WELCOME

Appleby Creek Erosion Control, Detailed Design Phase 2
Lakeshore Road to Lake Ontario
DIGITAL PUBLIC INFORMATION CENTER
September 27, 2022

Your comments are encouraged and appreciated, as this will provide us an opportunity to address project issues and concerns.

Aquafor Beech Limited

CITY OF Burlington

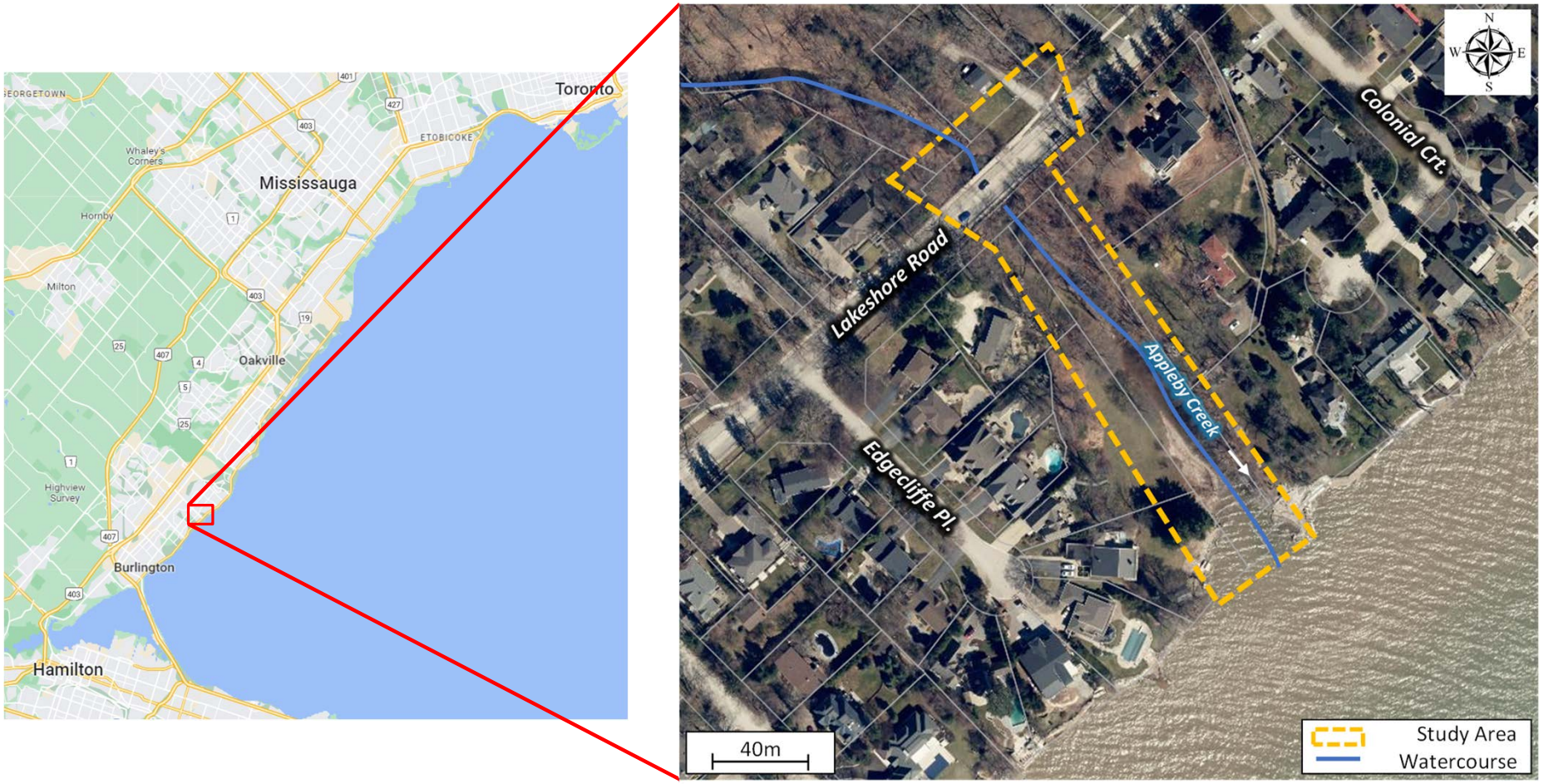
FIRST NATIONS LAND ACKNOWLEDGEMENT

Burlington as we know it today is rich in history and modern traditions of many First Nations and the Métis. From the Anishinaabeg to the Haudenosaunee, and the Métis – our lands spanning from Lake Ontario to the Niagara Escarpment are steeped in Indigenous history. The territory is mutually covered by the “Dish with One Spoon Wampum Belt Covenant”, an agreement between the Iroquois Confederacy, the Ojibway and other allied Nations to peaceably share and care for the resources around the Great Lakes.

We would like to acknowledge that the land on which we gather is part of the Treaty Lands and Territory of the “Mississaugas of the Credit”.

STUDY AREA

The study area extends ~30 meters upstream of the Lakeshore Road bridge crossing to the confluence with the Lake Ontario. The approximate channel length is 230 meters.



STUDY BACKGROUND

The City undertook a Municipal Class Environmental Assessment for erosion control on Appleby Creek between South Service Road to Lake Ontario. Active erosion of the Appleby Creek corridor has created risks, particularly to the Lakeshore Road, home owners, and the adjacent infrastructure.

The preferred alternative from the EA included:

1. Natural Channel Design / Re-Alignment to Protect Private Property
2. Enhanced Vegetated Buffer along the Western Bank to Protect Private Properties
3. Abutment Protection of the Lakeshore Road Bridge
4. Enhanced Permanent Erosion Protection on the Eastern Bank at Lake Ontario confluence

DIGITAL PUBLIC INFORMATION CENTRE PURPOSE

This digital Public Information Centre (PIC) is Designed to:

- Present detailed design plans, including tree removals, construction details, and access requirements.
- Prepare residents for pending construction and provide opportunity to ask questions to City representatives
- Provide input from members of the public on the detailed design and discuss concerns regarding construction activities

PROJECT HIGHLIGHTS

- Realigning and restoration of the creek, including natural channel design along the bed and banks;
- Construction of a vegetated boulders to provide shade to the creek and prevent future erosion;
- Protection to the Lakeshore Road bridge abutment with grouted boulders;
- Enhanced vegetated buffer along with post and paddle fence along the western bank;
- Buried armourstone wall with vegetated boulder along eastern bank; and
- Extensive native tree and shrub plantings within all impacted areas.

CONSTRUCTION ACCESS

- Access to the creek corridor off north side of Lakeshore Road.
- Channel bed and overbanks will be protected with the use of Steel Plates.

EXISTING CONDITIONS

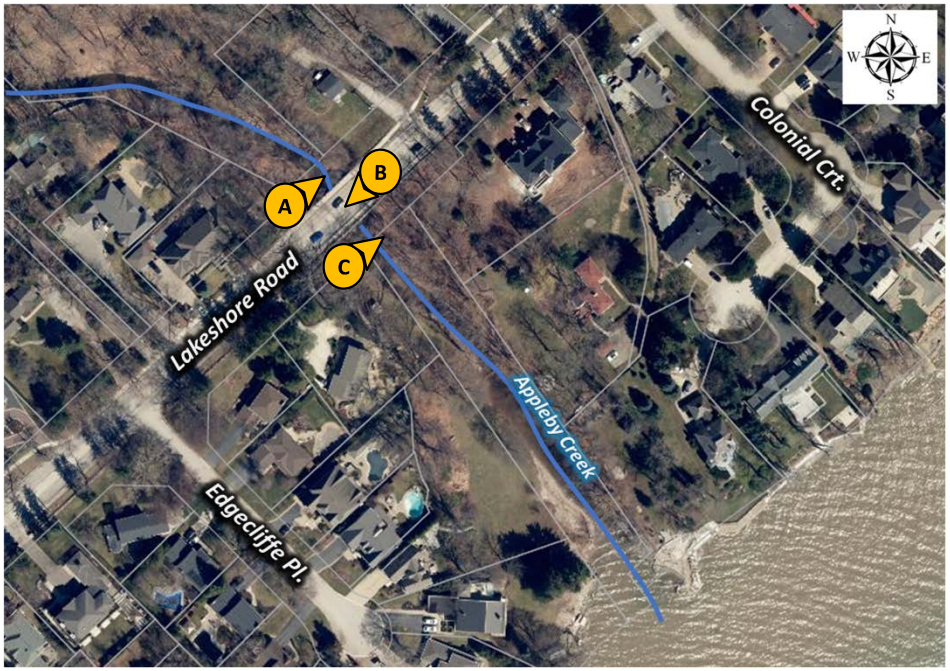


Photo A – Undermined Storm Outfall Upstream of Lakeshore Road.

Photo B – Failed Bridge Abutment Protection at Lakeshore Road Crossing.

Photo C - Evidence of Exposed Tree Roots and Leaning Trees.

EXISTING CONDITIONS

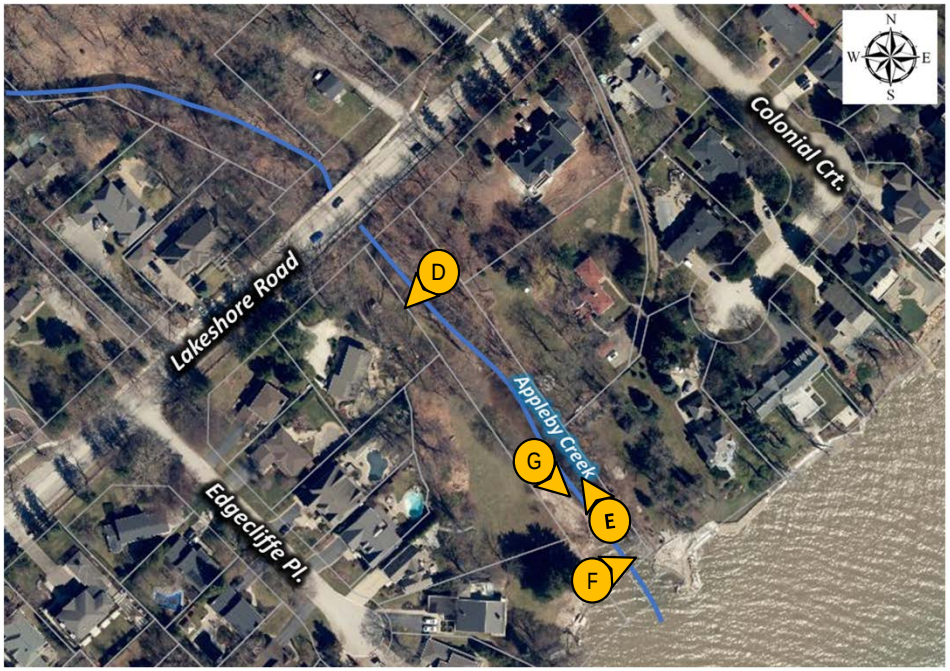


Photo D – Manicured Lawn on Private Property Experiencing Eroding Riprap Application.

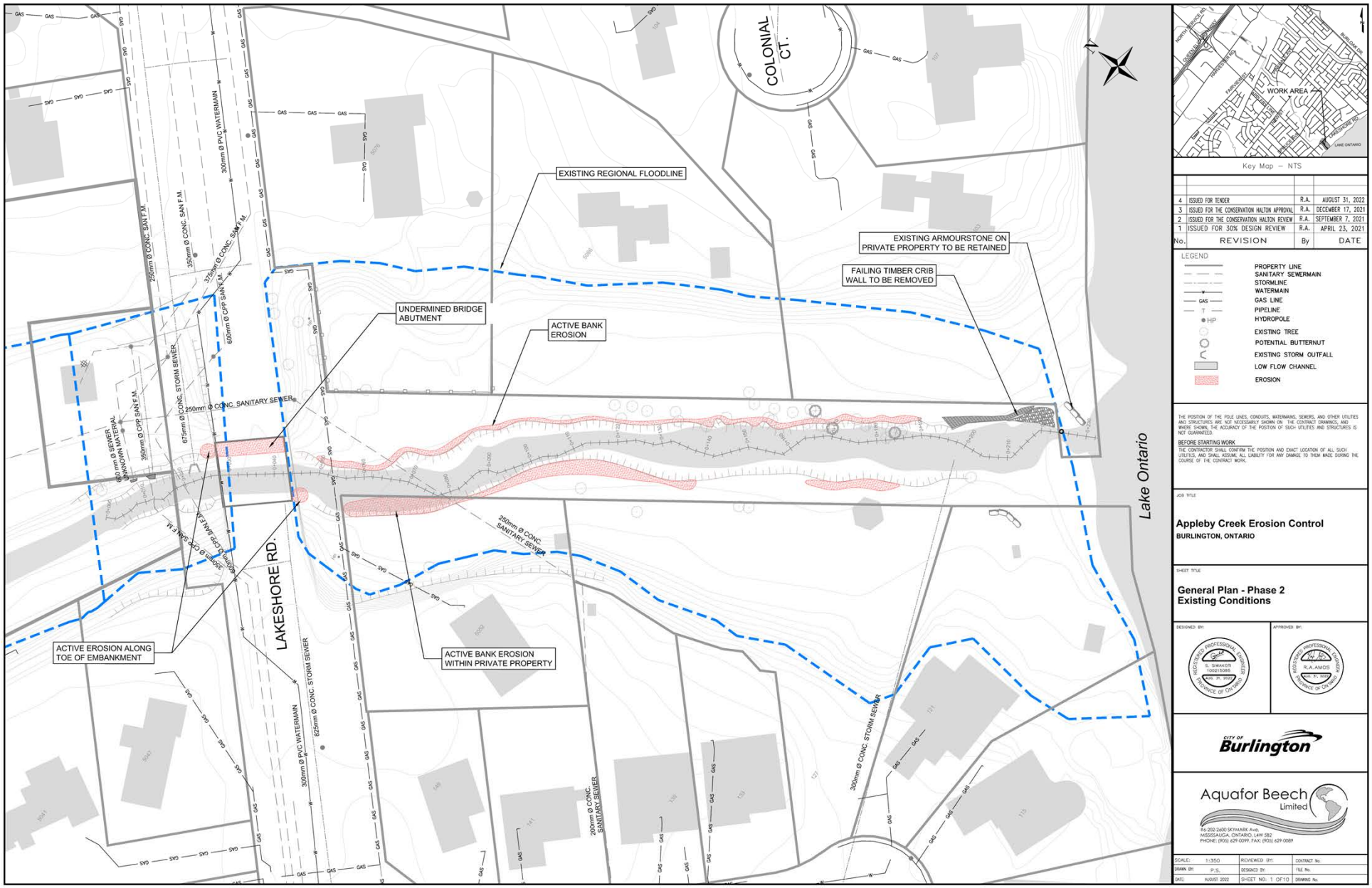
Photo E – Deposition of natural shoreline materials with river stone and shale/limestone fragments.

Photo F – Failing Crib Wall Erosion Protection Measure at the Confluence with Lake Ontario.

Photo G – Confluence of Appleby Creek and Lake Ontario.

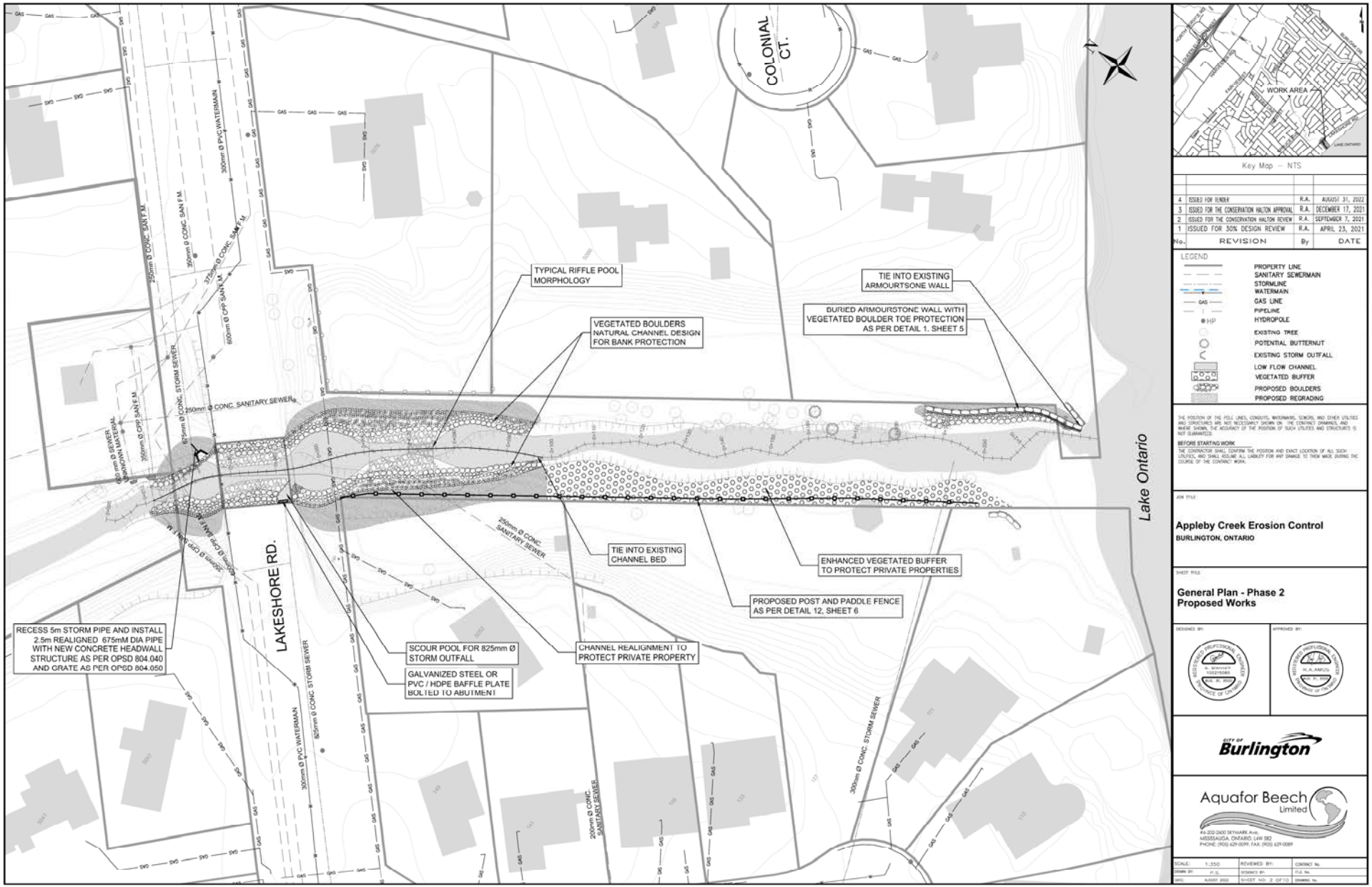
GENERAL PLAN – EXISTING CONDITIONS AND REMOVALS

Appleby Creek Erosion Control, Phase 2
Lakeshore Road to Lake Ontario



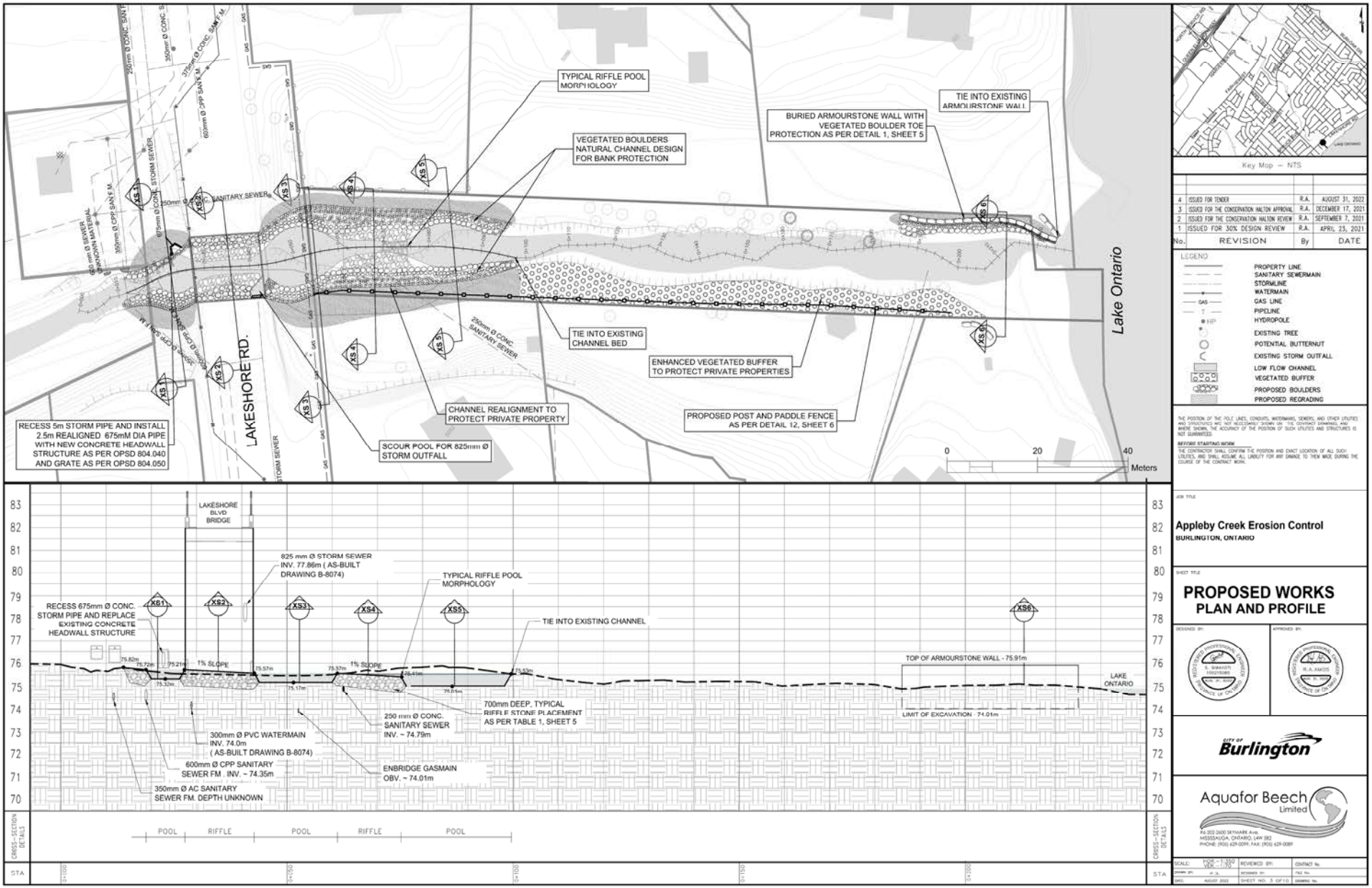
GENERAL PLAN – PROPOSED WORKS

Appleby Creek Erosion Control, Phase 2
Lakeshore Road to Lake Ontario



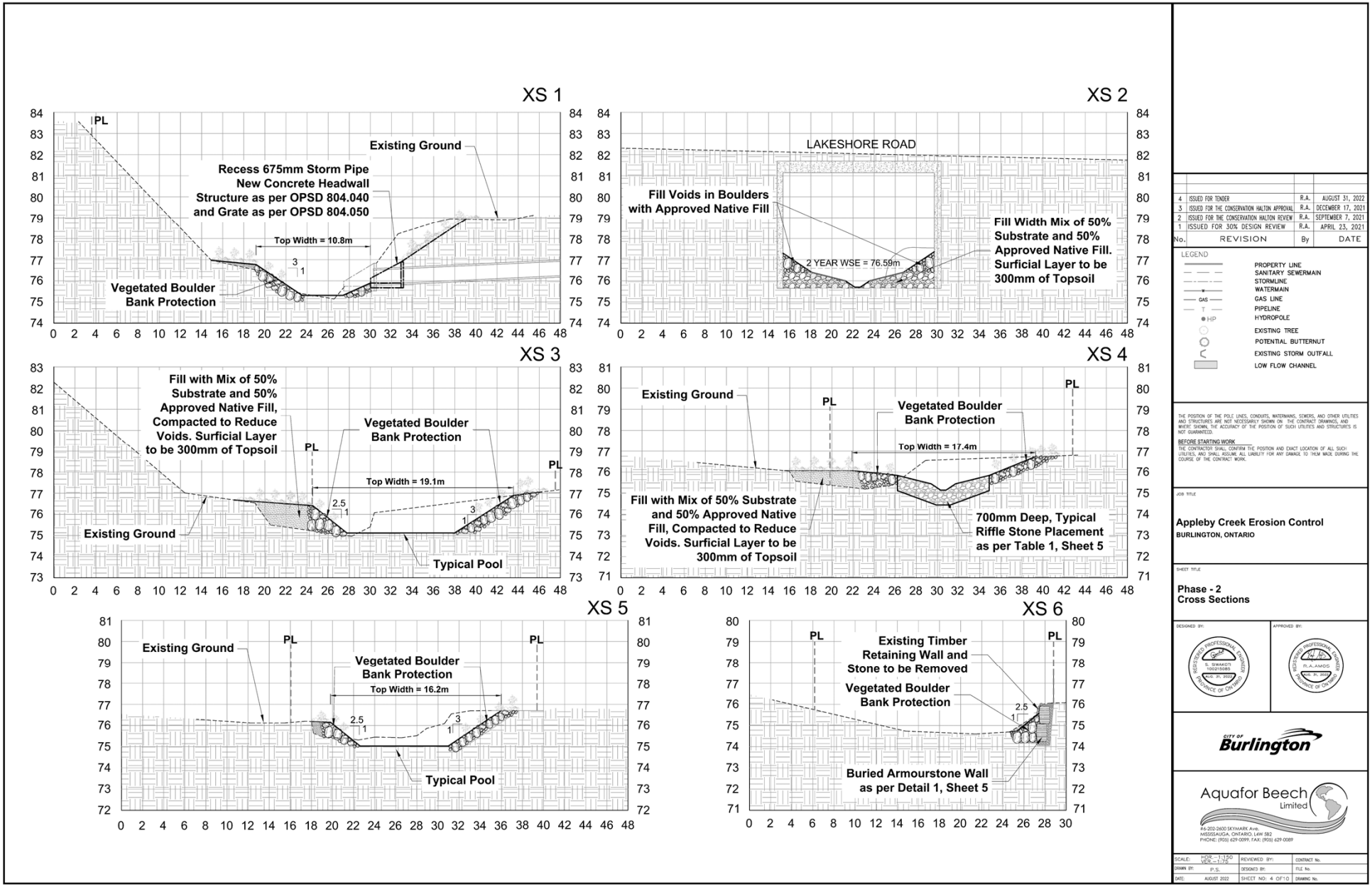
PLAN AND PROFILE – PROPOSED WORKS

Appleby Creek Erosion Control, Phase 2
Lakeshore Road to Lake Ontario



CROSS SECTIONS

Appleby Creek Erosion Control, Phase 2
Lakeshore Road to Lake Ontario



No.	REVISION	By	DATE
4	ISSUED FOR TENDER	R.A.	AUGUST 31, 2022
3	ISSUED FOR THE CONSERVATION HALTON APPROVAL	R.A.	DECEMBER 17, 2021
2	ISSUED FOR THE CONSERVATION HALTON REVIEW	R.A.	SEPTEMBER 7, 2021
1	ISSUED FOR 30% DESIGN REVIEW	R.A.	APRIL 23, 2021

LEGEND

- PROPERTY LINE
- SANITARY SEWERMAIN
- STORMLINE
- WATERMAIN
- GAS LINE
- PIPELINE
- HYDROPOLE
- EXISTING TREE
- POTENTIAL BUTTERNUT
- EXISTING STORM OUTFALL
- LOW FLOW CHANNEL

THE POSITION OF THE POLE LINES, CONDUITS, WATERMAINS, SEWERS, AND OTHER UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK
THE CONTRACTOR SHALL CONFIRM THE POSITION AND EXACT LOCATION OF ALL SUCH UTILITIES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM MADE DURING THE COURSE OF THE CONTRACT WORK.

JOB TITLE
Appleby Creek Erosion Control
BURLINGTON, ONTARIO

SHEET TITLE
Phase - 2
Cross Sections

DESIGNED BY: S. SIWAKOTI 100215080 NOV. 21, 2022 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

APPROVED BY: R.A. AMOS NOV. 21, 2022 PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

Aquafor Beech Limited
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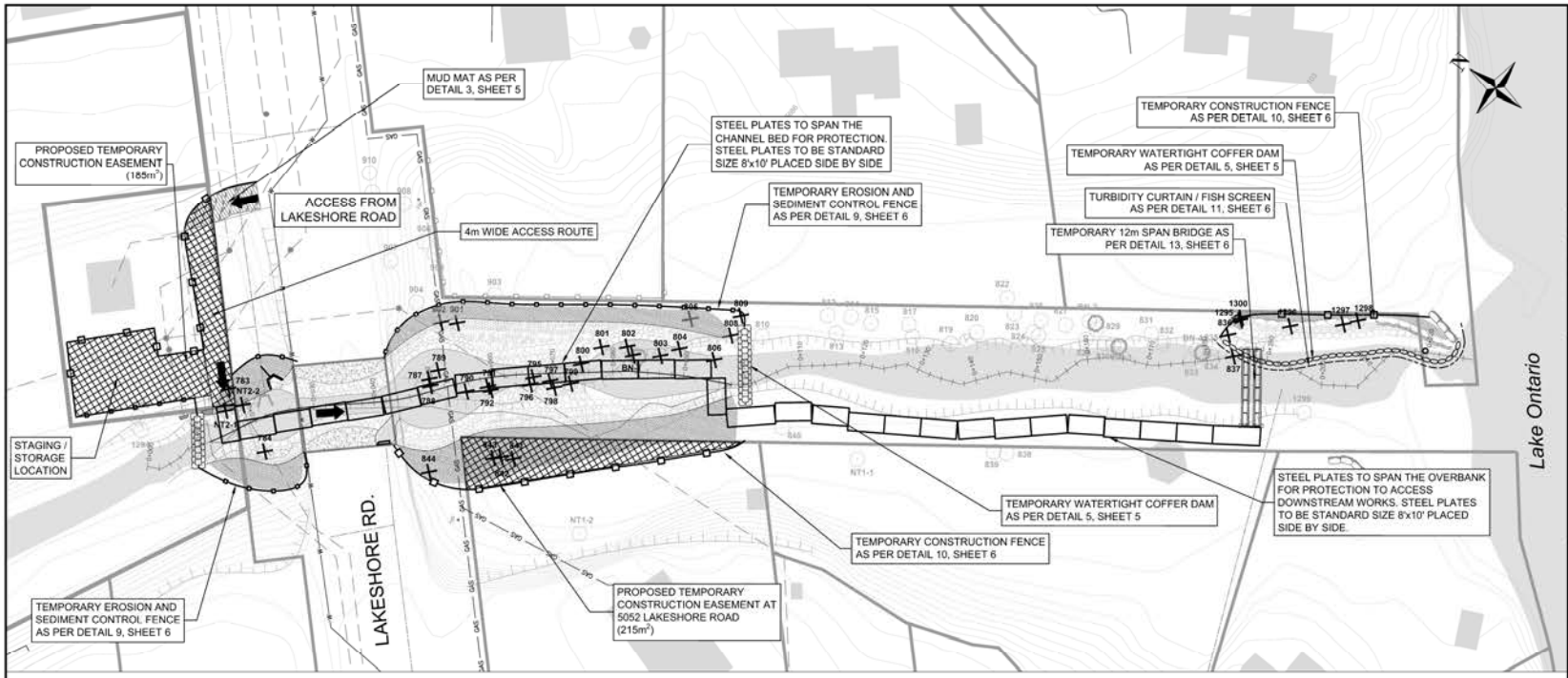
SCALE:	HOR. - 1:150 VER. - 1:75	REVIEWED BY:	CONTRACT No.
DRAWN BY:	P.S.	DESIGNED BY:	FILE No.
DATE:	AUGUST 2022	SHEET NO: 4 OF 10	DRAWING No.

EROSION AND FLOW MANAGEMENT

Appleby Creek Erosion Control, Phase 2
Lakeshore Road to Lake Ontario



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SANITARY SEWERMAIN
STORMLINE
WATERMAIN
GAS LINE
PIPELINE
HYDROPOLE
EXISTING TREE
POTENTIAL BUTTERNUT
EXISTING STORM OUTFALL
LOW FLOW CHANNEL
TEMPORARY CONSTRUCTION EASEMENT
PROPOSED REGRADING
TREE REMOVALS

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JOB TITLE
Appleby Creek Erosion Control
BURLINGTON, ONTARIO

SHEET TITLE
General Plan - Phase 2
Erosion & Sediment Control Plan

DESIGNED BY: S. SHAKOTI 100215080 PROVINCE OF ONTARIO
APPROVED BY: R.A. AMOS PROVINCE OF ONTARIO

CITY OF Burlington

Aquafor Beech Limited
#9-202-2800 SKYMARK Ave, MISSISSAUGA, ONTARIO, L4W 5B2
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SCALE:	1:300	REVIEWED BY:	CONTRACT No.
DRAWN BY:	P.S.	DESIGNED BY:	FILE No.
DATE:	AUGUST 2022	SHEET NO: 7 OF 10	DRAWING No.

GENERAL NOTES

1. TEMPORARY SEDIMENT CONTROLS TO BE INSTALLED PRIOR TO THE START OF CONSTRUCTION PER EROSION AND SEDIMENT PLAN THIS SHEET.
2. THE CONTRACTOR SHALL PROVIDE A QUALIFIED SEDIMENT AND EROSION CONTROL INSPECTOR ON SITE WHILE CONSTRUCTION IS UNDERWAY.
3. THE CONTRACTOR SHALL DELINEATE THE REQUIRED WORKING AREA ON-SITE PRIOR TO THE START OF WORK AND SHALL CONFINE OPERATIONS WITHIN THE DEFINED AREA.
4. THE CONTRACTOR SHALL COMPLETE A LAYOUT PRIOR TO START OF WORK.
5. TREE PROTECTION BARRIERS SHALL BE APPROVED BY THE SITE ENGINEER PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. ANY MODIFICATIONS TO THE TREE PROTECTION BARRIERS SHALL BE APPROVED BY A CERTIFIED ARBORIST.
6. TEMPORARY TOPSOIL AND/OR FILL MATERIAL STOCKPILE AREAS TO BE ENGLOSED WITH SEDIMENT CONTROL FENCE. SEE DETAIL THIS SHEET.
7. LOCATION OF STOCKPILE AREAS TO BE DETERMINED ON-SITE PRIOR TO CONSTRUCTION AND APPROVED BY THE ENGINEER.
8. WORKING AREAS, ACCESS REQUIREMENTS, AND TEMPORARY MATERIAL STORAGE AREAS TO BE MAINTAINED IN GOOD CONDITION BY THE CONTRACTOR AT ALL TIMES. AREAS AFFECTED BY THE CONTRACTOR'S ACTIVITIES TO BE REINSTATED TO THE EXISTING CONDITIONS OR BETTER.
9. ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REGULATIONS AND PERMITTING PROVISIONS OF CONSERVATION HALTON, AND THE CITY OF BURLINGTON. THESE ARE TO BE POSTED OR AVAILABLE AT THE CONSTRUCTION SITE.
10. ALL THE EXCAVATION AND GRADING WORKS ARE TO BE COMPLETED IN AS "DRY" AS POSSIBLE CONDITIONS.
11. NO RUNOFF FROM EXCAVATED OR UNVEGETATED AREAS SHALL BE DISCHARGED OFF SITE INTO ACTIVE AND/OR INACTIVE STORM SEWERS OR WATERCOURSES.
12. ALL ACCUMULATED SEDIMENTS TO BE REMOVED PRIOR TO THE REMOVAL OF CONTROLS AND DISPOSED OF IN AN APPROVED ON-SITE LOCATION (LOCATION TO BE DETERMINED IN THE FIELD).
13. ON-SITE EQUIPMENT REFUELING AND MAINTENANCE TO BE ONLY COMPLETED IN DESIGNATED AREAS, A MINIMUM OF 50m FROM THE WATERCOURSE.
14. SEDIMENT CONTROLS TO BE INSPECTED DAILY AND AFTER EACH RAINFALL EVENT. SEDIMENT CONTROLS TO BE MAINTAINED AND REPAIRED UNTIL COMPLETION OF CONSTRUCTION AND SITE RESTORATION.
15. ALL SITE RESTORATION TO BE IN ACCORDANCE WITH THE RESTORATION PLAN AND DETAILS.
16. ALL ROADWAYS AND SIDEWALKS TO BE CLEANED OF SEDIMENTS RESULTING FROM CONSTRUCTION TRAFFIC FROM THE SITE EACH DAY.
17. REMOVE TEMPORARY SEDIMENT CONTROLS FOLLOWING COMPLETION OF CONSTRUCTION AND SITE RESTORATION. STABILIZE SITE AND REINSTATE AFFECTED AREAS TO EXISTING CONDITIONS OR BETTER.

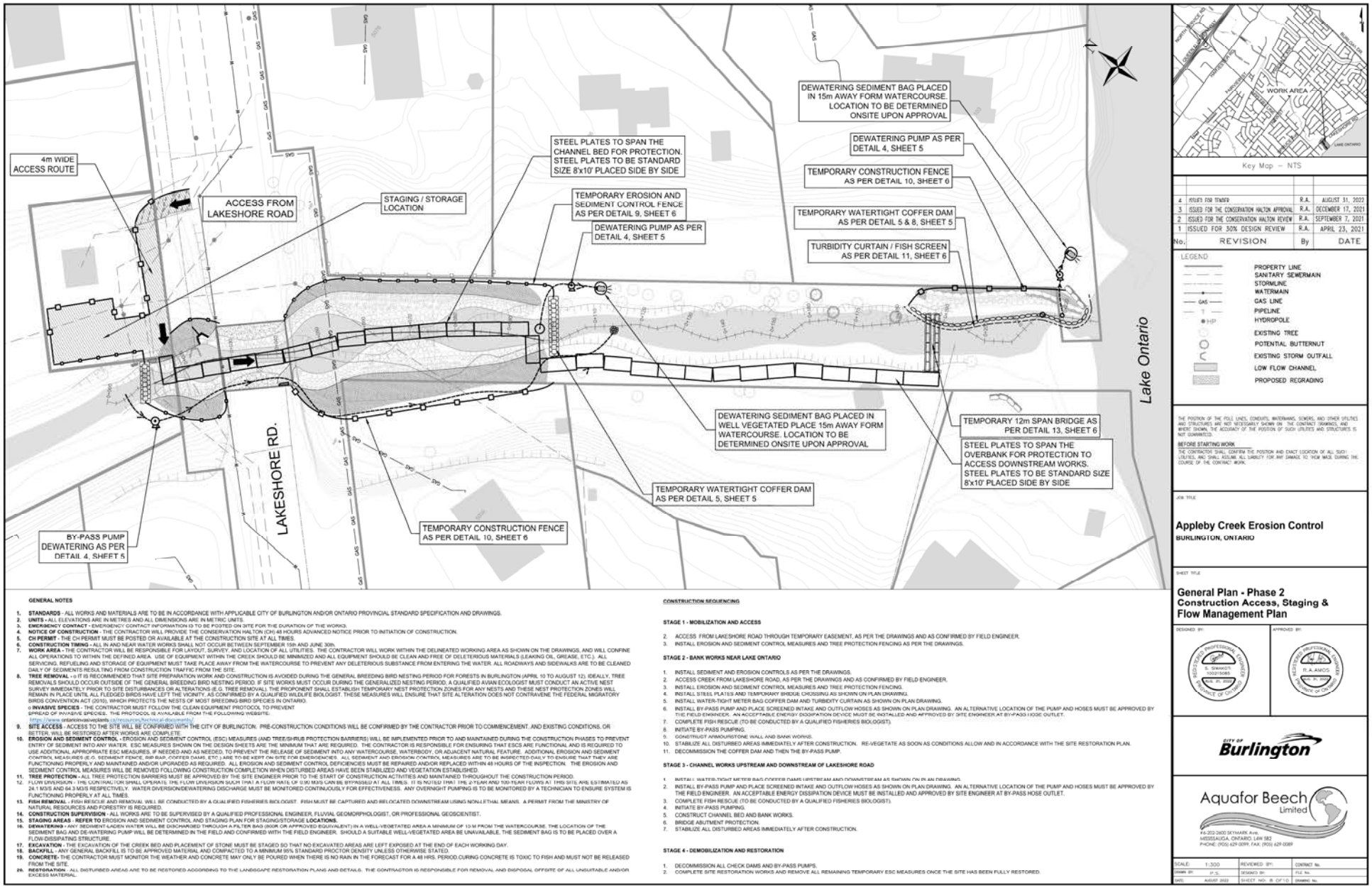
TABLE 2 - TREE INVENTORY AND MANAGEMENT

Tag #	Species Botanical Name	Species Common Name	DBH (cm)	Condition	Retain/ Remove
783	*Acer platanoides*	Norway Maple	35.0	Fair-Good	Remove
784	*Acer platanoides*	Norway Maple	18.0	Fair-Good	Remove
787	*Salix x fragilis*	Hybrid Crack Willow	74.3	Fair-Poor	Remove
788	*Acer platanoides*	Norway Maple	25.0	Good	Remove
789	*Acer platanoides*	Norway Maple	23.0	Good	Remove
790	*Fraxinus americana*	White Ash	24.0	Dead	Remove
791	*Acer platanoides*	Norway Maple	28.0	Fair-Good	Remove
792	*Malus spp.*	Common Apple	33.9	Fair	Remove
795	*Fraxinus americana*	White Ash	33.0	Dead	Remove
796	*Acer platanoides*	Norway Maple	23.0	Good	Remove
798	*Aesculus hippocastenum*	Horsechestnut	17.0	Fair	Remove
799	*Acer platanoides*	Norway Maple	17.0	Fair-Good	Remove
800	*Acer platanoides*	Norway Maple	16.0	Fair-Good	Remove
801	*Acer platanoides*	Norway Maple	13.5	Fair-Good	Remove
802	*Acer platanoides*	Norway Maple	20.0	Fair-Good	Remove
803	*Fraxinus americana*	White Ash	12.0	Fair-Good	Remove
804	*Acer platanoides*	Norway Maple	22.0	Fair-Good	Remove
805	*Salix x fragilis*	Hybrid Crack Willow	83.0	Fair	Remove
806	*Salix x fragilis*	Hybrid Crack Willow	54.0	Fair-Good	Remove
808	*Acer platanoides*	Norway Maple	32.0	Fair-Good	Remove
809	*Ulmus americana*	White Elm	19.0	Fair-Good	Remove
810	*Acer platanoides*	Norway Maple	41.0	Fair-Good	Retain
812	*Fraxinus americana*	White Ash	17.0	Fair-Good	Retain
813	*Acer platanoides*	Norway Maple	33.0	Fair-Good	Retain
814	*Salix x fragilis*	Hybrid Crack Willow	132.0	Fair-Good	Retain
815	*Acer platanoides*	Norway Maple	37.0	Good	Retain
816	*Acer platanoides*	Norway Maple	17.0	Fair	Retain
817	*Acer platanoides*	Norway Maple	14.0	Fair	Retain
819	*Acer platanoides*	Norway Maple	13.0	Fair	Retain
820	*Acer platanoides*	Norway Maple	39.0	Fair-Good	Retain
822	*Juglans nigra*	Black Walnut	50.0	Good	Retain
823	*Acer platanoides*	Norway Maple	23.0	Fair	Retain
824	*Acer platanoides*	Norway Maple	32.0	Fair-Good	Retain
825	*Acer platanoides*	Norway Maple	28.0	Fair-Good	Retain
826	*Salix x fragilis*	Hybrid Crack Willow	90.0	Fair-Good	Retain
827	*Acer platanoides*	Norway Maple	18.0	Fair-Good	Retain
828	*Acer platanoides*	Norway Maple	14.5	Fair-Good	Retain
829	*Acer platanoides*	Norway Maple	21.0	Fair-Good	Retain
830	*Acer platanoides*	Norway Maple	16.0	Fair	Retain
831	*Acer platanoides*	Norway Maple	42.0	Good	Retain
832	*Acer platanoides*	Norway Maple	52.0	Good	Retain
833	*Acer platanoides*	Norway Maple	15.0	Fair-Good	Retain
834	*Acer platanoides*	Norway Maple	13.0	Fair	Retain
835	*Fraxinus americana*	White Ash	16.0	Fair	Retain
836	*Salix x fragilis*	Hybrid Crack Willow	138.7	Fair-Good	Remove
837	*Acer platanoides*	Norway Maple	16.0	Fair	Remove
838	*Acer platanoides*	Norway Maple	54.9	Good	Remove
839	*Acer platanoides*	Norway Maple	57.0	Fair-Good	Retain
840	*Salix x fragilis*	Hybrid Crack Willow	76.3	Fair-Good	Retain
841	*Fraxinus americana*	White Ash	16.0	Fair-Poor	Remove
842	*Acer negundo*	Manitoba Maple	16.0	Fair-Good	Remove
843	*Fraxinus americana*	White Ash	11.0	Fair-Poor	Remove
844	*Acer platanoides*	Norway Maple	45.3	Fair-Good	Remove
901	*Acer platanoides*	Norway Maple	25.0	Fair-Good	Remove
902	*Salix x fragilis*	Hybrid Crack Willow	94.0	Good	Remove
903	*Acer platanoides*	Norway Maple	63.0	Good	Retain
904	*Acer platanoides*	Norway Maple	39.7	Fair-Good	Retain
905	*Acer platanoides*	Norway Maple	55.0	Good	Retain
906	*Acer rubrum*	Red Maple	54.0	Fair	Retain
907	*Acer platanoides*	Norway Maple	15.0	Good	Retain
908	*Acer saccharum*	Sugar Maple	29.0	Good	Retain
909	*Acer platanoides*	Norway Maple	42.0	Fair-Good	Retain
910	*Ulmus pumila*	Siberian Elm	59.0	Good	Retain
1293	*Acer platanoides*	Norway Maple	21.5	Good	Retain
1294	*Acer saccharum*	Sugar Maple	22.0	Good	Retain
1295	*Salix x fragilis*	Hybrid Crack Willow	148.7	Good	Remove
1296	*Juglans nigra*	Black Walnut	50.5	Good	Remove
1297	*Acer platanoides*	Norway Maple	32.0	Good	Remove
1298	*Juglans nigra*	Black Walnut	48.0	Fair-Good	Remove
1299	*Acer platanoides*	Norway Maple	29.5	Fair	Retain
1300	*Acer platanoides*	Norway Maple	25.0	Good	Remove
BN-1	*Juglans cinerea*	Butternut	53.0	Fair	Remove
BN-2	*Juglans cinerea*	Butternut	51.0	Fair-Good	Retain
BN-3	*Juglans cinerea*	Butternut	45.0	Fair-Good	Retain
BN-4	*Juglans cinerea*	Butternut	38.0	Fair-Good	Retain
NT1-1	*Acer platanoides*	Norway Maple	50.0	Good	Retain
NT1-2	*Acer saccharinum*	Silver Maple	60.0	Fair	Retain
NT2-1	*Acer platanoides*	Norway Maple	33.3	Fair-Good	Remove
NT2-2	*Acer platanoides*	Norway Maple	35.0	Fair-Good	Remove

TOTAL TREE REMOVALS = 38
TOTAL DBH REMOVAL = 1465.3cm

CONSTRUCTION STAGING, ACCESS PLAN, STAGING & FLOW MANAGEMENT PLAN

Appleby Creek Erosion Control, Phase 2
Lakeshore Road to Lake Ontario



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LEGEND

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JOB TITLE
Appleby Creek Erosion Control
BURLINGTON, ONTARIO

SHEET TITLE
General Plan - Phase 2 Construction Access, Staging & Flow Management Plan

DESIGNED BY: S. SHAKOTI 100215080 APPROVED BY: R.A.AMOS

CITY OF Burlington

Aquafor Beech Limited
#6-202-2600 SKYMARK Ave,
MISSISSAUGA, ONTARIO, L4W 5B2
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SCALE: 1:300	REVIEWED BY:	CONTRACT No.
DRAWN BY: P.S.	DESIGNED BY:	FILE No.
DATE: AUGUST 2022	SHEET NO. 8 OF 10	DRAWING No.

GENERAL NOTES

1. **STANDARDS** - ALL WORKS AND MATERIALS ARE TO BE IN ACCORDANCE WITH APPLICABLE CITY OF BURLINGTON AND/OR ONTARIO PROVINCIAL STANDARD SPECIFICATION AND DRAWINGS.
2. **UNITS** - ALL ELEVATIONS ARE IN METRES AND ALL DIMENSIONS ARE IN METRIC UNITS.
3. **EMERGENCY CONTACT** - EMERGENCY CONTACT INFORMATION IS TO BE POSTED ON SITE FOR THE DURATION OF THE WORKS.
4. **NOTICE OF CONSTRUCTION** - THE CONTRACTOR WILL PROVIDE THE CONSERVATION HALTON (CH) 48 HOURS ADVANCED NOTICE PRIOR TO INITIATION OF CONSTRUCTION.
5. **CH PERMIT** - THE CH PERMIT MUST BE POSTED OR AVAILABLE AT THE CONSTRUCTION SITE AT ALL TIMES.
6. **CONSTRUCTION TIMING** - ALL IN AND NEAR WATER WORKS SHALL NOT OCCUR BETWEEN SEPTEMBER 15th AND JUNE 30th.
7. **WORK AREA** - THE CONTRACTOR WILL BE RESPONSIBLE FOR LAYOUT, SURVEY, AND LOCATION OF ALL UTILITIES. THE CONTRACTOR WILL WORK WITHIN THE DELINEATED WORKING AREA AS SHOWN ON THE DRAWINGS, AND WILL CONFINE ALL OPERATIONS TO WITHIN THE DEFINED AREA. USE OF EQUIPMENT WITHIN THE CREEK SHOULD BE MINIMIZED AND ALL EQUIPMENT SHOULD BE CLEAN AND FREE OF DELETERIOUS MATERIALS (LEAKING OIL, GREASE, ETC.). ALL SERVICING, REFUELING AND STORAGE OF EQUIPMENT MUST TAKE PLACE AWAY FROM THE WATERCOURSE TO PREVENT ANY DELETERIOUS SUBSTANCE FROM ENTERING THE WATER. ALL ROADWAYS AND SIDEWALKS ARE TO BE CLEANED DAILY OF SEDIMENTS RESULTING FROM CONSTRUCTION TRAFFIC FROM THE SITE.
8. **TREE REMOVAL** - o IT IS RECOMMENDED THAT SITE PREPARATION WORK AND CONSTRUCTION IS AVOIDED DURING THE GENERAL BREEDING BIRD NESTING PERIOD FOR FORESTS IN BURLINGTON (APRIL 10 TO AUGUST 12). IDEALLY, TREE REMOVALS SHOULD OCCUR OUTSIDE OF THE GENERAL BREEDING BIRD NESTING PERIOD. IF SITE WORKS MUST OCCUR DURING THE GENERALIZED NESTING PERIOD, A QUALIFIED AVIAN ECOLOGIST MUST CONDUCT AN ACTIVE NEST SURVEY IMMEDIATELY PRIOR TO SITE DISTURBANCES OR ALTERATIONS (E.G. TREE REMOVAL). THE PROPONENT SHALL ESTABLISH TEMPORARY NEST PROTECTION ZONES FOR ANY NESTS AND THESE NEST PROTECTION ZONES WILL REMAIN IN PLACE UNTIL ALL FLEDGED BIRDS HAVE LEFT THE VICINITY, AS CONFIRMED BY A QUALIFIED WILDLIFE BIOLOGIST. THESE MEASURES WILL ENSURE THAT SITE ALTERATION DOES NOT CONTRAVENE THE FEDERAL MIGRATORY BIRDS CONVENTION ACT (2015), WHICH PROTECTS THE NESTS OF MOST BREEDING BIRD SPECIES IN ONTARIO.
   - **INVASIVE SPECIES** - THE CONTRACTOR MUST FOLLOW THE CLEAN EQUIPMENT PROTOCOL TO PREVENT SPREAD OF INVASIVE SPECIES. THE PROTOCOL IS AVAILABLE FROM THE FOLLOWING WEBSITE: https://www.ontarioinvasiveplants.ca/resources/technical-documents/
9. **SITE ACCESS** - ACCESS TO THE SITE WILL BE CONFIRMED WITH THE CITY OF BURLINGTON. PRE-CONSTRUCTION CONDITIONS WILL BE CONFIRMED BY THE CONTRACTOR PRIOR TO COMMENCEMENT. AND EXISTING CONDITIONS, OR BETTER, WILL BE RESTORED AFTER WORKS ARE COMPLETE.
10. **EROSION AND SEDIMENT CONTROL** - EROSION AND SEDIMENT CONTROL (ESC) MEASURES (AND TREE/SHRUB PROTECTION BARRIERS) WILL BE IMPLEMENTED PRIOR TO AND MAINTAINED DURING THE CONSTRUCTION PHASES TO PREVENT ENTRY OF SEDIMENT INTO ANY WATER. ESC MEASURES SHOWN ON THE DESIGN SHEETS ARE THE MINIMUM THAT ARE REQUIRED. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ESCS ARE FUNCTIONAL AND IS REQUIRED TO USE ADDITIONAL APPROPRIATE ESC MEASURES, IF NEEDED AND AS NEEDED, TO PREVENT THE RELEASE OF SEDIMENT INTO ANY WATERCOURSE, WATERBODY, OR ADJACENT NATURAL FEATURE. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES (E.G. SEDIMENT FENCE, RIP RAP, CONTROL DAMS, ETC.) ARE TO BE KEPT ON SITE FOR EMERGENCIES. ALL SEDIMENT AND EROSION CONTROL MEASURES ARE TO BE INSPECTED DAILY TO ENSURE THAT THEY ARE FUNCTIONING PROPERLY AND MAINTAINED AND/OR UPGRADED AS REQUIRED. ALL EROSION AND SEDIMENT CONTROL DEFICIENCIES MUST BE REPAIRED AND/OR REPLACED WITHIN 48 HOURS OF THE INSPECTION. THE EROSION AND SEDIMENT CONTROL MEASURES WILL BE REMOVED FOLLOWING CONSTRUCTION COMPLETION WHEN DISTURBED AREAS HAVE BEEN STABILIZED AND VEGETATION ESTABLISHED.
11. **TREE PROTECTION** - ALL TREE PROTECTION BARRIERS MUST BE APPROVED BY THE SITE ENGINEER PRIOR TO THE START OF CONSTRUCTION ACTIVITIES AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
12. FLOW DIVERSION - THE CONTRACTOR SHALL OPERATE THE FLOW DIVERSION SUCH THAT A FLOW RATE OF 0.90 M3/S CAN BE BYPASSED AT ALL TIMES. IT IS NOTED THAT THE 2-YEAR AND 100-YEAR FLOWS AT THIS SITE ARE ESTIMATED AS 24.1 M3/S AND 64.3 M3/S RESPECTIVELY. WATER DIVERSION/DEWATERING DISCHARGE MUST BE MONITORED CONTINUOUSLY FOR EFFECTIVENESS. ANY OVERNIGHT PUMPING IS TO BE MONITORED BY A TECHNICIAN TO ENSURE SYSTEM IS FUNCTIONING PROPERLY AT ALL TIMES.
13. **FISH REMOVAL** - FISH RESCUE AND REMOVAL WILL BE CONDUCTED BY A QUALIFIED FISHERIES BIOLOGIST. FISH MUST BE CAPTURED AND RELOCATED DOWNSTREAM USING NON-LETHAL MEANS. A PERMIT FROM THE MINISTRY OF NATURAL RESOURCES AND FORESTRY IS REQUIRED.
14. **CONSTRUCTION SUPERVISION** - ALL WORKS ARE TO BE SUPERVISED BY A QUALIFIED PROFESSIONAL ENGINEER, FLUVIAL GEOMORPHOLOGIST, OR PROFESSIONAL GEOSCIENTIST.
15. **STAGING AREAS - REFER TO** EROSION AND SEDIMENT CONTROL AND STAGING PLAN FOR STAGING/STORAGE **LOCATIONS.**
16. **DEWATERING** - ANY SEDIMENT-LADEN WATER WILL BE DISCHARGED THROUGH A FILTER BAG (600R OR APPROVED EQUIVALENT) IN A WELL-VEGETATED AREA A MINIMUM OF 10 M FROM THE WATERCOURSE. THE LOCATION OF THE SEDIMENT BAG AND DE-WATERING PUMP WILL BE DETERMINED IN THE FIELD AND CONFIRMED WITH THE FIELD ENGINEER. SHOULD A SUITABLE WELL-VEGETATED AREA BE UNAVAILABLE, THE SEDIMENT BAG IS TO BE PLACED OVER A FLOW-DISSIPATING STRUCTURE.
17. **EXCAVATION** - THE EXCAVATION OF THE CREEK BED AND PLACEMENT OF STONE MUST BE STAGED SO THAT NO EXCAVATED AREAS ARE LEFT EXPOSED AT THE END OF EACH WORKING DAY.
18. **BACKFILL** - ANY GENERAL BACKFILL IS TO BE APPROVED MATERIAL AND COMPACTED TO A MINIMUM 95% STANDARD PROCTOR DENSITY UNLESS OTHERWISE STATED.
19. **CONCRETE**- THE CONTRACTOR MUST MONITOR THE WEATHER AND CONCRETE MAY ONLY BE POURED WHEN THERE IS NO RAIN IN THE FORECAST FOR A 48 HRS. PERIOD.CURING CONCRETE IS TOXIC TO FISH AND MUST NOT BE RELEASED FROM THE SITE.
20. **RESTORATION** - ALL DISTURBED AREAS ARE TO BE RESTORED ACCORDING TO THE LANDSCAPE RESTORATION PLANS AND DETAILS. THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OFFSITE OF ALL UNSUITABLE AND/OR EXCESS MATERIAL.

CONSTRUCTION SEQUENCING

STAGE 1 - MOBILIZATION AND ACCESS

2. ACCESS FROM LAKESHORE ROAD THROUGH TEMPORARY EASEMENT, AS PER THE DRAWINGS AND AS CONFIRMED BY FIELD ENGINEER.
3. INSTALL EROSION AND SEDIMENT CONTROL MEASURES AND TREE PROTECTION FENCING AS PER THE DRAWINGS.

STAGE 2 - BANK WORKS NEAR LAKE ONTARIO

1. INSTALL SEDIMENT AND EROSION CONTROLS AS PER THE DRAWINGS.
2. ACCESS CREEK FROM LAKESHORE ROAD, AS PER THE DRAWINGS AND AS CONFIRMED BY FIELD ENGINEER.
3. INSTALL EROSION AND SEDIMENT CONTROL MEASURES AND TREE PROTECTION FENCING.
4. INSTALL STEEL PLATES AND TEMPORARY BRIDGE CROSSING AS SHOWN ON PLAN DRAWING.
5. INSTALL WATER-TIGHT METER BAG COFFER DAM AND TURBIDITY CURTAIN AS SHOWN ON PLAN DRAWING.
6. INSTALL BY-PASS PUMP AND PLACE SCREENED INTAKE AND OUTFLOW HOSES AS SHOWN ON PLAN DRAWING. AN ALTERNATIVE LOCATION OF THE PUMP AND HOSES MUST BE APPROVED BY THE FIELD ENGINEER. AN ACCEPTABLE ENERGY DISSIPATION DEVICE MUST BE INSTALLED AND APPROVED BY SITE ENGINEER AT BY-PASS HOSE OUTLET.
7. COMPLETE FISH RESCUE (TO BE CONDUCTED BY A QUALIFIED FISHERIES BIOLOGIST).
8. INITIATE BY-PASS PUMPING.
9. CONSTRUCT ARMOURSTONE WALL AND BANK WORKS.
10. STABILIZE ALL DISTURBED AREAS IMMEDIATELY AFTER CONSTRUCTION. RE-VEGETATE AS SOON AS CONDITIONS ALLOW AND IN ACCORDANCE WITH THE SITE RESTORATION PLAN.
11. DECOMMISSION THE COFFER DAM AND THEN THE BY-PASS PUMP.

STAGE 3 - CHANNEL WORKS UPSTREAM AND DOWNSTREAM OF LAKESHORE ROAD

1. INSTALL WATER-TIGHT METER BAG COFFER DAMS UPSTREAM AND DOWNSTREAM AS SHOWN ON PLAN DRAWING.
2. INSTALL BY-PASS PUMP AND PLACE SCREENED INTAKE AND OUTFLOW HOSES AS SHOWN ON PLAN DRAWING. AN ALTERNATIVE LOCATION OF THE PUMP AND HOSES MUST BE APPROVED BY THE FIELD ENGINEER. AN ACCEPTABLE ENERGY DISSIPATION DEVICE MUST BE INSTALLED AND APPROVED BY SITE ENGINEER AT BY-PASS HOSE OUTLET.
3. COMPLETE FISH RESCUE (TO BE CONDUCTED BY A QUALIFIED FISHERIES BIOLOGIST).
4. INITIATE BY-PASS PUMPING.
5. CONSTRUCT CHANNEL BED AND BANK WORKS.
6. BRIDGE ABUTMENT PROTECTION.
7. STABILIZE ALL DISTURBED AREAS IMMEDIATELY AFTER CONSTRUCTION.

STAGE 4 - DEMOBILIZATION AND RESTORATION

1. DECOMMISSION ALL CHECK DAMS AND BY-PASS PUMPS.
2. COMPLETE SITE RESTORATION WORKS AND REMOVE ALL REMAINING TEMPORARY ESC MEASURES ONCE THE SITE HAS BEEN FULLY RESTORED.

RESTORATION PLAN

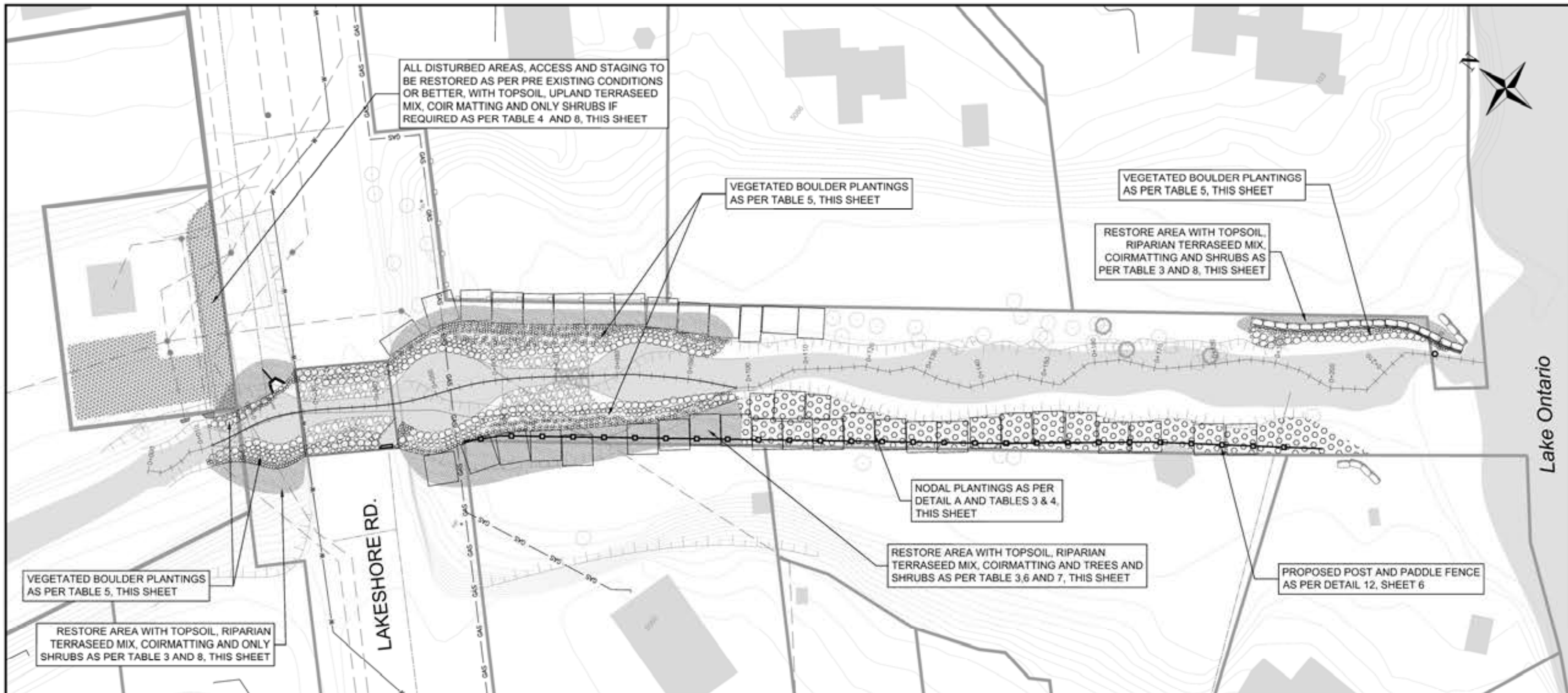


TABLE 3 - TERRASEED MIX - RIPARIAN

Species		Amount	Application Rate
Scientific Name	Common Name		
Anemonastrum canadense	Canada Anemone	5%	22-25 kg/ha
Carex bebbii	Bebb's Sedge	10%	
Grass-leaved Goldenrod	Euthamia graminifoila	5%	
Eutrochium maculatum	Spotted Joe-Pyeweed	10%	
Juncus tenuis	Path Rush	10%	
Scirpus atrovirens	Dark Green Bulrush	6%	
Bidens cernua	Nodding Beggarticks	25%	
Glyceria striata	Fowl Mannagrass	25%	
Hydrophyllum virginianum	Virginia Waterleaf	4%	
	TOTAL	100%	
Cover crop (After March 31st and Before October 31st			
Avena sativa	Annual Oats	60%	33 kg/ha
Elymus canadensis	Canada Wildrye	40%	
	TOTAL	100%	
Cover crop (Frost Risk)			
Avena sativa	Annual Oats	100%	33 kg/ha

TABLE 4 - TERRASEED MIX - UPLAND

Species		Amount	Application Rate
Scientific Name	Common Name		
Asclepias syriaca	Common Milkweed	20%	25-30 kg/ha
Asclepias tuberosa	Butterfly Milkweed	10%	
Danthonia spicata	Poverty Oat Grass	5%	
Hystrix patula	Bottle-brush Grass	20%	
Monarda fistulosa	Wild Bergamot	5%	
Rudbeckia hirta	Black-eyed Susan	20%	
Symphyotrichum novae-angliae	New-England Aster	5%	
Solidago canadensis	Canada Goldenrod	5%	
Poa palustris	Fowl Bluegrass	5%	
Verbena urticifolia	White Vervain	5%	
	Total	**100%**	

TABLE 5 - VEGETATED BOULDER SHRUBS (SPACING @ 0.5m O/C)

Species		Amount	Size (Potted)
Common Name	Scientific Name		
Slender Willow	*Salix petiolaris*	208	2 gal
Heart-leaved Willow	*Salix eriocephala*	208	2 gal
Red-Osier Dogwood	*Cornus stolonifera*	208	2 gal

TOTAL SHRUBS = 624

TABLE 6 - TREES (SPACING @ 2.5m O/C)

Species		Amount	Size
Common Name	Scientific Name		
Silver Maple	*Acer saccharium*	16	4L pot
White Oak	*Quercus alba*	16	4L pot
Red Oak	*Quercus rubra*	16	4L pot
Trembling Aspen	*Populus tremuloides*	16	4L pot
Basswood	*Tilia americana*	16	4L pot
Sugar Maple	*Acer saccharum*	33	60mm dia
White Elm	*Ulmus americana*	18	4L pot
Black Cherry	*Prunus serotina*	18	4L pot
Shagbark Hickory	*Carya ovata*	16	4L pot
Red Maple	*Acer rubrum*	15	60mm dia
Balsam Poplar	*Populus balsamifera*	15	4L pot
Butternut	*Juglans cinerea*	10	4L pot
Bur Oak	*Quercus macrocarpa*	15	60mm dia

TOTAL TREES = 220

TABLE 7 - SHRUBS (SPACING @ 1.0m O/C) - NODAL

Species		Amount	Size	Spacing
Common Name	Scientific Name			
Pussy Willow	*Salix discolor*	148	1L pot	1m
Meadow Willow	*Salix petiolaris*	148	1L pot	1m
Elderberry	*Sambucus canadensis*	146	1L pot	1m
Red-osier Dogwood	*Cornus sericea*	146	1L pot	1m
Nannyberry	*Viburnum lentago*	146	1L pot	1m
Buttonbush	*Cephalanthus occidentalis*	146	1L pot	1m

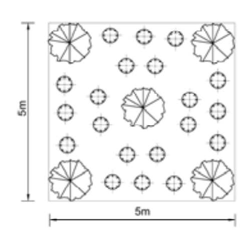
TOTAL SHRUBS = 880

TABLE 8 - SHRUBS (SPACING @ 1.0m O/C)- UPLAND

Species		Amount	Size	Spacing
Common Name	Scientific Name			
Pussy Willow	*Salix discolor*	120	1L pot	1m
Meadow Willow	*Salix petiolaris*	120	1L pot	1m
Elderberry	*Sambucus canadensis*	120	1L pot	1m
Red-osier Dogwood	*Cornus sericea*	115	1L pot	1m
Nannyberry	*Viburnum lentago*	115	1L pot	1m
Buttonbush	*Cephalanthus occidentalis*	115	1L pot	1m

TOTAL SHRUBS =705

DETAIL A - PLANTING POD



NUMBER OF TREES PER POD = 5
NUMBER OF SHRUBS PER POD = 20
TREE
SHRUB

Key Map – NTS

No.	REVISION	By	DATE
4	ISSUED FOR TENDER	R.A.	AUGUST 31, 2022
3	ISSUED FOR THE CONSERVATION HALTON APPROVAL	R.A.	DECEMBER 17, 2021
2	ISSUED FOR THE CONSERVATION HALTON REVIEW	R.A.	SEPTEMBER 7, 2021
1	ISSUED FOR 30% DESIGN REVIEW	R.A.	APRIL 23, 2021

LEGEND

- PROPERTY LINE
- SANITARY SEWERMAIN
- STORMLINE
- WATERMAIN
- GAS LINE
- PIPELINE
- HYDROPOLE
- EXISTING TREE
- POTENTIAL BUTTERNUT
- EXISTING STORM OUTFALL
- LOW FLOW CHANNEL
- VEGETATED BUFFER
- RIPARIAN SEED MIX AND PLANTING AREA
- UPLAND SEED MIX AND SHRUB PLANTING AREA

THE POSITION OF THE POLE LINES, CONDUITS, WATERMAINS, SEWERS, AND OTHER UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK

THE CONTRACTOR SHALL CONFIRM THE POSITION AND EXACT LOCATION OF ALL SUCH UTILITIES AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM MADE DURING THE COURSE OF THE CONTRACT WORK.

JOB TITLE

Appleby Creek Erosion Control
BURLINGTON, ONTARIO

SHEET TITLE

General Plan - Phase 2
Restoration Plan

DESIGNED BY: | APPROVED BY:

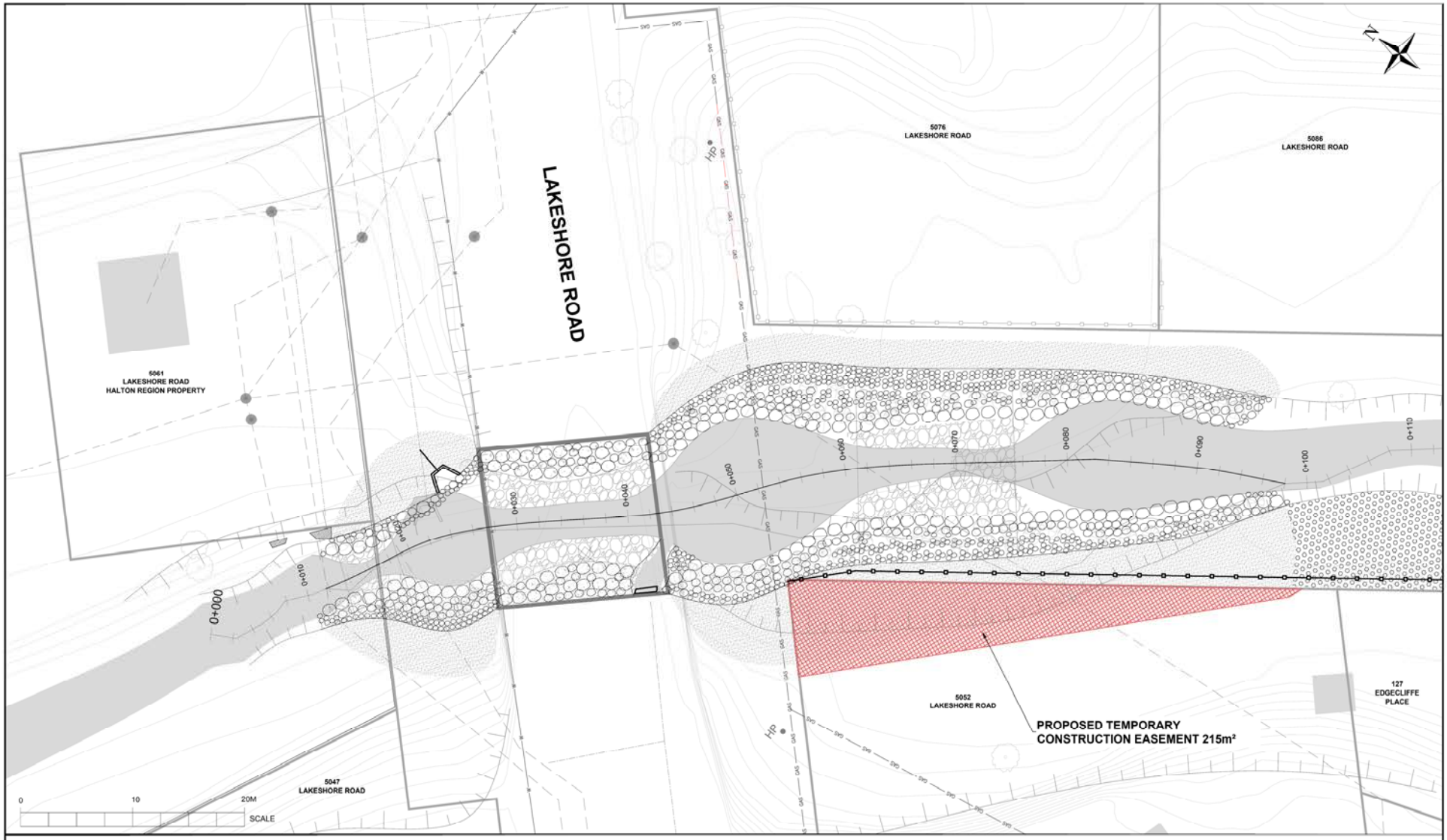
City of Burlington

Aquafor Beech Limited
#6-202-2600 SKYMARK Ave.
MISSISSAUGA, ONTARIO, L4W 5B2

SCALE: 1:350 | DRAWN BY: P.S. | DATE: AUGUST 2022 | SHEET NO. 9 OF 10

PROPERTY IMPACT PLAN – 5052 LAKESHORE ROAD

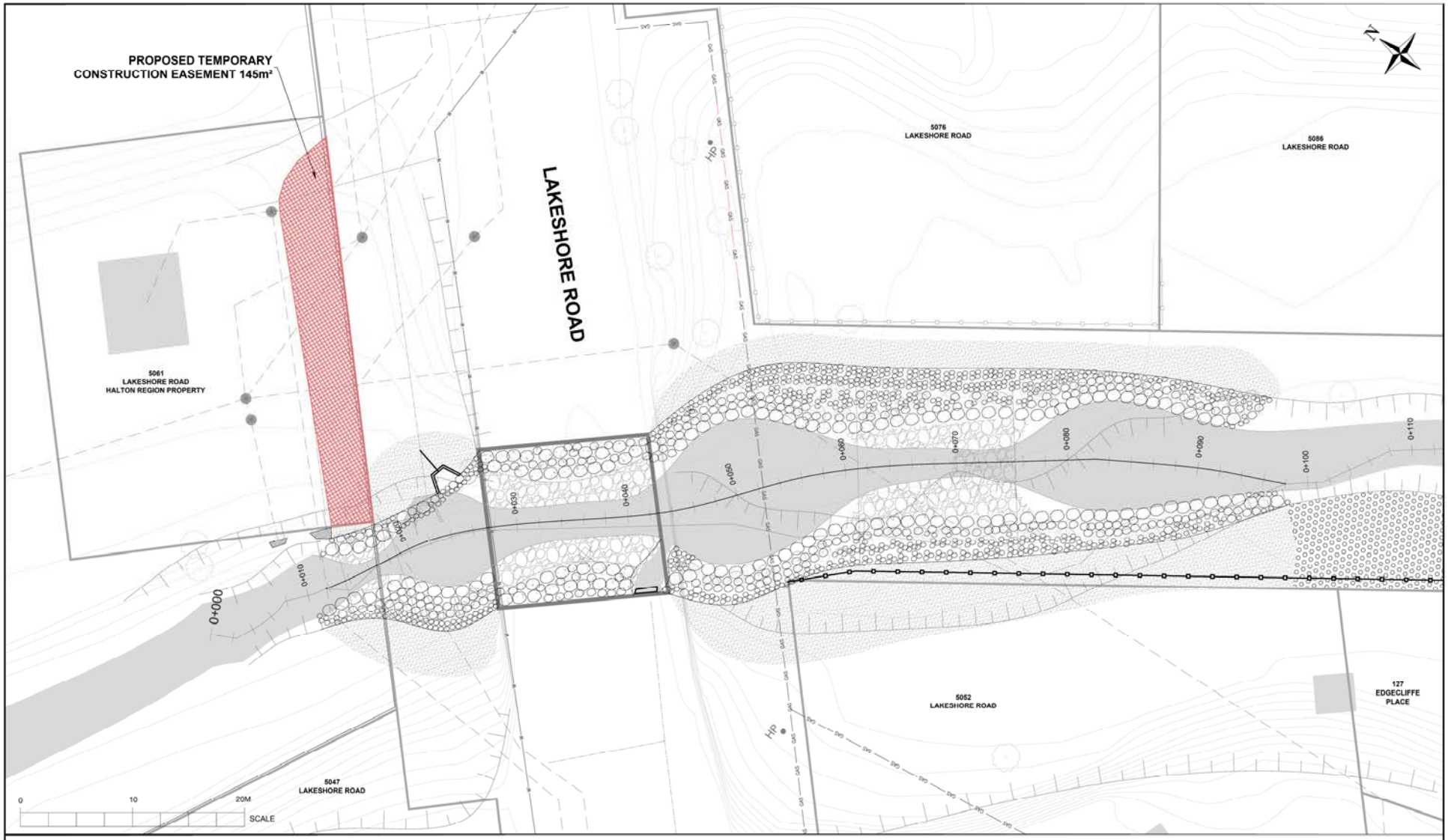
Appleby Creek Erosion Control, Phase 2
Lakeshore Road to Lake Ontario



PROPERTY IMPACT PLAN
TEMPORARY ACCESS PLAN - 5052 LAKESHORE ROAD
APPLEBY CREEK DESIGN - LAKESHORE ROAD TO LAKE ONTARIO

PROPERTY IMPACT PLAN – 5061 LAKESHORE ROAD - HALTON REGION PROPERTY

Appleby Creek Erosion Control, Phase 2
Lakeshore Road to Lake Ontario



PROPERTY IMPACT PLAN
TEMPORARY ACCESS PLAN FOR HALTON REGION
APPLEBY CREEK DESIGN - LAKESHORE ROAD TO LAKE ONTARIO

DETAILED DESIGN EXAMPLES

Natural Creek Restoration with Buried Armourstone Wall

Vegetated Buttress with Improved Aquatic Habitat

CONSTURCTION ACTIVITIES AND BEST MANAGEMENT

- **Experienced Contractors**
- **Construction Supervision by a Qualified Professional**
- **Safety First Mentality – Personal Protective Equipment**
- **Erosion and Sediment Control**
- **Flow Management Throughout Construction**
- **Fish Removals From Work Areas**
- **Tree Preservation Plan**
- **Post Construction Monitoring**
- **Daily Noise (M-F, 7am – 7pm)**
- **Conveniences for Workers (Trailer & Washroom)**

NEXT STEPS

IMPLEMENTATION

- Construction is scheduled to start with tree removals in March, 2023.
- In-Water & Restoration will then take place between July 1st to September 14th, 2023.

To provide comment, please contact:

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THANK YOU

For Participating In Appleby Creek Design – Lakeshore Road to Lake Ontario Public Engagement