Baffinland Iron Mines LP
Mary River Expansion Project

Construction Summary Report: Sailiivik Camp Effluent Line

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date APRIL 15, 2020
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

REGISTERED PROFESSIONAL ENGINEER
G.A. PEACE
LICENSEE
APRIL 15 2020
NT/NU

				Haaksma, Michael Digitally signed by Haaksma, Michael DN: cn=Haaksma, Michael Date: 2020.04.15 15:20:02 -04'00'		
2020-04-15	0	Approved for Use	G. Peace	M. Haaksma	N. Mason	D. Henkelman
Date	**Rev.**	**Status**	**Prepared By**	**Checked By**	**Approved By**	**Approved By**
			HATCH			**Client**

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1. Facility Description

1.1 Purpose and Design Basis

Baffinland Iron Mines Corporation (Baffinland) has added a new accommodation camp at the Mary River mine site (Sailiivik camp). In conjunction with the new camp a new effluent pumping station and effluent discharge line was added. The new effluent line ties in to the existing effluent line from the existing Mine Site Complex camp. The effluent discharge point is unchanged.

The effluent pumping station and discharge line is designed to accommodate the effluent from the Sailiivik camp as well as the effluent that results from the waste water from various remote locations that is discharged into the camp Waste Water Treatment Plant (WWTP).

The effluent line is a 76 mm (3 inch) heat traced and insulated high-density polyethylene (HDPE) pipe line.

The pumping station and effluent line were designed and constructed to the following codes and standards:

- National Building Code of Canada (NBC) 2010.
- National Fire Code of Canada (NFCC) 2010.
- ANSI B31.3-2010.
- Nunavut Mine Health and Safety Act.
- Nunavut Mine Health and Safety Regulations.
- Nunavut Electrical Protection Act.
- Nunavut Electrical Protection Regulations

1.2 Location and Base Elevations

The new Sailiivik camp is located on the south side of the Tote Road between northing N7913230 and N7913466, and easting E560487 and E560815. The effluent pumping station is located near the east edge of the camp pad. The new effluent line extends to the southeast where it meets the existing effluent line at northing N7912430 and easting E561906.

1.3 Geometry and Access

The effluent pumping station is accessible from the Sailiivik Camp roadways and the effluent line is accessible from existing roads.

1.4 Earthworks Materials Details

The effluent pumping station was constructed on the Sailiivik camp pad. The effluent line follows the existing ground contours.

2. Construction Activity Summary

Construction activities for the effluent line and pumping station started November 2, 2018 and were completed on November 18, 2019.

The following summarizes construction activities:

2.1 Pumping Station

- Placement of the container.
- Installation of interior tank heater.
- Installation of pumps and piping in the container.
- Modification of the container to allow room for controls and better access.
- Installation of electrical supply.

2.2 Effluent Line

- Placement of 3” heat traced and insulated HDPE pipe sections along route.
- Fusing HDPE piping.
- Installation of four (4) culverts for the pipeline. These culverts were for pipeline installation and not for flow of water.
- Connection of heat tracing at each joint.
- Covering joints with insulated jackets.
- Cutting into existing line and installing Y connection with valves.

2.3 Testing

Testing completed on the pumping station and effluent line as shown in Appendix B.

3. QA/QC

Quality Assurance (QA) was performed by the Hatch Construction Supervisor during daily audits with the Nuna/ADCO Supervisor during the construction. Quality Surveillance Inspection Acceptance and Sign-off Reports were prepared by the Nuna Supervisor and signed of by the Hatch Representative. Quality reports are included in as part of the turnover package Appendix B.

4. Photographic Records

Photo 4-1: Effluent Line

Photo 4-2: Effluent Line Continuing Installation

Photo 4-3: Effluent Line Installation

Photo 4-4: Effluent Line Installation in Progress

Photo 4-5: Effluent Line placed up to Effluent Tank

Photo 4-6: Insulation Kit at Tank

Photo 4-7: Effluent Line Pipe Supports

Photo 4-8: Effluent Line Supports

Photo 4-9: Effluent Line Heat Tracing

Photo 4-10: Tie into Existing Line

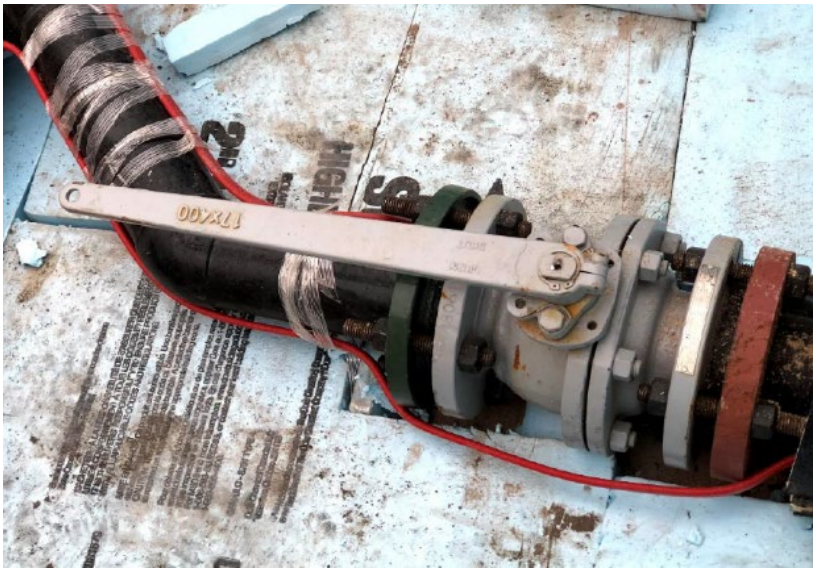


Photo 4-11: Insulation Box at Tie in

Photo 4-12: Effluent Line Heat Tracing

Photo 4-13: Existing Effluent Line Discharge Point

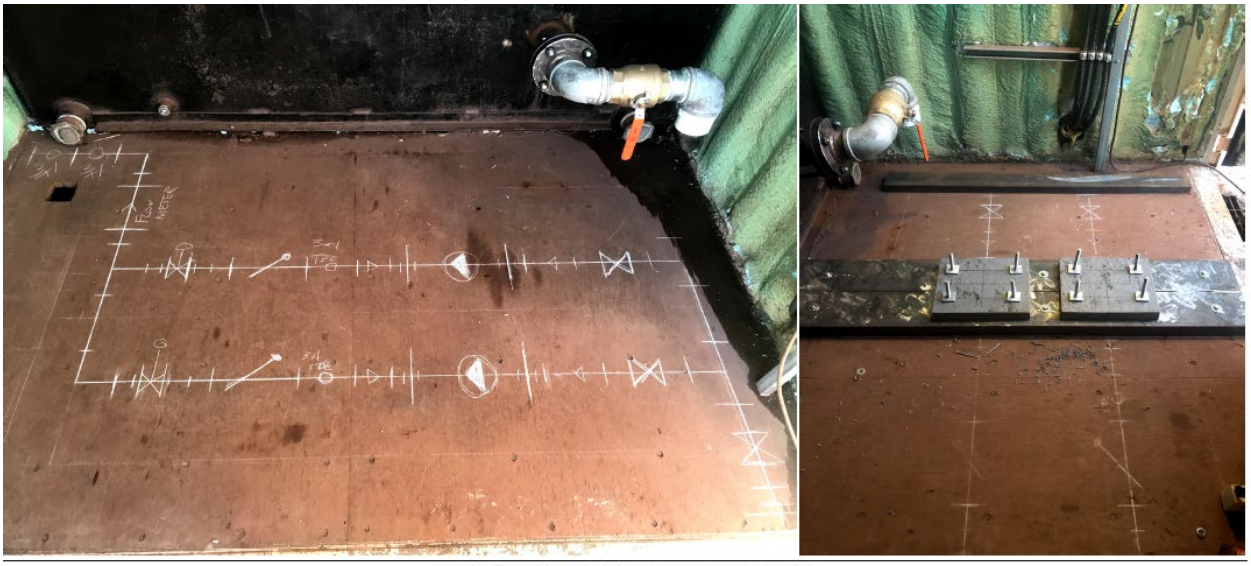


Photo 4-14: Effluent Pump Station Layout

Pumps Installed in Effluent Tank for Effluent Lift Station

Photo 4-15: Effluent Pumps Installation

Piping and Valves Installed in Effluent Tank Pump Station

Photo 4-16: Effluent Pump Station Piping

Photo 4-17: Pump Station Control Panel

Photo 4-18: Pump Station Cable Tray

5. As-built Drawings

The as-built drawings incorporate contractor red line markups, field instructions, requests for information, field sketches and all other inputs provided by the Engineering, Procurement and Construction Management (EPCM) field team. As-built drawings are attached in Appendix A. These drawings are representative of the final as-built conditions.

Table 5-1: As-built Drawing List

Drawing Number	Title	Revision
H353004-10000-240-272-0001-0001	Mine Site Mine Effluent and Raw Water Pipeline Overall Layout	2
AB 190912 MS Effluent Pipe.dwg	Mine Site Insulated Heat Traced Effluent Pipe As Built Sept 12, 2019	
H353004-10000-270-276-0003-0002	Mine Site Sewage Water Treatment Piping and Instrumentation Diagram	0
J2775-PD-1 SHT. No.1	Pump control/Power Panel Wiring Diagram (Page 1 of 2)	4
J2775-PD-1 SHT. No.2	Pump control/Power Panel Wiring Diagram (Page 2 of 2)	4
J2775-PD-1 SHT. No.3	Pump Control Panel Layout	2
J2775-PD-1 SHT. No.4	Pump Control Panel Terminal Strip Details	2
J2775-PD-1 SHT. No.5	Pump Control Panel Door Layout Details	2
J2775-PD-1 SHT. No.6	Pump Control Panel Layout Drawing	2
	Mary River Mine Site 1623-Effluent Pump Station Single Line	

6. Field Decisions

The following section describes field decisions made during construction:

- Modification of container to improve access and allow proper installation of controls.

7. Performance Evaluation

As of the date for this report there have been no adverse observations in operational performance of the work constructed under this scope. There was a small leak at the discharge of one of the effluent pumps. This occurred prior to being put into operation.

8. Vibration Monitoring and Quarrying Activity

No vibration monitoring was conducted during the construction of this work as it was not deemed necessary based on the scope of activities required for construction.

9. Environmental Monitoring

Baffinland Environment was responsible for environmental monitoring at the site during this work and following-up with construction if there were any reported environmental incidents or non-conformances.

The Spill contingency Plan (BAF-PH1-830-P16-0036), in conjunction with the Emergency Response Plan (BAF-PH1-830-P16-0007), provides guidance and instructions for first responders and Baffinland Management in the event of a spill event or other emergency such as fire or accident.

The risks to the environment as a result of construction activity for this work would originate from spills from equipment. There were no spills reported.

10. Earthworks Data

No Earthworks/Geotechnical investigations were performed in association with this work.

11. Unanticipated Observations

A small leak occurred at the discharge of one of the effluent pumps during testing. It was repaired immediately with no spill to the environment.

12. Surface Monitoring

Not applicable.

13. Required Maintenance

Non required.

14. Adaptive Management

Not applicable.

15. Concordance with Type "A" Water Licence

Baffinland's Type A Water Licence, Schedule D, outlines the requirements for Construction Summary/Monitoring Reports. Table 15-1 provides a concordance of this report with the requirements of Schedule D.

Table 15-1: Concordance with Type "A" Water Licence

Schedule D Item No.	Schedule D Description	Corresponding Section in this Report
1a	Description of all infrastructure and facilities designed and constructed to contain, withhold, divert or retain Water and/or Waste;	1
1b	A summary of construction activities including photographic records before, during and after construction of the facilities and infrastructure designed to contain, withhold, divert or retain Water and/or Waste;	2, 3, 4
1c	As-built drawings and design for facilities and infrastructure, in Item 1(a) of this schedule, designed and constructed to contain, withhold, divert or retain Water and/or Waste;	5
1d	Documentation of field decisions that deviate from the original plans and any data used to support or developed facilities and infrastructure to withhold, divert or retain Water and/or Waste;	6
1e	A comparison of measured versus predicted performance of infrastructure and facilities;	7
1f	Any blast vibration monitoring and control for quarrying activity carried out in close proximity to fish bearing waters;	8
1g	Monitoring conducted for sediment and explosives residue release from construction areas;	9
1h	Monitoring undertaken in accordance with Part D of Licence the during the Construction Phase of the Project;	8, 9
1i	Details confirming that the requirements of the CCME guidance document entitled "Aboveground Storage Tank Systems for Petroleum and Allied Petroleum Products (2003)" have been met by the Licensee;	N/A
1j	Data collected from instrumentation used to monitor earthworks and the interpretation of that data;	10
1k	A discussion of any unanticipated observations including changes in risk and mitigation measures implemented to reduce risk during construction;	11
1l	An overview of any method including frequency used to monitor deformations, seepage and geothermal responses;	12
1m	A summary of maintenance work undertaken as a result of settlement or deformation of dikes and dams;	N/A
1n	A summary of adaptive management principles and practices applied during the relevant phases of the Project and their overall effectiveness.	14

16. Concordance with Commercial Lease Requirements

Table 16-1 provides a concordance of this report with the requirements of the Commercial Lease for As-Built reporting.

Table 16-1: Concordance for Commercial Lease As-built Requirements

Component	Minimum Information Requirements	Corresponding Section in this Report
1	The name and contact information of the person and company responsible for completing the construction, construction monitoring and preparing the As-built Report	Appendix C
2	The name and contact information of the Baffinland representatives(s) that QIA can contact should it have any questions or comments regarding the As-built Report	Appendix C
3	An introduction to the infrastructure or facilities including but not limited to the construction background, concept and construction history	1,2
4	Construction records including As-Built drawings signed and stamped by a professional engineer detailing surveys, planar and cross sections that illustrate all designed components. This should be provided in PDF format and if requested the native file (e.g. CAD, .dxf, etc.)	Appendix A Appendix B
5	Detailed description of any deviations from the For Construction Design. Deviations that should be noted include, but are not limited to, changes in design and construction materials, construction methodology or monitoring	6
6	Observed performance of the construction including a comparison to predicted performance. Recommendations for performance monitoring based on observations during construction if applicable	NA
7	A description and list of instrumentation installed, if applicable, and results of construction monitoring including all environmental data. Recommendations for additional performance or environmental monitoring based on observations and monitoring results, if applicable.	NA
8	A summary of quality assurance testing results, if applicable, and comparison of these results to construction/design requirements to ensure performance of the infrastructure or facilities.	3 Appendix B
9	A summary of adaptive management principles and practices related to environmental management and monitoring applied during the relevant phases of the Project and their overall effectiveness	NA
10	Photographic records before, during and after construction of the facilities or infrastructure.	4
11	Map(s) to illustrate the completed construction in relation to Lease boundaries and water bodies. The minimum distance from completed or modified facilities and infrastructure to the surveyed boundary of the Property, surveyed boundary of the Impact Area, and the original high water mark should be provided.	Appendix D

Appendix A

As-built Drawings

DWG. No. H353004-10000-270-276-0003-0002

1623-TK-001
800 PERSON CAMP TREATED EFFLUENT
HOLDING TANK CAPACITY (TB)

1623-PP-001A/B
800 PERSON CAMP TREATED EFFLUENT
PUMP 7.5kW

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date 07-Aug-18
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

CS-1623-001

800 PERSON CAMP
PWTP (POTABLE FEED)
10000-270-276-0001-0001

800 PERSON CAMP
PWTP (BACKWASH EFFLUENT)
10000-270-276-0001-0001

800 PERSON CAMP LIFT STATIONS
RAW SEWAGE

RAW SEWAGE
FROM REMOTE USERS
10000-270-276-0006-0001
10000-270-276-0006-0002
10000-270-276-0006-0003
NOTE 2
SEWAGE TRUCK

800 PERSON CAMP
WASTE WATER AND SEWAGE
RECEIVING TANK
RECEIVING STATION P&ID - TBD

800 PERSON CAMP WASTE WATER TREATMENT PLANT
VENDOR PACKAGE - PM203
REFER TO VENDOR DWG E353004-PM203-260-262-0007 TO 0011

800 PERSON CAMP
SEWAGE TREATMENT PLANT
PUMP STATION

1623-TK-001
LSHH 001
LSH 001
LSL 001

1623-PP-001A
YA 001A
YL 001
M7 UX 001A
PI 001A
V1 XS 001A
XV 001A
FC
FI 001
PIT 001
NOTE 4
FE 001

1623-PP-001B
YA 001B
M7 UX 001B
PI 001B
V1 XS 001B
XV 001B
FC

MARY RIVER DISCHARGE
10000-270-276-0003-0001
1623-WEF-0001-HA1A-080-HC50

NOTE 2
GARBAGE TRUCK
SLUDGE FILTER CAKE
WASTE MANAGEMENT FACILITY
10000-270-276-0004-0001

NOTES:
1. ALL INSTRUMENTS ARE VENDOR SUPPLIED.
2. HOSE ARRANGEMENT IS PART OF THE TRUCK. SHOWN FOR REFERENCE ONLY.
3. VENDORS ARE RESPONSIBLE FOR STAMPING OF IFC PACKAGE DOCUMENTS.
4. CALORIMETRIC THERMAL MASS FLOW METER
5. ALL INSTRUMENT TAGS PRECEDED BY AREA CODE 1623

CS-1623-001:Treated Effluent Piping Change and associated heat trace from 800 man camp to tie in existing 3 line

FOR USE

REGISTERED PROFESSIONAL ENGINEER P.R. JIM LICENSEE NT/NU

No.	DESCRIPTION	BY	CHK'D	DATE
0	APPROVED FOR USE	HV	PC	11-07-2018

REVISIONS

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	H VINCENT	NR	25-06-2018
DESIGNER		NR	
CHECKER	P CHERRY		2018-08-06
DESIGN COORD.	R GOOSEN		2018-08-06
RESP. ENG.	P JIM		2018-08-06
LEAD DISC. ENG.	P CHERRY		2018-08-06
AREA LEAD	T ATIBA		
ENG. MANAGER	D STANGER		2018-08-06
AREA MANAGER	T ATIBA		2018-08-06

DRAWING APPROVAL STATUS: Approved for Use

HATCH

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

MINE SITE
SEWAGE WATER TREATMENT
PIPING & INSTRUMENTATION DIAGRAM

DRAWING No.	DRAWING TITLE
H349000-4731-75-031-0001	MINE SITE - SEWAGE WATER TREATMENT - PIPING & INSTRUMENTATION DIAGRAM

REFERENCE DRAWINGS

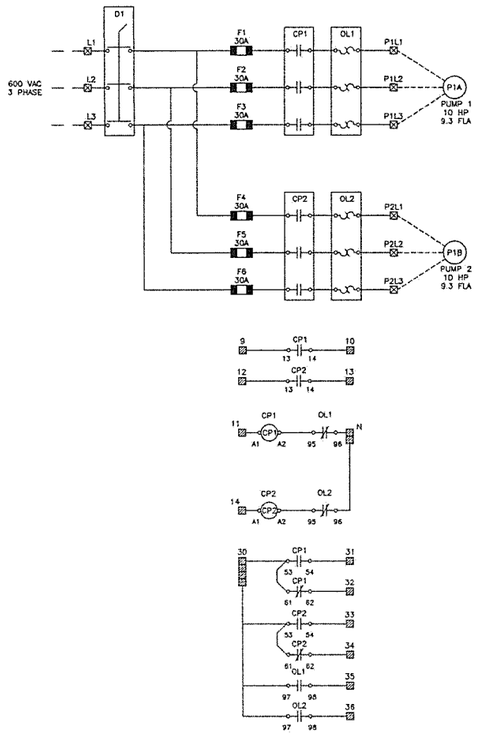
REG. PROFESSIONAL

SCALE NTS OR AS NOTED
DWG. No. H353004-10000-270-276-0003-0002
REV 0
SHEET SIZE: D

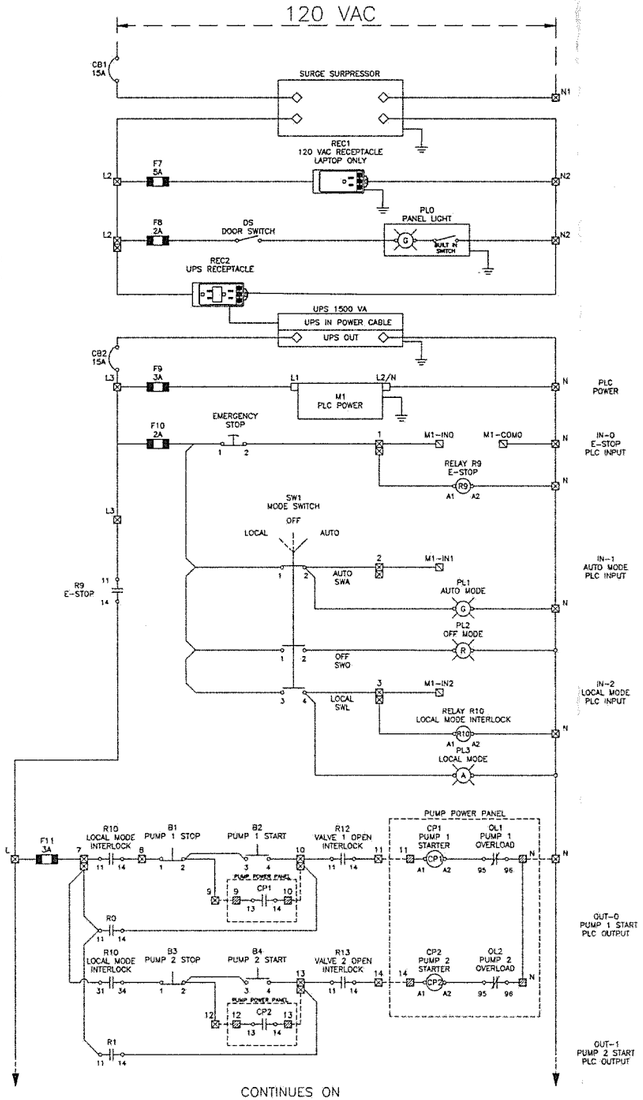
jdc_pwservice

REV. 4 | DRAWING NO. J2775-PD-1-1

POWER PANEL WIRING SCHEMATIC



CONTROL PANEL WIRING SCHEMATIC



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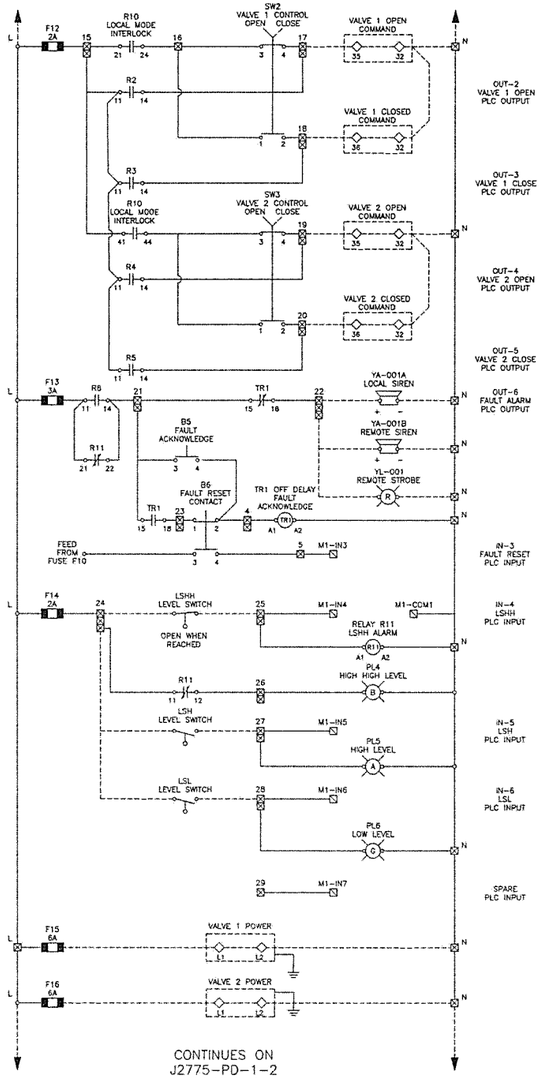
COLUMN 2

FROM J2775-PD-1-1
COLUMN 1



CONTINUES ON
J2775-PD-1-2
COLUMN 1

NOTES:

1. THE PANEL SHALL BE CSA APPROVED FOR GENERAL PURPOSE AND BEAR A CSA LABEL. TERMINATION.
2. ALL INTERNAL WIRING MUST BE TERMINATED ON A CSA APPROVED TERMINAL BLOCKS
3. ALL TERMINAL BLOCKS TO BE LABELED, NUMBERED MATCHING WIRING DIAGRAM.
4. ALL WIRE TERMINATION TO HAVE SHRINKABLE WINEMAKERS WITH DESTINATION TERMINATION POINT. (TO LOCATION)
5. WIRES COLOR PER LISTING BELOW:
   - 5.1. 120/60D VAC POWER – BLACK
   - 5.2. 120 VAC NEUTRAL – WHITE
   - 5.3. 120 VAC CONTROL – BLACK
   - 5.4. 24 VDC POSITIVE – BLUE
   - 5.5. 24 VDC NEGATIVE – BROWN
   - 5.6. ANALOG POSITIVE – BLACK
   - 5.7. ANALOG NEGATIVE – WHITE
   - 5.B. GROUND – GREEN
6. ALL 120 VAC FIELD WIRING CONNECTS TO BOTTOM RIGHT SIDE OF TERMINALS ON TERMINAL STRIP TS1, CABLES TO BE RUN IN RIGHT MOST WIREWAY (BOTTOM ENTRY FOR EASIEST ACCESS).
7. FLOW METER AND PRESSURE SENSOR ANALOG SIGNAL CABLES TO BE CONNECTED TO TERMINALS ON TS-4. GROUNDED AT PANEL NOT AT INSTRUMENTS
8. ALL PILOT LIGHTS FOR FAULTS ARE BLUE, FAULT STROBES ARE ALSO BLUE.
9. ITEMS 62 TO 65, (BLUE BEACONS AND SIREN) SHIPPED LOOSE AND TO BE INSTALLED AND WIRED SITE IN APPROPRIATE LOCATIONS.
10. UPS SHIPPED LOOSE AND TO BE INSTALLED AND WIRED TO CONTROL PANEL ON SITE. INSTALLATION STEPS:
    - 10.1. PRE CONNECT WIRES TO UPS SINCE AFTER INSTALLATION THERE WILL BE LIMITED ACCESS TO BACK OF UPS.
      - 10.5.1. CONNECT UPSR-1 AND UPSR-3 (LABELED BLUE WIRES) TO APPROPRIATE SCREW TERMINALS ON BACK OF UPS.
    - 10.9.2. PLUG PANELS INPUT POWER CORD (YELLOW SHRINK) TO RECEPTACLE ON THE UPS. THIS CORD HAS A 90 DEGREE PLUG.
    - 10.10. PLACE UPS IN THE CONTROL PANEL, UPS DISPLAY SHOULD BE FACING AWAY FROM LEFT ENCLOSURE WALL.
    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE-2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

REV.	ISSUE DATE Y	M	D	DESCRIPTION	DWN	CHK	ENG	APP	APP
4	19	2	18	AS BUILT	DI	GK			
3	19	2	1	ISSUED FOR PROGRAMMING	DI	GK			
2	19	1	30	ISSUED FOR PROGRAMMING	DI	GK			
1	19	1	28	ISSUED FOR REVIEW	DI	GK			
0	18	11	15	ISSUED FOR REVIEW	DI	GK			

REFERENCE DRAWINGS:

G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

DRAWING TITLE:

PUMP CONTROL/POWER PANEL WIRING DIAGRAM (PAGE 1 OF 2)

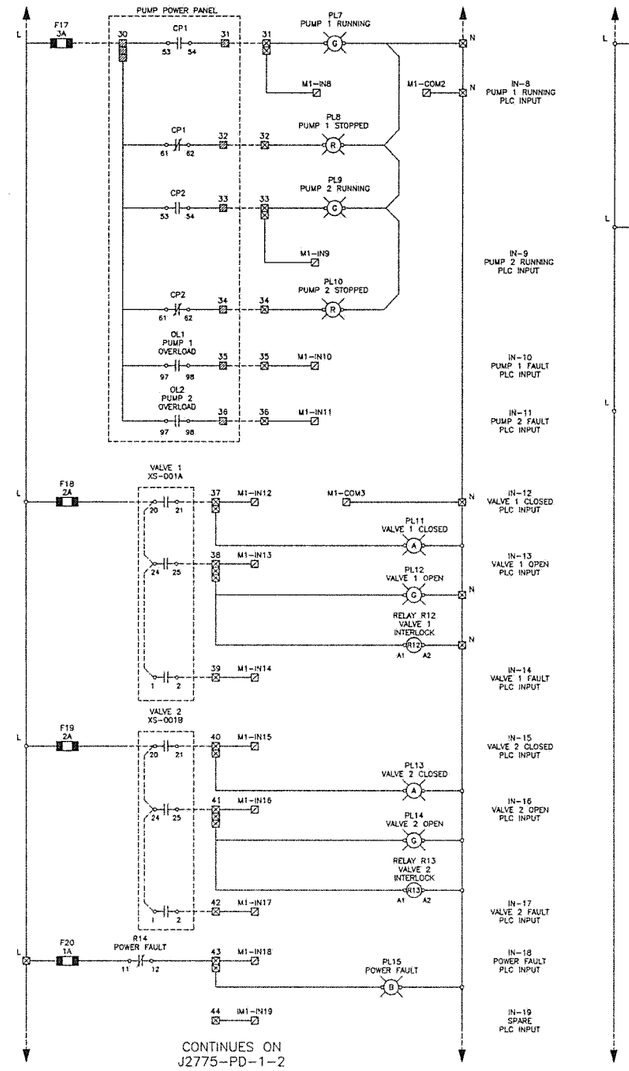
DRAWING NO.	SHT. No.	REV
J2775-PD-1	1	4

PLOT SCALE: X

DRAWING NO. J2775-PD-1-2 | REV. 4

CONTROL PANEL WIRING SCHEMATIC

FROM J2775-PD-1-1
COLUMN 2



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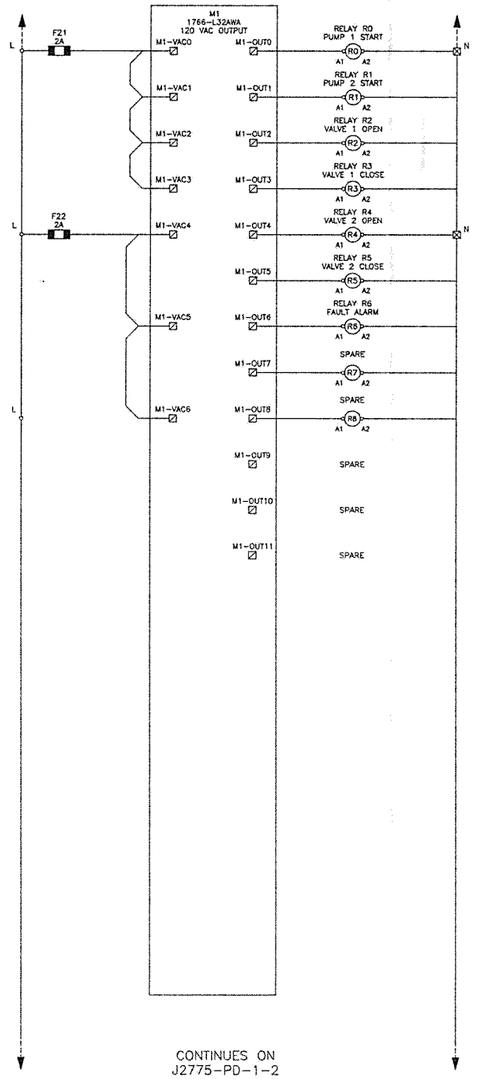
COLUMN 2

FROM J2775-PD-1-2
COLUMN 1



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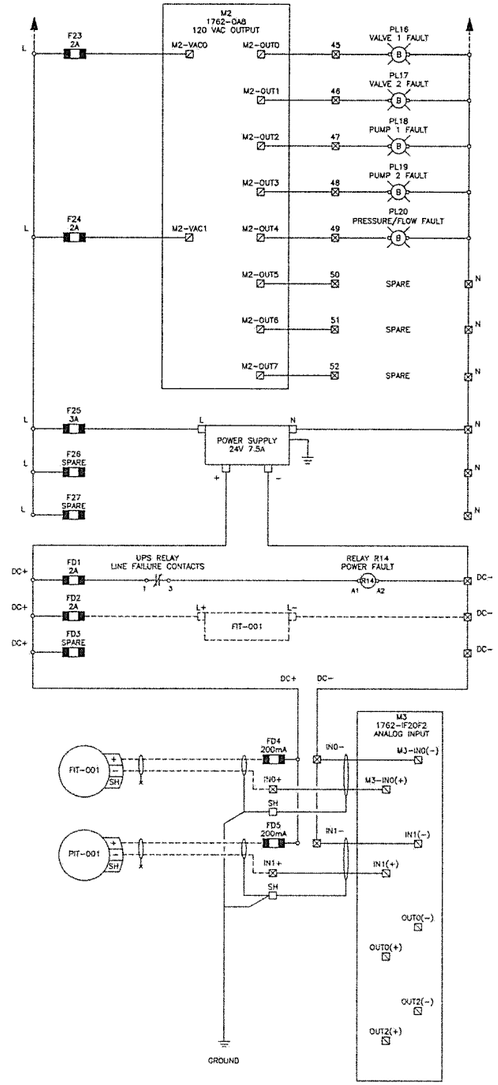
FROM J2775-PD-1-2
COLUMN 2



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0	18	11	15	ISSUED FOR REVIEW	DI	GK			

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Design & Manufacture of Electrical and Process Control Systems

DRAWING TITLE:

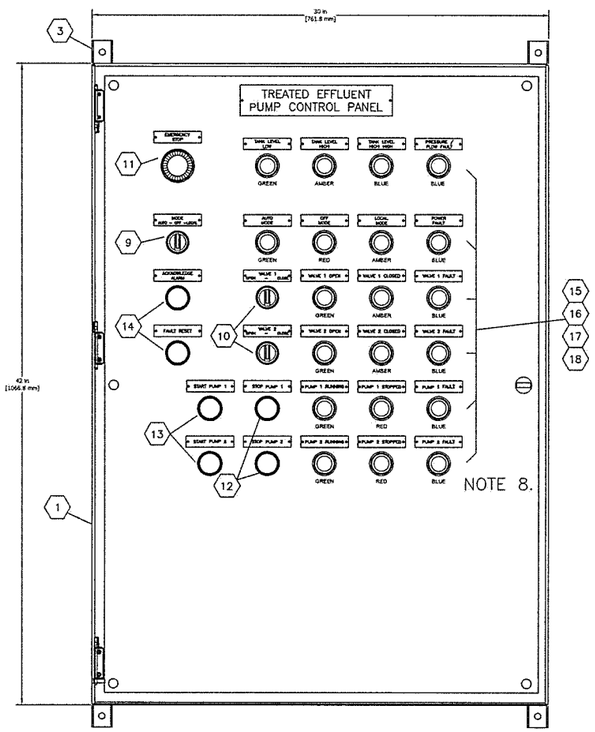
PUMP CONTROL/POWER PANEL WIRING DIAGRAM (PAGE 2 OF 2)

DRAWING NO.	SHT. No.	REV
J2775-PD-1	2	4

PLOT SCALE: X

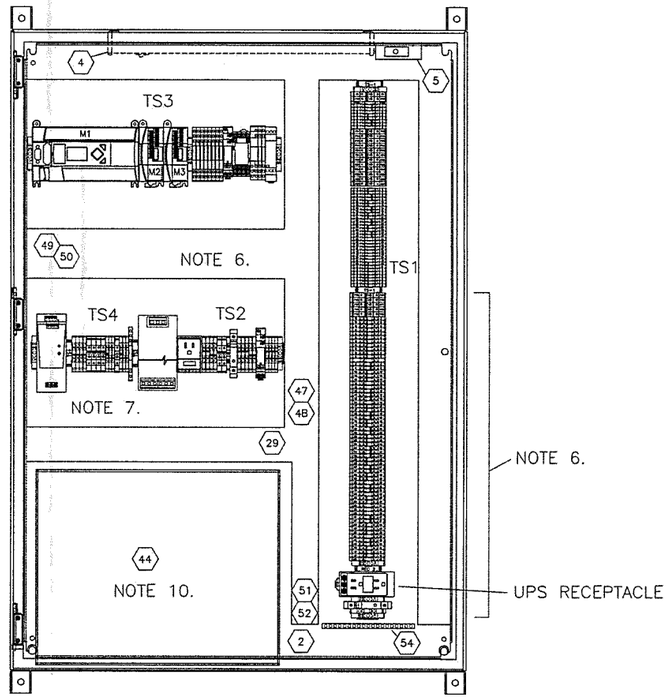
DRAWING NO. J2775-PD-1-3 REV. 2

FRONT VIEW



FRONT VIEW

(SHOWN WITH EXTERIOR DOOR REMOVED)



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   - 5.8. GROUND – GREEN
6. ALL 120 VAC FIELD WIRING CONNECTS TO BOTTOM RIGHT SIDE OF TERMINALS ON TERMINAL STRIP TS1, CABLES TO BE RUN IN RIGHT MOST WIREWAY (BOTTOM ENTRY FOR EASIEST ACCESS).
7. FLOW METER AND PRESSURE SENSOR ANALOG SIGNAL CABLES TO BE CONNECTED TO TERMINALS ON TS-4. GROUNDED AT PANEL NOT AT INSTRUMENTS.
8. ALL PILOT LIGHTS FOR FAULTS ARE BLUE, FAULT STROBES ARE ALSO BLUE.
9. ITEMS 62 TO 65, (BLUE BEACONS AND SIREN) SHIPPED LOOSE AND TO BE INSTALLED AND WIRED SITE IN APPROPRIATE LOCATIONS.
10. UPS SHIPPED LOOSE AND TO BE INSTALLED AND WIRED TO CONTROL PANEL ON SITE. INSTALLATION STEPS:
    - 10.1. PRE CONNECT WIRES TO UPS SINCE AFTER INSTALLATION THERE WILL BE LIMITED ACCESS TO BACK OF UPS.
      - 10.5.1. CONNECT UPSR-1 AND UPSR-3 (LABELED BLUE WIRES) TO APPROPRIATE SCREW TERMINALS ON BACK OF UPS.
      - 10.9.2. PLUG PANELS INPUT POWER CORD (YELLOW SHRINK) TO RECEPTACLE ON THE UPS. THIS CORD HAS A 90 DEGREE PLUG.
    - 10.10. PLACE UPS IN THE CONTROL PANEL, UPS DISPLAY SHOULD BE FACING AWAY FROM LEFT ENCLOSURE WALL.
    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE-2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

BILL OF MATERIAL

ITEM	QTY.	DESCRIPTION
1	1	HOFFMAN, ENCLOSURE, STAINLESS STEEL, 304, 3PT LATCH , 42 X 30 X 10 , #CSD423010SS
2	1	HOFFMAN, BACK PLATE, FITS 42 X 30, STEEL, WHITE, #CP4230
3	1	HOFFMAN, MOUNTING FEET, STAINLESS STEEL, #CMFKSS
4	1	HAMMOND, 17.5 IN LED LIGHT KIT , #FLK7LED
5	1	HAMMOND, REMOTE DOOR SWITCH , #FLKDS
6	1	A8, CONTROLLER, 20 DI, 12 RELAY OUTPUTS, 120/240 VAC POWER INPUT, #1766-L32AWA
7	1	A8, IO MODILE, 8 POINT, 120 VAC OUTPUT, #1762-OA8
8	1	A8, IO MODULE, 4 CHANNEL ANALOG COMBO , #1762-IF20F2
9	1	A8, SELECTOR SWITCH, 3 POSITION, M-M-M, KC7 CAM, STANDARD KNOB, 1NO – 1NC, #800T-J2KC7B
10	2	A8, SELECTOR SWITCH, 3 POSITION, S-M-S, 1NO-1NC, #800H-JR91A
11	1	A8, PUSH-PULL/TWIST RELEASE, 2 POSITION, JUMBO MUSHROOM HEAD, RED, 1 NC, #800H-FRXJT6D2
12	2	A8, PUSH BUTTON, MOMENTARY CONTACT, FLUSH HEAD, REO, 1NC, #800H-AR6D1
13	2	A8, PUSH BUTTON, MOMENTARY CONTACT, FLUSH HEAD, GREEN, 1NO, #800H-AR1D1
14	2	A8, PUSH BUTTON, MOMENTARY CONTACT, FLUSH HEAD, BLACK, 1NO, #800H-AR2D1
15	6	A8, PILOT LICHT, GREEN, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, #800H-ORH2C
16	4	A8, PILOT LIGHT, AMBER, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, , #800H-ORH2A
17	3	A8, PILOT LIGHT, RED, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, #800H-ORH2R
18	7	A8, PILOT LIGHT, BLUE, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, #800H-ORH28
19	1	SCHNEIGER, TIMER MULTI FUNCTION, 24 TO 240 VAC VOLTAGE RANGE, #RE17LMBM
20	1	FINGER, RELAY SOCKET, 14 POSITION, 4 FORM C, OIN RAIL MOUNTABLE, #94.74
21	1	FINGER, RELAY, 4PDT, 120 VAC COIL, 4 FORM C SOCKETABLE, 7 A 250 VAC RATED, #55.34.8.120.0040
22	2	FINDER, RELAY, SPDT , 120 VAC COIL, 16 A 250 VAC CONTACT, #46.61.8.120.0054
23	2	FINDER, RELAY BASE, SPDT, 5 PIN FOR 46.61 C/W SS MOOULE, #97.01SPA
24	1	WEIDMULLER, RECEPTACLE, DIN RAIL, 15 AMP, #6720005421
25	2	WEIDMULLER, CIRCUIT BREAKER, 15 AMP, SINGLE POLE, #9926251015
26	2	WEIDMULLER, OIN RAIL, TS 35 X 7.5, SLOTTED, STEEL , 2M, #0514500000
27	1	WEIDMULLER, POWER SUPPLY, PRO MAX, 1BOW, 25 VDC, 7.5 A, #1478120000
28	10	WEIDMULLER, RELAY , SPDT, 120 VAC COIL, 6A, 250VAC SWITCHING, #1122B30000
29	5	WEIDMULLER, RELAY , SPDT, 24 VDC COIL, 6A, 250VAC SWITCHING, #1122BB0000
30	50	WEIDMULLER, SCHT5S, CROUP MARKER CARRIER, BEIGE, 44.5 X 9.5 MM, #1631930000
31	47	WEIDMULLER, WDU 2.5, TERMINAL BLOCK, 600V/20A, BEIGE, #1020000000
32	78	WEIDMULLER, WDU 4, TERMINAL BLOCK, BOOV/32A, #1020100000
33	9	WEIOMULLER, WEW 35/2, W-SERIES, END BRACKET, #1061200000

ITEM	QTY.	DESCRIPTION
34	2	WEIOMULLER, WPE 2.5, 26-12 AWC, GROUND TERMINAL , #1010000000
35	LOT	WEIOMULLER, WS 12/5, NEUTRAL,TERMINAL MARKER , #1609B60000
36	LOT	WEIOMULLER, WS 12/6, NEUTRAL, TERMINAL MARKER , #1609900000
37	21	WEIOMULLER, WSI 6/LD, 5X20MM/5X25MM, 120VAC, FUSE TERMINAL, 300V/10A, #1012300001
38	3	WEIDMULLER, WSI 6/LD, 5X20MM/5X25MM, 24VDC, FUSE TERMINAL, 300V/10A, #1011300000
39	2	WEIDMULLER, WTR 2.5 ST8 2.3 , DISCONNECT TERMINAL, 500V/24A, #1B55620000
40	1	WEIDMULLLER, RELAY MOOULE, TRS, DPDT, 120 VAC COIL, 8A, 250 VAC SWITCH, #1123530000
41	5	WEIDMULLER, WOV 4/10, CROSS CONNECTORS, 10 POLE, #1052060000
42	5	WEIDMULLER, WOV 2.5/10, CROSS CONNECTORS, 10 POLE, #1054460000
43	1	SOLA, SURGE PROTECTOR, DIN RAIL, STV 25K SERIES, OUTLET STRIP, 120 VAC , #STV25K-10S
44	1	POWERWARE, 9130 2000VA UPS, #PW9130L2000T-XL
45	1	EATON, UPS OUTPUT RELAY CARD, #101401B
46	1	UPS OUTPUT POWER CABLE, #WIRE-UPS-PC
47	LOT	PANDUIT, DUCT, 2" W X 2 " H, PVC, LIGHT GREY, TYPE F, NARROW SLOT, #F2X2LG6
48	LOT	PANDUIT, COVER, 2" W, PVC, LIGHT GREY, #C2LG6
49	LOT	PANOUIT, DUCT, 3" W X 2 " H, PVC, LIGHT GREY, TYPE F, NARROW SLOT, #F3X2LG6
50	LOT	PANOUIT, COVER, 3" W, PVC, LIGHT GREY, #C3LG6
51	LOT	PANDUIT, DUCT, 1.5" W X 2 " H, PVC, LIGHT CREY, TYPE F, NARROW SLOT, #F1.5X2LG6
52	LOT	PANDUIT, COVER 1.5"W, PVC LIGHT GREY, #C1.5LG6
53	LOT	PANASONIC, ZNR TRANSEIENT SURGE ABSORBER, #ERZ-V05D241
54	1	ILSCO, GROUND BAR, NB020, ALUMINUM, 15 TAPS, 2 MOUNTING HOLES, #4-#14 AWC, #NB020
55	LOT	WIRE, THERMOPLASTIC EOUIPMENT WIRE, #14, #TEW14
56	LOT	WIRE, THERMOPLASTIC EOUIPMENT WRIRE, #16, #TEW16
57	2	WIRE, 1B CAUGE, 2 CONOUCTOR SHIELDED, #WIRE-18-2C-S
58	1	KILLARK, BREATHER ORAIN, STAINLESS STEEL, 1/2" NPT, #OPE3029S3
59	LOT	WIREMARKERS, VARIOUS, #WM
60	1	ENGRAVINGS, LARGE, BLACK ON WHITE, FASTENED, #ENG-L-BW-F
61	30	ENGRAVINGS, SMALL, BLACK ON WHITE, FASTENED, #ENG-S-BW-F
62	2	FEDERAL SIGNAL, STROBE, SINGLE FLASH, 1/2" NPT, SURFACE MOUNT, 120VAC, BLUE, #FB2PST-1208
63	2	FEDERAL SIGNAL, WALL MOUNTING KITS, #LWM82
64	1	FEFERAL SIGNAL, HORN, SURFACE MOUNT, 120 VAC, GRAY, 120 VAC, #350-120-30
65	1	FEOERAL SIGNAL, WEATHERPROOF BOX, GREY, #W8
66		

REV.	Y	M	D	DESCRIPTION	DWN	CHK	ENG	APP	APP
2	19	2	18	AS BUILT	DI	GK			
1	19	1	28	ISSUED FOR REVIEW	DI	GK			
0	18	11	15	ISSUED FOR REVIEW	DI	GK			

REFERENCE DRAWINGS:

G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

DRAWING TITLE:

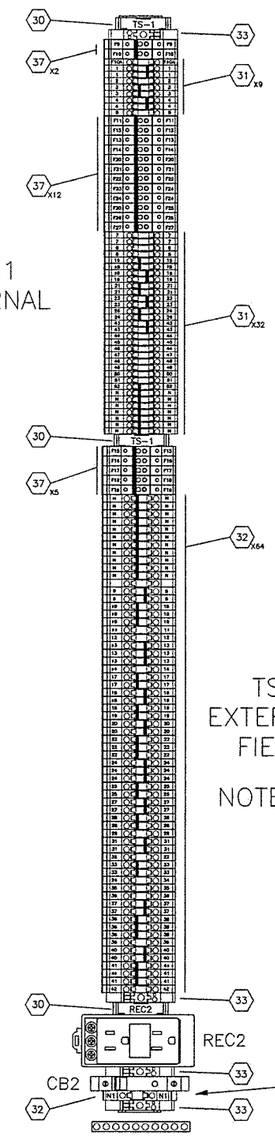
PUMP CONTROL PANEL LAYOUT

DRAWING NO.	SHT. No.	REV
J2775-PD-1	3	2

PLOT SCALE: X

DRAWING NO. J2775-PD-1-4 REV. 2

TERMINAL STRIP ARRANGEMENT TS1



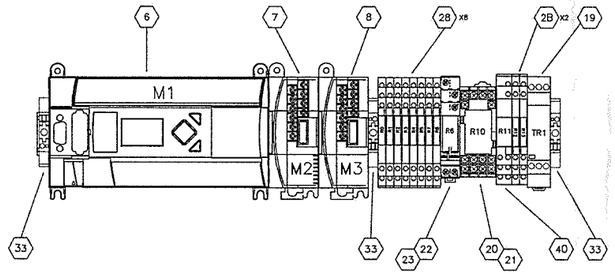
TS1 INTERNAL

TS1 EXTERNAL FIELD

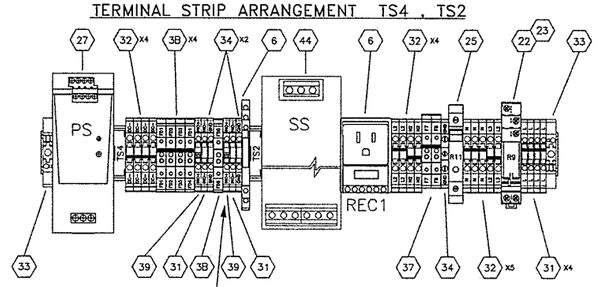
NOTE 6.

INCOMING 120 VAC POWER CONNECTION LOCATION

TERMINAL STRIP ARRANGEMENT TS3



TERMINAL STRIP ARRANGEMENT TS4 , TS2



INSTRUMENTATION 4-20 mA CONNECTION POINTS

NOTE 7.

NOTE 11.

BILL OF MATERIAL

ITEM	QTY.	DESCRIPTION
1	1	HOFFMAN, ENCLOSURE, STAINLESS STEEL, 304, 3PT LATCH , 42 X 30 X 10 , #CSD423010SS
2	1	HOFFMAN, BACK PLATE, FITS 42 X 30, STEEL, WHITE, #CP4230
3	1	HOFFMAN, MOUNTING FEET, STAINLESS STEEL, #CMFKSS
4	1	HAMMOND, 17.5 IN LED LIGHT KIT , #FLK7LED
5	1	HAMMOND, REMOTE DOOR SWITCH , #FLKDS
6	1	AB, CONTROLLER, 20 DI, 12 RELAY OUTPUTS, 120/240 VAC POWER INPUT, #1766-L32AWA
7	1	AB, IO MODILE, 8 POINT, 120 VAC OUTPUT, #1762-OA8
8	1	AB, IO MODULE, 4 CHANNEL ANALOG COMBO , #1762-IF2OF2
9	1	AB, SELECTOR SWITCH, 3 POSITION, M-M-M, KC7 CAM, STANDARD KNOB, 1NO - 1NC, #800T-J2KC78
10	2	AB, SELECTOR SWITCH, 3 POSITION, S-M-S, 1NO-1NC, #800H-JR91A
11	1	AB, PUSH-PULL/TWIST RELEASE, 2 POSITION, JUMBO MUSHROOM HEAD, RED, 1 NC, #800H-FRXJT6D2
12	2	AB, PUSH BUTTON, MOMENTARY CONTACT, FLUSH HEAD, RED, 1NC, #800H-AR6D1
13	2	AB, PUSH BUTTON, MOMENTARY CONTACT, FLUSH HEAD, GREEN, 1NO, #800H-AR1D1
14	2	AB, PUSH BUTTON, MOMENTARY CONTACT, FLUSH HEAD, BLACK, 1NO, #800H-AR2D1
15	6	AB, PILOT LIGHT, GREEN, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, #800H-ORH2G
16	4	AB, PILOT LIGHT, AMBER, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, , #800H-ORH2A
17	3	AB, PILOT LIGHT, RED, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, #800H-QRH2R
18	7	AB, PILOT LIGHT, BLUE, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, #800H-QRH28
19	1	SCHNEIDER, TIMER MULTI FUNCTION, 24 TO 240 VAC VOLTAGE RANGE, #RE17LMBM
20	1	FINDER, RELAY SOCKET, 14 POSITION, 4 FORM C, DIN RAIL MOUNTABLE, #94.74
21	1	FINDER, RELAY, 4PDT, 120 VAC COIL, 4 FORM C SOCKETABLE, 7 A 250 VAC RATED, #55.34.8.120.0040
22	2	FINDER, RELAY, SPDT , 120 VAC COIL, 16 A 250 VAC CONTACT, #46.61.8.120.0054
23	2	FINDER, RELAY BASE, SPDT, 5 PIN FOR 46.61 C/W SS MODULE, #97.01SPA
24	1	WEIDMULLER, RECEPTACLE, DIN RAIL, 15 AMP, #6720005421
25	2	WEIDMULLER, CIRCUIT BREAKER, 15 AMP, SINGLE POLE, #9926251015
26	2	WEIDMULLER, DIN RAIL, TS 35 X 7.5, SLOTTED, STEEL , 2M, #0514500000
27	1	WEIDMULLER, POWER SUPPLY, PRO MAX, 1BOW, 25 VDC, 7.5 A, #1478120000
28	10	WEIDMULLER, RELAY , SPDT, 120 VAC COIL, 6A, 250VAC SWITCHING, #1122830000
29	5	WEIDMULLER, RELAY , SPDT, 24 VDC COIL, 6A, 250VAC SWITCHING, #1122880000
30	50	WEIDMULLER, SCHT5S, GROUP MARKER CARRIER, BEIGE, 44.5 X 9.5 MM, #1631930000
31	47	WEIDMULLER, WDU 2.5, TERMINAL BLOCK, 600V/20A, BEIGE, #1020000000
32	78	WEIDMULLER, WDU 4, TERMINAL BLOCK, 800V/32A, #1020100000
33	9	WEIDMULLER, WEW 35/2, W-SERIES, END BRACKET, #1061200000
34	2	WEIDMULLER, WPE 2.5, 26-12 AWG, GROUND TERMINAL , #1010000000
35	LOT	WEIDMULLER, WS 12/5, NEUTRAL,TERMINAL MARKER , #1609860000
36	LOT	WEIDMULLER, WS 12/6, NEUTRAL, TERMINAL MARKER , #1609900000
37	21	WEIDMULLER, WSI 6/LD, 5X20MM/5X25MM, 120VAC, FUSE TERMINAL, 300V/10A, #1012300001
38	3	WEIDMULLER, WSI 6/LD, 5X20MM/5X25MM, 24VDC, FUSE TERMINAL, 300V/10A, #1011300000
39	2	WEIDMULLER, WTR 2.5 ST8 2.3 , DISCONNECT TERMINAL, 500V/24A, #1855620000
40	1	WEIDMULLLER, RELAY MODULE, TRS, OPDT, 120 VAC COIL, 8A, 250 VAC SWITCH, #1123530000
41	5	WEIDMULLER, WOV 4/10, CROSS CONNECTORS, 10 POLE, #1052060000
42	5	WEIDMULLER, WOV 2.5/10, CROSS CONNECTORS, 10 POLE, #1054460000
43	1	SOLA, SURGE PROTECTOR, DIN RAIL, STV 25K SERIES, OUTLET STRIP, 120 VAC , #STV25K-10S
44	1	POWERWARE, 9130 2000VA UPS, #PW9130L2000T-XL
45	1	EATON, UPS OUTPUT RELAY CARD, #1014018
46	1	UPS OUTPUT POWER CABLE, #WIRE-UPS-PC
47	LOT	PANDUIT, DUCT, 2" W X 2 " H, PVC, LIGHT GREY, TYPE F, NARROW SLOT, #F2X2LG6
48	LOT	PANDUIT, COVER, 2" W, PVC, LIGHT GREY, #C2LG6
49	LOT	PANDUIT, DUCT, 3" W X 2 " H, PVC, LIGHT GREY, TYPE F, NARROW SLOT, #F3X2LG6
50	LOT	PANDUIT, COVER, 3" W, PVC, LIGHT GREY, #C3LG6
51	LOT	PANDUIT, DUCT, 1.5" W X 2 " H, PVC, LIGHT GREY, TYPE F, NARROW SLOT, #F1.5X2LG6
52	LOT	PANDUIT, COVER 1.5"W, PVC LIGHT GREY, #C1.5LG6
53	LOT	PANASONIC, ZNR TRANSEIENT SURGE ABSORBER, #ERZ-V05D241
54	1	ILSCO, GROUND BAR, NB020, ALUMINUM, 15 TAPS, 2 MOUNTING HOLES, #4-#14 AWG, #N8020
55	LOT	WIRE, THERMOPLASTIC EQUIPMENT WIRE, #14, #TEW14
56	LOT	WIRE, THERMOPLASTIC EQUIPMENT WRIRE, #16, #TEW16
57	2	WIRE, 18 GAUGE, 2 CONDUCTOR SHIELDED, #WIRE-18-2C-S
58	1	KILLARK, BREATHER DRAIN, STAINLESS STEEL, 1/2" NPT, #DPE3029S3
59	LOT	WIREMARKERS, VARIOUS, #WM
60	1	ENGRAVINGS, LARGE, BLACK ON WHITE, FASTENED, #ENG-L-8W-F
61	30	ENGRAVINGS, SMALL, BLACK ON WHITE, FASTENED, #ENG-S-8W-F
62	2	FEDERAL SIGNAL, STR08E, SINGLE FLASH, 1/2" NPT, SURFACE MOUNT, 120VAC, BLUE, #FB2PST-120B
63	2	FEDERAL SIGNAL, WALL MOUNTING KITS, #LWM82
64	1	FEFERAL SIGNAL, HORN, SURFACE MOUNT, 120 VAC, GRAY, 120 VAC, #350-120-30
65	1	FEDERAL SIGNAL, WEATHERPROOF BOX, GREY, #WB
66		

NOTES:

1. THE PANEL SHALL BE CSA APPROVED FOR GENERAL PURPOSE AND BEAR A CSA LABEL. TERMINATION.
2. ALL INTERNAL WIRING MUST BE TERMINATED ON A CSA APPROVED TERMINAL BLOCKS
3. ALL TERMINAL BLOCKS TO BE LABELED, NUMBERED MATCHING WIRING DIAGRAM.
4. ALL WIRE TERMINATION TO HAVE SHRINKABLE WINEMAKERS WITH DESTINATION TERMINATION POINT. (TO LOCATION)
5. WIRES COLOR PER LISTING BELOW:
   - 5.1. 120/600 VAC POWER - BLACK
   - 5.2. 120 VAC NEUTRAL - WHITE
   - 5.3. 120 VAC CONTROL - BLACK
   - 5.4. 24 VDC POSTIVE - BLUE
   - 5.5. 24 VDC NEGATIVE - BROWN
   - 5.6. ANALOG POSITIVE - BLACK
   - 5.7. ANALOG NEGATIVE - WHITE
   - 5.8. GROUND - GREEN
6. ALL 120 VAC FIELD WIRING CONNECTS TO BOTTOM RIGHT SIDE OF TERMINALS ON TERMINAL STRIP TS1. CABLES TO BE RUN IN RIGHT MOST WIREWAY (BOTTOM ENTRY FOR EASIEST ACCESS).
7. FLOW METER AND PRESSURE SENSOR ANALOG SIGNAL CABLES TO BE CONNECTED TO TERMINALS ON TS-4. GROUNDED AT PANEL NOT AT INSTRUMENTS.
8. ALL PILOT LIGHTS FOR FAULTS ARE BLUE, FAULT STROBES ARE ALSO BLUE.
9. ITEMS 62 TO 65, (BLUE BEACONS AND SIREN) SHIPPED LOOSE AND TO BE INSTALLED AND WIRED SITE IN APPROPRIATE LOCATIONS.
10. UPS SHIPPED LOOSE AND TO BE INSTALLED AND WIRED TO CONTROL PANEL ON SITE. INSTALLATION STEPS:
    - 10.1. PRE CONNECT WIRES TO UPS SINCE AFTER INSTALLATION THERE WILL BE LIMITED ACCESS TO BACK OF UPS.
    - 10.5.1. CONNECT UPSR-1 AND UPSR-3 (LABELED BLUE WIRES) TO APPROPRIATE SCREW TERMINALS ON BACK OF UPS.
    - 10.9.2. PLUG PANELS INPUT POWER CORD (YELLOW SHRINK) TO RECEPTACLE ON THE UPS. THIS CORD HAS A 90 DEGREE PLUG.
    - 10.10. PLACE UPS IN THE CONTROL PANEL. UPS DISPLAY SHOULD BE FACING AWAY FROM LEFT ENCLOSURE WALL.
    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE-2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

REV.	ISSUE DATE Y	M	D	DESCRIPTION	DWN	CHK	ENG	APP	APP
2	19	2	18	AS BUILT	DI	CK			
1	19	1	28	ISSUED FOR REVIEW	DI	CK			
0	18	11	15	ISSUED FOR REVIEW	DI	CK			

REFERENCE DRAWINGS:

G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

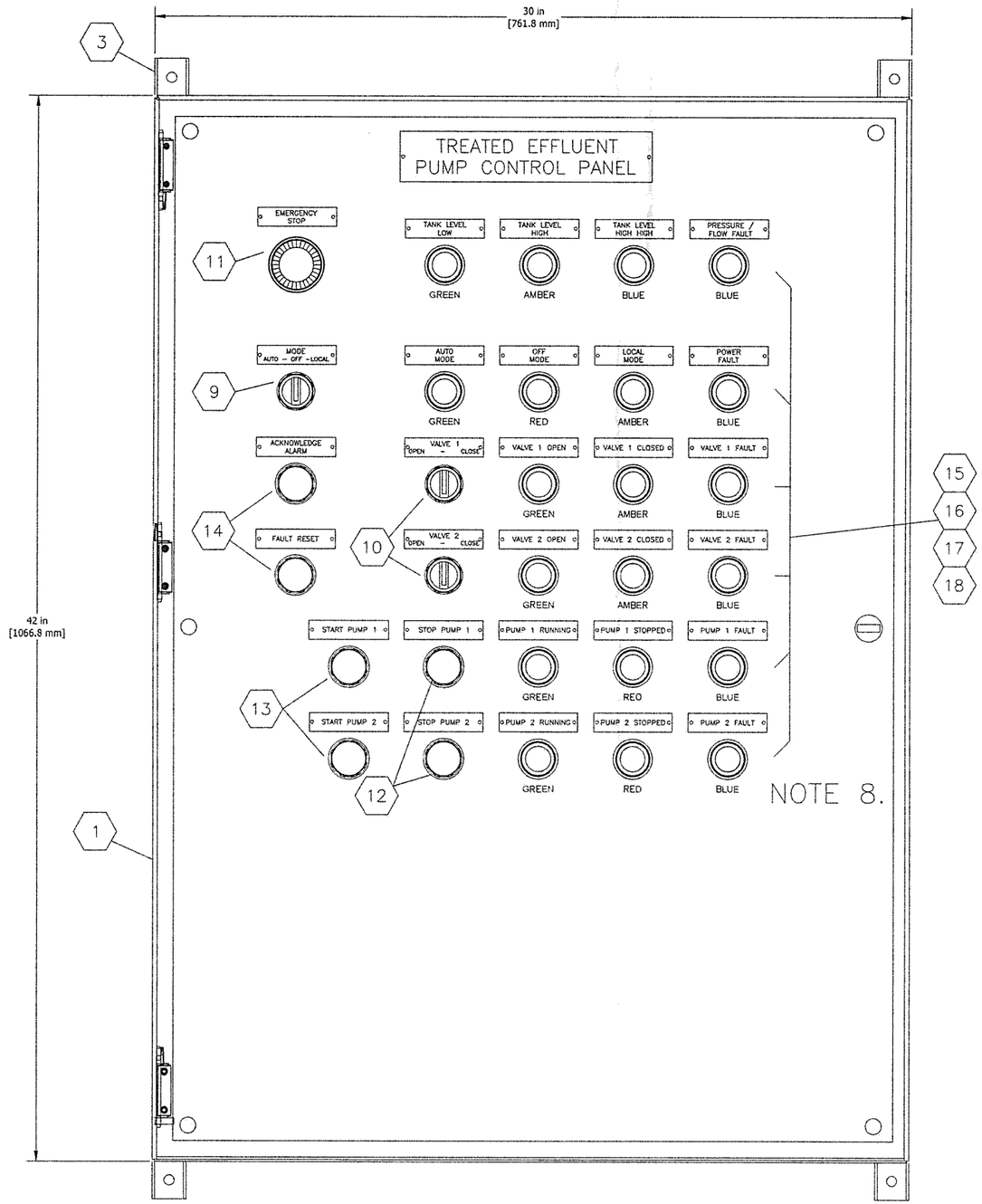
DRAWING TITLE:

PUMP CONTROL PANEL TERMINAL STRIP DETAILS

DRAWING NO.	SHT. No.	REV
J2775-PD-1	4	2

PLOT SCALE: X

FRONT VIEW



NOTES:

1. THE PANEL SHALL BE CSA APPROVED FOR GENERAL PURPOSE AND BEAR A CSA LABEL. TERMINATION.
2. ALL INTERNAL WIRING MUST BE TERMINATED ON A CSA APPROVED TERMINAL BLOCKS
3. ALL TERMINAL BLOCKS TO BE LABELED, NUMBERED MATCHING WIRING DIAGRAM.
4. ALL WIRE TERMINATION TO HAVE SHRINKABLE WINEMAKERS WITH DESTINATION TERMINATION POINT. (TO LOCATION)
5. WIRES COLOR PER LISTING BELOW:
   - 5.1. 120/600 VAC POWER – BLACK
   - 5.2. 120 VAC NEUTRAL – WHITE
   - 5.3. 120 VAC CONTROL – BLACK
   - 5.4. 24 VDC POSTIVE – BLUE
   - 5.5. 24 VDC NEGATIVE – BROWN
   - 5.6. ANALOG POSITIVE – BLACK
   - 5.7. ANALOG NEGATIVE – WHITE
   - 5.8. GROUND – GREEN
6. ALL 120 VAC FIELD WIRING CONNECTS TO BOTTOM RIGHT SIDE OF TERMINALS ON TERMINAL STRIP TS1, CABLES TO BE RUN IN RIGHT MOST WIREWAY (BOTTOM ENTRY FOR EASIEST ACCESS).
7. FLOW METER AND PRESSURE SENSOR ANALOG SIGNAL CABLES TO BE CONNECTED TO TERMINALS ON TS–4. GROUNDED AT PANEL NOT AT INSTRUMENTS.
8. ALL PILOT LIGHTS FOR FAULTS ARE BLUE, FAULT STROBES ARE ALSO BLUE.
9. ITEMS 62 TO 65, (BLUE BEACONS AND SIREN) SHIPPED LOOSE AND TO BE INSTALLED AND WIRED SITE IN APPROPRIATE LOCATIONS.
10. UPS SHIPPED LOOSE AND TO BE INSTALLED AND WIRED TO CONTROL PANEL ON SITE. INSTALLATION STEPS:
    - 10.1. PRE CONNECT WIRES TO UPS SINCE AFTER INSTALLATION THERE WILL BE LIMITED ACCESS TO BACK OF UPS.
      - 10.5.1. CONNECT UPSR–1 AND UPSR–3 (LABELED BLUE WIRES) TO APPROPRIATE SCREW TERMINALS ON BACK OF UPS.
      - 10.9.2. PLUG PANELS INPUT POWER CORD (YELLOW SHRINK) TO RECEPTACLE ON THE UPS. THIS CORD HAS A 90 DEGREE PLUG.
    - 10.10. PLACE UPS IN THE CONTROL PANEL, UPS DISPLAY SHOULD BE FACING AWAY FROM LEFT ENCLOSURE WALL.
    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE–2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

REV.	ISSUE Y	ISSUE M	ISSUE D	DESCRIPTION	DWN	CHK	ENG	APP	APP
2	19	2	18	AS BUILT	DI	GK			
1	19	1	28	ISSUED FOR REVIEW	DI	GK			
0	18	11	15	ISSUED FOR REVIEW	DI	GK			

REFERENCE ORAWINGS:

G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

DRAWING TITLE:

PUMP CONTROL PANEL
DOOR LAYOUT DETAILS

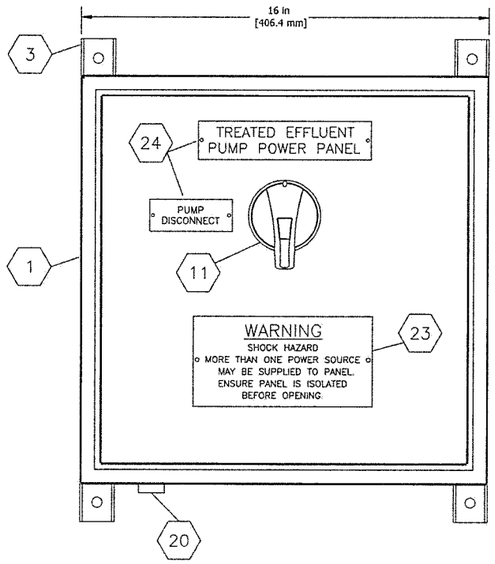
DRAWING NO.	SHT. No.	REV
J2775–PD–1	5	2

ORAWING NO. J2775–PD–1–5 REV. 2

PLOT SCALE: X

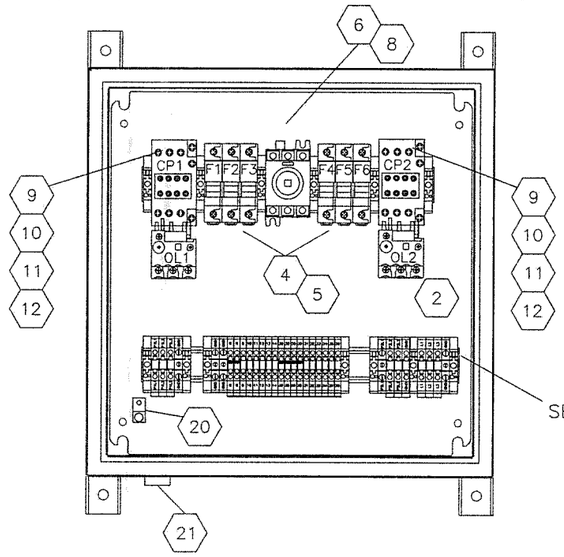
DRAWING NO. J2775-PD-1-6 | REV. 2

FRONT VIEW



FRONT VIEW

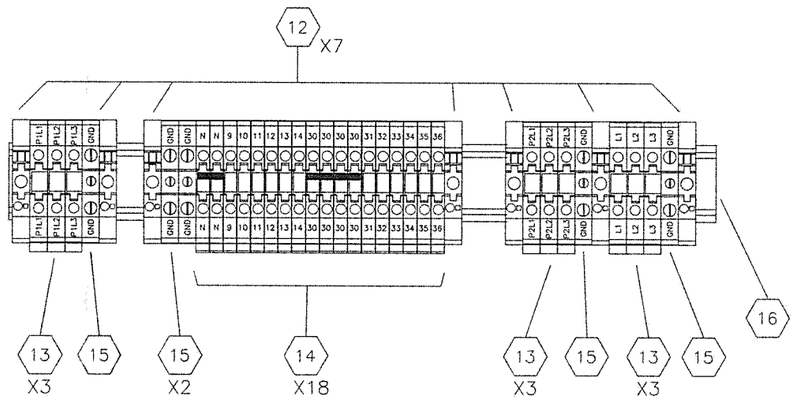
(SHOWN WITH EXTERIOR DOOR REMOVED)



BILL OF MATERIAL

ITEM	QTY.	DESCRIPTION
1	1	HOFFMAN, ENCLOSURE, STAINLESS STEEL, 16" W X 16" H X 8" D, CONCEPT, #CSD16168SS
2	1	HOFFMAN, BACK PANEL, FITS 16" W X 16 "H, 12 GAUGE, #CP1616
3	1	HOFFMAN, MOUNTING FEET, STAINLESS STEEL, #CMFKSS
4	2	MERSEN, FUSE HOLDER, 3 POLE, 30 AMPS, 600V, #USM3I
5	9	FUSE, FAST ACTING, 600VAC/DC, 30A , MIDGET,1-1/2", #ATM30
6	1	EATON, DISCONNECT, NON FUSIBLE, ROTARY DISCONNECT, 3 POLE, 30 AMP, #R5A3030U
7	1	EATON, HANDLE, BLACK, SIZE 0, NEMA 3R, #SHB0N12
8	1	EATON, DISCONNECT SWITCH SHAFT, 12", #SF150SH5X5
9	2	EATON, CONTACTOR, 3 POLE, FVNR, 18A, FRAME C , 1 NO, 120 VAC COIL, #XTCE018C10A
10	2	EATON, OVERLOAD RELAY, FRAMCE C, 10 TO 16 AMP, #XTOB016CC1
11	2	EATON, AUXILIARY CONTACT, XT SERIES, TOP MOUNT, 2 NO - 2 NC, #XTCEXFAC22
12	2	EATON, SUPPRESSOR, RC, 110 - 130 VAC, FOR CONTACT XTCE018C, #XTCEXRSCA
13	13	WEIDMULLER, WEW 35/2, W-SERIES, END BRACKET, #1061200000
14	9	WEIDMULLER, WDU 6 WEMID, TERMINAL BLOCK, 600V/45A, #1020200000
15	18	WEIDMULLER, WDU 4, TERMINAL BLOCK, 800V/32A, #1020100000
16	5	WEIDMULLER, WPE 6/35, GROUND TERMINAL , #1010200000
17	1	WEIDMULLER, DIN RAIL, TS 35 X 7.5, SLOTTED, STEEL , 2M, #0514500000
18	36	WEIDMULLER, WS 12/6, NEUTRAL, TERMINAL MARKER , #1609900000
19	28	WEIDMULLER, WS 12/6.5 NEUTRAL, TERMINAL MARKER, #1609920000
20	1	BLACKBURN, TERMINAL LUG, 1 CONDUCTOR, 14 TO 1/0 AWG, #ADR11
21	1	KILLARK, BREATHER DRAIN, STAINLESS STEEL, 1/2" NPT, #DPE3029S3
22	LOT	WIRE, THERMOPLASTIC EQUIPMENT WIRE, #14, #TEW14
23	LOT	WIRE, THERMOPLASTIC EQUIPMENT WRIRE, #10, #TEW10
24	1	ENGRAVINGS, LARGE, WHITE ON RED, FASTENED, #ENG-L-WR-F
25	2	ENGRAVINGS, LARGE, BLACK ON WHITE, FASTENED, #ENG-L-BW-F

TERMINAL STRIP ARRANGEMENT



NOTES:

1. THE PANEL SHALL BE CSA APPROVED FOR GENERAL PURPOSE AND BEAR A CSA LABEL. TERMINATION.
2. ALL INTERNAL WIRING MUST BE TERMINATED ON A CSA APPROVED TERMINAL BLOCKS
3. ALL TERMINAL BLOCKS TO BE LABELED, NUMBERED MATCHING WIRING DIAGRAM.
4. ALL WIRE TERMINATION TO HAVE SHRINKABLE WINEMAKERS WITH DESTINATION TERMINATION POINT. (TO LOCATION)
5. WIRES COLOR PER LISTING BELOW:
   - 5.1. 120/600 VAC POWER - BLACK
   - 5.2. 120 VAC NEUTRAL - WHITE
   - 5.3. 120 VAC CONTROL - BLACK
   - 5.4. 24 VDC POSTIVE - BLUE
   - 5.5. 24 VDC NEGATIVE - BROWN
   - 5.6. ANALOG POSITIVE - BLACK
   - 5.7. ANALOG NEGATIVE - WHITE
   - 5.8. GROUND - GREEN
6. ALL 120 VAC FIELD WIRING CONNECTS TO BOTTOM RIGHT SIDE OF TERMINALS ON TERMINAL STRIP TS1, CABLES TO BE RUN IN RIGHT MOST WIREWAY (BOTTOM ENTRY FOR EASIEST ACCESS).
7. FLOW METER AND PRESSURE SENSOR ANALOG SIGNAL CABLES TO BE CONNECTED TO TERMINALS ON TS-4. GROUNDED AT PANEL NOT AT INSTRUMENTS.
8. ALL PILOT LIGHTS FOR FAULTS ARE BLUE, FAULT STROBES ARE ALSO BLUE.
9. ITEMS 62 TO 65, (BLUE BEACONS AND SIREN) SHIPPED LOOSE AND TO BE INSTALLED AND WIRED SITE IN APPROPRIATE LOCATIONS.
10. UPS SHIPPED LOOSE AND TO BE INSTALLED AND WIRED TO CONTROL PANEL ON SITE. INSTALLATION STEPS:
    - 10.1. PRE CONNECT WIRES TO UPS SINCE AFTER INSTALLATION THERE WILL BE LIMITED ACCESS TO BACK OF UPS.
    - 10.5.1. CONNECT UPSR-1 AND UPSR-3 (LABELED BLUE WIRES) TO APPROPRIATE SCREW TERMINALS ON BACK OF UPS.
    - 10.9.2. PLUG PANELS INPUT POWER CORD (YELLOW SHRINK) TO RECEPTACLE ON THE UPS. THIS CORD HAS A 9D DEGREE PLUG.
    - 10.10. PLACE UPS IN THE CONTROL PANEL, UPS DISPLAY SHOULD BE FACING AWAY FROM LEFT ENCLOSURE WALL.
    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE-2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

REV.	ISSUE DATE Y	M	D	DESCRIPTION	DWN	CHK	ENG	APP	APP
2	19	2	18	AS BUILT	DI	GK			
1	19	1	28	ISSUED FOR REVIEW	DI	GK			
0	18	11	15	ISSUED FOR REVIEW	DI	GK			

REFERENCE DRAWINGS:

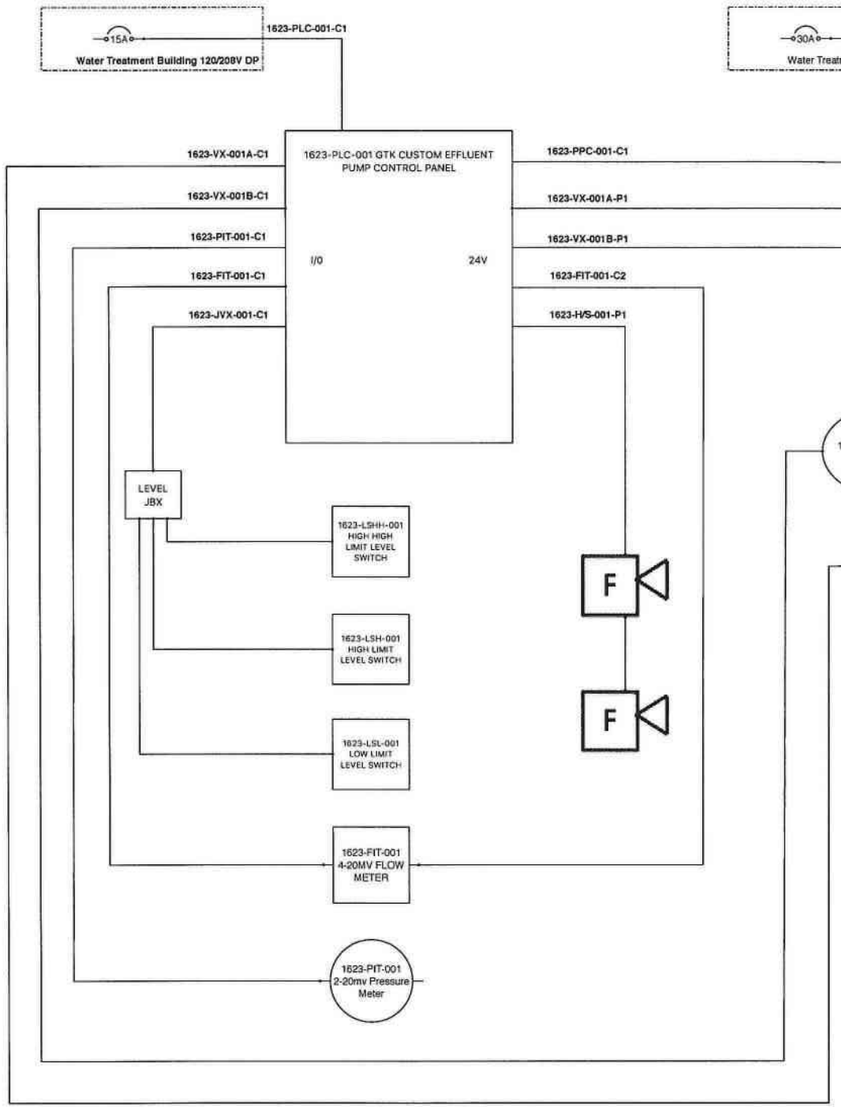
G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

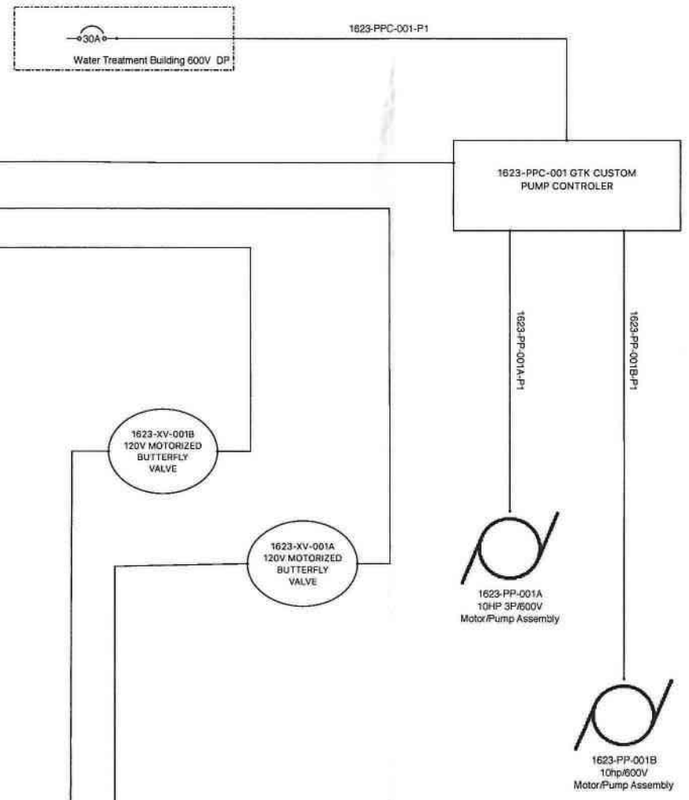
DRAWING TITLE:

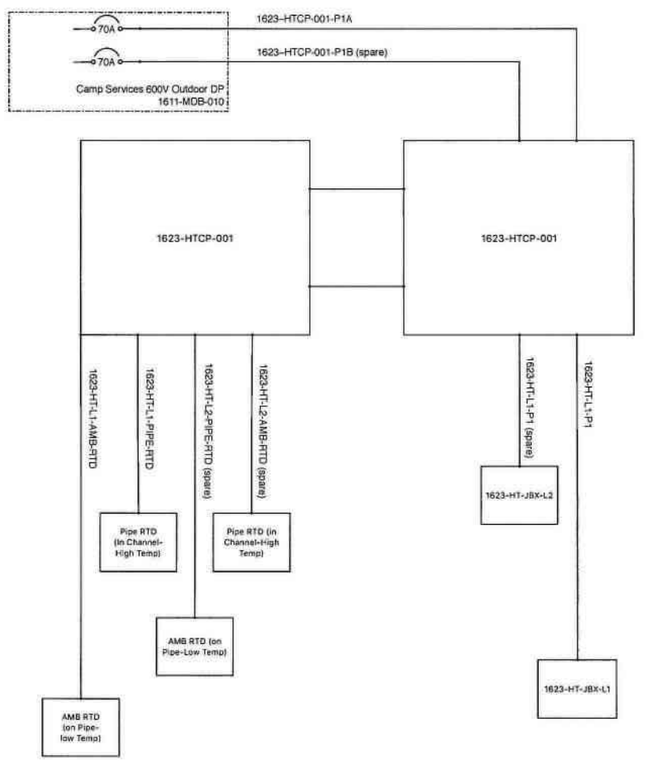
PUMP POWER PANEL LAYOUT DRAWING

DRAWING NO.	SHT. No.	REV
J2775-PD-1	6	2

PLOT SCALE: X







AS BUILT

NAME: A. Hamner

DATE: Oct 16, 2019

SIGNATURE:

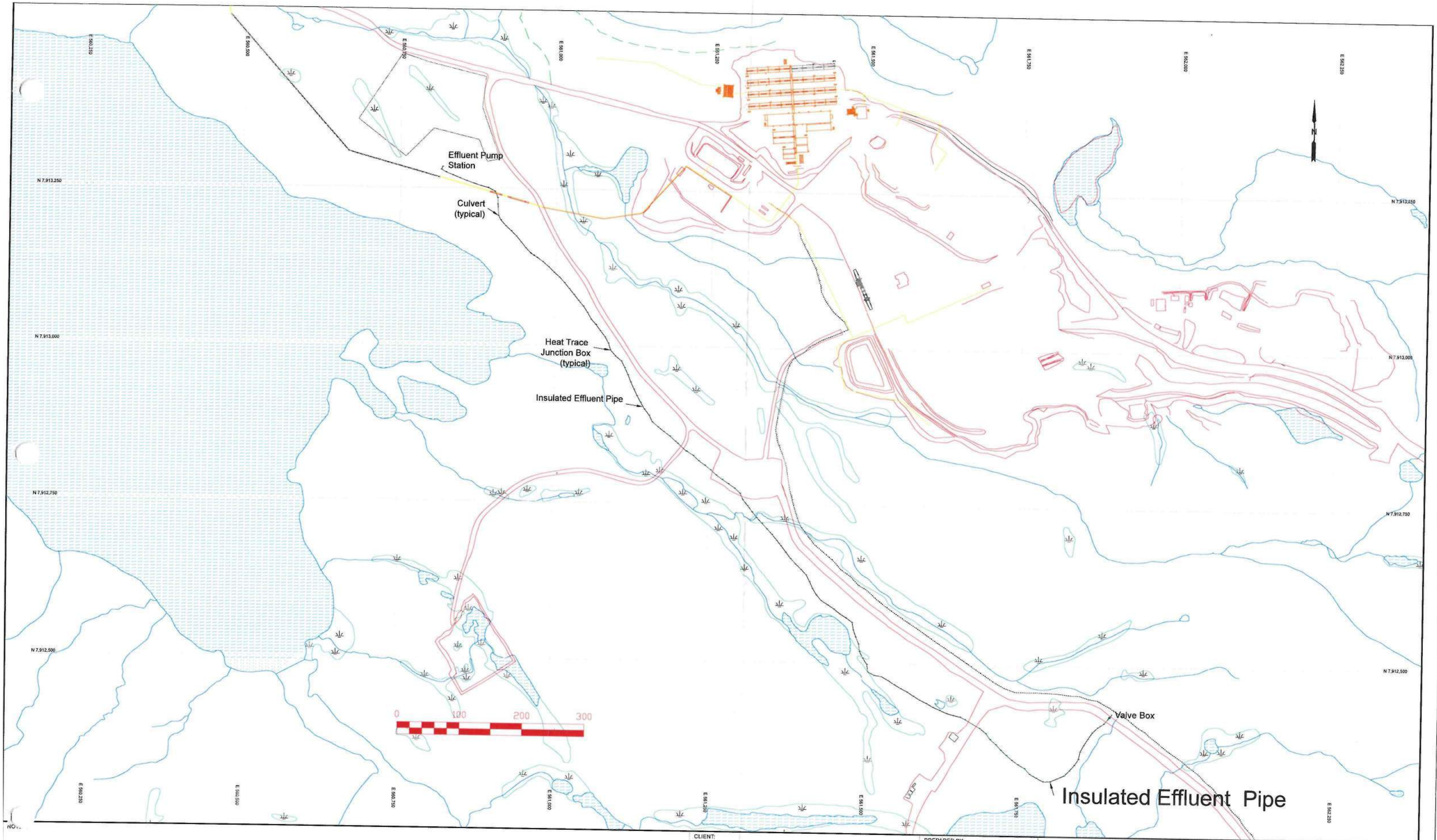
REV:	DESCRIPTION:	BY:	DATE:
C			
B			
A			

AMENDMENTS:

SITE: Baffinland-Mary River Mine Site	DRAWING NO.		PROJECT NO.	09/03/19 DATE.
TITLE: 1623-Effluent Pump Station Single Line	SCALE AT A4.	AHM DRAWN.	CHECKED.	REVISION.

ADCO Power
8750 58 Ave NW
Edmonton, AB
T6E 6G6

Baffinland



CLIENT: Baffinland Iron Mines Corporation	PREPARED BY: Nuna East Ltd. 9839 - 31 Avenue Edmonton, AB T6N 1C5	NUNA	DRAWING TITLE: **Mine Site Insulated Heat Traced Effluent Pipe Asbuilt Sept 12, 2019**
PROJECT: Mary River Expansion Project, Baffin Island, Nunavut	DRAWN BY: mc	SCALE: barscale	DATE: Sept 12, 2019
			DRAWING NAME (YYMMDD): AB 190912 MS Effluent Pipe.dwg

EXISTING RAW WATER PIPELINE

PLANT NORTH

RAW WATER PIPE
CUT EXISTING PIPE AND HEAT TRACE CABLES AT EXISTING PIPE JOINT. LOCATION TO BE DETERMINED ON SITE. FUSE NEW PIPELINE TO EXISTING AND CONNECT HEAT TRACE CABLES IN NEW JUNCTION BOX TYPICAL 2 LOCATIONS

NEW 3" TREATED EFFLUENT PIPELINE TO BE CONNECTED TO DISCHARGE OF STP DISCHARGE PUMP

INSTALL NEW HEAT TRACING CONTROLLER IN PUMP STATION

LOCATION OF 800 MAN CAMP TREATED EFFLUENT TANK

RAW WATER PIPE
INSTALL NEW 4" INSULATED AND HEAT TRACED HDPE LINE APPROX. 476m TOTAL LENGTH

ABANDON EXISTING RAW WATER PIPELINE AFTER INSTALLATION OF NEW PIPELINE

RAW WATER
VALVE BOX POSITION FOR WATER FEED TO 800 MAN CAMP W.T.P.

EXISTING RAW WATER PIPELINE

1. FOR HDPE PIPING DETAILS, REFER TO SPECIFICATIONS:
(HEAT TRACING) H353004-00000-260-078-0001
(PIPING) H353004-CX001-200-242-0001

2. WORK POINTS ARE NOMINAL. CONTRACTOR MAY ADJUST +- 2.0m TO SUIT THEIR DESIGN

KEY	
	NEW RAW WATER PIPELINE
	EXISTING RAW WATER PIPELINE
	NEW TREATED EFFLUENT
	EXISTING TREATED EFFLUENT

TREATED EFFLUENT PIPE
INSTALL NEW 3" INSULATED AND HEAT TRACED HDPE PIPELINE APPROX. 1660m LENGTH

S.O.P. 4

EXISTING PIPELINE APPROX. 380m LENGTH FROM S.O.P. 4 TO S.O.P. 5

S.O.P. 1

INSTALL TEE HERE WITH BLANK FLANGE FOR FUTURE TIE-IN FROM NORTH EAST

CULVERT REQUIRED AT THESE POINTS

CS-1623-001

S.O.P. 5

EXISTING PIPELINE APPROX. 600m LENGTH FROM S.O.P. 5 TO S.O.P. 3

NEW TREATED EFFLUENT PIPELINE

NEW PIPELINE TO BE LAID ON TUNDRA

CONNECTION POINT FOR DIVERTED TREATED EFFLUENT PIPE. FUSE NEW PIPELINE TO EXISTING AND CONNECT HEAT TRACE CABLES IN NEW JUNCTION BOX

S.O.P. 3

CULVERT REQUIRED AT THESE POINTS

S.O.P. 2

EXISTING 3" TREATED EFFLUENT PIPELINE APPROX. 670m LENGTH

SETTING OUT POINTS
TREATED EFFLUENT PIPELINE

S.O.P. 1 = N 7 912 961; E 561 127
S.O.P. 2 = N 7 912 321; E 561 817
S.O.P. 3 = N 7 912 430; E 561 906
S.O.P. 4 = N 7 913 032; E 561 470
S.O.P. 5 = N 7 912 715; E 561 399

CS-1623-001:Treated Effluent Piping Change and associated heat trace from 800 man camp to tie in existing 3 line

PLAN VIEW
SCALE 1:2000

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date 16 AUG 2018
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

REGISTERED PROFESSIONAL ENGINEER
M. J. BUYKX
LICENSEE
NT/NU

FOR CONSTRUCTION

No.	DESCRIPTION	BY	CHK'D	DATE
2	APPROVED FOR CONSTRUCTION	R.M.	R.G.	15-08-2018
1	PIPELINE CHANGED TO 3" FROM 800 MAN CAMP	R.M.	R.G.	
0	APPROVED FOR CONSTRUCTION	R.M.	R.G.	01-02-2018

REVISIONS

ROLE	NAME	SIGNATURE	DATE
DRAFT'S/PERSON	R MHLANGA	MR	20-06-2017
DESIGNER	R MHLANGA	MR	
CHECKER	R GOOSEN		2018-08-16
DESIGN COORD.	R GOOSEN		2018-08-16
RESP. ENG.	M BUYKX		2018-08-16
LEAD DISC. ENG.	R GOOSEN		2018-08-16
AREA LEAD	T ATIBA		
ENG. MANAGER	D STANGER		
AREA MANAGER	T ATIBA		

DRAWING APPROVAL STATUS: Approved for Construction

HATCH

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

MINE SITE
MINE EFFLUENT AND RAW WATER PIPELINE
OVERALL LAYOUT

SCALE	DWG. No.	REV
1:2,000 UNLESS NOTED	H353004-10000-240-272-0001-0001	2

DRAWING No. | DRAWING TITLE
REFERENCE DRAWINGS

REG. PROFESSIONAL

Appendix B

Effluent Pumping Station and Effluent Line
E353004-CX001-130-124-0009
Nuna Job File 3804-023 CVR-041
Mine Site Treated Effluent Pumping Station Turn Over

HATCH **Vendor/Contractor Document Review**

Doc Number	E353004-CX001-130-124-0009	**SUB**	01
Date Received			

Review Grade	**Next Submittal Status**
☐ **C1** - Proceed to next submission & status ☐ **C2** - Proceed with exceptions as noted to next submission & status	☐ Certified ☐ As-Built
☐ **C3** - Do not proceed. Revise as noted & resubmit	☐ Internal Review
Next Submittal Date:	☐ Certified/☐ As-Built

☒ **C4** - No further submission required - Complete (select status below)

☐ Certified Final ☒ Final ☐ Cancelled ☐ Superseded

Package Engineer: Name, signature and date

Franken, Ronny

Digitally signed by Franken, Ronny
DN: cn=Franken, Ronny, email=ronny.franken@hatch.com
Date: 2019.12.17 08:30:18 05'00'

Reviewed only for general conformity with the Specifications. Acceptance by the engineer does not warrant or represent that the information contained in this document is either accurate or complete. The sole responsibility for correct design, details & dimensions shall remain with the party submitting the drawing/document.

ADCO

MEIP- 3804-23

CVR-041

Mine Site Treated Effluent Pumping Station

ADCO CWP QAQC TURNOVER PACKAGE
TABLE OF CONTENTS

Tag No:		Project No:	3804 MEIP
(Sub)System:	1623- Effluent Pump Station	Area:	Milne Port Site
Description:		Drawing:	H353004-40000-260-284-0001-0001r0
CWP:	CVR-041	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

ADCO CWP QAQC TURNOVER PACKAGE
TABLE OF CONTENTS

Tag No:		Project No:	3804 MEIP
(Sub)System:	1623- Effluent Pump Station	Area:	Milne Port Site
Description:		Drawing:	H353004-40000-260-284-0001-0001r0
CWP:	CVR-041	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

#	SECTION
4	ITP Closeout
	PIS-70-999 Construction Work Package Punch List
	Final Walkdown Punch List
	PIS-10-001 As Builts
	Certificate of Construction Completion
	Care and Custody Certificate
	Declaration of Completion
	Turnover Package Review of Completion

SECTION 1: GENERAL

- Scope
- ITP
- IFC Drawings
- Signature Log
- Quality Surveillance Report
- Corrective Action Report
- Written Inspection Request
- RFI Registry

SECTION 1: GENERAL

Scope

Treated Effluent Pump Station Scope of Work

800-Person Camp

				2018-08-17		for
2018-08-16	0	Approved for Use	P. Cherry	R. Goosen	P. Jim	T Atiba
Date	Rev.	Status	Prepared By	Checked By	Approved By	Approved By
			HATCH			Client

Table of Contents

List of Tables

List of Appendices

1. Introduction

Baffinland Iron Mines (BIM), the Owner, has initiated the expansion of the Mary River project, which consists of an iron ore mine and associated infrastructure located in Baffin Island, Nunavut.

This equipment specification provides the requirements for all labour, materials and services for the design, fabrication, testing, preparation for and site installation and commissioning of a new pump station. The pipeline to convey treated effluent from the 800-person camp Sewage Treatment Plant (STP) to the licenced discharge point is part of an existing CX001 work package.

2. Scope of Work

The Contractor shall provide an appropriate system, based on all information contained herein, including: new, complete, fully operational equipment, with all necessary auxiliary equipment and accessories, except where excluded from scope of work.

All exceptions to this specification shall be clearly informed in the proposal, to characterize an alternative supply. Nevertheless, compliance to specification does not exempt the Contractor from their responsibilities of furnishing reliable and safe equipment.

2.1 Equipment List

The following equipment are the major components of the pump station. Minor components are not listed; however, these shall be in the Bidder's scope to provide a complete package.

Table 2-1: 800-Man Camp Major Equipment List

Equipment Title	Quantity	Equipment Tag No.
Discharge pumps	2	1623-PP-001A/B
Pump station instrumentation	complete system	Various
Pump station electrical power supply and MCC panel	complete system	Various

2.2 Drawing Index

The drawings listed in Table 2-2 form the basis of the work to be completed.

Table 2-2: Drawings and Specifications

Document Number	Title
H353004-10000-240-272-0001-0001	Mine Site – Mine effluent and raw water pipeline – Overall layout
H353004-10000-270-276-0003-0002	Sewage Water Treatment P&ID
H353004-00000-260-210-0002	Electrical Design Criteria
H353004-00000-200-078-0017	Basic Electrical Requirements
H353004-00000-271-242-0001	Basic Instrumentation and Control Requirements
H353004-00000-270-242-0001	Site wide – Fibre Optic Network Modifications

2.3 Work Included

The Bidder's scope of work includes, but is not limited to, the detail design, supply, install and commissioning of following components:

- Fully operational pumping system complete with pumps, piping, valves and controls
- New power supply to the heat trace controller in the pump station container and connect the heat trace cables to power supply
- Control panel/MCC to house motor drives as well as feeds to heat trace panel and container small power and lighting
- All required nozzles, manual valves for isolation and draining
- Interconnecting piping and supports
- All Electrical and Instrumentation scope items identified in Section 6.
- One full set of special tools, gaskets and sealants and all nuts and bolts required for field assembly and erection
- Shop assembly, testing, disassembly, match marking for field erection
- Equipment tagging and identification
- Lubrication/protection for equipment before shipment
- Preparation and crating for shipment
- Recommended spare parts
- Drawings and manuals.

2.4 Work Excluded

The Bidder's scope of work specifically excludes the following:

- Supply and installation of the new treated effluent discharge pipeline (this is currently included in a separate CX001 work package)
- Lubricants other than initial fills and what is needed for shop testing and assembly
- Area lighting

- Interface to the Owner's Process Control System
- Site preparation, concrete, foundations, grouting and anchor bolts
- Receiving, unloading and storage of equipment at the plant site.

2.5 Battery Limits

The battery limits for the bidder is the following:

- Outlet nozzle on treated effluent tank behind the 800-person camp STP
- Existing ISO container containing the treated Sewage effluent tank
- Load terminal of breaker in panel 1611-MDB-010.

3. Process Conditions

3.1 Process Description

The permanent facility is to be constructed at the Mary River (Mine Site).

Treated effluent from the 800-man camp is stored in a containerised tank. This effluent needs to be pumped away to the licensed discharge point via 2.4 km pipeline (part of separate CX001 work package).

Two (2) new pumps (1623-PP-001A/B) will be installed in the same container as where the treated effluent tank is situated. The interconnecting pipework will be PVC class 12.

Pipes from pump station to be connected to the new 3" HDPE SDR11 (insulated and heat traced) pipeline that will be installed from the container to the licenced discharge point into the Mary River (by CX001 as part of a separate work package).

High/low level switches will be installed and used to operate the pumps.

3.2 Duty and Operational Requirements

The equipment shall be designed and constructed to operate for 20 hours per day, for 365 days per year without excessive maintenance.

3.3 Material Characteristics

The Supplier shall fabricate the equipment using only new materials of first grade quality, free from defects impairing strength, durability and appearance.

After the Purchase Order is issued, the Supplier shall not substitute materials, without prior written approval from the Owner.

Materials of construction shall be suitable for the specified duty and operating conditions.

4. Design Conditions

4.1 Pump Characteristic

The flow required will be the daily allowance (250m³/day) x 1.5 (safety factor) / 20 (operating hours), resulting in the design flow of 18.75m³/hr.

Refer to Appendix B for the recommended vertical multi stage pumps. The duty points for the pumps can be seen on the pump curve.

5. Performance Requirement

5.1 Guarantees

The supplied equipment shall provide the flow as per Section 4.1.

5.2 Warranty

As per Contract.

5.3 Test Methods and Procedures

All test method details, timing, sampling protocols and procedures and tolerances shall be developed by the Contractor, submitted with the bid quotation and agreed upon with the Owner before issue of a variation order.

6. Control & Instrumentation and Electrical – Detailed Scope of Work

6.1 Overview of the Works

6.1.1 Control and Instrumentation Scope

- Programmable logical controller including programming
- Instruments
- Connection of all instruments
- PLC Panel.

6.1.2 Electrical Scope

- Connection to spare 100A breaker in outdoor panel 1611-MDB-010. This will include the installation of free-issued cable as well as any terminations.
- Motor Control Centre. Note that electronic motor protection relays must be fitted which can be controlled via PLC. See also Section 6.2.9.

- Electrical reticulation to all electrical loads
- Plant power cabling, cable racks and sleeving
- Earthing, Grounding and Bonding protection systems
- The feeds including required supply voltage to building small power and lighting as well as heat trace control panel must be supplied by the Contractor. 600V/3ph will be available from panel 1611-MDB-010
- Testing and certification of the electrical system.

6.2 Control & Instrumentation Requirements

6.2.1 Control System Architecture

6.2.1.1 The proposed system is a standalone PLC located near the Effluent Tank.

6.2.1.2 A SCADA system is not required, neither is an HMI panel.

6.2.1.3 The status of motors, valves and other interface indications and selections shall be implemented using lamps, pushbuttons and selector switches.

6.2.1.4 The MCC panel shall interface to the PLC using wired signals. The contractor may elect to utilise a fieldbus link to interface the MCC and PLC should the contractor utilise a smart electronic overload protection device.

6.2.2 Process Control System

6.2.2.1 The pump station layout is illustrated in P&ID H353004-10000-270-276-0003-0002 - Sewage Water Treatment P&ID (refer to Table 2-2).

6.2.2.2 Control of the pump station shall be implemented in the PLC. The PLC shall monitor all instruments, process the data, and output controls to achieve the efficient and reliable control of the pump station equipment. The PLC shall generate alarms as necessary.

6.2.2.3 Motor Control shall be achieved utilising MCC's either directly hardwired to the PLC, or fitted with intelligent protection relays and circuit breakers linked together on a fieldbus network, which will be linked to the PLC.

6.2.3 Program Logic Controller (PLC)

6.2.3.1 The PLC shall be a stand-alone system.

6.2.3.2 The PLC shall be the Allan Bradley MicroLogix 1100 family of controllers or similar approved.

6.2.3.3 The PLC panel shall be installed inside the Pump Station Container.

6.2.4 *Software Engineering Station*

6.2.4.1 A portable engineering station (laptop) shall allow for configuration and fault-finding of the PLC system for maintenance personnel. It shall host a licensed version of the PLC programming software together with all drivers to do programming when connected to the PLC.

6.2.4.2 The Engineering Station shall be supplied by the client onto which all software shall be loaded by the contractor. Should BIM be unable to supply a laptop for software development, the contractor shall purchase a laptop for this project. The minimum computer specification for the Engineering Laptop shall be as per BIM standards (refer to specification H353004-00000-270-242-0001 Site wide – Fibre Optic Network Modifications). The laptop will be handed over to BIM after completion of the project with all software and programming intact for use by BIM engineering / maintenance.

6.2.5 *Standby Power*

6.2.5.1 A battery charger and battery system will be installed for the PLC system. The battery back-up unit will be placed near the PLC and to it and the MCCs for a minimum of 20 minutes after a power failure. The battery unit will feed the following critical equipment:

6.2.6 *PLC Panel*

6.2.6.1 The contractor shall conform to the Panel and related requirements set out in contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering Requirements.

6.2.6.2 The PLC panel shall be equipped with sufficient I/O to accommodate all instrumentation (including motors and actuators) required for the systems and equipment to be installed. A minimum of 30% spare capacity shall be allowed for in the PLC panel.

6.2.6.3 Panel Electrical Supplies

6.2.6.3.1 Power Supplies

The contractor shall conform to the Power requirements set out in contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering Requirements.

A separate "Power Supply" compartment shall be provided for the housing of all power supply circuitry.

6.2.6.3.2 Signal and Power Supply Standards

Signal and power supply standards for this scope of work are as follows:

Table 6-1: Signal and Power Supply

Equipment	Voltage
Field Electronic Signals	4-20 mA
Back of Panel Electronic Signals	1-5 V
Instrument Power Supply	120 Vac / 24 Vdc
PLC and Control Circuit Supply	120 Vac / 24 Vdc
Panel Lighting/Utility Plug Supply	120 Vac Raw
Equipment Plug Supply	120 Vac Standby

6.2.6.3.3 Earth Leakage Protection

Raw power supplies (120 Vac) shall be protected by means of an earth leakage protection circuit breaker.

6.2.6.3.4 24 VDC Power Supplies

Two 24 VDC power supplies shall be utilised, one for the PLC control equipment and the other for supplying power to PLC I/O racks, analogue transmitters and analogue I/O modules. The PLC control PSU will be part of the PLC itself.

6.2.6.3.5 The 24 V power supply manufacturer is Phoenix or similar approved.

6.2.6.4 Earthing/Neutrals

The contractor shall conform to the Earthing requirements set out in contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering Requirements.

6.2.6.4.1 Two (2) Earth bars are to be provided, consisting of hard drawn high conductivity copper busbar of adequate length for analogue cable screen, instrument and power supply earthing. One earth bar will be for instrument earth and the other earth bar for electrical earth. The instrument earth bar is to be mounted on stand-off insulators.

6.2.6.4.2 The instrument earth bar will be isolated from panel and shall only be bonded through noise limiting chokes to the Electrical Earth System.

6.2.6.4.3 The Instrumentation earth system shall be colour coded blue to distinguish it from the electrical safety earth system which shall be colour coded green/yellow. The blue instrument earth conductor shall however be green/yellow sleeve identification at the termination points. Refer to Panel Earthing sketch in Appendix C

6.2.6.4.4 Double pole circuit breakers will be used for all power distribution. Terminal strips with suitably populated terminals and bridging strips can be used to common neutrals or lives.

6.2.6.4.5 No neutral bar like the earth bar is allowed.

6.2.6.5 Panel Wiring

6.2.6.5.1 General

The contractor shall conform to the Panel Wiring requirements set out in contract specification H353004-00000-271-242-0001 - Contract General Instrumentation Engineering Requirements.

6.2.6.5.2 Wiring Bundling

The contractor shall conform to the Panel Wiring requirements set out in contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering Requirements.

- Wiring in plastic cable trunking with covers shall not be filled greater than 60%.
- Bundling of wires outside trunking shall be accomplished with `Spiralbind' or equivalent. The bundles shall be securely fastened to the structure at suitable points between terminal blocks, trunking and electrical devices. (No stick-on cable tie holders are permitted.)
- Where wire bundles cross a hinge line, the bundle is to be arranged so that the wires twist as opposed to bending.
- All panel equipment terminals, labels, etc., will be completely accessible after the wiring and cabling has been completed.
- Where wiring bundles pass through a hole in a bulkhead, the hole will be rectangular with rounded corners and will be sized such that wires are layered no more than three deep, and such that only 50% of the hole space is used. The edges of the holes are to be securely lined with nylon or PVC protective trim, to prevent the metal from cutting through the insulation/wiring.

6.2.6.5.3 Wire

The contractor shall conform to Wiring requirements set out in contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering Requirements.

Wiring will be signal colour coded according to contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering Requirements.

6.2.6.5.4 PLC I/O Wiring

The contractor shall conform to the Panel Wiring requirements set out in contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering Requirements.

6.2.6.5.5 Cable Glanding Area

- A raised cable glanding area is to be provided to facilitate handling of the cables while glanding. A horizontal PVC wire trunk is to be provided immediately above the glanding area to facilitate distribution of wiring.
- Instrument earths are to be installed close to any analogue cable glanding area to allow for termination of earthing screen drain wires.

6.2.6.5.6 Terminals and Terminal Rails

The contractor shall conform to the Terminal requirements set out in contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering Requirements.

- All terminals shall be of Phoenix manufacture or equivalent approved
- 20% spare terminal rail space is to be allowed on each length of terminal rail.

6.2.7 Operator Interface

The contractor shall conform to the Local Operator requirements set out in contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering Requirements.

6.2.7.1 The operator interface shall be at the pump station. Start/stop buttons and lamp indications shall be available on the front of the PLC or MCC panel as appropriate.

6.2.7.2 Push Buttons will be approved types and powered by 24 Vdc.

6.2.7.3 Indication lights will be the approved types and powered by 24 Vdc. The preferred light is a LED 24 Vdc.

6.2.7.4 Local audio (siren) and visual alarms (flashing light) shall be supplied and installed by the contractor.

6.2.8 Safety Consideration

6.2.8.1 All alarms and safety interlocks shall be designed to be fail-safe.

6.2.8.2 Under normal operating conditions, contacts initiating an alarm or shutdown will be closed, and relays and actuating devices will be energised.

6.2.8.3 All personnel safety interlocks, such as E-stops, shall be hardwired into the motor control circuits and monitored by the PLC.

6.2.8.4 Whenever equipment stops due to a trip condition, a positive action from the operator via a reset pushbutton shall be required prior to restarting the equipment.

6.2.9 Motor Control

6.2.9.1 The MCC's shall be fitted with intelligent protection relays and circuit breakers and shall either be linked together on a Fieldbus network such as Industrial Ethernet, which shall be linked to the PLC system via a suitable link, or the signals shall be hardwired to the PLC.

6.2.10 Instrumentation

The contractor shall conform to the Instrumentation requirements set out in contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering Requirements.

6.2.10.1 Standard Signals

- Analog signals will be 4-20mA DC signals
- Digital signals will be 24 Vdc for field instrumentation and on/off I/O
- Signal types and wire colours shall conform to specification.

6.2.10.2 Field Instruments

- Control valves and in-line instruments shall conform to specification
- Instruments will be rated IP66 as a minimum
- Instruments with materials in direct contact with the process will be selected based on the liquid / solid in the process, as well as the piping / tank material specification
- No installation details will be prepared.

6.2.10.2.1 Flow Instruments

- A Calorimetric Mass flowmeter shall be used for flow measurement of the final effluent being pumped as indicated on the P&ID. An Endress and Hauser T-Mass or similar approved shall be used.

6.2.10.2.2 Level Switches

- Tilt type level sensors shall be used for level application. Direct wired tilt switches are preferred with timers in the PLC. Endress and Hauser Tilt or similar approved shall be used.
- The contractor may elect to utilise other level control instruments with approval from the Engineer.

6.2.10.2.3 Pressure Instruments

- Direct connected gauge pressure indicating transmitters shall be used for pressure measurements. An Endress and Hauser Pressure transmitter similar approved shall be used.
- The transmitters shall have a body and fittings of appropriate pressure rating and 316 Stainless Steel diaphragms as a minimum standard.
- The gauge pressure transmitters shall have two-way manifolds to facilitate isolation and calibration.

6.2.10.2.4 On/Off Control Valves

On/Off Control valves shall conform to contract specification H353004-00000-271-242-0001 - Contract General Instrumentation Engineering Requirements.

6.2.10.3 Instrument Earthing

Earthing shall conform to contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering Requirements.

- A separate instrument earth bar shall be provided at the PLC. All instrument earthing shall be connected to this earth bar only. Instruments shall not be earthed at the instrument in the field.
- The instrument earth bar shall be connected to the main earth bar via a surge gap arrestor.
- A minimum of 4mm2 copper cable shall be used for common bonding purposes. 16mm2 PVC copper wire shall be used to earth instruments and cabinets.

6.2.11 Cables

Instrumentation cables shall conform to contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering.

6.2.12 Cable Trays

The contractor shall conform to the cable layout section of the contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering.

Racking shall be of heavy duty ladder type for electrical cables. Industrial basket type racking may be utilised for instrumentation cables. No doubling up of cables is allowed. The racking shall be vertically mounted, and the cables fastened to the rack with plastic cable ties indoors and outdoors with stainless steel straps in all areas exposed to the sun, every 3m.

All racks shall be properly aligned and supported on permanent members and not affixed to the roof decks of temporary structures. Beam clamps are to be used to secure the cable rack to permanent fixtures on the building structure. The maximum distance between centres of adjacent supports shall be 1.5 metres horizontal and 3m vertical.

Separate cable trays shall be used to provide isolation between power, control and instrument cables.

Cable ladders and all fixing bolts, nuts, washers, brackets, etc., shall be 316L stainless steel.

6.2.13 Notices and Labels

All notices, labels and designations shall be in English. A list of wording, terms, designations etc., shall be submitted for approval before manufacturing of labels and notices commences. Equipment shall be marked clearly in accordance with the Drawings.

All cables shall be clearly labelled at both ends. Labels shall be permanent and indelible.

Numbering and labelling shall be such that, during maintenance, the wiring can be traced by using the Record ("As Installed") Drawings.

A unique combination of letters and numbers shall be used in identifying instruments. The instrument identification number shall be constructed as per the ISA standards (ANSI/ISA-5.1 Instrumentation Symbols and Identification).

The unique identification number shall be constructed as follows:

- MMMM-XX-NNNY

Where:

MMMM	=	4-digit area number
XX	=	2 to 5 character functional description according to the ISA standard specification for instrument numbering
NNN	=	3-digit serial number
Y	=	Suffix (optional) to differentiate between instrument with identical function

A parallel numbering system shall be used; all instruments on common mechanical equipment shall receive the same sequential number.

6.2.14 Operational Philosophy

6.2.14.1 The contractor shall conform to the Local/Auto Control Station requirements of the contract specification H353004-00000-271-242-0001 – Contract General Instrumentation Engineering.

6.2.14.2 The pump station shall be controlled automatically by the PLC when selected from the front panel in auto mode.

6.2.14.3 Pumpsets

6.2.14.3.1 Each motor control panel shall be equipped with at least the following lamp indications. The lamp indications shall be clearly labelled:

- Running (Red)
- Stopped (Green)
- Fault (Blue).

6.2.14.3.2 Each motor control panel shall be equipped with at least the following controls. The controls shall be clearly labelled:

- Start Pushbutton
- Stop Pushbutton
- Fault Reset Pushbutton
- Emergency Stop (E-Stop) Pushbutton
- Local/Auto Selector Switch.

The lamps and control buttons shall constitute the operator local control station. The controls on the front door of the MCC panel enclosure shall enable the operator to individually start/stop the pumps through the selection of local mode as well as sequence start/stop equipment subject to process and equipment interlocks.

6.2.14.4 Valves

6.2.14.4.1 Each valve shall be equipped with at least the following lamp indications. The lamp indications shall be clearly labelled:

- Closed Limit (Red)
- Open Limit (Green)
- Valve Moving (Yellow)
- Valve Fault (Blue).

6.2.14.4.2 Each Valve shall be equipped with at least the following controls. The controls shall be clearly labelled:

- Open Pushbutton
- Close Pushbutton
- Fault Reset Pushbutton
- Valve Local/Auto Selector Switch.

The lamps and control buttons shall constitute the operator local valve control station. The controls on the valve actuator shall enable the operator to individually open/close the valve through the selection of local/auto mode on the valve.

6.2.14.5 Level Switches

Lamps on the front of the PLC panel shall be used to indicate the level of the effluent in the tank. The lamps shall be driven by the PLC on receipt of signals from the Hi-Hi, Hi and Lo level switches installed in the tank.

The lamp indication shall illustrate the activation of the level switches. The lamp indications shall be clearly labelled:

- Level Switch Active (Red – On)
- Level Switch Inactive (Off).

6.2.15 Control Philosophy

Treated Sewage Effluent from the 800-person camp sewage treatment plant is transported to the Effluent Holding Tank 1623-TK-001 and from there the Effluent is pumped to the Licensed Discharge Point at the Mary River.

6.2.15.1 *Automatic Mode*

Three float type limit switches are utilised to control the operation of the pump sets, 1623-PP-001A and 1623-PP-001B. The pump sets are operated in a duty/standby arrangement. The PLC shall maintain equal operating hours for each pump set and shall as far as possible alternate the pumps after each start.

The duty pump will only start when the high-level switch (1623-LSH-001) in the tank is activated by the rising level of effluent in the tank.

Before the duty pump is started, the standby pump shall be stopped if running and the standby delivery shut-off valve shall be closed, if not already closed, to ensure no backflow through the standby pump.

Once the standby pump is stopped and its delivery shut-off valve is confirmed closed, the PLC shall open the delivery valve of the duty pump, if not already opened.

Upon successful completion of delivery valve opening, the PLC shall start the duty pump.

The duty pump will continue to run until the low-level switch (1623-LSL-001) in the tank is activated by the dropping level of effluent in the tank. Once the duty pump is stopped its associated delivery valve shall be closed.

The PLC shall ensure that flow (1623-FIT-001) is established in the line after a set period (initially 10 seconds) after a pump has been started. The PLC shall also ensure that pressure (1623-PIT-001) is established in the line after an initial stabilisation period of starting the pump. This shall be used to protect against a burst pipe situation. The pressure and flow limits shall be established during commissioning of the system. Should either of these situations arise an alarm shall be raised.

Flowmeter 1623-FIT-001 and Pressure Transmitter 1623-PIT-001 shall further be monitored whilst the duty pump is operating and excursions outside normal operating limits shall raise an alarm. Such alarms shall be inhibited whilst the pumps are idle and/or during pump start-up.

A high-high level of effluent in the tank shall also raise an alarm and the standby pump shall be called. This alarm shall be automatically reset once the level drops below the high operating level 1623-LSH-001 and the standby pump shall be released.

Alarms are indicated locally utilising an audio/visual system. The alarm shall be resettable from the local operator control station.

A pump shall not be started unless it is in automatic mode and is available to start. Activation of the E-Stop will cause the pump to be stopped immediately. The associated valve motor shall also be stopped immediately. These shall be a hard-wired safety interlock which the PLC shall monitor and record. It shall not be possible to override safety interlocks. However, an operator may manually override process interlocks (flow and pressure, tank levels) through the selection of manual mode.

Process interlock alarms shall be required to be reset via the operator at the local control panel.

6.3 Electrical Engineering Requirements

6.3.1 General Information

6.3.1.1 All relevant technical information regarding each component or item offered shall be included either in the forms to be completed by the contractor or as an Appendix to the offer, in order that the Engineer can make a proper evaluation of the offer.

6.3.1.2 Where products of a Contractor are specified, the supply of equal products from other Contractors may also be supplied if approval for such products is obtained from the Engineer.

6.3.2 Motor Control Centres (MCC), Distribution Boards (DB) and Local Control Panels (LCP)

6.3.2.1 General

- The MCC shall be a vermin-proof type and manufactured from sheet steel having a minimum thickness of 2.0 mm.
- Starters, incoming breakers and local DB shall be housed in separate compartments. Each separate compartment shall be provided with a hinged door which shall be arranged so that it cannot be opened while the apparatus contained therein is live unless this apparatus is fully shrouded or screened to prevent inadvertent contact. Where the apparatus contained in the compartment is provided with an isolating switch or MCB, the door shall be mechanically interlocked so that it cannot be opened unless the switch is in the "OFF" position.
- The bus-bars shall be rated for the full load capacity of the main switch and shall be capable of withstanding the stated fault level.

6.3.2.2 Bus-bars

- Horizontal power bus-bars and vertical bus-bar droppers shall be copper, of constant cross-sectional area throughout their length, and shall be mechanically braced for the short circuit current value as specified.
- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.2.3 Wiring

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.2.4 Earthing and Bonding

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.2.5 *Pushbutton Control Stations*

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.2.6 *Motor Control*

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

Table 6-2: Motor Control Centre Data Sheet

(To Be Completed for Each DB AND MCC)

Item No.	Description	Selection
1	MANUFACTURER AND TYPE NO	
2	APPLICABLE STANDARD	
3	ISO9001 CERTIFICATION	
4	TYPE TESTED DESIGN CERTIFICATION	
5	SEGREGATION	
6	ASSEMBLY TYPE	
7	PROTECTION CLASS: IP	
8	MODULE CONSTRUCTION TYPE	
9	CABLE ENTRY	
10	MOUNTING	
11	BUS-BAR DIMENSIONS (W,T)	
12	OVERALL DIMENSIONS (H,W,D)	
13	OVERALL MASS	
14	FREQUENCY	
15	PHASES	
16	RATED OPERATING VOLTAGE	
17	RATED INSULATION VOLTAGE	
18	RATED IMPULSE WITHSTAND VOLTAGE	
19	RATED NORMAL CURRENT OF THE BUS-BAR	
19.1	MAIN FEEDERS	
19.2	OTHER FEEDERS	
20	RATED SHORT TIME WITHSTAND CURRENT	

Item No.	Description	Selection
21	WITHSTAND TO INTERNAL ARC	
22	CONTROL TRANSFORMER RATING	
23	CONTROL VOLTAGE	
24	INCOMER CIRCUIT BREAKER MANUFACTURER AND TYPE NO	
25	BREAKERS MANUFACTURER AND TYPE NO	
26	SWITCH FUSES MANUFACTURER AND TYPE NO	
27	FUSE LINKS MANUFACTURER AND TYPE NO	
28	FUSES MANUFACTURER AND TYPE NO	
29	CONTACTORS MANUFACTURER AND TYPE NO	
30	INCOMER CIRCUIT BREAKER MANUFACTURER AND TYPE NO	
31	OVERLOAD RELAYS (THERMAL) MANUFACTURER AND TYPE NO	
32	OVERLOAD RELAYS (ELECTRONIC) MANUFACTURER AND TYPE NO	
33	THERMISTOR RELAYS MANUFACTURER AND TYPE NO	
34	SELECTOR SWITCHES MANUFACTURER AND TYPE NO	
35	ISOLATING SWITCHES MANUFACTURER AND TYPE NO	
36	CURRENT TRANSFORMERS MANUFACTURER AND TYPE NO	
37	AMMETERS MANUFACTURER AND TYPE NO	
38	VOLTMETERS MANUFACTURER AND TYPE NO	
39	INDICATOR LIGHTS MANUFACTURER AND TYPE NO	
40	HOURS RUN METERS MANUFACTURER AND TYPE NO	
41	METERING MANUFACTURER AND TYPE NO	
42	PUSHBUTTONS MANUFACTURER AND TYPE NO	
43	POWER TRANSDUCER MANUFACTURER AND TYPE NO	
44	RELAYS (AC) MANUFACTURER AND TYPE NO	
45	RELAYS (DC) MANUFACTURER AND TYPE NO	
46	PHASE FAILURE RELAYS MANUFACTURER AND TYPE NO	
47	SURGE SUPPRESSORS MANUFACTURER AND TYPE NO	
48	TERMINALS (POWER) MANUFACTURER AND TYPE NO	
49	TERMINALS (CONTROL) MANUFACTURER AND TYPE NO	
50	FERRULES MANUFACTURER AND TYPE NO	
51	TIMING RELAYS MANUFACTURER AND TYPE NO	
52	MOULDED CASE CIRCUIT BREAKERS MANUFACTURER AND TYPE NO	

Item No.	Description	Selection
53	CONTROL TRANSFORMER MANUFACTURER AND TYPE NO	
54	MOTOR STARTERS TYPES COORDINATION TYPE TO IEC 947	
55	PROTECTIVE COATING SYSTEM	
56	INTERNAL PAINT COLOUR	
57	EXTERNAL PAINT COLOUR	

6.3.3 Cables and Cabling

6.3.3.1 Cable Types

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.3.2 Identification of Cables

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.3.3 Cables Installed on Cable Racks and Trays

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.3.4 Termination and Jointing of Cables

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.4 Low Voltage Induction Motors

6.3.4.1 General

- This Clause defines the design, manufacture, inspection, testing and delivery of low voltage single speed, three phase, AC, induction motors.

6.3.4.2 Rating

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.4.3 Method of Starting

The motors shall be suitable for full voltage starting direct on line.

6.3.4.4 *Power Factor*

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.4.5 *Efficiency*

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.4.6 *Thermistors and Temperature Sensors*

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.4.7 *Enclosure*

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information on IP ratings.

6.3.4.8 *Cooling*

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.
- When controlled by a VSD, the motor cooling shall be designed for the load and the lowest duty speed at which the motor will operate.

6.3.4.9 *Motor Terminal Box*

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.4.10 *Insulation*

- Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.4.11 *Bearings*

- Bearings shall be sealed and shall have a nominal life rating of 60 000 hours.
- The bearing system of motors with vertical shafts shall be capable of carrying an axial thrust equivalent to not less than twice the weight of the rotor.
- For motors with horizontal shafts, the bearing system shall be capable of carrying sufficient axial thrust to allow the motor to be run disconnected from the load.

6.3.4.12 *Lifting Eyes*

- Motors shall be supplied with lifting eyes to enable each motor to be lifted by an overhead crane. The lifting eye shall be suitably rated for the mass of the fully assembled motor.

6.3.4.13 *Nameplates*

Motors shall be fitted with the following stainless steel nameplates:

- Motor rating plate with a unique serial number; and
- Temperature sensor data plate, including the manufacturer, type number, tripping temperature, resistance of each sensor at the tripping temperature, and the number of sensors embedded per winding.

6.3.5 *Earthing, Bonding and Lightning Protection*

6.3.5.1 *General*

- The earthing of the entire electrical installation shall be installed by the Contractor and shall consist of electrical earthing, instrument earthing and lightning protection.
- The Contractor shall carry out all the earth resistance testing as required. Refer to Electrical Design Criteria, H353004-00000-260-210-0002, and Basic Electrical Requirements specification, H353004-00000-200-078-0017 for more detailed information.

6.3.5.2 *Instrument Earthing*

- A separate instrument earth bar shall be provided at the PLC. All instrument earthing shall be connected to this earth bar only. Instruments shall not be earthed at the instrument in the field.
- The instrument earth bar shall be connected to the main earth bar via a surge gap arrestor.

7. Testing and Commissioning

7.1.1 *Factor Acceptance Tests (FAT)*

7.1.1.1 Factory Acceptance testing shall be performed as detailed in the contract specifications.

7.1.1.2 *Mechanical Equipment*

The Contractor shall provide the Employer with a test certificate and performance curves demonstrating the pumps ability to achieve the required duty flows.

7.1.1.3 *Process and Systems Control*

The Contractor shall submit with their offer a schedule of FAT tests complete with a proposed testing methodology which must be agreed with the Employer prior to finalising the contract variation.

The testing methodology shall be designed to ensure that the equipment proposed complies with the requirements of this specification as well as with all relevant national and international standards.

The testing methodology shall further be designed to simulate the Control Philosophy.

As a minimum the following equipment and instrumentation shall be tested:

- PLC Panel
- Delivery shutoff valves
- Local Control Panels
- Junction Boxes
- Instrumentation calibration certificates.

The Employer shall be given two weeks' notice prior to the execution of FAT tests should they wish to send a representative to witness the tests.

7.1.1.4 Electrical Equipment

The Engineer may carry out periodic inspections during various stages of manufacture.

An electrical COC (certificate of compliance) shall be provided for the complete installation.

Final factory tests of the Motor Control Centres shall be carried out before despatch from the works.

These tests shall include, but not be limited to, the following:

- Tests to determine that the apparatus fully and strictly complies with the requirements of the Specifications;
- Comprehensive primary injection tests of all current transformers and associated circuitry;
- Comprehensive pressure tests to prove insulation quality; and
- Functional tests of all control gear and the feeders.

7.1.1.5 Factory Tests (Low Voltage Induction Motors)

Motors shall be subjected to routine tests and a copy of the test certificates shall be supplied to the Engineer, within 7 days of the test.

The Engineer shall be informed in writing timeously of the testing before testing commences to arrange to witness the tests.

7.1.2 Site Acceptance Tests

7.1.2.1 Site Acceptance testing shall be performed as detail in the contract specification.

7.1.2.2 Water Tightness Tests to the following structures.

- Pump lines and Flanges, Valves, etc.

7.1.3 Dry Commissioning

7.1.3.1 The contractor shall, after installation perform their own tests to confirm that all mechanical and electrical equipment and control systems, instruments and alarms are operational.

7.1.3.2 Once the Contractor is satisfied that all systems are operational he shall invite the Engineer to witness a demonstration. The Engineer shall be obliged to make time available to witness the dry commissioning within 5 working days of being notified of the equipment readiness.

7.1.3.3 The Contractor shall demonstrate compliance with the technical specifications under simulated conditions at the dry commissioning.

7.1.3.4 Should the Contractor fail to demonstrate compliance, the Contractor shall be tasked with remedying the non-compliances and inviting the Engineer for a second dry commissioning simulation. The Engineer may redeem costs for the additional dry commissioning exercise.

7.1.4 Wet Commissioning

7.1.4.1 Having been informed by the Engineer that the Contractor has successfully demonstrated compliance with the technical specifications during the dry commissioning exercise, the Contractor may proceed with wet commissioning of the plant.

7.1.4.2 The wet commissioning shall require the Contractor to operate the equipment continuously and trouble free under normal site operating conditions for a duration of 7 days.

7.1.4.3 The Employer reserves the right to instruct the Contractor, at his cost, to proceed with detailed performance tests.

7.1.4.4 The cost of such a performance test shall be borne by the Employer if the results prove that the equipment complies with the requirements of this technical specification.

7.1.4.5 Should the tests prove that the equipment does not comply the requirements of this specification; the costs of the performance tests, as well as any remedial measures shall be borne by the Contractor.

7.1.4.6 Subsequent performance testing shall follow the same model.

8. Temporary Works

8.1.1 Temporary works are as defined in the Condition of Contract.

8.1.2 The Contractor retains responsibility for the design of all temporary works.

9. Contractors Documents

9.1.1 Programme

9.1.1.1 Notwithstanding the requirement for the Contractor's Programme to be approved by the Engineer prior to Commencement of the Works, the Contractor shall submit a first draft of the Programme with their submission.

9.1.1.2 The Programme shall:

- Be prepared with Microsoft Project and be submitted as a *.mmp format file as well as in hard copy.
- Be presented as a "Gantt" Chart and include the functionality to record %age complete for a particular activity.
- Have construction and personnel resources assigned to activities
- Be accompanied with a method statement.

9.1.1.3 The Contractor shall be deemed to have allowed fully in his tendered rates and prices as well as in his program for all possible delays due to normal adverse weather conditions as specified in the Project Specifications.

9.1.1.4 It is noted that there are several contracts being executed simultaneously in the execution of the Mine Expansion project. It may be expected that the performance of this contract may impact on the ability of other contractors to execute their responsibilities as defined in their respective contracts. To this end it is highlighted that the Employer shall rely upon the Contractor's Programme when planning the sequencing of works to be executed under other Contracts.

9.1.1.5 In the event of there being a delay to the completion of the works attributed to the Contractor, which results in a delay to the commencement and / or execution of another contract, the Employers reserves the right to claim delay damages from the Contract. In this instance, the delay damages shall be as defined in the Contractors existing contract, plus any additional damages suffered by the Employer under the other affected Contracts.

9.1.2 Progress Reports

9.1.2.1 As per contract specifications.

9.1.3 Method Statements

9.1.3.1 As per contract specifications.

9.1.4 Offer Submission

9.1.4.1 The Contractor shall submit a Design Report with their submission. The Design Report shall include the following information as a minimum:

- Equipment Schedule
- Valve and Piping Schedule

- Instrument Schedule
- Technical brochures and datasheets of all equipment and instrumentation offered
- General Arrangement Drawings of all installations (Where the Contractor's offer varies from the Employer's outline design)
- A schedule of FAT's and a brief description of the proposed testing methodologies.

9.1.4.2 The Tenderer shall complete and return all schedules and technical datasheets included in this scope of work as well as the contract documents.

9.1.5 Detailed Design Report

9.1.5.1 It is a requirement of this contract extension that the Contractor shall submit a Detailed Design Report to the Engineer for review.

9.1.5.2 The Contractor shall not be entitled to proceed with the execution of the works until the Contractor has received comment (and address these comments if required to do so) from the Engineer in respect of the submitted Detailed Design Report.

9.1.5.3 The duration of the review period in which the Engineer can provide comment is 14 days from submission to the Engineer. If the Engineer fails to provide comment within this period, it will be deemed that no comment exists, and the Contractor may proceed with the execution of the works.

9.1.5.4 Note that the Engineer's review is not an approval and does not release the Contractor of any responsibility of liability associated with his design.

9.1.5.5 The design report shall as a minimum include the following:

- Reference to all design codes, standard specification or the specifications where relevant.
- A detailed methodology illustrating in detail how the works is to be executed.
- All working drawings required for fabrication and installation of the works. Preliminary designs and drawings may be submitted with the design report.
  - Marked-up Piping and Instrumentation Diagram
  - Instrument index / I/O Lists
  - Cable Block Diagrams
  - Instrument Loop Diagrams
  - Instrument manuals and data sheets
  - Instrument Wiring Diagrams
  - Detailed functional design statement
  - PLC general arrangement diagrams plus wiring diagrams of these
  - Local Control Panel general arrangement Diagrams together with wiring diagrams
  - Detailed network diagrams if intelligent motor controllers utilised

- Local control panel layout
- Termination diagrams of all panels
- Power reticulation drawings
- Earthing reticulation drawings
- Motor control schematic diagrams
- Single Line Diagrams
- MCC termination diagrams
- MCC General Arrangement Drawings
- Cable Schedule
- Equipment List
- Earthing design
- Lightning Protection design
- Electrical Load List.

9.1.5.6 Upon completion of the works three (3) hard copies and one (1) PDF electronic copy of the signed design report and drawings shall be submitted to the Engineer. In addition, as per contract, native electronic copies (version 2012 or newer) shall be submitted of all drawings, as per Contract documents.

9.1.5.7 The Employer shall provide an AutoCAD drawing of the standardised project title blocks and a list of drawing requirements.

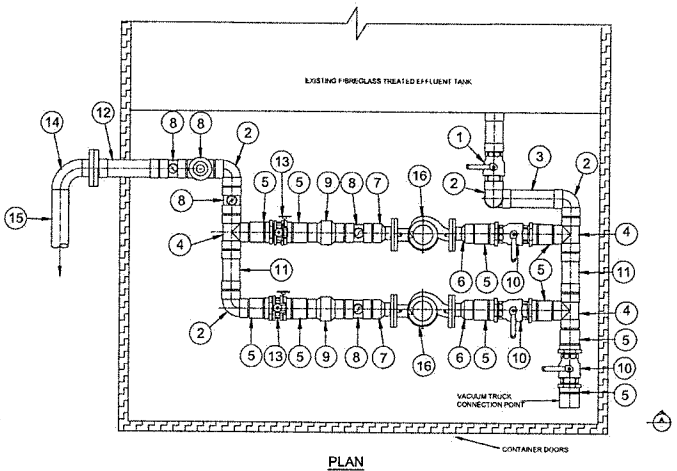
9.1.6 Operations and Maintenance Manuals

9.1.6.1 As per contract.

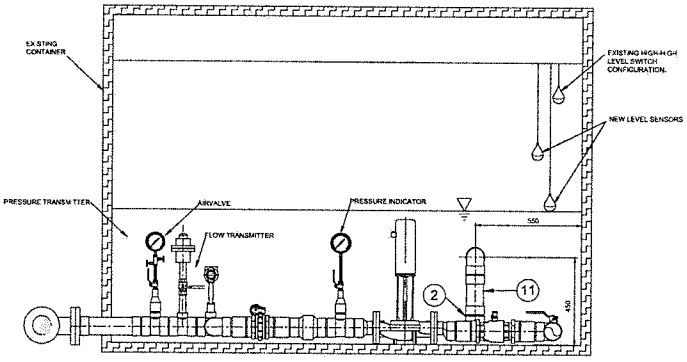
9.1.7 As Built Documentation

9.1.7.1 As per contract.

Appendix A
Pump Station Layout



PLAN
SCALE 1:10



SECTION A-A
SCALE 1:10

800-MAN CAMP: PIPE AND PIPE FITTING SCHEDULE

ITEM No.	DIAMETER	No. OF	ITEM DESCRIPTION
1	3"	1	EXISTING OUTLET NOZZLE ON TANK FITTED WITH BALL VALVE. EXISTING NOZZLE TO TIE IN WITH NEW 3" PVC BEND
2	3"	5	PVC 90° ELBOW WITH SOCKET ON BOTH ENDS
3	3"	1	PVC PIPE 300mm
4	3"	3	PVC EQUAL TEE PIECE WITH SOCKETS
5	3"	8	PVC VALVE SOCKET
6	3"x2"	2	DN 3" X DN 2" PVC ECCENTRIC REDUCER.
7	3"x2"	2	DN 3" X DN 2" PVC CONCENTRIC REDUCER.
8	3"x1"	5	DN 3" X DN 1" PVC REDUCING TEE-PIECE WITH SOCKETS ON ALL ENDS.
9	3"	2	PVC TYPE CHECK VALVE
10		9	DN 3" FULL BORE PVC BALL VALVE
11	3"	3	PVC PIPE 200mm
12	3"	1	PVC PIPE 300mm FLANGED ON ONE END
13	3"	2	DN 3" ACTUATED BUTTERFLY VALVE
14	3"	1	HDPE SDR11, 90° ELBOW FLANGED ON ONE END
15	3"		NEW 3" PIPELINE
			PUMPS
16	-	2	DUTY AND STANDBY - GOULDS 16SV5FC30 MULTISTAGE VERTICAL PUMP OR SIMILAR APPROVED

PIPE AND FITTING SPECIFICATIONS

1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE PROJECT PARTICULAR SPECIFICATIONS
2. ALL PVC PIPES TO BE CLASS 12

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR FINAL CUT LENGTHS ON THE PIPE AND FITTING SCHEDULE.
2. DIMENSIONS ARE APPROXIMATE
3. CONTRACTOR TO TAKE ACCURATE MEASUREMENTS OF THE EXISTING TANK, NOZZLE AND CONTAINER ON SITE.
4. PIPELINE TO BE HEAT TRACED AND INSULATED OUTSIDE OF THE PUMP ROOM CONTAINER

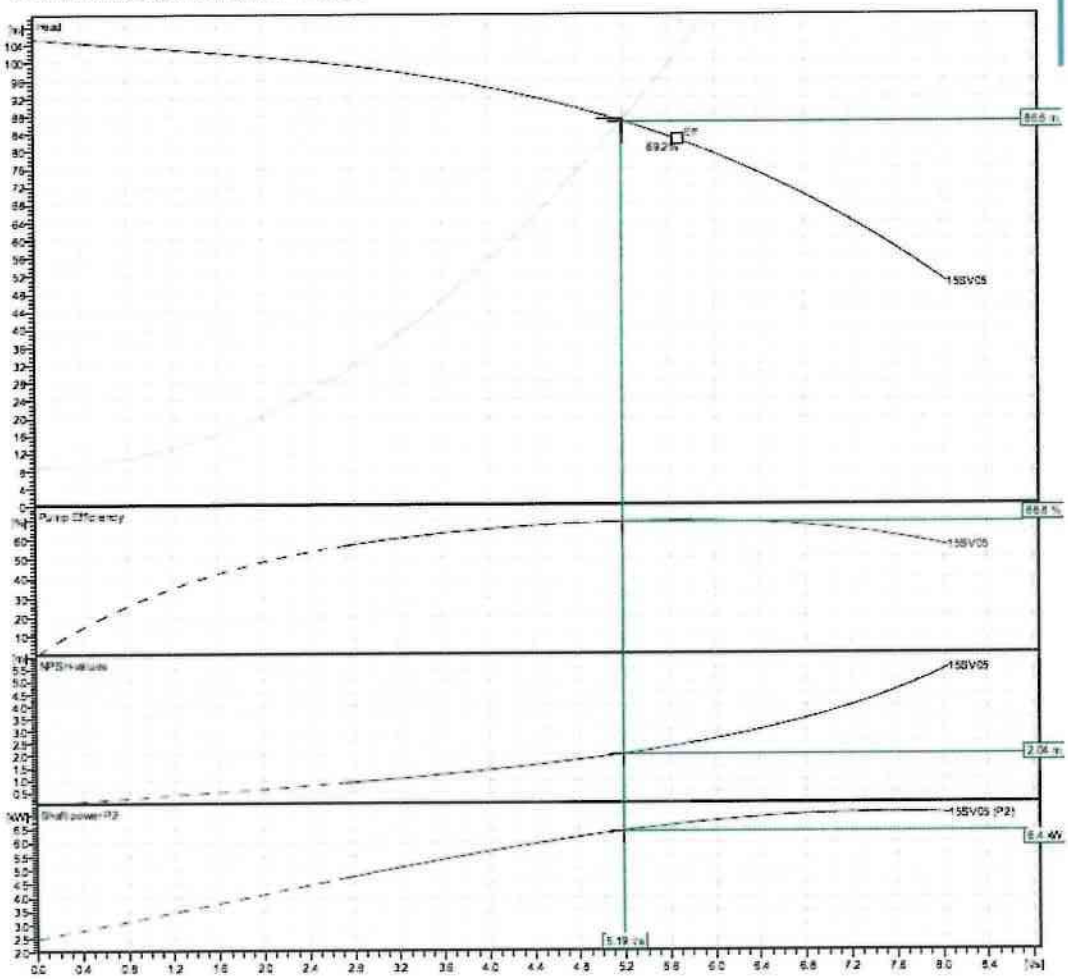
Appendix B
Pump Curve

The pump curve for a Gould 15SV5FC30 can be seen below:

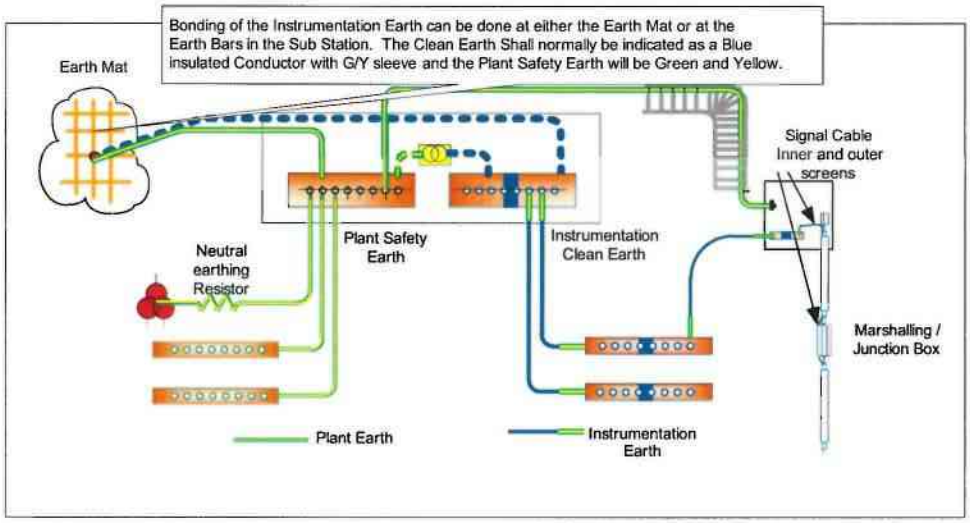
Hydraulic Data

Operating Data Specification		Hydraulic data (duty point)		Impeller design	
Flow	5.2 l/s			Impeller R	0 mm
Head	87 m	Flow	5.19 l/s	Frequency	60 Hz
Static head	8.9 m	Head	86.6 m	Speed	3500 1/min

Power data referred to:
Water [100%] : 4°C: 1kg/dm³; 1.57mm²/s
Performance according to ISO 9906:2012 – Grade 3B



Appendix C
Instrumentation Earthing Schematic



SECTION 1: GENERAL

ITP

INSPECTION TEST PLAN

SCOPE OF WORK:
PIPING INSTALLATIONS

Client:	Baffin Iron Mines
Project name:	Baffinland- Mine Site
(Sub-)Contractor:	NUNA- ADCO
Contract No.:	CX-001
CWPs:	Treated Effluent Pump Station
ITP No.:	39

Contractor QC Approved By		Print	Sign	Date
Client QA Approved By	Franken, Kenny	Print	Sign	Date

Verification Index: I = Inspection, R = Review Test Results, W = Witness Test, H = Hold All Construction Activities

Activity No.	Activity Description	Acceptance Criteria	Verification Documents (Use all check sheets applicable to the installation)	Verification Description			ITP Closeout (Sign & Date when ITP Activity is completed for the scope or work)	
				Contr. Const.	Contr. QC	Client QA	Contr. QC Designate	Client QA Designate
1	**GENERAL**							
1.1	Scope of Work (Contract Description, Issued IFC Drawings, S.I., FWO; CCO; Contract # - EPC #)	Summary of Work Document (H353004-CX001-227-248-0001)/ Vendor O&M Manuals Contract terms and conditions, Issued Specifications,Drwgs and Codes as Per Scope Summary of Work.	Contract Description, Issued IFC , S.I., FWO; CCO; Contract scope# - EPC #	H	H	H	KK	
1.2	ITP and Verification Documentation Approval (Inspection Test Reports)	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-028R0 ITP Quality Verification Documentation Registry	H	H	H	KK	
1.3	IFC Drawing Index (Issued For Construction) to the Latest Revision	All contract issued IFC drawings	RF-G-023R0 Print Index highlighted: Yellow for No Change, Red for Red Line As-Built	H/R	W	R	KK	
1.4	Signature Log	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-003R0	R	R	R	KK	
1.5	Procedures Submitted and Approved (Pipe testing, Grouting, Bolt Tightening, etc.)	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	Approved Procedures	H	H	R	KK	
1.6	Approved Construction Technical Deviations Direct Material Substitution Request	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-008R0 All copies of issued technical Deviations	H	H	W/R	KK	
1.7	Material and Equipment Receiving Report (MTRs must be attached for any Pipe, Structural Steel, and Fasteners)	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-001R0 RF-G-002R0	H	W/I	W/R	KK	
1.8	NCR-None Conformance Reports	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-010R0 Non Conformance Registry	H/R	H/R	H/R	KK	
1.9	QSR-Quality Surveillance Report	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-011R0 Quality Surveillance Registry	I/R	I	R	KK	
1.10	CAR-Corrective Action Report PAR-Preventative Action Report	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-030R0 RF-G-031R0	H	I	R	KK	
1.12	Written Inspection Request Notification (24 Hour Notification required for W & H Points)	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-013R0 Inspection Request Registry	H	W	W	KK	
1.13	Request For Information Registry (Listing RFI's issued pertaining to the work covered by this ITP)	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-015R0 Request For Information Registry	H	H	R	KK	
1.15	Preservation/Maintenance	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.H353004-00000-200-078-0015	RF-G-022R0 Preservation Registry RF-G-027R0	H/I	I/R	I/R	KK	
3	**PIPING**							
3.1	Pipe support installation	CSA B139, H353004-TM001-240-248-0001rev2, ICF DWGS	CIS-50-017 General Mechanical	I	I/R	R	KK	
3.3	Pipe Installation	CSA B139, H353004-TM001-240-248-0001rev2, ICF DWGS	CIS-60-004 Pipe work Installation	I	I/R	I/R	KK	
3.3	Control Valve Installation	CSA B139, H353004-TM001-240-248-0001rev2, ICF DWGS	CIS-75-Control Valves	I	I/R	I/R	KK	
3.4	Piping Gasket Installation and Flange Torque	CSA B139, H353004-TM001-240-248-0001rev2, ICF DWGS	CIS-50-057 Bolt Torque CIS-60-010 Gaskets, and Bolting	I/R	W/R	W/R	KK	
3.7	Piping Identification	CSA B139, H353004-TM001-240-248-0001rev2, ICF DWGS	CIS-60-004 Pipe work Installation	I/R	I	I	KK	
3.11	Service Testing Package	CSA B139, , H353004-CX001-227-248-0001 ICF DWGS	TBD	H	H	W/R	KK	
6	**ITP CLOSE OUT**							
6.1	Construction Completion (Contractor Punch list & Final Walk down Punch list)	Quality Manual & Site Quality Plan/ Vendor O&M Manuals (Vendor recommendations) (Applicable Site Specs and Code) (IFC Drawings)	RF-G-009R0 RF-G-017R0 RF-G-024R0 RF-G-025R0	I	R	R	KK	

INSPECTION TEST PLAN

SCOPE OF WORK:
PIPING INSTALLATIONS

Client:	Baffin Iron Mines
Project name:	Baffinland- Mine Site
(Sub-)Contractor:	NUNA- ADCO
Contract No.:	CX-001
CWPs:	Treated Effluent Pump Station
ITP No.:	39

	Print	Sign	Date
Contractor QC Approved By	Kyle Krahi	KC	Nov 13 2019
Client QA Approved By			

Verification Index: I = Inspection, R = Review Test Results, W = Witness Test, H = Hold All Construction Activities

Activity No.	Activity Description	Acceptance Criteria	Verification Documents (Use all check sheets applicable to the installation)	Verification Description			ITP Closeout (Sign & Date when ITP Activity is completed for the scope of work)	
				Contr. Const.	Contr. QC	Client QA	Contr. QC Designate	Client QA Designate
1.13	As Built Drawings complete (Red Line Condition)	Quality Manual & Site Quality Plan (Applicable Site Specs and Code) (IFC Drawings)	RF-G-023R0 Print Index highlighted: Yellow for No Change. Red for Red Line As-Built	I/R/H	I/R	R	KK	
6.2	Certificate of Construction Completion	Quality Manual & Site Quality Plan/ Vendor O&M Manuals. (Vendor recommendations) (Applicable Site Specs and Code) (IFC Drawings)	RF-G-019R0		R	R	KK	
6.3	Care & Custody Transfer Notification	Quality Manual & Site Quality Plan (Vendor O&M Manuals) (Vendor recommendations) (Applicable Site Specs and Code) (IFC Drawings)	RF-G-018R0		R	R	KK	
6.4	Declaration of Construction Completion	Quality Manual & Site Quality Plan (Vendor O&M Manuals) (Vendor recommendations) (Applicable Site Specs and Code) (IFC Drawings)	RF-G-020R0		R	R	KK	
6.5	Turn Over Packages Review Completion Construction Verification Certificate Package Checklist Manufacturing Data Report (MDR Index)	Quality Manual & Site Quality Plan (Vendor O&M Manuals) (Vendor recommendations) (Applicable Site Specs and Code) (IFC Drawings)	RF-G-021R0		H	H	KK	

On the execution of the signatures below. The work package(s) and/or system(s)/sub-system(s) identified below shall be deemed complete and activities within this approved Inspection Test Plan(ITP) will been considered fulfilled in its entirety by the contactor.

Kyle Krahi / KC	Construction Manager	Nov 13 2019	WORK PACKAGE(S) COMPLETE AND CLOSED OUT:
CONTRACTOR QC DESIGNATE - Print/Sign	TITLE	DATE	
/			SYSTEM/SUB-SYSTEM
CLIENT QA DESIGNATE - Print/Sign	TITLE	DATE	

An effective and/or acceptable ITP should provide the client with a high degree of confidence that the work will be or has been, completed in accordance with the applicable contract, IFC Drawings, Specs, Standards, Codes, Regulatory Authorities, Vendors and Installation Procedures, etc. Therefore, a sufficient sampling of each (identified) activity must be inspected by the Contractor, in order to ensure that conformance is in fact, being achieved. ITPs help define the auditable documentation that will be produced by the Contractor for each activity. A sufficient number of activities must be identified in order to accurately reflect the Scope of Work.

INSPECTION TEST PLAN

SCOPE OF WORK:
ELECTRICAL AND INSTRUMENTATION INSTALLATION

HATCH Vendor/Contractor Document Review
Franken, Ronny

Client:	Baffin Iron Mines
Project name:	Baffinland- Mine Site
(Sub-)Contractor:	NUNA- ADCO
Contract No.:	CX-001
CWPs:	Treated Effluent Pump Station
ITP No.:	39

Contractor QC Approved By	Print	Sign	Date
Client QA Approved By	Print	Sign	Date

Verification Index: I = Inspection, R = Review Test Results, W = Witness Test, H = Hold All Construction Activities

Activity No.	Activity Description	Acceptance Criteria	Verification Documents (Use all check sheets applicable to the installation)	Verification Description			ITP Closeout (Sign & Date when ITP Activity is completed for the scope or work)	
				Contr. Const.	Contr. QC	Client QA	Contr. QC Designate	Client QA Designate
1	**GENERAL**							
1.1	Scope of Work (Contract Description, Issued IFC Drawings, S.I., FWO; CCO; Contract # - EPC #)	Summary of Work Document (H353004-CX001-227-248-0001)/ Vendor O&M Manuals Contract terms and conditions, Issued Specifications,Drwgs and Codes as Per Scope Summary of Work.	Contract Description, Issued IFC , S.I., FWO; CCO; Contract scope# - EPC #	H	H	H	KK	R.M.
1.2	ITP and Verification Documentation Approval (Inspection Test Reports)	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-028R0 ITP Quality Verification Documentation Registry	H	H	H	KK	R.M.
1.3	IFC Drawing Index (Issued For Construction) to the Latest Revision	All contract issued IFC drawings	RF-G-023R0 Print Index highlighted: Yellow for No Change, Red for Red Line As-Built	H/R	W	R	KK	R.M.
1.4	Signature Log	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-003R0	R	R	R	KK	R.M.
1.5	Procedures Submitted and Approved (Pipe testing, Grouting, Bolt Tightening, etc.)	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	Approved Procedures	H	H	R	KK	R.M.
1.6	Approved Construction Technical Deviations Direct Material Substitution Request	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-008R0 All copies of issued technical Deviations	H	H	W/R	KK	
1.7	Material and Equipment Receiving Report (MTRs must be attached for any Pipe, Structural Steel, and Fasteners)	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-001R0 RF-G-002R0	H	W/I	W/R	KK	
1.8	NCR-None Conformance Reports	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-010R0 Non Conformance Registry	H/R	H/R	H/R	KK	
1.9	QSR-Quality Surveillance Report	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-011R0 Quality Surveillance Registry	I/R	I	R	KK	
1.10	CAR-Corrective Action Report PAR-Preventative Action Report	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-030R0 RF-G-031R0	H	I	R	KK	
1.11	Test Equipment Calibration Certification	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	Test Equipment Log All Calibration Certificates CTS-75-015 Calibration of Instruments	H	I/R	R	KK	
1.12	Written Inspection Request Notification (24 Hour Notification required for W & H Points)	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-013R0 Inspection Request Registry	H	W	W	KK	
1.13	Request For Information Registry (Listing RFI's issued pertaining to the work covered by this ITP)	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.	RF-G-015R0 Request For Information Registry	H	H	R	KK	
1.15	Preservation/Maintenance	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001.H353004-00000-200-078-0015	RF-G-022R0 Preservation Registry RF-G-027R0	H/I	I/R	I/R	KK	
2.0	**ELECTRICAL (LOW VOLTAGE)**							
2.1	Low Voltage Equipment: MCC, PDP, Switchgear & VFDs Install Test Record	CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626, ICF DWGS	CIS-70-035 Electrical Devices	H	H/I	W	KK	
2.9	Power Cables Installation	CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626, ICF DWGS	CIS-70-007 (CABLE), CTS-70-003 (MEGGER)	I	I/R	I/R	KK	
2.10	Control Cable installation	CSA(CEC,M421), H353004-00000-200 078-0017,H349000-S018626, ICF DWGS	CIS-70-007 (CABLE), CTS-70-003 (MEGGER)				KK	
2.12	Motor Installation	CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626, ICF DWGS	RF-E-031R0 RF-E-032R0 RF-E-033R0	I	W	I/R	KK	
2.24	Power and Control Cable Schedule (As per IFC Cable Schedule)	(IFC Cable Schedule)	(IFC Cable Schedule)	R	R	R	KK	
4	**INSTRUMENTATION**							
4.1	Powered Instrumentation Installation (Electrical) (PIT, PDIT, LIT, ETC)	CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626, ICF DWGS	CIS-70-035 Electrical Devices-General Inspection	I	I/R	I/R	KK	R.M.

INSPECTION TEST PLAN

SCOPE OF WORK:
ELECTRICAL AND INSTRUMENTATION INSTALLATION

Client:	Baffin Iron Mines
Project name:	Baffinland- Mine Site
(Sub-)Contractor:	NUNA- ADCO
Contract No.:	CX-001
CWPs:	Treated Effluent Pump Station
ITP No.:	39

	Print	Sign	Date
Contractor QC Approved By	Kyle Krahl	KK	Nov 13 2019
Client QA Approved By			

Verification Index: I = Inspection, R = Review Test Results, W = Witness Test, H = Hold All Construction Activities

Activity No.	Activity Description	Acceptance Criteria	Verification Documents (Use all check sheets applicable to the installation)	Verification Description			ITP Closeout (Sign & Date when ITP Activity is completed for the scope or work)	
				Contr. Const.	Contr. QC	Client QA	Contr. QC Designate	Client QA Designate
4.2	Non-Powered Instrumentation Installation (Pressure Gauges; Sight Glass; Level Floats; Orifice Plates; Temperature Gauges; Strain Gauges, PRVs)	CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626, ICF DWGS	RF-I-004R0 RP-I-007R0	I	I/R	I/R	KK	D.M.
4.3	Flow Meter and flanged instrument installation torques (Use Instrument manufacturer torque recommendations)	CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626, ICF DWGS	RF-P-005R0	H	I/H/W	W	KK	
4.5	Instrumentation - Bench Test of All Instruments (Control Valves, Flow Meters, etc.)	CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626, ICF DWGS	Manufacturer Data Sheets Calibration Certifications	I/R	R	R	KK	
4.9	Instrumentation Cable Termination (Point to Point all cables)	CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626, ICF DWGS	RF-I-010R0	H	I/W	I/R	KK	
4.10	Instrument Grounding (Flow meter and all required instruments) (isolated grounding) (Cable shield isolation)	CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626, ICF DWGS	RF-I-002R0 RF-I-006R0	I	I	I/R	KK	
	Instrumentation Junction Box Installation and Panels (Marshalling Panels, Control Panels, PLCs Installation, Communication Cabinet, Telephone, Paging System, Data Processing Systems)	CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626, ICF DWGS	RF-I-008R0	I	I	I	KK	
4.15	Instrument Cold Loop Testing (Stage 1 Pre-commissioning)	CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626, ICF DWGS	RF-I-009R0 RF-I-011R0	I/R	W	I/R	KK	
4.16	Instrument Hot Loop Testing (Stage 2 commissioning)	CSA(CEC,M421), H353004-CX001-227-248-0001,H349000-S018626, ICF DWGS	TBA	I/R	W	W/R	KK	
4.17	Instrument Lists (As per IFC Instrument list)	CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626, ICF DWGS	As per Issued with scope of work	R	R	R	KK	
4.15	Instrument Cable Schedule (As per IFC Cable Schedule)	CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626, ICF DWGS	As per Issued with scope of work	R	R	R	KK	D.M.
6	**ITP CLOSE OUT**							
6.1	Construction Completion (Contractor Punch list & Final Walk down Punch list)	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001./ Vendor O&M Manuals. (Vendor recommendations) (CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626)	RF-G-009R0 RF-G-017R0 RF-G-024R0 RF-G-025R0	I	R	R	KK	D.M.
1.13	As Built Drawings complete (Red Line Condition)	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001./ Vendor O&M Manuals. (Vendor recommendations) (CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626)	RF-G-023R0 Print Index highlighted: Yellow for No Change, Red for Red Line As-Built	I/R/H	I/R	R	KK	D.M.
6.2	Certificate of Construction Completion	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001./ Vendor O&M Manuals. (Vendor recommendations) (CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626)	RF-G-019R0		R	R	KK	
6.3	Care & Custody Transfer Notification	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001 / Vendor O&M Manuals (Vendor recommendations) (CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626)	RF-G-018R0		R	R	KK	
6.4	Declaration of Construction Completion	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001./ Vendor O&M Manuals. (Vendor recommendations) (CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626)	RF-G-020R0		R	R	KK	
6.5	Turn Over Packages Review Completion Construction Verification Certificate Package Checklist Manufacturing Data Report (MDR Index)	Adco Group Quality Assurance Manual & Site Quality Plan H353004-00000-130-028-0001 / Vendor O&M Manuals. (Vendor recommendations) (CSA(CEC,M421), H353004-00000-200-078-0017,H349000-S018626)	RF-G-021R0		H	H	KK	

On the execution of the signatures below. The work package(s) and/or system(s)/sub-system(s) identified below shall be deemed complete and activities within this approved Inspection Test Plan(ITP) will been considered fulfilled in its entirety by the contactor.

Kyle Krahl / KK	Construction Manager	Nov 13 2019	WORK PACKAGE(S) COMPLETE AND CLOSED OUT:
CONTRACTOR QC DESIGNATE - Print/Sign	TITLE	DATE	
/			SYSTEM/SUB-SYSTEM
CLIENT QA DESIGNATE - Print/Sign	TITLE	DATE	

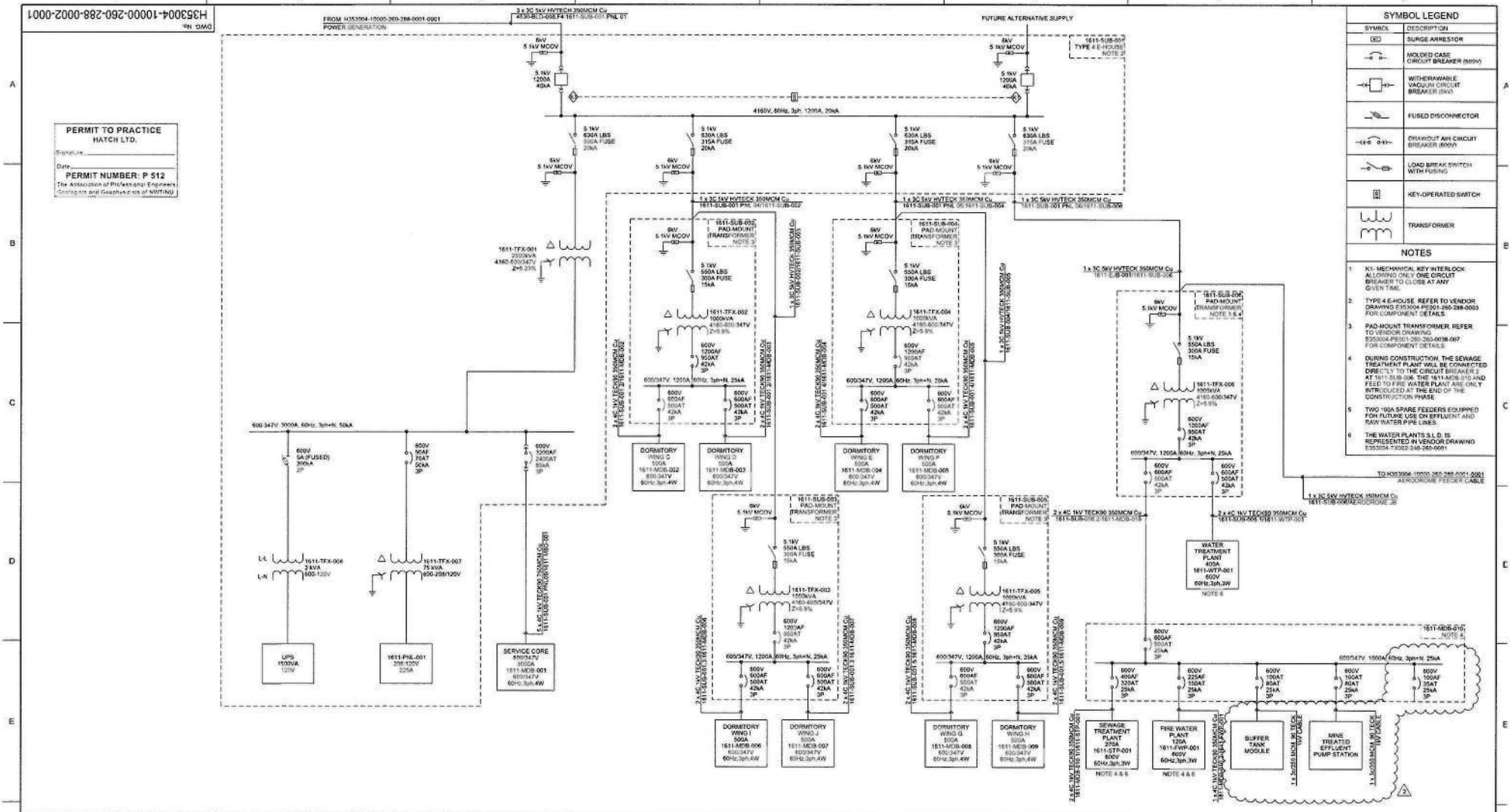
An effective and/or acceptable ITP should provide the client with a high degree of confidence that the work will be or has been, completed in accordance with the applicable contract, IFC Drawings, Specs, Standards, Codes, Regulatory Authorities, Vendors and Installation Procedures, etc. Therefore, a sufficient sampling of each (identified) activity must be inspected by the Contractor, in order to ensure that conformance is in fact, being achieved. ITPs help define the auditable documentation that will be produced by the Contractor for each activity. A sufficient number of activities must be identified in order to accurately reflect the Scope of Work.

SECTION 1: GENERAL

IFC Drawings

IFC DRAWING INDEX

Transmittal No.	Transmittal Date	Construction work Package (CWP)	Discipline	Document type	Status	Complete Drawing Number / Document Number	Drawing / Document Description	Revision	Format	Date Received	Distributed and Old Revision Archieved
		CWP-041	Electrical	Approved for Construction		H353004-10000-260-288-0002-0001_2	Mine Power Distribution Mine Accommodation Camp Single Line Drawing	2			
		CWP-041	Electrical	Approved For Use		H353004-10000-270-276-0003-0002	Mine Site Sewage Water Treatment Piping & Instrumentation Diagram	0			
		CWP-041	Electrical	Approved for Construction		H353004-10000-240-272-0001-0001	Mine Site Mine Effluent And Raw Water Pipeline Overall Layout	1			
			Electrical			J2775-PD-1 SHT 1	Pump Control/Power Panel Wiring Diagram	4			
			Electrical			J2775-PD-1 SHT 2	Pump Control/Power Panel Wiring Diagram	5			



DRAWING No	DRAWING TITLE
REFERENCE DRAWINGS	REG. PROFESSIONAL

APPROVED FOR CONSTRUCTION

No	DESCRIPTION	BY	CHK'D	DATE
2	NEW FEEDERS INCLUDED FOR BUFFER TANK & MINE TREATED EFFLUENT	DP	WDEB	16/08/2018
1	HOLDS REMOVED, 1611-EJB-001 REMOVED, 1611-MDB-010 ADDED	LvN	PK	02/11/2017
0	APPROVED FOR CONSTRUCTION	LvN	PK	20/09/2017

REVISIONS

HATCH

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	D PERROTTA	NR	
DESIGNER	D PERROTTA	NR	
CHECKER	L VAN NIEKERK		
DESIGN COORD	R GOOSEN		2018-08-30
RESP. ENG.	J WIKSTON		
LEAD DISC. ENG.	W DE BRUTO		2018-08-17
AREA LEAD	A ATIBA		
ENG. MANAGER	D STANGER		
AREA MANAGER	A ATIBA		
DRAWING APPROVAL STATUS	Approved for Construction		

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

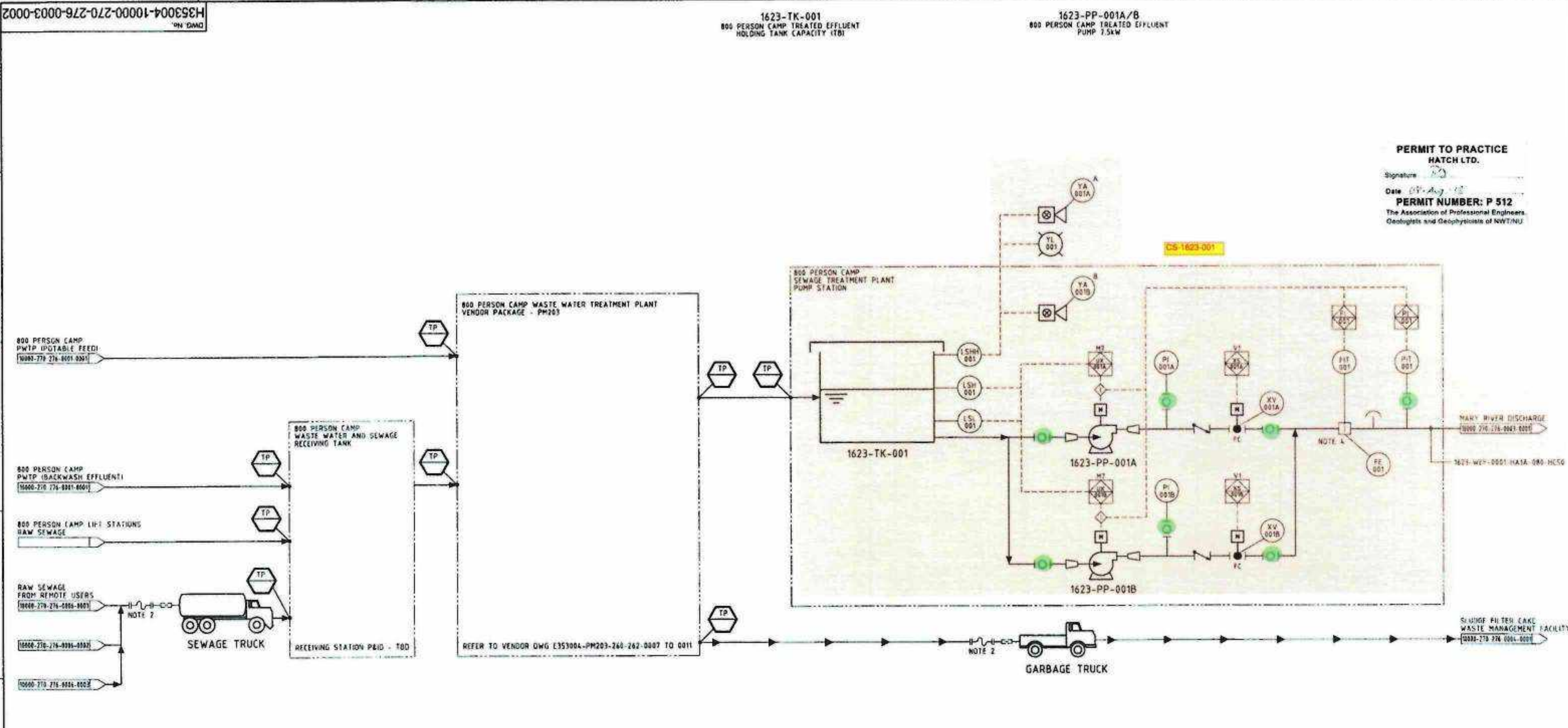
MINE POWER DISTRIBUTION
MINE ACCOMMODATION CAMP
SINGLE LINE DIAGRAM

SCALE	DWG No	REV
NTS OR AS NOTED	H353004-10000-260-288-0002-0001	2

SHEET SIZE D

dtc dwgservice

H353004-10000-270-276-0003-0002
DWG. No.



PERMIT TO PRACTICE
HATCH LTD.
Signature
Date 09-Aug-18
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

CS-1623-001 Treated Effluent Piping Change and associated heat trace from 800 man camp to tie in existing 3 line

NOTES
1. ALL INSTRUMENTS ARE VENDOR SUPPLIED
2. HOSE ARRANGEMENT IS PART OF THE TRUCK SHOWN FOR REFERENCE ONLY
3. VENDORS ARE RESPONSIBLE FOR STAMPING OF IFC PACKAGE DOCUMENTS.
4. CALORIMETRIC THERMAL MASS FLOW METER
5. ALL INSTRUMENT TAGS PRECEDED BY AREA CODE 1623

DRAWING No.	DRAWING TITLE
H349000-4731-75-031-0001	MINE SITE - SEWAGE WATER TREATMENT - PIPING & INSTRUMENTATION DIAGRAM

REFERENCE DRAWINGS

REG. PROFESSIONAL

FOR USE

No.	DESCRIPTION	BY	CHK'D	DATE
0	APPROVED FOR USE	HV	PC	11-07-2018

REVISIONS

HATCH

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	H VINCENT	NR	25-06-2018
DESIGNER		NR	
CHECKER	P CHERRY		
DESIGN COORD.	R GOOSEN		
RESP. ENG.	P JIM		
LEAD DISC. ENG.	P CHERRY		
AREA LEAD	T ATIBA		
ENG. MANAGER	D STANGER		
AREA MANAGER	T ATIBA		

DRAWING APPROVAL STATUS: Approved for Use

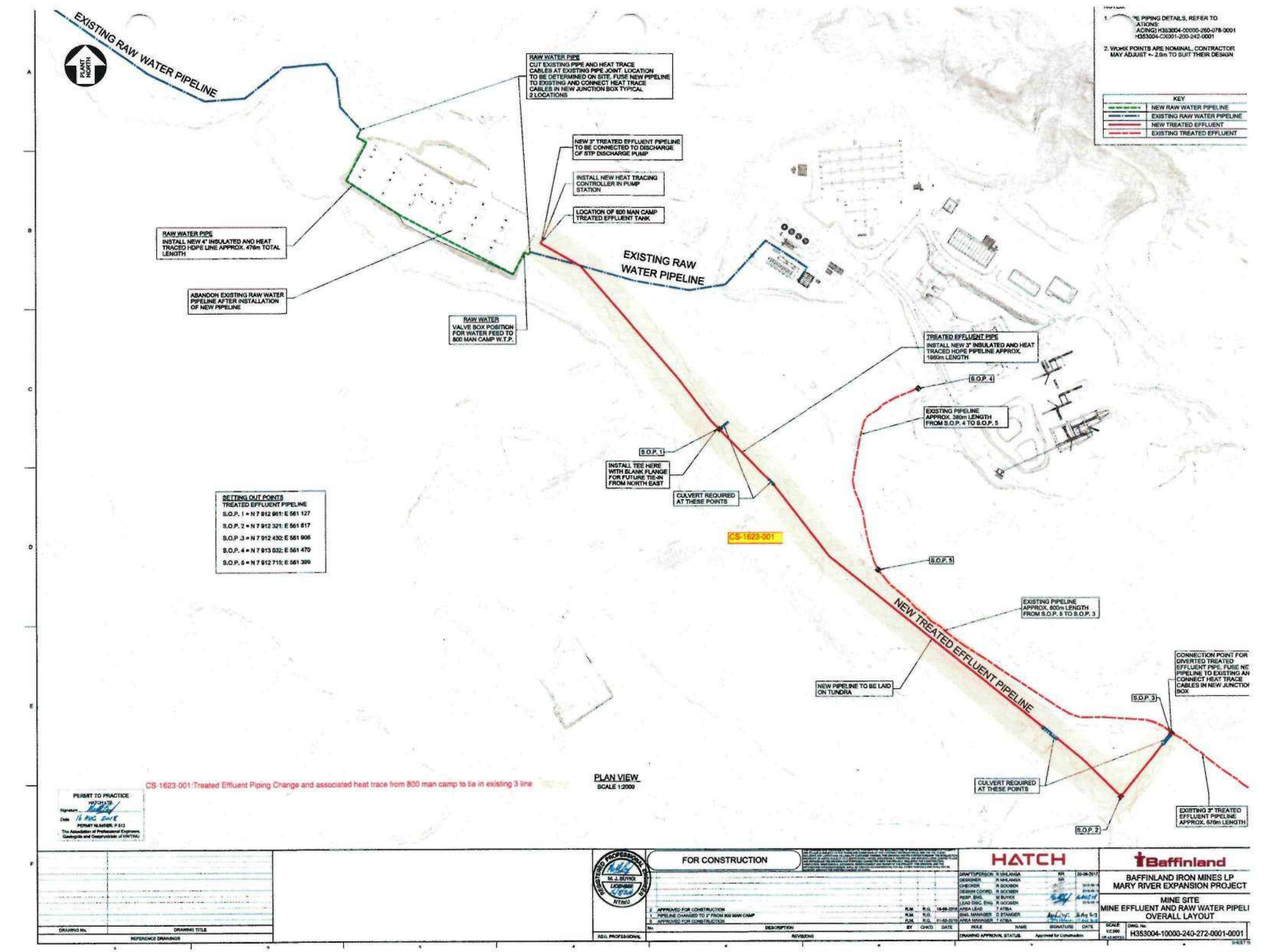
Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

MINE SITE
SEWAGE WATER TREATMENT
PIPING & INSTRUMENTATION DIAGRAM

SCALE NTS OR AS NOTED | DWG. No. H353004-10000-270-276-0003-0002 | REV 0

SHEET SIZE: D



CS-1623-001 Treated Effluent Piping Change and associated heat trace from 800 man camp to tie in existing 3 line

PLAN VIEW
SCALE 1:2000

PERMIT TO PRACTICE
HATCH LTD
Signature
Date 16 AUG. 2018
PERMIT NUMBER: P 513
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

REGISTERED PROFESSIONAL ENGINEER
M. J. BUYKX
LICENSEE
NT/NU

FOR CONSTRUCTION

No.	DESCRIPTION	BY	CHK'D	DATE
2	APPROVED FOR CONSTRUCTION	R.M.	R.G.	16-08-2018
1	PIPELINE CHANGED TO 3" FROM 800 MAN CAMP	R.M.	R.G.	
0	APPROVED FOR CONSTRUCTION	R.M.	R.G.	01-02-2018

REVISIONS

HATCH

DRAFTSPERSON	R MHLANGA	MR	20-09-2017
DESIGNER	R MHLANGA	MR	
CHECKER	R GOOSEN		
DESIGN COORD.	R GOOSEN		
RESP. ENG.	M BUYKX		
LEAD DISC. ENG.	R GOOSEN		
AREA LEAD	T ATIBA		
ENVL MANAGER	S STANGER		
AREA MANAGER	T ATIBA		

ROLE | NAME | SIGNATURE | DATE

DRAWING APPROVAL STATUS: Approved for Construction

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

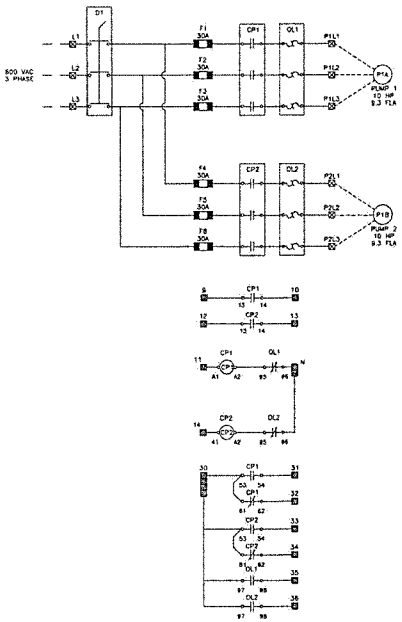
MINE SITE
MINE EFFLUENT AND RAW WATER PIPELI
OVERALL LAYOUT

SCALE: 1:2,000 (UNLESS NOTED)
DWG. No.: H353004-10000-240-272-0001-0001
SHEET 5

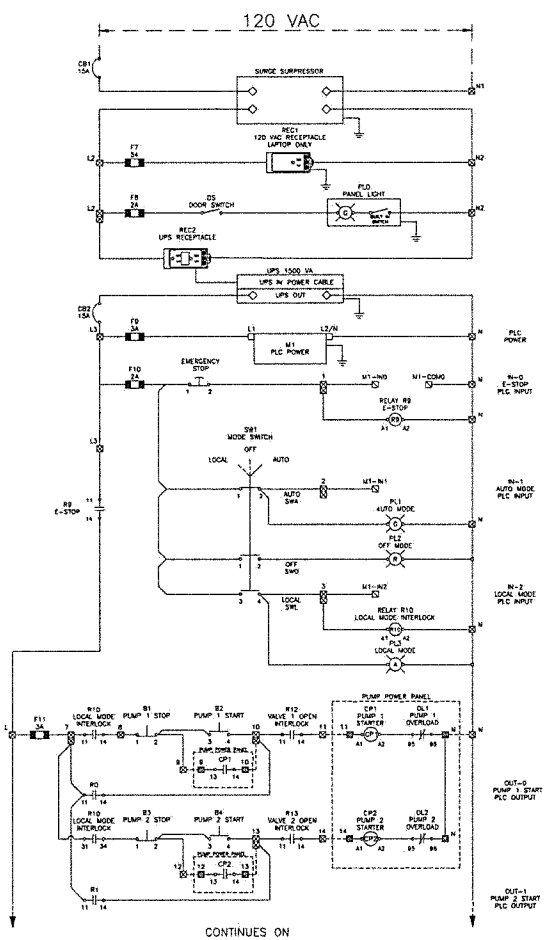
DRAWING No.	DRAWING TITLE
REFERENCE DRAWINGS	

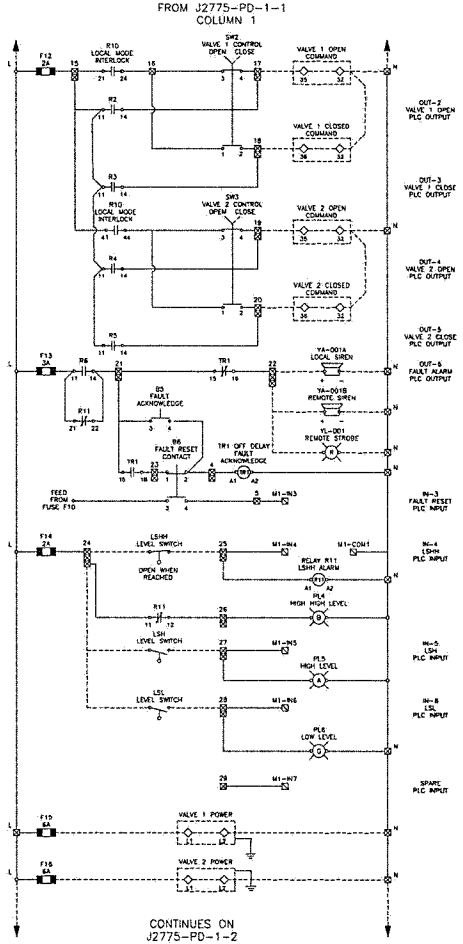
DRAWING NO. J2775-PD-1-1 REV 4

POWER PANEL WIRING SCHEMATIC



CONTROL PANEL WIRING SCHEMATIC





NOTES:

1. THE PANEL SHALL BE CSA APPROVED FOR GENERAL PURPOSE AND BEAR A CSA LABEL TERMINATION.
2. ALL INTERNAL WIRING MUST BE TERMINATED ON A CSA APPROVED TERMINAL BLOCKS
3. ALL TERMINAL BLOCKS TO BE LABELED, NUMBERED MATCHING WIRING DIAGRAM.
4. ALL WIRE TERMINATION TO HAVE SHRINKABLE WINEMAKERS WITH DESTINATION TERMINATION POINT. (TO LOCATION)
5. WIRES COLOR PER LISTING BELOW:
   - 5.1. 120/600 VAC POWER – BLACK
   - 5.2. 120 VAC NEUTRAL – WHITE
   - 5.3. 120 VAC CONTROL – BLACK
   - 5.4. 24 VDC POSITIVE – BLUE
   - 5.5. 24 VDC NEGATIVE – BROWN
   - 5.6. ANALOG POSITIVE – BLACK
   - 5.7. ANALOG NEGATIVE – WHITE
   - 5.8. GROUND – GREEN
6. ALL 120 VAC FIELD WIRING CONNECTS TO BOTTOM RIGHT SIDE OF TERMINALS ON TERMINAL STRIP TS1, CABLES TO BE RUN IN RIGHT MOST WIREWAY (BOTTOM ENTRY FOR EASIEST ACCESS).
7. FLOW METER AND PRESSURE SENSOR ANALOG SIGNAL CABLES TO BE CONNECTED TO TERMINALS ON TS-4, GROUNDED AT PANEL NOT AT INSTRUMENTS.
8. ALL PILOT LIGHTS FOR FAULTS ARE BLUE, FAULT STROBES ARE ALSO BLUE.
9. ITEMS 62 TO 65, (BLUE BEACONS AND SIREN) SHIPPED LOOSE AND TO BE INSTALLED AND WIRED SITE IN APPROPRIATE LOCATIONS.
10. UPS SHIPPED LOOSE AND TO BE INSTALLED AND WIRED TO CONTROL PANEL ON SITE. INSTALLATION STEPS:
    - 10.1. PRE CONNECT WIRES TO UPS SINCE AFTER INSTALLATION THERE WILL BE LIMITED ACCESS TO BACK OF UPS.
    - 10.5.1. CONNECT UPSR-1 AND UPSR-3 (LABELED BLUE WIRES) TO APPROPRIATE SCREW TERMINALS ON BACK OF UPS.
    - 10.9.2. PLUG PANELS INPUT POWER CORD (YELLOW SHRINK) TO RECEPTACLE ON THE UPS. THIS CORD HAS A 90 DEGREE PLUG.
    - 10.10. PLACE UPS IN THE CONTROL PANEL. UPS DISPLAY SHOULD BE FACING AWAY FROM LEFT ENCLOSURE WALL.
    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE-2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

REV.	ISSUE DATE Y	M	D	DESCRIPTION	DWN	CHK	ENG	APP	APP
4	19	2	16	AS BUILT	DI	DK			
3	18	2	1	ISSUED FOR PROGRAMING	DI	DK			
2	19	1	30	ISSUED FOR PROGRAMING	DI	DK			
1	19	1	28	ISSUED FOR REVIEW	DI	DK			
0	18	11	15	ISSUED FOR REVIEW	DI	DK			

REFERENCE DRAWINGS:

G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

DRAWING TITLE:

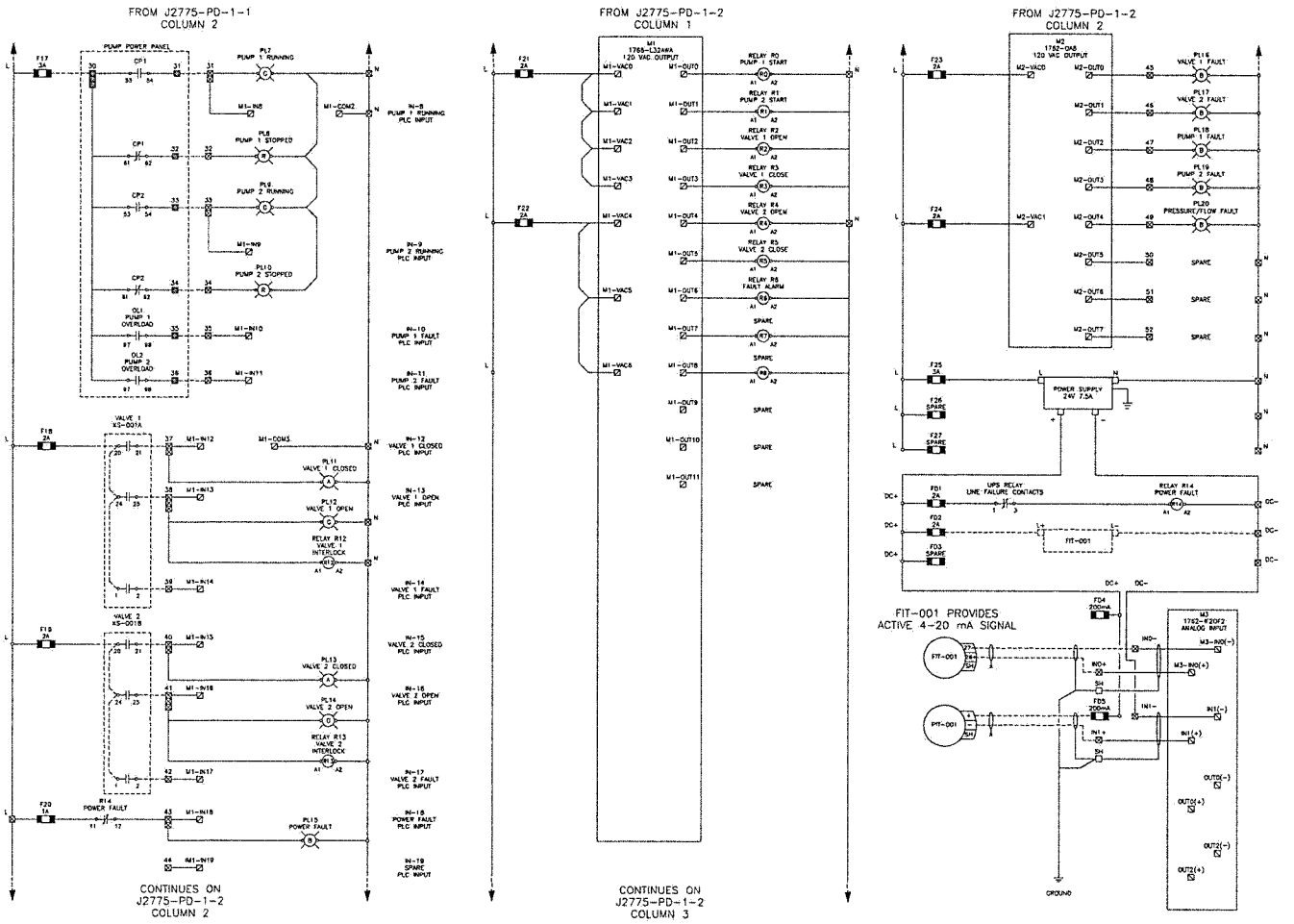
PUMP CONTROL/POWER PANEL WIRING DIAGRAM (PAGE 1 OF 2)

DRAWING NO.	SHT. No.	REV
J2775-PD-1	1	4

PLOT SCALE: X

DRAWING NO. J2775-PD-1-2 | REV. 5

CONTROL PANEL WIRING SCHEMATIC



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1. THE PANEL SHALL BE CSA APPROVED FOR GENERAL PURPOSE AND BEAR A CSA LABEL TERMINATION.
2. ALL INTERNAL WIRING MUST BE TERMINATED ON A CSA APPROVED TERMINAL BLOCKS
3. ALL TERMINAL BLOCKS TO BE LABELED, NUMBERED MATCHING WIRING DIAGRAM.
4. ALL WIRE TERMINATION TO HAVE SHRINKABLE WINEMAKERS WITH DESTINATION TERMINATION POINT. (TO LOCATION)
5. WIRES COLOR PER LISTING BELOW:
   - 5.1. 120/600 VAC POWER – BLACK
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   - 5.4. 24 VDC POSTIVE – BLUE
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    - 10.9.2. PLUG PANELS INPUT POWER CORD (YELLOW SHRINK) TO RECEPTACLE ON THE UPS. THIS CORD HAS A 90 DEGREE PLUG.
    - 10.10. PLACE UPS IN THE CONTROL PANEL. UPS DISPLAY SHOULD BE FACING AWAY FROM LEFT ENCLOSURE WALL.
    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE-2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

REV.	ISSUE DATE	DESCRIPTION	DWN	CHK	ENG	APP	APP
5	19 7 8	FIELD CHANGE	DI	DI			
4	19 2 18	AS BUILT	DI	DI			
3	19 2 1	ISSUED FOR PROGRAMING	DI	DI			
2	19 1 30	ISSUED FOR PROGRAMING	DI	DI			
1	19 1 28	ISSUED FOR REVIEW	DI	DI			
0	19 11 15	ISSUED FOR REVIEW	DI	DI			

REFERENCE ORAWINGS:

G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

DRAWING TITLE:

PUMP CONTROL/POWER PANEL WIRING DIAGRAM (PAGE 2 OF 2)

DRAWING NO.	SHT. No.	REV.
J2775-PD-1	2	5

PLOT SCALE: X

SECTION 1: GENERAL

Signature Log

SIGNATURE LOG

CONTRACTOR: Adco	CONTRACT NO.:	CWP:CVR-041	SUBSYSTEM: Treated Effluent
LOCATION: Mine Treated Effluent Pump Station			

NAME	SIGNATURE	INTIAL	POSITION	DATE (DD/MM/YY)
Andrew Hamilton		AHM	**Construction Manager**	31/08/2019
Jared Polachek		JP	**Pipe Fitter**	15/09/2019
Kris Krahl		KK	**Electrician**	31/08/2019
Kyle Krahl		KK	Construction manager	12/11/2019
Derek Pedlenski		DP	QA	12/11/19

Kyle Krahl /	Construction manager	Nov 12, 2019
CONTRACTOR QC DESINATE – Print/Sign	TITLE	DATE
Derek Pedlenski /	QA	12/11/19
CLIENT QA DESIGNATE – Print/Sign	TITLE	DATE

SECTION 1: GENERAL

Quality Surveillance Report

QUALITY SURVEILLANCE REPORT REGISTRY

QSR NO.	QSR ISSUED TO	CONTRACTOR	CONCTRACT NO.	AREA	LOCATION	CWP/ SUB-SYSTEM	ORIGINATOR	SURVEILANCE TYPE	DISCIPLINE	EQUIP. NO.	EQUIP. DESC.	SPEC. NO.	DRAW. NO.	DESCRIPTION OF ITEMS OR WORK SURVEILANCE	ROOT CAUSE	DISPOSTION PROPOSED	CORRECTIVE ACTION REPORT NO.	PREVENTATIVE ACTION REPORT NO.	DISPOSITION BY:	DISPOSITION BY TITLE:	DISPOSITION DATE:	QSR OPEN DATE	QSR CLOSE DATE
001		ADCO	3804 MEIP	Mine Site	Treated Effluent Pump Station	CVR-041	Andrew Hamilton	Workmanship/Quality	Mechanical					Leaking pipe spool	Bad glue joint	Repair	CVR-41-01		Jared Polachek	Pipe Fitter		Aug 15	Sep 15
002		ADCO	3804 MEIP	Mine Site	Treated Effluent Pump Station	CVR-041	Kyle Krahl	Material/Equipment	Electrical	1623-XV-001A	120V motorized butterly valve			Broken valve handle	Damaged while others manually drained tank	Repair	CVR-41-02					Aug 15	
003		ADCO	3804 MEIP	Mine Site	Treated Effluent Pump Station	CVR-041	Kyle Krahl	Material/Equipment	Electrical	1623-XV-001B	120V motorized butterly valve			Broken valve handle	Damaged while others manually drained tank	Repair	CVR-41-03					Aug 15	
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QUALITY SURVIELLANCE REPORT

QSR NO.: 001

QSR ISSUED TO:	ADCO	ORIGINATOR:	Kyle Krahl
CONTRACTOR:	ADCO		
CONTRACT NO.:	3804 MEIP	SIGNATUTE:	
LOCATION:	Treated Effluent Pump Station		
AREA:	Mine Site		
CWP/SUBSYSTEM:	CVR-041	DATE:	Aug 15 2019

REFERENCE DATA

QUALITY SURVIELLANCE TYPE:	Workmanship/Quality
CONSTRUCTION DISCIPLINE:	Mechanical
EQUIPMENT NO.:	0
EQUIPMENT DESCRIPTION:	0
SPECIFICATION NO.:	
DRAWING NO.:	

DISCRIPTION OF QUALITY SURVIELLANCE

Leaking pipe spool

ROOT CAUSE

Bad glue joint

QUALITY SURVIELLANCE DISPOSITION

DISPOSITION PROPOSED: Repair

DISPOSITION AS PER:
- CORRECTIVE ACTION REPORT.: CVR-41-01
- PREVENTATIVE ACTION REPORT NO.: 0

NAME: Kyle Krahl TITLE: Const. Manager DATE: Sept 15 2019

DISPOSITION ACTION COMPLETION AND QSR CLOSE OUT

Kyle Krahl /		Construction manager	Nov 14, 2019
CONSTRUCTION DESIGNATE - Print/Sign		TITLE	DATE
/			
CONTRACTOR QC DESIGNATE - Print/Sign		TITLE	DATE
D. Moffett /		Construction	14-Nov-19
CLIENT QA DESIGNATE - Print/Sign (If Applicable)		TITLE	DATE

QUALITY SURVIELLANCE REPORT

QSR NO.: 002

QSR ISSUED TO:	ADCO	ORIGINATOR:	Kyle Krahl
CONTRACTOR:	ADCO		
CONTRACT NO.:	3804 MEIP	SIGNATUTE:	
LOCATION:	Treated Effluent Pump Station		
AREA:	Mine Site		
CWP/SUBSYSTEM:	CVR-041	DATE:	Aug 15 2019

REFERENCE DATA

QUALITY SURVIELLANCE TYPE:	Material/Equipment
CONSTRUCTION DISCIPLINE:	Electrical
EQUIPMENT NO.:	0
EQUIPMENT DESCRIPTION:	120V motorized butterfly valve
SPECIFICATION NO.:	
DRAWING NO.:	

DISCRIPTION OF QUALITY SURVIELLANCE

Broken valve handle

ROOT CAUSE

Damaged while others manually drained tank

QUALITY SURVIELLANCE DISPOSITION

DISPOSITION PROPOSED:	Repair		
DISPOSITION AS PER:	CORRECTIVE ACTION REPORT.:	CVR-41-02	
	PREVENTATIVE ACTION REPORT NO.:	0	
NAME:	TITLE:	DATE:	

DISPOSITION ACTION COMPLETION AND QSR CLOSE OUT

Kyle Krahl /	Construction manager	
CONSTRUCTION DESIGNATE - Print/Sign	TITLE	DATE
/		
CONTRACTOR QC DESIGNATE - Print/Sign	TITLE	DATE
Dean Moffett /	construction	14-Nov-19
CLIENT QA DESIGNATE - Print/Sign (If Applicable)	TITLE	DATE

* Repair outstanding. Material not on site
Job Suspended

QUALITY SURVIELLANCE REPORT

QSR NO.: 003

QSR ISSUED TO:	ADCO	ORIGINATOR:	Kyle Krahl
CONTRACTOR:	ADCO		
CONTRACT NO.:	3804 MEIP	SIGNATUTE:	
LOCATION:	Treated Effluent Pump Station		
AREA:	Mine Site		
CWP/SUBSYSTEM:	CVR-041	DATE:	Aug 15 2019

REFERENCE DATA

QUALITY SURVIELLANCE TYPE:	Material/Equipment
CONSTRUCTION DISCIPLINE:	Electrical
EQUIPMENT NO.:	0
EQUIPMENT DESCRIPTION:	120V motorized butterly valve
SPECIFICATION NO.:	
DRAWING NO.:	

DISCRIPTION OF QUALITY SURVIELLANCE

Broken valve handle

ROOT CAUSE

Damaged while others manually drained tank

QUALITY SURVIELLANCE DISPOSITION

DISPOSITION PROPOSED: Repair

DISPOSITION AS PER: CORRECTIVE ACTION REPORT.: CVR-41-03

PREVENTATIVE ACTION REPORT NO.: 0

NAME: TITLE: DATE:

DISPOSITION ACTION COMPLETION AND QSR CLOSE OUT

Kyle Krahl /	Construction manager	
CONSTRUCTION DESIGNATE - Print/Sign	TITLE	DATE
/		
CONTRACTOR QC DESIGNATE - Print/Sign	TITLE	DATE
D. Moffett /	Construction	14-Nov.19
CLIENT QA DESIGNATE - Print/Sign (If Applicable)	TITLE	DATE

Repair outstanding. Material not on site

Job suspended

SECTION 1: GENERAL

Corrective Action Report

CORRECTIVE ACTION REPORT REGISTRY

CAR NO.	CAR ISSUED TO	CONTRACTOR	CONCTRACT NO.	AREA	LOCATION	CWP/ SUB-SYSTEM	ORIGINATOR	ORIGINATING REPORT	ORIGINATING REPORT NO.:	SURVEILANCE TYPE	DISCIPLINE	EQUIP. NO.	EQUIP. DESC.	SPEC. NO.	DRAW. NO.	DESCRIPTION OF NON-CONFORMANCE, SURVIELLANCE OR AUDIT	ROOT CAUSE	CORRECTIVE ACTION	ENGINEERING REVIEWED AND APPROVED	ENGINEERING COMMENTS	COMMENTS	ENGINEER NAME	ENGINEER TITLE	ENGINEER REVIEW DATE	CAR OPEN DATE	CAR CLOSE DATE
001		ADCO	3B04 MEIP	Mine Site	Treated Effluent Pump Station	CVR-041	Andrew Hamilton	QUALITY SURVIELLANCE	CVR-41-01	Integrity/Testing	Piping					Leaking pipe spool	Bad glue joint	Repair	N/A	N/A	Interal deficiency before turnover.	N/A	N/A	N/A	Aug 15	Sept 15
002		ADCO	3804 MEIP	Mine Site	Treated Effluent Pump Station	CVR-041	Kyle Krahl	QUALITY SURVIELLANCE	CVR-41-02	Material/Equipment	Electrical	1623-XV-001A	120V motorized butterly valve			Broken valve handle	Damaged while others manually drained tank	Repair	N/A	N/A	Interal deficiency before turnover.	N/A	N/A	N/A	Aug 15	
003		ADCO	3B04 MEIP	Mine Site	Treated Effluent Pump Station	CVR-041	Kyle Krahl	QUALITY SURVIELLANCE	CVR-41-03	Material/Equipment	Electrical	1623-XV-001B	120V motorized butterly valve			Broken valve handle	Damaged while others manually drained tank	Repair	N/A	N/A	Interal deficiency before turnover.	N/A	N/A	N/A	Aug 15	
004																										
005																										
006																										
007																										
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CORRECTIVE ACTION REPORT

CAR NO.: 001

CAR ISSUED TO:	ADCO	ORIGINATOR:	Kyle Krahl
CONTRACTOR:	ADCO		
CONTRACT NO.:	3804 MEIP	SIGNATURE:	
LOCATION:	Treated Effluent Pump Station		
AREA:			
CWP/SUBSYSTEM:	CVR-041	DATE:	Aug 15, 2019

REFERENCE DATA

ORIGINATING REPORT:		REPORT NO.:	CVR-41-01
QUALITY SURVIELLANCE TYPE:	Workmanship/Quality		
CONSTRUCTION DISCIPLINE:	Piping		
EQUIPMENT NO.:	0		
EQUIPMENT DESCRIPTION:	Pipe Spool		
SPECIFICATION NO.:			
DRAWING NO.:			

DESCRIPTION OF NON-CONFORMANCE, QUALITY SURVEILANCE OR AUDIT

Leaking pipe spool

ROOT CAUSE

Bad glue joint

CORRECTIVE ACTION

Repair

ENGINEERING REVIEW OF CORRECTIVE ACTION

ENGINEERING REVIEWED AND APPROVED: COMMENTS: (SEE BELOW)

Interal deficiency before turnover.

NAME: TITLE: DATE:

CORRECTIVE ACTION COMPLETION AND NCR CLOSE OUT

Kyle Krahl /		Construction manager	Nov 14 2019
CONSTRUCTION DESIGNATE - Print/Sign		TITLE	DATE
/			
CONTRACTOR QC DESIGNATE - Print/Sign		TITLE	DATE
B. Moffatt /		CM	14-Nov-19
CLIENT DESIGNATE - Print/Sign (If Applicable)		TITLE	DATE

CORRECTIVE ACTION REPORT

CAR NO.: 002

CAR ISSUED TO:	ADCO	ORIGINATOR:	Kyle Krahl
CONTRACTOR:	ADCO		
CONTRACT NO.:	3804 MEIP	SIGNATURE:	
LOCATION:	Treated Effluent Pump Station		
AREA:			
CWP/SUBSYSTEM:	CVR-041	DATE:	

REFERENCE DATA

ORIGINATING REPORT:		REPORT NO.:	CVR-41-02
QUALITY SURVIELLANCE TYPE:	Workmanship/Quality		
CONSTRUCTION DISCIPLINE:	Electrical		
EQUIPMENT NO.:	1623-XV-001A		
EQUIPMENT DESCRIPTION:	120V motorized butterly valve		
SPECIFICATION NO.:			
DRAWING NO.:			

DESCRIPTION OF NON-CONFORMANCE, QUALITY SURVEILANCE OR AUDIT

Broken valve handle

ROOT CAUSE

Damaged while others manually drained tank

CORRECTIVE ACTION

Repair

Note repair outstanding. Material not on Site
Job Suspended.

ENGINEERING REVIEW OF CORRECTIVE ACTION

ENGINEERING REVIEWED AND APPROVED:	COMMENTS: (SEE BELOW)
Interal deficiency before turnover.	

NAME: TITLE: DATE:

CORRECTIVE ACTION COMPLETION AND NCR CLOSE OUT

Kyle Krahl /	Construction manager	Nov 13 2019
CONSTRUCTION DESIGNATE - Print/Sign	TITLE	DATE
/		
CONTRACTOR QC DESIGNATE - Print/Sign	TITLE	DATE
/		
CLIENT DESIGNATE - Print/Sign (If Applicable)	TITLE	DATE

CORRECTIVE ACTION REPORT

CAR NO.: 003

CAR ISSUED TO:	ADCO	ORIGINATOR:	Kyle Krahl
CONTRACTOR:	ADCO		
CONTRACT NO.:	3804 MEIP	SIGNATURE:	
LOCATION:	Treated Effluent Pump Station		
AREA:			
CWP/SUBSYSTEM:	CVR-041	DATE:	

REFERENCE DATA

ORIGINATING REPORT:		REPORT NO.:	CVR-41-03
QUALITY SURVIELLANCE TYPE:	Workmanship/Quality		
CONSTRUCTION DISCIPLINE:	Electrical		
EQUIPMENT NO.:	1623-XV-001B		
EQUIPMENT DESCRIPTION:	120V motorized butterly valve		
SPECIFICATION NO.:			
DRAWING NO.:			

DESCRIPTION OF NON-CONFORMANCE, QUALITY SURVEILANCE OR AUDIT

Broken valve handle

ROOT CAUSE

Damaged while others manually drained tank

CORRECTIVE ACTION

Repair

Note repair outstanding. material not on site
Job suspended

ENGINEERING REVIEW OF CORRECTIVE ACTION

ENGINEERING REVIEWED AND APPROVED:	COMMENTS: (SEE BELOW)
Interal deficiency before turnover.	

NAME: TITLE: DATE:

CORRECTIVE ACTION COMPLETION AND NCR CLOSE OUT

Kyle Krahl /	Construction manager	Nov 13 2019
CONSTRUCTION DESIGNATE - Print/Sign	TITLE	DATE
/		
CONTRACTOR QC DESIGNATE - Print/Sign	TITLE	DATE
/		
CLIENT DESIGNATE - Print/Sign (If Applicable)	TITLE	DATE

SECTION 1: GENERAL

Written Inspection Request

INSPECTION REQUEST REGISTRY

IR No.	Project Name	Location	Contractor	Date issued	Contract No.	CWP	Area	Disc.	Type	Description	Reference Dwg. No/ Rev. No.	I/R Date &Time Inspected
0001	CVR-041	Treated Effluent Pump Station	ADCO		3804 MEIP	CVR-041	Treated Effluent Pumping Station			Pre Commisioning checks	H353004-CX001-227-248-0001	
0002												
0003												
0004												
0005												
0006												
0007												
0008												
0009												
0010												
0011												
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0022												

SECTION 1: GENERAL

RFI Registry

REQUEST FOR INFORMATION REGISTRY

RFI No.	Document No.	TO	FROM	Subject	DATE	REF Doc No.1	Requested Required By	Engineering Response	Prepared by	Engineer Approved By	Date
0001	RFI-013	HATCH	ADCO/NUNA	Level sensor lengths	2018-10-30		Colin Burd	Proceed as recommended		Glen Peace	11-Dec-2018
0002	RFI-015	HATCH	ADCO/NUNA	Power and Control clarification	2018-11-26		Colin Burd	Lots of comments on control panel requirements	Hermien Venter		2018-12-10
0003	RFI-022	HATCH	ADCO/NUNA	Space for electrical equipment	2019-03-06		Kyle Krahl/ Ryan Dicker	Will review and issue SI with path forward	Dean Moffett	Scott Deyoung	25-Apr-2019
0004	RFI-026	HATCH	ADCO/NUNA	Effluent seacan heat	2019-04-07		Kyle Krahl/ Ryan Dicker	Project will review heat requirements and issue a SI with path forward	Dean Moffett	Scott Deyoung	25-Apr-2019
0005											
0006											
0007											
0008											
0009											
0010											
0011											
0012											
0013											
0014											
0015											

Project Name:	**Mary River Expansion Stage 3**	**Project Number:**	**H353004**
CWP No:		**RFI No: 0013**	
Contractor: Nuna East Ltd.		**Contract No: CX001**	
Initiated By: Colin Burd		**Cost impact?**	**Y☒/ N☐**
Date of Submittal: 2018 – 10 - 30		**Schedule Impact?**	**Y☒ / N☐**

Information Requested:
In regards to the effluent pump station, please confirm the sensor lengths for the low, high, and high-high level sensors. Nuna is recommending the following sensor lengths:

- Low: 48"
- High: 12"
- High-High: 6"

See attached marked-up drawing for reference.

Reference Document No.	Revision	Title/Description
	0	

RFI Classification:

Design	☒	Construction	☒	Fabricator/Vendor	☐
Routine Request	☐	Clarification	☐	Other	☐

Project Response: [attach sufficient detail as required]

PROCEED AS YOU HAVE RECOMMENDED

RFI Follow-up Requirements:

Contract Order Issued	Yes ☐/No ☐ (insert associated tracking #)	Back-Charge Required	(Yes ☐/No ☐)
As-Built Required	Yes ☐/No ☐	Materials Required	(Yes ☐/No ☐)

RFI Receipts and Approvals

Stakeholder	Name	Signature	Date <YYYY-MM-DD>
Hatch Construction Management			
Hatch Engineering Home Office ☐ Site ☐	G. PEACE		2018-12-11

Hatch Project Management	HERMIEN VENTER		2018-12-11
Client (as required):			

Request for Information

Note: The response to this RFI is NOT an authorization to perform a change to the Contract. Work may proceed in accordance with the response only if such work involves NO change in cost or schedule. In the case where the response may involve change in cost or schedule, a Contractual instrument must be issued by Hatch and received by the Contractor before the response can be executed. Where no Contractual instrument is indicated, action must be taken in accordance with (reference appropnate Contract Sections that authorize execution of any change in schedule and cost).

Request for Information

Project Name:	Mary River Expansion Stage 3	Project Number:	H353004
CWP No:		RFI No: 0015	
Contractor: Nuna East Ltd.		Contract No: CX001	
Initiated By: Colin Burd		Cost impact?	Y☒/ N☐
Date of Submittal: 2018 – 11 – 26		Schedule Impact?	Y☒ / N☐

Information Requested:
Nuna is requesting clarification/confirmation in regard to the effluent pump station for the following:

1. Approval of attached control drawings
2. Is there 120 VAC available for the panel in addition to the 600V for the pumps? If so this would eliminate the requirement for a transformer.
3. The design calls for a MicroLogix 1400 controller (1766-L32AWA), Please confirm this is acceptable

Reference Document No.	Revision	Title/Description
	0	

RFI Classification:

Design	☒	Construction	☒	Fabricator/Vendor	☐
Routine Request	☐	Clarification	☐	Other	☐

Project Response: [attach sufficient detail as required]

See below

RFI Follow-up Requirements:

Contract Order Issued Yes ☐/No ☐ ([insert associated tracking #]) Back-Charge Required (Yes ☐/No ☐)

As-Built Required Yes ☐/No ☐ Materials Required (Yes ☐/No ☐)

RFI Receipts and Approvals

Stakeholder	Name	Signature	Date <YYYY-MM-DD>
Hatch Construction Management			
Hatch Engineering Home Office ☐ Site ☐		Digitally signed by scot.deyoung@hatch.com DN: cn=scot.deyoung@hatch.com Date: 2018.12.10 09:42:16 -05'00'	
Hatch Project Management	HERMIEN VENTER		2018/12/10
Client (as required):			

Note: The response to this RFI is NOT an authorization to perform a change to the Contract. Work may proceed in accordance with the response only if such work involves NO change in cost or schedule. In the case where the response may involve change in cost or schedule, a Contractual instrument must be issued by Hatch and received by the Contractor before the response can be executed. Where no Contractual instrument is indicated, action must be taken in accordance with (reference appropriate Contract Sections that authorize execution of any change in schedule and cost).

Comments on the drawings.
General comments:
- note 2 should read Terminal Block
- note 4 should read wire-markers

A Parts List is not included (relays, starters, overload protection etc.)
No Circuit breakers and Isolators are shown - it should be possible to switch off power to each section/ module/valve/pump etc. of the system, or all of it.
No surge arrestors are shown.
How will the UPS be incorporated into the wiring - the valves must close on loss of power.
The instrument and electrical grounding detail is insufficient.
The contractor needs to consider the following clauses from the specification:
2.6.16.7 All PLC and networking equipment, controller cabinet equipment, remote I/O cabinet equipment, HMI, and instrumentation associated with emergency equipment shall be connected to UPS having a full load rating of 30 minutes and will be supplied by emergency power. UPS units shall be used as necessary to provide transition between mainline power and emergency power.
2.6.17.4 Panels shall be provided with interior lighting and duplex, grounded-type 120 VAC, 60 Hz receptacles. An automatic light with manual override shall be mounted at the top of the panels near the front to allow for adequate lighting during installation and servicing of the equipment.
2.6.17.8 Power supply for control panel receptacles, heaters, lights, etc., shall be completely independent from instrument power sources in the panel.
2.6.17.5 The instrument ground bus in each cabinet shall be tied together using an insulated conductor. The instrument signal common from all devices in each cabinet shall be connected to the instrument ground.
2.6.17.26 Power signals and control signals shall have separate enclosures.
2.6.17.27 Terminal strips and wire-ways in panels and cabinets shall be segregated by voltage level and function as follows:
120 VAC power, control, and discrete input wiring (shroud and warning label).
Instrument or control system communications.
4 - 20 mA analog signals.
Other than the above its ok.
We need to include in our response the following comment
"Approval does not relieve the contractor of their design obligations as set out in the contract".
The PLC is the correct unit.

Project Name:	**Mary River Expansion Stage 3**	**Project Number:**	**H353004**
CWP No: CVR-041 R1 – Effluent Pump Station		**RFI No: 0022**	
Contractor: Nuna East Ltd.		**Contract No: CX001**	
Initiated By: Kyle Krahl / Ryan Dicker		**Cost impact?**	**Y☒/N☐**
Date of Submittal: 2019 – 03 – 06		**Schedule Impact?**	**Y☒/N☐**

Information Requested:
Nuna East is requesting information for the electrical installation of the effluent pumping station.

There is not enough physical space inside the existing effluent tank seacan for proper installation of the electrical panel and pump disconnect. The layout of the pumps in the design do not leave the required 1 meter of clearance in front of the electrical panels required by CEC Rule 2-308.

The attached mechanical layout drawing "Pump Station Dimensions" indicates the space available in corner of the seacan where the electrical panels had been proposed to be installed. The dimensions of the panels are provided in the other attached document, "Pump Station Panels".

Please provide an alternative mounting location for these panels.

Reference Document No.	Revision	Title/Description
H353004-CX001-227-248-0001_0_V3	0	Treated effluent pump station scope of work Pump station dimensions Pump station panels

RFI Classification:

Design	☒	Construction	☒	Fabricator/Vendor	☐
Routine Request	☐	Clarification	☒	Other	☐

Project Response: [attach sufficient detail as required]

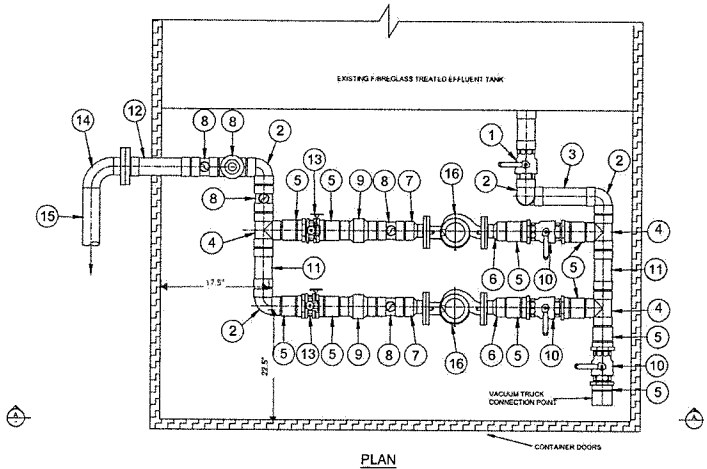
We will review email dated 10th of March and issue site instruction with path forward.

RFI Follow-up Requirements:

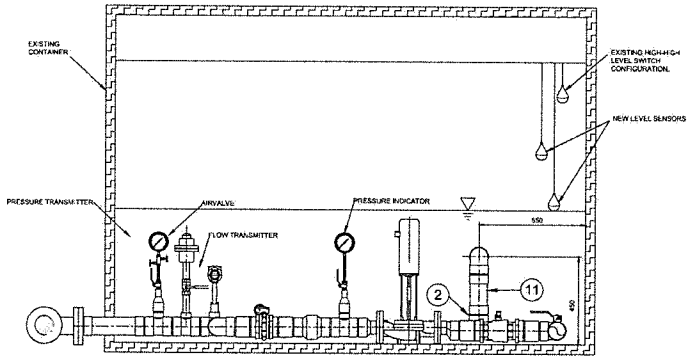
Contract Order Issued	Yes ☐/No ☐	([insert associated tracking #])		Back-Charge Required	(Yes ☐/No ☐)
As-Built Required	Yes ☐/No ☐			Materials Required	(Yes ☐/No ☐)

RFI Receipts and Approvals

Stakeholder	Name	Signature	Date <YYYY-MM-DD>
Hatch Construction Management		dean.moffett@hatch.com Digitally signed by dean.moffett@hatch.com DN: cn=dean.moffett@hatch.com Date: 2019.04.25 15:17:25 -04'00'	
Hatch Engineering Home Office ☐ Site ☐		scot.deyoung@hatch.com 2019.04.25 13:47:57 -04'00'	



PLAN
SCALE 1:10



SECTION A-A
SCALE 1:10

800-MAN CAMP: PIPE AND PIPE FITTING SCHEDULE

ITEM No.	DIAMETER	No. OF	ITEM DESCRIPTION
1	3"	1	EXISTING OUTLET NOZZLE ON TANK FITTED WITH BALL VALVE. EXISTING NOZZLE TO TIE IN WITH NEW 3" PVC BEND
2	3"	5	PVC 90° ELBOW WITH SOCKET ON BOTH ENDS
3	3"	1	PVC PIPE 300mm
4	3"	3	PVC EQUAL TEE PIECE WITH SOCKETS
5	3"	4	PVC VALVE SOCKET
6	3"x2"	2	DN 3" X DN 2" PVC ECCENTRIC REDUCER.
7	3"x2"	2	DN 3" X DN 2" PVC CONCENTRIC REDUCER.
8	3"x1"	5	DN 3" X DN 1" PVC REDUCING TEE-PIECE WITH SOCKETS ON ALL ENDS.
9	3"	2	PVC TYPE CHECK VALVE.
10		3	DN 3" FULL BORE PVC BALL VALVE
11	3"	3	PVC PIPE 200mm
12	3"	1	PVC PIPE 300mm FLANGED ON ONE END.
13	3"	2	DN 3" ACTUATED BUTTERFLY VALVE
14	3"	1	HDPE SDR11, 90° ELBOW FLANGED ON ONE END
15	3"		NEW 3" PIPELINE.
			PUMPS
16	-	2	DUTY AND STANDBY : GOULDS 16SV5FC30 MULTISTAGE VERTICAL PUMP OR SIMILAR APPROVED

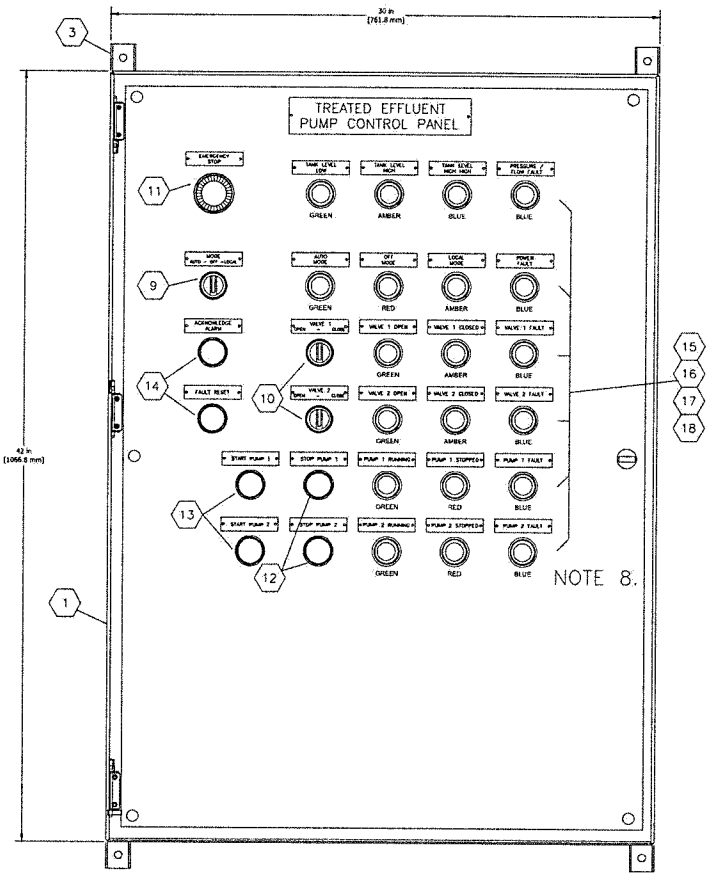
PIPE AND FITTING SPECIFICATIONS

1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH THE PROJECT PARTICULAR SPECIFICATIONS.
2. ALL PVC PIPES TO BE CLASS 12

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR FINAL CUT LENGTHS ON THE PIPE AND FITTING SCHEDULE
2. DIMENSIONS ARE APPROXIMATE
3. CONTRACTOR TO TAKE ACCURATE MEASUREMENTS OF THE EXISTING TANK, NOZZLE AND CONTAINER ON SITE.
4. PIPELINE TO BE HEAT TRACED AND INSULATED OUTSIDE OF THE PUMP ROOM CONTAINER

FRONT VIEW



NOTES:

1. THE PANEL SHALL BE CSA APPROVED FOR GENERAL PURPOSE AND BEAR A CSA LABEL TERMINATION.
2. ALL INTERNAL WIRING MUST BE TERMINATED ON A CSA APPROVED TERMINAL BLOCKS.
3. ALL TERMINAL BLOCKS TO BE LABELED, NUMBERED MATCHING WIRING DIAGRAM.
4. ALL WIRE TERMINATION TO HAVE SHRINKABLE WINEMAKERS WITH DESTINATION TERMINATION POINT. (TO LOCATION)
5. WIRES COLOR PER LISTING BELOW:
   - 5.1. 120/600 VAC POWER – BLACK
   - 5.2. 120 VAC NEUTRAL – WHITE
   - 5.3. 120 VAC CONTROL – BLACK
   - 5.4. 24 VDC POSITIVE – BLUE
   - 5.5. 24 VDC NEGATIVE – BROWN
   - 5.6. ANALOG POSITIVE – BLACK
   - 5.7. ANALOG NEGATIVE – WHITE
   - 5.8. GROUND – GREEN
6. ALL 120 VAC FIELD WIRING CONNECTS TO BOTTOM RIGHT SIDE OF TERMINALS ON TERMINAL STRIP TS1. CABLES TO BE RUN IN RIGHT MOST WIREWAY (BOTTOM ENTRY FOR EASIEST ACCESS).
7. FLOW METER AND PRESSURE SENSOR ANALOG SIGNAL CABLES TO BE CONNECTED TO TERMINALS ON TS-4. GROUNDED AT PANEL NOT AT INSTRUMENTS.
8. ALL PILOT LIGHTS FOR FAULTS ARE BLUE, FAULT STROBES ARE ALSO BLUE.
9. ITEMS #2 TO #3, (BLUE BEACONS AND SIREN) SHIPPED LOOSE AND TO BE INSTALLED AND WIRED SITE IN APPROPRIATE LOCATIONS.
10. UPS SHIPPED LOOSE AND TO BE INSTALLED AND WIRED TO CONTROL PANEL ON SITE. INSTALLATION STEPS:
    - 10.1. PRE CONNECT WIRES TO UPS SINCE AFTER INSTALLATION THERE WILL BE LIMITED ACCESS TO BACK OF UPS.
    - 10.5.1. CONNECT UPSR-1 AND UPSR-3 (LABELED BLUE WIRES) TO APPROPRIATE SCREW TERMINALS ON BACK OF UPS.
    - 10.9.2. PLUG PANELS INPUT POWER CORD (YELLOW SHRINK) TO RECEPTACLE ON THE UPS. THIS CORD HAS A 90 DEGREE PLUG.
    - 10.10. PLACE UPS IN THE CONTROL PANEL. UPS DISPLAY SHOULD BE FACING AWAY FROM LEFT ENCLOSURE WALL.
    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE-2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

REV	ISSUE DATE	DESCRIPTION	DWN	CHK	ENG	APP	APP
3	16 2 16	AS BUILT	SI	SK			
1	16 1 20	ISSUED FOR REVIEW	SI	SK			
0	16 11 16	ISSUED FOR REVIEW	SI	SK			

REFERENCE DRAWINGS:

G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

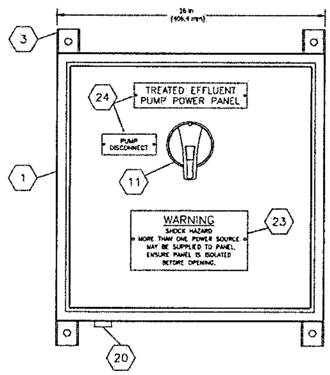
DRAWING TITLE:
PUMP CONTROL PANEL
DOOR LAYOUT DETAILS

DRAWING NO.	SHT. No.	REV
J2775-PD-1	5	2

DRAWING NO. J2775-PD-1-5 REV 2

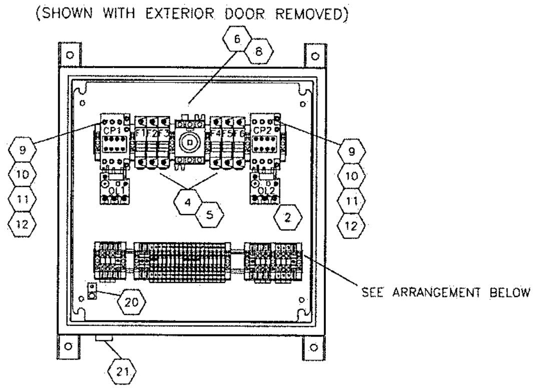
PLOT SCALE: X

FRONT VIEW

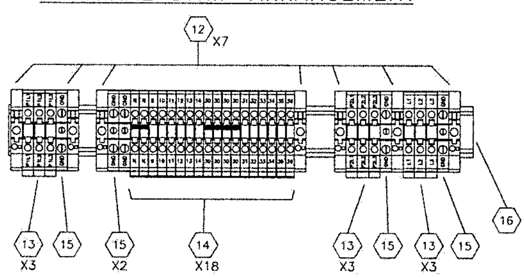


FRONT VIEW

(SHOWN WITH EXTERIOR DOOR REMOVED)



TERMINAL STRIP ARRANGEMENT



BILL OF MATERIAL

ITEM	QTY.	DESCRIPTION
1	1	HOFFMAN, ENCLOSURE, STAINLESS STEEL, 16" W X 16" H X 8" D, CONCEPT, #CSD161608SS
2	1	HOFFMAN, BACK PANEL, FITS 16" W X 16 "H, 12 GAUGE, #CP1616
3	1	HOFFMAN, MOUNTING FEET, STAINLESS STEEL, #CMFKSS
4	2	MERSEN, FUSE HOLDER, 3 POLE, 30 AMPS, 600V, #USM3I
5	9	FUSE, FAST ACTING, 600VAC/DC, 30A , MIDGET,1-1/2", #ATM30
6	1	EATON, DISCONNECT, NON FUSIBLE, ROTARY DISCONNECT, 3 POLE, 30 AMP, #R5A3030U
7	1	EATON, HANDLE, BLACK, SIZE 0, NEMA 3R, #SHB0N12
8	1	EATON, DISCONNECT SWITCH SHAFT, 12", #SF150SH5X5
9	2	EATON, CONTACTOR, 3 POLE, FVNR, 18A, FRAME C , 1 NO, 120 VAC COIL, #XTCE018C10A
10	2	EATON, OVERLOAD RELAY, FRAMCE C, 10 TO 16 AMP, #XTOB016CC1
11	2	EATON, AUXILIARY CONTACT, XT SERIES, TOP MOUNT, 2 NO - 2 NC, #XTCEXFAC22
12	2	EATON, SUPPRESSOR, RC, 110 - 130 VAC, FOR CONTACT XTCE018C, #XTCEXRSCA
13	13	WEIDMULLER, WEW 35/2, W-SERIES, END BRACKET, #1061200000
14	9	WEIDMULLER, WDU 6 WEMID, TERMINAL BLOCK, 600V/45A, #1020200000
15	18	WEIDMULLER, WDU 4, TERMINAL BLOCK, 800V/32A, #1020100000
16	5	WEIDMULLER, WPE 6/35, GROUND TERMINAL , #1010200000
17	1	WEIDMULLER, DIN RAIL, TS 35 X 7.5, SLOTTED, STEEL , 2M, #0514500000
18	36	WEIDMULLER, WS 12/6, NEUTRAL, TERMINAL MARKER , #1609900000
19	28	WEIDMULLER, WS 12/6.5 NEUTRAL, TERMINAL MARKER, #1609920000
20	1	BLACKBURN, TERMINAL LUG, 1 CONDUCTOR, 14 TO 1/0 AWG, #ADR11
21	1	KILLARK, BREATHER DRAIN, STAINLESS STEEL, 1/2" NPT, #DPE3029S3
22	LOT	WIRE, THERMOPLASTIC EQUIPMENT WIRE, #14, #TEW14
23	LOT	WIRE, THERMOPLASTIC EQUIPMENT WRIRE, #10, #TEW10
24	1	ENGRAVINGS, LARGE, WHITE ON RED, FASTENED, #ENG-L-WR-F
25	2	ENGRAVINGS, LARGE, BLACK ON WHITE, FASTENED, #ENG-L-BW-F

NOTES:

1. THE PANEL SHALL BE CSA APPROVED FOR GENERAL PURPOSE AND BEAR A CSA LABEL TERMINATION.
2. ALL INTERNAL WIRING MUST BE TERMINATED ON A CSA APPROVED TERMINAL BLOCKS
3. ALL TERMINAL BLOCKS TO BE LABELED, NUMBERED MATCHING WIRING DIAGRAM.
4. ALL WIRE TERMINATION TO HAVE SHRINKABLE WIREMAKERS WITH DESTINATION TERMINATION POINT. (TO LOCATION)
5. WIRES COLOR PER LISTING BELOW:
   - 5.1. 120/600 VAC POWER - BLACK
   - 5.2. 120 VAC NEUTRAL - WHITE
   - 5.3. 120 VAC CONTROL - BLACK
   - 5.4. 24 VDC POSTIVE - BLUE
   - 5.5. 24 VDC NEGATIVE - BROWN
   - 5.6. ANALOG POSITIVE - BLACK
   - 5.7. ANALOG NEGATIVE - WHITE
   - 5.8. GROUND - GREEN
6. ALL 120 VAC FIELD WIRING CONNECTS TO BOTTOM RIGHT SIDE OF TERMINALS ON TERMINAL STRIP TS1. CABLES TO BE RUN IN RIGHT MOST WIREWAY (BOTTOM ENTRY FOR EASIEST ACCESS).
7. FLOW METER AND PRESSURE SENSOR ANALOG SIGNAL CABLES TO BE CONNECTED TO TERMINALS ON TS-4, GROUNDED AT PANEL NOT AT INSTRUMENTS.
8. ALL PILOT LIGHTS FOR FAULTS ARE BLUE, FAULT STROBES ARE ALSO BLUE.
9. ITEMS 62 TO 65, (BLUE BEACONS AND SIREN) SHIPPED LOOSE AND TO BE INSTALLED AND WIRED SITE IN APPROPRIATE LOCATIONS.
10. UPS SHIPPED LOOSE AND TO BE INSTALLED AND WIRED TO CONTROL PANEL ON SITE. INSTALLATION STEPS:
    - 10.1. PRE CONNECT WIRES TO UPS SINCE AFTER INSTALLATION THERE WILL BE LIMITED ACCESS TO BACK OF UPS.
      - 10.5.1. CONNECT UPSR-1 AND UPSR-3 (LABELED BLUE WIRES) TO APPROPRIATE SCREW TERMINALS ON BACK OF UPS.
      - 10.9.2. PLUG PANELS INPUT POWER CORD (YELLOW SHRINK) TO RECEPTACLE ON THE UPS. THIS CORD HAS A 90 DEGREE PLUG.
    - 10.10. PLACE UPS IN THE CONTROL PANEL, UPS DISPLAY SHOULD BE FACING AWAY FROM LEFT ENCLOSURE WALL.
    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE-2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

REV.	ISSUE DATE Y	M	D	DESCRIPTION	DWN	CHK	ENG	APP	APP
2	19	2	18	AS BUILT	DI	GK			
1	19	1	28	ISSUED FOR REVIEW	DI	GK			
0	18	11	15	ISSUED FOR REVIEW	DI	GK			

REFERENCE DRAWINGS:

G.T.K. ELECTRIC CONTROLS LTD.

Design & Manufacture of Electrical and Process Control Systems

DRAWING TITLE: PUMP POWER PANEL LAYOUT DRAWING

DRAWING NO.	SH. No.	REV
J2775-PD-1	6	2

DRAWING NO. J2775-PD-1-6 REV. 2

Baffinland

HATCH

Baffinland Iron Mines LP
Mary River Expansion Stage 3
H353004

Construction Management Form
Site Contracts Administration
Request for Information

Project Name:	**Mary River Expansion Stage 3**	**Project Number:**	**H353004**
CWP No: Effluent Pump Station CVR-041		**RFI No: 0026**	
Contractor: Nuna East Ltd.		**Contract No: CX001**	
Initiated By: Kyle Krahl / Ryan Dicker		**Cost impact?**	**Y☒/N☐**
Date of Submittal: 2019 – 04 – 07		**Schedule Impact?**	**Y☒/N☐**

Nuna has started the installation of the Treated Effluent Pump Station. It appears that there is not enough heat inside the building to prevent the piping from freezing.

1. Nuna is requesting to use one of the two spare heaters (purchased for the under-camp heat scope) inside the treated effluent pumping station to provide additional heat. Source of power could be the same circuit as the existing heater (Please confirm)
2. Nuna also recommends installing a minimum of 1 sheet of rigid foam insulation on the floor of the seacan between the piping and the seacan floor to minimize the risk of freezing

Please advise if Hatch would like to Nuna to proceed with the above recommendations. A site instruction could be issued to complete the work under the existing CVR-041 budget.

Reference Document No.	Revision	Title/Description

RFI Classification:

Design	☒	Construction	☒	Fabricator/Vendor	☐
Routine Request	☐	Clarification	☒	Other	☐

Project Response: [attach sufficient detail as required]

The Project will review the heat requirements and issue a site instruction with the path forward.

Site Instruction

Contract No.:	**H353004-CX001**	**Date:**	2019-04-29
Contractor:	Nuna East Ltd.	**SI No.:**	H353004-CX001-0042
Contract Title:	Wrap Around MEIP	**Reference Doc No.:**	RFI 022, RFI 026

Site instruction requirements (check one):

(A) ☐ Proceed with the urgent work and submit a Contract Change Request (if applicable).

(B) ☐ Submit a quotation by _____ for the work requested and await Hatch instruction to proceed.

(C) ☒ No cost or schedule impact. Proceed with the work.

(D) ☐ Proceed with the work with a maximum cost impact of $___; schedule impact of __ (days) and submit your quotation (if applicable)

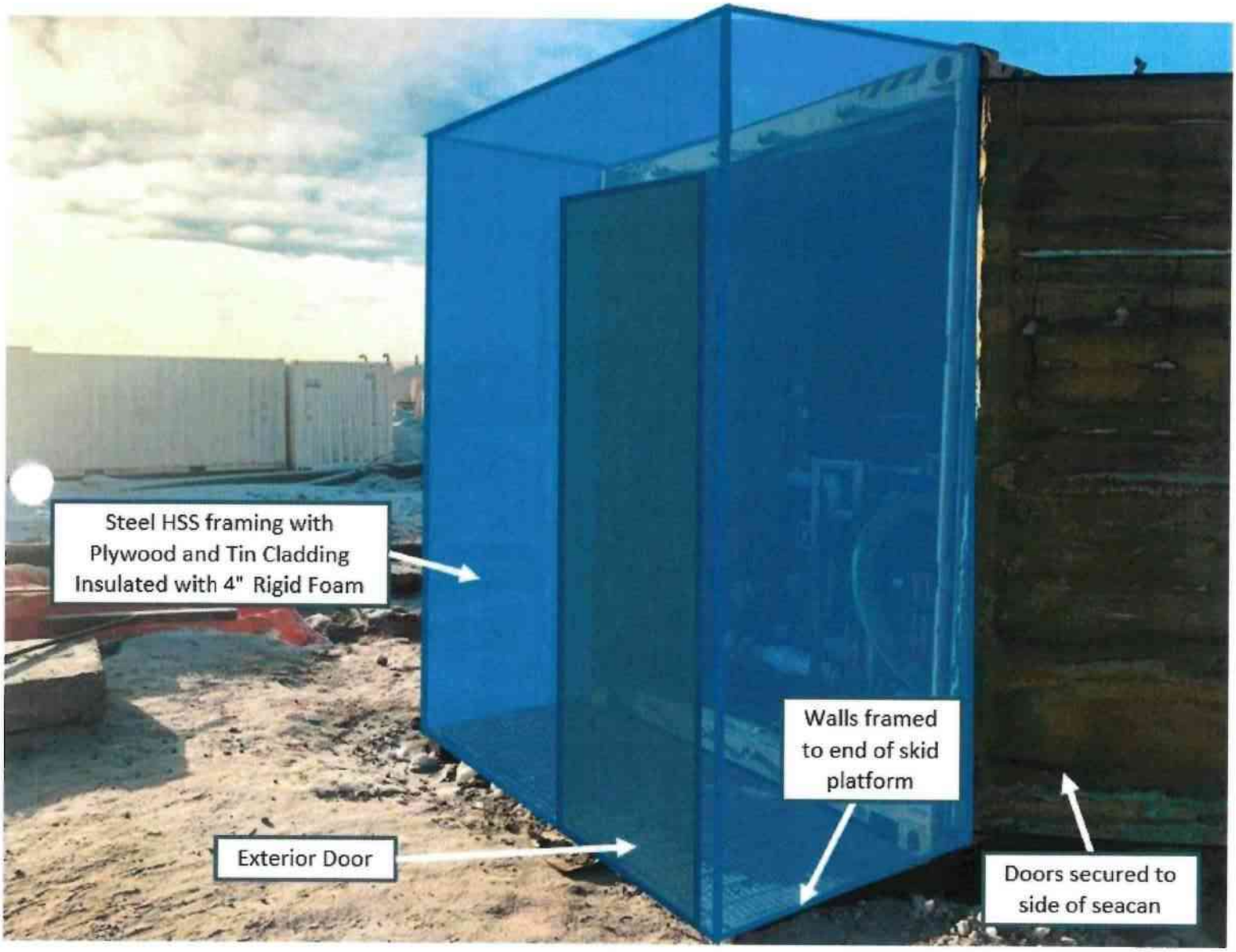
Additional details:

Contractor is requested to frame out end of treated effluent tank for Sailiivik camp as shown in attached sketch to allow additional space for electrical panel and pump disconnect as requested in RFI 0022. Install panel adjacent to exterior door. Also proceed with insulation as recommended in RFI 0026, however please add an additional layer of rigid foam insulation on the walls and proceed with the insulation of heaters as proposed.

Notes:

1. Any variation to the Contract arising from this instruction will be managed in accordance with the conditions of the Contract.
2. The response to this Site Instruction must be returned when and as required above to Hatch via the Contractor portal.

Action Record	Name and Position	Signature	Date
Initiated by:	**Dean Moffett** **Site Superintendent**	dean.moffett@hatch.com Digitally signed by dean.moffett@hatch.com DN: cn=dean.moffett@hatch.com Date: 2019.04.28 12:25:58 -04'00'	2019/04/29
Hatch/**Client:** Authorized by:	**Scot DeYoung** **Package Coordinator**	scot.deyoung@hatch.com 2019.04.29 14:35:26 -04'00'	2019/04/29
Hatch: Verified by:	**Michael Haaksma** **Area Manager**	michael.haaksma@hatch.com Digitally signed by michael.haaksma@hatch.com DN: cn=michael.haaksma@hatch.com Date: 2019.04.29 15:41:46 -04'00'	2019/04/29


Steel HSS framing with
Plywood and Tin Cladding
Insulated with 4" Rigid Foam
Walls framed
to end of skid
platform
Exterior Door
Doors secured to
side of seacan

RFI Follow-up Requirements:

Contract Order Issued Yes ☐/No ☐ ([insert associated tracking #]) Back-Charge Required (Yes ☐/No ☐)

As-Built Required Yes ☐/No ☐ Materials Required (Yes ☐/No ☐)

RFI Receipts and Approvals

Stakeholder	Name	Signature	Date <YYYY-MM-DD>
Hatch Construction Management		dean.moffett@hatch.com Digitally signed by dean.moffett@hatch.com DN: cn=dean.moffett@hatch.com Date: 2019.04.25 15:19:39 -04'00'	
Hatch Engineering Home Office ☐ Site ☐		scot.deyoung@hatch.com 2019.04.25 13:48:51 -04'00'	
Hatch Project Management			
Client (as required):			

Request for Information

Note: The response to this RFI is NOT an authorization to perform a change to the Contract. Work may proceed in accordance with the response only if such work involves NO change in cost or schedule. In the case where the response may involve change in cost or schedule, a Contractual instrument must be issued by Hatch and received by the Contractor before the response can be executed. Where no Contractual instrument is indicated, action must be taken in accordance with (reference appropriate Contract Sections that authorize execution of any change in schedule and cost).

SECTION 2: Mechanical

- CIS-70-999 Material Equipment Install List
- CTS-75-0156 Calibration of Instruments
- CIS-60-004 Pipework Installation
- CIS-60-010 Visual inspection of Flanges, Gaskets, and bolting
- CIS-75-019 Control Valves
- CIS-50-057 Bolt Torque Value Record
- CIS-60-007 Pressure Piping Report

SECTION 2: Mechanical

CIS-70-999 Material Equipment Install List

Construction Inspection Sheet
CIS-70-999 Material/Equipment Install List

Tag No:	Equipment	Project No:	3804 MEIP
(Sub)System:	Effluent Pumping Station	Area:	Mine Site
Description:		Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
INSTALL TYPE:			Electrical Equipment

ITEM	NAME	SIZE/ VOLT	TYPE/AMP	SUPPLY PROTECTION	SUPPLY ORIGIN	LOAD	DWG	COMMENTS
1	1623-PPC-001	120V	Cutom NEMA 4 Enclosure	15A	1611-MDB-010	>12A	NA	GTK Custom Pump Controler
2	1623-PLC-001	120V	Cutom NEMA 4 Enclosure	15A	1611-MDB-010	>12A	NA	GTK Custom Effluent Pump Control Panel
3	1623-PP-001A	600V	NEMA 4X	30 A fuse	1623-PPC-001	9.3FLA	NA	10 HP 3P/600V Motor/Pump Assembly
4	1623-PP-001B	600V	NEMA 4X	30 A fuse	1623-PPC-001	9.3FLA	NA	10 HP 3P/600V Motor/Pump Assembly
5	1623-FIT-001	120V & 24V	NEMA 4X	1623-PPC-001	1623-PPC-001		NA	4-20mv Flow Meter
6	1623-PIT-001	120V & 24V	NEMA 4X	1623-PPC-001	1623-PPC-001		NA	4-20mv Pressure Meter
7	1623-XV-001A	120V & 24V	NEMA 4X	1623-PPC-001	1623-PPC-001		NA	120V Motorized Butterfly Valve
8	1623-XV-001B	120V & 24V	NEMA 4X	1623-PPC-001	1623-PPC-001		NA	120V Motorized Butterfly Valve
9	1623-LSHH-001	24V	Submersible	1623-PPC-001	1623-PPC-001		NA	High High Limit Level Switch
10	1623-LSH-001	24V	Submersible	1623-PPC-001	1623-PPC-001		NA	High Limit Level Switch
11	1623-LSL-001	24V	Submersible	1623-PPC-001	1623-PPC-001		NA	Low Lmit Level Switch
12	1623-PLC-UPS-001	120V		1623-PPC-001	1623-PPC-001		NA	GTK Supplied UPS in Custom Pump Controler
13								
14								
12								
13								
14								
15								

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:		Kyle Krahl	Dean Moffatt
Sign:			
Date:		Nov 13 2019	14-Nov-19

Construction Inspection Sheet
CIS-70-999 Material/Equipment Install List

Tag No:	Power and Instumentation/Control Cables	Project No:	3804 MEIP
(Sub)System:	Effluent Pumping Station	Area:	Mine Site
Description:		Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
INSTALL TYPE:	Electrical Cables		

ITEM	CABLE NAME/TAG	ORIGIN	DESTINATION	TYPE	INSULATION RATING (KV)	NO. OF CONDUCTORS	SIZE (awg)	LENGTH (M)	COMMENTS
16	1623-PPC-001-P1	1611-MDB-010	1623-PPC-001	Power	1kV TECK	3	10	180	Pump Power Feed to Pump Motor Controler
17	1623-PP-001A-P1	1623-PPC-001	1623-PP-001A	Power	1kV TECK	3	10	5	Power to pump 1
18	1623-PP-001B-P1	1623-PPC-001	1623-PP-001B	Power	1kV TECK	3	10	4	Power to pump 2
19	1623-PPC-001-C1	1623-PLC-001	1623-PPC-001	Control	1kV TECK	13	14	3	Pump status lights and PLC inputs to M1, Starter and holding contacts
20	1623-PLC-001-P1	WTP 120/208V Panel	1623-PPC-001	Power	1kV TECK	3	10	180	Feed to PLC Control Panel
21	1623-PP-001A-P1	1623-PLC-001	1623-XV-001A	Power	1kV TECK	2	12	3	Valve 1 actuating Power
22	1623-PP-001B-P1	1623-PLC-001	1623-XV-001B	Power	1kV TECK	2	12	2	Valve 2 actuating Power
23	1623-PP-001A-C1	1623-PLC-001	1623-XV-001A	Control	300V TECK	2p	16	4	Valve 1 Control/Monitoring
24	1623-PP-001B-C1	1623-PLC-001	1623-XV-001B	Control	300V TECK	2p	16	3	Valve 2 Control/Monitoring
25	1623-FIT-001-C1	1623-PLC-001	1623-FIT-001	Control	300V TECK	1p	16	4	Flow transmitter control
26	1623-PIT-001-C1	1623-PLC-001	1623-PIT-001	Control	300V TECK	1p	16	3	Pressure transmitter control
27	1623-PIT-001-C2	1623-PLC-001	1623-PIT-001	DC Power	300V TECK	2	12	3	DC Power to Pressure transmitter
28	1623-JBX-001-C1	1623-PLC-001	Level Switch JBX (L,H,HH)	Power and Control	300V TECK	2p	16	5	Level indicator Sensors
29	1623-H/S-001-P1	1623-PLC-001	Horn/Strobe JBX	Power	1kV TECK	2	12	20	Horn Strobe notification Circuit
30									
30									
30									
30									

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:		Kyle Krahn	Derek Pedersen
n:			
Date:		Nov 13 2019	Nov 13/19

Construction Inspection Sheet
CIS-70-999 Material/Equipment Install List

Tag No:	CONTROL TERMINATIONS	Project No:	3804 MEIP
(Sub)System:	Effluent Pumping Station	Area:	Mine Site
Description:		Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
INSTALL TYPE:	Control Terminations		

ITEM	CABLE NAME	CABLE SIZE/TYPE	ORIGIN	TERMINAL	DESTINATION	TERMINAL		COMMENTS
31	1623-PP-001A-P1	3c10	1623-PPC-001	P1L1, P1L2, P1L3	1623-PP-001A	Rd,Bk,Bl		Pump 1 Power
32	1623-PP-001B-P1	3c10	1623-PPC-001	P2L1, P2L2, P3L3	1623-PP-001B	Rd,Bk,Bl		Pump 2 Power
33	1623-PPC-001-C1	14c14	Pump Power Panel	31/32,33/34,35/36, 30	PLC Control panel	TS1: 31/32,33/34,35/36, F17		Indicator lights, PLC Input
34			Pump Power Panel	9/10,12/13,11/N,14	PLC Control panel	TS1: 9/10,11/12,13/14,N		Starters and holding contacts
35	1623-PP-001A-P1	2c12	1623-PLC-001	TS1: F15/N	1623-XV-001A	L1/L2		Power
36	1623-PP-001B-P1	2c12	1623-PLC-001	TS1: F16/N	1623-XV-001B	L1/L2		Power
37	1623-PP-001A-C1	2p16	1623-PLC-001	TS1: 17,18, F18/37, 38, 39	1623-XV-001A	35, 36, 32 jumper N, 20/21, 25, 2		Open, closed, fault PLC inputs
38	1623-PP-001B-C1	2p16	1623-PLC-001	TS1: 19,20, F19/40, 41, 42	1623-XV-001B	35, 36, 32 jumper N, 20/21, 25, 2		Open, closed, fault PLC inputs
39	1623-FIT-001-C1	1p16	1623-PLC-001	TS4: FD4, IN0+, SH	1623-FIT-001	" +, - , SH "		Flow transmitter control
40	1623-PIT-001-C1	1p16	1623-PLC-001	TS44: FD5,IN1+,SH	1623-PIT-001	" +, - , SH "		Pressure transmitter control
41	1623-PIT-001-C2	1p16	1623-PLC-001	TS4: FD2, DC -	1623-PIT-001	L+, L-		DC Power to transmitter
42	1623-JBX-001-C1	2p16	1623-PLC-001	24, 25, 26, 27, 28	Level Switch JBX (L,H,HH)	L,H,HH,Com		Level indicator Sensors
43	1623-H/S-001-P1	2c12	1623-PLC-001	22, N	Horn/Strobe JBX	" +, - "		Horn Strobe Power
44								
42								
43								
44								
45								

	Trades Person	Supervisor	Field Eng or QA/QC
nt Name:		Kyle Krahl	Derek Pettersen
n:			
Date:		Nov 18 2019	Nov 18/19

SECTION 2: Mechanical

CTS-70-0156 Calibration of Instruments

CERTIFICATE OF CALIBRATION

WIKA

Customer	ADC100 ADCO POWER LTD. EDMONTON T6E 6G6	*Certificate No.*	**ED 58957**
		Calibration Date	2018-10-26
Cust. PO	3804-0204	*Order No*	883205
Order date	2018-10-24	*Line No*	1
Type	233.54.100	*Accuracy*	1.000%
Range	0 ... 300 psi	*Output signal*	-
Serial No.		*Tag No.*	883205-1-2
Reference Instrument	0 ... 34 bar	03660633 2018-06	SS 106

Results *Temperature* 20 °C

Reading DUT psi	Reading WS psi		Mean-value psi	Deviation psi	Hysteresis %	Deviation %
	M 1	M 2				
0.00	0.000	0.000	0.000	0.000	0.000	0.000
50.00	50.330	49.690	50.010	-0.010	0.213	-0.003
100.00	99.860	99.330	99.595	0.405	0.177	0.135
150.00	150.380	149.400	149.890	0.110	0.327	0.037
200.00	198.350	198.480	198.415	1.585	0.043	0.528
250.00	248.140	248.470	248.305	1.695	0.110	0.565
300.00	297.250	297.250	297.250	2.750	0.000	0.917

Declaration of conformity:
The object is within the specifications according to the stated standards.

Calibration is carried out according to the following norms:
- ASME B 40.1 (latest revision)
- Calibration of WIKA test instruments is carried out on an annual basis and test instruments are traceable to NIST.
- Validity of certification of WIKA's test instruments is one year from date of issuance.

Approved by John Morgan

Calibrated by Agata Haertel

HEAD OFFICE
WIKA INSTRUMENTS LTD.
3103 Parsons Road
Edmonton, AB Canada
T6N 1C8
Tel.: (780) 463-7035

WIKA INSTRUMENTS LTD
2679 Bristol Circle, Unit #1
Oakville, ON
L6H 6Z8
Tel.: (905) 337-1611

WIKA INSTRUMENTS LTD
4932 52 Street S.E.
Calgary, AB Canada
T2B 3R2
Tel.: (403) 237-5950

WIKA INSTRUMENTS LTD.
#204, 8804 - 100 Avenue
Grande Prairie, AB
T8V 0T8
Tel.: (780) 513-7480

WIKA INSTRUMENTS LTD.
901 First Avenue North
Saskatoon, SK
S7H 1Y4
Tel.: (306) 664-1105

WIKA INSTRUMENTS LTD.
4627 Frances Street
Burnaby, BC
V5C 2R9
Tel.: (604) 299-3855

CERTIFICATE OF CALIBRATION

WIKA

Customer	ADC100 ADCO POWER LTD. EDMONTON T6E 6G6	Certificate No. Calibration Date	ED 58956 2018-10-26
Cust. PO Order date	3804-0204 2018-10-24	Order No Line No	883205 1
Type	233.54.100	Accuracy	1.000%
Range	0 ... 300 psi	Output signal	-
Serial No.		Tag No.	883205-1-1
Reference Instrument	0 ... 34 bar	03660633 2018-06	SS 106
Results		Temperature	20 °C

Reading DUT psi	Reading WS psi		Mean-value psi	Deviation psi	Hysteresis %	Deviation %
	M 1	M 2				
0.00	0.000	0.000	0.000	0.000	0.000	0.000
50.00	50.610	49.460	50.035	-0.035	0.383	-0.012
100.00	100.010	98.460	99.235	0.765	0.517	0.255
150.00	149.940	147.840	148.890	1.110	0.700	0.370
200.00	198.840	198.940	198.890	1.110	0.033	0.370
250.00	248.600	247.780	248.190	1.810	0.273	0.603
300.00	299.610	299.610	299.610	0.390	0.000	0.130

Declaration of conformity:
The object is within the specifications according to the stated standards.

Calibration is carried out according to the following norms:
- ASME B 40.1 (latest revision)
- Calibration of WIKA test instruments is carried out on an annual basis and test instruments are traceable to NIST.
- Validity of certification of WIKA's test instruments is one year from date of issuance.

Approved by John Morgan

Calibrated by Agata Haertel

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WIKA INSTRUMENTS LTD.
3103 Parsons Road
Edmonton, AB Canada
T6N 1C8
Tel.: (780) 463-7035

WIKA INSTRUMENTS LTD.
2579 Bristol Circle, Unit #1
Oakville, ON
L6H 6Z8
Tel.: (905) 337-1811

WIKA INSTRUMENTS LTD.
4932 52 Street S.E.
Calgary, AB Canada
T2B 3R2
Tel.: (403) 237-5860

WIKA INSTRUMENTS LTD.
#204, 9504 - 100 Avenue
Grande Prairie, AB
T8V 0T6
Tel.: (780) 513-7480

WIKA INSTRUMENTS LTD.
901 First Avenue North
Saskatoon, SK
S7K 1Y4
Tel.: (306) 664-1105

WIKA INSTRUMENTS LTD.
4627 Frances Street
Burnaby, BC
V5C 2R9
Tel.: (604) 299-3855

SECTION 2: Mechanical

CIS-60-004 Pipework Installation

Construction Inspection Sheet
CIS-60-004 Pipework Installation

39 Tag No:	1623-EFL-101-XXX-100	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	CS40 CPVC PUMP SUCTION HEADER	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	Line as per P & ID (size, spec, from /to)	✓			
2	Material correct for pipe and fittings check against spec (material, SCH, fittings, valves, tests)	✓			
3	Welding of pipe flanges (procedure, qualifications, preparation/size)	✓			PVC Glue.
4	NDT complete and satisfactory	✓			Service Test
5	Weld records complete			✓	
6	Installation straight and plumb, pipe spacing correct	✓			
7	Line slopes as per drawing	✓			
8	High point vents installed	✓			
9	Drains installed and location approved by operations			✓	
10	Reducer type/location correct	✓			
11	Blinds installed. (spec, blinds as per dwg)			✓	
12	In-Line instruments installed	✓			
13	Grounding in place			✓	
14	Valve hand wheel accessibility	✓			
15	No walkway restrictions	✓			
16	Location and support of flexible lines satisfactory for operation			✓	
17	Temporary spools/blinds for testing installed as required			✓	
18	Bolts/studs/nuts correct type, length, dia, installation, lubrication, torque)	✓			
19	Correct gasket material and thickness (no grease)	✓			
20	Flushing & cleaning complete			✓	
21	Strainers & blinds/temporary spools removed			✓	
22	Painting as specified			✓	
23	Labelling and flow direction as specified		✓		
24	Valve labelled & operation check		✓		
25	Pipe supports located as specified	✓			
26	Hangers, mounting and support correct			✓	
27	Flange bolts tight	✓			
28	All equipment (valves, blinds instruments etc) installed as specified	✓			
29	Pipe Tie-ins and terminations complete	✓			
30	Notice of completion completed for gas piping			✓	

Comments: Flow & Valves To Be labelled.

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
n:	of ADCO	of ADCO	D. Moffett
Date:	15 ~~Aug~~ SEPT, 2019	Aug 15, 2019	12 Sep 19

Construction Inspection Sheet
CIS-60-004 Pipework Installation

40 Tag No:	1623-EFL-102-XXX-100	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	CS40 CPVC PUMP DISCHARGE HEADER	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	Line as per P & ID (size, spec, from /to)	✓			
2	Material correct for pipe and fittings check against spec (material, SCH, fittings, valves, tests)	✓			
3	Welding of pipe flanges (procedure, qualifications, preparation/size)	✓			PVC Glue
4	NDT complete and satisfactory	✓			Certificate
5	Weld records complete			✓	
6	Installation straight and plumb, pipe spacing correct	✓			
7	Line slopes as per drawing	✓			
8	High point vents installed	✓			
9	Drains installed and location approved by operations			✓	
10	Reducer type/location correct	✓			
11	Blinds installed. (spec, blinds as per dwg)			✓	
12	In-Line instruments installed	✓			
13	Grounding in place			✓	
14	Valve hand wheel accessibility	✓			
15	No walkway restrictions	✓			
16	Location and support of flexible lines satisfactory for operation			✓	
17	Temporary spools/blinds for testing installed as required			✓	
18	Bolts/studs/nuts correct type, length, dia, installation, lubrication, torque)	✓			
19	Correct gasket material and thickness (no grease)	✓			
20	Flushing & cleaning complete			✓	
21	Strainers & blinds/temporary spools removed			✓	
22	Painting as specified			✓	
23	Labelling and flow direction as specified		✓		
24	Valve labelled & operation check		✓		
25	Pipe supports located as specified	✓			
26	Hangers, mounting and support correct			✓	
27	Flange bolts tight	✓			
28	All equipment (valves, blinds instruments etc) installed as specified	✓			
29	Pipe Tie-ins and terminations complete	✓			
30	Notice of completion completed for gas piping			✓	

Comments:
- Flow & Values TO Be Labelled.
- Burp Valve Discharge to be Drained Back into tank.

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jared Polachek	Andrew Hamilton	Dean Moffett
n:	of ADCO	of ADCO	D. Moffett
Date:	15 ~~Aug~~ Sept, 2019	Aug 15, 2019	12 Sep 19

SECTION 2: Mechanical

CIS-60-010 Visual Inspection of Flanges, Gaskets, and Bolting

Construction Inspection Sheet
CIS-60-010 Visual Inspection of Flanges, Gaskets, and Bolting

39 Tag No:	Flanges on Spool 1623-EFL-101-XXX-100	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	3 Flanges on PUMP SUCTION HEADER with 1X 1" 2X2" RUBBER Gaskets	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	Check that flange faces have been thoroughly cleaned, removing all rust and burrs	✓			
2	Check sealing surfaces on flange face for any damage, in accordance with the requirements of the specification	✓			
3	Check the Flange type and rating	✓			
4	Check that bolts are of the correct size, type, length, cleanliness and absence of burrs	✓			
5	Ensure that all nuts and washers (where contact is made) have been cleaned by power brush			✓	
6	Ensure that the gasket is in accordance with the applicable material class	✓			
7	Check the condition and rating of gaskets	✓			
8	Ensure that spiral wound, metal gasket or sheet gaskets are not re-used after use			✓	
9	Check that the correct thread lubricant is applied to every friction surface of the bolt assembly			✓	
10	Check that the thread lubricant used is suitable for the operating temperature of the system			✓	
11	Torque sequence correct	✓			
12	Torque values verified	✓			
13	Identification of torqued connection				
14	Check the sealing surface of the flange faces for surface defects on non-metallic or metallic plastic lined flanges	✓			
15	Check that bolts are of the correct size, length, cleanliness and absence of burrs (Metallic or plastic lined flanges)	✓			
16	Ensure that the gasket is in accordance with the applicable material class (Metallic or plastic lined flanges)	✓			
17	Check that the thread lubricant used is suitable for the operating temperature of the system (Metallic or plastic lined flanges)			✓	
18	Check that gaskets are correctly centred	✓			
19	Check that all flanged joints are snugged up squarely	✓			
20	Check the measurement of the gap between the flange faces taken around the circumference	✓			
21	Check that all stud bolt threads have been cleaned and lubricated with the appropriate lubricant	✓			
22	Check and ensure that all stud bolts and nuts are hand tight ensuring that stud ends extend 1 thread (3mm) beyond the nut	✓			
23	Check that all flanges and bolts have been prepared and pre-assembled in accordance with the applicable project specifications	✓			
24	Check and ensure that all bolts have been torqued to 1/3 of the final torque value and ensure correct sequence	✓			
25	Check and ensure that all bolts have been torqued to 2/3 of the final torque value and ensure correct sequence	✓			
26	Check and ensure that all bolts have been torqued to 100% of the final torque value and ensure correct sequence	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	D. Moffett
Date:	15 ~~Aug~~ Sept, 2019	Aug 15, 2019	12 Sep 19

Construction Inspection Sheet
CIS-60-010 Visual Inspection of Flanges, Gaskets, and Bolting

40 Tag No:	Flanges on Spool 1623-EFL-102-XXX-100	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	11 Flanges on PUMP DISCHARGE HEADER with 2X 2" 7X 3" RUBBER Gaskets	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	Check that flange faces have been thoroughly cleaned, removing all rust and burrs	✓			
2	Check sealing surfaces on flange face for any damage, in accordance with the requirements of the specification	✓			
3	Check the Flange type and rating	✓			
4	Check that bolts are of the correct size, type, length, cleanliness and absence of burrs	✓			
5	Ensure that all nuts and washers (where contact is made) have been cleaned by power brush			✓	
6	Ensure that the gasket is in accordance with the applicable material class	✓			
7	Check the condition and rating of gaskets	✓			
8	Ensure that spiral wound, metal gasket or sheet gaskets are not re-used after use			✓	
9	Check that the correct thread lubricant is applied to every friction surface of the bolt assembly			✓	
10	Check that the thread lubricant used is suitable for the operating temperature of the system			✓	
11	Torque sequence correct	✓			
12	Torque values verified	✓			
13	Identification of torqued connection				
14	Check the sealing surface of the flange faces for surface defects on non-metallic or metallic plastic lined flanges	✓			
15	Check that bolts are of the correct size, length, cleanliness and absence of burrs (Metallic or plastic lined flanges)	✓			
16	Ensure that the gasket is in accordance with the applicable material class (Metallic or plastic lined flanges)	✓			
17	Check that the thread lubricant used is suitable for the operating temperature of the system (Metallic or plastic lined flanges)			✓	
18	Check that gaskets are correctly centred	✓			
19	Check that all flanged joints are snugged up squarely	✓			
20	Check the measurement of the gap between the flange faces taken around the circumference	✓			
21	Check that all stud bolt threads have been cleaned and lubricated with the appropriate lubricant	✓			
22	Check and ensure that all stud bolts and nuts are hand tight ensuring that stud ends extend 1 thread (3mm) beyond the nut	✓			
23	Check that all flanges and bolts have been prepared and pre-assembled in accordance with the applicable project specifications	✓			
24	Check and ensure that all bolts have been torqued to 1/3 of the final torque value and ensure correct sequence	✓			
25	Check and ensure that all bolts have been torqued to 2/3 of the final torque value and ensure correct sequence	✓			
26	Check and ensure that all bolts have been torqued to 100% of the final torque value and ensure correct sequence	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	D. Moffett
Date:	15 ~~Aug~~ Sept, 2019	Aug 15, 2019	12-Sep-19

SECTION 2: Mechanical

CIS-75-019 Control Valves

Construction Test Sheet
CTS-60-011 Manual Valve Operation
Project Template

1 Tag No:	1623-100-VGA-01	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	600 WOG BRASS BALL VALVE EFFLUENT TANK MAIN ISOLATION VALVE	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General Data				
2	Drawing No:				
3	Specification No:				
4	Naneplate Data				
5	Operating Pressure: - Ve				
6	From: Effluent Tank				
7	To: PP-001A & PP-001B				
8	Inspection				
9	Re-Check Lubrication	✓			
10	Visual check on bolt and fastener tightness	✓			NPT
11	Check plugs installed			✓	
12	Check correct handle type	✓			
13	Check each valve operation (fully stroked)	✓			
14	Check for locking mechanism			✓	
15	Line No Spool 1623-EFL-101-XXX-100				

mments:

	Trades Person	Supervisor	Field Eng or QA/QC
rint Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
ign:	of ADCO	of ADCO	D. Moffett
Date:	15 ~~Aug~~ Sept, 2019	Aug 13, 2019	12 Sep 19

Construction Test Sheet
CTS-60-011 Manual Valve Operation
Project Template

2 Tag No:	1623-100-VGA-02	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	CL150 PVC BALL VALVE PUMP 1 ISOLATION VALVE	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General Data				
2	Drawing No:				
3	Specification No:				
4	Naneplate Data				
5	Operating Pressure: - UE				
6	From: Effluent Tank				
7	To: Pump 1				
8	Inspection				
9	Re-Check Lubrication			✓	
10	Visual check on bolt and fastener tightness			✓	
11	Check plugs installed			✓	
12	Check correct handle type	✓			
13	Check each valve operation (fully stroked)	✓			
14	Check for locking mechanism			✓	
15	Line No Spool 1623-EFL-101-XXX-100				

mments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	
Date:	15 ~~Aug~~ SEPT , 2019	Aug , 2019	12 Sep 19

Construction Test Sheet
CTS-60-011 Manual Valve Operation
Project Template

3 Tag No:	1623-100-VGA-03	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	CL150 PVC BALL VALVE PUMP 2 ISOLATION VALVE	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General Data				
2	Drawing No:				
3	Specification No:				
4	Naneplate Data				
5	Operating Pressure: -VE				
6	From: Effluent Tank				
7	To: Pump 2				
8	Inspection				
9	Re-Check Lubrication			✓	
10	Visual check on bolt and fastener tightness			✓	
11	Check plugs installed			✓	
12	Check correct handle type	✓			
13	Check each valve operation (fully stroked)	✓			
14	Check for locking mechanism			✓	
15	Line No Spool 1623-EFL-101-XXX-100				

mments:

	Trades Person	Supervisor	Field Eng or QA/QC
rint Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
ign:	of ADCO	of ADCO	
Date:	15 ~~Aug~~ Sept , 2019	Aug , 2019	12-Sep-19

Construction Test Sheet
CTS-60-011 Manual Valve Operation
Project Template

4 Tag No:	1623-25-VGA-04	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	CL 800 CS BALL VALVE PUMP 1 PRESSURE GAUGE ISOLATION VALVE	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General Data				
2	Drawing No:				
3	Specification No:				
4	Naneplate Data				
5	Operating Pressure: 110 PSI				
6	From: Pump 1				
7	To: Pump 1 Pressure Gauge				
8	Inspection				
9	Re-Check Lubrication			✓	
10	Visual check on bolt and fastener tightness	✓			NPT
11	Check plugs installed			✓	
12	Check correct handle type	✓		✓	
13	Check each valve operation (fully stroked)	✓			
14	Check for locking mechanism	✓			
15	Line No Spool 1623-EFL-102-XXX-100				

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	D. Moffett
Date:	15 ~~Aug~~ 31 OCT, 2019	Aug 15, 2019	12-Sep-19

Construction Test Sheet
CTS-60-011 Manual Valve Operation
Project Template

5 Tag No:	1623-25-VGA-05	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	CL 800 CS BALL VALVE PUMP 2 PRESSURE GAUGE ISOLATION VALVE	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General Data				
2	Drawing No:				
3	Specification No:				
4	Naneplate Data				
5	Operating Pressure: 110 PSI				
6	From: Pump 2				
7	To: Pump 2 Pressure Gauge				
8	Inspection				
9	Re-Check Lubrication			✓	
10	Visual check on bolt and fastener tightness	✓			NPT
11	Check plugs installed			✓	
12	Check correct handle type	✓			
13	Check each valve operation (fully stroked)	✓			
14	Check for locking mechanism	✓			
15	Line No Spool 1623-EFL-102-XXX-100				

mments:

	Trades Person	Supervisor	Field Eng or QA/QC
rint Name:	Jered Polachek	Andrew Hamilton	Dean Moffatt
ign:	of ADCO	of ADCO	D. Moffatt
Date:	15 ~~Aug~~ Sept , 2019	Aug 15 , 2019	12-Sep-19

Construction Test Sheet
CTS-60-011 Manual Valve Operation
Project Template

6 Tag No:	1623-100-VGA-06	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	CL 150 MOV BUTTERFLY VALVE PUMP 1 MOV ISOLATION VALVE	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General Data				
2	Drawing No:				
3	Specification No:				
4	Naneplate Data Keystone Series 362 CL 150				
5	Operating Pressure: 110 PSI				
6	From: Pump 1				
7	To: Discharge Line				
8	Inspection				
9	Re-Check Lubrication			✓	
10	Visual check on bolt and fastener tightness	✓			
11	Check plugs installed			✓	
12	Check correct handle type	✓			
13	Check each valve operation (fully stroked)	✓			
14	Check for locking mechanism			✓	
15	Line No Spool 1623-EFL-102-XXX-100				

mments:
Handle broken on valve wheel

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	D. Moffett
Date:	15 Aug, 2019	Aug 15, 2019	12-Sep-19

Construction Test Sheet
CTS-60-011 Manual Valve Operation
Project Template

7 Tag No:	1623-100-VGA-07	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	CL 150 MOV BUTTERFLY VALVE PUMP 2 MOV CONTROL VALVE	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General Data				
2	Drawing No:				
3	Specification No:				
4	Naneplate Data				Keystone Series 362 CL 150
5	Operating Pressure:				110 PSI
6	From:				Pump 2
7	To:				Discharge Line
8	Inspection				
9	Re-Check Lubrication			✓	
10	Visual check on bolt and fastener tightness	✓			
11	Check plugs installed			✓	
12	Check correct handle type	✓			
13	Check each valve operation (fully stroked)	✓			
14	Check for locking mechanism			✓	
15	Line No	Spool 1623-EFL-102-XXX-100			

mments:

Handle broken of Valve wheel.

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	
Date:	15 ~~Aug~~ Sept, 2019	Aug 15, 2019	12-Sep-19

Construction Test Sheet
CTS-60-011 Manual Valve Operation
Project Template

8 Tag No:	1623-25-VGA-07	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	CL 800 CS BALL VALVE DISCHARGE BURP VALVE ISOLATION	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General Data				
2	Drawing No:				
3	Specification No: CL 800				
4	Naneplate Data				
5	Operating Pressure: 110 PSI				
6	From: Discharge Header				
7	To: Burp Valve				
8	Inspection				
9	Re-Check Lubrication			✓	
10	Visual check on bolt and fastener tightness	✓			NPT
11	Check plugs installed			✓	
12	Check correct handle type	✓			
13	Check each valve operation (fully stroked)	✓			
14	Check for locking mechanism	✓			
15	Line No Spool 1623-EFL-102-XXX-100				

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	D. Moffett
Date:	15 ~~Aug~~ Sept, 2019	Aug 15, 2019	12-Sep-19

Construction Test Sheet
CTS-60-011 Manual Valve Operation
Project Template

9 Tag No:	1623-25-VGA-08	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	CL 800 CS BALL VALVE DISCHARGE PRESSURE TRANSMITTER ISOLATION VALVE	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General Data				
2	Drawing No:				
3	Specification No: CL 800				
4	Naneplate Data				
5	Operating Pressure: 110 PSI				
6	From: Discharge Header.				
7	To: Pressure Transmitter.				
8	Inspection				
9	Re-Check Lubrication			✓	
10	Visual check on bolt and fastener tightness	✓			
11	Check plugs installed			✓	
12	Check correct handle type	✓			
13	Check each valve operation (fully stroked)	✓			
14	Check for locking mechanism	✓			
15	Line No Spool 1623-EFL-102-XXX-100				

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	D. Moffett
Date:	15 ~~Aug~~ Sept, 2019	Aug 15, 2019	12-Sep-19

SECTION 2: Mechanical

CIS-50-057 Bolt Torque Value Record

Construction Test Sheet

CIS-50-057 Bolt Torque Value Record

TAG:	Bolt/Lug/Bus Torque Test	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:		Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:		CLIENT:	BAFFINLAND IRON MINES, Baffin Island

1. Description of Test Equipment: Westward 1/2" torque wrench
2. Calibration Date: September 2016
3. Units of Measurement: N-M

ITEM DESCRIPTION	LOCATION	BOLT MARKINGS/ BOLT MATERIAL	BOLT SIZE	NUMBER OF BOLTS	VENDOR SPECIFIED TORQUE (ft-lb, in-lb, n-m)	CODE MINIMUM TORQUE (ft-lb, in-lb, n-m)	ACTUAL TORQUE (ft-lb, in-lb, n-m)
1623-100-VGA-02	Valve Bolt up	B7	5/8"	4	25 ft/lb		25
1623-100-VGA-03	Valve Bolt up	B7	5/8"	4	25 ft/lb		25
1623-100-VGA-06	Valve Bolt up	B7	5/8"	4	25 ft/lb		25
1623-100-VGA-07	Valve Bolt up	B7	5/8"	4	25 ft/lb		25
1623-EFL-101-XXX-100	Spool to Effluent Tank	B7	5/8"	4	25 ft/lb		25
:3-EFL-102-XXX-100	Spool to HDPE Line	B7	5/8"	4	25 ft/lb		25
1623-PP-001A	Pump to Spools	B7	5/8"	4	25 ft/lb		25
1623-PP-001B	Pump to Spools	B7	5/8"	4	25 ft/lb		25

Comments: Torque spec marked on Flanges By Manufacturer

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	D. Moffett
Date:	15 ~~Aug~~ Sept, 2019	Aug 15, 2019	12-Sep-19

CanTorque Inc.
14635-119 Avenue
Edmonton, AB T5L 2N9
(780) 436-2000-phone
(780) 732-0905-fax
(877) 436-4364-toll free
GST 864967997RT0001
info@cantorque.com
www.cantorque.com

Manual Certificate of Calibration # 21339

Customer Name	Adco Power Ltd
Customer Address	8750-58 Ave, Edmonton, Alberta T6E 6G6
Manufacturer Name	CDI
Model Number	2503MFRMH
Serial Number	1214600385
Asset Number	N/A
Maximum Capacity	250
Ratchet Drive Size	1/2"
Required Accuracy	4
Temperature Celsius	20.0
Service Technician	Wyatt Cochrane
Units of Measure	Lbf/ft
Calibration Procedure	OP-112

Calibration Data - Minimum 5 Results per Checkpoint

Capacity	Torque Setting	Initial Readings as Found	Target Torque Range	Readings After Adjustments
20%	50	47.20	48.00-52.00	49.98
60%	150	145.67	144.00-156.00	146.66
100%	250	242.38	240.00-260.00	242.95

Calibration Equipment Data

Manufacturer Name	Norbar
Display Model #	43228
Display Serial #	63987
Transducer Model #	50625.LOG
Transducer Serial #	86175

Calibration Date	Aug 3, 2018
Next Calibration Due	Aug 3, 2020
Transducer Capacity	250 Lbf/ft
Transducer Accuracy	+/-0.5%

The above described instrument has calibrated in accordance with the customer's requirements and specifications using measurement equipment that is directly traceable to the NRC/Canada and/or the NIST/USA and applicable national standards.

Calibration Date: Jul 26, 2019	Technician Print/Sign: Wyatt Cochrane	

SECTION 2: Mechanical

CIS-60-007 Pressure Piping Report

Construction Inspection Sheet
CIS-60-007 Pressure Piping Report

39 TAG:	1623-EFL-101-XXX-100	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	PUMP SUCTION HEADER	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Line No

☑ Hydrostatic - Service Test ☑ Pneumatic

1. REQUIRED SPECIFICATIONS

SYSTEM	CALCULATIONS	OPERATION	TEST PRESSURE	CLASS
				Fluid
				Fluid cat

2. INSPECTION RECORDS

PIPE MATERIAL AND CLASS	DIA	LENGTH	NUMBER OT JOINTS FLANGES	WELDED	THREADED	SUPPORTS TYPE	DISTANCE C/C
CS40 CPVC	100	300	3				

3. TEST RECORDS

Test Medium: Temperature:

Pressure reading and elapsed time

Service Test - 7 day Wet Test

PSI		MIN
PSI		MIN
PSI		MIN
PSI		MIN
PSI		MIN

Stress relief after welding:

☐ Radiographic test ☐ Magnetic particule test ☐ Hardness (Brinell)

☐ Ultrasonic test ☐ Penetrant test

Declaration of installation to the legal authority:

4. FINAL RESULTS

☑ Accepted ☐ Rejected

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	D. Moffett
Date:	15 ~~Aug~~ SEPT , 2019	Aug 15 , 2019	12-Sep-19

Construction Inspection Sheet
CIS-60-007 Pressure Piping Report

ADCO

40 TAG:	1623-EFL-102-XXX-100	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	PUMP DISCHARGE HEADER	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Line No

☑ Hydrostatic – Service Test ☑ Pneumatic

1. REQUIRED SPECIFICATIONS

SYSTEM	CALCULATIONS	OPERATION	TEST PRESSURE	CLASS
				Fluid
				Fluid cat

2. INSPECTION RECORDS

PIPE MATERIAL AND CLASS			NUMBER OT JOINTS			SUPPORTS	
	DIA	LENGTH	FLANGES	WELDED	THREADED	TYPE	DISTANCE C/C
CS40 CPVC	100	500	11				

3. TEST RECORDS

Test Medium: Temperature:

Pressure reading and elapsed time

110 PSI – 125 PSI
7 Day Wet Test

	PSI		MIN
	PSI		MIN
	PSI		MIN
	PSI		MIN
	PSI		MIN

Stress relief after welding:

☐ Radiographic test ☐ Magnetic particule test ☐ Hardness (Brinell)

☐ Ultrasonic test ☐ Penetrant test

Declaration of installation to the legal authority:

4. FINAL RESULTS

☐ Accepted ☑ Rejected

Comments:

- Pinhole leak on Byp Valve PVC 'T.
- Need to Replace 'T' and Re-Test

(Repaired [signature])

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jered Polachek	Andrew Hamilton	Dean Moffett
Sign:	[signature] of ADCO	[signature] of ADCO	D.M.
Date:	~~Aug~~ Sept , 2019	Aug 15 , 2019	15-Nov-19

SECTION 3: Electrical

- CIS-70-025 Control and Relay Panels
- PIS-70-015 Misc. Electrical Equipment
- CIS-75-027 Limit/Sensor
- CIS-70-017 Conduit and Cable Tray
- CIS-70-056 Grounding (above ground)
- CIS-70-007 Low Voltage Cables <1kV
- CTS-70-020 Electrical Motor
- PIS-50-012 Pump Installation
- PIS-70-021 UPS System Startup
- CTS-70-033 Electrical Junction Boxes
- CIS-75-029 Beacons, Sirens, Horns

SECTION 3: Electrical

CIS-70-025 Control and Relay Panels

Construction Inspection Sheet
CIS-70-025 Control and Relay Panels

1 Tag No:	1623-PPC-001	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	GTK Custom Pump Controler	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	**General Data**				
2	Drawing No:				
3	Specification No: Per CWP - J2775 CONTROL - 1200 ISA				
4	**Inspection**				
5	Acceptable in accordance with design documents	✓			
6	Panel ground wire installed	✓			
7	Internal cooling fan			✓	
8	Forced ventilation			✓	
9	Nameplates complete	✓			
10	Internal device labels complete	✓			
11	Terminal strips labelled	✓			
12	NEMA construction (1,3R, etc) of enclosure	✓			
13	Field wire markers complete	✓			
14	Unused knockouts plugged	✓			
15	Convenience outlet phased	✓			
16	internal lighting complete	✓			
17	Floor entrances sealed	✓			
18	Touch up paining complete			✓	
19	Annunciator wiring bundled and formed to allow removal of a single print wiring without shutdown. Futere points are not blocked	✓			
20	Doors have been secured in place. Dors open, close, and seal correctly	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffatt
Sign:	of ADCO	of ADCO	D. Moffatt
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

SECTION 3: Electrical

PIS-70-015 Misc. Electrical Equipment

Pre-Operational Inspection Sheet
PIS-70-015 Misc. Electrical Equipment

2 Tag No:	1623-PLC-001	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	GTK Custom Effluent Pump Control Panel	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	**General Data**				
2	PO No:				
3	Type:				
4	Rating: 3R - 600V 3P				
5	Serial No: J2775 Power				
6	Model No:				
7	Style No:				
8	**Inspection**				
9	Construction Completion status	✓			
10	Preservation removed	✓			
11	Equipment cleaned	✓			
12	Earthing correctly installed. Megger-test performed	✓			
13	Livening Up Notice (LUN) obtained			✓	
14	In Operation tag fitted			✓	
15	All safety requirements satisfied	✓			
16	Verify power cables are complete, tight and correct phasing.	✓			
17	Check terminal chambers are clean and free from dust and moisture ingress.	✓			
18	Check insulation resistance of equipment power circuits. (Min value = 10 M:)	✓			
19	Verify switchboard cubicle number and labelling is correct.	✓			
20	Verify MCB / fuse ratings at feeder are correct for application.	✓			
21	Function check feeder controls and Instrument Control System (ICS) interfaces.	✓			
22	Verify equipment MCB / fuse ratings and relay settings are correct.	✓			
23	Energize and function check equipment to manufacturer's instructions.	✓			
24	Measure live earth loop impedance, if practical and safe to do so.			✓	
25	Verify operation of anti-condensation heater circuits.			✓	
26	Verify operation and settings of alarms and trips.	✓			
27	Verify system Emergency Shutdown (ESD) trips and ICS interfaces.			✓	
28	Compile red line drawing where applicable.	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hanson	Dean Moffett
Sign:	VG of ADCO	of ADCO	D. Moffett
Date:	08/31/2019	Aug 15, 2019	12-Sep-19

Pre-Operational Inspection Sheet
PIS-70-015 Misc. Electrical Equipment

7 Tag No:	1623-XV-001A	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	120V Motorized Butterfly Valve	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	**General Data**				
2	PO No:				
3	Type: Nema 4X				
4	Rating: 120V				
5	Serial No: 184308T001023				
6	Model No: KEJ063HVPD000U4				
7	Style No:				
8	**Inspection**				
9	Construction Completion status	✓			
10	Preservation removed			✓	
11	Equipment cleaned	✓			
12	Earthing correctly installed. Megger-test performed	✓			
13	Livening Up Notice (LUN) obtained			✓	
14	In Operation tag fitted			✓	
15	All safety requirements satisfied		✓		
16	Verify power cables are complete, tight and correct phasing.	✓			
17	Check terminal chambers are clean and free from dust and moisture ingress.	✓			
18	Check insulation resistance of equipment power circuits. (Min value = 10 M:)	✓			
19	Verify switchboard cubicle number and labelling is correct.	✓			
20	Verify MCB / fuse ratings at feeder are correct for application.	✓			
21	Function check feeder controls and Instrument Control System (ICS) interfaces.	✓			
22	Verify equipment MCB / fuse ratings and relay settings are correct.	✓			
23	Energize and function check equipment to manufacturer's instructions.	✓			
24	Measure live earth loop impedance, if practical and safe to do so.			✓	
25	Verify operation of anti-condensation heater circuits.			✓	
26	Verify operation and settings of alarms and trips.	✓			
27	Verify system Emergency Shutdown (ESD) trips and ICS interfaces.			✓	
28	Compile red line drawing where applicable.	✓			

Comments: Handle on actuating wheel Damaged.

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
n:	of ADCO	of ADCO	D. Moffett
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

Pre-Operational Inspection Sheet
PIS-70-015 Misc. Electrical Equipment

8 Tag No:	1623-XV-001B	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	120V Motorized Butterfly Valve	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	**General Data**				
2	PO No:				
3	Type: Nema 4X				
4	Rating: 120V				
5	Serial No: 184308T001023				
6	Model No: KEV063HVPD000V4				
7	Style No:				
8	**Inspection**				
9	Construction Completion status	✓			
10	Preservation removed			✓	
11	Equipment cleaned	✓			
12	Earthing correctly installed. Megger-test performed	✓			
13	Livening Up Notice (LUN) obtained			✓	
14	In Operation tag fitted			✓	
15	All safety requirements satisfied		✓		
16	Verify power cables are complete, tight and correct phasing.	✓			
17	Check terminal chambers are clean and free from dust and moisture ingress.	✓			
18	Check insulation resistance of equipment power circuits. (Min value = 10 M:)	✓			
19	Verify switchboard cubicle number and labelling is correct.	✓			
20	Verify MCB / fuse ratings at feeder are correct for application.	✓			
21	Function check feeder controls and Instrument Control System (ICS) interfaces.	✓			
22	Verify equipment MCB / fuse ratings and relay settings are correct.	✓			
23	Energize and function check equipment to manufacturer's instructions.	✓			
24	Measure live earth loop impedance, if practical and safe to do so.			✓	
25	Verify operation of anti-condensation heater circuits.			✓	
26	Verify operation and settings of alarms and trips.	✓			
27	Verify system Emergency Shutdown (ESD) trips and ICS interfaces.			✓	
28	Compile red line drawing where applicable.	✓			

Comments: Handle on actuating wheel Damaged.

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	D. Moffett
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

SECTION 3: Electrical

CIS-75-027 Limit/Sensor

Construction Inspection Sheet
CIS-75-027 Limit Switch/Sensor (Level, Flow, Pressure, Temperature)

5 Tag No:	1623-FIT-001	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	4-20mv Flow Meter	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	**General Data**				
2	Drawing No: Per CWP				
3	Specification No:				
4	**Nameplate Data:**				
5	Manufacturer: Endress & Hauser				
6	Type: 4X				
7	Model: ProMag 400				
8	Serial No: & NC07E216000				
9	Sensor Element Type: Non-incendive electrodes				
10	Specifications process Range:				
11	Transmit Range: 4-20mA				
12	Engineer Range:				
13	**Inspection-**				
14	Correctly set (ie, pressure, temp, flow, limit, etc)				
16	Open Switch set & PLC Set points-Threshold	✓			
17	Open switch mode setting correct				
18	Closed switch set & PLC Set points-Threshold	✓			
19	Closed switch mode setting correct				
20	Ellectrical connections correct	✓			
21	Electrical certification correct	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
n:	of ADCO	of ADCO	D. Moffett
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

Construction Inspection Sheet

CIS-75-027 Limit Switch/Sensor (Level, Flow, Pressure, Temperature)

6 Tag No:	1623-PIT-001	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	4-20mv Pressure Meter	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	**General Data**				
2	Drawing No: Per CWP				
3	Specification No:				
4	**Nameplate Data:**				
5	Manufacturer: Endress + Hauser				
6	Type: 4X				
7	Model: Cerabar M				
8	Serial No: NC019B15129				
9	Sensor Element Type:				
10	Specifications process Range: -100 to 100 KPa				
11	Transmit Range: 4-20mA				
12	Engineer Range:				
13	**Inspection-**				
14	Correctly set (ie, pressure, temp, flow, limit, etc)				
16	Open Switch set } PLC set points	✓			
17	Open switch mode setting correct				
18	Closed switch set } PLC set points	✓			
19	Closed switch mode setting correct				
20	Ellectrical connections correct	✓			
21	Electrical certification correct	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

SECTION 3: Electrical

CIS-70-017 Conduit and Cable Tray

Construction Inspection Sheet
CIS-70-017 Conduit and Cable Tray

Tag No:	1626 CABLE TRAY	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	6" GALVINIZED LADDER TYPE TRAY	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	**General Data**				
2	Drawing No.				
3	Specifiation No.				
4	Inspection-General				
5	Installation neat and evenly spaced and in accordance with the drawings, specification and referenced code and standards	✓			
6	All covers, firestops, and partitions are installed			✓	
7	Field bend radius correct per specification - bend free of defect			✓	
8	Supports as per specification and drawing	✓			
9	Spacing between instrumentation conduit or cable and power cables shall be according to specification	✓			
10	Spacing from hot pipes and hot surfaces has been maintained according to specification	✓			
11	Conduit/Cable Tray permanently and effectively earthed, including proper bonding jumpers where necessary.	✓			
12	Wall penetrations as per drawings and specifications			✓	
13	Relative deficiencies list closed-out	✓			
14	Inspection - Conduits				
15	Conduits clean, stub-ups protected, conduit seals installed on all open ends, damage during construction repaired			✓	
16	Supports adjacent to terminal fittings			✓	
17	Sufficient pull joints			✓	
18	Expansion joints as shown on drawing			✓	
19	Proper fittings installed with threads fully engaged, proper sealing used, no wrench cuts, conduit ends have bushings and covers installed			✓	
20	Seals and drains installed per drawings			✓	
21	Aluminum, PVC and PVC coated conduits installed as per drawing			✓	
22	Junction boxes levelled and supported as per drawing with proper hubs, locknuts and bushings installed			✓	
23	Seals checked for:			✓	
	23a - Correct location			✓	
	23b - Properly packed			✓	
	23c - Seal compound poured			✓	
24	Inspection - Cable Tray				
25	Cables are properly spaced and tied down	✓			
26	Sufficient number and use of barriers where necessary and in accordance to design requirements	✓			
27	Splice Plates in accordance with design requirements	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	D. Moffett
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

SECTION 3: Electrical

CIS-70-056 Grounding (above ground)

Construction Inspection Sheet
CIS-70-056 Grounding (above ground)

Tag No:		Project No:	3804 MEIP
(Sub)System:	1623- Effluent Pump Station	Area:	Milne Port Site
Description:		Drawing:	H353004-40000-260-284-0001-0001r0
CWP:	CVR-041	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General Data				
2	Drawing No: N/A				
3	Specification No:				
4	Inspection				
5	Materials conform to specification	✓			
6	Grounding installations conform to drawing and specification	✓			
7	Terminations to equipment conform to project standard drawing	✓			
8	Location, type, size and insulation colour as per drawing	✓			
9	Thermal connections checked (no cold joints or burn outs)			✓	
10	Thermal connections are insulated			✓	
11	System grounding rod resistance to ground measurements in accordance with specification - record these measurements			✓	
12	Bonding to equipment and structural steel installed as per drawing. Measure resistance between ground conductor and tagged equipment bus bars, tagged equipment enclosures, structural steel surface in addition to all other items designed on the drawing. Record test results	✓		✓	
13	Continuity between ground conductor and conduit, metal junction boxes and between sections of cable tray verified and found correct	✓			
14	High quality ground installation conform to specification	✓			
15	All revisions recorded on "As built" drawing	✓			
16	"As built" signed off, transmitted and recorded	✓			
17	Manufacturer's commissioning procedures available and followed			✓	
18	Manufacturer's commissioning report available and recorded			✓	
19	Relative deficiencies list closed-out	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:		Kyle Knight	Dean Moffett
Sign:			
Date:		NOV 14 2019	15-Nov-19

SECTION 3: Electrical

CIS-70-007 Low Voltage Cables <1kV

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 16	1623-PPC-001-P1	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	3c10awg 1kV TECK- Pump Power Feed to Pump Motor Controler	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	1611-MDB-010	Destination:	1623-PPC-001

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
n:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 17	1623-PP-001A-P1	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	3c10awg 1kV TECK- Power to pump 1	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	1623-PPC-001	Destination:	1623-PP-001A

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
n:	of ADCO	of ADCO	D. Moffett
Date:	Aug 31 , 2019	Aug , 2019	12-Sep-19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 18	1623-PP-001B-P1	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	3c10awg 1kV TECK- Power to pump 2	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	1623-PPC-001	Destination:	1623-PP-001B

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffatt
n:	of ADCO	of ADCO	D. Moffatt
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 19	1623-PPC-001-C1	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	13c14awg 1kV TECK- Pump status lights and PLC inputs to M1, Starter and holding contacts	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	1623-PLC-001	Destination:	1623-PPC-001

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffatt
n:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 13 , 2019	12-Sep-19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 20	1623-PLC-001-P1	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	3c10awg 1kV TECK- Feed to PLC Control Panel	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	WTP 120/208V Panel	Destination:	1623-PPC-001

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
n:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 21	1623-PP-001A-P1	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	2c12awg 1kV TECK- Valve 1 actuating Power	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	1623-PLC-001	Destination:	1623-XV-001A

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffatt
Signature:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 22	1623-PP-001B-P1	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	2c12awg 1kV TECK- Valve 2 actuating Power	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	1623-PLC-001	Destination:	1623-XV-001B

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
n:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 23	1623-PP-001A-C1	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	2pc16awg 300V TECK- Valve 1 Control/Monitoring	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	1623-PLC-001	Destination:	1623-XV-001A

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffatt
n:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 24	1623-PP-001B-C1	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	2pc16awg 300V TECK- Valve 2 Control/Monitoring	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	1623-PLC-001	Destination:	1623-XV-001B

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 25	1623-FIT-001-C1	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	1pc16awg 300V TECK- Flow transmitter control	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	1623-PLC-001	Destination:	1623-FIT-001

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends			✓	
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 26	1623-PIT-001-C1	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	1pc16awg 300V TECK- Pressure transmitter control	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	1623-PLC-001	Destination:	1623-PIT-001

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends			✓	
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffatt
Sign:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 27	1623-PIT-001-C2	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	2c12awg 300V TECK- DC Power to Pressure transmitter	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	1623-PLC-001	Destination:	1623-PIT-001

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffatt
Sign:	of ADCO	of ADCO	D. Moffatt
Date:	Aug 31, 2019	Aug 15, 2019	12-Sep-19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 28	1623-JBX-001-C1	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	2pc16awg 300V TECK- Level indicator Sensors	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	1623-PLC-001	Destination:	Level Switch JBX (L,H,HH)

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends			✓	
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffatt
Sign:	of ADCO	of ADCO	
Date:	Aug 31, 2019	Aug 15, 2019	12-Sep-19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No: 29	1623-H/S-001-P1	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	2c12awg 1kV TECK- Horn Strobe notification Circuit	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island
Origin:	1623-PLC-001	Destination:	Horn/Strobe JBX

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits		✓		
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments: Cables require Lables

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

SECTION 3: Electrical

CTS-70-020 Electrical Motor

Constuction Test Sheet
CTS-70-020 Electrical Motor

Tag No: 3	1623-PP-001A	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	10 HP 3P/600V Motor/Pump Assembly	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	Verify equipment details correct against drawings/ datasheet.			✓	Owner Supply
2	Verify vendor's certification documents complete and available.			✓	Owner Supply
3	Verify earthing is correct and conforms to design specification.	✓			
4	Measure eath bar resistance to general earth. (Max Value= 0.5ohm)	✓			
5	Verify incoming feeder cables are complete, tight and correct phasing.	✓			
6	Verify tapping connections are correct.	✓			
7	Verify padlocking facilities on doors and tap selector switches.			✓	
8	Check air ventilation systems are available and free from obstruction	✓			
9	Verify satisfactory operation of winding temperature monitoring system.	✓			
10	Verify operation of auxiliary devices			✓	
11	Verify satisfactory dielectric tests of insulating medium.			✓	

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffatt
:n:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

Constuction Test Sheet
CTS-70-020 Electrical Motor

Tag No: 4	1623-PP-001B	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	10 HP 3P/600V Motor/Pump Assembly	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	Verify equipment details correct against drawings/ datasheet.			✓	Owner Supply
2	Verify vendor's certification documents complete and available.			✓	Owner Supply
3	Verify earthing is correct and conforms to design specification.	✓			
4	Measure eath bar resistance to general earth. (Max Value= 0.5ohm)	✓			
5	Verify incoming feeder cables are complete, tight and correct phasing.	✓			
6	Verify tapping connections are correct.	✓			
7	Verify padlocking facilities on doors and tap selector switches.			✓	
8	Check air ventilation systems are available and free from obstruction	✓			
9	Verify satisfactory operation of winding temperature monitoring system.	✓			
10	Verify operation of auxiliary devices			✓	
11	Verify satisfactory dielectric tests of insulating medium.			✓	

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

SECTION 3: Electrical

PIS-50-012 Pump Installation

Constuction Test Sheet
PIS-50-012 Pump Installation

Tag No: 3	1623-PP-001A	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	10 HP 3P/600V Motor/Pump Assembly	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	Construction & Installation checked against specifications & design drawings.	✓			
2	Location & Overall dimensions correct	✓			
3	Foundation complete and anchor bolts set	✓			
4	Unit assembled per manufactures instructions	✓			
5	Materials of construction as per specification and drawings	✓			
6	Labeling/Identification		✓		
7	Coating completed to specification			✓	
8	Overall aesthetics acceptable	✓			
9	Driver Installed			✓	
10	Anchor bolts torqued	✓			
11	Centerline location & Elevation checked	✓			
12	Cold alignment complete			✓	
13	Ratation checked and record complete	✓			
14	Packing / seal installed			✓	
15	Coupling guard installed			✓	
16	Pipe connection stresses removed & checked	✓			
17	Lube system complete			✓	
18	Manufacturer test data complete			✓	
19	For Reciprocating Pumps				
20	Seals packings tight			✓	
21	Flow dampeners on line			✓	
22	Configuration established			✓	
23	Stroke adjuster to Zero			✓	
24	Level in suction vessel established			✓	
25	Seal Type:			✓	

Comments: Equipment Label to be installed

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
Sign:	KS of ADCO	of ADCO	D. Moffett
Date:	Aug 31, 2019	Aug 15, 2019	12-Sep-19

Constuction Test Sheet
PIS-50-012 Pump Installation

Tag No: 4	1623-PP-001B	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	10 HP 3P/600V Motor/Pump Assembly	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	Construction & Installation checked against specifications & design drawings.	✓			
2	Location & Overall dimensions correct	✓			
3	Foundation complete and anchor bolts set	✓			
4	Unit assembled per manufactures instructions	✓			
5	Materials of construction as per specification and drawings	✓			
6	Labeling/Identification		✓		
7	Coating completed to specification			✓	
8	Overall aesthetics acceptable	✓			
9	Driver Installed			✓	
10	Anchor bolts torqued	✓			
11	Centerline location & Elevation checked	✓			
12	Cold alignment complete			✓	
13	Ratation checked and record complete	✓			
14	Packing / seal installed			✓	
15	Coupling guard installed			✓	
16	Pipe connection stresses removed & checked	✓			
17	Lube system complete			✓	
18	Manufacturer test data complete			✓	
19	For Reciprocating Pumps				
20	Seals packings tight			✓	
21	Flow dampeners on line			✓	
22	Configuration established			✓	
23	Stroke adjuster to Zero			✓	
24	Level in suction vessel established			✓	
25	Seal Type:			✓	

Comments: Equipment label to be installed

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	A. Moffett
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

SECTION 3: Electrical

PIS-70-021 UPS System Startup

Construction Inspection Sheet
PIS-70-021 UPS System Startup

Tag No: 12	1623-PLC-UPS-001	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	GTK Supplied UPS in Custom Pump Controler	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	Check for no voltage and that feeder is isolated and locked off			✓	
2	Check that all internals are clean and clear from dust and debris			✓	
3	Check that ventilation air inlet, (bottom), and outlet, (top), cubicles are free from obstructions			✓	
4	Check protective devices correc rating, (fuses and MCBs)	✓			
5	All vendor pre-energisation checks complete and sheets attached			✓	
6	Check that the battery charge expiry date has not passed. If expired then do NOT use and contact manufacturer.				
7	Energization notice (EN) obtained			✓	
8	Warning notice located at inverter			✓	
9	Check incoming DC supply at inverter and switch ON			✓	
10	Check inverter (AC) output	✓			
11	Energise switch and check for (AC) output voltage	✓			
12	Energise by-pass supply to static switch and check			✓	
13	Energize and verify satisfactory operation of anti-condensation heater circuits			✓	
14	Energize feeder cubicle and function check controls and DCS interfaces			✓	
15	Energize charger cubicles and check for correct phase rotation and voltage			✓	
16	Carry out live ground loop impedance test at charger panels (Max value = 1.0Ω)			✓	
17	Function check charger system in accordance with manufacturer's instructions			✓	
18	With the inverter on load, test the load transfer from charger/inverter to bypass (static bypass switch)			✓	
19	With the inverter on load, test the load transfer from charger/inverter to bypass (manual bypass switch)	✓			
20	With the inverter on load, test the load transfer from charger/inverter to battery/inverter	✓			
21	Check the inverter remote alarm - UPS unit failure			✓	
22	Check the inverter remote alarm - fuse blown/ground fault rectifier/SBS/battery			✓	
23	Check the inverter remote alarm - fuse blown/ground fault distribution			✓	
24	Check operation of all indicator LEDs, controls, display selectors and local alarms			✓	
25	Verify the operation and settings of alarms and trips			✓	
26	Verify satisfactory charging parameters	✓			
27	Verify satisfactory discharge parameters (Record test results)		✓		
28	Verify the satisfactory operation of the UPS Inverter circuits	✓			
29	Check inverter instrumentation functioning correctly			✓	
30	Protection cover for live parts replaced			✓	

Comments: No Load Test completed.

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	D. Moffett
Date:	Aug 31 , 2019	Aug 15 , 2019	12-Sep-19

SECTION 3: Electrical

CIS-70-033 Electrical Junction Boxes

Construction Inspection Sheet
CTS-70-033 Electrial Junction Boxes

Tag No: 13	1623-JBX-001	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	Level Indicator Switch JBX	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General Data				
2					
3	Specification No:				
4	Record Serial Number of junction box:			✓	
5	Confirm Ex label affixed:		✓		
6	Record Ex-Certificate No. (if applicable):			✓	
7	Inspection				
8	Check correct junction box installed according to drawing and area classification.	✓			
9	Labelling / numbering / ferruling correct.		✓		
10	Junction box mechanically sound, solidly and correctly mounted.	✓			
11	Correct type of cable glands and glands tightened.	✓			
12	Earthing / bonding / shrouding correct.	✓			
13	Terminations correct.	✓			
14	Spare holes plugged (i.e. unused cable entries).	✓			
15	All nuts, bolts and washers in place and secure.	✓			
16	All wiring neat and tidy.	✓			
17	Gaskets in place and correct.	✓			
18	Cables correctly cleated.	✓			
19	Terminal blocks are correct type, mechanically sound, mounted and segrated correctly.			✓	
20	Junction box located correctly to allow easy access for maintenance.	✓			
21	Mounting rail for PE-Terminals is made of copper (Cu).			✓	
22	Drain plug inserted.			✓	
23	Tag No. Visible and correct.			✓	
24	Check correct thermostat installed according to drawing and area classification.			✓	
25	Thermostat mechanically sound, solidy and correctly mounted.			✓	
26	Capillary installed correctly and mechanically sound.			✓	
27	CE mark in place.	✓			
28	Insulation Resistance of current carrying components tested.			✓	
	Instrument used:				
	Calibration date:				
	Voltage:				
	Duration:				
	Phase 1 to phase 2:				
	Phase 2 to phase 3:				
	Phase 1 to phase 3:				
	Phase 1 to Ground:				

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffett
Sign:	of ADCO	of ADCO	
Date:	Aug 31, 2019	Aug 15, 2019	12-Sep-19

SECTION 3: Electrical

CIS-75-029 Beacons, Sirens, Horns

Pre-Operational Inspection Sheet
CIS-75-029 Beacons, Sirens Horn

Tag No: 14	MODULE HORN/ STROBE	Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:	xisting Building Horn & Strobes Mounted on Effluent Seaca	Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:	3804-CVR-023	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	Manufacturer:				
2	Model:				
3	Serial No:				
4	Visual Inspection for damage	✓			
5	Installed in correctr locations	✓			
6	Termination correct, wire markers, ferrules, etc.	✓			

Comments:

Visual inspection of Horn & Strobe Annunciations for Alarm conditions on panel.

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Kris Krahl	Andrew Hamilton	Dean Moffatt
Sign:	of ADCO	of ADCO	
Date:	Aug 31 , 2019	Aug 15 , 2019	12 Sept 19

SECTION 4: ITP CLOSEOUT

- PIS-70-999 Construction Work Package Punch List
- Final Walkdown Punch List
- PIS-10-001 As Builts
- Certificate of Construction Completion
- Care and Custody Certificate
- Declaration of Completion
- Turnover Package Review of Completion

SECTION 4: ITP Closeout

PIS-70-999 Construction Work Package Punch List

Pre-Operational Report Sheet
PIS-70-999 Construction Work Package Punch List

Tag No:		Project No:	3804 MEIP
(Sub)System:	1623-Effluent Pumping Station	Area:	Mine Site
Description:		Drawing:	H353004-CX001-227-248-0001_0_V3
CWP:		CLIENT:	BAFFINLAND IRON MINES, Baffin Island

CHECK SHEET/ LOCATION/ ITEM	DEFECTS/INCOMPLETES TO BE REINSPECTED	REINSPECTED BY ADCO	REINSPECTED BY HATCH
Electrical pg 24, 25	two motorized valve handles to be replaced		
	Permanent lamacoids on electrical equipment		

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:		Kyle Krahl	Derek Padlewski
Sign:		K/L	
Date:		Nov 13 2019	Nov 13/19

SECTION 4: ITP Closeout

Final Walkdown Punch List

Baffinland
Mary River
Punch List Input Form
Project No.: H353004

HATCH
Baffinland

Punch List ID. CX001 (Contract Number) _____ (Document No)

Date: 13 / Sep / 2019 (dd / mmm / yyyy)

Area Inspected _____ (Area No.) / _____ (Package) / _____ (System) / _____ (Subsystem)

Treated Effluent Pumping Station & Pipeline (Description)

Inspected By Andrew Hamilton (For Contractor)

Dean Moffett (For EPCM)

Type		Priority		Cause		Discipline	
A	Safety	1	Complete before Pre-Operational Testing	G	Equipment problems	10	Civil
B	Equipment Performance	2	Complete before Commissioning	H	Design inadequate	50	Mechanical
C	General Installation	3	Complete before Operation	J	Installation incorrect	60	Piping
D	Documentation	4	Complete before Sustained Production	K	Work remaining	70	Electrical
		5	Complete before Final Performance Acceptance	L	Additional item	75	Instrumentation

This defects list in no way relieves the contractor of any Contractual obligations in terms of the Contract should any deficiency in terms of the Employer's requirements be omitted from this listing.

Participants:

Dean Moffett Hatch
Andrew Blackburn BIM
Andrew Hamilton Nuna/Adco
Christopher Kilosi Horizon North

Comments:

Printed on: 2019-10-18

Baffinland
Mary River
Punch List Input Form
Project No.: H353004

HATCH
Baffinland

Punch List ID. CX001 (Contract Number) 0 (Document No) Date: 13 / SEP / 2019 (dd / mmm / yyyy)

Area Inspected ____ (Area No.) / 0 (Package) / 0 (System) / 0 (Subsystem) Treated Effluent Pumping Station & Pipeline (Description)

Inspected By Andrew Hamilton (For Contractor) Dean Moffett (For EPCM)

Type		Priority		Cause		Discipline	
A	Safety	1	Complete before Pre-Operational Testing	G	Equipment problems	10	Civil
B	Equipment Performance	2	Complete before Commissioning	H	Design inadequate	50	Mechanical
C	General Installation	3	Complete before Operation	J	Installation incorrect	60	Piping
D	Documentation	4	Complete before Sustained Production	K	Work remaining	70	Electrical
		5	Complete before Final Performance Acceptance	L	Additional item	75	Instrumentation

This defects list in no way relieves the contractor of any Contractual obligations in terms of the Contract should any deficiency in terms of the Employer's requirements be omitted from this listing.

Item No.	Line / Equip ID Tag No.	Remedial Work Description	RespID	Action	T	P	C	D	Due Date	Closed by Contractor	Approved by Hatch
1	**Pumphouse**	Permanent Cable Tagging	**ADCO**	**ADCO**					2019-09-16		Nov 9/19
2	**Pumphouse**	Permanent Valve Tagging	**ADCO**	**ADCO**					2019-09-27		
3	**Pumphouse**	Equipment Asset Tagging	**ADCO**	**ADCO**					2019-09-27		
4	**Pumphouse**	Replace broken handles on the 2 motorized valves	**ADCO**	**ADCO**					2019-09-27		

Baffinland
Mary River
Punch List Input Form
Project No.: H353004

HATCH
Baffinland

Punch List ID. CX001 (Contract Number) 0 (Document No) Date: 13 / SEP / 2019 (dd / mmm / yyyy)

Area Inspected ____ (Area No.) / 0 (Package) / 0 (System) / 0 (Subsystem) Treated Effluent Pumping Station & Pipeline (Description)

Inspected By Andrew Hamilton (For Contractor) Dean Moffett (For EPCM)

Type		Priority		Cause		Discipline	
A	Safety	1	Complete before Pre-Operational Testing	G	Equipment problems	10	Civil
B	Equipment Performance	2	Complete before Commissioning	H	Design inadequate	50	Mechanical
C	General Installation	3	Complete before Operation	J	Installation incorrect	60	Piping
D	Documentation	4	Complete before Sustained Production	K	Work remaining	70	Electrical
		5	Complete before Final Performance Acceptance	L	Additional item	75	Instrumentation

This defects list in no way relieves the contractor of any Contractual obligations in terms of the Contract should any deficiency in terms of the Employer's requirements be omitted from this listing.

Item No.	Line / Equip ID Tag No.	Remedial Work Description	RespID	Action	T	P	C	D	Due Date	Closed by Contractor	Approved by Hatch
5	Pumphouse	Install tank level indicator (BIM WTP operator can provide tube) ? Not in design	ADCO	ADCO					2019-09-27		
6	Pumphouse	Install hard surface to cover rigid foam insulation under piping	NUNA	NUNA					2019-09-20	ICK	9/11/19
7	Pumphouse	Seal unused knockouts on seacan	NUNA	NUNA					2019-09-20		Nov 9/19
8	Pumphouse	Complete insulation at connection between addition and seacan.		NUNA						ICK	Nov 9/19

Baffinland
Mary River
Punch List Input Form
Project No.: H353004

HATCH
Baffinland

Punch List ID. CX001 (Contract Number) 0 (Document No) Date: 13 / SEP / 2019 (dd / mmm / yyyy)

Area Inspected ____ (Area No.) / 0 (Package) / 0 (System) / 0 (Subsystem) Treated Effluent Pumping Station & Pipeline (Description)

Inspected By Andrew Hamilton (For Contractor) Dean Moffett (For EPCM)

	Type		Priority		Cause		Discipline	
A	Safety	1	Complete before Pre-Operational Testing	G	Equipment problems	10	Civil
B	Equipment Performance	2	Complete before Commissioning	H	Design inadequate	50	Mechanical
C	General Installation	3	Complete before Operation	J	Installation incorrect	60	Piping
D	Documentation	4	Complete before Sustained Production	K	Work remaining	70	Electrical
		5	Complete before Final Performance Acceptance	L	Additional item	75	Instrumentation

This defects list in no way relieves the contractor of any Contractual obligations in terms of the Contract should any deficiency in terms of the Employer's requirements be omitted from this listing.

Item No.	Line / Equip ID Tag No.	Remedial Work Description	RespID	Action	T	P	C	D	Due Date	Closed by Contractor	Approved by Hatch
9	Pumphouse	Complete interior finishing for addition to seacan (plywood and paint)	HATCH	NUNA					2019-09-16	KK	Nov 9/19
10	Pumphouse	Remove seacan doors	HATCH	NUNA					2019-09-20	KK	Nov 9/19
11	Pumphouse	Install "Watch your step" and "Authorized Personnel Only" signage on entry door.	HATCH	A					2019-09-16		
12	Pumphouse	Turnover documentation package to be uploaded	HATCH	ADCO					2019-09-20		
13	Pipeline	Anchor HDPE lines going into Valve Box to eliminate possibility of uninsulated piping being exposed.	HATCH	ADCO					Complete	AHM	DM

Baffinland
Mary River
Punch List Input Form
Project No.: H353004

HATCH
Baffinland

Punch List ID. CX001 (Contract Number) 0 (Document No) Date: 13 / SEP / 2019 (dd / mmm / yyyy)

Area Inspected ____ (Area No.) / 0 (Package) / 0 (System) / 0 (Subsystem) Treated Effluent Pumping Station & Pipeline (Description)

Inspected By Andrew Hamilton (For Contractor) Dean Moffett (For EPCM)

Type		Priority		Cause		Discipline	
A	Safety	1	Complete before Pre-Operational Testing	G	Equipment problems	10	Civil
B	Equipment Performance	2	Complete before Commissioning	H	Design inadequate	50	Mechanical
C	General Installation	3	Complete before Operation	J	Installation incorrect	60	Piping
D	Documentation	4	Complete before Sustained Production	K	Work remaining	70	Electrical
		5	Complete before Final Performance Acceptance	L	Additional item	75	Instrumentation

This defects list in no way relieves the contractor of any Contractual obligations in terms of the Contract should any deficiency in terms of the Employer's requirements be omitted from this listing.

Item No.	Line / Equip ID Tag No.	Remedial Work Description	RespID	Action	T	P	C	D	Due Date	Closed by Contractor	Approved by Hatch
14	Pipeline	Valve tags missing in valve box	HATCH	ADCO					2019-09-27		
15	Pipeline	Insulation required on valve box lid	HATCH	ADCO					Complete	AHM	DM
16	Pipeline	Insulation required on piping and valves in valve box	HATCH	ADCO					2019-09-13	AHM	RL
17	Pipeline	Labels required on Heat Trace JBX's	HATCH	ADCO					2019-09-27	AHM	RL
18	Pipeline	HDPE Insulation Kits required at Heat Trace Cold-Hot Termination kits (8 places)	HATCH	ADCO					Complete	AHM	DM
19	Pipeline	Reposition HDPE line just North of Emulsion access road to get piping out of low point.	HATCH	ADCO					2019-09-20		
20	Pipeline	Installation of Cable Tray under HDPE line 150m South of Nuna access rd to bridge natural trench	HATCH	ADCO					Complete	AHM	DM
21	Pipeline	Installation of Cable Tray under HDPE line 100m South of Nuna access rd to bridge natural trench	HATCH	ADCO					Complete	AHM	DM
22	Pipeline	Repair HDPE jacket 75m South of Nuna access rd with splice kit jacket sheet and SS bands	HATCH	ADCO					Complete	AHM	DM
23	Pipeline	Installation of Cable Tray under HDPE line behind boot room to bridge natural trench	HATCH	ADCO					2019-09-20		

SECTION 4: ITP Closeout

PIS 10-001 As Builts

DWG. No. H353004-10000-270-276-0003-0002

1623-TK-001
800 PERSON CAMP TREATED EFFLUENT
HOLDING TANK CAPACITY (TB)

1623-PP-001A/B
800 PERSON CAMP TREATED EFFLUENT
PUMP 7.5kW

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date 07-Aug-18
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

CS-1623-001

800 PERSON CAMP
PWTP (POTABLE FEED)
10000-270-276-0001-0001

800 PERSON CAMP
PWTP (BACKWASH EFFLUENT)
10000-270-276-0001-0001

800 PERSON CAMP LIFT STATIONS
RAW SEWAGE

RAW SEWAGE
FROM REMOTE USERS
10000-270-276-0006-0001
10000-270-276-0006-0002
10000-270-276-0006-0003
NOTE 2
SEWAGE TRUCK

800 PERSON CAMP
WASTE WATER AND SEWAGE
RECEIVING TANK
RECEIVING STATION P&ID - TBD

800 PERSON CAMP WASTE WATER TREATMENT PLANT
VENDOR PACKAGE - PM203
REFER TO VENDOR DWG E353004-PM203-260-262-0007 TO 0011

800 PERSON CAMP
SEWAGE TREATMENT PLANT
PUMP STATION

1623-TK-001
LSHH 001
LSH 001
LSL 001

1623-PP-001A
YA 001A
YL 001
M7 UX 001A
PI 001A
V1 XS 001A
XV 001A
FC
FI 001
PIT 001
NOTE 4
FE 001

1623-PP-001B
YA 001B
M7 UX 001B
PI 001B
V1 XS 001B
XV 001B
FC

MARY RIVER DISCHARGE
10000-270-276-0003-0001
1623-WEF-0001-HA1A-080-HC50

NOTE 2
GARBAGE TRUCK
SLUDGE FILTER CAKE
WASTE MANAGEMENT FACILITY
10000-270-276-0004-0001

NOTES:
1. ALL INSTRUMENTS ARE VENDOR SUPPLIED.
2. HOSE ARRANGEMENT IS PART OF THE TRUCK. SHOWN FOR REFERENCE ONLY.
3. VENDORS ARE RESPONSIBLE FOR STAMPING OF IFC PACKAGE DOCUMENTS.
4. CALORIMETRIC THERMAL MASS FLOW METER
5. ALL INSTRUMENT TAGS PRECEDED BY AREA CODE 1623

CS-1623-001:Treated Effluent Piping Change and associated heat trace from 800 man camp to tie in existing 3 line

FOR USE

REGISTERED PROFESSIONAL ENGINEER P.R. JIM LICENSEE NT/NU

No.	DESCRIPTION	BY	CHK'D	DATE
0	APPROVED FOR USE	HV	PC	11-07-2018

REVISIONS

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	H VINCENT	NR	25-06-2018
DESIGNER		NR	
CHECKER	P CHERRY		2018-08-06
DESIGN COORD.	R GOOSEN		2018-08-06
RESP. ENG.	P JIM		2018-08-06
LEAD DISC. ENG.	P CHERRY		2018-08-06
AREA LEAD	T ATIBA		
ENG. MANAGER	D STANGER		2018-08-06
AREA MANAGER	T ATIBA		2018-08-06

DRAWING APPROVAL STATUS: Approved for Use

HATCH

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

MINE SITE
SEWAGE WATER TREATMENT
PIPING & INSTRUMENTATION DIAGRAM

DRAWING No.	DRAWING TITLE
H349000-4731-75-031-0001	MINE SITE - SEWAGE WATER TREATMENT - PIPING & INSTRUMENTATION DIAGRAM

REFERENCE DRAWINGS

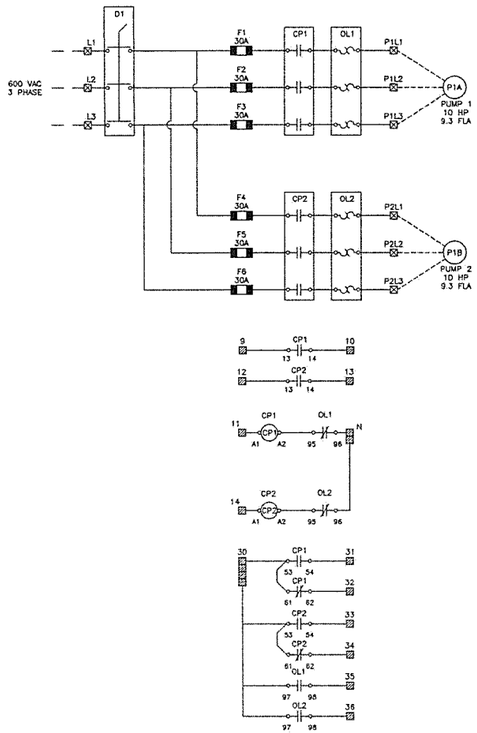
REG. PROFESSIONAL

SCALE NTS OR AS NOTED
DWG. No. H353004-10000-270-276-0003-0002
REV 0
SHEET SIZE: D

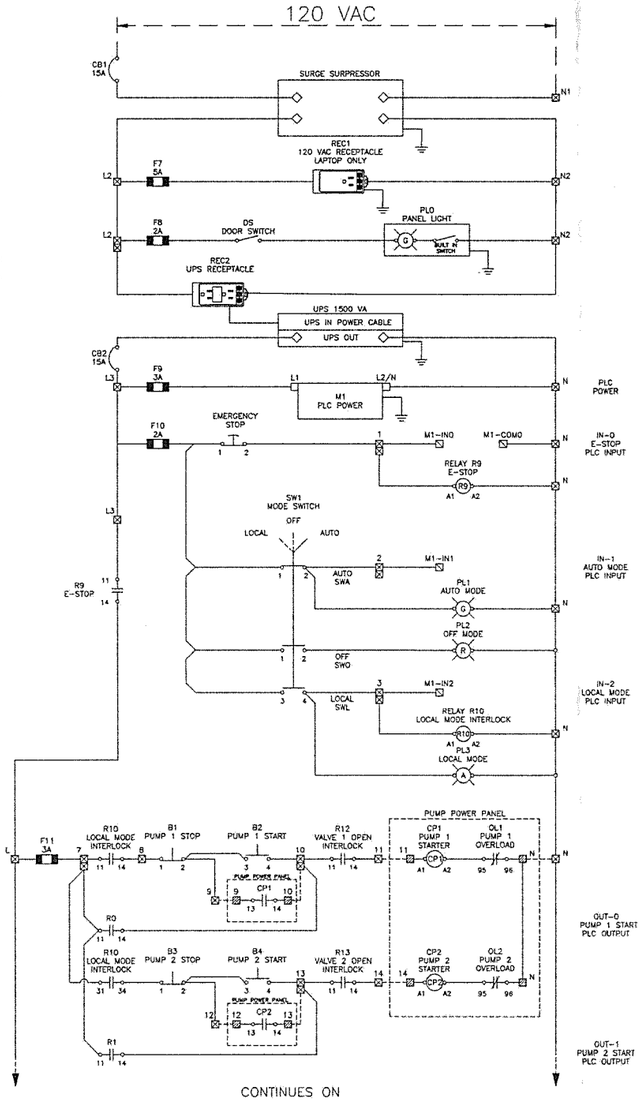
jdc_pwservice

REV. 4 | DRAWING NO. J2775-PD-1-1

POWER PANEL WIRING SCHEMATIC

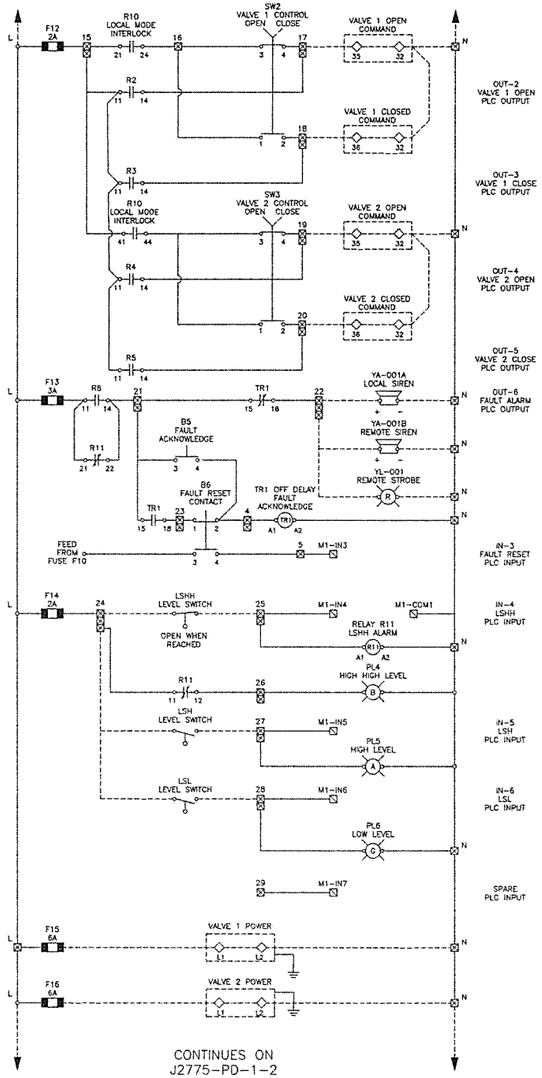


CONTROL PANEL WIRING SCHEMATIC



CONTINUES ON
J2775-PD-1-1
COLUMN 2

FROM J2775-PD-1-1
COLUMN 1



CONTINUES ON
J2775-PD-1-2
COLUMN 1

NOTES:

1. THE PANEL SHALL BE CSA APPROVED FOR GENERAL PURPOSE AND BEAR A CSA LABEL. TERMINATION.
2. ALL INTERNAL WIRING MUST BE TERMINATED ON A CSA APPROVED TERMINAL BLOCKS
3. ALL TERMINAL BLOCKS TO BE LABELED, NUMBERED MATCHING WIRING DIAGRAM.
4. ALL WIRE TERMINATION TO HAVE SHRINKABLE WINEMAKERS WITH DESTINATION TERMINATION POINT. (TO LOCATION)
5. WIRES COLOR PER LISTING BELOW:
   - 5.1. 120/60D VAC POWER – BLACK
   - 5.2. 120 VAC NEUTRAL – WHITE
   - 5.3. 120 VAC CONTROL – BLACK
   - 5.4. 24 VDC POSITIVE – BLUE
   - 5.5. 24 VDC NEGATIVE – BROWN
   - 5.6. ANALOG POSITIVE – BLACK
   - 5.7. ANALOG NEGATIVE – WHITE
   - 5.B. GROUND – GREEN
6. ALL 120 VAC FIELD WIRING CONNECTS TO BOTTOM RIGHT SIDE OF TERMINALS ON TERMINAL STRIP TS1, CABLES TO BE RUN IN RIGHT MOST WIREWAY (BOTTOM ENTRY FOR EASIEST ACCESS).
7. FLOW METER AND PRESSURE SENSOR ANALOG SIGNAL CABLES TO BE CONNECTED TO TERMINALS ON TS-4. GROUNDED AT PANEL NOT AT INSTRUMENTS
8. ALL PILOT LIGHTS FOR FAULTS ARE BLUE, FAULT STROBES ARE ALSO BLUE.
9. ITEMS 62 TO 65, (BLUE BEACONS AND SIREN) SHIPPED LOOSE AND TO BE INSTALLED AND WIRED SITE IN APPROPRIATE LOCATIONS.
10. UPS SHIPPED LOOSE AND TO BE INSTALLED AND WIRED TO CONTROL PANEL ON SITE. INSTALLATION STEPS:
    - 10.1. PRE CONNECT WIRES TO UPS SINCE AFTER INSTALLATION THERE WILL BE LIMITED ACCESS TO BACK OF UPS.
      - 10.5.1. CONNECT UPSR-1 AND UPSR-3 (LABELED BLUE WIRES) TO APPROPRIATE SCREW TERMINALS ON BACK OF UPS.
    - 10.9.2. PLUG PANELS INPUT POWER CORD (YELLOW SHRINK) TO RECEPTACLE ON THE UPS. THIS CORD HAS A 90 DEGREE PLUG.
    - 10.10. PLACE UPS IN THE CONTROL PANEL, UPS DISPLAY SHOULD BE FACING AWAY FROM LEFT ENCLOSURE WALL.
    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE-2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

REV.	ISSUE DATE Y	M	D	DESCRIPTION	DWN	CHK	ENG	APP	APP
4	19	2	18	AS BUILT	DI	GK			
3	19	2	1	ISSUED FOR PROGRAMMING	DI	GK			
2	19	1	30	ISSUED FOR PROGRAMMING	DI	GK			
1	19	1	28	ISSUED FOR REVIEW	DI	GK			
0	18	11	15	ISSUED FOR REVIEW	DI	GK			

REFERENCE DRAWINGS:

G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

DRAWING TITLE:

PUMP CONTROL/POWER PANEL WIRING DIAGRAM (PAGE 1 OF 2)

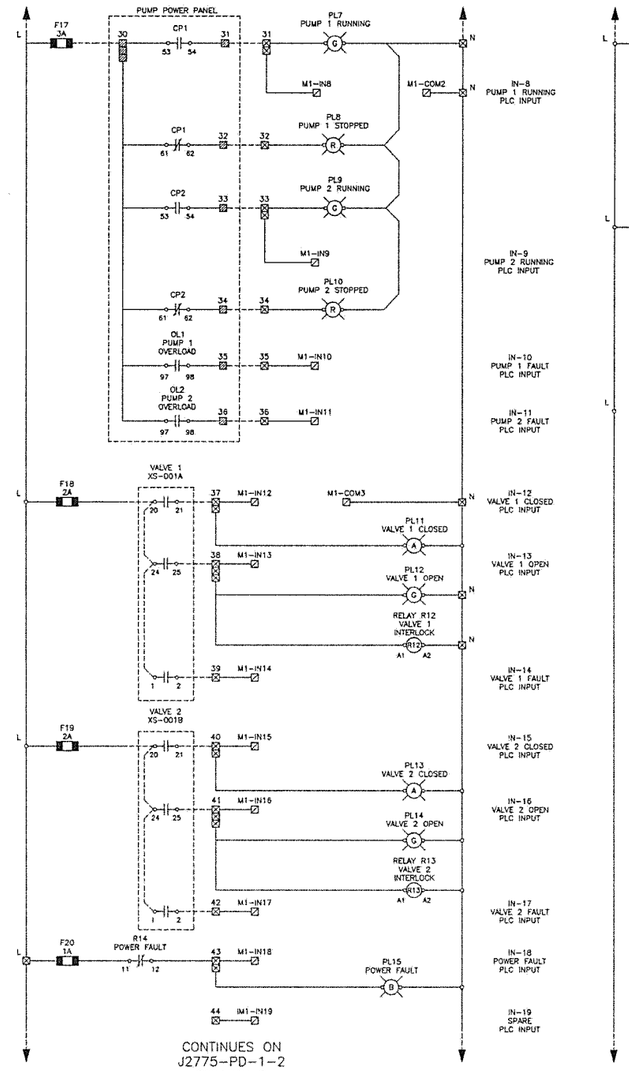
DRAWING NO.	SHT. No.	REV
J2775-PD-1	1	4

PLOT SCALE: X

DRAWING NO. J2775-PD-1-2 | REV. 4

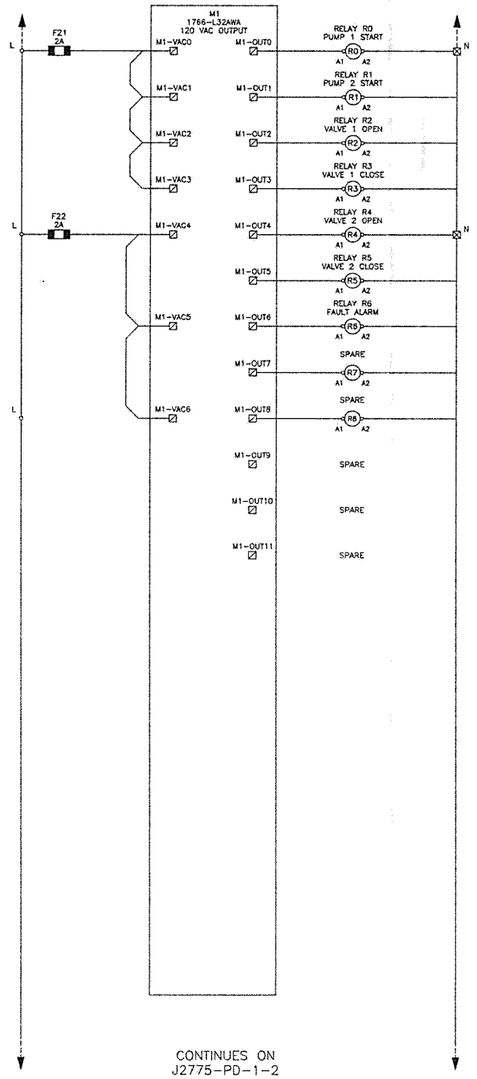
CONTROL PANEL WIRING SCHEMATIC

FROM J2775-PD-1-1
COLUMN 2



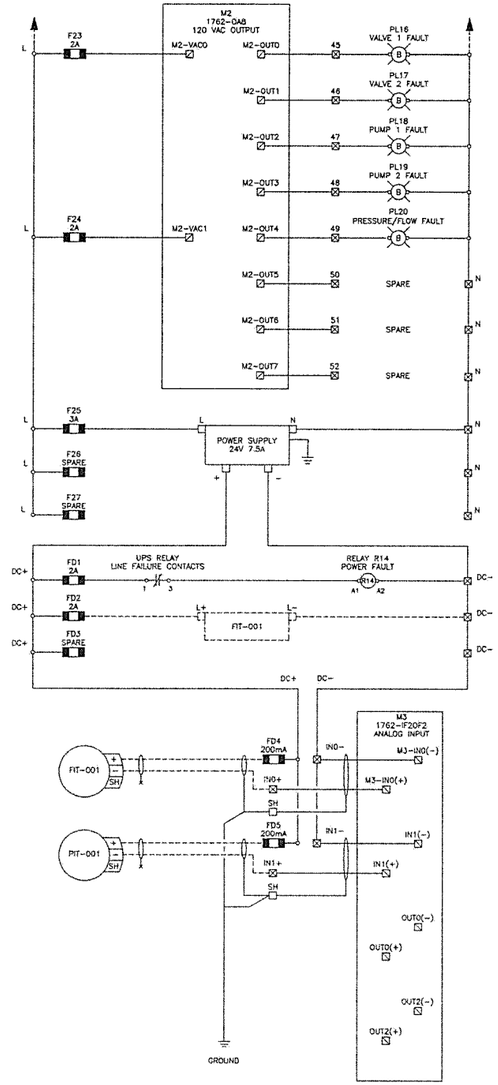
CONTINUES ON
J2775-PD-1-2
COLUMN 2

FROM J2775-PD-1-2
COLUMN 1



CONTINUES ON
J2775-PD-1-2
COLUMN 3

FROM J2775-PD-1-2
COLUMN 2



NOTES:

1. THE PANEL SHALL BE CSA APPROVED FOR GENERAL PURPOSE AND BEAR A CSA LABEL. TERMINATION.
2. ALL INTERNAL WIRING MUST BE TERMINATED ON A GSA APPROVED TERMINAL BLOCKS
3. ALL TERMINAL BLOCKS TO BE LABELED, NUMBERED MATCHING WIRING DIAGRAM.
4. ALL WIRE TERMINATION TO HAVE SHRINKABLE WINEMAKERS WITH DESTINATION TERMINATION POINT. (TO LOGATION)
5. WIRES COLOR PER LISTING BELOW:
   - 5.1. 120/6DD VAC POWER – BLACK
   - 5.2. 120 VAG NEUTRAL – WHITE
   - 5.3. 12D VAC CONTROL – BLACK
   - 5.4. 24 VDC POSTIVE – BLUE
   - 5.5. 24 VDC NEGATIVE – BROWN
   - 5.6. ANALOG POSITIVE – BLACK
   - 5.7. ANALOG NEGATIVE – WHITE
   - 5.B. GROUND – GREEN
6. ALL 120 VAG FIELD WIRING CONNECTS TO BOTTOM RIGHT SIDE OF TERMINALS ON TERMINAL STRIP TS1, CABLES TO BE RUN IN RIGHT MOST WIREWAY (BOTTOM ENTRY FOR EASIEST ACCESS).
7. FLOW METER AND PRESSURE SENSOR ANALOG SIGNAL CABLES TO BE CONNEGTED TO TERMINALS ON TS-4. GROUNDED AT PANEL NOT AT INSTRUMENTS.
8. ALL PILOT LIGHTS FOR FAULTS ARE BLUE, FAULT STROBES ARE ALSO BLUE.
9. ITEMS 62 TO 65, (BLUE BEACONS AND SIREN) SHIPPED LOOSE AND TO BE INSTALLED AND WIRED SITE IN APPROPRIATE LOCATIONS.
10. UPS SHIPPED LOOSE AND TO BE INSTALLEO AND WIRED TO CONTROL PANEL ON SITE. INSTALLATION STEPS:
    - 10.1. PRE CONNECT WIRES TO UPS SINCE AFTER INSTALLATION THERE WILL BE LIMITED ACCESS TO BACK OF UPS.
    - 10.5.1. CONNECT UPSR-1 AND UPSR-3 (LABELEO BLUE WIRES) TO APPROPRIATE SCREW TERMINALS ON BACK OF UPS.
    - 10.9.2. PLUG PANELS INPUT POWER CORD (YELLOW SHRINK) TO RECEPTACLE ON THE UPS. THIS CORD HAS A 90 DEGREE PLUG.
    - 10.10. PLACE UPS IN THE CONTROL PANEL, UPS DISPLAY SHOULD BE FACING AWAY FROM LEFT ENCLOSURE WALL.
    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE-2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

REV.	ISSUE DATE			DESCRIPTION	DWN	CHK	ENG	APP	APP
4	19	2	18	AS BUILT	DI	GK			
3	19	2	1	ISSUED FOR PROGRAMMING	DI	GK			
2	19	1	30	ISSUED FOR PROGRAMMING	DI	GK			
1	19	1	28	ISSUED FOR REVIEW	DI	GK			
0	18	11	15	ISSUED FOR REVIEW	DI	GK			

REFERENCE DRAWINGS:

G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

DRAWING TITLE:

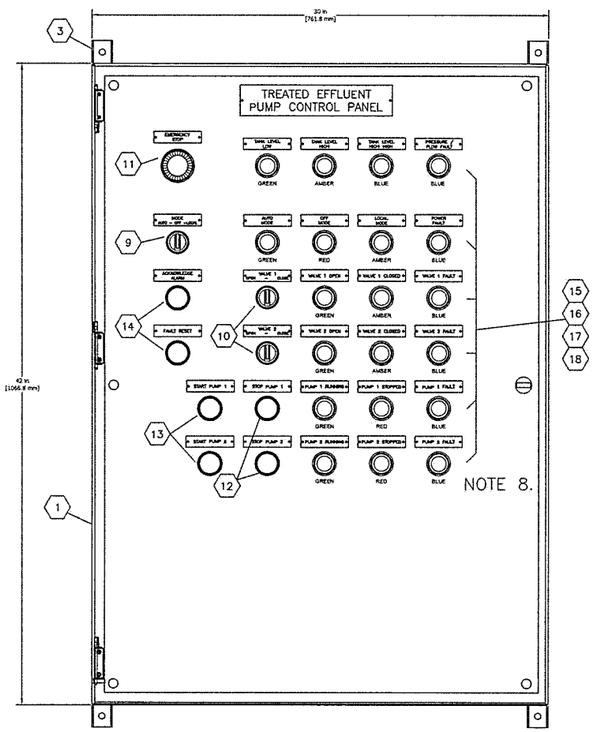
PUMP CONTROL/POWER PANEL WIRING DIAGRAM (PAGE 2 OF 2)

DRAWING NO.	SHT. No.	REV
J2775-PD-1	2	4

PLOT SCALE: X

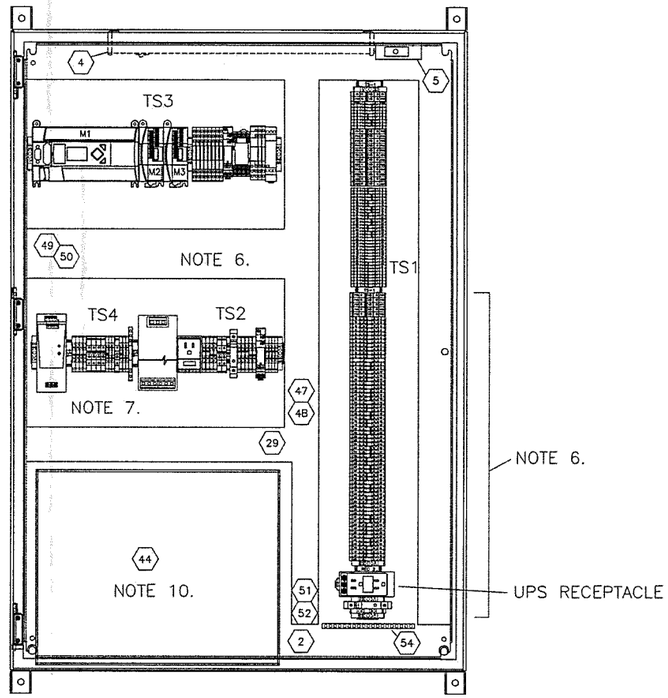
DRAWING NO. J2775-PD-1-3 REV. 2

FRONT VIEW



FRONT VIEW

(SHOWN WITH EXTERIOR DOOR REMOVED)



NOTES:

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3. ALL TERMINAL BLOCKS TO BE LABELED, NUMBERED MATCHING WIRING DIAGRAM.
4. ALL WIRE TERMINATION TO HAVE SHRINKABLE WINEMAKERS WITH DESTINATION TERMINATION POINT. (TO LOCATION)
5. WIRES COLOR PER LISTING BELOW:
   - 5.1. 120/600 VAC POWER – BLACK
   - 5.2. 120 VAC NEUTRAL – WHITE
   - 5.3. 120 VAC CONTROL – BLACK
   - 5.4. 24 VDC POSTIVE – BLUE
   - 5.5. 24 VDC NEGATIVE – BROWN
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   - 5.7. ANALOG NEGATIVE – WHITE
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11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

BILL OF MATERIAL

ITEM	QTY.	DESCRIPTION
1	1	HOFFMAN, ENCLOSURE, STAINLESS STEEL, 304, 3PT LATCH , 42 X 30 X 10 , #CSD423010SS
2	1	HOFFMAN, BACK PLATE, FITS 42 X 30, STEEL, WHITE, #CP4230
3	1	HOFFMAN, MOUNTING FEET, STAINLESS STEEL, #CMFKSS
4	1	HAMMOND, 17.5 IN LED LIGHT KIT , #FLK7LED
5	1	HAMMOND, REMOTE DOOR SWITCH , #FLKDS
6	1	A8, CONTROLLER, 20 DI, 12 RELAY OUTPUTS, 120/240 VAC POWER INPUT, #1766-L32AWA
7	1	A8, IO MODILE, 8 POINT, 120 VAC OUTPUT, #1762-OA8
8	1	A8, IO MODULE, 4 CHANNEL ANALOG COMBO , #1762-IF20F2
9	1	A8, SELECTOR SWITCH, 3 POSITION, M-M-M, KC7 CAM, STANDARD KNOB, 1NO – 1NC, #800T-J2KC7B
10	2	A8, SELECTOR SWITCH, 3 POSITION, S-M-S, 1NO-1NC, #800H-JR91A
11	1	A8, PUSH-PULL/TWIST RELEASE, 2 POSITION, JUMBO MUSHROOM HEAD, RED, 1 NC, #800H-FRXJT6D2
12	2	A8, PUSH BUTTON, MOMENTARY CONTACT, FLUSH HEAD, REO, 1NC, #800H-AR6D1
13	2	A8, PUSH BUTTON, MOMENTARY CONTACT, FLUSH HEAD, GREEN, 1NO, #800H-AR1D1
14	2	A8, PUSH BUTTON, MOMENTARY CONTACT, FLUSH HEAD, BLACK, 1NO, #800H-AR2D1
15	6	A8, PILOT LICHT, GREEN, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, #800H-ORH2C
16	4	A8, PILOT LIGHT, AMBER, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, , #800H-ORH2A
17	3	A8, PILOT LIGHT, RED, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, #800H-ORH2R
18	7	A8, PILOT LIGHT, BLUE, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, #800H-ORH28
19	1	SCHNEIGER, TIMER MULTI FUNCTION, 24 TO 240 VAC VOLTAGE RANGE, #RE17LMBM
20	1	FINGER, RELAY SOCKET, 14 POSITION, 4 FORM C, OIN RAIL MOUNTABLE, #94.74
21	1	FINGER, RELAY, 4PDT, 120 VAC COIL, 4 FORM C SOCKETABLE, 7 A 250 VAC RATED, #55.34.8.120.0040
22	2	FINDER, RELAY, SPDT , 120 VAC COIL, 16 A 250 VAC CONTACT, #46.61.8.120.0054
23	2	FINDER, RELAY BASE, SPDT, 5 PIN FOR 46.61 C/W SS MOOULE, #97.01SPA
24	1	WEIDMULLER, RECEPTACLE, DIN RAIL, 15 AMP, #6720005421
25	2	WEIDMULLER, CIRCUIT BREAKER, 15 AMP, SINGLE POLE, #9926251015
26	2	WEIDMULLER, OIN RAIL, TS 35 X 7.5, SLOTTED, STEEL , 2M, #0514500000
27	1	WEIDMULLER, POWER SUPPLY, PRO MAX, 1BOW, 25 VDC, 7.5 A, #1478120000
28	10	WEIDMULLER, RELAY , SPDT, 120 VAC COIL, 6A, 250VAC SWITCHING, #1122B30000
29	5	WEIDMULLER, RELAY , SPDT, 24 VDC COIL, 6A, 250VAC SWITCHING, #1122BB0000
30	50	WEIDMULLER, SCHT5S, CROUP MARKER CARRIER, BEIGE, 44.5 X 9.5 MM, #1631930000
31	47	WEIDMULLER, WDU 2.5, TERMINAL BLOCK, 600V/20A, BEIGE, #1020000000
32	78	WEIDMULLER, WDU 4, TERMINAL BLOCK, BOOV/32A, #1020100000
33	9	WEIOMULLER, WEW 35/2, W-SERIES, END BRACKET, #1061200000

ITEM	QTY.	DESCRIPTION
34	2	WEIOMULLER, WPE 2.5, 26-12 AWC, GROUND TERMINAL , #1010000000
35	LOT	WEIOMULLER, WS 12/5, NEUTRAL,TERMINAL MARKER , #1609B60000
36	LOT	WEIOMULLER, WS 12/6, NEUTRAL, TERMINAL MARKER , #1609900000
37	21	WEIOMULLER, WSI 6/LD, 5X20MM/5X25MM, 120VAC, FUSE TERMINAL, 300V/10A, #1012300001
38	3	WEIDMULLER, WSI 6/LD, 5X20MM/5X25MM, 24VDC, FUSE TERMINAL, 300V/10A, #1011300000
39	2	WEIDMULLER, WTR 2.5 ST8 2.3 , DISCONNECT TERMINAL, 500V/24A, #1B55620000
40	1	WEIDMULLLER, RELAY MOOULE, TRS, DPDT, 120 VAC COIL, 8A, 250 VAC SWITCH, #1123530000
41	5	WEIDMULLER, WOV 4/10, CROSS CONNECTORS, 10 POLE, #1052060000
42	5	WEIDMULLER, WOV 2.5/10, CROSS CONNECTORS, 10 POLE, #1054460000
43	1	SOLA, SURGE PROTECTOR, DIN RAIL, STV 25K SERIES, OUTLET STRIP, 120 VAC , #STV25K-10S
44	1	POWERWARE, 9130 2000VA UPS, #PW9130L2000T-XL
45	1	EATON, UPS OUTPUT RELAY CARD, #101401B
46	1	UPS OUTPUT POWER CABLE, #WIRE-UPS-PC
47	LOT	PANDUIT, DUCT, 2" W X 2 " H, PVC, LIGHT GREY, TYPE F, NARROW SLOT, #F2X2LG6
48	LOT	PANDUIT, COVER, 2" W, PVC, LIGHT GREY, #C2LG6
49	LOT	PANOUIT, DUCT, 3" W X 2 " H, PVC, LIGHT GREY, TYPE F, NARROW SLOT, #F3X2LG6
50	LOT	PANOUIT, COVER, 3" W, PVC, LIGHT GREY, #C3LG6
51	LOT	PANDUIT, DUCT, 1.5" W X 2 " H, PVC, LIGHT CREY, TYPE F, NARROW SLOT, #F1.5X2LG6
52	LOT	PANDUIT, COVER 1.5"W, PVC LIGHT GREY, #C1.5LG6
53	LOT	PANASONIC, ZNR TRANSEIENT SURGE ABSORBER, #ERZ-V05D241
54	1	ILSCO, GROUND BAR, NB020, ALUMINUM, 15 TAPS, 2 MOUNTING HOLES, #4-#14 AWC, #NB020
55	LOT	WIRE, THERMOPLASTIC EOUIPMENT WIRE, #14, #TEW14
56	LOT	WIRE, THERMOPLASTIC EOUIPMENT WRIRE, #16, #TEW16
57	2	WIRE, 1B CAUGE, 2 CONOUCTOR SHIELDED, #WIRE-18-2C-S
58	1	KILLARK, BREATHER ORAIN, STAINLESS STEEL, 1/2" NPT, #OPE3029S3
59	LOT	WIREMARKERS, VARIOUS, #WM
60	1	ENGRAVINGS, LARGE, BLACK ON WHITE, FASTENED, #ENG-L-BW-F
61	30	ENGRAVINGS, SMALL, BLACK ON WHITE, FASTENED, #ENG-S-BW-F
62	2	FEDERAL SIGNAL, STROBE, SINGLE FLASH, 1/2" NPT, SURFACE MOUNT, 120VAC, BLUE, #FB2PST-1208
63	2	FEDERAL SIGNAL, WALL MOUNTING KITS, #LWM82
64	1	FEFERAL SIGNAL, HORN, SURFACE MOUNT, 120 VAC, GRAY, 120 VAC, #350-120-30
65	1	FEOERAL SIGNAL, WEATHERPROOF BOX, GREY, #W8
66		

REV.	Y	M	D	DESCRIPTION	DWN	CHK	ENG	APP	APP
2	19	2	18	AS BUILT	DI	GK			
1	19	1	28	ISSUED FOR REVIEW	DI	GK			
0	18	11	15	ISSUED FOR REVIEW	DI	GK			

REFERENCE DRAWINGS:

G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

DRAWING TITLE:

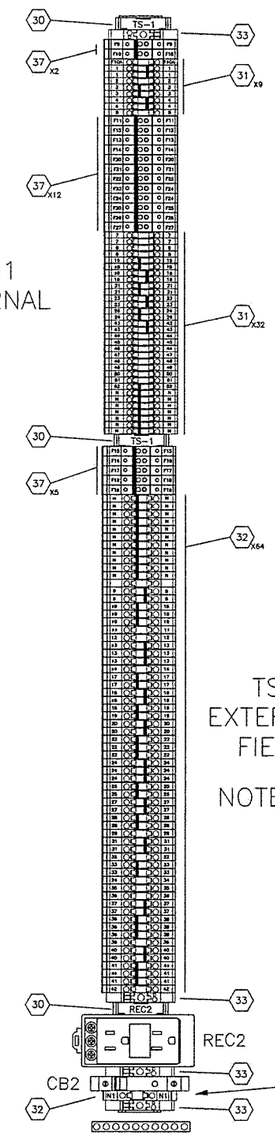
PUMP CONTROL PANEL LAYOUT

DRAWING NO.	SHT. No.	REV
J2775-PD-1	3	2

PLOT SCALE: X

DRAWING NO. J2775-PD-1-4 REV. 2

TERMINAL STRIP ARRANGEMENT TS1



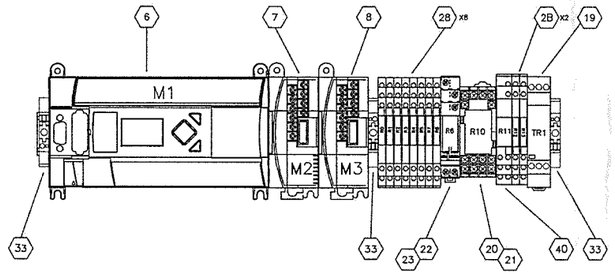
TS1 INTERNAL

TS1 EXTERNAL FIELD

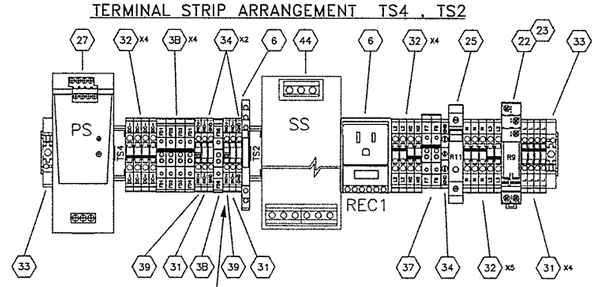
NOTE 6.

INCOMING 120 VAC POWER CONNECTION LOCATION

TERMINAL STRIP ARRANGEMENT TS3



TERMINAL STRIP ARRANGEMENT TS4 , TS2



INSTRUMENTATION 4-20 mA CONNECTION POINTS

NOTE 7.

NOTE 11.

BILL OF MATERIAL

ITEM	QTY.	DESCRIPTION
1	1	HOFFMAN, ENCLOSURE, STAINLESS STEEL, 304, 3PT LATCH , 42 X 30 X 10 , #CSD423010SS
2	1	HOFFMAN, BACK PLATE, FITS 42 X 30, STEEL, WHITE, #CP4230
3	1	HOFFMAN, MOUNTING FEET, STAINLESS STEEL, #CMFKSS
4	1	HAMMOND, 17.5 IN LED LIGHT KIT , #FLK7LED
5	1	HAMMOND, REMOTE DOOR SWITCH , #FLKDS
6	1	AB, CONTROLLER, 20 DI, 12 RELAY OUTPUTS, 120/240 VAC POWER INPUT, #1766-L32AWA
7	1	AB, IO MODILE, 8 POINT, 120 VAC OUTPUT, #1762-OA8
8	1	AB, IO MODULE, 4 CHANNEL ANALOG COMBO , #1762-IF2OF2
9	1	AB, SELECTOR SWITCH, 3 POSITION, M-M-M, KC7 CAM, STANDARD KNOB, 1NO - 1NC, #800T-J2KC78
10	2	AB, SELECTOR SWITCH, 3 POSITION, S-M-S, 1NO-1NC, #800H-JR91A
11	1	AB, PUSH-PULL/TWIST RELEASE, 2 POSITION, JUMBO MUSHROOM HEAD, RED, 1 NC, #800H-FRXJT6D2
12	2	AB, PUSH BUTTON, MOMENTARY CONTACT, FLUSH HEAD, RED, 1NC, #800H-AR6D1
13	2	AB, PUSH BUTTON, MOMENTARY CONTACT, FLUSH HEAD, GREEN, 1NO, #800H-AR1D1
14	2	AB, PUSH BUTTON, MOMENTARY CONTACT, FLUSH HEAD, BLACK, 1NO, #800H-AR2D1
15	6	AB, PILOT LIGHT, GREEN, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, #800H-ORH2G
16	4	AB, PILOT LIGHT, AMBER, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, , #800H-ORH2A
17	3	AB, PILOT LIGHT, RED, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, #800H-QRH2R
18	7	AB, PILOT LIGHT, BLUE, LED, 12-130V AC/DC, 30MM , TYPE 4/4X/13, #800H-QRH28
19	1	SCHNEIDER, TIMER MULTI FUNCTION, 24 TO 240 VAC VOLTAGE RANGE, #RE17LMBM
20	1	FINDER, RELAY SOCKET, 14 POSITION, 4 FORM C, DIN RAIL MOUNTABLE, #94.74
21	1	FINDER, RELAY, 4PDT, 120 VAC COIL, 4 FORM C SOCKETABLE, 7 A 250 VAC RATED, #55.34.8.120.0040
22	2	FINDER, RELAY, SPDT , 120 VAC COIL, 16 A 250 VAC CONTACT, #46.61.8.120.0054
23	2	FINDER, RELAY BASE, SPDT, 5 PIN FOR 46.61 C/W SS MODULE, #97.01SPA
24	1	WEIDMULLER, RECEPTACLE, DIN RAIL, 15 AMP, #6720005421
25	2	WEIDMULLER, CIRCUIT BREAKER, 15 AMP, SINGLE POLE, #9926251015
26	2	WEIDMULLER, DIN RAIL, TS 35 X 7.5, SLOTTED, STEEL , 2M, #0514500000
27	1	WEIDMULLER, POWER SUPPLY, PRO MAX, 1BOW, 25 VDC, 7.5 A, #1478120000
28	10	WEIDMULLER, RELAY , SPDT, 120 VAC COIL, 6A, 250VAC SWITCHING, #1122830000
29	5	WEIDMULLER, RELAY , SPDT, 24 VDC COIL, 6A, 250VAC SWITCHING, #1122880000
30	50	WEIDMULLER, SCHT5S, GROUP MARKER CARRIER, BEIGE, 44.5 X 9.5 MM, #1631930000
31	47	WEIDMULLER, WDU 2.5, TERMINAL BLOCK, 600V/20A, BEIGE, #1020000000
32	78	WEIDMULLER, WDU 4, TERMINAL BLOCK, 800V/32A, #1020100000
33	9	WEIDMULLER, WEW 35/2, W-SERIES, END BRACKET, #1061200000
34	2	WEIDMULLER, WPE 2.5, 26-12 AWG, GROUND TERMINAL , #1010000000
35	LOT	WEIDMULLER, WS 12/5, NEUTRAL,TERMINAL MARKER , #1609860000
36	LOT	WEIDMULLER, WS 12/6, NEUTRAL, TERMINAL MARKER , #1609900000
37	21	WEIDMULLER, WSI 6/LD, 5X20MM/5X25MM, 120VAC, FUSE TERMINAL, 300V/10A, #1012300001
38	3	WEIDMULLER, WSI 6/LD, 5X20MM/5X25MM, 24VDC, FUSE TERMINAL, 300V/10A, #1011300000
39	2	WEIDMULLER, WTR 2.5 ST8 2.3 , DISCONNECT TERMINAL, 500V/24A, #1855620000
40	1	WEIDMULLLER, RELAY MODULE, TRS, OPDT, 120 VAC COIL, 8A, 250 VAC SWITCH, #1123530000
41	5	WEIDMULLER, WOV 4/10, CROSS CONNECTORS, 10 POLE, #1052060000
42	5	WEIDMULLER, WOV 2.5/10, CROSS CONNECTORS, 10 POLE, #1054460000
43	1	SOLA, SURGE PROTECTOR, DIN RAIL, STV 25K SERIES, OUTLET STRIP, 120 VAC , #STV25K-10S
44	1	POWERWARE, 9130 2000VA UPS, #PW9130L2000T-XL
45	1	EATON, UPS OUTPUT RELAY CARD, #1014018
46	1	UPS OUTPUT POWER CABLE, #WIRE-UPS-PC
47	LOT	PANDUIT, DUCT, 2" W X 2 " H, PVC, LIGHT GREY, TYPE F, NARROW SLOT, #F2X2LG6
48	LOT	PANDUIT, COVER, 2" W, PVC, LIGHT GREY, #C2LG6
49	LOT	PANDUIT, DUCT, 3" W X 2 " H, PVC, LIGHT GREY, TYPE F, NARROW SLOT, #F3X2LG6
50	LOT	PANDUIT, COVER, 3" W, PVC, LIGHT GREY, #C3LG6
51	LOT	PANDUIT, DUCT, 1.5" W X 2 " H, PVC, LIGHT GREY, TYPE F, NARROW SLOT, #F1.5X2LG6
52	LOT	PANDUIT, COVER 1.5"W, PVC LIGHT GREY, #C1.5LG6
53	LOT	PANASONIC, ZNR TRANSEIENT SURGE ABSORBER, #ERZ-V05D241
54	1	ILSCO, GROUND BAR, NB020, ALUMINUM, 15 TAPS, 2 MOUNTING HOLES, #4-#14 AWG, #N8020
55	LOT	WIRE, THERMOPLASTIC EQUIPMENT WIRE, #14, #TEW14
56	LOT	WIRE, THERMOPLASTIC EQUIPMENT WRIRE, #16, #TEW16
57	2	WIRE, 18 GAUGE, 2 CONDUCTOR SHIELDED, #WIRE-18-2C-S
58	1	KILLARK, BREATHER DRAIN, STAINLESS STEEL, 1/2" NPT, #DPE3029S3
59	LOT	WIREMARKERS, VARIOUS, #WM
60	1	ENGRAVINGS, LARGE, BLACK ON WHITE, FASTENED, #ENG-L-8W-F
61	30	ENGRAVINGS, SMALL, BLACK ON WHITE, FASTENED, #ENG-S-8W-F
62	2	FEDERAL SIGNAL, STR08E, SINGLE FLASH, 1/2" NPT, SURFACE MOUNT, 120VAC, BLUE, #FB2PST-120B
63	2	FEDERAL SIGNAL, WALL MOUNTING KITS, #LWM82
64	1	FEFERAL SIGNAL, HORN, SURFACE MOUNT, 120 VAC, GRAY, 120 VAC, #350-120-30
65	1	FEDERAL SIGNAL, WEATHERPROOF BOX, GREY, #WB
66		

NOTES:

1. THE PANEL SHALL BE CSA APPROVED FOR GENERAL PURPOSE AND BEAR A CSA LABEL. TERMINATION.
2. ALL INTERNAL WIRING MUST BE TERMINATED ON A CSA APPROVED TERMINAL BLOCKS
3. ALL TERMINAL BLOCKS TO BE LABELED, NUMBERED MATCHING WIRING DIAGRAM.
4. ALL WIRE TERMINATION TO HAVE SHRINKABLE WINEMAKERS WITH DESTINATION TERMINATION POINT. (TO LOCATION)
5. WIRES COLOR PER LISTING BELOW:
   - 5.1. 120/600 VAC POWER - BLACK
   - 5.2. 120 VAC NEUTRAL - WHITE
   - 5.3. 120 VAC CONTROL - BLACK
   - 5.4. 24 VDC POSTIVE - BLUE
   - 5.5. 24 VDC NEGATIVE - BROWN
   - 5.6. ANALOG POSITIVE - BLACK
   - 5.7. ANALOG NEGATIVE - WHITE
   - 5.8. GROUND - GREEN
6. ALL 120 VAC FIELD WIRING CONNECTS TO BOTTOM RIGHT SIDE OF TERMINALS ON TERMINAL STRIP TS1. CABLES TO BE RUN IN RIGHT MOST WIREWAY (BOTTOM ENTRY FOR EASIEST ACCESS).
7. FLOW METER AND PRESSURE SENSOR ANALOG SIGNAL CABLES TO BE CONNECTED TO TERMINALS ON TS-4. GROUNDED AT PANEL NOT AT INSTRUMENTS.
8. ALL PILOT LIGHTS FOR FAULTS ARE BLUE, FAULT STROBES ARE ALSO BLUE.
9. ITEMS 62 TO 65, (BLUE BEACONS AND SIREN) SHIPPED LOOSE AND TO BE INSTALLED AND WIRED SITE IN APPROPRIATE LOCATIONS.
10. UPS SHIPPED LOOSE AND TO BE INSTALLED AND WIRED TO CONTROL PANEL ON SITE. INSTALLATION STEPS:
    - 10.1. PRE CONNECT WIRES TO UPS SINCE AFTER INSTALLATION THERE WILL BE LIMITED ACCESS TO BACK OF UPS.
    - 10.5.1. CONNECT UPSR-1 AND UPSR-3 (LABELED BLUE WIRES) TO APPROPRIATE SCREW TERMINALS ON BACK OF UPS.
    - 10.9.2. PLUG PANELS INPUT POWER CORD (YELLOW SHRINK) TO RECEPTACLE ON THE UPS. THIS CORD HAS A 90 DEGREE PLUG.
    - 10.10. PLACE UPS IN THE CONTROL PANEL. UPS DISPLAY SHOULD BE FACING AWAY FROM LEFT ENCLOSURE WALL.
    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE-2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

REV.	ISSUE DATE Y	M	D	DESCRIPTION	DWN	CHK	ENG	APP	APP
2	19	2	18	AS BUILT	DI	CK			
1	19	1	28	ISSUED FOR REVIEW	DI	CK			
0	18	11	15	ISSUED FOR REVIEW	DI	CK			

REFERENCE DRAWINGS:

G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

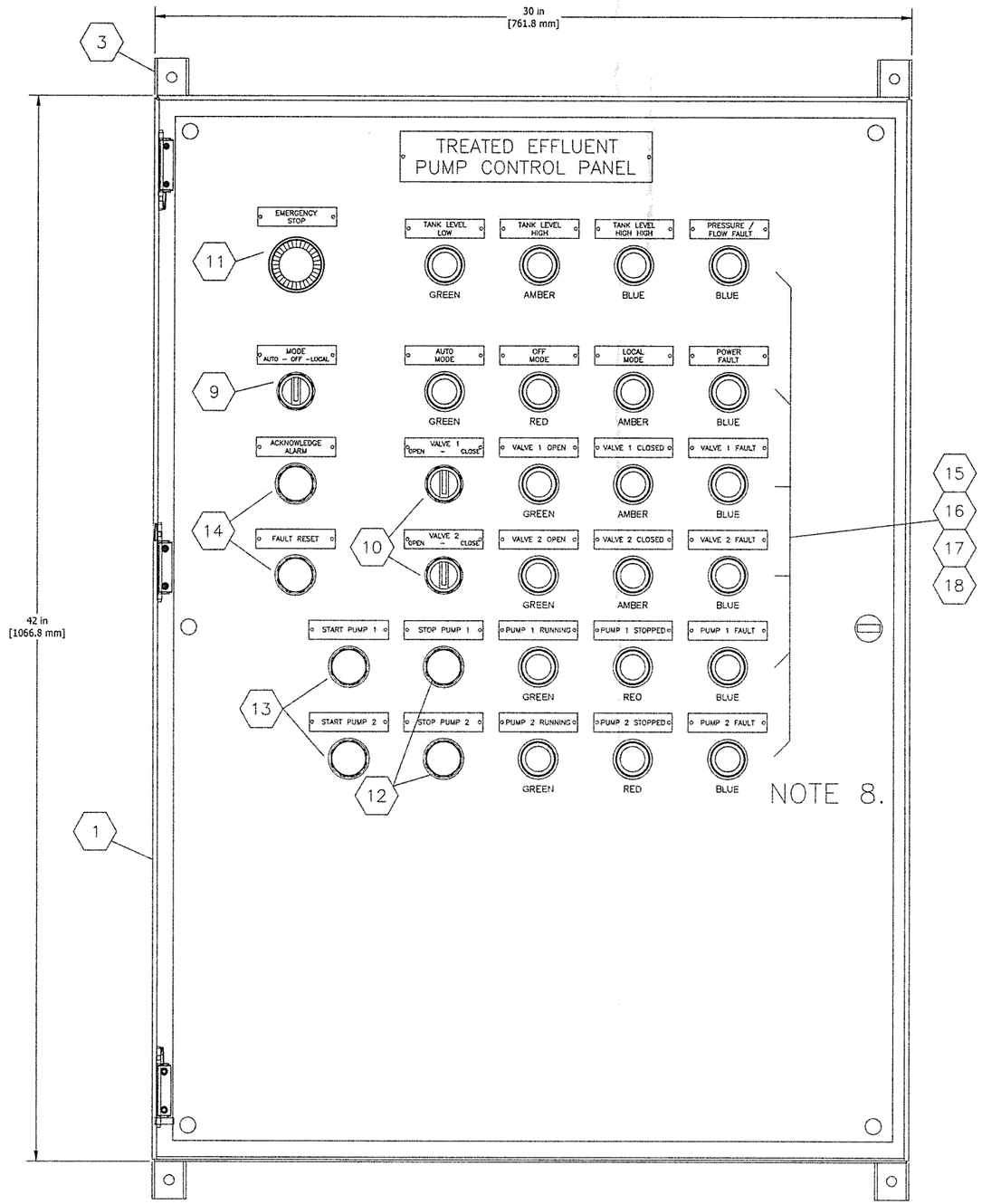
DRAWING TITLE:

PUMP CONTROL PANEL TERMINAL STRIP DETAILS

DRAWING NO.	SHT. No.	REV
J2775-PD-1	4	2

PLOT SCALE: X

FRONT VIEW



NOTES:

1. THE PANEL SHALL BE CSA APPROVED FOR GENERAL PURPOSE AND BEAR A CSA LABEL. TERMINATION.
2. ALL INTERNAL WIRING MUST BE TERMINATED ON A CSA APPROVED TERMINAL BLOCKS
3. ALL TERMINAL BLOCKS TO BE LABELED, NUMBERED MATCHING WIRING DIAGRAM.
4. ALL WIRE TERMINATION TO HAVE SHRINKABLE WINEMAKERS WITH DESTINATION TERMINATION POINT. (TO LOCATION)
5. WIRES COLOR PER LISTING BELOW:
   - 5.1. 120/600 VAC POWER – BLACK
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   - 5.3. 120 VAC CONTROL – BLACK
   - 5.4. 24 VDC POSTIVE – BLUE
   - 5.5. 24 VDC NEGATIVE – BROWN
   - 5.6. ANALOG POSITIVE – BLACK
   - 5.7. ANALOG NEGATIVE – WHITE
   - 5.8. GROUND – GREEN
6. ALL 120 VAC FIELD WIRING CONNECTS TO BOTTOM RIGHT SIDE OF TERMINALS ON TERMINAL STRIP TS1, CABLES TO BE RUN IN RIGHT MOST WIREWAY (BOTTOM ENTRY FOR EASIEST ACCESS).
7. FLOW METER AND PRESSURE SENSOR ANALOG SIGNAL CABLES TO BE CONNECTED TO TERMINALS ON TS–4. GROUNDED AT PANEL NOT AT INSTRUMENTS.
8. ALL PILOT LIGHTS FOR FAULTS ARE BLUE, FAULT STROBES ARE ALSO BLUE.
9. ITEMS 62 TO 65, (BLUE BEACONS AND SIREN) SHIPPED LOOSE AND TO BE INSTALLED AND WIRED SITE IN APPROPRIATE LOCATIONS.
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    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE–2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

REV.	ISSUE Y	ISSUE M	ISSUE D	DESCRIPTION	DWN	CHK	ENG	APP	APP
2	19	2	18	AS BUILT	DI	GK			
1	19	1	28	ISSUED FOR REVIEW	DI	GK			
0	18	11	15	ISSUED FOR REVIEW	DI	GK			

REFERENCE ORAWINGS:

G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

DRAWING TITLE:

PUMP CONTROL PANEL
DOOR LAYOUT DETAILS

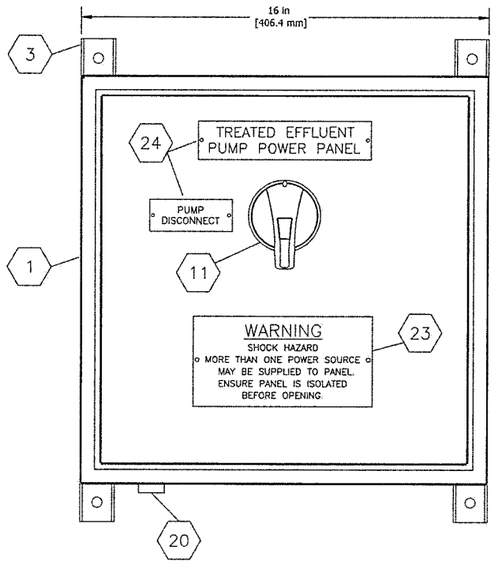
DRAWING NO.	SHT. No.	REV
J2775–PD–1	5	2

ORAWING NO. J2775–PD–1–5 REV. 2

PLOT SCALE: X

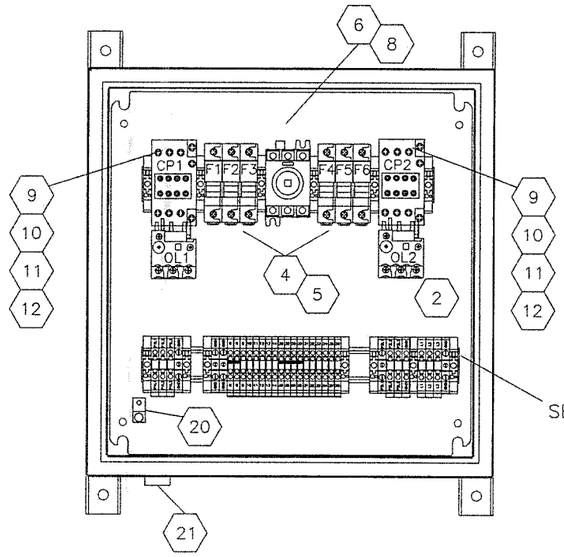
DRAWING NO. J2775-PD-1-6 | REV. 2

FRONT VIEW



FRONT VIEW

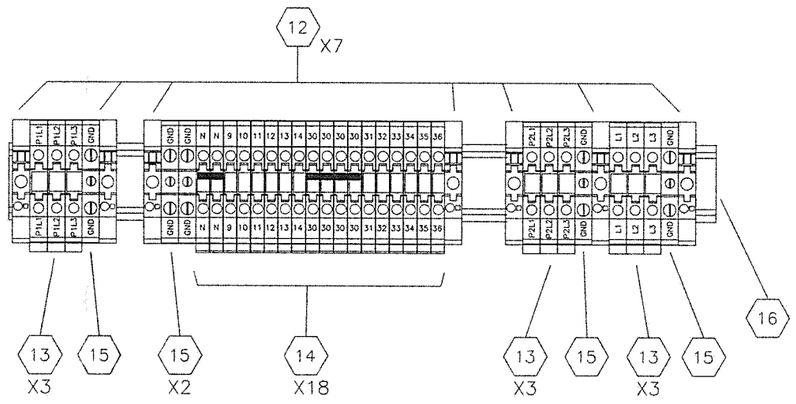
(SHOWN WITH EXTERIOR DOOR REMOVED)



BILL OF MATERIAL

ITEM	QTY.	DESCRIPTION
1	1	HOFFMAN, ENCLOSURE, STAINLESS STEEL, 16" W X 16" H X 8" D, CONCEPT, #CSD16168SS
2	1	HOFFMAN, BACK PANEL, FITS 16" W X 16 "H, 12 GAUGE, #CP1616
3	1	HOFFMAN, MOUNTING FEET, STAINLESS STEEL, #CMFKSS
4	2	MERSEN, FUSE HOLDER, 3 POLE, 30 AMPS, 600V, #USM3I
5	9	FUSE, FAST ACTING, 600VAC/DC, 30A , MIDGET,1-1/2", #ATM30
6	1	EATON, DISCONNECT, NON FUSIBLE, ROTARY DISCONNECT, 3 POLE, 30 AMP, #R5A3030U
7	1	EATON, HANDLE, BLACK, SIZE 0, NEMA 3R, #SHB0N12
8	1	EATON, DISCONNECT SWITCH SHAFT, 12", #SF150SH5X5
9	2	EATON, CONTACTOR, 3 POLE, FVNR, 18A, FRAME C , 1 NO, 120 VAC COIL, #XTCE018C10A
10	2	EATON, OVERLOAD RELAY, FRAMCE C, 10 TO 16 AMP, #XTOB016CC1
11	2	EATON, AUXILIARY CONTACT, XT SERIES, TOP MOUNT, 2 NO - 2 NC, #XTCEXFAC22
12	2	EATON, SUPPRESSOR, RC, 110 - 130 VAC, FOR CONTACT XTCE018C, #XTCEXRSCA
13	13	WEIDMULLER, WEW 35/2, W-SERIES, END BRACKET, #1061200000
14	9	WEIDMULLER, WDU 6 WEMID, TERMINAL BLOCK, 600V/45A, #1020200000
15	18	WEIDMULLER, WDU 4, TERMINAL BLOCK, 800V/32A, #1020100000
16	5	WEIDMULLER, WPE 6/35, GROUND TERMINAL , #1010200000
17	1	WEIDMULLER, DIN RAIL, TS 35 X 7.5, SLOTTED, STEEL , 2M, #0514500000
18	36	WEIDMULLER, WS 12/6, NEUTRAL, TERMINAL MARKER , #1609900000
19	28	WEIDMULLER, WS 12/6.5 NEUTRAL, TERMINAL MARKER, #1609920000
20	1	BLACKBURN, TERMINAL LUG, 1 CONDUCTOR, 14 TO 1/0 AWG, #ADR11
21	1	KILLARK, BREATHER DRAIN, STAINLESS STEEL, 1/2" NPT, #DPE3029S3
22	LOT	WIRE, THERMOPLASTIC EQUIPMENT WIRE, #14, #TEW14
23	LOT	WIRE, THERMOPLASTIC EQUIPMENT WRIRE, #10, #TEW10
24	1	ENGRAVINGS, LARGE, WHITE ON RED, FASTENED, #ENG-L-WR-F
25	2	ENGRAVINGS, LARGE, BLACK ON WHITE, FASTENED, #ENG-L-BW-F

TERMINAL STRIP ARRANGEMENT



NOTES:

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    - 10.9.2. PLUG PANELS INPUT POWER CORD (YELLOW SHRINK) TO RECEPTACLE ON THE UPS. THIS CORD HAS A 9D DEGREE PLUG.
    - 10.10. PLACE UPS IN THE CONTROL PANEL, UPS DISPLAY SHOULD BE FACING AWAY FROM LEFT ENCLOSURE WALL.
    - 10.11. PLUG THE UPS'S MAIN POWER CORD INTO RECEPTACLE-2 ON TERMINAL STRIP TS1 (BOTTOM RIGHT OF ENCLOSURE).
11. RECEPTACLE 2 IS ONLY FOR LAPTOP (5 AMP).

REV.	ISSUE DATE Y	M	D	DESCRIPTION	DWN	CHK	ENG	APP	APP
2	19	2	18	AS BUILT	DI	GK			
1	19	1	28	ISSUED FOR REVIEW	DI	GK			
0	18	11	15	ISSUED FOR REVIEW	DI	GK			

REFERENCE DRAWINGS:

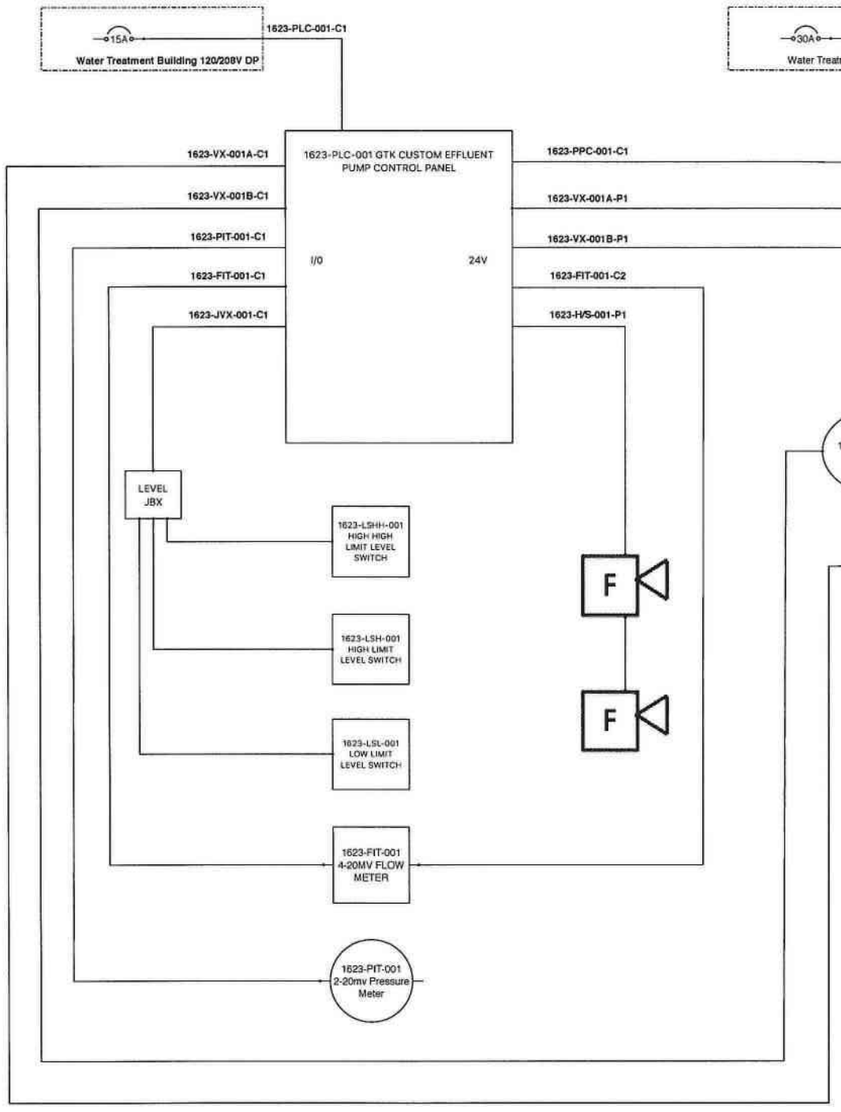
G.T.K. ELECTRIC CONTROLS LTD.
Design & Manufacture of Electrical and Process Control Systems

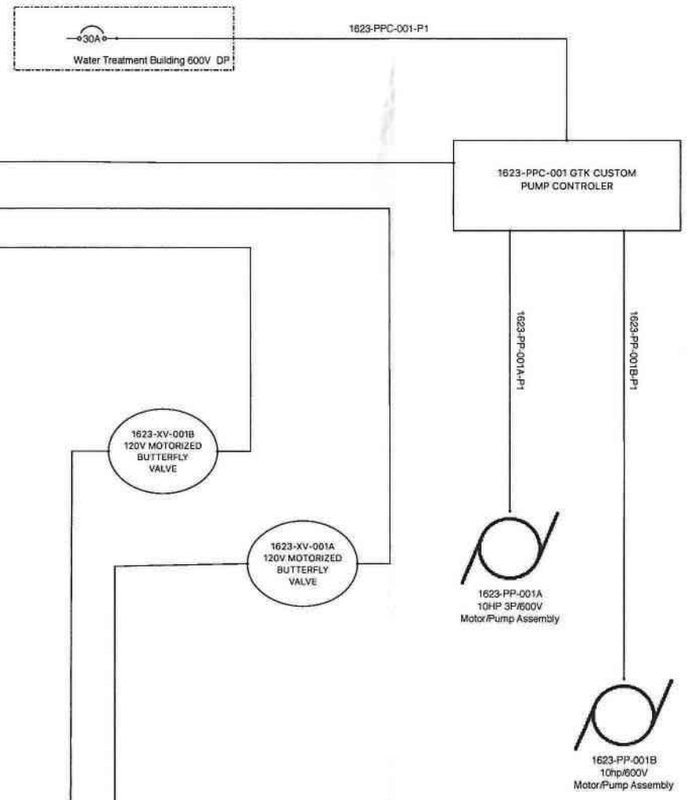
DRAWING TITLE:

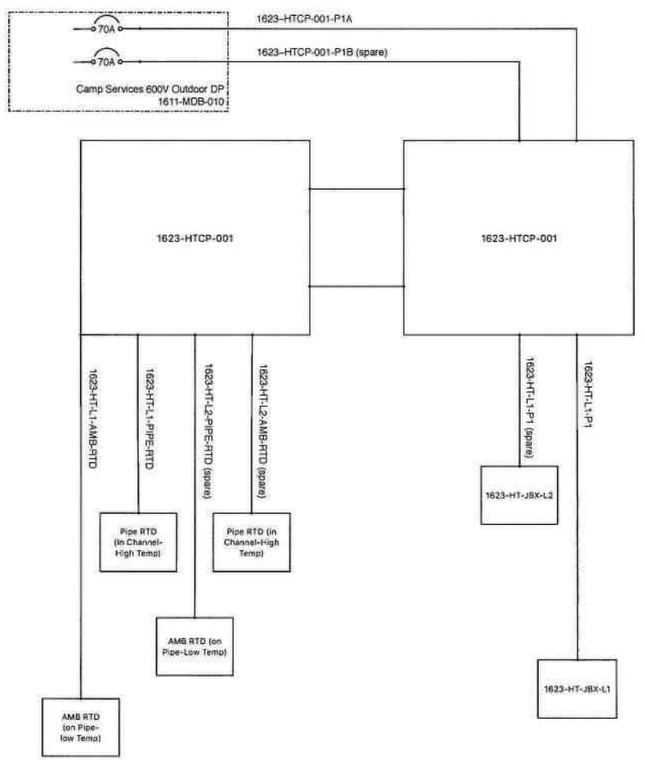
PUMP POWER PANEL LAYOUT DRAWING

DRAWING NO.	SHT. No.	REV
J2775-PD-1	6	2

PLOT SCALE: X







AS BUILT

NAME: A. Hamner

DATE: Oct 16, 2019

SIGNATURE:

REV:	DESCRIPTION:	BY:	DATE:
C			
B			
A			

AMENDMENTS:

SITE: Baffinland-Mary River Mine Site	DRAWING NO.		PROJECT NO.	09/03/19 DATE.
TITLE: 1623-Effluent Pump Station Single Line	SCALE AT A4.	AHM DRAWN.	CHECKED.	REVISION.

ADCO Power
8750 58 Ave NW
Edmonton, AB
T6E 6G6

Baffinland

SECTION 4: ITP Closeout

Certificate of Construction Completion

CERTIFICATION OF COMPLETION AND RELEASE FOR STAGE 1 PRE COMMISSIONING

CONTRACTOR:	Nuna/Adco	CONTRACT NO.:	CX001 MEIP 3804	CWP:	CVR-041
LOCATION:	Mary River	ELEVATION:		SUB SYSTEM:	Effluent Pump Station
AREA:	Saiiivik Camp Pad	AREA DESCRITION:			
ORIGINATING CONTRACT "A" DETAILS (SCOPE OF WORK):					

This certifies that contract installations of all components within the disciplines indicated below have been performed according to the IFC drawings and project specifications. All the installations have passed all the Inspection Test Plan specified quality testing. All relevant installation and testing documentation as per approved Inspection Test Plan have been reviewed and verified by the site Quality Assurance team and all components within the disciplines indicated below are hereby released for cold commissioning

DESCRIPTION OF COMPLETION AND RELEASE FOR PRE COMMISSIONING

Release includes (Select all that apply)	Full Description of Released Work Area Equipment, system and of Sub-System (Include all equipment identification tags)
☐ Civil ☐ Structural ☐ Mechanical ☒ Piping ☒ Electrical ☒ Instrumentation & Controls	Effluent Pump Station and discharge line

INSPECTION TEST PLAN REQUIREMENTS VERIFIED

☒ ITP Reports (Inspection and Testing Reports)	☐ NCR (Nonconformance Reports and Registry)
☒ RFI (Request For Information Registry)	☐ Scoped Sub-System Battery Limit Drawings
☐ TQ (Technical Query Registry)	☒ IFC Drawing Index (Redlined As-builts identified)

EXCEPTIONS

N/A	Exceptions (Select all that apply)	Full Description of Exception (All supporting documentation must be attached to this form prior to acceptance)
☐	☐ Open Nonconformance Report	Broken valve handles on automated valves. New handles not on site and job has been suspended
☐	☐ Open Request for Information	Permanent labels on electrical junction boxes
☐	☐ Open Technical Query	-See hatch Punch list.
☐	☒ Open B or C Punch List Items	

Contractor Quality Control Designate		/	
TITLE		NAME (Print / Sign)	DATE
Contractor Project Manager	Kyle Kraal	/	Nov 14 2019
TITLE		NAME (Print / Sign)	DATE
Client Construction Superintendent		/	
TITLE		NAME (Print / Sign)	DATE
Client Quality Assurance Manager		/	
TITLE		NAME (Print / Sign)	DATE
Client Construction Manager	Dean Moffett	/	15-Nov-19
TITLE		NAME (Print / Sign)	DATE
Commissioning Manager	ELMER MARQUILING	/	15-NOV 2019
TITLE		NAME (Print / Sign)	DATE

SECTION 4: ITP Closeout

Care and Custody Certificate

TRANSFER OF CARE, CUSTODY AND CONTROL

CONTRACTOR:	Nuna/Adco	CONTRACT NO.:	CX001 MEIP 3804	CWP:	CVR-041
LOCATION:	Mary River	ELEVATION:		SUB SYSTEM:	Effluent Pump Station
AREA:	Saiiivik Camp Pad	AREA DESCRITION:			
ORIGINATING CONTRACT "A" DETAILS (SCOPE OF WORK):					

CUSTODY TRANSFER

FROM CONTRACTOR **"A"**:	Nuna/Adco	TO CONTRACTOR **"B"**:	Hatch

This is notice to **"B"** Hatch that the following Work Area/Materials as per P.O. and/or Free Issue Tagged Items is/are being transferred by **"A"** Nuna/Adco and is/are being fully accepted by **"B"** Hatch from **"A"** Nuna/Adco with exceptions listed below (if any):

DISCRIPTION OF CUSTODY TRANSFER

Effluent pump station and discharge line

REFERENCE DRAWINGS

H353004-CX001-227-248-0001	Rev: 0		Rev:

EXCEPTIONS

1. Completion of Final Punchlist Outstanding
2.

STAKE HOLDERS ACCEPTANCE AND SIGN OFF

FROM CONTRACTOR "A" Nuna/Adco QC DESIGNATE "ACCEPTED AND RELEASED"

PRINT NAME: Kyle Krahi SIGNATURE:

DATE: Nov 15 2019

TO CONTRACTOR "B" Hatch QC DESIGNATE "ACCEPTED AND RECEIVED"

PRINT NAME: Dean Moffett SIGNATURE:

DATE: 15-Nov-19

CLIENT/QA Designate:

PRINT NAME SIGNATURE:

DATE:

SECTION 4: ITP Closeout

Declaration of Completion

CERTIFICATION OF PRE COMMISSIONING COMPLETION AND RELEASE FOR STAGE 3 COMMISSIONING

CONTRACTOR:	Nuna/Adco	CONTRACT NO.:	CX001 MEIP 3804	CWP:	CVR-041
LOCATION:	Mary River	ELEVATION:		SUB SYSTEM:	Effluent Pump Station
AREA:	Saiiivik Camp Pad	AREA DESCRITION:			
ORIGINATING CONTRACT "A" DETAILS (SCOPE OF WORK):					

This certifies that contract installations of all components within the discipline indicated above have been successfully tested in accordance with the required testing procedure for that component and that the work has met the specified standards of quality assurance and quality control and is hereby released form Stage 2 Pre commissioning and passed all Pre-Operational testing.

DESCRIPTION OF COLD COMMISSIONING COMPLETION AND RELEASE FOR COMMISSIONING

Release includes (Select all that apply)	Full Description of Cold Commissioned Work Area Equipment, system and of Sub-System (Include all equipment identification tags)
☐ Civil ☐ Structural ☐ Mechanical ☒ Piping ☒ Electrical ☒ Instrumentation & Controls	2x discharge pumps 1623-PP-001A/B 2x 120V motorized butterfly valves 1623-XV-001A/B Flow indicator 1623-PIT-001 Pressure indicator 1623-PIT-001 Treated Effluent Pump Control Panel Treated Effluent Pump Power Panel Treated Effluent Heat Trace Controller Effluent Pipeline HDPE to discharge pond

INSPECTION TEST PLAN AND COMMISSIONING DOCUMENTATION

☒ ITP Reports (Commissioning Test Reports)	☒ IFC Drawings (Redlined As-builts)

The Construction Testing QA/QC Test Reports, Pre-commissioning reports and stakeholder sign-off documentation for each component are contained within the Construction Completion Documentation Dossier. This Pre-commissioning Completion Certificate and release for Commissioning is only for the above stated system/sub-system or equipment tags.

TITLE	NAME (Print / Sign)	DATE
Contractor Quality Control Designate	/	
Contractor Project Manager	Kyle Krahl /	Nov 14 2019
Client Construction Superintendent	/	
Client Quality Assurance Manager	/	
Client Construction Manager	Dean Moffett /	15-Nov-19
Commissioning Manager	SIMON MARQUIS /	15-NOV-19

SECTION 4: ITP Closeout

Turnover Package Review of Completion

STAGE 3 COMMISSIONING COMPLETION AND DECLARATION OF CONSTRUCTION COMPLETION

CONTRACTOR:	Nuna/Adco	CONTRACT NO.:	CX001 MEIP 3804	CWP:	CVR-041
LOCATION:	Mary River	ELEVATION:		SUBSYSTEM:	Effluent Pump Station
AREA:	Sailiivik Camp Pad	AREA DESCRITION:			
SYSTEM / SUB SYSTEM NO.:		SYSTEM / SUB SYSTEM DESCRIPTION:			
ORIGINATING CONTRACT DETAILS (SCOPE OF WORK):		Effluent pump station and discharge pipeline			

This Declaration is declaring the below disciplines and the described scope of work is construction complete and passed Commissioning. Any outstanding items or scope of work (if any) has been agreed upon with the client and all items have been captured on the Master punch list (RP-G-022R0). Any outstanding items or scope of work will not affect person's safety, equipment integrity, life of mine or operating systems for its intended use.

DISCIPLINES AND DETAILED DESCRIPTION OF THIS STAGE 3 COMMISSIONING COMPLETION AND DECLARATION OF CONSTRUCTION COMPLETION

Release includes (Select all that apply)	Full Description of Work Area, Equipment, systems and of Sub-Systems (Include all equipment identification tags)
☐ Civil ☐ UG Development ☐ Structural ☐ Mechanical ☒ Piping ☒ Electrical ☒ Instrumentation & Controls	2x discharge pumps 1623-PP-001A/B 2x 120V motorized butterfly valves 1623-XV-001A/B Flow indicator 1623-PIT-001 Pressure indicator 1623-PIT-001 Treated Effluent Pump Control Panel Treated Effluent Pump Power Panel Treated Effluent Heat Trace Controller Effluent Pipeline HDPE to discharge pond

INSPECTION TEST PLAN CLOSE OUT AND TURNOVER REQUIRMENTS VERIFIED

☐ Master Punch List Cleared ☒ As Built Drawing Index (RP-G-023R0) ☒ Care and Custody Notification (RP-G-017R0)	☒ Certificate of Construction Completion and release for Pre-Commissioning(RP-G-018R0) ☒ Certificate of Pre-Commissioning completion and release to Commissioning(RP-G-019R0)

OUSTANDING WORK NOT COMPLETED

N/A	Outstanding Incomplete Scope	Full Description of Outstanding Work from the Scope of Work
☐	☒ Master Punch List (RP-G-022R0)	☒ Master Punch List Attached (Must be prior to signing)

I, the undersigned, declare that the described above installed equipment, assembly or discipline scope of work complies in all IFC drawings, IFC specifications, IFC installation details, Codes and to all Local Regulations. All testing and installation inspections as per the approved (ITP) Inspection Test Plan have been completed and all report have been reviewed and signed off.

Contractor Quality Control Designate		/	
TITLE		NAME (Print / Sign)	DATE
Contractor Project Manager	Kyle Krahl	/	Nov 14 2019
TITLE		NAME (Print / Sign)	DATE
Client Construction Superintendent		/	
TITLE		NAME (Print / Sign)	DATE
Client Quality Assurance Manager	Derek Pollard	/	18-Nov-19
TITLE		NAME (Print / Sign)	DATE
Client Construction Manager	Dean Moffett	/	15-Nov-19
TITLE		NAME (Print / Sign)	DATE
Client Commissioning/Operations Manager	ELMER INAQUILING	/	15-NOV-19
TITLE		NAME (Print / Sign)	DATE

Procedure

Treated Effluent Pump Station and Pipeline Stage-4 Commissioning Procedure

Pre-Operational Testing Management

2019-07-28	A	Internal Review	E. Maquiling	T. Kane	T. Haroon	
DATE	REV.	STATUS	PREPARED BY	CHECKED BY	APPROVED BY	APPROVED BY
						Client

STAGE 4 - SYSTEM COMMISSIONING PROCEDURE

Sub-System Number and Title:
CS-1623-001-Treated Effluent Piping Change and associated heat trace from 800-man camp to tie in existing 3 line.

Inclusions:	**Exclusions:**
Effluent Tank, Pumps and effluent piping to tie in existing 3 line.	**Existing effluent line.**

1. Safety, Health and Environment

- List the Safety, Health and Environment objectives and procedures applicable to this sub-system
- Follow all lock-out procedures
- Follow BIM Fuel Unloading procedures
- State special considerations and or hazards and JHA (job hazard analysis) specific to this system before any work in section 4 starts.
- Definition of Safety and Warning Signs used in this Procedure are the following:

	Instructions and information that follow the Stop Sign address an identified hazard. Failure to follow the instructions can increase exposure to this potential hazard.
	Instructions and information that follow the Caution Sign identify actions that are necessary to prevent accidental damage to plant or equipment
 Important	Does not usually pertain to actions that can result in serious consequences, but it is more critical for the user to know than the information in a Note.
	Includes information that is helpful, but not part of the action described in the step.
	Instructions and information that follow the Environment Sign identify actions necessary required to prevent exposure to environmental incidents.

2. Acceptance Criteria

The acceptance criteria for this sub-system are as follows:

- Effluent Storage Tank and pump piping syste is filled with On-spec Effluent Water no noticeable during In-Service Leak Test:

- No leaks during the in-service leak test of 2.4 km new 3" HDPE SDR11 (insulated and heat traced) pipeline to the licensed discharge point into the Mary River.
- Mechanical Load Run Test of Two (2) new pumps (1623-PP-001A/B) are completed.
    - Actual pump capacity verified against Gould 15SV5FC30 pump performance curve/data.
    - No mechanical seal seaks and no abnormal sound during operation.
    - Normal motor winding and bearing temperatures.
    - Vibration within Vendors Installation, Operation and Maintenance (IOM) Manual, or in the absence of it, any acceptable industry standard. (e.g. ISO 2372 (10816, etc.).

3. Pre-Requisites

State all pre-requisite activities and criteria that need to be performed an in place prior to commencing commissioning including but not limited to:

- Walkdown has been completed and all Category 1 and 2 punch items have been cleared. ✓
- Construction inspection and test check sheets filled up and signed off.
- Construction Turnover Certificate has been signed off.
- Ready for Commissioning Assurance Certificate/CS-1630-001A has been signed off.
- Dry commissioning is completed as described in 7.1.3 Dry Commissioning of the Scope of Works (Doc No. H353004-CX001-227-248-0001). ✓
- Pre-Commissioning Checklists Completed by Contractor.
- JHA for the effluent piping is approved and available.
- Field Level Risk Assessment has been completed.

The commissioning engineer must confirm beforehand that these are all in place as expected. The work instructions will be issued well in advance of the scheduled commissioning date to allow the engineer to make the required arrangements.

4. Method Statement

Step No	ACTION	Completed (Sign/Date)	Deviation class
⚠ Important	Prior to commencing pre-operational testing, make sure that valves are in correct position, in accordance with the operation pre-start valve checklist or marked up P&ID.		
1	Ensure all pre-requisites in Section 3 are confirmed completed for the following: • Control & Instrumentation and Electrical Works. • Effluent tank, Pumps 1623-PP-001A/B, • 2.4 km new 3" HDPE SDR11 (insulated and heat traced) pipeline to the licensed discharge point into the Mary River.	ADCO:	

2	Prior to Running of pumps and run-down of effluent water from Sailivik WWTP, conduct a Pre-Start-Up Safety Review Walkdown the Sub-system CS-1623-001 and record punch items in the punch list. The expected attendees are the following. • BIM Site Services • HNCC WWTP Operator • Hatch and BIM Safety/Environment • Hatch Construction and Commissioning		
Note	All of priority 1 and 2 items to be closed/cleared prior to the start of the wet commissioning or Stage-4 Process Commissioning.		
CS-1623-001-Treated Effluent Piping Change and associated heat trace from 800-man camp to tie in existing 3 line.			
Note	Ensure that effluent water samples are taken from WWTP for laboratory testing shall be confirmed within specification prior to filling the effluent tank and pipeline to the tie-in point to existing effluent line.		
3	Energize Pumps1623-PP-001A/B. • Power On the Treated Effluent Pump Power Panel. • Power On the Treated Effluent Pump Control Panel. 	ADCO	
4	Fill the effluent tank with treated influent water from Waste Water Treatment Plant to normal water level just below LSH 001. Fill further to confirm LSHH 001 function. Refer to Attached marked up Drawing.	ADCO	

4	Priming of Pumps 1623-PP-001A/B. • Confirm valve for vacuum truck connection is closed. • Open gradually valves and prime pumps by opening their respective vents until all air are evacuated in the volute.	ADCO:	
⚠ Caution	Ensure that pumps are properly primed prior to start-up.		
5	Bump/Rotation Check of Pump and Off-On Valve Functionality Check. • Select Pump Discharge Valves 1 and 2 in Manual. Stroke OPEN and CLOSE.	ADCO:	

Valve no.	OPEN	CLOSE
XV001A or Valve 1		
XV001V or Valve 2		

- Turn switch of Effluent Pump A (1623-PP-001A) to LOCAL from the Treated Effluent Control Panel. Open valves XV001A and B.
- Bump test the pump and confirm the rotational direction is correct.
- Repeat above procedure for Effluent Pump B (1623-PP-001A).

Correct Rotation
A & B

			
Important	If pump is in reverse rotation, call a qualified electrician to correct the deficiency. Correct Rotation		
6	Level Switches, Check/Verification. • Fill the Effluent Tank and verify high level switch LSH001 activates and "High Level Light On" the Pump Control Panel. • Raise level or simulate hig high level to verify high high level activates LSHH001 and "High High Level Light On" the Pump Control Panel. Verify "Alarm Beacon YL001 Lights On and YA001A Sounds On". • LSL001 to be verified in the succeeding step.	ADCO:	
Note	Three float type limit switches are utilized to control the operation of the pump sets, 1623-PP-001A and 1623-PP-001B. The pump sets are operated in a duty/standby arrangement. The PLC shall maintain equal operating hours for each pump set and shall as far as possible alternate the pumps after each start.		
7	Pump Automatic Mode Functionality Check/Verification. • Turn selector switch of Effluent Pump A (1623-PP-001A) to AUTO. • Fill the effluent tank and verify pump 1623-PP-001A auto start at LSH001. • Confirm delivery valve XV001A starts to open. Check opening time. • Confirm Effluent Pump A (1623-PP-001A) starts. • Push E-Stop and verify pump 1623-PP-001A stopped immediately. • Re-start pump1623-PP-001A • Verify pump 1623-PP-001A auto stop at LSL001 and "Low-Level Lights On" at the Pump Control Panel". • Conduct above tests for pump 1623-PP-001B	ADCO:	

Note	Process interlock alarms shall be required to be reset via the operator at the local control panel.		
8	Verification of (1623-FIT-001) and pressure (1623-PIT-001) • Verify if flow is established in the line after a set period (initially 10 seconds) after a pump has been started. Default values of time and pressure 0 gal/min New values of time and pressure ~~≈ 145 Kpa~~ ≈ 30 gal/min pump Other settings • Verify pressure (1623-PIT-001) is established in the line after an initial stabilization period of starting the pump is raised. Default values of time and pressure ≈ 65 Kpa Residual Pressure New values of time and pressure ≈ 144 Kpa pumping Other settings	ADCO:	
Important	Pressure verification shall be used to protect against a burst pipe situation. The pressure and flow limits shall be established during commissioning of the system. Should either of these situations arise an alarm shall be raised.		
8	Mechanical Load Test Run of Pump. • Start the pump and take a record of the following, where possible. For 1623-PP-001A o Voltage 587V o start-up and running current, 7.7A o vibration, o bearing/motor winding temperature, if possible. 32°C For 1623-PP-001B o Voltage o start-up and running current, 7.9A o vibration, o bearing/motor winding temperature, if possible. 33.5°C Acceptance Criteria: Vibration and bearing temperatures will be deemed acceptable if reading is within Vendor's acceptance criteria, or in the absence of it, any acceptable industry standard. (e.g. ISO 2372 (10816, etc.)		
9	In-service leak test of 2.4 km new 3" HDPE SDR11 (insulated and heat traced) pipeline to the licensed discharge point into the Mary River.	ADCO:	

	• Start pump and rundown effluent water to the pipeline until treated effluent water is observed at the licensed discharge point. Take the flow rate at FIT001 and discharge pressure at PIT001 of the pump 1623-PP-001A or B ○ FIT001 = 95-115 gpm ○ PIT001=_____psig ○ PI001A or B=_____psig ○ Accu. pumping time ≈980 minutes (for 7-days) • Patrol the pipeline for any visible leaks. • Verify if effluent water is coming out at the discharge point of the pipeline. • Pipeline is deemed acceptable if no leak is visually found during the site survey.  		
Note	Based on the design flow of 18.75 m3 /h and 2.4 km pipeline distance as described in H353004-CX001-227-248-0001 it will take 35 minutes or more to fill and in-service leak test the pipeline. Ensure test is done according to ASME B31.3 Category D guidelines.		
ENVIRONMENT	Coordinate WWTP and HATCH/HNCC/BIM Site Services and Environment teams prior to rundown of treated effluent water for in-service leak test of pipeline.	ADCO:	
10	Fill-up all applicable Pre-operational Testing and Commissioning Checksheets/record sheets of; • Pumps, • Instrument and Control,	ADCO:	

	• Piping, • Electrical equipment, • Pump Container heating and ventilation system. Hatch/BIM to witness.		
9	Other pre-operational /Commissioning Checks, if required.	ADCO: NA	
10	Put the Effluent Pumps in AUTO and conduct a 7-week"Wet (Commissioning) Test".	ADCO:	
11	Conduct training to Operation and Maintenance Contractor WWTP Operator and Maintenance Team and BIM WWTP Operator for each Shift. Keep a record of training.	ADCO:	
12	Transfer of care and custody Operations of the Effluent Pipeline and pump house.	ADCO: HNCC:	
Note	Performance Check and Provisional Handover Assurance Certificate is not a Completions Certificate.		

Site	Area	Facility	Work Package Title
Mary River	Effluent Pumping station to Existing Effluent tie in point	800mc Waste Water Service	CE-001 –MEIP- Effluent Line
Work Pkg No	ITP Number	Inspection & Test Plan Title	
CE-001	-3804-035-	800mc Effluent Line ITP	

Inspection Types		Document Review
"S" – Surveillance	Review on ongoing basis. Notification of work status not required. Approval to proceed not required.	
"N" – Notification	24 hour notification to be provided prior to commencing work step. Work proceeds with or without response or attendance.	
"W" – Witness	24 hour notification to be provided prior to commencing work step. Work shall not proceed without inspecting authority attendance.	
"I" – Inspection	Documented inspection / evaluation required. Verify compliance with specifications and standards prior to proceeding.	
"R" – Review	Review documents to verify compliance with specifications and standards prior to proceeding.	
"H" – Hold	Work shall not proceed without written approval from inspecting authority.	

Site	Area	Facility	Work Package Title
Mary River			
Work Pkg No	**ITP Number**	**Inspection & Test Plan Title**	
CE-001	-3804-035-		

	Work Step / Inspection Stage	Acceptance Procedure / Specification / Criteria	Verifying Document	Contractor			Hatch		
				Type	Initial	Date	Type	Initial	Date
1	QAQC Managment								
1.1	ITP	Internal Audit- Hatch Audit of ITP		H	KK				
1.2	Document/RFI Management	Approved project specifications	Appropriate documentation and traceability	S	KK				
1.3	Construction Drawings	Approved project specifications	Appropriate documentation and traceability	H	KK				
1.4	Verification of Testing Equipment	Approved Project specifications and Performance requirements	CTS-75-015 Calibration of Instruments	S	KK				
2	Mechanical Installation								
2.1	Materials and Equipment	Purchase Order	Material Receiving Reports	S	KK				

2.2	Installation/Fusing of HDPE Piping	Approved project specification and Manufactures installation specifications	CTS-60-014 HDPE FusionLog CIS-60-210 HDPE Piping CIS-50-057 Bolt Torque CIS-60-010 Gaskets, and Bolting	S	KK				
2.3	Pressure or service testing of HDPE Piping	Approved Project Specifications	CTS-60-007 Pressure Piping Report	W	KK				
2.4	Installation of HDPE Insulation	Approved project specifications / Manufactures installation instructions	CIS-60-017 Piping Thermal Insulation	S	KK				
3	Electrical Installation								
3.1	Materials and Provide Equipment	Purchase Order	Material Receiving Reports	S	KK				
3.2	Installation of 600V Heat Trace and Auxillaries/Equipment	Approved project specifications, Approved project Drawings, Manufactures installation Instructions CEC	CTS-70-039 Heat Trace A CTS-70-040 Heat Trace B CTS-70-033 Electrical JBX CIS-70-035 Electrical Devices	S	KK				

Work Step / Inspection Stage		Acceptance Procedure / Specification / Criteria	Verifying Document	Contractor			Hatch		
				Type	Initial	Date	Type	Initial	Date
3.3	Installation of 600V Heat Trace Service Feeds	Approved project specifications, Approved project Design, CEC	CIS-70-007 (CABLE), CTS-70-003 (MEGGER),	S	KK			D.M.	
4	Final QC and System Walkdown								
4.1	Red Line AsBuilts	Approved project specifications	Proper Documentation	S	KK			D.M.	
4.2	Punch List(s)	Approved project specifications	PIS-70-999	S	KK			D.M.	
5	Project Close-Out								
5.1	Documentation turnover	Approved project specifications	Proper Documentation & CIS-50-040 (CLOSING)	R	KK			D.M.	

DESIGNATE	CONTRACTOR	TITLE	NAME	SIGNATURE
PREPARED BY:	ADCO POWER LTD	CONSTRUCTION MANAGER	Kyle Krahn	
REVIEWED BY	NUNA	PROJECT COORDINATOR		
APPROVED BY:	HATCH	CLIENT REPRESENTATIVE	Dean Moffett	
ACCEPTED BY:	HATCH	CLIENT REPRESENTATIVE		

ADCO CWP QAQC TURNOVER PACKAGE
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ADCO

Tag No:		Project No:	3804 BIM MEIP
(Sub)System:	Effluent Line	Area:	800 Man Camp Pad
Description:	Effluent Discharge Line	Drawing:	
CWP:	3804-021	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

#	
1	**Table of Contents**
2	HDPE Piping CIS-60-013
3	Piping Installation CIS-60-032
4	Visual inspection of Flanges, Gaskets, and bolting CIS-60-010
5	Piping Thermal Insulation CIS-60-017
6	HDPE Spool Fusion Log CIS-60-014
7	Calibration of Instruments CIS-75-015/ certification of fusers
8	Bolt Torque Value Record CIS-50-057
9	Cable CIS-70-007
10	Heat trace pre insulation CTS-70-039
11	Heat trace post insulation PIS-70-017
12	Thermon Cable Testing Report
13	Misc Equipment CIS-70-036
14	Closing CIS-50-040
15	As-Builts PIS-10-001
16	Punch List PIS-70-999

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:		Kyle Krahl	Daniels Pedlenski
Sign:		[signature]	[signature]
Date:		Nov 14 2019	Nov 18/19

Construction Inspection Sheet
CIS-60-013 HDPE Piping ITP

ADCO

Tag No:	Sailiivik 3" Effluent Line	Project No:	3804 BIM MEIP
(Sub)System:	Effluent Line	Area:	800 Man Camp Pad
Description:	HDPE Effluent Discharge Line DR11	Drawing:	
CWP:	3804-021	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	Jointer ID				
2	Joint No. - GENERAL TO LINE - NOT PER JOINT				
3	Inspection - Butt Fusion Joint				
4	Preparation and inspection :				
	04a - Pipe - ends clean, dry and free of damage	✓			
	04b - Pipe - relieved from tension	✓			
	04c - Tools and heating equipment - proper working order	✓			
	04d - Tools and heating equipment - shielded from inclement weather	✓			
	04e - Heating equipment - surfaces correct temperature	✓			
5	Assembly:				
	05a - Components securely fastened	✓			
	05b - Pipe ends 'faced'	✓			
	05c - Pipe profiles aligned	✓			
	05d - Pipe interfaces melted	✓			
	05e - Pipe profiles jointed	✓			
	05f - Joint held under pressure	✓			
6	Visual inspection and Joint Paramaters recorded	✓			
7	Inspect - Saddle / Sidewall Fusion Joint				Not Recorded
8	Preparation and inspection :			✓	
	08a - Pipe - area clean, dry and free of damage				
	08b - Fitting - correct type, dimensions and free of damage				
	08c - Pipe - area of joint abraded correctly				
	08d - Fitting - area of fusion abraded correctly				
	08e - Saddle fusion machine - proper working order				
	08f - Heater saddle adapters - correct dimensions				
9	Assembly:				
	09a - Heater saddle adapters and saddle fusion machine installed correctly				
	09b - Parts aligned correctly				
	09c - Pipe and fitting heated correctly				
	09d - Joint held under pressure				
10	Visual inspection completed			✓	
11	Inspection - Socket Fusion Joint			✓	
12	Preparation and inspection :				
	12a - Pipe - end clean, dry, chamfered and free of damage				
	12b - Socket - clean and dry (depth checked)				
	12c - Cold ring - correct dimension				
	12d - Heating tool - operating correctly				
13	Assembly:				
	13a - Cold ring clamped into correct location				
	13b - Pipe and socket heated correctly				
	13c - Joint held under pressure				

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	JARED POLACHIC	ANDREW HAMILTON	DEAN MOFFETT
Sign:		of ADCO	
Date:	SEPT 15 2019	July 31, 2019	12-Sep-19

Construction Inspection Sheet
CIS-60-013 HDPE Piping ITP

Tag No:		Project No:	3804 BIM MEIP
(Sub)System:	Effluent Line	Area:	800 Man Camp Pad
Description:	Effluent Discharge Line	Drawing:	
CWP:	3804-021	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
14	Visual inspection completed				
15	Inspection - Electrofusion Joints				
16	Preparation and inspection :			NA	
	16a - Pipe - clean, dry and free of damage				
	16b - Pipe - area of joint abraded correctly				
	16c - Pipe - relieved from tension				
	16d - Electrofusion fitting/coupling of correct dimensions				
	16e - Electrofusion control box operating correctly				
	16f - Pipe marked with electrofusion fitting/coupling location				
17	Assembly:				
	17a - Pipes and electrofusion fitting/coupling placed in clamping fixture correctly				
	17b - Electrofusion control box connected to electrofusion fitting/coupling and power source				
	17c - Electric current applied for the recommended period				
18	Visual inspection completed				
19	Inspection - Flanged Joint	✓			
20	Preparation and inspection :				
	20a - Flange adapters - correct type and dimension	✓			
	20b - Gland ring/follower - correct type and dimension	✓			
	20c - Gasket - correct type and dimension			✓	
	20d - Grip ring (if required) - correct type and dimension			✓	
	20e - Flange faces	✓			
	20f - Bolts, nuts and washers installed	✓			
	20g - Torque wrench used (calibration)	✓			
21	Alignment correct	✓			
22	Assembly correct				
23	Bolting :				
	23a - Sequence correct	✓			
	23b - Torqued	✓			
24	Visual inspection completed				
25	Inspection - Mechanical Compression Joint				
26	Preparation and inspection :			✓	
	26a - Stiffener - correct type and dimension				
	26b - Compression fitting body - correct type and dimension				
	26c - Gasket/'O' ring - correct type and dimension				
	26d - Grip ring (if required) - correct type and dimension				
	26e - Compression nut - correct type and dimension				
27	Alignment correct				
28	Assembly correct				
29	Visual inspection completed				

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jared Polachek	Andrew Hanna	Dean Moffett
Sign:		of ADCO	
.te:	Sept 15/2019	July 31, 2019	12-Sep-19

Construction Inspection Sheet
CIS-60-032 Piping Installation, before Pneumatic Test

Tag No:	Sailivik Camp	Project No:	3804 BIM MEIP
(Sub)System:	Effluent Line	Area:	800 Man Camp Pad
Description:	3" HDPE Effluent Discharge Line DR-11	Drawing:	
CWP:	3804-021	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description: P & ID No:	Yes	No	N/A	Comments and Data
1	Ambient Temperature .: - For Service Test				
2	Test Pressure agreed, per specification	✓			
3	Test pressure and minimum metal design temperature compatible	✓			
4	Declaration of installation produced			✓	
5	Hazard of released energy reviewed by engineering			✓	
6	Pressure relief device - set pressure not higher than test pressure plus			✓	Open Ended.
7	the lesser of 50 PSI (345kPa) or 10% of test pressure				
8	Line size and wall thickness correct	✓			
9	Material correct	✓			
10	All welded joints have been 100% subjected to non-destructive examined (NDE)			✓	
11	Flange rating correct (including surface finish)	✓			
12	Stress relief completed			✓	
13	Installation straight and plumb	✓			
14	Line slope per drawing	✓			
15	Branches located correctly	✓			
16	Branches reinforced			✓	
17	Weepholes in reinforcing pad			✓	
18	Hign point vent in			✓	
19	Low point drain in			✓	
20	Reducer(s) located correctly			✓	
21	Reducer(s) type(s) correct			✓	
22	Blind(s) revoved			✓	
23	Cold spring(s) per drawing			✓	
24	Clearance for expansion				
25	Gaskets type and materials correct	✓			
26	Bolt size and material correct	✓			
27	Bolt torque correct	✓			
28	Valve flow direction correct	✓			
29	Electrical isolation correct				Incomplete
30	Valve identification correct		✓		
31	Bypass installed			✓	
32	Steam orientation correct			✓	
33	Valves are in the open position	✓			
34	Supports installed correctly	✓			
35	Sufficient supports per drawing	✓			
36	Anchors installed correctly	✓			
37	Guides installed	✓			
38	Proper shoes installed and welded			✓	
39	Enough clearance for insulation	✓			
40	Spring hangers correctly installed			✓	
41	Pins not removed before pneumatic test			✓	

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	JARED POLACHEK	[illegible] OF ADCO	Dean Moffett
Sign:			D. Moffett
Date:	SEPT 15/2019	July 31, 2019	12-Sep-19

Construction Inspection Sheet

CIS-60-032 Piping Installation, before Pneumatic Test

42	Joints and welds free of paint	✓			
43	Pressure safety valve (PSV) isolated with blinds (except the test protection)			✓	
44	Expansion joints removed or restrained			✓	
45	Flow restrictions removed			✓	
46	Non metallic system checks completed			✓	
47	Bonded joints conform			✓	
48	Line correctly identified		✓		
49	Other				
50	Specify:				

Comments:

No Pneumatic Test
- Used as a pre service test check.

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	JARED POLACHEK	Angela Hanson	Dean Moffett
Sign:		of ADCO	
Date:	SEPT 15/2019	July 31, 2019	12-Sep-19

Construction Inspection Sheet
CIS-60-010 Visual Inspection of Flanges, Gaskets, and Bolting

Tag No:	Salliuik Camp.	Project No:	3804 BIM MEIP
(Sub)System:	Effluent Line	Area:	800 Man Camp Pad
Description:	Effluent Discharge Line	Drawing:	
CWP:	3804-021	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	Check that flange faces have been thoroughly cleaned, removing all rust and burrs	✓			
2	Check sealing surfaces on flange face for any damage, in accordance with the requirements of the specification	✓			
3	Check the Flange type and rating	✓			
4	Check that bolts are of the correct size, type, length, cleanliness and absence of burrs	✓			
5	Ensure that all nuts and washers (where contact is made) have been cleaned by power brush			✓	
6	Ensure that the gasket is in accordance with the applicable material class			✓	
7	Check the condition and rating of gaskets			✓	
8	Ensure that spiral wound, metal gasket or sheet gaskets are not re-used after use			✓	
9	Check that the correct thread lubricant is applied to every friction surface of the bolt assembly			✓	
10	Check that the thread lubricant used is suitable for the operating temperature of the system			✓	
11	Torque sequence correct	✓			
12	Torque values verified				
13	Identification of torqued connection			✓	Tight no leakage
14	Check the sealing surface of the flange faces for surface defects on non-metallic or metallic plastic lined flanges	✓			
15	Check that bolts are of the correct size, length, cleanliness and absence of burrs (Metallic or plastic lined flanges)	✓			
16	Ensure that the gasket is in accordance with the applicable material class (Metallic or plastic lined flanges)			✓	
17	Check that the thread lubricant used is suitable for the operating temperature of the system (Metallic or plastic lined flanges)			✓	
18	Check that gaskets are correctly centred			✓	
19	Check that all flanged joints are snugged up squarely				
20	Check the measurement of the gap between the flange faces taken around the circumference			✓	
21	Check that all stud bolt threads have been cleaned and lubricated with the appropriate lubricant			✓	
22	Check and ensure that all stud bolts and nuts are hand tight ensuring that stud ends extend 1 thread (3mm) beyond the nut	✓			
23	Check that all flanges and bolts have been prepared and pre-assembled in accordance with the applicable project specifications	✓			
24	Check and ensure that all bolts have been torqued to 1/3 of the final torque value and ensure correct sequence	✓			
25	Check and ensure that all bolts have been torqued to 2/3 of the final torque value and ensure correct sequence	✓			
26	Check and ensure that all bolts have been torqued to 100% of the final torque value and ensure correct sequence	✓			

Comments: 3 Flanged connection on Effluent spool.

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	JARED POLACHEK	ANDREW HANCOCK	Dean Moffett
Sign:		of ADCO	D. Moffett
Date:	SEPT 15/2019	JULY 31, 2019	12-Sep-19

Construction Inspection Sheet
CIS-60-017 Piping Thermal Insulation

Tag No:		Project No:	3804 BIM MEIP
(Sub)System:	Effluent Line	Area:	800 Man Camp Pad
Description:	Effluent Discharge Line	Drawing:	
CWP:	3804-021	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General				
2	Pipe tested and final inspection done - Service Test -	✓			
3	Vertical supports and horizontal cradles			✓	
4	Pipe painting completed			✓	
5	Material weight or				
6	Tracing:				
	06a - Electrical	✓			
	06b - Steam			✓	
	06c - Heat transfer cement			✓	
7	Expansion bands	✓			
8	Beveled ends			✓	
9	Temporary supports and blind flanges removed			✓	
10	Instrumentation per specification	✓			
11	Inspection - Insulation Materials				
12	Proper Materials	✓			
13	Verify insulation materials are free from damage	✓			
14	Verify insulation materials shelf-life has not expired	✓			
15	Insulation, dry	✓			
16	Insulating Hot Piping			✓	
17	Proper material thickness used			✓	
18	Flanges, flanged valve bodies, bonnets and flanged fittings insulated			✓	
19	Minimum clearances between insulation and adjacent surfaces			✓	
20	45 degrees to vertical runs properly supported			✓	
21	Service over 850 °F shall be in two layers			✓	
22	Joints staggered and proper wire ties			✓	
23	Expansion joints spacing horizontal runs correct			✓	
24	Proper clearance at flange breaks			✓	
25	Tubing properly insulated			✓	
26	Proper use of filler and/or mastic materials			✓	
27	Inspection - Insulation Cold Piping	✓			
28	Proper material thickness used	✓			
29	Proper insulation of attachments	✓			
30	Contraction joints at specified intervals			✓	
31	Proper cradle diameter at supports			✓	
32	45 degrees to vertical runs properly supported			✓	
33	Proper use of joints sealer for single and multiple layer applications			✓	
34	Proper taping or banding used	✓			
35	Proper use of filler materials, sealer and/or vapor barriers	✓			
36	Inspection - Weatherproofing Hot Piping			✓	
37	Proper use of weather proofing mastic at fittings			✓	
38	Proper banding of metal jacket			✓	

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	JARED POLACHEK	Andrew Harvey	Dean Moffett
Sign:		for ADCO	D. Moffett
Date:	SEPT 15/2019	Sept 11, 2019	12-Sep-19

Construction Inspection Sheet
CIS-60-017 Piping Thermal Insulation

ADCO

Tag No:	0	Project No:	3804 BIM MEIP
(Sub)System:	Effluent Line	Area:	800 Man Camp Pad
Description:	Effluent Discharge Line	Drawing:	0
CWP:	3804-021	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
39	Proper use of "S" clips on vertical runs			✓	
40	Proper lap and metal screw spacing			✓	
41	Proper main shield on vertical vessels			✓	
42	Inspection - Weatherproofing Cold Piping	✓			
43	Proper use of vapor barrier mastic paint jacketing	✓			
44	No use of screws on cold work except on standing seam systems	✓			
45	Inspection - Removable Covers	✓			
46	Proper stenciling or tagging for identification	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jared Polachek	Andrew Hanson	Dean Moffett
Sign:	[signature]	[signature] of ADCO	[signature]
Date:	Sept 15/2019	Sept 11, 2019	12-Sep-19

Construction Test Sheet
CTS-60-014 Fusion Bonding Equipment Log

TAG:	SAILIIVIK EFFLUENT LINE	Project No:	CX001-3804-MEIP
(Sub)System:	WASTE WATER DISCHARGE	Area:	MINE SITE
Description:	3" HDPE DR11 INSULATED PIPING	Drawing:	H353004-10000-240-272-0001-0001. R1
CWP:	3804- CVR-021	CLIENT:	BAFFINLAND IRON MINES

Item	Description	Yes	No	N/A	Comments and Data
1	Description of Fuse Equipment: Track Star- Pit Bull 412				
2	Machine No: UnNumbered-				
3	Model No: AT1213001				
4	Serial No: C80844				

DATE	Clamps, heater plate, facer, and moveable carriage are aligned	Pipe lift and roller lubricated and good condition	All jaw inserts are in good condition	Heater plate surface in good condition (non-stick coated surface that is free	Heater plate built-in thermometer in good condition	A calibrated thermometer is available for checking heater plate temperature.	Hydraulic oil reservoir is filled to correct level	Hydraulic hoses and cylinders are free of leaks and in good condition.	Facer unit is in good operating condition (chain adjusted per	Facer Blades are in good operating condition (blades project between	Brake is in good operating condition	Tires/Tracks are in good condition	All Components actuated and fuction normally	Initials
11/5/2018	√	√	√	√	√	√	√	√	√	√	NA	√	√	MM
11/6/2018	√	√	√	√	√	√	√	√	√	√	NA	√	√	MM
11/7/2018	√	√	√	√	√	√	√	√	√	√	NA	√	√	MM
11/8/2018	√	√	√	√	√	√	√	√	√	√	NA	√	√	MM
3/12/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	CD
3/13/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	CD
3/14/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	CD
3/16/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	MM
3/17/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	MM
3/20/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	MM
3/21/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	MM
3/22/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	MM
3/23/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	MM
3/28/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	MM
4/3/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	JP
4/4/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	JP
4/5/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	JP

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	[illegible]	Andrew Hamilton	[illegible]
Sign:		of ADCO	
Date:	Nov 14/2019	10/10/2019	Oct 18, 2018

Construction Test Sheet
CTS-60-014 Fusion Bonding Equipment Log

ADCO

TAG:	SAILIIVIK EFFLUENT LINE	Project No:	CX001-3804-MEIP
(Sub)System:	WASTE WATER DISCHARGE	Area:	MINE SITE
Description:	3" HDPE DR11 INSULATED PIPING	Drawing:	H353004-10000-240-272-0001-0001. R1
CWP:	3804- CVR-021	CLIENT:	BAFFINLAND IRON MINES

Item	Description	Yes	No	N/A	Comments and Data
1	Description of Fuse Equipment: Track Star- Pit Bull 412				
2	Machine No: UnNumbered-				
3	Model No: AT1213001				
4	Serial No: C80844				

DATE	Clamps, heater plate, facer, and moveable carriage are aligned	Pipe lift and roller lubricated and good condition	All jaw inserts are in good condition	Heater plate surface in good condition (non-stick coated surface that is free	Heater plate built-in thermometer in good condition	A ~~calibrated~~ thermometer is available for checking heater plate temperature.	Hydraulic oil reservoir is filled to correct level	Hydraulic hoses and cylinders are free of leaks and in good condition.	Facer unit is in good operating condition (chain adjusted per	Facer Blades are in good operating condition (blades project between	Brake is in good operating condition	Tires/Tracks are in good condition	All Components actuated and fuction normally	Initials
4/6/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	JP
4/7/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	JP
4/8/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	JP
4/9/2019	√	√	√	√	√	√	√	√	√	√	NA	√	√	JP

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	JARED POLACHUK	Andrew Hamilton	[signature]
Sign:	[signature]	of ADCO	[signature]
Date:	NOV 14/2019	10/10/2019	Oct 18, 2019

Construction Test Sheet
CTS-60-014 Fusion Bonding Equipment Log

TAG:	SAILIIVIK EFFLUENT LINE	Project No:	CX001-3804-MEIP
(Sub)System:	WASTE WATER DISCHARGE	Area:	MINE SITE
Description:	3" HDPE DR11 INSULATED PIPING	Drawing:	H353004-10000-240-272-0001-0001. R1
CWP:	3804- CVR-021	CLIENT:	BAFFINLAND IRON MINES

Item	Description	Yes	No	N/A	Comments and Data
1	Description of Fuse Equipment: PitBull 14- Manual Fusing Mashine				
2	Machine No: 14				
3	Model No: 430101				
4	Serial No: C57864				

DATE	Clamps, heater plate, facer, and moveable carriage are aligned	Pipe lift and roller lubricated and good condition	All jaw inserts are in good condition	Heater plate surface in good condition (non-stick coated surface that is free	Heater plate built-in thermometer in good condition	A calibrated thermometer is available for checking heater plate temperature.	Hydraulic oil reservoir is filled to correct level	Hydraulic hoses and cylinders are free of leaks and in good condition.	Facer unit is in good operating condition (chain adjusted per	Facer Blades are in good operating condition (blades project between	Brake is in good operating condition	Tires/Tracks are in good condition	All Components actuated and fuction normally	Initials
4/10/2019	√	NA	√	√	√	√	NA	NA	√	√	NA	NA	√	JP
7/16/2019	√	NA	√	√	√	√	NA	NA	√	√	NA	NA	√	JP

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	J. Gauthier	Andrew Hamilton	Dwight Sutherland
Sign:		of ADCO	
Date:	Nov 14/2019	10/10/2019	Oct 18/19

Construction Test Sheet
CTS-60-014 Fusion Equipment Heat Log

TAG:	SAILIIVIK EFFLUENT LINE	Project No:	CX001-3804-MEIP
(Sub)System:	WASTE WATER DISCHARGE	Area:	MINE SITE
Description:	3" HDPE DR11 INSULATED PIPING	Drawing:	H353004-10000-240-272-0001-0001. R1
CWP:	3804- CVR-021	CLIENT:	BAFFINLAND IRON MINES

Item	Description	Yes	No	N/A	Comments and Data
1	Use the Adjust heater plate temperature if any individual temperature reading is more than +/- 25F from specified heater plate temperature and recheck				
2	Adjust heater plate temperature if the average temperature is more than +/- 10F from specified heater plate temperature and recheck				
3	Heater Plate Surface temperature Reading to be taken along the Pipe Radius.				

Fusing Equipment type	Machine No/ID	Date	Time of Day	Specified Heater Temp	Low Heater Plate Surface Temp	High Heater Plate Surfaace Temp	Fusion/Bonder Initials	
PitBull-Track Star 412	C80844	11/5/2018	10:36	400-450 F	> 400 F	< 450 F	MM	
PitBull-Track Star 412	C80844	11/6/2018	8:15	400-450 F	> 400 F	< 450 F	MM	
PitBull-Track Star 412	C80844	11/7/2018	9:00	400-450 F	> 400 F	< 450 F	MM	
PitBull-Track Star 412	C80844	11/8/2018	10:12	400-450 F	> 400 F	< 450 F	MM	
PitBull-Track Star 412	C80844	3/12/2019	7:05	400-450 F	> 400 F	< 450 F	CD	
PitBull-Track Star 412	C80844	3/13/2019	9:36	400-450 F	> 400 F	< 450 F	CD	
PitBull-Track Star 412	C80844	3/14/2019	10:55	400-450 F	> 400 F	< 450 F	CD	
PitBull-Track Star 412	C80844	3/16/2019	10:05	400-450 F	> 400 F	< 450 F	MM	
PitBull-Track Star 412	C80844	3/17/2019	7:25	400-450 F	> 400 F	< 450 F	MM	
PitBull-Track Star 412	C80844	3/20/2019	7:45	400-450 F	> 400 F	< 450 F	MM	
PitBull-Track Star 412	C80844	3/21/2019	8:20	400-450 F	> 400 F	< 450 F	MM	
PitBull-Track Star 412	C80844	3/22/2019	10:00	400-450 F	> 400 F	< 450 F	MM	
PitBull-Track Star 412	C80844	3/23/2019	8:55	400-450 F	> 400 F	< 450 F	MM	
PitBull-Track Star 412	C80844	3/28/2019	8:19	400-450 F	> 400 F	< 450 F	MM	
PitBull-Track Star 412	C80844	4/3/2019	7:46	400-450 F	> 400 F	< 450 F	JP	
PitBull-Track Star 412	C80844	4/4/2019	10:50	400-450 F	> 400 F	< 450 F	JP	
PitBull-Track Star 412	C80844	4/5/2019	7:40	400-450 F	> 400 F	< 450 F	JP	
PitBull-Track Star 412	C80844	4/6/2019	9:15	400-450 F	> 400 F	< 450 F	JP	
PitBull-Track Star 412	C80844	4/7/2019	10:18	400-450 F	> 400 F	< 450 F	JP	
PitBull-Track Star 412	C80844	4/8/2019	7:40	400-450 F	> 400 F	< 450 F	JP	
PitBull-Track Star 412	C80844	4/9/2019	7:05	400-450 F	> 400 F	< 450 F	JP	
PitBull 14-Manual	14	4/10/2019	9:39	400-450 F	> 400 F	< 450 F	JP	
PitBull 14-Manual	14	7/16/2019	8:05	400-450 F	> 400 F	< 450 F	JP	

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	J. Polachek	Andrew Hamilton	Derek Rybinski
Sign:		of ADCO	
Date:	Nov 14/2019	10/10/2019	Oct 18, 2019

Construction Test Sheet
CTS-60-014 HDPE Spool Fusion Log

TAG:	SAILIIVIK EFFLUENT LINE	Project No:	CX001-3804-MEIP
(Sub)System:	WASTE WATER DISCHARGE	Area:	MINE SITE
Description:	3" HDPE DR11 INSULATED PIPING	Drawing:	H353004-10000-240-272-0001-0001. R1
CWP:	3804- CVR-021	CLIENT:	BAFFINLAND IRON MINES

Item	Description	Yes	No	N/A	Comments and Data
1	Description of Fuse Equipment: PitBull 14				
2	Machine No: 14				
3	Model No: 430101				
4	Serial No: C57864				
5	Material Type: IPS High Density Poly Ethelene -DR11				
6	Notes:				
	6a) After the Faces are planed, their allignment shall not exceed a 10% offset in the vertical or horizontal axis.				
	6b) The Melt shall be 1/8 to 3/16 of an inch before the Heat Pad is removed and Fusion Pressure is applied.				
	6c) Once Fusion Pressure is applied, the jig is to be locked for a 900 second cool down period.				
	6d) The valley of the fused joint shall be above half the height of the final fuse bead.				

Joint Identification	Drag P	Interfacial P	Fusion P	Soak Time	Pad Temp	Cooling Time	Date	Initial
1.1	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	5-Nov-18	MM
1.2	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	5-Nov-18	MM
1.3	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	5-Nov-18	MM
1.4	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	5-Nov-18	MM
1.5	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	5-Nov-18	MM
1.6	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	5-Nov-18	MM
1.7	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	5-Nov-18	MM
1.8	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	5-Nov-18	MM
1.9	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	5-Nov-18	MM
2.1	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	5-Nov-18	MM
2.2	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	5-Nov-18	MM
2.3	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	6-Nov-18	MM
2.4	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	6-Nov-18	MM
2.5	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	6-Nov-18	MM
2.6	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	6-Nov-18	MM
2.7	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	6-Nov-18	MM
2.8	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	6-Nov-18	MM
2.9	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	6-Nov-18	MM
3.1	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	6-Nov-18	MM
3.2	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	6-Nov-18	MM
3.3	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	6-Nov-18	MM
3.4	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	6-Nov-18	MM
3.5	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	6-Nov-18	MM
3.6	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	7-Nov-18	

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jared Polachuk	Andrew Hamilton	Derek Rutherford
Sign:		of ADCO	
Date:	Nov 14/2019	10/10/2019	Oct 18, 2019

Construction Test Sheet
CTS-60-014 HDPE Spool Fusion Log

ADCO

TAG:	SAILIIVIK EFFLUENT LINE	Project No:	CX001-3804-MEIP
(Sub)System:	WASTE WATER DISCHARGE	Area:	MINE SITE
Description:	3" HDPE DR11 INSULATED PIPING	Drawing:	H353004-10000-240-272-0001-0001. R1
CWP:	3804- CVR-021	CLIENT:	BAFFINLAND IRON MINES

Item	Description	Yes	No	N/A	Comments and Data
1	Description of Fuse Equipment: PitBull 14				
2	Machine No: 14				
3	Model No: 430101				
4	Serial No: C57864				
5	Material Type: IPS High Density Poly Ethelene -DR11				
6	Notes:				
	6a) After the Faces are planed, their allignment shall not exceed a 10% offset in the vertical or horizontal axis.				
	6b) The Melt shall be 1/8 to 3/16 of an inch before the Heat Pad is removed and Fusion Pressure is applied.				
	6c) Once Fusion Pressure is applied, the jig is to be locked for a 900 second cool down period.				
	6d) The valley of the fused joint shall be above half the height of the final fuse bead.				

Joint Identification	Drag P	Interfacial P	Fusion P	Soak Time	Pad Temp	Cooling Time	Date	Initial
3.7	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	7-Nov-18	MM
3.8	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	7-Nov-18	MM
3.9	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	7-Nov-18	MM
4.1	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	7-Nov-18	MM
4.2	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	7-Nov-18	MM
4.3	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	7-Nov-18	MM
4.4	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	7-Nov-18	MM
4.5	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	8-Nov-18	MM
4.6	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	8-Nov-18	MM
4.7	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	8-Nov-18	MM
4.8	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	8-Nov-18	MM
4.9	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	8-Nov-18	MM
5.1	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	8-Nov-18	MM
5.2	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	8-Nov-18	MM
5.3	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	8-Nov-18	MM
5.4	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	8-Nov-18	MM
5.5	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	8-Nov-18	MM
5.6	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	8-Nov-18	MM
5.7	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD
5.8	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD
5.9	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD
6.1	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD
6.2	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD
6.3	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jared Polaczek	Andrew Hamilton	[illegible]
Sign:	[signature]	[signature] of ADCO	[signature]
Date:	Nov 19/2019	10/10/2019	Oct 18, 2019

Construction Test Sheet
CTS-60-014 HDPE Spool Fusion Log

TAG:	SAILIIVIK EFFLUENT LINE	Project No:	CX001-3804-MEIP
(Sub)System:	WASTE WATER DISCHARGE	Area:	MINE SITE
Description:	3" HDPE DR11 INSULATED PIPING	Drawing:	H353004-10000-240-272-0001-0001. R1
CWP:	3804- CVR-021	CLIENT:	BAFFINLAND IRON MINES

Item	Description	Yes	No	N/A	Comments and Data
1	Description of Fuse Equipment: PitBull 14				
2	Machine No: 14				
3	Model No: 430101				
4	Serial No: C57864				
5	Material Type: IPS High Density Poly Ethelene -DR11				
6	Notes:				
	6a) After the Faces are planed, their allignment shall not exceed a 10% offset in the vertical or horizontal axis.				
	6b) The Melt shall be 1/8 to 3/16 of an inch before the Heat Pad is removed and Fusion Pressure is applied.				
	6c) Once Fusion Pressure is applied, the jig is to be locked for a 900 second cool down period.				
	6d) The valley of the fused joint shall be above half the height of the final fuse bead.				

Joint Identification	Drag P	Interfacial P	Fusion P	Soak Time	Pad Temp	Cooling Time	Date	Initial
6.4	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD
6.5	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD
6.6	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD
6.7	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD
6.8	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD
6.9	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD
7.1	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD
7.2	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	12-Mar-19	CD
7.3	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	13-Mar-19	CD
7.4	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	13-Mar-19	CD
7.5	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	13-Mar-19	CD
7.6	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	13-Mar-19	CD
7.7	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	13-Mar-19	CD
7.8	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	13-Mar-19	CD
7.9	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	13-Mar-19	CD
8.1	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	13-Mar-19	CD
8.2	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	14-Mar-19	CD
8.3	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	14-Mar-19	CD
8.4	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	14-Mar-19	CD
8.5	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	14-Mar-19	CD
8.6	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	14-Mar-19	CD
8.7	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	14-Mar-19	CD
8.8	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	14-Mar-19	CD
8.9	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	14-Mar-19	CD

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	JARED POLISCHUK	Andrew Hamilton	Derek Pellerski
Sign:		of ADCO	
Date:	Nov 14/2019	10/10/2019	Oct 18, 2019

Construction Test Sheet
CTS-60-014 HDPE Spool Fusion Log

TAG:	SAILIIVIK EFFLUENT LINE	Project No:	CX001-3804-MEIP
(Sub)System:	WASTE WATER DISCHARGE	Area:	MINE SITE
Description:	3" HDPE DR11 INSULATED PIPING	Drawing:	H353004-10000-240-272-0001-0001. R1
CWP:	3804- CVR-021	CLIENT:	BAFFINLAND IRON MINES

Item	Description	Yes	No	N/A	Comments and Data
1	Description of Fuse Equipment: PitBull 14				
2	Machine No: 14				
3	Model No: 430101				
4	Serial No: C57864				
5	Material Type: IPS High Density Poly Ethelene -DR11				
6	Notes:				
	6a) After the Faces are planed, their allignment shall not exceed a 10% offset in the vertical or horizontal axis.				
	6b) The Melt shall be 1/8 to 3/16 of an inch before the Heat Pad is removed and Fusion Pressure is applied.				
	6c) Once Fusion Pressure is applied, the jig is to be locked for a 900 second cool down period.				
	6d) The valley of the fused joint shall be above half the height of the final fuse bead.				

Joint Identification	Drag P	Interfacial P	Fusion P	Soak Time	Pad Temp	Cooling Time	Date	Initial
9.1	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	14-Mar-19	CD
9.2	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	14-Mar-19	CD
9.3	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	14-Mar-19	CD
9.4	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	14-Mar-19	CD
9.5	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	14-Mar-19	CD
9.6	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	16-Mar-19	MM
9.7	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	16-Mar-19	MM
9.8	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	16-Mar-19	MM
9.9	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	16-Mar-19	MM
10.1	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	16-Mar-19	MM
10.2	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	17-Mar-19	MM
10.3	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	17-Mar-19	MM
10.4	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	17-Mar-19	MM
10.5	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	17-Mar-19	MM
10.6	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	17-Mar-19	MM
10.7	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	20-Mar-19	MM
10.8	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	20-Mar-19	MM
10.9	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	20-Mar-19	MM
11.1	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	21-Mar-19	MM
11.2	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	21-Mar-19	MM
11.3	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	21-Mar-19	MM
11.4	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	21-Mar-19	MM
11.5	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	21-Mar-19	MM
11.6	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	21-Mar-19	MM

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	JARED PULACHER	Andrew Hamilton	Derek Pedlowski
Sign:		of ADCO	
Date:	NOV 14/2019	10/10/2019	Oct 18, 2019

Construction Test Sheet
CTS-60-014 HDPE Spool Fusion Log

TAG:	SAILIIVIK EFFLUENT LINE	Project No:	CX001-3804-MEIP
(Sub)System:	WASTE WATER DISCHARGE	Area:	MINE SITE
Description:	3" HDPE DR11 INSULATED PIPING	Drawing:	H353004-10000-240-272-0001-0001. R1
CWP:	3804- CVR-021	CLIENT:	BAFFINLAND IRON MINES

Item	Description	Yes	No	N/A	Comments and Data
1	Description of Fuse Equipment: PitBull 14				
2	Machine No: 14				
3	Model No: 430101				
4	Serial No: C57864				
5	Material Type: IPS High Density Poly Ethelene -DR11				
6	Notes:				
	6a) After the Faces are planed, their allignment shall not exceed a 10% offset in the vertical or horizontal axis.				
	6b) The Melt shall be 1/8 to 3/16 of an inch before the Heat Pad is removed and Fusion Pressure is applied.				
	6c) Once Fusion Pressure is applied, the jig is to be locked for a 900 second cool down period.				
	6d) The valley of the fused joint shall be above half the height of the final fuse bead.				

Joint Identification	Drag P	Interfacial P	Fusion P	Soak Time	Pad Temp	Cooling Time	Date	Initial
11.7	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	22-Mar-14	JH
11.8	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	22-Mar-14	JH
11.9	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	22-Mar-14	JH
12.1	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	22-Mar-19	JH
12.2	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	22-Mar-19	JH
12.3	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	22-Mar-19	JH
12.4	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	23-Mar-19	JH
12.5	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	23-Mar-19	JH
12.6	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	23-Mar-19	MM
12.7	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	23-Mar-19	MM
12.8	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	23-Mar-19	MM
12.9	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	23-Mar-19	MM
F.1	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/3/2019	JP
F.2	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/3/2019	JP
F.3	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/4/2019	JP
F.4	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/4/2019	JP
F.5	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/4/2019	JP
F.6	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/5/2019	JP
F.7	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/5/2019	JP
F.8	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/5/2019	JP
F.9	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/6/2019	JP
F.10	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/6/2019	JP
F.11	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/7/2019	JP
F.12	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/7/2019	JP

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	JARED PEACHEY	Andrew Hamilton	Derek Rajewski
Sign:		of ADCO	
Date:	NOV 14/2019	10/10/2019	Oct 18, 2019

Construction Test Sheet
CTS-60-014 HDPE Spool Fusion Log

TAG:	SAILIIVIK EFFLUENT LINE	Project No:	CX001-3804-MEIP
(Sub)System:	WASTE WATER DISCHARGE	Area:	MINE SITE
Description:	3" HDPE DR11 INSULATED PIPING	Drawing:	H353004-10000-240-272-0001-0001. R1
CWP:	3804- CVR-021	CLIENT:	BAFFINLAND IRON MINES

Item	Description	Yes	No	N/A	Comments and Data
1	Description of Fuse Equipment: PitBull 14				
2	Machine No: 14				
3	Model No: 430101				
4	Serial No: C57864				
5	Material Type: IPS High Density Poly Ethelene -DR11				
6	Notes:				
	6a) After the Faces are planed, their allignment shall not exceed a 10% offset in the vertical or horizontal axis.				
	6b) The Melt shall be 1/8 to 3/16 of an inch before the Heat Pad is removed and Fusion Pressure is applied.				
	6c) Once Fusion Pressure is applied, the jig is to be locked for a 900 second cool down period.				
	6d) The valley of the fused joint shall be above half the height of the final fuse bead.				

Joint Identification	Drag P	Interfacial P	Fusion P	Soak Time	Pad Temp	Cooling Time	Date	Initial
F.13	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/7/2019	JP
F.14	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/8/2019	JP
F.15	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/8/2019	JP
F.16	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/8/2019	JP
F.16	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/8/2019	JP
F.17	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/9/2019	JP
F.18	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/9/2019	JP
F.19	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/9/2019	JP
F.20	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/9/2019	JP
F.21	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/9/2019	JP
F.22	NA	75 PSI	41 PSI	1:30min	400°-450°	>3:30min	4/9/2019	JP
H.1	Manual	Manual	Manual	1:30min	400°-450°	>3:30min	4/10/2019	JP
H.2	Manual	Manual	Manual	1:30min	400°-450°	>3:30min	4/10/2019	JP
H.3	Manual	Manual	Manual	1:30min	400°-450°	>3:30min	4/10/2019	JP
H.4	Manual	Manual	Manual	1:30min	400°-450°	>3:30min	4/10/2019	JP
H.5	Manual	Manual	Manual	1:30min	400°-450°	>3:30min	4/10/2019	JP
H.6	Manual	Manual	Manual	1:30min	400°-450°	>3:30min	4/10/2019	JP
Y.1	Manual	Manual	Manual	1:30min	400°-450°	>3:30min	7/16/2019	JP
Y.2	Manual	Manual	Manual	1:30min	400°-450°	>3:30min	7/16/2019	JP
Y.3	Manual	Manual	Manual	1:30min	400°-450°	>3:30min	7/16/2019	JP
Y.4	Manual	Manual	Manual	1:30min	400°-450°	>3:30min	7/16/2019	JP
Y.5	Manual	Manual	Manual	1:30min	400°-450°	>3:30min	7/16/2019	JP
Y.6	Manual	Manual	Manual	1:30min	400°-450°	>3:30min	7/16/2019	JP

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	JARED POLSTENEK	Andrew Hamilton	Derek Pollard
Sign:		of ADCO	
Date:	NOV 14/2019	10/10/2019	Oct 18, 2019

Construction Inspection Sheet
CIS-75-019 Control Valves

Tag No:	Sailiivik Effluent Line Isolation Valve	Project No:	3804-MEIP
(Sub)System:		Area:	Effluent Discharge Line
Description:	3" CS ~~HDPE~~ Ball Valve ISOLB	Drawing:	NA
CWP:	3804-021	CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General Data				
2	Drawing No:				
3	Specification No:				
4	Inspection				
5	Valve according to data sheet.	✓			
6	Record Serial Number.			✓	
7	No external damage.	✓			
8	Position, flow direction and orientation correct.	✓			
9	Labelling correct.		✓		
10	Position/Booster correctly installed.	✓			
11	Flange bolts tight.	✓			
12	Correct gasket.			✓	
13	Air supply to actuator installed.			✓	
14	Check if valve can be removed for service.	✓			
15	Tag No. visible and correct.		✓		
16	Functional Test completed. Refer to calibration certifcate or Supplier's calibration certificate (as applicable).	✓			
17	Components of Control Valve				

Tag No:	Description	Comments

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	JARED POLACHEK	ANDREW WARNER	Dean Moffett
Sign:		OF ADCO	D. Moffett
Date:	SEPT 15 2019	Sept 12, 2019	12-Sep-19

Construction Inspection Sheet
CIS-75-019 Control Valves

ADCO

Tag No:	MSC Effluent Line Isolation Valve	Project No:	3804-MEIP
(Sub)System:		Area:	Effluent Discharge Line
Description:	3"CS ~~HDPE~~ Ball Valve 150LB	Drawing:	NA
CWP:		CLIENT:	BAFFINLAND IRON MINES, Baffin Island

Item	Description	Yes	No	N/A	Comments and Data
1	General Data				
2	Drawing No:				
3	Specification No:				
4	Inspection				
5	Valve according to data sheet.	✓			
6	Record Serial Number.			✓	
7	No external damage.	✓			
8	Position, flow direction and orientation correct.	✓			
9	Labelling correct.		✓		
10	Position/Booster correctly installed.	✓			
11	Flange bolts tight.	✓			
12	Correct gasket.			✓	
13	Air supply to actuator installed.			✓	
14	Check if valve can be removed for service.	✓			
15	Tag No. visible and correct.		✓		
16	Functional Test completed. Refer to calibration certifcate or Supplier's calibration certificate (as applicable).	✓			
17	Components of Control Valve				

Tag No:	Description	Comments

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Jared Polachak	Andrew Hanikow	Dean Moffatt
Sign:	[signature]	[signature] OF ADCO	D. Moffatt
Date:	SEPT 15/2019	Sept 12, 2019	12-Sep-19

CanTorque Inc.
14635-119 Ave
Edmonton, AB T5L 2N9
P (780)436-2000
F (780)732-0905
info@cantorque.com
www.cantorque.com

Certificate of Calibration

 # 041347114 -2

Customer Name	Adco Power
Customer Address	Edmonton, AB
Manufacturer Name	Westward
Model Number	TWC12
Serial Number	**041347114**
Asset Number	n/a
Maximum Capacity	250 Lbf/ft
Ratchet Drive Size	1/2"
Required Accuracy	+/- 4%
Temperature °C	20.0
Service Technician	Mark MacNeil
Units of Measure	Lbf/ft
Calibration Procedure	OP-112

Calibration Data - Minimum 5 Results at Each Checkpoint

Capacity	Torque Setting	Initial Readings as Found	Target Torque Range			Readings After Adjustments
20%	50.00	49.48	48.00	-	52.00	In-Spec
60%	150.00	149.94	144.00	-	156.00	In-Spec
100%	250.00	246.34	240.00	-	260.00	In-Spec

Calibration Equipment Data

Manufacturer Name	Norbar		
Display Model #	TTT 43228		
Display Serial #	63987		
Transducer Model #	50625.LOG		
Transducer Serial #	59562	Transducer Capacity	250 Lbf/ft
Calibration Date	08-Sep-16		
Transducer Accuracy	+/- 0.5%	Next Calibration Due	08-Sep-18

The above described instrument has been calibrated in accordance with the customer's requirements and specifications using measurement equipment that is directly traceable to the NRC/Canada and/or the NIST/USA and applicable national standards.

Calibration Date:	25-Nov-16	Technician Print/Signature:	Mark L MacNeil Mark L MacNeil

A·H McELROY

This is to certify that

CARL DOERKSEN

has satisfactorily complete the courses neccessary to operate equipment, as noted on the reverse in compliance with ASTM F2620.

No:17292

JUNE 26, 2018
Date of Issue

Qualification valid for two years from the date of issue.

OPERATOR QUALIFICATION

- ☐ Mini MC/1LC
- ☐ #2LC/2CU
- ☐ PB #14
- ☐ PB #26
- ☑ #28/T28/HP
- ☑ #412/T412/HP
- ☑ #618/T618
- ☑ #T500
- ☐ #824/T630
- ☐ #1236/T900
- ☐ #1648
- ☐ #2065

- ☑ Datalogger
- ☐ Saddle Fusion
- ☐ Socket Fusion

Authorized by

McELROY

This is To Certify That

Jared Polachek

Has Satisfactorily Completed The Courses:
As Noted On Reverse

Date MAY 8 - 2014

for A.H. McElroy

Nº 14725

BUTT FUSION

- ☐ Mini Mc/1LC
- ☐ #2LC/2CU
- ☑ #14PB
- ☑ #26
- ☑ #28/T28/HP
- ☑ #412/T412/HP
- ☑ #618/T618
- ☑ #T500
- ☐ #824/T630
- ☐ #1236/T900
- ☐ #1648
- ☐ #2065
- ☑ Datalogger
- ☐ Linetamer
- ☐ Saddle Fusion
- ☐ Socket Fusion
- ☐ Electrofusion $\frac{1}{2}$" to 14"
- ☐ Electrofusion 16" to 28"
- ☐ Electrofusion Saddles
- ☐ Squeeze Tool Manual
- ☐ Squeeze Tool Hydraulic
- ☐ Hot Tapping

OPERATOR QUALIFICATION

- ☐ Mini MC/1LC
- ☐ #2LC/2CU
- ☐ PB #14
- ☐ PB #26
- ☑ #28/T28/HP
- ☑ #412/T412/HP
- ☑ #618/T618
- ☑ #T500
- ☐ #824/T630
- ☐ #1236/T900
- ☐ #1648
- ☐ #2065

- ☐ Datalogger
- ☐ Saddle Fusion
- ☐ Socket Fusion

Authorized by

Qualification valid for two years from the date of issue.

McELROY Sales & Service

This is to certify that

MATT MANNETTE

has satisfactorily complete the courses neccessary to operate equipment, as noted on the reverse in compliance with ASTM F2620.

No:16994

OCTOBER 4, 2017
Date of Issue

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No:	1623-HTCP-001-P1B	Project No:	3804-MEIP
(Sub)System:	Sailiivik Camp Services	Area:	Mine Site
Description:	3c#6 1kV Teck Cable	Drawing:	NA
CWP:	C001	CLIENT:	BAFFINLAND IRON MINES
Origin:	WTP-PDP1	Destination:	1623-HTCP-001

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits	✓			
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Murray Weir	Andrew Hanlon of ADCO	Derek Podgurski
Sign:			
Date:	09-13-19	Oct 4, 2019	Oct 18, 2019

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

ADCO

Tag No:	1623-HTCP-001-P1A	Project No:	3804-MEIP
(Sub)System:	Sailiivik Camp Services	Area:	Mine Site
Description:	3c#6 1kV Teck Cable	Drawing:	NA
CWP:	CX001	CLIENT:	BAFFINLAND IRON MINES
Origin:	WTP-PDP1	Destination:	1623-HTCP-001

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits	✓			
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Murray Weir	Andrew Hanson	Derek Pachowski
Sign:	[signature]	[signature] of ADCO	[signature]
Date:	09-13-19	Oct 4, 2019	Oct 18, 2019

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

ADCO

Tag No:	1623-HT-L1-P1	Project No:	3804-MEIP
(Sub)System:	Sailiivik Camp Services	Area:	Mine Site
Description:	3c#6 1kV Teck Cable-COLD LEAD	Drawing:	NA
CWP:	C~~X~~001	CLIENT:	BAFFINLAND IRON MINES
Origin:	1623-HTCP-001	Destination:	1623-HT-L1-JBX

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits	✓			
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Murray Weir	Andrew Harvey	Dave Pedkowski
Sign:	[signature]	[signature] of ADCO	[signature]
Date:	09-13-19	Oct 4, 2019	Oct 18, 2019

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No:	1623-HT-L2-P1	Project No:	3804-MEIP
(Sub)System:	Sailiivik Camp Services	Area:	Mine Site
Description:	3c#6 1kV Teck Cable-COLD LEAD	Drawing:	NA
CWP:	C001	CLIENT:	BAFFINLAND IRON MINES
Origin:	1623-HTCP-001	Destination:	1623-HT-L2-JBX

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits	✓			
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet			✓	
17	Cable lugs crimped and bolts tightened to correct torque rating	✓			
18	Phase sequence verified/checked	✓			
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications			✓	
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Murray Weir	Andrew Hanson	Derek Roberts
Sign:	Murray Weir	for of ADCO	
Date:	09-13-19	Oct 4, 2019	Oct 18, 19

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No:	1623-HT-L1-C1	Project No:	3804-MEIP
(Sub)System:	Sailiivik Camp Services	Area:	Mine Site
Description:	2P#16 1kV Teck Cable-RTD	Drawing:	NA
CWP:	C001	CLIENT:	BAFFINLAND IRON MINES
Origin:	1623-HTCP-001	Destination:	1623-HT-L1-PIPE RTD

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits	✓			
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet	✓			
17	Cable lugs crimped and bolts tightened to correct torque rating			✓	
18	Phase sequence verified/checked			✓	
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications	✓			
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Murray Weir	Andrew Harvey of ADCO	Derek Edwards
Sign:			
Date:	09-13-19	Oct 4, 2019	Oct 18, 2019

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

ADCO

Tag No:	1623-HT-L1-C2	Project No:	3804-MEIP
(Sub)System:	Sailiivik Camp Services	Area:	Mine Site
Description:	2P#16 1kV Teck Cable-RTD	Drawing:	NA
CWP:	CX001	CLIENT:	BAFFINLAND IRON MINES
Origin:	1623-HTCP-001	Destination:	1623-HT-L1-AMBIENT RTD

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits	✓			
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet	✓			
17	Cable lugs crimped and bolts tightened to correct torque rating			✓	
18	Phase sequence verified/checked			✓	
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications	✓			
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Murray Weir	[signature]	[signature]
Sign:	[signature]	[signature]	[signature]
Date:	09-13-19	Oct 4, 2019	Oct 18 2019

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

ADCO

Tag No:	1623-HT-L2-C1	Project No:	3804-MEIP
(Sub)System:	Sailiivik Camp Services	Area:	Mine Site
Description:	2P#16 1kV Teck Cable-RTD	Drawing:	NA
CWP:	C~~X~~001	CLIENT:	BAFFINLAND IRON MINES
Origin:	1623-HTCP-001	Destination:	1623-HT-L2-PIPE RTD

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits	✓			
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet	✓			
17	Cable lugs crimped and bolts tightened to correct torque rating			✓	
18	Phase sequence verified/checked			✓	
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications	✓			
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Murray Weir	[signature]	Derek [illegible]
Sign:	[signature]	OZ ADCO	[signature]
Date:	09-13-19	Oct 4, 2019	Oct 18, 2019

Construction Inspection Sheet
CIS-70-007 Low Voltage Cables (<1kV)

Tag No:	1623-HT-L2-C2	Project No:	3804-MEIP
(Sub)System:	Sailiivik Camp Services	Area:	Mine Site
Description:	2P#16 1kV Teck Cable-RTD	Drawing:	NA
CWP:	C001	CLIENT:	BAFFINLAND IRON MINES
Origin:	1623-HTCP-001	Destination:	1623-HT-L2-AMBIENT RTD

Item	Description	Yes	No	N/A	Comments and Data
1	Cable numbered and marked correctly on both ends and transits	✓			
2	Cable size and type correct	✓			
3	Earth conductor installed and connected	✓			
4	Cable support and enclosing systems satisfactory	✓			
5	Confirm protective measures (kick plates) are fitted correctly			✓	
6	Cable clamps / ties size and type / spacing correct	✓			
7	Cable spacing / formation to engineering Instruction	✓			
8	Bending radius is within manufacturer's recommendations	✓			
9	Cable installation completed satisfactorily	✓			
10	Cable glands size correct and tightened satisfactorily	✓			
11	Ensure IP sealing washers have been fitted to gland, where required			✓	
12	Glands comply with area classification	✓			
13	Lockouts and shrouding correct	✓			
14	Bedding correct	✓			
15	Cable ends made up and terminated satisfactorily	✓			
16	LV Cables Termination completed according to procedure. Attach separate LV Cable Termination Procedure sheet	✓			
17	Cable lugs crimped and bolts tightened to correct torque rating			✓	
18	Phase sequence verified/checked			✓	
19	Check that the earth bonding is correct and in accordance with the approved project drawings and specifications	✓			
20	On single core cables, ensure that the cables have been earthed in accordance with the requirements of the approved project electrical drawings and specifications			✓	
21	Continuity of earth conductor / screen / sheath okay	✓			
22	Cable armouring / sheath earthed at both ends	✓			
23	Confirm that the cable routing and segregation is correct	✓			
24	Check that, there is no damage to the cores, termination chamber layout is satisfactory, core identification is correct and that crimped fittings are satisfactory. Cable terminated to latest revision of drawing.	✓			
25	Confirm that spare cores and screens have been earthed and conform to the requirements of the approved project drawings and specifications	✓			
26	Check that all enclosure covers have been replaced and no bolts are missing	✓			
27	No unauthorised modifications	✓			
28	Overall appearance of installation satisfactory	✓			
29	Continuity check on conductors satisfactory	✓			

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Murray Weir	Andrew Hamilton	Derek Richards
Sign:		QC of ADCO	
Date:	09-13-19	Oct 4, 2019	Oct 18, 2019

Project			Identification			Operating Temperatures		
Project Name			Design Reference			Maintenance Temperature	5	°C
Location			Line\Pipe			Min Controlled Temperature	5	°C
Designer			Panel\Breaker Number			Max Controlled Temperature	N/A	°C
Project Number			Isometric Number			Heater Sheath Temperature	44	°C
Job Number			Module			Heater Sheath Temperature HI	N/A	°C
			Work Package			Uncontrolled Pipe Temperature	92	°C
			Area			Max Cable Temperature	122	°C
Pipe & Insulation			**Environment**			**Cable**		
Design Heat Loss	14.1	W/ m	Min Ambient Temperature	-45	°C	Cable Name	TEK 3C70-OJ	
			Startup Amb Temperature	-45	°C	Design Cable Output	14.7	W/ (m
Pipe Length	2400	m	Max Ambient Temperature	35	°C	Nominal Operating Power	38907	VA
Pipe Size	3	in	Max Process Temperature	20	°C	Circuit Length	2400	m
Pipe Type	HDPE DR11		Max Product Temperature	540	°C	Total Cable	2400	m
Insulation Size	3.5	in	Area Classification	Ordinary		Nominal Operating Current	37.4	A
Inner Insulation Thickness	2	in	T-Class	N/A		Total Maximum Current	55.3	A
Inner Insulation Type	PI		Autoignition Temperature	N/A	°C	Voltage	600	Vac
Inner Insulation K Value	0.0289	W/m-°C	Temperature Control	Pipe Sensing		Number Heater Sets	1	
Inner Insul Mean Temp	-20	°C	Temperature Control Set Point	N/A	°C	Trace Ratio Per Set	1	
Outer Insulation Thickness	N/A	in	Wind Speed	40	km/h	Spiral Pitch	N/A	cm
Outer Insulation Type	N/A		Safety Factor	25	%	Circuit Breaker Size	70	
Outer Insulation K Value	N/A	W/m-°C						
Outer Insul Mean Temp	N/A	°C						
Jacket Emissivity	0.12							
No. Valves 0	No. Supports 0		No. Flanges 0		No. Pumps 0			
Valve Allocatio 0 m	Support Allocati 0 m		Flange Allocation 0 m		Pmp Allocatio 0 m			
Remarks								

Item Number	Part Number	Catalog Number	Description	Quantity	Units
1	20989	TEK 3C70-OJ	Series Constant Watt Heater with braid and overjacket	2400.0	m

Cable Testing Report

make additional copies as required for each circuit.

Customer: Baffinland Iron mines
Address: Mary River

Phone No:

Project Reference: CXOOL MEIP

Contractor: Adco Power
Address: 8750 - 58 Ave Edmonton, AB T6E 6G6
Phone No. 780-465-3265

Record 1: Prior to Installation

Cable Type: TeK 3C 70
Reel Length: 1464
Reel Number: 2
Insulation Resistance M Ohms: ∠550
Tested By: Chris Byar — Date: 01/09/2019
Witnessed By: Kris Krahl — Date: 01/09/2019

Record 2: After Installation of Heating Cable

Insulation Resistance M Ohms: ∠550
Heater Length: 1464
Heater Number: 2
Tested By: Kris Krahl — Date: 03/10/2019
Witnessed By: Chris Byar — Date: 03/10/2019

Record 3: After The Thermal Insulation Is Installed

CT 7,9,11 Insulation Resistance M Ohms: Phase to ground Phase 1 > 2.2 GΩ Phase 2 > 2.2 GΩ Phase 3 285 MΩ — Phase to phase >2.2 GΩ's

Tested By: Jody Baerg — Date: 09/09/19
Witnessed By: Sam Cassar — Date: 09/09/19

Record 4: Final Commissioning

Panel Number: WTP-PD P1
Breaker Number:
Volts: 600V
Ambient Temperature (deg. C): -5°C
Pipe Temperature (deg. C): 20C
Recorded Amps (After 5 Min.): 47 A
Tested By: Grant Fitzgerald — Date: Oct 4 2019
Witnessed By: Andrew Hamilton — Date: Oct 4 2019

THERMON The Heat Tracing Specialists®

Cable Testing Report

make additional copies as required for each circuit.

Customer: Baffinland Iron Mines
Address: Mary River

Phone No:

Project Reference: CX001 MEIP

Contractor: Adco Power
Address: 8750-58 Ave, Edmonton, AB T6E 6G6
Phone No. 780-465-3265

Record 1: Prior to Installation

Cable Type: Tek 3C70
Reel Length: 1475
Reel Number: 4
Insulation Resistance M Ohms: < 550
Tested By: Chris Byar — Date: 09/01/2019
Witnessed By: Kris Krahl — Date: 09/01/2019

Record 2: After Installation of Heating Cable

Insulation Resistance M Ohms: < 550
Heater Length: 1475
Heater Number: 4
Tested By: Kris Krahl — Date: 03/10/2019
Witnessed By: Chris Byar — Date: 03/10/2019

Record 3: After The Thermal Insulation Is Installed

CCT 1,3,5 Insulation Resistance M Ohms: All Phases to ground > 2.2 GΩ Phase to phase > 2.2 GΩ
Tested By: Jody Baerg — Date: 09/09/19
Witnessed By: Sam Cassar — Date: 09/09/19

Record 4: Final Commissioning

Panel Number: UTP-PDP1
Breaker Number:
Volts: 600 V
Ambient Temperature (deg. C): -5°C
Pipe Temperature (deg. C): 20C
Recorded Amps (After 5 Min.): 35.7 A
Tested By: Grant Fitzgerald — Date: Oct 4 2019
Witnessed By: Andrew Hamilton — Date: Oct 4 2019

THERMON The Heat Tracing Specialists'

Cable Testing Report

make additional copies as required for each circuit.

Customer: Baffinland Iron Mines
Address: Mary River
Phone No:
Project Reference: CX001 MEIP

Contractor: Adco Power
Address: 8750-58 Ave Edmonton, AB T6E 6G6
Phone No. 780-465-3265

Record 1: Prior to Installation

Cable Type:
Reel Length: 1478
Reel Number: 1
Insulation Resistance M Ohms: < 550
Tested By: Chris Byar Date: 01/09/2019
Witnessed By: Kris Krahl Date: 01/09/2019

Record 2: After Installation of Heating Cable

Insulation Resistance M Ohms: <550
Heater Length: 1478 Ft
Heater Number: 1
Tested By: Kris Krahl Date: 03/10/2019
Witnessed By: Chris Byar Date: 03/10/2019

Record 3: After The Thermal Insulation Is Installed

Insulation Resistance M Ohms:
Tested By: Date:
Witnessed By: Date:

Record 4: Final Commissioning

Panel Number:
Breaker Number:
Volts:
Ambient Temperature (deg. F):
Pipe Temperature (deg. F):
Recorded Amps (After 5 Min.):
Tested By: Date:
Witnessed By: Date:

covered on previous page, Two circuits of heat trace using 4 reels

Cable Testing Report

make additional copies as required for each circuit.

Customer: Baffinland Iron Mines
Address: Mary River

Phone No:
Project Reference: CX001 MEIP

Contractor: Adro Power
Address: 8750-58 Ave Edmonton, AB T6E 6G6
Phone No. 780-465-3265

Record 1: Prior to Installation

Cable Type:
Reel Length: 1482
Reel Number: 3
Insulation Resistance M Ohms: < 550
Tested By: Chris Byar — Date: 01/09/2019
Witnessed By: Kris Krahl — Date: 01/09/2019

Record 2: After Installation of Heating Cable

Insulation Resistance M Ohms: <550
Heater Length: 1482
Heater Number: 3
Tested By: Kris Krahl — Date: 03/10/2019
Witnessed By: Chris Byar — Date: 03/10/2019

Record 3: After The Thermal Insulation Is Installed

Insulation Resistance M Ohms:
Tested By: — Date:
Witnessed By: — Date:

Record 4: Final Commissioning

Panel Number:
Breaker Number:
Volts:
Ambient Temperature (deg. F):
Pipe Temperature (deg. F):
Recorded Amps (After 5 Min.):
Tested By: — Date:
Witnessed By: — Date:

Covered on previous pages. Two circuits of heat trace using 4 reels.

Pre-Operational Inspection Sheet
PTS-70-031 Heat Trace Circuit (C-Test)

Tag No:	1623-HT-L2	Project No:	3804-MEIP
(Sub)System:	Effluent Line	Area:	Mine Site
Description:	600V Heat Trace	Drawing:	NA
CWP:	CE001	CLIENT:	BAFFINLAND IRON MINES

Item	Description	Yes	No	N/A	Comments and Data
1	Confirm cladding installation complete.	✓			
2	Confirm entry kits and warning labels fitted.				
3	Post cladding IR test. (Min value = 10MW @ 500V)	✓			
4	Verify circuit description/Identification is correct	✓			
5	Verify that an RCCD is fitted in the circuit. (Certification Requirement)				
6	Verify circuit connections and MCB ratings against latest distribution board schedule.	✓			
7	Confirm total installed tape length does not exceed manufacturer's instruction.				
8	Measure tape element resistance at distribution board.				
9	Carry out point to point verification and earth loop resistance check at last junction box.	✓			
10	Energize circuit and confirm initial inrush current is acceptable.	✓			GJF
11	Check Power Consumption & Record Results:				
	11a - Phase L1 - Current (A): 47A				GJF
	11b - Phase L1 - Inrush Current (A):				
	11c - Phase L2 - Current (A): 47A				GJF
	11d - Phase L2 - Inrush Current (A):				
	11e - Phase L3 - Current (A): 47A				GJF
	11f - Phase L3 - Inrush Current (A):				
	11g - N - Current (A):				
	11h - N - Inrush Current (A):				
12	Measure earth loop impedance at circuit extremities. (Max value for 16A MCB Type C = 1.5W)				
13	Verify Residual Current Device (RCCD) trip time at circuit extremities. (Trip within 200ms @ 100% trip rating)				
14	Verify correct setting and operation of thermostat controls.	✓			GJF
15	Verify satisfactory heat output of tapes and confirm steady state current after 1 hour is acceptable.	✓			GJF
16	Check tape temperature is satisfactory at appropriate locations.	✓			GJF
17	Compile red line drawing changes where applicable.				
18	Note: Lower IR values may be acceptable with approval of Commissioning Engineer				

Comments:

- Spare line
- Disconnected in Control Panel.

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	GRANT FITZGERALD	Andrew Hamilton at ADCO Oct 4, 2019	Dean Moffett
Sign:			D. Moffett
Date:	14/10/19		15-Nov-19

Pre-Operational Inspection Sheet

PIS-70-015 Misc. Electrical Equipment

ADCO

Tag No:	1623-HTCP-001	Project No:	3804-MEIP
(Sub)System:	Effluent Line	Area:	Mine Site
Description:	600V Heat Trace	Drawing:	NA
CWP:	CE001	CLIENT:	BAFFINLAND IRON MINES

Item	Description	Yes	No	N/A	Comments and Data
1	General Data Thermon 600V Digital Heat Trace Controller 2 Zone				
2	PO No:				
3	Type:				
4	Rating: Nema 4X				
5	Serial No:				
6	Model No:				
7	Style No:				
8	Inspection				
9	Construction Completion status	✓			
10	Preservation removed	✓			
11	Equipment cleaned	✓			
12	Earthing correctly installed. Megger-test performed	✓			
13	Livening Up Notice (LUN) obtained	✓			
14	In Operation tag fitted				
15	All safety requirements satisfied	✓			
16	Verify power cables are complete, tight and correct phasing.	✓			
17	Check terminal chambers are clean and free from dust and moisture ingress.	✓			
18	Check insulation resistance of equipment power circuits. (Min value = 10 M:)	✓			
19	Verify switchboard cubicle number and labelling is correct.	✓			
20	Verify MCB / fuse ratings at feeder are correct for application.	✓			
21	Function check feeder controls and Instrument Control System (ICS) interfaces.	✓			
22	Verify equipment MCB / fuse ratings and relay settings are correct.	✓			
23	Energize and function check equipment to manufacturer's instructions.	✓			
24	Measure live earth loop impedance, if practical and safe to do so.				
25	Verify operation of anti-condensation heater circuits.			✓	
26	Verify operation and settings of alarms and trips.			✓	
27	Verify system Emergency Shutdown (ESD) trips and ICS interfaces.			✓	
28	Compile red line drawing where applicable.				

Comments:

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	Murray Weir	Andrew Naulth	Derek Pollard
Sign:	[signature]	[signature] OF ADCO	[signature]
Date:	09-13-19	Oct 4, 2019	Nov 18/19

Pre-Operational Inspection Sheet
PTS-70-031 Heat Trace Circuit (C-Test)

Tag No:	1623-HT-L1	Project No:	3804-MEIP
(Sub)System:	Effluent Line	Area:	Mine Site
Description:	600V Heat Trace	Drawing:	NA
CWP:	CE001	CLIENT:	BAFFINLAND IRON MINES

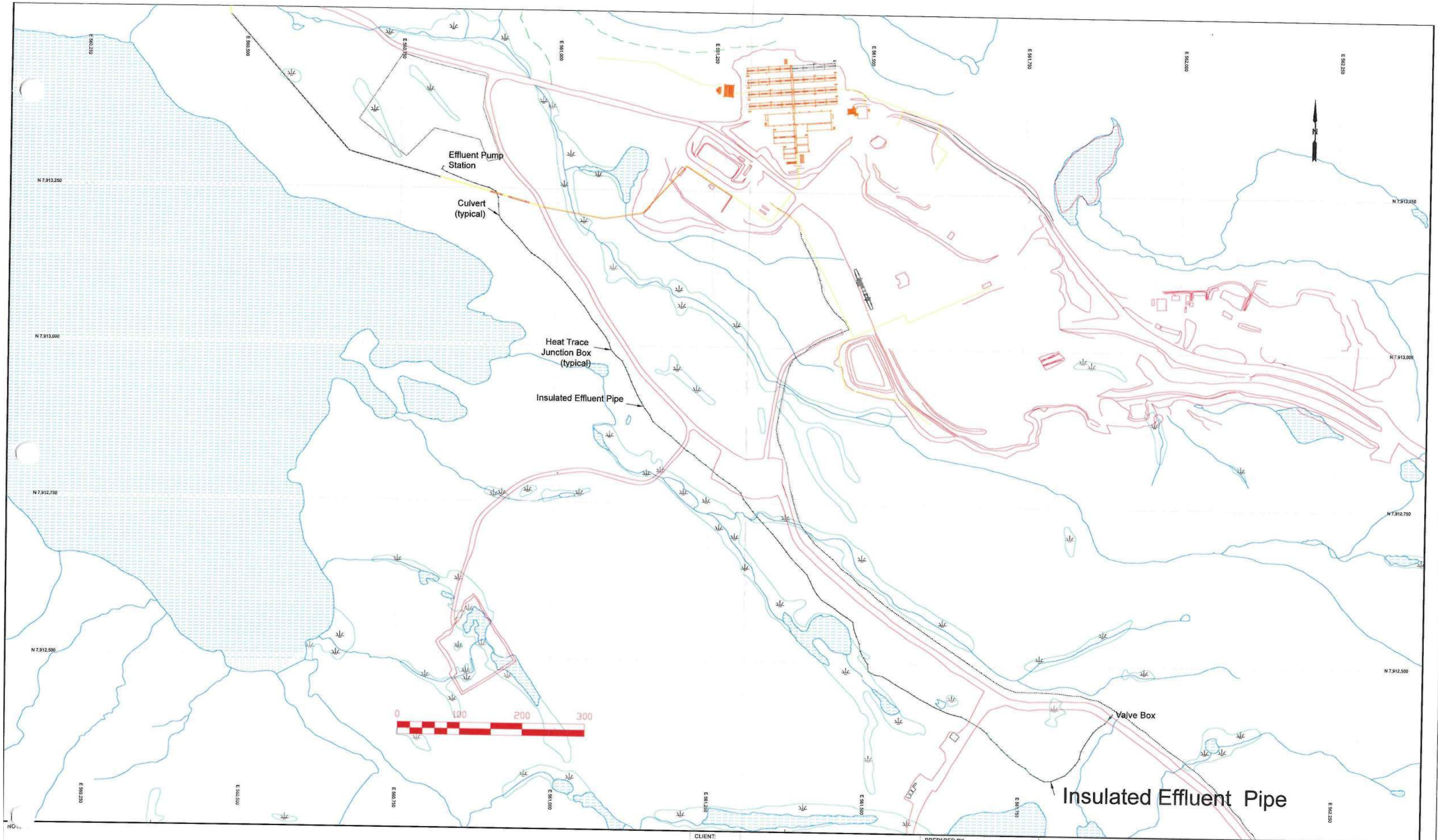
Item	Description	Yes	No	N/A	Comments and Data
1	Confirm cladding installation complete.	✓			
2	Confirm entry kits and warning labels fitted.				
3	Post cladding IR test. (Min value = 10MW @ 500V)	✓			
4	Verify circuit description/Identification is correct	✓			
5	Verify that an RCCD is fitted in the circuit. (Certification Requirement)				
6	Verify circuit connections and MCB ratings against latest distribution board schedule.	✓			
7	Confirm total installed tape length does not exceed manufacturer's instruction.				
8	Measure tape element resistance at distribution board.				
9	Carry out point to point verification and earth loop resistance check at last junction box.	✓			
10	Energize circuit and confirm initial inrush current is acceptable.	✓			GJF
11	Check Power Consumption & Record Results:				
	11a - Phase L1 - Current (A): 35.7A				
	11b - Phase L1 - Inrush Current (A):				
	11c - Phase L2 - Current (A): 35.7A				
	11d - Phase L2 - Inrush Current (A):				
	11e - Phase L3 - Current (A): —35.7A				
	11f - Phase L3 - Inrush Current (A):				
	11g - N - Current (A): —				
	11h - N - Inrush Current (A):				
12	Measure earth loop impedance at circuit extremities. (Max value for 16A MCB Type C = 1.5W)				
13	Verify Residual Current Device (RCCD) trip time at circuit extremities. (Trip within 200ms @ 100% trip rating)				
14	Verify correct setting and operation of thermostat controls.	✓			GJF
15	Verify satisfactory heat output of tapes and confirm steady state current after 1 hour is acceptable.	✓			GJF
16	Check tape temperature is satisfactory at appropriate locations.	✓			GJF
17	Compile red line drawing changes where applicable.				
18	Note: Lower IR values may be acceptable with approval of Commissioning Engineer				

Comments:

Maintain temp = 24°C
Bandwidth 1°C
Low Current = 1A
High Current = 65A trip
Ground current = 90mA

Low temp Alarm = 10°C
High temp Trip = 90°C

	Trades Person	Supervisor	Field Eng or QA/QC
Print Name:	GRANT FITZGERALD	Andrew Hawkins of ADCO	Derek Pollard
Sign:			
Date:	14/10/19	Oct 4, 2019	Nov 13/19



CLIENT: Baffinland Iron Mines Corporation	PREPARED BY: Nuna East Ltd. 9839 - 31 Avenue Edmonton, AB T6N 1C5	NUNA	DRAWING TITLE: **Mine Site Insulated Heat Traced Effluent Pipe Asbuilt Sept 12, 2019**
PROJECT: Mary River Expansion Project, Baffin Island, Nunavut	DRAWN BY: mc	SCALE: barscale	DATE: Sept 12, 2019
			DRAWING NAME (YYMMDD): AB 190912 MS Effluent Pipe.dwg

EXISTING RAW WATER PIPELINE

PLANT NORTH

RAW WATER PIPE
CUT EXISTING PIPE AND HEAT TRACE CABLES AT EXISTING PIPE JOINT. LOCATION TO BE DETERMINED ON SITE. FUSE NEW PIPELINE TO EXISTING AND CONNECT HEAT TRACE CABLES IN NEW JUNCTION BOX TYPICAL 2 LOCATIONS

NEW 3" TREATED EFFLUENT PIPELINE TO BE CONNECTED TO DISCHARGE OF STP DISCHARGE PUMP

INSTALL NEW HEAT TRACING CONTROLLER IN PUMP STATION

LOCATION OF 800 MAN CAMP TREATED EFFLUENT TANK

RAW WATER PIPE
INSTALL NEW 4" INSULATED AND HEAT TRACED HDPE LINE APPROX. 476m TOTAL LENGTH

ABANDON EXISTING RAW WATER PIPELINE AFTER INSTALLATION OF NEW PIPELINE

RAW WATER
VALVE BOX POSITION FOR WATER FEED TO 800 MAN CAMP W.T.P.

EXISTING RAW WATER PIPELINE

1. FOR HDPE PIPING DETAILS, REFER TO SPECIFICATIONS:
(HEAT TRACING) H353004-00000-260-078-0001
(PIPING) H353004-CX001-200-242-0001

2. WORK POINTS ARE NOMINAL. CONTRACTOR MAY ADJUST +- 2.0m TO SUIT THEIR DESIGN

KEY	
	NEW RAW WATER PIPELINE
	EXISTING RAW WATER PIPELINE
	NEW TREATED EFFLUENT
	EXISTING TREATED EFFLUENT

TREATED EFFLUENT PIPE
INSTALL NEW 3" INSULATED AND HEAT TRACED HDPE PIPELINE APPROX. 1660m LENGTH

S.O.P. 4

EXISTING PIPELINE APPROX. 380m LENGTH FROM S.O.P. 4 TO S.O.P. 5

S.O.P. 1

INSTALL TEE HERE WITH BLANK FLANGE FOR FUTURE TIE-IN FROM NORTH EAST

CULVERT REQUIRED AT THESE POINTS

CS-1623-001

S.O.P. 5

EXISTING PIPELINE APPROX. 600m LENGTH FROM S.O.P. 5 TO S.O.P. 3

NEW TREATED EFFLUENT PIPELINE

NEW PIPELINE TO BE LAID ON TUNDRA

CONNECTION POINT FOR DIVERTED TREATED EFFLUENT PIPE. FUSE NEW PIPELINE TO EXISTING AND CONNECT HEAT TRACE CABLES IN NEW JUNCTION BOX

S.O.P. 3

CULVERT REQUIRED AT THESE POINTS

S.O.P. 2

EXISTING 3" TREATED EFFLUENT PIPELINE APPROX. 670m LENGTH

SETTING OUT POINTS
TREATED EFFLUENT PIPELINE

S.O.P. 1 = N 7 912 961; E 561 127
S.O.P. 2 = N 7 912 321; E 561 817
S.O.P. 3 = N 7 912 430; E 561 906
S.O.P. 4 = N 7 913 032; E 561 470
S.O.P. 5 = N 7 912 715; E 561 399

CS-1623-001:Treated Effluent Piping Change and associated heat trace from 800 man camp to tie in existing 3 line

PLAN VIEW
SCALE 1:2000

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date 16 AUG 2018
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

REGISTERED PROFESSIONAL ENGINEER
M. J. BUYKX
LICENSEE
NT/NU

FOR CONSTRUCTION

No.	DESCRIPTION	BY	CHK'D	DATE
2	APPROVED FOR CONSTRUCTION	R.M.	R.G.	15-08-2018
1	PIPELINE CHANGED TO 3" FROM 800 MAN CAMP	R.M.	R.G.	
0	APPROVED FOR CONSTRUCTION	R.M.	R.G.	01-02-2018

REVISIONS

ROLE	NAME	SIGNATURE	DATE
DRAFT'S/PERSON	R MHLANGA	MR	20-06-2017
DESIGNER	R MHLANGA	MR	
CHECKER	R GOOSEN		2018-08-16
DESIGN COORD.	R GOOSEN		2018-08-16
RESP. ENG.	M BUYKX		2018-08-16
LEAD DISC. ENG.	R GOOSEN		2018-08-16
AREA LEAD	T ATIBA		
ENG. MANAGER	D STANGER		
AREA MANAGER	T ATIBA		

DRAWING APPROVAL STATUS: Approved for Construction

HATCH

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

MINE SITE
MINE EFFLUENT AND RAW WATER PIPELINE
OVERALL LAYOUT

SCALE	DWG. No.	REV
1:2,000 UNLESS NOTED	H353004-10000-240-272-0001-0001	2

DRAWING No. | DRAWING TITLE
REFERENCE DRAWINGS

REG. PROFESSIONAL

Appendix C

Contact Information as per Components 1 and 2 of the Commercial Lease Requirement

Company	Address	Contact Numbers
Hatch (Global Corporate Office) (EPCM Contractor)	Sheridan Science & Technology Park 2800 Speakman Drive Mississauga, ON L5K 2R7 Canada	Tel: 1-905-855-7600 Fax: 1-905-855-8270
Nuna East Limited	9839 – 31 Avenue NW Edmonton, AB T6N 1C5 Canada	Tel: 1-780-434-9114 Fax: 1-780-434-7758

Role	Name	Email
Preparer of Report	Glen Peace, P.Eng.	glen.peace@hatch.com
Responsible for Construction	Marlon Coakley	marlon.coakley@hatch.com
Baffinland Representative	Christopher Murray	Christopher.murray@baffinland.com

F

Appendix D

Map to Show Construction in Relation to Lease Boundaries and Water Bodies

EFFLUENT PUMP STATION
VALVE BOX
0 100 200 Meters
OPEN BURN LOCATION
KM 97 BORROW SOURCE
Camp Lake
WASTE MANAGEMENT BUILDING
HARZARDOUS WASTE BERM
SITE SERVICES SHOP
HELICOPTER PAD AERODROME
QMR2
WAREHOUSE
AIRSTRIP
ORE HAUL TRUCK PAD
SAILIIVIK CAMP
MINE SITE TANK FARM
MINE SITE COMPLEX
LAYDOWN 2
Sheardown Lake NW
LANDFILL
CRUSHER FACILITY
SURFACE WATER MANAGEMENT POND
EMULSION PLANT
EFFLUENT DISCHARGE LOCATION
Sheardown Lake SE
WASTE ROCK FACILITY WATER TREATMENT PLANT
SURFACE WATER MANAGEMENT POND
MS-08 DISCHARGE LINE
WASTE ROCK FACILITY
110 KM LAYDOWN AREA
ULTIMATE DEPOSIT 1 PIT LIMITS
HAUL ROAD
QUARRY D1Q1
ACTIVE MINING AREA
QUARRY D1Q2
EXPLOSIVE MAGAZINE
MARY RIVER TRIBUTARY F
MARY RIVER
554,000
555,000
556,000
557,000
558,000
559,000
560,000
561,000
562,000
563,000
564,000
565,000
7,917,000
7,916,000
7,915,000
7,914,000
7,913,000
7,912,000

LEGEND

- Effluent Discharge Pipeline
- Borrow Area
- Quarry Area
- Project Development Area
- Commercial Lease Boundary
- Current Infrastructure

MARY RIVER PROJECT

Sailiivik Camp Effluent Discharge

Projection: NAD 1983 UTM ZONE 17N.
Base Map: © 2019 Digital Global, Inc.
Imagery and Infrastructure are representative as of August 2019.

0 100 200 400 600 800 Meters
Scale 1:30,000

N

Baffinland

FIGURE 1

SAVED: C:\Users\kalie.mcguire\Documents\4 - Maps\Reporting\Mine Site\Sailivik Discharge\BIM_Fig 1 MineSite Discharge.mxd; 17-Mar-20