Appendix A: Drainage Design Drawings; Plans, Profiles

Wignell Municipal Drain

City of Port Colborne

FEBRUARY 09, 2024

LEGEND

	EXISTING DITCH BOTTOM (NPCA DEM DATA)
	EXISTING DITCH BOTTOM (SURVEYED)
	HISTORICAL GRADELINE
	PROPOSED DRAIN GRADELINE–EWA
LEFT	LEFT BANK
RIGHT	RIGHT BANK
	EXISTING DRAIN SECTION
	EXISTING STRUCTURE DETAILS
	ASSUMED EXISTING STRUCTURE DETAILS
OBV=175.00	EXISTING DRAIN ELEVATION
175.00 PR.	PROPOSED DRAIN CENTERLINE ELEVATION
175.00 EX.	PROPOSED DRAIN ELEVATION (WHERE MATCHES EXISTING ELEVATION)
	DATA POINT FROM HISTORICAL DESIGN GRADELINE RVA, 1979

DRAWING INDEX

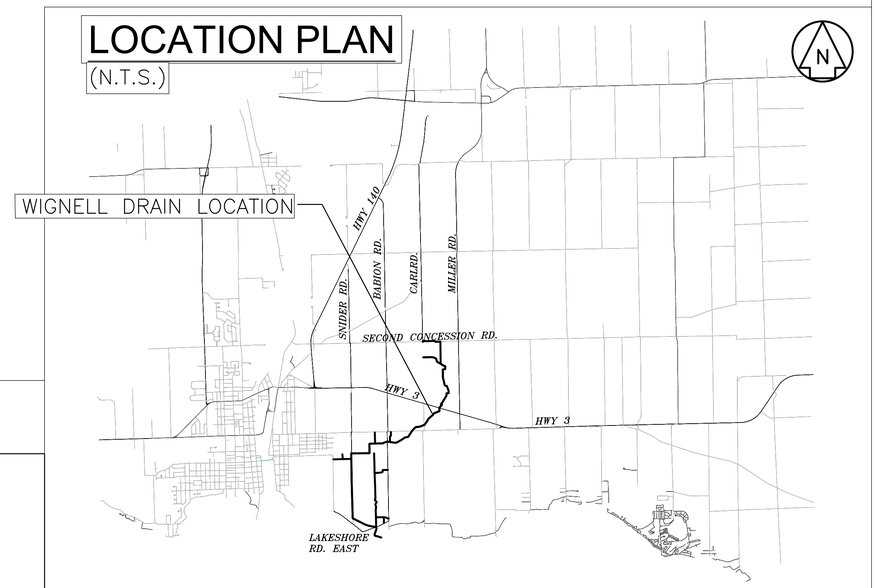
DRAWING #	DRAWING TITLE
W.PLAN	CONSTRUCTION PLAN
W.P0	WIGNELL DRAIN PROFILE
W.P1	PROFILE STA: –0+400 to 1+300
W.P2	PROFILE STA: 1+300 to 3+000
W.P3	PROFILE STA: 3+000 to 4+700
W.P4	PROFILE STA: 4+700 to 6+000
W.P5	PROFILE STA: 5+970 to 6+922.1 END OF DRAIN
W.P6	WIGNELL OUTLET PLAN & PROFILE STA: 0+000 to –0+297
W.SD–01	PLAN & PROFILE BOWER BRANCH DRAIN
W.SD–02	PLAN & PROFILE WIGNELL BRANCH DRAIN #2
W.SD–03	PLAN & PROFILE WIGNELL BRANCH DRAIN #3
W.SD–04	PLAN & PROFILE REALIGNED ALONG SECOND CONCESSION RD
W.SD–05	PLAN & PROFILE FOR SEDIMENT BASIN SB01, SB02
W.SD–06	PLAN & PROFILE WIGNELL EROSION CONTROL WORKS – 2007
W.GS–01	WIGNELL DRAIN CONTROL STRUCTURE PLAN VIEW–REMOVALS
W.GS–02	WIGNELL DRAIN CONTROL STRUCTURE SECTION VIEWS–REMOVALS
W.GS–03	WIGNELL DRAIN CONTROL STRUCTURE PLAN VIEW–DESIGN
W.GS–04	WIGNELL DRAIN CONTROL STRUCTURE SECTION/DETAIL VIEW–DESIGN
W.GS–05	WIGNELL DRAIN CONTROL STRUCTURE I&C IMPROVEMENTS
W.GD–01	GENERAL DETAILS – BANK RESTORATION IMPROVEMENT PROGRAM
W.GD–02	GENERAL DETAILS
W.CN	CONSTRUCTION NOTES

EARTH WATER AIR ENGINEERING

CITY OF PORT COLBORNE

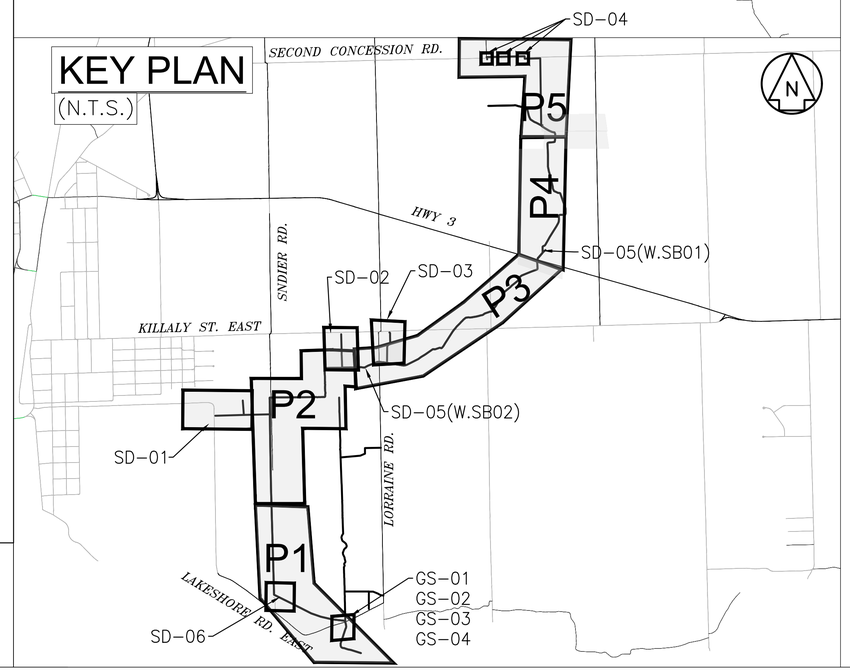
LOCATION PLAN

(N.T.S.)



KEY PLAN

(N.T.S.)



WIGNELL MUNICIPAL DRAIN - PROPOSED WORKS

WIGNELL DRAIN

PROPOSED 9m 1630mm x 1120mm ARCH CSP DWY CULVERT @ STA 6+673 SEE W.P5

PROPOSED: EXISTING ROAD SIDE DITCH TO BE FILLED BETWEEN @ STA 6+483 TO STA 6+694

EXISTING CHANNEL SOUTH OF SECOND CONCESSION TO BE BLOCKED WITH A BERM.

EXISTING DRAIN TO BE ABANDONED (472.0m)

PROPOSED WIGNELL DRAIN RE-ALIGNMENT FOR 944m STA:5+978 to 6+922

REMOVE VEGETATION, CLEAR & GRADE TO DESIGN GRADE LINE (209m) SEE W.SD-03

CLEAR AND RE-GRADE EXISTING DRAIN TO DESIGN GRADE-LINE

PROPOSED SEDIMENT BASIN W-SB01 SEDIMENT BARRIER DURING CONSTRUCTION FOR UPSTREAM WORK. SEDIMENT BASIN AFTER CONSTRUCTION CONSTRUCT @ STA 4+740 SEE DRAWING W.SD-05

REMOVE VEGETATION, CLEAR & GRADE TO DESIGN GRADE LINE (120m) SEE W.SD-02

REMOVE VEGETATION, CLEAR & GRADE TO DESIGN GRADE LINE SEE W.P4

PROPOSED 9m CULVERT TO REPLACE W-CS-015 SEE DRAWING W.P3 INSTALL AS PER DETAIL GD-06 ON DRAWING W.GD-02

PROPOSED SEDIMENT BASIN W-SB02 SEDIMENT BARRIER DURING CONSTRUCTION FOR UPSTREAM WORK. SEDIMENT BASIN AFTER CONSTRUCTION CONSTRUCT @ STA 3+100 SEE DRAWING W.SD-05

REMOVE VEGETATION, CLEAR & GRADE TO DESIGN GRADE LINE (STA 2+450 TO 4+700)

SPOT VEGETATION REMOVAL AS DIRECTED BY DRAINAGE SUPERINTENDENT (STA 0+600 TO 2+450)

WIGNELL CONTROL GATE STRUCTURE IMPROVEMENT PROGRAM SEE DRAWINGS W.GS-01 TO W.GS-05

CONSTRUCTED MAINTENANCE ACCESS LANE, 2020 225m x 3m WIDTH SEE DRAWING W.P6

EROSION CONTROL WORKS, 2007 SEE DRAWING W.SD-06

PROPOSED WIGNELL BANK RESTORATION AND IMPROVEMENT PROGRAM (BRIP) FROM 0+020 TO 0+380. WORK IS FROM BOTH SIDES SEE W.GD01 FOR DETAILS

BOWER DRAIN SEE W.SD-01

PROPOSED WIGNELL BRANCH DRAIN #2

PROPOSED WIGNELL BRANCH DRAIN #3

W-CS-001 ConcBox 3130x2570

W-CS-002 1200x850 CSPA

W-CS-003 ConcBox 3800x1400

W-CS-004 1200x850 CSPA

W-CS-005 1640x1260 CSPA

W-CS-006 ConcBox 2520x1100

W-CS-007 ConcBox 3090x1510

W-CS-008 ConcBox 2370x1200

W-CS-009 ConcBox 3800x1180

W-CS-010 Twin 1500mmø CSP

W-CS-011 1350mmø CSP

W-CS-012 ConcBox 5000x1300

W-CS-013 1700mmø CSP

W-CS-014 1300mmø CSP

W-CS-015 ConcBox 2350x1040

W-SB-01 PR. SEDIMENT BASIN

W-SB-02 PR. SEDIMENT BASIN:

W-BS-001 ConcBox 5200x2730

W-BS-002 ConcBox 16500x1710

W-BS-010 Wooden Bridge

W-GS-01

WIGNELL BENCHMARK

PRIVATE DRAIN

PRIVATE DRAIN

WEST BRANCH BEAVER DAM DRAIN

BEAVER DAM DRAIN

PORT COLBORNE DRAIN

MICHENER DRAIN

LORRAINE BAY

CHIPPAWA ROAD

SECOND CONCESSION ROAD

SNIDER ROAD

BABION ROAD

CARL ROAD

MILLER ROAD

WHITE ROAD

WEAVER ROAD

LORRAINE ROAD

KILLALY STREET EAST

DURHAM STREET

HWY #3

ELIZABETH ST

REUTER ROAD

FIRELANE 2

RAMP

0 500m 1000m

NOTES:

1. DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED
2. CATCHMENT BOUNDARIES ARE BASED ON THE NPCA DIGITAL ELEVATION MODEL (DEM) 2010
3. SPECIFIC POINTS IN THE SURFACE ARE BASED ON THE FOLLOWING SURVEYS:
   - DRAIN CROSSINGS & SPOT CHANNELS AMEC SURVEY, 2013
   - AS CONSTRUCTED SURVEY BY CofPC, 2016 STATION 0+000–1+940
   - SUPPLEMENTARY SURVEY BY CofPC, 2018
   - WEIBE ENGINEERING SURVEY, 2008

PLAN VIEW LEGEND:

- DRAINAGE AREA BOUNDARY
- DRAIN CENTERLINE
- PROPOSED DRAIN CENTERLINE
- 0+000 DRAIN CHAINAGE
- X.SD-02 SITE SPECIFIC DETAIL I.D.
- BOUNDARY OF AREA CAPTURED IN SITE DETAIL
- DRAINAGE WORK PROPOSED
- DRAINAGE WORK COMPLETED – TO BE ASSESSED

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

NO.	REVISION DESCRIPTION	DATE
1.0	ISSUED FOR REPORT	FEB 09,2024

EARTH WATER AIR ENGINEERING

City of Port Colborne

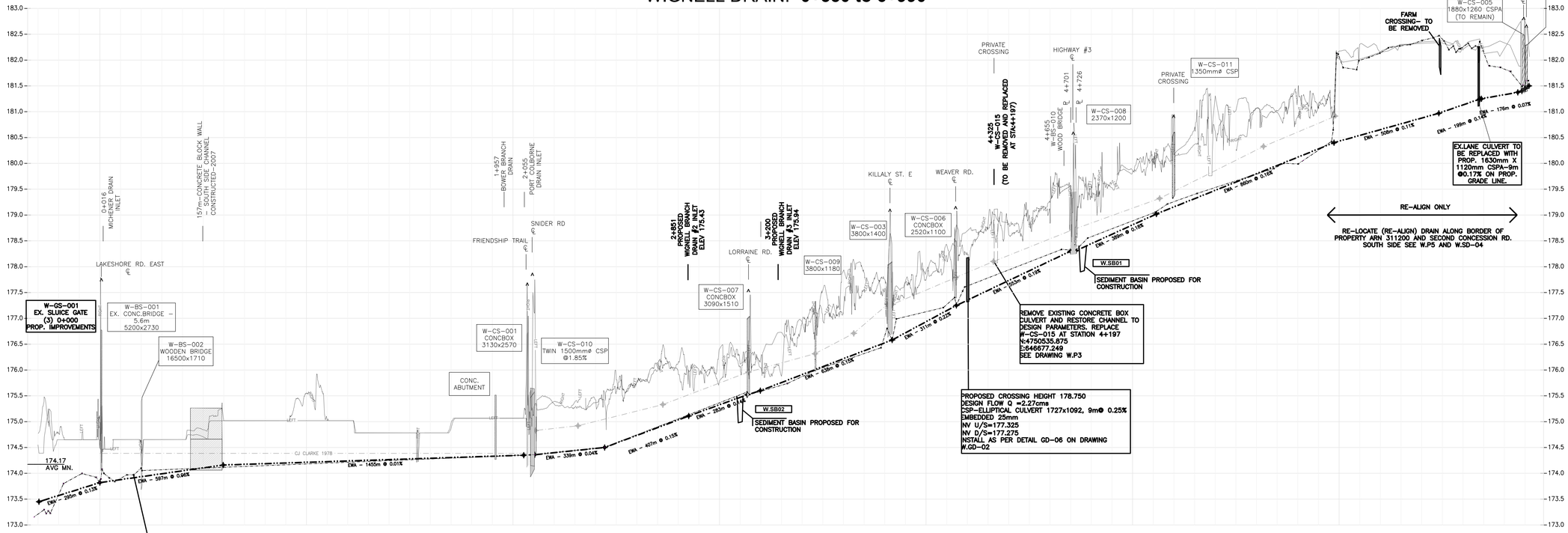
Wignell Municipal Drain

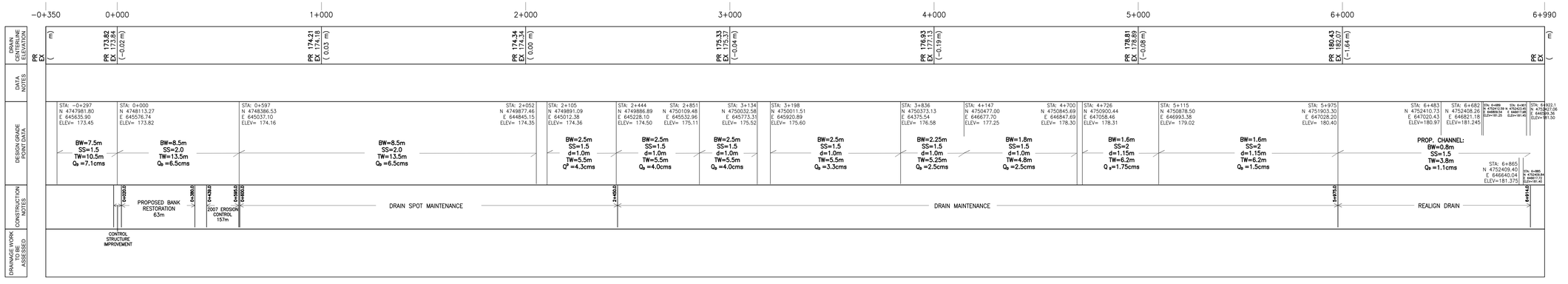
WIGNELL MUNICIPAL DRAIN CONSTRUCTION PLAN

Assessment numbers are shown for illustration only. For assessment roll numbers based on MPAC refer to the Assessment Atlas in Appendix G.

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	183927	W.PLAN
DESIGNED BY :	DATE :	SCALE :	
PCM	09–FEB–24	F.T.P.	

WIGNELL DRAIN: -0+350 to 6+990





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THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS 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 INFORM THEMSELVES OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE DONE TO THEM.

SPATIAL DATA:

DTM DATA FROM NIAGARA PENINSULA CONSERVATION AUTHORITY

- HORIZONTAL DATUM: UTM NAD83–CSRS ZONE 17N
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- ACCURACY: ABSOLUTE HORIZONTAL AND VERTICAL POSITIONAL ACCURACIES OF ±0.5m

LEGEND

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WIGNELL MUNICIPAL DRAIN
PLAN & PROFILE – SPECIFIC DETAIL
STA –0+350 to 6+990

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

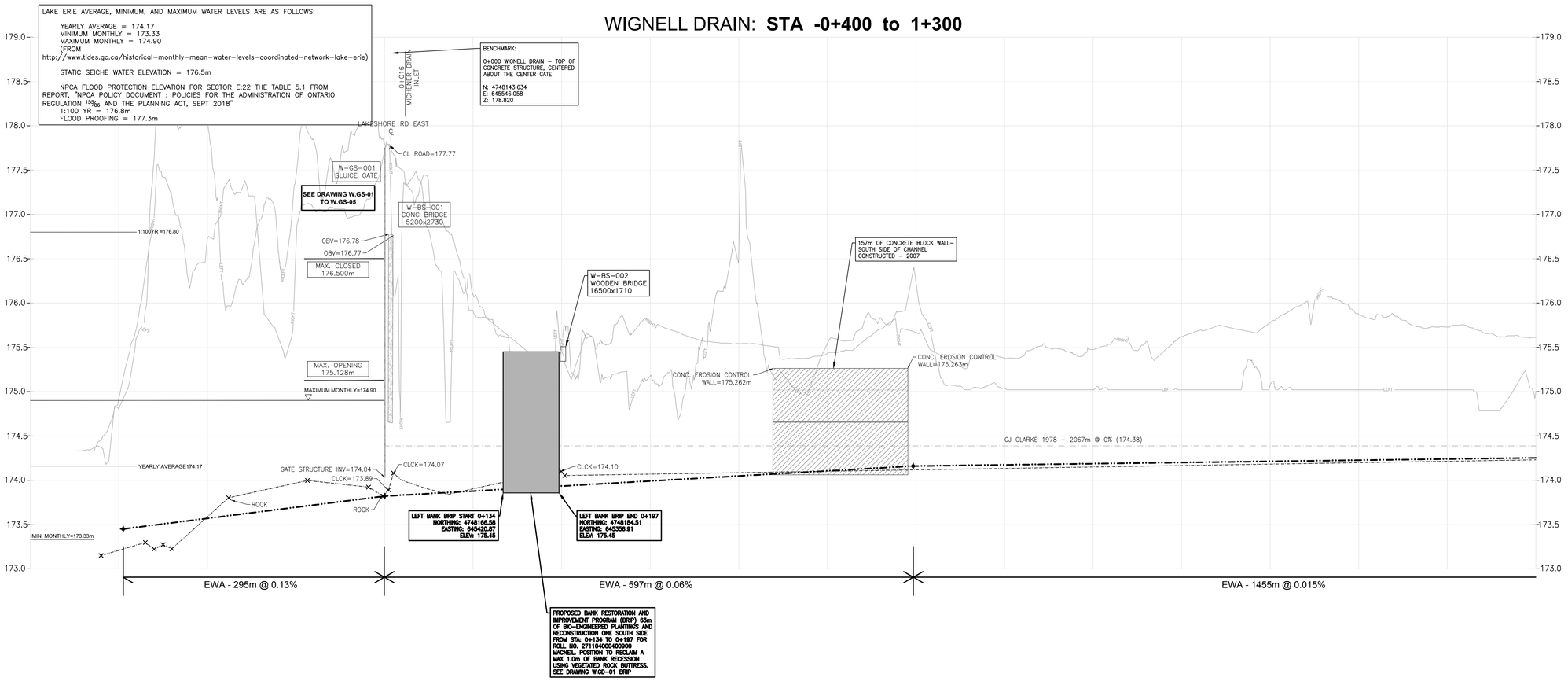
CITY OF PORT COLBORNE

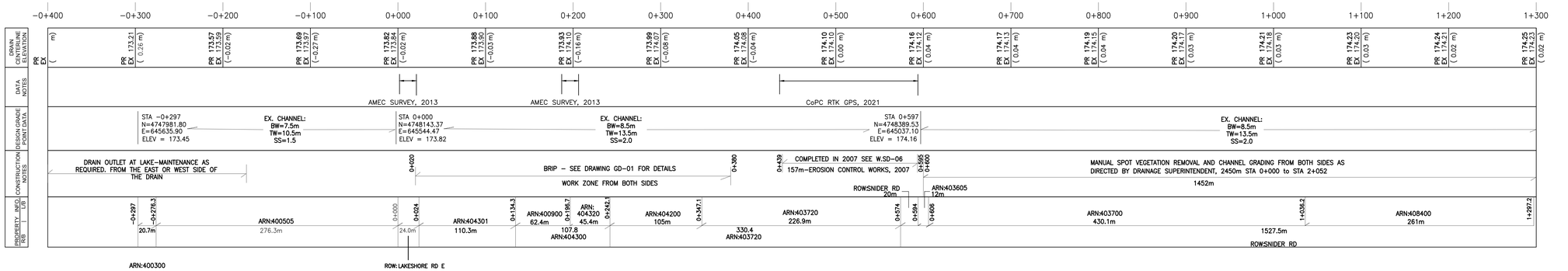
VERIFY SCALE
BAR IS 25mm ON ORIGINAL DRAWING.
0 25mm
IF NOT 25mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

EWA EARTH WATER AIR ENGINEERING

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	–	W.P0
DESIGNED BY :	DATE :	SCALE :	
PCM	09–FEB–24	F.T.P	

WIGNELL DRAIN: **STA -0+400 to 1+300**





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WIGNELL MUNICIPAL DRAIN
PLAN & PROFILE – SPECIFIC DETAIL
STA −0+400 to 1+300

LICENSED PROFESSIONAL ENGINEER PAUL C MARSH PROVINCE OF ONTARIO
2024-02-16

CITY OF PORT COLBORNE

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0 25mm
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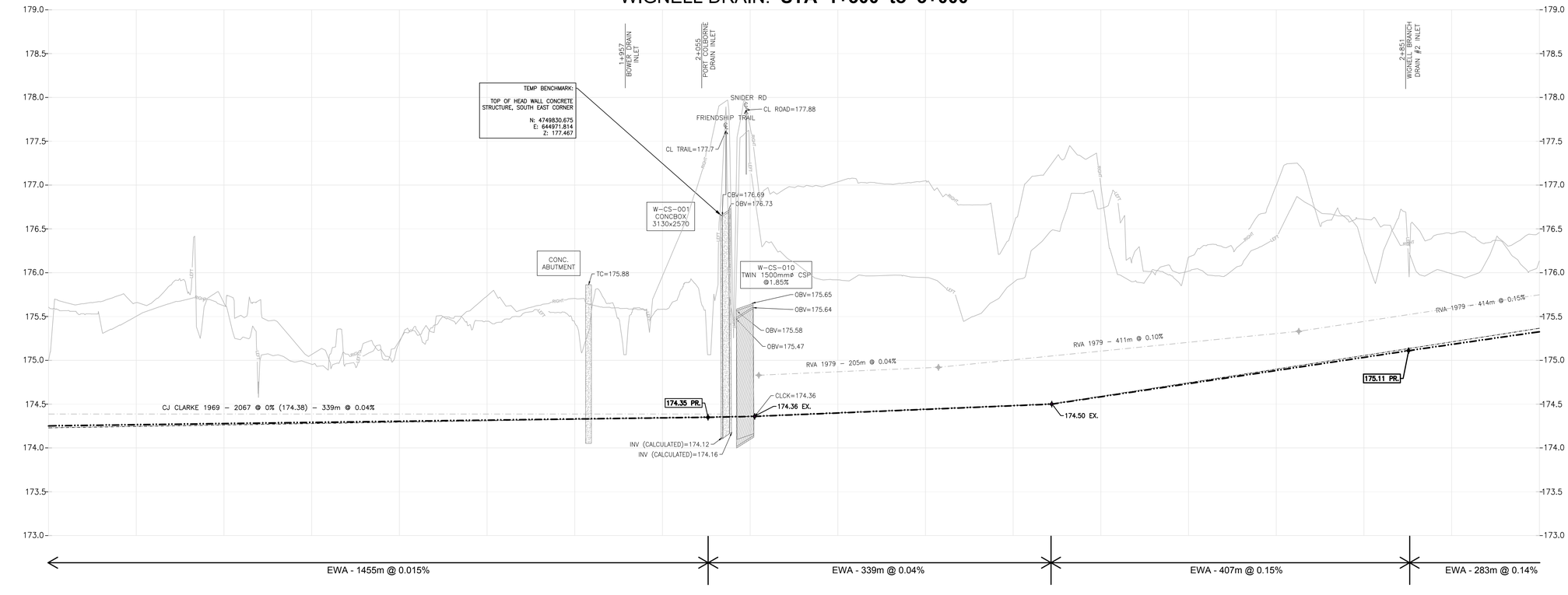
EWA EARTH WATER AIR ENGINEERING

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	–	W.P1
DESIGNED BY :	DATE :	SCALE :	
PCM	09-FEB-24	1:2500	

WIGNELL DRAIN: **STA 1+300 to 3+000**



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WIGNELL MUNICIPAL DRAIN
PLAN & PROFILE – SPECIFIC DETAIL
STA 1+300 to 3+000

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

CITY OF PORT COLBORNE

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0 25mm
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EARTH WATER AIR ENGINEERING

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	–	W.P2
DESIGNED BY :	DATE :	SCALE :	
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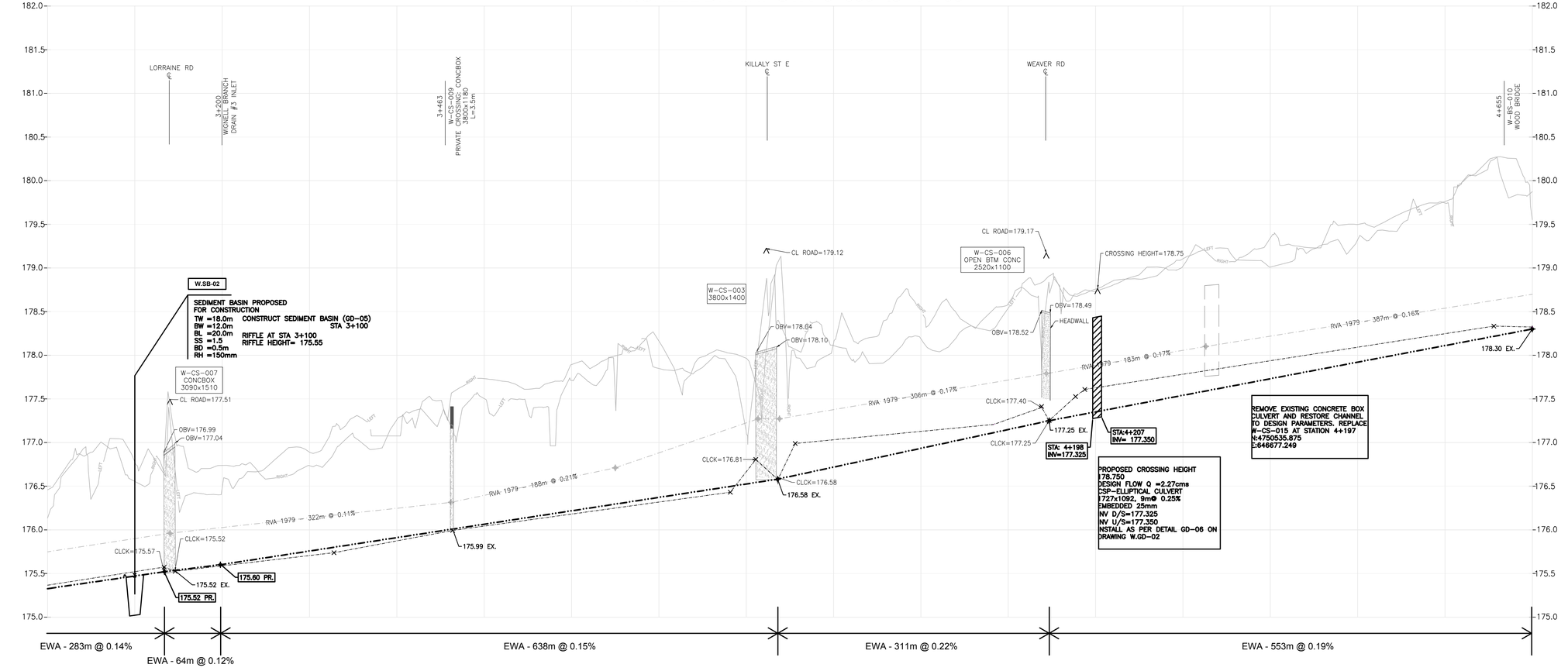
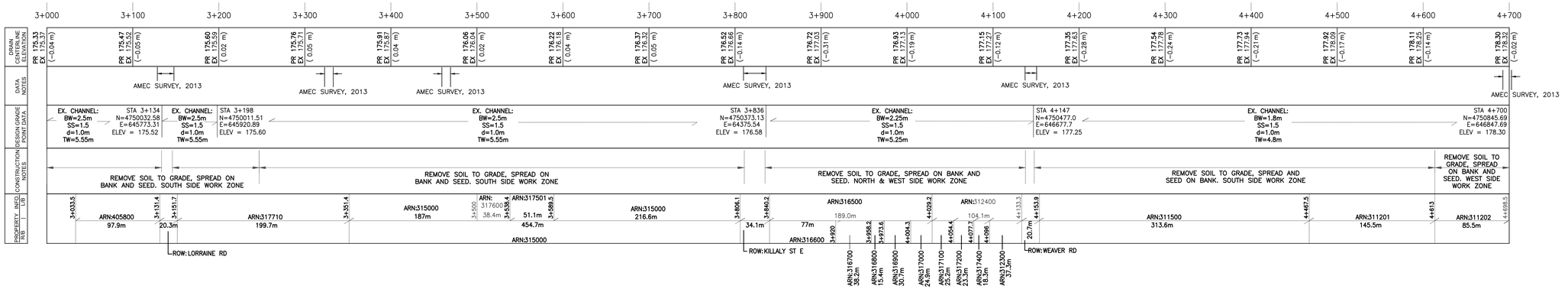
WIGNELL DRAIN: **STA 3+000 to 4+700**





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WIGNELL MUNICIPAL DRAIN
PLAN & PROFILE – SPECIFIC DETAIL
STA 3+000 to 4+700

LICENSED PROFESSIONAL ENGINEER
PAUL C. MARSH
PROVINCE OF ONTARIO
2024-02-16

CITY OF PORT COLBORNE

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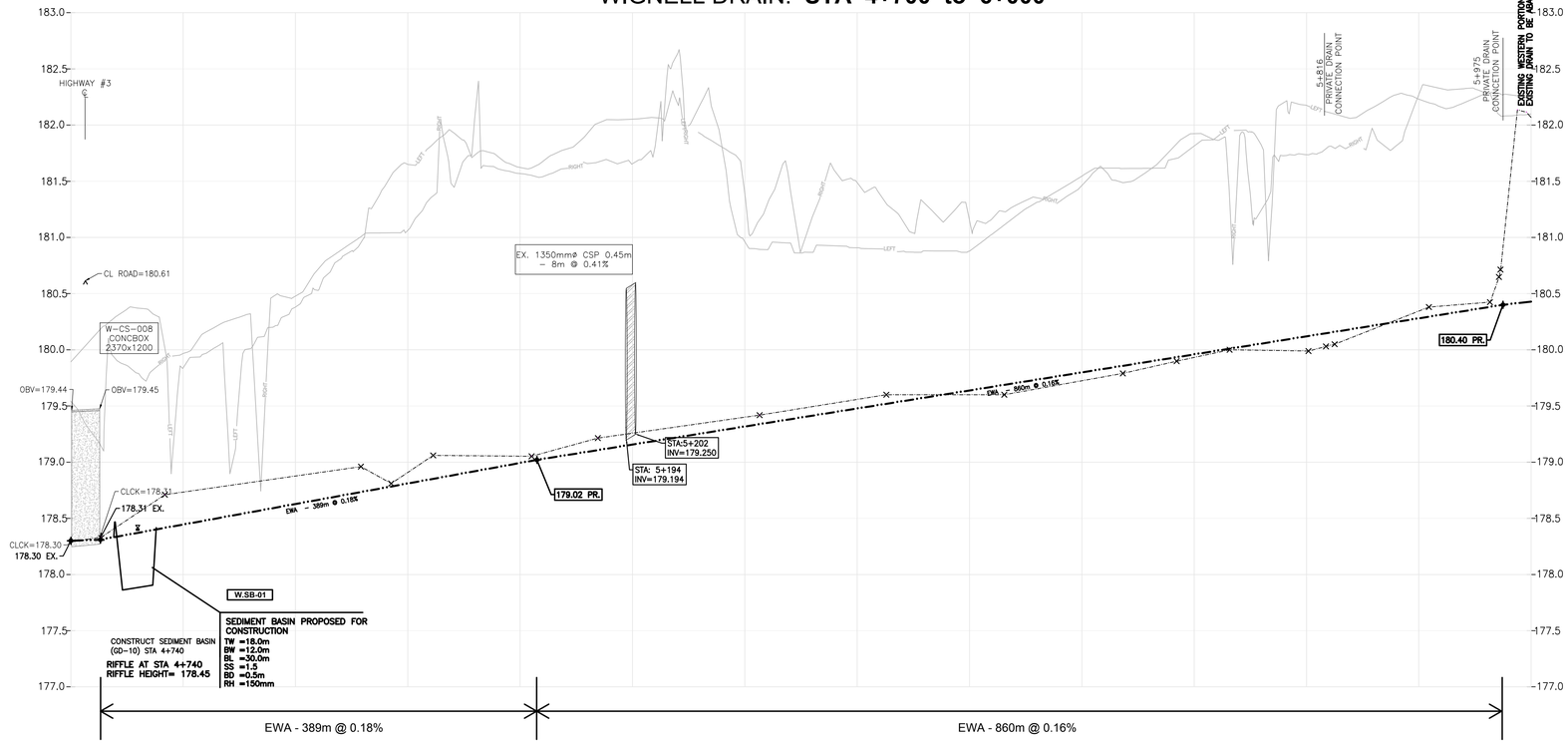
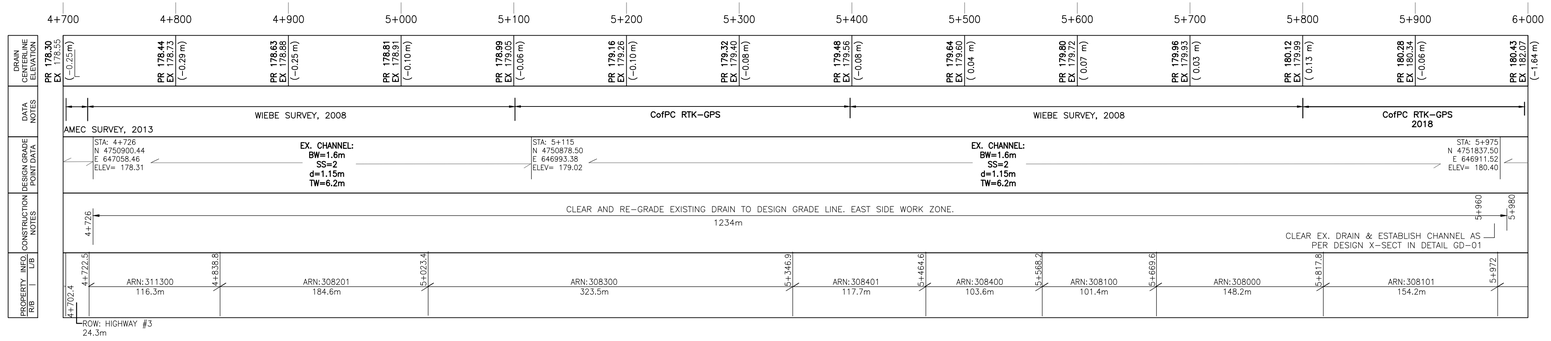
EARTH WATER AIR ENGINEERING

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	–	W.P3
DESIGNED BY :	DATE :	SCALE :	
PCM	09–FEB–24	1:2500	

WIGNELL DRAIN: **STA 4+700 to 6+000**





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	ASSUMED EXISTING STRUCTURE DETAILS
OBV=175.00	EXISTING DRAIN ELEVATION
175.00 PR.	PROPOSED DRAIN CENTERLINE ELEVATION
175.00 EX.	PROPOSED DRAIN ELEVATION (WHERE MATCHES EXISTING ELEVATION)
	DATA POINT FROM HISTORICAL DESIGN GRADELINE RVA, 1979

NO.	REVISION DESCRIPTION	DATE
1.0	ISSUED FOR REPORT	FEB 09,2024

WIGNELL MUNICIPAL DRAIN
PLAN & PROFILE – SPECIFIC DETAIL
STA 4+700 to 6+000

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

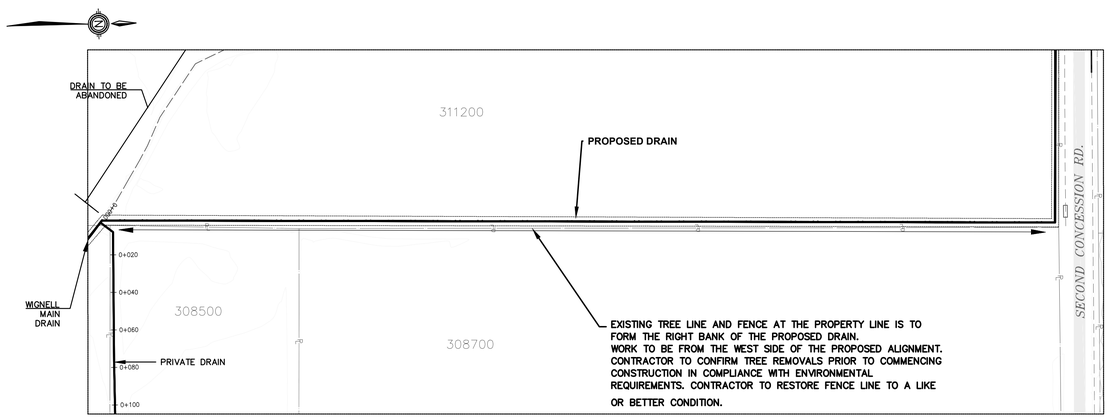
CITY OF PORT COLBORNE

VERIFY SCALE
BAR IS 25mm ON ORIGINAL DRAWING.
0 — 25mm
IF NOT 25mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

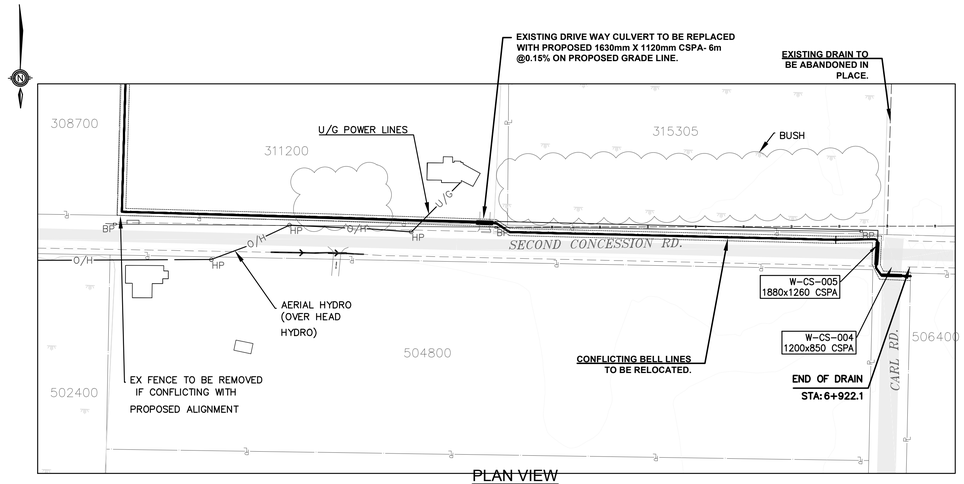
EARTH WATER AIR ENGINEERING

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	–	W.P4
DESIGNED BY :	DATE :	SCALE :	
PCM	09–FEB–24	1: 2500	

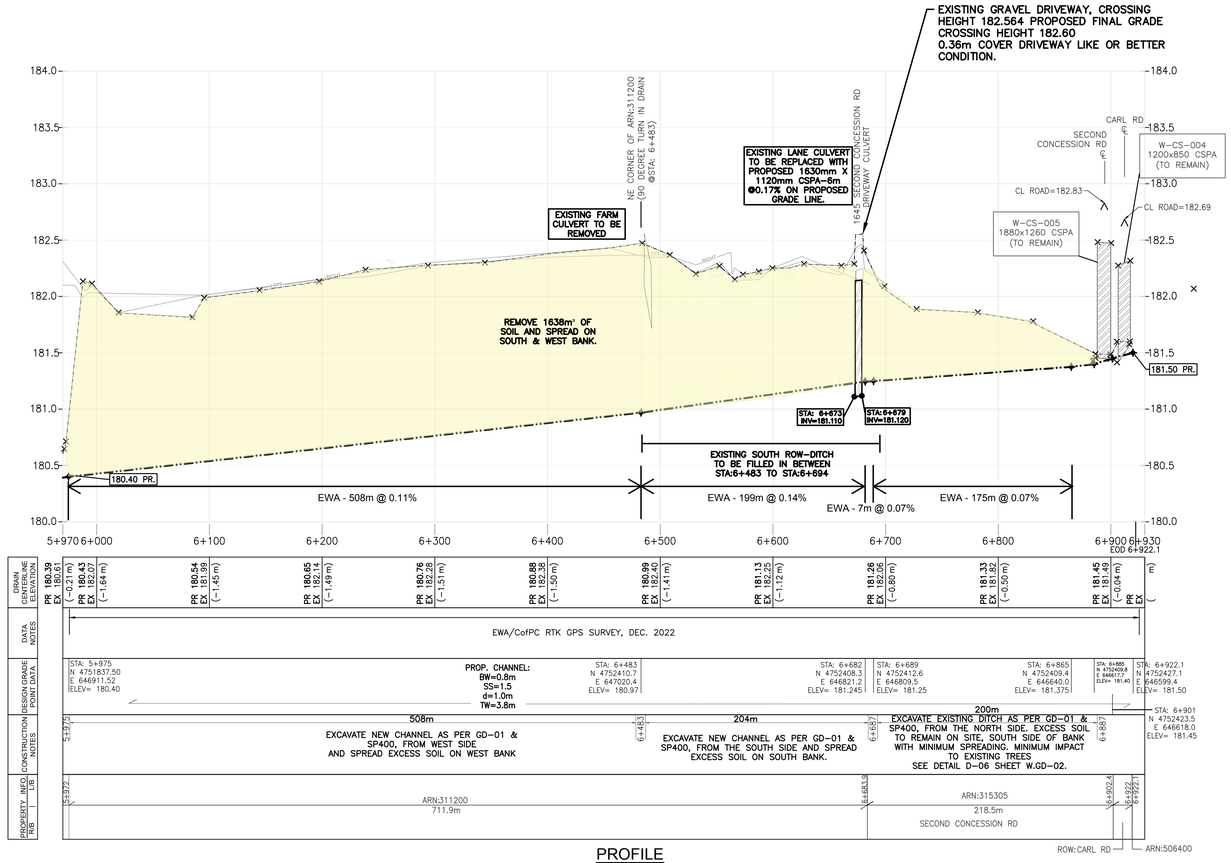
PROPOSED WIGNELL DRAIN RE-ALIGNMENT



PLAN VIEW
SCALE =1:1500



PLAN VIEW
SCALE =1:1500



PROFILE
SCALE H=1:2500 ,V=1:25

NOTES:

1. DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED
2. CATCHMENT BOUNDARIES ARE BASED ON THE NPCA DIGITAL ELEVATION MODEL (DEM) 2010
3. SPECIFIC POINTS IN THE SURFACE ARE BASED ON THE FOLLOWING SURVEYS:
   - DRAIN CROSSINGS & SPOT CHANNELS AMEC SURVEY, 2013
   - SUPPLEMENTARY SURVEY BY CoFPC, 2018
   - WIEBE ENGINEERING SURVEY, 2008
   - SUPPLEMENTARY SURVEY (SPOT CHECKS) BY CoFPC, 2018 TO 2021
   - WIEBE ENGINEERING REFERENCE SURVEY, 2008, PARTIAL USE OF DRAIN BOTTOM POINTS. NOT GEOREFERENCED.

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SPATIAL DATA:

DTM DATA FROM NIAGARA PENINSULA CONSERVATION AUTHORITY

- HORIZONTAL DATUM: UTM NAD83-CSRS ZONE 17N
- VERTICAL DATUM: CGVD28-1978
- ACCURACY: ABSOLUTE HORIZONTAL AND VERTICAL POSITIONAL ACCURACIES OF ±0.5m

LEGEND

	EXISTING DITCH BOTTOM (NPCA DEM DATA)
	EXISTING DITCH BOTTOM (SURVEYED)
	HISTORICAL GRADELINE
	PROPOSED DRAIN GRADELINE-EWA
LEFT	LEFT BANK
RIGHT	RIGHT BANK
	EXISTING DRAIN SECTION
	EXISTING STRUCTURE DETAILS
	ASSUMED EXISTING STRUCTURE DETAILS
OBW=175.00	EXISTING DRAIN ELEVATION
175.00 PR.	PROPOSED DRAIN CENTERLINE ELEVATION
175.00 EX.	PROPOSED DRAIN ELEVATION (WHERE MATCHES EXISTING ELEVATION)
	DATA POINT FROM HISTORICAL DESIGN GRADELINE RVA, 1979

NO.	REVISION DESCRIPTION	DATE
1.0	ISSUED FOR REPORT	FEB 09,2024

WIGNELL MUNICIPAL DRAIN
PLAN & PROFILE – SPECIFIC DETAIL
STA 6+000 to 6+922.1

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

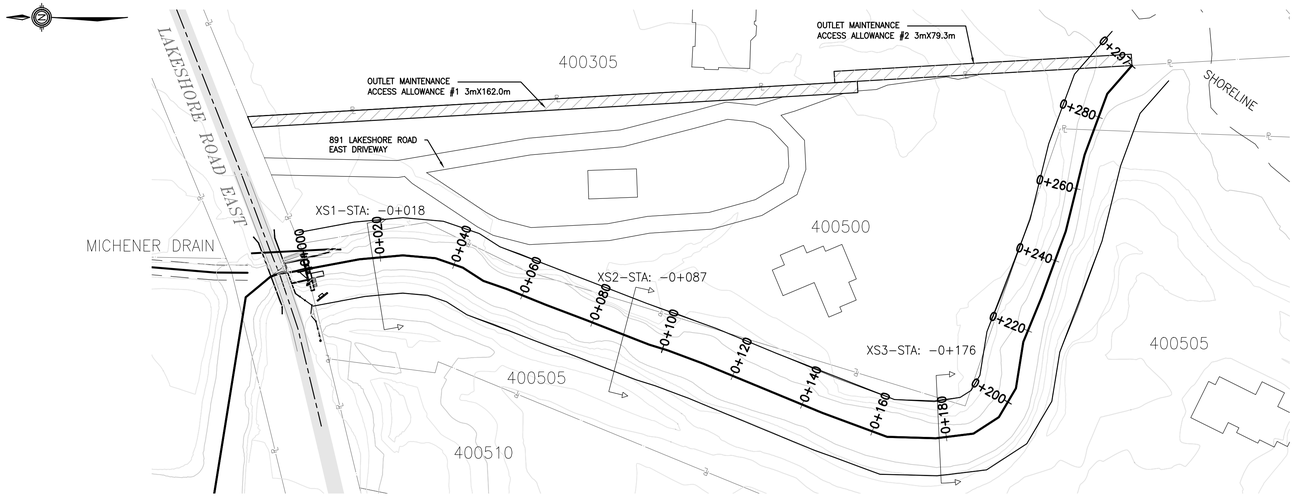
CITY OF PORT COLBORNE

VERIFY SCALE
BAR IS 25mm ON ORIGINAL DRAWING.
0 25mm
IF NOT 25mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

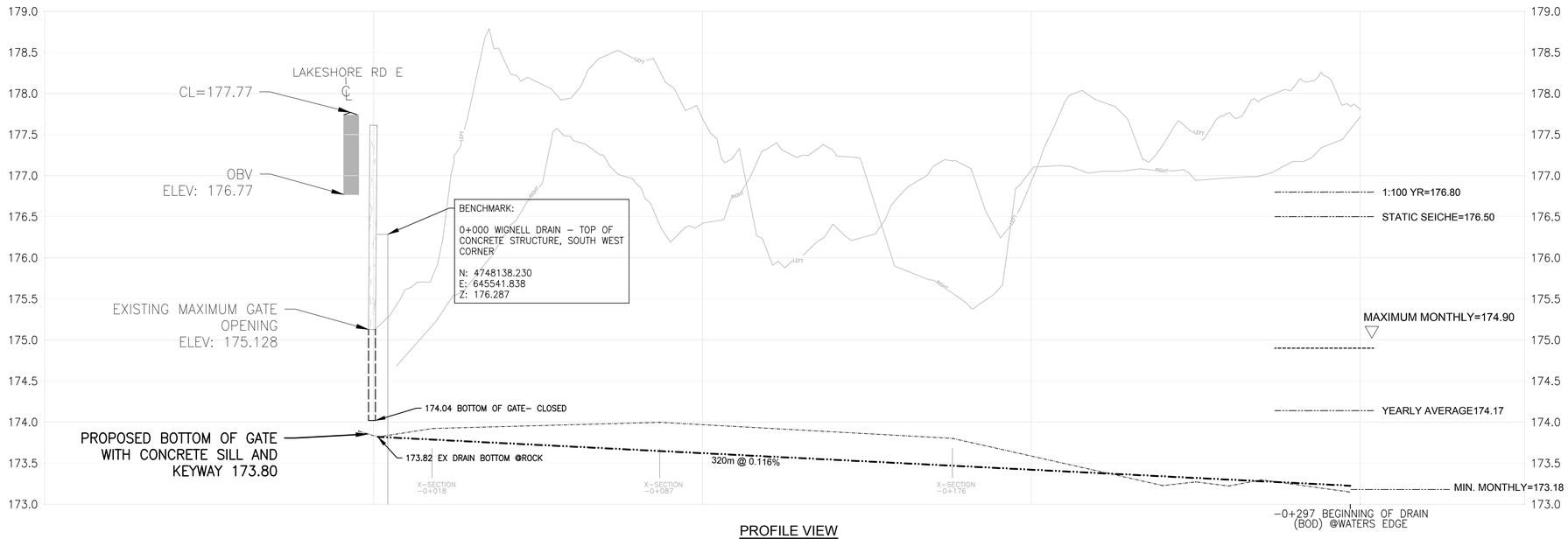
EARTH WATER AIR ENGINEERING

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	-	W.P5
DESIGNED BY :	DATE :	SCALE :	
PCM	09-FEB-24	AS SHOWN	

WIGNELL DRAIN: **OUTLET**

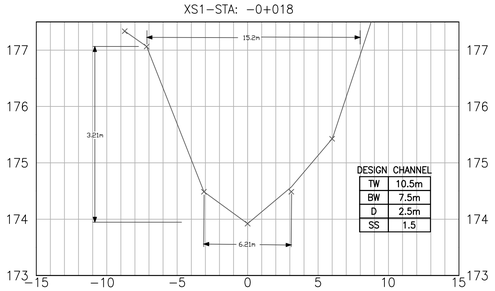


PLAN VIEW
SCALE 1:750

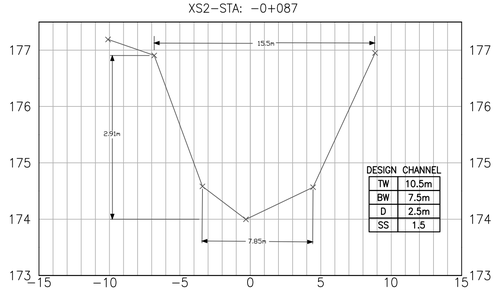


PROFILE VIEW
SCALE H=1:750, V=1:25

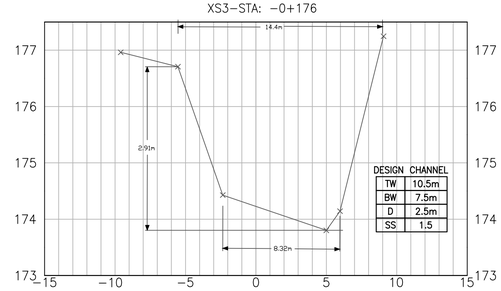
XS1–STA: –0+018



XS2–STA: –0+087



XS3–STA: –0+176



SECTION VIEWS
SCALE H=1:200 V=1:4

NOTES:

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2. CATCHMENT BOUNDARIES ARE BASED ON THE NPCA DIGITAL ELEVATION MODEL (DEM) 2010
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SPATIAL DATA:

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- VERTICAL DATUM: CGVD28–1978
- ACCURACY: ABSOLUTE HORIZONTAL AND VERTICAL POSITIONAL ACCURACIES OF ±0.5m

LEGEND

	EXISTING DITCH BOTTOM (NPCA DEM DATA)
	EXISTING DITCH BOTTOM (SURVEYED)
	HISTORICAL GRADELINE
	PROPOSED DRAIN GRADELINE–EWA
LEFT	LEFT BANK
RIGHT	RIGHT BANK
	EXISTING DRAIN SECTION
	EXISTING STRUCTURE DETAILS
	ASSUMED EXISTING STRUCTURE DETAILS
OBV=175.00	EXISTING DRAIN ELEVATION
175.00 PR.	PROPOSED DRAIN CENTERLINE ELEVATION
175.00 EX.	PROPOSED DRAIN ELEVATION (WHERE MATCHES EXISTING ELEVATION)
	DATA POINT FROM HISTORICAL DESIGN GRADELINE RVA, 1979

NO.	REVISION DESCRIPTION	DATE
1.0	ISSUED FOR REPORT	FEB 09,2024

WIGNELL MUNICIPAL DRAIN
PLAN & PROFILE – OUTLET
STA 0+000 to –0+297

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

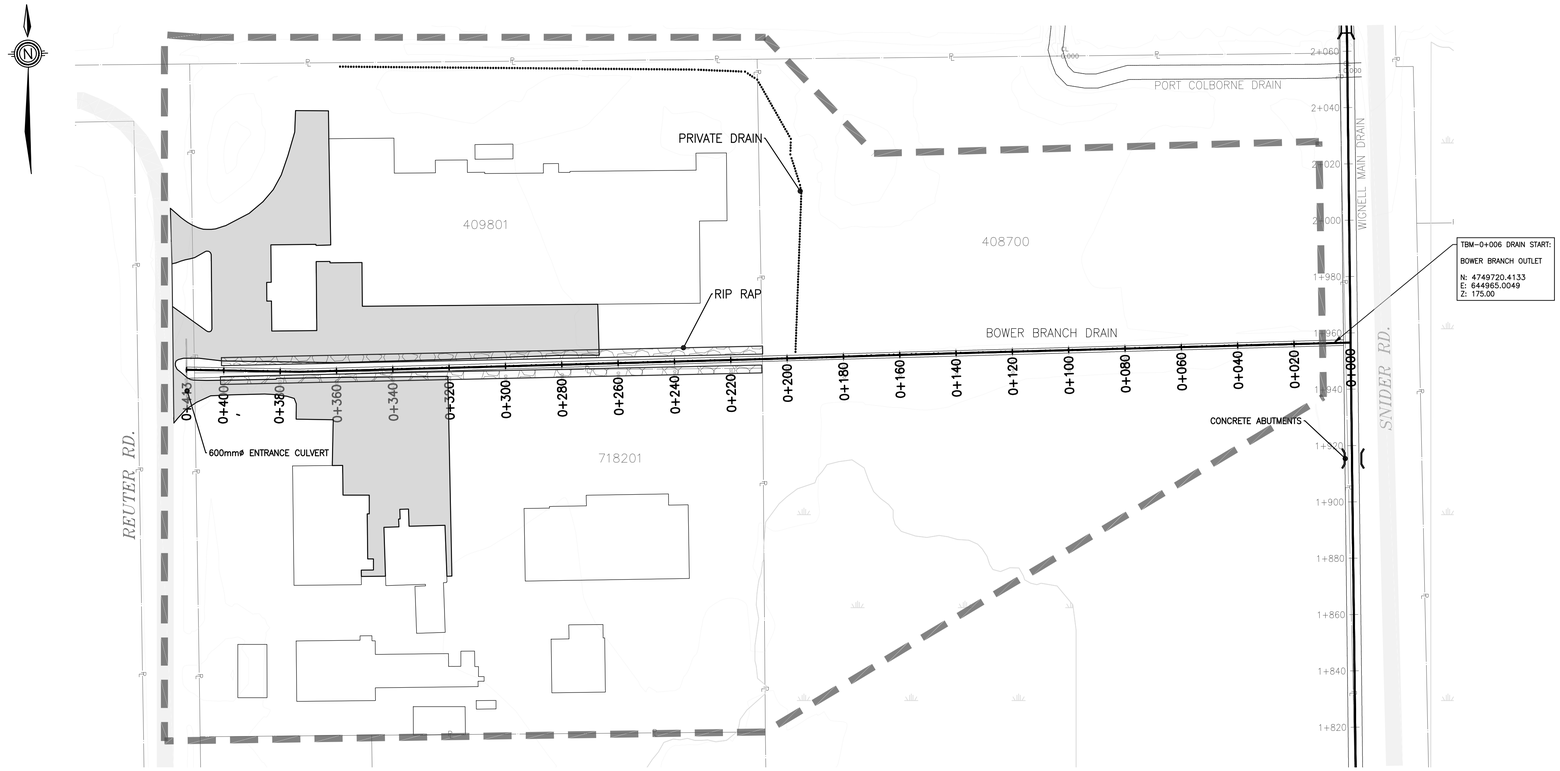
CITY OF
PORT COLBORNE

VERIFY SCALE
BAR IS 25mm ON ORIGINAL DRAWING.
0 25mm
IF NOT 25mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

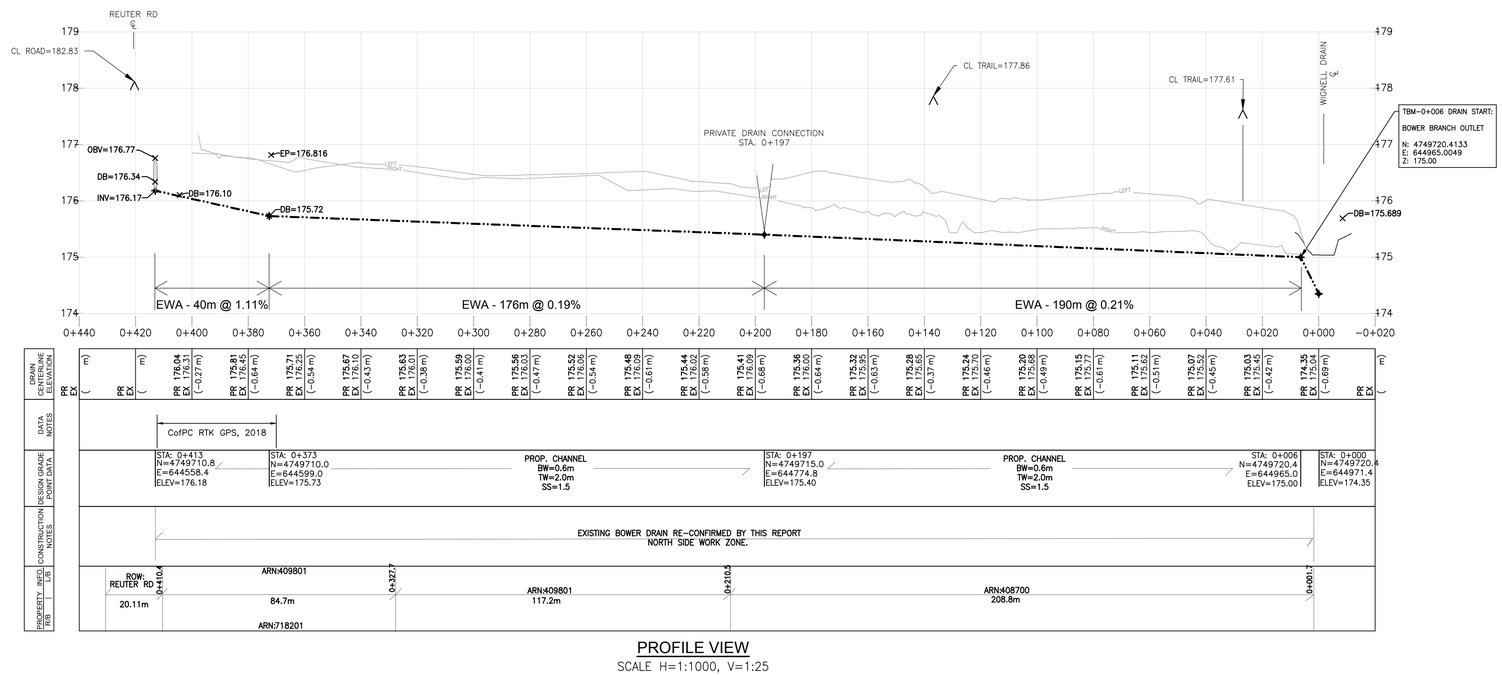
EWA EARTH WATER AIR ENGINEERING

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	–	W.P6
DESIGNED BY :	DATE :	SCALE :	
PCM	09–FEB–24	AS SHOWN	

BOWER BRANCH DRAIN



PLAN VIEW
SCALE 1:1000



PROFILE VIEW
SCALE H=1:1000, V=1:25

NOTES:

1. DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED
2. CATCHMENT BOUNDARIES ARE BASED ON THE NPCA DIGITAL ELEVATION MODEL (DEM) 2010
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   - SUPPLEMENTARY SURVEY BY CofPC, 2018
   - WIEBE ENGINEERING SURVEY, 2008
   - SUPPLEMENTARY SURVEY (SPOT CHECKS) BY CofPC, 2018 TO 2021
   - WIEBE ENGINEERING REFERENCE SURVEY, 2008, PARTIAL USE OF DRAIN BOTTOM POINTS. NOT GEOREFERENCED.

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- VERTICAL DATUM: CGVD28-1978
- ACCURACY: ABSOLUTE HORIZONTAL AND VERTICAL POSITIONAL ACCURACIES OF ±0.5m

LEGEND

	EXISTING DITCH BOTTOM (NPCA DEM DATA)
	EXISTING DITCH BOTTOM (SURVEYED)
	HISTORICAL GRADELINE
	PROPOSED DRAIN GRADELINE-EWA
LEFT	LEFT BANK
RIGHT	RIGHT BANK
	EXISTING DRAIN SECTION
	EXISTING STRUCTURE DETAILS
	ASSUMED EXISTING STRUCTURE DETAILS
OBV=175.00	EXISTING DRAIN ELEVATION
175.00 PR.	PROPOSED DRAIN CENTERLINE ELEVATION
175.00 EX.	PROPOSED DRAIN ELEVATION (WHERE MATCHES EXISTING ELEVATION)
	DATA POINT FROM HISTORICAL DESIGN GRADELINE RVA, 1979

NO.	REVISION DESCRIPTION	DATE
1.0	ISSUED FOR REPORT	FEB 09,2024

LICENSED PROFESSIONAL ENGINEER
PAULE MARSH
PROVINCE OF ONTARIO
2024-02-16

WIGNELL MUNICIPAL DRAIN
SPECIFIC DETAIL
BOWER BRANCH DRAIN

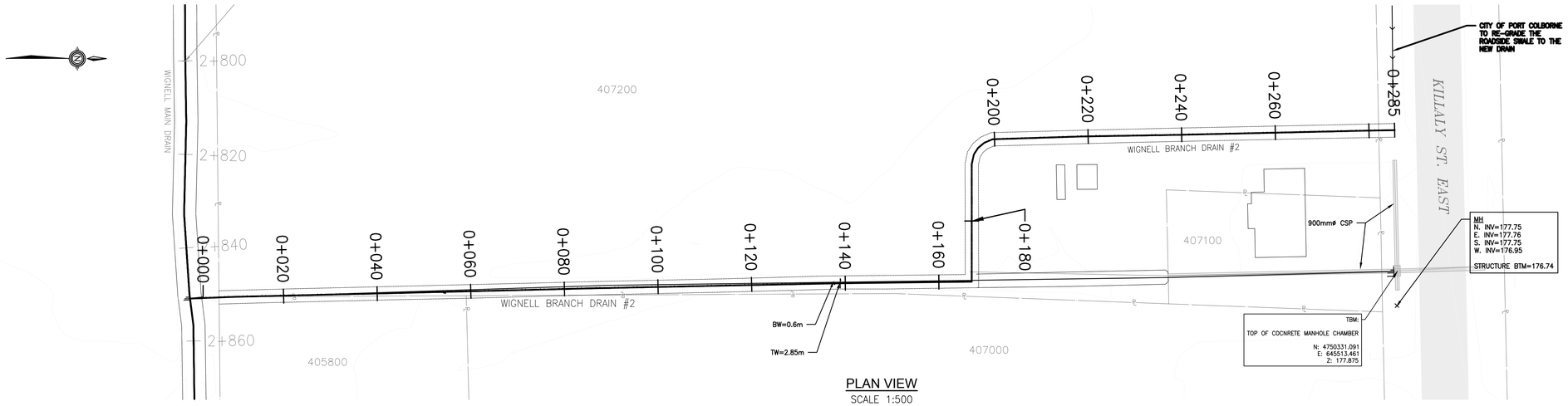
CITY OF
PORT COLBORNE

VERIFY SCALE
BAR IS 25mm ON ORIGINAL DRAWING.
0 25mm
IF NOT 25mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

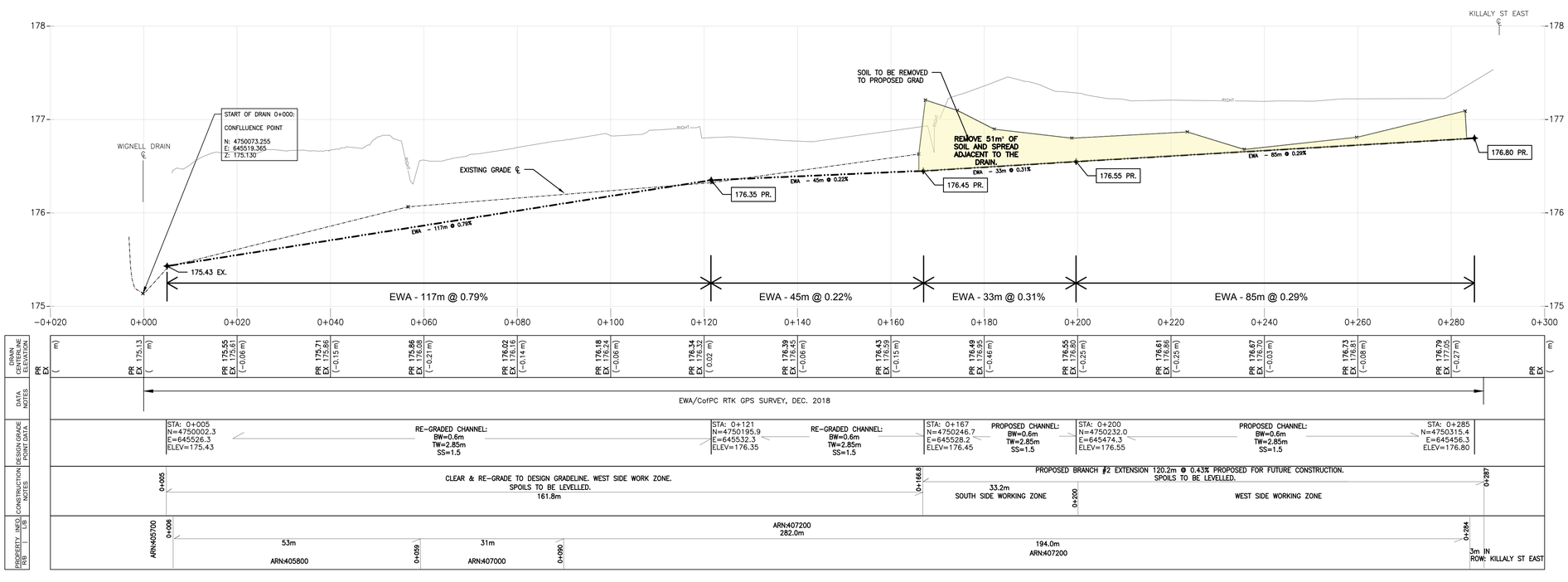
EARTH WATER AIR ENGINEERING

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	-	W.SD-01
DESIGNED BY :	DATE :	SCALE :	
PCM	09-FEB-24	AS SHOWN	

WIGNELL BRANCH DRAIN #2



PLAN VIEW
SCALE 1:500



PROFILE VIEW
SCALE H=1:500 V=1:25

NOTES:

1. DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED
2. CATCHMENT BOUNDARIES ARE BASED ON THE NPCA DIGITAL ELEVATION MODEL (DEM) 2010
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LEGEND

	EXISTING DITCH BOTTOM (NPCA DEM DATA)
	EXISTING DITCH BOTTOM (SURVEYED)
	HISTORICAL GRADELINE
	PROPOSED DRAIN GRADELINE–EWA
LEFT	LEFT BANK
RIGHT	RIGHT BANK
	EXISTING DRAIN SECTION
	EXISTING STRUCTURE DETAILS
	ASSUMED EXISTING STRUCTURE DETAILS
OBV=175.00	EXISTING DRAIN ELEVATION
175.00 PR.	PROPOSED DRAIN CENTERLINE ELEVATION
175.00 EX.	PROPOSED DRAIN ELEVATION (WHERE MATCHES EXISTING ELEVATION)
	DATA POINT FROM HISTORICAL DESIGN GRADELINE RVA, 1979

NO.	REVISION DESCRIPTION	DATE
1.0	ISSUED FOR REPORT	FEB 09,2024

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

WIGNELL MUNICIPAL DRAIN
SPECIFIC DETAIL
BRANCH DRAIN #2

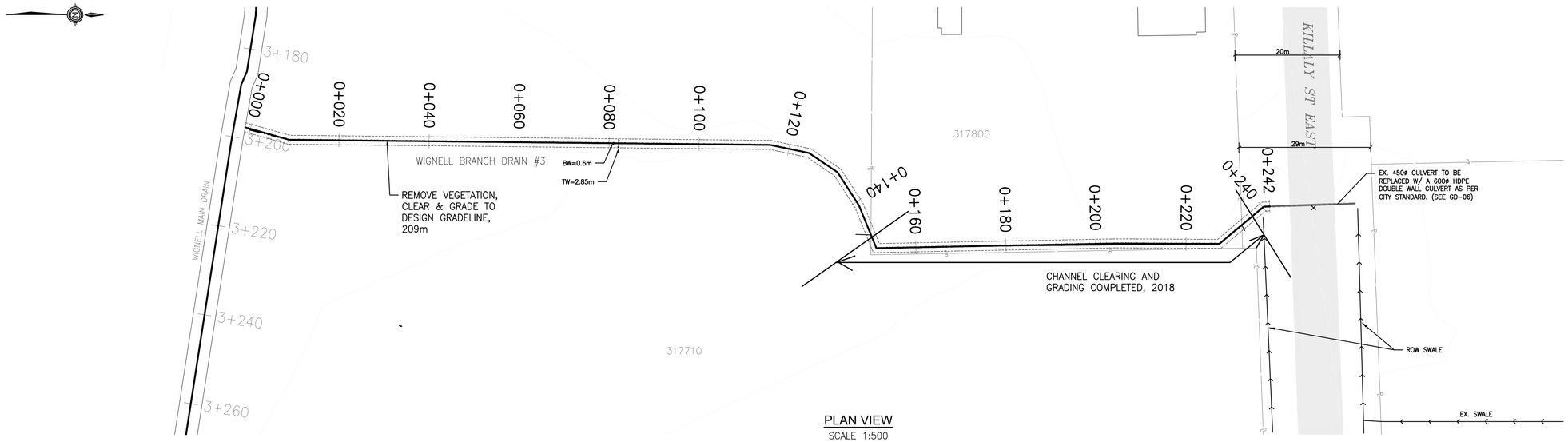
CITY OF
PORT COLBORNE

VERIFY SCALE
BAR IS 25mm ON ORIGINAL DRAWING.
0 25mm
IF NOT 25mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

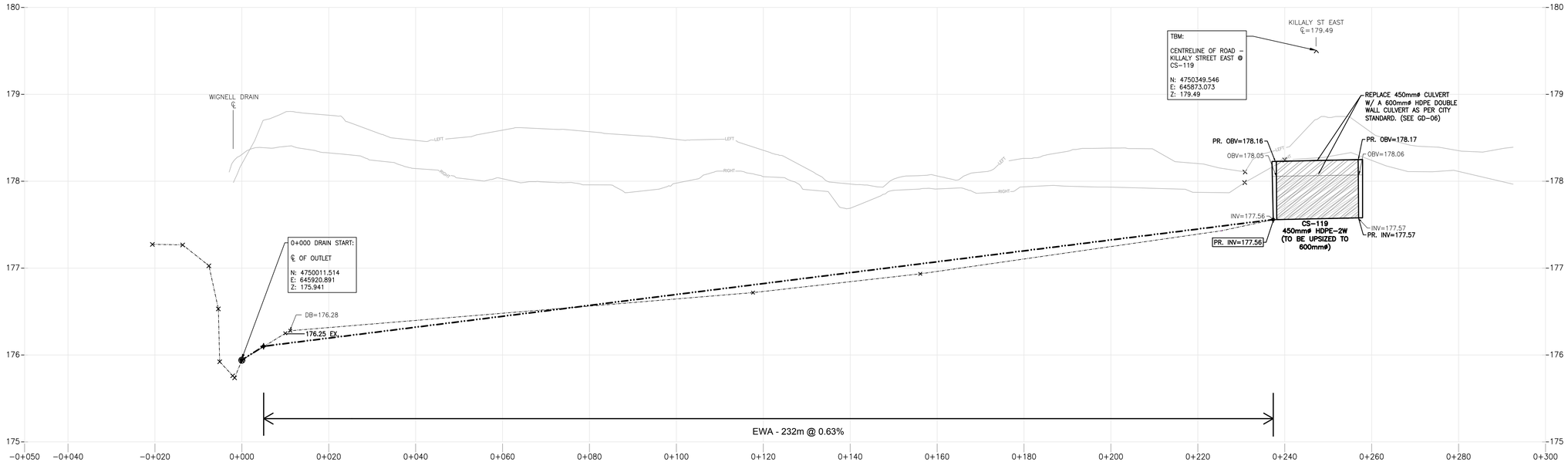
EARTH WATER AIR ENGINEERING

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	–	W.SD–02
DESIGNED BY :	DATE :	SCALE :	
PCM	09–FEB–24	AS SHOWN	

WIGNELL BRANCH DRAIN #3



PLAN VIEW
SCALE 1:500



PROFILE VIEW
SCALE 1:500

NOTES:

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- VERTICAL DATUM: CGVD28-1978
- ACCURACY: ABSOLUTE HORIZONTAL AND VERTICAL POSITIONAL ACCURACIES OF ±0.5m

LEGEND

	EXISTING DITCH BOTTOM (NPCA DEM DATA)
	EXISTING DITCH BOTTOM (SURVEYED)
	HISTORICAL GRADELINE
	PROPOSED DRAIN GRADELINE-EWA
LEFT	LEFT BANK
RIGHT	RIGHT BANK
	EXISTING DRAIN SECTION
	EXISTING STRUCTURE DETAILS
	ASSUMED EXISTING STRUCTURE DETAILS
OBV=175.00	EXISTING DRAIN ELEVATION
175.00 PR.	PROPOSED DRAIN CENTERLINE ELEVATION
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	DATA POINT FROM HISTORICAL DESIGN GRADELINE RVA, 1979

NO.	REVISION DESCRIPTION	DATE
1.0	ISSUED FOR REPORT	FEB 09,2024

LICENSED PROFESSIONAL ENGINEER
PAUL E MARSH
PROVINCE OF ONTARIO
2024-02-16

WIGNELL MUNICIPAL DRAIN
SPECIFIC DETAIL
WIGNELL BRANCH DRAIN #3

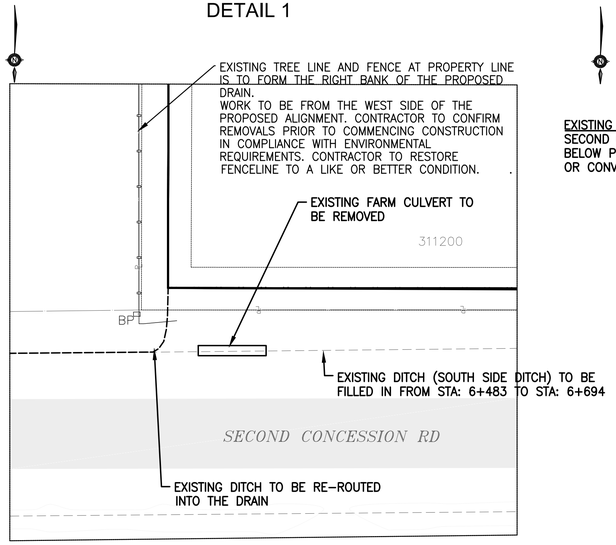
CITY OF
PORT COLBORNE

VERIFY SCALE
BAR IS 25mm ON ORIGINAL DRAWING.
0 25mm
IF NOT 25mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

EARTH WATER AIR ENGINEERING

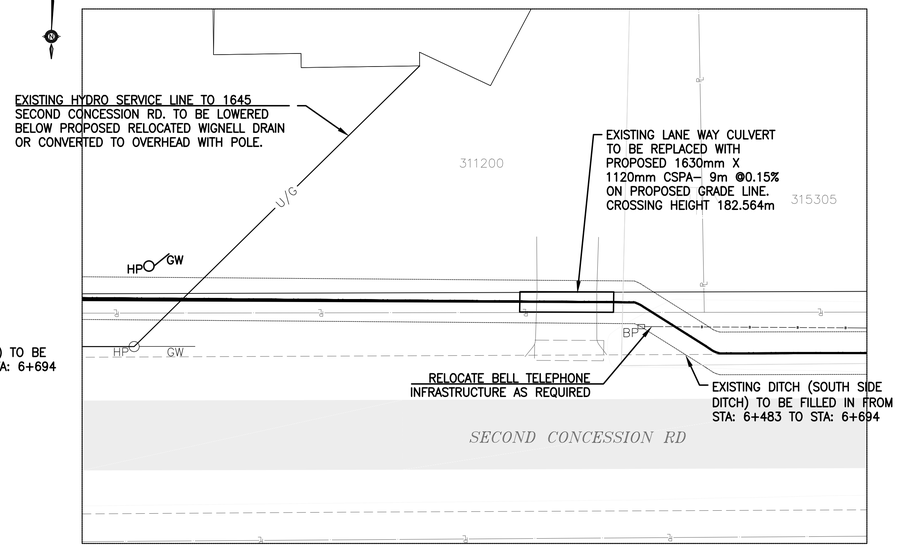
DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	-	W.SD-03
DESIGNED BY :	DATE :	SCALE :	
PCM	09-FEB-24	AS SHOWN	

PLAN PROFILE DETAIL 1



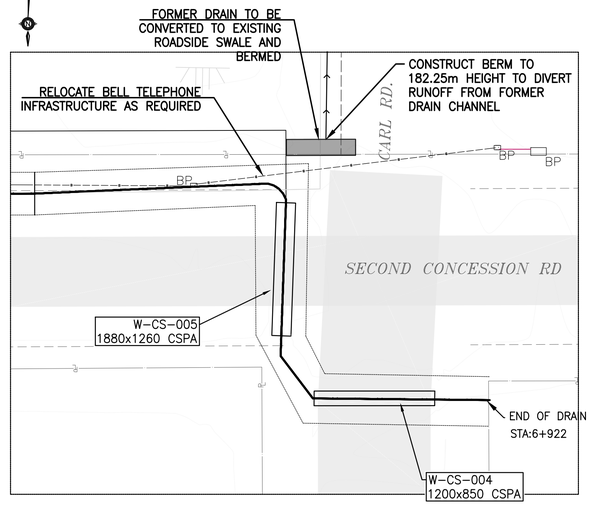
PLAN VIEW
SCALE =1:250

PLAN PROFILE DETAIL 2



PLAN VIEW
SCALE =1:250

PLAN PROFILE DETAIL 3



PLAN VIEW
SCALE =1:250

NOTES:

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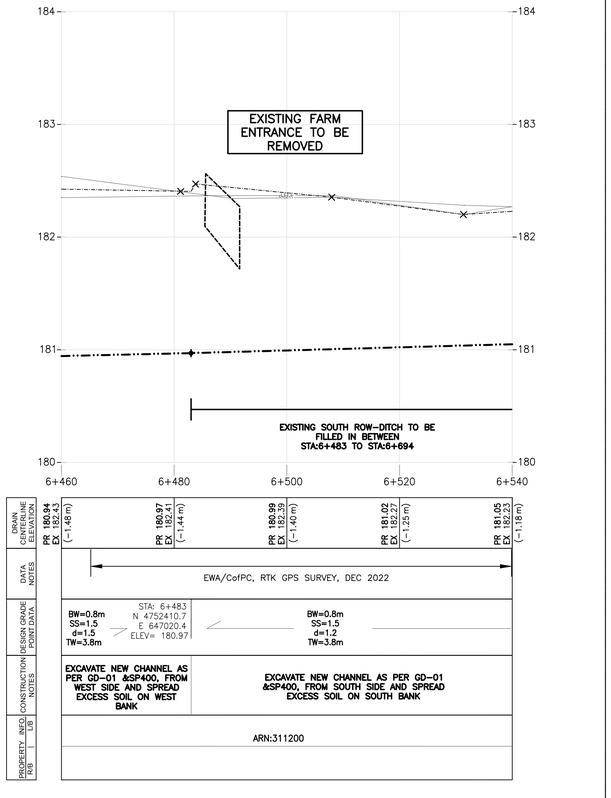
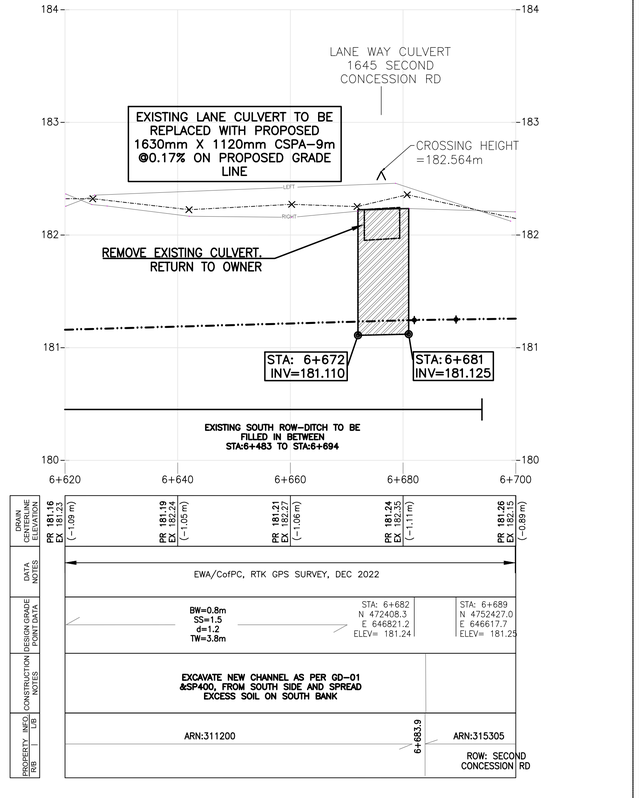
- ACCURACY: ABSOLUTE HORIZONTAL AND VERTICAL POSITIONAL ACCURACIES OF ±0.5m

LEGEND

	EXISTING DITCH BOTTOM (NPCA DEM DATA)
	EXISTING DITCH BOTTOM (SURVEYED)
	HISTORICAL GRADELINE
	PROPOSED DRAIN GRADELINE-EWA
LEFT	LEFT BANK
RIGHT	RIGHT BANK
	EXISTING DRAIN SECTION
	EXISTING STRUCTURE DETAILS
	ASSUMED EXISTING STRUCTURE DETAILS
OBV=175.00	EXISTING DRAIN ELEVATION
175.00 PR.	PROPOSED DRAIN CENTERLINE ELEVATION
175.00 EX.	PROPOSED DRAIN ELEVATION (WHERE MATCHES EXISTING ELEVATION)
	DATA POINT FROM HISTORICAL DESIGN GRADELINE RVA, 1979



PROFILE
SCALE H=1:500 ,V=1:20



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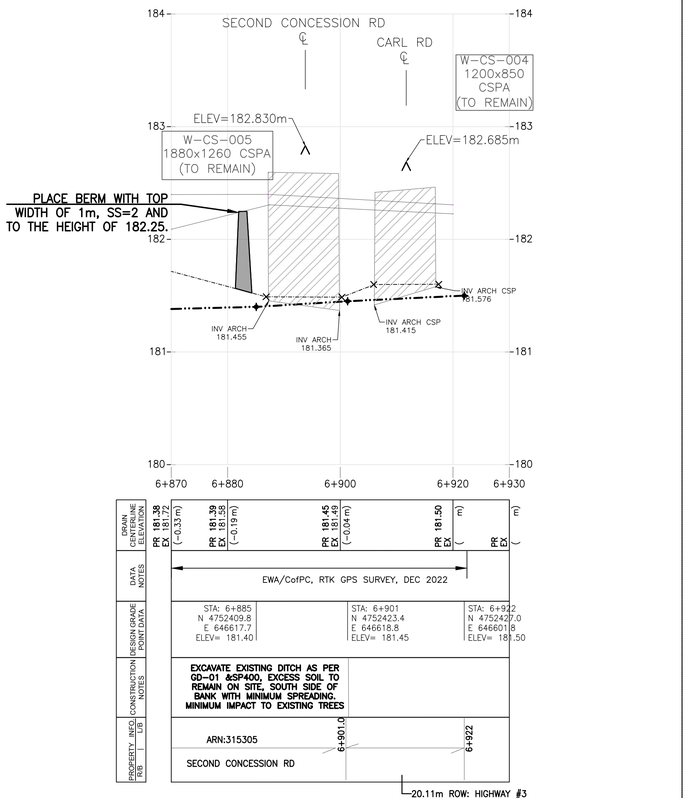

PROFILE
SCALE H=1:500 ,V=1:20

NO.	REVISION DESCRIPTION	DATE
1.0	ISSUED FOR REPORT	FEB 09,2024

WIGNELL MUNICIPAL DRAIN
PLAN & PROFILE - REALIGNMENT ALONG SECOND CONCESSION RD

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

CITY OF PORT COLBORNE

VERIFY SCALE
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0 25mm
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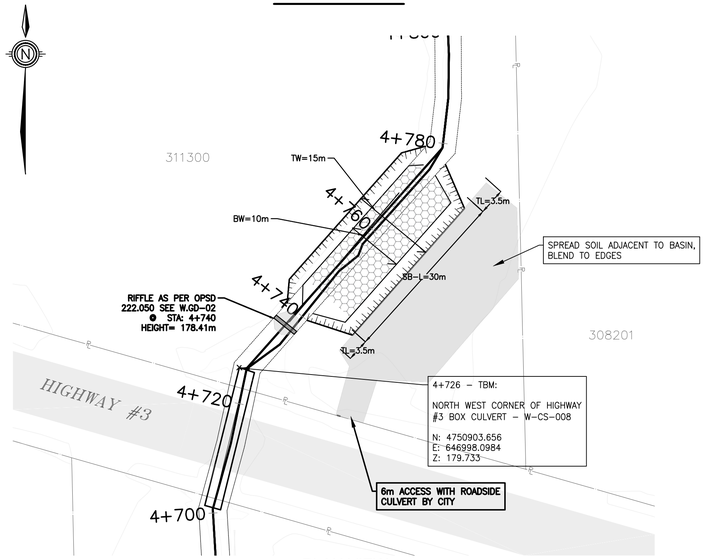
EARTH WATER AIR ENGINEERING

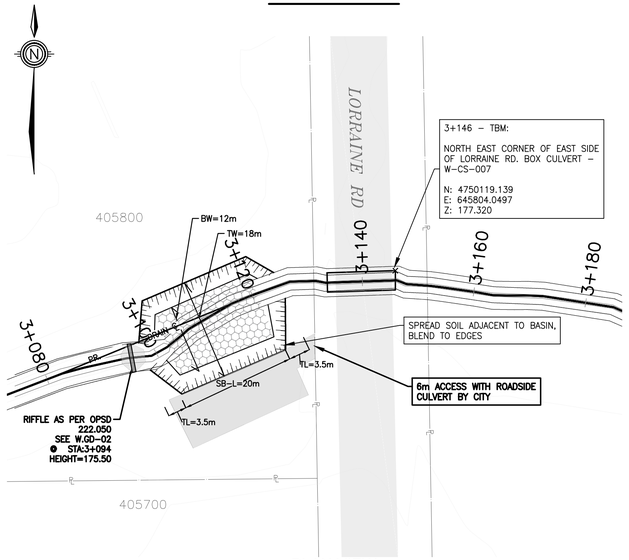
DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	-	W.SD-04
DESIGNED BY :	DATE :	SCALE :	
PCM	09-FEB-24	AS SHOWN	

W.SB01



PLAN VIEW
SCALE 1:500

W.SB02



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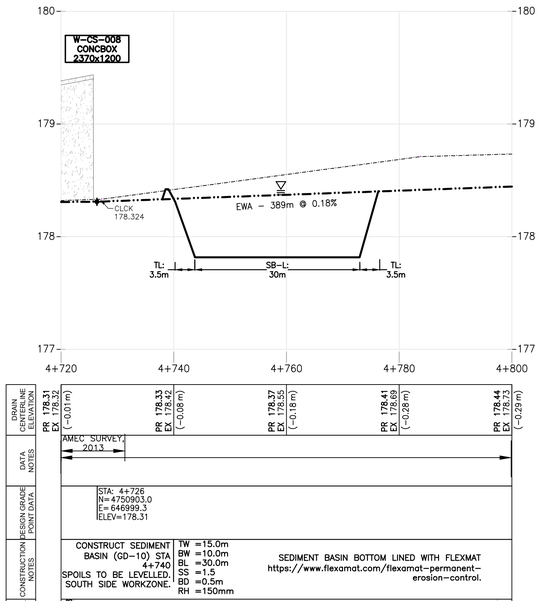
SCALE 1:500



PROFILE VIEW
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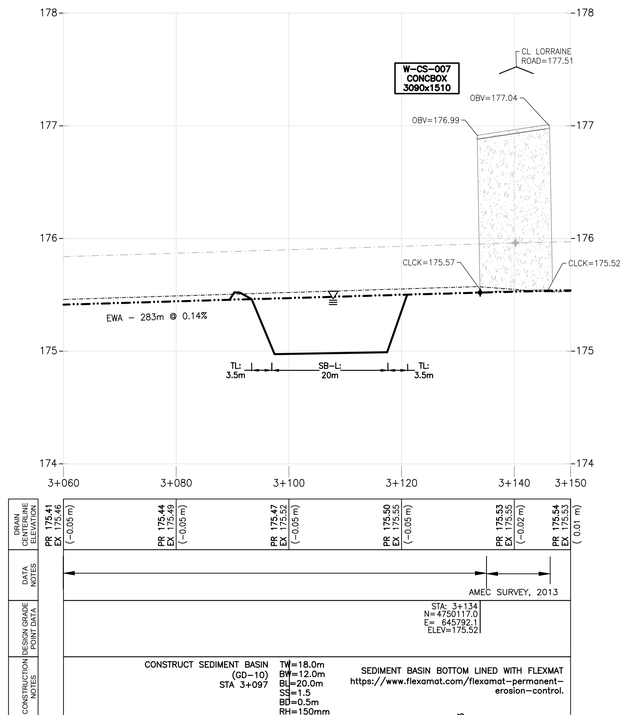

PROFILE VIEW
SCALE H=1:500, V=1:25

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- VERTICAL DATUM: CGVD28–1978
- ACCURACY: ABSOLUTE HORIZONTAL AND VERTICAL POSITIONAL ACCURACIES OF ±0.5m

LEGEND

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	PROPOSED DRAIN GRADELINE–EWA
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NO.	REVISION DESCRIPTION	DATE
1.0	ISSUED FOR REPORT	FEB 09,2024

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

WIGNELL MUNICIPAL DRAIN

SPECIFIC DETAIL
SEDIMENT BASINS

CITY OF PORT COLBORNE

VERIFY SCALE
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0 25mm
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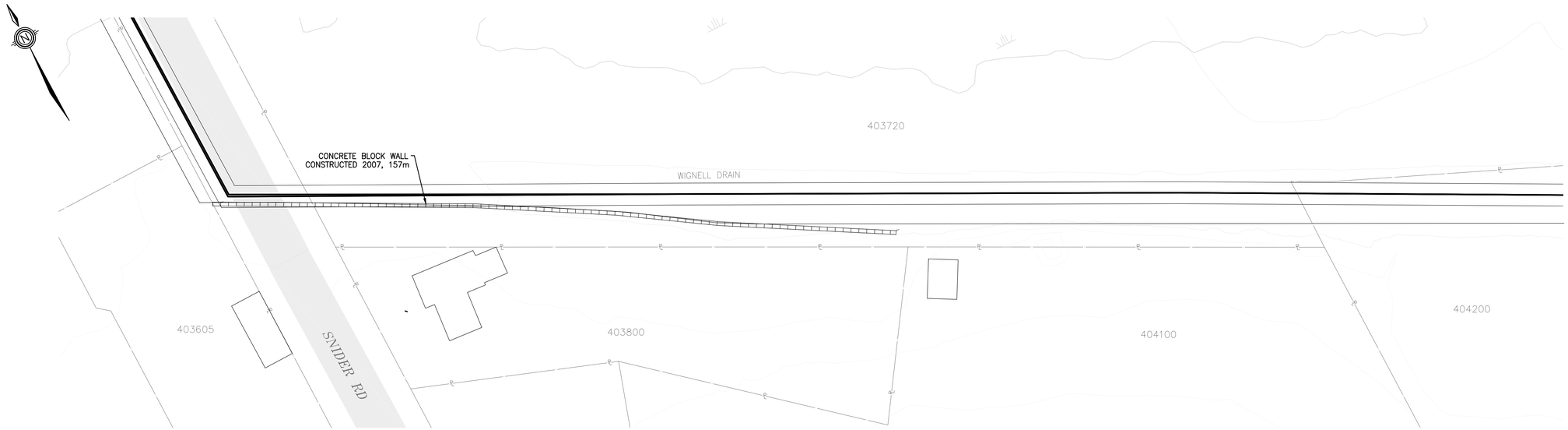
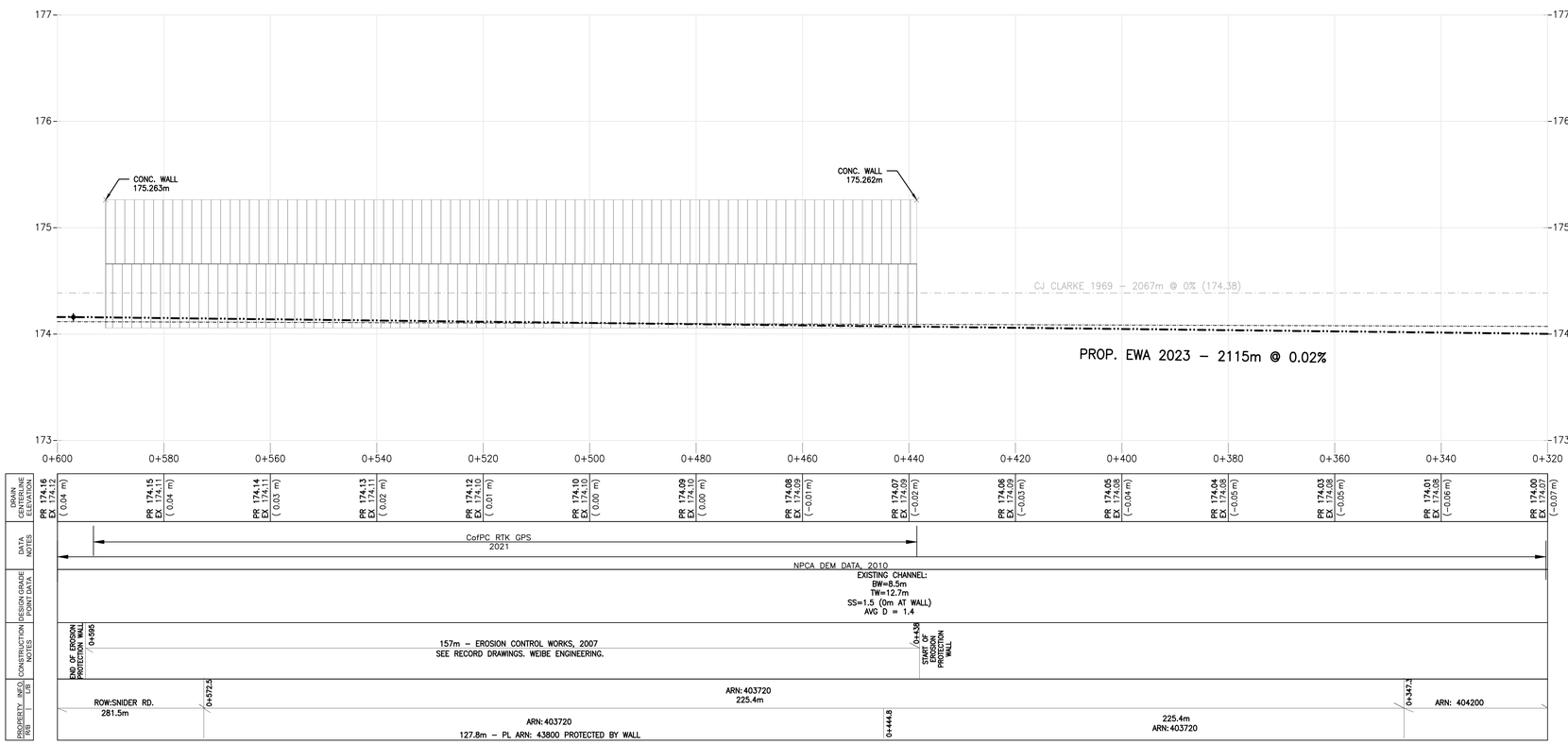
EARTH WATER AIR ENGINEERING

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	–	W.SD–05
DESIGNED BY :	DATE :	SCALE :	
PCM	09–FEB–24	AS SHOWN	

WIGNELL EROSION CONTROL WORKS_2007 - STA. 0+380 TO 0+600



PLAN VIEW
SCALE =1:500



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WIGNELL MUNICIPAL DRAIN
EROSION CONTROL WORKS - 2007

CITY OF PORT COLBORNE

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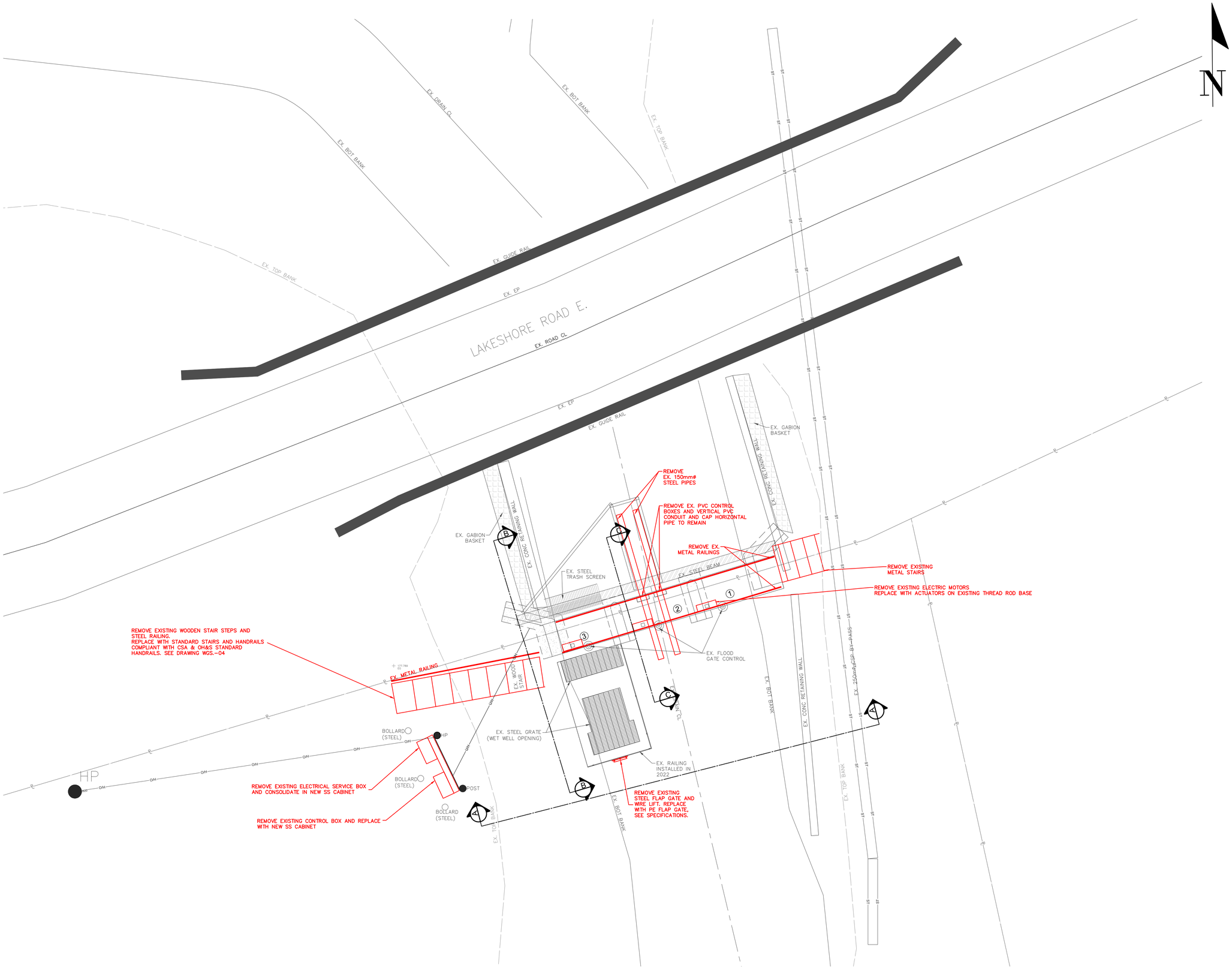
TJF	PCM	-	W.SD-06
DESIGNED BY :	DATE :	SCALE :	
PCM	09-FEB-24	AS SHOWN	



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1	ISSUED FOR REPORT	JUNE 30, 2023

WIGNELL DRAIN CONTROL STRUCTURE:

PLAN VIEW-REMOVALS

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

CITY OF PORT COLBORNE

VERIFY SCALE

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0 25mm

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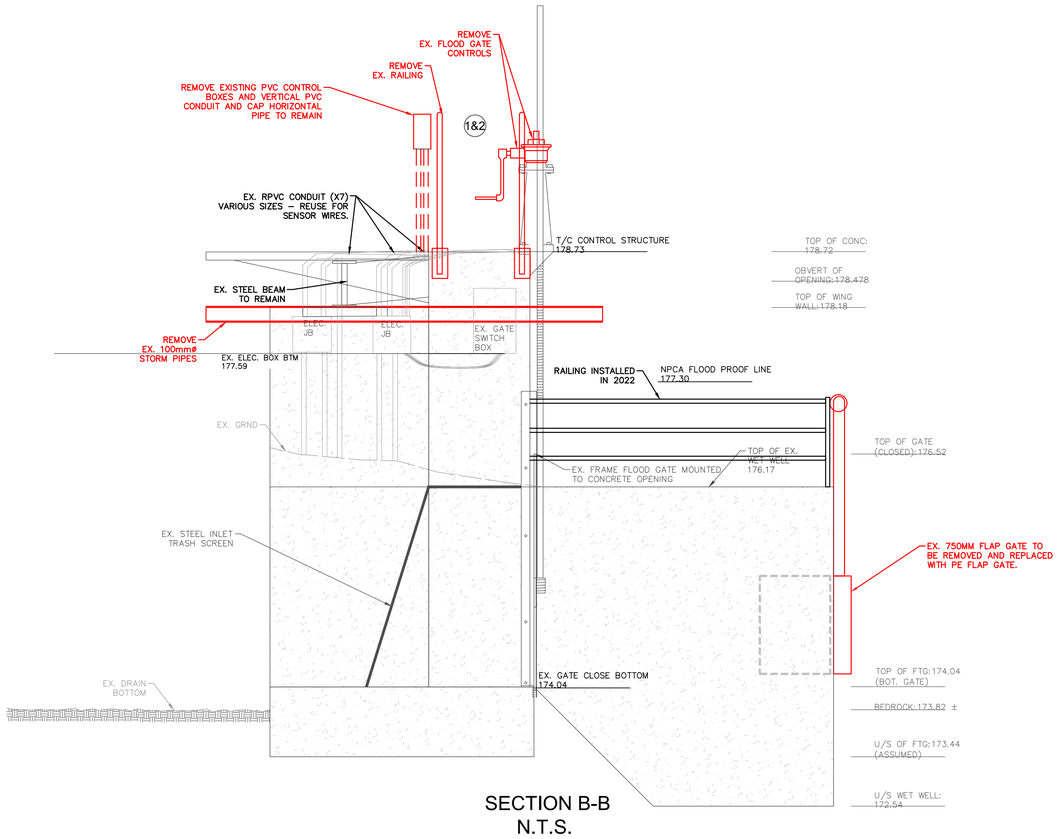
EARTH WATER INFRASTRUCTURE ENGINEERING

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	-	W.GS-01
DESIGNED BY :	DATE :	SCALE :	
PCM	20-JUN-23	-	



SECTION B-B
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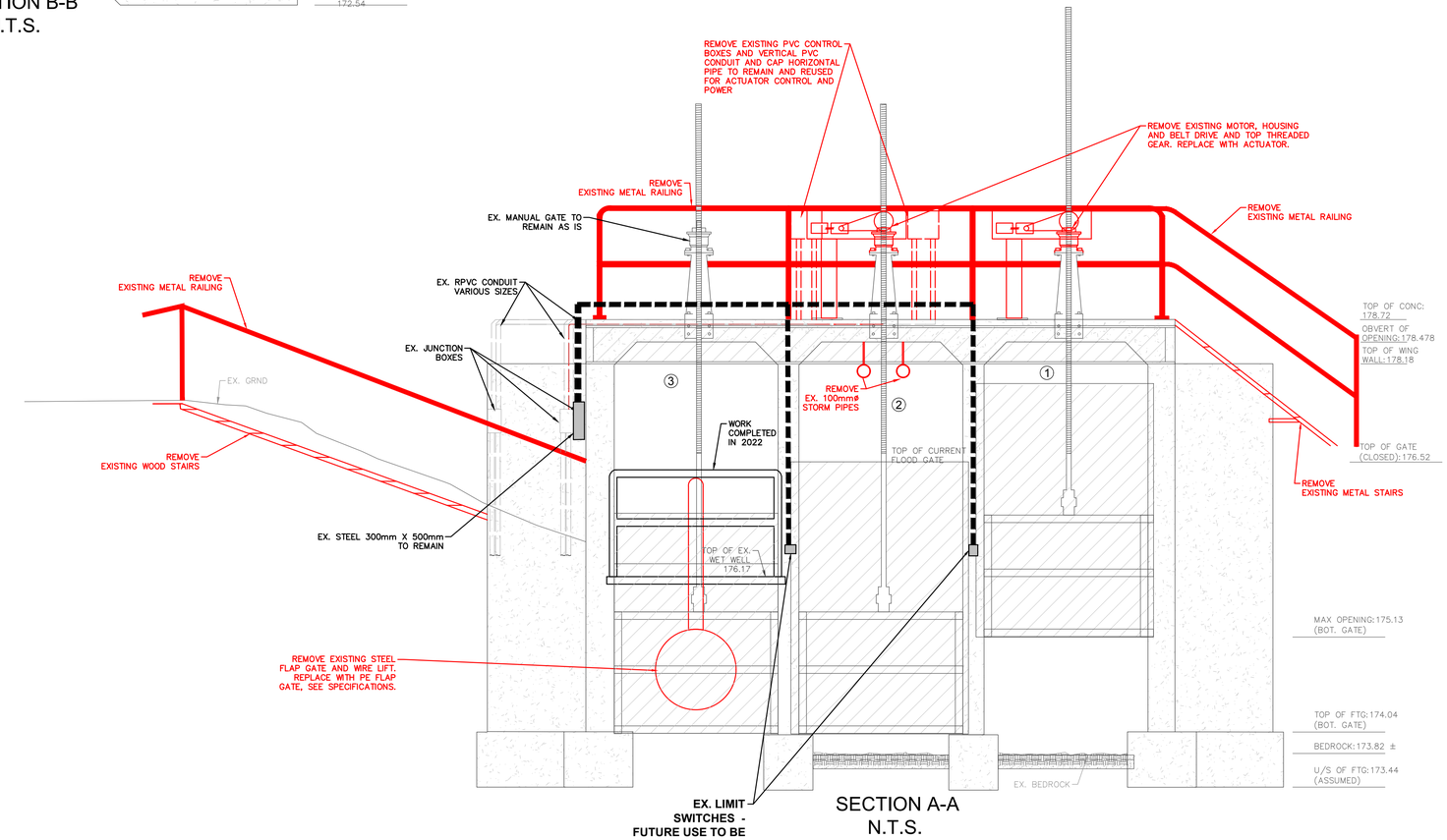
W.GS-02-A

W.GS-04-B



SECTION A-A
N.T.S.

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WIGNELL DRAIN CONTROL STRUCTURE:
SECTION VIEW–REMOVALS

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

CITY OF PORT COLBORNE

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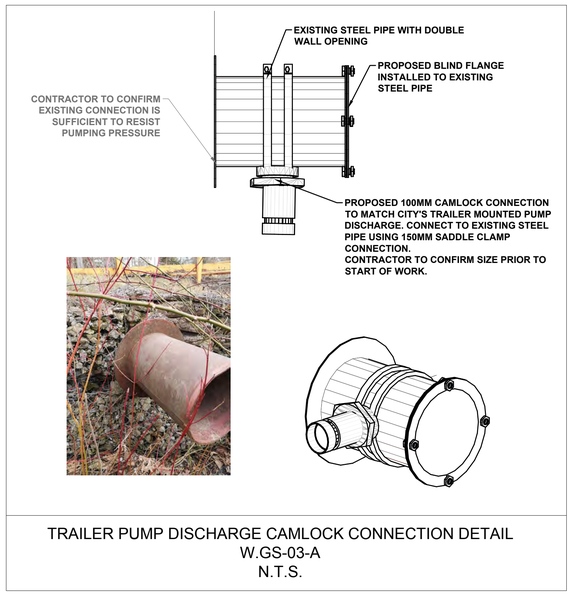
EARTH WATER AIR ENGINEERING

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	–	W.GS–02
DESIGNED BY :	DATE :	SCALE :	
PCM	22–MAR–23	–	



TRAILER PUMP DISCHARGE CAMLOCK CONNECTION DETAIL
W.GS-03-A
N.T.S.

MICHENER DRAIN

WIGNELL DRAIN

LAKESHORE RD. E

175.95
176.50
175.50
177.50
R=5m

INSTALL PROPOSED CABLE MAT RAMP 3000mm WIDE TO EXISTING MICHENER DRAIN TOP OF BANK FOR TRAILER MOUNTED PUMP DEPLOYMENT MAT TO BE PLACED ON 300mm OF COMPACTED GRANULAR A

INSTALL NEW COUPLING TO MATCH QUICK CONNECT ON TRAILER MOUNTED PUMP - SEE DETAIL W.GS-03-A

404303

404301

400300

400505

EX. GABION BASKET

EX. CONC RETAINING WALL

EX. STEEL TRASH SCREEN

EX. STEEL BEAM

EX. STEEL HAND RAIL (2022)

EX. WET WELL

EX. STEEL GRATE

WORK COMPLETED 2022 STEEL GRATE

GATE #1

GATE #2

GATE #3

EX. 250mmØ CSP BY-PASS

EX. DRAIN CL

EX. BOT BANK

EX. TOP BANK

EX. GUIDE RAIL

EX. EP

EX. ROAD CL

EX. DRAIN CL

BOLLARD (STEEL)

HP

PROPOSED FRP/GA STEEL PLATFORM 1200mmX6000mm WITH HAND RAILS IN COMPLIANCE WITH OHSA AND CSA REQUIREMENTS

REPLACE EX GATE CONTROLS WITH ACTUATORS ON EXISTING THREADED RODS (GATE 1 & 2)

INSTALL WARNING LIGHT NOT LESS THEN 2m TALL. CONNECT LIGHT TO PANEL POWER CONTROLS. LIGHT TO FLASH WARNING PRIOR TO GATE MOVEMENT

PROP. 900X4000, FRP WITH UV PAINT OR GALV. STEEL INCLUDES CSA, OS&H COMPLIANT RAILINGS WITH RESTRICTED ACCESS GATE LOCATED AT THE TOP OF THE RAMP AND BEFORE THE GATE STRUCTURE PLATFORM.

PROP. 600X1400X200 CONCRETE PAD TO SUPPORT CATWALK RAMP WITH GATED ENTERANCE.

PROP. 600X1100X200 CONCRETE PAD WITH 7 STEP X 900 WIDE STAIRS MOUNTED WITH A SINGLE HAND RAIL LOCATED ON NORTH SIDE.

PROP. POWER AND CONTROL SS PANEL MOUNTED ON CONC PAD 600mmX1200mm PANEL SIZE TO BE DETERMINED DURING CONSTRUCTION.

1700MMX1000MMX150MM CONCRETE PAD FOR SS PANEL FOUNDATION. PANEL SUPPORT REQUIREMENTS TO BE DETERMINED DURING CONSTRUCTION

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WIGNELL DRAIN CONTROL STRUCTURE:
PLAN VIEW–DESIGN

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

CITY OF PORT COLBORNE

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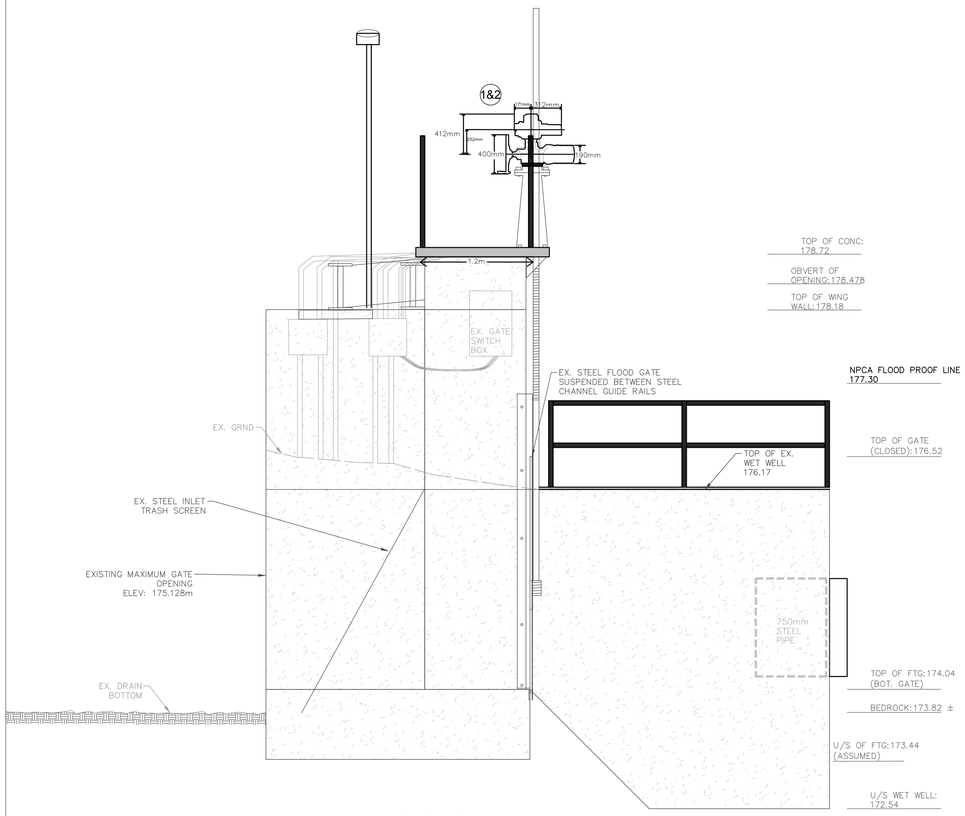
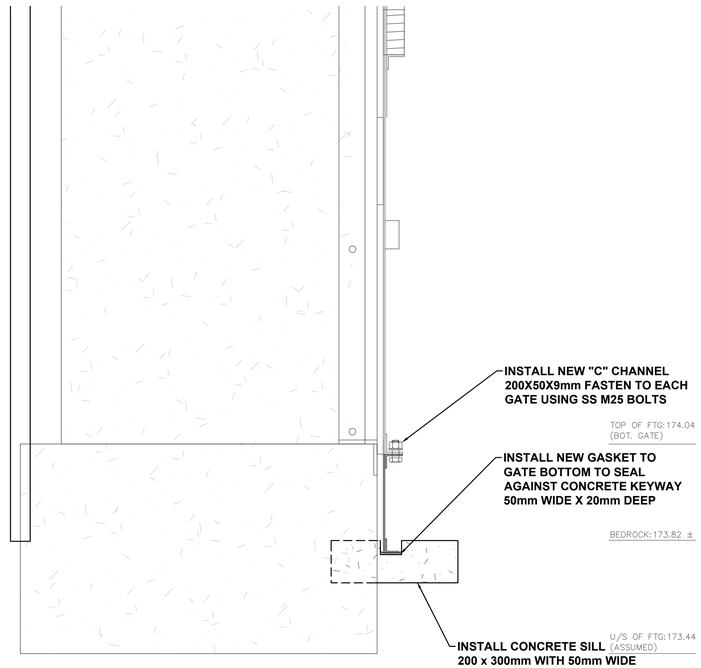
TJF	PCM	–	W.GS–03
DESIGNED BY :	DATE :	SCALE :	
PCM	22–MAR–23	–	

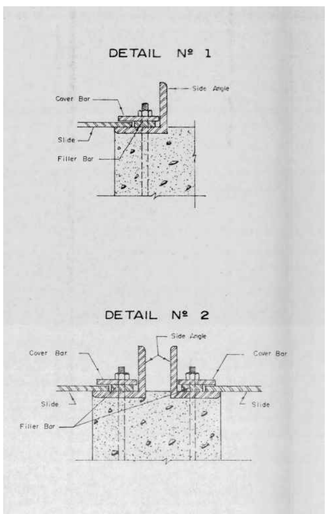


SECTION B-B
N.T.S.

PE FLAP GATE
W.GS-04-B

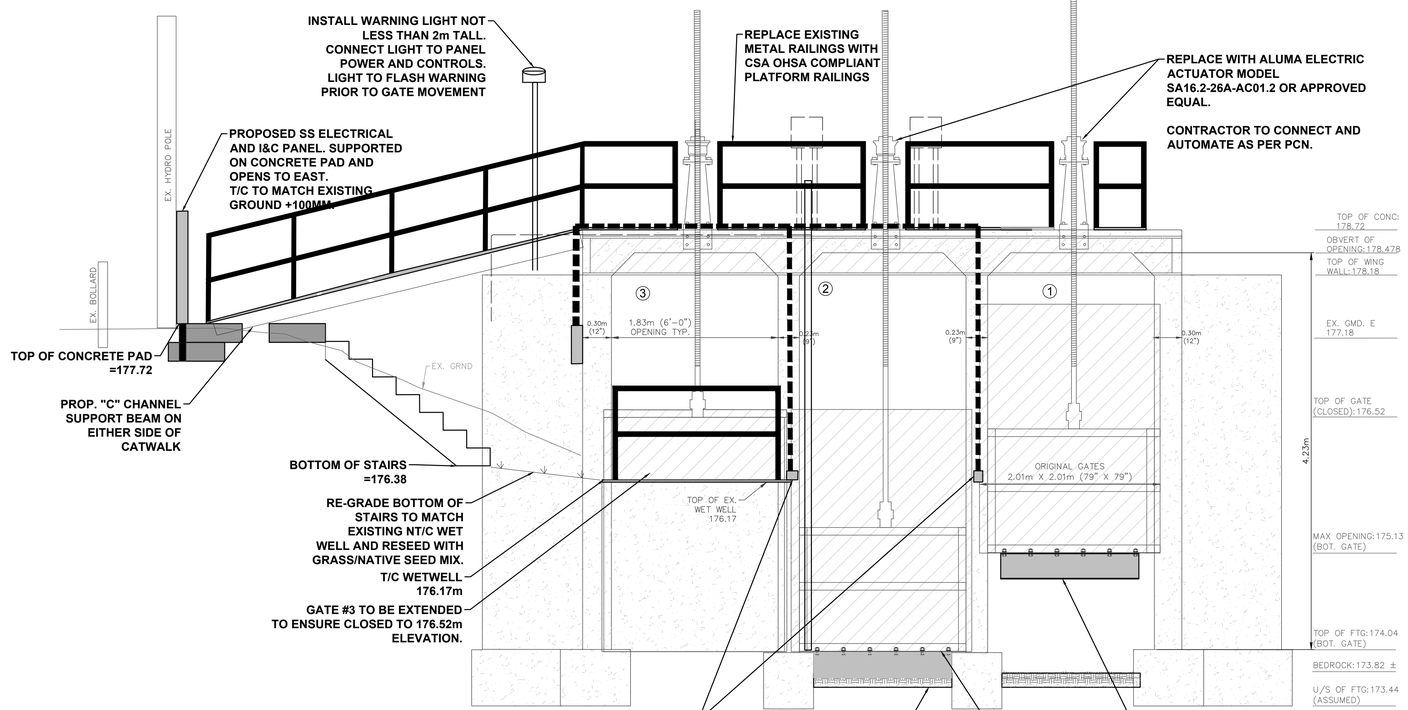


SECTION C-C
N.T.S.



GATE CHANNEL GUIDE
DETAILS
N.T.S.

U/S BACK FACE VIEW



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- ACCURACY: ABSOLUTE HORIZONTAL AND VERTICAL POSITIONAL ACCURACIES OF ±0.5m

LEGEND

	EXISTING DITCH BOTTOM (NPCA DEM DATA)
	EXISTING DITCH BOTTOM (SURVEYED)
	HISTORICAL GRADELINE
	PROPOSED DRAIN GRADELINE–EWA
LEFT	LEFT BANK
RIGHT	RIGHT BANK
	EXISTING DRAIN SECTION
	EXISTING STRUCTURE DETAILS
	ASSUMED EXISTING STRUCTURE DETAILS
OBV=175.00	EXISTING DRAIN ELEVATION
175.00 PR.	PROPOSED DRAIN CENTERLINE ELEVATION
175.00 EX.	PROPOSED DRAIN ELEVATION (WHERE MATCHES EXISTING ELEVATION)
	DATA POINT FROM HISTORICAL DESIGN GRADELINE RVA, 1979

NO.	REVISION DESCRIPTION	DATE
1	ISSUED FOR REPORT	JUNE 30, 2023

WIGNELL DRAIN CONTROL STRUCTURE:

SECTION/DETAIL VIEW–DESIGN

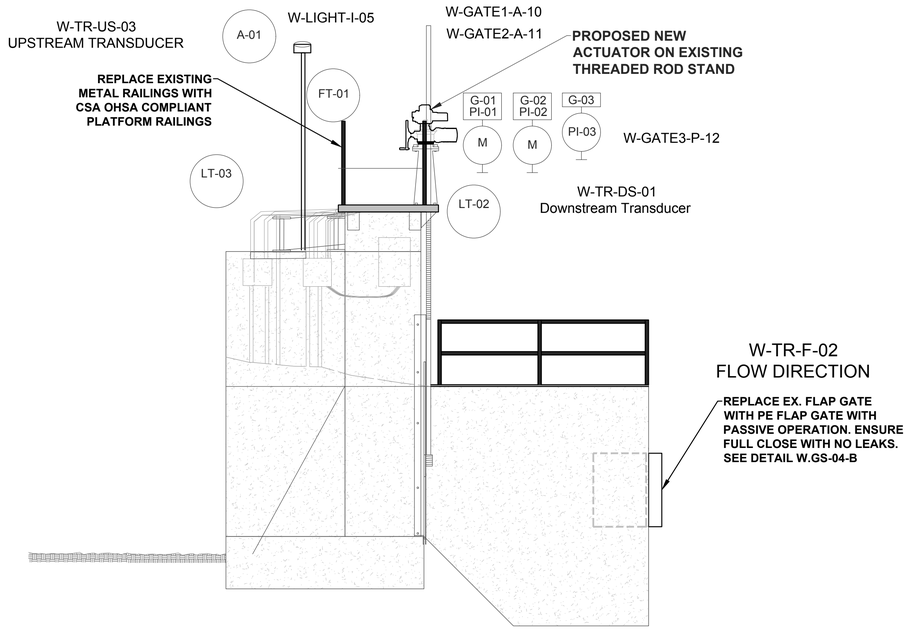
LICENCED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

CITY OF
PORT COLBORNE

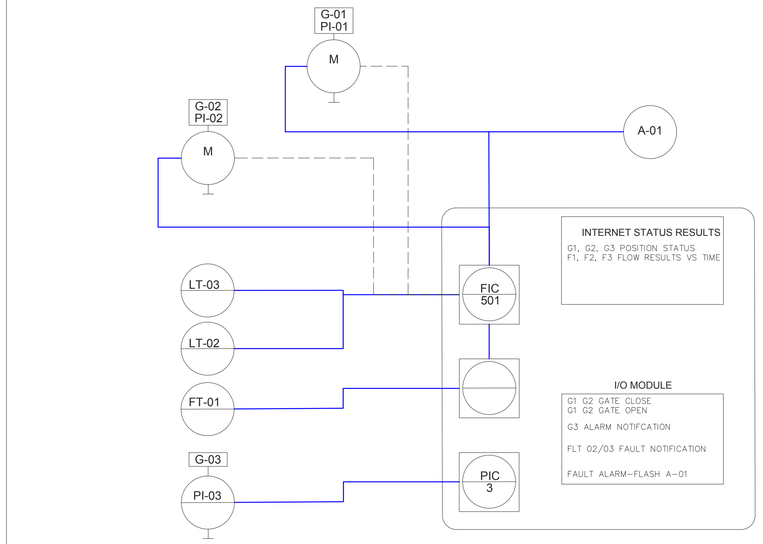
VERIFY SCALE
BAR IS 25mm ON ORIGINAL DRAWING.
0 — 25mm
IF NOT 25mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

EARTH WATER AIR ENGINEERING

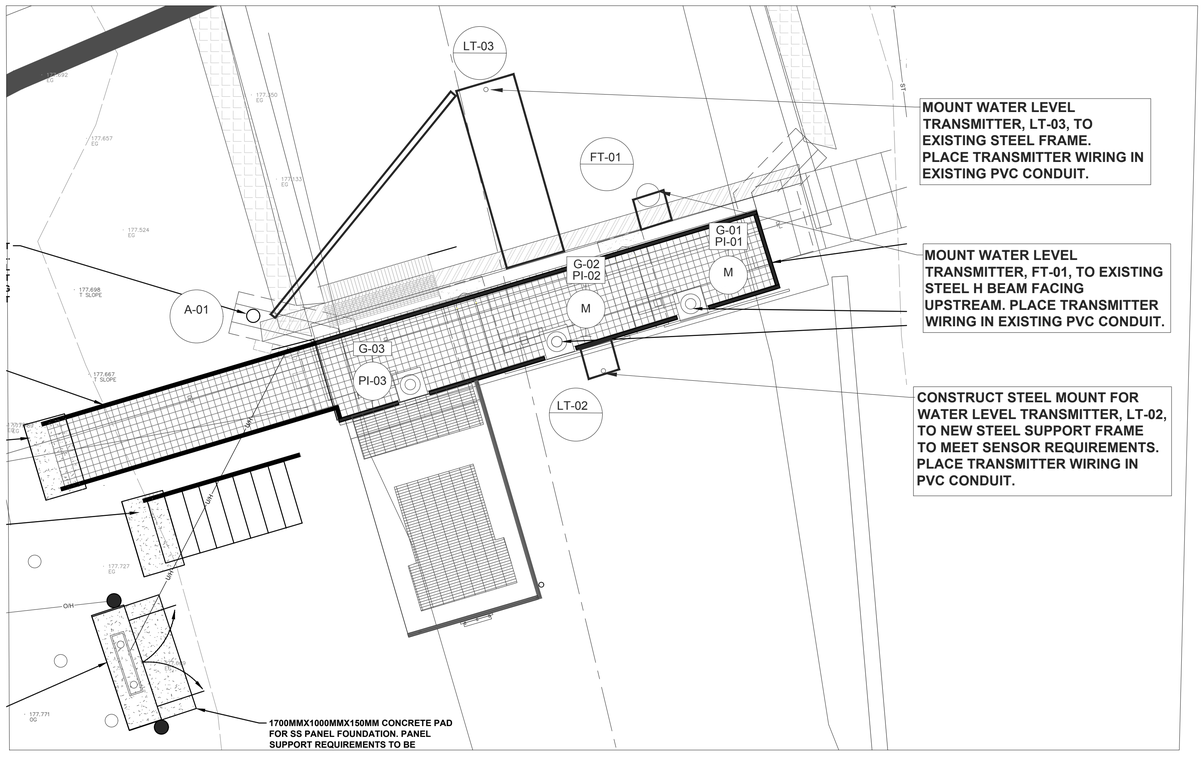
DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	–	W.GS–04
DESIGNED BY :	DATE :	SCALE :	
PCM	22–MAR–23	–	



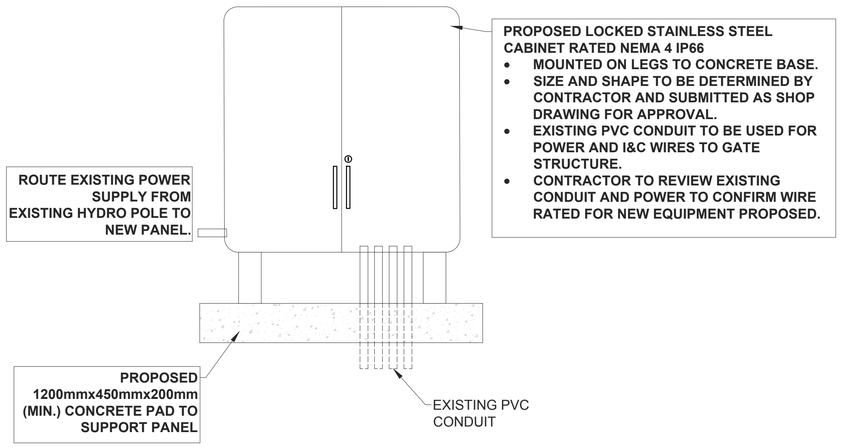
I&C DETAIL 1
PROCESS CONTROL DIAGRAM AND SENSOR PLACEMENTS



I&C DETAIL 2
PROCESS CONTROL



I&C PLAN
PROCESS CONTROL PLAN VIEW



I&C DETAIL 3
CONTROL SYSTEM CABINET

NOTES:

1. DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED
2. CATCHMENT BOUNDARIES ARE BASED ON THE NPCA DIGITAL ELEVATION MODEL (DEM) 2010
3. SPECIFIC POINTS IN THE SURFACE ARE BASED ON THE FOLLOWING SURVEYS:
   - DRAIN CROSSINGS & SPOT CHANNELS AMEC SURVEY, 2013
   - SUPPLEMENTARY SURVEY BY CofPC, 2018
   - WIEBE ENGINEERING SURVEY, 2008
   - SUPPLEMENTARY SURVEY (SPOT CHECKS) BY CofPC, 2018 TO 2021
   - WIEBE ENGINEERING REFERENCE SURVEY, 2008, PARTIAL USE OF DRAIN BOTTOM POINTS. NOT GEOREFERENCED.

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS 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 INFORM THEMSELVES OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE DONE TO THEM.

SPATIAL DATA:

DTM DATA FROM NIAGARA PENINSULA CONSERVATION AUTHORITY

- HORIZONTAL DATUM: UTM NAD83-CSRS ZONE 17N
- VERTICAL DATUM: CGVD28-1978
- ACCURACY: ABSOLUTE HORIZONTAL AND VERTICAL POSITIONAL ACCURACIES OF ±0.5m

LEGEND

G1 G2 G3 PI-01 M	Motorized gate (actuator) with position indicator (PI)
FLT 02	Flow Level Transmitter (FLT) – # Identifier
FIC 501	Flow – Integrated Controller (FIC)
A-01	Alarm (light + audible) – A
FIT-01	Flow Level Transmitter (FLT) – # Identifier

NO.	REVISION DESCRIPTION	DATE
1	ISSUED FOR REPORT	FEB 9, 2024

WIGNELL DRAIN CONTROL STRUCTURE:
WIGNELL I&C IMPROVEMENTS

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

CITY OF PORT COLBORNE

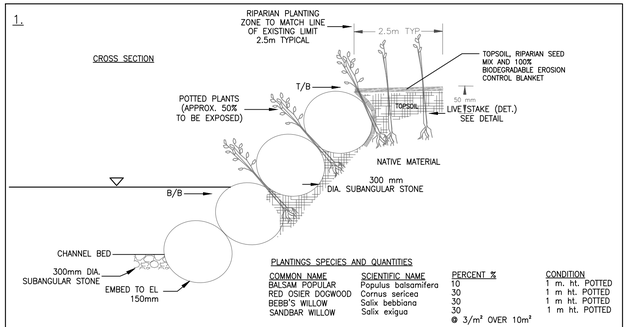
VERIFY SCALE
BAR IS 25mm ON ORIGINAL DRAWING.
0 25mm
IF NOT 25mm ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

EARTH WATER AIR ENGINEERING

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	–	W.GS-05
DESIGNED BY :	DATE :	SCALE :	
PCM	22-MAR-23	–	

BANK RESTORATION IMPROVEMENT PROGRAM (BRIP)

1.



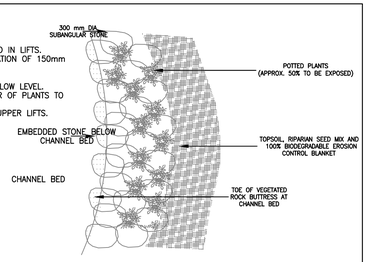
PLANTINGS SPECIES AND QUANTITIES

COMMON NAME	SCIENTIFIC NAME	PERCENT %	CONDITION
BALSAM POPULAR	Populus balsamifera	10	1 m. ht. POTTED
RED OSIER DOGWOOD	Cornus sericea	30	1 m ht. POTTED
BEBB'S WILLOW	Salix bebbiana	30	1 m ht. POTTED
SANDBAR WILLOW	Salix exigua	30	1 m ht. POTTED
		@ 3/m² OVER 10m²	

GD-10
VEGETATED ROCK BUTTRESS
NOT TO SCALE

2.

CONSTRUCTION NOTES
1. VEGETATED ROCK BUTTRESS TO BE INSTALLED IN LIFTS.
2. TOE STONES TO BE EMBEDDED TO AN ELEVATION OF 150mm BELOW EXISTING BANK BOTTOM
3. INSTALL PLANTS 1 m O/C IN EACH LAYER
4. LOWEST LAYER OF PLANTS TO BE AT LOW-FLOW LEVEL.
5. LATERALLY STAGGER EACH SUCCESSIVE LAYER OF PLANTS TO AVOID VERTICAL STACKING.
6. POPLAR SPECIES TO BE CONCENTRATED IN UPPER LIFTS.

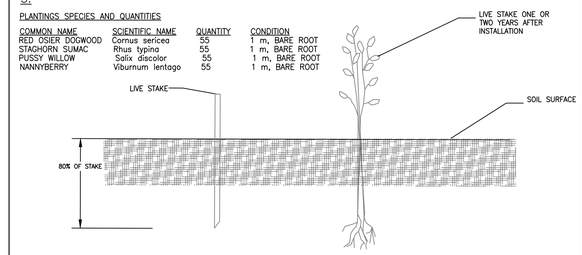


GD-11
VEGETATED ROCK BUTTRESS
NOT TO SCALE

3.

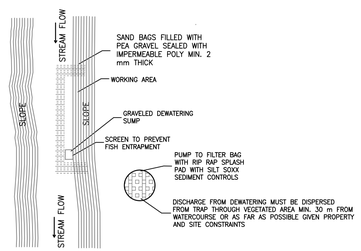
PLANTINGS SPECIES AND QUANTITIES

COMMON NAME	SCIENTIFIC NAME	QUANTITY	CONDITION
RED OSIER DOGWOOD	Cornus sericea	55	1 m, BARE ROOT
STAGHORN SUMAC	Rhus typina	55	1 m, BARE ROOT
PUSSY WILLOW	Salix discolor	55	1 m, BARE ROOT
NANNYBERRY	Viburnum lentago	55	1 m, BARE ROOT



GD-12
LIVE STAKES
NOT TO SCALE

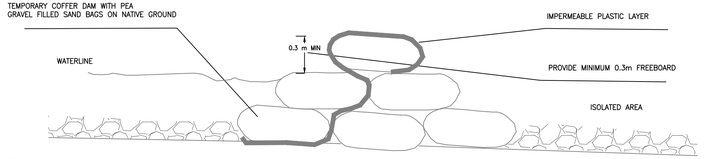
4.



1. THE WORKING AREA SHALL BE ISOLATED FROM THE WATERCOURSE BY BLOCKING THE FLOW AROUND THE SITE USING STONE AND IMPERMEABLE SHEETING, SAND BAGS FILLED WITH PEA GRAVEL, OR AQUA DAM.
2. DEWATER WORK AREA AND DISCHARGE MINIMUM 30m FROM THE WATERCOURSE.

GD-13
BANK ISOLATION AND DEWATERING
NOT TO SCALE

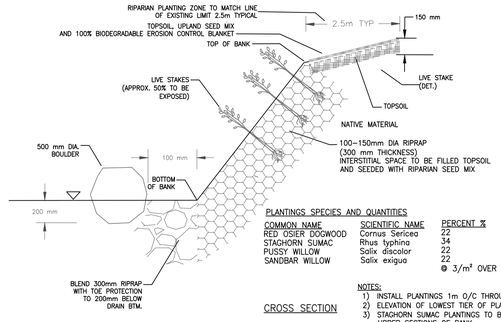
5.



NOTE:
1) ISOLATED AREA TO BE DEWATERED AFTER CONFIRMATION BY QUALIFIED PERSON THAT NO FISH ARE TRAPPED IN THE ISOLATED AREA AND/OR TRAPPED WILDLIFE ARE REMOVED.

GD-14
TEMPORARY COFFER DAM DETAIL
NOT TO SCALE

6.



PLANTINGS SPECIES AND QUANTITIES

COMMON NAME	SCIENTIFIC NAME	PERCENT %	CONDITION
RED OSIER DOGWOOD	Cornus Sericea	22	1 m. ht. POTTED
STAGHORN SUMAC	Rhus typhina	34	1 m ht. POTTED
PUSSY WILLOW	Salix discolor	22	1 m ht. POTTED
SANDBAR WILLOW	Salix exigua	22	1 m ht. POTTED
		@ 3/m² OVER 10m²	

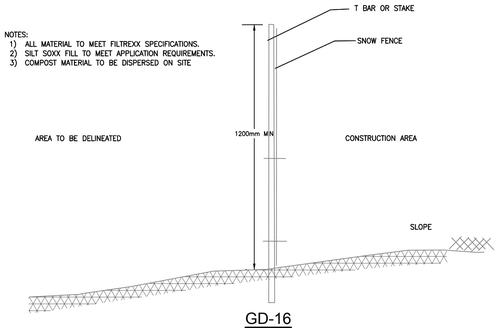
CROSS SECTION

NOTES:
1) INSTALL PLANTINGS 1m O/C THROUGHOUT BANK
2) ELEVATION OF LOWEST TIER OF PLANTINGS TO BE 175.50m
3) STAGHORN SUMAC PLANTINGS TO BE CONCENTRATED IN UPPER SECTIONS OF BANK

GD-15
RIPRAP REINFORCED BANK
NOT TO SCALE

7.

NOTES:
1) ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2) SILT SOXX FILL TO MEET APPLICATION REQUIREMENTS.
3) COMPOST MATERIAL TO BE DISPERSED ON SITE



GD-16
CONSTRUCTION DELINEATION SNOW FENCE DETAIL
NOT TO SCALE

RIPARIAN SEED MIX:

COMMON NAME	SPECIES	% OF MIX
FOWL MANNA GRASS	GLYCERIA STRIATA	2
FOWL BLUEGRASS	POA PALUSTRIS	30
FOX SEDGE	CAREX VULPINOIDEA	30
PATH RUSH	JUNCUS TENUIS	8
VIRGINIA WILD RYE	ELYMUS VIRGINICUS	30

NOTES
1. APPLY SEED MIX AT A RATE OF 25kg PER HECTARE.
2. SEEDING SHALL OVERLAP ADJACENT GROUND COVER BY 300mm.
3. APPLY COMMON OAT (AVENA SATIVA) NURSE CROP AT A RATE OF 22kg PER HECTARE
4. WATER SOIL AFTER SEED APPLICATION

UPLAND NATIVE MEADOW MIX:

COMMON NAME	SPECIES	% OF MIX
BLACK EYED SUSAN	RUDBECKIA HIRTA	10
BLUE WOOD (HEART LEAVED)	ASTER CORDIFOLIUS	1
CANADA ANEMONE	ANEMONE CANADENSIS	1
CANADA GOLDENROD	SOLIDAGO CANADENSIS	2
COMMON MILKWEED	ASCLEPIAS SYRIACA	2
EVENING PRIMROSE	OENETHERA BIENNIS	25
GRASS LEAVED GOLDENROD	EUTHAMIA GRAMINIFOLIA	1
MEADOW/OPEN FIELD SEDGE	CAREX GRANULARIS	15
NEW ENGLAND ASTER	ASTER NOVAE-ANGLIAE	1
RIVERBANK WILD RYE	ELYMUS RIPARIUS	40
VIRGINS BOWER	CLEMATIS VIRGINIANA	1
WILD BERGAMOT	MONARDA FISTULOSA	1

NOTES
1. TO BE INSTALLED TO DISTURBED AREAS.
2. APPLY SEED MIX AT A RATE OF 25kg PER HECTARE.
3. SEEDING SHALL OVERLAP ADJACENT GROUND COVER BY 300mm.
4. APPLY COMMON OAT (Avena Sativa) NURSE CROP AT A RATE OF 20kg PER HECTARE.

EROSION CONTROL BLANKET SPECIFICATIONS:

1. A BIODEGRADABLE EROSION CONTROL BLANKET (ECB) SHALL BE INSTALLED ON ALL DISTURBED NATURAL SURFACES FOLLOWING THE PLACEMENT OF TOPSOIL AND APPLICATION OF THE NATIVE SEED MIX.
2. THE ECB MUST BE CONSTRUCTED OF 100% WOVEN COCONUT FIBRE (E.G., COIR) OR STRAW MAT WITHIN A GEOJUTE NETTING (TOP AND BOTTOM) WITH BIODEGRADABLE THREAD. NON-BIODEGRADABLE MATERIAL INCLUDING POLYPROPYLENE OR PLASTICS WITH A BIODEGRADABL RATING ARE NOT ACCEPTABLE. THE MINIMUM WEIGHT OF THE ECB MUST BE 400g/m (12oz./yd)
3. TO INSTALL, THE ECB MUST BE UNROLLED DOWNSLOPE OR IN DIRECTION OF WATER FLOW. ADJACENT ECBS SHOULD OVERLAP A MINIMUM OF 150MM ALONG THE EDGES. AT THE END OF EACH ROLL, FOLD BACK 100MM TO 200MM OF THE ECB. OVERLAP THIS 100MM TO 200MM OVER THE START OF THE NEXT ROLL. SECURE THE TWO LAYERS TO THE GROUND SECURELY.
4. BIODEGRADABLE OR TAPERED WOODEN STAKES SHALL BE USED TO SECURE THE BLANKET. STAKES SHALL BE INSTALLED AT THE SPACING RECOMMENDED BY THE ECB MANUFACTURER TO PREVENT SURFACE RUNOFF FROM ERODING THE UNDERLYING SOIL.

EROSION AND SEDIMENT CONTROL NOTES:

1. EROSION AND SEDIMENT CONTROL (ESC) MEASURES WILL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING THE CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE WATER. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED AND/OR REPLACED WITHIN 48 HOURS OF THE INSPECTION, ADDITIONAL ESC MEASURES SHOULD BE KEPT ON SITE ENCASE THE NEED FOR REPAIR.
2. DISTURBED AREAS WILL BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED OR RESTORED AS THE WORK PROGRESSES.
3. ALL IN-WATER AND NEAR WATER WORKS WILL BE CONDUCTED IN THE DRY WITH APPROPRIATE EROSION AND SEDIMENT CONTROLS.
4. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREAS. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, INCLUDING SEDIMENT, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS. NPCA ENFORCEMENT OFFICER SHOULD BE IMMEDIATELY CONTACTED, ADDITIONAL ESC MEASURES SUCH AS A TARP TO BE KEPT ON SITE AND USED AS NECESSARY.
5. A QUALIFIED ENVIRONMENTAL MONITOR PERSON WILL ATTEND THE SITE AND INSPECT ALL EROSION CONTROL MEASURES ON A REGULAR BASIS AND FOLLOWING RAIN/SNOW EVENTS.
6. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, WILL BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE, OR OTHER DELETERIOUS SUBSTANCES INTO THE WATER. VEHICULAR REFUELING AND MAINTENANCE WILL BE CONDUCTED A MINIMUM OF 30 METRES FROM THE WATER.
7. ALL GRADES WITHIN THE REGULATORY FLOOD PLAIN WILL BE MAINTAINED, MATCHED OR AS SPECIFIED.
8. THE PROPONENT/CONTRACTOR SHALL MONITOR THE WEATHER SEVERAL DAYS IN ADVANCE OF THE ONSET OF THE PROJECT TO ENSURE THAT THE WORKS WILL BE CONDUCTED DURING FAVOURABLE WEATHER CONDITIONS. SHOULD AN UNEXPECTED STORM ARISE, THE CONTRACTOR WILL REMOVE ALL UNFIXED ITEMS FROM THE REGIONAL STORM FLOOD PLAIN THAT WOULD HAVE THE POTENTIAL TO CAUSE A SPILL OR AN OBSTRUCTION TO FLOW, E.G., FUEL TANKS, PORTA-POTTIES, MACHINERY, EQUIPMENT, CONSTRUCTION MATERIALS, ETC.
9. ALL DEWATERING/UNWATERING SHALL BE TREATED AND RELEASED TO THE ENVIRONMENT AT LEAST 30 METRES FROM A WATERCOURSE OR WETLAND AND ALLOWED TO DRAIN THROUGH A WELL-VEGETATED AREA. NO DEWATERING EFFLUENT SHALL BE SENT DIRECTLY TO ANY WATERCOURSE, WETLAND OR FOREST, OR ALLOWED TO DRAIN ONTO DISTURBED SOILS WITHIN THE WORK AREA. THESE CONTROL MEASURES SHALL BE MONITORED FOR EFFECTIVENESS AND MAINTAINED OR REVISED TO MEET THE OBJECTIVES OF PREVENTING THE RELEASE OF SEDIMENT LADEN WATER.
10. ALL ACCESS TO THE WORK SITE SHALL BE FROM EITHER SIDE OF THE WATERCOURSE. NO EQUIPMENT OR VEHICLES ARE PERMITTED TO CROSS THROUGH THE WATERCOURSE UNLESS APPROVED BY NPCA.
11. FISH AND WILDLIFE STRANDED WITHIN THE WORK AREA SHALL BE CAPTURED AND RELEASED IN A LIVE SUITABLE HABITAT UPSTREAM OF THE WORK AREA UNDER THE SUPERVISION OF A QUALIFIED AQUATIC BIOLOGIST. A PERMIT FROM THE MINISTRY OF NATURAL RESOURCES IS REQUIRED. THE CONSTRUCTOR IS RESPONSIBLE FOR ORGANIZING ANY WILDLIFE REMOVAL, IF REQUIRED.
12. THE CONTRACTOR SHALL NOTIFY NPCA PRIOR TO CONSTRUCTION.
13. WHERE AN ENVIRONMENTAL MONITOR IS REQUIRED ON SITE, THE DRAINAGE SUPERINTENDENT SHALL NOTIFY THE NPCA PRIOR TO CONSTRUCTION AND THE MONITOR SHALL NOTIFY BOTH CONTRACTOR AND DRAINAGE SUPERINTENDENT IF AN ISSUE IS FOUND.
14. ADDITIONAL ESC MEASURES OR DEVICES MAY BE DEEMED NECESSARY AS SITE CONDITIONS CHANGE AND SHALL BE INSTALLED AS DIRECTED BY THE SITE ENGINEER, QUALIFIED ENVIRONMENTAL MONITOR OR NPCA.

GENERAL NOTES:

1. THE CONTRACTOR SHALL CHECK AND VERIFY ALL EXISTING AND PROPOSED GRADING CONDITIONS ON THE PROJECT AND IMMEDIATELY REPORT ANY DISCREPANCIES TO THE DRAINAGE SUPERINTENDENT BEFORE PROCEEDING WITH ANY WORK.
2. KEEP AREA OUTSIDE CONSTRUCTION ZONE CLEAN AND USEABLE BY OTHERS AT ALL TIMES. CONTRACTOR SHALL THROUGHLY CLEAN AREAS SURROUNDING THE CONSTRUCTION ZONE AT THE END OF EACH WORK DAY.
3. CONTRACTOR TO MAKE GOOD ANY AND ALL DAMAGES OUTSIDE OF THE DEVELOPMENT AREA THAT MAY OCCUR AS A RESULT OF CONSTRUCTION AT NO EXTRA COST.
4. TREE REMOVALS ARE TO OCCUR OUTSIDE OF THE ACTIVE PERIOD FOR BATS (APRIL 1ST TO AUGUST 31ST) TO AVOID IMPACTS TO SPECIES AT RISK BATS AND ENSURE COMPLIANCE WITH THE ENDANGERED SPECIES ACT.
5. CONSTRUCTION TO OCCUR DURING THE WARM WATER CONSTRUCTION TIMING WINDOW OF JULY 1 – MARCH 31.
6. QUANTITY TO BE DETERMINED BASED ON AREA OF DISTURBANCE TO BE RESTORED.
7. LIVE SHOULD BE FROM AT MINIMUM 2-YEAR OLD STOCK.
8. LIVE STAKES ARE TO BE INSTALLED AT A DENSITY OF 3 STAKES PER SQUARE METRE.
9. LIVE STAKES SHOULD BE PRE-SOAKED (SUBMERGED IN WATER) FOR AT LEAST 24 HOURS AFTER HARVESTING AND IMMEDIATELY BEFORE INSTALLATION.
10. LIVE STAKES SHOULD NOT BE STORED FOR A PERIOD LONGER THAN 2 DAYS, UNLESS THEY ARE BEING SOAKED.
11. THE CONTRACTOR SHALL PROTECT PLANT MATERIALS FROM DRYING FROM THE TIME OF HARVEST UNTIL INSTALLED.
12. LIVE STAKES ARE TO BE A MINIMUM OF 25mm IN DIAMETER AND CUT TO A LENGTH OF 1000m.
13. CUT ANGLE AT THE BOTTOM OF THE STAKE AND FLAT ON THE TOP.
14. TRIM ALL SIDE BRANCHES WHILE TAKING CARE NOT TO DAMAGE THE BARK.
15. INSTALL LIVE STAKES WITH BUDS POINTING UPWARDS AND THICKER STEM IN THE BED.
16. LIVE STAKES SHOULD BE INSTALLED USING A LARGE RUBBER MALLET.
17. 80% OF THE STAKES IS TO BE BELOW SURFACE.
18. TAMP THE LIVE STAKE INTO THE GROUND AT RIGHT ANGLE TO THE SURFACE.
19. IN COMPACT SOIL A PILOT HOLE SHOULD BE USED TO LIMIT DAMAGE TO THE STAKES.
20. IF USING A PILOT HOLE REPACK SOIL AROUND THE LIVE STAKE.
21. LIVE STAKES SHOULD STAND FIRM FROM THE SOIL FOLLOWING INSTALLATION.
22. ALL STAKES NOT PLANTED TO THE SPECIFICATIONS ABOVE WILL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

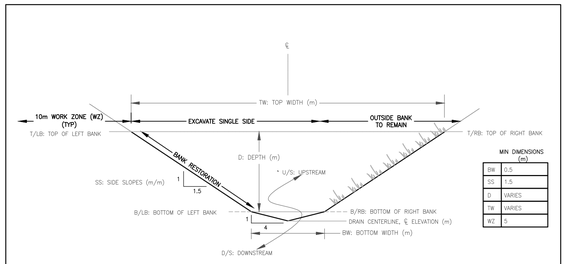
WIGNELL MUNICIPAL DRAIN GENERAL DETAILS

CITY OF PORT COLBORNE

EWA EARTH WATER AIR ENGINEERING

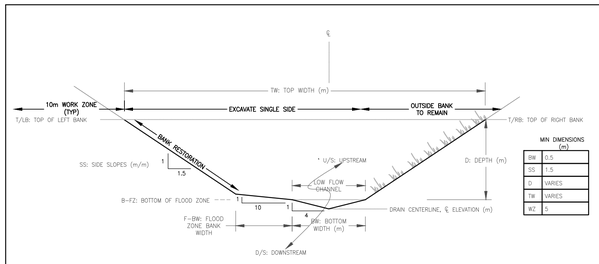
LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	PROJ#	W.GD-01
DESIGNED BY :	DATE :	SCALE :	
PCM	09-FEB-24	N/A	



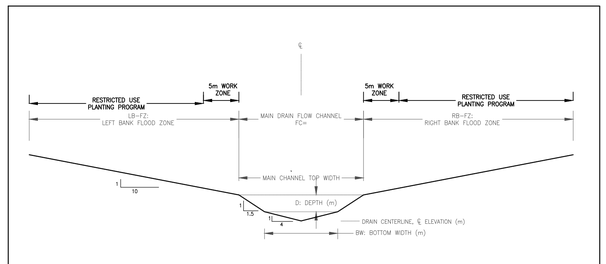
GD-01
DRAIN CHANNEL DIMENSIONS

NOT TO SCALE



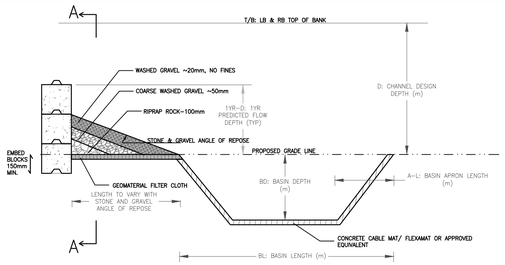
GD-02
FLOOD ZONE DRAIN CHANNEL DIMENSIONS

NOT TO SCALE

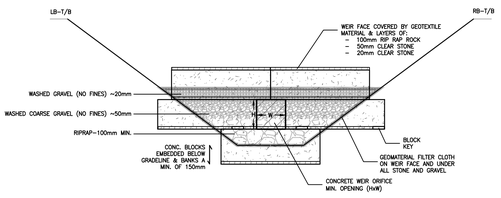


GD-03
NATURAL DRAIN CHANNEL DIMENSIONS

NOT TO SCALE



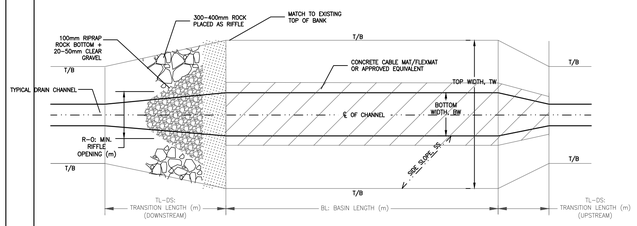
PROFILE VIEW
SEDIMENT BASIN - DURING CONSTRUCTION



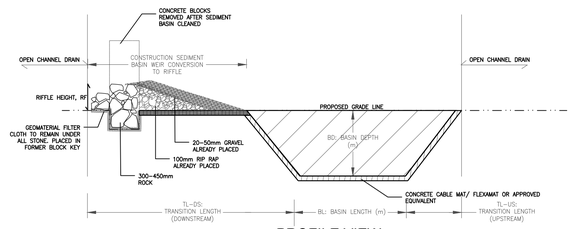
SECTION A-A
SEDIMENT BASIN - DURING CONSTRUCTION

GD-04
SEDIMENT BASIN - DURING CONSTRUCTION

NOT TO SCALE



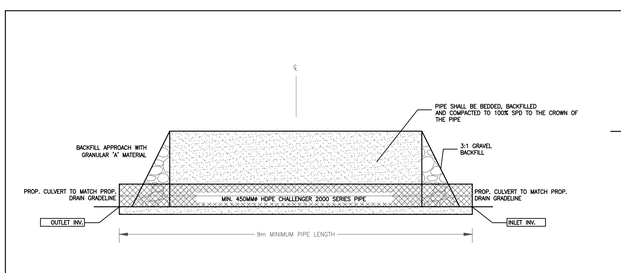
PLAN VIEW
SEDIMENT BASIN - POST-CONSTRUCTION

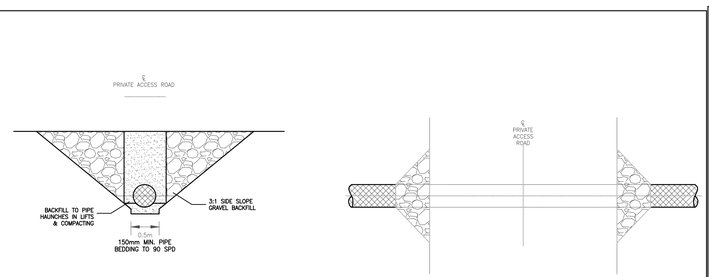


PROFILE VIEW
SEDIMENT BASIN - POST-CONSTRUCTION

GD-05
SEDIMENT BASIN - POST CONSTRUCTION

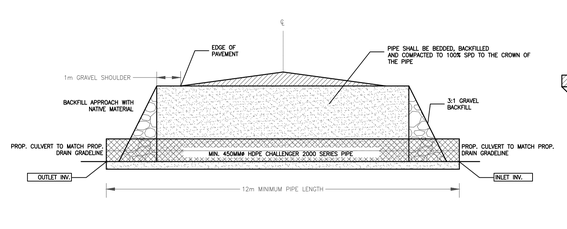
NOT TO SCALE

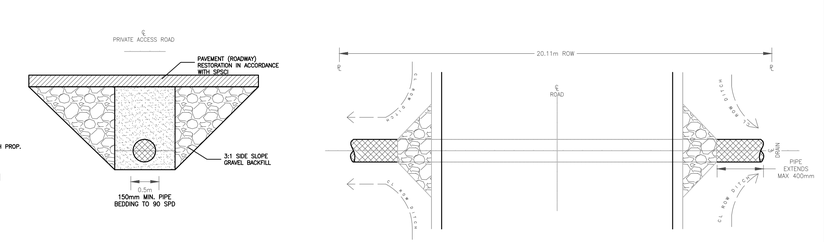




DETAIL GD-06
TYPICAL PRIVATE ACCESS ROAD CIRCULAR CULVERT INSTALLATION

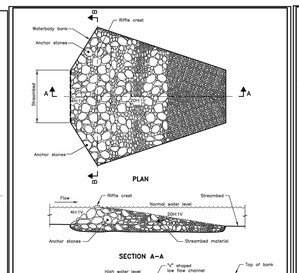
NOT TO SCALE





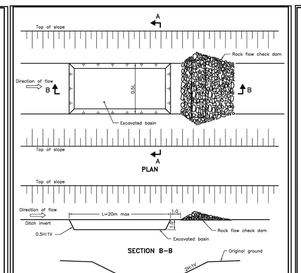
DETAIL GD-07
TYPICAL MUNICIPAL 20.11m ROW CULVERT INSTALLATION

NOT TO SCALE



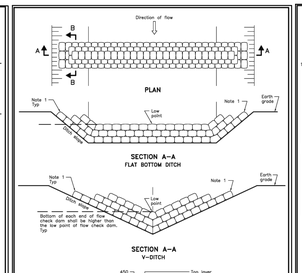
NOTES:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 0
RIFFLES ON STREAMBEDS		
OPSD 222.050		



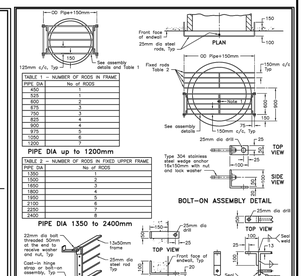
NOTES:
A Ditch cross-section upstream or downstream of sediment trap may be flat bottom, or V-shaped. Flat bottom shown.
B This OPSD shall be read in conjuction with OPSD 219.210 or 219.211.
C All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
SEDIMENT TRAP IN DITCH		
OPSD 219.220		



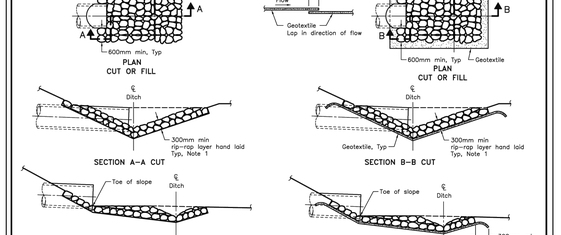
NOTES:
1 Sufficient sandbags shall be placed to prevent end scouring.
2 For sandbag dimensions see OPSD 219.150.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
SANDBAG FLOW CHECK DAM		
OPSD 219.200		



NOTES:
1 Grates shall be secured by either a bolt and nut or a locking device as specified.
A Metal surfaces shall be either painted with 2 coats of self priming abrasion resistant immersion grade epoxy or hot dip galvanized, as specified.
B Frame, hinge strap, mounting bracket, and steel rods shall be medium grade steel.
C All welding shall be according to CSA W59 and W47.1.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 2
GRATING FOR CONCRETE ENDWALL		
OPSD 804.050		



NOTES:
1 The thickness of the rip–rap layer shall be at least 1.5 times the rip–rap mean diameter.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 3
GENERAL RIP–RAP LAYOUT FOR SEWER AND CULVERT OUTLETS		
OPSD 810.010		

WIGNELL MUNICIPAL DRAIN GENERAL DETAILS

CITY OF PORT COLBORNE

EWA EARTH WATER AIR ENGINEERING

LICENCED PROFESSIONAL ENGINEER PAUL C. MARSH PROVINCE OF ONTARIO

2024-02-16

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
TJF	PCM	PROJ#	W.GD–02
DESIGNED BY :	DATE :	SCALE :	
PCM	09–FEB–24	N/A	

CITY OF PORT COLBORNE DRAINAGE CONTACTS:

APPOINTED DRAINAGE ENGINEER:
MR. PAUL C. MARSH, P.ENG.
EWA ENGINEERING INC.
84 MAIN STREET, UNIONVILLE, ON L3R 2E7
PCMARSH@EWAENG.COM
647.400.2824

DRAINAGE SUPERINTENDENT:
ALANA VANDER VEEN
DRAINAGE SUPERINTENDENT
1 KILLALY STREET WEST, PORT COLBORNE, ONTARIO L3K 6H1
TEL: 905-228-8127
ALANA.VANDERVEEN@PORTCOLBORNE.CA

DEPARTMENT OF FISHERIES AND OCEANS:
867 LAKESHORE RD
BURLINGTON ON L7S 1A1
TELEPHONE: 905-336-4999
EMAIL: INFO@DFO-MPO.GC.CA

MINISTRY OF NATURAL RESOURCES AND FORESTRY
ELIZABETH REIMER
ADMINISTRATION BUILDING
4890 VICTORIA AVE N
VINELAND STATION, ON L0R 2E0
905-562-4147

NIAGARA PARKS CONSERVATION AUTHORITY, NPCA
LEILANI LEE-YATES,
DIRECTOR, WATERSHED MANAGEMENT
NIAGARA PENINSULA CONSERVATION AUTHORITY
250 THOROLD ROAD WEST, 3RD FLOOR
WELLAND, ON, L3C 3W2
P: 905-788-3135 EXT. 229
F: 905-788-1121
LLEE-YATES@NPCA.CA
WWW.NPCA.CA

GENERAL NOTES:

THE CITY SHALL ARRANGE A PRE-CONSTRUCTION MEETING PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

ALL CONSTRUCTION MATERIALS AND METHODOLOGIES SHALL BE IN ACCORDANCE WITH:

- SPECIAL PROVISIONS - SUPPLEMENTARY GENERAL CONDITIONS (SPSGC)
- SPECIAL PROVISIONS - SUPPLEMENTARY CONTRACT ITEMS (SPSCI)
- NIAGARA PENINSULA STANDARD CONTRACT DOCUMENTS (NPSCD)
- ONTARIO PROVINCIAL STANDARDS FOR ROADS & PUBLIC WORKS (OPSS & OPSD)

AND ANY OTHER APPLICABLE STANDARDS THAT MAY APPLY.

IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT THESE MATERIALS AND METHODOLOGIES ARE STRICTLY ADHERED TO.

THE CITY OF PORT COLBORNE AND STAFF DISCLAIMS ANY LIABILITY AS TO THE CURRENT ACCURACY OF THE DRAWINGS PROVIDED. IN USING THE INFORMATION SHOWN OR CONTAINED ON THESE DRAWINGS, THE USER AGREES IMPLICITLY AND EXPLICITLY THAT THE CITY OF PORT COLBORNE AND STAFF SHALL NOT BE LIABLE FOR SPECIAL, INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES ARISING FOR THE USE OF SUCH INFORMATION. THE USER SHALL DO AN IN-FIELD VERIFICATION OF THE INFORMATION SHOWN ON OR CONTAINED WITHIN THESE DRAWINGS.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ANY APPROVALS WHICH MAY BE REQUIRED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION UNLESS DIRECTED OTHERWISE BY THE CONTRACT ADMINISTRATOR.

DIMENSIONING SHALL GOVERN OVER SCALED DIMENSIONS.

ANY WORKS COMPLETED IN SET-BACK AREAS, AND DISCHARGE TO CREEKS, STREAMS AND WATERCOURSES MAY BE SUBJECT TO FEDERAL AND PROVINCIAL APPROVALS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN SUCH APPROVALS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION IF REQUIRED FOR THE PROJECT.

PUBLIC UTILITIES:

THE CONTRACTOR SHALL NOTE THAT PUBLIC UTILITIES SHALL INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING, HYDRO, GAS, BELL, CABLE AND FIBRE OPTIC.

IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN THE NECESSARY CLEARANCES FROM SAID PUBLIC UTILITIES WHICH MAY BE IN DIRECT CONFLICT WITH THIS PROJECT.

ANY WORK REQUIRING EITHER RELOCATION/LOWERING OF SAID PUBLIC UTILITY SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE UTILITY, AND ANY WORKS WILL BE REQUIRED TO BE COMPLETE PRIOR TO THE INSTALLATION OF THE WORK.

ENVIRONMENTAL COMPLIANCE:

THE CONTRACTOR SHALL PREPARE AN ENVIRONMENTAL MANAGEMENT PLAN (EMP) PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES. THE EMP WILL ADDRESS THE FOLLOWING MAJOR SUBJECT AREAS:

- EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION
- TREE PROTECTION & REMOVAL (SAR - BUTTERNUT)
- MINIMIZE AND/OR MITIGATION MEASURES FOR CONSTRUCTION IMPACTS ON SPECIES AND SPECIES HABITAT INCLUDING STOPPING CONSTRUCTION PROCEDURES.
- AGENCY CONTACTS - IDENTIFY RESOURCES & CONTACT INFO.

THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH SPECIES AT RISK (SAR) LEGISLATION. BY LAW, YOU MUST IMMEDIATELY:

- AVOID DRAINAGE WORK DURING REPRODUCTION AND REARING SEASONS
- PREVENT A SPECIES FROM ENTERING THE WORK AREA (E.G. PUTTING UP A FENCE)
- GIVE THE SPECIES ADEQUATE TIME TO LEAVE THE AREA, BEFORE STARTING WORK
- GET ADVICE/HELP BEFORE YOU MOVE IT
- PROTECT AREAS THAT ARE IMPORTANT TO THE SPECIES (E.G. SPAWNING AREAS)
- CONTROL EROSION AND SEDIMENT
- STABILIZE WATER BANKS IN AFFECTED AREAS

TURTLES:

- YOU CANNOT REDUCE THE AMOUNT OF WATER IN A DRAIN OR DITCH WHERE A TURTLE IS HIBERNATING.

ABREVATIONS USED:

- ARN - ABBREVIATED ROLL NUMBER
- BOD - BEGINNING OF DRAIN
- BB - BOTTOM OF BANK
- BD - SEDIMENT BASIN BOTTOM DEPTH (FROM GRADE LINE)
- BL - SEDIMENT BASIN LENGTH
- BW - BOTTOM WIDTH OF CHANNEL
- CL - CENTRELINE OF ROAD, CHANNEL
- CLCK - CENTRELINE OF CREEK OR CHANNEL
- D - DEPTH
- D/S - DOWNSTREAM
- E - EASTING
- ELEV - ELEVATION
- EOD - END OF DRAIN
- EX. - EXISTING
- INV - INVERT
- LB - LEFT BANK, LOOKING UPSTREAM
- N - NORTHING
- PL - PROPERTY LINE
- PR. - PROPOSED
- RB - RIGHT BANK, LOOKING UPSTREAM
- RH - RIFFLE HEIGHT
- ROW - RIGHT OF WAY
- SS - SIDE SLOPE; RUN(m)/RISE, WHERE RISE=1m
- T/C - TOP OF CONCRETE
- T/B - TOP OF BANK
- TW - TOP WIDTH OF CHANNEL
- TYP - TYPICAL
- U/S - UPSTREAM
- WZ - WORK ZONE

OPSD REFERENCED DETAILS:

- OPSD 219.200
- OPSD 219.220
- OPSD 222.050
- OPSD 400.020
- OPSD 403.010
- OPSD 705.040
- OPSD 803.010

WIGNELL MUNICIPAL DRAIN CONSTRUCTION NOTES

CITY OF PORT COLBORNE

EARTH WATER AIR ENGINEERING

LICENSED PROFESSIONAL ENGINEER
PAUL C MARSH
PROVINCE OF ONTARIO
2024-02-16

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
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PCM	09-FEB-24	N/A	