

April 3, 2023



Environmental

Geotechnical

Building Sciences

Construction
MonitoringTelephone
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(705) 742.7900Facsimile
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cambium-inc.comMailing Address
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K9H 1E5Locations
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Table 2 Surface Water and Aquatic Habitat

Reach	Wetted Width (m)	Max. Depth (cm)	Substrate Type	Vegetative Cover and other Notes (Photos enclosed)
1: Durham St. N. Roadside Ditch	0.4 – 0.5	3 - 4	No sorting	Swale. 100% instream cover (grasses, clover, queen Anne's lace, Phragmites) (Photos 1 – 2).
2: On Site through Agricultural Field	0.6 – 1.0	7 - 10	Muck and detritus	Dug channel. Adjacent residential lots fronting on Durham St. N.: no instream cover, 80% overhanging cover (Photo 3). Adjacent fields only: 100% in-stream cover (grasses, Phragmites, meadow species) (Photo 4 - 5).
3: On Site through Meadow / Wetland	1.0	10	Muck and detritus .	Dug channel. 80% in-stream cover (shrub willows, Phragmites, meadow species) (Photos 6 – 7).
3A: NE Branch	Mainly dry with wet pockets: 0.5 – 1.6	Mainly dry with wet pockets: 4 – 10	Muck and detritus	Dug channel. 100% instream cover (grasses, Phragmites; Photos 8 – 9)
3B: SW Branch	Mainly dry with wet pockets: 1.1	Mainly dry with wet pockets: 11	Muck and detritus	Dug channel. 100% instream cover (grasses; Photos 10 – 11)
4: On Site along Woodland edge	2.0	15	Muck and detritus	Dug channel. 50% in-stream cover (grasses); 80% overhanging cover (cedar) (Photo 12 – 13).

Fish Community

Fish community records are not available for the unnamed watercourse on the Site or downstream. Fish ON-Line records for Colborne Creek approximately 500 m downstream of the confluence with the unnamed watercourse (immediately downstream of Victoria Street) include: Brook Trout, Coho Salmon, Pumpkinseed, Rainbow Smelt, Rainbow Trout, Rock Bass, Smallmouth Bass, White Sucker. This community assemblage indicates that Colborne Creek exhibits a cool to coldwater thermal regime.



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No physical barriers to fish movement were observed between Colborne Creek and the Site, though barriers may exist in areas on private property that were not directly observable. Upstream of King Street, based on the location of trees along the banks, it is likely that maximum depth within the watercourse is 0.5 m or less (Photo 17). Immediately upstream of the confluence with Colborne Creek, the unnamed watercourse is a roadside ditch along Kensington Avenue. Along this reach, there is no in-stream or overhanging cover, and limited coarse substrates (Photo 18). These conditions likely limit upstream habitat suitability for fish migrating upstream from Colborne Creek.

The watercourse on the Site (Photos 1-15) and immediately downstream of the Site (Photo 16) provides substantially different habitat than Colborne Creek. In the vicinity of the Site, Colborne Creek is approximately 4-5 m wide, and over 0.5 m deep (Photos 19-20). The watercourse on the Site and immediately downstream of the Site is almost entirely choked with in-channel vegetation, has no signs of groundwater inputs (to support coldwater thermal regime), and has no coarse substrates (substrates are limited to detritus and muck). As such, it is highly unlikely that the watercourse on the Site could support the majority of fish species documented downstream in Colborne Creek.

IMPACT ASSESSMENT AND RECOMMENDATIONS

The Stormwater Management Report (Jewell Engineering, 2022) details how enhanced quality treatment and required quantity control will be achieved across the Site, ensuring maintenance of pre- vs post- development flows to downstream receivers. According to the current Redline Draft Plan of Subdivision and Watercourse Relocation Plan (enclosed):

- Reach 1 is to remain in its existing condition, with exception of additional driveway culverts for the new lots to front on Durham Street. Some deepening of the channel is required to accommodate the driveway culverts from lots 71-60;
- Reach 2 is to remain as an open channel along the south property boundary, with no alterations except for regrading (i.e., raising) of the north bank, to



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match height of south bank. Conversely, the western portion of the reach is to be piped under Street B and realigned as an open ditch through the park block to the west of Street B;

- Reach 3 is to remain in its existing condition; no alteration to Reach 3 is proposed;
- Reach 3A is to be removed and surface water conveyance will be replicated through stormwater management (SWM) system design. The proposed SWM system has been designed to maximize the retention of external undeveloped catchment area, in order to maintain the pre-development surface water patterns to the extent possible. Additionally, the proposed system allows for post-development flows to match pre-development flows as closely as possible at the outlet of the SWM facility;
- Reach 3B is to remain in its existing condition – no alteration to Reach 3B is proposed, as this feature is located within the wetland buffer;
- Reach 4 is to remain in its existing condition - no alteration to Reach 4 is proposed; and,
- The current draft stormwater management pond design drains west through the wetland for additional filtration and thermal mitigation prior to reaching the watercourse.

Based on the relatively low sensitivity of the watercourse on the Site, as detailed above (man-made origin to serve agricultural purposes, channelized, limited substrates and habitat features, choked with in-channel vegetation), the proposed alterations are not anticipated to have a negative effect on the ecological or hydrologic function of the watercourse downstream, provided the following recommendations are adhered to:

- All required approvals and permits should be obtained prior to the commencement of any Site alteration or construction activities.
- The final design for the Reach 2 realignment and stormwater management pond outlet should be reviewed by a qualified ecologist, to assess compliance



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with fish and fish habitat protection provisions under the federal Fisheries Act. A request for review will be submitted to Fisheries and Oceans Canada (DFO) for review, to determine if the project poses a risk of 'serious harm' to fish or fish habitat.

- An Erosion and Sediment Control (ESC) Plan should be developed as part of the detailed design process, to prevent sedimentation into Reaches 3 and 4, and downstream receivers. This Plan should have specific design considerations towards the preservation of riparian habitats.
- In-water works should occur outside of spring spawning period which extends from March 15 to July 15, per Ministry guidance (MNR, 2013).
- Prior to site alteration and dewatering, fish community presence should be confirmed and/or Reaches 1 and 2 should be isolated and a fish and wildlife salvage should be conducted by qualified ecologists. A License to Collect Fish for Scientific Purposes (LCFSP) and Wildlife Scientific Collectors Authorization (WSCA) issued by the local MNR District office will be required. Any fish or wildlife taken from these reaches should be carefully relocated to suitable habitat downstream.
- The proposed culvert under Street B should be appropriately sized and partially embedded, as to not create a barrier to fish movement under flowing conditions.
- Portions of the watercourse can be removed, piped, or realigned, given that pre-development flows are maintained in the post-development condition. If necessary, clean drainage from rear yards, roofs, or other clean sources should be conveyed directly to the watercourse to help maintain pre-development flows.
- The design for the proposed realigned portion of Reach 2 should reflect and serve to replicate the existing channel morphology, cover features, and substrates (refer to Table 2 for details).
- Native, non-invasive tree and shrub species should be used in Landscape Plans for riparian areas along the realigned portion of Reach 2, as well as



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Reaches 3 and 4, and around the SWM facility. Preliminary recommendations are provided in Table 3. Cambium is available to provide more detailed recommendations during detailed design.

- Cambium also recommends applying suitable seed mixtures in areas adjacent to riparian areas along the realigned portion of Reach 2, as well as Reaches 3 and 4, and around the SWM facility, including all disturbed and sloped areas within the development envelope. The Ontario Seed Company (OSC) based out of Waterloo, Ontario carries a variety of native seed mixtures that contain native wildflowers and grass species, which provide rapid vegetation cover. Suitable seed mixes for the conditions documented are detailed in Table 3.

Table 3 Planting Plan Recommendations

Planting Location	Species	Size	Instructions
Top of Slope	Trees: White Oak (<i>Quercus alba</i>) Pin Cherry (<i>Prunus pensylvanica</i>) Sugar Maple (<i>Acer saccharum</i>) Canada Plum (<i>Prunus nigra</i>) Downy Serviceberry (<i>Amelanchier arborea</i>) Trembling Aspen (<i>Populus tremuloides</i>) Eastern Red Cedar (<i>Juniperus virginiana</i>) Eastern White Cedar (<i>Thuja occidentalis</i>)	2 m height	Species selection should include a mix of deciduous and coniferous species; a minimum of 4 species should be used. Trees should be randomly spaced to replicate natural conditions.
Top of Slope	Shrubs: Alternate-leaved Dogwood (<i>Cornus alternifolia</i>) Fragrant Sumac (<i>Rhus aromatica</i>) Nannyberry (<i>Viburnum lentago</i>) Red Elderberry (<i>Sambucus racemosa</i>) Red Raspberry (<i>Rubus ideaus</i>)	8-10" container stock	A minimum of 3 species should be used. Shrubs should be planted in clusters with plants in random assemblages, spaced 2-5 m apart, offset by 1 m or less from the top of bank.

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Planting Location	Species	Size	Instructions
Top of Slope	Groundcover: Native grass and wildflower seed mixture (i.e., OSC Rural Ontario Roadside Mixture 8145)	N/A	Application rates as per manufacturers instructions. All exposed soils at top of bank up to the edge of the development footprint should be seeded.
Slope	Any of the above listed shrub species plus: Chokeberry (<i>Aronia melanocarpa</i>) Common Elderberry (<i>Sambucus canadensis</i>) Highbush Cranberry (<i>Viburnum trilobum</i>) Red-osier Dogwood (<i>Cornus sericea</i>) Silky Dogwood (<i>Cornus amomum</i>) Balsam Fir (<i>Abies balsamea</i>)	8-10" container stock	Clusters of 2-3 shrubs spaced at 8-12 m intervals along the feature embankment. Random spacing of clusters.
Slope	Groundcover: OSC8215 Creek Bank Mixture, or OSC8240 Seasonally Flooded Native Seed Mixture	N/A	Application rates as per manufacturers instructions. All exposed soils on the slope, extending 0.5 m upgradient of the top of slope position should be seeded.
Additional Notes:			
Timing:	Planting should occur in the autumn, ideally between October 15 – November 15		
Stock:	Container stock is preferred, but bare root stock can be used if planting occurs within 24 hours of collecting materials from the source.		
Species Selection :	Listed species have been selected based on growth characteristics, soil and topography conditions of the Site, and restoration objectives. Other species may be considered, provided that the selected species are native to the local area.		

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Planting Location	Species	Size	Instructions
Wildlife Value:	Clusters of trees and shrubs provide diverse sheltering habitat for a variety of wildlife and are preferred over individual plantings. Planting a variety of species increases the ecological value for wildlife.		
Compost / Mulch	If compost or mulch is applied at the Site, these media should be obtained from a reputable source and be heat treated to prevent spread of invasive species.		

Further measures that could be implemented to improve the ecological and hydrologic function of the watercourse downstream of the Site post-development include:

- Creation of an Invasive Species Management Plan with a focus on removal of Common Reed (*Phragmites*) from Reaches 3 and 4 as well as the dug pond north of Reach 3, to mitigate downstream seed dispersion.
- Consideration of channel naturalization practices in Reaches 3 and 4, in conjunction with the removal of invasive *Phragmites*.





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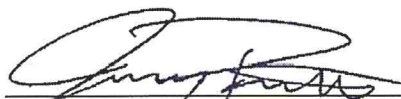
CLOSING

In closing, potential negative impacts associated with the proposed development and Site alteration can be appropriately minimized, provided that the recommendations outlined above are adhered to. The information presented herein demonstrates that the proposed development can be carried out in a way that will not adversely impact natural heritage and hydrologic features and functions identified on or adjacent to the subject Site.

Respectfully submitted,

Cambium Inc.


Kristina Domsic, B.E.S.
Ecologist / Project Coordinator

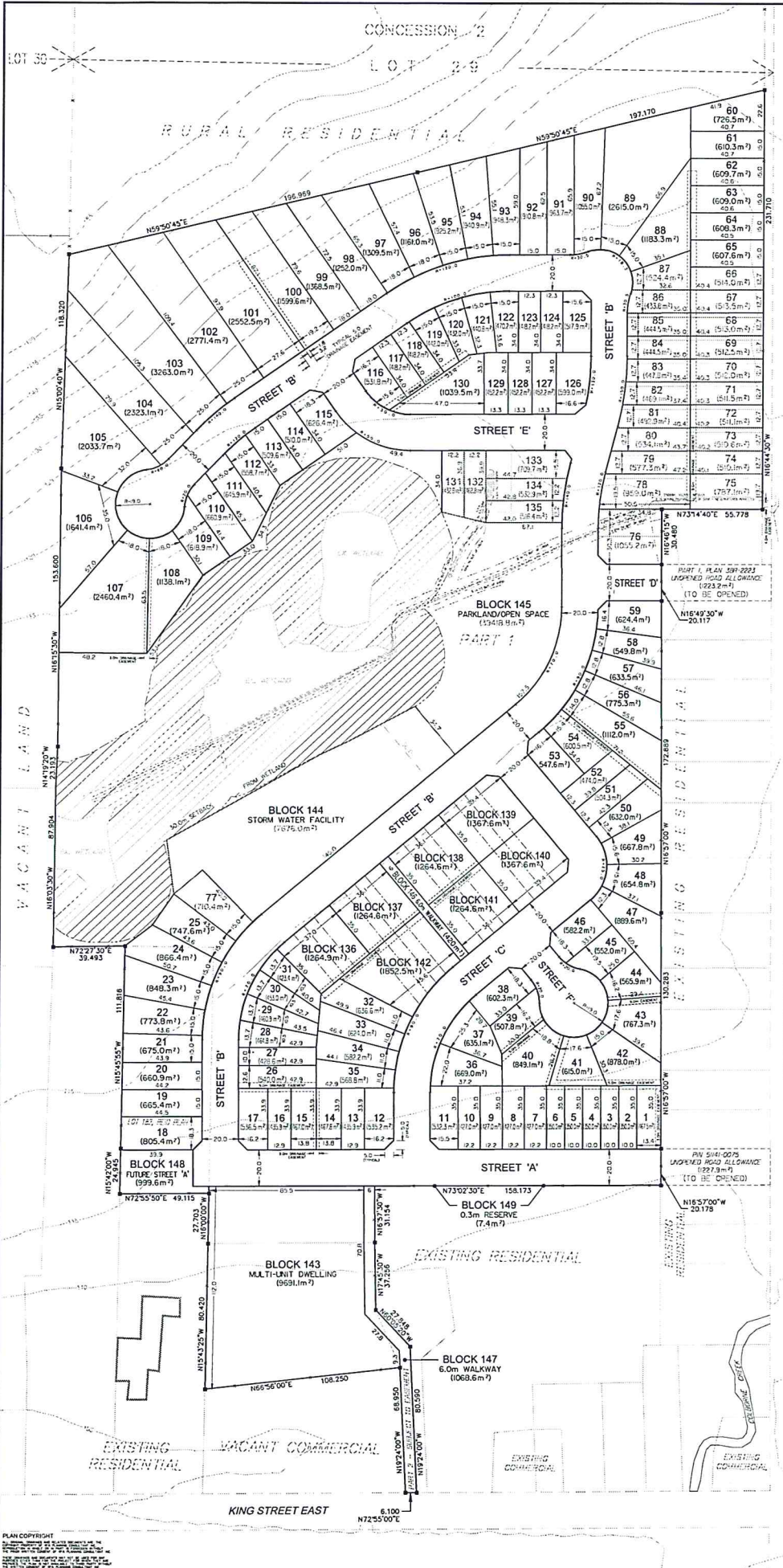

Jeremy Prah, B.Sc., EP, Can-CISEC
Senior Ecologist / Group Manager

KD/jp

- Encl. Redline Draft Plan of Subdivision (RFA, April 3, 2023)
- Figure 1 Site Drainage Features
- Historical Air Photo A17791-053
- Representative Photos
- Watercourse Relocation Plan

P:\6600 to 6699\6697-003 Fidelity Engineering & Construction - EIS Review - Eastfields Colborne Res Dev\Deliverables\REPORT - EIS Review\2023-03 Update\2023-04-03 LTR - EIS Review Eastfields, Colborne.docx





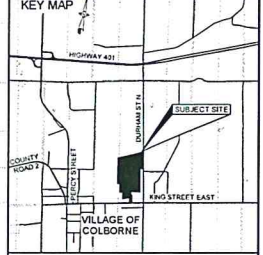
REDLINE AMENDED - APPROVED PLAN OF SUBDIVISION D12-CR1702

DRAFT PLAN OF SUBDIVISION EASTFIELDS SUBDIVISION - REDLINE PLAN
 PARTS 1 AND 2, PLAN 36R-14479
 PART OF LOT 182, REID PLAN AND PART OF LOT 29, CONCESSION 2 (FORMER VILLAGE OF COLBORNE)
 TOWNSHIP OF CRAMAHÉ
 COUNTY OF NORTHUMBERLAND

METRIC NOTE
 DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 3.048.

CONTOURS NOTE
 CONTOURS REFERRED TO ARE DATA OBTAINED BY OTHERS. CONTOURS DRAWN AT INTERVALS OF 2.0M.

DRAWN BY: LB CHECKED BY: R.F.A. DATE: 03/17/17



ADDITIONAL INFORMATION REQUIRED UNDER SECTION 5(17) OF THE PLANNING ACT.

- 01 SEE SURVEYOR'S CERTIFICATE.
- 02 AS SHOWN ON DRAFT PLAN.
- 03 AS SHOWN ON DRAFT PLAN.
- 04 SEE LAND USE SCHEDULE.
- 05 SEE DRAFT PLAN.
- 06 AS SHOWN ON DRAFT PLAN.
- 07 AS SHOWN ON DRAFT PLAN.
- 08 AS SHOWN ON DRAFT PLAN.
- 09 AS SHOWN ON DRAFT PLAN.
- 10 GARAGE COLLECTION FIRE PROTECTION HOOD MAINTENANCE, SOCOL INSULETIC.
- 11 AS SHOWN ON DRAFT PLAN.

LAND USE SCHEDULE

LAND USE	AREA(M ²)	AREAS (UNITS)
LOT 1-17, 47, 50-58, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116	31893.3	15.7
LOT 18-21, 22-24, 25-27, 28-30, 31-33, 34-36, 37-39, 40-42, 43-45, 46-48, 49-51, 52-54, 55-57, 58-60, 61-63, 64-66, 67-69, 70-72, 73-75, 76-78, 79-81, 82-84, 85-87, 88-90, 91-93, 94-96, 97-99, 100-102, 103-105, 106-108, 109-111, 112-114, 115-116	33672.7	16.4
LOT 1-16, 18-21, 22-24, 25-27, 28-30, 31-33, 34-36, 37-39, 40-42, 43-45, 46-48, 49-51, 52-54, 55-57, 58-60, 61-63, 64-66, 67-69, 70-72, 73-75, 76-78, 79-81, 82-84, 85-87, 88-90, 91-93, 94-96, 97-99, 100-102, 103-105, 106-108, 109-111, 112-114, 115-116	25993.1	12.4
LOT 1-16, 18-21, 22-24, 25-27, 28-30, 31-33, 34-36, 37-39, 40-42, 43-45, 46-48, 49-51, 52-54, 55-57, 58-60, 61-63, 64-66, 67-69, 70-72, 73-75, 76-78, 79-81, 82-84, 85-87, 88-90, 91-93, 94-96, 97-99, 100-102, 103-105, 106-108, 109-111, 112-114, 115-116	7399.9	3.6
LOT 1-16, 18-21, 22-24, 25-27, 28-30, 31-33, 34-36, 37-39, 40-42, 43-45, 46-48, 49-51, 52-54, 55-57, 58-60, 61-63, 64-66, 67-69, 70-72, 73-75, 76-78, 79-81, 82-84, 85-87, 88-90, 91-93, 94-96, 97-99, 100-102, 103-105, 106-108, 109-111, 112-114, 115-116	9614.4	4.8
LOT 1-16, 18-21, 22-24, 25-27, 28-30, 31-33, 34-36, 37-39, 40-42, 43-45, 46-48, 49-51, 52-54, 55-57, 58-60, 61-63, 64-66, 67-69, 70-72, 73-75, 76-78, 79-81, 82-84, 85-87, 88-90, 91-93, 94-96, 97-99, 100-102, 103-105, 106-108, 109-111, 112-114, 115-116	301.9	0.0
LOT 1-16, 18-21, 22-24, 25-27, 28-30, 31-33, 34-36, 37-39, 40-42, 43-45, 46-48, 49-51, 52-54, 55-57, 58-60, 61-63, 64-66, 67-69, 70-72, 73-75, 76-78, 79-81, 82-84, 85-87, 88-90, 91-93, 94-96, 97-99, 100-102, 103-105, 106-108, 109-111, 112-114, 115-116	1412.0	0.8
LOT 1-16, 18-21, 22-24, 25-27, 28-30, 31-33, 34-36, 37-39, 40-42, 43-45, 46-48, 49-51, 52-54, 55-57, 58-60, 61-63, 64-66, 67-69, 70-72, 73-75, 76-78, 79-81, 82-84, 85-87, 88-90, 91-93, 94-96, 97-99, 100-102, 103-105, 106-108, 109-111, 112-114, 115-116	3141.9	1.6
LOT 1-16, 18-21, 22-24, 25-27, 28-30, 31-33, 34-36, 37-39, 40-42, 43-45, 46-48, 49-51, 52-54, 55-57, 58-60, 61-63, 64-66, 67-69, 70-72, 73-75, 76-78, 79-81, 82-84, 85-87, 88-90, 91-93, 94-96, 97-99, 100-102, 103-105, 106-108, 109-111, 112-114, 115-116	1588.6	0.8
LOT 1-16, 18-21, 22-24, 25-27, 28-30, 31-33, 34-36, 37-39, 40-42, 43-45, 46-48, 49-51, 52-54, 55-57, 58-60, 61-63, 64-66, 67-69, 70-72, 73-75, 76-78, 79-81, 82-84, 85-87, 88-90, 91-93, 94-96, 97-99, 100-102, 103-105, 106-108, 109-111, 112-114, 115-116	999.0	0.5
LOT 1-16, 18-21, 22-24, 25-27, 28-30, 31-33, 34-36, 37-39, 40-42, 43-45, 46-48, 49-51, 52-54, 55-57, 58-60, 61-63, 64-66, 67-69, 70-72, 73-75, 76-78, 79-81, 82-84, 85-87, 88-90, 91-93, 94-96, 97-99, 100-102, 103-105, 106-108, 109-111, 112-114, 115-116	77.4	0.0
LOT 1-16, 18-21, 22-24, 25-27, 28-30, 31-33, 34-36, 37-39, 40-42, 43-45, 46-48, 49-51, 52-54, 55-57, 58-60, 61-63, 64-66, 67-69, 70-72, 73-75, 76-78, 79-81, 82-84, 85-87, 88-90, 91-93, 94-96, 97-99, 100-102, 103-105, 106-108, 109-111, 112-114, 115-116	3419.0	1.7
SUB TOTAL	20298.0	100.0

LEGEND

- EXISTING WETLAND
- 30M SETBACK AND BUFFER FROM EXISTING WETLAND

SURVEYOR'S CERTIFICATE
 I CERTIFY THAT THE DIMENSIONS OF THE LAND TO BE SUBDIVIDED ARE CORRECTLY SHOWN.

[Signature] *[Date]*
 GIFFORD, HARRIS SURVEYING LTD.
 ONTARIO LAND SURVEYORS
 255 Glen Watford Dr., Toronto, Ontario M5H 1B7
 416-593-2777 • 1-877-394-6244



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MNRF District: Peterborough District
 MECP Region: Peterborough MECP District
 Conservation Authority: Lower Trent Conservation Authority

**ENVIRONMENTAL
 IMPACT STUDY**
 2852243 ONTARIO INC., FIDELITY
 ENGINEERING & CONSTRUCTION
 Part of Lot 182, Reid Plan and
 Part of Lot 29, Concession 2,
 Township of Cramahe, Ontario

LEGEND

- Watercourse, Intermittent
 - Watercourse, Permanent
 - Contour 5m Interval (Major)
 - Contour 5m Interval (Minor)
 - Unevaluated Wetlands
 - Ecodistrict
 - Adjacent Lands (120m)
 - Site
- Drainage Feature:**
- Reach 1
 - Reach 2
 - Reach 3
 - Reach 3A
 - Reach 3B
 - Reach 4

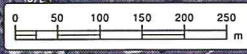
Notes:
 - Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources and Forestry or the Ontario Government).
 - Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
 - Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.



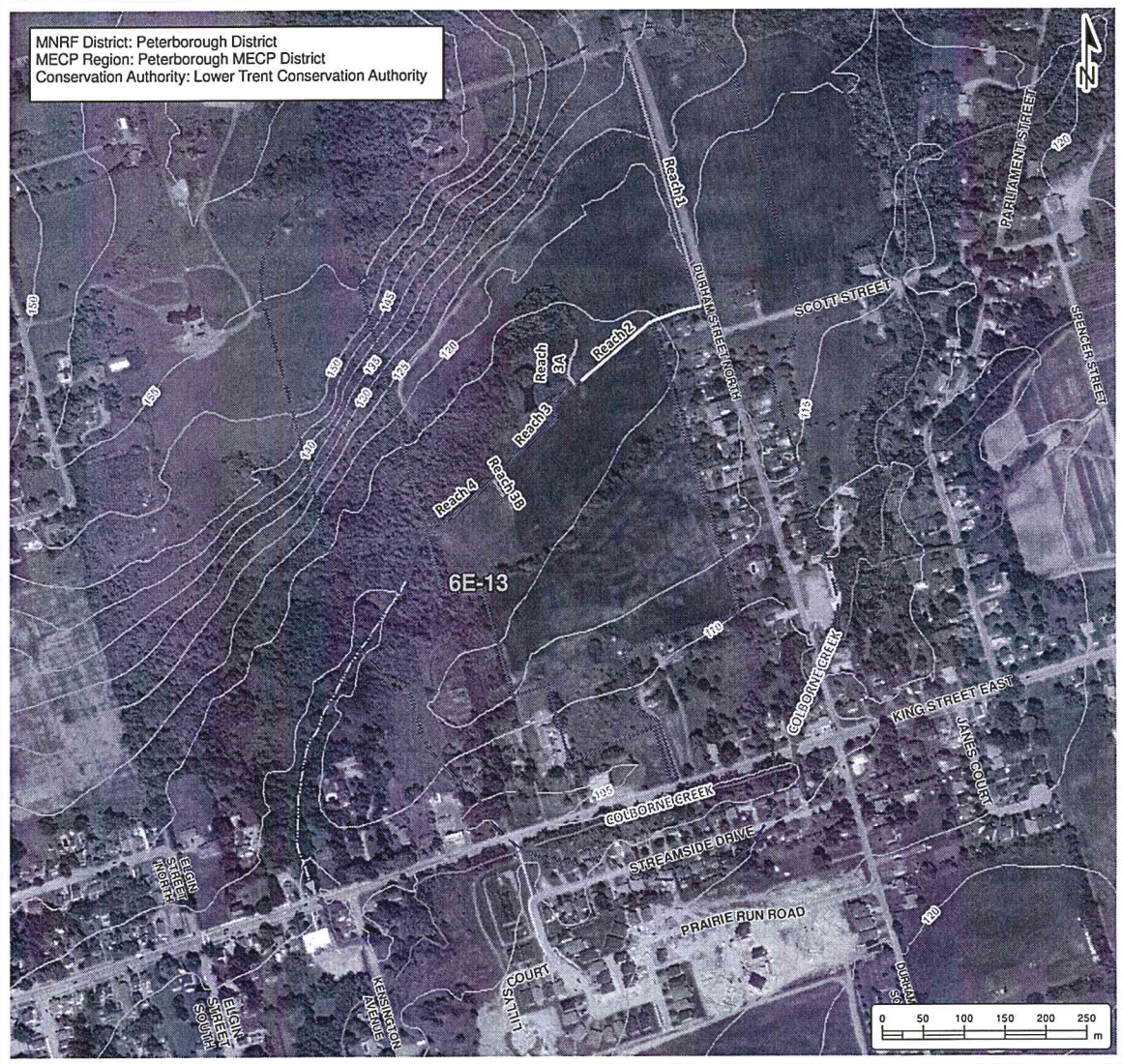
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 www.cambium-inc.com

SITE DRAINAGE FEATURES

Project No.: 6697-003	Date: February 2023
Scale: 1:6,500	Rev.:
Created by: DBB	Checked by: KD
	Figure: 1



O:\GIS\ANDR\6697-003\Fidelity_Engineering_&_Construction - EIS Review - Earthfiled Culture Rev.Dwg_2023-03-16\FID_1 - 5m Drainage Features.mxd





AIR PHOTO DIVISION ENERGY, MINES & RESOURCES - CANADIAN GOVT. COPY



Photo 1 Downstream view of Reach 1: roadside ditch (south towards Site), December 3, 2021.

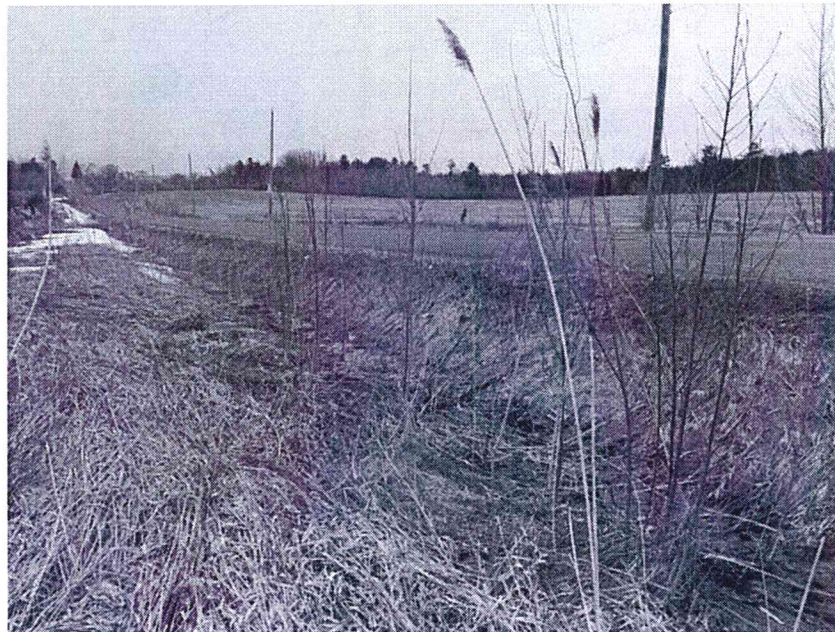
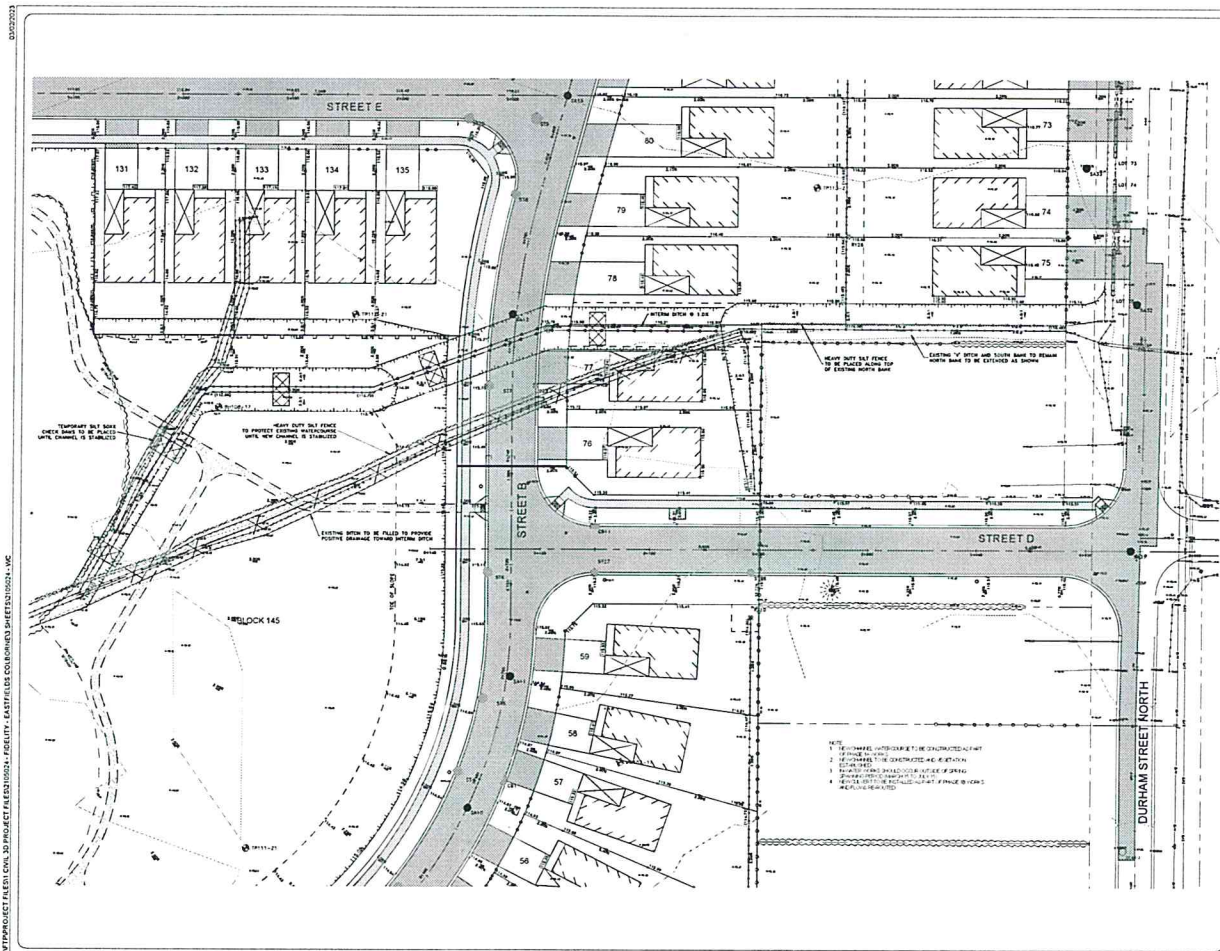


Photo 2 Upstream view of Reach 1: roadside ditch (north from culvert at southeast corner of Site), February 21, 2023.



REVISIONS

NO.	DATE	DESCRIPTION	BY
1	02/01/2011	ISSUED FOR PERMIT	MR
2	02/01/2011	REVISIONS TO PERMIT	MR

KEY PLAN

JEWELL ENGINEERING

EASTFIELDS SUBDIVISION
COLBORNE
FOOTY GROUP OF COMPANIES
TOWNSHIP OF CRANWEE

WATERCOURSE REALIGNMENT PLAN
PHASE 1A

DESIGNED BY: JCH
CHECKED BY: JCH
DATE: February 2011
SCALE: HORIZONTAL 1:300
VERTICAL 1:150
DRAWN BY: MR
CHECKED BY: VC1

03/02/2011
 WATERCOURSE REALIGNMENT PLAN - EASTFIELDS SUBDIVISION - COLBORNE - TOWNSHIP OF CRANWEE



Photo 3 *Downstream view of Reach 2: channelized watercourse (from culvert at southeast corner of Site), December 3, 2021.*



Photo 4 *Downstream view of Reach 2: channelized watercourse (from culvert at southeast corner of Site), February 21, 2023.*



Photo 5 *Downstream view of Reach 2 through agricultural fields, December 3, 2021.*



Photo 6 *Downstream view of Reach 2 through agricultural fields, February 21, 2023.*



Photo 7 Channel structure of Reach 3 (along wetland edge), December 3, 2021.



Photo 8 Downstream view of Reach 3 (along wetland edge), December 3, 2021.



Photo 9 Downstream view of Reach 3 (along wetland edge), February 21, 2023.



Photo 10 Upstream view of Reach 3A, February 21, 2023.



Photo 11 Downstream view of Reach 3A, February 21, 2023.



Photo 12 Upstream view of Reach 3B, February 21, 2023.



Photo 13 Downstream view of Reach 3B, February 21, 2023.



Photo 14 Upstream view of Reach 4, December 3, 2021.



Photo 15 Downstream view of Reach 4, February 21, 2023.



Photo 16 Downstream view of watercourse off-Site from west edge of Site, December 3, 2021.



Photo 17 Upstream view of watercourse off-Site from King Street E, December 3, 2021.



Photo 18 Downstream view of watercourse off-Site along Kensington Ave, December 3, 2021.



Photo 19 Upstream view of Colborne Creek from Kensington Ave, December 3, 2021.

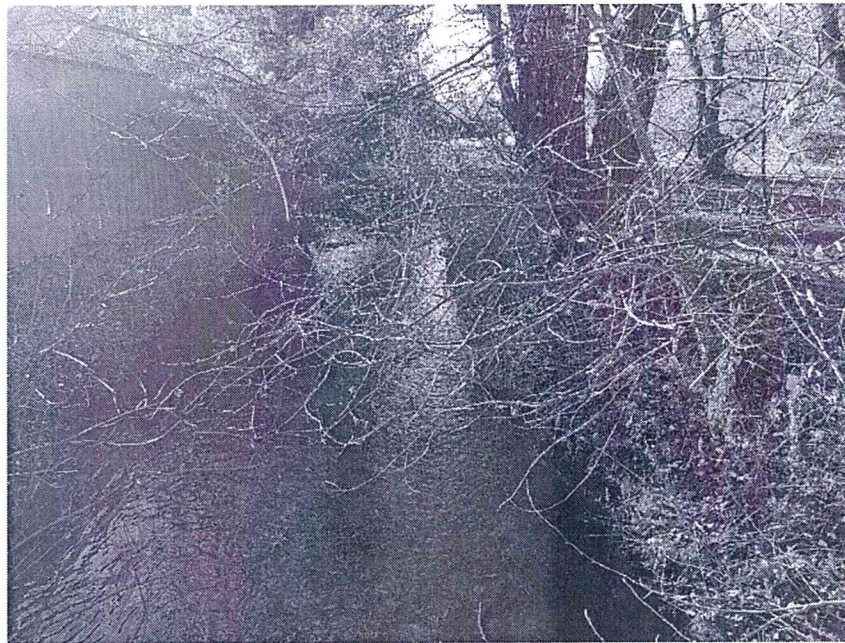


Photo 20 Downstream view of Colborne Creek from Kensington Ave (at confluence with watercourse from Site), December 3, 2021.



Environmental

Geotechnical

Building Sciences

Construction Quality
Verification**Telephone**(866) 217.7900
(705) 742.7900**Facsimile**

(705) 742.7907

Website

cambium-inc.com

Mailing AddressP.O. Box 325,
Peterborough, Ontario
Canada, K9J 6Z3**Locations**Peterborough
Kingston
Barrie
Oshawa**Laboratory**

Peterborough

March 20, 2023

2852243 Ontario Inc.
512 Purdy Road
Colborne, ON. K0K 1S0

Attn: Jim Pilsworth

Re: Eastfields Drainage Feature Slope Stability Letter Report
Cambium Reference: 6697-006

Dear, Mr. Pilsworth,

Cambium was asked to provide a slope stability assessment of the drainage features present at the Eastfields Residential Development in Colborne, Ontario (Site). Cambium has observed the drainage features in question on site and reviewed the updated site grading plan and associated watercourse drawing supplied by Jewell Engineering. It is apparent that there is a drainage feature that cuts across the northern portion of the Site from northeast to southwest. The main drainage feature initiates on the west side of Durham Street North, just north of the intersection with Scott Street, and extends to the southwest with slight offset immediately southeast of the pond on Site. The main drainage feature is fed by a ditch that runs south along the west side of Durham Street North and a culvert that drains water from the east side of Durham Street North. A secondary drainage feature extends approximately 120 m north from the main feature, along the east side of the pond on Site.

It is understood that a portion of the drainage feature, from the intersection with the secondary drainage feature to the northwest corner of the lot at 94 Durham Street North, is to be realigned to be more conducive to development.

The existing drainage feature is linear in nature, ranging from 2 m to 8 m in width, with no signs of meandering from the confines of the existing ditch. The slopes of the drainage feature range from 0.5 m to 1.5 m in height and have inclinations that range from less steep than 3 Horizontal to 1 Vertical (3H:1V) to steeper than 1H:1V. The slopes of the drainage features are vegetated mainly with grasses and weeds, and small bushes in some areas. There are no significant signs of slope failure, slide features or toe erosion along the length of the drainage





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Peterborough

**APGO**

March 20, 2023

features. Previous geotechnical investigations provide evidence that the soils within the slopes are known to be silt and sand or gravelly silty sand till.

Based on the MNR Technical Guide for River and Stream Systems: Erosion Hazard Limit (2002), despite the shallow depth and lack of failure observed within the drainage features, the slopes are considered to have low to slight potential for instability with a slope rating ranging from 15 in areas of gentle inclination to 31 in areas of steep inclination.

Erosion Hazard Limit

The erosion hazard limit for the drainage features is the sum of the toe erosion allowance, the stable slope allowance, and the erosion access allowance.

Based on the conditions observed on site, the lack of slope failure features, the linear trend of the drainage features, and the confinement of the system, negligible toe erosion has been observed and is anticipated within the drainage features over a 100 year development period.

Generally, a 3H:1V slope would be considered a stable slope in the absence of geotechnical studies, but a recent 2022 slope stability study of the large slope to the north, was completed on the same site, providing evidence that the soils were considered stable at inclinations of 2H:1V, meeting a Factor of Safety of 1.3. As such, a stable slope allowance equivalent to two times the height of the slope should be applied from the base of each side of the drainage feature.

Conservation policy states that a 6 m erosion access allowance is to be applied to all slopes that prove to be unstable, to provide emergency access and access to repair the slope, should it be required. It is understood that this value has been fashioned to apply to all slopes, regardless of size, and are considered an over-estimate of what is required for shorter slopes, such as this. Based on Cambium's experience with slopes of short height in various conservation authorities, an erosion access allowance of 3 m is considered sufficient in this scenario, providing adequate space for emergency vehicles and/or a mini excavator, which would offer sufficient reach.



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March 20, 2023

Ultimately, the erosion hazard limit, as measured from the base of the drainage feature slope, is equivalent to $2H+3$ (m), where H is the height of the slope in meters. Alternately, in areas where the drainage feature is at or designed to have an inclination of 2H:1V, resulting in a low potential for instability, development may occur no closer than a distance equivalent to the height of the slope, away from the crest of the slope, as per the MNR technical guide.

Erosion Control

During construction, care should be taken to retain as much of the vegetation on the slope as possible and erosion control measures should be put in place to maintain the stable slope, including revegetation of the slope if any bushes and trees are removed, or in areas where vegetation is presently sparse. Care should also be taken to ensure that there is no concentration of runoff down the slope from downspouts or regrading of the site.

Closing

We trust the information in this report is sufficient for your current needs. If you have questions or comments regarding this document, please do not hesitate to contact Mr. Peterkin at (705) 761-1426.

Best regards,

Cambium Inc.

Stuart Baird, M.Eng., P.Eng.
General Manager - Geotechnical

Brian Peterkin, M.Eng., P. Eng.,
P. Geo.
Senior Project Manager

SEB/bjp

C:\Users\joanne_kendrick\Desktop\2022-03-20 - LRT RPT Eastfields Drainage Feature Slope Letter Report.docx





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Barrie
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Peterborough

March 20, 2023

CAMBIUM QUALIFICATIONS AND LIMITATIONSLimited Warranty

In performing work on behalf of a client, Cambium relies on its client to provide instructions on the scope of its retainer and, on that basis, Cambium determines the precise nature of the work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards. Unless required under local laws, other than as expressly stated herein, no other warranties or conditions, either expressed or implied, are made regarding the services, work or reports provided.

Reliance on Materials and Information

The findings and results presented in reports prepared by Cambium are based on the materials and information provided by the client to Cambium and on the facts, conditions and circumstances encountered by Cambium during the performance of the work requested by the client. In formulating its findings and results into a report, Cambium assumes that the information and materials provided by the client or obtained by Cambium from the client or otherwise are factual, accurate and represent a true depiction of the circumstances that exist. Cambium relies on its client to inform Cambium if there are changes to any such information and materials. Cambium does not review, analyze or attempt to verify the accuracy or completeness of the information or materials provided, or circumstances encountered, other than in accordance with applicable accepted industry practice. Cambium will not be responsible for matters arising from incomplete, incorrect or misleading information or from facts or circumstances that are not fully disclosed to or that are concealed from Cambium during the provision of services, work or reports.

Facts, conditions, information and circumstances may vary with time and locations and Cambium's work is based on a review of such matters as they existed at the particular time and location indicated in its reports. No assurance is made by Cambium that the facts, conditions, information, circumstances or any underlying assumptions made by Cambium in connection with the work performed will not change after the work is completed and a report is submitted. If any such changes occur or additional information is obtained, Cambium should be advised and requested to consider if the changes or additional information affect its findings or results.

When preparing reports, Cambium considers applicable legislation, regulations, governmental guidelines and policies to the extent they are within its knowledge, but Cambium is not qualified to advise with respect to legal matters. The presentation of information regarding applicable legislation, regulations, governmental guidelines and policies is for information only and is not intended to and should not be interpreted as constituting a legal opinion concerning the work completed or conditions outlined in a report. All legal matters should be reviewed and considered by an appropriately qualified legal practitioner.

Site Assessments

A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

Only conditions at the site and locations chosen for study by the client are evaluated; no adjacent or other properties are evaluated unless specifically requested by the client. Any physical or other aspects of the site chosen for study by the client, or any other matter not specifically addressed in a report prepared by Cambium, are beyond the scope of the work performed by Cambium and such matters have not been investigated or addressed.

Reliance

Cambium's services, work and reports may be relied on by the client and its corporate directors and officers, employees, and professional advisors. Cambium is not responsible for the use of its work or reports by any other party, or for the reliance on, or for any decision which is made by any party using the services or work performed by or a report prepared by Cambium without Cambium's express written consent. Any party that relies on services or work performed by Cambium or a report prepared by Cambium without Cambium's express written consent, does so at its own risk. No report of Cambium may be disclosed or referred to in any public document without Cambium's express prior written consent. Cambium specifically disclaims any liability or responsibility to any such party for any loss, damage, expense, fine, penalty or other such thing which may arise or result from the use of any information, recommendation or other matter arising from the services, work or reports provided by Cambium.

Limitation of Liability

Potential liability to the client arising out of the report is limited to the amount of Cambium's professional liability insurance coverage. Cambium shall only be liable for direct damages to the extent caused by Cambium's negligence and/or breach of contract. Cambium shall not be liable for consequential damages.

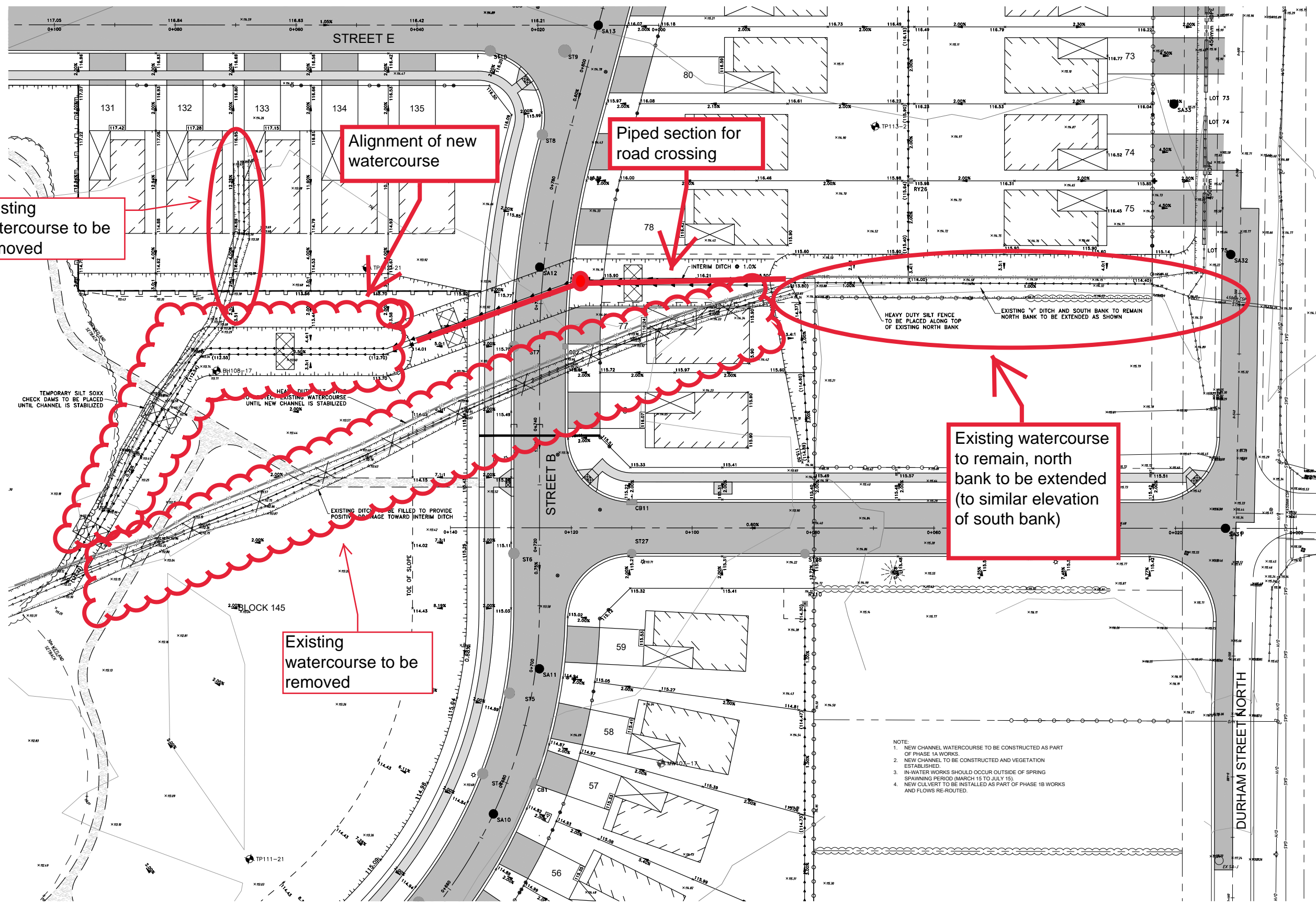
Personal Liability

The client expressly agrees that Cambium employees shall have no personal liability to the client with respect to a claim, whether in contract, tort and/or other cause of action in law. Furthermore, the client agrees that it will bring no proceedings nor take any action in any court of law against Cambium employees in their personal capacity.



03/02/2023

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Existing watercourse to be removed

Alignment of new watercourse

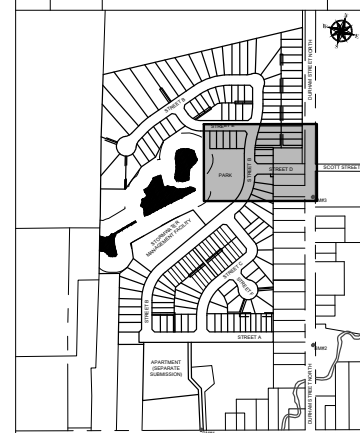
Piped section for road crossing

Existing watercourse to remain, north bank to be extended (to similar elevation of south bank)

Existing watercourse to be removed

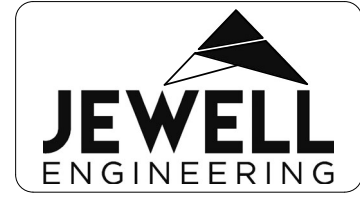
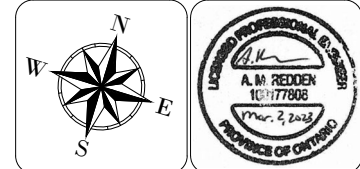
GENERAL NOTES:
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 - ALL UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL CONFIRM THE LOCATION ON SITE AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES.
 - EXCLUDING THE BENCHMARK AND DESCRIPTION PROVIDED FOR THIS PROJECT, NO OTHER ELEVATIONS ARE TO BE USED AS A REFERENCE ELEVATION FOR ANY PURPOSE.
METRIC NOTE:
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GEOMETRIC NOTE:
 - ALL SURVEY DATA SHOWN ON THIS DRAWING WAS RECORDED USING REAL TIME KINEMATIC WITH GPS OBSERVATIONS IN REFERENCE TO ITM '93 NORTH COORDINATE SYSTEM.
 - ALL ELEVATIONS ARE IN REFERENCE TO LOCAL DATUM NAD83 - GEODETIC MODEL HTZ & UNLESS DESCRIBED OTHERWISE.
 - DRAWINGS ARE NOT TO BE SCALED.

REVISIONS			
NO.	DATE	DESCRIPTION	BY
1	02/24/2023	SUBMISSION #1	JH
2	03/02/2023	SUBMISSION #1A - DURHAM ST N SERVICES	JH



KEY PLAN
SCALE - N.T.S.

- BENCHMARKS**
- TOP NUT OF FIRE HYDRANT ON KING STREET EAST AT THE SITE ACCESS ELEV = 105.748
 - TOP NUT OF FIRE HYDRANT ON DURHAM STREET NORTH IN FRONT OF COLBORNE CURLING CLUB ELEV = 109.261
 - TOP NUT OF FIRE HYDRANT ON DURHAM STREET NORTH JUST SOUTH OF SCOTT STREET ELEV = 118.765



EASTFIELDS SUBDIVISION
COLBORNE
FIDELITY GROUP OF COMPANIES
TOWNSHIP OF CRAMAHE

WATERCOURSE RE-ALIGNMENT PLAN
PHASE 1A

DRAWN BY: JGH PROJECT NO: 210-5024
 DESIGNED BY: JGH/AMR DATE: February 2023
 CHECKED BY: AMR SCALE: HORIZONTAL - 1:300
 APPROVED BY: AMR VERTICAL - N/A
 CONTRACT NO: DRAWING NO: WC-1

NOTE:
 1. NEW CHANNEL WATERCOURSE TO BE CONSTRUCTED AS PART OF PHASE 1A WORKS.
 2. NEW CHANNEL TO BE CONSTRUCTED AND VEGETATION ESTABLISHED.
 3. IN-WATER WORKS SHOULD OCCUR OUTSIDE OF SPRING SPAWNING PERIOD (MARCH 15 TO JULY 15).
 4. NEW CULVERT TO BE INSTALLED AS PART OF PHASE 1B WORKS AND FLOWS RE-ROUTED.



Fisheries and Oceans
Canada

Ontario and Prairie Region
Fish and Fish Habitat Protection Program
867 Lakeshore Rd.
Burlington, ON
L7S 1A1

Pêches et Océans
Canada

Région de l'Ontario et des Prairies
Programme de protection du poisson et de son habitat
867 chemin Lakeshore
Burlington, ON
L7S 1A1

April 17, 2023

Your file *Votre référence*

Our file *Notre référence*
23-HCAA-00632

Jim Pillsworth
512 Purdy Rd, Colborne, ON, K0K 1S0

**Subject: Channel Realignment, Colborne Creek, Cramahe (23-HCAA-00632) –
Implementation of Measures to Avoid and Mitigate the Potential for
Prohibited Effects to Fish and Fish Habitat**

Dear Jim Pillsworth:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on March 29, 2023. We understand that you propose to:

- Relocate a tributary of Colborne Creek to facilitate future development in the area;
- Create a channel with approximate dimensions of: 0.55m deep, 1m wide, and a 3:1 slope on the banks;
- Install a new 750mm concrete culvert to facilitate a new road on the future;
- Create a vegetated buffer on both sides of the new channel;
- Fill in the existing channel.

Our review considered the following information:

- Request for Review form and associated documents submitted on March 29, 2023

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*
- effects to listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*

The aforementioned impacts are prohibited unless authorized under their respective legislation and regulations.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures listed below:

- Plan in-water works, undertakings and activities to respect [timing windows](#), or as stipulated by the Ministry of Natural Resources and Forestry (MNRF), to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed and migrate
 - No in-water work between March 15 – July 15.
- Capture, relocate and monitor for fish trapped within isolated, enclosed, or dewatered areas
 - Dewater gradually to reduce the potential for stranding fish
- Screen intake pipes to prevent entrainment or impingement of fish
 - Use the [code of practice](#) for water intake screens
- Apply the interim [code of practice](#) for temporary cofferdams and diversion channels
- Limit impacts on riparian vegetation to those approved for the work, undertaking or activity
 - Limit access to banks or areas adjacent to waterbodies
 - Construct access points and approaches perpendicular to the watercourse or waterbody
 - Re-vegetate the disturbed area with native species suitable for the site
- Replace/restore any other disturbed habitat features and remediate any areas impacted by the work, undertaking or activity
- Conduct in-water undertakings and activities during periods of low flow
- Limit the duration of in-water works, undertakings and activities so that it does not diminish the ability of fish to carry out one or more of their life processes (spawning, rearing, feeding, migrating)
- Develop and implement an Sediment Control Plan to minimize sedimentation of the waterbody during all phases of the work, undertaking or activity
 - Conduct all in-water works, undertakings or activities in isolation of open or flowing water to reduce the introduction of sediment into the watercourse
 - Schedule work to avoid wet, windy and rainy periods (and heed weather advisories)
 - Inspect and maintain regularly the erosion and sediment control measures and structures during all phases of the project
 - Remove all exposed non-biodegradable sediment control materials once site has been stabilized
 - Operate machinery on land, or from barges or on ice
 - Monitor the watercourse to observe signs of sedimentation during all phases of the work, undertaking or activity and take corrective action
 - Dispose and stabilize all dredged material above the high water mark of nearby waterbodies to prevent entry in the water

- Avoid changing flow or water level
- Maintain an appropriate depth and flow (i.e., base flow and seasonal flow of water) for the protection of fish and fish habitat
- Do not deposit any deleterious substances in the water course
- Develop and implement a response plan to avoid a spill of deleterious substances
 - Keep an emergency spill kit on site during the work, undertaking or activity
 - Report any spills of sewage, oil, fuel or other deleterious material, whether near or directly into a water body
 - Ensure clean-up measures are suitably applied so as not to result in further alteration of the bed and/or banks of the watercourse
 - Maintain all machinery on site in a clean condition and free of fluid leaks
 - Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal is not likely to result in the contravention of the above mentioned prohibitions and requirements.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to remain in compliance with the *Fisheries Act*, and the *Species at Risk Act*.

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to (<http://www.dfo-mpo.gc.ca/pnw-ppe/CONTACT-eng.html>).

We recommend that you notify this office at least 10 days before starting your project and that a copy of this letter be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal ([DFO.OP.10DayNotification-Notification10Jours.OP.MPO@dfo-mpo.gc.ca](mailto:DFO.OP.10DayNotificationNotification10Jours.OP.MPO@dfo-mpo.gc.ca)).

If you have any questions with the content of this letter, please contact Carter Bryant by email at Carter.Bryant@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

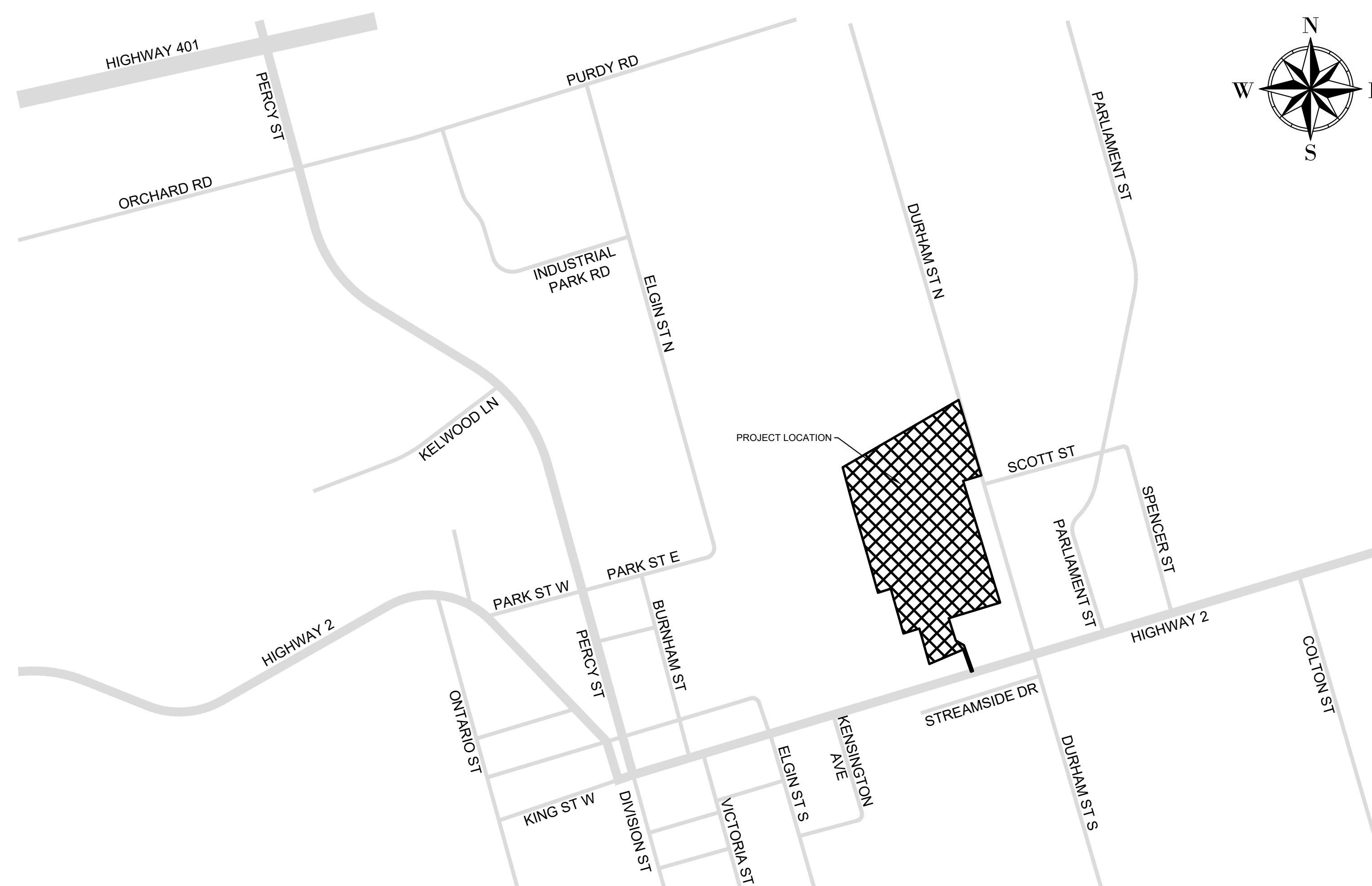
Yours sincerely,

A handwritten signature in blue ink that reads "Carter Bryant". The signature is written in a cursive style with a horizontal line through the middle of the letters.

Carter Bryant
Biologist, Triage and Planning

EASTFIELDS DEVELOPMENT FIDELITY GROUP OF COMPANIES

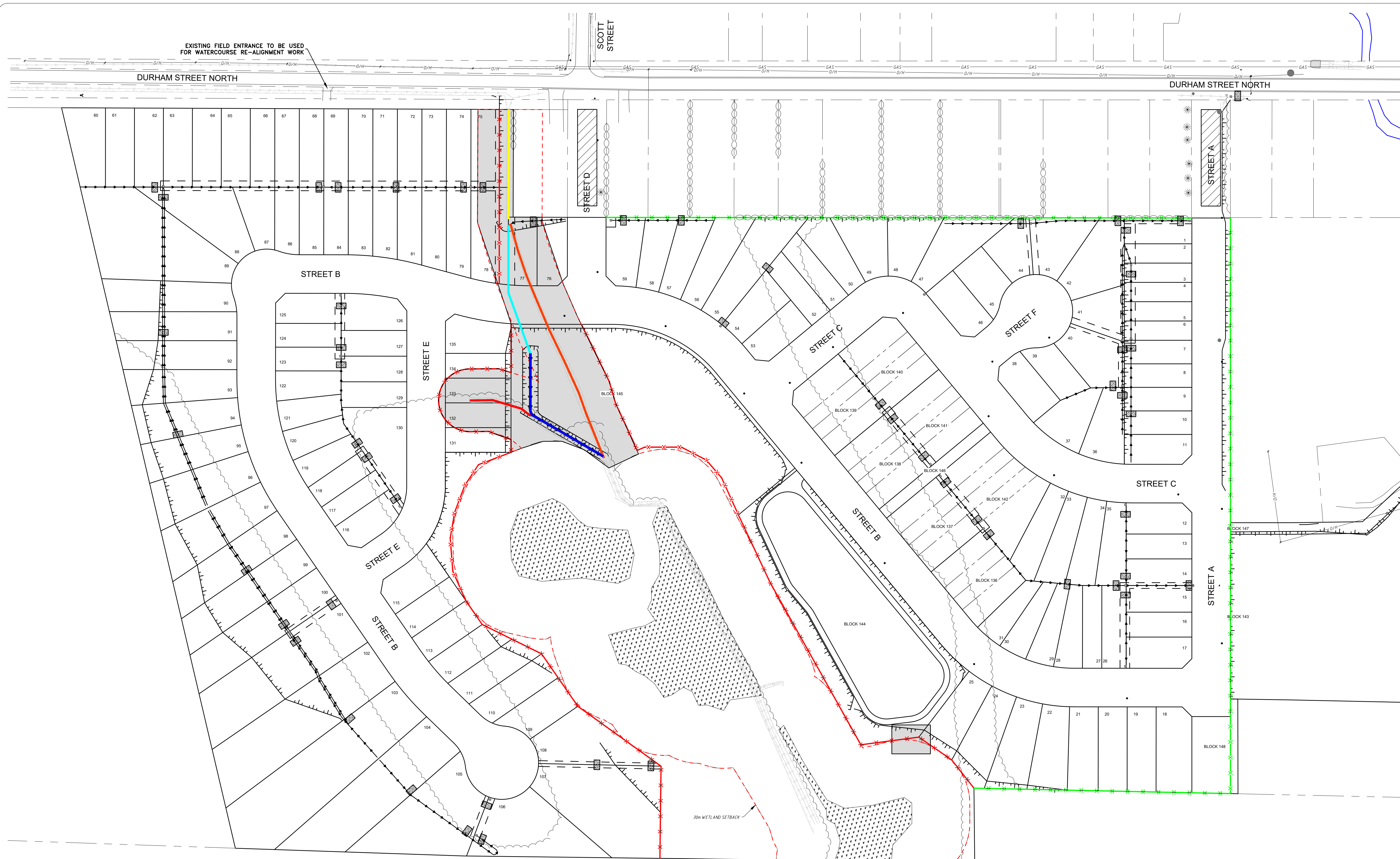
COLBORNE, ONTARIO TOWNSHIP OF CRAMAHE



DRAWING LIST	
DRAWING No.	DRAWING TITLE
WC-1	WATERCOURSE RE-ALIGNMENT PLAN - PHASE 1A
WC-ESC-1	EROSION & SEDIMENT CONTROL PLAN
PP-WC-1	PLAN & PROFILE - EXISTING WATERCOURSE (EAST-WEST) STA. 0+000 to 0+110
PP-WC-2	PLAN & PROFILE - EXISTING WATERCOURSE (EAST-WEST) STA. 0+110 to 0+220
PP-WC-3	PLAN & PROFILE - EXISTING WATERCOURSE (NORTH-SOUTH) STA. 0+000 to 0+080
WC-DE-1	EXISTING WATERCOURSE DETAILS
PP-WC-4	PLAN & PROFILE - PROPOSED WATERCOURSE (EAST-WEST) STA. 0+000 to 0+110
PP-WC-5	PLAN & PROFILE - PROPOSED WATERCOURSE (EAST-WEST) STA. 0+110 to 0+230
WC-DE-2	PROPOSED WATERCOURSE DETAILS

04/26/2023

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EXISTING FIELD ENTRANCE TO BE USED FOR WATERCOURSE RE-ALIGNMENT WORK

DURHAM STREET NORTH

DURHAM STREET NORTH

SCOTT STREET

STREET B

STREET E

STREET C

STREET F

STREET C

STREET B

STREET A

LEGEND

	STRAW BALE FLOW CHECK DAM OPSD 219.180
	LIGHT DUTY, SILT FENCE BARRIER OPSD 219.110
	HEAVY DUTY, SILT FENCE BARRIER OPSD 219.130
	MUD MAT
	WETLAND
	LTC PERMIT APPLICATION AREA
	EXISTING WATERCOURSE TO BE REMOVED
	EXISTING WATERCOURSE TO REMAIN WITH MODIFIED NORTH BANK
	PROPOSED CULVERT
	PROPOSED WATERCOURSE

GENERAL NOTES:

- ALL INFORMATION TO BE VERIFIED ON SITE PRIOR TO COMMENCING ANY WORK. ANY DISCREPANCIES ARE TO BE REPORTED TO THE CONSULTANT IMMEDIATELY.
- ALL UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL CONFIRM THE LOCATION ON SITE AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES.
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GEOMETRIC NOTE:

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- ALL ELEVATIONS ARE IN REFERENCE TO LOCAL DATUM NAD83 - GEODETIC MODEL HT2.0 UNLESS DESCRIBED OTHERWISE.
- **DRAWINGS ARE NOT TO BE SCALED**

REVISIONS

NO.	DATE	DESCRIPTION	BY
1	04/25/2023	LTC WATERCOURSE PERMIT	JH

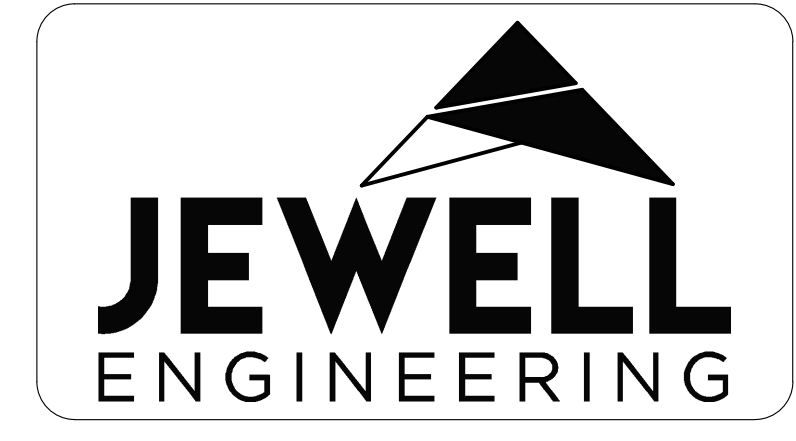
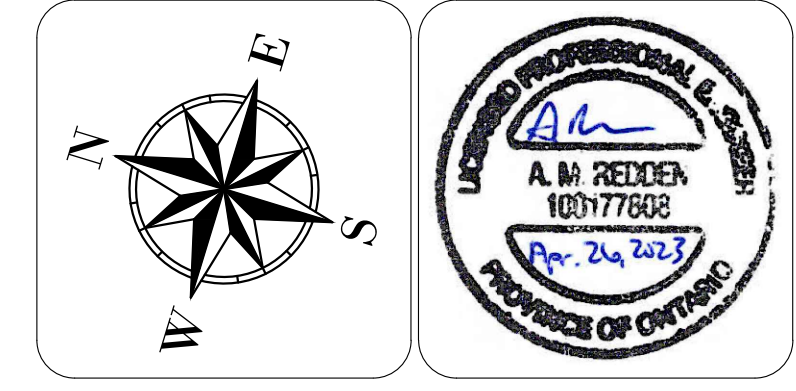
- NOTES**
1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE THE PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE DURING CONSTRUCTION ACTIVITIES. THIS INCLUDES LIMITING THE AMOUNT OF EXPOSED SOIL AND INSTALLING SILT FENCES AND OTHER SEDIMENT TRAPS.
 2. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING EROSION AND SEDIMENT CONTROL MEASURES ARE INSTALLED CORRECTLY.
 3. FOR STRAW BALE FLOW CHECK DAM, USE OPSD 219.180. FOR LIGHT DUTY AND HEAVY DUTY SILT FENCE BARRIER, USE OPSD 219.110 AND 219.130, RESPECTIVELY.
 4. THE OWNER AGREES TO PREPARE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CONSERVATION AUTHORITY.
 5. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE PRIOR TO ANY EXCAVATION OR CONSTRUCTION WORK COMMENCE.
 6. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE REGULARLY MONITORED AND MAINTAINED UNTIL LANDSCAPING HAS BEEN ESTABLISHED.
 7. ALL CATCH BASINS AND MANHOLES WHICH MAY COLLECT SEDIMENT FROM THE DISTURBED AREAS OF THE SITE SHALL HAVE FILTER CLOTH OR OTHER APPROVED MEANS OF SEDIMENT CONTROL INSTALLED AND MAINTAINED UNTIL THE CONTRIBUTING SURFACES HAVE ADEQUATELY STABILIZED, I.E. ASPHALT, SO2, OR 80% GRASS COVER.
 8. MUD MAT MUST BE A MINIMUM OF 20 m IN LENGTH AND THE FULL WIDTH OF THE ENTRANCE (10 m MINIMUM). THE PAD SHOULD BE A MINIMUM OF 300 mm THICK BUT 450 mm THICKNESS IS RECOMMENDED. THE PAD SHOULD BE UNDERLAIN WITH A GEOTEXTILE (OR GRADED AGGREGATE FILTER) AND CONSIST OF 50 mm DIAMETER CLEAR STONE FOR THE FIRST 10 m EXTENDING FROM THE STREET) AND THE REMAINDER OF THE LENGTH TO CONSIST OF 150 mm DIAMETER CLEAR STONE.

EMERGENCY CONTACT INFORMATION

SPILLS ACTION CENTRE
PHONE: 416-325-3000
TOLL-FREE: 1-800-268-0060

BENCHMARKS

1. TOP NUT OF FIRE HYDRANT ON KING STREET EAST AT THE SITE ACCESS ELEV = 105.748
2. TOP NUT OF FIRE HYDRANT ON DURHAM STREET NORTH IN FRONT OF COLBORNE CURLING CLUB ELEV = 109.261
3. TOP NUT OF FIRE HYDRANT ON DURHAM STREET NORTH JUST SOUTH OF SCOTT STREET ELEV = 118.765



**EASTFIELDS SUBDIVISION
COLBORNE**

FIDELITY GROUP OF COMPANIES
TOWNSHIP OF CRAMAHE

WATERCOURSE RE-ALIGNMENT PLAN

DRAWN BY: JGH **PROJECT NO:** 210-5024

DESIGNED BY: JGH/AMR **DATE:** April 2023

CHECKED BY: AMR **SCALE:** HORIZONTAL - 1:1000
VERTICAL - N/A

APPROVED BY: AMR **CONTRACT NO:** **DRAWING NO:** WC-1

04/26/2023

NOTES

1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE THE PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE DURING CONSTRUCTION ACTIVITIES. THIS INCLUDES LIMITING THE AMOUNT OF EXPOSED SOIL AND INSTALLING SILT FENCES AND OTHER SEDIMENT TRAPS.
2. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING EROSION AND SEDIMENT CONTROL MEASURES ARE INSTALLED CORRECTLY.
3. FOR STRAW BALE FLOW CHECK DAM, USE OPSD 219.100. FOR LIGHT DUTY AND HEAVY DUTY SILT FENCE BARRIER, USE OPSD 219.110 AND 219.130, RESPECTIVELY.
4. THE OWNER AGREES TO PREPARE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CONSERVATION AUTHORITY.
5. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE PRIOR TO ANY EXCAVATION OR CONSTRUCTION WORK COMMENCE.
6. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE REGULARLY MONITORED AND MAINTAINED UNTIL LANDSCAPING HAS BEEN ESTABLISHED.
7. ALL CATCH BASINS AND MANHOLES WHICH MAY COLLECT SEDIMENT FROM THE DISTURBED AREAS OF THE SITE SHALL HAVE FILTER CLOTH OR OTHER APPROVED MEANS OF SEDIMENT CONTROL INSTALLED AND MAINTAINED UNTIL THE CONTRIBUTING SURFACES HAVE ADEQUATELY STABILIZED, I.E. ASPHALT, SOD, OR 80% GRASS COVER.
8. MUD MAT MUST BE A MINIMUM OF 20 m IN LENGTH AND THE FULL WIDTH OF THE ENTRANCE (10 m MINIMUM). THE PAD SHOULD BE A MINIMUM OF 300 mm THICK BUT 450 mm THICKNESS IS RECOMMENDED. THE PAD SHOULD BE UNDERLAIN WITH A GEOTEXTILE (OR GRADED AGGREGATE FILTER) AND CONSIST OF 50 mm DIAMETER CLEAR STONE FOR THE FIRST 10 m (EXTENDING FROM THE STREET) AND THE REMAINDER OF THE LENGTH TO CONSIST OF 150 mm DIAMETER CLEAR STONE.

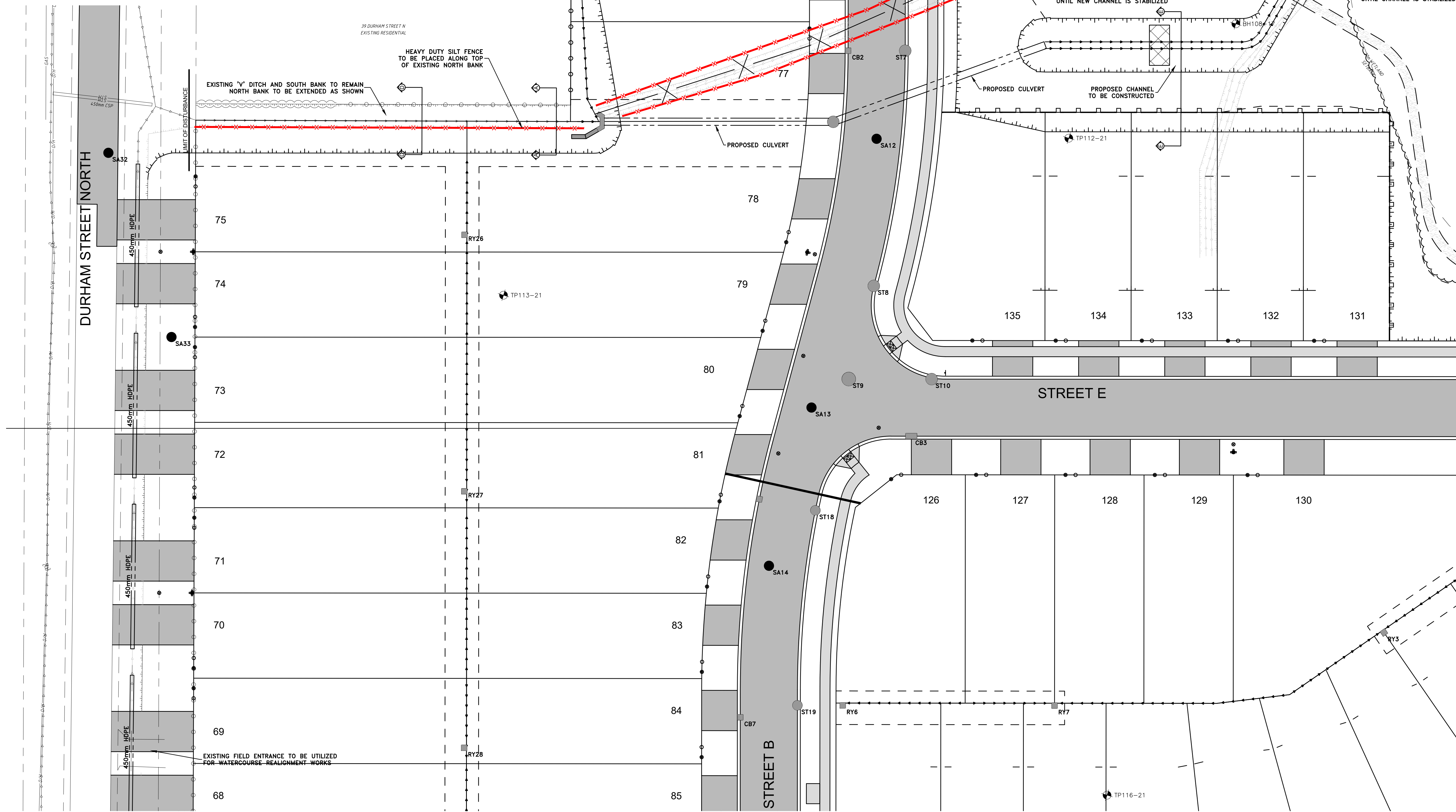
EMERGENCY CONTACT INFORMATION
 SPILLS ACTION CENTRE
 PHONE: 416-325-3000
 TOLL-FREE: 1-800-268-6090

CONSTRUCTION STAGING NOTE

1. THE NEW CHANNEL WILL BE CREATED FULLY IN THE DRY WITH APPROPRIATE EROSION AND SEDIMENT CONTROLS (ESC) INSTALLED PRIOR TO COMMENCING WORK.
2. MATERIALS EXCAVATED FROM THE NEW CHANNEL WILL STOCKPILED ON-SITE ABOVE THE HIGH WATER MARK OF THE WATERCOURSE AND PROPERLY STABILIZED.
3. THE BANKS WILL BE STABILIZED WITH A ROLLED EROSION CONTROL PRODUCT. A VEGETATIVE BUFFER WILL BE ESTABLISHED ALONG BOTH BANKS OF THE NEW CHANNEL AND WILL BE PLANTED WITH NATIVE SPECIES.
4. ONCE THE NEW CHANNEL IS COMPLETED, THE EXISTING DRAINAGE WILL BE SWEEPED TO DETERMINE IF ANY WATER IS CONTAINED WITHIN, AS THE INTENT IS TO BEGIN WORK IN THIS AREA DURING DRY CONDITIONS. IF THE DRAINAGE IS DRY, IT WILL BE CONNECTED TO THE NEW CHANNEL. SEDIMENT AND EROSION CONTROLS WILL BE MAINTAINED ON THE BANKS AND IN THE CHANNEL UNTIL ALL AREAS OF DISTURBED SOIL ARE STABILIZED. IF WATER IS PRESENT IN THE DRAINAGE DITCH, THE WORK AREA SHOULD BE ISOLATED USING COFFERDAMS AND DEWATERED TO FACILITATE WORK IN THE DRY. A QUALIFIED AQUATIC ECOLOGIST SHOULD BE ON-SITE DURING THE INSTALLATION OF THE ISOLATION TO ENSURE ACTIVITIES DO NOT ADVERSELY IMPACT THE AQUATIC ENVIRONMENT. PRIOR TO ANY DEWATERING ACTIVITIES, A FISH SALVAGE SHOULD BE CONDUCTED BY A QUALIFIED AQUATIC ECOLOGIST UNDER A LICENSE TO COLLECT FISH FOR SCIENTIFIC PURPOSES (LCFSP) ISSUED BY MNRF. IF REQUIRED, A PUMP BY-PASS SYSTEM SHALL BE INSTALLED TO DIVERT FLOWS AROUND THE PROJECT SITE DURING CONSTRUCTION. DEWATERING DISCHARGE HOSES WILL BE DIRECTED TO A SILT BAG DESIGNED TO LIMIT FINE SEDIMENT INPUT, AND DIRECTED TO AN AREA 30 m FROM THE FEATURE OR INTO A VEGETATED AREA. ALL PUMP INTAKES WILL BE FITTED WITH SUITABLY SIZED SCREENING TO PREVENT ENTRAINMENT AND IMPINGEMENT OF FISH.
5. ALL WORK BELOW THE HIGH WATER MARK SHOULD BE COMPLETED IN ISOLATION OF FLOWS, TO FACILITATE WORK "IN THE DRY."
6. ANY EQUIPMENT, MACHINERY, OR TOOLS USED IN OR IMMEDIATELY ADJACENT TO THE WATER SHOULD BE CLEAN AND MAINTAINED IN GOOD REPAIR. ALL MACHINERY SHOULD BE INSPECTED FOR FLUID LEAKS OR OTHER POTENTIAL POLLUTANTS.
7. IN-WATER WORKS SHOULD BE COMPLETED WITHIN THE APPROPRIATE IN-WATER TIMING WINDOWS TO RESPECT SENSITIVE LIFE STAGES OF THE AQUATIC COMMUNITY, INCLUDING FISH. THE RECOMMENDED TIMING WINDOW FOR THE PROPOSED WORK IS JULY 15 TO MARCH 15 OF ANY GIVEN YEAR.

LEGEND

- SILT SOXX CHECK DAM
- HEAVY DUTY, SILT FENCE BARRIER OPSD 219.130



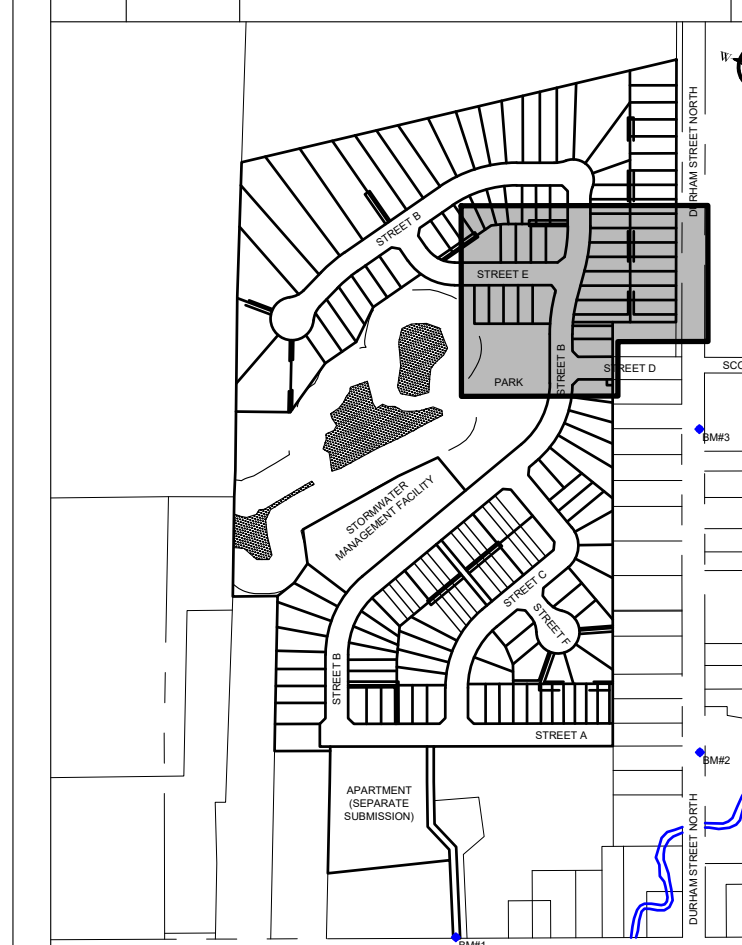
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GEOMETRIC NOTE:
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 - * DRAWINGS ARE NOT TO BE SCALED *

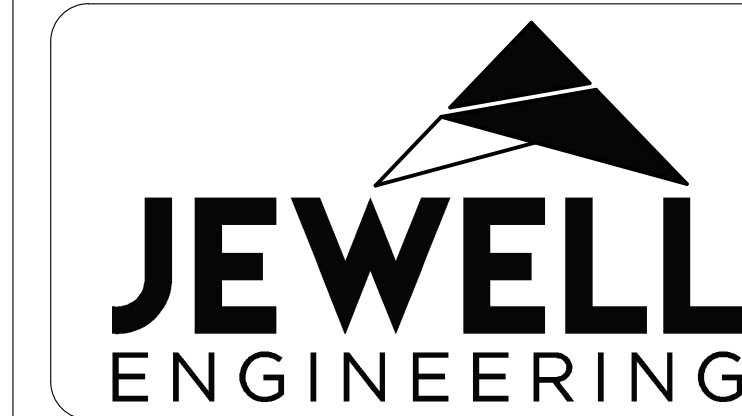
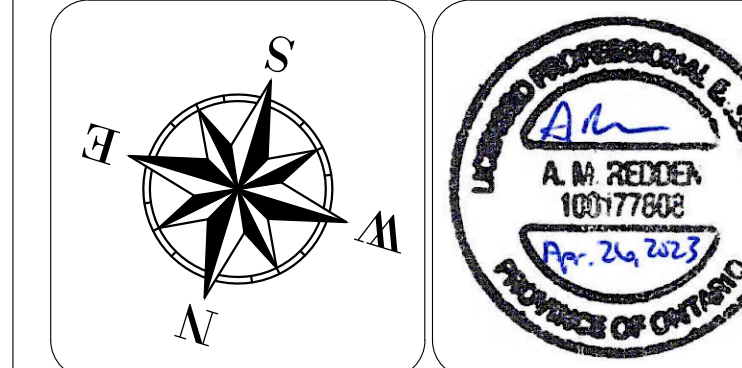
REVISIONS

NO.	DATE	DESCRIPTION	BY
1	04/26/2023	LTC WATERCOURSE PERMIT	JH



KEY PLAN SCALE - N.T.S.

- BENCHMARKS
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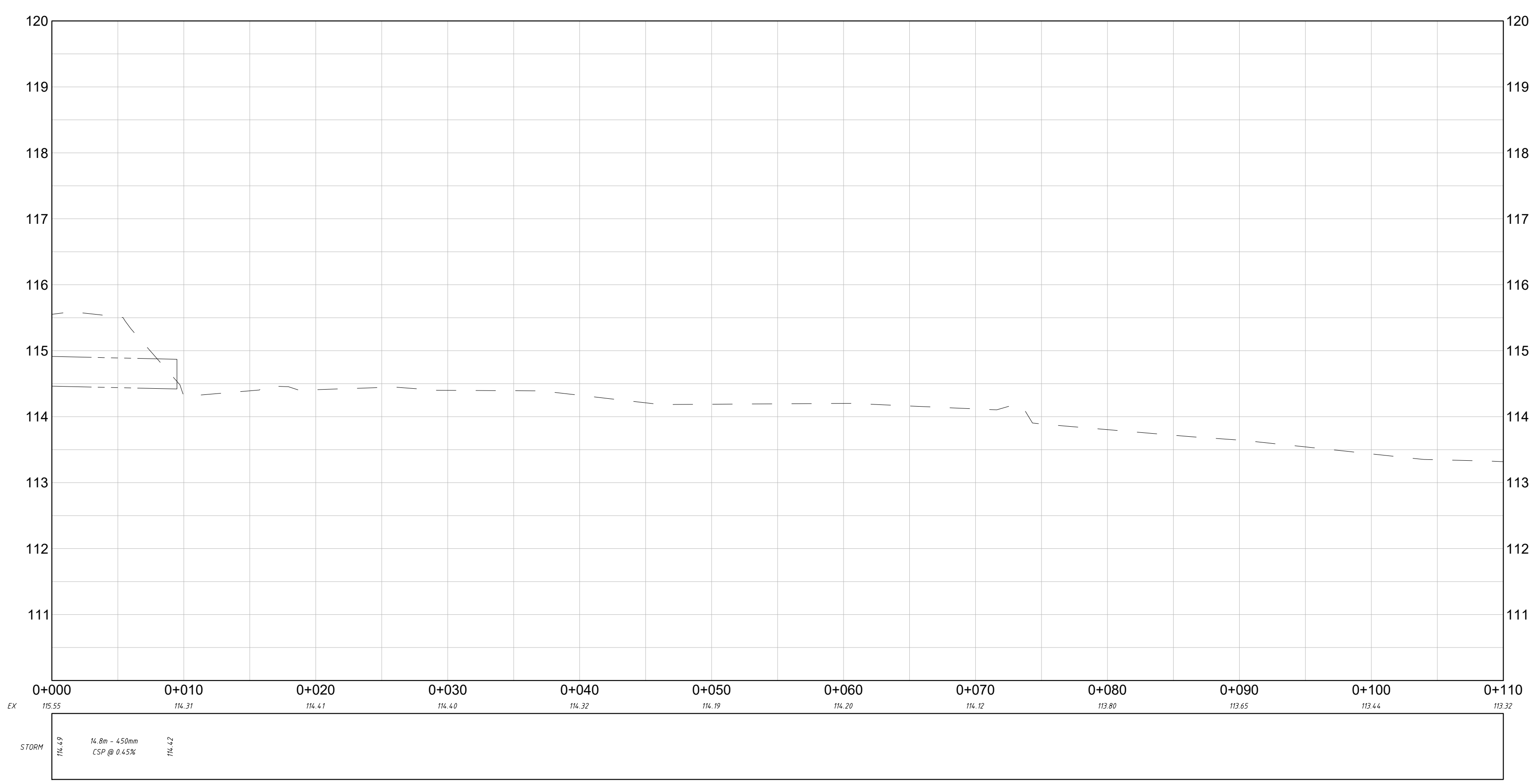
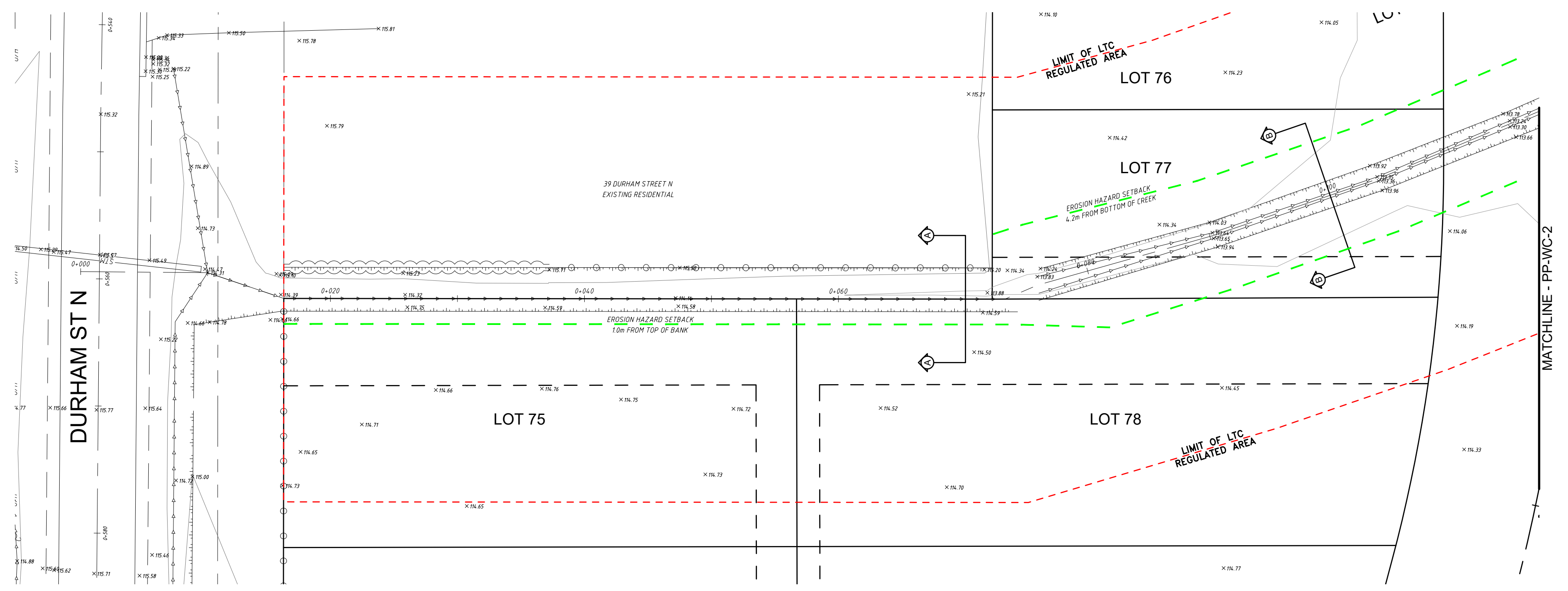
EASTFIELDS SUBDIVISION
 COLBORNE
 FIDELITY GROUP OF COMPANIES
 TOWNSHIP OF CRAMAHE

WATERCOURSE RE-ALIGNMENT
 SEDIMENT AND EROSION CONTROL PLAN

DRAWN BY: JGH PROJECT NO: 210-5024
 DESIGNED BY: JGH/AMR DATE: April 2023
 CHECKED BY: AMR SCALE: HORIZONTAL - 1:300 VERTICAL - N/A
 APPROVED BY: AMR CONTRACT NO: DRAWING NO: WC-ESC-1

F:\IT\PROJECT FILES\1 CIVIL 3D PROJECT FILES\2105024 - FIDELITY - EASTFIELDS COLBORNE\3 SHEETS\2105024 - WC - ESC

EXISTING WATERCOURSE (EAST-WEST)



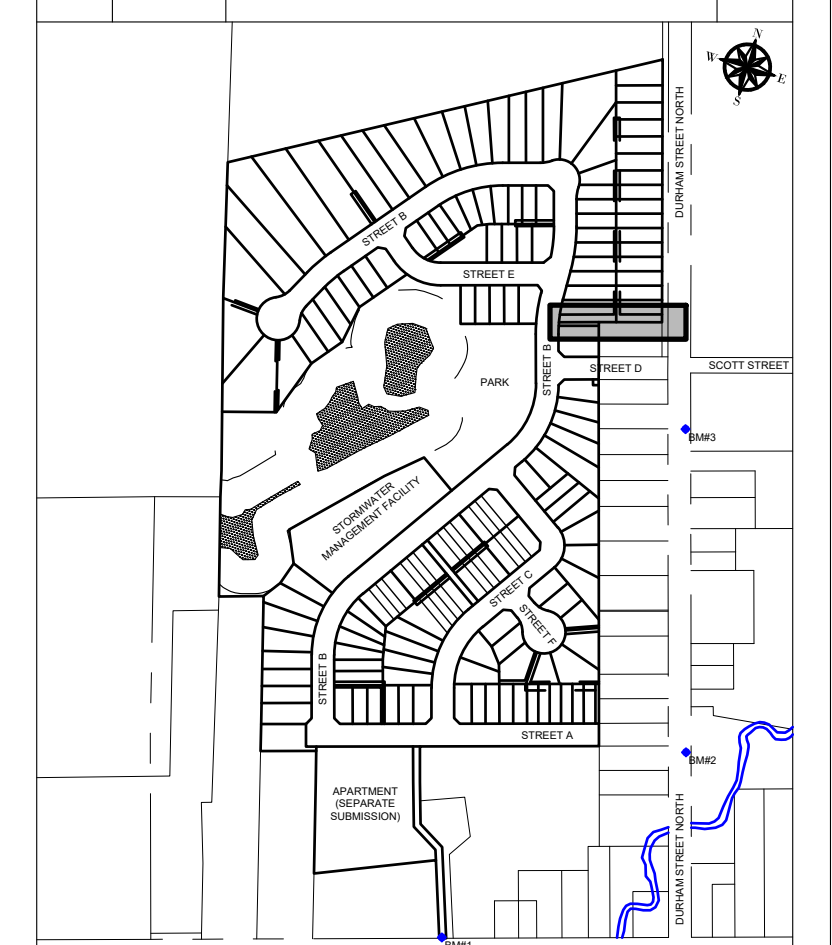
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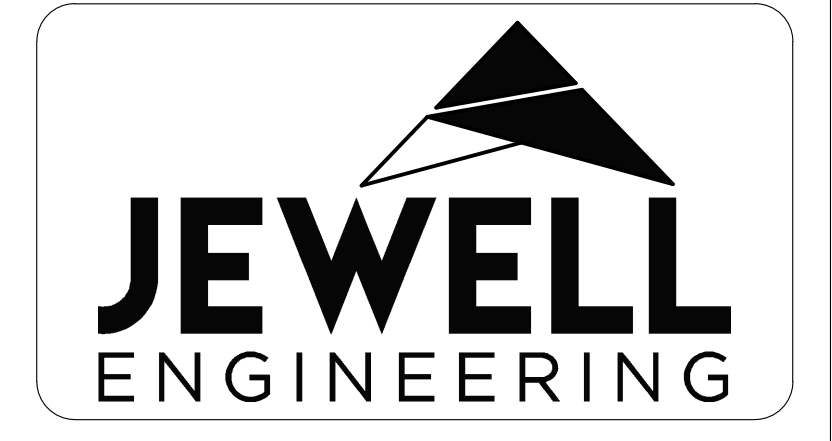
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REVISIONS			
NO.	DATE	DESCRIPTION	BY
1	04/25/2023	LTC WATERCOURSE PERMIT	JH



KEY PLAN
SCALE - N.T.S.

- BENCHMARKS**
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EASTFIELDS SUBDIVISION
COLBORNE

FIDELITY GROUP OF COMPANIES
TOWNSHIP OF CRAMAHE

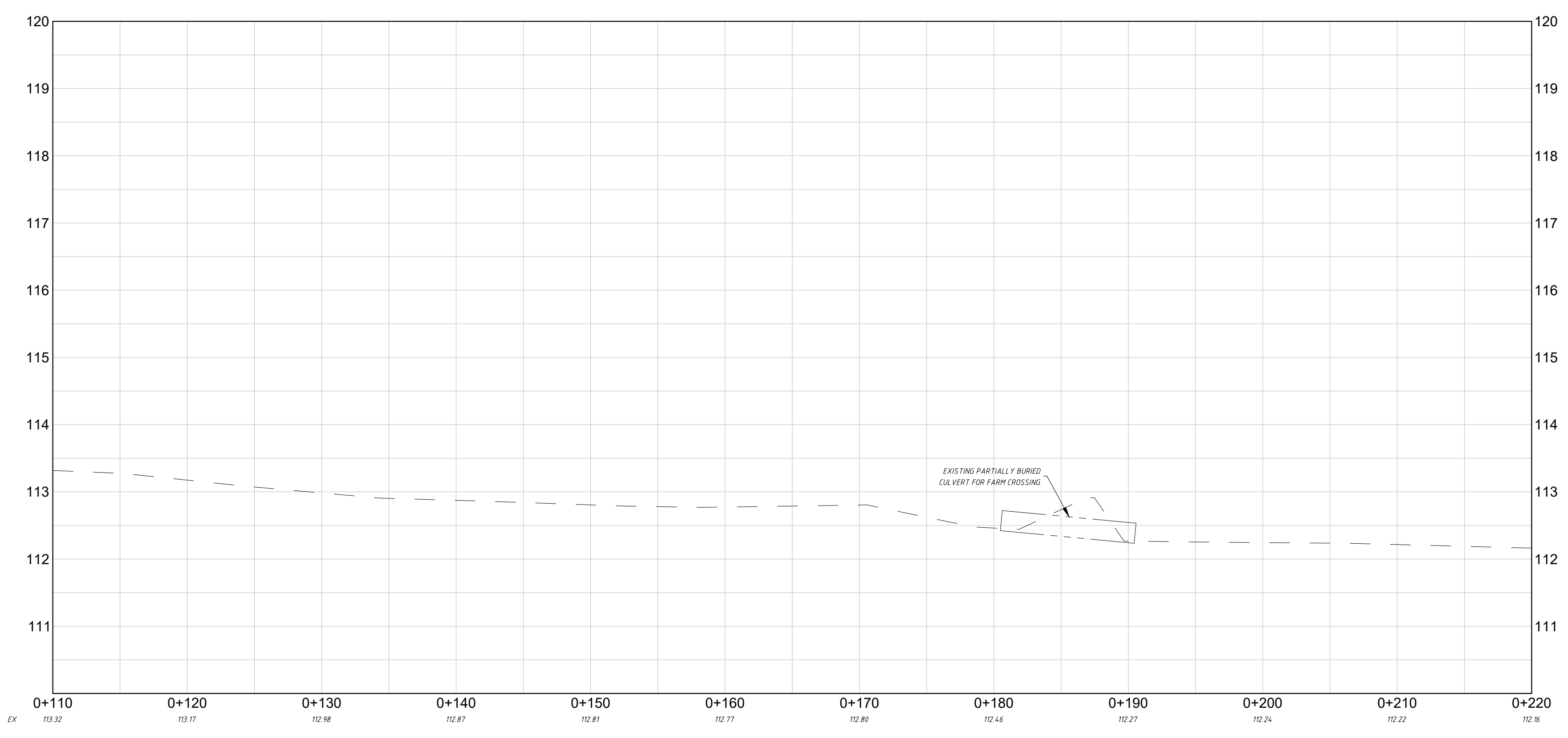
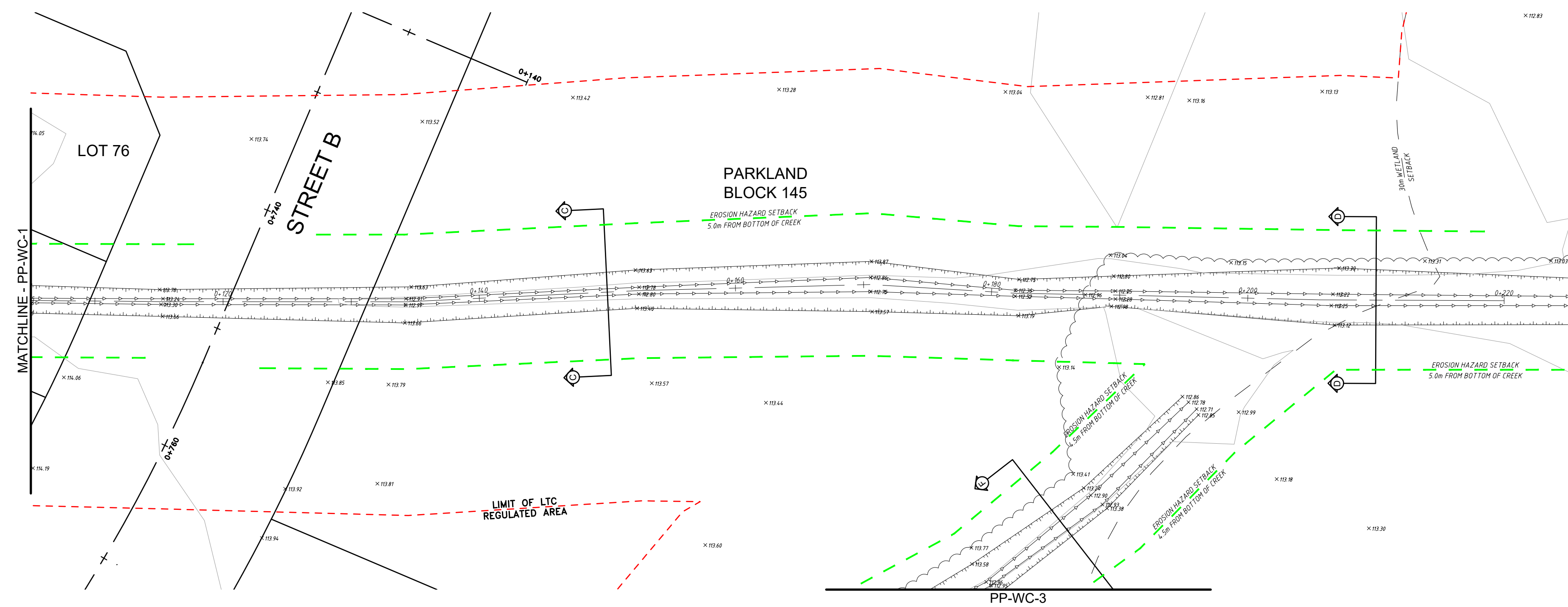
PLAN & PROFILE
EXISTING WATERCOURSE (EAST-WEST)
STA. 0+000 to 0+110

DRAWN BY: JGH	PROJECT NO.: 210-5024
DESIGNED BY: JGH/AMR	DATE: April 2023
CHECKED BY: AMR	SCALE: HORIZONTAL - 1:250 VERTICAL - 1:50
APPROVED BY: AMR	CONTRACT NO.: DRAWING NO.: PP-WC-1

04/26/2023

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EXISTING WATERCOURSE (EAST-WEST)



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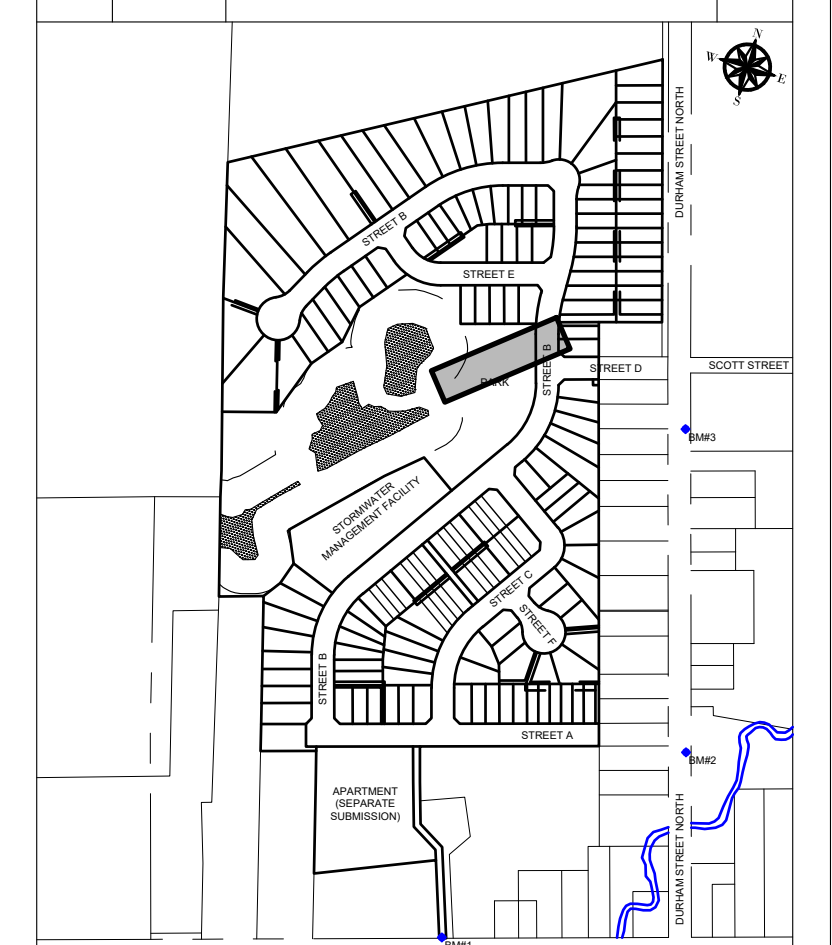
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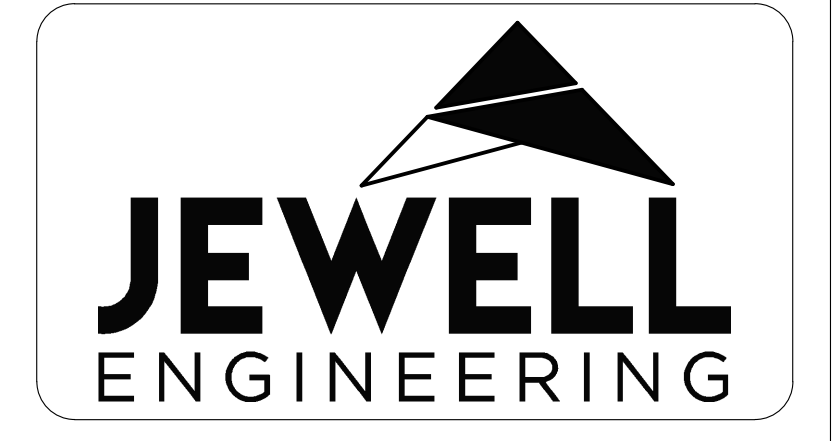
**** DRAWINGS ARE NOT TO BE SCALED ****

REVISIONS			
NO.	DATE	DESCRIPTION	BY
1	04/25/2023	LTC WATERCOURSE PERMIT	JH



KEY PLAN
SCALE - N.T.S.

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EASTFIELDS SUBDIVISION
COLBORNE

FIDELITY GROUP OF COMPANIES
TOWNSHIP OF CRAMAHE

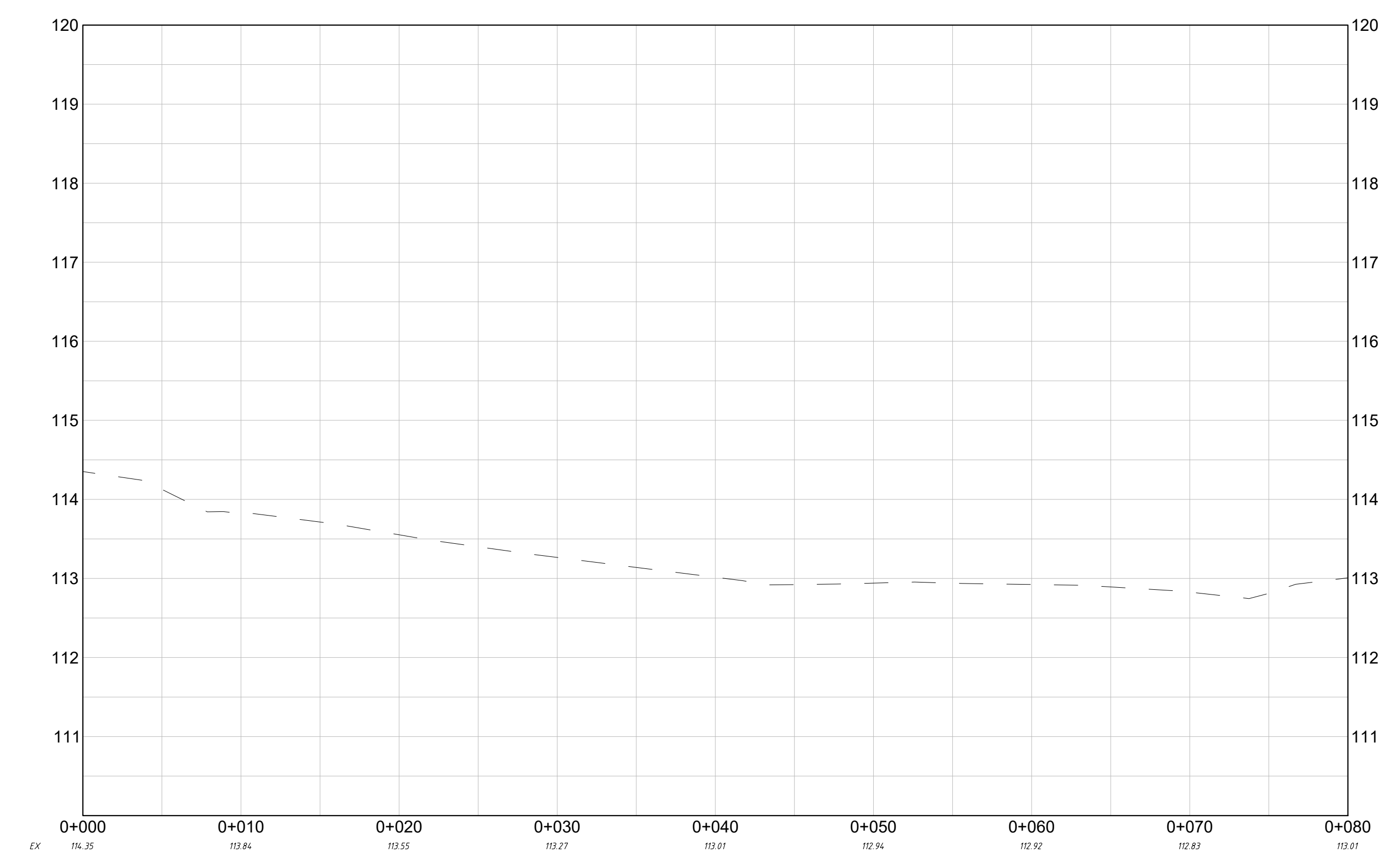
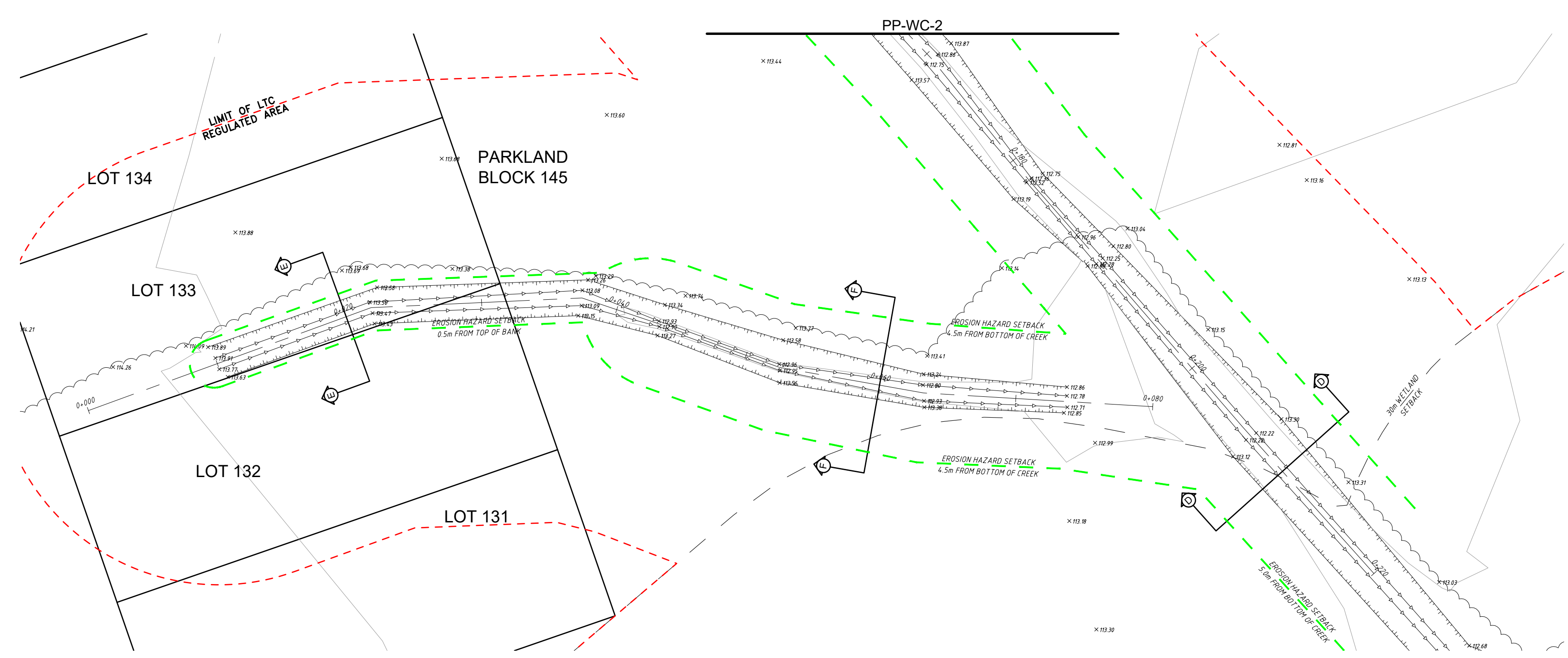
PLAN & PROFILE
EXISTING WATERCOURSE (EAST-WEST)
STA. 0+110 to 0+220

DRAWN BY: JGH	PROJECT NO: 210-5024
DESIGNED BY: JGH/AMR	DATE: April 2023
CHECKED BY: AMR	SCALE: HORIZONTAL - 1:250 VERTICAL - 1:50
APPROVED BY: AMR	CONTRACT NO: DRAWING NO: PP-WC-2

04/26/2023

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EXISTING WATERCOURSE (NORTH-SOUTH)



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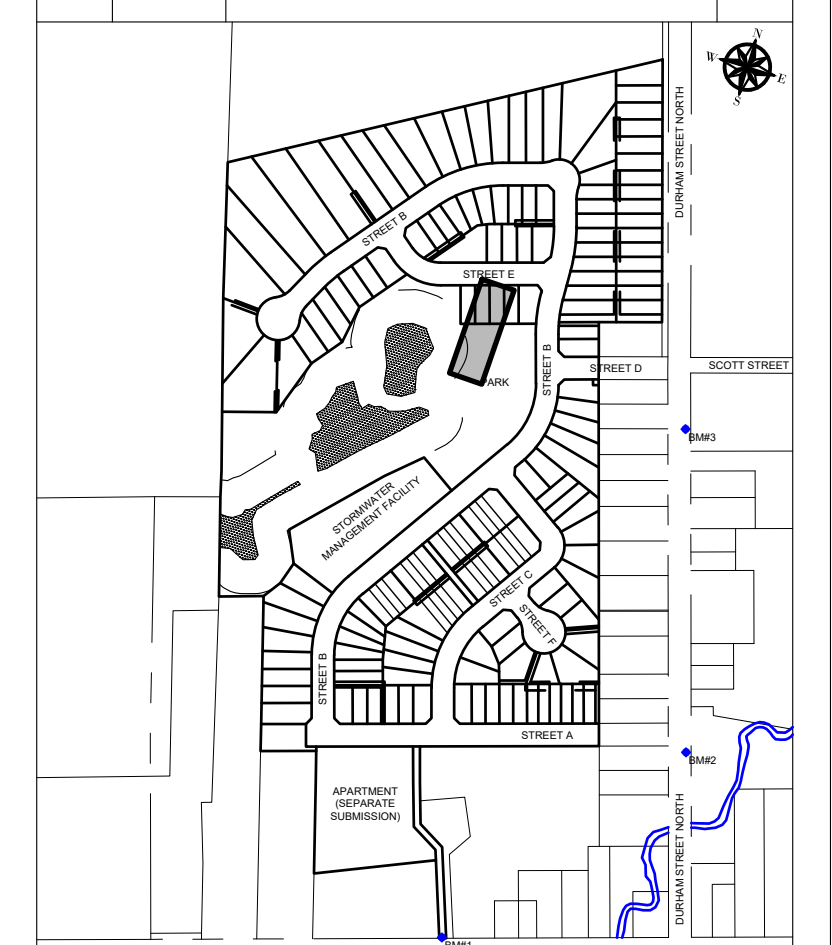
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GEOMETRIC NOTE:

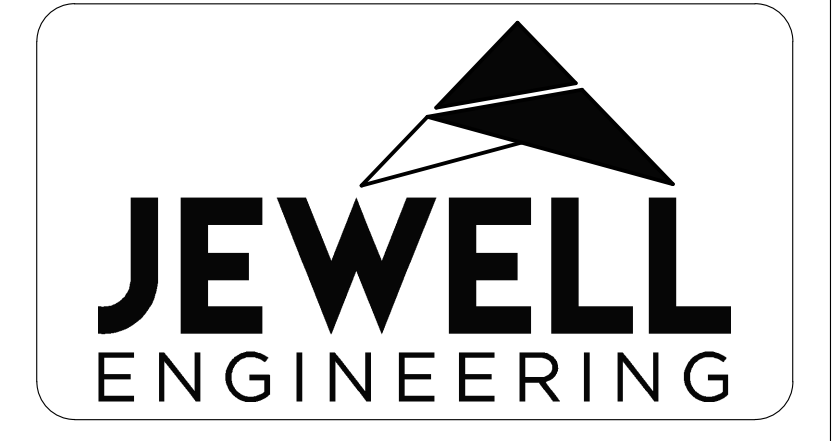
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**** DRAWINGS ARE NOT TO BE SCALED ****

REVISIONS			
NO.	DATE	DESCRIPTION	BY
1	04/25/2023	LTC WATERCOURSE PERMIT	JH



- BENCHMARKS**
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EASTFIELDS SUBDIVISION
COLBORNE

FIDELITY GROUP OF COMPANIES
TOWNSHIP OF CRAMAHE

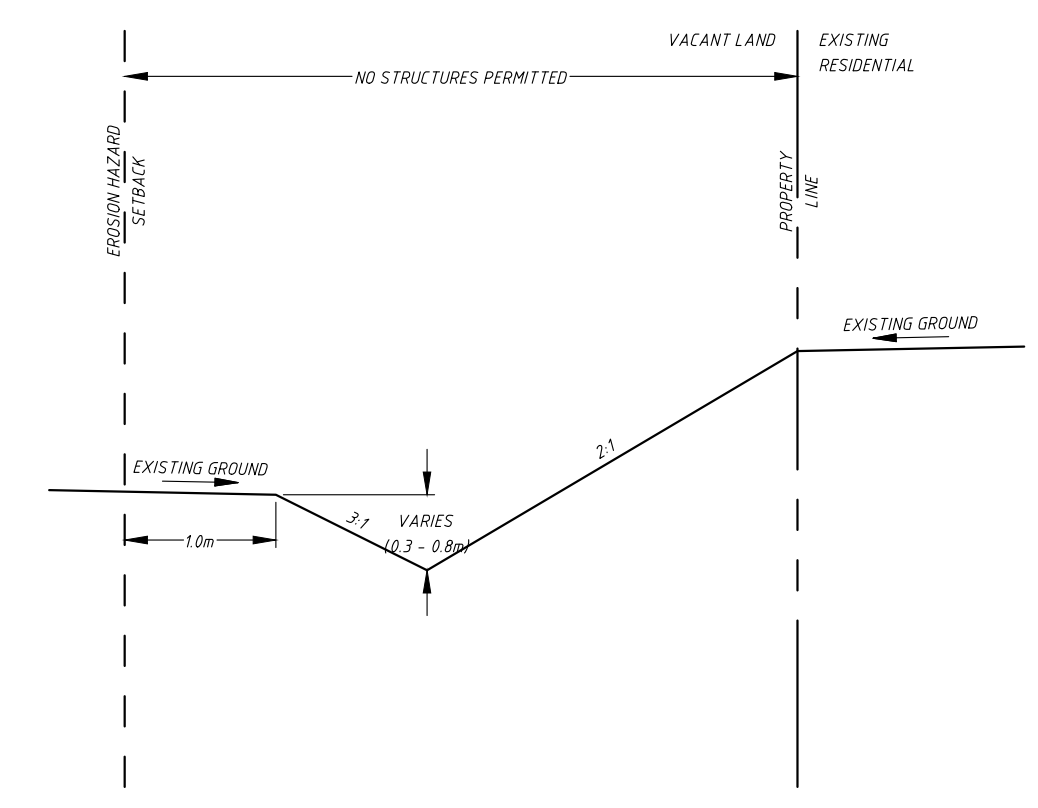
PLAN & PROFILE
EXISTING WATERCOURSE (NORTH-SOUTH)
STA. 0+000 to 0+080

DRAWN BY: JGH PROJECT NO: 210-5024
DESIGNED BY: JGH/AMR DATE: April 2023
CHECKED BY: AMR SCALE: HORIZONTAL - 1:250 VERTICAL - 1:50
APPROVED BY: AMR CONTRACT NO: DRAWING NO: PP-WC-3

04/26/2023

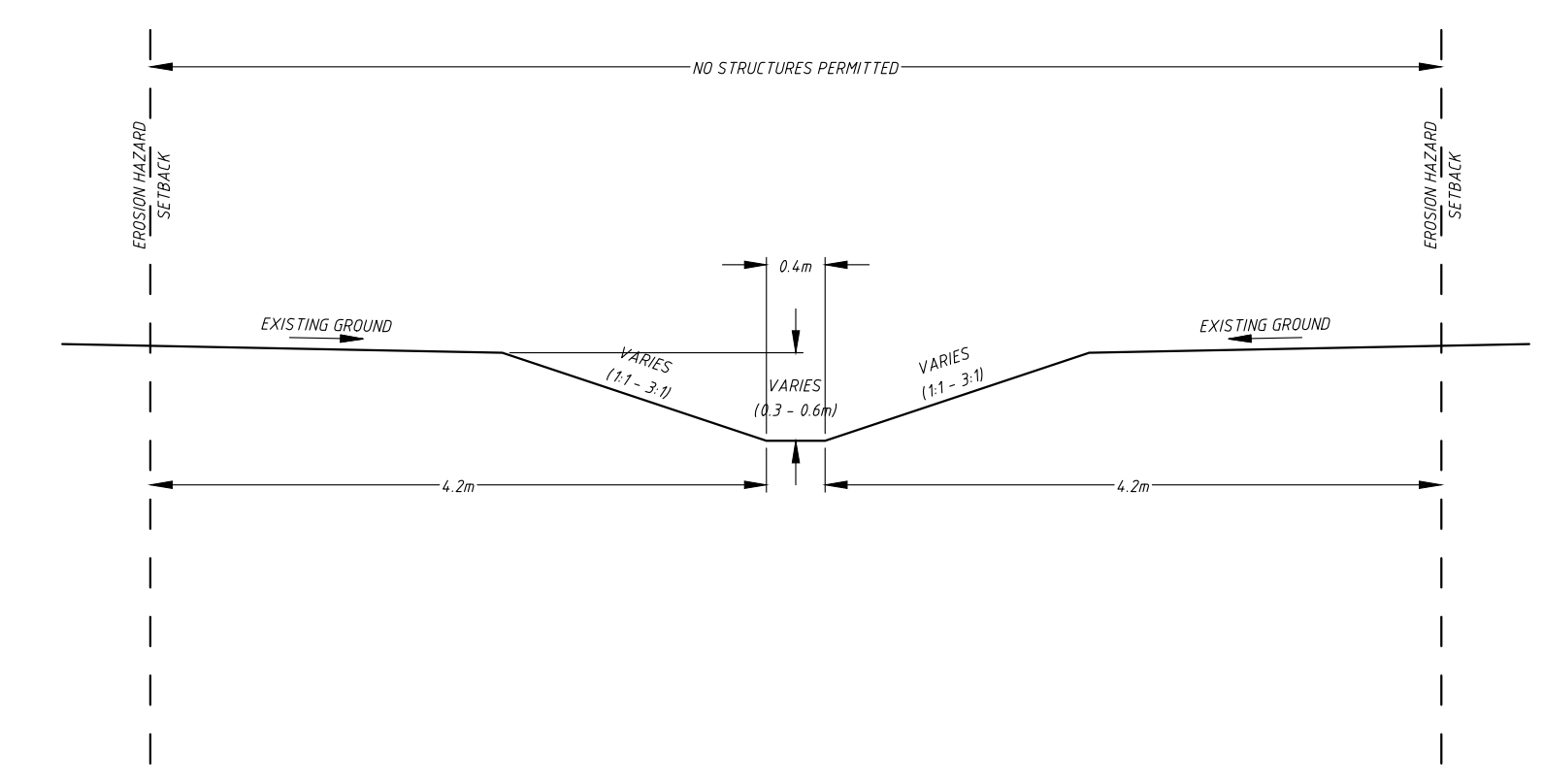
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EROSION HAZARD SETBACK CALCULATION:
(2H:1V OR GREATER)
= H FROM TOP OF BANK
= 0.8m FROM TOP OF BANK MIN
= ROUNDED TO 1.0m



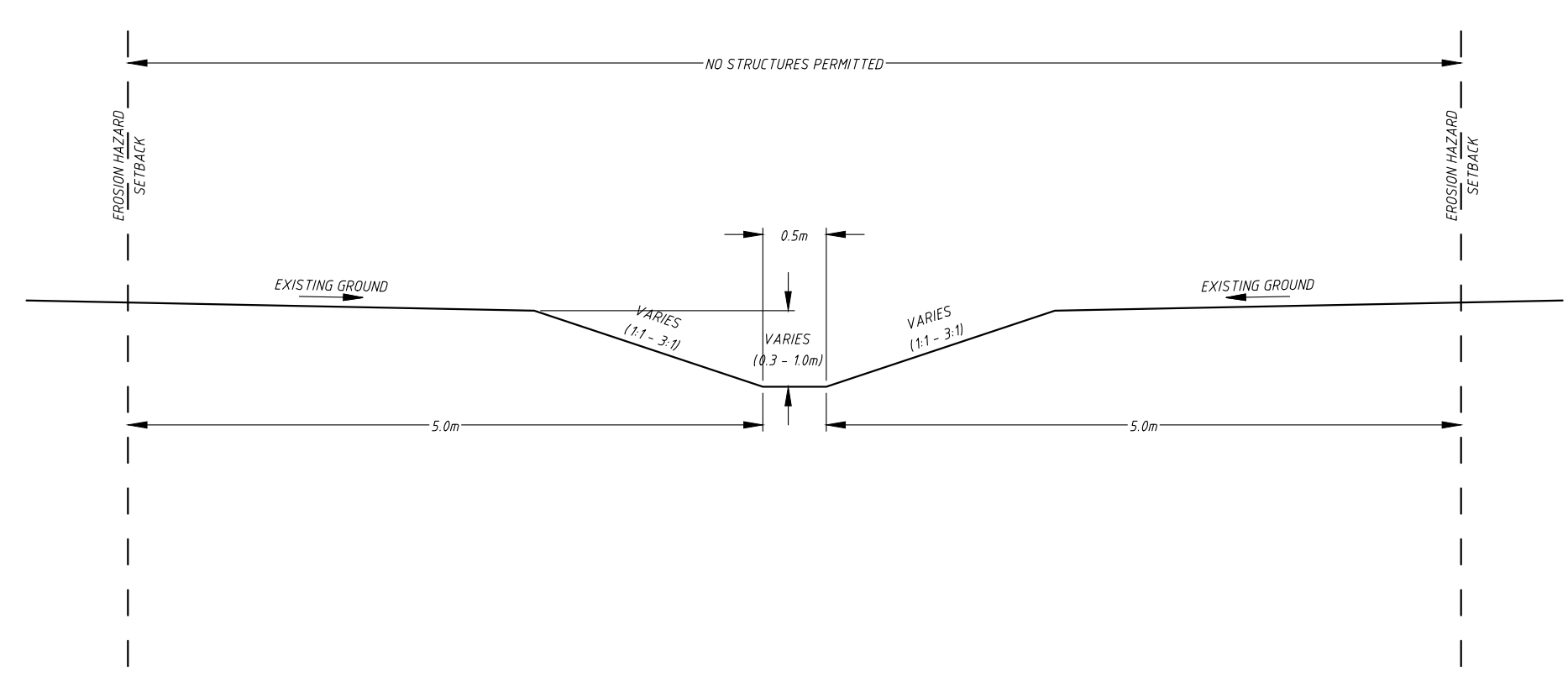
SECTION A-A (EAST-WEST)
STA. 0+020 to 0+075
SCALE - N.T.S.

EROSION HAZARD SETBACK CALCULATION:
(LESS THAN 2H:1V)
= 2H + 3 TO BOTTOM OF BANK
= 2(0.6) + 3
= 4.2m TO BOTTOM OF BANK



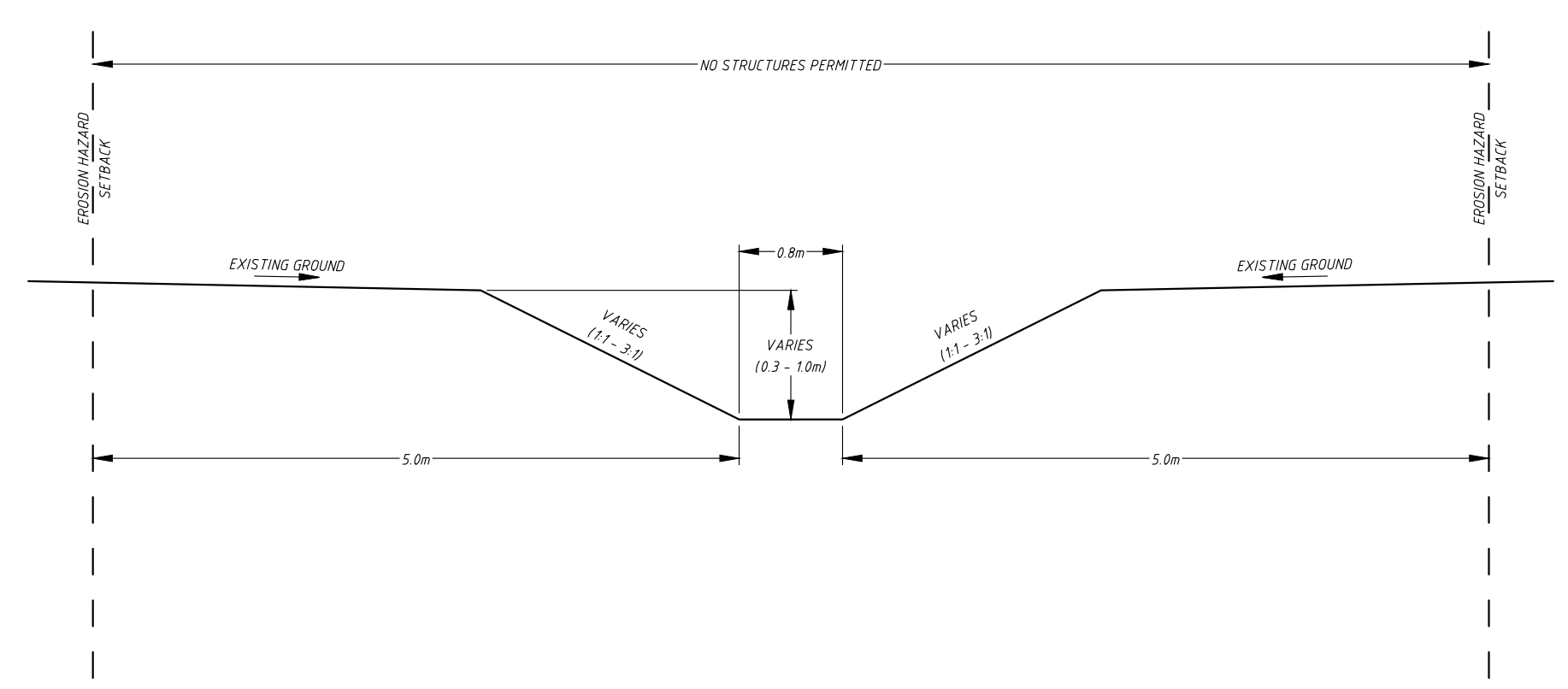
SECTION B-B (EAST-WEST)
STA. 0+075 to 0+120
SCALE - N.T.S.

EROSION HAZARD SETBACK CALCULATION:
(LESS THAN 2H:1V)
= 2H + 3 TO BOTTOM OF BANK
= 2(1.0) + 3
= 5.0m TO BOTTOM OF BANK



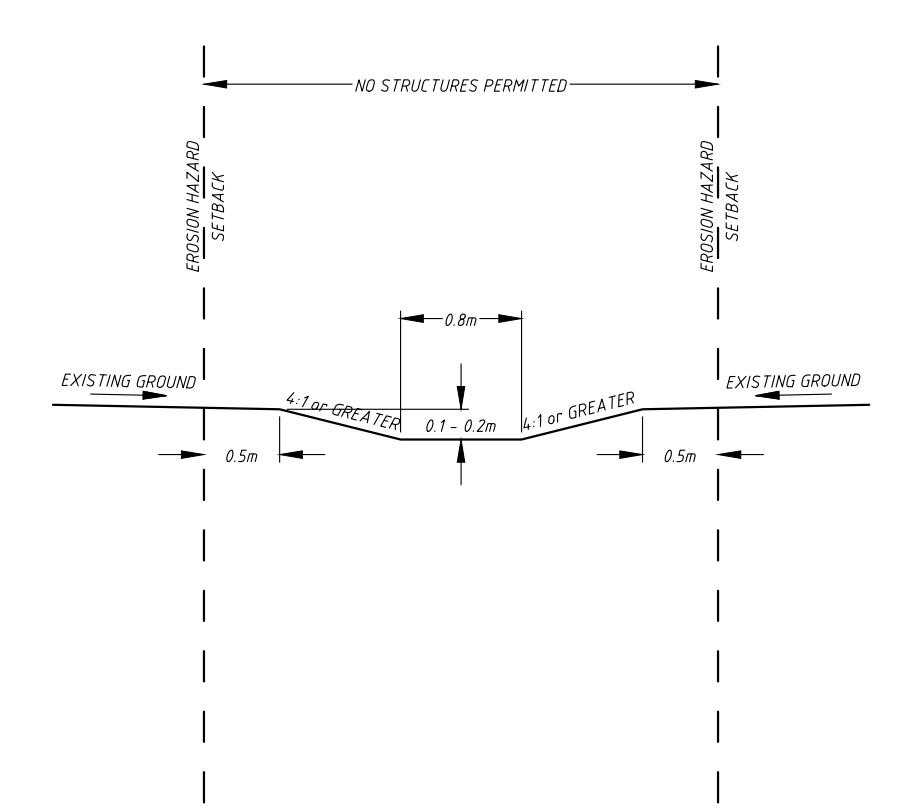
SECTION C-C (EAST-WEST)
STA. 0+120 to 0+200
SCALE - N.T.S.

EROSION HAZARD SETBACK CALCULATION:
(LESS THAN 2H:1V)
= 2H + 3 TO BOTTOM OF BANK
= 2(1.0) + 3
= 5.0m TO BOTTOM OF BANK



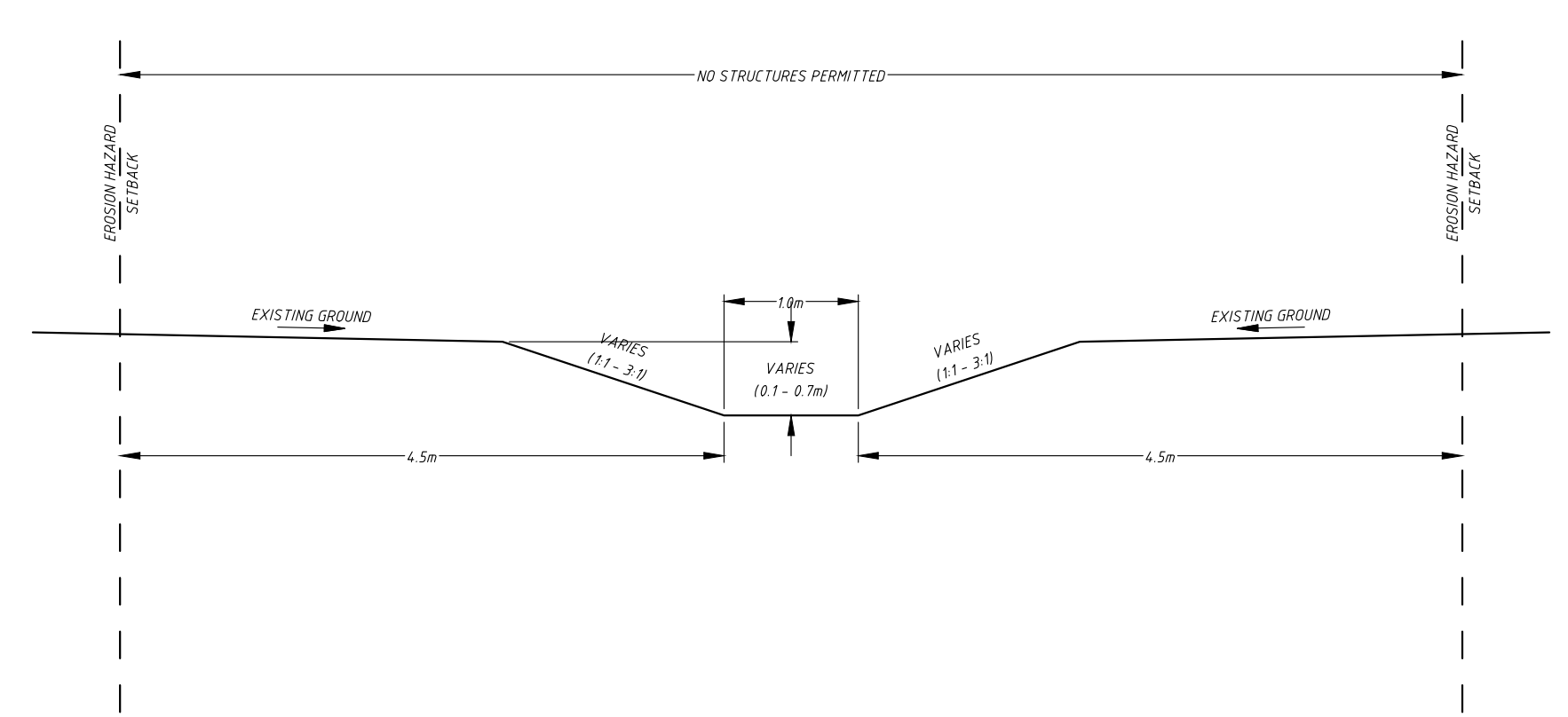
SECTION D-D (EAST-WEST)
STA. 0+200 to DOWNSTREAM
SCALE - N.T.S.

EROSION HAZARD SETBACK CALCULATION:
(2H:1V OR GREATER)
= H FROM TOP OF BANK
= 0.2m FROM TOP OF BANK MIN
= ROUNDED TO 0.5m



SECTION E-E (NORTH-SOUTH)
STA. 0+010 to 0+040
SCALE - N.T.S.

EROSION HAZARD SETBACK CALCULATION:
(LESS THAN 2H:1V)
= 2H + 3 TO BOTTOM OF BANK
= 2(0.7) + 3
= 4.4m TO BOTTOM OF BANK
= ROUNDED TO 4.5m



SECTION F-F (NORTH-SOUTH)
STA. 0+040 to 0+080
SCALE - N.T.S.

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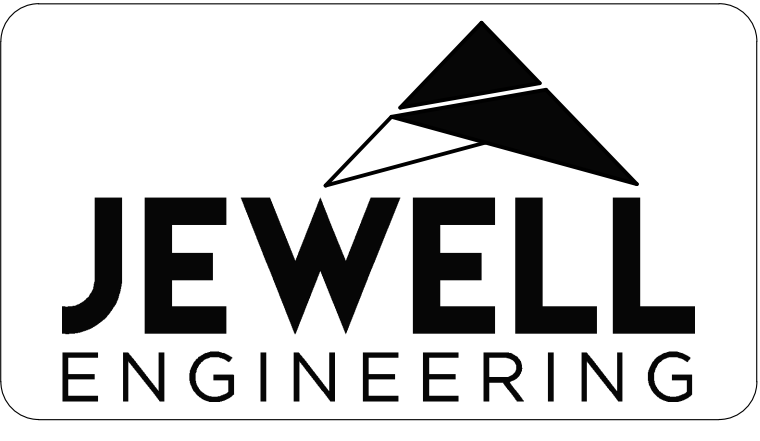
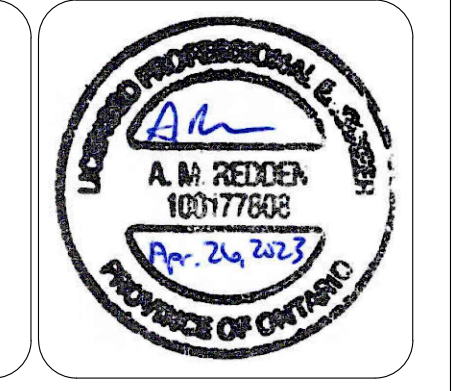
**** DRAWINGS ARE NOT TO BE SCALED ****

REVISIONS

NO.	DATE	DESCRIPTION	BY
1	04/25/2023	LTC WATERCOURSE PERMIT	JH

NOTE:
EROSION HAZARD SETBACK CALCULATION METHODOLOGY BASED ON "EASTFIELDS DRAINAGE FEATURE SLOPE STABILITY LETTER REPORT" PREPARED BY CAMBIUM INC, DATED MARCH 20, 2023

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EASTFIELDS SUBDIVISION
COLBORNE

FIDELITY GROUP OF COMPANIES
TOWNSHIP OF CRAMAHE

EXISTING
WATERCOURSE DETAILS

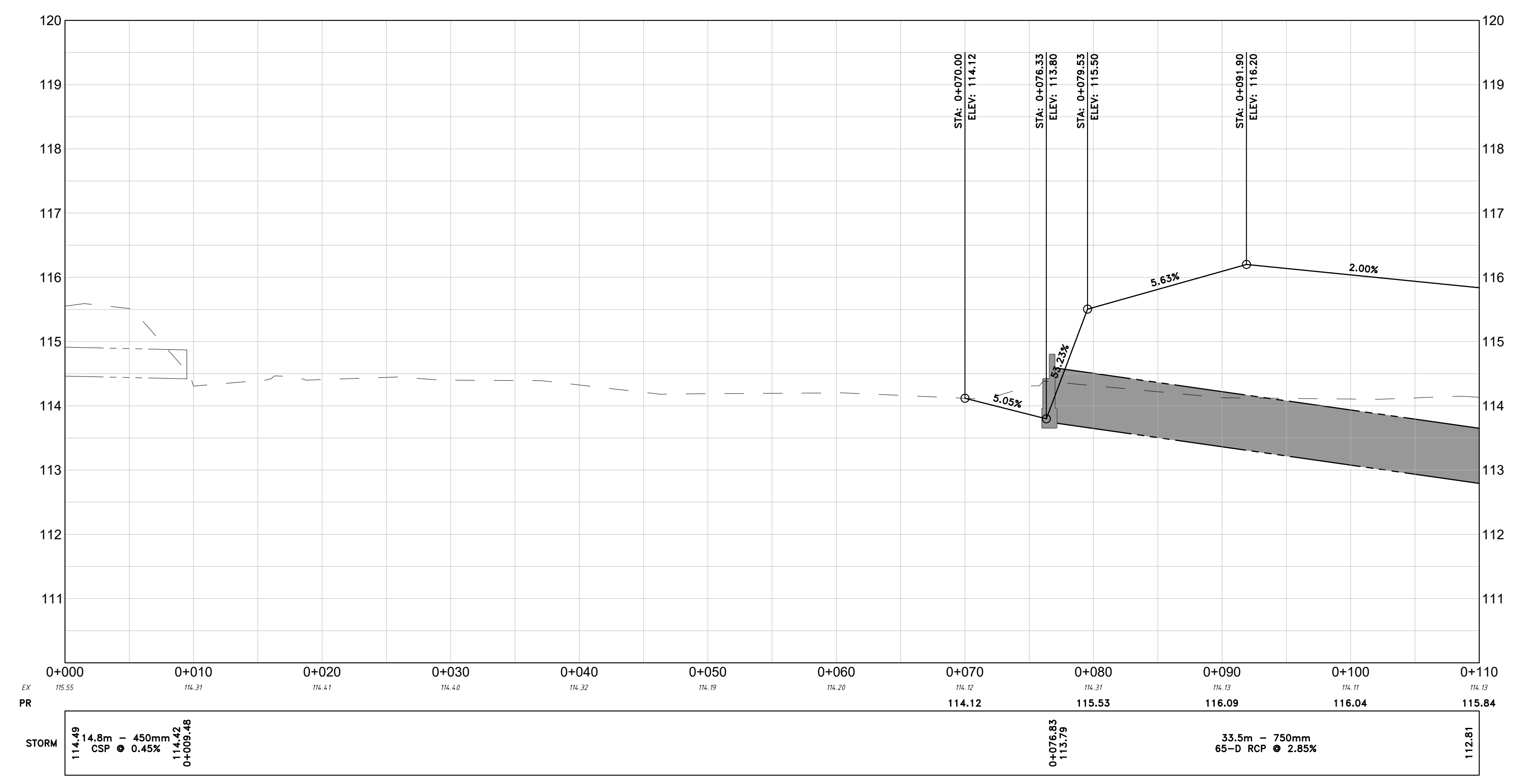
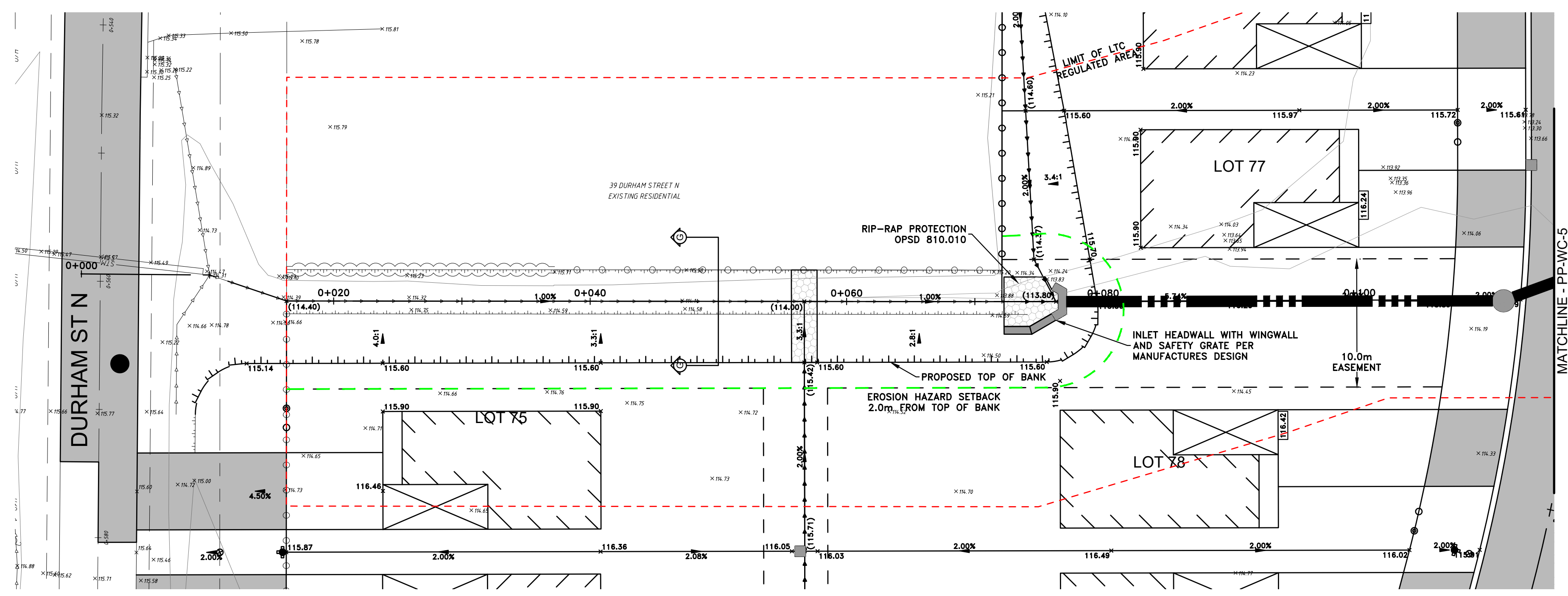
DRAWN BY: JGH **PROJECT NO:** 210-5024

DESIGNED BY: JGH/AMR **DATE:** April 2023

CHECKED BY: AMR **SCALE:** HORIZONTAL - N.T.S.
VERTICAL - N.T.S.

APPROVED BY: AMR **CONTRACT NO:** **DRAWING NO:** WC-DE-1

PROPOSED WATERCOURSE (EAST-WEST)



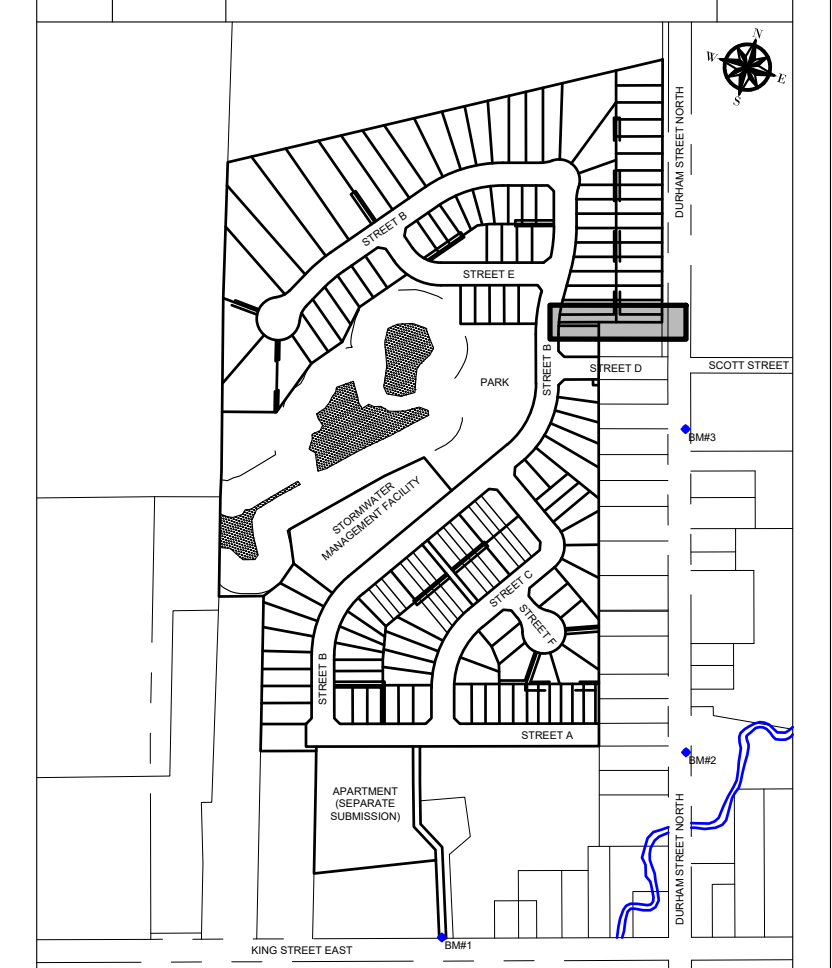
GENERAL NOTES:
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GEOMETRIC NOTE:
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 - ALL ELEVATIONS ARE IN REFERENCE TO LOCAL DATUM NAD83 - GEODETIC MODEL HTF.2, UNLESS DESCRIBED OTHERWISE.

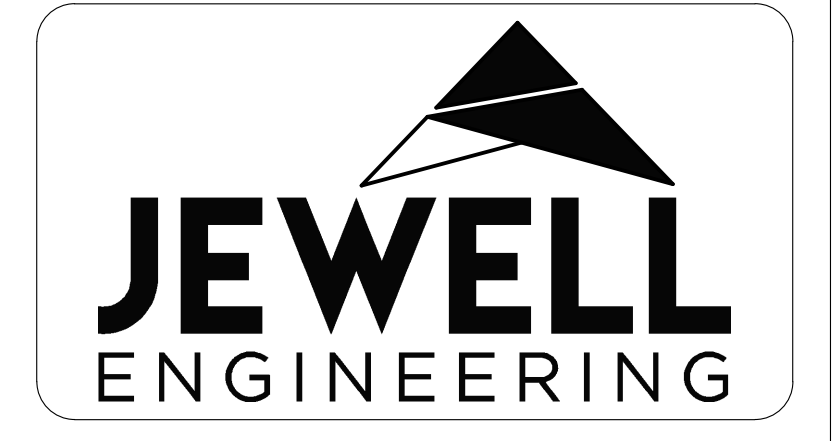
**** DRAWINGS ARE NOT TO BE SCALED ****

REVISIONS			
NO.	DATE	DESCRIPTION	BY
1	04/25/2023	LTC WATERCOURSE PERMIT	JH



KEY PLAN
SCALE - N.T.S.

- BENCHMARKS**
- TOP NUT OF FIRE HYDRANT ON KING STREET EAST AT THE SITE ACCESS ELEV = 105.748
 - TOP NUT OF FIRE HYDRANT ON DURHAM STREET NORTH IN FRONT OF COLBORNE CURLING CLUB ELEV = 109.261
 - TOP NUT OF FIRE HYDRANT ON DURHAM STREET NORTH JUST SOUTH OF SCOTT STREET ELEV = 118.765



EASTFIELDS SUBDIVISION
COLBORNE

FIDELITY GROUP OF COMPANIES
TOWNSHIP OF CRAMAHE

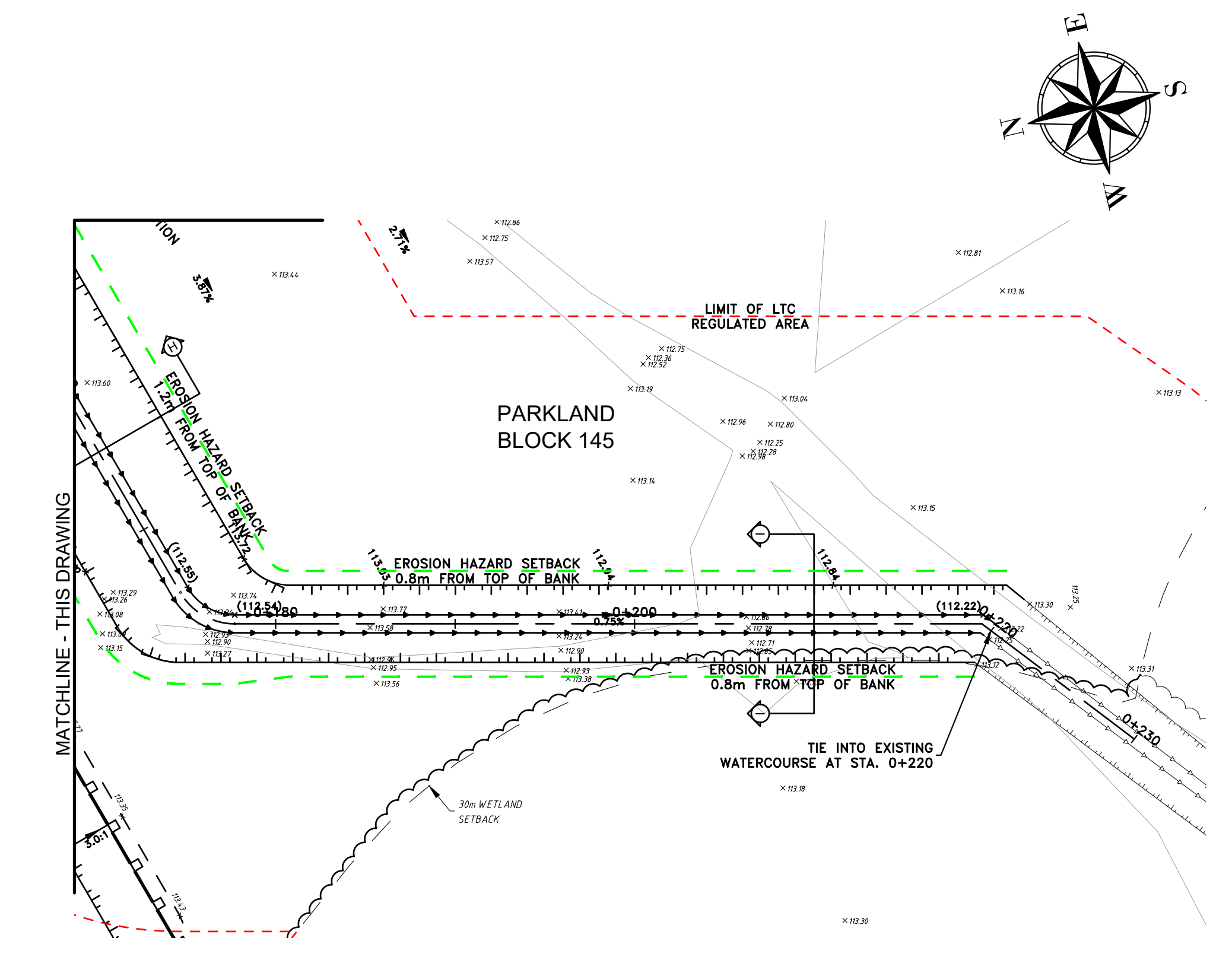
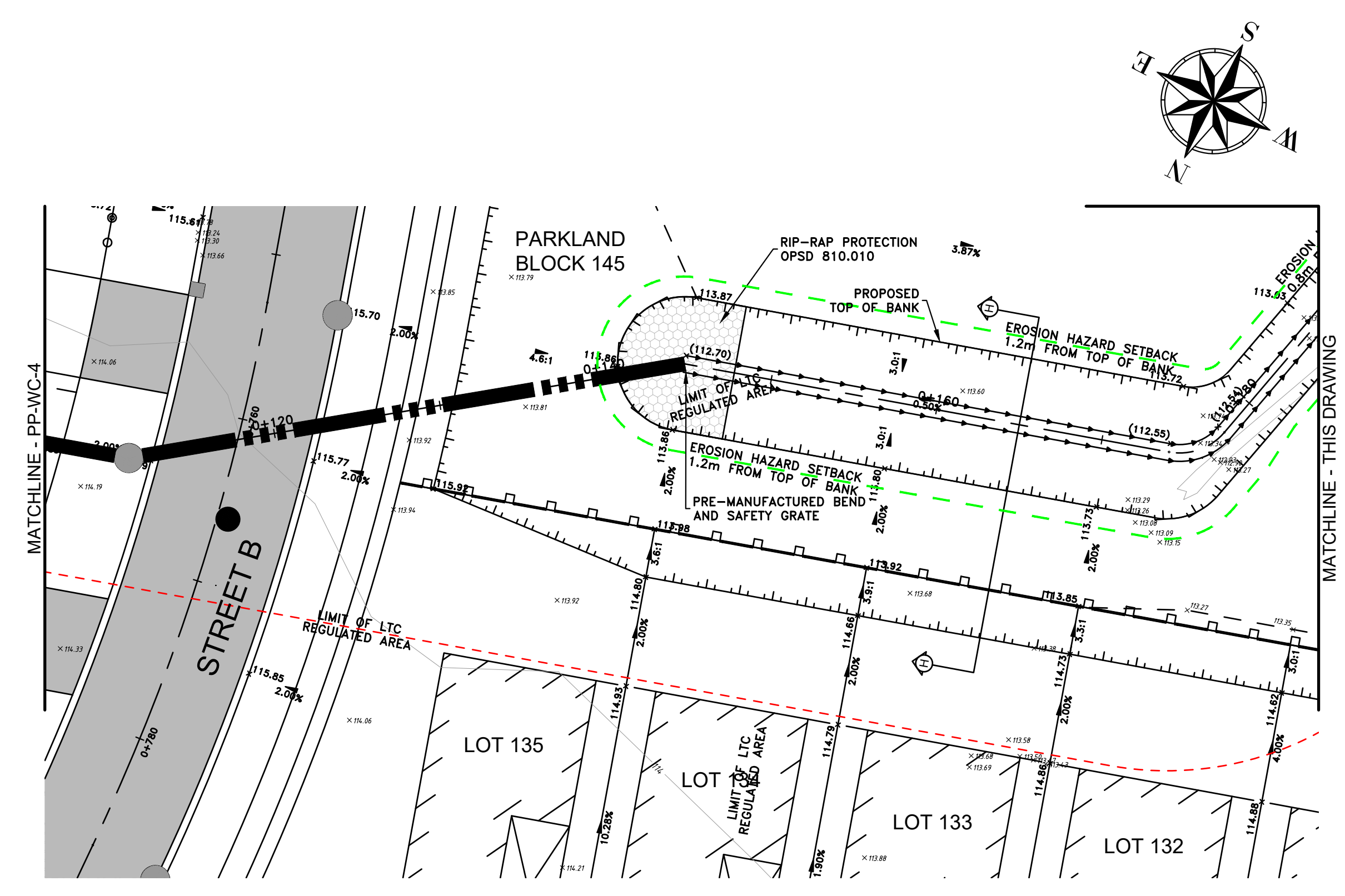
PLAN & PROFILE
PROPOSED WATERCOURSE (EAST-WEST)
STA. 0+000 to 0+110

DRAWN BY: JGH	PROJECT NO: 210-5024
DESIGNED BY: JGH/AMR	DATE: April 2023
CHECKED BY: AMR	SCALE: HORIZONTAL - 1:250 VERTICAL - 1:50
APPROVED BY: AMR	CONTRACT NO: DRAWING NO: PP-WC-4

04/26/2023

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PROPOSED WATERCOURSE (EAST-WEST)



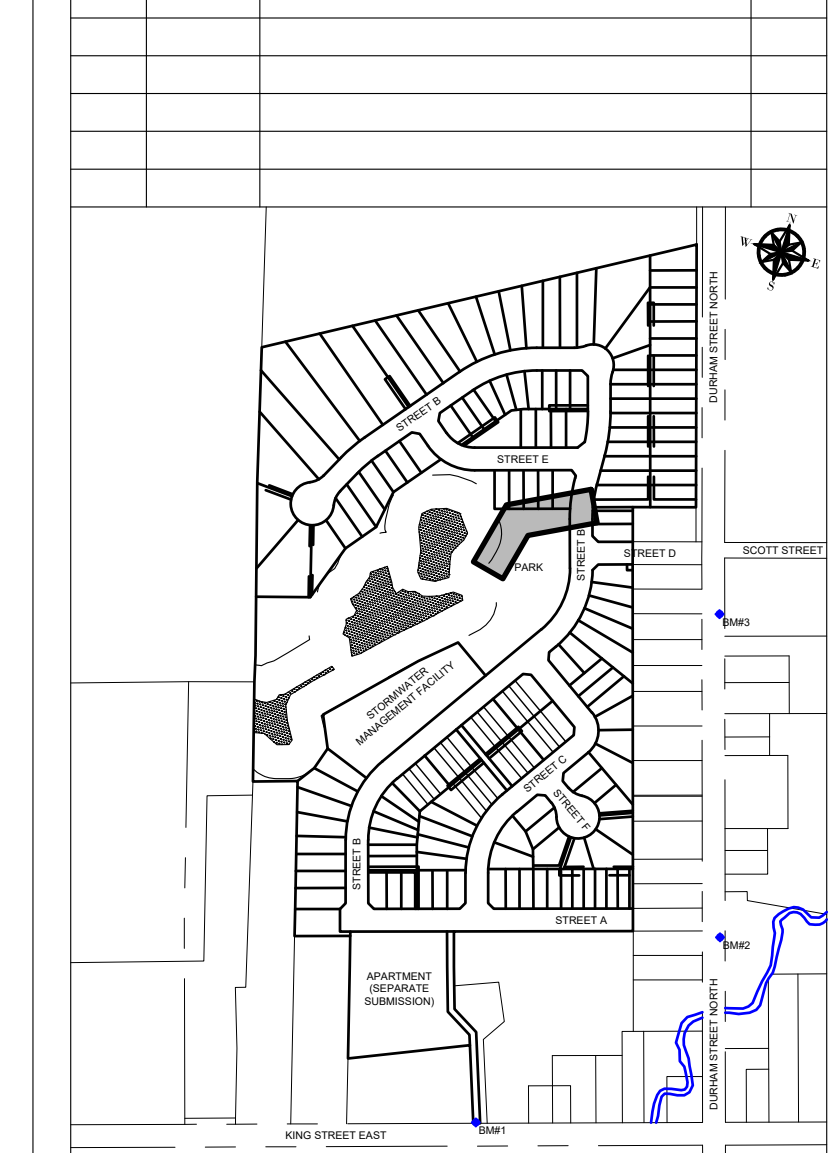
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REVISIONS

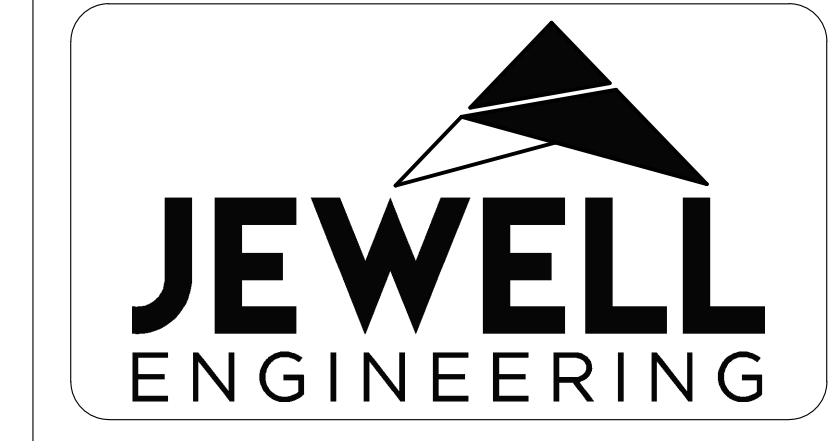
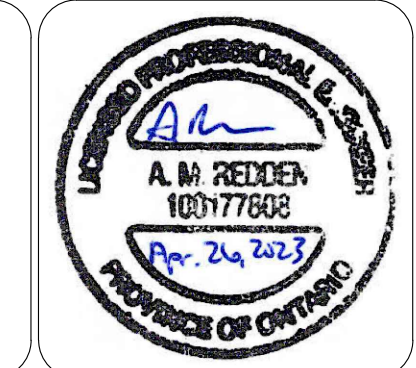
NO.	DATE	DESCRIPTION	BY
1	04/25/2023	LTC WATERCOURSE PERMIT	JH



KEY PLAN
 SCALE - N.T.S.

BENCHMARKS

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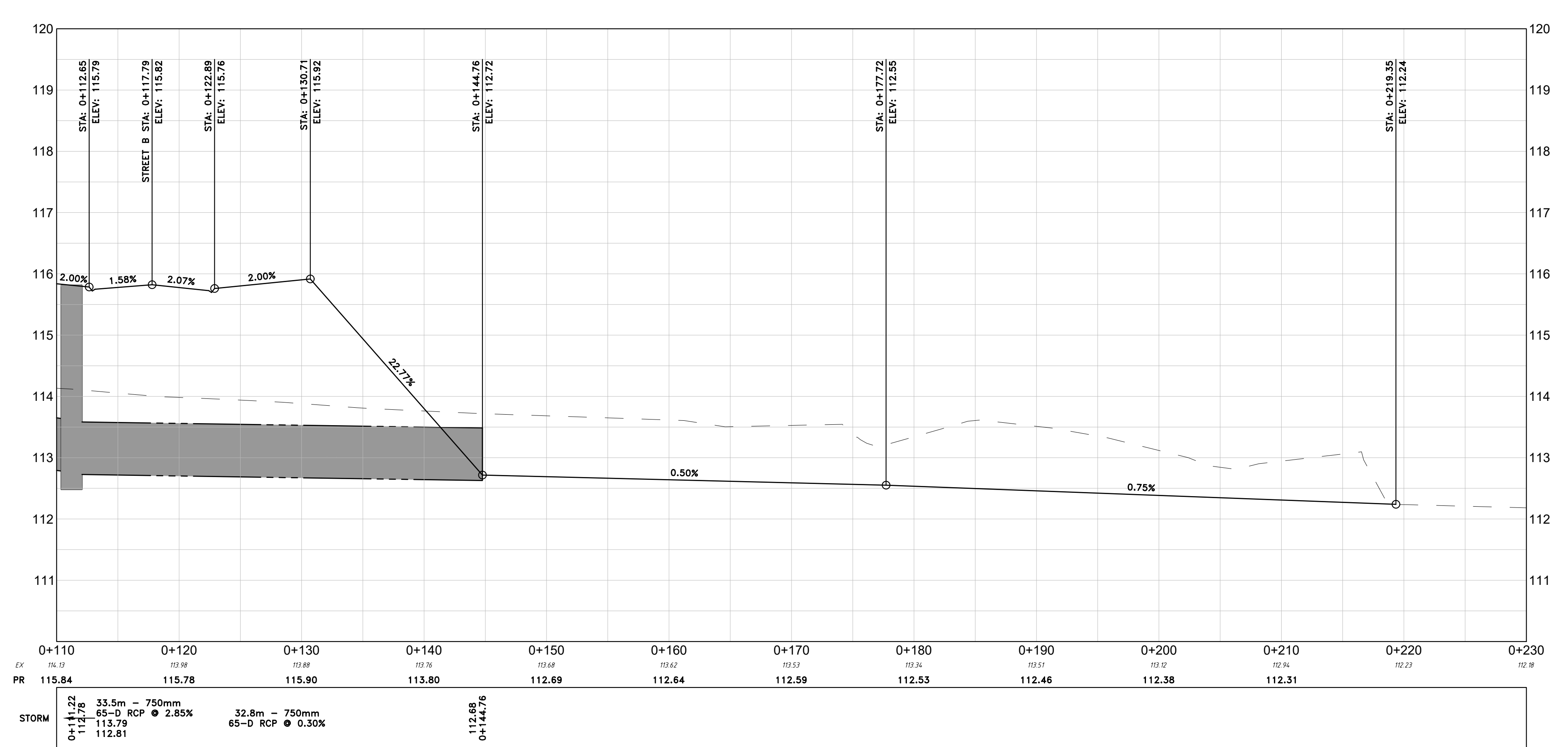


EASTFIELDS SUBDIVISION
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PLAN & PROFILE
 PROPOSED WATERCOURSE (EAST-WEST)
 STA. 0+110 to 0+230

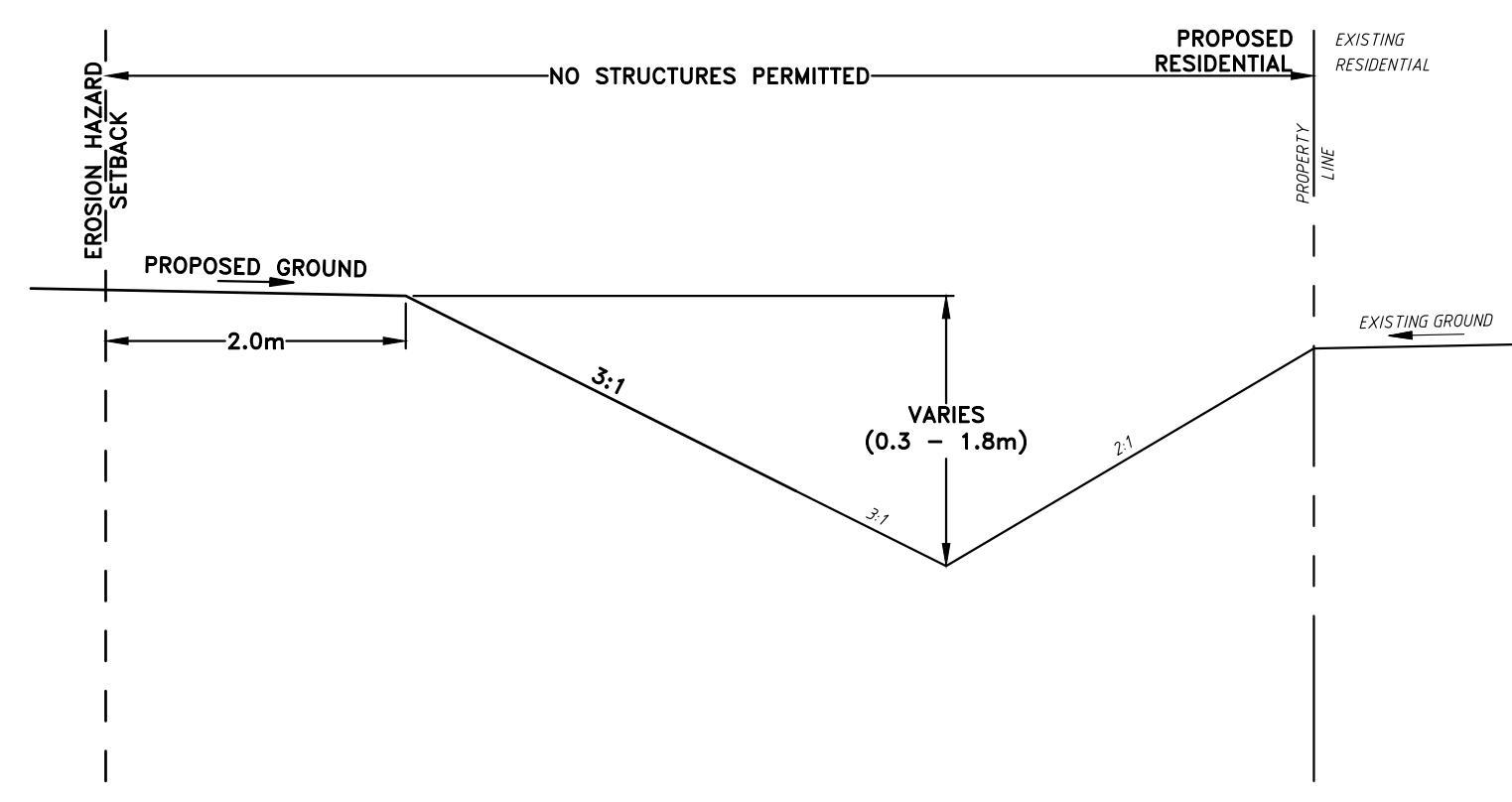
DRAWN BY: JGH **PROJECT NO.:** 210-5024
DESIGNED BY: JGH/AMR **DATE:** April 2023
CHECKED BY: AMR **SCALE:** HORIZONTAL - 1:250
APPROVED BY: AMR **CONTRACT NO.:** **VERTICAL - 1:50**
DRAWING NO.: PP-WC-5



04/26/2023

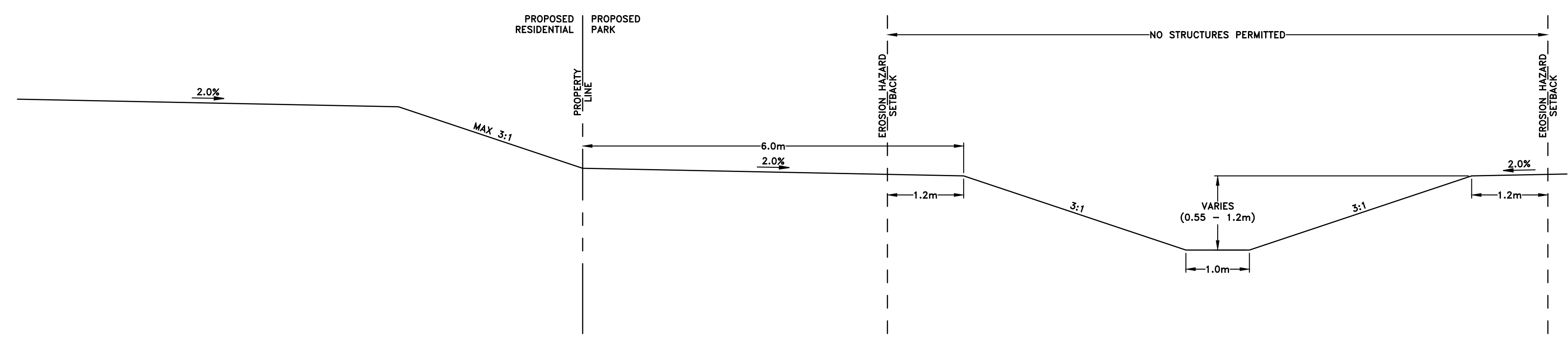
F:\PT\PROJECT FILES\1 CIVIL 3D PROJECT FILES\2105024 - FIDELITY - EASTFIELDS COLBORNE\3 SHEETS\2105024 - WC - DE

EROSION HAZARD SETBACK CALCULATION:
 (Z:1V OR GREATER)
 = H FROM TOP OF BANK
 = 1.8m FROM TOP OF BANK MIN
 = ROUNDED TO 2.0m



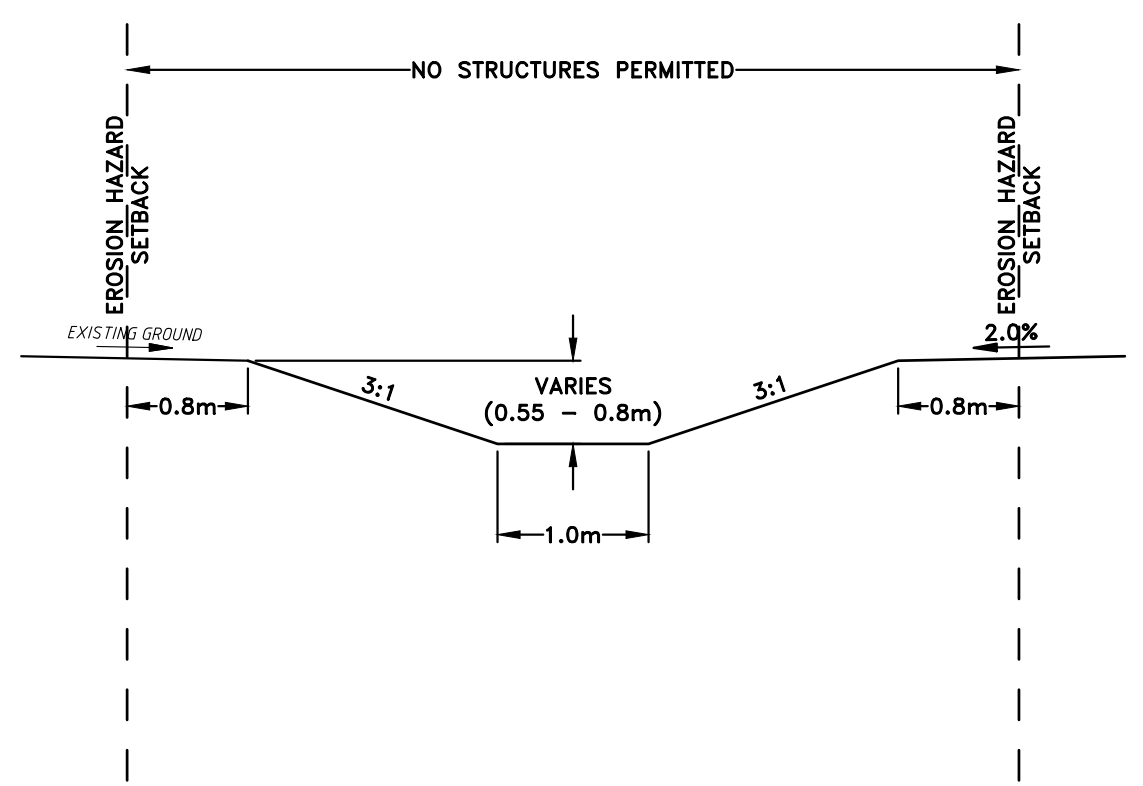
SECTION G-G
 STA. 0+020 to 0+075
 SCALE - N.T.S.

EROSION HAZARD SETBACK CALCULATION:
 (Z:1V OR GREATER)
 = H FROM TOP OF BANK
 = 1.2m FROM TOP OF BANK MIN



SECTION H-H
 STA. 0+145 to 0+175
 SCALE - N.T.S.

EROSION HAZARD SETBACK CALCULATION:
 (Z:1V OR GREATER)
 = H FROM TOP OF BANK
 = 0.8m FROM TOP OF BANK MIN



SECTION I-I
 STA. 0+175 to 0+220
 SCALE - N.T.S.

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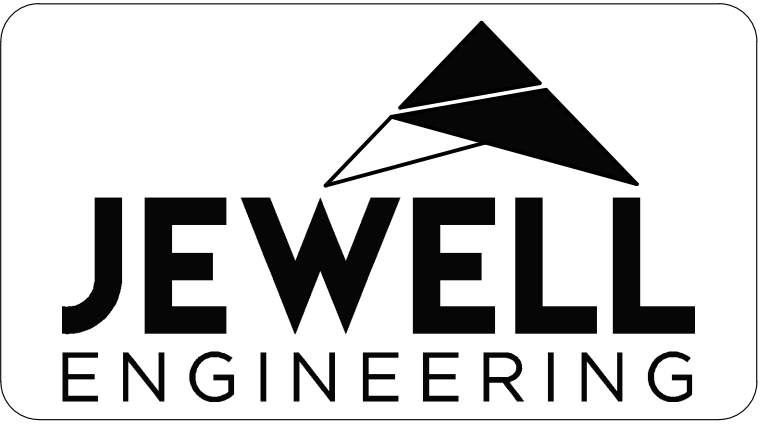
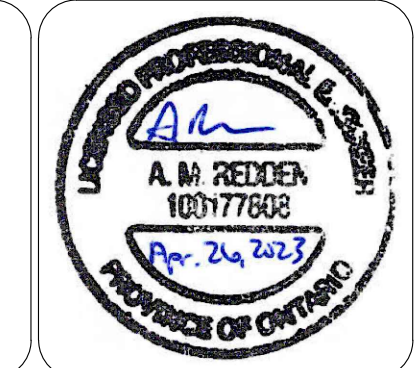
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REVISIONS

NO.	DATE	DESCRIPTION	BY
1	04/25/2023	LTC WATERCOURSE PERMIT	JH

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EASTFIELDS SUBDIVISION
 COLBORNE

FIDELITY GROUP OF COMPANIES
 TOWNSHIP OF CRAMAHE

PROPOSED
 WATERCOURSE DETAILS

DRAWN BY: JGH PROJECT NO: 210-5024
 DESIGNED BY: JGH/AMR DATE: April 2023
 CHECKED BY: AMR SCALE: HORIZONTAL - N.T.S., VERTICAL - N.T.S.
 APPROVED BY: AMR CONTRACT NO: DRAWING NO: WC-DE-2