



CONSTRUCTION SUMMARY REPORT Baker Lake Fuel Storage Tank 7 and Containment Facilities

Agnico Eagle Mines Ltd

Report

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EXECUTIVE SUMMARY

SNC Lavalin Stavibel Inc. was retained by Agnico Eagle Mines Limited to prepare a construction summary (as built) report for the fuel storage tank and containment facilities of the Meadowbank Gold Project, Nunavut. SNC Lavalin Stavibel Inc. previously prepared the construction drawings and specifications as well as the design report for the fuel storage tank and containment facilities.

SNC Lavalin Stavibel Inc. wasn't involved in the construction of the fuel storage tank and containment facilities, the information presented in this report was provided in part by Agnico Eagle.

The construction of the fuel storage tank and containment facilities were completed in September 2019. The construction monitoring and quality assurance was managed by Agnico Eagle.

This report summarizes the construction as-built information for the fuel storage tank and containment facilities.



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1. Introduction

This document presents the fuel storage tank 7 and containment facilities construction summary report required by the Water Licence 2AM-MEA1526 Part D Item 14 and Part G Item 4. As required by Water Licence Schedule D, this report contains the final design and construction drawings, a summary of construction activities including pictures recorded before, during and after construction. The as-built drawings, detailed explanation of field decision to reflect any deviations from the original construction drawings/plans and how such deviations may affect performance of engineered structures, a discussion of the mitigation measures implemented during construction and its effectiveness are also presented.

2. Construction Summary

2.1 Site location plan

Agnico Eagle is developing the Whale Tail Project in the Kivalliq Region of Nunavut (65°24'25" N, 96°41'50" W). The 99,878-hectare Amaruq property is located on Inuit-owned and federal crown land, approximately 55 km north of the Meadowbank mine. The Meadowbank mine is accessible from Baker Lake, located 70 kilometers to the south. The Baker Lake Bulk Fuel Storage Tank Facility is located east of the hamlet of Baker Lake, on the north shore of Baker Lake.

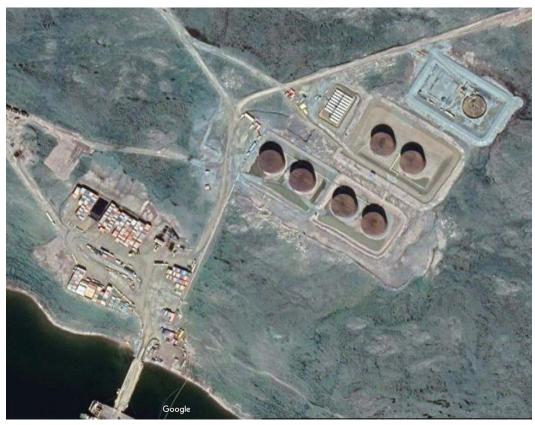


Figure 1 – Baker Lake Fuel Farm Site Overview (tank 7 in construction)



2.2 Fuel tank size

Baker Lake fuel farm now includes seven (7) fuel storage tank. This report is base on the seventh tank built in spring/summer 2019.

The Table 1 below presents the tank main dimensions.

Table 1 – Description of the fuel farm

Fuel farm Description	Baker Lake fuel tank 7
Product	Diesel
Volume (liter)	10 M
Diameter (m)	33.5
Height (m)	12.2

The detailed design of the Fuel Farm is presented in drawings in Appendix A.

2.3 Tank Foundations Design

The tank foundation pad is built 2 meters lower than the surrounding ground with a minimum total thickness of 800 mm of compacted material which includes the liner system. A 3 m shoulder surround the tank with a slope of 1V:2H away from the tank. The embankments of the foundation pad are no steeper than 1V:2H.

The Table 2 below presents the design parameters for the tank foundations.

Table 2 – Design parameters for the tank foundations

Tank Foundation Pad	k Foundation Pad			
Tank Diameter (m)	33.5			
Tank foundation pad top (m)	2x 18.0 x 18.0			
Tank foundation pad average thickness, above surrounding ground (m)	1.2			
Slope on shoulder	1V:2H			
Embankment slope	1V:2H			

2.4 Berms Design

The storage tank is enclosed inside berms to contain accidental spillage of fuel product. The berms are made of granular material and are made impervious with a geomembrane.

The design parameters for the berms surrounding the fuel tank are presented in the table below.



Table 3 - Design parameters for fuel farm Berms

ank Farm Berms				
Berms length (distance between the outer sides of the Berms) (m)	125			
Berms width (distance between the outer sides of the Berms) (m)	71			
Berms height (min) (m)	3			
Containment height (m)	2			
Berms flat top width (m)	1.5			
Berms embankment slope	1V:2H			
Impervious area (m²)	10 000			

2.5 Secondary Containment Capacity

The required capacity of the fuel farms new section was calculated based on the following codes and regulations:

- National Fire Code of Canada (NFCC);
- National Fire Protection Association (NFPA); and
- Design Rationale for Fuel Storage and Distribution Facility (DRFS).

As per the latest edition of NFCC, art. 4.3.7.3, the required secondary containment capacity for a fuel farm must have a volumetric capacity of not less than the sum of:

- A) The capacity of the largest storage tank located in the contained space, and;
- B) 10% of the greater of:
 - i. The capacity specified in Clause (A), or;
 - ii. The aggregate capacity of all other storage Tanks located in the contained space.

The volume occupied by the Tank foundation is considered in the total secondary containment capacity. The height of the secondary containment capacity is 300 mm lower than the berms' maximum elevation. Based on the above-mentioned, the secondary containment capacity requirements and the available capacity for fuel farms are summarized in the Table 4.

Table 4 – Fuel farm new section containment capacity

New section				
Volume (liter)	20 M (2X 10M)			
Required Containment Capacity (liter)	11 M			
Available Containment Capacity (liter)	20M			



2.6 Secondary Containment Imperviousness

As per NFCC art. 4.3.7.2, the base and walls of the fuel farms secondary containment are designed, constructed and maintained to withstand full hydrostatic head and provide a permeability of not more than 10⁻⁶ cm/s to the flammable liquids or combustible liquids contained in the storage tank. The berm is impervious to avoid any seepage into the environment. A 5.10 mm ES-2 Coletanche geomembrane provide adequate imperviousness.

2.7 Secondary Containment Drainage

The finished grade of the secondary containment is sloped away from the Tank to drain the runoff water. The bottom of the berms surface is built with slopes that will allow accidental spills to be concentrated at a low point. A drainage basin located at the low point allows the recovery by pumping accumulations of rainwater and accidental spills.

2.8 Drawings and photographs

Fuel farm tank and containment final design and construction drawings are available in the Appendix A, construction pictures are available in Appendix C.

2.9 Timeline

The baker lake fuel storage tank number 7 and containment facility where built in 2019. Civil and earth work started on April 2019, followed by tank and piping fabrication in August 2019. Construction work were finalised on September 17th, 2019.

3. Field decisions

3.1 Equipment and controls

Equipment where build in containers and installed without modification on site document 6120-C-260-001-REP-001 Fuel Tank Storage and Containment Facilities Design Report and Drawings, present the rational and decisions that led to its construction. No modifications were performed, and the Fuel storage tank and containment facilities are operational as they were designed.

3.2 Piping

Piping between filling and distributing container and the fuel tank respect the point to point design. The piping isn't exactly as per drawing (can be seen on photos in Appendix C) but respect the P&ID. As built drawings can be consulted in Appendix B.



4. Mitigation measure

Quarrying activities to build the berm was at Quarry #2 situated at KM 13 on AWAR. No blast were done on the construction site. During the fuel storage tank and containment facilities construction, no sediments were released in water from construction areas and no water was used to manage dust emissions from construction activity.

5. Construction monitoring and inspection test plan

5.1 Membrane

The manufacture and supply of the liner system for the fuel farm comply with ASTM standard. The manufacturer provided a certification stating that the material proposed has physical properties that meet the required values. The rolls of liner were labelled, packaged, shipped, off-loaded, stored and handled by appropriate means to prevent damage to the material.

The subgrade surface was inspected by an engineer to verify suitability prior to installation of the liner system. A minimum thickness of fill covering the liner is maintained for operating equipment over the liner to prevent any damage. The installation of the liner system was performed by a qualified technician. All seaming, patching, welding operations, and testing were performed by a qualified technician. Joints/seams between liners panels were welded using the manufacturer's recommended procedures and equipment. The backfill material was placed in accordance with the drawings and specifications for the maximum lift thickness, compaction requirements and final grade levels.

During membrane installation, visual testing by a qualified worker was carried. Those tests were done on cooled bitumen. Joints were tested with a round-tipped trowel to ensure that the welds were not separating. All defects were clearly marked for repair.

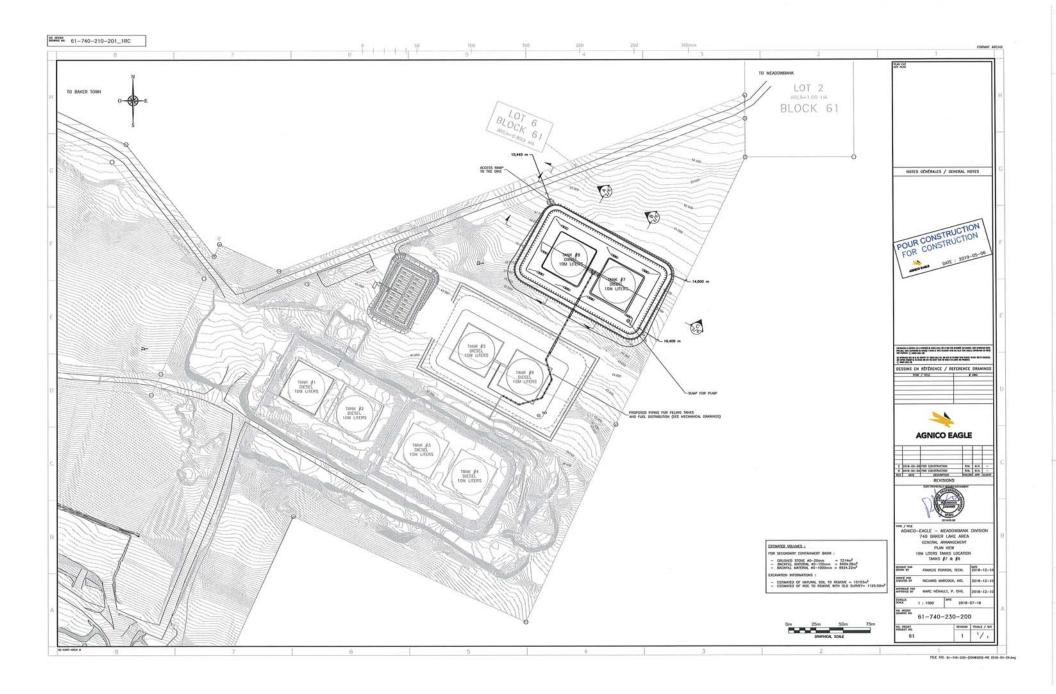
5.2 Tank weld

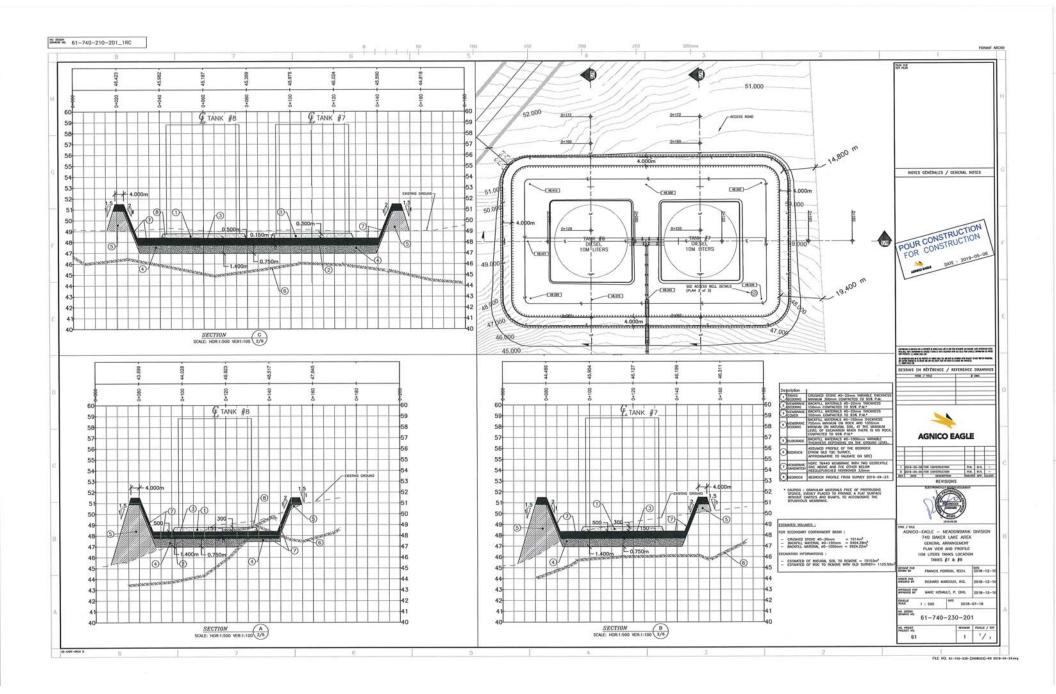
During the tank construction, a testing protocol was followed by the construction team. To meet API Standard 650, companies building tank are required to monitor their work trough an inspection program. In this program, the contractor registers welder's qualifications, confirm construction material quality and outlines its testing protocol. The results from weld tests are also registered there. All that information is required by API 650 standard. Testing on welds took place during the whole construction process. To attest welds quality, inspector relied on visual inspection, magnetic particulate tests and high penetration oil tests. To review those tests results, the materials quality and weld inspection results can be consulted in Appendix D.

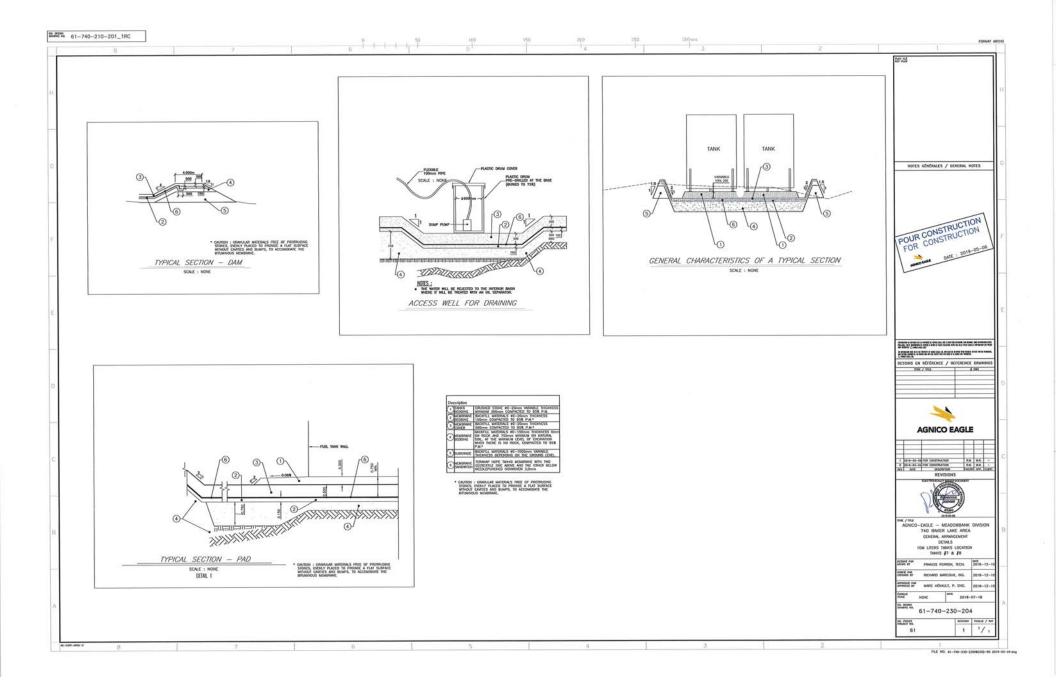
Appendix A

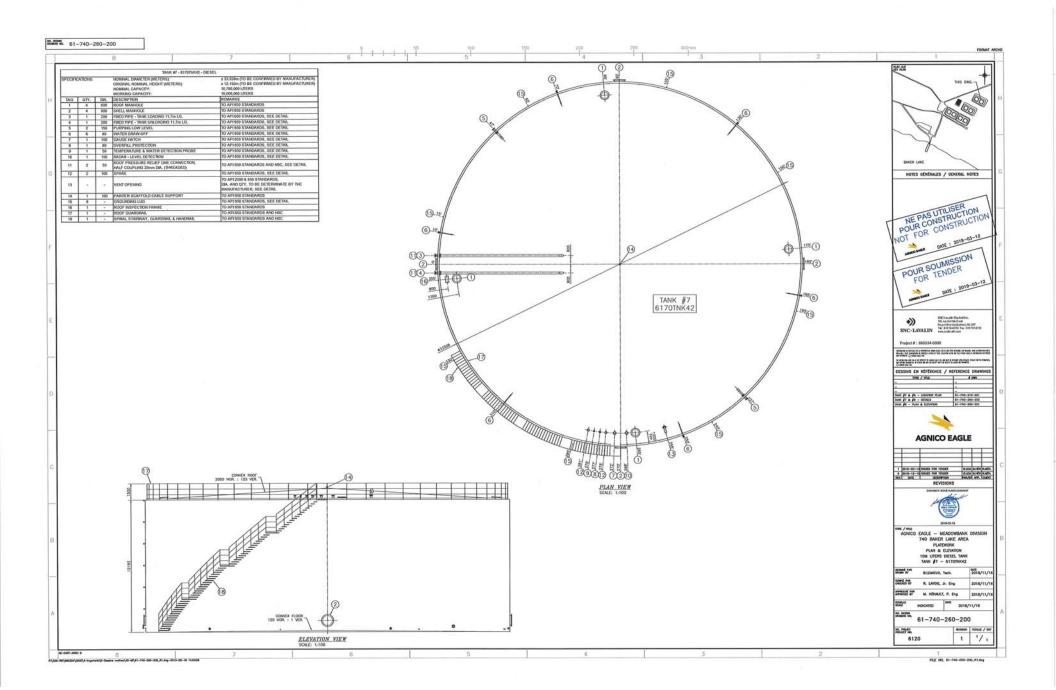
Final construction drawing

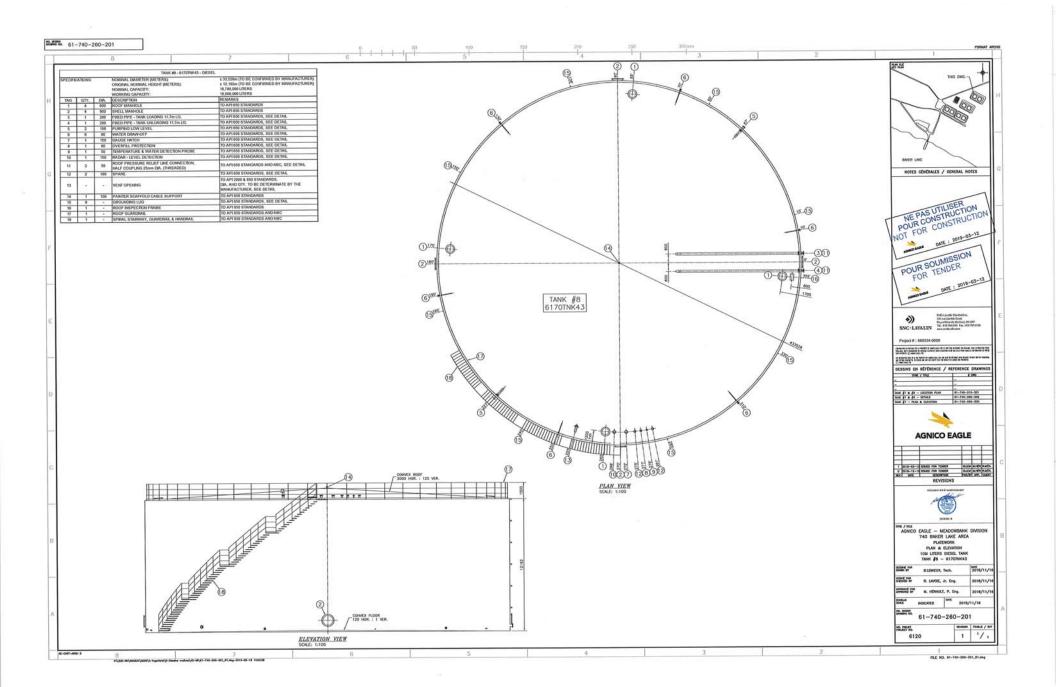


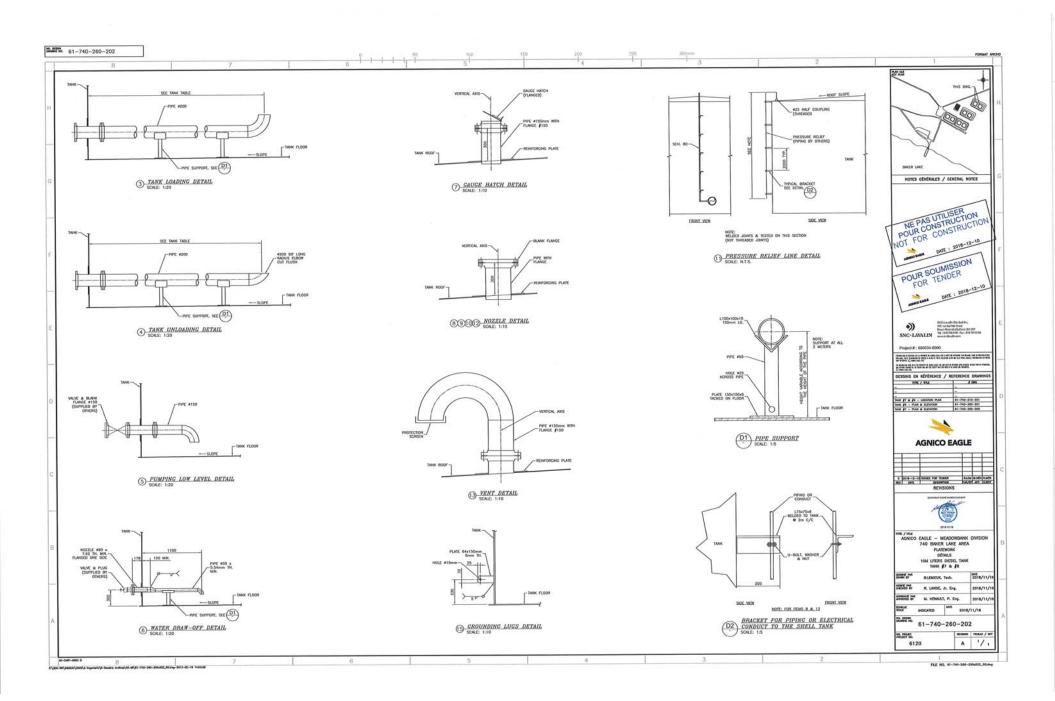


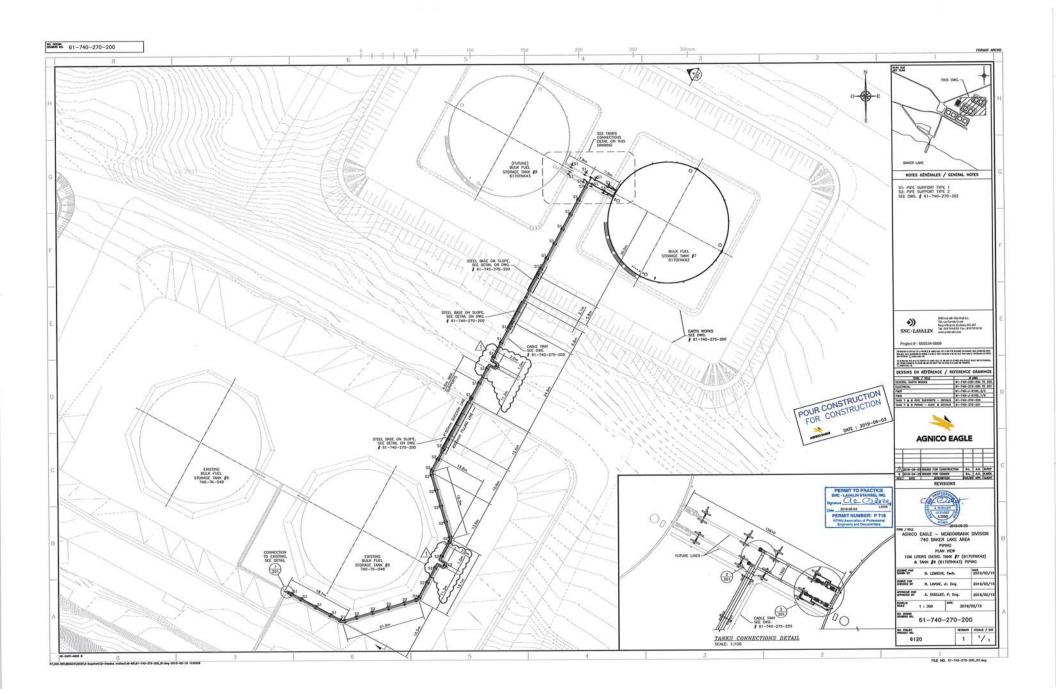


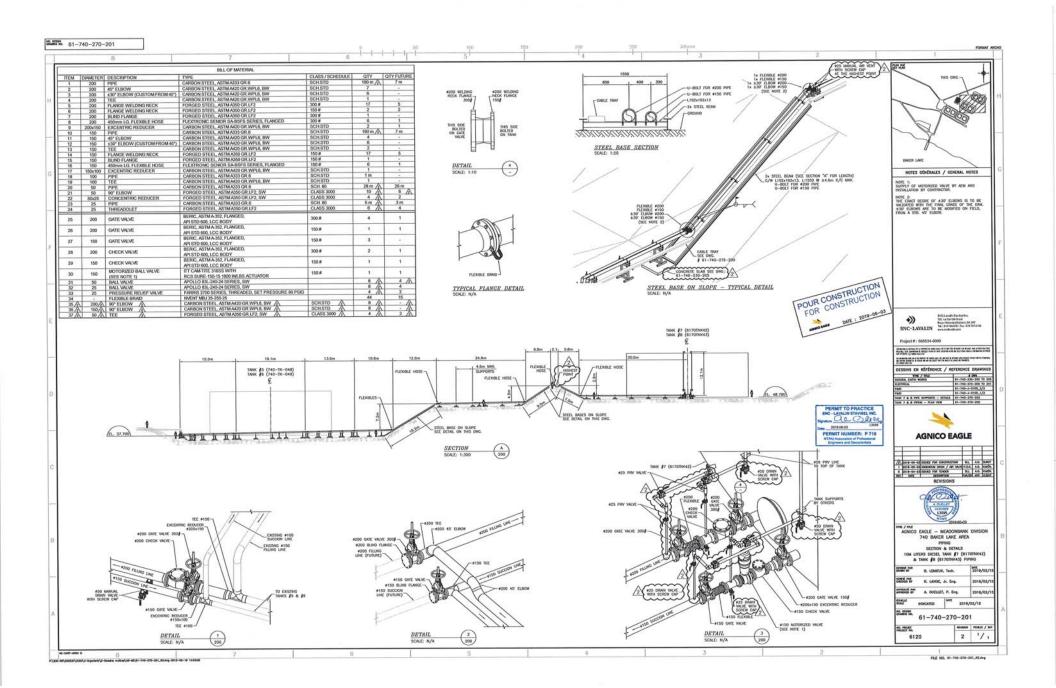


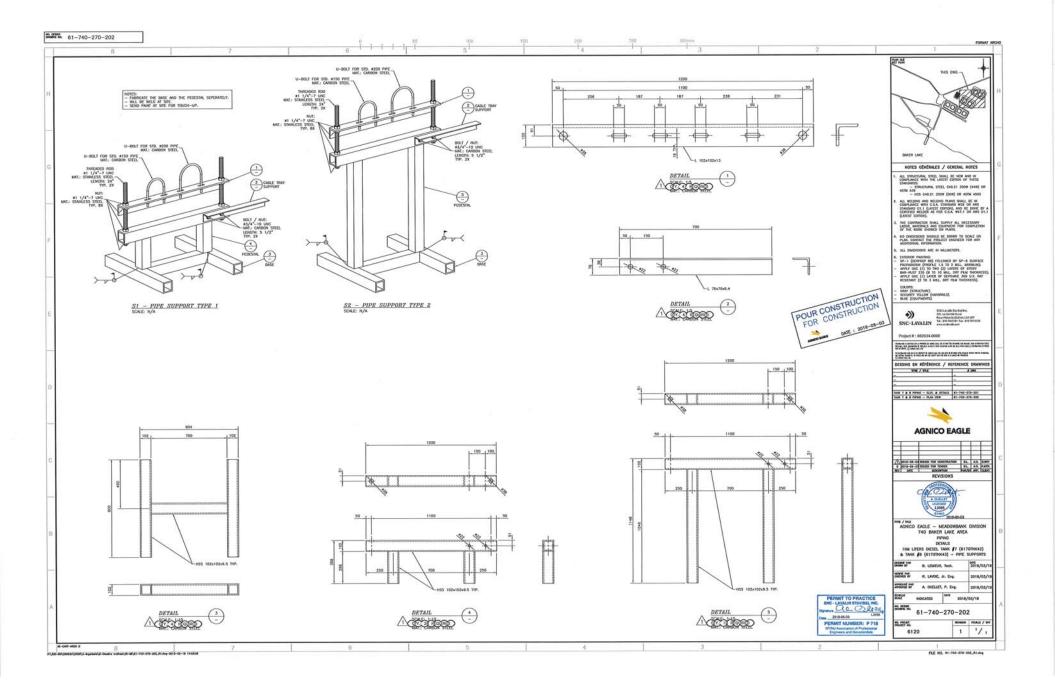


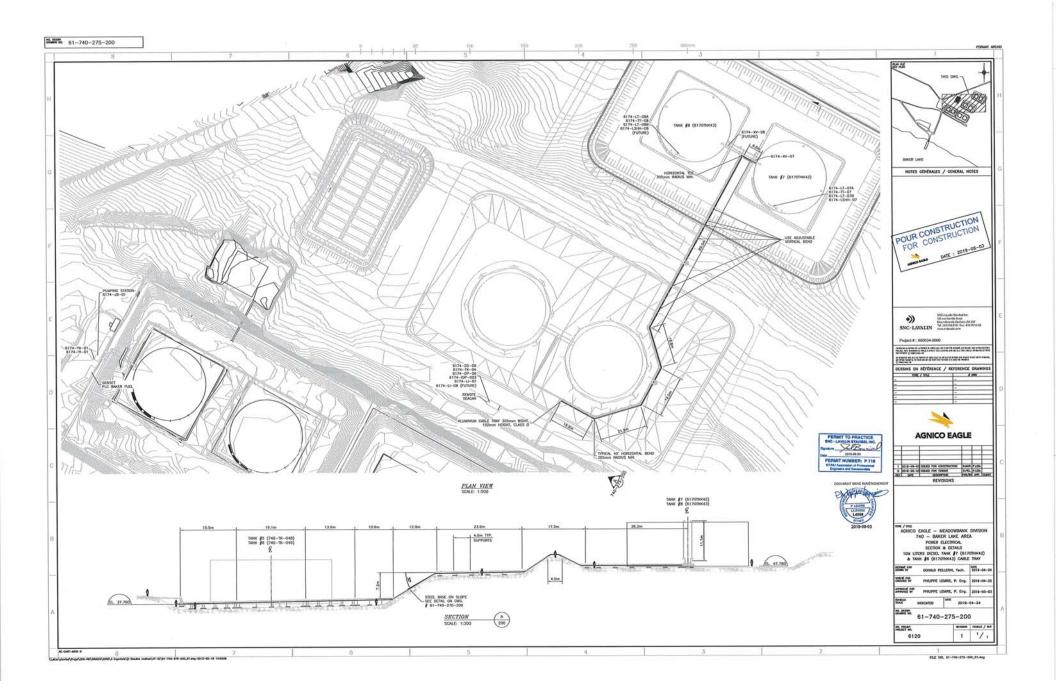


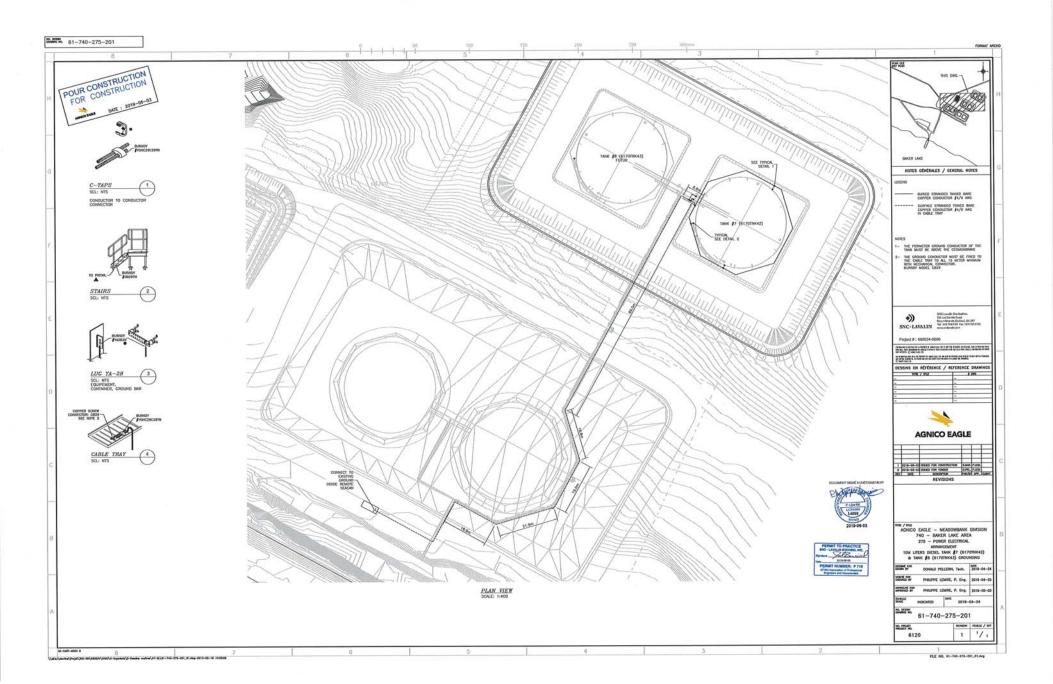


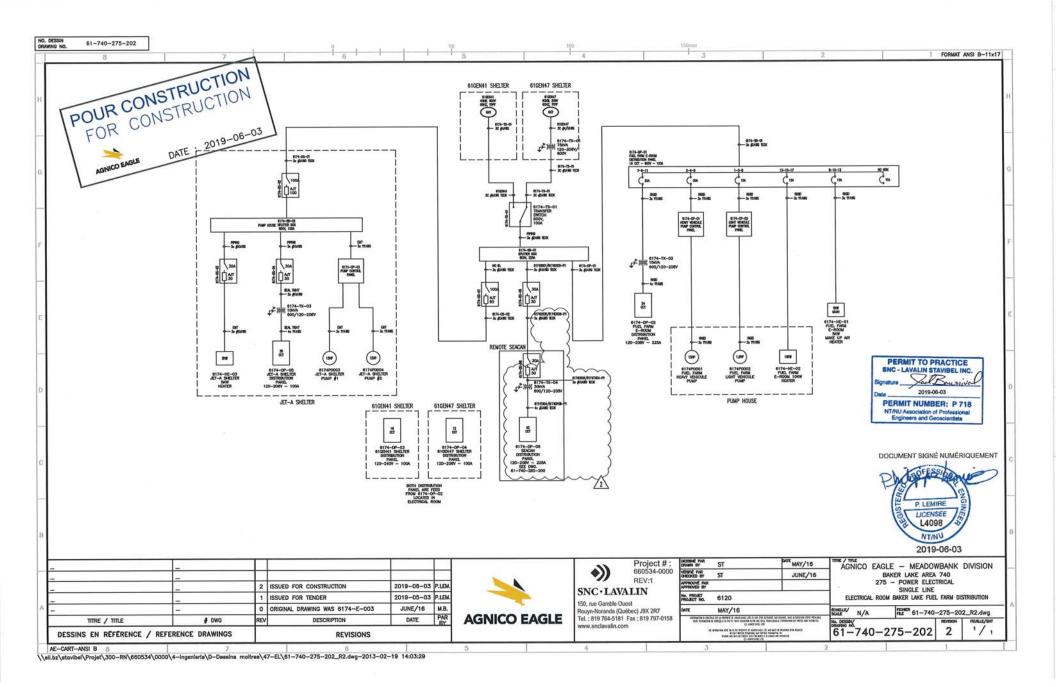


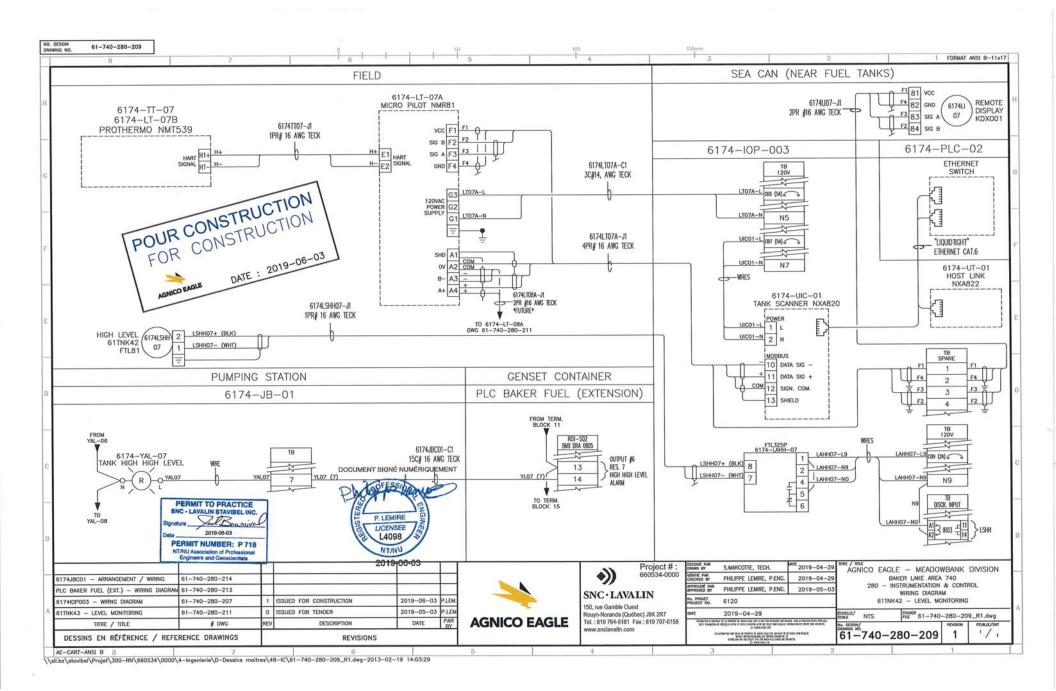


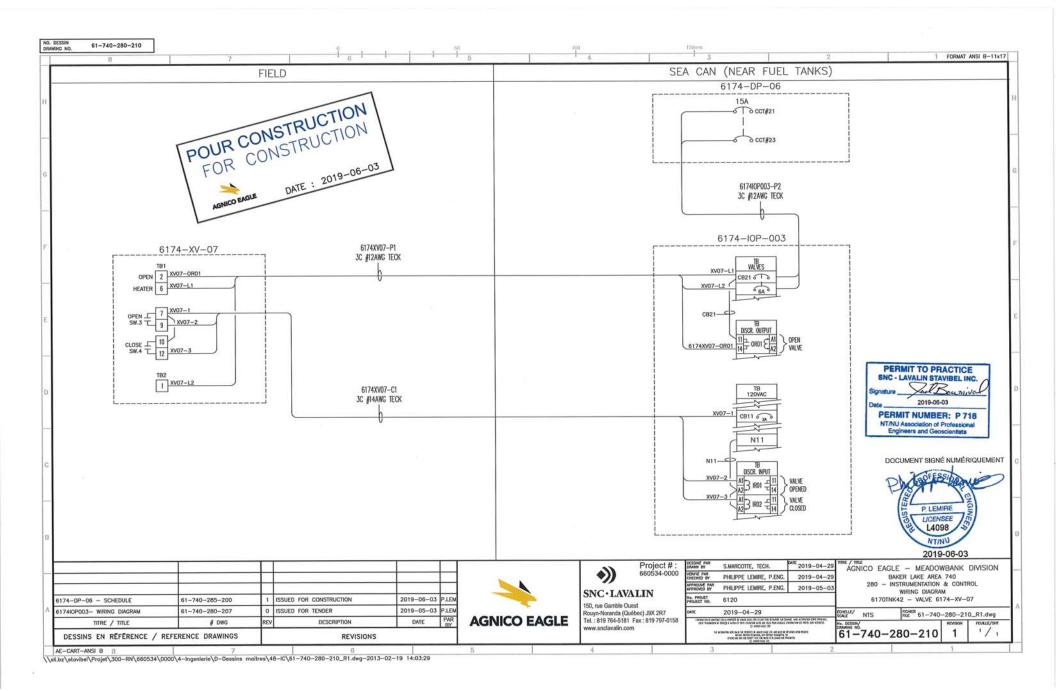


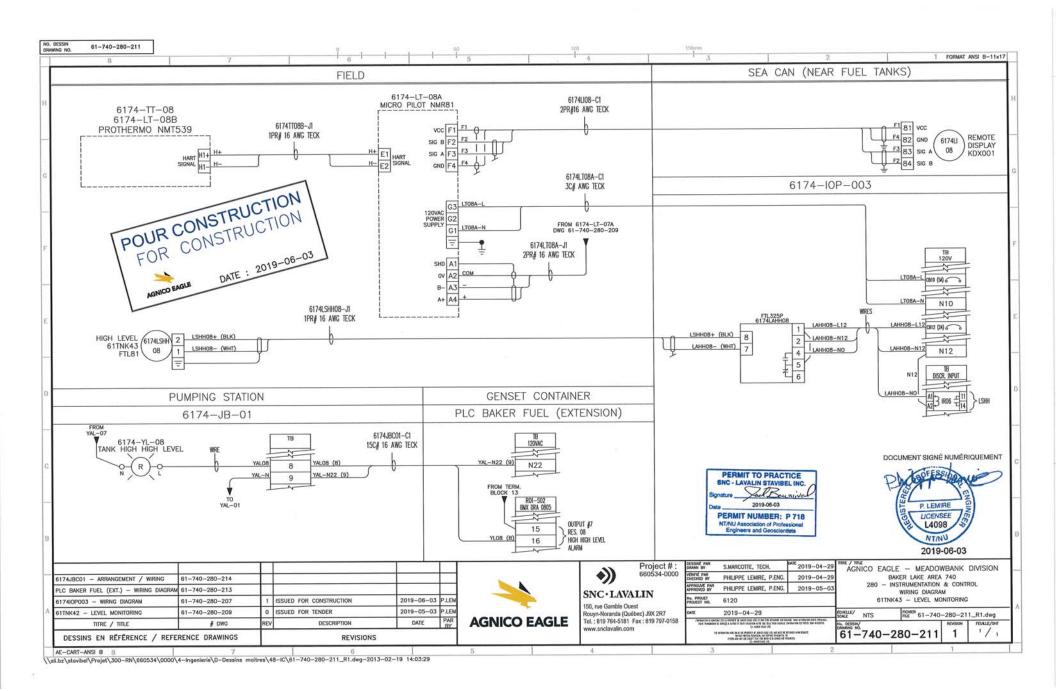


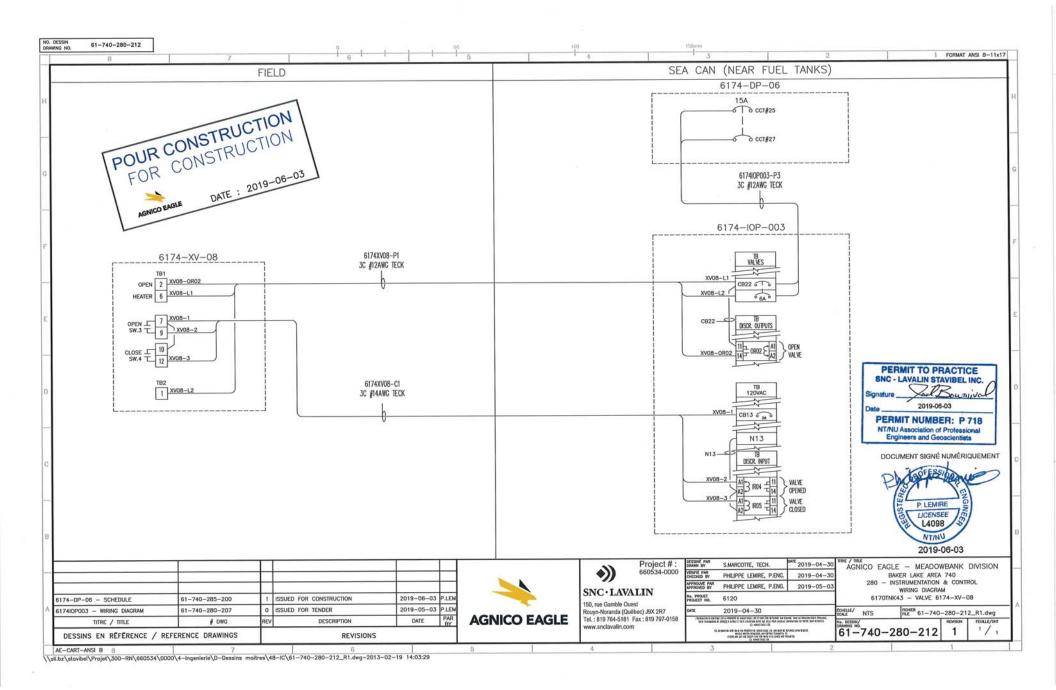


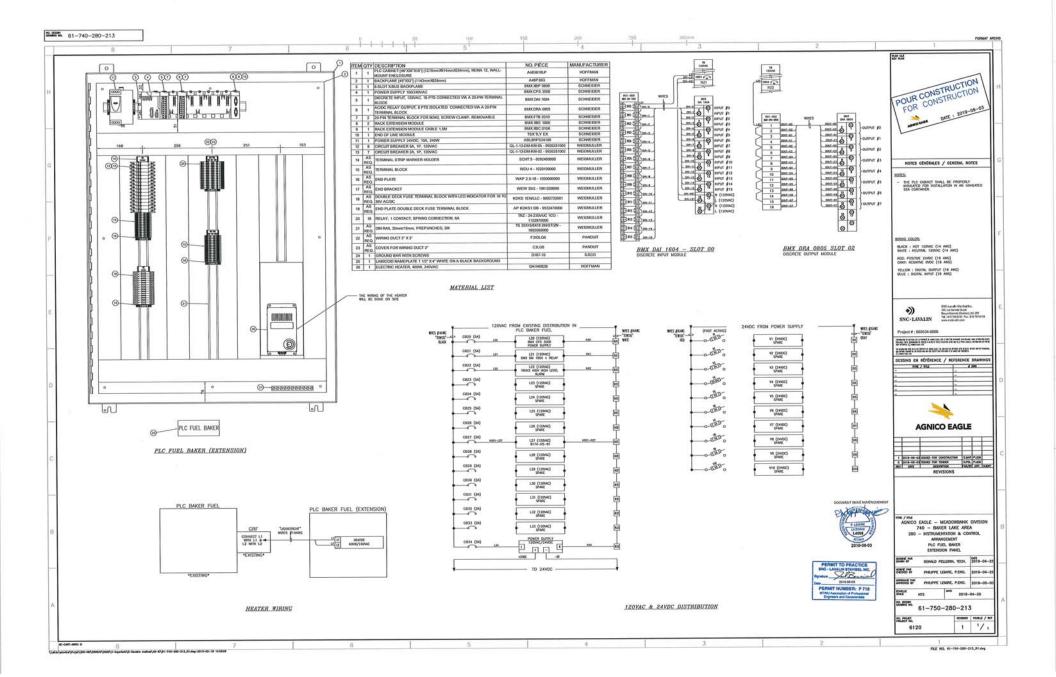


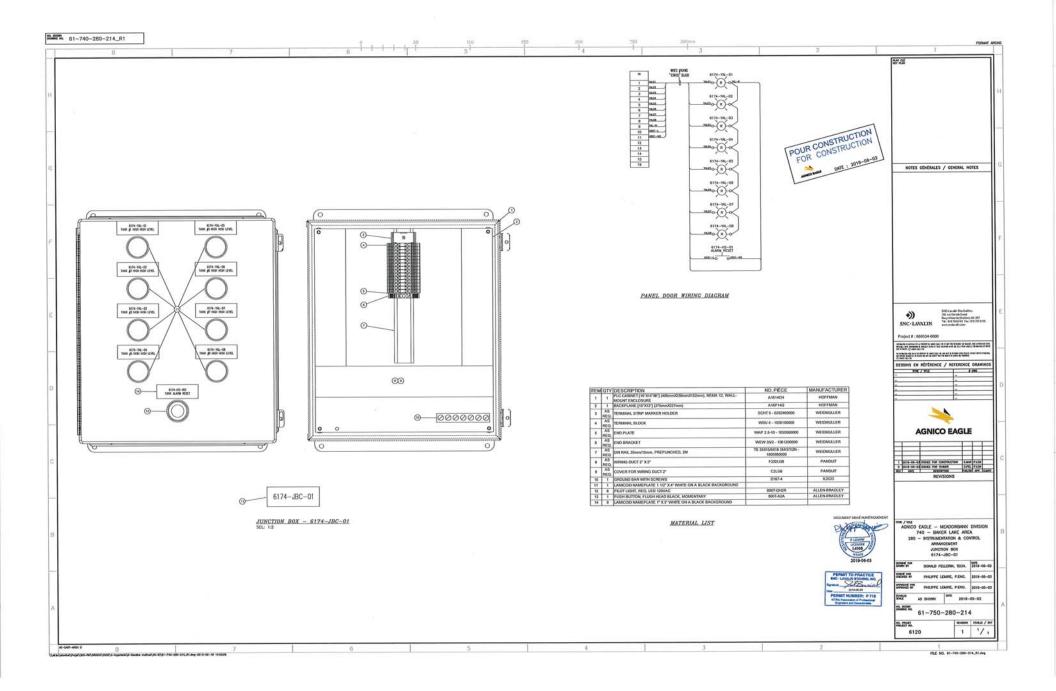


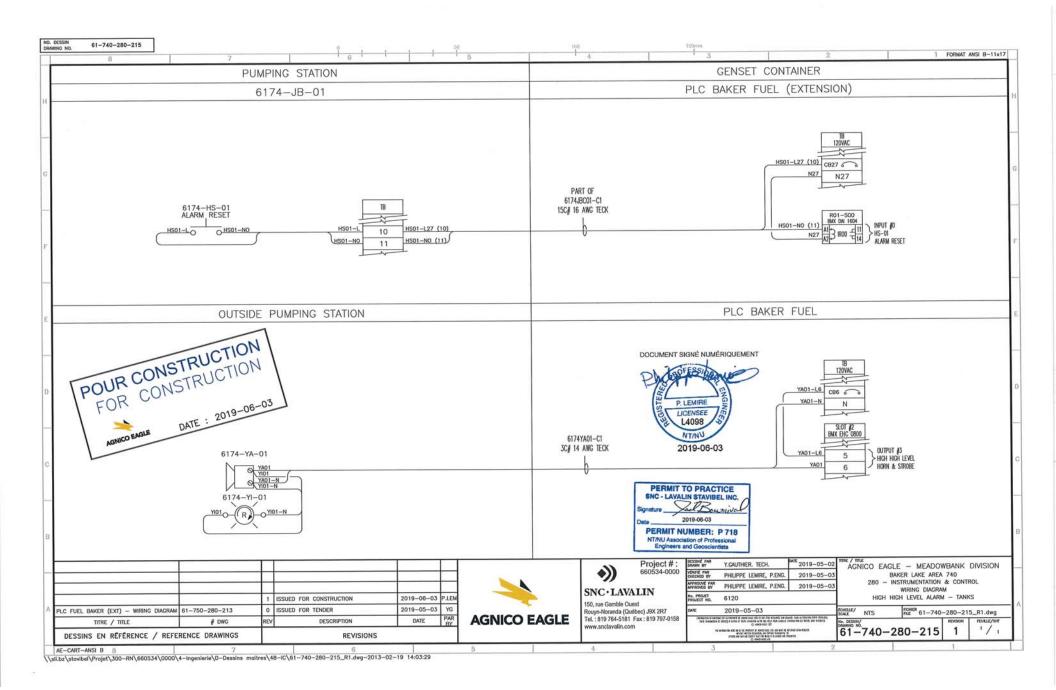


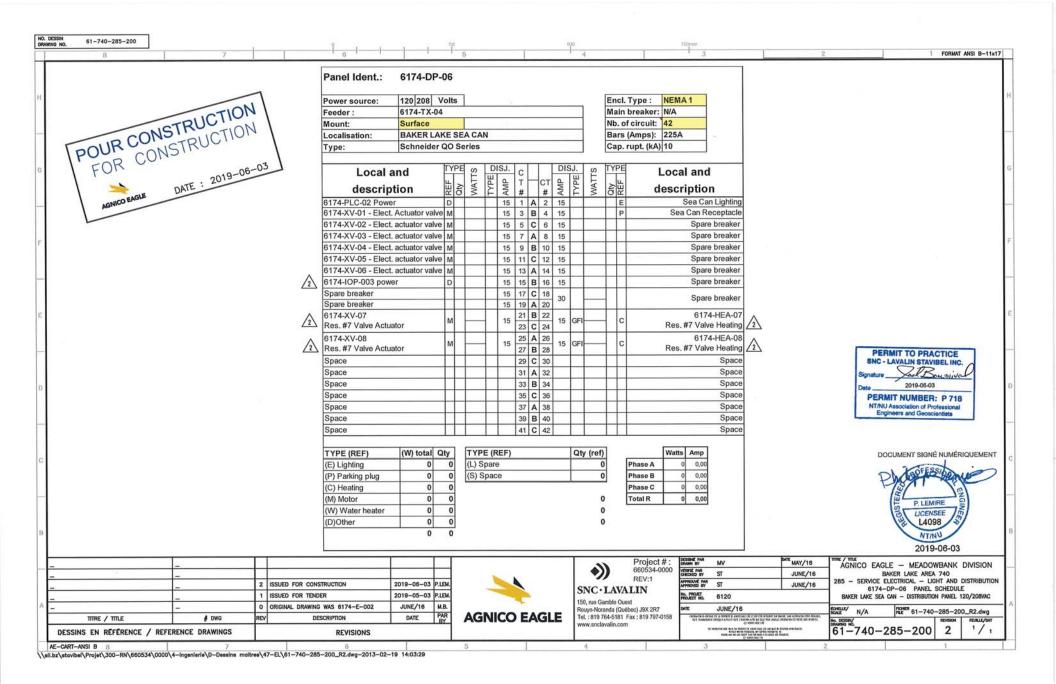


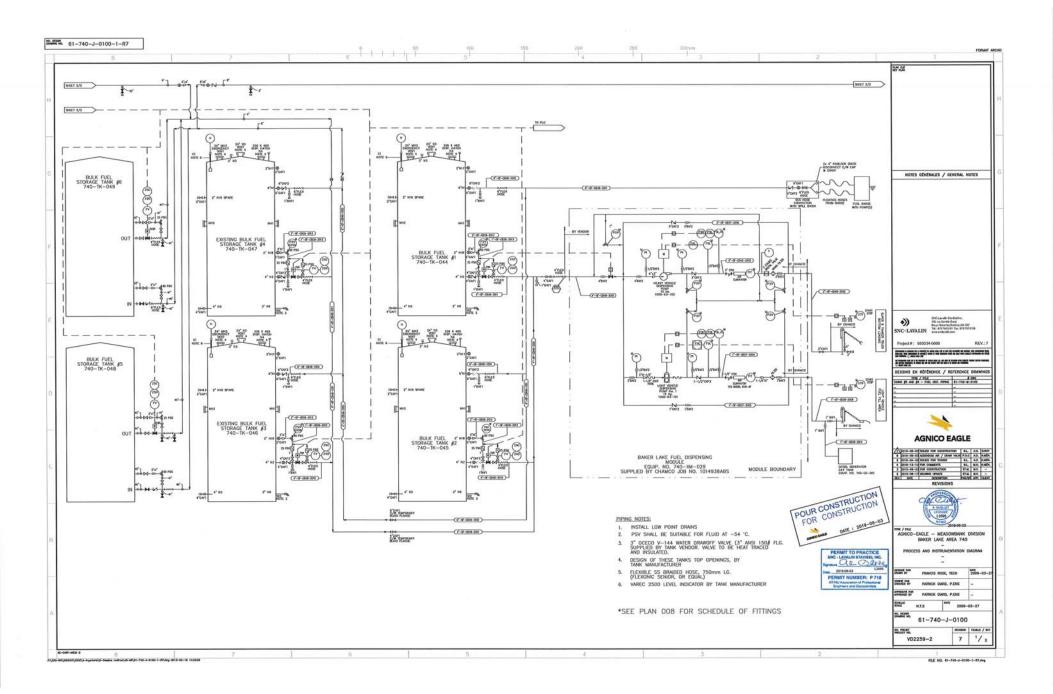


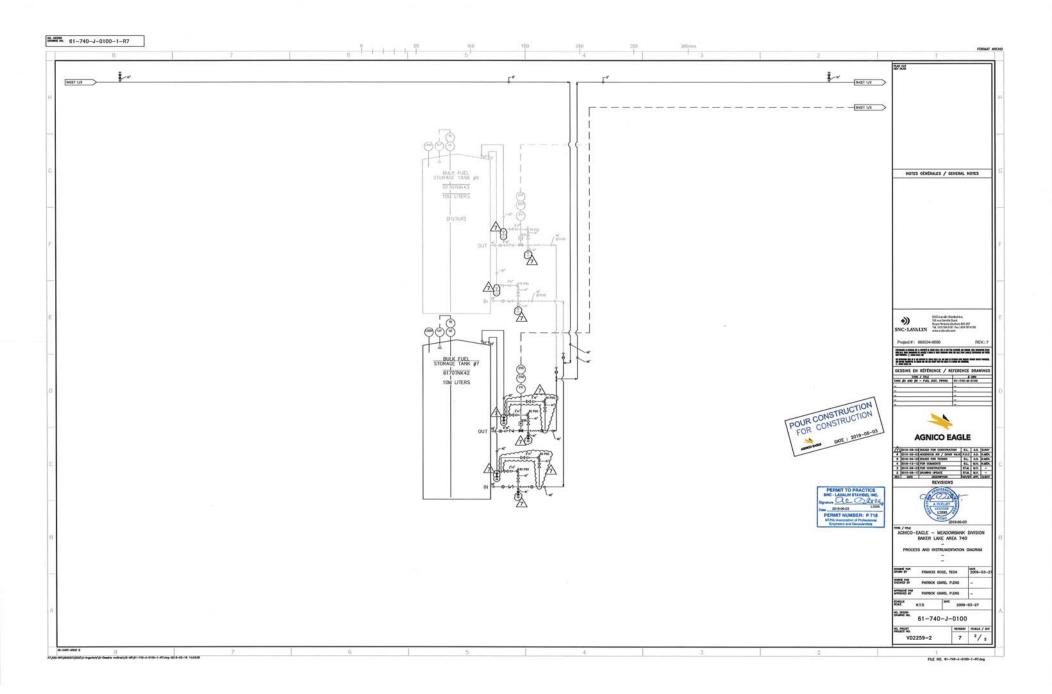




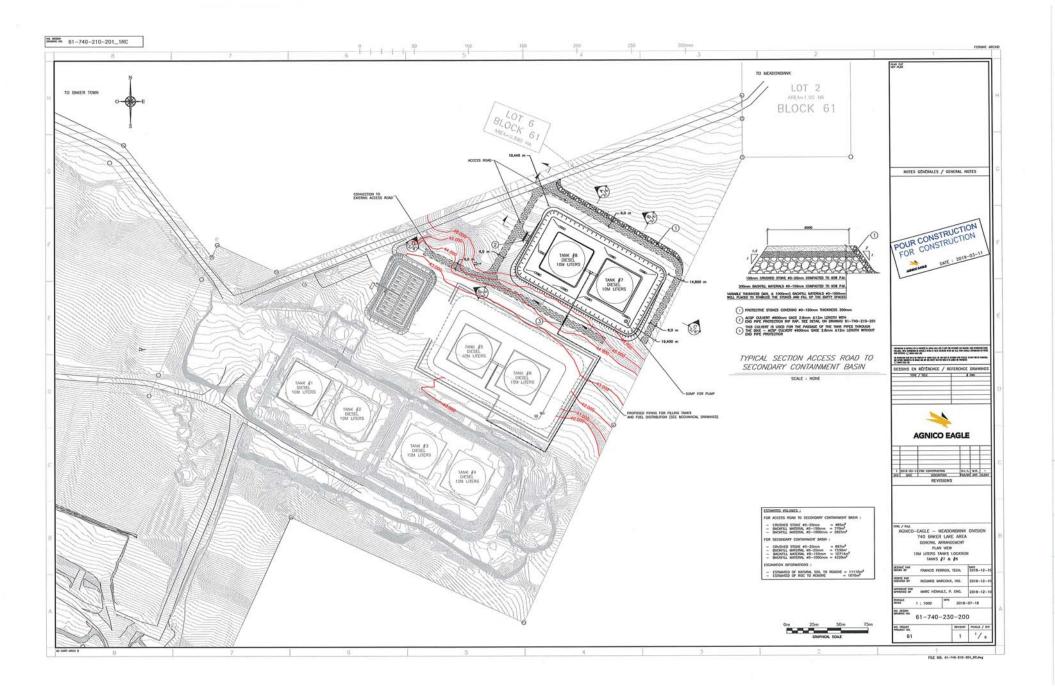


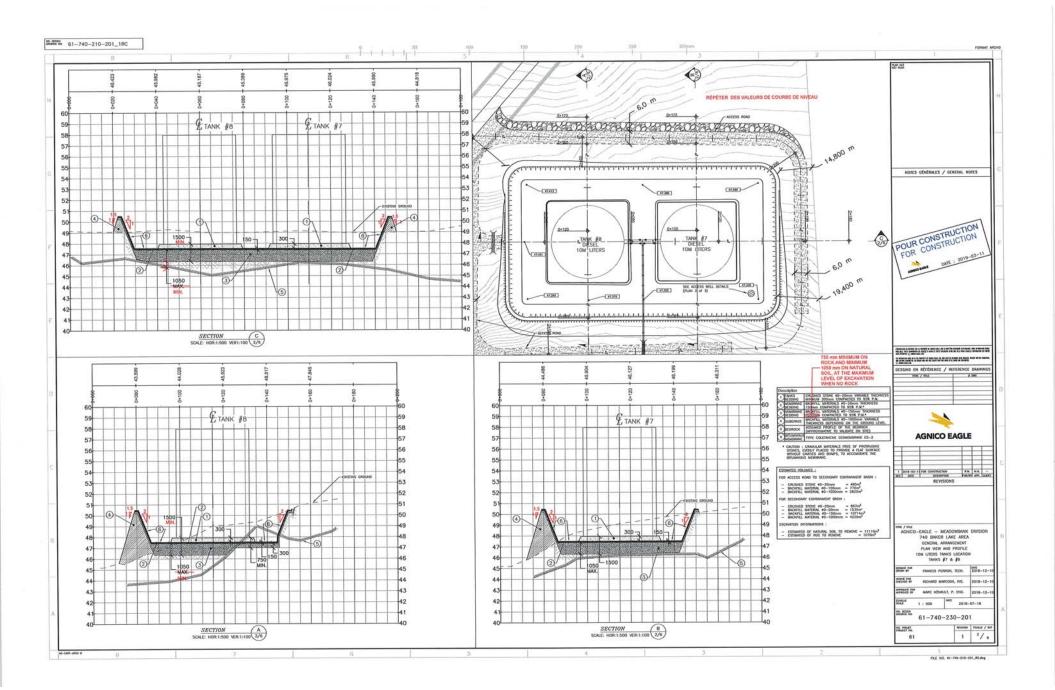


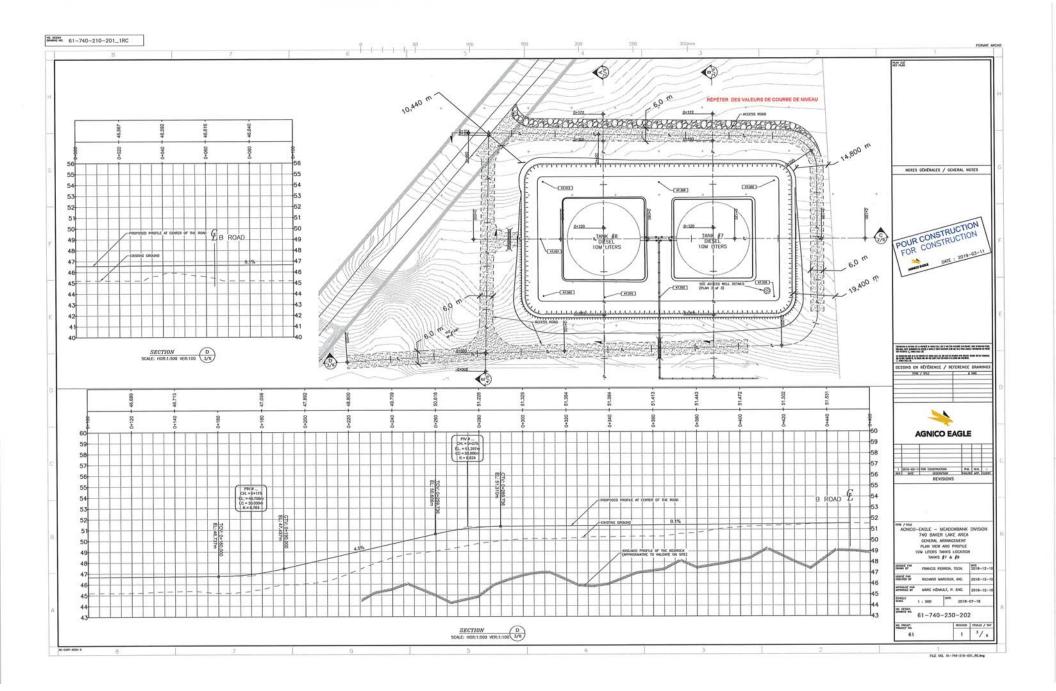


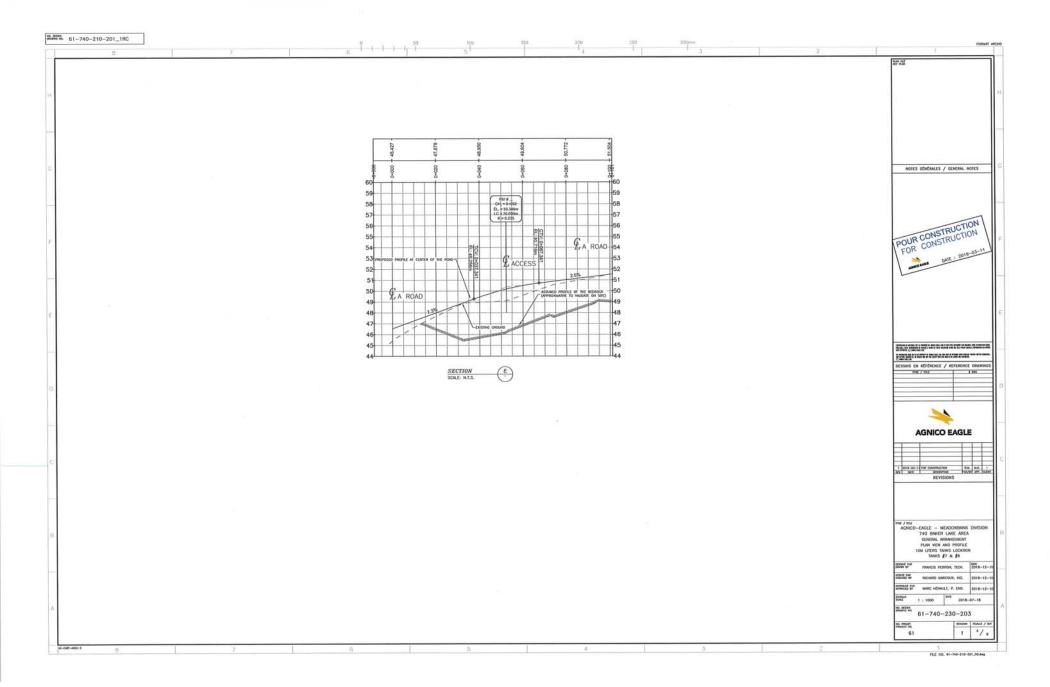


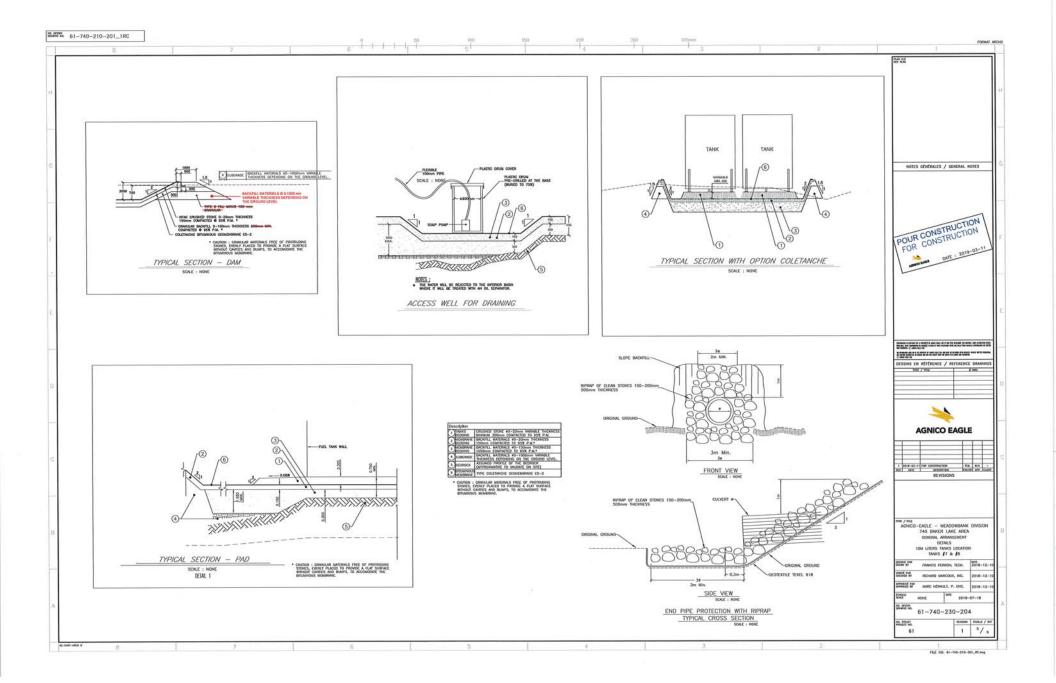
Appendix B As built drawing

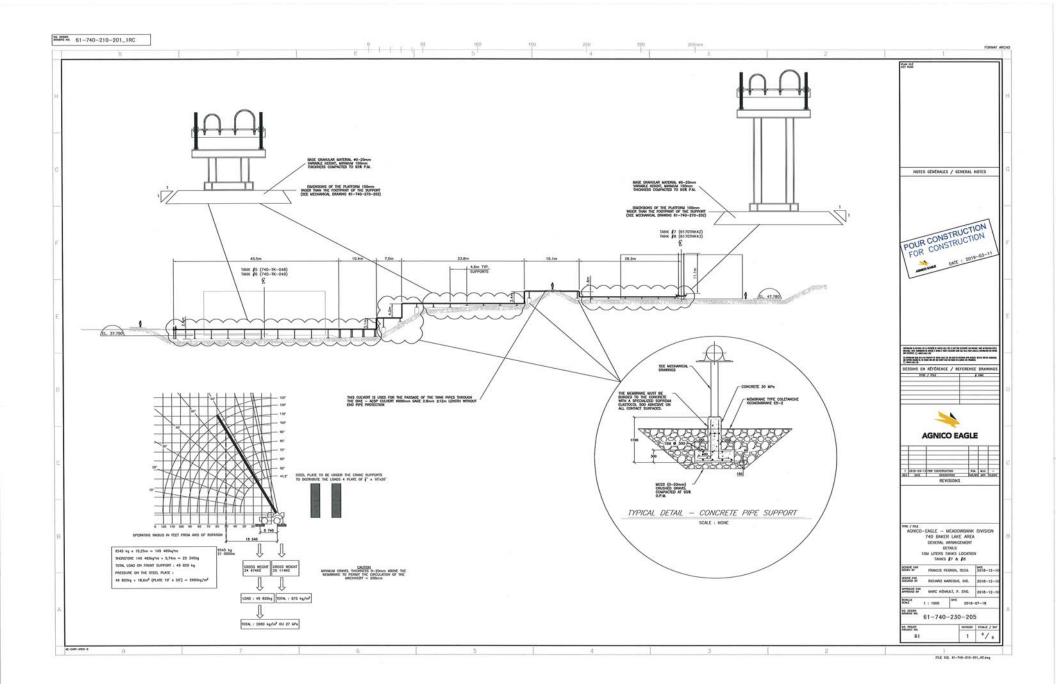




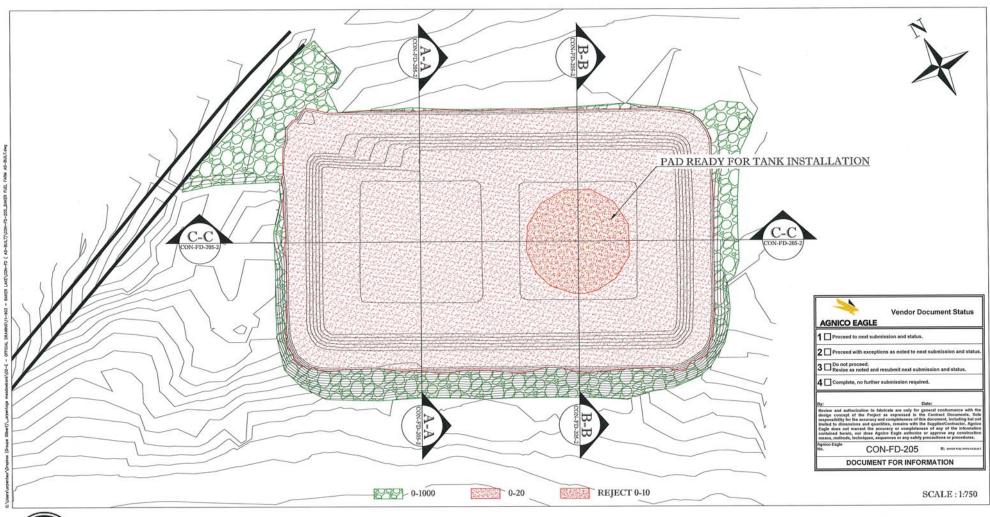








AS-BUILT BAKER LAKE FUEL FARM CONSTRUCTION CONTRACT # 11-903





Julie Belanger

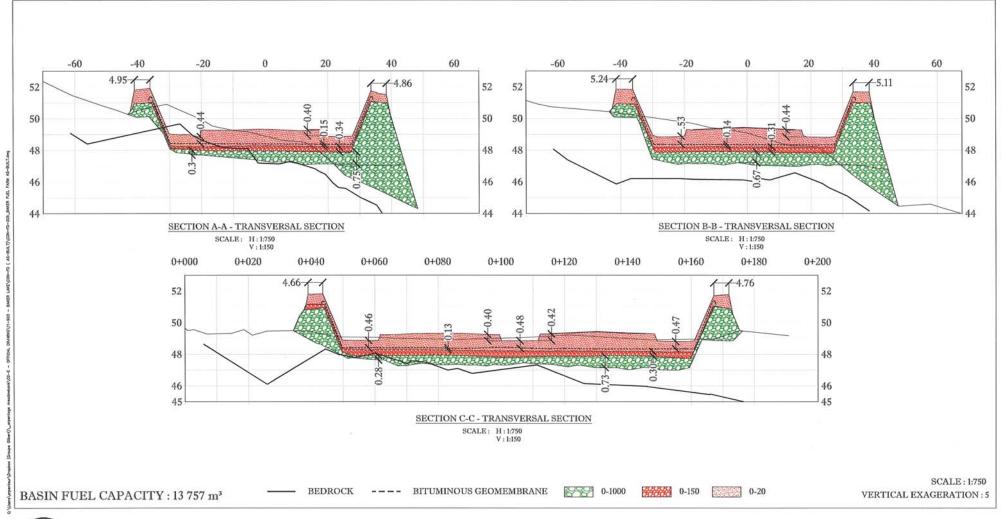
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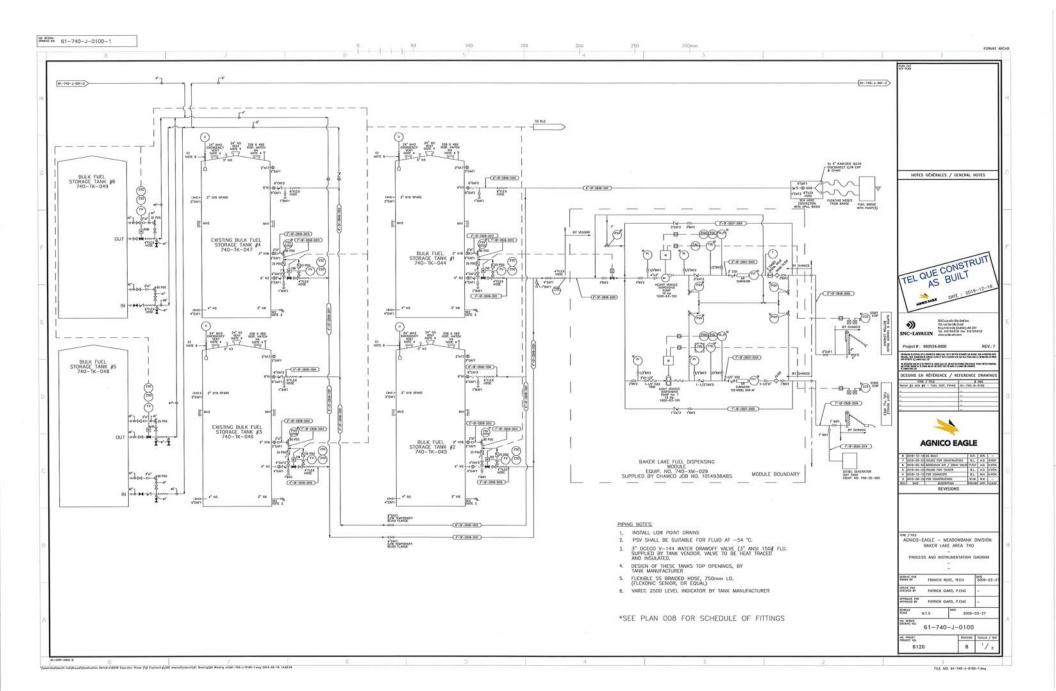
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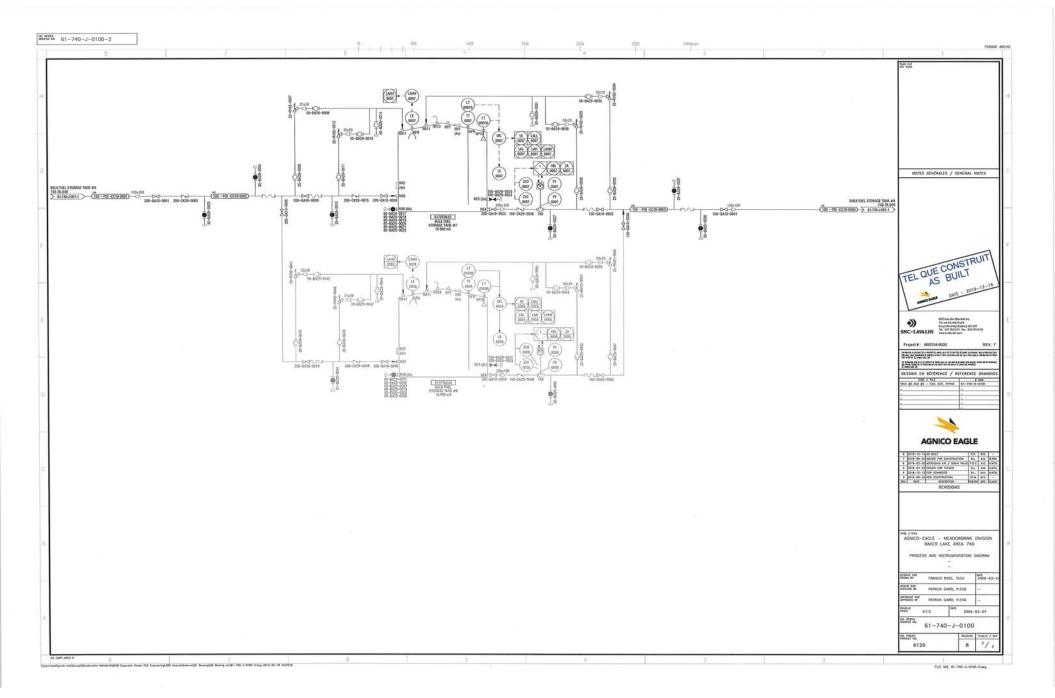
AS-BUILT BAKER LAKE FUEL FARM CONSTRUCTION CONTRACT # 11-903





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Appendix C Photographs



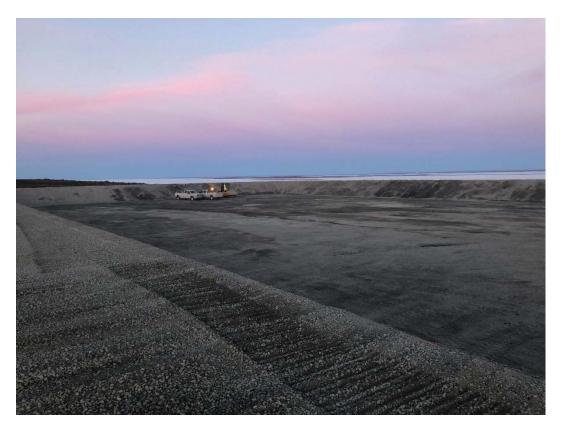
General site view before tank and containment construction



Overburden excavation



Pad and Berm construction



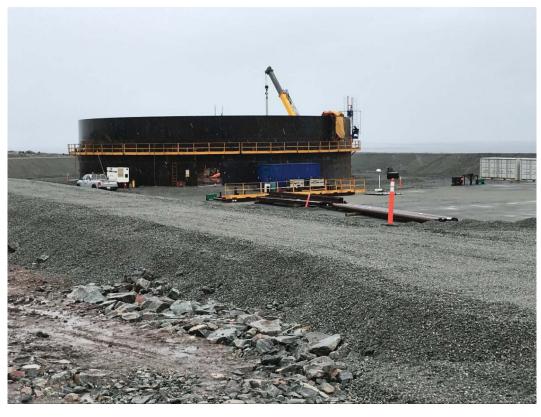
Containment overview



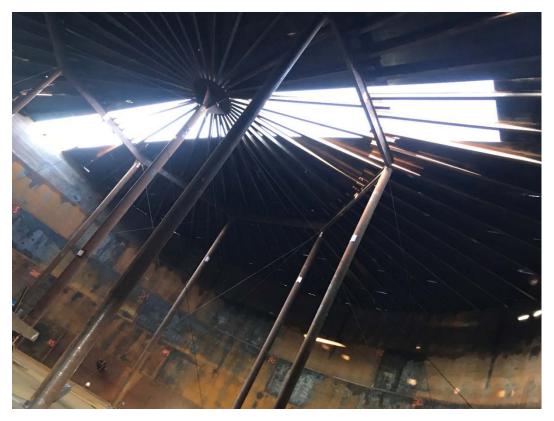
Tank pad construction



Tank floor construction



Tank wall welding



Tank roof structure



Piping to and from fuel tank



Tank general view

Appendix D Fuel tank handover package