



Construction Summary Report Whale Tail Lake South Basin Treated Water Winter/Summer Diffuser

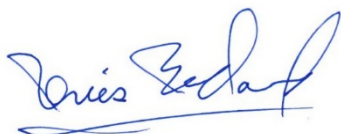
Agnico Eagle Mines Ltd

Report

6127-695-132-REP-013_R1

January 22, 2021

Prepared by:



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Authorized Signatory:



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Mechanical engineer
2021-01-22

Executive summary

SNC-Lavalin Stavibel Inc. was retained by Agnico Eagle Mines Limited to prepare a construction summary (as built) report for the Summer/Winter Diffuser installed at the Whale Tail Lake South Basin Water Treated Plant of the Whale Tail Gold Project Expansion, Nunavut.

SNC-Lavalin previously prepared a detailed engineering report for design of the water diffuser as requested by the amended Water License 2AM-WTP-1830 Part D item 1, including construction drawings and technical specifications to support the construction activities.

SNC-Lavalin Stavibel Inc. wasn't involved in the construction of the diffuser, the information presented in this report was provided in part by Agnico Eagle.

The construction of the diffuser was completed in October 2020. The construction monitoring and quality assurance was managed by Agnico Eagle.

This report summarizes the construction as-built information for the Winter/Summer diffusers in Whale Tail South as required by the Water License 2AM-WTP1830 Part D Item 16.

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1. Introduction

Agnico Eagle Mines Limited, Meadowbank Division (AEM) is developing the Whale Tail Project, a satellite deposit located on the Amaruq property (Kivalliq Region of Nunavut, Canada). The Whale Tail Project construction is ongoing and commercial production has started in the third quarter of 2019. To continue mining and milling, AEM is proposing to expand the Whale Tail Project by expanding the Whale Tail pit, developing another open pit called the IVR pit and including underground mining operations. As part of the expansion project, new water management and geotechnical infrastructure are required for surface water management. As part of the water management infrastructure, a diffuser was required when discharging treated water from the Amaruq Arsenic Water Treatment Plant (AsWTP) to Whale Tail Lake South Basin (WTS) during the summer months (i.e. open water season) and when required, during the winter. A design report for the treated water diffuser to WTS has been already submitted as per the amended Water License 2AM-WTP1830, Part D, Item 1.

As required by Water Licence 2AM-WTP1830 Part D Item 16, this report contains the final design and construction drawings, a summary of construction activities including photographic recorded before, during and after construction. Detailed explanation of field decision to reflect any deviations from the original construction drawings/plans, a discussion of the mitigation measures implemented during construction and as-built drawings 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.

As part of the Whale Tail Project expansion, contact surface water runoff and pit infiltration from the Amaruq site are collected and transferred to the new IVR Attenuation Pond. The raw water is then pumped and treated at the Amaruq AsWTP to remove total suspended solids and arsenic. A new treated water diffuser will be used to disperse the treated water in the Whale Tail Lake South Basin (WTS) water column. The purpose of the diffuser is to enhance mixing of the piped effluent in WTS to meet receiving water quality objectives outside of the effluent mixing zone.

The figure 1 illustrates the location of the diffusers Water Discharge Locations in Whale Tail South Basin.



2.2 Design Basis

During the summer months, treated water from the Amaruq AsWTP will be transferred to WTS using up to 2 x 14- in HDPE pipelines and will be discharged in the lake via two (2) submerged diffusers. Each line and diffuser are designed for a flow of 800 m³/h. The total treatment capacity of the Amaruq AsWTP is 1600 m³/h. During the winter months, pit infiltration and dike seepage will be transferred and stored to the IVR Attenuation Pond. The primary strategy for water management during winter is to store all contact water in the Whale tail and/or IVR attenuation ponds until early spring. This strategy is aligned with the latest water balance. Nevertheless, if winter inflows are greater than expected by the model, some excess water might need to be treated and discharged to Whale Tail South Lake through the diffuser during the winter. Prior to discharge, an evaluation of the projected impact on the receiving lake will be performed. Winter discharge to Whale Tail South will only be carried out if the projected water quality meets the 2AM-WTP1830 license and MDMER requirements. In order to do so, one of the two 14-in HDPE pipelines and diffuser is insulated, and the heat is traced to allow for the rapid start-up of the AsWTP at the end of the winter/start of the spring freshet to allow the transfer of treated water to WTS. The discharge flow to WTS during this period will be up to 800 m³/h.

The quality of the treated water that will be discharged in Whale Tail Lake South Basin shall not exceed the Effluent quality limits set in the amended Water License 2AM-WTP1830, part F, item 5 and meet the Metal and Diamond Mining Effluent Regulations (MDMER) effluent criteria. Furthermore, the diffuser will enhance mixing of the piped effluent in WTS to meet the Canadian Environmental Quality Guidelines (CEQG) for the protection of Aquatic Life receiving water quality objectives outside of the effluent mixing zone.

Table 1 summarizes the treated effluent water quality limits as per Water License.

Parameters	Units	Maximum Authorized Monthly Mean Concentration at Discharge of AsWTP	Maximum Authorized Concentration in a Grab Sample at Discharge of AsWTP	CEQG Aquatic Life Limits after Dilution (note 1)
pH		6.0 to 9.5	6.0 to 9.5	--
Total Suspended Solids	mg/L	15	30	--
Total Ammonia (NH ₃ -N)	mg-N/L	16	32	--
Total Phosphorus	mg-P/L	0.3	0.6	0.01
Aluminum	mg/L	0.5	1.0	0.1
Arsenic	mg/L	0.1	0.2	0.025
Cadmium	mg/L	0.002	0.004	0.00004
Chromium	mg/L	0.02	0.04	0.001
Copper	mg/L	0.1	0.2	0.002
Iron	mg/L	1.0	2.0	0.3
Lead	mg/L	0.05	0.1	0.001
Mercury	mg/L	0.004	0.008	0.000026
Nickel	mg/L	0.25	0.5	0.038
Zinc	mg/L	0.1	0.2	0.03
Total Petroleum Hydrocarbons (TPH)	mg/L	3.0	6.0	--

Note 1: From Table A1 "Required Dilution for different parameters – WTP" of Golder Effluent Plume Modelling in Whale Tail Lake (South Basin), May 28th, 2019 (Golder 2019b)

Table 1 – Treated Effluent Water Quality Limits

2.3 Treated Water Diffuser Design Details

The treated water diffusers are designed to enhance mixing of the piped effluent in WTS to meet the Canadian Environmental Quality Guidelines (CEQG) for the protection of Aquatic Life receiving water quality objectives outside of the effluent mixing zone. Of all the parameters listed in Table 2, total phosphorus required the highest dilution factor in order to meet the water quality objective of 0.01 mg/L within the near-field mixing zone (typically 100 m). The diffusers are designed to provide a minimum dilution factor of 16.7 for total phosphorus with a water depth of at least 7.3 m under open water conditions and a flow rate of 800 m³/h. The minimum dilution factor provided by the diffuser is sufficient for all other constituents in the treated water (Golder 2019b).

To achieve the required dilution, in the summer months (open-water season), a diffuser equipped with 7 ports spaced at 14 m interval is required. Two diffusers are required to be able to discharge a total flow of 1600 m³/h.

Each diffuser consists of:

- > 7 discharge ports spaced out at 14 m intervals starting at the end of the line on a 14-in DR17 HDPE pipeline;
- > Each port consists of a Ø63.5 mm (2.5-in) diameter schedule 40 stainless steel pipes mounted on a branch saddle with a total length of 720 mm. The internal diameter of the pipe is 62.7 mm;
- > The diffuser and offshore pipelines are weighted using concrete ballasts, each weighing approximately 90 kg. The ballasts are uniformly distributed along the diffuser and offshore pipeline. Each concrete ballast is sized to fit around a 14-in HDPE non-insulated pipe.
- > The insulated portion of the summer/winter diffuser is weighted using sets of concrete ballasts. Each ballast set consist of three (3) individual concrete ballasts installed side by side and weighing approximately 181 kg each (400 lbs), for a total of 543 kg (1200 lbs) per set. The ballasts are uniformly distributed along the insulated portion of the offshore pipeline. Each concrete ballast is sized to fit around a 14-in HDPE with a 2.5-in insulation plus a red rubber sheet to fill the gap (i.e. 20-in HDPE pipe).

Please refer to Appendix A for the details of the final construction drawings on the diffusers and offshore pipelines. The table 3 summarizes these reference documents.

Document Number	Revision	Title
61-695-270-224	R0	Diffuser pipe layout and profile
61-695-270-225	R0	Plan and details for summer treated water discharge pipeline and diffuser
61-695-270-226	R0	Plan and details for treated water discharge pipeline and diffuser #1 and #2
61-695-270-230	R0	HDPE piping typical installation details

Table 3 – Construction Final Drawings List

2.4 Operation Description

During the open water seasons (summer), raw water stored in the IVR Attenuation Pond will be pumped to the Water Treatment Plant (AsWTP) for treatment. Two HL250 diesel pumps will be used to transfer the water to the AsWTP. The treated water will then be pumped from the AsWTP to Whale Tail Lake South Basin (WTS) via two (2) 14-in HDPE pipelines. The treated water will be discharged into WTS using the two submerged diffusers. The total treatment flow rate will be limited up to 1600 m³/h, 800 m³/h per diffuser.

At the end of the summer, all pipelines will be drained. At the end of winter/start of the spring freshet, treatment of the water stored in IVR Attenuation Pond will begin. The insulated and heat traced pipeline will be used to transfer water from the pond to the AsWTP and then from the AsWTP to WTS. The treatment flow rate will be limited up to 800 m³/h. Once the ice sheet cover is melted, the second diffuser will be put into service. The flow rate and cumulative volume pumped to WTS will be measured continuously using the magnetic flowmeters located at the AsWTP.

During the operation, an operator will:

- › Inspect each pump station at least once a day;
- › Monitor on a daily basis the operation and treatment performance of the AsWTP;
- › Collect water samples of the treated water after the AsWTP per the requirements of the amended Water License #2AM-WTP1830 Part F Item 5 and Schedule I Table 2;
- › Inspect the air release valves located before the drop into South Whale Tail Lake to insure they function as they should at least twice a week.

3. Diffuser and Pipeline Installation description

3.1 Overall Project Schedule

The overall schedule for the installation and commissioning of the diffusers was the following:

- › Pipeline fusion started on September 3, 2020
- › Completion of the summer diffuser sinking: September 16, 2020
- › Completion of the winter diffuser sinking: October 1, 2020
- › Commissioning of heat tracing on the Winter diffuser: October 17, 2020
- › Commissioning of the winter diffuser: November 4, 2020

3.2 Roles and Responsibilities

The engineering design and construction documents for the diffusers was developed by SNC Lavalin. Agnico Eagle Mines Limited was responsible for the construction and installation of the system and the QA/QC during construction. The table 4 provides a summary of the general roles and responsibilities for each party involved during the diffuser's installation. This table also includes the key companies and the key personnel who contributed to the various construction activities.

Company	Role	Responsibility	Key Personnel	Position
Agnico Eagle Mines Ltd	› Owner	› Manage construction activity › QC during › Construction Provide Survey	Jessy Gauthier	Mechanical Resident
			Alex Gélinas	Construction general Supervisor
			Sylvain Chartier Serge Racicot Bruno Roy Marc-André Beaudet	Engineering Lead Construction Lead
Agnico Eagle Mines Ltd	› Owner	› QA during construction	Laurier Colette / Claude Gagné / Arnaud Poirier	Geotechnical Engineer / Water & Tailings Specialist / Intern
			Frederick Bolduc	Geotechnical Coordinator
			Yan Côté / Mark Morin	Engineering Superintendent / Engineering General Supervisor
SNC-Lavalin	› Designer	Provide Engineering Report & Construction › As-built	Dan Chen Anh-Long Nguyen	Engineers
ABF Artic Construction	› Contractor	› Carry out construction activity › Supervise work	Francois Caouette Alexandre Coulombe Pepin	Superintendent ABF

Table 4 – Roles, Responsibilities and Key Personnel

3.3 Diffuser and Pipeline Installation

The following section describes the general installation procedure that was used for the diffuser and offshore pipeline in Whale Tail Lake South Basin. The installation took place over the summer months. The general installation procedure for each diffuser was as follows:

1. Assembled one (1) of the two diffusers/pipelines:
 - a) Assembled one diffuser and an offshore pipeline segment on the shoreline using pipe-butt welding for the whole length.
 - b) Installed flanges at both ends of the pipeline.
 - c) Installed a blind flange on the diffuser end and keep the other end open on the shoreline.
 - d) Installed the discharge ports by mounting 2.5-in saddles on the 14-in DR17 HDPE and drilling a 2.5-in hole. Each saddle was mechanically secured. Screw in the 2.5-in diffuser riser and cap them so that they are airtight. Refer to drawing 61-695-270-225 to 61-695-270-226 for details.
 - e) Gradually pulled the assembled diffuser/pipeline off the shoreline while installing concrete ballasts. Keep a +/-50 m section of unballasted pipeline on the shoreline. Refer to drawing 61-695-270-225 to 61-695-270-226 for details. The assembly and positioning of the diffuser/pipeline assembly was carried out in such a way to limit any erosion along the shoreline.
 - f) Continued the diffuser/pipeline/concrete ballast assembly, while continually pulling the ballasted pipeline into the lake.
 - g) On the insulated and heat-traced pipeline, installed heat trace channel and insulation kit around the HDPE pipe on the shoreline. Attached the concrete ballasts to this section of insulated pipeline. Pulled the line into the lake gradually as insulation and ballasts are added to the assembly.
2. Positioned the floating diffuser/pipeline into position in Whale Tail Lake South Basin.
3. The end of the pipeline that is onshore was anchored to the shore to prevent it from slipping into the water.
4. Once the diffuser/pipeline was floating in position, removed caps on diffuser risers.
5. Slowly filled pipeline/diffuser from the shoreline end until the pipe was approximately 70% full. Filling was done with a pump at a rate no higher than 5 l/sec using lake water.
6. Once diffuser/pipeline was in place and partly full, cracked open lake-side blind-flange and allowed the diffuser/pipeline to sink. Kept tension in the rope used for towing from the boat to ensure it remained in position.

All piping installed at the site was High-Density Polyethylene (HDPE). The HDPE pipe segments were assembled by butt fusion joints performed by a technician quality in this field according to Plastique Pipe Institute (PPI) TN-42 guidelines.

3.4 QA/QC Program

The construction activities of the pipeline and diffuser were performed during the summer 2020, until early October 2020. The commissioning of the pipeline and diffuser was performed during the first week of November 2020.

The owner Agnico Eagle Mines Limited (AEM) was responsible to manage all the related construction activities. During construction period AEM conducted a complete QA/QC supervision of the overall construction activities including:

- › NPAG rockfill material was properly assessed and identified for use in the construction of the access roads;
- › Ensured proper compaction of the rockfill and granular fill material;
- › Tracked the quantity of NPAG rockfill and granular fill used in the construction;
- › Identified and placed the proper diameter and HDPE DR rated pipeline at its proper location on the site;
- › Verified qualifications of the field technician that is assembling the piping;
- › Verified functionality of heat tracers after installation and ballasting.

The appendix B includes: the complete QA/QC program of the pipeline and diffuser installation, the QA Inspection Reports during the construction period, the mechanical completion certificates, the specific QC reports on the pipeline fusion and heat tracing verification functionality, and finally the procedure and commented pictures on the typical ballast installation.

3.5 Design Changes and Field Adjustments

Design changes were required and agreed upon with the designer (SNC) during the construction and the installation of the diffusers.

In order to prevent the pipe from turning on itself during installation, a different assembly for weight distribution over the length was proposed and accepted. The original design of the concrete ballast assembly was based on a two-piece assembly (one at the bottom of the pipe and the other at the top). A different type of assembly was discussed and agreed upon for each other ballast: the two concrete blocks are at the bottom of the pipe, attached to the pipe with a custom-made bracket.

The winter diffuser arrived at the site 30 feet shorter. A design modification was required and agreed upon with the designer (SNC) during the assembly of the diffuser with the pipeline. After simulation and validation of the different parameters, since the diffuser end remained below the elevation of 145.0, the designer provided approval of the design modification by e-mail.

A Complete e-mail exchange between AEM and the designer regarding this design change is attached as Appendix C. These changes have been tracked in AEM change log, also in Appendix C.

3.6 TSS Mitigation

To minimize TSS reporting to the Whale Tail Lake South Basin (WTS) during the assembly and installation of the diffuser/pipeline, the location where the assembly work has been carried out was selected to have an easy access to the water. An existing ramp located along the shoreline of WTS.

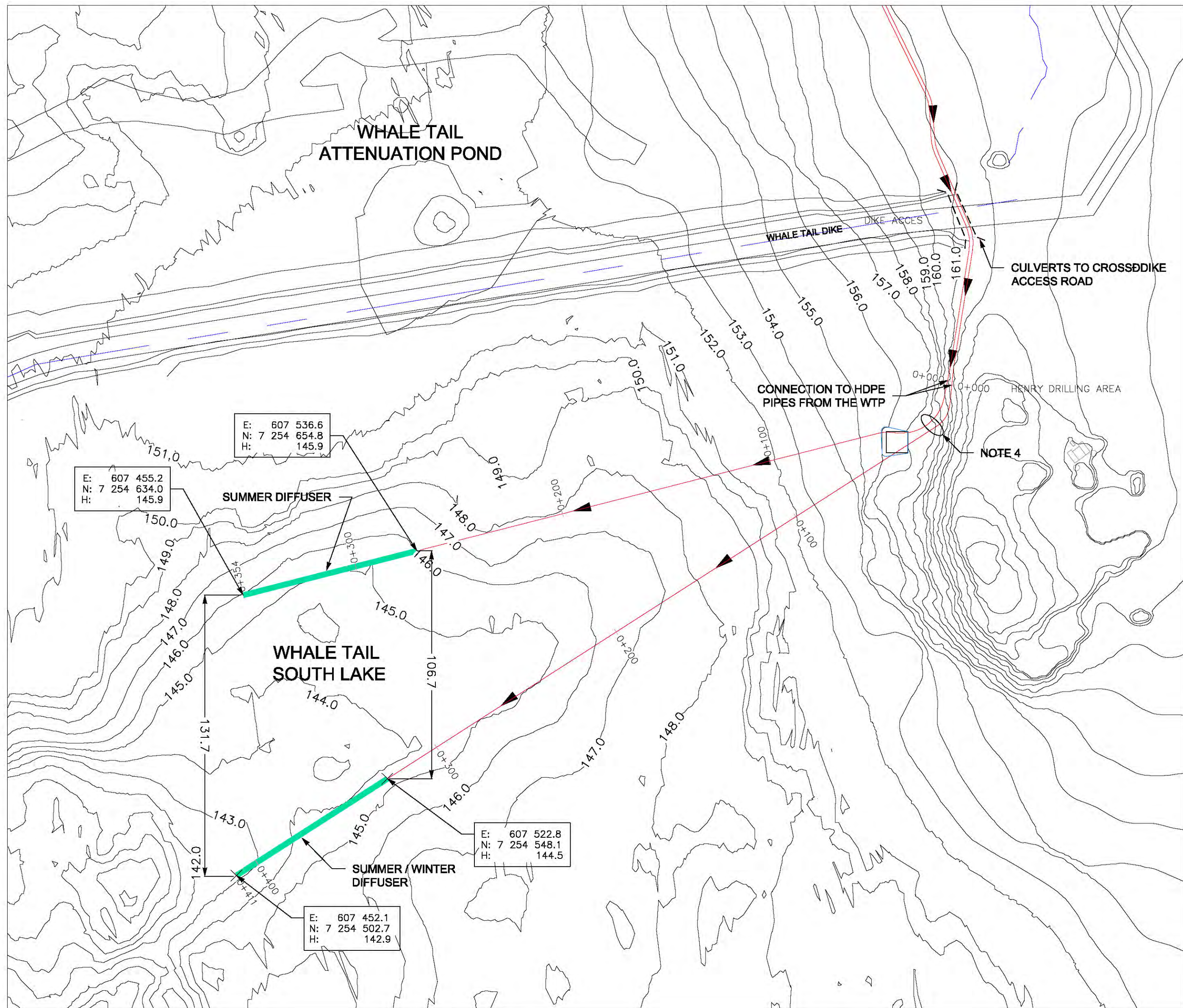
During construction, field observations were carried out of the water body where the diffusers/pipelines were being installed. If there was a TSS excursion, silt curtains would have been deployed around the disturbed area.

3.7 As-Built Drawings and pictures

The final as-built drawings including related pictures are available in the Appendix D.

APPENDIX A
FINAL CONSTRUCTION DRAWINGS

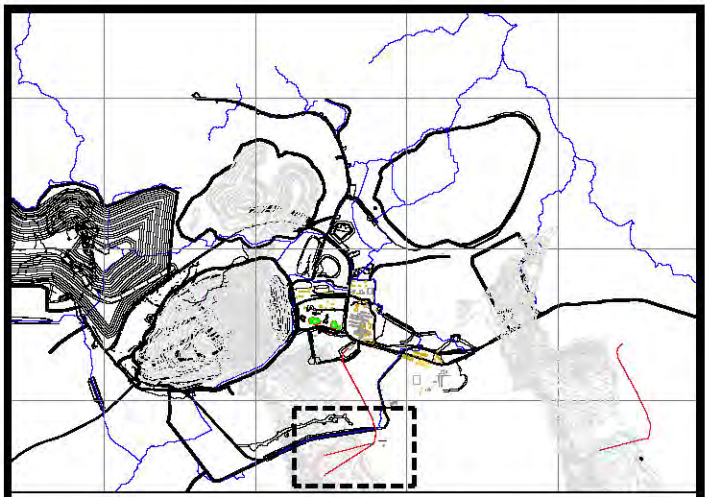




PLAN VIEW
SCALE : 1: 1500



DETAILED PLAN VIEW
SCALE : 1: 200



PLAN CLE / KEY PLAN

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
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NOTES GÉNÉRALES / GENERAL NOTES

NOTE:

- FOR DETAILS ON THE OFFSHORE BALLAST OF THE PIPELINE, REFER TO DRAWING 61-695-270-225 AND 61-695-270-226.
- EXISTING PAD SHOWN ON THIS DRAWING IS PRELIMINARY. ELEVATION AND DIMENSIONS OF THE PAD ARE TO BE CONFIRMED ON SITE.
- ON-SHORE PIPES SHALL BE ANCHORED TO PREVENT ANY SLIPPING OF THE OFF-SHORE PIPES.
- EXISTING ACCESS ROAD IN THE AREA SHALL BE USED TO ACCESS THE PIPELINES. EXISTING ACCESS ROAD TO THE EXISTING PAD MAY REQUIRE REPROFILING TO FACILITATE PIPELINE MAINTENANCE.

LEGEND

- RUN-OF-MINE
- ROCKFILL 0-1000 MM
- CULVERT TO CROSS THE WHALE TAIL DIKE ROAD

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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG



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RD	2020-07-07	ISSUED FOR CONSTRUCTION	M/DC/NE	AN/18
RC	2020-06-15	ISSUED FOR PERMITTING	M/DC/NE	AN/18
RB	2020-03-19	ISSUED FOR CLIENT COMMENTS	M/DC/NE	AN/18
RA	2020-03-16	ISSUED FOR INTERNAL COMMENTS	M/DC/NE	AN/18

REVISIONS



PERMIT TO PRACTICE
SNC-LAVALIN INC.
NAME: Marius Movila
DATE: 2020-07-29
PERMIT NUMBER: P 260
The Association of Professional Engineers,
Geoscientists and Geophysicists of METRO

TITRE / TITLE
AGNICO EAGLE - AMARUQ DIVISION
695 - WATER MANAGEMENT
270 - PIPING

AMARUQ PHASE 2
DIFFUSER PIPE LAYOUT AND PROFILE

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DRAWN BY
MARIUS MOVILA
DATE
2020-03-16

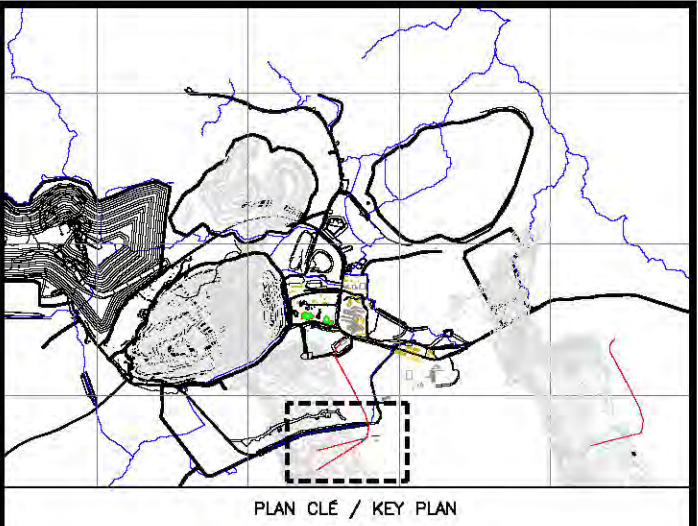
VERIFIÉ PAR
CHECKED BY
DARIUSH RASTGOU / DAN CHEN
DATE
2020-03-16

APPROUVE PAR
APPROVED BY
ANH-LONG NGUYEN
DATE
2020-03-16

ECHELLE
SCALE
AS SHOWN
DATE
2020-03-16

NO. DESIGN
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PROJECT NO.
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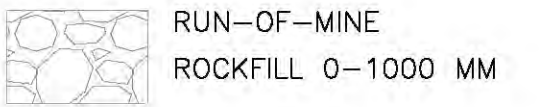
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NOTES GÉNÉRALES / GENERAL NOTES

NOTE:

1. FOR DETAILS ON THE OFFSHORE BALLAST OF THE PIPELINE, REFER TO DRAWING 61-695-270-225 AND 61-695-270-226.
2. EXISTING PAD SHOWN ON THIS DRAWING IS PRELIMINARY. ELEVATION AND DIMENSIONS OF THE PAD ARE TO BE CONFIRMED ON SITE.
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LEGEND



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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG



AGNICO EAGLE

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RA	2020-03-19	ISSUED FOR CLIENT COMMENTS	NM/DC/NQ	N/A/HB		
RB	2020-03-16	ISSUED FOR INTERNAL COMMENTS	NM/DC/NQ	N/A/HB		
REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT	

REVISIONS



PERMIT TO PRACTICE
SNC-LAVALIN INC.
Signature NAME *[Signature]*
Date DATE 2020-07-09
PERMIT NUMBER: P 260
Association of Professional Engineers,
Geologists and Geophysicists of NWT/NU

TITRE / TITLE

AGNICO EAGLE - AMARUQ DIVISION
695 - WATER MANAGEMENT
270 - PIPING

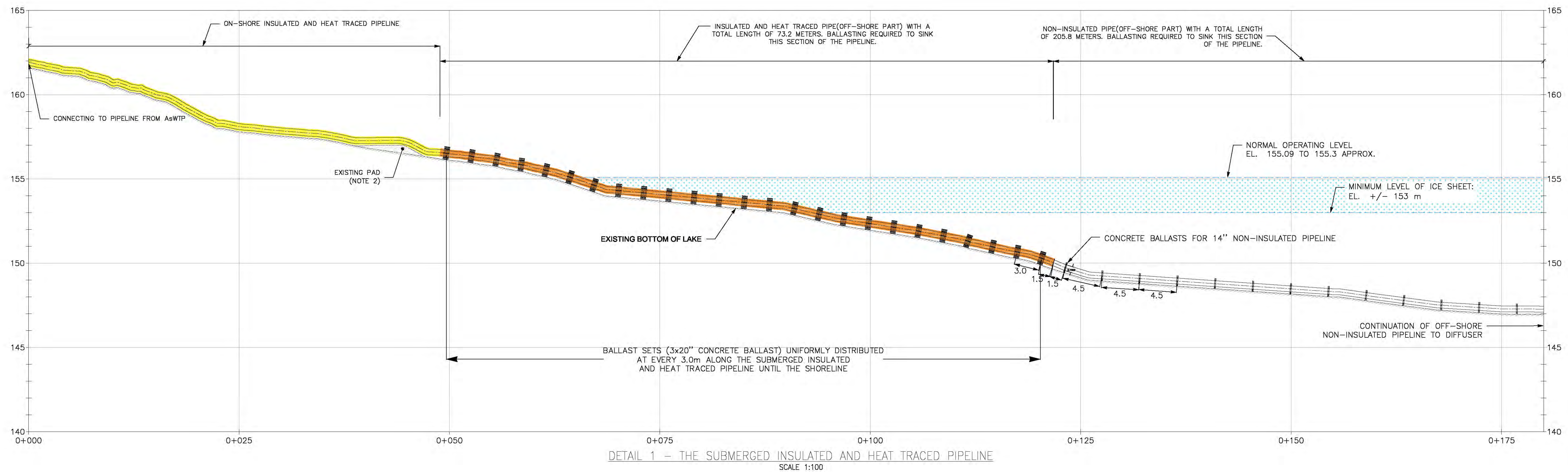
AMARUQ PHASE 2
DIFFUSER PIPE LAYOUT AND PROFILE

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APPROUVÉ PAR APPROVED BY	ANH-LONG NGUYEN	2020-03-16

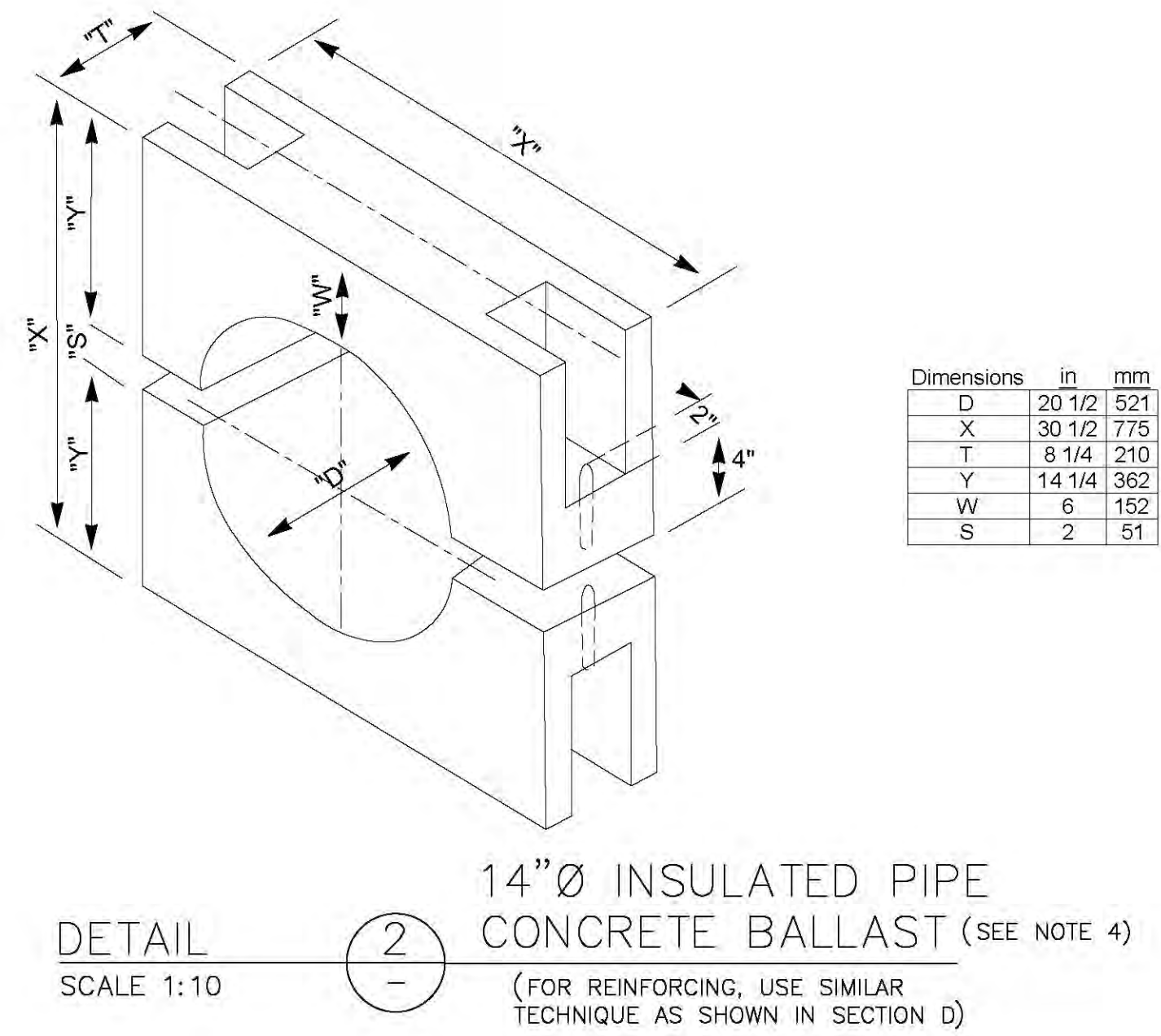
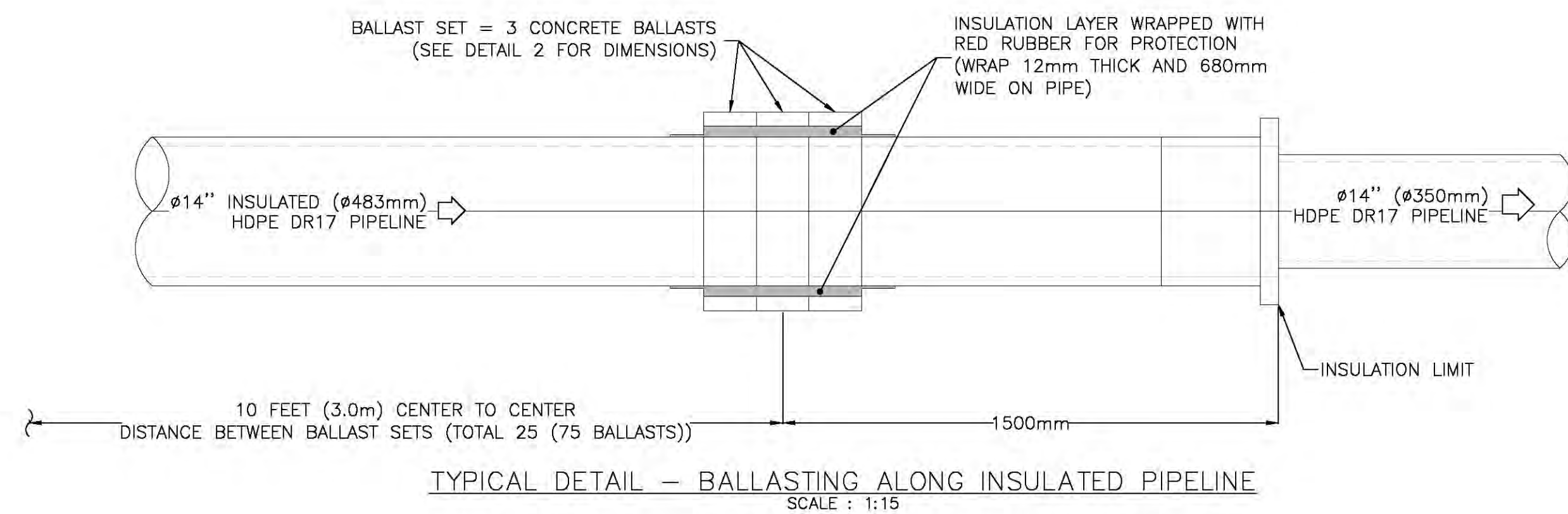
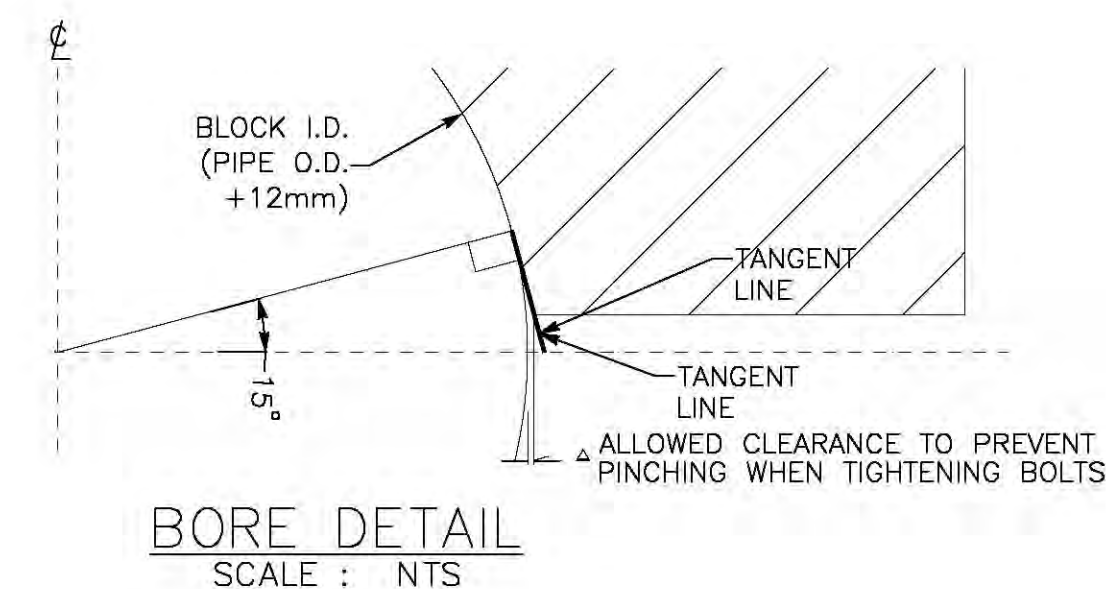
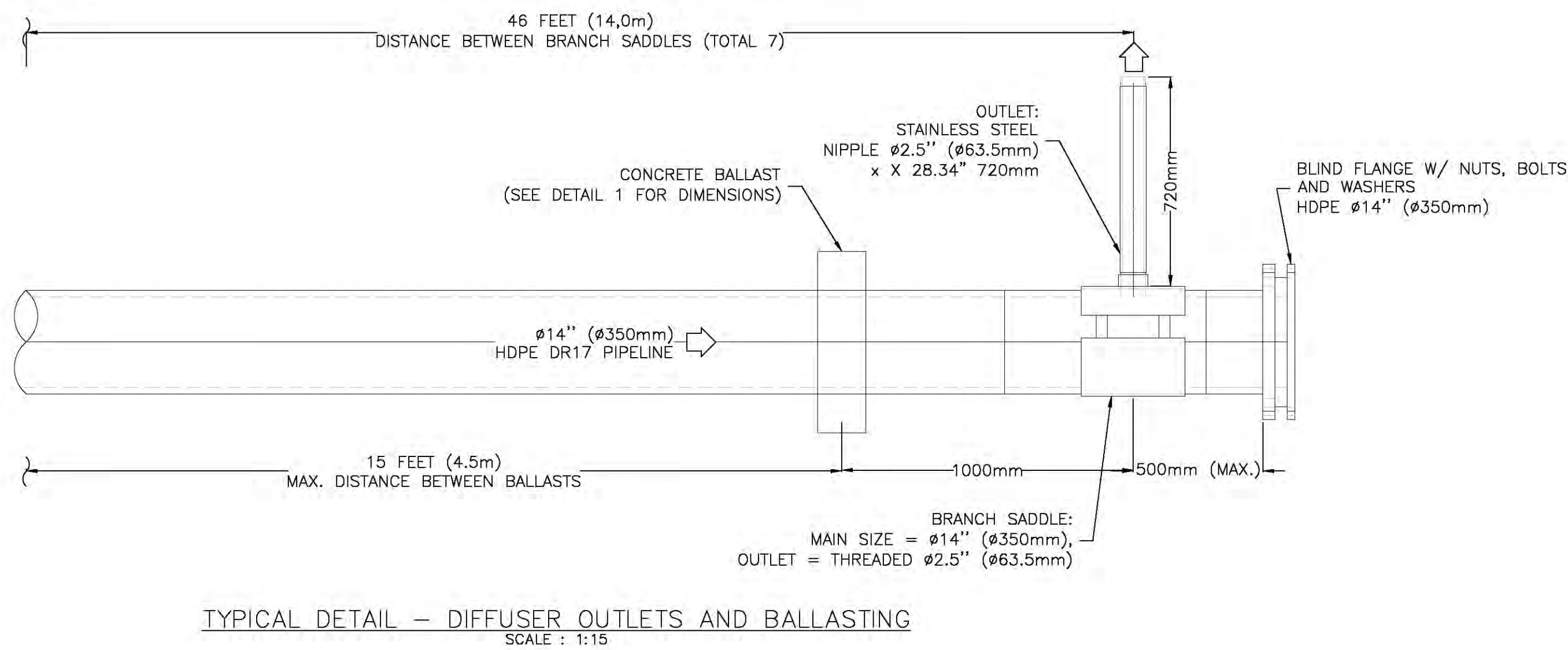
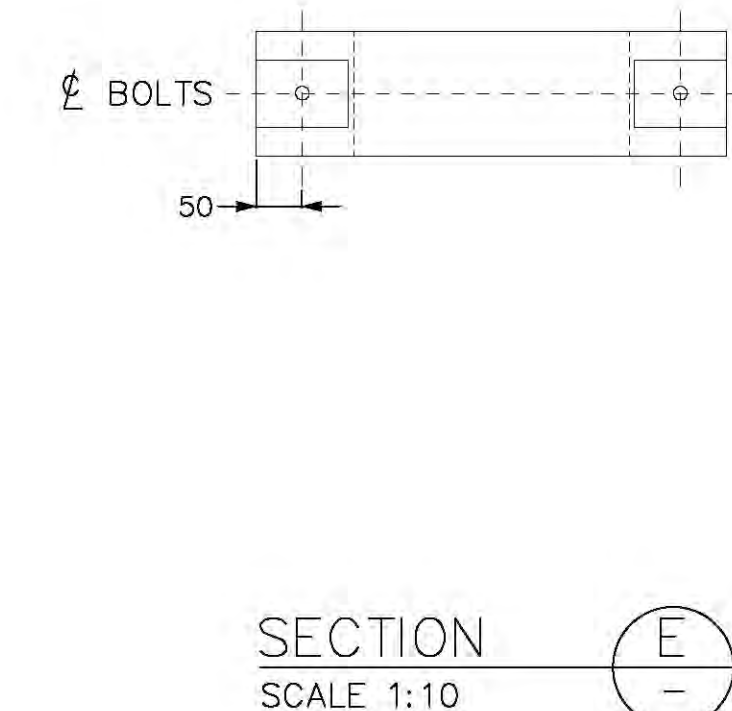
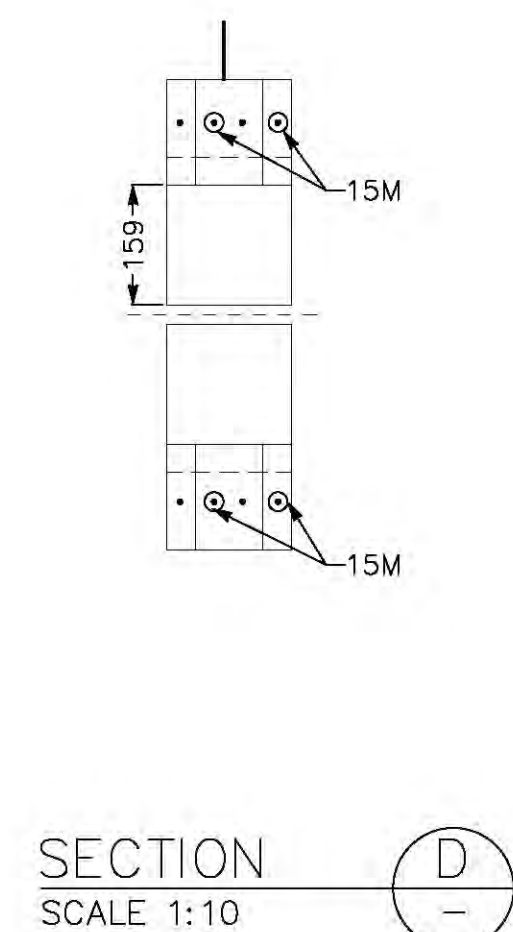
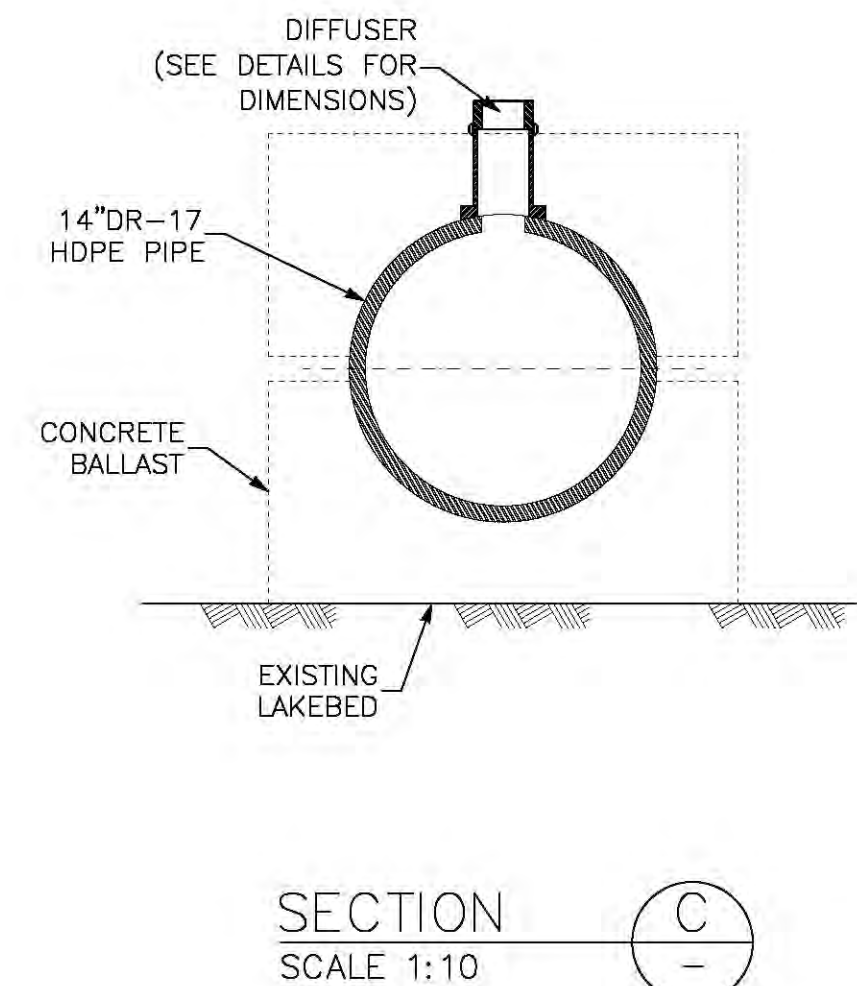
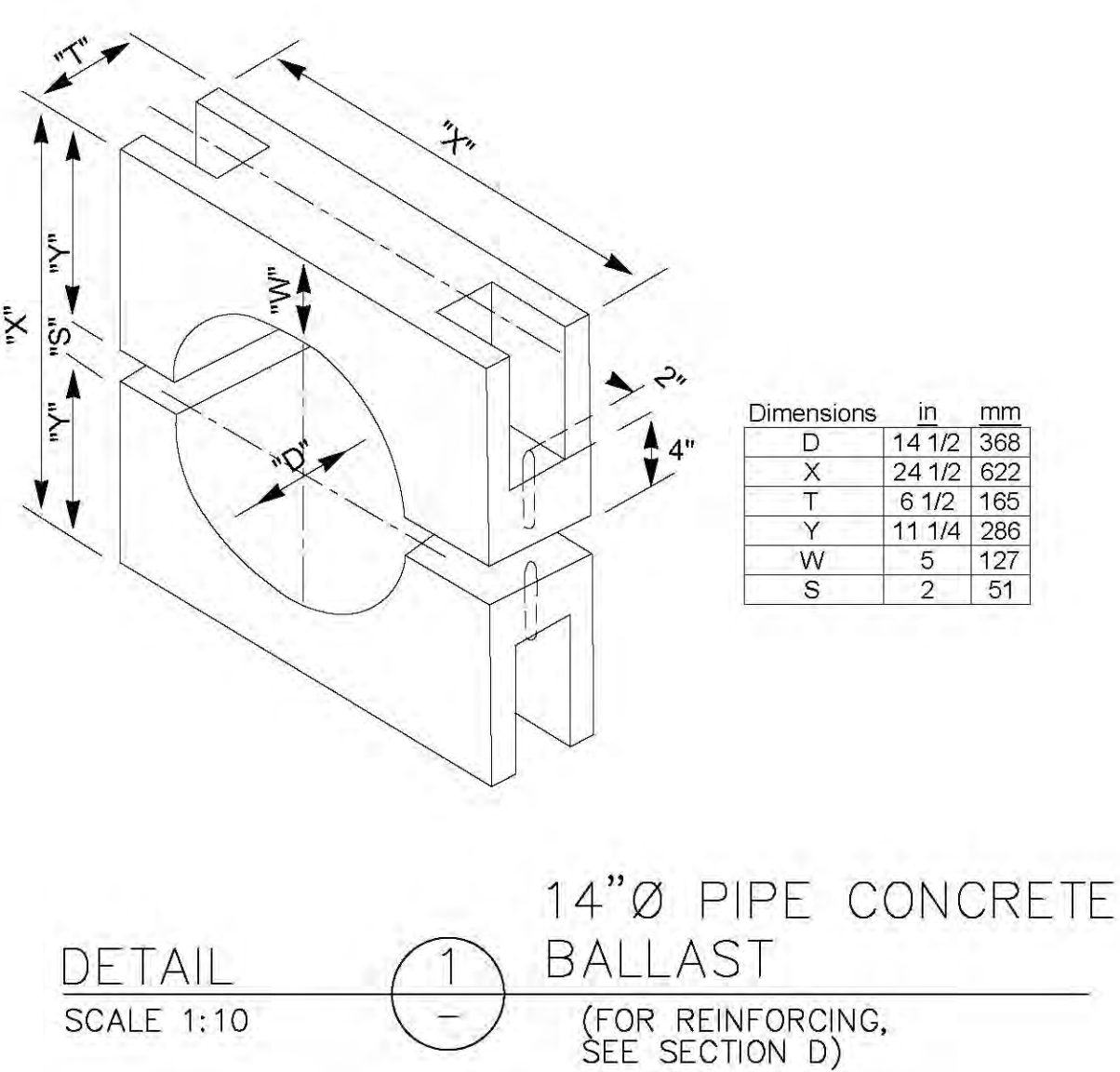
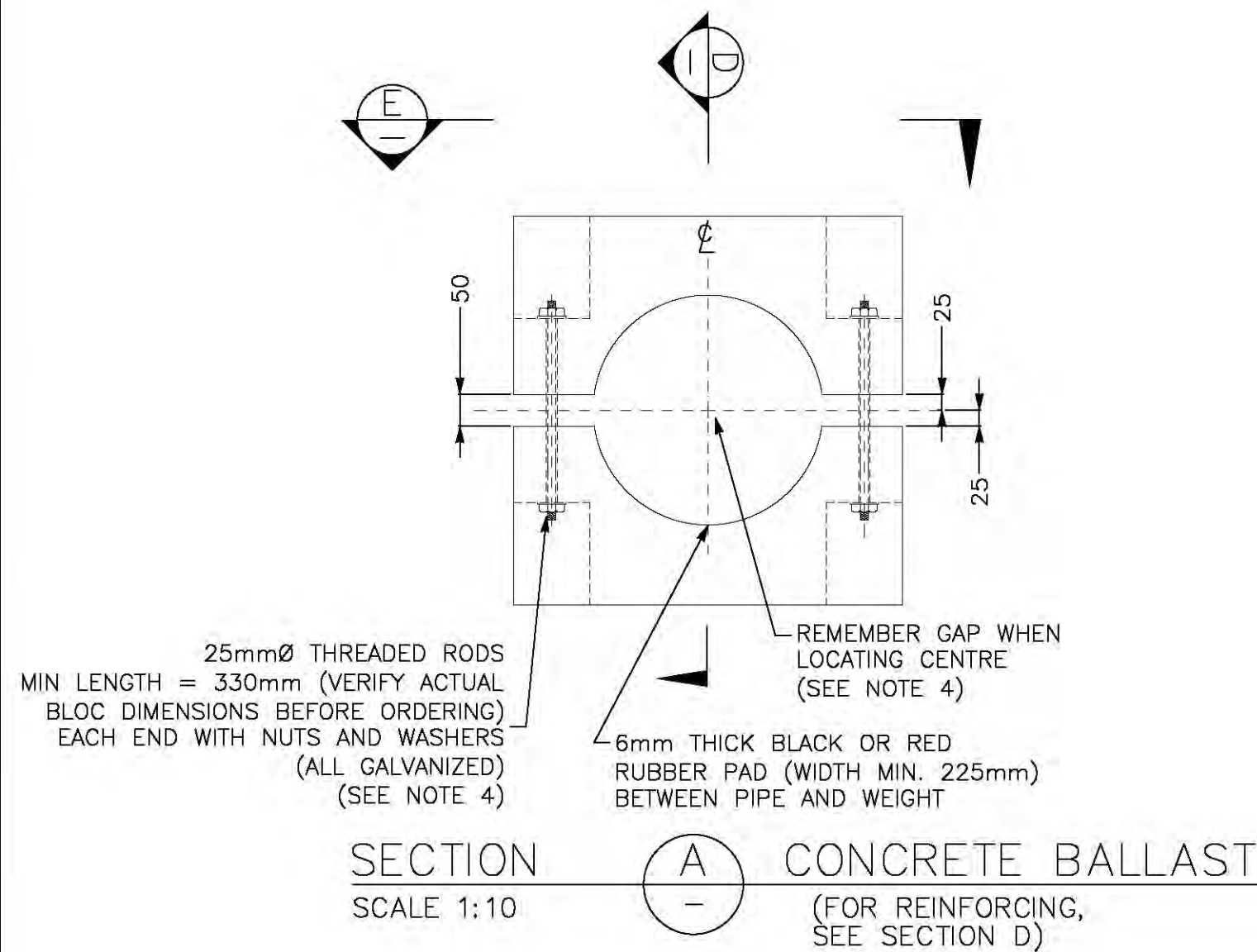
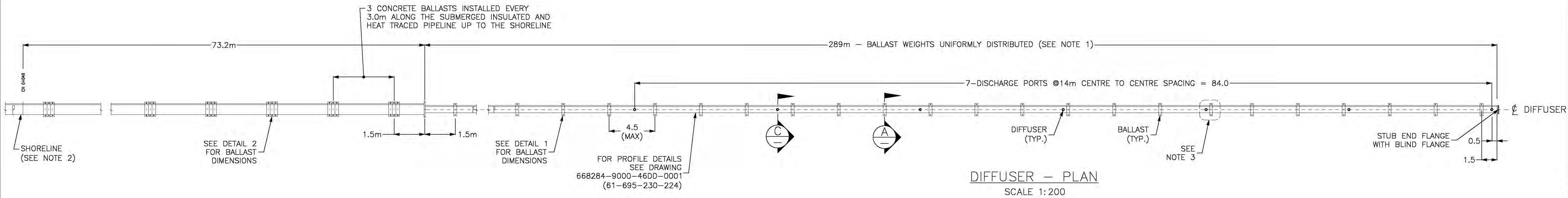
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DRAWING NO. 61-695-270-224

NO. PROJ PROJECT NO.	REVISION	FEUILLE / SHT
	R0	2 / 2



DETAIL 1 – THE SUBMERGED INSULATED AND HEAT TRACED PIPELINE
SCALE 1:100



PLAN, CLE / KEY PLAN

SNC-LAVALIN

Mining & Metallurgy
5500, des Gables Blvd., 2nd Floor, Québec, Québec, Canada G2K 2E2
Téléphone: (418) 597-5500 Fax: (418) 597-5507

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
668284	9000	46 DD	0003	E00

NOTES GÉNÉRALES / GENERAL NOTES

NOTES:
1) BALLAST UNIFORMLY DISTRIBUTED ON WHOLE LENGTH OF UNDERWATER PIPE STARTING FROM PROJECTED SHORELINE TO END OF DIFFUSER. IF A BALLAST WEIGHT ENTERS IN CONFLICT WITH DIFFUSER PORT, SEE NOTE 3.
2) 1ST BALLAST MUST BE INSTALLED 3.0m MAX FROM INDICATED SHORELINE.
3) BALLASTS ARE TO BE EVENLY DISTRIBUTED. IF A BALLAST POSITION ENTERS IN CONFLICT WITH A DIFFUSER PORT POSITION, THE BALLAST MUST BE DISPLACED. THE DISPLACEMENT MUST MINIMALLY 1.0m FROM DIFFUSER PORT. ALL THE WHILE RESPECTING 4.5m MAX SPACING BETWEEN TWO BALLASTS.
4) THESE INDICATIONS ARE EQUALLY VALID FOR 14" INSULATED PIPE CONCRETE BALLAST INSTALLATION (DETAIL 2)

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DESIGNS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/APP.	LOI/ENT.
RD	2020-07-07	ISSUED FOR CONSTRUCTION	MS/PA/AL	A.L.N.
RC	2020-06-15	ISSUED FOR PERMITTING	MS/PA/AL	A.L.N.
RB	2020-04-24	ISSUED FOR CLIENT COMMENTS	MS/PA/AL	A.L.N.
RA	2020-03-25	ISSUED FOR INTERNAL COMMENTS	MS/PA/AL	A.L.N.

REVISIONS

PERMIT TO PRACTICE
SNC-LAVALIN INC.
Signature: NAME
DATE: 2020-07-09
PERMIT NUMBER: P-260
The Association of Professional Engineers, Geologists and Geophysicists of HNTNU

TITRE / TITLE
AGNICO EAGLE - AMARUQ DIVISION
695 - WATER MANAGEMENT
270 - PIPING
AMARUQ PHASE 2
PLAN AND DETAILS FOR WINTER TREATED WATER DISCHARGE PIPELINE AND DIFFUSER

DESIGNÉ PAR DRAWN BY	MARK SYKES	DATE 2020-07-07
VÉRIFIÉ PAR CHECKED BY	PIERRE CARIGNAN / DAN CHEN	2020-07-07
APPROUVÉ PAR APPROVED BY	ANH-LONG NGUYEN	2020-07-07

ÉCHELLE SCALE	AS SHOWN	DATE 2020-07-07
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NO. DESSIN
PROJECT NO.
61-695-270-226

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHEET
6127	R0	1 / 1

A diagram of a circular track with 8 numbered points (1-8) and a dashed line indicating a path. The points are arranged in a circle, with 1 at the top, 3 at the right, 5 at the bottom, and 7 at the left. The dashed line starts at point 1, goes clockwise to point 2, then to point 3, then to point 4, then to point 5, then to point 6, then to point 7, and finally to point 8, returning to point 1.

The diagram shows a circular track with 12 numbered points (1 through 12) arranged in a circle. A dashed line connects the points in a sequence that starts at 1, goes to 2, then 3, 4, 5, 6, 7, 8, 9, 10, 11, and finally back to 12, forming a single continuous loop.

TYPICAL PIPE DRAIN ASSEMBLY
SCALE: N.T.S.

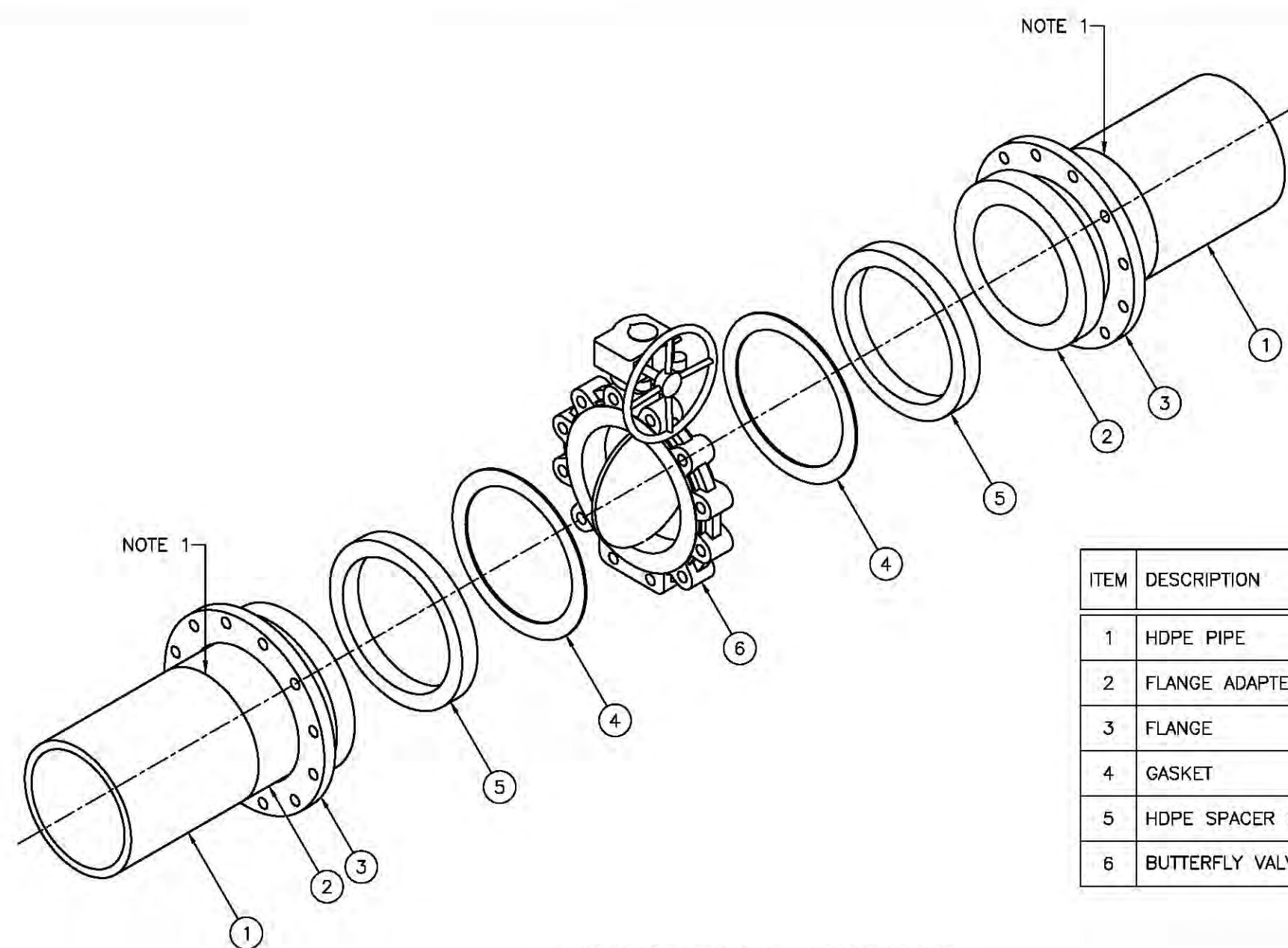
PLAN CLÉ
KEY PLAN



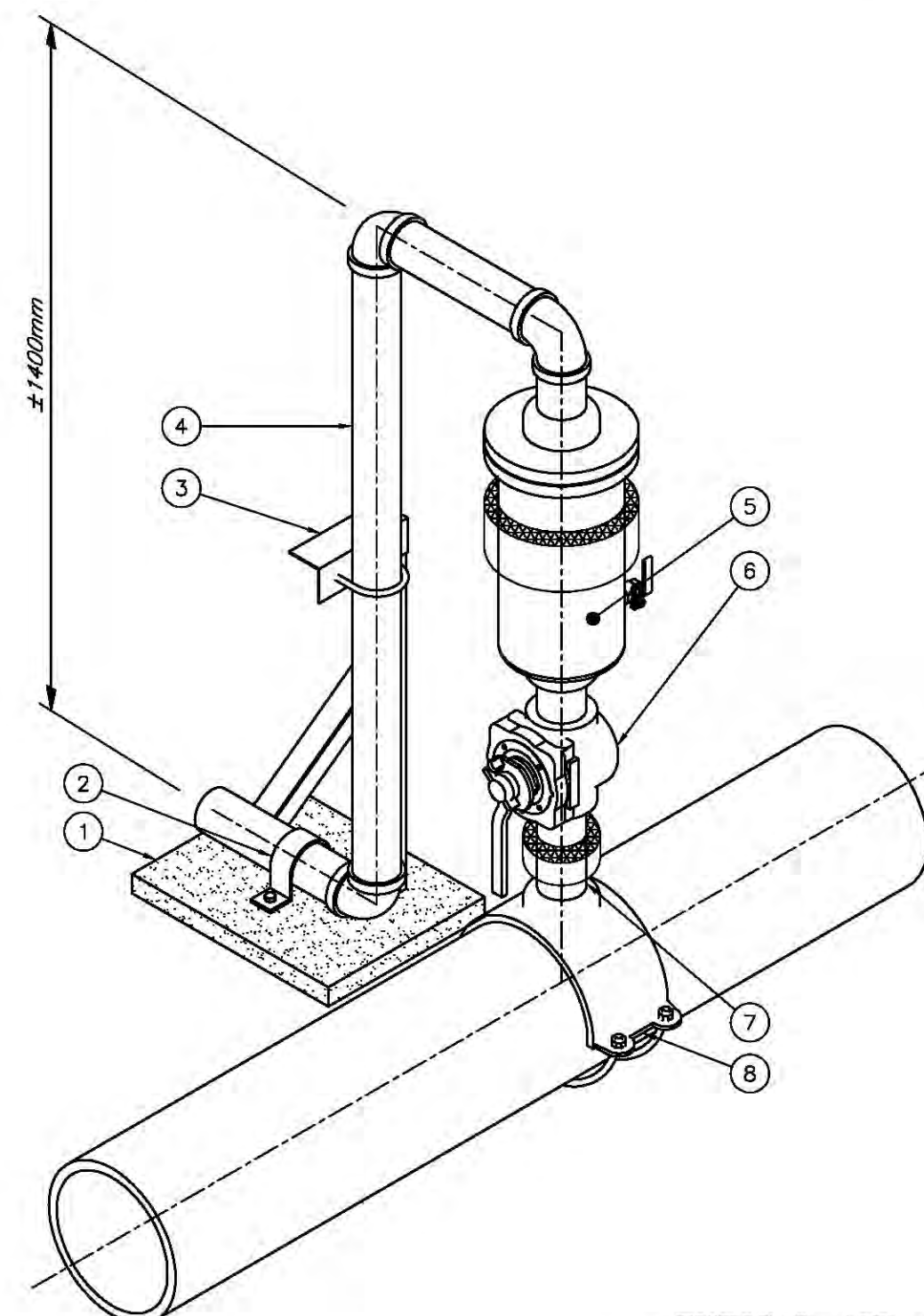
**Sustainable Mining
Mining & Metallurgy
SNC LAVALIN INC.**
455 boul. René Lévesque Ouest
Montreal (Quebec)
Canada H2Z 1Z3

NOTES GÉNÉRALES / GENERAL NOTES

1. HDPE PIPE SEGMENTS SHALL BE ASSEMBLED TYPICALLY WITH A BUTT FUSION JOINTS.
2. A FLANGED CONNECTION SHALL BE INSTALLED EVERY 250 FT (76.2m).
3. TORQUE VALUES ARE SUGGESTIVE BASED ON PLASTIC PIPE INSTITUTE TN-38.
RE-TORQUE BOLTS 4 HR TO 24 HR AFTER COMPLETION OF INITIAL TORQUE APPLICATION.



TYPICAL BFV ASSEMBLY
SCALE: N.T.S.



TYPICAL AIR / VACUUM VALVE ASSEMBLY
SCALE: N.T.S.

**POUR CONSTRUCTION
FOR CONSTRUCTION**

 **AGNICO EAGLE**

DATE : 2020-07-13

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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS	
TITRE / TITLE	# DWG
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**AGNICO EAGLE**

0	2020-07-13	ISSUED FOR CONSTRUCTION	ST.M.	ALN	-	-
REV.	DATE	DESCRIPTION	PAY/BY	APP.	CLIENT	

REVISIONS



TITLE / TITLE

AGNICO EAGLE - WHALE TAIL (AMARUQ)
695 - WATER MANAGEMENT
270 - PIPING
DETAILS
AMARUQ PHASE 2
HDPE PIPING TYPICAL INSTALLATION DETAILS

DESSINE PAR DRAWN BY	BRUNO LEMIEUX, TECH.	DATE 2020/06/01
VERIFIE PAR CHECKED BY	DAN CHEN, ING.	2020/06/01
APPROUVE PAR APPROVED BY	ANH-LONG NGUYEN, ING.	2020/06/1

ÉCHELLE SCALE	N/A	DATE	2020/06/09
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NO. DESSIN
DRAWING NO. 61-695-270-230

NO. PROJ. PROJECT NO.	REVISION	FEUILLE / SHT
	0	1 / 3

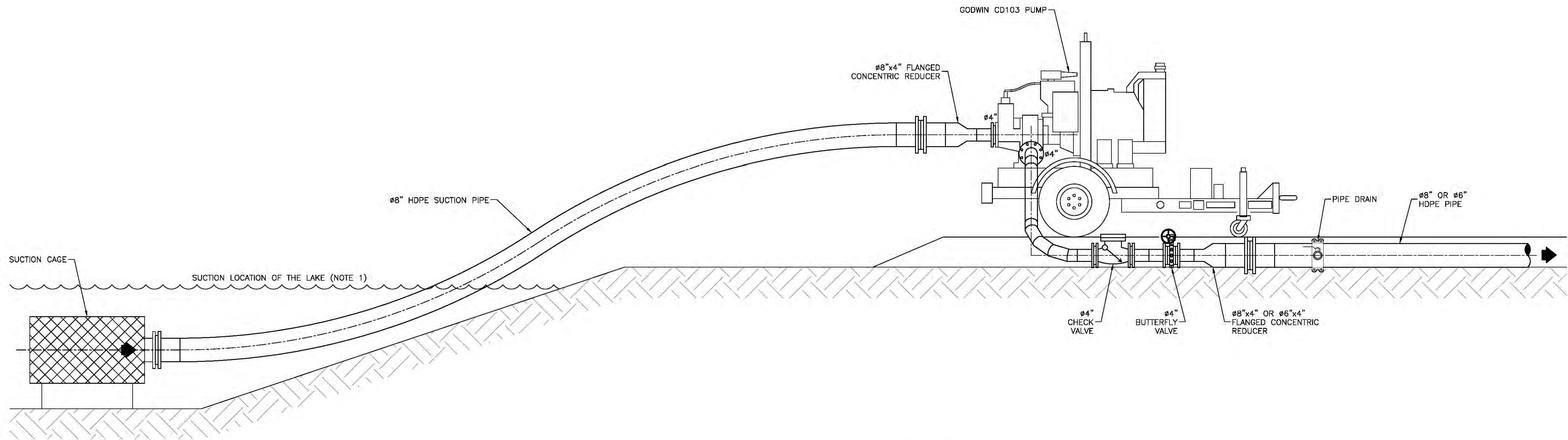
Exploded view diagram of a typical HDPE pipeline assembly. The assembly consists of two HDPE pipe sections (1), two flange adapters (2), two gaskets (3), and two bolts (4). The diagram includes callouts for 'NOTE 1' and 'NOTE 2'. A table on the right lists dimensions for different pipe diameters.

DIA.	NUMBER OF BOLT	DIAMETER OF BOLT
4"	8	3/8"
6"	8	7/8"
8"	8	1"
10"	12	1 1/4"
12"	12	1 1/2"
14"	12	1 3/4"
20"	20	2"

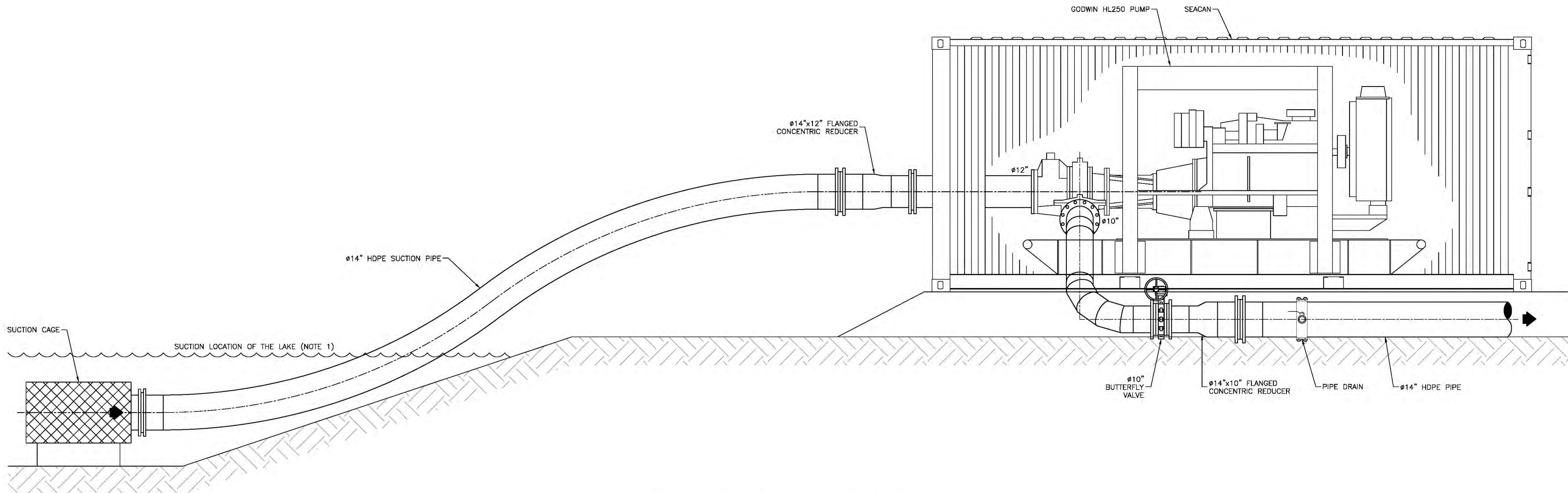
DIA.	NUMBER OF BOLT	DIAMETER OF HOLE	DIAMETER OF BOLT	BOLT LENGTH	SUGGESTED TORQUE (FT/LBS) NOTE 3
4"	8	3/4"	5/8"	5-7/8"	33 TO 50
6"	8	7/8"	3/4"	6"	50 TO 75
8"	8	7/8"	3/4"	6-1/4"	58 TO 88
10"	12	1"	7/8"	10"	58 TO 88
12"	12	1"	7/8"	10"	75 TO 114
14"	12	1-1/8"	1"	10-1/2"	140 TO 210
20"	20	1-1/4"	1-1/8"	11-1/2"	140 TO 210

ITEM	DESCRIPTION
1	HDPE PIPE
2	FLANGE ADAPTER
3	FLANGE
4	GASKET
5	BLIND FLANGE
6	TEE MOLDED

TYPICAL HDPE TEE ASSEMBLY
SCALE: N.T.S.

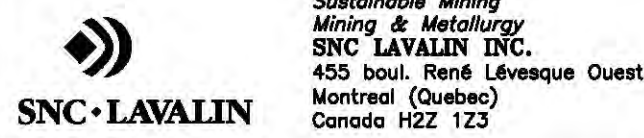


TYPICAL CONNECTION TO CD103 DIESEL PUMP
SCALE: N.T.S.



TYPICAL CONNECTION TO HL250 DIESEL PUMP
SCALE: N.T.S.

PLAN CLE
KEY PLAN



PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
668284	6000	461 DD	0010	00

NOTES GÉNÉRALES / GENERAL NOTES

1. PLACE SUCTION CAGE IN LOWEST POINT IN THE POND OR LAKE, IF ACCESSIBLE. IF NOT, PLACE THE SUCTION CAGE THE FURTHEST AWAY FROM THE SHORE LINE AND MOVE THE CAGE ONCE THE WATER LEVEL IS DRAINED OUT.



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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITLE / TITRE	# DWG



REV.	DATE	DESCRIPTION	PREP.	BY	APP.	CLIENT
0	2020-07-13	ISSUED FOR CONSTRUCTION	ST.M.	ALN	-	-

REVISIONS



TITLE / TITRE
AGNICO EAGLE - WHALE TAIL (AMARUQ)
695 - WATER MANAGEMENT
270 - PIPING
DETAILS
AMARUQ PHASE 2
HDPE PIPING TYPICAL INSTALLATION DETAILS

DESIGNED PAR DRAWN BY	BRUNO LEMIEUX, TECH.	DATE	2020/06/09
VERIFIÉ PAR CHECKED BY	DAN CHEN, ING.	DATE	2020/06/09
APPROUVÉ PAR APPROVED BY	ANH-LONG NGUYEN, ING.	DATE	2020/06/11

ÉCHELLE
SCALE

N/A

DATE 2020/06/09

NO. DESIGN
DRAWING NO.

61-695-270-230

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHEET
61	0	2 / 3

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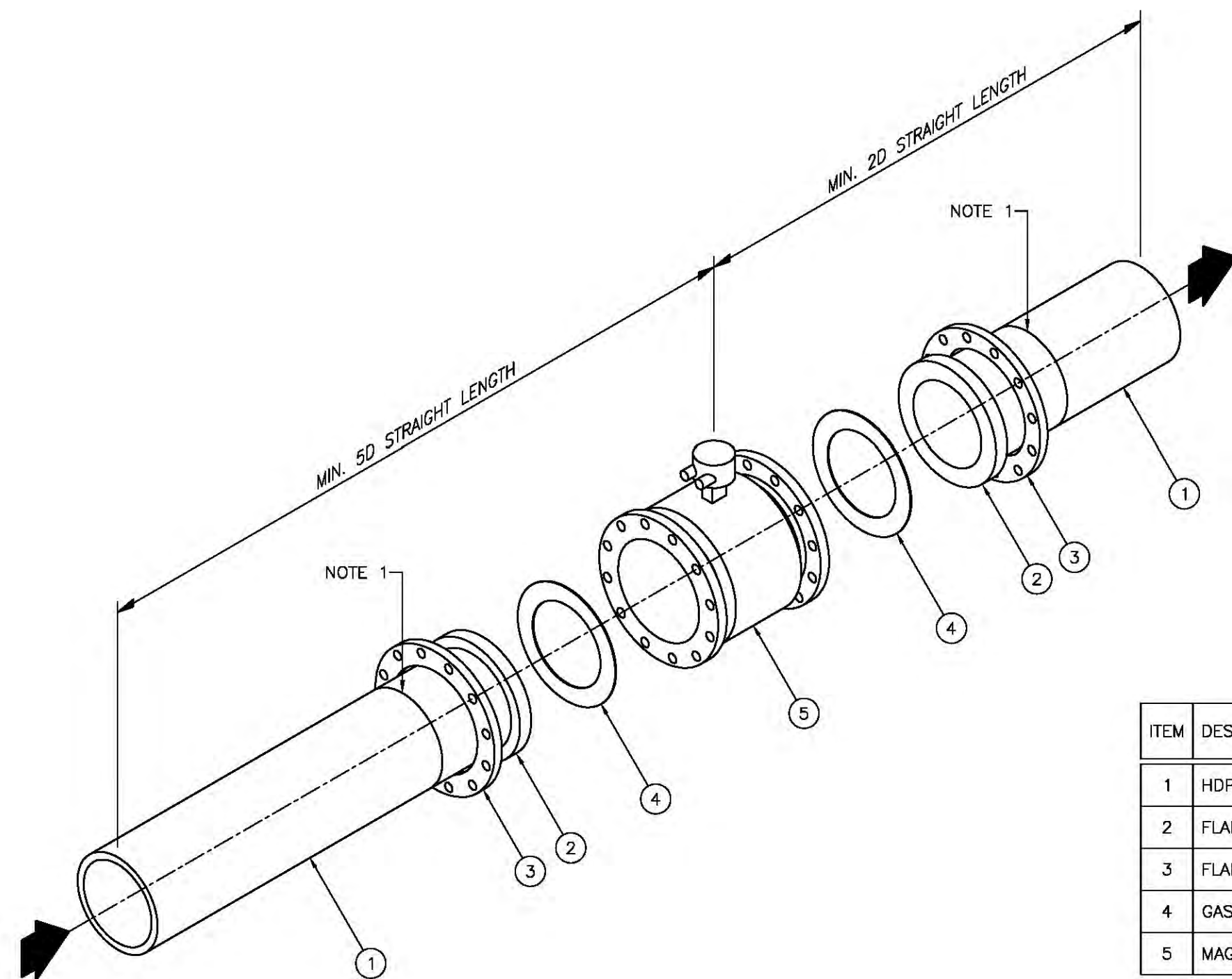
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D

C

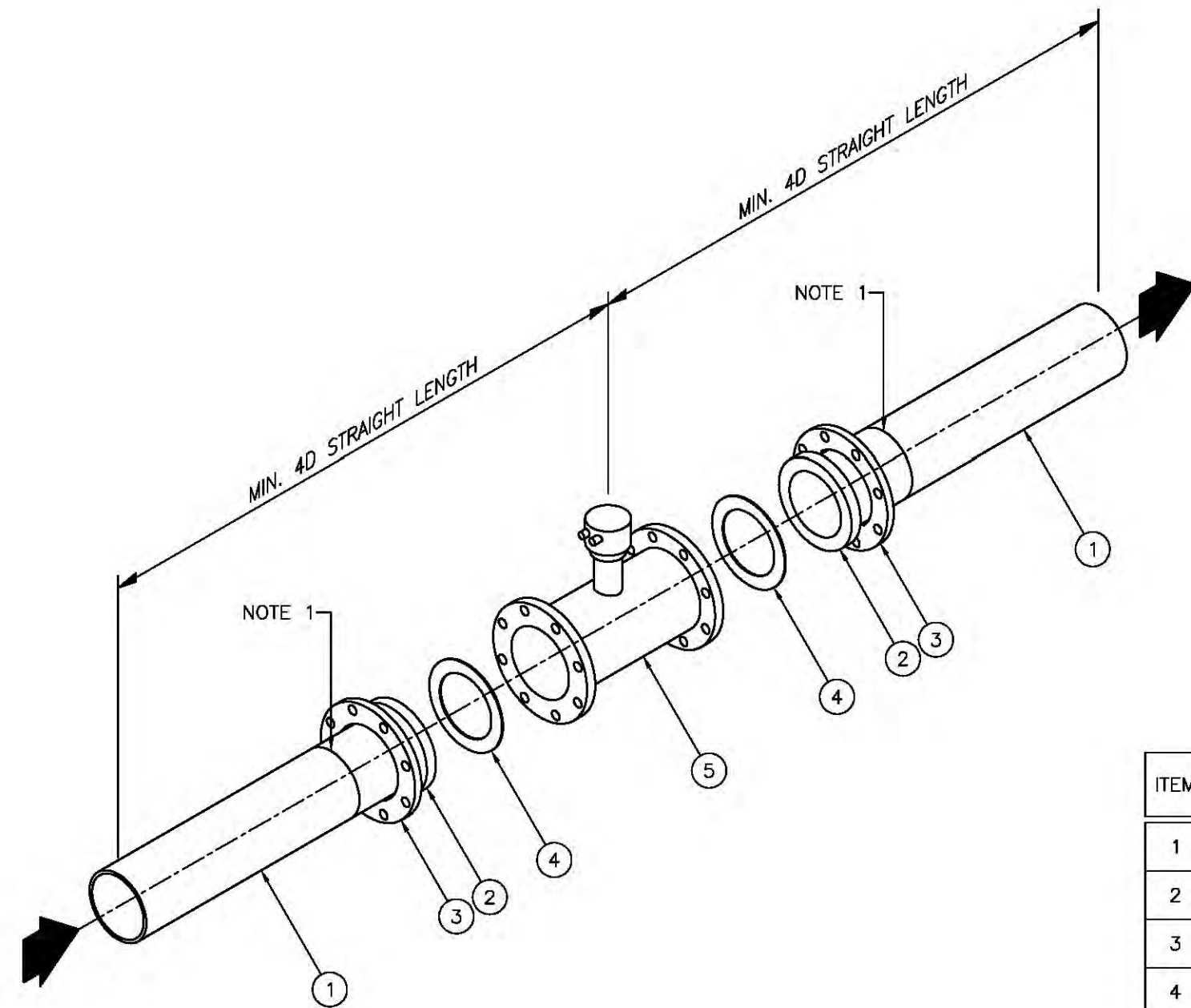
B

A



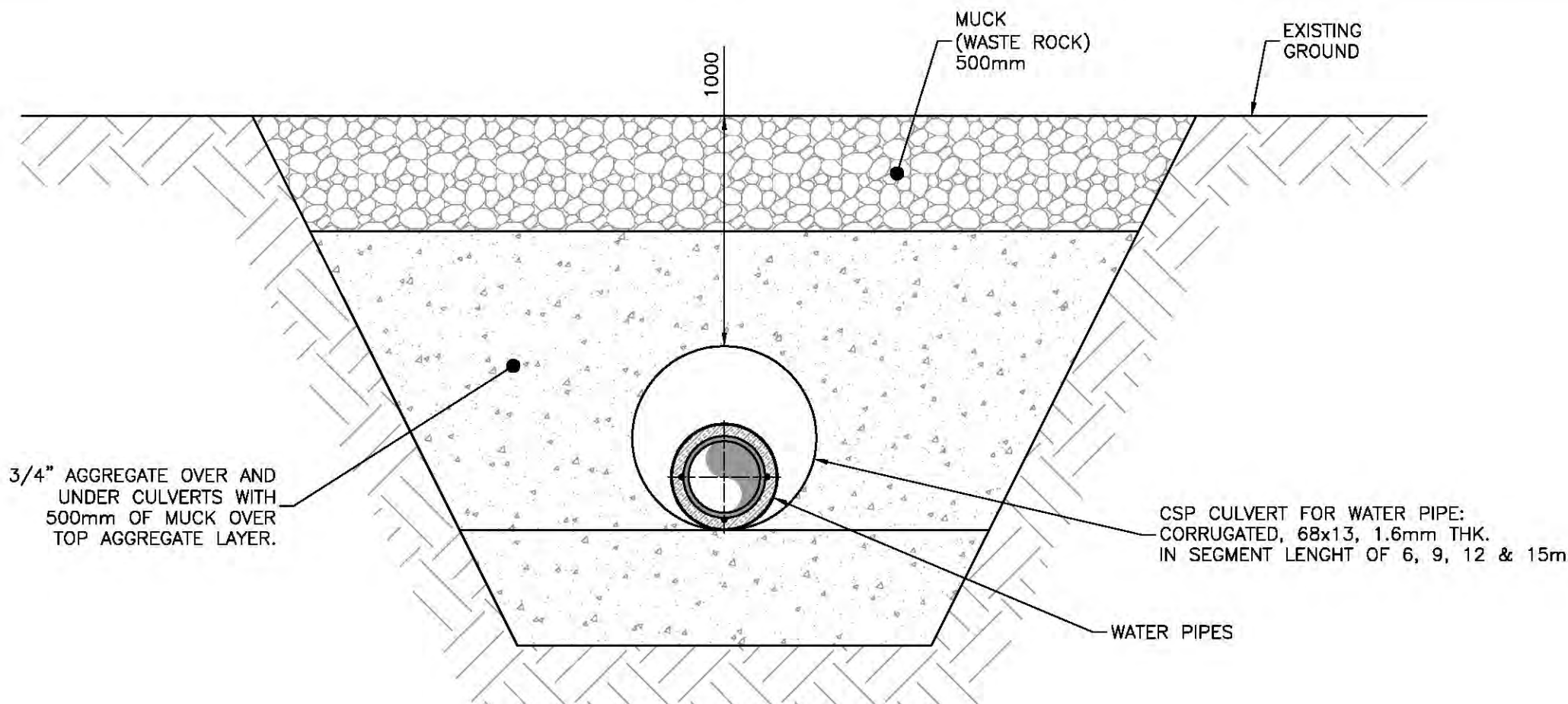
TYPICAL ASSEMBLY OF MAGNETIC FLOWMETER Ø10" & Ø8"
SCALE: N.T.S.

ITEM	DESCRIPTION
1	HDPE PIPE
2	FLANGE ADAPTER
3	FLANGE
4	GASKET
5	MAGNETIC FLOWMETER



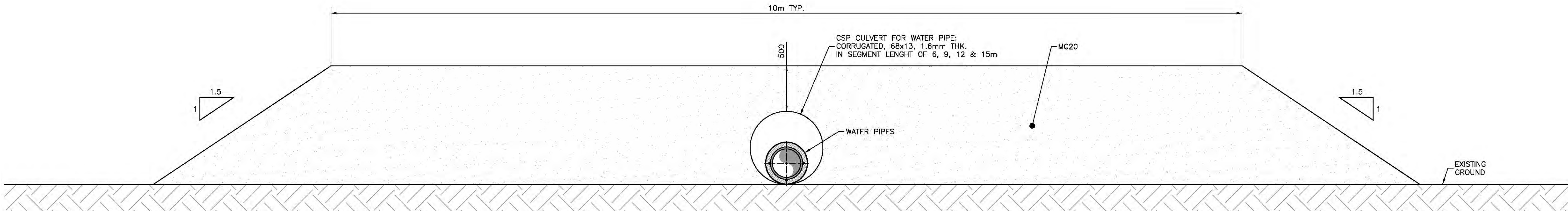
TYPICAL ASSEMBLY OF PADDLE WHEEL FLOWMETER Ø6"
SCALE: N.T.S.

ITEM	DESCRIPTION
1	HDPE PIPE
2	FLANGE ADAPTER
3	FLANGE
4	GASKET
5	PADDLE WHEEL FLOWMETER



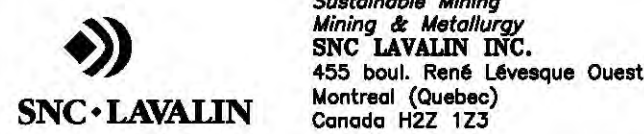
PRIMARY ROAD CROSSING
SCALE: N.T.S.

PIPE DIA.	CSP CULVERT DIA.
4"	500mm
6"	500mm
8"	500mm
8" W/ INSULATION	500mm
14"	700mm
14" W/ INSULATION	700mm



SECONDARY ROAD CROSSING
SCALE: N.T.S.

PLAN CLE
KEY PLAN



PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
668284	6000	461 DD	0010	00

NOTES GÉNÉRALES / GENERAL NOTES

1. HDPE PIPE SEGMENTS SHALL BE ASSEMBLED TYPICALLY WITH A BUTT FUSION JOINTS.



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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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REV.	DATE	DESCRIPTION	PREP.	CHK.	APP.	CLIENT
0	2020-07-13	ISSUED FOR CONSTRUCTION	ST.M.	ALN	---	---

REVISIONS



TITRE / TITLE
AGNICO EAGLE - WHALE TAIL (AMARUQ)
695 - WATER MANAGEMENT
270 - PIPING
DETAILS
HDPE PIPING TYPICAL INSTALLATION DETAILS

DESIGNÉ PAR DRAWN BY	BRUNO LEMIEUX, TECH.	DATE 2020/06/09
VÉRIFIÉ PAR CHECKED BY	DAN CHEN, ING.	2020/06/09
APPROUVÉ PAR APPROVED BY	ANH-LONG NGUYEN, ING.	2020/06/11

ÉCHELLE
SCALE

N/A

DATE
2020/06/09

NO. DESSIN
DRAWING NO.

61-695-270-230

NO. PROJET
PROJECT NO.

61

REVISION
0

FEUILLE / SHEET
3 / 3

APPENDIX B

QA/QC PROGRAM



Item	Material	QA Inspector			QC Representatives			Owner's representative – Engineer
		Task	Frequency	Form to be filled	Task	Frequency	Form to be filled	
Correct pipe installed	All pipes	Visual assessment to confirm correct pipe diameter and type are installed.	Daily Inspection	Inspection report	Ensure that the correct pipes (i.e. pipe diameter and DR type) are installed (see numerical code printed on pipe) and pipes are not damaged	Continuously	Daily report	Coordinate and compile information
Proper pipe storage and handling procedures	All pipes	Visual inspection to confirm the HDPE pipe is not damaged	Daily Inspection	Inspection report	Visual inspection	Continuously	Daily report	Ensure piping is not damage during storage and handling
Proper pipe assembly with accessories	End cap of diffuser/pipeline	Visual inspection of blind flange at the submerged end of the diffuser and on the shore line	Each end of the diffuser/pipeline	Inspection reports	Ensure that all components are available for the assembly of pipe accessories (flange adapted, backing flange, bling flange, nuts and bolts, gaskets)	Each end of the diffuser/pipeline	Daily reports	Ensure the following items are inspected before installation: pipe placement, minimum bend radius, attachment of mechanical joints, fittings and/or appurtenances.
Fusion (butt fusion)	All pipes	Visual assessment Inspect of registered fusion parameters	1 out of 2 butt fusions	Inspection report	Testing standard ASTM F2620 Make sure that all necessary tools are available Respect standard fusion procedure and record fusion parameters (heat temperature, soak time and cooling time) Visual inspection of fusion beads	Continuously on every fusion	Daily report	Make sure that the fusion is visually robust, and all fusions conditions are documented.
Hydrostatic leak test	All pipes	Inspect leak testing with pressure and duration Visual observation of leakage	Each	Inspection report	Testing standard ASTM F2164 Carry out hydrostatic leak test on the shoreline before pulling into the lake	Each 85 m or 5 sections of 50' pipe	Daily report	Ensure the leak test is done and no leak is observed along the length
Concrete ballast installation	All concrete ballasts	Visual assessment of the ballasts assembled on the pipe. Confirm all MTO are assembled (concrete ballast, rubber pad, nuts and bolts) Validate the location of the concrete ballasts on the pipeline Verify rubber vs ballast width	1 out of 5 ballasts	Inspection report	Install concrete ballast on the pipe: make sure that threaded rods are well tightened and all the components such as washers and nuts are not forgotten Record the location of the ballast (distance vs end of the pipe)	Continuously on each installation	Daily report	Ensure that ballasts are well attached to the pipe without any damage to the pipe or insulation
Diffuser port installation	All diffuser ports	Visual assessment of each port. Verify the bolt torque value during the installation Validate the location of the ports	Each port	Inspection report	Record the location of each port (distance from the pipe end) Make sure that the risers are well installed, and no mechanical components are forgotten Record torque used during the installation	Continuously on each installation	Daily report	Ensure that the ports are installed according to initial design
Pre-Insulated Pipe Assembly	Pre-insulated pipe assembly for off-shore submerged heat traced pipe	Visual assessment of butt-fusion. Visual inspection to confirm heat trace channel are connected together between pipe segements. Visual assessment of the connection/joints of the insulation jackets. Visual assessment of the water tight seal on the termination end of the pipeline. Inspect of registered parameters recorded by the Contractor.	Each joint and at termination end of the pre-insulated pipeline	Inspection report	Ensure all materials are available for the assembly. Visual inspection: • Ensure heat trace channel between pipe segments are connected with compression fittings. • Insulation kit and Super-seal shrinking is well done between each section of insulation jackets • Insulation kit installed on the submerged end of the pipe is well done. • Record flame intensity and heat conditions	Continuously on each installation	Daily report	Ensure that the manufacturer procedures are followed and the insulation is water proof to protect the heating cables
Diffuser/Pipeline location	Diffusers/Pipeline	Data inspection (GPS data)	Each diffuser / pipeline	Inspection report	Make sure that the coordinates of the two diffusers are respected before sinking the diffusers/pipeline in the lake. Record position of the diffuser/pipeline after they are submerged in the lake.	Both diffusers	Daily report	Make sure that the diffusers are in place according to designed coordinates and the distance between diffusers are more than 100 meters

Period: 2020-08-30 to 2020-09-05 Arnaud Poirier
Report Prepared by

Visit date:	time (Start/End)		QA Rep.	Weather	Wind conditions	Temperature
2020-09-03	14:30	16:00	AP/LC	Overcast	Heavy	9
2020-09-05	15:00	18:00	AP/LC	Overcast	Heavy	4
2020-09-06	14:00	15:00	AP	Overcast	Light	2

Comments: _____

Appendix: ☐ Yes ☐ No Pictures: ☒ Yes ☐ No

SAFETY REMARKS

Nothing to report

Temperature is dropping

SUMMARY OF CONSTRUCTION ACTIVITIES

- Pipe 113 walkdown with construction representative. Line 113 was installed around the IVR ring road during the week of the 23rd of August between lake A-47 and tee at Nemo road crossing. Remaining section of line 113 from nemo road to A53 remains to be installed.
- Line 114 installed between tie-in to line 113 and Road 7/Nemo road intersection.
- Dike 1 overflow culvert installation.
- Pipe Fusion of DR17 8".
- Construction of Whale Tail South diffuser, to be installed shortly.

ACTIVITIES PERFORMED BY AEM QA REPRESENTATIVE

Periodic QA inspections performed by the QA Representative to monitor the construction activities, progress and QC program.

QA Activities	Approximate location	Visual observation during field visit
Pipe walkdown, line 113 partially completed	A-47 to road 7	• North end of the line ready to be connected to the pump, once the jetty is built and the LH250 pump moved on it, except that a 100ft of pipe is missing for connection. • Suction to be installed after the pad is built. • Good fusions observed all along the pipe, with 2 or 3 exceptions of minor misalignment. • Spray paint identification of fusion observed on all fusions. Around 40% of them were also identified with punches. • Adequate flange installation observed all along the pipe (Bolts, washers, gaskets, etc.). • Good layout of the pipe allowing thermal contraction during the winter. • Valves to be installed on the T joint near lake A-50. • 2 bolts and 3 washers missing on unfinished end of the T joint. Construction personnel was on its way to fix it.

		• Mineflex left on the ground by E&I near road 7.
Culvert installation verification	Dike D1 overflow culvert	• Culvert installation is completed. • 3x 1200mm culverts were installed. Invert elevation on D1 side is 162.5 masl. • Proper fill material under and around the culvert.
Fusion spot check	Fusion pad between IVR ring road and road 7.	• All verified fusions were adequate.
Inspection of the WTS diffuser installation	Whale Tail South dike downstream	• Pipe construction is ongoing near the lake. • Some branch saddles were installed in prevision of the outlet installation. • Good fusions and alignment on the pipes observed on site. • Concrete ballasts and stainless steel outlets were on site and ready to be coupled to the pipes. • Culverts allowing the pipes (lines 135 & 137) to pass the Whale tail dike acces road were installed where it was previously requested by Geotech engineering to remove pipes & culverts.
WTS diffuser inspection	Whale Tail South dike downstream	• Concrete ballasts installation ongoing. • Pipe endings installed with adequate bolts, gasket and washers.
Inspection of pumping ramp & pad	A53	• Pad is partially completed, currently ending at the lake shore. It will be extended further upon lake dewatering.
Butt fusion log review	Fusion pad between IVR ring road and road 7.	• All the fusions of 8" DR17 pipes verified were adequate. • Some fusions that were verified were missing pictures, but the parameters of the fusion were compliants.

ADDITIONNAL COMMENTS:

-

SPECIFIC ELEMENTS VERIFIED

Elements	Location	Scope and comments
Butt fusion log review for 2020-09-02	Pipes to be installed at WTS diffuser, DR17 8" pipe.	Butt fusion verified: PP187, FL10198 (no photos), PP190, FL10211 (no photos), FL10208 (no photos). All adequate.
Butt fusion log review for the 2020-08-30	Fusion pad, DR17 8" pipe.	Butt fusion verified: PP156, FL10176, PP165, all adequate
Butt fusion log review for the 2020-09-04	Fusion pad, DR17 8" pipe.	Butt fusion verified: PP245, FL10257, PP251, all adequate

QA NOTES**Line 113:**

The connexion to the pump and the Y joint was made by E&I and the pipe is now operational. (2020-09-05)

The bolts and washers missing at the T joint were added before the pipe started operating. (2020-09-06)

Dike D1 overflow culvert near camp:

The culvert installation was completed as planned



Discussed with AEM Construction Representative:

Jessy Gauthier

Cons. Rep.

05/09/2020

Date & Time

Issued by AEM QA

Representative :

Signature

02/09/2020

Date

PHOTOS/PICTURES



1.1 Fused pipe with punch on line 113, for tracking fusion parameters



1.2 Pipe misalignment, line 113.



1.3 Line 113 pipe near A-47 and stakes for pad construction

Photo set #1. Line 113 between lake A47



2.1 Dike D1 overflow culvert near camp

Photo set #2. Dike D1 overflow culvert



3.1 Branch saddle



3.2 Hole drilled prior to installing branch saddle



3.3 Concrete ballasts ready to be installed



3.4 Culverts installed under WTS Dike access road
need to be move uphill to free dike abutment of any
material

Photo set #3. WTS Diffuser construction



4.3 Concrete ballasts installation at the WTS
diffuser



4.4 Adequate pipe ending for the Whale Tail South
Lake diffuser

Photo set #4. Pipes at the Whale Tail South Lake diffuser site

Period: 2020-09-06 to 2020-09-12

Arnaud Poirier

Report Prepared by

Visit date:	time (Start/End)		QA Rep.	Weather	Wind conditions	Temperature
2020-09-07	15:00	16:00	AP	Cloudy	Light	5
2020-09-08	16:30	17:30	AP	Overcast	Light	6
2020-09-10	8:30	10:00	AP	Foggy	Light	3
2020-09-11	15:30	16:30	AP	Cloudy	Light	5
2020-09-12	10:00	11:00	AP	Light rain	Light	4
2020-09-12	16:00	17:00	AP	Light rain	Light	4

Comments:

Appendix: ☐ Yes ☐ No Pictures: ☒ Yes ☐ No

SAFETY REMARKS

Nothing to report

SUMMARY OF CONSTRUCTION ACTIVITIES

- Construction of Whale Tail South diffuser, to be installed shortly.
- Pipe Fusion of DR17 14".
- Extension of the pumping pad on lake A-53.
- Line 140 and 148 installation.

ACTIVITIES PERFORMED BY AEM QA REPRESENTATIVE

Periodic QA inspections performed by the QA Representative to monitor the construction activities, progress and QC program.

QA Activities	Approximate location	Visual observation during field visit
Inspection of the WTS diffuser installation	Whale Tail South dike downstream	• Pipe construction is ongoing near the lake. • All the branch saddles have been installed in prevision of the outlet installation. • All the concrete ballasts have been installed on the pipes, with some slight changes from the original design (see details in comments). • Tension fractures have been observed at the center of some concrete ballasts. These ballasts need to be replaced before the diffuser is sunk in the lake. • The spacing between some ballasts and outlets is insufficient and needs to be corrected before the diffuser is sunk in the lake. • One bolt of the pipe ending has been bent. • Multiple superficial and critical breakage have been observed on the concrete ballasts, due to the handling of the diffusers. • All the diffuser's outlets have been installed on the pipe. • The first section of the summer diffuser has been put on trailers in order to be placed in the water.

		The last portion of piping has been brought on site for preparation.
Fusion pad inspection	Fusion pad on the West side of the Whale Tail Dike.	- Fusions of 14" DR17 pipes is ongoing. - One butt fusion machine has been placed in a sea-can in prevision of the cold weather. - The fusions inspected on site were adequate. - Fused pipe stockpile placed on the side of the road.
Inspection of pumping ramp & pad	Lake A-53.	The pad is waiting to be extended in order to allow the pump to access the bottom of the lake.
Line 140 and 148 verification	West shore of WTS and Mammoth lake	- The pipe is laid on its path and ready to be connected to the diffusers and intakes. - Insulation is incomplete on both end of the line. - Insulation is torn off near the channel road culvert.

ADDITIONNAL COMMENTS:

- Half of the diffuser's concrete ballasts have been placed differently from the plan specifications, so that the pipe can stay afloat and stable during installation. This change was approved by SNC.

SPECIFIC ELEMENTS VERIFIED

Elements	Location	Scope and comments
Butt fusion log review for 2020-09-08	Fusion pad, DR17 14"	Butt fusion verified: FL10283, PP287, PP292, PP288. All adequate.
Butt fusion log review for 2020-09-09	Fusion pad, DR17 14"	Butt fusion verified: PP307, PP306, PP303, PP298. All adequate.
Butt fusion log review for 2020-09-10	Fusion pad, DR17 14"	Butt fusion verified: PP316, PP320, PP308, PP310. All adequate.

QA NOTES

Whale Tail South fusion pad:

Fusion activities stopped on 2020-09-10.

☐ Discussed with AEM Construction Representative: _____

Cons. Rep.
Date & Time

Issued by AEM QA Representative : _____

Signature
02/09/2020
Date

PHOTOS/PICTURES



1.1 Tension fracture on a concrete ballast that needs to be changed.



1.2 Changed ballast configuration to ensure adequate floatability.



1.3 Bent bolt and slightly broken ballast.



1.4 Pipe placed on trailers and diffuser outlets installed.



1.5 Last portion of piping being brought on site.

Photo set #1. Concrete ballasts at the WTS diffuser site.



2.1 Fused pipe stockpile near the road leading to the fusion pad.



2.1 Adequate fusion observed during a spot check in the pipe stockpile.

Photo set #2. Fusion pad and pipe stockpile



3.1 Pad of lake the A-53 that needs to be extended

Photo set #3. A-53 pad area.

Period: 2020-09-13 to 2020-09-19

Arnaud Poirier, Claude Gagné

Report Prepared by

Visit date:	time (Start/End)		QA Rep.	Weather	Wind conditions	Temperature
2020-09-14	8:45	9:45	AP	Cloudy and sunny	Light	0
2020-09-15	10:00	11:30	AP	Cloudy and sunny	Heavy	-3
2020-09-15	16:30	17:45	AP	Cloudy and sunny	Light	-2
2020-09-18	12:30	13:30	CG	Sunny	Light	0

Comments:

Appendix: ☐ Yes ☐ No Pictures: ☒ Yes ☐ No

SAFETY REMARKS

Nothing to report

SUMMARY OF CONSTRUCTION ACTIVITIES

- Construction and installation of the Whale Tail South diffuser.
- Extension of the pumping pad on lake A-53.
- Line 114 installation

ACTIVITIES PERFORMED BY AEM QA REPRESENTATIVE

Periodic QA inspections performed by the QA Representative to monitor the construction activities, progress and QC program.

QA Activities	Approximate location	Visual observation during field visit
Inspection of the WTS diffuser installation	Whale Tail South dike downstream	• The faults surveyed on the concrete ballasts have been corrected prior to the installation of the pipe in the lake. • The placement of the ballasts compared to the outlets have been corrected prior to installation. • Some ballasts are still fractured in the middle and/or misplaced on the winter diffuser. • The summer diffusor was sunk • There was no final survey of the summer diffusor • The as-built location of each chimney will be determined with the buoy location and the distance
Inspection of pumping ramp & pad	Lake A-53.	• The pad was extended up to the lake shore. • The ramp is not wide enough for the HL250 seacan. • Not enough man power to build the second pad.
Inspection of the line 114	From road 7 to Attenuation pond	• The pipe was installed and put in function without a walkdown • E&I needed the line before it was finish • Some part of the line need adjustment a proper walkdown will be done after the adjustments

ADDITIONNAL COMMENTS:

- The summer diffusor was installed and sunk at the location of the buoy. The buoy was installed at the coordinates given by SNC.
- The A53 ramp between the first and second pad will be widened without additional material to temporary install the HL250 seacan.

SPECIFIC ELEMENTS VERIFIED

Elements	Location	Scope and comments
Butt fusion log review 2020-06-18	Fusion Pad near Sana	Diffuser Fusion # JL10289, JL10288, JL10285, JG322 Proper parameters and beads.
Butt fusion log review 2020-06-18	Fusion Pad near Sana	Diffuser Fusion # JL10290, JL10292, JL10295, JL10297 Proper parameters and beads.

QA NOTES

WTS Diffusers;
A backhoe thethered to the diffuser was used on Whale Tail Dike to prevent it from drifting in the lake.
A surveying method was proposed to construction for the as-built survey of the winter diffuser (Total station on the shore or Whale Tail dike).

☒ Discussed with AEM Construction Representative:

Alex Gelinas
Cons. Rep.

2020-09-20 9:00
Date & Time

Issued by AEM QA Representative :

Claude Gagné
Signature

2020-09-20
Date

PHOTOS/PICTURES



1.1 *Fractured ballast that needs to be changed on the winter diffuser*



1.2 *Ballast placement that was corrected compared to the outlet*



1.3 *Summer diffuser being placed in the Whale Tail South Lake*



1.4 *Summer diffuser sunk in Whale Tail South*

Photo set #1. Whale Tail South summer diffuser being placed in the lake.



2.1 *The pad of lake A-53 has been extended.*

Photo set #2. Lake A-53 pad area.



3.1 Line 114 passing on the inner right hand side of the road to Quarry 1.

Photo set #3. A-53 pad area.



3.1 Diffuser discharging in Mammoth lake and uninsulated pipe on line 140 and 148.



3.2 Torn off insulation layer near the culvert

Photo set #4. Line 140 and 148.



QA INSPECTION REPORT PHASE 2 SURFACE WATER MANAGEMENT

Period: 2020-09-20 to 2020-09-26 Claude Gagné
Report Prepared by

Visit date:	time (Start/End)		QA Rep.	Weather	Wind conditions	Temperature
2020-09-24	11:00	11:45	CG	Cloudy	Light	0
2020-09-26	17:30	18:00	CG	Sunny	Light	5

Comments:

Appendix: ☐ Yes ☐ No Pictures: ☒ Yes ☐ No

SAFETY REMARKS

Nothing to report

SUMMARY OF CONSTRUCTION ACTIVITIES

- Construction and installation of the Whale Tail South winter diffuser.

ACTIVITIES PERFORMED BY AEM QA REPRESENTATIVE

Periodic QA inspections performed by the QA Representative to monitor the construction activities, progress and QC program.

QA Activities	Approximate location	Visual observation during field visit
Inspection of the WTS diffuser	Whale Tail dike upstream	• Six channels on seven are heat traced • One channel for temperature probe • The probe to prevent overheating is not installed yet • The preform insulated joint kit for the inner part is too small • The joint is insulated with an injection of urethane in a home made mold then wrapped with Pittwrap and finally a thermoshrinking sleeve is installed. • The exceeding urethane on each joint is cut with a saw to have an even diameter.

ADDITIONAL COMMENTS:

- It's not planned to install the larger preform insulated joint on top of the thermoshrinking sleeve.

SPECIFIC ELEMENTS VERIFIED

Elements	Location	Scope and comments
Butt fusion log review 2020-09-22	Fusion Pad near Sana	Diffuser Fusion # JL10298 Pressure higher than the specification. Fusion at 805 psi, not in the range of 508 to 762 psi Large beads due to overpressure
Butt fusion log review 2020-09-22	Fusion Pad near Sana	Diffuser Fusion # JL10299 Proper parameters and beads.

QA NOTES

WTS Diffusers;

☒ Discussed with AEM Construction Representative:

Alex Gelinas
Cons. Rep.

2020-09-27 15:30
Date & Time

Issued by AEM QA Representative :

Claude Gagné
Signature

2020-09-27
Date

PHOTOS/PICTURES



1.1 A section of the winter diffuser in the water



1.2 Excavator on the West shore of WTS and a boat to place the diffuser

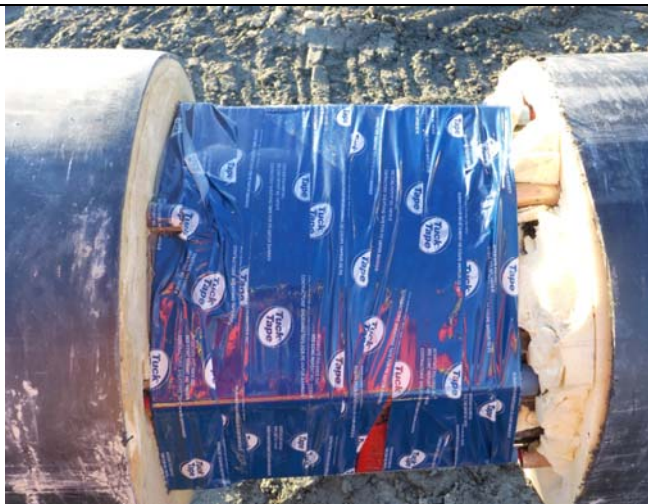


1.3 Ballast on the winter diffuser



1.4 Insertion of the heat trace

Photo set #1. Whale Tail South winter diffuser non-insulated part being placed in the lake.



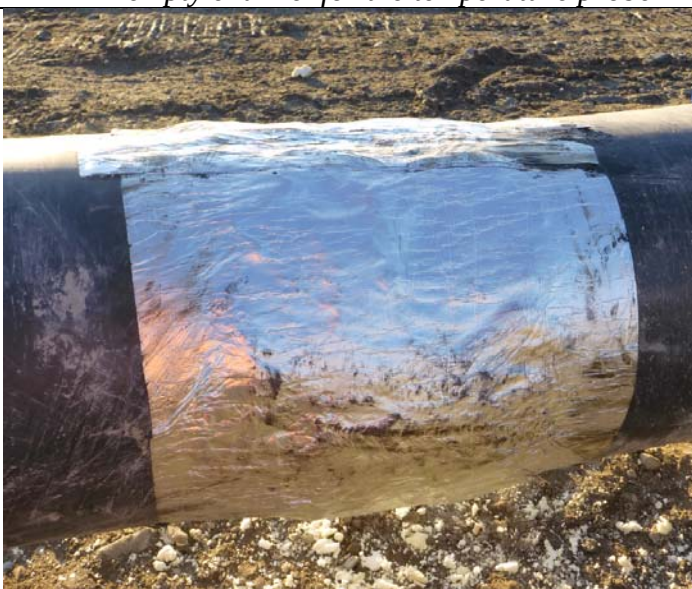
2.1 Heat trace in tube wrapped with tape



2.2 An empty channel for the temperature probe



2.3 Urethane over the tape to insulate the pipe



2.4 Pittwrap over the urethane



2.5 Six channel heat traced



2.6 Temperature probe in grey

Photo set #2. Whale Tail South winter diffuser joints insulation.

Period: 2020-09-27 to 2020-10-03 Claude Gagné, Arnaud Poirier
Report Prepared by

Visit date:	time (Start/End)		QA Rep.	Weather	Wind conditions	Temperature
2020-09-27	10:30	11:00	CG	Cloudy	Light	2
2020-09-29	16:00	16:30	CG	Overcast	Light	2
2020-09-30	15:30	16:15	CG	Snow	Light	0
2020-10-03	10:20	11:30	AP	Snow	Light	-2

Comments:

Appendix: ☐ Yes ☒ No Pictures: ☒ Yes ☐ No

SAFETY REMARKS

Nothing to report

SUMMARY OF CONSTRUCTION ACTIVITIES

- Construction and installation of the Whale Tail South winter diffuser.

ACTIVITIES PERFORMED BY AEM QA REPRESENTATIVE

Periodic QA inspections performed by the QA Representative to monitor the construction activities, progress and QC program.

QA Activities	Approximate location	Visual observation during field visit
Inspection of the WTS winter diffuser	Whale Tail dike upstream	- The distance between ballasts is respected. - Chimney are pointing upward. - The location of the end of the diffuser is checked with a handheld GPS. - The buoy had been repositioned at the right location. - The winter diffuser has been sunk in the lake in the right position, according to the design change approved by the designer.
Pipe walkdown line 114	Road 7 to Attenuation pond	- Two 8" butterfly valves to be installed on the T joint near A-50. - Missing bolts and gaskets near the culvert of the road 7. - Used 8" pipe section at Quarry 1. - The 8" line is connected on 14" line at the South Ring Road Culvert, enough room in this existing culvert to add an 8" section. - The section piping located on the berm at AP5 needs to be relocated so it doesn't slide down the pit.

ADDITIONNAL COMMENTS:

- The cable linking the winter diffuser to the excavator broke (29/09/2020).
- The diffuser is 30 feet too short to reach the planned location, but since the diffuser is deep enough below the surface, this change has been accepted by the designer (30/09/2020).
- The buoy seems to have drifted over 50 ft. (30/09/2020). It has been repositioned prior to sinking the winter diffuser.

SPECIFIC ELEMENTS VERIFIED

Elements	Location	Scope and comments

QA NOTES

No fusion activities have been reported since September 22nd

☒ Discussed with AEM Construction Representative:

Alex Gelinas
Cons. Rep.

2020-09-26
Date & Time

Issued by AEM QA Representative :

Signature

Date

PHOTOS/PICTURES



1.1 Winter diffuser before being pulled.



1.2 Winter diffuser being straightened.



1.3 The end of the winter diffusor is not reaching the buoy.



1.4 Installation of ballasts on the insulated part of the winter diffuser.



1.5 Sunk winter diffuser with the buoy at the end of it in the distance

Photo set #1. Whale Tail South winter diffuser being placed in the lake.



2.1 Missing butterfly valves at the T joint near Nemo Road..



2.2 8" pipe merging into 14" pipe at the culvert between Quarry 1 and WTN

Photo set #2. Walkdown of the line 114.

Period: 2020-10-04 to 2020-10-10

Arnaud Poirier

Report Prepared by

Visit date:	time (Start/End)		QA Rep.	Weather	Wind conditions	Temperature
2020-10-04	17:10	17:40	AP	Overcast	Light	-1
2020-10-05	13:30	14:00	AP	Overcast	Light	-2
2020-10-06	15:30	6:20	AP	Overcast	Moderate	-4
2020-10-08	11:00	11:40	AP	Overcast	Moderate	-3
2020-10-08	17:00	17:40	AP	Mix of sun and clouds	Light	-2
2020-10-10	14:00	15:00	AP	Overcast	Light	-2

Comments:

Appendix: ☐ Yes ☒ No Pictures: ☒ Yes ☐ No

SAFETY REMARKS

Nothing to report

SUMMARY OF CONSTRUCTION ACTIVITIES

- Construction and installation of the Whale Tail South winter diffuser.
- Construction of the crossing of road 7 for the line 113 & 115.
- Extension of the A-53 pad.
- Corrections on the line 114.
- Fusion at the new Nemo fusion pad

ACTIVITIES PERFORMED BY AEM QA REPRESENTATIVE

Periodic QA inspections performed by the QA Representative to monitor the construction activities, progress and QC program.

QA Activities	Approximate location	Visual observation during field visit
Inspection of the WTS diffuser	Whale Tail dike upstream	Both diffusers were extended on the shore and passed through the Whale Tail dike culvert in prevision of their connection to the line leading to the WTP.
Inspection of the line 113 and 115	Junction of Road 7 and Nemo Road	- The pipes of the lines 113 and 115 were laid on the ground from A-53 to Nemo Road. - The pipe of line 115 is laid on the ground from the IVR south ring road to the intersection of Nemo Road and Road 7 - An unidentified pipe is lying next to the line 115 between the IVR south ring round and AP5, this line has inadequate flanged connexions
Inspection of the line 114	Between AP5 and WTN	- The portion of line 114 close to the AP5, located on top of a berm between the road and the pit, is slowly sliding toward AP5. - The line 114 has been connected to an old insulated pipe crossing Road 7 directly in the muck.
Inspection of the extension of the A53 jetty	A53 pad	The pad extension is ongoing, several muck loads have been brought for that purpose
Fusion activity spot check	Nemo fusion pad	Fusion activities have resumed after the relocation of the equipment on the new pad.

		The fusions checked on the pipes on site were adequate.
--	--	---

ADDITIONNAL COMMENTS:

- The work on the A-53 pad is now on hold until the next run of the construction team in 3 weeks. (2020-10-08)
- The line 114 close to AP5 was relocated on top of the berm so it doesn't slide down the pit. (2020-10-10)

SPECIFIC ELEMENTS VERIFIED

Elements	Location	Scope and comments
Butt fusion log review for 2020-10-04	Nemo road fusion pad	Butt fusion verified: 10329, 10335, 10338. All parameters respected for 8" DR17.
Butt fusion log review for 2020-10-05	Nemo road fusion pad	Butt fusion verified: 10344, 10346, 10347. All parameters respected, except for 10346 & 10347 which are missing data, the pictures show that the fusions were adequate for 8" DR17 for 8" DR17.
Butt fusion log review for 2020-10-06	Nemo road fusion pad	Butt fusion verified: 10357, 10354, 10361. All parameters respected for 8" DR17
Butt fusion log review for 2020-10-07	Nemo road fusion pad	Butt fusion verified: 10371, 10374, 10378. All parameters respected for 8" DR17.
Butt fusion log review for 2020-10-08	Nemo road fusion pad	Butt fusion verified: 10381 to 10389, excessive pressure was applied during contact phase of pipes. Further analysis must be done to determine if this is problematic.

QA NOTES

Fusion activities have restarted at the fusion pad near Nemo Road.

The fusion pad of nemo road is getting extended in order to give more room to the workers.

The crossing of the Road 7 for the lines 113 and 115 is waiting for the shortcut leading to the new waste dump, so the intersection is free for the workers.

The new Nemo pad is bumpy, but the quality of the fusion is not affected by it.

☒ Discussed with AEM Construction Representative:	Jessy Gauthier	2020-10-09
	Cons. Rep.	Date & Time

Issued by AEM QA
Representative :

Signature

Date

PHOTOS/PICTURES



1.1 Whale Tail South diffusers, extended on the shore. Note the heat traced pipe for the winter diffuser.



1.1 Whale Tail South diffusers extensions towards the WTP.

Photo set #1. Whale Tail South diffusers



2.1 Line 113 & 115 laid on the ground North of the Orbit pad, regarding East.



2.2 West end of the section of line 113 & 115 leading to IVR attenuation pond. Regarding West, with the Road 7-Nemo Road intersection in the background



2.3 Line 115 located south of road 7, with the unidentified line on the left



2.4 Line 115 on the right hand side, leading to the IVR south ring road.

Photo set #2. Lines 113 & 115, crossing the Road 7-Nemo Road intersection.



3.1 Line 114 on the berm between AP5 and the road



3.2 Old insulated section of line 114 crossing Road 7 straight in the rock, near Quarry 1.

Photo set #3. Lines 114.



4.1 Backhoe preparing the ground for the bulldozer and loader bringing a load of muck



4.2 Bulldozer extending the pad

Photo set #4. Extension of the A-53 pad

Mechanical Completion Certificat 6127 - Amaruq Project

AREA # :

695

Description:

**695-350-WFR-PC17-0136HT & 0138
WTS Diffusors**

1. MECHANICAL COMPLETION DECLARATION

We confirm that the area listed above that we have jointly inspected has been tested and critical defects have been resolved. The remaining defects are recorded in the deficiency form (attached). This facility is mechanically completed and ready for commissioning in accordance with AEM Project rules.

Name	Position	Signature	Date
Pierre Gauthier	AEM Commissioning Coordinator		
Marc-André Beaudet	AEM Construction Surintendant		
Alex Gélinas	AEM Construction POV responsible		

2. ACCEPTANCE OF THE FINAL TEST COMPLETION

We acknowledge the completion of the Electro/Mechanical installation of the Area or sub-system and the commitment of the construction team to complete the deficiencies list within the respect of the scope of work. I agree that the Sub-System is safe to initiate the commissioning phase.

Name	AEM Project Position	Signature	Date
Marc-André Beaudet	AEM Construction Surintendant		
Pierre Gauthier	AEM Commissioning Coordinator		
Guillaume Gemme	AEM Operation Surintendant		

3. WALK-DOWN PARTICIPATION

See below the name of participant during the Walk-Down of the area, system or sub-system.

Name	AEM Project Position
Alex G��linas	Construction Resident Eng.
Nicole Brisson	Water and Tailing Eng.



Defect Discipline Codes		Defect Category Codes		Defect Priority Codes	
P	Piping	A	Safety or critical to operation	1	Complete before Pre-Commissioning starts
C	Civil/Structural	B	Included in the construction package, not completed	2	Complete before Cold Commissioning starts
M	Mechanical	C	Included in the construction package, need to be reviewed by engineering	3	Complete before Hot Commissioning starts
E	Electrical	D	Not included in the construction package	4	Complete before starts-up
I	Instrument & Control	M	Modification requested by the operation department	5	Complete before Hand Over
				6	Complete after Hand Over

Page 3 of 3

McElroy Joint Report

Reference Number 2231352

Job Details

Joint Number 10290
Joint Time 2020-09-19 07:54:38 GMT
Job amaruq insulated pipe diffuser
Operator jonathan leclerc
Tie-In No
Aborted Joint No

Fusion Machine

Machine Name TracStar® 500 MF
Machine Model TracStar® 500 MF
Piston Area 6.01 in²
Carriage Serial T5002510
Using In-Ditch Kit No

Pipe Specifications

Pipe Material PE4710
Pipe Size 14" IPS
Wall Thickness DR 11

Pressures

Drag Pressure	0 psi	Interfacial	Gauge
Bead Up	75 psi	635 psi	635 psi
Heat Soak	0 psi	0 psi	0 psi
Fuse/Cool	75 psi	635 psi	635 psi

Fusion Specification

Fusion Type	Butt Fusion	
Fusion Specification	ASTM F2620-19	
Bead Time	0 seconds	
Bead Size	3/8"	
Heat/Soak Time	343 seconds	
Fuse Time	839 seconds	
Open/Close Time	20 seconds	
Cool Time	0 seconds	
Bead Up	508 psi	762 psi
Heat Soak	0 psi	0 psi
Fuse	508 psi	762 psi
Cool	0 psi	0 psi

External Heater Temperatures

Side A	Side B
--------	--------

GPS Location

Date	Latitude	Longitude
2020-09-19 07:54:38.0	65°23'52.168200"N	96°40'38.395800"W

Weather Conditions

Ambient Temperature 33 F
Pipe Temperature 33 F
Weather Conditions SLEET
Type of Shelter TENT

Logged Data Summary

Number of Data Points 156
Total Fusion Time 1442 seconds
Maximum Recorded Pressure 633 psi

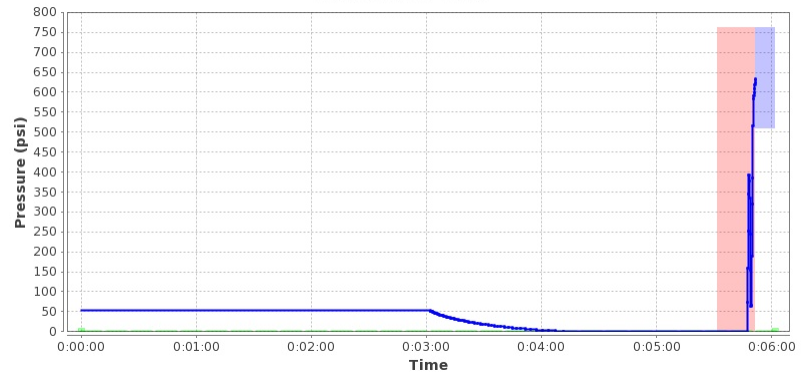
Device Information

DataLogger Serial Number RK503Z0809
Sensor Serial Number MDL7658
Calibration Date 2020-05-28
Firmware Version v6.0
Software Version 1.17 (41)
Software Product Name DataLogger 6

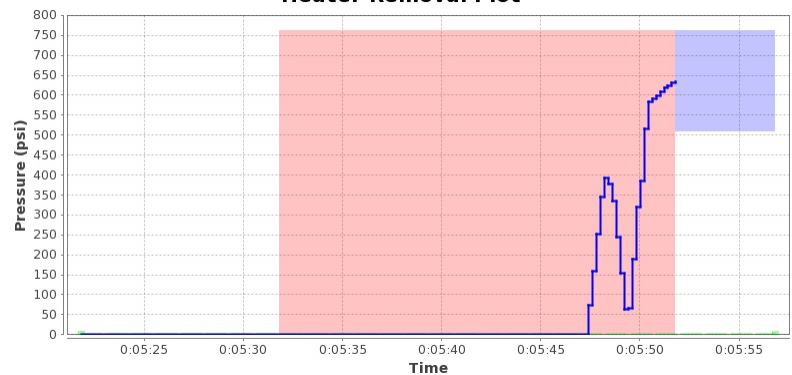
Data Source

Upload Time 2020-09-19 23:04:42 GMT

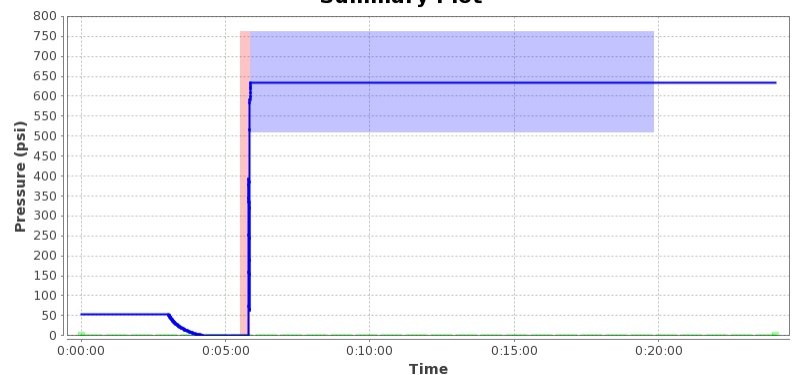
Front-end Plot



Heater Removal Plot



Summary Plot



Notes

Y
Y
N



McElroy Joint Report

Reference Number 2231353

Job Details

Joint Number 10291
Joint Time 2020-09-19 08:40:22 GMT
Job amaruq insulated pipe diffuser
Operator jonathan leclerc
Tie-In No
Aborted Joint No

Fusion Machine

Machine Name TracStar® 500 MF
Machine Model TracStar® 500 MF
Piston Area 6.01 in²
Carriage Serial T5002510
Using In-Ditch Kit No

Pipe Specifications

Pipe Material PE4710
Pipe Size 14" IPS
Wall Thickness DR 11

Pressures

Drag Pressure	0 psi	Interfacial	Gauge
Bead Up	75 psi	635 psi	
Heat Soak	0 psi	0 psi	
Fuse/Cool	75 psi	635 psi	

Fusion Specification

Fusion Type	Butt Fusion	
Fusion Specification	ASTM F2620-19	
Bead Time	0 seconds	
Bead Size	3/8"	
Heat/Soak Time	343 seconds	
Fuse Time	839 seconds	
Open/Close Time	20 seconds	
Cool Time	0 seconds	
	Minimum	Maximum
Bead Up	508 psi	762 psi
Heat Soak	0 psi	0 psi
Fuse	508 psi	762 psi
Cool	0 psi	0 psi

External Heater Temperatures

Side A	Side B

GPS Location

Date	Latitude	Longitude
2020-09-19 08:40:22.0	65°23'52.186200"N	96°40'38.672400"W

Weather Conditions

Ambient Temperature 33 F
Pipe Temperature 33 F
Weather Conditions SLEET
Type of Shelter TENT

Logged Data Summary

Number of Data Points 252
Total Fusion Time 1220 seconds
Maximum Recorded Pressure 632 psi

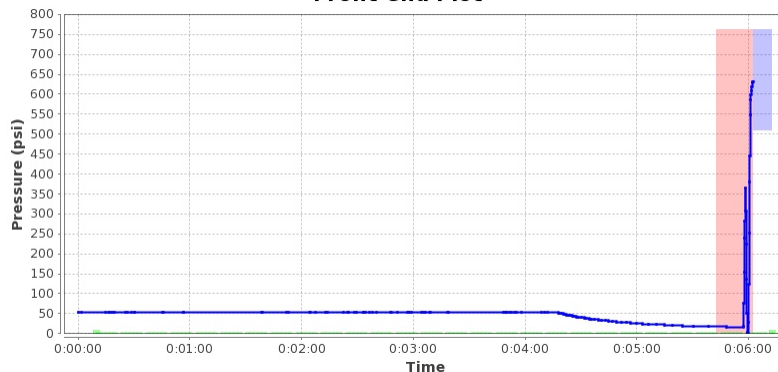
Device Information

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Sensor Serial Number MDL7658
Calibration Date 2020-05-28
Firmware Version v6.0
Software Version 1.17 (41)
Software Product Name DataLogger 6

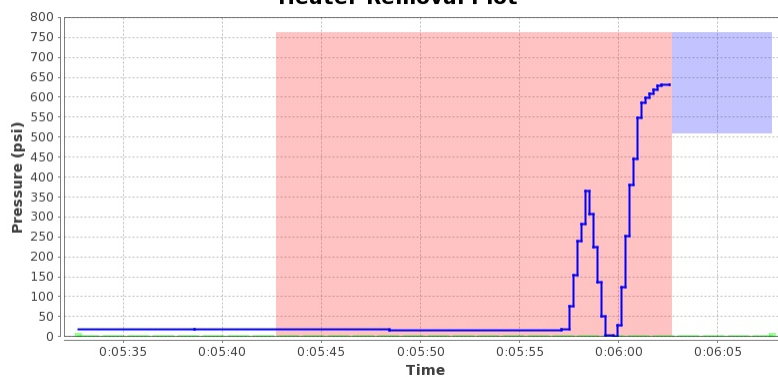
Data Source

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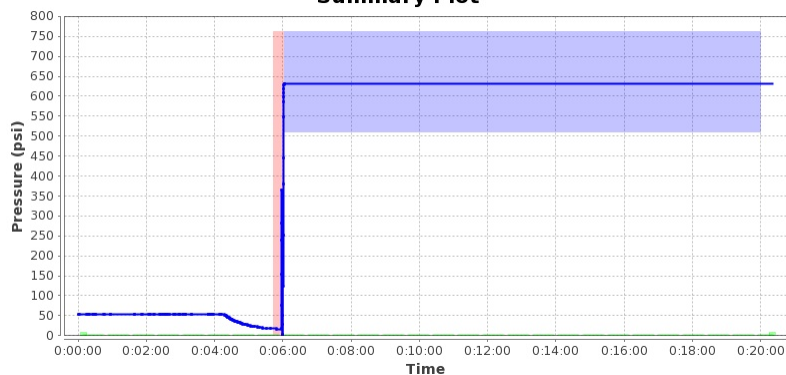
Front-end Plot



Heater Removal Plot



Summary Plot



Notes

Y
Y
N



McElroy Joint Report

Reference Number 2231354

Job Details

Joint Number 10292
Joint Time 2020-09-19 10:07:42 GMT
Job amaruq insulated pipe diffuser
Operator jonathan leclerc
Tie-In No
Aborted Joint No

Fusion Machine

Machine Name TracStar® 500 MF
Machine Model TracStar® 500 MF
Piston Area 6.01 in²
Carriage Serial T5002510
Using In-Ditch Kit No

Pipe Specifications

Pipe Material PE4710
Pipe Size 14" IPS
Wall Thickness DR 11

Pressures

Drag Pressure 0 psi
Bead Up 75 psi
Heat Soak 0 psi
Fuse/Cool 75 psi
Interfacial 635 psi
Gauge 635 psi

Fusion Specification

Fusion Type Butt Fusion
Fusion Specification ASTM F2620-19
Bead Time 0 seconds
Bead Size 3/8"
Heat/Soak Time 343 seconds
Fuse Time 839 seconds
Open/Close Time 20 seconds
Cool Time 0 seconds
Minimum 508 psi
Maximum 762 psi
Bead Up 508 psi
Heat Soak 0 psi
Fuse 508 psi
Cool 0 psi

External Heater Temperatures

Side A Side B

GPS Location

Date 2020-09-19 10:07:42.0
Latitude 65°23'52.222800"N
Longitude 96°40'38.637000"W

Weather Conditions

Ambient Temperature 33 F
Pipe Temperature 33 F
Weather Conditions SLEET
Type of Shelter TENT

Logged Data Summary

Number of Data Points 962
Total Fusion Time 1261 seconds
Maximum Recorded Pressure 634 psi

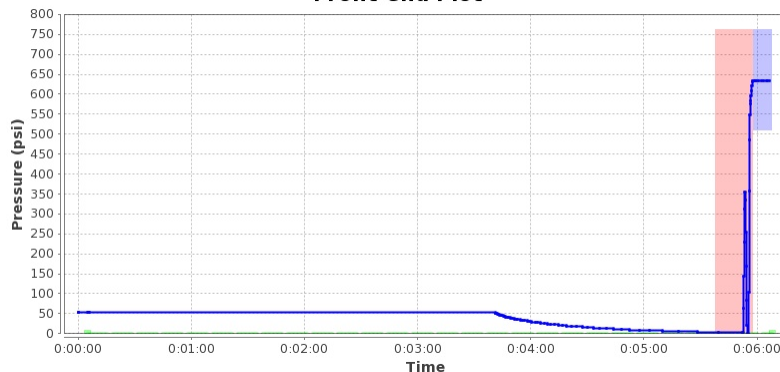
Device Information

DataLogger Serial Number RK503Z0809
Sensor Serial Number MDL7658
Calibration Date 2020-05-28
Firmware Version v6.0
Software Version 1.17 (41)
Software Product Name DataLogger 6

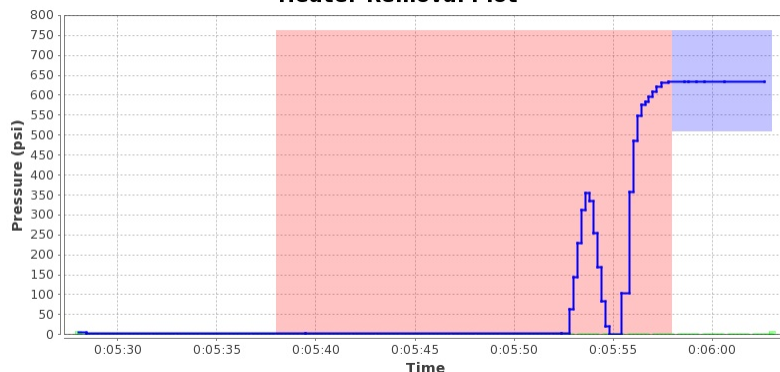
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Upload Time 2020-09-19 23:04:53 GMT

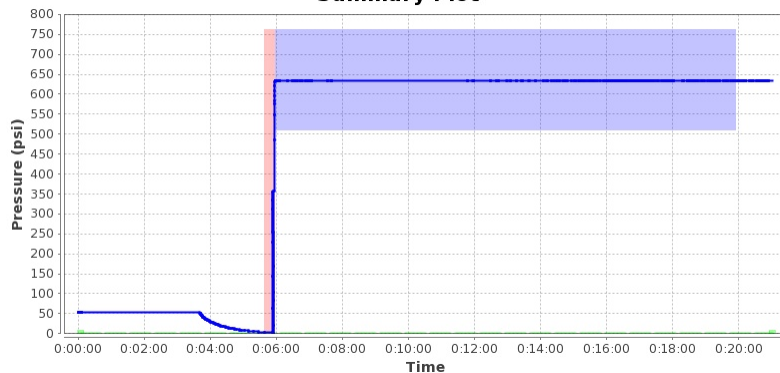
Front-end Plot



Heater Removal Plot



Summary Plot



Notes

Y
Y
N



McElroy Joint Report

Reference Number 2231355

Job Details

Joint Number 10293
 Joint Time 2020-09-19 10:43:37 GMT
 Job amaruq insulated pipe diffuser
 Operator jonathan leclerc
 Tie-In No
 Aborted Joint No

Fusion Machine

Machine Name TracStar® 500 MF
 Machine Model TracStar® 500 MF
 Piston Area 6.01 in²
 Carriage Serial T5002510
 Using In-Ditch Kit No

Pipe Specifications

Pipe Material PE4710
 Pipe Size 14 " IPS
 Wall Thickness DR 11

Pressures

Drag Pressure 0 psi

	Interfacial	Gauge
Bead Up	75 psi	635 psi
Heat Soak	0 psi	0 psi
Fuse/Cool	75 psi	635 psi

Fusion Specification

Fusion Type Butt Fusion
 Fusion Specification ASTM F2620-19
 Bead Time 0 seconds
 Bead Size 3/8"
 Heat/Soak Time 343 seconds
 Fuse Time 839 seconds
 Open/Close Time 20 seconds
 Cool Time 0 seconds

	Minimum	Maximum
Bead Up	508 psi	762 psi
Heat Soak	0 psi	0 psi
Fuse	508 psi	762 psi
Cool	0 psi	0 psi

External Heater Temperatures

	Side A	Side B

GPS Location

Date	Latitude	Longitude
2020-09-19 10:43:37.0	65°23'52.187400"N	96°40'38.518800"W

Weather Conditions

Ambient
 Temperature 33 F
 Pipe Temperature 33 F
 Weather Conditions SLEET
 Type of Shelter TENT

Logged Data Summary

Number of Data Points 166
 Total Fusion Time 1311 seconds
 Maximum Recorded Pressure 632 psi

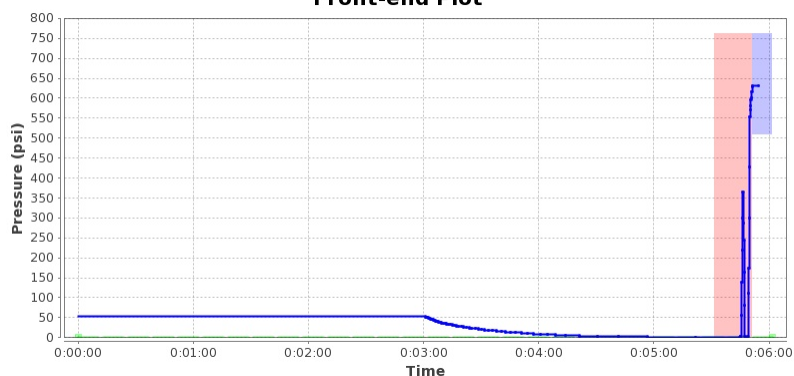
Device Information

DataLogger Serial Number RK503Z0809
 Sensor Serial Number MDL7658
 Calibration Date 2020-05-28
 Firmware Version v6.0
 Software Version 1.17 (41)
 Software Product Name DataLogger 6

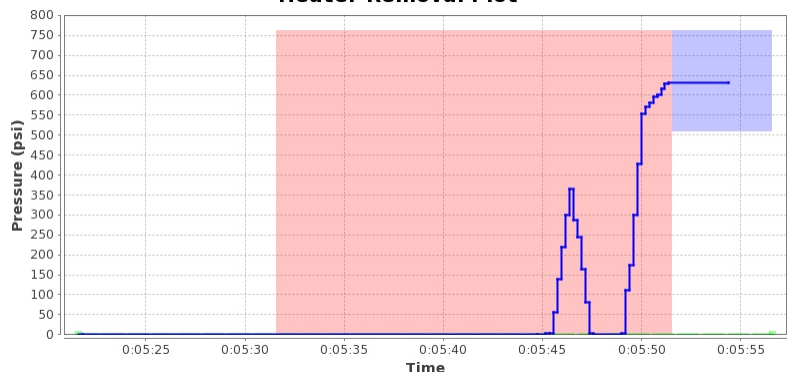
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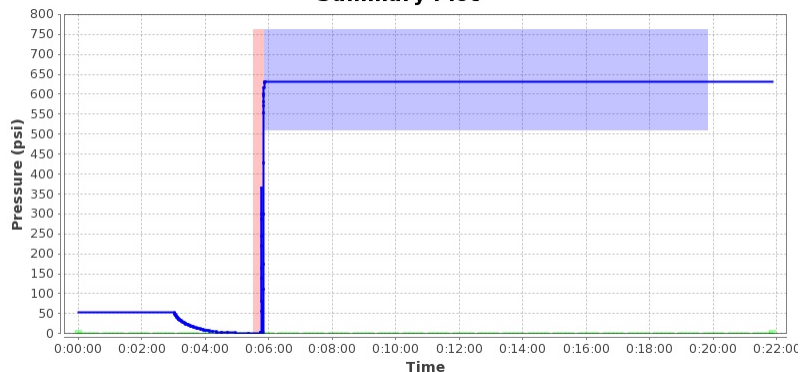
Front-end Plot



Heater Removal Plot



Summary Plot



Notes

Y
 Y
 N

McElroy Joint Report

Reference Number 2231356

Job Details

Joint Number 10294
Joint Time 2020-09-19 11:33:57 GMT
Job amaruq insulated pipe diffuser
Operator jonathan leclerc
Tie-In No
Aborted Joint No

Fusion Machine

Machine Name TracStar® 500 MF
Machine Model TracStar® 500 MF
Piston Area 6.01 in²
Carriage Serial T5002510
Using In-Ditch Kit No

Pipe Specifications

Pipe Material PE4710
Pipe Size 14" IPS
Wall Thickness DR 11

Pressures

Drag Pressure	0 psi	Interfacial	Gauge
Bead Up	75 psi	635 psi	
Heat Soak	0 psi	0 psi	
Fuse/Cool	75 psi	635 psi	

Fusion Specification

Fusion Type	Butt Fusion	Fusion Specification	ASTM F2620-19	Bead Time	0 seconds	Bead Size	3/8"	Heat/Soak Time	343 seconds	Fuse Time	839 seconds	Open/Close Time	20 seconds	Cool Time	0 seconds
Bead Up	508 psi	762 psi													
Heat Soak	0 psi	0 psi													
Fuse	508 psi	762 psi													
Cool	0 psi	0 psi													

External Heater Temperatures

	Side A	Side B

GPS Location

Date	Latitude	Longitude
2020-09-19 11:33:57.0	65°23'52.110000"N	96°40'38.598600"W

Weather Conditions

Ambient Temperature 33 F
Pipe Temperature 33 F
Weather Conditions SLEET
Type of Shelter TENT

Logged Data Summary

Number of Data Points 204
Total Fusion Time 1184 seconds
Maximum Recorded Pressure 634 psi

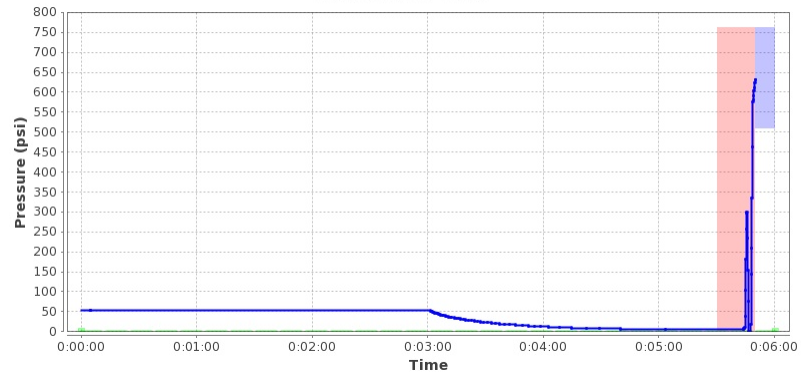
Device Information

DataLogger Serial Number RK503Z0809
Sensor Serial Number MDL7658
Calibration Date 2020-05-28
Firmware Version v6.0
Software Version 1.17 (41)
Software Product Name DataLogger 6

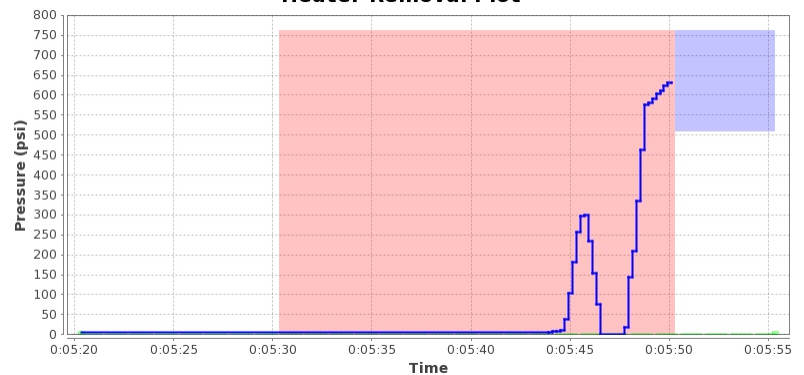
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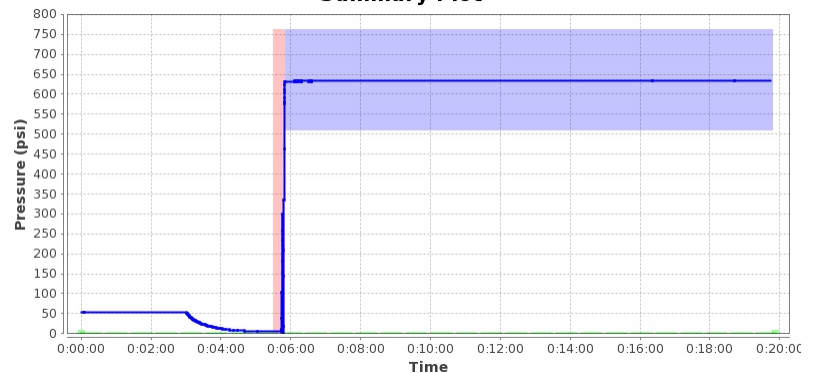
Front-end Plot



Heater Removal Plot



Summary Plot



Notes

Y
Y
N



McElroy Joint Report

Reference Number 2231358

Job Details

Joint Number 10295
 Joint Time 2020-09-19 13:13:52 GMT
 Job amaruq insulated pipe diffuser
 Operator jonathan leclerc
 Tie-In No
 Aborted Joint No

Fusion Machine

Machine Name TracStar® 500 MF
 Machine Model TracStar® 500 MF
 Piston Area 6.01 in²
 Carriage Serial T5002510
 Using In-Ditch Kit No

Pipe Specifications

Pipe Material PE4710
 Pipe Size 14" IPS
 Wall Thickness DR 11

Pressures

Drag Pressure	0 psi	Interfacial	Gauge
Bead Up	75 psi	635 psi	
Heat Soak	0 psi	0 psi	
Fuse/Cool	75 psi	635 psi	

Fusion Specification

Fusion Type	Butt Fusion	
Fusion Specification	ASTM F2620-19	
Bead Time	0 seconds	
Bead Size	3/8"	
Heat/Soak Time	343 seconds	
Fuse Time	839 seconds	
Open/Close Time	20 seconds	
Cool Time	0 seconds	
	Minimum	Maximum
Bead Up	508 psi	762 psi
Heat Soak	0 psi	0 psi
Fuse	508 psi	762 psi
Cool	0 psi	0 psi

External Heater Temperatures

Side A	Side B
--------	--------

GPS Location

Date	Latitude	Longitude
2020-09-19 13:13:52.0	65°23'52.211400"N	96°40'38.719800"W

Weather Conditions

Ambient Temperature 33 F
 Pipe Temperature 33 F
 Weather Conditions SLEET
 Type of Shelter TENT

Logged Data Summary

Number of Data Points 598
 Total Fusion Time 1264 seconds
 Maximum Recorded Pressure 635 psi

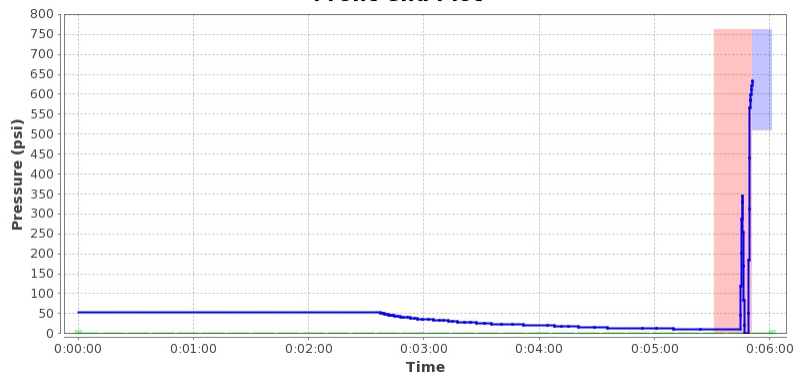
Device Information

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 Calibration Date 2020-05-28
 Firmware Version v6.0
 Software Version 1.17 (41)
 Software Product Name DataLogger 6

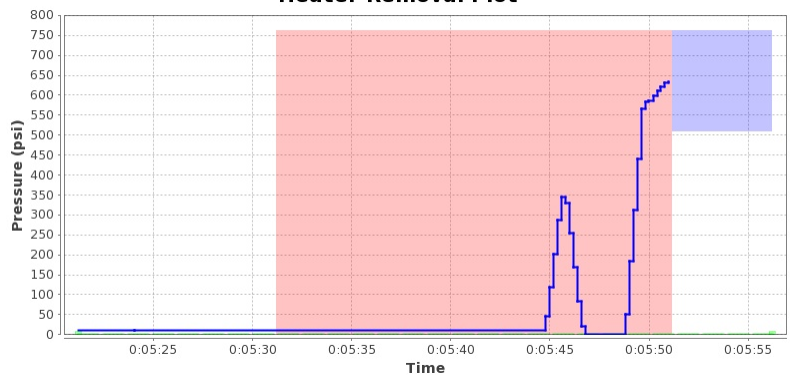
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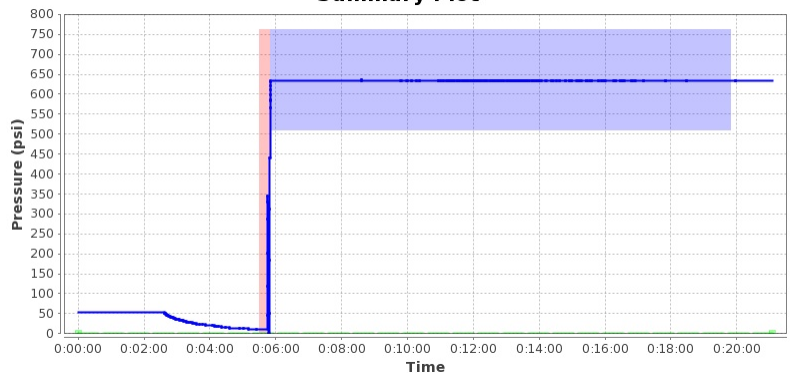
Front-end Plot



Heater Removal Plot



Summary Plot



Notes

Y
 Y
 N



McElroy Joint Report

Reference Number 2231359

Job Details

Joint Number 10296
Joint Time 2020-09-19 13:51:43 GMT
Job amaruq insulated pipe diffuser
Operator jonathan leclerc
Tie-In No
Aborted Joint No

Fusion Machine

Machine Name TracStar® 500 MF
Machine Model TracStar® 500 MF
Piston Area 6.01 in²
Carriage Serial T5002510
Using In-Ditch Kit No

Pipe Specifications

Pipe Material PE4710
Pipe Size 14" IPS
Wall Thickness DR 11

Pressures

Drag Pressure 0 psi
Bead Up 75 psi
Heat Soak 0 psi
Fuse/Cool 75 psi
Interfacial 635 psi
Gauge 635 psi

Fusion Specification

Fusion Type Butt Fusion
Fusion Specification ASTM F2620-19
Bead Time 0 seconds
Bead Size 3/8"
Heat/Soak Time 343 seconds
Fuse Time 839 seconds
Open/Close Time 20 seconds
Cool Time 0 seconds
Minimum 508 psi
Maximum 762 psi
Bead Up 508 psi
Heat Soak 0 psi
Fuse 508 psi
Cool 0 psi

External Heater Temperatures

Side A Side B

GPS Location

Date 2020-09-19 13:51:43.0
Latitude 65°23'52.278600"N
Longitude 96°40'38.559600"W

Weather Conditions

Ambient Temperature 33 F
Pipe Temperature 33 F
Weather Conditions SLEET
Type of Shelter TENT

Logged Data Summary

Number of Data Points 178
Total Fusion Time 1266 seconds
Maximum Recorded Pressure 632 psi

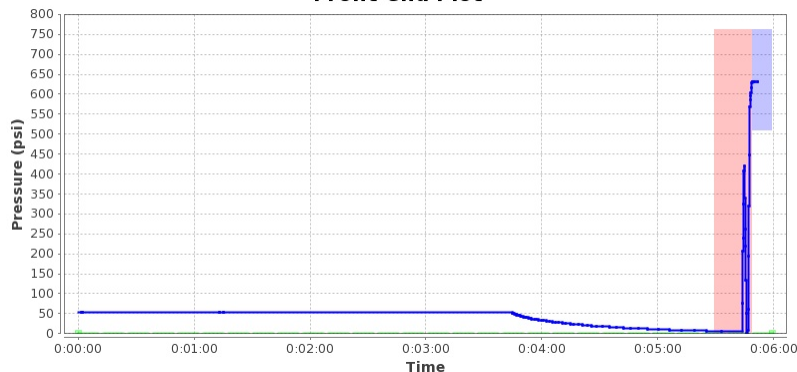
Device Information

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Calibration Date 2020-05-28
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Software Version 1.17 (41)
Software Product Name DataLogger 6

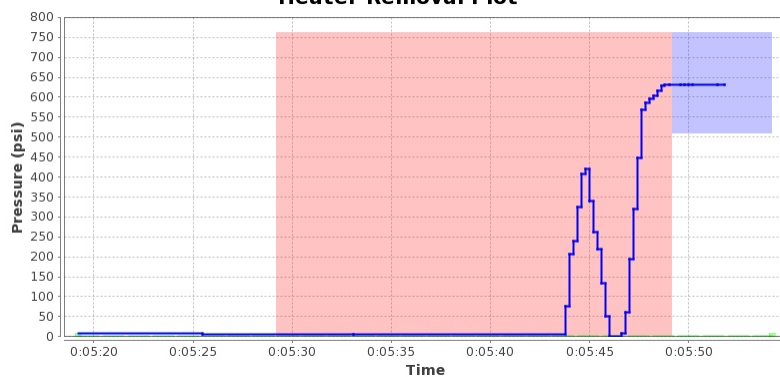
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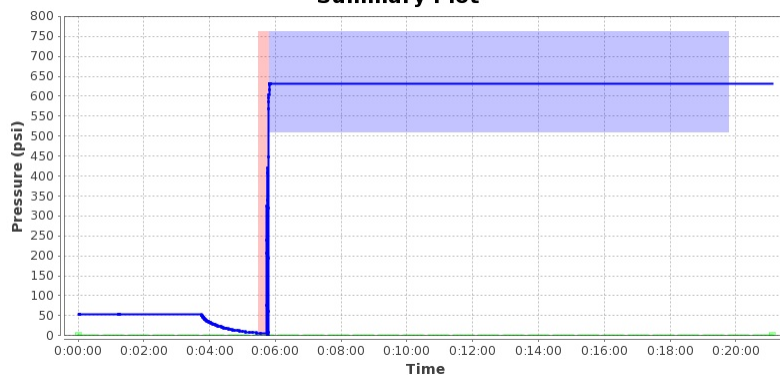
Front-end Plot



Heater Removal Plot



Summary Plot



Notes

Y
Y
N



McElroy Joint Report

Reference Number 2231360

Job Details

Joint Number 10297
Joint Time 2020-09-19 14:29:18 GMT
Job amaruq insulated pipe diffuser
Operator jonathan leclerc
Tie-In No
Aborted Joint No

Fusion Machine

Machine Name TracStar® 500 MF
Machine Model TracStar® 500 MF
Piston Area 6.01 in²
Carriage Serial T5002510
Using In-Ditch Kit No

Pipe Specifications

Pipe Material PE4710
Pipe Size 14" IPS
Wall Thickness DR 11

Pressures

Drag Pressure	Interfacial	Gauge
0 psi	75 psi	635 psi
Bead Up	0 psi	0 psi
Heat Soak	75 psi	635 psi

Fusion Specification

Fusion Type	Butt Fusion	
Fusion Specification	ASTM F2620-19	
Bead Time	0 seconds	
Bead Size	3/8"	
Heat/Soak Time	343 seconds	
Fuse Time	839 seconds	
Open/Close Time	20 seconds	
Cool Time	0 seconds	
	Minimum	Maximum
Bead Up	508 psi	762 psi
Heat Soak	0 psi	0 psi
Fuse	508 psi	762 psi
Cool	0 psi	0 psi

External Heater Temperatures

Side A	Side B

GPS Location

Date	Latitude	Longitude
2020-09-19 14:29:18.0	65°23'52.281600"N	96°40'38.490000"W

Weather Conditions

Ambient Temperature 33 F
Pipe Temperature 33 F
Weather Conditions SLEET
Type of Shelter TENT

Logged Data Summary

Number of Data Points 312
Total Fusion Time 1264 seconds
Maximum Recorded Pressure 632 psi

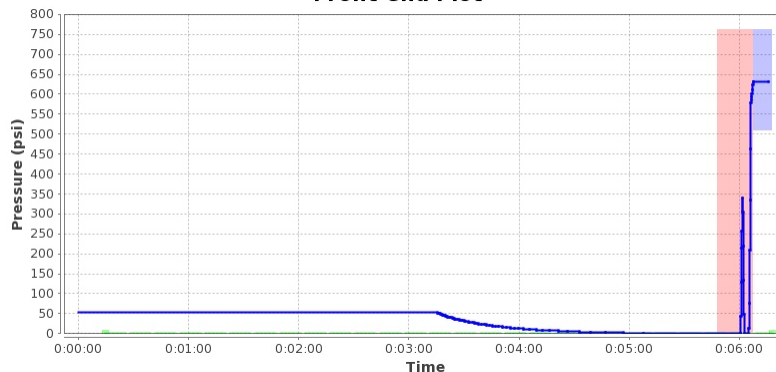
Device Information

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Calibration Date 2020-05-28
Firmware Version v6.0
Software Version 1.17 (41)
Software Product Name DataLogger 6

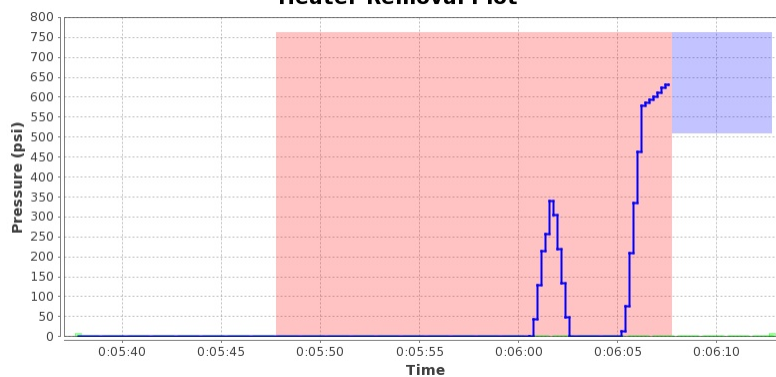
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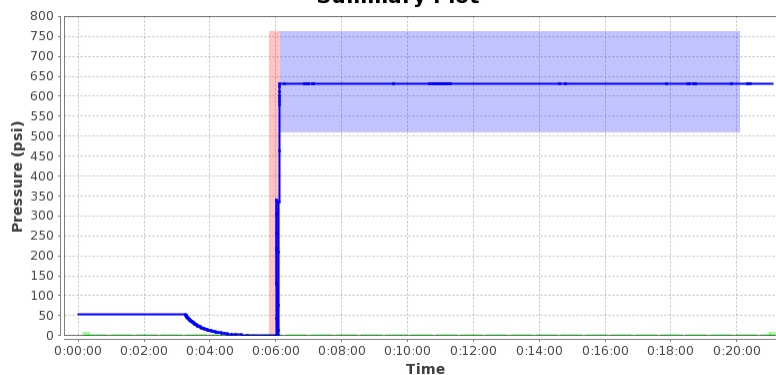
Front-end Plot



Heater Removal Plot



Summary Plot



Notes

Y
Y
N



McElroy Joint Report

Reference Number 2235031

Job Details

Joint Number 10298
Joint Time 2020-09-22 08:19:51 GMT
Job amaruq insulated pipe diffuser
Operator jonathan leclerc
Tie-In No
Aborted Joint No

Fusion Machine

Machine Name TracStar® 500 MF
Machine Model TracStar® 500 MF
Piston Area 6.01 in²
Carriage Serial T5002510
Using In-Ditch Kit No

Pipe Specifications

Pipe Material PE4710
Pipe Size 14" IPS
Wall Thickness DR 11

Pressures

Drag Pressure	0 psi	Interfacial	Gauge
Bead Up	75 psi	635 psi	
Heat Soak	0 psi	0 psi	
Fuse/Cool	75 psi	635 psi	

Fusion Specification

Fusion Type	Butt Fusion	
Fusion Specification	ASTM F2620-19	
Bead Time	0 seconds	
Bead Size	3/8"	
Heat/Soak Time	343 seconds	
Fuse Time	839 seconds	
Open/Close Time	20 seconds	
Cool Time	0 seconds	
	Minimum	Maximum
Bead Up	508 psi	762 psi
Heat Soak	0 psi	0 psi
Fuse	508 psi	762 psi
Cool	0 psi	0 psi

External Heater Temperatures

Side A	Side B

GPS Location

Date	Latitude	Longitude
2020-09-22 08:19:51.0	65°23'52.121400"N	96°40'38.590800"W

Weather Conditions

Ambient Temperature 33 F
Pipe Temperature 33 F
Weather Conditions SLEET
Type of Shelter TENT

Logged Data Summary

Number of Data Points 2734
Total Fusion Time 1345 seconds
Maximum Recorded Pressure 805 psi

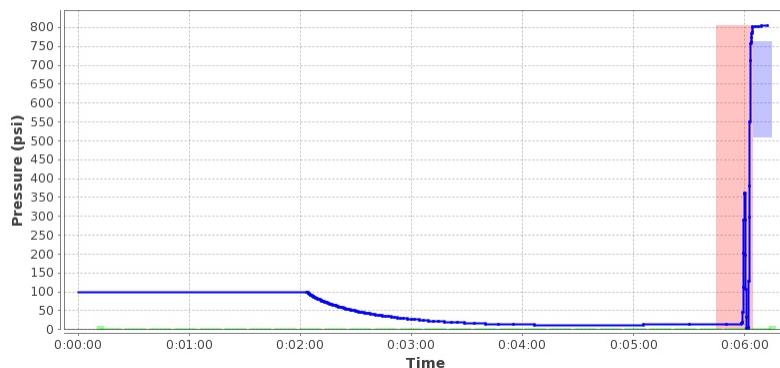
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Firmware Version v6.0
Software Version 1.17 (41)
Software Product Name DataLogger 6

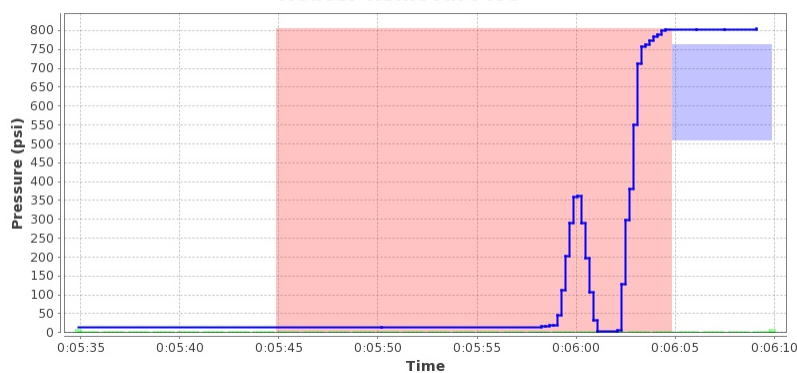
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Upload Time 2020-09-23 11:32:42 GMT

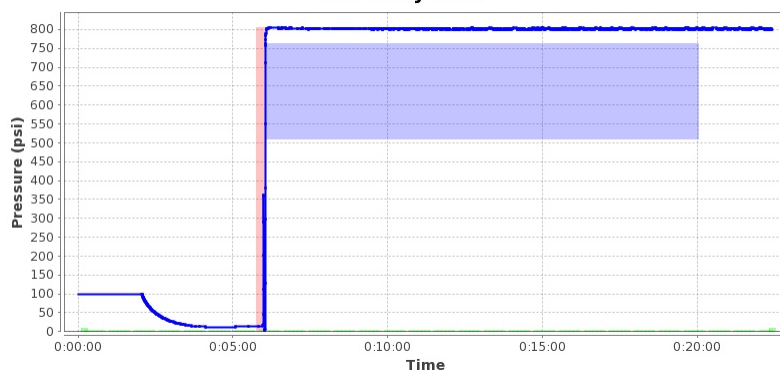
Front-end Plot



Heater Removal Plot



Summary Plot



Notes

Y
Y
N



McElroy Joint Report

Reference Number 2235032

Job Details

Joint Number 10299
Joint Time 2020-09-22 10:49:13 GMT
Job amaruq insulated pipe diffuser
Operator jonathan leclerc
Tie-In No
Aborted Joint No

Fusion Machine

Machine Name TracStar® 618 HF
Machine Model TracStar® 618 HF
Piston Area 11.78 in²
Using In-Ditch Kit No

Pipe Specifications

Pipe Material PE4710
Pipe Size 14 " IPS
Wall Thickness DR 17

Pressures

Drag Pressure	0 psi	Interfacial	Gauge
Bead Up	75 psi	217 psi	
Heat Soak	0 psi	0 psi	
Fuse/Cool	75 psi	217 psi	

Fusion Specification

Fusion Type	Butt Fusion	Fusion Specification	ASTM F2620-19
Bead Time	0 seconds	Bead Size	3/8"
Heat/Soak Time	222 seconds	Fuse Time	543 seconds
Open/Close Time	15 seconds	Cool Time	0 seconds
Bead Up	174 psi	Minimum	Maximum
Heat Soak	0 psi	0 psi	0 psi
Fuse	174 psi	260 psi	260 psi
Cool	0 psi	0 psi	0 psi

External Heater Temperatures

Side A	Side B

GPS Location

Date	Latitude	Longitude
2020-09-22 10:49:13.0	65°23'48.482400"N	96°41'51.942600"W

Weather Conditions

Ambient Temperature 33 F
Pipe Temperature 33 F
Weather Conditions SLEET
Type of Shelter TENT

Logged Data Summary

Number of Data Points 342
Total Fusion Time 1090 seconds
Maximum Recorded Pressure 217 psi

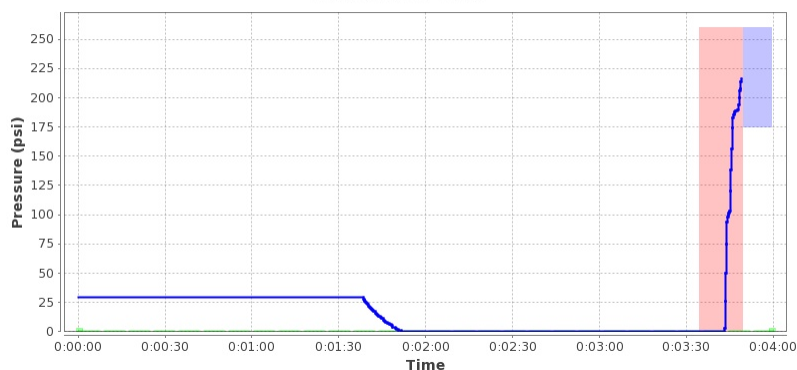
Device Information

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Sensor Serial Number MDL7658
Calibration Date 2020-05-28
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Software Version 1.17 (41)
Software Product Name DataLogger 6

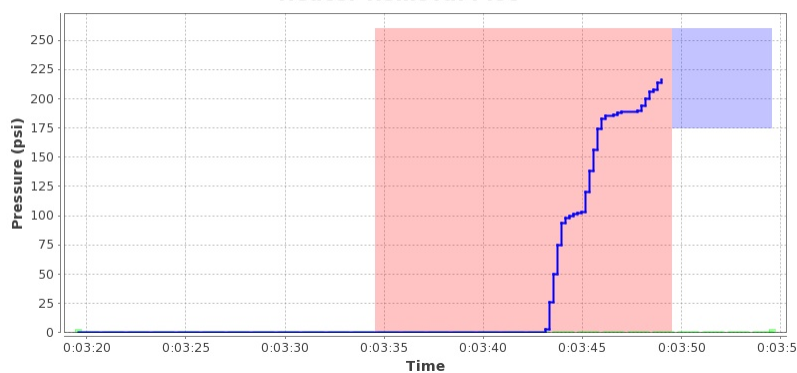
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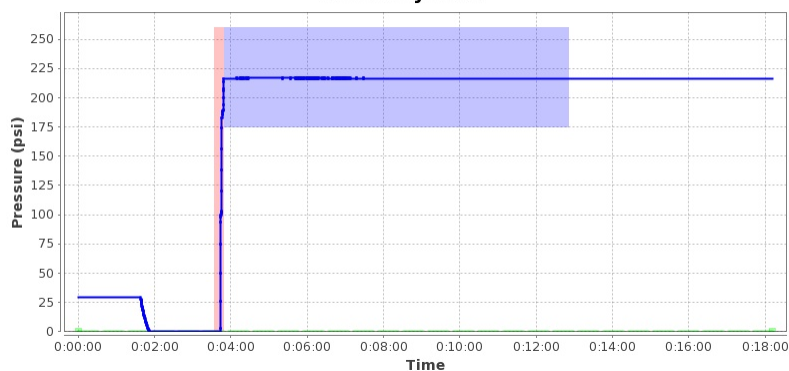
Front-end Plot



Heater Removal Plot



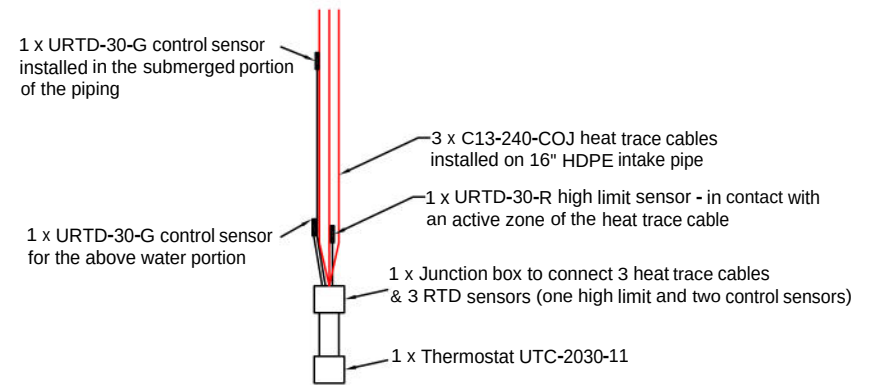
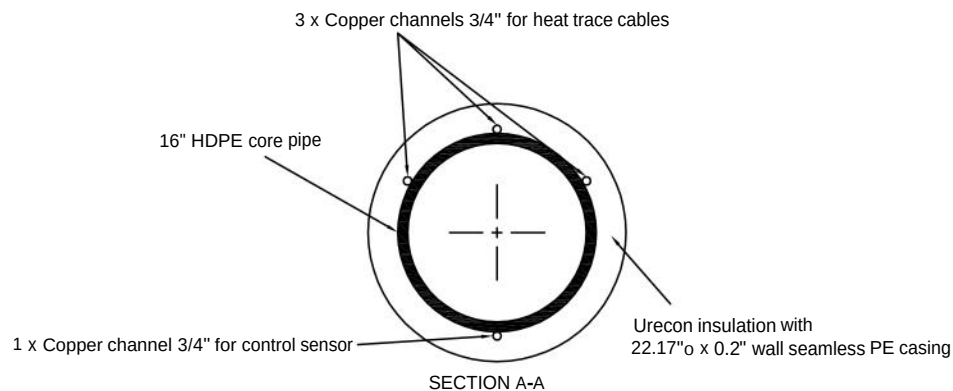
Summary Plot



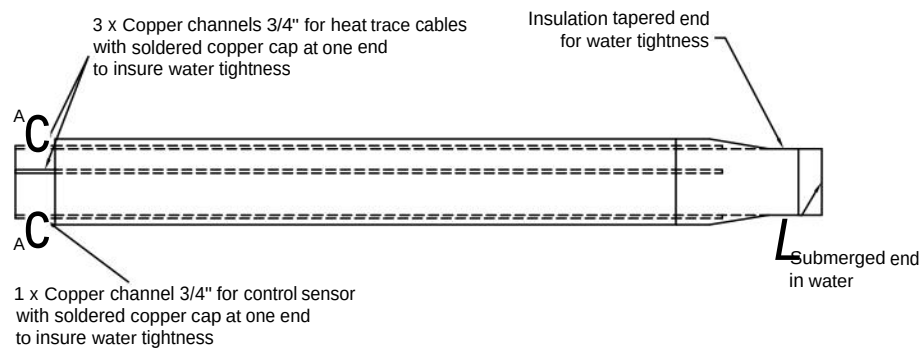
Notes

Y
N

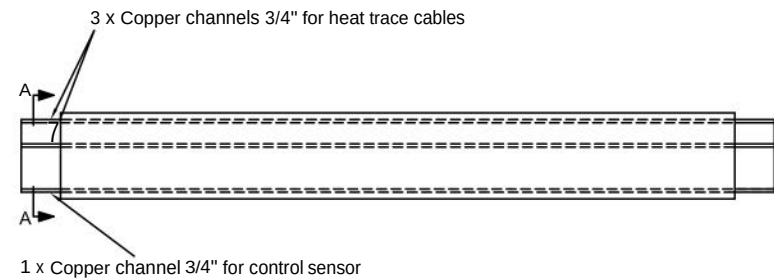




Heat trace schematic



16"o intake line - termination length



Intake line - intermediate sections
(required if submerged portion is longer than 1 full length)

Note: Insulated pipe joints for submerged portion of piping should consist of preformed polyisocyanurate foam and Urecon Mec-Seal® for more demanding waterproof application. The insulation shall be pre-grooved on the inside or slightly oversized to accommodate heat trace cables.



Coteau-du-Lac, Québec Tél. : (450) 455-0961
Calmar, Alberta Tel. : (780) 985-3636
urecQn@urecon.com • www.urecon.com

PROJECT:			
DESCRIPTION:			
16"o HDPE Intake line - Typical drawing			
Format:	Contrat :		REV
Scale:	NTS	Jan 24, 2017	Dwg # SF16-01

Procédure d'inspection des câbles chauffants Thermocâble®

Le Thermocâble® est un câble chauffant à puissance constante, composé de résistances à valeurs constantes connectées en parallèle. Lors de l'essai initial, avant la mise en service, trois tests doivent être effectués et leurs valeurs notées au bordereau d'essais : la résistance du câble, la résistance d'isolation et la lecture du courant de charge.

La résistance du câble est mesurée à l'aide d'un multimètre digital (DMM). Le test est effectué entre les deux fils conducteurs du Thermocâble. La valeur de résistance dépend de la longueur du câble chauffant testé, donc elle peut varier de quelques milliers d'Ohms jusqu'à une dizaine d'Ohms.

La résistance d'isolation est mesurée avec un appareil d'essai de haute tension, mégohmmètre connu sous le nom de « Megger ». Le Thermocâble peut être testé avec un appareil à 2500 volts mais les appareils communément disponibles permettent de tester l'isolation jusqu'à 1000 Volts. Cette tension est suffisante pour le diagnostic du Thermocâble. Dans ce test, l'intégrité de l'isolation électrique entre la tresse de mise à la terre et chacun des fils conducteurs est vérifiée. La lecture de résistance obtenue doit être de l'ordre de centaines de MOhms (1,000,000 ohms). Un nouveau câble chauffant peut facilement avoir une valeur dans les 200 MOhms si certains facteurs ne contribuent pas à affecter cette valeur, comme l'humidité de l'air ambiant lors du test, le cheminement de surface (humidité sur les câbles), etc.

Lorsqu'un circuit est composé de plusieurs segments, chaque segment doit être testé individuellement et ses valeurs doivent être documentées pour évaluation. **La longueur de chaque segment doit être mesurée et annotée au bordereau d'essais avec les autres valeurs mesurées tel qu'indiqué plus bas.** Veuillez vous assurer, avant de commencer les tests, que chaque fin de course a été proprement faite selon les directives et que le câble est dans les meilleures conditions d'essais possibles.

Directives pour effectuer les essais sur câbles chauffants:

- Déconnectez l'alimentation et assurez-vous que le disjoncteur est ouvert et sécurisé dans cette position;
- Débranchez le câble chauffant du thermostat ou de la boîte de jonction;
- Effectuez le test de résistance d'isolation. Ce test doit être fait entre chaque fil conducteur et la tresse de mise à la terre. Chaque test doit durer au moins une (1) minute pour la stabilité de la lecture et l'arrêt de fluctuation. Inscrivez les valeurs sur le « bordereau d'essais »;
- Effectuez le test de résistance du câble. La lecture est prise entre les deux (2) fils conducteurs. Inscrivez la valeur sur le « bordereau d'essais »;
- Envoyez le « bordereau d'essais » complétés à GF Urecon pour analyse.

DIRECTIVE D'INSTALLATION N°44F

THERMOSTAT ÉLECTRONIQUE

Modèle n° UTC-2030-(code de programmation)

et

Modèle n° UTC-2230-(code de programmation)

(avec disjoncteur bipolaire)

et

Version à contacteur

Ces thermostats électroniques ont été conçus pour la commande d'un ou plusieurs câbles chauffants pour lesquels l'intensité de courant ne dépasse pas 30 A pour la version à relais et 60 A pour la version à contacteur. Ils peuvent être équipés de trois capteurs de température, selon les exigences de l'application. Du fait qu'on utilise des capteurs de température séparés, on peut les installer sur la tuyauterie durant la première phase, le coffret de commande pouvant s'installer par la suite.

Caractéristiques :

- Alimentation électrique multitension, permettant un fonctionnement de 120 à 240 V c.a., sans modification du câblage.
- Circuit interne de détection de fuite à la terre, évitant d'avoir recours à un dispositif externe de détection de fuite à la terre. En cas de fuite à la terre, il y a alarme seulement ou alarme et déclenchement.
- Trois entrées de capteur de température : TS1 pour la température de la tuyauterie, TS2 (s'il est mis en fonction) pour la commande de température à un autre endroit du système de tuyauterie et TS3 (s'il est mis en fonction) utilisé comme coupure sur haute température, pour la protection de tuyauterie en matière plastique. L'alarme est déclenchée sur détection d'un capteur en fonction « ouvert » ou en « court-circuit ».
- Alarme de basse température sur les deux capteurs de commande TS1 et TS2. Le niveau d'alarme est réglé en usine à une valeur déterminée pour chaque capteur.
- Commande tout ou rien à cycle lent, avec une température différentielle de 1 °C (1.8 °F), pour une régulation précise du fonctionnement des systèmes de tuyauterie. Cette régulation à tolérance serrée peut faire économiser des milliers de kilowatts-heures en énergie électrique et constitue la solution idéale pour la commande de systèmes de traçage électrique dans les régions où l'électricité coûte cher.
- Commande prioritaire (programmable en usine) : avec minuterie de 1 à 48 heures ou sans minuterie.
- Fonction cycle automatique (si elle est activée): met sous tension momentanément le câble chauffant à intervalles de 24 heures, pour vérifier s'il y a fuite à la terre de la charge.
- Une lampe témoin trois couleurs, à diode électroluminescente (LED), est montée sur la porte du thermostat et fonctionne comme suit :
 - ❖ Vert : cette couleur indique que le thermostat est sous tension et que la température de la tuyauterie à l'endroit du capteur est au-dessus du point de consigne. Lorsque éteinte, l'alimentation électrique est coupée.
 - ❖ Ambre : cette couleur indique que le thermostat commande de la chaleur.
 - ❖ Rouge : cette couleur indique qu'une des alarmes a été déclenchée. Le thermostat ne commande pas de chaleur.
 - ❖ Ambre et rouge (alternativement): cela indique qu'une des alarmes a été déclenchée. Le thermostat commande de la chaleur.
- Lors d'une panne d'électricité, la mémoire non volatile conserve tous les paramètres qui ont été programmés.

Déclaration de conformité

Cet appareil numérique de classe B est conforme à la norme NMB-003 du Canada.

Installation :

- S'assurer que le personnel affecté à l'installation et à l'entretien est qualifié et connaît bien les équipements électriques, leurs caractéristiques et les codes en vigueur.
- Ce thermostat a une vaste plage de température de service extérieure et peut donc s'installer à tout endroit approprié. Tenir compte de l'exposition aux intempéries et de l'accessibilité pour entretien et essais.
- La position des trous de fixation est indiquée aux dessins en annexes A, B et C.
- Afin d'éviter tout dommage par projection de débris, retirer la plaque de fond du boîtier avant de le percer.
- Prévoir les entrées de conduit/câble au bas du boîtier pour diminuer les risques d'infiltration d'eau. Éviter de percer les côtés adjacents aux composants électroniques.
- L'utilisateur peut vouloir percer des trous de drainage de 3 mm (1/8 in), au bas du boîtier, à gauche et à droite (il faut noter qu'avec des trous de drainage, le boîtier ne rencontre plus la classification Nema 4).
- Utiliser des raccords adaptés au boîtier et les poser de sorte que l'étanchéité soit assurée.

Câblage :

- Toujours vérifier les connexions avant de mettre le thermostat sous tension. Pour éviter toute blessure corporelle ou tout dommage aux équipements, ne pas installer ni retirer de câbles lorsque le thermostat est sous tension.
- Pour réduire le risque de desserrage des connexions du câblage de signal, on utilise des bornes à levier, chargées par ressort.
- Utiliser des câbles à trois conducteurs, torsadés et blindés, pour les rallonges de câbles de capteurs de température à résistance (désignés par « RTD » dans la suite du texte).
- Utiliser des câbles à deux conducteurs, torsadés et blindés, pour les rallonges de câbles de thermistance.
- Le blindage des câbles de capteurs de température doit être mis à la terre du côté coffret, en utilisant uniquement les bornes appropriées (n° 4, n° 8 et n° 15).

Note : certains capteurs sont fabriqués avec un conducteur de drainage ayant une continuité électrique avec l'extrémité métallique ; dans ce cas, le conducteur de drainage ne doit pas être connecté à la terre. La continuité du conducteur de drainage doit être vérifiée à l'aide d'un multimètre numérique.

- Pour réduire tout risque d'endommagement du thermostat, suite à une défectuosité du câble chauffant, vérifier l'intégrité de ce câble en :
 - ✦ Effectuant un essai d'isolation à haute tension.
 - ✦ Mesurant la résistance de la charge au moyen d'un ohmmètre.
 - ✦ Enregistrer les résultats pour référence future.

Type de capteur :

Ce thermostat électronique peut être programmé en usine pour fonctionner avec deux types de capteurs différents. Par défaut, le coffret de commande est programmé pour des RTD de 100 ohms à 0 °C (32 °F), en platine et, sur demande spéciale, il peut également être programmé pour des thermistances de 2 252 ohms à 25 °C (77 °F). Les deux derniers chiffres du numéro de modèle du thermostat correspondent au code de programmation : les codes de 01 à 49 sont réservés aux RTD et les codes de 51 à 99 sont réservés aux thermistances. S'assurer que le thermostat est doté du bon type de capteur. Les codes de programmation sont indiqués sur la liste de l'annexe E et une étiquette indiquant le code utilisé est apposée à l'intérieur du thermostat.

Emplacement des capteurs :

- Installer le(s) capteur(s) de température avec du ruban adhésif de papier d'aluminium afin de favoriser le transfert de chaleur.
- Le capteur de commande doit être fixé avec le ruban directement sur la tuyauterie, à 180 degrés par rapport au câble chauffant.
- Le(s) capteur(s) de commande TS1 et TS2 (lorsqu'en fonction) doit(vent) se trouver à(aux) l'emplacement(s) le(s) plus froid(s) du système de tuyauterie.
- Dans le cas d'une tuyauterie qui entre dans un bâtiment chauffé, le(s) capteur(s) doit (doivent) être situé(s) à au moins 3 m (10 pi) du mur extérieur, afin d'éviter toute imprécision dans la détection de température.
- Le capteur de haute température de câble (TS3) doit être fixé avec du ruban sur une zone active du câble chauffant (et non sur l'extrémité froide), dans le caniveau de traçage.

NOTE : Pour un fonctionnement sûr et efficace du système, il est primordial d'identifier et de positionner le(s) capteur(s) avec précision.

Dépannage :

Défaut de capteur de température :

Cette alarme indique qu'un des capteurs ne fonctionne pas correctement; un capteur de température peut être défectueux par suite d'une coupure ou d'un court-circuit. S'assurer de bien utiliser le bon type de capteur : RTD à 3 fils ou thermistance à 2 fils, se reporter au tableau de codes de programmation à l'annexe E et voir à ce qu'il(s) soit (soient) câblé(s) correctement.

Causes probables d'alarme :

- Câblage sur le terrain mal fait ou endommagé, circuit ouvert ou résistance excessive dû à des câbles sectionnés ou endommagés, ou encore à un desserrement de connexion.
- Capteur de température endommagé ou hors fonction.
- Mauvais type de capteur.

Lorsqu'on utilise un RTD :

- S'assurer que le capteur est à 3 fils, d'une résistance de 100 ohms à 0 °C (32 °F), en platine.
- Débrancher les fils du capteur des bornes d'entrée.
- Mesurer la résistance entre les fils d'alimentation (blanc) et de détection (noir) au niveau du thermostat. Elle ne doit pas dépasser 40 ohms. Toute résistance excessive dans une boucle de fil déclenche une alarme de défaut de capteur et doit faire l'objet d'une correction. Vérifier si des bornes ne sont pas desserrées, si des fils ne sont pas trop longs ou si le calibre des câbles est adéquat.
- Mesurer la résistance entre les fils d'alimentation (blanc) ou de détection (noir) et le fil commun (rouge) du RTD au niveau du thermostat. Elle doit être comprise entre 84 et 178 ohms, selon la température du capteur et la résistance du fil. Se reporter au tableau des résistances, à l'annexe F.
- Vérifier que le RTD est bien câblé. Se reporter au schéma de câblage, à l'annexe D.
- S'assurer que le câble de rallonge du RTD (lorsque utilisé) est mis à la terre à une extrémité seulement, en principe à une borne du coffret de commande.

Lorsqu'on utilise une thermistance :

- S'assurer que la thermistance est à 2 fils, de 2 252 ohms à 25 °C (77 °F) et à coefficient de température négatif (NTC).

- Débrancher les fils de thermistance des bornes d'entrée.
- Mesurer la résistance entre les deux fils de la thermistance, au niveau du thermostat. Elle doit être comprise entre 75,593 et 152 ohms, selon la température de la sonde et la résistance du fil. Se reporter au tableau des résistances, à l'annexe F.
- Vérifier que la thermistance est bien câblée. Se reporter au schéma de câblage, à l'annexe D.
- S'assurer que le câble de rallonge de la thermistance (lorsque utilisé) est mis à la terre à une extrémité seulement, en principe à une borne du coffret de commande.

Alarme basse température (lorsqu'elle a été mise en fonction) :

Cette alarme se déclenche lorsque la température au capteur s'abaisse en-dessous du point de consigne de basse température.

Causes probables d'alarme :

- Le point de consigne d'alarme est trop près du point de consigne de température à maintenir.
- Écoulement de liquide froid.
- Tuyauterie vide avec échappement à l'atmosphère.
- Isolation thermique endommagée ou absente.
- Câble chauffant mal dimensionné en fonction de l'application considérée.
- Câble chauffant endommagé.
- Panne de courant récente, ayant entraîné le refroidissement de la tuyauterie en-dessous du point de consigne.

Température apparemment incorrecte :

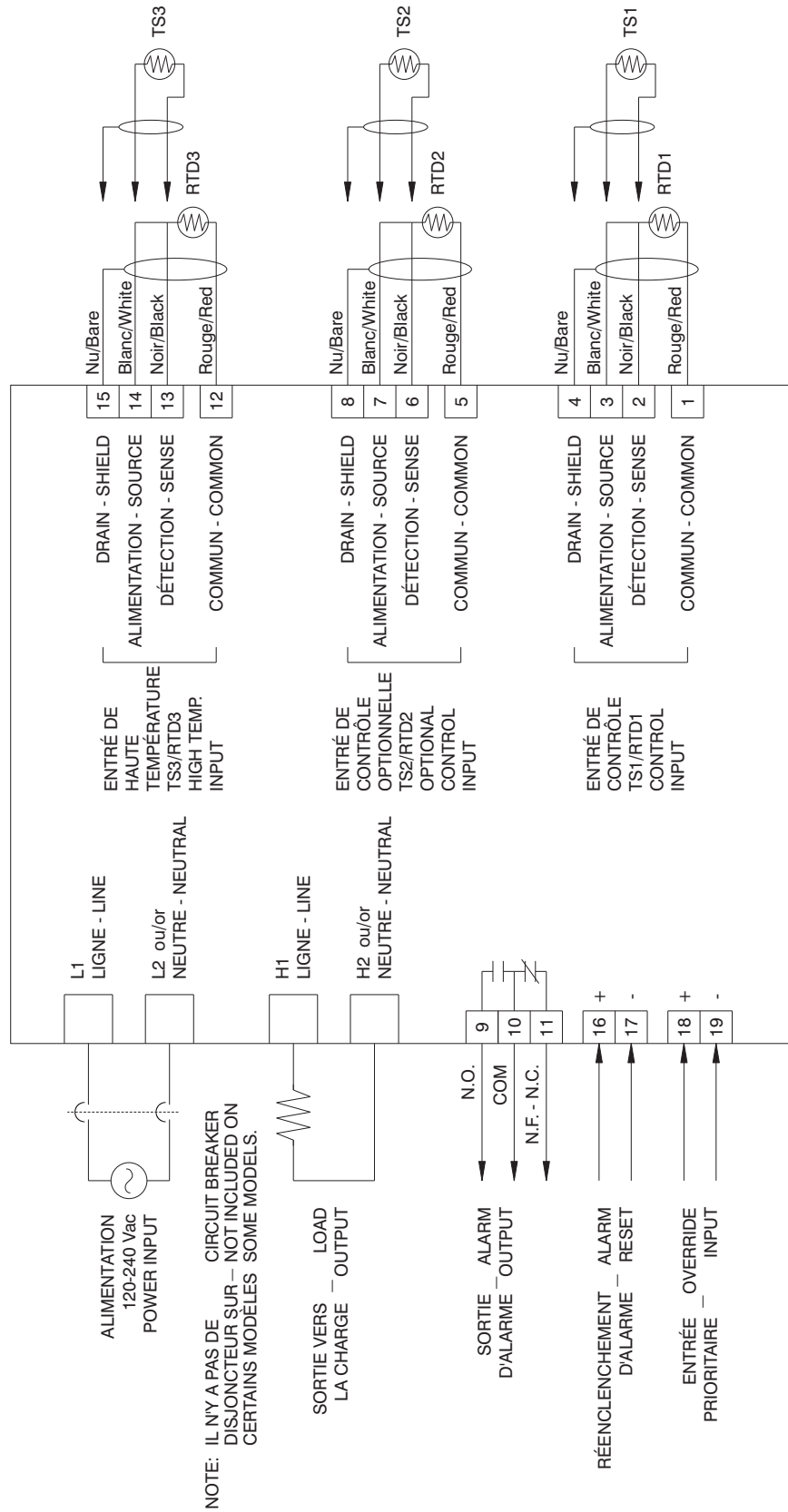
- Débrancher le capteur de température des bornes d'entrée du coffret de commande.

Lorsqu'on utilise un RTD :

- Pour évaluer la température au niveau d'un RTD, mesurer la résistance entre le fil d'alimentation et le fil commun ou entre le fil de détection et le fil commun, puis soustraire la résistance mesurée entre les fils d'alimentation et de détection. La valeur obtenue peut être comparée aux valeurs indiquées dans le tableau de l'annexe F.

Lorsqu'on utilise une thermistance :

- Pour évaluer la température au niveau d'une thermistance, mesurer la résistance entre les deux fils. La valeur obtenue peut être comparée aux valeurs indiquées dans le tableau de l'annexe F.

Schéma de câblage / Wiring Diagram

UTC-2030-xx, UTC-2230-xx, UTC-VPAA-xx

xx doit être remplacé par le code de programmation approprié

xx is to be replaced by the appropriate program code number

code de programmation pour RTD	Capteur de contrôle TS1 (alarme en indice)	Capteur de contrôle TS2 (alarme en indice)	Capteur de haute température TS3	code de programmation pour thermistance
RTD program code	Température	Température	Température	Thermistor program code
	Controlling sensor TS1 (alarm in subscript)	Controlling sensor TS2 (alarm in subscript)	High temperature sensor TS3	

POUR TUYAU DE PLASTIQUE FOR PLASTIC PIPE	01	3 °C (37.4 °F)	–	65 °C (149 °F)	51	POUR TUYAU DE PLASTIQUE FOR PLASTIC PIPE
	02	3 ₁ °C (37.4 _{33.8} °F)	–	65 °C (149 °F)	52	
	03	5 °C (41 °F)	–	65 °C (149 °F)	53	
	04	5 ₃ °C (41 _{37.4} °F)	–	65 °C (149 °F)	54	
	05	10 °C (50 °F)	–	65 °C (149 °F)	55	
	06	10 ₅ °C (50 ₄₁ °F)	–	65 °C (149 °F)	56	
	07	15 °C (59 °F)	–	65 °C (149 °F)	57	
	08	15 ₁₀ °C (59 ₅₀ °F)	–	65 °C (149 °F)	58	
	11	3 °C (37.4 °F)	3 °C (37.4 °F)	65 °C (149 °F)	61	
	12	3 ₁ °C (37.4 _{33.8} °F)	3 ₁ °C (37.4 _{33.8} °F)	65 °C (149 °F)	62	
	13	5 °C (41 °F)	5 °C (41 °F)	65 °C (149 °F)	63	
	14	5 ₃ °C (41 _{37.4} °F)	5 ₃ °C (41 _{37.4} °F)	65 °C (149 °F)	64	
	15	10 °C (50 °F)	10 °C (50 °F)	65 °C (149 °F)	65	
	16	10 ₅ °C (50 ₄₁ °F)	10 ₅ °C (50 ₄₁ °F)	65 °C (149 °F)	66	
	17	15 °C (59 °F)	15 °C (59 °F)	65 °C (149 °F)	67	
	18	15 ₁₀ °C (59 ₅₀ °F)	15 ₁₀ °C (59 ₅₀ °F)	65 °C (149 °F)	68	

POUR TUYAU DE MÉTAL FOR METAL PIPE	21	3 °C (37.4 °F)	–	–	71	POUR TUYAU DE MÉTAL FOR METAL PIPE
	22	3 ₁ °C (37.4 _{33.8} °F)	–	–	72	
	23	5 °C (41 °F)	–	–	73	
	24	5 ₃ °C (41 _{37.4} °F)	–	–	74	
	25	10 °C (50 °F)	–	–	75	
	26	10 ₅ °C (50 ₄₁ °F)	–	–	76	
	27	15 °C (59 °F)	–	–	77	
	28	15 ₁₀ °C (59 ₅₀ °F)	–	–	78	
	31	3 °C (37.4 °F)	3 °C (37.4 °F)	–	81	
	32	3 ₁ °C (37.4 _{33.8} °F)	3 ₁ °C (37.4 _{33.8} °F)	–	82	
	33	5 °C (41 °F)	5 °C (41 °F)	–	83	
	34	5 ₃ °C (41 _{37.4} °F)	5 ₃ °C (41 _{37.4} °F)	–	84	
	35	10 °C (50 °F)	10 °C (50 °F)	–	85	
	36	10 ₅ °C (50 ₄₁ °F)	10 ₅ °C (50 ₄₁ °F)	–	86	
	37	15 °C (59 °F)	15 °C (59 °F)	–	87	
	38	15 ₁₀ °C (59 ₅₀ °F)	15 ₁₀ °C (59 ₅₀ °F)	–	88	

**Capteurs de température utilisés avec les
thermostats électroniques de la série UTC.**

**Temperature sensors used with the
UTC line of electronic thermostats.**

Thermistance / Thermistor (Modèle précédent / Previous model) de / of 2 252 ohms @ 25 °C (77 °F)	
Température Temperature	Résistance Resistance
-40 °C (-40 °F)	75 593 Ω
-35 °C (-31 °F)	54 542 Ω
-30 °C (-22 °F)	39 789 Ω
-25 °C (-13 °F)	29 331 Ω
-20 °C (-4 °F)	21 839 Ω
-15 °C (5 °F)	16 416 Ω
-10 °C (14 °F)	12 453 Ω
-5 °C (23 °F)	9 529,2 Ω
0 °C (32 °F)	7 353,0 Ω
5 °C (41 °F)	5 719,1 Ω
10 °C (50 °F)	4 482,3 Ω
15 °C (59 °F)	3 538,8 Ω
20 °C (68 °F)	2 813,6 Ω
25 °C (77 °F)	2 252,0 Ω
30 °C (86 °F)	1 814,2 Ω
35 °C (95 °F)	1 470,6 Ω
40 °C (104 °F)	1 192,2 Ω
45 °C (113 °F)	983,4 Ω
50 °C (122 °F)	810,9 Ω
55 °C (131 °F)	672,2 Ω
60 °C (140 °F)	560,1 Ω
65 °C (149 °F)	468,9 Ω
70 °C (158 °F)	394,5 Ω
75 °C (167 °F)	333,3 Ω
80 °C (176 °F)	282,9 Ω
85 °C (185 °F)	241,1 Ω
90 °C (194 °F)	206,3 Ω
95 °C (203 °F)	177,2 Ω
100 °C (212 °F)	152,8 Ω

RTD de Platine / Platinum RTD (Modèle courant / Current model) de / of 100 ohms @ 0 °C (32 °F)	
Température Temperature	Résistance Resistance
-40 °C (-40 °F)	84,27 Ω
-35 °C (-31 °F)	86,25 Ω
-30 °C (-22 °F)	88,22 Ω
-25 °C (-13 °F)	90,19 Ω
-20 °C (-4 °F)	92,16 Ω
-15 °C (5 °F)	94,12 Ω
-10 °C (14 °F)	96,09 Ω
-5 °C (23 °F)	98,04 Ω
0 °C (32 °F)	100,00 Ω
5 °C (41 °F)	101,95 Ω
10 °C (50 °F)	103,90 Ω
15 °C (59 °F)	105,85 Ω
20 °C (68 °F)	107,79 Ω
25 °C (77 °F)	109,73 Ω
30 °C (86 °F)	111,67 Ω
35 °C (95 °F)	113,61 Ω
40 °C (104 °F)	115,54 Ω
45 °C (113 °F)	117,47 Ω
50 °C (122 °F)	119,40 Ω
55 °C (131 °F)	121,32 Ω
60 °C (140 °F)	123,24 Ω
65 °C (149 °F)	125,16 Ω
70 °C (158 °F)	127,07 Ω
75 °C (167 °F)	128,98 Ω
80 °C (176 °F)	130,89 Ω
85 °C (185 °F)	132,80 Ω
90 °C (194 °F)	134,70 Ω
95 °C (203 °F)	136,60 Ω
100 °C (212 °F)	138,50 Ω

BORDEREAU DE MISE EN SERVICE POUR LE THERMOCÂBLE®

DESCRIPTION DE LA TUYAUTERIE			DONNÉES TECHNIQUES THERMOCÂBLE®					DONNÉES TECHNIQUES THERMOSTAT		DONNÉES ÉLECTRIQUES		
NUMÉRO OU IDENTIFICATION DE LA TUYAUTERIE	N° ENTRE DE LA TUYAUTERIE	LA TUBÉRIE (m)	TYPE DE CÂBLE	LONGUEUR DU CIRCUIT (m)	ES/88HUE	ES/88 #	RÉSISTANCE DU CÂBLE (Ohms)	RÉSISTANCE D'ISOLATION (mOhms)	MODÈLE DE THERMOSTAT	CODE DE PROGRAMMATION	TENSION D'ALIMENTATION (V)	COURANT DE CHARGE (A)
013it?	ir	73m	130/W Q&joV	73m		1	55	0	NGUTC	il	240V	12.2A
015G?	ir	15m	3ul/v S Ploi'	73m		3	5Y	0		il	240V	12.2A
013CP	ir	75m	12Luj/v Ppfav	73m		H	5Y	0		3	37V	2.5A
0136	IV"	73m	13u/m @ 240V	73m		5	55	0		13	240V	1P.5A
013b	ir	73m	15u/jwQ Pypv	73m		U	55	0		i5	7V	1A5A
01bG?	IV ¹⁴	—	357	—		i	99.7	—	1&uTC	1	2V	12.2A
0136	IV"	—	Tla	—		E	voexD	—	bJXK	W	ptfoü	12.2A
0136?	H ¹⁷	—	TM	—		3	102.8	—	W30TC	1V	240V	12.2A
0136	ir	—	T53	—		i	¥L5	—	U&OK	13	240V	12.5A
0136	K	—	T5 oic	—		a	Λ ^{v7}	—	NGUTC	13	240V	OTA
0136?	N ¹	—	Tbl	—		3	10p. H	—	LAV-TC	V 7>	d10U	12.5A

DATE : 2020-10-07

CONÇU PAR : AieyC GtYWA

RÉV. N° : 01

N° COMMANDE CLIENT : G177

CLIENT : HERSILO-EGLE

PROJET : AMONIC CIV39, Water Management

LIEU : AMMONIC

ENTREPRENEUR CHARGÉ DE L'INSTALLATION : ABF AgrVd

CANADA

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E-mail: 111@1800.com

WWW.111800.COM

1 800 3636-5636



Circuit ;

UjsyXef *Differ* fiCA "Vrfrac

Discipline :

GLE

INFORMATION

Cable No.:	4th VOPP&ASch cct 31-33-35
Cable type:	
Length:	JAOC VR
Origin:	GIDPP69501
Destination:	V-AIÆ-SVKOU
Test voltage:	1000 V
Continuity:	crr-

TEST

	A/G	B/G	C/G	N/G
Reading :	fefD K-O	GtOn sh		N/A

A/B A/C B/C

Megger model :

FLAKE

Notes ;

NOTES v

SEMI Representative

David Lord

Client Representative

Alex Gelman

Signature,

Da:e

YohJozJ

ZX



The Ballast in the Diffuser area were installed on the bottom of the pipe to keep the diffuser pipe (2½" SS) remain pointed upwards during the sinking.

The ballasts are installed this side every two ballasts

This method was use for both diffuswr (Winter and summer)

APPENDIX C
DESIGN CHANGES RECORDS



DESIGN CHANGE LOG

PROJECT: WATER MANAGEMENT PHASE 2



ID	DATE	SUBJECT	ITEM	LOCATION	DRAWING OR SPEC REF.	DESIGN	CHANGE	STATUS	APPROVED BY	NOTES
3	2020-09-10	Diffuser	WTS diffusers: 695-350-WFR-PC17-0138, 695-350-WFR-PC17-0136	Whale Tail south lake	61-695-270-225, Detail A, C, D, E	Concrete balast assembly: 2 parts, one at the bottom of the pipe and the other one on top.	Different assembly for every other concrete ballast: the two blocks are on the bottom, attached to the pipe with a custom made bracket.	Approved	SNC	Different assembly for weight distribution. It should prevent the pipe to turn on itself during installation while floating before sinking it down. That way, the stainless steel outlets remain upright and prevent water to fill in the pipe.
4	2020-10-01	Diffuser	WTS diffusers: 695-350-WFR-PC17-0136	Whale Tail south lake	61-695-270-224	The end of the winter diffuser is reaching the middle of the lake at chaining 0+411 and elevation 143.0.	Winter diffuser is too short of 30 feet, so reaching the original ending location is impossible.	Approved	SNC	After discussions with the designer, it has been concluded that the 30 foot shortening of the diffuser does not cause any problem. As long as the diffuser's end is below the elevation of 145.0, wich is the case in this situation, the change can be applied

De: Bruno Roy
Envoyé: 1 octobre 2020 09:55
À: Jessy Gauthier
Cc: Marc-Andre Beaudet; Alex Gelinas
Objet: FW: [EXTERNAL] Re: Bruno Roy vous a envoyé un message dans Skype Entreprise (Localisation du diffuseur)

Messieurs,

Voir ci-dessous la réponse de SNC pour la position du winter diffuser.



Bruno Roy P.Eng | Construction |
bruno.roy@agnicoeagle.com | Direct 819.759.3555 x4608019 | Mobile 819.301.2901 |
Agnico Eagle Mines Limited - 93, Rue Arseneault, Suite 202 - Val d'Or, Quebec, Canada J9P 0E9
agnicoeagle.com    

From: Nguyen, Anh-Long <Anh-Long.Nguyen@snclavalin.com>
Sent: Thursday, October 1, 2020 8:58 AM
To: Bruno Roy <bruno.roy@agnicoeagle.com>
Subject: RE: [EXTERNAL] Re: Bruno Roy vous a envoyé un message dans Skype Entreprise (Localisation du diffuseur)

Bonjour,

Pour confirmer notre conversation, c'est ok que le diffuseur a un retrait de 40 à 100 pied. Tant que le diffuseur est dans la partie profonde du lac, entre el. 144 à 145 on est ok.

En été :

- On a besoin de 7.3 m minimum selon Golder pour avoir une bonne diffusion.
- Le WTS aura un niveau minimum de El. 155.37 m (invert du SWTDC).
- En installant le diffuseur été/hiver à el. 145 m, on a $155.37 - 145 - 1$ m pour la hauteur du diffuseur = 9.37 m de profondeur disponible.
- En installant le diffuseur été seulement à el. 146 m, on a $155.37 - 146 - 1$ m pour la hauteur du diffuseur = 8.37 m de profondeur disponible

En hiver,

- Selon Golder, on a besoin de 4 m de niveau d'eau au minimum.
- Donc, en installant le diffuseur été/hiver à el. 145 m, on a $155.37 - 145 - 1$ m pour la hauteur du diffuseur - 2 m pour la glace = 7.37 m de profondeur disponible.

Salutations,

Anh-Long Nguyen, *ing./Eng.*

Gestionnaire Ressources hydriques minières / Manager Mine Water Resources

Développement minier durable / Sustainable mining

Mines et métallurgie / Mining & Metallurgy

Tél./Tel. : +1(514)393-8000 x 54292

SNC-Lavalin

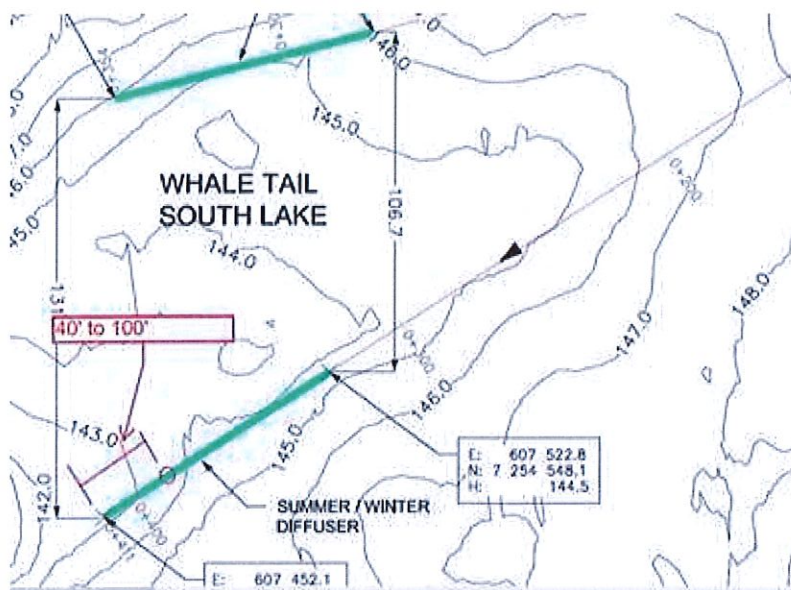
De : Bruno Roy <bruno.roy@agnicoeagle.com>

Envoyé : October-01-20 08:41

À : Nguyen, Anh-Long <Anh-Long.Nguyen@snclavalin.com>

Objet : RE: [EXTERNAL] Re: Bruno Roy vous a envoyé un message dans Skype Entreprise

En espérant que ce soit suffisamment clair.



Bruno Roy P.Eng | Construction |

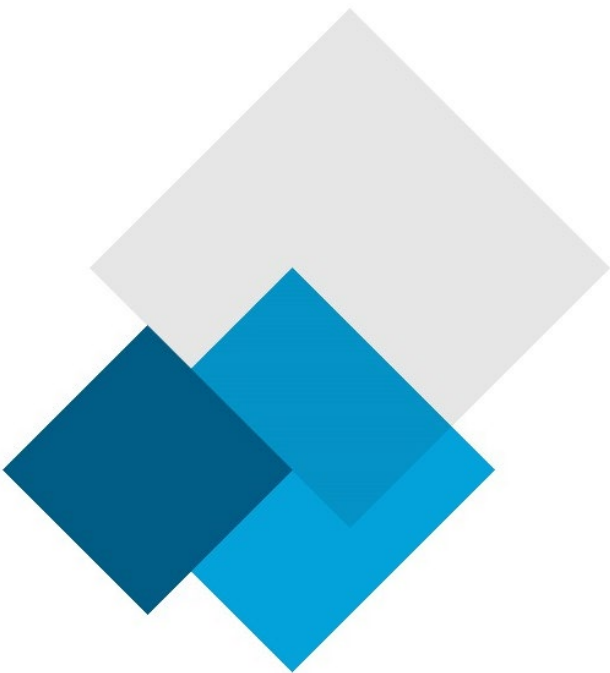
bruno.roy@agnicoeagle.com | Direct 819.759.3555 x4608019 | Mobile 819.301.2901 |

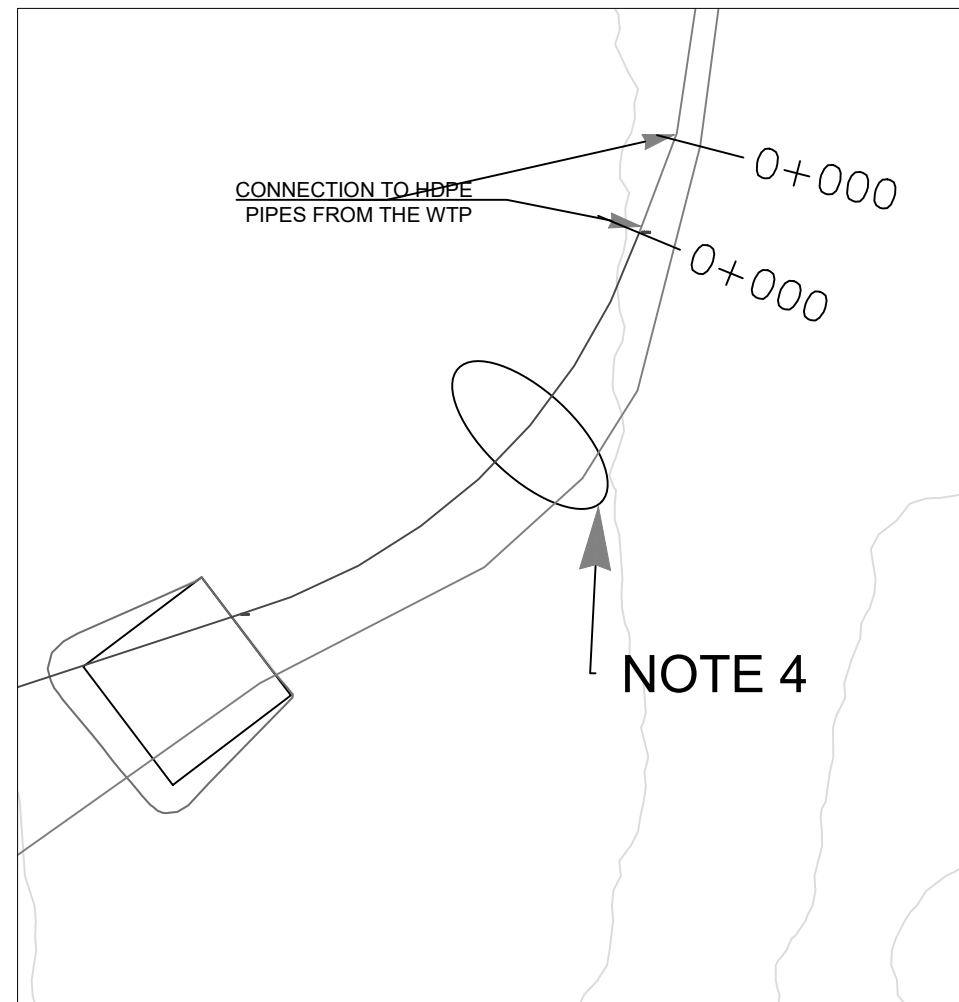
Agnico Eagle Mines Limited - 93, Rue Arseneault, Suite 202 - Val d'Or, Quebec, Canada J9P 0E9

agnicoeagle.com

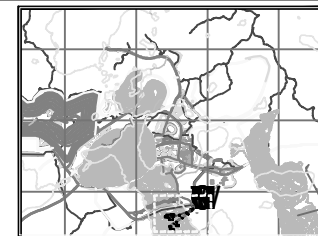


APPENDIX D-1
AS-BUILT DRAWINGS





DETAILED PLAN VIEW



PLAN CLÉ / KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

NOTE:

1. FOR DETAILS ON THE OFFSHORE BALLAST OF THE PIPELINE, REFER TO DRAWING 61-695-270-225 AND 61-695-270-226.
2. EXISTING PAD SHOWS ON THIS DRAWING IS PRELIMINARY. ELEVATION AND DIMENSIONS OF THE PAD ARE TO BE CONFIRMED ON SITE.
3. ON-SHORE PIPES SHALL BE ANCHORED TO PREVENT ANY SLIPPING OF THE OFF-SHORE PIPES.
4. EXISTING ACCESS ROAD IN THE AREA SHALL BE USED TO ACCESS THE PIPELINE. IF AN EXISTING ACCESS ROAD TO THE EXISTING PAD MAY REQUIRE REPROFILING TO FACILITATE PIPELINE MAINTENANCE.



L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE MONDO EAGLE LITE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION PRÉALABLE, TOUTE TRANSMISSION DE COPIES À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE INTERDITES. © MONDO EAGLE LITE

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITLE / TITLE	# DWG

**AGNICO EAGLE**

R1	2021-01-21	AS BUILD	YH	BR	
RO	2020-07-07	ISSUED FOR CONSTRUCTION	MM/DC/AL	AL/AB	
RC	2020-06-15	ISSUED FOR PERMITTING	MM/DC/AL	AL/AB	
RB	2020-03-19	ISSUED FOR CLIENT COMMENTS	MM/DC/AL	AL/AB	
RA	2020-03-16	ISSUED FOR INTERNAL COMMENTS	MM/DC/AL	AL/AB	
REV.	DATE	DESCRIPTION	PAR/REV	APP.	CLIENT

REVISIONS

TITLE / TITRE

AGNICO EAGLE - AMARUQ DIVISION
695 - WATER MANAGEMENT
270 - PIPING

AMARUQ PHASE 2
DIFFUSER PIPE LAYOUT AND PROFILE

DESSINÉ PAR DRAWN BY	MARIUS MOVILA	DATE 2020-03-11
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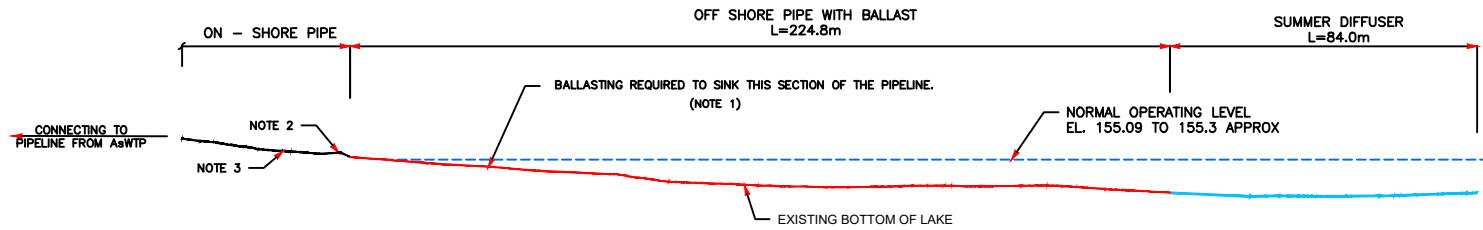
VERIFIÉ PAR CHECKED BY	DARIUSH RASTGOU / DAN CHEN	2020-03-18
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APPROUVE PAR APPROVED BY	ANH-LONG NGUYEN	2020-03-11
ÉCHELLE	DATE	

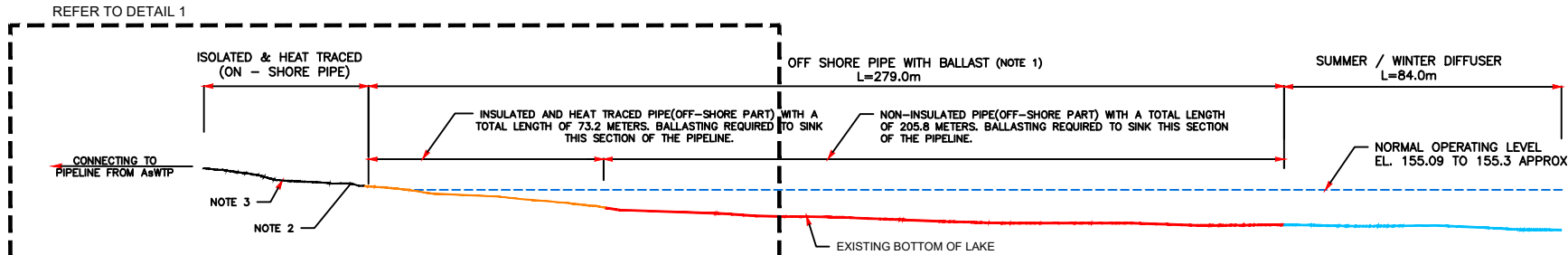
SCALE	AS SHOWN	DATE	2020-03-16
NO. DESSIN			
DRAWING NO.			

61-695-270-224

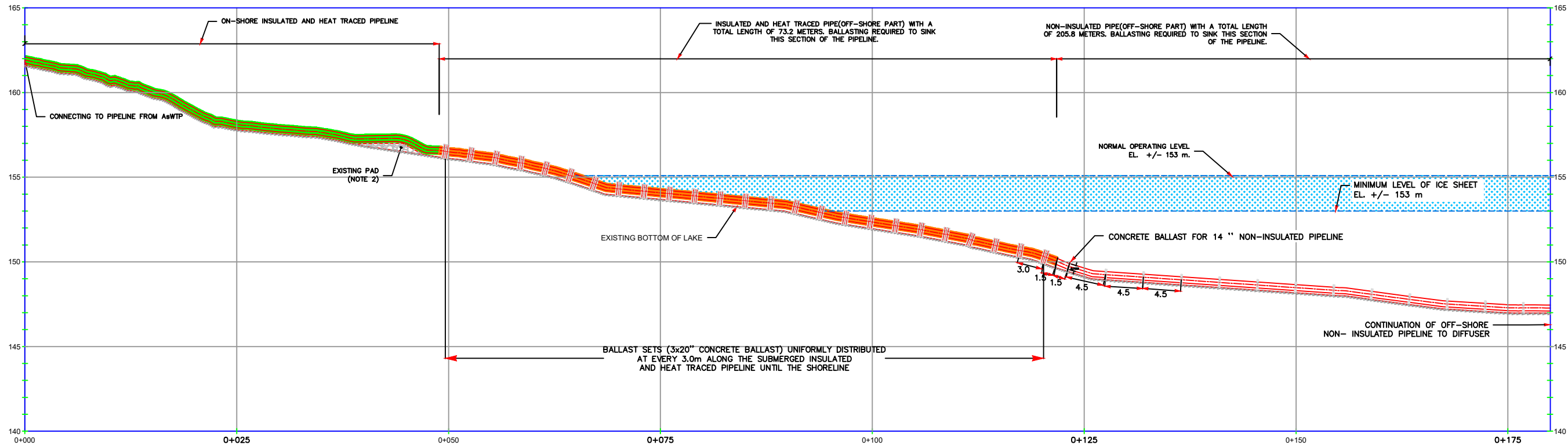
NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHEET
6127	R1	1 / 2



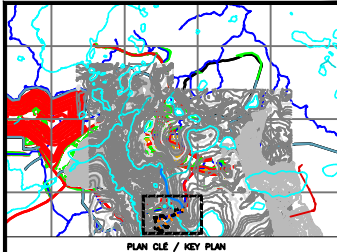
LINE 695-350-WFR-PC17-0137 & 0138 FROM DISCHARGE COMMON HEADER TO WHALE TAIL SOUTH LAKE (SUMMER DIFFUSER)
SCALE 1:1000



LINE 695-350-WFR-PC17-0135-HT & 0136-HT FROM DISCHARGE COMMON HEADER TO WHALE TAIL SOUTH LAKE (SUMMER / WINTER)
SCALE 1:1000



DETAIL 1 - THE SUBMERGED INSULATED AND HEAT TRACED PIPELINE
SCALE 1:100



PLAN CLE / KEY PLAN

PROJECT No	SUBDIVISION	SUBJECT	SERIAL	REV.
668284	9000	46 DD	0001	E00

NOTES GÉNÉRALES / GENERAL NOTES

NOTE:

- FOR DETAILS ON THE OFFSHORE BALLAST OF THE PIPELINE, REFER TO DRAWING 61-695-270-225 AND 61-695-270-226.
- EXISTING PAD SHOWN ON THIS DRAWING IS PRELIMINARY. ELEVATION AND DIMENSIONS OF THE PAD ARE TO BE CONFIRMED ON SITE.
- ON-SHORE PIPES SHALL BE ANCHORED TO PREVENT ANY SLIPPING OF THE OFF-SHORE PIPES

LEGEND



RUN-OF-MINE
ROCKFILL 0-1000 MM

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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG



AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/ET	APP.	CLIENT
R1	2021-01-21	AS BUILT		YH	BR
RD	2020-07-07	ISSUED FOR CONSTRUCTION	M/R/M	AN/NB	
RC	2020-06-10	ISSUED FOR PERMITTING	M/R/M	AN/NB	
RD	2020-03-19	ISSUED FOR CLIENT COMMENTS	M/R/M	AN/NB	
RA	2020-03-16	ISSUED FOR INTERNAL COMMENTS	M/R/M	AN/NB	

REVISIONS

TITRE / TITLE
AGNICO EAGLE - AMARUQ DIVISION
695 - WATER MANAGEMENT
270 - PIPING

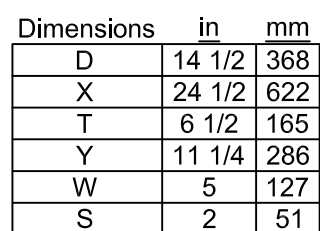
AMARUQ PHASE 2
DIFFUSER PIPE LAYOUT AND PROFILE

DESSINÉ PAR DRAWN BY	MARIUS MOVILA	DATE 2020-03-16
VÉRIFIÉ PAR CHECKED BY	DARIUSH RASTGOU / DAN CHEN	2020-03-16
APPROUVÉ PAR APPROVED BY	ANH-LONG NGUYEN	2020-03-16

ÉCHELLE SCALE	AS SHOWN	DATE 2020-03-16
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NO. DESIGN
DRAWING NO.
61-695-270-224

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHEET
6127	R1	2 / 2

NOTES GÉNÉRALES / GENERAL NOTES

NOTES:

- 1) BALLAST UNIFORMLY DISTRIBUTED ON WHOLE LENGTH OF UNDERWATER PIPE STARTING FROM PROJECTED SHORELINE TO END OF DIFFUSER. IF A BALLAST WEIGHT ENTERS IN CONFLICT WITH DIFFUSER PORT, SEE NOTE 3.
- 2) 1ST BALLAST MUST BE INSTALLED 4.5m MAX FROM INDICATED SHORELINE.
- 3) BALLASTS ARE TO BE EVENLY DISTRIBUTED. IF A BALLAST POSITION ENTERS IN CONFLICT WITH A DIFFUSER PORT POSITION, THE BALLAST MUST BE DISPLACED. THE DISPLACEMENT MUST MINIMALLY 1.0m FROM DIFFUSER PORT, ALL THE WHILE RESPECTING 4.5m MAX SPACING BETWEEN TWO BALLASTS

TEL QUE CONSTRUIT
AS BUILT

 DATE : 2021-01-22

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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS[illegible]

AGNICO EAGLE

R1	2021-01-22	AS BUILT DRAWING	A.G	B.R	
RO	2020-07-07	ISSUED FOR CONSTRUCTION	MS,P,C,B,C	AL.N	
RC	2020-06-15	ISSUED FOR PERMITTING	MS,P,C,B,C	AL.N.	
RB	2020-04-24	ISSUED FOR CLIENT COMMENTS	MS,P,C,B,C	AL.N	
RA	2020-03-25	ISSUED FOR INTERNAL COMMENTS	MS,P,C,B,C	AL.N	
REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT

REVISIONS

TITLE / TITLE

AGNICO EAGLE - AMARUQ DIVISION
695 - WATER MANAGEMENT
270 - PIPING

AMARUQ PHASE 2
PLAN AND DETAILS FOR SUMMER TREATED WATER DISCHARGE
PIPELINE AND DIFFUSER

DESSINÉ PAR DRAWN BY	MARK SYKES	DATE 2020-07-0
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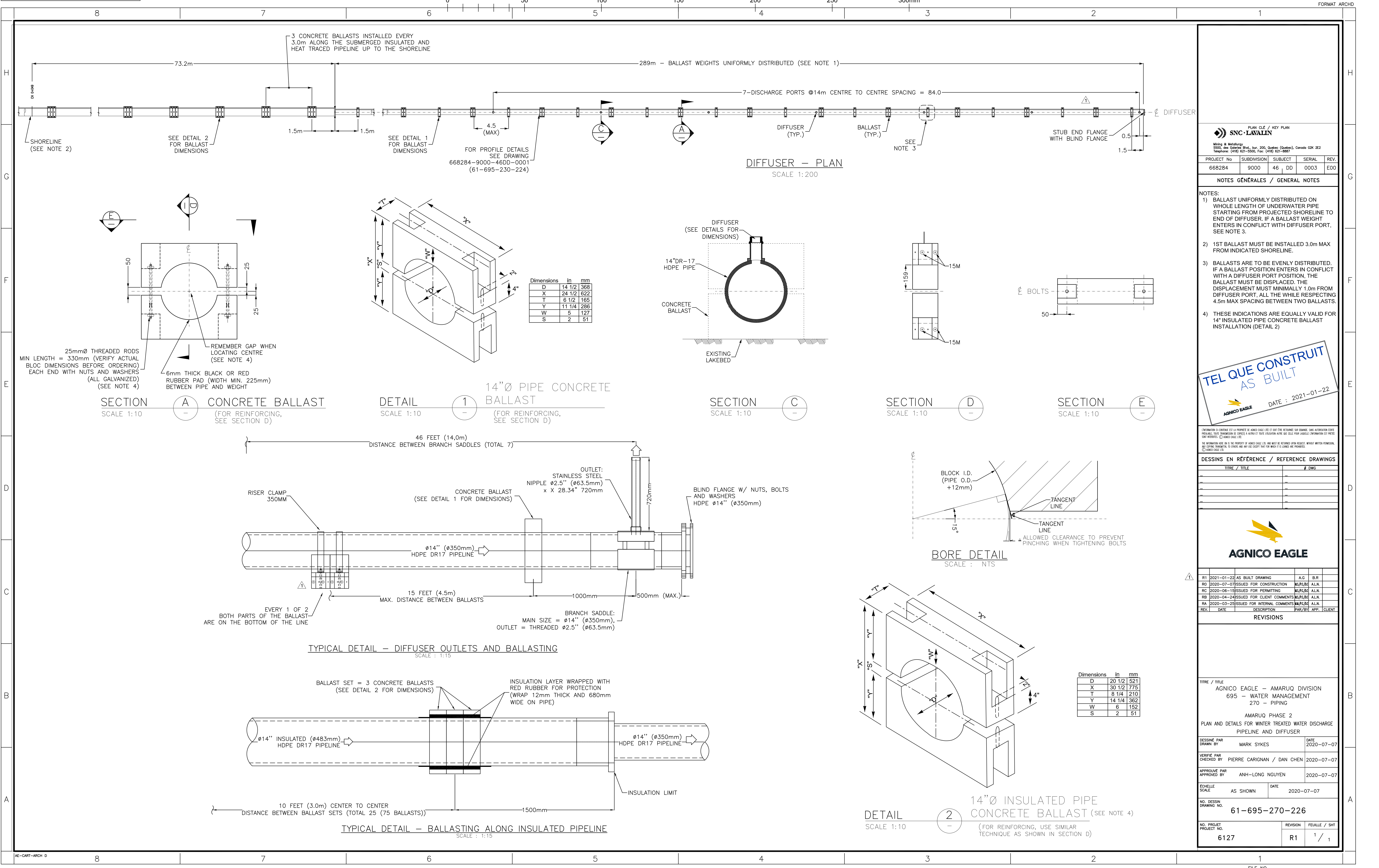
VERIFIÉ PAR CHECKED BY	PIERRE CARIGNAN / DAN CHEN	2020-07-0
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APPROUVÉ PAR		
APPROUVED BY	ANH LONG NGUYEN	2022-07-05

APPROVED BY	ANH- <u>LONG NGUYEN</u>	2020-07-0
ÉCHELLE	DATE	

SCALE	AS SHOWN	DATE	2020-0
NO. DESSIN DRAWING NO.		61-695-270-225	

NO. PROJ. PROJECT NO.	REVISION	FEUILLE / SHEET
	R1	1 / 1



PLAN CLE / KEY PLAN

SNC-LAVALIN

Mining & Metallurgy
5000, des Glaciers Blvd., bur. 200, Québec (Québec), Canada G2K 2E2
Téléphone: (418) 621-3500, Fax: (418) 621-9887

PROJECT No.	SUBMISSION	SUBJECT	SERIAL	REV.
668284	9000	46 - DD	0003	E00

NOTES GÉNÉRALES / GENERAL NOTES

NOTES:

- 1) BALLAST UNIFORMLY DISTRIBUTED ON WHOLE LENGTH OF UNDERWATER PIPE STARTING FROM PROJECTED SHORELINE TO END OF DIFFUSER. IF A BALLAST WEIGHT ENTERS IN CONFLICT WITH DIFFUSER PORT, SEE NOTE 3.
- 2) 1ST BALLAST MUST BE INSTALLED 3.0m MAX FROM INDICATED SHORELINE.
- 3) BALLASTS ARE TO BE EVENLY DISTRIBUTED. IF A BALLAST POSITION ENTERS IN CONFLICT WITH A DIFFUSER PORT POSITION, THE BALLAST MUST BE DISPLACED. THE DISPLACEMENT MUST MINIMALLY 1.0m FROM DIFFUSER PORT, ALL THE WHILE RESPECTING 4.5m MAX SPACING BETWEEN TWO BALLASTS.
- 4) THESE INDICATIONS ARE EQUALLY VALID FOR 14" INSULATED PIPE CONCRETE BALLAST INSTALLATION (DETAIL 2)

TEL QUE CONSTRUIT AS BUILT

AGNICO EAGLE DATE : 2021-01-22

INFORMATION D'ENTRÉE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTD ET NE DOIT ÊTRE RETENUE QUE POUR RÉFÉRENCE. AGNICO EAGLE LTD NE GARANTIT PAS L'EXACTITUDE DE CES DONNÉES. AGNICO EAGLE LTD.

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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/APP.	CLIENT
R1	2021-01-22	AS BUILT DRAWING	A.C.	B.R.
RD	2020-07-07	ISSUED FOR CONSTRUCTION	W.P./A.C.	ALN.
RC	2020-06-10	ISSUED FOR PERMITTING	W.P./A.C.	ALN.
RB	2020-04-24	ISSUED FOR CLIENT COMMENTS	W.P./A.C.	ALN.
RA	2020-03-25	ISSUED FOR INTERNAL COMMENTS	W.P./A.C.	ALN.

REVISIONS

TITRE / TITLE

AGNICO EAGLE - AMARUQ DIVISION
695 - WATER MANAGEMENT
270 - PIPING

AMARUQ PHASE 2
PLAN AND DETAILS FOR WINTER TREATED WATER DISCHARGE PIPELINE AND DIFFUSER

DESSINÉ PAR
MARK SYKES

DATE
2020-07-07

VÉRIFIÉ PAR
PIERRE CARIGNAN / DAN CHEN

2020-07-07

APPROUVÉ PAR
ANH-LONG NGUYEN

2020-07-07

ECHELLE
SCALE

AS SHOWN

DATE
2020-07-07

NO. DESSIN
DRAWING NO.

61-695-270-226

NO. PROJ. PROJECT NO.	REVISION	FEUILLE / SHEET
6127	R1	1 / 1

APPENDIX D-2

Pictures





1. Area where the pipeline to the WTS will be installed



2. View of the installed pipeline



3. Details on a discharge port assembly (branch saddle, 2.5 in Stainless Steel Pipe and final assembly)



4. Illustration of a 90kg concrete ballast installed along the diffuser



5. Illustration of the insulated portion of the offshore pipeline



6. Illustration of the assembly work of the diffuser



7. Final alignment of the diffuser in the WTS basin



8. Final result before sinking