CONSTRUCTION SUMMARY (AS-BUILT) REPORT FOR RANKIN INLET BYPASS ROAD AND CULVERTS MELIADINE PROJECT, NUNAVUT

PRESENTED TO
Agnico Eagle Mines Ltd.

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EXECUTIVE SUMMARY

Tetra Tech was retained by Agnico Eagle Mines Limited (Agnico Eagle) to conduct a detailed design of the civil works and the water management infrastructures at the Meliadine Gold Project, Nunavut. As a part of this mandate, Tetra Tech designed the Rankin Inlet Bypass Road and associated culverts. Tetra Tech also previously prepared the design report for these infrastructures (Agnico Eagle N° 6515-E-132-005-132-REP-006).

Agnico Eagle requested Tetra Tech to complete on their behalf the following as-built construction record report. It should be noted that Tetra Tech was not involved, nor was on site, during the construction activities for these infrastructures. Accordingly, all the construction, quality assurance, and commissioning activities associated with the aforementioned infrastructure was managed by Agnico Eagle and their subcontractors. As such, Tetra Tech has presented the construction data as supplied by Agnico Eagle and therefore Tetra Tech cannot accept any responsibility for the accuracy of any of the data supplied.

The construction for the Rankin Inlet Bypass Road was conducted over two construction work seasons between August 2017 and September 2018.

This report summarizes the construction as-built information for the Rankin Inlet Bypass Road for the Meliadine project.

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1.0 INTRODUCTION

Agnico Eagle Mines Limited (Agnico Eagle) retained the services of Tetra Tech to carry out the planning and design works associated with the Water and Environment and the Civil Works components of the Meliadine Project, a gold mine located approximately 25 km north from Rankin Inlet, and 80 km southwest from Chesterfield Inlet in the Kivalliq Region of Nunavut. The remote location of the Project requires that access, service and haul roads be built to support the development. A controlled 31 km long All-Weather Access Road (AWAR) links the Meliadine mine site and Rankin Inlet.

A bypass road including culverts was designed and built to divert traffic associated to the Meliadine Project around Rankin Inlet, in order to reduce impacts on the community (dust, noise, traffic, etc.). The 6.2 km long bypass road allow traffic from the Rankin Inlet Laydown Area, near Melvin Bay (part of Hudson Bay) to bypass the community of Rankin Inlet, minimizing the use of municipal roads by Agnico Eagle to deliver material, fuel and people to the Meliadine mine site.

Tetra Tech previously prepared the design drawings for the construction of Rankin Inlet Bypass Road. As part of the scope of work, Agnico Eagle asked Tetra Tech to:

- Design the Rankin Inlet Bypass Road and associated culverts;
- Produce construction drawings and specifications for the Rankin Inlet Bypass Road and associated culverts;
- Prepare design and construction summary reports of the Rankin Inlet Bypass Road and associated culverts.

As required by the Water Licence A (No. 2AM-MEL1631), this report summarizes the construction work of the Rankin Inlet Bypass Road. Included in this report is:

- A summary of the characteristics of the infrastructures;
- Documentation on field decisions that deviate from original plans;
- As-built drawings;
- Survey drawings;
- Photographs;
- Construction Summary Report of Rankin Inlet Bypass Road and Culverts;
- Particle Size Summary for 25 mm minus material and 20 mm minus material.

The design report for the Rankin Inlet Bypass Road was issued for approval to the Nunavut Water Board (NWB) in March 2017. Two amendments were issued after the original design report issuance:

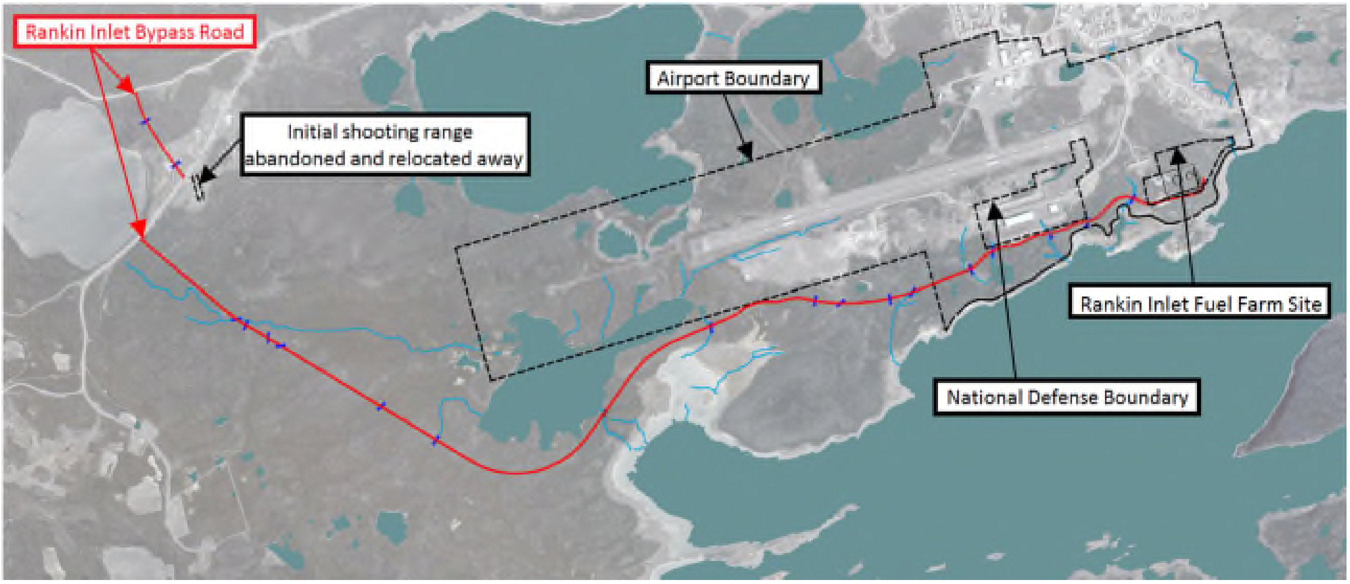
1. Amendment 1: Design report for crossing C10 with a group of culverts instead of a bridge, issued August 2017, refer to Appendix F.
2. Amendment 2: Design report for Culvert C13 and C14 were added along the Bypass Road, issued September 2017, refer to Appendix G.

2.0 SUMMARY OF THE CONSTRUCTION

2.1 Site Location Plan

The figure below presents a site location plan.

Figure 2.1: Site location plan



2.2 Construction Schedule

The construction work for the Rankin Inlet Bypass Road and associated culverts were conducted between August 2017 and September 2018. Construction was completed according to the milestone dates shown in Table 2.1.

Table 2.1: Construction Milestone Dates

Year	Item	Date of completion
2017 Work	Site Preparation	August 25, 2017
	Road (from 1+500 to 6+173)	December 7, 2017
	Culverts (C14, C13, C12B, C12A, C11C, C11B1, C11B, C10, C9)	November 16, 2017
2018 Work	Site Preparation	May 22, 2018
	Road (from 0+000 to 6+173)	September 1, 2018
	Culverts (C11A, C7B, C7A, C6A, C6B, C5, C4, C3, C2, C1)	July 12, 2018

2.3 Rankin Inlet Bypass Road Components

The Rankin Inlet Bypass Road has 19 groups of culverts to allow existing natural water streams and surface water runoff to reach Melvin Bay (part of Hudson Bay). From the original 14 groups, some were divided into smaller groups to better suit the on-site conditions.

2.3.1 Bypass Road

The table below presents a summary of the as-built bypass road characteristics.

Table 2.2: Summary of the As-Built Bypass Road Characteristics

Parameters	Value
Length	6 173 m
Width	6.5 m for most of the road At least 8.0 m from chainage 0+222 to 1+492
Minimum fill on running surface	1.3 m
Number of pullouts	13
Number of groups of culverts	19
Embankment typical slope	2.5H: 1V

2.3.2 Culverts

The following table presents a summary of the as-built culverts characteristics.

Table 2.3: As-Built Parameters for the Culverts and Peak Flow for a 1:25 year return period

No.	Drainage Area (ha)	Peak Flow (m^3/s)	Typical Cross-Section Type	Type F1 culverts	Type F2 culverts	Type F3 culverts	Culvert Capacity (m^3/s)	Length of Culverts (m)
				Number x Diameter				
C01	9.7	0.72	A*	1 x 1.0 m		1 x 1.0 m	1.90	2 x 36
C02	3.9	0.29	A*	2 x 0.7 m			0.80	2 x 42
C03	3.3	0.24	B*	1 x 1.0 m	1 x 1.0 m	1 x 0.7 m	2.30	3 x 36
C04	8.0	0.59	A*	1 x 1.0 m		1 x 1.0 m	1.90	1 x 30 1 x 36
C05	13.2	0.97	D*	2 x 1.0 m			1.90	2 x 30
C06A	12.0	0.89	D*	2 x 0.8 m			1.24	2 x 30
C06B	5.3	0.39	E*		1 x 0.8 m		0.62	1 x 18
C07A	8.1	0.60	D*	2 x 0.8 m			1.24	2 x 30
C07B	1.7	0.13	D*	2 x 0.8 m			1.24	2 x 18
C09	13.1	0.97	D*	1 x 1.0 m		1 x 1.0 m	1.90	2 x 24
C10**	1004.3	5.40	CULVERT #C10 CROSS SECTION	1 x 1.2 m	4 x 1.2 m	1 x 1.0 m	8.45	6 x 30
C11A	31.2	0.82	D*		2 x 1.2 m		3.00	2 x 18
C11B	63.1	1.66	D*		2 x 1.0 m		1.90	2 x 18
C11B1	8.9	0.23	E*			1 x 1.0 m	0.95	1 x 24
C11C	23.5	0.62	D*	1 x 1.0 m	1 x 1.0 m		1.90	2 x 18
C12A	6.2	0.16	D*			2 x 1.2 m	3.00	2 x 18
C12B	328.5	4.40	D*			2 x 1.2 m	3.00	2 x 30
C13	6.2	0.75	D*		2 x 0.8 m		1.24	2 x 18
C14	7.7	0.93	D*		3 x 0.8 m		1.86	3 x 18

* No embedment was provided to the lowest pipes.
** The original design of C10 called for a bridge of approximately 15 m long and 7.4 m width. It was replaced by a group of culverts in August 2017.

2.4 Drawings and Photographs

Sealed as-built drawings completed by Tetra Tech are presented in Appendix A.

Survey drawings conducted by Hamel Arpentage after the construction of the Rankin Inlet Bypass Road can be found in Appendix B.

Photographs of the Rankin Inlet Bypass Road and associated culverts during and after construction are shown in Appendix C.

3.0 FIELD DECISIONS THAT DEVIATE FROM ORIGINAL DESIGN

This section documents variations from original design which were approved by the designer and/or the field engineer on site for the Rankin Inlet Bypass Road. The changes listed herein do not negatively affect the original water management strategy.

A construction summary was prepared for the Rankin Inlet Bypass Road by the Agnico Eagle construction team. This summary is available in Appendix D.

The bypass road and culverts geometry and characteristics were adjusted to site conditions. The tables below present the changes between the proposed work and the actual work.

The original design of the bypass road was conducted during winter (2016-2017) and the presence of snow during the engineering phase prevented the engineering team from completing a survey and gather on-site relevant information before the issuance of the design report.

Once the site visits and surveys were conducted (May to July 2017), a revised design was issued for construction by the engineering team to the construction team providing 19 groups of culverts instead of the 14 groups in the original design. These changes were made by the designer.

3.1 Bypass Road

The construction work led to slight variations from the original design in bypass road as summarized in Table 3.1 below.

Table 3.1: General Details for the Bypass Road

Item	Proposed	Actual	Difference
Length	6 321 m	6 173 m	- 148 m
Width	6.5 m for the majority of the road 8.0 m from chainage 0+262 to 1+492 8.0 m from chainage 5+840 to 5+871	6.5 m for most of the road At least 8.0 m from chainage 0+222 to 1+492	-
Minimum fill on running surface	1.3 m	1.3 m	-
Number of pullouts	11	13	+ 2
Number of groups of culverts	14	19	+ 5
Embankment typical slope	2.5H: 1V	2.5H: 1V	-

The road length difference (-148 m) is the result of several slight adjustments to the original design included in the Design Report, approved by the field engineer:

- A grave site monument was located at the centerline of 5+860 requiring a shift in the design of approximately 200 m to the northwest.
- Alignment modifications were made to reduce the volume of fill material by straightening out the curves heading up chainage from station 3+530 to the existing access community road.

Two additional pullouts were made to facilitate construction work. They were left as permanent features for the road after construction.

Earthen safety berms were planned for the sections of road with an embankment height of 3 m or greater, to comply with NWT/NU Mine Act safety requirements:

- Selected boulders were strategically placed to work as safety barriers to replace earthen berms, as accepted by the designer in order to minimize the anticipated maintenance required along those sections of the road due to snow accumulations. Around 227 boulders were installed for about 824 m of roadway from stations 0+000 to 0+044 and 0+375 to 1+160.
- A berm of 600 mm minus Class A esker material as per design specifications was used as a safety berm from station 1+160 to 1+330 (an extension of approximately 170 m because the fill heights were of 3 m or greater). Fill heights were also the rationale for extension of the safety barrier specified from station 2+100 to 2+308, which was extended by about 200 m to conform to the design and was placed from station 1+920 to 2+330.
- No safety barriers where placed when the as-built fill heights were less than 3 m. Therefore, the safety barrier specified from station 0+290 to 0+303 was no longer required.

3.2 Bridge

In the original design report, a bridge was considered at crossing C10. However, the final design was pending due to the lack of information on; fish, fish habitat, the watershed, the existing ground as well as the watercourse and the existing flow at the crossing. Further, the presence of snow during the engineering phase prevented the engineering team from completing a field survey to acquire the relevant on-site information to decide if either a bridge or a group of culverts would be recommended.

After a number of site surveys were completed it appeared that the flow to be managed in crossing C10 was substantially less than that expected by theoretical calculations. It was also observed that the area was totally dry after the freshet. As a result, the engineering team recommended installation of a group of culverts instead of a bridge at crossing C10. The design report detailing the revised design for the C10 group of culverts, prepared in August 2017, is provided in Appendix F.

3.3 Culverts

Additional groups of culverts have been installed due to the new alignment of the road and to fit with the field observations:

- Some groups of culverts (C07, C11, and C12) were divided into two or three smaller locations to better suit the field topography and the natural spread of the water flow and were part of the revised design prepared by the engineering team.
- New culverts C06B and C11B1 were installed by the construction team based on field observations of freshet flows.

Some groups of culverts were not installed:

- The culvert C08 was not installed due to very steep topography and instead the water was diverted to C09 crossing.
- Group of culverts C12C was removed two weeks after being installed because the placement location was in a natural draw, with no place for the collected water to flow. Instead, the field engineer approved to excavate a small ditch on the side of the road alignment to direct the water away from the road.

All installed culverts have a greater capacity than the estimated peak flow for a 1:25 year return period which complies with the design and provides a buffer for any “wet freshet” event.

- The culvert C12B is an exception, as the designer divided the original group of culverts C12 into 3 smaller groups with reduced capacity that better suits the site topography. Installation of the group of culverts C12C was cancelled on-site during the construction phase. The culvert C12B has the capacity to manage a lower peak flow than a 1:25 year return period, thus, should a 1:25 year return period or rarer event occur, the temporary runoff water exceeding the culvert capacity would naturally flow toward culvert C12A on the native ground along the road which would behave as a dam. The culvert C12A is located just 50 m downstream of culvert C12B and the overall capacity of both culverts is adequate to manage the peak flow for a 1:25 year return period.

For a better understanding of the changes made from the original design to the revised design by the designer and the changes approved by the field engineer from the revised design to the as-built, the following tables 3.2, 3.3, and 3.4 are summarizing information from original, revised and as-built designs.

Table 3.2: Culverts Capacity and Peak Flow for a 1:25 year return period

Original Design				Revised Design				As-built			
No.	Drainage Area (ha)	Peak Flow (m^3/s)	Total Culvert Capacity (m^3/s)	No.	Drainage Area (ha)	Peak Flow (m^3/s)	Total Culvert Capacity (m^3/s)	No.	Drainage Area (ha)	Peak Flow (m^3/s)	Total Culvert Capacity (m^3/s)
C01	9.7	0.72	1.90	C01	9.7	0.72	1.90	C01	9.7	0.72	1.90
C02	3.9	0.29	0.80	C02	3.9	0.29	0.80	C02	3.9	0.29	0.80
C03	3.3	0.24	0.80	C03	3.3	0.24	2.30	C03	3.3	0.24	2.30
C04	8.0	0.59	1.90	C04	8.0	0.59	1.90	C04	8.0	0.59	1.90
C05	13.2	0.97	2.30	C05	13.2	0.97	1.90	C05	13.2	0.97	1.90
C06	17.3	1.28	2.85	C06	17.3	1.28	1.24	C06A	12.0	0.89	1.24
								C06B	5.3	0.39	0.62
C07	9,7	0.72	1.90	C07A	8.1	0.60	1.24	C07A	8.1	0.60	1.24
				C07B	1.7	0.13	1.24	C07B	1.7	0.13	1.24
C08	4.3	0.32	0.80	C08	4.3	0.32	0.95	C08	NOT INSTALLLED		
C09	8.8	0.65	1.90	C09	8.8	0.65	1.90	C09	13.1	0.97	1.90
C10	1004.3	5.40	8.45	C10	1004.3	5.40	8.45	C10	1 004.3	5.40	8.45
C11	132.9	3.50	8.45	C11A	31.2	0.82	3.00	C11A	31.2	0.82	3.00
				C11B	72	1.89	1.90	C11B	63.1	1.66	1.90
								C11B1	8.9	0.23	0.95
				C11C	23.5	0.62	1.90	C11C	23.5	0.62	1.90
C12	328.5	4.40	9.95	C12A	6.2	0.16	3.00	C12A	6.2	0.16	3.00
				C12B	110	1.47	3.00	C12B	328.5	4.40	3.00
				C12C	218.5	2.93	1.90	C12C	NOT INSTALLED		
C13	6.2	0.75	1.33	C13	6.2	0.75	1.24	C13	6.2	0.75	1.24
C14	7.7	0.93	3.04	C14	7.7	0.93	1.86	C14	7.7	0.93	1.86

Table 3.3: General Details for the Culverts

Original Design				Revised Design				As-built			
No.	Typical cross-section type	Number x Diameter	Length	No.	Typical cross-section type	Number x Diameter	Length	No.	Typical cross-section type	Number x Diameter	Length
C01	A	2 x 1.0 m	2 x 31.5 m	C01	A	2 x 1.0 m	2 x 34.8 m	C01	A*	2 x 1.0 m	2 x 36.0 m
C02	A	2 x 0.7 m	2 x 31.4 m	C02	A	2 x 0.7 m	2 x 42.4 m	C02	A*	2 x 0.7 m	2 x 42.0 m
C03	A	2 x 0.7 m	2 x 31.3 m	C03	B	1 x 0.7 m 2 x 1.0 m	3 x 49.3 m	C03	B*	1 x 0.7 m 2 x 1.0 m	3 x 36.0 m
C04	A	2 x 1.0 m	2 x 32.2 m	C04	A	2 x 1.0 m	2 x 35.9 m	C04	A*	2 x 1.0 m	1 x 30.0 m 1 x 36.0 m
C05	B	2 x 1.0 m 1 x 0.7 m	3 x 20.0 m	C05	D	2 x 1.0 m	2 x 23.1 m	C05	D*	2 x 1.0 m	2 x 30.0 m
C06	B	1 X 1.2 m 1 x 1.0 m 1 x 0.7 m	3 x 31.8 m	C06	D	2 X 0.8 m	2 x 31.8 m	C06A	D*	2 x 0.8 m	2 x 30.0 m
								C06B	E*	1 x 0.8 m	1 x 18.0 m
C07	A	2 x 1.0 m	2 x 19.9 m	C07A	D	2 x 0.8 m	2 x 32.0 m	C07A	D*	2 x 0.8 m	2 x 30.0 m
				C07B	D	2 x 0.8 m	2 x 17.6 m	C07B	D*	2 x 0.8 m	2 x 18.0 m
C08	A	2 x 0.7 m	2 x 37.3 m	C08	D	1 x 1.0 m	1 x 36.9 m	C08	NOT INSTALLED		
C09	A	2 x 1.0 m	2 x 19.1 m	C09	A	2 x 1.0 m	2 x 23.4 m	C09	D*	2 x 1.0 m	2 x 24.0 m
C10	CULVERT #C10 CROSS SECTION	1 x 1.0 m 5 x 1.2 m	6 x 27.0 m	C10	CULVERT #C10 CROSS SECTION	1 x 1.0 m 5 x 1.2 m	6 x 27.0 m	C10	CULVERT #C10 CROSS SECTION	1 x 1.0 m 5 x 1.2 m	6 x 30.0 m
C11	C	5 x 1.2 m 1 x 1.0 m	6 x 18.4 m	C11A	D	2 x 1.2 m	2 x 23.0 m	C11A	D*	2 x 1.2 m	2 x 18.0 m
				C11B	D	2 x 1.0 m	2 x 19.0 m	C11B	D*	2 x 1.0 m	2 x 18.0 m
								C11B1	E*	1 x 1.0 m	1 x 24.0 m
				C11C	D	2 x 1.0 m	2 x 22.0 m	C11C	D*	2 x 1.0m	2 x 18.0 m
C12	D	5 x 1.2 m 1 x 1.0 m	7 x 18.4 m	C12A	D	2 x 1.2 m	2 x 23.6 m	C12A	D*	2 x 1.2 m	2 x 18.0 m
				C12B	D	2 x 1.2 m	2 x 34.0 m	C12B	D*	2 x 1.2 m	2 x 30.0 m
				C12C	D	2 x 1.0 m	2 x 19.0 m	C12C	NOT INSTALLED		
C13	D	2 x 0.8 m	2 x 23.0 m	C13	D	2 x 0.8 m	2 x 23.0 m	C13	D*	2 x 0.8 m	2 x 18.0 m
C14	D	3 x 0.8 m	3 x 19.0 m	C14	D	3 x 0.8 m	3 x 19.0 m	C14	D*	3 x 0.8 m	3 x 18.0 m

* No embedment was provided to the lowest pipes

The final length of each culvert was adjusted to fit the final width of the bypass road at the crossing location and also to coincide with the standard culvert section length.

The minimum cover depth over all culverts along the road was increased to 1 m to allow heavy load equipment trucking without damaging the culverts, approved by the designer and the field engineer.

The typical cross-section type (configuration of culverts) was modified to suit with the accepted changes for the culverts location and number when applicable.

All culverts were installed with respect to the natural stream or ground slope as much as possible, avoiding any outlet drop to help prevent erosion. The natural stream or ground slope at the final culvert position was found to be generally gentler than assumed in the original design. Therefore, the natural velocities are less than designed when using the as-built slopes. However, there are 5 culverts location (C05, C09, C10, C12A and C13) where the slopes are steeper than the original design, and so are the velocities.

- The as-built slope of the group of culverts C10 was greater than designed to suit with the natural stream slope without an outlet drop and therefore minimize impact on the potential fish and fish habitat. The on-site velocity in the main channel at C10 crossing was measured at 0.6 m/s in May 2017. For the peak flow associated to the 1:2 years annual rainfall event, a velocity of 1.97 m/s can be reached. As per design, to ensure that fish passage potential is not less than what was already existing, a 1.2 m diameter culvert has been strategically placed on-site to perfectly fit in the main channel, and was embedded 0.3 m below the channel invert. Since the culvert width is larger than the stream channel width, there is no channel constriction that could increase velocities within the culvert. Furthermore, 4 additional pipes of 1.2 m diameter were installed at ground level besides the embedded culvert and main watercourse, as per design. These secondary culverts allow sufficient capacity to convey the peak flow, but are also providing routes of reduced velocity during high flow period.

Following the installation of the group of culverts C12C with the design criteria specifying 0.3 m of embedment on the lowest pipes, field observations showed large volumes of ponding water within the culverts, creating concerns for potential ice jacking and damage. Therefore, the field engineer approved to proceed with the installation of the remaining culverts (all of them except for the group of culvert C10) with the lowest pipes at original ground level, without any embedment.

- Consequently, the lowest pipe in the group of culverts C01, C03, C04 and C09 (located where there is an ephemeral stream crossing) were not embedded as recommended. However, the as-built slopes were smoother than designed for the group of culverts C01, C03 and C04 reducing their expected velocity; while the expected velocity for the group of culvert C09 is slightly greater than assumed in the original design due to the natural steeper slope. None of the subject culverts is installed with an outlet drop that could negatively affect their potential use by small-bodied fish when water is flowing.
- The exception is for the installation of the group of culverts C10 that followed the original design with an embedment of 0.3 m for the lowest pipe to provide seasonal fish passage for both small-bodied and large bodied species between Cygnet Lake and the marine environment.

Table 3.4: Culverts Velocity for a 1:2 year return period

Original Design				Revised Design				As-built			
No.	Average Slope (%)	Peak Flow per culvert (m/s)	Velocity per culvert (m/s)	No.	Average Slope (%)	Peak Flow per culvert (m/s)	Velocity per culvert (m/s)	No.	Average Slope (%)	Peak Flow per culvert (m/s)	Velocity per culvert (m/s)
C01	7.2	0.21	2.44	C01	6.0	0.21	2.29	C01	4.9	0.21	2.13
C02	10.3	0.08	2.18	C02	6.0	0.08	1.80	C02	10.0	0.08	2.15
C03	12.1	0.07	2.21	C03	6.0	0.05	1.53	C03	5.9	0.05	1.50
C04	10.4	0.17	2.61	C04	6.0	0.17	2.15	C04	6.7	0.17	2.23
C05	1.3	0.19	1.32	C05	2.0	0.28	1.69	C05	3.0	0.28	1.95
C06	3.8	0.25	1.99	C06	3.5	0.26	2.06	C06A	2.0	0.26	1.69
								C06B	3.5	0.23	1.99
C07	7.2	0.21	2.44	C07A	1.7	0.11	1.25	C07A	1.2	0.11	1.25
				C07B	6.0	0.17	2.21	C07B	5.3	0.04	1.38
C08	16.4	0.09	2.65	C08	6.0	0.07	1.65	C08	NOT INSTALLED		
C09	2.1	0.19	1.54	C09	1.8	0.28	1.63	C09	2.2	0.28	1.75
C10	0.5	0.58	1.23	C10	0.5	0.58	1.23	C10	1.8	0.58	1.97
C11	3.2	0.38	2.14	C11A	2.3	0.22	1.63	C11A	1.6	0.22	1.43
				C11B	2.3	0.51	2.11	C11B	1.8	0.45	1.86
								C11B1	2.3	0.12	1.40
				C11C	2.4	0.17	1.56	C11C	0.8	0.17	1.05
C12	1.0	0.40	1.44	C12A	0.5	0.04	0.58	C12A	0.8	0.04	0.69
				C12B	1.0	0.40	1.44	C12B	1.6	1.19	2.29
				C12C	0.6	0.79	1.42	C12C	NOT INSTALLED		
C13	0.9	0.07	0.86	C13	0.9	0.07	0.86	C13	1.1	0.07	0.95
C14	2.0	0.03	0.90	C14	2.0	0.03	0.90	C14	1.1	0.03	0.74

4.0 EARTHWORKS

Table 4.1 below presents the granular material quantities for the construction of the Rankin Inlet Bypass Road, including the associated culverts. The quantities presented are in-place quantities and do not include any extras for excess or losses.

Table 4.1: Granular Material In-Place Quantities

<table>
<tr><th>Material</th><th>Proposed Quantities</th><th>Actual Quantities</th><th>Difference Quantities</th></tr>
<tr><td>Borrow pit material Class A or Granular Fill 0-600 mm material for road base (m^3)</td><td>116 350</td><td rowspan="2">94 766</td><td rowspan="2">- 27 164</td></tr>
<tr><td>Borrow pit material Class A or Granular Fill 0-600 mm material or overburden material approved by the field engineer for safety berms and road shoulder (m^3)</td><td>5 580</td></tr>
<tr><td>Granular fill 0-50 mm for road and culverts (m^3)</td><td>10 400</td><td>3 752</td><td rowspan="2">+152</td></tr>
<tr><td>Granular fill 0-25 mm for road topping (m^3)</td><td>-</td><td>6 800</td></tr>
<tr><td>Rip Rap 50-300 mm for culverts (m^3)</td><td>420</td><td>588</td><td>+168</td></tr>
<tr><td>Rip Rap 600-1000 mm for protection of embankments (m^3)</td><td>760</td><td>640</td><td>-120</td></tr>
<tr><td>Total Fill Material Volume (m^3)</td><td>133 910</td><td>113 336</td><td>-27 466</td></tr>
<tr><td>Non-woven geotextile 200 g/m^2 (if required) (m^2)</td><td>10 000</td><td>Not required</td><td>Not required</td></tr>
</table>

4.1 Field decisions that deviate from original design

This section documents variations in material quantities between original design and as-built for the Rankin Inlet Bypass Road.

- No overburden material was used as fill material, and the global borrow pit material Class A quantity is less than designed since the road length was shortened.
- Calcium chloride was applied to the road topping and compacted to help dust control. The road topping material was 0-25 mm instead of 0-30 mm, which is accepted by the designer.
- The quantity of riprap 50-300 mm installed is greater than the minimum design quantity. It was placed to the satisfaction of the field engineer to prevent erosion of the culverts inlet and outlet areas.
- So far, riprap 600-1000 mm for the protection of embankments has been installed in accordance with the design drawings. The installation of the riprap for section 1+297 to 1+353 will be completed in 2019.
- The installation of a geotextile under the road was recommended to minimize loss of fill material if the construction schedule extended into the summer and if site conditions required it. It was decided that it was unnecessary to place the geotextile on the natural ground based on site conditions. Instead, the fill was placed to design grades and compensated for the loss penetration of the road base granular fill into the tundra with additional granular fill.

- At some culvert locations (C14 through to C11B1), as an addition to the design, a geotextile was placed between the clean gravel bedding of the culverts and the natural ground to help avoid the clean gravel to get mixed with the natural ground. This is a good practice, however no as-built quantities were provided to record.

5.0 CONSTRUCTION MONITORING

The construction monitoring was managed by Agnico Eagle. The performance of the installed culverts will be monitored frequently, particularly during freshet flows.

6.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Agnico Eagle Mines Ltd. and their agents. Tetra Tech does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Agnico Eagle Mines Ltd., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Tetra Tech accepts no responsibility for losses, claims, expenses or damages, if any, suffered by a third party as a result of any decisions made or actions based on this report. Use of this report is subject to the terms and conditions stated in Tetra Tech's Services Agreement.

While it is believed that the information contained herein is reliable under the conditions and subject to the limitations set forth in the report, this report is based on information not within the control of Tetra Tech, nor has said information been verified by Tetra Tech, and Tetra Tech therefore cannot and does not guarantee its sufficiency and accuracy. The comments in the report reflect Tetra Tech's best judgment in light of the information available to it at the time of preparation.

Use of this Document acknowledges acceptance of the foregoing conditions.

7.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2019-02-14
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
NT/NU

2019-02-14

Prepared by:
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2019-02-14

Reviewed by:
Josée Alarie, P.Eng.
Direct Line: 514.257.2427 x3323
Josee.Alarie@tetratech.com

APPENDIX A
As-built Drawings

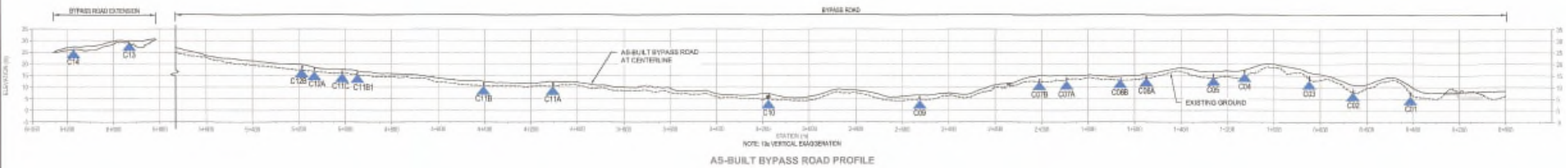
NO. DESSIN DRAWING NO. 65-117-230-201_R4-AS-BUILT-F

FORMAT ARCHD

LEGEND:

CULVERT

BYPASS ROAD



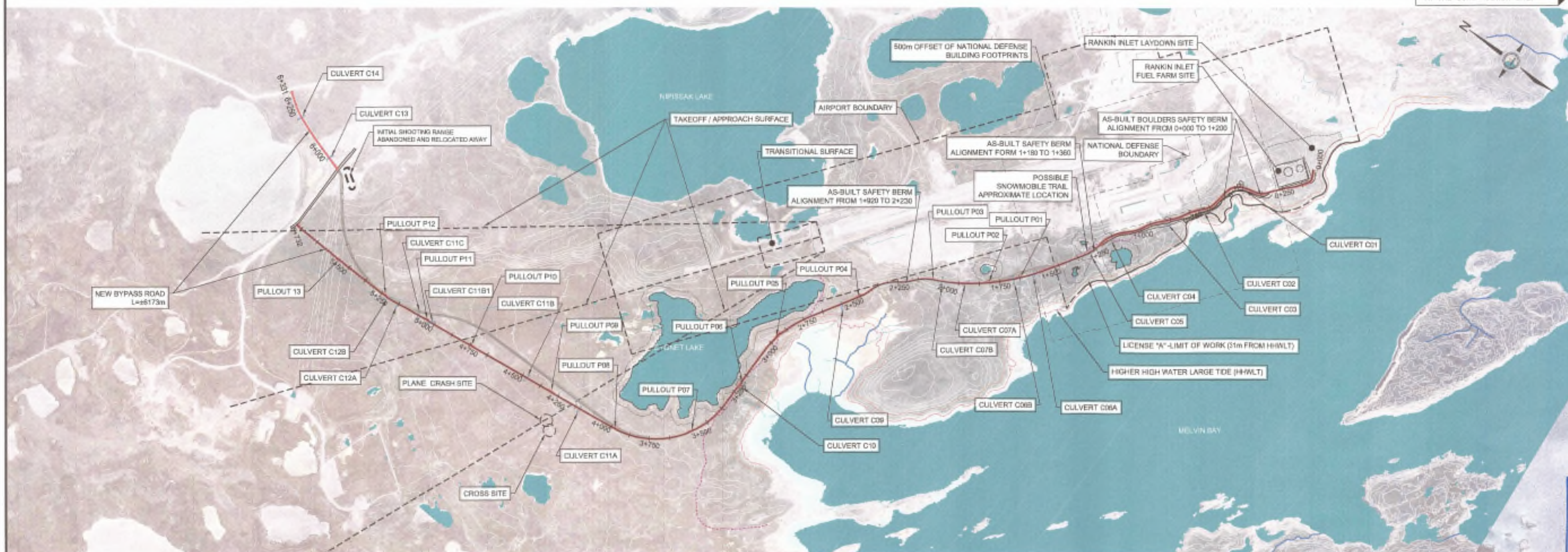
AS-BUILT BYPASS ROAD PROFILE

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE DATE : 2019-02-13

TETRA TECH

FINAL ISSUE
AFTER CONSTRUCTION

SOME ANNOTATIONS HAVE BEEN ADDED TO THE DRAWING ISSUED FOR CONSTRUCTION IN ORDER TO INCORPORATE THE INFORMATIONS RECIEVED. IN THIS PROJECT, TETRA TECH HADN'T DONE ANY FIELD SUPERVISION AT THE CONSTRUCTION SITE.



PLAN CLÉ KEY PLAN

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

1. EXISTING GROUND DTM PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. ELEVATIONS IN DRAWING PROVIDE FINISHED GRADE ELEVATIONS AT THE TOP OF THE SURFACE GRAVEL LAYER.
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7. AN AS-BUILT DRAWING SHALL BE PROVIDED AFTER CONSTRUCTION.
8. THE LOCATION, ELEVATION AND LENGTH OF CULVERT GROUP SHALL BE CONFIRMED ON SITE.
9.
10. 4
11. NO EQUIPMENT CAN BE STORED AND NO DEPOSITION OF EXCAVATED AND STOCKPILED MATERIALS CAN BE DONE WITHIN THE LICENCE "A" - LIMIT OF WORK (31M) LINE.
12. FOR SUMMER CONSTRUCTION, GEOTEXTILE SHALL BE INSTALLED BETWEEN THE ORIGINAL GROUND AND THE GRANULAR MATERIAL WHEREVER THE ORIGINAL GROUND IS UNSTABLE TO SUPPORT FILL MATERIAL COMPACTION.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
4	2019-02-13	ISSUED FOR AS-BUILT	S.M.	J.A.	
3	2017-07-33	ISSUED FOR 0-230-005, CON004	S.M.	J.A.	
2	2017-07-06	ISSUED FOR 0-230-005, CON005	S.M.	J.A.	
1	2017-04-27	ISSUED FOR CONSTRUCTION	C.M.	J.A.	
0	2017-03-17	ISSUED FOR CONSTRUCTION	C.M.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature [signature]
Date 2019-02-13
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
2019-02-13

TITRE / TITLE

AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
PLAN / PROFILE
GENERAL OVERVIEW

DESSINÉ PAR DRAWN BY	PATRICK HAMEL	DATE 2017-03-17
VÉRIFIÉ PAR CHECKED BY	JOSÉE ALARIE	2017-03-17
APPROUVÉ PAR APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE SCALE 1:10000	DATE	2016-11-07
NO. DESSIN DRAWING NO.	65-117-230-201	
NO. PROJET PROJECT NO. 6515 / 28920	RÉVISION 4	FEUILLE / SHT 1 / 1

AE-SHRT-ARCH D

FILE NO. 65-117-230-201_R4-AS-BUILT-f.dwg

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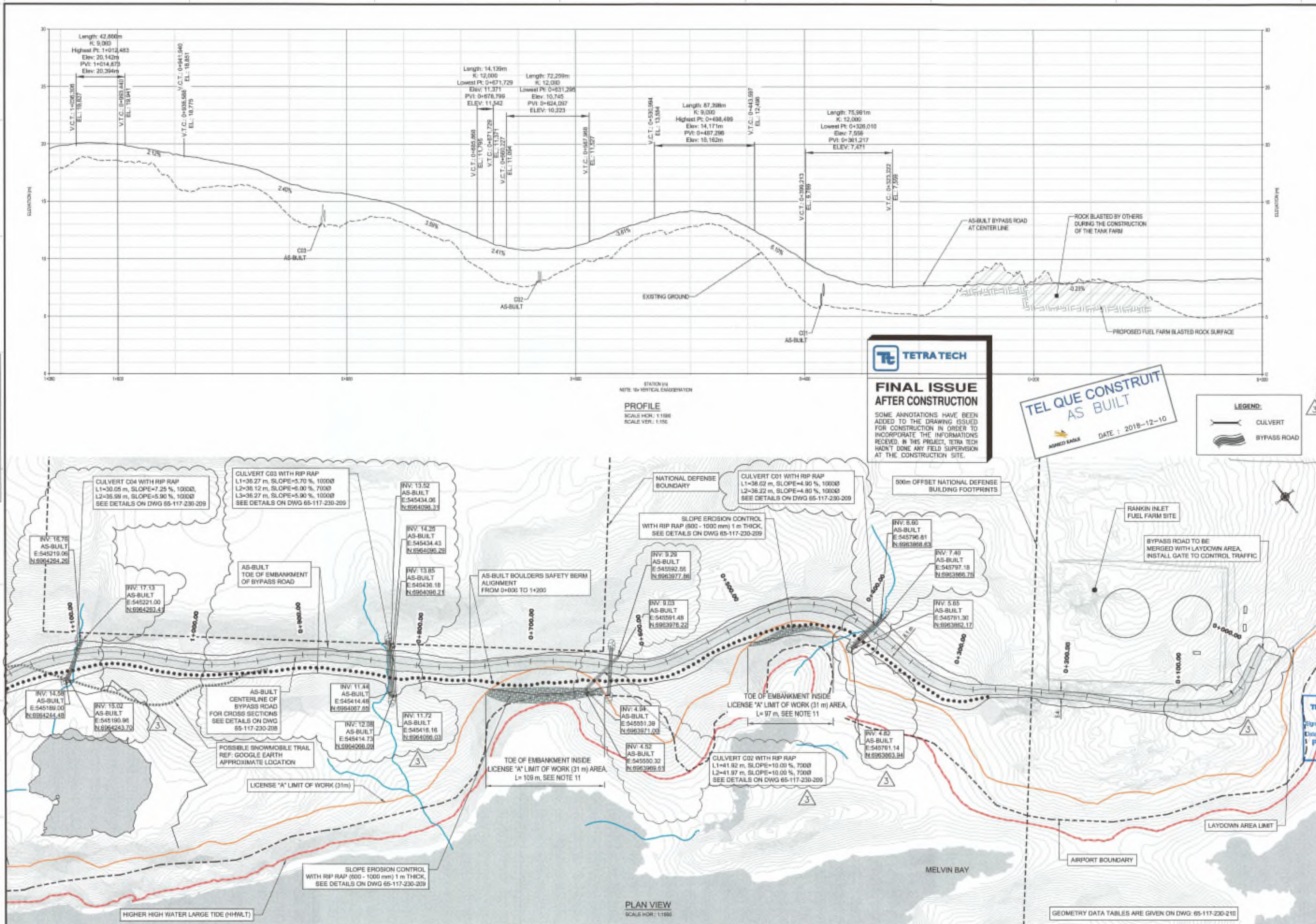

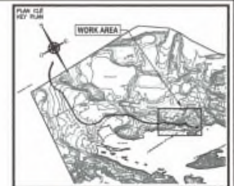

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

1. EXISTING GROUND DTM PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
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4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY, SECURITY AND SLOPES OF ALL EXCAVATIONS/ BACKFILL AND SHALL ABIDE BY ALL RELEVANT STANDARDS AND REGULATIONS. THE STABILITY, DEWATERING AND MAINTENANCE OF ALL EXCAVATIONS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
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7. AN AS-BUILT DRAWING SHALL BE PROVIDED AFTER CONSTRUCTION.
8. THE LOCATION, ELEVATION AND LENGTH OF CULVERT GROUP SHALL BE CONFIRMED ON SITE.
9.
10.
11. NO EQUIPMENT CAN BE STORED AND NO DEPOSITION OF EXCAVATED AND STOCKPILED MATERIALS CAN BE DONE WITHIN THE LICENCE "A" - LIMIT OF WORK (31M) LINE.
12. FOR SUMMER CONSTRUCTION, GEOTEXTILE SHALL BE INSTALLED BETWEEN THE ORIGINAL GROUND AND THE GRANULAR MATERIAL WHEREVER THE ORIGINAL GROUND IS UNSTABLE TO SUPPORT FILL MATERIAL COMPACTION.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
3	2018-12-10	ISSUED FOR AS-BUILT	S.M.	J.A.	
2	2017-07-20	ISSUED FOR C-230-005, CONFIRM	S.M.	J.A.	
1	2017-04-27	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
0	2017-03-17	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
B	2017-02-24	ISSUED FOR TENDER	M.T.	J.A.	
A	2017-02-03	ISSUED FOR COMMENTS	M.T.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC. O/A TETRA TECH
Signature
Date 2018-12-10
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

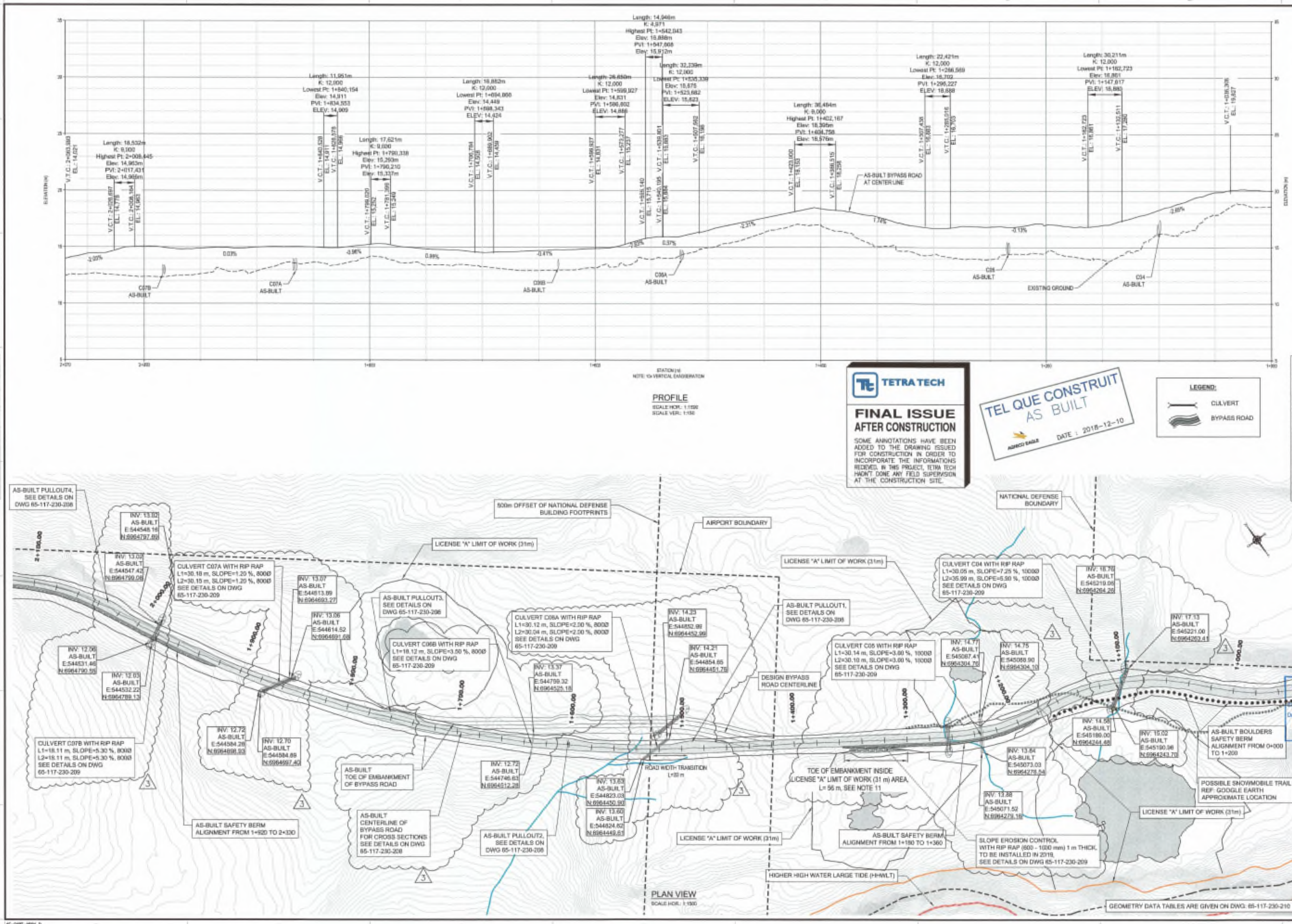
J.M.I.F. ALARIE
LICENSEE
2018-12-10

AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
PLAN / PROFILE
0+000 TO 1+000

DESSINÉ PAR / DRAWN BY	MOURAD SENNADJ	DATE 2017-03-17
VÉRIFIÉ PAR / CHECKED BY	SOLENE MOREAU	2017-03-17
APPROUVÉ PAR / APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE / SCALE H=1:1500 V=1:150	DATE	2017-02-03
NO. DESSIN / DRAWING NO.	65-117-230-202	
NO. PROJET / PROJECT NO. 6515 / 28920	RÉVISION 3	FEUILLE / SHT 1/1

FILE NO. 65-117-230-202to204_R2_205_R4_206to207_R2_AS-BUILT-3.dwg

65-117-230-202TO204_R2_205_R4_206TO207_R2_AS-BUILT-3



FOR CONTINUITY, SEE DRAWING 65-117-230-204

FOR CONTINUITY, SEE DRAWING 65-117-230-202

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

1. EXISTING GROUND DTM PROVIDED BY AEM.
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5. GRANULAR MATERIAL 0-20 mm OR 0-50 mm SHALL BE PLACED IN LIFTS NOT EXCEEDING 300 mm AND COMPACTED TO A MINIMUM OF 98% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR). BORROW PIT MATERIAL, GRANULAR FILL MATERIAL 0-600 mm OR OVERBURDEN MATERIAL SHALL BE PLACED IN LIFTS NOT EXCEEDING 600 mm AND COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR). MOISTURE CONDITIONING MAY BE REQUIRED PRIOR TO COMPACTION.
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9.
10. 3
11. NO EQUIPMENT CAN BE STORED AND NO DEPOSITION OF EXCAVATED AND STOCKPILED MATERIALS CAN BE DONE WITHIN THE LICENCE "A" - LIMIT OF WORK (31M) LINE.
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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
3	2018-12-10	ISSUED FOR AS-BUILT	S.M.	J.A.	
2	2017-07-20	ISSUED FOR 2-530-400, [illegible]	S.M.	J.A.	
1	2017-04-27	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
0	2017-03-17	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
B	2017-02-24	ISSUED FOR TENDER	M.T.	J.A.	
A	2017-02-03	ISSUED FOR COMMENTS	M.T.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
D/A TETRA TECH
Signature
Date 2018-12-10
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

JOSÉE ALARIE
LICENSEE
2018-12-10

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
PLAN / PROFILE
1+000 TO 2+000

DESSINÉ PAR / DRAWN BY	MOURAD SENNADJ	DATE 2017-03-17
VÉRIFIÉ PAR / CHECKED BY	SOLENE MOREAU	2017-03-17
APPROUVÉ PAR / APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE / SCALE H=1:1500 V=1:150	DATE 2017-02-03	

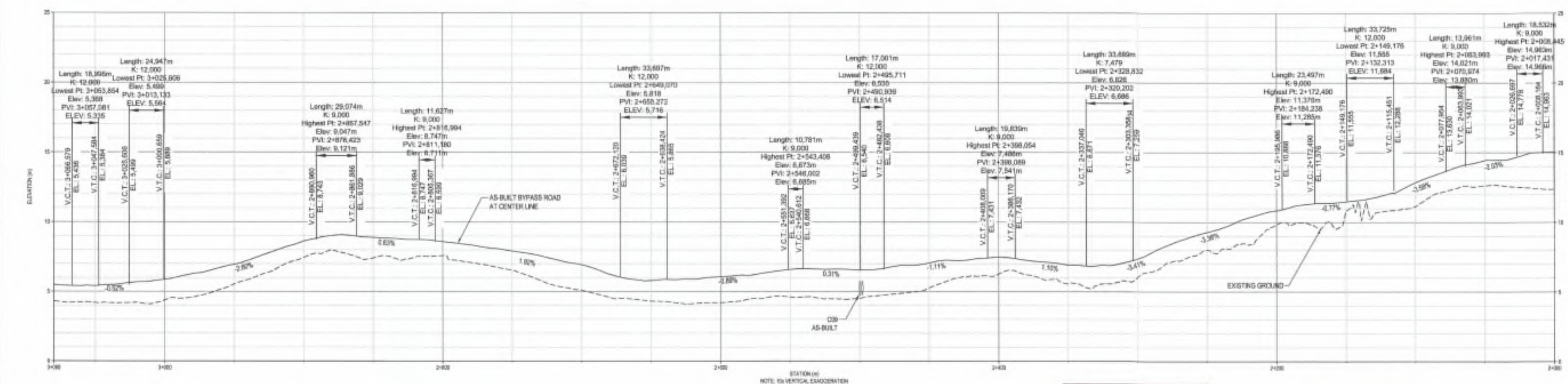
NO. DESSIN / DRAWING NO. 65-117-230-203

NO. PROJET / PROJECT NO.	RÉVISION	FEUILLE / SHT
6515 / 28920	3	1 / 1

FILE NO: 65-117-230-202to204_R2_205_R4_206to207_R2_AS-BUILT-3.dwg

NO. DESSIN DRAWING NO. 65-117-230-202TO204_R2_205_R4_206TO207_R2_AS-BUILT-3

FORMAT ARCHD



PROFILE
SCALE HOR.: 1:1500
SCALE VER.: 1:150

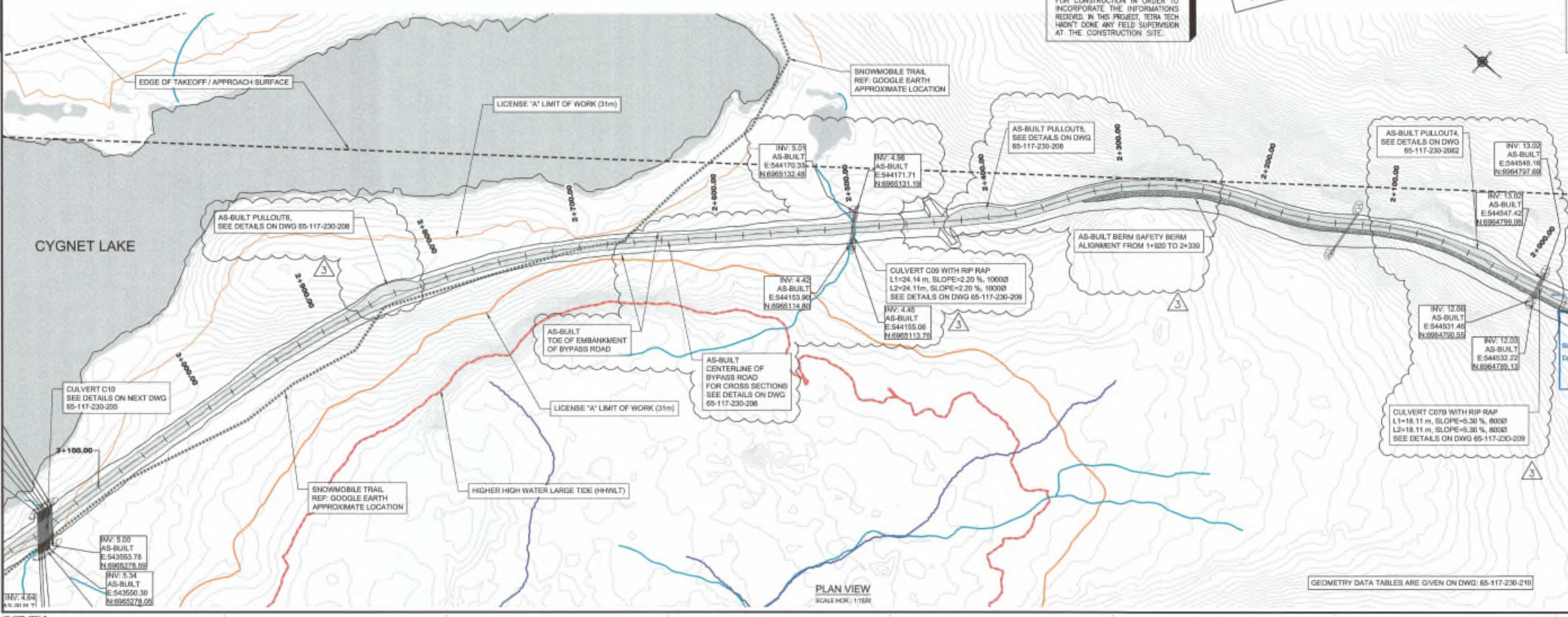
TETRA TECH

FINAL ISSUE AFTER CONSTRUCTION

SOME ANNOTATIONS HAVE BEEN ADDED TO THE DRAWING ISSUED FOR CONSTRUCTION IN ORDER TO INCORPORATE THE INFORMATIONS RECEIVED. IN THIS PROJECT, TETRA TECH HADN'T DONE ANY FIELD SUPERVISION AT THE CONSTRUCTION SITE.

TEL QUE CONSTRUIT
AS BUILT
DATE : 2018-12-10

LEGEND:
CULVERT
BYPASS ROAD



PLAN VIEW
SCALE HOR.: 1:1500

FOR CONTINUITY, SEE DRAWING 65-117-230-205

FOR CONTINUITY, SEE DRAWING 65-117-230-203

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:
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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
3	2018-12-10	ISSUED FOR AS-BUILT	S.M.	J.A.	
2	2017-07-20	ISSUED FOR C-230-005, [illegible]	S.M.	J.A.	
1	2017-04-27	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
0	2017-03-17	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
B	2017-02-24	ISSUED FOR TENDER	M.Y.	J.A.	
A	2017-02-03	ISSUED FOR COMMENTS	M.Y.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
D/A TETRA TECH
Signature
Date 2018-12-10
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

J.M.F. ALARIE
LICENSEE
2018-12-10

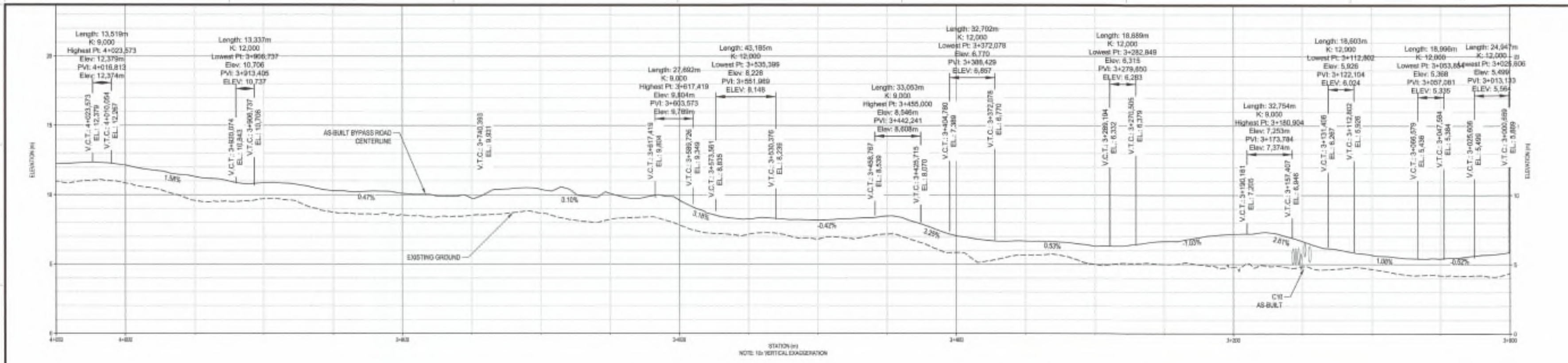
AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
PLAN / PROFILE
2+000 TO 3+000

DESSINÉ PAR DRAWN BY	MOURAD SENNADJ	DATE 2017-03-17
VÉRIFIÉ PAR CHECKED BY	SOLENE MOREAU	2017-03-17
APPROUVÉ PAR APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE SCALE	H=1:1500 V=1:150	DATE 2017-02-03
NO. DESSIN DRAWING NO.	65-117-230-204	
NO. PROJET PROJECT NO. 6515 / 28920	RÉVISION 3	FEUILLE / SHT 1 / 1

FILE NO: 65-117-230-202to204_R2_205_R4_206to207_R2_AS-BUILT-3.dwg

NO. DESSIN DRAWING NO. 65-117-230-202TO204_R2_205_R4_206TO207_R2_AS-BUILT-3

FORMAT ARCHD



PROFILE

SCALE HOR.: 1:1500
SCALE VER.: 1:150

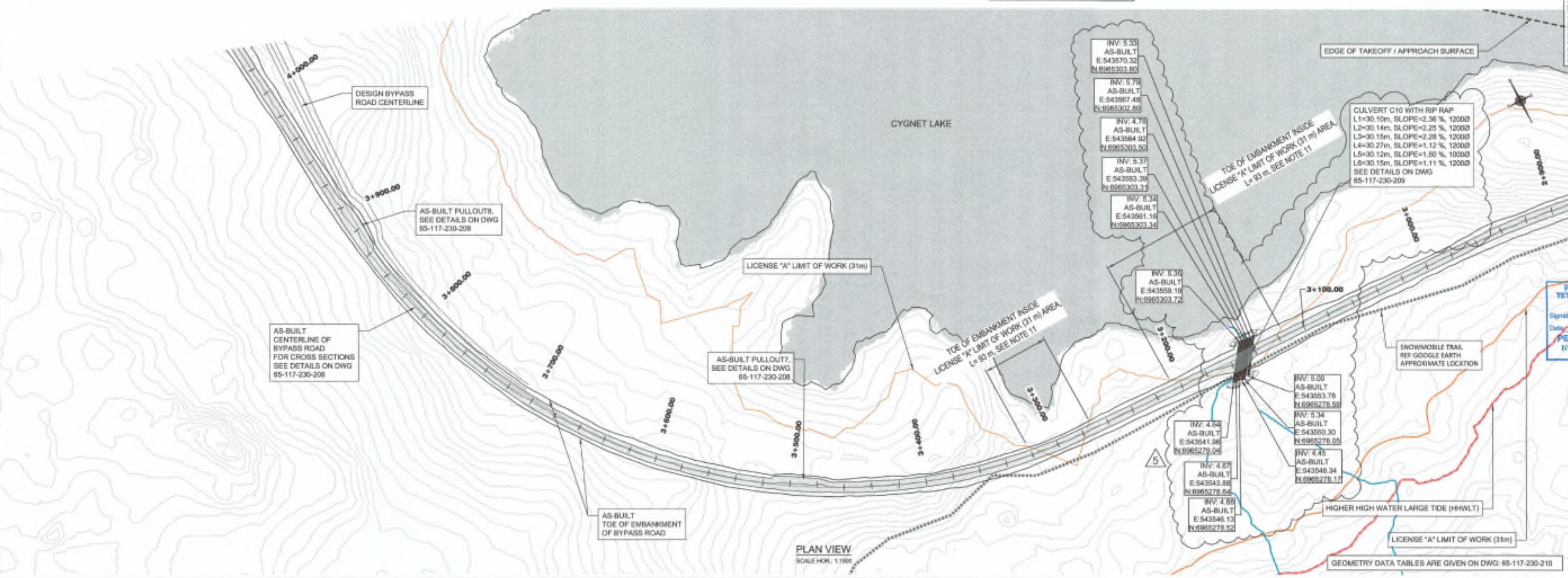
TETRA TECH

FINAL ISSUE AFTER CONSTRUCTION

SOME ANNOTATIONS HAVE BEEN ADDED TO THE DRAWING ISSUED FOR CONSTRUCTION IN ORDER TO INCORPORATE THE INFORMATIONS RECIEVED. IN THIS PROJECT, TETRA TECH HADN'T DONE ANY FIELD SUPERVISION AT THE CONSTRUCTION SITE.

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE DATE : 2018-12-10

LEGEND:
CULVERT
BYPASS ROAD



GEOMETRY DATA TABLES ARE GIVEN ON DWG: 65-117-230-210

PLAN VIEW

SCALE HOR.: 1:1500

FOR CONTINUITY, SEE DRAWING 65-117-230-206

FOR CONTINUITY, SEE DRAWING 65-117-230-204

PLAN CLÉ / KEY PLAN
WORK AREA

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

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2. ALL UNITS ARE IN METERS.
3. ELEVATIONS IN DRAWING PROVIDE FINISHED GRADE ELEVATIONS AT THE TOP OF THE SURFACE GRAVEL LAYER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY, SECURITY AND SLOPES OF ALL EXCAVATIONS/ BACKFILL AND SHALL ABIDE BY ALL RELEVANT STANDARDS AND REGULATIONS. THE STABILITY, DEWATERING AND MAINTENANCE OF ALL EXCAVATIONS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
5. GRANULAR MATERIAL 0-30 mm OR 0-50 mm SHALL BE PLACED IN LIFTS NOT EXCEEDING 300 mm AND COMPACTED TO A MINIMUM OF 98% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR). BORROW PIT MATERIAL, GRANULAR FILL MATERIAL 0-600 mm OR OVERBURDEN MATERIAL SHALL BE PLACED IN LIFTS NOT EXCEEDING 600 mm AND COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR). MOISTURE CONDITIONING MAY BE REQUIRED PRIOR TO COMPACTION.
6. OVERBURDEN MATERIAL CAN BE USED FOR FILL IN SPECIFIED AREAS ONLY WHEN APPROVED BY FIELD GEOTECHNICAL ENGINEER.
7. AN AS-BUILT DRAWING SHALL BE PROVIDED AFTER CONSTRUCTION.
8. ~~THE LOCATION, ELEVATION AND LENGTH OF CULVERT GROUP SHALL BE CONFIRMED ON SITE.~~
9.
10. 3
11. NO EQUIPMENT CAN BE STORED AND NO DEPOSITION OF EXCAVATED AND STOCKPILED MATERIALS CAN BE DONE WITHIN THE LICENCE "A" - LIMIT OF WORK (31M) LINE.
12. FOR SUMMER CONSTRUCTION, GEOTEXTILE SHALL BE INSTALLED BETWEEN THE ORIGINAL GROUND AND THE GRANULAR MATERIAL WHEREVER THE ORIGINAL GROUND IS UNSTABLE TO SUPPORT FILL MATERIAL COMPACTION.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
–	–
–	–
–	–
–	–
–	–

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
5	2018-12-10	ISSUED FOR AS-BUILT	S.M.	J.A.	
4	2017-10-20	ISSUED FOR CONSTRUCTION, 218	C.M.	J.A.	
3	2017-07-20	ISSUED FOR C-230-005, ECN004	S.M.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC. D/A TETRA TECH
Signature
Date 2018-12-10
PERMIT NUMBER: P 1020
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.L.F. ALARIE
LICENSEE
2018-12-10

AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
PLAN / PROFILE
3+000 TO 4+000

DESSINÉ PAR / DRAWN BY	MOURAD SENNADJ	DATE 2017-03-17
VÉRIFIÉ PAR / CHECKED BY	SOLENE MOREAU	2017-03-17
APPROUVÉ PAR / APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE / SCALE H=1:1500 V=1:150	DATE	2017-02-03

NO. DESSIN / DRAWING NO. 65-117-230-205

NO. PROJET / PROJECT NO.	RÉVISION	FEUILLE / SHT
6515 / 28920	5	1 / 1

FILE NO. 65-117-230-202to204_R2_205_R4_206to207_R2_AS-BUILT-3.dwg

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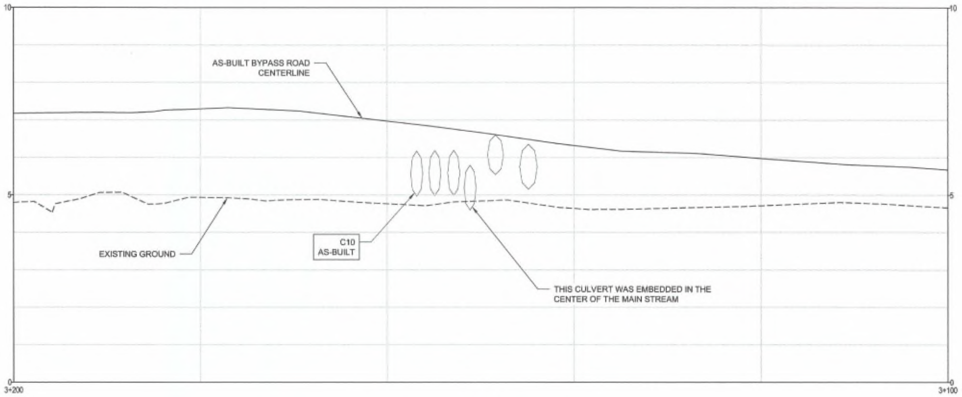
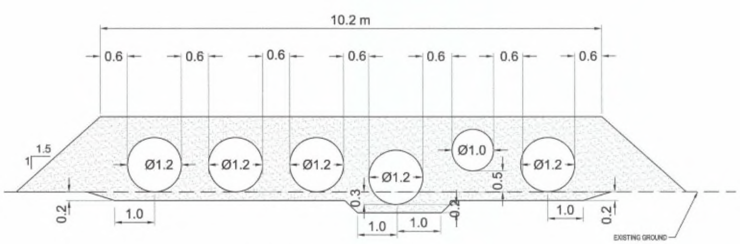


AS-BUILT C10 PROFILE AT ROAD CENTERLINE

SCALE HOR.: 1:250
SCALE VER.: 1:62.5



CULVERT #C10 CROSS SECTION

SCALE: N.T.S

TETRA TECH

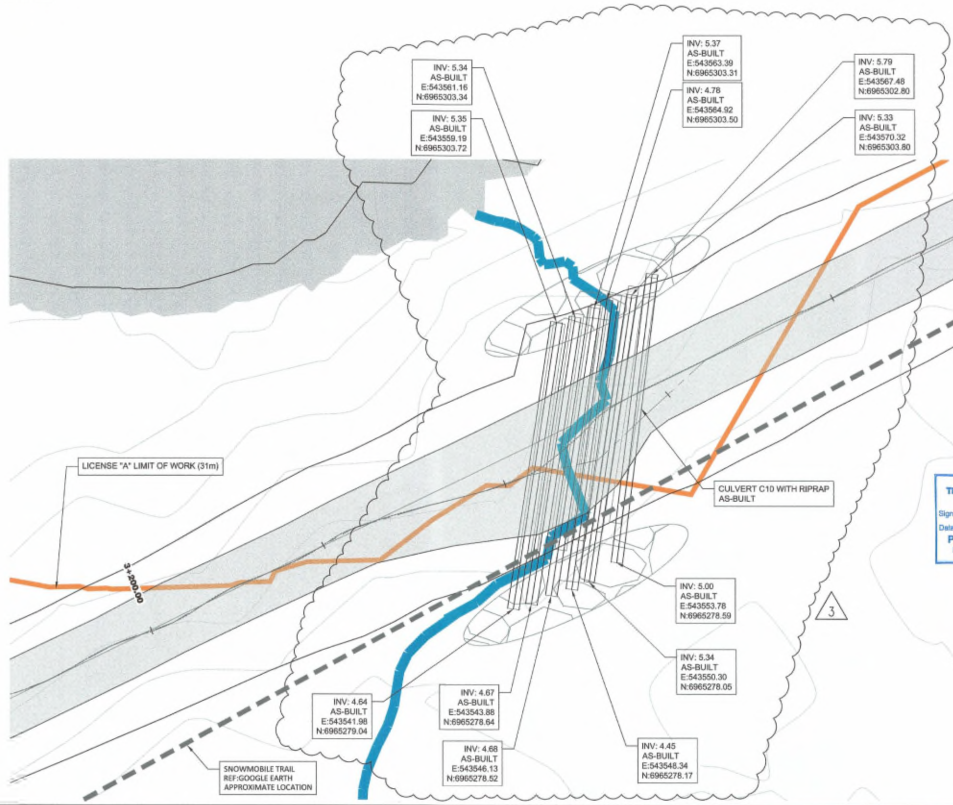
FINAL ISSUE AFTER CONSTRUCTION

SOME ANNOTATIONS HAVE BEEN ADDED TO THE DRAWING ISSUED FOR CONSTRUCTION IN ORDER TO INCORPORATE THE INFORMATIONS RECIEVED. IN THIS PROJECT, TETRA TECH HADN'T DONE ANY FIELD SUPERVISION AT THE CONSTRUCTION SITE.

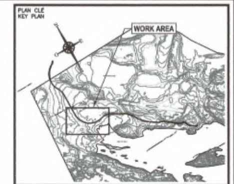
TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2018-12-10

LEGEND:

- CULVERT
- BYPASS ROAD



PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

1. EXISTING GROUND DTM PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. ELEVATIONS IN DRAWING PROVIDE FINISHED GRADE ELEVATIONS AT THE TOP OF THE SURFACE GRAVEL LAYER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY, SECURITY AND SLOPES OF ALL EXCAVATIONS/ BACKFILL AND SHALL ABIDE BY ALL RELEVANT STANDARDS AND REGULATIONS. THE STABILITY, DEWATERING AND MAINTENANCE OF ALL EXCAVATIONS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2018-12-10	ISSUED FOR AS-BUILT	C.M.	J.A.	
0	2017-10-20	ISSUED FOR CONSTRUCTION	C.M.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2018-12-10
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
NT/NU
2018-12-10

TITRE / TITLE

AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
PLAN / PROFILE
C10 DETAILS

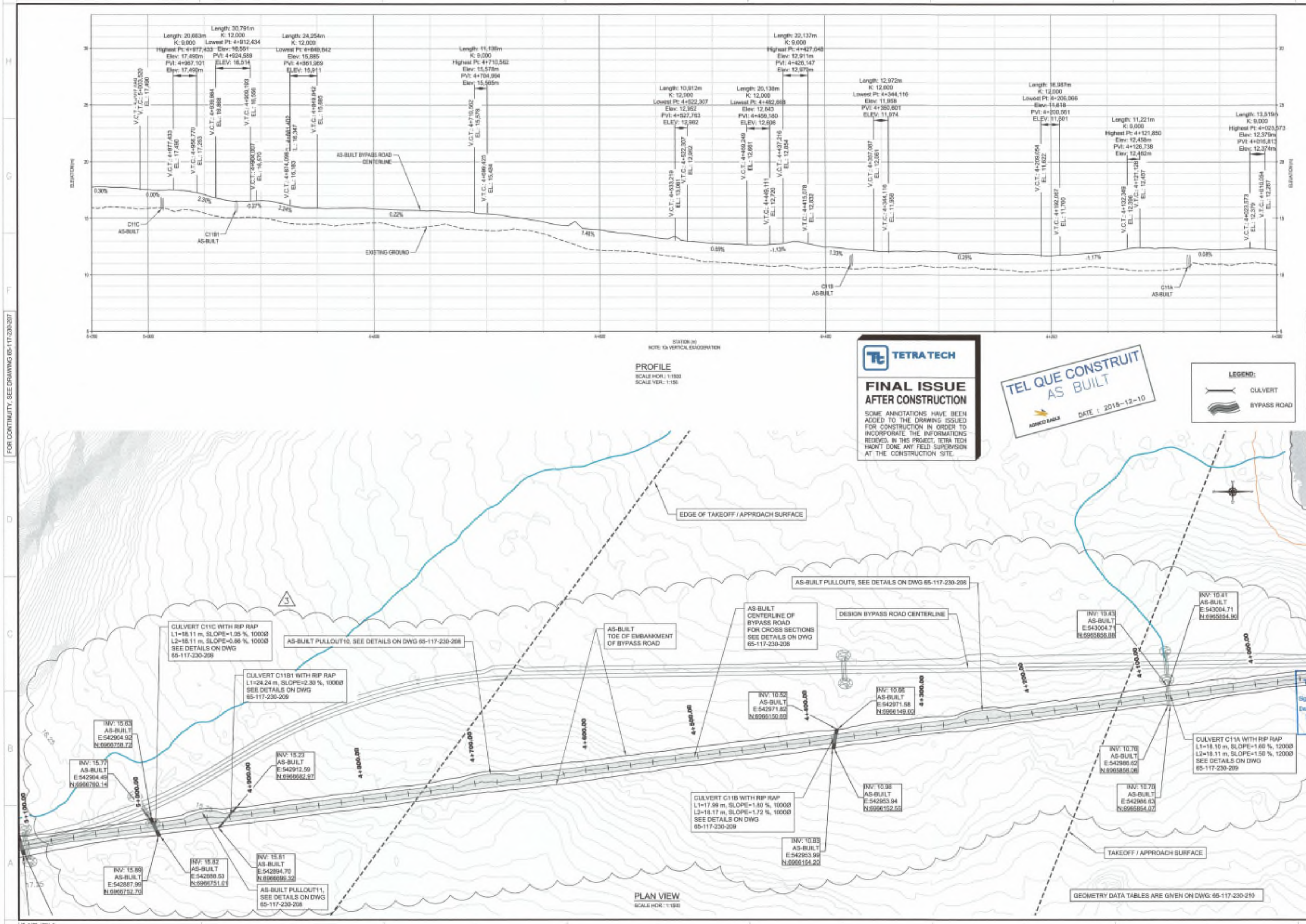
DESSINÉ PAR / DRAWN BY	MOURAD SENNADJ	DATE 2017-03-17
VERIFIÉ PAR / CHECKED BY	SOLENE MOREAU	2017-03-17
APPROUVÉ PAR / APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE / SCALE H=1:1500 V=1:150	DATE	2017-02-03

NO. DESSIN / DRAWING NO. 65-117-230-205-1

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515 / 28920	1	1 / 1

NO. DESSIN DRAWING NO. 65-117-230-202TO204_R2_205_R4_206TO207_R2_AS-BUILT-3

FORMAT ARCH D



TETRA TECH

FINAL ISSUE
AFTER CONSTRUCTION

SOME ANNOTATIONS HAVE BEEN ADDED TO THE DRAWING ISSUED FOR CONSTRUCTION IN ORDER TO INCORPORATE THE INFORMATIONS RECEIVED. IN THIS PROJECT, TETRA TECH HADN'T DONE ANY FIELD SUPERVISION AT THE CONSTRUCTION SITE.

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE DATE : 2018-12-10

LEGEND:

- CULVERT
- BYPASS ROAD

KEY PLAN
WORK AREA

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

1. EXISTING GROUND DTM PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. ELEVATIONS IN DRAWING PROVIDE FINISHED GRADE ELEVATIONS AT THE TOP OF THE SURFACE GRAVEL LAYER.
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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
-	-
-	-
-	-

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
3	2018-12-10	ISSUED FOR AS-BUILT	S.M.	J.A.	
2	2017-07-08	ISSUED FOR C-230-003, COM/005	S.M.	J.A.	
1	2017-04-27	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
0	2017-03-17	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
B	2017-02-24	ISSUED FOR TENDER	M.Y.	J.A.	
A	2017-02-03	ISSUED FOR COMMENTS	M.Y.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2018-12-10
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.J.F. ALARIE
LICENSEE
2018-12-10

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
PLAN / PROFILE
4+000 TO 5+000

DESSINÉ PAR / DRAWN BY	MOURAD SENNADJ	DATE 2017-03-17
VÉRIFIÉ PAR / CHECKED BY	SOLENE MOREAU	2017-03-17
APPROUVÉ PAR / APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE / SCALE H=1:1500 V=1:150	DATE 2017-02-03	

NO. DESSIN / DRAWING NO. 65-117-230-206

NO. PROJET / PROJECT NO.	RÉVISION	FEUILLE / SHT
6515 / 28920	3	1 / 1

FILE NO. 65-117-230-202to204_R2_205_R4_206to207_R2_AS-BUILT-3.dwg

NO. DESSIN DRAWING NO. 65-117-230-202TO204_R2_205_R4_206TO207_R2_AS-BUILT-3

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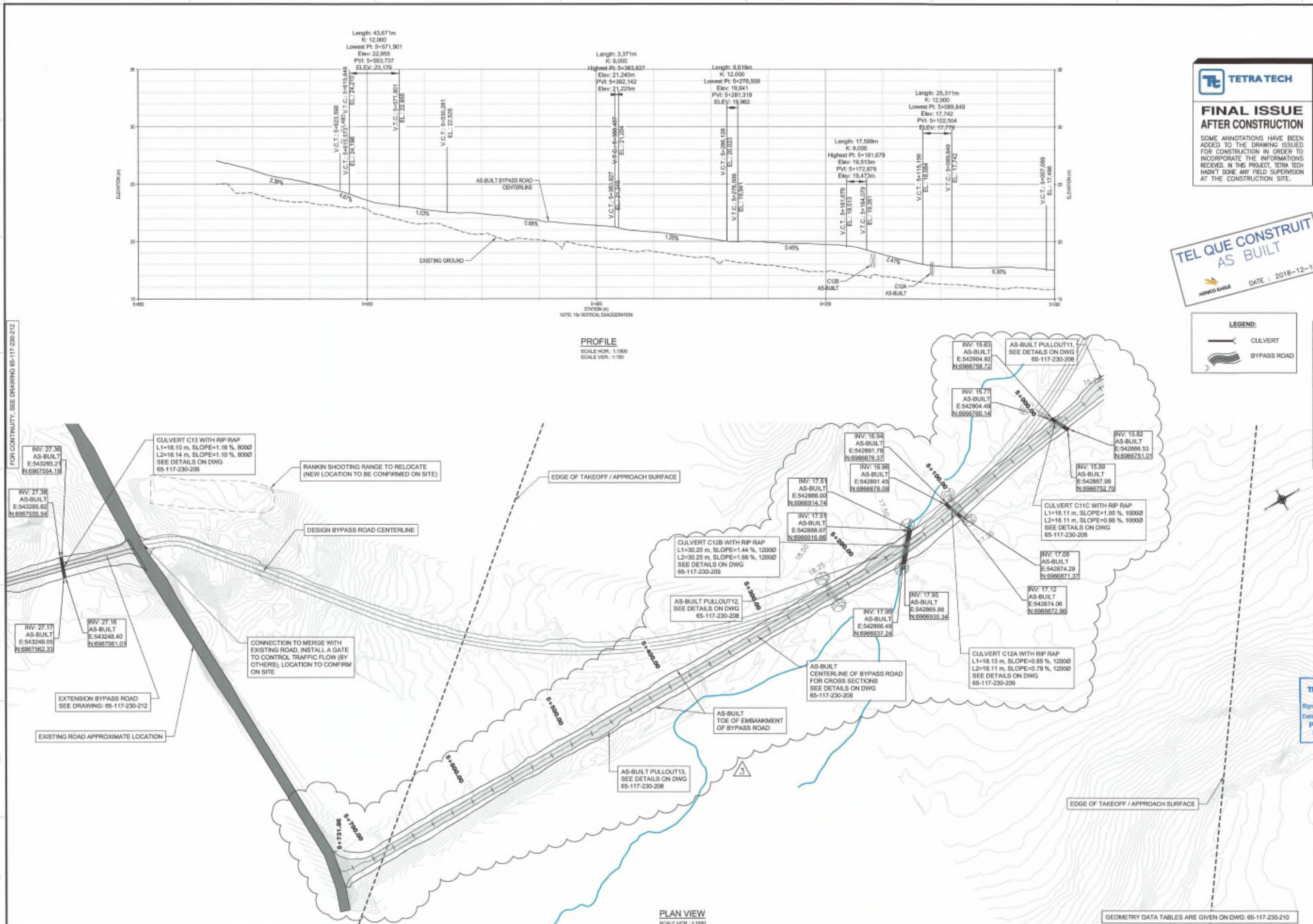

PLAN CLÉ KEY PLAN

WORK AREA

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

1. EXISTING GROUND DTM PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. ELEVATIONS IN DRAWING PROVIDE FINISHED GRADE ELEVATIONS AT THE TOP OF THE SURFACE GRAVEL LAYER.
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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
3	2018-12-10	ISSUED FOR AS-BUILT	S.M.	J.A.	
2	2017-07-05	ISSUED FOR C-230-003, ECN#003	S.M.	J.A.	
1	2017-04-27	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
0	2017-03-17	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
B	2017-02-24	ISSUED FOR TENDER	M.T.	J.A.	
A	2017-02-03	ISSUED FOR COMMENTS	M.T.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC. O/A TETRA TECH
Signature
Date 2018-12-10
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

J.M.I.F. ALARIE
LICENSEE
2018-12-10

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
PLAN / PROFILE
5+000 TO 5+900

DESSINÉ PAR DRAWN BY	MOURAD SENNAOJ	DATE 2017-03-17
VÉRIFIÉ PAR CHECKED BY	SOLENE MOREAU	2017-03-17
APPROUVÉ PAR APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE SCALE	H=1:1500 V=1:150	DATE 2017-02-03

NO. DESSIN DRAWING NO. 65-117-230-207

NO. PROJET PROJECT NO.	RÉVISION	FEUILLE / SHT
6515 / 28920	3	1 / 1

FILE NO. 65-117-230-202to204_R2_205_R4_206to207_R2_AS-BUILT-3.dwg

NO. DESSIN DRAWING NO. 65–117–230–208T0210_R4–AS–BUILT–2

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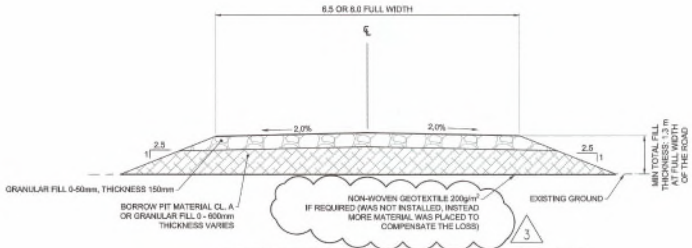
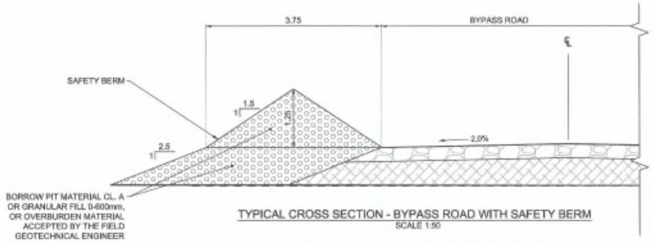


TYPICAL CROSS SECTION - BYPASS ROAD - 6.5 m OR 8.0 m WIDE

SCALE 1:50

NOTE: IF EXISTING GROUND IS ROCK, MINIMUM FILL THICKNESS IS 0.3m.

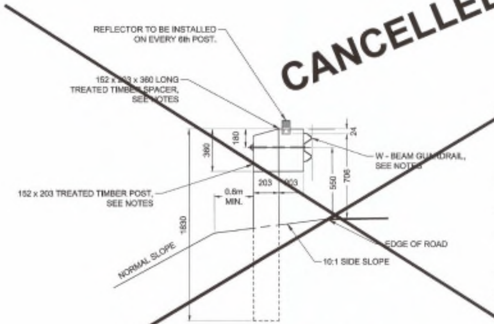


TYPICAL CROSS SECTION - BYPASS ROAD WITH SAFETY BERM

SCALE 1:50

NOTE: SAFETY BERMS ARE REQUIRED WHEN THE HEIGHT IS GREATER THAN 3 METERS.

CANCELLED



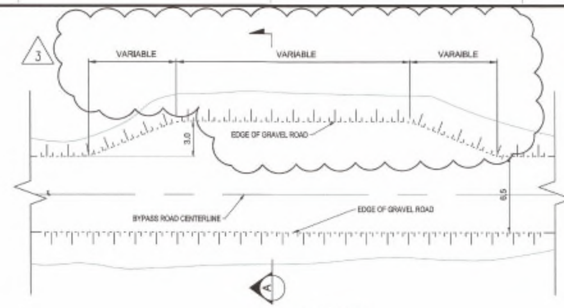
TYPICAL DETAIL - POST AND W-BEAM

SCALE 1:75

NOTES:

1. GUARDRAILS ARE W-BEAM GUARDRAILS INSTALLED ON WOOD POSTS. THE GUARDRAILS SHALL CONFORM TO AASHTO STANDARD DESIGNATION M-180-841 "CORRUGATED SHEET STEEL BEAMS FOR HIGHWAY GUARDRAIL".
2. ALL RAIL SECTIONS AND OTHER COMPONENTS SHALL BE FULLY INTERCHANGEABLE WITH SIMILAR COMPONENTS REGARDLESS OF THE MANUFACTURER.
3. POSTS AND OFFSET BLOCKS SHALL BE EITHER DOUGLAS FIR, HEMLOCK, LODGEPOLE PINE OR BETTER.
4. BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM-A307, AND SHALL BE HOT DIP GALVANIZED IN ACCORDANCE TO CSA-G164M.
5. RAILS SHALL BE INSTALLED ON WOOD POSTS 152 X 203 X 1830mm. WOOD BLOCKS SPACERS ARE 152 X 203mm.
6. POSTS SHALL BE SPACED BY 1905mm.
7. THE TOP OF THE GUARDRAIL SHALL BE INSTALLED 730mm ABOVE THE FINISHED GRADE OF THE ROAD.
8. STEEL POSTS AND STEEL OFFSET BLOCKS COULD BE USED INSTEAD OF TIMBER POSTS AFTER CLIENT APPROVAL.
9. UNITS IN THIS TYPICAL DETAIL ARE IN MILLIMETERS.

TYPICAL DETAIL - GUARDRAIL



PLAN VIEW

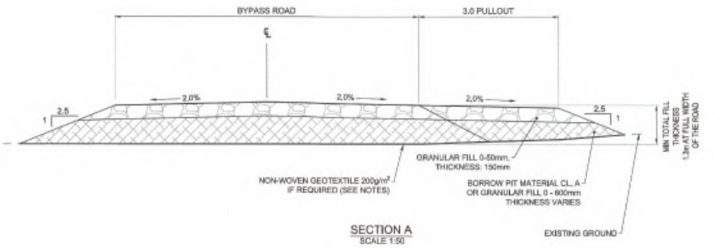
SCALE 1:200

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2018-12-10

TETRA TECH

FINAL ISSUE AFTER CONSTRUCTION

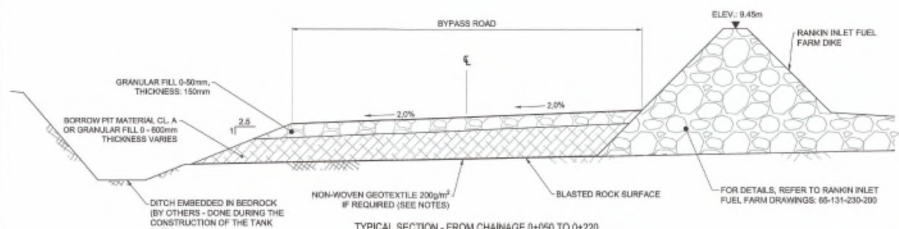
SOME ANNOTATIONS HAVE BEEN ADDED TO THE DRAWING ISSUED FOR CONSTRUCTION IN ORDER TO INCORPORATE THE INFORMATIONS RECEIVED. IN THIS PROJECT, TETRA TECH HADN'T DONE ANY FIELD SUPERVISION AT THE CONSTRUCTION SITE.



SECTION A

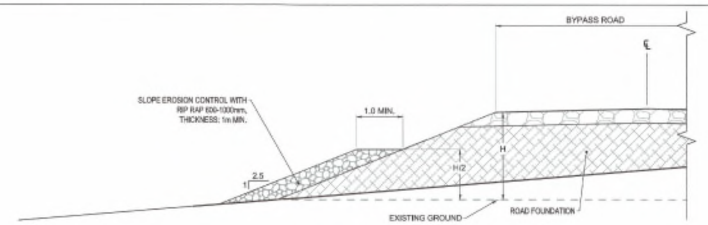
SCALE 1:50

TYPICAL DETAIL - PULLOUT



TYPICAL SECTION - FROM CHAINAGE 0+050 TO 0+220

N.T.S.



TYPICAL DETAIL

SLOPE EROSION CONTROL WITH RIP RAP

SCALE: 1:50

NOTE:

SLOPE EROSION CONTROL WITH RIP RAP IS REQUIRED WHEN THE TOE OF EMBANKMENT OF THE ROAD IS WITHIN THE LICENSE "A" LIMIT.

PLAN CLÉ KEY PLAN

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

1. EXISTING GROUND DTM PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
4	2018-12-10	ISSUED FOR AS-BUILT	S.M.	J.A.	
3	2017-07-20	ISSUED FOR C-230-005, C...	S.M.	J.A.	
2	2017-07-05	ISSUED FOR C-230-003, C...	S.M.	J.A.	
1	2017-04-27	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
0	2017-03-17	ISSUED FOR COMMENTS	S.M.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC. O/A TETRA TECH
Signature
Date 2018-12-10
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.LF. ALARIE
LICENSEE
2018-12-10

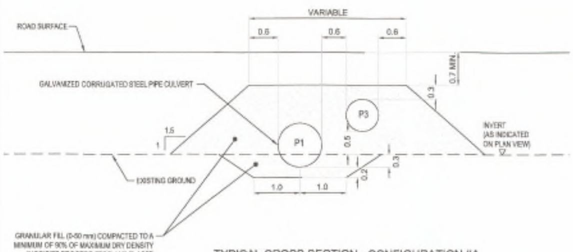
AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
DETAILS / SECTIONS

DESSINÉ PAR DRAWN BY	MOURAD SENNADJ	DATE	2017-03-17
VÉRIFIÉ PAR CHECKED BY	SOLENE MOREAU		2017-03-17
APPROUVÉ PAR APPROVED BY	JOSÉE ALARIE		2017-03-17
ÉCHELLE SCALE	AS SHOWN	DATE	2017-02-03
NO. DESSIN DRAWING NO.	65–117–230–208		
NO. PROJET PROJECT NO.	6515 / 28920	REVISION 4	FEUILLE / SHT 1/1

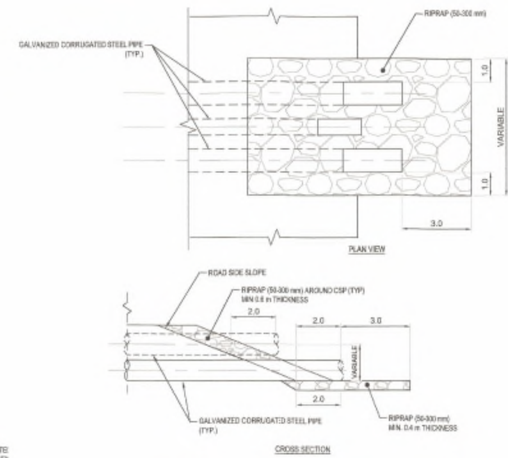
FILE NO. 65-117-230-208t0210_R4-AS-BUILT-2.dwg

NO. DESSIN DRAWING NO. 65-117-230-208T0210_R4-AS-BUILT--

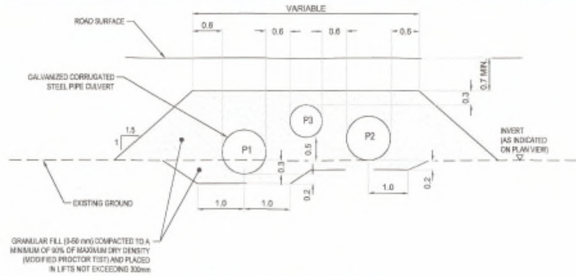
FORMAT ARCHD



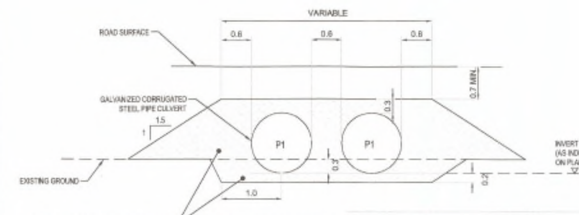
TYPICAL CROSS SECTION - CONFIGURATION #A
SCALE 1:50



TYPICAL DETAIL - CULVERT RIPRAP FOR BOTH INLET AND OUTLET
SCALE = N.T.S



TYPICAL CROSS SECTION - CONFIGURATION #B
SCALE 1:50

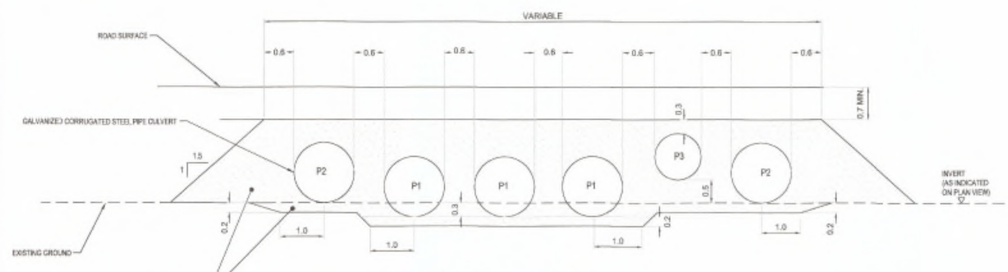


TYPICAL CROSS SECTION - CONFIGURATION #D
SCALE 1:50

TETRA TECH

FINAL ISSUE
AFTER CONSTRUCTION

SOME ANNOTATIONS HAVE BEEN ADDED TO THE DRAWING ISSUED FOR CONSTRUCTION IN ORDER TO INCORPORATE THE INFORMATIONS RECIEVED. IN THIS PROJECT, TETRA TECH HADN'T DONE ANY FIELD SUPERVISION AT THE CONSTRUCTION SITE.



TYPICAL CROSS SECTION - CONFIGURATION #C
SCALE 1:50

No	CONFIGURATION OF THE GROUP OF CULVERTS	CULVERT POSITION						TOTAL NUMBER OF CULVERT	APPROX. LENGTH OF EACH CULVERT (m)
		P1 (EMBEDDED)		P2 (NON-EMBEDDED)		P3 (NON-EMBEDDED and HIGH POSITION)			
		Nb of culverts	Ø (mm)	Nb of culverts	Ø (mm)	Nb of culverts	Ø (mm)		
C01	A *	1	1000			1	1000	2	38.02-38.22
C02	A *	2	700					2	41.92-41.87
C03	B *	1	1000	1	1000	1	700	3	38.27-38.12-38.27
C04	A *	1	1000			1	1000	2	30.05-35.99
C05	D *	2	1000					2	31.14-30.10
C06A	D *	2	800					2	30.12-30.04
C06B	E *			1	800			1	18.12
C07A	D *	2	800					2	30.18-30.15
C07B	D *	2	800					2	2x18.11
C09	D *	1	1000			1	1000	2	24.14-24.11
C10	C10	1	1200	4	1200	1	1000	6	30.10-30.14-30.15-30.27-31.12-30.15
C11A	D *			2	1200			2	18.10-18.11
C11B	D *			2	1000			2	17.99-18.17
C11B1	E *					1	1000	1	24.24
C11C	D *	1	1000	1	1000			2	2x18.11
C12A	D *					2	1200	2	18.13-18.11
C12B	D *					2	1200	2	30.25-30.25
C13	D *			2	800			2	18.10-18.14
C14	D *			3	800			3	18.17-18.15-18.11

* NO EMBEDMENT WAS PROVIDED TO THE LOWEST PIPES

4

Notes:

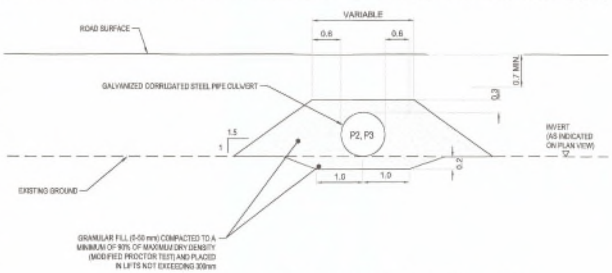
1. Culverts are provided by AEM. Culverts will be Galvanized Corrugated Pipes, with a profile of 68x13 mm.

2. At any time, the minimum backfill cover indicated in the table below shall be respected.

CULVERT DIAMETER (mm)	GAUGE (mm)	PROFILE (mm)	Min COVER (mm) (required at any time)
600	2	68x13	750
700	2	68x13	800
800	2.8	68x13	825
900	2.8	68x13	825
1000	2.8	68x13	850
1200	2.8	68x13	850

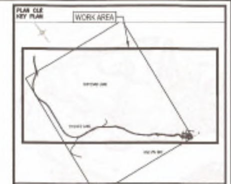
3. The installation of the culverts shall be conform to the Manufacturer instructions.

4. The maximum allowable slope for culverts is 6%. Install RipRap to fill the gap between the pipe bottom and the existing ground if required.



TYPICAL CROSS SECTION - CONFIGURATION #E
SCALE 1:50

PLAN CLÉ KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

1. ALL UNITS ARE IN METERS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY, SECURITY AND SLOPES OF ALL EXCAVATIONS/ BACKFILL AND SHALL ABIDE BY ALL RELEVANT STANDARD S AND REGULATIONS. THE STABILITY, DEWATERING AND MAINTENANCE OF ALL EXCAVATIONS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
3. THE LOCATION, ELEVATION AND LENGTH OF CULVERT GROUP SHALL BE CONFIRMED ON SITE.
4. AN AS-BUILT DRAWING SHALL BE PROVIDED AFTER CONSTRUCTION.

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2018-12-10

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
4	2018-12-10	ISSUED FOR AS-BUILT	S.M.	J.A.	
3	2017-07-20	ISSUED FOR C-230-005, CON004	S.M.	J.A.	
2	2017-07-05	ISSUED FOR C-230-003, CON003	S.M.	J.A.	
1	2017-04-27	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
0	2017-03-17	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
B	2017-03-24	ISSUED FOR TENDER	M.Y.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2018-12-10
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
2018-12-10

TITRE / TITLE
AGNICO EAGLE - MELIADINE DIVISION
117 - ROADS, FENCES, AND YARDS
230 - GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
DETAILS / SECTIONS

DESSINÉ PAR DRAWN BY	MOURAD SENNADJ	DATE 2017-03-17
VÉRIFIÉ PAR CHECKED BY	SOLENE MOREAU	2017-03-17
APPROUVÉ PAR APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE SCALE	AS SHOWN	DATE 2017-02-03
NO. DESSIN DRAWING NO.	65-117-230-209	
NO. PROJET PROJECT NO. 6515 / 28920	RÉVISION 4	FEUILLE / SHT 1 / 1

AE-CART-ARCH D

FILE NO. 65-117-230-209to210_R4-AS-BUILT--.dwg

NO. DESSIN DRAWING NO. 65-117-230-208T0210_R4-AS-BUILT-2

FORMAT ARCHD

NOTE: FOR AS-BUILT HORIZONTAL ALIGNMENT, REFER TO THE AS-BUILT ROAD CAD FILE PROVIDED IN DRAWINGS 65-117-230-202 TO 207 AND 65-117-230-212.

GEOMETRY DATA TABLES FOR THE BYPASS ROAD

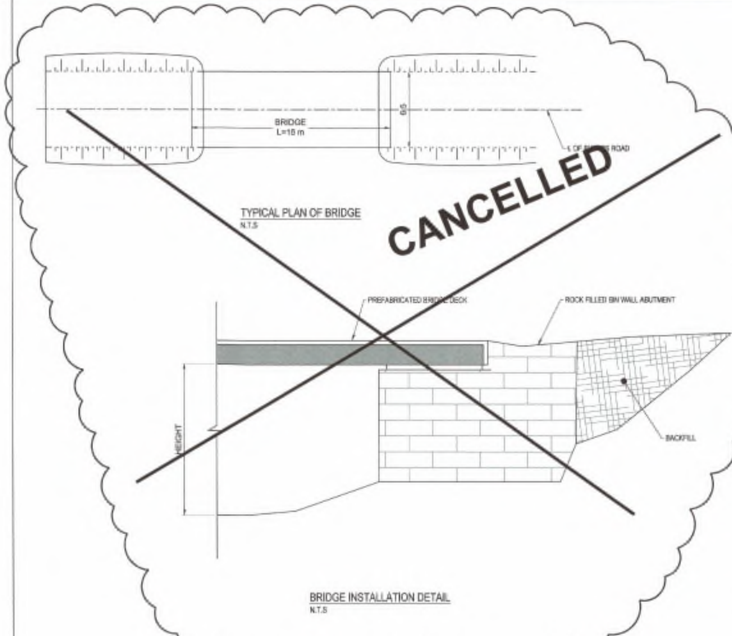
TABLE 1: HORIZONTAL ALIGNMENT DATA

CANCELLED

Number	Type	Parameter Constraint	Length	Radius	Direction	Start Station	End Station	Delta angle	PI Station	Start Point	End Point	Center Point	PI Point
1	Line	Two points	34.021m		S68° 23' 49"W	0+000.00m	0+034.02m			(548053.5877m,6963650.2396m,0.0000m)	[illegible]		
2	Curve	Radius	37.822m	35.000m		0+034.02m	0+071.84m	61.9156 (d)	0+055.02m	(548021.9969m,6963637.7541m,0.0000m)	[illegible]	[illegible]	[illegible]
3	Line	Two points	47.[illegible]m		N49° 43' 25"W	0+071.84m	0+118.86m			(545986.4273m,6963648.5871m,0.0000m)	[illegible]		
4	Curve	Radius	43.785m	1000.000m		0+118.86m	0+162.64m	2.5086 (d)	0+140.76m	(545950.5745m,6963679.9860m,0.0000m)	[illegible]	[illegible]	[illegible]
5	Line	Two points	67.809m		N52° 13' 46"W	0+162.64m	0+230.45m			(545916.5740m,6963701.5720m,0.0000m)	[illegible]		
6	Line	Two points	42.780m		N51° 54' 25"W	0+230.45m	0+273.23m			(545863.0035m,6963740.1350m,0.0000m)	[illegible]		
7	Curve	Radius	58.699m	90.000m		0+273.23m	0+331.93m	37.3652 (d)	0+303.67m	[illegible]	[illegible]	[illegible]	[illegible]
8	Line	Two points	52.067m		N[illegible] 32' 30"W	0+331.93m	0+383.99m			(545707.7427m,6963817.7615m,0.0000m)	[illegible]		
9	Curve	Radius	105.538m	90.000m		0+383.99m	0+489.53m	67.1874 (d)	0+443.77m	(545764.6805m,6963868.1802m,0.0000m)	[illegible]	[illegible]	[illegible]
10	Line	Two points	74.979m		N81° 43' 45"[illegible]	0+489.53m	0+564.51m			(545710.4894m,6963934.0265m,0.0000m)	[illegible]		
11	Curve	Radius	52.960m	90.000m		0+564.51m	0+617.47m	33.7175 (d)	0+591.78m	(545636.3003m,6963945.412[illegible])	[illegible]	[illegible]	[illegible]
12	Line	Two points	38.877m		N48° 00' 42"W	0+617.[illegible]	0+656.35m			[illegible]	[illegible]		
13	Curve	Radius	64.633m	265.408m		0+656.35m	0+720.98m	13.9531 (d)	0+688.83m	[illegible]	[illegible]	[illegible]	[illegible]
14	Line	Two points	10.889m		N61° 57' 53"W	0+720.98m	0+731.88m			[illegible]	[illegible]		
15	Curve	Radius	49.975m	200.000m		0+731.88m	0+781.[illegible]	14.3168 (d)	0+756.99m	[illegible]	[illegible]	[illegible]	[illegible]
16	Line	Two points	84.524m		N47° 38' 52"W	0+781.85m	0+866.37m			(545456.9874m,6964064.4382m,0.0000m)	[illegible]		
17	Curve	Radius	65.544m	200.000m		0+866.37m	0+931.92m	18.[illegible] (d)	0+899.44m	(545394.5227m,6964121.3707m,0.0000m)	[illegible]	[illegible]	[illegible]
18	Line	Two points	0.588m		N66° 25' 30"W	0+931.92m	0+932.50m			(545339.7759m,6964156.8742m,0.0000m)	[illegible]		
19	Curve	Radius	88.581m	200.000m		0+932.50m	1+021.08m	25.3768 (d)	[illegible]977.53m	(545339.2439m,6964157.1072m,0.0000m)	[illegible]	[illegible]	[illegible]
20	Line	Two points	2.768m		N41° 02' 54"W	1+021.08m	1+023.85m			(545268.4098m,6964209.0755m,0.0000m)	[illegible]		
21–54	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE 2: VERTICAL ALIGNMENT DATA

No.	PVI Station	PVI Elevation	Grade In	Grade Out	A (Grade Change)	Profile Curve Type	Profile Curve Length	K Value	Curve Radius
1	0+000.00m	8.310m		-0.23%					
2	0+361.23m	7.471m	-0.23%	8.10%	8.33%	Sag	75.991m	12	1200.000m
3	0+487.30m	13.162m	6.30%	-3.61%	9.71%	Crest	87.398m	9	900.000m
4	0+624.10m	10.223m	-3.81%	1.41%	6.02%	Sag	72.199m	12	1200.000m
5	0+678.80m	11.542m	3.41%	3.59%	1.18%	Sag	14.139m	12	1200.000m
6	0+765.48m	14.581m	3.59%	1.40%	1.19%				
7	0+940.29m	18.818m	2.40%	2.12%	0.28%	Crest	8.852m	12	1200.000m
8	1+024.87m	20.950m	2.12%	-2.89%	4.78%	Crest	42.986m	9	900.000m
9	1+147.62m	16.880m	-3.60%	-0.13%	2.52%	Sag	30.211m	12	1200.000m
10	1+396.29m	16.600m	-0.13%	1.70%	1.87%	Sag	22.421m	12	1200.000m
11	1+494.76m	18.378m	1.70%	-1.81%	4.06%	Crest	36.484m	9	900.000m
12	1+520.69m	15.819m	-2.31%	0.87%	2.08%	Sag	32.290m	12	1200.000m
13	1+547.67m	15.812m	0.87%	-3.60%	3.03%	Crest	14.946m	4.871	487.138m
14	1+586.68m	14.888m	-3.62%	-0.41%	2.22%	Sag	26.650m	12	1200.000m
15	1+686.36m	14.434m	-0.41%	0.99%	1.41%	Sag	16.882m	12	1200.000m
16	1+780.21m	15.337m	0.99%	-0.96%	1.96%	Crest	17.621m	9	900.000m
17	1+894.55m	14.808m	-0.96%	0.69%	1.08%	Sag	13.951m	12	1200.000m
18	2+017.43m	14.866m	0.59%	-2.15%	2.06%	Crest	18.532m	9	900.000m
19	2+070.87m	13.888m	-2.00%	-3.58%	1.55%	Crest	13.961m	9	900.000m
20–61	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]



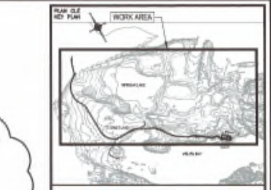
TETRA TECH

FINAL ISSUE AFTER CONSTRUCTION

SOME ANNOTATIONS HAVE BEEN ADDED TO THE DRAWING ISSUED FOR CONSTRUCTION IN ORDER TO INCORPORATE THE INFORMATIONS RECEIVED IN THIS PROJECT. TETRA TECH HADN'T DONE ANY FIELD SUPERVISION AT THE CONSTRUCTION SITE.

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2018-12-10

PLAN CLÉ / KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

1. EXISTING GROUND DTM PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. ELEVATIONS IN DRAWING PROVIDE FINISHED GRADE ELEVATIONS AT THE TOP OF THE SURFACE GRAVEL LAYER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY, SECURITY AND SLOPES OF ALL EXCAVATIONS/BACKFILL AND SHALL ABIDE BY ALL RELEVANT STANDARDS AND REGULATIONS. THE STABILITY, DEWATERING AND MAINTENANCE OF ALL EXCAVATIONS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
5. GRANULAR MATERIAL SHALL BE PLACED IN LIFTS NOT EXCEEDING 300mm AND COMPACTED TO A MINIMUM OF 98% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR). BORROW PIT MATERIAL, GRANULAR FILL MATERIAL 0-600 mm OR OVERBURDEN MATERIAL SHALL BE PLACED IN LIFTS NOT EXCEEDING 600mm AND COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR). MOISTURE CONDITIONING MAY BE REQUIRED PRIOR TO COMPACTION.
6. OVERBURDEN MATERIAL CAN BE USE FOR FILL IN SPECIFIED AREAS ONLY WHEN APPROVED BY FIELD GEOTECHNICAL ENGINEER.
7. AN AS-BUILT DRAWING SHALL BE PROVIDED AFTER CONSTRUCTION.
8. [illegible]
9. [illegible]

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
4	2018-12-10	ISSUED FOR AS-BUILT	S.M.	J.A.	
3	2017-07-26	ISSUED FOR C-300-805, ECN[illegible]	S.M.	J.A.	
2	2017-06-27	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
1	2017-04-27	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
0	2017-03-17	ISSUED FOR CONSTRUCTION	S.M.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2018-12-10
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
DETAILS / SECTIONS

DESSINÉ PAR / DRAWN BY	MOURAD SENNAOUI	2017-03-17
VÉRIFIÉ PAR / CHECKED BY	MELANIE YIP WOON SUN	2017-03-17
APPROUVÉ PAR / APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE / SCALE	AS SHOWN	DATE 2017-02-03
NO. DESSIN / DRAWING NO.	65-117-230-210	
NO. PROJET / PROJECT NO.	6515 / 28920	RÉVISION 4 — FEUILLE / SHT 1 / 1

FILE NO. 65-117-230-208T0210_R4-AS-BUILT-2.dwg

NO. DESSIN DRAWING NO. 65-117-230-C3D-HAMLET BYPASS ROAD-R0

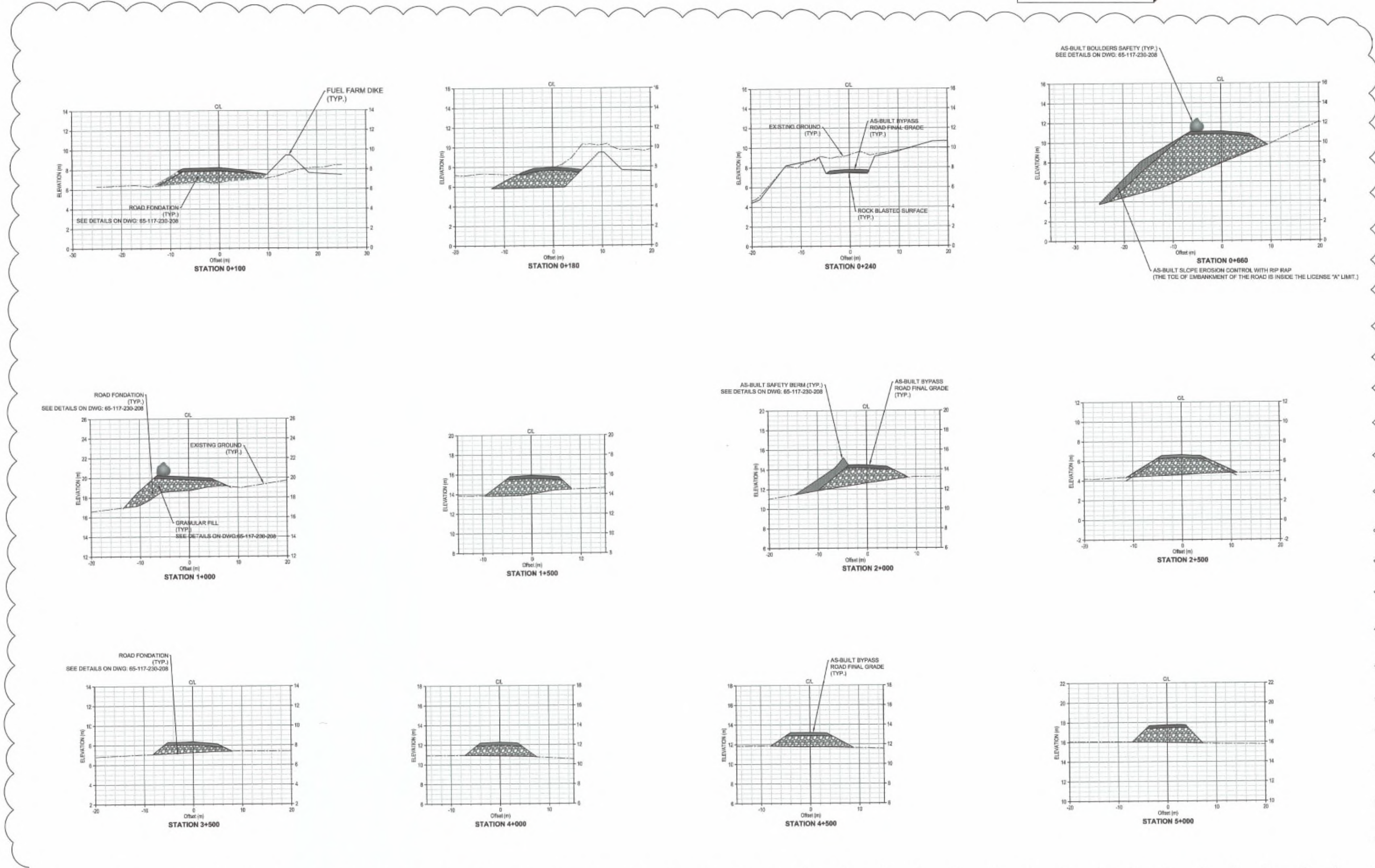
FORMAT ARCHD

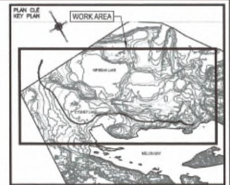
TETRA TECH

FINAL ISSUE AFTER CONSTRUCTION

SOME ANNOTATIONS HAVE BEEN ADDED TO THE DRAWING ISSUED FOR CONSTRUCTION IN ORDER TO INCORPORATE THE INFORMATIONS RECEIVED. IN THIS PROJECT, TETRA TECH HADN'T DONE ANY FIELD SUPERVISION AT THE CONSTRUCTION SITE.

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2018-12-10





TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

1. EXISTING GROUND DTM PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. LEVATIONS IN DRAWING PROVIDE FINISHED GRADE ELEVATIONS AT THE TOP OF THE SURFACE GRAVEL LAYER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY, SECURITY AND SLOPES OF ALL EXCAVATIONS/ BACKFILL AND SHALL ABIDE BY ALL RELEVANT STANDARDS AND REGULATIONS. THE STABILITY, DEWATERING AND MAINTENANCE OF ALL EXCAVATIONS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
5. GRANULAR MATERIAL SHALL BE PLACED IN LIFTS NOT EXCEEDING 300mm AND COMPACTED TO A MINIMUM OF 98% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR). BORROW PIT MATERIAL, GRANULAR FILL MATERIAL 0-600 mm OR OVERBURDEN MATERIAL SHALL BE PLACED IN LIFTS NOT EXCEEDING 600mm AND COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR). MOISTURE CONDITIONING MAY BE REQUIRED PRIOR TO COMPACTION.
6. OVERBURDEN MATERIAL CAN BE USE FOR FILL IN SPECIFIED AREAS ONLY WHEN APPROVED BY FIELD GEOTECHNICAL ENGINEER.
7. AN AS-BUILT DRAWING SHALL BE PROVIDED AFTER CONSTRUCTION.
8. THE BRIDGE AND ABUTMENTS, WITH THE EXCEPTION OF BACKFILL, SHALL BE PROVIDED BY OTHERS.
9. CONTRACTOR SHALL INSTALL THE BRIDGE AND ABUTMENTS AS THE RECOMMENDATIONS AND SPECIFICATIONS OF THE SUPPLIER.

LEGEND

- GRANULAR MATERIAL 0 - 50 mm
- GRANULAR MATERIAL 0 - 600 mm
- OVERBURDEN OR CLASS A
- RIP RAP

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
–	–
–	–
–	–
–	–

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
2	2018-12-10	ISSUED FOR AS-BUILT	S.M.	J.A.	
1	2017-07-20	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
0	2017-04-27	ISSUED FOR CONSTRUCTION	S.M.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2018-12-10
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
2018-12-10

TITRE / TITLE

AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
DETAILS / SECTIONS

DESSINÉ PAR DRAWN BY	MOURAD SENNADJ	DATE 2017-03-17
VERIFIÉ PAR CHECKED BY	MELANIE YIP WOON SUN	2017-03-17
APPROUVÉ PAR APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE SCALE	AS SHOWN	DATE 2017-02-03

NO. DESSIN DRAWING NO. 65-117-230-211

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6515 / 28920	2	1 / 1

AE-CART-ARCH D

P:\28920\DESSIN\CIV-INFRA\DESSINS DE TRAVAIL\AUTOCAD\C3D DESIGN FILES\65-117-230-C3D-Hamlet Bypass road-R0.dwg-2018-02-19 14:03:29

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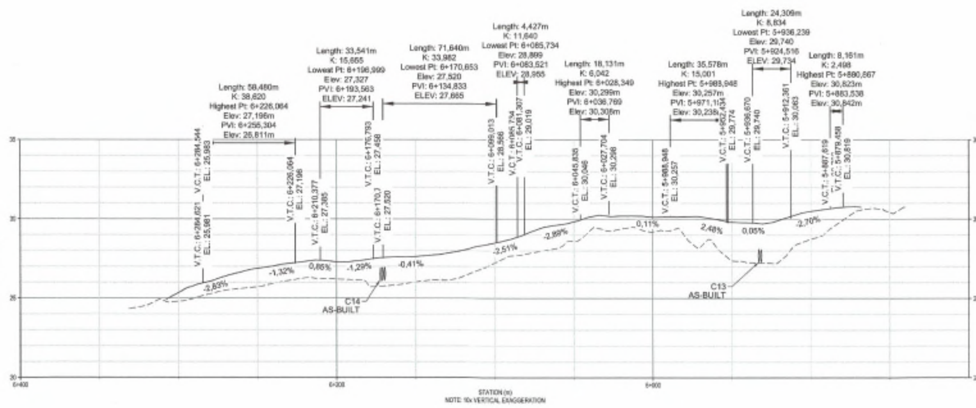
NO. DESSIN DRAWING NO. 65-117-230-212_R1_AS-BUILT

FORMAT ARCHD



PROFILE
SCALE HOR.: 1:1500
SCALE VER.: 1:150

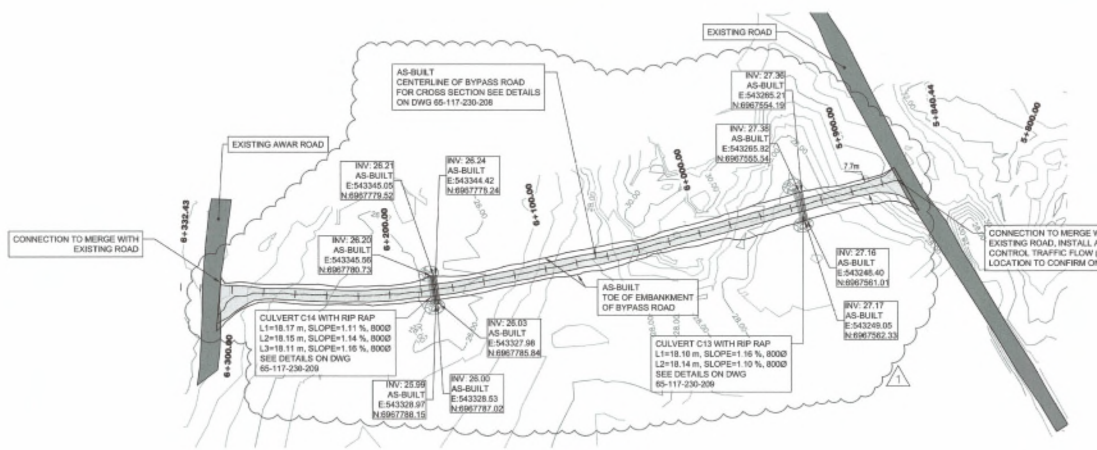
TETRA TECH

FINAL ISSUE AFTER CONSTRUCTION

SOME ANNOTATIONS HAVE BEEN ADDED TO THE DRAWING ISSUED FOR CONSTRUCTION IN ORDER TO INCORPORATE THE INFORMATIONS RECEIVED. IN THIS PROJECT, TETRA TECH HADN'T DONE ANY FIELD SUPERVISION AT THE CONSTRUCTION SITE.

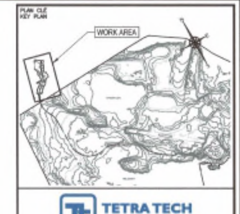
TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE DATE : 2018-12-10

LEGEND:
CULVERT
BYPASS ROAD



PLAN VIEW
SCALE HOR.: 1:1500

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:
1. EXISTING GROUND DTM PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. ELEVATIONS IN DRAWING PROVIDE FINISHED GRADE ELEVATIONS AT THE TOP OF THE SURFACE GRAVEL LAYER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY, SECURITY AND SLOPES OF ALL EXCAVATIONS/ BACKFILL AND SHALL ABIDE BY ALL RELEVANT STANDARDS AND REGULATIONS. THE STABILITY, DEWATERING AND MAINTENANCE OF ALL EXCAVATIONS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
5. GRANULAR MATERIAL 0-30 mm OR 0-50 mm SHALL BE PLACED IN LIFTS NOT EXCEEDING 300 mm AND COMPACTED TO A MINIMUM OF 98% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR). BORROW PIT MATERIAL, GRANULAR FILL MATERIAL 0-606 mm OR OVERBURDEN MATERIAL SHALL BE PLACED IN LIFTS NOT EXCEEDING 600 mm AND COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR). MOISTURE CONDITIONING MAY BE REQUIRED PRIOR TO COMPACTION.
6. OVERBURDEN MATERIAL CAN BE USED FOR FILL IN SPECIFIED AREAS ONLY WHEN APPROVED BY FIELD GEOTECHNICAL ENGINEER.
7. AN AS-BUILT DRAWING SHALL BE PROVIDED AFTER CONSTRUCTION.
8. ~~THE LOCATION, ELEVATION AND LENGTH OF CULVERT GROUP SHALL BE CONFIRMED ON SITE.~~
9.
10. 3
11. NO EQUIPMENT CAN BE STORED AND NO DEPOSITION OF EXCAVATED AND STOCKPILED MATERIALS CAN BE DONE WITHIN THE LICENCE "A" - LIMIT OF WORK (31M) LINE.
12. FOR SUMMER CONSTRUCTION, GEOTEXTILE SHALL BE INSTALLED BETWEEN THE ORIGINAL GROUND AND THE GRANULAR MATERIAL WHEREVER THE ORIGINAL GROUND IS UNSTABLE TO SUPPORT FILL MATERIAL COMPACTION.

FOR CONTINUITY, SEE DRAWING 65-117-230-207

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
-	-
-	-
-	-
-	-
-	-

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2018-12-10	ISSUED FOR AS-BUILT	S.M.	J.A.	
0	2017-07-06	ISSUED FOR CONSTRUCTION	M.Y.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2018-12-10
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
2018-12-10

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
PLAN / PROFILE
5+900 TO 6+312

DESSINÉ PAR DRAWN BY	MOURAD SENNADJ	DATE 2017-03-17
VÉRIFIÉ PAR CHECKED BY	SOLENE MOREAU	2017-03-17
APPROUVÉ PAR APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE SCALE H=1:1500 V=1:150	DATE 2017-02-03	

NO. DESSIN DRAWING NO. 65-117-230-212

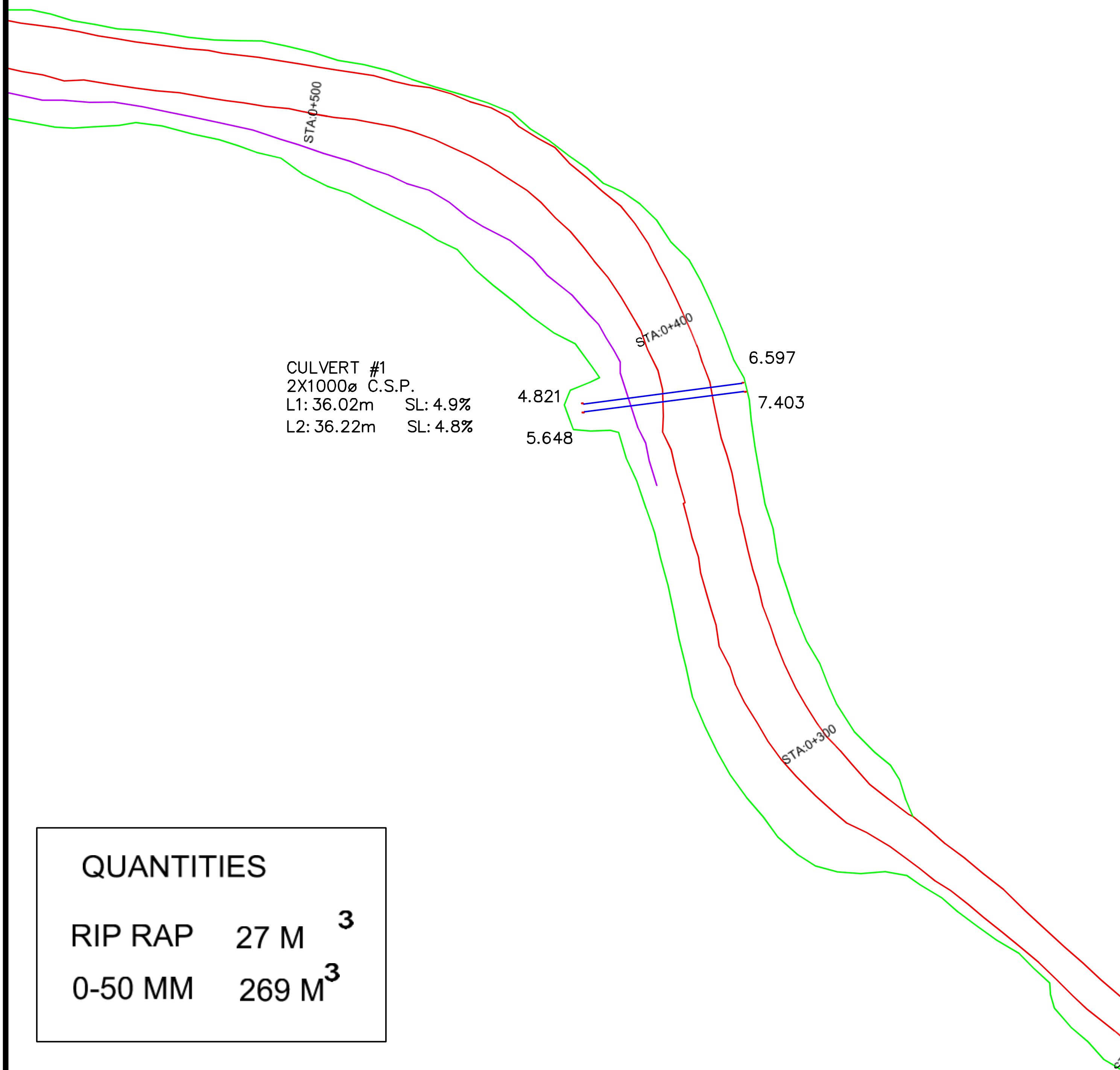
NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6515 / 28920	1	1 / 1

AC-CART-ARCH D

P:\28920\DESSIN_CIV-INFRA\DESSINS DE TRAVAIL\AUTOCAD\65-117-230-212_R1_AS-BUILT.dwg-2017-03-16

FILE NO. 65-117-230-212_R1_AS-BUILT.dwg

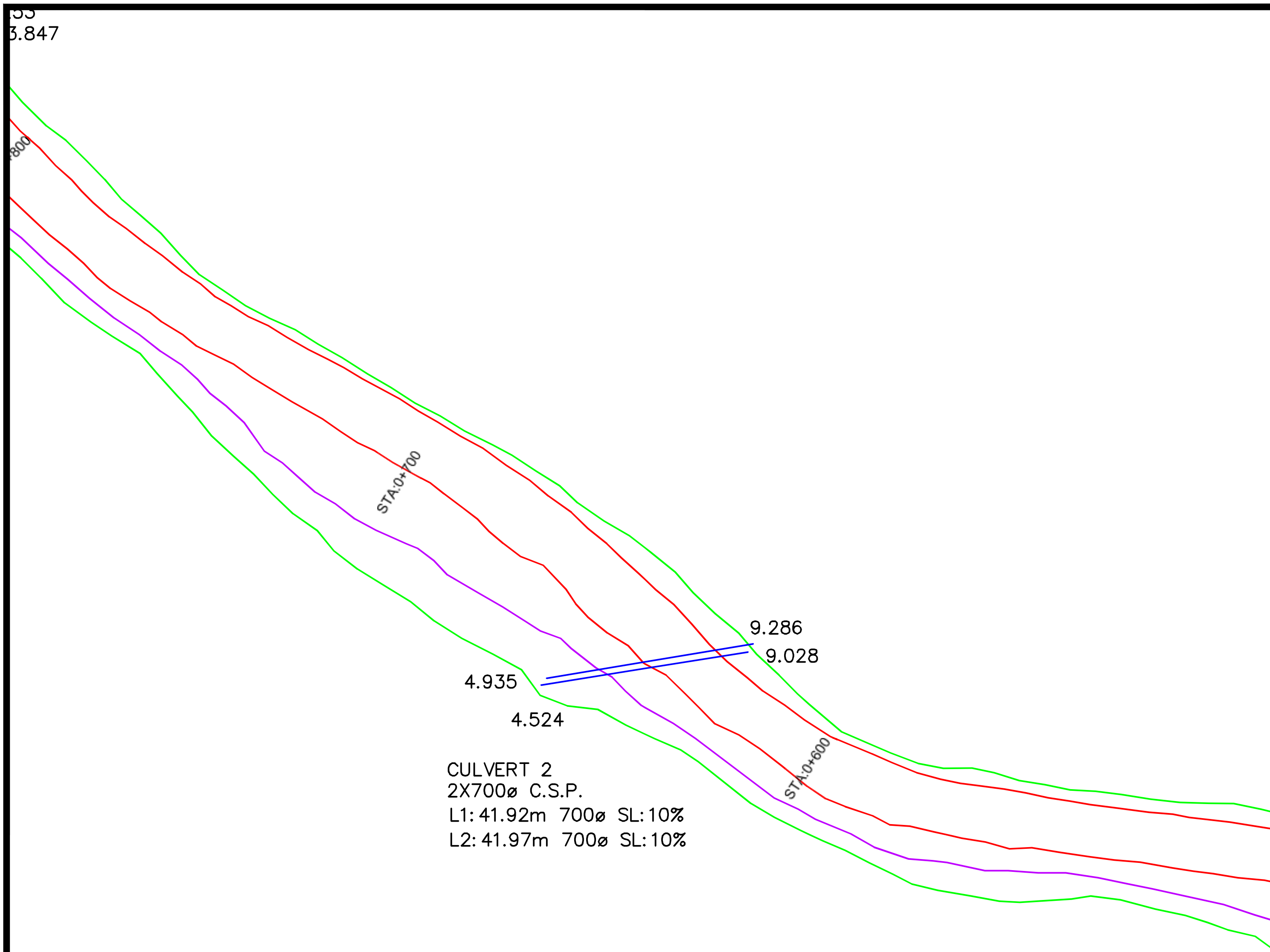
APPENDIX B
Survey Drawings



QUANTITIES

RIP RAP	27 M^3
0-50 MM	269 M^3

HAMELARPENTAGE	AGNICO	Date des travaux : 2017–2018	Date d'envoi : 2018–11–03
	Système de Coord.: UTM15 NAD83	CULVERT 1 0+385	Dessine par: Y. Hamel
	Echelle: 1:50	No plan: 65–117–142–200–R0_ABD	Approuve par: HAMEL ARP

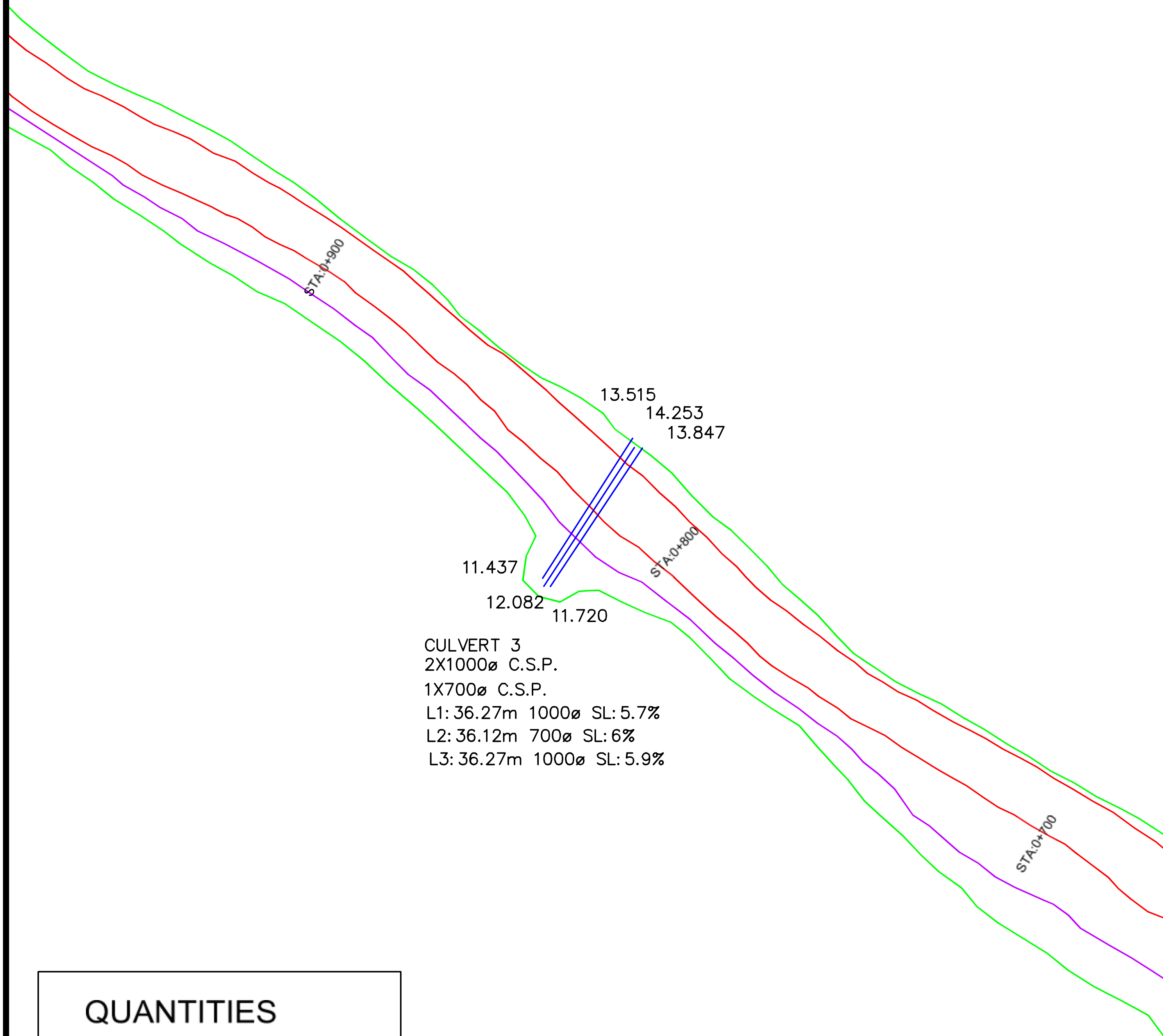


QUANTITIES

RIP RAP	38 M^3
0-50 MM	299 M^3

HAMELARPENTAGE

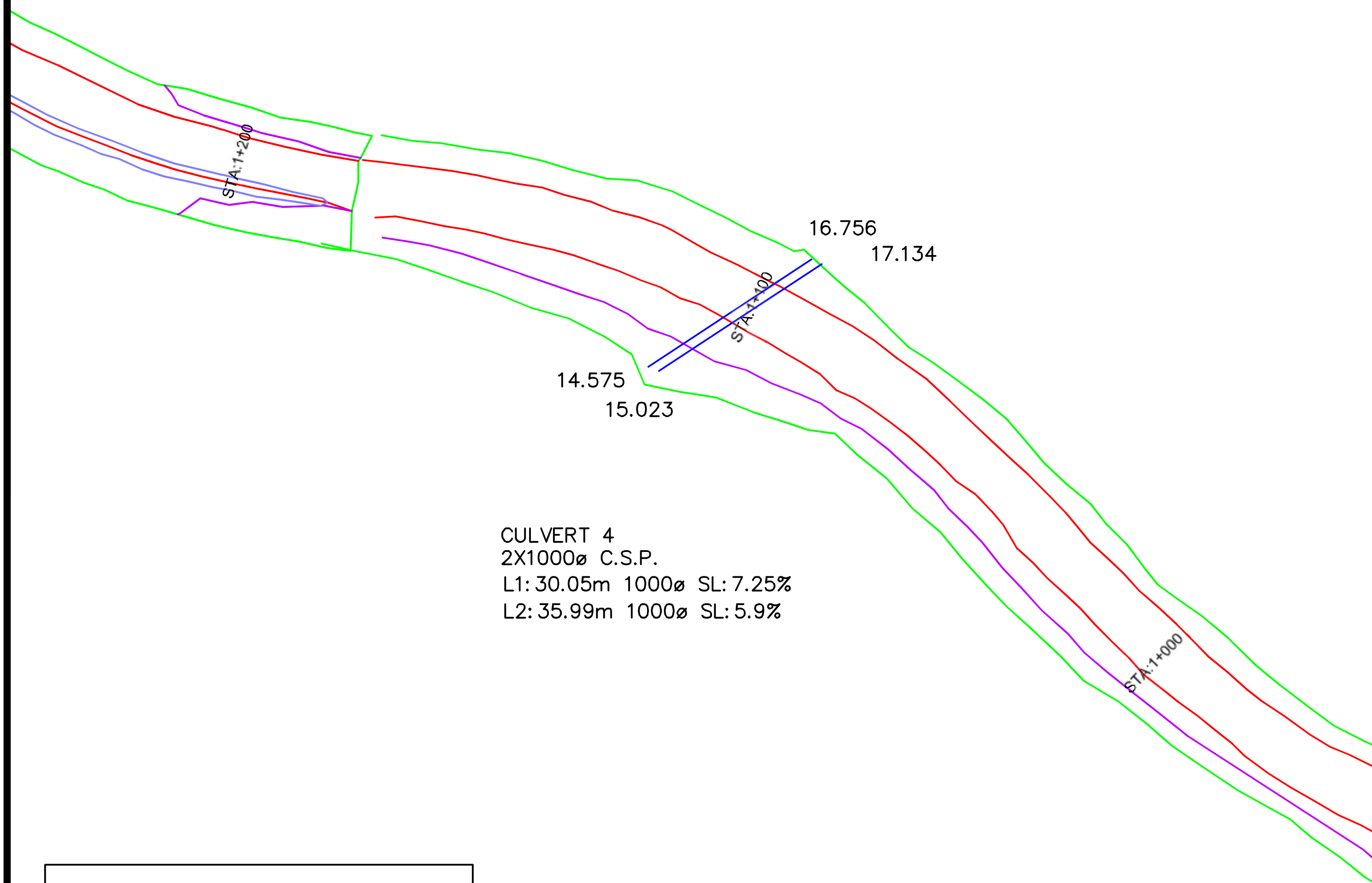
AGNICO	Date des travaux : 2017–2018		Date d'envoi : 2018–11–03
Système de Coord.: UTM15 NAD83	CULVERT 2 0+635		Dessine par: Y. Hamel
Echelle: 1:50	No plan: 65–117–142–200–R0_ABD		Approuve par: HAMEL ARP



QUANTITIES

RIP RAP	31 M^3
0-50 MM	298 M^3

HAMELARPENTAGE	AGNICO	Date des travaux : 2017–2018	Date d'envoi : 2018–11–03
	Système de Coord.: UTM15 NAD83	CULVERT 3 0+820	Dessine par: Y. Hamel
	Echelle: 1:50	No plan: 65–117–142–200–R0_ABD	Approuve par: HAMEL ARP

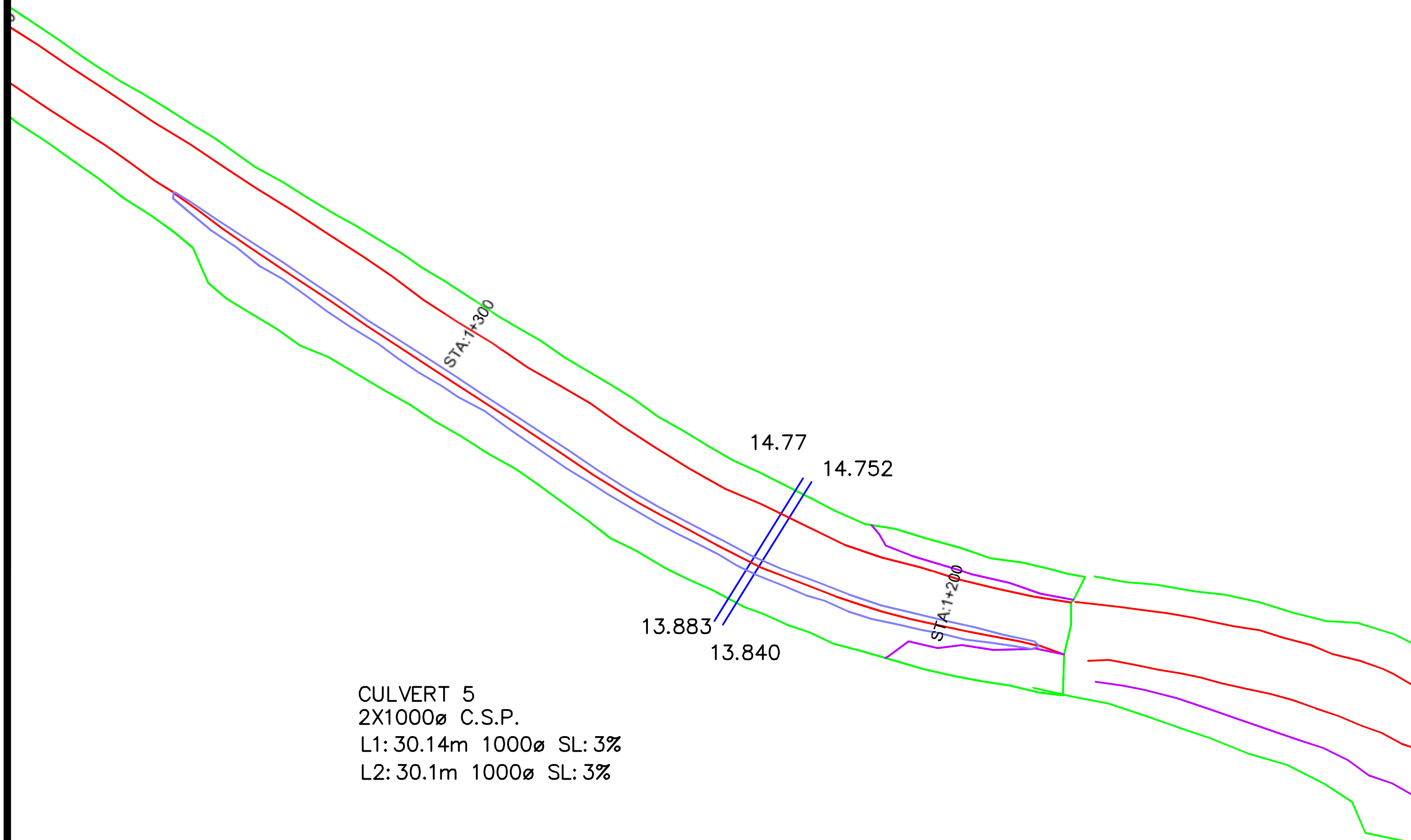


QUANTITIES

RIP RAP 44 M^3

0-50 MM 268 M^3

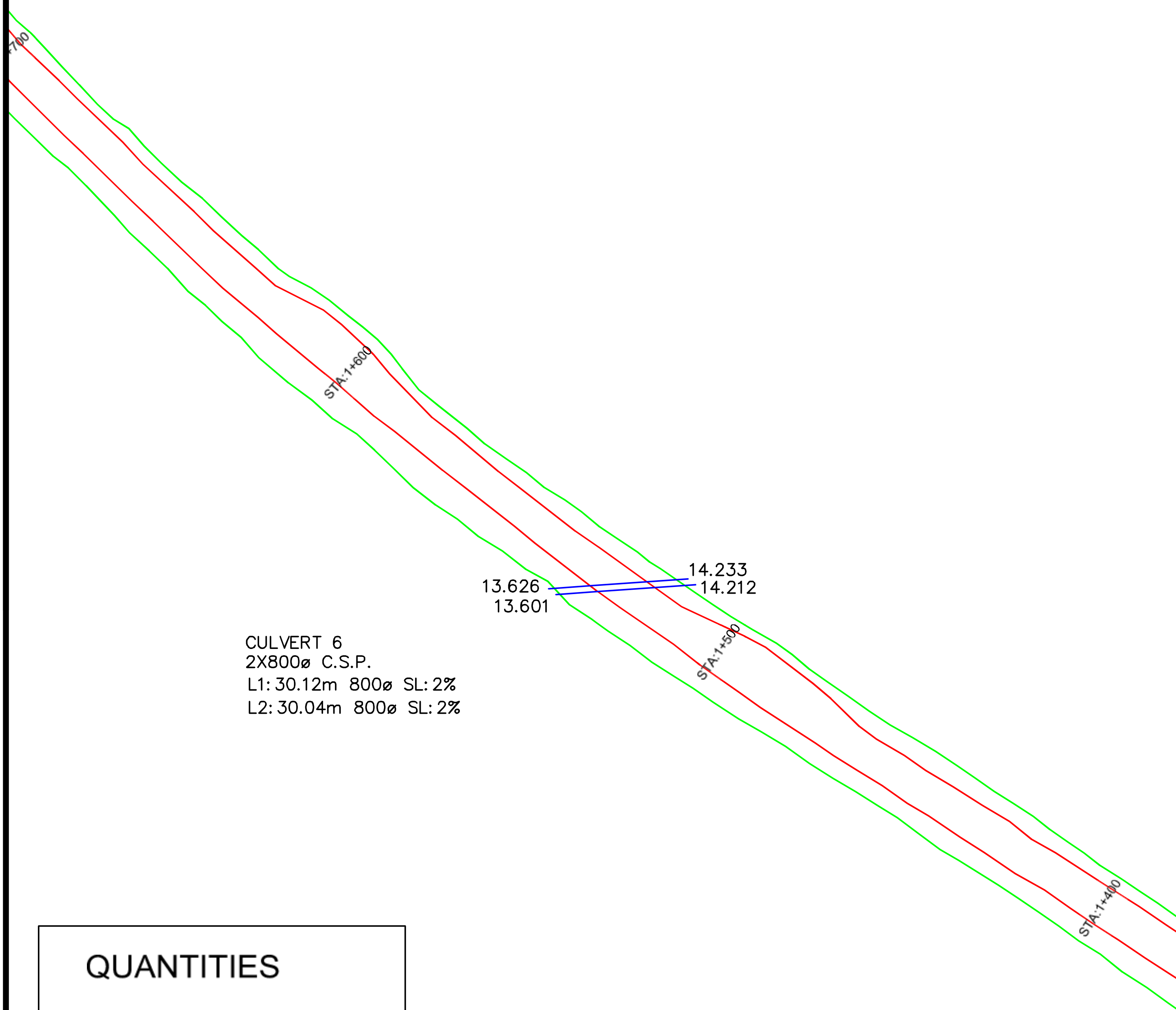
HAMELARPENTAGE	AGNICO	Date des travaux : 2017–2018	Date d'envoi : 2018–11–03
	Système de Coord.: UTM15 NAD83	CULVERT 4 1+100	Dessine par: Y. Hamel
	Echelle: 1:50	No plan: 65–117–142–200–R0_ABD	Approuve par: HAMEL ARP



QUANTITIES

RIP RAP	30 M^3
0-50 MM	164 M^3

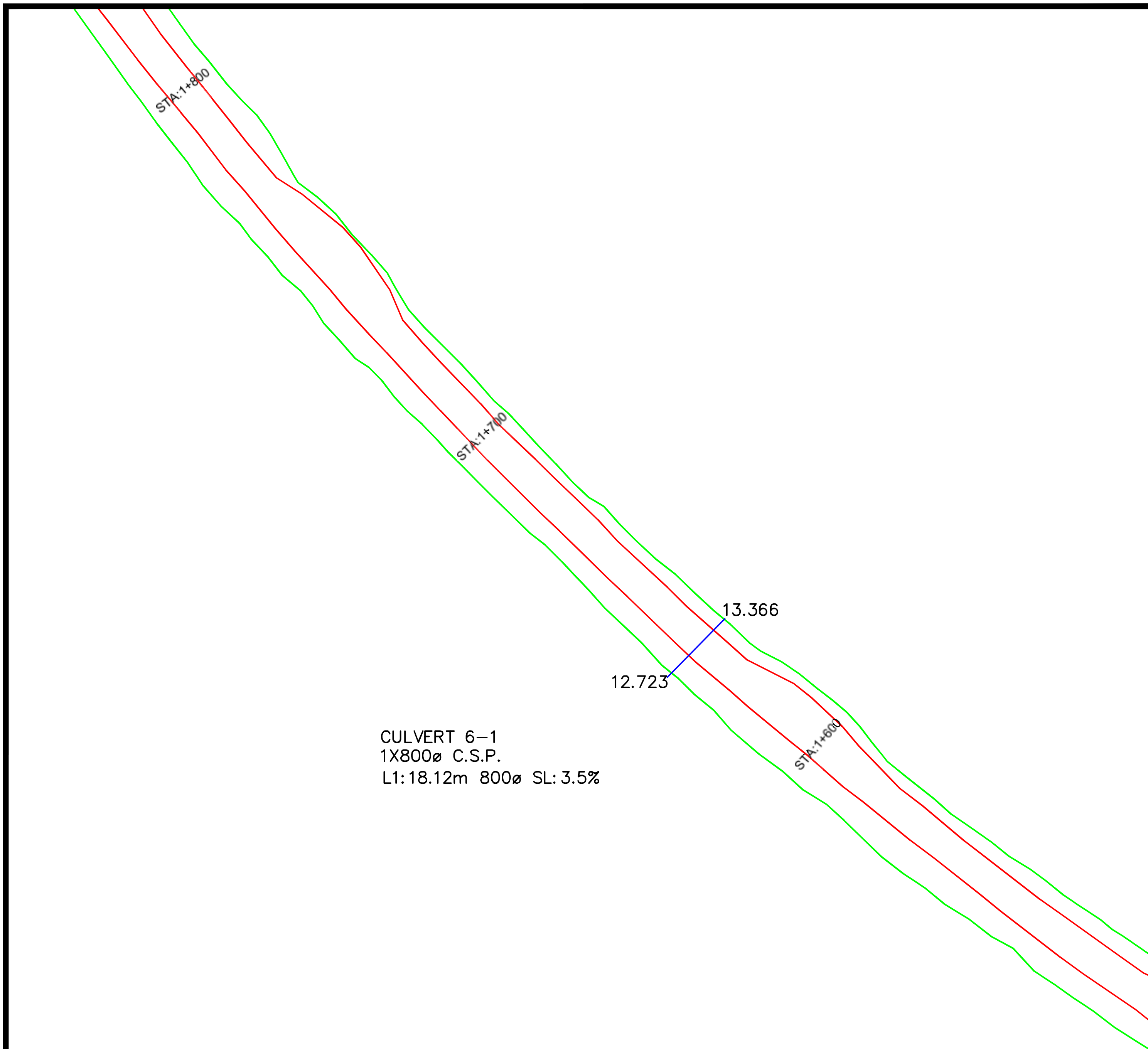
HAMELARPENTAGE	AGNICO	Date des travaux : 2017–2018	Date d'envoi : 2018–11–03
	Système de Coord.: UTM15 NAD83	CULVERT 5 1+235	Dessine par: Y. Hamel
	Echelle: 1:50	No plan: 65–117–142–200–R0_ABD	Approuve par: HAMEL ARP



QUANTITIES

RIP RAP	16 M^3
0-50 MM	198 M^3

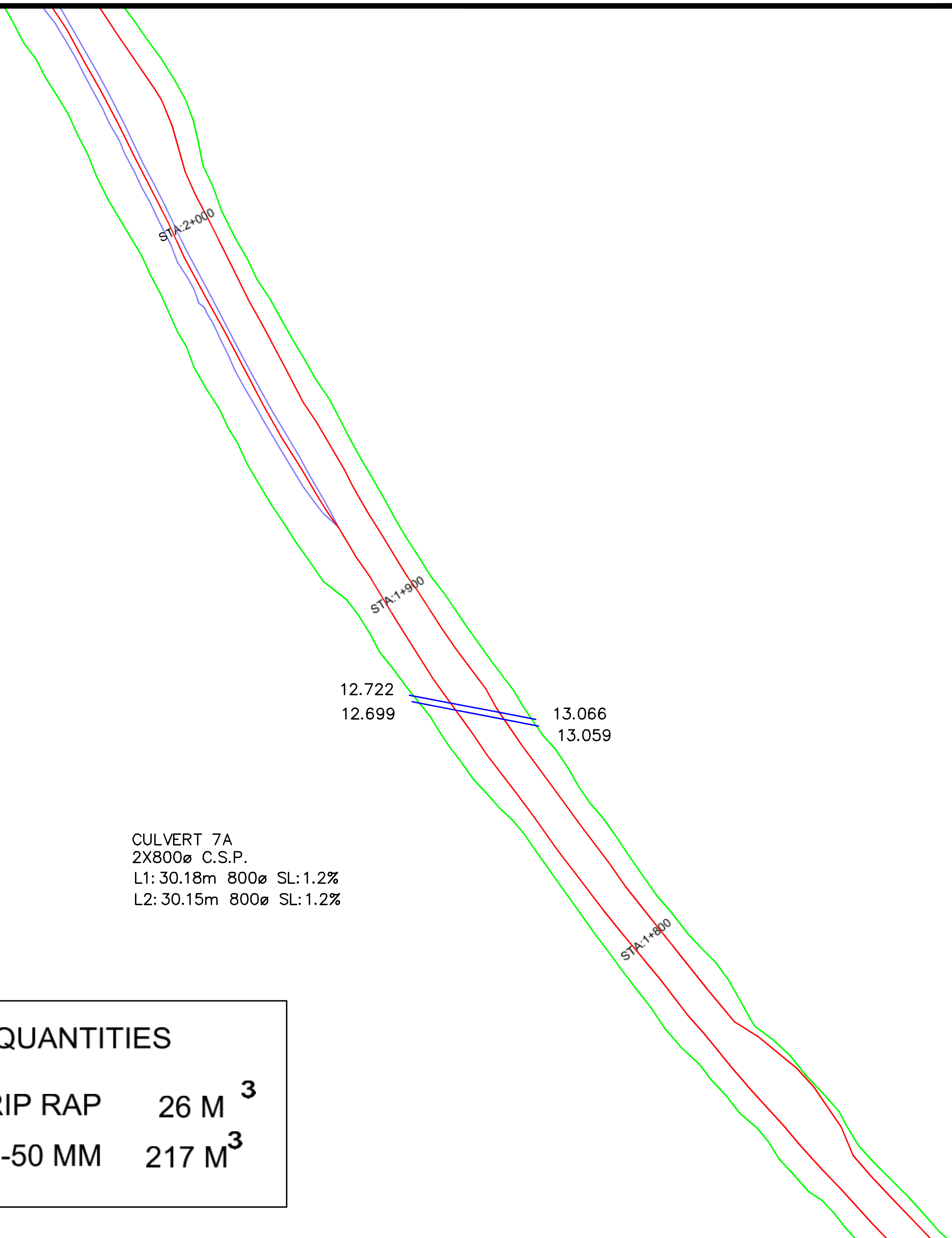
HAMELARPENTAGE	AGNICO	Date des travaux : 2017-2018	Date d'envoi : 2018-11-03
	Système de Coord.: UTM15 NAD83	CULVERT 6 1+525	Dessine par: Y. Hamel
	Echelle: 1:50	No plan: 65-117-142-200-R0_ABD	Approuve par: HAMEL ARP



QUANTITIES

RIP RAP	26 M^3
0-50 MM	123 M^3

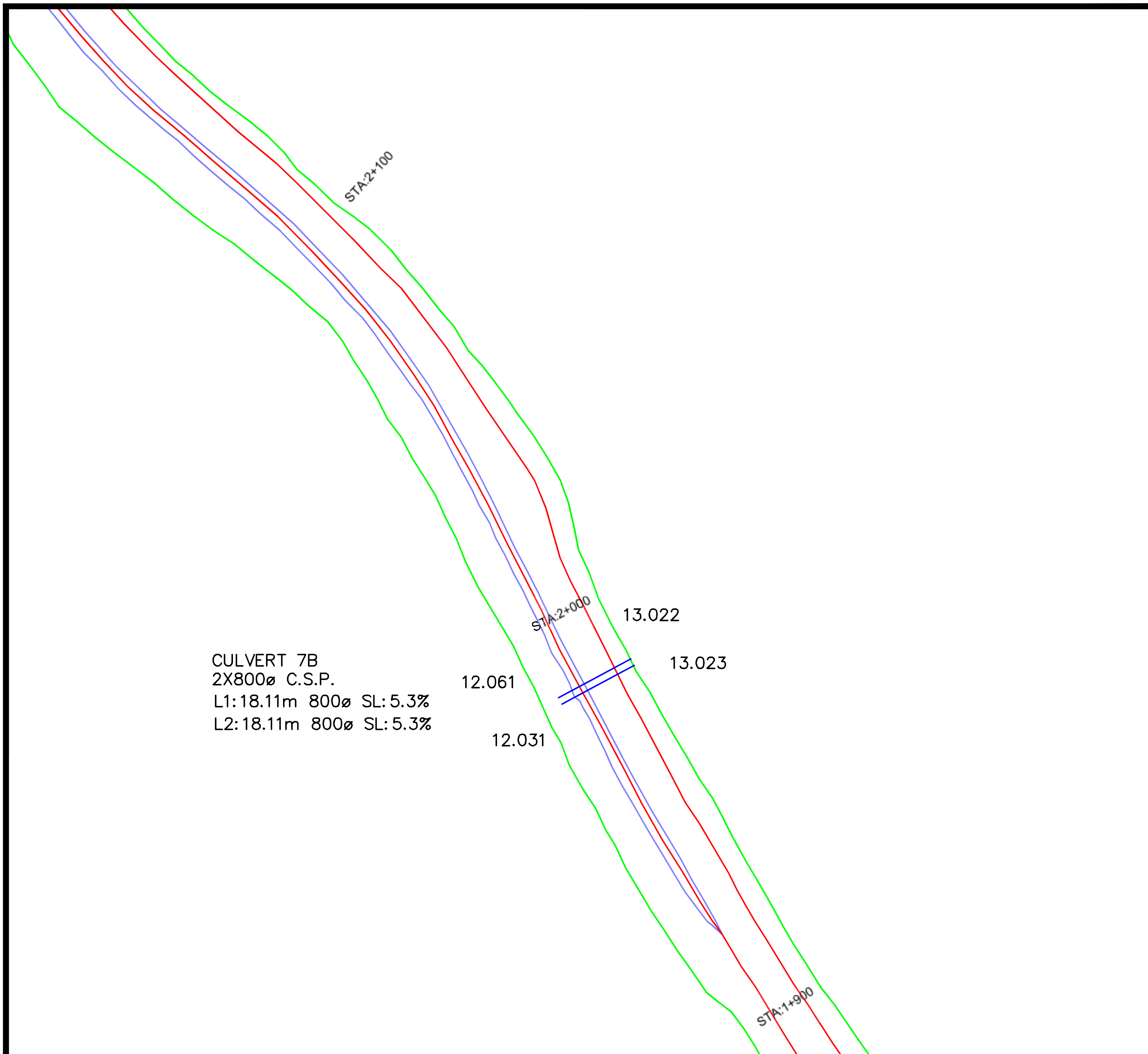
HAMELARPENTAGE	AGNICO	Date des travaux : 2017–2018	Date d'envoi : 2018–11–03
	Système de Coord.: UTM15 NAD83	CULVERT 6-1 1+635	Dessine par: Y. Hamel
	Echelle: 1:50	No plan: 65–117–142–200–R0_ABD	Approuve par: HAMEL ARP



QUANTITIES

RIP RAP	26 M^3
0-50 MM	217 M^3

HAMELARPENTAGE	AGNICO	Date des travaux : 2017–2018	Date d'envoi : 2018–11–03
	Système de Coord.: UTM15 NAD83	CULVERT 7A 1+865	Dessine par: Y. Hamel
	Echelle: 1:50	No plan: 65–117–142–200–R0_ABD	Approuve par: HAMEL ARP

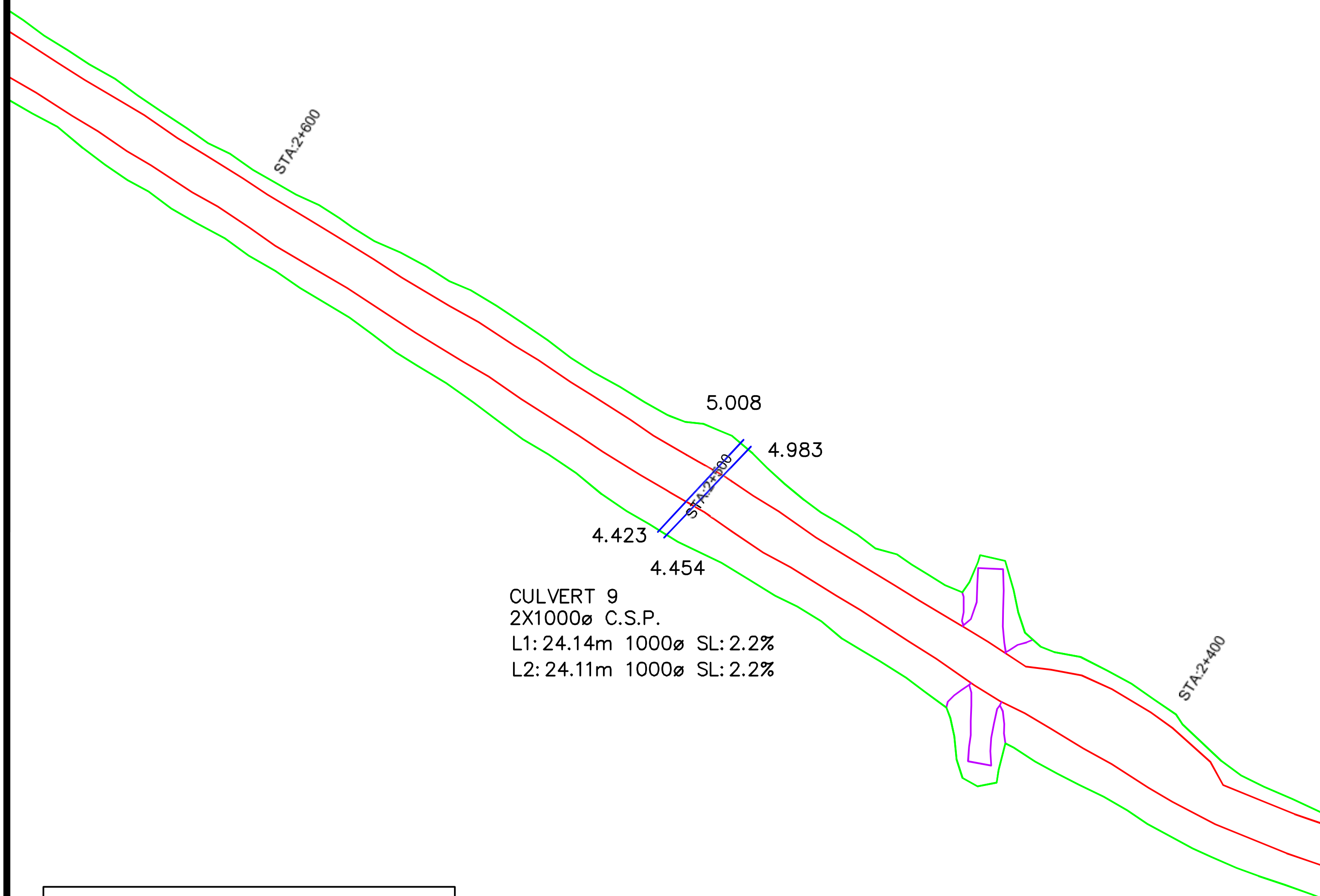


QUANTITIES

RIP RAP	23 M^3
0-50 MM	265 M^3

HAMELARPENTAGE

AGNICO	Date des travaux : 2017–2018	Date d'envoi : 2018–11–03
Système de Coord.: UTM15 NAD83	CULVERT 7B 1+985	Dessine par: Y. Hamel
Echelle: 1:50	No plan: 65–117–142–200–R0_ABD	Approuve par: HAMEL ARP

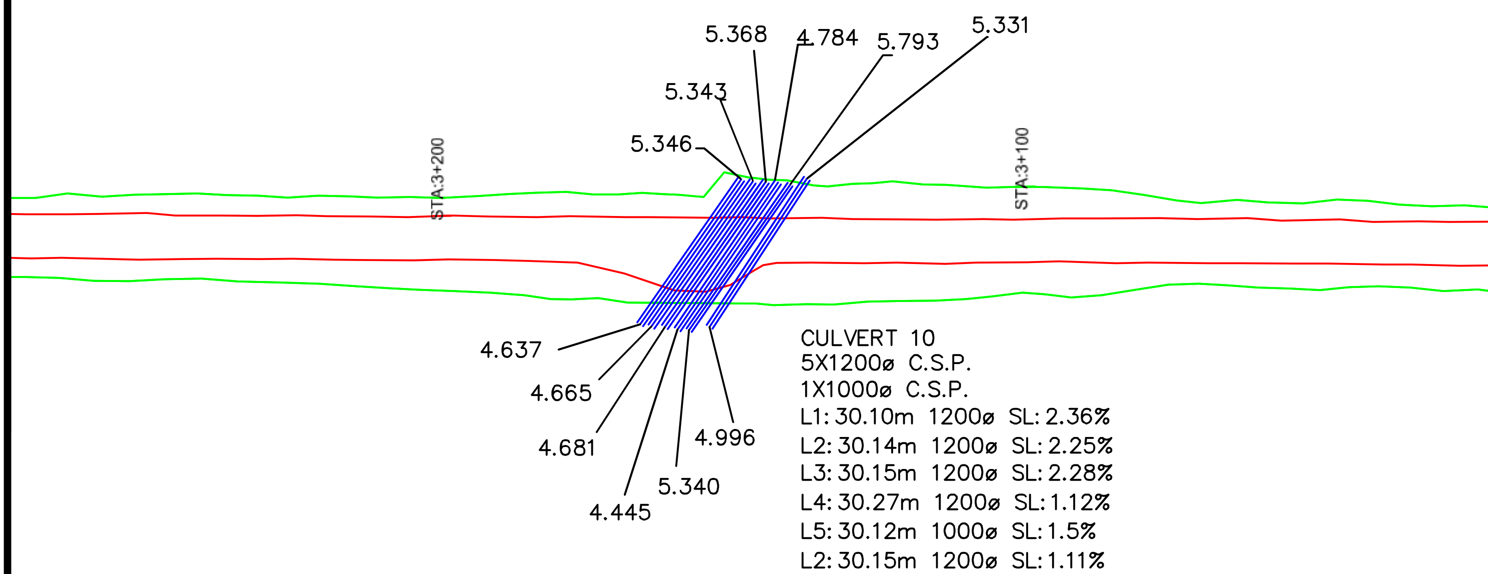


QUANTITIES

RIP RAP	20 M^3
0-50 MM	138 M^3

HAMELARPENTAGE

AGNICO	Date des travaux : 2017–2018	Date d'envoi : 2018–11–03
Système de Coord.: UTM15 NAD83	CULVERT 9 2+500	Dessine par: Y. Hamel
Echelle: 1:50	No plan: 65–117–142–200–R0_ABD	Approuve par: HAMEL ARP

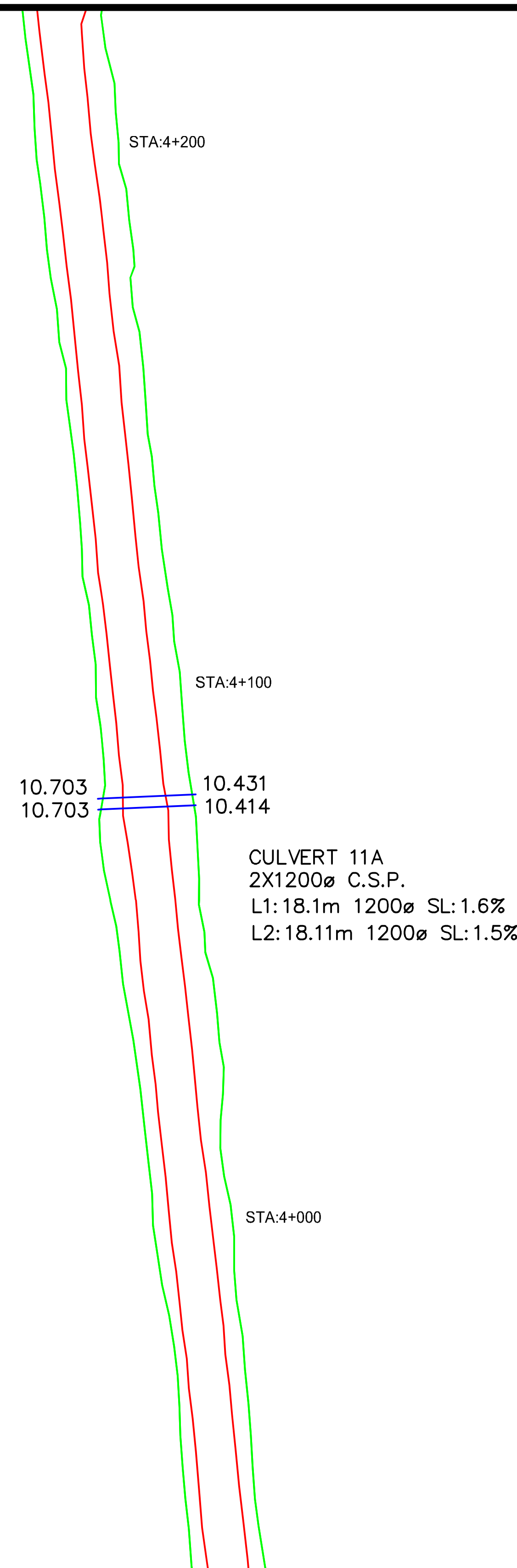


QUANTITIES

RIP RAP	83 M^3
0-50 MM	411 M^3

HAMEL ARPENTAGE

AGNICO	Date des travaux : 2017–2018	Date d'envoi : 2018–11–03
Système de Coord.: UTM15 NAD83	CULVERT 10 3+150	Dessine par: Y. Hamel
Echelle: 1:50	No plan: 65–117–142–200–R0_ABD	Approuve par: HAMEL ARP

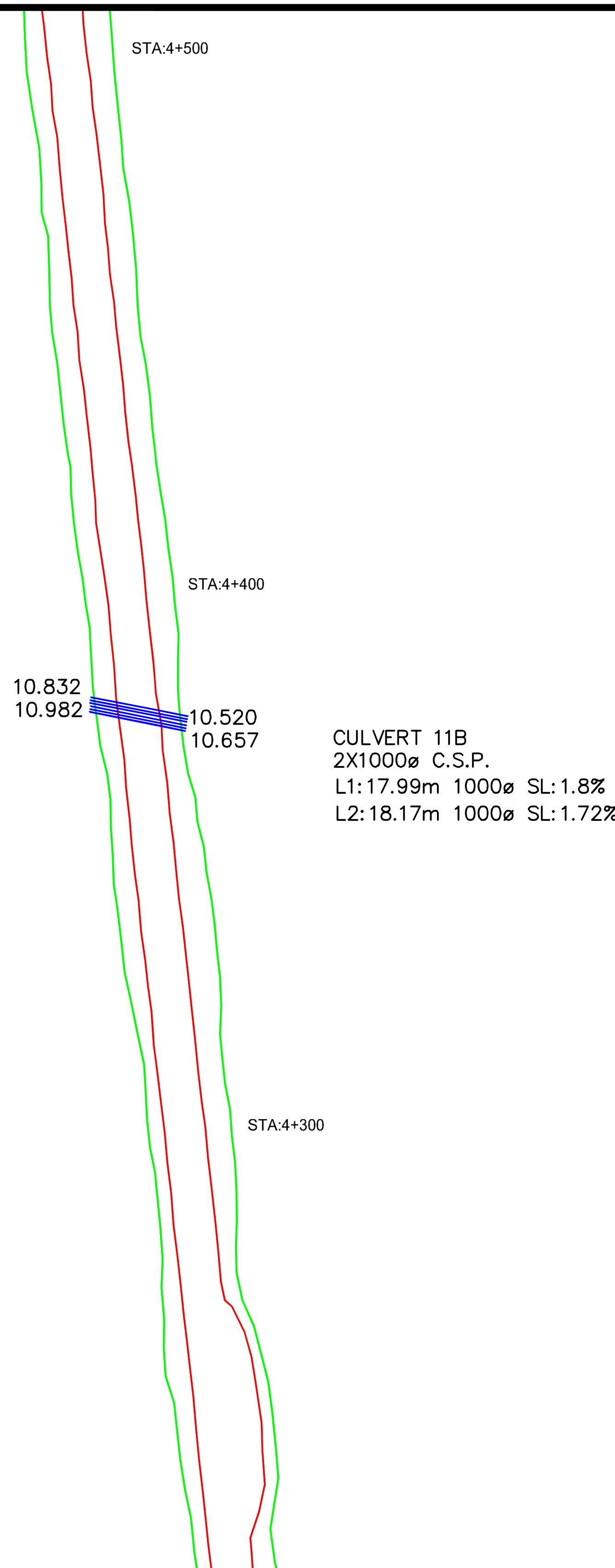


QUANTITIES

RIP RAP	35 M^3
0-50 MM	117 M^3

HAMELARPENTAGE

AGNICO	Date des travaux : 2017–2018	Date d'envoi : 2018–11–03	
Système de Coord.: UTM15 NAD83	CULVERT 11A 4+080	Dessine par: Y. Hamel	
Echelle: 1:50	No plan: 65–117–142–200–R0_ABD	Approuve par: HAMEL ARP	

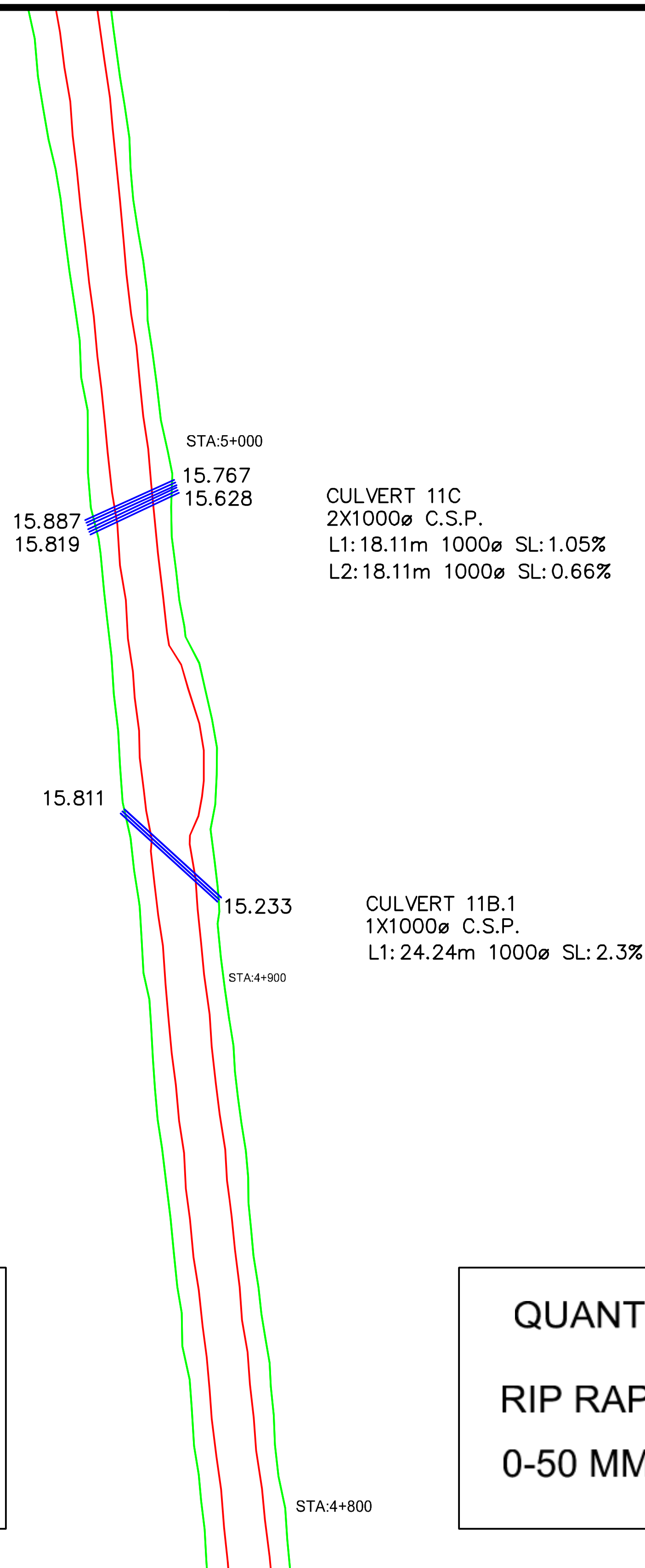


QUANTITIES

RIP RAP	35 M^3
0-50 MM	119 M^3

HAMELARPENTAGE

AGNICO	Date des travaux : 2017–2018		Date d'envoi : 2018–11–03
Système de Coord.: UTM15 NAD83	CULVERT 11B 4+375		Dessine par: Y. Hamel
Echelle: 1:50	No plan: 65–117–142–200–R0_ABD		Approuve par: HAMEL ARP

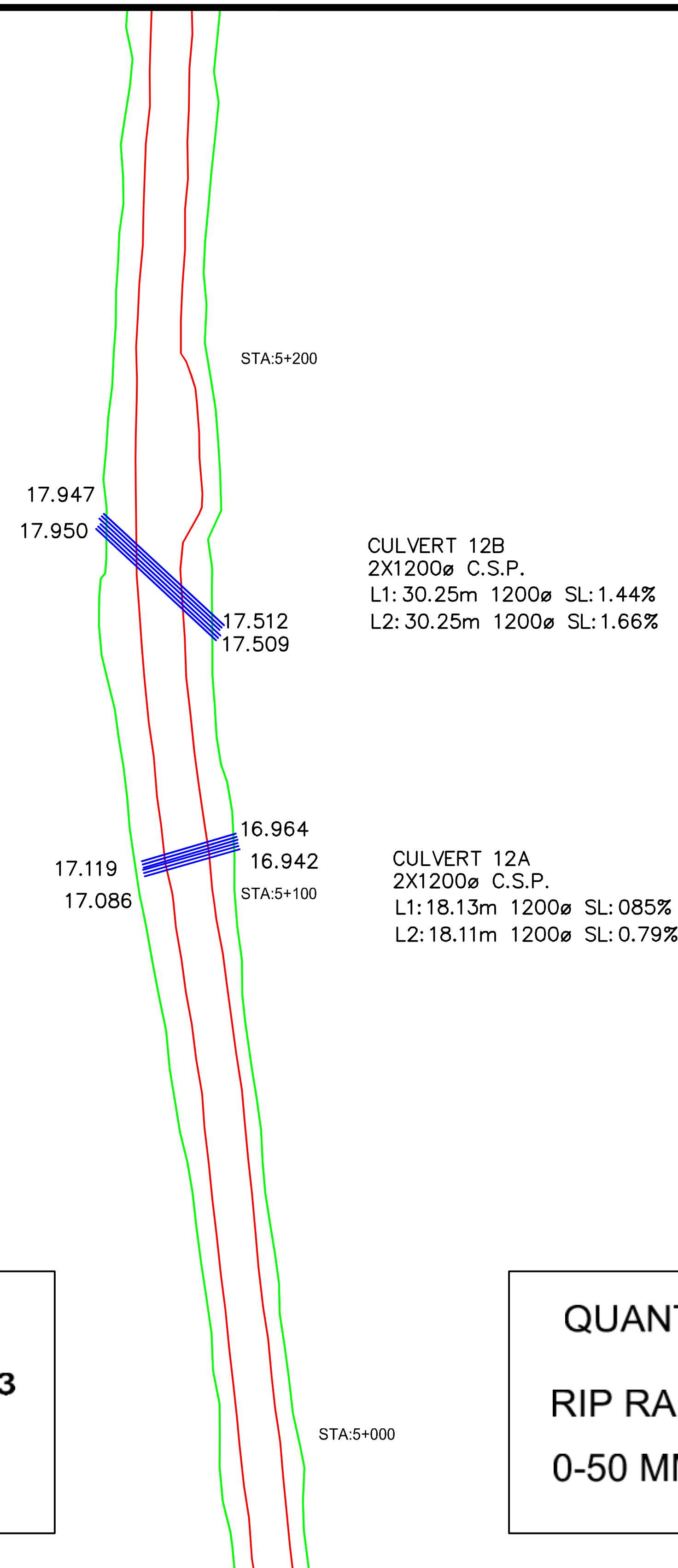


QUANTITIES C11 B1	
RIP RAP	15 M^3
0-50 MM	190 M^3

QUANTITIES C11 C	
RIP RAP	31 M^3
0-50 MM	120 M^3

HAMELARPENTAGE

AGNICO	Date des travaux : 2017–2018		Date d'envoi : 2018–11–03
Système de Coord.: UTM15 NAD83	CULVERT 11 B1 4+925 CULVERT 11 C 4+ 990		Dessine par: Y. Hamel
Echelle: 1:50	No plan: 65–117–142–200–R0_ABD		Approuve par: HAMEL ARP



QUANTITIES C12 A

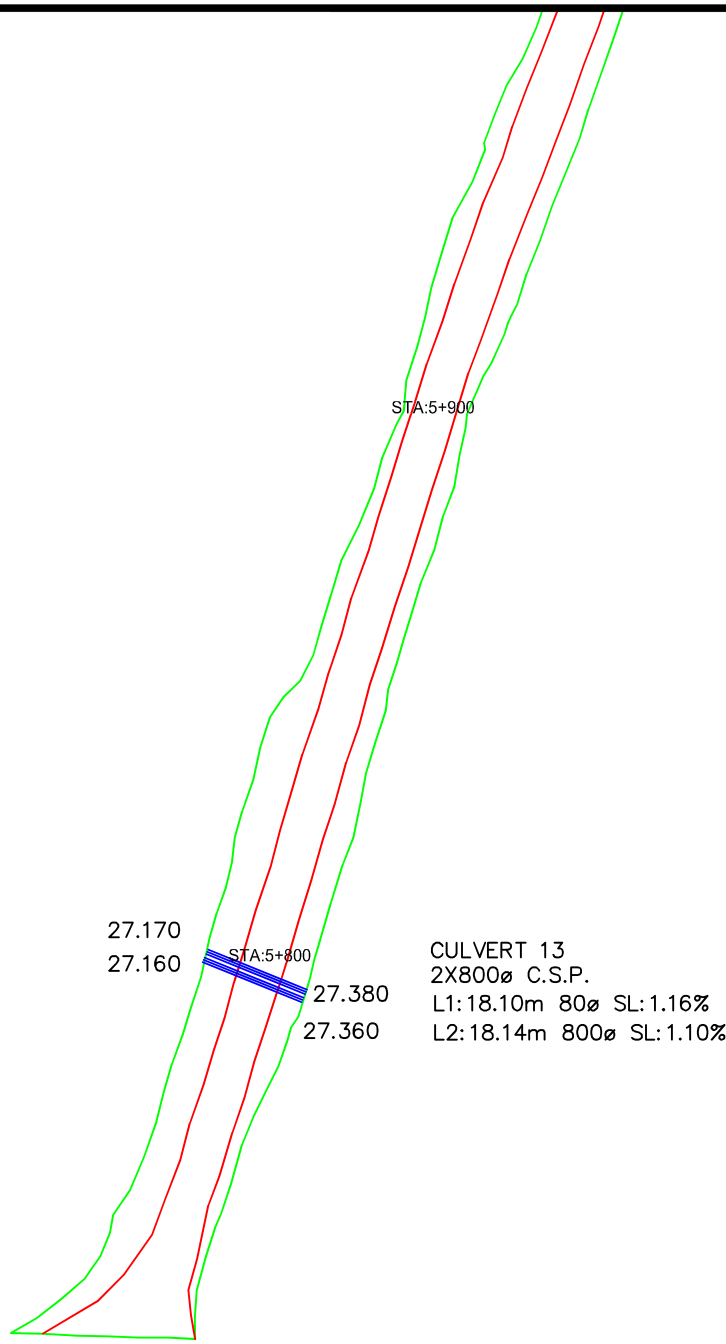
RIP RAP	15.2 M^3
0-50 MM	190 M^3

QUANTITIES C12 B

RIP RAP	31 M^3
0-50 MM	120 M^3

HAMELARPENTAGE

AGNICO	Date des travaux : 2017–2018	Date d'envoi : 2018–11–03
Système de Coord.: UTM15 NAD83	CULVERT 12A 5+110 CULVERT 12B 5+160	Dessine par: Y. Hamel
Echelle: 1:50	No plan: 65–117–142–200–R0_ABD	Approuve par: HAMEL ARP

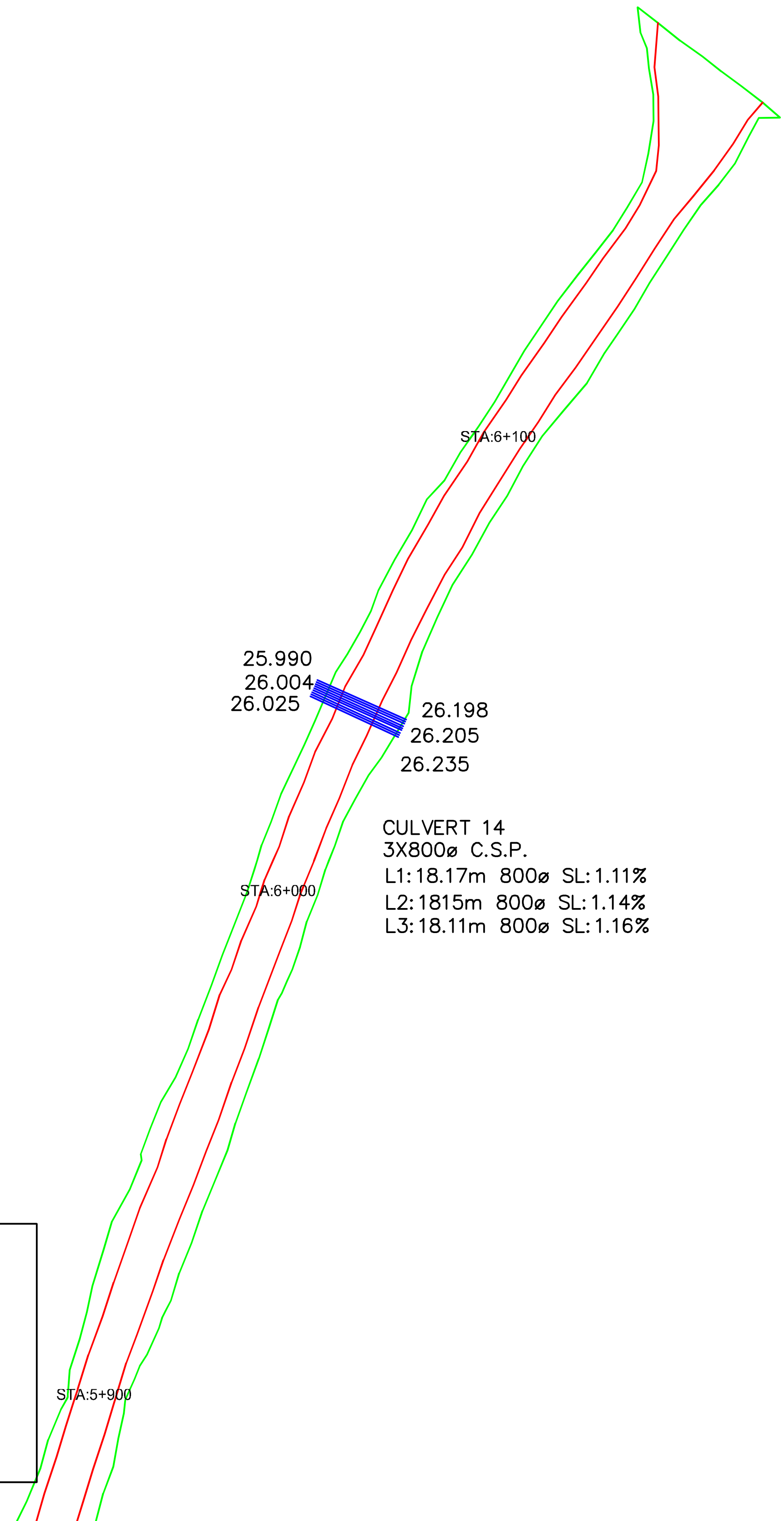


QUANTITIES

RIP RAP	26 M^3
0-50 MM	134 M^3

HAMELARPENTAGE

AGNICO	Date des travaux : 2017–2018	Date d'envoi : 2018–11–03
Système de Coord.: UTM15 NAD83	CULVERT 13 5+800	Dessine par: Y. Hamel
Echelle: 1:50	No plan: 65–117–142–200–R0_ABD	Approuve par: HAMEL ARP



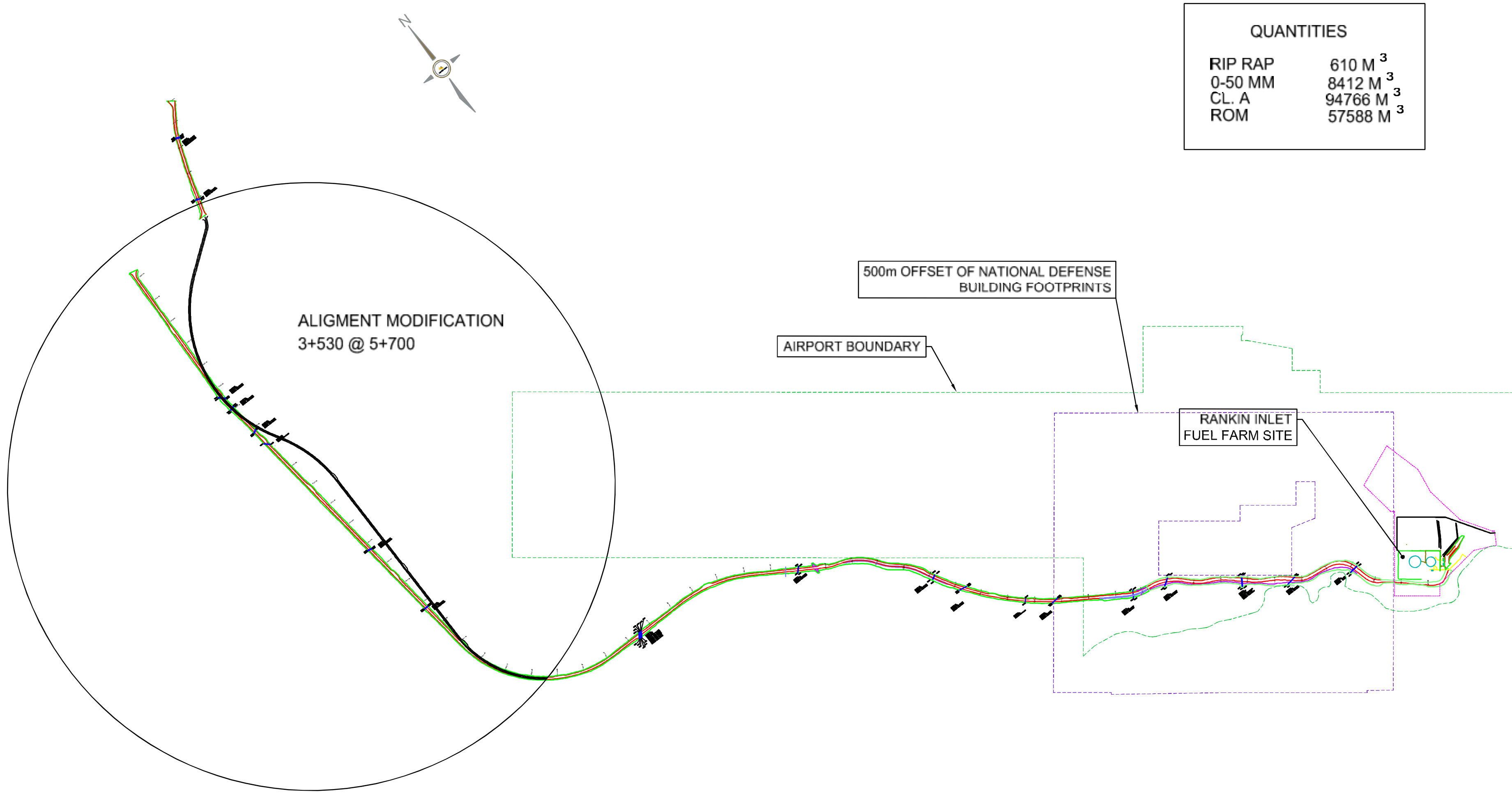
QUANTITIES

RIP RAP	36 M^3
0-50 MM	112 M^3

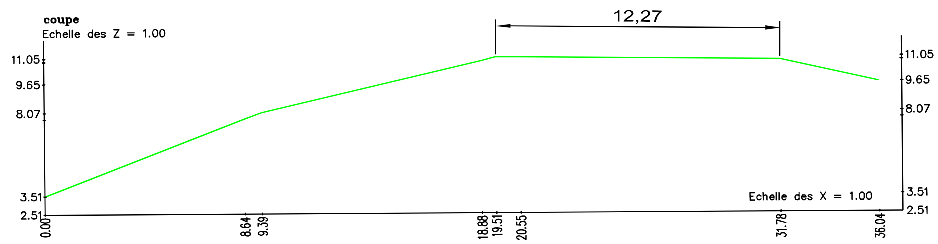
HAMELARPENTAGE

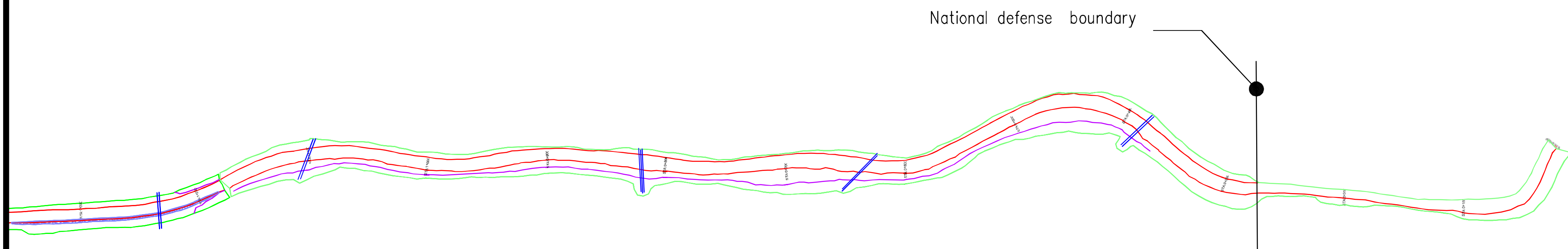
AGNICO	Date des travaux : 2017–2018	Date d'envoi : 2018–11–03
Système de Coord.: UTM15 NAD83	CULVERT 14 6+035	Dessine par: Y. Hamel
Echelle: 1:50	No plan: 65–117–142–200–R0_ABD	Approuve par: HAMEL ARP

QUANTITIES	
RIP RAP	610 M ^{3}
0-50 MM	8412 M ^{3}
CL. A	94766 M ^{3}
ROM	57588 M ^{3}



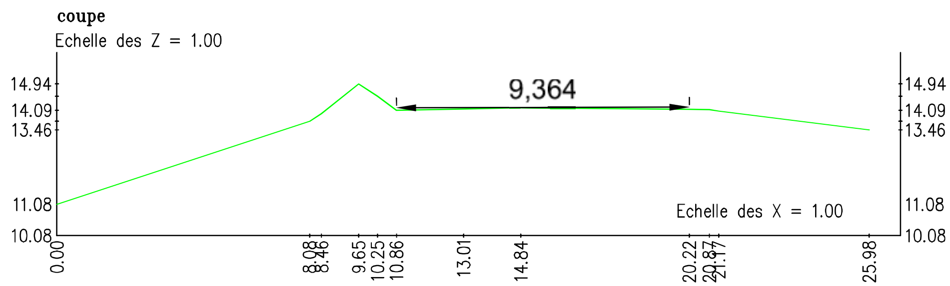
HA HAMELARPENTAGE	Système de Coord.: UTM15 NAD83 Echelle: NA	No plan: 65–117–142–200–R0–ABD	QUANTITIES	AGNICO	Date des travaux : 2017–2018 Date d'envoi : 2018–11–05	Dessine par: Y. Hamel Approuve par: HAMEL ARP

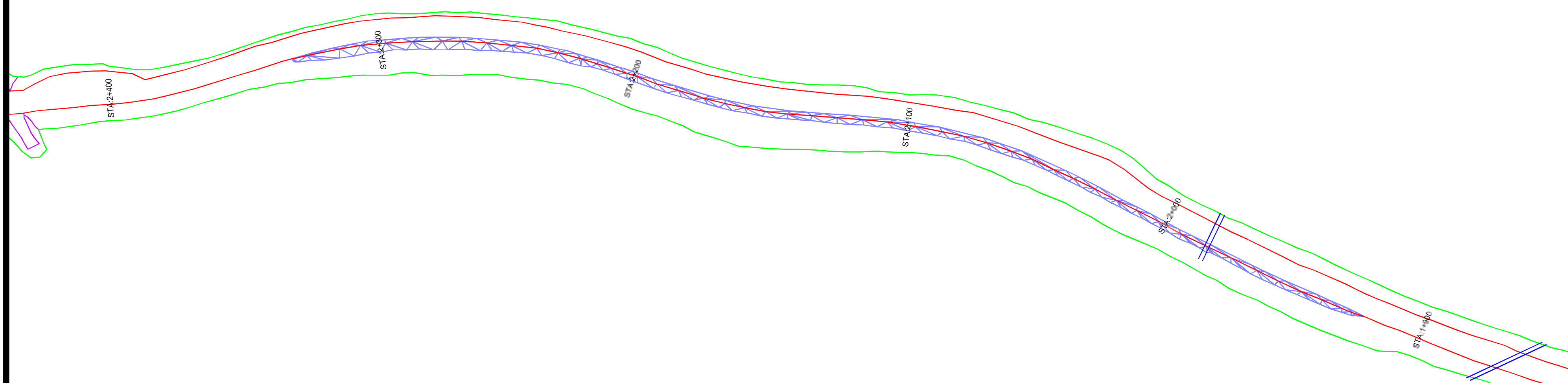




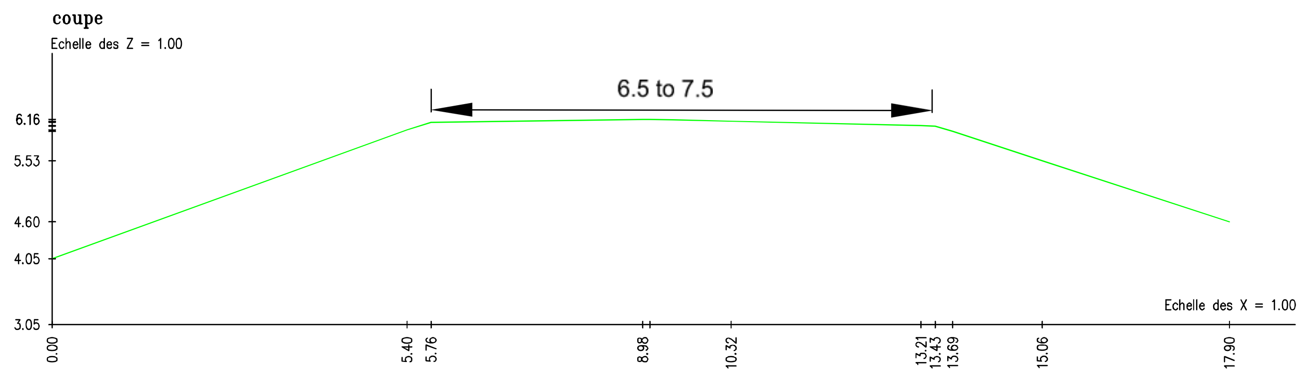
0+000 @ 1+200 WITH BOLDERS BERM PROTECTION

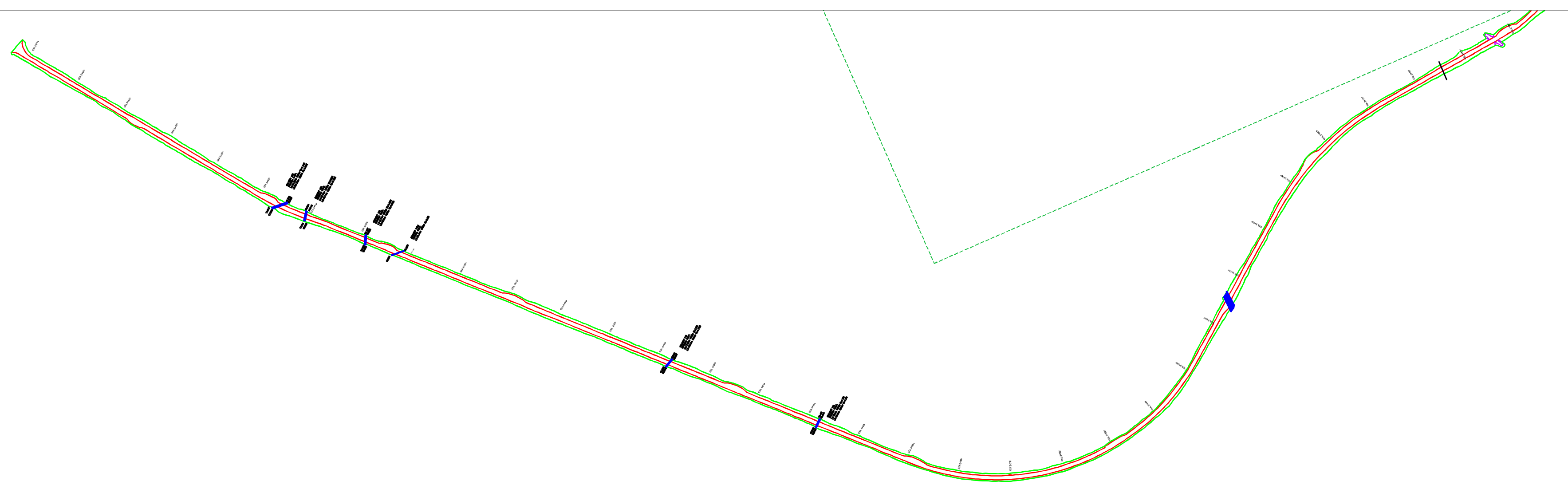
HA HAMEL ARPENTAGE	Système de Coord.: UTM15 NAD83	No plan: 65–117–142–200–R0–ABD	0 +000 @ 1+200 58722 M3 BOLDERS BERM PROTECTION	AGNICO	Date des travaux : 2017–2018	Dessine par: Y. Hamel
	Echelle: 1 : 2000				Date d'envoi : 2018–11–05	Approuve par: HAMEL ARP





HAMEL ARPENTAGE	Système de Coord.: UTM15 NAD83	No plan: 65–117–142–200–R0–ABD	SAFETY BERM 1+ 920 @ 2+330 SAFETY BERM PROTECTION	AGNICO	Date des travaux : 2017–2018	Dessine par: Y. Hamel
	Echelle: 1 : 2000				Date d'envoi : 2018–11–05	Approuve par: HAMEL ARP





HAMELARPENTAGE	Système de Coord.: UTM15 NAD83	No plan: 65–117–142–200–R0–ABD	TYP 2+350 @ 6+173	AGNICO	Date des travaux : 2017–2018	Dessine par: Y. Hamel
	Echelle: NA				Date d'envoi : 2018–11–05	Approuve par: HAMEL ARP

APPENDIX C
Photographs

RANKIN INLET BY-PASS ROAD VIEW STATION 0+000 FACING UP CHAINAGE

RANKIN INLET BY-PASS ROAD VIEW STATION 0+280 FIRST LIFT OF ROM


RANKIN INLET BY-PASS ROAD VIEW STATION 0+300 FACING DOWN CHAINAGE


RANKIN INLET BY-PASS ROAD VIEW STATION 0+500 FACING DOWN CHAINAGE

RANKIN INLET BY-PASS ROAD VIEW STATION 1+100 FACING UP CHAINAGE

RANKIN INLET BY-PASS ROAD VIEW STATION 1+300 FACING UP CHAINAGE


RANKIN INLET BY-PASS ROAD STATION 2+200 FACING DOWN CHAINAGE


RANKIN INLET BY-PASS ROAD VIEW STATION 2+360 FACING UP CHAINAGE

RANKIN INLET BY-PASS ROAD VIEW STATION 2+800 FACING DOWN CHAINAGE

RANKIN INLET BY-PASS ROAD VIEW STATION 5+700 FACING WEST
PLACEMENT OF ROAD MATERIAL


RANKIN INLET BY-PASS ROAD VIEW STATION 5+700
PLACING MATERIAL LOOKING NORTH EAST

RANKIN INLET BY-PASS ROAD SNOW
REMOVAL FROM CULVERTS


CULVERT C01 UPSTREAM


CULVERT C01 DOWNSTREAM

CULVERT C02 UPSTREAM

CULVERT C02 DOWNSTREAM

CULVERT C03 UPSTREAM

CULVERT C03 DOWNSTREAM

CULVERT C04 UPSTREAM

CULVERT C04 DOWNSTREAM

CULVERT C05 UPSTREAM


CULVERT C05 DOWNSTREAM

CULVERT C06A INSTALLATION


CULVERT C06A UPSTREAM

CULVERT C06A DOWNSTREAM

CULVERT C06B PRIOR TO INSTALLATION


CULVERT C06B UPSTREAM


CULVERT C06B DOWNSTREAM

CULVERT C07A UPSTREAM


CULVERT C07A DOWNSTREAM

CULVERT C07B UPSTREAM


CULVERT C07B DOWNSTREAM


CULVERT C09 INSTALLATION
VIEW LOOKING SOUTHWEST


CULVERT C09 UPSTREAM


CULVERT C09 DOWNSTREAM

CULVERT C10 INSTALLATION VIEW FACING DOWNSTREAM


CULVERT C10 COMPACTION OF BACKFILL

CULVERT C10 UPSTREAM

CULVERT C10 DOWNSTREAM

CULVERT C11A INSTALLATION

CULVERT C11A UPSTREAM


CULVERT C11A DOWNSTREAM

CULVERT C11B INSTALLATION

CULVERT C11B UPSTREAM


CULVERT C11B DOWNSTREAM

CULVERT C11B1 UPSTREAM

CULVERT C11B1 DOWNSTREAM


CULVERT C11C PRIOR TO INSTALLATION VIEW LOOKING NORTH


CULVERT C11C UPSTREAM

CULVERT C11C DOWNSTREAM


CULVERT C12A INSTALLATION VIEW LOOKING NORTH
CAT
CATERPILLAR

CULVERT C12A UPSTREAM


CULVERT C12A DOWSTREAM

CULVERT C12B INSTALLATION

CULVERT C12B UPSTREAM


CULVERT C12B DOWNSTREAM

CULVERT C13 INSTALLATION VIEW LOOKING SOUTH

CULVERT C13 UPSTREAM


CULVERT C13 DOWNSTREAM

CULVERT C14 INSTALLATION


CULVERT C14 UPSTREAM

APPENDIX D
Construction Summary Report of Rankin Inlet Bypass Road and Culverts

Civil Earthworks Construction Summary – Rankin Inlet By-Pass Road (2017)

- Construction management and quality assurance performed by Agnico Eagle Construction
- Primary civil construction contractor was Inukshuk Contracting Ltd. (ICL)
- All survey conducted by Hamel Arpentage

Design and Alignment Adjustments (2017)

- Construction of the By-Pass Road was originally planned to begin from both ends simultaneously: with one crew starting from km 0+000 (Rankin Inlet Fuel Farm) and working up chainage and one crew starting from km 5+600 and working down chainage. However, several challenges encountered pre-construction in 2017 prevented both an early commencement to road construction and necessitated a number of adjustments to the original design presented in the Design Report and Drawings (6515-E-132-005-132-REP-006):
  - The large fills and steep slopes presented from km 0+200 to 1+100 were challenged by the AEM Construction Team as potentially unstable, provoking a design review of alternative options. A viable alternative to significantly reduce the fills throughout this section would necessitate a slight encroachment on Department of National Defense (DND) leased property, and discussions with DND officials were initiated.
  - Staking of the design alignment on August 5 encountered two additional issues:
    a. A grave site monument was located at the centerline of km 5+860 (original alignment) requiring a shift in the design alignment approximately 200 m to the northwest
    b. Although previous discussions with community members had agreed to a relocation of the shooting range so as not to interfere with road activities, the range was actively in use at the time of the survey and plans to begin construction were halted until further discussions could be held. On August 17 it was decided that AEM would rebuild the shooting range approximately 1 km northwest of the original location. The relocation of the shooting range took about eight days to complete.
- Additional alignment modifications were made to reduce the volumes of fill material by straightening out the curves heading up chainage from Station 3+530 to the existing access community road. These alignment modifications were made with the approval of AEM Construction.
- The above noted alignment changes resulted in a rework of the chainage, so that the total length of the By-Pass road is now 6,173 m rather than the 6,350 m shown on the IFC drawings.
- It is noted on the issued for construction (IFC) drawings that “For summer construction, geotextile shall be installed between the original ground and the granular material wherever the original ground is unstable to support fill material compaction.” Due to the very short window of placement of the first lift of material in summer construction and “wet” field conditions (less than one month 2017), it was the decision of AEM construction to not place geotextile under the road fill but to instead continue with the fill to design grades and compensate the contractor for the loss penetration (an estimated 4,000 m3) of the road base granular fill into the tundra.

1. Site Preparation (August 5 to August 25, 2017)

- Multiple discussions held with airport authority, community and Department of National Defense stakeholders prior to and during project commencement (see notes above).
- Survey of original ground along alignment conducted.

2. Road Placement (August 25 to December 7, 2017)

- All 600 mm minus granular material was obtained from the Char River (Site D) borrow pit located at about km 6 on the All Weather Access Road (AWAR)
- Esker road material was mechanically excavated from the borrow source, loaded onto tandem dump trucks to the By-Pass road, then pushed into place with a bulldozer in controlled lifts
- All placed material was compacted with a 10-tonne vibratory drum.
- A total of 65, 033 m3 of 600 mm minus esker material (the first lift) was placed from km 1+500 to 6+173 during the 2017 road building campaign.

3. Culvert Installation (August 31 to November 16, 2017)

- A total of nine culvert systems were installed along the road alignment in 2017, summarized as follows:

Culvert System	Station Installed	Date of Installation		Diameter (mm)	Length (m)	No. of Culverts	Avg. Slope (%)
		Start Date	End Date				
C14	6+035	Sept 2	Sept 6	800	18	3	1.1
C13	5+800	Sept 14	Sept 14	800	18	2	1.1
C12b	5+160	Sept 9	Sept 10	1200	30	2	1.6
C12a	5+110	Sept 12	Sept 12	1200	18	2	0.8
C11c	4+990	Sept 14	Sept 15	1000	18	2	0.9
C11b-1	4+925	Sept 17	Sept 17	1000	24	1	2.3
C11b	4+375	Sept 25	Sept 25	1000	18	2	1.8
C10	3+150	Oct 21	Oct 31	1200	30	5	1.8
				1000	30	1	1.8
C9	2+500	Nov 15	Nov 16	1000	24	2	2.2

- The original culvert design specifies that a minimum of one culvert in any given culvert group configuration is to be embedded 0.3 m below natural ground level into the underlying tundra (65-117-230-209_R2). However, field observations following the installation of Culverts 12c with the design specified 0.3 m of embedment showed large volumes of ponding water within the culverts, creating concerns for potential ice jacking and damage. The contractor was directed by AEM Construction to halt embedment for all future culvert installations and instead install the culverts as per the design specifications used at Meliadine site: excavation 200 mm into original ground, backfilling, and culvert placement at original ground level. The exception to this direction was the culvert C10 system, which followed the original design of 0.3 m embedment in order to provide fish passage.
- Until September 29 2017, all culverts installed (C14 through to C11b-1) were bedded on screened 50 mm minus clean gravel from Char River/Site D. A layer of 200 g/m2 geotextile was placed between the clean gravel and the natural ground, with no sub-excavation being conducted. Approved bedding material (20 mm minus) was then placed on and around the culverts and compacted with a small hand tamper. Although this approach was approved by AEM Construction, it is noted that there may be the potential for uplift and ice jacking due to ice build-up under the culverts. Alternatively, the use of clean gravel under the culverts may create a flow of water underneath, rather than through, the culverts and risk destabilization of the

overlying road. The performance of these culverts should be monitored frequently, particularly during freshet flows.

- Culvert C9 was installed as per AEM Construction direction.
- Culvert 12c was initially installed on August 31 and was removed September 17, with one of the culverts being reinstalled at the C11b-1 location. No additional culvert system was installed at the original 12c area. When initially installed, it was shown that the design placement location was in a natural draw, with no place for the collected water to flow. It was the decision of AEM Construction to excavate a small ditch on either side of the road alignment to direct water away from the road and remove this culvert system from consideration.
- No culvert system was installed in the design specified location of C11a (approximate Station 4+800) in 2017. This culvert system will be installed prior to the 2018 freshet.

Civil Earthworks Construction Summary – Rankin Inlet By-Pass Road (2018)

- Construction management and quality assurance performed by Agnico Eagle Construction
- Primary civil construction contractors were Inukshuk Contracting Ltd. (ICL) and MTKSL
- All survey conducted by Hamel Arpentage

Design and Alignment Adjustments (2018)

- Discussions with DND officials regarding encroachment on government leased property to reduce the depth of road fills from km 0+200 to 1+100 were unsuccessful. As such, the original design and alignment of the road throughout this section were respected.
- To expediate the construction process, completion of the road was split between two contractors, with each utilizing different material sources: km 6+154 to 1+200 was completed by ICL using pit run obtained from the Char River Esker and km 0+000 to 1+200 was completed by MTKSL using rock sourced from Itivia Quarry. Road topping for the entire road surface was provided from crushed esker material produced by ICL.
- RFI-014 was initiated to address use of berm material for sections of the road greater than 3 m in height, with AEM Construction being concerned that berms would catch or trap snow and increase the maintenance required along those sections of the road affected. The Design Engineer approved use of selectively sized boulders spaced at appropriate distances to maintain the intent of safety barriers yet still allow for snow passage.
- The minimum cover depth over all culverts along the road was increased to 1.0 m in order to accommodate the expected large genset loads, as per the direction of the AEM Construction.

MTKSL Section (km 0+000 to km 1+200)

1. Site Preparation and Snow Removal (May 2 to May 11, 2018)

- Multiple discussions held with airport authority and community prior to and during project commencement.
- Survey of original ground along alignment conducted. Road and culvert locations staked.
- Snow removal from road alignment and for quarry access.

2. Road Placement (May 19 to July 24, 2018)

- The design-specified 600 mm minus granular material was predominantly obtained from the Itivia Quarry located to the east of the Tank Farm.

- A total of 57,588 m3 (surveyed as-built quantity) was placed by MTKSL for this section of the By-Pass road. Based on truck load counts (bulking factor therefore included), this material was sourced from the following:
    - o Approximately 27,740 m3 from blast rock left in place at the quarry during the 2017 blasting campaign, a portion of which was hammered down to acceptable size for placement;
    - o About 16,765 m3 from drill/blast operations conducted in 2018;
    - o An estimated 16,080 m3 was reclaimed from the Itivia overburden waste disposal area which was later converted to a laydown area (Laydown 4).
- All 600 m minus granular material was loaded from the quarry or waste disposal area, hauled to and dumped at the road, then pushed into place with a bulldozer. After placement, all material was compacted with a 10-tonne vibratory drum roller. Sloping to the minimum design grade of 2.5H:1V occurred as the number of lifts increased, so as not to exceed the reach of the excavator.
- Crest widths within this section were built as per design, with a minimum of 6.5 m running surface from Stations 0+000 to 0+222 and at least 8.0 m running surface within the DND lease boundary from Stations 0+222 to 1+200.
- The minimum road material design depth of 1.3 m was respected throughout the MTKSL section.

3. Safety Barrier

- Placement of safety barriers are a Mine Act requirement for those sections of road with a drop of 3 m or greater. As per RFI-14 described above, select boulders (approximate width of 1 m, minimum height of 1.25 m with no sharp edges presented on road side) were strategically placed (two boulders placed together to form a minimum 2.5 m long barrier with 1 m distance kept between barrier sections) to act as safety barriers. A total of 227 boulders were placed as safety barriers along approximately 824 m of roadway from approximate Stations 0+000 to 0+044 and 0+375 to 1+160.
- Although safety barriers were also specified on the IFC drawings between Stations 0+290 to 0+303), as-built fill heights were less than 3 m along this section.

4. Culvert Installation (May 24 to July 12, 2018)

- MTKSL was responsible for placement of four (4) culvert systems within their section of road, summarized as follows:

Culvert System	Station Installed	Date of Installation		Diameter (mm)	Length (m)	No. of Culverts	Avg. Slope (%)
		Start Date	End Date				
C1	0+385	May 24	May 27	1000	36.0	2	4.9
C2	0+635	June 6	June 12	700	42.0	2	10.5
C3	0+820	June 26	June 30	1000	36.0	2	5.9
				700	36.0	1	5.9
C4	1+100	July 10	July 12	1000	30.0	2	6.6

- Culverts C1, C3 and C4 were placed in the design-specified locations. The position of Culvert C2 was field fit based on observations of freshet flows.

- 20 mm minus bedding material for the culverts consisted of crushed esker material from the Char River quarry.

5. **Slope Erosion Rip Rap Installation (July 22 to July 25, 2018)**

- Two areas of the MTKSL road section fall within the License "A" 31 m limit (km 0+412 to 0+509 and km 0+631 to 0+740). As specified in the design basis report and the IFC drawings, 600 to 1000 mm rip rap was placed to a design thickness of 1 m within these areas.

ICL Section (km 1+200 to 6+173)

1. **Site Preparation and Snow Removal (May 16 to May 22, 2018)**

- Snow was removed around previously installed culverts for freshet flows.

2. **Road Placement (May 24 to September 1, 2018)**

- As in 2017, all 600 mm minus granular material was obtained from the Char River (Site D) borrow pit. Material was placed and compacted as in 2017.
- Sloping to the design-specified 2.5H:1V occurred after final lift placement and compaction of the 600 mm minus granular material, but prior to the final placement of road topping.
- Crest widths within this section were built as per design, with a minimum of 8.0 m running surface within the DND lease boundary from Stations 1+200 to 1+492 and at least 6.5 m running width for the remaining length of roadway. Road widths were expanded as per design in areas approaching tie-ins with existing roads.
- A total of eleven (11) pullouts were installed along the ICL road section as per design, with their locations being at the approximate chainage as specified.
- The minimum design road material thickness of 1.3 m above original ground was generally respected throughout this section of roadway.

3. **Safety Barrier**

- The IFC drawings specified that one section of the ICL roadway required a safety barrier as per the Mine Act (Station 2+100 to 2+308). However due to the height of the fills, this barrier was extended by about 200 m and was placed from Station 1+920 to 2+330. Fill heights of 3 m or greater were also the rationale for extension of the safety barrier from 1+160 to 1+330 (approximately 170 m). The safety barrier constructed by ICL in these sections consisted of a berm of 600 mm minus Class A esker material as per design specifications. The height and side slopes of these berms generally conform to design.

4. **Culvert Installation (May 22 to August 22, 2018)**

- A total of six culvert systems were installed along the road alignment in 2018, summarized as follows:

Culvert System	Approx. Station Installed	Date of Installation		Diameter (mm)	Length (m)	No. of Culverts	Avg. Slope (%)
		Start Date	End Date				
C11a	4+080	May 22	May 24	1200	18.0	2	1.6
C7b	1+985	May 31	June 2	800	18.0	2	5.3
C7a	1+865	June 3	June 6	800	30.0	2	1.2
C6-1	1+635	June 7	June 7	800	18.0	1	3.5

C6	1+525	June 8	June 10	800	30.0	2	2.0
C5	1+235	June 16	June 18	1000	30.0	2	3.0

- Culvert 8 was not installed due to very steep topography, particularly directly upstream of the proposed culvert location.
- An additional single culvert, C6-1, was installed based on field observations of freshet flows.
- With the exception of the above noted deviations, all other culvert systems were installed in the design-specified location.

5. **Road Topping (August 18 to September 16)**

- 30 mm minus road topping material was also sourced from the Char River borrow pit, crushed on site and hauled for placement along the full road alignment (MTKSL and ICL sections). Compaction efforts after placement consisted of a minimum of four (4) passes with a 10-ton vibratory drum compactor.
- As a final step, calcium chloride was applied to the road topping and compacted for dust control.

6. **Slope Erosion Rip Rap Installation (Future 2019 Work)**

- One area of the ICL road section falls within the License "A" 31 m limit (km 1+297 to 1+353). As specified in the design basis report and the IFC drawings, 600 to 1000 mm rip rap will be placed to a design thickness of 1 m within these areas.

Equipment Used for Construction

(MTKSL 2018):

- CAT D8 Bulldozer
- CAT D6 Bulldozer
- CAT 349 Excavator
- CAT 345 Excavator
- CAT 330 Excavator
- CAT 980 Loader
- IT62 Loader
- CAT 740 Articulated Haul Trucks
- CAT CS56 10-ton vibratory drum compactor
- Various small hand-pushed compactors
- Komatsu PC400 with rock hammer attachment (Fournier et Fils)
- Drill (Canadrill)

(ICL 2017/2018):

- CAT D8 Bulldozer
- CAT D6 Bulldozer
- CAT 320 Excavator
- CAT 345 Excavator
- Jaw crusher/screener
- Tandem dump trucks
- CAT CS56 10-ton vibratory drum compactor
- Various small hand-pushed compactors

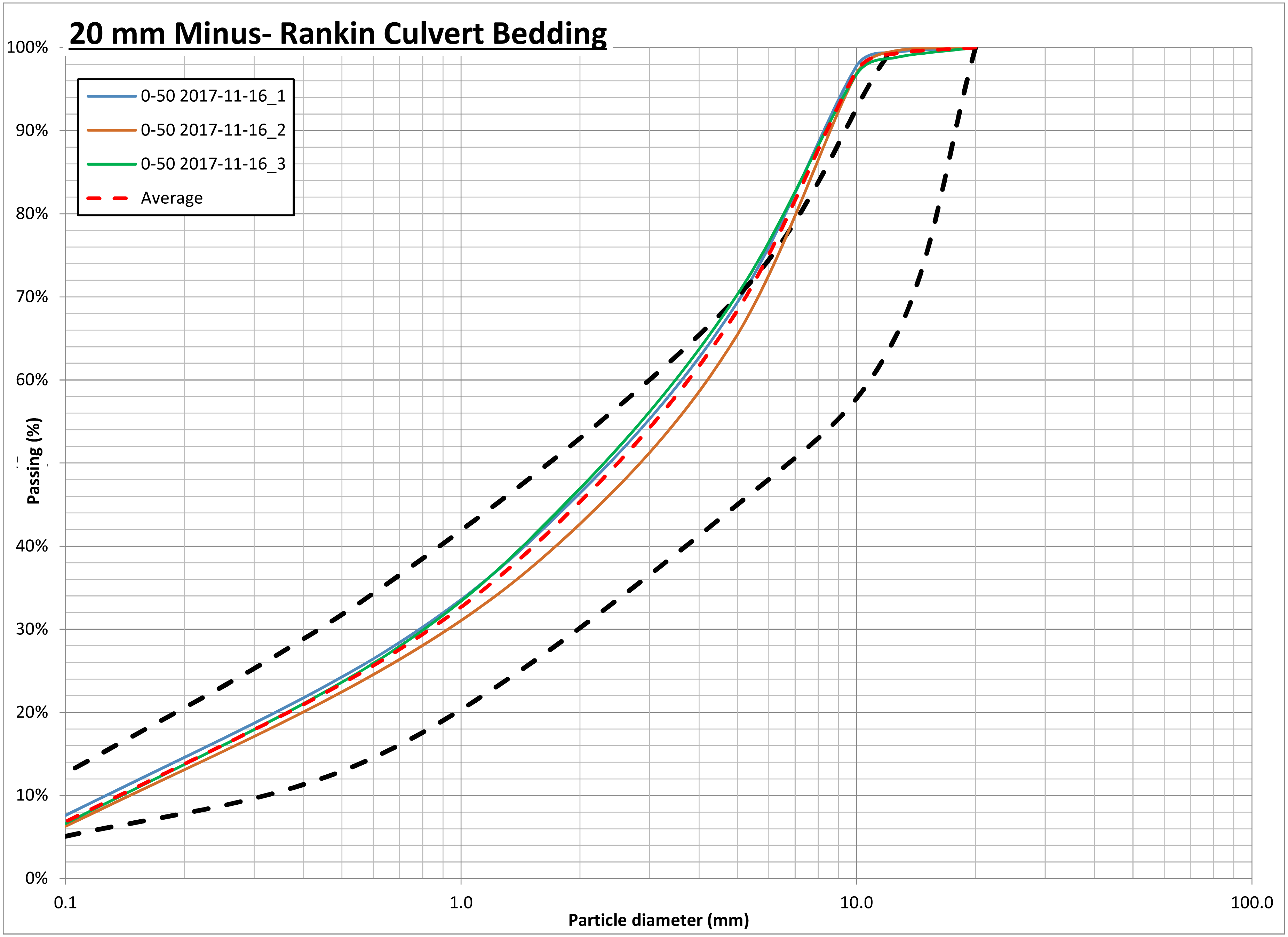
QA/QC Summary

1. All earthworks material used for road construction not subject to particle size analysis (600 mm minus granular material from both Char River (Site D) and Itivia (quarry and laydown); culvert rip

rap; and slope erosion rip rap) was visually assessed as satisfactory for placement by AEM Construction.

2. All granular material was placed according to the Technical Specifications for Civil Earthworks Revision 3 (6515-GNS-014, June 6, 2017). Compaction efforts consisted of a minimum number (4) of passes with a 10-tonne vibratory compactor and were approved by AEM Construction.
3. Particle size analysis conducted on the culvert bedding material (attached) indicate that the material generally falls within specification for 20 mm minus Liner Bedding Fill (Technical Specifications for Civil Earthworks Rev 3 (6515-GNS-014, June 6, 2017)).
4. Particle size analysis conducted on the 30 mm minus road topping material (attached) indicates that the material is generally low on particles sized between 5 and 14 mm but contains an adequate percentage (5.2% average) of fines to achieve compaction.

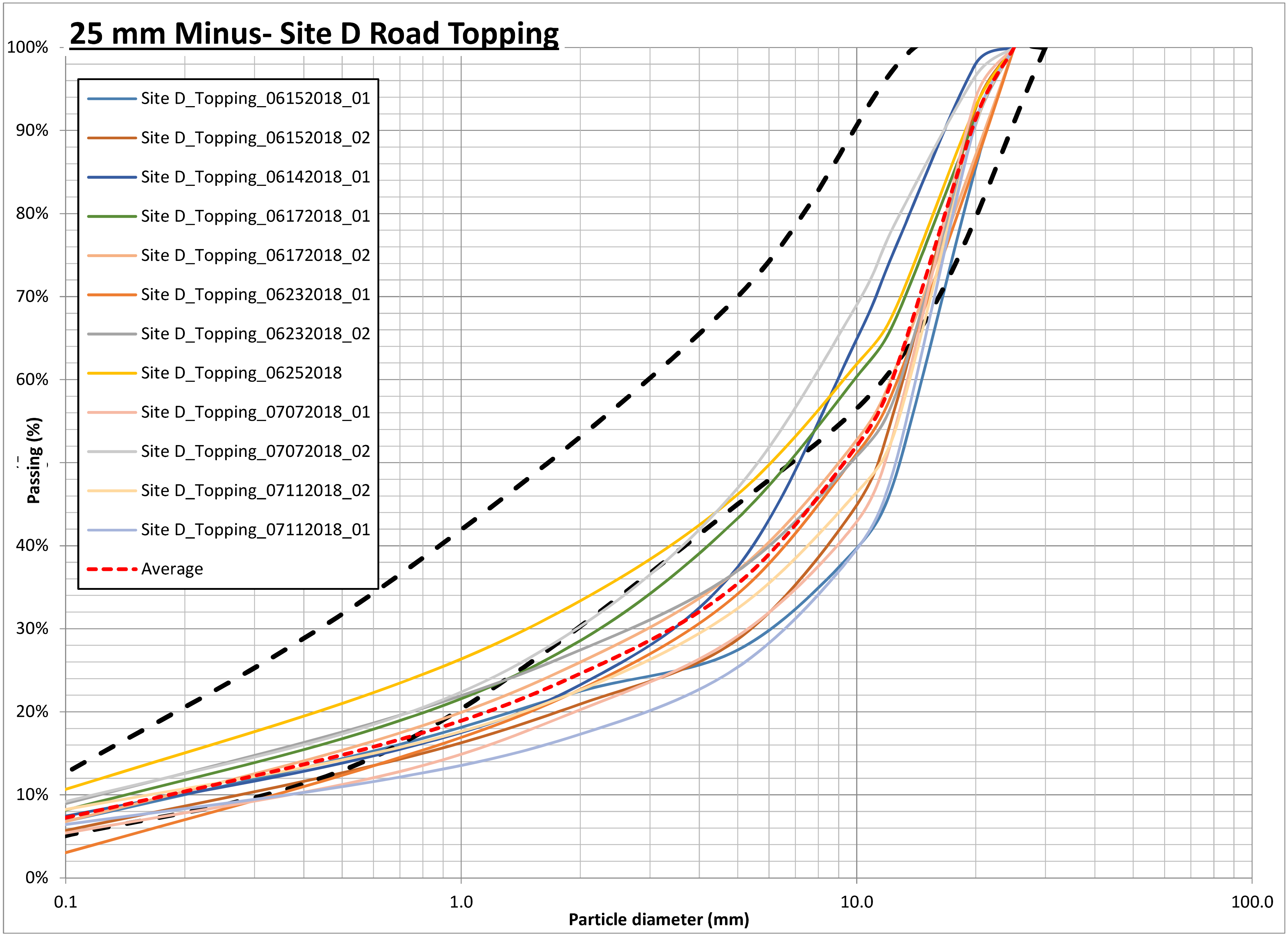
APPENDIX E
Particle Size Summary



20 mm Minus- Rankin Culvert Bedding
0-50 2017-11-16_1
0-50 2017-11-16_2
0-50 2017-11-16_3
Average
Passing (%)
100%
90%
80%
70%
60%
40%
30%
20%
10%
0%
0.1
1.0
10.0
100.0
Particle diameter (mm)

Table 1: Summary of Particle Size Analysis Results - 20 mm minus Culvert Bedding Rankin

No.	Sample ID	Sieve Size (mm)							Moisture Content
		20.00	12.50	10.00	5.00	2.00	0.63	0.08	
1	0-50 2017-11-16_1	100.0%	99.4%	97.8%	69.3%	46.4%	27.1%	5.3%	3.0%
2	0-50 2017-11-16_2	100.0%	99.6%	96.9%	65.5%	42.7%	25.1%	4.0%	4.2%
3	0-50 2017-11-16_3	100.0%	98.8%	96.8%	70.3%	46.9%	26.5%	4.2%	4.1%
Average		**100.0%**	**99.3%**	**97.1%**	**68.4%**	**45.3%**	**26.2%**	**4.5%**	**3.8%**



25 mm Minus- Site D Road Topping
Site D_Topping_06152018_01
Site D_Topping_06152018_02
Site D_Topping_06142018_01
Site D_Topping_06172018_01
Site D_Topping_06172018_02
Site D_Topping_06232018_01
Site D_Topping_06232018_02
Site D_Topping_06252018
Site D_Topping_07072018_01
Site D_Topping_07072018_02
Site D_Topping_07112018_02
Site D_Topping_07112018_01
Average
Passing (%)
Particle diameter (mm)
0%
10%
20%
30%
40%
60%
70%
80%
90%
100%
0.1
1.0
10.0
100.0

Table 1: Summary of Particle Size Analysis Results - 25 mm minus Site D Road Topping

No.	Sample ID	Sieve Size (mm)								Moisture Content
		25.00	20.00	12.50	10.00	5.00	2.00	0.63	0.08	
1	Site D_Topping_06152018_01	100.0%	85.6%	48.1%	39.7%	27.4%	22.5%	15.5%	5.8%	1.5%
2	Site D_Topping_06152018_02	100.0%	92.7%	56.6%	44.9%	28.7%	20.9%	13.8%	4.8%	1.7%
3	Site D_Topping_06142018_01	100.0%	98.0%	75.8%	64.9%	37.4%	23.3%	14.9%	6.6%	2.1%
4	Site D_Topping_06172018_01	100.0%	91.5%	67.1%	60.4%	43.3%	28.6%	18.2%	7.0%	3.0%
5	Site D_Topping_06172018_02	100.0%	87.1%	61.2%	52.7%	37.0%	26.0%	16.8%	5.6%	2.6%
6	Site D_Topping_06232018_01	100.0%	86.1%	59.2%	51.1%	34.2%	22.7%	13.8%	1.7%	1.6%
7	Site D_Topping_06232018_02	100.0%	90.8%	58.0%	50.8%	37.0%	27.4%	18.9%	7.8%	1.6%
8	Site D_Topping_06252018	100.0%	92.9%	68.4%	61.9%	46.2%	33.4%	22.7%	9.2%	1.9%
9	Site D_Topping_07072018_01	100.0%	93.9%	54.2%	42.9%	29.1%	20.2%	12.3%	4.6%	2.8%
10	Site D_Topping_07072018_02	100.0%	96.6%	78.8%	69.0%	46.9%	30.3%	18.8%	8.1%	3.4%
11	Site D_Topping_07112018_01	100.0%	91.1%	49.7%	39.6%	25.4%	17.3%	11.8%	5.8%	0.5%
12	Site D_Topping_07112018_02	100.0%	90.9%	53.8%	46.4%	32.5%	22.6%	15.2%	7.4%	0.5%
Average		**100.0%**	**91.4%**	**60.9%**	**52.0%**	**35.4%**	**24.6%**	**16.1%**	**6.2%**	**1.9%**

APPENDIX F
Design Report for Crossing C10 with a Group of Culverts Instead of a Bridge

AMENDMENT#01 TO 6515-E-132-005-132-REP-006:

DESIGN REPORT FOR CROSSING C10 ON RANKIN INLET BYPASS ROAD MELIADINE PROJECT, NUNAVUT

PRESENTED TO

Agnico Eagle Mines Ltd.

AUGUST 2017
ISSUED FOR USE
TETRA TECH PROJECT NUMBER: 28920
AGNICO EAGLE DOCUMENT NUMBER: 6515-E-132-005-132-REP-006_AMENDMENT01

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1.0 INTRODUCTION

Agnico Eagle Mines Limited (Agnico Eagle) is developing the Meliadine Project, a gold mine located approximately 25 km north from Rankin Inlet, and 80 km southwest from Chesterfield Inlet in the Kivalliq Region of Nunavut. The proposed project site is located on the peninsula between the East, South, and West basins of Meliadine Lake (63°01'23.8"N, 92°13'6.42"W) on Inuit Owned Land.

As presented in the Design Report 6515-E-132-005-132-REP-006 issued for use in March 2017, Agnico Eagle intents to build a bypass road to divert traffic around the community of Rankin Inlet to minimize impacts on the Community (dust, noise, traffic, etc…). The bypass road will be 6.1 km long.

With respect to water management and fish habitat protection, some group of culverts shall be installed along the road to allow surface water to drain properly. Refer to Figure 2 given in appendix A of the initial Design Report 6515-E-132-005-132-REP-006 to have a global layout of the bypass road and proposed culverts.

In the initial report, the final design at the crossing C10 was pending due to the lack of information on fish and fish habitat, as well as on the watershed, the existing ground, the watercourse and the existing flow at the crossing. Indeed, the presence of snow during the engineering phase prevented the engineering team from completing a field survey and gather on-site relevant information to decide if either a bridge or a group of culverts would be recommended.

From May to July 2017, some site visits and surveys were conducted. It appears that the flow to be managed in crossing C10 is much less than the one expected by theoretical calculations. It has also been observed that the area was totally dry after the freshet. As a consequence, the engineering team recommends to install a group of culverts instead of a bridge at Crossing C10.

This document will summarize design basis, considerations, criteria and the detailed design for the crossing C10 with a group of culverts (Culvert#C10), as specified under Water License 2AM-MEL1631, Part D Item1.

2.0 DESIGN OF CULVERT #C10

2.1 Culvert Design Basis and Water Management Strategy

The overall objective of the water management strategy of this project is to develop a practical and feasible site-wide water management plan to minimize the potential negative impacts of mining development on the surrounding environment including habitats for fish and wildlife, and to facilitate mine operation and long-term closure and reclamation of the mine site. To attain this objective, culverts are used to control and divert runoff underneath the bypass road.

More precisely, the Culvert#C10 is required to allow the passage of runoff water under the future bypass road at the south outlet of Lake Cygnet. The design of Culvert#C10 will respect the recommended culvert's configurations for a potential fish habitat area.

2.2 Hydraulic analyses and peak flow calculations

The catchment area for the crossing C10 was delineated using the 2014 ML survey data (refer to Figure 2 provided in appendix A of the initial Design Report 6515-E-132-005-132-REP-006). Hydrologic and hydraulic analyses were carried out for the crossing to determine the culvert sizes to accommodate 25-year peak design flows at this location.

Because the catchment area is greater than 50 ha for the Crossing C10, a regional analysis approach was used to estimate 25-year peak flows.

Two Water Survey of Canada streamflow gauge stations were considered:

- Akkutuak Creek near Baker Lake with a drainage basin area of 18 km^2
- Qinguk Creek near Baker Lake with a drainage basin area of 392 km^2

Also considered as part of the regional analysis were peak flows for the All Weather Access Road for the Meliadine Gold Project developed by Golder for 11 drainage crossings with catch basin areas ranging from 16 to 1431 ha (Golder, 2010).

Historical flow data was obtained from the Water Survey of Canada (Water Survey of Canada, 2014) and the annual maximum flows were identified for each station for each year of record. A statistical analysis using HYFRAN-PLUS software was performed on the collected data and the peak flow for a 25 year return period was obtained for each station. The results were plotted in order to identify a correlation between the peak discharge and catchment area in order to provide a conservative estimate for the remaining larger catchment areas on the site.

Estimated 25-year peak flow for Crossing C10 catchment area which is greater than 50 ha was subjectively determined considering the Golder and WSC-derived results and the amount of lake storage in each basin which would attenuate the peak flow.

The estimated peak flow at Crossing C10 is summarized in Table 2.1 below:

Table 2.1: Estimated Peak Flow at Crossing C10

Crossing Name	Drainage Area (ha)	Return Period (years)	Estimated Peak Flow (m^3/s)
C10	1004.3	1:25	5.40
		1:10	4.59
		1:5	3.89
		1:2 (annual)	2.92

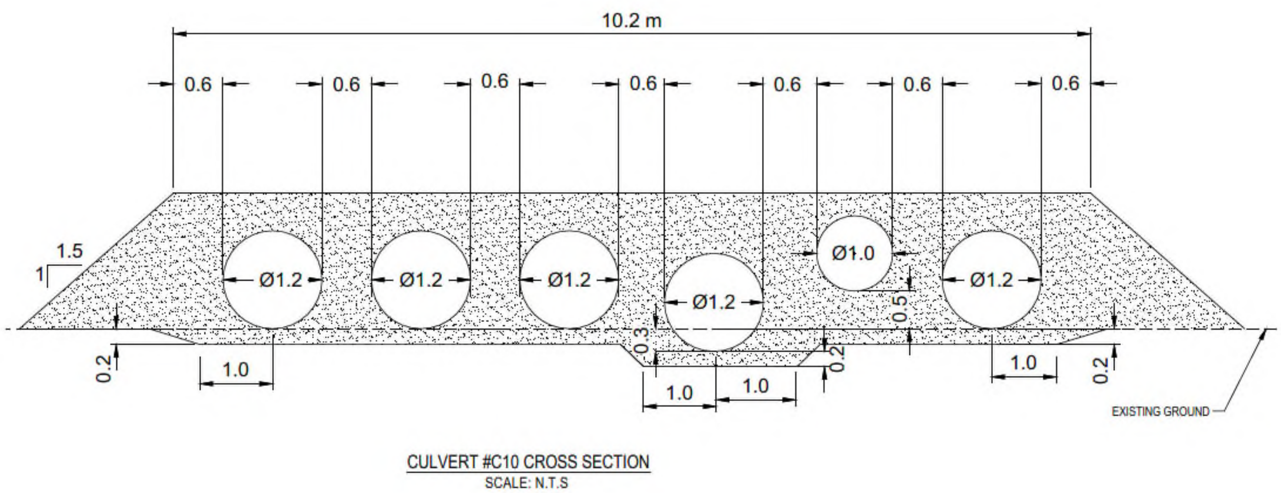
2.3 Culvert specifications for C10

2.3.1 Characteristics and configuration for culverts at Crossing C10

At Crossing C10, a combination of 6 culverts (5 x Ø1.2 m and 1 x Ø1.0 m) is recommended in order to convey the designed peak flow. An "offset stacked" configuration will be used to enable flow conveyance before complete ice break-up within the watercourses (Golder, 2010). The lowest culvert will also be embedded into the watercourse to provide low water potential fish passage. Moreover, the embedded culvert will be aligned with the stream centerline surveyed on field.

The configuration of the group of culvert for C10 is presented in Figure 2.1 below.

Figure 2.1: Cross-section for culverts at Crossing C10



The proposed culverts at Crossing C10 will be installed during the construction of the bypass road and will be in service for up to 15 years. The standard galvanized, corrugated steel pipe culvert is proposed with a corrugation profile of 68X13 mm and a thickness of 2.8 mm.

A minimum of 850 mm fill cover shall be placed over the culverts. The backfill around the culverts will be Granular Fill 0-50 mm and shall be placed in lifts no greater than 0.3 m thick and compacted to a minimum of 90% of Maximum Dry Density (Modified Proctor test).

The table below presents the characteristics for the group of culverts at Crossing C10.

Table 2.1: Characteristics for Culvert #C10

No.	Number of culvert x diameter	Length of Culverts (m)	Slope (%)
C10	5 x Ø1200mm 1 x Ø1000mm	6 x 27 m	0.5 %

2.3.2 Calculation of culvert capacity

To determine the culvert capacity, the Continuity equation and Manning formula were used.

Table 2.2: Culvert capacity at Crossing C10

No.	Drainage Area (ha)	Peak Flow (m^3/s) (1:25 years)	Number of culvert x diameter	Slope (%)	Culvert Capacity (m^3/s)
C10	1004.3	5.40	5 x Ø1200mm 1 x Ø1000mm	0.5 %	8.45

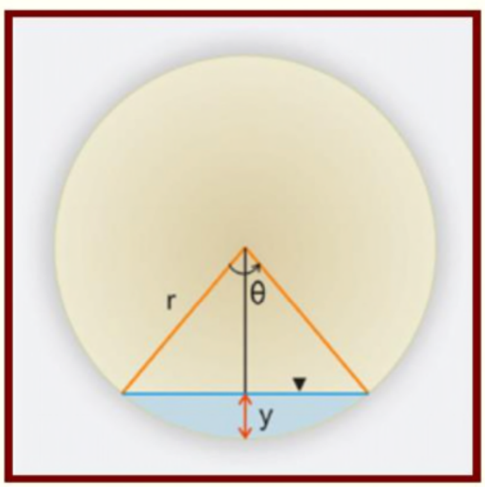
As indicated in the table above, the capacity of the proposed group of culverts is 8.45 m^3/s, which is greater than the 5.40 m^3/s estimated peak flow for a Return Period of 1:25 years.

Moreover, the capacity of the proposed group of culverts is greater than the estimated peak flow (1:25 years) by 56%, which allows a buffer for any "wet Freshet" events.

2.3.3 Calculation of the velocity in culverts

To calculate the velocity in the culverts, the estimated peak flow is considered to be distributed in 5 culverts (4 culverts at ground level and 1 embedded).

The velocity is calculated with the following formula and the results are presented in Table 2.3.



Formulas

$$\theta = 2\cos^{-1}[1 - 2(y/D)]$$

$$A = (D^2/8)(\theta - \sin\theta)$$

$$P = r\theta$$

$$R = A/P$$

$$Q = (k/n)\,AR^{2/3}S^{1/2}$$

$$V = Q/A$$

Table 2.3: Velocity calculations at different return period rainfall events

Return Period (years)	Peak Flow (m^3/s)	Flow per culvert (m^3/s)	Velocity at peak flow in each culverts (m/s)
1:25	5.40	1.08	1,44
1:10	4.59	0.92	1.39
1:5	3.89	0.78	1.33
1:2 (annual)	2.92	0.58	1.23

.

The estimated velocity of 1.44 m/s for a 1:25 years return period is adequate to prevent erosion problem caused by washout effects. Erosion control measures are also indicated in section 2.4.

For a peak flow associated to an annual rainfall event with a return period 1:2 years, the estimated velocity is 1.23 m/s, which is adequate to allow fish passage.

2.4 Erosion Control

To control erosion, rip rap of diameter 50-300 mm will be installed around the culvert inlet and outlet areas, and on a length of 3 m minimum. The riprap will come from a NPAG source of rock. For the rip rap section, see drawing 65-117-230-230 provided in Appendix B of the initial Design Report 6515-E-132-005-132-REP-006.

During installation of the culverts, if required, straw logs will be used in the work area to prevent total suspended solids from reaching downstream water bodies. The plan is to start construction in fall 2017, when the ground is expected to be dry.

2.5 Site visits, surveys and other considerations

As mentioned, field surveys have been undertaken from May to July 2017 at the location of Crossing C10.

- Observations from field surveys conducted in May 2017 :
    - The run-off flow observed was during Freshet
    - The main flow runs into a well-marked channel :
        - Water depth : 30 to 45 cm
        - Channel width : 30 cm maximum
    - The wet area outside the main channel was from 0.5 m to 6 m wide
    - The flow velocity in the channel was measured at 0.6 m/s
    - The routing of the channel and the surrounding area were surveyed with a GPS station
- Site visit during July 2017
    - The area was totally dry

Based on field calculations, design and observations, it is considered that the proposed design of a group of culverts for managing runoff water at the Crossing C10 is adequate. Indeed, the proposed group of culverts will allow the passage of the estimated peak flow under the future bypass road. It will cover a wider width at the inlet than the spread wet area observed and the impact on the fish and fish habitat will be minimized.

3.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Agnico Eagle Mines Ltd. and their agents. Tetra Tech does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Agnico Eagle Mines Ltd., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech's Services Agreement.

4.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2017. 07. 28
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

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28.07.2017

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APPENDIX G
Design Report for Culvert C13 and C14

AMENDMENT #2 TO 6515-E-132-005-132-REP-006:

DESIGN REPORT FOR RANKIN INLET BYPASS ROAD CULVERTS C13 AND C14 MELIADINE PROJECT, NUNAVUT

PRESENTED TO

Agnico Eagle Mines Ltd.

SEPTEMBER 2017
ISSUED FOR USE
TETRA TECH PROJECT NUMBER: 28920
AGNICO EAGLE DOCUMENT NUMBER: 6515-E-132-005-132-REP-006_AMENDMENT02

Tetra Tech
5100, Sherbrooke street east, suite 400
Montreal, QC H1V 3R9, CANADA
Tel 514.257.1112 Fax 514.257.0717

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 Site Location and Access

Agnico Eagle Mines Limited (Agnico Eagle) is developing the Meliadine Project (the Project), a gold mine located approximately 25 km north from Rankin Inlet, and 80 km southwest from Chesterfield Inlet in the Kivalliq Region of Nunavut. The proposed project site is located on the peninsula between the East South, and West basins of Meliadine Lake (63°01'23.8"N, 92°13'6.42"W) on Inuit Owned Land.

As presented in the Design Report 6515-E-132-005-132-REP-006 issued for use in March 2017, Agnico Eagle intents to build a bypass road to divert traffic around the community of Rankin Inlet to minimize impacts on the Community (dust, noise, traffic, etc…). The bypass road will be 6.1 km long.

Following the water management plan, several group of culverts will be installed along the road to allow surface water to drain properly,

From May to July 2017, some site visits and surveys were conducted, providing sufficient information to further define the west portion of the bypass road. It appears that two additional crossings are required in that portion to allow natural drainage, while there was 12 crossings analysed in the initial report.

The required culverts are Culvert C13 and Culvert C14, located on the west portion of the Rankin Inlet Bypass Road, north of Nipissak Lake and east of a small lake, in a section between an existing community road and the actual AWAR, as shown in the stations 5+900 and 6+200. The site location is shown in Figure 1 (Appendix A).

2.0 DESIGN

2.1 Culvert Design Basis and Water Management Strategy

The overall objective of the water management strategy of this project is to develop a practical and feasible site-wide water management plan to minimize the potential negative impacts of mining development on the surrounding environment including habitats for fish and wildlife, and to facilitate mine operation and long-term closure and reclamation of the mine site. To attain this objective, culverts are used to control and divert runoff crossing the road and new facilities.

The location of proposed Culvert C13 and Culvert C14 along the course of the Rankin Inlet Bypass Road are shown in Drawing 65-117-230-201 presented in Appendix B while Drawing 65-117-230-209 presents typical cross-sections of the culverts in Appendix C.

2.2 Hydraulic Analyses and Peak Flow Calculations

Hydrologic and hydraulic analyses were carried out to determine culvert sizes to accommodate a 25-year peak design flow.

The Rational Method was applied to calculate the peak flows. The Intensity-Duration-Frequency (IDF) curve developed by Environment and Climate Change Canada for Rankin Inlet Station was used (Environment Canada 2014). A 1 in 25 year rainfall intensity for a duration equivalent to the time of concentration of the catchment area was considered to determine the design peak flow for each culvert.

The time of concentration (T_C), which represents the time it takes for the most remote portion of the catchment to contribute to the flow at the outlet of the catchment, was calculated using the Kirpich equation (Akan, A. O., & Houghtalen, R. J.,2003). For catchments where TC < 10 min, a TC of 10 minutes was used for design purposes.

The estimated peak flow, culvert capacity and characteristics of each culvert are summarized in Table 2.1.

Table 2.1: Characteristics of the culverts

CULVERT	C13	C14
Pipe's number and Ø (mm)	2 x Ø 800	3 x Ø 800
Length of each culvert (m)	23	19
Slope (%)	0.86	2.0
Corrugated profile (mm)	68x13	68x13
Thickness (mm)	2.8	2.8
Minimum cover over culvert (mm)	825	825
Estimated Peak Flow (m^3/s)	0.75	0.93
Culvert Flow Capacity (m^3/s)	1.33	3.04

2.3 Culvert Specifications

The proposed culverts will be in service for up to 15 years. The standard galvanized, corrugated steel pipe culvert, with a profile of 68 x13 mm and a minimum thickness of 2.8 mm is proposed.

A minimum of fill cover will be placed over the culverts according to the material thickness and the manufacturer's recommendations for heavy traffic as shown in the table provided on drawing 65-117-230-209 presented in Appendix C.

The backfill around the culverts will be granular fill 0-50 mm, or an approved equivalent, and will be placed in layers no greater than 0.3 m thickness and compacted to a minimum of 95% of Standard Proctor Maximum Dry Density (ASTM D698). Typical cross-section for the culverts are shown on drawing 65-117-230-209 provided in Appendix C.

Details and layout for the culverts are shown on drawings 65-117-230-209 and 65-117-203-212 presented in Appendix C.

2.4 Erosion Control

To control erosion, rip-rap of diameter 50-300 mm will be installed around the inlet and outlet areas of culverts. The rip-rap material will come from a NPAG source of rock, see drawing 65-117-230-209 given in Appendix C.

During the installation of the culverts, if required, straw logs will be used in the work area to prevent total suspended solids from reaching downstream water bodies.

3.0 FIGURES AND DRAWINGS

Figure 1 in Appendix A shows the mine site location.

Drawing 65-117-230-201 in Appendix B shows a general overview of the Rankin Inlet Bypass Road plan/profile including the proposed culverts location.

The following construction drawings are presented in Appendix C and show details for the culverts construction:

- 65-117-230-209: RIBR Details/Sections including culverts installation details
- 65-117-230-212: RIBR Plan/Profile 5+900 to 6+312 showing Culvert C13 and Culvert C14

4.0 LIMITATIONS OF REPORT

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5.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2017·09·27
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

Respectfully submitted,
Tetra Tech

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2017-09-27

Reviewed by:
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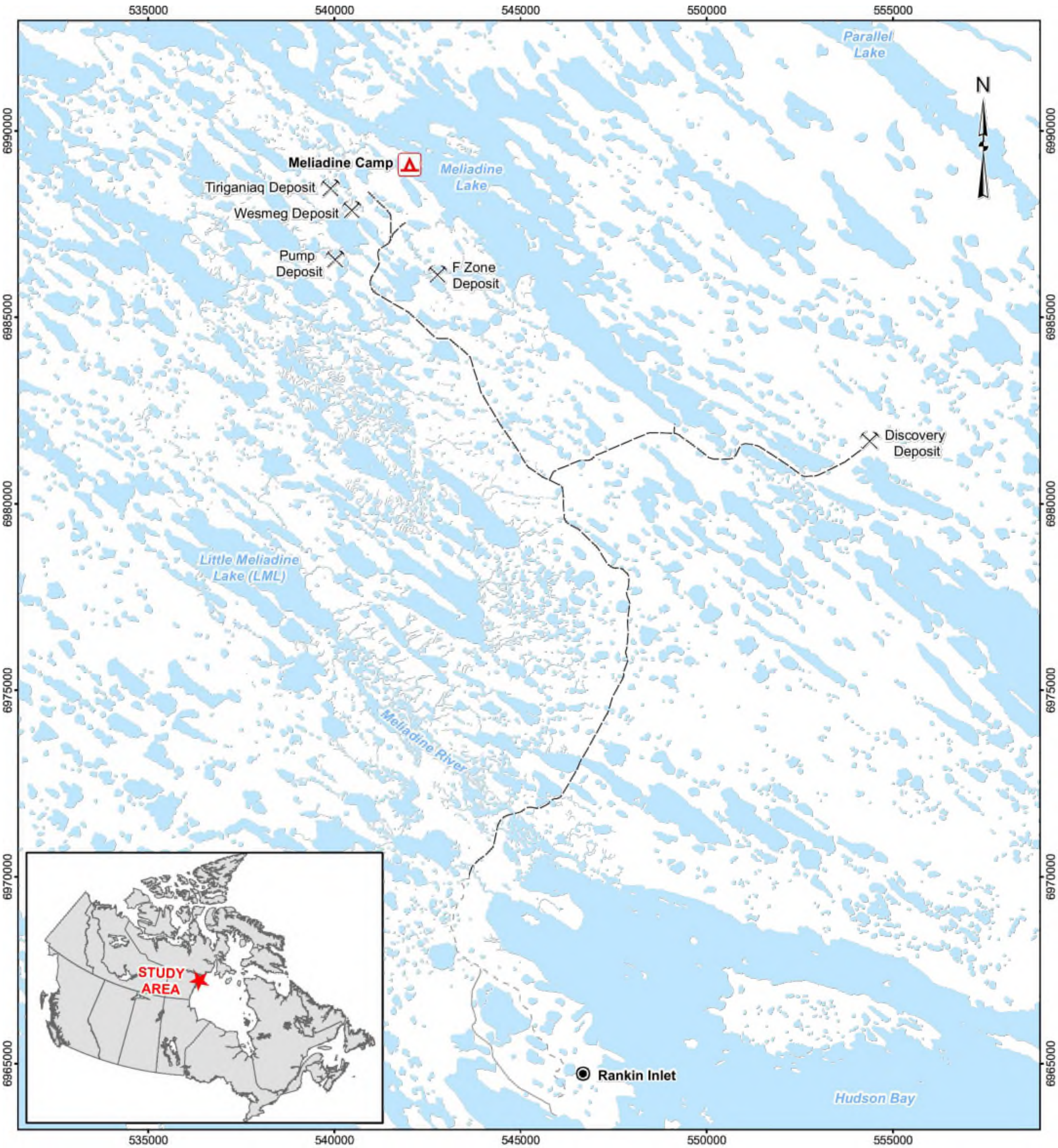
APPENDIX A

Figure 1 – Site Location



LEGEND

- Camp
- Proposed Mine Site
- All-weather Access Road (AWAR)
- Road - New
- Road - Existing
- Watercourse
- Waterbody

AGNICO EAGLE – MELIADINE DIVISION

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GENERAL PROJECT LOCATION PLAN

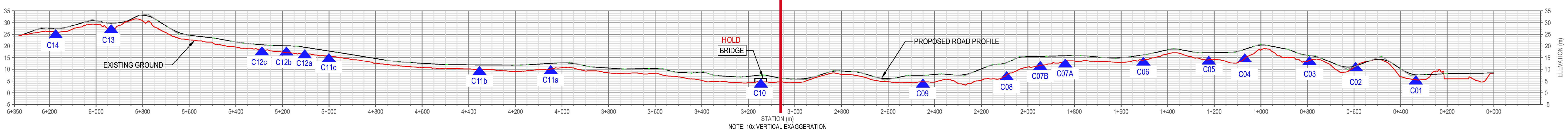
No. PROJET PROJECT No.		DATE 2017–05–04	
DESSINÉ PAR DRAWN BY	M. SENNADJ		FEUILLE/SHT 1 / 1
APPROUVÉ PAR APPROVED BY	R. PANAZAN		
NO. DESSIN DRAWING NO.	FIGURE 1		REVISION A

APPENDIX B

Drawing 65-117-230-201
Rankin Inlet Bypass Road Plan/Profile General Overview

NO. DESSIN DRAWING NO. 65-117-230-201_R3

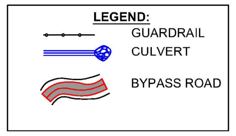
FORMAT ARCHD



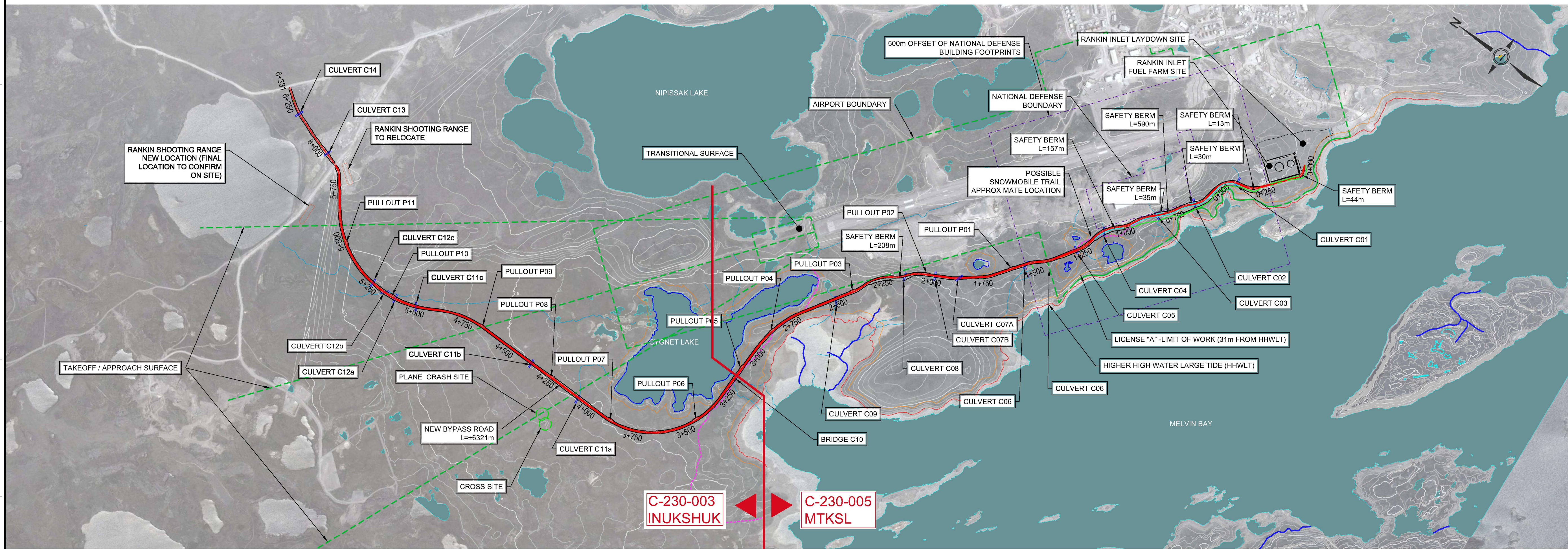
131-Hamlet Bypass road

C-230-003 INUKSHUK

C-230-005 MTKSL



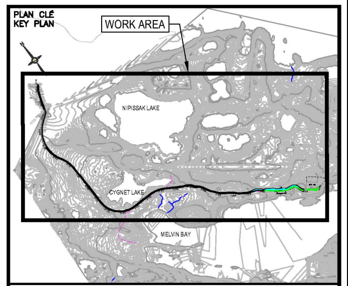
POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2017-07-20
AGNICO EAGLE



QUANTITY CONSTRUCTION CHART*								
*THEORETICAL MEASURE IN PLACE QUANTITIES								
AGGREGATE MATERIAL	BYPASS ROAD (3+130 TO 5+863)		BYPASS ROAD (5+863 TO 6+321)		CULVERTS (C11a,C11b,C11c, C12a, C12b, C12c)	CULVERTS (C13, C14)	BRIDGE ABUTMENTS (HOLD)	OVERALL
	AREA (FOOTPRINT) = 41 382 m^2		AREA (FOOTPRINT) = 6 267 m^2					
	AVE. THICK. (mm)	REQUIRED (m^3)	AVE. THICK. (mm)	REQUIRED (m^3)	REQUIRED (m^3)	REQUIRED (m^3)	REQUIRED (m^3)	REQUIRED (m^3)
CL.A. OR GRANULAR MATERIAL (0-600 mm)	1 450	44 012	1 410	6 540	-	-	-	50 552
GRANULAR MATERIAL (0-30 mm)	-	-	-	-	-	-	400	400
GRANULAR MATERIAL (0-50 mm)	150	2 965	150	480	1 125	336	-	4 426
RIP RAP (50-300 mm)	-	-	-	-	223	74	-	297
TOTAL		46 977		7 020	1 348	410	400	55 675

QUANTITY CONSTRUCTION CHART*						
*THEORETICAL MEASURE IN PLACE QUANTITIES						
AGGREGATE MATERIAL	BYPASS ROAD (0+000 TO 3+130)		SAFETY BERM SHOULDER	SAFETY BERM	CULVERTS (C01 TO C09)	OVERALL
	AREA (FOOTPRINT) = 61 925 m^2			L=1077m		
	AVE. THICK. (mm)	REQUIRED (m^3)	REQUIRED (m^3)	REQUIRED (m^3)	REQUIRED (m^3)	REQUIRED (m^3)
CL.A. OR GRANULAR MATERIAL (0-600 mm)	1 801	81 637			-	81 637
CL.A. OR GRANULAR MATERIAL (0-600 mm) OR OVERBURDEN MATERIAL	-	-	18 809	3 066	-	21 875
GRANULAR MATERIAL (0-50 mm)	150	3 480			2 173	5 653
RIP RAP (50-300 mm)	-	-			385	385
RIP RAP FOR TOE OF EMBANKMENT (600 - 1000 mm)	-	760			-	760
TOTAL		85 877			2 558	110 310

PLAN CLÉ KEY PLAN



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NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

1. EXISTING GROUND DTM PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. ELEVATIONS IN DRAWING PROVIDE FINISHED GRADE ELEVATIONS AT THE TOP OF THE SURFACE GRAVEL LAYER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY, SECURITY AND SLOPES OF ALL EXCAVATIONS/ BACKFILL AND SHALL ABIDE BY ALL RELEVANT STANDARDS AND REGULATIONS. THE STABILITY, DEWATERING AND MAINTENANCE OF ALL EXCAVATIONS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
5. GRANULAR MATERIAL 0-30 mm OR 0-50 mm SHALL BE PLACED IN LIFTS NOT EXCEEDING 300 mm AND COMPACTED TO A MINIMUM OF 98% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR). BORROW PIT MATERIAL, GRANULAR FILL MATERIAL 0-600 mm OR OVERBURDEN MATERIAL SHALL BE PLACED IN LIFTS NOT EXCEEDING 600 mm AND COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR) . MOISTURE CONDITIONING MAY BE REQUIRED PRIOR TO COMPACTION.
6. OVERBURDEN MATERIAL CAN BE USED FOR FILL IN SPECIFIED AREAS ONLY WHEN APPROVED BY FIELD GEOTECHNICAL ENGINEER.
7. AN AS-BUILT DRAWING SHALL BE PROVIDED AFTER CONSTRUCTION.
8. THE LOCATION, ELEVATION AND LENGTH OF CULVERT GROUP SHALL BE CONFIRMED ON SITE.

HOLD

9. THE BRIDGE AND ABUTMENTS, WITH THE EXCEPTION OF BACKFILL, SHALL BE PROVIDED BY OTHERS.
10. CONTRACTOR SHALL INSTALL THE BRIDGE AND ABUTMENTS AS PER THE RECOMMENDATIONS AND SPECIFICATIONS OF THE SUPPLIER.
11. NO EQUIPMENT CAN BE STORED AND NO DEPOSITION OF EXCAVATED AND STOCKPILED MATERIALS CAN BE DONE WITHIN THE LICENCE "A" - LIMIT OF WORK (31M) LINE.
12. FOR SUMMER CONSTRUCTION, GEOTEXTILE SHALL BE INSTALLED BETWEEN THE ORIGINAL GROUND AND THE GRANULAR MATERIAL WHEREVER THE ORIGINAL GROUND IS UNSTABLE TO SUPPORT FILL MATERIAL COMPACTION.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
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2	2017-07-06	ISSUED FOR C-230-005, ECN#005	S.M.	J.A.	
1	2017-04-27	ISSUED FOR CONSTRUCTION	C.M.	J.A.	
0	2017-03-17	ISSUED FOR CONSTRUCTION	C.M.	J.A.	
C	2017-03-14	ISSUED FOR PERMIT	C.M.	J.A.	
B	2017-02-24	ISSUED FOR TENDER	M.Y.	J.A.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
PLAN / PROFILE
GENERAL OVERVIEW

DESSINÉ PAR DRAWN BY	PATRICK HAMEL	DATE 2017-03-17
VERIFIÉ PAR CHECKED BY	JOSÉE ALARIE	2017-03-17
APPROUVÉ PAR APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE SCALE 1:10000	DATE 2016-11-07	
NO. DESSIN DRAWING NO.	65-117-230-201	
NO. PROJET PROJECT NO. 6515 / 28920	REVISION 3	FEUILLE / SHT 1 / 1

AE-CART-ARCH D

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FILE NO. 65-117-230-201_R3.dwg

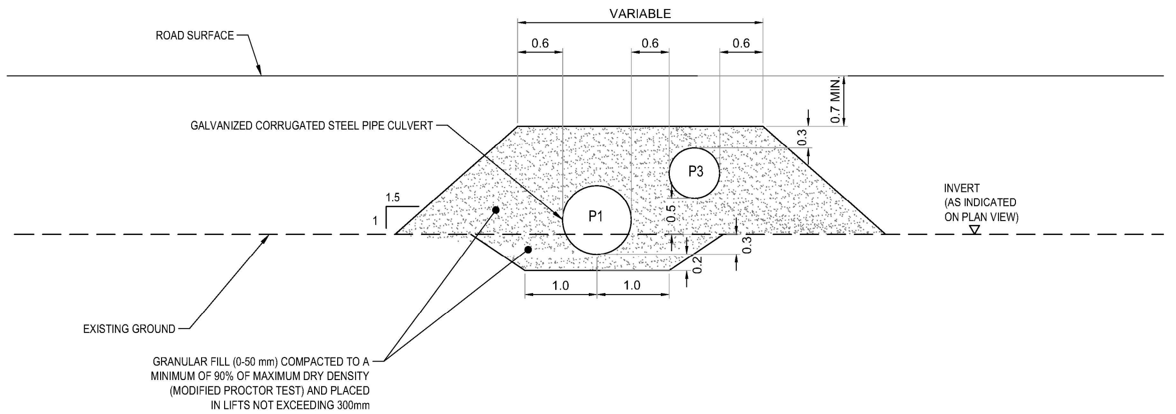
APPENDIX C

Construction Drawings :

- 65-117-230-209
- 65-117-230-212

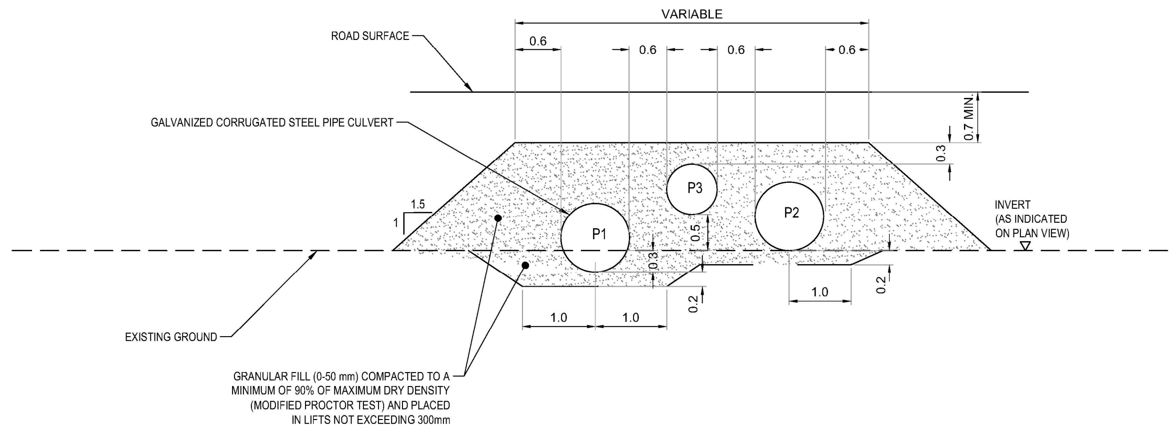
NO. DESSIN DRAWING NO. 65-117-230-208TO210_R3

FORMAT ARCHD



TYPICAL CROSS SECTION - CONFIGURATION #A

SCALE 1:50



TYPICAL CROSS SECTION - CONFIGURATION #B

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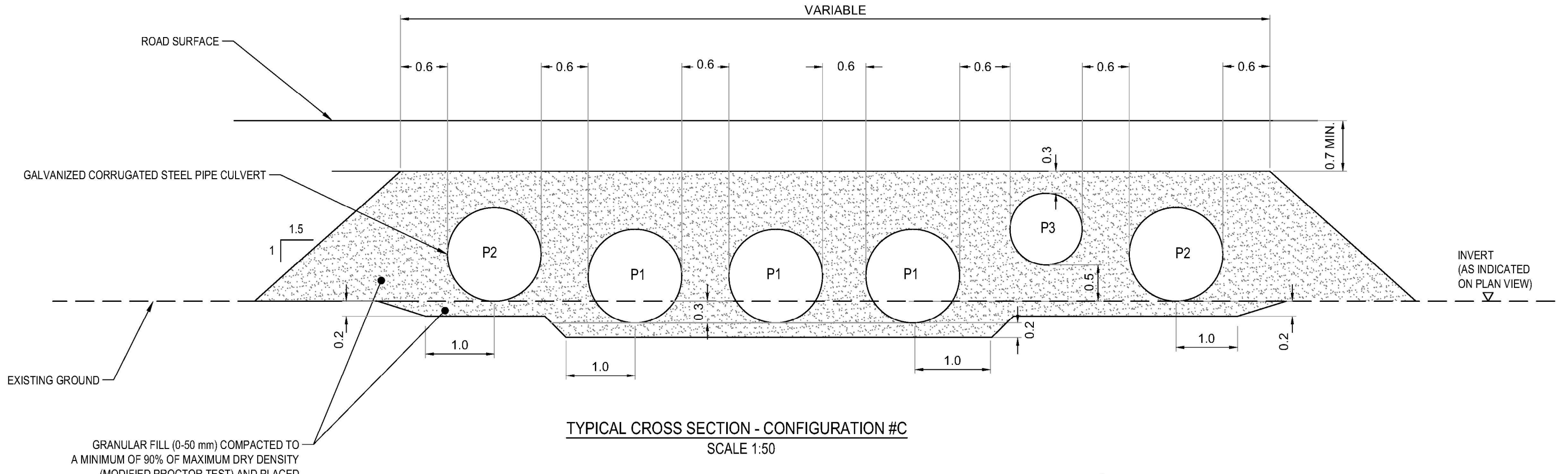
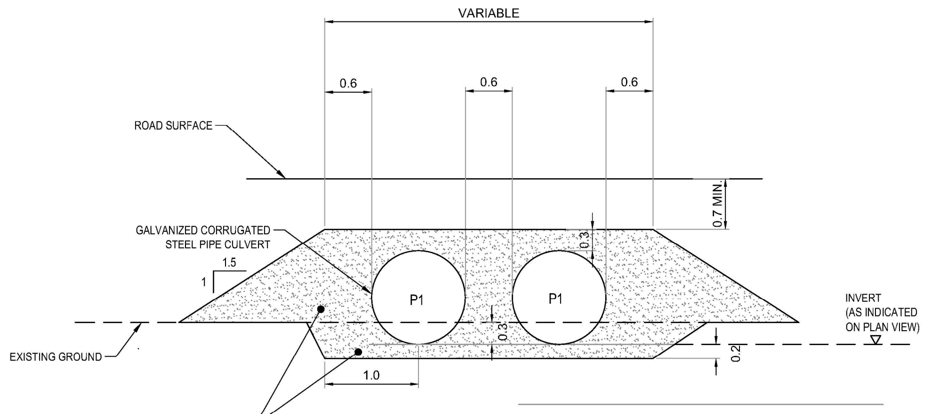


TYPICAL CROSS SECTION - CONFIGURATION #C

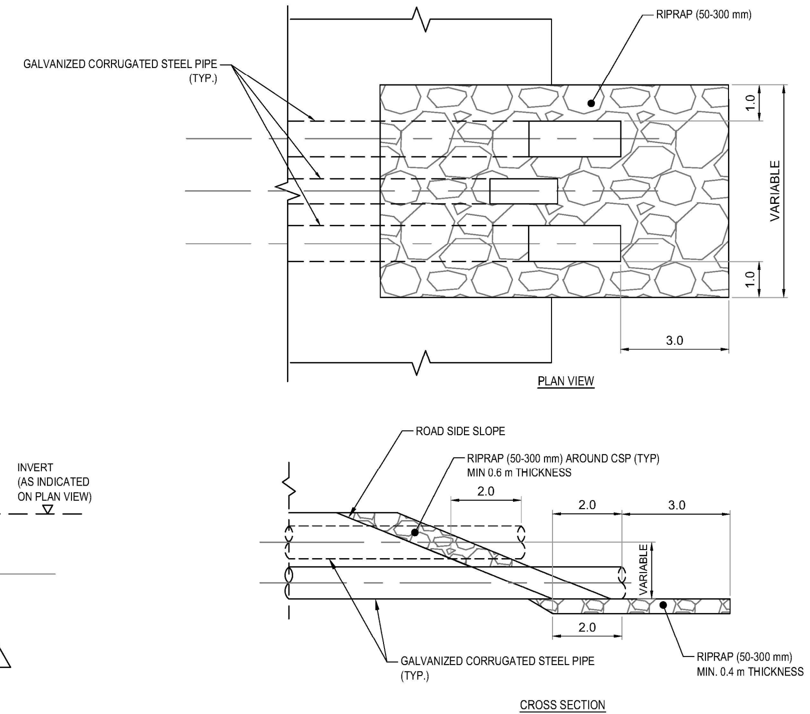
SCALE 1:50



TYPICAL CROSS SECTION - CONFIGURATION #D

SCALE 1:50

2



TYPICAL DETAIL - CULVERT RIPRAP FOR BOTH INLET AND OUTLET

SCALE = N.T.S

No	CONFIGURATION OF THE GROUP OF CULVERTS	CULVERT POSITION						TOTAL NUMBER OF CULVERT	APPROX. LENGTH OF EACH CULVERT (m)
		P1		P2		P3			
		(EMBEDDED)		(NON-EMBEDDED)		(NON-EMBEDDED and HIGH POSITION)			
		Nb of culverts	Ø (mm)	Nb of culverts	Ø (mm)	Nb of culverts	Ø (mm)		
C01	A	1	1000			1	1000	2	34.8
C02	A	1	700			1	700	2	42.4
C03	B	1	1000	1	1000	1	700	3	49.3
C04	A	1	1000			1	1000	2	35.9
C05	D	2	1000					2	23.1
C06	D	2	800					2	31.8
C07a	D	2	800					2	32.0
C07b	D	2	800					2	17.6
C08	D	1	1000					1	36.9
C09	A	1	1000			1	1000	2	23.4
C10	ON HOLD – Final design for C10 is not available. C10 will be a bridge or a group of culverts with a configuration type C.								
C11a	D	2	1200					2	23.0
C11b	D	2	1000					2	19.0
C11c	D	2	1000					2	22.
C12a	D	2	1200					2	23.6
C12b	D	2	1200					2	34.0
C12c	D	2	1000					2	19.0
C13	D	2	800					2	23.0
C14	D	3	800					3	19.0

Notes:

1. Culverts are provided by AEM. Culverts will be Galvanized Corrugated Pipes, with a profile of 68x13 mm.

2. At any time, the minimum backfill cover indicated in the table below shall be respected.

CULVERT DIAMETER (mm)	GAUGE (mm)	PROFILE (mm)	Min COVER (mm) (required at any time)
600	2	68x13	750
700	2	68x13	800
800	2.8	68x13	825
900	2.8	68x13	825
1000	2.8	68x13	850
1200	2.8	68x13	850

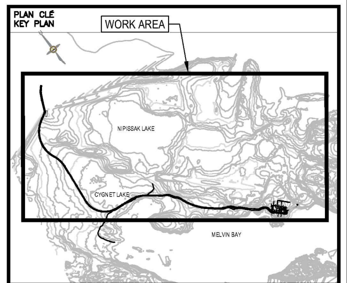
3. The installation of the culverts shall be conform to the Manufacturer instructions.

4. The maximum allowable slope for culverts is 6%. Install RipRap to fill the gap between the pipe bottom and the existing ground if required.

TABLE: CULVERTS CHARACTERISTICS

3

PLAN CLÉ KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

1. ALL UNITS ARE IN METERS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY, SECURITY AND SLOPES OF ALL EXCAVATIONS/ BACKFILL AND SHALL ABIDE BY ALL RELEVANT STANDARDS AND REGULATIONS. THE STABILITY, DEWATERING AND MAINTENANCE OF ALL EXCAVATIONS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
3. THE LOCATION, ELEVATION AND LENGTH OF CULVERT GROUP SHALL BE CONFIRMED ON SITE.
4. AN AS-BUILT DRAWING SHALL BE PROVIDED AFTER CONSTRUCTION.

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2017-07-20
AGNICO EAGLE

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
3	2017-07-20	ISSUED FOR C-230-005, ECN#004	S.M.	J.A.	
2	2017-07-05	ISSUED FOR C-230-003, ECN#005	S.M.	J.A.	
1	2017-04-27	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
0	2017-03-17	ISSUED FOR CONSTRUCTION	S.M.	J.A.	
B	2017-02-24	ISSUED FOR TENDER	M.Y.	J.A.	
A	2017-02-03	ISSUED FOR COMMENTS	M.Y.	J.A.	

REVISIONS

TITRE / TITLE

AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
DETAILS / SECTIONS

DESSINÉ PAR DRAWN BY	MOURAD SENNADJ	DATE 2017-03-17
VERIFIÉ PAR CHECKED BY	SOLENE MOREAU	2017-03-17
APPROUVÉ PAR APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE SCALE	AS SHOWN	DATE 2017-02-03

NO. DESSIN DRAWING NO. 65-117-230-209

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6515 / 28920	3	1 / 1

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FILE NO. 65-117-230-208to210_R3.dwg

NO. DESSIN
DRAWING NO. 65-117-230-212_R0

FORMAT ARCHD

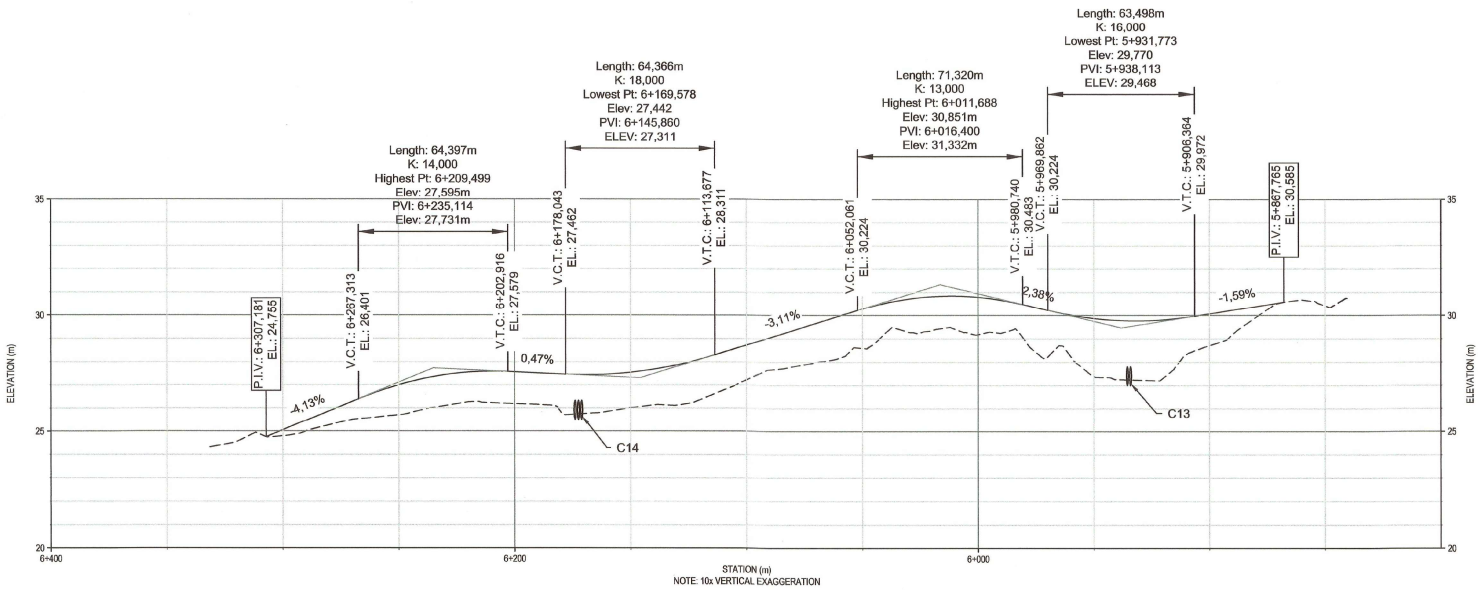
GEOMETRY DATA TABLES FOR THE BYPASS ROAD

TABLE 1 : HORIZONTAL ALIGNMENT DATA

Number	Type	Parameter Constraint	Length	Start Station	End Station	PI Station	Start Point	End Point	Center Point	PI Point
1	Line	Two points	22.176m	5+840.44m	5+862.62m		(543228.5552m, 6967471.2772m)	(543237.5341m, 6967491.5537m)		
2	Line	Two points	149.288m	5+862.62m	6+011.91m		(543237.5341m, 6967491.5537m)	(543281.2841m, 6967634.2871m)		
3	Curve	Radius	64.583m	6+011.91m	6+076.49m	6+044.21m	(543281.2841m, 6967634.2871m)	(543302.1907m, 6967695.3807m)	(544237.3789m, 6967341.2297m)	(543290.7506m, 6967665.1716m)
4	Line	Two points	68.324m	6+076.49m	6+144.81m		(543302.1907m, 6967695.3807m)	(543326.3877m, 6967759.2765m)		
5	Curve	Radius	106.287m	6+144.81m	6+251.10m	6+198.27m	(543326.3877m, 6967759.2765m)	(543376.7162m, 6967852.5374m)	(543700.4630m, 6967617.6161m)	(543345.3200m, 6967809.2700m)
6	Line	Two points	81.325m	6+251.10m	6+332.43m		(543376.7162m, 6967852.5374m)	(543424.4784m, 6967918.3588m)		

TABLE 2 : VERTICAL ALIGNMENT DATA

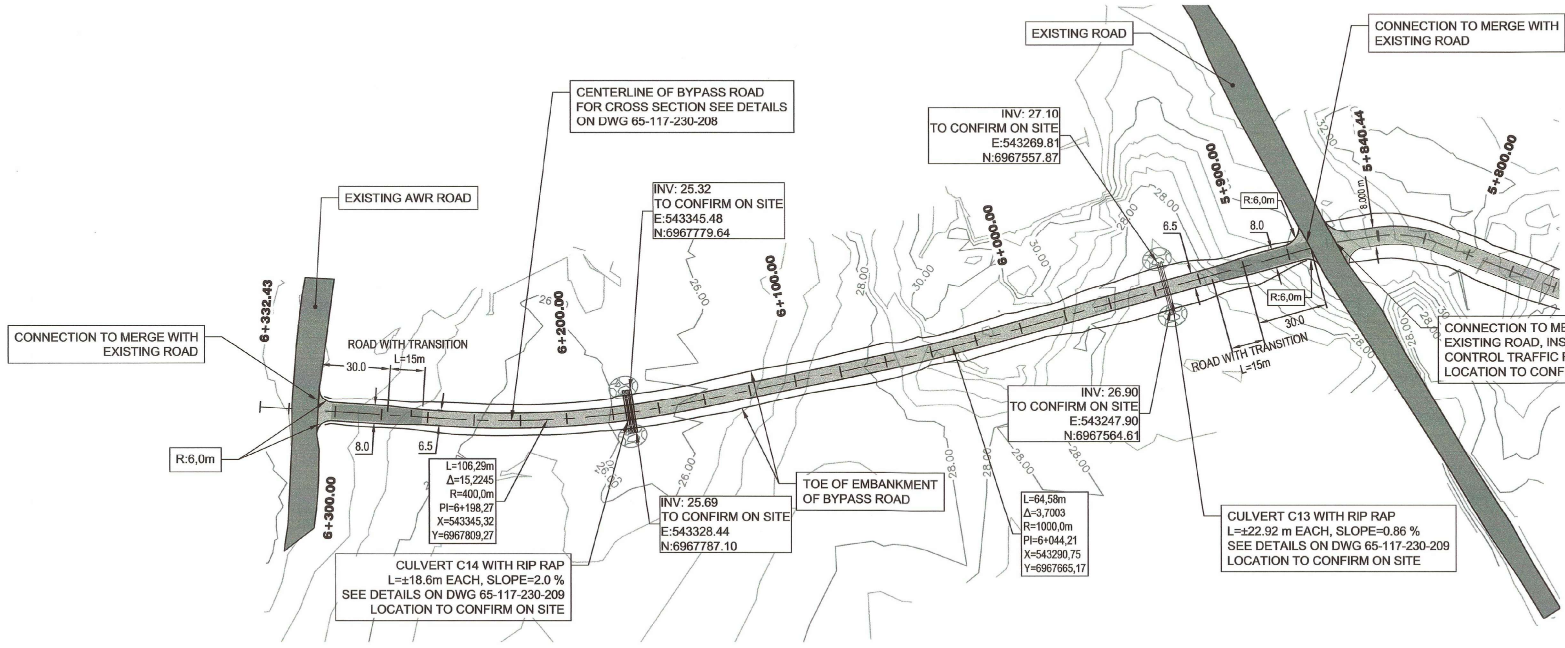
Number	PVI Station	PVI Elevation	Grade In	Grade Out	A (Grade Change)	Profile Curve Type	Profile Curve Length	K Value	Curve Radius
1	5+867.77m	30.585m		-1.59%					
2	5+938.11m	29.468m	-1.59%	2.38%	3.97%	Sag	63.498m	16	1600.000m
3	6+016.40m	31.332m	2.38%	-3.11%	5.49%	Crest	71.320m	13	1300.000m
4	6+145.86m	27.311m	-3.11%	0.47%	3.58%	Sag	64.366m	18	1800.000m
5	6+235.11m	27.731m	0.47%	-3.64%	4.11%	Crest	57.514m	14	1400.000m
6	6+307.18m	24.755m	-0.0413						



PROFILE
SCALE HOR.: 1:1500
SCALE VER.: 1:150

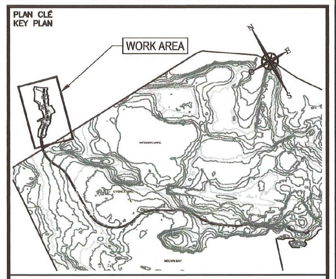
LEGEND:
CULVERT
BYPASS ROAD

POUR CONSTRUCTION
FOR CONSTRUCTION
AGNICO EAGLE
DATE : 2017-07-06



PLAN VIEW
SCALE HOR.: 1:1500

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTES:

1. EXISTING GROUND DTM PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. ELEVATIONS IN DRAWING PROVIDE FINISHED GRADE ELEVATIONS AT THE TOP OF THE SURFACE GRAVEL LAYER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY, SECURITY AND SLOPES OF ALL EXCAVATIONS/ BACKFILL AND SHALL ABIDE BY ALL RELEVANT STANDARDS AND REGULATIONS. THE STABILITY, DEWATERING AND MAINTENANCE OF ALL EXCAVATIONS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
5. GRANULAR MATERIAL 0-30 mm OR 0-50 mm SHALL BE PLACED IN LIFTS NOT EXCEEDING 300 mm AND COMPACTED TO A MINIMUM OF 98% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR). BORROW PIT MATERIAL, GRANULAR FILL MATERIAL 0-600 mm OR OVERBURDEN MATERIAL SHALL BE PLACED IN LIFTS NOT EXCEEDING 600 mm AND COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY (STANDARD PROCTOR) . MOISTURE CONDITIONING MAY BE REQUIRED PRIOR TO COMPACTION.
6. OVERBURDEN MATERIAL CAN BE USED FOR FILL IN SPECIFIED AREAS ONLY WHEN APPROVED BY FIELD GEOTECHNICAL ENGINEER.
7. AN AS-BUILT DRAWING SHALL BE PROVIDED AFTER CONSTRUCTION.
8. THE LOCATION, ELEVATION AND LENGTH OF CULVERT GROUP SHALL BE CONFIRMED ON SITE.
9. NO EQUIPMENT CAN BE STORED AND NO DEPOSITION OF EXCAVATED AND STOCKPILED MATERIALS CAN BE DONE WITHIN THE LICENCE "A" - LIMIT OF WORK (31M) LINE.
10. FOR SUMMER CONSTRUCTION, GEOTEXTILE SHALL BE INSTALLED BETWEEN THE ORIGINAL GROUND AND THE GRANULAR MATERIAL WHEREVER THE ORIGINAL GROUND IS UNSTABLE TO SUPPORT FILL MATERIAL COMPACTION.

FOR CONTINUITY, SEE DRAWING 65-117-230-207

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REVISIONS

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2017-07-06	ISSUED FOR CONSTRUCTION	M.Y.	J.A.	

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2017.07.07
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
NT/NU
2017-07-06

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
117 – ROADS, FENCES, AND YARDS
230 – GENERAL EARTH WORKS
RANKIN INLET BYPASS ROAD
PLAN / PROFILE
5+900 TO 6+312

DESSINÉ PAR / DRAWN BY	MOURAD SENNADJ	DATE 2017-03-17
VERIFIÉ PAR / CHECKED BY	SOLENE MOREAU	2017-03-17
APPROUVÉ PAR / APPROVED BY	JOSÉE ALARIE	2017-03-17
ÉCHELLE / SCALE H=1:1500 V=1:150		DATE 2017-02-03
NO. DESSIN / DRAWING NO.	65-117-230-212	
NO. PROJET / PROJECT NO. 6515 / 28920	REVISION 0	FEUILLE / SHT 1/1

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