



Vendor Document Status

AGNICO EAGLE

- 1 ☐ Proceed to next submission and status.
- 2 ☐ Proceed with exceptions as noted to next submission and status.
- 3 ☐ Do not proceed.
Revise as noted and resubmit next submission and status.
- 4 ☒ Complete, no further submission required.

By: **JEAN-FRANCOIS TREMBLAY**

Date: **2017-06-22**

Review and authorization to fabricate are only for general conformance with the design concept of the Project as expressed in the Contract Documents. Sole responsibility for the accuracy and completeness of this document, including but not limited to dimensions and quantities, remains with the Supplier/Contractor. Agnico Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agnico Eagle authorize or approve any construction means, methods, techniques, sequences or any safety precautions or procedures.

Agnico Eagle
No.

6515-C-270-007-141-TES-0056 R: Sub001

DOCUMENT FOR INFORMATION



AGNICO-EAGLE MINES Ltd. Inspection & Testing Report

ITR Number:
ITR Type:
Contract No.:

AEM-IN-ITR-001A
FLOW ELEMENT
6515-C-270-007



Tag Number:		Equipment/ Pipe N°:		System:	
Service:		Function:		Purchase Order:	
Manufacturer:		Model:		Serial Number:	
Location Dwg :		Reference Datasheet:		Installation Detail Dwg:	
Reference Datasheet Number:					

Item N°	Inspection Points	C	NC/ NCR #	N/A	Completed By/ Date
1	INSTRUMENT TAG ATTACHED	C	NC # _____	N/A	Promec: CLIENT:
2	CABLE TAG ATTACHED	C	NC # _____	N/A	Promec: CLIENT:
3	DEVICE INSTALLED AS PER INSTALLATION DETAILS, LOCATION OR MANUFACTURER'S DRAWING	C	NC # _____	N/A	Promec: CLIENT:
4	EQUIPMENT ACCESSIBLE AND EASY TO MAINTAIN	C	NC # _____	N/A	Promec: CLIENT:
5	EQUIPMENT RACK OR CLAMPING DEVICE ADEQUATE (HEIGHT, SOLIDITY ETC.)	C	NC # _____	N/A	Promec: CLIENT:
6	WIRING CORRECT AND PROPERLY LABELED	C	NC # _____	N/A	Promec: CLIENT:
7	MINIMUM STRAIGHT PIPE LENGHT UPSTREAM AND DOWNSTREAM REQUIREMENT	C	NC # _____	N/A	Promec: CLIENT:
8	GROUNDING OF DEVICE	C	NC # _____	N/A	Promec: CLIENT:
9	FLOW ARROW OR ORIENTATION MATCHES PROCESS FLOW	C	NC # _____	N/A	Promec: CLIENT:
10	PROCESS CONNECTION ADEQUATE (SCREWED OR FLANGED)	C	NC # _____	N/A	Promec: CLIENT:
11	DEFICIENCY LIST ITEMS CLEARED	C	NC # _____	N/A	Promec: CLIENT:
12	CALIBRATION CERTIFICATE AVAILABLE	C	NC # _____	N/A	Promec: CLIENT:
13	ELECTRICAL SUPPLY COMPATIBLE WITH SOURCE	C	NC # _____	N/A	Promec: CLIENT:

Comments

Sign Off			
Promec Signature:		CLIENT Signature:	
Date:		Date:	

Legend					
C	Conformance	NC	Non Conformance	N/A	Not Applicable
NCR	Non Conformance Report				



Vendor Document Status

AGNICO EAGLE

- 1 ☐ Proceed to next submission and status.
- 2 ☐ Proceed with exceptions as noted to next submission and status.
- 3 ☐ Do not proceed.
Revise as noted and resubmit next submission and status.
- 4 ☒ Complete, no further submission required.

By: **JEAN-FRANCOIS TREMBLAY**

Date:

2017-06-22

Review and authorization to fabricate are only for general conformance with the design concept of the Project as expressed in the Contract Documents. Sole responsibility for the accuracy and completeness of this document, including but not limited to dimensions and quantities, remains with the Supplier/Contractor. Agnico Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agnico Eagle authorize or approve any construction means, methods, techniques, sequences or any safety precautions or procedures.

Agnico Eagle
No.

6515-C-270-007-141-TES-0025 R: Sub002

DOCUMENT FOR INFORMATION



AGNICO-EAGLE MINES Ltd. Inspection & Testing Report

ITR Number: AEM-IN-ITR-004A
ITR Type: PRESSURE INDICATOR
Contract No.: 6515-C-270-007



AGNICO EAGLE

Tag Number:		Equipment/ Pipe N°:		System:	
Service:		Function:		Purchase Order:	
Manufacturer:		Model:		Serial Number:	
Location Dwg :		Reference Datasheet:		Installation Detail Dwg:	
Reference Datasheet Number:					

Item N°	Inspection Points	C	NC/ NCR #	N/A	Completed By/ Date
1	INSTRUMENT TAG ATTACHED	C	NC # _____	N/A	Promec: CLIENT:
2	DEVICE INSTALLED AS PER INSTALLATION DETAILS, LOCATION OR MANUFACTURER'S DRAWING	C	NC # _____	N/A	Promec: CLIENT:
3	EQUIPMENT ACCESSIBLE AND EASY TO MAINTAIN	C	NC # _____	N/A	Promec: CLIENT:
4	PROCESS CONNECTION ADEQUATE (SCREWED OR FLANGED)	C	NC # _____	N/A	Promec: CLIENT:
5	OPERATION BLOCK IN VALVE	C	NC # _____	N/A	Promec: CLIENT:
6	READING VISIBLE	C	NC # _____	N/A	Promec: CLIENT:
7	CALIBRATION CERTIFICATE AVAILABLE	C	NC # _____	N/A	Promec: CLIENT:
8	ELECTRICAL SUPPLY COMPATIBLE WITH SOURCE	C	NC # _____	N/A	Promec: CLIENT:
9		C	NC # _____	N/A	Promec: CLIENT:
10		C	NC # _____	N/A	Promec: CLIENT:
11		C	NC # _____	N/A	Promec: CLIENT:

Comments

Sign Off			
Promec Signature:		CLIENT Signature:	
Date:		Date:	

Legend				
C	Conformance	NC	Non Conformance	N/A
NCR	Non Conformance Report			Not Applicable



Vendor Document Status

AGNICO EAGLE

- 1 ☐ Proceed to next submission and status.
- 2 ☐ Proceed with exceptions as noted to next submission and status.
- 3 ☐ Do not proceed.
Revise as noted and resubmit next submission and status.
- 4 ☒ Complete, no further submission required.

By: **JEAN-FRANCOIS TREMBLAY**

Date: **2017-06-22**

Review and authorization to fabricate are only for general conformance with the design concept of the Project as expressed in the Contract Documents. Sole responsibility for the accuracy and completeness of this document, including but not limited to dimensions and quantities, remains with the Supplier/Contractor. Agnico Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agnico Eagle authorize or approve any construction means, methods, techniques, sequences or any safety precautions or procedures.

Agnico Eagle
No.

6515-C-270-007-141-TES-0026 R: Sub002

DOCUMENT FOR INFORMATION



AGNICO-EAGLE MINES Ltd.
Inspection & Testing Report

ITR Number:
ITR Type:
Contract No.:

AEM-IN-ITR-004B
PRESSURE SAFETY VALVE
6515-C-270-007



AGNICO EAGLE

Tag Number:		Equipment/ Pipe N°:		System:	
Service:		Function:		Purchase Order:	
Manufacturer:		Model:		Serial Number:	
Location Dwg :		Reference Datasheet:		Installation Detail Dwg:	
Reference Datasheet Number:					

Item N°	Inspection Points	C	NC/ NCR #	N/A	Completed By/ Date
1	INSTRUMENT TAG ATTACHED	C	NC # _____	N/A	Promec: CLIENT:
2	DEVICE INSTALLED AS PER INSTALLATION DETAILS, LOCATION OR MANUFACTURER'S DRAWING	C	NC # _____	N/A	Promec: CLIENT:
3	EQUIPMENT ACCESSIBLE AND EASY TO MAINTAIN	C	NC # _____	N/A	Promec: CLIENT:
4	FLOW ARROW ON SENSOR OR ORIENTATION MATCHES PROCESS FLOW	C	NC # _____	N/A	Promec: CLIENT:
5	PROCESS CONNECTION ADEQUATE (SCREWED OR FLANGED)	C	NC # _____	N/A	Promec: CLIENT:
6	CALIBRATION CERTIFICATE AVAILABLE	C	NC # _____	N/A	Promec: CLIENT:
7	ELECTRICAL SUPPLY COMPATIBLE WITH SOURCE	C	NC # _____	N/A	Promec: CLIENT:
8		C	NC # _____	N/A	Promec: CLIENT:
9		C	NC # _____	N/A	Promec: CLIENT:
10		C	NC # _____	N/A	Promec: CLIENT:
11		C	NC # _____	N/A	Promec: CLIENT:

Comments

Sign Off			
Promec Signature:		CLIENT Signature:	
Date:		Date:	

Legend					
C	Conformance	NC	Non Conformance	N/A	Not Applicable
NCR	Non Conformance Report				



AGNICO-EAGLE MINES Ltd. Inspection & Testing Report

ITR Number: AEM-IN-ITR-003B
ITR Type: LEVEL GAUGE GLASS
Contract No.: 6515-C-270-007

Vendor Document Status	
1	☐ Proceed to next submission and status.
2	☐ Proceed with exceptions as noted to next submission and status.
3	☒ Document processed, no action needed and resubmit next submission and status.
4	☐ Complete, no further submission required.
By: JEAN-FRANCOIS TREMBLAY Date: 2017-06-29	
Review and authorization to demonstrate any for general conformance with the design intent of the Program/Equipment in the Control Document, and responsibility for the accuracy and completeness of the document, including but not limited to, dimensions and quantities, relates with the Inspection/Contract. Agneco Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agneco Eagle assume or accept any responsibility for errors, omissions, misprints, or any other provision or products.	
Agneco Eagle No. 6515-C-270-007-141-TES-0057 # Sub002	
DOCUMENT FOR INFORMATION	



Tag Number:		Equipment/ Pipe N°:		System:	
Service:		Function:		Purchase Order:	
Manufacturer:		Model:		Serial Number:	
Location Dwg :		Reference Datasheet:		Installation Detail Dwg:	
Reference Datasheet Number:					

Item N°	Inspection Points	C	NC/ NCR #	N/A	Completed By/ Date
1	INSTRUMENT TAG ATTACHED	C	NC # _____	N/A	Promec: CLIENT:
2	DEVICE INSTALLED AS PER INSTALLATION DETAILS, LOCATION OR MANUFACTURER'S DRAWING	C	NC # _____	N/A	Promec: CLIENT:
3	EQUIPMENT ACCESSIBLE AND EASY TO MAINTAIN	C	NC # _____	N/A	Promec: CLIENT:
4	PROCESS CONNECTION ADEQUATE (SCREWED OR FLANGED)	C	NC # _____	N/A	Promec: CLIENT:
5	HAVE OPERATION BLOCK IN VALVE	C	NC # _____	N/A	Promec: CLIENT:
6	READING VISIBLE	C	NC # _____	N/A	Promec: CLIENT:
7	CALIBRATION CERTIFICATE AVAILABLE	C	NC # _____	N/A	Promec: CLIENT:
8	ELECTRICAL SUPPLY COMPATIBLE WITH SOURCE	C	NC # _____	N/A	Promec: CLIENT:
9		C	NC # _____	N/A	Promec: CLIENT:
10		C	NC # _____	N/A	Promec: CLIENT:
11		C	NC # _____	N/A	Promec: CLIENT:

Comments

Sign Off			
Promec Signature:		CLIENT Signature:	
Date:		Date:	

Legend					
C	Conformance	NC	Non Conformance	N/A	Not Applicable
NCR	Non Conformance Report				



Vendor Document Status

AGNICO EAGLE

- 1 ☐ Proceed to next submission and status.
- 2 ☐ Proceed with exceptions as noted to next submission and status.
- 3 ☐ Do not proceed.
Revise as noted and resubmit next submission and status.
- 4 ☒ Complete, no further submission required.

By:

Jean-Francois Tremblay

Date: 2017-05-02

Review and authorization to fabricate are only for general conformance with the design concept of the Project as expressed in the Contract Documents. Sole responsibility for the accuracy and completeness of this document, including but not limited to dimensions and quantities, remains with the Supplier/Contractor. Agnico Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agnico Eagle authorize or approve any construction means, methods, techniques, sequences or any safety precautions or procedures.

Agnico Eagle
No.

6515-C-270-007-141-TES-0012 R: Sub001

DOCUMENT FOR INFORMATION



AGNICO-EAGLE MINES Ltd.
Inspection & Testing Report

ITR Number: AEM-EL-ITR-005
ITR Type: MOTOR
Contract No.: 6515-C-270-007



AGNICO EAGLE

Tag Number:		Equipment/ Pipe N°:		System:	
Service:		Function:		Purchase Order:	
Manufacturer:		Model:		Serial Number:	
Location Dwg :		Reference Datasheet:		Installation Detail Dwg:	
Reference Datasheet Number:					

Item N°	Inspection Points	C	NC/ NCR #	N/A	Completed By/ Date
1	EQUIPEMENT ACCESSIBLE AND EASY TO MAINTAIN	C	NC # _____	N/A	Promec: CLIENT:
2	NAME PLATE DATA AGREES WITH MOTOR DATA SHEET	C	NC # _____	N/A	Promec: CLIENT:
3	MOTOR ENCLOSURE TYPE IS SUITABLE FOR USE IN AREA CLASSIFICATION	C	NC # _____	N/A	Promec: CLIENT:
4	GROUNDING CONDUCTORS INSTALLED AND CONNECTED (4/ 0 for motor over 100 HP)	C	NC # _____	N/A	Promec: CLIENT:
5	MOTOR HAS BEEN INSULATION RESISTANCE TESTED (Megger)	C	NC # _____	N/A	Promec: CLIENT:
6	MOTOR TERMINATIONS HAVE BEEN PROPERLY MADE UP	C	NC # _____	N/A	Promec: CLIENT:
7	ROTATION CHECKED	C	NC # _____	N/A	Promec: CLIENT:
8	DEFICIENCY LIST ITEMS CLEARED	C	NC # _____	N/A	Promec: CLIENT:

Comments

Sign Off			
Promec Signature:		CLIENT Signature:	
Date:		Date:	

Legend					
C	Conformance	NC	Non Conformance	N/A	Not Applicable
NCR	Non Conformance Report				



Vendor Document Status

AGNICO EAGLE

- 1 ☐ Proceed to next submission and status.
- 2 ☐ Proceed with exceptions as noted to next submission and status.
- 3 ☐ Do not proceed.
Revise as noted and resubmit next submission and status.
- 4 ☒ Complete, no further submission required.

By:

Jean-Francois Tremblay

Date:

2017-05-02

Review and authorization to fabricate are only for general conformance with the design concept of the Project as expressed in the Contract Documents. Sole responsibility for the accuracy and completeness of this document, including but not limited to dimensions and quantities, remains with the Supplier/Contractor. Agnico Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agnico Eagle authorize or approve any construction means, methods, techniques, sequences or any safety precautions or procedures.

Agnico Eagle
No.

6515-C-270-007-141-TES-0018 R: Sub001

DOCUMENT FOR INFORMATION



Agnico-Eagle Mines Ltd.
Miscellaneous Field Report

ITR Number : AEM-GE-ITR-006
Contract no. : C22466T / C22498E



SYSTEM:	TAG NO. :	
LOCATION:	AREA:	UNIT:

DATE	ACTIVITY

_____ PROMEC DESIGNATE - SIGNATURE	_____ TITLE	_____ DATE
_____ CLIENT DESIGNATE - SIGNATURE	_____ TITLE	_____ DATE



AGNICO EAGLE

Vendor Document Status

- 1 ☐ Proceed to next submission and status.
- 2 ☐ Proceed with exceptions as noted to next submission and status.
- 3 ☐ Do not proceed.
☐ Revise as noted and resubmit next submission and status.
- 4 ☒ Complete, no further submission required.

Jean-Francois Tremblay

By:

Date: 2017-05-02

Review and authorization to fabricate are only for general conformance with the design concept of the Project as expressed in the Contract Documents. Sole responsibility for the accuracy and completeness of this document, including but not limited to dimensions and quantities, remains with the Supplier/Contractor. Agnico Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agnico Eagle authorize or approve any construction means, methods, techniques, sequences or any safety precautions or procedures.

Agnico Eagle

No.

6515-C-270-007-141-TES-0015 R: Sub001

DOCUMENT FOR INFORMATION



Fuel Tanks Piping
Supply and Installation



Punchlist

Document Number : AEM-GE-ITR-003
Contract Number : C22466T / C22498E

Equipment/System description:

ITEM No	DESCRIPTION	CAT 1	CAT 2	CAT 3	COMMENTS	COMPLETED
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
CAT 1 = Effects commissioning CAT 2 = Effects operation CAT 3 = Post operation						

**TO BE VALIDATED
AT A LATER DATE**



Vendor Document Status

AGNICO EAGLE

- 1 ☐ Proceed to next submission and status.
- 2 ☐ Proceed with exceptions as noted to next submission and status.
- 3 ☐ Do not proceed.
Revise as noted and resubmit next submission and status.
- 4 ☒ Complete, no further submission required.

By:

Jean-Francois Tremblay

Date:

2017-05-02

Review and authorization to fabricate are only for general conformance with the design concept of the Project as expressed in the Contract Documents. Sole responsibility for the accuracy and completeness of this document, including but not limited to dimensions and quantities, remains with the Supplier/Contractor. Agnico Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agnico Eagle authorize or approve any construction means, methods, techniques, sequences or any safety precautions or procedures.

Agnico Eagle
No.

6515-C-270-007-141-TES-0016 R: Sub001

DOCUMENT FOR INFORMATION



Agnico-Eagle Mines Ltd.
Notice of Final Completion

ITR Number : AEM-GE-ITR-004
Contract no. : C22466T / C22498E



Date: _____

To: _____

Project No: _____

Contract No: _____

Contract Title: _____

Contractor: _____

We, _____ (Contractor's Name), the Contractor
for the above described contract, hereby certify that we have reviewed the Contract
Documents pertaining to:

Contract No.: _____

Contract Name: _____

Partial Completion Certificates: _____

and having physically inspected the Work performed, do hereby file claim for a notice of
Final Completion.

I do declare that I am, _____ (Responsible's Name),
HAVING AUTHORITY FROM MY COMPANY TO PETITION FOR THE ABOVE REFERRED TO
FINAL COMPLETION NOTICE.

Signature: _____

Name: _____

Title: _____

Signature:  2017-11-14

REV	DATE	DESCRIPTION	AMT
PAY	2017-02-15	ISSUED FOR REVIEW	10
	2017-02-15	ISSUED FOR CONSTRUCTION	0
	2017-04-01	UPDATE AREA 5 ROAD MILEAGE	1
	2017-09-20	ISSUED FOR CONSTRUCTION	2

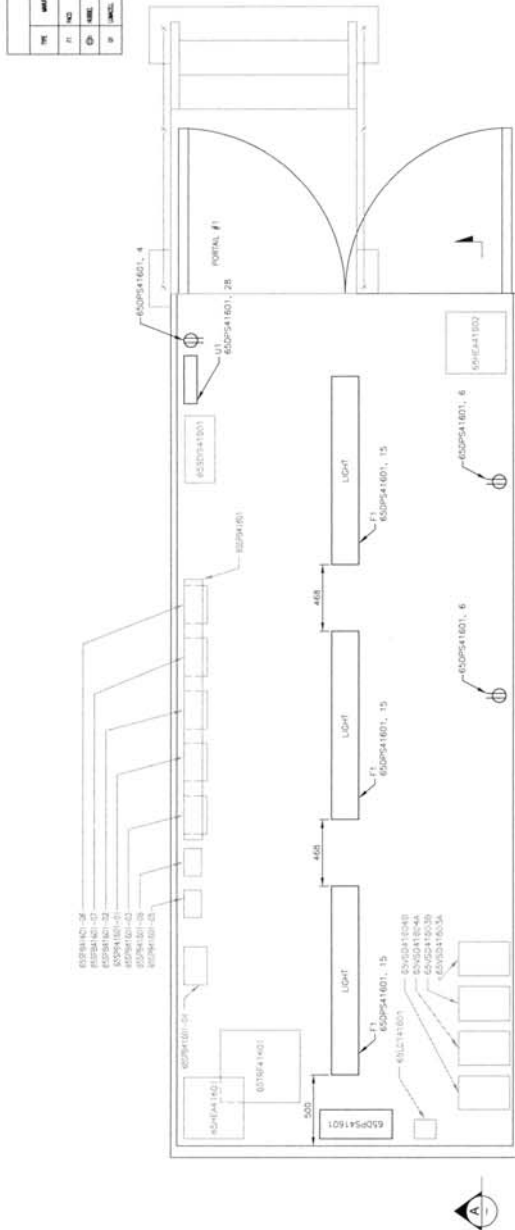
SEP 7 6 2017

DATE	TIME	BY	REMARKS
2024	10:00	John Doe	Initial inspection, all systems operational.
2024	11:30	John Doe	Minor issue with lighting in Room 101, resolved.
2024	14:00	John Doe	Check on generator, fuel levels adequate.
2024	16:00	John Doe	Test fire alarm system, all sensors responsive.
2024	18:00	John Doe	Review security camera footage, no suspicious activity.
2024	19:00	John Doe	Complete site inspection, all clear.

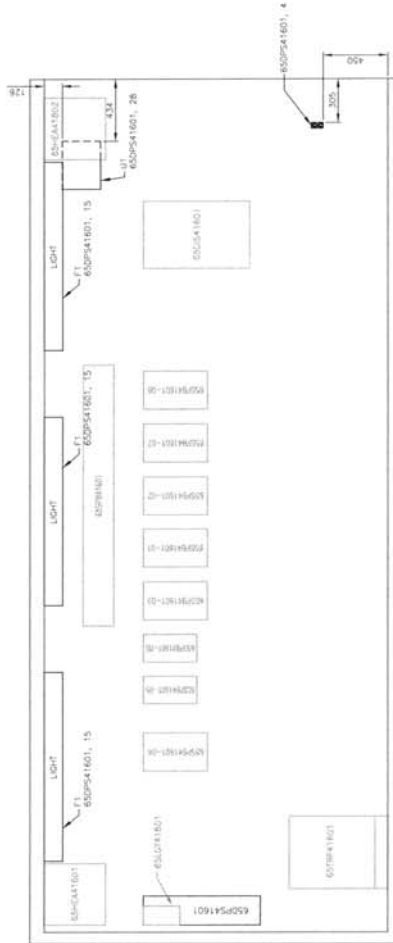
2024
 10:00
 11:30
 14:00
 16:00
 18:00
 19:00

John Doe
 Initial inspection, all systems operational.
 Minor issue with lighting in Room 101, resolved.
 Check on generator, fuel levels adequate.
 Test fire alarm system, all sensors responsive.
 Review security camera footage, no suspicious activity.
 Complete site inspection, all clear.

MATERIAL LIST			
ITEM	DESCRIPTION	QUANTITY	REMARKS
1	65-ULT-416-EL-005	1	SEE NOTE 1
2	65-ULT-416-EL-005	1	SEE NOTE 1
3	65-ULT-416-EL-005	1	SEE NOTE 1
4	65-ULT-416-EL-005	1	SEE NOTE 1
5	65-ULT-416-EL-005	1	SEE NOTE 1
6	65-ULT-416-EL-005	1	SEE NOTE 1
7	65-ULT-416-EL-005	1	SEE NOTE 1
8	65-ULT-416-EL-005	1	SEE NOTE 1
9	65-ULT-416-EL-005	1	SEE NOTE 1
10	65-ULT-416-EL-005	1	SEE NOTE 1



PLAN VIEW
SCALE 1:16
PORTAL #1 ELECTRICAL ROOM
LIGHTING AND SERVICES



ELEVATION VIEW A
SCALE 1:16
PORTAL #1 ELECTRICAL ROOM
LIGHTING AND SERVICES

PERMIT TO PRACTICE
LE GROUPE ULTRAGEN LITEE
Signature: *[Signature]*
Date: NOV 15 2007
PERMIT NUMBER: P 1180
NTNU Association of Professional
Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
D. CARRIER
13027
NOV 15 2007

ISSUED FOR CONSTRUCTION
DATE: 08/27/07

DESIGNER: [Name]
CHECKED: [Name]
APPROVED: [Name]

AGNICO EAGLE

ULTRAGEN

NOTES: [List of notes]

REVISIONS: [List of revisions]

PROJECT: [Project Name]

DATE: [Date]

SCALE: [Scale]

PROJECT: [Project Name]

DATE: [Date]

SCALE: [Scale]

[illegible]NOTES GENERALES / GENERAL NOTES

ISSUED FOR CONSTRUCTION
JULY 2007 DATE: SEPT 2007

DESIGNS IN REFERENCE / REFERENCE DRAWINGS	TYPE / TYPE	1990
COMPASSIBLE PANEL, SCHEDULE IN E-ROOM	80-037-018-E-012	
ELECTRICAL EQUIPMENT LAYOUT E-ROOM	80-037-018-E-002	
ELECTRICAL EQUIPMENT LAYOUT	80-037-018-E-007	
LABORATORY LAB	027-041700-E-00-001	



AGNICO EAGLE

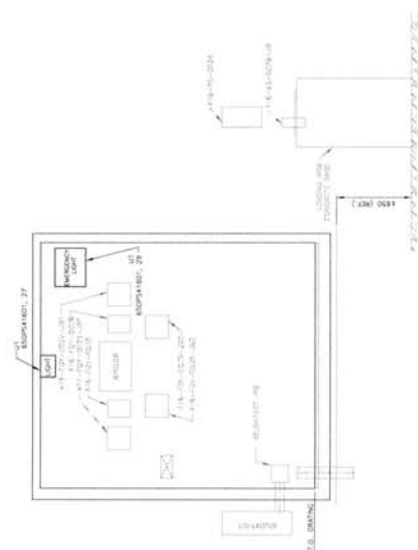
[illegible]

ADNICO EAGLE — MELADINE DIVISION
416 — FUEL TANK FARM
FUEL DISTRIBUTION
PORTAL #1 PUMPING STATION
LIGHTING AND SERVICES

2017-05-18	2017-05-18	2017-05-18
WILLIAM, JAMES	STEPHAN, GUYARD	DANIEL, CARRIER
2017-05-18	2017-05-18	2017-05-18
WILLIAM, JAMES	STEPHAN, GUYARD	DANIEL, CARRIER

2017-09-18	1:00	65-ULT-416-EL-010
------------	------	-------------------

6515	3	1	2
------	---	---	---



ELEVATION
SCALE 1:20
PORTAL #1 PUMPING STATION
ELECTRICAL EQUIPMENT LAYOUT

PERMIT TO PRACTICE
E GROUPE ULTRAGEN LTÉE

Signature _____

Date NOV 15 2017

PERMIT NUMBER: P 1180
NTNU Association of Professional
Engineers and Geoscientists



NOV 15 2017

Source:	120	208	Volts
Feeder from / Single line diagram:	65TRF41601 / 65-416-275-200		
Mounting:	SURFACE		
Location:	ELECTRICAL ROOM 416 (PORTAL #1)		
Manufacturer / Catalog No.:	SQUARE-D (SCHNEIDER) / NQ430L2C		
Breaker type:	QOB		

Enclosure type:	NEMA 1
Main breaker.:	NONE
No. of circuits:	30 CCTs
Bars:	225 A
Short circuit Ampacity:	10 kA
Power:	30 kVA

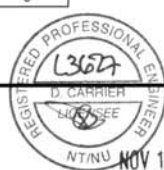
DESCRIPTION	CABLE		TYPE	WATTS	BREAK.	C T #	C T #	BREAK.	WATTS	TYPE	CABLE		DESCRIPTION		
	AWG	REF									QTY	QTY		REF	AWG
LIGHTING FIXTURES TANK #3 AND #6	12	L	10	690		15	1	A	2	15	240	2	O	12	OUTLET PUMPING STATION & OPERATION ROOM 416 (PORTAL #1)
							3	B	4	15	120	1	O	12	OUTLET ELECTRICAL ROOM 416
LIGHTING FIXTURES OUTSIDE ELECTRICAL ROOM/OUTSIDE PUMPING STATION	12	L	7	483		15	5	C	6	15	240	2	O	12	OUTLET ELECTRICAL ROOM IT AREA 416
							7	A	8	15	400	1	I	12	PLC/HMI/IO CARDS IN OPERATION ROOM CABINET 65PLC41601
LIGHTING FIXTURES TANK LIGHT AND HEAVY VEHICLE LOADING, CONTAINERIZED DEF PORTAL #1	12	L	8	552		15	9	B	10						HEATING IN OPERATION ROOM 416 65HEA41605
							11	C	12	30	2000	1	H	6	
						15	13	A	14	15	200	1	I	12	LIGHT VEHICLE GASBOY - CONTROL 416-FQY-0049
LIGHTING ELECTRICAL ROOM 416	12	L	3	144		15	15	B	16	15	200	1	I	12	PLC CABINET 65PLC41601 OUTLET UTILITY IN OPERATION ROOM
LIGHTING CONTACTOR CONTROL FEEDER	12	L	1	37		15	17	C	18	15	100	1	I	12	INSTRUMENT (65-ULT-416-IN-013)
MOTORIZED OPERATOR VALVES FEEDER 416-FV-0014/0016 (65-ULT-416-IN-013)	10	I	2	888		15	19	A	20	15	888	2	I	12	MOTORIZED OPERATOR VALVES FEEDER 416-FV-0004/0006 (65-ULT-416-IN-013)
HEAVY VEHICLE GASBOY - MOTOR (1 1/2 HP) 416-FQY-0044	12	I	1	1120		15	21	B	22	15	444	2	I	12	MOTORIZED OPERATOR VALVES FEEDER 416-FV-0043 (65-ULT-416-IN-013)
							23	C	24	15	444	2	I	10	MOTORIZED OPERATOR VALVES FEEDER 416-FV-0048 (65-ULT-416-IN-013)
HEAVY VEHICLE GASBOY - CONTROL 416-FQY-0044	12	I	1	200		15	25	A	26	15	560	1	I	12	LIGHT VEHICLE GASBOY - MOTOR (3/4 HP) 416-FQY-0049
LIGHTING PUMPING STATION & OPERATION ROOM 416	12	L	5	240		15	27	B	28	15	36		L	12	EMERGENCY LIGHTING ELECTRICAL ROOM 416
EMERGENCY LIGHTING PUMPING STATION & OPERATION ROOM 416	12	L	2	72		15	29	C	30	15				12	ALARM PANEL

TYPE (REF)	(W)	total	Qty
(L) Lighting	2254		36
(O) Outlet	600		5
(H) Heating	2000		1
(I) Instrument	5444		15

BREAKER TYPE	Qty (ref)
(L) SPARE	0
(S) SPACE	0
(G) DDFT BREAKER (30mA)	0

	Watts
Phase A	3962,5
Phase B	3365
Phase C	2970,5
Total	10298

NOTES:
1. SEE LIGHTING DIAGRAM FOR DETAILS OF CABLE SIZE DWG #65-ULT-416-EL-013.



REV	DATE	DESCRIPTION	PAR	VER	APP	DES	DATE	REV
3	2017-11-15	AS BUILT	D.C.	D.C.				
2	2017-09-20	ISSUED FOR CONSTRUCTION	S. GRIMARD	D. CARRIER	D. CARRIER			
1	2017-08-04	UPDATE AREA & TAG NUMBER	N. SALDAN	D. CARRIER	D. CARRIER			
0	2017-06-12	ISSUED FOR CONSTRUCTION	SG 111891	DC 40308	DC 40308			
PA	2017-05-16	ISSUED FOR REVIEW	MT 5029941	SG 111891	DC 40308			





416 - FUEL TANK FARM
PORTAL #1 ELECTRICAL ROOM
PANEL SCHEDULE 65DPS41601

DATE	DATE	REV
2017-05-16	2017-05-16	3

65-ULT-416-EL-012

PERMIT TO PRACTICE
LE GROUPE ULTRAGEN LTÉE

Signature: 

Date: _____

PERMIT NUMBER: P 1180
NT/NU Association of Professional Engineers and Geoscientists





NOTES GENERALES / GENERAL NOTES

DESIGN IN REFERENCE / REFERENCE DRAWINGS
1. 2017-04-11
2. 2017-04-11
3. 2017-04-11
4. 2017-04-11
5. 2017-04-11
6. 2017-04-11
7. 2017-04-11
8. 2017-04-11
9. 2017-04-11
10. 2017-04-11
11. 2017-04-11
12. 2017-04-11
13. 2017-04-11
14. 2017-04-11
15. 2017-04-11
16. 2017-04-11
17. 2017-04-11
18. 2017-04-11
19. 2017-04-11
20. 2017-04-11
21. 2017-04-11
22. 2017-04-11
23. 2017-04-11
24. 2017-04-11
25. 2017-04-11
26. 2017-04-11
27. 2017-04-11
28. 2017-04-11
29. 2017-04-11
30. 2017-04-11
31. 2017-04-11
32. 2017-04-11
33. 2017-04-11
34. 2017-04-11
35. 2017-04-11
36. 2017-04-11
37. 2017-04-11
38. 2017-04-11
39. 2017-04-11
40. 2017-04-11
41. 2017-04-11
42. 2017-04-11
43. 2017-04-11
44. 2017-04-11
45. 2017-04-11
46. 2017-04-11
47. 2017-04-11
48. 2017-04-11
49. 2017-04-11
50. 2017-04-11
51. 2017-04-11
52. 2017-04-11
53. 2017-04-11
54. 2017-04-11
55. 2017-04-11
56. 2017-04-11
57. 2017-04-11
58. 2017-04-11
59. 2017-04-11
60. 2017-04-11
61. 2017-04-11
62. 2017-04-11
63. 2017-04-11
64. 2017-04-11
65. 2017-04-11
66. 2017-04-11
67. 2017-04-11
68. 2017-04-11
69. 2017-04-11
70. 2017-04-11
71. 2017-04-11
72. 2017-04-11
73. 2017-04-11
74. 2017-04-11
75. 2017-04-11
76. 2017-04-11
77. 2017-04-11
78. 2017-04-11
79. 2017-04-11
80. 2017-04-11
81. 2017-04-11
82. 2017-04-11
83. 2017-04-11
84. 2017-04-11
85. 2017-04-11
86. 2017-04-11
87. 2017-04-11
88. 2017-04-11
89. 2017-04-11
90. 2017-04-11
91. 2017-04-11
92. 2017-04-11
93. 2017-04-11
94. 2017-04-11
95. 2017-04-11
96. 2017-04-11
97. 2017-04-11
98. 2017-04-11
99. 2017-04-11
100. 2017-04-11

ISSUED FOR CONSTRUCTION
DATE: 2017-04-11

AGNICO EAGLE

REVISIONS

ULTRAGEN

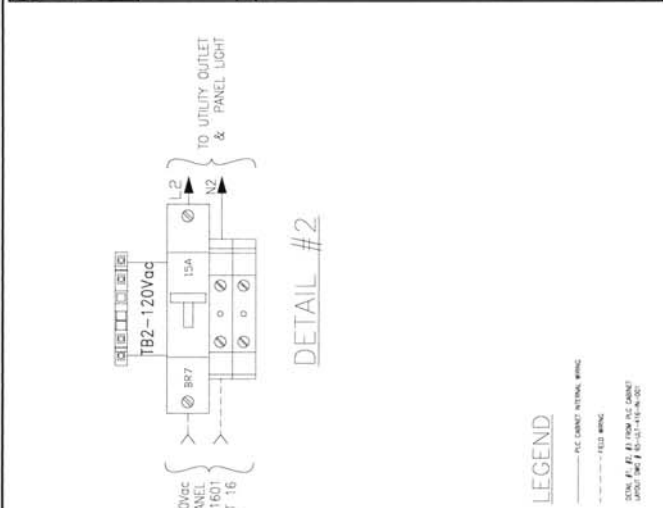
AGNICO EAGLE - ULTRAGEN DIVISION
416 - FUEL TANK FARM
FUEL DISTRIBUTION (PORTAL #1)
120VAC / 240VAC DISTRIBUTION
MAIN PLC CABINET

DESIGNED BY: ETC LAROCHE
DATE: 2017-04-11

CHECKED BY: DANIEL GARRER
DATE: 2017-04-11

APPROVED BY: DANIEL GARRER
DATE: 2017-04-11

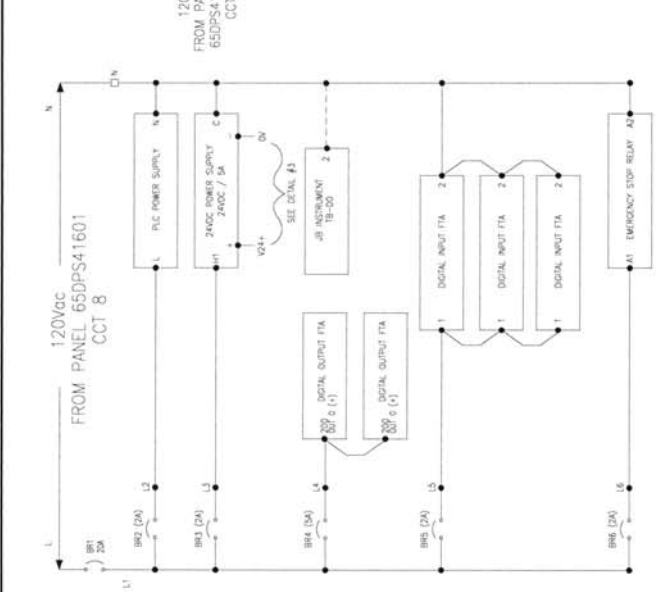
SCALE: 1:1
SHEET: 4 OF 4



LEGEND

PERMIT TO PRACTICE
LE GROUPE ULTRAGEN LTÉE
Signature: [Signature]
Date: NOV 15 2017
PERMIT NUMBER: P 1180
NTAQ Association of Professional
Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
D. CARRIER
L36274
RTIN NOV 15 2017



DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM

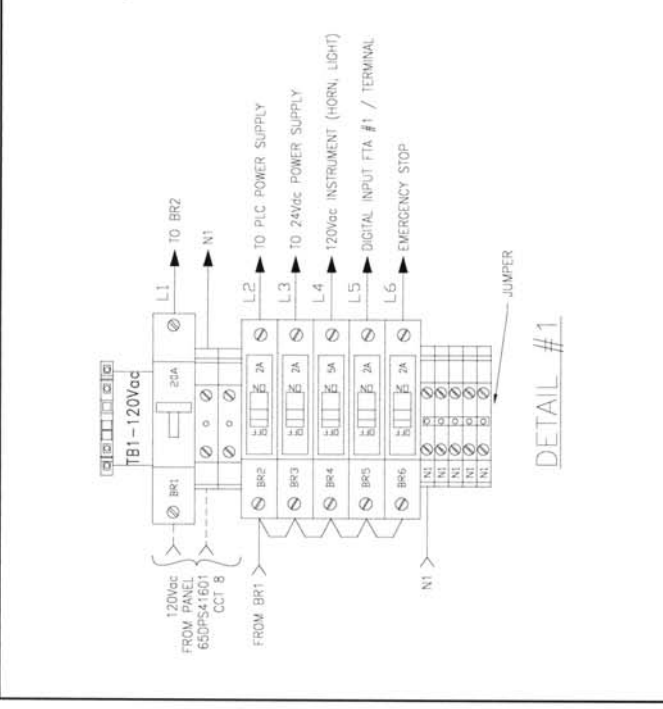
DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM



DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM

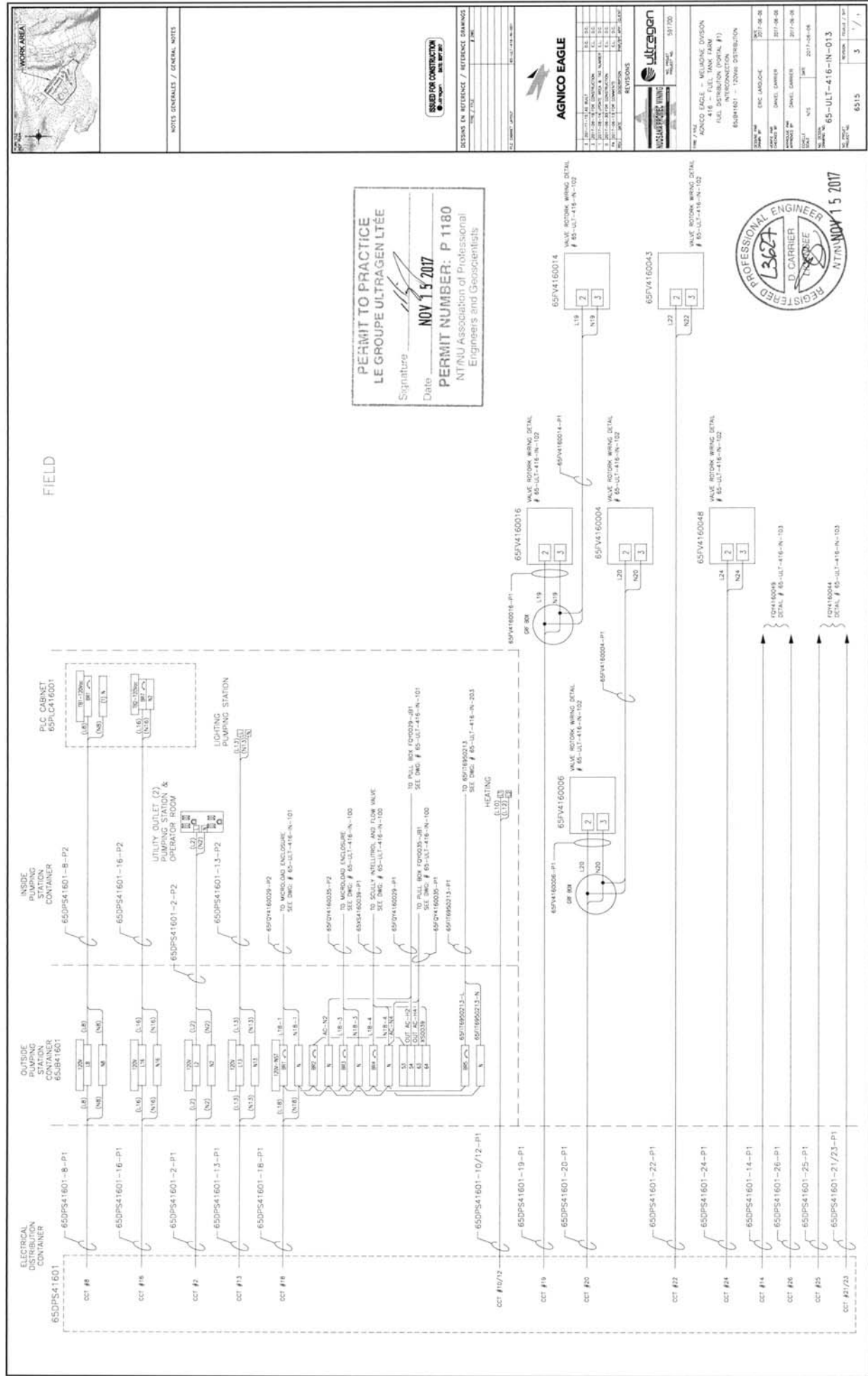
DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM

DETAIL #1 SCHEMATIC DIAGRAM





NOTE 1 : CONTRACTOR MUST INSTALL JUMPER WIRE ON VALVE TERMINAL BLOCK
REF : 65-UL7-416-102

ISSUED FOR CONSTRUCTION

[illegible]

AGNICO EAGLE - VELAUNE DIVISION
416 - FUEL TANK FARM
FUEL DISTRIBUTION (PORTAL #1)
CARD WIRING INTERCONNECTION
DIGITAL INPUT (120VAC)

STUDENT NAME	STUDENT ID	DATE
ERIC LAMOUË	2017-04-11	2017-04-11
DANIEL CARRIER	2017-04-11	2017-04-11
DANIEL CARRIER	2017-04-11	2017-04-11

65-ULT-416-IN-201	DATE	2017-04-11
E. J. JONES (Arrested) NC	NTS	
E. J. JONES (Arrested) NC	RESULTS / SET	

6515	4	1
------	---	---

PERMIT TO PRACTICE
 LE GROUPE ULTRAGEN LTÉE
 Signature 
 Date **NOV 15 2017**
 PERMIT NUMBER: P 1180
 NTNU Association of Professional
 Engineers and Geoscientists

BMXDD16402K
DIGITAL INPUT MODULE
BLOT 2

EXCEPTION

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201

REF: 65-ULI-416-N-201



NOTES GÉNÉRALES / GENERAL NOTES

ISSUED FOR CONSTRUCTION

REVISIONS IN REFERENCE / RÉVISIONS EN RÉFÉRENCE

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

REVISIONS

PERMIT TO PRACTICE
LE GROUPE ULTRAGEN LTÉE

Signature: *[Signature]*
Date: NOV 15 2017

PERMIT NUMBER: P 1180
NTNU Association of Professional
Engineers and Geoscientists





NOTES GENERALES / GENERAL NOTES

ISSUED FOR CONSTRUCTION
DATE: 08/07/2017

SECOND IN REFERENCE / REFERENCE DRAWING

REV.	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	08/07/2017



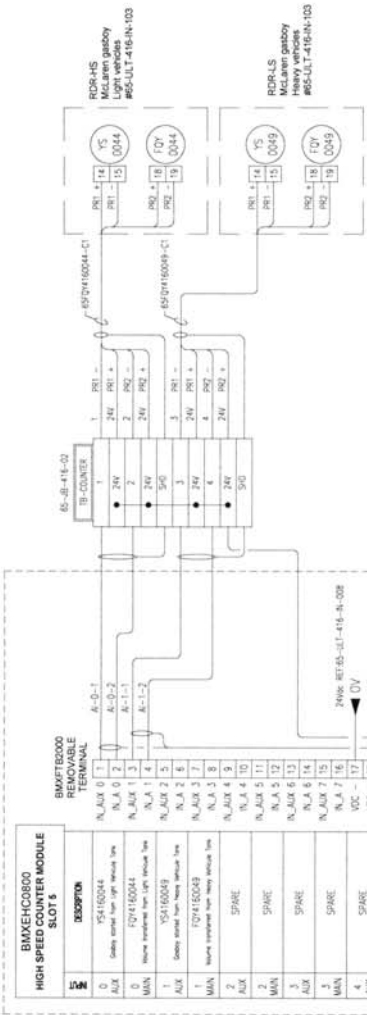
REV.	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	08/07/2017



AGNICO EAGLE - MELJUNG DIVISION
416 - FUEL TANK FARM
FUEL DISTRIBUTION (PORTAL P1)
CARD WING INTERCONNECTION
HIGH SPEED COUNTER MODULE
SLOT 5

REV.	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	08/07/2017

REV.	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	08/07/2017



PLC CABINET 65PLC416001

PERMIT TO PRACTICE
LE GROUPE ULTRAGEN LTÉE
Signature: *[Signature]*
Date: NOV 15 2017
PERMIT NUMBER: P 1180
NTNU Association of Professional
Engineers and Geoscientists



NOV 15 2017

APPENDIX G

Inspection Report – Inspection Test Plan

Comments: All Survey to be performed by Hamel. Material Testing to be performed by AEM.
Applicable Site Standard XXXXX-XXXXX
Applicable Technical Specification - 6515-GNS-014_R3.

AEM Quality Manager / Supervisor
(Print)

ITP CLOSEOUT AND WORK ACCEPTANCE APPROVALS

<i>Olivier Sonier</i> Contractor Site Quality Manager / Supervisor (Print)	Supervisor Title	<i>[Signature]</i> Signature	11/15/17 Date (mm/dd/yy)
Jennifer Pyluk AEM Quality Manager / Supervisor / Designate (Print)	Resident Engineer Title	<i>[Signature]</i> Signature	10/20/17 Date (mm/dd/yy)

APPENDIX H

Inspection Report – Handover Package for Tank #3

Handover Package Tank 3 – 3,000CUM

AEM PURCHASE ORDER: OC-568510
AEM PACKAGE NO.: 6515-C-260-002
PACKAGE TITLE: FUEL TANKS (SUPPLY & INSTALL)
TANK LOCATION: MELIADINE PORTAL #1

ICL Project No.: 295
ICL Document No.: 295-H3
AEM Document No.: 6515-C-260-002-141-QCR-0003_Sub001
Revision: 1

OWNER:

Agnico Eagle Mines Limited
145 King St. East, Suite 400,
Toronto, Ontario M5C 2Y7

GENERAL CONTRACTOR:

Inukshuk Construction Limited
PO Box 654
Rankin Inlet NU
X0C 0G0

Contact: David Mosher

PH: (867) 645-4030
FX: (902) 429-7762

Submitted by: Inukshuk Construction Limited
Submitted: October 20, 2017

	
Vendor Document Status	
AGNICO EAGLE	
1	☐ Proceed to next submission and status.
2	☐ Proceed with exceptions as noted to next submission and status.
3	☐ Do not proceed. Revise as noted and resubmit next submission and status.
4	☒ Complete, no further submission required.
By: _____ Date: _____	
Review and authorization to fabricate are only for general conformance with the design concept of the Project as expressed in the Contract Documents. Sole responsibility for the accuracy and completeness of this document, including but not limited to dimensions and quantities, remains with the Supplier/Contractor. Agnico Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agnico Eagle authorize or approve any construction means, methods, techniques, sequences or any safety precautions or procedures.	
Agnico Eagle No. 6515-C-260-002-141-QCR-0003 R: Sub001	
DOCUMENT FOR INFORMATION	

Preamble:

This package contains all QA/QC documents and drawings for the field erected fuel storage tank. The Inspection and Test Plan (ITP) serves as a Table of Contents for the Handover Package. The contents have been divided into items 1-20, and a table of contents for each item of the ITP can be found at the beginning of each section (item). The As-Built Drawings can be found at the end of this package.

This package was compiled by the General Contractor: **Inukshuk Construction Ltd.** and reviewed by Mechanical Engineer: **Kyle Brown**.

INSPECTION & TEST PLAN

Client: AGNICO EAGLE	Tank Tag: TK #3	Document: TK#3 ITP
Project ID: MELIADINE GOLD MINE	Work Order: 295	Revision: 0

Item	Component	Activity	ITP Type	Documentation	Acceptance Criteria	Notes	Witness, Hold, Review		
							Points		
							Client	Q.C.	Sign/Date
1	Kick-Off Meeting	Kickoff Meeting	N/A	Meeting Minutes	N/A				H
2	Signature Log	Verify	N/A	Signature Log	N/A				H
3	Welder Qualification	Verify	N/A	Individual Welder Qualifications / Welder Log	API-650 / ASME IX				H
4	Inspector Qualification	Verify	N/A	In house Inspector & 3 rd Party Qualifications	API-650				H
5	Weld Procedures	Verify	N/A	Approved Weld Procedures	API-650 / ASME IX, CWB W47.1				H
6	Welding Consumable	Electrode Storage	N/A	N/A	Manufacturer's Instructions				R
7	Foundation	Foundation Survey	DC	Foundation Acceptance Report, Compaction Report & Survey from 3 rd Party	API-650 Para 7.5.5				H
8	Floor	Materials	FI	MTR Confirmation to Dwg	Drawing & API-650 Sect. 4	MTR of all plate under shell.			
		Fit up	VE, DC	As Built Drawing	Drawing	per API-650 5.1.5.4 - bottom plates under the shell shall have the outer ends of the joints fitted and lap-welded to form a smooth bearing surface.			R
		Welding	VE	Weld Map, Visual Report	API-650 Para 7.2 & 8.5 & WPS				R
		Vacuum Test	VB	Vacuum Box Test Report	API-650 Para 7.3.3(a) & 8.6				W
9	Shell to Floor Seams	Initial Weld Pass	VE	Weld Map, Visual Report	API-650 Para 8.5, 7.2.4.1				R
		Final Weld Pass	VE	Weld Map, Visual Report	API-650 Para 8.5, 7.2.4.1				R
		Diesel Test	NDT	Leak Test Report	API-650 Para 7.2.4.1 d)				W
		Materials	FI	MTR Confirmation to Dwg	Drawing & API-650 Sect. 4	MTR of all plate			H
10	Shell	Fit up 1 st Course	VE, DC	As Built Drawing	Drawing				R
		Roundness	DC	Dimension Report	API-650 Para 7.5.3				H
		Welding	VE	Weld Map, Visual Report	API-650 Para 7.2, 7.5, 8.5 & WPS				R
		Tolerance Check – Plumbness & Local Deviations	DC	Dimension Report	API-650 Para 7.5				H
		Diesel Test Shell Welds	NDT	Leak Test Report	API-650 Para 7.3.6 2(a)i)				W
		UT – All Shell	NDT	UT report / Log / Map	API-650 Para Annex U	Shell less than 3/8" shall be interpreted as 3/8" as a modification of API-650. All T joint UT.			H
		Fit up	VE, DC	As Built Drawing	Drawing				R
		Welding	VE	Weld Map, Visual Report	API-650 Para 7.2 & 8.5 & WPS				R
11	Compression Ring	Fit up	VE, DC	As Built Drawing	As Built Drawing				R
12	Roof	Fit up	VE, DC	As Built Drawing	Drawing				R
		Welding	VE	Visual Report	API-650 Para 7.2 & 8.5 & WPS				R
		Fit up	VE, DC	As Built Drawing	Drawing				R
13	Roof Structure	Column Plumbness	DC	Dimension Report	API-650 Para 7.5.2 b)				H
		Welding	VE	Visual Report	API-650 Para 7.2 & 8.5 & WPS				R

Item	Component	Activity	ITP Type	Documentation	Acceptance Criteria	Notes	Witness, Hold, Review		
							Points		Q.C.
							Client	Sign/Date	
14	Nozzles	Layout	VE, DC	As Built Drawing	Drawing				H
		Fit up	VE, DC	As Built Drawing	Drawing				R
		Welding	VE	Weld Map, Visual Report	API-650 Para 7.2 & 8.5 & WPS				R
		Tolerance Check – Plumbness & Local Deviations	DC	Dimension Report	API-650 Para 7.5				H
		Shell Nozzle Repad Air test	AT	Leak Test Report	API-650 Para 7.3.5				W
		MPI	NDT	MPI Report	API-650 Para 7.2.3.6	All welds of Shell Nozzles			W
		Layout	VE, DC	As Built Drawing	Drawing				H
		Fit up	VE, DC	As Built Drawing	Drawing				R
15	Manway	Welding	VE	Weld Map, Visual Report	API-650 Para 7.2 & 8.5 & WPS				R
		Tolerance Check – Plumbness & Local Deviations	DC	Dimension Report	API-650 Para 7.5				H
		Shell Manway Repad Air test	AT	Leak Test Report	API-650 Para 7.3.5				W
		MPT	NDT	MPI Report	API-650 Para 7.2.3.6	All welds of Shell Manways			R
16	Internals	Layout / Fit up	VE, DC	As Built Drawing	Drawing				R
		Welding	VE	Visual Report	API-650 Para 7.2 & 8.5 & WPS				R
		Stillwell Plumbness	DC	Dimension Report	API-650 Para H.4.5				R
		MPI or LP	NDT	NDT Report	Sump Welds (if applicable) 7.3.4	MPI all welds			H
17	Externals	Layout / Fit up	VE, DC	As Built Drawing	Drawing				R
	Externals	Welding	VE	Visual Report	API-650 Para 7.2 & 8.5 & WPS				R
18	Stairs & Platforms	Fit up	VE, DC	As Built Drawing	Drawing				R
19	Bolts & Nuts	Welding	VE	Visual Report	API-650 Para 7.2 & 8.5 & WPS				R
		Inspection	VE, DC	As Built Drawing	Drawing	Bolt Torque			W
20	Final	Name Plate Verification	N/A	Scan of Name Plate	Drawings				H
		Final Inspection	FI	As Built Drawings, Data Sheet, Manufacturer's Certification (3 rd Party), Punch List	Drawings				H

DEFINITIONS:

W - WITNESS: Specified activity to be observed by an outlined party. QC to provide the applicable party 24 hours notice of witness point.

H - HOLD: Specified component or installation to be inspected by an outlined party. No further activities specific to the component or installation may proceed until inspection is carried out. QC to provide the applicable party 24 hours notice of hold point.

R - REVIEW: Specified documentation and specifications applicable to a particular component and/or installation to be examined by an outlined party.

AT - AIR TEST: Specified component and/or installation to be air tested according to specified documentation and specifications.

DC - DIMENSION CHECK: Physical dimensions of component and/or installation to be verified according to specified documentation and specifications.

FI - FINAL INSPECTION: Specified inspection procedures to be executed prior to release of the component and/or installation and verified according to specified documentation and specifications.

NDT - NON DESTRUCTIVE TESTING: Specified component and/or installation to be inspected using a named non destructive testing method according to specified documentation and specifications.

VE - VISUAL Examination: Specified component and/or installation to be examined visually according to specified documentation and specification.

VB - VACUUM-BOX TEST: Specified component and/or installation to be vacuum box tested according to specified documentation and specifications.

Item 2 – Signature Log

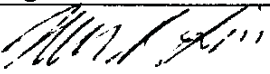
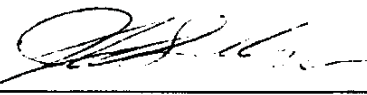
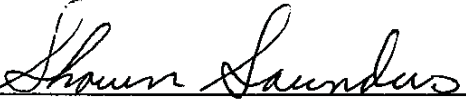
Contents

1. ICL Signature Log

Item 2 - Signature Log

AEM Meliadine Fuel Storage Tanks
Inukshuk Construction Ltd. – Project 295

Signature Log

Name	Company	Title	Signature
Marc Losier	ICL	Project Manager	
Jacob Saunders	ICL	Technical Coordinator	
Sheldon Burry	ICL	Supervisor	
Shawn Saunders	ICL	Supervisor	
Bruno Roy	AEM	QA/QC	
Stephane Dubois	AEM	QA/QC Mech. Engineer	
Sylvain Chartier	AEM	QA/QC	
Claude Filteau	AEM	Mechanical General Foreman	

Item 3 – Welder Qualification

Contents

1. Welder Qualification Log
2. Individual Welder Qualifications

Item 3 – Welder Qualification

Welder Qualification Log

[illegible]

WELDERS' QUALIFICATION RECORD

API 650

Exhibit 8, Rev A

QC (PRINT)	DATE (yyyy-MM-dd):
SIGN:	
QA (PRINT) Robert Hoffman	DATE (yyyy-MM-dd):
SIGN: 	2017.03.36

WELDERS' QUALIFICATION RECORD

Exhibit 8, Rev A

[illegible]**DATE (yyyy-MM-dd):**

SIGN:

DATE (yyyy-MM-dd):

SIGN: 

Report # G2574

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4

SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664

EMAIL: shop@allcaninspection.com www.allcaninspection.com

PAGE 1 OF 1

[illegible]

RADIOGRAPHIC EXAMINATION REPORT

Report # G2340

EMAIL: shop@allcaninspection.com www.allcaninspection.com

PAGE 1 OF 1

[illegible]

RADIOGRAPHIC EXAMINATION REPORT



File No. 591

**WELDING PERFORMANCE
QUALIFICATION**

Justin Dredge Is qualified

As a B CLASS Welder - Operator

Subject to the limitations and for a period mentioned at the back of this card.

Chief Boiler and Gas Inspector (Muhammad Wani)

06/06/2017
Date of Issue

PERFORMANCE QUALIFICATION

(In accordance with section IX, A.S.M.E code)

Renewal of performance qualification is required when the welding operator named hereon has not used the specified process and materials, etc., for a period of six months or more.

Process **SMAW**
Material group **P1 - 11**
Max Thickness **0.688"**
Filler Metal **F3, F4**
Positions **all**

06/06/2018

Expiry date dd/mm/yyyy



File No. 589

**WELDING PERFORMANCE
QUALIFICATION**

Ryan Kettle Is qualified

As a B CLASS Welder - Operator

Subject to the limitations and for a period mentioned at the back of this card.

Chief Boiler and Gas Inspector (Muhammad Wani)

30/05/2017
Date of Issue

PERFORMANCE QUALIFICATION

(In accordance with section IX, A.S.M.E code)

Renewal of performance qualification is required when the welding operator named hereon has not used the specified process and materials, etc., for a period of six months or more.

Process **SMAW**
Material group **P1 - 11**
Max Thickness **0.688"**
Filler Metal **F3, F4**
Positions **all**

30/05/2018

Expiry date dd/mm/yyyy



File No. 590

**WELDING PERFORMANCE
QUALIFICATION**

Daniel White Is qualified

As a B CLASS Welder - Operator

Subject to the limitations and for a period mentioned at the back of this card.

Chief Boiler and Gas Inspector (Muhammad Wani)

06/06/2017
Date of Issue

PERFORMANCE QUALIFICATION

(In accordance with section IX, A.S.M.E code)

Renewal of performance qualification is required when the welding operator named hereon has not used the specified process and materials, etc., for a period of six months or more.

Process **SMAW**
Material group **P1 - 11**
Max Thickness **0.75"**
Filler Metal **F4**
Positions **all**

06/06/2018

Expiry date dd/mm/yyyy



WELDING PERFORMANCE
QUALIFICATION

File No. 588

Michael K. Paul

Is qualified

As a B CLASS Welder - Operator

Subject to the limitations and for a period mentioned at the back of this card.


Chief Boiler and Gas Inspector (Muhammad Wani)

11/07/2017
Date of Issue

NOVA SCOTIA
Labour and Advanced Education

NSID

Name

Certified by

Purge

NR

NR

: W0186

: Zachary G. King

: Mosher Engineering Limited

Backing

NR

R

Process

SMAW

SMAW

F.No.

1 - 3

1 - 4

Inspector :

Qual. thk.

0.25"

0.438"

[Signature]

Boiler and Pressure Equipment Regulations
Tested in accordance with ASME Section IX
Pressure Welder Licence

Expires : 24 July 2019

Base metal (s)

P/S-No.

PI - 11

Position (s)

Electrode (s)

Max. thk.

0.688"

1: All

2:

1: EXX per F 1-3

2: EXX per F4

3:

Min. thk.

up

Min. dia.

1"



Machine controls

Visual

Auto volt

Auto joint

: n/a

: n/a

: n/a

Other

GMAW mode

Con. inert

Fused only

: n/a

: n/a

: n/a

WPS : MEL-WP-002

NOVA SCOTIA
Labour and Advanced Education

NSID
Name

Certified by

Purge

NR
NR

: V0083
: Abel Kalai

: Mosher Engineering Limited

Backing

NR
R

Process

SMAW
SMAW

E-No.

1 - 3
1 - 4

Qual. thk.

0.25"
0.5"

Expires : 11 Aug 2019

Inspector :

WPS : A072.8-MEL-WP-00

Boiler and Pressure Equipment Regulations
Tested in accordance with ASME Section IX
Pressure Welder Licence

Base metal (s)

P/S-No.

P1 - 11

Position (s)

Electrode (s)

Other

GMAW mode
Con. inert
Fused only

: n/a
: n/a
: n/a

Max. thk.

0.75"

1: All

2: FH 2 7/8" to 24" dia.

1: F1-3 per QW-432/433

2: F1-4 per QW-432/433

3:

Min. thk.

up

Min. dia.
> 24"

Machine controls

Visual : n/a
Auto volt : n/a
Auto joint : n/a



File No. 573

**WELDING PERFORMANCE
QUALIFICATION**

John Cusick Is qualified

As a B CLASS Welder - Operator

Subject to the limitations and for a period mentioned at the back of this card.

Chief Boiler and Gas Inspector (Muhammad Wani)

30/05/2017
Date of Issue

PERFORMANCE QUALIFICATION

(In accordance with section IX, A.S.M.E code)

Renewal of performance qualification is required when the welding operator named hereon has not used the specified process and materials, etc., for a period of SIX months or more.

Process **SMAW**
Material group **P1 - 11**
Max Thickness **0.688"**
Filler Metal **F3, F4**
Positions **all**

30/05/2018

Expiry date dd/mm/yyyy

This card is valid only while employed by a CNE certified company
Transferable Welder

Name	DEAN W. GOODYEAR	Exp. Date	Aug 06, 2017
Employer	Iron Workers - Local 764, Mount Pearl, NL	Material	Carbon Steel
Thickness Range	3mm & above	Process	SMAW
Mode	MANUAL	Standard	CSA W47.1
		Classification	T
		Electrode	F4
Class	FLAT/HORIZONTAL/VERTICAL UP/OVERHEAD		

Item 4 – Inspector Qualification

Contents

1. CWB Inspector Qualifications for NDE Testing

Item 4 - Inspector Qualifications - Pierre Dostie (NDE)



Conditions

1. La possession de cette carte ne signifie nullement que son détenteur représente un organisme d'inspection certifiée en vertu de la norme CSA W178.1 et ayant du personnel et des procédures approuvées par le Bureau canadien de soudage.
2. Cette carte demeure la propriété du Bureau et peut être rappelée en tout temps.
3. L'usage de la présente carte à des fins frauduleuses peut entraîner son annulation.

Pour toute question concernant cette qualification, veuillez communiquer avec :

1-800-844-6790 | www.cwbgroup.org



Item 4 - Inspector Qualifications - Sylvain Germain (NDE)



Conditions

1. La possession de cette carte ne signifie nullement que son détenteur représente un organisme d'inspection certifiée en vertu de la norme CSA W178.1 et ayant du personnel et des procédures approuvées par le Bureau canadien de soudage.
2. Cette carte demeure la propriété du Bureau et peut être rappelée en tout temps.
3. L'usage de la présente carte à des fins frauduleuses peut entraîner son annulation.

Pour toute question concernant cette qualification, veuillez communiquer avec :

1-800-844-6790 | www.cwbgroup.org



Item 5 – Weld Procedures

Contents

1. Approved Weld Procedures

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		PAGE: 1 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

SUBMERGED ARC-WELDING MANUAL

TABLE OF CONTENT

<u>SECTION</u>	<u>PAGE</u>
1 SCOPE	2
2 WELDING PROCEDURE.....	3
3 BASE MATERIAL	4
4 BASE METAL THICKNESS	5
5 FILLER METAL.....	6
STORAGE AND CONDITIONING OF ELECTRODES AND FLUXES	6
6 POSITION.....	7
7 PREHEAT	8
8 HEAT TREATMENT AND STRESS RELIEVING	9
9 ELECTRICAL CHARACTERISTICS WELDING TECHNIQUE.....	10
EFFECT OF PARAMETERS	11
<i>Amperage</i>	11
<i>Voltage</i>	11
<i>Welding (Travel) Speed</i>	12
10 PREPARATION OF BASE MATERIAL.....	13
12 TREATMENT OF UNDERSIDE OF WELDING GROOVE	14
13 QUALITY.....	15
14 WELD METAL CLEANING	16
15 DATA SHEETS.....	17
16 TROUBLE SHOOTING	18
17 APPROVALS.....	20

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 1 SCOPE PAGE: 2 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	



1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1

WELDING PROCEDURE SPECIFICATION NUMBER SAW-1 Submerged Arc Welding

1 SCOPE

This Welding Procedure Specification covers welding and related operations of steel structures that are fabricated in accordance with the terms outlined in CSA Standard W47.1 and W59, latest revisions. The attached Data Sheets form an essential part of this specification.

A change in any of the essential variables contained in the succeeding paragraphs or detailed on applicable Welding Procedure Data Sheets shall require a new Welding Procedure Specification and/or new Welding Procedure Data Sheets.

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 2 WELDING PROCEDURE PAGE: 3 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

2 WELDING PROCEDURE

The welding shall be done automatically or semi-automatically using the SAW (Submerged Arc Welding) process.

Joints shall be made following the procedural stipulations indicated in CSA Standard W59 and may consist of single or multiple passes, in accordance with the approved welding procedure data sheets to which this specification refers.

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 3 BASE MATERIAL PAGE: 4 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

3 BASE MATERIAL

The base metal shall conform to the specifications for the steel groups 1, 2, and 3 per Table 11.1 or Table 12.1 of CSA W59. Other groups may be welded providing the Canadian Welding Bureau accepts the Welding Procedure Data Sheets (WPDS).

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 4 BASE METAL THICKNESS PAGE: 5 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

4 BASE METAL THICKNESS

Base metal thickness from over 3.2 mm ($\frac{1}{8}$ ") to an unlimited thickness (inclusive) may be welded under this specification providing the respective welding procedure data sheets have been supplied and approved for an appropriate weld size.

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 5 FILLER METAL PAGE: 6 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

5 FILLER METAL

The filler metal shall conform to specification for CSA Standard W48 and shall be compatible with the base metal, as specified in Table 11.1 and 12.1 of CSA Standard W59. The classification of electrode to be used is shown on the appropriate Welding Procedure Data Sheet.

5.1 Storage and Conditioning of Electrodes and Fluxes

Electrodes (wire) shall be stored in a clean, dry environment in original containers until ready for use. All wire contaminated by surface rust or foreign material shall be discarded.

Flux used for SAW shall be dry and free from contamination of dirt, mill scale or other foreign material. All flux shall be purchased in packages capable of being stored under normal conditions for at least six (6) months without such storage affecting its welding characteristics or weld metal properties. Flux from damaged packages that have been exposed to free moisture shall be discarded or shall be dried before use in shallow layers (2 in. / 50 mm maximum) at a minimum temperature of 500°F (260°C) for at least one (1) hour or at time and temperature conditions as recommended by the flux manufacturer. Any flux that has been fused during welding shall not be reused.

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 6 POSITION PAGE: 7 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

6 POSITION

The welding shall be done in the flat position or horizontal positions provided approved Welding Procedure Data Sheets referring to those positions and this procedure specification are followed.

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 7 PREHEAT PAGE: 8 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

7 PREHEAT

The minimum preheat before welding will comply with Table 5-3 shown in the CSA Standard W59. Welding will be done at sufficient speed to ensure that the minimum preheat is maintained or exceeded.

If welding is interrupted for some time so that the temperature of the base metal falls below the minimum preheat temperature, then arrangements will be made to preheat again prior to recommencing welding.

The weldment shall be allowed to cool to the ambient temperature, without an external quench media being supplied. In other words, cooling water or placement in frigid conditions that cause a quick temperature change shall not be used.

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 8 HEAT TREATMENT AND STRESS RELIEVING PAGE: 9 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

8 HEAT TREATMENT AND STRESS RELIEVING

This will not be applicable to structures welded under this specification unless a specification showing all the parameters is submitted to the Canadian Welding Bureau and approval is obtained.

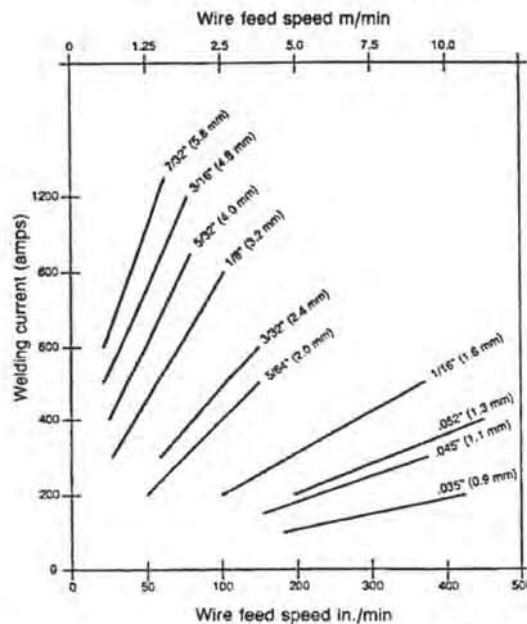
Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 9 ELECTRICAL CHARACTERISTICS WELDING TECHNIQUE PAGE: 10 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

9 ELECTRICAL CHARACTERISTICS WELDING TECHNIQUE

The Welding Procedure Data Sheets show details of the electrical characteristics to be used. The current used shall be direct current (DC) or alternating current (AC) as indicated on the welding procedure data sheets. However, unless otherwise noted on the data sheets or recommended by the consumable supplier, current and voltage ranges and electrode stick outs shall be as shown below:

Wire Diameter, in.	Current Range DC(+), amp	Arc Voltage Range	Stick out (standard), in
1/16	150 – 400	19 – 37	5/8" - 1 1/4"
5/64	200 – 600	20 – 37	5/8" - 1 1/4"
3/32	350 – 700	22 – 37	5/8" - 1 1/4"
1/8	300 – 900	23 – 37	5/8" - 1 1/4"
5/32	400 – 1000	25 – 37	5/8" - 1 1/4"
3/16	500 - 1100	27 – 37	5/8" - 1 1/4"
7/32	600 – 1200	30 – 37	5/8" - 1 1/4"
1/4	700 - 1600	30 – 38	5/8" - 1 1/4"

CURRENT (AMPS) VS. WIRE FEED SPEED
DC(+) Polarity, Single Arc, Normal Stickout



Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 9 ELECTRICAL CHARACTERISTICS WELDING TECHNIQUE PAGE: 11 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

9.1 Effect of Parameters

9.1.1 Amperage

Increasing the amperage results in an increased deposition rate and penetration

Amperage too high

- Unstable arc
- Undercutting
- High narrow bead
- Burn through

Amperage too Low

- Unstable Arc
- Poor Penetration



Weak Medium Strong

9.1.2 Voltage

An increased in voltage will increase the arc length, create a flatter and wider bead, increases flux consumption, improves slag removal; reduce penetration; increases resistance to porosity caused by rust or scale; increase alloy pick-up from the flux and will reduces flattening (root gap).

Voltage too high

- Produces a "hat-shaped" bead (cracking)
- Poor slag removal
- Concave fillet weld - crack-sensitive
- Increases transfer of alloying elements
- Undercuts at weld connection



Low Medium High

Voltage too low

- Produces a high, narrow bead

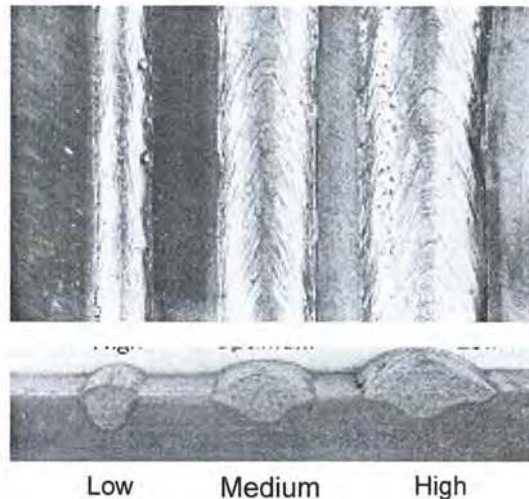
Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 9 ELECTRICAL CHARACTERISTICS WELDING TECHNIQUE
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

Poor slag removal

9.1.3 Welding (Travel) Speed

Welding speed greatly affects penetration and bead shape. An increase in speed will reduce penetration, increases tendency to undercut, increase possibility of arc blow, increases porosity, can cause an irregular bead and may result in bad degassing.

If your welding speed too low it may result in bead profile subject to cracking, arc visibility, large difficult to control molten pool, rough looking bead, slag inclusions, make it difficult to remove slag and causes a risk of burn through



Low Medium High

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 10 PREPARATION OF BASE MATERIAL PAGE: 13 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

10 PREPARATION OF BASE MATERIAL

The edges or surfaces of parts to be joined by welding shall be prepared by suitable means (e.g. Oxy-acetylene, plasma, etc.). Where hand cutting is involved the edge will be ground to a smooth surface. All surfaces and edges shall be free from fins, tears, cracks or any other defects that could adversely affect the quality of the weld.

All loose or thick scale, rust, moisture or other foreign material that would prevent proper welding or produce objectionable fumes shall be removed.

Typical joint preparations can be found in the appendix of this WPS.

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 11TREATMENT OF UNDERSIDE OF WELDING PAGE: 14 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

11 TREATMENT OF UNDERSIDE OF WELDING GROOVE{tc 112 "12.0 TREATMENT OF UNDERSIDE OF WELDING GROOVE}

Prior to depositing weld metal on the underside of a welding groove, the root shall be back gouged to sound metal, unless otherwise specified on the applicable data sheet.

Machining, air carbon arc or oxygen gouging, chipping or grinding may be used for back gouging.

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 12 QUALITY PAGE: 15 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

12 QUALITY

Cracks or blowholes that appear on the surface of any pass shall be removed before depositing the next covering pass. The procedure and technique shall be such that undercutting of base metal or adjacent passes is minimized. Fillet and butt welds shall meet the desirable or acceptable fillet weld profiles shown in Figure 5.4 of CSA Standard W59. The reinforcement in groove welds shall not exceed 3 mm (1/8") and shall have a gradual transition to the plane of the base metal surface. In general, the weld quality will be such as to meet the requirements of Clause 11.5.4 or 12.5.4 (as applicable) of CSA W59.

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 13 WELD METAL CLEANING PAGE: 16 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

13 WELD METAL CLEANING

Glass remaining after a pass shall be removed before applying the next covering pass. Prior to painting, all glass shall be removed and the parts shall be free of loose scale, oil and dirt.

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION: 14 DATA SHEETS PAGE: 17 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

14 DATA SHEETS

Welding Procedure Data Sheets are specifications setting broad guidelines for the shop and field welding practice of the fabricator for each anticipated combination of essential variables. From the practical point of view, it is essential to include all variables that would make the weld easier or more difficult to make. The practical men will find that this will cover suitable tolerances for the geometry of joint and the other parameters involved.

The attached data sheets form part of this specification.

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION 15: TROUBLE SHOOTING PAGE: 18 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

15 TROUBLE SHOOTING

The solutions below should only be used where they do not conflict with the Welding Procedure Data Sheets. Contact welding engineer for problems that cannot be corrected without conflict

Problem

Porosity

Causes

- Moist flux
- Rust, carbon deposit or paint on plate surface
- Oxidized electrode wire
- Base metal chemistry
- Contaminants
- Excessive or insufficient flux thickness

Lack of Penetration

- Excessive root face
- Insufficient amperage or wire speed
- Travel speed too high
- Voltage too high
- Bad positioning of electrode wire
- Excessive final length

Lack of Fusion

- Amperage too low
- Travel speed too high
- Bad positioning of electrode wire
- Presence of carbon deposits or other foreign matters

Undercutting

- Travel speed too high
- Excessive amperage
- Excessive voltage
- Bad positioning of electrode wire (angle, distance)

Hot Cracking

- Bad width/depth ratio
- Base metal chemistry (presence of sulphur, carbon or phosphor)
- Presence of contaminants
- Concave fillet weld
- Stress

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1		SECTION 15: TROUBLE SHOOTING PAGE: 19 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:	
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:	

Cold Cracking

- Presence of hydrogen
- Inappropriate pre-heat
- Base metal chemistry
- Tack welds too small

Unstable arc

- Check wire feed system

Mosher ENGINEERING 1007 Cobequid Road, Windsor Junction, Nova Scotia B2T 1K1	SAW Welding Procedure Specification Number SAW-1	SECTION:16 APPROVALS PAGE: 20 of 20
DATE ISSUED:	July 22, 2008	REVISION NO.:
APPROVED BY:	Sean Keay, P.Eng IWE	APPROVED BY:

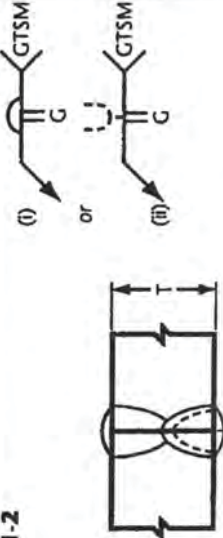
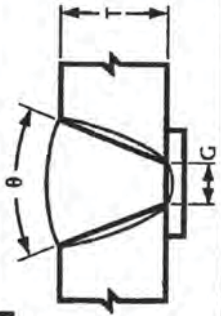
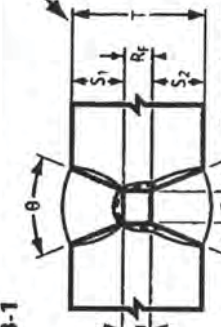
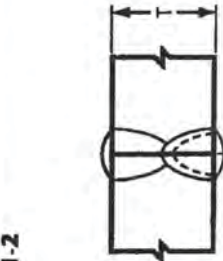
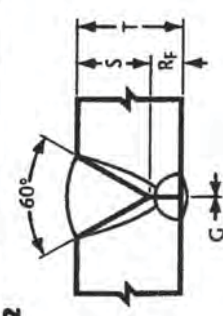
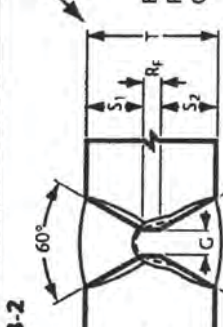
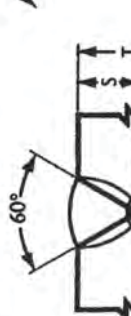
16 APPROVALS

CWB APPROVAL



COMPANY'S APPROVAL



Welds Joints		1 – Square Groove		2 – Single V-Groove		3 – Double V-Groove																														
S1-1		S1-2		S2-1		S3-1																														
Butt (B)					<table><tr><th>θ</th><th>G</th><th>l_1</th><th>Notes</th></tr><tr><td>20°</td><td>$\geq 16 \text{ mm (5/8 in)}$</td><td>$\geq 6 \text{ mm (1/4 in)}$</td><td>Mandatory</td></tr><tr><td>30°</td><td>$\geq 6 \text{ mm (1/4 in)}$</td><td>$\geq 6 \text{ mm (1/4 in)}$</td><td>Mandatory</td></tr><tr><td>45°</td><td>$\geq 3 \text{ mm (1/8 in)}$</td><td>—</td><td>—</td></tr></table>		θ	G	l_1	Notes	20°	$\geq 16 \text{ mm (5/8 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory	30°	$\geq 6 \text{ mm (1/4 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory	45°	$\geq 3 \text{ mm (1/8 in)}$	—	—	<table><tr><th>θ</th><th>G</th><th>l_1</th><th>Notes</th></tr><tr><td>20°</td><td>$\geq 16 \text{ mm (5/8 in)}$</td><td>$\geq 6 \text{ mm (1/4 in)}$</td><td>Mandatory</td></tr><tr><td>30°</td><td>$\geq 6 \text{ mm (1/4 in)}$</td><td>$\geq 6 \text{ mm (1/4 in)}$</td><td>Mandatory</td></tr></table>		θ	G	l_1	Notes	20°	$\geq 16 \text{ mm (5/8 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory	30°	$\geq 6 \text{ mm (1/4 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory
	θ	G	l_1	Notes																																
20°	$\geq 16 \text{ mm (5/8 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory																																	
30°	$\geq 6 \text{ mm (1/4 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory																																	
45°	$\geq 3 \text{ mm (1/8 in)}$	—	—																																	
θ	G	l_1	Notes																																	
20°	$\geq 16 \text{ mm (5/8 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory																																	
30°	$\geq 6 \text{ mm (1/4 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory																																	
B-L1-S		B-U1-S		B-U2a-S		B-U3a-S																														
Butt (B)				<table><tr><th>θ</th><th>G</th><th>l_1</th><th>Notes</th></tr><tr><td>20°</td><td>$\geq 16 \text{ mm (5/8 in)}$</td><td>$\geq 6 \text{ mm (1/4 in)}$</td><td>Mandatory</td></tr><tr><td>30°</td><td>$\geq 6 \text{ mm (1/4 in)}$</td><td>$\geq 6 \text{ mm (1/4 in)}$</td><td>Mandatory</td></tr></table>		θ	G	l_1	Notes	20°	$\geq 16 \text{ mm (5/8 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory	30°	$\geq 6 \text{ mm (1/4 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory	<table><tr><th>θ</th><th>G</th><th>l_1</th><th>Notes</th></tr><tr><td>20°</td><td>$\geq 16 \text{ mm (5/8 in)}$</td><td>$\geq 6 \text{ mm (1/4 in)}$</td><td>Mandatory</td></tr><tr><td>30°</td><td>$\geq 6 \text{ mm (1/4 in)}$</td><td>$\geq 6 \text{ mm (1/4 in)}$</td><td>Mandatory</td></tr></table>		θ	G	l_1	Notes	20°	$\geq 16 \text{ mm (5/8 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory	30°	$\geq 6 \text{ mm (1/4 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory					
	θ	G	l_1	Notes																																
20°	$\geq 16 \text{ mm (5/8 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory																																	
30°	$\geq 6 \text{ mm (1/4 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory																																	
θ	G	l_1	Notes																																	
20°	$\geq 16 \text{ mm (5/8 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory																																	
30°	$\geq 6 \text{ mm (1/4 in)}$	$\geq 6 \text{ mm (1/4 in)}$	Mandatory																																	
B-U1-S		B-U2b-S		B-U2c-S		B-U3b-S																														
Butt (B) or Corner (C)				<table><tr><th>R_f</th><th>GTSM</th></tr><tr><td>$\leq 6 \text{ mm (1/4 in)}$</td><td>Not mandatory</td></tr><tr><td>$> 6 \text{ mm (1/4 in)}$</td><td>Mandatory</td></tr></table>		R_f	GTSM	$\leq 6 \text{ mm (1/4 in)}$	Not mandatory	$> 6 \text{ mm (1/4 in)}$	Mandatory	<table><tr><th>R_f</th><th>GTSM</th></tr><tr><td>$\leq 6 \text{ mm (1/4 in)}$</td><td>Not mandatory</td></tr><tr><td>$> 6 \text{ mm (1/4 in)}$</td><td>Mandatory</td></tr></table>		R_f	GTSM	$\leq 6 \text{ mm (1/4 in)}$	Not mandatory	$> 6 \text{ mm (1/4 in)}$	Mandatory																	
	R_f	GTSM																																		
$\leq 6 \text{ mm (1/4 in)}$	Not mandatory																																			
$> 6 \text{ mm (1/4 in)}$	Mandatory																																			
R_f	GTSM																																			
$\leq 6 \text{ mm (1/4 in)}$	Not mandatory																																			
$> 6 \text{ mm (1/4 in)}$	Mandatory																																			
C-L1-S		B-U2c-S		B-U3c-S		B-U3c-S																														

See **NOTES** at bottom left of following page
 (Continued)

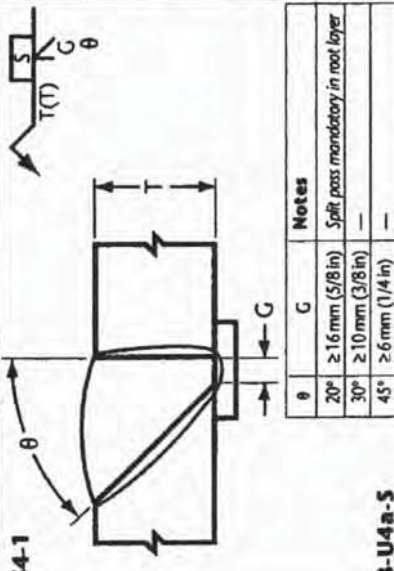
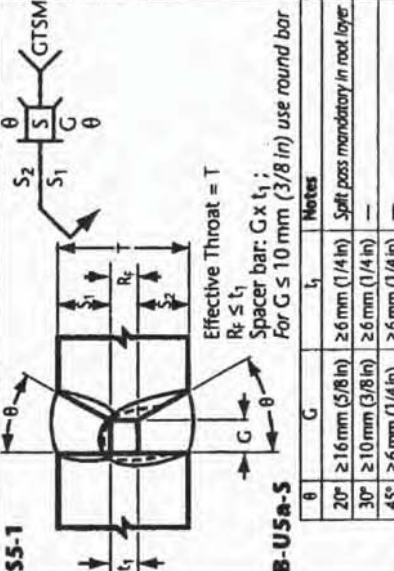
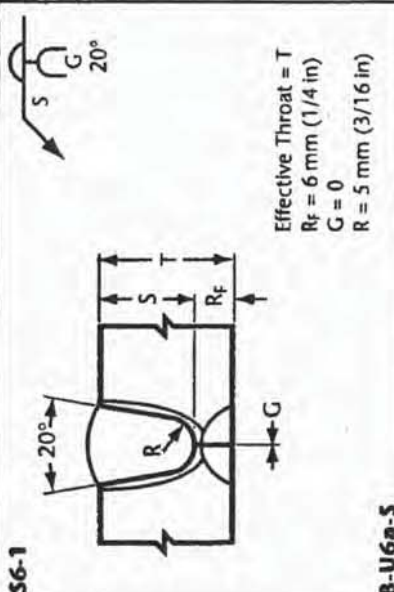
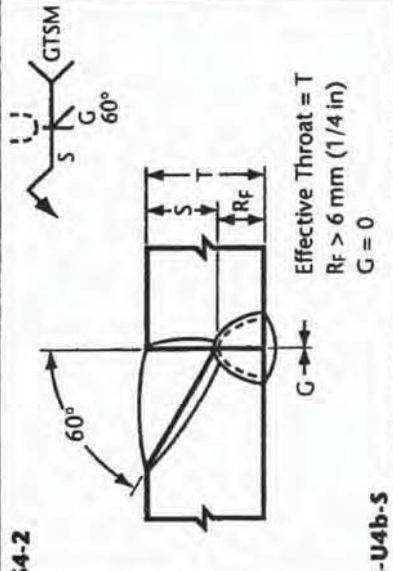
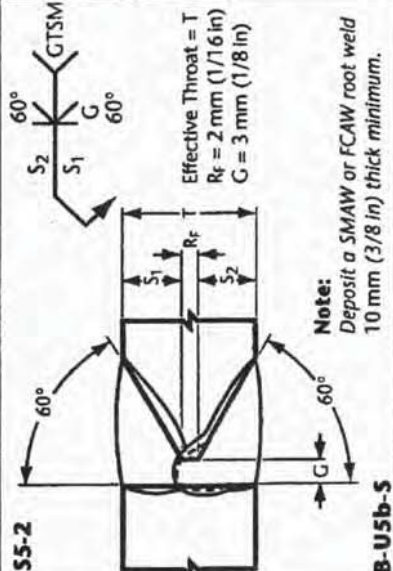
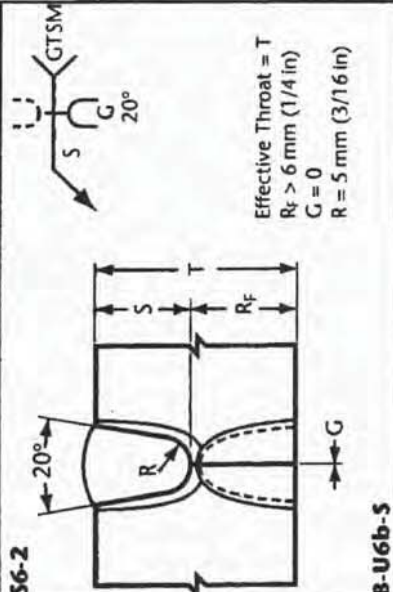
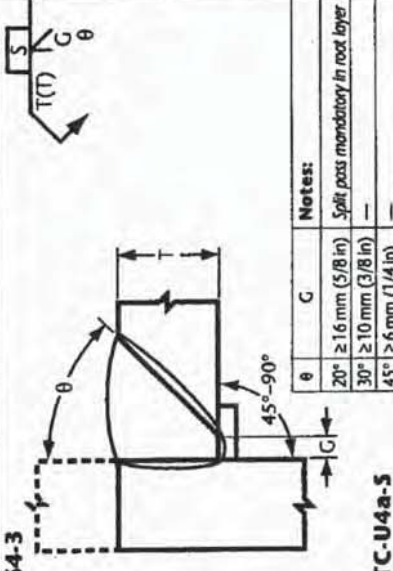
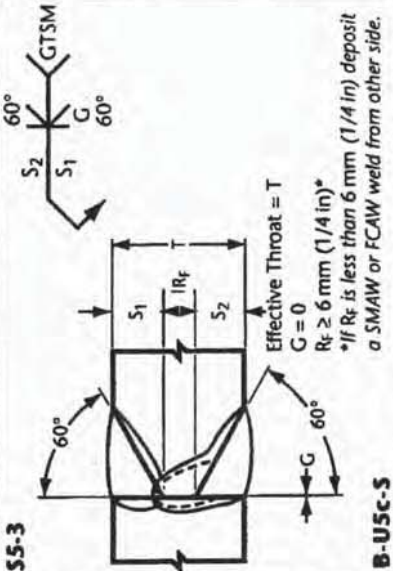
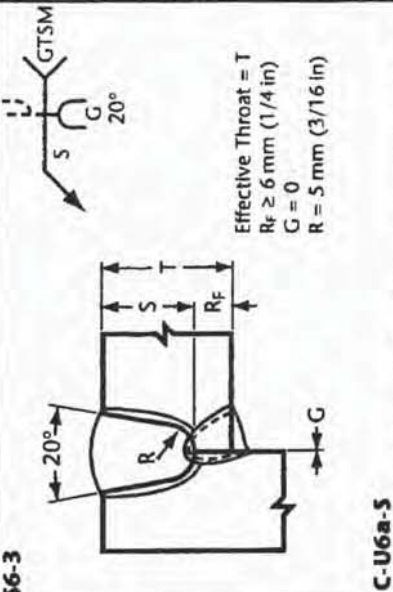
Figure 10.3

Prequalified Complete Joint Penetration Groove Welds for the Submerged Arc Welding Process (SAW)
 (See Clauses 10.1.1 and 10.3.1.)

Figure 10.3 (Continued)

Prequalified Complete Joint Penetration Groove Welds for the Submerged Arc Welding Process (SAW)

(Continued)

	4 – Single Bevel Groove	5 – Double Bevel Groove	6 – Single U-Groove																																																	
Welds Joints	Butt (B)	S4-1  B-U4a-S <table><thead><tr><th>θ</th><th>G</th><th>Notes</th></tr></thead><tbody><tr><td>20°</td><td>≥ 16 mm (5/8 in)</td><td>Split pass mandatory in root layer</td></tr><tr><td>30°</td><td>≥ 10 mm (3/8 in)</td><td>—</td></tr><tr><td>45°</td><td>≥ 6 mm (1/4 in)</td><td>—</td></tr></tbody></table>	θ	G	Notes	20°	≥ 16 mm (5/8 in)	Split pass mandatory in root layer	30°	≥ 10 mm (3/8 in)	—	45°	≥ 6 mm (1/4 in)	—	S5-1  B-U5a-S Effective Throat = T $R_f \leq t_1$ Spacer bar: $G \times t_1$; For $G \leq 10 \text{ mm (3/8 in)}$ use round bar <table><thead><tr><th>θ</th><th>G</th><th>t_1</th><th>Notes</th></tr></thead><tbody><tr><td>20°</td><td>≥ 16 mm (5/8 in)</td><td>≥ 6 mm (1/4 in)</td><td>Split pass mandatory in root layer</td></tr><tr><td>30°</td><td>≥ 10 mm (3/8 in)</td><td>≥ 6 mm (1/4 in)</td><td>—</td></tr><tr><td>45°</td><td>≥ 6 mm (1/4 in)</td><td>≥ 6 mm (1/4 in)</td><td>—</td></tr></tbody></table>	θ	G	t_1	Notes	20°	≥ 16 mm (5/8 in)	≥ 6 mm (1/4 in)	Split pass mandatory in root layer	30°	≥ 10 mm (3/8 in)	≥ 6 mm (1/4 in)	—	45°	≥ 6 mm (1/4 in)	≥ 6 mm (1/4 in)	—	S6-1  B-U6a-S Effective Throat = T $R_f = 6 \text{ mm (1/4 in)}$ $G = 0$ $R = 5 \text{ mm (3/16 in)}$	Butt (B)	S4-2  B-U4b-S Effective Throat = T $R_f > 6 \text{ mm (1/4 in)}$ $G = 0$	S5-2  B-U5b-S Effective Throat = T $R_f = 2 \text{ mm (1/16 in)}$ $G = 3 \text{ mm (1/8 in)}$ Note: Deposit a SMAW or FCAW root weld 10 mm (3/8 in) thick minimum.	S6-2  B-U6b-S Effective Throat = T $R_f > 6 \text{ mm (1/4 in)}$ $G = 0$ $R = 5 \text{ mm (3/16 in)}$	Butt (B) Tee (T) Corner (C)	S4-3  TC-U4a-S <table><thead><tr><th>θ</th><th>G</th><th>Notes</th></tr></thead><tbody><tr><td>20°</td><td>≥ 16 mm (5/8 in)</td><td>Split pass mandatory in root layer</td></tr><tr><td>30°</td><td>≥ 10 mm (3/8 in)</td><td>—</td></tr><tr><td>45°</td><td>≥ 6 mm (1/4 in)</td><td>—</td></tr></tbody></table>	θ	G	Notes	20°	≥ 16 mm (5/8 in)	Split pass mandatory in root layer	30°	≥ 10 mm (3/8 in)	—	45°	≥ 6 mm (1/4 in)	—	S5-3  B-U5c-S Effective Throat = T $G = 0$ $R_f \geq 6 \text{ mm (1/4 in)}^*$ *If R_f is less than 6 mm (1/4 in) deposit a SMAW or FCAW weld from other side.	S6-3  C-U6a-S Effective Throat = T $R_f \geq 6 \text{ mm (1/4 in)}$ $G = 0$ $R = 5 \text{ mm (3/16 in)}$
	θ	G	Notes																																																	
	20°	≥ 16 mm (5/8 in)	Split pass mandatory in root layer																																																	
30°	≥ 10 mm (3/8 in)	—																																																		
45°	≥ 6 mm (1/4 in)	—																																																		
θ	G	t_1	Notes																																																	
20°	≥ 16 mm (5/8 in)	≥ 6 mm (1/4 in)	Split pass mandatory in root layer																																																	
30°	≥ 10 mm (3/8 in)	≥ 6 mm (1/4 in)	—																																																	
45°	≥ 6 mm (1/4 in)	≥ 6 mm (1/4 in)	—																																																	
θ	G	Notes																																																		
20°	≥ 16 mm (5/8 in)	Split pass mandatory in root layer																																																		
30°	≥ 10 mm (3/8 in)	—																																																		
45°	≥ 6 mm (1/4 in)	—																																																		

See NOTES at bottom left of following page
(Continued)

Figure 10.3 (Continued)

Prequalified Complete Joint Penetration Groove Welds for the Submerged Arc Welding Process (SAW)

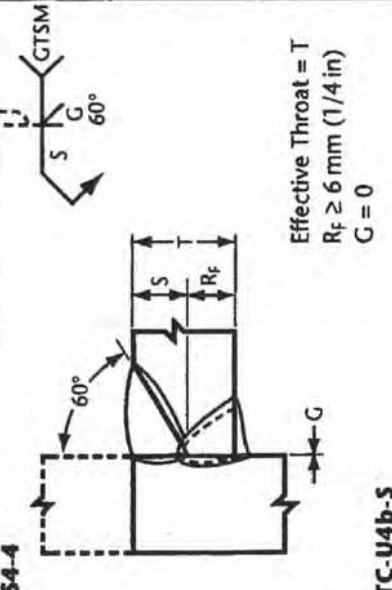
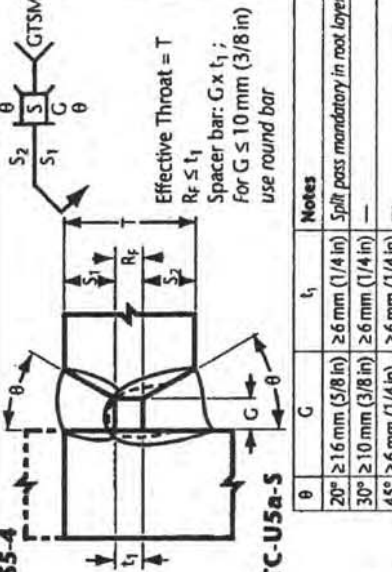
Welds Joints	4 – Single Bevel Groove (cont'd)	5 – Double Bevel Groove (cont'd)	6 – Single U-Groove (cont'd)															
	S4-4  Effective Throat = T Rf ≥ 6 mm (1/4 in) G = 0 TC-U4b-S	S5-4  Effective Throat = T Rf ≤ t1 Spacer bar: G x t1; For G ≤ 10 mm (3/8 in) use round bar <table border="1"><thead><tr><th>theta</th><th>G</th><th>t1</th><th>Notes</th></tr></thead><tbody><tr><td>20°</td><td>≥ 16 mm (5/8 in)</td><td>≥ 6 mm (1/4 in)</td><td>Split pass mandatory in root layer</td></tr><tr><td>30°</td><td>≥ 10 mm (3/8 in)</td><td>≥ 6 mm (1/4 in)</td><td>—</td></tr><tr><td>45°</td><td>≥ 6 mm (1/4 in)</td><td>≥ 6 mm (1/4 in)</td><td>—</td></tr></tbody></table> TC-U5a-S	theta	G	t1	Notes	20°	≥ 16 mm (5/8 in)	≥ 6 mm (1/4 in)	Split pass mandatory in root layer	30°	≥ 10 mm (3/8 in)	≥ 6 mm (1/4 in)	—	45°	≥ 6 mm (1/4 in)	≥ 6 mm (1/4 in)	—
theta	G	t1	Notes															
20°	≥ 16 mm (5/8 in)	≥ 6 mm (1/4 in)	Split pass mandatory in root layer															
30°	≥ 10 mm (3/8 in)	≥ 6 mm (1/4 in)	—															
45°	≥ 6 mm (1/4 in)	≥ 6 mm (1/4 in)	—															
Tee (T) Corner (C)	7 – Double U-Groove S7-1 Effective Throat = T G = 0 B-U7-S <table border="1"><thead><tr><th>Rf</th><th>GTSM</th></tr></thead><tbody><tr><td>≤ 6 mm (1/4 in)</td><td>Not mandatory</td></tr><tr><td>> 6 mm (1/4 in)</td><td>Mandatory</td></tr></tbody></table>			Rf	GTSM	≤ 6 mm (1/4 in)	Not mandatory	> 6 mm (1/4 in)	Mandatory									
Rf	GTSM																	
≤ 6 mm (1/4 in)	Not mandatory																	
> 6 mm (1/4 in)	Mandatory																	

Figure 10.3 (Continued)

Prequalified Complete Joint Penetration Groove Welds for the Submerged Arc Welding Process (SAW)

(Continued)

Welds Joints	8 – Single J-Groove	9 – Double J-Groove
Butt (B)	S8-1 B-U8a-S S8-2 B-U8b-S Effective Throat = T $R_f \leq 6 \text{ mm (1/4 in)}$ $G = 0$ $R = 12 \text{ mm (1/2 in)}$	S9-1 B-U9-S Effective Throat = T $R_f \geq 6 \text{ mm (1/4 in)}$ $G = 0$ $R = 12 \text{ mm (1/2 in)}$
Tee (T) Corner (C)	S8-3 TC-U8a-S Effective Throat = T $R_f \geq 6 \text{ mm (1/4 in)}$ $G = 0$ $R = 12 \text{ mm (1/2 in)}$	S9-2 TC-U9-S Effective Throat = T $R_f \geq 6 \text{ mm (1/4 in)}$ $G = 0$ $R = 12 \text{ mm (1/2 in)}$
Tee (T) Corner (C)	S8-4 TC-U8b-S Effective Throat = T $R_f \leq 3 \text{ mm (1/8 in)}$ $G = 0$ $d \geq 6 \text{ mm (1/4 in)}$ $R = 12 \text{ mm (1/2 in)}$ Note: Weld back side first with a SMAW or FCAW min. 10 mm (3/8 in) fillet.	Notes: (1) For all joints that show the GTSM reference on the welding symbol, gouging to sound metal prior to welding from the other side is mandatory. See Clause 5.1.4 for definition. (2) The groove in a joint may be reversed where more practical or necessary. (3) See Clause 10.3.1. (4) For corner joints, see preferred preparation as shown in Figure 4.1.

Figure 10.3 (Concluded)
Prequalified Complete Joint Penetration Groove Welds for the Submerged Arc Welding Process (SAW)

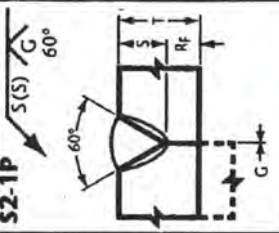
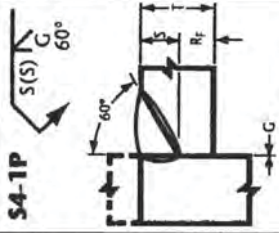
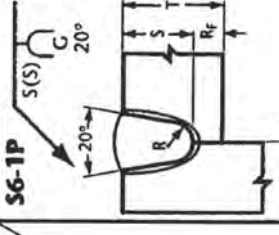
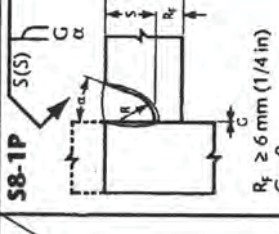
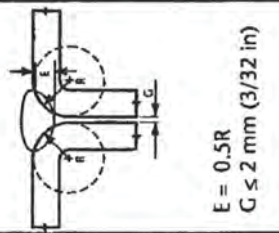
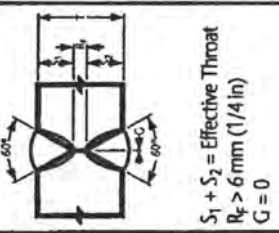
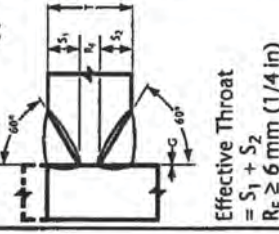
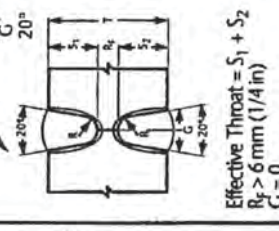
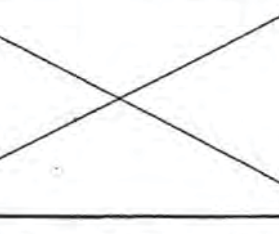
Welds Joints	V-Groove		Bevel Groove		U-Groove		J-Groove							
	2 Single V. and 10 Flare V-Groove	3 Double V- Groove	4 Single Bevel Groove	5 Double Bevel Groove	6 Single U- Groove	7 Double U- Groove	8 Single J- Groove	9 Double J- Groove						
Butt (B) Tee (T) or Corner (C)	S2-1P  $R_f \geq 6 \text{ mm (1/4 in)}$ $G = 0$ BC-P2-S		S4-1P  $R_f \geq 6 \text{ mm (1/4 in)}$ $G = 0$ TC-P4-S		S6-1P  $R_f \geq 6 \text{ mm (1/4 in)}$ $G = 0$ $R = 5 \text{ mm (3/16 in)}$ BC-P6-S		S8-1P  $R_f \geq 6 \text{ mm (1/4 in)}$ $G = 0$ $R = 12 \text{ mm (1/2 in)}$ <table><tr><td>α</td><td>Joint</td></tr><tr><td>20°</td><td>C-P8-S</td></tr><tr><td>45°</td><td>T-P8-S</td></tr></table>	α	Joint	20°	C-P8-S	45°	T-P8-S	
	α	Joint												
20°	C-P8-S													
45°	T-P8-S													
Butt (B) Tee (T) or Corner (C)	S10-2P  $E = 0.5R$ $G \leq 2 \text{ mm (3/32 in)}$ B-P10-S	S3-1P  $S_1 + S_2 = \text{Effective Throat}$ $R_f \geq 6 \text{ mm (1/4 in)}$ $G = 0$ B-P3-S	S5-1P  $S_1 + S_2 = \text{Effective Throat}$ $R_f \geq 6 \text{ mm (1/4 in)}$ $G = 0$ TC-P5-S	S7-1P  $S_1 + S_2 = \text{Effective Throat}$ $R_f \geq 6 \text{ mm (1/4 in)}$ $G = 0$ $R = 5 \text{ mm (3/16 in)}$ B-P7-S		S9-1P  $S_1 + S_2 = \text{Effective Throat}$ $R_f \geq 6 \text{ mm (1/4 in)}$ $G = 0$ $R = 13 \text{ mm (1/2 in)}$ <table><tr><td>α</td><td>Joint</td></tr><tr><td>20°</td><td>C-P9-S</td></tr><tr><td>45°</td><td>T-P9-S</td></tr></table>	α	Joint	20°	C-P9-S	45°	T-P9-S		
	α	Joint												
20°	C-P9-S													
45°	T-P9-S													

Figure 10.4

Prequalified Partial Joint Penetration Groove Welds for the Submerged Arc Welding Process (SAW)
(See Clause 10.3.2.)

Company Name: Mosher Engineering				Wldg. Specification No: RTR-4			
Address: 1358 Queen Street				Reference WPQR:			
Halifax		Nova Scotia		B3J 2H5		Ref. Standards: CSA W47.1, W59 & W48	

Material Information:							
Position: Horizontal		Welding Process: FCAW		Consumable: E491T-12MJ-H4			
Base Mat'l: CAN G40.21 350WT Cat. 5 (27J @-40°C)		Mode of Transfer: Globular Transfer		Shielding Gas: 75% Ar 25% CO2			
		Process Mode: Semi-Automatic		Gas Flow: 45 ft ³ /h			
		Tungsten Type:		Tungsten Dia.: in			
Cleaning: Wire brush and remove slag in between passes				PHT Temp: 15°C or 59 °F			
				PWHT Temp: NA °F			

Typical Joint Details: **Typical Pass & Layer Sequence:**

$ETT = T$
 $G = 0$
 $T_{max} = 12mm (1/2")$

Joint Configuration:				Joint Details:				Technique & Process Information:			
Joint Type: Butt, Tee, Corner				G = 0.045 θ (°) = 0				Electrical Stickout: 3/4 ± 1/8 in			
Weld Type: Complete Joint Penetration				R _F = 0				Nozzle Diameter: 1/2 in			
Backgouging: Backgouged to Sound Metal								Average Deposition Rate: 7.0 lbs/h			

Welding Parameters:																								
Weld Size		Depth of Prep'n	Side No.	Layer No.		Pass No.		Electrode Size		Current (Amps) DCRP		Wire Feed Speed (in/min)		Arc Volts (Volts)		Travel Speed (in/min)		Average Heat Input (kJ/in)						
in.	mm	in		Min	Max	Min	Max	in.	mm	Min	Max	Min	Max	Min	Max	Min	Max							
1/4	6.4	1/4	1	1	-	1	1	-	1	0.045	1.2	200	-	240	300	-	400	27	-	29	31.4	-	42.5	10.0
			2			2	2	-	2	0.045	1.2	200	-	240	300		400	27	-	29	21.0		28.4	15.0
5/16	7.9	5/16	1	1	-	1	1	-	1	0.045	1.2	200	-	240	300		400	27	-	29	25.1		34.0	12.5
			2			2	2	-	2	0.045	1.2	200	-	240	300		400	27	-	29	21.0		28.4	15.0
3/8	9.5	3/8	1	1	-	1	1	-	1	0.045	1.2	200	-	240	300		400	27	-	29	21.0		28.4	15.0
			2			2	2	-	2	0.045	1.2	200	-	240	300		400	27	-	29	21.0		28.4	15.0

Revision Status:		CWB Approval:		Company's Approval:	
Date:	Explanation:	CWB Accepted Jul 25, 2008 Valid only if welding consumables are certified by the CWB			
22/07/2008	Per PQR P5745				
NOTES: 1. Use stringer beads only. Restrict weld bead to ≤ 16 mm. 2. Weld Sizes represent effective weld throat thickness for qualified T range. 3. Target heat inputs at calculated average. 4. Tack weld parameters to be per main weld parameters 5. Backgouge as necessary to repair side 2.					

Prepared by: FORGERON ENGINEERING LIMITED Tel: (902) 835-7225

DATA SHEET

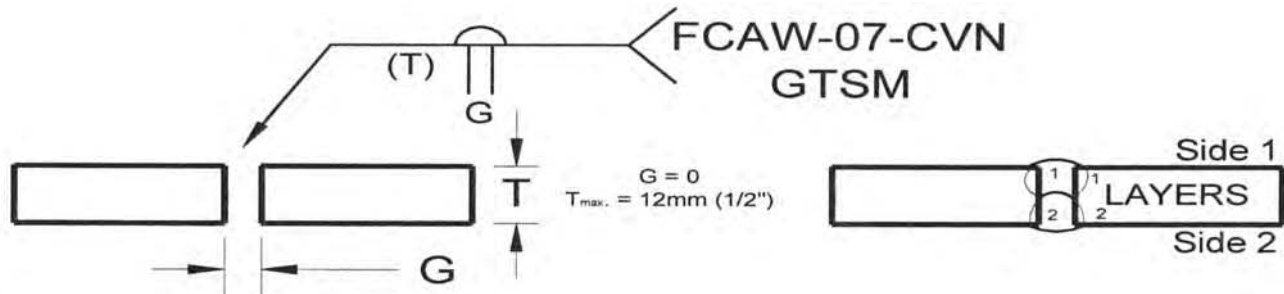
Date: May 5, 2008

Company Name:	Mosher Engineering	Wldg. Specification No:	RTR-4
Address:	1358 Queen Street	Reference WPQR:	
	Halifax Nova Scotia B3J 2H5	Ref. Standards:	CSA W47.1, W59 & W48

Material Information:

Position:	Vertical Up	Welding Process:	FCAW	Consumable:	E491T-12MJ-H4
Base Mat'l:	CAN G40.21 350WT Cat. 5 (27J @-40°C)	Mode of Transfer:	Globular Transfer	Shielding Gas:	75% Ar 25% CO ₂
		Process Mode:	Semi-Automatic	Gas Flow:	38 ft ³ /h
		Tungsten Type:		Tungsten Dia.:	in

Cleaning:	Wire brush and remove slag in between passes	PHT Temp:	15°C or 59 °F
		PWHT Temp:	NA °F

Typical Joint Details:
Typical Pass & Layer Sequence:


Joint Configuration:	Joint Details:	Technique & Process Information:
Joint Type: Butt. Tee, Corner	G = 0.045 θ (°) = 0	Electrical Stickout: 3/4 ± 1/8 in
Weld Type: Complete Joint Penetration	R _F = 0	Nozzle Diameter: 1/2 in
Backgouging: Backgouged to Sound Metal		Average Deposition Rate: 4.7 lbs/h

Welding Parameters:

Weld Size	Depth of Prep'n	Side No.	Layer No.	Pass No.	Electrode Size	Current (Amps)	Wire Feed Speed	Arc Volts	Travel Speed	Average Heat Input
in. mm	in		Min Max	Min Max	in. mm	Min Max	(in/min)	(Volts)	(in/min)	(kJ/in)
1/4 6.4	1/4	1	1 - 1	1 - 1	0.045 1.2	150 - 170	175 - 225	21 - 25	6.9 - 7.4	30.9
		2	2 - 2	2 - 2	0.045 1.2	150 - 170	175 - 225	21 - 25	6.9 - 7.4	30.9
5/16 7.9	5/16	1	1 - 1	1 - 1	0.045 1.2	150 - 170	175 - 225	21 - 25	6.9 - 7.4	30.9
		2	2 - 2	2 - 2	0.045 1.2	150 - 170	175 - 225	21 - 25	6.9 - 7.4	30.9
3/8 9.5	3/8	1	1 - 1	1 - 1	0.045 1.2	150 - 170	175 - 225	21 - 25	6.9 - 7.4	30.9
		2	2 - 2	2 - 2	0.045 1.2	150 - 170	175 - 225	21 - 25	6.9 - 7.4	30.9

Revision Status:	CWB Approval:	Company's Approval:
-------------------------	----------------------	----------------------------

Date:	Explanation:	
22/07/2008	Per PQR P5745	

NOTES:

1. Use stringer beads only. Restrict weld bead to ≤ 16 mm.
2. Weld Sizes represent effective weld throat thickness for qualified T range.
3. Target heat inputs at calculated average.
4. Tack weld parameters to be per main weld parameters
5. Backgouge as necessary to repair side 2.

Prepared by: FORGERON ENGINEERING LIMITED

Tel: (902) 835-7225

CWB Accepted


Jul 25, 2008

Valid only if welding consumables are certified by the CWB

