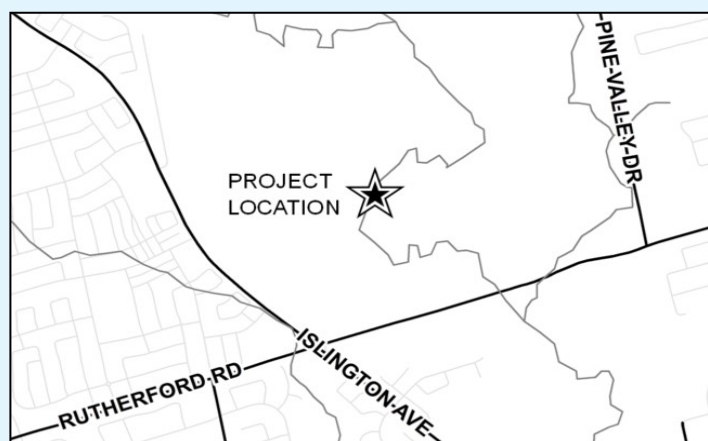
| WORK DESCRIPTION | SCHEDULE |
|--------------------------|---------------------------|
| Planning and Design | January 2018-July 2021 |
| Permitting and Approvals | September 2020-May 2022 |
| Implementation | September 2022-March 2023 |

EAST HUMBER (EMS789) BANK STABILIZATION PROJECT



PROJECT OVERVIEW

- An erosion hazard threatening a pedestrian bridge and trail is currently being monitored under the **TRCA Maintenance & Other Hazards (York Region)** portfolio
- The at-risk trail and bridge abutment is a part of the William Granger Greenway trail system located within the City of Vaughan
- Construction of bank stabilization works along the east bank of the watercourse have been deemed necessary given the potential risk to public safety



PROJECT BENEFITS

- Addressing erosion hazard on heavily used recreational trail
- Mitigation of any potential safety risk to the general public
- Provide protection to publicly owned assets
- Enhancement of the surrounding riparian and aquatic habitat through the installation of native shrub plantings

DESCRIPTION OF PROPOSED WORKS

- Finalize detailed designs for remedial bank stabilization measures that include a vegetated rip rap revetment
- Obtain all permits and approvals to proceed with construction
- Implementation of bank stabilization measures to mitigate risk and provide protection to the William Granger Greenway pedestrian bridge and trail

| WORK DESCRIPTION | SCHEDULE |
|--------------------------|------------------------|
| Planning and Design | June 2021-April 2022 |
| Permitting and Approvals | November 2021-May 2022 |
| Implementation | Summer 2022 |

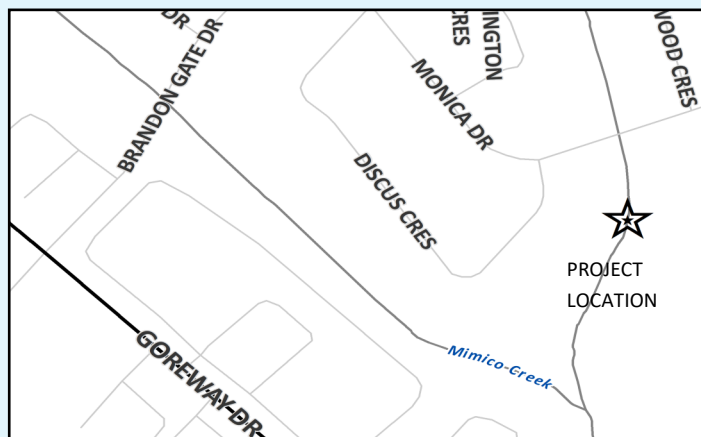
MALTON GREENWAY PROJECT

SANITARY INFRASTRUCTURE PROTECTION



PROJECT OVERVIEW

- This Project has been planned as part of the **Peel Capital and Special Projects** portfolio
- The site is located within the Malton Greenway in the City of Mississauga intersecting the East Mimico Creek
- TRCA Erosion Hazard Monitoring staff have been inspecting the site since 2018 as part of the Peel Infrastructure Hazard Monitoring Program
- As a result of the 16m bank scour and undercutting along the west bank, the encasement of the sanitary main is exposed in the area of crossing
- The site was identified as critical priority in 2020 due to the exposed condition of the sanitary main encasement
- TRCA retained engineering services to undertake a geomorphic, geotechnical and hydraulic investigation, including subsequent detailed design development
- The project will be implemented under a schedule A+ of the Municipal Class Environmental Assessment.



PROJECT BENEFITS

- Protect the Monica Drive sanitary sewer crossing from exposure and secure long-term sewer protection
- Improve bank stabilization and create erosion control structures to protect the west slope
- Mitigate safety risks to the Public and Regional sanitary infrastructure
- Enhancement of the surrounding riparian and aquatic habitat through the installation of channel riffles and vegetated revetment

DESCRIPTION OF PROPOSED WORKS

- Planning and Detailed Design Development were completed in early 2022, the Project Team is undergoing permitting and approvals for Implementation in Summer 2022
- The Implementation works involves construction of stone riffle grade control above the sanitary sewer crossing and slope stabilization along the west bank through the construction of a vegetated geogrid reinforced soil slope

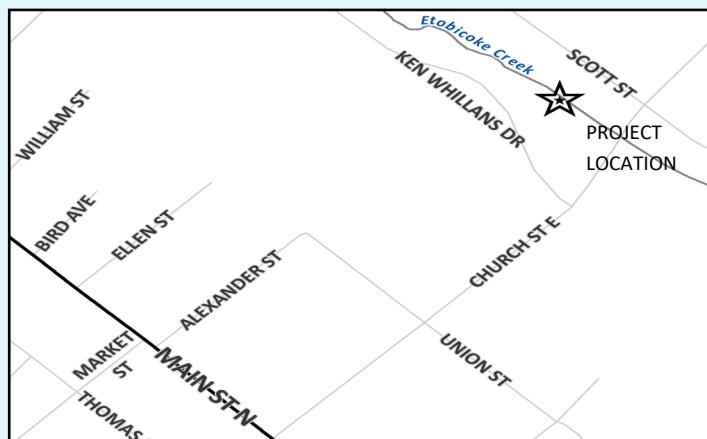
| WORK DESCRIPTION | SCHEDULE |
|--------------------------|----------------------------|
| Planning and Design | January 2021-February 2022 |
| Permitting and Approvals | November 2021-April 2022 |
| Implementation | May 2022-August 2022 |

KEN WHILLANS DRIVE PARK PROJECT SANITARY INFRASTRUCTURE PROTECTION



PROJECT OVERVIEW

- This Project has been planned as part of the **Peel Capital and Special Projects** portfolio
- The site is located within Ken Whillans Park in the City of Brampton, intersecting the West Etobicoke Creek
- TRCA Erosion Hazard Monitoring staff have been inspecting the site since 2016 as part of the Peel Infrastructure Hazard Monitoring Program
- The exposed encasement measured approximately 6m long with minor spalling noted along the upstream and downstream limits of the encasement
- TRCA retained engineering services to undertake a geomorphic, geotechnical and hydraulic investigation, including subsequent detailed design development
- Following discussions with the design Consultant the Project Scope of Work was revised to localize interim infrastructure protection due to the proposed Riverwalk EA Project in the site area
- The project will be implemented under a schedule A+ of the Municipal Class Environmental Assessment.



PROJECT BENEFITS

- Protect the Ken Whillans Drive sanitary sewer crossing from exposure to secure interim-term sewer protection
- Mitigate safety risks to the Public and Regional sanitary infrastructure
- Enhance surrounding riparian and aquatic habitat through channel and bank protection works

DESCRIPTION OF PROPOSED WORKS

- Planning and Detailed Design Development are underway with Final Designs expected in July 2022, the Project Team is further undergoing permitting and approvals for Implementation in Fall 2022
- Concept Design Development and subsequent Detailed Designs are in progress at the engineering Consultant, implementation is expected to include interim channel works to protect the sanitary crossing and minor bank works

| WORK DESCRIPTION | SCHEDULE |
|--------------------------|------------------------|
| Planning and Design | January 2019-June 2022 |
| Permitting and Approvals | January 2022-July 2022 |
| Implementation | July 2022-October 2022 |

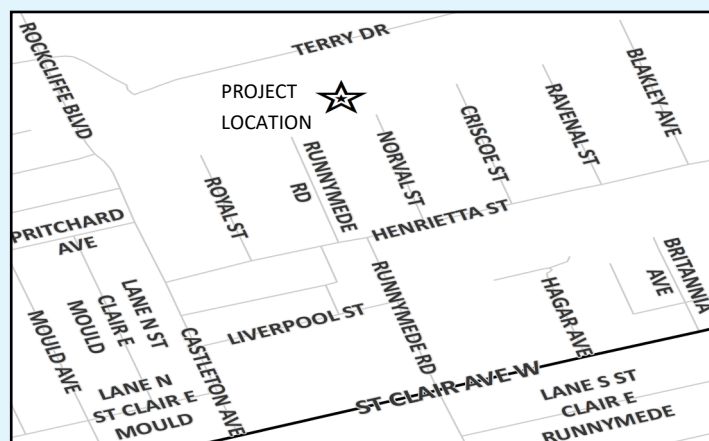
GAFFNEY PARK PROJECT

EROSION CONTROL AND DRAINAGE



PROJECT OVERVIEW

- This is a **Fee-for-Service** project funded by City of Toronto's Parks, Forestry, and Recreation Division
- The site is located within Gaffney Park in the City of Toronto, encompassing the trail section between Castleton Avenue and Ravenal Street, at the rear of the residential properties between 13 and 59 Terry Drive
- Following completion of the slope stabilization work by TRCA and other park improvement works by the City at the eastern limit of the park, erosion concerns were raised by the resident at 49 Terry Drive
- In Phase 1 Letter Agreement (LA) with the City, TRCA retained engineering services to undertake a geotechnical investigation and prepare design concepts for an erosion and drainage solution
- As part of Phase 2, TRCA retained engineering services to develop the detailed design and provide stormwater management analysis of the preferred solution
- In Spring 2022, the Project Team underwent the Request for Tender process to retaining construction services, to be conducted as Phase 3 LA with the City



PROJECT BENEFITS

- Erosion Control slope protection to the bottom slope residential properties at Terry Drive
- Stormwater and Drainage improvements to the Gaffney Park and surrounding tableland
- Improved public safety with reduced risk of failure to the pedestrian trail and adjacent slopes
- Enhancement of Gaffney Park with the installation of armourstone retaining walls, fencing and re-paving of the pedestrian trail

DESCRIPTION OF PROPOSED WORKS

- The Project Team is undergoing final permitting and awaiting Board approval to execute the Construction Tender, following final approvals TRCA with proceed with the Phase 3 LA Implementation in Fall 2022
- The works involve the installation of a drainage trench with a perforated pipe, re-grading of existing swales and potentially creating new swales, including re-aligned and cross-slope re-graded of the existing pedestrian trail

| WORK DESCRIPTION | SCHEDULE |
|------------------------------------|-------------------------|
| Planning and Design (Phase 1 & 2) | July 2019-January 2022 |
| Permitting and Approvals (Phase 2) | October 2021-June 2022 |
| Implementation (Phase 3) | June 2022-December 2022 |

CITY-WIDE WATERCOURSE EROSION REASSESSMENT STUDY



PROGRAM OVERVIEW

In 2022, Erosion Risk Management staff will reinspect 425 priority erosion hazard sites and structures that were previously assessed in the City of Brampton in support of the City-wide Watercourse Erosion Assessment Study. ERM staff will then utilize information gathered from the reinspection to prepare a technical memorandum that will summarize the results, comment on any change in priorities from a previous report that was prepared in 2018 and provide recommendations for consideration in 2022 and beyond.



PROGRAM BENEFITS

- Reinspect the following amount of high, medium, and low priority erosion hazard sites and structures that were previously assessed as part of the City-wide Watercourse Erosion Assessment Study:
 - 12 erosion hazard sites
 - 91 high priority sites
 - 67 medium priority sites
 - 255 low priority sites
- Immediately report any imminent/urgent threats to municipal infrastructure or public safety to the City for follow-up

DESCRIPTION OF WORK

- Inspections performed by trained Field Assistants that utilize tablets to enter information directly into an internet accessible database
- Imminent or urgent hazards to City of Brampton infrastructure are immediately flagged to identified staff
- A technical memorandum is submitted to the City at year-end

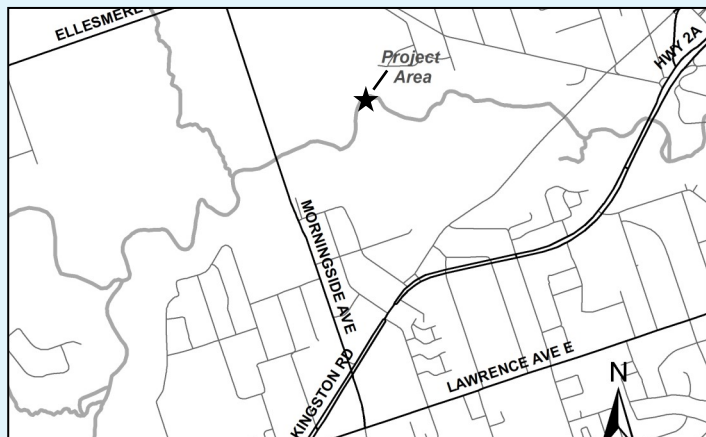
| WORK DESCRIPTION | SCHEDULE |
|---|------------------------------|
| Monitoring fieldwork | April 2022-September 2022 |
| Quality control of records and memo preparation | September 2022-December 2022 |

UNIVERSITY OF TORONTO SCARBOROUGH CAMPUS (AREA B) BANK STABILIZATION PROJECT



PROJECT OVERVIEW

- This is a **Fee-for-Service** project funded by the City of Toronto's Parks, Forestry and Recreation Division
- TRCA has been undertaking remedial works along Highland Creek between Morningside Avenue and Old Kingston Road since the late 1980s
- In 2013, the City of Toronto identified two erosion hazard sites along the University of Toronto Scarborough Campus (UTSC) property, including Area B, which is the site of a former pedestrian bridge crossing
- To address public safety concerns caused by the eroding bank, TRCA completed a realignment project in 2015 by constructing a raised trail at this site
- TRCA is now undertaking bank stabilization works to provide long term protection to the realigned trail



PROJECT BENEFITS

- Address public safety concerns related to erosion and provide long-term protection to the realigned raised trail along this section of Highland Creek
- Repair of the existing trail and outfalls within the work area
- Stabilization of the existing banks with installation of an armourstone wall and rip rap buttress along the outer bend of this section of Highland Creek

DESCRIPTION OF PROPOSED WORKS

- Planning, designs and permitting phases undertaken in 2021
- Construction began in late 2021 and is anticipated to be completed in Summer 2022
- The project includes the installation of vegetated buttress and armourstone wall treatments

| WORK DESCRIPTION | SCHEDULE |
|--------------------------|------------------------------|
| Planning and Design | February 2021-September 2021 |
| Permitting and Approvals | March 2021-October 2021 |
| Implementation | September 2021-Summer 2022 |