

CN

**FINAL STORMWATER MANAGEMENT
DESIGN REPORT
Milton Logistics Hub**

Prepared by:

AECOM

5080 Commerce Boulevard
Mississauga, ON, Canada L4W 4P2
www.aecom.com

905 238 0007 tel

Distribution List

# Hard Copies	PDF Required	Association / Company Name

Revision History

Revision #	Date	Revised By:	Revision Description
0	December 2019	Aws Nabeel	60% Draft Report Issued (omitted)
1	June 2020	Aws Nabeel	90% Draft Report Issued
2	September 2020	Aws Nabeel	Revised Draft Report Issued
3	November 2021	Aws Nabeel	Final Design Report Issued to IAAC

Statement of Qualifications and Limitations

The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("AECOM") for the benefit of CN ("Client") in accordance with the agreement between AECOM and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations");
- represents AECOM's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to AECOM which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

AECOM shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. AECOM accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

AECOM agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but AECOM makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Without in any way limiting the generality of the foregoing, any estimates or opinions regarding probable construction costs or construction schedule provided by AECOM represent AECOM's professional judgement in light of its experience and the knowledge and information available to it at the time of preparation. Since AECOM has no control over market or economic conditions, prices for construction labour, equipment or materials or bidding procedures, AECOM, its directors, officers and employees are not able to, nor do they, make any representations, warranties or guarantees whatsoever, whether express or implied, with respect to such estimates or opinions, or their variance from actual construction costs or schedules, and accept no responsibility for any loss or damage arising therefrom or in any way related thereto. Persons relying on such estimates or opinions do so at their own risk.

Except (1) as agreed to in writing by AECOM and Client; (2) as required by-law; or (3) to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by Client.

AECOM accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information ("improper use of the Report"), except to the extent those parties have obtained the prior written consent of AECOM to use and rely upon the Report and the Information. Any injury, loss or damages arising from improper use of the Report shall be borne by the party making such use.

This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

Quality Information

<Original signed by>

Report Prepared
By:

Aws Nabeel, P.Eng
Water Resources Engineer

<Original signed by>

Report Reviewed
By:

Brian Richert, P.Eng.
Senior Water Resources Engineer

Table of Contents

	page
1. Introduction	1
1.1 Background	4
2. Existing Conditions	14
2.1 Hydrology	14
2.1.1 Physiography	14
2.1.2 Topography	14
2.1.3 Land Use	15
2.1.4 Soils	16
2.1.5 Existing and Proposed Culverts Inventory	16
2.1.6 PDA Characterization	18
2.1.7 Model Set-up	19
2.1.8 Model Results	20
3. Stormwater Management Criteria	28
3.1 Design Criteria and Constraints	28
3.2 Quantity Control	28
3.2.1 Upstream Surface Water Effects	28
3.2.2 Fish Passage	29
3.2.3 Water Balance	29
3.3 Quality Control	30
3.3.1 Salt Management	30
3.3.2 Thermal Mitigation	30
3.4 Stormwater Management Facility	30
3.4.1 Stormwater Management Criteria for Indian Creek Tributaries	32
3.4.2 Pond and Grading	33
3.4.3 Outlet control (Bottom Draw and Shut-off Valve)	33
3.4.4 Freeboard	34
3.4.5 Oil Grit Separator (OGS) Units	34
4. Stormwater Management Design	35
4.1 Treatment Train	35
4.2 Final Conditions Hydrology	36
4.2.1 Feasibility of LID Application	41
4.2.2 Uncontrolled Flows Hydrology	41
4.3 Lot Level Controls and Oil and Grit Separators	44
4.3.1 Oil and Grit Separators for the Yard and Parking Lot	44
4.4 Conveyance System	46
4.4.1 Proposed Storm Sewer Networks	46
4.4.2 Subdrains	53
4.5 End of Pipe Controls	53
4.5.1 Pond 1	54
4.5.1.1 Pond 1 Components	55

4.5.2	Pond 2.....	59
4.5.2.1	Pond 2 Components	59
5.	Water Balance	63
6.	Hydraulic Modelling.....	64
6.1	Existing Conditions Hydraulics.....	64
6.2	Final MHL Hydraulics.....	71
6.2.1	Logistics Hub Culverts.....	71
6.2.2	Rail Culverts.....	73
6.2.3	Uncontrolled Flows Hydraulics	81
6.3	Drainage Swales.....	82
6.3.1	Ditches and Grassed Swales.....	83
7.	Pond and Channel Vegetation Plan.....	86
7.1.1	Tributary A – Indian Creek Planting Plan (By Stantec)	89
7.1.2	Tributary A Planting Notes (By Stantec)	90
7.1.3	Ponds Planting Plan (By Crozier & Associates).....	90
7.1.4	Ponds – Planting Plan (By Crozier & Associates).....	90
8.	Climate Change.....	91
9.	Construction Management.....	92
9.1	Erosion and Sediment Control	92
10.	Operation and Maintenance	95
10.1	Oil Grit Separators (OGS).....	96
10.2	Wet Pond SWM Facilities.....	96
10.2.1	Sediment Removal.....	97
10.2.2	Planning Sediment Removal	97
10.2.3	Draining the Permanent Pool.....	98
10.2.4	Removing Sediment.....	98
10.2.5	Addressing Excessive Algae	99
10.2.1	Sediment Drying Area	99
10.3	Storm Sewer Systems	99
10.4	Watercourse Systems.....	99
10.5	Stormwater Management Pond.....	100
10.6	General Maintenance.....	100
10.6.1	Outlet Control Structure.....	101
10.6.2	Maintenance of Outlet Structure.....	101
10.6.3	Landscaping.....	101
11.	SWM Facility Operations Monitoring.....	102
11.1	Sampling Parameters, Methods and Locations.....	102
11.1.1	Water Quality Reporting	103
11.1.1	Water Quantity Reporting	104

12. Summary.....105

13. References.....106

List of Figures

Figure 1: Site Location Plan3

Figure 2. Existing Drainage Subwatersheds5

Figure 3. Existing Drainage Subwatersheds6

Figure 4. Proposed Land Use Development7

Figure 5. Proposed Land Use Development8

Figure 6. Proposed Conditions – Drainage Catchments.....9

Figure 7. Proposed Tributary A Realignment Flood Extents.....10

Figure 8. Proposed Tributary A to Indian Creek Regional Diversion.....11

Figure 9. Existing and Proposed Indian Creek Flood Extents.....12

Figure 10. West of Britannia Flood Extents.....13

Figure 11. Aerial Photography.....22

Figure 12. Aerial Photography.....23

Figure 13. Land Use Information24

Figure 14. Land use Information.....25

Figure 15. Soil Information26

Figure 16. Soil Information27

Figure 17. SWM Concept Yard and Admin Building Area43

Figure 18: OGS Unit45

Figure 19. Yard Storm Sewer Network Drainage49

Figure 20. Yard Storm Sewer Network Drainage50

Figure 21. Yard Storm Sewer Network Drainage51

Figure 22. Yard Storm Sewer Network Drainage52

Figure 23. AASHTO Quality of drainage criteria.....53

Figure 24. SWM Concept – Pond 158

Figure 25. SWM Concept – Pond 2.....62

Figure 26. Water Surface Profiles (Existing Conditions).....66

Figure 27. Regional Water Surface Profiles (Existing and Proposed Retaining Wall Conditions)67

Figure 28. Regional Water Surface Elevations (Xs # 5477.548) – Existing & Proposed Retaining Wall Conditions.....68

Figure 29. Regional Water Surface Elevations (Xs # 5400) - Existing & Proposed Retaining Wall Conditions.....69

Figure 30. Regional Water Surface Elevations (Xs # 5300) - Existing & Proposed Retaining Wall Conditions.....70

Figure 31. Tributary C Channel Realignment.....75

Figure 32. PDA Channel Realignment Alternatives.....77

Figure 33. Regional Storm Spill Location on Lower Baseline Road.....78

Figure 34. Rating Curve to Determine Spill Discharge on Lower Baseline Road79

Figure 35. Depth of Flood During Regional Storm on Lower Baseline Road.....79

Figure 36. Duration Period Rainfall Depth (mm) – 95% Confidence Limits91

List of Tables

Table 1: Overview of Drainage Catchments15

Table 2. Assessment of Existing Culverts and Proposed Requirements.....16

Table 3. Existing and Proposed Culvert Inventory17

Table 4:	Visual OTTHYMO Input Parameters - Existing Conditions	19
Table 5:	Existing Peak Flows	20
Table 6:	Peak Flow Rates Summary - Existing Conditions.....	21
Table 7:	Detention Ponds – Stormwater Management Criteria.....	31
Table 8:	Stormwater Management Facility Sizing Criteria (as per Table 4.2.5 AMEC, November 2015)	32
Table 10:	Visual OTTHYMO Input Parameters - Proposed Conditions.....	36
Table 11:	Culvert and Ditch Peak Flows.....	37
Table 12:	Proposed Drainage Areas Peak Flows	39
Table 13:	Comparison of Controlled and Uncontrolled External Peak Flow Rates (m ³ /s).....	42
Table 13:	Oil Grit Separators Sizing Summary	45
Table 14:	CN Milton Yard – OGS Design Summary	46
Table 15:	Storm Sewer Network for Lower Baseline Grade Separation.	47
Table 16:	Storm Sewer Network for rail corridor between Britannia Road and Louis Saint Laurent Ave.....	47
Table 17:	Storm Sewer Network for rail corridor between Lower Baseline and Britannia Road North	48
Table 18:	Pond 1 Design Elements Summary	55
Table 19:	Overall Comparison of Peak Flow Rates Within the Watercourse Downstream of the Catchment Area under Existing and Proposed Conditions*	55
Table 20:	Stormwater Management Facility Components, Description and Purpose for Pond 1	56
Table 21:	Pond 2 Design Elements Summary	59
Table 22:	Stormwater Management Facility Components, Description and Purpose for Pond 2	60
Table 23:	Annual Water Balance Summary.....	63
Table 24:	Water Surface Profiles.....	64
Table 25:	Existing Culverts in Yard and Gate Areas	72
Table 26:	phase 1 and 2 Culvert Hydraulic Model Results Compared to AREMA Standards.....	74
Table 27:	Regional Flow Depth	80
Table 28:	2-year Flow Fish Passage Analysis	80
Table 29:	Comparison of Controlled and Uncontrolled Tributary A Water Surface Elevations.....	81
Table 30:	Drainage Swale Dimensions - Controlled and Uncontrolled Flows.....	82
Table 31:	Drainage Swale Dimensions.....	83
Table 32:	Drainage Ditch Dimension and Location	83
Table 33:	Drainage Ditch Capacity Results	84
Table 34:	Recommended Pond Planting List.....	87
Table 35:	Proposed Pond Planting List	87
Table 36:	Proposed Pond Seed Mixes	88
Table 37:	Proposed Detailed Tributary A Planting List.....	88
Table 38:	Proposed Tributary A Seed Mixes	89
Table 39:	Summary of Maintenance Activities for Various Stormwater Management Practices Proposed for the Boyne Survey Area.....	96
Table 40:	Trunk Storm Sewer System Operations and Maintenance Procedures.....	99
Table 41:	Watercourse System Operations and Maintenance Procedures.....	100
Table 42:	Water Quality Monitoring – Seasonal Sampling Frequency	103

Appendices

- Appendix A.** AutoCAD Internal Drainage
Phase 1 Drainage Maps
Phase 2 Drainage Maps
Lower Baseline Storm Sewer Network Map
- Appendix B.** Culvert Hydrology
Culvert/Ditch Summary
Intensity-Duration-Frequency (IDF) Curves
C and CN Calculations
Time of Concentration Calculations for Phase 1 and 2
Rational Method
Flow Summary
Visual OTTHYMO Summary
- Appendix C.** Culvert Hydraulics
Phase 1 and 2 Proposed Culvert Hydraulic Summary
Summary of Culvert Master Input Information
Summary of Hydraulic Calculations and Performance Criterion
Detailed Culvert Master Output
HEC-RAS Model Outputs and Fish Passage
- Appendix D.** Additional Assessments
Ditch Conveyance Assessment
Lower Baseline Regional Spill Assessment
Lower Baseline Spread Calculations
Storm Sewer Network Assessment
Subdrain Assessment
Yard CB Bypass Flow Assessment
- Appendix E.** Treatment Measures
ECHELON Environmental OGS units
Stormceptor OGS units
- Appendix F** SWM Facility – Pond Review Form 1
Maintenance Log Form 2
Sediment Removal Form 3
- Appendix G** AMEC 2015 Study – Relevant Drawings and Tables
- Appendix H** Rainwater Harvesting Design Calculations
- Appendix I** Pond Design Calculations
OGS Calculations by Crozier & Associates
Parking lot and Gate Area Storm Sewer Design Sheet by Crozier & Associates
Tree Planting Plan by Crozier & Associates
- Appendix J** Typical Cross Sections
- Appendix K** Panel Recommendation Responses Memo
- Appendix L** Final Decision Statement (Jan 2021)

1. Introduction

AECOM Canada Ltd. (AECOM) was retained by the Canadian National Railway (CN) to prepare an engineering and servicing design for the Milton Logistics Hub (MLH). The Project is located in the Greater Toronto and Hamilton Area (GTHA) within the Town of Milton in the Regional Municipality of Halton (Halton Region). The Terminal is located adjacent and parallel to the existing CN mainline on properties entirely owned by CN.

The Terminal will be built on approximately 400 acres (approximately 160 ha) of the 1,000 acres (approximately 400 ha) of CN-owned land adjacent to CN's Halton Subdivision, which is one of CN's existing mainline corridors in the western half of the GTHA. The extent of the realignment and extension of the mainline are within CN's property and are bounded by Derry Road to the north and 2nd Sideroad to the south. The Project components as they relate to the Terminal will generally be bounded by Britannia Road to the north, First Line to the east, Tremaine Road to the west, and Lower Base Line to the south (**Figure 1**). The Project Development Area (PDA) encompasses these construction areas. The Project site is located within the Indian Creek sub-watershed of Bronte Creek.

AECOM was engaged by CN to complete the design of the MLH. The development of the Milton Logistics Hub includes crane operations, tracks (re-aligned mainline, yard tracks, and pad tracks), work pads, facilities, and roadways. A Stormwater Management (SWM) Report in line with the SWM Strategy developed in support of the Environmental Impact Statement (EIS) in 2015 has been developed and is described herein in order to mitigate the potential adverse impacts that the MLH development could have on stormwater quality and quantity. The proposed SWM strategy consists of diversion channels, culverts, swales, oil grit separator (OGS) units and two detention ponds which have been designed as part of a stormwater treatment train which includes provision of stormwater quality and quantity control.

Details regarding the external drainage and final culvert crossings design are provided in the Indian Creek Tributary A and C Crossing Report (AECOM, 2020). Detailed design drawings of the parking lot and administration building drainage systems, parking lot oil grit separators (OGS), and the two stormwater management facilities (SWMFs) were developed by Crozier and Associates, and these designs are referenced in **Appendix I**. Summary of findings will be discussed throughout the report to outline the final design.

An erosion and sediment control (ESC) plan has been developed and will be implemented by the contactor (Dufferin, 2021). It is consistent with the Toronto and Region Conservation Authority's Erosion and Sediment Control Guidelines for Urban Construction (January 2020) that also covers the Region of Halton. Additional supporting ESC drawings for the corridor, minor and major culverts, ditches, outfall outlets, Tributary C realignment have been developed by AECOM (Erosion and Sediment Control Plans Drawings, AECOM April 2021). The stormwater management facility (SWMF) component design, and hydrologic and hydraulic assessments have been completed according to the requirements from the Ministry of The Environment, Conservation and Parks (MECP) Stormwater Management Planning Design Manual (March 2003), and AREMA design criteria, as well as the requirements prescribed by the Town of Milton in the Boyne Secondary Plan Area Report (2015).

The proposed development will be completed in 2 Phases. The construction activities that will occur during Phase 1 include:

- Construction of diversion tracks from south of Lower Baseline Road to south of Britannia Road;
- Relocation of the existing Sun Canadian pipeline;
- Realignment of Indian Creek, Tributary A and Tributary C;
- Construction of two Stormwater Management Ponds;
- Construction of new culverts (2a, 2b, 2c, 3), installation of temporary culvert and extension of existing culvert 7;
- Construction of access road for relocation of the hydro pole line at Lower Baseline Road;
- Demolition and removal of existing buildings; and
- Co-ordination with CN Track and signal forces.

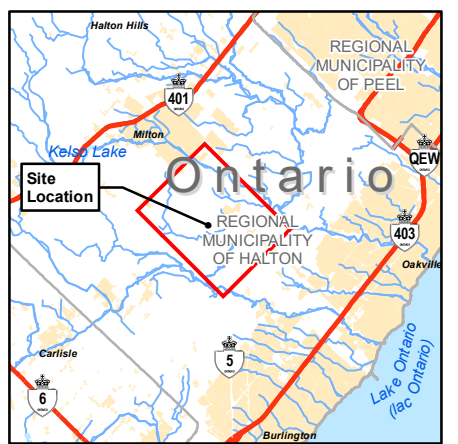
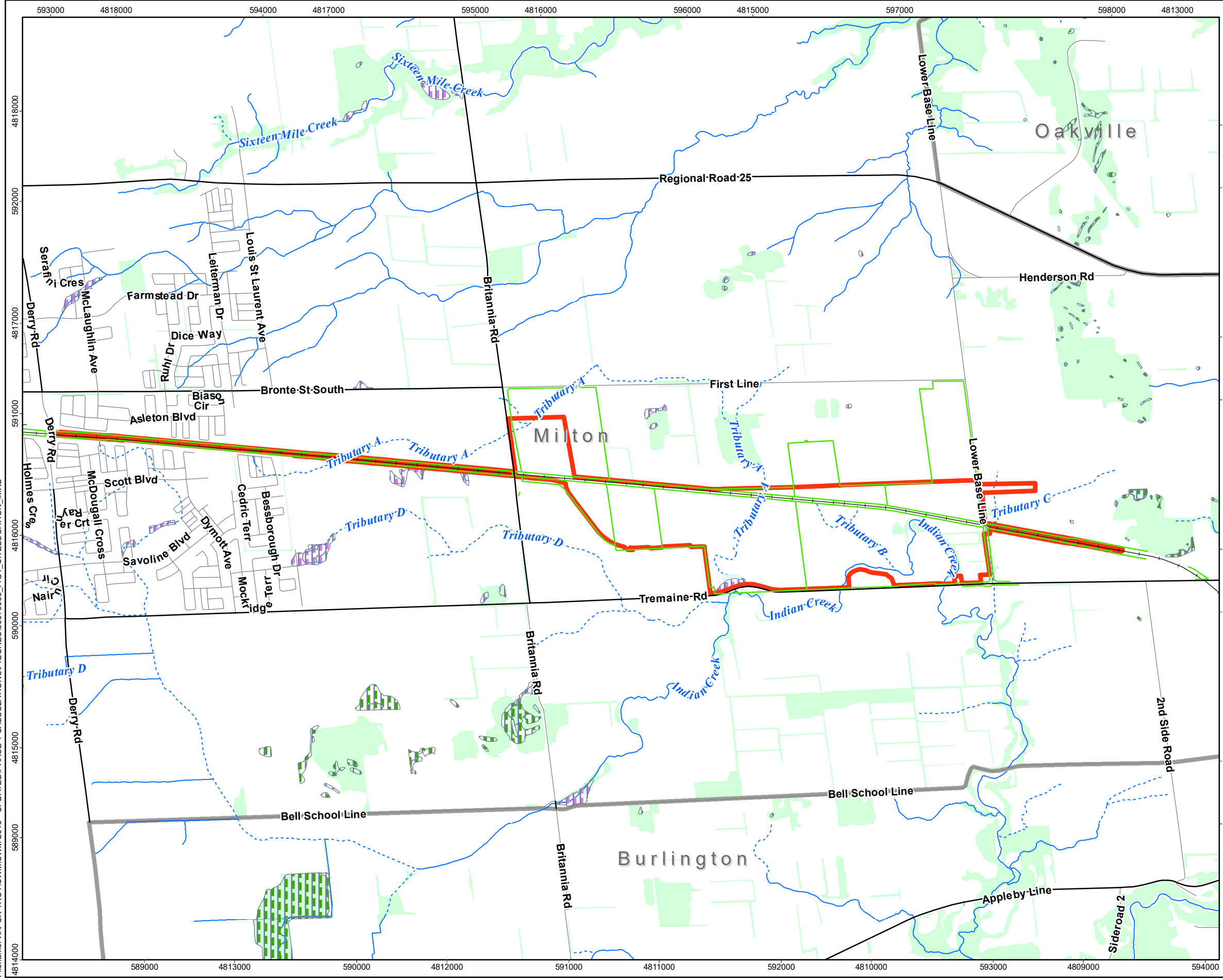
Phase 2 will include the following construction activities, or construction of:

- Grading, draining, ditches and culverts for new mainline track;
- Utility installation and connection;
- Lower Baseline Grade Separation;
- Onsite truck access road and overpass;
- Installation of mainline tracks between Britannia Road and Derry Road;
- Realignment of the mainline tracks between Lower Base line and Britannia Road;
- Construction of administration and maintenance garage;
- Installation of service tracks and pad tracks; and
- Installation of mainline turnout and connecting to new mainline tracks.

Both phases require SWM controls, though the controls implemented for Phase 1 will only be interim. The Phase 2 developments represent the final condition of the site and this SWM Report will need to be updated with the progression of the Phase 2 construction design plans.

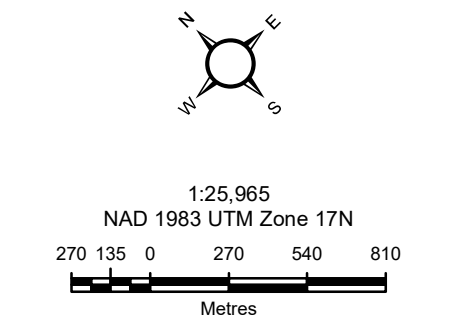
This report presents the hydrologic and hydraulic analyses of the likely impacts of the development as compared to the previously existing conditions within the development area. Proposed culvert, subdrain and ditching upgrades are presented and have been designed to meet the AREMA hydraulic criteria for mitigating flooding impacts and to maintain the stability of the railway embankment. The hydrology of the PDA was analyzed using the Rational Method and/or Visual OTTHYMO Modelling methods, and hydraulics were modelled using standard inlet and outlet control conditions within Culvert Master. For watercourse crossings, both the Rational Method and Visual OTTHYMO modelling was used to assess hydrology, and HEC-RAS modelling was used to evaluate system hydraulics (as addressed in the Crossing Report, AECOM 2020).

Last saved by: AWS,NABEEL (2019-12-17) Last Plotted: Thu Aug 20, 2020 Project Management Initials: Designer: AN Checked: BT Approved: BR ANS/B 279.4mm x 431.8mm
 Filename: X:\FOX TROTSMISWMM 2018 - UPDATED\PHASE 1 CALCULATIONS\FIGURES\60579933_FIG1_SITELOCATION_MXD



Legend

- Roads**
 - Major Road
 - Local Road
 - Railway
- Wooded Area**
 - Wooded Area
- Evaluated Wetlands**
 - Unknown
 - Provincially Significant Wetland
- Water Features**
 - Lake
 - Intermittent Stream
 - Permanent Stream
 - PDA Limit
 - CN ROW



Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

1.1 Background

Initial designs and stormwater management measures for the site were developed and assessed in AECOM's Stormwater Management Strategy Report (June 2015) as a part of the Environmental Impact Statement (EIS). The current Stormwater Management Report summarizes and updates the 2015 stormwater management measures, and also addresses mainline drainage and drainage from the service tracks to demonstrate how the SWM system has been designed to address the criteria established through the EA process.

The PDA is located within the bounds of the Indian Creek subwatershed. Several local subwatershed studies undertaken by Conservation Halton, Town of Milton and Region of Halton are relevant to the hydrologic analysis of the area, as noted below.

The headwaters of much of the Indian Creek subwatershed emanate from the slopes of the Niagara Escarpment and rapidly descend the slopes to the Peel Plain south of Derry Road. Indian Creek discharges into Bronte Creek approximately 2 km south of the PDA. Bronte Creek flows eastwardly and ultimately discharges into Lake Ontario. The following studies have been reviewed and used to support the investigations completed as part of this report:

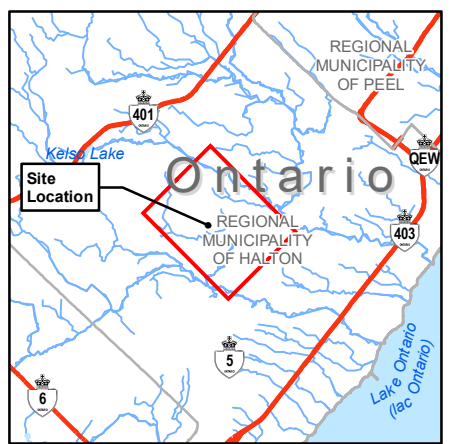
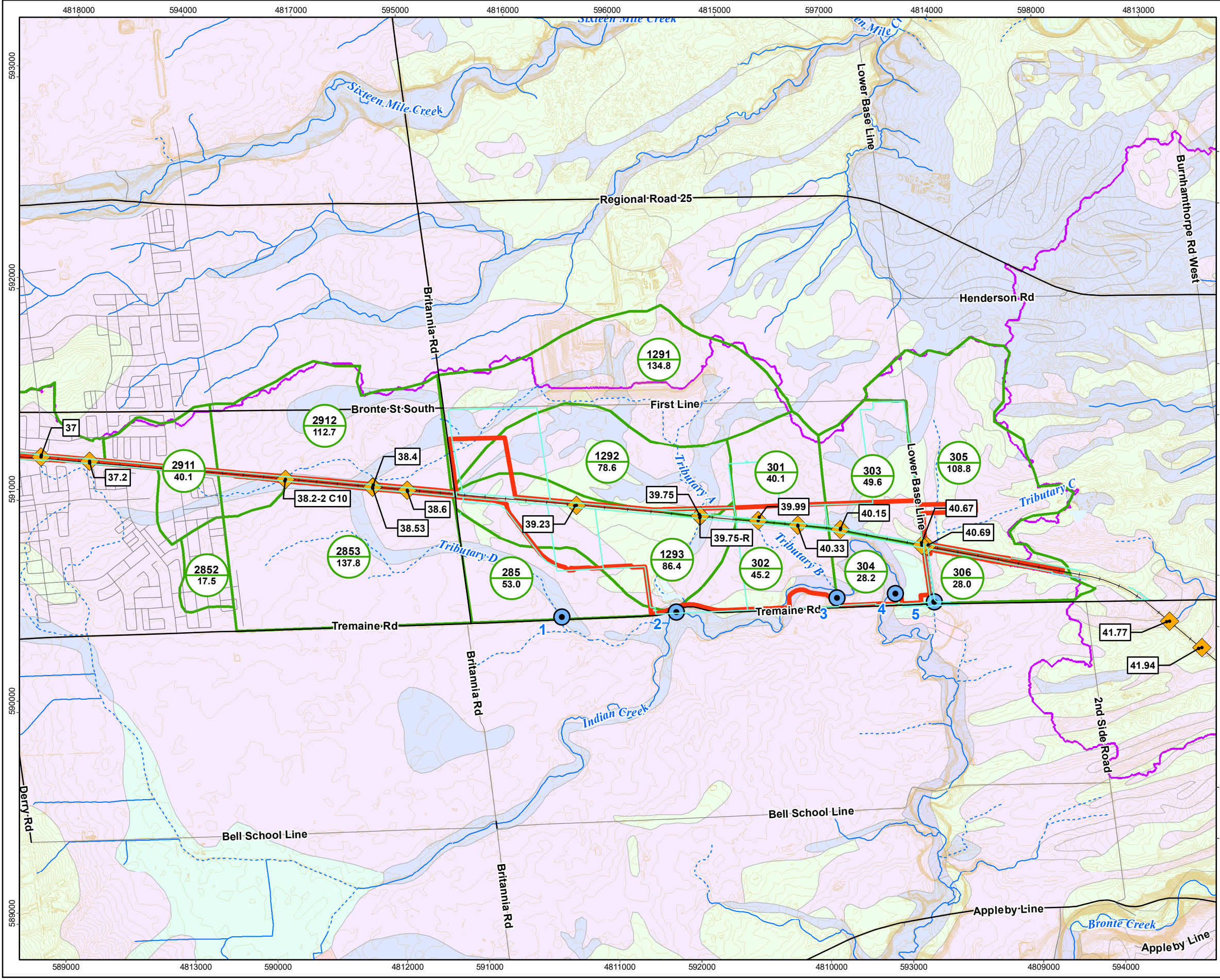
- Bronte Creek Watershed Study, Planning and Engineering Initiatives Ltd., Schroeter and Associates, October 2002;
- Indian Creek / Sixteen Mile Creek Sherwood Survey Subwatershed Management Study, Town of Milton, Phillips Engineering, May 2004;
- Sixteen Mile Creek, Areas 2 & 7 Subwatershed Update Study, AMEC, May 2015;
- Functional Stormwater and Environmental Management Strategy, Boyne Survey Secondary Plan Area – Draft Final, Town of Milton, AMEC, November 2015;
- Boyne Survey Secondary Plan Master Plan, Appendix C.10.A, Town of Milton, July 2017;
- Britannia Road Transportation Corridor Improvement: Tremaine Road to Highway 407 Class EA Study, Hydraulic Analysis of Stream Crossings and Stormwater Management Alternatives Assessment, Aquafor Beech Limited, Revised 20 December 2013;
- Milton Logistics Hub Stormwater Management Strategy, AECOM, June 2015;
- Draft subdivision plans (available on the Town of Milton website); and,
- Draft conditions and Panel Review comments, including, including IR3.23, IR3.26, IR3.32, IR3.33, IR3.37, IR3.38, IR3.39, IR4.40, IR4.47, IR7.4, and IR7.5.
- Decision Statement - Final Conditions (IAAC, 2021)

The overall ground surface within the PDA slopes towards the southeast from an elevation of approximately 185 meters above sea level (mASL) near the northern property boundary (at the intersection of Britannia Road and existing railway tracks) to roughly 174 mASL near the southern boundary (at the intersection of Tremaine Road and Indian Creek). Under existing conditions, the PDA and its adjoining areas can be divided into five subcatchments. These subcatchments are drained by various intermittent tributaries of Indian Creek as described below. The existing drainage areas and areas covered by the subwatershed studies noted are shown in **Figure 2** and **Figure 3**.

The PDA also includes areas of development identified within the Milton Official Plan (2008). The development area is within the Schedule B urban land use area. Residential, commercial, and institutional land uses are proposed within the catchment area upstream of several culverts within the PDA. The culverts impacted by development must be designed to convey the uncontrolled peak flow determined after taking the future development into account. The development areas are shown in **Figure 4** and **Figure 5**.

The floodlines determined by the studies are also relevant to several culverts within the PDA, and applicable floodlines have been considered in both the analysis and design of the stormwater management and drainage systems. Regulatory floodlines are shown in **Figure 6**, **Figure 7**, **Figure 8**, **Figure 9** and **Figure 10**.

Last saved by: AWS,NABEEL (2020-07-15) Last Plotted: Thu Sep 03, 2020
 File name: X:\FOX TROTTS\SWMS\2018 - UPDATED\PHASE 1 CALCULATIONS\FIGURES\60579933_FIG2_EXISTINGCONDITIONS.MXD
 Project Management Initials: Designer: AN Checked: BT Approved: BR ANS\B 279.4mm x 431.8mm



Legend

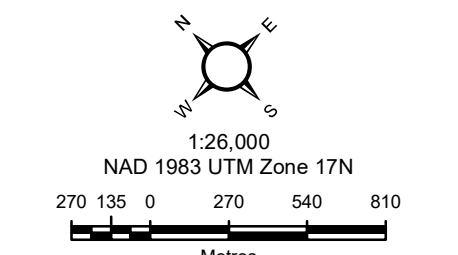
- Study Area
- Existing Culvert Locations
- 301
40 Catchment ID
- 112.7 Area (ha)
- 2 Flow Node

Water Features

- Lake
- Intermittent Stream
- Permanent Stream

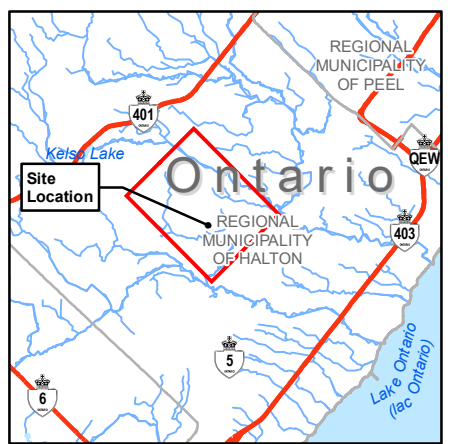
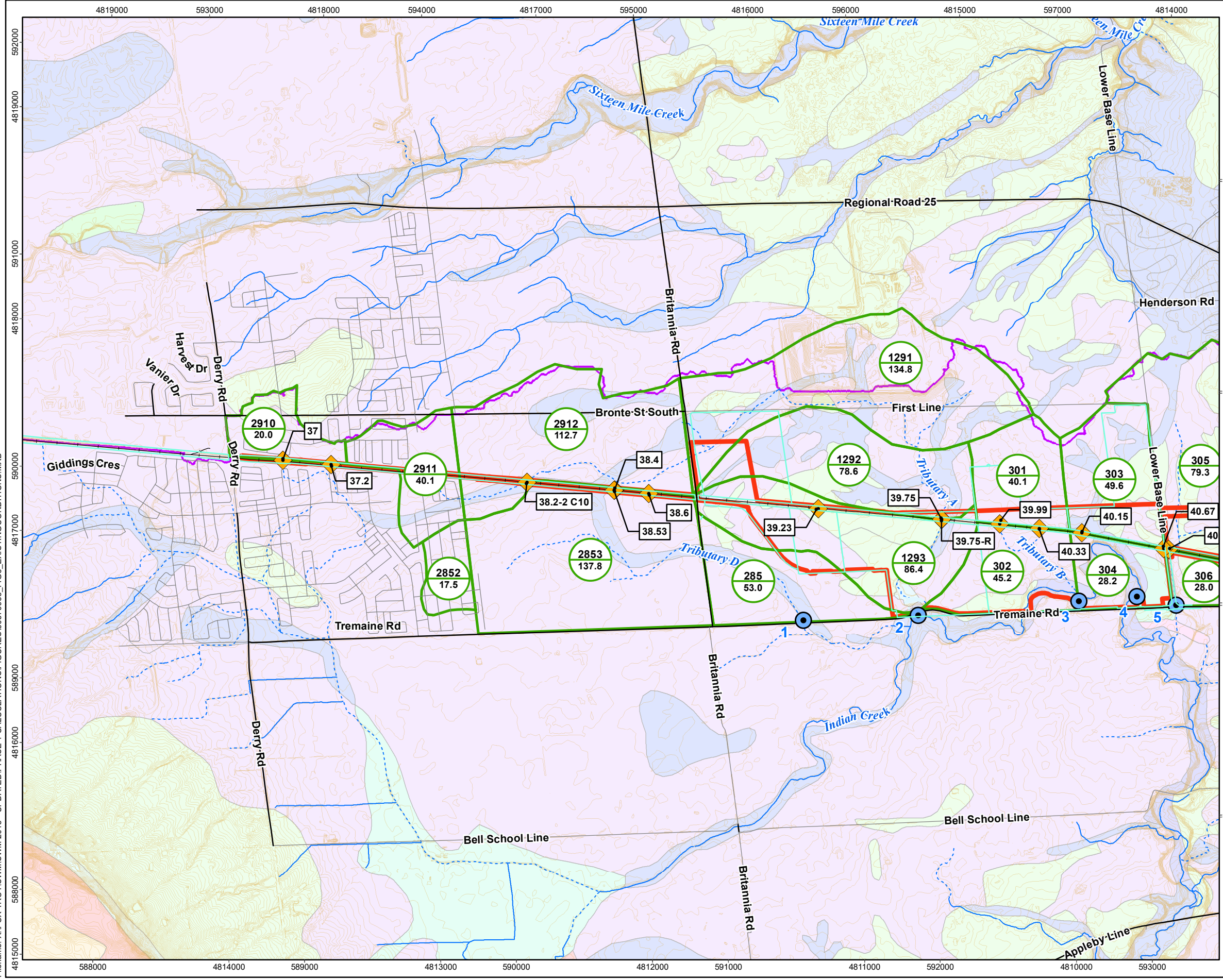
OMAFRA Soil Survey

- BRADY
- BRISBANE
- CHINGUACOUSY
- COLWOOD
- DONNYBROOK
- GILFORD
- JEDDO
- ONEIDA
- UNCLASSIFIED
- WATER
- CN ROW
- 1m Contours 2002 CH
- CH Drainage Boundary
- Existing Catchment Areas



Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

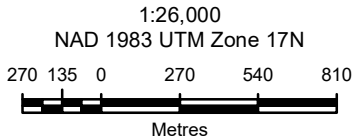
Last saved by: AWS,NABEEL (2019-12-17) Last Plotted: Thu Sep 03, 2020 Project Management Initials: Designer: AN Checked: BT Approved: BR ANS/B 279.4mm x 431.8mm
 Filename: X:\FOX TROTISWMSWMM 2018 - UPDATED\PHASE 1 CALCULATIONS\FIGURES\60579933_FIG3_EXISTINGCONDITIONS.MXD



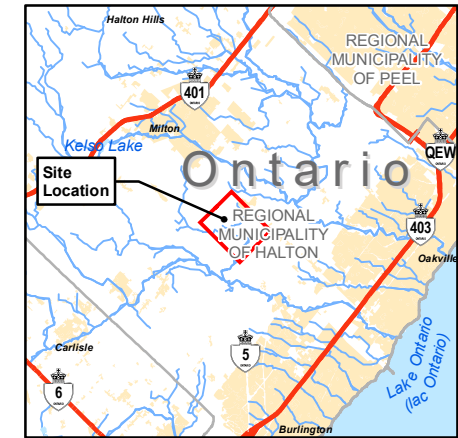
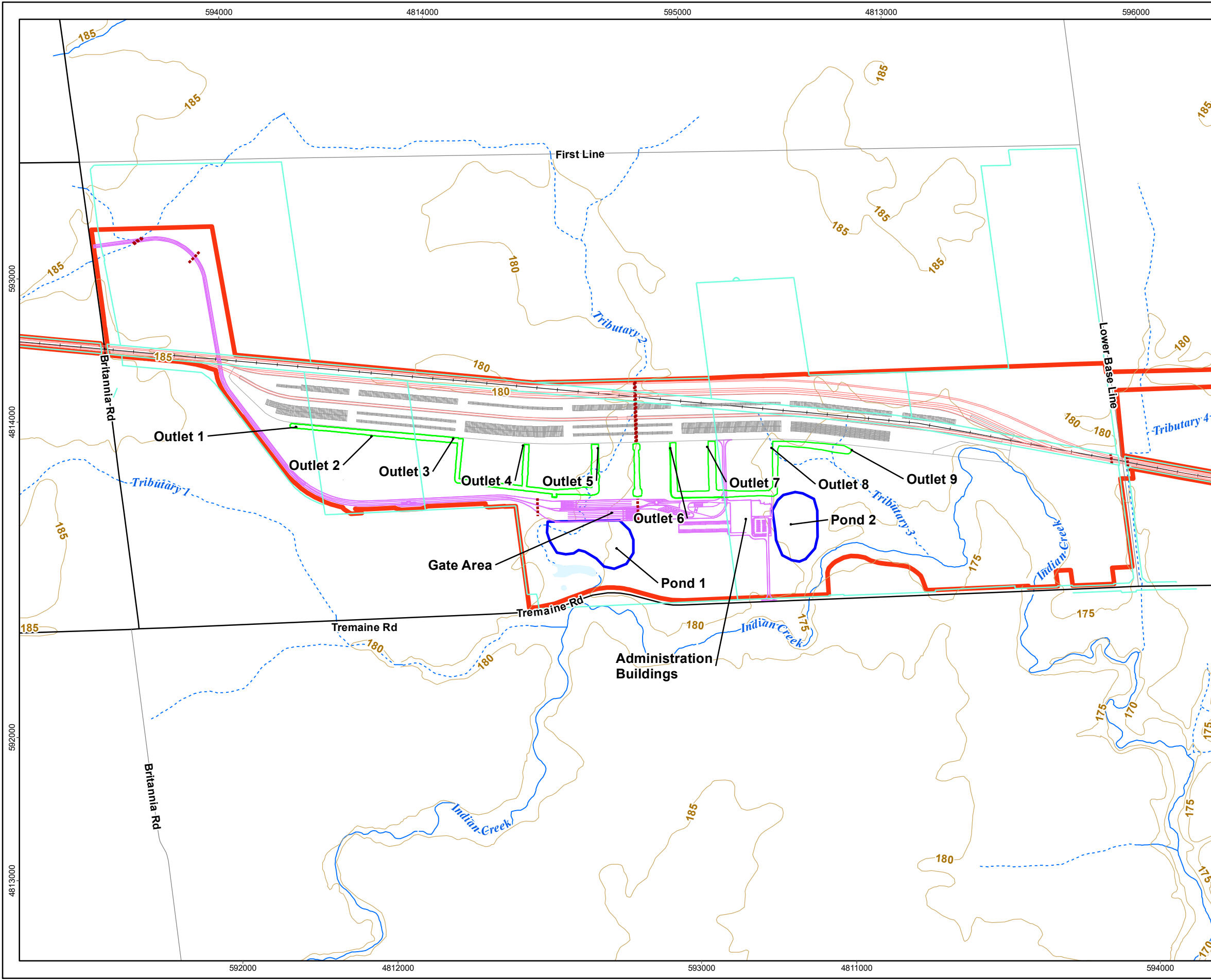
Key Map

Legend

- Study Area
 - Existing Culvert Locations
 - Catchment ID
 - 40 Area (ha)
 - Flow Node
- Water Features**
- Lake
 - Intermittent Stream
 - Permanent Stream
- OMAFRA Soil Survey**
- BRADY
 - BRISBANE
 - CHINGUACOUSY
 - COLWOOD
 - DONNYBROOK
 - GILFORD
 - JEDDO
 - ONEIDA
 - UNCLASSIFIED
 - WATER
 - CN ROW
 - 1m Contours 2002 CH
 - CH Drainage Boundary
 - Existing Catchment Areas
 - Major Road
 - Local Road

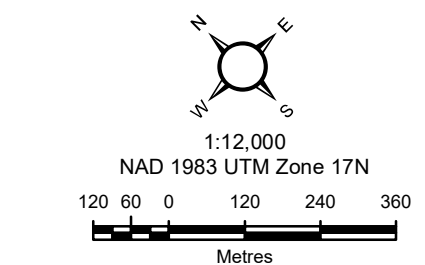


Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

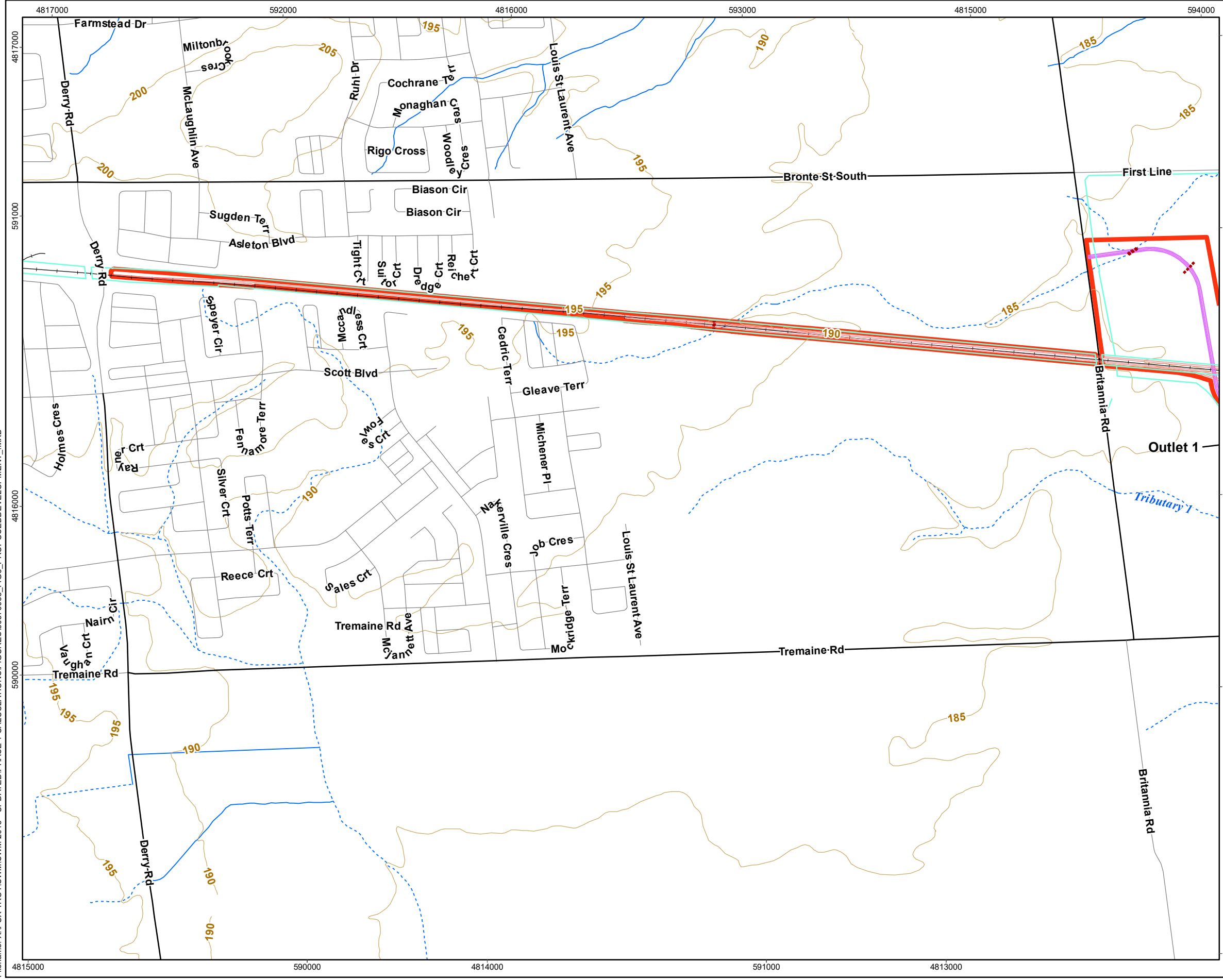


Key Map

- Legend**
- CN ROW
 - Ditches and Swales
 - - - - Proposed Culverts
 - Proposed Tracks
 - Proposed Yard
 - Administration/Gate Area
- Roads**
- Major Road
 - Local Road
 - +— Railway
 - Ponds_Dec_2019
 - Contour (5m)
 - Study Area
- Water Features**
- Lake
 - River
- Streams**
- Intermittent Stream
 - Permanent Stream

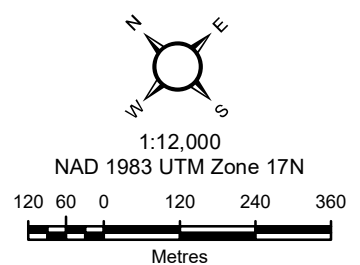


Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written



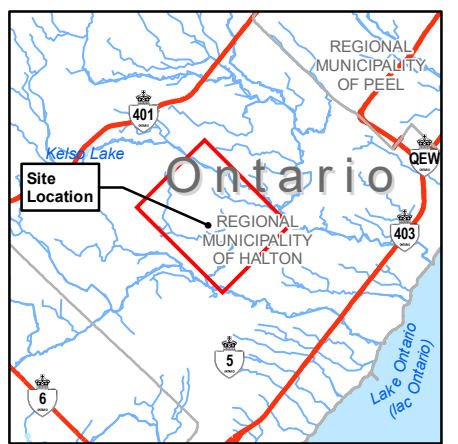
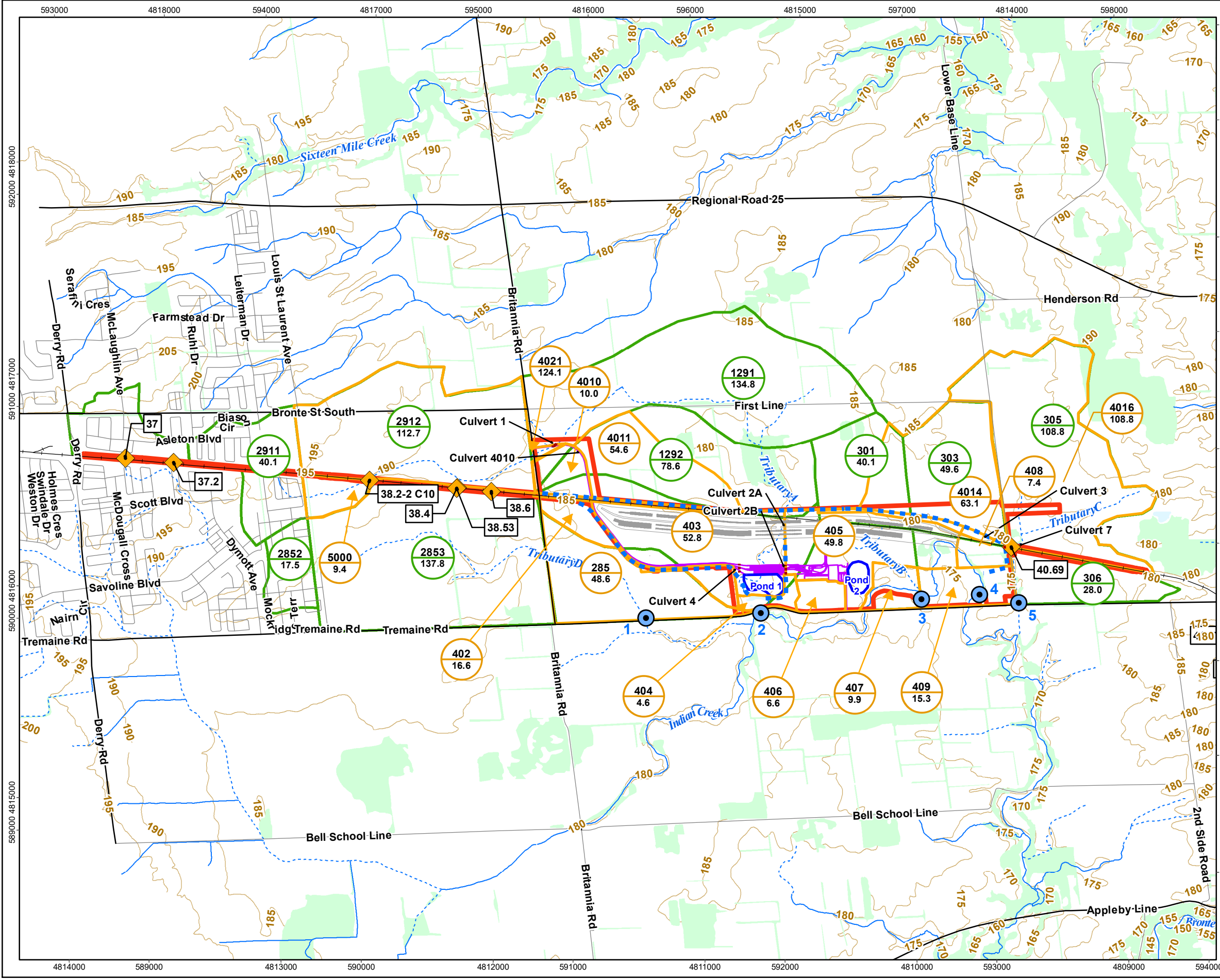
Key Map

- Legend**
- CN ROW
 - Ditches and Swales
 - - - - Proposed Culverts
 - Proposed Tracks
 - Proposed Yard
 - Administration/Gate Area
- Roads**
- Major Road
 - Local Road
 - +— Railway
 - Ponds_Dec_2019
 - Contour (5m)
 - Study Area
- Water Features**
- Lake
 - River
- Streams**
- Intermittent Stream
 - Permanent Stream

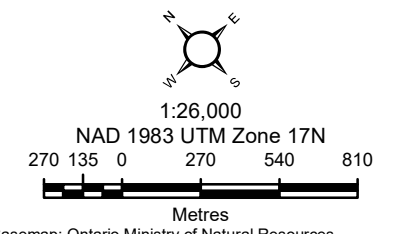


Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

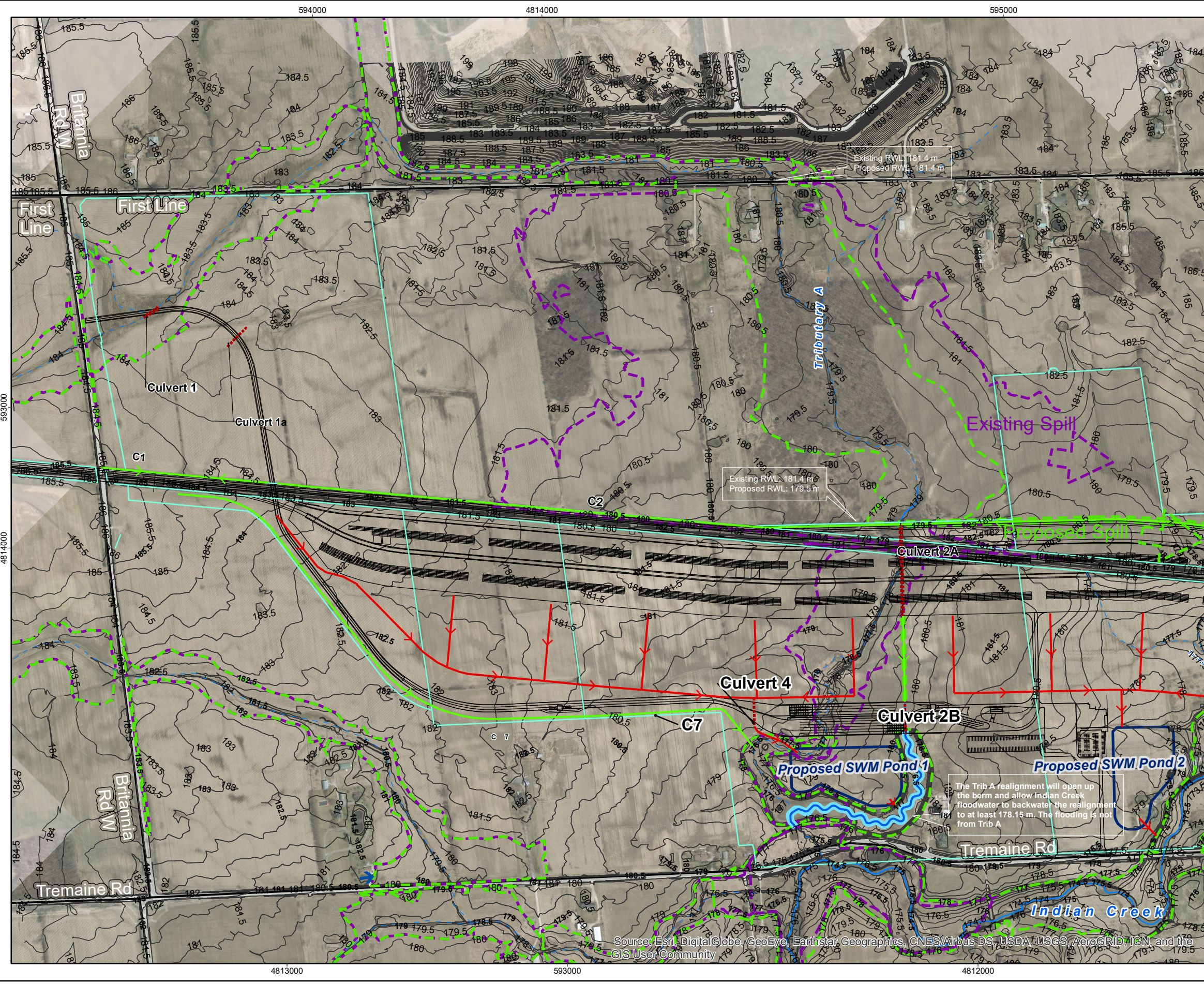
Last saved by: AWS\NABEEL (2020-07-14) Last Plotted: Thu Sep 03, 2020 Project Management Initials: Designer: AN Checked: BT Approved: BR ANS\B 279.4mm x 431.8mm
 Filename: X:\FOX TROTIS\SWMS\2018 - UPDATED\PHASE 1 CALCULATIONS\FIGURES\60579933_FIG6_PROPOSEDCONDITIONS.MXD 5910000 4817000 5920000 4818000



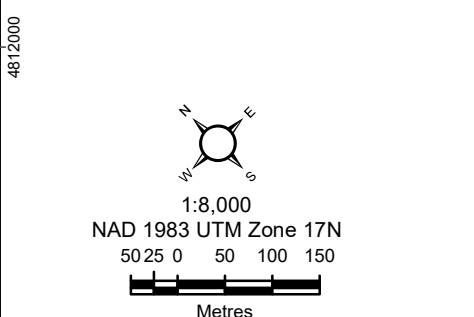
- Legend**
- Study Area
 - Existing Culvert Locations
 - 1 Proposed Culverts
 - Existing Catchment ID Area (ha)
 - Proposed Catchment ID Area (ha)
 - Diversion Channel
 - Proposed Yard Layout
 - Administration/Gate Area
 - 2 Flow Node
- Roads**
- Major Road
 - Local Road
 - Railway
- Water Features**
- Lake
 - Intermittent Stream
 - Permanent Stream
 - WATER



Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

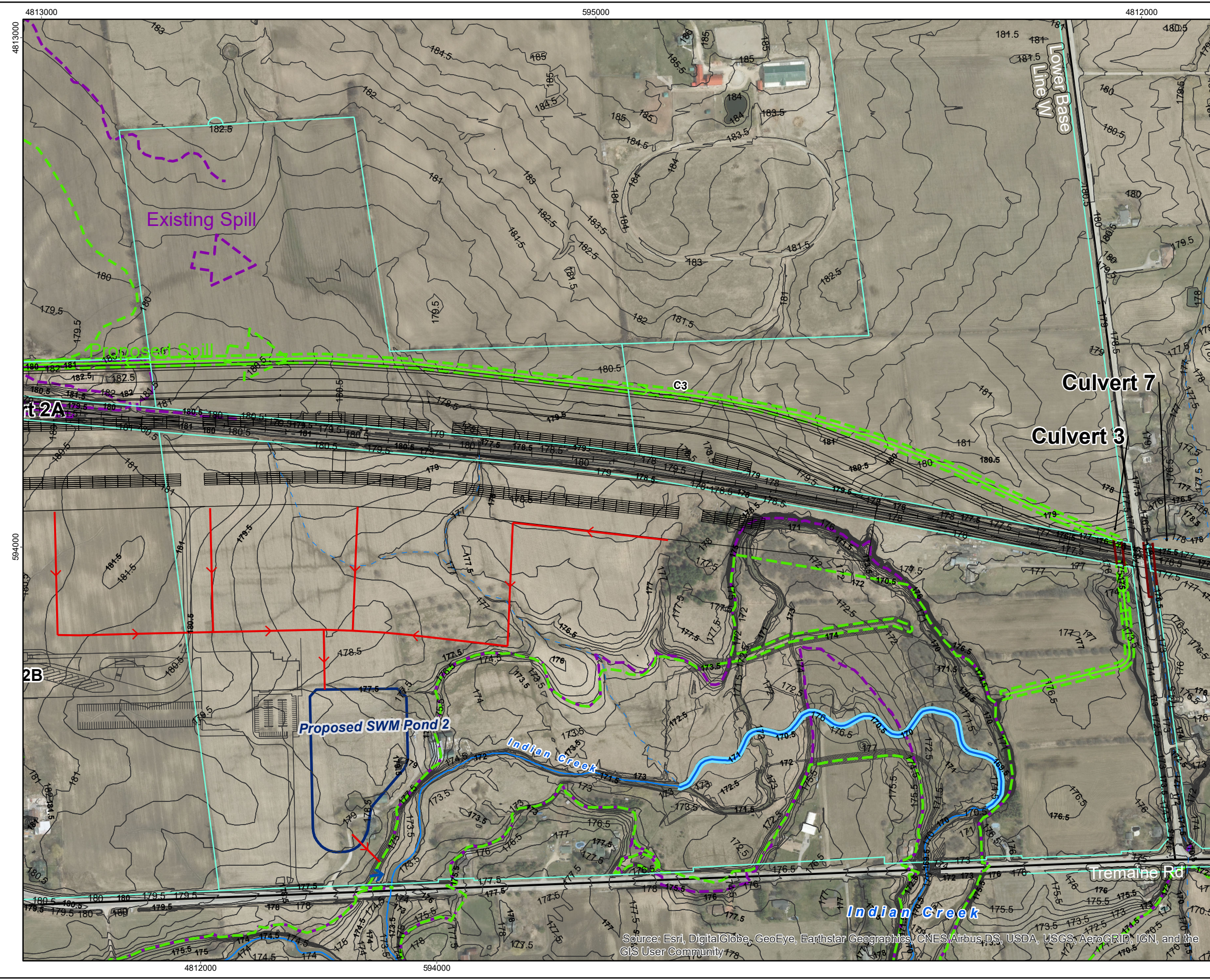


- Legend**
- Rail
 - Proposed Yard
 - Existing (MNR) Proposed (Design) Contours
 - HEC-RAS Cross Sections and Station Number
 - CN Property Limit
- Water Features**
- Proposed Culverts
 - Proposed Ditches
 - Proposed Swale
 - Watercourse
 - Intermittent Watercourse
 - Proposed Tributary A Realignment
 - Existing Floodline (Conservation Halton)
 - Proposed Flood Extents
 - Proposed SWMF Ponds

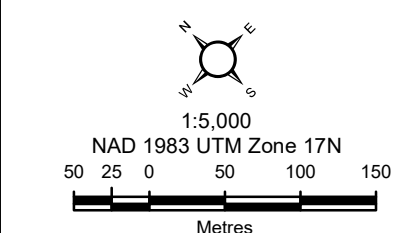


Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

Source: Esri, DigitalGlobe, GeoEye, Earthstar, Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

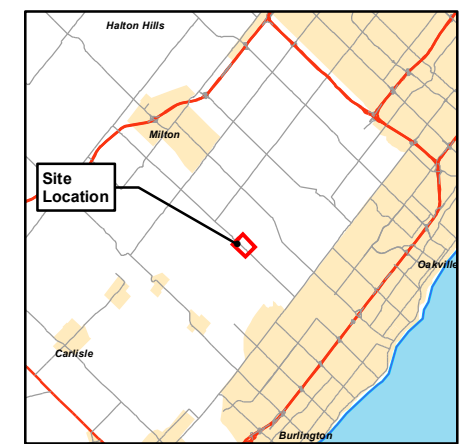
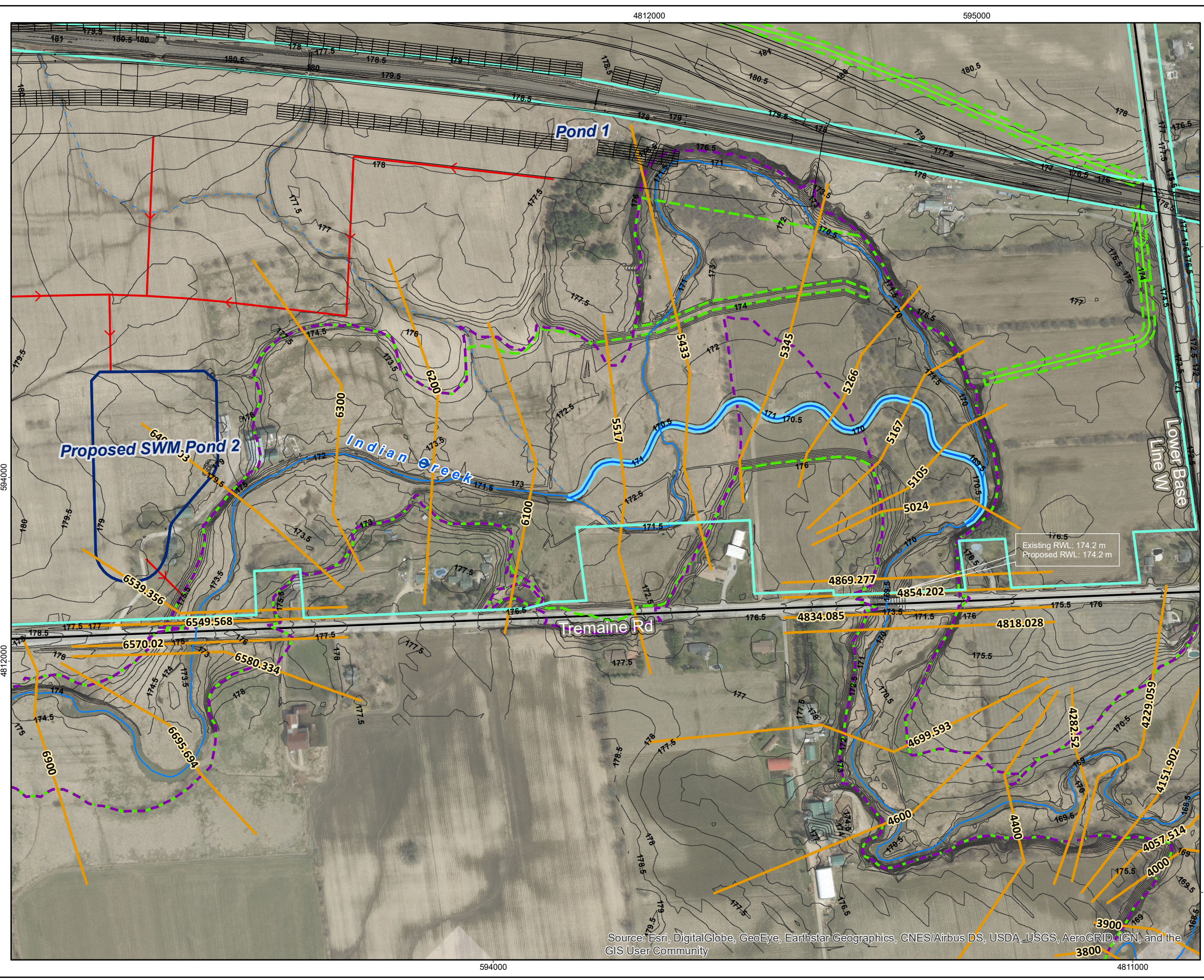


- Legend**
- Rail
 - Proposed Yard
 - Existing (MNR) Proposed (Design) Contours
 - HEC-RAS Cross Sections and Station Number
 - CN Property Limit
- Water Features**
- Proposed Culverts
 - Proposed Ditches
 - Proposed Swale
 - Watercourse
 - Intermittent Watercourse
 - Proposed Tributary A Realignment
 - Existing Floodline (Conservation Halton)
 - Proposed Flood Extents
 - Proposed SWMF Ponds



Basemap: Ontario Ministry of Natural Resources.
 Additional Sources: Ortho-Imagery.
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

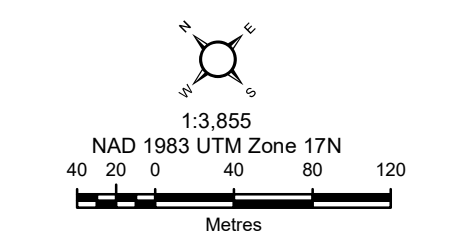


- Legend**
- Rail
 - Proposed Yard
 - Proposed Contours*
 - HEC-RAS Cross Sections and Station Number (Proposed Conditions)
 - CN Property Limit
- Water Features**
- Watercourse
 - Intermittent Watercourse
 - Proposed Indian Creek Realignment
 - Existing Floodline (Conservation Halton)
 - Proposed Flood Extents**
 - Proposed Swale

Notes:

- * Proposed Contours Generated Based On Stantec's Proposed Indian Creek Alignment (Received July 10, 2015)
- ** Proposed Flood Extents Subject To Detailed Design Of Yard And Required Grading Within The Abandoned Alignment Of Indian Creek.

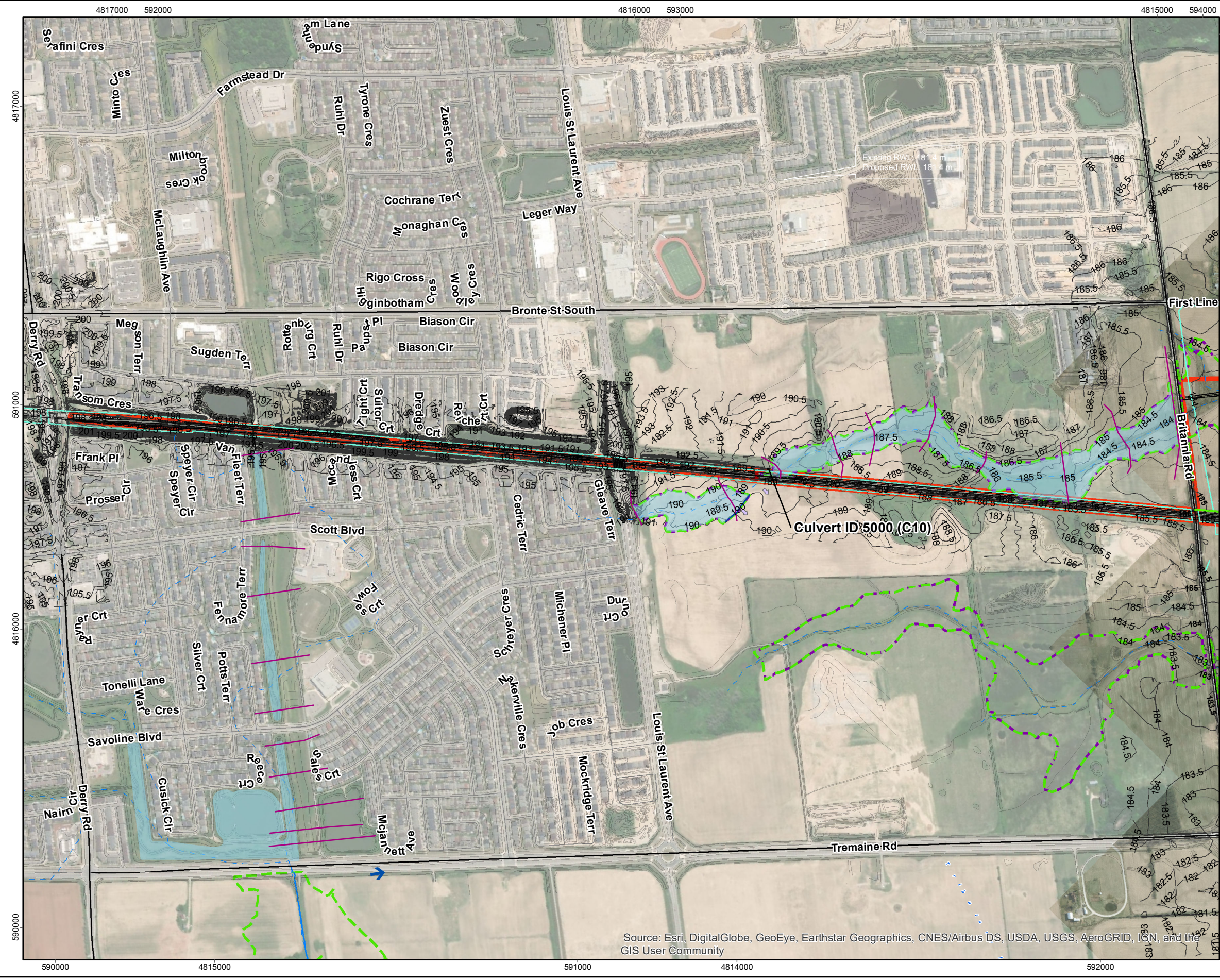
Floodwater Spills Into The Abandoned Alignment Of Indian Creek At The Downstream End.



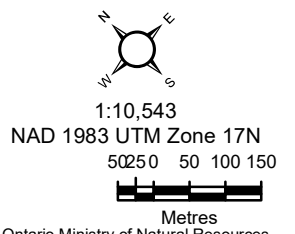
Basemap: Ontario Ministry of Natural Resources.
 Additional Sources: Ortho-Imagery.

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



- Legend**
- Rail
 - Proposed Yard
 - Existing (MNR) Proposed (Design) Contours
 - HEC-RAS Cross Sections and Station Number
 - CN Property Limit
 - Study Area
- Water Features**
- Proposed Culverts
 - Proposed Ditches
 - Proposed Swale
 - Watercourse
 - Intermittent Watercourse
 - Existing Floodline (Conservation Halton)
 - Proposed Flood Extents
 - Proposed SWMF Ponds



Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

2. Existing Conditions

2.1 Hydrology

To assess the existing conditions within the PDA, AECOM completed a desktop review. The review included the assessment of land cover, soils, and topography.

2.1.1 Physiography

The PDA is located within the Peel Plain physiographic region as defined by Chapman and Putnam (1984). The Peel Plain is characterized by a level to undulating tract of clay soils that extends across the central portions of the Regional Municipalities of York, Peel and Halton in a northeast – southwest orientation. This feature is the bottom of former Lake Peel, which was formed by glacial meltwater that collected between the glacial ice front to the east and the Niagara Escarpment to the west (Ontario Ministry of Natural Resources, 1983). Beyond the site, the Peel Plain region extends west past Appleby Line where it is truncated by the Niagara Escarpment and south approximately to Lower Baseline where the Trafalgar Moraine is located.

2.1.2 Topography

The Peel Plain region extends west past Appleby Line where it is truncated by the Niagara Escarpment, and to the south approximately to Lower Baseline where the Trafalgar Moraine is located. Surface elevations within the region range from approximately 150 mASL to 230 mASL, and the terrain gradually slopes downward in a southeasterly direction toward Lake Ontario. The overall ground surface within the PDA also slopes downward in a southeasterly direction from a local maximal elevation of approximately 185 mASL near the northern property boundary (at the intersection of Britannia Road and existing railway tracks) to roughly 174 mASL near the southern boundary (at the intersection of Tremaine Road and Indian Creek). Under existing conditions, the PDA and its adjoining areas are drained by five intermittent tributaries of Indian Creek as described below and shown on **Figure 2**. A summary of drainage characteristics is provided in **Table 1**.

Tributary 1 (D) (Subcatchment IDs # 2852, 2853 and 285) – has an approximate drainage area of 208 ha and drains areas located northwest of Britannia Road along with the southwest corner of the PDA. The hydrology of the proposed development does not affect the drainage areas of Tributary 1 (D) and therefore no further investigations are to be carried out.

Tributary 2 (A) (Subcatchment IDs # 1293, 1292, 1291, 2912 and 2911) – has an approximate drainage area of 452.6 ha and crosses the existing railway tracks through a culvert that in turn discharges into an online agricultural pond located northeast of Tremaine Road. Water from this area then discharges to Indian Creek. This tributary is the dominant and most well-defined watercourse within the PDA.

The channel appears to have been historically straightened within the PDA. The channel resumes a meandering pattern before entering a shallow but well-defined valley and proceeds to an online pond. Water exits this pond through a corroded corrugated steel pipe (CSP) situated within a water level control structure in the pond, to the west side of a fill embankment. The channel continues a short distance downstream to its confluence with Indian Creek, south of Tremaine Road. The hydrology for the proposed development does affect the drainage areas of Tributary 2 (A) (subcatchments # 1292 and 1293).

Tributary 3 (B) (Subcatchment IDs # 301 and 302) – has a drainage area of approximately 85.3 ha and originates in an agricultural field to the north of the railway tracks where the feature appears to sporadically occupy topographic depressions within the existing agricultural field. A well-defined channel forms a short distance upstream of the tracks before entering a concrete structure to the west of the embankment. Immediately west of the culvert, the tributary resumes a defined channel form that loses definition in the downstream direction. The hydrology for the proposed development does affect the drainage areas of Tributary 3 (B).

Tributary 4 (C) (Subcatchment IDs # 303 and 304) - has a drainage area of 77.8 ha and runs northwest of Lower Baseline Road, crosses Tremaine Road to join Tributary 5 and ultimately discharges into Indian Creek. The hydrology for the proposed development will not affect the drainage areas of Tributary 4 (C) and therefore no further investigations are to be carried out.

Tributary 5 (C) (Subcatchment IDs # 305 and 306) - has a drainage area of approximately 107.3 ha and runs northeast of Lower Baseline Road, crosses Tremaine Road and discharges into Indian Creek. The hydrology for the proposed development does not affect the drainage areas of Tributary 5 (C) and therefore no further investigations are to be carried out. There will only be alteration to the hydraulics assessment due to the proposed channel realignment for Tributary 5 (C).

Table 1: Overview of Drainage Catchments

Subcatchment No.	Drainage Area (ha)	Tributary Characteristics				
		Subcatchment IDs.	Width (m)	Depth (m)	Bank Height (m)	Bed Form
1 (D)	208	2852, 2853, 285	-	-	-	-
2 (A)	452.6	2911, 2912, 1291, 1292, 1293	1.85 – 3.55	0.28 – 0.48	0.61	Poorly defined
3 (B)	85.3	301, 302	2	0.04	Poorly defined	Poorly defined
4 (C)	77.8	303, 304	-	-	-	-
5 (C)¹	107.3	306, 305	0.5 – 1.3	2.0	3.0	Defined

Notes: 1. Tributary 5 (C) is not impacted by the development and is not considered any further.

Subwatershed delineations follow delineations completed as part of previous background studies. CH contour data was used to determine surface topographical details at a 1 m grid resolution for the rail corridor. Beyond the bounds of the corridor, neither GIS or LiDAR topographic data was provided by the Town of Milton or CH and could not be incorporated into the assessment. The corridor data was supplemented with topographic data (5 m contours) obtained from Land Information Ontario (LIO). According to the LIO topographic information, the topography in the vicinity of the PDA is generally slightly to gently sloping. The topography of the PDA is shown in **Figure 7**, **Figure 8** and **Figure 10**.

2.1.3 Land Use

Land cover within the PDA was determined from aerial photography as shown in **Figure 11** and **Figure 12**, as well as from the Town of Milton Official Plan, Ontario Land Cover Compilation v.2.0 and Technical Data Report Terrestrial (Appendix E.16). Existing land use is dominated by agricultural and residential areas. The main developed area is the Town of Milton, which has a land use designation of primarily residential and commercial land use between Britannia Road to the east and Derry Road West to the west. The Halton Region Waste Management Site is also located nearby, north of First Line. The existing track drainage ditching typically consists of moderate grass cover with some hydrophilic (wetland) plant species.

The existing CN Halton Subdivision rail corridor includes the mainline between Britannia Road and Derry Road. The land use adjacent to the rail corridor in this reach is a mix of residential densities on the southwest side, and a mix of industrial and commercial lands on the northeast side. Within the rail corridor, the track bed consists of a 225 mm - 300 mm thick layer of 50 mm crushed granular ballast overlying a 200 mm – 230 mm thick layer of Granular B, Type 2 compacted sub-ballast on native material. Impervious surfaces within the PDA, with some access roads, hardstand areas, small buildings, existing residential and commercial lands. The land use information within the PDA is shown in **Figure 13** and **Figure 14**.

2.1.4 Soils

The soil information within the PDA is shown in **Figure 15** and **Figure 16**. The Geotechnical and Hydrogeological Data Report (AECOM, 2020) and the Geotechnical Engineering and Hydrogeological Assessment Report (AECOM, 2020) outline subsurface conditions within the development area. In general, these reports note that the subsurface conditions encountered consisted of firm to hard silty clayey till underlain by the hard and cohesive Halton till/shale complex, which in turn is underlain by weathered shale bedrock. In order to supplement these results, soil information from the Ministry of Natural Resources and Forestry (MNR) geo-database, surficial soils mapping (obtained from the Ontario Ministry of Agricultural Food and Rural Affairs – OMAFRA) were also considered. The Jeddo soil type is categorized as loamy and poorly drained. Chinguacousy loam is a silt loam which is imperfectly drained. The Colwood soil series consists of very deep, poorly drained or very poorly drained soils formed in stratified silty and loamy glaciolacustrine deposits or outwash. The Oneida series is categorized as loamy and poorly drained. This surface soil data was used in order to obtain hydrologic parameters for the sub-catchments. Detailed C and runoff curve number (CN) calculations are provided in **Appendix B**.

2.1.5 Existing and Proposed Culverts Inventory

The following section discusses the condition and nature of drainage infrastructure within the PDA and establishes drainage and stormwater management considerations for the rail corridor works and proposed works.

AECOM has assessed the potential for the rail corridor works to impact drainage and stormwater management within the vicinity of the rail corridor. The June 2015 Stormwater Management Strategy described the existing drainage conditions in detail. The proposed design associated with the corridor works and the corresponding stormwater management considerations have been considered for Phase 1 and 2 detailed design. Area delineations that are smaller than 10 ha are shown in AutoCAD Phase 1 and 2 internal drainage, included in **Appendix A**. AECOM performed culvert assessment for existing and proposed conditions and applied key findings recommendation and stormwater consideration as shown in **Table 2**, below. More details regarding external catchment area crossings are provided in the Indian Creek Tributary A and C Crossing Report (AECOM, 2020), which includes information about Culverts 10. The crossing report will require a cross check and to be updated once phase 2 is completed.

Table 2. Assessment of Existing Culverts and Proposed Requirements

Mileage (Station)	Analysis Required	Key Findings and Recommendations	Drainage and Stormwater Management Considerations
37.00 (59+544.25) (Culvert 13)	Yes	Remove and Replace Existing 1250 mm CSP Culvert	Assess upstream and downstream ditch capacity, assess hydraulic capacity and condition of culvert
37.12 (59+750)	No	Protect Existing 1200 mm CSP Culvert (no upsize required)	No further considerations necessary
37.13 (59+755.27)	No	Protect Existing 1500 mm Concrete Circular Culvert (Equalizer Culvert) No upsize required	No further considerations necessary
37.2 (59+869.25) (Culvert 12)	Yes	Protect and Extend Existing 600 mm CSP Culvert	Assess upstream ditch capacity, assess hydraulic capacity and condition of culvert
37.63 (60+567.18) (Culvert 11)	Yes	Protect and Extend Existing 900 mm CSP Culvert	Assess upstream ditch capacity, access hydraulic capacity and condition of culvert
37.63 (60+590.81 R)	Yes	Ditch Existing 600 mm CSP Culvert	Assess downstream ditch capacity, access hydraulic capacity and condition of culvert
37.63 (60+590.81 L)	No	Remove Existing Culvert	No further considerations necessary
37.98 (61+125) (Culverts 10 removal)	Yes	Update HEC-RAS Model Provided by CH – (upsized twin 900 mm CSP culverts if required) relocate and replace twin culverts from 38.02 (61+157.4) to Mi. 37.98 (61+125)	Access hydraulic capacity and condition of culvert

Mileage (Station)	Analysis Required	Key Findings and Recommendations	Drainage and Stormwater Management Considerations
38.02 (61+157.4) (Culverts 10 replacement)	No	Remove Existing 900 mm CSP twin culverts	No further considerations necessary
38.10 (61+325)	No	Remove Existing Ditch Culvert	No further considerations necessary
38.27 (61+425 to 61+750)	Yes	New South Ditch Culvert extends from 61+425 to 61+750	assess hydraulic capacity of proposed culvert
38.56 (61+750 to 62+375)	Yes	New South Ditch Culvert extends from 61+425 to 61+750	Access hydraulic capacity of proposed culvert
38.31 (61+756) (Culvert 9)	Yes	Protect and Extend Existing 900 mm CSP Culvert	Access hydraulic capacity and condition of culvert
38.52 (61+993) (Culvert 8)	Yes	Protect and Extend Existing 900 mm CSP Culvert	Access hydraulic capacity and condition of culvert
38.6 (62+158)	No	Protect Existing 600 mm CSP Culvert right of the ditch	No further considerations necessary
39.23 (62+960)	No	Remove Existing 700 mm CSP Culvert	No further considerations necessary
39.61 (63+550 to 63+948.6)	Yes	New 1400 mm Concrete Circular Culvert	Access hydraulic capacity of proposed culvert
39.67 (63+958) (Culverts 2A)	Yes	Replace existing and Partially build culvert box 2A 21.5m 3.4m x 1.4 m concrete box	Access hydraulic capacity of proposed culvert
40.59 (65+328)	Yes	Install 900 mm CSP Culvert under mainline track discharging into south Ditch	Access hydraulic capacity of proposed culvert
40.63 (65+400) (Culvert 3)	Yes	Install the remaining portion of culvert box C3 1.9m x 2.5m concrete box or 2.4 m CSP culvert	Access hydraulic capacity of proposed culvert
40.71 (65+525) (Culvert 7)	Yes	Replace existing culvert to 2.4 m concrete circular culvert under lower baseline track diversion phase	Access hydraulic capacity of proposed culvert
6.45 (10+380)	Yes	New 900 mm Concrete Circular Culvert under access road	Access hydraulic capacity of proposed culvert

Culvert inspections were carried out in April 2019. Culvert information obtained during this visit included material of construction and diameter/size. Culvert length was obtained from a combination of survey information, existing plans, CAD drawings and aerial imagery. A total of 18 culverts were found to either cross the rail corridor or be located in-line with the existing ditches within the site limits. These culverts include centreline culverts that convey surface runoff. For all culverts, two drainage types were identified: internal drainage where the culvert receives runoff from the track corridor only, and external drainage where the culvert receives runoff from both the track corridor and external catchments. **Table 3** provides a summary of the inventory of existing and proposed culverts within the PDA.

Culverts in locations where additional tracks are proposed to be constructed have been considered for extension.

Table 3. Existing and Proposed Culvert Inventory

Mileage	Drainage ID	Development	Material	Drainage	Length (m)	Dimensions (mm)	Considerations
37.00 (59+544.25) (Culvert 13)	4001	Existing	CSP	Internal Drainage	13.54	1250	Assess and Replace
37.12 (59+750)	-	Existing	CSP	Internal Drainage	30.1	1200	Leave as is
37.13 (59+755.27)	-	Existing	Circular Concrete	Internal Drainage	83.5	1500	Leave as is

Mileage	Drainage ID	Development	Material	Drainage	Length (m)	Dimensions (mm)	Considerations
37.2 (59+869.25) (Culvert 12)	4002	Existing	CSP	Internal Drainage	13.8	600	Assess and Extend
37.63 (60+567.18) (Culvert 11)	4003	Existing	CSP	Internal Drainage	12.4	900	Assess and Extend
37.63 (60+590.81 R)	4004	Existing	CSP	Internal Drainage	8.8	600	Assess and Replace if necessary
37.63 (60+590.81 L)	-	Existing	CSP	Internal Drainage	8.9	600	Remove Culvert
38.02 (61+125.5) (Culvert 10)	5000	Existing/ Proposed	CSP	External Drainage	13	900	Access, Remove and Relocate
38.02 (61+176.2) (Culvert 10)	-	Existing	CSP	Internal Drainage	13	900	Remove Twin Culverts
38.10 (61+325 L and R)	-	Existing	CSP	Internal Drainage	5.5	unknown	Remove Culvert
38.27 (61+425 to 61+750)	4007	Proposed	CSP	Internal Drainage	322.7	450	New Culvert
37.56 (61+750 to 62+375)	4007-1	Proposed	CSP	Internal Drainage	625	450	New Culvert
38.31 (61+756) (Culvert 9)	4008	Existing	CSP	Internal Drainage	12.4	900	Assess and Extend
38.52 (61+993) (Culvert 8)	4009	Existing	CSP	Internal Drainage	13.3	900	Assess and Extend
38.93 (62+665)	4010	Proposed	CSP	Internal Drainage	16.9	750	New Culvert
38.6 (62+158 R)	-	Existing	CSP	Internal Drainage	6	unknown	Leave as is
39.23 (62+960)	-	Existing	CSP	Internal Drainage	3	700	Remove Culvert
39.61(63+550 to 63+948.6)	4011	Proposed	Circular Concrete	External Drainage	398.6	1400	New Culvert
39.67 (63+958) (Culvert 2A)	4012	Existing	CSP	External Drainage	24.3	1500	Assess and Replace
40.59 (65+328)	4013	Existing	CSP	Internal Drainage	32.8	900	Assess and Replace
40.63 (65+400) (Culvert 3)	4014	Existing	Concrete Box	External Drainage	66.1	2400	Assess and Replace
40.71 (65+525) (Culvert 7)	4016	Existing	CSP	External Drainage	21.2	2000	Assess and Replace
6.45 (10+380)	4020	Proposed	Circular Concrete	External Drainage	67.2	900	New Culvert

2.1.6 PDA Characterization

The PDA is drained by five intermittent tributaries as described in **Section 2.1.2**, four of which are potentially impacted by the development and further assessed. Based on the available topography and existing stream network the PDA was divided into various subcatchments as shown on **Figure 2** and **Figure 3**. The subcatchment boundaries are similar to those delineated as part of previous studies (Phillips, 2004 and AMEC, 2015), which facilitates comparison and achievement of the required targets through the proposed stormwater management plan. Some of the subcatchments are already developed or currently undergoing various phases of development; however, they were modeled as rural catchments, assuming that quantity controls have already been provided or would be provided within these catchments and the resultant outflows will be similar to the pre-development conditions (i.e., rural). This aligns with the requirements stated within the Boyne Survey Secondary Plan Area Report (2015), where flows from developed areas are to be controlled to existing conditions. AECOM was able to obtain an uncontrolled regional and 100-year event from the Britannia Road hydraulic discharge point and apply uncontrolled

conditions to the hydraulic modelling to assess and ensure no overtopping to Culverts 1, 2A, 2B and 3. More details regarding these crossings are provided in the Indian Creek Tributary A and C Crossing Report (AECOM, 2020). The crossing report will require a cross check and to be updated once Phase 2 is completed.

2.1.7 Model Set-up

The Town of Milton has a continuous Hydrologic Simulation Program – Fortran (HSP-F) model for the Boyne Survey Area which was not made available to CN, and as such a new model was developed specifically for this site. The hydrologic model of the PDA was prepared using the Visual OTTHYMO (VO3) hydrologic modeling software to estimate peak runoff rates and volumes from the catchment areas. 24-hour Chicago design storm events were created using intensity-duration-frequency (IDF) values derived from the rainfall data taken from the AES Toronto Pearson International Airport climate station. The VO3 results were then compared using the Rational Method.

The rural subcatchments were represented in the VO3 model using the NAHSHYD command. This command is recommended for modelling of rural drainage areas, and requires a curve number, initial abstraction depth (Ia) and time to peak (Tp) as inputs.

The Curve Number and Ia values are based on soil and land cover. The Curve Numbers were estimated using surficial soils mapping (obtained from the Ontario Ministry of Agricultural Food and Rural Affairs – OMAFRA). The predominant soil types within the drainage area are mostly clay loam from the Jeddo, Oneida and Chinguacousy series. These soils are generally imperfectly drained and fall largely within Hydrological Soil Group (HSG) C or D and have moderate to high runoff generation potential. The SCS Curve Numbers are based on soils having Group C or D hydrologic soil classes and pasture or grassland as land cover (with good grass cover > 75%). An initial abstraction of 5 mm was assumed for the entire PDA.

Time of concentration is based on the catchment area, land cover and the length and slope of the flow path to the subcatchment outlet. The time of concentration was calculated using the SCS lag method and the time to peak is calculated as 66% of the estimated time of concentration.

The ROUTE CHANNEL command in VO3 was used to account for the attenuation of flows as they travel along the flow path. The input parameters are based on a representative channel cross section and the length and slope of the flow paths from the subcatchments to the system outlet at their respective tributaries and discharge point at Indian Creek.

The hydrologic modeling parameters are summarized in **Table 4** and detailed model input and output files are provided in **Appendix A**

Table 4: Visual OTTHYMO Input Parameters - Existing Conditions

Catchment ID ¹	Total Area (ha)	Slope (%)	Length (m)	Time to Peak (hr)	SCS Curve Number ²	Initial Abstraction (Ia) (mm)
2911	40.1	0.6	850	1.25	74	5
2912	112.7	0.6	1600	1.96	75	5
1291	134.8	0.3	1600	2.76	75	5
1292	78.6	0.3	1650	2.79	76	5
1293	86.4	0.6	1450	1.98	74	5
2852	17.5	0.4	350	0.74	74	5
2853	137.8	0.4	1650	2.42	75	5
285	53.0	0.8	800	1.02	75	5
301	40.1	0.7	710	0.99	74	5
302	45.2	0.7	750	1.01	74	5
303	49.6	0.7	840	1.14	75	5

304	28.2	1.1	280	0.41	71	5
305	79.3	0.5	1000	1.54	74	5
306	28.0	0.5	800	1.29	74	5

- Notes: 1. Catchment IDs shown on **Figure 2** and **Figure 3**
2. SCS Curve Numbers based on Antecedent Moisture Condition (AMC) II.

Rational Method

The Rational Method is a simple method useful for calculating peak flows based on catchment area, runoff coefficient (C), and time of concentration (t_c). It is most relevant when applied to catchments with a total area of less than 100 ha. Various empirical equations have been developed to estimate t_c from physical watershed parameters. These include the Soil Conservation Service (SCS) Lag Method, Airport Formula, and the Uplands-Overland Method. In this report, the Airport Formula has been used to estimate t_c . The rainfall intensity was calculated with parameters derived from the Pearson Airport IDF curve. Runoff coefficients were based on land cover and soil type. The procedure and results for this method are provided in **Appendix B**, and peak flows are provided in **Table 5** for existing drainage areas.

Visual OTTHYMO

Visual OTTHYMO analysis was used to estimate peak flows. Design calculations and the Visual OTTHYMO detailed output file and analysis are included in **Appendix B**. Regional flows for areas greater than 100 ha were used through application of the Visual OTTHYMO method.

Peak flows at the rail crossing were determined using the maximum value provided by the Rational Method or Visual OTTHYMO, and these values are summarized in **Table 6**. For culverts that are within the development area of the CN Milton yard, both 100-year and regional flows have been determined.

Table 5. Existing Peak Flows

Catchment ID ¹	Total Area (ha)	2-yr Peak (m ³ /s) ²	25-yr Peak (m ³ /s)	100-yr Peak (m ³ /s)	Regional Peak (m ³ /s)
2911	40.1	0.34 - VO	1.15 - VO	1.64 - VO	-
2912	112.7	0.71 - VO	2.38 - VO	3.38 - VO	7.9
1291	134.8	0.65 - VO	2.18 - VO	3.11 - VO	7.8
1292	78.6	0.39 - VO	1.3 - VO	1.85 - VO	-
1293	86.4	0.52 - VO	1.76 - VO	2.51 - VO	-
2852	17.5	0.22 - VO	0.73 - VO	1.04 - VO	-
2853	137.8	0.76 - VO	2.54 - VO	3.61 - VO	8.8
285	53	0.54 - VO	1.81 - VO	2.57 - VO	-
301	40.1	0.4 - VO	1.36 - VO	1.94 - VO	-
302	45.2	0.45 - VO	1.52 - VO	2.16 - VO	-
303	49.6	0.52 - VO	1.73 - VO	2.45 - VO	-
304	28.2	0.46 - VO	1.62 - VO	2.33 - VO	-
305	79.3	0.58 - VO	1.97 - VO	2.8 - VO	-
306	28	0.23 - VO	0.79 - VO	1.12 - VO	-

2.1.8 Model Results

Hydrologic simulations using VO3 were completed for the 2-year through 100-year return period and the Regional storm events, and results are summarized in **Table 6**. Detailed modelling output files are included in **Appendix A**.

Table 6: Peak Flow Rates Summary - Existing Conditions

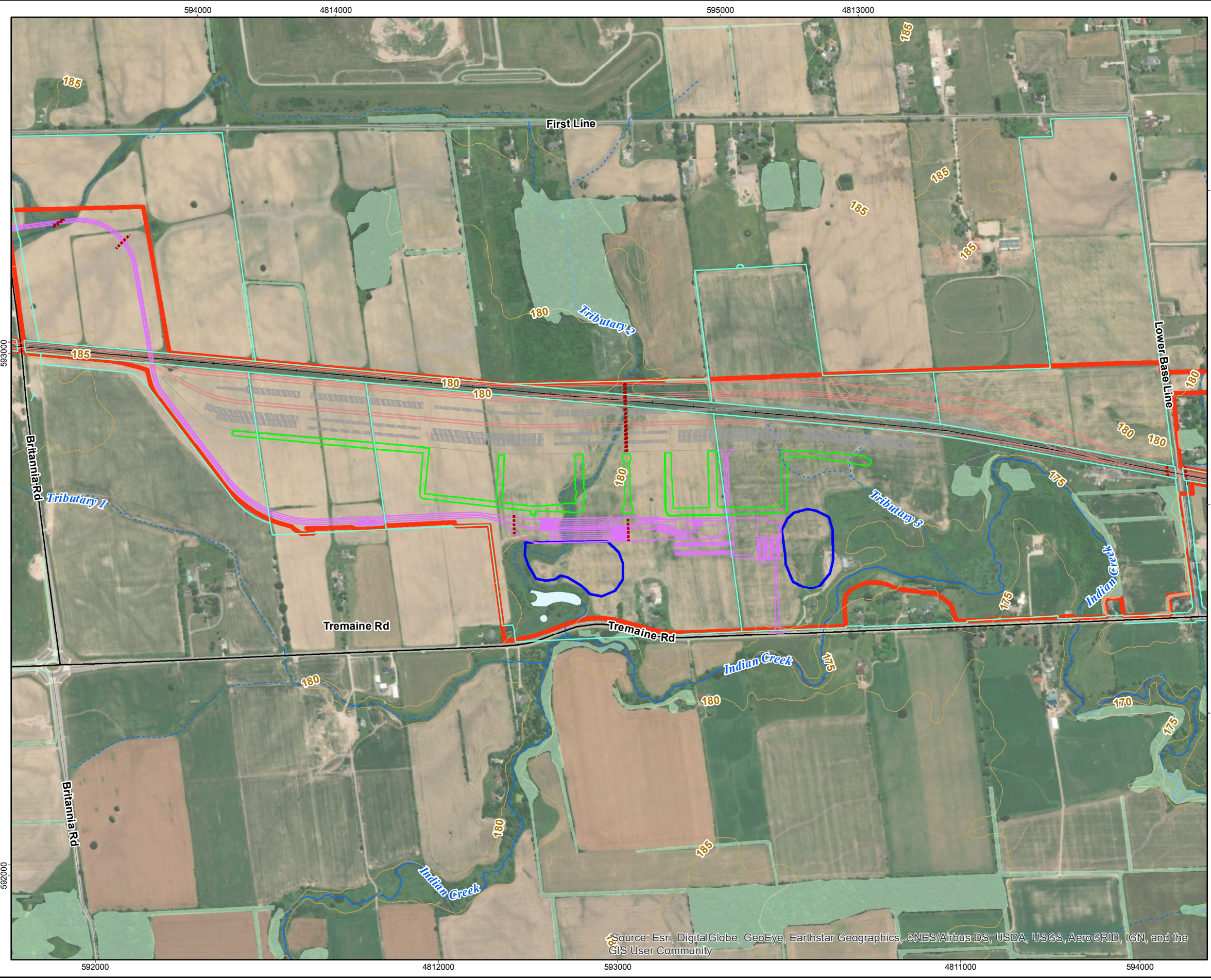
Flow Node Location (Refer to Figure 2)	Hyd. No. in the Model	Drainage Area (ha)	Peak Flow Rates (m ³ /s)							
			25 mm	2-year	5-year	10-year	25-year	50-year	100-year	Regional
1	69	208.3	0.46	1.2	2.3	3.0	4.1	5.0	5.9	16.1
2	2930	452.6	0.93	2.4	4.5	6.1	8.3	10.1	11.9	34.6
3	53	85.3	0.29	0.85	1.6	2.1	2.9	3.5	4.1	8.8
4	100	77.8	0.26	0.83	1.5	2.1	2.8	3.5	4.1	7.8
5	59	107.3	0.30	0.81	1.5	2.0	2.7	3.3	3.9	9.6
Total-(1+2+3+4+5) at Tremaine Road	70	931.3	2.0	5.1	9.6	13.0	17.8	21.7	25.6	72.6
East Tributary (Boyne Survey HSPF Results equivalent to Node 2)	2.930	452.6		2.8	4.6	5.9	7.3	9.2	10.7	28.4
Difference (VO3-HSPF at Node 2)				-0.4	-	0.2	1.0	0.9	1.2	6.3

Hydrologic analyses for the PDA have been completed using VO3 then compared with the Hydrologic Simulation Program – Fortran (HSP-F) methodology used in the Boyne Survey Secondary Plan. The Boyne Survey HSP-F model was not made available to CN. However, the results of the model are available in the Boyne Survey Secondary Plan report, and were compared to the results provided by the developed VO3 model.

As shown in **Table 6** above, VO3 simulated peak flow rates of Tributary A (Flow Node 2) are compared with the HSP-F modeling results (Table 2.4, Phillips, 2004) and the two models were found to provide consistent results.

The HSP-F model used in the Boyne Survey Secondary Plan has been calibrated to rainfall data and has been parameterized to simulate runoff from storm events, as well as snow accumulation and melt conditions. The intermittent tributaries and contributing drainage areas located north of Tremaine Road join Indian Creek at various locations (**Figure 2**). The combined total flow from these areas is shown in **Table 6** and provides a benchmark for comparison with post-development flow rates. For reference, under existing conditions, the combined peak flow from all the areas located north of Tremaine Road during the 100-year and Regional Storm events are 25.6 m³/s and 72.6 m³/s, respectively.

Last saved by: AWS NABEEL (2019-12-17) Last Plotted: Thu Sep 03, 2020
 File name: X:\FOX TROTISWMS\2018 - UPDATED\PHASE 1 CALCULATIONS\FIGURES\60579933_FIG11_AERIAL PHOTOGRAPHY.MXD
 Project Management Initials: Designer: AN Checked: BT Approved: BR
 ANS/B 279.4mm x 431.8mm



Legend

- CN ROW
- Ditches and Swales
- - - - Proposed Culverts
- Proposed Tracks
- Proposed Yard
- Administration/Gate Area

Roads

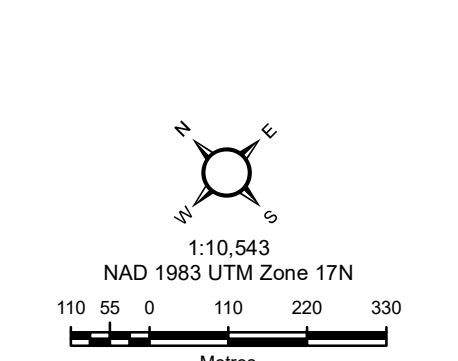
- Major Road
- Local Road
- +— Railway
- ▭ Ponds_Dec_2019
- Contour (5m)
- Study Area

Water Features

- ▭ Lake
- ▭ River

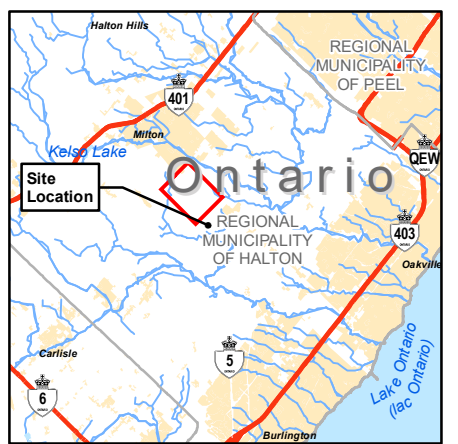
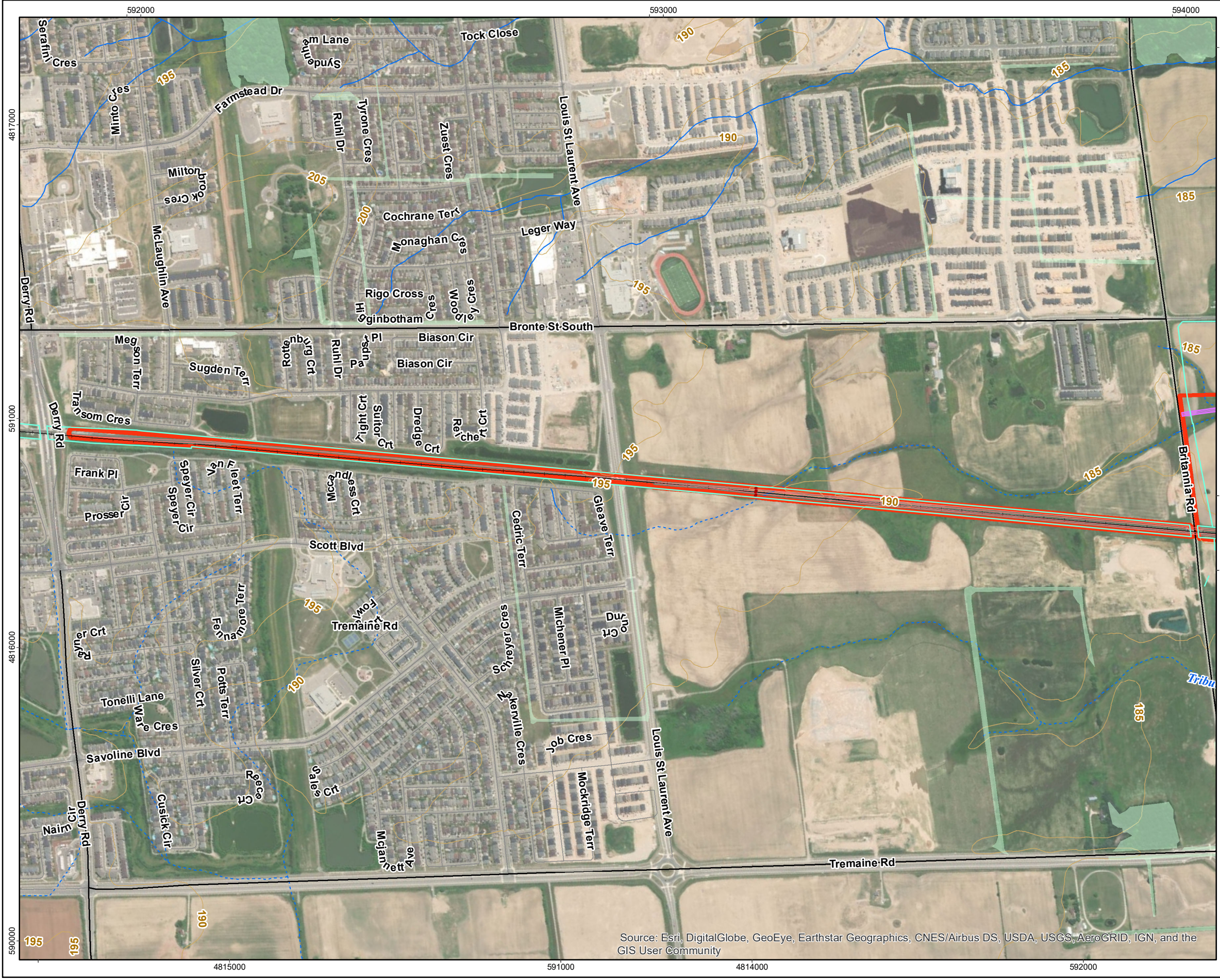
Streams

- - - - Intermittent Stream
- Permanent Stream

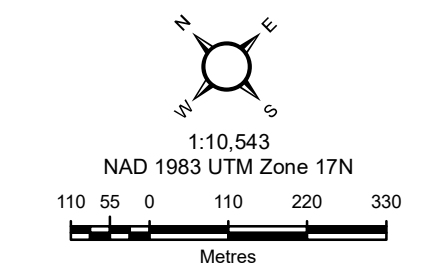


Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

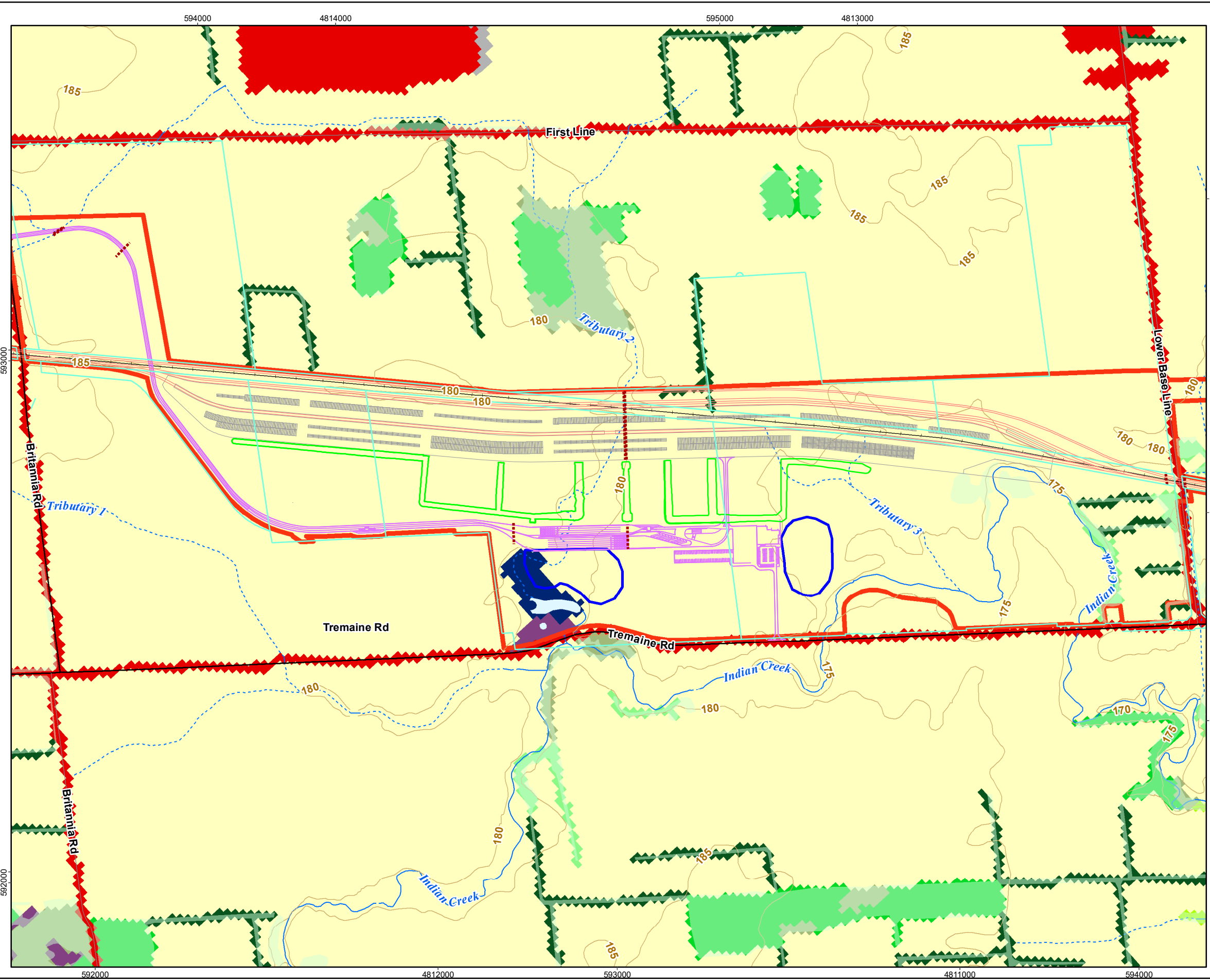


- Legend**
- CN ROW
 - Ditches and Swales
 - - - - - Proposed Culverts
 - Proposed Tracks
 - Proposed Yard
 - Administration/Gate Area
- Roads**
- Major Road
 - Local Road
 - Railway
 - Ponds_Dec_2019
 - Contour (5m)
 - Study Area
- Water Features**
- Lake
 - River
- Streams**
- - - - - Intermittent Stream
 - Permanent Stream



Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

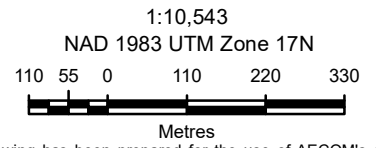
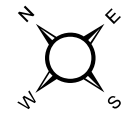
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



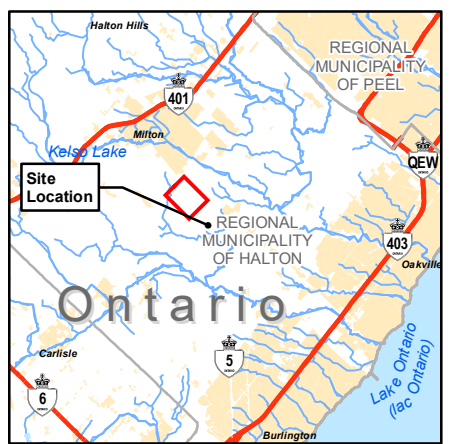
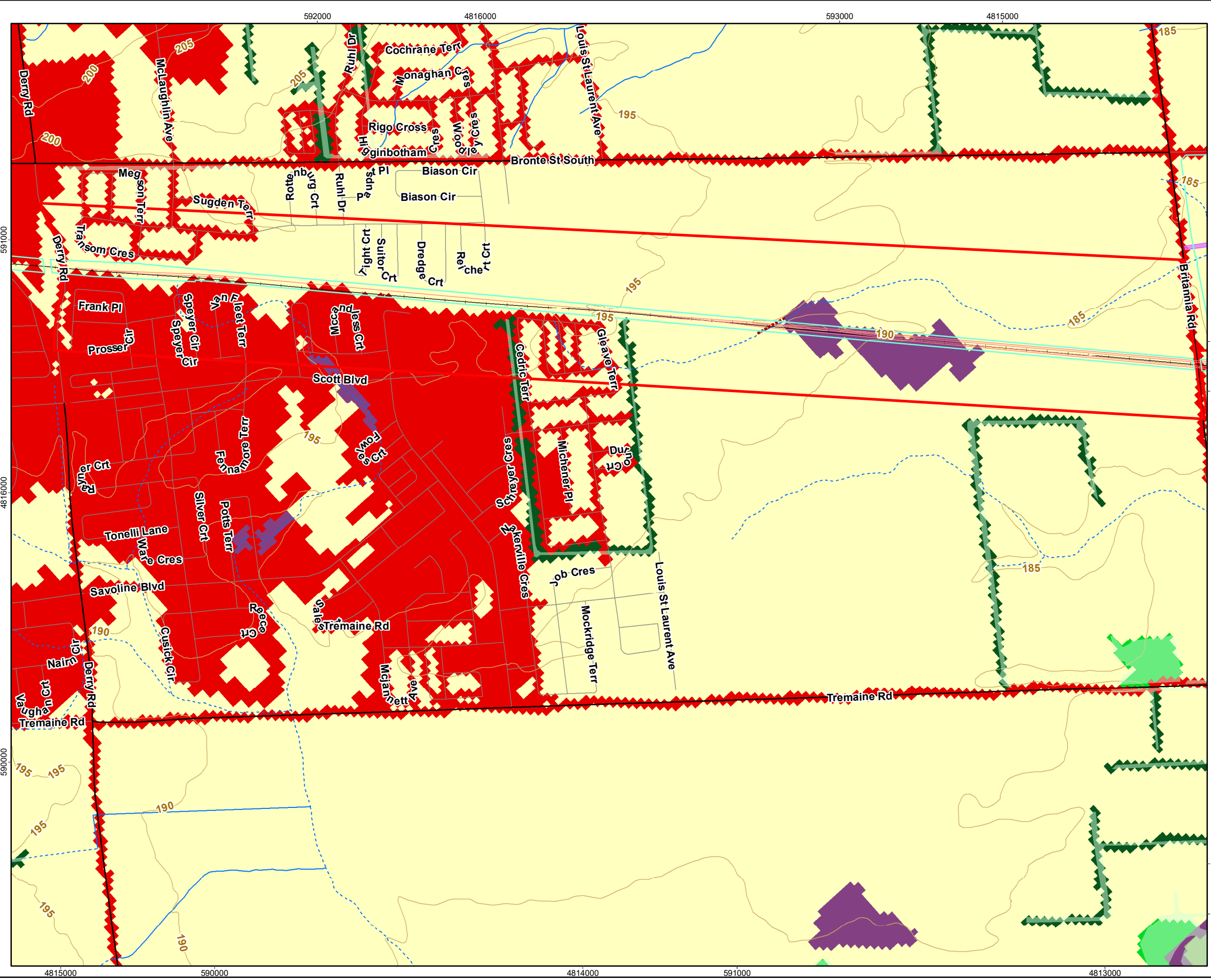
Key Map

Legend

- 99 - Other
- 9 - Cloud/Shadow
- 1 - Clear Open Water
- 2 - Turbid Water
- 3 - Shoreline
- 4 - Mudflats
- 5 - Marsh
- 6 - Swamp
- 7 - Fen
- 8 - Bog
- 10 - Heath
- 11 - Sparse Treed
- 12 - Treed Upland
- 13 - Deciduous Treed
- 14 - Mixed Treed
- 15 - Coniferous Treed
- 16 - Plantations - Treed Cultivated
- 17 - Hedge Rows
- 18 - Disturbance
- 19 - Cliff and Talus
- 20 - Alvar
- 21 - Sand Barren and Dune
- 22 - Open Tallgrass Prairie
- 23 - Tallgrass Savannah
- 24 - Tallgrass Woodland
- 25 - Sand/Gravel/Mine
- 26 - Bedrock
- 27 - Community/Infrastructure
- 28 - Agriculture and Rural

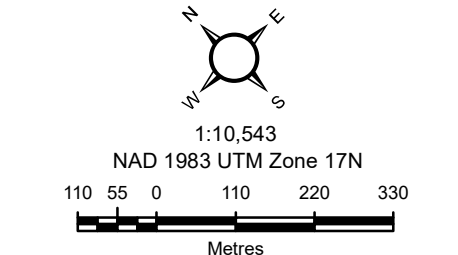


This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written



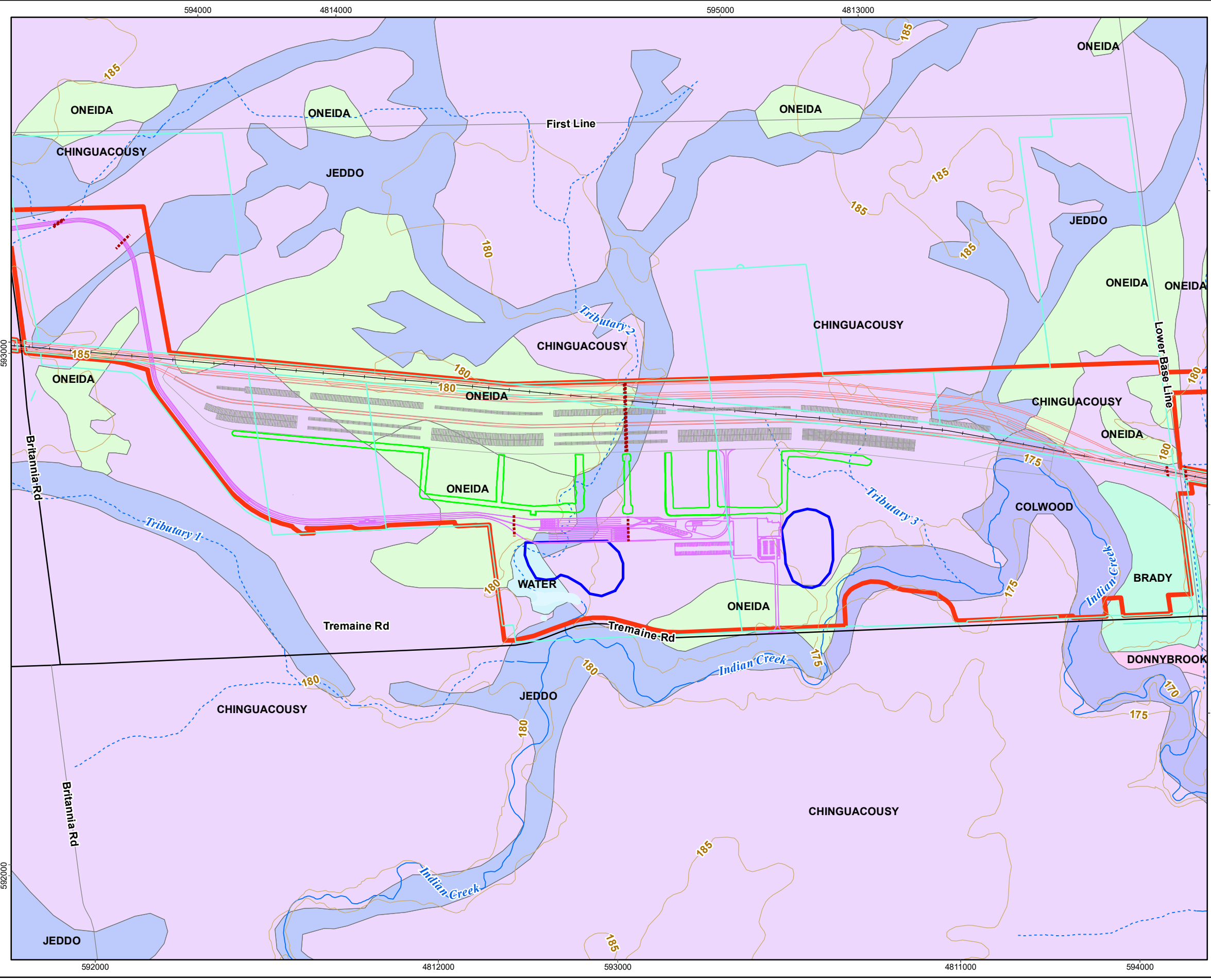
Legend

- 99 - Other
- 9 - Cloud/Shadow
- 1 - Clear Open Water
- 2 - Turbid Water
- 3 - Shoreline
- 4 - Mudflats
- 5 - Marsh
- 6 - Swamp
- 7 - Fen
- 8 - Bog
- 10 - Heath
- 11 - Sparse Treed
- 12 - Treed Upland
- 13 - Deciduous Treed
- 14 - Mixed Treed
- 15 - Coniferous Treed
- 16 - Plantations - Treed Cultivated
- 17 - Hedge Rows
- 18 - Disturbance
- 19 - Cliff and Talus
- 20 - Alvar
- 21 - Sand Barren and Dune
- 22 - Open Tallgrass Prairie
- 23 - Tallgrass Savannah
- 24 - Tallgrass Woodland
- 25 - Sand/Gravel/Mine
- 26 - Bedrock
- 27 - Community/Infrastructure
- 28 - Agriculture and Rural



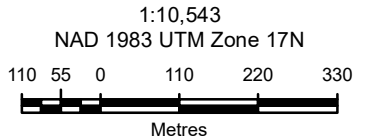
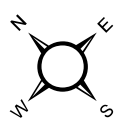
This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

Last saved by: AWS,NABEEL (2019-12-17) Last Plotted: Thu Sep 03, 2020
 File name: X:\FOX TROTTS\SWMS\2018 - UPDATED\PHASE 1 CALCULATIONS\FIGURES\60579933_FIG13_SOIL INFORMATION.MXD
 Project Management Initials: Designer: AN Checked: BT Approved: BR
 ANS I B 279.4mm x 431.8mm

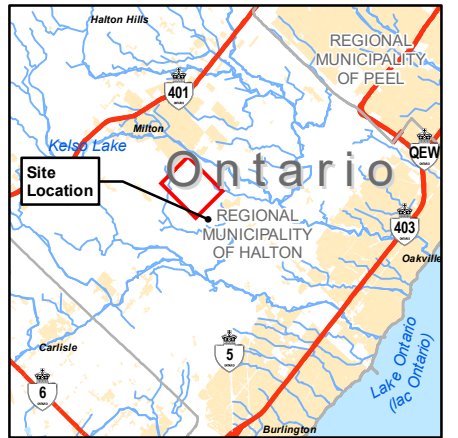
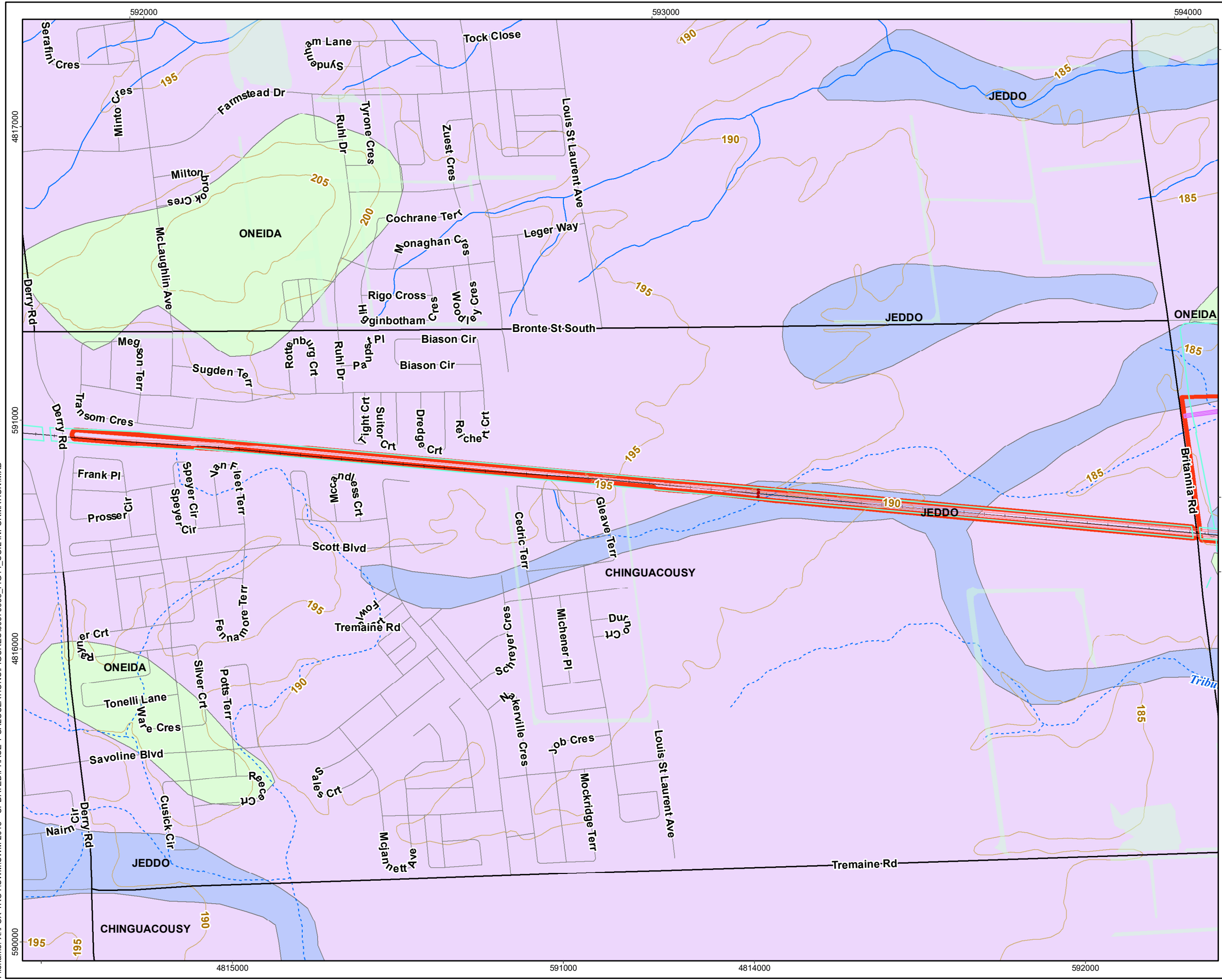


Key Map

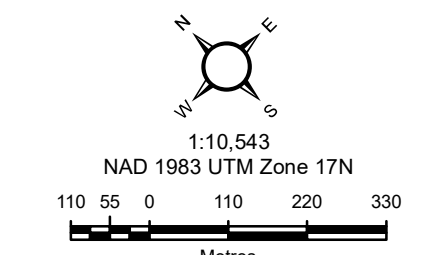
- Legend**
- CN ROW
 - Ditches and Swales
 - - - - Proposed Culverts
 - Proposed Tracks
 - Proposed Yard
 - Administration/Gate Area
- Roads**
- Major Road
 - Local Road
 - +— Railway
 - Ponds_Dec_2019
 - Contour (5m)
 - Study Area
- Water Features**
- Lake
 - River
- Streams**
- - - - Intermittent Stream
 - Permanent Stream



Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written



- Legend**
- CN ROW
 - Ditches and Swales
 - - - - Proposed Culverts
 - Proposed Tracks
 - Proposed Yard
 - Administration/Gate Area
- Roads**
- Major Road
 - Local Road
 - Railway
 - Ponds_Dec_2019
 - Contour (5m)
 - Study Area
- Water Features**
- Lake
 - River
- Streams**
- Intermittent Stream
 - Permanent Stream



Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

3. Stormwater Management Criteria

3.1 Design Criteria and Constraints

Stormwater management criteria have been developed from a combination of various elements of the Stormwater Management Planning and Design Manual (MECP, 2003), AREMA design criteria, Bronte Creek Watershed Study recommendations, Indian Creek / Sixteen Mile Creek Sherwood Survey Subwatershed Management Study outputs (Phillips, 2004), and conclusions from the Functional Stormwater and Environmental Management Strategy for the Boyne Survey Secondary Plan Area (AMEC, 2015). Applications of low impact development (LID) best management practices are recommended in the updated Boyne Survey Secondary Plan report (2015).

In addition, the final conditions as per the Final Decision Statement (January 2021) have been used to inform the stormwater management design. The Final Decision Statement for sections 5, 6, 7, 14 are referenced in **Appendix L**.

3.2 Quantity Control

Proposed storm sewers are to provide sufficient capacity to convey the minor (5-year) flow event.

During the major (100-year) flow event, conveyance is to be provided in order to limit ponding depth within the Terminal to a maximum allowable depth of 100 mm.

Post-development peak flow rates are to be controlled to the pre-development level during the 2-year event through to the Regional storm event (Regulatory storm is the greater of the 100-year and regional storm (the historical Hurricane Hazel storm event) that defines the extent of a riverine flood hazard in a given area). Requirements specific to the proposed SWM ponds are provided in **Section 3.4**.

The proposed culverts were evaluated against the hydraulic design criteria from Section 4.8 of the AREMA Manual of Railway Engineering. The minimum recommended criteria are as follows:

- A maximum headwater to depth (HW/D) ratio of 1.5 during the 100-year return period flood;
- No static head (i.e., HW/D must be < 1) during the 25-year return period flood; and
- A minimum freeboard of 2 feet (0.6 m) to the base of rail during a 100-year return period flood.
- For the provision of subdrainage, approximately 300 feet (91 m) of 6-inch (150 mm) intercepting drain may be used before a change to a larger size is necessary. A slope to ensure a velocity of 2 feet per second (0.6 m/s) should be used for all pipes. Where periodic cleaning of subdrains is required, 6-inch (150 mm) pipe or larger is recommended.

It is important to note that the 100-year criteria for $HW/D < 1.5$ should be considered in conjunction with the individual site conditions at each culvert to ensure that a HW/D greater than 1.0 does not result in upstream flooding of private landowners and infrastructure and/or embankment failure due to hydrostatic pressure resulting from high headwater levels upstream of the culvert. This consideration is addressed in the Indian Creek Tributary A and C Crossing Report (AECOM, 2020). The crossing report will require a cross check and to be updated once phase 2 is completed.

The design criteria applied to drainage ditching within the rail corridor requires the ditching to convey the 100-year flow with a freeboard of 0.3 m.

3.2.1 Upstream Surface Water Effects

Any alterations to the existing culverts or the drainage hydraulic characteristics by the proposed works should not increase flooding upstream if there are potential impacts to any structures or private property. Several culverts are

located in areas downstream of proposed development areas throughout the project study limits. These culverts should provide conveyance for the uncontrolled Regulatory Storm from the developed areas without increasing the upstream flood hazard. This consideration is addressed in the Indian Creek Tributary A and C Crossing Report (AECOM, 2020). The crossing report will require a cross check and to be updated once Phase 2 is completed.

3.2.2 Fish Passage

The following list of criteria relates to stormwater management as set out by DFO in Paragraph 35(2)(b) Fisheries Act Authorization. Conditions that relate to measures and standards to avoid and mitigate impacts to fish and fish habitat are as follows:

- Sediment and erosion control: Sediment and erosion control measures must be in place and shall be upgraded and maintained, such that release of sediment is avoided at the location of the authorized work, undertaking, or activity.
- To protect spawning fish, their incubating eggs and larval life stages, no in-water works shall occur during the restricted activity timing window of March 15 to June 30 of any given year, unless otherwise approved in writing by DFO and the Ontario Ministry of the Environment, Conservation and Parks (MECP).
- All in-water activities shall be undertaken in isolation (i.e., cofferdam) of open or flowing water to avoid introducing sediment into the watercourse.
- Temporary cofferdams shall consist of non-permeable material and only materials free of silt and other fine particles shall be used; earthen cofferdams shall not be used for this purpose.
- The natural flow of water downstream shall be maintained in each watercourse for the duration of in-water construction activities.
- the water shall be released into a well-vegetated area or settling basin and not directly into any fish-frequented waters. Water returned to fish-frequented waters shall be of equal or better quality than the receiving waters.
- The outlet shall have a diffuser to dissipate energy or shall be placed in a location that is not subject to erosion from the outflow.
- Any excavated or stockpiled material shall be stored above the high water level, and located and stabilized so that it cannot enter the watercourse.
- Appropriately sized, clean rock shall be used to stabilize eroding or exposed areas, and shall be installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment. Any rip rap, cobble and/or gravel used for the project must be clean and free of fine sediments and shall not be taken from below the normal high-water line of any waterbody.

As for the stormwater perspective, hydraulically speaking, there should not be an increase in velocity of water due to the new proposed works (Practitioner's Guide to Fish Passage for DFO Habitat Management Staff, 2007). A migration delay of 3 days during a 1 in 10-year flow event is recommended by DFO for the assessment of fish passage (Practitioners Guide to Fish Passage for DFO Habitat Management Staff, DFO, 2007).

3.2.3 Water Balance

As specified in the conditions 6.2.1 to 6.2.3 of the Final Decision Statement (January 2021), CN is to maintain baseline drainage and inflows and outflows to and from any pre-existing wetland that are to be retained within the Designated PDA following construction. This includes:

- conducting a feature-based water balance analysis for all wetlands with drainage areas that may be affected by the development by maintaining a balance between infiltration, runoff and evapotranspiration;
- use of the water balance assessment results to inform the design and maintenance of any replacement wetlands; and
- use the water balance assessment result to inform the design and installation of the stormwater management system.

These criteria are addressed in **Section 5** of this document.

3.3 Quality Control

Enhanced (formerly Level 1) Protection as per the MECP guidelines has been applied to areas of increased imperviousness. 80% Total Suspended Sediments (TSS) Removal has been provided on a long-term basis.

During construction, an Erosion and Sediment Control (ESC) plan will be developed and be implemented by the contractor (Erosion and Sediment Control Implementation Plan, Dufferin Construction Company, November 2021). Additional supporting ESC plans for the corridor, minor and major culverts, ditches, outfall outlets, Tributary C realignment have been implemented by AECOM (Erosion and Sediment Control Plans Drawings, AECOM April 2021).

3.3.1 Salt Management

The Final Decision Statement states that CN shall not use salt for de-icing or traction control purposes within the Designated Project Development Area (PDA) during any phase of the Designated Project, other technically and economically feasible methods for de-icing or traction control purposes may result in unsafe construction conditions or unsafe railway or facility operation. In the event that salt must be used, a salt management plan will be implemented to mitigate salt loading into the stormwater management system, and CN will provide the plan and mitigation measures to the relevant regulatory bodies before implementing the use of salt.

For this project, there will be no salt used during the construction phase. CN is committed to providing a salt management plan prior to facility operation.

3.3.2 Thermal Mitigation

As part of the existing conditions site characterization and EIS completed previously, Stantec characterized the thermal regime of Indian Creek and its associated tributaries. The study found that Indian Creek and the associated tributary areas draining the PDA are warm water features. Analysis of temperature data collected in support of the Milton Logistics Hub Technical Data Report - Hydrology and Surface Water Quality Baseline Study and Effects Assessment (Stantec 2015) corroborates the thermal regime classifications provided in background data (CH 2002 and 2009). The data collected is consistent with the warmwater thermal regime and associated warmwater fish communities of Indian Creek and Tributary A.

Criteria for the SWM Facility includes measures, where feasible, to mitigate thermal impacts of the development on Indian Creek and its tributaries, which have been identified as warmwater watercourses. These measures include:

- plantation along the wet ponds and outlet channel to provide dense shading;
- maintain grassed swales;
- design of a reverse bottom draw outlet pipe; and
- vegetated berms.

While cooling trenches may also be utilized in order to provide thermal mitigation in some applications, they are most effective when the runoff is able to mix with shallow groundwater before being discharged. As shallow groundwater is not present within the area, cooling trenches will have limited benefit in this location. Therefore, the specification of reverse bottom draw outlet pipes and strategic planting of the ponds is recommended.

3.4 Stormwater Management Facility

With development, catchment areas are typically characterized by an increase in impervious surfaces due to asphalt paving, building construction, etc. The increase in impervious surfaces disturbs the area's natural hydrologic cycle and increases the runoff rates and volumes, as well as potentially impacting water quality; this runoff can carry with it

sediments and other contaminants from paved surfaces. The purpose of a stormwater management strategy is to mitigate the impacts of increased runoff from a developed area. The stormwater management strategy includes the design of two wet ponds as stormwater management (SWM) facilities. The relevant design requirements are summarized in **Table 7** and described below. The requirements are partially informed by previously completed studies (e.g., Phillips, 2004 and AMEC, 2015) for the adjacent properties and are understood to be appropriate for the PDA.

The ponds are to meet the following criteria:

- two stormwater management ponds that contain flows up to the 1:100-year storm event and can attenuate and manage flows up to the Regional storm event, identified locally as Hurricane Hazel;
- a minimum of 0.6 m of stormwater pond freeboard during the 1:100-year storm event;
- low flow orifice outlets in the ponds for the 25 mm return period storm event which will release the detention volumes over an approximately 3-day period in order to mitigate against receiving watercourse erosion;
- Oil Grit Separator (OGS) units for the administration and maintenance buildings, workpads, and gate area to capture sediments, oil and grease before discharge to the wet ponds;
- shut off valves to be installed on the stormwater management pond outlets;

The required erosion control volume and unitary peak flow rates for the 25-year and 100-year events are taken from the Functional Stormwater and Environment Strategy for the Boyne Survey Secondary Plan Area and the Indian Creek/Sixteen Mile Creek Subwatershed Management Study, as listed in **Table 7** and described in the following subsection. The Regional Storm is managed according to existing flows from the catchment area. The Regional Storm is attenuated even though a portion exits via the spillway, as a significant portion of the total flow is captured within the pond.

Table 7: Detention Ponds – Stormwater Management Criteria

Quantity Component	Parameter	Unit	Pond 1	Pond 2
		Area	(ha)	52.80
	Imperviousness	(%)	50.00	50.00
	Total storage requirement ¹	(m ³ /ha)	179.20	179.20
		(m ³)	9,462	8,924
Permanent Pool Volume ¹	Volume	(m ³ /ha)	139.2	139.2
		(m ³)	7,350	6,933
Extended Detention ¹	Volume	(m ³ /ha)	40	40
		(m ³)	2,112	1,992
Erosion ²	Volume	(m ³ /impervious ha)	375	375
		(m ³)	9,900	9,338
	Flow Rate ³	(m ³ /s/ha)	0.001	0.001
		(m ³ /s)	0.06	0.06
25 year ²	Volume	(m ³ /impervious ha)	600	600
		(m ³)	15,840	14,940
	Flow Rate	(m ³ /s/ha)	0.01	0.01
		(m ³ /s)	0.53	0.50
100 year ²	Volume	(m ³ /impervious ha)	850	850
		(m ³)	22,440	21,165
	Flow Rate	(m ³ /s/ha)	0.023	0.023
		(m ³ /s)	1.21	1.15
Regional Storm ⁴	Volume	(m ³)	35,667	37,525
	Flow Rate	(m ³ /s)	6.98	7.90

Notes: 1. Ministry of Environment, Stormwater Management Planning and Design Manual, 2003

2. Cumulative Unitary Volume and Unitary Discharge as described in Table 4.2.5 of the Functional Stormwater and Environment Strategy, Boyne Survey Secondary Plan Area Draft Final, AMEC, November 2015

3. $m^3/s/ha$ is updated from 0.004 (from Boyne Survey Plan) to 0.001 to reflect a 2-day drawdown time. m^3/s is also updated from 0.02 to 0.06 to reflect a 2-day drawdown rate.
4. Based on existing conditions flows.

MOE Table 5.2 provides wet pond storage requirements of 140 m^3/ha for 35% imperviousness, and 190 m^3/ha for 55% imperviousness. For the 50% imperviousness on the site, AECOM interpolated this Table for a required wet pond storage volume of 179.2 m^3/ha (note-AECOM used a non-linear best fit line of the MOE requirements). Of this, 40 m^3/ha is for extended detention, so the permanent pool volume requirement for Level 1 enhanced treatment is 139.2 m^3/ha . This is the requirement presented in Table 7 of the SWM report, and it is correct. It leads to a permanent pool volume requirement of 7,350 m^3 for pond 1, and 6,933 m^3 for pond 2. The ponds are hence sufficiently sized.

3.4.1 Stormwater Management Criteria for Indian Creek Tributaries

The Subwatershed Planning Study for Sixteen Mile Creek Watershed (Areas 2 & 7), and the Indian Creek/Sixteen Mile Creek Subwatershed Management Study provided preliminary volumetric requirements for extended detention (erosion control) and flood control, on an impervious hectare basis, and corresponding unitary discharge rates, based upon the total contributing drainage area, for the Boyne Survey Area at the outlets to the receiving watercourses within the Sixteen Mile Creek and Indian Creek Subwatersheds. These requirements have been updated based upon the detailed hydrologic analyses completed in support of the Secondary Plan for the existing and future uncontrolled land use conditions. The requirements are listed in **Section 3.4**. Based on the design requirements, the following stormwater management strategy has been evaluated:

- Erosion controls for all future development within the Boyne Survey Area based on subwatershed targets for the Indian Creek Subwatershed and local targets established within Subwatersheds 2 & 7 of the Sixteen Mile Creek Watershed.
- Stormwater quantity controls for the Boyne Survey Area to each of the PDA outlets at Britannia Road, as well as the portion of the Boyne Survey Area which discharges to the Centre Tributary.
- No stormwater quantity controls (flood management) for the areas discharging directly to the Sixteen Mile Creek Main Branch

The HSP-F hydrologic model which was developed for the future land use condition within the Boyne Survey Area has been used in order to determine the requisite unitary storage and discharge criteria for flooding and erosion control. Routing elements have been added to the outlet of each subcatchment representing the future urban development within the Boyne Survey Area. The unitary storage and discharge values for erosion and flood control have been iteratively adjusted until the requisite erosion and flood control have been achieved. The unitary volume at each outlet of the Boyne Survey Area has been adjusted by incremental multiples of 25 $m^3/imp. ha$, recognizing the assumptions regarding the discrete drainage area boundaries contributing to each drainage outlet for the Boyne Survey Area.

The storage requirements for the Boyne Survey Area (Specifically for Node 9.120) are presented in **Table 8** and have been applied to this site.

Table 8: Stormwater Management Facility Sizing Criteria (as per Table 4.2.5 AMEC, November 2015)

Quantity Component	Cumulative Unitary Volume ($m^3/impervious ha$)	Unitary Discharge ($m^3/s/ha$)
Node 9.120		
Erosion	375	0.001
25 Year	600	0.01
100 Year	850	0.023

3.4.2 Pond and Grading

The stormwater management ponds have been designed to facilitate ease of maintenance. As a minimum, the pond was designed to meet the following criteria:

1. Topographic Conditions: The wet ponds have been located in a large, relatively flat area downslope from developed areas.
2. Slope grades: Slopes are varied between 3:1 to 7:1.
3. Water Edge Treatment: Provides ease of egress from water. There is a 6:1 terrace at the permanent pool edge, 3 m wide on either side of the permanent pool.
4. Fencing: Prevents access and falls. Any slopes steeper than 3:1 have fencing where vegetative barriers and/or terracing would not be practical or effective.
5. Maintenance access Road: This is to facilitate access for maintenance vehicles to critical pond features. The criterion is that roads are constructed on a granular base, covered with grass and minimum topsoil, 3 m wide within a 4 m "no shrub/tree" zone, 2% crossfall, and a maximum 4:1 (H:V) grade.
6. Access to Pond Inlet/Outlet: Facilitates maintenance of pond inlets/outlets. Routes, accessible by personnel and maintenance vehicles, to top and bottom of inlet and outlet structures have been constructed.
7. Access to Sediment Forebay: Facilitates removal of sediments. The grade of ramp is < 6:1 above the permanent pool for a length of 9 m from the permanent pool edge.
8. Sediment Forebay Bottom Treatment: Provides adequate bearing capacity for maintenance vehicles removing sediment. A 3 m wide ramp of adequate bearing capacity continues along bottom of forebay if bearing capacity of native soils is inadequate.
9. Vegetation: Stabilizes ground surface, enhance stormwater control effectiveness, safety and aesthetics. Vegetation is to include only native species which require minimal maintenance and which are suited to variations in water levels experienced in ponds (i.e. see MOE guidelines).
10. Sediment Dewatering Area: the objective is to dewater sediment. Temporary dewatering areas for sediment have been identified for use in the future.
11. Subsurface Conditions: Extended Detention Wet Ponds are generally not feasible in areas with shallow bedrock and should not be located on fractured bedrock because runoff may seep into fractures which may discharge directly to a waterbody or be drawn into a water supply well with no pollutant removal. A 1 m minimum separation distance is maintained.
12. Depth to Groundwater: The permanent pool elevation is more than three feet above the seasonal high-water table. This protects the pond from constant spring fed flow through. It also protects side slopes from becoming unstable and eroding.
13. Setback from Natural Water Bodies: The basin has been set at least 5 m away from any wetland, stream, river, lake, or coastal estuary.
14. Setback from Regional Flood Line: The basin has been set at least 15 m away from the Regional floodline.
15. Setback from Property Lines: The basin has been set at least 10 m away from the property line.
16. Setback from Live Rail Tracks: The basin has been set at least 60 m away from live rail tracks.

3.4.3 Outlet control (Bottom Draw and Shut-off Valve)

As discussed in Section 3.3.2, a bottom draw outlet is required, where feasible, to mitigate thermal impacts associated with stormwater warming in the stormwater management ponds.

To mitigate a potential spill on site, manually operated gate valves have been included in the design of each pond outlet. Gate valves are simply a shut-off device used to stop any discharge through the pond outlet. These valves should not be used to throttle flow. They should be either totally open or totally closed.

Based on the permanent pool surface area of the ponds, shutting the gate valves would provide approximately 44,362 m³ of storage in the ponds prior to overtopping of the outlet weir.

3.4.4 Freeboard

The stormwater management ponds have an emergency spillway to convey overflow during extreme storm events such as 100-year event. The spillway consists of a lined channel. At a minimum, the spillway must convey a flow equal to the 100-year, 24-hour peak inflow from the basin, while maintaining 0.6 m of pond embankment freeboard above the water elevation in the basin and least 0.3 m of freeboard is provided during the Regional Storm.

3.4.5 Oil Grit Separator (OGS) Units

Oil-Grit Separators (OGS) are devices designed to provide an enhanced (formerly Level 1) Protection as per the MECP guidelines has been applied to areas of increased imperviousness. 80% Total Suspended Sediments (TSS) Removal has been provided on a long-term basis.

OGS units for the administration and maintenance buildings, workpads and gate areas were sized using the PCSWMM software for Stormceptor. The size of the OGS unit is based on the catchment area, percent imperviousness, total suspended solids (TSS) removal targets, historical rainfall data and particle size distribution of the particles to be removed. The OGS unit is sized to capture fine particles and oil and grease as no additional quality pre-treatment upstream of the SWM pond is provided.

4. Stormwater Management Design

The final design of Milton Logistics Hub will be built on approximately 160 ha of land, located largely between the existing tracks and Tremaine Road. Included are mobile reach stacker crane operations, tracks (re-aligned mainline, service tracks, and pad tracks), work pads, facilities, and roadways as shown on **Figure 4** and **Figure 5**, and summarized below:

- Reach Stacker Crane Operations: providing lifts between rail and road transportation;
- Tracks: realignment of the mainline, and the addition of service tracks and pad tracks to access pads;
- Work Pads: for loading/unloading activities and temporary storage of containers and trailers;
- Facilities: administration building, wash down area, maintenance building; and
- Roadways: access to the facility is be provided in addition to a parking lot area.

Of the 160 ha project footprint, approximately 50 ha is to become impervious under the final development conditions. The final development could impact stormwater characteristics in terms of quantity and quality. The SWM strategy includes conveyance considerations for the designed storm sewer system and the vegetated ditches, management of flows through the culverts within the PDA, treatment of collected flows with the use of Oil and Grit Separator (OGS) units and wet pond SWM Facilities. These elements of the SWM strategy are included to mitigate potential impacts to stormwater quantity and quality.

4.1 Treatment Train

Traditional forms of development are associated with a range of stormwater management challenges, including higher peak flows due to the collection and transmission efficiency of storm sewers, larger total volumes of stormwater runoff resulting from increases in catchment imperviousness, and overall decreases in water quality related to land use activities, winter maintenance, vehicles and traffic. The majority of these problems are not adequately addressed by “end-of-pipe” controls (i.e., stormwater management ponds) alone. To address these challenges, a “treatment train” approach to managing stormwater runoff from the site has been developed.

The stormwater treatment train approach uses a combination of source, conveyance, and end-of-pipe stormwater management practices to detain, attenuate and treat stormwater runoff along its path of travel and prior to discharge from a site. As noted by CVC (2010), a treatment train approach is usually required to meet the multiple objectives of stormwater management, which include maintaining the hydrologic cycle, protecting water quality, and preventing increased erosion and flooding.

The stormwater servicing design utilizes a treatment train approach to managing stormwater from its point of collection, along its path of travel, and at the end-of-pipe through the incorporation of several features. For example; 110 hectares of open green space, which is designed to maintain a large percentage of the total perviousness within the PDA in order to ensure that rainfall and snowmelt can continue to be infiltrated. Parking lot-level ponding is designed to attenuate peak stormwater flows to the SWMFs, thereby helping to augment the performance of the SWMFs themselves. Furthermore, basic swales are designed to provide for collection, attenuation, primary filtration of runoff from the track area. The swales are designed to be vegetated features and the plants growing within will make use of some of the stormwater collected by the features.

OGS units are designed to provide additional water quality pre-treatment for both total suspended solids (TSS) and oils and greases. The pre-cast structure of OGS units are designed to help and provide containment of potential spills, and this helps to protect both ground and surface water resources downstream of the OGS units. The SWMFs are designed to include a number of water quality enhancement considerations: ample woody vegetation is to be included around the perimeter of each SWMF – including throughout the berm and outlet channel areas – in order to provide enhanced shading of detained stormwater. A reverse slope bottom-draw outlet has also been designed in order to ensure that the coolest stormwater is discharged from each SWMF.

4.2 Final Conditions Hydrology

The stormwater management strategy implemented for this site consists of a treatment train approach, involving a system which includes storm sewers, culverts, OGS units, grassed swales, and stormwater management ponds in order to provide quantity and quality control of the runoff from the development. In addition to the quantity and quality control, the storm sewers and culverts within the site are designed to convey the design flows for each structure. This management approach serves runoff from the internal development areas and provides conveyance of flows from external catchment areas and watercourses. The major external drainage relevant to this site is addressed in the Indian Creek Tributary A and C Crossing Report (AECOM, 2020). The crossing report will require a cross check and to be updated once phase 2 is completed.

The hydrologic conditions summarized in this section have been used to design a stormwater management system that collects and treats all stormwater run-off from the terminal prior to release to Indian Creek or Tributary A, as recommended in Final Decision Statement 5.9, which includes the diversion of Tributary A for the Regional event around the PDA and into Indian Creek via interception with a perimeter ditch, and the stormwater management facility criteria described in **Section 3.4**.

The final conditions impacting the Logistics Hub were assessed and designed using the same methodology described in **Section 2.1**, after modifying the land use and imperviousness to reflect the final development. The final development and the catchment areas are shown in **Figure 4** and **Figure 5**. The files and outputs are provided in **Appendix B**.

Pond 1, located on the western side of the PDA, is designed to drain to Tributary A, and to collect runoff from a catchment area of 52.80 ha with a proposed 50% imperviousness. Pond 2, located on the eastern side of the PDA, is designed to drain to Indian Creek, and to collect runoff from a catchment area of 49.80 ha at a proposed 50% imperviousness.

Additionally, in order to assess the conveyance of flows for the rail work and related culverts and ditches, the proposed development flows to each of the culverts were assessed. In most instances, additional trackage within an existing rail corridor has a negligible impact on the quality and quantity of stormwater runoff and the necessary location of storm outlets. However, the quality and quantity of stormwater runoff and the location of outlets may be impacted by activities such as regrading, grade separation, the construction of access roads, and the development of station facilities. A larger impact on water quality is anticipated due to the construction and paving of the yard area, hence OGS units and water quality ponds have been specified for such areas. Culverts and ditches provide conveyance but not peak flow control.

The hydrologic modeling parameters are summarized in **Table 9** and detailed model input and output files are provided in **Appendix A**. Catchment ID 403 and 405 were modeled using the VO3 Standhyd approach.

Table 9: Visual OTTHYMO Input Parameters - Proposed Conditions

Catchment ID ¹	Total Area (ha)	Slope (%)	Length (m)	Time to Peak (hr)	SCS Curve Number ²	Initial Abstraction (I _a) (mm)
2911	40.1	0.6	850	1.25	74	5
2912	112.7	0.6	1600	1.95	75	5
1291	132.7	0.6	1600	2.76	75	5
1292	81.3	0.6	1450	2.36	76	5
1293	86.4	0.6	1450	1.97	74	5
401	10.6	0.6	350	0.72	74	5
402	16.6	0.6	1500	2.49	74	5
403	52.8	0.6	-	-	74	5
404	5.9	0.6	250	0.54	76	5

2852	17.5	0.6	350	0.74	74	5
2853	137.8	0.6	1600	2.33	75	5
285	48.6	0.6	800	1.02	75	5
301	34.4	0.6	630	0.77	74	5
302	45.2	0.6	750	1.01	74	5
405	49.8	0.6	-	-	74	5
406	9	0.6	450	0.70	74	5
303	45.3	0.6	760	1.00	75	5
304	28.2	0.6	280	0.41	71	5
407	9.9	0.6	125	0.33	74	5
408	7.4	0.6	300	0.35	75	5
409	15.2	0.6	300	0.68	76	5
305	77.2	0.6	950	1.52	74	5
306	28	0.6	800	1.29	74	5

Notes: 1. Catchment IDs shown on **Figure 6**.
2. SCS Curve Numbers based on Antecedent Moisture Condition (AMC) II.

Rational Method

The procedure and results for this method are provided in **Appendix B**. The design criterion applied to drainage ditch sizing which conveys the 100-year peak flow. The peak flows for the ditches and culverts are summarized in **Table 101**. Catchment areas for the ditches are shown in **Appendix A**.

Visual OTTHYMO

Visual OTTHYMO analysis was used to estimate peak flows. Design calculations and the Visual OTTHYMO detailed output file and analysis are provided in **Appendix B**.

Peak flows at all rail crossings were determined by using the maximum value provided by the Rational Method or Visual OTTHYMO and are shown in **Table 10**. The catchment peak flows are shown in **Table 11**. Culverts that are within the development area of the Milton yard, 100-year and regional uncontrolled flows under development conditions were designed and calculated. Refinement to the hydrology model will be made if required once phase 2 design is completed.

Table 10. Culvert and Ditch Peak Flows

Feature	Drainage ID	Culvert Mileage (Station)	Ditch Station	2-yr Peak Flow (m ³ /s)	25-yr Peak Flow (m ³ /s)	100-yr Peak Flow (m ³ /s)	Regional Peak Flow (m ³ /s)
Culvert/Ditch	4001	37.00 (59+543.78) (Culvert 13)	59+505.3- 59+556.8	0.09 - RM	0.16 - RM	0.21 - VO	-
Culvert/Ditch	4002	37.2 (59+869.25) (Culvert 12)	59+660.6- 60+147.4	0.14 - RM	0.25 - VO	0.35 - VO	-
Culvert/Ditch	4003	37.63 (60+567.18) (Culvert 11)	60+168.7- 60+725.6	0.04 - RM	0.06 - RM	0.09 - VO	-
Culvert	4004	37.63 (60+590.81 R) Protect	-	0.02 - RM	0.03 - RM	0.05 - VO	-

Feature	Drainage ID	Culvert Mileage (Station)	Ditch Station	2-yr Peak Flow (m ³ /s)	25-yr Peak Flow (m ³ /s)	100-yr Peak Flow (m ³ /s)	Regional Peak Flow (m ³ /s)
		Existing Culvert					
Ditch	4005	-	60+780-61+315	0.02 - RM	0.03 - RM	0.05 - VO	-
Ditch	4006	-	61+315-61+425	0.02 - RM	0.03 - RM	0.05 - VO	-
Culvert	4007	(61+425 to 61+750)	-	0.03 - RM	0.06 - VO	0.08 - VO	-
Culvert	4007-1	(61+750 to 62+375)	-	0.07 - RM	0.13 - VO	0.18 - VO	-
Culvert	4008	38.31 (61+756) (Culvert 9)	-	0.16 - RM	0.29 - VO	0.41 - VO	-
Culvert	4009	38.52 (61+993) (Culvert 8)	-	0.04 - RM	0.08 - VO	0.11 - VO	-
Culvert/Ditch	4010	(62+665) under access road pass	62+373.3-62+650	0.06 - RM	0.12 - VO	0.17 - VO	-
Culvert/Ditch	4011	(63+550 to 63+948.6) (Culvert 2C)	62+650-63+550	0.73 - RM	1.24 - RM	1.74 - VO	-
Culvert/Ditch	4012 (2A/2B)	39.67 (63+958) (Culvert 2A and 2B)	63+960.8-64+900	2.0 - VO	6.8 - VO	9.8 - VO	23.7
Culvert/Ditch	4013	(65+328)	64+560-65+320	0.1 - RM	0.17 - VO	0.25 - VO	-
Culvert/Ditch	4014	40.64 (65+400) (Culvert 3)	64+900-64+424	1.16 - RM	2.01 - VO	2.85 - VO	5.6
Ditch	4015	-	65+150-64+424	0.08 - RM	0.14 - VO	0.19 - VO	-
Culvert	4016	40.70 (65+525) (Culvert 7)	-	1.0 - VO	3.3 - VO	4.7 - VO	9.5
Culvert/Ditch	4017	-	65+550-66+077.9	0.26 - RM	0.46 - VO	0.56 - VO	-
Culvert/Ditch	4018	-	65+550-66+200	0.08 - RM	0.13 - RM	0.19 - VO	-
Culvert/Ditch	4019	-	66+200-66+322	0.1 - RM	0.18 - VO	0.25 - VO	-
Culvert	4020	(10+380) Culvert under access road	-	0.39 - RM	0.73 - VO	1.02 - VO	-
Culvert	4021 (C1)	(10+200) (Culvert 1)	-	1.0 - VO	3.3 - VO	4.7 - VO	10.6
Culvert	5000	37.98 (61+125.5) (Culvert 10)	-	0.46 - RM	0.77 - RM	1.1 - VO	2.8
Culvert	4-403	(11+950) (Culvert 4)	-	3.0 - VO	7.6 - VO	9.9 - VO	6.7

Feature	Drainage ID	Culvert Mileage (Station)	Ditch Station	2-yr Peak Flow (m ³ /s)	25-yr Peak Flow (m ³ /s)	100-yr Peak Flow (m ³ /s)	Regional Peak Flow (m ³ /s)
Culvert	5-410	(12+535) (Culvert 5)	-	1.0 - VO	2.5 - VO	3.3 - VO	2.2
Culvert	5a-405	-	-	2.8 - VO	7.2 - VO	9.3 - VO	6.3
Ditch	6002	-	62+375- 62+675	0.2 - RM	0.34 - RM	0.41 - RM	-
Ditch	6003	-	62+760- 63+025	0.03 - RM	0.07 - VO	0.09 - VO	-
Ditch	6004	-	63+025- 63+430	0.04 - RM	0.07 - RM	0.09 - RM	-
Ditch	6005	-	63+430- 63+975	0.06 - RM	0.1 - RM	0.13 - VO	-
Ditch	6006	-	63+975- 64+230	0.02 - RM	0.04 - VO	0.06 - VO	-
Ditch	6007	-	64+230- 64+625	0.02 - RM	0.04 - VO	0.05 - VO	-

Note: * RM = Rational Method is higher peak value, VO = Visual OTTHYMO is higher peak value.

*The largest catchment area directed to the ditch has been adopted for this assessment, mileage is approximate.

*Some dashes "-" for the Regional peaks because the drainage areas are small.

Table 11. Proposed Drainage Areas Peak Flows

Drainage ID	2-yr Peak Flow (m ³ /s)	25-yr Peak Flow (m ³ /s)	100-yr Peak Flow (m ³ /s)	Regional Peak Flow (m ³ /s)
2911	0.34 - VO	1.15 - VO	1.64 - VO	-
2912	0.71 - VO	2.38 - VO	3.38 - VO	8.0
1291	0.64 - VO	2.15 - VO	3.06 - VO	7.7
1292	0.46 - VO	1.53 - VO	2.17 - VO	-
1293	0.52 - VO	1.76 - VO	2.51 - VO	-
401	0.13 - VO	0.45 - VO	0.64 - VO	-
402	0.09 - VO	0.3 - VO	0.43 - VO	-
403	3 - VO	7.6 - VO	9.9 - VO	6.3
404	0.08 - RM	0.24 - VO	0.34 - VO	-
2852	0.22 - VO	0.73 - VO	1.04 - VO	-
2853	0.76 - VO	2.5 - VO	3.6 - VO	8.8
285	0.49 - VO	1.7 - VO	2.34 - VO	4.5
301	0.42 - VO	1.41 - VO	2 - VO	-
302	0.45 - VO	1.52 - VO	2.16 - VO	-
405	2.82 - VO	7.2 - VO	9.3 - VO	6.0
406	0.23 - VO	0.79 - VO	1.12 - VO	-
303	0.47 - VO	1.58 - VO	2.24 - VO	-
304	0.46 - VO	1.62 - VO	2.33 - VO	-
407	0.35 - VO	1.2 - VO	1.73 - VO	-
408	0.14 - VO	0.48 - VO	0.68 - VO	-
409	0.22 - VO	0.73 - VO	1.03 - VO	-

305	0.57 - VO	1.91 - VO	2.73 - VO	-
306	0.23 - VO	0.79 - VO	1.12 - VO	-
2911	0.34 - VO	1.15 - VO	1.64 - VO	-
2912	0.71 - VO	2.34 - VO	3.4 - VO	7.9
1291	0.64 - VO	2.12 - VO	3.12 - VO	7.7
1292	0.46 - VO	1.53 - VO	2.17 - VO	-
1293	0.52 - VO	1.76 - VO	2.51 - VO	-
401	0.13 - VO	0.45 - VO	0.64 - VO	-
402	0.09 - VO	0.3 - VO	0.43 - VO	-

Note: * RM = Rational Method is higher peak value, VO = Visual OTTHYMO is higher peak value.

*The largest catchment area directed to the ditch has been adopted for this assessment, mileage is approximate.

*Some dashes "-" for the Regional peaks because the drainage areas are small.

4.2.1 Feasibility of LID Application

The latest Ontario-specific guidance regarding the use of low impact development (LID) best management practices (BMPs) advises that water balance (i.e. stormwater retention features) are not suitable for application in areas which experience winter maintenance in the form of salt or sand application or areas with industrial land uses. In such circumstances LID guidance recommends use of non-infiltrating measures such as filtration systems, which have been included within the design in the form of both the swales and the OGS units. OGS units are an appropriate BMP for this site because they provide pre-treatment upstream of the SWM ponds, and also function in such a way that they help to contain oil, grease and related deleterious substances. The swales help to provide some additional stormwater pre-treatment, while providing a more natural landscaped feature that promotes vegetation (as compared to storm sewers).

4.2.2 Uncontrolled Flows Hydrology

As part of the proposed development, Tributary A is to be diverted from its original alignment and its flows conveyed through single span culverts (Culverts 2A and 2B) under the yard and gate area as shown on **Figure 6**. Tributary A drains an area of approximately 366.2 ha and includes external areas located west of Britannia Road, and this is shown on **Figure 6**. The areas located west of Britannia Road are being developed (catchment # 2911- Sherwood Survey Area) or proposed for development (catchment # 2912- Boyne Survey Area). The preferred stormwater and management strategy for the Boyne Survey Area was outlined in the Functional Stormwater and Environmental Management Strategy report (AMEC, 2015). This report recommends stormwater management criteria for quality and quantity to mitigate the potential impacts of development proposed in this area. While developing the stormwater management strategy for the proposed MLH, AECOM designed the proposed development using uncontrolled future flows within the MLH property. However, the regional storm event is used for uncontrolled conditions.

The drainage infrastructure (Culvert 2A, 2B, 1 and associated channels) conveying these external flows across the MLH were designed for uncontrolled future flows, and the design assesses the impact of upstream external uncontrolled flows passing through the proposed MLH, along with possible mitigation measures.

A hydrologic model of the PDA was prepared using the Visual OTTHYMO (VO3) hydrologic modeling software package to estimate peak runoff rates and volumes from the catchment areas. Detailed description of the model, input parameters and assumptions have been provided in **Section 2.1.7**. For the external areas draining through the site Tributary A, one scenario was analyzed where it was assumed that the proposed condition flows from the MLH site will be controlled to the pre-development levels. To determine the future land use for the external areas east of Britannia Road and assess future uncontrolled development flows, AECOM reviewed available studies and proposed land use plans for the Sherwood and Boyne Survey Areas. The Boyne Survey Secondary Plan was prepared to house 50,000 residents when fully implemented. The Plan applies to the Milton Urban Expansion Area, which is south of the Bristol Survey and Sherwood Survey Secondary Plan Areas. The area is around 930 hectares within:

- Louis St. Laurent Ave. to the west
- James Snow Pky. to the north
- Britannia Rd. to the east
- Tremaine Rd. to the south

These plans include:

- Indian Creek / Sixteen Mile Creek Sherwood Survey Subwatershed Management Study, Town of Milton, Phillips Engineering, May 2005;
- Functional Stormwater and Environmental Management Strategy, Boyne Survey Secondary Plan Area – Town of Milton, AMEC, November 2015;
- Boyne Survey Secondary Plan Master Plan, Appendix C.10.A, Town of Milton, July 2017;
- Britannia Road Transportation Corridor Improvement: Tremaine Road to Highway 407 Class EA Study, Hydraulic Analysis of Stream Crossings and Stormwater Management Alternatives Assessment, Aquafor Beech Limited, Revised 20 December 2013; and
- Draft subdivision plans (available on the Town of Milton website).

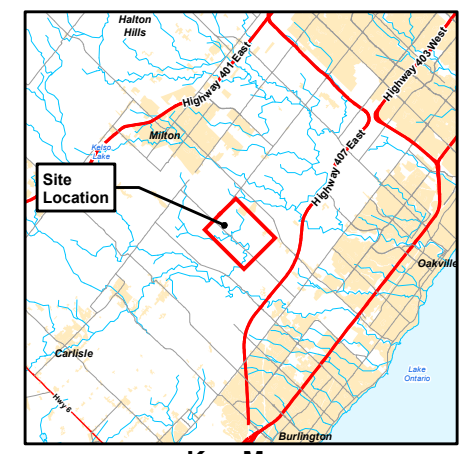
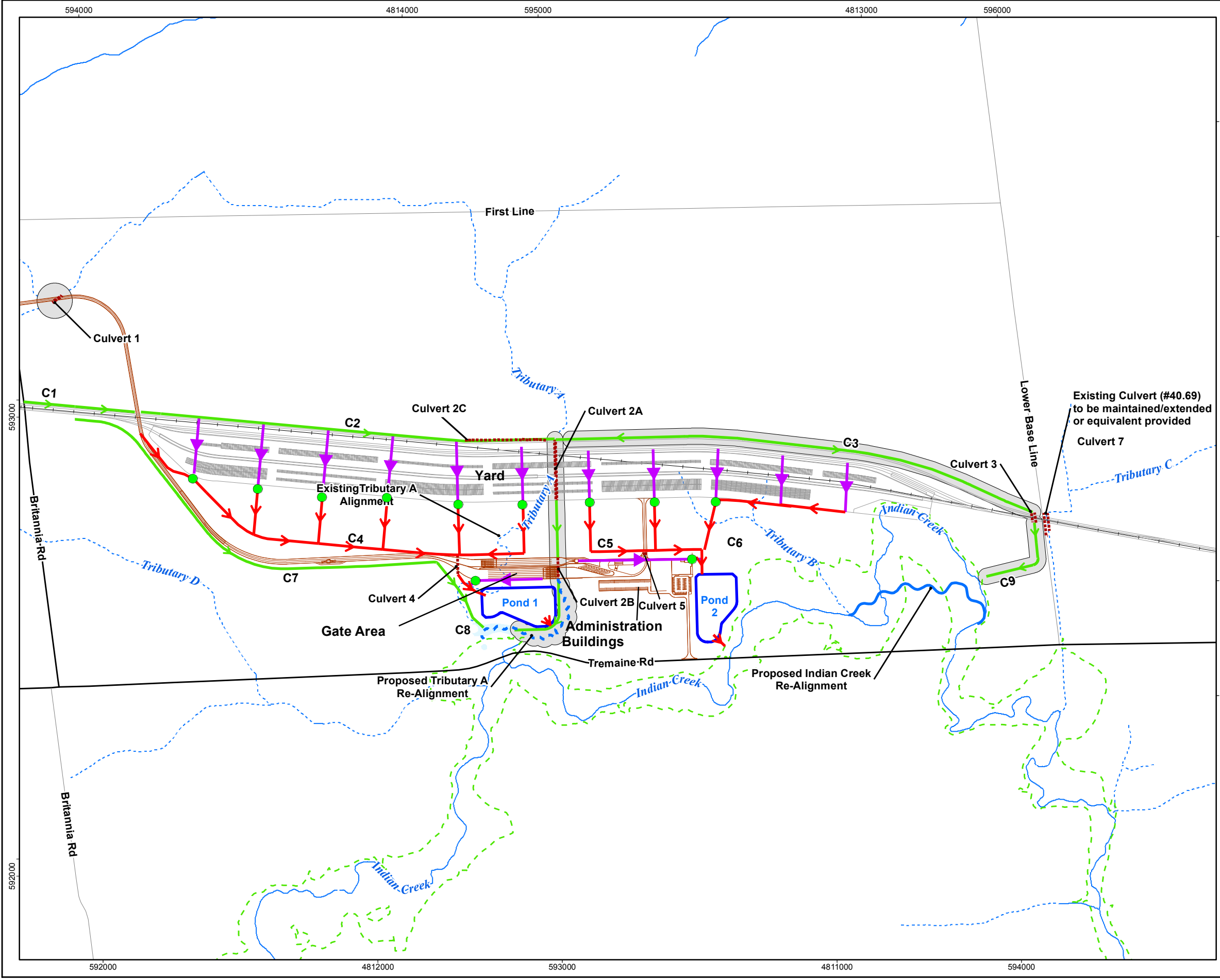
Upon review of the above study reports and draft plans, it was determined that the future land use for the Tributary A areas located west of Britannia Road includes natural heritage systems, district park areas, Institutional areas, residential/office areas, secondary mixed-use node areas and major node areas. The proposed future land use plan for the Boyne Survey area is included in **Appendix G**. Since the exact configuration and extent of the future land use is not known at this phase, uncertainty exists in the estimation of overall imperviousness of the future land use for the purpose of hydrologic modeling. Alternatively, the Functional Stormwater and Environmental Management Strategy report for the Boyne Survey Secondary Plan Area (AMEC, 2015) provides an assessment of the uncontrolled peak flow rates (without SWM facilities) for the future land use at Britannia Road. These peak flow rates (AMEC 2015 - Table 4.2.3, included in **Appendix G**) were estimated using the HSP-F hydrologic model in continuous simulation mode and were therefore considered to be appropriate for this level of study. Details pertaining to the HSP-F model are provided in **Section 3.4**

The uncontrolled peak flow rates (from the HSP-F model, AMEC 2015) at Britannia Road were added as constant flows in the AECOM hydrologic model to estimate external flows reaching the proposed MLH. Simulations were conducted for the 25-year, 100-year and the Regional Storm event and results are summarized in **Table 12**. As noted in the table, the uncontrolled peak flow rates at Britannia Road are higher than the controlled peak flow rates by 33% and 31% during the 100-year and the Regional Storm event, respectively. Similarly, at Culvert 2A/2B, the uncontrolled peak flow rates are higher than the controlled peak flow rates by 21% during the 100-year and the Regional Storm event. The potential uncontrolled flows would affect Culvert 5, Culvert 2A/2B, Culvert 4 and the associated drainage swales as shown on **Figure 17**. Further hydraulic analysis confirming the landuse and imperviousness have been implemented to adjust flows.

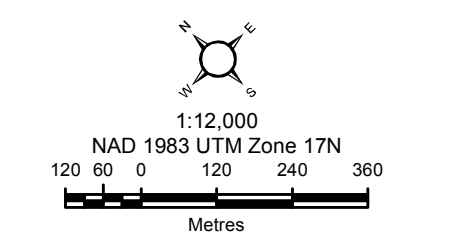
Table 12: Comparison of Controlled and Uncontrolled External Peak Flow Rates (m³/s)

Location	Drainage Infrastructure	Hyd No.	HEC-RAS XS No.	Controlled Flows			Uncontrolled Flows			% Difference		
				25 yr.	100 yr.	Reg.	25 yr.	100 yr.	Reg.	25 yr.	100 yr.	Reg.
Tributary A - Britannia Road	Culvert 1	9120	-	3.4	4.9	11.2	5.8	7.2	16.1	41	33	31
Tributary A - North of Tracks	-	4012 / 2920	1083.57	6.8	9.8	23.7 (13.7 spill)	10.9	12.4	38.3	37	21	38
Tributary A - North of Tracks (MLH Boundary)	Culvert 2A/2B	92	1062.61	6.8	9.8	9.8	10.9	12.4	12.2	37	21	21
Tributary A - Pond 1 Outlet	Channel C8	135	338.04	7.4	10.8	15.7	11.4	13.3	18.3	35	19	14
Tributary A - Agriculture Pond	Channel C8	2930	126.57	7.8	11.4	17.9	11.8	14.0	20.6	34	18	13
Diversion Channel - C3	Channel C3	93	-	2.8	4.0	18.2	2.8	4.0	20.4	0	0	11
Diversion Channel - Culvert 3	Culvert 3	93	-	2.8	4.0	18.2	2.8	4.0	20.4	0	0	11
Diversion Channel - C9	Channel C9	95	-	2.9	4.2	18.3	2.9	4.21	20.8	0	0	12

Last saved by: LEVESQUEI (2016-05-24) Last Plotted: Tue May 24, 2016
 File name: P:\60332275\900-WORK\920-929 (GIS-GRAPHICS)\MAPS\WORKING\SWM 2016\60332275_FIG2_SWMCONCEPT_ADMINAREA.MXD
 Project Management Initials: Designer: IL Checked: JK Approved:
 ANS/B 279.4mm x 431.8mm



- Legend**
- - - - - Proposed Culverts
 - C4 Proposed Ditches with Channel Identification No.
 - C6 Southern Swale with Channel Identification No.
 - Oil-Grit Separator
 - Proposed Storm Sewer
 - Proposed Ponds
 - Proposed Yard
 - Administration Building/ Gate Area
 - Proposed Tributary A Re-Alignment
 - Proposed Indian Creek Re-Alignment
- Water Features**
- Lake
 - Intermittent Stream
 - Permanent Stream
 - Existing Floodplain
 - Drainage Infrastructure Affected by Uncontrolled Flows at Britannia Road



Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

4.3 Lot Level Controls and Oil and Grit Separators

One of the stormwater management water balance criteria is to minimize impacts to run-off volumes where practical. Lot-level controls refer to the practice of implementing multiple, small-scale systems of water treatment and detention systems throughout the relevant portions of the PDA, such as through the use of soakaway pits or rain barrels.

The stormwater management criteria require management of the site water balance to minimize adverse impacts. Rainwater harvesting cisterns to collect water from building rooftops for irrigation of landscaped areas or for re-use in grey water systems or for washing of equipment will contribute to minimizing impacts to the water balance.

Rainwater is a resource and will be captured and utilized rather than disposed of quickly. Harvesting and re-use of stormwater for non-drinking purposes not only reduces the runoff and pollution in the receiving watercourses but also reduces the water supply demand. Rainwater can be harvested between the months of April to October each year and utilized for non-potable purposes (e.g. toilet flushing and landscape irrigation). The non-drinking uses at the proposed site will potentially consist of:

- Irrigation of landscaped areas;
- Provision of wash down services for machinery. An estimated 570 L (150 US gal) per week per machine will be required to clean all machinery. With 20 machines, this equates to a total volume of 11,400 L/week (3,000 gallons/week, 11.4 m³/week or 1.6 m³/day); and
- Grey water systems.

The rainwater will be directed to a cistern from the rooftops of the proposed garage and administration buildings. The buildings have a combined roof area of 1,900 m². Water from the rooftops of both buildings will be collected into a storage tank and pumped through a distribution system for the above purposes.

A preliminary rainwater harvesting calculation was carried out using the rainfall/precipitation records collected at the MECP Georgetown climate station from 1984 to 2013 (30 years), refer to **Appendix H** for details. The results showed that the average rainfall during the year (April – October) is approximately 475 mm. With a cistern of 20 m³, an average of 321 m³ of water can be harvested each year.

Therefore a cistern having a volume of 20 m³ and a collection system to harvest rainwater from the roof of the administration building and a distribution system for reuse will be implemented.

In addition to the rainwater harvesting, the development area has retained portions of grassed areas and 7.4 hectares of open green space, which will maintain a large percentage of the total perviousness within the PDA in order to ensure that rainfall and snowmelt can continue to be infiltrated, as well as grassed swales, to provide some water quality improvement and infiltration. This has been taken into account in the water balance assessment in **Section 5**. Goss traps will be placed in the catchbasins within the development area, which will capture sediment and debris and provide further water quality benefits.

4.3.1 Oil and Grit Separators for the Yard and Parking Lot

Pre-treatment in areas of elevated pollutant loading (i.e., high density commercial and industrial developments) may be necessary to decrease the sediment loads reaching the basin. Pre-treatment can be provided by several best management practices (BMPs). For the PDA, flow entering the basin through a pipe should be pretreated with a water quality inlet device such as an oil grit separator.

Oil-Grit Separators (OGS) are devices designed to separate and settle hydrocarbons and suspended solids. Typically utilized as end-of-pipe solutions to provide treatment prior to discharge. OGS units could be utilized upstream of each outfall in the project limits (administration and maintenance buildings, gate area and work pad areas). This helps the capture of sediment or to provide pre-treatment prior to discharging to wet ponds. The benefits of utilizing OGS units include minimizing the treatment footprint compared to other treatment measures as they often occupy the same footprint of a standard maintenance hole. They do not provide any benefit for quantity control or

water balance. Enhanced (formerly Level 1) Protection as per the MECP guidelines has been applied to areas of increased imperviousness. 80% Total Suspended Sediments (TSS) Removal has been provided on a long-term basis.

OGS units have been implemented downstream of heavily used paved areas (yard terminal outlets, workpads, parking lot area, and administration building) to pre-treat runoff prior to discharging to the SWM pond. The integration of the oil grit separator into the treatment system allows for additional removal of contaminated coarse sediment and capture of floatable hydrocarbons prior to discharge to the pond. Some benefits of including oil grit separators as pretreatment devices include:

- Extension of the operational life of stormwater management facilities;
- Extension of maintenance intervals; and
- Prevention of oil sheen within the pond.

OGS separators will be installed for the administration and maintenance buildings, gate area and work pad areas to capture sediment, oil and grease before discharge to the SWM ponds in accordance with Condition 5.2.2 of the Final Conditions (IAAC, 2021). The units will be installed for the Gate area and Terminal outlets 1 to 9, as shown on **Figure 4**. The OGS units provide water quality control by trapping and collecting sediment, debris, and oil from the influent flows and discharging the cleaned water. A schematic of an OGS unit that will be installed is provided in **Figure 18**.

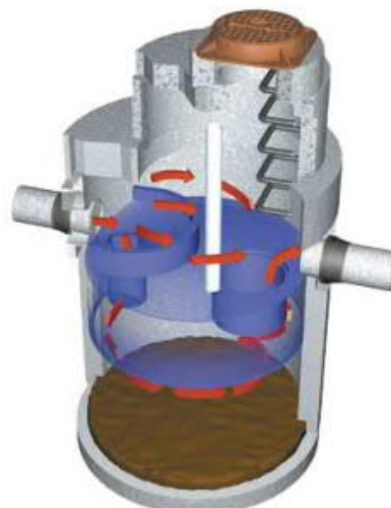


Figure 18: OGS Unit

OGS units for the administration and maintenance buildings, workpads and gate areas were sized using the PCSWMM software for Stormceptor. The size of the OGS unit is based on the catchment area, percent imperviousness, total suspended solids (TSS) removal targets, historical rainfall data and particle size distribution of the particles to be removed. The OGS unit is sized to capture fine particles and oil and grease as no additional quality pre-treatment upstream of the SWM pond is provided. The resultant sizes of the required Stormceptor are summarized in

Table 13 below, and a detailed sizing report is provided in **Appendix E**.

Table 13: Oil Grit Separators Sizing Summary

Location	Drainage Area (ha)	Imperviousness (%)	TSS Removal Target (%)	OGS Unit Size or Equivalent	25-yr Peak Flow (m ³ /s)	No. of OGS Units
Gate Area 1	3.7	100	80	Fine Particles	STC 14000	1

Gate Area 2 +Administration & maintenance Buildings	3.3 (excluding roof area)	100	80	Fine Particles	STC 14000	1
--	---------------------------------	-----	----	----------------	-----------	---

AECOM consulted Echelon Environmental in order to specify appropriate OGS units for the yard outlet locations. Echelon obtained the preliminary site plans and design parameters that AECOM provided for the yard drainage and used this information to design a suitable OGS unit for outlets 1 through to 9. **Table 14** below summarizes the key sizing information required for the OGS units based on the Terminal layout design. Sample drawings for the 9 OGS units are provided in **Appendix E**.

Table 14. CN Milton Yard – OGS Design Summary

Location	Area (ha)	Pipes are designed for 100yr (m ² /s)	Imperviousness (%)	PSD	Inlet Pipe (mm)	Outlet	Treatment Level	OGS Unit	Mahole Size (feet)	Total Holding Volume (L)	Sediment Capacity (L)	Oil Capacity (L)	Budgetary Price** OGS ONLY	Comments
Outlet 1	1.84	1.01	90%	FINE	1050	to swale/dich	Level 1 "Enhanced" (80%) TSS removal	PMSU 3025	6'	4,916	2,402	795	\$ 34,500	Inline
Outlet 2	3.65	1.72	90%	FINE	1200	to swale/dich	Level 1 "Enhanced" (80%) TSS removal	PMSU 4030	8'	9,425	4,270	1,612	\$ 58,000	Offline
Outlet 3	3.15	1.67	90%	FINE	1050	to swale/dich	Level 1 "Enhanced" (80%) TSS removal	PMSU 3035	6'	5,718	2,402	994	\$ 48,000	Offline
Outlet 4	2.58	1.25	90%	FINE	1050	to swale/dich	Level 1 "Enhanced" (80%) TSS removal	PMSU 3030	6'	5,284	2,402	895	\$ 39,000	Offline
Outlet 5	4.68	2.42	90%	FINE	1350	to swale/dich	Level 1 "Enhanced" (80%) TSS removal	PMSU 4040	8'	10,915	4,270	1,970	\$ 70,000	Offline
Outlet 6	2.63	1.35	90%	FINE	1050	to swale/dich	Level 1 "Enhanced" (80%) TSS removal	PMSU 3030	6'	5,284	2,402	895	\$ 39,000	Offline
Outlet 7	2.57	1.28	90%	FINE	1050	to swale/dich	Level 1 "Enhanced" (80%) TSS removal	PMSU 3030	6'	5,284	2,402	895	\$ 39,000	Offline
Outlet 8	2.99	1.49	90%	FINE	1050	to swale/dich	Level 1 "Enhanced" (80%) TSS removal	PMSU 3035	6'	5,718	2,402	994	\$ 48,000	Offline
Outlet 9	5.61	2.36	90%	FINE	1300	to swale/dich	Level 1 "Enhanced" (80%) TSS removal	PMSU 4045	8'	11,508	4,270	2,149	\$ 78,000	Offline
												Subtotal	\$ 453,500	
Notes / Assumptions														
** The prices noted are only for the OGS units only, for an assumed depth of 2m from T/G to invert elevations. The diversion structure costs are not included. 1) All manholes are based on the assumption of straight through pipes. In other cases the size of the manhole may need to be increased.														

Details of the parking lots' OGS units are included in **Appendix I**.

4.4 Conveyance System

4.4.1 Proposed Storm Sewer Networks

Storm sewer sizing has been completed based on the following criteria:

- Yard Area – Sized to convey the 5-year return period without surcharging. Additionally, the storm sewers in this area were sized in order to maintain a maximum ponding depth of 100 mm during the 100-year storm event to prevent flooding of the tracks;
- Administration Building Area – Sized to convey the 5-year return period event with a major flow route to the adjacent swale; and
- Gate Area – Sized to convey the 5-year return period event with major flow route to the adjacent swale.
- Inlet Entry Time – 10 minutes

There are five locations for which storm sewer infrastructure is to be included which were assessed by AECOM and Crozier & Associates (parking lot area). Spreadsheet calculations showing their storm sewer network are included in **Appendix I**. The first location is the Lower Baseline Road storm sewer network, located just under the Lower Baseline Road bridge within the proposed grade separation location. **Table 15** summarizes the details of the storm sewer network at the Lower Baseline Grade Separation. The storm sewers are designed to convey the 100-year event. A summary of the storm sewer hydraulic calculations and a map of the plan layout is included in **Appendix A** and **Appendix D**, respectively.

The second location is the Milton CN Intermodal Terminal storm sewer network, which has a total of 235 pipe segments and 226 catch-basin manholes and 452 inlet catch-basins. Refer to **Appendix D** for details related to the proposed storm sewer network for the Milton CN Intermodal Terminal. The storm sewers are designed to convey the 100-year event. Depth of ponding at the top of inlets should not exceed 100 mm to prevent flooding of the tracks. A

summary of the storm sewer hydraulic calculation is included in **Appendix D**. Detailed drainage maps and network connections are shown in, **Figure 19, Figure 20, Figure 21** and **Figure 22**. Typical cross sections of the proposed storm sewer network for the yard are shown in **Appendix J** (Typical Section A – Sheet 01-C-1059).

The third location is the storm sewer network proposed to serve the area between Britannia Road and Louis Saint Laurent Ave. There is an access road for maintenance vehicles to enter the rail corridor for service in this location. Catchbasin (CB) 29 to CB 39 outlet to a ditch. Water from both the paved access road surface as well as the subdrains located beneath the sub-ballast material discharge to the proposed storm sewer network. The proposed sewer network between Britannia Road and Louis Saint Laurent Ave has a total 11 pipe segments, 10 catch-basin manholes and 10 inlet catch-basins. **Table 16** summarizes the details of the storm sewer network between Britannia Road and Louis Saint Laurent Ave rail line. The storm sewers are designed to convey the 100-year event. A summary of the storm sewer hydraulic calculations and a map detailing the plan layout for this area is included in **Appendix A** and **Appendix D**. A typical cross section of the proposed storm sewer network for Britannia Road and Louis Saint Laurent Ave rail line is shown in **Appendix J** (Typical Section BC – Sheet 01-R-3501).

The fourth location for a proposed storm sewer network inclusion is located between Lower Baseline and Britannia Road, North of the yard pavement between stations 62+720 to 64+900. CBs 4 through 27, which collect water from ditches and subdrains with no proposed impervious area within the catchment, are proposed for this section. The water is collected and discharged to the storm sewer network at the Milton CN Intermodal Yard then discharged to an OGS unit. The OGS unit discharges water to grassed swales for further water quality treatment. The sewer network between Lower Baseline and Britannia Road North has a total of 16 pipe segments, 15 catch-basin manholes and 15 inlet catch-basins. **Table 17** summarizes the details of the storm sewer network between Lower Baseline and the Britannia Road North rail line. The storm sewers are designed to convey the 100-year event. A summary of the storm sewer hydraulic calculations and a map of plan layout is included In **Appendix A** and **Appendix D**. Typical cross sections of the proposed storm sewer network for Lower Baseline and Britannia Road North rail line are shown in **Appendix J** (Typical Section BR – Sheet 01-R-3508). all proposed storm sewer pipes have sufficient capacity to convey to 100-year event.

Crozier & Associates designed the details of the parking lot and administration building drainage system. Details of storm sewer layout and design sheet calculations are included in **Appendix I**. The fifth location serves the parking lot and administration building that consists of 22 pipe segments and 10 inlets catch basins. The storm sewers are designed to convey the 100-year event. The water is collected and discharged to the storm sewer network at administration building and parking lot are then discharged to an OGS unit. The OGS unit discharges water to interceptor ditch carrying water from terminal for further water quality treatment and then to pond 1.

Table 15. Storm Sewer Network for Lower Baseline Grade Separation.

From CB	to CB	US Invert Elevation (m)	DS Invert Elevation (m)	Length (m)	Slope (%)	Inlet CB ID	Rim Elevation (m)	Diameter (mm)	Depth of Cover (m)	MH Invert Elevation (m)
6	outlet	172.74	172.70	22	0.2	6	173.85	450	0.66	172.44
3	6	172.77	172.74	13.5	0.2	3	173.85	45	0.63	172.47
2	3	172.85	172.77	37.4	0.2	2	174.04	375	0.82	-
1	2	172.93	172.85	40	0.2	1	174.47	375	1.17	-
5	6	172.82	172.74	37.4	0.2	5	174.04	375	0.85	-
4	5	172.90	172.82	40	0.2	4	174.47	375	1.20	-

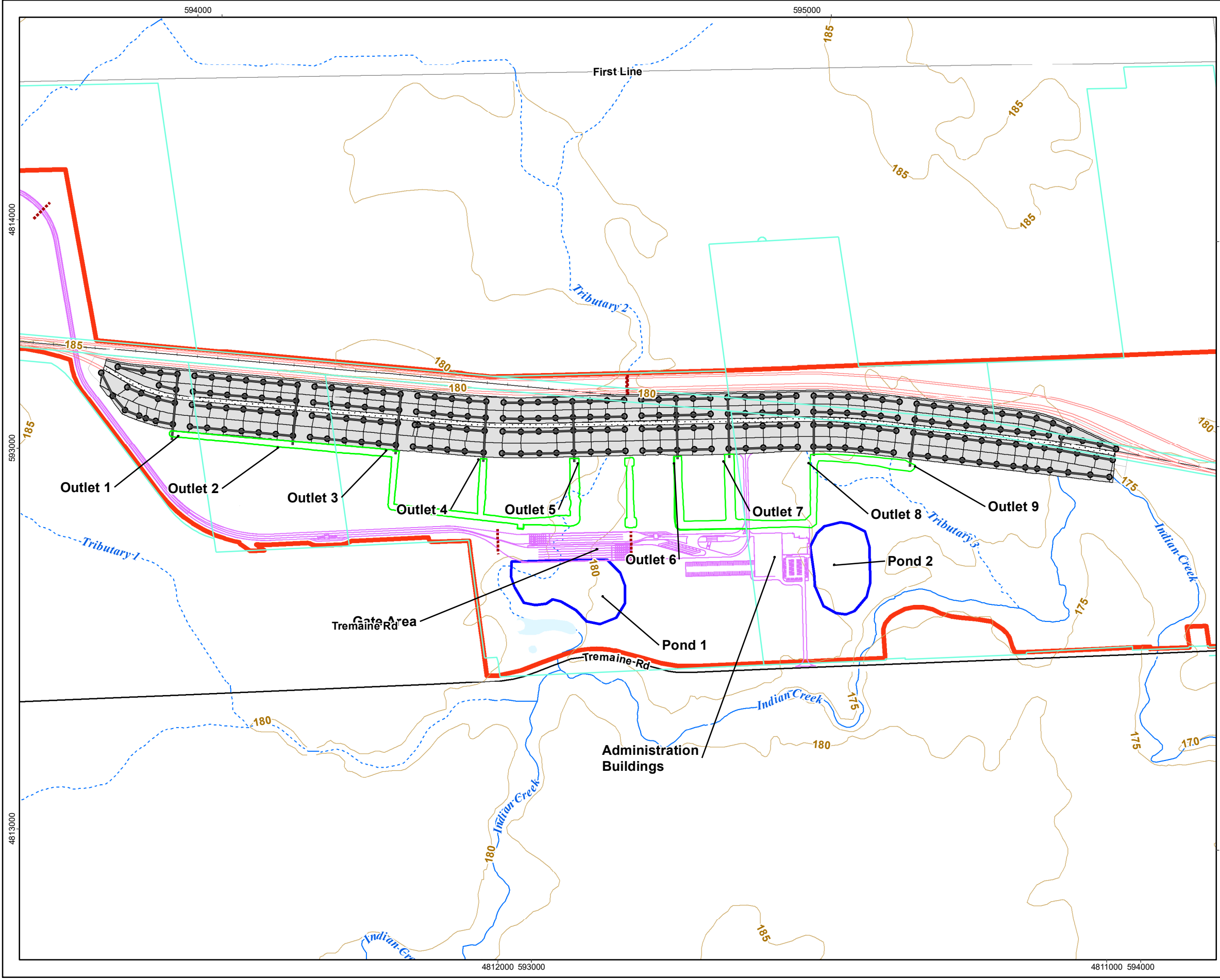
Table 16. Storm Sewer Network for rail corridor between Britannia Road and Louis Saint Laurent Ave

Station Extent	Drainage ID	From CB	To CB	Invert U/S	Invert D/S	Longitudinal Slope (%)	Pipe Diameter (mm)	Pipe Length (m)
61+300 to 61+400	9001-1	29	30	188.09	187.56	0.53	300	100
61+400 to 61+500	9002-1	30	31	187.56	187.02	0.54	300	100

61+500 to 61+600	9003-1	31	32	187.02	186.48	0.54	300	100
61+600 to 61+700	9004-1	32	33	186.48	185.94	0.54	375	100
61+700 to 61+800	9005-1	33	34	185.94	185.40	0.54	375	100
61+800 to 61+900	9006-1	34	35	185.40	184.86	0.54	375	100
61+900 to 62+000	9007-1	35	36	184.86	184.32	0.54	450	100
62+000 to 62+100	9008-1	36	37	184.32	183.78	0.54	450	100
62+100 to 62+200	9009-1	37	38	183.78	183.24	0.54	450	100
62+200 to 62+300	9010-1	38	39	183.24	182.70	0.54	450	100
62+300 to 62+372	9011-1	39	outlet	182.70	182.23	0.54	450	87.2

Table 17. Storm Sewer Network for rail corridor between Lower Baseline and Britannia Road North

Station Extent	Drainage ID	From CB	To CB	Invert U/S	Invert D/S	Longitudinal Slope (%)	Pipe Diameter (mm)	Pipe Length (m)
62+724 to 62+824	9012	4	5	181.16	180.88	0.30	300	92.1
62+824 to 62+915	9013	5	6	180.56	180.30	0.30	375	88.7
62+915 to 62+995	9014	7	8	180.81	180.58	0.30	300	75.7
62+995 to 63+100	9015	8	9	180.52	180.21	0.30	375	103.6
63+100 to 63+195	9016	9	10	180.15	179.87	0.30	375	93.7
63+325 to 63+435	9018	11	12	180.01	179.68	0.30	375	108.9
63+533 to 63+634	9020	13	14	179.98	179.68	0.30	375	100.0
63+634 to 63+731	9021	15	16	179.93	179.65	0.30	300	92.8
63+731 to 63+832	9022	16	17	179.55	179.25	0.30	375	100.0
63+965 to 64+072	9024	18	19	179.37	179.04	0.30	375	108.5
64+300 to 64+393	9027	21	22	178.92	178.65	0.30	375	92.3
64+515 to 64+393	9028	23	22	179.01	178.66	0.29	375	118.5
64+725 to 64+635	9030	25	24	178.77	178.55	0.25	400	88.2
64+825 to 64+725	9031	26	25	179.05	178.76	0.30	375	98.8
64+906 to 64+825	9032	27	26	179.29	179.09	0.25	375	79.9
64+975 to 64+906	9033	28	27	179.55	179.38	0.25	250	67.6



Legend

- CN ROW
- Ditches and Swales
- - - - - Proposed Culverts
- Proposed Tracks
- Proposed Yard
- Administration/Gate Area

Roads

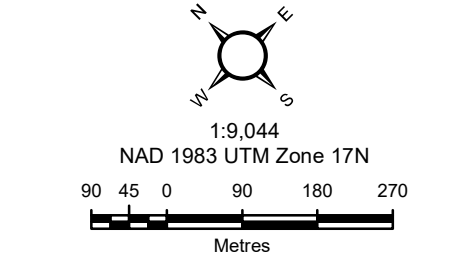
- Major Road
- Local Road
- +— Railway
- Contour (5m)
- Study Area

Water Features

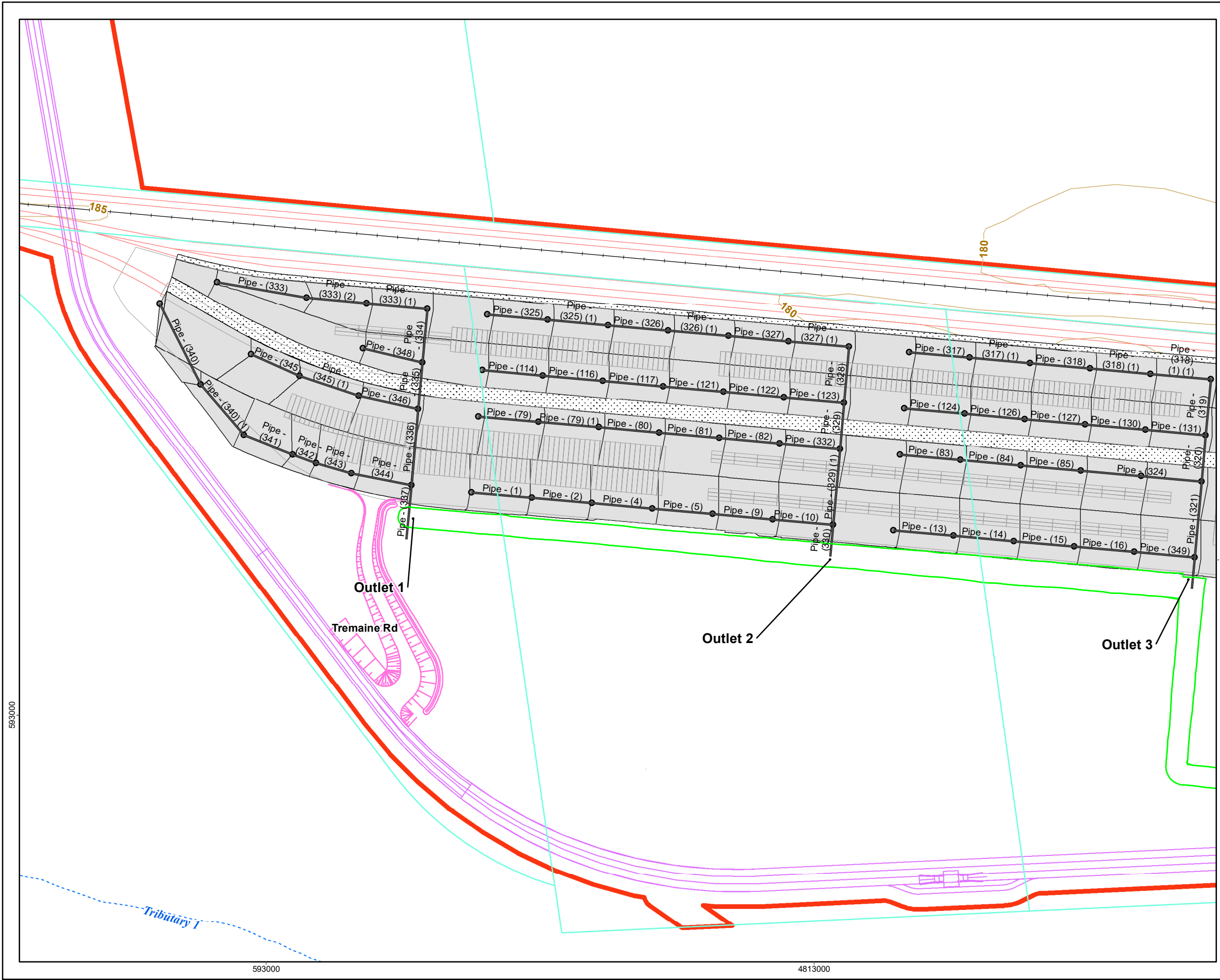
- Paved Surface Catchments
- Ballast Surface Catchments
- Pipe Network
- CB Manholes
- Lake
- River

Streams

- - - - - Intermittent Stream
- Permanent Stream

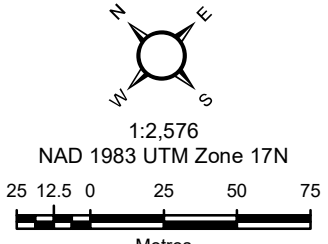


Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written



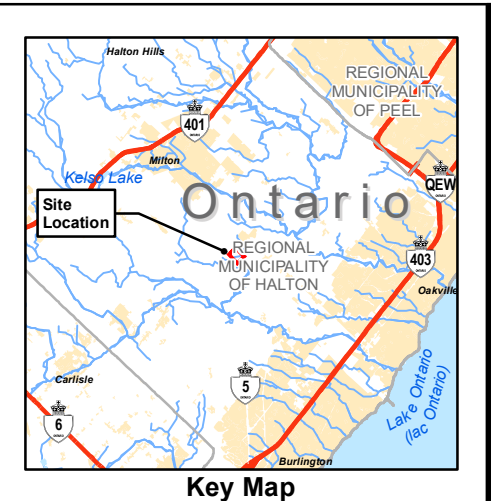
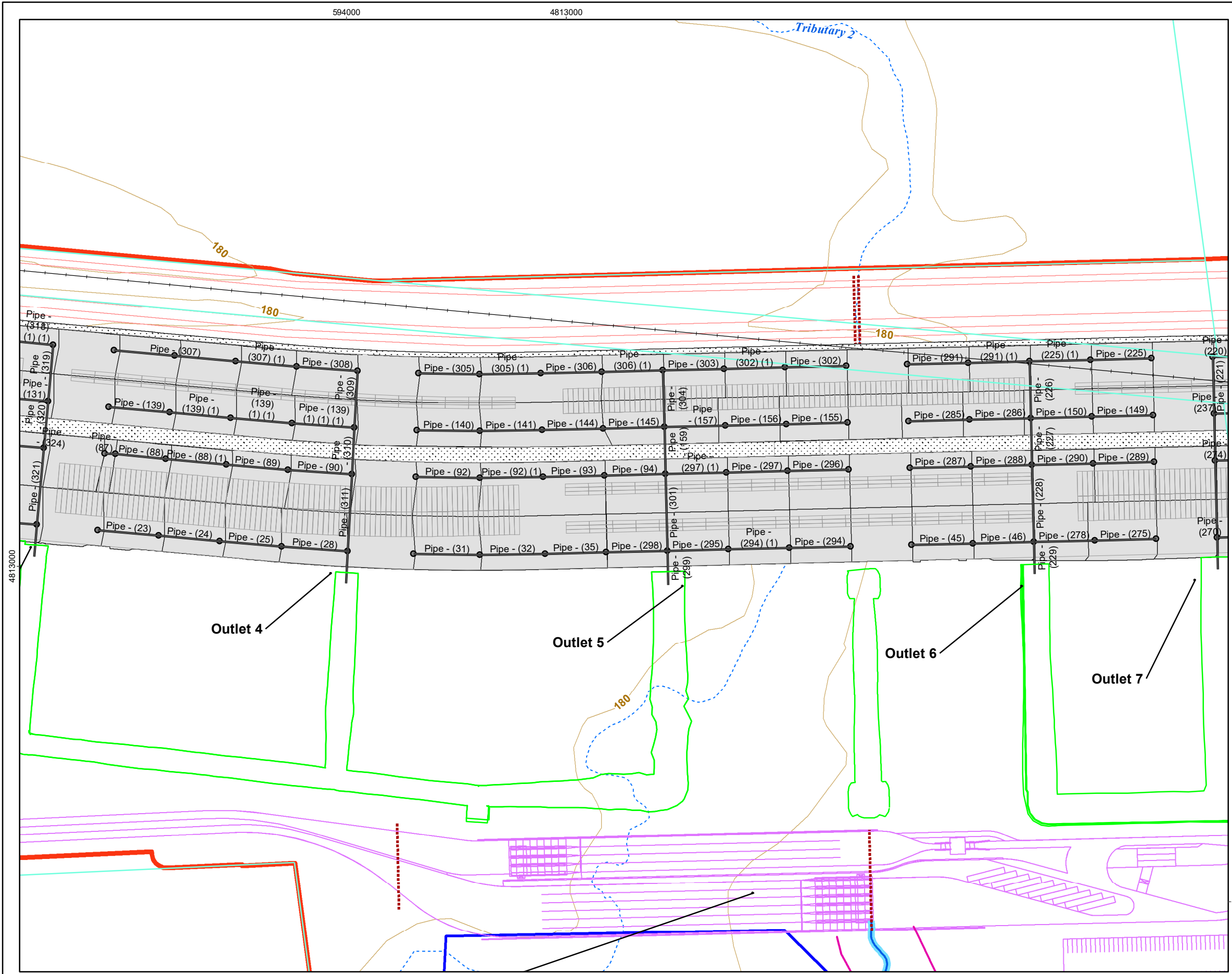
Key Map

- Legend**
- CN ROW
 - Ditches and Swales
 - - - - Proposed Culverts
 - Proposed Tracks
 - Proposed Yard
 - Administration/Gate Area
- Roads**
- Major Road
 - Local Road
 - Railway
 - Contour (5m)
 - Study Area
 - Paved Surface Catchments
 - Ballast Surface Catchments
 - Pipe Network
 - CB Manholes
- Water Features**
- Lake
 - River
- Streams**
- Intermittent Stream
 - Permanent Stream



Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

Last saved by: AWS,NABEL (2020-09-03) Last Plotted: Thu Sep 03, 2020
 Filename: X:\FOX TROT\SWM\SWM 2018 - UPDATED\PHASE 1 CALCULATIONS\FIGURES\60579933_FIG17_YARD_STODRAINAGE_PRODEV.MXD
 Project Management Initials: Designer: AN Checked: BT Approved: BR
 ANSIB 279.4mm x 431.8mm



Legend

- CN ROW
- Ditches and Swales
- Proposed Culverts
- Proposed Tracks
- Proposed Yard
- Administration/Gate Area

Roads

- Major Road
- Local Road
- Railway
- Contour (5m)
- Study Area

Water Features

- Lake
- River
- Intermittent Stream
- Permanent Stream

Streams

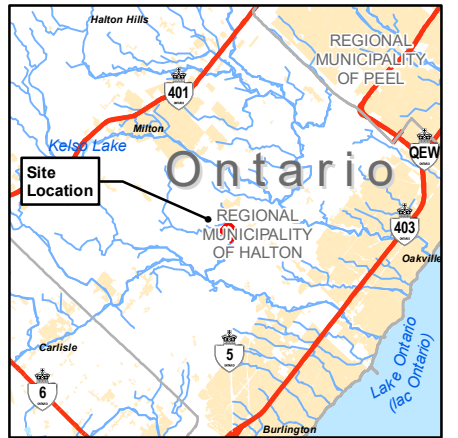
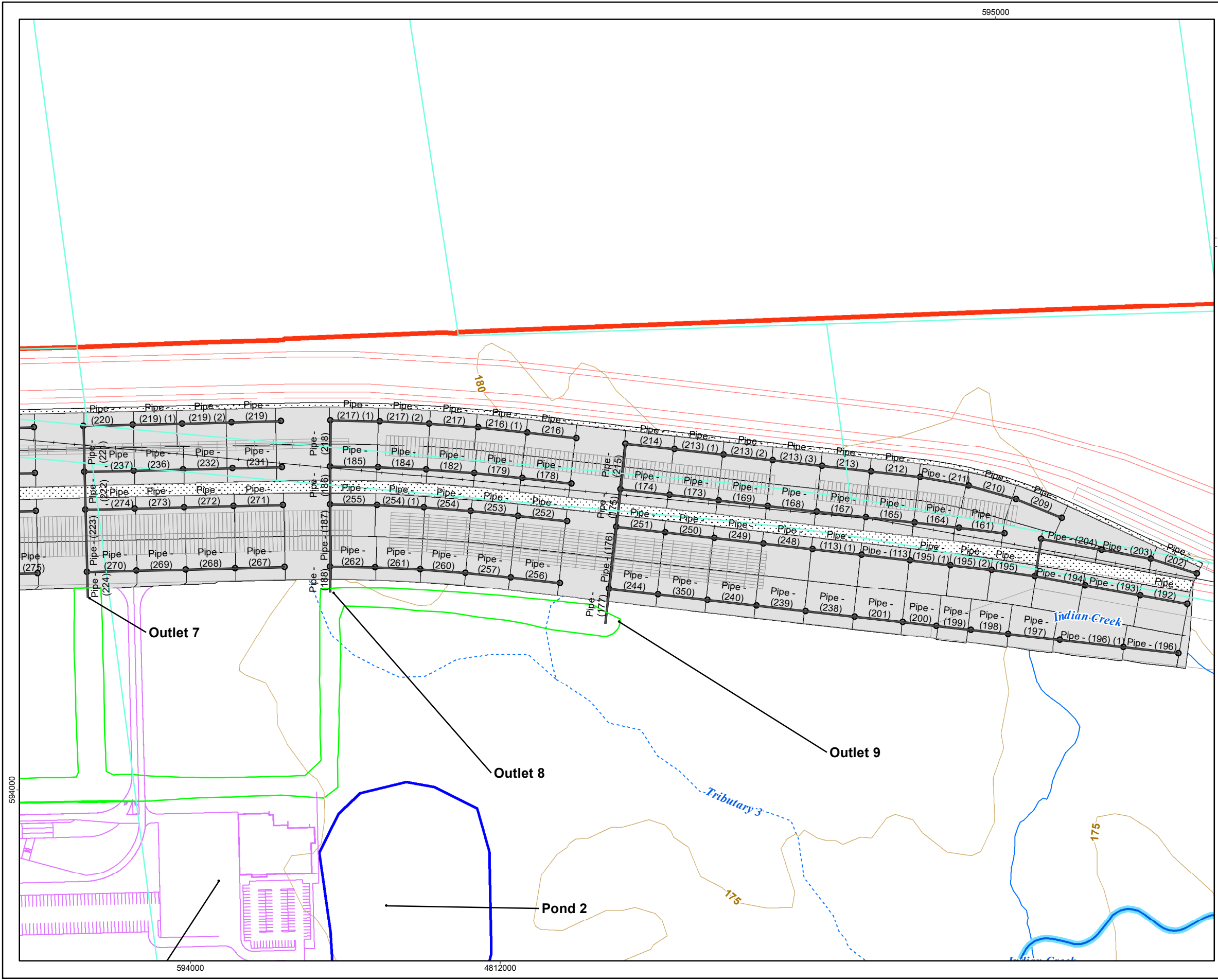
- Intermittent Stream
- Permanent Stream

Other Features

- ▨ Paved Surface Catchments
- ▨ Ballast Surface Catchments
- Pipe Network
- CB Manholes

Basemap: Ontario Ministry of Natural Resources.
 Additional Sources:
 Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

AECOM
Figure: 21
PROPOSED DEVELOPMENT YARD STORM SEWER NETWORK
 CN, Milton, Ontario
 Project No.: 60579933 Date: August 2020



Legend

- CN ROW
- Ditches and Swales
- - - - Proposed Culverts
- Proposed Tracks
- Proposed Yard
- Administration/Gate Area

Roads

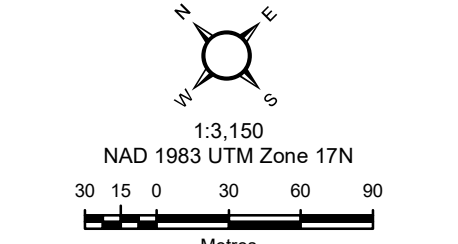
- Major Road
- Local Road
- Railway
- Contour (5m)
- Study Area
- Paved Surface Catchments
- Ballast Surface Catchments
- Pipe Network
- CB Manholes

Water Features

- Lake
- River

Streams

- Intermittent Stream
- Permanent Stream



Basemap: Ontario Ministry of Natural Resources.
 Additional Sources: Ortho-Imagery:
 This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written

4.4.2 Subdrains

In locations where there is insufficient area within the Right of Way (ROW) for a ditch, subdrains will convey flow. A map showing the proposed layout is provided in **Appendix A**. A detailed assessment of the proposed subdrain system is provided in **Appendix D**. The subdrains have been sized in order to convey the 100-year flow while providing the minimum 0.6 m of clearance to the rail, as required by the AREMA standards.

Construction of this project will occur in multiple phases. The completion of Phase 2 works represents the final drainage conditions within the track area. Subdrains for the Phase 1 development will discharge to CN's private storm sewer pipes then to ditches, similar to the existing conditions for the area located between Britannia Road and Louis Saint Laurent Ave, as well as the areas between Lower Baseline and Britannia Road. Subdrains for Phase 2 will discharge to storm pipes between Britannia Road and Louis Saint Laurent Ave as well as North of the paved yard between Lower Baseline and Britannia Road. Detailed hydraulic calculations are included in **Appendix D** which demonstrate that all subdrains have sufficient conveyance capacity.

Conditions peak flow rates from the subdrains have been designed for the 100-year event. To provide a free draining sub-ballast condition for the proposed tracks, as required by AREMA criteria, a subdrain has been specified in order to capture ballast infiltration. According to the US Army Core of Engineers (U.S. Army, 1979) standard, the base and subbase courses should be able to attain a 50% degree of drainage in not more than 10 days. Since the time required to drain horizontal layers is a function of the square of the length of the flow path, the flow paths should be as short as possible. The American Association of State Highway and Transportation Officials (AASHTO, 1986a) have a criterion for rating pavement drainability based on the time for 50% drainage of the free water. AASHTO's rating system is shown in **Figure 23**, below.

Table 3. AASHTO quality of drainage criteria (after AASHTO 1986b).

<i>Quality of drainage</i>	<i>Water removed within</i>
Excellent	2 hours
Good	1 day
Fair	1 week
Poor	1 month
Very poor	(water will not drain)

Figure 23. AASHTO Quality of drainage criteria

150 mm to 250 mm subdrains were designed to capture the excess flow that drains within 2 hours. A T_c of 2 hours was then used in the subdrain sizing calculations. Detailed calculations for sub-surface drainage of the ballast and sub-ballast material are provided in **Appendix D**. The calculations confirm that the 2-hour drainage time is reasonable. The time of concentration in the ballast material is calculated to be 11 minutes and sub-ballast material is calculated to be 19 hours. Therefore, the 2-hour drainage time assigned within the calculations is considered to be somewhat conservative for subdrain sizing.

4.5 End of Pipe Controls

The SWM ponds are intended to provide water quality control, water quantity control, and thermal mitigation. The SWM ponds have been designed in such a way to meet conditions as specified in the Final Decision Statement, specifically conditions 5.2.3, and 5.2.4. In addition, the SWM ponds have been designed to provide the required

detention storage volumes and to satisfy depth criteria for various components of each pond. Outlet structures are designed to control pond outflows and to provide required erosion and flood control storage volumes.

A sediment forebay is provided at the inlet of each pond to capture the majority of the sediment load before it enters into the main cell of the pond. The sediment forebay was designed according to the guidance and criteria provided in the Stormwater Management Planning Design Manual (MECP, 2003) guidelines. According to the MECP guidelines, the forebay length should be greater than or equal to the larger of the settling and dispersion lengths. The required forebay dimensions for Pond 1 are: 50 m long, 25 m wide, and 1.5 m deep. The required forebay dimensions for Pond 2 are: 48 m long, 24 m wide, and 1.5 m deep.

The outlet structures are designed in such a way that the erosion control volumes are completely detained in the extended detention storage and released through the low flow orifice. Similarly, the required flood control volumes are detained and released through the weir and overflow spillway in a controlled manner. The outlet of the system is located above and outside of the floodline and therefore the water levels within the receiving water body will not have an impact on the conveyance of flows from the SWM pond. Flows from the pond to the receiver are always positive and receiver water levels will never exceed pond levels, therefore no backwater condition will be created.

The storage volume required for enhanced level of treatment (80% TSS removal on long-term basis) is based on the Stormwater Management Planning Design Manual (MECP, 2003) criteria for quality control as tabulated above in **Section 3.3** and described below for each individual pond.

As part of the long-term operations, periodic maintenance of the ponds is required to maintain proper functionality. The stormwater facility will accumulate sediments and related pollutants over time which may in turn decrease its volume of storage and ability to improve water quality. This report also addresses the operation and maintenance requirements for the installed oil grit separators and stormwater water management ponds.

4.5.1 Pond 1

The required quality storage volumes have been provided in the permanent pool and active storage of the wet ponds. The required volumes for the ponds are summarized in **Table 7** in **Section 3.4**.

For Pond 1, a 200 mm orifice was selected as the low flow outlet to control the pond outflow during the 25 mm quality storm and to provide a suitable erosion control volume to provide a 2-day drawdown time. Falling head calculations were carried out to estimate the draining time of extended detention volumes through the bottom draw 200 mm orifice. The analysis showed that approximately 1.2 days (32 hours) will be required to release the required detention control volume from Pond 1. The MECP guidelines recommend a 24-hour drainage time for the quality storm. This high erosion control volume requirement necessitated further analysis and the design of additional storage for flood control. The extended detention volume provided within Pool 1 is 12,081 m³.

A 600 mm diameter high flow outlet is designed to convey larger flows from the pond once the water reaches a depth of 1 m above the height of the permanent pool volume. A 600 mm high flow outlet is proposed to convey flows when the water reaches a depth of 1.7 m above the permanent pool volume. Finally, a 14 m wide spillway conveys flows to the watercourse if the 100-year flow volume is exceeded, at a depth of 2.0 m above the permanent pool elevation (28,997 m³ storage volume). The portion of the total Regional Flood control volume (35,667 m³) which exceeds the volume provided by the pond is conveyed by this spillway. The depth within the pond reaches 2.4 m above the permanent pool elevation during the Regional Flood, providing 0.30 m of freeboard to the top of the embankment.

A summary of the design elements is provided in **Table 18**.

Table 18: Pond 1 Design Elements Summary

Return Storm	Target Outflow (m ³ /s)	Actual Outflow (m ³ /s)	Required Storage (m ³)	Provided Storage (m ³)	Elevation (m)
Normal Water Level	N/A	N/A	N/A	7,530	176.85
Extended Det.	0.02	0.01	9,900	12,081	177.85
25 Year	0.53	0.52	15,840	23,354	178.55
100 Year	1.21	1.05	22,440	28,997	178.90
Regional	N/A	6.98	35,667	35,667	179.25

An Excel spreadsheet was used to model the flows for the catchment areas of both pond systems under existing and proposed conditions, and a stage-storage discharge curve was developed and modelled in Visual Otthymo. A summary of the peak flow rates within the watercourse determined at nodes downstream of the proposed facilities is provided in **Table 19**, indicating that the proposed SWM design provides peak flow control sufficient to reduce flows to levels lower than the existing flows for all events. The Regional Flood is attenuated even though a portion exits via the spillway, as a significant portion of the total flow is captured within the pond.

Table 19: Overall Comparison of Peak Flow Rates Within the Watercourse Downstream of the Catchment Area under Existing and Proposed Conditions*

Storm event	Existing	Proposed	Difference
25 mm	1.97	1.81	-0.16
2-year	5.09	4.69	-0.40
5-year	9.63	9.06	-0.57
10-year	13.01	12.31	-0.70
25-year	17.82	16.99	-0.83
50-year	21.70	21.02	-0.68
100-year	25.60	25.02	-0.58
Regional	72.61	70.35	-2.26

* Peak Flow rates (m³/s) are for Hyd. No. 70 i.e. total areas located northeast of Tremaine Road

4.5.1.1 Pond 1 Components

The key components of Pond 1 are provided in **Appendix I**, Figure 90% SWM-201A by Crozier & Associates. Pond drawings and components are described in **Table 20**. The SWM concept for Pond 1 is shown in **Figure 24** which was used in the detailed design. A 600 mm thick clay liner has been included at the base of the permanent pool in order to mitigate seepage of surface water from the SWMF to the groundwater table. The clay liner is capped with an 80 mm thick layer of turf stone placed on 200mm compacted granular 'A' on geotextile. This protects the clay liner and facilitates proper maintenance by preventing over-excavation.

A 5:1 (horizontal to vertical) shelf is provided within the design to provide a level grade for when maintenance personnel are working along the water's edge. There is a 4.0 m wide gravel maintenance access road near the perimeter of the pond. The 5:1 shelf is to be fully vegetated and the permanent pool elevation is 177.2 m. The remainder of the pond to the track elevation is to be built on a 2:1 side slope and be fully vegetated. The sediment forebay top of berm elevation is 180.3 m and bottom of forebay elevation is 175.8 m.

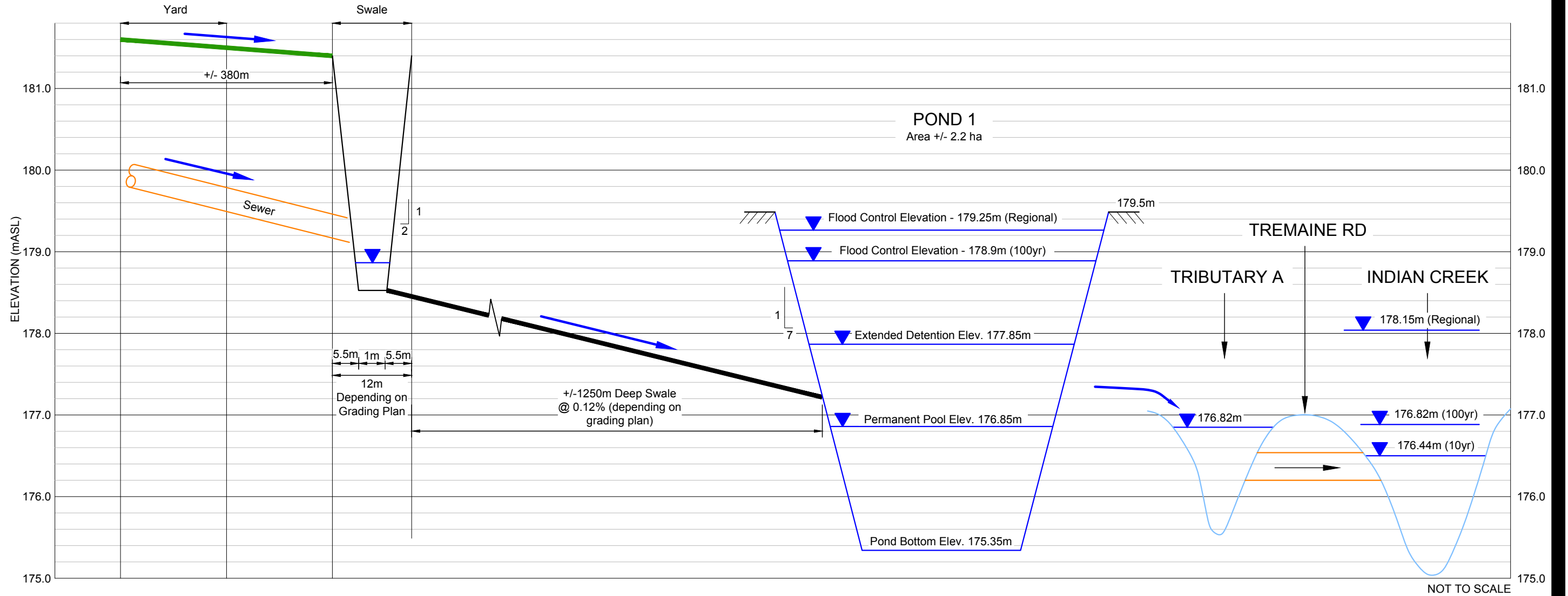
Table 20: Stormwater Management Facility Components, Description and Purpose for Pond 1

Component	Description	Purpose
Oil Grit Separator	An oil grit separator has been implemented just downstream of heavily used paved areas, as a part of the storm sewers installed to collect flows.	The integration of the oil grit separator into the treatment system allows for additional removal of contaminated coarse sediment and capture of floatable hydrocarbons prior to discharge to the pond.
2550 mm Inlet Storm Sewer Pipe	2550 mm Concrete Pipe and Headwall	Pipe conveys runoff to the pond from the access road and yard.
Pond 1	Pond is located at Mile 36.86 to 41.26	designed to provide stormwater quality, erosion, and quantity control)
Pond Liner	600 mm clay liner, protected with 200 mm compacted granular 'A' material and 80 mm of turf stone over a geotextile.	Mitigate seepage from the pond and protect the liner from excavation equipment.
Sediment Forebay	Section of the pond that is west of the pond.	Traps large sediment particles.
Berm	1.1 m high berm (submerged)	Designed to separate the sediment forebay from the remainder of the pond.
Permanent Pool	2 permanent pool cells	The permanent pool is a single larger combined detention area for large events.
600 mm Outlet Pipe	600 mm concrete headwall as per OPSD 804.03 obvert elevation is at the permanent pool elevation	Principal pipe that conveys runoff out of the wet pond to the Outlet Control Structure.
Outlet Headwall Control Structure	1200 mm x 1200 mm MH with 200mm circular orifice knockout in metal plate bolted to catch basin wall over 600mm pipe outlet. The 200 mm orifice inlet is submerged and the outlet gate valve	Controls the discharge of stormwater during a rainfall event.
Pond Maintenance Structure	1200 mm x 1200 mm MH pre-punched manhole riser c/w ladder at grate elevation 180.0 m	Includes a knife gate valve that allows the pond to be drained of water in order to remove sediment.
Emergency Spillway	Interlocking turfstone overflow weir along the south middle of the pond with 900 mm thickness rip rap ($D_{50} = 300$ mm).	In the event that the pond overflows, excess water will be discharged from this point and spill into Indian Creek.
Pond Safety Stations (2)	Recommended to be installed	Provides emergency rescue items
Pond Signage –	Recommended to be installed	Provides warning of high-water levels and restricting of activities

Component	Description	Purpose
Access Road Structure	4.0 m wide access road structure. Road layer details consists of 100 mm (20 mm dia) of crusher run limestone, 300 mm (50 mm dia) of crusher run limestone and bottom compacted subbase.	4.0 m wide access road structure around the pond for easy access.
Precast Concrete Utility Chamber Structure	1800 mm x 2400 mm Precast Concrete Utility Chamber Structure to be cut out by contractor in MH and install proposed grate. The grate size is 600 mm x 1000 mm box opening. 13	Used for easy maintenance access.
Reversed Slope Pipe	A 26.5 m – 200 mm dia PVC pipe reverse slope @ -2.6 %. The reversed slope pipe should drain to an outlet chamber located in the embankment.	The reverse pipe is used for extended detention.
Gate Valve	A 200 mm gate valve and box are installed at the inlet and outlet end in the chamber.	A gate value is used to contain potential spills within the pond.
Sediment drying area	A designated drying area adjacent to the access road.	Used to spread the wet sediment out and allow it to dry and freeze. The drying/freezing took place over the span of 4-5 days. The frozen

*Safety fencing is not required to the pond due to CN private property and won't be accessed by the public.

STORMWATER MANAGEMENT CONCEPT POND 1



POND 1 CROSS-SECTION

NOTE:
FLOOD ELEVATIONS IN INDIAN CREEK ARE BASED ON HYDRAULIC MODEL FOR EXISTING CONDITIONS FOR CROSS-SECTION No. 7630.803.

4.5.2 Pond 2

The required quality storage volumes have been provided in the permanent pool and active storage volumes of the wet ponds. The required volumes for the ponds are summarized in **Table 7** in **Section 3.4**

For Pond 2, a 200 mm orifice was selected as the bottom draw low flow outlet to control the pond outflow during the 25 mm quality storm, and to provide the necessary erosion control volume to provide a 2-day drawdown time. Falling head calculations were carried out to estimate the drainage time of extended detention volumes through the 200 mm orifice. The analysis showed that approximately 1.2 days (32 hours) required to release the required detention control volume from pond 2. The MECP guideline suggests a 24-hour drainage time for the quality storm. The high erosion control requirement necessitated further analysis and additional storage requirements for the provision of adequate flood control. The extended detention volume provided within Pond 2 is 12,095 m³.

A 360 mm diameter high flow outlet is designed to convey larger flows from the pond once the water reaches a depth of 1 m above the height of the permanent pool elevation. A larger 1,058 mm high flow outlet is proposed to convey flows when the water reaches a depth of 1.7 m above the permanent pool elevation. Finally, a 14 m width spillway conveys flows to Indian Creek if the 100-year flow volume is exceeded, at a depth of 2.1 m above the permanent pool elevation (28,828 m³ storage volume). The portion of the total Regional Flood control volume (37,525 m³) which exceeds the volume provided in the pond is conveyed by this spillway. The depth within the pond reaches 2.5 m above the permanent pool elevation during the Regional Flow, providing 0.30 m of freeboard to the top of the embankment. A summary of the design elements is provided in **Table 21**.

Table 21: Pond 2 Design Elements Summary

Return Storm	Target Outflow (m ³ /s)	Actual Outflow (m ³ /s)	Required Storage (m ³)	Provided Storage (m ³)	Elevation (m)
Normal Water Level	N/A	N/A	N/A	6933	175.50
Extended Det.	0.02	0.01	9338	12095	176.50
25 Year	0.50	0.41	14940	24508	177.20
100 Year	1.15	0.84	21165	29828	177.60
Regional	N/A	7.90	37525	37525	178.00

Excel calculations were used to model the flows for the catchment areas of both pond systems under existing and proposed conditions. A summary of the peak flow rates determined at nodes downstream of the proposed facilities are provided in **Table 19** and wet pond calculations are provided in **Appendix I**, indicating that the proposed SWM design provides peak flow control sufficient to reduce flows to levels lower than the existing flows for all events. The Regional Flood is attenuated even though a portion exits via the spillway, as a significant portion of the total flow is captured within the pond.

4.5.2.1 Pond 2 Components

The key components of the Pond 2 wet pond are provided in **Appendix I**, Figure 90% SWM-202A by Crozier & Associates. Pond drawing components are described in **Table 22**. The Pond 2 SWM Concept is shown in **Figure 25** which was used for the detailed design. A 600 mm thick clay liner has been included at the base of the permanent pool in order to mitigate seepage of surface water from the SWMF to the groundwater table. The clay liner is capped with an 80 mm thick layer of turf stone placed on 200mm compacted granular 'A' on geotextile. This protects the clay liner and facilitates proper maintenance by preventing over-excavation.

A 5:1 (horizontal to vertical) shelf is provided around the banks of Pond 2 and serves as a level safety grade when maintenance personnel are working along the water's edge. There is a 4.0 m wide gravel maintenance access road near the perimeter of the pond. The 5:1 shelf is to be fully vegetated. The pond embankment slopes up toward the adjacent track on a 2:1 side slope and is to be fully vegetated. The sediment forebay top of berm elevation is 178.3 m and bottom of forebay elevation is 174.0 m. The permanent pool elevation is 175.5 m.

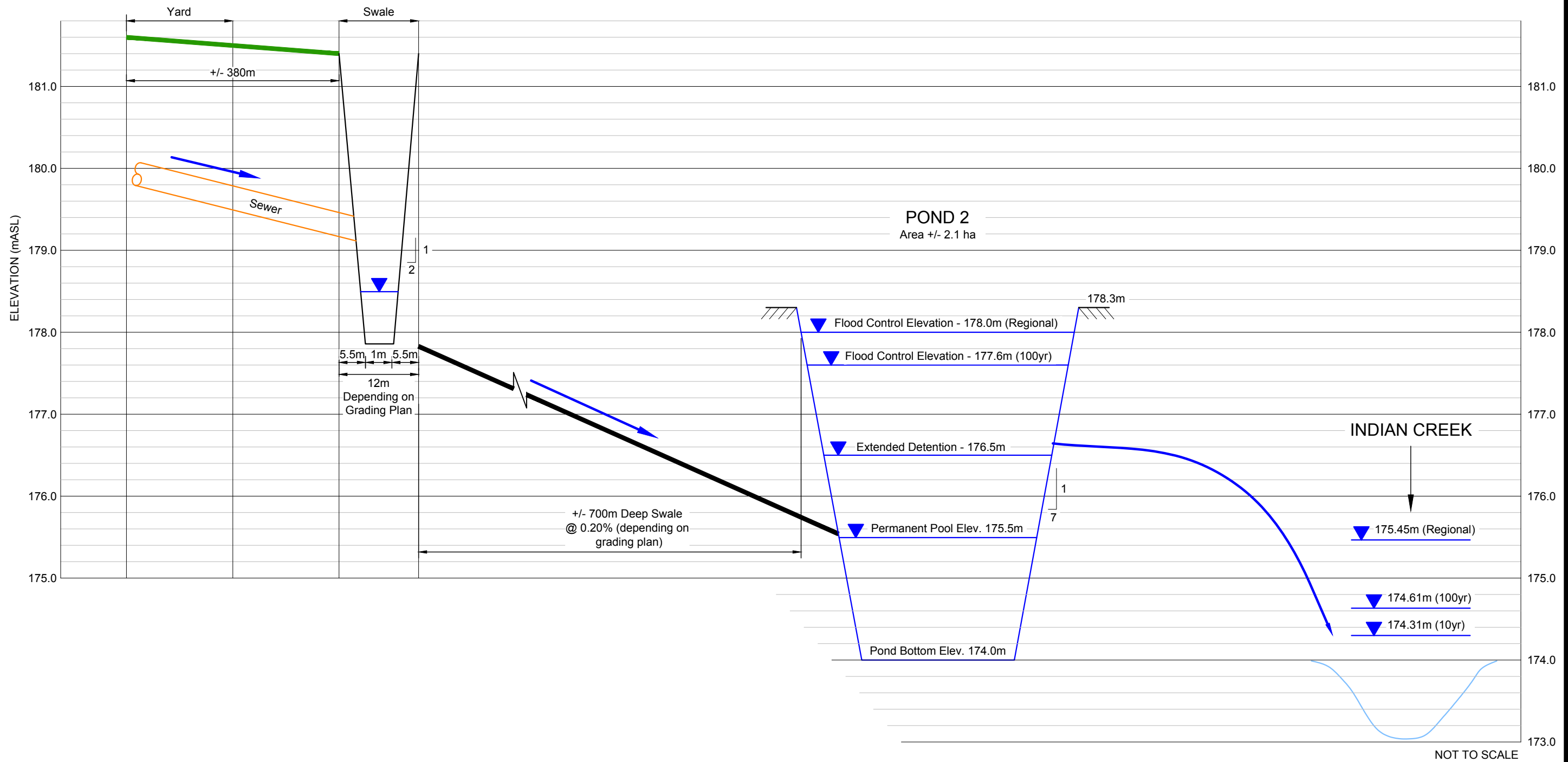
Table 22: Stormwater Management Facility Components, Description and Purpose for Pond 2

Component	Description	Purpose
Oil Grit Separator	An oil grit separator has been implemented just downstream of heavily used paved areas	The integration of the oil grit separator into the treatment system allows for additional removal of contaminated coarse sediment and capture of floatable hydrocarbons prior to discharge to the pond.
2400 mm Inlet Storm Sewer Pipe	2400 mm Concrete Pipe and Headwall	Pipe conveys runoff to the pond from the access road and yard.
Pond 2	Pond is located at Mile 36.86 to 41.26	designed to provide stormwater quality, erosion, and quantity control)
Pond Liner	600 mm clay liner, protected with 200 mm compacted granular 'A' material and 80 mm of turf stone over a geotextile.	Mitigate seepage from the pond and protect the liner from excavation equipment.
Sediment Forebay	Section of the pond that is west of the pond.	Traps large sediment particles.
Berm	0.7 m high berm	Designed to separate the sediment forebay from the remainder of the pond.
Permanent Pool	2 permanent pool cells	The permanent pool is a single larger combined detention area for large events.
600 mm Outlet Pipe	600 mm concrete headwall as per OPSD 804.03 obvert elevation is at the permanent pool elevation	Principal pipe that conveys runoff out of the wet pond to the Outlet Control Structure.
Outlet Headwall Control Structure	1200 mm x 1200 mm MH with 200mm circular orifice knockout in metal plate bolted to catch basin wall over 600mm pipe outlet. The 200 mm orifice inlet is submerged and the outlet gate valve	Controls the discharge of stormwater during a rainfall event.
Pond Maintenance Structure	1200 mm x 1200 mm MH pre-punched manhole riser c/w ladder at grate elevation 178.4 m	Includes a knife gate valve that allows the pond to be drained of water in order to remove sediment.
Emergency Spillway	Interlocking turfstone overflow weir along the south middle of the pond with 900 mm thickness rip rap ($D_{50} = 300$ mm).	In the event that the pond overflows, excess water will be discharged from this point and spill into Indian Creek.
Pond Safety Stations (2)	Recommended to be installed	Provides emergency rescue items
Pond Signage –	Recommended to be installed	Provides warning of high-water levels and restricting of activities

Component	Description	Purpose
Access Road Structure	4.0 m wide access road structure. Road layer details consists of 100 mm (20 mm dia) of crusher run limestone, 300 mm (50 mm dia) of crusher run limestone and bottom compacted subbase.	4.0 m wide access road structure around the pond for easy access.
Precast Concrete Utility Chamber Structure	1800 mm x 2400 mm Precast Concrete Utility Chamber Structure to be cut out by contractor in MH and install proposed grate. The grate size is 600 mm x 1000 mm box opening. 13 mm dia horizontal round bars at 150 mm spacing. 13 mm dia vertical round bars at 100 mm spacing. 50 mm x 50 mm x 6 mm angel frame to be bolted to ditch inlet with galvanized 100 x 13 mm dia anchor at time of installation.	Used for easy maintenance access.
Reversed Slope Pipe	A 26.5 m – 200 mm dia PVC pipe reverse slope @ -3.0 %. The reversed slope pipe should drain to an outlet chamber located in the embankment.	The reverse pipe is used for extended detention.
Gate Valve	A 200 mm gate valve and box are installed at the inlet and outlet end in the chamber.	A gate value is used to allow the drawdown time to be modified for future operating conditions and for spill control.
Sediment drying area	A designated drying area adjacent to the access road east of the pond.	Used to spread the wet sediment out and allow it to dry and freeze. The drying/freezing took place over the span of 4-5 days. The frozen sediment passed the slump test, allowing it to be hauled to an off-site landfill.

*Safety fencing is not required to the pond due to CN private property and won't be accessed by the public.

STORMWATER MANAGEMENT CONCEPT POND 2



POND 2 CROSS-SECTION

5. Water Balance

A water balance is used to assess the flow of water into and out of a system. Following the method developed by Thornthwaite and Mather (1957) the water balance can be expressed in terms of inputs (precipitation (P)) and outputs (evapotranspiration (ET), runoff (R), and infiltration (I)). Expressed algebraically, the water balance appears as follows:

$$P = ET + R + I$$

To form a water balance for the site, the general hydrologic cycle component values provided in the Stormwater Management Planning and Design Manual (MECP, 2003), Table 3.1 were used. Geologic data from the area discussed in **Section 2.1.4** indicate that the soils of the site are primarily clay loam, and the existing land use is primarily rural cropland.

The total existing drainage area of all sub-catchments is 931.3 ha, of which 51.3 ha are proposed to be developed into impervious land uses. The remainder of the sub-catchments that overlap with the PDA were assumed to retain existing water balance properties. There are no proposed infiltration measures in place to provide enhanced infiltration of runoff or water balance mitigation, and runoff from the impervious area is directed through storm sewers and grassed swales into the proposed SWM Facilities. Due to the slope of the grassed swales, infiltration within the swales was not considered significant; therefore, it was assumed that all rainfall on the impervious areas is discharged via runoff or evaporation. MECP Table 3.1 does not provide a value for evaporation from impervious areas. The evaporation values for clay loam and urban lawn land, which are the least pervious materials available in the design manual, were assumed for the impervious area, with the remainder of the precipitation discharged as runoff.

Table 23 provides a summary of the water balance results determined using the methodology described in this section.

Table 23: Annual Water Balance Summary

Conditions	Area (ha)	Change in Imperviousness (%)	Precipitation (mm)	Evapotranspiration (mm)	Runoff (mm)	Infiltration (mm)
Existing Condition	931.3	-	940	531	245	164
Proposed Condition	931.3	-	940	525	254	155
% Change	0%	+5.5%	0%	-1%	+2%	-5%

Pond 1 is expected to discharge an additional 103,335 m³ of runoff annually, and Pond 2 is expected to discharge an additional 109,560 m³ of runoff annually.

There are limited wetlands located within the PDA. No Provincially Significant Wetlands (PSWs) are located within the PDA.

There is a low-lying area south of the development area and Pond 1 where water ponds after rainfall events, however, this is due to poor drainage from the area and does not reflect an upwelling of groundwater. Therefore, changes to the infiltration within the PDA will not impact this location. The 5% reduction in infiltration from the PDA is considered unlikely to negatively impact any wetland features within the area, as there are no significant features within 1 km of the PDA.

6. Hydraulic Modelling

6.1 Existing Conditions Hydraulics

AECOM completed a desktop review in order to identify existing and final catchment conditions. The PDA is drained by five intermittent tributaries, four of which are potentially impacted by the development and have been assessed. Based on the available topography and existing stream network the PDA was divided into various subcatchments as shown on **Figure 2** and **Figure 3**. The subcatchment boundaries are similar to the previous study (Phillips, 2004 and AMEC, 2015) which facilitates comparison and achievement of the required targets through the proposed stormwater management plan. It is noted that some of the subcatchments are already developed or proceeding through varying phases of development, however, they were modeled as rural catchments, assuming that quantity controls have already been provided or will be provided within these catchments and the resultant outflows will be similar to the pre-development conditions (i.e., rural). **Section 6.2.3** provides the results of the developed, uncontrolled flow assessment calculations.

AECOM reviewed the existing hydraulic model of Indian Creek and the existing flood extents are shown on **Figure 9**.

Water surface profiles (near the proposed development) for the 2-year through 100-year and Regional storm events are shown on **Figure 26** and tabulated in **Table 24**.

A retaining wall is proposed along the Indian Creek (**Figure 4**). However, the retaining wall is located outside of the floodplain limits with the exception of a small portion which is not anticipated to affect the floodplain, and this is shown on **Figure 26**, **Figure 27**, **Figure 28**, **Figure 29** and **Figure 30**. Detailed modeling files are included in **Appendix A**.

Table 24. Water Surface Profiles

River Station	Drainage Channel	Flow Rate (m ³ /s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Top Width (m)
5647.025	Existing Regional	209.51	171.42	174.59	2.19	141.16
5647.025	Future Regional	222.34	171.42	174.66	2.21	143.64
5647.025	100-year	62.9	171.42	173.41	1.67	84.81
5647.025	50-year	54.7	171.42	173.31	1.63	83.85
5647.025	20-year	44	171.42	173.19	1.52	82.72
5647.025	10-year	36.1	171.42	173.09	1.41	81.81
5647.025	5-year	28.1	171.42	172.97	1.29	80.72
5647.025	2-year	16.9	171.42	172.75	1.03	33.47
5477.549	Existing Regional	209.51	171.28	174.55	1.52	192.55
5477.549	Future Regional	222.34	171.28	174.62	1.55	197.52
5477.549	100-year	62.9	171.28	173.33	1.16	135.93
5477.549	50-year	54.7	171.28	173.22	1.14	129.47
5477.549	20-year	44	171.28	173.09	1.07	123.12

5477.549	10-year	36.1	171.28	172.99	1	117.91
5477.549	5-year	28.1	171.28	172.87	0.93	110.72
5477.549	2-year	16.9	171.28	172.63	0.84	87.03
5400	Existing Regional	209.51	171.25	174.46	2.11	169.1
5400	Future Regional	222.34	171.25	174.55	2.1	169.22
5400	100-year	62.9	171.25	173.18	1.92	98.05
5400	50-year	54.7	171.25	173.03	2.04	89.4
5400	20-year	44	171.25	172.87	2.06	80.51
5400	10-year	36.1	171.25	172.76	1.99	73.13
5400	5-year	28.1	171.25	172.65	1.86	61.78
5400	2-year	16.9	171.25	172.41	1.62	23.28
5300	Existing Regional	209.51	170.86	174.36	1.94	131.73
5300	Future Regional	222.34	170.86	174.44	1.97	134.64
5300	100-year	62.9	170.86	173.07	1.45	84.26
5300	50-year	54.7	170.86	172.88	1.53	76.6
5300	20-year	44	170.86	172.68	1.55	69.07
5300	10-year	36.1	170.86	172.55	1.52	63.73
5300	5-year	28.1	170.86	172.42	1.43	58.53
5300	2-year	16.9	170.86	172.16	1.26	19.31

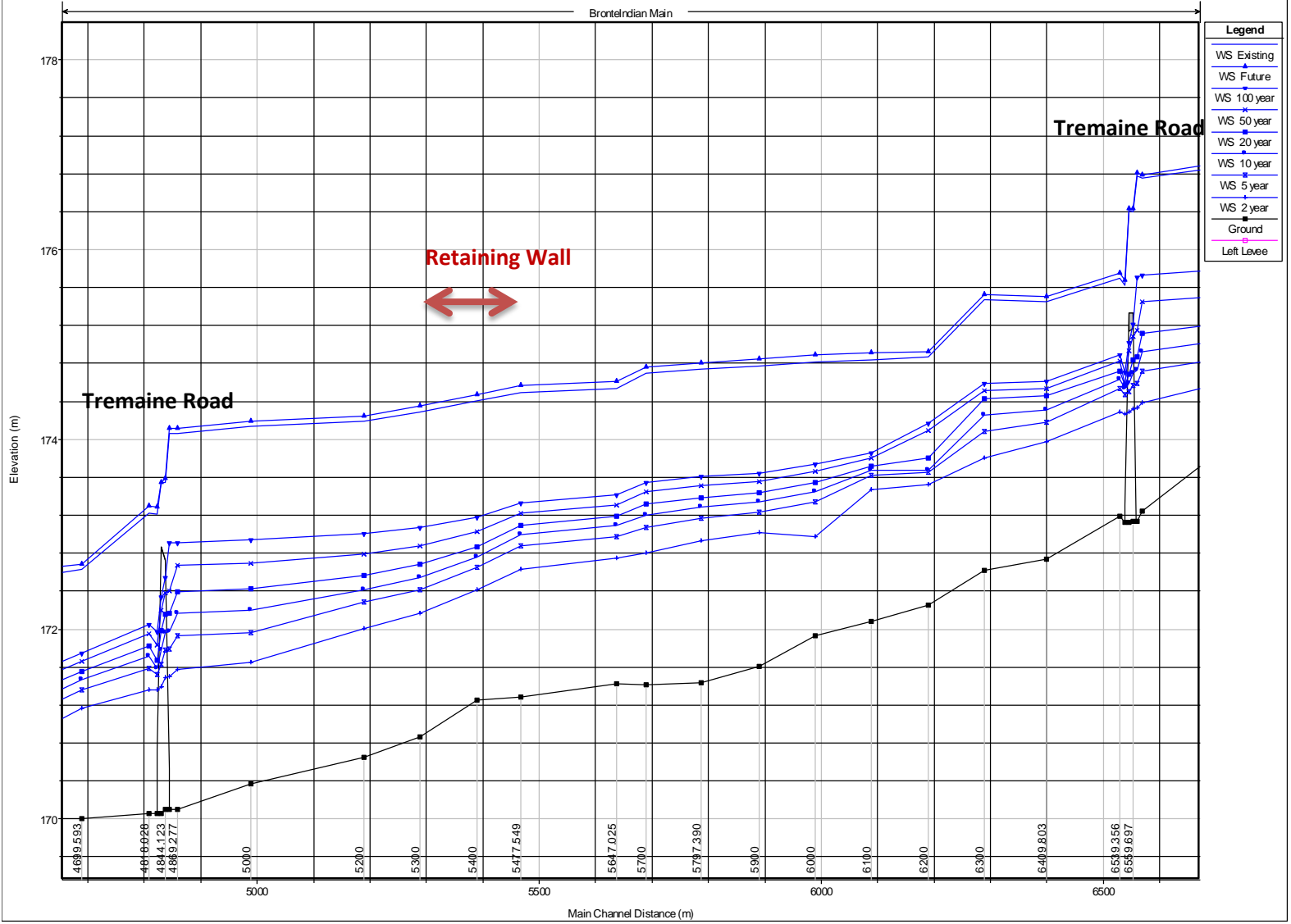


Figure 26: Water Surface Profiles (Existing Conditions)

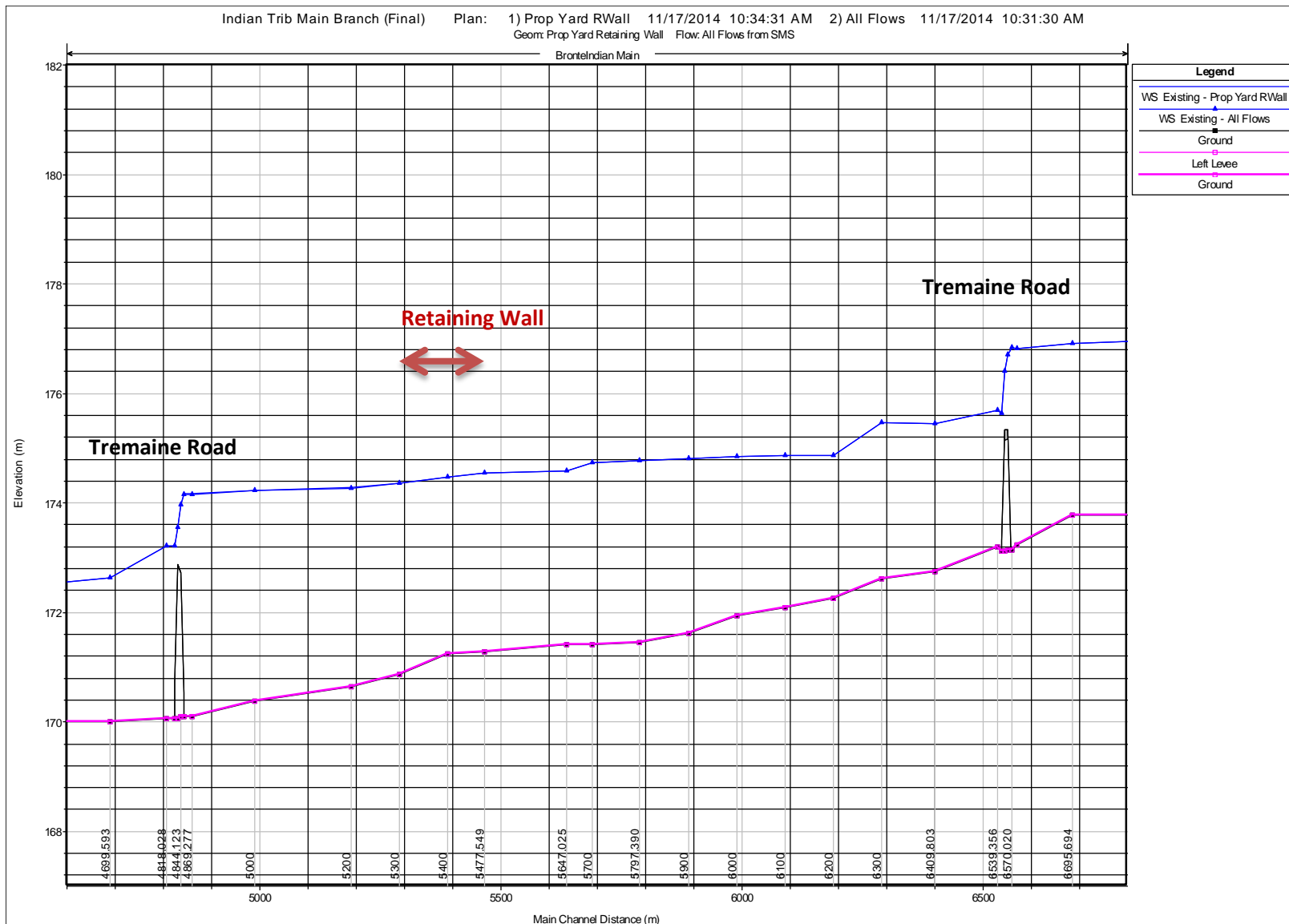


Figure 27: Regional Water Surface Profiles (Existing and Proposed Retaining Wall Conditions)

Indian Trib Main Branch (Final) Plan: 1) Prop Yard RWall 10:34:31 AM 2) All Flows 10:31:30 AM
 Geom: Prop Yard Retaining Wall Flow: All Flows from SMS
 River = Brontelndian Reach = Main RS = 5477.549

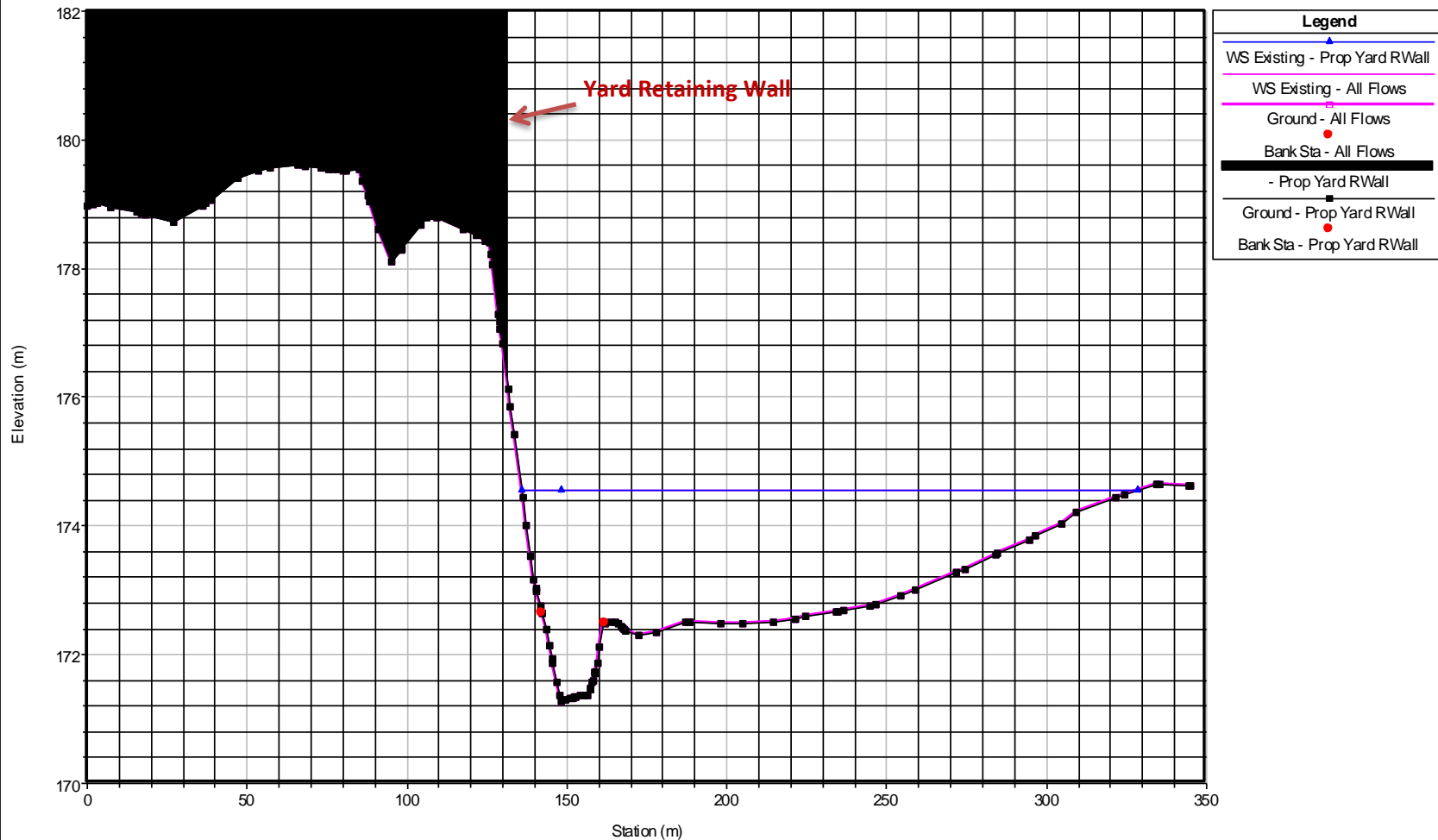


Figure 28: Regional Water Surface Elevations (Xs # 5477.548) – Existing & Proposed Retaining Wall Conditions

Indian Trib Main Branch (Final) Plan: 1) Prop Yard RWall 10:34:31 AM 2) All Flows 10:31:30 AM
 Geom: Prop Yard Retaining Wall Flow: All Flows from SMS
 River = BronteIndian Reach = Main RS = 5400

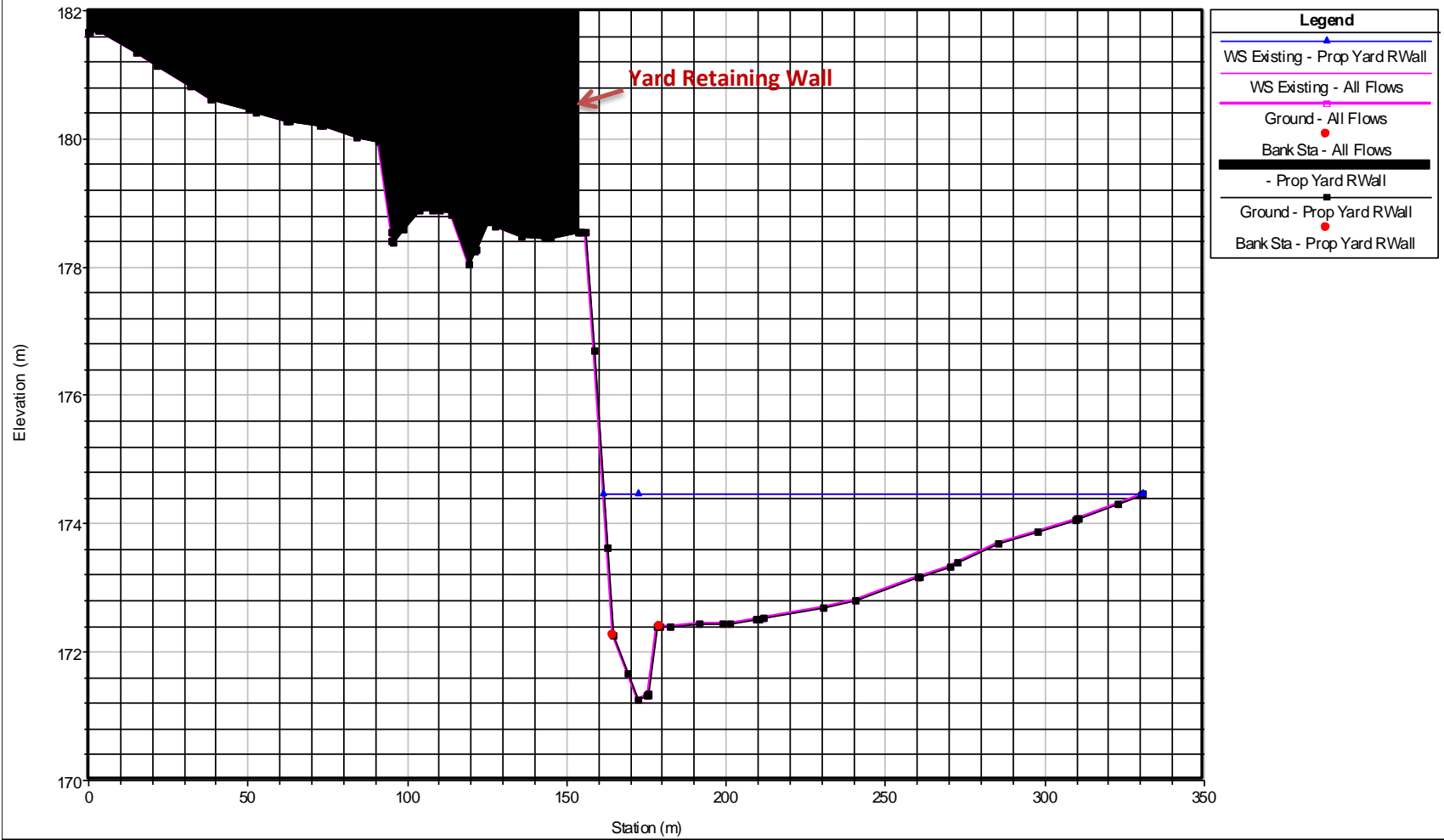


Figure 29: Regional Water Surface Elevations (Xs # 5400) - Existing & Proposed Retaining Wall Conditions

Indian Trib Main Branch (Final) Plan: 1) Prop Yard RWall 10:34:31 AM 2) All Flows 10:31:30 AM
 Geom: Prop Yard Retaining Wall Flow: All Flows from SMS
 River = Brontelndian Reach = Main RS = 5300

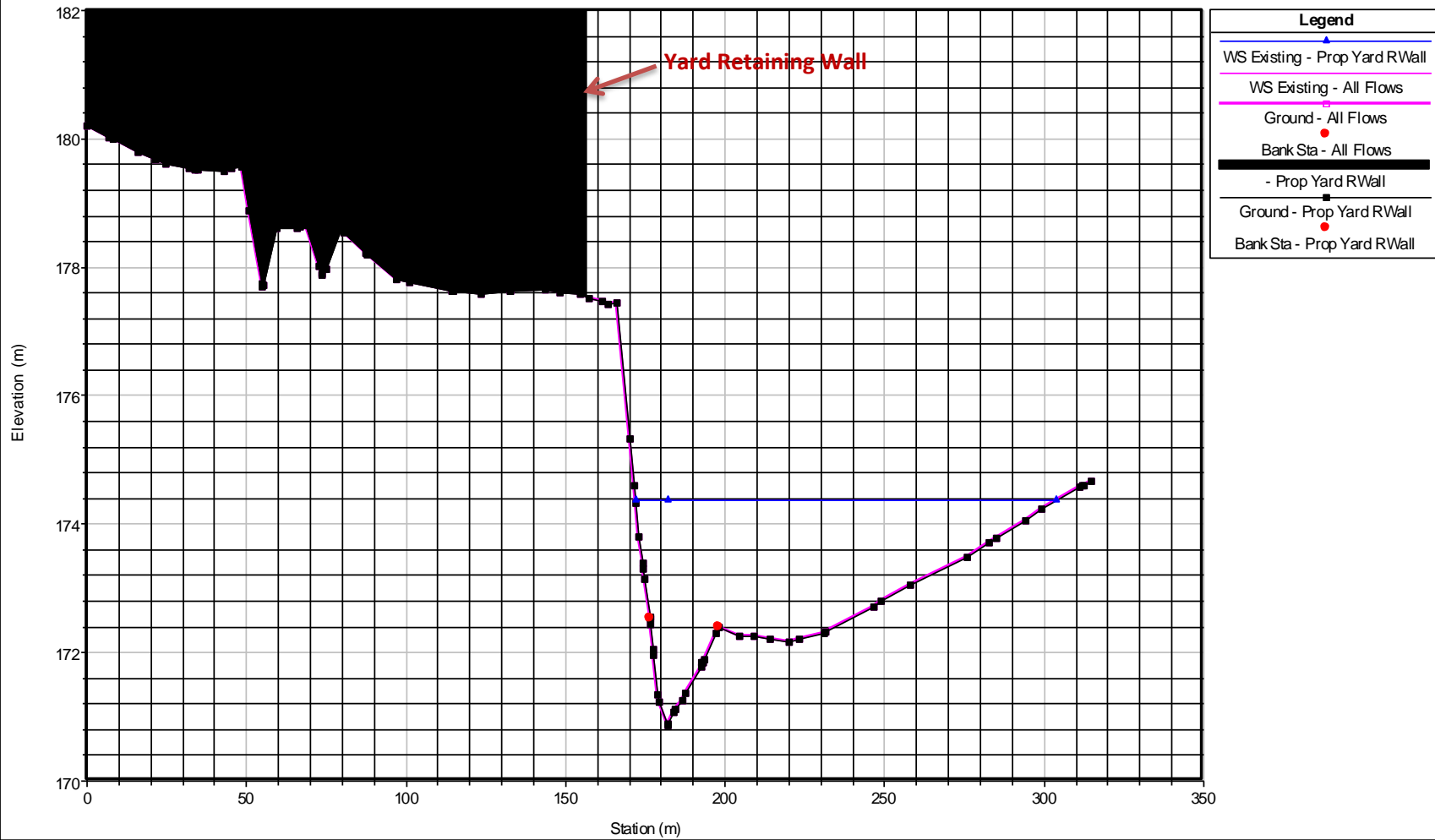


Figure 30: Regional Water Surface Elevations (Xs # 5300) - Existing & Proposed Retaining Wall Conditions

6.2 Final MHL Hydraulics

The SWM features control runoff from the site such that there is no increase in peak flows under final conditions; therefore, the model outputs assessed in **Section 6.1** are expected to remain unchanged. The realignment of Tributary A and Indian Creek will not alter the hydrology of the catchment area and therefore the flows will be unchanged. The final conditions requirements which discuss additional mitigation measures to provide sufficient capacity to adequately manage the range of climate conditions, is addressed in this section and in **Appendix K**. The Crossing Report (AECOM 2020) demonstrates that the PDA has sufficient capacity to safely accommodate and convey the Regional Storm into the foreseeable future in a manner that ensures no upstream or downstream effects on neighbouring properties, fish habitat, or wetlands. The crossing report will require a cross check and to be updated once Phase 2 is completed.

Changes to the internal hydraulics of the PDA are managed with storm sewers, culverts, and grassed swales, and channel realignments and the flow patterns are shown on **Figure 17**. Design of the storm sewers and swales is discussed in **Section 6.3**. Sizing of the proposed and existing culverts within the PDA is discussed within this section.

6.2.1 Logistics Hub Culverts

The following culverts will be placed as part of the SWM Facilities; refer to **Figure 4** and **Figure 5** for locations:

Culvert 1 – To convey flow across the railway tracks near Britannia Road. The culvert has been designed to convey all storm events up to and including the Regional Storm event from subcatchment # 401 as shown on **Figure 6**.

Culvert 2A/2B – To convey the 100-year storm event in Tributary A and the excess flows during the Regional Storm event are to be diverted westward through a diversion channel and discharged through Culvert 3 and into Indian Creek as shown on **Figure 6**.

Culvert 3 – To convey flow across the railway tracks from subcatchment 301, 303 and balance flows from Tributary A during the Regional Storm event. The culvert has been designed to convey all storm events up to and including the Regional Storm event as shown on **Figure 6**.

Culvert 4 – To convey flow across the Gate Area from subcatchment 403. The culvert has been designed to convey all storm events up to and including the Regional Storm event as shown on **Figure 6**.

Culvert 5 – To convey Tributary A flow across access road for the Gate Area. The culvert has been designed to convey all storm events up to and including the Regional Storm event from catchments located west of Britannia Road as shown on **Figure 6**.

Flow Diversion Channel – A flow diversion channel has been designed along the northeast side of the railway tracks to capture and convey storm flows from Tributary A (greater than the 100-year storm event) and captured drainage from subcatchment 301 and 303. The diversion channel originates at proposed Culvert 2 (with a high point approximately at the junction of subcatchment 301 and 1292) and has been designed to convey flows to Culvert 3 and ultimately into Indian Creek. This channel minimizes the dimensions of Culvert 2 and replaces the existing culverts along its way (#39.99, 40.15, 40.33 and 40.67) with Culvert 3, to be located near Lower Baseline (**Figure 6**).

Details regarding the external drainage and culvert crossings are provided in the Indian Creek Tributary A and C Crossing Report (AECOM, 2020). The crossing report will require a cross check and to be updated once Phase 2 is completed.

Minor Flow

To keep the railway yard, internal roads and parking lots free of nuisance ponding during frequent storm events (up to the 5-year storm event); a network of storm sewers has been designed for under the yard, roads and parking lots. Effective collection and conveyance of minor flows minimizes interruptions to operations, reduce maintenance requirements, and increases pavement life span.

For the administration building and gate areas, the storm sewers have been designed to convey all flows from the 5-year return period event.

Major Flows

For larger storm events (i.e., greater than 5-year storm), when the minor system is flowing full, the remaining runoff from the yard area ponds on the yard surface and gradually discharges into the storm sewers with a maximum ponding depth of 100 mm. The storm sewers outlet into the adjacent swales and ultimately into the detention ponds. The swales have been designed to convey stormwater runoff up to and including the 100-year and Regional storm events. A cross slope which drains towards the swale is provided to drain the yard during a major storm event or in the case that the storm sewers fail for any reason.

For the administration and maintenance buildings area, the storm sewers have been designed for a 5-year return period event, and a major flow route is provided which conveys storm runoff from larger (i.e., >5-year return period storm) into the adjacent swale which outlets into Pond 2 and, eventually, Indian Creek.

Similarly, for the Gate area, the storm sewers have been designed for a 5-year return period event and a major flow route is provided to convey storm runoff (in excess of the 5-year return period event) into the adjacent swale which discharges into the wet pond and ultimately into Indian Creek (**Figure 4**).

There are eight culverts in the hub area under the existing track between Britannia Road and Tremaine Road which convey water to the north side of the tracks, as shown in **Figure 6** and summarized in **Table 25**.

Table 25. Existing Culverts in Yard and Gate Areas

Culvert ID (Figure 2)	Shape	Length (m)	Width (m)	Height (m)	U/S Invert Elevation (m)	D/S Invert Elevation (m)	Maximum Allowable HW Elevation (m)	Maximum Flow Capacity* (m ³ /s)
39.23	Box	4.9	1.83	1.83	180.43	180.62	183.09	9.2
39.75-1	CSP	21.83	1.5		178.24	177.89	181.60	6.8
39.75 -2	CSP	20.72	1.5		178.31	177.88	181.60	6.8
39.99*	CSP	14.33	0.6		NOT shown on recent survey drawing, capacity is estimated			1.0
40.15	Box	19.2	2.13	2.44	180.36	177.33	180.3	14.0
40.33	CSP	15.55	0.75		178.06	178.04	179.58	1.0
40.67	CSP	23.85	0.6		174.48	174.29	178.30	1.1
40.69**	CSP	22.25	2.1		175.4	175.07	178.29	10.9

*Estimated using Culvert Master with existing survey information and maximum allowable head as top of the railway track ballast

** The survey drawing shows 2.0x1.0 m Size, however, a conservative approach is adopted, and flow capacity was estimated using the size provided in CN culvert data sheets

The seven existing culverts between Britannia Road and Lower Baseline have been replaced with three culverts: Culvert 1, Culvert 2A and Culvert 3, as shown on **Figure 6**. Culvert 1 is designed to convey flows during the Regional Storm event from catchment # 401. Culvert 2 A is designed to convey flows up to and including the 100-year storm event in Tributary A while the excess flow during the Regional Storm event spill over to the diversion swale and are to be conveyed across the tracks through Culvert 3. This culvert is designed to convey the excess flows from Culvert 2 A as well as and catchments # 301 and # 302 during the Regional storm event. Screens at the inlet of minor drainage culverts (except culvert 10, 1, 2A/2B, 3 and 7) will trap trash, debris and prevent unauthorized entry for safety and security purposes. Regular maintenance of these culverts mitigates rises in local water levels and will ensure there is no upstream flooding. Further details regarding Culverts 10, 1, 2A/2B, 3, and 7) are provided in the Indian Creek Tributary A and C Crossing Report (AECOM, 2020). The crossing report will require a cross check and to be updated once Phase 2 is completed.

In addition to the above three main culverts, Culvert 1 is to convey Tributary A flows under the Gate Area access road and internal yard culverts (2B & 3) are required for proper conveyance of stormwater runoff.

The AREMA Manual for Railway Engineering (2000), Chapter 1, Section 4.8.2 provides the following design criteria applicable to culverts:

- Pass the 25-year flood without static head at entrance (maximum headwater/depth (HW/D) ratio of 1.0).
- Pass the 100-year flood with a minimum freeboard of 2 feet (0.61 m) to the base of the rail, and with a maximum HW/D ratio of 1.5.
- Further to the AREMA design requirements, evaluation of the 2-year storm event has been included for future environmental impact consideration should it be required.

The dimensions of the culverts and design analysis are summarized in **Table 26** below, and detailed calculations are provided in **Appendix D**. The culverts fulfill the AREMA design criteria with respect to HW/D ratio and free board during the specified storms, and this is summarized in **Table 26**.

Culvert # 40.69, located east of Lower Baseline Road, may require replacement. This along with other culverts located along the tracks other than the yard area may be replaced with existing equivalent sizes to avoid any upstream and downstream flooding issues.

6.2.2 Rail Culverts

Headwater elevations upstream of the culverts were calculated for both the Phase 1 and 2 proposed conditions for each of the following:

- the design storm event defined as the 25-year event, and
- the major storm event defined as the 100-year event.

Outlet control calculations were based on critical depth to calculate tailwater for each culvert. Culvert inverts and tailwater invert along with discharge information were then used in Culvert Master software to calculate the inlet control. Outlet control calculation spreadsheets and culvert master model output results are provided in **Appendix C**.

Culvert Capacity - Inlet Control

In order for a culvert to meet the current AREMA design standards the headwater to diameter ratio (HW/D) must be less than 1.0 for the design storm flow (25-year). A HW/D value of 1.0 indicates that the water level at the inlet of the culvert is equal to the culvert obvert and therefore there is no static head present. Furthermore, the HW/D during the 100-year design storm must be equal to or less than 1.5.

Inlet and outlet control analyses were performed using Culvert Master software. The software can effectively analyze culverts from simple barrel crossings to complex embankment cross-drain systems, with different shapes and sizes, special tailwater considerations, and roadway overtopping considering watershed data, culvert characteristics, and even weir geometry. Headwater is calculated using both inlet and outlet control options. The controlling headwater depth is given as the higher of inlet control or outlet control headwater. Inlet control headwater is determined using the equations set forth in Hydraulic Design Series No. 5, Hydraulic Design of Highway Culverts (1985), prepared for the U.S. Federal Highway Administration. Outlet control headwater is determined using the direct step or standard step method to solve the energy equation. The overtopping flow rate is calculated using the general broad crested weir equation assuming the discharge coefficient is a function of submergence. Culvert Master software is an accepted drainage management practice design software provided by the MTO Drainage Management Manual (1997).

Culvert Capacity – Outlet Control

Outlet control calculations were performed for Phase 1 and 2 culverts. Outlet control calculations incorporate head losses within the culvert as well as the downstream water elevation. The effective tailwater elevation was determined from critical depth calculations. For free outlet conditions, if the critical depth is greater than $\frac{3}{4}$ of the culvert diameter, the effective tailwater depth was based on the relationship $T_w = (d_c + D)/2$, where d_c is the critical depth and D is the diameter of the culvert. If the critical depth is less than $\frac{3}{4}$ of the culvert diameter the tailwater depth is taken to be the critical depth.

Furthermore, culverts 2A (ID 4012 63+958) and 2B Station (ID 4012 63+958) are situated within the Regulatory floodplain of Indian Creek. Floodplain impacts will result in a backwater effect at the culverts and may cause higher tailwater depths. Culvert 2A is designed to convey flows up to and including the 100-year storm event in Tributary A while the excess flows during the Regional Storm event will spill over to the diversion swale and are conveyed across the tracks through Culvert 3. This ditch is designed to convey the excess flows from Culvert 2A.

Hydraulic Assessment Results

Table 26 shows the results of the hydraulic analysis, including the extended barrel lengths where proposed. The hydraulic adequacy of the existing culverts is based on the appropriate 25-year, 100-year, and uncontrolled developed 100-year design storms (as per **Section 2.1**).

All Culverts satisfy the AREMA criteria of HW/D < 1.0 for the 25-year event and HW/D < 1.5 for the 100-year event and provide greater than 0.6 m freeboard to the base of rail during the 100-year event. Refinement to the hydraulic model will be made if any once phase 2 design is completed.

Table 26. phase 1 and 2 Culvert Hydraulic Model Results Compared to AREMA Standards

Culvert ID	Mileage (Station)	Dimensions (mm)	Shape	Recommendation	Performance Criterion Satisfied?					
					HW Depth	H/D< 1.0	HW Depth	H/D< 1.5	Freeboard	Over-topping ?
					25-Year	25-Year	100-Year	100-Year	100-Year	100-Year
4001	37.00 (59+544.25) (Culvert 13)	1250	CSP	Extend 6.7 m	0.38	Y 0.3	0.41	Y 0.33	Y 1.01	No
4002	37.2 (59+869.25) (Culvert 12)	800	CSP	upsize to 800mm	0.59	Y 0.74	0.67	Y 0.84	Y 1.24	No
4003	37.63 (60+567.18) (Culvert 11)	900	CSP	Extend 5.2 m	0.34	Y 0.38	0.37	Y 0.41	Y 0.73	No
4004	37.63 (60+590.81 R)	600	CSP	Keep as is	0.33	Y 0.54	0.34	Y 0.57	Y 1.1	No
4007	(61+425 to 61+750)	450	CSP	New culvert	0.29	Y 0.64	0.34	Y 0.76	Y 1.72	No
4007-1	(61+750 to 62+375)	450	CSP	New culvert	0.41	Y 0.68	0.52	Y 0.87	Y 1.59	No
4008	38.31 (61+756) (Culvert 9)	900	CSP	Extend 10.4 m	0.6	Y 0.67	0.68	Y 0.76	Y 1.14	No
4009	38.52 (61+993) (Culvert 8)	900	CSP	Extend 10.5 m	0.42	Y 0.47	0.45	Y 0.5	Y 1.53	No
4010	(62+665)	750	Circular Conc	New culvert	0.35	Y 0.47	0.39	Y 0.52	Y 1.11	No
4011	(63.550 to 63+948.6) (Culvert 2C)	1350	Circular Conc	New culvert	0.90	Y 0.67	1.09	Y 0.81	Y 0.8	No
4012 (2A) (HEC-RAS)	39.67 (63+958) (Culvert 2A)	3400 x 1400	Conc Box	New culvert	1.09	Y 0.78	1.24	Y 0.89	Y 2.23	No
4012 (2B) (HEC-RAS)	39.67 (63+958) (Culvert 2B)	3400 x 1400	Conc Box	New culvert	1.04	Y 0.74	1.20	Y 0.86	Y 1.85	No
4013	(65+328)	900	CSP	New culvert	0.45	Y 0.5	0.53	Y 0.59	Y 3.19	No
4014 (C3)	(65+400) (Culvert 3)	2400	CSP	New culvert	0.99	Y 0.41	1.15	Y 0.48	Y 2.23	No
4016 (C7) (HEC-RAS)	40.63 (65+525) (Culvert 7)	2400	Circular Conc	upsize to 2400mm	1.41	Y 0.59	1.68	Y 0.7	Y 5.56	No

Culvert ID	Mileage (Station)	Dimensions (mm)	Shape	Recommendation	Performance Criterion Satisfied?					
					HW Depth	H/D< 1.0	HW Depth	H/D< 1.5	Freeboard	Overtopping?
					25-Year	25-Year	100-Year	100-Year	100-Year	100-Year
4 - ID 403 to pond 1	(11+950) (Culvert 4) to pond 1	2550	Circular Conc	New culvert	2.08	Y 0.82	2.33	Y 0.91	Y 0.63	No
5 - ID 410	(12+535) (Culvert 5)	1400	Circular Conc	New culvert	1.37	Y 0.98	1.60	Y 1.14	Y 2.07	No
5a - ID 405 to pond 2	To pond 2	2400	Circular Conc	New culvert	2.07	Y 0.86	2.25	Y 0.94	Y 0.92	No
5000 (HEC-RAS)	37.98 (61+125.5) (Culvert 10)	2 x 900	Circular Conc	Relocate same size	0.61	Y 0.68	0.75	Y 0.83	Y 0.73	No
4020	(10+380 under access road)	900	Circular Conc	New culvert	0.8	Y 0.89	0.97	Y 1.08	Y 4.93	No
4021 (HEC-RAS)	(10+200 under access road) (Culvert 1)	7620 x 1520	Arch Conc	New culvert	0.86	Y 0.57	0.95	Y 0.62	Y 2.16	No

Note: * Y = meeting AREMA criterion. N = not meeting AREMA criterion

Regional Storm Channel Realignment Spill Assessment on Lower Baseline Road

Although the Regional flow is not a part of AREMA guidelines, it should be noted that the regional flow has been assessed for Culvert 7 (ID 4016 station 65+525), and this is summarized in **Table 26**. Overtopping of culvert 7 is anticipated and a detailed spill assessment has been completed to quantify the amount of water spilling to Lower Baseline Road. AECOM performed a tributary C channel realignment for the road ditch west of Lower Baseline Road. The upstream end of the proposed channel realignment is located approximately 20 m southwest of the Lower Baseline Road grade separation location. Refer to tributary C channel realignment on **Figure 31**.

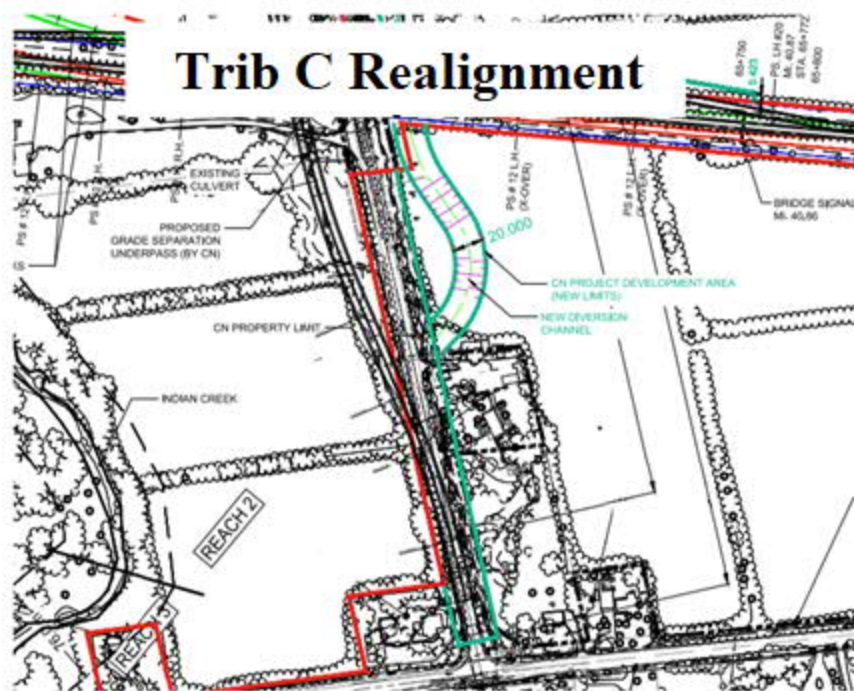


Figure 31. Tributary C Channel Realignment

Tributary C channel realignment conveys the regional storm within the channel without spilling to either the separated grade or adjacent properties. The drainage area to culvert 7 (ID 4016 station 65+525) is 108.8 ha, as shown in **Figure 6**. Under existing conditions, the runoff is conveyed through an open channel to an existing 2,000

mm x 1,000 mm CSP oval culvert beneath the rail embankment at Mi 40.69. This culvert discharges to the Lower Baseline Road channel realignment which conveys flows to the Tremaine Road Culvert and, eventually, Indian Creek. As part of the Milton Intermodal Terminal project, a grade separation at the existing railway and Lower Baseline Road level crossing intersection will occur, with the passing beneath the rail line.

Tributary C channel realignment is placed to realign the road ditch west of Lower Baseline Road through a CN-owned property east of Lower Baseline Road toward the existing ditch along the east side of Lower Baseline Road. This channel will outlet directly to the ditch that runs parallel to Lower Baseline Road upstream of the nearest private property.

A HEC-RAS model was prepared to assess the impact of flooding on Lower Baseline Road. For both the existing and final conditions, the Regional storm would encroach the travel lanes of Lower Baseline Road due to the existing culvert sizes under the private property access road being insufficient. Since the limit of construction ends before the private property entrance culverts, there is no upsizing required for these culverts. **Figure 32** shows the difference between existing (top) and proposed (bottom) conditions for the two private property access culverts. It demonstrates that the existing flood water level for the regional event is very similar to final conditions.

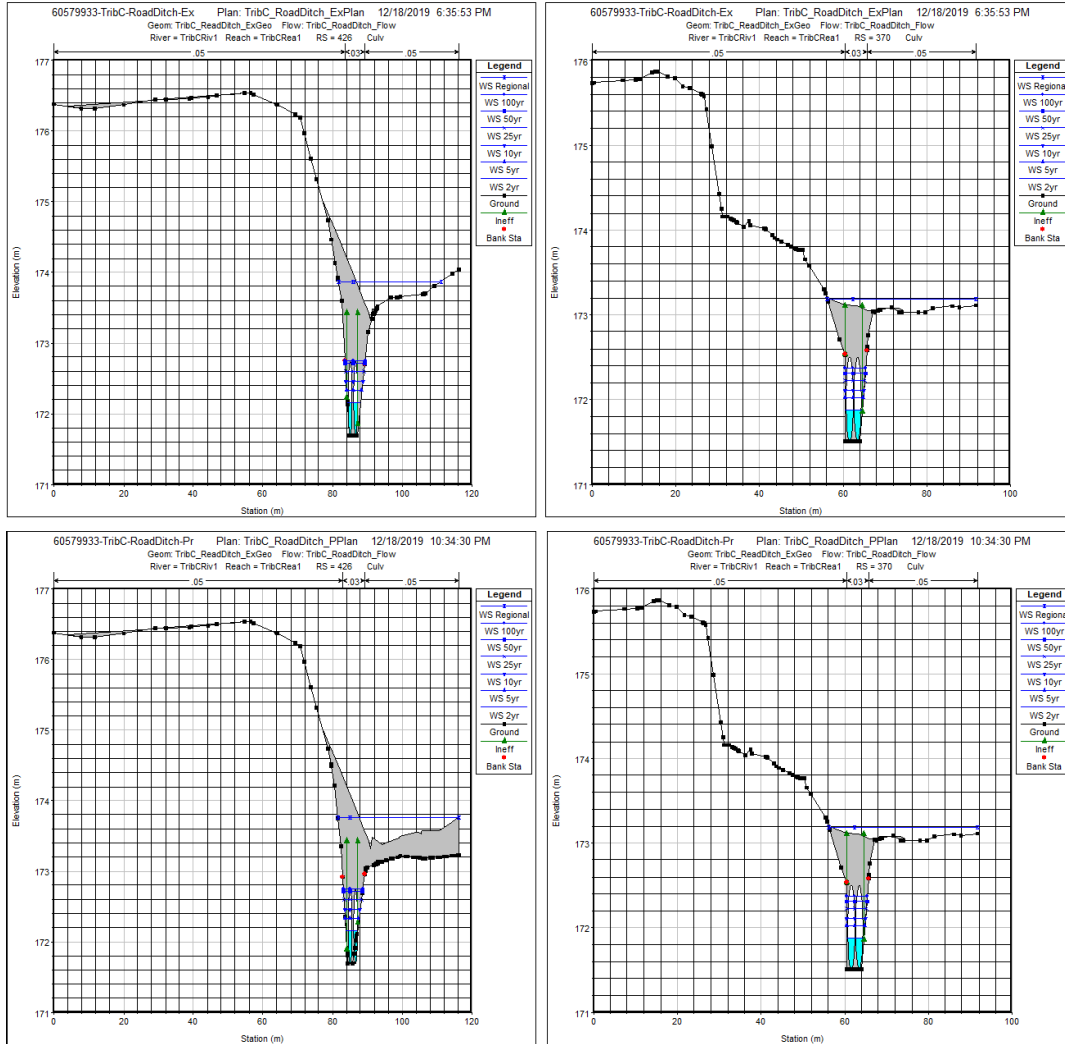


Figure 32. PDA Channel Realignment Alternatives

The channel realignment is designed to prevent flooding in the vicinity of Lower Baseline Road. The flood levels do not impinge on third party properties. The channel realignment satisfies the Milton Engineering and Parks Standards (Town of Milton, 2014), which state that major overland flooding cannot exceed 150mm depth over the crown during a 100-year event for any roadway and that flooding must remain within the designated right-of-way.

Regional Storm Spill Assessment on Lower Baseline Road at Inlet of Culvert 7 (ID 4016 station 65+525)

AECOM notes that the regional flood water level is expected to spill away from the upstream ditch of Culvert 7 on to Lower Baseline Road. Under existing conditions, there is major flooding for the regional storm event that overtops the CN rail tracks for Tributary C. AECOM investigated the location of the spill and notes that there is an 8 m wide spill weir channel that the Regional storm flow is spilling into, as seen in **Figure 33**.

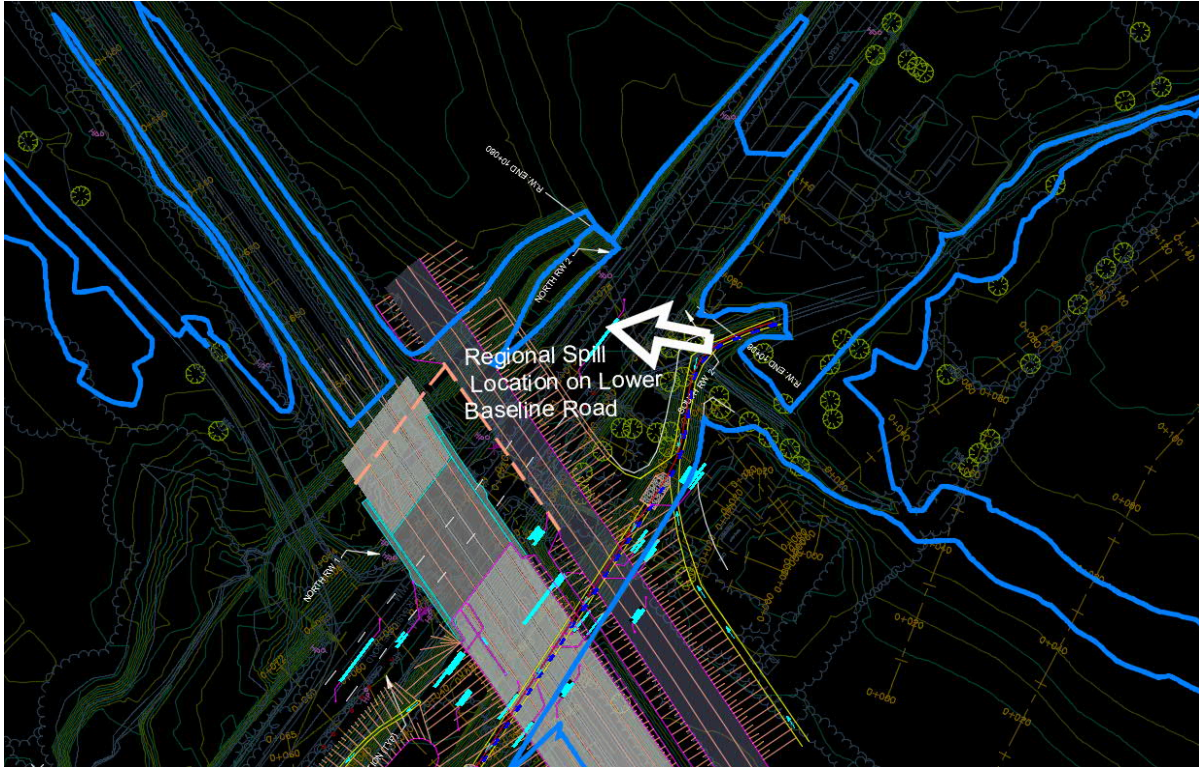


Figure 33. Regional Storm Spill Location on Lower Baseline Road

AECOM utilized two different methodologies to investigate whether or not the spill onto Lower Baseline Road is acceptable. As per Milton Engineering and Parks Standards (Town of Milton, 2014), major overland flooding cannot exceed 150mm depth over the crown during a 100-year event for any roadway and must remain within the designated right-of-way. In addition, the product of water depth (m) at the gutter times the velocity of flow (m/s) shall not exceed $0.65\text{m}^2/\text{s}$.

One method utilized to assess the acceptability of the spill employs a hydraulic rating curve for culvert 7 and weir spill rating curve to calculate the amount of discharge that spills to Lower Baseline Road. Rating curves are graphs showing the relationship between flow rate and a given inlet head. From **Figure 34**, the resultant spill discharge rate is found to be $1.7\text{ m}^3/\text{s}$ at the anticipated overflow elevation.

The second method entailed the use of HEC-RAS modelling to simulate lateral flows. In HEC-RAS, lateral structures are used to model flows being transferred between a creek and adjacent elements, in this case Lower Baseline Road. The lateral structure acts as an internal boundary element between the above model elements, and can represent a levee or flood wall, a flow diversion structure, or the natural terrain. An 8m long levee wall was inserted into the model and the resultant spill discharge was found to be $1.7\text{ m}^3/\text{s}$. Calculations are provided in **Appendix D**.

A flow of $1.7\text{ m}^3/\text{s}$ was then used to assess the depth of spill on Lower Baseline Road. Due to the complexity of the cross section, a HEC-RAS model was used to assess the spill over Lower Baseline Road using the flattest slope (worst case assumption). The resultant depth of flooding was determined to be 0.05m, which is less than the acceptable depth of 0.15m noted in the Milton Engineering and Parks Standards (Town of Milton, 2014). This is depicted in **Figure 35**. Under these conditions, flood flow velocity has been calculated to be 1.08 m/s. The product of depth of water times the velocity of flow is $0.05\text{m}^2/\text{s}$, which is less than the acceptable limit. Therefore, the regional spill on Lower Baseline Road is acceptable.

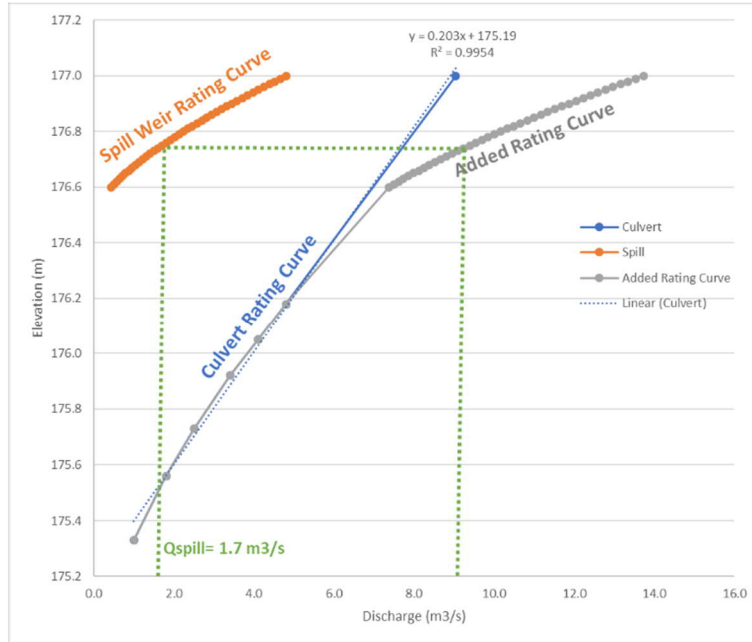


Figure 34. Rating Curve to Determine Spill Discharge on Lower Baseline Road

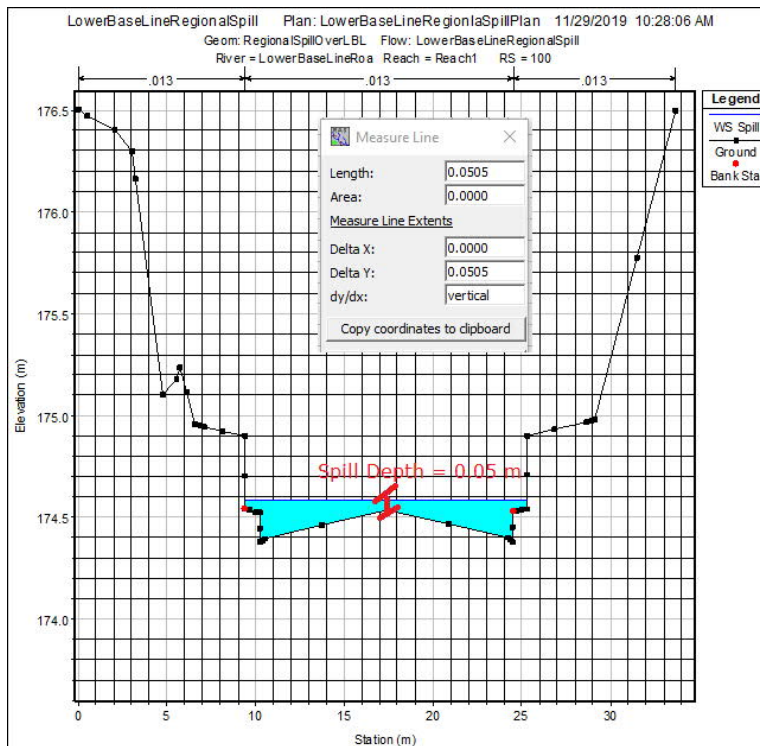


Figure 35. Depth of Flood During Regional Storm on Lower Baseline Road

Upstream Surface Water Effects

Any alterations to the existing culverts or the drainage hydraulic characteristics by the construction of the MLH should not increase flooding upstream if impacting any structures or private property.

For the culverts which have a HW/D greater than 1.0 during the 25-year event, this indicates that flow exceeds culvert capacity, and it is therefore recommended that the culvert be upsized, or a relief culvert be installed in order to mitigate any potential impacts to upstream properties.

The regional flow must be considered when taking upstream water surface effects into account. The headwater depth during the regional flow was determined for each culvert at their existing length and for culverts proposed to be lengthened. Both the existing and the uncontrolled developed Regional flows were considered. The comparison of the headwater depth for culverts proposed to be lengthened is provided in **Table 27**.

Table 27. Regional Flow Depth

Crossing Number	Mileage	Existing Length (m)	Proposed Length (m)	Existing Regional HW* (m)	Proposed Regional HW* (m)
4012 (2A)	39.67 (63+958)	24.3	201	181.39	180.24
4012 (2B)	39.67 (63+958)	-	92.3	-	178.75
4016 (C7)	40.70 (65+525)	21.1	78	181.4	176.9
5000 (C10)	37.98 (61+125.5)	13	26.2	190.0	189.9

*The HW is calculated assuming that flow is constrained within and above the culvert dimensions; overtopping of the rail is not considered. As such the calculated depths do not necessarily represent the actual depth of flow. Existing HEC-RAS modeling provided by CH does not consider the Regional spill, which gives a higher head water than anticipated.

The culverts at 4012 (2A/2B, 4016 (7) and 5000 (C10) all operate under inlet control conditions during the Regional flow and lengthening the culverts does not impact the upstream flood elevation. More details are provided in a separate report entitled *Indian Creek Tributary A and C Crossing Report* (AECOM, 2020), which show floodline maps for both existing and proposed conditions. The crossing report will require a cross check and to be updated once phase 2 is completed.

Fish Passage

Culverts 4012 (2A/2B) and 4016 (Culvert 7) within the work area convey watercourses which may provide fish habitat. An additional change that could occur as a result of the development relates to a change in flow through culverts, where the dimensions of the culverts are modified. If the culverts are made smaller or narrower, an increase in velocity may occur, and this has the potential to affect fish passage.

An assessment of the expected flow velocities through the culverts are provided in **Table 28**. Detailed information is provided in the Culvert Master and HEC-RAS model outputs in **Appendix C**. Lengthening the culverts does not significantly change the velocities through the culverts. No lining of the culverts is recommended, and the implementation of recommended culvert upsizing reduces velocities at the crossings and improves fish passage. No negative impacts to fish passage are anticipated as a result of the works.

Table 28. 2-year Flow Fish Passage Analysis

Structure	Existing Structure	Proposed Structure	Existing 3Q10 Flow (m/s)	Proposed 3Q10 Flow (m/s)
Culvert 2A	Twin 1200 mm CSP; 21.8 m long	Precast Closed Box Culvert 4000mm x 2300 mm 192.1 m long; anchor rock every 10m with maximum distance of 42.5m of between resting pools	2.4 m/s (discharge = 0.4 m ³ /s) (high velocity 5% slope culvert)	0.7 m/s (discharge = 0.4 m ³ /s) (4 m wide box at 0.4% slope, with low flow channel approx. 1.5 m bottom width, 0.4 m deep and having 3:1 slopes)

Culvert 2B	There was no existing Culvert 2B at that location.	Precast Closed Box Culvert 4000mm x 2300mm 92.3 m long; Anchor rock every 10m with maximum distance of 49.23 m between resting pools.	No existing crossing here, just existing channel – 0.6 m/s (discharge = 0.4 m ³ /s)	0.7 m/s (discharge = 0.4 m ³ /s) (4 m wide box at 0.4% slope, with low flow channel approx. 1.5 m bottom width, 0.4 m deep and having 3:1 slopes)
Culvert 3	Not Available	Not Available	No existing crossing here. No channel under existing conditions.	No low flow coming here only regional flow spilling from 2A in a ditch.
Culvert 7	2000mm x 1000m 21.2 m long Elliptical CSP	2400 mm diameter CSP; 78 m long with concrete baffles every 15 m	1.2 m/s (discharge = 0.12 m ³ /s)	0.8 m/s (discharge = 0.12 m ³ /s) (V channel at 1.0% slope, with low flow channel approx. 0 m bottom width, 0.5 m deep and having 2:1 slopes)

6.2.3 Uncontrolled Flows Hydraulics

To determine the potential impacts of uncontrolled flows at Britannia Road from upstream development, a hydraulic analysis was conducted for the proposed realignment of Tributary A, diversion channels and associated culverts as described below.

Culverts:

Culvert 2A/2B: Tributary A is to be realigned and upstream flows conveyed through a box culvert (Culverts 2A and 2B) under the yard and gate area as shown on **Figure 6**. It is noted that the proposed culverts were designed and sized to convey existing condition flows up to and including the 100-year storm event, while the excess flows during the Regional Storm event spills over to the diversion swale and are conveyed across the tracks through Culvert 3.

To determine potential increases in flooding upstream of the proposed MLH and to assess hydraulic impacts along the proposed Tributary realignment, the uncontrolled peak flow data summarized in **Table 12** was applied to the proposed conditions HEC-RAS model. The proposed conditions HEC-RAS hydraulic model for Tributary A (AECOM 2020) consists of a single 3,400 mm by 1,400 mm barrel box culvert which passes under the facility (Culvert 2A/2B), as shown on **Figure 6**, and a realigned channel, described in Stantec's Channel Realignment TDR (Addendum 1- Milton Logistics Hub – Technical Data Report – Channel Realignment (Appendix E.2) May 2020). A comparison of the water surface elevations for the proposed controlled and uncontrolled peak flow rates are summarized in **Table 29**.

Table 29: Comparison of Controlled and Uncontrolled Tributary A Water Surface Elevations

Location	River Sta.	Water Surface Elevations (m)					
		100 yr.			Regional		
		Controlled	Uncontrolled	Difference ¹	Controlled	Uncontrolled	Difference ¹
	1083.57	180.24	181.13	0.89	180.24	181.14	0.90
	1062.61	180.21	180.12	-0.09	180.22	181.12	0.90
Culvert 2A	957.65						
	852.47	178.80	179.07	0.27	178.81	179.08	0.27
	694.49	178.74	179.03	0.29	178.75	179.03	0.28
Culvert 2B	661.19						
	624.61	177.77	177.87	0.10	178.13	178.11	-0.02
	428.93	177.24	177.32	0.08	178.18	178.19	0.01
	381.31	177.22	177.29	0.07	178.18	178.18	0
Pond 1 Outlet	338.04	177.19	177.26	0.07	178.17	178.18	0.01
Orifice Elev. : 176.85m							

Weir Elev. : 177.85m							
Spillway Elev. : 178.90m							
Emb Top Elev. : 179.50m							
	304.73	177.18	177.24	0.06	178.17	178.18	0.01
	97.83	177.05	177.07	0.02	178.14	178.13	-0.01
	70.5	177.09	177.13	0.04	178.15	178.15	0
	36.84	177.09	177.12	0.03	178.15	178.15	0
Tremaine Rd Culvert	14.34						
	4.84*	176.82	176.82	0.00	178.15	178.15	0
Indian Creek²	0	176.82	176.82	0.00	178.15	178.15	0

1. Difference in water surface elevation (m), Uncontrolled – Controlled
2. Water surface elevations at this Station are taken from Indian Creek HEC-RAS Model Output at Cross Section No. 7630.803

Potential uncontrolled flows from the development areas north of Britannia Road could increase the water surface elevation upstream of the proposed MLH by 0.89 m and 0.90 m (from controlled conditions) for the 100-year and the Regional Storm event, respectively. Minimal changes in the water surface elevations are expected along the realigned channel, downstream of Culvert 2B. Although that increase will not result in overtopping of the tracks. Culverts 2A and 2B meet the required AREMA hydraulic criteria and will not cause any increase in flood elevations upstream of the CN tracks.

Culvert 1 is located under the proposed MLH access road immediately downstream of the Tributary crossing culvert at Britannia Road. The Region of Halton recently conducted a Class EA study for the widening and improvements of Britannia Road (Aquafor Beech, 2013) which also includes grade separation works at the intersection of the CN tracks and Britannia Road. The study recommends the replacement of the existing Tributary A CSP Pipe Arch culvert (1500 mm x 850 mm) with an open footing 7400 mm x 1400 mm concrete box culvert. The proposed culvert will not be overtopped during the Regional Storm event. Since culvert 1 under the access road is located immediately downstream of the Britannia Road culvert and therefore the same size will be installed (i.e. open footing 7400 mm x 1400 mm) to avoid any contractions in channel width. AECOM has assessed the culvert 1 opening and the results of the hydraulic assessment are provided in **Table 26**.

The external areas located west of Britannia Road are proposed for various residential developments under the Sherwood and Boyne Survey areas. These areas are drained through Tributary A, which passes through the proposed CN Milton Logistic Hub and ultimately discharges into Indian Creek. While framing the SWM Strategy (AECOM, 2015) for the Project, it was assumed that flows from external areas draining into Tributary A will be controlled to the pre-development levels. However, concerns with this assumption were raised and further analysis was conducted assuming that flows from external areas will not be controlled to the pre-development levels and uncontrolled flows will cross Britannia Road and pass the Project. The analysis indicates that uncontrolled flows for Culverts 2A and 2B passed AREMA’s guidelines.

6.3 Drainage Swales

The potential uncontrolled external flows in Tributary A affect the realigned Tributary A Channel C8 and diversion channels C3 and C9 as shown in **Figure 17**. Hydraulic analysis was completed for the channels affected by the uncontrolled flows, the results of which are summarized in **Table 30**. The results indicate that the increase in flow depths and channel widths are not significant and uncontrolled flows can be accommodated within the freeboard and therefore do not require any further modifications.

Table 30: Drainage Swale Dimensions - Controlled and Uncontrolled Flows

Channel ID	Catchment Area ID	Controlled Flows			Uncontrolled Flows		
		Peak Flow (Reg. or 100 year)	Channel Depth*	Top Width**	Peak Flow (Reg. or 100 year)	Channel Depth*	Top Width**

		(m ³ /s)	(m)	(m)	(m ³ /s)	(m)	(m)
C3	#301, 303+ Balance flow from Tributary A	9.34	2.15	11.20	12.41	2.17	11.28
C8	Culvert 2+ Pond 1+C7	16.09	2.10	12.00	18.70	2.24	12.56
C9	Culvert 3+408	22.14	2.40	13.20	23.27	2.45	13.40

*Channel depth with 0.3 m freeboard;

** Top width with 0.3 m buffer on each side

6.3.1 Ditches and Grassed Swales

The final conditions recommends that CN implement a combination of various measures during the detailed design phase including but not limited to grassed swales.

The location of the proposed grassed drainage swales is shown on **Figure 17**. Swale geometry has been designed using Manning's equation in conjunction with the peak flow rates derived from the hydrologic modeling. The design parameters and resultant swale dimensions are shown in **Table 31** below. Detailed calculations are provided in **Appendix C**.

Table 31: Drainage Swale Dimensions

Location	Channel ID (Figure 17)	Catchment Area ID	Design Flow (Regional or 100 year) (m ³ /s)	Bed Slope (%)	Bed Width (m)	Side Slope (H:V)	Channel Depth with 0.3 m Free Board (m)	Top Width with 0.3 m buffer on each side (m)
Yard Area	C1	#401	0.64	0.50	1.00	2	0.86	5.04
	C2	#1292	5.88	0.50	1.00	2	1.40	7.20
	C3	#301, 303+ Balance flow from Tributary A	9.34	0.26	3.00	2	2.15	11.20
	C4	#403	9.88	0.15	2.00	2	2.20	11.40
	C5	#405 (50%)	3.18	0.15	2.00	2	1.55	8.80
	C6	#405 (50%)	3.18	0.15	2.00	2	1.55	8.80
	C7	#401, #402	2.20	0.15	2.00	2	0.96	6.44
	C8	Culvert 2,+Pond 1+C7	16.09	0.15	3.00	2	2.10	12.00
	C9	C3+408	22.14	0.15	3.00	2	2.40	13.20

Conveyance Ditches

Ditch dimensions have been assessed in the event that the works encroach on the existing ditch or a new ditch is required. Utilizing Manning's equation for open channel flow with the peak flow rates calculated in **Section 6.1 Table 10**, the resultant flow depth has been estimated for the rail corridor ditching. Typical ditch cross-sections were obtained from phase 1 and 2 designs. Ditch sizing and locations for phase 1 and 2 are presented in **Table 32**. The computed depth for each location in phase 1 and 2 is presented in **Table 33**. Detailed phase 1 and 2 ditch catchment delineations are presented in the AutoCAD sheets in **Appendix A**. The analysis indicates that all typical sections convey the 100-year design flow. More detailed calculations are provided in **Appendix D**.

Table 32. Drainage Ditch Dimension and Location

Ditch ID	From Station	To Station	Area (ha)	Longitudinal Slope (%)	Shape	Side Slope	Bed Width	Manning Roughness	Design Flow (Regional or 100-yr)
4001	59+505	59+556	1.7	0.3	Trapezoidal	2:1	3	0.03	0.19
4002	59+660	60+147	3.1	0.2	Trapezoidal	2:1	1	0.03	0.45

4003	60+168	60+725	0.8	0.28	Trapezoidal	2:1	1	0.03	0.08
4005	60+780	61+315	0.4	0.3	Trapezoidal	2:1	1	0.03	0.04
4006	61+315	61+425	0.4	0.7	Trapezoidal	2:1	1	0.03	0.04
4010	62+373	62+650	2.5	0.19	Trapezoidal	2:1	5	0.03	0.12
4011	62+650	63+550	54.6	0.22	Trapezoidal	2:1	5	0.03	2
4012	63+960	64+560	Only regional (366.8)	0.26	Trapezoidal	2:1	3	0.03	9.34
4013	64+560	65+320	3.3	0.26	Trapezoidal	2:1	3	0.03	0.13
4014	64+900	64+424	63.1 + regional from 4012	0.5	Trapezoidal	2:1	3	0.03	12.17
4015	65+150	64+424	2.1	0.55	Trapezoidal	2:1	2	0.03	0.19
4017	65+550	66+077	7.6	0.76	Trapezoidal	2:1	2	0.03	0.51
4018	65+550	66+200	1.8	0.36	Trapezoidal	2:1	2	0.03	0.12
4019	66+200	66+322	2.4	0.58	Trapezoidal	2:1	2	0.03	0.29
6002	62+375	62+675	5.5	0.3	Trapezoidal	2:1	1	0.03	0.27
6003	62+760	63+025	0.7	0.28	Trapezoidal	2:1	1	0.03	0.09
6004	63+025	63+430	1	0.25	Trapezoidal	2:1	1	0.03	0.08
6005	63+430	63+975	1.4	0.26	Trapezoidal	2:1	1	0.03	0.13
6006	63+975	64+230	0.5	0.23	Trapezoidal	2:1	1	0.03	0.06
6007	64+230	64+625	0.5	0.29	Trapezoidal	2:1	1	0.03	0.05

Ditch 4012 and 4014 collect the Regional flow that is expected to spill from Culvert 2A. Typical cross are shown
Appendix J

Table 33. Drainage Ditch Capacity Results

Ditch ID	Computed Discharge (m ³ /s)	Channel Area (m ²)	Wetted Perimeter P (m)	Hydraulic Radius (m)	Channel Slope (m/m)	Velocity (m/s)	Channel Depth with 0.3 m Freeboard (m)	Top Width with 0.3 m buffer on each side
4001	0.19	0.43	3.59	0.12	0.003	0.44	0.4	5.3
4002	0.45	0.74	2.82	0.26	0.002	0.61	0.7	4.4
4003	0.08	0.19	1.66	0.12	0.003	0.42	0.4	3.4
4005	0.04	0.12	1.44	0.08	0.003	0.34	0.4	3.2
4006	0.04	0.09	1.34	0.07	0.007	0.45	0.4	3.1
4010	0.12	0.44	5.38	0.08	0.002	0.27	0.4	7.1
4011	2.00	2.51	6.92	0.36	0.002	0.80	0.7	8.5
4012	9.34	6.51	8.38	0.78	0.003	1.44	1.5	9.6
4013	0.13	0.35	3.49	0.10	0.003	0.37	0.4	5.2
4014	12.17	6.22	8.21	0.76	0.005	1.96	1.5	9.5
4015	0.19	0.32	2.62	0.12	0.006	0.60	0.4	4.4
4017	0.51	0.55	3.00	0.18	0.008	0.93	0.5	4.7
4018	0.12	0.27	2.54	0.11	0.004	0.45	0.4	4.3
4019	0.29	0.41	2.78	0.15	0.006	0.71	0.5	4.5

6002	0.27	0.44	2.26	0.19	0.003	0.61	0.6	3.9
6003	0.09	0.21	1.71	0.12	0.003	0.43	0.5	3.4
6004	0.08	0.20	1.68	0.12	0.003	0.40	0.5	3.4
6005	0.13	0.28	1.88	0.15	0.003	0.47	0.5	3.6
6006	0.06	0.17	1.60	0.11	0.002	0.36	0.4	3.3
6007	0.05	0.14	1.50	0.09	0.003	0.37	0.4	3.3

7. Pond and Channel Vegetation Plan

The planting plan has been developed to mitigate erosion and provide thermal mitigation benefits for the drainage water collected, attenuated, treated and discharged by the SWM ponds. Native plants will be used wherever possible in order to emulate existing conditions, support native species (e.g. birds and pollinating insects) and to minimize long-term maintenance requirements. A planting plan for the two SWMFs, included in **Appendix I**.

The Town requires street tree planting along public right-of-ways for all development and redevelopment, including but not limited to subdivisions, consents and site plans. With respect to site plans, the requirement for street tree planting will apply to development and redevelopment subject to Site Plan control in the Town of Milton. The final planting location is to be staked on site for approval in the field by the Town in conjunction with the Owner's Landscape Architect prior to installation. It is the Owner's responsibility to obtain utility locates prior to staking final planting locations.

Vegetation will provide thermal mitigation and cooling benefits via plantation along the wet ponds and outlet channel, which will provide dense shading, in addition to further plantings and shading in the form of vegetated berms. The planting plan was developed according to the final condition, Stormwater Management Planning and Design Manual (MECP, 2003), and the Conservation Halton Landscaping and Tree Preservation Guidelines (2010).

Larger trees (3 m in height or greater) should be used to shade permanent pools of streams and SWM ponds. Plantings should be placed immediately adjacent to pools to maximize the immediate shading and stabilizing benefits. Smaller species can be interspersed in these areas to allow for gradual growth and stabilization.

Tree planting stock should include a variety of sizes and successional species to accelerate establishment of a natural vegetation structure. It is recommended that the following percentages be used to determine the amount of each size to plant:

- 10% caliper, balled and burlap and/or wire basket material.
- 50% whip and/or saplings.
- 40% seedling and/or plugs.

To reduce thermal enrichment, shading of the southern exposure of the pond, inflow and outflow channels has been included within the design whenever possible. Consideration has been given to planting a portion of the required caliper species on the south side of the pond. A minimum of four aquatic plant species is to be included. Aquatic species include at least one species of submergent or floating-leaved plant, and at least one species of robust, broadleaved or narrow-leaved emergent.

Ground cover also includes no-maintenance, non-invasive species with locally native herbaceous species and grasses.

Aquatic plants should be planted in groupings and spaced 0.5 m to 1 m apart and cover 40% (at full growth) of the area defined by the normal water level up to 0.75 m deep. Cattails (*Typha latifolia*) are provided as interim vegetation in the sediment forebay to aid in sediment trapping (NOTE: it is recognized that this material will be removed during sediment dredging operations). Plantings of cattails should be limited to areas away from maintenance access areas. Other aquatic species are not to be planted in the sediment forebay as they may be less likely to re-colonize following dredging. *Typha latifolia* is to be used instead of *T. angustifolia* or *T. x glauca* which are invasive and non-native. The latter produces large quantities of seed and can spread even from temporary detention areas to adjacent natural areas. *Typha latifolia* seeds germinate and grow extremely rapidly and can be directly sown onto sites.

Protection from waterfowl may be required. Dense shrubby vegetation placed close to the permanent waterline will help to discourage loafing and nesting geese, however, protection of planting nodes may also be required.

The recommended plant species are provided in **Table 34**, proposed pond detailed planting list is in **Table 35** and proposed pond seeding mix is in **Table 36** by Crozier & Associates. Proposed Tributary A detailed planting list is in **Table 37** and proposed seeding mix is in **Table 38** by Stantec.

Table 34. Recommended Pond Planting List

Upland	Floodline Fringe	Shoreline	Deep Water
Betula papyrifera*	Acer saccharinum*	Typha Latifolia	Ceratophyllum demersum
Fraxinus americana*	Betula alleghaniensis*	Scirpus Validus	Potamogeton pectinatus
Populus tremuloides*	Populus balsamifera*	Glyceria borealis	Utricularia vulgaris
Quercus alba*	Salix discolor	Polygonum amphibium	Lemna minor
Quercus rubra*	Salix eriocephala	Sparganium eurycarpum	Lemna trisulca
Lonicera dioica	Salix exigua	Carex lacustris	Nuphar variegatum
Rhus typhina	Bidens cernua	Equisetum fluviatile	Scirpus validus

*The indicated plant species are trees

Table 35. Proposed Pond Planting List

Deciduous (Height in cm)	Coniferous Trees (Height in cm)	Deciduous Shrubs (Height in cm)	Plugs - Aquatics (far apart on-center)
Acer rubrum (4 and 100)	Larix laricina (150 and 100)	Aronia melanocarpa (50)	Alisma plantago-aquatica (1.0 m) in groups of 15
Acer saccharum (4 and 100)	Thaja occidentalis (150 and 100)	Cornus stolonifera (50)	Brasenia schreberi (1.0 m) in groups of 40
Betula alleghaniensis (4 and 100)	-	Physocarpus opulifolius (50)	Caltha palustris (1.0 m) in groups of 15
Carya cordiformis (4 and 100)	-	Rosa palustris (50)	Chelone glabra (1.0 m) in groups of 15
Quercus macrocarpa (4 and 100)	-	Salix amygdaloides (50)	Iris versicolor (1.0 m) in groups of 15
Populus balsamifera (4 and 100)	-	Salix discolor (50)	Nymphaea odorata (1.0 m) in groups of 35
-	-	Salix eriocephala (50)	Sagittaria latifolia (1.0 m) in groups of 15
-	-	Salix interior (50)	Sparganium emersum (1.0 m) in groups of 35
-	-	Shepherdia canadensis (50)	Utricularia cornuta (1.0 m) in groups of 35
-	-	Viburnum acerifolium (50)	-

*refer to Crozier & Associates drawing SWM-1 to SWM-8

Table 36. Proposed Pond Seed Mixes

Mesic Meadow Seed Mix	Wet Meadow Seed Mix
Aster novae-angliae	Asclepias incarnata
Desmodium canadense	Aster puniceus
Elymus canadensis	Bidens ceruna
Elymus virginicus	Carex crinata
Eupatorium perfoliatum	Carex lurida
Liatris spicata	Carex stipata
Monarda fistulosa	Carex vulpinoidea
Penstemon digitalis	Elymus virginicus
Rudbeckia hirta	Eupatorium maculatum
Schizachyrium scorparium	Eupatorium perfoliatum
Sorghastrum nutans	Glyceria grandis
Verbena hastata	Juncus effusus
-	Leersia oryzoides
-	Scirpus acutus
-	Scirpus atrovirens

*refer to Crozier & Associates drawing SWM-1 to SWM-8

Table 37. Proposed Detailed Tributary A Planting List

Upland Trees/Shrubs (Height in cm)	Deciduous Trees/Shrubs Floodline (Height in cm)	Live Stakes - Riparian (Height in cm)	Plugs - Floodplain and Upland (far apart on-center)	Plugs - Riparian Wetlands (far apart on-center)
Acer saccharum (150)	Acer rubrum (250 and 150)	Cornus stolonifera (75)	Asclepias syriaca (0.5 m) in groups of 72	Alisma plantago-aquatica (0.5 m)
Betula papyrifera (150)	Acer x freeman (250 and 150)	Salix discolor (75)	Asclepias tuberosa (0.5 m) in groups of 72	Asclepias incarnata (0.5 m)
Juniperus virginiana (80)	Populus tremuloides (250 and 150)	Salix eriocephala (75)	-	Calla palustris (0.5 m)
Prunus serotina (150)	Populus balsamifera (250 and 150)	-	-	Carex stricta (0.5 m)
Quercus rubra (150)	Thuja occidentalis (80)	-	-	Carex vulpinoidea (0.5 m)
Tilia americana (150)	Cornus amomum (30)	-	-	Chelone glabra (0.5 m)
Amelanchier arborea shrub (30)	Cornus foemina (30)	-	-	Iris versicolor (0.5 m)
Hamamelis virginiana shrub (30)	Ilex verticillate (30)	-	-	Lemna minor (0.5 m)

Prunus pensylvanica shrub (30)	Rosa palustris (30)	-	-	Polygonum amphibium (0.5 m)
Rhus typhina shrub (30)	Salix bebbiana (30)	-	-	Sagittaria latifolia (0.5 m)
Rosa blanda shrub (30)	Spirea alba (30)	-	-	Scirous cyperinus (0.5 m)
Rubus Odoratus (30)	Viburnum lentago/trilobum (30)	-	-	-

*refer to IFC (Issued for Construction) drawing 01-L-501 for planting notes and details prepared by Stantec

Table 38. Proposed Tributary A Seed Mixes

Seed Mix #1 - Channel Riparian and Wetland Riparian (5 kg/ha.)	Seed Mix #2 - Floodplain (5 kg/ha.)	Seed Mix #3 - Upland (5 kg/ha.)	Seed Mix #4 - Stabilization Mix (25 kg/ha.)
Poa palustris	Poa palustris	Schizachyrium scoparium	Elym us canadensis
Carex vulpinoidea	Carex granularis	Elym us histrix	Avena sativa
Verbena hastata	Verbena hastata	Rudbeckia hirta	-
Carex granularis	Andropogon geraraii	Carex granularis	-
Scirpus atrovirens	Juncus tenuis	Solidago canadensis	-
Juncus effusus	Rudbeckia hirta	Oenothera biennis	-
Eupatorium perfoliatum	Asclepias syriaca	Asclepias syriaca	-
Asclepias incarnata	Solidago canadensis	Clem atis virginiana	-
Carex stipata	Clematis virginiana	Monarda fistulosa	-
Glyceria grandis	Monarda fistulosa	Anem one canadensis	-
Scirpus cyperinus	Anem one canadensis	Eutham ia gram inifolia	-
Eupatorium maculatum	Sym phyotrichum novae-angliae	Sym phyotrichum cordifolium	-
Carex bebbi	Sym phyotrichum puniceum	Aster novae-angliae	-
Lobelia silphilitica	-	-	-
Eutham ia gram inifolia	-	-	-
Sym phyotrichum puniceum	-	-	-
Mim ulus ringens	-	-	-

*refer to IFC (Issued for Construction) drawing 01-L-501 for planting notes and details prepared by Stantec

7.1.1 Tributary A – Indian Creek Planting Plan (By Stantec)

Planting plans has been applied to Indian Creek by Stantec. There are 6 zones to where the trees are planted:

- Zone 1 - Channel riparian (low flow channel to 2 m above top of bank)
- Zone 2 - Floodplain planting:
- Zone 3 - Upland (valley walls and other disturbed uplands):
- Zone 4 - Riparian wetlands
- Zone 5 - Other disturbed uplands (not shown on plan)
- Zone 6 - Additional monarch enhancement areas:

More detailed notes to Indian creek planting plan are outlined in the IFC package drawing 01-C-952 to 01-L-311.

7.1.2 Tributary A Planting Notes (By Stantec)

Planting notes has been applied to Indian Creek by Stantec. There are 8 planting notes and details:

- LD1 Details (Typical coniferous tree planting).
- LD2 Details (Typical deciduous tree planting 40 – 60 mm caliper).
- LD3 Details (Typical deciduous whip planting):
- LD4 Details (Shrub planting):
- LD5 Details (Typical Shrub planting for slope conditions):
- LD6 Details (Nucleation cell planting):
- LD7 Details (Typical channel riparian livestock locations):
- LD8 Details (TYPICAL CHANNEL RIPARIAN LIVESTAKE LAYOUT AND INSTAL):

More detailed planting notes and details are outlined in the IFC package drawing 01-L-500.

7.1.3 Ponds Planting Plan (By Crozier & Associates)

Planting plans has been applied to pond 1 and 2 by Crozier & Associates. There are 2 locations in which trees are planted:

- Location 1 – Around the perimeter of pond 1.
- Location 2 – Around the perimeter of pond 2.

More detailed notes to ponds planting plan are outlined in **Appendix I sheet SWM-1 to SWM-8**.

7.1.4 Ponds – Planting Plan (By Crozier & Associates)

Planting plans has been applied to pond 1 and 2 by Crozier & Associates. There are 3 planting notes and details:

- LD1 Details (Deciduous tree planting).
- LD2 Details (Deciduous tree planting).
- LD3 Details (Shrub understory planting):

8. Climate Change

Consideration of potential climate change impacts is foundational to the design of the stormwater servicing works proposed for the Project. Starting with the anticipated rainfall intensities and volumes, the intensity-duration-frequency (IDF) curves used in the proposed conditions hydrologic modelling were updated according to MTO’s projected 2095 IDF curve conditions, in order to account for climate change over the expected 75-year lifespan of a given culvert. However, the Visual Otthymo modelling used the IDF values derived from the rainfall data taken from the AES Toronto Pearson International Airport climatic station.

There are significant uncertainties inherent in downscaling climate change models to develop regional IDF statistics. Additionally, the 100-year climate change event depth confidence limits were found to be within the upper and lower (95% and 5%) confidence levels used in the modelling, as seen in **Figure 36** below:

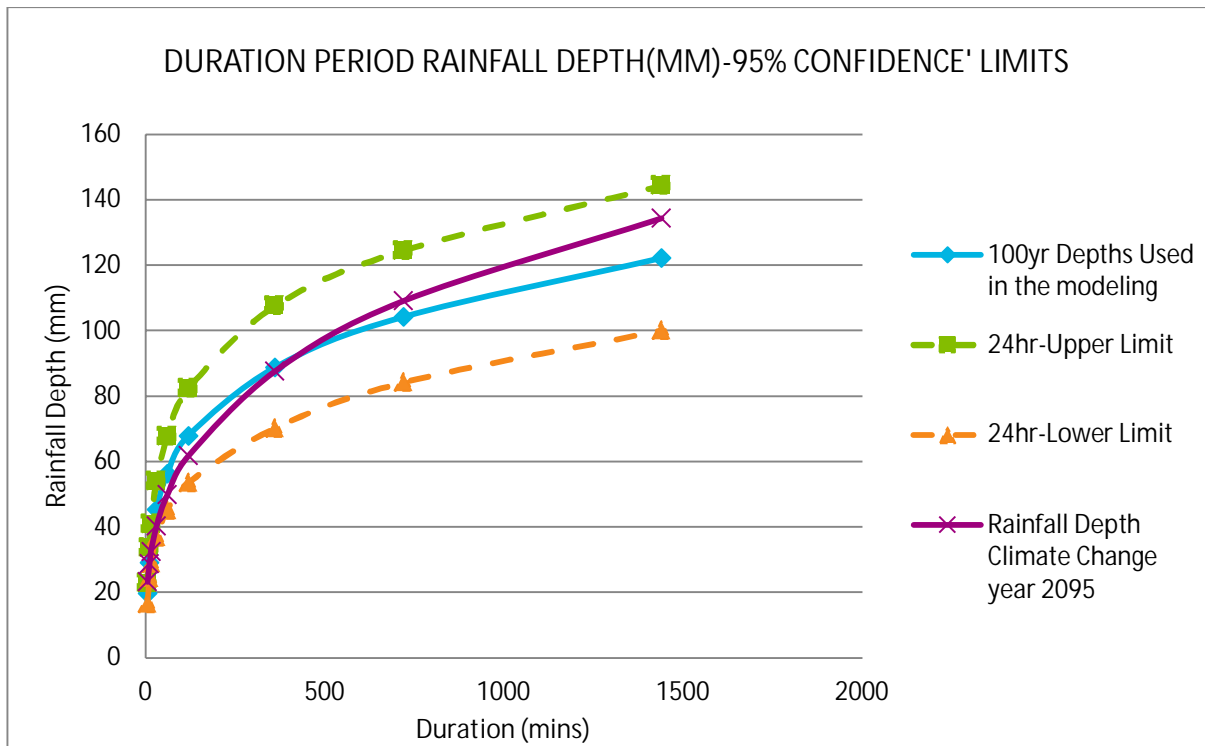


Figure 36. Duration Period Rainfall Depth (mm) – 95% Confidence Limits

The expected flow volumes into the SWM ponds were based off of the defined unitary discharge anticipated from impervious catchment areas, provided in the Boyne Survey Secondary Plan Area Functional Stormwater and Environmental Management Strategy Report (AMEC, 2015), and while no mention of climate change has been made in that report, the unitary discharge rates are understood to be reflective of the environmental needs and flow targets of the area. Therefore, management of future (climate adjusted) runoff to the allowable discharge rates specified in the Boyne Survey Secondary Plan Area Functional Stormwater and Environmental Management Strategy Report is expected to satisfy climate change-related concerns and considerations.

9. Construction Management

9.1 Erosion and Sediment Control

The erosion and sediment control (ESC) plan (Dufferin 2021) and Accidents and Malfunctions Response Plan – Construction (Dufferin 2021) will be employed during and after construction in compliance with Final Conditions 5.4, and 14.

The final conditions provide recommendations regarding the implementation of mitigation measures for surface water flows as necessary in order to avoid a significant adverse environmental effect. Therefore, the following mitigation measures will be implemented at a minimum in accordance with the Erosion and Sediment Control Plan and Drawings (Dufferin, 2021; AECOM, 2021) and the Accidents and Malfunctions Response Plan- Construction (Dufferin, 2021):

- ESC measures shall not be removed until permanent vegetation is established or the site is otherwise fully established.
- Ensure water and pump intakes reduce or avoid disturbance of the watercourse bed and are screened in accordance with Fisheries and Ocean Canada's Freshwater Intake End-of-Pipe Fish Screen Guideline (Fisheries and Oceans Canada, 1995); and
- Oil grit separators proposed for the administration and maintenance buildings and gate area to capture sediments, oil and grease before discharge to the wet ponds;
- Install erosion and sediment control measures at appropriate locations adjacent to all watercourses and water bodies. Appropriate temporary erosion and sediment control structures shall be installed, maintained and monitored through all phases of construction see the Erosion and Sediment Control Devices section below;
- Implement stabilized construction access and roadways to reduce the tracking of construction sediment (mud and dirt) onto public roads by construction equipment;
- Ensure water from flumes, dams and pumps, diversion or other methods do not cause erosion or introduce sediment into the channel;
- Restrict grubbing, stripping and grading on approach slopes to watercourses and water bodies to the amount required to allow safe passage of equipment and completion of the relevant work, in order to facilitate the restoration of shrub communities;
- delay grading of the primary banks of watercourses and water bodies until immediately before construction of temporary crossings and watercourse realignment, where practicable;
- Complete dewatering in a manner that does not cause erosion or allow sediment to re-enter a watercourse or water body through the use of appropriate sediment control devices;
- Establish designated refueling areas for yard equipment at a safe distance (30-metre setback minimum distance from top of bank) from fish habitat;
- Implement measures to prevent wet concrete or sediment-laden water, including high pH run-off occurring during concrete work, from entering any wetland or waterbody during construction. Establish washout areas before beginning concrete work.
- Have spill containment kits present on-site in designated locations where there is a higher risk of spills, such as refueling areas);
- Should dewatering of excavated area be required (due to rain or minor amounts of groundwater), any water pumped from the excavated area will be pumped through a filter bag or into an area of undisturbed

vegetation at least 30 m from the watercourse or an alternate area approved by the engineer and fisheries biologist; and

- Implement the following specific erosion and sediment control measures:
 - Vegetation seeding and planting would be stabilized, where necessary, by erosion control matting and blankets; and
 - Erosion and sediment control measures around channel realignments will remain in place, at least until vegetation has established.

Additional ESC measures are outlined in the ESC Plans (Dufferin, 2021; AECOM, 2021) and Accident's and Malfunctions Response Plan – Construction (Dufferin, 2021).

Erosion and Sediment Control Devices (ESCDs)

The Contractor will install erosion and sediment control measures at appropriate locations adjacent to all watercourses and/or water bodies, or as directed by the Environmental Monitor(s). Appropriate temporary erosion and sediment control structures shall be installed, maintained and monitored through all phases of construction.

Emphasis is placed on minimizing the extent and duration of exposed soil and containing any eroded material outside of the watercourses. A multi-barrier approach will be utilized. The sediment and erosion control measures to be implemented could include the following:

- Heavy duty silt fencing;
- Sandbag filters as per OPSD 219.200;
- Temporary V-Ditch and flow diversion channels;
- Silt control filter;
- Rock flow check dams;
- Straw bale filters;
- Silt curtain;
- Cofferdams and pumping systems;
- Cobble or rubber for re-stabilized channels;
- Erosion matting;
- Filter fabric under catch basins frame and gates; and
- Mud mats.

Refer to **Appendix L** for design drawings and specifications that shows the placement and implementation of these measures.

Contingency Measures in Case of Failure

In the event where failure of ESCDs occurs, the contractor shall complete the following:

- Cease all construction work and focus on erosion and sediment control.
- Stabilize the site of failure.
- Prepare a report within a 2-hour period for the MECP, CH, DFO and CN if a discharge of sediment to a watercourse occurs.
- Establish a restoration plan if damage to fish habitat has occurred. Restoration plan to include:
 - Removal and disposal of sediment from flood plain;
 - Restoration of flood plain;
 - Restoration of any disturbed areas.

Erosion and sediment control strategies are not static and may need to be upgraded or amended as site conditions change to minimize sediment laden runoff from leaving the work areas. ESC plans are to be treated as living documents and must be modified to reflect the dynamic, changing conditions characteristic of the phased site development and weather events which will be experienced over the course of construction. If the initially-prescribed measures are not effective, alternate measures shall be implemented immediately in order to minimize ecological impacts.

10. Operation and Maintenance

This operation, maintenance and monitoring manual is intended to provide sufficient guidance, recommendations, and instructions to ensure proper functionality of all components of the development area's stormwater management system. This program has been developed to address the inspection, maintenance, and monitoring requirements of the SWM facility and the rest of the SWM system. CN is responsible for the operation, maintenance and monitoring of the two wet pond facilities.

A comprehensive operation, maintenance and monitoring program ensures the SWM facilities function as designed, providing adequate flood control, water quality control and minimal impact to adjacent and downstream habitats.

In accordance with the final conditions, CN will implement an Accidents and Malfunctions Response Plan to contain potential spills and prevent contamination. The Accidents and Malfunctions Plan includes structural elements such as shut-off valves on stormwater management ponds in the event of an accidental spill to protect the downstream environment. In the event a stormwater management pond becomes contaminated with a spill, implementation of bird deterrents shall be completed to prevent use of any affected pond by birds until cleanup measures have been completed.

An Accidents and Malfunction Response Plan will be implemented during both construction and operations. These plans include measures to:

- identify location of spill equipment on-site, methods to prevent containerized material spills from spreading and for recovering the materials in the water as well as identify any sensitive habitats to best direct response efforts;
- restrict the storage of hazardous materials to designated areas with proper containment and in accordance with appropriate safety procedures and requirements;
- audit shipments for compliance with safe loading practices; and
- use authority, when necessary, to evacuate personnel from CN property, and assist in simultaneously notifying nearby businesses and the community, recognizing that it is the decision and responsibility of local authorities, including police and fire departments, to initiate protective action, such as evacuations, for the community outside the facility or mainline right of way.

Additionally, the final conditions recommend that CN further reduce the potential environmental effects of accidents and malfunctions by:

- ensuring that spill prevention measures and mechanisms incorporate multiple barriers, including physical barriers such as concrete berms, to contain the movement of dangerous chemicals over the land surface and prevent entry into watercourses, in consultation with Transport Canada, emergency response professionals, and others as appropriate;
- locating storage areas for containers with combustible or flammable materials a minimum of six metres away from the property line or buildings;
- regularly updating emergency response plans to align with the Network Operations Emergency Response Plan, or in response to regulatory changes, personnel changes or other process changes;
- ensuring that any relevant emergency response plans include provisions for fire preparedness and fire hazard reduction;
- working closely with local authorities to develop and implement CN's Emergency Response Plans, including evacuation and emergency communication procedures and staff training, in order to properly coordinate protective actions; and
- working closely with the Community Liaison Group to update the community on any known or emerging issues, or where the effects of an accidents and malfunctions may be felt outside the PDA.

10.1 Oil Grit Separators (OGS)

The OGS units shall be inspected two times per year to visually determine the depth of trapped material and evaluate if the unit requires maintenance. One of the inspections shall occur during early spring following the spring melt and another shall be conducted during late fall to ensure capacity exists in the unit in order to accommodate winter loading. After the first year of inspection, the inspection intervals may be modified according to the first year's observations and local maintenance requirements. Other general maintenance recommendations for OGS units are as follows:

- Inspect the OGS units post construction, prior to being put into service;
- Inspect the OGS units every 6 months for the first year to determine the oil and sediment accumulation rate. In subsequent years, inspections are to be based on a combination of first-year observations and local maintenance requirements;
- Inspect immediately after an oil, fuel or chemical spill. A licensed waste management company should remove oil and sediment and dispose of all material responsibly and;
- Use a vacuum truck to remove collected sediment and oil when unit is reaching capacity.

OGS units are proprietary and each entails its own maintenance guidelines and schedule.

10.2 Wet Pond SWM Facilities

Stormwater management facilities require periodic maintenance to sustain long term effectiveness for pollutant removal. The type of required maintenance activity varies for each of the different stormwater management practices. The SWM Facilities (wet ponds and grassed swales) follow the management practices provided by the Boyne Survey Secondary Plan Area Report (2015). These are summarized in **Table 39**. Cleanout protocols for the ponds follow the wildlife management plan.

Table 39. Summary of Maintenance Activities for Various Stormwater Management Practices Proposed for the Boyne Survey Area

Stormwater Management Practice	Operations and Maintenance Activity	Frequency of Activity (years)
Wet Pond	Inspection	1
	Debris Removal	1
	Vegetation Replanting/Maintenance	5-10
	Grass cutting/weed control	1
	Outlet adjustment	As required
	Sediment removal from forebay	10-20
	Sediment removal from wet pond area with replanting	25-35
Grassed Swales	Inspection	1
	Debris Removal	1
	Sediment removal/grading with reseeded/planting	7-10

In addition to the foregoing, operation and maintenance is required for all LID BMPs, such as the rooftop rainfall collection. The specific operation and maintenance requirements for these types of facilities depends upon the type and function of the specific facility. The vendor of the systems may provide further information regarding monitoring and maintenance.

10.2.1 Sediment Removal

Part of the role of the wet pond is to remove pollutants from stormwater runoff prior to discharging water off site. As such, the wet pond will need to be periodically dewatered and the sediment captured will need to be removed and disposed of. The following section outlines the triggers and process for maintaining the wet pond. Sediment removal is required when the volume of the pond has been reduced by sediment accumulation, thereby reducing TSS removal efficiencies by 5% below the target 80% TSS removal rate.

It is estimated that 10 to 20 years would be an ideal period in which to remove sediment from pond as shown in **Table 39**. However, during periods of construction, more sediment than usual will be collected by the pond, and it is possible that the pond will require cleaning earlier than the stated interval after it has been constructed. Sediment removal may be focused on the forebay if inspections of the pond indicate that the forebay is collecting the majority of the sediment. Providing TSS removal in the forebay reduces more costly sediment removal operations associated with removing sediment from the main cell.

Sediment cleanout requires that the wet pond be drained of all excess water. In order to drain the pond, it is recommended to open the knife gate valve and to allow the water to drain out. Once the pond is drained and sediment has been allowed to solidify (e.g. over 24 hours), excavators may enter to remove the sediment.

Prior to undertaking any sediment removal activities, the following should be completed:

- Check weather forecasts to ensure that no rain will occur for at least a period of one week.
- Drain the pond of water by using the knife gate valve. A submergible pump may be used to drain the forebay.
- Remove the sediment from the wet pond using either excavators or vacuum trucks. If removing by excavators, the sediment should be stored on the side of the banks of the pond in order to allow excess water to drain. Once the water is drained, the sediment may be loaded onto dump trucks and disposed of in accordance with applicable regulations.
 - If removing by vacuum trucks, sediment should be moved to an area where it can be easily collected by the vacuum trucks.
- Once sediment is removed, allow the pond to re-fill with water over subsequent rainfall events. There is no need to re-fill the pond with potable water.

10.2.2 Planning Sediment Removal

If sediment removal has been identified as a required maintenance item, CN will authorize the removal of accumulated sediment. Two weeks prior to sediment removal a sediment removal work plan should be submitted to the CN operations and maintenance management. The intention of the work plan is for CN management to confirm that MECP and MNRF guidelines and protocols will be adhered to. Providing notice of sediment removal works will permit CN to respond to questions or concerns from the public.

Qualified personnel are required to approve, supervise, and review the sediment removal and disposal requirements. All cleaning shall be completed within five days and be undertaken in dry weather conditions with no chance of rain in the forecast over the period of working days. The enclosed Sediment Removal Form 3 (**Appendix F**) is to be completed following sediment removal.

The sediment is to be analyzed prior to removal to assess suitable disposal options including on-site land application, off-site land application (i.e. as fill or for agricultural application) or landfill disposal. Sediment sampling should be undertaken by a qualified technician based upon on-site conditions and using appropriate methods to ensure a representative sample is collected. Samples are to be taken from at least two areas of the pond to form a composite sample for each test. Samples should be collected at a minimum from an inlet and outlet location. If the physical characteristics, such as colour, sheen, or texture of one sample appear to be different to the other areas, this sample should be analyzed separately.

Samples must be analyzed by a qualified laboratory, in accordance with "Regulation 347 of the Environmental Protection Act" and include at minimum, leachate extraction, Schedule 4 metals and Schedule 4 anions, in order to

determine appropriate disposal options. If testing indicates that the sediment does not meet the criteria for clean land fill, the "Guidance on Sampling and Analytical Methods for Use on Contaminated Sites" must be used to determine the type(s) and severity of contamination and the subsequent appropriate method of disposal.

10.2.3 Draining the Permanent Pool

Cleaning of the ponds (whether the forebay or main cell) will initially require drawing down the water level in the wet pond. The permanent pool water is to be drawn down by valve for pond maintenance. The sediment forebay may be drawn down with a portable submersible pump, typically discharging into the main pond cell. The pond cannot be drawn down further upon visual evidence of suspension of sediment in the effluent. When the drawdown is complete, maintenance equipment will enter the forebay of the facility and the main cell. If the removed sediment is too wet to handle, it may be initially placed along the upper inner slope of the shelf for drying.

Before the dewatering process, a qualified aquatic biologist will salvage and relocate fish in a manner that is consistent with any license issued under the Fisheries Act and its Regulations. In doing so, they will:

- salvage and relocate fish to the satisfaction of Fisheries and Oceans Canada and other relevant authorities;
- give preference to relocating fish within the same waterbody, outside of the work area; and
- if relocating fish within the same waterbody is not technically feasible, relocate fish where suitable habitat exists, outside of the work area.

10.2.4 Removing Sediment

Sediment removal within each facility may require the use of a small rubber-tired backhoe tractor or similar vehicle or vacuum equipment, and a dump truck. The layers of sediment must be removed down to the original elevation and the bottom of the pond graded and restored. The sediment forebay at the inlet to the facility will also require sediment removal with similar type equipment.

After the pond has been cleared of sediment, the bottom and sides must be regraded to design grades and should be left to regenerate via natural processes. Prior to maintenance, identify vegetation not to be impacted by the work, which to be avoided, transplanted, or replaced as required.

The turfstone placed around the pond inlet, outlet, and forebay areas should not be loosened or removed from its location. The sediment and subsequent natural regeneration of wetland species will provide good stabilization and prevent bank erosion.

The Contractor would provide all labour, equipment and materials necessary to dewater the SWM facility as well as to bypass new stormwater flows around dewatered areas in order to permit the sediment removal to be undertaken in appropriate working conditions. The dewatering and bypassing to be undertaken in stages as noted below.

To protect aquatic / reptilian / amphibian wildlife the sediment forebay and the main cell to be dewatered and bypassed separately in order to provide an area where trapped aquatic / reptilian / amphibian wildlife can be relocated to, while either the sediment forebay and or the main cell are being dewatered and the sediment removed.

The Contractor would siphon water from the top of the facility cells rather than drawing water from the bottom of the facility cells, so as to not disturb and re-suspend sediment. All dewatering effluent to be discharged in a manner that prevents the entry of sediment to the downstream watercourses or scouring and erosion at the outlet of the pumping operation. Dewatering effluent to be discharged well away from any watercourse or waterbody and be allowed to pass through a minimum of 15 m of grassed area to remove suspended sediment. A straw bale check dam to be installed downstream of the discharge outlet to improve sediment removal.

Once the work area is dewatered, the Contractor would maintain a bypass around the dewatered work area at all times to permit sediment removal in dry conditions, including but not limited to the installation, maintenance and ultimate removal of any required coffer dams, pumps, sediment control or other items as required.

10.2.5 Addressing Excessive Algae

The experience of most municipalities across Ontario is that odour and algae are not problems at SWM ponds. The presence of algae will be monitored as part of routine inspections. If algae becomes a problem, a wind driven aeration unit can be considered for the facility.

10.2.1 Sediment Drying Area

Stormwater management facilities must be maintained regularly, otherwise they will not function optimally and may fail to provide the required level of water quality treatment. The contractor will develop an operation and maintenance manual to identify how future sediment cleanouts will be undertaken. CN will be responsible for the operation and maintenance of the SWM facilities in accordance with the requirements outlined in the EA including any additional details listed in the design plans and specifications. The operations and maintenance manual should identify the location where cleanouts of the forebay and main cell will be completed from, how the two ponds will be drawn down, the type of equipment to be used, the location of the sediment drying area and any special operational considerations that must be utilized such as bypass piping or valves. These procedures must be reviewed by a geotechnical engineer with consideration of the design of the pond to identify if the maintenance works will impact the overall function and stability of the stormwater management facility.

10.3 Storm Sewer Systems

Trunk storm sewer systems provide a critical function in the drainage network, whereby urban runoff is conveyed subsurface to a 'suitable' open system. The component elements associated with the trunk storm sewer system include ditch inlets, catch basins, stormwater management facility inlets and outlets, and outfalls. Key concerns associated with the system's function include blockages and concerns with structural integrity. Storm sewer maintenance will follow the management practices provided by the Boyne Survey Secondary Plan Area Report (2015). These are summarized in **Table 40**.

Table 40. Trunk Storm Sewer System Operations and Maintenance Procedures

System Element	Operations and Maintenance Activity	Frequency of Activity (years)
Ditch Inlets	Inspection	0.3 – 0.5
	Debris Removal	0.3 – 0.5
	Repair	10-20
Catch basins	Inspection	1
	Sediment removal	1-2
	Repair	20+
Outfalls	Inspection	0.3 – 0.5
	Debris removal	0.3 – 0.5
	Erosion Repair	3 – 5
	Repair	20+
Trunk Sewers	Inspection	1
	Structural Repairs	20+
	Replacement	50

10.4 Watercourse Systems

Historically, engineered open watercourse systems were constructed in urban environments to convey flood flows efficiently, minimize erosion and maximize development opportunities of adjacent tablelands. This management

approach led to the construction of various channel realignments. Open watercourse systems through urban settings are designed to incorporate features of natural systems including low flow channels, flood plains, riparian vegetation, meandering alignments and natural substrate. long term capital maintenance activities would be expected to be nominal and likely localized, rather than involving major repairs or replacement. The watercourse systems maintenance will follow the management practices provided by the Boyne Survey Secondary Plan Area Report (2015) as shown in **Table 41**. it suggests that maintenance activities in the first 3 to 5 years are likely to be required, until the system has stabilized; after this point maintenance works should reduce substantially and ultimately be minimal.

Table 41. Watercourse System Operations and Maintenance Procedures

System Element	Operations and Maintenance Activity	Frequency of Activity (years)
Thalweg/Low Flood Channel	Inspection	0.25 (following major storms)
	Repair Localized Erosion	1
Flood Plain	Inspection	1
	Repair Localized Erosion	3 – 5
	Reinstate Riparian Plantings	1 – 5

10.5 Stormwater Management Pond

The continued function of the SWM facility to achieve design operating objectives is based on maintaining the SWM facility and several key performance criteria. The key performance criteria include; extended detention, water quality and sediment storage.

Pond inspections are required twice a year. The SWM facility should be inspected following three days of dry weather in late autumn each year to ensure functionality during the spring freshet. A second annual inspection is recommended to take place in the spring during wet or dry conditions to ensure functionality throughout the spring, summer and autumn. The inspections should include an annual sediment level monitoring component to monitor and identify sediment clean-out requirements during the first few years of operation. Once the facility and drainage area have become stable and sediment loading rates are well established, less frequent sediment quantity monitoring may be authorized by the owner.

During each site visit, it is recommended an inspection is undertaken and the enclosed Pond Review Form 1 is completed (**Appendix F**). The form should be completed by a qualified technician and will provide the basis for any required pond maintenance. This form is to be used to identify:

- Minimum liquid retention volumes are maintained within the facility;
- Erosion of embankments;
- Sediment and debris accumulation;
- Condition of access roads and pathways;
- Structural deficiencies (bulging, spalling, sliding, obstructions)
- Odours;
- Potential water quality concerns (i.e. excessive algae growth, evidence of oil spill); and
- Other items which would differ from the intended design function.

10.6 General Maintenance

The following program must be undertaken on a semi-annual (spring, autumn) basis to maintain functionality within the facility. These inspections apply for both ponds:

- Complete the enclosed Pond Review Form 1 (included in the **Appendix F**) during each inspection. The form should be completed by a qualified technician and will provide the basis for any required pond maintenance;
- Complete annual sediment inspections to identify the quantity of sediment within the pond. After the ponds and drainage areas have become established a sediment loading rate may be determined to estimate when sediment removal may be required. After the sediment loading rate has been established sediment inspections may occur less frequently.
- Undertake all required repairs to the pond identified during routine inspections and complete the enclosed Maintenance Log Form 2 (**Appendix F**).

Annual sediment levels should be determined based on spot measurements in 4 to 6 locations across the pond and forebay. There are a number of acceptable techniques for measuring sediment levels (including but not limited to core samples, disc and rod, depth sounding, guided radar levels). Prior to sediment removal, a full bathymetric survey of the pond sediment is recommended for contracting purposes.

10.6.1 Outlet Control Structure

The Outlet Control structure houses a dual orifice plate that controls the discharge of water from the pond during a rainfall event. There are 200 mm outlet orifice openings for Pond 1 and Pond 2. Both ponds also have 100mm knife gate valves on 100mm inlet pipe to the pond maintenance structure.

Bi-annual visual inspections of the orifice controls should be made in order to ensure that they are not plugged with debris or garbage. The interior of the structure should be visually inspected to ensure that the structure is free from debris. The debris may be removed using a vacuum truck.

10.6.2 Maintenance of Outlet Structure

The maintenance structure houses a knife gate valve to facilitate the draining of the permanent pool when sediment needs to be removed. The knife gate valve should be exercised every 6 months. Exercising the gate valve requires opening and closing the valve a minimum of 3 times to ensure that it is not seized up. In addition, the interior of the structure should be visually inspected to ensure that the structure is free from debris. The debris may be removed using a vacuum truck.

10.6.3 Landscaping

All woody plant material is to be pruned as necessary (where stems and branches are broken or present conflict). It is important to recognize that pruning woody plant material promotes new growth; therefore, pruning is essential for reduced maintenance efforts.

The perennial plantings that make up the perimeter of the pond area, to the back of the curb/edge of access road, are to be cut back once a year. This task may be performed either in the early spring before new growth appears, or in the late autumn after the vegetation is dormant. It is important to use appropriate, clean, sharp tools when performing pruning and cutting to reduce the risk of infecting plants with disease. Follow all safety protocols when conducting maintenance on vegetation. Where plantings encroach beneath the woody plants they should be removed and plant beds re-mulched.

Monitoring of plant material should be completed in order to mitigate the possibility of site landscaping being taken over by invasive species. Main aquatic species of concern are: Water Soldier, Eurasian Water-milfoil, European Water Chestnut, European Frog-bit, Curly Pondweed, European Common Reed, and Starry Stonewort.

For the list of the perennial invasive species refer to TRCA website <http://trca.on.ca/dotAsset/40025.pdf>. Consult CH regarding the identification of these species, appropriate eradication methods and the restoration of impacted areas. Refer to The Invasive Species Centre's aquatic plants details at <http://www.invasivespeciescentre.ca/LEARN-ABOUT-INVASIVE-SPECIES/Aquatic-Plant>.

11. SWM Facility Operations Monitoring

An inspection, monitoring, and maintenance program is a critical component of any SWM facility asset management program, as it will help to ensure that the SWM facility functions as designed.

CN will be responsible for the operation and maintenance of the SWM facilities. Inspections of the SWM facilities will be completed a minimum of twice per year with findings recorded in a logbook. The logbook is to include the name of the works, inspection date, observations, description of any maintenance works completed, and estimate of any quantity of material removed from the facility. Inspection records are advised to be retained for a minimum of five years. The Owner must ensure that the minimum design volume is always maintained in the facilities.

Monitoring plans were developed to meet conditions as specified in the Final Decision Statement, specifically 5.9, and 5.10.

Project area monitoring includes site preparation monitoring activities, (i.e. private well monitoring to gather baseline information), construction monitoring, follow-up monitoring, and compliance monitoring programs. The relevant parameters of interest for the monitoring programs are:

- Surface water quantity and quality monitoring;
- Surface water quantity and quality monitoring; and
- SWM pond effluent monitoring.

11.1 Sampling Parameters, Methods and Locations

The effluent monitoring program is intended to assess each SWM facility's efficiency in providing the designed protection level of 80% removal of TSS, in addition to other parameters including E.coli, pH, oil, heavy metals, and grease.

The methods and protocols for sampling and analysis shall be in accordance with the principles specified in the MECP's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" dated January, 2016, as revised from time to time by more recently published editions.

The owner shall establish and carry out, upon commencement of operation of the works, the following monitoring program:

1. One (1) grab sample of the pond influent into the forebay and one grab sample of the pond effluent from the outlet structure shall be collected within one hour following remission of a storm event with at least one sample per season and with a minimum of five samples during summer months and analyzed for the following parameters:
total suspended solids, *E. coli*, pH, oils, heavy metals and grease.
2. Unless otherwise stated, the protocol for sampling and analysis shall be in accordance with the principles specified in the MECP's publication titled "*Protocol for the Sampling and Analysis of Industrial and Municipal Waste Water*" dated January 2016, as revised from time to time by more recently published editions.
3. After the owner obtains a minimum of three years of monitoring results, the monitoring frequency and monitoring parameters specified in subsection (1) may be modified through consultation with the agencies if written request is made by the Engineer on behalf of the Owner.

The following **Table 42** is provided to summarize the seasonal water quality sampling requirements as per the monitoring program. This seasonal water quality sampling is applied to both ponds.

Table 42. Water Quality Monitoring – Seasonal Sampling Frequency

Season (Sample Month)	Minimum # of Seasonal Sample Events	Sample Location	Parameters
Winter (January)	1	Pond influent into forebay and effluent from the outlet structure	Total suspended solids, E. Coli, pH, oil, heavy metals and grease
Spring (April)	1		
Summer (July, August, September)	5		
Fall (November)	1		

A sampling event is considered to be the collection of grab samples from the pond influent into the forebay and the pond effluent from the outlet structure, each for the analysis of TSS, E.coli, pH, oil, heavy metals and grease. A rainfall sampling event is to be conducted following the remission of all 10-15mm rainfall events, up to and exceeding the minimum required seasonal sampling events.

It should be noted that the spring seasonal sampling event shall be collected during the spring freshet and at least two (2) of the five (5) summer sampling events must not be associated with a rainfall event. Otherwise, if rainfall sampling events conducted within a season fulfill the minimum seasonal requirement, additional seasonal sampling events are not required.

If environmental/weather conditions (e.g., frozen pond) create unsafe conditions for a sampling event, documentation of the attempt to sample should be included in the maintenance logs and the sampling event is to be rescheduled for the next reasonably viable sample collection time.

11.1.1 Water Quality Reporting

Annual water quality monitoring reports are to be completed to monitor the facility’s efficiency in providing the designed protection level of 80% removal of TSS and to analyze trends in the collected water quality data. The first report will cover the annual period following the commencement of the monitoring program and subsequent reports will be submitted to cover the successive annual monitoring periods. Upon successful completion of the fifth year of monitoring, monitoring may be scaled back to annual inspections.

The monitoring report will identify parameter levels and summarize each facility’s effectiveness in providing the design target of 80% TSS removal, in addition to comparing results from season to season and year to year for all parameters. The monitoring report will comment on each pond’s efficiency of TSS removal related to and stipulated EA requirements. Further trend analysis will determine each facility’s effectiveness in providing a reduction of parameter concentrations and potential impacts to receiving watercourses.

The monitoring report will also include a description of any operational issues noted, complaints issued, corrective actions taken or other relevant information obtained during the course of the monitoring period. Based on these conclusions, further recommendations may be provided to modify the existing monitoring program and/or improve the performance of the facility to meet performance targets.

11.1.2 Water Quantity Reporting

Annual water quantity monitoring reports are to be submitted to CN to monitor the facilities' efficiency in controlling the peak flows from the facilities. Continuous water quantity monitoring will be undertaken during construction and for at least five years after the completion of construction. The monitoring locations are located at the outlets of the stormwater management ponds.

12. Summary

The proposed development will be completed in 2 phases. Both phases require SWM controls, though the controls implemented for phase 1 will only be interim. The Phase 2 developments represent the final condition of the site and this SWM Report will need to be updated with the progression of the Phase 2 construction design plans.

This report presents the hydrologic and hydraulic analyses of the impacts of the development compared to the existing conditions within the rail corridor and associated culverts. Culvert, subdrain, and ditching upgrades are presented to meet the AREMA hydraulic criteria to mitigate flooding impacts and maintain the stability of the railway embankment. The hydrology of the PDA was analyzed using the Rational Method and Visual OTTHYMO, and flow hydraulics were modelled using HEC-RAS for the watercourse assessment and Culvert Master for inlet and outlet control calculations.

Typical ditch cross-sections within the PDA provide sufficient conveyance of the 100-year flow.

There are five locations in which storm sewer infrastructure is to be located. The first location is the Lower Baseline Road storm sewer network, located under the bridge at the grade separation location. The second location is the Milton CN Intermodal Yard storm sewer network. The third location is the storm sewer network between Britannia Road and Louis Saint Laurent Ave. The fourth location is the storm sewer network between Lower Baseline and Britannia Road, North of the paved site between station 62+720 to 64+900. All proposed storm sewer pipes have sufficient capacity. The fifth storm sewer area will serve the parking lot area.

Subdrains are included as part of the Phase 1 development which discharge to storm sewers between Britannia Road/Louis Saint Laurent Ave and between Lower Baseline and Britannia Road. Subdrains for phase 2 discharge to storm pipes between Britannia Road/Louis Saint Laurent Ave and North of the paved yard between Lower Baseline and Britannia Road. All subdrains will have sufficient capacity.

Two stormwater management ponds are proposed to provide water quality control, water quantity control, and pond thermal mitigation to prevent ponds from having an impact. OGS units upstream of the pond will provide pre-treatment of influent to the ponds, and the ponds are sized to provide 80% TSS removal and provide the unitary flow rate specified by the Boyne Secondary Plan for storms up to the 100-year event. The design storage volumes in the SWM ponds was based off of the allowed unitary discharge flow rate specified in the Boyne Survey Secondary Plan Area Functional Stormwater and Environmental Management Strategy Report (2015), and while no mention of climate change has been made in that report, the unitary discharge rates are understood to be reflective of the environmental needs and flow targets of the area. Therefore, management of future (climate adjusted) runoff to the allowable discharge rates specified in the Boyne Survey Secondary Plan Area Functional Stormwater and Environmental Management Strategy Report (2015) is expected to satisfy climate change-related concerns and considerations.

A pond vegetation plan has been developed in order to provide thermal mitigation by shading the pond. Additional thermal mitigation will occur in the form of grassed swales to convey the runoff and by using a reverse bottom draw outlet pipe in the stormwater management ponds.

An erosion and sediment control plan has been developed to be implemented during construction, and operations and maintenance guidance has been provided to be utilized following construction of the stormwater management measures.

13. References

- AECOM (2015). Milton Logistics Hub Stormwater Management Strategy
- AECOM (2020). Draft Indian Creek Tributary A and C Crossing Report
- AECOM (April 2021) Erosion and Sediment Control Plans Drawings
- AMEC (2015). Sixteen Mile Creek, Areas 2 & 7 Subwatershed Update Study
- AMEC, Town of Milton (2015). Functional Stormwater and Environmental Management Strategy, Boyne Survey Secondary Plan Area - Draft Final
- Aquafor Beech Limited (2013). Britannia Road Transportation Corridor Improvement: Tremaine Road to Highway 407 Class EA Study, Hydraulic Analysis of Stream Crossings and Stormwater Management Alternatives Assessment
- Chapman and Putnam (1984) The Physiography of Southern Ontario, 3rd Editions, Ontario Geologic Survey
- Conservation Halton (2010). Landscaping and Tree Preservation Guidelines
- DFO (2007) Practitioner's Guide to Fish Passage for DFO Habitat Management Staff
- Dufferin (2021) Erosion and Sediment Control Implementation Plan
- Engineering and Parks Standards - Town of Milton (August 2014)
- Erosion and Sediment Control Implementation Plan, Dufferin Construction Company (November 2021)
- Final Decision Statement - Issued under Section 54 of the Canadian Environmental Assessment Act, 2012
- Grand River Conservation Authority. (2006) Erosion and Sediment Control Guideline for Urban Construction
- The Ontario Ministry of Natural Resources, 1983
- The Ontario Ministry of the Environment, Conservation, and Parks (2003). Stormwater Management Planning and Design Manual
- Town of Milton (2008). Town of Milton Official Plan
- Town of Milton (2017). Boyne Survey Secondary Plan Master Plan, Appendix C.10.A
- Toronto and Region Conservation Authority (2015). Crossings Guideline for Valley and Stream Corridors
- Schroeter and Associates Planning and Engineering Initiatives Ltd. (2002) Bronte Creek Watershed Study
- Stantec (2020). CN Milton Logistics Hub - Letter of Intent to Implement Offsetting Measures
- Phillips Engineering (2004) Indian Creek / Sixteen Mile Creek Sherwood Survey Subwatershed Management Study, Town of Milton.

Appendix **A**

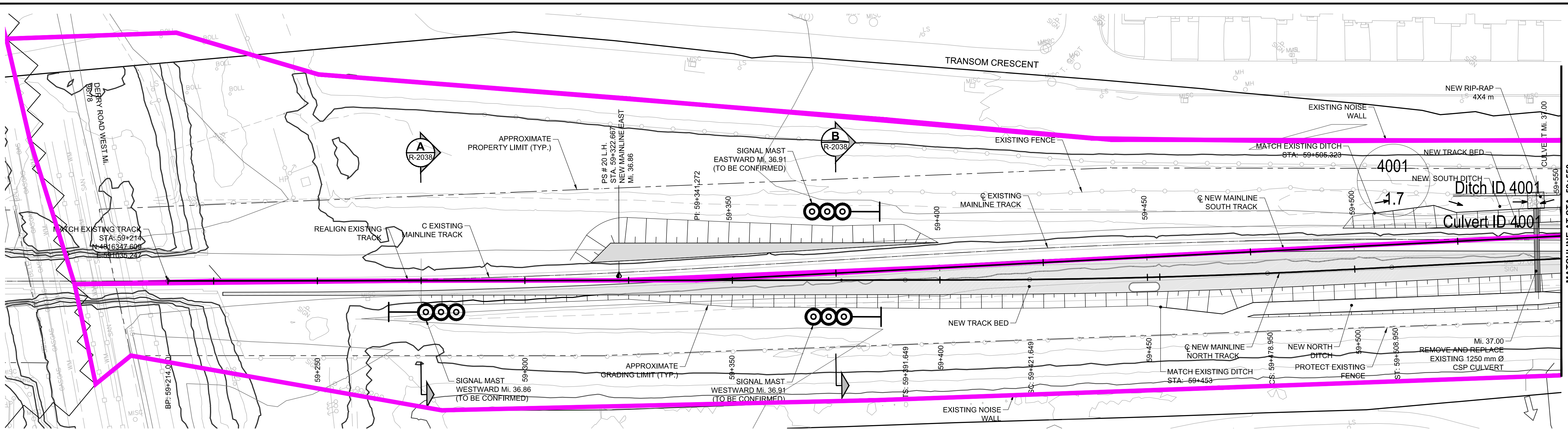
FINAL DRAINAGE REPORT

Milton Logistic Hub

- Existing Conditions Hydrology
 - Hydrologic Modelling Inputs and Results

D SIZE 22" x 34" (558.8mm x 863.6mm)

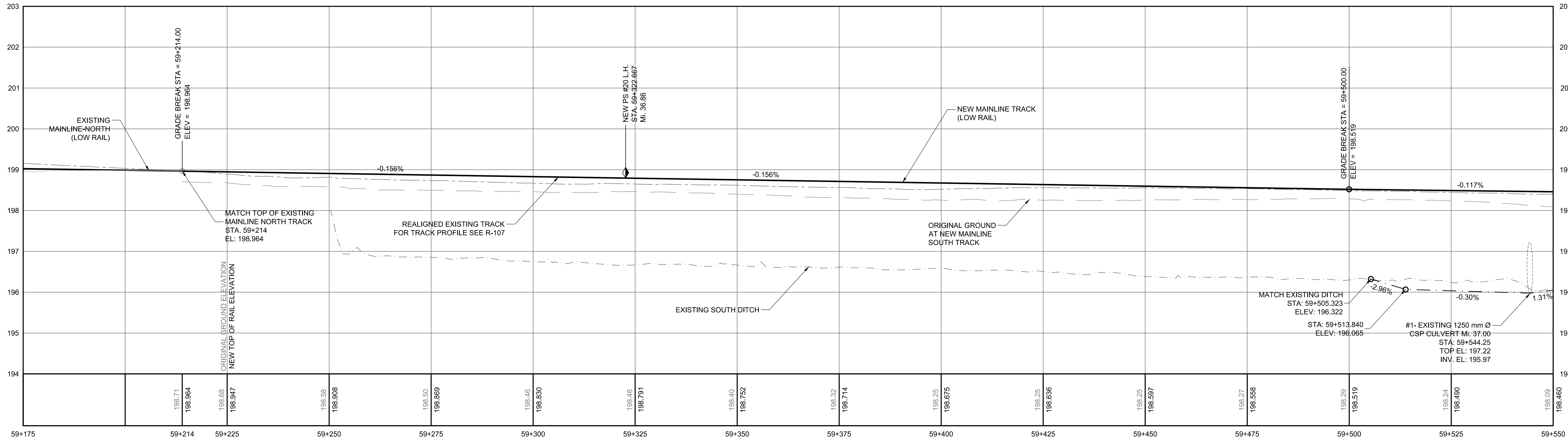
AECOM FILE NAME: \\caart1\p001\Data\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\910-CAD\20-SHEETS\060579933_01-R-2008-R-2028_plan_profile_SRA\01.dwg(2/20)60579933_RMs_Nabeel



PLAN
SCALE 1:500

To Georgetown

To Burlington West



PROFILE
SCALE H 1:500 V 1:50

NOTE
FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2029

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS							
B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB	
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB	
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR APP

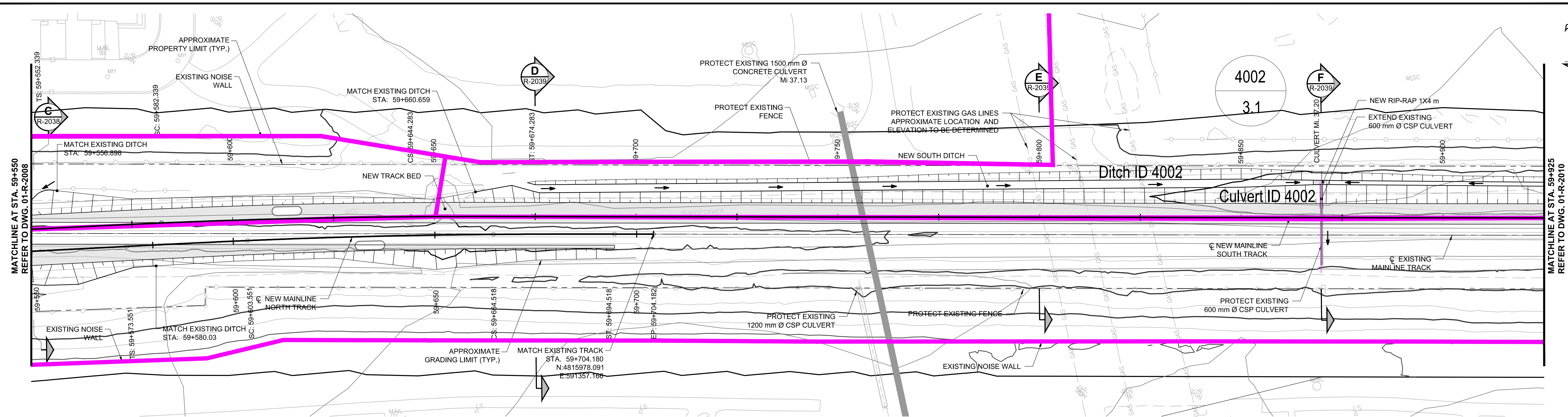


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 59+245 to 59+550 (Mi. 36.81 to 37.00)

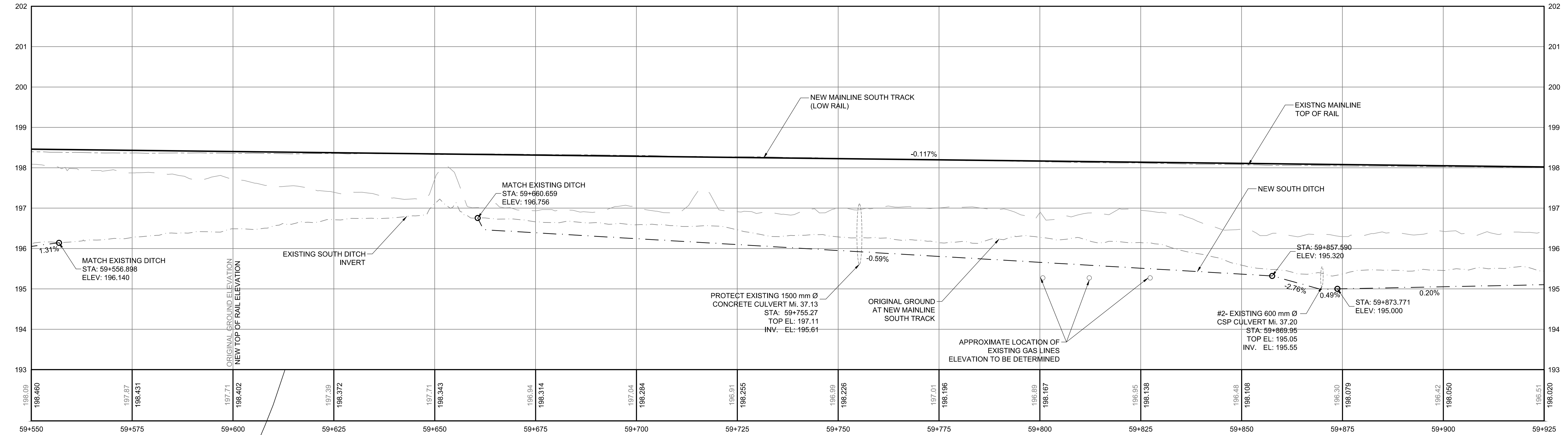
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2008	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cartt1\p001\Data\Projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\910-CAD\20-SHEETS\060579933_01-R-2008-R-2028_plan_profile_SRA\01.dwg(2/20)60579933_RMs_Nabeel



PLAN
SCALE 1:500



PROFILE
SCALE H 1:500, V 1:50

NOTE
FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2029

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.
© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--

B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG
			IDR			APP

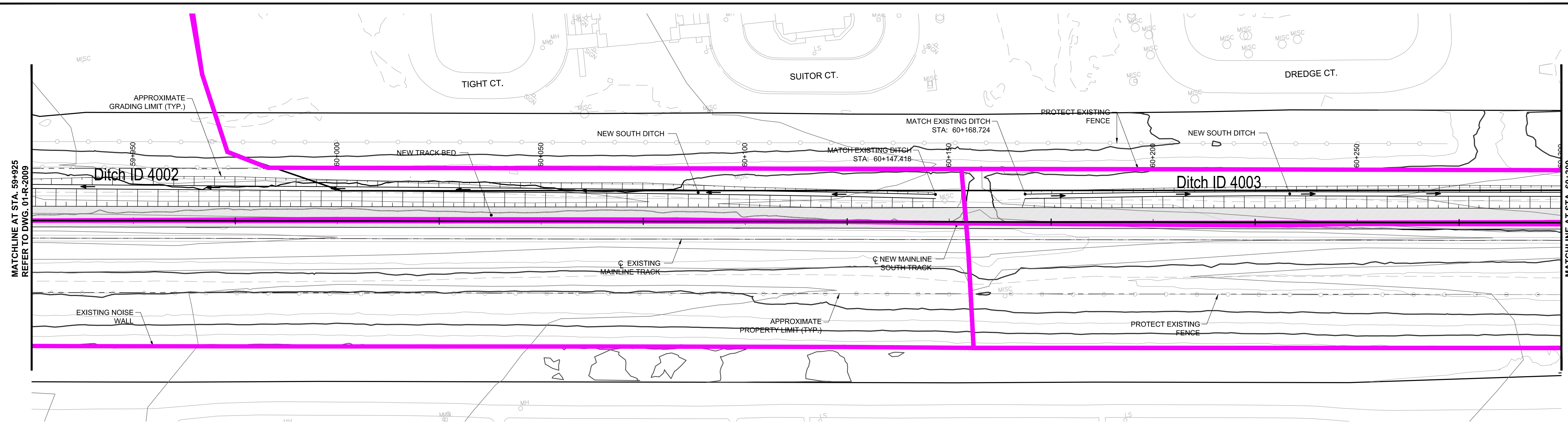


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 59+550 to 59+925 (Mi. 37.00 to 37.24)

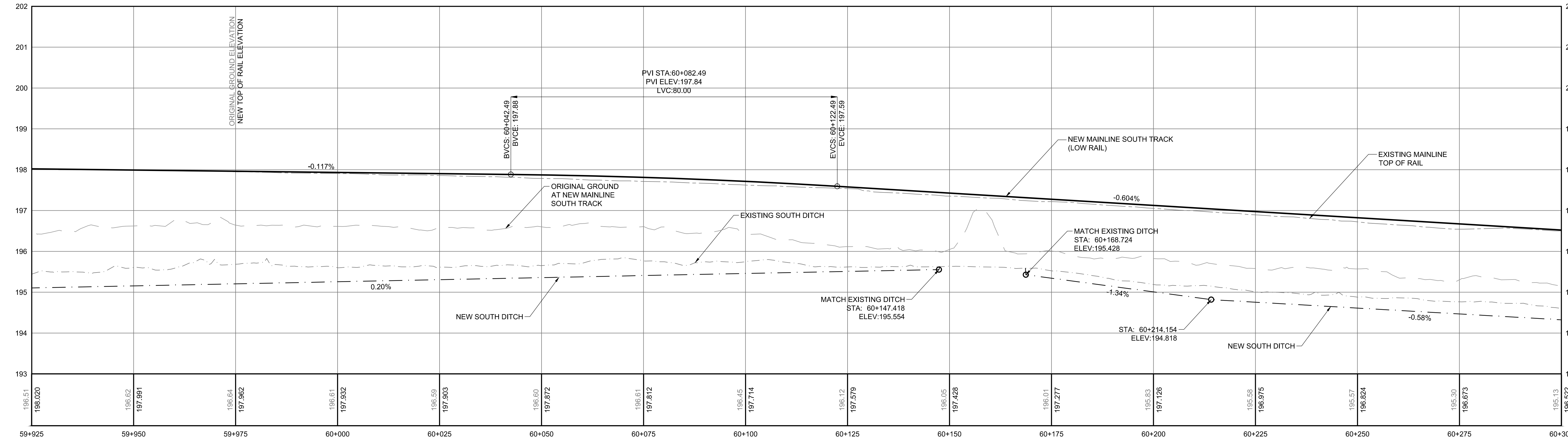
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2009	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cartt1\p001\Data\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\910-CAD\20-SHEETS\060579933_01-R-2010-01-R-2008-R-2028_plan_profile_Site.dwg (12/20/2008) RMs: Nabiel



PLAN
SCALE 1:500



PROFILE
SCALE H 1:500, V 1:50

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--	--	--	--	--

I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP
B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB		

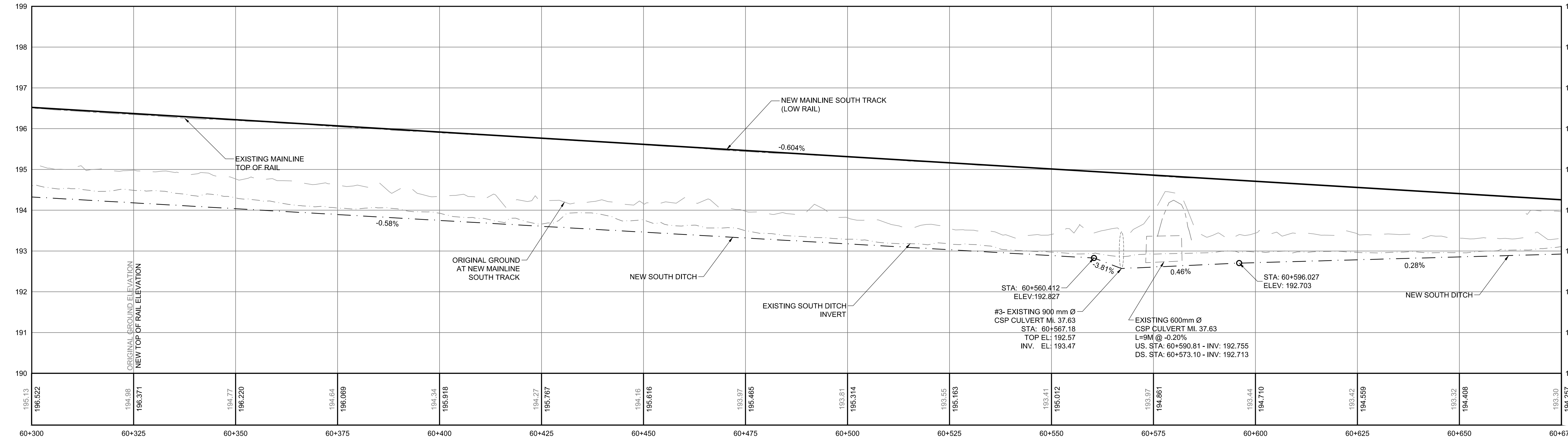
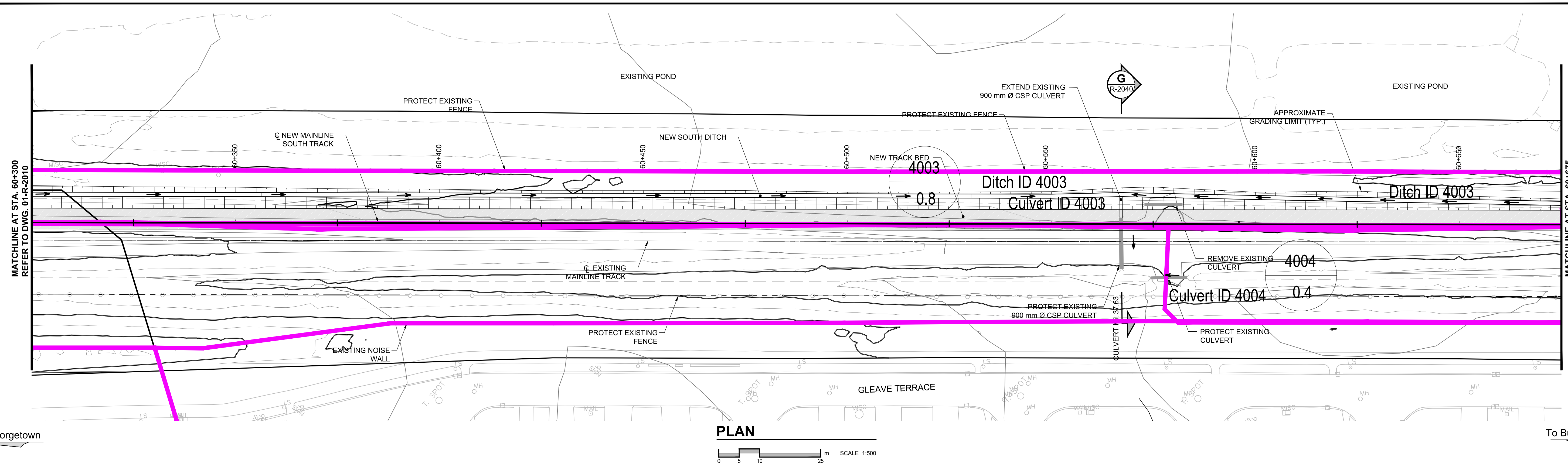


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 59+925 to 60+300 (Mi. 37.24 to 37.47)

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2010	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cartt1\p001\Data\Projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\010-CAD\20-SHEETS\060579933_01-R-2008-R-2028_plan_profile_SRA\01.dwg(2/20)BareidBk_RMs_Nabeel



	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--	--	--	--	--

I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP
B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB		

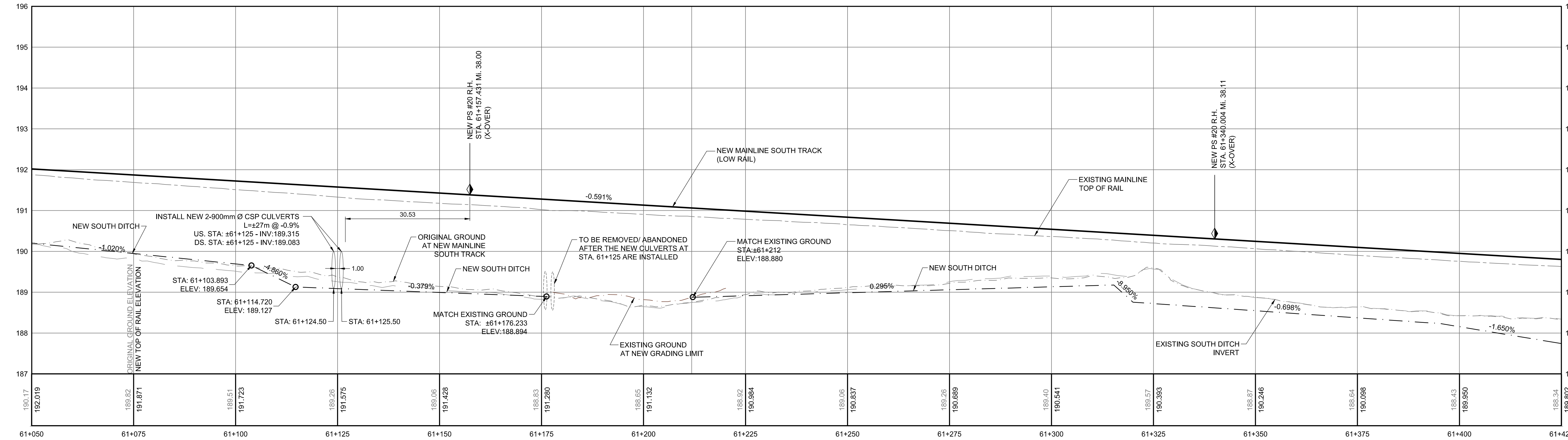
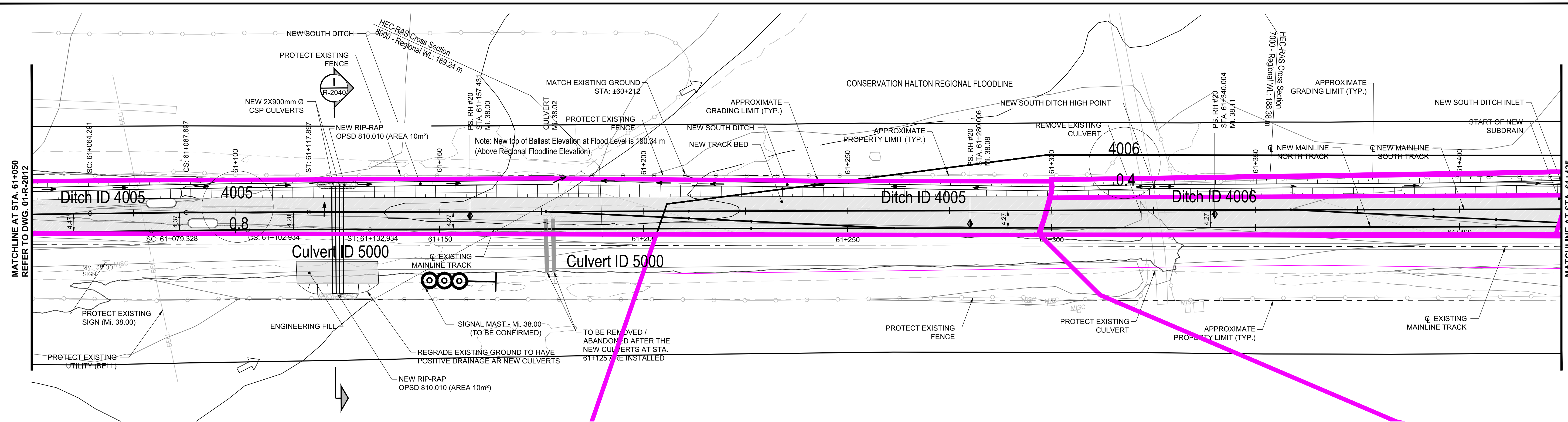


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 60+300 to 60+675 (Mi. 37.47 to 37.70)

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2011	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\caart1\p001\Drawings\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\01-D-CAD\20-SHEETS\060579933_01-R-2008-R-2028_plan_profile_Sheet.dwg (12/20/2008) RLM: Nabiel



NOTE
- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2030

PROFESSIONAL SEALS

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP
B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB		

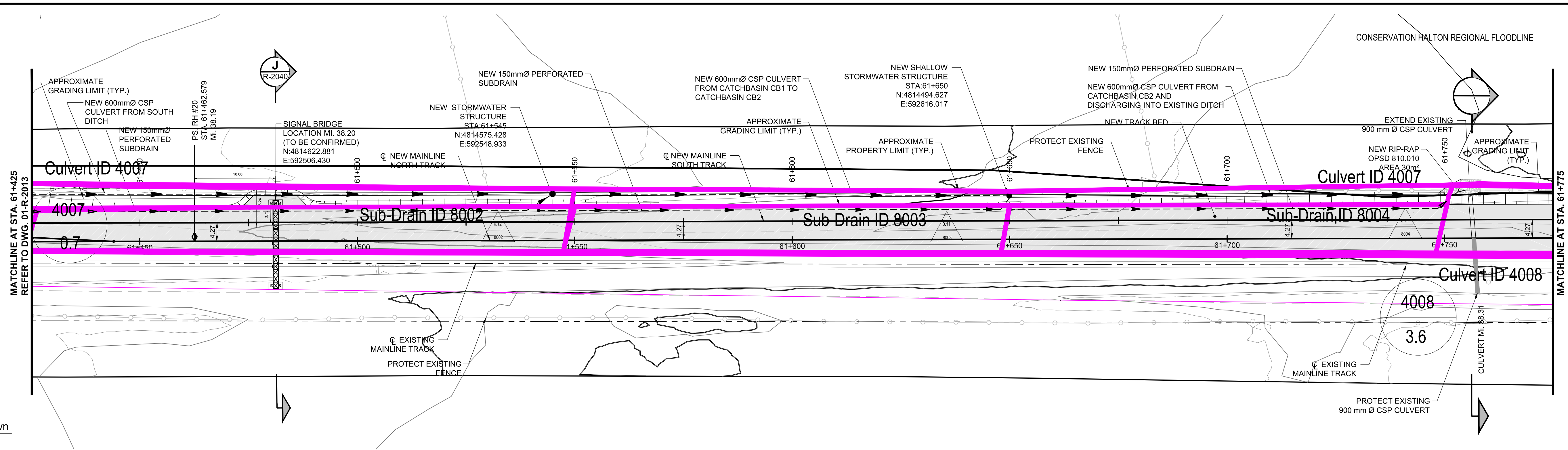


	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

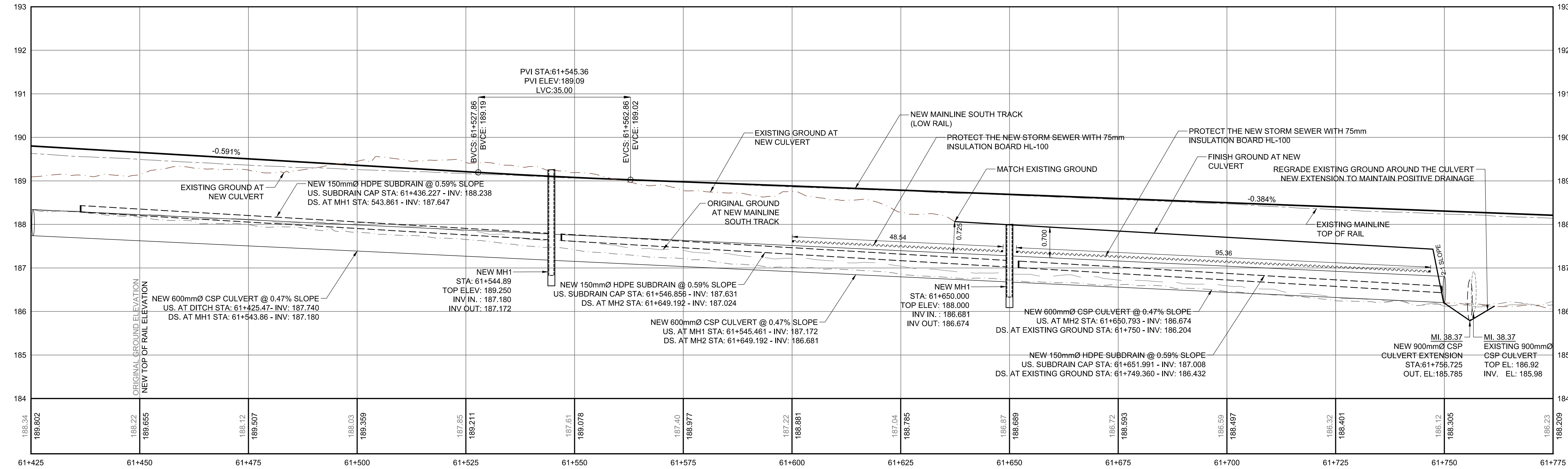
CN		
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27		
NEW MAINLINE TRACKS		
PLAN & SOUTH TRACK PROFILE		
STA. 61+050 to 61+425 (Mi. 37.94 to 38.17)		
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2013	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cart1\p001\Data\Projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\010-CAD\20-SHEETS\060579933_01-R-2008-R-2028_plan_profile_SRA\011.dwg(2/20) 06/06/2008 09:06:06 P.M. Nabeel



PLAN
SCALE 1:500



PROFILE
SCALE H 1:500, V 1:50

NOTE
- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2031

CN	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--	--	--	--	--

B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB		
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP

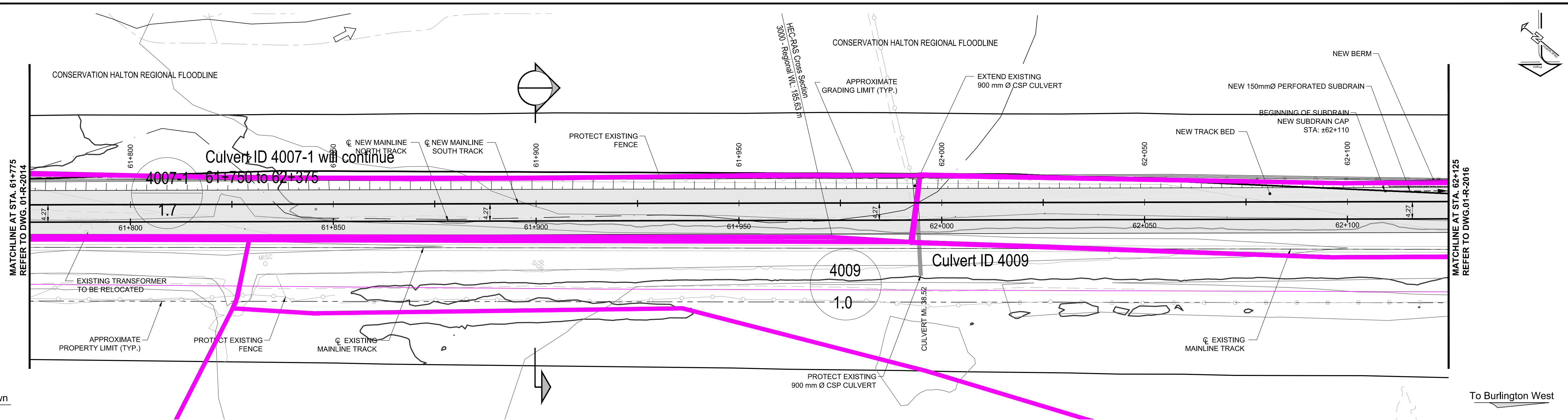


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 61+425 to 61+775 (Mi. 38.17 to 38.39)

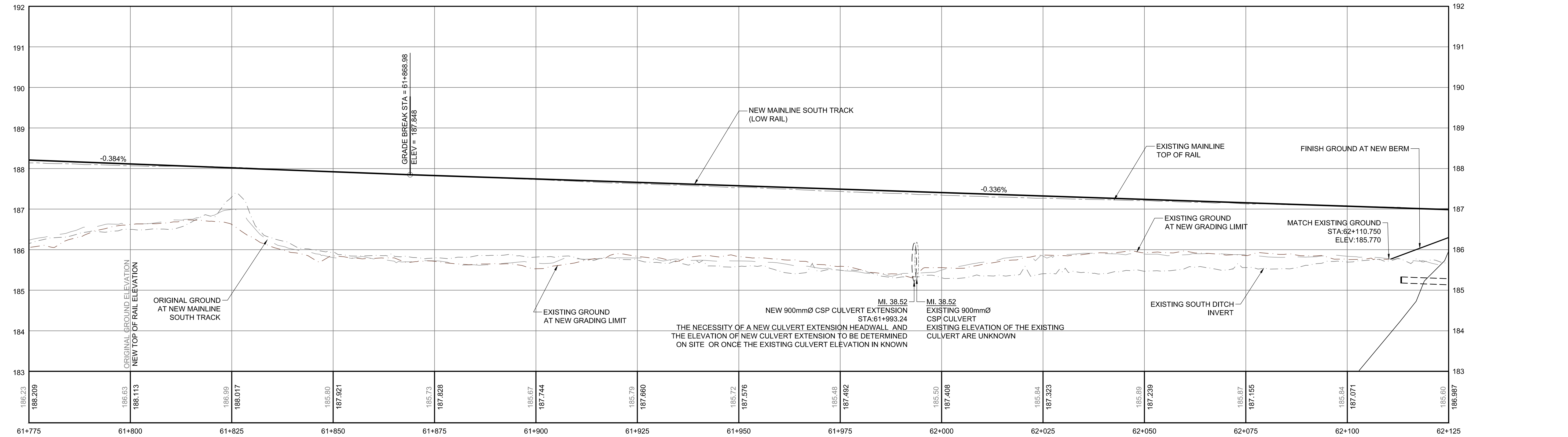
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2014	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cart11\p001\Data\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\01\0-CAD\20-SHEETS\060579933_01-R-2008-R-2028_plan_profile_SRA\01.dwg(2/20/2008)60579933_RMs_Nabeel



PLAN
SCALE 1:500



PROFILE
SCALE H 1:500 V 1:50

NOTE
- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2031

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--

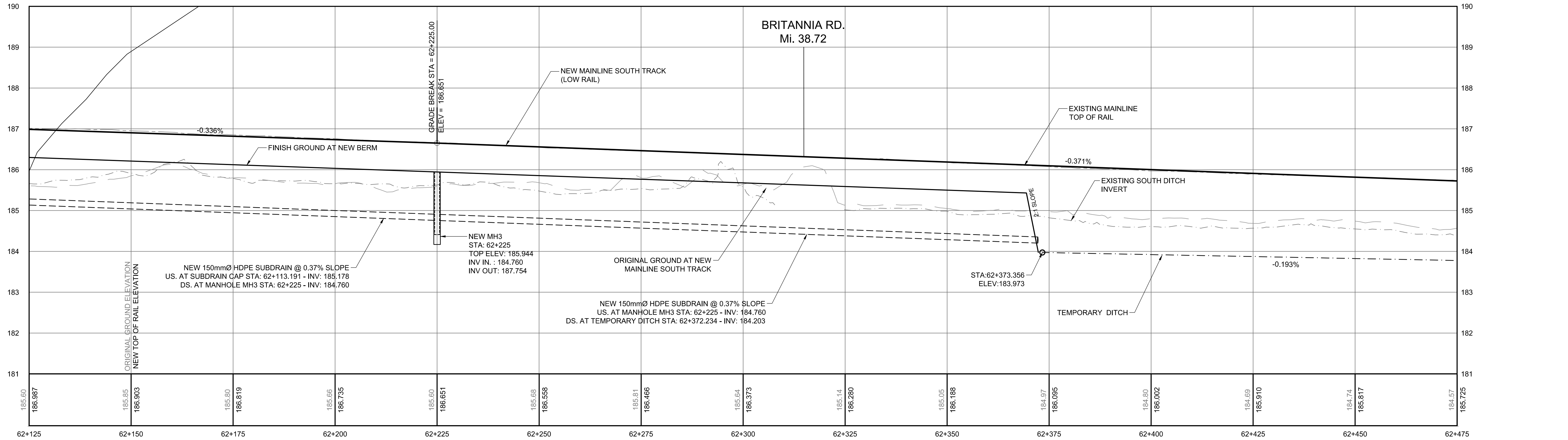
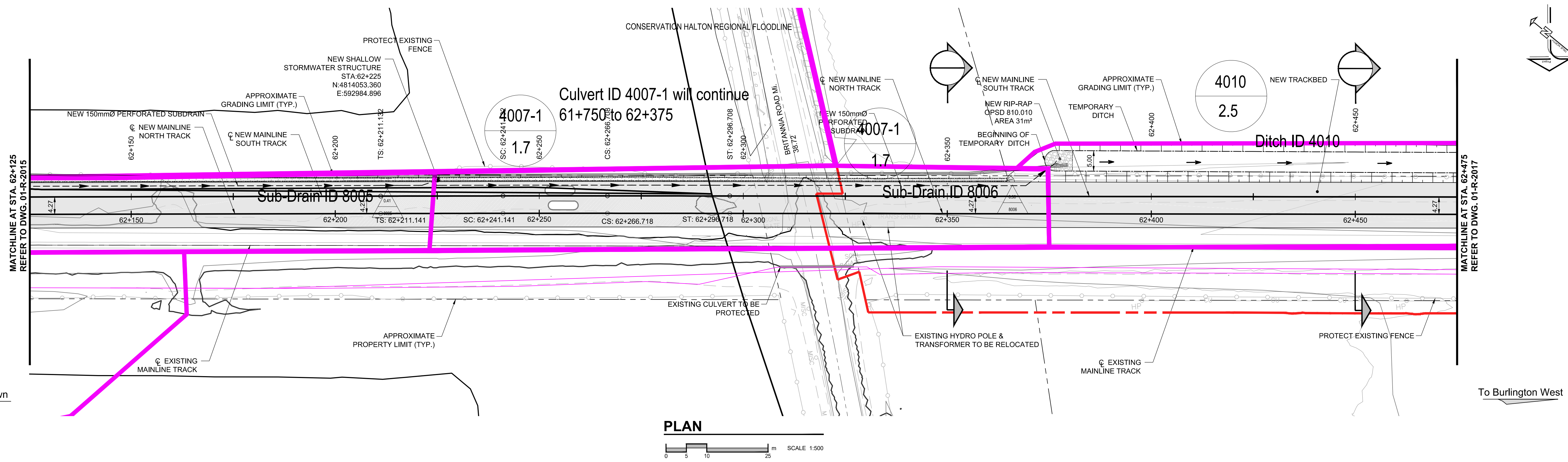
B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG



CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 61+775 to 62+125 (Mi. 38.39 to 38.60)

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60327563	01-R-2015	B

D SIZE 22" x 34" (558.8mm x 863.6mm)
 AECOM FILE NAME: \\cart11\p001\Drawings\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\01-D-CAD\20-SHEETS\060579933_01-R-2008-R-2028_plan_profile_SRA\01.dwg(2/20/2008) RMs: Nabiel



NOTE
- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2032

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--

B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG

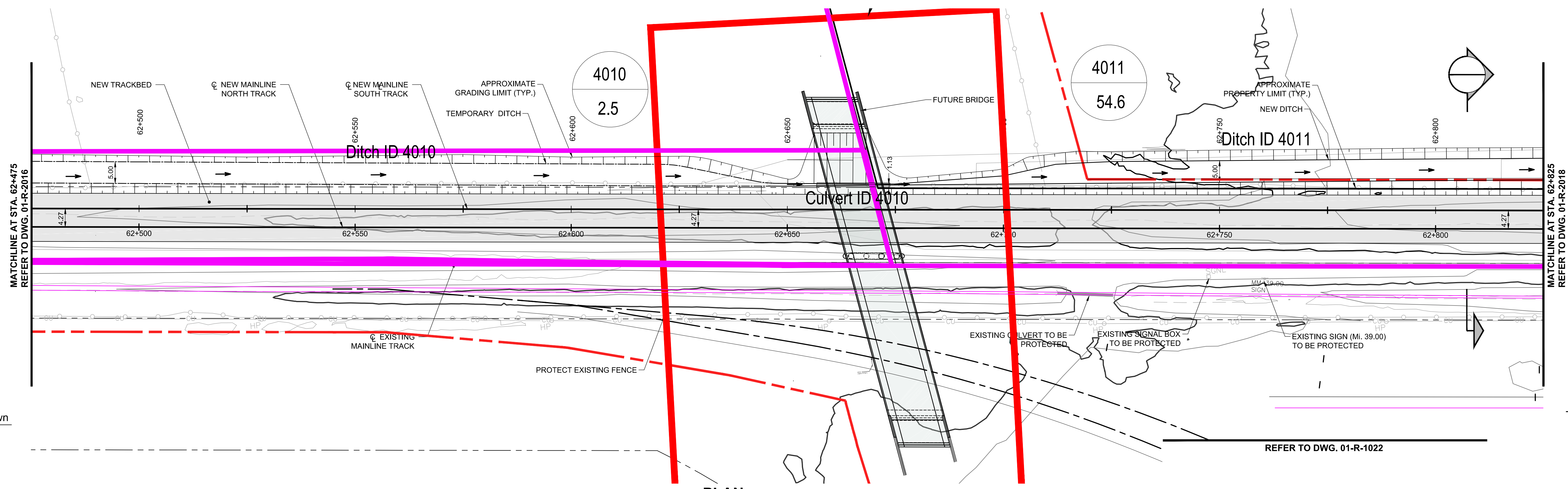


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 62+125 to 62+475 (Mi. 38.60 to 38.82)

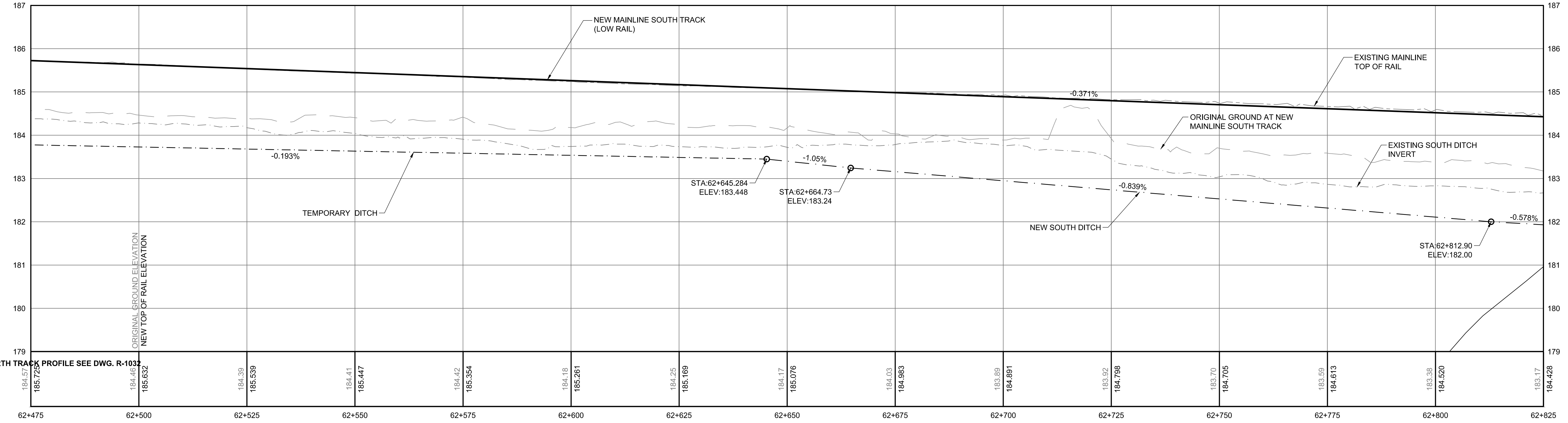
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2016	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cartt1\p001\Data\Projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\01-CAD\20-SHEETS\060579933_01-R-2008-R-2028_plan_profile_Signals.dwg



PLAN
SCALE 1:500



PROFILE
SCALE H 1:500, V 1:50

NOTE
FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-1032

NOTE
FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2032

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--	--	--

I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP
B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB		

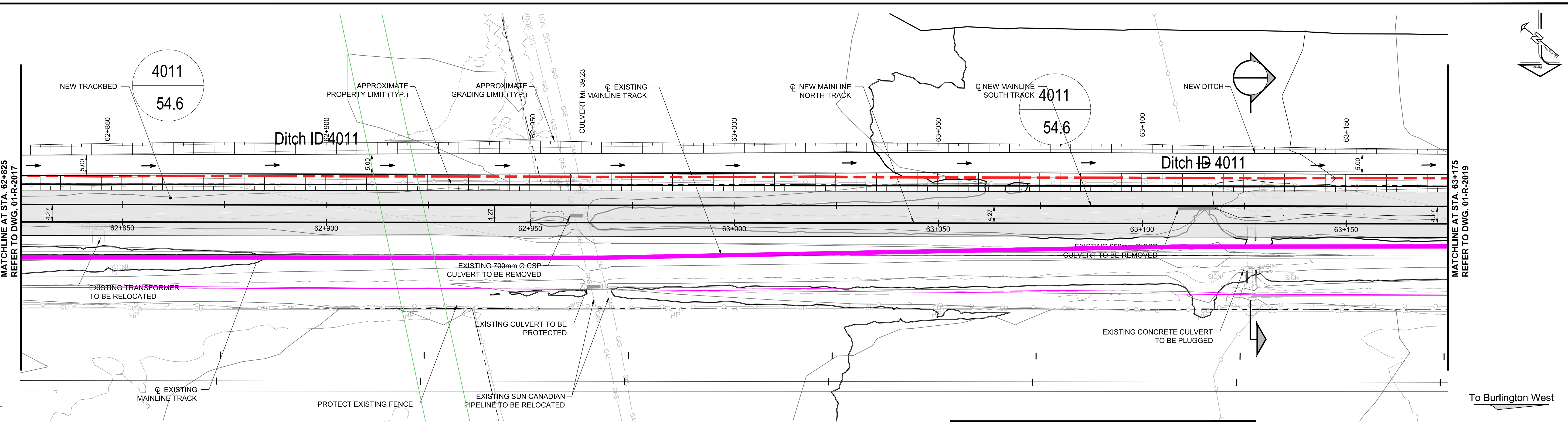


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 62+475 to 62+825 (Mi. 38.82 to 39.04)

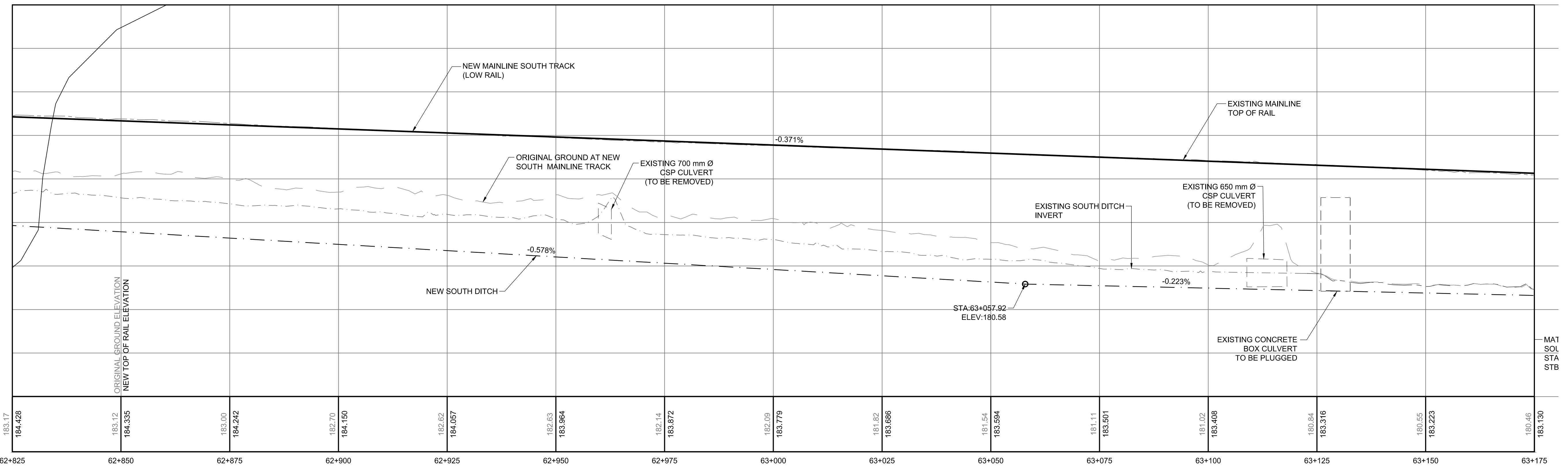
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2017	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cartt1\p001\Data\Projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\01-CAD\20-SHEETS\060579933_01-R-2018-R-2028_plan_profile_SRA\01.dwg(2/20)Rev:06/28/18 P.M.S. Nabeel



PLAN
SCALE 1:500
0 5 10 25 m



PROFILE
SCALE H 1:500 V 1:50
0 10 25 m

NOTE
- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2033

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS									
B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB			
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB			
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP	

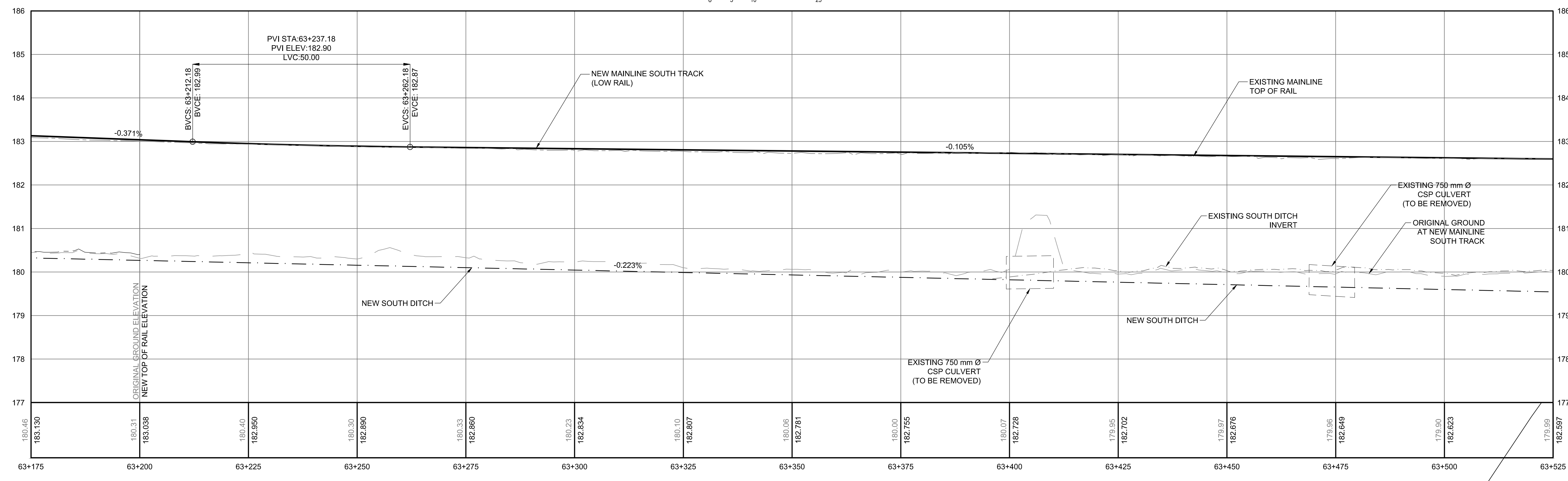
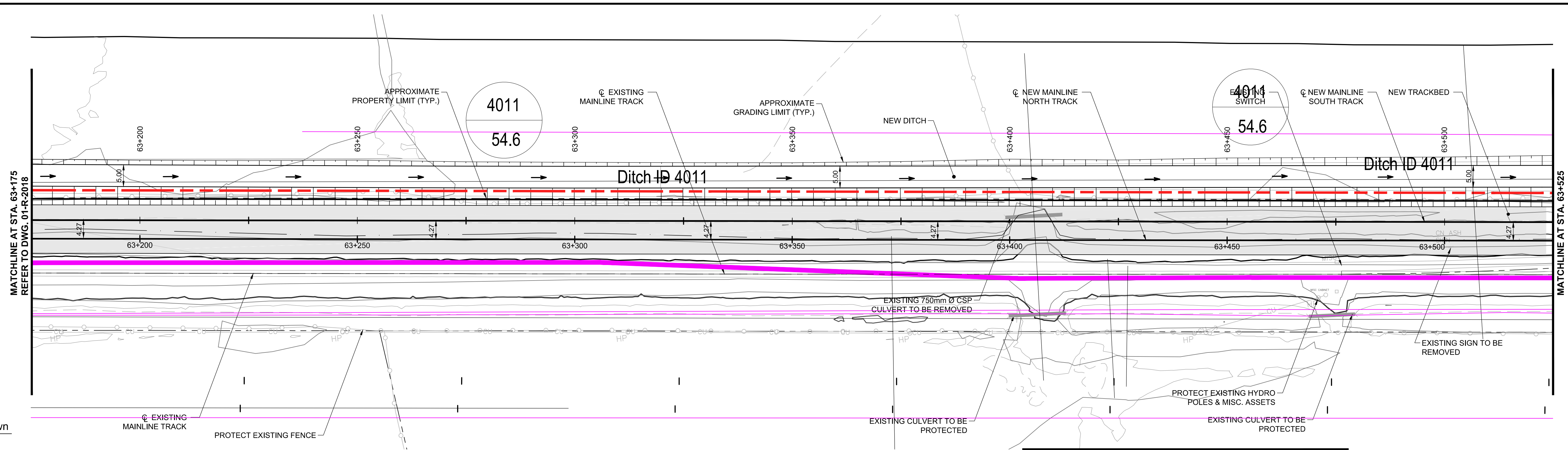
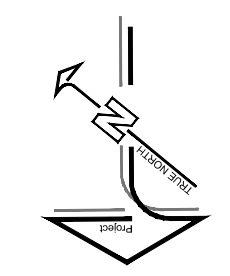


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 62+825 to 63+175 (Mi. 39.04 to 39.26)

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2018	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cart11\p001\Drawings\Projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\01-CAD\20-SHEETS\060579933_01-R-2019-R-2019-plan profile_S1.dwg



NOTE
- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2033

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--	--	--	--	--

B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB			
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB			
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP	

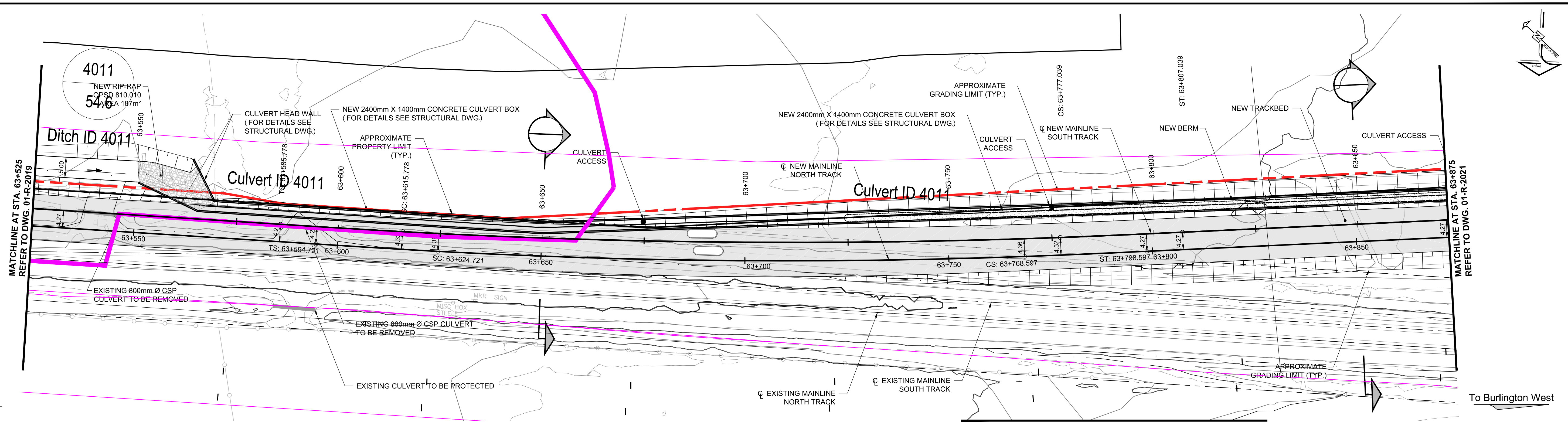


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 63+175 to 63+525 (Mi. 39.26 to 39.47)

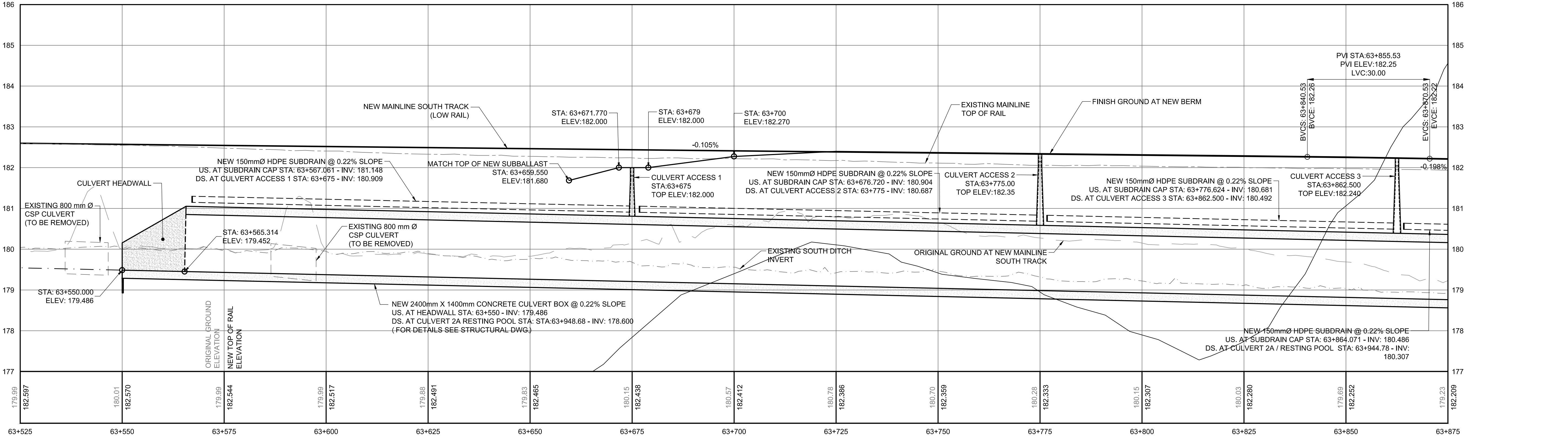
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2019	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cartt1\p001\Data\Projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\910-CAD\20-SHEETS\060579933_01-R-2020-R-2020_plan_profile_Sheet.dwg



PLAN
SCALE 1:500



PROFILE
SCALE H 1:500, V 1:50

NOTE
- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2034

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--

B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG
			IDR			

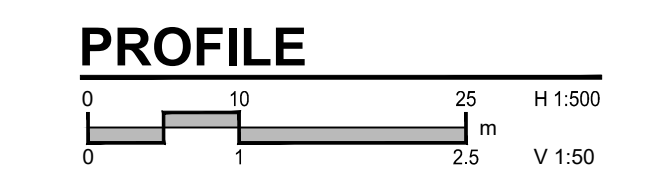
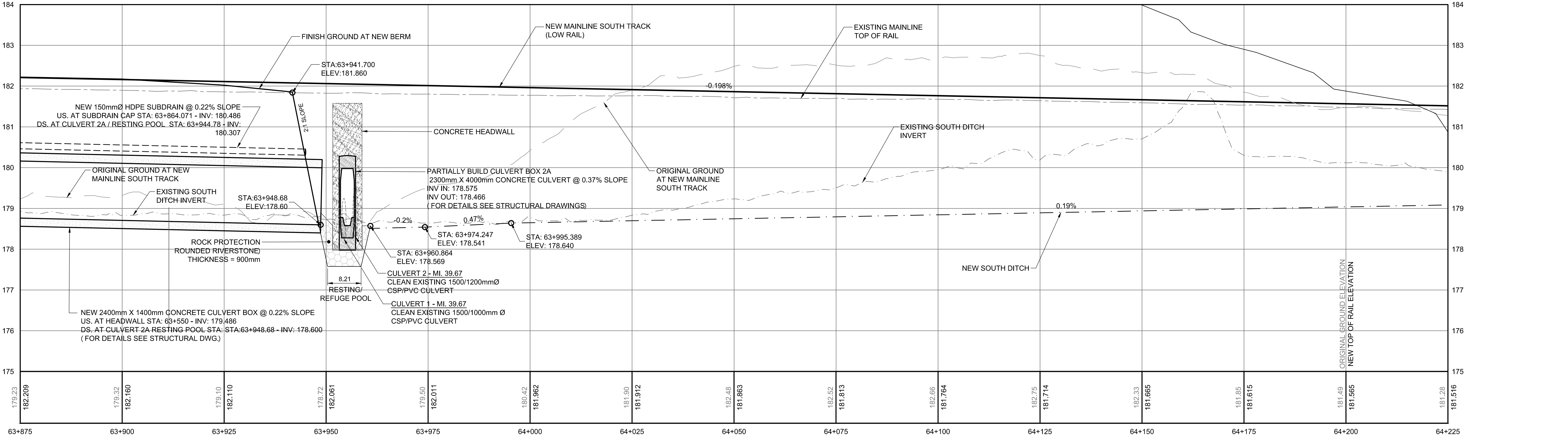
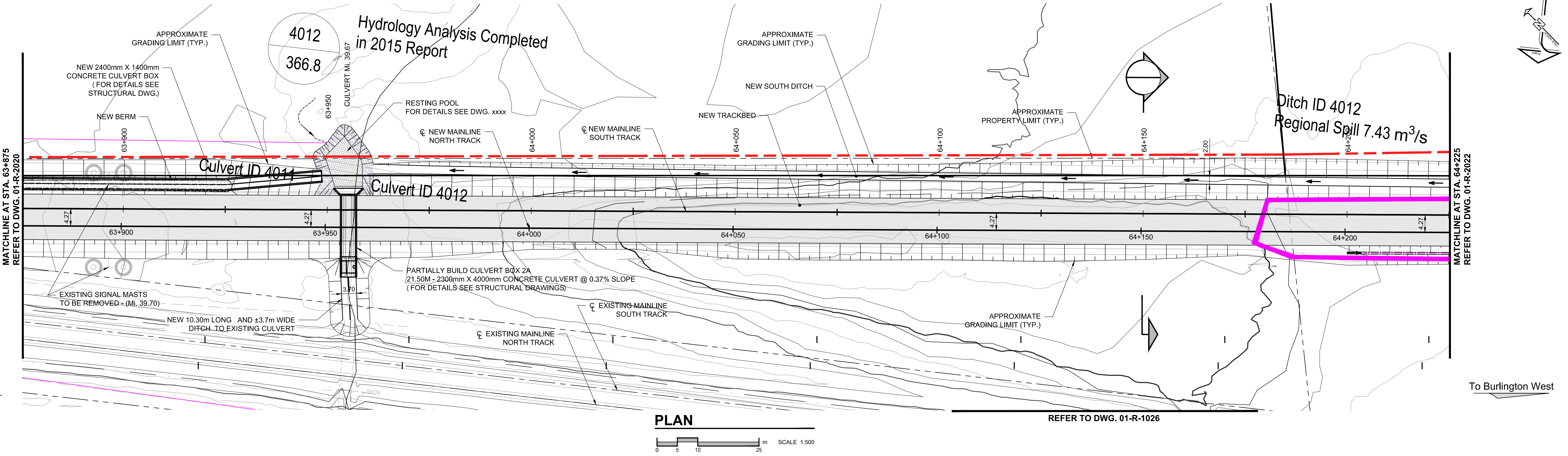


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 63+525 to 63+875 (Mi. 39.47 to 39.69)

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2020	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \carrt\p001\data\proj\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\10-CAD\20-SHEETS\060579933_01-R-2021-R-2021-plan_profile_Sign@1.dwg(2/20)Barefoot\BMs_Nabaeel



NOTE
- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2034

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS					
B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP LB
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR LB
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES ENG IDR APP



CN MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27

NEW MAINLINE TRACKS

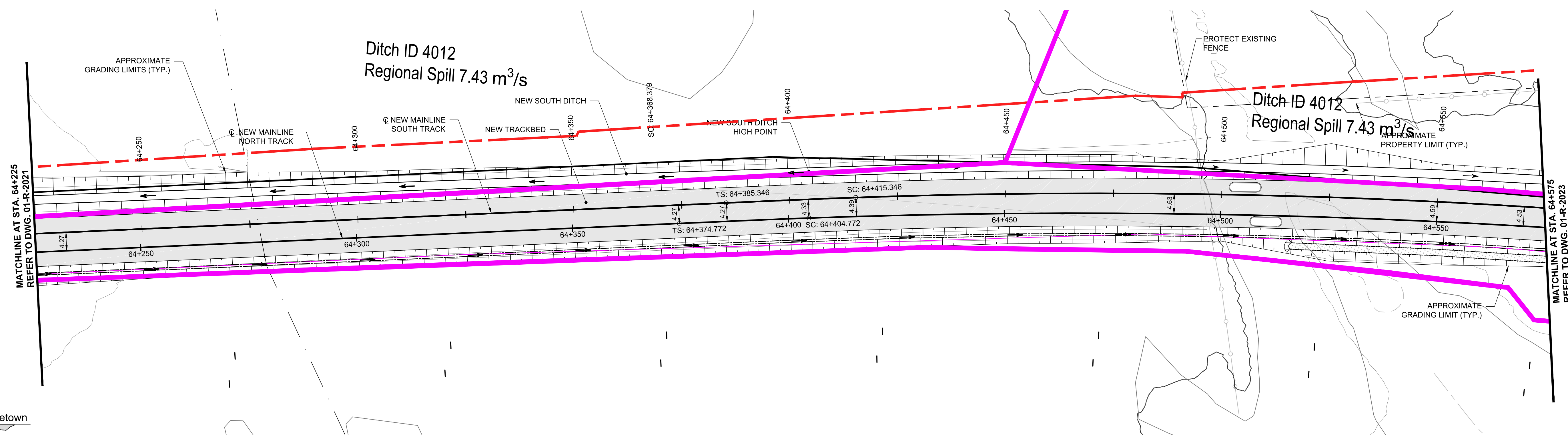
PLAN & SOUTH TRACK PROFILE

STA. 63+875 to 64+225 (Mi. 39.69 to 39.91)

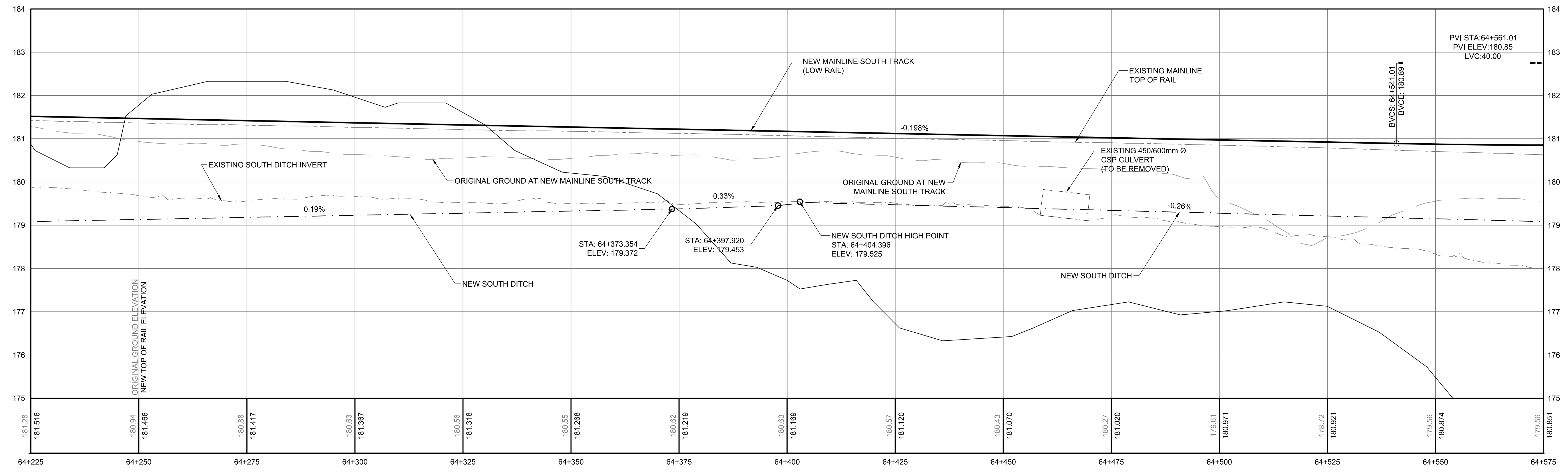
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2021	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cartt1\p001\Data\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\01-CAD\20-SHEETS\060579933_01-R-2022-R-2028_plan_profile_Sheet.dwg



PLAN
SCALE 1:500



PROFILE
H 1:500
V 1:50

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--

B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG

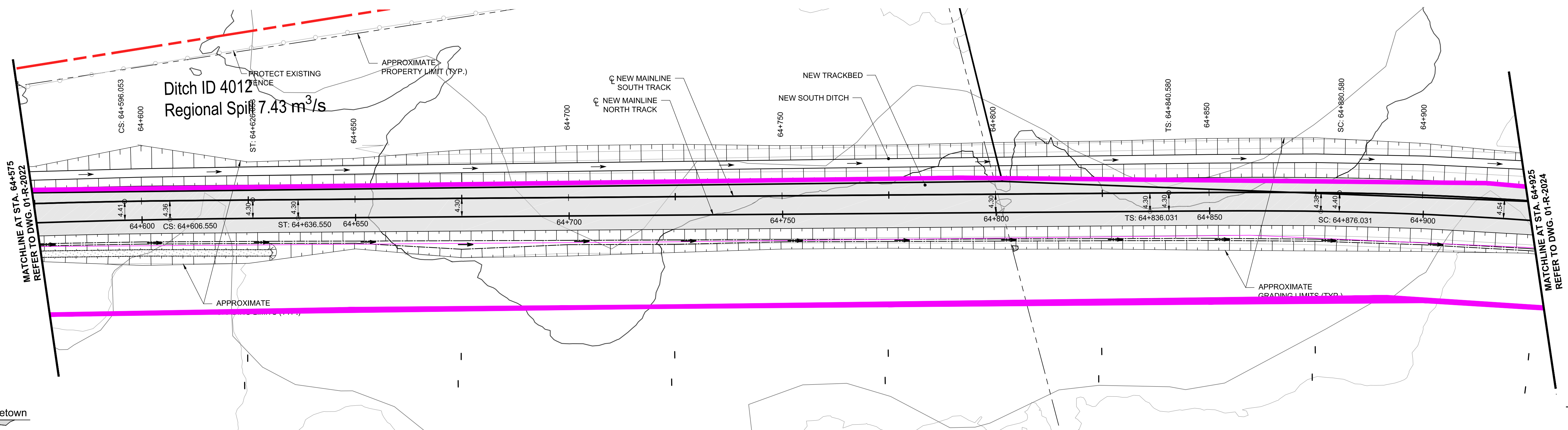


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 64+225 to 64+575 (Mi. 39.91 to 40.13)

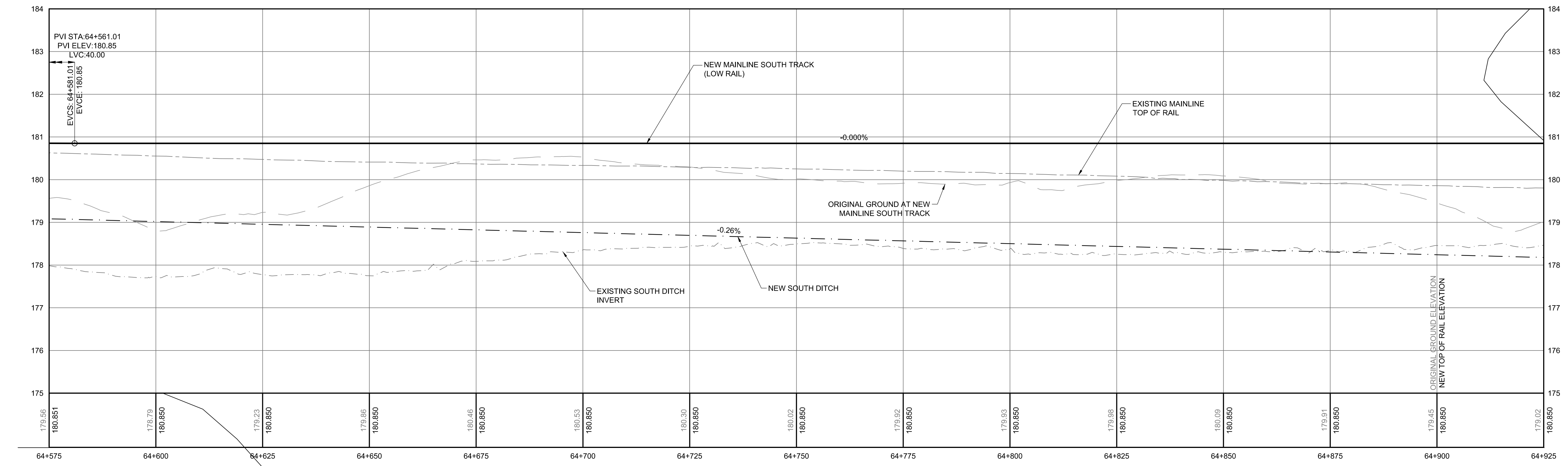
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2022	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cart11\p001\Data\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\01-CAD\20-SHEETS\060579933_01-R-2023-R-2023_plan_profile_SRA\01.dwg(2/20)Bakal@10/25/23 10:58:11 AM



PLAN
SCALE 1:500



PROFILE
SCALE H 1:500, V 1:50

NOTE
- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2035

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--	--	--	--	--

B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB			
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB			
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP	

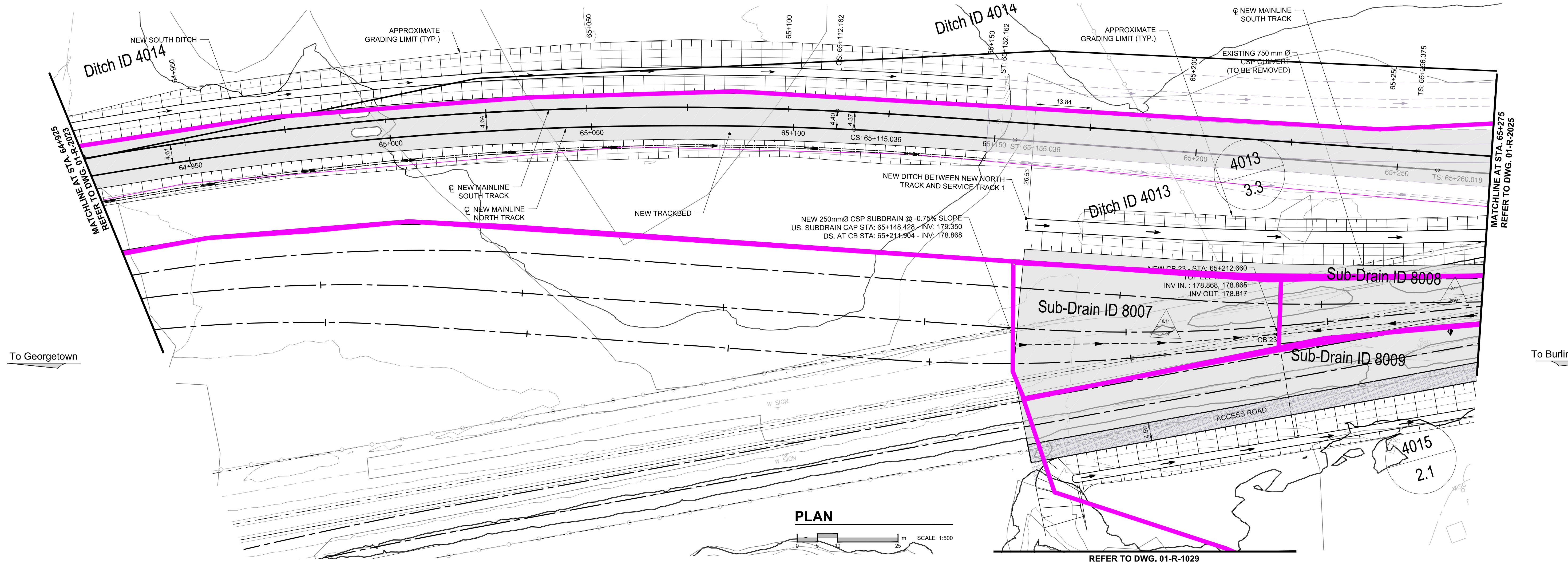
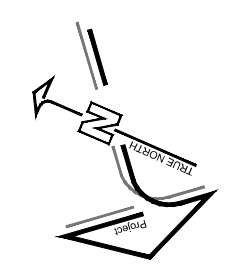


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 64+575 to 64+925 (Mi. 40.13 to 40.34)

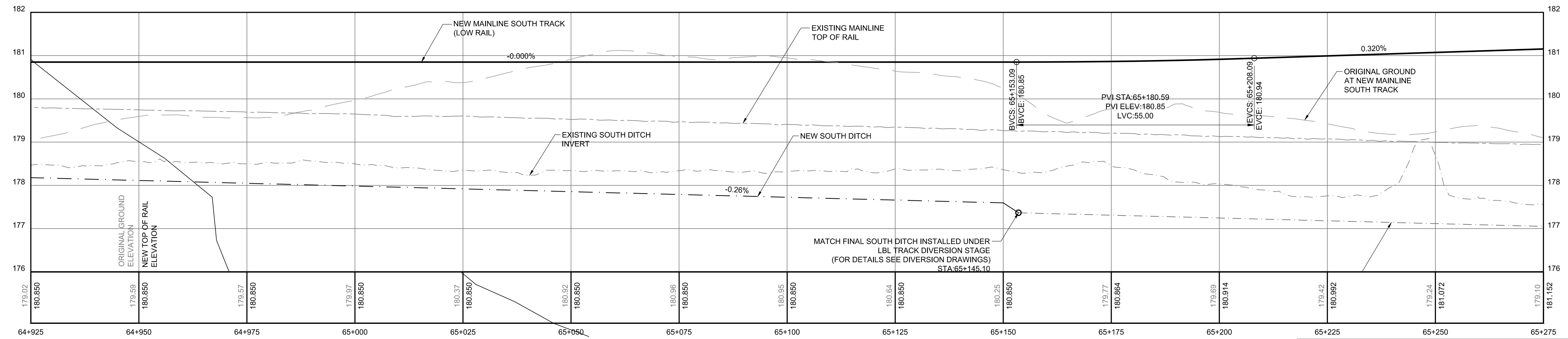
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2023	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cartt1\p001\data\projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\01-D-CAD\20-SHEETS\060579933_01-R-2024-R-2028_plan_profile_SRA\01.dwg(2/20)60579933_RMs_Nabeel



PLAN



PROFILE



NOTE
 - FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2036
 - FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3037
 - FOR NEW SERVICE TRACK-2 PROFILE SEE DWG. R-3018
 - FOR NEW SERVICE TRACK-3 PROFILE SEE DWG. R-3042

PROFESSIONAL SEALS

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP
B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB		

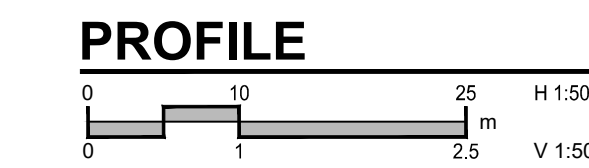
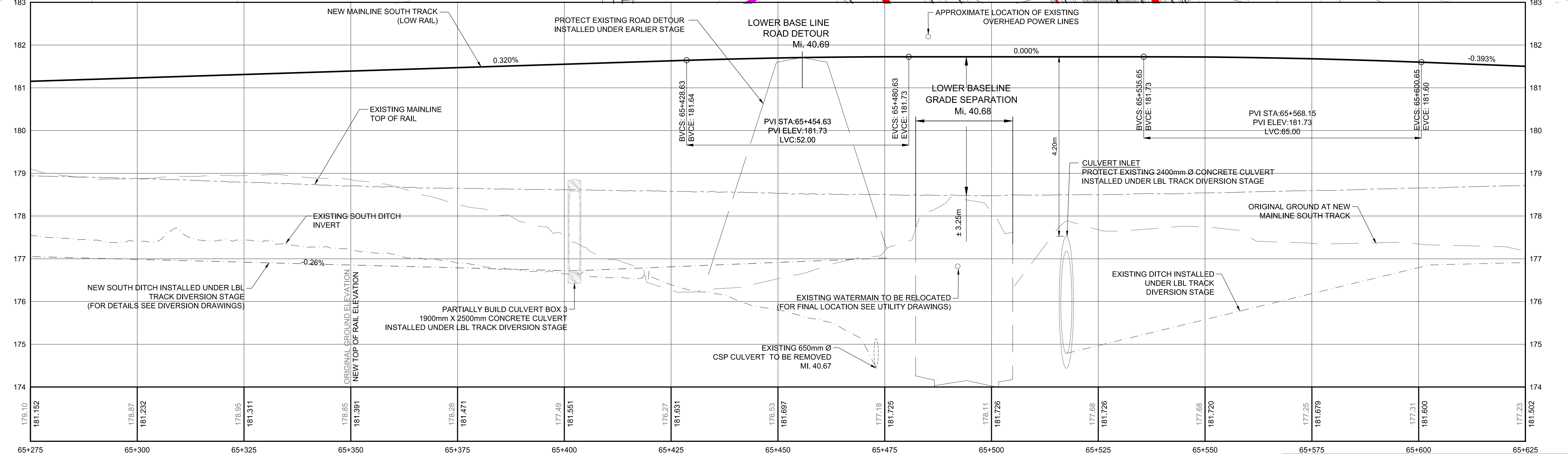
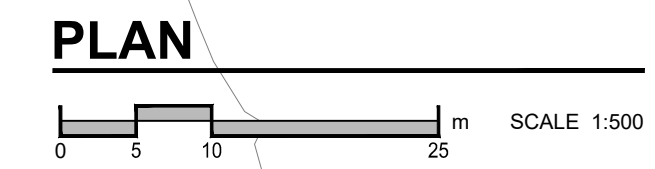
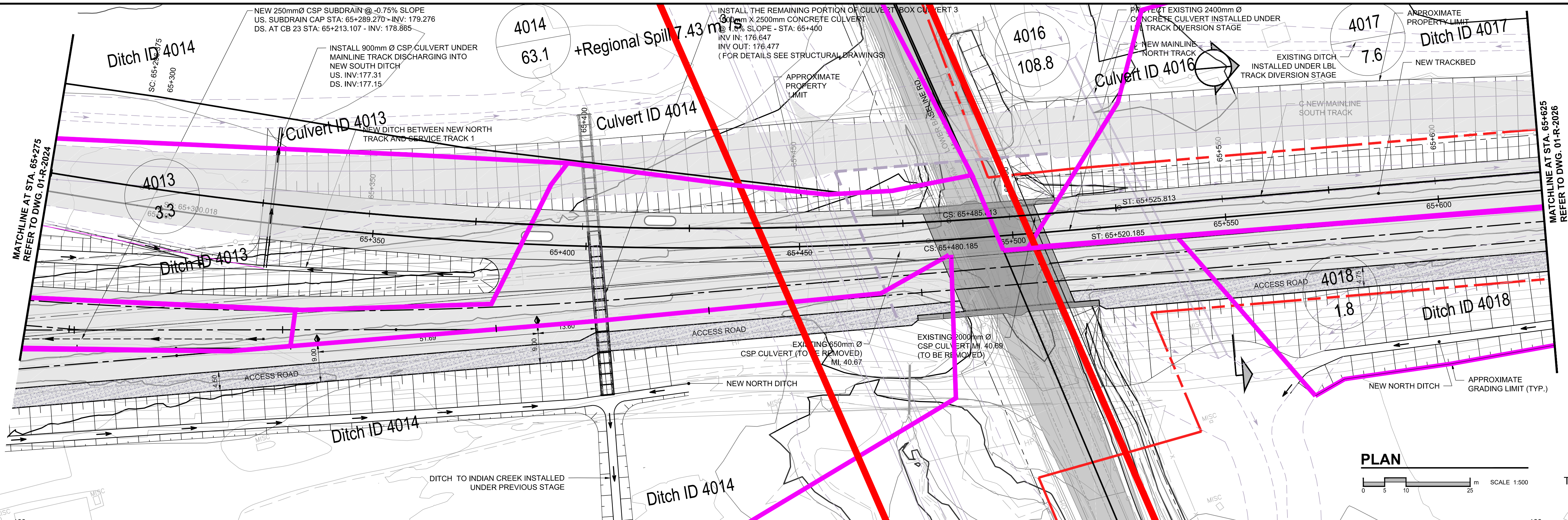


CN	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

CN MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27		
NEW MAINLINE TRACKS		
PLAN & SOUTH TRACK PROFILE		
STA. 64+925 to 65+275 (Mi. 40.34 to 40.56)		
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2024	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cartt1\p001\data\Projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\010-CAD\20-SHEETS\060579933_01-R-2025-R-2025_plan_profile_SRA\01.dwg



NOTE
 - FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2036
 - FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3038
 - FOR NEW SERVICE TRACK-2 PROFILE SEE DWG. R-3019

PROFESSIONAL SEALS

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP
B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB		

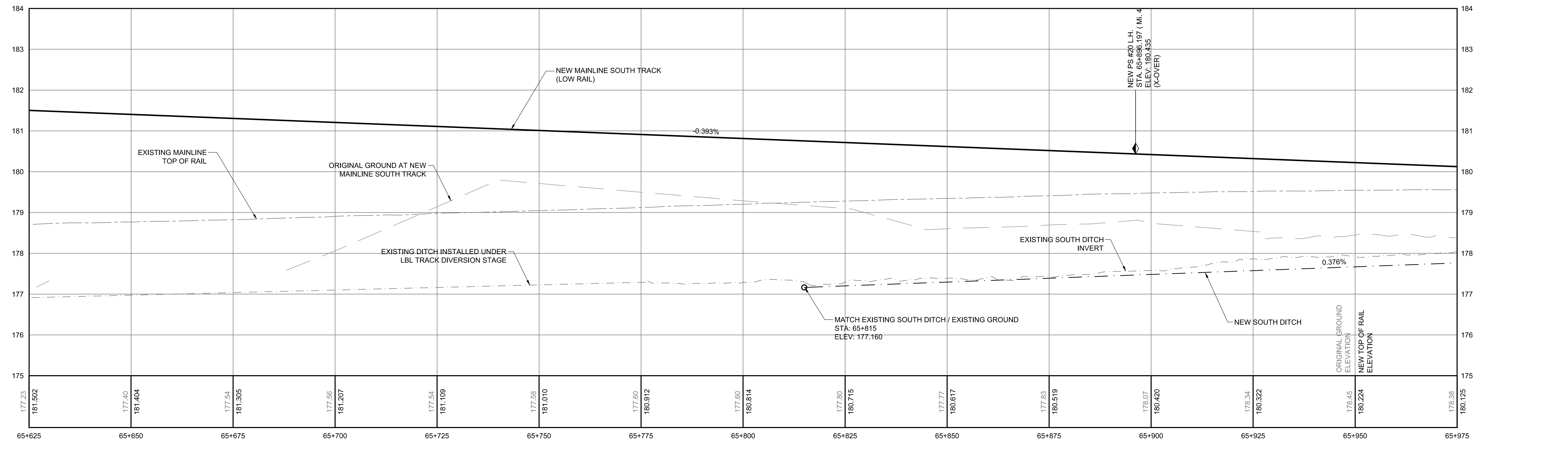
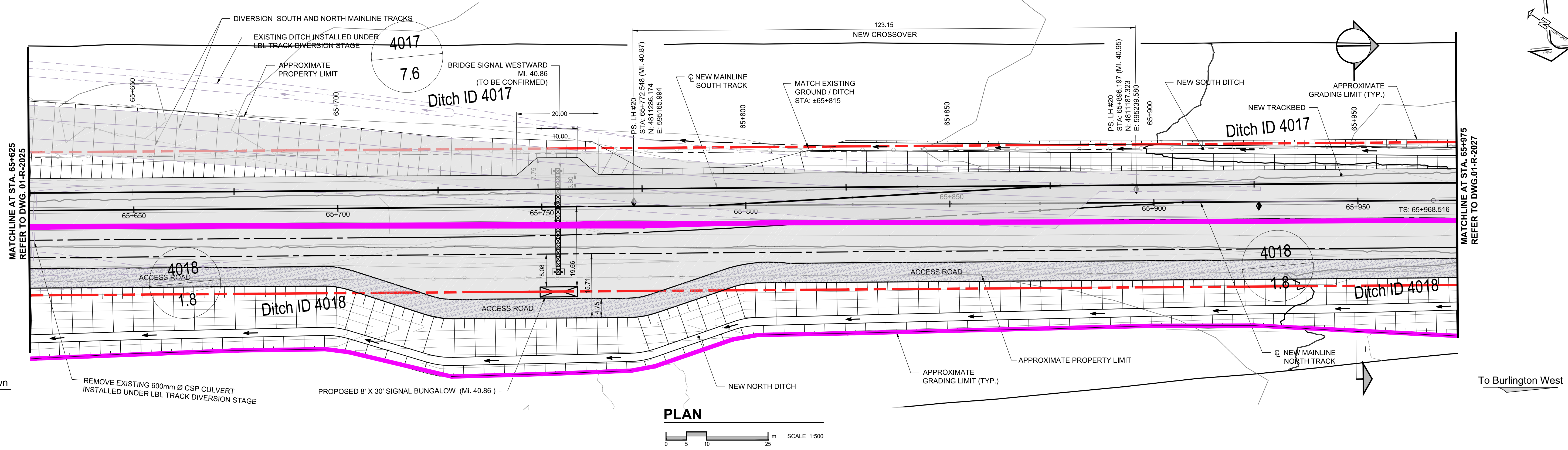


REGION		SUBDIVISION		MILE	
-		HALTON		36.79 - 41.27	
CN PROJECT NO.		CN DRAWING NO.			
-		-			
PROJECT NUMBER		DRAWING NUMBER		ISSUE/REVISION	
60579933		01-R-2025		B	

CN
 MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
 NEW MAINLINE TRACKS
 PLAN & SOUTH TRACK PROFILE
 STA. 65+275 to 65+625 (Mi. 40.56 to 40.78)

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cart11\p001\Data\Projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\910-CAD\20-SHEETS\060579933_01-R-2026-R-2026_plan_profile_SRA\01.dwg(2/20)Bakr@05/11/2026 10:58:11 AM



NOTE
 - FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2037
 - FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3038
 - FOR NEW SERVICE TRACK-2 PROFILE SEE DWG. R-3020

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.	CN DRAWING NO.		
-	-		

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--	--	--	--	--

B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB		
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP

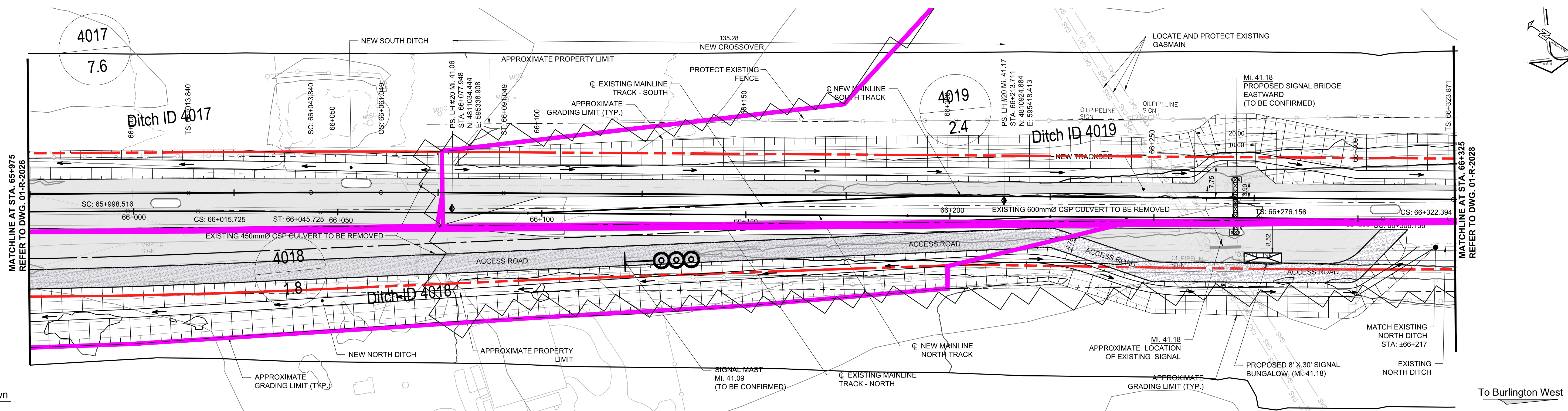


CN
 MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
 NEW MAINLINE TRACKS
 PLAN & SOUTH TRACK PROFILE
 STA. 65+625 to 65+975 (Mi. 40.78 to 40.99)

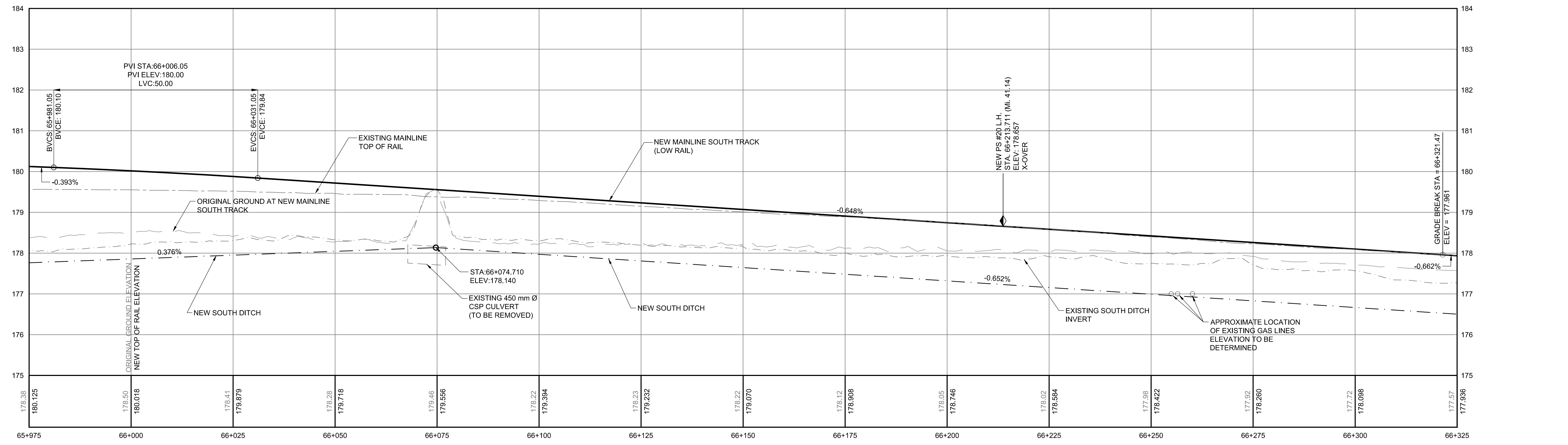
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2026	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\caart1\p001\Data\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\01-D-CAD\20-SHEETS\060579933_01-R-2008-R-2028_plan profile_SRA\01.dwg(12/20/2008) RMs: Nabiel



PLAN
SCALE 1:500



PROFILE
SCALE 1:500

NOTE
- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2037
- FOR NEW SERVICE TRACK-2 PROFILE SEE DWG. R-3021

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--	--	--	--	--

B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB		
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP

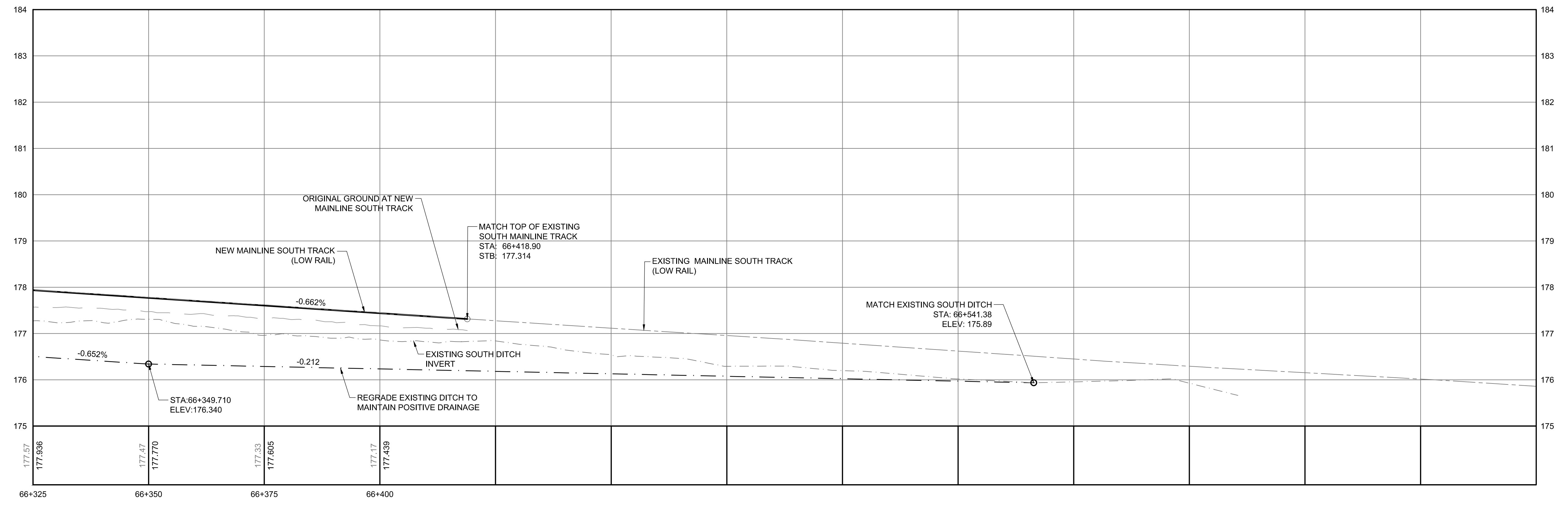
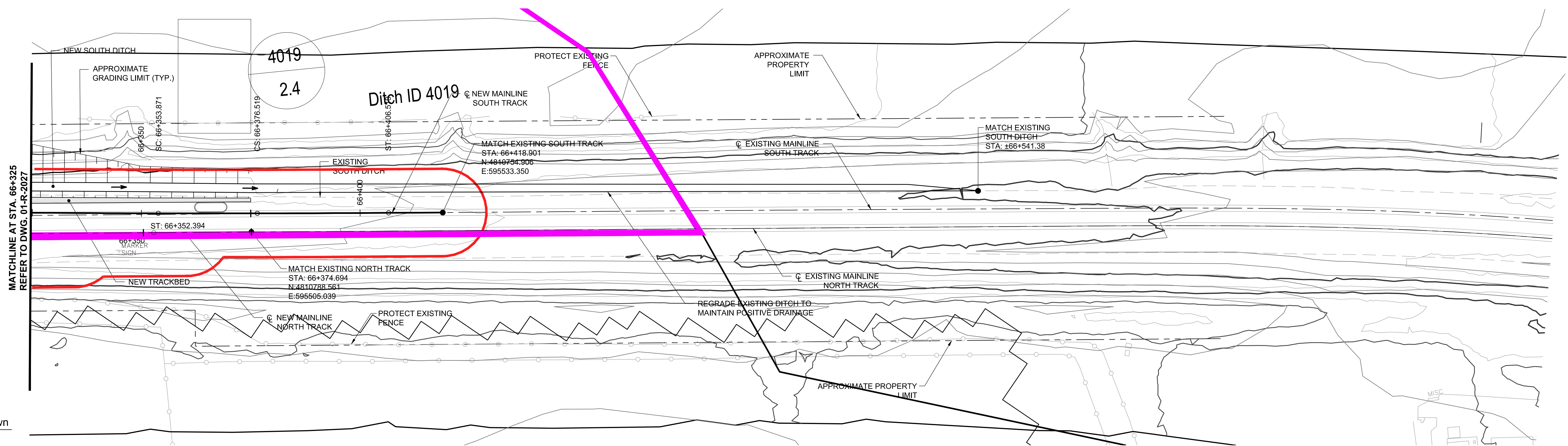
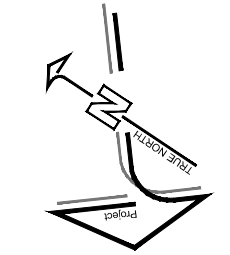


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 65+975 to 66+325 (Mi. 40.99 to 41.21)

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2027	B

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cart11\p001\Data\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\01-CAD\20-SHEETS\060579933_01-R-2008-R-2028_plan_profile_SRA\01.dwg(2/20)Rev:06/05/08 P.Ms: Nabeel



NOTE
FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2038

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--	--	--	--	--

B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB			
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB			
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP	

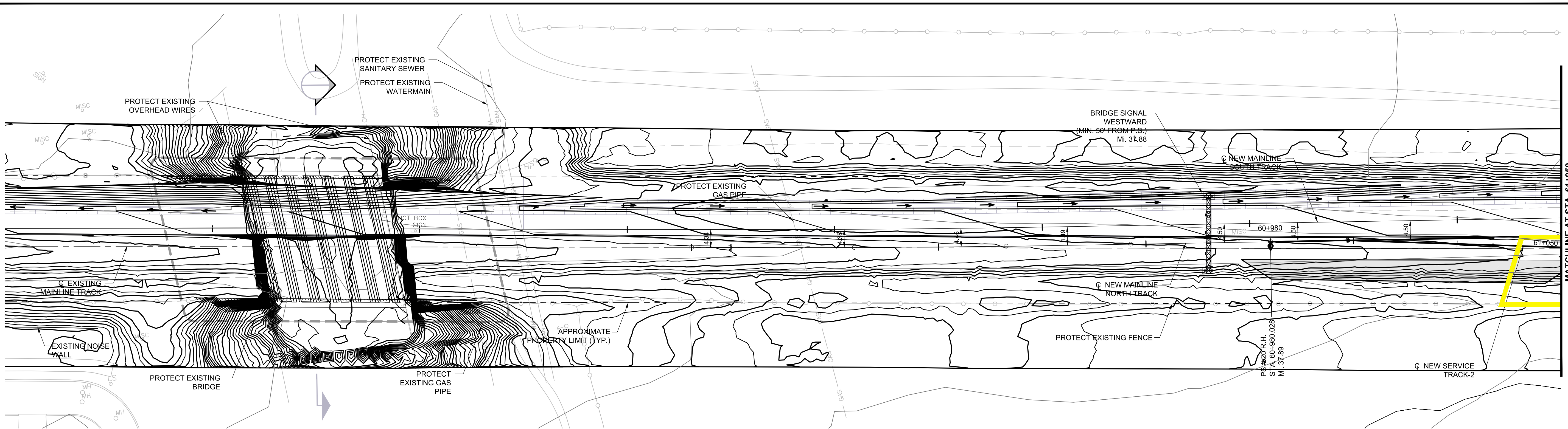


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 66+325 to 66+419.19 (Mi. 41.21 to 41.27)

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2028	B

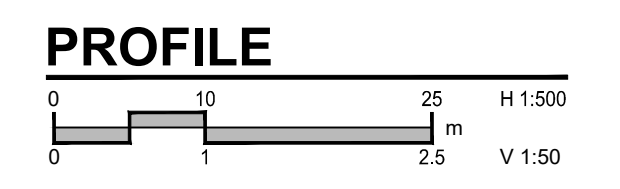
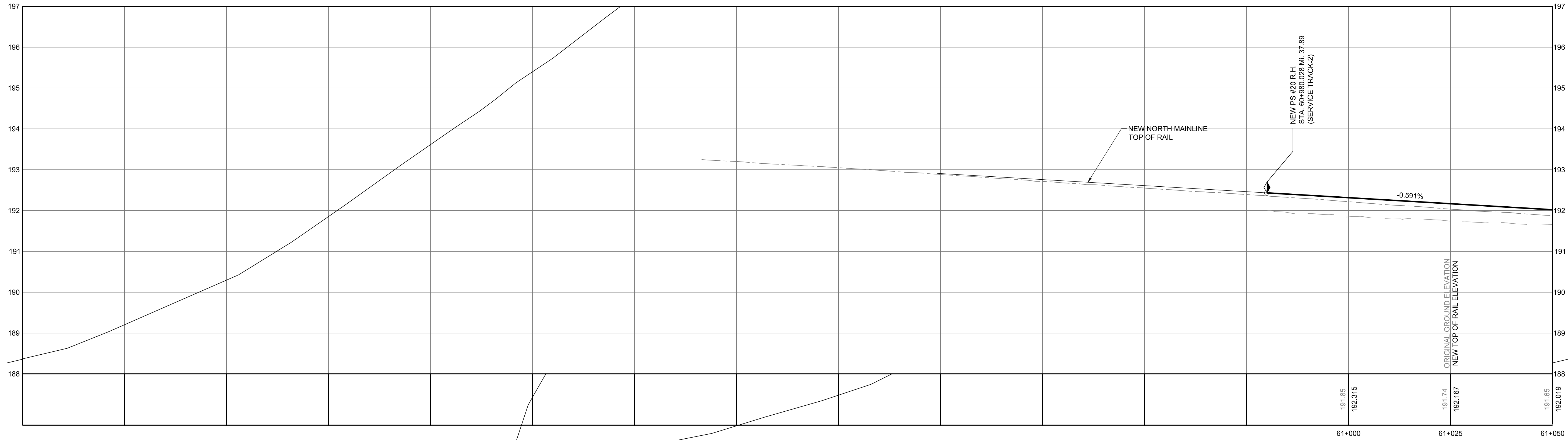
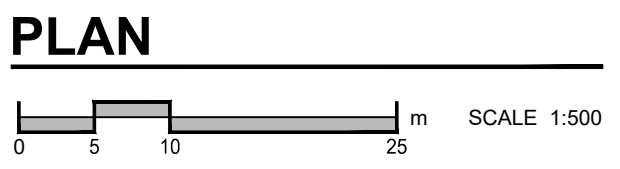
D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cartt\p001\Drawings\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\01\0-CAD\20-SHEETS\060579933_01-R-3006-R-3021_Stage 2_PLAN\AECOM PROJECT\060579933_01-R-3006-R-3021.dwg By: Avin Nabeel



To Georgetown

To Burlington West



NOTE
 - FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2030
 - FOR NEW MAINLINE SOUTH TRACK PROFILE SEE DWG. R-2012

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.	CN DRAWING NO.		
-	-		

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--	--	--	--	--

A	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB			
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP	

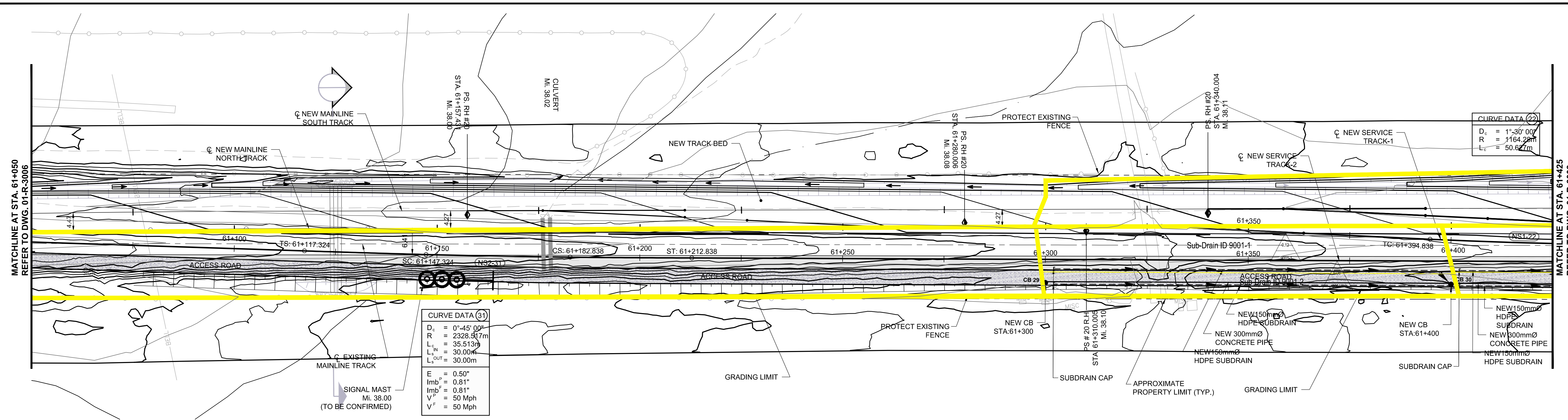


CN
 MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
 NEW SERVICE AND PAD TRACKS
 PLAN & SERVICE TRACK 2 PROFILE
 STA. 60+675 to 61+050 (Mi. 37.70 to 37.94)

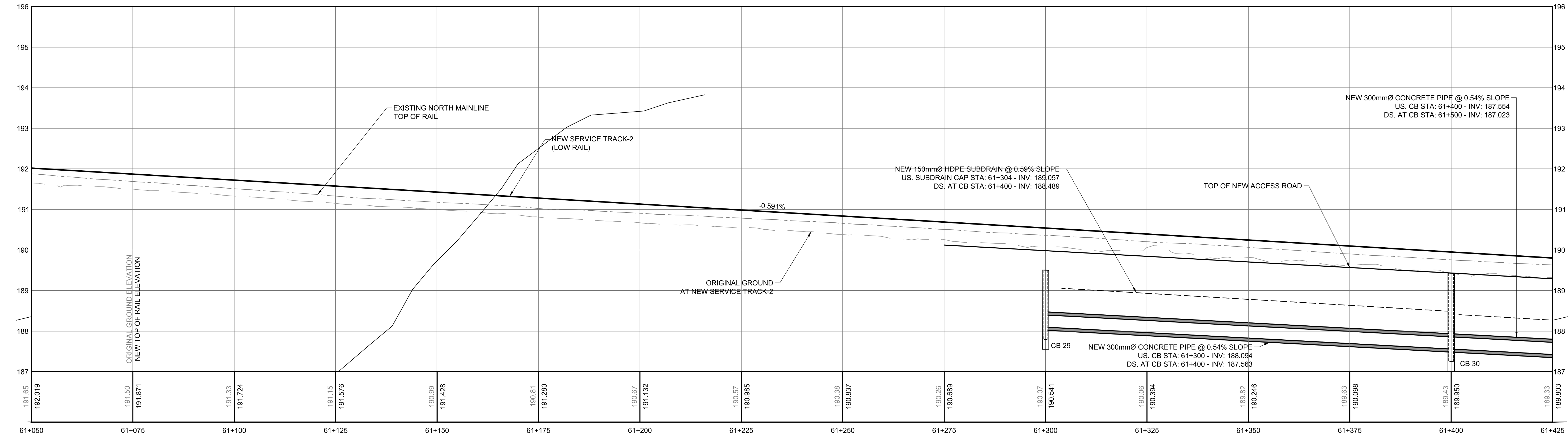
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-3006	A

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cart11\p001\Data\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\010-CAD\20-SHEETS\060579933_01-R-3006-R-3021_Stage_2_PLAN\2010_REVISED\060579933_01-R-3006-R-3021_Stage_2_PLAN.dwg By: Avin Nabeel



PLAN
 SCALE 1:500



NOTE
 - FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2030
 - FOR NEW MAINLINE SOUTH TRACK PROFILE SEE DWG. R-2013
 - FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3032

CN	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.
 © 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS									
A	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB			
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP	

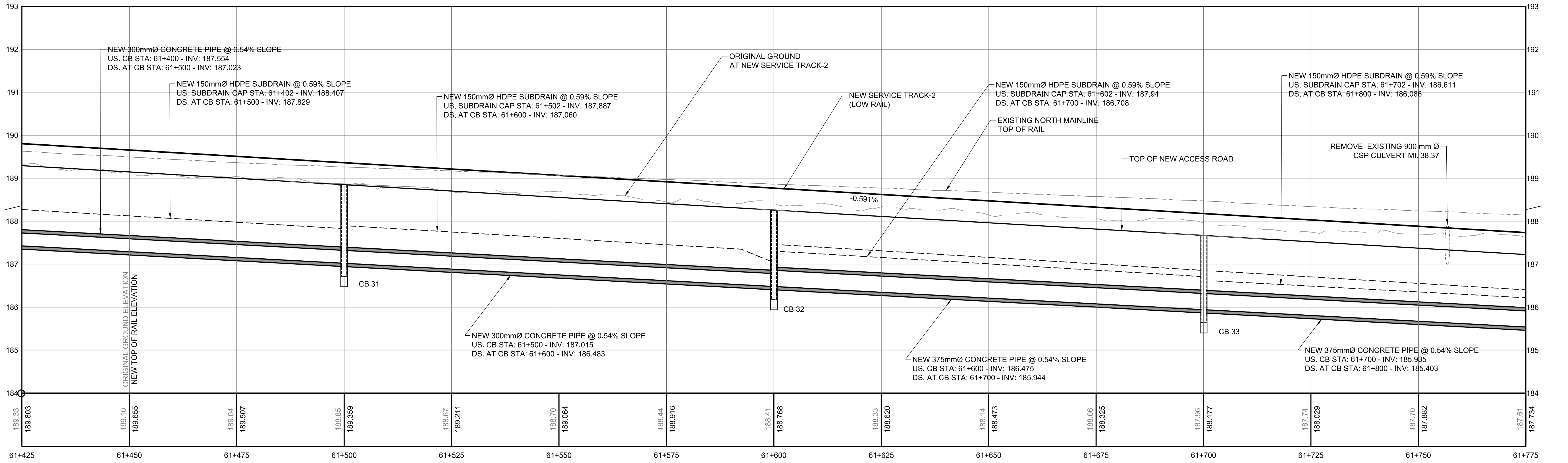
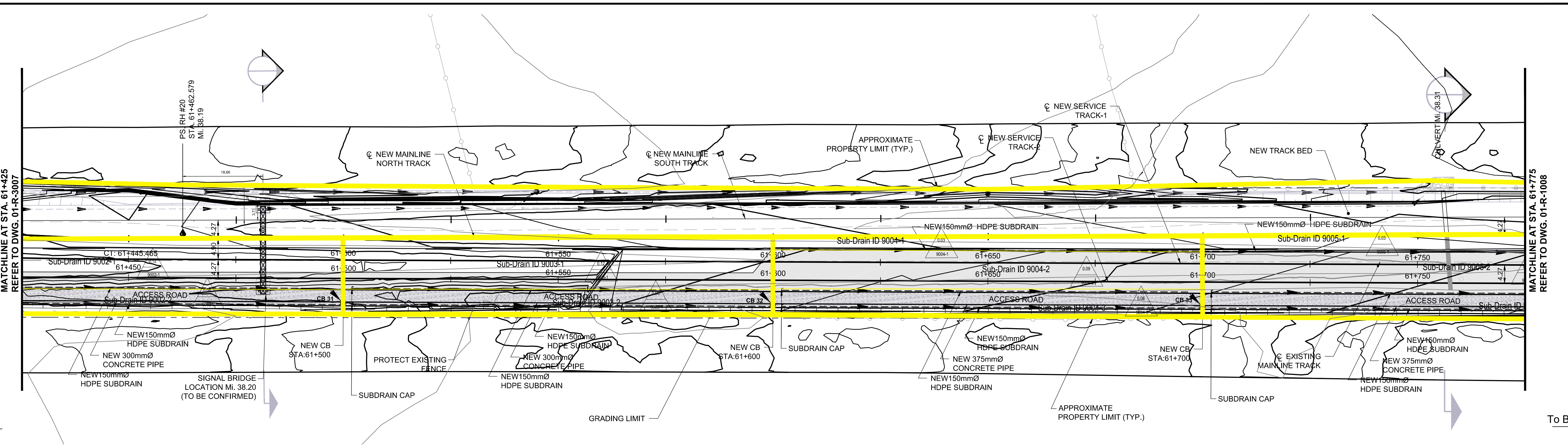


CN
 MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
 NEW SERVICE AND PAD TRACKS
 PLAN & SERVICE TRACK 2 PROFILE
 STA. 61+050 to 61+425 (Mi. 37.94 to 38.17)

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-3007	A

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cartt1\p001\Data\Projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\01-CAD\20-SHEETS\060579933_01-R-3006-R-3021_Stage_2_PLAN\2014_REVISED\060579933_01-R-3006-R-3021_Stage_2_PLAN.dwg By: Aviv Nabeel



NOTE

- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2031
- FOR NEW MAINLINE SOUTH TRACK PROFILE SEE DWG. R-2014
- FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3032

PROFESSIONAL SEALS

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

NO.	DATE	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP
A	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION						



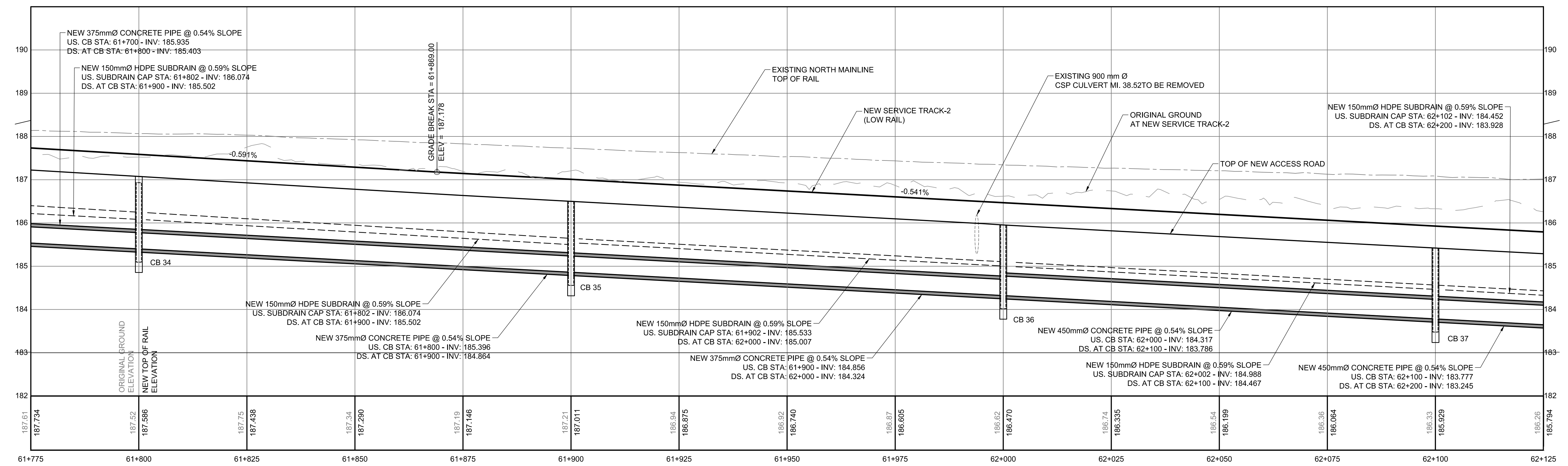
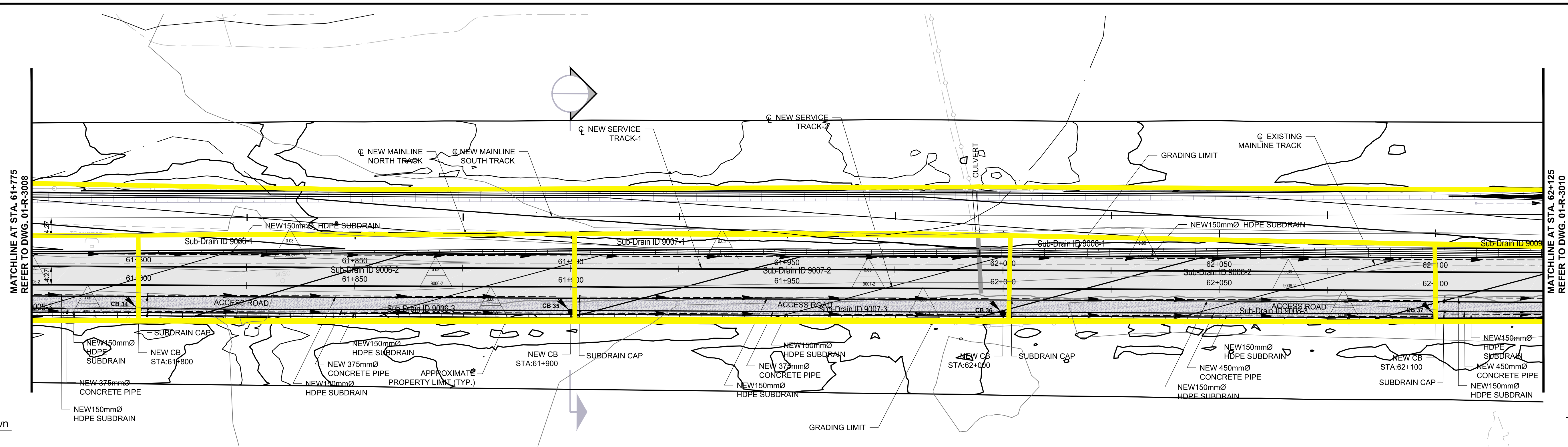
	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.	CN DRAWING NO.		
-	-		

CN MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27		
NEW SERVICE AND PAD TRACKS		
PLAN & SERVICE TRACK 2 PROFILE		
STA. 61+425 to 61+775 (Mi. 38.17 to 38.39)		
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-3008	A

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cart11\proj\1\Drawings\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\01-CAD\20-SHEETS\060579933_01-R-3006-R-3021_Plan\01-R-3006-R-3021_Plan.dwg

REVISED BY: AVIS NABAEEL



NOTE

- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2031
- FOR NEW MAINLINE SOUTH TRACK PROFILE SEE DWG. R-2015
- FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3033

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.	CN DRAWING NO.		
-	-		

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

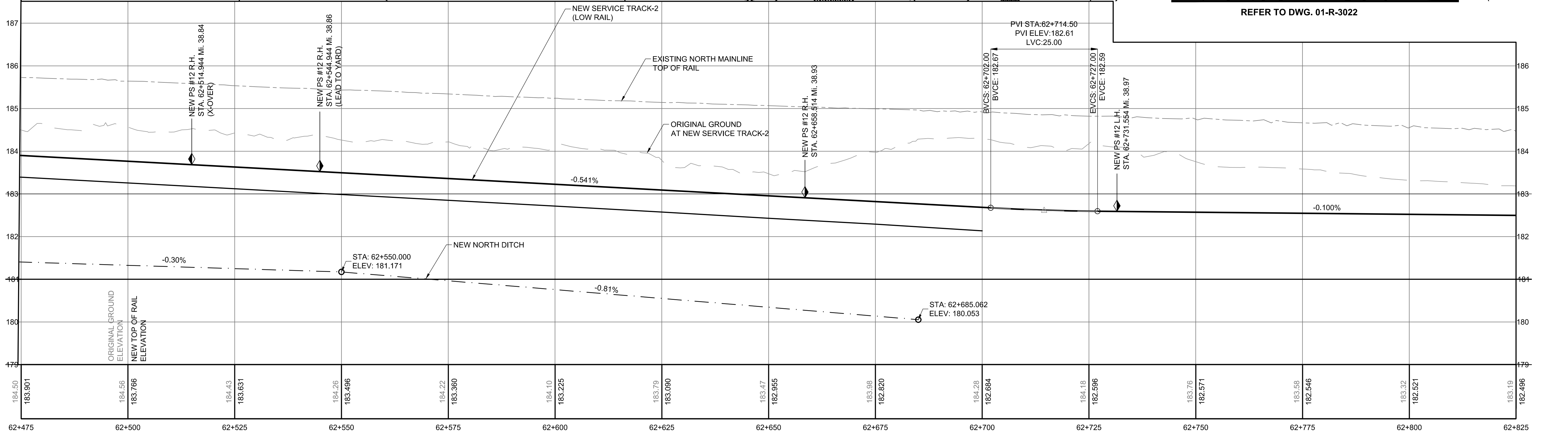
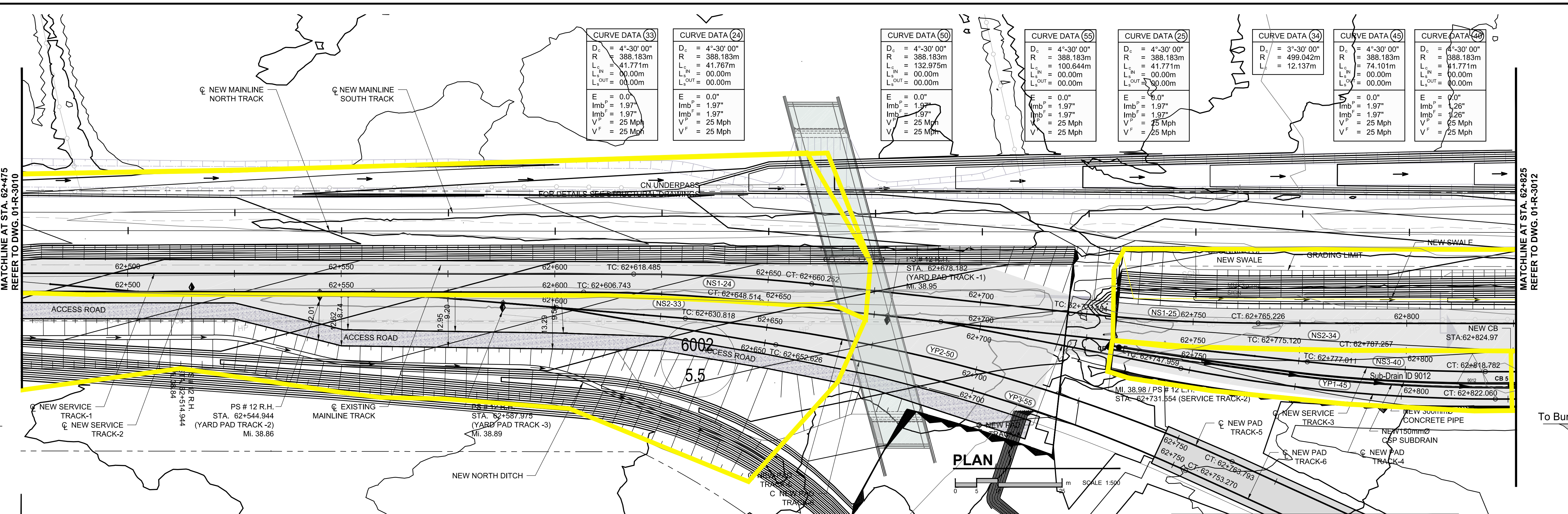
PROFESSIONAL SEALS									
A	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB			
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP	



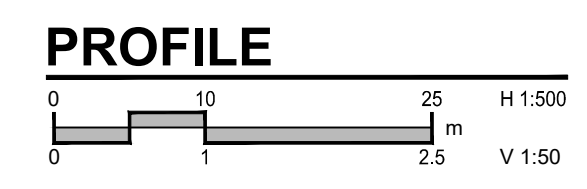
CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW SERVICE AND PAD TRACKS
PLAN & SERVICE TRACK 2 PROFILE
STA. 61+775 to 62+125 (Mi. 38.39 to 38.60)

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60327563	01-R-3009	A

D SIZE 22" x 34" (558.8mm x 863.6mm) AECOM FILE NAME: \\caarth\p001\data\projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\010-CAD\20-SHEETS\060579933_01-R-3006-R-3021_Stage_2_PLAN\01000_REVISED\060579933_01-R-3006-R-3021_Stage_2_PLAN.dwg By: Avish Nabeel



NOTE
 - FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2032
 - FOR NEW MAINLINE SOUTH TRACK PROFILE SEE DWG. R-2017
 - FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3034
 - FOR NEW SERVICE TRACK-3 PROFILE SEE DWG. R-3039
 - FOR NEW YARD PAD TRACK-4 PROFILE SEE DWG. R-3043
 - FOR NEW YARD PAD TRACK-5 PROFILE SEE DWG. R-3047
 - FOR NEW YARD PAD TRACK-6 PROFILE SEE DWG. R-3051



CN	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

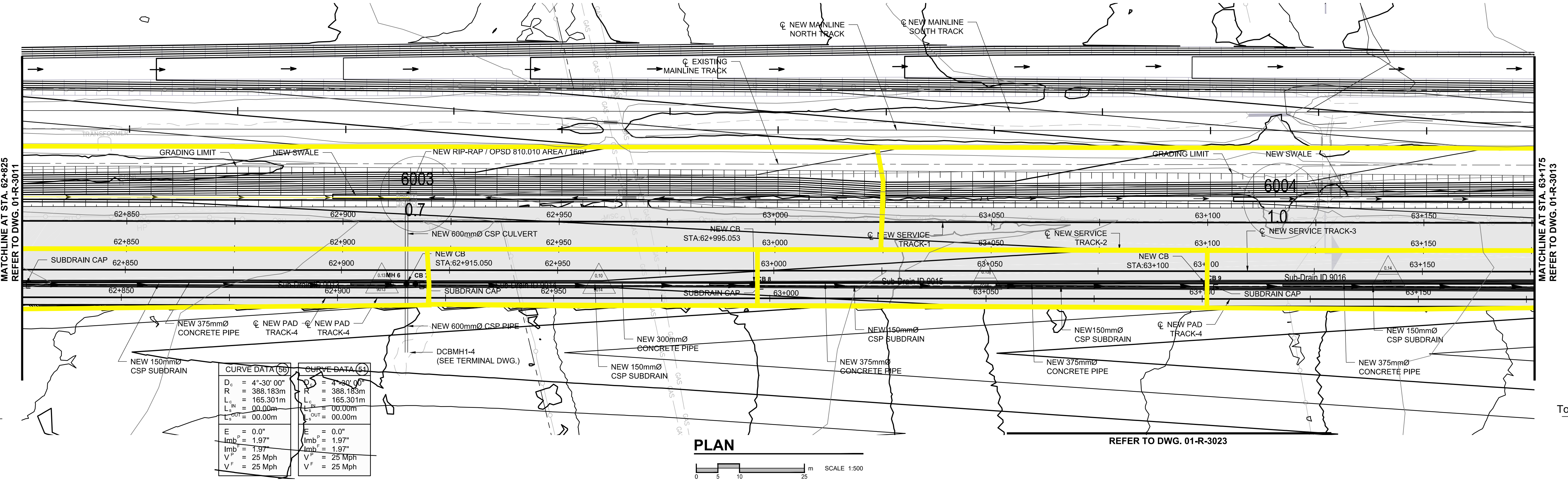
DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.
 © 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS									
A	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB			
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP	

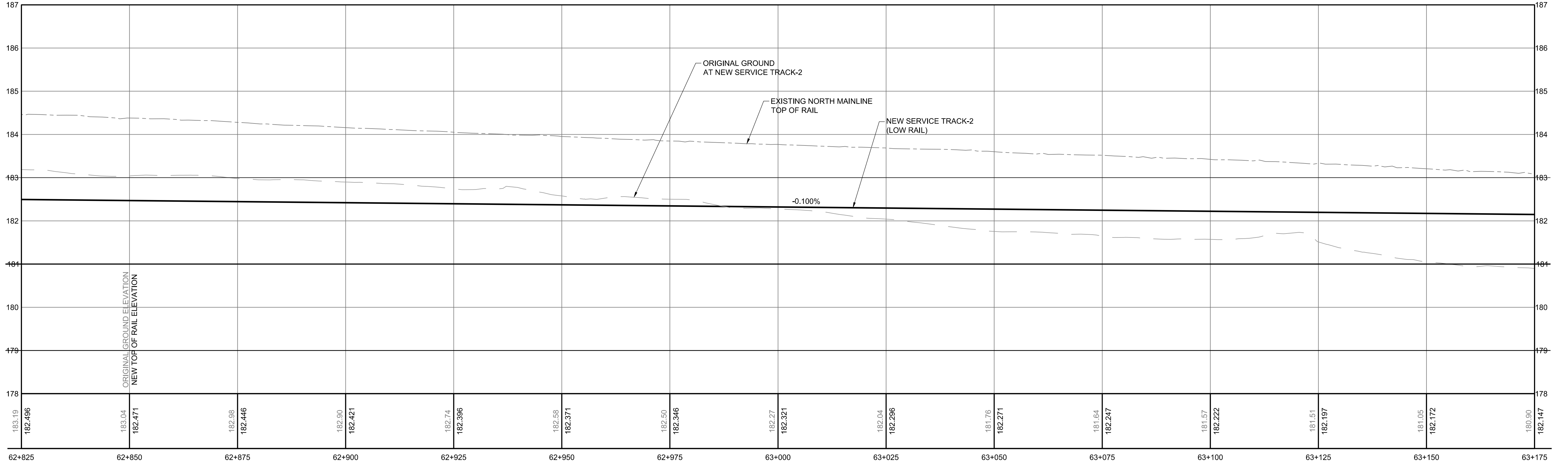


CN
 MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
 NEW SERVICE AND PAD TRACKS
 PLAN & SERVICE TRACK 2 PROFILE
 STA. 62+475 to 62+825 (Mi. 38.82 to 39.04)

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-3011	A



PLAN
SCALE 1:500



PROFILE
SCALE H 1:500 V 1:50

NOTE
 - FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2033
 - FOR NEW MAINLINE SOUTH TRACK PROFILE SEE DWG. R-2018
 - FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3034
 - FOR NEW SERVICE TRACK-3 PROFILE SEE DWG. R-3039
 - FOR NEW YARD PAD TRACK-4 PROFILE SEE DWG. R-3043

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.
 © 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS	

A	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP

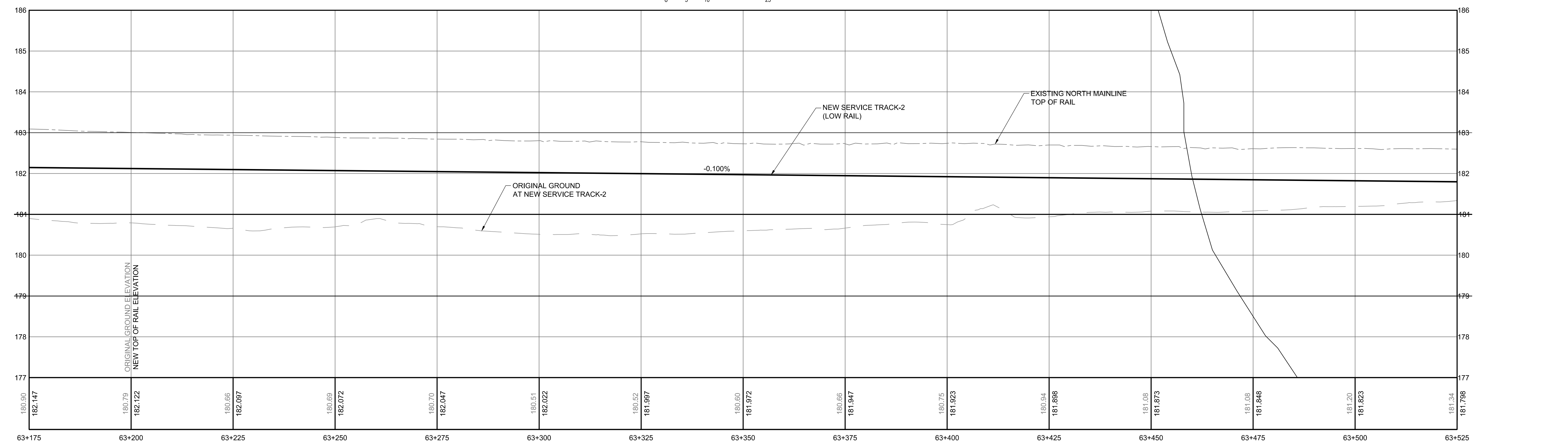
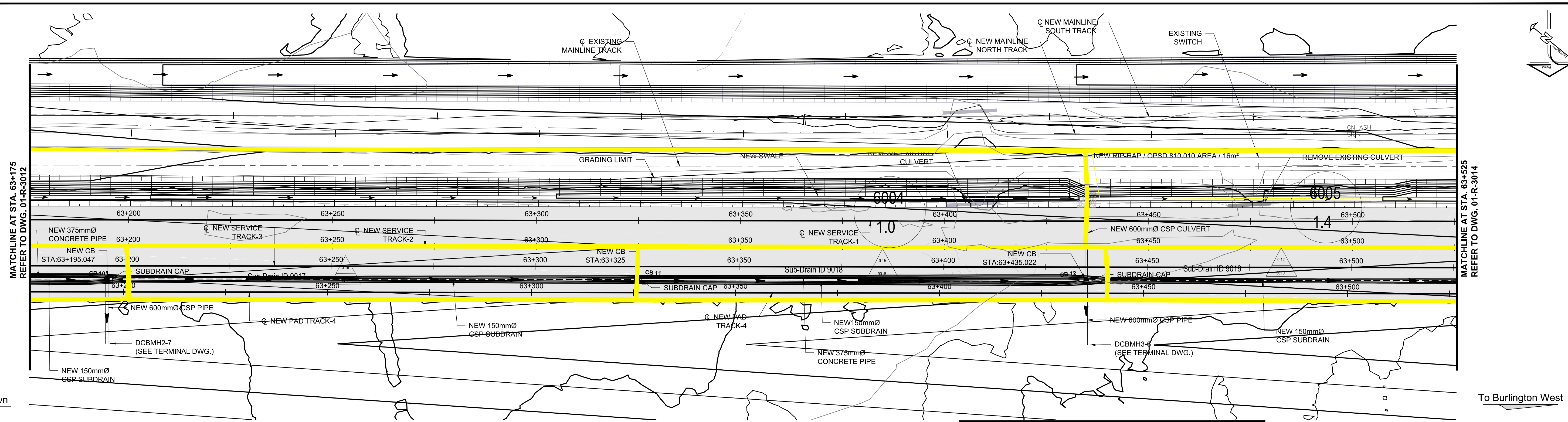


CN MILTON LOGISTIC HUB
NEW SERVICE AND PAD TRACKS
PLAN & SERVICE TRACK 2 PROFILE
STA. 62+825 to 63+175 (Mi. 39.04 to 39.26)

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-3012	A

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cart11\p001\Data\Projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\010-CAD\20-SHEETS\060579933_01-R-3006-R-3021_Stage_2_PLAN\2010_REVISED\060579933_01-R-3006-R-3021.dwg



NOTE
 - FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2033
 - FOR NEW MAINLINE SOUTH TRACK PROFILE SEE DWG. R-2019
 - FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3035
 - FOR NEW SERVICE TRACK-3 PROFILE SEE DWG. R-3040
 - FOR NEW YARD PAD TRACK-4 PROFILE SEE DWG. R-3043 / R-3044

PROFESSIONAL SEALS

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

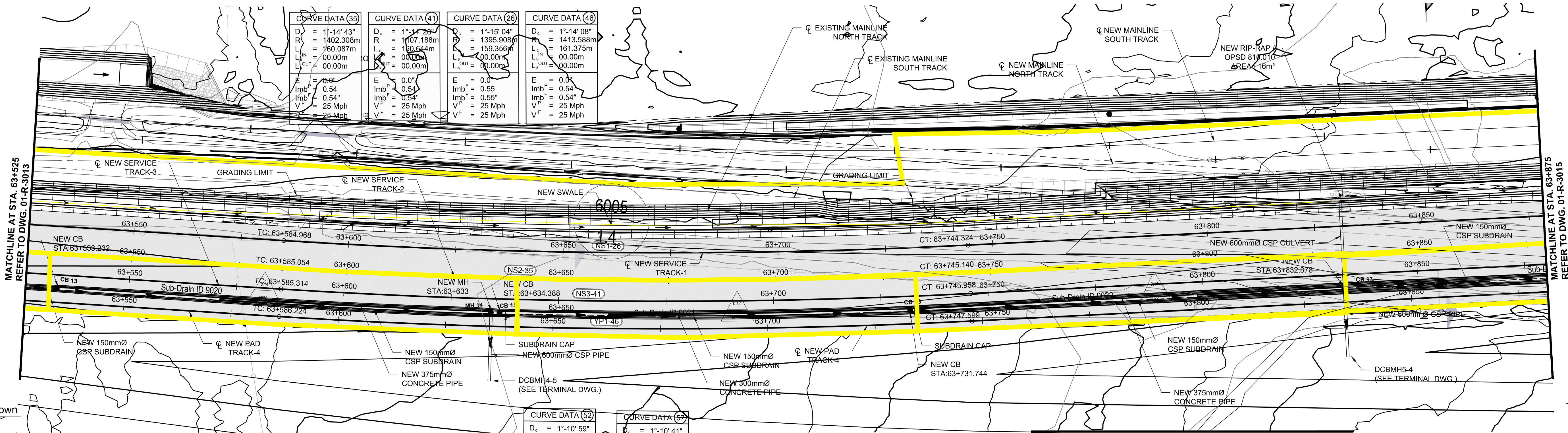
© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

A	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP



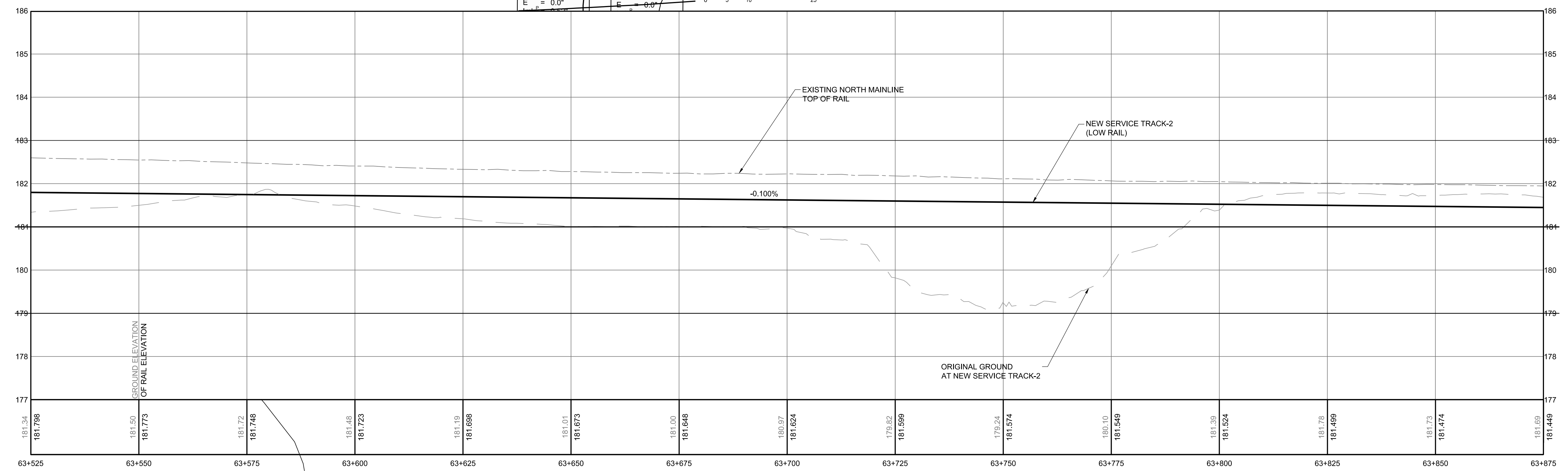
	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.	CN DRAWING NO.		
-	-		

CN		
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27		
NEW SERVICE AND PAD TRACKS		
PLAN & SERVICE TRACK 2 PROFILE		
STA. 63+175 to 63+525 (Mi. 39.26 to 39.47)		
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-3013	A



CURVE DATA (35)	CURVE DATA (41)	CURVE DATA (26)	CURVE DATA (46)
$D_c = 1^\circ-14' 43''$ $R = 1402.308m$ $L_{IN} = 160.087m$ $L_{OUT} = 00.00m$ $E = 0.0^\circ$ $Imb^i = 0.54$ $Imb^f = 0.54$ $V = 25 Mph$ $V^f = 26 Mph$	$D_c = 1^\circ-14' 26''$ $R = 1407.188m$ $L_{IN} = 160.644m$ $L_{OUT} = 00.00m$ $E = 0.0^\circ$ $Imb^i = 0.54$ $Imb^f = 0.54$ $V = 25 Mph$ $V^f = 25 Mph$	$D_c = 1^\circ-15' 04''$ $R = 1395.908m$ $L_{IN} = 159.356m$ $L_{OUT} = 00.00m$ $E = 0.0^\circ$ $Imb^i = 0.55$ $Imb^f = 0.55$ $V = 25 Mph$ $V^f = 25 Mph$	$D_c = 1^\circ-14' 08''$ $R = 1413.588m$ $L_{IN} = 161.375m$ $L_{OUT} = 00.00m$ $E = 0.0^\circ$ $Imb^i = 0.54$ $Imb^f = 0.54$ $V = 25 Mph$ $V^f = 25 Mph$

CURVE DATA (52)	CURVE DATA (57)
$D_c = 1^\circ-10' 59''$ $R = 1476.058m$ $L_{IN} = 168.506m$ $L_{OUT} = 00.00m$ $E = 0.0^\circ$	$D_c = 1^\circ-10' 41''$ $R = 1482.458m$ $L_{IN} = 169.297m$ $L_{OUT} = 00.00m$ $E = 0.0^\circ$



NOTE
 - FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2034
 - FOR NEW MAINLINE SOUTH TRACK PROFILE SEE DWG. R-2020
 - FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3035

PROFESSIONAL SEALS

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

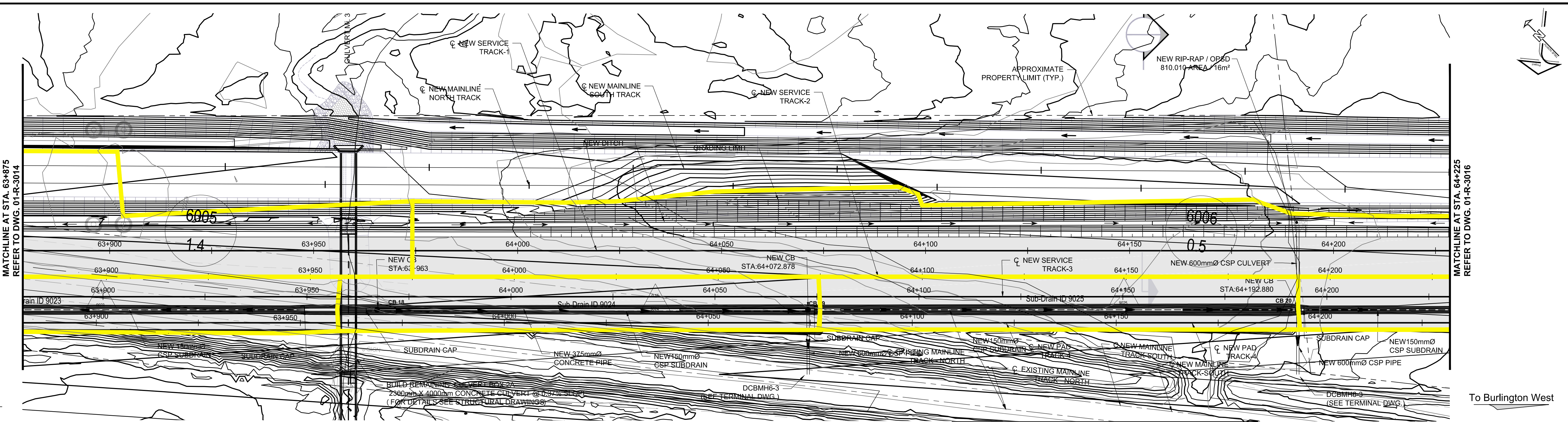
© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

NO.	DATE	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP
A	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION						

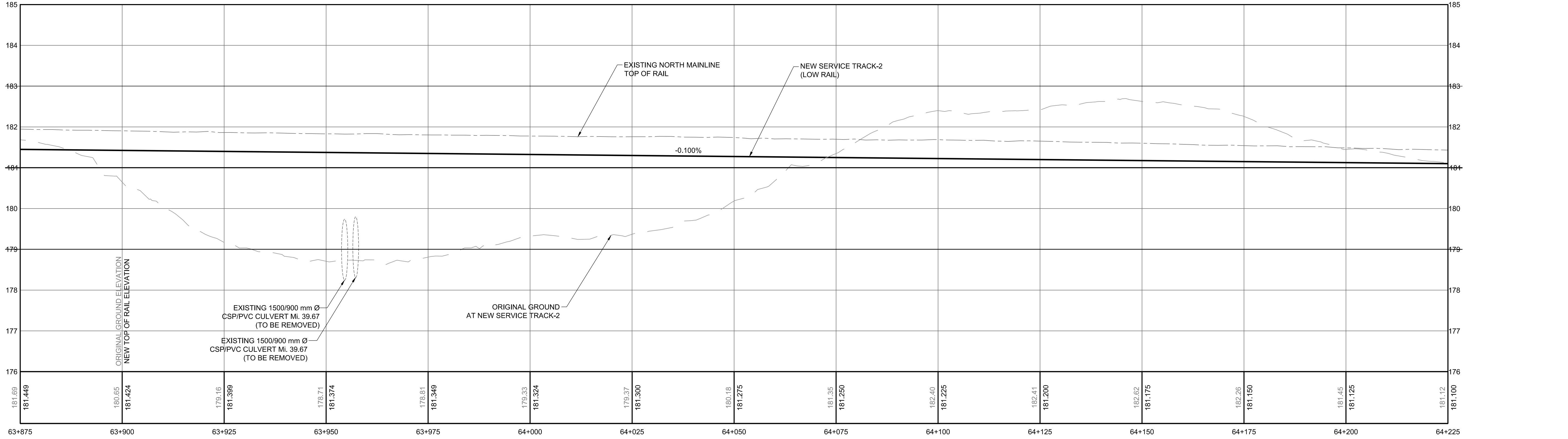
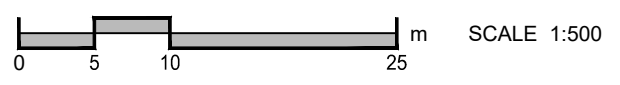


REGION -	SUBDIVISION HALTON	MILE 36.79 - 41.27
CN PROJECT NO. -	CN DRAWING NO. -	

CN MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27 NEW SERVICE AND PAD TRACKS PLAN & SERVICE TRACK 2 PROFILE STA. 63+525 to 63+875 (Mi. 39.47 to 39.69)		
PROJECT NUMBER 60579933	DRAWING NUMBER 01-R-3014	ISSUE/REVISION A



PLAN



PROFILE



NOTE

- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2034
- FOR NEW MAINLINE SOUTH TRACK PROFILE SEE DWG. R-2021
- FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3036
- FOR NEW SERVICE TRACK-3 PROFILE SEE DWG. R-3041
- FOR NEW YARD PAD TRACK-4 PROFILE SEE DWG. R-3044/ R-3045

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--

A	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG
			IDR			APP

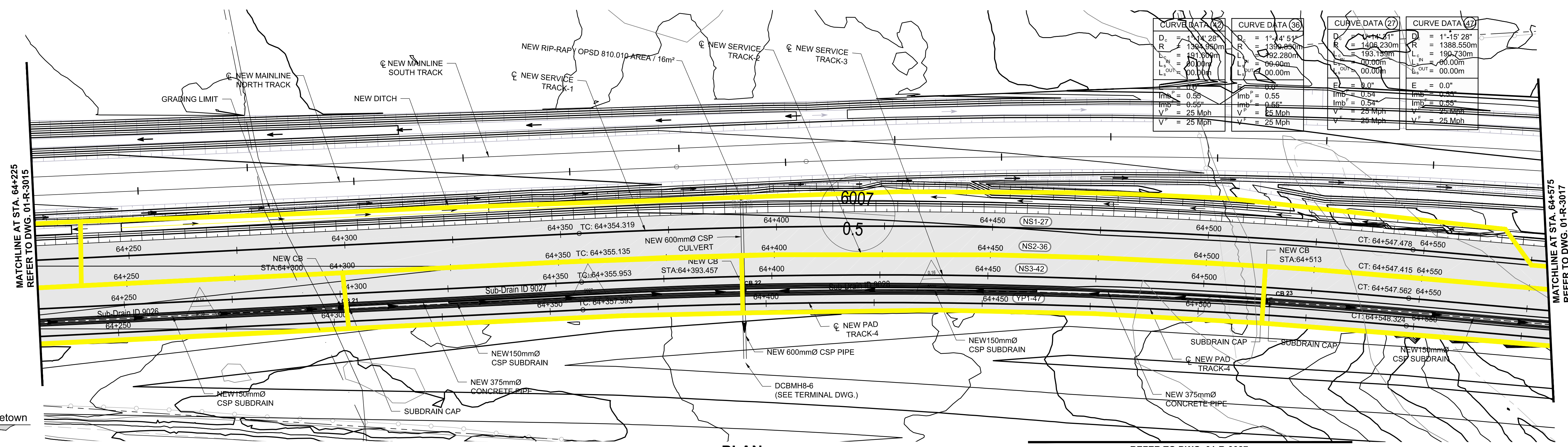


CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW SERVICE AND PAD TRACKS
PLAN & SERVICE TRACK 2 PROFILE
STA. 63+875 to 64+225 (Mi. 39.69 to 39.91)

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-3015	A

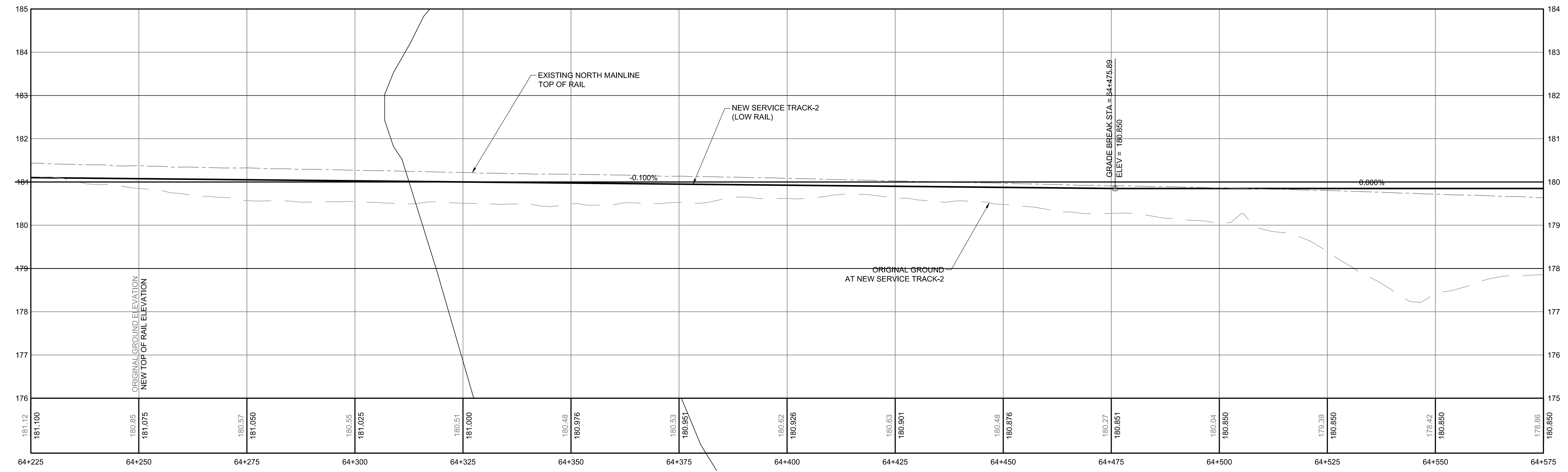
D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\caarth\p001\Drawings\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\010-CAD\20-SHEETS\060579933_01-R-3006-R-3021_Stage_2_PLAN\2010_REVISED\060579933_01-R-3006-R-3021.dwg



CURVE DATA (2)	CURVE DATA (36)	CURVE DATA (27)	CURVE DATA (47)
D _c = 1'-11" 28"	D _c = 1'-11" 51"	D _c = 1'-11" 41"	D _c = 1'-11" 28"
R = 1399.950m	R = 1399.950m	R = 1405.230m	R = 1388.550m
L _{in} = 491.600m	L _{in} = 492.280m	L _{in} = 193.199m	L _{in} = 193.730m
L _{out} = 00.000m	L _{out} = 00.000m	L _{out} = 00.000m	L _{out} = 00.000m
E = 0.0°	E = 0.0°	E = 0.0°	E = 0.0°
Imb = 0.55	Imb = 0.55	Imb = 0.54	Imb = 0.54
V = 25 Mph	V = 25 Mph	V = 25 Mph	V = 25 Mph

PLAN
SCALE 1:500



PROFILE
SCALE H 1:500 V 1:50

NOTE
 - FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2035
 - FOR NEW MAINLINE SOUTH TRACK PROFILE SEE DWG. R-2022
 - FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3036
 - FOR NEW SERVICE TRACK-3 PROFILE SEE DWG. R-3041
 - FOR NEW YARD PAD TRACK-4 PROFILE SEE DWG. R-3045

CN	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--

A	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG
			IDR			APP

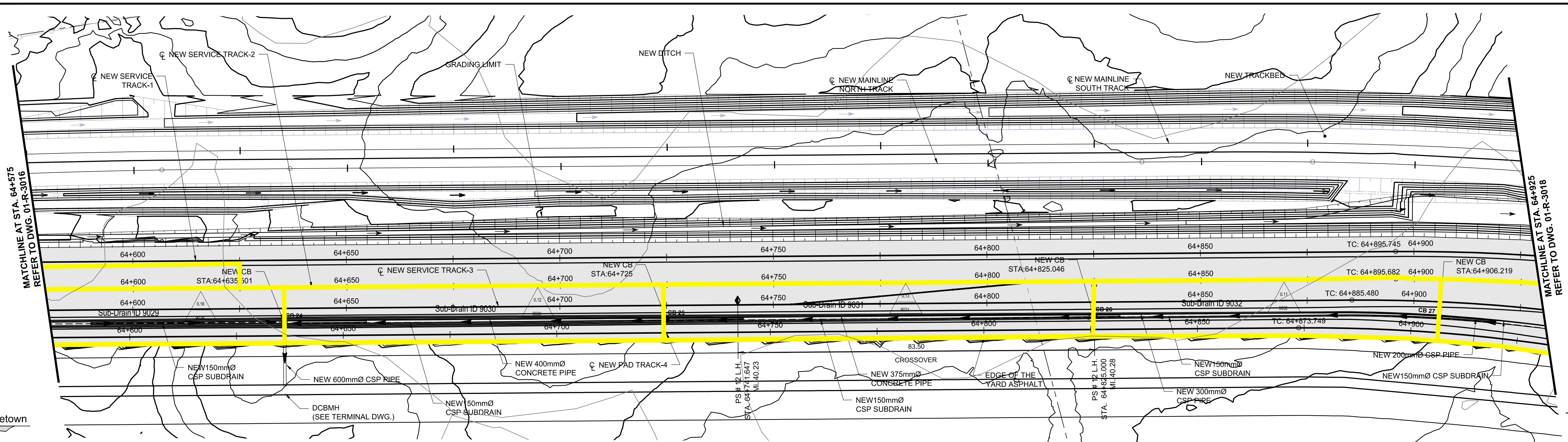


CN
 MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
 NEW SERVICE AND PAD TRACKS
 PLAN & SERVICE TRACK 2 PROFILE
 STA. 64+225 to 64+575 (Mi. 39.91 to 40.13)

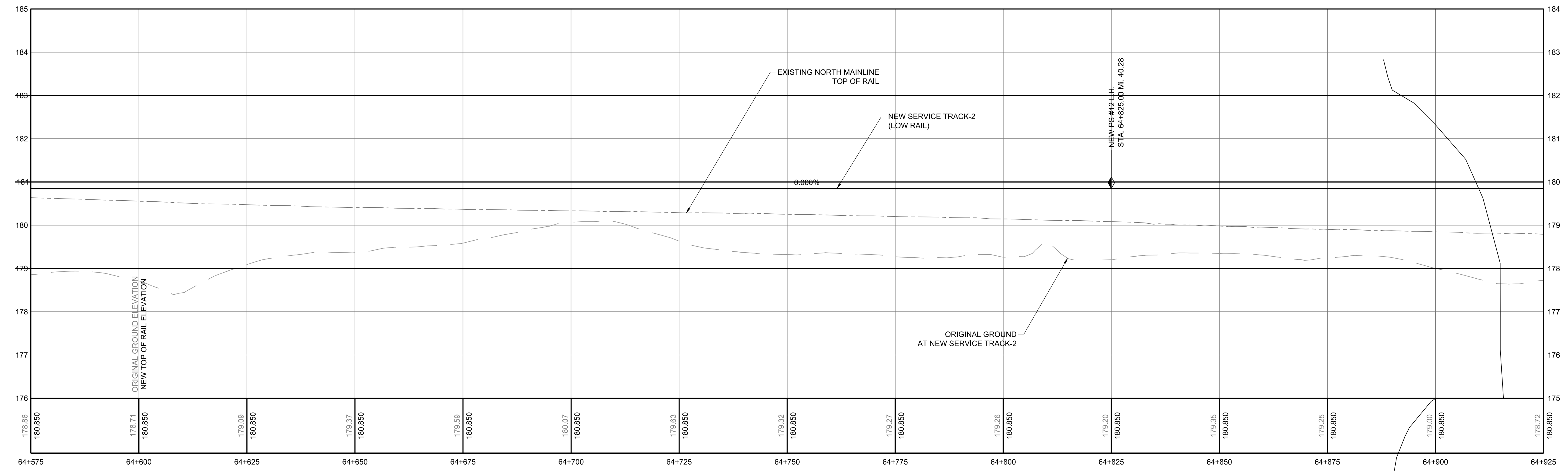
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-3016	A

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\caart1\p001\Drawings\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\010-CAD\20-SHEETS\060579933_01-R-3006-R-3021_Stage_2_PLAN\2010_REVISED\0607_105\0607_105.dwg



PLAN
SCALE 1:500



PROFILE
SCALE H 1:500 V 1:50

NOTE
 - FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2035
 - FOR NEW MAINLINE SOUTH TRACK PROFILE SEE DWG. R-2023
 - FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3037
 - FOR NEW SERVICE TRACK-3 PROFILE SEE DWG. R-3042
 - FOR NEW YARD PAD TRACK-4 PROFILE SEE DWG. R-3045

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.
 © 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

--	--	--	--	--	--	--	--	--	--

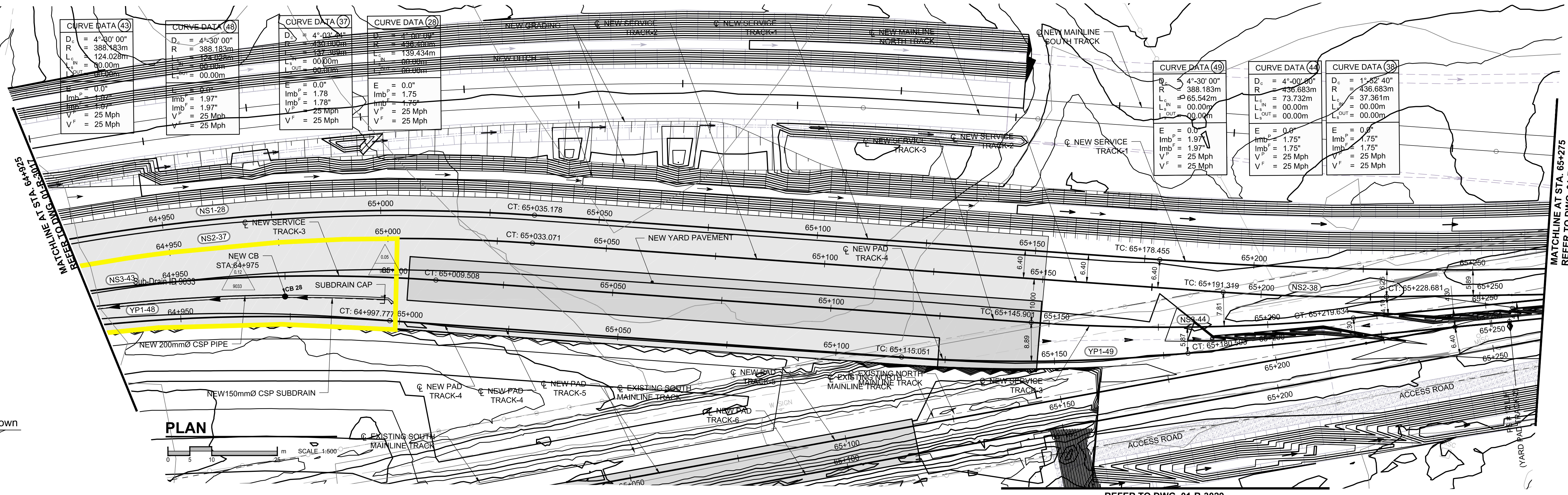
A	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG
			IDR			APP



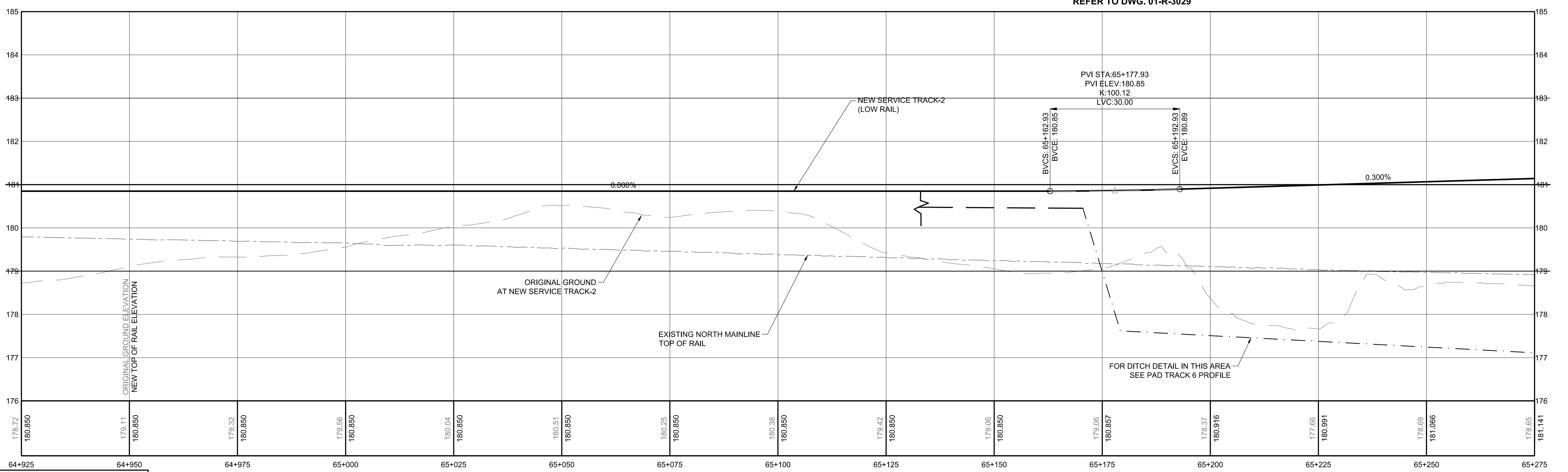
CN
 MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
 NEW SERVICE AND PAD TRACKS
 PLAN & SERVICE TRACK 2 PROFILE
 STA. 64+575 to 64+925 (Mi. 40.13 to 40.34)

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-3017	A

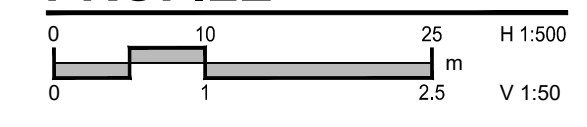
D. SIZE 22" x 34" (558.8mm x 863.6mm) AECOM FILE NAME: \\cart11\p001\data\projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\01\0-CAD\20-SHEETS\060579933_01-R-3006-R-3021_Stage 2_PLAN\2001_R-3018-R-3021.dwg



PLAN



PROFILE



- NOTE**
- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2036
 - FOR NEW MAINLINE SOUTH TRACK PROFILE SEE DWG. R-2024
 - FOR NEW SERVICE TRACK-1 PROFILE SEE DWG. R-3037
 - FOR NEW SERVICE TRACK-3 PROFILE SEE DWG. R-3042
 - FOR NEW YARD PAD TRACK-4 PROFILE SEE DWG. R-3046
 - FOR NEW YARD PAD TRACK-5 PROFILE SEE DWG. R-3050
 - FOR NEW YARD PAD TRACK-6 PROFILE SEE DWG. R-3054

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

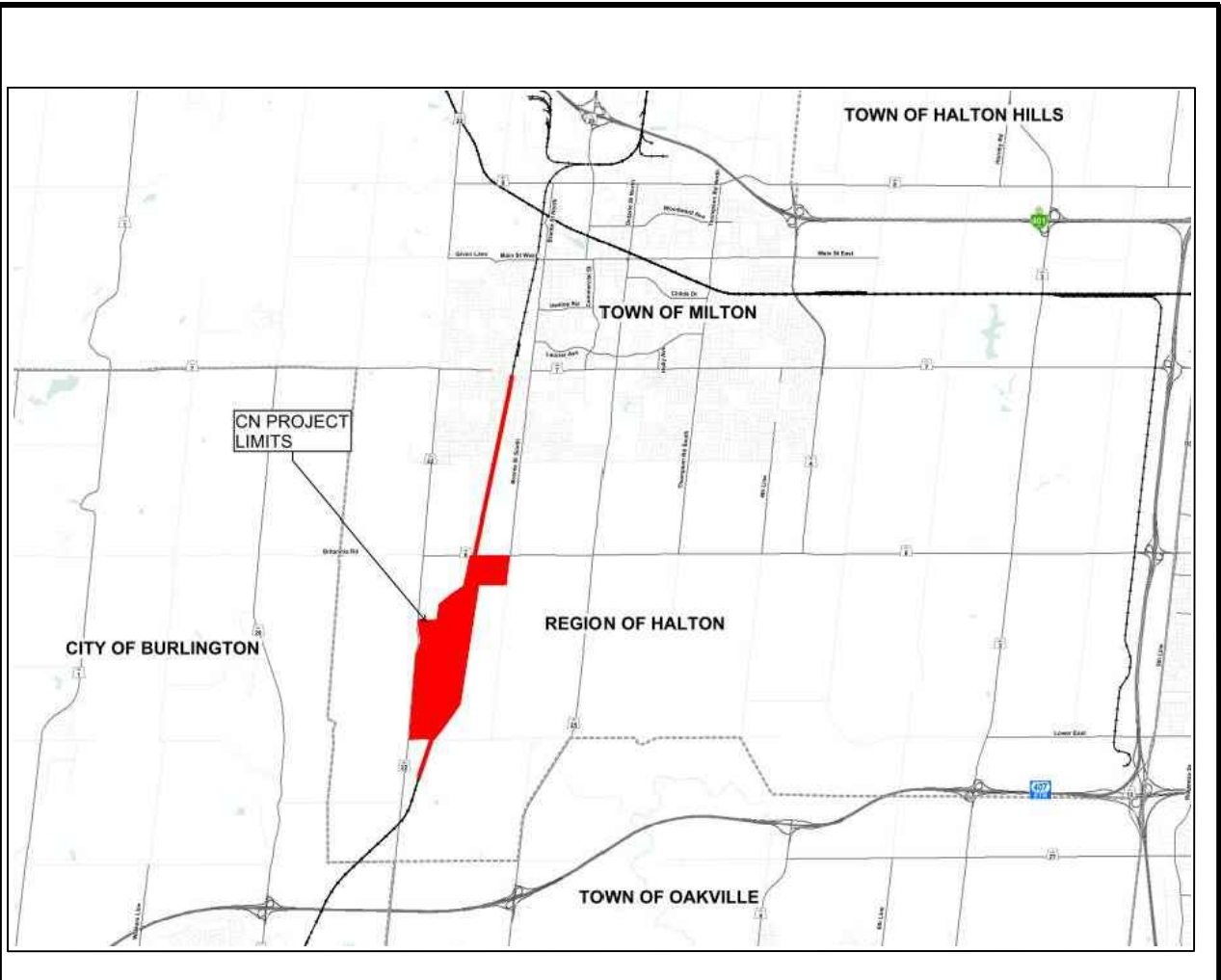
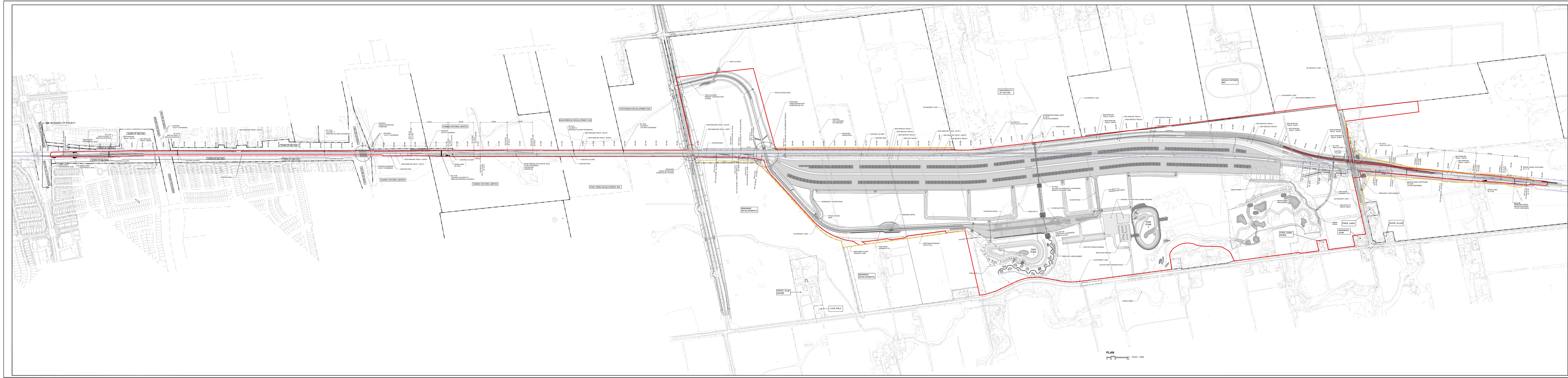
--	--	--	--	--	--

A	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB
I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG



CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW SERVICE AND PAD TRACKS
PLAN & SERVICE TRACK 2 PROFILE
STA. 64+925 to 65+275 (Mi. 40.34 to 40.56)

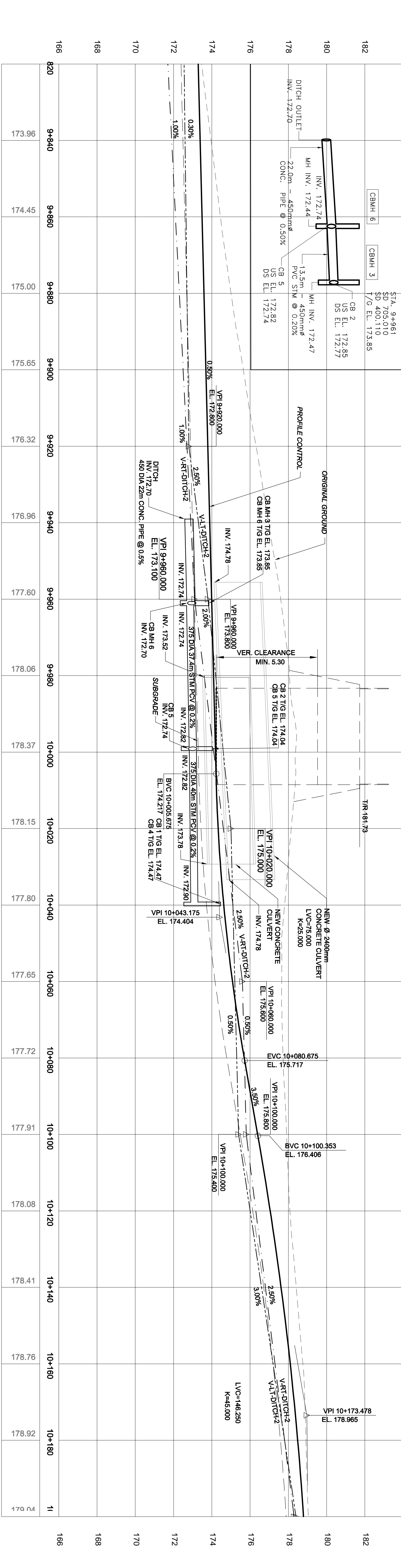
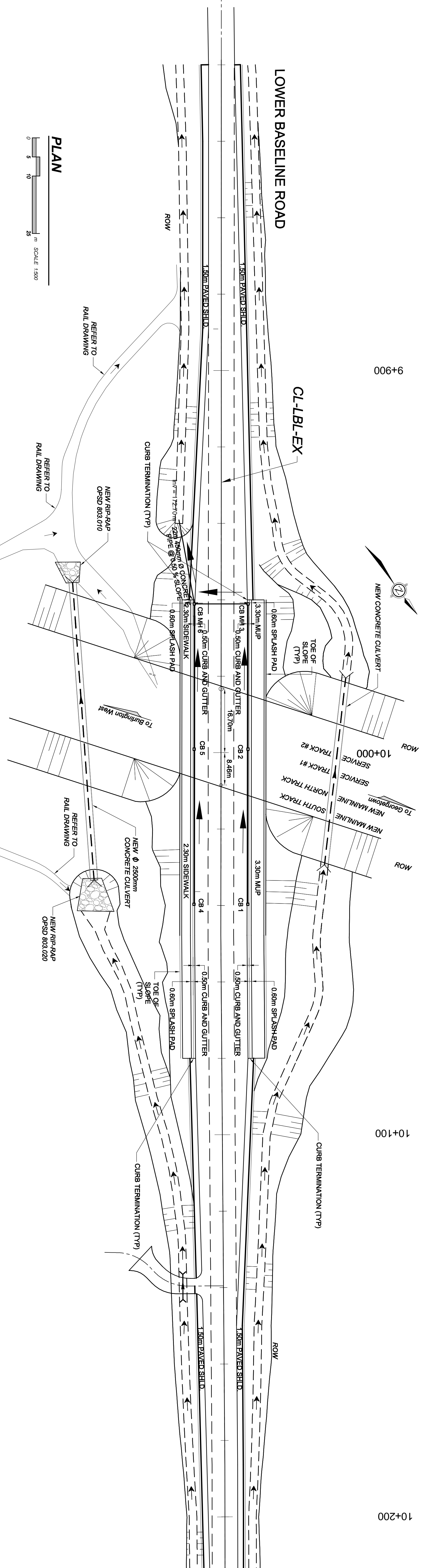
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-3018	A



GENERAL LOCATION PLAN

LEGEND	
	EXISTING ROW
	PROPOSED ROW
	PC/LINE

PLAN
SCALE 1:2000



DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

ISSUE/REVISION	DATE	DESCRIPTION	BY	CHECKED	APP'D
A	2019/12/12	ISSUED FOR 30% SUBMISSION	HJ	HJ	NA
		ISSUE/REVISION DESCRIPTION	DRN	CHK	DES
			ENG	IDR	APP

AECOM

CN

MILTON LOGISTIC HUB
HALTON SUBDIVISION - Mile 36.86 to 41.26
LOWER BASELINE ROAD - PLAN AND PROFILE
STORM SEWER

REGION	SUBDIVISION	MILE
HALTON	HALTON	36.86 - 41.26

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-C-3012A	A

Appendix **B**

FINAL DRAINAGE REPORT

Milton Logistic Hub

- Proposed Conditions Hydrology
- AutoCAD Internal Drainage
 - Phase 1 Drainage Maps
 - Phase 2 Drainage Maps
- Culvert Hydrology
 - Culvert/Ditch Summary
 - Intensity-Duration-Frequency (IDF) Curves
 - C and CN Calculations
 - Time of Concentration Calculations for Phase 1 and 2
 - Rational Method
 - Flow Summary
 - Visual OTTHYMO Summary

Intensity-Duration-Frequency (IDF) Curves

Active coordinate

43° 27' 45" N, 79° 50' 14" W (43.462500, -79.837500) Modify selection

Retrieved: Mon, 18 Nov 2019 16:10:01 GMT



Map options: Modify selection | Show/hide gauging stations | Re-center selection

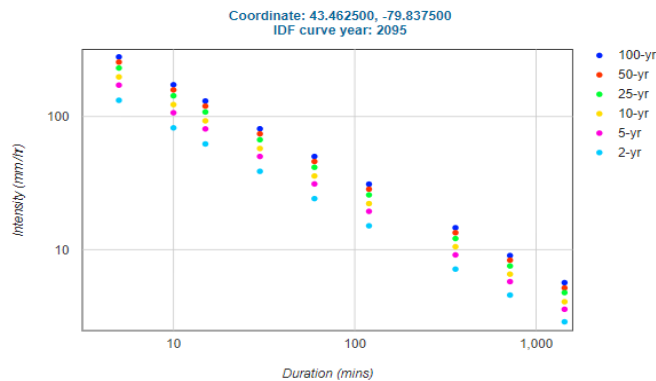
Location summary

These are the locations in the selection.

IDF Curve: 43° 27' 45" N, 79° 50' 14" W (43.462500, -79.837500)

Results

An IDF curve was found.



Source: http://www.mto.gov.on.ca/IDF_Curves/

Annual Maximum Rainfall Intensity [mm hr⁻¹]

Return Period [yr]	Storm Duration [hr]								
	0.083333 (5-min)	0.166667 (10-min)	0.25 (15-min)	0.5 (30-min)	1	2	6	12	24
2	132.5	82.4	62.4	38.9	24.3	15.2	7.2	4.6	2.9
5	172.2	106.9	80.9	50.3	31.3	19.5	9.2	5.8	3.6
10	198.4	123	93	57.7	35.9	22.3	10.6	6.6	4.1
25	231.3	143.3	108.3	67.1	41.7	25.9	12.2	7.6	4.8
50	256.3	158.6	119.9	74.3	46.1	28.6	13.5	8.4	5.2
100	280.2	173.3	130.9	81.1	50.3	31.2	14.7	9.1	5.7

Original A B parameters provided by MTO curve lookup

Return Period [yr]	A	B
2	24.3	-0.680
5	31.3	-0.685
10	35.8	-0.686
25	41.7	-0.688
50	46.1	-0.689
100	50.3	-0.690

From Visual Otthymo

A	B	C
453.953	1.500	0.701
601.236	1.500	0.708
694.878	1.500	0.710
810.835	1.500	0.711
904.442	1.500	0.714
988.958	1.500	0.714

where, R (mm/h) = $A(T)^B$

Stage 1

Drainage ID	Catchment Area (ha)	Percentage of Different Soil Types and land use in Catchment																					Total (Class)	Basin Weighted CN	Basin Weighted C							
		Poorly Drained Sandy Loam, Forested	Poorly Drained Silt Loam, Forested	Poorly Drained Silt Loam, Cultivated	Well Drained Sandy Loam, Forested	Well Drained Sandy Loam, Cultivated	Well Drained Silt Loam, Cultivated	Well Drained Sand, Forested	Well Drained Sand, Cultivated	Very Poorly Drained Muck, Cultivated	Very Poorly Drained Muck, Forested	Poorly Drained Clay, Cultivated	Poorly Drained Clay, Forested	Rockland, Forested	Rockland, Cultivated	Pavement	Buzwah Clay Loam, Forested	Buzwah Clay Loam, Meadow	Leech Clay Loam, Forested	Leech Clay Loam, Meadow	Muck, Forested	Muck, Meadow				Wosley Silty Clay Loam, Forested	Gordon Silty Clay Loam, Meadow	Stream Channel, Forested	Stream Channel, Meadow	Sandy	Water	
		C = 0.12 CN = 54	C = 0.3 CN = 71	C = 0.45 CN = 82	C = 0.12 CN = 50	C = 0.3 CN = 66	C = 0.55 CN = 78	C = 0.18 CN = 50	C = 0.3 CN = 66	C = 0.55 CN = 84	C = 0.35 CN = 74	C = 0.55 CN = 82	C = 0.42 CN = 71	C = 0.3 CN = 58	C = 0.45 CN = 74	C = 0.98 CN = 98	C = 0.35 CN = 71	C = 0.4 CN = 76	C = 0.35 CN = 56	C = 0.4 CN = 65	C = 0.25 CN = 74	C = 0.35 CN = 79				C = 0.31 CN = 77	C = 0.37 CN = 76	C = 0.28 CN = 62	C = 0.28 CN = 62	C = 0.24 CN = 62	C = 1 CN = 100	
4001	1.7														20%															100%	81	0.49
4002	3.1																													100%	78	0.41
4003	0.8																													100%	78	0.41
4004	0.4																													100%	76	0.41
4005	0.4																													100%	78	0.41
4006	0.4																													100%	78	0.41
4007	0.7																													100%	78	0.41
4007-1	1.7																													100%	78	0.41
4008	3.6																													100%	78	0.41
4009	1.0																													100%	78	0.41
4010	2.5																													100%	78	0.41
4011	54.6																													100%	75	0.39
4011-1	13.9															20%	80%													100%	75	0.39
4011-2	40.7															20%	80%													100%	75	0.39
4012	366.8																													100%	75	0.39
4013	3.3															20%	80%													100%	75	0.39
4014	63.1															20%	80%													100%	75	0.39
4015	2.1															20%	80%													100%	75	0.39
4016	108.8															20%	80%													100%	75	0.39
4017	7.6															20%	80%													100%	75	0.39
4018	1.8															20%	80%													100%	75	0.39
4019	2.4															20%	80%													100%	75	0.39
4020	10.0															20%	80%													100%	78	0.41
4021 (C1)	124.1														11%		9%													80%		
2911	40.1																													100%	79	0.44
2912	112.7																													100%	74	0.36
1291	132.7															46%														100%	74	0.36
1292	81.3															20%														100%	75	0.37
1293	85.4															46%														100%	74	0.36
401	10.6															46%														100%	74	0.36
402	16.8															46%														100%	74	0.36
403	92.8															46%														100%	74	0.36
404	5.9															20%														100%	76	0.37
2852	17.5															46%														100%	74	0.36
2853	137.8															20%														100%	75	0.37
285	48.6															20%														100%	75	0.37
301	34.4															46%														100%	74	0.36
302	45.2															46%														100%	74	0.36
405	49.8															46%														100%	74	0.36
406	9.0															46%														100%	74	0.36
303	45.3															20%														100%	75	0.37
304	28.2															100%														100%	71	0.35
407	9.9															46%														100%	74	0.36
408	7.4															20%														100%	75	0.37
409	15.2															20%														100%	76	0.37
305	77.2															46%														100%	74	0.36
306	28.0															46%														100%	74	0.36
5000	9.4															46%														100%	74	0.36

C values based off Design Chart 1.07: Runoff Coefficients (MTO Design Manual, 1995)
 CN values based off Design Chart 1.09: Soil Conservation Service Curve Numbers (MTO Design Manual, 1995)

Stage 2

Drainage ID	Catchment Area (ha)	Percentage of Different Soil Types and land use in Catchment																					Total (Class)	Basin Weighted CN	Basin Weighted C							
		Poorly Drained Sandy Loam, Forested	Poorly Drained Silt Loam, Forested	Poorly Drained Silt Loam, Cultivated	Well Drained Sandy Loam, Forested	Well Drained Sandy Loam, Cultivated	Well Drained Silt Loam, Cultivated	Well Drained Sand, Forested	Well Drained Sand, Cultivated	Very Poorly Drained Muck, Cultivated	Very Poorly Drained Muck, Forested	Poorly Drained Clay, Cultivated	Poorly Drained Clay, Forested	Rockland, Forested	Rockland, Cultivated	Pavement	Buzwah Clay Loam, Forested	Buzwah Clay Loam, Meadow	Leech Clay Loam, Forested	Leech Clay Loam, Meadow	Muck, Forested	Muck, Meadow				Wosley Silty Clay Loam, Forested	Gordon Silty Clay Loam, Meadow	Stream Channel, Forested	Stream Channel, Meadow	Sandy	Water	
		C = 0.12 CN = 54	C = 0.3 CN = 71	C = 0.45 CN = 82	C = 0.12 CN = 50	C = 0.3 CN = 66	C = 0.55 CN = 78	C = 0.18 CN = 50	C = 0.3 CN = 66	C = 0.55 CN = 84	C = 0.35 CN = 74	C = 0.55 CN = 82	C = 0.42 CN = 71	C = 0.3 CN = 58	C = 0.45 CN = 74	C = 0.98 CN = 98	C = 0.35 CN = 71	C = 0.4 CN = 76	C = 0.35 CN = 56	C = 0.4 CN = 65	C = 0.25 CN = 74	C = 0.35 CN = 79				C = 0.31 CN = 77	C = 0.37 CN = 76	C = 0.28 CN = 62	C = 0.28 CN = 62	C = 0.24 CN = 62	C = 1 CN = 100	
6001	2.2															20%														100%	79	0.41
6002	5.5																													100%	77	0.43
6003	0.7															6%	14%	80%												100%	75	0.39
6004	1.0															20%	80%													100%	75	0.39
6005	1.4															20%	80%													100%	75	0.39
6006	0.5															20%	80%													100%	75	0.39
6007	0.5															20%	80%													100%	75	0.39

Stage 1 Catchments																				Upland Method			SCS Lag Method			Mean			
Drainage ID	Stage 1 Area ha	Channel						Overland						Total			C _{N1}	C _{N2}	Runoff Coefficient C	Overland Velocity		Channel Velocity ²		T _c min	T _p hrs	T _c min	T _p hrs	T _c min	T _p hrs
		L	HL	LL	HL	SL	S(m/m)	L	HL	LL	HL	SL	S(m/m)	Length	S%	S(m/m)				m/s	min	m/s	min						
4001	1.7	371	198	196	0.5	0.005	25	198.3	196	9.2	0.092	396	0.6	0.006	81	90.7	0.49	0.09	0.6	10	0.11	12	0.14	30	0.33				
4002	3.1	232	199	195	1.8	0.008	12.6	197	195.4	12.7	0.127	234.3	1.7	0.017	78	89.1	0.41	1.00	1.0	10	0.11	8	0.09	30	0.33				
4003	0.8	408	195.5	192.6	0.7	0.007	4.8	194.5	193.9	12.5	0.125	412.8	0.7	0.007	78	89.1	0.41	0.90	0.6	10	0.11	12	0.13	30	0.33				
4004	0.4	146	193.7	192.5	0.8	0.008	13.6	195.3	192.7	19.1	0.191	159.6	1.8	0.018	78	89.1	0.41	1.20	0.7	10	0.11	5	0.05	30	0.33				
4005	0.4	450	192.3	188.8	0.8	0.008	8.9	191.3	190.3	11.2	0.112	458.9	0.8	0.008	78	89.1	0.41	0.70	0.7	10	0.11	14	0.15	30	0.33				
4006	0.4	242	188.6	187.7	0.4	0.004	8.1	188.6	187.7	9.4	0.094	387.7	0.4	0.004	78	89.1	0.41	0.90	0.5	10	0.11	9	0.10	30	0.33				
4007	0.7	449	188.6	186.2	0.5	0.005	8.1	188.6	187.8	9.6	0.096	457.3	0.5	0.005	78	89.1	0.41	0.80	0.6	10	0.11	15	0.17	30	0.33				
4007.1	1.7	1073	188.6	184.8	0.4	0.004	8.1	188.6	187.8	9.6	0.096	1,081.3	0.4	0.004	78	89.1	0.41	0.50	0.5	40	0.44	30	0.33	35	0.39				
4008	3.6	452	189.3	186.2	0.7	0.007	38.8	189.8	186	2.1	0.021	450.3	0.6	0.006	78	89.1	0.41	0.60	0.6	10	0.11	14	0.15	30	0.33				
4009	1	242	186.6	186	0.2	0.002	21.9	186	185.7	1.4	0.014	218.5	0.1	0.001	78	89.1	0.41	0.90	0.3	10	0.11	22	0.25	30	0.33				
4010	2.5	1034	186.2	183.6	0.3	0.003	21	185.5	185.3	1.0	0.010	1,055.0	0.2	0.002	78	89.1	0.41	0.30	0.4	40	0.44	93	1.04	67	0.74				
4011	54.6	1650	184.7	179.5	0.3	0.003	250	184.4	182.9	0.6	0.006	1,900.0	0.3	0.003	75	87.3	0.39	0.90	0.4	120	1.33	205	2.28	163	1.81				
4011.1	13.9	1550	185.75	179.5	0.4	0.004	209	186	183.63	1.1	0.011	1,759.0	0.4	0.004	75	87.3	0.39	0.90	0.5	90	1.00	140	1.56	115	1.28				
4011.2	40.7	1550	185.75	179.5	0.4	0.004	209	186	183.63	1.1	0.011	1,759.0	0.4	0.004	75	87.3	0.39	0.90	0.5	90	1.00	140	1.56	115	1.28				
4012	366.8																												
4012.1	3.3	1119	188.1	177.3	0.3	0.003	20.7	179.9	179	4.3	0.043	1,139.7	0.2	0.002	75	87.3	0.39	0.90	0.4	50	0.56	51	0.56	50	0.56				
4014	63.1	1284	182	179	0.2	0.002	180.7	180	180.2	0.7	0.007	1,354.4	0.2	0.002	75	87.3	0.39	0.90	0.4	60	0.67	144	1.60	102	1.13				
4015	2.1	234	177.6	176.9	0.3	0.003	65	177	176.7	0.5	0.005	299.0	0.3	0.003	75	87.3	0.39	0.20	0.4	20	0.22	53	0.59	37	0.41				
4016	109.8	1877	188	178	0.5	0.005	243	185	181	1.6	0.016	2,120.0	0.5	0.005	75	87.3	0.39	0.30	0.5	80	0.89	135	1.50	108	1.20				
4017	7.6	671	182	177.9	0.6	0.006	160.9	183	177.9	2.5	0.025	931.9	0.5	0.005	75	87.3	0.39	0.40	0.6	30	0.39	51	0.57	41	0.45				
4018	1.5	633.8	177.4	174.7	0.4	0.004	21.8	179	176.5	11.6	0.116	655.4	0.7	0.007	75	87.3	0.39	0.90	0.5	20	0.22	20	0.22	30	0.33				
4019	2.4	194	178.1	176.5	0.8	0.008	65.5	182	176.7	8.1	0.081	259.5	2.1	0.021	75	87.3	0.39	0.80	0.7	10	0.11	11	0.13	30	0.33				
4020	30	434	185.1	182.6	0.5	0.005	55	183.8	181.3	0.9	0.009	489.0	0.4	0.004	78	89.1	0.41	0.90	0.5	20	0.22	52	0.57	36	0.40				
4021(C)	124.1	1241	189.6	191	0.4	0.004	301	186	194	0.7	0.007	2,977.0	0.6	0.006	78	89.6	0.44	0.10	0.5	110	1.22	195	2.18	152	1.69				
5000	9.4	408	191	189.3	0.4	0.004	134	192	191	0.7	0.007	542.0	0.5	0.005	74	86.7	0.36	0.20	0.5	20	0.22	69	0.77	45	0.50				

Proposed Visual Ditch External Catchments Only SCS Lag Method selected																											
Drainage ID	Stage 1 Area ha	L	HL	LL	HL	SL	S(m/m)	L	HL	LL	HL	SL	S(m/m)	Length	S%	S(m/m)	C _{N1}	C _{N2}	Runoff Coefficient C	Overland Velocity	Channel Velocity ²	T _c min	T _p hrs	T _c min	T _p hrs	T _c min	T _p hrs
2911	40.1						850	200	195	0.6	0.006	850.0	0.6	0.006	74	86.7	0.36	0.20				112	1.25	112	1.25		
2912	112.7						1600	195	185	0.6	0.006	1,600.0	0.6	0.006	75	87.3	0.37	0.20				125	1.95	175	1.95		
1291	132.7						1600	185	180	0.3	0.003	1,600.0	0.3	0.003	75	87.3	0.37	0.10				248	2.76	248	2.76		
1292	81.3						1450	184	179	0.3	0.003	1,450.0	0.3	0.003	76	87.9	0.37	0.10				212	2.36	212	2.36		
401	10.6						150	185	181.5	0.4	0.004	150.0	0.4	0.004	74	86.7	0.36	0.15				65	0.72	65	0.72		
402	16.6						150	185	179.5	0.4	0.004	1,500.0	0.4	0.004	74	86.7	0.36	0.25				234	2.49	234	2.49		
403	52.8											0.0				74	86.7	0.36									
404	5.8						250	179.5	178.5	0.4	0.004	250.0	0.4	0.004	74	86.7	0.37	0.15				48	0.54	48	0.54		
2852	17.5						350	179.5	178.1	0.4	0.004	350.0	0.4	0.004	74	86.7	0.37	0.15				67	0.74	67	0.74		
2853	137.8						1600	190	183	0.4	0.004	1,600.0	0.4	0.004	75	87.3	0.37	0.15				210	2.33	210	2.33		
285	48.6						800	185.5	179.5	0.8	0.008	800.0	0.8	0.008	75	87.3	0.37	0.25				92	1.02	92	1.02		
301	34.4						620	185	179	1.0	0.010	620.0	1.0	0.010	74	86.7	0.36	0.20				69	0.77	69	0.77		
405	49.8											0.0				74	86.7	0.36									
406	9						450	181	178	0.7	0.007	450.0	0.7	0.007	74	86.7	0.36	0.20				63	0.70	63	0.70		
303	45.3						760	184.5	179	0.7	0.007	760.0	0.7	0.007	75	87.3	0.37	0.20				90	1.00	90	1.00		
407	9.9						125	177.5	173.5	3.2	0.032	125.0	3.2	0.032	74	86.7	0.36	0.05				10	0.12	30	0.33		
408	7.4						300	178	174	1.3	0.013	300.0	1.3	0.013	75	87.3	0.37	0.30				31	0.35	31	0.35		
409	15.2						300	176	175	0.3	0.003	300.0	0.3	0.003	76	87.9	0.37	0.10				61	0.68	61	0.68		
305	77.2						920	181.5	177	0.5	0.005	920.0	0.5	0.005	74	86.7	0.36	0.15				117	1.52	117	1.52		
306	28						800	179.5	175.5	0.5	0.005	800.0	0.5	0.005	74	86.7	0.36	0.25				116	1.29	116	1.29		

Existing Visual Ditch External Catchments Only SCS Lag Method selected																											
Drainage ID	Stage 1 Area ha	L	HL	LL	HL	SL	S(m/m)	L	HL	LL	HL	SL	S(m/m)	Length	S%	S(m/m)	C _{N1}	C _{N2}	Runoff Coefficient C	Overland Velocity	Channel Velocity ²	T _c min	T _p hrs	T _c min	T _p hrs	T _c min	T _p hrs
2911	40.1						850	200	195	0.6	0.006	850.0	0.6	0.006	74	86.7	0.36	0.20				112	1.25	112	1.25		
2912	112.7						1600	195	185	0.6	0.006	1,600.0	0.6	0.006	75	87.3	0.37	0.20				125	1.95	175	1.95		
1291	134.8						1600	185	180	0.3	0.003	1,600.0	0.3	0.003	75	87.3	0.37	0.10				248	2.76	248	2.76		
1292	78.6						1650	184	179	0.3	0.003	1,650.0	0.3	0.003	76	87.9	0.37	0.10				251	2.79	251	2.79		
1293	86.4						1450	185	177	0.6	0.006	1,450.0	0.6	0.006	74	86.7	0.36	0.20				178	1.97	178	1.97		
2852	17.5						350	179.5	178.1	0.4	0.004	350.0	0.4	0.004	74	86.7	0.37	0.10				67	0.74	67	0.74		
2853	137.8						1600	190	183	0.4	0.004	1,600.0	0.4	0.004	75	87.3	0.37	0.15				218	2.42	218	2.42		
285	53						800	185.5	179.5	0.8	0.008	800.0	0.8	0.008	75	87.3	0.37	0.25				92	1.02	92	1.02		
301	4																										

Rational Method

general equation $Q = C \times i \times A$

Required data entries

where:

C = weighted runoff coefficient for the catchment area (unitless)

i = rainfall intensity

A = drainage area, limited to watersheds less than 100 ha in size

Rainfall Intensity, i (mm/hr)

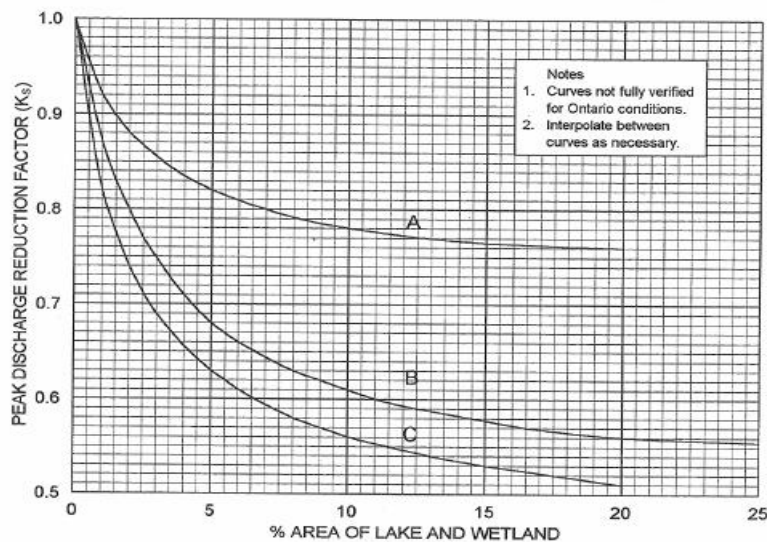
Calculated based on MTO IDF Curve Look-up online tool:

where, i (mm/h) = $A(T)^B$

Assumptions of this method:

- the peak rate of runoff, Q , is determined by using an average rainfall intensity, i , over the entire watershed with a time duration equal to the watershed time of concentration, t_c ;
- the peak rate of runoff is assumed to have a return period equal to that of the intensity-duration-frequency curve;
- the rainfall intensity, i , remains constant for the computed time of concentration, t_c , and is uniform across the drainage area;
- the runoff coefficient, C , does not vary over the duration of the storm.

Design Chart 1.06: Peak Discharge Reduction Factor to Allow for Storage



Curve A - Significant portion of flow passes through detention areas in upper reaches, or elsewhere in basin not in path of flow.

Curve B - Significant portion of flow passes through detention areas distributed throughout basin or in the middle reaches only.

Curve C - Most of detention is located in path of flow at lower end of basin.

Stage 1

Drainage ID	Area (ha)	Rational Method Valid?*	Tc (min)	Ad water (ha)	% Area of Lake & Wetland	Wetland & Lake Reduction Factor **	Intensity - IDF Curve Lookup Online MTO Tool (24 hr)						Runoff Coefficient C	Flow Estimate - Q = CiA					
							i ₂ (mm/hr)	i ₅ (mm/hr)	i ₁₀ (mm/hr)	i ₂₅ (mm/hr)	i ₅₀ (mm/hr)	i ₁₀₀ (mm/hr)		Q ₂ (m ³ /s)	Q ₅ (m ³ /s)	Q ₁₀ (m ³ /s)	Q ₂₅ (m ³ /s)	Q ₅₀ (m ³ /s)	Q ₁₀₀ (m ³ /s)
4001	1.7	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.49	0.09	0.12	0.13	0.16	0.17	0.19
4002	3.1	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.41	0.14	0.18	0.20	0.23	0.26	0.28
4003	0.8	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.41	0.04	0.05	0.05	0.06	0.07	0.07
4004	0.4	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.41	0.02	0.02	0.03	0.03	0.03	0.04
4005	0.4	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.41	0.02	0.02	0.03	0.03	0.03	0.04
4006	0.4	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.41	0.02	0.02	0.03	0.03	0.03	0.04
4007	0.7	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.41	0.03	0.04	0.05	0.05	0.06	0.06
4007-1	1.7	YES	35	0.0	0%	1.0	35.1	45.3	51.9	60.5	66.8	73.0	0.41	0.07	0.09	0.10	0.12	0.13	0.14
4008	3.6	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.41	0.16	0.20	0.23	0.27	0.30	0.33
4009	1.0	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.41	0.04	0.06	0.07	0.08	0.08	0.09
4010	2.5	YES	67	0.0	0%	1.0	22.6	29.1	33.4	38.8	42.9	46.8	0.41	0.06	0.08	0.09	0.11	0.12	0.13
4011	54.6	YES	163	0.0	0%	1.0	12.3	15.8	18.1	21.0	23.2	25.3	0.39	0.73	0.93	1.07	1.24	1.37	1.49
4012	366.8	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4013	3.3	YES	50	0.0	0%	1.0	27.4	35.3	40.4	47.1	52.0	56.7	0.39	0.10	0.13	0.14	0.17	0.19	0.20
4014	63.1	YES	102	0.0	0%	1.0	16.9	21.8	24.9	29.0	32.0	34.9	0.39	1.16	1.49	1.70	1.98	2.18	2.38
4015	2.1	YES	37	0.0	0%	1.0	34.0	43.9	50.2	58.5	64.7	70.6	0.39	0.08	0.10	0.11	0.13	0.15	0.16
4016	108.8	NO	108	0.0	0%	1.0	-	-	-	-	-	-	0.39	-	-	-	-	-	-
4017	7.6	YES	41	0.0	0%	1.0	31.6	40.8	46.7	54.4	60.1	65.7	0.39	0.26	0.34	0.38	0.45	0.50	0.54
4018	1.8	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.39	0.08	0.10	0.11	0.13	0.14	0.16
4019	2.4	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.39	0.10	0.13	0.15	0.17	0.19	0.21
4020	10.0	YES	36	0.0	0%	1.0	34.6	44.6	51.1	59.5	65.8	71.8	0.41	0.39	0.50	0.58	0.67	0.74	0.81
4021 (C1)	124.1	NO	152	0.0	0%	1.0	-	-	-	-	-	-	0.44	-	-	-	-	-	-
5000	9.4	YES	45	0.0	0%	1.0	29.7	38.3	43.8	51.1	56.4	61.6	0.36	0.28	0.36	0.41	0.48	0.53	0.58

Stage 2

Drainage ID	Area (ha)	Rational Method Valid?*	Tc (min)	Ad water (ha)	% Area of Lake & Wetland	Wetland & Lake Reduction Factor **	Intensity - IDF Curve Lookup Online MTO Tool (24 hr)						Runoff Coefficient C	Flow Estimate - Q = CiA					
							i ₂ (mm/hr)	i ₅ (mm/hr)	i ₁₀ (mm/hr)	i ₂₅ (mm/hr)	i ₅₀ (mm/hr)	i ₁₀₀ (mm/hr)		Q ₂ (m ³ /s)	Q ₅ (m ³ /s)	Q ₁₀ (m ³ /s)	Q ₂₅ (m ³ /s)	Q ₅₀ (m ³ /s)	Q ₁₀₀ (m ³ /s)
6001	2.2	YES	43	0.0	0%	1.0	30.7	39.6	45.4	52.8	58.4	63.7	0.41	0.08	0.10	0.11	0.13	0.14	0.16
6002	5.5	YES	44	0.0	0%	1.0	29.9	38.5	44.1	51.4	56.8	62.0	0.43	0.20	0.25	0.29	0.34	0.37	0.41
6003	0.7	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.39	0.03	0.04	0.04	0.05	0.06	0.06
6004	1.0	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.39	0.04	0.05	0.06	0.07	0.08	0.09
6005	1.4	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.39	0.06	0.08	0.09	0.10	0.11	0.12
6006	0.5	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.39	0.02	0.03	0.03	0.04	0.04	0.04
6007	0.5	YES	30	0.0	0%	1.0	39.0	50.3	57.7	67.2	74.3	81.1	0.39	0.02	0.03	0.03	0.04	0.04	0.04

Stage 1		depths (mm) =							Stage 1						
Drainage ID	Area (ha)	CN _{ii}	Runoff Coefficient C	Flow Estimate from Visual Otthymo Model							Regional (m ³ /s)				
				Q ₂ (m ³ /s)	Q ₅ (m ³ /s)	Q ₁₀ (m ³ /s)	Q ₂₅ (m ³ /s)	Q ₅₀ (m ³ /s)	Q ₁₀₀ (m ³ /s)						
4001	1.7	81	0.49	0.05	0.09	0.11	0.15	0.18	0.21	-					
4002	3.1	78	0.41	0.08	0.14	0.19	0.25	0.30	0.35	-					
4003	0.8	78	0.41	0.02	0.04	0.05	0.06	0.08	0.09	-					
4004	0.4	78	0.41	0.01	0.02	0.02	0.03	0.04	0.05	-					
4005	0.4	78	0.41	0.01	0.02	0.02	0.03	0.04	0.05	-					
4006	0.4	78	0.41	0.01	0.02	0.02	0.03	0.04	0.05	-					
4007	0.7	78	0.41	0.02	0.03	0.04	0.06	0.07	0.08	-					
4007-1	1.7	78	0.41	0.04	0.07	0.09	0.13	0.15	0.18	-					
4008	3.6	78	0.41	0.09	0.16	0.22	0.29	0.35	0.41	-					
4009	1.0	78	0.41	0.03	0.05	0.06	0.08	0.10	0.11	-					
4010	2.5	78	0.41	0.04	0.07	0.09	0.12	0.14	0.17	-					
4011	54.6	75	0.39	0.36	0.67	0.90	1.22	1.49	1.74	-					
4012	366.8	0	0.00	2.01	3.73	5.03	6.84	8.34	9.79	23.66					
4013	3.3	75	0.39	0.05	0.09	0.13	0.17	0.21	0.25	-					
4014	63.1	75	0.39	0.60	1.10	1.48	2.01	2.44	2.85	5.63					
4015	2.1	75	0.39	0.04	0.07	0.01	0.14	0.17	0.19	-					
4016	108.8	75	0.39	0.99	1.82	2.45	3.32	4.03	4.72	9.50					
4017	7.6	75	0.39	0.14	0.25	0.34	0.46	0.56	0.56	-					
4018	1.8	75	0.39	0.04	0.07	0.10	0.13	0.16	0.19	-					
4019	2.4	75	0.39	0.05	0.10	0.13	0.18	0.21	0.25	-					
4020	10.0	78	0.41	0.22	0.41	0.54	0.73	0.88	1.02	-					
4021 (C1)	124.1	79	0.44	1.02	1.85	2.46	3.30	3.98	4.63	9.74					
5000	9.4	74	0.36	0.15	0.28	0.38	0.52	0.63	0.74	1.02					

		Proposed Visual Otthymo External Catchments								
Drainage ID	Area (ha)	CN _{ii}	Runoff Coefficient C	Q ₂ (m ³ /s)	Q ₅ (m ³ /s)	Q ₁₀ (m ³ /s)	Q ₂₅ (m ³ /s)	Q ₅₀ (m ³ /s)	Q ₁₀₀ (m ³ /s)	Regional (m ³ /s)
2911	40.1	74	0.36	0.34	0.63	0.85	1.15	1.40	1.64	-
2912	112.7	75	0.37	0.71	1.30	1.75	2.38	2.89	3.38	7.89
1291	132.7	75	0.37	0.64	1.18	1.58	2.15	2.61	3.06	7.70
1292	81.3	76	0.37	0.46	0.84	1.13	1.53	1.85	2.17	-
401	10.6	74	0.36	0.13	0.25	0.33	0.45	0.55	0.64	-
402	16.6	74	0.36	0.09	0.16	0.22	0.30	0.37	0.43	-
403	52.8	74	0.36	3.00	5.04	6.20	7.63	8.74	9.87	6.34
404	5.9	76	0.37	0.07	0.13	0.18	0.24	0.29	0.34	-
2852	17.5	74	0.36	0.22	0.40	0.54	0.73	0.89	1.04	-
2853	137.8	75	0.37	0.76	1.39	1.87	2.54	3.08	3.61	8.80
285	48.6	75	0.37	0.49	0.91	1.22	1.66	2.01	2.35	4.49
301	34.4	74	0.36	0.42	0.77	1.04	1.41	1.71	2.00	-
405	49.8	74	0.36	2.82	4.75	5.85	7.20	8.24	9.31	5.98
406	9.0	74	0.36	0.23	0.43	0.58	0.79	0.96	1.12	-
303	45.3	75	0.37	0.47	0.87	1.17	1.58	1.92	2.24	-
407	9.9	74	0.36	0.35	0.65	0.89	1.20	1.46	1.73	-
408	7.4	75	0.37	0.14	0.26	0.36	0.48	0.59	0.68	-
409	15.2	76	0.37	0.22	0.40	0.54	0.73	0.88	1.03	-
305	77.2	74	0.36	0.57	1.04	1.41	1.91	2.33	2.73	-
306	28.0	74	0.36	0.23	0.43	0.58	0.79	0.96	1.12	-

		Existing Visual Otthymo External Catchments (only SCS Lag Method selected)								
Drainage ID	Area (ha)	CN _{ii}	Runoff Coefficient C	Q ₂ (m ³ /s)	Q ₅ (m ³ /s)	Q ₁₀ (m ³ /s)	Q ₂₅ (m ³ /s)	Q ₅₀ (m ³ /s)	Q ₁₀₀ (m ³ /s)	Regional (m ³ /s)
2911	40.1	74	0.36	0.34	0.63	0.85	1.15	1.40	1.64	-
2912	112.7	75	0.37	0.71	1.30	1.75	2.38	2.89	3.38	7.89
1291	134.8	75	0.37	0.65	1.19	1.61	2.18	2.65	3.11	7.82
1292	78.6	76	0.37	0.39	0.71	0.96	1.30	1.57	1.85	-
1293	86.4	74	0.36	0.52	0.96	1.29	1.76	2.14	2.51	-
2852	17.5	74	0.36	0.22	0.40	0.54	0.73	0.89	1.04	-
2853	137.8	75	0.37	0.76	1.39	1.87	2.54	3.08	3.61	8.80
285	53.0	75	0.37	0.54	0.99	1.34	1.81	2.20	2.57	-
301	40.1	74	0.36	0.40	0.75	1.00	1.36	1.66	1.94	-
302	45.2	74	0.36	0.45	0.83	1.12	1.52	1.85	2.16	-
303	49.6	75	0.37	0.52	0.95	1.28	1.73	2.10	2.45	-
304	28.2	71	0.35	0.46	0.87	1.18	1.62	1.98	2.33	-
305	79.3	74	0.36	0.58	1.07	1.45	1.97	2.39	2.80	-
306	28.0	74	0.36	0.23	0.43	0.58	0.79	0.96	1.12	-

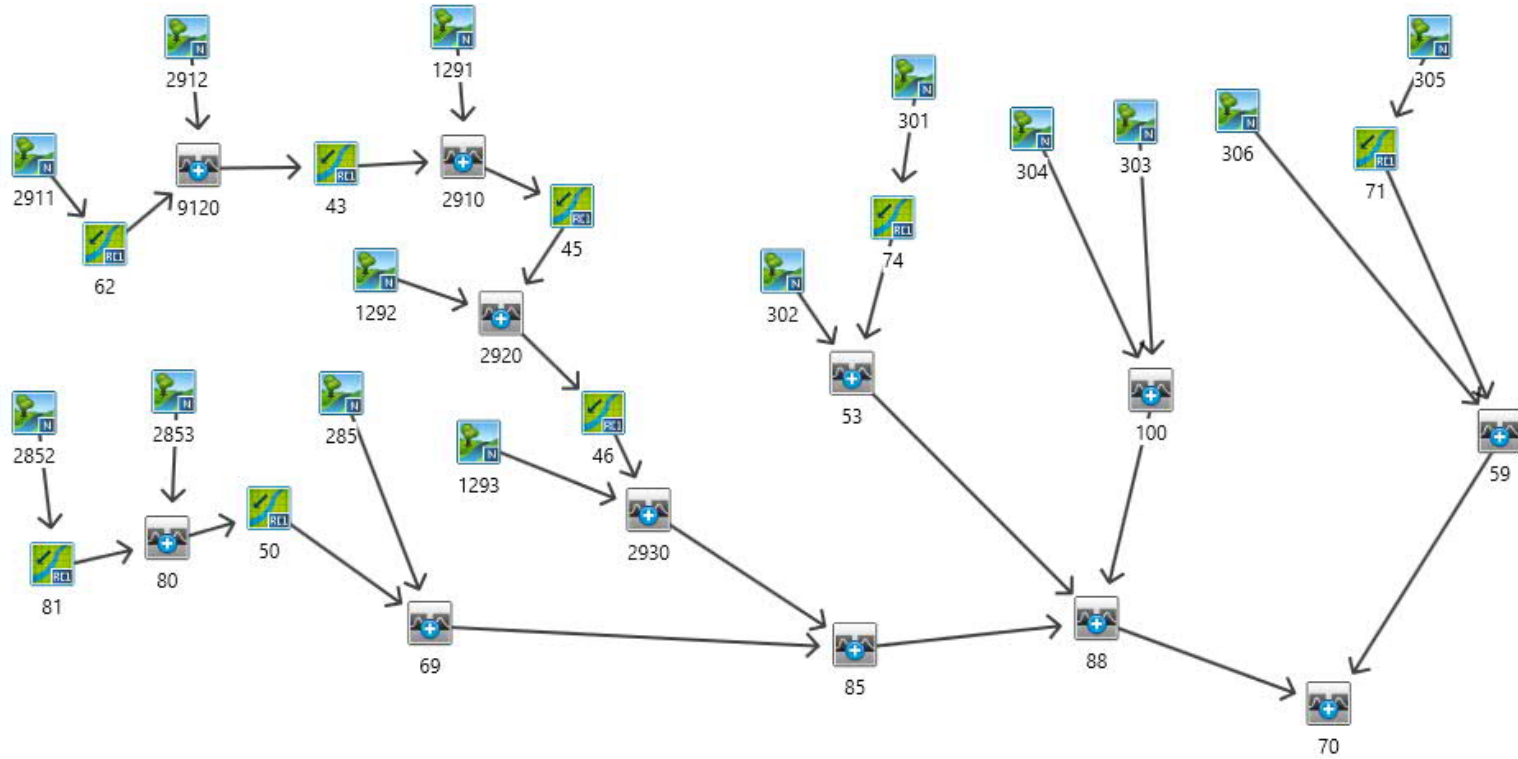
Stage 2		depths (mm) =							Stage 2						
Drainage ID	Area (ha)	CN _{ii}	Runoff Coefficient C	Flow Estimate from Visual Otthymo Model							Regional (m ³ /s)				
				Q ₂ (m ³ /s)	Q ₅ (m ³ /s)	Q ₁₀ (m ³ /s)	Q ₂₅ (m ³ /s)	Q ₅₀ (m ³ /s)	Q ₁₀₀ (m ³ /s)						
6001	2.2	78	0.41	0.03	0.05	0.06	0.09	0.11	0.12	0.22					
6002	5.5	77	0.43	0.06	0.11	0.14	0.19	0.23	0.27	0.51					
6003	0.7	75	0.39	0.02	0.04	0.05	0.07	0.08	0.09	0.09					
6004	1.0	75	0.39	0.02	0.03	0.04	0.06	0.07	0.08	0.11					
6005	1.4	75	0.39	0.03	0.05	0.07	0.09	0.11	0.13	0.16					
6006	0.5	75	0.39	0.01	0.02	0.03	0.04	0.05	0.06	0.06					
6007	0.5	75	0.39	0.01	0.02	0.03	0.04	0.05	0.05	0.06					

Governing Flow (Visual Otthymo Model or Rational Method)						
Q ₂ (m ³ /s)	Q ₅ (m ³ /s)	Q ₁₀ (m ³ /s)	Q ₂₅ (m ³ /s)	Q ₅₀ (m ³ /s)	Q ₁₀₀ (m ³ /s)	
0.09 - RM	0.12 - RM	0.13 - RM	0.16 - RM	0.18 - VO	0.21 - VO	-
0.14 - RM	0.18 - RM	0.2 - RM	0.25 - VO	0.3 - VO	0.35 - VO	-
0.04 - RM	0.05 - RM	0.05 - RM	0.06 - RM	0.08 - VO	0.09 - VO	-
0.02 - RM	0.02 - RM	0.03 - RM	0.03 - RM	0.04 - VO	0.05 - VO	-
0.02 - RM	0.02 - RM	0.03 - RM	0.03 - RM	0.04 - VO	0.05 - VO	-
0.02 - RM	0.02 - RM	0.03 - RM	0.03 - RM	0.04 - VO	0.05 - VO	-
0.03 - RM	0.04 - RM	0.05 - RM	0.06 - VO	0.07 - VO	0.08 - VO	-
0.07 - RM	0.09 - RM	0.1 - RM	0.13 - VO	0.15 - VO	0.18 - VO	-
0.16 - RM	0.2 - RM	0.23 - RM	0.29 - VO	0.35 - VO	0.41 - VO	-
0.04 - RM	0.06 - RM	0.07 - RM	0.08 - VO	0.1 - VO	0.11 - VO	-
0.06 - RM	0.08 - RM	0.09 - RM	0.12 - VO	0.14 - VO	0.17 - VO	-
0.73 - RM	0.93 - RM	1.07 - RM	1.24 - RM	1.49 - VO	1.74 - VO	-
2.01 - VO	3.73 - VO	5.03 - VO	6.84 - VO	8.34 - VO	9.79 - VO	-
0.1 - RM	0.13 - RM	0.14 - RM	0.17 - VO	0.21 - VO	0.25 - VO	-
1.16 - RM	1.49 - RM	1.7 - RM	2.01 - VO	2.44 - VO	2.85 - VO	-
0.08 - RM	0.1 - RM	0.11 - RM	0.14 - VO	0.17 - VO	0.19 - VO	-
0.99 - VO	1.82 - VO	2.45 - VO	3.32 - VO	4.03 - VO	4.72 - VO	-
0.26 - RM	0.34 - RM	0.38 - RM	0.46 - VO	0.56 - VO	0.56 - VO	-
0.08 - RM	0.1 - RM	0.11 - RM	0.13 - RM	0.16 - VO	0.19 - VO	-
0.1 - RM	0.13 - RM	0.15 - RM	0.18 - VO	0.21 - VO	0.25 - VO	-
0.39 - RM	0.5 - RM	0.58 - RM	0.73 - VO	0.88 - VO	1.02 - VO	-
1.02 - VO	1.85 - VO	2.46 - VO	3.3 - VO	3.98 - VO	4.63 - VO	-
0.28 - RM	0.36 - RM	0.41 - RM	0.52 - VO	0.63 - VO	0.74 - VO	-

Proposed Visual Otthymo External Catchments						
Q ₂ (m ³ /s)	Q ₅ (m ³ /s)	Q ₁₀ (m ³ /s)	Q ₂₅ (m ³ /s)	Q ₅₀ (m ³ /s)	Q ₁₀₀ (m ³ /s)	
0.34 - VO	0.63 - VO	0.85 - VO	1.15 - VO	1.4 - VO	1.64 - VO	-
0.71 - VO	1.3 - VO	1.75 - VO	2.38 - VO	2.89 - VO	3.38 - VO	-
0.64 - VO	1.18 - VO	1.58 - VO	2.15 - VO	2.61 - VO	3.06 - VO	-
0.46 - VO	0.84 - VO	1.13 - VO	1.53 - VO	1.85 - VO	2.17 - VO	-
0.13 - VO	0.25 - VO	0.33 - VO	0.45 - VO	0.55 - VO	0.64 - VO	-
0.09 - VO	0.16 - VO	0.22 - VO	0.3 - VO	0.37 - VO	0.43 - VO	-
3 - VO	5.04 - VO	6.2 - VO	7.63 - VO	8.74 - VO	9.87 - VO	-
0.08 - RM	0.13 - VO	0.18 - VO	0.24 - VO	0.29 - VO	0.34 - VO	-
0.22 - VO	0.4 - VO	0.54 - VO	0.73 - VO	0.89 - VO	1.04 - VO	-
0.76 - VO	1.39 - VO	1.87 - VO	2.54 - VO	3.08 - VO	3.61 - VO	-
0.49 - VO	0.91 - VO	1.22 - VO	1.66 - VO	2.01 - VO	2.35 - VO	-
0.42 - VO	0.77 - VO	1.04 - VO	1.41 - VO	1.71 - VO	2 - VO	-
2.82 - VO	4.75 - VO	5.85 - VO	7.2 - VO	8.24 - VO	9.31 - VO	-
0.23 - VO	0.43 - VO	0.58 - VO	0.79 - VO	0.96 - VO	1.12 - VO	-
0.47 - VO	0.87 - VO	1.17 - VO	1.58 - VO	1.92 - VO	2.24 - VO	-
0.35 - VO	0.65 - VO	0.89 - VO	1.2 - VO	1.46 - VO	1.73 - VO	-
0.14 - VO	0.26 - VO	0.36 - VO	0.48 - VO	0.59 - VO	0.68 - VO	-
0.22 - VO	0.4 - VO	0.54 - VO	0.73 - VO	0.88 - VO	1.03 - VO	-
0.57 - VO	1.04 - VO	1.41 - VO	1.91 - VO	2.33 - VO	2.73 - VO	-
0.23 - VO	0.43 - VO	0.58 - VO	0.79 - VO	0.96 - VO	1.12 - VO	-

Existing Visual Otthymo External Catchments (only SCS Lag Method selected)						
Q ₂ (m ³ /s)	Q ₅ (m ³ /s)	Q ₁₀ (m ³ /s)	Q ₂₅ (m ³ /s)	Q ₅₀ (m ³ /s)	Q ₁₀₀ (m ³ /s)	
0.34 - VO	0.63 - VO	0.85 - VO	1.15 - VO	1.4 - VO	1.64 - VO	-
0.71 - VO	1.3 - VO	1.75 - VO	2.38 - VO	2.89 - VO	3.38 - VO	-
0.65 - VO	1.19 - VO	1.61 - VO	2.18 - VO	2.65 - VO	3.11 - VO	-
0.39 - VO	0.71 - VO	0.96 - VO	1.3 - VO	1.57 - VO	1.85 - VO	-
0.52 - VO	0.96 - VO	1.29 - VO	1.76 - VO	2.14 - VO	2.51 - VO	-
0.22 - VO	0.4 - VO	0.54 - VO	0.73 - VO	0.89 - VO	1.04 - VO	-
0.76 - VO	1.39 - VO	1.87 - VO	2.54 - VO	3.08 - VO	3.61 - VO	-
0.54 - VO	0.99 - VO	1.34 - VO	1.81 - VO	2.2 - VO	2.57 - VO	-
0.4 - VO	0.75 - VO	1 - VO	1.36 - VO	1.66 - VO	1.94 - VO	-
0.45 - VO	0.83 - VO	1.12 - VO	1.52 - VO	1.85 - VO		

Milton Logistics Hub 2020 Visual Otthymo – 2yr to Regional Existing Conditions



```

*****
** SIMULATION: Run 01 **
*****
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

** CALIB NASHYD 2912 1 10.0 112.70 0.28 4.33 3.82 0.15 0.000
[CN=75.0 ]
[ N = 3.0: Tp 1.96 ]
*
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

*
** CALIB NASHYD 2911 1 10.0 40.10 0.12 3.50 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0: Tp 1.25 ]
*
CHANNEL[ 2: 2911] 0062 1 10.0 40.10 0.11 4.17 3.65 n/a 0.000
*
ADD [ 2912+ 0062] 9120 3 10.0 152.80 0.39 4.33 3.77 n/a 0.000
*
CHANNEL[ 2: 9120] 0043 1 10.0 152.80 0.35 4.83 3.77 n/a 0.000
*
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

*
** CALIB NASHYD 1291 1 10.0 134.80 0.26 5.17 3.82 0.15 0.000
[CN=75.0 ]
[ N = 3.0: Tp 2.77 ]
*
ADD [ 1291+ 0043] 2910 3 10.0 287.60 0.61 5.00 3.79 n/a 0.000
*
CHANNEL[ 2: 2910] 0045 1 10.0 287.60 0.60 5.17 3.79 n/a 0.000
*
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :

*
CHANNEL[ 2: 2852] 0081 1 5.0 17.50 0.04 3.92 3.62 n/a 0.000
*
ADD [ 2853+ 0081] 0080 3 5.0 155.30 0.34 4.67 3.80 n/a 0.000
*
CHANNEL[ 2: 0080] 0050 1 5.0 155.30 0.33 4.83 3.80 n/a 0.000
*
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

** CALIB NASHYD 0285 1 10.0 53.00 0.18 3.17 3.82 0.15 0.000
[CN=75.0 ]
[ N = 3.0: Tp 1.03 ]
*
ADD [ 0285+ 0050] 0069 3 5.0 208.30 0.46 4.33 3.80 n/a 0.000
*
ADD [ 2930+ 0069] 0085 3 5.0 660.90 1.36 4.83 3.80 n/a 0.000
*
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

*
** CALIB NASHYD 0301 1 10.0 40.10 0.14 3.00 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0: Tp 0.99 ]
*
CHANNEL[ 2: 0301] 0074 1 10.0 40.10 0.14 3.00 3.66 n/a 0.000
*
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

*
** CALIB NASHYD 0302 1 10.0 45.20 0.15 3.00 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0: Tp 1.01 ]
*
ADD [ 0302+ 0074] 0053 3 10.0 85.30 0.29 3.00 3.66 n/a 0.000

```

```

fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

*
** CALIB NASHYD 1292 1 10.0 78.60 0.15 5.17 3.99 0.16 0.000
[CN=76.0 ]
[ N = 3.0: Tp 2.80 ]
*
ADD [ 1292+ 0045] 2920 3 10.0 366.20 0.76 5.17 3.84 n/a 0.000
*
CHANNEL[ 2: 2920] 0046 1 10.0 366.20 0.75 5.33 3.84 n/a 0.000
*
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

*
** CALIB NASHYD 1293 1 10.0 86.40 0.20 4.33 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0: Tp 1.98 ]
*
ADD [ 1293+ 0046] 2930 3 10.0 452.60 0.93 5.17 3.80 n/a 0.000
*
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

*
** CALIB NASHYD 2853 1 10.0 137.80 0.30 4.67 3.82 0.15 0.000
[CN=75.0 ]
[ N = 3.0: Tp 2.34 ]
*
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

*
** CALIB NASHYD 2852 1 10.0 17.50 0.07 2.67 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0: Tp 0.75 ]
*
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

*
** CALIB NASHYD 0303 1 10.0 49.60 0.18 3.00 3.82 0.15 0.000
[CN=75.0 ]
[ N = 3.0: Tp 1.00 ]
*
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

*
** CALIB NASHYD 0304 1 10.0 28.20 0.13 2.00 3.23 0.13 0.000
[CN=71.0 ]
[ N = 3.0: Tp 0.41 ]
*
ADD [ 0303+ 0304] 0100 3 10.0 77.80 0.26 2.50 3.60 n/a 0.000
*
ADD [ 0100+ 0053] 0088 3 10.0 163.10 0.55 2.83 3.63 n/a 0.000
*
ADD [ 0088+ 0085] 0088 1 5.0 824.00 1.68 4.33 3.77 n/a 0.000
*
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

*
** CALIB NASHYD 0306 1 10.0 28.00 0.08 3.50 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0: Tp 1.29 ]
*
READ STORM 10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

*
** CALIB NASHYD 0305 1 10.0 79.30 0.22 4.00 3.66 0.15 0.000

```

```

[CN=74.0 ]
[ N = 3.0:Tp 1.52]
* CHANNEL[ 2: 0305] 0071 1 10.0 79.30 0.22 4.00 3.66 n/a 0.000
* ADD [ 0306+ 0071] 0059 3 10.0 107.30 0.30 3.83 3.66 n/a 0.000
* ADD [ 0059+ 0088] 0070 3 5.0 931.30 1.97 4.33 3.76 n/a 0.000

```

```

*****
** SIMULATION: Run 02 **
*****

```

```

READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD 2912 1 10.0 112.70 0.71 10.33 14.16 0.30 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.96]

```

```

READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD 2911 1 10.0 40.10 0.34 9.50 13.67 0.29 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.25]

```

```

* CHANNEL[ 2: 2911] 0062 1 10.0 40.10 0.31 10.00 13.66 n/a 0.000
* ADD [ 2912+ 0062] 9120 3 10.0 152.80 1.01 10.17 14.03 n/a 0.000
* CHANNEL[ 2: 9120] 0043 1 10.0 152.80 0.95 10.67 14.03 n/a 0.000

```

```

READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD 1291 1 10.0 134.80 0.65 11.50 14.16 0.30 0.000

```

```

fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD 2852 1 10.0 17.50 0.22 8.83 13.67 0.29 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.75]
* CHANNEL[ 2: 2852] 0081 1 5.0 17.50 0.15 9.42 13.63 n/a 0.000
* ADD [ 2853+ 0081] 0080 3 5.0 155.30 0.85 10.50 14.10 n/a 0.000
* CHANNEL[ 2: 0080] 0050 1 5.0 155.30 0.84 10.75 14.10 n/a 0.000

```

```

READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD 0285 1 10.0 53.00 0.54 9.17 14.16 0.30 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.03]

```

```

* ADD [ 0285+ 0050] 0069 3 5.0 208.30 1.20 10.00 14.12 n/a 0.000
* ADD [ 2930+ 0069] 0085 3 5.0 660.90 3.51 10.83 14.11 n/a 0.000

```

```

READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD 0301 1 10.0 40.10 0.40 9.17 13.67 0.29 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.99]

```

```

* CHANNEL[ 2: 0301] 0074 1 10.0 40.10 0.40 9.17 13.67 n/a 0.000

```

```

READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-

```

```

[CN=75.0 ]
[ N = 3.0:Tp 2.77]
* ADD [ 1291+ 0043] 2910 3 10.0 287.60 1.58 11.00 14.09 n/a 0.000
* CHANNEL[ 2: 2910] 0045 1 10.0 287.60 1.57 11.17 14.09 n/a 0.000

```

```

READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD 1292 1 10.0 78.60 0.39 11.50 14.68 0.31 0.000
[CN=76.0 ]
[ N = 3.0:Tp 2.80]

```

```

* ADD [ 1292+ 0045] 2920 3 10.0 366.20 1.96 11.17 14.22 n/a 0.000
* CHANNEL[ 2: 2920] 0046 1 10.0 366.20 1.95 11.33 14.22 n/a 0.000

```

```

READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD 1293 1 10.0 86.40 0.52 10.33 13.67 0.29 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.98]

```

```

* ADD [ 1293+ 0046] 2930 3 10.0 452.60 2.43 11.17 14.11 n/a 0.000

```

```

READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD 2853 1 10.0 137.80 0.76 10.83 14.16 0.30 0.000
[CN=75.0 ]
[ N = 3.0:Tp 2.34]

```

```

* READ STORM 10.0
[ Ptot= 47.43 mm ]

```

```

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD 0302 1 10.0 45.20 0.45 9.17 13.67 0.29 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.01]

```

```

* ADD [ 0302+ 0074] 0053 3 10.0 85.30 0.85 9.17 13.67 n/a 0.000

```

```

READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD 0303 1 10.0 49.60 0.52 9.17 14.16 0.30 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.00]

```

```

* READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD 0304 1 10.0 28.20 0.46 8.33 12.29 0.26 0.000
[CN=71.0 ]
[ N = 3.0:Tp 0.41]

```

```

* ADD [ 0303+ 0304] 0100 3 10.0 77.80 0.83 8.67 13.49 n/a 0.000
* ADD [ 0100+ 0053] 0088 3 10.0 163.10 1.61 9.00 13.58 n/a 0.000
* ADD [ 0088+ 0085] 0088 1 5.0 824.00 4.33 10.33 14.01 n/a 0.000

```

```

READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD 0306 1 10.0 28.00 0.23 9.50 13.67 0.29 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.29]

```

READ STORM 10.0
[Ptot= 47.43 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0305 1 10.0 79.30 0.58 9.83 13.67 0.29 0.000
[CN=74.0]
[N = 3.0:Tp 1.52]
*
* CHANNEL[2: 0305] 0071 1 10.0 79.30 0.58 9.83 13.67 n/a 0.000
*
* ADD [0306+ 0071] 0059 3 10.0 107.30 0.81 9.83 13.67 n/a 0.000
*
* ADD [0059+ 0088] 0070 3 5.0 931.30 5.09 10.17 13.97 n/a 0.000
*

** SIMULATION: Run 03 **

READ STORM 10.0
[Ptot= 66.79 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 2912 1 10.0 112.70 1.30 10.33 26.07 0.39 0.000
[CN=75.0]
[N = 3.0:Tp 1.96]
*

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 2911 1 10.0 40.10 0.63 9.50 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 1.25]
*

* CHANNEL[2: 2911] 0062 1 10.0 40.10 0.59 9.83 25.27 n/a 0.000

* ADD [2912+ 0062] 9120 3 10.0 152.80 1.87 10.17 25.86 n/a 0.000

* CHANNEL[2: 9120] 0043 1 10.0 152.80 1.78 10.67 25.85 n/a 0.000

remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 2853 1 10.0 137.80 1.39 10.83 26.07 0.39 0.000
[CN=75.0]
[N = 3.0:Tp 2.34]
*

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 2852 1 10.0 17.50 0.40 8.83 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 0.75]
*

* CHANNEL[2: 2852] 0081 1 5.0 17.50 0.31 9.33 25.24 n/a 0.000

* ADD [2853+ 0081] 0080 3 5.0 155.30 1.56 10.50 25.98 n/a 0.000

* CHANNEL[2: 0080] 0050 1 5.0 155.30 1.56 10.75 25.98 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0285 1 10.0 53.00 0.99 9.17 26.07 0.39 0.000
[CN=75.0]
[N = 3.0:Tp 1.03]
*

* ADD [0285+ 0050] 0069 3 5.0 208.30 2.24 9.92 26.00 n/a 0.000

* ADD [2930+ 0069] 0085 3 5.0 660.90 6.54 10.83 25.99 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0301 1 10.0 40.10 0.75 9.17 25.28 0.38 0.000
[CN=74.0]

READ STORM 10.0
[Ptot= 66.79 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 1291 1 10.0 134.80 1.19 11.33 26.07 0.39 0.000
[CN=75.0]
[N = 3.0:Tp 2.77]
*

* ADD [1291+ 0043] 2910 3 10.0 287.60 2.93 10.83 25.96 n/a 0.000

* CHANNEL[2: 2910] 0045 1 10.0 287.60 2.91 11.00 25.96 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 1292 1 10.0 78.60 0.71 11.33 26.89 0.40 0.000
[CN=76.0]
[N = 3.0:Tp 2.80]
*

* ADD [1292+ 0045] 2920 3 10.0 366.20 3.62 11.00 26.16 n/a 0.000

* CHANNEL[2: 2920] 0046 1 10.0 366.20 3.61 11.17 26.16 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 1293 1 10.0 86.40 0.96 10.33 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 1.98]
*

* ADD [1293+ 0046] 2930 3 10.0 452.60 4.52 11.00 25.99 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

[N = 3.0:Tp 0.99]

* CHANNEL[2: 0301] 0074 1 10.0 40.10 0.75 9.17 25.28 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0302 1 10.0 45.20 0.83 9.17 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 1.01]
*

* ADD [0302+ 0074] 0053 3 10.0 85.30 1.57 9.17 25.28 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0303 1 10.0 49.60 0.95 9.17 26.07 0.39 0.000
[CN=75.0]
[N = 3.0:Tp 1.00]
*

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0304 1 10.0 28.20 0.87 8.33 23.03 0.34 0.000
[CN=71.0]
[N = 3.0:Tp 0.41]
*

* ADD [0303+ 0304] 0100 3 10.0 77.80 1.54 8.67 24.97 n/a 0.000

* ADD [0100+ 0053] 0088 3 10.0 163.10 2.97 9.00 25.13 n/a 0.000

* ADD [0088+ 0085] 0088 1 5.0 824.00 8.15 10.17 25.83 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0306 1 10.0 28.00 0.43 9.50 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 1.29]
*
READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0305 1 10.0 79.30 1.07 9.83 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 1.52]
*
CHANNEL[2: 0305] 0071 1 10.0 79.30 1.07 9.83 25.28 n/a 0.000
*
ADD [0306+ 0071] 0059 3 10.0 107.30 1.49 9.67 25.28 n/a 0.000
*
ADD [0059+ 0088] 0070 3 5.0 931.30 9.58 10.17 25.76 n/a 0.000
*

** SIMULATION: Run 04 **

READ STORM 10.0
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 2912 1 10.0 112.70 1.75 10.33 34.93 0.44 0.000
[CN=75.0]
[N = 3.0:Tp 1.96]
*
READ STORM 10.0
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 2911 1 10.0 40.10 0.85 9.50 33.95 0.43 0.000
[CN=74.0]

[N = 3.0:Tp 1.98]

*
ADD [1293+ 0046] 2930 3 10.0 452.60 6.09 11.00 34.83 n/a 0.000
*
READ STORM 10.0
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 2853 1 10.0 137.80 1.87 10.83 34.93 0.44 0.000
[CN=75.0]
[N = 3.0:Tp 2.34]
*
READ STORM 10.0
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 2852 1 10.0 17.50 0.54 8.83 33.95 0.43 0.000
[CN=74.0]
[N = 3.0:Tp 0.75]
*
CHANNEL[2: 2852] 0081 1 5.0 17.50 0.43 9.25 33.91 n/a 0.000
*
ADD [2853+ 0081] 0080 3 5.0 155.30 2.10 10.50 34.81 n/a 0.000
*
CHANNEL[2: 0080] 0050 1 5.0 155.30 2.10 10.67 34.81 n/a 0.000
*
READ STORM 10.0
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0285 1 10.0 53.00 1.34 9.17 34.93 0.44 0.000
[CN=75.0]
[N = 3.0:Tp 1.03]
*
ADD [0285+ 0050] 0069 3 5.0 208.30 3.03 9.83 34.84 n/a 0.000
*
ADD [2930+ 0069] 0085 3 5.0 660.90 8.83 10.67 34.83 n/a 0.000
*
READ STORM 10.0

[CN=74.0]
[N = 3.0:Tp 1.25]

*
CHANNEL[2: 2911] 0062 1 10.0 40.10 0.80 9.83 33.94 n/a 0.000
*
ADD [2912+ 0062] 9120 3 10.0 152.80 2.52 10.17 34.67 n/a 0.000
*
CHANNEL[2: 9120] 0043 1 10.0 152.80 2.42 10.50 34.66 n/a 0.000
*
READ STORM 10.0
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 1291 1 10.0 134.80 1.61 11.33 34.93 0.44 0.000
[CN=75.0]
[N = 3.0:Tp 2.77]
*
ADD [1291+ 0043] 2910 3 10.0 287.60 3.95 10.83 34.79 n/a 0.000
*
CHANNEL[2: 2910] 0045 1 10.0 287.60 3.93 11.00 34.79 n/a 0.000
*
READ STORM 10.0
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 1292 1 10.0 78.60 0.96 11.33 35.94 0.45 0.000
[CN=76.0]
[N = 3.0:Tp 2.80]
*
ADD [1292+ 0045] 2920 3 10.0 366.20 4.88 11.00 35.03 n/a 0.000
*
CHANNEL[2: 2920] 0046 1 10.0 366.20 4.87 11.00 35.03 n/a 0.000
*
READ STORM 10.0
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 1293 1 10.0 86.40 1.29 10.33 33.95 0.43 0.000
[CN=74.0]

[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0301 1 10.0 40.10 1.00 9.17 33.95 0.43 0.000
[CN=74.0]
[N = 3.0:Tp 0.99]
*
CHANNEL[2: 0301] 0074 1 10.0 40.10 1.01 9.17 33.95 n/a 0.000
*
READ STORM 10.0
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0302 1 10.0 45.20 1.12 9.17 33.95 0.43 0.000
[CN=74.0]
[N = 3.0:Tp 1.01]
*
ADD [0302+ 0074] 0053 3 10.0 85.30 2.12 9.17 33.95 n/a 0.000
*
READ STORM 10.0
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0303 1 10.0 49.60 1.28 9.17 34.93 0.44 0.000
[CN=75.0]
[N = 3.0:Tp 1.00]
*
READ STORM 10.0
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0304 1 10.0 28.20 1.18 8.33 31.14 0.39 0.000
[CN=71.0]
[N = 3.0:Tp 0.41]

```

* ADD [ 0303+ 0304] 0100 3 10.0 77.80 2.08 8.67 33.55 n/a 0.000
* ADD [ 0100+ 0053] 0088 3 10.0 163.10 4.01 9.00 33.76 n/a 0.000
* ADD [ 0088+ 0085] 0088 1 5.0 824.00 11.06 10.17 34.63 n/a 0.000
  READ STORM 10.0
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALI B NASHYD 0306 1 10.0 28.00 0.58 9.50 33.95 0.43 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.29]
*
  READ STORM 10.0
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\0ec6bc5b-f627-4166-a5de-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALI B NASHYD 0305 1 10.0 79.30 1.45 9.83 33.95 0.43 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.52]
*
  CHANNEL[ 2: 0305] 0071 1 10.0 79.30 1.45 9.83 33.95 n/a 0.000
*
  ADD [ 0306+ 0071] 0059 3 10.0 107.30 2.01 9.67 33.95 n/a 0.000
*
  ADD [ 0059+ 0088] 0070 3 5.0 931.30 13.01 10.00 34.55 n/a 0.000
*
*****
** SIMULATION: Run 05 **
*****
  READ STORM 10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALI B NASHYD 2912 1 10.0 112.70 2.38 10.33 47.27 0.49 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.96]
*
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALI B NASHYD 1293 1 10.0 86.40 1.76 10.33 46.08 0.48 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.98]
*
  ADD [ 1293+ 0046] 2930 3 10.0 452.60 8.28 10.83 47.15 n/a 0.000
*
  READ STORM 10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALI B NASHYD 2853 1 10.0 137.80 2.54 10.83 47.27 0.49 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 2.34]
*
  READ STORM 10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALI B NASHYD 2852 1 10.0 17.50 0.73 8.83 46.07 0.48 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.75]
*
  CHANNEL[ 2: 2852] 0081 1 5.0 17.50 0.60 9.25 46.03 n/a 0.000
*
  ADD [ 2853+ 0081] 0080 3 5.0 155.30 2.85 10.50 47.13 n/a 0.000
*
  CHANNEL[ 2: 0080] 0050 1 5.0 155.30 2.85 10.58 47.13 n/a 0.000
*
  READ STORM 10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

  READ STORM 10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALI B NASHYD 2911 1 10.0 40.10 1.15 9.50 46.07 0.48 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.25]
*
  CHANNEL[ 2: 2911] 0062 1 10.0 40.10 1.10 9.83 46.06 n/a 0.000
*
  ADD [ 2912+ 0062] 9120 3 10.0 152.80 3.42 10.00 46.96 n/a 0.000
*
  CHANNEL[ 2: 9120] 0043 1 10.0 152.80 3.32 10.50 46.95 n/a 0.000
*
  READ STORM 10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALI B NASHYD 1291 1 10.0 134.80 2.18 11.33 47.27 0.49 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 2.77]
*
  ADD [ 1291+ 0043] 2910 3 10.0 287.60 5.38 10.67 47.10 n/a 0.000
*
  CHANNEL[ 2: 2910] 0045 1 10.0 287.60 5.34 10.83 47.10 n/a 0.000
*
  READ STORM 10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALI B NASHYD 1292 1 10.0 78.60 1.30 11.33 48.50 0.50 0.000
  [CN=76.0 ]
  [ N = 3.0:Tp 2.80]
*
  ADD [ 1292+ 0045] 2920 3 10.0 366.20 6.61 10.83 47.40 n/a 0.000
*
  CHANNEL[ 2: 2920] 0046 1 10.0 366.20 6.60 11.00 47.40 n/a 0.000
*
  READ STORM 10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALI B NASHYD 0285 1 10.0 53.00 1.81 9.17 47.27 0.49 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.03]
*
  ADD [ 0285+ 0050] 0069 3 5.0 208.30 4.13 9.83 47.17 n/a 0.000
*
  ADD [ 2930+ 0069] 0085 3 5.0 660.90 12.02 10.67 47.16 n/a 0.000
*
  READ STORM 10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALI B NASHYD 0301 1 10.0 40.10 1.36 9.17 46.07 0.48 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.99]
*
  CHANNEL[ 2: 0301] 0074 1 10.0 40.10 1.37 9.17 46.07 n/a 0.000
*
  READ STORM 10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALI B NASHYD 0302 1 10.0 45.20 1.52 9.17 46.07 0.48 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.01]
*
  ADD [ 0302+ 0074] 0053 3 10.0 85.30 2.89 9.17 46.07 n/a 0.000
*
  READ STORM 10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALI B NASHYD 0303 1 10.0 49.60 1.73 9.17 47.27 0.49 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.00]
*
  READ STORM 10.0
  [ Ptot= 96.17 mm ]
  fname :

```

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-remark: Milton IDF, based on AES Toronto Pearson International Airp

** CALIB NASHYD 0304 1 10.0 28.20 1.62 8.33 42.57 0.44 0.000
[CN=71.0]
[N = 3.0:Tp 0.41]
* ADD [0303+ 0304] 0100 3 10.0 77.80 2.83 8.67 45.57 n/a 0.000
* ADD [0100+ 0053] 0088 3 10.0 163.10 5.45 9.00 45.83 n/a 0.000
* ADD [0088+ 0085] 0088 1 5.0 824.00 15.13 10.08 46.90 n/a 0.000
* READ STORM 10.0
[Ptot= 96.17 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-remark: Milton IDF, based on AES Toronto Pearson International Airp

** CALIB NASHYD 0306 1 10.0 28.00 0.79 9.50 46.07 0.48 0.000
[CN=74.0]
[N = 3.0:Tp 1.29]
* READ STORM 10.0
[Ptot= 96.17 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\39fe9681-7c7c-4b3f-a234-remark: Milton IDF, based on AES Toronto Pearson International Airp

** CALIB NASHYD 0305 1 10.0 79.30 1.97 9.83 46.07 0.48 0.000
[CN=74.0]
[N = 3.0:Tp 1.52]
* CHANNEL[2: 0305] 0071 1 10.0 79.30 1.97 9.83 46.07 n/a 0.000
* ADD [0306+ 0071] 0059 3 10.0 107.30 2.73 9.67 46.07 n/a 0.000
* ADD [0059+ 0088] 0070 3 5.0 931.30 17.80 10.00 46.80 n/a 0.000

** SIMULATION: Run 06 **

READ STORM 10.0
[Ptot=109.12 mm]
fname :

** CALIB NASHYD 1292 1 10.0 78.60 1.57 11.33 58.81 0.54 0.000
[CN=76.0]
[N = 3.0:Tp 2.80]
* ADD [1292+ 0045] 2920 3 10.0 366.20 8.07 10.83 57.57 n/a 0.000
* CHANNEL[2: 2920] 0046 1 10.0 366.20 8.06 11.00 57.57 n/a 0.000
* READ STORM 10.0
[Ptot=109.12 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4-efd1-423a-b24c-remark: Milton IDF, based on AES Toronto Pearson International Airp

** CALIB NASHYD 1293 1 10.0 86.40 2.14 10.33 56.07 0.51 0.000
[CN=74.0]
[N = 3.0:Tp 1.98]
* ADD [1293+ 0046] 2930 3 10.0 452.60 10.10 10.83 57.28 n/a 0.000
* READ STORM 10.0
[Ptot=109.12 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4-efd1-423a-b24c-remark: Milton IDF, based on AES Toronto Pearson International Airp

** CALIB NASHYD 2853 1 10.0 137.80 3.08 10.83 57.43 0.53 0.000
[CN=75.0]
[N = 3.0:Tp 2.34]
* READ STORM 10.0
[Ptot=109.12 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4-efd1-423a-b24c-remark: Milton IDF, based on AES Toronto Pearson International Airp

** CALIB NASHYD 2852 1 10.0 17.50 0.89 8.83 56.06 0.51 0.000
[CN=74.0]
[N = 3.0:Tp 0.75]
* CHANNEL[2: 2852] 0081 1 5.0 17.50 0.74 9.25 56.02 n/a 0.000
* ADD [2853+ 0081] 0080 3 5.0 155.30 3.47 10.50 57.27 n/a 0.000
* CHANNEL[2: 0080] 0050 1 5.0 155.30 3.46 10.58 57.27 n/a 0.000

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4-efd1-423a-b24c-remark: Milton IDF, based on AES Toronto Pearson International Airp

** CALIB NASHYD 2912 1 10.0 112.70 2.89 10.33 57.43 0.53 0.000
[CN=75.0]
[N = 3.0:Tp 1.96]
* READ STORM 10.0
[Ptot=109.12 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4-efd1-423a-b24c-remark: Milton IDF, based on AES Toronto Pearson International Airp

** CALIB NASHYD 2911 1 10.0 40.10 1.40 9.33 56.07 0.51 0.000
[CN=74.0]
[N = 3.0:Tp 1.25]
* CHANNEL[2: 2911] 0062 1 10.0 40.10 1.34 9.67 56.05 n/a 0.000
* ADD [2912+ 0062] 9120 3 10.0 152.80 4.16 10.00 57.07 n/a 0.000
* CHANNEL[2: 9120] 0043 1 10.0 152.80 4.04 10.33 57.06 n/a 0.000
* READ STORM 10.0
[Ptot=109.12 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4-efd1-423a-b24c-remark: Milton IDF, based on AES Toronto Pearson International Airp

** CALIB NASHYD 1291 1 10.0 134.80 2.65 11.33 57.43 0.53 0.000
[CN=75.0]
[N = 3.0:Tp 2.77]
* ADD [1291+ 0043] 2910 3 10.0 287.60 6.55 10.67 57.23 n/a 0.000
* CHANNEL[2: 2910] 0045 1 10.0 287.60 6.53 10.83 57.23 n/a 0.000
* READ STORM 10.0
[Ptot=109.12 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4-efd1-423a-b24c-remark: Milton IDF, based on AES Toronto Pearson International Airp

READ STORM 10.0
[Ptot=109.12 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4-efd1-423a-b24c-remark: Milton IDF, based on AES Toronto Pearson International Airp

** CALIB NASHYD 0285 1 10.0 53.00 2.20 9.17 57.42 0.53 0.000
[CN=75.0]
[N = 3.0:Tp 1.03]
* ADD [0285+ 0050] 0069 3 5.0 208.30 5.05 9.75 57.31 n/a 0.000
* ADD [2930+ 0069] 0085 3 5.0 660.90 14.66 10.67 57.29 n/a 0.000
* READ STORM 10.0
[Ptot=109.12 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4-efd1-423a-b24c-remark: Milton IDF, based on AES Toronto Pearson International Airp

** CALIB NASHYD 0301 1 10.0 40.10 1.66 9.17 56.06 0.51 0.000
[CN=74.0]
[N = 3.0:Tp 0.99]
* CHANNEL[2: 0301] 0074 1 10.0 40.10 1.66 9.17 56.06 n/a 0.000
* READ STORM 10.0
[Ptot=109.12 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4-efd1-423a-b24c-remark: Milton IDF, based on AES Toronto Pearson International Airp

** CALIB NASHYD 0302 1 10.0 45.20 1.85 9.17 56.06 0.51 0.000
[CN=74.0]
[N = 3.0:Tp 1.01]
* ADD [0302+ 0074] 0053 3 10.0 85.30 3.51 9.17 56.06 n/a 0.000
* READ STORM 10.0
[Ptot=109.12 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4-efd1-423a-b24c-remark: Milton IDF, based on AES Toronto Pearson International Airp

```

*
** CALI B NASHYD      0303 1 10.0 49.60 2.10 9.17 57.42 0.53 0.000
   [CN=75.0          ]
   [ N = 3.0:Tp 1.00]
*
  READ STORM          10.0
   [ Ptot=109.12 mm ]
   fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4
-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD      0304 1 10.0 28.20 1.98 8.33 52.07 0.48 0.000
   [CN=71.0          ]
   [ N = 3.0:Tp 0.41]
*
  ADD [ 0303+ 0304] 0100 3 10.0 77.80 3.45 8.67 55.48 n/a 0.000
*
  ADD [ 0100+ 0053] 0088 3 10.0 163.10 6.64 8.83 55.79 n/a 0.000
*
  ADD [ 0088+ 0085] 0088 1 5.0 824.00 18.47 10.00 57.00 n/a 0.000
*
  READ STORM          10.0
   [ Ptot=109.12 mm ]
   fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4
-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD      0306 1 10.0 28.00 0.96 9.50 56.07 0.51 0.000
   [CN=74.0          ]
   [ N = 3.0:Tp 1.29]
*
  READ STORM          10.0
   [ Ptot=109.12 mm ]
   fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\8ce1efa4
-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD      0305 1 10.0 79.30 2.39 9.83 56.07 0.51 0.000
   [CN=74.0          ]
   [ N = 3.0:Tp 1.52]
*
  CHANNEL[ 2: 0305] 0071 1 10.0 79.30 2.39 9.83 56.07 n/a 0.000
*
  ADD [ 0306+ 0071] 0059 3 10.0 107.30 3.33 9.67 56.07 n/a 0.000

*
  READ STORM          10.0
   [ Ptot=122.36 mm ]
   fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD      1292 1 10.0 78.60 1.85 11.33 69.71 0.57 0.000
   [CN=76.0          ]
   [ N = 3.0:Tp 2.80]
*
  ADD [ 1292+ 0045] 2920 3 10.0 366.20 9.47 10.83 68.34 n/a 0.000
*
  CHANNEL[ 2: 2920] 0046 1 10.0 366.20 9.46 11.00 68.34 n/a 0.000
*
  READ STORM          10.0
   [ Ptot=122.36 mm ]
   fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD      1293 1 10.0 86.40 2.51 10.33 66.67 0.54 0.000
   [CN=74.0          ]
   [ N = 3.0:Tp 1.98]
*
  ADD [ 1293+ 0046] 2930 3 10.0 452.60 11.85 10.83 68.02 n/a 0.000
*
  READ STORM          10.0
   [ Ptot=122.36 mm ]
   fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD      2853 1 10.0 137.80 3.61 10.83 68.18 0.56 0.000
   [CN=75.0          ]
   [ N = 3.0:Tp 2.34]
*
  READ STORM          10.0
   [ Ptot=122.36 mm ]
   fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

*
  ADD [ 0059+ 0088] 0070 3 5.0 931.30 21.72 10.00 56.89 n/a 0.000
*
*****
** SIMULATION: Run 07 **
*****
  READ STORM          10.0
   [ Ptot=122.36 mm ]
   fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD      2912 1 10.0 112.70 3.38 10.33 68.18 0.56 0.000
   [CN=75.0          ]
   [ N = 3.0:Tp 1.96]
*
  READ STORM          10.0
   [ Ptot=122.36 mm ]
   fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD      2911 1 10.0 40.10 1.64 9.33 66.66 0.54 0.000
   [CN=74.0          ]
   [ N = 3.0:Tp 1.25]
*
  CHANNEL[ 2: 2911] 0062 1 10.0 40.10 1.58 9.67 66.65 n/a 0.000
*
  ADD [ 2912+ 0062] 9120 3 10.0 152.80 4.88 10.00 67.78 n/a 0.000
*
  CHANNEL[ 2: 9120] 0043 1 10.0 152.80 4.75 10.33 67.77 n/a 0.000
*
  READ STORM          10.0
   [ Ptot=122.36 mm ]
   fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD      1291 1 10.0 134.80 3.11 11.33 68.18 0.56 0.000
   [CN=75.0          ]
   [ N = 3.0:Tp 2.77]
*
  ADD [ 1291+ 0043] 2910 3 10.0 287.60 7.69 10.67 67.96 n/a 0.000
*
  CHANNEL[ 2: 2910] 0045 1 10.0 287.60 7.66 10.83 67.96 n/a 0.000

*
** CALI B NASHYD      2852 1 10.0 17.50 1.04 8.83 66.65 0.54 0.000
   [CN=74.0          ]
   [ N = 3.0:Tp 0.75]
*
  CHANNEL[ 2: 2852] 0081 1 5.0 17.50 0.88 9.17 66.62 n/a 0.000
*
  ADD [ 2853+ 0081] 0080 3 5.0 155.30 4.06 10.33 68.00 n/a 0.000
*
  CHANNEL[ 2: 0080] 0050 1 5.0 155.30 4.05 10.50 68.00 n/a 0.000
*
  READ STORM          10.0
   [ Ptot=122.36 mm ]
   fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD      0285 1 10.0 53.00 2.57 9.17 68.17 0.56 0.000
   [CN=75.0          ]
   [ N = 3.0:Tp 1.03]
*
  ADD [ 0285+ 0050] 0069 3 5.0 208.30 5.93 9.75 68.04 n/a 0.000
*
  ADD [ 2930+ 0069] 0085 3 5.0 660.90 17.20 10.50 68.03 n/a 0.000
*
  READ STORM          10.0
   [ Ptot=122.36 mm ]
   fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD      0301 1 10.0 40.10 1.94 9.00 66.66 0.54 0.000
   [CN=74.0          ]
   [ N = 3.0:Tp 0.99]
*
  CHANNEL[ 2: 0301] 0074 1 10.0 40.10 1.95 9.17 66.66 n/a 0.000
*
  READ STORM          10.0
   [ Ptot=122.36 mm ]
   fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD      0302 1 10.0 45.20 2.16 9.17 66.66 0.54 0.000
   [CN=74.0          ]
   [ N = 3.0:Tp 1.01]

```

```

*
* ADD [ 0302+ 0074] 0053 3 10.0 85.30 4.11 9.17 66.66 n/a 0.000
*
* READ STORM 10.0
* [ Ptot=122.36 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALI B NASHYD 0303 1 10.0 49.60 2.45 9.17 68.17 0.56 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.00]
*
* READ STORM 10.0
* [ Ptot=122.36 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

*
** CALI B NASHYD 0304 1 10.0 28.20 2.33 8.33 62.19 0.51 0.000
[CN=71.0 ]
[ N = 3.0:Tp 0.41]
*
* ADD [ 0303+ 0304] 0100 3 10.0 77.80 4.04 8.67 66.00 n/a 0.000
*
* ADD [ 0100+ 0053] 0088 3 10.0 163.10 7.78 8.83 66.35 n/a 0.000
*
* ADD [ 0088+ 0085] 0088 1 5.0 824.00 21.72 10.00 67.70 n/a 0.000
*
* READ STORM 10.0
* [ Ptot=122.36 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALI B NASHYD 0306 1 10.0 28.00 1.12 9.50 66.66 0.54 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.29]
*
* READ STORM 10.0
* [ Ptot=122.36 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

*
** CALI B NASHYD 1291 1 10.0 134.80 7.82 12.67 146.91 0.69 0.000
[CN=75.0 ]
[ N = 3.0:Tp 2.77]
*
* ADD [ 1291+ 0043] 2910 3 10.0 287.60 18.64 12.33 146.59 n/a 0.000
*
* CHANNEL[ 2: 2910] 0045 1 10.0 287.60 18.58 12.50 146.59 n/a 0.000
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

```

```

** CALI B NASHYD 1292 1 10.0 78.60 4.59 12.67 149.19 0.70 0.000
[CN=76.0 ]
[ N = 3.0:Tp 2.80]
*
* ADD [ 1292+ 0045] 2920 3 10.0 366.20 23.16 12.50 147.15 n/a 0.000
*
* CHANNEL[ 2: 2920] 0046 1 10.0 366.20 23.11 12.67 147.15 n/a 0.000
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

```

```

** CALI B NASHYD 1293 1 10.0 86.40 5.95 12.00 144.64 0.68 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.98]
*
* ADD [ 1293+ 0046] 2930 3 10.0 452.60 28.84 12.50 146.67 n/a 0.000
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

```

```

** CALI B NASHYD 2853 1 10.0 137.80 8.80 12.33 146.91 0.69 0.000
[CN=75.0 ]
[ N = 3.0:Tp 2.34]

```

```

** CALI B NASHYD 0305 1 10.0 79.30 2.80 9.67 66.67 0.54 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.52]
*
* CHANNEL[ 2: 0305] 0071 1 10.0 79.30 2.81 9.83 66.67 n/a 0.000
*
* ADD [ 0306+ 0071] 0059 3 10.0 107.30 3.90 9.67 66.66 n/a 0.000
*
* ADD [ 0059+ 0088] 0070 3 5.0 931.30 25.52 10.00 67.58 n/a 0.000

```

```

*****
** SIMULATION: Run 08
*****
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

```

```

*
** CALI B NASHYD 2912 1 10.0 112.70 7.89 12.00 146.91 0.69 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.96]
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

```

```

** CALI B NASHYD 2911 1 10.0 40.10 3.41 11.33 144.64 0.68 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.25]
*
* CHANNEL[ 2: 2911] 0062 1 10.0 40.10 3.35 11.50 144.63 n/a 0.000
*
* ADD [ 2912+ 0062] 9120 3 10.0 152.80 11.15 11.83 146.31 n/a 0.000
*
* CHANNEL[ 2: 9120] 0043 1 10.0 152.80 10.95 12.17 146.31 n/a 0.000
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

```

```

*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

```

```

** CALI B NASHYD 2852 1 10.0 17.50 1.73 10.83 144.62 0.68 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.75]
*
* CHANNEL[ 2: 2852] 0081 1 5.0 17.50 1.68 11.17 144.58 n/a 0.000
*
* ADD [ 2853+ 0081] 0080 3 5.0 155.30 9.99 12.00 146.65 n/a 0.000
*
* CHANNEL[ 2: 0080] 0050 1 5.0 155.30 9.97 12.08 146.65 n/a 0.000
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

```

```

** CALI B NASHYD 0285 1 10.0 53.00 4.90 11.17 146.90 0.69 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.03]
*
* ADD [ 0285+ 0050] 0069 3 5.0 208.30 14.22 11.58 146.71 n/a 0.000
*
* ADD [ 2930+ 0069] 0085 3 5.0 660.90 42.07 12.17 146.68 n/a 0.000
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

```

```

** CALI B NASHYD 0301 1 10.0 40.10 3.71 11.17 144.63 0.68 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.99]
*
* CHANNEL[ 2: 0301] 0074 1 10.0 40.10 3.71 11.17 144.63 n/a 0.000
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]

```

fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurri cane Hazel Storm

*
** CALI B NASHYD 0302 1 10.0 45.20 4.16 11.17 144.63 0.68 0.000
[CN=74.0]
[N = 3.0:Tp 1.01]

*
ADD [0302+ 0074] 0053 3 10.0 85.30 7.87 11.17 144.63 n/a 0.000

READ STORM 60.0
[Ptot=212.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurri cane Hazel Storm

*
** CALI B NASHYD 0303 1 10.0 49.60 4.62 11.17 146.90 0.69 0.000
[CN=75.0]
[N = 3.0:Tp 1.00]

*
READ STORM 60.0
[Ptot=212.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurri cane Hazel Storm

*
** CALI B NASHYD 0304 1 10.0 28.20 3.11 10.17 137.65 0.65 0.000
[CN=71.0]
[N = 3.0:Tp 0.41]

*
ADD [0303+ 0304] 0100 3 10.0 77.80 7.24 11.00 143.55 n/a 0.000

*
ADD [0100+ 0053] 0088 3 10.0 163.10 15.04 11.00 144.12 n/a 0.000

*
ADD [0088+ 0085] 0088 1 5.0 824.00 53.33 11.67 146.22 n/a 0.000

*
READ STORM 60.0
[Ptot=212.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurri cane Hazel Storm

*
** CALI B NASHYD 0306 1 10.0 28.00 2.35 11.33 144.64 0.68 0.000

[CN=74.0]
[N = 3.0:Tp 1.29]

*
READ STORM 60.0
[Ptot=212.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\6e5db927-9b8e-48df-9964-02f73ef9833a\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurri cane Hazel Storm

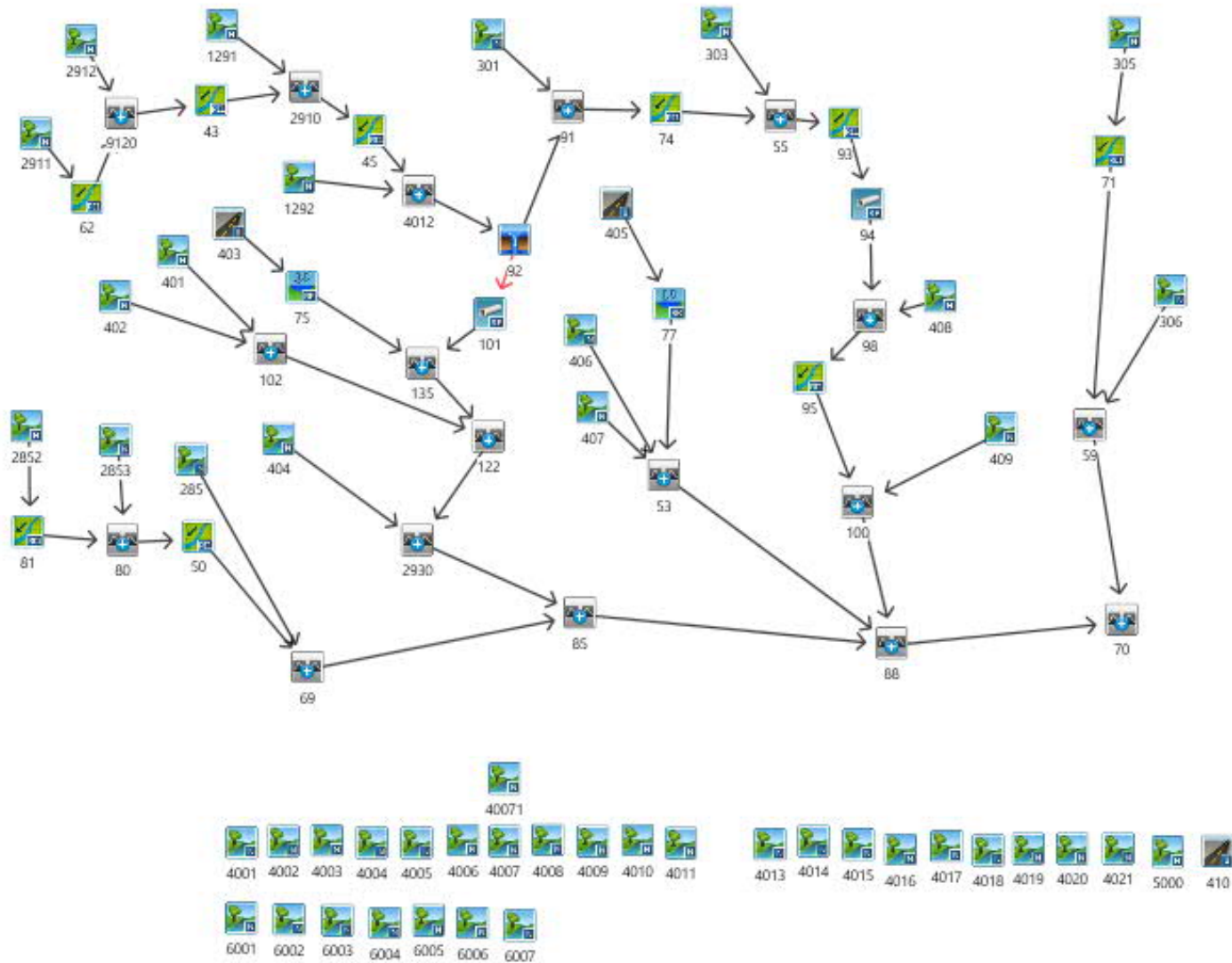
*
** CALI B NASHYD 0305 1 10.0 79.30 6.18 11.50 144.64 0.68 0.000
[CN=74.0]
[N = 3.0:Tp 1.52]

*
CHANNEL[2: 0305] 0071 1 10.0 79.30 6.19 11.67 144.64 n/a 0.000

*
ADD [0306+ 0071] 0059 3 10.0 107.30 8.52 11.50 144.64 n/a 0.000

*
ADD [0059+ 0088] 0070 3 5.0 931.30 61.82 11.67 146.04 n/a 0.000

Milton Logistics Hub 2020 Visual Otthymo – 2yr to Regional - Proposed Conditions



```

*****
** SIMULATION: Run 01 **
*****
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

** CALI B NASHYD          2912 1 10.0 112.70 0.28 4.33 3.82 0.15 0.000
[CN=75.0 ]
[ N = 3.0: Tp 1.96 ]
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

*
** CALI B NASHYD          2911 1 10.0 40.10 0.12 3.50 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0: Tp 1.25 ]
*
CHANNEL [ 2: 2911] 0062 1 10.0 40.10 0.11 4.17 3.65 n/a 0.000
*
ADD [ 2912+ 0062] 9120 3 10.0 152.80 0.39 4.33 3.77 n/a 0.000
*
CHANNEL [ 2: 9120] 0043 1 10.0 152.80 0.35 4.83 3.77 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

*
** CALI B NASHYD          1291 1 10.0 132.70 0.25 5.17 3.82 0.15 0.000
[CN=75.0 ]
[ N = 3.0: Tp 2.77 ]
*
ADD [ 1291+ 0043] 2910 3 10.0 285.50 0.61 5.00 3.79 n/a 0.000
*
CHANNEL [ 2: 2910] 0045 1 10.0 285.50 0.60 5.17 3.79 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

*
** CALI B NASHYD          0408 1 10.0 7.40 0.04 2.00 3.81 0.15 0.000
[CN=75.0 ]
[ N = 3.0: Tp 0.41 ]
*
ADD [ 0408+ 0094] 0098 3 5.0 87.10 0.28 3.42 3.74 n/a 0.000
*
CHANNEL [ 2: 0098] 0095 1 5.0 87.10 0.28 3.58 3.74 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

*
** CALI B NASHYD          0409 1 10.0 15.30 0.07 2.50 3.99 0.16 0.000
[CN=76.0 ]
[ N = 3.0: Tp 0.68 ]
*
ADD [ 0409+ 0095] 0100 3 5.0 102.40 0.33 3.42 3.78 n/a 0.000
*
PIPE [ 2: 0092] 0101 1 5.0 366.80 0.78 5.08 3.84 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

*
* CALI B STANDHYD        0403 1 10.0 52.80 1.64 1.67 13.83 0.55 0.000
[ I%=50.0: S%= 0.50 ]
*
RESRVR [ 2: 0403] 0075 1 5.0 52.80 0.01 6.58 8.62 n/a 0.000
{ST= 0.71 ha.m }
*
ADD [ 0101+ 0075] 0135 3 5.0 419.60 0.79 5.08 4.44 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

```

```

fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

*
** CALI B NASHYD          1292 1 10.0 81.30 0.18 4.83 3.99 0.16 0.000
[CN=76.0 ]
[ N = 3.0: Tp 2.37 ]
*
ADD [ 1292+ 0045] 4012 3 10.0 366.80 0.78 5.17 3.84 n/a 0.000
*
DUHYD                    0092 1 10.0 366.80 0.78 5.17 3.84 n/a 0.000
MAJOR SYSTEM:           0092 2 10.0 0.00 0.00 0.00 0.00 n/a 0.000
MINOR SYSTEM:           0092 3 10.0 366.80 0.78 5.17 3.84 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

*
** CALI B NASHYD          0301 1 10.0 34.40 0.13 2.67 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0: Tp 0.77 ]
*
ADD [ 0301+ 0092] 0091 3 10.0 34.40 0.13 2.67 3.66 n/a 0.000
*
CHANNEL [ 2: 0091] 0074 1 10.0 34.40 0.11 3.33 3.64 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

*
** CALI B NASHYD          0303 1 10.0 45.30 0.16 3.00 3.82 0.15 0.000
[CN=75.0 ]
[ N = 3.0: Tp 1.00 ]
*
ADD [ 0303+ 0074] 0055 3 10.0 79.70 0.27 3.17 3.74 n/a 0.000
*
CHANNEL [ 2: 0055] 0093 1 10.0 79.70 0.26 3.50 3.74 n/a 0.000
*
PIPE [ 2: 0093] 0094 1 5.0 79.70 0.26 3.58 3.74 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

*
** CALI B NASHYD          0401 1 10.0 10.60 0.04 2.50 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0: Tp 0.72 ]
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

*
** CALI B NASHYD          0402 1 10.0 16.60 0.04 4.67 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0: Tp 2.28 ]
*
ADD [ 0401+ 0402] 0102 3 10.0 27.20 0.06 3.50 3.66 n/a 0.000
*
ADD [ 0102+ 0135] 0122 3 5.0 446.80 0.83 5.08 4.39 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

*
** CALI B NASHYD          0404 1 10.0 4.60 0.02 2.17 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0: Tp 0.54 ]
*
ADD [ 0122+ 0404] 2930 3 5.0 451.40 0.83 5.00 4.38 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

*
** CALI B NASHYD          2853 1 10.0 137.80 0.30 4.67 3.82 0.15 0.000
[CN=75.0 ]
[ N = 3.0: Tp 2.34 ]
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr. stm

```

[Ptot= 25.00 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B NASHYD 2852 1 10.0 17.50 0.07 2.67 3.66 0.15 0.000
[CN=74.0]
[N = 3.0: Tp 0.75]

* CHANNEL[2: 2852] 0081 1 5.0 17.50 0.04 3.92 3.62 n/a 0.000

* ADD [2853+ 0081] 0080 3 5.0 155.30 0.34 4.67 3.80 n/a 0.000

* CHANNEL[2: 0080] 0050 1 5.0 155.30 0.33 4.83 3.80 n/a 0.000

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B NASHYD 0285 1 10.0 48.60 0.17 3.17 3.82 0.15 0.000
[CN=75.0]
[N = 3.0: Tp 1.03]

* ADD [0285+ 0050] 0069 3 5.0 203.90 0.45 4.33 3.80 n/a 0.000

* ADD [2930+ 0069] 0085 3 5.0 655.30 1.26 4.75 4.20 n/a 0.000

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B NASHYD 0407 1 10.0 9.90 0.09 1.50 3.14 0.13 0.000
[CN=74.0]
[N = 3.0: Tp 0.12]

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

[CN=74.0]
[N = 3.0: Tp 1.29]

* ADD [0306+ 0071] 0059 3 10.0 105.20 0.29 3.83 3.66 n/a 0.000

* ADD [0059+ 0088] 0070 3 5.0 929.20 1.81 4.33 4.33 n/a 0.000

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B NASHYD 4013 1 10.0 3.30 0.02 2.33 3.82 0.15 0.000
[CN=75.0]
[N = 3.0: Tp 0.56]

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B NASHYD 4015 1 10.0 2.10 0.01 2.00 3.81 0.15 0.000
[CN=75.0]
[N = 3.0: Tp 0.41]

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B NASHYD 4014 1 10.0 63.10 0.21 3.33 3.82 0.15 0.000
[CN=75.0]
[N = 3.0: Tp 1.13]

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B NASHYD 0406 1 10.0 6.60 0.03 2.50 3.66 0.15 0.000
[CN=74.0]
[N = 3.0: Tp 0.71]

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B STANDHYD 0405 1 10.0 49.80 1.55 1.67 13.83 0.55 0.000
[I%=50.0: S%= 0.50]

* RESRVR [2: 0405] 0077 1 5.0 49.80 0.01 6.58 8.62 n/a 0.000
{ST= 0.67 ha.m }

* ADD [0406+ 0407] 0053 3 10.0 16.50 0.09 1.50 3.35 n/a 0.000

* ADD [0053+ 0077] 0053 1 5.0 66.30 0.54 8.00 7.55 n/a 0.000

* ADD [0100+ 0053] 0088 3 5.0 168.70 0.57 8.00 5.26 n/a 0.000

* ADD [0088+ 0085] 0088 1 5.0 824.00 1.53 4.42 4.42 n/a 0.000

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B NASHYD 0305 1 10.0 77.20 0.21 4.00 3.66 0.15 0.000
[CN=74.0]
[N = 3.0: Tp 1.52]

* CHANNEL[2: 0305] 0071 1 10.0 77.20 0.21 4.00 3.66 n/a 0.000

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B NASHYD 0306 1 10.0 28.00 0.08 3.50 3.66 0.15 0.000

* CALI B NASHYD 4003 1 10.0 0.80 0.01 1.83 4.34 0.17 0.000
[CN=78.0]
[N = 3.0: Tp 0.33]

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B NASHYD 4010 1 10.0 2.50 0.01 2.50 4.36 0.17 0.000
[CN=78.0]
[N = 3.0: Tp 0.74]

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B NASHYD 4004 1 10.0 0.40 0.00 1.83 4.34 0.17 0.000
[CN=78.0]
[N = 3.0: Tp 0.33]

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B NASHYD 4007 1 10.0 0.70 0.01 1.83 4.34 0.17 0.000
[CN=78.0]
[N = 3.0: Tp 0.33]

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr.stm

* CALI B NASHYD 4011 1 10.0 54.60 0.14 4.33 3.82 0.15 0.000
[CN=75.0]
[N = 3.0: Tp 1.81]

```

*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             4017 1 10.0   7.60   0.04   2.00   3.82 0.15   0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.45]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             4006 1 10.0   0.40   0.00   1.83   4.34 0.17   0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             4001 1 10.0   1.70   0.01   1.83   5.00 0.20   0.000
  [CN=81.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             4005 1 10.0   0.40   0.00   1.83   4.34 0.17   0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             4009 1 10.0   1.00   0.01   1.83   4.34 0.17   0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             6001 1 10.0   2.20   0.01   2.17   4.36 0.17   0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.47]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             6002 1 10.0   5.50   0.03   2.17   4.17 0.17   0.000
  [CN=77.0 ]
  [ N = 3.0:Tp 0.49]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             4020 1 10.0  10.00   0.07   2.00   4.35 0.17   0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.40]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*

```

```

  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             4019 1 10.0   2.40   0.02   1.83   3.80 0.15   0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             4008 1 10.0   3.60   0.03   1.83   4.35 0.17   0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             4018 1 10.0   1.80   0.01   1.83   3.80 0.15   0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             4002 1 10.0   3.10   0.02   1.83   4.35 0.17   0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             6003 1 10.0   0.70   0.00   1.83   3.80 0.15   0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             6004 1 10.0   1.00   0.01   1.83   3.80 0.15   0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             6005 1 10.0   1.40   0.01   1.83   4.15 0.17   0.000
  [CN=77.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             6006 1 10.0   0.50   0.00   1.83   3.80 0.15   0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 25.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4
-a442-4790-a20d-
  remark: 25mm-4hr. stm

*
* CALI B NASHYD             6007 1 10.0   0.50   0.00   1.83   3.80 0.15   0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]

```

* READ STORM 10.0
[Ptot= 25.00 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr. stm

* CALIB NASHYD 4021 1 10.0 154.50 0.42 4.67 4.57 0.18 0.000
[CN=79.0]
[N = 3.0:Tp 2.22]

* READ STORM 10.0
[Ptot= 25.00 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr. stm

* CALIB NASHYD 40071 1 10.0 1.70 0.01 2.00 4.35 0.17 0.000
[CN=78.0]
[N = 3.0:Tp 0.39]

* READ STORM 10.0
[Ptot= 25.00 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr. stm

* CALIB NASHYD 4016 1 10.0 108.80 0.35 3.33 3.82 0.15 0.000
[CN=75.0]
[N = 3.0:Tp 1.20]

* READ STORM 10.0
[Ptot= 25.00 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr. stm

* CALIB NASHYD 5000 1 10.0 49.80 0.09 5.17 3.66 0.15 0.000
[CN=74.0]
[N = 3.0:Tp 2.82]

* READ STORM 10.0
[Ptot= 25.00 mm]

[CN=75.0]
[N = 3.0:Tp 2.77]

* ADD [1291+ 0043] 2910 3 10.0 285.50 1.57 11.00 14.09 n/a 0.000

* CHANNEL[2: 2910] 0045 1 10.0 285.50 1.56 11.17 14.09 n/a 0.000

* READ STORM 10.0
[Ptot= 47.43 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 1292 1 10.0 81.30 0.46 10.83 14.68 0.31 0.000
[CN=76.0]
[N = 3.0:Tp 2.37]

* ADD [1292+ 0045] 4012 3 10.0 366.80 2.01 11.00 14.22 n/a 0.000

* DUHYD 0092 1 10.0 366.80 2.01 11.00 14.22 n/a 0.000
MAJOR SYSTEM: 0092 2 10.0 0.00 0.00 0.00 0.00 n/a 0.000
MINOR SYSTEM: 0092 3 10.0 366.80 2.01 11.00 14.22 n/a 0.000

* READ STORM 10.0
[Ptot= 47.43 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0301 1 10.0 34.40 0.42 8.83 13.67 0.29 0.000
[CN=74.0]
[N = 3.0:Tp 0.77]

* ADD [0301+ 0092] 0091 3 10.0 34.40 0.42 8.83 13.67 n/a 0.000

* CHANNEL[2: 0091] 0074 1 10.0 34.40 0.35 9.33 13.65 n/a 0.000

* READ STORM 10.0
[Ptot= 47.43 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0303 1 10.0 45.30 0.47 9.17 14.16 0.30 0.000
[CN=75.0]

fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\41eab7b4-a442-4790-a20d-remark: 25mm-4hr. stm

* CALIB STANDHYD 0410 1 10.0 17.60 0.55 1.67 13.83 0.55 0.000
[I%=50.0:S%= 0.50]

** SIMULATION: Run 02 **

* READ STORM 10.0
[Ptot= 47.43 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 2912 1 10.0 112.70 0.71 10.33 14.16 0.30 0.000
[CN=75.0]
[N = 3.0:Tp 1.96]

* READ STORM 10.0
[Ptot= 47.43 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 2911 1 10.0 40.10 0.34 9.50 13.67 0.29 0.000
[CN=74.0]
[N = 3.0:Tp 1.25]

* CHANNEL[2: 2911] 0062 1 10.0 40.10 0.31 10.00 13.66 n/a 0.000

* ADD [2912+ 0062] 9120 3 10.0 152.80 1.01 10.17 14.03 n/a 0.000

* CHANNEL[2: 9120] 0043 1 10.0 152.80 0.95 10.67 14.03 n/a 0.000

* READ STORM 10.0
[Ptot= 47.43 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 1291 1 10.0 132.70 0.64 11.50 14.16 0.30 0.000

[N = 3.0:Tp 1.00]

* ADD [0303+ 0074] 0055 3 10.0 79.70 0.82 9.17 13.94 n/a 0.000

* CHANNEL[2: 0055] 0093 1 10.0 79.70 0.78 9.50 13.94 n/a 0.000

* PIPE [2: 0093] 0094 1 5.0 79.70 0.78 9.42 13.94 n/a 0.000

* READ STORM 10.0
[Ptot= 47.43 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0408 1 10.0 7.40 0.14 8.33 14.14 0.30 0.000
[CN=75.0]
[N = 3.0:Tp 0.41]

* ADD [0408+ 0094] 0098 3 5.0 87.10 0.83 9.42 13.96 n/a 0.000

* CHANNEL[2: 0098] 0095 1 5.0 87.10 0.82 9.50 13.95 n/a 0.000

* READ STORM 10.0
[Ptot= 47.43 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0409 1 10.0 15.30 0.22 8.67 14.68 0.31 0.000
[CN=76.0]
[N = 3.0:Tp 0.68]

* ADD [0409+ 0095] 0100 3 5.0 102.40 0.98 9.33 14.06 n/a 0.000

* PIPE [2: 0092] 0101 1 5.0 366.80 2.01 11.08 14.22 n/a 0.000

* READ STORM 10.0
[Ptot= 47.43 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB STANDHYD 0403 1 10.0 52.80 3.00 8.17 30.05 0.63 0.000
[I%=50.0:S%= 0.50]

```

RESRVR [ 2: 0403] 0075 1 5.0 52.80 0.06 18.00 19.75 n/a 0.000
{ST= 1.32 ha.m }
*
ADD [ 0101+ 0075] 0135 3 5.0 419.60 2.03 11.08 14.92 n/a 0.000
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B NASHYD 0401 1 10.0 10.60 0.13 8.83 13.67 0.29 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.72]
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B NASHYD 0402 1 10.0 16.60 0.09 10.83 13.67 0.29 0.000
[CN=74.0 ]
[ N = 3.0:Tp 2.28]
*
ADD [ 0401+ 0402] 0102 3 10.0 27.20 0.17 9.00 13.67 n/a 0.000
*
ADD [ 0102+ 0135] 0122 3 5.0 446.80 2.15 11.08 14.84 n/a 0.000
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B NASHYD 0404 1 10.0 4.60 0.07 8.50 13.66 0.29 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.54]
*
ADD [ 0122+ 0404] 2930 3 5.0 451.40 2.17 11.08 14.83 n/a 0.000
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-

```

```

[CN=74.0 ]
[ N = 3.0:Tp 0.12]
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B NASHYD 0406 1 10.0 6.60 0.08 8.83 13.67 0.29 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.71]
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B STANDHYD 0405 1 10.0 49.80 2.82 8.17 30.05 0.63 0.000
[1%=50.0: S%= 0.50]
*
RESRVR [ 2: 0405] 0077 1 5.0 49.80 0.05 20.67 19.18 n/a 0.000
{ST= 1.29 ha.m }
*
ADD [ 0406+ 0407] 0053 3 10.0 16.50 0.37 8.00 12.51 n/a 0.000
*
ADD [ 0053+ 0077] 0053 1 5.0 66.30 0.37 8.00 17.62 n/a 0.000
*
ADD [ 0100+ 0053] 0088 3 5.0 168.70 1.10 9.33 15.46 n/a 0.000
*
ADD [ 0088+ 0085] 0088 1 5.0 824.00 3.92 10.33 14.78 n/a 0.000
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B NASHYD 0305 1 10.0 77.20 0.57 9.83 13.67 0.29 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.52]
*
CHANNEL [ 2: 0305] 0071 1 10.0 77.20 0.56 9.83 13.67 n/a 0.000
*

```

```

-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B NASHYD 2853 1 10.0 137.80 0.76 10.83 14.16 0.30 0.000
[CN=75.0 ]
[ N = 3.0:Tp 2.34]
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B NASHYD 2852 1 10.0 17.50 0.22 8.83 13.67 0.29 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.75]
*
CHANNEL [ 2: 2852] 0081 1 5.0 17.50 0.15 9.42 13.63 n/a 0.000
*
ADD [ 2853+ 0081] 0080 3 5.0 155.30 0.85 10.50 14.10 n/a 0.000
*
CHANNEL [ 2: 0080] 0050 1 5.0 155.30 0.84 10.75 14.10 n/a 0.000
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B NASHYD 0285 1 10.0 48.60 0.49 9.17 14.16 0.30 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.03]
*
ADD [ 0285+ 0050] 0069 3 5.0 203.90 1.17 10.08 14.12 n/a 0.000
*
ADD [ 2930+ 0069] 0085 3 5.0 655.30 3.24 10.75 14.61 n/a 0.000
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B NASHYD 0407 1 10.0 9.90 0.35 8.00 11.73 0.25 0.000
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B NASHYD 0306 1 10.0 28.00 0.23 9.50 13.67 0.29 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.29]
*
ADD [ 0306+ 0071] 0059 3 10.0 105.20 0.79 9.83 13.67 n/a 0.000
*
ADD [ 0059+ 0088] 0070 3 5.0 929.20 4.67 10.25 14.66 n/a 0.000
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B NASHYD 4013 1 10.0 3.30 0.05 8.67 14.16 0.30 0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.56]
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B NASHYD 4015 1 10.0 2.10 0.04 8.33 14.14 0.30 0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.41]
*
READ STORM 10.0
[ Ptot= 47.43 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALI B NASHYD 4014 1 10.0 63.10 0.60 9.33 14.16 0.30 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.13]

```



```

*
  READ STORM                10.0
  [ Ptot= 47.43 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD              6003 1 10.0 0.70 0.02 8.33 14.11 0.30 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 47.43 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD              6004 1 10.0 1.00 0.02 8.33 14.11 0.30 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 47.43 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD              6005 1 10.0 1.40 0.03 8.33 15.16 0.32 0.000
  [CN=77.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 47.43 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD              6006 1 10.0 0.50 0.01 8.33 14.11 0.30 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 47.43 mm ]

```

```

  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD              5000 1 10.0 49.80 0.23 11.50 13.67 0.29 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 2.82]
*
  READ STORM                10.0
  [ Ptot= 47.43 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB STANDHYD           0410 1 10.0 17.60 1.00 8.17 30.05 0.63 0.000
  [I%=50.0:S%= 0.50]
*
*****
** SIMULATION: Run 03 **
*****
  READ STORM                10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALIB NASHYD            2912 1 10.0 112.70 1.30 10.33 26.07 0.39 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.96]
*
  READ STORM                10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALIB NASHYD            2911 1 10.0 40.10 0.63 9.50 25.28 0.38 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.25]
*
  CHANNEL[ 2: 2911] 0062 1 10.0 40.10 0.59 9.83 25.27 n/a 0.000
*
  ADD [ 2912+ 0062] 9120 3 10.0 152.80 1.87 10.17 25.86 n/a 0.000
*
  CHANNEL[ 2: 9120] 0043 1 10.0 152.80 1.78 10.67 25.85 n/a 0.000
*

```

```

  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD              6007 1 10.0 0.50 0.01 8.33 14.11 0.30 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 47.43 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD              4021 1 10.0 154.50 1.03 10.67 16.37 0.35 0.000
  [CN=79.0 ]
  [ N = 3.0:Tp 2.22]
*
  READ STORM                10.0
  [ Ptot= 47.43 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD              40071 1 10.0 1.70 0.04 8.33 15.75 0.33 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.39]
*
  READ STORM                10.0
  [ Ptot= 47.43 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD              4016 1 10.0 108.80 0.99 9.33 14.16 0.30 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.20]
*
  READ STORM                10.0
  [ Ptot= 47.43 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\9e87b13d-4436-4d54-8fde-

```

```

  READ STORM                10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALIB NASHYD            1291 1 10.0 132.70 1.18 11.33 26.07 0.39 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 2.77]
*
  ADD [ 1291+ 0043] 2910 3 10.0 285.50 2.91 10.83 25.95 n/a 0.000
*
  CHANNEL[ 2: 2910] 0045 1 10.0 285.50 2.89 11.00 25.95 n/a 0.000
*
  READ STORM                10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALIB NASHYD            1292 1 10.0 81.30 0.84 10.83 26.89 0.40 0.000
  [CN=76.0 ]
  [ N = 3.0:Tp 2.37]
*
  ADD [ 1292+ 0045] 4012 3 10.0 366.80 3.73 11.00 26.16 n/a 0.000
*
  DUHYD                    0092 1 10.0 366.80 3.73 11.00 26.16 n/a 0.000
  MAJOR SYSTEM:           0092 2 10.0 0.00 0.00 0.00 0.00 n/a 0.000
  MINOR SYSTEM:           0092 3 10.0 366.80 3.73 11.00 26.16 n/a 0.000
*
  READ STORM                10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALIB NASHYD            0301 1 10.0 34.40 0.77 8.83 25.28 0.38 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.77]
*
  ADD [ 0301+ 0092] 0091 3 10.0 34.40 0.77 8.83 25.28 n/a 0.000
*
  CHANNEL[ 2: 0091] 0074 1 10.0 34.40 0.68 9.17 25.26 n/a 0.000
*
  READ STORM                10.0

```

[Ptot= 66.79 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0303 1 10.0 45.30 0.87 9.17 26.07 0.39 0.000
[CN=75.0]
[N = 3.0:Tp 1.00]
* ADD [0303+ 0074] 0055 3 10.0 79.70 1.54 9.17 25.72 n/a 0.000
* CHANNEL [2: 0055] 0093 1 10.0 79.70 1.48 9.33 25.72 n/a 0.000
* PIPE [2: 0093] 0094 1 5.0 79.70 1.48 9.33 25.72 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0408 1 10.0 7.40 0.26 8.33 26.03 0.39 0.000
[CN=75.0]
[N = 3.0:Tp 0.41]
* ADD [0408+ 0094] 0098 3 5.0 87.10 1.57 9.33 25.74 n/a 0.000
* CHANNEL [2: 0098] 0095 1 5.0 87.10 1.56 9.33 25.74 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0409 1 10.0 15.30 0.40 8.67 26.88 0.40 0.000
[CN=76.0]
[N = 3.0:Tp 0.68]
* ADD [0409+ 0095] 0100 3 5.0 102.40 1.86 9.25 25.91 n/a 0.000
* PIPE [2: 0092] 0101 1 5.0 366.80 3.73 10.92 26.16 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]

[CN=74.0]
[N = 3.0:Tp 0.54]
* ADD [0122+ 0404] 2930 3 5.0 451.40 4.18 10.92 27.12 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 2853 1 10.0 137.80 1.39 10.83 26.07 0.39 0.000
[CN=75.0]
[N = 3.0:Tp 2.34]

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 2852 1 10.0 17.50 0.40 8.83 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 0.75]

* CHANNEL [2: 2852] 0081 1 5.0 17.50 0.31 9.33 25.24 n/a 0.000
* ADD [2853+ 0081] 0080 3 5.0 155.30 1.56 10.50 25.98 n/a 0.000
* CHANNEL [2: 0080] 0050 1 5.0 155.30 1.56 10.75 25.98 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0285 1 10.0 48.60 0.91 9.17 26.07 0.39 0.000
[CN=75.0]
[N = 3.0:Tp 1.03]

* ADD [0285+ 0050] 0069 3 5.0 203.90 2.17 9.92 26.00 n/a 0.000
* ADD [2930+ 0069] 0085 3 5.0 655.30 6.18 10.75 26.77 n/a 0.000

fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB STANDHYD 0403 1 10.0 52.80 5.04 8.00 45.54 0.68 0.000
[I%=50.0:S%= 0.50]
* RESRVR [2: 0403] 0075 1 5.0 52.80 0.20 12.42 34.89 n/a 0.000
{ST= 1.71 ha.m }
* ADD [0101+ 0075] 0135 3 5.0 419.60 3.93 11.00 27.26 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0401 1 10.0 10.60 0.25 8.83 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 0.72]

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0402 1 10.0 16.60 0.16 10.83 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 2.28]

* ADD [0401+ 0402] 0102 3 10.0 27.20 0.32 9.00 25.28 n/a 0.000
* ADD [0102+ 0135] 0122 3 5.0 446.80 4.15 10.92 27.14 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0404 1 10.0 4.60 0.13 8.50 25.27 0.38 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0407 1 10.0 9.90 0.65 8.00 21.69 0.32 0.000
[CN=74.0]
[N = 3.0:Tp 0.12]

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0406 1 10.0 6.60 0.16 8.83 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 0.71]

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB STANDHYD 0405 1 10.0 49.80 4.75 8.00 45.54 0.68 0.000
[I%=50.0:S%= 0.50]

* RESRVR [2: 0405] 0077 1 5.0 49.80 0.17 13.08 34.21 n/a 0.000
{ST= 1.65 ha.m }
* ADD [0406+ 0407] 0053 3 10.0 16.50 0.69 8.00 23.13 n/a 0.000
* ADD [0053+ 0077] 0053 1 5.0 66.30 0.70 8.00 31.61 n/a 0.000

* ADD [0100+ 0053] 0088 3 5.0 168.70 2.14 9.25 28.15 n/a 0.000
* ADD [0088+ 0085] 0088 1 5.0 824.00 7.59 10.25 27.05 n/a 0.000

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      0305 1 10.0  77.20  1.04  9.83  25.28  0.38  0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.52]

* CHANNEL [ 2: 0305] 0071 1 10.0  77.20  1.04  9.83  25.28  n/a  0.000

READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      0306 1 10.0  28.00  0.43  9.50  25.28  0.38  0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.29]

* ADD [ 0306+ 0071] 0059 3 10.0  105.20  1.46  9.67  25.28  n/a  0.000

* ADD [ 0059+ 0088] 0070 3 5.0  929.20  8.98  10.08  26.85  n/a  0.000

READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4013 1 10.0  3.30  0.09  8.50  26.06  0.39  0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.56]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4015 1 10.0  2.10  0.07  8.33  26.02  0.39  0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.41]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
```

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4007 1 10.0  0.70  0.03  8.33  28.50  0.43  0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.33]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4011 1 10.0  54.60  0.67  10.17  26.07  0.39  0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.81]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4017 1 10.0  7.60  0.25  8.50  26.04  0.39  0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.45]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4006 1 10.0  0.40  0.02  8.33  28.50  0.43  0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.33]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4014 1 10.0  63.10  1.10  9.33  26.07  0.39  0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.13]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4003 1 10.0  0.80  0.04  8.33  28.50  0.43  0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.33]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4010 1 10.0  2.50  0.07  8.83  28.61  0.43  0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.74]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4004 1 10.0  0.40  0.02  8.33  28.50  0.43  0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.33]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

```
* CALIB NASHYD      4001 1 10.0  1.70  0.09  8.33  31.33  0.47  0.000
[CN=81.0 ]
[ N = 3.0:Tp 0.33]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4005 1 10.0  0.40  0.02  8.33  28.50  0.43  0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.33]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4019 1 10.0  2.40  0.10  8.33  25.97  0.39  0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.33]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4008 1 10.0  3.60  0.16  8.33  28.50  0.43  0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.33]

* READ STORM          10.0
[ Ptot= 66.79 mm ]
fname :
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

```
* CALIB NASHYD      4018 1 10.0  1.80  0.07  8.33  25.97  0.39  0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.33]
```

```

*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4002 1 10.0   3.10   0.14   8.33  28.50  0.43   0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4009 1 10.0   1.00   0.05   8.33  28.50  0.43   0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6001 1 10.0   2.20   0.08   8.50  28.59  0.43   0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.47]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6002 1 10.0   5.50   0.19   8.50  27.71  0.41   0.000
  [CN=77.0 ]
  [ N = 3.0:Tp 0.49]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6006 1 10.0   0.50   0.02   8.33  25.96  0.39   0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6007 1 10.0   0.50   0.02   8.33  25.96  0.39   0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4021 1 10.0  154.50   1.87  10.67  29.53  0.44   0.000
  [CN=79.0 ]
  [ N = 3.0:Tp 2.22]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        40071 1 10.0   1.70   0.07   8.33  28.56  0.43   0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.39]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4020 1 10.0   10.00   0.41   8.33  28.56  0.43   0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.40]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6003 1 10.0   0.70   0.03   8.33  25.97  0.39   0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6004 1 10.0   1.00   0.04   8.33  25.97  0.39   0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6005 1 10.0   1.40   0.06   8.33  27.62  0.41   0.000
  [CN=77.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4016 1 10.0  108.80   1.82   9.33  26.07  0.39   0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.20]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        5000 1 10.0   49.80   0.42  11.50  25.28  0.38   0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 2.82]
*
  READ STORM          10.0
  [ Ptot= 66.79 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\424c0483
-0721-4d94-8520-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB STANDHYD      0410 1 10.0   17.60   1.68   8.00  45.54  0.68   0.000
  [I%=50.0:S%= 0.50]
*
*****
** SIMULATION: Run 04 **
*****
  READ STORM          10.0
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALIB NASHYD      2912 1 10.0  112.70   1.75  10.33  34.93  0.44   0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.96]
*
  READ STORM          10.0
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALIB NASHYD      2911 1 10.0   40.10   0.85   9.50  33.95  0.43   0.000

```

[CN=74.0
[N = 3.0:Tp 1.25]

* CHANNEL [2: 2911] 0062 1 10.0 40.10 0.80 9.83 33.94 n/a 0.000

* ADD [2912+ 0062] 9120 3 10.0 152.80 2.52 10.17 34.67 n/a 0.000

* CHANNEL [2: 9120] 0043 1 10.0 152.80 2.42 10.50 34.66 n/a 0.000

* READ STORM
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD [CN=75.0
[N = 3.0:Tp 2.77]

* ADD [1291+ 0043] 2910 3 10.0 285.50 3.93 10.83 34.79 n/a 0.000

* CHANNEL [2: 2910] 0045 1 10.0 285.50 3.91 11.00 34.79 n/a 0.000

* READ STORM
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD [CN=76.0
[N = 3.0:Tp 2.37]

* ADD [1292+ 0045] 4012 3 10.0 366.80 5.03 10.83 35.04 n/a 0.000

* DIJHYD 0092 1 10.0 366.80 5.03 10.83 35.04 n/a 0.000

* MAJOR SYSTEM: 0092 2 10.0 0.00 0.00 0.00 0.00 n/a 0.000

* MINOR SYSTEM: 0092 3 10.0 366.80 5.03 10.83 35.04 n/a 0.000

* READ STORM
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

[CN=76.0
[N = 3.0:Tp 0.68]

* ADD [0409+ 0095] 0100 3 5.0 102.40 2.55 9.25 34.73 n/a 0.000

* PIPE [2: 0092] 0101 1 5.0 366.80 5.03 10.92 35.04 n/a 0.000

* READ STORM
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB STANDHYD [I%=50.0: S%= 0.50] 0403 1 10.0 52.80 6.20 8.00 56.27 0.71 0.000

* RESRVR [2: 0403] 0075 1 5.0 52.80 0.31 11.50 45.47 n/a 0.000
{ST= 2.01 ha.m }

* ADD [0101+ 0075] 0135 3 5.0 419.60 5.34 10.92 36.35 n/a 0.000

* READ STORM
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD [CN=74.0
[N = 3.0:Tp 0.72]

* READ STORM
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD [CN=74.0
[N = 3.0:Tp 2.28]

* ADD [0401+ 0402] 0102 3 10.0 27.20 0.44 9.00 33.95 n/a 0.000

* ADD [0102+ 0135] 0122 3 5.0 446.80 5.65 10.92 36.21 n/a 0.000

** CALIB NASHYD [CN=74.0
[N = 3.0:Tp 0.77]

* ADD [0301+ 0092] 0091 3 10.0 34.40 1.04 8.83 33.95 n/a 0.000

* CHANNEL [2: 0091] 0074 1 10.0 34.40 0.92 9.17 33.93 n/a 0.000

* READ STORM
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD [CN=75.0
[N = 3.0:Tp 1.00]

* ADD [0303+ 0074] 0055 3 10.0 79.70 2.09 9.17 34.50 n/a 0.000

* CHANNEL [2: 0055] 0093 1 10.0 79.70 2.02 9.33 34.49 n/a 0.000

* PIPE [2: 0093] 0094 1 5.0 79.70 2.01 9.33 34.49 n/a 0.000

* READ STORM
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD [CN=75.0
[N = 3.0:Tp 0.41]

* ADD [0408+ 0094] 0098 3 5.0 87.10 2.14 9.25 34.52 n/a 0.000

* CHANNEL [2: 0098] 0095 1 5.0 87.10 2.13 9.33 34.52 n/a 0.000

* READ STORM
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0409 1 10.0 15.30 0.54 8.67 35.93 0.45 0.000

READ STORM
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD [CN=74.0
[N = 3.0:Tp 0.54]

* ADD [0122+ 0404] 2930 3 5.0 451.40 5.68 10.92 36.18 n/a 0.000

* READ STORM
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD [CN=75.0
[N = 3.0:Tp 2.34]

* READ STORM
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD [CN=74.0
[N = 3.0:Tp 0.75]

* CHANNEL [2: 2852] 0081 1 5.0 17.50 0.43 9.25 33.91 n/a 0.000

* ADD [2853+ 0081] 0080 3 5.0 155.30 2.10 10.50 34.81 n/a 0.000

* CHANNEL [2: 0080] 0050 1 5.0 155.30 2.10 10.67 34.81 n/a 0.000

* READ STORM
[Ptot= 79.58 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

* CALI B NASHYD      0285 1 10.0 48.60 1.22 9.17 34.93 0.44 0.000
  [CN=75.0          ]
  [ N = 3.0:Tp 1.03]
*
* ADD [ 0285+ 0050] 0069 3 5.0 203.90 2.94 9.83 34.84 n/a 0.000
*
* ADD [ 2930+ 0069] 0085 3 5.0 655.30 8.39 10.67 35.77 n/a 0.000
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      0407 1 10.0 9.90 0.89 8.00 29.13 0.37 0.000
  [CN=74.0          ]
  [ N = 3.0:Tp 0.12]
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      0406 1 10.0 6.60 0.21 8.83 33.95 0.43 0.000
  [CN=74.0          ]
  [ N = 3.0:Tp 0.71]
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B STANDHYD    0405 1 10.0 49.80 5.85 8.00 56.27 0.71 0.000
  [I%=50.0:S%= 0.50]
*
* RESRVR [ 2: 0405] 0077 1 5.0 49.80 0.26 12.00 44.77 n/a 0.000
  {ST= 1.93 ha.m }
*
* ADD [ 0406+ 0407] 0053 3 10.0 16.50 0.93 8.00 31.06 n/a 0.000
*
* ADD [ 0053+ 0077] 0053 1 5.0 66.30 0.94 8.00 41.56 n/a 0.000
*
*
*
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      4015 1 10.0 2.10 0.10 8.33 34.87 0.44 0.000
  [CN=75.0          ]
  [ N = 3.0:Tp 0.41]
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      4014 1 10.0 63.10 1.48 9.33 34.93 0.44 0.000
  [CN=75.0          ]
  [ N = 3.0:Tp 1.13]
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      4003 1 10.0 0.80 0.05 8.33 37.89 0.48 0.000
  [CN=78.0          ]
  [ N = 3.0:Tp 0.33]
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      4010 1 10.0 2.50 0.09 8.83 38.03 0.48 0.000
  [CN=78.0          ]
  [ N = 3.0:Tp 0.74]
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*

```

```

* ADD [ 0100+ 0053] 0088 3 5.0 168.70 3.00 9.17 37.42 n/a 0.000
*
* ADD [ 0088+ 0085] 0088 1 5.0 824.00 10.37 10.17 36.10 n/a 0.000
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      0305 1 10.0 77.20 1.41 9.83 33.95 0.43 0.000
  [CN=74.0          ]
  [ N = 3.0:Tp 1.52]
*
* CHANNEL[ 2: 0305] 0071 1 10.0 77.20 1.41 9.83 33.95 n/a 0.000
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      0306 1 10.0 28.00 0.58 9.50 33.95 0.43 0.000
  [CN=74.0          ]
  [ N = 3.0:Tp 1.29]
*
* ADD [ 0306+ 0071] 0059 3 10.0 105.20 1.97 9.67 33.95 n/a 0.000
*
* ADD [ 0059+ 0088] 0070 3 5.0 929.20 12.27 10.08 35.86 n/a 0.000
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      4013 1 10.0 3.30 0.13 8.50 34.91 0.44 0.000
  [CN=75.0          ]
  [ N = 3.0:Tp 0.56]
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      4004 1 10.0 0.40 0.02 8.33 37.89 0.48 0.000
  [CN=78.0          ]
  [ N = 3.0:Tp 0.33]
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      4007 1 10.0 0.70 0.04 8.33 37.89 0.48 0.000
  [CN=78.0          ]
  [ N = 3.0:Tp 0.33]
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      4011 1 10.0 54.60 0.90 10.17 34.93 0.44 0.000
  [CN=75.0          ]
  [ N = 3.0:Tp 1.81]
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      4017 1 10.0 7.60 0.34 8.50 34.89 0.44 0.000
  [CN=75.0          ]
  [ N = 3.0:Tp 0.45]
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b
-f627-4166-a5de-
  remark: Mil ton IDF, based on AES Toronto Pearson International Ai rpo
*
* CALI B NASHYD      4006 1 10.0 0.40 0.02 8.33 37.89 0.48 0.000
  [CN=78.0          ]
  [ N = 3.0:Tp 0.33]

```



```

*
READ STORM                      10.0
[ Ptot= 79.58 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B NASHYD                    4016 1 10.0 108.80 2.45 9.33 34.93 0.44 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.20]

*
READ STORM                      10.0
[ Ptot= 79.58 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B NASHYD                    5000 1 10.0 49.80 0.57 11.50 33.95 0.43 0.000
[CN=74.0 ]
[ N = 3.0:Tp 2.82]

*
READ STORM                      10.0
[ Ptot= 79.58 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\0ec6bc5b-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B STANDHYD                  0410 1 10.0 17.60 2.07 8.00 56.27 0.71 0.000
[I%=50.0:S%= 0.50]

*****
** SIMULATION: Run_05 **
*****

READ STORM                      10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

**
CALI B NASHYD                    2912 1 10.0 112.70 2.38 10.33 47.27 0.49 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.96]

*

*
READ STORM                      10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

**
CALI B NASHYD                    0301 1 10.0 34.40 1.41 8.83 46.07 0.48 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.77]

*
ADD [ 0301+ 0092] 0091 3 10.0 34.40 1.41 8.83 46.07 n/a 0.000

*
CHANNEL [ 2: 0091] 0074 1 10.0 34.40 1.27 9.17 46.05 n/a 0.000

*
READ STORM                      10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

**
CALI B NASHYD                    0303 1 10.0 45.30 1.58 9.17 47.27 0.49 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.00]

*
ADD [ 0303+ 0074] 0055 3 10.0 79.70 2.85 9.17 46.75 n/a 0.000

*
CHANNEL [ 2: 0055] 0093 1 10.0 79.70 2.76 9.33 46.74 n/a 0.000

*
PIPE [ 2: 0093] 0094 1 5.0 79.70 2.76 9.25 46.74 n/a 0.000

*
READ STORM                      10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

**
CALI B NASHYD                    0408 1 10.0 7.40 0.48 8.33 47.19 0.49 0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.41]

*
ADD [ 0408+ 0094] 0098 3 5.0 87.10 2.95 9.25 46.78 n/a 0.000

*
CHANNEL [ 2: 0098] 0095 1 5.0 87.10 2.93 9.25 46.78 n/a 0.000

*

*
READ STORM                      10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

**
CALI B NASHYD                    2911 1 10.0 40.10 1.15 9.50 46.07 0.48 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.25]

*
CHANNEL [ 2: 2911] 0062 1 10.0 40.10 1.10 9.83 46.06 n/a 0.000

*
ADD [ 2912+ 0062] 9120 3 10.0 152.80 3.42 10.00 46.96 n/a 0.000

*
CHANNEL [ 2: 9120] 0043 1 10.0 152.80 3.32 10.50 46.95 n/a 0.000

*
READ STORM                      10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

**
CALI B NASHYD                    1291 1 10.0 132.70 2.15 11.33 47.27 0.49 0.000
[CN=75.0 ]
[ N = 3.0:Tp 2.77]

*
ADD [ 1291+ 0043] 2910 3 10.0 285.50 5.35 10.67 47.10 n/a 0.000

*
CHANNEL [ 2: 2910] 0045 1 10.0 285.50 5.31 10.83 47.10 n/a 0.000

*
READ STORM                      10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

**
CALI B NASHYD                    1292 1 10.0 81.30 1.53 10.83 48.50 0.50 0.000
[CN=76.0 ]
[ N = 3.0:Tp 2.37]

*
ADD [ 1292+ 0045] 4012 3 10.0 366.80 6.84 10.83 47.41 n/a 0.000

*
DUHYD
MAJOR SYSTEM: 0092 1 10.0 366.80 6.84 10.83 47.41 n/a 0.000
MINOR SYSTEM: 0092 2 10.0 0.00 0.00 0.00 0.00 n/a 0.000
0092 3 10.0 366.80 6.84 10.83 47.41 n/a 0.000

*
READ STORM                      10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

**
CALI B NASHYD                    0409 1 10.0 15.30 0.73 8.67 48.49 0.50 0.000
[CN=76.0 ]
[ N = 3.0:Tp 0.68]

*
ADD [ 0409+ 0095] 0100 3 5.0 102.40 3.51 9.17 47.03 n/a 0.000

*
PIPE [ 2: 0092] 0101 1 5.0 366.80 6.83 10.83 47.41 n/a 0.000

*
READ STORM                      10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B STANDHYD                  0403 1 10.0 52.80 7.63 8.00 70.62 0.73 0.000
[I%=50.0:S%= 0.50]

*
RESRVR [ 2: 0403] 0075 1 5.0 52.80 0.52 10.67 59.69 n/a 0.000
{ST= 2.38 ha.m }

*
ADD [ 0101+ 0075] 0135 3 5.0 419.60 7.36 10.83 48.96 n/a 0.000

*
READ STORM                      10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B NASHYD                    0401 1 10.0 10.60 0.45 8.83 46.07 0.48 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.72]

*
READ STORM                      10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

* CALI B NASHYD          0402 1 10.0 16.60 0.30 10.67 46.07 0.48 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 2.28]
*
* ADD [ 0401+ 0402] 0102 3 10.0 27.20 0.59 9.00 46.07 n/a 0.000
*
* ADD [ 0102+ 0135] 0122 3 5.0 446.80 7.78 10.75 48.78 n/a 0.000
*
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0404 1 10.0 4.60 0.24 8.50 46.05 0.48 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.54]
*
* ADD [ 0122+ 0404] 2930 3 5.0 451.40 7.82 10.75 48.75 n/a 0.000
*
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          2853 1 10.0 137.80 2.54 10.83 47.27 0.49 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 2.34]
*
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          2852 1 10.0 17.50 0.73 8.83 46.07 0.48 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.75]
*
* CHANNEL[ 2: 2852] 0081 1 5.0 17.50 0.60 9.25 46.03 n/a 0.000
*
* ADD [ 2853+ 0081] 0080 3 5.0 155.30 2.85 10.50 47.13 n/a 0.000
*

  [I%=50.0: S%= 0.50]
*
  RESRVR [ 2: 0405] 0077 1 5.0 49.80 0.41 11.17 58.95 n/a 0.000
  [ST= 2.31 ha.m ]
*
* ADD [ 0406+ 0407] 0053 3 10.0 16.50 1.27 8.00 42.15 n/a 0.000
*
* ADD [ 0053+ 0077] 0053 1 5.0 66.30 1.29 8.00 55.04 n/a 0.000
*
* ADD [ 0100+ 0053] 0088 3 5.0 168.70 4.19 9.08 50.18 n/a 0.000
*
* ADD [ 0088+ 0085] 0088 1 5.0 824.00 14.32 10.08 48.65 n/a 0.000
*
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0305 1 10.0 77.20 1.91 9.83 46.07 0.48 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.52]
*
* CHANNEL[ 2: 0305] 0071 1 10.0 77.20 1.92 9.83 46.07 n/a 0.000
*
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0306 1 10.0 28.00 0.79 9.50 46.07 0.48 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.29]
*
* ADD [ 0306+ 0071] 0059 3 10.0 105.20 2.68 9.67 46.07 n/a 0.000
*
* ADD [ 0059+ 0088] 0070 3 5.0 929.20 16.92 10.00 48.36 n/a 0.000
*
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CHANNEL[ 2: 0080] 0050 1 5.0 155.30 2.85 10.50 47.13 n/a 0.000
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0285 1 10.0 48.60 1.66 9.17 47.27 0.49 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.03]
*
* ADD [ 0285+ 0050] 0069 3 5.0 203.90 4.01 9.83 47.17 n/a 0.000
*
* ADD [ 2930+ 0069] 0085 3 5.0 655.30 11.53 10.58 48.26 n/a 0.000
*
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0407 1 10.0 9.90 1.20 8.00 39.54 0.41 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.12]
*
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0406 1 10.0 6.60 0.28 8.67 46.07 0.48 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.71]
*
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B STANDHYD       0405 1 10.0 49.80 7.20 8.00 70.62 0.73 0.000

*
* CALI B NASHYD          4013 1 10.0 3.30 0.17 8.50 47.25 0.49 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.56]
*
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          4015 1 10.0 2.10 0.14 8.33 47.19 0.49 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.41]
*
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          4014 1 10.0 63.10 2.01 9.33 47.27 0.49 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.13]
*
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          4003 1 10.0 0.80 0.06 8.33 50.85 0.53 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM              10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Mil ton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          4010 1 10.0 2.50 0.12 8.83 51.05 0.53 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.74]

```

```

*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      4004 1 10.0 0.40 0.03 8.33 50.85 0.53 0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.33]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      4007 1 10.0 0.70 0.06 8.33 50.85 0.53 0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.33]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      4011 1 10.0 54.60 1.22 10.17 47.27 0.49 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.81]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      4017 1 10.0 7.60 0.46 8.50 47.22 0.49 0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.45]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]

remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      4008 1 10.0 3.60 0.29 8.33 50.85 0.53 0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.33]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      4018 1 10.0 1.80 0.13 8.33 47.08 0.49 0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.33]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      4002 1 10.0 3.10 0.25 8.33 50.85 0.53 0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.33]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      4009 1 10.0 1.00 0.08 8.33 50.85 0.53 0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.33]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      4005 1 10.0 0.40 0.03 8.33 50.85 0.53 0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.33]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      4019 1 10.0 2.40 0.18 8.33 47.08 0.49 0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.33]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      6001 1 10.0 2.20 0.14 8.50 51.00 0.53 0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.47]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      6002 1 10.0 5.50 0.34 8.50 49.72 0.52 0.000
[CN=77.0 ]
[ N = 3.0:Tp 0.49]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      4020 1 10.0 10.00 0.73 8.33 50.96 0.53 0.000
[CN=78.0 ]
[ N = 3.0:Tp 0.40]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      6003 1 10.0 0.70 0.05 8.33 47.08 0.49 0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.33]
*
READ STORM          10.0
[ Ptot= 96.17 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      6004 1 10.0 1.00 0.07 8.33 47.08 0.49 0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.33]

```

```

*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              6005 1 10.0 1.40 0.11 8.33 49.56 0.52 0.000
  [CN=77.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              6006 1 10.0 0.50 0.04 8.33 47.08 0.49 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              6007 1 10.0 0.50 0.04 8.33 47.08 0.49 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              4021 1 10.0 154.50 3.33 10.67 52.38 0.54 0.000
  [CN=79.0 ]
  [ N = 3.0:Tp 2.22]
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

**
** CALI B NASHYD              2912 1 10.0 112.70 2.89 10.33 57.43 0.53 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.96]
*
  ADD [ 2912+ 0062] 9120 3 10.0 152.80 4.16 10.00 57.07 n/a 0.000
*
  CHANNEL[ 2: 2911] 0062 1 10.0 40.10 1.34 9.67 56.05 n/a 0.000
*
  ADD [ 2912+ 0062] 9120 3 10.0 152.80 4.16 10.00 57.07 n/a 0.000
*
  CHANNEL[ 2: 9120] 0043 1 10.0 152.80 4.04 10.33 57.06 n/a 0.000
*
  READ STORM                10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD              2911 1 10.0 40.10 1.40 9.33 56.07 0.51 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.25]
*
  CHANNEL[ 2: 2911] 0062 1 10.0 40.10 1.34 9.67 56.05 n/a 0.000
*
  ADD [ 2912+ 0062] 9120 3 10.0 152.80 4.16 10.00 57.07 n/a 0.000
*
  CHANNEL[ 2: 9120] 0043 1 10.0 152.80 4.04 10.33 57.06 n/a 0.000
*
  READ STORM                10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD              1291 1 10.0 132.70 2.61 11.33 57.43 0.53 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 2.77]
*
  ADD [ 1291+ 0043] 2910 3 10.0 285.50 6.51 10.67 57.23 n/a 0.000
*
  CHANNEL[ 2: 2910] 0045 1 10.0 285.50 6.49 10.83 57.23 n/a 0.000
*
  READ STORM                10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
*
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              40071 1 10.0 1.70 0.13 8.33 50.95 0.53 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.39]
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              4016 1 10.0 108.80 3.32 9.33 47.27 0.49 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.20]
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              5000 1 10.0 49.80 0.77 11.33 46.08 0.48 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 2.82]
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\39fe9681
-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B STANDHYD            0410 1 10.0 17.60 2.54 8.00 70.62 0.73 0.000
  [I%=50.0: S%= 0.50]
*
*****
** SIMULATION: Run 06 **
*****
  READ STORM                10.0
  [ Ptot=109.12 mm ]
  fname :

** CALI B NASHYD              1292 1 10.0 81.30 1.85 10.83 58.81 0.54 0.000
  [CN=76.0 ]
  [ N = 3.0:Tp 2.37]
*
  ADD [ 1292+ 0045] 4012 3 10.0 366.80 8.34 10.83 57.58 n/a 0.000
*
  DUHYD                    0092 1 10.0 366.80 8.34 10.83 57.58 n/a 0.000
  MAJOR SYSTEM:            0092 2 10.0 0.00 0.00 0.00 0.00 n/a 0.000
  MINOR SYSTEM:           0092 3 10.0 366.80 8.34 10.83 57.58 n/a 0.000
*
  READ STORM                10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD              0301 1 10.0 34.40 1.71 8.83 56.06 0.51 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.77]
*
  ADD [ 0301+ 0092] 0091 3 10.0 34.40 1.71 8.83 56.06 n/a 0.000
*
  CHANNEL[ 2: 0091] 0074 1 10.0 34.40 1.55 9.17 56.04 n/a 0.000
*
  READ STORM                10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD              0303 1 10.0 45.30 1.92 9.17 57.42 0.53 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.00]
*
  ADD [ 0303+ 0074] 0055 3 10.0 79.70 3.46 9.17 56.83 n/a 0.000
*
  CHANNEL[ 2: 0055] 0093 1 10.0 79.70 3.36 9.33 56.82 n/a 0.000
*
  PIPE [ 2: 0093] 0094 1 5.0 79.70 3.37 9.25 56.82 n/a 0.000
*
  READ STORM                10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALIB NASHYD      0408 1 10.0  7.40  0.59  8.33  57.33  0.53  0.000
[CN=75.0
 [ N = 3.0:Tp 0.41]
*
* ADD [ 0408+ 0094] 0098 3 5.0  87.10  3.59  9.17  56.87  n/a  0.000
*
* CHANNEL [ 2: 0098] 0095 1 5.0  87.10  3.57  9.25  56.86  n/a  0.000
*
* READ STORM
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD      0409 1 10.0  15.30  0.88  8.67  58.80  0.54  0.000
[CN=76.0
 [ N = 3.0:Tp 0.68]
*
* ADD [ 0409+ 0095] 0100 3 5.0  102.40  4.28  9.08  57.15  n/a  0.000
*
* PIPE [ 2: 0092] 0101 1 5.0  366.80  8.34  10.83  57.58  n/a  0.000
*
* READ STORM
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB STANDHYD    0403 1 10.0  52.80  8.74  8.00  82.09  0.75  0.000
[I%=50.0:S%= 0.50]
*
* RESRVR [ 2: 0403] 0075 1 5.0  52.80  0.79  10.08  71.10  n/a  0.000
(ST= 2.63 ha.m)
*
* ADD [ 0101+ 0075] 0135 3 5.0  419.60  9.10  10.83  59.28  n/a  0.000
*
* READ STORM
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      0401 1 10.0  10.60  0.55  8.83  56.06  0.51  0.000
[CN=74.0
 ]
*
*
*
*
*
* CALIB NASHYD      2852 1 10.0  17.50  0.89  8.83  56.06  0.51  0.000
[CN=74.0
 [ N = 3.0:Tp 0.75]
*
* CHANNEL [ 2: 2852] 0081 1 5.0  17.50  0.74  9.25  56.02  n/a  0.000
*
* ADD [ 2853+ 0081] 0080 3 5.0  155.30  3.47  10.50  57.27  n/a  0.000
*
* CHANNEL [ 2: 0080] 0050 1 5.0  155.30  3.46  10.58  57.27  n/a  0.000
*
* READ STORM
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      0285 1 10.0  48.60  2.01  9.17  57.42  0.53  0.000
[CN=75.0
 [ N = 3.0:Tp 1.03]
*
* ADD [ 0285+ 0050] 0069 3 5.0  203.90  4.89  9.83  57.31  n/a  0.000
*
* ADD [ 2930+ 0069] 0085 3 5.0  655.30  14.20  10.50  58.51  n/a  0.000
*
* READ STORM
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      0407 1 10.0  9.90  1.46  8.00  48.11  0.44  0.000
[CN=74.0
 [ N = 3.0:Tp 0.12]
*
* READ STORM
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      0406 1 10.0  6.60  0.35  8.67  56.06  0.51  0.000
[CN=74.0
 [ N = 3.0:Tp 0.71]
*

```

```

[ N = 3.0:Tp 0.72]
*
* READ STORM
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      0402 1 10.0  16.60  0.37  10.67  56.07  0.51  0.000
[CN=74.0
 [ N = 3.0:Tp 2.28]
*
* ADD [ 0401+ 0402] 0102 3 10.0  27.20  0.72  9.00  56.06  n/a  0.000
*
* ADD [ 0102+ 0135] 0122 3 5.0  446.80  9.61  10.75  59.09  n/a  0.000
*
* READ STORM
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      0404 1 10.0  4.60  0.29  8.50  56.03  0.51  0.000
[CN=74.0
 [ N = 3.0:Tp 0.54]
*
* ADD [ 0122+ 0404] 2930 3 5.0  451.40  9.66  10.75  59.06  n/a  0.000
*
* READ STORM
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      2853 1 10.0  137.80  3.08  10.83  57.43  0.53  0.000
[CN=75.0
 [ N = 3.0:Tp 2.34]
*
* READ STORM
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* READ STORM
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB STANDHYD    0405 1 10.0  49.80  8.24  8.00  82.09  0.75  0.000
[I%=50.0:S%= 0.50]
*
* RESRVR [ 2: 0405] 0077 1 5.0  49.80  0.63  10.42  70.35  n/a  0.000
(ST= 2.56 ha.m)
*
* ADD [ 0406+ 0407] 0053 3 10.0  16.50  1.55  8.00  51.29  n/a  0.000
*
* ADD [ 0053+ 0077] 0053 1 5.0  66.30  1.56  8.00  65.90  n/a  0.000
*
* ADD [ 0100+ 0053] 0088 3 5.0  168.70  5.20  9.17  60.59  n/a  0.000
*
* ADD [ 0088+ 0085] 0088 1 5.0  824.00  17.79  10.08  58.94  n/a  0.000
*
* READ STORM
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      0305 1 10.0  77.20  2.33  9.83  56.07  0.51  0.000
[CN=74.0
 [ N = 3.0:Tp 1.52]
*
* CHANNEL [ 2: 0305] 0071 1 10.0  77.20  2.33  9.83  56.07  n/a  0.000
*
* READ STORM
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD      0306 1 10.0  28.00  0.96  9.50  56.07  0.51  0.000
[CN=74.0
 [ N = 3.0:Tp 1.29]
*
* ADD [ 0306+ 0071] 0059 3 10.0  105.20  3.27  9.67  56.07  n/a  0.000
*
* ADD [ 0059+ 0088] 0070 3 5.0  929.20  20.97  10.00  58.61  n/a  0.000

```

```

*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4013 1 10.0 3.30 0.21 8.50 57.40 0.53 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.56 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4015 1 10.0 2.10 0.17 8.33 57.33 0.53 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.41 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4014 1 10.0 63.10 2.44 9.33 57.42 0.53 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.13 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4003 1 10.0 0.80 0.08 8.33 61.43 0.56 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4017 1 10.0 7.60 0.56 8.33 57.36 0.53 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.45 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4006 1 10.0 0.40 0.04 8.33 61.43 0.56 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4001 1 10.0 1.70 0.18 8.33 65.96 0.60 0.000
  [CN=81.0 ]
  [ N = 3.0:Tp 0.33 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4005 1 10.0 0.40 0.04 8.33 61.43 0.56 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*

```

```

  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4010 1 10.0 2.50 0.14 8.83 61.67 0.57 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.74 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4004 1 10.0 0.40 0.04 8.33 61.43 0.56 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4007 1 10.0 0.70 0.07 8.33 61.43 0.56 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4011 1 10.0 54.60 1.49 10.17 57.43 0.53 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.81 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-

*
* CALIB NASHYD        4019 1 10.0 2.40 0.21 8.33 57.20 0.52 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4008 1 10.0 3.60 0.35 8.33 61.44 0.56 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4018 1 10.0 1.80 0.16 8.33 57.20 0.52 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4002 1 10.0 3.10 0.30 8.33 61.44 0.56 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33 ]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4009 1 10.0 1.00 0.10 8.33 61.43 0.56 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33 ]

```

```

*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6001 1 10.0 2.20 0.17 8.50 61.62 0.56 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.47]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6002 1 10.0 5.50 0.41 8.50 60.18 0.55 0.000
  [CN=77.0 ]
  [ N = 3.0:Tp 0.49]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4020 1 10.0 10.00 0.88 8.33 61.57 0.56 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.40]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6003 1 10.0 0.70 0.06 8.33 57.20 0.52 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4021 1 10.0 154.50 4.02 10.67 63.16 0.58 0.000
  [CN=79.0 ]
  [ N = 3.0:Tp 2.22]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        40071 1 10.0 1.70 0.15 8.33 61.55 0.56 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.39]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4016 1 10.0 108.80 4.03 9.33 57.43 0.53 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.20]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        5000 1 10.0 49.80 0.94 11.33 56.07 0.51 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 2.82]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6004 1 10.0 1.00 0.09 8.33 57.20 0.52 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6005 1 10.0 1.40 0.13 8.33 59.99 0.55 0.000
  [CN=77.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6006 1 10.0 0.50 0.04 8.33 57.19 0.52 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6007 1 10.0 0.50 0.04 8.33 57.19 0.52 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB STANDHYD      0410 1 10.0 17.60 2.91 8.00 82.09 0.75 0.000
  [I%=50.0:S%= 0.50]
*
** SIMULATION: Run 07 **
*****
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALIB NASHYD        2912 1 10.0 112.70 3.38 10.33 68.18 0.56 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.96]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALIB NASHYD        2911 1 10.0 40.10 1.64 9.33 66.66 0.54 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.25]
*
  CHANNEL[ 2: 2911] 0062 1 10.0 40.10 1.58 9.67 66.65 n/a 0.000
*
  ADD [ 2912+ 0062] 9120 3 10.0 152.80 4.88 10.00 67.78 n/a 0.000
*
  CHANNEL[ 2: 9120] 0043 1 10.0 152.80 4.75 10.33 67.77 n/a 0.000
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALIB NASHYD        1291 1 10.0 132.70 3.06 11.33 68.18 0.56 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 2.77]
*
  ADD [ 1291+ 0043] 2910 3 10.0 285.50 7.64 10.67 67.96 n/a 0.000
*
  CHANNEL[ 2: 2910] 0045 1 10.0 285.50 7.62 10.83 67.96 n/a 0.000

```

* READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALI B NASHYD 1292 1 10.0 81.30 2.17 10.83 69.71 0.57 0.000
 [CN=76.0]
 [N = 3.0:Tp 2.37]
 * ADD [1292+ 0045] 4012 3 10.0 366.80 9.79 10.83 68.35 n/a 0.000
 * DIHYD 0092 1 10.0 366.80 9.79 10.83 68.35 n/a 0.000
 MAJOR SYSTEM: 0092 2 10.0 0.00 0.00 0.00 0.00 n/a 0.000
 MINOR SYSTEM: 0092 3 10.0 366.80 9.79 10.83 68.35 n/a 0.000

* READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALI B NASHYD 0301 1 10.0 34.40 2.00 8.83 66.66 0.54 0.000
 [CN=74.0]
 [N = 3.0:Tp 0.77]
 * ADD [0301+ 0092] 0091 3 10.0 34.40 2.00 8.83 66.66 n/a 0.000
 * CHANNEL [2: 0091] 0074 1 10.0 34.40 1.83 9.00 66.64 n/a 0.000

* READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALI B NASHYD 0303 1 10.0 45.30 2.24 9.17 68.17 0.56 0.000
 [CN=75.0]
 [N = 3.0:Tp 1.00]
 * ADD [0303+ 0074] 0055 3 10.0 79.70 4.06 9.00 67.51 n/a 0.000
 * CHANNEL [2: 0055] 0093 1 10.0 79.70 3.95 9.17 67.51 n/a 0.000

[Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALI B NASHYD 0401 1 10.0 10.60 0.64 8.67 66.65 0.54 0.000
 [CN=74.0]
 [N = 3.0:Tp 0.72]

* READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALI B NASHYD 0402 1 10.0 16.60 0.43 10.67 66.67 0.54 0.000
 [CN=74.0]
 [N = 3.0:Tp 2.28]
 * ADD [0401+ 0402] 0102 3 10.0 27.20 0.85 9.00 66.66 n/a 0.000
 * ADD [0102+ 0135] 0122 3 5.0 446.80 11.36 10.75 69.97 n/a 0.000

* READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALI B NASHYD 0404 1 10.0 4.60 0.34 8.50 66.63 0.54 0.000
 [CN=74.0]
 [N = 3.0:Tp 0.54]

* ADD [0122+ 0404] 2930 3 5.0 451.40 11.42 10.75 69.94 n/a 0.000
 * READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALI B NASHYD 2853 1 10.0 137.80 3.61 10.83 68.18 0.56 0.000
 [CN=75.0]

* PIPE [2: 0093] 0094 1 5.0 79.70 3.95 9.25 67.51 n/a 0.000
 * READ STORM 10.0
 [Ptot=122.36 mm]
 fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALI B NASHYD 0408 1 10.0 7.40 0.68 8.33 68.06 0.56 0.000
 [CN=75.0]
 [N = 3.0:Tp 0.41]

* ADD [0408+ 0094] 0098 3 5.0 87.10 4.22 9.17 67.55 n/a 0.000
 * CHANNEL [2: 0098] 0095 1 5.0 87.10 4.19 9.25 67.55 n/a 0.000

* READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALI B NASHYD 0409 1 10.0 15.30 1.03 8.67 69.70 0.57 0.000
 [CN=76.0]
 [N = 3.0:Tp 0.68]

* ADD [0409+ 0095] 0100 3 5.0 102.40 5.04 9.08 67.87 n/a 0.000
 * PIPE [2: 0092] 0101 1 5.0 366.80 9.78 10.83 68.35 n/a 0.000

* READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALI B STANDHYD 0403 1 10.0 52.80 9.87 8.00 94.01 0.77 0.000
 [I%=50.0: S%= 0.50]

* RESRVR [2: 0403] 0075 1 5.0 52.80 1.04 9.83 82.96 n/a 0.000
 {ST= 2.86 ha.m }

* ADD [0101+ 0075] 0135 3 5.0 419.60 10.75 10.75 70.19 n/a 0.000

* READ STORM 10.0

[N = 3.0:Tp 2.34]
 * READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALI B NASHYD 2852 1 10.0 17.50 1.04 8.83 66.65 0.54 0.000
 [CN=74.0]
 [N = 3.0:Tp 0.75]

* CHANNEL [2: 2852] 0081 1 5.0 17.50 0.88 9.17 66.62 n/a 0.000
 * ADD [2853+ 0081] 0080 3 5.0 155.30 4.06 10.33 68.00 n/a 0.000

* CHANNEL [2: 0080] 0050 1 5.0 155.30 4.05 10.50 68.00 n/a 0.000

* READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALI B NASHYD 0285 1 10.0 48.60 2.35 9.17 68.17 0.56 0.000
 [CN=75.0]
 [N = 3.0:Tp 1.03]

* ADD [0285+ 0050] 0069 3 5.0 203.90 5.74 9.75 68.04 n/a 0.000
 * ADD [2930+ 0069] 0085 3 5.0 655.30 16.76 10.50 69.35 n/a 0.000

* READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALI B NASHYD 0407 1 10.0 9.90 1.73 8.00 57.20 0.47 0.000
 [CN=74.0]
 [N = 3.0:Tp 0.12]

* READ STORM 10.0
 [Ptot=122.36 mm]
 fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 0406 1 10.0 6.60 0.41 8.67 66.65 0.54 0.000
[CN=74.0]
[N = 3.0:Tp 0.71]
* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB STANDHYD 0405 1 10.0 49.80 9.31 8.00 94.01 0.77 0.000
[I%=50.0;S%= 0.50]
* RESRVR [2: 0405] 0077 1 5.0 49.80 0.84 10.08 82.20 n/a 0.000
{ST= 2.79 ha.m }
* ADD [0406+ 0407] 0053 3 10.0 16.50 1.84 8.00 60.98 n/a 0.000
* ADD [0053+ 0077] 0053 1 5.0 66.30 1.86 8.00 77.27 n/a 0.000
* ADD [0100+ 0053] 0088 3 5.0 168.70 6.28 9.08 71.56 n/a 0.000
* ADD [0088+ 0085] 0088 1 5.0 824.00 21.12 10.00 69.80 n/a 0.000
* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 0305 1 10.0 77.20 2.73 9.67 66.67 0.54 0.000
[CN=74.0]
[N = 3.0:Tp 1.52]
* CHANNEL [2: 0305] 0071 1 10.0 77.20 2.73 9.83 66.67 n/a 0.000
* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 4003 1 10.0 0.80 0.09 8.33 72.58 0.59 0.000
[CN=78.0]
[N = 3.0:Tp 0.33]
* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 4010 1 10.0 2.50 0.17 8.83 72.86 0.60 0.000
[CN=78.0]
[N = 3.0:Tp 0.74]
* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 4004 1 10.0 0.40 0.05 8.33 72.58 0.59 0.000
[CN=78.0]
[N = 3.0:Tp 0.33]
* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 4007 1 10.0 0.70 0.08 8.33 72.58 0.59 0.000
[CN=78.0]
[N = 3.0:Tp 0.33]
* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 4005 1 10.0 0.40 0.05 8.33 72.58 0.59 0.000
[CN=78.0]
[N = 3.0:Tp 0.33]

* CALIB NASHYD 0306 1 10.0 28.00 1.12 9.50 66.66 0.54 0.000
[CN=74.0]
[N = 3.0:Tp 1.29]

* ADD [0306+ 0071] 0059 3 10.0 105.20 3.83 9.67 66.66 n/a 0.000
* ADD [0059+ 0088] 0070 3 5.0 929.20 24.87 9.92 69.45 n/a 0.000

* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 4013 1 10.0 3.30 0.25 8.50 68.14 0.56 0.000
[CN=75.0]
[N = 3.0:Tp 0.56]

* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 4015 1 10.0 2.10 0.19 8.33 68.06 0.56 0.000
[CN=75.0]
[N = 3.0:Tp 0.41]

* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 4014 1 10.0 63.10 2.85 9.17 68.17 0.56 0.000
[CN=75.0]
[N = 3.0:Tp 1.13]

* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-

* CALIB NASHYD 4011 1 10.0 54.60 1.74 10.17 68.18 0.56 0.000
[CN=75.0]
[N = 3.0:Tp 1.81]

* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 4017 1 10.0 7.60 0.65 8.33 68.09 0.56 0.000
[CN=75.0]
[N = 3.0:Tp 0.45]

* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 4006 1 10.0 0.40 0.05 8.33 72.58 0.59 0.000
[CN=78.0]
[N = 3.0:Tp 0.33]

* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 4001 1 10.0 1.70 0.21 8.17 77.53 0.63 0.000
[CN=81.0]
[N = 3.0:Tp 0.33]

* READ STORM 10.0
[Ptot=122.36 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALIB NASHYD 4005 1 10.0 0.40 0.05 8.33 72.58 0.59 0.000
[CN=78.0]
[N = 3.0:Tp 0.33]

```

*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4019 1 10.0 2.40 0.25 8.33 67.90 0.55 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4008 1 10.0 3.60 0.41 8.33 72.58 0.59 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4018 1 10.0 1.80 0.19 8.33 67.90 0.55 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4002 1 10.0 3.10 0.35 8.33 72.58 0.59 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6003 1 10.0 0.70 0.07 8.33 67.90 0.55 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6004 1 10.0 1.00 0.10 8.33 67.90 0.55 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6005 1 10.0 1.40 0.15 8.33 70.99 0.58 0.000
  [CN=77.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6006 1 10.0 0.50 0.05 8.33 67.90 0.55 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4009 1 10.0 1.00 0.11 8.33 72.58 0.59 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6001 1 10.0 2.20 0.20 8.50 72.80 0.59 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.47]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        6002 1 10.0 5.50 0.47 8.50 71.22 0.58 0.000
  [CN=77.0 ]
  [ N = 3.0:Tp 0.49]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4020 1 10.0 10.00 1.02 8.33 72.74 0.59 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.40]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-

*
* CALIB NASHYD        6007 1 10.0 0.50 0.05 8.33 67.90 0.55 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4021 1 10.0 154.50 4.68 10.67 74.50 0.61 0.000
  [CN=79.0 ]
  [ N = 3.0:Tp 2.22]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        40071 1 10.0 1.70 0.18 8.33 72.72 0.59 0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.39]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        4016 1 10.0 108.80 4.72 9.33 68.17 0.56 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.20]
*
  READ STORM          10.0
  [ Ptot=122.36 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6
-946f-43de-993b-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD        5000 1 10.0 49.80 1.10 11.33 66.67 0.54 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 2.82]

```

*
 READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpro

* CALI B STANDHYD 0410 1 10.0 17.60 3.29 8.00 94.01 0.77 0.000
 [I%=50.0: S%= 0.50]

 ** SIMULATION: Run 08 **

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :
 C:\Users\Aws.Nabeeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALI B NASHYD 2912 1 10.0 112.70 7.89 12.00 146.91 0.69 0.000
 [CN=75.0]
 [N = 3.0: Tp 1.96]

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :
 C:\Users\Aws.Nabeeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALI B NASHYD 2911 1 10.0 40.10 3.41 11.33 144.64 0.68 0.000
 [CN=74.0]
 [N = 3.0: Tp 1.25]

CHANNEL[2: 2911] 0062 1 10.0 40.10 3.35 11.50 144.63 n/a 0.000
 ADD [2912+ 0062] 9120 3 10.0 152.80 11.15 11.83 146.31 n/a 0.000
 CHANNEL[2: 9120] 0043 1 10.0 152.80 10.95 12.17 146.31 n/a 0.000

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :
 C:\Users\Aws.Nabeeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

* CALI B NASHYD 0303 1 10.0 45.30 4.22 11.17 146.90 0.69 0.000
 [CN=75.0]
 [N = 3.0: Tp 1.00]

ADD [0303+ 0074] 0055 3 10.0 191.61 18.25 12.17 146.65 n/a 0.000
 CHANNEL[2: 0055] 0093 1 10.0 191.61 18.17 12.33 146.65 n/a 0.000
 PIPE [2: 0093] 0094 1 5.0 191.61 18.17 12.33 146.64 n/a 0.000

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :
 C:\Users\Aws.Nabeeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

* CALI B NASHYD 0408 1 10.0 7.40 0.86 10.17 146.66 0.69 0.000
 [CN=75.0]
 [N = 3.0: Tp 0.41]

ADD [0408+ 0094] 0098 3 5.0 199.01 18.35 12.25 146.64 n/a 0.000
 CHANNEL[2: 0098] 0095 1 5.0 199.01 18.35 12.33 146.64 n/a 0.000

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :
 C:\Users\Aws.Nabeeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALI B NASHYD 0409 1 10.0 15.30 1.58 10.67 149.15 0.70 0.000
 [CN=76.0]
 [N = 3.0: Tp 0.68]

ADD [0409+ 0095] 0100 3 5.0 214.31 19.06 12.17 146.82 n/a 0.000
 PIPE [2: 0092] 0101 1 5.0 254.89 9.79 9.58 147.16 n/a 0.000

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :
 C:\Users\Aws.Nabeeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALI B NASHYD 1291 1 10.0 132.70 7.70 12.67 146.91 0.69 0.000
 [CN=75.0]
 [N = 3.0: Tp 2.77]

ADD [1291+ 0043] 2910 3 10.0 285.50 18.52 12.33 146.59 n/a 0.000
 CHANNEL[2: 2910] 0045 1 10.0 285.50 18.46 12.50 146.59 n/a 0.000

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :
 C:\Users\Aws.Nabeeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALI B NASHYD 1292 1 10.0 81.30 5.22 12.33 149.19 0.70 0.000
 [CN=76.0]
 [N = 3.0: Tp 2.37]

ADD [1292+ 0045] 4012 3 10.0 366.80 23.66 12.50 147.16 n/a 0.000
 DUHYD 0092 1 10.0 366.80 23.66 12.50 147.16 n/a 0.000
 MAJOR SYSTEM: 0092 2 10.0 111.91 13.87 12.50 147.16 n/a 0.000
 MINOR SYSTEM: 0092 3 10.0 254.89 9.79 9.67 147.16 n/a 0.000

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :
 C:\Users\Aws.Nabeeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALI B NASHYD 0301 1 10.0 34.40 3.38 10.83 144.62 0.68 0.000
 [CN=74.0]
 [N = 3.0: Tp 0.77]

ADD [0301+ 0092] 0091 3 10.0 146.31 15.59 12.17 146.57 n/a 0.000
 CHANNEL[2: 0091] 0074 1 10.0 146.31 15.39 12.33 146.57 n/a 0.000

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :
 C:\Users\Aws.Nabeeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

* CALI B STANDHYD 0403 1 10.0 52.80 6.34 10.17 177.82 0.84 0.000
 [I%=50.0: S%= 0.50]

RESRVR [2: 0403] 0075 1 5.0 52.80 5.91 10.42 167.12 n/a 0.000
 {ST= 3.46 ha.m }
 ADD [0101+ 0075] 0135 3 5.0 307.69 15.70 10.42 150.59 n/a 0.000

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :
 C:\Users\Aws.Nabeeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

* CALI B NASHYD 0401 1 10.0 10.60 1.06 10.67 144.61 0.68 0.000
 [CN=74.0]
 [N = 3.0: Tp 0.72]

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :
 C:\Users\Aws.Nabeeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

* CALI B NASHYD 0402 1 10.0 16.60 1.06 12.33 144.64 0.68 0.000
 [CN=74.0]
 [N = 3.0: Tp 2.28]

ADD [0401+ 0402] 0102 3 10.0 27.20 1.93 11.17 144.63 n/a 0.000
 ADD [0102+ 0135] 0122 3 5.0 334.89 17.43 10.50 150.10 n/a 0.000

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :
 C:\Users\Aws.Nabeeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

* CALI B NASHYD 0404 1 10.0 4.60 0.49 10.33 144.56 0.68 0.000
 [CN=74.0]
 [N = 3.0: Tp 0.54]

ADD [0122+ 0404] 2930 3 5.0 339.49 17.92 10.50 150.03 n/a 0.000
 READ STORM 60.0

```

[ Ptot=212.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B NASHYD      2853  1 10.0  137.80   8.80 12.33 146.91 0.69  0.000
  [CN=75.0          ]
  [ N = 3.0:Tp 2.34]
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B NASHYD      2852  1 10.0   17.50   1.73 10.83 144.62 0.68  0.000
  [CN=74.0          ]
  [ N = 3.0:Tp 0.75]
*
* CHANNEL [ 2: 2852]  0081  1  5.0   17.50   1.68 11.17 144.58 n/a  0.000
*
* ADD [ 2853+ 0081]  0080  3  5.0  155.30   9.99 12.00 146.65 n/a  0.000
*
* CHANNEL [ 2: 0080]  0050  1  5.0  155.30   9.97 12.08 146.65 n/a  0.000
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B NASHYD      0285  1 10.0   48.60   4.49 11.17 146.90 0.69  0.000
  [CN=75.0          ]
  [ N = 3.0:Tp 1.03]
*
* ADD [ 0285+ 0050]  0069  3  5.0  203.90  13.84 11.58 146.71 n/a  0.000
*
* ADD [ 2930+ 0069]  0085  3  5.0  543.39  30.89 11.17 148.78 n/a  0.000
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CHANNEL [ 2: 0305]  0071  1 10.0   77.20   6.03 11.67 144.64 n/a  0.000
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B NASHYD      0306  1 10.0   28.00   2.35 11.33 144.64 0.68  0.000
  [CN=74.0          ]
  [ N = 3.0:Tp 1.29]
*
* ADD [ 0306+ 0071]  0059  3 10.0  105.20   8.35 11.50 144.64 n/a  0.000
*
* ADD [ 0059+ 0088]  0070  3  5.0  929.20  61.47 11.33 148.51 n/a  0.000
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B NASHYD      4013  1 10.0   3.30   0.35 10.33 146.84 0.69  0.000
  [CN=75.0          ]
  [ N = 3.0:Tp 0.56]
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B NASHYD      4015  1 10.0   2.10   0.24 10.17 146.66 0.69  0.000
  [CN=75.0          ]
  [ N = 3.0:Tp 0.41]
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B NASHYD      0407  1 10.0   9.90   1.08 10.00 124.11 0.59  0.000
  [CN=74.0          ]
  [ N = 3.0:Tp 0.12]
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B NASHYD      0406  1 10.0   6.60   0.66 10.67 144.61 0.68  0.000
  [CN=74.0          ]
  [ N = 3.0:Tp 0.71]
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B STANDHYD    0405  1 10.0  49.80   5.98 10.17 177.82 0.84  0.000
  [I%=50.0:S%= 0.50]
*
* RESRVR [ 2: 0405]  0077  1  5.0  49.80   5.52 10.50 166.35 n/a  0.000
  {ST= 3.55 ha.m }
*
* ADD [ 0406+ 0407]  0053  3 10.0  16.50   1.62 10.00 132.31 n/a  0.000
*
* ADD [ 0053+ 0077]  0053  1  5.0  66.30   6.96 10.50 157.88 n/a  0.000
*
* ADD [ 0100+ 0053]  0088  3  5.0  280.61  22.73 11.67 149.43 n/a  0.000
*
* ADD [ 0088+ 0085]  0088  1  5.0  824.00  53.20 11.33 149.00 n/a  0.000
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B NASHYD      0305  1 10.0  77.20   6.02 11.50 144.64 0.68  0.000
  [CN=74.0          ]
  [ N = 3.0:Tp 1.52]
*
* CALI B NASHYD      4014  1 10.0  63.10   5.63 11.17 146.91 0.69  0.000
  [CN=75.0          ]
  [ N = 3.0:Tp 1.13]
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B NASHYD      4003  1 10.0   0.80   0.10 10.00 153.16 0.72  0.000
  [CN=78.0          ]
  [ N = 3.0:Tp 0.33]
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B NASHYD      4010  1 10.0   2.50   0.26 10.83 153.75 0.73  0.000
  [CN=78.0          ]
  [ N = 3.0:Tp 0.74]
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B NASHYD      4004  1 10.0   0.40   0.05 10.00 153.16 0.72  0.000
  [CN=78.0          ]
  [ N = 3.0:Tp 0.33]
*
* READ STORM
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
* CALI B NASHYD      4007  1 10.0   0.70   0.09 10.00 153.16 0.72  0.000
  [CN=78.0          ]
  [ N = 3.0:Tp 0.33]

```

```

*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            4011 1 10.0  54.60   3.97 11.83 146.91 0.69  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.81]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            4017 1 10.0   7.60   0.86 10.17 146.73 0.69  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.45]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            4006 1 10.0   0.40   0.05 10.00 153.16 0.72  0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            4001 1 10.0   1.70   0.22 10.00 160.09 0.76  0.000
  [CN=81.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            4002 1 10.0   3.10   0.39 10.00 153.16 0.72  0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            4009 1 10.0   1.00   0.12 10.00 153.16 0.72  0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            6001 1 10.0   2.20   0.26 10.17 153.62 0.72  0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.47]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            6002 1 10.0   5.50   0.62 10.17 151.35 0.71  0.000
  [CN=77.0 ]
  [ N = 3.0:Tp 0.49]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            4005 1 10.0   0.40   0.05 10.00 153.16 0.72  0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            4019 1 10.0   2.40   0.29 10.00 146.32 0.69  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            4008 1 10.0   3.60   0.45 10.00 153.16 0.72  0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            4018 1 10.0   1.80   0.22 10.00 146.32 0.69  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            4020 1 10.0  10.00   1.20 10.17 153.49 0.72  0.000
  [CN=78.0 ]
  [ N = 3.0:Tp 0.40]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            6003 1 10.0   0.70   0.08 10.00 146.32 0.69  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            6004 1 10.0   1.00   0.12 10.00 146.32 0.69  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            6005 1 10.0   1.40   0.17 10.00 150.87 0.71  0.000
  [CN=77.0 ]
  [ N = 3.0:Tp 0.33]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurri cane Hazel Storm

*
* CALI B NASHYD            6006 1 10.0   0.50   0.06 10.00 146.32 0.69  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.33]

```

```

*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurricane Hazel Storm

*
* CALIB NASHYD              6007 1 10.0 0.50 0.06 10.00 146.32 0.69 0.000
  [CN=75.0 ]
  [ N = 3.0: Tp 0.33]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurricane Hazel Storm

*
* CALIB NASHYD              4021 1 10.0 154.50 10.62 12.17 156.09 0.74 0.000
  [CN=79.0 ]
  [ N = 3.0: Tp 2.22]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurricane Hazel Storm

*
* CALIB NASHYD              40071 1 10.0 1.70 0.20 10.00 153.46 0.72 0.000
  [CN=78.0 ]
  [ N = 3.0: Tp 0.39]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurricane Hazel Storm

*
* CALIB NASHYD              4016 1 10.0 108.80 9.50 11.33 146.91 0.69 0.000
  [CN=75.0 ]
  [ N = 3.0: Tp 1.20]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]

```

```

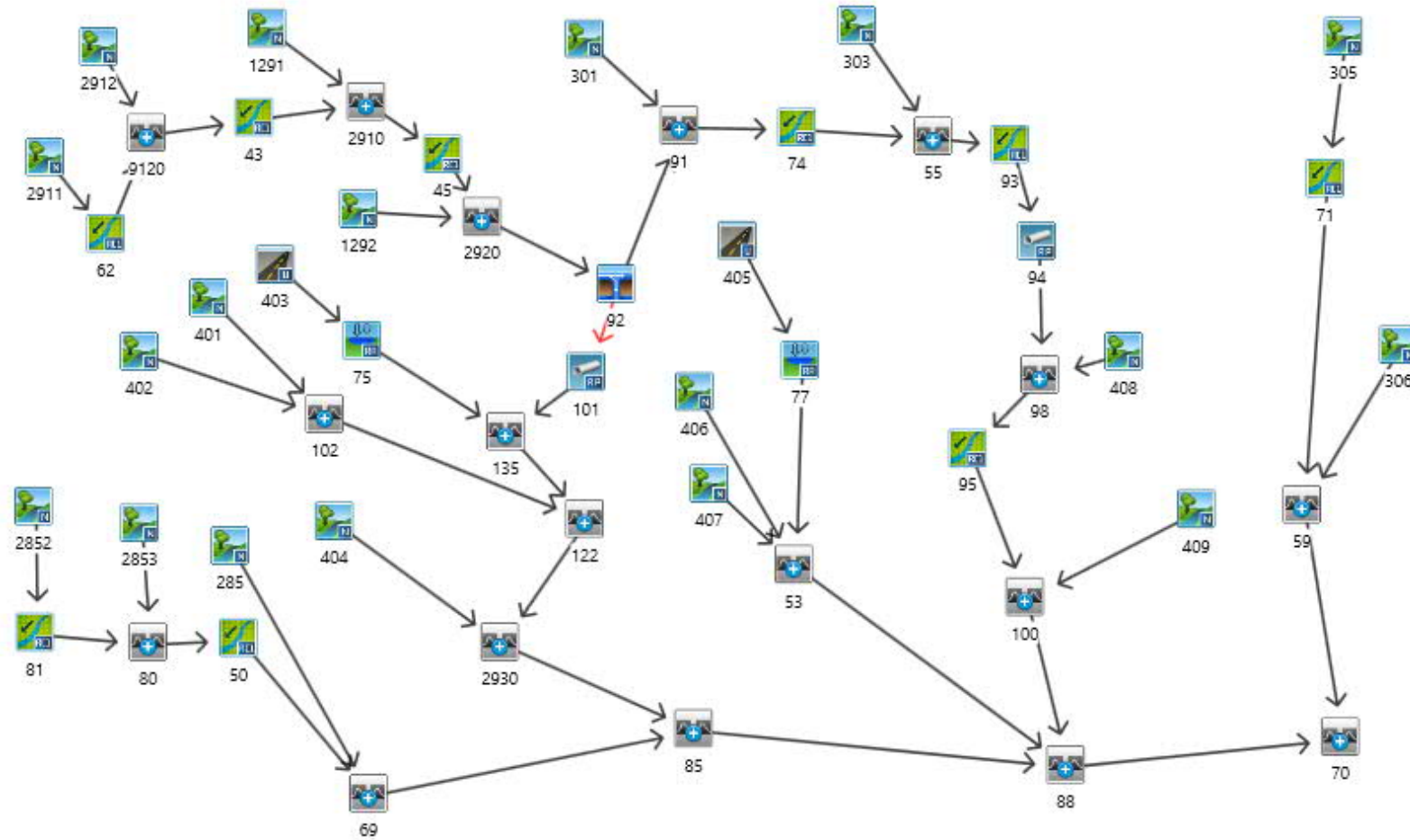
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurricane Hazel Storm

*
* CALIB NASHYD              5000 1 10.0 49.80 2.82 12.67 144.64 0.68 0.000
  [CN=74.0 ]
  [ N = 3.0: Tp 2.82]
*
  READ STORM                60.0
  [ Ptot=212.00 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\fb710e1-cc2e-429d-a228-9bb898bc53e2\2917df81
-4626-40a7-a7ad-
  remark: 12 Hour Hurricane Hazel Storm

*
* CALIB STANDHYD           0410 1 10.0 17.60 2.11 10.17 177.82 0.84 0.000
  [I%=50.0; S%= 0.50]
*

```

Milton Logistics Hub 2020 Visual Otthymo – 2yr to Regional - Proposed Conditions (Ponds at Extended Detention Elevation)



```

*****
** SIMULATION: Run 01 **
*****
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

** CALI B NASHYD          2912 1 10.0 112.70 0.28 4.33 3.82 0.15 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.96]
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

*
** CALI B NASHYD          2911 1 10.0 40.10 0.12 3.50 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.25]
*
CHANNEL [ 2: 2911] 0062 1 10.0 40.10 0.11 4.17 3.65 n/a 0.000
*
ADD [ 2912+ 0062] 9120 3 10.0 152.80 0.39 4.33 3.77 n/a 0.000
*
CHANNEL [ 2: 9120] 0043 1 10.0 152.80 0.35 4.83 3.77 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

*
** CALI B NASHYD          1291 1 10.0 132.70 0.25 5.17 3.82 0.15 0.000
[CN=75.0 ]
[ N = 3.0:Tp 2.77]
*
ADD [ 1291+ 0043] 2910 3 10.0 285.50 0.61 5.00 3.79 n/a 0.000
*
CHANNEL [ 2: 2910] 0045 1 10.0 285.50 0.60 5.17 3.79 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

*
** CALI B NASHYD          0408 1 10.0 7.40 0.04 2.00 3.81 0.15 0.000
[CN=75.0 ]
[ N = 3.0:Tp 0.41]
*
ADD [ 0408+ 0094] 0098 3 5.0 87.10 0.28 3.42 3.74 n/a 0.000
*
CHANNEL [ 2: 0098] 0095 1 5.0 87.10 0.28 3.58 3.74 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

*
** CALI B NASHYD          0409 1 10.0 15.30 0.07 2.50 3.99 0.16 0.000
[CN=76.0 ]
[ N = 3.0:Tp 0.68]
*
ADD [ 0409+ 0095] 0100 3 5.0 102.40 0.33 3.42 3.78 n/a 0.000
*
PIPE [ 2: 0092] 0101 1 5.0 366.80 0.78 5.08 3.84 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

*
** CALI B STANDHYD       0403 1 10.0 52.80 1.64 1.67 13.83 0.55 0.000
[ I%=50.0: S%= 0.50]
*
RESRVR [ 2: 0403] 0075 1 5.0 52.80 0.20 4.17 13.83 n/a 0.000
{ST= 0.51 ha.m }
*
ADD [ 0101+ 0075] 0135 3 5.0 419.60 0.97 5.08 5.09 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

```

```

fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

*
** CALI B NASHYD          1292 1 10.0 81.30 0.18 4.83 3.99 0.16 0.000
[CN=76.0 ]
[ N = 3.0:Tp 2.37]
*
ADD [ 1292+ 0045] 2920 3 10.0 366.80 0.78 5.17 3.84 n/a 0.000
*
DUHYD                    0092 1 10.0 366.80 0.78 5.17 3.84 n/a 0.000
MAJOR SYSTEM:           0092 2 10.0 0.00 0.00 0.00 0.00 n/a 0.000
MINOR SYSTEM:           0092 3 10.0 366.80 0.78 5.17 3.84 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

*
** CALI B NASHYD          0301 1 10.0 34.40 0.13 2.67 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.77]
*
ADD [ 0301+ 0092] 0091 3 10.0 34.40 0.13 2.67 3.66 n/a 0.000
*
CHANNEL [ 2: 0091] 0074 1 10.0 34.40 0.11 3.33 3.64 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

*
** CALI B NASHYD          0303 1 10.0 45.30 0.16 3.00 3.82 0.15 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.00]
*
ADD [ 0303+ 0074] 0055 3 10.0 79.70 0.27 3.17 3.74 n/a 0.000
*
CHANNEL [ 2: 0055] 0093 1 10.0 79.70 0.26 3.50 3.74 n/a 0.000
*
PIPE [ 2: 0093] 0094 1 5.0 79.70 0.26 3.58 3.74 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

*
** CALI B NASHYD          0401 1 10.0 10.60 0.04 2.50 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.72]
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

*
** CALI B NASHYD          0402 1 10.0 16.60 0.04 4.67 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0:Tp 2.28]
*
ADD [ 0401+ 0402] 0102 3 10.0 27.20 0.06 3.50 3.66 n/a 0.000
*
ADD [ 0102+ 0135] 0122 3 5.0 446.80 1.01 5.00 5.01 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

*
** CALI B NASHYD          0404 1 10.0 4.60 0.02 2.17 3.66 0.15 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.54]
*
ADD [ 0122+ 0404] 2930 3 5.0 451.40 1.02 4.92 4.99 n/a 0.000
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

*
** CALI B NASHYD          2853 1 10.0 137.80 0.30 4.67 3.82 0.15 0.000
[CN=75.0 ]
[ N = 3.0:Tp 2.34]
*
READ STORM                10.0
[ Ptot= 25.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

```

[Ptot= 25.00 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

* CALI B NASHYD 2852 1 10.0 17.50 0.07 2.67 3.66 0.15 0.000
[CN=74.0]
[N = 3.0:Tp 0.75]

* CHANNEL[2: 2852] 0081 1 5.0 17.50 0.04 3.92 3.62 n/a 0.000

* ADD [2853+ 0081] 0080 3 5.0 155.30 0.34 4.67 3.80 n/a 0.000

* CHANNEL[2: 0080] 0050 1 5.0 155.30 0.33 4.83 3.80 n/a 0.000

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

* CALI B NASHYD 0285 1 10.0 48.60 0.17 3.17 3.82 0.15 0.000
[CN=75.0]
[N = 3.0:Tp 1.03]

* ADD [0285+ 0050] 0069 3 5.0 203.90 0.45 4.33 3.80 n/a 0.000

* ADD [2930+ 0069] 0085 3 5.0 655.30 1.44 4.75 4.62 n/a 0.000

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

* CALI B NASHYD 0407 1 10.0 9.90 0.09 1.50 3.14 0.13 0.000
[CN=74.0]
[N = 3.0:Tp 0.12]

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

[CN=74.0]
[N = 3.0:Tp 1.29]

* ADD [0306+ 0071] 0059 3 10.0 107.30 0.30 3.83 3.66 n/a 0.000

* ADD [0059+ 0088] 0070 3 5.0 931.30 2.18 4.33 4.91 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d
-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALI B NASHYD 2912 1 10.0 112.70 0.71 10.33 14.16 0.30 0.000
[CN=75.0]
[N = 3.0:Tp 1.96]

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d
-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALI B NASHYD 2911 1 10.0 40.10 0.34 9.50 13.67 0.29 0.000
[CN=74.0]
[N = 3.0:Tp 1.25]

* CHANNEL[2: 2911] 0062 1 10.0 40.10 0.31 10.00 13.66 n/a 0.000

* ADD [2912+ 0062] 9120 3 10.0 152.80 1.01 10.17 14.03 n/a 0.000

* CHANNEL[2: 9120] 0043 1 10.0 152.80 0.95 10.67 14.03 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d
-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALI B NASHYD 1291 1 10.0 132.70 0.64 11.50 14.16 0.30 0.000
[CN=75.0]
[N = 3.0:Tp 2.77]

* CALI B NASHYD 0406 1 10.0 6.60 0.03 2.50 3.66 0.15 0.000
[CN=74.0]
[N = 3.0:Tp 0.71]

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

* CALI B STANDHYD 0405 1 10.0 49.80 1.55 1.67 13.83 0.55 0.000
[I%=50.0: S%= 0.50]

* RESRVR [2: 0405] 0077 1 5.0 49.80 0.18 4.25 13.83 n/a 0.000
[ST= 0.49 ha.m]

* ADD [0406+ 0407] 0053 3 10.0 16.50 0.09 1.50 3.35 n/a 0.000

* ADD [0053+ 0077] 0053 1 5.0 66.30 0.78 8.00 11.52 n/a 0.000

* ADD [0100+ 0053] 0088 3 5.0 168.70 0.81 8.00 6.82 n/a 0.000

* ADD [0088+ 0085] 0088 1 5.0 824.00 1.89 4.42 5.07 n/a 0.000

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

* CALI B NASHYD 0305 1 10.0 79.30 0.22 4.00 3.66 0.15 0.000
[CN=74.0]
[N = 3.0:Tp 1.52]

* CHANNEL[2: 0305] 0071 1 10.0 79.30 0.22 4.00 3.66 n/a 0.000

READ STORM 10.0
[Ptot= 25.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\41eab7b4
-a442-4790-a20d-
remark: 25mm-4hr.stm

* CALI B NASHYD 0306 1 10.0 28.00 0.08 3.50 3.66 0.15 0.000

* ADD [1291+ 0043] 2910 3 10.0 285.50 1.57 11.00 14.09 n/a 0.000

* CHANNEL[2: 2910] 0045 1 10.0 285.50 1.56 11.17 14.09 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d
-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALI B NASHYD 1292 1 10.0 81.30 0.46 10.83 14.68 0.31 0.000
[CN=76.0]
[N = 3.0:Tp 2.37]

* ADD [1292+ 0045] 2920 3 10.0 366.80 2.01 11.00 14.22 n/a 0.000

* DUHYD MAJOR SYSTEM: 0092 1 10.0 366.80 2.01 11.00 14.22 n/a 0.000

MINOR SYSTEM: 0092 2 10.0 0.00 0.00 0.00 0.00 n/a 0.000

* READ STORM 0092 3 10.0 366.80 2.01 11.00 14.22 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d
-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALI B NASHYD 0301 1 10.0 34.40 0.42 8.83 13.67 0.29 0.000
[CN=74.0]
[N = 3.0:Tp 0.77]

* ADD [0301+ 0092] 0091 3 10.0 34.40 0.42 8.83 13.67 n/a 0.000

* CHANNEL[2: 0091] 0074 1 10.0 34.40 0.35 9.33 13.65 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d
-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALI B NASHYD 0303 1 10.0 45.30 0.47 9.17 14.16 0.30 0.000
[CN=75.0]
[N = 3.0:Tp 1.00]

* ADD [0303+ 0074] 0055 3 10.0 79.70 0.82 9.17 13.94 n/a 0.000

* CHANNEL [2: 0055] 0093 1 10.0 79.70 0.78 9.50 13.94 n/a 0.000

* PIPE [2: 0093] 0094 1 5.0 79.70 0.78 9.42 13.94 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0408 1 10.0 7.40 0.14 8.33 14.14 0.30 0.000
[CN=75.0]
[N = 3.0:Tp 0.41]

* ADD [0408+ 0094] 0098 3 5.0 87.10 0.83 9.42 13.95 n/a 0.000

* CHANNEL [2: 0098] 0095 1 5.0 87.10 0.82 9.50 13.95 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0409 1 10.0 15.30 0.22 8.67 14.68 0.31 0.000
[CN=76.0]
[N = 3.0:Tp 0.68]

* ADD [0409+ 0095] 0100 3 5.0 102.40 0.98 9.42 14.06 n/a 0.000

* PIPE [2: 0092] 0101 1 5.0 366.80 2.01 11.08 14.22 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB STANDHYD 0403 1 10.0 52.80 3.00 8.17 30.05 0.63 0.000
[I%=50.0:S%= 0.50]

* RESRVR [2: 0403] 0075 1 5.0 52.80 0.33 10.17 30.05 n/a 0.000
{ST= 0.86 ha.m }

* CALIB NASHYD 2853 1 10.0 137.80 0.76 10.83 14.16 0.30 0.000
[CN=75.0]
[N = 3.0:Tp 2.34]

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 2852 1 10.0 17.50 0.22 8.83 13.67 0.29 0.000
[CN=74.0]
[N = 3.0:Tp 0.75]

* CHANNEL [2: 2852] 0081 1 5.0 17.50 0.15 9.42 13.63 n/a 0.000

* ADD [2853+ 0081] 0080 3 5.0 155.30 0.85 10.50 14.10 n/a 0.000

* CHANNEL [2: 0080] 0050 1 5.0 155.30 0.84 10.75 14.10 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0285 1 10.0 48.60 0.49 9.17 14.16 0.30 0.000
[CN=75.0]
[N = 3.0:Tp 1.03]

* ADD [0285+ 0050] 0069 3 5.0 203.90 1.17 10.08 14.12 n/a 0.000

* ADD [2930+ 0069] 0085 3 5.0 655.30 3.54 10.75 15.44 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0407 1 10.0 9.90 0.35 8.00 11.73 0.25 0.000
[CN=74.0]
[N = 3.0:Tp 0.12]

* ADD [0101+ 0075] 0135 3 5.0 419.60 2.33 11.08 16.21 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0401 1 10.0 10.60 0.13 8.83 13.67 0.29 0.000
[CN=74.0]
[N = 3.0:Tp 0.72]

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0402 1 10.0 16.60 0.09 10.83 13.67 0.29 0.000
[CN=74.0]
[N = 3.0:Tp 2.28]

* ADD [0401+ 0402] 0102 3 10.0 27.20 0.17 9.00 13.67 n/a 0.000

* ADD [0102+ 0135] 0122 3 5.0 446.80 2.45 11.08 16.06 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0404 1 10.0 4.60 0.07 8.50 13.66 0.29 0.000
[CN=74.0]
[N = 3.0:Tp 0.54]

* ADD [0122+ 0404] 2930 3 5.0 451.40 2.47 11.00 16.03 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0406 1 10.0 6.60 0.08 8.83 13.67 0.29 0.000
[CN=74.0]
[N = 3.0:Tp 0.71]

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB STANDHYD 0405 1 10.0 49.80 2.82 8.17 30.05 0.63 0.000
[I%=50.0:S%= 0.50]

* RESRVR [2: 0405] 0077 1 5.0 49.80 0.30 10.25 30.05 n/a 0.000
{ST= 0.82 ha.m }

* ADD [0406+ 0407] 0053 3 10.0 16.50 0.37 8.00 12.51 n/a 0.000

* ADD [0053+ 0077] 0053 1 5.0 66.30 0.44 8.00 25.80 n/a 0.000

* ADD [0100+ 0053] 0088 3 5.0 168.70 1.36 9.33 18.68 n/a 0.000

* ADD [0088+ 0085] 0088 1 5.0 824.00 4.51 10.33 16.10 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0305 1 10.0 79.30 0.58 9.83 13.67 0.29 0.000
[CN=74.0]
[N = 3.0:Tp 1.52]

* CHANNEL [2: 0305] 0071 1 10.0 79.30 0.58 9.83 13.67 n/a 0.000

READ STORM 10.0
[Ptot= 47.43 mm]

fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\9e87b13d-4436-4d54-8fde-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0306 1 10.0 28.00 0.23 9.50 13.67 0.29 0.000
[CN=74.0]
[N = 3.0:Tp 1.29]
* ADD [0306+ 0071] 0059 3 10.0 107.30 0.81 9.83 13.67 n/a 0.000
* ADD [0059+ 0088] 0070 3 5.0 931.30 5.27 10.17 15.82 n/a 0.000

** SIMULATION: Run 03 **

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 2912 1 10.0 112.70 1.30 10.33 26.07 0.39 0.000
[CN=75.0]
[N = 3.0:Tp 1.96]

READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 2911 1 10.0 40.10 0.63 9.50 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 1.25]

* CHANNEL [2: 2911] 0062 1 10.0 40.10 0.59 9.83 25.27 n/a 0.000
* ADD [2912+ 0062] 9120 3 10.0 152.80 1.87 10.17 25.86 n/a 0.000

* CHANNEL [2: 9120] 0043 1 10.0 152.80 1.78 10.67 25.85 n/a 0.000
* READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483-0721-4d94-8520-

-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 1291 1 10.0 132.70 1.18 11.33 26.07 0.39 0.000
[CN=75.0]
[N = 3.0:Tp 2.77]

* ADD [1291+ 0043] 2910 3 10.0 285.50 2.91 10.83 25.95 n/a 0.000
* CHANNEL [2: 2910] 0045 1 10.0 285.50 2.89 11.00 25.95 n/a 0.000

* READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 1292 1 10.0 81.30 0.84 10.83 26.89 0.40 0.000
[CN=76.0]
[N = 3.0:Tp 2.37]

* ADD [1292+ 0045] 2920 3 10.0 366.80 3.73 11.00 26.16 n/a 0.000
* DUHYD 0092 1 10.0 366.80 3.73 11.00 26.16 n/a 0.000
MAJOR SYSTEM: 0092 2 10.0 0.00 0.00 0.00 0.00 n/a 0.000
MINOR SYSTEM: 0092 3 10.0 366.80 3.73 11.00 26.16 n/a 0.000

* READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0301 1 10.0 34.40 0.77 8.83 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 0.77]

* ADD [0301+ 0092] 0091 3 10.0 34.40 0.77 8.83 25.28 n/a 0.000
* CHANNEL [2: 0091] 0074 1 10.0 34.40 0.68 9.17 25.26 n/a 0.000

* READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483-0721-4d94-8520-

remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0303 1 10.0 45.30 0.87 9.17 26.07 0.39 0.000
[CN=75.0]
[N = 3.0:Tp 1.00]

* ADD [0303+ 0074] 0055 3 10.0 79.70 1.54 9.17 25.72 n/a 0.000
* CHANNEL [2: 0055] 0093 1 10.0 79.70 1.48 9.33 25.72 n/a 0.000

* PIPE [2: 0093] 0094 1 5.0 79.70 1.48 9.33 25.72 n/a 0.000
* READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0408 1 10.0 7.40 0.26 8.33 26.03 0.39 0.000
[CN=75.0]
[N = 3.0:Tp 0.41]

* ADD [0408+ 0094] 0098 3 5.0 87.10 1.57 9.33 25.74 n/a 0.000
* CHANNEL [2: 0098] 0095 1 5.0 87.10 1.56 9.33 25.74 n/a 0.000

* READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0409 1 10.0 15.30 0.40 8.67 26.88 0.40 0.000
[CN=76.0]
[N = 3.0:Tp 0.68]

* ADD [0409+ 0095] 0100 3 5.0 102.40 1.86 9.25 25.91 n/a 0.000
* PIPE [2: 0092] 0101 1 5.0 366.80 3.73 10.92 26.16 n/a 0.000

* READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB STANDHYD 0403 1 10.0 52.80 5.04 8.00 45.54 0.68 0.000
[I%=50.0:S%= 0.50]

* RESRVR [2: 0403] 0075 1 5.0 52.80 0.60 9.67 45.54 n/a 0.000
{ST= 1.25 ha.m }

* ADD [0101+ 0075] 0135 3 5.0 419.60 4.26 10.92 28.60 n/a 0.000
* READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0401 1 10.0 10.60 0.25 8.83 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 0.72]

* READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0402 1 10.0 16.60 0.16 10.83 25.28 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 2.28]

* ADD [0401+ 0402] 0102 3 10.0 27.20 0.32 9.00 25.28 n/a 0.000
* ADD [0102+ 0135] 0122 3 5.0 446.80 4.49 10.83 28.40 n/a 0.000

* READ STORM 10.0
[Ptot= 66.79 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0404 1 10.0 4.60 0.13 8.50 25.27 0.38 0.000
[CN=74.0]
[N = 3.0:Tp 0.54]

* ADD [0122+ 0404] 2930 3 5.0 451.40 4.51 10.83 28.36 n/a 0.000

```

*
READ STORM                10.0
[ Ptot= 66.79 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483
-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD            2853 1 10.0 137.80 1.39 10.83 26.07 0.39 0.000
[CN=75.0 ]
[ N = 3.0:Tp 2.34 ]
*
READ STORM                10.0
[ Ptot= 66.79 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483
-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD            2852 1 10.0 17.50 0.40 8.83 25.28 0.38 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.75 ]
*
CHANNEL [ 2: 2852] 0081 1 5.0 17.50 0.31 9.33 25.24 n/a 0.000
*
ADD [ 2853+ 0081] 0080 3 5.0 155.30 1.56 10.50 25.98 n/a 0.000
*
CHANNEL [ 2: 0080] 0050 1 5.0 155.30 1.56 10.75 25.98 n/a 0.000
*
READ STORM                10.0
[ Ptot= 66.79 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483
-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD            0285 1 10.0 48.60 0.91 9.17 26.07 0.39 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.03 ]
*
ADD [ 0285+ 0050] 0069 3 5.0 203.90 2.17 9.92 26.00 n/a 0.000
*
ADD [ 2930+ 0069] 0085 3 5.0 655.30 6.54 10.67 27.63 n/a 0.000
*
READ STORM                10.0
[ Ptot= 66.79 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483

```

```

[CN=74.0 ]
[ N = 3.0:Tp 1.52 ]
*
CHANNEL [ 2: 0305] 0071 1 10.0 79.30 1.07 9.83 25.28 n/a 0.000
*
READ STORM                10.0
[ Ptot= 66.79 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483
-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD            0306 1 10.0 28.00 0.43 9.50 25.28 0.38 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.29 ]
*
ADD [ 0306+ 0071] 0059 3 10.0 107.30 1.49 9.67 25.28 n/a 0.000
*
ADD [ 0059+ 0088] 0070 3 5.0 931.30 9.79 10.08 28.06 n/a 0.000

```

```

*****
** SIMULATION: Run 04 **
*****
READ STORM                10.0
[ Ptot= 79.58 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b
-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALI B NASHYD            2912 1 10.0 112.70 1.75 10.33 34.93 0.44 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.96 ]
*
READ STORM                10.0
[ Ptot= 79.58 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b
-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALI B NASHYD            2911 1 10.0 40.10 0.85 9.50 33.95 0.43 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.25 ]
*
CHANNEL [ 2: 2911] 0062 1 10.0 40.10 0.80 9.83 33.94 n/a 0.000
*
ADD [ 2912+ 0062] 9120 3 10.0 152.80 2.52 10.17 34.67 n/a 0.000

```

```

-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD            0407 1 10.0 9.90 0.65 8.00 21.69 0.32 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.12 ]
*
READ STORM                10.0
[ Ptot= 66.79 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483
-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD            0406 1 10.0 6.60 0.16 8.83 25.28 0.38 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.71 ]
*
READ STORM                10.0
[ Ptot= 66.79 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483
-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B STANDHYD          0405 1 10.0 49.80 4.75 8.00 45.54 0.68 0.000
[I%=50.0: S%= 0.50 ]
*
RESRVR [ 2: 0405] 0077 1 5.0 49.80 0.50 9.83 45.54 n/a 0.000
{ST= 1.21 ha.m }
*
ADD [ 0406+ 0407] 0053 3 10.0 16.50 0.69 8.00 23.13 n/a 0.000
*
ADD [ 0053+ 0077] 0053 1 5.0 66.30 0.84 8.00 40.14 n/a 0.000
*
ADD [ 0100+ 0053] 0088 3 5.0 168.70 2.53 9.25 31.50 n/a 0.000
*
ADD [ 0088+ 0085] 0088 1 5.0 824.00 8.35 10.17 28.42 n/a 0.000
*
READ STORM                10.0
[ Ptot= 66.79 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\424c0483
-0721-4d94-8520-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD            0305 1 10.0 79.30 1.07 9.83 25.28 0.38 0.000

```

```

*
CHANNEL [ 2: 9120] 0043 1 10.0 152.80 2.42 10.50 34.66 n/a 0.000
*
READ STORM                10.0
[ Ptot= 79.58 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b
-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALI B NASHYD            1291 1 10.0 132.70 1.58 11.33 34.93 0.44 0.000
[CN=75.0 ]
[ N = 3.0:Tp 2.77 ]
*
ADD [ 1291+ 0043] 2910 3 10.0 285.50 3.93 10.83 34.79 n/a 0.000
*
CHANNEL [ 2: 2910] 0045 1 10.0 285.50 3.91 11.00 34.79 n/a 0.000
*
READ STORM                10.0
[ Ptot= 79.58 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b
-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALI B NASHYD            1292 1 10.0 81.30 1.13 10.83 35.94 0.45 0.000
[CN=76.0 ]
[ N = 3.0:Tp 2.37 ]
*
ADD [ 1292+ 0045] 2920 3 10.0 366.80 5.03 10.83 35.04 n/a 0.000
*
DIHYD 0092 1 10.0 366.80 5.03 10.83 35.04 n/a 0.000
MAJOR SYSTEM: 0092 2 10.0 0.00 0.00 0.00 0.00 n/a 0.000
MINOR SYSTEM: 0092 3 10.0 366.80 5.03 10.83 35.04 n/a 0.000
*
READ STORM                10.0
[ Ptot= 79.58 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b
-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALI B NASHYD            0301 1 10.0 34.40 1.04 8.83 33.95 0.43 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.77 ]
*
ADD [ 0301+ 0092] 0091 3 10.0 34.40 1.04 8.83 33.95 n/a 0.000

```

```

* CHANNEL[ 2: 0091] 0074 1 10.0 34.40 0.92 9.17 33.93 n/a 0.000
  READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b-f627-4166-a5de-
  remark: Mil lton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD 0303 1 10.0 45.30 1.17 9.17 34.93 0.44 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.00]
*
* ADD [ 0303+ 0074] 0055 3 10.0 79.70 2.09 9.17 34.50 n/a 0.000
*
* CHANNEL[ 2: 0055] 0093 1 10.0 79.70 2.02 9.33 34.49 n/a 0.000
*
* PIPE [ 2: 0093] 0094 1 5.0 79.70 2.01 9.33 34.49 n/a 0.000
  READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b-f627-4166-a5de-
  remark: Mil lton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD 0408 1 10.0 7.40 0.36 8.33 34.87 0.44 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.41]
*
* ADD [ 0408+ 0094] 0098 3 5.0 87.10 2.14 9.25 34.52 n/a 0.000
*
* CHANNEL[ 2: 0098] 0095 1 5.0 87.10 2.13 9.33 34.52 n/a 0.000
  READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b-f627-4166-a5de-
  remark: Mil lton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD 0409 1 10.0 15.30 0.54 8.67 35.93 0.45 0.000
  [CN=76.0 ]
  [ N = 3.0:Tp 0.68]
*
* ADD [ 0409+ 0095] 0100 3 5.0 102.40 2.55 9.25 34.73 n/a 0.000
*
* PIPE [ 2: 0092] 0101 1 5.0 366.80 5.03 10.92 35.04 n/a 0.000

*
* CALI B NASHYD 0404 1 10.0 4.60 0.18 8.50 33.93 0.43 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.54]
*
* ADD [ 0122+ 0404] 2930 3 5.0 451.40 6.09 10.75 37.45 n/a 0.000
  READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b-f627-4166-a5de-
  remark: Mil lton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD 2853 1 10.0 137.80 1.87 10.83 34.93 0.44 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 2.34]
*
  READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b-f627-4166-a5de-
  remark: Mil lton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD 2852 1 10.0 17.50 0.54 8.83 33.95 0.43 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.75]
*
* CHANNEL[ 2: 2852] 0081 1 5.0 17.50 0.43 9.25 33.91 n/a 0.000
*
* ADD [ 2853+ 0081] 0080 3 5.0 155.30 2.10 10.50 34.81 n/a 0.000
*
* CHANNEL[ 2: 0080] 0050 1 5.0 155.30 2.10 10.67 34.81 n/a 0.000
  READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b-f627-4166-a5de-
  remark: Mil lton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD 0285 1 10.0 48.60 1.22 9.17 34.93 0.44 0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.03]
*
* ADD [ 0285+ 0050] 0069 3 5.0 203.90 2.94 9.83 34.84 n/a 0.000

```

```

* READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b-f627-4166-a5de-
  remark: Mil lton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B STANDHYD 0403 1 10.0 52.80 6.20 8.00 56.27 0.71 0.000
  [I%=50.0:S%= 0.50]
*
  RESRVR [ 2: 0403] 0075 1 5.0 52.80 0.86 9.42 56.27 n/a 0.000
  {ST= 1.49 ha.m }
*
* ADD [ 0101+ 0075] 0135 3 5.0 419.60 5.75 10.83 37.71 n/a 0.000
  READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b-f627-4166-a5de-
  remark: Mil lton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD 0401 1 10.0 10.60 0.33 8.83 33.95 0.43 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.72]
*
  READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b-f627-4166-a5de-
  remark: Mil lton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD 0402 1 10.0 16.60 0.22 10.67 33.95 0.43 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 2.28]
*
* ADD [ 0401+ 0402] 0102 3 10.0 27.20 0.44 9.00 33.95 n/a 0.000
*
* ADD [ 0102+ 0135] 0122 3 5.0 446.80 6.06 10.83 37.48 n/a 0.000
  READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b-f627-4166-a5de-
  remark: Mil lton IDF, based on AES Toronto Pearson International Airpo

*
* ADD [ 2930+ 0069] 0085 3 5.0 655.30 8.84 10.58 36.64 n/a 0.000
  READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b-f627-4166-a5de-
  remark: Mil lton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD 0407 1 10.0 9.90 0.89 8.00 29.13 0.37 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.12]
*
  READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b-f627-4166-a5de-
  remark: Mil lton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD 0406 1 10.0 6.60 0.21 8.83 33.95 0.43 0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.71]
*
  READ STORM
  [ Ptot= 79.58 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b-f627-4166-a5de-
  remark: Mil lton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B STANDHYD 0405 1 10.0 49.80 5.85 8.00 56.27 0.71 0.000
  [I%=50.0:S%= 0.50]
*
  RESRVR [ 2: 0405] 0077 1 5.0 49.80 0.72 9.58 56.27 n/a 0.000
  {ST= 1.45 ha.m }
*
* ADD [ 0406+ 0407] 0053 3 10.0 16.50 0.93 8.00 31.06 n/a 0.000
*
* ADD [ 0053+ 0077] 0053 1 5.0 66.30 1.12 8.00 50.20 n/a 0.000
*
* ADD [ 0100+ 0053] 0088 3 5.0 168.70 3.51 9.17 40.81 n/a 0.000
*
* ADD [ 0088+ 0085] 0088 1 5.0 824.00 11.36 10.08 37.49 n/a 0.000
  READ STORM
  [ Ptot= 79.58 mm ]

```

```

fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b
-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0305  1 10.0  79.30  1.45  9.83  33.95  0.43  0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.52]
*
* CHANNEL[ 2: 0305]    0071  1 10.0  79.30  1.45  9.83  33.95  n/a  0.000
*
* READ STORM
  [ Ptot= 79.58 mm ]
  fname :

```

```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\0ec6bc5b
-f627-4166-a5de-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0306  1 10.0  28.00  0.58  9.50  33.95  0.43  0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.29]
*
* ADD [ 0306+ 0071]    0059  3 10.0  107.30  2.01  9.67  33.95  n/a  0.000
*
* ADD [ 0059+ 0088]    0070  3  5.0  931.30  13.32  10.00  37.08  n/a  0.000
*

```

```

*****
** SIMULATION: Run 05 **
*****
*
* READ STORM
  [ Ptot= 96.17 mm ]
  fname :

```

```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681
-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD          2912  1 10.0  112.70  2.38  10.33  47.27  0.49  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.96]
*
* READ STORM
  [ Ptot= 96.17 mm ]
  fname :

```

```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681
-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

*
** CALI B NASHYD          0301  1 10.0  34.40  1.41  8.83  46.07  0.48  0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.77]
*
* ADD [ 0301+ 0092]    0091  3 10.0  34.40  1.41  8.83  46.07  n/a  0.000
*
* CHANNEL[ 2: 0091]    0074  1 10.0  34.40  1.27  9.17  46.05  n/a  0.000
*
* READ STORM
  [ Ptot= 96.17 mm ]
  fname :

```

```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681
-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD          0303  1 10.0  45.30  1.58  9.17  47.27  0.49  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.00]
*
* ADD [ 0303+ 0074]    0055  3 10.0  79.70  2.85  9.17  46.75  n/a  0.000
*
* CHANNEL[ 2: 0055]    0093  1 10.0  79.70  2.76  9.33  46.74  n/a  0.000
*
* PIPE [ 2: 0093]      0094  1  5.0  79.70  2.76  9.25  46.74  n/a  0.000
*
* READ STORM
  [ Ptot= 96.17 mm ]
  fname :

```

```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681
-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0408  1 10.0  7.40  0.48  8.33  47.19  0.49  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 0.41]
*
* ADD [ 0408+ 0094]    0098  3  5.0  87.10  2.95  9.25  46.78  n/a  0.000
*
* CHANNEL[ 2: 0098]    0095  1  5.0  87.10  2.93  9.25  46.78  n/a  0.000
*
* READ STORM
  [ Ptot= 96.17 mm ]
  fname :

```

```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681
-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

** CALI B NASHYD          2911  1 10.0  40.10  1.15  9.50  46.07  0.48  0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.25]
*
* CHANNEL[ 2: 2911]    0062  1 10.0  40.10  1.10  9.83  46.06  n/a  0.000
*
* ADD [ 2912+ 0062]    9120  3 10.0  152.80  3.42  10.00  46.96  n/a  0.000
*
* CHANNEL[ 2: 9120]    0043  1 10.0  152.80  3.32  10.50  46.95  n/a  0.000
*
* READ STORM
  [ Ptot= 96.17 mm ]
  fname :

```

```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681
-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD          1291  1 10.0  132.70  2.15  11.33  47.27  0.49  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 2.77]
*
* ADD [ 1291+ 0043]    2910  3 10.0  285.50  5.35  10.67  47.10  n/a  0.000
*
* CHANNEL[ 2: 2910]    0045  1 10.0  285.50  5.31  10.83  47.10  n/a  0.000
*
* READ STORM
  [ Ptot= 96.17 mm ]
  fname :

```

```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681
-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

*
** CALI B NASHYD          1292  1 10.0  81.30  1.53  10.83  48.50  0.50  0.000
  [CN=76.0 ]
  [ N = 3.0:Tp 2.37]
*
* ADD [ 1292+ 0045]    2920  3 10.0  366.80  6.84  10.83  47.41  n/a  0.000
*
* DUHYD
  MAJOR SYSTEM: 0092  1 10.0  366.80  6.84  10.83  47.41  n/a  0.000
  MINOR SYSTEM: 0092  2 10.0  0.00  0.00  0.00  0.00  n/a  0.000
*
* READ STORM
  [ Ptot= 96.17 mm ]
  fname :

```

```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681
-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

*
* CALI B NASHYD          0409  1 10.0  15.30  0.73  8.67  48.49  0.50  0.000
  [CN=76.0 ]
  [ N = 3.0:Tp 0.68]
*
* ADD [ 0409+ 0095]    0100  3  5.0  102.40  3.51  9.17  47.03  n/a  0.000
*
* PIPE [ 2: 0092]      0101  1  5.0  366.80  6.83  10.83  47.41  n/a  0.000
*
* READ STORM
  [ Ptot= 96.17 mm ]
  fname :

```

```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681
-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B STANDHYD        0403  1 10.0  52.80  7.63  8.00  70.62  0.73  0.000
  [I%=50.0;S%=0.50]
*
* RESRVR [ 2: 0403]    0075  1  5.0  52.80  1.58  9.08  70.63  n/a  0.000
  {ST= 1.75 ha.m }
*
* ADD [ 0101+ 0075]    0135  3  5.0  419.60  7.76  10.75  50.33  n/a  0.000
*
* READ STORM
  [ Ptot= 96.17 mm ]
  fname :

```

```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681
-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

*
* CALI B NASHYD          0401  1 10.0  10.60  0.45  8.83  46.07  0.48  0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.72]
*
* READ STORM
  [ Ptot= 96.17 mm ]
  fname :

```

```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681
-7c7c-4b3f-a234-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

```

```

*
* CALI B NASHYD          0402  1 10.0  16.60  0.30  10.67  46.07  0.48  0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 2.28]
*
* ADD [ 0401+ 0402]    0102  3 10.0  27.20  0.59  9.00  46.07  n/a  0.000
*
* ADD [ 0102+ 0135]    0122  3  5.0  446.80  8.19  10.75  50.07  n/a  0.000

```

```

*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              0404 1 10.0  4.60  0.24  8.50  46.05 0.48  0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.54]
*
* ADD [ 0122+ 0404] 2930 3 5.0  451.40  8.23 10.75  50.03 n/a  0.000
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              2853 1 10.0 137.80  2.54 10.83  47.27 0.49  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 2.34]
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              2852 1 10.0  17.50  0.73  8.83  46.07 0.48  0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.75]
*
* CHANNEL [ 2: 2852] 0081 1 5.0  17.50  0.60  9.25  46.03 n/a  0.000
*
* ADD [ 2853+ 0081] 0080 3 5.0  155.30  2.85 10.50  47.13 n/a  0.000
*
* CHANNEL [ 2: 0080] 0050 1 5.0  155.30  2.85 10.58  47.13 n/a  0.000
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* ADD [ 0100+ 0053] 0088 3 5.0  168.70  4.86  9.08  53.63 n/a  0.000
*
* ADD [ 0088+ 0085] 0088 1 5.0  824.00  15.45 10.00  50.06 n/a  0.000
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              0305 1 10.0  79.30  1.97  9.83  46.07 0.48  0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.52]
*
* CHANNEL [ 2: 0305] 0071 1 10.0  79.30  1.97  9.83  46.07 n/a  0.000
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              0306 1 10.0  28.00  0.79  9.50  46.07 0.48  0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.29]
*
* ADD [ 0306+ 0071] 0059 3 10.0  107.30  2.73  9.67  46.07 n/a  0.000
*
* ADD [ 0059+ 0088] 0070 3 5.0  931.30  18.13  9.92  49.60 n/a  0.000
*
*****
** SIMULATION: Run 06 **
*****
  READ STORM                10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD              2912 1 10.0 112.70  2.89 10.33  57.43 0.53  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.96]
*
  READ STORM                10.0

```

```

*
* CALI B NASHYD              0285 1 10.0  48.60  1.66  9.17  47.27 0.49  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 1.03]
*
* ADD [ 0285+ 0050] 0069 3 5.0  203.90  4.01  9.83  47.17 n/a  0.000
*
* ADD [ 2930+ 0069] 0085 3 5.0  655.30  11.98 10.42  49.14 n/a  0.000
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              0407 1 10.0  9.90  1.20  8.00  39.54 0.41  0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.12]
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD              0406 1 10.0  6.60  0.28  8.67  46.07 0.48  0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 0.71]
*
  READ STORM                10.0
  [ Ptot= 96.17 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\39fe9681-7c7c-4b3f-a234-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B STANDHYD            0405 1 10.0  49.80  7.20  8.00  70.62 0.73  0.000
  [I%=50.0: S%= 0.50]
*
* RESRVR [ 2: 0405] 0077 1 5.0  49.80  1.00  9.50  70.63 n/a  0.000
  {ST= 1.76 ha.m }
*
* ADD [ 0406+ 0407] 0053 3 10.0  16.50  1.27  8.00  42.15 n/a  0.000
*
* ADD [ 0053+ 0077] 0053 1 5.0  66.30  1.50  8.00  63.81 n/a  0.000

*
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD              2911 1 10.0  40.10  1.40  9.33  56.07 0.51  0.000
  [CN=74.0 ]
  [ N = 3.0:Tp 1.25]
*
* CHANNEL [ 2: 2911] 0062 1 10.0  40.10  1.34  9.67  56.05 n/a  0.000
*
* ADD [ 2912+ 0062] 9120 3 10.0  152.80  4.16 10.00  57.07 n/a  0.000
*
* CHANNEL [ 2: 9120] 0043 1 10.0  152.80  4.04 10.33  57.06 n/a  0.000
*
  READ STORM                10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD              1291 1 10.0 132.70  2.61 11.33  57.43 0.53  0.000
  [CN=75.0 ]
  [ N = 3.0:Tp 2.77]
*
* ADD [ 1291+ 0043] 2910 3 10.0  285.50  6.51 10.67  57.23 n/a  0.000
*
* CHANNEL [ 2: 2910] 0045 1 10.0  285.50  6.49 10.83  57.23 n/a  0.000
*
  READ STORM                10.0
  [ Ptot=109.12 mm ]
  fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
  remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALI B NASHYD              1292 1 10.0  81.30  1.85 10.83  58.81 0.54  0.000
  [CN=76.0 ]
  [ N = 3.0:Tp 2.37]
*
* ADD [ 1292+ 0045] 2920 3 10.0  366.80  8.34 10.83  57.58 n/a  0.000
*
* DUHYD
  MAJOR SYSTEM:             0092 1 10.0  366.80  8.34 10.83  57.58 n/a  0.000
  MINOR SYSTEM:             0092 2 10.0  0.00  0.00  0.00  0.00 n/a  0.000
*
*
  MAJOR SYSTEM:             0092 3 10.0  366.80  8.34 10.83  57.58 n/a  0.000

```

READ STORM 10.0
[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALIB NASHYD 0301 1 10.0 34.40 1.71 8.83 56.06 0.51 0.000
[CN=74.0]
[N = 3.0:Tp 0.77]
*
* ADD [0301+ 0092] 0091 3 10.0 34.40 1.71 8.83 56.06 n/a 0.000
*
* CHANNEL [2: 0091] 0074 1 10.0 34.40 1.55 9.17 56.04 n/a 0.000
*

READ STORM 10.0
[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALIB NASHYD 0303 1 10.0 45.30 1.92 9.17 57.42 0.53 0.000
[CN=75.0]
[N = 3.0:Tp 1.00]
*
* ADD [0303+ 0074] 0055 3 10.0 79.70 3.46 9.17 56.83 n/a 0.000
*
* CHANNEL [2: 0055] 0093 1 10.0 79.70 3.36 9.33 56.82 n/a 0.000
*
* PIPE [2: 0093] 0094 1 5.0 79.70 3.37 9.25 56.82 n/a 0.000
*

READ STORM 10.0
[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD 0408 1 10.0 7.40 0.59 8.33 57.33 0.53 0.000
[CN=75.0]
[N = 3.0:Tp 0.41]
*
* ADD [0408+ 0094] 0098 3 5.0 87.10 3.59 9.17 56.87 n/a 0.000
*
* CHANNEL [2: 0098] 0095 1 5.0 87.10 3.57 9.25 56.86 n/a 0.000
*
* READ STORM 10.0

*
* CALIB NASHYD 0402 1 10.0 16.60 0.37 10.67 56.07 0.51 0.000
[CN=74.0]
[N = 3.0:Tp 2.28]
*
* ADD [0401+ 0402] 0102 3 10.0 27.20 0.72 9.00 56.06 n/a 0.000
*
* ADD [0102+ 0135] 0122 3 5.0 446.80 9.83 10.75 60.39 n/a 0.000
*

READ STORM 10.0
[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD 0404 1 10.0 4.60 0.29 8.50 56.03 0.51 0.000
[CN=74.0]
[N = 3.0:Tp 0.54]
*
* ADD [0122+ 0404] 2930 3 5.0 451.40 9.88 10.75 60.34 n/a 0.000
*

READ STORM 10.0
[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD 2853 1 10.0 137.80 3.08 10.83 57.43 0.53 0.000
[CN=75.0]
[N = 3.0:Tp 2.34]
*

READ STORM 10.0
[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD 2852 1 10.0 17.50 0.89 8.83 56.06 0.51 0.000
[CN=74.0]
[N = 3.0:Tp 0.75]
*
* CHANNEL [2: 2852] 0081 1 5.0 17.50 0.74 9.25 56.02 n/a 0.000
*
* ADD [2853+ 0081] 0080 3 5.0 155.30 3.47 10.50 57.27 n/a 0.000
*
* CHANNEL [2: 0080] 0050 1 5.0 155.30 3.46 10.58 57.27 n/a 0.000

[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD 0409 1 10.0 15.30 0.88 8.67 58.80 0.54 0.000
[CN=76.0]
[N = 3.0:Tp 0.68]
*
* ADD [0409+ 0095] 0100 3 5.0 102.40 4.28 9.08 57.15 n/a 0.000
*
* PIPE [2: 0092] 0101 1 5.0 366.80 8.34 10.83 57.58 n/a 0.000
*

READ STORM 10.0
[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB STANDHYD 0403 1 10.0 52.80 8.74 8.00 82.09 0.75 0.000
[I%=50.0:S%= 0.50]
*
* RESRVR [2: 0403] 0075 1 5.0 52.80 2.51 8.83 82.10 n/a 0.000
{ST= 1.86 ha.m }
*
* ADD [0101+ 0075] 0135 3 5.0 419.60 9.31 10.75 60.67 n/a 0.000
*

READ STORM 10.0
[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD 0401 1 10.0 10.60 0.55 8.83 56.06 0.51 0.000
[CN=74.0]
[N = 3.0:Tp 0.72]
*

READ STORM 10.0
[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* READ STORM 10.0
[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD 0285 1 10.0 48.60 2.01 9.17 57.42 0.53 0.000
[CN=75.0]
[N = 3.0:Tp 1.03]
*
* ADD [0285+ 0050] 0069 3 5.0 203.90 4.89 9.83 57.31 n/a 0.000
*
* ADD [2930+ 0069] 0085 3 5.0 655.30 14.44 10.50 59.40 n/a 0.000
*

READ STORM 10.0
[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD 0407 1 10.0 9.90 1.46 8.00 48.11 0.44 0.000
[CN=74.0]
[N = 3.0:Tp 0.12]
*

READ STORM 10.0
[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD 0406 1 10.0 6.60 0.35 8.67 56.06 0.51 0.000
[CN=74.0]
[N = 3.0:Tp 0.71]
*

READ STORM 10.0
[Ptot=109.12 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB STANDHYD 0405 1 10.0 49.80 8.24 8.00 82.09 0.75 0.000
[I%=50.0:S%= 0.50]

```

*
RESRVR [ 2: 0405] 0077 1 5.0 49.80 1.89 9.00 82.10 n/a 0.000
  {ST= 1.88 ha.m }
*
ADD [ 0406+ 0407] 0053 3 10.0 16.50 1.55 8.00 51.29 n/a 0.000
*
ADD [ 0053+ 0077] 0053 1 5.0 66.30 2.40 8.92 74.73 n/a 0.000
*
ADD [ 0100+ 0053] 0088 3 5.0 168.70 6.62 9.00 64.06 n/a 0.000
*
ADD [ 0088+ 0085] 0088 1 5.0 824.00 18.81 9.67 60.35 n/a 0.000
*
READ STORM 10.0
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B NASHYD 0305 1 10.0 79.30 2.39 9.83 56.07 0.51 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.52]
*
CHANNEL[ 2: 0305] 0071 1 10.0 79.30 2.39 9.83 56.07 n/a 0.000
*
READ STORM 10.0
[ Ptot=109.12 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\8ce1efa4
-efd1-423a-b24c-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B NASHYD 0306 1 10.0 28.00 0.96 9.50 56.07 0.51 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.29]
*
ADD [ 0306+ 0071] 0059 3 10.0 107.30 3.33 9.67 56.07 n/a 0.000
*
ADD [ 0059+ 0088] 0070 3 5.0 931.30 22.14 9.67 59.86 n/a 0.000
*
*****
** SIMULATION: Run 07 **
*****
READ STORM 10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
ADD [ 1292+ 0045] 2920 3 10.0 366.80 9.79 10.83 68.35 n/a 0.000
*
DUHYD 0092 1 10.0 366.80 9.79 10.83 68.35 n/a 0.000
MAJOR SYSTEM: 0092 2 10.0 0.00 0.00 0.00 0.00 n/a 0.000
MINOR SYSTEM: 0092 3 10.0 366.80 9.79 10.83 68.35 n/a 0.000
*
READ STORM 10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B NASHYD 0301 1 10.0 34.40 2.00 8.83 66.66 0.54 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.77]
*
ADD [ 0301+ 0092] 0091 3 10.0 34.40 2.00 8.83 66.66 n/a 0.000
*
CHANNEL[ 2: 0091] 0074 1 10.0 34.40 1.83 9.00 66.64 n/a 0.000
*
READ STORM 10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B NASHYD 0303 1 10.0 45.30 2.24 9.17 68.17 0.56 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.00]
*
ADD [ 0303+ 0074] 0055 3 10.0 79.70 4.06 9.00 67.51 n/a 0.000
*
CHANNEL[ 2: 0055] 0093 1 10.0 79.70 3.95 9.17 67.51 n/a 0.000
*
PIPE [ 2: 0093] 0094 1 5.0 79.70 3.95 9.25 67.51 n/a 0.000
*
READ STORM 10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B NASHYD 0408 1 10.0 7.40 0.68 8.33 68.06 0.56 0.000
[CN=75.0 ]

*
RESRVR [ 2: 0405] 0077 1 5.0 49.80 1.89 9.00 82.10 n/a 0.000
  {ST= 1.88 ha.m }
*
CALI B NASHYD 2912 1 10.0 112.70 3.38 10.33 68.18 0.56 0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.96]
*
READ STORM 10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B NASHYD 2911 1 10.0 40.10 1.64 9.33 66.66 0.54 0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.25]
*
CHANNEL[ 2: 2911] 0062 1 10.0 40.10 1.58 9.67 66.65 n/a 0.000
*
ADD [ 2912+ 0062] 9120 3 10.0 152.80 4.88 10.00 67.78 n/a 0.000
*
CHANNEL[ 2: 9120] 0043 1 10.0 152.80 4.75 10.33 67.77 n/a 0.000
*
READ STORM 10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B NASHYD 1291 1 10.0 132.70 3.06 11.33 68.18 0.56 0.000
[CN=75.0 ]
[ N = 3.0:Tp 2.77]
*
ADD [ 1291+ 0043] 2910 3 10.0 285.50 7.64 10.67 67.96 n/a 0.000
*
CHANNEL[ 2: 2910] 0045 1 10.0 285.50 7.62 10.83 67.96 n/a 0.000
*
READ STORM 10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B NASHYD 1292 1 10.0 81.30 2.17 10.83 69.71 0.57 0.000
[CN=76.0 ]
[ N = 3.0:Tp 2.37]

*
[ N = 3.0:Tp 0.41]
*
ADD [ 0408+ 0094] 0098 3 5.0 87.10 4.22 9.17 67.55 n/a 0.000
*
CHANNEL[ 2: 0098] 0095 1 5.0 87.10 4.19 9.25 67.55 n/a 0.000
*
READ STORM 10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B NASHYD 0409 1 10.0 15.30 1.03 8.67 69.70 0.57 0.000
[CN=76.0 ]
[ N = 3.0:Tp 0.68]
*
ADD [ 0409+ 0095] 0100 3 5.0 102.40 5.04 9.08 67.87 n/a 0.000
*
PIPE [ 2: 0092] 0101 1 5.0 366.80 9.78 10.83 68.35 n/a 0.000
*
READ STORM 10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B STANDHYD 0403 1 10.0 52.80 9.87 8.00 94.01 0.77 0.000
[I%=50.0:S%= 0.50]
*
RESRVR [ 2: 0403] 0075 1 5.0 52.80 3.37 8.67 94.02 n/a 0.000
  {ST= 1.96 ha.m }
*
ADD [ 0101+ 0075] 0135 3 5.0 419.60 10.80 10.75 71.58 n/a 0.000
*
READ STORM 10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6
-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
CALI B NASHYD 0401 1 10.0 10.60 0.64 8.67 66.65 0.54 0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.72]
*
READ STORM 10.0

```

```

[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0402 1 10.0  16.60  0.43 10.67  66.67 0.54  0.000
[CN=74.0 ]
[ N = 3.0:Tp 2.28]
*
* ADD [ 0401+ 0402] 0102 3 10.0  27.20  0.85  9.00  66.66 n/a  0.000
*
* ADD [ 0102+ 0135] 0122 3  5.0  446.80  11.40 10.75  71.28 n/a  0.000
*
* READ STORM              10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0404 1 10.0   4.60  0.34  8.50  66.63 0.54  0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.54]
*
* ADD [ 0122+ 0404] 2930 3  5.0  451.40  11.46 10.75  71.23 n/a  0.000
*
* READ STORM              10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          2853 1 10.0  137.80  3.61 10.83  68.18 0.56  0.000
[CN=75.0 ]
[ N = 3.0:Tp 2.34]
*
* READ STORM              10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          2852 1 10.0   17.50  1.04  8.83  66.65 0.54  0.000
[CN=74.0 ]

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B STANDHYD       0405 1 10.0   49.80  9.31  8.00  94.01 0.77  0.000
[I%=50.0: S%= 0.50]
*
* RESRVR [ 2: 0405] 0077 1  5.0   49.80  2.67  8.83  94.01 n/a  0.000
{ST= 1.98 ha.m }
*
* ADD [ 0406+ 0407] 0053 3 10.0   16.50  1.84  8.00  60.98 n/a  0.000
*
* ADD [ 0053+ 0077] 0053 1  5.0   66.30  3.32  8.75  86.14 n/a  0.000
*
* ADD [ 0100+ 0053] 0088 3  5.0  168.70  8.13  8.92  75.05 n/a  0.000
*
* ADD [ 0088+ 0085] 0088 1  5.0  824.00  22.10  9.50  71.22 n/a  0.000
*
* READ STORM              10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0305 1 10.0   79.30  2.80  9.67  66.67 0.54  0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.52]
*
* CHANNEL [ 2: 0305] 0071 1 10.0   79.30  2.81  9.83  66.67 n/a  0.000
*
* READ STORM              10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0306 1 10.0   28.00  1.12  9.50  66.66 0.54  0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.29]
*
* ADD [ 0306+ 0071] 0059 3 10.0  107.30  3.90  9.67  66.66 n/a  0.000
*
* ADD [ 0059+ 0088] 0070 3  5.0  931.30  25.96  9.50  70.70 n/a  0.000
*
*****
** SIMULATION: Run 08 **

```

```

[ N = 3.0:Tp 0.75]
*
* CHANNEL [ 2: 2852] 0081 1  5.0   17.50  0.88  9.17  66.62 n/a  0.000
*
* ADD [ 2853+ 0081] 0080 3  5.0  155.30  4.06 10.33  68.00 n/a  0.000
*
* CHANNEL [ 2: 0080] 0050 1  5.0  155.30  4.05 10.50  68.00 n/a  0.000
*
* READ STORM              10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0285 1 10.0   48.60  2.35  9.17  68.17 0.56  0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.03]
*
* ADD [ 0285+ 0050] 0069 3  5.0  203.90  5.74  9.75  68.04 n/a  0.000
*
* ADD [ 2930+ 0069] 0085 3  5.0  655.30  16.81 10.50  70.24 n/a  0.000
*
* READ STORM              10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0407 1 10.0   9.90  1.73  8.00  57.20 0.47  0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.12]
*
* READ STORM              10.0
[ Ptot=122.36 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALI B NASHYD          0406 1 10.0   6.60  0.41  8.67  66.65 0.54  0.000
[CN=74.0 ]
[ N = 3.0:Tp 0.71]
*
* READ STORM              10.0
[ Ptot=122.36 mm ]
fname :

*****
*
* READ STORM              60.0
[ Ptot=212.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
** CALI B NASHYD          2912 1 10.0  112.70  7.89 12.00 146.91 0.69  0.000
[CN=75.0 ]
[ N = 3.0:Tp 1.96]
*
* READ STORM              60.0
[ Ptot=212.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
** CALI B NASHYD          2911 1 10.0   40.10  3.41 11.33 144.64 0.68  0.000
[CN=74.0 ]
[ N = 3.0:Tp 1.25]
*
* CHANNEL [ 2: 2911] 0062 1 10.0   40.10  3.35 11.50 144.63 n/a  0.000
*
* ADD [ 2912+ 0062] 9120 3 10.0  152.80  11.15 11.83 146.31 n/a  0.000
*
* CHANNEL [ 2: 9120] 0043 1 10.0  152.80  10.95 12.17 146.31 n/a  0.000
*
* READ STORM              60.0
[ Ptot=212.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm

*
** CALI B NASHYD          1291 1 10.0  132.70  7.70 12.67 146.91 0.69  0.000
[CN=75.0 ]
[ N = 3.0:Tp 2.77]
*
* ADD [ 1291+ 0043] 2910 3 10.0  285.50  18.52 12.33 146.59 n/a  0.000
*
* CHANNEL [ 2: 2910] 0045 1 10.0  285.50  18.46 12.50 146.59 n/a  0.000
*
* READ STORM              60.0
[ Ptot=212.00 mm ]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81-4626-40a7-a7ad-

```

-4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

```

** CALI B NASHYD      1292  1 10.0   81.30   5.22 12.33 149.19 0.70  0.000
   [CN=76.0          ]
   [ N = 3.0:Tp 2.37]
*
* ADD [ 1292+ 0045] 2920  3 10.0   366.80   23.66 12.50 147.16 n/a  0.000
*
* DUHYD                0092  1 10.0   366.80   23.66 12.50 147.16 n/a  0.000
* MAJOR SYSTEM:       0092  2 10.0   111.62   13.85 12.50 147.16 n/a  0.000
* MINOR SYSTEM:       0092  3 10.0   255.18   9.81  9.67 147.16 n/a  0.000
*
* READ STORM           60.0
   [ Ptot=212.00 mm ]
   fname :
  
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

```

** CALI B NASHYD      0301  1 10.0   34.40   3.38 10.83 144.62 0.68  0.000
   [CN=74.0          ]
   [ N = 3.0:Tp 0.77]
*
* ADD [ 0301+ 0092] 0091  3 10.0   146.02   15.57 12.17 146.56 n/a  0.000
*
* CHANNEL[ 2: 0091] 0074  1 10.0   146.02   15.37 12.33 146.56 n/a  0.000
*
* READ STORM           60.0
   [ Ptot=212.00 mm ]
   fname :
  
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

```

* CALI B NASHYD      0303  1 10.0   45.30   4.22 11.17 146.90 0.69  0.000
   [CN=75.0          ]
   [ N = 3.0:Tp 1.00]
*
* ADD [ 0303+ 0074] 0055  3 10.0   191.32   18.23 12.17 146.64 n/a  0.000
*
* CHANNEL[ 2: 0055] 0093  1 10.0   191.32   18.15 12.33 146.64 n/a  0.000
*
* PIPE [ 2: 0093] 0094  1 5.0     191.32   18.14 12.33 146.64 n/a  0.000
*
* READ STORM           60.0
   [ Ptot=212.00 mm ]
   fname :
  
```

```

* CALI B NASHYD      0401  1 10.0   10.60   1.06 10.67 144.61 0.68  0.000
   [CN=74.0          ]
   [ N = 3.0:Tp 0.72]
*
* READ STORM           60.0
   [ Ptot=212.00 mm ]
   fname :
  
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

```

* CALI B NASHYD      0402  1 10.0   16.60   1.06 12.33 144.64 0.68  0.000
   [CN=74.0          ]
   [ N = 3.0:Tp 2.28]
*
* ADD [ 0401+ 0402] 0102  3 10.0   27.20   1.93 11.17 144.63 n/a  0.000
*
* ADD [ 0102+ 0135] 0122  3 5.0     335.18   17.45 10.50 151.79 n/a  0.000
*
* READ STORM           60.0
   [ Ptot=212.00 mm ]
   fname :
  
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

```

* CALI B NASHYD      0404  1 10.0   4.60    0.49 10.33 144.56 0.68  0.000
   [CN=74.0          ]
   [ N = 3.0:Tp 0.54]
*
* ADD [ 0122+ 0404] 2930  3 5.0     339.78   17.94 10.50 151.69 n/a  0.000
*
* READ STORM           60.0
   [ Ptot=212.00 mm ]
   fname :
  
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

```

* CALI B NASHYD      2853  1 10.0   137.80   8.80 12.33 146.91 0.69  0.000
   [CN=75.0          ]
   [ N = 3.0:Tp 2.34]
*
* READ STORM           60.0
   [ Ptot=212.00 mm ]
   fname :
  
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

```

* CALI B NASHYD      0408  1 10.0   7.40    0.86 10.17 146.66 0.69  0.000
   [CN=75.0          ]
   [ N = 3.0:Tp 0.41]
*
* ADD [ 0408+ 0094] 0098  3 5.0     198.72   18.33 12.25 146.64 n/a  0.000
*
* CHANNEL[ 2: 0098] 0095  1 5.0     198.72   18.32 12.33 146.64 n/a  0.000
*
* READ STORM           60.0
   [ Ptot=212.00 mm ]
   fname :
  
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

```

** CALI B NASHYD      0409  1 10.0   15.30   1.58 10.67 149.15 0.70  0.000
   [CN=76.0          ]
   [ N = 3.0:Tp 0.68]
*
* ADD [ 0409+ 0095] 0100  3 5.0     214.02   19.04 12.17 146.82 n/a  0.000
*
* PIPE [ 2: 0092] 0101  1 5.0     255.18   9.81  9.75 147.16 n/a  0.000
*
* READ STORM           60.0
   [ Ptot=212.00 mm ]
   fname :
  
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

```

* CALI B STANDHYD    0403  1 10.0   52.80   6.34 10.17 177.82 0.84  0.000
   [I%=50.0;S%= 0.50]
*
* RESRVR [ 2: 0403] 0075  1 5.0     52.80   5.91 10.42 177.82 n/a  0.000
   {ST= 2.25 ha.m }
*
* ADD [ 0101+ 0075] 0135  3 5.0     307.98   15.72 10.42 152.42 n/a  0.000
*
* READ STORM           60.0
   [ Ptot=212.00 mm ]
   fname :
  
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

```

* CALI B NASHYD      2852  1 10.0   17.50   1.73 10.83 144.62 0.68  0.000
   [CN=74.0          ]
   [ N = 3.0:Tp 0.75]
*
* CHANNEL[ 2: 2852] 0081  1 5.0     17.50   1.68 11.17 144.58 n/a  0.000
*
* ADD [ 2853+ 0081] 0080  3 5.0     155.30   9.99 12.00 146.65 n/a  0.000
*
* CHANNEL[ 2: 0080] 0050  1 5.0     155.30   9.97 12.08 146.65 n/a  0.000
*
* READ STORM           60.0
   [ Ptot=212.00 mm ]
   fname :
  
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

```

* CALI B NASHYD      0285  1 10.0   48.60   4.49 11.17 146.90 0.69  0.000
   [CN=75.0          ]
   [ N = 3.0:Tp 1.03]
*
* ADD [ 0285+ 0050] 0069  3 5.0     203.90   13.84 11.58 146.71 n/a  0.000
*
* ADD [ 2930+ 0069] 0085  3 5.0     543.68   30.91 11.17 149.82 n/a  0.000
*
* READ STORM           60.0
   [ Ptot=212.00 mm ]
   fname :
  
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

```

* CALI B NASHYD      0407  1 10.0   9.90    1.08 10.00 124.11 0.59  0.000
   [CN=74.0          ]
   [ N = 3.0:Tp 0.12]
*
* READ STORM           60.0
   [ Ptot=212.00 mm ]
   fname :
  
```

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurri cane Hazel Storm

* CALI B NASHYD 0406 1 10.0 6.60 0.66 10.67 144.61 0.68 0.000
[CN=74.0]
[N = 3.0:Tp 0.71]

* READ STORM 60.0
[Ptot=212.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81-4626-40a7-a7ad-remark: 12 Hour Hurri cane Hazel Storm

* CALI B STANDHYD 0405 1 10.0 49.80 5.98 10.17 177.82 0.84 0.000
[I%=50.0: S%= 0.50]

* RESRVR [2: 0405] 0077 1 5.0 49.80 5.49 10.50 177.82 n/a 0.000
{ST= 2.34 ha.m }

* ADD [0406+ 0407] 0053 3 10.0 16.50 1.62 10.00 132.31 n/a 0.000

* ADD [0053+ 0077] 0053 1 5.0 66.30 6.94 10.58 166.50 n/a 0.000

* ADD [0100+ 0053] 0088 3 5.0 280.32 22.71 11.67 151.47 n/a 0.000

* ADD [0088+ 0085] 0088 1 5.0 824.00 53.20 11.33 150.38 n/a 0.000

* READ STORM 60.0
[Ptot=212.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81-4626-40a7-a7ad-remark: 12 Hour Hurri cane Hazel Storm

* CALI B NASHYD 0305 1 10.0 79.30 6.18 11.50 144.64 0.68 0.000
[CN=74.0]
[N = 3.0:Tp 1.52]

* CHANNEL[2: 0305] 0071 1 10.0 79.30 6.19 11.67 144.64 n/a 0.000

* READ STORM 60.0
[Ptot=212.00 mm]
fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\0b22e1b7-7d75-46d1-ad67-8e29196b0c73\2917df81-4626-40a7-a7ad-remark: 12 Hour Hurri cane Hazel Storm

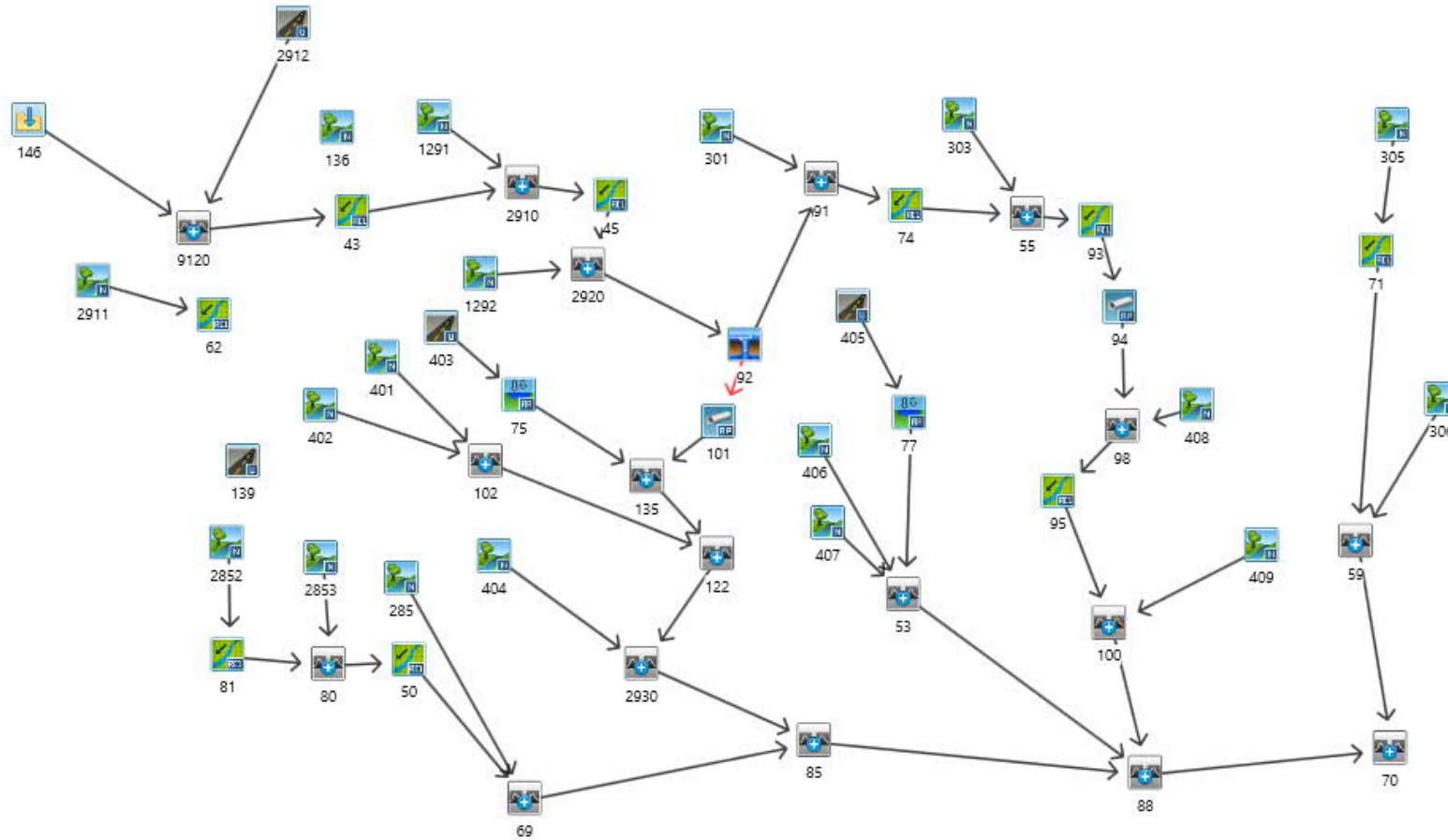
* CALI B NASHYD 0306 1 10.0 28.00 2.35 11.33 144.64 0.68 0.000
[CN=74.0]
[N = 3.0:Tp 1.29]

* ADD [0306+ 0071] 0059 3 10.0 107.30 8.52 11.50 144.64 n/a 0.000

* ADD [0059+ 0088] 0070 3 5.0 931.30 61.63 11.33 149.72 n/a 0.000

* ADD [0059+ 0088] 0070 3 5.0 931.30 61.63 11.33 149.72 n/a 0.000

Milton Logistics Hub 2020 Visual Otthymo – Proposed Uncontrolled 100 yr



=====

V V I SSSS U U A L (v 5.0.2027)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
W I SSSS UUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
0 0 T T H H Y Y M M 0 0
0 0 T T H H Y Y M M 0 0
000 T T H H Y Y M M 000

Developed and Distributed by Civica Infrastructure
Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.

***** SUMMARY OUTPUT *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\vo.in.dat

Output filename:

C:\Users\Aws.Nabeel\AppData\Local\Civica\NH5\Fb696141-a3a4-4edc-a4f2-c8b89cf86476\6700b2ac-a469-4604-a33a-783cdaf9674b\

Summary filename:

C:\Users\Aws.Nabeel\AppData\Local\Civica\NH5\Fb696141-a3a4-4edc-a4f2-c8b89cf86476\6700b2ac-a469-4604-a33a-783cdaf9674b\

DATE: 06/19/2020

TIME: 01:35:41

USER:

COMMENTS: _____

** SIMULATION : Run 07

W/E COMMAND HYD ID DT AREA Opeak Tpeak R.V. R.C. Obase
min ha cms hrs mm cms
START @ 0.00 hrs

READ STORM 10.0
[Ptot=122.36 mm]

** CALIB NASHYD 1292 1 10.0 81.30 2.17 10.83 69.71 0.57 0.000
[CN=76.0]
[N = 3.0:Tp 2.37]
* ADD [1292+ 0045] 2920 3 5.0 369.47 12.41 11.17 350.08 n/a 0.000
* DUHYD 0092 1 5.0 369.47 12.41 11.17 350.08 n/a 0.000
MAJOR SYSTEM: 0092 2 5.0 0.00 0.00 0.00 0.00 n/a 0.000
MINOR SYSTEM: 0092 3 5.0 369.47 12.41 11.17 350.08 n/a 0.000
* READ STORM 10.0
[Ptot=122.36 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0301 1 10.0 34.40 2.00 8.83 66.66 0.54 0.000
[CN=74.0]
[N = 3.0:Tp 0.77]
* ADD [0301+ 0092] 0091 3 10.0 34.40 2.00 8.83 66.66 n/a 0.000
* CHANNEL[2: 0091] 0074 1 10.0 34.40 1.83 9.00 66.64 n/a 0.000
* READ STORM 10.0
[Ptot=122.36 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

** CALIB NASHYD 0303 1 10.0 45.30 2.24 9.17 68.17 0.56 0.000
[CN=75.0]
[N = 3.0:Tp 1.00]
* ADD [0303+ 0074] 0055 3 10.0 79.70 4.06 9.00 67.51 n/a 0.000
* CHANNEL[2: 0055] 0093 1 10.0 79.70 3.95 9.17 67.51 n/a 0.000
* PIPE [2: 0093] 0094 1 5.0 79.70 3.95 9.25 67.51 n/a 0.000
* READ STORM 10.0
[Ptot=122.36 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-

fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
** CALIB NASHYD 2911 1 10.0 40.10 1.64 9.33 66.66 0.54 0.000
[CN=74.0]
[N = 3.0:Tp 1.25]
*
* CHANNEL[2: 2911] 0062 1 10.0 40.10 1.58 9.67 66.65 n/a 0.000
* READ STORM 10.0
[Ptot=122.36 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
** CALIB NASHYD 1291 1 10.0 132.70 3.06 11.33 68.18 0.56 0.000
[CN=75.0]
[N = 3.0:Tp 2.77]
*
* READ STORM 10.0
[Ptot=122.36 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALIB STANDHYD 2912 1 5.0 0.00 0.00 8.00 46.12 0.38 0.000
[I%=35.0:S%= 2.00]
*
* STORE HYD 0146 1 **** 155.47 7.23 0.00 803.58 n/a 0.000
*
* ADD [0146+ 2912] 9120 3 5.0 155.47 7.23 8.00 738.01 n/a 0.000
*
* CHANNEL[2: 9120] 0043 1 5.0 155.47 7.23 3.00 737.30 n/a 0.000
*
* ADD [1291+ 0043] 2910 3 5.0 288.17 10.29 11.33 429.18 n/a 0.000
*
* CHANNEL[2: 2910] 0045 1 5.0 288.17 10.29 11.42 429.18 n/a 0.000
*
* READ STORM 10.0
[Ptot=122.36 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

remark: Milton IDF, based on AES Toronto Pearson International Airpo
*
* CALIB NASHYD 0408 1 10.0 7.40 0.68 8.33 68.06 0.56 0.000
[CN=75.0]
[N = 3.0:Tp 0.41]
*
* ADD [0408+ 0094] 0098 3 5.0 87.10 4.22 9.17 67.55 n/a 0.000
*
* CHANNEL[2: 0098] 0095 1 5.0 87.10 4.19 9.25 67.55 n/a 0.000
*
* READ STORM 10.0
[Ptot=122.36 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB NASHYD 0409 1 10.0 15.30 1.03 8.67 69.70 0.57 0.000
[CN=76.0]
[N = 3.0:Tp 0.68]
*
* ADD [0409+ 0095] 0100 3 5.0 102.40 5.04 9.08 67.87 n/a 0.000
*
* PIPE [2: 0092] 0101 1 5.0 369.47 12.41 11.17 350.08 n/a 0.000
*
* READ STORM 10.0
[Ptot=122.36 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo

*
* CALIB STANDHYD 0403 1 10.0 52.80 9.87 8.00 94.01 0.77 0.000
[I%=50.0:S%= 0.50]
*
* RESVR [2: 0403] 0075 1 5.0 52.80 1.04 9.83 82.96 n/a 0.000
{ST= 2.86 ha.m}
*
* ADD [0101+ 0075] 0135 3 5.0 422.27 13.34 11.00 316.68 n/a 0.000
*
* READ STORM 10.0
[Ptot=122.36 mm]
fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
remark: Milton IDF, based on AES Toronto Pearson International Airpo
*

* CALIB NASHYD 0401 1 10.0 10.60 0.64 8.67 66.65 0.54 0.000
 [CN=74.0]
 [N = 3.0:Tp 0.72]
 *
 READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0402 1 10.0 16.60 0.43 10.67 66.67 0.54 0.000
 [CN=74.0]
 [N = 3.0:Tp 2.28]
 *
 ADD [0401+ 0402] 0102 3 10.0 27.20 0.85 9.00 66.66 n/a 0.000
 *
 ADD [0102+ 0135] 0122 3 5.0 449.47 13.91 10.92 301.55 n/a 0.000
 *
 READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0404 1 10.0 4.60 0.34 8.50 66.63 0.54 0.000
 [CN=74.0]
 [N = 3.0:Tp 0.54]
 *
 ADD [0122+ 0404] 2930 3 5.0 454.07 13.97 10.92 299.17 n/a 0.000
 *
 READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 2853 1 10.0 137.80 3.61 10.83 68.18 0.56 0.000
 [CN=75.0]
 [N = 3.0:Tp 2.34]
 *
 READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-

[N = 3.0:Tp 0.71]
 *
 READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB STANDHYD 0405 1 10.0 49.80 9.31 8.00 94.01 0.77 0.000
 [I%=50.0: S%= 0.50]
 *
 RESRVR [2: 0405] 0077 1 5.0 49.80 0.84 10.08 82.20 n/a 0.000
 {ST= 2.79 ha.m }
 *
 ADD [0406+ 0407] 0053 3 10.0 16.50 1.84 8.00 60.98 n/a 0.000
 *
 ADD [0053+ 0077] 0053 1 5.0 66.30 8.00 28.00 80.46 n/a 0.000
 *
 ADD [0100+ 0053] 0088 3 5.0 168.70 8.02 28.00 72.82 n/a 0.000
 *
 ADD [0088+ 0085] 0088 1 5.0 826.67 24.26 9.67 195.97 n/a 0.000
 *
 READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0305 1 10.0 79.30 2.80 9.67 66.67 0.54 0.000
 [CN=74.0]
 [N = 3.0:Tp 1.52]
 *
 CHANNEL [2: 0305] 0071 1 10.0 79.30 2.81 9.83 66.67 n/a 0.000
 *
 READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0306 1 10.0 28.00 1.12 9.50 66.66 0.54 0.000
 [CN=74.0]
 [N = 3.0:Tp 1.29]
 *
 ADD [0306+ 0071] 0059 3 10.0 107.30 3.90 9.67 66.66 n/a 0.000

remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 2852 1 10.0 17.50 1.04 8.83 66.65 0.54 0.000
 [CN=74.0]
 [N = 3.0:Tp 0.75]
 *
 CHANNEL [2: 2852] 0081 1 5.0 17.50 0.88 9.17 66.62 n/a 0.000
 *
 ADD [2853+ 0081] 0080 3 5.0 155.30 4.06 10.33 68.00 n/a 0.000
 *
 CHANNEL [2: 0080] 0050 1 5.0 155.30 4.05 10.50 68.00 n/a 0.000
 *
 READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0285 1 10.0 48.60 2.35 9.17 68.17 0.56 0.000
 [CN=75.0]
 [N = 3.0:Tp 1.03]
 *
 ADD [0285+ 0050] 0069 3 5.0 203.90 5.74 9.75 68.04 n/a 0.000
 *
 ADD [2930+ 0069] 0085 3 5.0 657.97 19.29 10.33 227.54 n/a 0.000
 *
 READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0407 1 10.0 9.90 1.73 8.00 57.20 0.47 0.000
 [CN=74.0]
 [N = 3.0:Tp 0.12]
 *
 READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

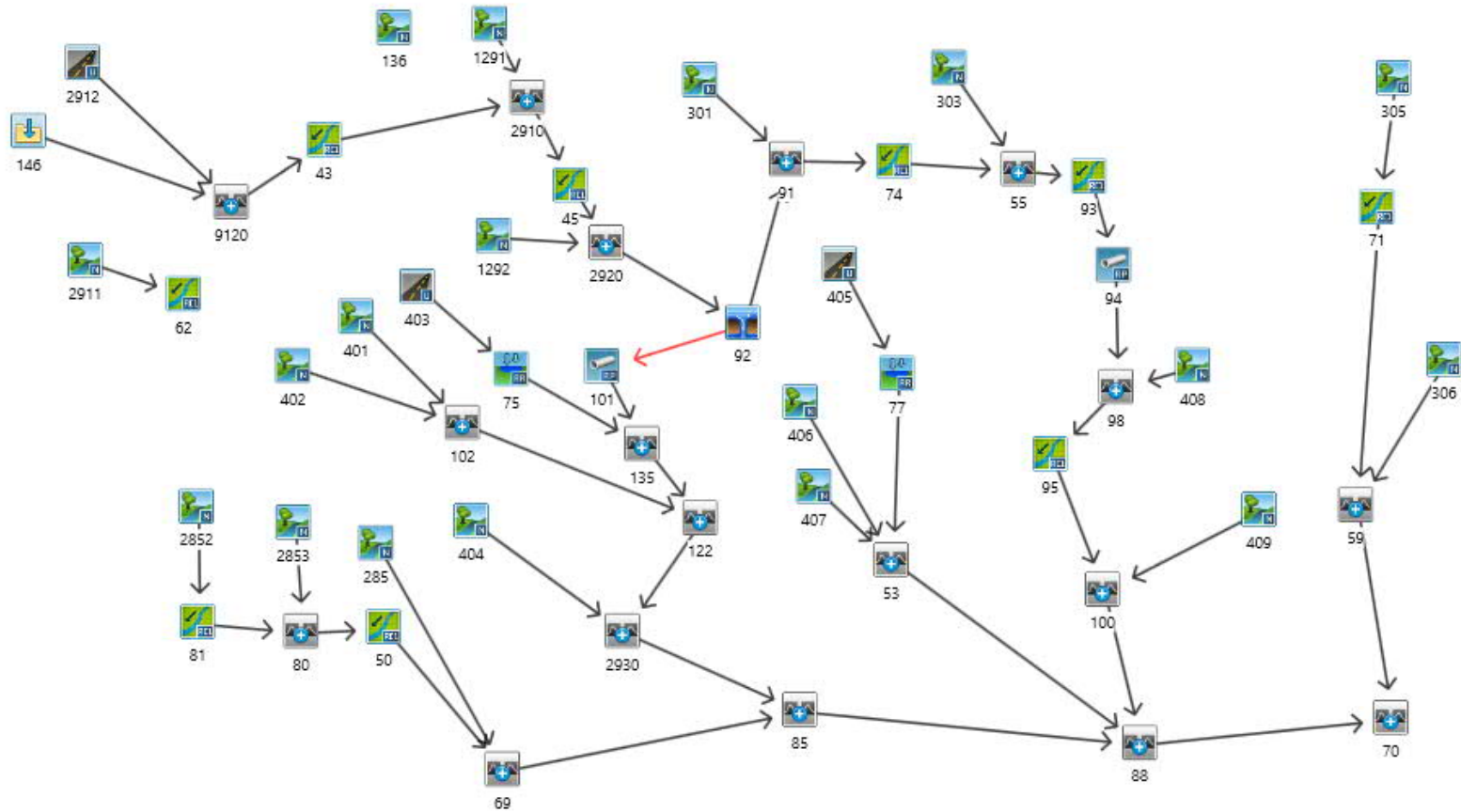
* CALIB NASHYD 0406 1 10.0 6.60 0.41 8.67 66.65 0.54 0.000
 [CN=74.0]

* ADD [0059+ 0088] 0070 3 5.0 933.97 28.16 9.67 181.11 n/a 0.000
 *
 READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB NASHYD 0136 1 10.0 112.70 3.38 10.33 68.18 0.56 7.230
 [CN=75.0]
 [N = 3.0:Tp 1.96]
 *
 READ STORM 10.0
 [Ptot=122.36 mm]
 fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\549bab61-14aa-4329-9424-509b5a10379a\ef44aac6-946f-43de-993b-
 remark: Milton IDF, based on AES Toronto Pearson International Airpo

* CALIB STANDHYD 0139 1 5.0 155.47 26.51 8.08 86.79 0.71 0.000
 [I%=35.0: S%= 2.00]
 *

Milton Logistics Hub 2020 Visual Otthymo – Proposed Uncontrolled Regional



```

=====
V V I SSSSS U U A L (v 5.0.2027)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
W I SSSSS UUUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
O O T T H H Y Y M M O O
O O T T H H Y Y M M O O
000 T T H H Y Y M M 000

```

Developed and Distributed by Civica Infrastructure
 Copyright 2007 - 2013 Civica Infrastructure
 All rights reserved.

***** SUMMARY OUTPUT *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 5.0\VO2\vo.in.dat

Output filename:
 C:\Users\Aws.Nabeel\AppData\Local\Civica\NH5\Fb696141-a3a4-4edc-a4f2-c8b89cf86476\90
 8c5101-ee52-472b-adbe-e4edd4f19bee\
 Summary filename:
 C:\Users\Aws.Nabeel\AppData\Local\Civica\NH5\Fb696141-a3a4-4edc-a4f2-c8b89cf86476\90
 8c5101-ee52-472b-adbe-e4edd4f19bee\

DATE: 06/19/2020 TIME: 01:36:53
 USER:

COMMENTS: _____

 ** SIMULATION : Run 08 **

W/E COMMAND	HYD ID	DT min	AREA ha	Opeak cms	Tpeak hrs	R.V. mm	R.C.	Obase cms
START @ 0.00 hrs								

READ STORM		60.0						
[Ptot=212.00 mm]								

* CHANNEL [2: 9120]	0043	1 5.0	155.47	16.10	5.75	*****	n/a	0.000
* ADD [1291+ 0043]	2910	3 5.0	288.17	23.80	12.67	953.45	n/a	0.000
* CHANNEL [2: 2910]	0045	1 5.0	288.17	38.25	44.17	953.45	n/a	0.000
* READ STORM		60.0						
* [Ptot=212.00 mm]								
* fname :								

C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALIB NASHYD	1292	1 10.0	81.30	5.22	12.33	149.19	0.70	0.000
[CN=76.0]								
[N = 3.0: Tp 2.37]								
* ADD [1292+ 0045]	2920	3 5.0	369.47	38.25	44.17	776.48	n/a	0.000
* DUHYD	0092	1 5.0	369.47	38.25	44.17	776.48	n/a	0.000
MAJOR SYSTEM:	0092	2 5.0	114.01	25.83	44.17	776.48	n/a	0.000
MINOR SYSTEM:	0092	3 5.0	255.46	12.42	1.50	776.48	n/a	0.000

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALIB NASHYD	0301	1 10.0	34.40	3.38	10.83	144.62	0.68	0.000
[CN=74.0]								
[N = 3.0: Tp 0.77]								
* ADD [0301+ 0092]	0091	3 5.0	148.41	25.83	44.17	630.02	n/a	0.000
* CHANNEL [2: 0091]	0074	1 5.0	148.41	17.28	12.42	630.02	n/a	0.000

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALIB NASHYD	0303	1 10.0	45.30	4.22	11.17	146.90	0.69	0.000
[CN=75.0]								
[N = 3.0: Tp 1.00]								

fname :
 C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALIB NASHYD	0136	1 10.0	112.70	7.89	12.00	146.91	0.69	0.000
[CN=75.0]								
[N = 3.0: Tp 1.96]								
* READ STORM		60.0						
* [Ptot=212.00 mm]								
* fname :								

C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALIB NASHYD	2911	1 10.0	40.10	3.41	11.33	144.64	0.68	0.000
[CN=74.0]								
[N = 3.0: Tp 1.25]								
* CHANNEL [2: 2911]	0062	1 10.0	40.10	3.35	11.50	144.63	n/a	0.000
* READ STORM		60.0						
* [Ptot=212.00 mm]								
* fname :								

C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALIB NASHYD	1291	1 10.0	132.70	7.70	12.67	146.91	0.69	0.000
[CN=75.0]								
[N = 3.0: Tp 2.77]								
* READ STORM		60.0						
* [Ptot=212.00 mm]								
* fname :								

C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

* CALIB STANDHYD	2912	1 5.0	0.00	0.00	0.00	0.00	0.00	0.000
[I%=35.0: S%= 2.00]								
* STORE HYD	0146	1 ****	155.47	16.10	0.00	*****	n/a	0.000
* ADD [0146+ 2912]	9120	3 5.0	155.47	16.10	0.00	*****	n/a	0.000

* ADD [0303+ 0074]	0055	3 5.0	193.71	20.49	11.67	517.04	n/a	0.000
* CHANNEL [2: 0055]	0093	1 5.0	193.71	20.44	11.92	517.04	n/a	0.000
* PIPE [2: 0093]	0094	1 5.0	193.71	20.44	11.92	517.04	n/a	0.000
* READ STORM		60.0						
* [Ptot=212.00 mm]								
* fname :								

C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALIB NASHYD	0408	1 10.0	7.40	0.86	10.17	146.66	0.69	0.000
[CN=75.0]								
[N = 3.0: Tp 0.41]								
* ADD [0408+ 0094]	0098	3 5.0	201.11	20.75	11.83	503.41	n/a	0.000
* CHANNEL [2: 0098]	0095	1 5.0	201.11	20.75	11.92	503.41	n/a	0.000

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

** CALIB NASHYD	0409	1 10.0	15.30	1.58	10.67	149.15	0.70	0.000
[CN=76.0]								
[N = 3.0: Tp 0.68]								
* ADD [0409+ 0095]	0100	3 5.0	216.41	21.80	11.67	478.37	n/a	0.000
* PIPE [2: 0092]	0101	1 5.0	255.46	12.45	1.58	776.48	n/a	0.000

READ STORM 60.0
 [Ptot=212.00 mm]
 fname :

C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
 -4626-40a7-a7ad-
 remark: 12 Hour Hurricane Hazel Storm

* CALIB STANDHYD	0403	1 10.0	52.80	6.34	10.17	177.82	0.84	0.000
[I%=50.0: S%= 0.50]								
* RESRVR [2: 0403]	0075	1 5.0	52.80	5.91	10.42	167.12	n/a	0.000

```

      {ST= 3.46 ha.m }
*
* ADD [ 0101+ 0075] 0135 3 5.0 308.26 18.33 10.42 672.11 n/a 0.000
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm
*
* CALIB NASHYD 0401 1 10.0 10.60 1.06 10.67 144.61 0.68 0.000
* [CN=74.0 ]
* [ N = 3.0:Tp 0.72]
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm
*
* CALIB NASHYD 0402 1 10.0 16.60 1.06 12.33 144.64 0.68 0.000
* [CN=74.0 ]
* [ N = 3.0:Tp 2.28]
*
* ADD [ 0401+ 0402] 0102 3 10.0 27.20 1.93 11.17 144.63 n/a 0.000
*
* ADD [ 0102+ 0135] 0122 3 5.0 335.46 20.06 10.50 629.34 n/a 0.000
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm
*
* CALIB NASHYD 0404 1 10.0 4.60 0.49 10.33 144.56 0.68 0.000
* [CN=74.0 ]
* [ N = 3.0:Tp 0.54]
*
* ADD [ 0122+ 0404] 2930 3 5.0 340.06 20.55 10.50 622.78 n/a 0.000
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
-4626-40a7-a7ad-

```

```

* [ N = 3.0:Tp 0.12]
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm
*
* CALIB NASHYD 0406 1 10.0 6.60 0.66 10.67 144.61 0.68 0.000
* [CN=74.0 ]
* [ N = 3.0:Tp 0.71]
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm
*
* CALIB STANDHYD 0405 1 10.0 49.80 5.98 10.17 177.82 0.84 0.000
* [I%=50.0;S%= 0.50]
*
* RESRVR [ 2: 0405] 0077 1 5.0 49.80 5.52 10.50 166.35 n/a 0.000
* {ST= 3.55 ha.m }
*
* ADD [ 0406+ 0407] 0053 3 10.0 16.50 1.62 10.00 132.31 n/a 0.000
*
* ADD [ 0053+ 0077] 0053 1 5.0 66.30 6.96 10.50 157.88 n/a 0.000
*
* ADD [ 0100+ 0053] 0088 3 5.0 282.71 27.39 11.08 403.21 n/a 0.000
*
* ADD [ 0088+ 0085] 0088 1 5.0 826.67 60.87 11.17 430.26 n/a 0.000
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm
*
* CALIB NASHYD 0305 1 10.0 79.30 6.18 11.50 144.64 0.68 0.000
* [CN=74.0 ]
* [ N = 3.0:Tp 1.52]
*
* CHANNEL[ 2: 0305] 0071 1 10.0 79.30 6.19 11.67 144.64 n/a 0.000
*
* READ STORM 60.0

```

```

remark: 12 Hour Hurricane Hazel Storm
*
* CALIB NASHYD 2853 1 10.0 137.80 8.80 12.33 146.91 0.69 0.000
* [CN=75.0 ]
* [ N = 3.0:Tp 2.34]
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm
*
* CALIB NASHYD 2852 1 10.0 17.50 1.73 10.83 144.62 0.68 0.000
* [CN=74.0 ]
* [ N = 3.0:Tp 0.75]
*
* CHANNEL[ 2: 2852] 0081 1 5.0 17.50 1.68 11.17 144.58 n/a 0.000
*
* ADD [ 2853+ 0081] 0080 3 5.0 155.30 9.99 12.00 146.65 n/a 0.000
*
* CHANNEL[ 2: 0080] 0050 1 5.0 155.30 9.97 12.08 146.65 n/a 0.000
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm
*
* CALIB NASHYD 0285 1 10.0 48.60 4.49 11.17 146.90 0.69 0.000
* [CN=75.0 ]
* [ N = 3.0:Tp 1.03]
*
* ADD [ 0285+ 0050] 0069 3 5.0 203.90 13.84 11.58 146.71 n/a 0.000
*
* ADD [ 2930+ 0069] 0085 3 5.0 543.96 33.52 11.17 444.33 n/a 0.000
*
* READ STORM 60.0
* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm
*
* CALIB NASHYD 0407 1 10.0 9.90 1.08 10.00 124.11 0.59 0.000
* [CN=74.0 ]

```

```

* [ Ptot=212.00 mm ]
* fname :
C:\Users\Aws.Nabeel\AppData\Local\Temp\8c7ab0a-f093-4229-9348-1494c3680790\2917df81
-4626-40a7-a7ad-
remark: 12 Hour Hurricane Hazel Storm
*
* CALIB NASHYD 0306 1 10.0 28.00 2.35 11.33 144.64 0.68 0.000
* [CN=74.0 ]
* [ N = 3.0:Tp 1.29]
*
* ADD [ 0306+ 0071] 0059 3 10.0 107.30 8.52 11.50 144.64 n/a 0.000
*
* ADD [ 0059+ 0088] 0070 3 5.0 933.97 69.17 11.25 397.45 n/a 0.000
*

```

Appendix **C**

FINAL DRAINAGE REPORT

Milton Logistic Hub

- SWM Culvert Design Sheets
- Culvert Hydraulics
 - Phase 1 and 2 Proposed Culvert Hydraulic Summary
 - Summary of Culvert Master Input Information
 - Summary of Hydraulic Calculations and Performance Criterion
 - Detailed Culvert Master Output
 - HEC-RAS Model Outputs and Fish Passage

Summary of Hydrologic Calculations - CN Milton

Drainage ID	Culvert MI	Station	Span (m)	Rise (m)	Barrels	Culvert Length (m)	Shape	Manning n	Overall Area (ha)	24hr SCS Storm			
										Discharge Q (m³/s) from Visual Othymo model / RM Output (Whichever is Higher)			
										2 yr	25 yr	100 yr	Reg. Storm
4001	37	59+544.25		1.25	1	20.2	CSP	0.024	1.7	0.09	0.16	0.21	-
4002	37.2	59+869.25		0.80	1	19.9	CSP	0.024	3.1	0.14	0.25	0.35	-
4003	37.63	60+567.18		0.90	1	17.6	CSP	0.024	0.8	0.04	0.06	0.09	-
4004	37.63	60+590.81 R		0.60	1	9.0	CSP	0.024	0.4	0.02	0.03	0.05	-
4007	-	61+425 to 61+750		0.45	1	322.7	CSP	0.024	0.7	0.03	0.06	0.08	-
4007-1	-	61+750 to 62+375		0.60	1	625.0	CSP	0.024	1.7	0.07	0.13	0.18	-
4008	38.31	61+756		0.90	1	22.8	CSP	0.024	3.6	0.16	0.29	0.41	-
4009	38.52	61+993		0.90	1	23.8	CSP	0.024	1.0	0.04	0.08	0.11	-
4010	-	62+665		0.75	1	16.9	Circular Conc.	0.013	2.5	0.06	0.12	0.17	-
4011	-	63.550 to 63+948.6		1.35	1	398.6	Circular Conc.	0.013	54.6	0.73	1.24	1.74	-
4012 (2A)	39.67	63+958	3.40	1.40	1	201.0	Conc Box	0.013	366.8	2.01	6.84	9.79	23.66
4012 (2B)	39.67	63+958	3.40	1.40	1	92.3	Conc Box	0.013	366.8	2.01	6.84	9.79	14.31
4013	-	65+328		0.90	1	32.8	CSP	0.024	3.3	0.10	0.17	0.25	-
4014	-	65+400		2.40	1	66.1	CSP	0.013	63.1	1.16	2.01	2.85	14.97
4016 (HEC-RAS) (C7)	-	65+525		2.40	1	78.0	Circular Conc.	0.013	108.8	0.99	3.32	4.72	9.50
4 - ID 403 to pond 1	-	11+950		2.55	1	86.8	Circular Conc.	0.013	52.8	3.00	7.63	9.87	6.34
5 - ID 410	-	12+535		1.40	1	24.2	Circular Conc.	0.013	17.6	1.00	2.54	3.29	2.11
5a - ID 405 to pond 2	-	-		2.40	1	24.7	Circular Conc.	0.013	49.8	2.82	7.20	9.31	5.98
5000 (HEC-RAS)	-	61+125.5		0.90	2	26.2	Circular Conc.	0.024	49.8	0.46	0.77	1.10	2.82
4020	-	10+380 under access road		0.90	1	67.2	Circular Conc.	0.013	10.0	0.39	0.73	1.02	-
4021 (C1)	-	10+200 under access road	7.62	1.52	1	42.0	Circular Conc.	0.013	154.5	1.03	3.33	4.68	10.62

Summary of Culvert Master Input Information

Culvert ID	Culvert MI	Station	Upstream Obv. (m)	Downstream Obv. (m)	Upstream Inv. (m)	Downstream Inv. (m)	Length (m)	Slope (%)	Manning n	Ke Inlet	Height (mm)	Cover Depth (m)	Edge of Road Elev. (m)	Critical Depth dc (m) Using MTO Design Chart 2.37				Tailwater (m)			
														2 yr	25 yr	100 yr	Reg. Storm	2 yr	25 yr	100 yr	Reg. Storm
4001	37	59+544.25	197.23	196.85	195.98	195.60	20.45	1.86	0.024	0.9	1250	0.17	197.4	0.16	0.22	0.25	-	196.31	196.33	196.35	-
4002	37.2	59+869.25	195.89	195.85	195.09	195.05	19.89	0.20	0.024	0.9	800	1.11	197	0.23	0.30	0.36	-	195.56	195.60	195.63	-
4003	37.63	60+567.18	193.60	193.41	192.70	192.51	17.60	1.08	0.024	0.9	900	0.20	193.8	0.12	0.14	0.18	-	193.02	193.03	193.05	-
4004	37.63	60+590.81 R	193.36	193.31	192.76	192.71	9.00	0.47	0.024	0.9	600	0.84	194.2	0.09	0.11	0.15	-	193.06	193.07	193.09	-
4007	-	61+425 to 61+750	188.19	186.64	187.74	186.19	322.71	0.48	0.024	0.9	450	1.61	189.8	0.12	0.17	0.20	-	186.48	186.50	186.51	-
4007-1	-	61+750 to 62+375	186.79	184.80	186.19	184.20	625.00	0.32	0.024	0.9	600	1.51	188.3	0.17	0.23	0.28	-	184.59	184.62	184.64	-
4008	38.31	61+756	187.18	187.09	186.28	186.19	22.80	0.39	0.024	0.9	900	0.92	188.1	0.23	0.32	0.38	-	186.76	186.80	186.83	-
4009	38.52	61+993	186.32	186.20	185.42	185.30	23.78	0.50	0.024	0.9	900	1.08	187.4	0.12	0.17	0.19	-	185.81	185.83	185.85	-
4010	-	62+665	184.08	183.92	183.33	183.17	16.90	0.95	0.013	0.5	750	0.75	184.83	0.15	0.21	0.25	-	183.62	183.65	183.67	-
4011	-	63.550 to 63+948.6	180.84	179.95	179.49	178.60	398.60	0.22	0.013	0.5	1350	0.54	181.38	0.45	0.59	0.70	-	179.50	179.57	179.62	-
4012 (2A)	39.67	63+958	179.99	179.22	178.59	177.82	201.00	0.38	0.013	0.5	1400	2.07	182.06	0.33	0.74	0.94	1.70	178.68	178.89	178.99	179.37
4012 (2B)	39.67	63+958	178.65	178.31	177.25	176.91	92.32	0.37	0.013	0.5	1400	1.65	180.3	0.33	0.74	0.94	1.22	177.77	177.98	178.08	178.22
4013	-	65+328	178.21	178.05	177.31	177.15	22.80	0.49	0.024	0.9	900	2.82	181.03	0.19	0.24	0.29	-	177.69	177.72	177.75	-
4014	-	65+400	179.32	178.70	176.92	176.30	66.10	0.94	0.013	0.5	2400	0.98	180.3	0.49	0.64	0.77	1.76	177.14	177.82	177.88	178.38
4016 (HEC-RAS) (C7)	-	65+525	176.89	176.11	174.49	173.71	78.00	1.00	0.013	0.5	2400	4.84	181.73	-	-	-	Using a HEC-RAS Model TribCD17chExi.prj	-	-	-	-
4 - ID 403 to pond 1	-	11+950	179.99	179.83	177.44	177.28	86.79	0.19	0.013	0.5	2550	0.41	180.4	0.77	1.24	1.41	1.13	178.94	179.17	179.25	179.11
5 - ID 410	-	12+535	178.40	178.31	177.00	176.91	24.21	0.38	0.013	0.5	1400	2.27	180.67	0.52	0.83	0.95	0.76	177.87	178.03	178.08	177.99
5a - ID 405 to pond 2	-	-	178.73	178.67	176.33	176.27	24.75	0.24	0.013	0.5	2400	0.77	179.5	0.76	1.22	1.39	1.11	177.85	178.08	178.17	178.03
5000 (HEC-RAS)	-	61+125.5	190.22	189.98	189.32	189.08	26.20	0.92	0.024	0.9	900	0.58	190.8	-	-	-	Using CH HEC-RAS Model PRCONDITIONSURBANT.prj	-	-	-	-
4020	-	10+380 under access road	184.00	183.70	183.10	182.80	67.20	0.45	0.013	0.5	900	5.00	189	0.37	0.50	0.59	-	183.43	183.50	183.55	-
4021 (C1)	-	10+200 under access road	185.27	185.23	183.75	183.71	42.00	0.10	0.013	0.5	1520	1.59	186.86	-	-	-	Using CH HEC-RAS Model - EXCONDITIONSURBANT.prj - MPR 412	-	-	-	-

Summary of Hydraulic Calculations for CN Milton Culverts

Drainage Criteria:

1. Water level shall not overtop the yard
2. The DW/D for 25-yr storm must be less than 1.0
3. The DW/D for 100-yr storm must be less than 1.5
4. The freeboard for the 100-yr must be greater than 0.6 m

Culvert ID	Span (m)	Rise (m)	Head Water Levels (m) - Culvert Master Output				Velocity (m/s) - Culvert Master Output				Performance Criterion Satisfied?					
											HW Depth	H/D-1.0	HW Depth	H/D-1.5	Freeboard	Overtopping?
			2 yr	25 yr	100 yr	Regional	2 yr	25 yr	100 yr	Regional	25-Year	25-Year	100-Year	100-Year	100-Year	100-Year
4001		1.25	196.32	196.36	196.39	-	0.13	0.22	0.28	-	0.38	Y 0.3	0.41	Y 0.33	Y 1.01	No
4002		0.80	195.59	195.68	195.76	-	0.41	0.68	0.90	-	0.59	Y 0.74	0.67	Y 0.84	Y 1.24	No
4003		0.90	193.02	193.04	193.07	-	0.11	0.15	0.22	-	0.34	Y 0.38	0.37	Y 0.41	Y 0.73	No
4004		0.60	193.06	193.08	193.10	-	0.12	0.17	0.26	-	0.33	Y 0.54	0.34	Y 0.57	Y 1.1	No
4007		0.45	187.93	188.03	188.08	-	0.27	0.51	0.65	-	0.29	Y 0.64	0.34	Y 0.76	Y 1.72	No
4007-1		0.60	186.48	186.60	186.71	-	0.35	0.61	0.80	-	0.41	Y 0.68	0.52	Y 0.87	Y 1.59	No
4008		0.90	186.79	186.88	186.96	-	0.37	0.62	0.84	-	0.60	Y 0.67	0.68	Y 0.76	Y 1.14	No
4009		0.90	185.81	185.84	185.87	-	0.11	0.20	0.27	-	0.42	Y 0.47	0.45	Y 0.5	Y 1.53	No
4010		0.75	183.63	183.68	183.72	-	0.21	0.39	0.54	-	0.35	Y 0.47	0.39	Y 0.52	Y 1.11	No
4011		1.35	180.16	180.39	180.58	-	0.71	1.11	1.48	-	0.90	Y 0.67	1.09	Y 0.81	Y 0.8	No
4012 (2A)	3.40	1.40	179.12	179.68	179.83	180.25	0.69	2.92	3.15	3.01	1.09	Y 0.78	1.24	Y 0.89	Y 2.23	No
4012 (2B)	3.40	1.40	177.73	178.29	178.45	178.86	0.69	2.91	3.25	3.01	1.04	Y 0.74	1.20	Y 0.86	Y 1.85	No
4013		0.90	177.71	177.76	177.84	-	0.25	0.40	0.65	-	0.45	Y 0.5	0.53	Y 0.59	Y 3.19	No
4014		2.40	177.77	177.91	178.07	179.98	0.40	0.66	0.89	3.53	0.99	Y 0.41	1.15	Y 0.48	Y 2.23	No
4016 (HEC-RAS) (C7)		2.40	175.33	175.90	176.17	176.89	0.63	1.01	1.16	1.52	1.41	Y 0.59	1.68	Y 0.7	Y 5.56	No
4 - ID 403 to pond 1		2.55	179.02	179.52	179.77	179.37	0.84	1.85	2.30	1.59	2.08	Y 0.82	2.33	Y 0.91	Y 0.63	No
5 - ID 410		1.40	177.95	178.37	178.60	178.29	0.89	1.92	2.39	1.75	1.37	Y 0.98	1.60	Y 1.14	Y 2.07	No
5a - ID 405 to pond 2		2.40	177.92	178.40	178.58	178.26	0.88	1.93	2.22	1.66	2.07	Y 0.86	2.25	Y 0.94	Y 0.92	No
5000 (HEC-RAS)		0.90	189.78	189.93	190.07	190.68	0.14	0.12	0.11	0.08	0.61	Y 0.68	0.75	Y 0.83	Y 0.73	No
4020		0.90	183.66	183.90	184.07	-	0.81	1.35	1.77	-	0.80	Y 0.89	0.97	Y 1.08	Y 4.93	No
4021 (C1)	7.62	1.52	184.34	184.61	184.70	185.04	0.18	0.39	0.49	-	0.86	Y 0.57	0.95	Y 0.62	Y 2.16	No

Culvert Analysis Report
2012-2B-100yr-1-3.4x1.4 - April 2019

Analysis Component				
Storm Event	Design	Discharge	9.7900 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	9.7900 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	178.08 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3400 x 1400 mm Box	9.7910 m³/s	178.80 m	3.25 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	178.80 m	N/A
Total	-----	9.7910 m³/s	178.80 m	N/A

Culvert Analysis Report
2012-2B-100yr-1-3.4x1.4 - April 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	178.80 m	
Roadway Width	90.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	180.30 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	180.30			
100.00	180.30			

Culvert Analysis Report
2012-2B-100yr-1-3.4x1.4 - April 2019

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	178.80 m	Discharge	9.7910 m³/s	
Inlet Control HW Elev.	178.80 m	Tailwater Elevation	178.08 m	
Outlet Control HW Elev.	178.76 m	Control Type	Inlet Control	
Headwater Depth/Height	1.11			
Grades				
Upstream Invert	177.25 m	Downstream Invert	176.91 m	
Length	92.32 m	Constructed Slope	0.003683 m/m	
Hydraulic Profile				
Profile	CompositeS152	Depth Downstream	0.88 m	
Slope Type	Steep	Normal Depth	0.88 m	
Flow Regime	N/A	Critical Depth	0.95 m	
Velocity Downstream	3.25 m/s	Critical Slope	0.003045 m/m	
Section				
Section Shape	Box	Mannings Coefficient	0.013	
Section Material	Concrete	Span	3.40 m	
Section Size	3400 x 1400 mm	Rise	1.40 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	178.76 m	Upstream Velocity Head	0.47 m	
Ke	0.20	Entrance Loss	0.09 m	
Inlet Control Properties				
Inlet Control HW Elev.	178.80 m	Flow Control	N/A	
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.8 m²	
K	0.51500	HDS S Chart	10	
M	0.66700	HDS S Scale	1	
C	0.03750	Equation Form	2	
Y	0.79000			

Culvert Analysis Report
2012-2B-25yr-1-3.4x1.4 - April 2019

Analysis Component				
Storm Event	Design	Discharge	6.8400 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	6.8400 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	177.98 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3400 x 1400 mm Box	6.8390 m³/s	178.47 m	2.91 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	178.47 m	N/A
Total	-----	6.8390 m³/s	178.47 m	N/A

Culvert Analysis Report
2012-2B-25yr-1-3.4x1.4 - April 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	178.47 m	Discharge	6.8390 m³/s
Inlet Control HW Elev.	178.47 m	Tailwater Elevation	177.98 m
Outlet Control HW Elev.	178.44 m	Control Type	Inlet Control
Headwater Depth/Height	0.87		
Grades			
Upstream Invert	177.25 m	Downstream Invert	176.91 m
Length	92.30 m	Constructed Slope	0.003684 m/m
Hydraulic Profile			
Profile	CompositeS152	Depth, Downstream	0.69 m
Slope Type	Steep	Normal Depth	0.69 m
Flow Regime	N/A	Critical Depth	0.74 m
Velocity Downstream	2.91 m/s	Critical Slope	0.002968 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.40 m
Section Size	3400 x 1400 mm	Rise	1.40 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	178.44 m	Upstream Velocity Head	0.37 m
Ke	0.20	Entrance Loss	0.07 m
Inlet Control Properties			
Inlet Control HW Elev.	178.47 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.8 m²
K	0.51500	HDS S Chart	10
M	0.66700	HDS S Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Analysis Report
2012-2B-2yr-1-3.4x1.4 - April 2019

Analysis Component				
Storm Event	Design	Discharge	2.0100 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	2.0100 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	177.77 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3400 x 1400 mm Box	2.0111 m³/s	177.94 m	0.69 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	177.94 m	N/A
Total	-----	2.0111 m³/s	177.94 m	N/A

Culvert Analysis Report
2012-2B-25yr-1-3.4x1.4 - April 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	178.47 m
Roadway Width	207.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	180.30 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	180.30	
	100.00	180.30	

Culvert Analysis Report
2012-2B-2yr-1-3.4x1.4 - April 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	177.94 m	Discharge	2.0111 m³/s
Inlet Control HW Elev.	177.79 m	Tailwater Elevation	177.77 m
Outlet Control HW Elev.	177.94 m	Control Type	Outlet Control
Headwater Depth/Height	0.49		
Grades			
Upstream Invert	177.25 m	Downstream Invert	176.91 m
Length	92.32 m	Constructed Slope	0.003683 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.86 m
Slope Type	Mid	Normal Depth	0.53 m
Flow Regime	Subcritical	Critical Depth	0.33 m
Velocity Downstream	0.69 m/s	Critical Slope	0.016185 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.030
Section Material	Concrete	Span	3.40 m
Section Size	3400 x 1400 mm	Rise	1.40 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	177.94 m	Upstream Velocity Head	0.04 m
Ke	0.20	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	177.79 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.8 m²
K	0.51500	HDS S Chart	10
M	0.66700	HDS S Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Analysis Report
2012-2B-2yr-1-3.4x1.4 - April 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	177.94 m
Roadway Width	90.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	180.30 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	180.30
100.00	180.30

Culvert Analysis Report
2012-2B-Regional-1-3.4x1.4 - April 2019

Analysis Component			
Storm Event	Design	Discharge	14.3100 m³/s

Peak Discharge Method: User-Specified			
Design Discharge	14.3100 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	178.22 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3400 x 1400 mm Box	14.3091 m³/s	179.75 m	3.01 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	179.75 m	N/A
Total	-----	14.3091 m³/s	179.75 m	N/A

Culvert Analysis Report
2012-2B-Regional-1-3.4x1.4 - April 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	179.75 m	Discharge	14.3091 m³/s
Inlet Control HW Elev.	179.75 m	Tailwater Elevation	178.22 m
Outlet Control HW Elev.	179.48 m	Control Type	Inlet Control
Headwater Depth/Height	1.58		

Grades			
Upstream Invert	177.53 m	Downstream Invert	177.21 m
Length	92.50 m	Constructed Slope	0.003459 m/m

Hydraulic Profile			
Profile	S2	Depth, Downstream	1.40 m
Slope Type	Steep	Normal Depth	N/A m
Flow Regime	Supercritical	Critical Depth	1.22 m
Velocity Downstream	3.01 m/s	Critical Slope	0.003189 m/m

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.40 m
Section Size	3400 x 1400 mm	Rise	1.40 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	179.48 m	Upstream Velocity Head	0.61 m
Ke	0.20	Entrance Loss	0.12 m

Inlet Control Properties			
Inlet Control HW Elev.	179.75 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.8 m²
K	0.51500	HDS S Chart	10
M	0.66700	HDS S Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Analysis Report
2012-2B-Regional-1-3.4x1.4 - April 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	179.75 m
Roadway Width	92.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	180.30 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	180.30
100.00	180.30

**Culvert Analysis Report
4001-100yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.2100 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.2100 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	196.35 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-1200 mm Circular	0.2098 m³/s	196.39 m	0.28 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	196.39 m	N/A
Total	-----	0.2098 m³/s	196.39 m	N/A

**Culvert Analysis Report
4001-100yr- Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	196.39 m	
Roadway Width	20.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	197.40 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	197.40			
100.00	197.40			

**Culvert Analysis Report
4001-100yr- Nov 2019**

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	196.39 m	Discharge	0.2098 m³/s	
Inlet Control HW Elev.	196.35 m	Tailwater Elevation	196.35 m	
Outlet Control HW Elev.	196.39 m	Control Type	Outlet Control	
Headwater Depth/Height	0.34			
Grades				
Upstream Invert	195.98 m	Downstream Invert	195.60 m	
Length	20.45 m	Constructed Slope	0.018582 m/m	
Hydraulic Profile				
Profile	S1	Depth Downstream	0.75 m	
Slope Type	Steep	Normal Depth	0.22 m	
Flow Regime	Subcritical	Critical Depth	0.24 m	
Velocity Downstream	0.28 m/s	Critical Slope	0.012424 m/m	
Section				
Section Shape	Circular	Mannings Coefficient	0.024	
Section Material	CMP	Span	1.22 m	
Section Size	1200 mm	Rise	1.22 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	196.39 m	Upstream Velocity Head	0.03 m	
Ke	0.90	Entrance Loss	0.02 m	
Inlet Control Properties				
Inlet Control HW Elev.	196.35 m	Flow Control	N/A	
Inlet Type	Projecting	Area Full	1.2 m²	
K	0.03400	HDS 5 Chart	2	
M	1.50000	HDS 5 Scale	3	
C	0.05530	Equation Form	1	
Y	0.54000			

**Culvert Analysis Report
4001-25yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.1600 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.1600 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	196.33 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-1200 mm Circular	0.1596 m³/s	196.36 m	0.22 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	196.36 m	N/A
Total	-----	0.1596 m³/s	196.36 m	N/A

Culvert Analysis Report
4001-25yr- Nov 2019

Component: Culvert-1

Culvert Summary			
Computed Headwater Elevation	196.36 m	Discharge	0.1596 m³/s
Inlet Control HW Elev.	196.33 m	Tailwater Elevation	196.33 m
Outlet Control HW Elev.	196.36 m	Control Type	Outlet Control
Headwater Depth/Height	0.31		
Grades			
Upstream Invert	195.98 m	Downstream Invert	195.60 m
Length	20.45 m	Constructed Slope	0.018582 m/m
Hydraulic Profile			
Profile	S1	Depth, Downstream	0.73 m
Slope Type	Steep	Normal Depth	0.19 m
Flow Regime	Subcritical	Critical Depth	0.21 m
Velocity Downstream	0.22 m/s	Critical Slope	0.012696 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	1.22 m
Section Size	1200 mm	Rise	1.22 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	196.36 m	Upstream Velocity Head	0.02 m
Ke	0.90	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	196.33 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	1.2 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4001-25yr- Nov 2019

Component: Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	196.36 m
Roadway Width	20.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	197.40 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	197.40	
	100.00	197.40	

Culvert Analysis Report
4001-2yr- Nov 2019

Analysis Component				
Storm Event	Design	Discharge	0.0900 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.0900 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	196.31 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-1200 mm Circular	0.0898 m³/s	196.32 m	0.13 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	196.32 m	N/A
Total	-----	0.0898 m³/s	196.32 m	N/A

Culvert Analysis Report
4001-2yr- Nov 2019

Component: Culvert-1

Culvert Summary			
Computed Headwater Elevation	196.32 m	Discharge	0.0898 m³/s
Inlet Control HW Elev.	196.31 m	Tailwater Elevation	196.31 m
Outlet Control HW Elev.	196.32 m	Control Type	Outlet Control
Headwater Depth/Height	0.28		
Grades			
Upstream Invert	195.98 m	Downstream Invert	195.60 m
Length	20.45 m	Constructed Slope	0.018582 m/m
Hydraulic Profile			
Profile	S1	Depth, Downstream	0.71 m
Slope Type	Steep	Normal Depth	0.14 m
Flow Regime	Subcritical	Critical Depth	0.16 m
Velocity Downstream	0.13 m/s	Critical Slope	0.013424 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	1.22 m
Section Size	1200 mm	Rise	1.22 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	196.32 m	Upstream Velocity Head	0.01 m
Ke	0.90	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	196.31 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	1.2 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4001-2yr- Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	196.32 m
Roadway Width	20.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	197.40 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	197.40
100.00	197.40

Culvert Analysis Report
4002 -100yr-1 - Nov 2019

Analysis Component			
Storm Event	Design	Discharge	0.3500 m³/s

Peak Discharge Method: User-Specified			
Design Discharge	0.3500 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	195.63 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-800 mm Circular	0.3498 m³/s	195.76 m	0.90 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	195.76 m	N/A
Total	-----	0.3498 m³/s	195.76 m	N/A

Culvert Analysis Report
4002 -100yr-1 - Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	195.76 m	Discharge	0.3498 m³/s
Inlet Control HW Elev.	195.63 m	Tailwater Elevation	195.63 m
Outlet Control HW Elev.	195.76 m	Control Type	Outlet Control
Headwater Depth/Height	0.84		

Grades			
Upstream Invert	195.09 m	Downstream Invert	195.05 m
Length	19.89 m	Constructed Slope	0.002011 m/m

Hydraulic Profile			
Profile	M2	Depth, Downstream	0.58 m
Slope Type	Mild	Normal Depth	N/A m
Flow Regime	Subcritical	Critical Depth	0.35 m
Velocity Downstream	0.90 m/s	Critical Slope	0.014554 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.80 m
Section Size	800 mm	Rise	0.80 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	195.76 m	Upstream Velocity Head	0.04 m
Ke	0.90	Entrance Loss	0.03 m

Inlet Control Properties			
Inlet Control HW Elev.	195.63 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.5 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4002 -100yr-1 - Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	195.76 m
Roadway Width	18.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	197.00 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	197.00
100.00	197.00

**Culvert Analysis Report
4002 -25yr-1 - Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.2500 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.2500 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	195.60 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-800 mm Circular	0.2498 m³/s	195.68 m	0.68 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	195.68 m	N/A
Total	-----	0.2498 m³/s	195.68 m	N/A

**Culvert Analysis Report
4002 -25yr-1 - Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	195.68 m	
Roadway Width	18.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	197.00 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	197.00			
100.00	197.00			

**Culvert Analysis Report
4002 -25yr-1 - Nov 2019**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	195.68 m	Discharge	0.2498 m³/s
Inlet Control HW Elev.	195.60 m	Tailwater Elevation	195.60 m
Outlet Control HW Elev.	195.68 m	Control Type	Outlet Control
Headwater Depth/Height	0.74		
Grades			
Upstream Invert	195.09 m	Downstream Invert	195.05 m
Length	19.89 m	Constructed Slope	0.002011 m/m
Hydraulic Profile			
Profile	M1	Depth Downstream	0.55 m
Slope Type	Mid	Normal Depth	0.53 m
Flow Regime	Subcritical	Critical Depth	0.30 m
Velocity Downstream	0.68 m/s	Critical Slope	0.014053 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.80 m
Section Size	800 mm	Rise	0.80 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	195.68 m	Upstream Velocity Head	0.02 m
Ke	0.90	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	195.60 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.5 m²
K	0.03400	HDS 5 Chart	2
M	1.50000	HDS 5 Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

**Culvert Analysis Report
4002 -2yr-1 - Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.1400 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.1400 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	195.56 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-800 mm Circular	0.1396 m³/s	195.59 m	0.41 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	195.59 m	N/A
Total	-----	0.1396 m³/s	195.59 m	N/A

Culvert Analysis Report
4002 -2yr-1 - Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	195.59 m	Discharge	0.1396 m³/s
Inlet Control HW Elev.	195.56 m	Tailwater Elevation	195.56 m
Outlet Control HW Elev.	195.59 m	Control Type	Outlet Control
Headwater Depth/Height	0.63		
Grades			
Upstream Invert	195.09 m	Downstream Invert	195.05 m
Length	19.89 m	Constructed Slope	0.002011 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.51 m
Slope Type	Mild	Normal Depth	0.37 m
Flow Regime	Subcritical	Critical Depth	0.22 m
Velocity Downstream	0.41 m/s	Critical Slope	0.013895 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.80 m
Section Size	800 mm	Rise	0.80 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	195.59 m	Upstream Velocity Head	0.01 m
Ke	0.90	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	195.56 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.5 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4003 -100yr- Nov 2019

Analysis Component				
Storm Event	Design	Discharge	0.0900 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.0900 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	193.05 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.0893 m³/s	193.07 m	0.22 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	193.07 m	N/A
Total	-----	0.0893 m³/s	193.07 m	N/A

Culvert Analysis Report
4002 -2yr-1 - Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	195.59 m
Roadway Width	18.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	197.00 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	197.00	
	100.00	197.00	

Culvert Analysis Report
4003 -100yr- Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	193.07 m	Discharge	0.0893 m³/s
Inlet Control HW Elev.	193.05 m	Tailwater Elevation	193.05 m
Outlet Control HW Elev.	193.07 m	Control Type	Outlet Control
Headwater Depth/Height	0.40		
Grades			
Upstream Invert	192.70 m	Downstream Invert	192.51 m
Length	17.60 m	Constructed Slope	0.010795 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.54 m
Slope Type	Mild	Normal Depth	0.18 m
Flow Regime	Subcritical	Critical Depth	0.17 m
Velocity Downstream	0.22 m/s	Critical Slope	0.013801 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.07 m	Upstream Velocity Head	0.01 m
Ke	0.90	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	193.05 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.7 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4003 -100yr- Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	193.07 m
Roadway Width	16.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	193.80 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	193.80
100.00	193.80

Culvert Analysis Report
4003 -25yr- Nov 2019

Analysis Component

Storm Event	Design	Discharge	0.0600 m³/s
Peak Discharge Method: User-Specified			
Design Discharge	0.0600 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	193.03 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.0595 m³/s	193.04 m	0.15 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	193.04 m	N/A
Total	-----	0.0595 m³/s	193.04 m	N/A

Culvert Analysis Report
4003 -25yr- Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	193.04 m	Discharge	0.0595 m³/s
Inlet Control HW Elev.	193.03 m	Tailwater Elevation	193.03 m
Outlet Control HW Elev.	193.04 m	Control Type	Outlet Control
Headwater Depth/Height	0.37		

Grades			
Upstream Invert	192.70 m	Downstream Invert	192.51 m
Length	17.60 m	Constructed Slope	0.010795 m/m

Hydraulic Profile			
Profile	M1	Depth, Downstream	0.52 m
Slope Type	Mild	Normal Depth	0.15 m
Flow Regime	Subcritical	Critical Depth	0.14 m
Velocity Downstream	0.15 m/s	Critical Slope	0.014305 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	193.04 m	Upstream Velocity Head	0.00 m
Ke	0.90	Entrance Loss	0.00 m

Inlet Control Properties			
Inlet Control HW Elev.	193.03 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.7 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4003 -25yr- Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	193.04 m
Roadway Width	16.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	193.80 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	193.80
100.00	193.80

**Culvert Analysis Report
4003 -2yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.0400 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.0400 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	193.02 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.0402 m³/s	193.02 m	0.11 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	193.02 m	N/A
Total	-----	0.0402 m³/s	193.02 m	N/A

**Culvert Analysis Report
4003 -2yr- Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	193.02 m	
Roadway Width	16.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	193.80 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	193.80			
100.00	193.80			

**Culvert Analysis Report
4003 -2yr- Nov 2019**

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	193.02 m	Discharge	0.0402 m³/s	
Inlet Control HW Elev.	193.02 m	Tailwater Elevation	193.02 m	
Outlet Control HW Elev.	193.02 m	Control Type	Outlet Control	
Headwater Depth/Height	0.35			
Grades				
Upstream Invert	192.70 m	Downstream Invert	192.51 m	
Length	17.60 m	Constructed Slope	0.010795 m/m	
Hydraulic Profile				
Profile	M1	Depth, Downstream	0.51 m	
Slope Type	Mid	Normal Depth	0.12 m	
Flow Regime	Subcritical	Critical Depth	0.11 m	
Velocity Downstream	0.11 m/s	Critical Slope	0.014906 m/m	
Section				
Section Shape	Circular	Mannings Coefficient	0.024	
Section Material	CMP	Span	0.91 m	
Section Size	900 mm	Rise	0.91 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	193.02 m	Upstream Velocity Head	0.00 m	
Ke	0.90	Entrance Loss	0.00 m	
Inlet Control Properties				
Inlet Control HW Elev.	193.02 m	Flow Control	N/A	
Inlet Type	Projecting	Area Full	0.7 m²	
K	0.03400	HDS 5 Chart	2	
M	1.50000	HDS 5 Scale	3	
C	0.05530	Equation Form	1	
Y	0.54000			

**Culvert Analysis Report
4004 -100yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.0500 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.0500 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	193.09 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-600 mm Circular	0.0499 m³/s	193.10 m	0.26 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	193.10 m	N/A
Total	-----	0.0499 m³/s	193.10 m	N/A

**Culvert Analysis Report
4004 -100yr- Nov 2019**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	193.10 m	Discharge	0.0499 m³/s
Inlet Control HW Elev.	193.09 m	Tailwater Elevation	193.09 m
Outlet Control HW Elev.	193.10 m	Control Type	Outlet Control
Headwater Depth/Height	0.56		
Grades			
Upstream Invert	192.76 m	Downstream Invert	192.71 m
Length	9.00 m	Constructed Slope	0.005556 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.38 m
Slope Type	Mild	Normal Depth	0.18 m
Flow Regime	Subcritical	Critical Depth	0.14 m
Velocity Downstream	0.26 m/s	Critical Slope	0.015383 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.61 m
Section Size	600 mm	Rise	0.61 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.10 m	Upstream Velocity Head	0.00 m
Ke	0.90	Entrance Loss	0.00 m
Inlet Control Properties			
Inlet Control HW Elev.	193.09 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.3 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

**Culvert Analysis Report
4004 -25yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.0300 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.0300 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	193.07 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-600 mm Circular	0.0300 m³/s	193.08 m	0.17 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	193.08 m	N/A
Total	-----	0.0300 m³/s	193.08 m	N/A

**Culvert Analysis Report
4004 -100yr- Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	193.10 m
Roadway Width	8.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	194.20 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	194.20	
	100.00	194.20	

**Culvert Analysis Report
4004 -25yr- Nov 2019**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	193.08 m	Discharge	0.0300 m³/s
Inlet Control HW Elev.	193.07 m	Tailwater Elevation	193.07 m
Outlet Control HW Elev.	193.08 m	Control Type	Outlet Control
Headwater Depth/Height	0.52		
Grades			
Upstream Invert	192.76 m	Downstream Invert	192.71 m
Length	9.00 m	Constructed Slope	0.005556 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.38 m
Slope Type	Mild	Normal Depth	0.14 m
Flow Regime	Subcritical	Critical Depth	0.11 m
Velocity Downstream	0.17 m/s	Critical Slope	0.015883 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.61 m
Section Size	600 mm	Rise	0.61 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.08 m	Upstream Velocity Head	0.00 m
Ke	0.90	Entrance Loss	0.00 m
Inlet Control Properties			
Inlet Control HW Elev.	193.07 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.3 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4004 -25yr- Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	193.08 m
Roadway Width	8.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	194.20 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	194.20
100.00	194.20

Culvert Analysis Report
4004 -2yr- Nov 2019

Analysis Component

Storm Event	Design	Discharge	0.0200 m³/s
Peak Discharge Method: User-Specified			
Design Discharge	0.0200 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	193.06 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-600 mm Circular	0.0201 m³/s	193.06 m	0.12 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	193.06 m	N/A
Total	-----	0.0201 m³/s	193.06 m	N/A

Culvert Analysis Report
4004 -2yr- Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	193.06 m	Discharge	0.0201 m³/s
Inlet Control HW Elev.	193.06 m	Tailwater Elevation	193.06 m
Outlet Control HW Elev.	193.06 m	Control Type	Outlet Control
Headwater Depth/Height	0.50		

Grades			
Upstream Invert	192.76 m	Downstream Invert	192.71 m
Length	9.00 m	Constructed Slope	0.005556 m/m

Hydraulic Profile			
Profile	M1	Depth, Downstream	0.35 m
Slope Type	Mid	Normal Depth	0.11 m
Flow Regime	Subcritical	Critical Depth	0.09 m
Velocity Downstream	0.12 m/s	Critical Slope	0.016502 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.61 m
Section Size	600 mm	Rise	0.61 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	193.06 m	Upstream Velocity Head	0.00 m
Ke	0.90	Entrance Loss	0.00 m

Inlet Control Properties			
Inlet Control HW Elev.	193.06 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.3 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4004 -2yr- Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	193.06 m
Roadway Width	8.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	194.20 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	194.20
100.00	194.20

**Culvert Analysis Report
4007-1 -100yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.1800 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.1800 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	184.64 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-600 mm Circular	0.1800 m³/s	186.71 m	0.80 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	186.71 m	N/A
Total	-----	0.1800 m³/s	186.71 m	N/A

**Culvert Analysis Report
4007-1 -100yr- Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	186.71 m	
Roadway Width	600.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	188.30 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	188.30			
100.00	188.30			

**Culvert Analysis Report
4007-1 -100yr- Nov 2019**

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	186.71 m	Discharge	0.1800 m³/s	
Inlet Control HW Elev.	186.60 m	Tailwater Elevation	184.64 m	
Outlet Control HW Elev.	186.71 m	Control Type	Outlet Control	
Headwater Depth/Height	0.85			
Grades				
Upstream Invert	186.19 m	Downstream Invert	184.20 m	
Length	625.00 m	Constructed Slope	0.003184 m/m	
Hydraulic Profile				
Profile	M2	Depth Downstream	0.44 m	
Slope Type	Mild	Normal Depth	0.46 m	
Flow Regime	Subcritical	Critical Depth	0.27 m	
Velocity Downstream	0.80 m/s	Critical Slope	0.015947 m/m	
Section				
Section Shape	Circular	Mannings Coefficient	0.024	
Section Material	CMP	Span	0.61 m	
Section Size	600 mm	Rise	0.61 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	186.71 m	Upstream Velocity Head	0.03 m	
Ke	0.90	Entrance Loss	0.03 m	
Inlet Control Properties				
Inlet Control HW Elev.	186.60 m	Flow Control	N/A	
Inlet Type	Projecting	Area Full	0.3 m²	
K	0.03400	HDS S Chart	2	
M	1.50000	HDS S Scale	3	
C	0.05530	Equation Form	1	
Y	0.54000			

**Culvert Analysis Report
4007-1 -25yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.1300 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.1300 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	184.62 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-600 mm Circular	0.1299 m³/s	186.60 m	0.61 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	186.60 m	N/A
Total	-----	0.1299 m³/s	186.60 m	N/A

**Culvert Analysis Report
4007-1 -25yr- Nov 2019**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	186.60 m	Discharge	0.1299 m ³ /s
Inlet Control HW Elev.	186.53 m	Tailwater Elevation	184.62 m
Outlet Control HW Elev.	186.60 m	Control Type	Outlet Control
Headwater Depth/Height	0.68		
Grades			
Upstream Invert	186.19 m	Downstream Invert	184.20 m
Length	625.00 m	Constructed Slope	0.003184 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.42 m
Slope Type	Mild	Normal Depth	0.36 m
Flow Regime	Subcritical	Critical Depth	0.23 m
Velocity Downstream	0.61 m/s	Critical Slope	0.015413 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.61 m
Section Size	600 mm	Rise	0.61 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	186.60 m	Upstream Velocity Head	0.03 m
Ke	0.90	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	186.53 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.3 m ²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

**Culvert Analysis Report
4007-1 -2yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.0700 m ³ /s	
Peak Discharge Method: User-Specified				
Design Discharge	0.0700 m ³ /s	Check Discharge	0.0000 m ³ /s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	184.59 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-600 mm Circular	0.0700 m ³ /s	186.48 m	0.35 m/s
Weir	Roadway (Constant Elevation)	0.0000 m ³ /s	186.48 m	N/A
Total	-----	0.0700 m ³ /s	186.48 m	N/A

**Culvert Analysis Report
4007-1 -25yr- Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m ³ /s	Allowable HW Elevation	186.60 m
Roadway Width	600.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	188.30 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	188.30	
	100.00	188.30	

**Culvert Analysis Report
4007-1 -2yr- Nov 2019**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	186.48 m	Discharge	0.0700 m ³ /s
Inlet Control HW Elev.	186.42 m	Tailwater Elevation	184.59 m
Outlet Control HW Elev.	186.48 m	Control Type	Outlet Control
Headwater Depth/Height	0.47		
Grades			
Upstream Invert	186.19 m	Downstream Invert	184.20 m
Length	625.00 m	Constructed Slope	0.003184 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.39 m
Slope Type	Mild	Normal Depth	0.25 m
Flow Regime	Subcritical	Critical Depth	0.17 m
Velocity Downstream	0.35 m/s	Critical Slope	0.015215 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.61 m
Section Size	600 mm	Rise	0.61 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	186.48 m	Upstream Velocity Head	0.02 m
Ke	0.90	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	186.42 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.3 m ²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

**Culvert Analysis Report
4007-1 -2yr- Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	186.48 m
Roadway Width	600.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	188.30 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	188.30
100.00	188.30

**Culvert Analysis Report
4007 -100yr- Nov 2019**

Analysis Component			
Storm Event	Design	Discharge	0.0800 m³/s

Peak Discharge Method: User-Specified			
Design Discharge	0.0800 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	186.51 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-450 mm Circular	0.0799 m³/s	188.08 m	0.65 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	188.08 m	N/A
Total	-----	0.0799 m³/s	188.08 m	N/A

**Culvert Analysis Report
4007 -100yr- Nov 2019**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	188.08 m	Discharge	0.0799 m³/s
Inlet Control HW Elev.	188.03 m	Tailwater Elevation	186.51 m
Outlet Control HW Elev.	188.08 m	Control Type	Outlet Control
Headwater Depth/Height	0.74		

Grades			
Upstream Invert	187.74 m	Downstream Invert	186.19 m
Length	322.71 m	Constructed Slope	0.004803 m/m

Hydraulic Profile			
Profile	M1	Depth, Downstream	0.32 m
Slope Type	Mild	Normal Depth	0.29 m
Flow Regime	Subcritical	Critical Depth	0.19 m
Velocity Downstream	0.65 m/s	Critical Slope	0.017363 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.46 m
Section Size	450 mm	Rise	0.46 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	188.08 m	Upstream Velocity Head	0.03 m
Ke	0.90	Entrance Loss	0.03 m

Inlet Control Properties			
Inlet Control HW Elev.	188.03 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.2 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

**Culvert Analysis Report
4007 -100yr- Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	188.08 m
Roadway Width	320.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	189.80 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	189.80
100.00	189.80

**Culvert Analysis Report
4007 -25yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.0600 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.0600 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	186.50 m			
Hydraulic Profile				
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-450 mm Circular	0.0601 m³/s	188.03 m	0.51 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	188.03 m	N/A
Total	-----	0.0601 m³/s	188.03 m	N/A

**Culvert Analysis Report
4007 -25yr- Nov 2019**

Component:Weir				
Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	188.03 m	
Roadway Width	320.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	189.80 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Stationing				
Sta (m)	Elev. (m)			
0.00	189.80			
100.00	189.80			

**Culvert Analysis Report
4007 -25yr- Nov 2019**

Component:Culvert-1			
Culvert Summary			
Computed Headwater Elevation	188.03 m	Discharge	0.0601 m³/s
Inlet Control HW Elev.	187.98 m	Tailwater Elevation	186.50 m
Outlet Control HW Elev.	188.03 m	Control Type	Outlet Control
Headwater Depth/Height	0.62		
Grades			
Upstream Invert	187.74 m	Downstream Invert	186.19 m
Length	322.71 m	Constructed Slope	0.004803 m/m
Hydraulic Profile			
Profile	M1	Depth Downstream	0.31 m
Slope Type	Mid	Normal Depth	0.24 m
Flow Regime	Subcritical	Critical Depth	0.17 m
Velocity Downstream	0.51 m/s	Critical Slope	0.016906 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.46 m
Section Size	450 mm	Rise	0.46 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	188.03 m	Upstream Velocity Head	0.02 m
Ke	0.90	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	187.98 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.2 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

**Culvert Analysis Report
4007 -2yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.0300 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.0300 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	186.48 m			
Hydraulic Profile				
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-450 mm Circular	0.0301 m³/s	187.93 m	0.27 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	187.93 m	N/A
Total	-----	0.0301 m³/s	187.93 m	N/A

Culvert Analysis Report
4007 -2yr- Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	187.93 m	Discharge	0.0301 m³/s
Inlet Control HW Elev.	187.90 m	Tailwater Elevation	186.48 m
Outlet Control HW Elev.	187.93 m	Control Type	Outlet Control
Headwater Depth/Height	0.43		
Grades			
Upstream Invert	187.74 m	Downstream Invert	186.19 m
Length	322.71 m	Constructed Slope	0.004803 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.29 m
Slope Type	Mid	Normal Depth	0.16 m
Flow Regime	Subcritical	Critical Depth	0.12 m
Velocity Downstream	0.27 m/s	Critical Slope	0.016799 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.46 m
Section Size	450 mm	Rise	0.46 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	187.93 m	Upstream Velocity Head	0.02 m
Ke	0.90	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	187.90 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.2 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4008 -100yr- Nov 2019

Analysis Component				
Storm Event	Design	Discharge	0.4100 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.4100 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	186.83 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.4100 m³/s	186.96 m	0.84 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	186.96 m	N/A
Total	-----	0.4100 m³/s	186.96 m	N/A

Culvert Analysis Report
4007 -2yr- Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	187.93 m
Roadway Width	322.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	189.80 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	189.80	
	100.00	189.80	

Culvert Analysis Report
4008 -100yr- Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	186.96 m	Discharge	0.4100 m³/s
Inlet Control HW Elev.	186.83 m	Tailwater Elevation	186.83 m
Outlet Control HW Elev.	186.96 m	Control Type	Outlet Control
Headwater Depth/Height	0.74		
Grades			
Upstream Invert	186.28 m	Downstream Invert	186.19 m
Length	22.80 m	Constructed Slope	0.003947 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.64 m
Slope Type	Mid	Normal Depth	0.53 m
Flow Regime	Subcritical	Critical Depth	0.37 m
Velocity Downstream	0.84 m/s	Critical Slope	0.013620 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	186.96 m	Upstream Velocity Head	0.04 m
Ke	0.90	Entrance Loss	0.04 m
Inlet Control Properties			
Inlet Control HW Elev.	186.83 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.7 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4008 -100yr- Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	186.96 m
Roadway Width	22.80 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	188.10 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	188.10
100.00	188.10

Culvert Analysis Report
4008 -25yr- Nov 2019

Analysis Component			
Storm Event	Design	Discharge	0.2900 m³/s

Peak Discharge Method: User-Specified			
Design Discharge	0.2900 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	186.80 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.2897 m³/s	186.88 m	0.62 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	186.88 m	N/A
Total	-----	0.2897 m³/s	186.88 m	N/A

Culvert Analysis Report
4008 -25yr- Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	186.88 m	Discharge	0.2897 m³/s
Inlet Control HW Elev.	186.80 m	Tailwater Elevation	186.80 m
Outlet Control HW Elev.	186.88 m	Control Type	Outlet Control
Headwater Depth/Height	0.65		

Grades			
Upstream Invert	186.28 m	Downstream Invert	186.19 m
Length	22.80 m	Constructed Slope	0.003947 m/m

Hydraulic Profile			
Profile	M1	Depth, Downstream	0.61 m
Slope Type	Mild	Normal Depth	0.43 m
Flow Regime	Subcritical	Critical Depth	0.31 m
Velocity Downstream	0.62 m/s	Critical Slope	0.013319 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	186.88 m	Upstream Velocity Head	0.03 m
Ke	0.90	Entrance Loss	0.02 m

Inlet Control Properties			
Inlet Control HW Elev.	186.80 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.7 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4008 -25yr- Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	186.88 m
Roadway Width	22.80 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	188.10 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	188.10
100.00	188.10

**Culvert Analysis Report
4008 -2yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.1600 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.1600 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	186.76 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.1596 m³/s	186.79 m	0.37 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	186.79 m	N/A
Total	-----	0.1596 m³/s	186.79 m	N/A

**Culvert Analysis Report
4008 -2yr- Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	186.79 m	
Roadway Width	22.80 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	188.10 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	188.10			
100.00	188.10			

**Culvert Analysis Report
4008 -2yr- Nov 2019**

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	186.79 m	Discharge	0.1596 m³/s	
Inlet Control HW Elev.	186.76 m	Tailwater Elevation	186.76 m	
Outlet Control HW Elev.	186.79 m	Control Type	Outlet Control	
Headwater Depth/Height	0.56			
Grades				
Upstream Invert	186.28 m	Downstream Invert	186.19 m	
Length	22.80 m	Constructed Slope	0.003947 m/m	
Hydraulic Profile				
Profile	M1	Depth, Downstream	0.57 m	
Slope Type	Mid	Normal Depth	0.31 m	
Flow Regime	Subcritical	Critical Depth	0.23 m	
Velocity Downstream	0.37 m/s	Critical Slope	0.013358 m/m	
Section				
Section Shape	Circular	Mannings Coefficient	0.024	
Section Material	CMP	Span	0.91 m	
Section Size	900 mm	Rise	0.91 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	186.79 m	Upstream Velocity Head	0.01 m	
Ke	0.90	Entrance Loss	0.01 m	
Inlet Control Properties				
Inlet Control HW Elev.	186.76 m	Flow Control	N/A	
Inlet Type	Projecting	Area Full	0.7 m²	
K	0.03400	HDS 5 Chart	2	
M	1.50000	HDS 5 Scale	3	
C	0.05530	Equation Form	1	
Y	0.54000			

**Culvert Analysis Report
4009 -100yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.1100 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.1100 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	185.85 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.1097 m³/s	185.87 m	0.27 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	185.87 m	N/A
Total	-----	0.1097 m³/s	185.87 m	N/A

Culvert Analysis Report
4009 -100yr- Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	185.87 m	Discharge	0.1097 m³/s
Inlet Control HW Elev.	185.85 m	Tailwater Elevation	185.85 m
Outlet Control HW Elev.	185.87 m	Control Type	Outlet Control
Headwater Depth/Height	0.49		
Grades			
Upstream Invert	185.42 m	Downstream Invert	185.30 m
Length	23.78 m	Constructed Slope	0.005046 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.55 m
Slope Type	Mild	Normal Depth	0.24 m
Flow Regime	Subcritical	Critical Depth	0.19 m
Velocity Downstream	0.27 m/s	Critical Slope	0.013623 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	185.87 m	Upstream Velocity Head	0.01 m
Ke	0.90	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	185.85 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.7 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4009 -25yr- Nov 2019

Analysis Component				
Storm Event	Design	Discharge	0.0800 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.0800 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	185.83 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.0798 m³/s	185.84 m	0.20 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	185.84 m	N/A
Total	-----	0.0798 m³/s	185.84 m	N/A

Culvert Analysis Report
4009 -100yr- Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	185.87 m
Roadway Width	23.78 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	187.40 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	187.40	
	100.00	187.40	

Culvert Analysis Report
4009 -25yr- Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	185.84 m	Discharge	0.0798 m³/s
Inlet Control HW Elev.	185.83 m	Tailwater Elevation	185.83 m
Outlet Control HW Elev.	185.84 m	Control Type	Outlet Control
Headwater Depth/Height	0.46		
Grades			
Upstream Invert	185.42 m	Downstream Invert	185.30 m
Length	23.78 m	Constructed Slope	0.005046 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.53 m
Slope Type	Mild	Normal Depth	0.20 m
Flow Regime	Subcritical	Critical Depth	0.16 m
Velocity Downstream	0.20 m/s	Critical Slope	0.013962 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	185.84 m	Upstream Velocity Head	0.00 m
Ke	0.90	Entrance Loss	0.00 m
Inlet Control Properties			
Inlet Control HW Elev.	185.83 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.7 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4009 -25yr- Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	185.84 m
Roadway Width	23.78 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	187.40 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	187.40
100.00	187.40

Culvert Analysis Report
4009 -2yr- Nov 2019

Analysis Component			
Storm Event	Design	Discharge	0.0400 m³/s

Peak Discharge Method: User-Specified			
Design Discharge	0.0400 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	185.81 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.0402 m³/s	185.81 m	0.11 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	185.81 m	N/A
Total	-----	0.0402 m³/s	185.81 m	N/A

Culvert Analysis Report
4009 -2yr- Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	185.81 m	Discharge	0.0402 m³/s
Inlet Control HW Elev.	185.81 m	Tailwater Elevation	185.81 m
Outlet Control HW Elev.	185.81 m	Control Type	Outlet Control
Headwater Depth/Height	0.43		

Grades			
Upstream Invert	185.42 m	Downstream Invert	185.30 m
Length	23.78 m	Constructed Slope	0.005046 m/m

Hydraulic Profile			
Profile	M1	Depth, Downstream	0.51 m
Slope Type	Mild	Normal Depth	0.15 m
Flow Regime	Subcritical	Critical Depth	0.11 m
Velocity Downstream	0.11 m/s	Critical Slope	0.014909 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	185.81 m	Upstream Velocity Head	0.00 m
Ke	0.90	Entrance Loss	0.00 m

Inlet Control Properties			
Inlet Control HW Elev.	185.81 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.7 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Analysis Report
4009 -2yr- Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	185.81 m
Roadway Width	23.78 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	187.40 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	187.40
100.00	187.40

**Culvert Analysis Report
4010 -100yr-1 - Dec 2019**

Analysis Component				
Storm Event	Design	Discharge	0.1700 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.1700 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	183.67 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-750 mm Circular	0.1705 m³/s	183.72 m	0.54 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	183.72 m	N/A
Total	-----	0.1705 m³/s	183.72 m	N/A

**Culvert Analysis Report
4010 -100yr-1 - Dec 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	183.72 m	
Roadway Width	16.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	184.50 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	184.50			
100.00	184.50			

**Culvert Analysis Report
4010 -100yr-1 - Dec 2019**

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	183.72 m	Discharge	0.1705 m³/s	
Inlet Control HW Elev.	183.67 m	Tailwater Elevation	183.67 m	
Outlet Control HW Elev.	183.72 m	Control Type	Outlet Control	
Headwater Depth/Height	0.51			
Grades				
Upstream Invert	183.33 m	Downstream Invert	183.17 m	
Length	16.90 m	Constructed Slope	0.009467 m/m	
Hydraulic Profile				
Profile	S1	Depth Downstream	0.50 m	
Slope Type	Steep	Normal Depth	0.20 m	
Flow Regime	Subcritical	Critical Depth	0.25 m	
Velocity Downstream	0.54 m/s	Critical Slope	0.004144 m/m	
Section				
Section Shape	Circular	Mannings Coefficient	0.013	
Section Material	Concrete	Span	0.76 m	
Section Size	750 mm	Rise	0.76 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	183.72 m	Upstream Velocity Head	0.04 m	
Ke	0.50	Entrance Loss	0.02 m	
Inlet Control Properties				
Inlet Control HW Elev.	183.67 m	Flow Control	N/A	
Inlet Type	Square edge w/headwall	Area Full	0.5 m²	
K	0.00980	HDS S Chart	1	
M	2.00000	HDS S Scale	1	
C	0.03980	Equation Form	1	
Y	0.67000			

**Culvert Analysis Report
4010 -25yr-1 - Dec 2019**

Analysis Component				
Storm Event	Design	Discharge	0.1200 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.1200 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	183.65 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-750 mm Circular	0.1194 m³/s	183.68 m	0.39 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	183.68 m	N/A
Total	-----	0.1194 m³/s	183.68 m	N/A

**Culvert Analysis Report
4010 -25yr-1 - Dec 2019**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	183.68 m	Discharge	0.1194 m³/s
Inlet Control HW Elev.	183.65 m	Tailwater Elevation	183.65 m
Outlet Control HW Elev.	183.68 m	Control Type	Outlet Control
Headwater Depth/Height	0.46		
Grades			
Upstream Invert	183.33 m	Downstream Invert	183.17 m
Length	16.90 m	Constructed Slope	0.009467 m/m
Hydraulic Profile			
Profile	S1	Depth, Downstream	0.48 m
Slope Type	Steep	Normal Depth	0.17 m
Flow Regime	Subcritical	Critical Depth	0.21 m
Velocity Downstream	0.39 m/s	Critical Slope	0.004146 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	0.76 m
Section Size	750 mm	Rise	0.76 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	183.68 m	Upstream Velocity Head	0.02 m
Ke	0.50	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	183.65 m	Flow Control	N/A
Inlet Type	Square edge w/headwall	Area Full	0.5 m²
K	0.00980	HDS S Chart	1
M	2.00000	HDS S Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

**Culvert Analysis Report
4010 -2yr-1 - Dec 2019**

Analysis Component				
Storm Event	Design	Discharge	0.0600 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.0600 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	183.62 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-750 mm Circular	0.0600 m³/s	183.63 m	0.21 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	183.63 m	N/A
Total	-----	0.0600 m³/s	183.63 m	N/A

**Culvert Analysis Report
4010 -25yr-1 - Dec 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	183.68 m
Roadway Width	16.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	184.50 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	184.50	
	100.00	184.50	

**Culvert Analysis Report
4010 -2yr-1 - Dec 2019**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	183.63 m	Discharge	0.0600 m³/s
Inlet Control HW Elev.	183.62 m	Tailwater Elevation	183.62 m
Outlet Control HW Elev.	183.63 m	Control Type	Outlet Control
Headwater Depth/Height	0.39		
Grades			
Upstream Invert	183.33 m	Downstream Invert	183.17 m
Length	16.90 m	Constructed Slope	0.009467 m/m
Hydraulic Profile			
Profile	S1	Depth, Downstream	0.45 m
Slope Type	Steep	Normal Depth	0.12 m
Flow Regime	Subcritical	Critical Depth	0.14 m
Velocity Downstream	0.21 m/s	Critical Slope	0.004286 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	0.76 m
Section Size	750 mm	Rise	0.76 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	183.63 m	Upstream Velocity Head	0.01 m
Ke	0.50	Entrance Loss	0.00 m
Inlet Control Properties			
Inlet Control HW Elev.	183.62 m	Flow Control	N/A
Inlet Type	Square edge w/headwall	Area Full	0.5 m²
K	0.00980	HDS S Chart	1
M	2.00000	HDS S Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Analysis Report
4010 -2yr-1 - Dec 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	183.63 m
Roadway Width	16.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	184.50 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	184.50
100.00	184.50

Culvert Analysis Report
4011 -2C-100yr-1 - Nov 2019

Analysis Component			
Storm Event	Design	Discharge	1.7400 m³/s

Peak Discharge Method: User-Specified			
Design Discharge	1.7400 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	179.62 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-1350 mm Circular	1.7402 m³/s	180.58 m	1.48 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	180.58 m	N/A
Total	-----	1.7402 m³/s	180.58 m	N/A

Culvert Analysis Report
4011 -2C-100yr-1 - Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	180.58 m	Discharge	1.7402 m³/s
Inlet Control HW Elev.	180.50 m	Tailwater Elevation	179.62 m
Outlet Control HW Elev.	180.58 m	Control Type	Outlet Control
Headwater Depth/Height	0.80		

Grades			
Upstream Invert	179.49 m	Downstream Invert	178.60 m
Length	398.60 m	Constructed Slope	0.002233 m/m

Hydraulic Profile			
Profile	M1	Depth, Downstream	1.02 m
Slope Type	Mid	Normal Depth	0.81 m
Flow Regime	Subcritical	Critical Depth	0.69 m
Velocity Downstream	1.48 m/s	Critical Slope	0.003740 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.37 m
Section Size	1350 mm	Rise	1.37 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	180.58 m	Upstream Velocity Head	0.18 m
Ke	0.50	Entrance Loss	0.09 m

Inlet Control Properties			
Inlet Control HW Elev.	180.50 m	Flow Control	N/A
Inlet Type	Square edge w/headwall	Area Full	1.5 m²
K	0.00980	HDS S Chart	1
M	2.00000	HDS S Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Analysis Report
4011 -2C-100yr-1 - Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	180.58 m
Roadway Width	207.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	181.38 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	181.38
100.00	181.38

Culvert Analysis Report
4011 -2C-25yr-1 - Nov 2019

Analysis Component				
Storm Event	Design	Discharge	1.2400 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	1.2400 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	179.57 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-1350 mm Circular	1.2396 m³/s	180.39 m	1.11 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	180.39 m	N/A
Total	-----	1.2396 m³/s	180.39 m	N/A

Culvert Analysis Report
4011 -2C-25yr-1 - Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	180.39 m	
Roadway Width	207.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	181.38 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	181.38			
100.00	181.38			

Culvert Analysis Report
4011 -2C-25yr-1 - Nov 2019

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	180.39 m	Discharge	1.2396 m³/s	
Inlet Control HW Elev.	180.31 m	Tailwater Elevation	179.57 m	
Outlet Control HW Elev.	180.39 m	Control Type	Outlet Control	
Headwater Depth/Height	0.65			
Grades				
Upstream Invert	179.49 m	Downstream Invert	178.60 m	
Length	398.60 m	Constructed Slope	0.002233 m/m	
Hydraulic Profile				
Profile	M1	Depth Downstream	0.97 m	
Slope Type	Mid	Normal Depth	0.66 m	
Flow Regime	Subcritical	Critical Depth	0.58 m	
Velocity Downstream	1.11 m/s	Critical Slope	0.003527 m/m	
Section				
Section Shape	Circular	Mannings Coefficient	0.013	
Section Material	Concrete	Span	1.37 m	
Section Size	1350 mm	Rise	1.37 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	180.39 m	Upstream Velocity Head	0.16 m	
Ke	0.50	Entrance Loss	0.08 m	
Inlet Control Properties				
Inlet Control HW Elev.	180.31 m	Flow Control	N/A	
Inlet Type	Square edge w/headwall	Area Full	1.5 m²	
K	0.00980	HDS S Chart	1	
M	2.00000	HDS S Scale	1	
C	0.03980	Equation Form	1	
Y	0.67000			

Culvert Analysis Report
4011 -2C-2yr-1 - Nov 2019

Analysis Component				
Storm Event	Design	Discharge	0.7300 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.7300 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	179.50 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-1350 mm Circular	0.7303 m³/s	180.16 m	0.71 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	180.16 m	N/A
Total	-----	0.7303 m³/s	180.16 m	N/A

Culvert Analysis Report
4011 -2C-2yr-1 - Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	180.16 m	Discharge	0.7303 m³/s
Inlet Control HW Elev.	180.10 m	Tailwater Elevation	179.50 m
Outlet Control HW Elev.	180.16 m	Control Type	Outlet Control
Headwater Depth/Height	0.49		
Grades			
Upstream Invert	179.49 m	Downstream Invert	178.60 m
Length	398.60 m	Constructed Slope	0.002233 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.90 m
Slope Type	Mid	Normal Depth	0.49 m
Flow Regime	Subcritical	Critical Depth	0.44 m
Velocity Downstream	0.71 m/s	Critical Slope	0.003406 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.37 m
Section Size	1350 mm	Rise	1.37 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	180.16 m	Upstream Velocity Head	0.12 m
Ke	0.50	Entrance Loss	0.06 m
Inlet Control Properties			
Inlet Control HW Elev.	180.10 m	Flow Control	N/A
Inlet Type	Square edge w/headwall	Area Full	1.5 m²
K	0.00980	HDS S Chart	1
M	2.00000	HDS S Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Analysis Report
4012-2A-100yr-1-3.4x1.4 - April 2019

Analysis Component				
Storm Event	Design	Discharge	9.7900 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	9.7900 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	178.99 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3400 x 1400 mm Box	8.4010 m³/s	179.99 m	3.15 m/s
Weir	Roadway	1.3910 m³/s	179.99 m	N/A
Total	-----	9.7919 m³/s	179.99 m	N/A

Culvert Analysis Report
4011 -2C-2yr-1 - Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	180.16 m
Roadway Width	207.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	181.38 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	181.38	
	100.00	181.38	

Culvert Analysis Report
4012-2A-100yr-1-3.4x1.4 - April 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	179.99 m	Discharge	8.4010 m³/s
Inlet Control HW Elev.	179.99 m	Tailwater Elevation	178.99 m
Outlet Control HW Elev.	179.96 m	Control Type	Inlet Control
Headwater Depth/Height	1.00		
Grades			
Upstream Invert	178.59 m	Downstream Invert	177.82 m
Length	201.00 m	Constructed Slope	0.003831 m/m
Hydraulic Profile			
Profile	CompositeS152	Depth, Downstream	0.79 m
Slope Type	Steep	Normal Depth	0.79 m
Flow Regime	N/A	Critical Depth	0.85 m
Velocity Downstream	3.15 m/s	Critical Slope	0.003006 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.40 m
Section Size	3400 x 1400 mm	Rise	1.40 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	179.96 m	Upstream Velocity Head	0.43 m
Ke	0.20	Entrance Loss	0.09 m
Inlet Control Properties			
Inlet Control HW Elev.	179.99 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.8 m²
K	0.51500	HDS S Chart	10
M	0.66700	HDS S Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Analysis Report
4012-2A-100yr-1-3.4x1.4 - April 2019

Component:Weir

Hydraulic Component(s): Roadway			
Discharge	1.3910 m³/s	Allowable HW Elevation	179.99 m
Roadway Width	200.00 m	Overtopping Coefficient	1.51 SI
Low Point	179.50 m	Headwater Elevation	179.99 m
Discharge Coefficient (Cr)	2.74	Submergence Factor (Kt)	1.00
Tailwater Elevation	178.99 m		

Sta (m)	Elev. (m)
0.00	180.85
5.00	180.85
7.70	179.50
9.70	179.50
12.40	180.85
17.40	180.85

Culvert Analysis Report
4012-2A-25yr-1-3.4x1.4 - April 2019

Analysis Component				
Storm Event	Design	Discharge	6.8400 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	6.8400 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	178.89 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3400 x 1400 mm Box	6.8400 m³/s	179.81 m	2.92 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	179.81 m	N/A
Total	-----	6.8400 m³/s	179.81 m	N/A

Culvert Analysis Report
4012-2A-25yr-1-3.4x1.4 - April 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	179.81 m	Discharge	6.8400 m³/s
Inlet Control HW Elev.	179.81 m	Tailwater Elevation	178.89 m
Outlet Control HW Elev.	179.78 m	Control Type	Inlet Control
Headwater Depth/Height	0.87		

Grades			
Upstream Invert	178.59 m	Downstream Invert	177.82 m
Length	207.00 m	Constructed Slope	0.003720 m/m

Hydraulic Profile			
Profile	CompositeS152	Depth, Downstream	0.69 m
Slope Type	Steep	Normal Depth	0.69 m
Flow Regime	N/A	Critical Depth	0.74 m
Velocity Downstream	2.92 m/s	Critical Slope	0.002968 m/m

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.40 m
Section Size	3400 x 1400 mm	Rise	1.40 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	179.78 m	Upstream Velocity Head	0.37 m
Ke	0.20	Entrance Loss	0.07 m

Inlet Control Properties			
Inlet Control HW Elev.	179.81 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.8 m²
K	0.51500	HDS S Chart	10
M	0.66700	HDS S Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Analysis Report
4012-2A-25yr-1-3.4x1.4 - April 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	179.81 m
Roadway Width	207.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	181.00 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
0.00	181.00		
100.00	181.00		

Culvert Analysis Report
4012-2A-2yr-1-3.4x1.4 - April 2019

Analysis Component				
Storm Event	Design	Discharge	2.0100 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	2.0100 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	178.68 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3400 x 1400 mm Box	2.0092 m³/s	179.19 m	0.69 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	179.19 m	N/A
Total	-----	2.0092 m³/s	179.19 m	N/A

Culvert Analysis Report
4012-2A-2yr-1-3.4x1.4 - April 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	179.19 m	
Roadway Width	207.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	181.00 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	181.00			
100.00	181.00			

Culvert Analysis Report
4012-2A-2yr-1-3.4x1.4 - April 2019

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	179.19 m	Discharge	2.0092 m³/s	
Inlet Control HW Elev.	179.13 m	Tailwater Elevation	178.68 m	
Outlet Control HW Elev.	179.19 m	Control Type	Outlet Control	
Headwater Depth/Height	0.43			
Grades				
Upstream Invert	178.59 m	Downstream Invert	177.82 m	
Length	201.00 m	Constructed Slope	0.003831 m/m	
Hydraulic Profile				
Profile	M1	Depth Downstream	0.86 m	
Slope Type	Mild	Normal Depth	0.53 m	
Flow Regime	Subcritical	Critical Depth	0.33 m	
Velocity Downstream	0.69 m/s	Critical Slope	0.016186 m/m	
Section				
Section Shape	Box	Mannings Coefficient	0.030	
Section Material	Concrete	Span	3.40 m	
Section Size	3400 x 1400 mm	Rise	1.40 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	179.19 m	Upstream Velocity Head	0.06 m	
Ke	0.20	Entrance Loss	0.01 m	
Inlet Control Properties				
Inlet Control HW Elev.	179.13 m	Flow Control	N/A	
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.8 m²	
K	0.51500	HDS S Chart	10	
M	0.66700	HDS S Scale	1	
C	0.03750	Equation Form	2	
Y	0.79000			

Culvert Analysis Report
4012-2A-Regional-1-3.4x1.4 - April 2019

Analysis Component				
Storm Event	Design	Discharge	23.6600 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	23.6600 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	179.37 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3400 x 1400 mm Box	14.3163 m³/s	180.81 m	3.01 m/s
Weir	Roadway	9.3469 m³/s	180.81 m	N/A
Total	-----	23.6631 m³/s	180.81 m	N/A

Culvert Analysis Report
4012-2A-Regional-1-3.4x1.4 - April 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	180.81 m	Discharge	14.3163 m³/s
Inlet Control HW Elev.	180.81 m	Tailwater Elevation	179.37 m
Outlet Control HW Elev.	180.73 m	Control Type	Inlet Control
Headwater Depth/Height	1.58		
Grades			
Upstream Invert	178.59 m	Downstream Invert	177.82 m
Length	207.00 m	Constructed Slope	0.003720 m/m
Hydraulic Profile			
Profile	PressureProfile	Depth, Downstream	1.40 m
Slope Type	N/A	Normal Depth	N/A m
Flow Regime	N/A	Critical Depth	1.22 m
Velocity Downstream	3.01 m/s	Critical Slope	0.003190 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.40 m
Section Size	3400 x 1400 mm	Rise	1.40 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	180.73 m	Upstream Velocity Head	0.61 m
Ke	0.20	Entrance Loss	0.09 m
Inlet Control Properties			
Inlet Control HW Elev.	180.81 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.8 m²
K	0.51500	HDS S Chart	10
M	0.66700	HDS S Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Analysis Report
4013 -100yr-1 - Nov 2019

Analysis Component				
Storm Event	Design	Discharge	0.2500 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.2500 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	177.75 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.2499 m³/s	177.84 m	0.55 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	177.84 m	N/A
Total	-----	0.2499 m³/s	177.84 m	N/A

Culvert Analysis Report
4012-2A-Regional-1-3.4x1.4 - April 2019

Component:Weir

Hydraulic Component(s): Roadway			
Discharge	9.3469 m³/s	Allowable HW Elevation	180.81 m
Roadway Width	200.00 m	Overtopping Coefficient	1.63 SI
Low Point	179.50 m	Headwater Elevation	180.81 m
Discharge Coefficient (Cr)	2.95	Submergence Factor (Kt)	1.00
Tailwater Elevation	179.37 m		
Sta (m)	Elev. (m)		
0.00	180.85		
5.00	180.85		
7.70	179.50		
9.70	179.50		
12.40	180.85		
17.40	180.85		

Culvert Analysis Report
4013 -100yr-1 - Nov 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	177.84 m	Discharge	0.2499 m³/s
Inlet Control HW Elev.	177.75 m	Tailwater Elevation	177.75 m
Outlet Control HW Elev.	177.84 m	Control Type	Outlet Control
Headwater Depth/Height	0.58		
Grades			
Upstream Invert	177.31 m	Downstream Invert	177.15 m
Length	32.80 m	Constructed Slope	0.004878 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.60 m
Slope Type	Mid	Normal Depth	0.37 m
Flow Regime	Subcritical	Critical Depth	0.29 m
Velocity Downstream	0.55 m/s	Critical Slope	0.013275 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	177.84 m	Upstream Velocity Head	0.03 m
Ke	0.90	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	177.75 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.7 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

**Culvert Analysis Report
4013 -100yr-1 - Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	177.84 m
Roadway Width	30.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	181.03 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	181.03
100.00	181.03

**Culvert Analysis Report
4013 -25yr-1 - Nov 2019**

Analysis Component			
Storm Event	Design	Discharge	0.1700 m³/s

Peak Discharge Method: User-Specified			
Design Discharge	0.1700 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	177.71 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.1697 m³/s	177.76 m	0.40 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	177.76 m	N/A
Total	-----	0.1697 m³/s	177.76 m	N/A

**Culvert Analysis Report
4013 -25yr-1 - Nov 2019**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	177.76 m	Discharge	0.1697 m³/s
Inlet Control HW Elev.	177.71 m	Tailwater Elevation	177.71 m
Outlet Control HW Elev.	177.76 m	Control Type	Outlet Control
Headwater Depth/Height	0.50		

Grades			
Upstream Invert	177.31 m	Downstream Invert	177.15 m
Length	32.80 m	Constructed Slope	0.004878 m/m

Hydraulic Profile			
Profile	M1	Depth, Downstream	0.56 m
Slope Type	Mild	Normal Depth	0.30 m
Flow Regime	Subcritical	Critical Depth	0.23 m
Velocity Downstream	0.40 m/s	Critical Slope	0.013334 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	177.76 m	Upstream Velocity Head	0.02 m
Ke	0.90	Entrance Loss	0.02 m

Inlet Control Properties			
Inlet Control HW Elev.	177.71 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.7 m²
K	0.03400	HDS S Chart	2
M	1.50000	HDS S Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

**Culvert Analysis Report
4013 -25yr-1 - Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	177.76 m
Roadway Width	30.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	181.03 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	181.03
100.00	181.03

**Culvert Analysis Report
4013 -2yr-1 - Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.1000 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.1000 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	177.69 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.0997 m³/s	177.71 m	0.25 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	177.71 m	N/A
Total	-----	0.0997 m³/s	177.71 m	N/A

**Culvert Analysis Report
4013 -2yr-1 - Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	177.71 m	
Roadway Width	30.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	181.03 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	181.03			
100.00	181.03			

**Culvert Analysis Report
4013 -2yr-1 - Nov 2019**

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	177.71 m	Discharge	0.0997 m³/s	
Inlet Control HW Elev.	177.69 m	Tailwater Elevation	177.69 m	
Outlet Control HW Elev.	177.71 m	Control Type	Outlet Control	
Headwater Depth/Height	0.44			
Grades				
Upstream Invert	177.31 m	Downstream Invert	177.15 m	
Length	32.80 m	Constructed Slope	0.004878 m/m	
Hydraulic Profile				
Profile	M1	Depth Downstream	0.54 m	
Slope Type	Mid	Normal Depth	0.23 m	
Flow Regime	Subcritical	Critical Depth	0.18 m	
Velocity Downstream	0.25 m/s	Critical Slope	0.013698 m/m	
Section				
Section Shape	Circular	Mannings Coefficient	0.024	
Section Material	CMP	Span	0.91 m	
Section Size	900 mm	Rise	0.91 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	177.71 m	Upstream Velocity Head	0.01 m	
Ke	0.90	Entrance Loss	0.01 m	
Inlet Control Properties				
Inlet Control HW Elev.	177.69 m	Flow Control	N/A	
Inlet Type	Projecting	Area Full	0.7 m²	
K	0.03400	HDS 5 Chart	2	
M	1.50000	HDS 5 Scale	3	
C	0.05530	Equation Form	1	
Y	0.54000			

**Culvert Analysis Report
4014 -100yr-1 - Nov 2019 final**

Analysis Component				
Storm Event	Design	Discharge	2.8500 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	2.8500 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	177.88 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2400 mm Circular	2.8503 m³/s	178.07 m	0.89 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	178.07 m	N/A
Total	-----	2.8503 m³/s	178.07 m	N/A

Culvert Analysis Report
4014 -100yr-1 - Nov 2019 final

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	178.07 m	Discharge	2.8503 m³/s
Inlet Control HW Elev.	177.94 m	Tailwater Elevation	177.88 m
Outlet Control HW Elev.	178.07 m	Control Type	Outlet Control
Headwater Depth/Height	0.47		
Grades			
Upstream Invert	176.92 m	Downstream Invert	176.30 m
Length	66.10 m	Constructed Slope	0.009380 m/m
Hydraulic Profile			
Profile	S1	Depth, Downstream	1.58 m
Slope Type	Steep	Normal Depth	0.56 m
Flow Regime	Subcritical	Critical Depth	0.76 m
Velocity Downstream	0.89 m/s	Critical Slope	0.002808 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.44 m
Section Size	2400 mm	Rise	2.44 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	178.07 m	Upstream Velocity Head	0.21 m
Ke	0.50	Entrance Loss	0.10 m
Inlet Control Properties			
Inlet Control HW Elev.	177.94 m	Flow Control	N/A
Inlet Type	Beveled ring, 33.7° bevels	Area Full	4.7 m²
K	0.00180	HDS S Chart	3
M	2.50000	HDS S Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Analysis Report
4014 -25yr-1 - Nov 2019 final

Analysis Component				
Storm Event	Design	Discharge	2.0100 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	2.0100 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	177.82 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2400 mm Circular	2.0086 m³/s	177.91 m	0.66 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	177.91 m	N/A
Total	-----	2.0086 m³/s	177.91 m	N/A

Culvert Analysis Report
4014 -100yr-1 - Nov 2019 final

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	178.07 m
Roadway Width	65.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	181.50 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	181.50	
	100.00	181.50	

Culvert Analysis Report
4014 -25yr-1 - Nov 2019 final

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	177.91 m	Discharge	2.0086 m³/s
Inlet Control HW Elev.	177.82 m	Tailwater Elevation	177.82 m
Outlet Control HW Elev.	177.91 m	Control Type	Outlet Control
Headwater Depth/Height	0.41		
Grades			
Upstream Invert	176.92 m	Downstream Invert	176.30 m
Length	66.10 m	Constructed Slope	0.009380 m/m
Hydraulic Profile			
Profile	S1	Depth, Downstream	1.52 m
Slope Type	Steep	Normal Depth	0.47 m
Flow Regime	Subcritical	Critical Depth	0.63 m
Velocity Downstream	0.66 m/s	Critical Slope	0.002817 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.44 m
Section Size	2400 mm	Rise	2.44 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	177.91 m	Upstream Velocity Head	0.10 m
Ke	0.50	Entrance Loss	0.05 m
Inlet Control Properties			
Inlet Control HW Elev.	177.82 m	Flow Control	N/A
Inlet Type	Beveled ring, 33.7° bevels	Area Full	4.7 m²
K	0.00180	HDS S Chart	3
M	2.50000	HDS S Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Analysis Report
4014 -25yr-1 - Nov 2019 final

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	177.91 m
Roadway Width	65.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	181.50 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	181.50
100.00	181.50

Culvert Analysis Report
4014 -2yr-1 - Nov 2019 final

Analysis Component			
Storm Event	Design	Discharge	1.1600 m³/s

Peak Discharge Method: User-Specified			
Design Discharge	1.1600 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	177.74 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2400 mm Circular	1.1575 m³/s	177.77 m	0.40 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	177.77 m	N/A
Total	-----	1.1575 m³/s	177.77 m	N/A

Culvert Analysis Report
4014 -2yr-1 - Nov 2019 final

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	177.77 m	Discharge	1.1575 m³/s
Inlet Control HW Elev.	177.74 m	Tailwater Elevation	177.74 m
Outlet Control HW Elev.	177.77 m	Control Type	Outlet Control
Headwater Depth/Height	0.35		

Grades			
Upstream Invert	176.92 m	Downstream Invert	176.30 m
Length	66.10 m	Constructed Slope	0.009380 m/m

Hydraulic Profile			
Profile	S1	Depth, Downstream	1.44 m
Slope Type	Steep	Normal Depth	0.36 m
Flow Regime	Subcritical	Critical Depth	0.48 m
Velocity Downstream	0.40 m/s	Critical Slope	0.002898 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.44 m
Section Size	2400 mm	Rise	2.44 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	177.77 m	Upstream Velocity Head	0.04 m
Ke	0.20	Entrance Loss	0.01 m

Inlet Control Properties			
Inlet Control HW Elev.	177.74 m	Flow Control	N/A
Inlet Type	Beveled ring, 33.7° bevels	Area Full	4.7 m²
K	0.00180	HDS S Chart	3
M	2.50000	HDS S Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Analysis Report
4014 -2yr-1 - Nov 2019 final

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	177.77 m
Roadway Width	65.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	181.50 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	181.50
100.00	181.50

**Culvert Analysis Report
4014 -Regional-1 - Nov 2019 final**

Analysis Component				
Storm Event	Design	Discharge	14.9700 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	14.9700 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	178.38 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2400 mm Circular	14.9689 m³/s	179.98 m	3.53 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	179.98 m	N/A
Total	-----	14.9689 m³/s	179.98 m	N/A

**Culvert Analysis Report
4014 -Regional-1 - Nov 2019 final**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	179.98 m	
Roadway Width	65.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	181.50 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	181.50			
100.00	181.50			

**Culvert Analysis Report
4014 -Regional-1 - Nov 2019 final**

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	179.98 m	Discharge	14.9689 m³/s	
Inlet Control HW Elev.	179.89 m	Tailwater Elevation	178.38 m	
Outlet Control HW Elev.	179.98 m	Control Type	Entrance Control	
Headwater Depth/Height	1.26			
Grades				
Upstream Invert	176.92 m	Downstream Invert	176.30 m	
Length	66.10 m	Constructed Slope	0.009380 m/m	
Hydraulic Profile				
Profile	CompositeS152	Depth Downstream	2.08 m	
Slope Type	Steep	Normal Depth	1.36 m	
Flow Regime	N/A	Critical Depth	1.79 m	
Velocity Downstream	3.53 m/s	Critical Slope	0.004270 m/m	
Section				
Section Shape	Circular	Mannings Coefficient	0.013	
Section Material	Concrete	Span	2.44 m	
Section Size	2400 mm	Rise	2.44 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	179.98 m	Upstream Velocity Head	0.85 m	
Ke	0.50	Entrance Loss	0.42 m	
Inlet Control Properties				
Inlet Control HW Elev.	179.89 m	Flow Control	N/A	
Inlet Type	Square edge w/headwall	Area Full	4.7 m²	
K	0.00980	HDS S Chart	1	
M	2.00000	HDS S Scale	1	
C	0.03980	Equation Form	1	
Y	0.67000			

**Culvert Analysis Report
4020 -100yr-1 - Dec 2019**

Analysis Component				
Storm Event	Design	Discharge	1.0200 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	1.0200 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	183.55 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	1.0197 m³/s	184.07 m	1.77 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	184.07 m	N/A
Total	-----	1.0197 m³/s	184.07 m	N/A

Culvert Analysis Report
4020 -100yr-1 - Dec 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	184.07 m	Discharge	1.0197 m³/s
Inlet Control HW Elev.	184.03 m	Tailwater Elevation	183.55 m
Outlet Control HW Elev.	184.07 m	Control Type	Outlet Control
Headwater Depth/Height	1.06		
Grades			
Upstream Invert	183.10 m	Downstream Invert	182.80 m
Length	67.20 m	Constructed Slope	0.004464 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	0.75 m
Slope Type	Mid	Normal Depth	0.62 m
Flow Regime	Subcritical	Critical Depth	0.59 m
Velocity Downstream	1.77 m/s	Critical Slope	0.005085 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	184.07 m	Upstream Velocity Head	0.23 m
Ke	0.50	Entrance Loss	0.12 m
Inlet Control Properties			
Inlet Control HW Elev.	184.03 m	Flow Control	N/A
Inlet Type	Square edge w/headwall	Area Full	0.7 m²
K	0.00980	HDS S Chart	1
M	2.00000	HDS S Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Analysis Report
4020 -25yr-1 - Dec 2019

Analysis Component				
Storm Event	Design	Discharge	0.7300 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.7300 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	183.50 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.7302 m³/s	183.90 m	1.35 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	183.90 m	N/A
Total	-----	0.7302 m³/s	183.90 m	N/A

Culvert Analysis Report
4020 -100yr-1 - Dec 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	184.07 m
Roadway Width	65.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	189.00 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	189.00	
	100.00	189.00	

Culvert Analysis Report
4020 -25yr-1 - Dec 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	183.90 m	Discharge	0.7302 m³/s
Inlet Control HW Elev.	183.84 m	Tailwater Elevation	183.50 m
Outlet Control HW Elev.	183.90 m	Control Type	Entrance Control
Headwater Depth/Height	0.88		
Grades			
Upstream Invert	183.10 m	Downstream Invert	182.80 m
Length	67.20 m	Constructed Slope	0.004464 m/m
Hydraulic Profile			
Profile	CompositeS152	Depth, Downstream	0.70 m
Slope Type	Steep	Normal Depth	0.50 m
Flow Regime	N/A	Critical Depth	0.50 m
Velocity Downstream	1.35 m/s	Critical Slope	0.004450 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	183.90 m	Upstream Velocity Head	0.20 m
Ke	0.50	Entrance Loss	0.10 m
Inlet Control Properties			
Inlet Control HW Elev.	183.84 m	Flow Control	N/A
Inlet Type	Square edge w/headwall	Area Full	0.7 m²
K	0.00980	HDS S Chart	1
M	2.00000	HDS S Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Analysis Report
4020 -25yr-1 - Dec 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	183.90 m
Roadway Width	65.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	189.00 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	189.00
100.00	189.00

Culvert Analysis Report
4020 -2yr-1 - Dec 2019

Analysis Component			
Storm Event	Design	Discharge	0.3900 m³/s

Peak Discharge Method: User-Specified			
Design Discharge	0.3900 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	183.43 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.3901 m³/s	183.66 m	0.81 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	183.66 m	N/A
Total	-----	0.3901 m³/s	183.66 m	N/A

Culvert Analysis Report
4020 -2yr-1 - Dec 2019

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	183.66 m	Discharge	0.3901 m³/s
Inlet Control HW Elev.	183.60 m	Tailwater Elevation	183.43 m
Outlet Control HW Elev.	183.66 m	Control Type	Entrance Control
Headwater Depth/Height	0.61		

Grades			
Upstream Invert	183.10 m	Downstream Invert	182.80 m
Length	67.20 m	Constructed Slope	0.004464 m/m

Hydraulic Profile			
Profile	CompositeS152	Depth, Downstream	0.63 m
Slope Type	Steep	Normal Depth	0.35 m
Flow Regime	N/A	Critical Depth	0.36 m
Velocity Downstream	0.81 m/s	Critical Slope	0.003978 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	183.66 m	Upstream Velocity Head	0.13 m
Ke	0.50	Entrance Loss	0.07 m

Inlet Control Properties			
Inlet Control HW Elev.	183.60 m	Flow Control	N/A
Inlet Type	Square edge w/headwall	Area Full	0.7 m²
K	0.00980	HDS S Chart	1
M	2.00000	HDS S Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Analysis Report
4020 -2yr-1 - Dec 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	183.66 m
Roadway Width	65.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	189.00 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	189.00
100.00	189.00

**Culvert Analysis Report
6001 -100yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.1200 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.1200 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	182.03 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2130 x 910 mm Box	0.1201 m³/s	182.07 m	0.12 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	182.07 m	N/A
Total	-----	0.1201 m³/s	182.07 m	N/A

**Culvert Analysis Report
6001 -100yr- Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	182.07 m	
Roadway Width	100.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	185.00 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	185.00			
100.00	185.00			

**Culvert Analysis Report
6001 -100yr- Nov 2019**

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	182.07 m	Discharge	0.1201 m³/s	
Inlet Control HW Elev.	182.06 m	Tailwater Elevation	182.03 m	
Outlet Control HW Elev.	182.07 m	Control Type	Entrance Control	
Headwater Depth/Height	0.13			
Grades				
Upstream Invert	181.95 m	Downstream Invert	181.55 m	
Length	39.00 m	Constructed Slope	0.010256 m/m	
Hydraulic Profile				
Profile	CompositeS152	Depth Downstream	0.48 m	
Slope Type	Steep	Normal Depth	0.05 m	
Flow Regime	N/A	Critical Depth	0.07 m	
Velocity Downstream	0.12 m/s	Critical Slope	0.004399 m/m	
Section				
Section Shape	Box	Mannings Coefficient	0.013	
Section Material	Concrete	Span	2.13 m	
Section Size	2130 x 910 mm	Rise	0.91 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	182.07 m	Upstream Velocity Head	0.03 m	
Ke	0.50	Entrance Loss	0.02 m	
Inlet Control Properties				
Inlet Control HW Elev.	182.06 m	Flow Control	N/A	
Inlet Type	18 to 33.7" wingwall flare, d=0.0630	Area Full	2.0 m²	
K	0.48600	HDS S Chart	9	
M	0.66700	HDS S Scale	2	
C	0.02490	Equation Form	2	
Y	0.83000			

**Culvert Analysis Report
6001 -100yr- Nov 2019 Option 1**

Analysis Component				
Storm Event	Design	Discharge	0.1200 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.1200 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	182.10 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.1201 m³/s	182.25 m	0.29 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	182.25 m	N/A
Total	-----	0.1201 m³/s	182.25 m	N/A

**Culvert Analysis Report
6001 -100yr- Nov 2019 Option 1**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	182.25 m	Discharge	0.1201 m³/s
Inlet Control HW Elev.	182.21 m	Tailwater Elevation	182.10 m
Outlet Control HW Elev.	182.25 m	Control Type	Entrance Control
Headwater Depth/Height	0.33		
Grades			
Upstream Invert	181.95 m	Downstream Invert	181.55 m
Length	39.00 m	Constructed Slope	0.010256 m/m
Hydraulic Profile			
Profile	CompositeS152	Depth, Downstream	0.55 m
Slope Type	Steep	Normal Depth	0.16 m
Flow Regime	N/A	Critical Depth	0.20 m
Velocity Downstream	0.29 m/s	Critical Slope	0.003970 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	182.25 m	Upstream Velocity Head	0.07 m
Ke	0.50	Entrance Loss	0.03 m
Inlet Control Properties			
Inlet Control HW Elev.	182.21 m	Flow Control	N/A
Inlet Type	Square edge w/headwall	Area Full	0.7 m²
K	0.00980	HDS S Chart	1
M	2.00000	HDS S Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

**Culvert Analysis Report
6001 -25yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.0900 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.0900 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	182.03 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2130 x 910 mm Box	0.0901 m³/s	182.05 m	0.09 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	182.05 m	N/A
Total	-----	0.0901 m³/s	182.05 m	N/A

**Culvert Analysis Report
6001 -100yr- Nov 2019 Option 1**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	182.25 m
Roadway Width	100.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	185.00 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	185.00	
	100.00	185.00	

**Culvert Analysis Report
6001 -25yr- Nov 2019**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	182.05 m	Discharge	0.0901 m³/s
Inlet Control HW Elev.	182.04 m	Tailwater Elevation	182.03 m
Outlet Control HW Elev.	182.05 m	Control Type	Outlet Control
Headwater Depth/Height	0.11		
Grades			
Upstream Invert	181.95 m	Downstream Invert	181.55 m
Length	39.00 m	Constructed Slope	0.010256 m/m
Hydraulic Profile			
Profile	S1	Depth, Downstream	0.48 m
Slope Type	Steep	Normal Depth	0.04 m
Flow Regime	Subcritical	Critical Depth	0.06 m
Velocity Downstream	0.09 m/s	Critical Slope	0.004623 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.13 m
Section Size	2130 x 910 mm	Rise	0.91 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	182.05 m	Upstream Velocity Head	0.02 m
Ke	0.50	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	182.04 m	Flow Control	N/A
Inlet Type	18 to 33.7° wingwall flare, d=0.0630	Area Full	2.0 m²
K	0.48600	HDS S Chart	9
M	0.66700	HDS S Scale	2
C	0.02490	Equation Form	2
Y	0.83000		

Culvert Analysis Report
6001 -25yr- Nov 2019

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	182.05 m
Roadway Width	100.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	185.00 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	185.00
100.00	185.00

Culvert Analysis Report
6001 -25yr- Nov 2019 option 1

Analysis Component			
Storm Event	Design	Discharge	0.0900 m³/s

Peak Discharge Method: User-Specified			
Design Discharge	0.0900 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	182.09 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.0899 m³/s	182.21 m	0.22 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	182.21 m	N/A
Total	-----	0.0899 m³/s	182.21 m	N/A

Culvert Analysis Report
6001 -25yr- Nov 2019 option 1

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	182.21 m	Discharge	0.0899 m³/s
Inlet Control HW Elev.	182.17 m	Tailwater Elevation	182.09 m
Outlet Control HW Elev.	182.21 m	Control Type	Entrance Control
Headwater Depth/Height	0.28		

Grades			
Upstream Invert	181.95 m	Downstream Invert	181.55 m
Length	39.00 m	Constructed Slope	0.010256 m/m

Hydraulic Profile			
Profile	CompositeS152	Depth, Downstream	0.54 m
Slope Type	Steep	Normal Depth	0.13 m
Flow Regime	N/A	Critical Depth	0.17 m
Velocity Downstream	0.22 m/s	Critical Slope	0.004047 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	182.21 m	Upstream Velocity Head	0.06 m
Ke	0.50	Entrance Loss	0.03 m

Inlet Control Properties			
Inlet Control HW Elev.	182.17 m	Flow Control	N/A
Inlet Type	Square edge w/headwall	Area Full	0.7 m²
K	0.00980	HDS S Chart	1
M	2.00000	HDS S Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Analysis Report
6001 -25yr- Nov 2019 option 1

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	182.21 m
Roadway Width	100.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	185.00 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	185.00
100.00	185.00

**Culvert Analysis Report
6001 -2yr- Nov 2019**

Analysis Component				
Storm Event	Design	Discharge	0.0500 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.0500 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	182.02 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2130 x 910 mm Box	0.0500 m³/s	182.03 m	0.05 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	182.03 m	N/A
Total	-----	0.0500 m³/s	182.03 m	N/A

**Culvert Analysis Report
6001 -2yr- Nov 2019**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	182.03 m	
Roadway Width	100.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	185.00 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	185.00			
100.00	185.00			

**Culvert Analysis Report
6001 -2yr- Nov 2019**

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	182.03 m	Discharge	0.0500 m³/s	
Inlet Control HW Elev.	182.02 m	Tailwater Elevation	182.02 m	
Outlet Control HW Elev.	182.03 m	Control Type	Outlet Control	
Headwater Depth/Height	0.08			
Grades				
Upstream Invert	181.95 m	Downstream Invert	181.55 m	
Length	39.00 m	Constructed Slope	0.010256 m/m	
Hydraulic Profile				
Profile	S1	Depth Downstream	0.47 m	
Slope Type	Steep	Normal Depth	0.03 m	
Flow Regime	Subcritical	Critical Depth	0.04 m	
Velocity Downstream	0.05 m/s	Critical Slope	0.005154 m/m	
Section				
Section Shape	Box	Mannings Coefficient	0.013	
Section Material	Concrete	Span	2.13 m	
Section Size	2130 x 910 mm	Rise	0.91 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	182.03 m	Upstream Velocity Head	0.01 m	
Ke	0.50	Entrance Loss	0.00 m	
Inlet Control Properties				
Inlet Control HW Elev.	182.02 m	Flow Control	N/A	
Inlet Type	18 to 33.7" wingwall flare, d=0.0630	Area Full	2.0 m²	
K	0.48600	HDS S Chart	9	
M	0.66700	HDS S Scale	2	
C	0.02490	Equation Form	2	
Y	0.83000			

**Culvert Analysis Report
6001 -2yr- Nov 2019 option 1**

Analysis Component				
Storm Event	Design	Discharge	0.0500 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	0.0500 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	182.07 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-900 mm Circular	0.0501 m³/s	182.14 m	0.13 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	182.14 m	N/A
Total	-----	0.0501 m³/s	182.14 m	N/A

Culvert Analysis Report
6001 -2yr- Nov 2019 option 1

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	182.14 m	Discharge	0.0501 m³/s
Inlet Control HW Elev.	182.11 m	Tailwater Elevation	182.07 m
Outlet Control HW Elev.	182.14 m	Control Type	Entrance Control
Headwater Depth/Height	0.21		
Grades			
Upstream Invert	181.95 m	Downstream Invert	181.55 m
Length	39.00 m	Constructed Slope	0.010256 m/m
Hydraulic Profile			
Profile	CompositeS152	Depth, Downstream	0.52 m
Slope Type	Steep	Normal Depth	0.10 m
Flow Regime	N/A	Critical Depth	0.13 m
Velocity Downstream	0.13 m/s	Critical Slope	0.004273 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	0.91 m
Section Size	900 mm	Rise	0.91 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	182.14 m	Upstream Velocity Head	0.04 m
Ke	0.50	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	182.11 m	Flow Control	N/A
Inlet Type	Square edge w/headwall	Area Full	0.7 m²
K	0.00980	HDS S Chart	1
M	2.00000	HDS S Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Analysis Report
C4-100yr - Oct 2019 Final

Analysis Component				
Storm Event	Design	Discharge	9.8700 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	9.8700 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	179.25 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2550 mm Circular	9.8714 m³/s	179.77 m	2.30 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	179.77 m	N/A
Total	-----	9.8714 m³/s	179.77 m	N/A

Culvert Analysis Report
6001 -2yr- Nov 2019 option 1

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	182.14 m
Roadway Width	100.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	185.00 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	185.00	
	100.00	185.00	

Culvert Analysis Report
C4-100yr - Oct 2019 Final

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	179.77 m	Discharge	9.8714 m³/s
Inlet Control HW Elev.	179.46 m	Tailwater Elevation	179.25 m
Outlet Control HW Elev.	179.77 m	Control Type	Outlet Control
Headwater Depth/Height	0.90		
Grades			
Upstream Invert	177.44 m	Downstream Invert	177.28 m
Length	86.79 m	Constructed Slope	0.001844 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	1.97 m
Slope Type	Mid	Normal Depth	1.69 m
Flow Regime	Subcritical	Critical Depth	1.42 m
Velocity Downstream	2.30 m/s	Critical Slope	0.003144 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.59 m
Section Size	2550 mm	Rise	2.59 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	179.77 m	Upstream Velocity Head	0.29 m
Ke	0.50	Entrance Loss	0.14 m
Inlet Control Properties			
Inlet Control HW Elev.	179.46 m	Flow Control	N/A
Inlet Type	Beveled ring, 33.7° bevels	Area Full	5.3 m²
K	0.00180	HDS S Chart	3
M	2.50000	HDS S Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

**Culvert Analysis Report
C4-100yr - Oct 2019 Final**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	179.77 m
Roadway Width	80.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	180.40 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	180.40
100.00	180.40

**Culvert Analysis Report
C4-25yr- Oct 2019 Final**

Analysis Component

Storm Event	Design	Discharge	7.6300 m³/s
Peak Discharge Method: User-Specified			
Design Discharge	7.6300 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	179.17 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2550 mm Circular	7.6292 m³/s	179.52 m	1.85 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	179.52 m	N/A
Total	-----	7.6292 m³/s	179.52 m	N/A

**Culvert Analysis Report
C4-25yr- Oct 2019 Final**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	179.52 m	Discharge	7.6292 m³/s
Inlet Control HW Elev.	179.17 m	Tailwater Elevation	179.17 m
Outlet Control HW Elev.	179.52 m	Control Type	Outlet Control
Headwater Depth/Height	0.80		

Grades			
Upstream Invert	177.44 m	Downstream Invert	177.28 m
Length	86.79 m	Constructed Slope	0.001844 m/m

Hydraulic Profile			
Profile	M1	Depth, Downstream	1.89 m
Slope Type	Mild	Normal Depth	1.42 m
Flow Regime	Subcritical	Critical Depth	1.24 m
Velocity Downstream	1.85 m/s	Critical Slope	0.002955 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.59 m
Section Size	2550 mm	Rise	2.59 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	179.52 m	Upstream Velocity Head	0.20 m
Ke	0.50	Entrance Loss	0.10 m

Inlet Control Properties			
Inlet Control HW Elev.	179.17 m	Flow Control	N/A
Inlet Type	Beveled ring, 33.7° bevels	Area Full	5.3 m²
K	0.00180	HDS S Chart	3
M	2.50000	HDS S Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

**Culvert Analysis Report
C4-25yr- Oct 2019 Final**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	179.52 m
Roadway Width	80.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	180.40 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	180.40
100.00	180.40

**Culvert Analysis Report
C4-2yr- Oct 2019 Final**

Analysis Component				
Storm Event	Design	Discharge	3.0000 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	3.0000 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	178.94 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2550 mm Circular	3.0019 m³/s	179.02 m	0.84 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	179.02 m	N/A
Total	-----	3.0019 m³/s	179.02 m	N/A

**Culvert Analysis Report
C4-2yr- Oct 2019 Final**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	179.02 m	
Roadway Width	80.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	180.40 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	180.40			
100.00	180.40			

**Culvert Analysis Report
C4-2yr- Oct 2019 Final**

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	179.02 m	Discharge	3.0019 m³/s	
Inlet Control HW Elev.	178.94 m	Tailwater Elevation	178.94 m	
Outlet Control HW Elev.	179.02 m	Control Type	Outlet Control	
Headwater Depth/Height	0.61			
Grades				
Upstream Invert	177.44 m	Downstream Invert	177.28 m	
Length	86.79 m	Constructed Slope	0.001844 m/m	
Hydraulic Profile				
Profile	M1	Depth Downstream	1.66 m	
Slope Type	Mild	Normal Depth	0.85 m	
Flow Regime	Subcritical	Critical Depth	0.76 m	
Velocity Downstream	0.84 m/s	Critical Slope	0.002749 m/m	
Section				
Section Shape	Circular	Mannings Coefficient	0.013	
Section Material	Concrete	Span	2.59 m	
Section Size	2550 mm	Rise	2.59 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	179.02 m	Upstream Velocity Head	0.05 m	
Ke	0.50	Entrance Loss	0.02 m	
Inlet Control Properties				
Inlet Control HW Elev.	178.94 m	Flow Control	N/A	
Inlet Type	Beveled ring, 33.7° bevels	Area Full	5.3 m²	
K	0.00180	HDS S Chart	3	
M	2.50000	HDS S Scale	B	
C	0.02430	Equation Form	1	
Y	0.83000			

**Culvert Analysis Report
C4-Reg- Oct 2019 Final**

Analysis Component				
Storm Event	Design	Discharge	6.3400 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	6.3400 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	179.11 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2550 mm Circular	6.3405 m³/s	179.37 m	1.59 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	179.37 m	N/A
Total	-----	6.3405 m³/s	179.37 m	N/A

**Culvert Analysis Report
C4-Reg- Oct 2019 Final**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	179.37 m	Discharge	6.3405 m³/s
Inlet Control HW Elev.	179.11 m	Tailwater Elevation	179.11 m
Outlet Control HW Elev.	179.37 m	Control Type	Outlet Control
Headwater Depth/Height	0.75		
Grades			
Upstream Invert	177.44 m	Downstream Invert	177.28 m
Length	86.79 m	Constructed Slope	0.001844 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	1.83 m
Slope Type	Mild	Normal Depth	1.27 m
Flow Regime	Subcritical	Critical Depth	1.12 m
Velocity Downstream	1.59 m/s	Critical Slope	0.002869 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.59 m
Section Size	2550 mm	Rise	2.59 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	179.37 m	Upstream Velocity Head	0.15 m
Ke	0.50	Entrance Loss	0.08 m
Inlet Control Properties			
Inlet Control HW Elev.	179.11 m	Flow Control	N/A
Inlet Type	Beveled ring, 33.7° bevels	Area Full	5.3 m²
K	0.00180	HDS S Chart	3
M	2.50000	HDS S Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

**Culvert Analysis Report
C4-Reg- Oct 2019 Final**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	179.37 m
Roadway Width	80.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	180.40 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	180.40	
	100.00	180.40	

**Culvert Analysis Report
C5-100yr- Oct 2019 option 1**

Analysis Component				
Storm Event	Design	Discharge	3.2900 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	3.2900 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	178.08 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-1400 mm Circular	3.2895 m³/s	178.60 m	2.39 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	178.60 m	N/A
Total	-----	3.2895 m³/s	178.60 m	N/A

**Culvert Analysis Report
C5-100yr- Oct 2019 option 1**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	178.60 m	Discharge	3.2895 m³/s
Inlet Control HW Elev.	178.44 m	Tailwater Elevation	178.08 m
Outlet Control HW Elev.	178.60 m	Control Type	Outlet Control
Headwater Depth/Height	1.14		
Grades			
Upstream Invert	177.00 m	Downstream Invert	176.91 m
Length	24.21 m	Constructed Slope	0.003717 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	1.17 m
Slope Type	Mild	Normal Depth	1.06 m
Flow Regime	Subcritical	Critical Depth	0.96 m
Velocity Downstream	2.39 m/s	Critical Slope	0.004692 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.40 m
Section Size	1400 mm	Rise	1.40 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	178.60 m	Upstream Velocity Head	0.31 m
Ke	0.50	Entrance Loss	0.15 m
Inlet Control Properties			
Inlet Control HW Elev.	178.44 m	Flow Control	N/A
Inlet Type	Beveled ring, 33.7° bevels	Area Full	1.5 m²
K	0.00180	HDS S Chart	3
M	2.50000	HDS S Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Analysis Report
C5-100yr- Oct 2019 option 1

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	178.60 m
Roadway Width	20.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	180.67 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	180.67
100.00	180.67

Culvert Analysis Report
C5-25yr-1- Oct 2019 Final

Analysis Component			
Storm Event	Design	Discharge	2.5400 m³/s

Peak Discharge Method: User-Specified			
Design Discharge	2.5400 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	178.03 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-1400 mm Circular	2.5402 m³/s	178.37 m	1.92 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	178.37 m	N/A
Total	-----	2.5402 m³/s	178.37 m	N/A

Culvert Analysis Report
C5-25yr-1- Oct 2019 Final

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	178.37 m	Discharge	2.5402 m³/s
Inlet Control HW Elev.	178.22 m	Tailwater Elevation	178.03 m
Outlet Control HW Elev.	178.37 m	Control Type	Outlet Control
Headwater Depth/Height	0.98		

Grades			
Upstream Invert	177.00 m	Downstream Invert	176.91 m
Length	24.21 m	Constructed Slope	0.003717 m/m

Hydraulic Profile			
Profile	M1	Depth, Downstream	1.12 m
Slope Type	Mild	Normal Depth	0.87 m
Flow Regime	Subcritical	Critical Depth	0.84 m
Velocity Downstream	1.92 m/s	Critical Slope	0.004113 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.40 m
Section Size	1400 mm	Rise	1.40 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	178.37 m	Upstream Velocity Head	0.21 m
Ke	0.50	Entrance Loss	0.11 m

Inlet Control Properties			
Inlet Control HW Elev.	178.22 m	Flow Control	N/A
Inlet Type	Beveled ring, 33.7° bevels	Area Full	1.5 m²
K	0.00180	HDS S Chart	3
M	2.50000	HDS S Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Analysis Report
C5-25yr-1- Oct 2019 Final

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	178.37 m
Roadway Width	20.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	180.67 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	180.67
100.00	180.67

**Culvert Analysis Report
C5-2yr-1- Oct 2019 Final**

Analysis Component				
Storm Event	Design	Discharge	1.0000 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	1.0000 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	177.87 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-1400 mm Circular	1.0010 m³/s	177.95 m	0.89 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	177.95 m	N/A
Total	-----	1.0010 m³/s	177.95 m	N/A

**Culvert Analysis Report
C5-2yr-1- Oct 2019 Final**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	177.95 m	
Roadway Width	20.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	180.67 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	180.67			
100.00	180.67			

**Culvert Analysis Report
C5-2yr-1- Oct 2019 Final**

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	177.95 m	Discharge	1.0010 m³/s	
Inlet Control HW Elev.	177.87 m	Tailwater Elevation	177.87 m	
Outlet Control HW Elev.	177.95 m	Control Type	Outlet Control	
Headwater Depth/Height	0.68			
Grades				
Upstream Invert	177.00 m	Downstream Invert	176.91 m	
Length	24.21 m	Constructed Slope	0.003717 m/m	
Hydraulic Profile				
Profile	S1	Depth Downstream	0.96 m	
Slope Type	Steep	Normal Depth	0.51 m	
Flow Regime	Subcritical	Critical Depth	0.52 m	
Velocity Downstream	0.89 m/s	Critical Slope	0.003419 m/m	
Section				
Section Shape	Circular	Mannings Coefficient	0.013	
Section Material	Concrete	Span	1.40 m	
Section Size	1400 mm	Rise	1.40 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	177.95 m	Upstream Velocity Head	0.05 m	
Ke	0.50	Entrance Loss	0.03 m	
Inlet Control Properties				
Inlet Control HW Elev.	177.87 m	Flow Control	N/A	
Inlet Type	Beveled ring, 33.7° bevels	Area Full	1.5 m²	
K	0.00180	HDS S Chart	3	
M	2.50000	HDS S Scale	B	
C	0.02430	Equation Form	1	
Y	0.83000			

**Culvert Analysis Report
C5-Reg- Oct 2019 option 1**

Analysis Component				
Storm Event	Design	Discharge	2.2500 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	2.2500 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	178.00 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-1400 mm Circular	2.2496 m³/s	178.29 m	1.75 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	178.29 m	N/A
Total	-----	2.2496 m³/s	178.29 m	N/A

Culvert Analysis Report
C5-Reg- Oct 2019 option 1

Component: Culvert-1

Culvert Summary			
Computed Headwater Elevation	178.29 m	Discharge	2.2496 m³/s
Inlet Control HW Elev.	178.13 m	Tailwater Elevation	178.00 m
Outlet Control HW Elev.	178.29 m	Control Type	Outlet Control
Headwater Depth/Height	0.92		
Grades			
Upstream Invert	177.00 m	Downstream Invert	176.91 m
Length	24.21 m	Constructed Slope	0.003717 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	1.09 m
Slope Type	Mild	Normal Depth	0.80 m
Flow Regime	Subcritical	Critical Depth	0.79 m
Velocity Downstream	1.75 m/s	Critical Slope	0.003933 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	1.40 m
Section Size	1400 mm	Rise	1.40 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	178.29 m	Upstream Velocity Head	0.18 m
Ke	0.50	Entrance Loss	0.09 m
Inlet Control Properties			
Inlet Control HW Elev.	178.13 m	Flow Control	N/A
Inlet Type	Beveled ring, 33.7° bevels	Area Full	1.5 m²
K	0.00180	HDS S Chart	3
M	2.50000	HDS S Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

Culvert Analysis Report
C5a-100yr-- Oct 2019 Final

Analysis Component				
Storm Event	Design	Discharge	9.3100 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	9.3100 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	178.17 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2400 mm Circular	8.6799 m³/s	178.58 m	2.22 m/s
Weir	Roadway (Constant Elevation)	0.6369 m³/s	178.59 m	N/A
Total	-----	9.3168 m³/s	178.58 m	N/A

Culvert Analysis Report
C5-Reg- Oct 2019 option 1

Component: Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	178.29 m
Roadway Width	20.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	180.67 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	180.67	
	100.00	180.67	

Culvert Analysis Report
C5a-100yr-- Oct 2019 Final

Component: Culvert-1

Culvert Summary			
Computed Headwater Elevation	178.58 m	Discharge	8.6799 m³/s
Inlet Control HW Elev.	178.33 m	Tailwater Elevation	178.17 m
Outlet Control HW Elev.	178.58 m	Control Type	Outlet Control
Headwater Depth/Height	0.92		
Grades			
Upstream Invert	176.33 m	Downstream Invert	176.27 m
Length	24.75 m	Constructed Slope	0.002424 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	1.90 m
Slope Type	Mild	Normal Depth	1.48 m
Flow Regime	Subcritical	Critical Depth	1.35 m
Velocity Downstream	2.22 m/s	Critical Slope	0.003231 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.44 m
Section Size	2400 mm	Rise	2.44 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	178.58 m	Upstream Velocity Head	0.26 m
Ke	0.50	Entrance Loss	0.13 m
Inlet Control Properties			
Inlet Control HW Elev.	178.33 m	Flow Control	N/A
Inlet Type	Square edge w/headwall	Area Full	4.7 m²
K	0.00980	HDS S Chart	1
M	2.00000	HDS S Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

**Culvert Analysis Report
C5a-100yr-- Oct 2019 Final**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.6369 m³/s	Allowable HW Elevation	178.59 m
Roadway Width	20.00 m	Overtopping Coefficient	1.62 SI
Length	100.00 m	Crest Elevation	179.50 m
Headwater Elevation	178.58 m	Discharge Coefficient (Cr)	2.93
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	179.50
100.00	179.50

**Culvert Analysis Report
C5a-25yr- Oct 2019 Final**

Analysis Component

Storm Event	Design	Discharge	7.1900 m³/s
Peak Discharge Method: User-Specified			
Design Discharge	7.1900 m³/s	Check Discharge	0.0000 m³/s

Tailwater Conditions: Constant Tailwater	
Tailwater Elevation	178.08 m

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2400 mm Circular	7.1882 m³/s	178.40 m	1.93 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	178.40 m	N/A
Total	-----	7.1882 m³/s	178.40 m	N/A

**Culvert Analysis Report
C5a-25yr- Oct 2019 Final**

Component:Culvert-1

Culvert Summary			
Computed Headwater Elevation	178.40 m	Discharge	7.1882 m³/s
Inlet Control HW Elev.	178.08 m	Tailwater Elevation	178.08 m
Outlet Control HW Elev.	178.40 m	Control Type	Outlet Control
Headwater Depth/Height	0.85		

Grades			
Upstream Invert	176.33 m	Downstream Invert	176.27 m
Length	24.75 m	Constructed Slope	0.002424 m/m

Hydraulic Profile			
Profile	M1	Depth, Downstream	1.81 m
Slope Type	Mild	Normal Depth	1.31 m
Flow Regime	Subcritical	Critical Depth	1.22 m
Velocity Downstream	1.93 m/s	Critical Slope	0.003073 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.44 m
Section Size	2400 mm	Rise	2.44 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	178.40 m	Upstream Velocity Head	0.20 m
Ke	0.50	Entrance Loss	0.10 m

Inlet Control Properties			
Inlet Control HW Elev.	178.08 m	Flow Control	N/A
Inlet Type	Beveled ring, 33.7° bevels	Area Full	4.7 m²
K	0.00180	HDS S Chart	3
M	2.50000	HDS S Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

**Culvert Analysis Report
C5a-25yr- Oct 2019 Final**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m³/s	Allowable HW Elevation	178.40 m
Roadway Width	20.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	179.50 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		

Sta (m)	Elev. (m)
0.00	179.50
100.00	179.50

**Culvert Analysis Report
C5a-2yr-1 Oct 2019 Final**

Analysis Component				
Storm Event	Design	Discharge	2.8300 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	2.8300 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	177.85 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2400 mm Circular	2.8268 m³/s	177.92 m	0.88 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	177.92 m	N/A
Total	-----	2.8268 m³/s	177.92 m	N/A

**Culvert Analysis Report
C5a-2yr-1 Oct 2019 Final**

Component:Weir

Hydraulic Component(s): Roadway (Constant Elevation)				
Discharge	0.0000 m³/s	Allowable HW Elevation	177.92 m	
Roadway Width	20.00 m	Overtopping Coefficient	1.60 SI	
Length	100.00 m	Crest Elevation	179.50 m	
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90	
Submergence Factor (Kt)	1.00			
Sta (m)	Elev. (m)			
0.00	179.50			
100.00	179.50			

**Culvert Analysis Report
C5a-2yr-1 Oct 2019 Final**

Component:Culvert-1

Culvert Summary				
Computed Headwater Elevation	177.92 m	Discharge	2.8268 m³/s	
Inlet Control HW Elev.	177.85 m	Tailwater Elevation	177.85 m	
Outlet Control HW Elev.	177.92 m	Control Type	Outlet Control	
Headwater Depth/Height	0.65			
Grades				
Upstream Invert	176.33 m	Downstream Invert	176.27 m	
Length	24.75 m	Constructed Slope	0.002424 m/m	
Hydraulic Profile				
Profile	M1	Depth Downstream	1.58 m	
Slope Type	Mild	Normal Depth	0.78 m	
Flow Regime	Subcritical	Critical Depth	0.75 m	
Velocity Downstream	0.88 m/s	Critical Slope	0.002808 m/m	
Section				
Section Shape	Circular	Mannings Coefficient	0.013	
Section Material	Concrete	Span	2.44 m	
Section Size	2400 mm	Rise	2.44 m	
Number Sections	1			
Outlet Control Properties				
Outlet Control HW Elev.	177.92 m	Upstream Velocity Head	0.04 m	
Ke	0.50	Entrance Loss	0.02 m	
Inlet Control Properties				
Inlet Control HW Elev.	177.85 m	Flow Control	N/A	
Inlet Type	Beveled ring, 33.7° bevels	Area Full	4.7 m²	
K	0.00180	HDS S Chart	3	
M	2.50000	HDS S Scale	B	
C	0.02430	Equation Form	1	
Y	0.83000			

**Culvert Analysis Report
C5a-Reg- Oct 2019 Final**

Analysis Component				
Storm Event	Design	Discharge	5.9800 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	5.9800 m³/s	Check Discharge	0.0000 m³/s	
Tailwater Conditions: Constant Tailwater				
Tailwater Elevation	178.03 m			
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2400 mm Circular	5.9784 m³/s	178.26 m	1.66 m/s
Weir	Roadway (Constant Elevation)	0.0000 m³/s	178.26 m	N/A
Total	-----	5.9784 m³/s	178.26 m	N/A

**Culvert Analysis Report
C5a-Reg- Oct 2019 Final**

Component: Culvert-1

Culvert Summary			
Computed Headwater Elevation	178.26 m	Discharge	5.9784 m ³ /s
Inlet Control HW Elev.	178.03 m	Tailwater Elevation	178.03 m
Outlet Control HW Elev.	178.26 m	Control Type	Outlet Control
Headwater Depth/Height	0.79		
Grades			
Upstream Invert	176.33 m	Downstream Invert	176.27 m
Length	24.75 m	Constructed Slope	0.002424 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	1.76 m
Slope Type	Mild	Normal Depth	1.18 m
Flow Regime	Subcritical	Critical Depth	1.11 m
Velocity Downstream	1.66 m/s	Critical Slope	0.002967 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.44 m
Section Size	2400 mm	Rise	2.44 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	178.26 m	Upstream Velocity Head	0.15 m
Ke	0.50	Entrance Loss	0.07 m
Inlet Control Properties			
Inlet Control HW Elev.	178.03 m	Flow Control	N/A
Inlet Type	Beveled ring, 33.7° bevels	Area Full	4.7 m ²
K	0.00180	HDS S Chart	3
M	2.50000	HDS S Scale	B
C	0.02430	Equation Form	1
Y	0.83000		

**Culvert Analysis Report
C5a-Reg- Oct 2019 Final**

Component: Weir

Hydraulic Component(s): Roadway (Constant Elevation)			
Discharge	0.0000 m ³ /s	Allowable HW Elevation	178.26 m
Roadway Width	20.00 m	Overtopping Coefficient	1.60 SI
Length	100.00 m	Crest Elevation	178.70 m
Headwater Elevation	N/A m	Discharge Coefficient (Cr)	2.90
Submergence Factor (Kt)	1.00		
Sta (m)	Elev. (m)		
	0.00	178.70	
	100.00	178.70	

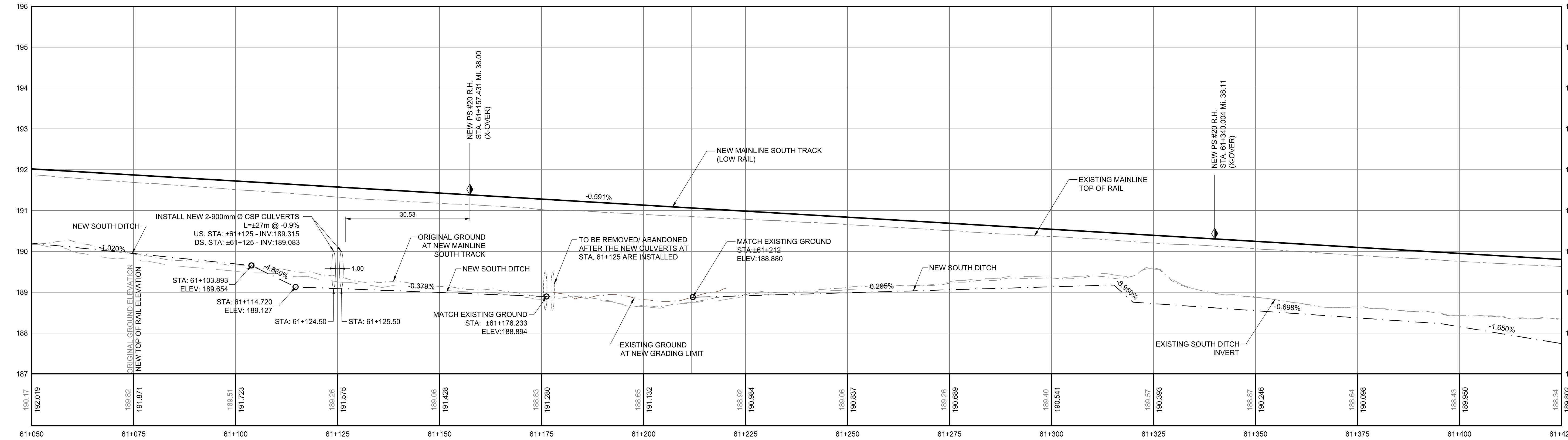
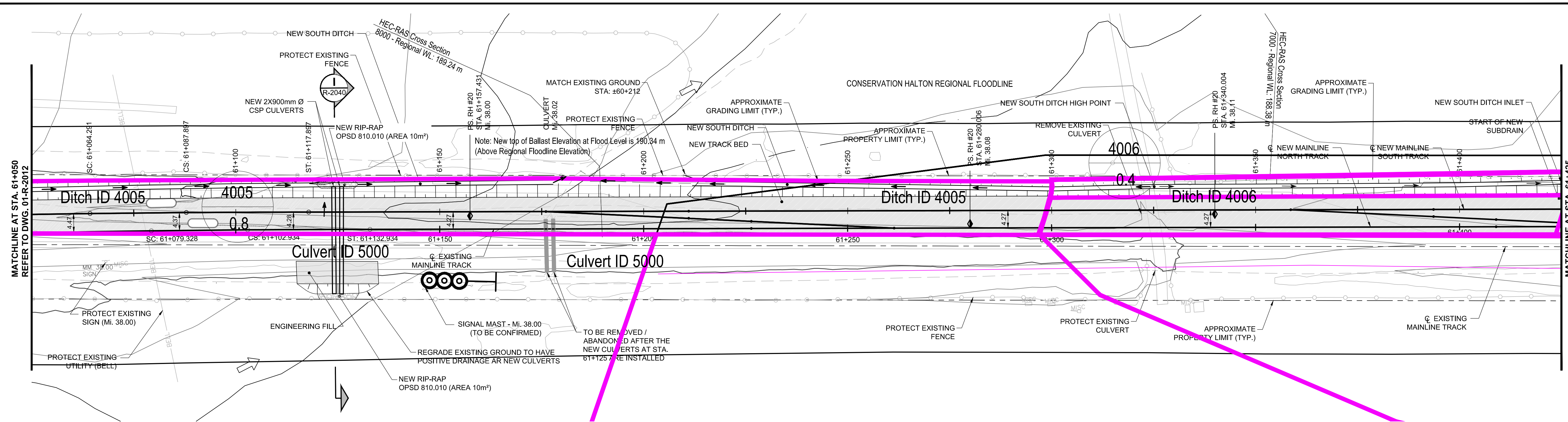


Milton Logistics Hub 2020 HEC-RAS Model Output

Culvert 5000-C10 Existing Conditions

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\caart1\p001\Drawings\Projects\60579933_CN_Milton_Logistics_Hub\900-CAD_GIS\01-D-CAD\20-SHEETS\060579933_01-R-2008-R-2028_plan_profile_Sheet.dwg (12/20/2008) RLM: Nabeel



NOTE
- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2030

PROFESSIONAL SEALS

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

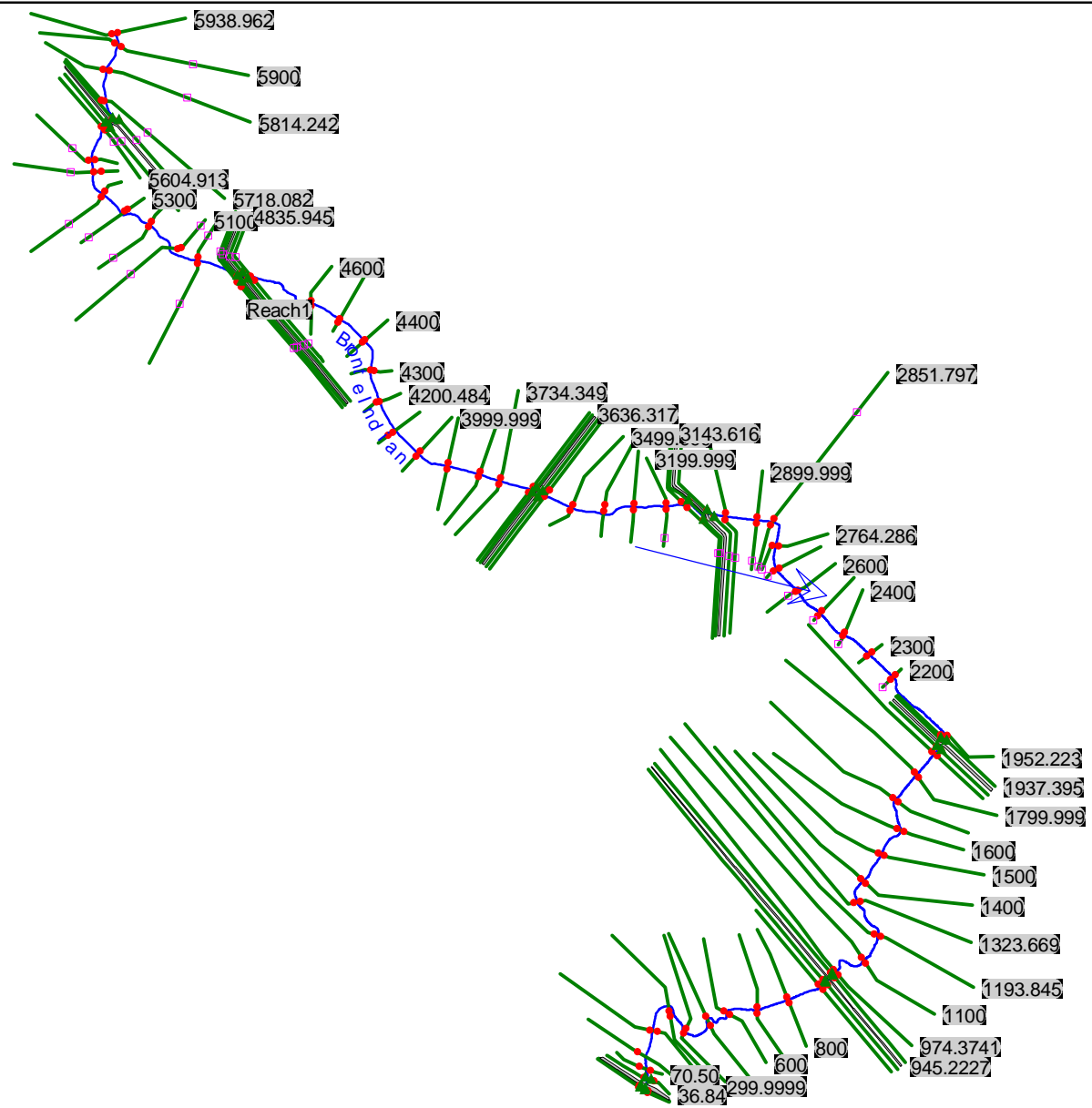
© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP
B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB		



	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

CN		
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27		
NEW MAINLINE TRACKS		
PLAN & SOUTH TRACK PROFILE		
STA. 61+050 to 61+425 (Mi. 37.94 to 38.17)		
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2013	B



HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	5938.962	CH	0.89	194.83	195.07	194.97	195.07	0.001069	0.31	3.20	30.42	0.26
Reach1	5938.962	Regional	1.02	194.83	195.08	194.98	195.08	0.001123	0.34	3.51	31.50	0.26
Reach1	5938.962	2-yr	0.28	194.83	195.00	194.92	195.00	0.000781	0.18	1.54	19.08	0.20
Reach1	5938.962	5-yr	0.36	194.83	195.01	194.93	195.01	0.000837	0.21	1.78	20.24	0.21
Reach1	5938.962	10-yr	0.41	194.83	195.02	194.94	195.02	0.000878	0.22	1.91	21.40	0.22
Reach1	5938.962	25-yr	0.52	194.83	195.03	194.95	195.03	0.000925	0.25	2.23	23.91	0.23
Reach1	5938.962	50-yr	0.63	194.83	195.04	194.96	195.05	0.000984	0.27	2.51	26.01	0.24
Reach1	5938.962	100-yr	0.74	194.83	195.05	194.97	195.06	0.001014	0.29	2.82	28.05	0.24
Reach1	5900	CH	0.89	194.83	194.93	194.93	194.96	0.024026	0.75	1.19	22.05	1.02
Reach1	5900	Regional	1.02	194.83	194.93	194.93	194.96	0.021799	0.76	1.34	22.90	0.99
Reach1	5900	2-yr	0.28	194.83	194.89	194.89	194.91	0.029442	0.57	0.49	15.63	1.03
Reach1	5900	5-yr	0.36	194.83	194.90	194.90	194.92	0.027363	0.60	0.60	16.91	1.01
Reach1	5900	10-yr	0.41	194.83	194.90	194.90	194.92	0.025102	0.60	0.68	17.77	0.98
Reach1	5900	25-yr	0.52	194.83	194.91	194.91	194.93	0.026218	0.65	0.80	18.94	1.02
Reach1	5900	50-yr	0.63	194.83	194.92	194.92	194.94	0.023999	0.67	0.94	20.35	0.99
Reach1	5900	100-yr	0.74	194.83	194.92	194.92	194.95	0.025355	0.71	1.04	21.19	1.03
Reach1	5814.242	CH	0.89	194.07	194.57	194.19	194.57	0.000022	0.09	15.17	78.78	0.04
Reach1	5814.242	Regional	1.02	194.07	194.57	194.20	194.57	0.000029	0.10	15.17	78.77	0.05
Reach1	5814.242	2-yr	0.28	194.07	194.57	194.15	194.57	0.000002	0.03	15.19	78.82	0.01
Reach1	5814.242	5-yr	0.36	194.07	194.57	194.15	194.57	0.000004	0.04	15.19	78.82	0.02
Reach1	5814.242	10-yr	0.41	194.07	194.57	194.16	194.57	0.000005	0.04	15.19	78.82	0.02
Reach1	5814.242	25-yr	0.52	194.07	194.57	194.17	194.57	0.000007	0.05	15.18	78.81	0.03
Reach1	5814.242	50-yr	0.63	194.07	194.57	194.18	194.57	0.000011	0.06	15.18	78.81	0.03
Reach1	5814.242	100-yr	0.74	194.07	194.57	194.19	194.57	0.000015	0.07	15.18	78.79	0.04
Reach1	5718.082	CH	0.89	193.47	194.57	193.57	194.57	0.000000	0.02	163.27	330.95	0.00
Reach1	5718.082	Regional	1.02	193.47	194.57	193.58	194.57	0.000000	0.02	163.28	330.95	0.01
Reach1	5718.082	2-yr	0.28	193.47	194.57	193.53	194.57	0.000000	0.00	163.27	330.95	0.00
Reach1	5718.082	5-yr	0.36	193.47	194.57	193.54	194.57	0.000000	0.01	163.27	330.95	0.00
Reach1	5718.082	10-yr	0.41	193.47	194.57	193.54	194.57	0.000000	0.01	163.27	330.95	0.00
Reach1	5718.082	25-yr	0.52	193.47	194.57	193.55	194.57	0.000000	0.01	163.27	330.95	0.00
Reach1	5718.082	50-yr	0.63	193.47	194.57	193.56	194.57	0.000000	0.01	163.27	330.95	0.00
Reach1	5718.082	100-yr	0.74	193.47	194.57	193.57	194.57	0.000000	0.01	163.28	330.95	0.00
Reach1	5652.039	CH	0.89	193.11	194.57	193.25	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	Regional	1.02	193.11	194.57	193.26	194.57	0.000000	0.01	411.18	481.09	0.00
Reach1	5652.039	2-yr	0.28	193.11	194.57	193.19	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	5-yr	0.36	193.11	194.57	193.20	194.57	0.000000	0.00	411.18	481.08	0.00

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	5652.039	10-yr	0.41	193.11	194.57	193.21	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	25-yr	0.52	193.11	194.57	193.22	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	50-yr	0.63	193.11	194.57	193.23	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	100-yr	0.74	193.11	194.57	193.24	194.57	0.000000	0.00	411.18	481.09	0.00
Reach1	5639.221		Culvert									
Reach1	5620.962	CH	0.89	192.84	192.95	192.93	192.97	0.014426	0.76	1.66	40.52	0.84
Reach1	5620.962	Regional	1.02	192.84	192.95	192.93	192.97	0.018050	0.86	1.69	40.65	0.95
Reach1	5620.962	2-yr	0.28	192.84	192.90	192.89	192.91	0.023583	0.56	0.71	32.06	0.94
Reach1	5620.962	5-yr	0.36	192.84	192.91	192.90	192.92	0.021703	0.60	0.85	33.76	0.93
Reach1	5620.962	10-yr	0.41	192.84	192.91	192.90	192.92	0.022347	0.63	0.92	34.52	0.95
Reach1	5620.962	25-yr	0.52	192.84	192.93	192.91	192.94	0.011804	0.58	1.28	38.24	0.73
Reach1	5620.962	50-yr	0.63	192.84	192.93	192.91	192.95	0.012898	0.64	1.40	39.09	0.77
Reach1	5620.962	100-yr	0.74	192.84	192.94	192.92	192.96	0.013745	0.70	1.51	39.78	0.81
Reach1	5604.913	CH	0.89	192.68	192.80	192.77	192.81	0.006768	0.57	1.72	21.17	0.59
Reach1	5604.913	Regional	1.02	192.68	192.81	192.78	192.83	0.004926	0.55	2.10	22.31	0.52
Reach1	5604.913	2-yr	0.28	192.68	192.75	192.73	192.76	0.004836	0.33	0.89	18.47	0.45
Reach1	5604.913	5-yr	0.36	192.68	192.76	192.74	192.77	0.004873	0.36	1.05	18.98	0.47
Reach1	5604.913	10-yr	0.41	192.68	192.77	192.74	192.78	0.004660	0.38	1.16	19.36	0.46
Reach1	5604.913	25-yr	0.52	192.68	192.77	192.75	192.78	0.008160	0.49	1.13	19.25	0.61
Reach1	5604.913	50-yr	0.63	192.68	192.78	192.76	192.79	0.007401	0.51	1.32	19.91	0.60
Reach1	5604.913	100-yr	0.74	192.68	192.79	192.76	192.80	0.007122	0.54	1.49	20.46	0.59
Reach1	5499.999	CH	0.89	191.76	191.86	191.85	191.88	0.011970	0.64	1.58	27.41	0.75
Reach1	5499.999	Regional	1.02	191.76	191.85	191.85	191.88	0.020509	0.81	1.42	24.99	0.98
Reach1	5499.999	2-yr	0.28	191.76	191.81	191.81	191.82	0.021437	0.54	0.55	15.93	0.90
Reach1	5499.999	5-yr	0.36	191.76	191.82	191.81	191.83	0.020830	0.58	0.66	16.75	0.91
Reach1	5499.999	10-yr	0.41	191.76	191.82	191.82	191.84	0.023164	0.63	0.70	17.02	0.96
Reach1	5499.999	25-yr	0.52	191.76	191.84	191.82	191.85	0.009476	0.50	1.13	20.14	0.65
Reach1	5499.999	50-yr	0.63	191.76	191.85	191.83	191.86	0.010613	0.56	1.25	22.35	0.70
Reach1	5499.999	100-yr	0.74	191.76	191.85	191.84	191.87	0.011187	0.59	1.40	24.67	0.72
Reach1	5463.964	CH	0.89	191.52	191.64	191.60	191.64	0.003915	0.41	2.51	40.29	0.44
Reach1	5463.964	Regional	1.02	191.52	191.65	191.61	191.66	0.002734	0.39	3.23	44.66	0.38
Reach1	5463.964	2-yr	0.28	191.52	191.60	191.57	191.60	0.002813	0.24	1.21	28.14	0.34
Reach1	5463.964	5-yr	0.36	191.52	191.61	191.58	191.61	0.002841	0.26	1.44	30.47	0.35
Reach1	5463.964	10-yr	0.41	191.52	191.61	191.58	191.61	0.002735	0.28	1.60	32.15	0.35
Reach1	5463.964	25-yr	0.52	191.52	191.61	191.58	191.62	0.004840	0.36	1.55	31.60	0.46

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	5463.964	50-yr	0.63	191.52	191.62	191.59	191.62	0.004446	0.38	1.84	34.45	0.46
Reach1	5463.964	100-yr	0.74	191.52	191.63	191.59	191.63	0.004225	0.39	2.12	36.97	0.45
Reach1	5382.460	CH	0.89	190.97	191.15	191.13	191.17	0.009310	0.66	1.36	14.72	0.69
Reach1	5382.460	Regional	1.02	190.97	191.14	191.14	191.18	0.020621	0.91	1.12	13.37	1.01
Reach1	5382.460	2-yr	0.28	190.97	191.07	191.07	191.09	0.023320	0.69	0.41	8.13	0.99
Reach1	5382.460	5-yr	0.36	190.97	191.08	191.08	191.11	0.022009	0.72	0.50	9.00	0.98
Reach1	5382.460	10-yr	0.41	190.97	191.08	191.08	191.11	0.023620	0.76	0.54	9.32	1.02
Reach1	5382.460	25-yr	0.52	190.97	191.13	191.10	191.14	0.007195	0.52	1.00	12.66	0.59
Reach1	5382.460	50-yr	0.63	190.97	191.13	191.11	191.15	0.007904	0.57	1.11	13.35	0.63
Reach1	5382.460	100-yr	0.74	190.97	191.14	191.12	191.16	0.008267	0.60	1.24	14.06	0.65
Reach1	5300	CH	0.89	190.54	190.66	190.62	190.67	0.004383	0.49	3.09	39.07	0.48
Reach1	5300	Regional	1.02	190.54	190.68	190.62	190.69	0.002485	0.43	4.14	41.75	0.38
Reach1	5300	2-yr	0.28	190.54	190.63	190.59	190.64	0.001172	0.21	2.19	36.32	0.24
Reach1	5300	5-yr	0.36	190.54	190.65	190.59	190.65	0.001163	0.23	2.62	37.76	0.24
Reach1	5300	10-yr	0.41	190.54	190.64	190.60	190.65	0.001680	0.27	2.52	37.47	0.29
Reach1	5300	25-yr	0.52	190.54	190.63	190.60	190.63	0.005329	0.43	1.99	35.55	0.50
Reach1	5300	50-yr	0.63	190.54	190.64	190.61	190.64	0.004950	0.45	2.33	36.86	0.50
Reach1	5300	100-yr	0.74	190.54	190.65	190.61	190.65	0.004819	0.47	2.64	37.81	0.50
Reach1	5200	CH	0.89	190.22	190.41	190.34	190.41	0.001638	0.35	3.17	45.31	0.31
Reach1	5200	Regional	1.02	190.22	190.39	190.35	190.40	0.003412	0.46	2.54	35.58	0.43
Reach1	5200	2-yr	0.28	190.22	190.30	190.30	190.32	0.026428	0.60	0.46	12.42	1.00
Reach1	5200	5-yr	0.36	190.22	190.30	190.30	190.33	0.027996	0.65	0.55	13.76	1.04
Reach1	5200	10-yr	0.41	190.22	190.33	190.31	190.34	0.007605	0.43	0.97	18.58	0.57
Reach1	5200	25-yr	0.52	190.22	190.38	190.32	190.38	0.001519	0.28	2.05	25.59	0.28
Reach1	5200	50-yr	0.63	190.22	190.39	190.32	190.39	0.001582	0.30	2.34	30.90	0.29
Reach1	5200	100-yr	0.74	190.22	190.40	190.33	190.40	0.001576	0.32	2.70	39.63	0.30
Reach1	5100	CH	0.89	189.90	190.00	190.00	190.03	0.019164	0.81	1.47	29.77	0.95
Reach1	5100	Regional	1.02	189.90	190.04	190.01	190.05	0.003833	0.50	3.28	49.05	0.46
Reach1	5100	2-yr	0.28	189.90	190.01	189.96	190.01	0.000952	0.20	1.96	36.19	0.22
Reach1	5100	5-yr	0.36	189.90	190.02	189.97	190.03	0.000988	0.22	2.39	40.72	0.23
Reach1	5100	10-yr	0.41	189.90	190.02	189.97	190.02	0.001777	0.28	2.08	37.46	0.30
Reach1	5100	25-yr	0.52	189.90	189.98	189.98	190.00	0.023194	0.70	0.91	23.55	0.99
Reach1	5100	50-yr	0.63	189.90	189.98	189.98	190.01	0.021080	0.73	1.09	25.38	0.96
Reach1	5100	100-yr	0.74	189.90	189.99	189.99	190.02	0.021784	0.79	1.21	26.60	0.99
Reach1	4999.999	CH	0.89	189.67	189.99	189.75	189.99	0.000042	0.09	16.13	85.56	0.06

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	4999.999	Regional	1.02	189.67	190.04	189.76	190.04	0.000028	0.09	21.46	108.95	0.05
Reach1	4999.999	2-yr	0.28	189.67	189.72	189.72	189.73	0.029976	0.55	0.54	19.75	1.02
Reach1	4999.999	5-yr	0.36	189.67	189.72	189.72	189.74	0.025468	0.55	0.69	22.16	0.96
Reach1	4999.999	10-yr	0.41	189.67	189.75	189.73	189.76	0.003886	0.32	1.52	40.28	0.42
Reach1	4999.999	25-yr	0.52	189.67	189.82	189.73	189.82	0.000426	0.17	4.45	53.86	0.15
Reach1	4999.999	50-yr	0.63	189.67	189.87	189.74	189.87	0.000148	0.13	7.64	62.04	0.10
Reach1	4999.999	100-yr	0.74	189.67	189.92	189.74	189.92	0.000076	0.11	11.07	71.53	0.07
Reach1	4900.587	CH	0.89	189.36	189.99	189.15	189.99	0.000000	0.01	169.65	350.52	0.00
Reach1	4900.587	Regional	1.02	189.36	190.04	189.16	190.04	0.000000	0.01	188.77	355.40	0.00
Reach1	4900.587	2-yr	0.28	189.36	189.68	189.11	189.68	0.000000	0.01	64.96	325.97	0.01
Reach1	4900.587	5-yr	0.36	189.36	189.73	189.12	189.73	0.000000	0.01	81.57	329.37	0.01
Reach1	4900.587	10-yr	0.41	189.36	189.76	189.13	189.76	0.000000	0.01	91.23	331.33	0.01
Reach1	4900.587	25-yr	0.52	189.36	189.82	189.13	189.82	0.000000	0.01	111.07	335.31	0.01
Reach1	4900.587	50-yr	0.63	189.36	189.87	189.14	189.87	0.000000	0.01	129.53	340.12	0.00
Reach1	4900.587	100-yr	0.74	189.36	189.92	189.14	189.92	0.000000	0.01	147.04	344.63	0.00
Reach1	4856.577	CH	0.89	189.31	189.99	189.38	189.99	0.000006	0.06	13.92	335.41	0.03
Reach1	4856.577	Regional	1.02	189.31	190.04	189.39	190.04	0.000006	0.07	15.05	353.57	0.03
Reach1	4856.577	2-yr	0.28	189.31	189.68	189.35	189.68	0.000005	0.04	7.42	253.45	0.02
Reach1	4856.577	5-yr	0.36	189.31	189.73	189.35	189.73	0.000005	0.04	8.48	262.72	0.02
Reach1	4856.577	10-yr	0.41	189.31	189.76	189.36	189.76	0.000006	0.05	9.09	271.00	0.02
Reach1	4856.577	25-yr	0.52	189.31	189.82	189.36	189.82	0.000006	0.05	10.34	285.61	0.02
Reach1	4856.577	50-yr	0.63	189.31	189.87	189.37	189.87	0.000006	0.05	11.48	299.35	0.02
Reach1	4856.577	100-yr	0.74	189.31	189.92	189.37	189.92	0.000006	0.06	12.55	322.08	0.02
Reach1	4846.378		Culvert									
Reach1	4835.945	CH	0.89	189.02	189.13	189.08	189.14	0.002947	0.38	2.31	170.74	0.39
Reach1	4835.945	Regional	1.02	189.02	189.14	189.09	189.15	0.002907	0.40	2.53	172.81	0.40
Reach1	4835.945	2-yr	0.28	189.02	189.08	189.05	189.09	0.002360	0.23	1.22	154.46	0.32
Reach1	4835.945	5-yr	0.36	189.02	189.09	189.06	189.10	0.002230	0.25	1.45	157.90	0.32
Reach1	4835.945	10-yr	0.41	189.02	189.10	189.06	189.10	0.002360	0.27	1.54	159.20	0.33
Reach1	4835.945	25-yr	0.52	189.02	189.11	189.07	189.11	0.002451	0.30	1.76	162.44	0.34
Reach1	4835.945	50-yr	0.63	189.02	189.11	189.07	189.12	0.002812	0.33	1.90	164.52	0.37
Reach1	4835.945	100-yr	0.74	189.02	189.12	189.08	189.13	0.002737	0.35	2.11	167.76	0.37
Reach1	4816.446	CH	0.89	188.90	189.00	189.00	189.02	0.015766	0.68	1.80	49.18	0.85
Reach1	4816.446	Regional	1.02	188.90	189.00	189.00	189.02	0.017482	0.73	1.95	50.83	0.90
Reach1	4816.446	2-yr	0.28	188.90	188.96	188.96	188.98	0.025638	0.55	0.52	17.54	0.96

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	4816.446	5-yr	0.36	188.90	188.97	188.97	188.98	0.026461	0.59	0.64	22.26	0.99
Reach1	4816.446	10-yr	0.41	188.90	188.97	188.97	188.99	0.022028	0.57	0.78	27.42	0.92
Reach1	4816.446	25-yr	0.52	188.90	188.98	188.98	189.00	0.021872	0.62	0.95	32.46	0.94
Reach1	4816.446	50-yr	0.63	188.90	188.99	188.99	189.00	0.016830	0.61	1.28	42.29	0.85
Reach1	4816.446	100-yr	0.74	188.90	188.99	188.99	189.01	0.019016	0.68	1.40	44.00	0.91
Reach1	4600	CH	0.89	187.56	187.83	187.72	187.83	0.001184	0.35	2.76	20.98	0.27
Reach1	4600	Regional	1.02	187.56	187.84	187.73	187.84	0.001219	0.37	3.02	21.89	0.28
Reach1	4600	2-yr	0.28	187.56	187.74	187.66	187.74	0.001133	0.23	1.23	13.94	0.24
Reach1	4600	5-yr	0.36	187.56	187.76	187.67	187.76	0.000960	0.23	1.58	15.93	0.23
Reach1	4600	10-yr	0.41	187.56	187.77	187.68	187.77	0.001008	0.24	1.72	16.63	0.23
Reach1	4600	25-yr	0.52	187.56	187.79	187.69	187.79	0.001038	0.27	1.98	17.90	0.24
Reach1	4600	50-yr	0.63	187.56	187.80	187.70	187.80	0.001091	0.29	2.22	18.97	0.25
Reach1	4600	100-yr	0.74	187.56	187.81	187.71	187.82	0.001118	0.32	2.47	19.92	0.26
Reach1	4500	CH	0.89	187.38	187.55	187.53	187.57	0.009351	0.71	1.36	16.62	0.71
Reach1	4500	Regional	1.02	187.38	187.56	187.54	187.58	0.008850	0.74	1.54	17.60	0.70
Reach1	4500	2-yr	0.28	187.38	187.50	187.48	187.51	0.007782	0.45	0.63	11.34	0.59
Reach1	4500	5-yr	0.36	187.38	187.49	187.48	187.51	0.017437	0.64	0.57	10.77	0.87
Reach1	4500	10-yr	0.41	187.38	187.50	187.49	187.52	0.015304	0.64	0.65	11.51	0.83
Reach1	4500	25-yr	0.52	187.38	187.51	187.50	187.53	0.014172	0.67	0.80	12.81	0.81
Reach1	4500	50-yr	0.63	187.38	187.52	187.51	187.55	0.011470	0.67	0.99	14.34	0.75
Reach1	4500	100-yr	0.74	187.38	187.53	187.52	187.56	0.010471	0.69	1.14	15.33	0.73
Reach1	4400	CH	0.89	186.93	187.22	187.12	187.23	0.001715	0.46	2.14	14.88	0.34
Reach1	4400	Regional	1.02	186.93	187.23	187.13	187.25	0.001747	0.49	2.36	15.61	0.34
Reach1	4400	2-yr	0.28	186.93	187.12		187.12	0.002269	0.32	0.87	9.62	0.34
Reach1	4400	5-yr	0.36	186.93	187.15	187.06	187.15	0.001469	0.31	1.18	11.14	0.29
Reach1	4400	10-yr	0.41	186.93	187.15	187.07	187.16	0.001531	0.33	1.27	11.55	0.30
Reach1	4400	25-yr	0.52	186.93	187.17	187.09	187.18	0.001531	0.36	1.50	12.51	0.30
Reach1	4400	50-yr	0.63	186.93	187.19	187.10	187.20	0.001627	0.40	1.69	13.25	0.32
Reach1	4400	100-yr	0.74	186.93	187.20	187.11	187.21	0.001667	0.43	1.88	13.98	0.32
Reach1	4300	CH	0.89	186.67	186.77	186.77	186.80	0.020728	0.87	1.28	19.53	1.00
Reach1	4300	Regional	1.02	186.67	186.78	186.78	186.81	0.020729	0.92	1.40	19.84	1.01
Reach1	4300	2-yr	0.28	186.67	186.75	186.73	186.76	0.006572	0.39	0.87	18.48	0.53
Reach1	4300	5-yr	0.36	186.67	186.74	186.74	186.76	0.026727	0.67	0.64	17.86	1.03
Reach1	4300	10-yr	0.41	186.67	186.74	186.74	186.76	0.022878	0.67	0.74	18.12	0.97
Reach1	4300	25-yr	0.52	186.67	186.75	186.75	186.77	0.025482	0.76	0.83	18.39	1.04
Reach1	4300	50-yr	0.63	186.67	186.76	186.76	186.78	0.021672	0.77	1.00	18.83	0.99

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	4300	100-yr	0.74	186.67	186.76	186.76	186.79	0.021263	0.82	1.12	19.14	0.99
Reach1	4200.484	CH	0.89	186.13	186.51	186.24	186.51	0.000084	0.13	12.22	54.89	0.08
Reach1	4200.484	Regional	1.02	186.13	186.51	186.24	186.51	0.000109	0.15	12.29	54.99	0.09
Reach1	4200.484	2-yr	0.28	186.13	186.24		186.24	0.004272	0.32	1.33	20.92	0.43
Reach1	4200.484	5-yr	0.36	186.13	186.29	186.20	186.29	0.001197	0.21	2.54	28.79	0.24
Reach1	4200.484	10-yr	0.41	186.13	186.31	186.20	186.31	0.000829	0.20	3.20	32.68	0.21
Reach1	4200.484	25-yr	0.52	186.13	186.34	186.21	186.34	0.000581	0.19	4.36	38.72	0.18
Reach1	4200.484	50-yr	0.63	186.13	186.36	186.22	186.36	0.000492	0.20	5.24	41.10	0.17
Reach1	4200.484	100-yr	0.74	186.13	186.39	186.23	186.39	0.000384	0.19	6.38	44.36	0.15
Reach1	4100	CH	9.86	185.82	186.25		186.27	0.002119	0.86	20.69	75.82	0.42
Reach1	4100	Regional	9.74	185.82	186.24		186.27	0.002152	0.86	20.37	75.35	0.43
Reach1	4100	2-yr	1.02	185.82	185.99		185.99	0.000995	0.31	4.90	43.96	0.25
Reach1	4100	5-yr	1.85	185.82	186.03		186.04	0.001279	0.41	7.01	50.72	0.29
Reach1	4100	10-yr	2.46	185.82	186.06		186.07	0.001282	0.45	8.70	54.78	0.30
Reach1	4100	25-yr	3.30	185.82	186.10		186.11	0.001370	0.51	10.58	58.35	0.32
Reach1	4100	50-yr	3.98	185.82	186.12		186.13	0.001405	0.55	12.07	61.02	0.32
Reach1	4100	100-yr	4.63	185.82	186.14		186.15	0.001579	0.60	12.95	62.62	0.35
Reach1	3999.999	CH	9.86	185.63	185.89		185.92	0.006819	1.06	17.54	109.35	0.69
Reach1	3999.999	Regional	9.74	185.63	185.88		185.92	0.006742	1.05	17.46	109.28	0.69
Reach1	3999.999	2-yr	1.02	185.63	185.71	185.70	185.73	0.019165	0.70	1.99	46.12	0.92
Reach1	3999.999	5-yr	1.85	185.63	185.74	185.73	185.76	0.009657	0.70	4.19	66.97	0.71
Reach1	3999.999	10-yr	2.46	185.63	185.75	185.74	185.78	0.011891	0.82	4.84	70.96	0.80
Reach1	3999.999	25-yr	3.30	185.63	185.77	185.76	185.80	0.011773	0.90	6.12	77.56	0.82
Reach1	3999.999	50-yr	3.98	185.63	185.78	185.77	185.82	0.011986	0.97	7.07	83.92	0.84
Reach1	3999.999	100-yr	4.63	185.63	185.81	185.78	185.84	0.008762	0.92	9.21	101.89	0.73
Reach1	3899.999	CH	9.86	185.10	185.49		185.51	0.002661	0.88	18.09	69.27	0.46
Reach1	3899.999	Regional	9.74	185.10	185.48		185.51	0.002717	0.89	17.77	68.79	0.47
Reach1	3899.999	2-yr	1.02	185.10	185.23		185.23	0.002220	0.36	3.82	39.95	0.35
Reach1	3899.999	5-yr	1.85	185.10	185.26		185.27	0.003014	0.49	5.17	44.13	0.42
Reach1	3899.999	10-yr	2.46	185.10	185.29		185.30	0.002552	0.52	6.68	47.85	0.40
Reach1	3899.999	25-yr	3.30	185.10	185.33		185.34	0.002448	0.58	8.35	51.52	0.41
Reach1	3899.999	50-yr	3.98	185.10	185.35		185.37	0.002337	0.61	9.70	54.21	0.40
Reach1	3899.999	100-yr	4.63	185.10	185.36		185.38	0.002795	0.68	10.15	55.06	0.44
Reach1	3799.999	CH	10.18	184.70	185.12		185.16	0.004757	1.10	16.26	77.98	0.61
Reach1	3799.999	Regional	9.74	184.70	185.11		185.15	0.004826	1.09	15.62	76.77	0.61

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	3799.999	2-yr	1.02	184.70	184.89		184.90	0.005505	0.52	2.54	35.58	0.54
Reach1	3799.999	5-yr	1.85	184.70	184.94		184.96	0.003271	0.55	4.81	43.49	0.45
Reach1	3799.999	10-yr	2.46	184.70	184.95		184.97	0.004481	0.67	5.32	53.57	0.53
Reach1	3799.999	25-yr	3.30	184.70	184.98		185.00	0.004856	0.76	6.58	57.57	0.56
Reach1	3799.999	50-yr	3.98	184.70	184.99		185.01	0.005802	0.86	7.13	58.76	0.62
Reach1	3799.999	100-yr	4.63	184.70	185.02		185.05	0.003966	0.79	9.37	63.32	0.53
Reach1	3734.349	CH	10.18	184.29	185.07		185.08	0.000529	0.53	34.42	96.02	0.22
Reach1	3734.349	Regional	9.74	184.29	185.06		185.07	0.000505	0.52	33.85	95.42	0.22
Reach1	3734.349	2-yr	1.02	184.29	184.89		184.89	0.000023	0.09	19.08	75.82	0.04
Reach1	3734.349	5-yr	1.85	184.29	184.94		184.94	0.000047	0.14	23.20	82.45	0.06
Reach1	3734.349	10-yr	2.46	184.29	184.95		184.95	0.000077	0.18	23.90	83.40	0.08
Reach1	3734.349	25-yr	3.30	184.29	184.97		184.97	0.000119	0.22	25.44	85.41	0.10
Reach1	3734.349	50-yr	3.98	184.29	184.97		184.98	0.000167	0.27	25.84	85.94	0.12
Reach1	3734.349	100-yr	4.63	184.29	185.01		185.01	0.000171	0.28	28.86	89.74	0.12
Reach1	3636.317	CH	10.18	184.20	185.05		185.06	0.000088	0.26	91.87	247.94	0.10
Reach1	3636.317	Regional	9.74	184.20	185.05		185.05	0.000083	0.25	90.54	246.64	0.09
Reach1	3636.317	2-yr	1.02	184.20	184.89		184.89	0.000003	0.04	54.52	198.87	0.02
Reach1	3636.317	5-yr	1.85	184.20	184.94		184.94	0.000006	0.06	65.31	217.50	0.02
Reach1	3636.317	10-yr	2.46	184.20	184.95		184.95	0.000011	0.08	67.03	218.89	0.03
Reach1	3636.317	25-yr	3.30	184.20	184.97		184.97	0.000017	0.11	70.85	222.88	0.04
Reach1	3636.317	50-yr	3.98	184.20	184.97		184.97	0.000024	0.13	71.68	224.03	0.05
Reach1	3636.317	100-yr	4.63	184.20	185.00		185.00	0.000025	0.14	79.49	234.56	0.05
Reach1	3625.504	CH	10.18	184.20	185.05	184.74	185.05	0.000296	0.41	50.35	157.92	0.17
Reach1	3625.504	Regional	9.74	184.20	185.04	184.73	185.05	0.000281	0.40	49.56	156.49	0.16
Reach1	3625.504	2-yr	1.02	184.20	184.89	184.42	184.89	0.000030	0.11	11.60	109.87	0.05
Reach1	3625.504	5-yr	1.85	184.20	184.94	184.48	184.94	0.000022	0.10	35.57	121.12	0.04
Reach1	3625.504	10-yr	2.46	184.20	184.95	184.52	184.95	0.000037	0.13	36.50	122.49	0.06
Reach1	3625.504	25-yr	3.30	184.20	184.96	184.57	184.97	0.000058	0.16	38.59	125.53	0.07
Reach1	3625.504	50-yr	3.98	184.20	184.97	184.59	184.97	0.000082	0.20	39.00	126.11	0.09
Reach1	3625.504	100-yr	4.63	184.20	185.00	184.61	185.00	0.000085	0.21	43.43	137.61	0.09
Reach1	3615.502		Culvert									
Reach1	3602.958	CH	10.18	184.32	184.62	184.62	184.76	0.013190	1.66	6.13	149.50	0.99
Reach1	3602.958	Regional	9.74	184.32	184.61	184.61	184.75	0.013372	1.64	5.94	148.43	0.99
Reach1	3602.958	2-yr	1.02	184.32	184.40	184.40	184.43	0.015115	0.69	1.48	86.39	0.84
Reach1	3602.958	5-yr	1.85	184.32	184.43	184.43	184.47	0.020018	0.95	1.94	99.67	1.01

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	3602.958	10-yr	2.46	184.32	184.45	184.45	184.50	0.018285	1.04	2.37	110.68	1.00
Reach1	3602.958	25-yr	3.30	184.32	184.47	184.47	184.54	0.017243	1.15	2.88	117.83	1.00
Reach1	3602.958	50-yr	3.98	184.32	184.49	184.49	184.56	0.016830	1.23	3.24	125.11	1.01
Reach1	3602.958	100-yr	4.63	184.32	184.50	184.50	184.59	0.015979	1.28	3.61	128.96	1.00
Reach1	3588.753	CH	10.18	184.16	184.58	184.36	184.58	0.000584	0.44	46.74	178.82	0.22
Reach1	3588.753	Regional	9.74	184.16	184.47	184.35	184.48	0.001903	0.64	29.33	154.72	0.38
Reach1	3588.753	2-yr	1.02	184.16	184.25		184.26	0.008904	0.52	2.68	60.83	0.64
Reach1	3588.753	5-yr	1.85	184.16	184.29	184.25	184.30	0.004314	0.50	6.00	101.44	0.48
Reach1	3588.753	10-yr	2.46	184.16	184.31	184.27	184.32	0.003634	0.51	8.11	106.36	0.46
Reach1	3588.753	25-yr	3.30	184.16	184.33	184.29	184.34	0.003089	0.53	10.83	112.21	0.43
Reach1	3588.753	50-yr	3.98	184.16	184.35	184.30	184.36	0.002806	0.55	12.92	116.81	0.42
Reach1	3588.753	100-yr	4.63	184.16	184.37	184.30	184.38	0.002623	0.56	14.90	122.62	0.41
Reach1	3499.999	CH	17.44	183.96	184.50		184.51	0.001078	0.72	59.30	239.59	0.31
Reach1	3499.999	Regional	9.74	183.96	184.36		184.37	0.001002	0.57	34.29	135.66	0.29
Reach1	3499.999	2-yr	1.02	183.96	184.11		184.11	0.000679	0.24	6.94	68.80	0.20
Reach1	3499.999	5-yr	1.85	183.96	184.14		184.15	0.000951	0.33	9.57	80.97	0.25
Reach1	3499.999	10-yr	2.46	183.96	184.18		184.18	0.000924	0.36	12.39	95.43	0.25
Reach1	3499.999	25-yr	3.30	183.96	184.21		184.21	0.000930	0.39	15.55	103.65	0.26
Reach1	3499.999	50-yr	3.98	183.96	184.23		184.24	0.000927	0.42	17.96	108.59	0.26
Reach1	3499.999	100-yr	4.63	183.96	184.25		184.25	0.000946	0.44	19.96	111.54	0.27
Reach1	3399.999	CH	17.44	183.80	184.23		184.29	0.005606	1.38	25.28	134.25	0.69
Reach1	3399.999	Regional	9.74	183.80	184.12		184.17	0.005668	1.13	14.65	74.49	0.66
Reach1	3399.999	2-yr	1.02	183.80	183.89	183.89	183.91	0.018831	0.76	1.59	33.60	0.93
Reach1	3399.999	5-yr	1.85	183.80	183.96		183.97	0.004130	0.58	4.61	48.34	0.49
Reach1	3399.999	10-yr	2.46	183.80	183.97		183.99	0.005195	0.69	5.25	50.42	0.56
Reach1	3399.999	25-yr	3.30	183.80	183.99		184.02	0.005452	0.77	6.45	54.11	0.59
Reach1	3399.999	50-yr	3.98	183.80	184.01		184.03	0.006081	0.85	7.14	56.12	0.63
Reach1	3399.999	100-yr	4.63	183.80	184.02		184.05	0.006187	0.90	7.96	58.44	0.64
Reach1	3299.999	CH	17.81	183.43	183.96		183.98	0.001991	0.90	38.36	121.98	0.42
Reach1	3299.999	Regional	9.74	183.43	183.85		183.86	0.001954	0.74	25.02	110.50	0.40
Reach1	3299.999	2-yr	1.02	183.43	183.63	183.54	183.63	0.000827	0.25	6.10	59.01	0.22
Reach1	3299.999	5-yr	1.85	183.43	183.62		183.63	0.003015	0.47	5.87	58.00	0.42
Reach1	3299.999	10-yr	2.46	183.43	183.66		183.67	0.002316	0.48	8.03	67.04	0.38
Reach1	3299.999	25-yr	3.30	183.43	183.69		183.70	0.002198	0.53	10.24	74.69	0.38
Reach1	3299.999	50-yr	3.98	183.43	183.72		183.73	0.001936	0.54	12.43	81.49	0.37
Reach1	3299.999	100-yr	4.63	183.43	183.74		183.75	0.001867	0.56	14.18	86.84	0.36

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	3199.999	CH	17.81	183.28	183.81	183.60	183.82	0.001511	0.80	46.03	151.19	0.37
Reach1	3199.999	Regional	9.74	183.28	183.74	183.54	183.75	0.000847	0.54	36.24	137.48	0.27
Reach1	3199.999	2-yr	1.02	183.28	183.39	183.39	183.41	0.017494	0.73	1.70	45.58	0.90
Reach1	3199.999	5-yr	1.85	183.28	183.56	183.41	183.57	0.000287	0.22	15.48	102.69	0.14
Reach1	3199.999	10-yr	2.46	183.28	183.61	183.43	183.61	0.000246	0.23	20.37	111.34	0.14
Reach1	3199.999	25-yr	3.30	183.28	183.63	183.44	183.63	0.000348	0.28	22.33	115.09	0.16
Reach1	3199.999	50-yr	3.98	183.28	183.66	183.46	183.66	0.000332	0.30	26.22	122.20	0.16
Reach1	3199.999	100-yr	4.63	183.28	183.68	183.47	183.68	0.000361	0.32	28.48	125.80	0.17
Reach1	3143.616	CH	17.81	182.99	183.79	183.36	183.80	0.000152	0.34	112.44	229.88	0.12
Reach1	3143.616	Regional	9.74	182.99	183.73	183.29	183.73	0.000067	0.21	98.56	224.54	0.08
Reach1	3143.616	2-yr	1.02	182.99	183.37	183.10	183.37	0.000026	0.08	26.23	168.78	0.04
Reach1	3143.616	5-yr	1.85	182.99	183.56	183.14	183.56	0.000009	0.06	61.60	207.48	0.03
Reach1	3143.616	10-yr	2.46	182.99	183.61	183.16	183.61	0.000011	0.07	71.39	217.66	0.03
Reach1	3143.616	25-yr	3.30	182.99	183.63	183.18	183.63	0.000017	0.09	75.06	218.60	0.04
Reach1	3143.616	50-yr	3.98	182.99	183.66	183.19	183.66	0.000019	0.10	82.22	220.43	0.04
Reach1	3143.616	100-yr	4.63	182.99	183.68	183.22	183.68	0.000022	0.11	86.18	221.43	0.05
Reach1	3071.819	CH	18.21	182.93	183.79	183.57	183.79	0.000269	0.28	96.36	247.60	0.15
Reach1	3071.819	Regional	9.74	182.93	183.73	183.33	183.73	0.000129	0.17	82.24	243.39	0.10
Reach1	3071.819	2-yr	1.02	182.93	183.37	183.06	183.37	0.000097	0.16	6.31	84.28	0.09
Reach1	3071.819	5-yr	1.85	182.93	183.56	183.10	183.56	0.000157	0.16	12.14	188.54	0.10
Reach1	3071.819	10-yr	2.46	182.93	183.61	183.12	183.61	0.000042	0.08	41.64	206.68	0.05
Reach1	3071.819	25-yr	3.30	182.93	183.63	183.15	183.63	0.000065	0.09	44.26	216.32	0.07
Reach1	3071.819	50-yr	3.98	182.93	183.66	183.18	183.66	0.000066	0.10	49.62	221.94	0.07
Reach1	3071.819	100-yr	4.63	182.93	183.68	183.20	183.68	0.000073	0.11	52.56	224.70	0.07
Reach1	3059.960		Culvert									
Reach1	3044.762	CH	18.21	182.84	183.37	183.24	183.46	0.004279	1.30	14.02	187.05	0.61
Reach1	3044.762	Regional	9.74	182.84	183.23	183.13	183.28	0.003990	0.99	9.83	162.40	0.56
Reach1	3044.762	2-yr	1.02	182.84	182.98	182.95	182.99	0.005686	0.46	2.22	57.62	0.52
Reach1	3044.762	5-yr	1.85	182.84	183.02	182.98	183.03	0.005333	0.56	3.33	68.94	0.54
Reach1	3044.762	10-yr	2.46	182.84	183.04	183.00	183.06	0.004784	0.60	4.08	79.95	0.53
Reach1	3044.762	25-yr	3.30	182.84	183.07	183.02	183.09	0.004686	0.67	4.90	105.55	0.54
Reach1	3044.762	50-yr	3.98	182.84	183.09	183.03	183.12	0.004546	0.72	5.53	118.34	0.54
Reach1	3044.762	100-yr	4.63	182.84	183.11	183.04	183.14	0.004395	0.76	6.11	129.41	0.54
Reach1	2995.296	CH	18.21	182.60	183.23	182.98	183.25	0.001389	0.82	43.47	140.26	0.36

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	2995.296	Regional	9.74	182.60	183.08	182.88	183.10	0.001516	0.69	24.66	103.58	0.35
Reach1	2995.296	2-yr	1.02	182.60	182.78	182.72	182.79	0.001939	0.35	4.36	45.62	0.33
Reach1	2995.296	5-yr	1.85	182.60	182.84	182.75	182.84	0.001745	0.40	7.01	53.68	0.33
Reach1	2995.296	10-yr	2.46	182.60	182.87	182.76	182.88	0.001689	0.43	8.74	58.16	0.33
Reach1	2995.296	25-yr	3.30	182.60	182.90	182.78	182.91	0.001628	0.47	10.87	63.69	0.33
Reach1	2995.296	50-yr	3.98	182.60	182.93	182.80	182.94	0.001586	0.51	12.51	66.99	0.33
Reach1	2995.296	100-yr	4.63	182.60	182.95	182.81	182.96	0.001566	0.53	13.99	69.85	0.34
Reach1	2899.999	CH	18.21	182.54	183.12	182.81	183.14	0.001078	0.72	46.30	112.04	0.31
Reach1	2899.999	Regional	9.74	182.54	182.97	182.71	182.98	0.001044	0.56	30.18	99.50	0.29
Reach1	2899.999	2-yr	1.02	182.54	182.70	182.57	182.70	0.000639	0.19	7.58	62.09	0.19
Reach1	2899.999	5-yr	1.85	182.54	182.75	182.60	182.75	0.000692	0.26	11.03	71.09	0.21
Reach1	2899.999	10-yr	2.46	182.54	182.78	182.61	182.78	0.000748	0.30	13.01	75.26	0.22
Reach1	2899.999	25-yr	3.30	182.54	182.81	182.63	182.81	0.000802	0.34	15.52	80.11	0.23
Reach1	2899.999	50-yr	3.98	182.54	182.83	182.64	182.83	0.000837	0.37	17.42	83.54	0.24
Reach1	2899.999	100-yr	4.63	182.54	182.85	182.65	182.85	0.000879	0.40	19.02	85.85	0.25
Reach1	2851.797	CH	19.32	182.48	182.85	182.85	182.98	0.019171	1.95	15.25	65.03	1.19
Reach1	2851.797	Regional	9.74	182.48	182.74	182.74	182.83	0.023928	1.58	8.89	56.32	1.22
Reach1	2851.797	2-yr	1.02	182.48	182.56	182.56	182.60	0.046224	0.98	1.29	18.06	1.39
Reach1	2851.797	5-yr	1.85	182.48	182.60	182.60	182.65	0.039518	1.08	2.09	28.47	1.35
Reach1	2851.797	10-yr	2.46	182.48	182.63	182.63	182.67	0.036513	0.94	3.01	44.11	1.26
Reach1	2851.797	25-yr	3.30	182.48	182.64	182.64	182.69	0.036420	1.09	3.72	47.17	1.31
Reach1	2851.797	50-yr	3.98	182.48	182.66	182.66	182.71	0.035234	1.18	4.29	48.87	1.32
Reach1	2851.797	100-yr	4.63	182.48	182.67	182.67	182.73	0.030571	1.22	4.99	50.34	1.26
Reach1	2764.286	CH	19.32	181.04	182.38	181.57	182.39	0.000130	0.44	75.94	83.33	0.13
Reach1	2764.286	Regional	9.74	181.04	182.02	181.42	182.02	0.000137	0.35	46.34	78.98	0.12
Reach1	2764.286	2-yr	1.02	181.04	181.39	181.16	181.39	0.000220	0.19	6.42	33.13	0.12
Reach1	2764.286	5-yr	1.85	181.04	181.51	181.21	181.51	0.000179	0.22	10.84	45.72	0.12
Reach1	2764.286	10-yr	2.46	181.04	181.57	181.23	181.58	0.000165	0.24	14.24	55.75	0.12
Reach1	2764.286	25-yr	3.30	181.04	181.65	181.27	181.66	0.000159	0.26	19.06	67.04	0.12
Reach1	2764.286	50-yr	3.98	181.04	181.71	181.29	181.71	0.000147	0.27	22.90	69.86	0.12
Reach1	2764.286	100-yr	4.63	181.04	181.75	181.31	181.76	0.000144	0.28	26.05	72.09	0.12
Reach1	2689.225	CH	19.32	180.88	182.32	181.76	182.37	0.000750	0.92	22.11	24.96	0.29
Reach1	2689.225	Regional	9.74	180.88	181.97	181.55	182.00	0.000791	0.72	13.84	22.35	0.28
Reach1	2689.225	2-yr	1.02	180.88	181.36	181.15	181.36	0.000826	0.37	2.74	11.22	0.24
Reach1	2689.225	5-yr	1.85	180.88	181.47	181.22	181.48	0.000872	0.44	4.20	13.94	0.26
Reach1	2689.225	10-yr	2.46	180.88	181.54	181.26	181.55	0.000880	0.47	5.19	15.56	0.26

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	2689.225	25-yr	3.30	180.88	181.62	181.31	181.63	0.000898	0.51	6.46	17.62	0.27
Reach1	2689.225	50-yr	3.98	180.88	181.67	181.34	181.69	0.000888	0.53	7.50	19.14	0.27
Reach1	2689.225	100-yr	4.63	180.88	181.72	181.38	181.73	0.000894	0.55	8.36	20.09	0.27
Reach1	2600	CH	20.08	180.84	182.20	181.75	182.27	0.001426	1.42	22.06	25.29	0.41
Reach1	2600	Regional	9.74	180.84	181.87	181.51	181.92	0.001115	1.02	14.27	22.99	0.35
Reach1	2600	2-yr	1.02	180.84	181.28	181.10	181.29	0.000824	0.42	2.72	12.80	0.25
Reach1	2600	5-yr	1.85	180.84	181.39	181.17	181.41	0.000839	0.52	4.34	16.12	0.26
Reach1	2600	10-yr	2.46	180.84	181.46	181.21	181.47	0.000852	0.58	5.45	18.21	0.27
Reach1	2600	25-yr	3.30	180.84	181.53	181.25	181.55	0.000874	0.65	6.85	19.65	0.28
Reach1	2600	50-yr	3.98	180.84	181.59	181.29	181.61	0.000866	0.69	7.98	20.62	0.29
Reach1	2600	100-yr	4.63	180.84	181.63	181.32	181.65	0.000913	0.74	8.81	21.33	0.30
Reach1	2500	CH	20.08	180.72	182.02		182.10	0.002067	1.28	15.82	21.42	0.46
Reach1	2500	Regional	9.74	180.72	181.71		181.77	0.002132	1.00	9.69	18.25	0.44
Reach1	2500	2-yr	1.02	180.72	181.15		181.16	0.002230	0.56	1.82	8.48	0.39
Reach1	2500	5-yr	1.85	180.72	181.26		181.28	0.002140	0.64	2.88	10.69	0.39
Reach1	2500	10-yr	2.46	180.72	181.32		181.35	0.002118	0.68	3.59	11.98	0.40
Reach1	2500	25-yr	3.30	180.72	181.40		181.42	0.002072	0.73	4.54	13.66	0.40
Reach1	2500	50-yr	3.98	180.72	181.46		181.49	0.001834	0.73	5.48	15.03	0.38
Reach1	2500	100-yr	4.63	180.72	181.49		181.52	0.001934	0.78	5.97	15.44	0.40
Reach1	2400	CH	20.08	180.52	181.68	181.48	181.83	0.003539	1.77	13.41	20.76	0.61
Reach1	2400	Regional	9.74	180.52	181.49	181.23	181.55	0.002096	1.14	9.59	18.76	0.45
Reach1	2400	2-yr	1.02	180.52	180.99	180.81	181.00	0.001242	0.45	2.26	9.64	0.29
Reach1	2400	5-yr	1.85	180.52	181.09	180.89	181.10	0.001460	0.57	3.30	11.67	0.33
Reach1	2400	10-yr	2.46	180.52	181.14	180.93	181.16	0.001564	0.63	3.99	12.84	0.35
Reach1	2400	25-yr	3.30	180.52	181.24	180.98	181.26	0.001228	0.64	5.39	14.92	0.32
Reach1	2400	50-yr	3.98	180.52	181.35	181.02	181.37	0.000806	0.60	7.09	17.13	0.27
Reach1	2400	100-yr	4.63	180.52	181.36	181.05	181.39	0.001008	0.69	7.30	17.37	0.30
Reach1	2300	CH	20.22	180.49	181.53		181.58	0.001520	1.09	26.37	52.57	0.40
Reach1	2300	Regional	9.74	180.49	181.40		181.42	0.000732	0.67	19.76	51.36	0.27
Reach1	2300	2-yr	1.02	180.49	180.82		180.84	0.002228	0.48	2.13	12.65	0.37
Reach1	2300	5-yr	1.85	180.49	180.90		180.92	0.002343	0.57	3.23	15.23	0.40
Reach1	2300	10-yr	2.46	180.49	181.01		181.02	0.001241	0.49	5.01	19.26	0.30
Reach1	2300	25-yr	3.30	180.49	181.19		181.20	0.000397	0.38	9.97	35.79	0.18
Reach1	2300	50-yr	3.98	180.49	181.32		181.33	0.000210	0.33	15.64	48.62	0.14
Reach1	2300	100-yr	4.63	180.49	181.33		181.33	0.000277	0.38	15.80	49.02	0.16

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	2200	CH	20.22	180.42	181.46	180.86	181.48	0.000621	0.67	43.60	57.31	0.25
Reach1	2200	Regional	9.74	180.42	181.38	180.72	181.38	0.000194	0.35	38.99	53.54	0.14
Reach1	2200	2-yr	1.02	180.42	180.64	180.50	180.65	0.001570	0.31	4.67	29.23	0.29
Reach1	2200	5-yr	1.85	180.42	180.83	180.54	180.83	0.000402	0.19	11.37	43.58	0.16
Reach1	2200	10-yr	2.46	180.42	180.98	180.57	180.98	0.000150	0.17	18.47	48.78	0.10
Reach1	2200	25-yr	3.30	180.42	181.18	180.59	181.18	0.000064	0.16	28.40	51.81	0.07
Reach1	2200	50-yr	3.98	180.42	181.32	180.61	181.32	0.000044	0.15	35.60	52.99	0.06
Reach1	2200	100-yr	4.63	180.42	181.32	180.62	181.32	0.000059	0.18	35.68	53.01	0.07
Reach1	1952.223	CH	20.34	179.87	181.40		181.40	0.000180	0.45	103.92	279.32	0.14
Reach1	1952.223	Regional	9.74	179.87	181.36		181.36	0.000050	0.23	94.15	265.93	0.07
Reach1	1952.223	2-yr	1.02	179.87	180.55		180.56	0.000177	0.21	5.87	39.80	0.12
Reach1	1952.223	5-yr	1.85	179.87	180.81		180.81	0.000049	0.15	20.25	64.56	0.07
Reach1	1952.223	10-yr	2.46	179.87	180.97		180.97	0.000030	0.13	31.16	78.12	0.05
Reach1	1952.223	25-yr	3.30	179.87	181.17		181.17	0.000016	0.11	53.86	152.72	0.04
Reach1	1952.223	50-yr	3.98	179.87	181.31		181.31	0.000011	0.10	81.62	244.26	0.03
Reach1	1952.223	100-yr	4.63	179.87	181.31		181.31	0.000015	0.12	81.62	244.26	0.04
Reach1	1937.395	CH	20.34	179.87	181.40	180.90	181.40	0.000017	0.12	269.61	286.13	0.04
Reach1	1937.395	Regional	9.74	179.87	181.36	180.65	181.36	0.000004	0.06	259.31	283.87	0.02
Reach1	1937.395	2-yr	1.02	179.87	180.55	180.25	180.55	0.000327	0.27	3.75	197.24	0.16
Reach1	1937.395	5-yr	1.85	179.87	180.80	180.34	180.81	0.000159	0.26	7.21	201.37	0.12
Reach1	1937.395	10-yr	2.46	179.87	180.97	180.37	180.97	0.000118	0.25	9.79	226.99	0.11
Reach1	1937.395	25-yr	3.30	179.87	181.17	180.42	181.17	0.000090	0.24	13.51	269.77	0.09
Reach1	1937.395	50-yr	3.98	179.87	181.31	180.45	181.31	0.000001	0.03	226.09	280.81	0.01
Reach1	1937.395	100-yr	4.63	179.87	181.31	180.48	181.31	0.000001	0.03	226.10	280.81	0.01
Reach1	1921.497		Culvert									
Reach1	1906.334	CH	20.34	179.74	181.36	180.85	181.36	0.000019	0.14	274.65	323.81	0.05
Reach1	1906.334	Regional	9.74	179.74	181.35	180.66	181.35	0.000004	0.07	273.21	323.35	0.02
Reach1	1906.334	2-yr	1.02	179.74	180.01	180.11	180.36	0.091609	2.61	0.39	16.98	2.28
Reach1	1906.334	5-yr	1.85	179.74	180.07	180.21	180.56	0.095728	3.08	0.60	42.94	2.41
Reach1	1906.334	10-yr	2.46	179.74	180.27	180.27	180.40	0.013715	1.60	1.54	96.02	0.99
Reach1	1906.334	25-yr	3.30	179.74	180.34	180.34	180.49	0.013576	1.71	1.93	111.38	1.00
Reach1	1906.334	50-yr	3.98	179.74	180.46	180.38	180.56	0.007050	1.40	2.84	147.60	0.75
Reach1	1906.334	100-yr	4.63	179.74	181.19	180.42	181.19	0.000094	0.28	16.56	284.10	0.10
Reach1	1885.931	CH	20.34	179.74	181.36		181.36	0.000009	0.11	447.70	585.84	0.03
Reach1	1885.931	Regional	9.74	179.74	181.35		181.35	0.000002	0.05	445.19	585.38	0.02

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	1885.931	2-yr	1.02	179.74	180.04	179.97	180.04	0.004209	0.60	3.60	38.39	0.50
Reach1	1885.931	5-yr	1.85	179.74	180.11	180.00	180.12	0.003131	0.60	7.62	76.93	0.45
Reach1	1885.931	10-yr	2.46	179.74	180.16	180.04	180.16	0.001933	0.50	11.39	87.96	0.36
Reach1	1885.931	25-yr	3.30	179.74	180.21	180.06	180.21	0.001448	0.43	15.80	98.30	0.31
Reach1	1885.931	50-yr	3.98	179.74	180.48		180.48	0.000065	0.13	62.47	255.86	0.07
Reach1	1885.931	100-yr	4.63	179.74	181.19		181.19	0.000001	0.03	352.65	533.75	0.01
Reach1	1799.999	CH	20.83	179.48	181.36		181.36	0.000005	0.09	597.42	707.95	0.02
Reach1	1799.999	Regional	9.74	179.48	181.35		181.35	0.000001	0.04	594.67	707.42	0.01
Reach1	1799.999	2-yr	1.02	179.48	179.99		179.99	0.000226	0.20	12.53	92.07	0.13
Reach1	1799.999	5-yr	1.85	179.48	180.07		180.07	0.000190	0.21	21.26	112.53	0.12
Reach1	1799.999	10-yr	2.46	179.48	180.12		180.12	0.000189	0.18	27.08	125.78	0.11
Reach1	1799.999	25-yr	3.30	179.48	180.17		180.17	0.000206	0.16	33.36	144.51	0.12
Reach1	1799.999	50-yr	3.98	179.48	180.48		180.48	0.000016	0.07	113.06	372.78	0.04
Reach1	1799.999	100-yr	4.63	179.48	181.19		181.19	0.000000	0.02	485.26	649.75	0.01
Reach1	1699.999	CH	20.83	179.32	181.35		181.35	0.000016	0.17	499.78	664.39	0.05
Reach1	1699.999	Regional	9.74	179.32	181.35		181.35	0.000004	0.08	497.78	664.11	0.02
Reach1	1699.999	2-yr	1.02	179.32	179.93		179.94	0.001695	0.41	3.79	48.28	0.32
Reach1	1699.999	5-yr	1.85	179.32	180.03		180.04	0.000921	0.41	9.44	68.38	0.26
Reach1	1699.999	10-yr	2.46	179.32	180.08		180.09	0.000789	0.42	13.25	80.10	0.24
Reach1	1699.999	25-yr	3.30	179.32	180.13		180.13	0.000838	0.47	16.89	91.40	0.26
Reach1	1699.999	50-yr	3.98	179.32	180.47		180.47	0.000052	0.16	70.81	197.31	0.07
Reach1	1699.999	100-yr	4.63	179.32	181.19		181.19	0.000002	0.05	391.65	649.09	0.01
Reach1	1600	CH	22.58	179.20	181.35		181.35	0.000019	0.18	457.03	562.04	0.05
Reach1	1600	Regional	9.74	179.20	181.35		181.35	0.000003	0.08	456.08	561.75	0.02
Reach1	1600	2-yr	1.02	179.20	179.86	179.63	179.87	0.000475	0.33	9.89	65.24	0.19
Reach1	1600	5-yr	1.85	179.20	179.98		179.98	0.000436	0.24	18.93	87.13	0.17
Reach1	1600	10-yr	2.46	179.20	180.04		180.04	0.000414	0.21	24.38	105.03	0.16
Reach1	1600	25-yr	3.30	179.20	180.08		180.08	0.000457	0.23	28.68	112.74	0.17
Reach1	1600	50-yr	3.98	179.20	180.47		180.47	0.000024	0.11	95.62	241.56	0.05
Reach1	1600	100-yr	4.63	179.20	181.19		181.19	0.000001	0.04	372.38	499.77	0.01
Reach1	1500	CH	22.58	179.24	181.35		181.35	0.000012	0.15	595.72	666.81	0.04
Reach1	1500	Regional	9.74	179.24	181.35		181.35	0.000002	0.07	595.20	666.74	0.02
Reach1	1500	2-yr	1.02	179.24	179.63	179.63	179.72	0.016032	1.38	0.74	3.84	1.01
Reach1	1500	5-yr	1.85	179.24	179.74	179.74	179.85	0.015335	1.48	1.25	5.75	1.01
Reach1	1500	10-yr	2.46	179.24	179.79	179.79	179.91	0.015736	1.53	1.61	7.11	1.03
Reach1	1500	25-yr	3.30	179.24	179.92	179.92	179.96	0.010605	0.96	6.46	88.11	0.79

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	1500	50-yr	3.98	179.24	180.47		180.47	0.000016	0.10	127.49	318.06	0.04
Reach1	1500	100-yr	4.63	179.24	181.19		181.19	0.000001	0.04	488.79	652.10	0.01
Reach1	1400	CH	22.58	179.13	181.35		181.35	0.000005	0.12	803.24	720.74	0.03
Reach1	1400	Regional	9.74	179.13	181.35		181.35	0.000001	0.05	803.06	720.63	0.01
Reach1	1400	2-yr	1.02	179.13	179.56	179.28	179.56	0.000069	0.13	12.03	57.28	0.07
Reach1	1400	5-yr	1.85	179.13	179.63	179.32	179.63	0.000121	0.20	15.78	64.40	0.10
Reach1	1400	10-yr	2.46	179.13	179.84	179.34	179.84	0.000041	0.15	42.66	227.14	0.06
Reach1	1400	25-yr	3.30	179.13	179.86	179.37	179.86	0.000064	0.20	46.62	233.33	0.08
Reach1	1400	50-yr	3.98	179.13	180.47		180.47	0.000002	0.06	269.12	465.66	0.02
Reach1	1400	100-yr	4.63	179.13	181.19		181.19	0.000000	0.03	690.60	686.11	0.01
Reach1	1323.669	CH	22.58	179.01	181.35		181.35	0.000004	0.10	931.09	879.14	0.02
Reach1	1323.669	Regional	9.74	179.01	181.35		181.35	0.000001	0.04	931.04	879.13	0.01
Reach1	1323.669	2-yr	1.02	179.01	179.55		179.55	0.000386	0.23	6.41	89.14	0.16
Reach1	1323.669	5-yr	1.85	179.01	179.61		179.61	0.000471	0.29	13.56	140.07	0.18
Reach1	1323.669	10-yr	2.46	179.01	179.84		179.84	0.000041	0.13	55.46	205.79	0.06
Reach1	1323.669	25-yr	3.30	179.01	179.85		179.85	0.000064	0.17	58.74	208.32	0.08
Reach1	1323.669	50-yr	3.98	179.01	180.47		180.47	0.000002	0.05	302.03	587.08	0.02
Reach1	1323.669	100-yr	4.63	179.01	181.19		181.19	0.000000	0.02	795.01	801.28	0.01
Reach1	1193.845	CH	23.66	178.85	181.35		181.35	0.000004	0.10	1039.86	1015.37	0.02
Reach1	1193.845	Regional	23.66	178.85	181.35		181.35	0.000004	0.10	1039.86	1015.37	0.02
Reach1	1193.845	2-yr	2.01	178.85	179.20	179.20	179.29	0.016405	1.32	1.52	8.78	1.02
Reach1	1193.845	5-yr	3.73	178.85	179.51		179.52	0.000909	0.47	14.57	80.34	0.26
Reach1	1193.845	10-yr	5.03	178.85	179.83		179.83	0.000097	0.24	57.52	179.31	0.10
Reach1	1193.845	25-yr	6.84	178.85	179.84		179.84	0.000168	0.32	59.21	180.52	0.13
Reach1	1193.845	50-yr	8.34	178.85	180.47		180.47	0.000010	0.12	287.83	662.60	0.03
Reach1	1193.845	100-yr	9.79	178.85	181.19		181.19	0.000001	0.05	877.85	995.72	0.01
Reach1	1100	CH	23.66	178.25	181.35		181.35	0.000001	0.05	1295.30	1114.48	0.01
Reach1	1100	Regional	23.66	178.25	181.35		181.35	0.000001	0.05	1295.30	1114.48	0.01
Reach1	1100	2-yr	2.01	178.25	179.09	178.57	179.09	0.000073	0.17	20.01	102.58	0.08
Reach1	1100	5-yr	3.73	178.25	179.52		179.52	0.000008	0.09	102.63	254.06	0.03
Reach1	1100	10-yr	5.03	178.25	179.83		179.83	0.000003	0.07	189.31	326.90	0.02
Reach1	1100	25-yr	6.84	178.25	179.84		179.84	0.000006	0.09	192.51	340.19	0.03
Reach1	1100	50-yr	8.34	178.25	180.47		180.47	0.000001	0.05	471.65	574.92	0.01
Reach1	1100	100-yr	9.79	178.25	181.19		181.19	0.000000	0.03	1118.76	1080.94	0.01
Reach1	974.3741	CH	23.66	178.28	181.35		181.35	0.000002	0.09	940.96	978.97	0.02

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	974.3741	Regional	23.66	178.28	181.35		181.35	0.000002	0.09	940.96	978.97	0.02
Reach1	974.3741	2-yr	2.01	178.28	179.08		179.08	0.000014	0.08	43.21	119.02	0.03
Reach1	974.3741	5-yr	3.73	178.28	179.52		179.52	0.000005	0.07	110.01	176.96	0.02
Reach1	974.3741	10-yr	5.03	178.28	179.83		179.83	0.000003	0.06	166.90	189.27	0.02
Reach1	974.3741	25-yr	6.84	178.28	179.84		179.84	0.000005	0.08	168.68	190.34	0.02
Reach1	974.3741	50-yr	8.34	178.28	180.47		180.47	0.000001	0.06	312.03	318.15	0.01
Reach1	974.3741	100-yr	9.79	178.28	181.19		181.19	0.000000	0.04	786.85	928.94	0.01
Reach1	960.8255	CH	23.66	178.28	181.35	179.64	181.35	0.000005	0.14	433.90	1129.82	0.03
Reach1	960.8255	Regional	23.66	178.28	181.35	179.64	181.35	0.000005	0.14	433.90	1129.82	0.03
Reach1	960.8255	2-yr	2.01	178.28	179.06	178.63	179.07	0.000470	0.55	3.63	154.12	0.22
Reach1	960.8255	5-yr	3.73	178.28	179.48	178.75	179.50	0.000317	0.63	5.92	199.97	0.19
Reach1	960.8255	10-yr	5.03	178.28	179.79	178.83	179.81	0.000253	0.66	7.58	248.81	0.18
Reach1	960.8255	25-yr	6.84	178.28	179.77	178.93	179.81	0.000494	0.92	7.45	244.41	0.25
Reach1	960.8255	50-yr	8.34	178.28	180.42	179.01	180.45	0.000203	0.76	10.95	447.04	0.17
Reach1	960.8255	100-yr	9.79	178.28	181.15	179.08	181.18	0.000100	0.66	14.90	1020.33	0.13
Reach1	945.2227		Culvert									
Reach1	929.6181	CH	23.66	177.14	178.76	178.76	179.42	0.008395	3.61	6.55	97.84	1.00
Reach1	929.6181	Regional	23.66	177.14	178.76	178.76	179.42	0.008395	3.61	6.55	97.84	1.00
Reach1	929.6181	2-yr	2.01	177.14	178.37	177.66	178.38	0.000194	0.43	4.62	28.33	0.14
Reach1	929.6181	5-yr	3.73	177.14	178.47	177.81	178.50	0.000471	0.73	5.13	45.54	0.23
Reach1	929.6181	10-yr	5.03	177.14	178.52	177.90	178.56	0.000736	0.94	5.37	71.37	0.29
Reach1	929.6181	25-yr	6.84	177.14	178.57	178.01	178.64	0.001171	1.22	5.62	79.45	0.36
Reach1	929.6181	50-yr	8.34	177.14	178.60	178.09	178.71	0.001589	1.44	5.78	82.06	0.43
Reach1	929.6181	100-yr	9.79	177.14	178.63	178.17	178.77	0.002030	1.66	5.91	84.14	0.48
Reach1	908.9127	CH	23.66	177.14	178.84	178.58	178.85	0.001140	0.83	60.30	167.88	0.33
Reach1	908.9127	Regional	23.66	177.14	178.84	178.58	178.85	0.001140	0.83	60.30	167.88	0.33
Reach1	908.9127	2-yr	2.01	177.14	178.36		178.37	0.000998	0.47	4.88	37.17	0.27
Reach1	908.9127	5-yr	3.73	177.14	178.46		178.47	0.001213	0.54	11.29	88.82	0.30
Reach1	908.9127	10-yr	5.03	177.14	178.50		178.52	0.001250	0.56	15.77	99.76	0.31
Reach1	908.9127	25-yr	6.84	177.14	178.56		178.57	0.001231	0.59	21.18	111.02	0.31
Reach1	908.9127	50-yr	8.34	177.14	178.59		178.60	0.001233	0.63	25.04	118.98	0.32
Reach1	908.9127	100-yr	9.79	177.14	178.62		178.63	0.001213	0.66	28.72	124.44	0.32
Reach1	800	CH	23.66	177.14	178.71		178.73	0.001286	0.82	60.60	169.63	0.34
Reach1	800	Regional	23.66	177.14	178.71		178.73	0.001286	0.82	60.60	169.63	0.34
Reach1	800	2-yr	2.01	177.14	178.09		178.13	0.007313	0.88	2.32	15.31	0.67

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	800	5-yr	3.73	177.14	178.22		178.26	0.003315	0.85	5.87	46.54	0.49
Reach1	800	10-yr	5.03	177.14	178.28		178.32	0.002886	0.88	8.97	61.03	0.47
Reach1	800	25-yr	6.84	177.14	178.35		178.38	0.002446	0.91	13.75	81.16	0.45
Reach1	800	50-yr	8.34	177.14	178.40		178.43	0.002148	0.91	18.13	96.43	0.42
Reach1	800	100-yr	9.79	177.14	178.45		178.48	0.001767	0.87	23.57	113.13	0.39
Reach1	699.9999	CH	23.66	177.14	178.54		178.59	0.001514	1.10	43.75	160.57	0.40
Reach1	699.9999	Regional	23.66	177.14	178.54		178.59	0.001514	1.10	43.75	160.57	0.40
Reach1	699.9999	2-yr	2.01	177.14	177.82		177.84	0.001508	0.63	3.17	9.12	0.34
Reach1	699.9999	5-yr	3.73	177.14	177.98		178.00	0.002029	0.72	5.32	19.46	0.40
Reach1	699.9999	10-yr	5.03	177.14	178.04		178.07	0.002053	0.80	6.70	22.81	0.41
Reach1	699.9999	25-yr	6.84	177.14	178.12		178.16	0.002088	0.89	8.58	26.73	0.42
Reach1	699.9999	50-yr	8.34	177.14	178.17		178.22	0.002130	0.96	10.07	29.47	0.43
Reach1	699.9999	100-yr	9.79	177.14	178.23		178.27	0.002383	0.98	11.90	35.20	0.46
Reach1	600	CH	23.66	177.14	178.37		178.44	0.001527	1.19	29.63	103.00	0.41
Reach1	600	Regional	23.66	177.14	178.37		178.44	0.001527	1.19	29.63	103.00	0.41
Reach1	600	2-yr	2.01	177.14	177.55		177.59	0.004981	0.82	2.46	11.93	0.58
Reach1	600	5-yr	3.73	177.14	177.66		177.71	0.004604	0.94	3.98	14.85	0.58
Reach1	600	10-yr	5.03	177.14	177.73		177.78	0.004372	1.00	5.05	16.61	0.58
Reach1	600	25-yr	6.84	177.14	177.82		177.87	0.004126	1.05	6.50	18.81	0.57
Reach1	600	50-yr	8.34	177.14	177.88		177.94	0.003940	1.08	7.71	21.41	0.57
Reach1	600	100-yr	9.79	177.14	177.93		177.99	0.003555	1.12	8.84	23.50	0.55
Reach1	509.8065	CH	23.66	176.97	178.32		178.35	0.000597	0.84	34.46	66.20	0.26
Reach1	509.8065	Regional	23.66	176.97	178.32		178.35	0.000597	0.84	34.46	66.20	0.26
Reach1	509.8065	2-yr	2.01	176.97	177.45		177.46	0.000592	0.34	5.97	22.26	0.21
Reach1	509.8065	5-yr	3.73	176.97	177.57		177.58	0.000643	0.44	8.58	23.68	0.23
Reach1	509.8065	10-yr	5.03	176.97	177.63		177.65	0.000674	0.50	10.22	24.49	0.24
Reach1	509.8065	25-yr	6.84	176.97	177.71		177.73	0.000719	0.57	12.20	25.39	0.25
Reach1	509.8065	50-yr	8.34	176.97	177.77		177.79	0.000751	0.62	13.69	25.90	0.26
Reach1	509.8065	100-yr	9.79	176.97	177.83		177.85	0.000771	0.67	15.07	26.37	0.27
Reach1	399.9999	CH	23.66	176.91	178.22		178.27	0.000961	1.09	30.99	51.42	0.33
Reach1	399.9999	Regional	23.66	176.91	178.22		178.27	0.000961	1.09	30.99	51.42	0.33
Reach1	399.9999	2-yr	2.01	176.91	177.32		177.34	0.002658	0.60	3.34	16.11	0.42
Reach1	399.9999	5-yr	3.73	176.91	177.43		177.45	0.002397	0.72	5.25	19.83	0.42
Reach1	399.9999	10-yr	5.03	176.91	177.49		177.52	0.002297	0.80	6.54	21.86	0.43
Reach1	399.9999	25-yr	6.84	176.91	177.56		177.60	0.002249	0.90	8.21	24.25	0.44
Reach1	399.9999	50-yr	8.34	176.91	177.61		177.66	0.002251	0.97	9.51	26.10	0.45

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	399.9999	100-yr	9.79	176.91	177.66		177.71	0.002176	1.02	10.88	27.77	0.45
Reach1	299.9999	CH	23.66	176.86	178.18		178.20	0.000440	0.74	51.05	60.72	0.23
Reach1	299.9999	Regional	23.66	176.86	178.18		178.20	0.000440	0.74	51.05	60.72	0.23
Reach1	299.9999	2-yr	2.01	176.86	177.20		177.20	0.000808	0.36	8.08	31.58	0.24
Reach1	299.9999	5-yr	3.73	176.86	177.29		177.30	0.001025	0.48	11.15	33.57	0.28
Reach1	299.9999	10-yr	5.03	176.86	177.35		177.36	0.001144	0.55	13.07	34.76	0.30
Reach1	299.9999	25-yr	6.84	176.86	177.42		177.43	0.001276	0.63	15.44	36.22	0.32
Reach1	299.9999	50-yr	8.34	176.86	177.47		177.48	0.001352	0.68	17.29	37.38	0.34
Reach1	299.9999	100-yr	9.79	176.86	177.52		177.54	0.001316	0.70	19.45	38.80	0.34
Reach1	199.9999	CH	23.66	176.86	178.14		178.16	0.000251	0.61	53.52	75.03	0.18
Reach1	199.9999	Regional	23.66	176.86	178.14		178.16	0.000251	0.61	53.52	75.03	0.18
Reach1	199.9999	2-yr	2.01	176.86	177.10	176.98	177.11	0.000866	0.35	6.92	37.08	0.24
Reach1	199.9999	5-yr	3.73	176.86	177.17	177.02	177.18	0.001129	0.48	9.45	37.70	0.29
Reach1	199.9999	10-yr	5.03	176.86	177.21	177.05	177.22	0.001329	0.56	10.85	38.04	0.32
Reach1	199.9999	25-yr	6.84	176.86	177.25	177.08	177.27	0.001553	0.66	12.56	38.45	0.35
Reach1	199.9999	50-yr	8.34	176.86	177.22	177.10	177.26	0.003060	0.88	11.48	38.19	0.49
Reach1	199.9999	100-yr	9.79	176.86	177.17	177.12	177.24	0.007468	1.23	9.57	37.73	0.74
Reach1	117.8047	CH	23.66	176.86	178.15		178.15	0.000010	0.12	195.51	155.66	0.03
Reach1	117.8047	Regional	23.66	176.86	178.15		178.15	0.000010	0.12	195.51	155.66	0.03
Reach1	117.8047	2-yr	2.01	176.86	176.89	176.89	176.90	0.030265	0.52	3.89	146.00	1.01
Reach1	117.8047	5-yr	3.73	176.86	176.90	176.90	176.92	0.028322	0.65	5.75	146.17	1.04
Reach1	117.8047	10-yr	5.03	176.86	176.91	176.91	176.93	0.024210	0.70	7.21	146.31	1.00
Reach1	117.8047	25-yr	6.84	176.86	176.92	176.92	176.95	0.022695	0.77	8.85	146.46	1.00
Reach1	117.8047	50-yr	8.34	176.86	176.98		176.99	0.003275	0.47	17.83	147.17	0.43
Reach1	117.8047	100-yr	9.79	176.86	177.06		177.06	0.000880	0.34	29.18	148.08	0.24
Reach1	70.50	CH	23.66	175.45	178.15		178.15	0.000008	0.16	242.05	141.10	0.03
Reach1	70.50	Regional	23.66	175.45	178.15		178.15	0.000008	0.16	242.05	141.10	0.03
Reach1	70.50	2-yr	2.01	175.45	176.08	175.74	176.08	0.000259	0.23	8.89	32.48	0.14
Reach1	70.50	5-yr	3.73	175.45	176.40	175.83	176.40	0.000061	0.18	23.57	65.20	0.08
Reach1	70.50	10-yr	5.03	175.45	176.64	175.87	176.65	0.000027	0.15	48.21	116.79	0.05
Reach1	70.50	25-yr	6.84	175.45	176.86	175.93	176.86	0.000018	0.14	73.73	120.39	0.05
Reach1	70.50	50-yr	8.34	175.45	176.98		176.98	0.000017	0.15	88.82	121.82	0.04
Reach1	70.50	100-yr	9.79	175.45	177.06		177.06	0.000018	0.16	97.82	122.75	0.05
Reach1	36.84	CH	23.66	174.49	178.15	175.24	178.15	0.000003	0.12	403.89	208.27	0.02
Reach1	36.84	Regional	23.66	174.49	178.15	175.24	178.15	0.000003	0.12	403.89	208.27	0.02

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	36.84	2-yr	2.01	174.49	176.08	174.72	176.08	0.000003	0.08	26.54	67.71	0.02
Reach1	36.84	5-yr	3.73	174.49	176.40	174.79	176.40	0.000006	0.11	32.74	147.20	0.03
Reach1	36.84	10-yr	5.03	174.49	176.64	174.84	176.65	0.000007	0.13	37.43	174.51	0.03
Reach1	36.84	25-yr	6.84	174.49	176.86	174.90	176.86	0.000005	0.11	112.80	182.94	0.03
Reach1	36.84	50-yr	8.34	174.49	176.98	174.94	176.98	0.000005	0.12	129.85	186.01	0.03
Reach1	36.84	100-yr	9.79	174.49	177.06	174.98	177.06	0.000006	0.13	139.98	187.26	0.03
Reach1	14.37		Culvert									
Reach1	4.840	CH	23.66	174.41	178.15	175.25	178.15	0.000004	0.13	367.04	230.02	0.02
Reach1	4.840	Regional	23.66	174.41	178.15	175.25	178.15	0.000004	0.13	367.04	230.02	0.02
Reach1	4.840	2-yr	2.01	174.41	176.05	174.64	176.05	0.000005	0.09	22.68	79.32	0.02
Reach1	4.840	5-yr	3.73	174.41	176.29	174.73	176.29	0.000009	0.14	26.57	86.91	0.04
Reach1	4.840	10-yr	5.03	174.41	176.44	174.79	176.44	0.000013	0.17	29.00	91.65	0.04
Reach1	4.840	25-yr	6.84	174.41	176.56	174.86	176.56	0.000019	0.22	30.95	95.45	0.05
Reach1	4.840	50-yr	8.34	174.41	176.71	174.92	176.71	0.000014	0.19	58.37	99.69	0.04
Reach1	4.840	100-yr	9.79	174.41	176.82	174.96	176.82	0.000016	0.21	63.94	107.91	0.05
Reach1	0	CH	23.66	174.40	178.15	175.25	178.15	0.000012	0.20	248.26	232.48	0.04
Reach1	0	Regional	23.66	174.40	178.15	175.25	178.15	0.000012	0.20	248.26	232.48	0.04
Reach1	0	2-yr	2.01	174.40	176.05	174.62	176.05	0.000005	0.09	22.21	79.91	0.02
Reach1	0	5-yr	3.73	174.40	176.29	174.72	176.29	0.000010	0.14	25.98	86.98	0.04
Reach1	0	10-yr	5.03	174.40	176.44	174.78	176.44	0.000013	0.18	28.34	91.59	0.04
Reach1	0	25-yr	6.84	174.40	176.56	174.86	176.56	0.000019	0.23	30.23	95.30	0.05
Reach1	0	50-yr	8.34	174.40	176.71	174.91	176.71	0.000030	0.26	33.18	99.38	0.06
Reach1	0	100-yr	9.79	174.40	176.82	174.95	176.82	0.000033	0.28	38.35	102.31	0.07

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1

Reach	River Sta	Profile	E.G. US. (m)	W.S. US. (m)	E.G. IC (m)	E.G. OC (m)	Min El Weir Flow (m)	Q Culv Group (m3/s)	Q Weir (m3/s)	Delta WS (m)	Culv Vel US (m/s)	Culv Vel DS (m/s)
Reach1	5639.221 Culvert #1	CH	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.63	2.37	2.37
Reach1	5639.221 Culvert #1	Regional	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.62	2.37	2.37
Reach1	5639.221 Culvert #1	2-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.67	2.37	2.37
Reach1	5639.221 Culvert #1	5-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.67	2.37	2.37
Reach1	5639.221 Culvert #1	10-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.66	2.37	2.37
Reach1	5639.221 Culvert #1	25-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.64	2.37	2.37
Reach1	5639.221 Culvert #1	50-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.64	2.37	2.37
Reach1	5639.221 Culvert #1	100-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.63	2.37	2.37
Reach1	4846.378 Culvert #1	CH	189.99	189.99	189.89	189.99	191.09	0.44		0.86	1.70	2.02
Reach1	4846.378 Culvert #2	CH	189.99	189.99	189.89	189.99	191.09	0.44		0.86	1.70	2.02
Reach1	4846.378 Culvert #1	Regional	190.04	190.04	189.94	190.04	191.09	0.51		0.90	1.77	2.09
Reach1	4846.378 Culvert #2	Regional	190.04	190.04	189.94	190.04	191.09	0.51		0.90	1.77	2.09
Reach1	4846.378 Culvert #1	2-yr	189.68	189.68	189.61	189.68	191.09	0.14		0.59	1.22	1.44
Reach1	4846.378 Culvert #2	2-yr	189.68	189.68	189.61	189.68	191.09	0.14		0.59	1.22	1.44
Reach1	4846.378 Culvert #1	5-yr	189.73	189.73	189.65	189.73	191.09	0.18		0.63	1.30	1.56
Reach1	4846.378 Culvert #2	5-yr	189.73	189.73	189.65	189.73	191.09	0.18		0.63	1.30	1.56
Reach1	4846.378 Culvert #1	10-yr	189.76	189.76	189.68	189.76	191.09	0.20		0.66	1.35	1.61
Reach1	4846.378 Culvert #2	10-yr	189.76	189.76	189.68	189.76	191.09	0.20		0.66	1.35	1.61
Reach1	4846.378 Culvert #1	25-yr	189.82	189.82	189.73	189.82	191.09	0.26		0.71	1.45	1.74
Reach1	4846.378 Culvert #2	25-yr	189.82	189.82	189.73	189.82	191.09	0.26		0.71	1.45	1.74
Reach1	4846.378 Culvert #1	50-yr	189.87	189.87	189.78	189.87	191.09	0.32		0.76	1.53	1.83
Reach1	4846.378 Culvert #2	50-yr	189.87	189.87	189.78	189.87	191.09	0.32		0.76	1.53	1.83
Reach1	4846.378 Culvert #1	100-yr	189.92	189.92	189.83	189.92	191.09	0.37		0.80	1.60	1.91
Reach1	4846.378 Culvert #2	100-yr	189.92	189.92	189.83	189.92	191.09	0.37		0.80	1.60	1.91
Reach1	3615.502 Culvert #1	CH	185.05	185.05	185.06	185.05	184.88	0.99	9.26	0.43	1.47	2.10
Reach1	3615.502 Culvert #1	Regional	185.05	185.04	185.05	185.05	184.88	0.98	8.70	0.43	1.47	2.10
Reach1	3615.502 Culvert #1	2-yr	184.89	184.89	184.88	184.89	184.88	0.73	0.29	0.48	1.25	1.86
Reach1	3615.502 Culvert #1	5-yr	184.94	184.94	184.92	184.94	184.88	0.81	1.04	0.51	1.33	1.94
Reach1	3615.502 Culvert #1	10-yr	184.95	184.95	184.94	184.95	184.88	0.82	1.59	0.50	1.34	1.95
Reach1	3615.502 Culvert #1	25-yr	184.97	184.96	184.96	184.97	184.88	0.85	2.45	0.50	1.36	1.98
Reach1	3615.502 Culvert #1	50-yr	184.97	184.97	184.97	184.97	184.88	0.86	3.12	0.48	1.36	1.98
Reach1	3615.502 Culvert #1	100-yr	185.00	185.00	184.98	185.00	184.88	0.91	3.72	0.50	1.41	2.03
Reach1	3059.960 Culvert #1	CH	183.79	183.79	183.79	183.75	183.61	2.79	15.42	0.42	1.86	2.92
Reach1	3059.960 Culvert #1	Regional	183.73	183.73	183.73	183.71	183.61	2.58	7.16	0.50	1.72	2.81
Reach1	3059.960 Culvert #1	2-yr	183.37	183.37	183.34	183.37	183.61	1.02		0.38	1.49	2.00
Reach1	3059.960 Culvert #1	5-yr	183.56	183.56	183.52	183.56	183.61	1.85		0.54	1.82	2.37
Reach1	3059.960 Culvert #1	10-yr	183.61	183.61	183.57	183.61	183.61	2.07	0.39	0.57	1.89	2.45
Reach1	3059.960 Culvert #1	25-yr	183.63	183.63	183.60	183.63	183.61	2.15	1.15	0.56	1.92	2.48
Reach1	3059.960 Culvert #1	50-yr	183.66	183.66	183.65	183.66	183.61	2.32	1.66	0.57	1.96	2.53
Reach1	3059.960 Culvert #1	100-yr	183.68	183.68	183.68	183.67	183.61	2.38	2.25	0.57	1.98	2.55

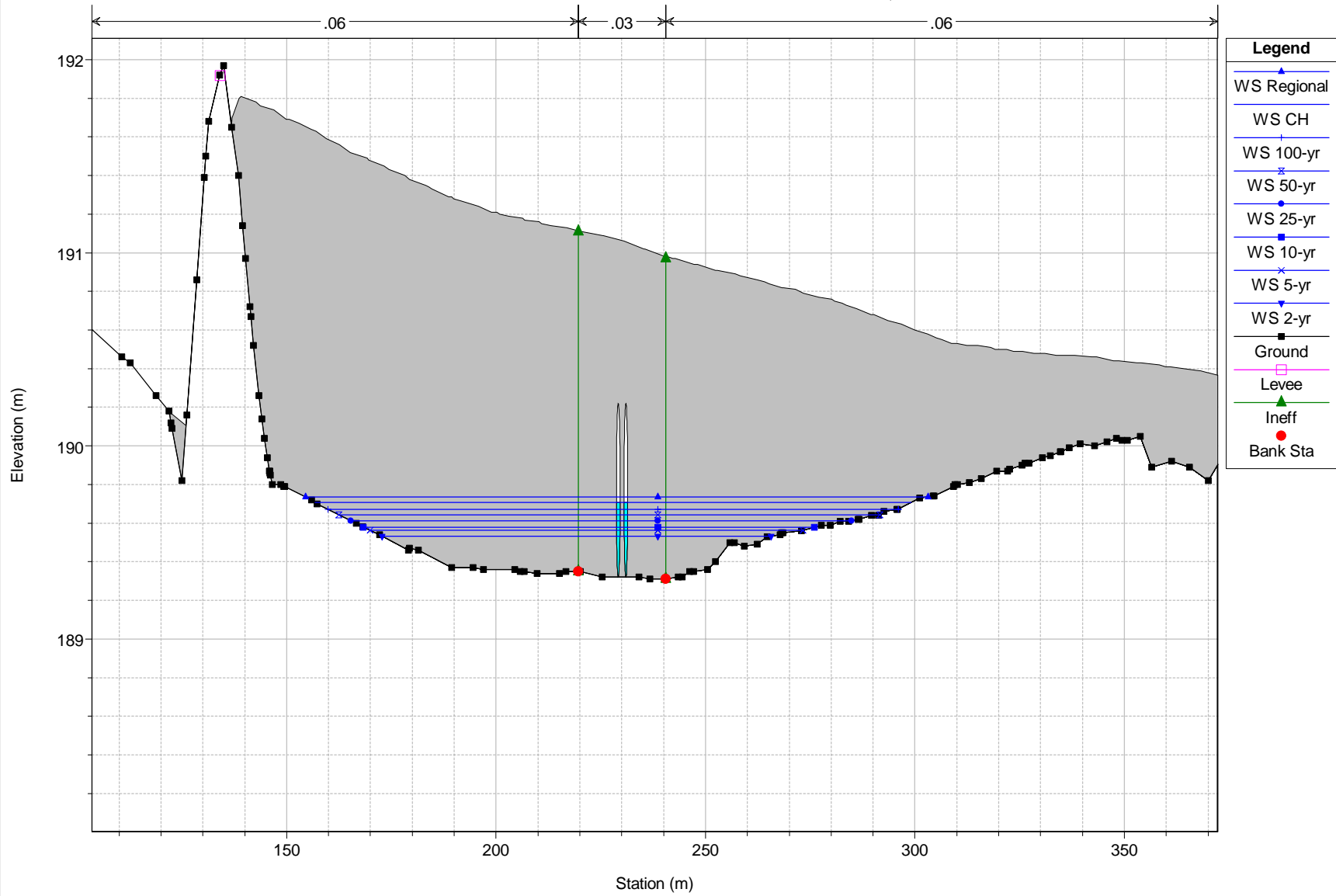
HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	E.G. US. (m)	W.S. US. (m)	E.G. IC (m)	E.G. OC (m)	Min El Weir Flow (m)	Q Culv Group (m3/s)	Q Weir (m3/s)	Delta WS (m)	Culv Vel US (m/s)	Culv Vel DS (m/s)
Reach1	1921.497 Culvert #1	CH	181.40	181.40	181.39	181.40	181.32	1.44	18.90	0.04	0.72	0.72
Reach1	1921.497 Culvert #1	Regional	181.36	181.36	181.35	181.36	181.32	0.72	9.02	0.01	0.36	0.36
Reach1	1921.497 Culvert #1	2-yr	180.55	180.55	180.52	180.55	181.32	1.02		0.40	1.71	2.41
Reach1	1921.497 Culvert #1	5-yr	180.81	180.80	180.76	180.81	181.32	1.85		0.59	2.09	2.82
Reach1	1921.497 Culvert #1	10-yr	180.97	180.97	180.91	180.97	181.32	2.46		0.69	2.29	3.04
Reach1	1921.497 Culvert #1	25-yr	181.17	181.17	181.10	181.17	181.32	3.30		0.83	2.53	3.28
Reach1	1921.497 Culvert #1	50-yr	181.31	181.31	181.24	181.31	181.32	3.93	6.13	0.85	2.68	3.43
Reach1	1921.497 Culvert #1	100-yr	181.31	181.31	181.31	181.31	181.32	2.45	6.07	0.12	1.22	1.22
Reach1	945.2227 Culvert #1	CH	181.35	181.35	182.24	181.35	181.18	9.87	13.67	2.59	4.36	4.36
Reach1	945.2227 Culvert #1	Regional	181.35	181.35	182.24	181.35	181.18	9.87	13.67	2.59	4.36	4.36
Reach1	945.2227 Culvert #1	2-yr	179.07	179.06	179.07	179.22	181.18	2.01		0.69	2.02	0.89
Reach1	945.2227 Culvert #1	5-yr	179.50	179.48	179.50	179.64	181.18	3.73		1.01	2.51	1.65
Reach1	945.2227 Culvert #1	10-yr	179.81	179.79	179.81	179.94	181.18	5.03		1.27	2.85	2.22
Reach1	945.2227 Culvert #1	25-yr	179.81	179.77	180.56	179.81	181.18	6.84		1.20	3.02	3.02
Reach1	945.2227 Culvert #1	50-yr	180.45	180.42	181.36	180.45	181.18	8.34		1.82	3.69	3.69
Reach1	945.2227 Culvert #1	100-yr	181.18	181.15	182.30	181.18	181.18	9.79		2.53	4.33	4.33
Reach1	14.37 Culvert #3	CH	178.15	178.15	174.73	178.15	176.71	0.09	23.27	0.00	0.09	0.09
Reach1	14.37 Culvert #2	CH	178.15	178.15	174.73	178.15	176.71	0.09	23.27	0.00	0.09	0.09
Reach1	14.37 Culvert #1	CH	178.15	178.15	174.81	178.15	176.71	0.20	23.27	0.00	0.09	0.09
Reach1	14.37 Culvert #3	Regional	178.15	178.15	174.73	178.15	176.71	0.09	23.27	0.00	0.09	0.09
Reach1	14.37 Culvert #2	Regional	178.15	178.15	174.73	178.15	176.71	0.09	23.27	0.00	0.09	0.09
Reach1	14.37 Culvert #1	Regional	178.15	178.15	174.81	178.15	176.71	0.20	23.27	0.00	0.09	0.09
Reach1	14.37 Culvert #3	2-yr	176.08	176.08	174.97	176.08	176.71	0.43		0.03	0.43	0.43
Reach1	14.37 Culvert #2	2-yr	176.08	176.08	174.97	176.08	176.71	0.43		0.03	0.43	0.43
Reach1	14.37 Culvert #1	2-yr	176.08	176.08	175.20	176.08	176.71	1.16		0.03	0.49	0.49
Reach1	14.37 Culvert #3	5-yr	176.40	176.40	175.15	176.40	176.71	0.80		0.11	0.80	0.80
Reach1	14.37 Culvert #2	5-yr	176.40	176.40	175.15	176.40	176.71	0.80		0.11	0.80	0.80
Reach1	14.37 Culvert #1	5-yr	176.40	176.40	175.47	176.40	176.71	2.14		0.11	0.91	0.91
Reach1	14.37 Culvert #3	10-yr	176.65	176.64	175.27	176.64	176.71	1.08		0.20	1.09	1.09
Reach1	14.37 Culvert #2	10-yr	176.65	176.64	175.27	176.64	176.71	1.08		0.20	1.09	1.09
Reach1	14.37 Culvert #1	10-yr	176.65	176.64	175.65	176.65	176.71	2.88		0.20	1.22	1.22
Reach1	14.37 Culvert #3	25-yr	176.86	176.86	175.37	176.86	176.71	1.30	0.77	0.30	1.31	1.31
Reach1	14.37 Culvert #2	25-yr	176.86	176.86	175.37	176.86	176.71	1.30	0.77	0.30	1.31	1.31
Reach1	14.37 Culvert #1	25-yr	176.86	176.86	175.79	176.86	176.71	3.47	0.77	0.30	1.47	1.47
Reach1	14.37 Culvert #3	50-yr	176.98	176.98	175.34	176.98	176.71	1.24	2.55	0.27	1.25	1.25
Reach1	14.37 Culvert #2	50-yr	176.98	176.98	175.34	176.98	176.71	1.24	2.55	0.27	1.25	1.25
Reach1	14.37 Culvert #1	50-yr	176.98	176.98	175.75	176.99	176.71	3.31	2.55	0.27	1.41	1.41
Reach1	14.37 Culvert #3	100-yr	177.06	177.06	175.30	177.06	176.71	1.15	4.40	0.23	1.16	1.16
Reach1	14.37 Culvert #2	100-yr	177.06	177.06	175.30	177.06	176.71	1.15	4.40	0.23	1.16	1.16
Reach1	14.37 Culvert #1	100-yr	177.06	177.06	175.70	177.06	176.71	3.08	4.40	0.23	1.31	1.31

Bronte Creek Indian Trib Reach1 Plan: Plan 01 7/14/2020

Flow: Regional Flows

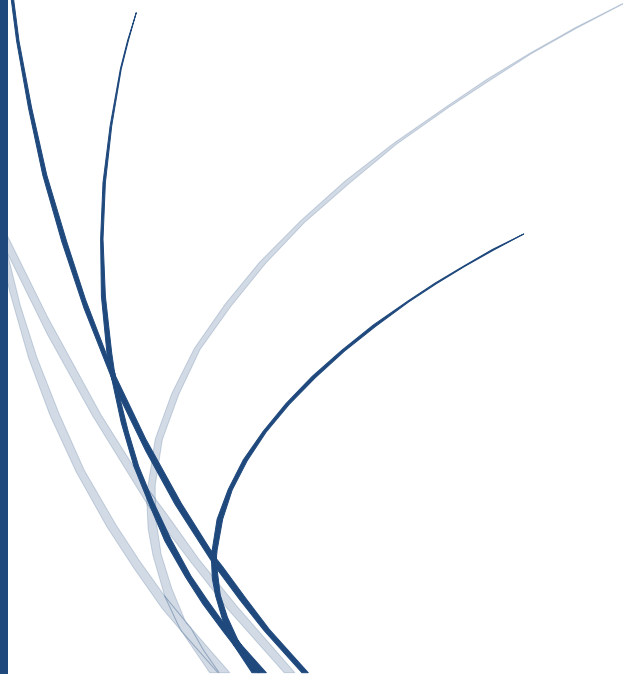
RS = 4846.378 Culv Railroad West of First Line, North of Britannia Rd (Estimated fr

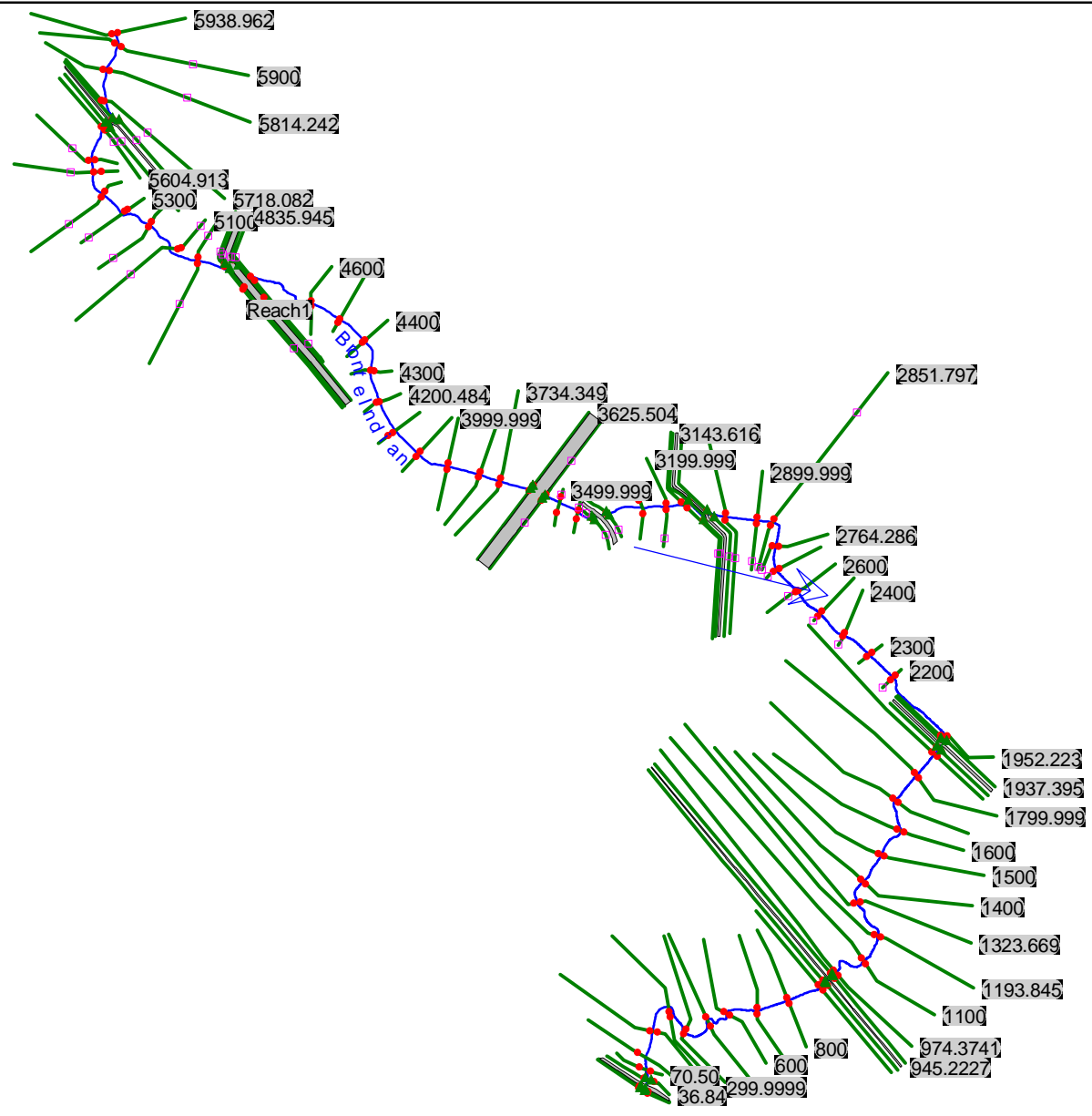




Milton Logistics Hub 2020 HEC-RAS Model Output

Culvert 5000-C10 Proposed Conditions

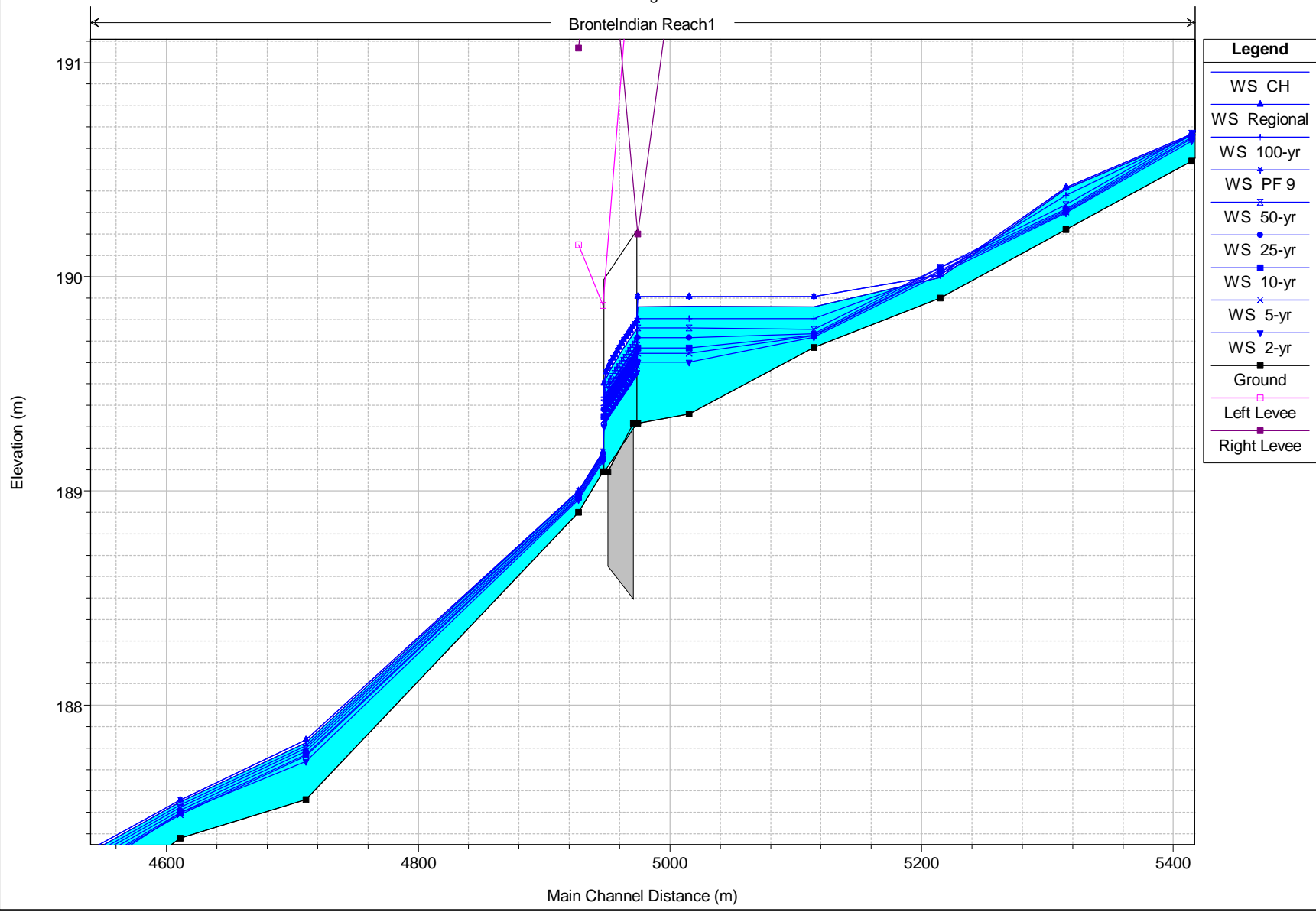




Bronte Creek Indian Trib Reach1 Proposed Plan: Proposed 7/29/2020

Flow: Regional Flows

BronteIndian Reach1



HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	5652.039	CH	0.89	193.11	194.57	193.25	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	Regional	1.02	193.11	194.57	193.26	194.57	0.000000	0.01	411.18	481.08	0.00
Reach1	5652.039	2-yr	0.28	193.11	194.57	193.19	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	5-yr	0.36	193.11	194.57	193.20	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	10-yr	0.41	193.11	194.57	193.21	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	25-yr	0.52	193.11	194.57	193.22	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	50-yr	0.63	193.11	194.57	193.23	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	100-yr	0.74	193.11	194.57	193.24	194.57	0.000000	0.00	411.18	481.09	0.00
Reach1	5652.039	PF 9	1.02	193.11	194.57	193.26	194.57	0.000000	0.01	411.18	481.08	0.00
Reach1	5639.221		Culvert									
Reach1	5620.962	CH	0.89	192.84	192.95	192.93	192.97	0.014426	0.76	1.66	40.52	0.84
Reach1	5620.962	Regional	1.02	192.84	192.95	192.93	192.98	0.014811	0.81	1.79	41.15	0.87
Reach1	5620.962	2-yr	0.28	192.84	192.90	192.89	192.91	0.023583	0.56	0.71	32.06	0.94
Reach1	5620.962	5-yr	0.36	192.84	192.91	192.90	192.92	0.021703	0.60	0.85	33.76	0.93
Reach1	5620.962	10-yr	0.41	192.84	192.91	192.90	192.92	0.022347	0.63	0.92	34.52	0.95
Reach1	5620.962	25-yr	0.52	192.84	192.92	192.91	192.93	0.021494	0.69	1.07	36.08	0.96
Reach1	5620.962	50-yr	0.63	192.84	192.93	192.91	192.94	0.020506	0.73	1.21	37.59	0.95
Reach1	5620.962	100-yr	0.74	192.84	192.93	192.92	192.95	0.019402	0.77	1.36	38.87	0.95
Reach1	5620.962	PF 9	1.02	192.84	192.95	192.93	192.98	0.014811	0.81	1.79	41.15	0.87
Reach1	5604.913	CH	0.89	192.68	192.80	192.77	192.81	0.006768	0.57	1.72	21.17	0.59
Reach1	5604.913	Regional	1.02	192.68	192.81	192.78	192.82	0.006389	0.59	1.92	21.80	0.58
Reach1	5604.913	2-yr	0.28	192.68	192.75	192.73	192.76	0.004836	0.33	0.89	18.47	0.45
Reach1	5604.913	5-yr	0.36	192.68	192.76	192.74	192.77	0.004873	0.36	1.05	18.98	0.47
Reach1	5604.913	10-yr	0.41	192.68	192.77	192.74	192.78	0.004660	0.38	1.16	19.36	0.46
Reach1	5604.913	25-yr	0.52	192.68	192.78	192.75	192.79	0.004690	0.41	1.35	20.01	0.48
Reach1	5604.913	50-yr	0.63	192.68	192.79	192.76	192.80	0.004743	0.45	1.53	20.60	0.49
Reach1	5604.913	100-yr	0.74	192.68	192.80	192.76	192.81	0.004851	0.48	1.70	21.11	0.50
Reach1	5604.913	PF 9	1.02	192.68	192.81	192.78	192.82	0.006389	0.59	1.92	21.80	0.58
Reach1	5499.999	CH	0.89	191.76	191.86	191.85	191.88	0.011970	0.64	1.58	27.41	0.75
Reach1	5499.999	Regional	1.02	191.76	191.86	191.85	191.89	0.013092	0.69	1.72	30.52	0.79
Reach1	5499.999	2-yr	0.28	191.76	191.81	191.81	191.82	0.021437	0.54	0.55	15.93	0.90
Reach1	5499.999	5-yr	0.36	191.76	191.82	191.81	191.83	0.020830	0.58	0.66	16.75	0.91
Reach1	5499.999	10-yr	0.41	191.76	191.82	191.82	191.84	0.023164	0.63	0.70	17.02	0.96
Reach1	5499.999	25-yr	0.52	191.76	191.82	191.82	191.85	0.022779	0.68	0.83	17.93	0.97
Reach1	5499.999	50-yr	0.63	191.76	191.83	191.83	191.86	0.022149	0.71	0.96	18.79	0.98
Reach1	5499.999	100-yr	0.74	191.76	191.84	191.84	191.87	0.021110	0.74	1.10	19.64	0.97

HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	5499.999	PF 9	1.02	191.76	191.86	191.85	191.89	0.013092	0.69	1.72	30.52	0.79
Reach1	5463.964	CH	0.89	191.52	191.64	191.60	191.64	0.003915	0.41	2.51	40.29	0.44
Reach1	5463.964	Regional	1.02	191.52	191.64	191.61	191.65	0.003727	0.43	2.86	42.58	0.44
Reach1	5463.964	2-yr	0.28	191.52	191.60	191.57	191.60	0.002813	0.24	1.21	28.14	0.34
Reach1	5463.964	5-yr	0.36	191.52	191.61	191.58	191.61	0.002841	0.26	1.44	30.47	0.35
Reach1	5463.964	10-yr	0.41	191.52	191.61	191.58	191.61	0.002735	0.28	1.60	32.15	0.35
Reach1	5463.964	25-yr	0.52	191.52	191.62	191.58	191.62	0.002748	0.30	1.91	35.08	0.36
Reach1	5463.964	50-yr	0.63	191.52	191.63	191.59	191.63	0.002797	0.33	2.19	37.62	0.37
Reach1	5463.964	100-yr	0.74	191.52	191.63	191.59	191.64	0.002827	0.35	2.47	39.97	0.38
Reach1	5463.964	PF 9	1.02	191.52	191.64	191.61	191.65	0.003727	0.43	2.86	42.58	0.44
Reach1	5382.460	CH	0.89	190.97	191.15	191.13	191.17	0.009310	0.66	1.36	14.72	0.69
Reach1	5382.460	Regional	1.02	190.97	191.16	191.14	191.18	0.009986	0.70	1.46	15.29	0.72
Reach1	5382.460	2-yr	0.28	190.97	191.07	191.07	191.09	0.023320	0.69	0.41	8.13	0.99
Reach1	5382.460	5-yr	0.36	190.97	191.08	191.08	191.11	0.022009	0.72	0.50	9.00	0.98
Reach1	5382.460	10-yr	0.41	190.97	191.08	191.08	191.11	0.023620	0.76	0.54	9.32	1.02
Reach1	5382.460	25-yr	0.52	190.97	191.10	191.10	191.13	0.022890	0.80	0.65	10.22	1.02
Reach1	5382.460	50-yr	0.63	190.97	191.11	191.11	191.14	0.021047	0.82	0.77	11.14	0.99
Reach1	5382.460	100-yr	0.74	190.97	191.12	191.12	191.15	0.019670	0.83	0.89	11.97	0.97
Reach1	5382.460	PF 9	1.02	190.97	191.16	191.14	191.18	0.009986	0.70	1.46	15.29	0.72
Reach1	5300	CH	0.89	190.54	190.66	190.62	190.67	0.004383	0.49	3.09	39.07	0.48
Reach1	5300	Regional	1.02	190.54	190.67	190.62	190.67	0.004224	0.51	3.45	39.99	0.48
Reach1	5300	2-yr	0.28	190.54	190.63	190.59	190.64	0.001172	0.21	2.19	36.32	0.24
Reach1	5300	5-yr	0.36	190.54	190.65	190.59	190.65	0.001163	0.23	2.62	37.76	0.24
Reach1	5300	10-yr	0.41	190.54	190.65	190.60	190.65	0.001209	0.24	2.83	38.37	0.25
Reach1	5300	25-yr	0.52	190.54	190.66	190.60	190.67	0.001210	0.27	3.33	39.70	0.26
Reach1	5300	50-yr	0.63	190.54	190.67	190.61	190.67	0.001443	0.30	3.58	40.34	0.28
Reach1	5300	100-yr	0.74	190.54	190.66	190.61	190.67	0.002767	0.39	3.20	39.34	0.39
Reach1	5300	PF 9	1.02	190.54	190.67	190.62	190.67	0.004224	0.51	3.45	39.99	0.48
Reach1	5200	CH	0.89	190.22	190.41	190.34	190.41	0.001638	0.35	3.17	45.31	0.31
Reach1	5200	Regional	1.02	190.22	190.42	190.35	190.42	0.001731	0.37	3.53	48.04	0.32
Reach1	5200	2-yr	0.28	190.22	190.30	190.30	190.32	0.026428	0.60	0.46	12.42	1.00
Reach1	5200	5-yr	0.36	190.22	190.30	190.30	190.33	0.027996	0.65	0.55	13.76	1.04
Reach1	5200	10-yr	0.41	190.22	190.31	190.31	190.33	0.023942	0.63	0.65	15.08	0.97
Reach1	5200	25-yr	0.52	190.22	190.32	190.32	190.34	0.026012	0.69	0.75	16.42	1.03
Reach1	5200	50-yr	0.63	190.22	190.34	190.32	190.35	0.012586	0.59	1.09	19.67	0.75
Reach1	5200	100-yr	0.74	190.22	190.38	190.33	190.39	0.002898	0.39	2.09	25.78	0.39

HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	5200	PF 9	1.02	190.22	190.42	190.35	190.42	0.001731	0.37	3.53	48.04	0.32
Reach1	5100	CH	0.89	189.90	190.00	190.00	190.03	0.019164	0.81	1.47	29.77	0.95
Reach1	5100	Regional	1.02	189.90	190.01	190.01	190.03	0.016024	0.80	1.77	33.51	0.89
Reach1	5100	2-yr	0.28	189.90	190.01	189.96	190.01	0.000952	0.20	1.96	36.19	0.22
Reach1	5100	5-yr	0.36	189.90	190.02	189.97	190.03	0.000988	0.22	2.39	40.72	0.23
Reach1	5100	10-yr	0.41	189.90	190.03	189.97	190.03	0.001002	0.24	2.66	43.40	0.23
Reach1	5100	25-yr	0.52	189.90	190.04	189.98	190.05	0.001039	0.26	3.22	48.54	0.24
Reach1	5100	50-yr	0.63	189.90	190.05	189.98	190.05	0.001367	0.30	3.38	49.89	0.28
Reach1	5100	100-yr	0.74	189.90	190.02	189.99	190.03	0.004773	0.48	2.26	39.31	0.50
Reach1	5100	PF 9	1.02	189.90	190.01	190.01	190.03	0.016024	0.80	1.77	33.51	0.89
Reach1	4999.999	CH	0.89	189.67	189.86	189.75	189.86	0.000364	0.19	7.05	60.59	0.15
Reach1	4999.999	Regional	1.02	189.67	189.91	189.76	189.91	0.000183	0.16	10.13	69.04	0.11
Reach1	4999.999	2-yr	0.28	189.67	189.72	189.72	189.73	0.029976	0.55	0.54	19.75	1.02
Reach1	4999.999	5-yr	0.36	189.67	189.72	189.72	189.74	0.025468	0.55	0.69	22.16	0.96
Reach1	4999.999	10-yr	0.41	189.67	189.73	189.73	189.74	0.026992	0.59	0.74	22.94	1.00
Reach1	4999.999	25-yr	0.52	189.67	189.73	189.73	189.75	0.023523	0.61	0.92	24.74	0.96
Reach1	4999.999	50-yr	0.63	189.67	189.76	189.74	189.77	0.007959	0.47	1.62	40.78	0.60
Reach1	4999.999	100-yr	0.74	189.67	189.80	189.74	189.81	0.001266	0.27	3.84	52.17	0.26
Reach1	4999.999	PF 9	1.02	189.67	189.91	189.76	189.91	0.000183	0.16	10.13	69.04	0.11
Reach1	4900.587	CH	0.89	189.36	189.86	189.42	189.86	0.000001	0.02	68.19	223.25	0.01
Reach1	4900.587	Regional	1.02	189.36	189.91	189.42	189.91	0.000001	0.02	79.03	238.77	0.01
Reach1	4900.587	2-yr	0.28	189.36	189.60	189.39	189.60	0.000003	0.02	19.11	153.87	0.01
Reach1	4900.587	5-yr	0.36	189.36	189.64	189.40	189.64	0.000002	0.02	25.87	173.97	0.01
Reach1	4900.587	10-yr	0.41	189.36	189.67	189.40	189.67	0.000002	0.02	30.18	180.62	0.01
Reach1	4900.587	25-yr	0.52	189.36	189.72	189.41	189.72	0.000002	0.02	39.21	184.92	0.01
Reach1	4900.587	50-yr	0.63	189.36	189.76	189.41	189.76	0.000001	0.02	47.80	192.56	0.01
Reach1	4900.587	100-yr	0.74	189.36	189.81	189.41	189.81	0.000001	0.02	56.35	202.92	0.01
Reach1	4900.587	PF 9	1.02	189.36	189.91	189.42	189.91	0.000001	0.02	79.03	238.77	0.01
Reach1	4856.577	CH	0.89	189.31	189.86	189.38	189.86	0.000013	0.08	11.20	147.92	0.03
Reach1	4856.577	Regional	1.02	189.31	189.91	189.39	189.91	0.000013	0.08	12.19	150.69	0.04
Reach1	4856.577	2-yr	0.28	189.31	189.60	189.35	189.60	0.000012	0.05	5.76	119.32	0.03
Reach1	4856.577	5-yr	0.36	189.31	189.64	189.35	189.64	0.000012	0.05	6.63	125.12	0.03
Reach1	4856.577	10-yr	0.41	189.31	189.67	189.36	189.67	0.000012	0.06	7.14	126.73	0.03
Reach1	4856.577	25-yr	0.52	189.31	189.72	189.36	189.72	0.000013	0.06	8.17	132.15	0.03
Reach1	4856.577	50-yr	0.63	189.31	189.76	189.37	189.76	0.000013	0.07	9.13	134.21	0.03
Reach1	4856.577	100-yr	0.74	189.31	189.80	189.37	189.81	0.000013	0.07	10.04	138.39	0.03

HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	4856.577	PF 9	1.02	189.31	189.91	189.39	189.91	0.000013	0.08	12.19	150.69	0.04
Reach1	4846.378		Culvert									
Reach1	4835.945	CH	0.89	189.09	189.18	189.15	189.19	0.005165	0.45	2.04	119.04	0.50
Reach1	4835.945	Regional	1.02	189.09	189.18	189.15	189.20	0.004971	0.47	2.24	121.61	0.50
Reach1	4835.945	2-yr	0.28	189.09	189.14	189.12	189.14	0.004142	0.27	1.07	106.93	0.41
Reach1	4835.945	5-yr	0.36	189.09	189.15	189.12	189.15	0.003987	0.29	1.27	109.37	0.41
Reach1	4835.945	10-yr	0.41	189.09	189.15	189.13	189.15	0.004220	0.31	1.35	110.40	0.43
Reach1	4835.945	25-yr	0.52	189.09	189.16	189.13	189.16	0.004285	0.34	1.55	112.97	0.44
Reach1	4835.945	50-yr	0.63	189.09	189.16	189.14	189.17	0.004820	0.39	1.69	114.63	0.47
Reach1	4835.945	100-yr	0.74	189.09	189.17	189.14	189.18	0.004547	0.40	1.89	117.24	0.47
Reach1	4835.945	PF 9	1.02	189.09	189.18	189.15	189.20	0.004971	0.47	2.24	121.61	0.50
Reach1	4816.446	CH	0.89	188.90	189.00	189.00	189.02	0.015766	0.68	1.80	49.18	0.85
Reach1	4816.446	Regional	1.02	188.90	189.00	189.00	189.02	0.017482	0.73	1.95	50.83	0.90
Reach1	4816.446	2-yr	0.28	188.90	188.96	188.96	188.98	0.025638	0.55	0.52	17.54	0.96
Reach1	4816.446	5-yr	0.36	188.90	188.97	188.97	188.98	0.026461	0.59	0.64	22.26	0.99
Reach1	4816.446	10-yr	0.41	188.90	188.97	188.97	188.99	0.022028	0.57	0.78	27.42	0.92
Reach1	4816.446	25-yr	0.52	188.90	188.98	188.98	189.00	0.021872	0.62	0.95	32.46	0.94
Reach1	4816.446	50-yr	0.63	188.90	188.99	188.99	189.00	0.016830	0.61	1.28	42.29	0.85
Reach1	4816.446	100-yr	0.74	188.90	188.99	188.99	189.01	0.019016	0.68	1.40	44.00	0.91
Reach1	4816.446	PF 9	1.02	188.90	189.00	189.00	189.02	0.017482	0.73	1.95	50.83	0.90
Reach1	4600	CH	0.89	187.56	187.83		187.83	0.001184	0.35	2.76	20.98	0.27
Reach1	4600	Regional	1.02	187.56	187.84		187.84	0.001219	0.37	3.02	21.89	0.28
Reach1	4600	2-yr	0.28	187.56	187.74		187.74	0.001175	0.23	1.22	13.84	0.24
Reach1	4600	5-yr	0.36	187.56	187.76		187.76	0.000959	0.23	1.58	15.94	0.23
Reach1	4600	10-yr	0.41	187.56	187.77		187.77	0.001008	0.24	1.72	16.63	0.23
Reach1	4600	25-yr	0.52	187.56	187.79		187.79	0.001038	0.27	1.98	17.90	0.24
Reach1	4600	50-yr	0.63	187.56	187.80		187.80	0.001091	0.29	2.22	18.97	0.25
Reach1	4600	100-yr	0.74	187.56	187.81		187.82	0.001118	0.32	2.47	19.92	0.26
Reach1	4600	PF 9	1.02	187.56	187.84		187.84	0.001219	0.37	3.02	21.89	0.28
Reach1	4500	CH	0.89	187.38	187.55	187.53	187.57	0.009351	0.71	1.36	16.62	0.71
Reach1	4500	Regional	1.02	187.38	187.56	187.54	187.58	0.008850	0.74	1.54	17.60	0.70
Reach1	4500	2-yr	0.28	187.38	187.50	187.48	187.51	0.006797	0.43	0.66	11.61	0.55
Reach1	4500	5-yr	0.36	187.38	187.49	187.48	187.51	0.017708	0.64	0.56	10.74	0.87
Reach1	4500	10-yr	0.41	187.38	187.50	187.49	187.52	0.015304	0.64	0.65	11.51	0.83
Reach1	4500	25-yr	0.52	187.38	187.51	187.50	187.53	0.014172	0.67	0.80	12.81	0.81

HEC-RAS Plan: Proposed River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	4500	50-yr	0.63	187.38	187.52	187.51	187.55	0.011470	0.67	0.99	14.34	0.75
Reach1	4500	100-yr	0.74	187.38	187.53	187.52	187.56	0.010471	0.69	1.14	15.33	0.73
Reach1	4500	PF 9	1.02	187.38	187.56	187.54	187.58	0.008850	0.74	1.54	17.60	0.70
Reach1	4400	CH	0.89	186.93	187.22	187.12	187.23	0.001715	0.46	2.14	14.88	0.34
Reach1	4400	Regional	1.02	186.93	187.23	187.13	187.25	0.001747	0.49	2.36	15.61	0.34
Reach1	4400	2-yr	0.28	186.93	187.11		187.12	0.002485	0.33	0.84	9.46	0.35
Reach1	4400	5-yr	0.36	186.93	187.15		187.15	0.001462	0.31	1.18	11.15	0.29
Reach1	4400	10-yr	0.41	186.93	187.15	187.07	187.16	0.001531	0.33	1.27	11.55	0.30
Reach1	4400	25-yr	0.52	186.93	187.17	187.09	187.18	0.001531	0.36	1.50	12.51	0.30
Reach1	4400	50-yr	0.63	186.93	187.19	187.10	187.20	0.001627	0.40	1.69	13.25	0.32
Reach1	4400	100-yr	0.74	186.93	187.20	187.11	187.21	0.001667	0.43	1.88	13.98	0.32
Reach1	4400	PF 9	1.02	186.93	187.23	187.13	187.25	0.001747	0.49	2.36	15.61	0.34
Reach1	4300	CH	0.89	186.67	186.77	186.77	186.80	0.020728	0.87	1.28	19.53	1.00
Reach1	4300	Regional	1.02	186.67	186.78	186.78	186.81	0.020729	0.92	1.40	19.84	1.01
Reach1	4300	2-yr	0.28	186.67	186.75	186.73	186.76	0.005455	0.37	0.92	18.63	0.49
Reach1	4300	5-yr	0.36	186.67	186.74	186.74	186.76	0.026727	0.67	0.64	17.86	1.03
Reach1	4300	10-yr	0.41	186.67	186.74	186.74	186.76	0.022878	0.67	0.74	18.12	0.97
Reach1	4300	25-yr	0.52	186.67	186.75	186.75	186.77	0.025482	0.76	0.83	18.39	1.04
Reach1	4300	50-yr	0.63	186.67	186.76	186.76	186.78	0.021672	0.77	1.00	18.83	0.99
Reach1	4300	100-yr	0.74	186.67	186.76	186.76	186.79	0.021263	0.82	1.12	19.14	0.99
Reach1	4300	PF 9	1.02	186.67	186.78	186.78	186.81	0.020729	0.92	1.40	19.84	1.01
Reach1	4200.484	CH	0.89	186.13	186.51		186.51	0.000078	0.13	12.53	55.30	0.08
Reach1	4200.484	Regional	1.02	186.13	186.51		186.51	0.000108	0.15	12.31	55.01	0.09
Reach1	4200.484	2-yr	0.28	186.13	186.23		186.24	0.005131	0.34	1.24	20.24	0.47
Reach1	4200.484	5-yr	0.36	186.13	186.28		186.28	0.001614	0.24	2.27	27.14	0.28
Reach1	4200.484	10-yr	0.41	186.13	186.30		186.30	0.000963	0.21	3.03	31.70	0.22
Reach1	4200.484	25-yr	0.52	186.13	186.34		186.34	0.000657	0.20	4.16	37.69	0.19
Reach1	4200.484	50-yr	0.63	186.13	186.36		186.36	0.000536	0.20	5.09	40.65	0.18
Reach1	4200.484	100-yr	0.74	186.13	186.38		186.38	0.000479	0.21	5.91	43.04	0.17
Reach1	4200.484	PF 9	1.02	186.13	186.41		186.41	0.000504	0.24	7.23	46.11	0.18
Reach1	4100	CH	9.86	185.82	186.23		186.26	0.002434	0.90	19.62	74.22	0.45
Reach1	4100	Regional	9.74	185.82	186.24		186.27	0.002171	0.86	20.30	75.24	0.43
Reach1	4100	2-yr	1.02	185.82	185.99		185.99	0.000957	0.30	4.97	44.22	0.24
Reach1	4100	5-yr	1.85	185.82	186.04		186.04	0.001125	0.39	7.36	51.70	0.27
Reach1	4100	10-yr	2.46	185.82	186.07		186.08	0.001176	0.44	8.98	55.34	0.29
Reach1	4100	25-yr	3.30	185.82	186.10		186.11	0.001264	0.50	10.91	58.94	0.30

HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	4100	50-yr	3.98	185.82	186.13		186.14	0.001314	0.54	12.38	61.56	0.32
Reach1	4100	100-yr	4.63	185.82	186.15		186.16	0.001316	0.57	13.89	64.38	0.32
Reach1	4100	PF 9	5.40	185.82	186.17		186.19	0.001393	0.61	15.31	67.22	0.33
Reach1	3999.999	CH	9.86	185.63	185.91		185.93	0.004572	0.92	20.17	111.60	0.58
Reach1	3999.999	Regional	9.74	185.63	185.89		185.92	0.006418	1.03	17.76	109.54	0.67
Reach1	3999.999	2-yr	1.02	185.63	185.70	185.70	185.73	0.021959	0.73	1.89	45.20	0.98
Reach1	3999.999	5-yr	1.85	185.63	185.73	185.73	185.76	0.016685	0.83	3.36	59.77	0.91
Reach1	3999.999	10-yr	2.46	185.63	185.74	185.74	185.78	0.017448	0.93	4.15	66.72	0.95
Reach1	3999.999	25-yr	3.30	185.63	185.76	185.76	185.80	0.016712	1.02	5.33	73.57	0.96
Reach1	3999.999	50-yr	3.98	185.63	185.77	185.77	185.81	0.016156	1.07	6.26	78.26	0.96
Reach1	3999.999	100-yr	4.63	185.63	185.78	185.78	185.83	0.019261	1.19	6.58	79.81	1.05
Reach1	3999.999	PF 9	5.40	185.63	185.79	185.79	185.84	0.017056	1.21	7.89	91.07	1.01
Reach1	3899.999	CH	9.86	185.10	185.44		185.48	0.004496	1.05	14.86	63.89	0.59
Reach1	3899.999	Regional	9.74	185.10	185.48		185.51	0.002881	0.90	17.39	68.18	0.48
Reach1	3899.999	2-yr	1.02	185.10	185.23		185.24	0.001813	0.34	4.09	40.86	0.32
Reach1	3899.999	5-yr	1.85	185.10	185.28		185.29	0.001714	0.42	6.29	46.92	0.33
Reach1	3899.999	10-yr	2.46	185.10	185.32		185.32	0.001617	0.45	7.85	50.50	0.33
Reach1	3899.999	25-yr	3.30	185.10	185.35		185.36	0.001628	0.51	9.66	54.12	0.34
Reach1	3899.999	50-yr	3.98	185.10	185.38		185.39	0.001616	0.54	11.09	56.87	0.34
Reach1	3899.999	100-yr	4.63	185.10	185.39		185.41	0.001706	0.58	12.15	58.92	0.35
Reach1	3899.999	PF 9	5.40	185.10	185.42		185.43	0.001753	0.62	13.47	61.40	0.36
Reach1	3799.999	CH	10.18	184.70	185.28		185.29	0.000965	0.64	30.59	103.32	0.29
Reach1	3799.999	Regional	9.74	184.70	185.12		185.16	0.004233	1.04	16.45	78.32	0.58
Reach1	3799.999	2-yr	1.02	184.70	184.87	184.85	184.89	0.009197	0.62	2.06	31.96	0.68
Reach1	3799.999	5-yr	1.85	184.70	184.90	184.89	184.93	0.012094	0.83	2.97	38.48	0.81
Reach1	3799.999	10-yr	2.46	184.70	184.91	184.91	184.95	0.015197	0.99	3.38	39.72	0.92
Reach1	3799.999	25-yr	3.30	184.70	184.93	184.93	184.98	0.016295	1.13	4.08	41.57	0.97
Reach1	3799.999	50-yr	3.98	184.70	184.94	184.94	185.00	0.017513	1.23	4.56	42.84	1.02
Reach1	3799.999	100-yr	4.63	184.70	184.96	184.96	185.02	0.014966	1.23	5.45	54.06	0.97
Reach1	3799.999	PF 9	5.40	184.70	184.97	184.97	185.04	0.014320	1.28	6.32	57.01	0.96
Reach1	3734.349	CH	10.18	184.29	185.26		185.27	0.000170	0.37	56.83	137.48	0.13
Reach1	3734.349	Regional	9.74	184.29	185.08		185.09	0.000447	0.50	35.51	97.16	0.21
Reach1	3734.349	2-yr	1.02	184.29	184.60		184.61	0.002412	0.42	2.94	37.18	0.37
Reach1	3734.349	5-yr	1.85	184.29	184.66		184.67	0.001857	0.45	5.48	45.05	0.34
Reach1	3734.349	10-yr	2.46	184.29	184.71		184.72	0.001365	0.45	7.66	50.71	0.31
Reach1	3734.349	25-yr	3.30	184.29	184.77		184.78	0.000944	0.44	11.12	59.44	0.27

HEC-RAS Plan: Proposed River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	3734.349	50-yr	3.98	184.29	184.83		184.83	0.000697	0.43	14.56	67.01	0.23
Reach1	3734.349	100-yr	4.63	184.29	184.87		184.87	0.000602	0.43	17.42	72.71	0.22
Reach1	3734.349	PF 9	5.40	184.29	184.90		184.91	0.000574	0.44	20.11	77.69	0.22
Reach1	3625.504	CH	10.18	183.81	185.18	184.75	185.23	0.001217	1.01	10.07	220.95	0.35
Reach1	3625.504	Regional	9.74	183.81	184.74	184.74	184.94	0.012689	2.01	4.86	82.26	1.00
Reach1	3625.504	2-yr	1.02	183.81	184.09	184.06	184.17	0.010779	1.31	0.78	3.11	0.84
Reach1	3625.504	5-yr	1.85	183.81	184.26	184.17	184.36	0.006901	1.38	1.34	3.49	0.71
Reach1	3625.504	10-yr	2.46	183.81	184.37	184.24	184.47	0.005720	1.41	1.74	3.73	0.66
Reach1	3625.504	25-yr	3.30	183.81	184.42	184.33	184.57	0.007662	1.71	1.93	3.84	0.77
Reach1	3625.504	50-yr	3.98	183.81	184.39	184.39	184.63	0.013240	2.19	1.82	3.78	1.01
Reach1	3625.504	100-yr	4.63	183.81	184.58	184.58	184.70	0.014721	1.56	2.97	53.68	1.00
Reach1	3625.504	PF 9	5.40	183.81	184.61	184.61	184.74	0.014271	1.64	3.29	59.87	1.00
Reach1	3615.502		Culvert									
Reach1	3602.958	CH	10.18	183.68	185.15	184.68	185.19	0.000993	0.94	10.84	407.14	0.32
Reach1	3602.958	Regional	9.74	183.68	184.66	184.66	184.86	0.012667	1.98	4.92	156.04	1.00
Reach1	3602.958	2-yr	1.02	183.68	184.08	184.01	184.17	0.008437	1.33	0.77	2.37	0.75
Reach1	3602.958	5-yr	1.85	183.68	184.17	184.15	184.35	0.012670	1.83	1.01	2.59	0.93
Reach1	3602.958	10-yr	2.46	183.68	184.24	184.24	184.46	0.014208	2.07	1.19	2.74	1.00
Reach1	3602.958	25-yr	3.30	183.68	184.46	184.46	184.56	0.016117	1.38	2.39	114.16	1.00
Reach1	3602.958	50-yr	3.98	183.68	184.48	184.48	184.59	0.015942	1.48	2.68	123.79	1.01
Reach1	3602.958	100-yr	4.63	183.68	184.51	184.51	184.63	0.015099	1.55	2.99	129.68	1.00
Reach1	3602.958	PF 9	5.40	183.68	184.53	184.53	184.67	0.014480	1.63	3.32	137.52	1.00
Reach1	3499.999	CH	17.44	183.55	185.15	184.11	185.15	0.000032	0.22	103.60	95.28	0.06
Reach1	3499.999	Regional	9.74	183.55	184.45	184.03	184.45	0.000198	0.32	37.29	93.02	0.14
Reach1	3499.999	2-yr	1.02	183.55	183.81	183.72	183.83	0.002713	0.48	2.13	14.66	0.40
Reach1	3499.999	5-yr	1.85	183.55	183.89	183.77	183.90	0.002728	0.52	3.59	23.62	0.41
Reach1	3499.999	10-yr	2.46	183.55	183.93	183.81	183.95	0.002348	0.54	4.66	26.30	0.39
Reach1	3499.999	25-yr	3.30	183.55	183.99	183.85	184.01	0.001870	0.55	6.29	29.93	0.36
Reach1	3499.999	50-yr	3.98	183.55	184.05	183.88	184.06	0.002022	0.46	9.00	54.71	0.36
Reach1	3499.999	100-yr	4.63	183.55	184.09	183.89	184.10	0.001239	0.42	11.54	56.50	0.29
Reach1	3499.999	PF 9	5.40	183.55	184.15	183.91	184.15	0.000813	0.40	14.60	59.45	0.24
Reach1	3464.449	CH	17.44	183.43	185.15	183.96	185.15	0.000038	0.27	95.91	76.62	0.07
Reach1	3464.449	Regional	9.74	183.43	184.43	183.84	184.44	0.000130	0.33	42.20	74.25	0.12
Reach1	3464.449	2-yr	1.02	183.43	183.70	183.59	183.71	0.001327	0.34	3.02	20.57	0.28
Reach1	3464.449	5-yr	1.85	183.43	183.80	183.63	183.81	0.000883	0.34	5.41	26.73	0.24

HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	3464.449	10-yr	2.46	183.43	183.86	183.66	183.87	0.000676	0.34	7.29	33.31	0.22
Reach1	3464.449	25-yr	3.30	183.43	183.94	183.69	183.95	0.000486	0.35	10.13	40.04	0.19
Reach1	3464.449	50-yr	3.98	183.43	184.00	183.71	184.01	0.000392	0.35	12.63	43.89	0.18
Reach1	3464.449	100-yr	4.63	183.43	184.06	183.73	184.06	0.000328	0.35	15.30	53.63	0.17
Reach1	3464.449	PF 9	5.40	183.43	184.12	183.75	184.12	0.000282	0.35	18.88	69.30	0.16
Reach1	3428.899	CH	17.44	183.30	185.08	184.22	185.14	0.000649	1.16	19.06	101.40	0.29
Reach1	3428.899	Regional	9.74	183.30	184.34	184.00	184.42	0.001745	1.27	9.27	33.99	0.43
Reach1	3428.899	2-yr	1.02	183.30	183.58	183.47	183.61	0.003334	0.75	1.36	5.48	0.48
Reach1	3428.899	5-yr	1.85	183.30	183.68	183.55	183.73	0.003736	0.95	1.94	5.89	0.53
Reach1	3428.899	10-yr	2.46	183.30	183.74	183.60	183.80	0.003941	1.07	2.31	6.14	0.56
Reach1	3428.899	25-yr	3.30	183.30	183.82	183.67	183.89	0.004420	1.14	3.01	32.16	0.59
Reach1	3428.899	50-yr	3.98	183.30	183.89	183.71	183.96	0.003450	1.13	3.85	32.42	0.54
Reach1	3428.899	100-yr	4.63	183.30	183.96	183.75	184.02	0.002894	1.13	4.60	32.64	0.50
Reach1	3428.899	PF 9	5.40	183.30	184.02	183.82	184.09	0.002615	1.16	5.34	32.86	0.49
Reach1	3424.759		Culvert									
Reach1	3399.999	CH	17.44	183.26	184.16	184.16	184.47	0.009516	2.58	8.07	25.90	0.97
Reach1	3399.999	Regional	9.74	183.26	183.96	183.96	184.17	0.009931	2.11	5.35	22.41	0.94
Reach1	3399.999	2-yr	1.02	183.26	183.52	183.43	183.55	0.004285	0.81	1.25	5.36	0.54
Reach1	3399.999	5-yr	1.85	183.26	183.59	183.51	183.65	0.006473	1.15	1.62	5.64	0.68
Reach1	3399.999	10-yr	2.46	183.26	183.62	183.57	183.71	0.008211	1.36	1.80	5.78	0.78
Reach1	3399.999	25-yr	3.30	183.26	183.63	183.63	183.79	0.013092	1.76	1.88	5.83	0.99
Reach1	3399.999	50-yr	3.98	183.26	183.68	183.68	183.85	0.012924	1.86	2.14	6.02	1.00
Reach1	3399.999	100-yr	4.63	183.26	183.73	183.73	183.91	0.012822	1.88	2.47	6.82	1.00
Reach1	3399.999	PF 9	5.40	183.26	183.80	183.80	183.96	0.011049	1.75	3.29	20.81	0.93
Reach1	3299.999	CH	17.81	183.20	183.88		183.90	0.000640	0.58	43.79	123.01	0.24
Reach1	3299.999	Regional	9.74	183.20	183.78		183.79	0.000400	0.40	32.39	106.15	0.19
Reach1	3299.999	2-yr	1.02	183.20	183.47		183.47	0.000227	0.14	7.48	55.75	0.12
Reach1	3299.999	5-yr	1.85	183.20	183.58		183.58	0.000115	0.15	14.31	68.68	0.09
Reach1	3299.999	10-yr	2.46	183.20	183.62		183.62	0.000117	0.16	17.53	76.18	0.09
Reach1	3299.999	25-yr	3.30	183.20	183.65		183.65	0.000165	0.20	19.30	81.96	0.11
Reach1	3299.999	50-yr	3.98	183.20	183.68		183.68	0.000171	0.22	22.15	90.71	0.12
Reach1	3299.999	100-yr	4.63	183.20	183.70		183.70	0.000190	0.24	24.00	94.07	0.12
Reach1	3299.999	PF 9	5.40	183.20	183.71		183.71	0.000234	0.27	24.99	95.94	0.14
Reach1	3199.999	CH	17.81	183.28	183.81	183.60	183.82	0.001511	0.80	46.03	151.19	0.37
Reach1	3199.999	Regional	9.74	183.28	183.74	183.54	183.75	0.000847	0.54	36.24	137.48	0.27

HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	3199.999	2-yr	1.02	183.28	183.39	183.39	183.41	0.017494	0.73	1.70	45.58	0.90
Reach1	3199.999	5-yr	1.85	183.28	183.56	183.41	183.57	0.000287	0.22	15.48	102.69	0.14
Reach1	3199.999	10-yr	2.46	183.28	183.61	183.43	183.61	0.000246	0.23	20.37	111.34	0.14
Reach1	3199.999	25-yr	3.30	183.28	183.63	183.44	183.63	0.000348	0.28	22.33	115.09	0.16
Reach1	3199.999	50-yr	3.98	183.28	183.66	183.46	183.66	0.000332	0.30	26.22	122.20	0.16
Reach1	3199.999	100-yr	4.63	183.28	183.68	183.47	183.68	0.000361	0.32	28.48	125.80	0.17
Reach1	3199.999	PF 9	5.40	183.28	183.68	183.48	183.69	0.000461	0.37	29.17	126.75	0.19
Reach1	3143.616	CH	17.81	182.99	183.79	183.36	183.80	0.000152	0.34	112.44	229.88	0.12
Reach1	3143.616	Regional	9.74	182.99	183.73	183.29	183.73	0.000067	0.21	98.56	224.54	0.08
Reach1	3143.616	2-yr	1.02	182.99	183.37	183.10	183.37	0.000026	0.08	26.23	168.78	0.04
Reach1	3143.616	5-yr	1.85	182.99	183.56	183.14	183.56	0.000009	0.06	61.60	207.48	0.03
Reach1	3143.616	10-yr	2.46	182.99	183.61	183.16	183.61	0.000011	0.07	71.39	217.66	0.03
Reach1	3143.616	25-yr	3.30	182.99	183.63	183.18	183.63	0.000017	0.09	75.06	218.60	0.04
Reach1	3143.616	50-yr	3.98	182.99	183.66	183.19	183.66	0.000019	0.10	82.22	220.43	0.04
Reach1	3143.616	100-yr	4.63	182.99	183.68	183.22	183.68	0.000022	0.11	86.18	221.43	0.05
Reach1	3143.616	PF 9	5.40	182.99	183.68	183.23	183.68	0.000029	0.13	87.27	221.71	0.05
Reach1	3071.819	CH	18.21	182.93	183.79	183.57	183.79	0.000269	0.28	96.36	247.60	0.15
Reach1	3071.819	Regional	9.74	182.93	183.73	183.33	183.73	0.000129	0.17	82.24	243.39	0.10
Reach1	3071.819	2-yr	1.02	182.93	183.37	183.06	183.37	0.000097	0.16	6.31	84.28	0.09
Reach1	3071.819	5-yr	1.85	182.93	183.56	183.10	183.56	0.000157	0.16	12.14	188.54	0.10
Reach1	3071.819	10-yr	2.46	182.93	183.61	183.12	183.61	0.000042	0.08	41.64	206.68	0.05
Reach1	3071.819	25-yr	3.30	182.93	183.63	183.15	183.63	0.000065	0.09	44.26	216.32	0.07
Reach1	3071.819	50-yr	3.98	182.93	183.66	183.18	183.66	0.000066	0.10	49.62	221.94	0.07
Reach1	3071.819	100-yr	4.63	182.93	183.68	183.20	183.68	0.000073	0.11	52.56	224.70	0.07
Reach1	3071.819	PF 9	5.40	182.93	183.68	183.22	183.68	0.000094	0.13	53.29	225.44	0.08
Reach1	3059.960		Culvert									
Reach1	3044.762	CH	18.21	182.84	183.37	183.24	183.46	0.004279	1.30	14.02	187.05	0.61
Reach1	3044.762	Regional	9.74	182.84	183.23	183.13	183.28	0.003990	0.99	9.83	162.40	0.56
Reach1	3044.762	2-yr	1.02	182.84	182.98	182.95	182.99	0.005686	0.46	2.22	57.62	0.52
Reach1	3044.762	5-yr	1.85	182.84	183.02	182.98	183.03	0.005333	0.56	3.33	68.94	0.54
Reach1	3044.762	10-yr	2.46	182.84	183.04	183.00	183.06	0.004784	0.60	4.08	79.95	0.53
Reach1	3044.762	25-yr	3.30	182.84	183.07	183.02	183.09	0.004686	0.67	4.90	105.55	0.54
Reach1	3044.762	50-yr	3.98	182.84	183.09	183.03	183.12	0.004546	0.72	5.53	118.34	0.54
Reach1	3044.762	100-yr	4.63	182.84	183.11	183.04	183.14	0.004395	0.76	6.11	129.41	0.54
Reach1	3044.762	PF 9	5.40	182.84	183.13	183.06	183.16	0.004248	0.80	6.77	134.93	0.54

HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	1921.497		Culvert									
Reach1	1906.334	CH	20.34	179.74	181.36	180.85	181.36	0.000019	0.14	274.65	323.81	0.05
Reach1	1906.334	Regional	9.74	179.74	181.35	180.66	181.35	0.000004	0.07	273.21	323.35	0.02
Reach1	1906.334	2-yr	1.02	179.74	180.15	180.11	180.21	0.009715	1.13	0.91	64.93	0.80
Reach1	1906.334	5-yr	1.85	179.74	180.21	180.21	180.33	0.014663	1.52	1.21	84.35	1.00
Reach1	1906.334	10-yr	2.46	179.74	180.27	180.27	180.40	0.013715	1.60	1.54	96.02	0.99
Reach1	1906.334	25-yr	3.30	179.74	180.34	180.34	180.49	0.013576	1.71	1.93	111.38	1.00
Reach1	1906.334	50-yr	3.98	179.74	180.46	180.38	180.56	0.007050	1.40	2.84	147.60	0.75
Reach1	1906.334	100-yr	4.63	179.74	181.19	180.42	181.19	0.000094	0.28	16.56	284.10	0.10
Reach1	1906.334	PF 9	5.40	179.74	181.35	180.47	181.35	0.000001	0.04	272.95	323.26	0.01
Reach1	1885.931	CH	20.34	179.74	181.36		181.36	0.000009	0.11	447.70	585.84	0.03
Reach1	1885.931	Regional	9.74	179.74	181.35		181.35	0.000002	0.05	445.19	585.38	0.02
Reach1	1885.931	2-yr	1.02	179.74	180.04		180.04	0.004209	0.60	3.60	38.39	0.50
Reach1	1885.931	5-yr	1.85	179.74	180.11		180.12	0.003131	0.60	7.62	76.93	0.45
Reach1	1885.931	10-yr	2.46	179.74	180.16		180.16	0.001933	0.50	11.39	87.96	0.36
Reach1	1885.931	25-yr	3.30	179.74	180.21		180.21	0.001448	0.43	15.80	98.30	0.31
Reach1	1885.931	50-yr	3.98	179.74	180.48		180.48	0.000065	0.13	62.47	255.86	0.07
Reach1	1885.931	100-yr	4.63	179.74	181.19		181.19	0.000001	0.03	352.65	533.75	0.01
Reach1	1885.931	PF 9	5.40	179.74	181.35		181.35	0.000001	0.03	444.73	585.30	0.01
Reach1	1799.999	CH	20.83	179.48	181.36		181.36	0.000005	0.09	597.42	707.95	0.02
Reach1	1799.999	Regional	9.74	179.48	181.35		181.35	0.000001	0.04	594.67	707.42	0.01
Reach1	1799.999	2-yr	1.02	179.48	179.99		179.99	0.000226	0.20	12.53	92.07	0.13
Reach1	1799.999	5-yr	1.85	179.48	180.07		180.07	0.000190	0.21	21.26	112.53	0.12
Reach1	1799.999	10-yr	2.46	179.48	180.12		180.12	0.000189	0.18	27.08	125.78	0.11
Reach1	1799.999	25-yr	3.30	179.48	180.17		180.17	0.000206	0.16	33.36	144.51	0.12
Reach1	1799.999	50-yr	3.98	179.48	180.48		180.48	0.000016	0.07	113.06	372.78	0.04
Reach1	1799.999	100-yr	4.63	179.48	181.19		181.19	0.000000	0.02	485.26	649.75	0.01
Reach1	1799.999	PF 9	5.40	179.48	181.35		181.35	0.000000	0.02	594.18	707.32	0.01
Reach1	1699.999	CH	20.83	179.32	181.35		181.35	0.000016	0.17	499.78	664.39	0.05
Reach1	1699.999	Regional	9.74	179.32	181.35		181.35	0.000004	0.08	497.78	664.11	0.02
Reach1	1699.999	2-yr	1.02	179.32	179.93		179.94	0.001695	0.41	3.79	48.28	0.32
Reach1	1699.999	5-yr	1.85	179.32	180.03		180.04	0.000921	0.41	9.44	68.38	0.26
Reach1	1699.999	10-yr	2.46	179.32	180.08		180.09	0.000789	0.42	13.25	80.10	0.24
Reach1	1699.999	25-yr	3.30	179.32	180.13		180.13	0.000838	0.47	16.89	91.40	0.26
Reach1	1699.999	50-yr	3.98	179.32	180.47		180.47	0.000052	0.16	70.81	197.31	0.07
Reach1	1699.999	100-yr	4.63	179.32	181.19		181.19	0.000002	0.05	391.65	649.09	0.01

HEC-RAS Plan: Proposed River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	1699.999	PF 9	5.40	179.32	181.35		181.35	0.000001	0.04	497.45	664.06	0.01
Reach1	1600	CH	22.58	179.20	181.35		181.35	0.000019	0.18	457.03	562.04	0.05
Reach1	1600	Regional	9.74	179.20	181.35		181.35	0.000003	0.08	456.08	561.75	0.02
Reach1	1600	2-yr	1.02	179.20	179.86	179.63	179.87	0.000475	0.33	9.89	65.24	0.19
Reach1	1600	5-yr	1.85	179.20	179.98		179.98	0.000436	0.24	18.93	87.13	0.17
Reach1	1600	10-yr	2.46	179.20	180.04		180.04	0.000414	0.21	24.38	105.03	0.16
Reach1	1600	25-yr	3.30	179.20	180.08		180.08	0.000457	0.23	28.68	112.74	0.17
Reach1	1600	50-yr	3.98	179.20	180.47		180.47	0.000024	0.11	95.62	241.56	0.05
Reach1	1600	100-yr	4.63	179.20	181.19		181.19	0.000001	0.04	372.38	499.77	0.01
Reach1	1600	PF 9	5.40	179.20	181.35		181.35	0.000001	0.04	455.90	561.69	0.01
Reach1	1500	CH	22.58	179.24	181.35		181.35	0.000012	0.15	595.72	666.81	0.04
Reach1	1500	Regional	9.74	179.24	181.35		181.35	0.000002	0.07	595.20	666.74	0.02
Reach1	1500	2-yr	1.02	179.24	179.63	179.63	179.72	0.016032	1.38	0.74	3.84	1.01
Reach1	1500	5-yr	1.85	179.24	179.74	179.74	179.85	0.015335	1.48	1.25	5.75	1.01
Reach1	1500	10-yr	2.46	179.24	179.79	179.79	179.91	0.015736	1.53	1.61	7.11	1.03
Reach1	1500	25-yr	3.30	179.24	179.92	179.92	179.96	0.010605	0.96	6.46	88.11	0.79
Reach1	1500	50-yr	3.98	179.24	180.47		180.47	0.000016	0.10	127.49	318.06	0.04
Reach1	1500	100-yr	4.63	179.24	181.19		181.19	0.000001	0.04	488.79	652.10	0.01
Reach1	1500	PF 9	5.40	179.24	181.35		181.35	0.000001	0.04	595.10	666.73	0.01
Reach1	1400	CH	22.58	179.13	181.35		181.35	0.000005	0.12	803.24	720.74	0.03
Reach1	1400	Regional	9.74	179.13	181.35		181.35	0.000001	0.05	803.06	720.63	0.01
Reach1	1400	2-yr	1.02	179.13	179.56		179.56	0.000069	0.13	12.03	57.28	0.07
Reach1	1400	5-yr	1.85	179.13	179.63		179.63	0.000121	0.20	15.78	64.40	0.10
Reach1	1400	10-yr	2.46	179.13	179.84		179.84	0.000041	0.15	42.66	227.14	0.06
Reach1	1400	25-yr	3.30	179.13	179.86		179.86	0.000064	0.20	46.62	233.33	0.08
Reach1	1400	50-yr	3.98	179.13	180.47		180.47	0.000002	0.06	269.12	465.66	0.02
Reach1	1400	100-yr	4.63	179.13	181.19		181.19	0.000000	0.03	690.60	686.11	0.01
Reach1	1400	PF 9	5.40	179.13	181.35		181.35	0.000000	0.03	803.00	720.60	0.01
Reach1	1323.669	CH	22.58	179.01	181.35		181.35	0.000004	0.10	931.09	879.14	0.02
Reach1	1323.669	Regional	9.74	179.01	181.35		181.35	0.000001	0.04	931.04	879.13	0.01
Reach1	1323.669	2-yr	1.02	179.01	179.55		179.55	0.000386	0.23	6.41	89.14	0.16
Reach1	1323.669	5-yr	1.85	179.01	179.61		179.61	0.000471	0.29	13.56	140.07	0.18
Reach1	1323.669	10-yr	2.46	179.01	179.84		179.84	0.000041	0.13	55.46	205.79	0.06
Reach1	1323.669	25-yr	3.30	179.01	179.85		179.85	0.000064	0.17	58.74	208.32	0.08
Reach1	1323.669	50-yr	3.98	179.01	180.47		180.47	0.000002	0.05	302.03	587.08	0.02
Reach1	1323.669	100-yr	4.63	179.01	181.19		181.19	0.000000	0.02	795.01	801.28	0.01

HEC-RAS Plan: Proposed River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	1323.669	PF 9	5.40	179.01	181.35		181.35	0.000000	0.02	931.01	879.13	0.01
Reach1	1193.845	CH	23.66	178.85	181.35		181.35	0.000004	0.10	1039.86	1015.37	0.02
Reach1	1193.845	Regional	23.66	178.85	181.35		181.35	0.000004	0.10	1039.86	1015.37	0.02
Reach1	1193.845	2-yr	2.01	178.85	179.20	179.20	179.29	0.016405	1.32	1.52	8.78	1.02
Reach1	1193.845	5-yr	3.73	178.85	179.51		179.52	0.000909	0.47	14.57	80.34	0.26
Reach1	1193.845	10-yr	5.03	178.85	179.83		179.83	0.000097	0.24	57.52	179.31	0.10
Reach1	1193.845	25-yr	6.84	178.85	179.84		179.84	0.000168	0.32	59.21	180.52	0.13
Reach1	1193.845	50-yr	8.34	178.85	180.47		180.47	0.000010	0.12	287.83	662.60	0.03
Reach1	1193.845	100-yr	9.79	178.85	181.19		181.19	0.000001	0.05	877.85	995.72	0.01
Reach1	1193.845	PF 9	23.66	178.85	181.35		181.35	0.000004	0.10	1039.86	1015.37	0.02
Reach1	1100	CH	23.66	178.25	181.35		181.35	0.000001	0.05	1295.30	1114.48	0.01
Reach1	1100	Regional	23.66	178.25	181.35		181.35	0.000001	0.05	1295.30	1114.48	0.01
Reach1	1100	2-yr	2.01	178.25	179.09		179.09	0.000073	0.17	20.01	102.58	0.08
Reach1	1100	5-yr	3.73	178.25	179.52		179.52	0.000008	0.09	102.63	254.06	0.03
Reach1	1100	10-yr	5.03	178.25	179.83		179.83	0.000003	0.07	189.31	326.90	0.02
Reach1	1100	25-yr	6.84	178.25	179.84		179.84	0.000006	0.09	192.51	340.19	0.03
Reach1	1100	50-yr	8.34	178.25	180.47		180.47	0.000001	0.05	471.65	574.92	0.01
Reach1	1100	100-yr	9.79	178.25	181.19		181.19	0.000000	0.03	1118.76	1080.94	0.01
Reach1	1100	PF 9	23.66	178.25	181.35		181.35	0.000001	0.05	1295.30	1114.48	0.01
Reach1	974.3741	CH	23.66	178.28	181.35		181.35	0.000002	0.09	940.96	978.97	0.02
Reach1	974.3741	Regional	23.66	178.28	181.35		181.35	0.000002	0.09	940.96	978.97	0.02
Reach1	974.3741	2-yr	2.01	178.28	179.08		179.08	0.000014	0.08	43.21	119.02	0.03
Reach1	974.3741	5-yr	3.73	178.28	179.52		179.52	0.000005	0.07	110.01	176.96	0.02
Reach1	974.3741	10-yr	5.03	178.28	179.83		179.83	0.000003	0.06	166.90	189.27	0.02
Reach1	974.3741	25-yr	6.84	178.28	179.84		179.84	0.000005	0.08	168.68	190.34	0.02
Reach1	974.3741	50-yr	8.34	178.28	180.47		180.47	0.000001	0.06	312.03	318.15	0.01
Reach1	974.3741	100-yr	9.79	178.28	181.19		181.19	0.000000	0.04	786.85	928.94	0.01
Reach1	974.3741	PF 9	23.66	178.28	181.35		181.35	0.000002	0.09	940.96	978.97	0.02
Reach1	960.8255	CH	23.66	178.28	181.35	179.64	181.35	0.000005	0.14	433.90	1129.82	0.03
Reach1	960.8255	Regional	23.66	178.28	181.35	179.64	181.35	0.000005	0.14	433.90	1129.82	0.03
Reach1	960.8255	2-yr	2.01	178.28	179.06	178.63	179.07	0.000470	0.55	3.63	154.12	0.22
Reach1	960.8255	5-yr	3.73	178.28	179.48	178.75	179.50	0.000317	0.63	5.92	199.97	0.19
Reach1	960.8255	10-yr	5.03	178.28	179.79	178.83	179.81	0.000253	0.66	7.58	248.81	0.18
Reach1	960.8255	25-yr	6.84	178.28	179.77	178.93	179.81	0.000494	0.92	7.45	244.41	0.25
Reach1	960.8255	50-yr	8.34	178.28	180.42	179.01	180.45	0.000203	0.76	10.95	447.04	0.17
Reach1	960.8255	100-yr	9.79	178.28	181.15	179.08	181.18	0.000100	0.66	14.90	1020.33	0.13

HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	960.8255	PF 9	23.66	178.28	181.35	179.64	181.35	0.000005	0.14	433.90	1129.82	0.03
Reach1	945.2227		Culvert									
Reach1	929.6181	CH	23.66	177.14	178.76	178.76	179.42	0.008395	3.61	6.55	97.84	1.00
Reach1	929.6181	Regional	23.66	177.14	178.76	178.76	179.42	0.008395	3.61	6.55	97.84	1.00
Reach1	929.6181	2-yr	2.01	177.14	178.37	177.66	178.38	0.000194	0.43	4.62	28.33	0.14
Reach1	929.6181	5-yr	3.73	177.14	178.47	177.81	178.50	0.000471	0.73	5.13	45.54	0.23
Reach1	929.6181	10-yr	5.03	177.14	178.52	177.90	178.56	0.000736	0.94	5.37	71.37	0.29
Reach1	929.6181	25-yr	6.84	177.14	178.57	178.01	178.64	0.001171	1.22	5.62	79.45	0.36
Reach1	929.6181	50-yr	8.34	177.14	178.60	178.09	178.71	0.001589	1.44	5.78	82.06	0.43
Reach1	929.6181	100-yr	9.79	177.14	178.63	178.17	178.77	0.002030	1.66	5.91	84.14	0.48
Reach1	929.6181	PF 9	23.66	177.14	178.76	178.76	179.42	0.008395	3.61	6.55	97.84	1.00
Reach1	908.9127	CH	23.66	177.14	178.84		178.85	0.001140	0.83	60.30	167.88	0.33
Reach1	908.9127	Regional	23.66	177.14	178.84		178.85	0.001140	0.83	60.30	167.88	0.33
Reach1	908.9127	2-yr	2.01	177.14	178.36		178.37	0.000998	0.47	4.88	37.17	0.27
Reach1	908.9127	5-yr	3.73	177.14	178.46		178.47	0.001213	0.54	11.29	88.82	0.30
Reach1	908.9127	10-yr	5.03	177.14	178.50		178.52	0.001250	0.56	15.77	99.76	0.31
Reach1	908.9127	25-yr	6.84	177.14	178.56		178.57	0.001231	0.59	21.18	111.02	0.31
Reach1	908.9127	50-yr	8.34	177.14	178.59		178.60	0.001233	0.63	25.04	118.98	0.32
Reach1	908.9127	100-yr	9.79	177.14	178.62		178.63	0.001213	0.66	28.72	124.44	0.32
Reach1	908.9127	PF 9	23.66	177.14	178.83		178.85	0.001144	0.83	60.21	167.80	0.33
Reach1	800	CH	23.66	177.14	178.71		178.73	0.001287	0.82	60.60	169.63	0.34
Reach1	800	Regional	23.66	177.14	178.71		178.73	0.001287	0.82	60.60	169.63	0.34
Reach1	800	2-yr	2.01	177.14	178.09		178.13	0.007313	0.88	2.32	15.31	0.67
Reach1	800	5-yr	3.73	177.14	178.22		178.26	0.003315	0.85	5.87	46.54	0.49
Reach1	800	10-yr	5.03	177.14	178.28		178.32	0.002886	0.88	8.97	61.03	0.47
Reach1	800	25-yr	6.84	177.14	178.35		178.38	0.002446	0.91	13.75	81.16	0.45
Reach1	800	50-yr	8.34	177.14	178.40		178.43	0.002148	0.91	18.13	96.42	0.42
Reach1	800	100-yr	9.79	177.14	178.45		178.48	0.001767	0.87	23.57	113.13	0.39
Reach1	800	PF 9	23.66	177.14	178.71		178.72	0.001316	0.83	60.08	169.00	0.35
Reach1	699.9999	CH	23.66	177.14	178.54		178.59	0.001515	1.10	43.74	160.56	0.40
Reach1	699.9999	Regional	23.66	177.14	178.54		178.59	0.001515	1.10	43.74	160.56	0.40
Reach1	699.9999	2-yr	2.01	177.14	177.82		177.84	0.001508	0.63	3.17	9.12	0.34
Reach1	699.9999	5-yr	3.73	177.14	177.98		178.00	0.002029	0.72	5.32	19.46	0.40
Reach1	699.9999	10-yr	5.03	177.14	178.04		178.07	0.002053	0.80	6.70	22.81	0.41
Reach1	699.9999	25-yr	6.84	177.14	178.12		178.16	0.002088	0.89	8.58	26.73	0.42

HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	699.9999	50-yr	8.34	177.14	178.17		178.22	0.002130	0.96	10.07	29.47	0.43
Reach1	699.9999	100-yr	9.79	177.14	178.23		178.27	0.002383	0.98	11.90	35.20	0.46
Reach1	699.9999	PF 9	23.66	177.14	178.52	178.29	178.58	0.001741	1.16	40.48	154.49	0.42
Reach1	600	CH	23.66	177.14	178.37		178.44	0.001528	1.19	29.62	102.94	0.41
Reach1	600	Regional	23.66	177.14	178.37		178.44	0.001528	1.19	29.62	102.94	0.41
Reach1	600	2-yr	2.01	177.14	177.55		177.59	0.004981	0.82	2.46	11.93	0.58
Reach1	600	5-yr	3.73	177.14	177.66		177.71	0.004604	0.94	3.98	14.85	0.58
Reach1	600	10-yr	5.03	177.14	177.73		177.78	0.004372	1.00	5.05	16.61	0.58
Reach1	600	25-yr	6.84	177.14	177.82		177.87	0.004126	1.05	6.50	18.81	0.57
Reach1	600	50-yr	8.34	177.14	177.88		177.94	0.003941	1.08	7.71	21.41	0.57
Reach1	600	100-yr	9.79	177.14	177.93		177.99	0.003555	1.12	8.84	23.50	0.55
Reach1	600	PF 9	23.66	177.14	178.28		178.37	0.002380	1.38	22.25	60.34	0.50
Reach1	509.8065	CH	23.66	176.97	178.32		178.35	0.000597	0.84	34.45	66.15	0.26
Reach1	509.8065	Regional	23.66	176.97	178.32		178.35	0.000597	0.84	34.45	66.15	0.26
Reach1	509.8065	2-yr	2.01	176.97	177.45		177.46	0.000592	0.34	5.97	22.26	0.21
Reach1	509.8065	5-yr	3.73	176.97	177.57		177.58	0.000643	0.44	8.58	23.68	0.23
Reach1	509.8065	10-yr	5.03	176.97	177.63		177.65	0.000674	0.50	10.22	24.49	0.24
Reach1	509.8065	25-yr	6.84	176.97	177.71		177.73	0.000719	0.57	12.20	25.39	0.25
Reach1	509.8065	50-yr	8.34	176.97	177.77		177.79	0.000751	0.62	13.69	25.90	0.26
Reach1	509.8065	100-yr	9.79	176.97	177.82		177.85	0.000772	0.67	15.07	26.37	0.27
Reach1	509.8065	PF 9	23.66	176.97	178.19		178.23	0.000942	0.97	27.81	45.48	0.32
Reach1	399.9999	CH	23.66	176.91	178.22		178.27	0.000962	1.09	30.98	51.40	0.33
Reach1	399.9999	Regional	23.66	176.91	178.22		178.27	0.000962	1.09	30.98	51.40	0.33
Reach1	399.9999	2-yr	2.01	176.91	177.32		177.34	0.002658	0.60	3.34	16.11	0.42
Reach1	399.9999	5-yr	3.73	176.91	177.43		177.45	0.002397	0.72	5.25	19.83	0.42
Reach1	399.9999	10-yr	5.03	176.91	177.49		177.52	0.002297	0.80	6.54	21.86	0.43
Reach1	399.9999	25-yr	6.84	176.91	177.56		177.60	0.002249	0.90	8.21	24.25	0.44
Reach1	399.9999	50-yr	8.34	176.91	177.61		177.66	0.002256	0.97	9.50	26.09	0.45
Reach1	399.9999	100-yr	9.79	176.91	177.66		177.71	0.002179	1.02	10.87	27.76	0.45
Reach1	399.9999	PF 9	23.66	176.91	177.98		178.07	0.002414	1.46	20.57	36.28	0.51
Reach1	299.9999	CH	23.66	176.86	178.18		178.20	0.000441	0.74	51.03	60.71	0.23
Reach1	299.9999	Regional	23.66	176.86	178.18		178.20	0.000441	0.74	51.03	60.71	0.23
Reach1	299.9999	2-yr	2.01	176.86	177.20		177.20	0.000808	0.36	8.08	31.58	0.24
Reach1	299.9999	5-yr	3.73	176.86	177.29		177.30	0.001025	0.48	11.15	33.57	0.28
Reach1	299.9999	10-yr	5.03	176.86	177.35		177.36	0.001144	0.55	13.07	34.76	0.30
Reach1	299.9999	25-yr	6.84	176.86	177.42		177.43	0.001276	0.63	15.44	36.22	0.32

HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	299.9999	50-yr	8.34	176.86	177.46		177.48	0.001365	0.68	17.23	37.34	0.34
Reach1	299.9999	100-yr	9.79	176.86	177.52		177.54	0.001321	0.70	19.43	38.78	0.34
Reach1	299.9999	PF 9	23.66	176.86	177.83		177.87	0.001534	1.06	32.74	46.74	0.39
Reach1	199.9999	CH	23.66	176.86	178.14		178.16	0.000251	0.61	53.49	74.97	0.18
Reach1	199.9999	Regional	23.66	176.86	178.14		178.16	0.000251	0.61	53.49	74.97	0.18
Reach1	199.9999	2-yr	2.01	176.86	177.10	176.98	177.11	0.000866	0.35	6.92	37.08	0.24
Reach1	199.9999	5-yr	3.73	176.86	177.17	177.02	177.18	0.001129	0.48	9.45	37.70	0.29
Reach1	199.9999	10-yr	5.03	176.86	177.21	177.05	177.22	0.001329	0.56	10.85	38.04	0.32
Reach1	199.9999	25-yr	6.84	176.86	177.25	177.08	177.27	0.001553	0.66	12.56	38.45	0.35
Reach1	199.9999	50-yr	8.34	176.86	177.23	177.10	177.26	0.002960	0.87	11.60	38.22	0.48
Reach1	199.9999	100-yr	9.79	176.86	177.18	177.12	177.24	0.007275	1.22	9.65	37.75	0.74
Reach1	199.9999	PF 9	23.66	176.86	177.29	177.29	177.48	0.012983	2.06	14.07	38.81	1.04
Reach1	117.8047	CH	23.66	176.86	178.15		178.15	0.000010	0.12	195.46	155.66	0.03
Reach1	117.8047	Regional	23.66	176.86	178.15		178.15	0.000010	0.12	195.46	155.66	0.03
Reach1	117.8047	2-yr	2.01	176.86	176.89	176.89	176.90	0.030265	0.52	3.89	146.00	1.01
Reach1	117.8047	5-yr	3.73	176.86	176.90	176.90	176.92	0.028322	0.65	5.75	146.17	1.04
Reach1	117.8047	10-yr	5.03	176.86	176.91	176.91	176.93	0.024210	0.70	7.21	146.31	1.00
Reach1	117.8047	25-yr	6.84	176.86	176.92	176.92	176.95	0.022695	0.77	8.85	146.46	1.00
Reach1	117.8047	50-yr	8.34	176.86	176.98		176.99	0.003529	0.48	17.44	147.14	0.44
Reach1	117.8047	100-yr	9.79	176.86	177.06		177.06	0.000916	0.34	28.84	148.05	0.25
Reach1	117.8047	PF 9	23.66	176.86	177.25		177.26	0.000524	0.41	58.20	149.81	0.21
Reach1	70.50	CH	23.66	175.45	178.15		178.15	0.000008	0.16	242.05	141.10	0.03
Reach1	70.50	Regional	23.66	175.45	178.15		178.15	0.000008	0.16	242.05	141.10	0.03
Reach1	70.50	2-yr	2.01	175.45	176.08		176.08	0.000259	0.23	8.89	32.48	0.14
Reach1	70.50	5-yr	3.73	175.45	176.40		176.40	0.000061	0.18	23.57	65.20	0.08
Reach1	70.50	10-yr	5.03	175.45	176.64		176.65	0.000027	0.15	48.21	116.79	0.05
Reach1	70.50	25-yr	6.84	175.45	176.86		176.86	0.000018	0.14	73.73	120.39	0.05
Reach1	70.50	50-yr	8.34	175.45	176.98		176.98	0.000017	0.15	88.82	121.82	0.04
Reach1	70.50	100-yr	9.79	175.45	177.06		177.06	0.000018	0.16	97.82	122.75	0.05
Reach1	70.50	PF 9	23.66	175.45	177.25		177.25	0.000056	0.31	121.82	125.10	0.08
Reach1	36.84	CH	23.66	174.49	178.15	175.24	178.15	0.000003	0.12	403.89	208.27	0.02
Reach1	36.84	Regional	23.66	174.49	178.15	175.24	178.15	0.000003	0.12	403.89	208.27	0.02
Reach1	36.84	2-yr	2.01	174.49	176.08	174.72	176.08	0.000003	0.08	26.54	67.71	0.02
Reach1	36.84	5-yr	3.73	174.49	176.40	174.79	176.40	0.000006	0.11	32.74	147.20	0.03
Reach1	36.84	10-yr	5.03	174.49	176.64	174.84	176.65	0.000007	0.13	37.43	174.51	0.03
Reach1	36.84	25-yr	6.84	174.49	176.86	174.90	176.86	0.000005	0.11	112.80	182.94	0.03

HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	36.84	50-yr	8.34	174.49	176.98	174.94	176.98	0.000005	0.12	129.85	186.01	0.03
Reach1	36.84	100-yr	9.79	174.49	177.06	174.98	177.06	0.000006	0.13	139.98	187.26	0.03
Reach1	36.84	PF 9	23.66	174.49	177.25	175.24	177.25	0.000022	0.28	166.78	190.53	0.06
Reach1	14.34		Culvert									
Reach1	4.840	CH	23.66	174.41	178.15	175.25	178.15	0.000004	0.13	367.04	230.02	0.02
Reach1	4.840	Regional	23.66	174.41	178.15	175.25	178.15	0.000004	0.13	367.04	230.02	0.02
Reach1	4.840	2-yr	2.01	174.41	176.05	174.64	176.05	0.000005	0.09	22.68	79.32	0.02
Reach1	4.840	5-yr	3.73	174.41	176.29	174.73	176.29	0.000009	0.14	26.57	86.91	0.04
Reach1	4.840	10-yr	5.03	174.41	176.44	174.79	176.44	0.000013	0.17	29.00	91.65	0.04
Reach1	4.840	25-yr	6.84	174.41	176.56	174.86	176.56	0.000019	0.22	30.95	95.45	0.05
Reach1	4.840	50-yr	8.34	174.41	176.71	174.92	176.71	0.000014	0.19	58.37	99.69	0.04
Reach1	4.840	100-yr	9.79	174.41	176.82	174.96	176.82	0.000016	0.21	63.94	107.91	0.05
Reach1	4.840	PF 9	23.66	174.41	176.84	175.25	176.85	0.000089	0.51	64.63	108.17	0.11
Reach1	0	CH	23.66	174.40	178.15	175.25	178.15	0.000012	0.20	248.26	232.48	0.04
Reach1	0	Regional	23.66	174.40	178.15	175.25	178.15	0.000012	0.20	248.26	232.48	0.04
Reach1	0	2-yr	2.01	174.40	176.05	174.63	176.05	0.000005	0.09	22.21	79.91	0.02
Reach1	0	5-yr	3.73	174.40	176.29	174.72	176.29	0.000010	0.14	25.98	86.98	0.04
Reach1	0	10-yr	5.03	174.40	176.44	174.78	176.44	0.000013	0.18	28.34	91.59	0.04
Reach1	0	25-yr	6.84	174.40	176.56	174.86	176.56	0.000019	0.23	30.23	95.30	0.05
Reach1	0	50-yr	8.34	174.40	176.71	174.91	176.71	0.000030	0.26	33.18	99.38	0.06
Reach1	0	100-yr	9.79	174.40	176.82	174.95	176.82	0.000033	0.28	38.35	102.31	0.07
Reach1	0	PF 9	23.66	174.40	176.82	175.25	176.84	0.000194	0.67	38.35	102.31	0.16

HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1

Reach	River Sta	Profile	E.G. US. (m)	W.S. US. (m)	E.G. IC (m)	E.G. OC (m)	Min El Weir Flow (m)	Q Culv Group (m3/s)	Q Weir (m3/s)	Delta WS (m)	Culv Vel US (m/s)	Culv Vel DS (m/s)
Reach1	5639.221 Culvert #1	CH	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.63	2.37	2.37
Reach1	5639.221 Culvert #1	Regional	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.62	2.37	2.37
Reach1	5639.221 Culvert #1	2-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.67	2.37	2.37
Reach1	5639.221 Culvert #1	5-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.67	2.37	2.37
Reach1	5639.221 Culvert #1	10-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.66	2.37	2.37
Reach1	5639.221 Culvert #1	25-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.66	2.37	2.37
Reach1	5639.221 Culvert #1	50-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.65	2.37	2.37
Reach1	5639.221 Culvert #1	100-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.64	2.37	2.37
Reach1	5639.221 Culvert #1	PF 9	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.62	2.37	2.37
Reach1	4846.378 Culvert #1	CH	189.86	189.86	189.86	189.95	191.57	0.44		0.68	1.43	1.70
Reach1	4846.378 Culvert #2	CH	189.86	189.86	189.86	189.95	191.57	0.44		0.68	1.43	1.70
Reach1	4846.378 Culvert #1	Regional	189.91	189.91	189.91	190.01	191.57	0.51		0.72	1.48	1.77
Reach1	4846.378 Culvert #2	Regional	189.91	189.91	189.91	190.01	191.57	0.51		0.72	1.48	1.77
Reach1	4846.378 Culvert #1	2-yr	189.60	189.60	189.60	189.66	191.57	0.14		0.46	1.04	1.22
Reach1	4846.378 Culvert #2	2-yr	189.60	189.60	189.60	189.66	191.57	0.14		0.46	1.04	1.22
Reach1	4846.378 Culvert #1	5-yr	189.64	189.64	189.64	189.71	191.57	0.18		0.50	1.11	1.30
Reach1	4846.378 Culvert #2	5-yr	189.64	189.64	189.64	189.71	191.57	0.18		0.50	1.11	1.30
Reach1	4846.378 Culvert #1	10-yr	189.67	189.67	189.67	189.73	191.57	0.20		0.52	1.16	1.35
Reach1	4846.378 Culvert #2	10-yr	189.67	189.67	189.67	189.73	191.57	0.20		0.52	1.16	1.35
Reach1	4846.378 Culvert #1	25-yr	189.72	189.72	189.72	189.79	191.57	0.26		0.56	1.24	1.45
Reach1	4846.378 Culvert #2	25-yr	189.72	189.72	189.72	189.79	191.57	0.26		0.56	1.24	1.45
Reach1	4846.378 Culvert #1	50-yr	189.76	189.76	189.76	189.84	191.57	0.32		0.60	1.30	1.53
Reach1	4846.378 Culvert #2	50-yr	189.76	189.76	189.76	189.84	191.57	0.32		0.60	1.30	1.53
Reach1	4846.378 Culvert #1	100-yr	189.81	189.80	189.81	189.89	191.57	0.37		0.63	1.35	1.60
Reach1	4846.378 Culvert #2	100-yr	189.81	189.80	189.81	189.89	191.57	0.37		0.63	1.35	1.60
Reach1	4846.378 Culvert #1	PF 9	189.91	189.91	189.91	190.01	191.57	0.51		0.72	1.48	1.77
Reach1	4846.378 Culvert #2	PF 9	189.91	189.91	189.91	190.01	191.57	0.51		0.72	1.48	1.77
Reach1	3615.502 Culvert #1	CH	185.23	185.18	184.60	185.23	186.60	10.18		0.03	0.82	0.78
Reach1	3615.502 Culvert #1	Regional	184.93	184.74	184.58	184.93	186.60	9.74		0.07	0.97	0.90
Reach1	3615.502 Culvert #1	2-yr	184.18	184.09	183.98	184.18	186.60	1.02		0.01	0.27	0.21
Reach1	3615.502 Culvert #1	5-yr	184.36	184.26	184.06	184.36	186.60	1.85		0.08	0.34	0.28
Reach1	3615.502 Culvert #1	10-yr	184.47	184.37	184.12	184.47	186.60	2.46		0.13	0.37	0.32
Reach1	3615.502 Culvert #1	25-yr	184.57	184.42	184.18	184.57	186.60	3.30		0.04	0.44	0.39
Reach1	3615.502 Culvert #1	50-yr	184.61	184.39	184.23	184.61	186.60	3.98		0.09	0.51	0.45
Reach1	3615.502 Culvert #1	100-yr	184.65	184.58	184.28	184.65	186.60	4.63		0.07	0.57	0.51
Reach1	3615.502 Culvert #1	PF 9	184.70	184.61	184.33	184.70	186.60	5.40		0.07	0.64	0.57
Reach1	3424.759 Culvert #1	CH	185.14	185.08	184.72	185.14	186.88	17.44		0.92	2.60	3.04
Reach1	3424.759 Culvert #1	Regional	184.42	184.34	184.27	184.42	186.88	9.74		0.39	1.63	2.07
Reach1	3424.759 Culvert #1	2-yr	183.61	183.58	183.52	183.61	186.88	1.02		0.06	0.48	0.50
Reach1	3424.759 Culvert #1	5-yr	183.73	183.68	183.62	183.73	186.88	1.85		0.09	0.65	0.70
Reach1	3424.759 Culvert #1	10-yr	183.80	183.74	183.69	183.80	186.88	2.46		0.12	0.75	0.82

HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	E.G. US. (m)	W.S. US. (m)	E.G. IC (m)	E.G. OC (m)	Min El Weir Flow (m)	Q Culv Group (m3/s)	Q Weir (m3/s)	Delta WS (m)	Culv Vel US (m/s)	Culv Vel DS (m/s)
Reach1	3424.759 Culvert #1	25-yr	183.89	183.82	183.77	183.89	186.88	3.30		0.19	0.87	0.97
Reach1	3424.759 Culvert #1	50-yr	183.96	183.89	183.83	183.96	186.88	3.98		0.22	0.96	1.07
Reach1	3424.759 Culvert #1	100-yr	184.02	183.96	183.89	184.02	186.88	4.63		0.23	1.03	1.15
Reach1	3424.759 Culvert #1	PF 9	184.09	184.02	183.96	184.09	186.88	5.40		0.22	1.13	1.28
Reach1	3059.960 Culvert #1	CH	183.79	183.79	183.79	183.75	183.61	2.79	15.42	0.42	1.86	2.92
Reach1	3059.960 Culvert #1	Regional	183.73	183.73	183.73	183.71	183.61	2.58	7.16	0.50	1.72	2.81
Reach1	3059.960 Culvert #1	2-yr	183.37	183.37	183.34	183.37	183.61	1.02		0.38	1.49	2.00
Reach1	3059.960 Culvert #1	5-yr	183.56	183.56	183.52	183.56	183.61	1.85		0.54	1.82	2.37
Reach1	3059.960 Culvert #1	10-yr	183.61	183.61	183.57	183.61	183.61	2.07	0.39	0.57	1.89	2.45
Reach1	3059.960 Culvert #1	25-yr	183.63	183.63	183.60	183.63	183.61	2.15	1.15	0.56	1.92	2.48
Reach1	3059.960 Culvert #1	50-yr	183.66	183.66	183.65	183.66	183.61	2.32	1.66	0.57	1.96	2.53
Reach1	3059.960 Culvert #1	100-yr	183.68	183.68	183.68	183.67	183.61	2.38	2.25	0.57	1.98	2.55
Reach1	3059.960 Culvert #1	PF 9	183.68	183.68	183.68	183.67	183.61	2.40	3.00	0.55	1.99	2.55
Reach1	1921.497 Culvert #1	CH	181.40	181.40	181.39	181.40	181.32	1.44	18.90	0.04	0.72	0.72
Reach1	1921.497 Culvert #1	Regional	181.36	181.36	181.35	181.36	181.32	0.72	9.02	0.01	0.36	0.36
Reach1	1921.497 Culvert #1	2-yr	180.55	180.55	180.52	180.55	181.32	1.02		0.40	1.71	2.41
Reach1	1921.497 Culvert #1	5-yr	180.81	180.80	180.76	180.81	181.32	1.85		0.59	2.09	2.82
Reach1	1921.497 Culvert #1	10-yr	180.97	180.97	180.91	180.97	181.32	2.46		0.69	2.29	3.04
Reach1	1921.497 Culvert #1	25-yr	181.17	181.17	181.10	181.17	181.32	3.30		0.83	2.53	3.28
Reach1	1921.497 Culvert #1	50-yr	181.31	181.31	181.24	181.31	181.32	3.93	6.13	0.85	2.68	3.43
Reach1	1921.497 Culvert #1	100-yr	181.31	181.31	181.31	181.31	181.32	2.45	6.07	0.12	1.22	1.22
Reach1	1921.497 Culvert #1	PF 9	181.35	181.35	181.35	181.35	181.32	0.28	5.12	0.00	0.14	0.14
Reach1	945.2227 Culvert #1	CH	181.35	181.35	182.24	181.35	181.18	9.87	13.67	2.59	4.36	4.36
Reach1	945.2227 Culvert #1	Regional	181.35	181.35	182.24	181.35	181.18	9.87	13.67	2.59	4.36	4.36
Reach1	945.2227 Culvert #1	2-yr	179.07	179.06	179.07	179.22	181.18	2.01		0.69	2.02	0.89
Reach1	945.2227 Culvert #1	5-yr	179.50	179.48	179.50	179.64	181.18	3.73		1.01	2.51	1.65
Reach1	945.2227 Culvert #1	10-yr	179.81	179.79	179.81	179.94	181.18	5.03		1.27	2.85	2.22
Reach1	945.2227 Culvert #1	25-yr	179.81	179.77	180.56	179.81	181.18	6.84		1.20	3.02	3.02
Reach1	945.2227 Culvert #1	50-yr	180.45	180.42	181.36	180.45	181.18	8.34		1.82	3.69	3.69
Reach1	945.2227 Culvert #1	100-yr	181.18	181.15	182.30	181.18	181.18	9.79		2.53	4.33	4.33
Reach1	945.2227 Culvert #1	PF 9	181.35	181.35	182.24	181.35	181.18	9.87	13.67	2.59	4.36	4.36
Reach1	14.34 Culvert #3	CH	178.15	178.15	174.73	178.15	176.71	0.09	23.27	0.00	0.09	0.09
Reach1	14.34 Culvert #2	CH	178.15	178.15	174.73	178.15	176.71	0.09	23.27	0.00	0.09	0.09
Reach1	14.34 Culvert #1	CH	178.15	178.15	174.81	178.15	176.71	0.20	23.27	0.00	0.09	0.09
Reach1	14.34 Culvert #3	Regional	178.15	178.15	174.73	178.15	176.71	0.09	23.27	0.00	0.09	0.09
Reach1	14.34 Culvert #2	Regional	178.15	178.15	174.73	178.15	176.71	0.09	23.27	0.00	0.09	0.09
Reach1	14.34 Culvert #1	Regional	178.15	178.15	174.81	178.15	176.71	0.20	23.27	0.00	0.09	0.09
Reach1	14.34 Culvert #3	2-yr	176.08	176.08	174.97	176.08	176.71	0.43		0.03	0.43	0.43
Reach1	14.34 Culvert #2	2-yr	176.08	176.08	174.97	176.08	176.71	0.43		0.03	0.43	0.43
Reach1	14.34 Culvert #1	2-yr	176.08	176.08	175.20	176.08	176.71	1.16		0.03	0.49	0.49

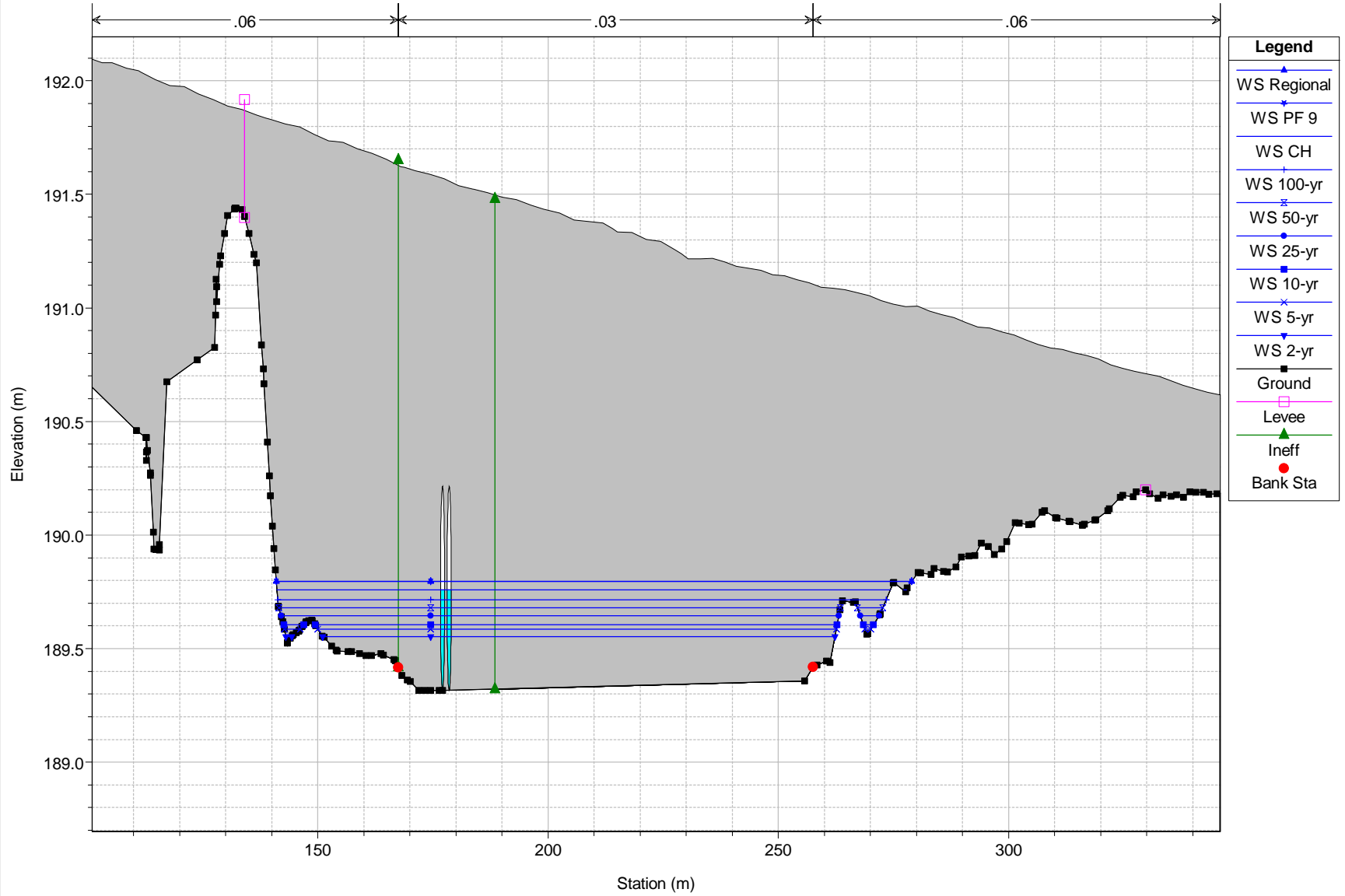
HEC-RAS Plan: Proposed River: BronteIndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	E.G. US. (m)	W.S. US. (m)	E.G. IC (m)	E.G. OC (m)	Min El Weir Flow (m)	Q Culv Group (m3/s)	Q Weir (m3/s)	Delta WS (m)	Culv Vel US (m/s)	Culv Vel DS (m/s)
Reach1	14.34 Culvert #3	5-yr	176.40	176.40	175.15	176.40	176.71	0.80		0.11	0.80	0.80
Reach1	14.34 Culvert #2	5-yr	176.40	176.40	175.15	176.40	176.71	0.80		0.11	0.80	0.80
Reach1	14.34 Culvert #1	5-yr	176.40	176.40	175.47	176.40	176.71	2.14		0.11	0.91	0.91
Reach1	14.34 Culvert #3	10-yr	176.65	176.64	175.27	176.64	176.71	1.08		0.20	1.09	1.09
Reach1	14.34 Culvert #2	10-yr	176.65	176.64	175.27	176.64	176.71	1.08		0.20	1.09	1.09
Reach1	14.34 Culvert #1	10-yr	176.65	176.64	175.65	176.65	176.71	2.88		0.20	1.22	1.22
Reach1	14.34 Culvert #3	25-yr	176.86	176.86	175.37	176.86	176.71	1.30	0.77	0.30	1.31	1.31
Reach1	14.34 Culvert #2	25-yr	176.86	176.86	175.37	176.86	176.71	1.30	0.77	0.30	1.31	1.31
Reach1	14.34 Culvert #1	25-yr	176.86	176.86	175.79	176.86	176.71	3.47	0.77	0.30	1.47	1.47
Reach1	14.34 Culvert #3	50-yr	176.98	176.98	175.34	176.98	176.71	1.24	2.55	0.27	1.25	1.25
Reach1	14.34 Culvert #2	50-yr	176.98	176.98	175.34	176.98	176.71	1.24	2.55	0.27	1.25	1.25
Reach1	14.34 Culvert #1	50-yr	176.98	176.98	175.75	176.99	176.71	3.31	2.55	0.27	1.41	1.41
Reach1	14.34 Culvert #3	100-yr	177.06	177.06	175.30	177.06	176.71	1.15	4.40	0.23	1.16	1.16
Reach1	14.34 Culvert #2	100-yr	177.06	177.06	175.30	177.06	176.71	1.15	4.40	0.23	1.16	1.16
Reach1	14.34 Culvert #1	100-yr	177.06	177.06	175.70	177.06	176.71	3.08	4.40	0.23	1.31	1.31
Reach1	14.34 Culvert #3	PF 9	177.25	177.25	175.47	177.25	176.71	1.54	16.48	0.42	1.55	1.55
Reach1	14.34 Culvert #2	PF 9	177.25	177.25	175.47	177.25	176.71	1.54	16.48	0.42	1.55	1.55
Reach1	14.34 Culvert #1	PF 9	177.25	177.25	175.94	177.25	176.71	4.10	16.48	0.42	1.74	1.74

Bronte Creek Indian Trib Reach1 Proposed Plan: Proposed 7/29/2020

Flow: Regional Flows

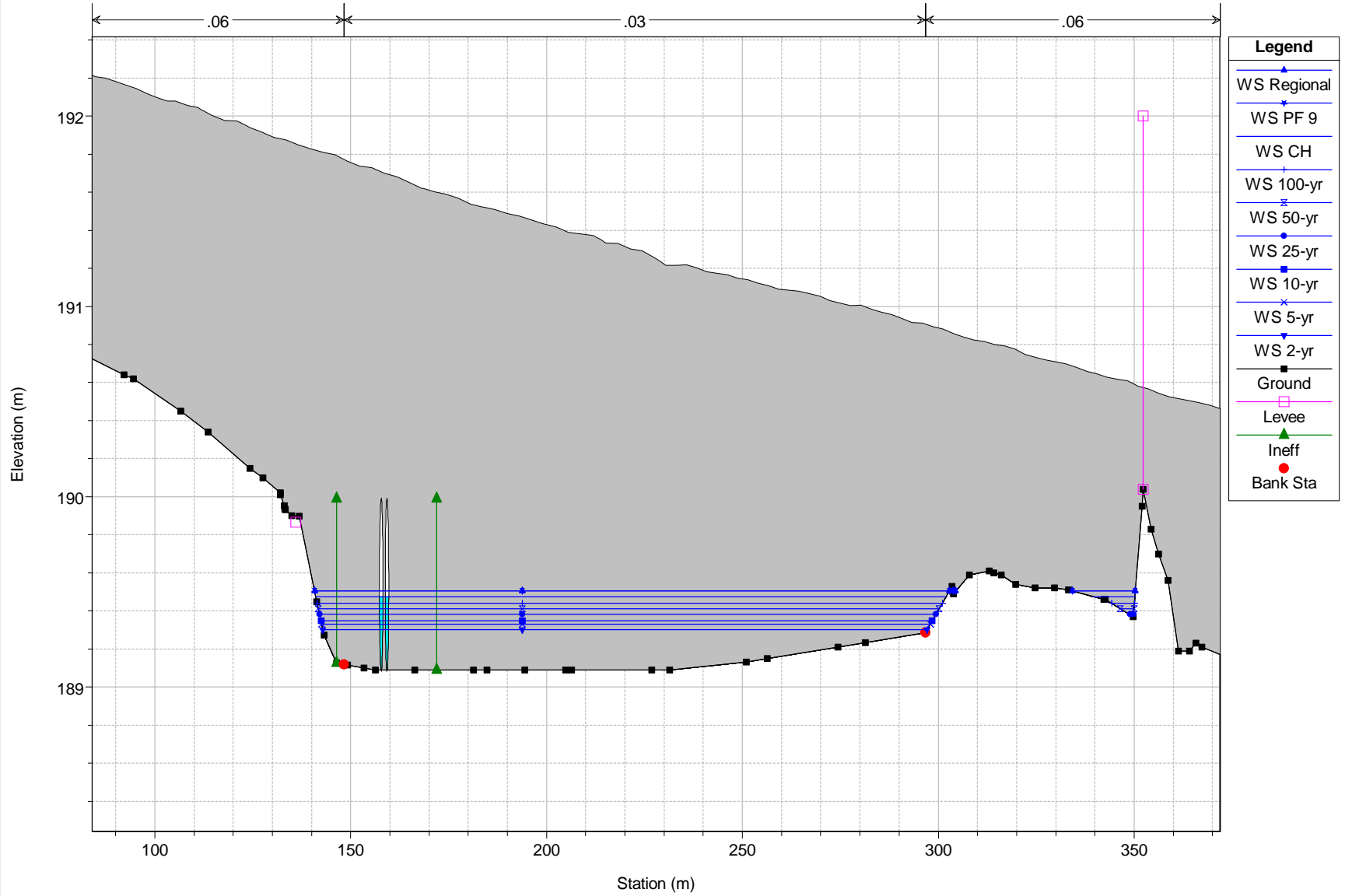
RS = 4846.378 Culv Railroad West of First Line, North of Britannia Rd (Estimated fr



Bronte Creek Indian Trib Reach1 Proposed Plan: Proposed 7/29/2020

Flow: Regional Flows

RS = 4846.378 Culv Railroad West of First Line, North of Britannia Rd (Estimated fr



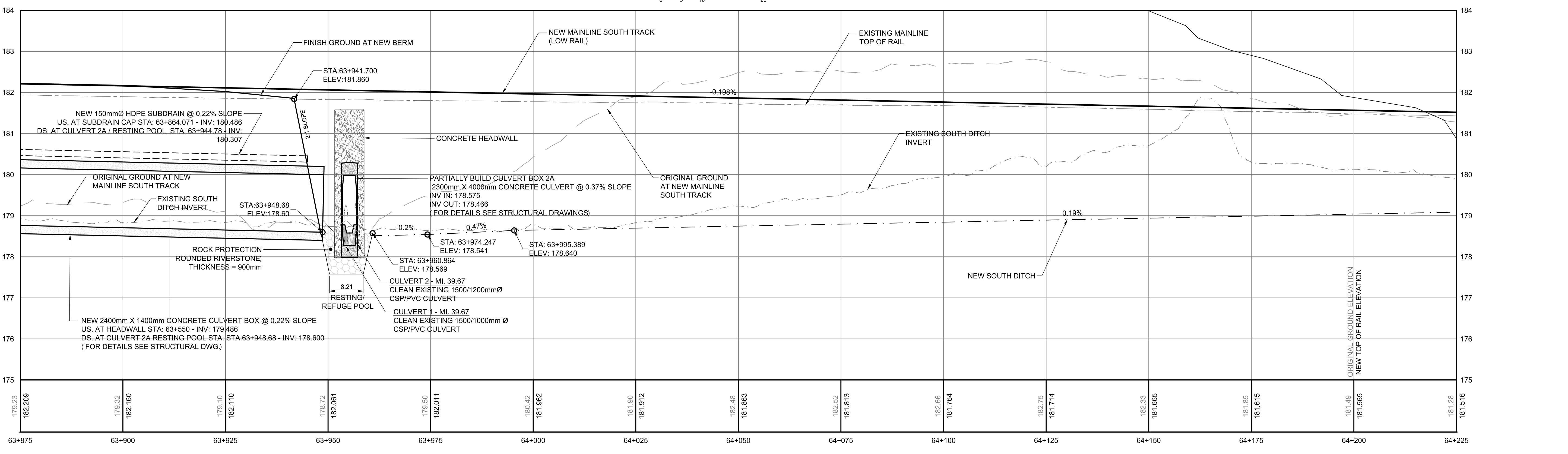
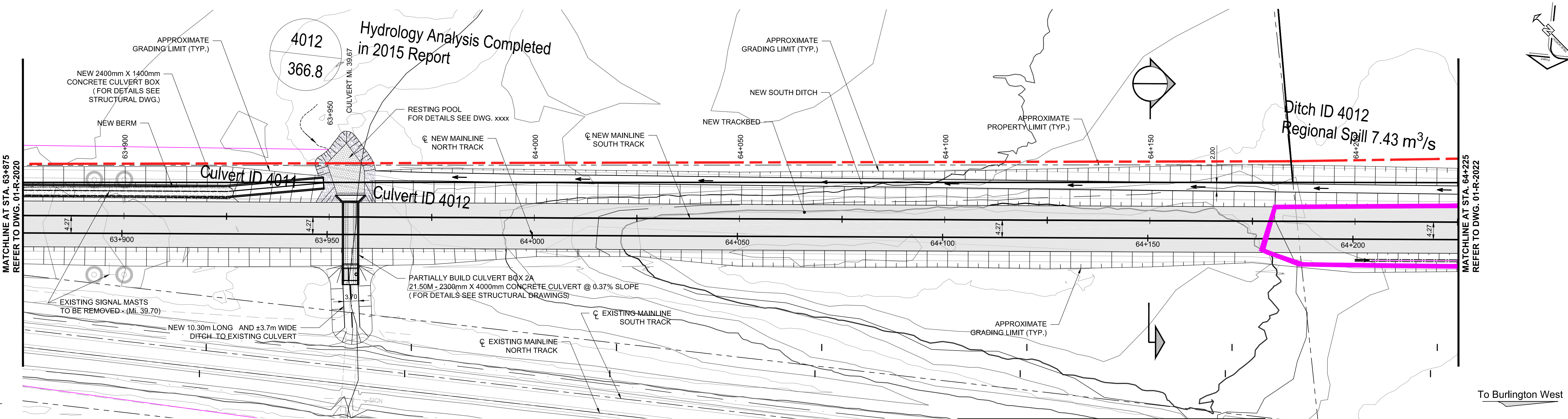


Milton Logistics Hub 2020 HEC-RAS Model Output

Culvert 2A and 2B Existing Conditions

D SIZE 22" x 34" (558.8mm x 863.6mm)

AECOM FILE NAME: \\cartt1\p001\Data\Projects\60579933_CN_Milton_Logistic_Hub\900-CAD_GIS\910-CAD\20-SHEETS\060579933_01-R-2021-R-2021-plan_profile_sheets.dwg



NOTE
- FOR NEW MAINLINE NORTH TRACK PROFILE SEE DWG. R-2034

	REGION	SUBDIVISION	MILE
	-	HALTON	36.79 - 41.27
CN PROJECT NO.		CN DRAWING NO.	
-		-	

DO NOT SCALE THIS DOCUMENT. ALL MEASUREMENTS MUST BE OBTAINED FROM STATED DIMENSIONS.

© 2014 AECOM CANADA LTD. ALL RIGHTS RESERVED. THIS DOCUMENT IS PROTECTED BY COPYRIGHT LAW AND MAY NOT BE REPRODUCED IN ANY MANNER, OR FOR ANY PURPOSE EXCEPT BY THE WRITTEN PERMISSION OF AECOM CANADA LTD.

PROFESSIONAL SEALS

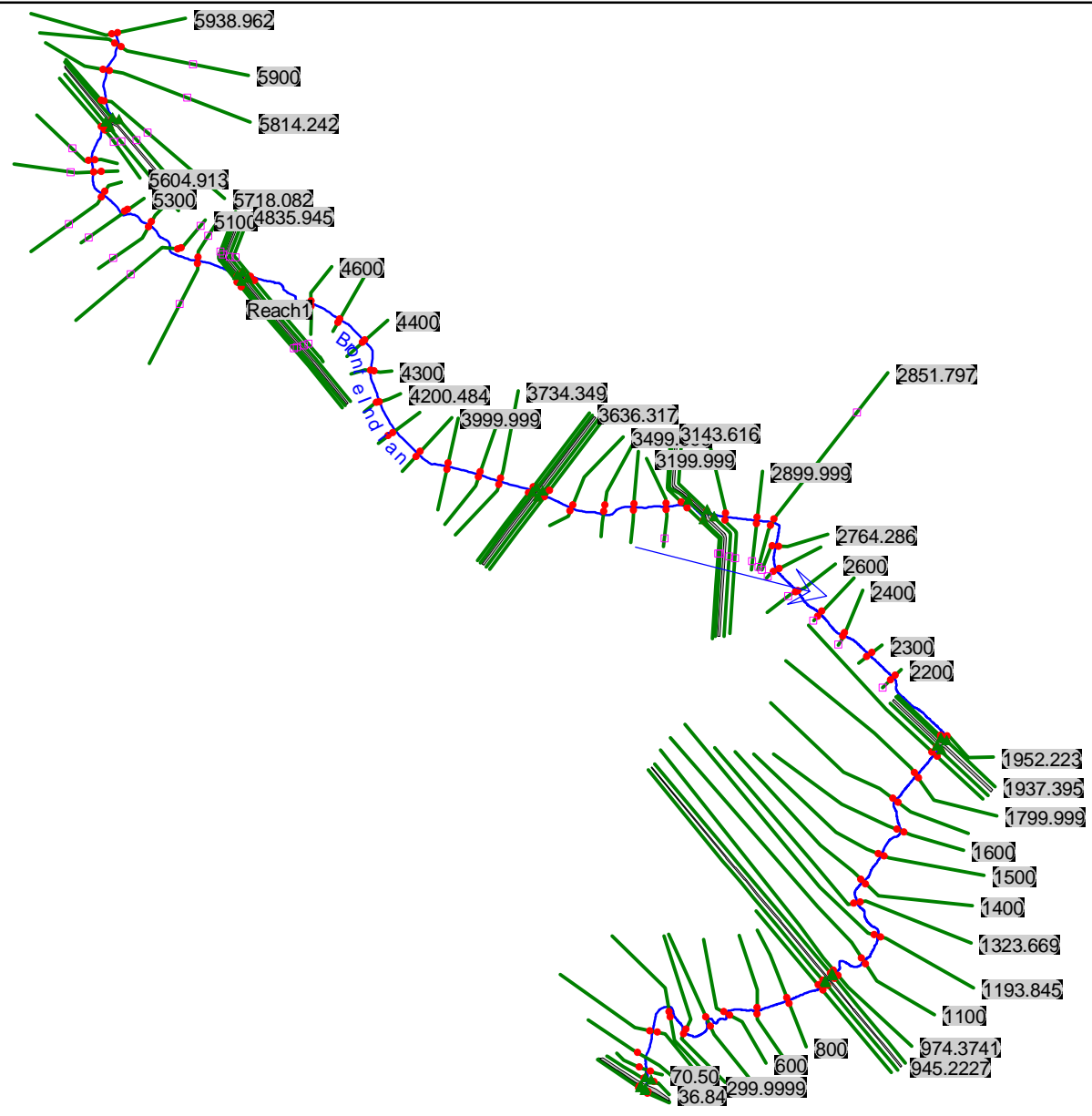
--	--	--	--	--	--	--	--	--	--

I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP
B	19/10/23	ISSUED FOR 60% SUBMISSION	JR/LP	AS	JR/LP	LB		
A	19/04/29	ISSUED FOR 30% SUBMISSION	JR	AS	JR	LB		



CN
MILTON LOGISTIC HUB - HALTON SUBDIVISION - Mile 36.79 to 41.27
NEW MAINLINE TRACKS
PLAN & SOUTH TRACK PROFILE
STA. 63+875 to 64+225 (Mi. 39.69 to 39.91)

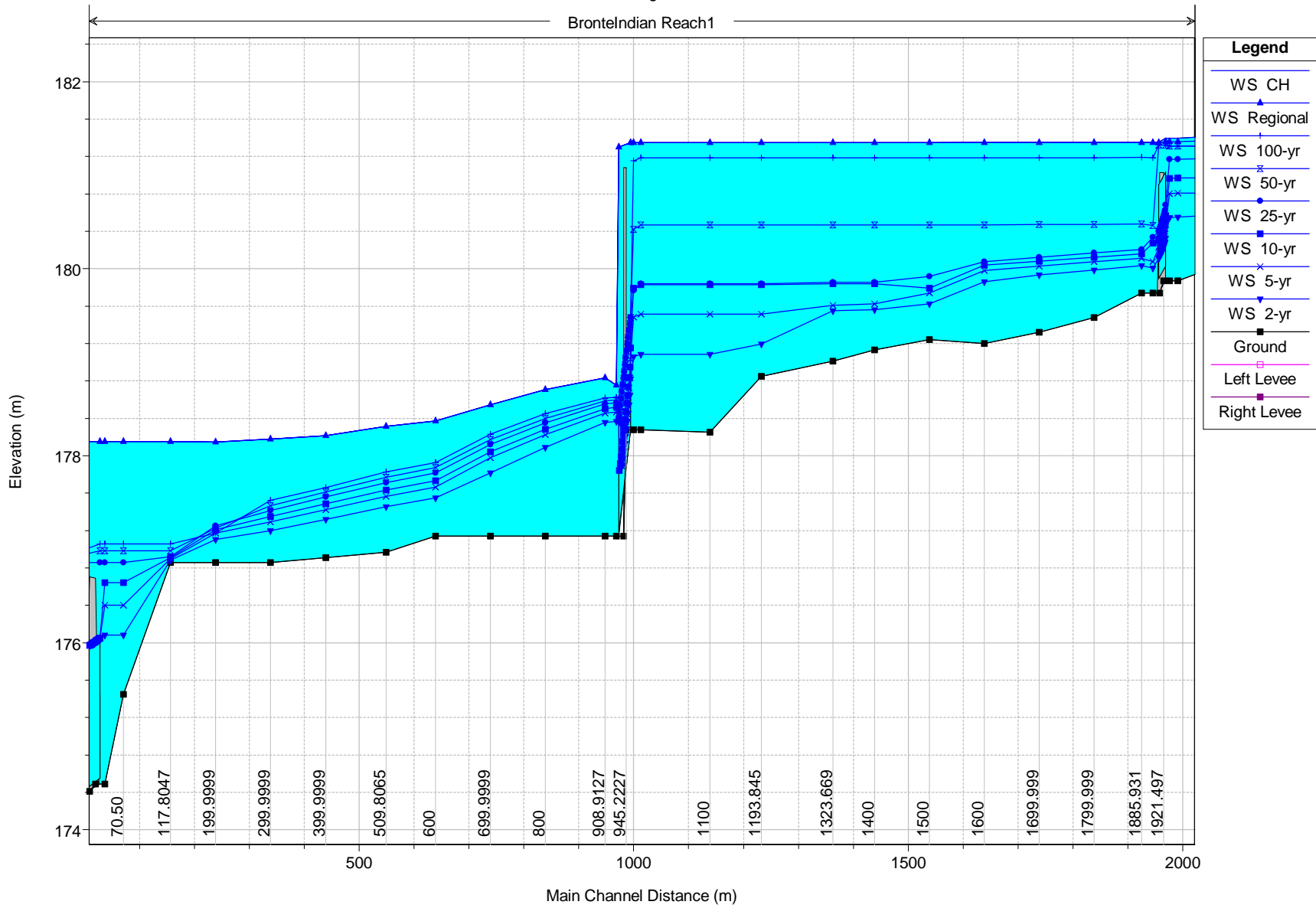
PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60579933	01-R-2021	B



Bronte Creek Indian Trib Reach1 Plan: Plan 01 7/14/2020

Flow: Regional Flows

BronteIndian Reach1



HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	5938.962	CH	0.89	194.83	195.07	194.97	195.07	0.001069	0.31	3.20	30.42	0.26
Reach1	5938.962	Regional	1.02	194.83	195.08	194.98	195.08	0.001123	0.34	3.51	31.50	0.26
Reach1	5938.962	2-yr	0.28	194.83	195.00	194.92	195.00	0.000781	0.18	1.54	19.08	0.20
Reach1	5938.962	5-yr	0.36	194.83	195.01	194.93	195.01	0.000837	0.21	1.78	20.24	0.21
Reach1	5938.962	10-yr	0.41	194.83	195.02	194.94	195.02	0.000878	0.22	1.91	21.40	0.22
Reach1	5938.962	25-yr	0.52	194.83	195.03	194.95	195.03	0.000925	0.25	2.23	23.91	0.23
Reach1	5938.962	50-yr	0.63	194.83	195.04	194.96	195.05	0.000984	0.27	2.51	26.01	0.24
Reach1	5938.962	100-yr	0.74	194.83	195.05	194.97	195.06	0.001014	0.29	2.82	28.05	0.24
Reach1	5900	CH	0.89	194.83	194.93	194.93	194.96	0.024026	0.75	1.19	22.05	1.02
Reach1	5900	Regional	1.02	194.83	194.93	194.93	194.96	0.021799	0.76	1.34	22.90	0.99
Reach1	5900	2-yr	0.28	194.83	194.89	194.89	194.91	0.029442	0.57	0.49	15.63	1.03
Reach1	5900	5-yr	0.36	194.83	194.90	194.90	194.92	0.027363	0.60	0.60	16.91	1.01
Reach1	5900	10-yr	0.41	194.83	194.90	194.90	194.92	0.025102	0.60	0.68	17.77	0.98
Reach1	5900	25-yr	0.52	194.83	194.91	194.91	194.93	0.026218	0.65	0.80	18.94	1.02
Reach1	5900	50-yr	0.63	194.83	194.92	194.92	194.94	0.023999	0.67	0.94	20.35	0.99
Reach1	5900	100-yr	0.74	194.83	194.92	194.92	194.95	0.025355	0.71	1.04	21.19	1.03
Reach1	5814.242	CH	0.89	194.07	194.57	194.19	194.57	0.000022	0.09	15.17	78.78	0.04
Reach1	5814.242	Regional	1.02	194.07	194.57	194.20	194.57	0.000029	0.10	15.17	78.77	0.05
Reach1	5814.242	2-yr	0.28	194.07	194.57	194.15	194.57	0.000002	0.03	15.19	78.82	0.01
Reach1	5814.242	5-yr	0.36	194.07	194.57	194.15	194.57	0.000004	0.04	15.19	78.82	0.02
Reach1	5814.242	10-yr	0.41	194.07	194.57	194.16	194.57	0.000005	0.04	15.19	78.82	0.02
Reach1	5814.242	25-yr	0.52	194.07	194.57	194.17	194.57	0.000007	0.05	15.18	78.81	0.03
Reach1	5814.242	50-yr	0.63	194.07	194.57	194.18	194.57	0.000011	0.06	15.18	78.81	0.03
Reach1	5814.242	100-yr	0.74	194.07	194.57	194.19	194.57	0.000015	0.07	15.18	78.79	0.04
Reach1	5718.082	CH	0.89	193.47	194.57	193.57	194.57	0.000000	0.02	163.27	330.95	0.00
Reach1	5718.082	Regional	1.02	193.47	194.57	193.58	194.57	0.000000	0.02	163.28	330.95	0.01
Reach1	5718.082	2-yr	0.28	193.47	194.57	193.53	194.57	0.000000	0.00	163.27	330.95	0.00
Reach1	5718.082	5-yr	0.36	193.47	194.57	193.54	194.57	0.000000	0.01	163.27	330.95	0.00
Reach1	5718.082	10-yr	0.41	193.47	194.57	193.54	194.57	0.000000	0.01	163.27	330.95	0.00
Reach1	5718.082	25-yr	0.52	193.47	194.57	193.55	194.57	0.000000	0.01	163.27	330.95	0.00
Reach1	5718.082	50-yr	0.63	193.47	194.57	193.56	194.57	0.000000	0.01	163.27	330.95	0.00
Reach1	5718.082	100-yr	0.74	193.47	194.57	193.57	194.57	0.000000	0.01	163.28	330.95	0.00
Reach1	5652.039	CH	0.89	193.11	194.57	193.25	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	Regional	1.02	193.11	194.57	193.26	194.57	0.000000	0.01	411.18	481.09	0.00
Reach1	5652.039	2-yr	0.28	193.11	194.57	193.19	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	5-yr	0.36	193.11	194.57	193.20	194.57	0.000000	0.00	411.18	481.08	0.00

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	5652.039	10-yr	0.41	193.11	194.57	193.21	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	25-yr	0.52	193.11	194.57	193.22	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	50-yr	0.63	193.11	194.57	193.23	194.57	0.000000	0.00	411.18	481.08	0.00
Reach1	5652.039	100-yr	0.74	193.11	194.57	193.24	194.57	0.000000	0.00	411.18	481.09	0.00
Reach1	5639.221		Culvert									
Reach1	5620.962	CH	0.89	192.84	192.95	192.93	192.97	0.014426	0.76	1.66	40.52	0.84
Reach1	5620.962	Regional	1.02	192.84	192.95	192.93	192.97	0.018050	0.86	1.69	40.65	0.95
Reach1	5620.962	2-yr	0.28	192.84	192.90	192.89	192.91	0.023583	0.56	0.71	32.06	0.94
Reach1	5620.962	5-yr	0.36	192.84	192.91	192.90	192.92	0.021703	0.60	0.85	33.76	0.93
Reach1	5620.962	10-yr	0.41	192.84	192.91	192.90	192.92	0.022347	0.63	0.92	34.52	0.95
Reach1	5620.962	25-yr	0.52	192.84	192.93	192.91	192.94	0.011804	0.58	1.28	38.24	0.73
Reach1	5620.962	50-yr	0.63	192.84	192.93	192.91	192.95	0.012898	0.64	1.40	39.09	0.77
Reach1	5620.962	100-yr	0.74	192.84	192.94	192.92	192.96	0.013745	0.70	1.51	39.78	0.81
Reach1	5604.913	CH	0.89	192.68	192.80	192.77	192.81	0.006768	0.57	1.72	21.17	0.59
Reach1	5604.913	Regional	1.02	192.68	192.81	192.78	192.83	0.004926	0.55	2.10	22.31	0.52
Reach1	5604.913	2-yr	0.28	192.68	192.75	192.73	192.76	0.004836	0.33	0.89	18.47	0.45
Reach1	5604.913	5-yr	0.36	192.68	192.76	192.74	192.77	0.004873	0.36	1.05	18.98	0.47
Reach1	5604.913	10-yr	0.41	192.68	192.77	192.74	192.78	0.004660	0.38	1.16	19.36	0.46
Reach1	5604.913	25-yr	0.52	192.68	192.77	192.75	192.78	0.008160	0.49	1.13	19.25	0.61
Reach1	5604.913	50-yr	0.63	192.68	192.78	192.76	192.79	0.007401	0.51	1.32	19.91	0.60
Reach1	5604.913	100-yr	0.74	192.68	192.79	192.76	192.80	0.007122	0.54	1.49	20.46	0.59
Reach1	5499.999	CH	0.89	191.76	191.86	191.85	191.88	0.011970	0.64	1.58	27.41	0.75
Reach1	5499.999	Regional	1.02	191.76	191.85	191.85	191.88	0.020509	0.81	1.42	24.99	0.98
Reach1	5499.999	2-yr	0.28	191.76	191.81	191.81	191.82	0.021437	0.54	0.55	15.93	0.90
Reach1	5499.999	5-yr	0.36	191.76	191.82	191.81	191.83	0.020830	0.58	0.66	16.75	0.91
Reach1	5499.999	10-yr	0.41	191.76	191.82	191.82	191.84	0.023164	0.63	0.70	17.02	0.96
Reach1	5499.999	25-yr	0.52	191.76	191.84	191.82	191.85	0.009476	0.50	1.13	20.14	0.65
Reach1	5499.999	50-yr	0.63	191.76	191.85	191.83	191.86	0.010613	0.56	1.25	22.35	0.70
Reach1	5499.999	100-yr	0.74	191.76	191.85	191.84	191.87	0.011187	0.59	1.40	24.67	0.72
Reach1	5463.964	CH	0.89	191.52	191.64	191.60	191.64	0.003915	0.41	2.51	40.29	0.44
Reach1	5463.964	Regional	1.02	191.52	191.65	191.61	191.66	0.002734	0.39	3.23	44.66	0.38
Reach1	5463.964	2-yr	0.28	191.52	191.60	191.57	191.60	0.002813	0.24	1.21	28.14	0.34
Reach1	5463.964	5-yr	0.36	191.52	191.61	191.58	191.61	0.002841	0.26	1.44	30.47	0.35
Reach1	5463.964	10-yr	0.41	191.52	191.61	191.58	191.61	0.002735	0.28	1.60	32.15	0.35
Reach1	5463.964	25-yr	0.52	191.52	191.61	191.58	191.62	0.004840	0.36	1.55	31.60	0.46

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	5463.964	50-yr	0.63	191.52	191.62	191.59	191.62	0.004446	0.38	1.84	34.45	0.46
Reach1	5463.964	100-yr	0.74	191.52	191.63	191.59	191.63	0.004225	0.39	2.12	36.97	0.45
Reach1	5382.460	CH	0.89	190.97	191.15	191.13	191.17	0.009310	0.66	1.36	14.72	0.69
Reach1	5382.460	Regional	1.02	190.97	191.14	191.14	191.18	0.020621	0.91	1.12	13.37	1.01
Reach1	5382.460	2-yr	0.28	190.97	191.07	191.07	191.09	0.023320	0.69	0.41	8.13	0.99
Reach1	5382.460	5-yr	0.36	190.97	191.08	191.08	191.11	0.022009	0.72	0.50	9.00	0.98
Reach1	5382.460	10-yr	0.41	190.97	191.08	191.08	191.11	0.023620	0.76	0.54	9.32	1.02
Reach1	5382.460	25-yr	0.52	190.97	191.13	191.10	191.14	0.007195	0.52	1.00	12.66	0.59
Reach1	5382.460	50-yr	0.63	190.97	191.13	191.11	191.15	0.007904	0.57	1.11	13.35	0.63
Reach1	5382.460	100-yr	0.74	190.97	191.14	191.12	191.16	0.008267	0.60	1.24	14.06	0.65
Reach1	5300	CH	0.89	190.54	190.66	190.62	190.67	0.004383	0.49	3.09	39.07	0.48
Reach1	5300	Regional	1.02	190.54	190.68	190.62	190.69	0.002485	0.43	4.14	41.75	0.38
Reach1	5300	2-yr	0.28	190.54	190.63	190.59	190.64	0.001172	0.21	2.19	36.32	0.24
Reach1	5300	5-yr	0.36	190.54	190.65	190.59	190.65	0.001163	0.23	2.62	37.76	0.24
Reach1	5300	10-yr	0.41	190.54	190.64	190.60	190.65	0.001680	0.27	2.52	37.47	0.29
Reach1	5300	25-yr	0.52	190.54	190.63	190.60	190.63	0.005329	0.43	1.99	35.55	0.50
Reach1	5300	50-yr	0.63	190.54	190.64	190.61	190.64	0.004950	0.45	2.33	36.86	0.50
Reach1	5300	100-yr	0.74	190.54	190.65	190.61	190.65	0.004819	0.47	2.64	37.81	0.50
Reach1	5200	CH	0.89	190.22	190.41	190.34	190.41	0.001638	0.35	3.17	45.31	0.31
Reach1	5200	Regional	1.02	190.22	190.39	190.35	190.40	0.003412	0.46	2.54	35.58	0.43
Reach1	5200	2-yr	0.28	190.22	190.30	190.30	190.32	0.026428	0.60	0.46	12.42	1.00
Reach1	5200	5-yr	0.36	190.22	190.30	190.30	190.33	0.027996	0.65	0.55	13.76	1.04
Reach1	5200	10-yr	0.41	190.22	190.33	190.31	190.34	0.007605	0.43	0.97	18.58	0.57
Reach1	5200	25-yr	0.52	190.22	190.38	190.32	190.38	0.001519	0.28	2.05	25.59	0.28
Reach1	5200	50-yr	0.63	190.22	190.39	190.32	190.39	0.001582	0.30	2.34	30.90	0.29
Reach1	5200	100-yr	0.74	190.22	190.40	190.33	190.40	0.001576	0.32	2.70	39.63	0.30
Reach1	5100	CH	0.89	189.90	190.00	190.00	190.03	0.019164	0.81	1.47	29.77	0.95
Reach1	5100	Regional	1.02	189.90	190.04	190.01	190.05	0.003833	0.50	3.28	49.05	0.46
Reach1	5100	2-yr	0.28	189.90	190.01	189.96	190.01	0.000952	0.20	1.96	36.19	0.22
Reach1	5100	5-yr	0.36	189.90	190.02	189.97	190.03	0.000988	0.22	2.39	40.72	0.23
Reach1	5100	10-yr	0.41	189.90	190.02	189.97	190.02	0.001777	0.28	2.08	37.46	0.30
Reach1	5100	25-yr	0.52	189.90	189.98	189.98	190.00	0.023194	0.70	0.91	23.55	0.99
Reach1	5100	50-yr	0.63	189.90	189.98	189.98	190.01	0.021080	0.73	1.09	25.38	0.96
Reach1	5100	100-yr	0.74	189.90	189.99	189.99	190.02	0.021784	0.79	1.21	26.60	0.99
Reach1	4999.999	CH	0.89	189.67	189.99	189.75	189.99	0.000042	0.09	16.13	85.56	0.06

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	4999.999	Regional	1.02	189.67	190.04	189.76	190.04	0.000028	0.09	21.46	108.95	0.05
Reach1	4999.999	2-yr	0.28	189.67	189.72	189.72	189.73	0.029976	0.55	0.54	19.75	1.02
Reach1	4999.999	5-yr	0.36	189.67	189.72	189.72	189.74	0.025468	0.55	0.69	22.16	0.96
Reach1	4999.999	10-yr	0.41	189.67	189.75	189.73	189.76	0.003886	0.32	1.52	40.28	0.42
Reach1	4999.999	25-yr	0.52	189.67	189.82	189.73	189.82	0.000426	0.17	4.45	53.86	0.15
Reach1	4999.999	50-yr	0.63	189.67	189.87	189.74	189.87	0.000148	0.13	7.64	62.04	0.10
Reach1	4999.999	100-yr	0.74	189.67	189.92	189.74	189.92	0.000076	0.11	11.07	71.53	0.07
Reach1	4900.587	CH	0.89	189.36	189.99	189.15	189.99	0.000000	0.01	169.65	350.52	0.00
Reach1	4900.587	Regional	1.02	189.36	190.04	189.16	190.04	0.000000	0.01	188.77	355.40	0.00
Reach1	4900.587	2-yr	0.28	189.36	189.68	189.11	189.68	0.000000	0.01	64.96	325.97	0.01
Reach1	4900.587	5-yr	0.36	189.36	189.73	189.12	189.73	0.000000	0.01	81.57	329.37	0.01
Reach1	4900.587	10-yr	0.41	189.36	189.76	189.13	189.76	0.000000	0.01	91.23	331.33	0.01
Reach1	4900.587	25-yr	0.52	189.36	189.82	189.13	189.82	0.000000	0.01	111.07	335.31	0.01
Reach1	4900.587	50-yr	0.63	189.36	189.87	189.14	189.87	0.000000	0.01	129.53	340.12	0.00
Reach1	4900.587	100-yr	0.74	189.36	189.92	189.14	189.92	0.000000	0.01	147.04	344.63	0.00
Reach1	4856.577	CH	0.89	189.31	189.99	189.38	189.99	0.000006	0.06	13.92	335.41	0.03
Reach1	4856.577	Regional	1.02	189.31	190.04	189.39	190.04	0.000006	0.07	15.05	353.57	0.03
Reach1	4856.577	2-yr	0.28	189.31	189.68	189.35	189.68	0.000005	0.04	7.42	253.45	0.02
Reach1	4856.577	5-yr	0.36	189.31	189.73	189.35	189.73	0.000005	0.04	8.48	262.72	0.02
Reach1	4856.577	10-yr	0.41	189.31	189.76	189.36	189.76	0.000006	0.05	9.09	271.00	0.02
Reach1	4856.577	25-yr	0.52	189.31	189.82	189.36	189.82	0.000006	0.05	10.34	285.61	0.02
Reach1	4856.577	50-yr	0.63	189.31	189.87	189.37	189.87	0.000006	0.05	11.48	299.35	0.02
Reach1	4856.577	100-yr	0.74	189.31	189.92	189.37	189.92	0.000006	0.06	12.55	322.08	0.02
Reach1	4846.378		Culvert									
Reach1	4835.945	CH	0.89	189.02	189.13	189.08	189.14	0.002947	0.38	2.31	170.74	0.39
Reach1	4835.945	Regional	1.02	189.02	189.14	189.09	189.15	0.002907	0.40	2.53	172.81	0.40
Reach1	4835.945	2-yr	0.28	189.02	189.08	189.05	189.09	0.002360	0.23	1.22	154.46	0.32
Reach1	4835.945	5-yr	0.36	189.02	189.09	189.06	189.10	0.002230	0.25	1.45	157.90	0.32
Reach1	4835.945	10-yr	0.41	189.02	189.10	189.06	189.10	0.002360	0.27	1.54	159.20	0.33
Reach1	4835.945	25-yr	0.52	189.02	189.11	189.07	189.11	0.002451	0.30	1.76	162.44	0.34
Reach1	4835.945	50-yr	0.63	189.02	189.11	189.07	189.12	0.002812	0.33	1.90	164.52	0.37
Reach1	4835.945	100-yr	0.74	189.02	189.12	189.08	189.13	0.002737	0.35	2.11	167.76	0.37
Reach1	4816.446	CH	0.89	188.90	189.00	189.00	189.02	0.015766	0.68	1.80	49.18	0.85
Reach1	4816.446	Regional	1.02	188.90	189.00	189.00	189.02	0.017482	0.73	1.95	50.83	0.90
Reach1	4816.446	2-yr	0.28	188.90	188.96	188.96	188.98	0.025638	0.55	0.52	17.54	0.96

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	4816.446	5-yr	0.36	188.90	188.97	188.97	188.98	0.026461	0.59	0.64	22.26	0.99
Reach1	4816.446	10-yr	0.41	188.90	188.97	188.97	188.99	0.022028	0.57	0.78	27.42	0.92
Reach1	4816.446	25-yr	0.52	188.90	188.98	188.98	189.00	0.021872	0.62	0.95	32.46	0.94
Reach1	4816.446	50-yr	0.63	188.90	188.99	188.99	189.00	0.016830	0.61	1.28	42.29	0.85
Reach1	4816.446	100-yr	0.74	188.90	188.99	188.99	189.01	0.019016	0.68	1.40	44.00	0.91
Reach1	4600	CH	0.89	187.56	187.83	187.72	187.83	0.001184	0.35	2.76	20.98	0.27
Reach1	4600	Regional	1.02	187.56	187.84	187.73	187.84	0.001219	0.37	3.02	21.89	0.28
Reach1	4600	2-yr	0.28	187.56	187.74	187.66	187.74	0.001133	0.23	1.23	13.94	0.24
Reach1	4600	5-yr	0.36	187.56	187.76	187.67	187.76	0.000960	0.23	1.58	15.93	0.23
Reach1	4600	10-yr	0.41	187.56	187.77	187.68	187.77	0.001008	0.24	1.72	16.63	0.23
Reach1	4600	25-yr	0.52	187.56	187.79	187.69	187.79	0.001038	0.27	1.98	17.90	0.24
Reach1	4600	50-yr	0.63	187.56	187.80	187.70	187.80	0.001091	0.29	2.22	18.97	0.25
Reach1	4600	100-yr	0.74	187.56	187.81	187.71	187.82	0.001118	0.32	2.47	19.92	0.26
Reach1	4500	CH	0.89	187.38	187.55	187.53	187.57	0.009351	0.71	1.36	16.62	0.71
Reach1	4500	Regional	1.02	187.38	187.56	187.54	187.58	0.008850	0.74	1.54	17.60	0.70
Reach1	4500	2-yr	0.28	187.38	187.50	187.48	187.51	0.007782	0.45	0.63	11.34	0.59
Reach1	4500	5-yr	0.36	187.38	187.49	187.48	187.51	0.017437	0.64	0.57	10.77	0.87
Reach1	4500	10-yr	0.41	187.38	187.50	187.49	187.52	0.015304	0.64	0.65	11.51	0.83
Reach1	4500	25-yr	0.52	187.38	187.51	187.50	187.53	0.014172	0.67	0.80	12.81	0.81
Reach1	4500	50-yr	0.63	187.38	187.52	187.51	187.55	0.011470	0.67	0.99	14.34	0.75
Reach1	4500	100-yr	0.74	187.38	187.53	187.52	187.56	0.010471	0.69	1.14	15.33	0.73
Reach1	4400	CH	0.89	186.93	187.22	187.12	187.23	0.001715	0.46	2.14	14.88	0.34
Reach1	4400	Regional	1.02	186.93	187.23	187.13	187.25	0.001747	0.49	2.36	15.61	0.34
Reach1	4400	2-yr	0.28	186.93	187.12		187.12	0.002269	0.32	0.87	9.62	0.34
Reach1	4400	5-yr	0.36	186.93	187.15	187.06	187.15	0.001469	0.31	1.18	11.14	0.29
Reach1	4400	10-yr	0.41	186.93	187.15	187.07	187.16	0.001531	0.33	1.27	11.55	0.30
Reach1	4400	25-yr	0.52	186.93	187.17	187.09	187.18	0.001531	0.36	1.50	12.51	0.30
Reach1	4400	50-yr	0.63	186.93	187.19	187.10	187.20	0.001627	0.40	1.69	13.25	0.32
Reach1	4400	100-yr	0.74	186.93	187.20	187.11	187.21	0.001667	0.43	1.88	13.98	0.32
Reach1	4300	CH	0.89	186.67	186.77	186.77	186.80	0.020728	0.87	1.28	19.53	1.00
Reach1	4300	Regional	1.02	186.67	186.78	186.78	186.81	0.020729	0.92	1.40	19.84	1.01
Reach1	4300	2-yr	0.28	186.67	186.75	186.73	186.76	0.006572	0.39	0.87	18.48	0.53
Reach1	4300	5-yr	0.36	186.67	186.74	186.74	186.76	0.026727	0.67	0.64	17.86	1.03
Reach1	4300	10-yr	0.41	186.67	186.74	186.74	186.76	0.022878	0.67	0.74	18.12	0.97
Reach1	4300	25-yr	0.52	186.67	186.75	186.75	186.77	0.025482	0.76	0.83	18.39	1.04
Reach1	4300	50-yr	0.63	186.67	186.76	186.76	186.78	0.021672	0.77	1.00	18.83	0.99

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	4300	100-yr	0.74	186.67	186.76	186.76	186.79	0.021263	0.82	1.12	19.14	0.99
Reach1	4200.484	CH	0.89	186.13	186.51	186.24	186.51	0.000084	0.13	12.22	54.89	0.08
Reach1	4200.484	Regional	1.02	186.13	186.51	186.24	186.51	0.000109	0.15	12.29	54.99	0.09
Reach1	4200.484	2-yr	0.28	186.13	186.24		186.24	0.004272	0.32	1.33	20.92	0.43
Reach1	4200.484	5-yr	0.36	186.13	186.29	186.20	186.29	0.001197	0.21	2.54	28.79	0.24
Reach1	4200.484	10-yr	0.41	186.13	186.31	186.20	186.31	0.000829	0.20	3.20	32.68	0.21
Reach1	4200.484	25-yr	0.52	186.13	186.34	186.21	186.34	0.000581	0.19	4.36	38.72	0.18
Reach1	4200.484	50-yr	0.63	186.13	186.36	186.22	186.36	0.000492	0.20	5.24	41.10	0.17
Reach1	4200.484	100-yr	0.74	186.13	186.39	186.23	186.39	0.000384	0.19	6.38	44.36	0.15
Reach1	4100	CH	9.86	185.82	186.25		186.27	0.002119	0.86	20.69	75.82	0.42
Reach1	4100	Regional	9.74	185.82	186.24		186.27	0.002152	0.86	20.37	75.35	0.43
Reach1	4100	2-yr	1.02	185.82	185.99		185.99	0.000995	0.31	4.90	43.96	0.25
Reach1	4100	5-yr	1.85	185.82	186.03		186.04	0.001279	0.41	7.01	50.72	0.29
Reach1	4100	10-yr	2.46	185.82	186.06		186.07	0.001282	0.45	8.70	54.78	0.30
Reach1	4100	25-yr	3.30	185.82	186.10		186.11	0.001370	0.51	10.58	58.35	0.32
Reach1	4100	50-yr	3.98	185.82	186.12		186.13	0.001405	0.55	12.07	61.02	0.32
Reach1	4100	100-yr	4.63	185.82	186.14		186.15	0.001579	0.60	12.95	62.62	0.35
Reach1	3999.999	CH	9.86	185.63	185.89		185.92	0.006819	1.06	17.54	109.35	0.69
Reach1	3999.999	Regional	9.74	185.63	185.88		185.92	0.006742	1.05	17.46	109.28	0.69
Reach1	3999.999	2-yr	1.02	185.63	185.71	185.70	185.73	0.019165	0.70	1.99	46.12	0.92
Reach1	3999.999	5-yr	1.85	185.63	185.74	185.73	185.76	0.009657	0.70	4.19	66.97	0.71
Reach1	3999.999	10-yr	2.46	185.63	185.75	185.74	185.78	0.011891	0.82	4.84	70.96	0.80
Reach1	3999.999	25-yr	3.30	185.63	185.77	185.76	185.80	0.011773	0.90	6.12	77.56	0.82
Reach1	3999.999	50-yr	3.98	185.63	185.78	185.77	185.82	0.011986	0.97	7.07	83.92	0.84
Reach1	3999.999	100-yr	4.63	185.63	185.81	185.78	185.84	0.008762	0.92	9.21	101.89	0.73
Reach1	3899.999	CH	9.86	185.10	185.49		185.51	0.002661	0.88	18.09	69.27	0.46
Reach1	3899.999	Regional	9.74	185.10	185.48		185.51	0.002717	0.89	17.77	68.79	0.47
Reach1	3899.999	2-yr	1.02	185.10	185.23		185.23	0.002220	0.36	3.82	39.95	0.35
Reach1	3899.999	5-yr	1.85	185.10	185.26		185.27	0.003014	0.49	5.17	44.13	0.42
Reach1	3899.999	10-yr	2.46	185.10	185.29		185.30	0.002552	0.52	6.68	47.85	0.40
Reach1	3899.999	25-yr	3.30	185.10	185.33		185.34	0.002448	0.58	8.35	51.52	0.41
Reach1	3899.999	50-yr	3.98	185.10	185.35		185.37	0.002337	0.61	9.70	54.21	0.40
Reach1	3899.999	100-yr	4.63	185.10	185.36		185.38	0.002795	0.68	10.15	55.06	0.44
Reach1	3799.999	CH	10.18	184.70	185.12		185.16	0.004757	1.10	16.26	77.98	0.61
Reach1	3799.999	Regional	9.74	184.70	185.11		185.15	0.004826	1.09	15.62	76.77	0.61

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	3799.999	2-yr	1.02	184.70	184.89		184.90	0.005505	0.52	2.54	35.58	0.54
Reach1	3799.999	5-yr	1.85	184.70	184.94		184.96	0.003271	0.55	4.81	43.49	0.45
Reach1	3799.999	10-yr	2.46	184.70	184.95		184.97	0.004481	0.67	5.32	53.57	0.53
Reach1	3799.999	25-yr	3.30	184.70	184.98		185.00	0.004856	0.76	6.58	57.57	0.56
Reach1	3799.999	50-yr	3.98	184.70	184.99		185.01	0.005802	0.86	7.13	58.76	0.62
Reach1	3799.999	100-yr	4.63	184.70	185.02		185.05	0.003966	0.79	9.37	63.32	0.53
Reach1	3734.349	CH	10.18	184.29	185.07		185.08	0.000529	0.53	34.42	96.02	0.22
Reach1	3734.349	Regional	9.74	184.29	185.06		185.07	0.000505	0.52	33.85	95.42	0.22
Reach1	3734.349	2-yr	1.02	184.29	184.89		184.89	0.000023	0.09	19.08	75.82	0.04
Reach1	3734.349	5-yr	1.85	184.29	184.94		184.94	0.000047	0.14	23.20	82.45	0.06
Reach1	3734.349	10-yr	2.46	184.29	184.95		184.95	0.000077	0.18	23.90	83.40	0.08
Reach1	3734.349	25-yr	3.30	184.29	184.97		184.97	0.000119	0.22	25.44	85.41	0.10
Reach1	3734.349	50-yr	3.98	184.29	184.97		184.98	0.000167	0.27	25.84	85.94	0.12
Reach1	3734.349	100-yr	4.63	184.29	185.01		185.01	0.000171	0.28	28.86	89.74	0.12
Reach1	3636.317	CH	10.18	184.20	185.05		185.06	0.000088	0.26	91.87	247.94	0.10
Reach1	3636.317	Regional	9.74	184.20	185.05		185.05	0.000083	0.25	90.54	246.64	0.09
Reach1	3636.317	2-yr	1.02	184.20	184.89		184.89	0.000003	0.04	54.52	198.87	0.02
Reach1	3636.317	5-yr	1.85	184.20	184.94		184.94	0.000006	0.06	65.31	217.50	0.02
Reach1	3636.317	10-yr	2.46	184.20	184.95		184.95	0.000011	0.08	67.03	218.89	0.03
Reach1	3636.317	25-yr	3.30	184.20	184.97		184.97	0.000017	0.11	70.85	222.88	0.04
Reach1	3636.317	50-yr	3.98	184.20	184.97		184.97	0.000024	0.13	71.68	224.03	0.05
Reach1	3636.317	100-yr	4.63	184.20	185.00		185.00	0.000025	0.14	79.49	234.56	0.05
Reach1	3625.504	CH	10.18	184.20	185.05	184.74	185.05	0.000296	0.41	50.35	157.92	0.17
Reach1	3625.504	Regional	9.74	184.20	185.04	184.73	185.05	0.000281	0.40	49.56	156.49	0.16
Reach1	3625.504	2-yr	1.02	184.20	184.89	184.42	184.89	0.000030	0.11	11.60	109.87	0.05
Reach1	3625.504	5-yr	1.85	184.20	184.94	184.48	184.94	0.000022	0.10	35.57	121.12	0.04
Reach1	3625.504	10-yr	2.46	184.20	184.95	184.52	184.95	0.000037	0.13	36.50	122.49	0.06
Reach1	3625.504	25-yr	3.30	184.20	184.96	184.57	184.97	0.000058	0.16	38.59	125.53	0.07
Reach1	3625.504	50-yr	3.98	184.20	184.97	184.59	184.97	0.000082	0.20	39.00	126.11	0.09
Reach1	3625.504	100-yr	4.63	184.20	185.00	184.61	185.00	0.000085	0.21	43.43	137.61	0.09
Reach1	3615.502		Culvert									
Reach1	3602.958	CH	10.18	184.32	184.62	184.62	184.76	0.013190	1.66	6.13	149.50	0.99
Reach1	3602.958	Regional	9.74	184.32	184.61	184.61	184.75	0.013372	1.64	5.94	148.43	0.99
Reach1	3602.958	2-yr	1.02	184.32	184.40	184.40	184.43	0.015115	0.69	1.48	86.39	0.84
Reach1	3602.958	5-yr	1.85	184.32	184.43	184.43	184.47	0.020018	0.95	1.94	99.67	1.01

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	3602.958	10-yr	2.46	184.32	184.45	184.45	184.50	0.018285	1.04	2.37	110.68	1.00
Reach1	3602.958	25-yr	3.30	184.32	184.47	184.47	184.54	0.017243	1.15	2.88	117.83	1.00
Reach1	3602.958	50-yr	3.98	184.32	184.49	184.49	184.56	0.016830	1.23	3.24	125.11	1.01
Reach1	3602.958	100-yr	4.63	184.32	184.50	184.50	184.59	0.015979	1.28	3.61	128.96	1.00
Reach1	3588.753	CH	10.18	184.16	184.58	184.36	184.58	0.000584	0.44	46.74	178.82	0.22
Reach1	3588.753	Regional	9.74	184.16	184.47	184.35	184.48	0.001903	0.64	29.33	154.72	0.38
Reach1	3588.753	2-yr	1.02	184.16	184.25		184.26	0.008904	0.52	2.68	60.83	0.64
Reach1	3588.753	5-yr	1.85	184.16	184.29	184.25	184.30	0.004314	0.50	6.00	101.44	0.48
Reach1	3588.753	10-yr	2.46	184.16	184.31	184.27	184.32	0.003634	0.51	8.11	106.36	0.46
Reach1	3588.753	25-yr	3.30	184.16	184.33	184.29	184.34	0.003089	0.53	10.83	112.21	0.43
Reach1	3588.753	50-yr	3.98	184.16	184.35	184.30	184.36	0.002806	0.55	12.92	116.81	0.42
Reach1	3588.753	100-yr	4.63	184.16	184.37	184.30	184.38	0.002623	0.56	14.90	122.62	0.41
Reach1	3499.999	CH	17.44	183.96	184.50		184.51	0.001078	0.72	59.30	239.59	0.31
Reach1	3499.999	Regional	9.74	183.96	184.36		184.37	0.001002	0.57	34.29	135.66	0.29
Reach1	3499.999	2-yr	1.02	183.96	184.11		184.11	0.000679	0.24	6.94	68.80	0.20
Reach1	3499.999	5-yr	1.85	183.96	184.14		184.15	0.000951	0.33	9.57	80.97	0.25
Reach1	3499.999	10-yr	2.46	183.96	184.18		184.18	0.000924	0.36	12.39	95.43	0.25
Reach1	3499.999	25-yr	3.30	183.96	184.21		184.21	0.000930	0.39	15.55	103.65	0.26
Reach1	3499.999	50-yr	3.98	183.96	184.23		184.24	0.000927	0.42	17.96	108.59	0.26
Reach1	3499.999	100-yr	4.63	183.96	184.25		184.25	0.000946	0.44	19.96	111.54	0.27
Reach1	3399.999	CH	17.44	183.80	184.23		184.29	0.005606	1.38	25.28	134.25	0.69
Reach1	3399.999	Regional	9.74	183.80	184.12		184.17	0.005668	1.13	14.65	74.49	0.66
Reach1	3399.999	2-yr	1.02	183.80	183.89	183.89	183.91	0.018831	0.76	1.59	33.60	0.93
Reach1	3399.999	5-yr	1.85	183.80	183.96		183.97	0.004130	0.58	4.61	48.34	0.49
Reach1	3399.999	10-yr	2.46	183.80	183.97		183.99	0.005195	0.69	5.25	50.42	0.56
Reach1	3399.999	25-yr	3.30	183.80	183.99		184.02	0.005452	0.77	6.45	54.11	0.59
Reach1	3399.999	50-yr	3.98	183.80	184.01		184.03	0.006081	0.85	7.14	56.12	0.63
Reach1	3399.999	100-yr	4.63	183.80	184.02		184.05	0.006187	0.90	7.96	58.44	0.64
Reach1	3299.999	CH	17.81	183.43	183.96		183.98	0.001991	0.90	38.36	121.98	0.42
Reach1	3299.999	Regional	9.74	183.43	183.85		183.86	0.001954	0.74	25.02	110.50	0.40
Reach1	3299.999	2-yr	1.02	183.43	183.63	183.54	183.63	0.000827	0.25	6.10	59.01	0.22
Reach1	3299.999	5-yr	1.85	183.43	183.62		183.63	0.003015	0.47	5.87	58.00	0.42
Reach1	3299.999	10-yr	2.46	183.43	183.66		183.67	0.002316	0.48	8.03	67.04	0.38
Reach1	3299.999	25-yr	3.30	183.43	183.69		183.70	0.002198	0.53	10.24	74.69	0.38
Reach1	3299.999	50-yr	3.98	183.43	183.72		183.73	0.001936	0.54	12.43	81.49	0.37
Reach1	3299.999	100-yr	4.63	183.43	183.74		183.75	0.001867	0.56	14.18	86.84	0.36

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	3199.999	CH	17.81	183.28	183.81	183.60	183.82	0.001511	0.80	46.03	151.19	0.37
Reach1	3199.999	Regional	9.74	183.28	183.74	183.54	183.75	0.000847	0.54	36.24	137.48	0.27
Reach1	3199.999	2-yr	1.02	183.28	183.39	183.39	183.41	0.017494	0.73	1.70	45.58	0.90
Reach1	3199.999	5-yr	1.85	183.28	183.56	183.41	183.57	0.000287	0.22	15.48	102.69	0.14
Reach1	3199.999	10-yr	2.46	183.28	183.61	183.43	183.61	0.000246	0.23	20.37	111.34	0.14
Reach1	3199.999	25-yr	3.30	183.28	183.63	183.44	183.63	0.000348	0.28	22.33	115.09	0.16
Reach1	3199.999	50-yr	3.98	183.28	183.66	183.46	183.66	0.000332	0.30	26.22	122.20	0.16
Reach1	3199.999	100-yr	4.63	183.28	183.68	183.47	183.68	0.000361	0.32	28.48	125.80	0.17
Reach1	3143.616	CH	17.81	182.99	183.79	183.36	183.80	0.000152	0.34	112.44	229.88	0.12
Reach1	3143.616	Regional	9.74	182.99	183.73	183.29	183.73	0.000067	0.21	98.56	224.54	0.08
Reach1	3143.616	2-yr	1.02	182.99	183.37	183.10	183.37	0.000026	0.08	26.23	168.78	0.04
Reach1	3143.616	5-yr	1.85	182.99	183.56	183.14	183.56	0.000009	0.06	61.60	207.48	0.03
Reach1	3143.616	10-yr	2.46	182.99	183.61	183.16	183.61	0.000011	0.07	71.39	217.66	0.03
Reach1	3143.616	25-yr	3.30	182.99	183.63	183.18	183.63	0.000017	0.09	75.06	218.60	0.04
Reach1	3143.616	50-yr	3.98	182.99	183.66	183.19	183.66	0.000019	0.10	82.22	220.43	0.04
Reach1	3143.616	100-yr	4.63	182.99	183.68	183.22	183.68	0.000022	0.11	86.18	221.43	0.05
Reach1	3071.819	CH	18.21	182.93	183.79	183.57	183.79	0.000269	0.28	96.36	247.60	0.15
Reach1	3071.819	Regional	9.74	182.93	183.73	183.33	183.73	0.000129	0.17	82.24	243.39	0.10
Reach1	3071.819	2-yr	1.02	182.93	183.37	183.06	183.37	0.000097	0.16	6.31	84.28	0.09
Reach1	3071.819	5-yr	1.85	182.93	183.56	183.10	183.56	0.000157	0.16	12.14	188.54	0.10
Reach1	3071.819	10-yr	2.46	182.93	183.61	183.12	183.61	0.000042	0.08	41.64	206.68	0.05
Reach1	3071.819	25-yr	3.30	182.93	183.63	183.15	183.63	0.000065	0.09	44.26	216.32	0.07
Reach1	3071.819	50-yr	3.98	182.93	183.66	183.18	183.66	0.000066	0.10	49.62	221.94	0.07
Reach1	3071.819	100-yr	4.63	182.93	183.68	183.20	183.68	0.000073	0.11	52.56	224.70	0.07
Reach1	3059.960		Culvert									
Reach1	3044.762	CH	18.21	182.84	183.37	183.24	183.46	0.004279	1.30	14.02	187.05	0.61
Reach1	3044.762	Regional	9.74	182.84	183.23	183.13	183.28	0.003990	0.99	9.83	162.40	0.56
Reach1	3044.762	2-yr	1.02	182.84	182.98	182.95	182.99	0.005686	0.46	2.22	57.62	0.52
Reach1	3044.762	5-yr	1.85	182.84	183.02	182.98	183.03	0.005333	0.56	3.33	68.94	0.54
Reach1	3044.762	10-yr	2.46	182.84	183.04	183.00	183.06	0.004784	0.60	4.08	79.95	0.53
Reach1	3044.762	25-yr	3.30	182.84	183.07	183.02	183.09	0.004686	0.67	4.90	105.55	0.54
Reach1	3044.762	50-yr	3.98	182.84	183.09	183.03	183.12	0.004546	0.72	5.53	118.34	0.54
Reach1	3044.762	100-yr	4.63	182.84	183.11	183.04	183.14	0.004395	0.76	6.11	129.41	0.54
Reach1	2995.296	CH	18.21	182.60	183.23	182.98	183.25	0.001389	0.82	43.47	140.26	0.36

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	2995.296	Regional	9.74	182.60	183.08	182.88	183.10	0.001516	0.69	24.66	103.58	0.35
Reach1	2995.296	2-yr	1.02	182.60	182.78	182.72	182.79	0.001939	0.35	4.36	45.62	0.33
Reach1	2995.296	5-yr	1.85	182.60	182.84	182.75	182.84	0.001745	0.40	7.01	53.68	0.33
Reach1	2995.296	10-yr	2.46	182.60	182.87	182.76	182.88	0.001689	0.43	8.74	58.16	0.33
Reach1	2995.296	25-yr	3.30	182.60	182.90	182.78	182.91	0.001628	0.47	10.87	63.69	0.33
Reach1	2995.296	50-yr	3.98	182.60	182.93	182.80	182.94	0.001586	0.51	12.51	66.99	0.33
Reach1	2995.296	100-yr	4.63	182.60	182.95	182.81	182.96	0.001566	0.53	13.99	69.85	0.34
Reach1	2899.999	CH	18.21	182.54	183.12	182.81	183.14	0.001078	0.72	46.30	112.04	0.31
Reach1	2899.999	Regional	9.74	182.54	182.97	182.71	182.98	0.001044	0.56	30.18	99.50	0.29
Reach1	2899.999	2-yr	1.02	182.54	182.70	182.57	182.70	0.000639	0.19	7.58	62.09	0.19
Reach1	2899.999	5-yr	1.85	182.54	182.75	182.60	182.75	0.000692	0.26	11.03	71.09	0.21
Reach1	2899.999	10-yr	2.46	182.54	182.78	182.61	182.78	0.000748	0.30	13.01	75.26	0.22
Reach1	2899.999	25-yr	3.30	182.54	182.81	182.63	182.81	0.000802	0.34	15.52	80.11	0.23
Reach1	2899.999	50-yr	3.98	182.54	182.83	182.64	182.83	0.000837	0.37	17.42	83.54	0.24
Reach1	2899.999	100-yr	4.63	182.54	182.85	182.65	182.85	0.000879	0.40	19.02	85.85	0.25
Reach1	2851.797	CH	19.32	182.48	182.85	182.85	182.98	0.019171	1.95	15.25	65.03	1.19
Reach1	2851.797	Regional	9.74	182.48	182.74	182.74	182.83	0.023928	1.58	8.89	56.32	1.22
Reach1	2851.797	2-yr	1.02	182.48	182.56	182.56	182.60	0.046224	0.98	1.29	18.06	1.39
Reach1	2851.797	5-yr	1.85	182.48	182.60	182.60	182.65	0.039518	1.08	2.09	28.47	1.35
Reach1	2851.797	10-yr	2.46	182.48	182.63	182.63	182.67	0.036513	0.94	3.01	44.11	1.26
Reach1	2851.797	25-yr	3.30	182.48	182.64	182.64	182.69	0.036420	1.09	3.72	47.17	1.31
Reach1	2851.797	50-yr	3.98	182.48	182.66	182.66	182.71	0.035234	1.18	4.29	48.87	1.32
Reach1	2851.797	100-yr	4.63	182.48	182.67	182.67	182.73	0.030571	1.22	4.99	50.34	1.26
Reach1	2764.286	CH	19.32	181.04	182.38	181.57	182.39	0.000130	0.44	75.94	83.33	0.13
Reach1	2764.286	Regional	9.74	181.04	182.02	181.42	182.02	0.000137	0.35	46.34	78.98	0.12
Reach1	2764.286	2-yr	1.02	181.04	181.39	181.16	181.39	0.000220	0.19	6.42	33.13	0.12
Reach1	2764.286	5-yr	1.85	181.04	181.51	181.21	181.51	0.000179	0.22	10.84	45.72	0.12
Reach1	2764.286	10-yr	2.46	181.04	181.57	181.23	181.58	0.000165	0.24	14.24	55.75	0.12
Reach1	2764.286	25-yr	3.30	181.04	181.65	181.27	181.66	0.000159	0.26	19.06	67.04	0.12
Reach1	2764.286	50-yr	3.98	181.04	181.71	181.29	181.71	0.000147	0.27	22.90	69.86	0.12
Reach1	2764.286	100-yr	4.63	181.04	181.75	181.31	181.76	0.000144	0.28	26.05	72.09	0.12
Reach1	2689.225	CH	19.32	180.88	182.32	181.76	182.37	0.000750	0.92	22.11	24.96	0.29
Reach1	2689.225	Regional	9.74	180.88	181.97	181.55	182.00	0.000791	0.72	13.84	22.35	0.28
Reach1	2689.225	2-yr	1.02	180.88	181.36	181.15	181.36	0.000826	0.37	2.74	11.22	0.24
Reach1	2689.225	5-yr	1.85	180.88	181.47	181.22	181.48	0.000872	0.44	4.20	13.94	0.26
Reach1	2689.225	10-yr	2.46	180.88	181.54	181.26	181.55	0.000880	0.47	5.19	15.56	0.26

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	2689.225	25-yr	3.30	180.88	181.62	181.31	181.63	0.000898	0.51	6.46	17.62	0.27
Reach1	2689.225	50-yr	3.98	180.88	181.67	181.34	181.69	0.000888	0.53	7.50	19.14	0.27
Reach1	2689.225	100-yr	4.63	180.88	181.72	181.38	181.73	0.000894	0.55	8.36	20.09	0.27
Reach1	2600	CH	20.08	180.84	182.20	181.75	182.27	0.001426	1.42	22.06	25.29	0.41
Reach1	2600	Regional	9.74	180.84	181.87	181.51	181.92	0.001115	1.02	14.27	22.99	0.35
Reach1	2600	2-yr	1.02	180.84	181.28	181.10	181.29	0.000824	0.42	2.72	12.80	0.25
Reach1	2600	5-yr	1.85	180.84	181.39	181.17	181.41	0.000839	0.52	4.34	16.12	0.26
Reach1	2600	10-yr	2.46	180.84	181.46	181.21	181.47	0.000852	0.58	5.45	18.21	0.27
Reach1	2600	25-yr	3.30	180.84	181.53	181.25	181.55	0.000874	0.65	6.85	19.65	0.28
Reach1	2600	50-yr	3.98	180.84	181.59	181.29	181.61	0.000866	0.69	7.98	20.62	0.29
Reach1	2600	100-yr	4.63	180.84	181.63	181.32	181.65	0.000913	0.74	8.81	21.33	0.30
Reach1	2500	CH	20.08	180.72	182.02		182.10	0.002067	1.28	15.82	21.42	0.46
Reach1	2500	Regional	9.74	180.72	181.71		181.77	0.002132	1.00	9.69	18.25	0.44
Reach1	2500	2-yr	1.02	180.72	181.15		181.16	0.002230	0.56	1.82	8.48	0.39
Reach1	2500	5-yr	1.85	180.72	181.26		181.28	0.002140	0.64	2.88	10.69	0.39
Reach1	2500	10-yr	2.46	180.72	181.32		181.35	0.002118	0.68	3.59	11.98	0.40
Reach1	2500	25-yr	3.30	180.72	181.40		181.42	0.002072	0.73	4.54	13.66	0.40
Reach1	2500	50-yr	3.98	180.72	181.46		181.49	0.001834	0.73	5.48	15.03	0.38
Reach1	2500	100-yr	4.63	180.72	181.49		181.52	0.001934	0.78	5.97	15.44	0.40
Reach1	2400	CH	20.08	180.52	181.68	181.48	181.83	0.003539	1.77	13.41	20.76	0.61
Reach1	2400	Regional	9.74	180.52	181.49	181.23	181.55	0.002096	1.14	9.59	18.76	0.45
Reach1	2400	2-yr	1.02	180.52	180.99	180.81	181.00	0.001242	0.45	2.26	9.64	0.29
Reach1	2400	5-yr	1.85	180.52	181.09	180.89	181.10	0.001460	0.57	3.30	11.67	0.33
Reach1	2400	10-yr	2.46	180.52	181.14	180.93	181.16	0.001564	0.63	3.99	12.84	0.35
Reach1	2400	25-yr	3.30	180.52	181.24	180.98	181.26	0.001228	0.64	5.39	14.92	0.32
Reach1	2400	50-yr	3.98	180.52	181.35	181.02	181.37	0.000806	0.60	7.09	17.13	0.27
Reach1	2400	100-yr	4.63	180.52	181.36	181.05	181.39	0.001008	0.69	7.30	17.37	0.30
Reach1	2300	CH	20.22	180.49	181.53		181.58	0.001520	1.09	26.37	52.57	0.40
Reach1	2300	Regional	9.74	180.49	181.40		181.42	0.000732	0.67	19.76	51.36	0.27
Reach1	2300	2-yr	1.02	180.49	180.82		180.84	0.002228	0.48	2.13	12.65	0.37
Reach1	2300	5-yr	1.85	180.49	180.90		180.92	0.002343	0.57	3.23	15.23	0.40
Reach1	2300	10-yr	2.46	180.49	181.01		181.02	0.001241	0.49	5.01	19.26	0.30
Reach1	2300	25-yr	3.30	180.49	181.19		181.20	0.000397	0.38	9.97	35.79	0.18
Reach1	2300	50-yr	3.98	180.49	181.32		181.33	0.000210	0.33	15.64	48.62	0.14
Reach1	2300	100-yr	4.63	180.49	181.33		181.33	0.000277	0.38	15.80	49.02	0.16

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	2200	CH	20.22	180.42	181.46	180.86	181.48	0.000621	0.67	43.60	57.31	0.25
Reach1	2200	Regional	9.74	180.42	181.38	180.72	181.38	0.000194	0.35	38.99	53.54	0.14
Reach1	2200	2-yr	1.02	180.42	180.64	180.50	180.65	0.001570	0.31	4.67	29.23	0.29
Reach1	2200	5-yr	1.85	180.42	180.83	180.54	180.83	0.000402	0.19	11.37	43.58	0.16
Reach1	2200	10-yr	2.46	180.42	180.98	180.57	180.98	0.000150	0.17	18.47	48.78	0.10
Reach1	2200	25-yr	3.30	180.42	181.18	180.59	181.18	0.000064	0.16	28.40	51.81	0.07
Reach1	2200	50-yr	3.98	180.42	181.32	180.61	181.32	0.000044	0.15	35.60	52.99	0.06
Reach1	2200	100-yr	4.63	180.42	181.32	180.62	181.32	0.000059	0.18	35.68	53.01	0.07
Reach1	1952.223	CH	20.34	179.87	181.40		181.40	0.000180	0.45	103.92	279.32	0.14
Reach1	1952.223	Regional	9.74	179.87	181.36		181.36	0.000050	0.23	94.15	265.93	0.07
Reach1	1952.223	2-yr	1.02	179.87	180.55		180.56	0.000177	0.21	5.87	39.80	0.12
Reach1	1952.223	5-yr	1.85	179.87	180.81		180.81	0.000049	0.15	20.25	64.56	0.07
Reach1	1952.223	10-yr	2.46	179.87	180.97		180.97	0.000030	0.13	31.16	78.12	0.05
Reach1	1952.223	25-yr	3.30	179.87	181.17		181.17	0.000016	0.11	53.86	152.72	0.04
Reach1	1952.223	50-yr	3.98	179.87	181.31		181.31	0.000011	0.10	81.62	244.26	0.03
Reach1	1952.223	100-yr	4.63	179.87	181.31		181.31	0.000015	0.12	81.62	244.26	0.04
Reach1	1937.395	CH	20.34	179.87	181.40	180.90	181.40	0.000017	0.12	269.61	286.13	0.04
Reach1	1937.395	Regional	9.74	179.87	181.36	180.65	181.36	0.000004	0.06	259.31	283.87	0.02
Reach1	1937.395	2-yr	1.02	179.87	180.55	180.25	180.55	0.000327	0.27	3.75	197.24	0.16
Reach1	1937.395	5-yr	1.85	179.87	180.80	180.34	180.81	0.000159	0.26	7.21	201.37	0.12
Reach1	1937.395	10-yr	2.46	179.87	180.97	180.37	180.97	0.000118	0.25	9.79	226.99	0.11
Reach1	1937.395	25-yr	3.30	179.87	181.17	180.42	181.17	0.000090	0.24	13.51	269.77	0.09
Reach1	1937.395	50-yr	3.98	179.87	181.31	180.45	181.31	0.000001	0.03	226.09	280.81	0.01
Reach1	1937.395	100-yr	4.63	179.87	181.31	180.48	181.31	0.000001	0.03	226.10	280.81	0.01
Reach1	1921.497		Culvert									
Reach1	1906.334	CH	20.34	179.74	181.36	180.85	181.36	0.000019	0.14	274.65	323.81	0.05
Reach1	1906.334	Regional	9.74	179.74	181.35	180.66	181.35	0.000004	0.07	273.21	323.35	0.02
Reach1	1906.334	2-yr	1.02	179.74	180.01	180.11	180.36	0.091609	2.61	0.39	16.98	2.28
Reach1	1906.334	5-yr	1.85	179.74	180.07	180.21	180.56	0.095728	3.08	0.60	42.94	2.41
Reach1	1906.334	10-yr	2.46	179.74	180.27	180.27	180.40	0.013715	1.60	1.54	96.02	0.99
Reach1	1906.334	25-yr	3.30	179.74	180.34	180.34	180.49	0.013576	1.71	1.93	111.38	1.00
Reach1	1906.334	50-yr	3.98	179.74	180.46	180.38	180.56	0.007050	1.40	2.84	147.60	0.75
Reach1	1906.334	100-yr	4.63	179.74	181.19	180.42	181.19	0.000094	0.28	16.56	284.10	0.10
Reach1	1885.931	CH	20.34	179.74	181.36		181.36	0.000009	0.11	447.70	585.84	0.03
Reach1	1885.931	Regional	9.74	179.74	181.35		181.35	0.000002	0.05	445.19	585.38	0.02

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	1885.931	2-yr	1.02	179.74	180.04	179.97	180.04	0.004209	0.60	3.60	38.39	0.50
Reach1	1885.931	5-yr	1.85	179.74	180.11	180.00	180.12	0.003131	0.60	7.62	76.93	0.45
Reach1	1885.931	10-yr	2.46	179.74	180.16	180.04	180.16	0.001933	0.50	11.39	87.96	0.36
Reach1	1885.931	25-yr	3.30	179.74	180.21	180.06	180.21	0.001448	0.43	15.80	98.30	0.31
Reach1	1885.931	50-yr	3.98	179.74	180.48		180.48	0.000065	0.13	62.47	255.86	0.07
Reach1	1885.931	100-yr	4.63	179.74	181.19		181.19	0.000001	0.03	352.65	533.75	0.01
Reach1	1799.999	CH	20.83	179.48	181.36		181.36	0.000005	0.09	597.42	707.95	0.02
Reach1	1799.999	Regional	9.74	179.48	181.35		181.35	0.000001	0.04	594.67	707.42	0.01
Reach1	1799.999	2-yr	1.02	179.48	179.99		179.99	0.000226	0.20	12.53	92.07	0.13
Reach1	1799.999	5-yr	1.85	179.48	180.07		180.07	0.000190	0.21	21.26	112.53	0.12
Reach1	1799.999	10-yr	2.46	179.48	180.12		180.12	0.000189	0.18	27.08	125.78	0.11
Reach1	1799.999	25-yr	3.30	179.48	180.17		180.17	0.000206	0.16	33.36	144.51	0.12
Reach1	1799.999	50-yr	3.98	179.48	180.48		180.48	0.000016	0.07	113.06	372.78	0.04
Reach1	1799.999	100-yr	4.63	179.48	181.19		181.19	0.000000	0.02	485.26	649.75	0.01
Reach1	1699.999	CH	20.83	179.32	181.35		181.35	0.000016	0.17	499.78	664.39	0.05
Reach1	1699.999	Regional	9.74	179.32	181.35		181.35	0.000004	0.08	497.78	664.11	0.02
Reach1	1699.999	2-yr	1.02	179.32	179.93		179.94	0.001695	0.41	3.79	48.28	0.32
Reach1	1699.999	5-yr	1.85	179.32	180.03		180.04	0.000921	0.41	9.44	68.38	0.26
Reach1	1699.999	10-yr	2.46	179.32	180.08		180.09	0.000789	0.42	13.25	80.10	0.24
Reach1	1699.999	25-yr	3.30	179.32	180.13		180.13	0.000838	0.47	16.89	91.40	0.26
Reach1	1699.999	50-yr	3.98	179.32	180.47		180.47	0.000052	0.16	70.81	197.31	0.07
Reach1	1699.999	100-yr	4.63	179.32	181.19		181.19	0.000002	0.05	391.65	649.09	0.01
Reach1	1600	CH	22.58	179.20	181.35		181.35	0.000019	0.18	457.03	562.04	0.05
Reach1	1600	Regional	9.74	179.20	181.35		181.35	0.000003	0.08	456.08	561.75	0.02
Reach1	1600	2-yr	1.02	179.20	179.86	179.63	179.87	0.000475	0.33	9.89	65.24	0.19
Reach1	1600	5-yr	1.85	179.20	179.98		179.98	0.000436	0.24	18.93	87.13	0.17
Reach1	1600	10-yr	2.46	179.20	180.04		180.04	0.000414	0.21	24.38	105.03	0.16
Reach1	1600	25-yr	3.30	179.20	180.08		180.08	0.000457	0.23	28.68	112.74	0.17
Reach1	1600	50-yr	3.98	179.20	180.47		180.47	0.000024	0.11	95.62	241.56	0.05
Reach1	1600	100-yr	4.63	179.20	181.19		181.19	0.000001	0.04	372.38	499.77	0.01
Reach1	1500	CH	22.58	179.24	181.35		181.35	0.000012	0.15	595.72	666.81	0.04
Reach1	1500	Regional	9.74	179.24	181.35		181.35	0.000002	0.07	595.20	666.74	0.02
Reach1	1500	2-yr	1.02	179.24	179.63	179.63	179.72	0.016032	1.38	0.74	3.84	1.01
Reach1	1500	5-yr	1.85	179.24	179.74	179.74	179.85	0.015335	1.48	1.25	5.75	1.01
Reach1	1500	10-yr	2.46	179.24	179.79	179.79	179.91	0.015736	1.53	1.61	7.11	1.03
Reach1	1500	25-yr	3.30	179.24	179.92	179.92	179.96	0.010605	0.96	6.46	88.11	0.79

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	1500	50-yr	3.98	179.24	180.47		180.47	0.000016	0.10	127.49	318.06	0.04
Reach1	1500	100-yr	4.63	179.24	181.19		181.19	0.000001	0.04	488.79	652.10	0.01
Reach1	1400	CH	22.58	179.13	181.35		181.35	0.000005	0.12	803.24	720.74	0.03
Reach1	1400	Regional	9.74	179.13	181.35		181.35	0.000001	0.05	803.06	720.63	0.01
Reach1	1400	2-yr	1.02	179.13	179.56	179.28	179.56	0.000069	0.13	12.03	57.28	0.07
Reach1	1400	5-yr	1.85	179.13	179.63	179.32	179.63	0.000121	0.20	15.78	64.40	0.10
Reach1	1400	10-yr	2.46	179.13	179.84	179.34	179.84	0.000041	0.15	42.66	227.14	0.06
Reach1	1400	25-yr	3.30	179.13	179.86	179.37	179.86	0.000064	0.20	46.62	233.33	0.08
Reach1	1400	50-yr	3.98	179.13	180.47		180.47	0.000002	0.06	269.12	465.66	0.02
Reach1	1400	100-yr	4.63	179.13	181.19		181.19	0.000000	0.03	690.60	686.11	0.01
Reach1	1323.669	CH	22.58	179.01	181.35		181.35	0.000004	0.10	931.09	879.14	0.02
Reach1	1323.669	Regional	9.74	179.01	181.35		181.35	0.000001	0.04	931.04	879.13	0.01
Reach1	1323.669	2-yr	1.02	179.01	179.55		179.55	0.000386	0.23	6.41	89.14	0.16
Reach1	1323.669	5-yr	1.85	179.01	179.61		179.61	0.000471	0.29	13.56	140.07	0.18
Reach1	1323.669	10-yr	2.46	179.01	179.84		179.84	0.000041	0.13	55.46	205.79	0.06
Reach1	1323.669	25-yr	3.30	179.01	179.85		179.85	0.000064	0.17	58.74	208.32	0.08
Reach1	1323.669	50-yr	3.98	179.01	180.47		180.47	0.000002	0.05	302.03	587.08	0.02
Reach1	1323.669	100-yr	4.63	179.01	181.19		181.19	0.000000	0.02	795.01	801.28	0.01
Reach1	1193.845	CH	23.66	178.85	181.35		181.35	0.000004	0.10	1039.86	1015.37	0.02
Reach1	1193.845	Regional	23.66	178.85	181.35		181.35	0.000004	0.10	1039.86	1015.37	0.02
Reach1	1193.845	2-yr	2.01	178.85	179.20	179.20	179.29	0.016405	1.32	1.52	8.78	1.02
Reach1	1193.845	5-yr	3.73	178.85	179.51		179.52	0.000909	0.47	14.57	80.34	0.26
Reach1	1193.845	10-yr	5.03	178.85	179.83		179.83	0.000097	0.24	57.52	179.31	0.10
Reach1	1193.845	25-yr	6.84	178.85	179.84		179.84	0.000168	0.32	59.21	180.52	0.13
Reach1	1193.845	50-yr	8.34	178.85	180.47		180.47	0.000010	0.12	287.83	662.60	0.03
Reach1	1193.845	100-yr	9.79	178.85	181.19		181.19	0.000001	0.05	877.85	995.72	0.01
Reach1	1100	CH	23.66	178.25	181.35		181.35	0.000001	0.05	1295.30	1114.48	0.01
Reach1	1100	Regional	23.66	178.25	181.35		181.35	0.000001	0.05	1295.30	1114.48	0.01
Reach1	1100	2-yr	2.01	178.25	179.09	178.57	179.09	0.000073	0.17	20.01	102.58	0.08
Reach1	1100	5-yr	3.73	178.25	179.52		179.52	0.000008	0.09	102.63	254.06	0.03
Reach1	1100	10-yr	5.03	178.25	179.83		179.83	0.000003	0.07	189.31	326.90	0.02
Reach1	1100	25-yr	6.84	178.25	179.84		179.84	0.000006	0.09	192.51	340.19	0.03
Reach1	1100	50-yr	8.34	178.25	180.47		180.47	0.000001	0.05	471.65	574.92	0.01
Reach1	1100	100-yr	9.79	178.25	181.19		181.19	0.000000	0.03	1118.76	1080.94	0.01
Reach1	974.3741	CH	23.66	178.28	181.35		181.35	0.000002	0.09	940.96	978.97	0.02

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	974.3741	Regional	23.66	178.28	181.35		181.35	0.000002	0.09	940.96	978.97	0.02
Reach1	974.3741	2-yr	2.01	178.28	179.08		179.08	0.000014	0.08	43.21	119.02	0.03
Reach1	974.3741	5-yr	3.73	178.28	179.52		179.52	0.000005	0.07	110.01	176.96	0.02
Reach1	974.3741	10-yr	5.03	178.28	179.83		179.83	0.000003	0.06	166.90	189.27	0.02
Reach1	974.3741	25-yr	6.84	178.28	179.84		179.84	0.000005	0.08	168.68	190.34	0.02
Reach1	974.3741	50-yr	8.34	178.28	180.47		180.47	0.000001	0.06	312.03	318.15	0.01
Reach1	974.3741	100-yr	9.79	178.28	181.19		181.19	0.000000	0.04	786.85	928.94	0.01
Reach1	960.8255	CH	23.66	178.28	181.35	179.64	181.35	0.000005	0.14	433.90	1129.82	0.03
Reach1	960.8255	Regional	23.66	178.28	181.35	179.64	181.35	0.000005	0.14	433.90	1129.82	0.03
Reach1	960.8255	2-yr	2.01	178.28	179.06	178.63	179.07	0.000470	0.55	3.63	154.12	0.22
Reach1	960.8255	5-yr	3.73	178.28	179.48	178.75	179.50	0.000317	0.63	5.92	199.97	0.19
Reach1	960.8255	10-yr	5.03	178.28	179.79	178.83	179.81	0.000253	0.66	7.58	248.81	0.18
Reach1	960.8255	25-yr	6.84	178.28	179.77	178.93	179.81	0.000494	0.92	7.45	244.41	0.25
Reach1	960.8255	50-yr	8.34	178.28	180.42	179.01	180.45	0.000203	0.76	10.95	447.04	0.17
Reach1	960.8255	100-yr	9.79	178.28	181.15	179.08	181.18	0.000100	0.66	14.90	1020.33	0.13
Reach1	945.2227		Culvert									
Reach1	929.6181	CH	23.66	177.14	178.76	178.76	179.42	0.008395	3.61	6.55	97.84	1.00
Reach1	929.6181	Regional	23.66	177.14	178.76	178.76	179.42	0.008395	3.61	6.55	97.84	1.00
Reach1	929.6181	2-yr	2.01	177.14	178.37	177.66	178.38	0.000194	0.43	4.62	28.33	0.14
Reach1	929.6181	5-yr	3.73	177.14	178.47	177.81	178.50	0.000471	0.73	5.13	45.54	0.23
Reach1	929.6181	10-yr	5.03	177.14	178.52	177.90	178.56	0.000736	0.94	5.37	71.37	0.29
Reach1	929.6181	25-yr	6.84	177.14	178.57	178.01	178.64	0.001171	1.22	5.62	79.45	0.36
Reach1	929.6181	50-yr	8.34	177.14	178.60	178.09	178.71	0.001589	1.44	5.78	82.06	0.43
Reach1	929.6181	100-yr	9.79	177.14	178.63	178.17	178.77	0.002030	1.66	5.91	84.14	0.48
Reach1	908.9127	CH	23.66	177.14	178.84	178.58	178.85	0.001140	0.83	60.30	167.88	0.33
Reach1	908.9127	Regional	23.66	177.14	178.84	178.58	178.85	0.001140	0.83	60.30	167.88	0.33
Reach1	908.9127	2-yr	2.01	177.14	178.36		178.37	0.000998	0.47	4.88	37.17	0.27
Reach1	908.9127	5-yr	3.73	177.14	178.46		178.47	0.001213	0.54	11.29	88.82	0.30
Reach1	908.9127	10-yr	5.03	177.14	178.50		178.52	0.001250	0.56	15.77	99.76	0.31
Reach1	908.9127	25-yr	6.84	177.14	178.56		178.57	0.001231	0.59	21.18	111.02	0.31
Reach1	908.9127	50-yr	8.34	177.14	178.59		178.60	0.001233	0.63	25.04	118.98	0.32
Reach1	908.9127	100-yr	9.79	177.14	178.62		178.63	0.001213	0.66	28.72	124.44	0.32
Reach1	800	CH	23.66	177.14	178.71		178.73	0.001286	0.82	60.60	169.63	0.34
Reach1	800	Regional	23.66	177.14	178.71		178.73	0.001286	0.82	60.60	169.63	0.34
Reach1	800	2-yr	2.01	177.14	178.09		178.13	0.007313	0.88	2.32	15.31	0.67

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	800	5-yr	3.73	177.14	178.22		178.26	0.003315	0.85	5.87	46.54	0.49
Reach1	800	10-yr	5.03	177.14	178.28		178.32	0.002886	0.88	8.97	61.03	0.47
Reach1	800	25-yr	6.84	177.14	178.35		178.38	0.002446	0.91	13.75	81.16	0.45
Reach1	800	50-yr	8.34	177.14	178.40		178.43	0.002148	0.91	18.13	96.43	0.42
Reach1	800	100-yr	9.79	177.14	178.45		178.48	0.001767	0.87	23.57	113.13	0.39
Reach1	699.9999	CH	23.66	177.14	178.54		178.59	0.001514	1.10	43.75	160.57	0.40
Reach1	699.9999	Regional	23.66	177.14	178.54		178.59	0.001514	1.10	43.75	160.57	0.40
Reach1	699.9999	2-yr	2.01	177.14	177.82		177.84	0.001508	0.63	3.17	9.12	0.34
Reach1	699.9999	5-yr	3.73	177.14	177.98		178.00	0.002029	0.72	5.32	19.46	0.40
Reach1	699.9999	10-yr	5.03	177.14	178.04		178.07	0.002053	0.80	6.70	22.81	0.41
Reach1	699.9999	25-yr	6.84	177.14	178.12		178.16	0.002088	0.89	8.58	26.73	0.42
Reach1	699.9999	50-yr	8.34	177.14	178.17		178.22	0.002130	0.96	10.07	29.47	0.43
Reach1	699.9999	100-yr	9.79	177.14	178.23		178.27	0.002383	0.98	11.90	35.20	0.46
Reach1	600	CH	23.66	177.14	178.37		178.44	0.001527	1.19	29.63	103.00	0.41
Reach1	600	Regional	23.66	177.14	178.37		178.44	0.001527	1.19	29.63	103.00	0.41
Reach1	600	2-yr	2.01	177.14	177.55		177.59	0.004981	0.82	2.46	11.93	0.58
Reach1	600	5-yr	3.73	177.14	177.66		177.71	0.004604	0.94	3.98	14.85	0.58
Reach1	600	10-yr	5.03	177.14	177.73		177.78	0.004372	1.00	5.05	16.61	0.58
Reach1	600	25-yr	6.84	177.14	177.82		177.87	0.004126	1.05	6.50	18.81	0.57
Reach1	600	50-yr	8.34	177.14	177.88		177.94	0.003940	1.08	7.71	21.41	0.57
Reach1	600	100-yr	9.79	177.14	177.93		177.99	0.003555	1.12	8.84	23.50	0.55
Reach1	509.8065	CH	23.66	176.97	178.32		178.35	0.000597	0.84	34.46	66.20	0.26
Reach1	509.8065	Regional	23.66	176.97	178.32		178.35	0.000597	0.84	34.46	66.20	0.26
Reach1	509.8065	2-yr	2.01	176.97	177.45		177.46	0.000592	0.34	5.97	22.26	0.21
Reach1	509.8065	5-yr	3.73	176.97	177.57		177.58	0.000643	0.44	8.58	23.68	0.23
Reach1	509.8065	10-yr	5.03	176.97	177.63		177.65	0.000674	0.50	10.22	24.49	0.24
Reach1	509.8065	25-yr	6.84	176.97	177.71		177.73	0.000719	0.57	12.20	25.39	0.25
Reach1	509.8065	50-yr	8.34	176.97	177.77		177.79	0.000751	0.62	13.69	25.90	0.26
Reach1	509.8065	100-yr	9.79	176.97	177.83		177.85	0.000771	0.67	15.07	26.37	0.27
Reach1	399.9999	CH	23.66	176.91	178.22		178.27	0.000961	1.09	30.99	51.42	0.33
Reach1	399.9999	Regional	23.66	176.91	178.22		178.27	0.000961	1.09	30.99	51.42	0.33
Reach1	399.9999	2-yr	2.01	176.91	177.32		177.34	0.002658	0.60	3.34	16.11	0.42
Reach1	399.9999	5-yr	3.73	176.91	177.43		177.45	0.002397	0.72	5.25	19.83	0.42
Reach1	399.9999	10-yr	5.03	176.91	177.49		177.52	0.002297	0.80	6.54	21.86	0.43
Reach1	399.9999	25-yr	6.84	176.91	177.56		177.60	0.002249	0.90	8.21	24.25	0.44
Reach1	399.9999	50-yr	8.34	176.91	177.61		177.66	0.002251	0.97	9.51	26.10	0.45

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	399.9999	100-yr	9.79	176.91	177.66		177.71	0.002176	1.02	10.88	27.77	0.45
Reach1	299.9999	CH	23.66	176.86	178.18		178.20	0.000440	0.74	51.05	60.72	0.23
Reach1	299.9999	Regional	23.66	176.86	178.18		178.20	0.000440	0.74	51.05	60.72	0.23
Reach1	299.9999	2-yr	2.01	176.86	177.20		177.20	0.000808	0.36	8.08	31.58	0.24
Reach1	299.9999	5-yr	3.73	176.86	177.29		177.30	0.001025	0.48	11.15	33.57	0.28
Reach1	299.9999	10-yr	5.03	176.86	177.35		177.36	0.001144	0.55	13.07	34.76	0.30
Reach1	299.9999	25-yr	6.84	176.86	177.42		177.43	0.001276	0.63	15.44	36.22	0.32
Reach1	299.9999	50-yr	8.34	176.86	177.47		177.48	0.001352	0.68	17.29	37.38	0.34
Reach1	299.9999	100-yr	9.79	176.86	177.52		177.54	0.001316	0.70	19.45	38.80	0.34
Reach1	199.9999	CH	23.66	176.86	178.14		178.16	0.000251	0.61	53.52	75.03	0.18
Reach1	199.9999	Regional	23.66	176.86	178.14		178.16	0.000251	0.61	53.52	75.03	0.18
Reach1	199.9999	2-yr	2.01	176.86	177.10	176.98	177.11	0.000866	0.35	6.92	37.08	0.24
Reach1	199.9999	5-yr	3.73	176.86	177.17	177.02	177.18	0.001129	0.48	9.45	37.70	0.29
Reach1	199.9999	10-yr	5.03	176.86	177.21	177.05	177.22	0.001329	0.56	10.85	38.04	0.32
Reach1	199.9999	25-yr	6.84	176.86	177.25	177.08	177.27	0.001553	0.66	12.56	38.45	0.35
Reach1	199.9999	50-yr	8.34	176.86	177.22	177.10	177.26	0.003060	0.88	11.48	38.19	0.49
Reach1	199.9999	100-yr	9.79	176.86	177.17	177.12	177.24	0.007468	1.23	9.57	37.73	0.74
Reach1	117.8047	CH	23.66	176.86	178.15		178.15	0.000010	0.12	195.51	155.66	0.03
Reach1	117.8047	Regional	23.66	176.86	178.15		178.15	0.000010	0.12	195.51	155.66	0.03
Reach1	117.8047	2-yr	2.01	176.86	176.89	176.89	176.90	0.030265	0.52	3.89	146.00	1.01
Reach1	117.8047	5-yr	3.73	176.86	176.90	176.90	176.92	0.028322	0.65	5.75	146.17	1.04
Reach1	117.8047	10-yr	5.03	176.86	176.91	176.91	176.93	0.024210	0.70	7.21	146.31	1.00
Reach1	117.8047	25-yr	6.84	176.86	176.92	176.92	176.95	0.022695	0.77	8.85	146.46	1.00
Reach1	117.8047	50-yr	8.34	176.86	176.98		176.99	0.003275	0.47	17.83	147.17	0.43
Reach1	117.8047	100-yr	9.79	176.86	177.06		177.06	0.000880	0.34	29.18	148.08	0.24
Reach1	70.50	CH	23.66	175.45	178.15		178.15	0.000008	0.16	242.05	141.10	0.03
Reach1	70.50	Regional	23.66	175.45	178.15		178.15	0.000008	0.16	242.05	141.10	0.03
Reach1	70.50	2-yr	2.01	175.45	176.08	175.74	176.08	0.000259	0.23	8.89	32.48	0.14
Reach1	70.50	5-yr	3.73	175.45	176.40	175.83	176.40	0.000061	0.18	23.57	65.20	0.08
Reach1	70.50	10-yr	5.03	175.45	176.64	175.87	176.65	0.000027	0.15	48.21	116.79	0.05
Reach1	70.50	25-yr	6.84	175.45	176.86	175.93	176.86	0.000018	0.14	73.73	120.39	0.05
Reach1	70.50	50-yr	8.34	175.45	176.98		176.98	0.000017	0.15	88.82	121.82	0.04
Reach1	70.50	100-yr	9.79	175.45	177.06		177.06	0.000018	0.16	97.82	122.75	0.05
Reach1	36.84	CH	23.66	174.49	178.15	175.24	178.15	0.000003	0.12	403.89	208.27	0.02
Reach1	36.84	Regional	23.66	174.49	178.15	175.24	178.15	0.000003	0.12	403.89	208.27	0.02

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Reach1	36.84	2-yr	2.01	174.49	176.08	174.72	176.08	0.000003	0.08	26.54	67.71	0.02
Reach1	36.84	5-yr	3.73	174.49	176.40	174.79	176.40	0.000006	0.11	32.74	147.20	0.03
Reach1	36.84	10-yr	5.03	174.49	176.64	174.84	176.65	0.000007	0.13	37.43	174.51	0.03
Reach1	36.84	25-yr	6.84	174.49	176.86	174.90	176.86	0.000005	0.11	112.80	182.94	0.03
Reach1	36.84	50-yr	8.34	174.49	176.98	174.94	176.98	0.000005	0.12	129.85	186.01	0.03
Reach1	36.84	100-yr	9.79	174.49	177.06	174.98	177.06	0.000006	0.13	139.98	187.26	0.03
Reach1	14.37		Culvert									
Reach1	4.840	CH	23.66	174.41	178.15	175.25	178.15	0.000004	0.13	367.04	230.02	0.02
Reach1	4.840	Regional	23.66	174.41	178.15	175.25	178.15	0.000004	0.13	367.04	230.02	0.02
Reach1	4.840	2-yr	2.01	174.41	176.05	174.64	176.05	0.000005	0.09	22.68	79.32	0.02
Reach1	4.840	5-yr	3.73	174.41	176.29	174.73	176.29	0.000009	0.14	26.57	86.91	0.04
Reach1	4.840	10-yr	5.03	174.41	176.44	174.79	176.44	0.000013	0.17	29.00	91.65	0.04
Reach1	4.840	25-yr	6.84	174.41	176.56	174.86	176.56	0.000019	0.22	30.95	95.45	0.05
Reach1	4.840	50-yr	8.34	174.41	176.71	174.92	176.71	0.000014	0.19	58.37	99.69	0.04
Reach1	4.840	100-yr	9.79	174.41	176.82	174.96	176.82	0.000016	0.21	63.94	107.91	0.05
Reach1	0	CH	23.66	174.40	178.15	175.25	178.15	0.000012	0.20	248.26	232.48	0.04
Reach1	0	Regional	23.66	174.40	178.15	175.25	178.15	0.000012	0.20	248.26	232.48	0.04
Reach1	0	2-yr	2.01	174.40	176.05	174.62	176.05	0.000005	0.09	22.21	79.91	0.02
Reach1	0	5-yr	3.73	174.40	176.29	174.72	176.29	0.000010	0.14	25.98	86.98	0.04
Reach1	0	10-yr	5.03	174.40	176.44	174.78	176.44	0.000013	0.18	28.34	91.59	0.04
Reach1	0	25-yr	6.84	174.40	176.56	174.86	176.56	0.000019	0.23	30.23	95.30	0.05
Reach1	0	50-yr	8.34	174.40	176.71	174.91	176.71	0.000030	0.26	33.18	99.38	0.06
Reach1	0	100-yr	9.79	174.40	176.82	174.95	176.82	0.000033	0.28	38.35	102.31	0.07

HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1

Reach	River Sta	Profile	E.G. US. (m)	W.S. US. (m)	E.G. IC (m)	E.G. OC (m)	Min El Weir Flow (m)	Q Culv Group (m3/s)	Q Weir (m3/s)	Delta WS (m)	Culv Vel US (m/s)	Culv Vel DS (m/s)
Reach1	5639.221 Culvert #1	CH	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.63	2.37	2.37
Reach1	5639.221 Culvert #1	Regional	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.62	2.37	2.37
Reach1	5639.221 Culvert #1	2-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.67	2.37	2.37
Reach1	5639.221 Culvert #1	5-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.67	2.37	2.37
Reach1	5639.221 Culvert #1	10-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.66	2.37	2.37
Reach1	5639.221 Culvert #1	25-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.64	2.37	2.37
Reach1	5639.221 Culvert #1	50-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.64	2.37	2.37
Reach1	5639.221 Culvert #1	100-yr	194.57	194.57	194.57	194.57	194.57	0.17	434.56	1.63	2.37	2.37
Reach1	4846.378 Culvert #1	CH	189.99	189.99	189.89	189.99	191.09	0.44		0.86	1.70	2.02
Reach1	4846.378 Culvert #2	CH	189.99	189.99	189.89	189.99	191.09	0.44		0.86	1.70	2.02
Reach1	4846.378 Culvert #1	Regional	190.04	190.04	189.94	190.04	191.09	0.51		0.90	1.77	2.09
Reach1	4846.378 Culvert #2	Regional	190.04	190.04	189.94	190.04	191.09	0.51		0.90	1.77	2.09
Reach1	4846.378 Culvert #1	2-yr	189.68	189.68	189.61	189.68	191.09	0.14		0.59	1.22	1.44
Reach1	4846.378 Culvert #2	2-yr	189.68	189.68	189.61	189.68	191.09	0.14		0.59	1.22	1.44
Reach1	4846.378 Culvert #1	5-yr	189.73	189.73	189.65	189.73	191.09	0.18		0.63	1.30	1.56
Reach1	4846.378 Culvert #2	5-yr	189.73	189.73	189.65	189.73	191.09	0.18		0.63	1.30	1.56
Reach1	4846.378 Culvert #1	10-yr	189.76	189.76	189.68	189.76	191.09	0.20		0.66	1.35	1.61
Reach1	4846.378 Culvert #2	10-yr	189.76	189.76	189.68	189.76	191.09	0.20		0.66	1.35	1.61
Reach1	4846.378 Culvert #1	25-yr	189.82	189.82	189.73	189.82	191.09	0.26		0.71	1.45	1.74
Reach1	4846.378 Culvert #2	25-yr	189.82	189.82	189.73	189.82	191.09	0.26		0.71	1.45	1.74
Reach1	4846.378 Culvert #1	50-yr	189.87	189.87	189.78	189.87	191.09	0.32		0.76	1.53	1.83
Reach1	4846.378 Culvert #2	50-yr	189.87	189.87	189.78	189.87	191.09	0.32		0.76	1.53	1.83
Reach1	4846.378 Culvert #1	100-yr	189.92	189.92	189.83	189.92	191.09	0.37		0.80	1.60	1.91
Reach1	4846.378 Culvert #2	100-yr	189.92	189.92	189.83	189.92	191.09	0.37		0.80	1.60	1.91
Reach1	3615.502 Culvert #1	CH	185.05	185.05	185.06	185.05	184.88	0.99	9.26	0.43	1.47	2.10
Reach1	3615.502 Culvert #1	Regional	185.05	185.04	185.05	185.05	184.88	0.98	8.70	0.43	1.47	2.10
Reach1	3615.502 Culvert #1	2-yr	184.89	184.89	184.88	184.89	184.88	0.73	0.29	0.48	1.25	1.86
Reach1	3615.502 Culvert #1	5-yr	184.94	184.94	184.92	184.94	184.88	0.81	1.04	0.51	1.33	1.94
Reach1	3615.502 Culvert #1	10-yr	184.95	184.95	184.94	184.95	184.88	0.82	1.59	0.50	1.34	1.95
Reach1	3615.502 Culvert #1	25-yr	184.97	184.96	184.96	184.97	184.88	0.85	2.45	0.50	1.36	1.98
Reach1	3615.502 Culvert #1	50-yr	184.97	184.97	184.97	184.97	184.88	0.86	3.12	0.48	1.36	1.98
Reach1	3615.502 Culvert #1	100-yr	185.00	185.00	184.98	185.00	184.88	0.91	3.72	0.50	1.41	2.03
Reach1	3059.960 Culvert #1	CH	183.79	183.79	183.79	183.75	183.61	2.79	15.42	0.42	1.86	2.92
Reach1	3059.960 Culvert #1	Regional	183.73	183.73	183.73	183.71	183.61	2.58	7.16	0.50	1.72	2.81
Reach1	3059.960 Culvert #1	2-yr	183.37	183.37	183.34	183.37	183.61	1.02		0.38	1.49	2.00
Reach1	3059.960 Culvert #1	5-yr	183.56	183.56	183.52	183.56	183.61	1.85		0.54	1.82	2.37
Reach1	3059.960 Culvert #1	10-yr	183.61	183.61	183.57	183.61	183.61	2.07	0.39	0.57	1.89	2.45
Reach1	3059.960 Culvert #1	25-yr	183.63	183.63	183.60	183.63	183.61	2.15	1.15	0.56	1.92	2.48
Reach1	3059.960 Culvert #1	50-yr	183.66	183.66	183.65	183.66	183.61	2.32	1.66	0.57	1.96	2.53
Reach1	3059.960 Culvert #1	100-yr	183.68	183.68	183.68	183.67	183.61	2.38	2.25	0.57	1.98	2.55

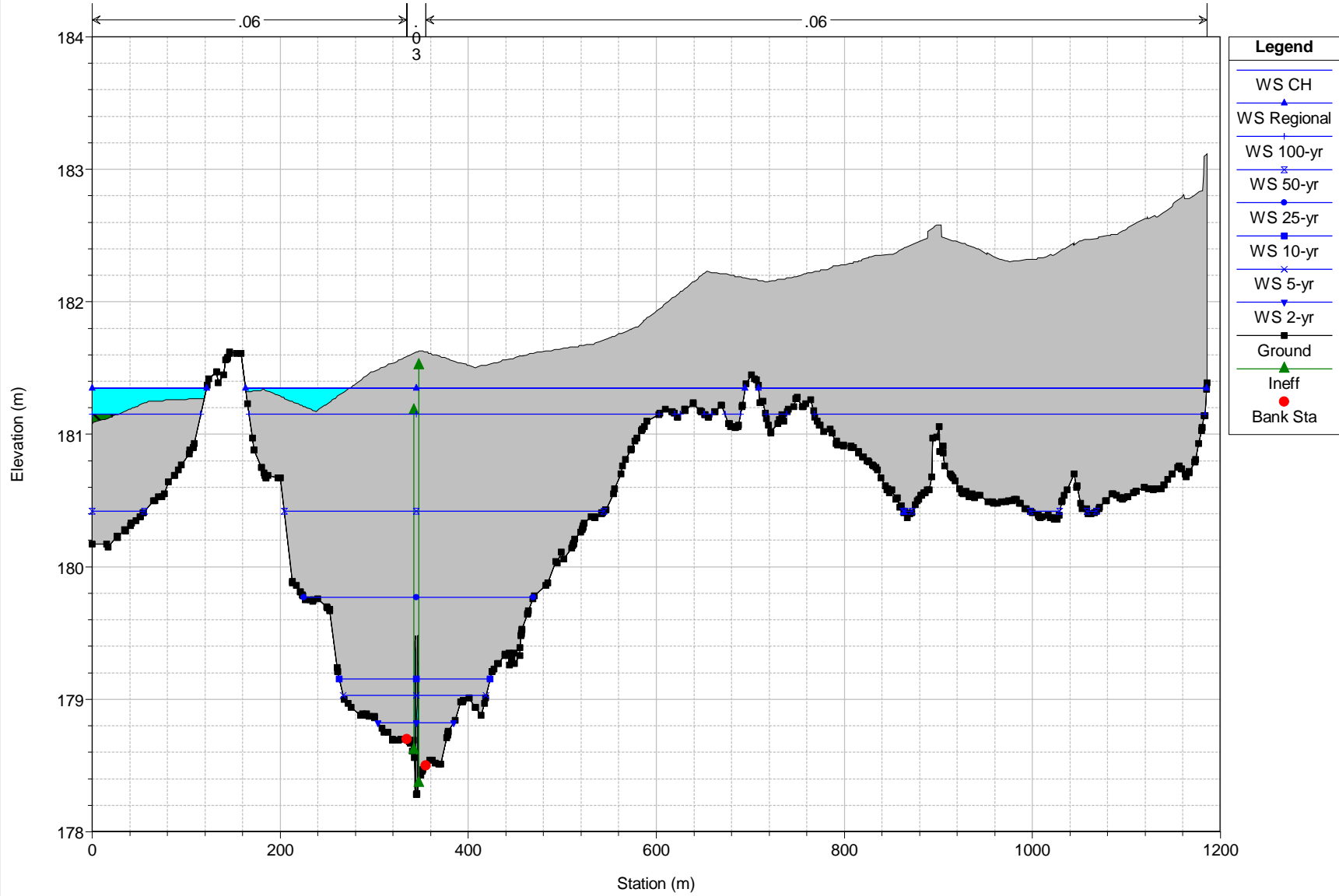
HEC-RAS Plan: Plan 01 River: Brontelndian Reach: Reach1 (Continued)

Reach	River Sta	Profile	E.G. US. (m)	W.S. US. (m)	E.G. IC (m)	E.G. OC (m)	Min El Weir Flow (m)	Q Culv Group (m3/s)	Q Weir (m3/s)	Delta WS (m)	Culv Vel US (m/s)	Culv Vel DS (m/s)
Reach1	1921.497 Culvert #1	CH	181.40	181.40	181.39	181.40	181.32	1.44	18.90	0.04	0.72	0.72
Reach1	1921.497 Culvert #1	Regional	181.36	181.36	181.35	181.36	181.32	0.72	9.02	0.01	0.36	0.36
Reach1	1921.497 Culvert #1	2-yr	180.55	180.55	180.52	180.55	181.32	1.02		0.40	1.71	2.41
Reach1	1921.497 Culvert #1	5-yr	180.81	180.80	180.76	180.81	181.32	1.85		0.59	2.09	2.82
Reach1	1921.497 Culvert #1	10-yr	180.97	180.97	180.91	180.97	181.32	2.46		0.69	2.29	3.04
Reach1	1921.497 Culvert #1	25-yr	181.17	181.17	181.10	181.17	181.32	3.30		0.83	2.53	3.28
Reach1	1921.497 Culvert #1	50-yr	181.31	181.31	181.24	181.31	181.32	3.93	6.13	0.85	2.68	3.43
Reach1	1921.497 Culvert #1	100-yr	181.31	181.31	181.31	181.31	181.32	2.45	6.07	0.12	1.22	1.22
Reach1	945.2227 Culvert #1	CH	181.35	181.35	182.24	181.35	181.18	9.87	13.67	2.59	4.36	4.36
Reach1	945.2227 Culvert #1	Regional	181.35	181.35	182.24	181.35	181.18	9.87	13.67	2.59	4.36	4.36
Reach1	945.2227 Culvert #1	2-yr	179.07	179.06	179.07	179.22	181.18	2.01		0.69	2.02	0.89
Reach1	945.2227 Culvert #1	5-yr	179.50	179.48	179.50	179.64	181.18	3.73		1.01	2.51	1.65
Reach1	945.2227 Culvert #1	10-yr	179.81	179.79	179.81	179.94	181.18	5.03		1.27	2.85	2.22
Reach1	945.2227 Culvert #1	25-yr	179.81	179.77	180.56	179.81	181.18	6.84		1.20	3.02	3.02
Reach1	945.2227 Culvert #1	50-yr	180.45	180.42	181.36	180.45	181.18	8.34		1.82	3.69	3.69
Reach1	945.2227 Culvert #1	100-yr	181.18	181.15	182.30	181.18	181.18	9.79		2.53	4.33	4.33
Reach1	14.37 Culvert #3	CH	178.15	178.15	174.73	178.15	176.71	0.09	23.27	0.00	0.09	0.09
Reach1	14.37 Culvert #2	CH	178.15	178.15	174.73	178.15	176.71	0.09	23.27	0.00	0.09	0.09
Reach1	14.37 Culvert #1	CH	178.15	178.15	174.81	178.15	176.71	0.20	23.27	0.00	0.09	0.09
Reach1	14.37 Culvert #3	Regional	178.15	178.15	174.73	178.15	176.71	0.09	23.27	0.00	0.09	0.09
Reach1	14.37 Culvert #2	Regional	178.15	178.15	174.73	178.15	176.71	0.09	23.27	0.00	0.09	0.09
Reach1	14.37 Culvert #1	Regional	178.15	178.15	174.81	178.15	176.71	0.20	23.27	0.00	0.09	0.09
Reach1	14.37 Culvert #3	2-yr	176.08	176.08	174.97	176.08	176.71	0.43		0.03	0.43	0.43
Reach1	14.37 Culvert #2	2-yr	176.08	176.08	174.97	176.08	176.71	0.43		0.03	0.43	0.43
Reach1	14.37 Culvert #1	2-yr	176.08	176.08	175.20	176.08	176.71	1.16		0.03	0.49	0.49
Reach1	14.37 Culvert #3	5-yr	176.40	176.40	175.15	176.40	176.71	0.80		0.11	0.80	0.80
Reach1	14.37 Culvert #2	5-yr	176.40	176.40	175.15	176.40	176.71	0.80		0.11	0.80	0.80
Reach1	14.37 Culvert #1	5-yr	176.40	176.40	175.47	176.40	176.71	2.14		0.11	0.91	0.91
Reach1	14.37 Culvert #3	10-yr	176.65	176.64	175.27	176.64	176.71	1.08		0.20	1.09	1.09
Reach1	14.37 Culvert #2	10-yr	176.65	176.64	175.27	176.64	176.71	1.08		0.20	1.09	1.09
Reach1	14.37 Culvert #1	10-yr	176.65	176.64	175.65	176.65	176.71	2.88		0.20	1.22	1.22
Reach1	14.37 Culvert #3	25-yr	176.86	176.86	175.37	176.86	176.71	1.30	0.77	0.30	1.31	1.31
Reach1	14.37 Culvert #2	25-yr	176.86	176.86	175.37	176.86	176.71	1.30	0.77	0.30	1.31	1.31
Reach1	14.37 Culvert #1	25-yr	176.86	176.86	175.79	176.86	176.71	3.47	0.77	0.30	1.47	1.47
Reach1	14.37 Culvert #3	50-yr	176.98	176.98	175.34	176.98	176.71	1.24	2.55	0.27	1.25	1.25
Reach1	14.37 Culvert #2	50-yr	176.98	176.98	175.34	176.98	176.71	1.24	2.55	0.27	1.25	1.25
Reach1	14.37 Culvert #1	50-yr	176.98	176.98	175.75	176.99	176.71	3.31	2.55	0.27	1.41	1.41
Reach1	14.37 Culvert #3	100-yr	177.06	177.06	175.30	177.06	176.71	1.15	4.40	0.23	1.16	1.16
Reach1	14.37 Culvert #2	100-yr	177.06	177.06	175.30	177.06	176.71	1.15	4.40	0.23	1.16	1.16
Reach1	14.37 Culvert #1	100-yr	177.06	177.06	175.70	177.06	176.71	3.08	4.40	0.23	1.31	1.31

Bronte Creek Indian Trib Reach1 Plan: Plan 01 7/14/2020

Flow: Regional Flows

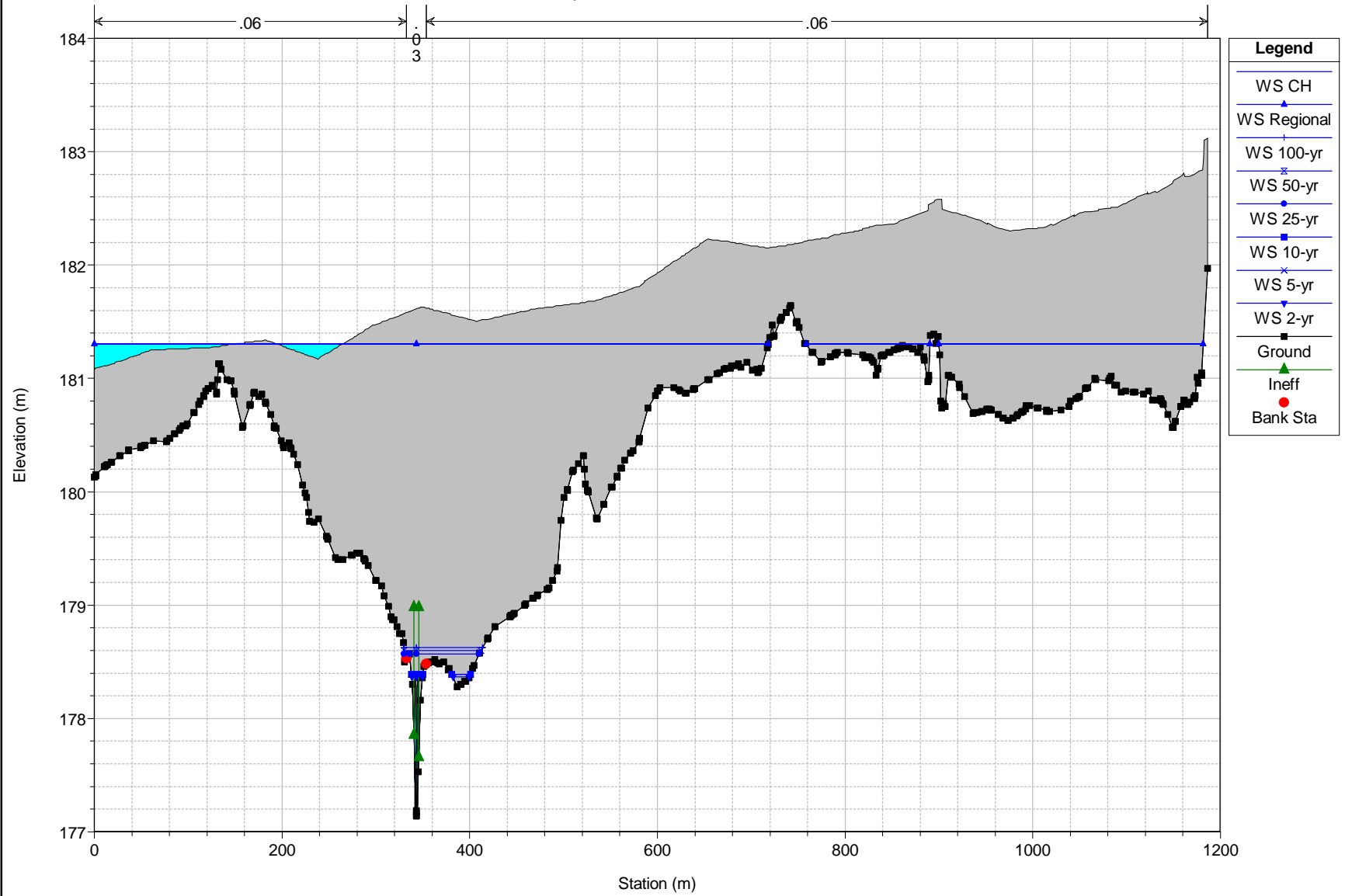
RS = 945.2227 Culv Railway North of Lower Baseline Road and West of First Line Esti



Bronte Creek Indian Trib Reach1 Plan: Plan 01 7/14/2020

Flow: Regional Flows

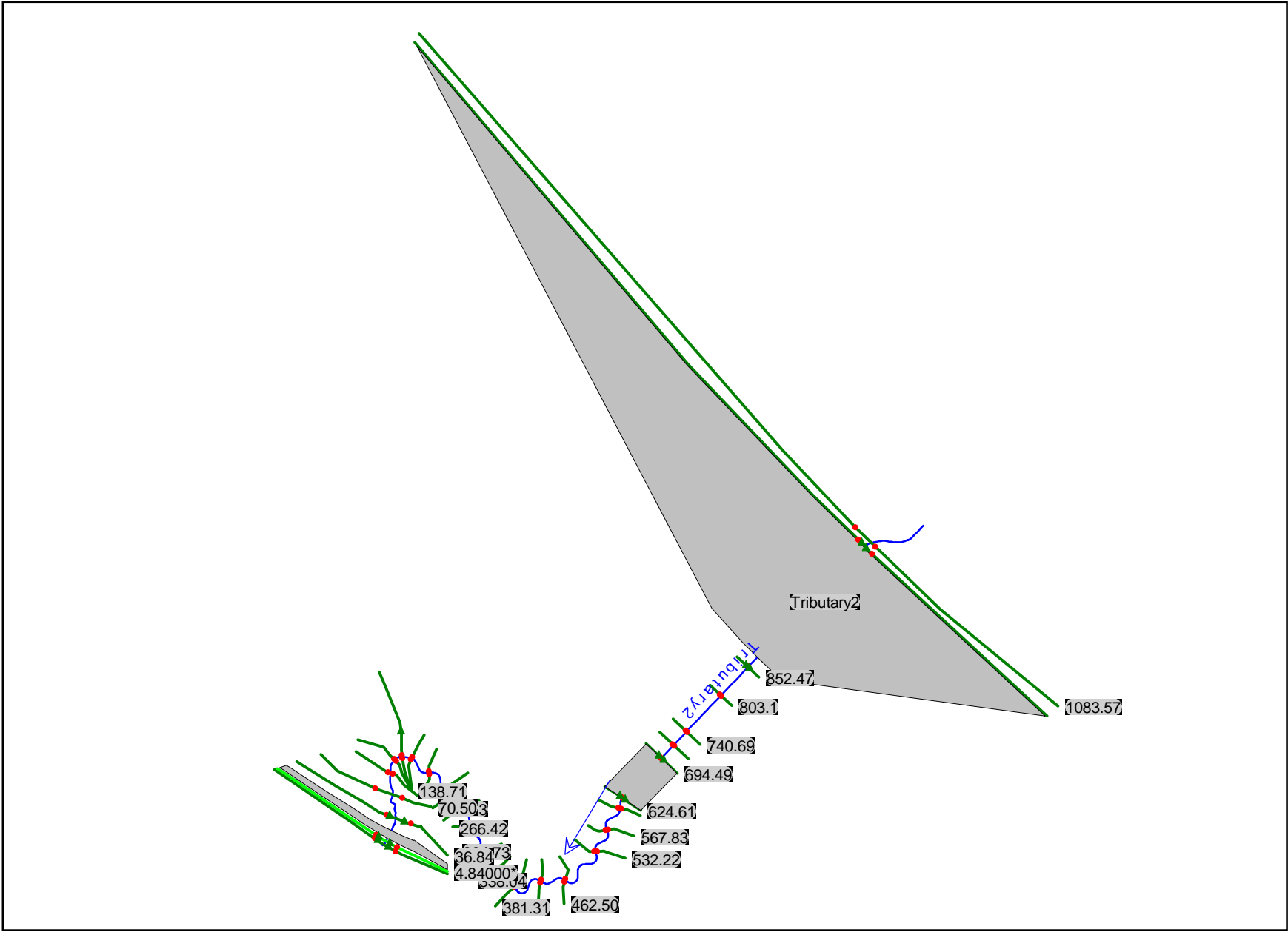
RS = 945.2227 Culv Railway North of Lower Baseline Road and West of First Line Esti





Milton Logistics Hub 2020 HEC-RAS Model Output

Culvert 2A and 2B Proposed Conditions



HEC-RAS Plan: Trib2_Draft2 River: Tributary2 Reach: Tributary2

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary2	1083.57	25mm	0.78	178.64	178.95		178.96	0.003596	0.42	1.88	19.74	0.43
Tributary2	1083.57	2 yr	2.01	178.64	179.15		179.16	0.000425	0.26	7.76	33.51	0.17
Tributary2	1083.57	5 yr	3.73	178.64	179.44		179.44	0.000057	0.16	41.60	181.49	0.07
Tributary2	1083.57	10 yr	5.03	178.64	179.62		179.62	0.000024	0.13	77.71	214.99	0.05
Tributary2	1083.57	25 yr	6.84	178.64	179.85		179.85	0.000012	0.11	132.60	260.58	0.04
Tributary2	1083.57	50 yr	8.34	178.64	180.03		180.03	0.000008	0.10	181.64	285.21	0.03
Tributary2	1083.57	100 yr	9.79	178.64	180.19		180.19	0.000006	0.09	229.47	310.05	0.03
Tributary2	1083.57	Regional	23.66	178.64	180.20		180.20	0.000033	0.22	230.04	310.95	0.06
Tributary2	1062.61	25mm	0.78	178.55	178.85	178.80	178.87	0.004851	0.63	1.23	20.68	0.53
Tributary2	1062.61	2 yr	2.01	178.55	179.13	178.89	179.14	0.000928	0.56	3.56	42.29	0.28
Tributary2	1062.61	5 yr	3.75	178.55	179.42	178.98	179.44	0.000565	0.62	6.01	180.53	0.24
Tributary2	1062.61	10 yr	5.03	178.55	179.60	179.04	179.62	0.000475	0.67	7.55	206.40	0.23
Tributary2	1062.61	25 yr	6.84	178.55	179.82	179.11	179.85	0.000409	0.72	9.50	259.64	0.22
Tributary2	1062.61	50 yr	8.34	178.55	180.00	179.17	180.03	0.000375	0.76	10.98	287.68	0.21
Tributary2	1062.61	100 yr	9.79	178.55	180.16	179.22	180.19	0.000351	0.79	12.34	300.23	0.21
Tributary2	1062.61	Regional	9.81	178.55	180.16	179.22	180.19	0.000350	0.79	12.35	300.47	0.21
Tributary2	957.65		Culvert									
Tributary2	852.47	25mm	0.78	177.82	178.19		178.22	0.003792	0.81	1.09	11.71	0.50
Tributary2	852.47	2 yr	2.01	177.82	178.33		178.39	0.004634	1.19	2.24	30.61	0.60
Tributary2	852.47	5 yr	3.75	177.82	178.43		178.55	0.006867	1.68	3.04	31.21	0.75
Tributary2	852.47	10 yr	5.03	177.82	178.45	178.44	178.64	0.010733	2.15	3.19	31.32	0.95
Tributary2	852.47	25 yr	6.84	177.82	178.55	178.53	178.77	0.009728	2.32	4.07	31.97	0.93
Tributary2	852.47	50 yr	8.34	177.82	178.70		178.89	0.006737	2.21	5.22	32.83	0.80
Tributary2	852.47	100 yr	9.79	177.82	178.84		179.02	0.004954	2.12	6.39	33.71	0.71
Tributary2	852.47	Regional	9.81	177.82	178.85		179.02	0.004689	2.09	6.51	33.80	0.69
Tributary2	803.1	25mm	0.78	177.63	178.00		178.03	0.003899	0.82	1.11	11.35	0.51
Tributary2	803.1	2 yr	2.01	177.63	178.12	178.09	178.16	0.004266	1.10	3.73	30.47	0.57
Tributary2	803.1	5 yr	3.75	177.63	178.21		178.26	0.003978	1.23	6.65	31.04	0.57
Tributary2	803.1	10 yr	5.03	177.63	178.35		178.38	0.001821	0.99	10.99	31.88	0.40
Tributary2	803.1	25 yr	6.84	177.63	178.56		178.57	0.000839	0.81	17.68	33.12	0.29
Tributary2	803.1	50 yr	8.34	177.63	178.72		178.73	0.000552	0.74	23.21	34.12	0.24
Tributary2	803.1	100 yr	9.79	177.63	178.87		178.88	0.000411	0.70	28.47	35.04	0.21
Tributary2	803.1	Regional	9.81	177.63	178.89		178.90	0.000391	0.69	28.98	35.13	0.21
Tributary2	740.69	25mm	0.78	177.40	177.77		177.80	0.003597	0.81	1.15	12.11	0.50
Tributary2	740.69	2 yr	2.01	177.40	177.90		177.94	0.003072	0.98	4.37	30.60	0.49

HEC-RAS Plan: Trib2_Draft2 River: Tributary2 Reach: Tributary2 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary2	740.69	5 yr	3.75	177.40	178.14		178.15	0.000832	0.69	11.79	32.03	0.28
Tributary2	740.69	10 yr	5.03	177.40	178.31		178.32	0.000482	0.62	17.35	33.06	0.22
Tributary2	740.69	25 yr	6.84	177.40	178.53		178.54	0.000303	0.57	24.87	34.41	0.18
Tributary2	740.69	50 yr	8.34	177.40	178.70		178.71	0.000236	0.56	30.83	35.45	0.16
Tributary2	740.69	100 yr	9.79	177.40	178.86		178.87	0.000197	0.56	36.43	36.40	0.15
Tributary2	740.69	Regional	9.81	177.40	178.87		178.88	0.000189	0.55	36.98	36.49	0.15
Tributary2	716.84	25mm	0.78	177.31	177.70		177.72	0.002472	0.71	1.53	16.86	0.42
Tributary2	716.84	2 yr	2.01	177.31	177.87		177.88	0.001452	0.73	6.04	30.93	0.34
Tributary2	716.84	5 yr	3.75	177.31	178.13		178.13	0.000471	0.56	14.33	32.50	0.21
Tributary2	716.84	10 yr	5.03	177.31	178.30		178.31	0.000310	0.53	20.12	33.57	0.18
Tributary2	716.84	25 yr	6.84	177.31	178.53		178.53	0.000216	0.51	27.84	34.93	0.15
Tributary2	716.84	50 yr	8.34	177.31	178.70		178.70	0.000177	0.51	33.92	35.97	0.14
Tributary2	716.84	100 yr	9.79	177.31	178.86		178.86	0.000153	0.51	39.63	36.93	0.14
Tributary2	716.84	Regional	9.81	177.31	178.87		178.88	0.000147	0.50	40.19	37.02	0.13
Tributary2	694.49	25mm	0.78	177.25	177.52	177.52	177.60	0.016643	1.31	0.60	3.51	1.00
Tributary2	694.49	2 yr	2.01	177.25	177.78	177.67	177.83	0.003293	1.07	2.59	30.94	0.52
Tributary2	694.49	5 yr	3.75	177.25	178.07	177.79	178.11	0.001720	1.08	4.89	32.66	0.41
Tributary2	694.49	10 yr	5.03	177.25	178.24	177.86	178.29	0.001386	1.12	6.32	33.73	0.38
Tributary2	694.49	25 yr	6.84	177.25	178.47	177.95	178.52	0.001152	1.19	8.13	35.08	0.36
Tributary2	694.49	50 yr	8.34	177.25	178.63	178.02	178.69	0.001040	1.24	9.50	36.10	0.35
Tributary2	694.49	100 yr	9.79	177.25	178.79	178.08	178.85	0.000964	1.28	10.74	37.03	0.34
Tributary2	694.49	Regional	9.81	177.25	178.80	178.08	178.86	0.000929	1.27	10.88	37.13	0.34
Tributary2	661.19		Culvert									
Tributary2	624.61	25mm	0.78	176.86	177.13	177.13	177.22	0.017198	1.32	0.59	3.47	1.01
Tributary2	624.61	2 yr	2.01	176.86	177.31	177.31	177.43	0.010048	1.59	1.54	18.79	0.86
Tributary2	624.61	5 yr	3.75	176.86	177.44	177.44	177.60	0.009904	1.95	2.60	30.77	0.90
Tributary2	624.61	10 yr	5.03	176.86	177.51	177.51	177.71	0.010102	2.16	3.20	31.22	0.93
Tributary2	624.61	25 yr	6.84	176.86	177.60	177.60	177.84	0.010177	2.41	3.95	31.78	0.96
Tributary2	624.61	50 yr	8.34	176.86	177.67	177.67	177.94	0.010123	2.58	4.53	32.21	0.97
Tributary2	624.61	100 yr	9.79	176.86	177.73	177.73	178.03	0.010383	2.75	5.00	32.56	1.00
Tributary2	624.61	Regional	9.81	176.86	178.14		178.24	0.002182	1.67	8.29	35.02	0.49
Tributary2	603.95	25mm	0.78	176.44	176.89		176.90	0.001441	0.56	2.85	30.61	0.33
Tributary2	603.95	2 yr	2.01	176.44	177.00		177.01	0.001567	0.72	6.23	31.27	0.36
Tributary2	603.95	5 yr	3.75	176.44	177.10		177.12	0.001766	0.88	9.34	31.86	0.39
Tributary2	603.95	10 yr	5.03	176.44	177.16		177.18	0.001817	0.96	11.31	32.23	0.41

HEC-RAS Plan: Trib2_Draft2 River: Tributary2 Reach: Tributary2 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary2	603.95	25 yr	6.84	176.44	177.25		177.27	0.001742	1.04	14.10	32.75	0.41
Tributary2	603.95	50 yr	8.34	176.44	177.32		177.34	0.001614	1.07	16.50	33.19	0.40
Tributary2	603.95	100 yr	9.79	176.44	177.38		177.41	0.001548	1.11	18.60	33.57	0.40
Tributary2	603.95	Regional	9.81	176.44	178.18		178.19	0.000091	0.43	47.51	38.41	0.11
Tributary2	567.83	25mm	0.78	176.39	176.84		176.85	0.001333	0.55	2.99	31.25	0.31
Tributary2	567.83	2 yr	2.01	176.39	176.95		176.96	0.001494	0.70	6.72	36.70	0.35
Tributary2	567.83	5 yr	3.75	176.39	177.04		177.06	0.001635	0.84	10.23	37.30	0.38
Tributary2	567.83	10 yr	5.03	176.39	177.10		177.12	0.001626	0.91	12.54	37.69	0.38
Tributary2	567.83	25 yr	6.84	176.39	177.20		177.22	0.001445	0.95	16.03	38.27	0.37
Tributary2	567.83	50 yr	8.34	176.39	177.28		177.29	0.001271	0.96	19.07	38.77	0.35
Tributary2	567.83	100 yr	9.79	176.39	177.34		177.36	0.001191	0.98	21.64	39.19	0.35
Tributary2	567.83	Regional	9.81	176.39	178.18		178.19	0.000063	0.36	56.85	44.52	0.09
Tributary2	532.22	25mm	0.78	176.35	176.79		176.81	0.001511	0.57	2.81	31.31	0.33
Tributary2	532.22	2 yr	2.01	176.35	176.90		176.91	0.001567	0.71	6.98	42.68	0.36
Tributary2	532.22	5 yr	3.75	176.35	176.99		177.01	0.001559	0.82	11.06	43.32	0.37
Tributary2	532.22	10 yr	5.03	176.35	177.06		177.07	0.001449	0.85	13.88	43.75	0.36
Tributary2	532.22	25 yr	6.84	176.35	177.16		177.17	0.001164	0.85	18.34	44.43	0.33
Tributary2	532.22	50 yr	8.34	176.35	177.24		177.26	0.000974	0.85	22.15	45.00	0.31
Tributary2	532.22	100 yr	9.79	176.35	177.31		177.33	0.000898	0.86	25.25	45.46	0.30
Tributary2	532.22	Regional	9.81	176.35	178.18		178.18	0.000044	0.31	67.30	51.30	0.08
Tributary2	462.50	25mm	0.78	176.25	176.69		176.70	0.001551	0.57	2.74	28.60	0.34
Tributary2	462.50	2 yr	2.01	176.25	176.80		176.81	0.001559	0.71	6.93	41.41	0.35
Tributary2	462.50	5 yr	3.75	176.25	176.90		176.92	0.001437	0.79	11.24	42.03	0.35
Tributary2	462.50	10 yr	5.03	176.25	176.98		176.99	0.001244	0.81	14.42	42.49	0.34
Tributary2	462.50	25 yr	6.84	176.25	177.10		177.11	0.000909	0.78	19.61	43.21	0.30
Tributary2	462.50	50 yr	8.34	176.25	177.20		177.21	0.000749	0.77	23.78	43.79	0.28
Tributary2	462.50	100 yr	9.79	176.25	177.27		177.28	0.000701	0.79	26.96	44.22	0.27
Tributary2	462.50	Regional	9.81	176.25	178.18		178.18	0.000038	0.29	69.78	49.68	0.07
Tributary2	428.93	25mm	0.78	176.20	176.64		176.65	0.001507	0.57	2.70	30.08	0.33
Tributary2	428.93	2 yr	2.01	176.20	176.75		176.76	0.001562	0.71	6.58	36.68	0.36
Tributary2	428.93	5 yr	3.75	176.20	176.85		176.87	0.001504	0.81	10.50	37.35	0.36
Tributary2	428.93	10 yr	5.03	176.20	176.94		176.95	0.001264	0.82	13.61	37.87	0.34
Tributary2	428.93	25 yr	6.84	176.20	177.07		177.08	0.000901	0.79	18.69	38.71	0.30
Tributary2	428.93	50 yr	8.34	176.20	177.17		177.18	0.000748	0.79	22.63	39.35	0.28
Tributary2	428.93	100 yr	9.79	176.20	177.24		177.26	0.000713	0.82	25.53	39.81	0.27
Tributary2	428.93	Regional	9.81	176.20	178.18		178.18	0.000040	0.31	65.53	45.74	0.07

HEC-RAS Plan: Trib2_Draft2 River: Tributary2 Reach: Tributary2 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary2	381.31	25mm	0.78	176.13	176.58		176.59	0.001237	0.52	3.10	31.24	0.30
Tributary2	381.31	2 yr	2.01	176.13	176.69		176.70	0.001260	0.65	7.50	41.93	0.32
Tributary2	381.31	5 yr	3.75	176.13	176.80		176.82	0.001120	0.72	12.25	42.69	0.32
Tributary2	381.31	10 yr	5.03	176.13	176.90		176.91	0.000867	0.70	16.29	43.33	0.28
Tributary2	381.31	25 yr	6.84	176.13	177.04		177.05	0.000588	0.67	22.67	44.33	0.24
Tributary2	381.31	50 yr	8.34	176.13	177.15		177.16	0.000490	0.66	27.39	45.05	0.23
Tributary2	381.31	100 yr	9.79	176.13	177.22		177.23	0.000472	0.69	30.76	45.55	0.23
Tributary2	381.31	Regional	9.81	176.13	178.18		178.18	0.000028	0.27	77.26	51.99	0.06
Tributary2	338.04	25mm	0.79	176.07	176.52		176.54	0.001344	0.55	2.98	30.29	0.32
Tributary2	338.04	2 yr	2.03	176.07	176.63		176.65	0.001457	0.70	6.75	35.82	0.35
Tributary2	338.04	5 yr	3.93	176.07	176.75		176.76	0.001458	0.82	10.88	36.69	0.36
Tributary2	338.04	10 yr	5.34	176.07	176.86		176.87	0.001078	0.80	14.86	37.51	0.32
Tributary2	338.04	25 yr	7.35	176.07	177.01		177.03	0.000733	0.76	20.90	38.73	0.27
Tributary2	338.04	50 yr	9.10	176.07	177.12		177.13	0.000639	0.78	25.17	39.57	0.26
Tributary2	338.04	100 yr	10.75	176.07	177.20		177.21	0.000637	0.82	28.12	40.14	0.26
Tributary2	338.04	Regional	15.72	176.07	178.17		178.18	0.000084	0.47	70.91	47.64	0.11
Tributary2	304.73	25mm	0.79	176.03	176.48		176.49	0.001507	0.57	2.85	32.32	0.33
Tributary2	304.73	2 yr	2.03	176.03	176.59		176.60	0.001435	0.69	6.97	37.98	0.34
Tributary2	304.73	5 yr	3.93	176.03	176.70		176.72	0.001362	0.79	11.41	38.71	0.35
Tributary2	304.73	10 yr	5.34	176.03	176.83		176.84	0.000894	0.74	16.17	39.48	0.29
Tributary2	304.73	25 yr	7.35	176.03	176.99		177.00	0.000586	0.70	22.92	40.55	0.24
Tributary2	304.73	50 yr	9.10	176.03	177.11		177.12	0.000515	0.71	27.48	41.25	0.23
Tributary2	304.73	100 yr	10.75	176.03	177.18		177.19	0.000519	0.75	30.56	41.72	0.24
Tributary2	304.73	Regional	15.72	176.03	178.17		178.17	0.000072	0.44	74.93	47.97	0.10
Tributary2	266.42	25mm	0.79	175.98	176.41		176.43	0.001811	0.61	2.48	26.97	0.36
Tributary2	266.42	2 yr	2.03	175.98	176.53		176.55	0.001695	0.74	6.16	32.71	0.37
Tributary2	266.42	5 yr	3.93	175.98	176.65		176.67	0.001629	0.86	10.07	33.33	0.38
Tributary2	266.42	10 yr	5.34	175.98	176.79		176.81	0.000933	0.77	14.94	34.09	0.30
Tributary2	266.42	25 yr	7.35	175.98	176.97		176.98	0.000615	0.73	21.16	35.06	0.25
Tributary2	266.42	50 yr	9.10	175.98	177.09		177.10	0.000553	0.75	25.18	35.68	0.24
Tributary2	266.42	100 yr	10.75	175.98	177.16		177.17	0.000569	0.80	27.81	36.07	0.25
Tributary2	266.42	Regional	15.72	175.98	178.17		178.17	0.000085	0.49	66.86	41.49	0.11
Tributary2	239.91	25mm	0.79	175.87	176.38		176.39	0.000977	0.48	2.97	28.04	0.27
Tributary2	239.91	2 yr	2.03	175.87	176.49		176.51	0.001283	0.67	6.52	34.13	0.32
Tributary2	239.91	5 yr	3.93	175.87	176.61		176.63	0.001326	0.79	10.59	34.93	0.34

HEC-RAS Plan: Trib2_Draft2 River: Tributary2 Reach: Tributary2 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary2	239.91	10 yr	5.34	175.87	176.77		176.78	0.000700	0.68	16.35	36.01	0.26
Tributary2	239.91	25 yr	7.35	175.87	176.96		176.97	0.000468	0.65	23.19	37.27	0.22
Tributary2	239.91	50 yr	9.10	175.87	177.07		177.08	0.000429	0.68	27.52	38.05	0.21
Tributary2	239.91	100 yr	10.75	175.87	177.15		177.16	0.000447	0.72	30.32	38.54	0.22
Tributary2	239.91	Regional	15.72	175.87	178.16		178.17	0.000071	0.45	73.22	46.66	0.10
Tributary2	210.43	25mm	0.79	175.89	176.35		176.36	0.001346	0.55	3.11	36.30	0.32
Tributary2	210.43	2 yr	2.03	175.89	176.46		176.47	0.001242	0.65	7.99	47.54	0.32
Tributary2	210.43	5 yr	3.93	175.89	176.58		176.59	0.000977	0.69	14.00	48.31	0.30
Tributary2	210.43	10 yr	5.34	175.89	176.76		176.77	0.000418	0.54	22.74	49.41	0.20
Tributary2	210.43	25 yr	7.35	175.89	176.95		176.96	0.000267	0.51	32.32	50.58	0.17
Tributary2	210.43	50 yr	9.10	175.89	177.07		177.07	0.000243	0.52	38.23	51.29	0.16
Tributary2	210.43	100 yr	10.75	175.89	177.14		177.15	0.000253	0.56	42.00	51.74	0.17
Tributary2	210.43	Regional	15.72	175.89	178.16		178.17	0.000039	0.34	98.15	58.11	0.07
Tributary2	170.12	25mm	0.79	175.84	176.28		176.30	0.001650	0.60	2.75	31.81	0.35
Tributary2	170.12	2 yr	2.03	175.84	176.41		176.42	0.001228	0.65	7.63	40.56	0.32
Tributary2	170.12	5 yr	3.93	175.84	176.54		176.55	0.000984	0.70	13.15	41.51	0.30
Tributary2	170.12	10 yr	5.34	175.84	176.74		176.75	0.000404	0.55	21.65	42.93	0.20
Tributary2	170.12	25 yr	7.35	175.84	176.94		176.95	0.000275	0.53	30.24	44.33	0.17
Tributary2	170.12	50 yr	9.10	175.84	177.06		177.06	0.000259	0.55	35.45	45.15	0.17
Tributary2	170.12	100 yr	10.75	175.84	177.13		177.14	0.000275	0.59	38.75	45.66	0.18
Tributary2	170.12	Regional	15.72	175.84	178.16		178.16	0.000046	0.37	89.62	52.95	0.08
Tributary2	138.71	25mm	0.79	175.75	176.24		176.26	0.001054	0.51	3.11	34.37	0.28
Tributary2	138.71	2 yr	2.03	175.75	176.38		176.39	0.000802	0.56	8.97	45.39	0.26
Tributary2	138.71	5 yr	3.93	175.75	176.52		176.53	0.000667	0.61	15.44	46.92	0.25
Tributary2	138.71	10 yr	5.34	175.75	176.74		176.74	0.000270	0.47	25.81	49.34	0.17
Tributary2	138.71	25 yr	7.35	175.75	176.94		176.94	0.000190	0.46	35.89	51.62	0.14
Tributary2	138.71	50 yr	9.10	175.75	177.05		177.06	0.000181	0.48	42.00	52.89	0.14
Tributary2	138.71	100 yr	10.75	175.75	177.12		177.13	0.000194	0.52	45.85	53.72	0.15
Tributary2	138.71	Regional	15.72	175.75	178.16		178.16	0.000033	0.32	106.40	63.07	0.07
Tributary2	126.57	25mm	0.83	175.76	176.23		176.24	0.001270	0.56	3.02	44.97	0.31
Tributary2	126.57	2 yr	2.17	175.76	176.37		176.38	0.000987	0.62	9.22	76.52	0.29
Tributary2	126.57	5 yr	4.18	175.76	176.51		176.52	0.000685	0.62	17.13	87.77	0.25
Tributary2	126.57	10 yr	5.68	175.76	176.73		176.74	0.000245	0.45	29.70	96.27	0.16
Tributary2	126.57	25 yr	7.82	175.76	176.93		176.94	0.000166	0.43	41.49	101.96	0.13
Tributary2	126.57	50 yr	9.66	175.76	177.05		177.05	0.000156	0.45	48.52	104.20	0.13
Tributary2	126.57	100 yr	11.42	175.76	177.12		177.13	0.000167	0.48	52.91	105.58	0.14

HEC-RAS Plan: Trib2_Draft2 River: Tributary2 Reach: Tributary2 (Continued)

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
Tributary2	4.84000*	25mm	0.83	174.41	176.05		176.05	0.000001	0.03	38.11	79.32	0.01
Tributary2	4.84000*	2 yr	2.17	174.41	176.05		176.05	0.000005	0.07	38.13	79.33	0.02
Tributary2	4.84000*	5 yr	4.18	174.41	176.29		176.29	0.000007	0.10	58.19	86.94	0.03
Tributary2	4.84000*	10 yr	5.68	174.41	176.44		176.44	0.000008	0.12	71.66	91.71	0.03
Tributary2	4.84000*	25 yr	7.82	174.41	176.56		176.56	0.000011	0.14	83.05	95.54	0.04
Tributary2	4.84000*	50 yr	9.66	174.41	176.71		176.72	0.000011	0.15	97.81	99.76	0.04
Tributary2	4.84000*	100 yr	11.42	174.41	176.83		176.83	0.000012	0.16	109.30	107.97	0.04
Tributary2	4.84000*	Regional	17.94	174.41	178.15		178.15	0.000002	0.10	360.22	230.00	0.02
Tributary2	0.00	25mm	0.83	174.40	176.05	174.54	176.05	0.000001	0.04	22.21	79.91	0.01
Tributary2	0.00	2 yr	2.17	174.40	176.05	174.63	176.05	0.000005	0.10	22.21	79.91	0.03
Tributary2	0.00	5 yr	4.18	174.40	176.29	174.74	176.29	0.000012	0.16	25.98	86.98	0.04
Tributary2	0.00	10 yr	5.68	174.40	176.44	174.81	176.44	0.000017	0.20	28.34	91.59	0.05
Tributary2	0.00	25 yr	7.82	174.40	176.56	174.89	176.56	0.000025	0.26	30.23	95.30	0.06
Tributary2	0.00	50 yr	9.66	174.40	176.71	174.95	176.71	0.000041	0.30	33.18	99.38	0.07
Tributary2	0.00	100 yr	11.42	174.40	176.82	175.00	176.83	0.000045	0.33	38.35	102.31	0.08
Tributary2	0.00	Regional	17.94	174.40	178.15	175.15	178.15	0.000007	0.15	248.26	232.48	0.03

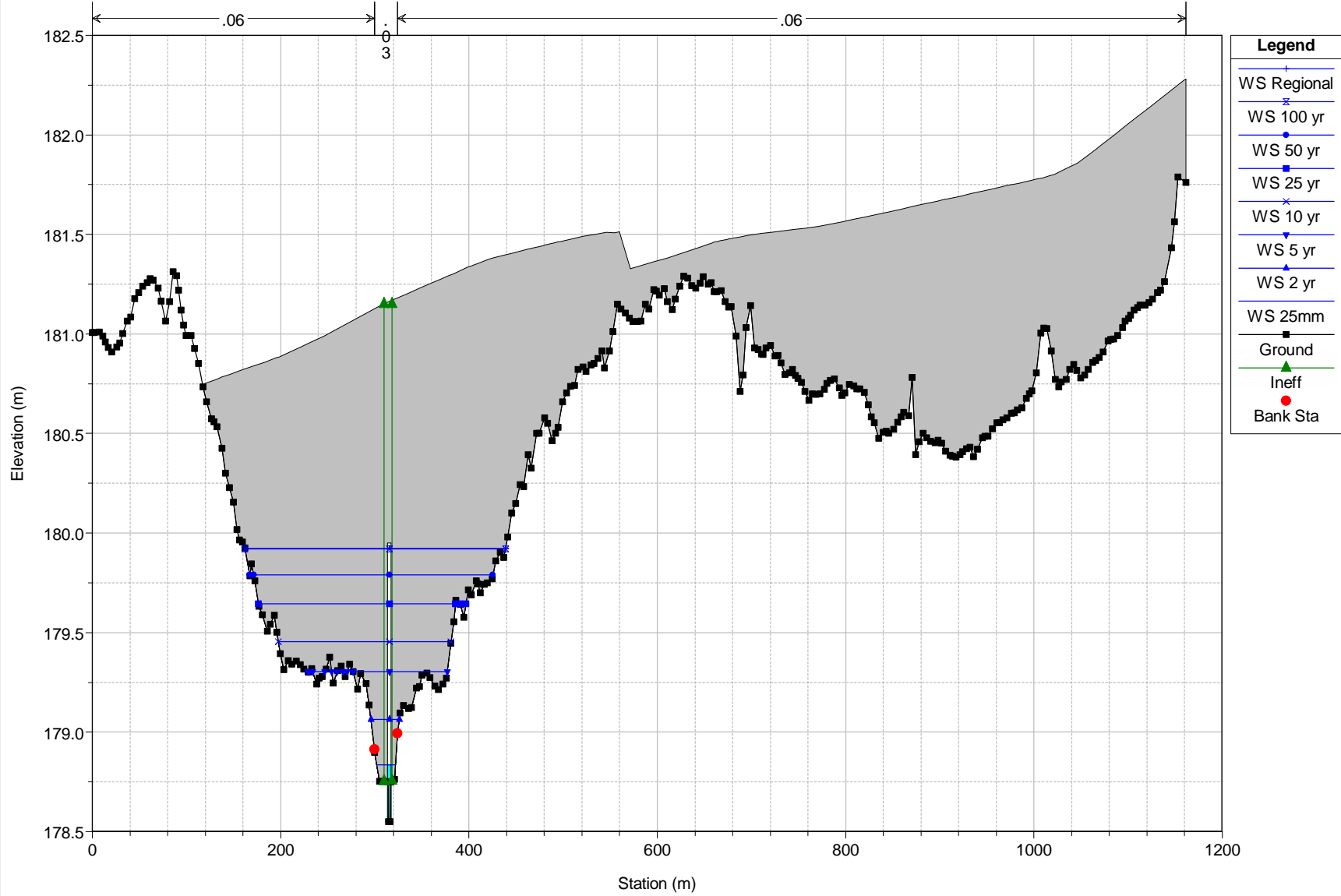
HEC-RAS Plan: Trib2_Draft2 River: Tributary2 Reach: Tributary2

Reach	River Sta		Profile	E.G. US.	W.S. US.	E.G. IC	E.G. OC	Min El Weir Flow	Q Culv Group	Q Weir	Delta WS	Culv Vel US	Culv Vel DS
				(m)	(m)	(m)	(m)	(m)	(m3/s)	(m3/s)	(m)	(m/s)	(m/s)
Tributary2	957.65	Culvert #1	25mm	178.88	178.85	178.82	178.88	181.60	0.78		0.67	0.80	0.60
Tributary2	957.65	Culvert #1	2 yr	179.14	179.13	179.07	179.14	181.60	2.01		0.80	1.16	1.16
Tributary2	957.65	Culvert #1	5 yr	179.44	179.42	179.34	179.44	181.60	3.75		0.99	1.46	1.82
Tributary2	957.65	Culvert #1	10 yr	179.62	179.60	179.52	179.62	181.60	5.03		1.15	1.64	2.36
Tributary2	957.65	Culvert #1	25 yr	179.85	179.82	179.75	179.85	181.60	6.84		1.27	1.84	2.70
Tributary2	957.65	Culvert #1	50 yr	180.03	180.00	179.92	180.03	181.60	8.34		1.30	1.98	2.80
Tributary2	957.65	Culvert #1	100 yr	180.19	180.16	180.08	180.19	181.60	9.79		1.32	2.10	2.83
Tributary2	957.65	Culvert #1	Regional	180.19	180.16	180.08	180.19	181.60	9.81		1.31	2.10	2.79
Tributary2	661.19	Culvert #1	25mm	177.57	177.52	177.52	177.57	181.60	0.78		0.39	0.83	0.69
Tributary2	661.19	Culvert #1	2 yr	177.83	177.78	177.76	177.83	181.60	2.01		0.48	1.19	1.19
Tributary2	661.19	Culvert #1	5 yr	178.12	178.07	178.04	178.12	181.60	3.75		0.63	1.53	1.92
Tributary2	661.19	Culvert #1	10 yr	178.29	178.24	178.22	178.29	181.60	5.03		0.73	1.71	2.28
Tributary2	661.19	Culvert #1	25 yr	178.52	178.47	178.44	178.52	181.60	6.84		0.86	1.93	2.70
Tributary2	661.19	Culvert #1	50 yr	178.69	178.63	178.62	178.69	181.60	8.34		0.96	2.08	2.89
Tributary2	661.19	Culvert #1	100 yr	178.85	178.79	178.78	178.85	181.60	9.79		1.06	2.22	3.05
Tributary2	661.19	Culvert #1	Regional	178.87	178.80	178.78	178.87	181.60	9.81		0.67	2.18	2.26
Tributary2	14.34	Culvert #3	25mm	176.06	176.06	174.84	176.06	176.71	0.22		0.01	0.22	0.22
Tributary2	14.34	Culvert #2	25mm	176.06	176.06	174.84	176.06	176.71	0.22		0.01	0.22	0.22
Tributary2	14.34	Culvert #1	25mm	176.06	176.06	174.91	176.05	176.71	0.39		0.01	0.17	0.17
Tributary2	14.34	Culvert #3	2 yr	176.09	176.09	174.98	176.09	176.71	0.46		0.04	0.47	0.47
Tributary2	14.34	Culvert #2	2 yr	176.09	176.09	174.98	176.09	176.71	0.46		0.04	0.47	0.47
Tributary2	14.34	Culvert #1	2 yr	176.09	176.09	175.22	176.09	176.71	1.25		0.04	0.53	0.53
Tributary2	14.34	Culvert #3	5 yr	176.43	176.43	175.19	176.43	176.71	0.89		0.14	0.90	0.90
Tributary2	14.34	Culvert #2	5 yr	176.43	176.43	175.19	176.43	176.71	0.89		0.14	0.90	0.90
Tributary2	14.34	Culvert #1	5 yr	176.43	176.43	175.53	176.43	176.71	2.40		0.14	1.02	1.02
Tributary2	14.34	Culvert #3	10 yr	176.70	176.70	175.33	176.70	176.71	1.21		0.26	1.23	1.23
Tributary2	14.34	Culvert #2	10 yr	176.70	176.70	175.33	176.70	176.71	1.21		0.26	1.23	1.23
Tributary2	14.34	Culvert #1	10 yr	176.70	176.70	175.74	176.70	176.71	3.25		0.26	1.38	1.38
Tributary2	14.34	Culvert #3	25 yr	176.91	176.91	175.41	176.91	176.71	1.40	1.30	0.34	1.41	1.41
Tributary2	14.34	Culvert #2	25 yr	176.91	176.91	175.41	176.91	176.71	1.40	1.30	0.34	1.41	1.41
Tributary2	14.34	Culvert #1	25 yr	176.91	176.91	175.85	176.91	176.71	3.73	1.30	0.34	1.58	1.58
Tributary2	14.34	Culvert #3	50 yr	177.02	177.02	175.38	177.02	176.71	1.32	3.48	0.31	1.34	1.34
Tributary2	14.34	Culvert #2	50 yr	177.02	177.02	175.38	177.02	176.71	1.32	3.48	0.31	1.34	1.34
Tributary2	14.34	Culvert #1	50 yr	177.02	177.02	175.81	177.03	176.71	3.53	3.48	0.31	1.50	1.50
Tributary2	14.34	Culvert #3	100 yr	177.09	177.09	175.34	177.09	176.71	1.23	5.69	0.26	1.24	1.24
Tributary2	14.34	Culvert #2	100 yr	177.09	177.09	175.34	177.09	176.71	1.23	5.69	0.26	1.24	1.24
Tributary2	14.34	Culvert #1	100 yr	177.09	177.09	175.75	177.09	176.71	3.28	5.69	0.26	1.39	1.39
Tributary2	14.34	Culvert #3	Regional	178.15	178.15	174.75	178.15	176.71	0.11	17.47	0.00	0.11	0.11
Tributary2	14.34	Culvert #2	Regional	178.15	178.15	174.75	178.15	176.71	0.11	17.47	0.00	0.11	0.11
Tributary2	14.34	Culvert #1	Regional	178.15	178.15	174.84	178.15	176.71	0.25	17.47	0.00	0.11	0.11

Indian Creek Trib 2 - Realignment Plan: Trib2_Draft2 7/30/2020

Flow: Phase1-Proposed(Ponds at ED)

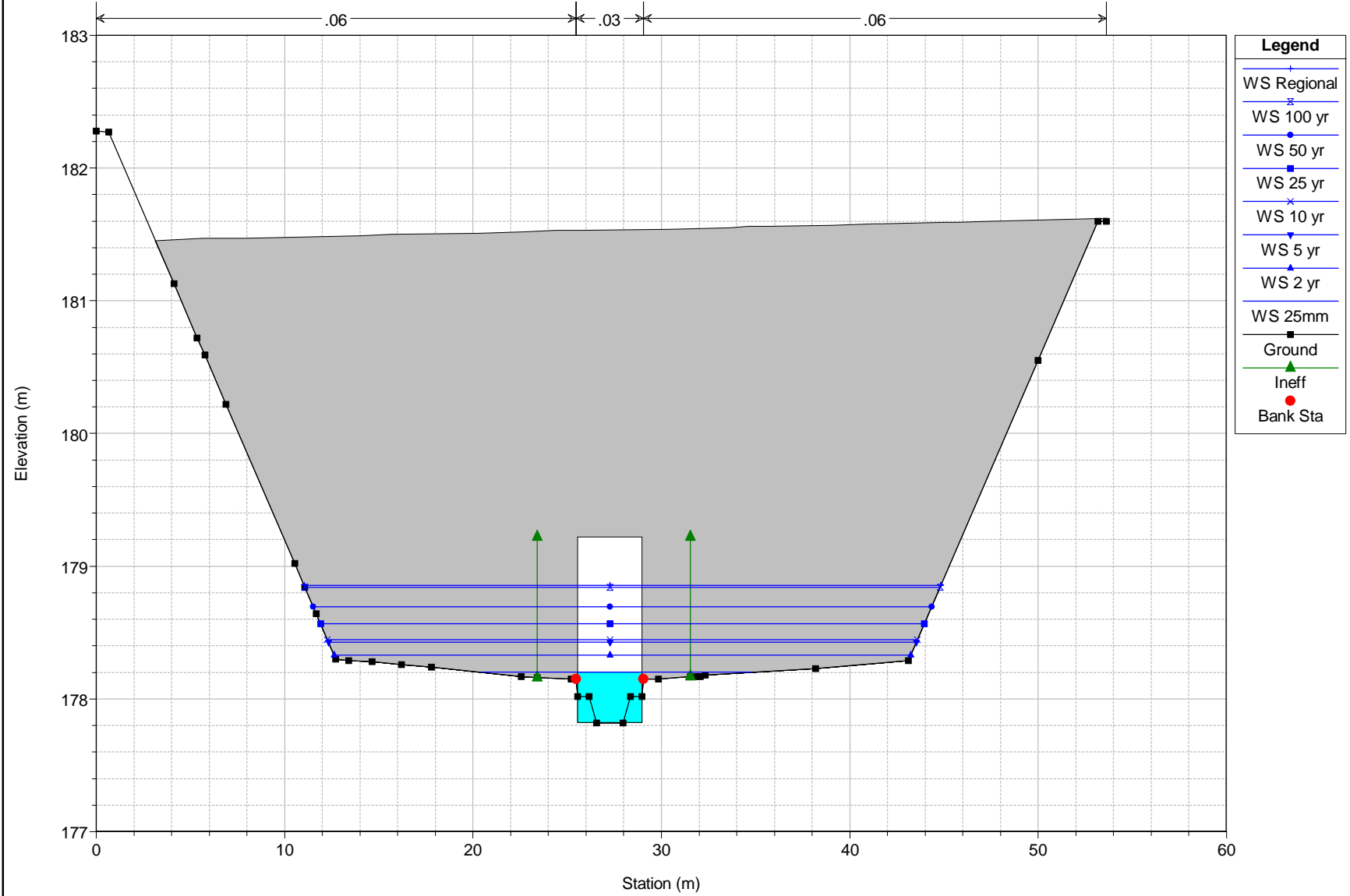
RS = 957.65 Culv 1061.545 Culvert 2B



Indian Creek Trib 2 - Realignment Plan: Trib2_Draft2 7/30/2020

Flow: Phase1-Proposed(Ponds at ED)

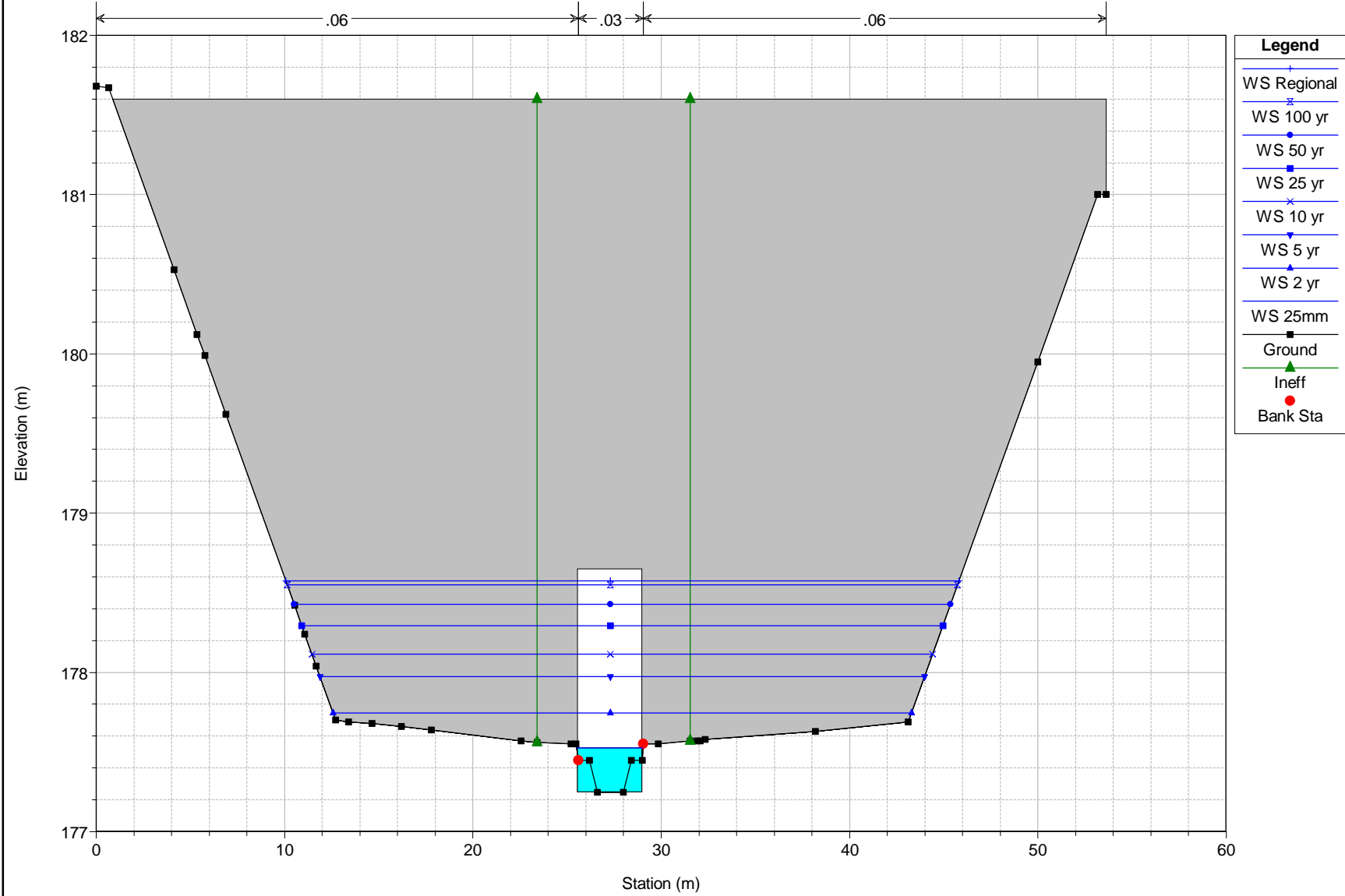
RS = 957.65 Culv 1061.545 Culvert 2B



Indian Creek Trib 2 - Realignment Plan: Trib2_Draft2 7/30/2020

Flow: Phase1-Proposed(Ponds at ED)

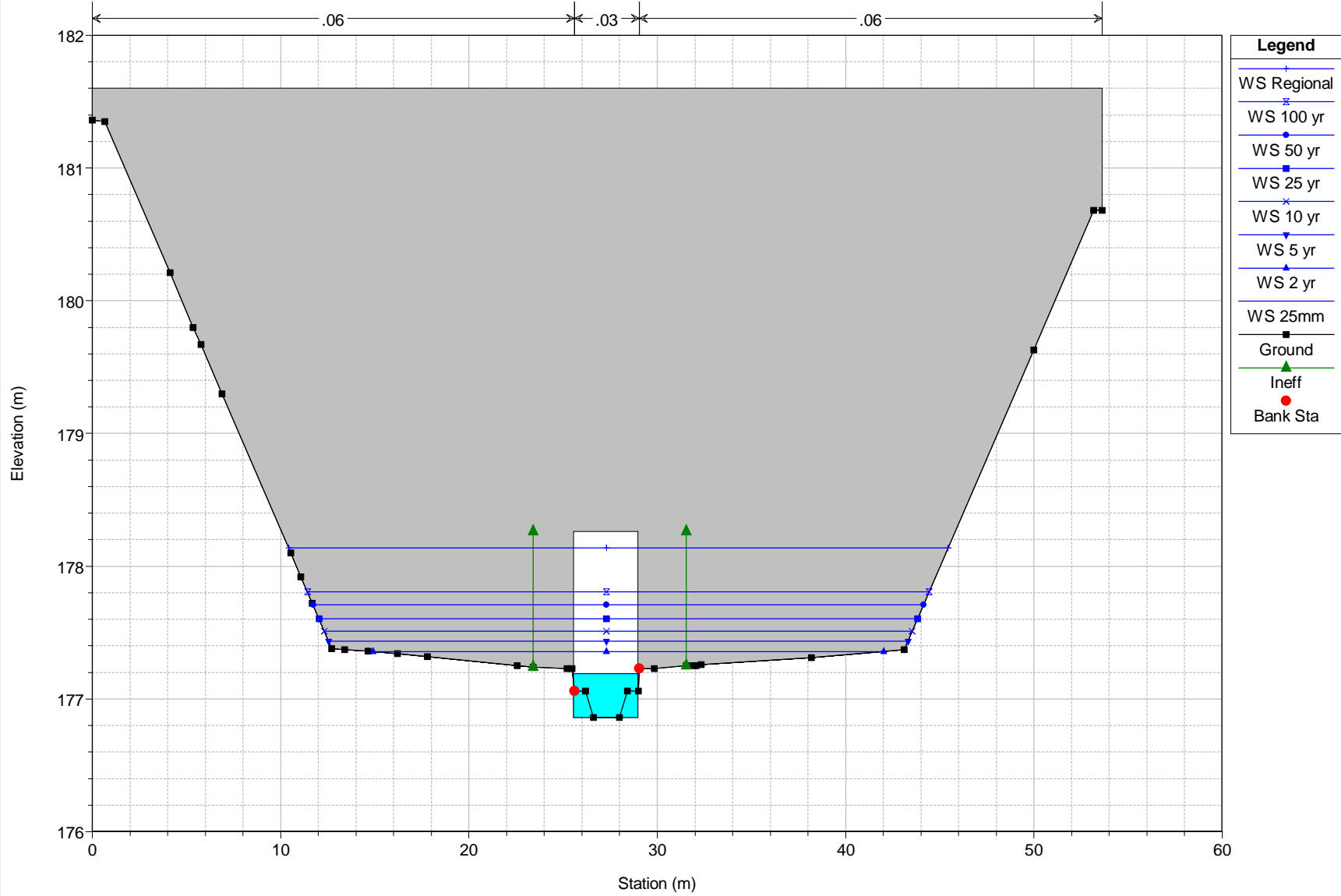
RS = 661.19 Culv 693.38 Culvert 2B



Indian Creek Trib 2 - Realignment Plan: Trib2_Draft2 7/30/2020

Flow: Phase1-Proposed(Ponds at ED)

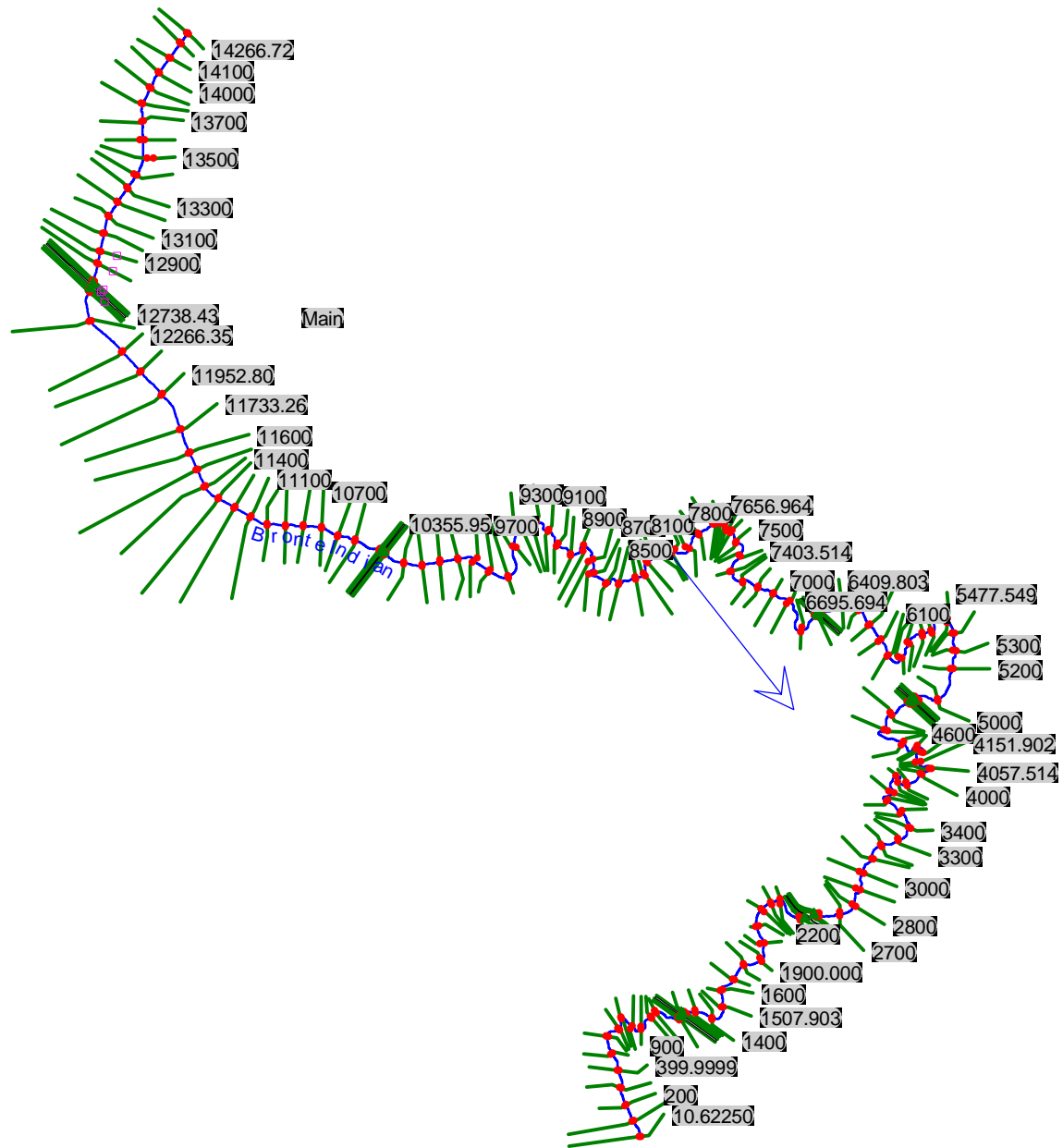
RS = 661.19 Culv 693.38 Culvert 2B

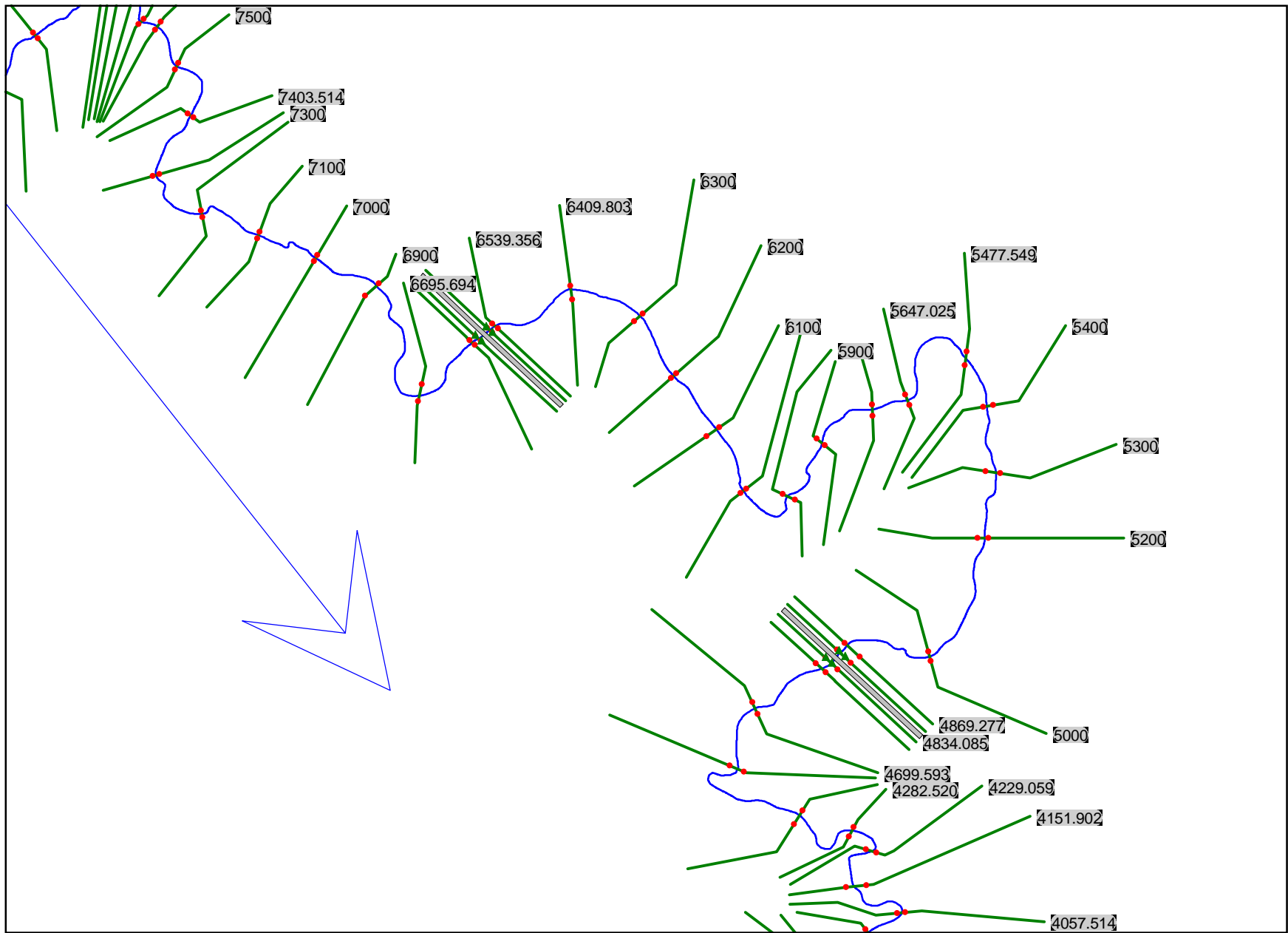




Milton Logistics Hub 2020 HEC-RAS Model Output

Indian Creek Existing Conditions

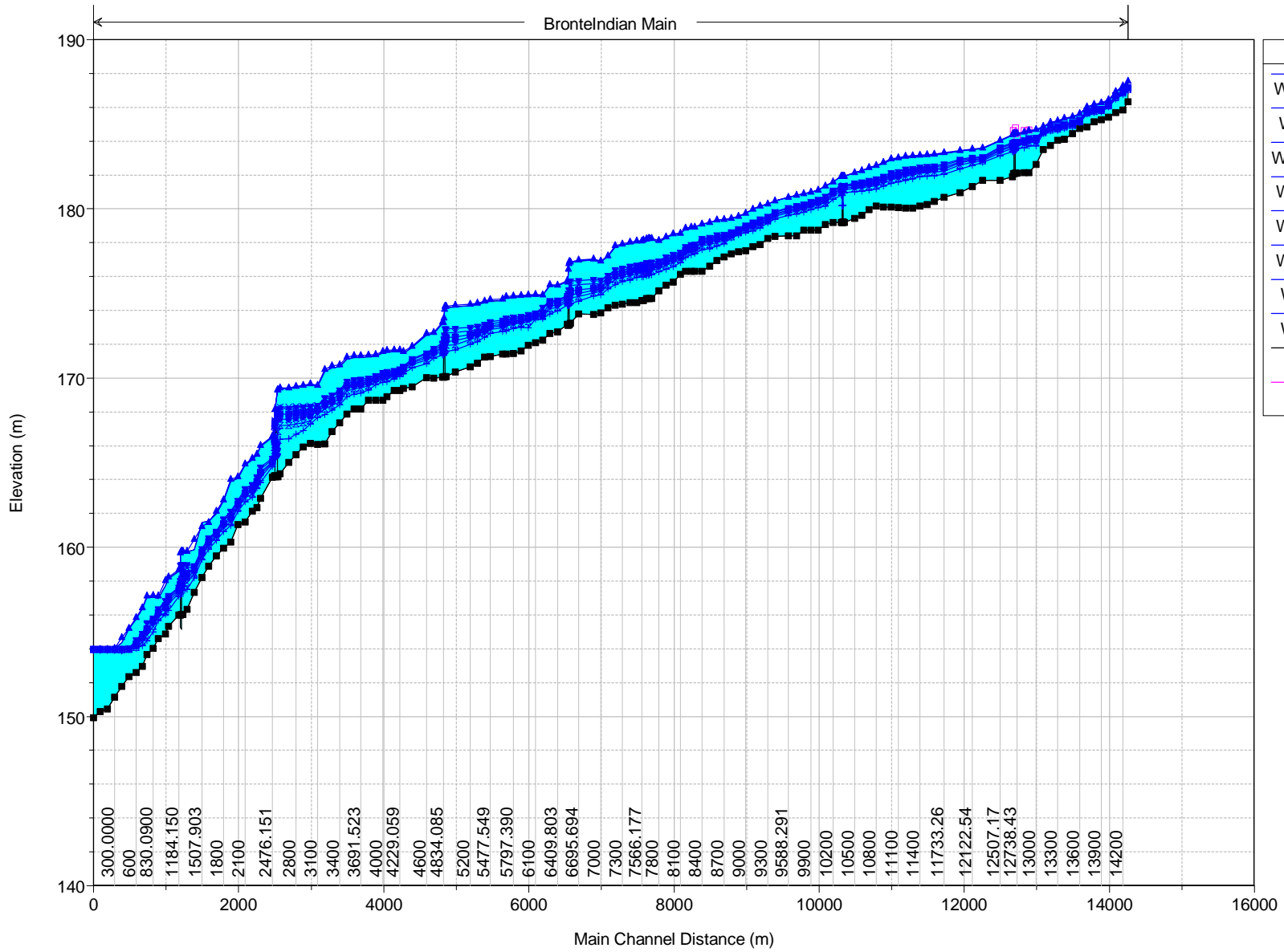




Indian Trib Main Branch (Final) Plan: 2006 Model--All Flows 7/13/2015

Flow: All Flows from SMS

BrontelIndian Main



Legend	
WS Existing	▲
WS Future	▼
WS 100 year	×
WS 50 year	■
WS 20 year	◆
WS 10 year	●
WS 5 year	⊗
WS 2 year	▽
Ground	■
Left Levee	◻