

Completion Report.....P 12014

48" O.D. Horizontal Separator
S.N. Separator: P8078-1
S.N. Bridle: P8078.LCB.01
S.N. Bridle P8078.LCB.02

For:



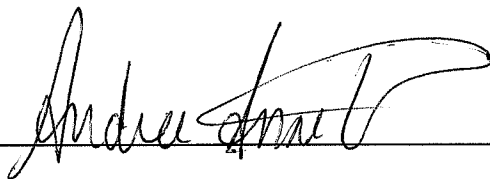
Artek Exploration Ltd.

July 31, 2012

Contents:

- Repair Procedure
- BCSA Repair and Alteration Report
- Traveller Sheet
- ABSA and BCSA Design Registration
- Vessel Information
- Name plates
- Drawings
- Design Calculations
- Welder Qualifications
- NDE
- Stress Relief
- Hydro Test Report

By: _____



Access Manufacturing Ltd.

Phone: (250) 785-5578 Fax: (250) 785-5997

Billing address: #339, 9420 93 Ave Fort St. John, BC V1J 6W7

February 14, 2012

CLIENT:
LOCATION:
CONTACT:
BOILER INSPECTOR:

REPAIR PROCEDURE P-12014
ACCESS MANUFACTURING LTD.
10801 CLAIRMONT FRONTAGE RD, FORT ST. JOHN
DEAN OWEN
DENNIS DORNBUSCH

VESSEL DATA:

MANUFACTURED BY: ACCESS MANUFACTURING LTD.
SERIAL NUMBER: 8078-01
BC NUMBER:
DATE MANUFACTURED: 2008
CRN: K6964.1
MAWP: 285PSI @ 100°F
HEAD/SHELL THICKNESS: 0.500"
HEAD/SHELL MATERIAL: SA-516-70N
NDE: RT1
PWHT: YES

PROJECT SCOPE:

ADD WELD REINFORCEMENT TO THREE WELDS AS PER REQUEST FROM ABSA FOR REGISTRATION. THESE WELDS ARE ALL ON A1 OF THE ACCESS MANUFACTURING LTD. DRAWING # HSEP-WB-48X285.125.08 REV.2

PROCEDURE:

1. INCREASE FILLET WELD SIZE FROM 3/8" TO 7/8" ON NOZZLE TO REPAD WELD USING AML-2.
2. INSIDE NOZZLE TO HEAD WILL BE MINIMUM 3/4" FILLET FOR REINFORCEMENT.
3. THE FILLET WELD ON REPAD TO HEAD IS NOT 3/8" SO WE WILL INCREASE IT FOR BETTER REINFORCEMENT TO THE HEAD.
4. ONCE WELDING IS COMPLETED MPI WILL BE CONDUCTED ON WELDS.
5. AS PER ASME SEC VIII DIV 1 2010 ADDENDA, WE WILL HAVE UT PERFORMED ON 4 SECTIONAL REPADS TO ENSURE SOUND QUALITY WELDS AT INTERSECTIONS OF THE TWO HALVES.
6. PHWT 1100°F FOR 30 MINS AS PER UW-40(F).
7. HYDRO TEST VESSEL TO 1.3 TIMES MAWP (370.5 PSI) AND HOLD FOR 1 HOUR.
8. DOCUMENTATION OF THE FOREMENTIONED WORK WILL BE AVAILABLE FOR REVIEW UPON COMPLETION OF PROJECT.

WELDING:

ALL WELDING TO BE PERFORMED BY WELDERS QUALIFIED TO ACCESS WELD PROCEDURES.

NDE:

ALL NDE TO BE PERFORMED BY CGSB CERTIFIED INSPECTORS.

REQUIRED DOCUMENTS:

- WELDERS PERFORMANCE QUALIFICATION
- COMPLETED NDE REPORT
- HYDROTEST REPORT
- TRAVEL SHEET
- REPAIR ALTERATION REPORT



505 - 6th Street, Suite 200,
New Westminster
British Columbia V3L 0E1

Local Phone: 778-396-2000
Local Fax: 778-396-2174 Toll
Free: 1-866-566-SAFE (7233)
Toll Free Fax: 778-396-2174
www.safetyauthority.ca

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BOILERS AND PRESSURE VESSELS REPAIR AND ALTERATION REPORT

Access Project #P12014

B.C. ID #:

OWNER EQUIP. #: _____

REPAIR ☒ and/or ALTERATION Partial ☐ Final ☐

1. Name and Address of Organization doing Repair/Alteration Access Manufacturing Ltd. Shop Location:
10810 Clairmont Frontage Road; Billing address: Box 339, 9420 - 93rd St. Fort St. John, BC V1J 6W7;
BCSA License No. & Expiry Date: 46419, Expires November 30, 2012 Location of Installation: c-14-H/94B8

2. Name of Owner Access Manufacturing Ltd.
Address 10810 Clairmont Frontage Road, Fort St. John

3. Boiler/Pressure Vessel Description CRN: K6964.1
Manufacturers Name: Access Manufacturing Ltd. Serial No: P8078-01

4. Design Conditions:

a) Vessel/Shell /Boiler: Max Allowable Working Press. 285 PSI Min/Max Design Temp / 100 °F
b) Jacket/Tubeside: Max Allowable Working Press _____ PSI Min/Max Design Temp ____/____ °F

5. Description of Defects: (Location and types of deterioration that resulted in the repair/alteration): INCREASE
FILLET WELD SIZE AROUND A1 (MANWAY)

6. ASME Code Edition and Addenda used for work: ASME Sect. VIII Year 2010 Addenda 1

7. Repair/Alteration Description of Work. (Step by step description of repair/alteration method. Attach additional sheets as needed).

Note 1: Repair/Alteration Procedure to be accepted by BCSA Boiler Safety Officer prior to start of work.

Please see the attached Repair Procedure

8. Material – List any material used in repair/alteration and any base material welded on:

Item	Material Specifications	Thick/Sch	Diameter	Item	Material Specifications	Thick/Sch	Diameter
Shell/Drum	SA 516-70N	0.500"	48" O.D.	Heads/Ends	SA 516-70N	0.500"	48"
Tube-sheet				Tubes			
Nozzles	SA 516-70N	1.250"	21.5" O.D.	Flanges/ Fitting			

9. Welding Procedure – British Columbia Registration Number WP-_____ WPS Numbers used: AML-2

10. Heat Treatment: Bake Out (Temp./Time) _____ Preheat Temp. ____ Post Weld HT (Temp./Time) 1100 °F /30 min

11. Non Destructive Examination (Specify type and extent).

100% MPI on fillet welds

UT on sectional repad groove welds

B.C. ID #: _____

OWNER EQUIP. #: _____

12. Pressure Test Vessel/Boiler/Shellside Tubeside/Jacket

a) Hydrostatic 371 ✓ PSI _____ PSI

b) Other Test _____

13. Welded Replacement Parts: Attached are Manufacturer's Partial Data Reports or Repair/Alteration Reports properly identified and signed by Authorized Inspectors for the following items of this report: (Welded parts supplied by others).

14. Responsibility Owner/Client. Identify below items that the owner/client has assumed responsibility for Note (2)

a) Design Submission _____ b) Repair/Alteration Procedure: _____ c) Material Control _____

d) Welding Control _____ e) NDE _____ f) Heat Treatment _____ g) Pressure Test _____

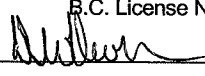
Note 2: Owner/Client must have a valid B.C. Contractors License for the Scope of Work to assume responsibility for function c, d, e, f, or g.

15. REMARKS: _____

16. **CERTIFICATE OF COMPLIANCE**

We certify that the statements made in this Report are correct and that all design, material, construction and workmanship on this repair/alteration conform to the requirements of the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation:

a) For all items except for items identified in 14:

Access Manufacturing Ltd.
Repair/Alteration Organization Name
46419 November 30, 2012
B.C. License Number and Expiry Date
 Aug 29/12
Signature and Date
Dean Owen
Print Name

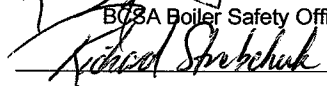
b) For items identified in 14 only:

Owner/Client Organization Name
B.C. License Number and Expiry Date
Signature and Date
Print Name

17. DATE WORK WAS COMPLETED: _____

18. **CERTIFICATE OF INSPECTION**

- a) I have inspected the repairs and/or alterations described in this report. To the best of my knowledge this work has been done in accordance with the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation.
- b) BCSA Boiler Safety Officer (when work is inspected by BCSA)


BCSA Boiler Safety Officer Signature and Date

Print Name

Report Received by BCSA Boiler Safety Officer _____ Date _____

ACCESS MANUFACTURING LTD.

10810-Clairmont Frontage Road
Fort St. John, BC V1J 6W7

Phone: (250) 785-5578
Fax: (250) 785-5997

REPAIR EXAMINATION CHECKLIST (Traveller Sheet)

PROJECT NO: VESSEL TITLE:	SERIAL NO.: C.R.N. NO.: BC PROVINCIAL NO: (A) NO.:					
Over Sequence No. indicates applicable items.	SEQUENCE NO.	HOLD	Verification	INSPECTOR SIGN AND DATE		
				<i>Access</i>	<i>Owner</i>	<i>BCSO</i>
Repair procedure accepted by Owner	1.	✓		DO Feb 19/12		
Welding procedures registered.	2.	✓		DO Feb 19/12		
Welders have valid P.Q. Record	3.	✓		DO Feb 19/12		
Cracks checked by NDT after removal	4.					
Material to be used check against dwg. P.O. Material ID'd with SA/SB Spec. Material test reports checked.	5a.					
	5b.					
	5c.					
Fitup shells/flush patches Tubesheet/shell/firetube nozzles - fittings	6a.					
	6b.					
	6c.					
Radiographic examination	7.					
Non-destructive examination	8.	✓		DO Feb 29/12		
Internal Visual after welding	9.	✓		DO Feb 29/12		
External Visual after welding	10.	✓		DO Feb 29/12		
Heat Treatment	11.	✓		DO Feb 29/12		
Hardness Tests	12.					
Hydrostatic Pressure Test	13.	✓		DO Mar 6/12		
Alternative Test (Specify)	14.					
Repair Form (#10) completed	15.		✓	DO Mar 6/12		
Name plate attached	16.	✓		DO Mar 6/12		
OUTLINE SKETCH (ATTACH SEPARATE SHEET IF NECESSARY).	MATERIAL USED FOR REPAIR					
	ITEM	MATERIAL SPEC.	HEAT NO.	THK./SCH.	RATING	
	Shell/patches					
	Heads/end					
	Tubesheet					
	Firetube					
	Nozzles					
	Fittings					
	Flanges					



505 6th Street, Suite 200
New Westminster, BC V3L 0E1

Phone: (778) 396-2031
Toll Free: 1-866-566-SAFE
Fax: (778) 396-2064
www.safetyauthority.ca

BLUE DIAMOND DESIGN LTD
1977 VALLEY VIEW PLACE
VICTORIA BC V9B 6H8

Date: August 28, 2012
Account #: 48488
Journal #: 54965

Attn: PHIL DADE / ANDREE-ANNE PELLETIER

Re: Application for Design Registration

The design, as detailed in your, Ref: P8078 / Billing Ref 3893,, for a Fittings is accepted for registration as follows:

Registered To: ACCESS MANUFACTURING LTD **CRN:** 0H5361.1

MDMT: -20 deg F

MAWT: 100 deg F

MAWP: 285 psig

Drawing #: 6-LC-BRIDLE-P8078.09

Drawing Revision: 2

Reviewer's Notes:

1. CRN reissued to indicate the expiry date.
2. As required by CSA B51 Clause 4.2.1, this registration expires on February 7, 2019. This CRN is valid until the expiry date and as long as the Manufacturer maintains a valid quality control program verified by an acceptable third-party agency until that date. Should the certification of the quality control program lapse before the expiry date, this registration shall become void.

Contact me if you have any questions.

ROMEO TUAZON
(778) 396-2031
Romeo.Tuazon@safetyauthority.ca
Design Engineer

cc:



88 6th Street, Suite 400
New Westminster, BC V3L 5B3

Phone: (604) 660 - 6286
Toll Free: 1-866-566-SAFE
Fax: (604) 660 - 6215
www.safetyauthority.ca

ACCESS MANUFACTURING LTD
7904 101 AVENUE
FT ST JOHN BC V1J 2A3

Date: November 8, 2008
Account #: 48488
Journal #: 45597
Our File #: 3873626

Attn: RICHARD STREBCHUK

Re: Application for Design Registration

The design, as detailed in your, DWG: HSEP-WB-48x250.125.08 R.0, for a Pressure Vessel is accepted for registration as follows:

Registered To: ACCESS MANUFACTURING LTD **CRN:** K6964.1

MDMT: -20 deg F

MAWT: 100 deg F

MAWP: 285 psig

Drawing #: HSEP-WB-48x250.125.08

Drawing Revision: 0 (As Noted)

Contact me if you have any questions.

ROMEO TUAZON
(604) 660-6246
Romeo.Tuazon@safetyauthority.ca
Design Engineer

The Pressure Equipment Safety Authority

ALBERTA BOILERS SAFETY ASSOCIATION
9410 - 20 Avenue
Edmonton, Alberta T6N 0A4
Tel: (780) 437-9100 Fax: (780) 437-7787
e-mail: AR@absa.ca

INVOICE

**For information on your
pressure equipment
inventory please contact
Records@absa.ca**

Bill To:

ACCESS MANUFACTURING LTD
9420-9 3Ave Sub PO, Box 339
Attn: Accounts Payable
Fort St. John, BC V1J 6W7

RECEIVED

MA 23 2012

INVOICE NO DS055212

INVOICE DATE 2012/03/14

PAGE Page 1 of 1

Reference Number	Account Number	Payment Terms		
	024989	NET 30	Finance Charge 24% per annum @ 2% per month	
ORDERED	DATE OF SERVICE	DESCRIPTION	UNIT PRICE	EXT PRICE
1.00	2012.03.07	REGISTRATION OF A VESSEL DESIGN. Attention: PAT WILLIS Reg. No. V7290.2; Drawing No: HSEP-WB-48X250.125.08 Rev. 2; Track #: 2008-06975 ACCT# 020454	617.25	617.25
P12014				
2% Calculated Monthly on Past Due Fees			GST - R895026763	
ABSA is the Regulatory Authority that administers pressure equipment safety programs for this jurisdiction. ABSA's authority to collect fees is established in the Boilers Delegated Administration Regulation (AR 32/2002) The Fee Schedule is located on the internet at: www.absa.ca/ABSA-info/Fees/FeeSched.aspx			SUBTOTAL	617.25
			GST	0.00
			TOTAL	\$617.25

March 07, 2012

RECEIVED

MAR 22 2012

Pat Willis
ACCESS MANUFACTURING LTD
9420 93 AVENUE
BOX 339
FORT ST JOHN, BC

Dear Pat Willis,

The design submission, tracking number 2008-06975, originally received on September 23, 2008 was surveyed and accepted for registration as follows:

CRN : V7290.2

Accepted on: March 07, 2012

Reg Type : New Design

Drawing No. : HSEP-WB-48X250.125.08 Rev 2 As Noted

Description	MAWP	Design Temperature	MDMT
Internal Pressure	1965 kPa	38°C	-29°C

The registration is conditional on your compliance with the following notes:

- Please note that the upper fillet size of 0.4286" instead 0.375" shall be for the flange type RFSO nozzle A1 and material SA-105N shall be for item-#8 24"-150# RF Blind flange instead SA-36.

An invoice covering survey and registration fees will be forwarded from our Revenue Accounts.

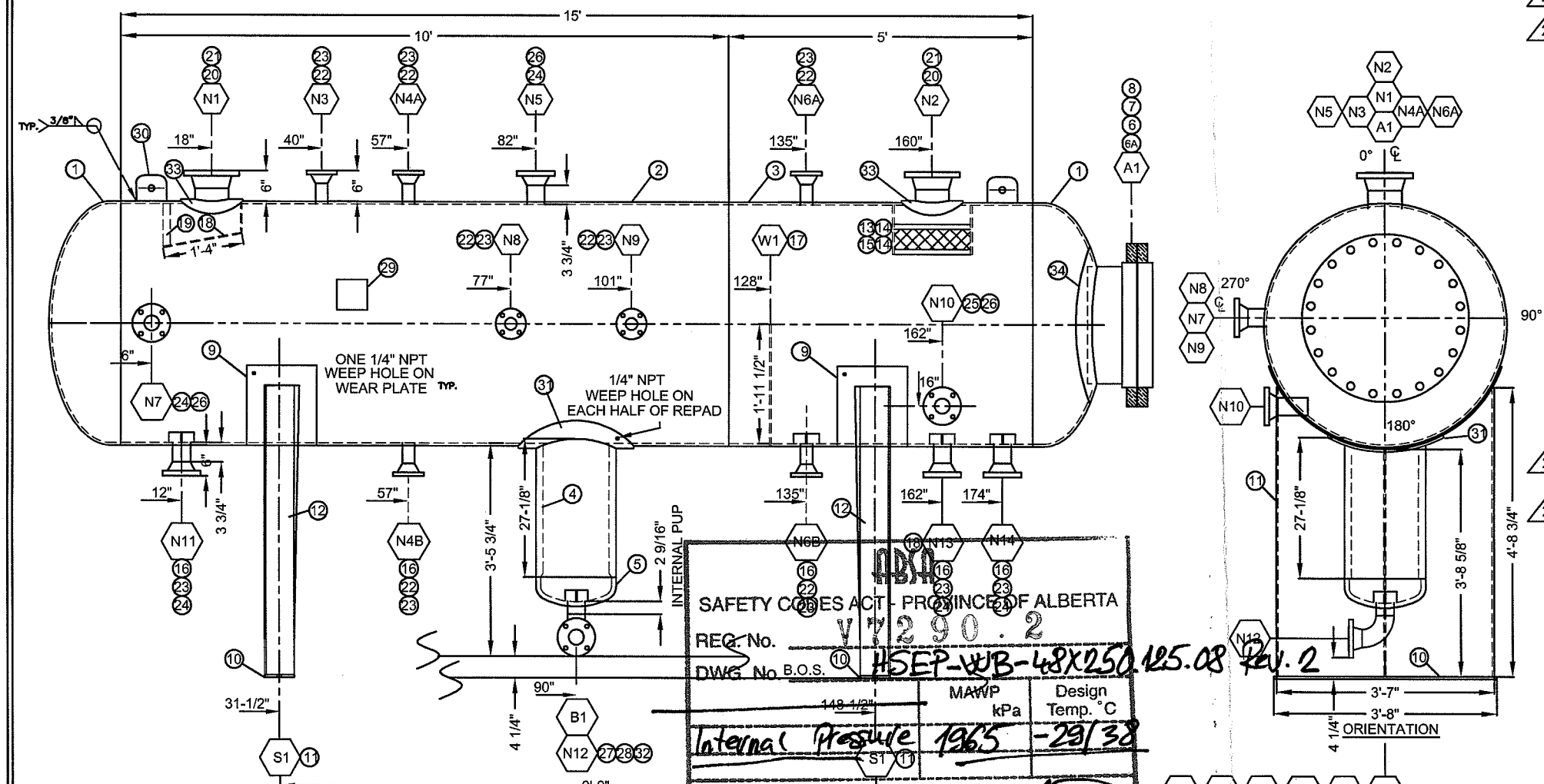
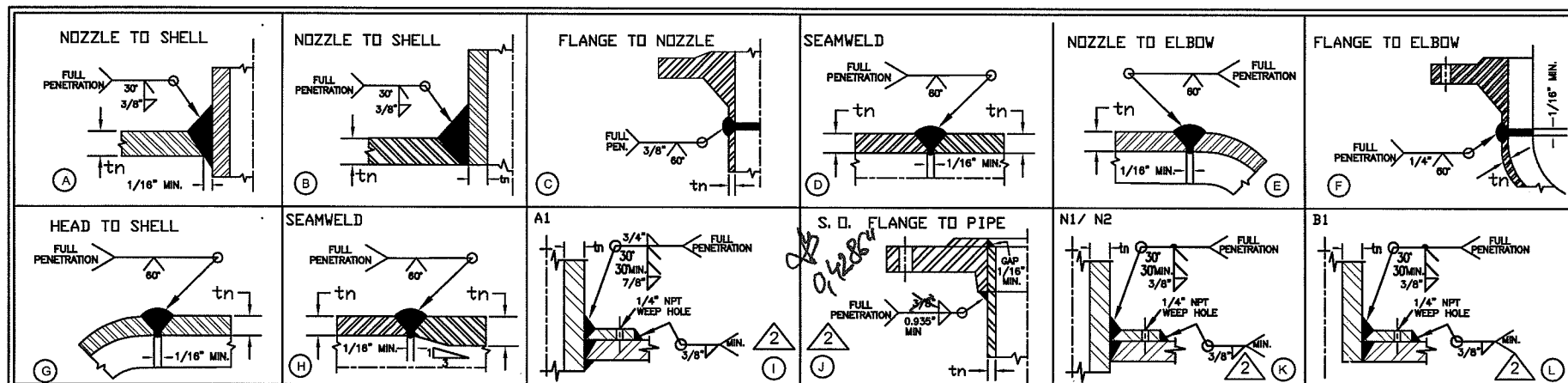
Enclosed are stamped prints for your reference.

Sincerely,



DEDOVIC, BLAZO
Design Surveyor

P12014



NOZZLE SCHEDULE									
MK.	QTY.	SIZE	RATING	SCH.	TYPE	SERVICE	INT. PROJ.	O/S PROJ.	WELD DETAIL
N1	1	6"	150#	160	RFWN	INLET	1/2"	6"	C,K
N2	1	6"	150#	160	RFWN	GAS OUTLET	1/2"	6"	C,K
N3	1	2"	150#	160	RFWN	GUIDED WAVE RADAR	FLUSH	6"	B,C
N4A/B	1	2"	150#	160	RFWN	WATER BRIDLE-LSHH,LG,L.SLL	FLUSH	6"	B,C
N5	1	3"	150#	160	RFWN	PSV	FLUSH	6"	B,C
N6A/B	2	2"	150#	160	RFWN	HC BRIDLE-LC, LG	FLUSH	6"	B,C
N7	1	3"	150#	160	RFWN	INSPECTION	1/2"	6"	A,C
N8	1	2"	150#	160	RFWN	PI	FLUSH	6"	B,C
N9	1	2"	150#	160	RFWN	TI	FLUSH	6"	B,C
N10	1	3"	150#	160	RFWN	SPARE	FLUSH	6"	B,C
N11	1	3"	150#	160	RFWN	SPARE	FLUSH	6"	B,C
N12	1	3"	150#	160	RFWN	WATER BOOT DRAIN	FLUSH	6"	B,C
N13	1	3"	150#	160	RFWN	OIL / CONDY OUT	FLUSH	6"	B,C
N14	1	3"	150#	160	RFWN	SPARE	FLUSH	6"	B,C
A1	1	24"	150#	1 1/4"	RFSO	MANWAY	1.00"	6"	I,J,D
B1	1	16"	-	80	PIPE	WATER BOOT	FLUSH	AS SHOWN	L,H

ITEM QTY.			DESCRIPTION	MATERIAL
1	2		HEADS - 47" I.D. x (0.460" MIN. HEAD THK) 2:1 SEMI-ELLIPTICAL C/W 2" x 0.500" WT SF	SA-516-70N
2	1		SHELL PLATE - 47" I.D. x 0.500" THK. x 10'-0" LG SHELL #1	SA-516-70N
3	1		SHELL PLATE - 47" I.D. x 0.500" THK. x 5'-0" LG SHELL #2	SA-516-70N
4	1		16" x 0.844" WT x 27'-1/8" LG SMLS PIPE WATER BOOT- WATER BOOT SCARF 3:1 TO 3/8"	SA-106B
5	1		16" x 0.375" WT WELD CAP HEAD	SA-234-WPB
6	1		24" 150# RFSO FLANGE A1	SA-105N
6A	1		SHELL PLATE - 21.5" I.D. x 1.250" THK x 12" LG A1	SA-516-70N
7	1		24" 150# FLEXITALIC GASKET A1	SA-105N
8	1		24" 150# RF BLIND FLANGE A1	SA-105N
9	2		3/8" FLATBAR x 14" x 5'-0" LG WEAR PLATE	SA-36
10	2		1/2" FLATBAR x 6" x 44" LG LEG BASEPLATE	SA-36
11	2		3/8" PLATE x 43" x 56-3/4" LG SUPPORT LEGS	SA-36
12	2		3/8" FLAT BAR x 6" x 44-5/8" LG SUPPORT LEG RIB	SA-36
13	1		18" 0.375 WT x 8'-1/4" LG SMLS PIPE DEMISTER PAD HOLDER	SA-36
14	2		3/16" x 1" x 1.7 SQ. FT. TWIST BAR GRATING DEMISTER PAD SUPPORT	SA-316L
15	1		18" x 9#/CU FT. x 4" THK. 316L DEMISTER PAD	SA-36
16	5		3/8" FLATBAR x 2" x 5" LG, 2 PIECES EA. VORTEX BREAKER	SA-106B
17	1		3/8" PLATE x 23-1/2" x 47" WEIR	SA-36
18	1		3/8" PLATE x 16" x 22" LG INLET DIVERTER	SA-36
19	2		3/8" FLATBAR x 1-1/2" x 8'-7/16" LG INLET DIVERTER SUPPORT	SA-106B
20	2		6" SCH. 160 SMLS PIPE x 3'-1/2" LG N1, N2	SA-105N
21	2		6" 150# SCH. 160 RFWN FLANGES N1, N2	SA-106B
22	7		2" SCH 160 SMLS PIPE x 4" LG N3, N4A/B, N6A/B, N8, N9	SA-105N
23	7		2" 150# SCH. 160 RFWN FLANGES N3, N4A/B, N6A/B, N8, N9	SA-106B
24	6		3" SCH 160 SMLS PIPE x 3'-3/4" LG N5, N7, N11, N12, N13, N14	SA-106B
25	1		3" SCH 160 SMLS PIPE x 5'-3/4" LG N10	SA-106B
26	2		3" 150# SCH 160 RFWN FLANGES N5, N7, N10	SA-105N
27	1		3" SCH. 160 SMLS PIPE x 2'-9/16" LG N12	SA-106B
28	1		3" SCH 160 90° L.R. B.W. ELBOW N12	SA-234-WPB
29	1		ACCESS MANUFACTURING LTD. STANDARD NAMEPLATE & BRACKET	SA-36
30	2		1-3/16" PLATE x 5" x 6" LIFT LUGS	SA-36
31	1		1/2" THK PLATE x 23" O.D. x 16'-1/8" I.D. SPLIT REPAD B1 RADIOGRAPH SEAM	SA-516-70N
32	4		3" 150# SCH. 160 RFWN FLANGES N11, N12, N13, N14	SA-105N
33	1		PLATE: 3/8" x 10'-5/8" O.D. x 6'-5/8" I.D. SPLIT REPAD N1, N2	SA-516-70N
34	1		PLATE: 3/8" x 32" O.D. x 23'-7/8" I.D. SPLIT REPAD A1 RADIOGRAPH SEAM	SA-516-70N

GENERAL DESIGN NOTES:

SERIAL NO: TBA A.S.M.E. SECTION VIII DIV.1, YEAR: 2010, 2011 ADDENDA
 DESIGN PRESSURE: 285 PSIG AT 100° F. M.D.M.T.: -20° F. @ 285 PSIG C/A: 0.125"
 HYDRO-STATIC TEST PRESSURE: 371 PSIG.
 HEAD MATERIAL: SA-516-70N HD. THK: 0.500" THICK (MIN: 0.460")
 SHELL MATERIAL: SA-516-70N SHELL THK: 0.500"
 WATER BOOT HEAD MATERIAL: SA-234-WPB MIN. HEAD. THK: 0.3125"
 WATER BOOT SHELL MATERIAL: SA-106B SMLS SHELL THK: 0.844"
 RADIOGRAPHY: FULL PER UW-11a
 STRESS RELIEVED: 1100°F FOR 30 MINUTES LOCAL
 CAPACITY: 5.7 m³ DRY WEIGHT: 6,788 LBS. VESSEL WEIGHT FULL OF WATER: 19,569 LBS.
 IMPACT TESTING EXEMPT PER UCS-66a, UG-201 f-5.
 ALL BOLT HOLES STRADDLE NORMAL CENTER LINES UNLESS OTHERWISE NOTED.
 MTR(s) TO BE PROVIDED FOR ALL PRESSURE RETAINING MATERIAL.
 MATERIAL USED MAY BE SUBSTITUTED TO A HIGHER GRADE DEPENDING ON AVAILABILITY
 HYDROSTATIC TEST TEMPERATURE TO BE CONDUCTED AS PER PARA. UG-99 (h).
 ACCESS MANUFACTURING LTD. DOES NOT ASSUME RESPONSIBILITY OR LIABILITY FOR ANY CHANGES MADE TO THE VESSEL OR ANY EXTERNAL ATTACHMENTS ADDED TO THIS VESSEL NOT DONE IN OUR SHOP.
 SSPC-SP-10 COMMERCIAL SANDBLAST AND APPLY 1 COAT OF GREY EPOXY PRIMER.
 *SA-193 B7M STUDS & SA-194 2HM NUTS C/W 304 SS FLEXITALIC GASKETS TO BE SUPPLIED WITH APPROPRIATE FLANGES.

DO NOT SCALE FROM THIS DRAWING

2 SUPPLEMENTARY CALCULATIONS: 3797ACC-R0
 - Exposed inside edges shall be chamfered or rounded per UG-76C.
 OB

SAFETY CODES ACT - PROVINCE OF ALBERTA
 REG. No. V 7290.2
 DWG. No. B.O.S. HSEP-WB-48x250.125.08 Rev. 2
 Internal Pressure 196.5 -29/38
 M.A.W.P. kPa Design Temp. °C
 ACCEPTED
 MAR 07 2012
 VESSEL TAG No: BLAZO DE DOVIC DESIGN SURVEYOR

REVISIONS:			
2	ISSUED FOR ABSA REGISTRATION	TL/PD	06.03.12
1	FOR CONSTRUCTION	RS	05.01.09
0	FOR REGISTRATION	RS	19.09.08
NO.	DESCRIPTION:	BY:	DD/MM/YR

TITLE: ACCESS MANUFACTURING LTD.
 47" I.D. x 15'-0" S/S x 285 MAWP x 1/8" C.A.
 3 PHASE SEPARATOR

DRAWN BY:	RS	SCALE:	NTS
CHECKED BY:	T.L.	PROJ. #:	
APPROVED BY:	W.M.	DWG. #:	HSEP-WB-48 x285.125.08
SHEET 1 OF: 2	REV.:		2

CUSTOMER: ACCESS MANUFACTURING LTD. TITLE: 48" O.D. x 15FT S/S HORIZONTAL SEPARATOR SERIAL #:

August 28, 2012

Attention: Andree-Anne Pelletier
ACCESS MANUFACTURING LTD
9420 93 AVENUE
BOX 339
FORT ST JOHN, BC

The design submission, tracking number 2012-05145, originally received on July 24, 2012 was surveyed and accepted for registration as follows:

CRN : OH05361.12

Accepted on: August 28, 2012

Reg Type: New Design

Expiry Date: February 07, 2019

Drawing No. : 6-LC-BRIDLE-P8078.09 Rev 2

Fitting type: 6" SCH STD BRIDLE

Description	MAWP	Design Temperature	MDMT
Internal Pressure	1965 kPa	38°C	-29°C

The registration is conditional on your compliance with the following notes:

This registration is valid until the indicated expiry date only if the Manufacturer maintains a valid quality management system approved by an acceptable third-party agency until that date. Should the approval of the quality management system lapse before the expiry date indicated above, this registration shall become void.

An invoice covering survey and registration fees will be forwarded from our Revenue Accounts.

If you have any question don't hesitate to contact me by phone at (780) 433-0281 ext 3369 or fax (780) 437-7787 or e-mail Radisavljevic@absa.ca.

Sincerely,

Zana Radisavljevic

RADISAVLJEVIC, ZANA, R.E.T.



88 6th Street, Suite 400
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British Columbia V3L 5B3

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Fax: (604) 660-6215
www.safetyauthority.ca

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MANUFACTURER'S DATA REPORT FOR PRESSURE VESSEL

Partial/ Partiel ☐

DÉCLARATION DE CONFORMITÉ DU CONSTRUCTEUR D'APPAREILS SOUS PRESSION

Upon shipment of a pressure vessel, this form fully and correctly filled in must be mailed to the office of the Chief Inspector in the province of installation in accordance with the regulations under the Act, governing the construction and installation of pressure vessels.

Au moment de l'expédition d'un appareil sous pression, ce formulaire complété correctement, doit être envoyé au bureau de l'inspecteur en chef de la province d'installation tel que prévu dans les règlements de la loi sur les appareils sous pression.

Manufactured by Construit par	Name and address of Manufacturer/ <i>Nom et adresse du constructeur</i> ACCESS MANUFACTURING LTD.
Manufactured for Construit pour	Name and address of Purchaser or Consignee/ <i>Nom et adresse du client ou de son représentant</i> Resale
Ultimate owner Utilisateur	Name and address/ <i>Nom et adresse</i> UNKNOWN
Location of installation Lieu d'installation	Address/ <i>Adresse</i> UNKNOWN

Pressure Vessel/ Appareil

Type/ <i>Genre</i> 48" O.D. HORIZONTAL SEPARATOR	Overall Length/ <i>Longueur totale</i> 15'-0" SEAM TO SEAM	Serial No./ <i>N° de série</i> P8078-01	Year Built/ <i>Année de fabrication</i> 2008
Provincial Registration No. - C.R.N./ <i>N° d'enregistrement provincial - N.E.C.</i> K6964.1	National Board No./ <i>N° National Board</i> NONE	Drawing No./ <i>N° de design</i> HSEP-WB-48x285.125.08	

The chemical and physical properties of all parts meet the requirements of material specifications of the A.S.M.E. Code.

Les propriétés chimiques et physiques de toutes les composantes respectent les exigences des spécifications de matériaux de code ASME.

The design, construction and workmanship conform to CSA B51. <i>La conception, la construction et la façon sont conformes à ACNOR B51.</i>	ASME Section VIII	Division 1	Addenda/Supplément 2007	Code Case No. <i>N° de cas</i>
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Shell/ Virole

Description	Material <i>Matériau</i>	Thickness <i>Épaisseur</i>	Corr. Allow. <i>Surépais De corr.</i>	Diameter <i>Diamètre</i>	Longitudinal Joints <i>Joints longitudinaux</i>			P.W.H.T. <i>Traitement therm</i>		Girth Joints <i>Hoints de circonférence</i>		Number of Courses <i>Nombre de sections</i>
					Type	R.T. Radiog.	Efficiency <i>Efficacité</i>	Temp.	Time <i>Durée</i>	Type	R.T. Radiog.	
CYLINDER	SA-516-70N	0.500"	0.125"	48"	1	FULL	100%	1100 °F	30 MIN.	1	100%	3

Heads/ Tetes

Description	Material <i>Matériau</i>	Min. Thickn. <i>Épais minim.</i>	Corr. Allow. <i>Surép. Corr.</i>	Crown Radius <i>Rayon couron.</i>	Knuckle Radius <i>Petit rayon</i>	Ellipse Ratio <i>Rapp. ellipse</i>	Conical Apex Angle <i>Angle conique</i>	Hemisph Radius <i>Ray. Hemisph</i>	Flat Diameter <i>Diam. plat</i>	Side to Pressure <i>Côte sous pression</i>
2:1 SEMI ELLIPTICAL	SA-516-70N	0.500"	0.125"	23.5"	8.16"					CONCAVE
Removable Bolts Used (Describe other fastenings) <i>Boulons amovible utilisés (décrire tout autre attache)</i>					Mat'l Spec./ <i>Spéc. Du mat.</i> SA-193			Grade B7M	Size/ <i>Dimension</i> SEE FLANGES	

Pressure-Temperature/ Pression - température

Pressure Vessel Part <i>Partie de l'appareil</i>	Constructed for Maximum Allowable Working Pressure <i>Construit pour une pression maximale de marche premise</i> 285 PSI	At Max. Temp. <i>A une temp. max.</i> 100 DEG. F	Min. Temp. (when less than -29°C). <i>Temp. min. (inférieure à - 29°C)</i>	Test Pressure (hydro-pneumatic or combination) <i>Pression d'épreuve (hydro-pneumatique ou combinaison)</i> 370.5 PSIG
SHELL / HEADS				

Tube Section/ Faisceau tubulaire

Tubesheet/ <i>Plaque tubulaire</i>	Material/ <i>Matériau</i>	Diameter/ <i>Diamètre</i>	Nominal Thickness <i>Épaisseur nominale</i>	Corr. Allowance <i>Surépais. corrosion</i>	Attachment <i>Mode d'attachement</i>
Tube Material/ <i>Matériau des tubes</i>	Diameter/ <i>Diamètre</i>	Nominal Thickness (Gauge) <i>Épaisseur nominale (calibre)</i>	Number/ <i>Nbre</i>	Type (Straight or U) <i>Type (Droit ou U)</i>	Heating Surface <i>Surface de chauffe</i>

MANUFACTURER'S DATA REPORT FOR PRESSURE VESSEL

Jacket / Chemise

Type of Jacket Genre de chemise	Jacket Closure Fermeture de chemise	Proof Test Pression d'épreuve	Heating Surface Surface de chauffe	Sketch/ Schéma
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Safety Valve Outlets/ Soupapes de sûreté

Number/ Nombre 1	Dimension 2 INCH	Location/ Endroit CYLINDER
---------------------	---------------------	-------------------------------

Nozzles and Openings/ Tubulures et ouvertures

Purpose/ But	Number Nombre	Dimensi on	Type	Material Matériau	Nominal Thickness Épaisseur nominale	Reinforcement Material Matériau de renfort	How Attached Genre d'attaches	Location Endroit
PROCESS INLET	N1	6"	150# RFWN	SA-105N	Sch.160	YES	UW-16 (c)	SHELL
PROCESS OUTLET	N2	6"	150# RFWN	SA-105N	Sch.160	YES	UW-16 (c)	SHELL
GUIDED WAVE RADAR	N3	2"	150# RFWN	SA-105N	Sch.160	NO	UW-16 (c)	SHELL
WATER BRIDLE	N4A/B	2"	150# RFWN	SA-105N	Sch.160	NO	UW-16 (c)	SHELL
PSV	N5	3"	150# RFWN	SA-105N	Sch.160	NO	UW-16 (c)	SHELL
HC BRIDLE-LC, LG	N6A/B	2"	150# RFWN	SA-105N	Sch.160	NO	UW-16 (c)	SHELL
INSPECTION	N7	3"	150# RFWN	SA-105N	Sch.160	NO	UW-16 (c)	SHELL
PRESSURE INDICATOR	N8	2"	150# RFWN	SA-105N	Sch.160	NO	UW-16 (c)	SHELL
TEMP. IND.	N9	2"	150# RFWN	SA-105N	Sch.160	NO	UW-16 (c)	SHELL
SPARE	N10	3"	150# RFWN	SA-105N	Sch.160	NO	UW-16 (c)	SHELL
SPARE	N11	3"	150# RFWN	SA-105N	Sch.160	NO	UW-16 (c)	SHELL
WATER BOOT DRAIN	N12	3"	150# RFWN	SA-105N	Sch.160	NO	UW-16 (c)	SHELL
OIL/COND. OUT	N13	3"	150# RFWN	SA-105N	Sch.160	NO	UW-16 (c)	SHELL
SPARE	N14	3"	150# RFWN	SA-105N	Sch.160	NO	UW-16 (c)	SHELL
ACCESS	A1	24"	150# RFSO	SA-105N	1.00" WT.	NO	UW-16 (c)	HEAD

Supports/ Supports

Skirt/ Jupe Yes/ Oui NO	No/ Non	Lugs/ Oreilles No./ Nbre YES 2	Legs/ Pieds No./ Nbre YES 2	Other/ Autres (Description)	Attached/ Attaches (Where and How/ Méthode et endroit) SHELL- WELDED
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Remarks/ Observations (Cubical capacity/ Volume)

5.7 m3 *Owner to supply relief valve

Certificate of Compliance/ Certificat de conformité

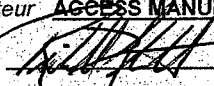
We certify that the statements made in this data report are correct and that the said vessel has been constructed in accordance with the Provincial Registered design below and the requirements of standard CSA B51.

Nous certifions que les données de la déclaration de conformité sont correctes et que l'appareil a été construit en accord avec l'enregistrement provincial ci-dessous et les exigences de la norme ACNOR B51.

Provincial Registered Design Enregistrement provincial CRN K6964.1

Manufacturer

Constructeur ACCESS MANUFACTURING LTD.

Signature  Date JAN. 23/09

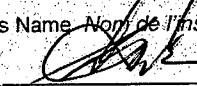
Certificate of Shop Inspection/ Certificat d'inspection en usine

I, the undersigned, a duly authorized Boiler and Pressure Vessel Inspector Je, soussigné, inspecteur autorisé de chaudières et appareil sous pression employed by employé par British Columbia Safety Authority of/ de British Columbia, have inspected the above vessel and state that to the best of my knowledge and belief, the manufacturer has constructed the vessel in accordance with the Provincial registration

CRN K6964.1 and the requirements of standard CSA B51.

Ai inspecté l'appareil précité et autant que je sache, crois que le constructeur a construit l'appareil en accord avec l'enregistrement provincial NEC et les exigences de la norme ACNOR B51.

Inspector's Name Nom de l'inspecteur D. WARDEN

Signature  BC # 63 Date 09/01/23

Certificate of Compliance – Field Work/

Certificat de conformité – Installation au chantier

We certify that the field installation of all parts of the vessel conforms with the requirements of Provincial Regulations.

Nous certifions que l'installation au chantier de toutes les composantes de l'appareil est conforme aux règlements provinciaux.

Installer's Name

Nom de l'installateur

Signature

Date

Certificate of Field Inspection/ Certificat d'inspection – Installation au chantier

I, the undersigned, a duly authorized Boiler and Pressure Vessel Inspector Je, soussigné, inspecteur autorisé de chaudières et appareil sous pression employed by employé par

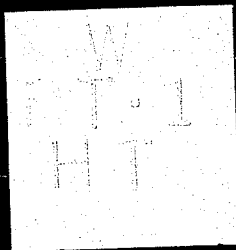
have inspected the items not covered by the Shop Inspection Certificate and the installation of the items and state that to the best of my knowledge and belief the construction and assembly of the items are in accordance with the Provincial Regulations.

Ai inspecté les composantes non couvertes par le certificat d'inspection en usine et l'installation de l'appareil et, autant que je sache, la construction et l'assemblage de l'appareil sont en accord avec les règlements provinciaux.

Inspector's Name

Nom de l'inspecteur

Signature Date



CERTIFIED BY:

**ACCESS
MANUFACTURING
Ltd.**

FORT ST. JOHN, B.C., CANADA
PHONE: (250) 785-5578

MA-LICENCE # 46475

JOB # P8078 TAG # YEAR BLT 2008

VESSEL TYPE 48 X 15 5/8 HORIZONTAL SEPARATOR

CRN K6964.1

SERIAL # P8078.01

NAT. BD #

C.A. 0.125

M.A.W.P.

285

P.S.I.

AT 100

°F

M.D.M.T.

-20

°F

AT 285

P.S.I.

SHELL THK. 0.500

IN. HEAD THK. 0.500

IN.

SHELL MTL. SA-516-70

HEAD MTL. SA-516-70

PROV. ID #

A #

CODE REF. ASME SEC VIII DIV I

CERTIFIED BY:
ACCESS
MANUFACTURING
Ltd.
FORT ST. JOHN, B.C., CANADA
PHONE: (250) 785-5578

62 51 5/8 LEVEL
CONTROL BRIDLE

JOB #

8078

M.A.W.P. 235 P.S.I. @ 100 °F

SERIAL # 8078 02

YEAR: 2002

C.R.N. # 011001.1

PROV. #

CERTIFIED BY:

ACCESS
MANUFACTURING
Ltd.

FORT ST. JOHN, B.C., CANADA
PHONE: (250) 785-5578

JOB #

18078

EX-ENT-VALVE
CONTROL HANDLE

M.A.W.P.

150

P.S.I. @

100

°F

SERIAL #

11078135701

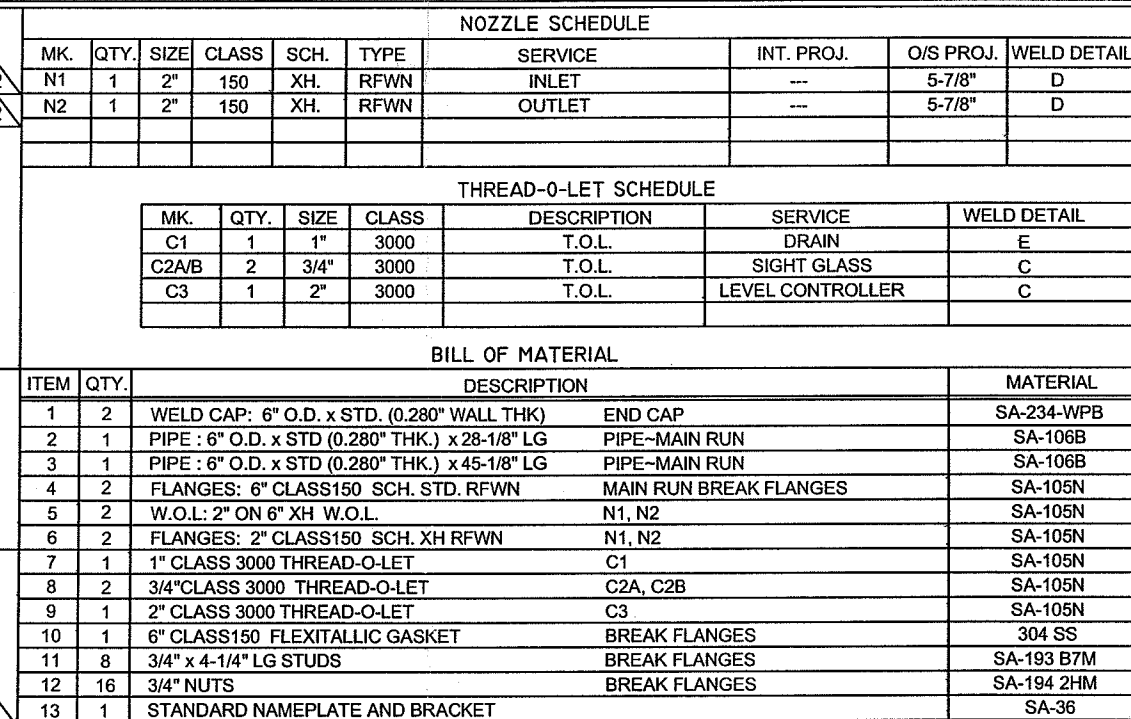
YEAR:

2003

C.R.N. #

0115211

PROV. #



NOTE:
*SA-193 B7M STUDS & SA-194 2HM NUTS C/W 304 SS FLEXITALIC GASKETS TO BE SUPPLIED FOR ALL FLANGES NOT FURTHER SPECIFIED.

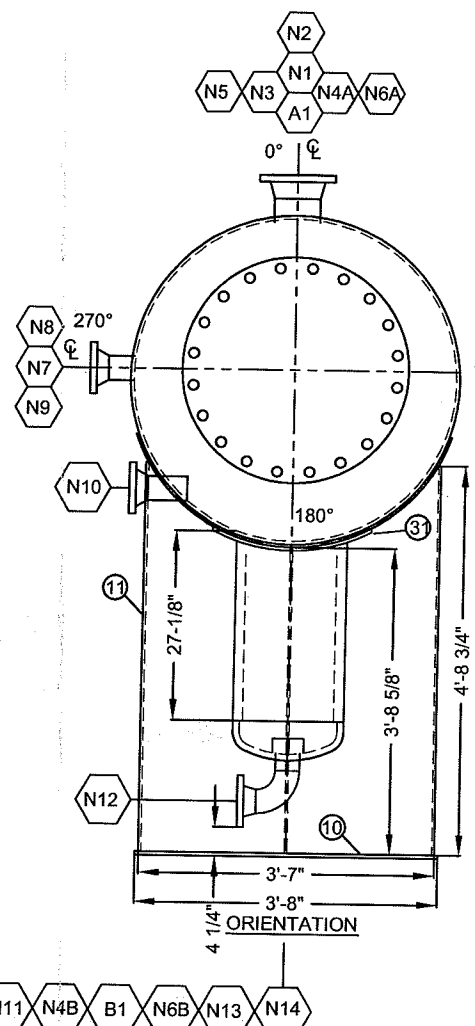
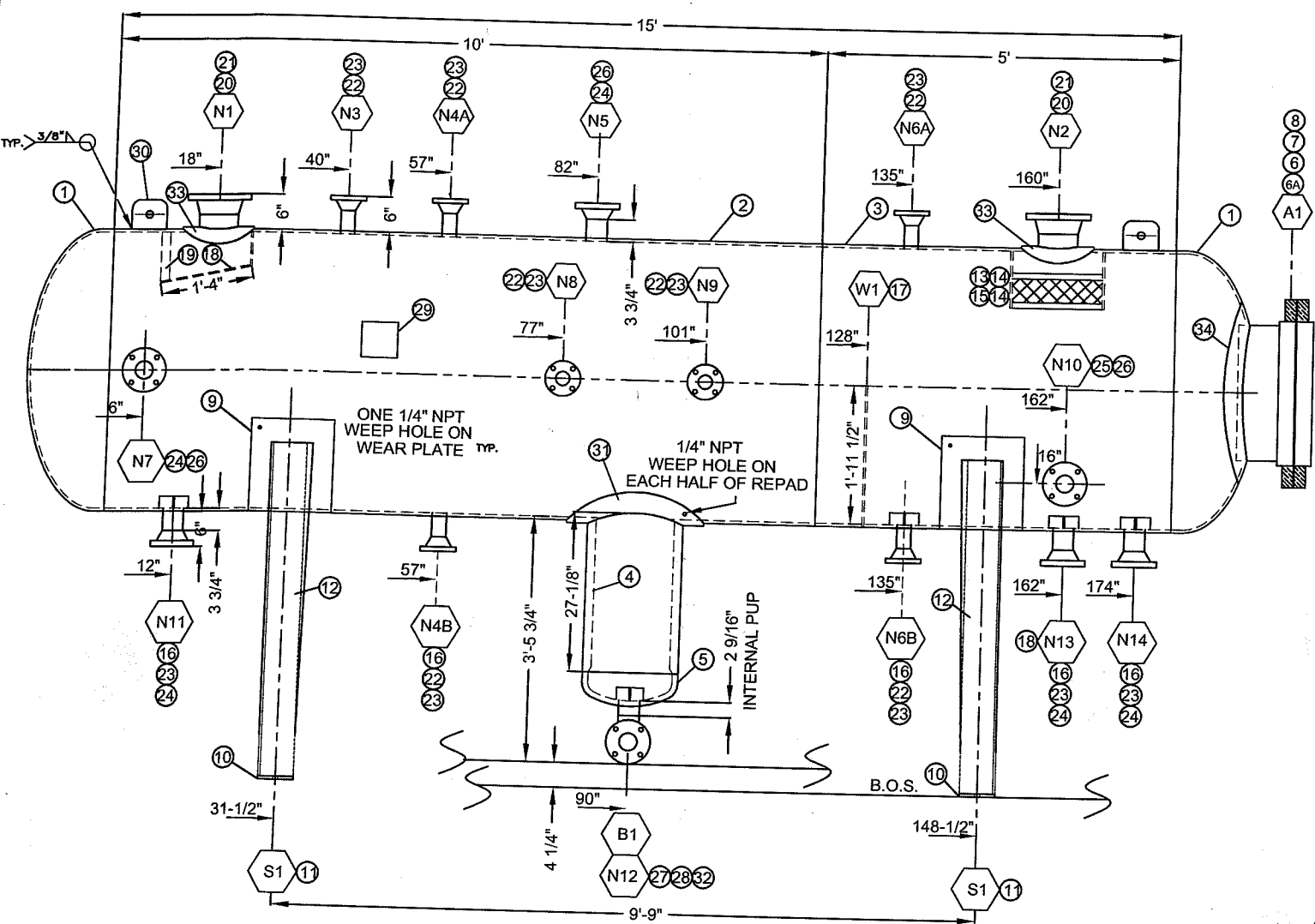
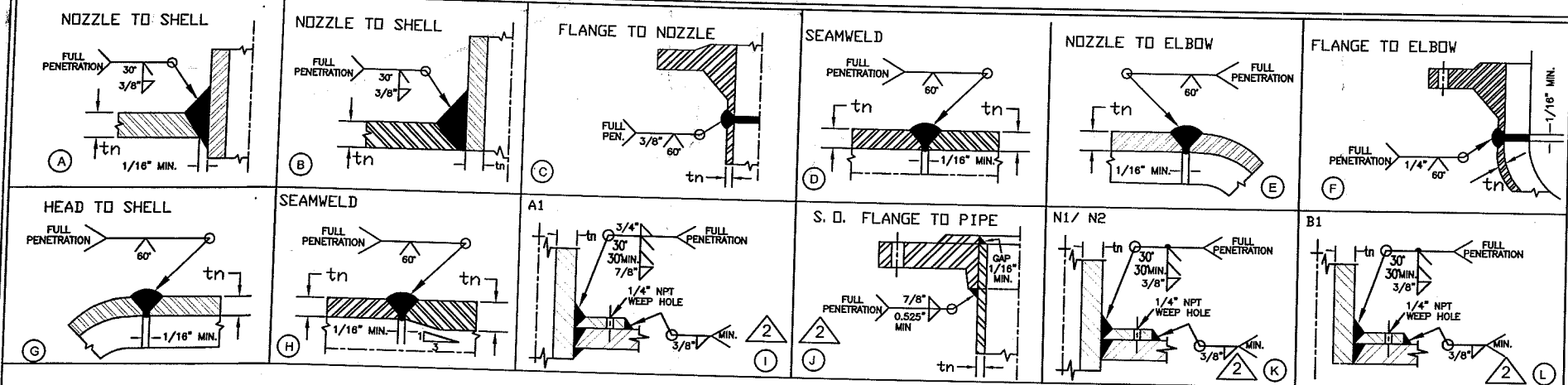
CRN:OH5361.1 SERIAL NO: P8078.LCB.01
 2 A.S.M.E. B31.3 YEAR: 2010 WELD PROCEDURES: AML-5M, AML-2
 DESIGN PRESSURE: 285 PSIG AT 100° F. M.D.M.T. -20° F. @ 285 PSIG C/A: 0.125"
 RADIOGRAPHY: 100%
 2 IMPACT TESTING OF ALL COMPONENTS IS EXEMPT PER TABLE 323.2.2 COLUMN A
 STRESS RELIEVED: NO PWHT
 HYDRO-STATIC TEST PRESSURE: 427.5 PSI
 2 CAPACITY: 1.45FT³ DRY WEIGHT: 140 LBS. VESSEL WEIGHT FULL OF WATER: 240 LBS.
 ALL BOLT HOLES STRADDLE NORMAL CENTER LINES UNLESS OTHERWISE NOTED.
 MTR(s) TO BE PROVIDED FOR ALL PRESSURE RETAINING MATERIAL.
 MATERIAL USED MAY BE SUBSTITUTED TO A HIGHER GRADE DEPENDING ON AVAILABILITY
 ACCESS MANUFACTURING LTD. DOES NOT ASSUME RESPONSIBILITY OR LIABILITY FOR
 ANY CHANGES MADE TO THE VESSEL OR ANY EXTERNAL ATTACHMENTS
 ADDED TO THIS VESSEL NOT DONE IN OUR SHOP.
 *SA-193 B7M STUDS & SA-194 2HM NUTS C/W 304 SS FLEXITALIC GASKETS TO BE SUPPLIED
 WITH APPROPRIATE FLANGES.
 SSPC-SP-6 COMMERCIAL SANDBLAST AND APPLY 1 COAT OF GREY EPOXY PRIMER.

DRAWN BY:	RS	SCALE: NTS
CHECKED BY:	T.L.	PROJ.#: T.B.A.
APPROVED BY:	W.M.	DWG.#: 6-LC-BRIDLE-P8078.09
SHEET 1 OF: 1		REV.: 

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REVISIONS:			
2	UPDATED TO 2010 CODE, GENERAL REVISIONS	DO	04.17.12
1	ADD WELD DETAIL	RS	03.02.09
0	FOR REGISTRATION	RS	02.02.09
NO.	DESCRIPTION	BY	DD/MM/YR

CUSTOMER: ACCESS MANUFACTURING LTD. TITLE: 48" O.D. x 15FT S/S HORIZONTAL SEPARATOR SERIAL #:



NOZZLE SCHEDULE										INT. PROJ.	O/S PROJ.	WELD DETAIL
MK.	QTY.	SIZE	RATING	SCH.	TYPE	SERVICE						
N1	1	6"	150#	160	RFWN	INLET				1/2"	6"	C,K
N2	1	6"	150#	160	RFWN	GAS OUTLET				1/2"	6"	C,K
N3	1	2"	150#	160	RFWN	GUIDED WAVE RADAR				FLUSH	6"	B,C
N4A/B	1	2"	150#	160	RFWN	WATER BRIDLE-LSHH,LG,LSLL				FLUSH	6"	B,C
N5	1	3"	150#	160	RFWN	PSV				FLUSH	6"	B,C
N6A/B	2	2"	150#	160	RFWN	HC BRIDLE-LC, LG				FLUSH	6"	B,C
N7	1	3"	150#	160	RFWN	INSPECTION				1/2"	6"	A,C
N8	1	2"	150#	160	RFWN	PI				FLUSH	6"	B,C
N9	1	2"	150#	160	RFWN	TI				FLUSH	6"	B,C
N10	1	3"	150#	160	RFWN	SPARE				FLUSH	6"	B,C
N11	1	3"	150#	160	RFWN	SPARE				FLUSH	6"	B,C
N12	1	3"	150#	160	RFWN	WATER BOOT DRAIN				FLUSH	6"	B,C
N13	1	3"	150#	160	RFWN	OIL / CONDY OUT				FLUSH	6"	B,C
N14	1	3"	150#	160	RFWN	SPARE				FLUSH	6"	B,C
A1	1	24"	1 1/4"	1	RFSO	MANWAY				1.00"	6"	I,J,D
B1	1	16"	-	80	PIPE	WATER BOOT				FLUSH	AS SHOWN	L,H

ITEM QTY.			DESCRIPTION		MATERIAL
1	2		HEADS - 47" I.D. x (0.460" MIN. HEAD THK)	2:1 SEMI-ELLIPTICAL C/W 2" x 0.500" WT SF	SA-516-70N
2	1		SHELL PLATE - 47" I.D. x 0.500" THK. x 10'-0" LG	SHELL #1	SA-516-70N
3	1		SHELL PLATE - 47" I.D. x 0.500" THK. x 5'-0" LG	SHELL #2	SA-516-70N
4	1		16" x 0.844" WT x 27'-1/8" LG SMLS PIPE	WATER BOOT	SA-106B
5	1		16" x 0.375" WT WELD CAP	HEAD - WATER BOOT SCARF 3:1 TO 3/8"	SA-234-WPB
6A	1		24" SCH. 80 (1.219" WT) SMLS PIPE x 24" LG.	A1	SA-105N
7	1		24" 150# FLEXITALIC GASKET	A1	SA-304L
8	1		24" 150# RF BLIND FLANGE	A1	SA-105N
9	2		3/8" FLATBAR x 14" x 5'-0" LG	WEAR PLATE	SA-36
10	2		1/2" FLATBAR x 6" x 44" LG	LEG BASEPLATE	SA-36
11	2		3/8" PLATE x 43" x 56-3/4" LG	SUPPORT LEGS	SA-36
12	2		3/8" FLAT BAR x 6" x 44-5/8" LG	SUPPORT LEG RIB	SA-36
13	1		18" 0.375 WT x 8-1/4" LG SMLS PIPE	DEMISTER PAD HOLDER	SA-36
14	2		3/16" x 1" x 1.7 SQ. FT. TWIST BAR GRATING	DEMISTER PAD SUPPORT	SA-316L
15	1		18" x 9#/CU FT. x 4" THK. 316L	DEMISTER PAD	SA-36
16	5		3/8" FLATBAR x 2" x 5" LG, 2 PIECES EA.	VORTEX BREAKER	SA-106B
17	1		3/8" PLATE x 23-1/2" x 47"	WEIR	SA-36
18	1		3/8" PLATE x 16" x 22" LG	INLET DIVERTER	SA-36
19	2		3/8" FLATBAR x 1-1/2" x 8-7/16" LG	INLET DIVERTER SUPPORT	SA-106B
20	2		6" SCH. 160 SMLS PIPE x 3-1/2" LG	N1, N2	SA-105N
21	2		6" 150# SCH. 160 RFWN FLANGES	N1, N2	SA-106B
22	7		2" SCH 160 SMLS PIPE x 4" LG	N3, N4A/B, N6A/B, N8, N9	SA-105N
23	7		2" 150# SCH. 160 RFWN FLANGES	N3, N4A/B, N6A/B, N8, N9	SA-106B
24	6		3" SCH 160 SMLS PIPE x 3-3/4" LG	N5, N7, N11, N12, N13, N14	SA-105N
25	1		3" SCH 160 SMLS PIPE x 5-3/4" LG	N10	SA-106B
26	2		3" 150# SCH 160 RFWN FLANGES	N5, N7, N10	SA-105N
27	1		3" SCH. 160 SMLS PIPE x 2-9/16" LG	N12	SA-106B
28	1		3" SCH 160 90° L.R. B.W. ELBOW	N12	SA-234-WPB
29	1		ACCESS MANUFACTURING LTD. STANDARD NAMEPLATE & BRACKET		
30	2		1-3/16" PLATE x 5" x 6"	LIFT LUGS	SA-36
31	1		1/2" THK PLATE x 23" O.D. x 16-1/8" I.D.	SPLIT REPAD B1 RADIOGRAPH SEAM	SA-516-70N
32	4		3" 150# SCH. 160 RFWN FLANGES	N11, N12, N13, N14	SA-105N
33	1		PLATE: 3/8" x 10-5/8" O.D. x 6-5/8" I.D.	SPLIT REPAD N1, N2	SA-516-70N
34	1		PLATE: 3/8" x 32" O.D. x 23-7/8" I.D.	SPLIT REPAD A1 RADIOGRAPH SEAM	SA-516-70N

GENERAL DESIGN NOTES:

SERIAL NO: TBA A.S.M.E. SECTION VIII DIV.1, YEAR: 2010, 2011 ADDENDA
DESIGN PRESSURE: 285 PSIG AT 100° F. M.D.M.T.: -20° F. @ 285 PSIG C/A: 0.125"
HYDRO-STATIC TEST PRESSURE: 371.5 PSIG
HEAD MATERIAL: SA-516-70N HD. THK: 0.500" THICK (MIN: 0.460")
SHELL MATERIAL: SA-516-70N SHELL THK: 0.500"
WATER BOOT HEAD MATERIAL: SA-234-WPB MIN. HEAD. THK: 0.3125"
WATER BOOT SHELL MATERIAL: SA-106B SMLS SHELL THK: 0.844"
RADIOGRAPHY: FULL PER UW-11a
STRESS RELIEVED: 1100°F FOR 30 MINUTES LOCAL
CAPACITY: 5.7 m3 DRY WEIGHT: 6,768 LBS. VESSEL WEIGHT FULL OF WATER: 19,569 LBS.
IMPACT TESTING EXEMPT PER UG-201-1.5.
ALL BOLT HOLES STRADDLE NORMAL CENTER LINES UNLESS OTHERWISE NOTED.
MTR(s) TO BE PROVIDED FOR ALL PRESSURE RETAINING MATERIAL.
MATERIAL USED MAY BE SUBSTITUTED TO A HIGHER GRADE DEPENDING ON AVAILABILITY
HYDROSTATIC TEST TEMPERATURE TO BE CONDUCTED AS PER PARA. UG-99 (h).
ACCESS MANUFACTURING LTD. DOES NOT ASSUME RESPONSIBILITY OR LIABILITY FOR
ANY CHANGES MADE TO THE VESSEL OR ANY EXTERNAL ATTACHMENTS
ADDED TO THIS VESSEL NOT DONE IN OUR SHOP.
SSPC-SP-10 COMMERCIAL SANDBLAST AND APPLY 1 COAT OF GREY EPOXY PRIMER.
*SA-193 B7M STUDS & SA-194 2HM NUTS C/W 304 SS FLEXITALIC GASKETS TO BE SUPPLIED
WITH APPROPRIATE FLANGES.

DO NOT SCALE FROM THIS DRAWING

VESSEL TAG No:

CRN: K6964.1

NOTES:

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APPROVED FOR CONSTRUCTION BY:

REVISIONS:

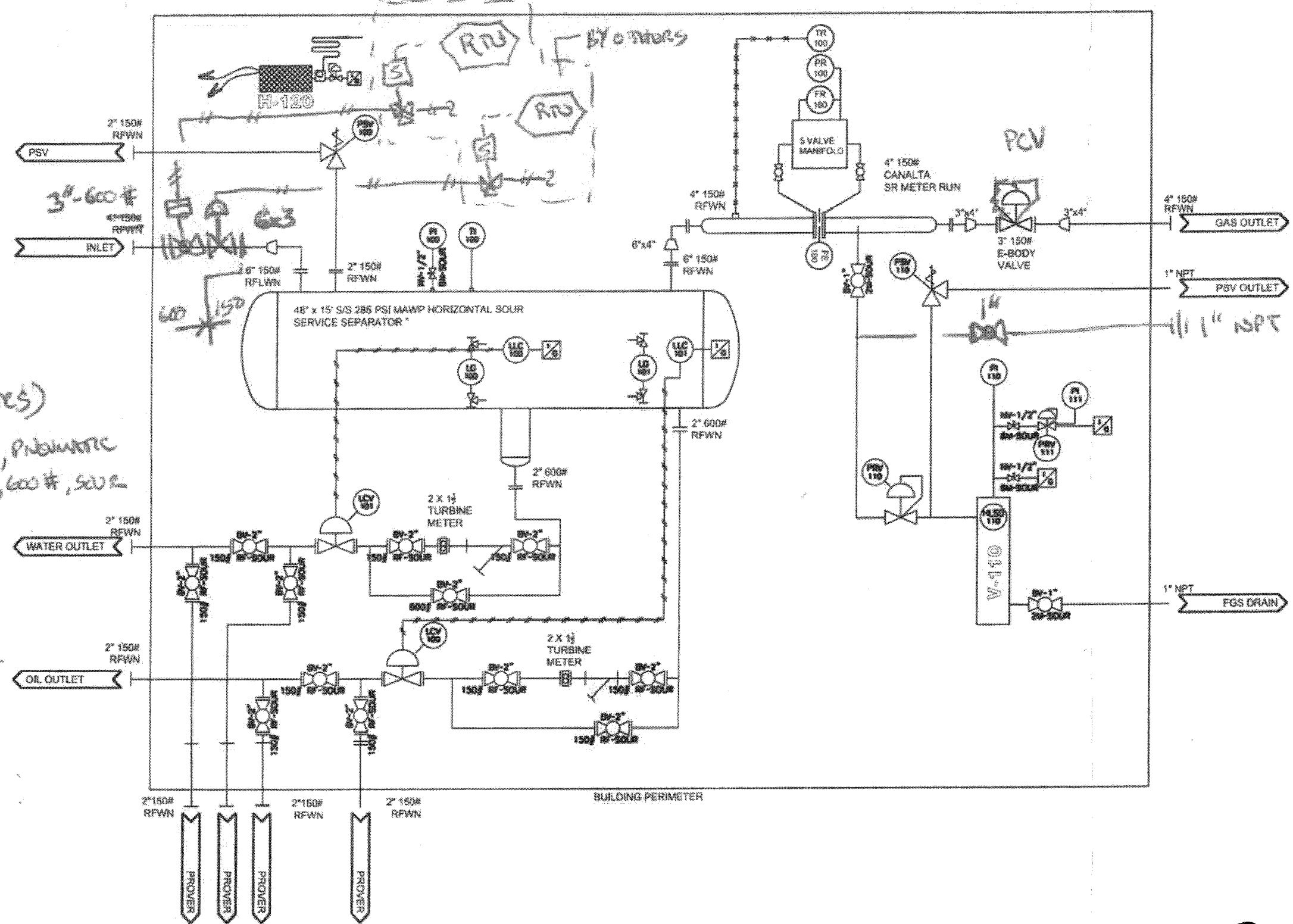
NO.	DESCRIPTION	BY	DD/MM/YR
2	ISSUED FOR ABSA REGISTRATION	TL/PD	06.03.12
1	FOR CONSTRUCTION	RS	05.01.09
0	FOR REGISTRATION	RS	19.09.08

TITLE: ACCESS MANUFACTURING LTD.
47" I.D. x 15'-0" S/S x 285 MAWP x 1/8" C.A.
3 PHASE SEPARATOR

ACCESS
MANUFACTURING
LTD.

DRAWN BY:	RS	SCALE:	NTS
CHECKED BY:	T.L.	PROJ.#:	
APPROVED BY:	W.M.	DWG.#:	HSEP-WB-48 x285.125.08
SHEET 1 OF: 2		REV.:	2

- (RTU BY OTHERS)
- (LV SOLANOIDS BY OTHERS)
- 3" FP 600# SOLE EBDV, PNEUMATIC
- 3" PCV, PNEUMATIC, 600#, SOLE (PC BY OTHERS)
- EXTERNAL F.G CONNECTION
- ACTUATORS SIZED FOR 40PSIG SUPPLY
- CONVERT BREV TO PCV



* P12014

NUMBER	REFERENCE DRAWINGS	NO	REVISION DESCRIPTION	BY	DATE	CHD	APPD	ENGINEERS AND PERMIT STAMPS	ACCESS MANUFACTURING LTD.			PROJECT P 8078-			
													48" X 15' 1440 PSI HORIZONTAL SEPARATOR 20' x 10' SKID P&ID		
													DRAWN	CHECKED	APPROVED
										BY	TROY		1/2"=1'-0"	48 X 15_HZSEP_SKID_	

CUSTOMER:

ARKTEK EXPLORATION LTD TITLE: UPGRADE 48" 285 PSIG INLET SEPERATOR

SERIAL #: 48HSEP.P12014.01

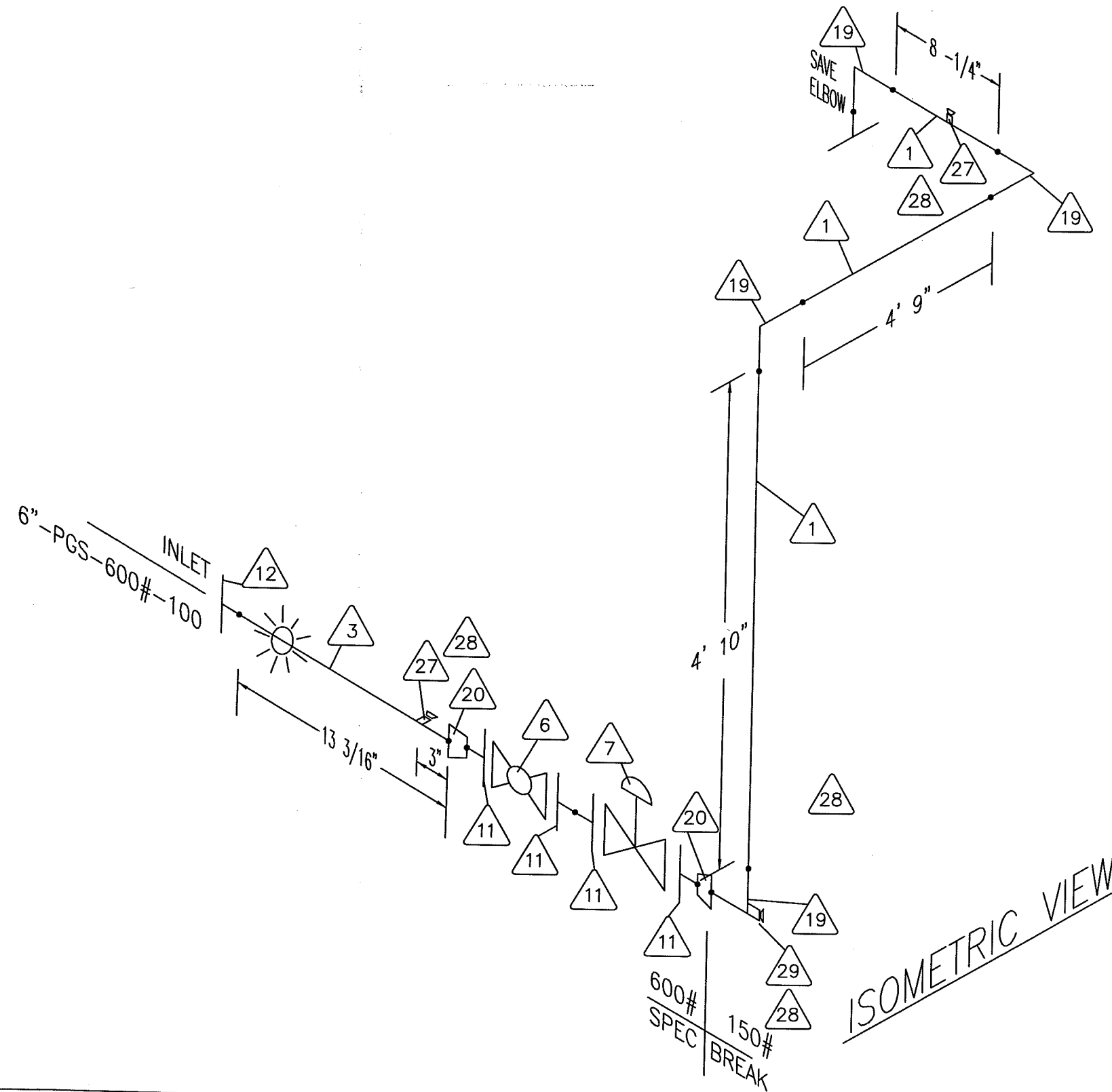
PIPE SCHEDULE							STUD BOLTS c/w HEX NUTS B7M STUDS / 2HM NUTS			
ITEM	QTY	SIZE	TYPE	SCH	DESCRIPTION	HEAT#	ITEM	QTY	SIZE	DESCRIPTION
1	20'	6"	SMLS	40	SA-106B		35	4	3"	150# BOLT UP
2	1'	3"	SMLS	XH	SA-106B		36			
3	3'	6"	SMLS	XH	SA-106B		37			
4							38			
5							39			

VALVES							NIPPLES			
ITEM	QTY	SIZE	RATING	DESCRIPTION	SERIAL#		ITEM	QTY	SIZE	DESCRIPTION
6	1	3"	600#	ACTUATED BALL V.			40			
7	1	3"	600#	ET BODY w I TO P			41			
8							42			
9							43			
10										

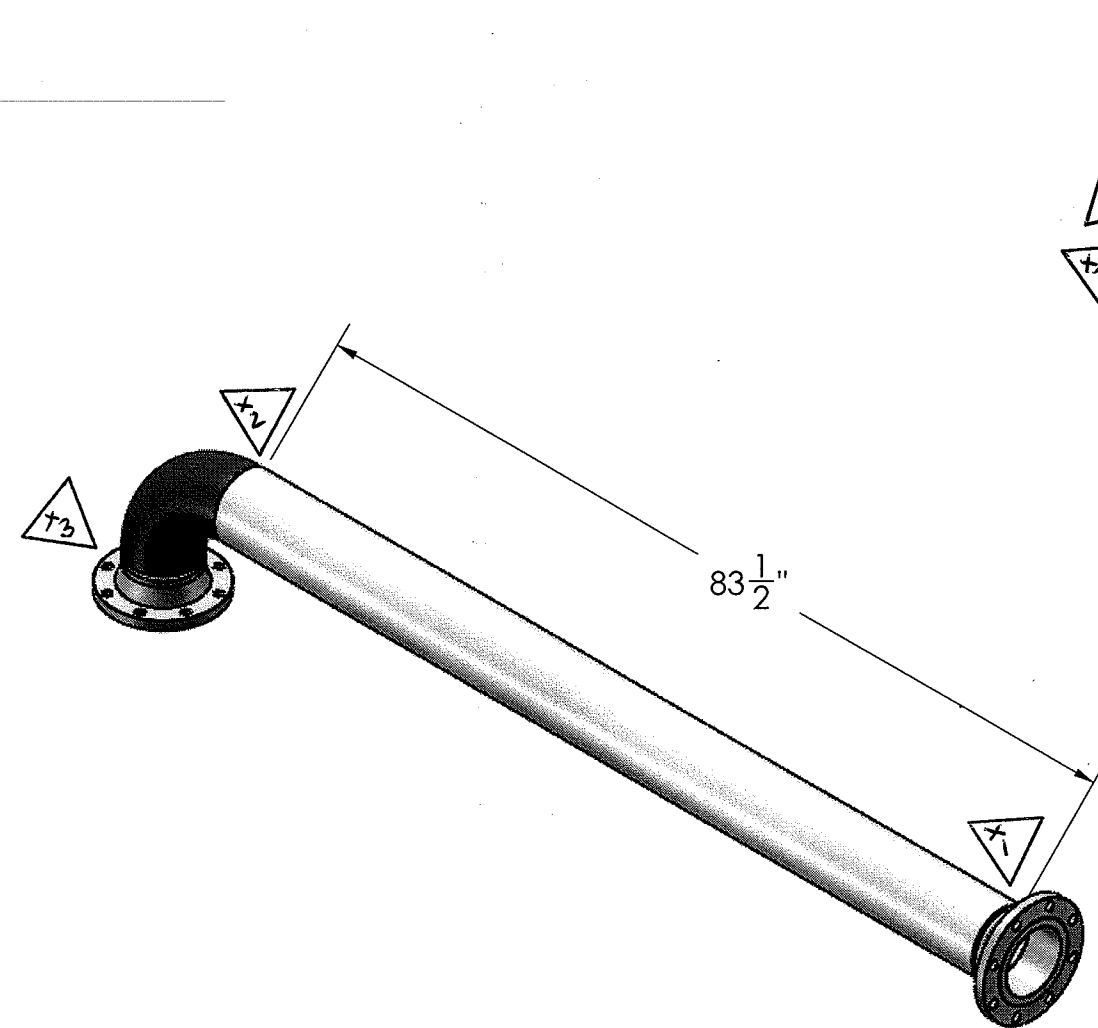
FLANGES							GASKETS				
ITEM	QTY	SIZE	RATING	SCH	DESCRIPTION	TYPE	ITEM	QTY	SIZE	RATING	DESC.
11	1	6"	600#	80	RF WN	SA-105N	44				
12	4	3"	600#	80	RF WN	SA-105N	45				
13							46				
14							47				
15							48				
16							49				
17							50				
18							51				

FITTINGS BUTT WELD							MISCELLANEOUS			
ITEM	QTY	SIZE	SCH	DESCRIPTION	TYPE		ITEM	QTY	SIZE	DESCRIPTION
19	3	6"	40	90° ELBOW LR	WPB		52			
20	2	6X3"	80	CONC. REDUCER	WPB		53			
21							54			
22							55			
23							56			
24							57			
25							58			
26							59			

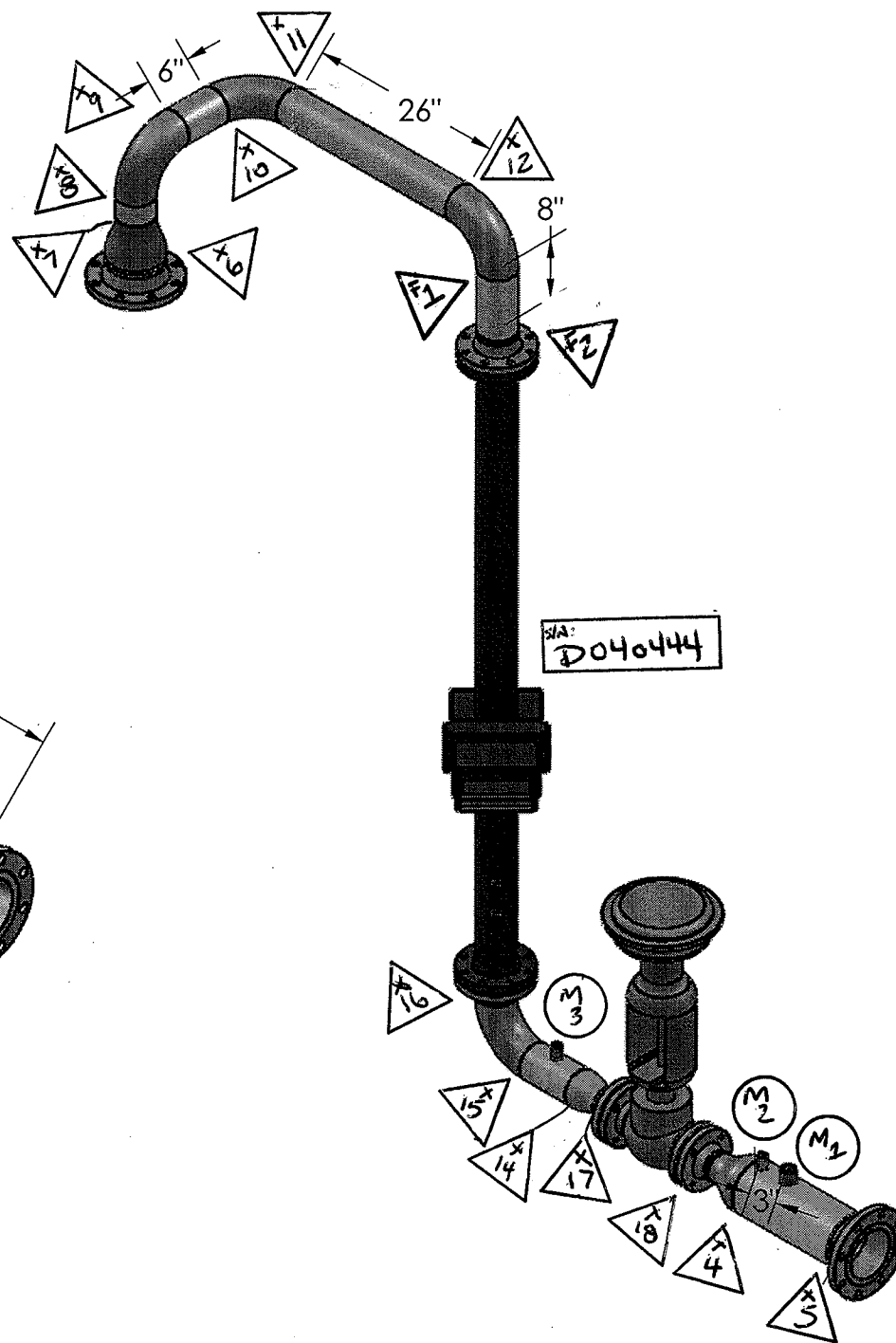
FITTINGS, SCREWED, SOCKET WELD								REFERENCE DRAWINGS:	
ITEM	QTY	SIZE	RATING	SCH	DESCRIPTION	HEAT#			
27	2	1"	3M		T.O.L				
28	3	1"	3M		HEX PLUG				
29	1	1"	3M		E.O.L				
30									
31									
32									
33									
34									



VESSEL TAG No:		CRN: TBA	
NOTES:		REVISIONS:	
1. ALL MEASUREMENTS ARE IN FEET AND INCHES.			
2. WELD PROCEEDURE AML-1			
3. MATERIAL LIST REFERS TO THIS DRAWING ONLY.			
4. FABRICATORS TO VERIFY ALL DIMENSIONS.			
ASB FOR AS BUILT TL 28/02/12			
C FOR CONSTRUCTION TL 21/02/12			
A FOR APPROVAL SJ/TL 01/01/12			
NO.: DESCRIPTION: BY: YR/MM/DD			
TITLE: ARKTEK EXPLORTION UPGRADE 48" 285 PSIG INLET SEPERATOR			
ACCESS MANUFACTURING LTD.		DRAWN BY: TL	SCALE: NTS
		CHECKED BY: TL	PROJ.#: P12014
		APPROVED BY: TL/ SJ	DWG.#: 48HSEP.P12014.01.R0
DO NOT SCALE FROM THIS DRAWING		SHEET 5 OF: 6	REV.: 0



ISOMETRIC VIEW
6" 150# INLET SPOOL



ISOMETRIC VIEW
4" & 6" 150# OUTLET SPOOL

INLET SPOOL-BOM

ITEM NO.	QTY.	PART NUMBER	PIPE LENGTH
1	1	FLEX GASKET 150#, 6	
2	2	WNeck Flange 150-NPS6	
3	1	90L LR Inch 6 Sch40	
4	1	6 in, Schedule 40	83 1/2"

OUTLET SPOOL-BOM

ITEM NO.	QTY.	PART NUMBER	PIPE LENGTH
1	1	FLEX GASKET 150#, 6	
2	2	WNeck Flange 150-NPS6	
3	1	REDUCER 6 x 4	
4	2	WNeck Flange 150-NPS4	
5	4	90L LR Inch 4 Sch40	
6	1	REDUCER 4 x 3	
7	2	WNeck Flange 150-NPS3	
8	1	REDUCER 6 x 3	
9	1	4 in, Schedule 40, 2	2 9/16"
10	1	4 in, Schedule 40	26"
11	1	4 in, Schedule 40, 3	7"
12	1	6 in, Schedule 40	14 7/16"
13	1	4 in, Schedule 40, 4	6"
14	1	4 150 DUAL CHAMBERED METER RUN	
15	2	FLEX GASKET 150#, 4	
16	2	FLEX GASKET 150#, 3	
17	1	3 150 E BODY CONTROL VALVE	
18	1	CLASS 3000 COUPLING, 1.00 IN	
19	2	CLASS 3000 COUPLING, .50 IN	
22	1	4 in, Schedule 40, 5	8"
23	1	0.5 in, Schedule 40, 2	3 11/16"

ALL WELDS BY DEREK MULLIGAN-'X'

Access Manufacturing Ltd.

SHOP: 10828-269 RD.
BILLING: 7904 -101ST AVE,
FORT ST. JOHN, BC. V1J2A3

COMMENTS:

PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ACCESS MANUFACTURING LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ACCESS MANUFACTURING LTD. IS PROHIBITED.

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/16"

MATERIAL
SA 106B

FINISH
PRIME: PAINT TAN
WEIGHT (LBS)
150

DEPARTMENT

CHK.	INITIAL	DATE
DRAFT		
OCM. APPR.		
QCM. APPR.		
PRC. APPR.		
INST. APPR.		
WELD. APPR.		

DRAWING ISSUE STATUS

ASBD	CO	GO	NO.	DESCRIPTION	BY.	DATE.
				ISSUED FOR CONSTRUCTION	TL	FEB 5, 2009
				ISSUED FOR APPROVAL	WM	FEB 5, 2009

DO NOT SCALE FROM DRAWING

TITLE:

ACCESS MFG LTD.

48" 285 PSI HORIZONTAL SEPARATOR UNIT
INLET & OUTLET SPOOLS

DRAWN BY: TL

CHECKED BY: RS

APPROVED BY: WM

SHEET 5 OF 8

SCALE: 1:50

DWG NO.: 48HSEP.P8078.01.R0

SERIAL NO.: 48HSEP.P8078.01

REV NO.: 0

PROJECT NO.

P8078

CUSTOMER:

ARKTEK EXPLORATION LTD TITLE: UPGRADE 48" 285 PSIG INLET SEPERATOR

SERIAL #: 48HSEP.P12014.01

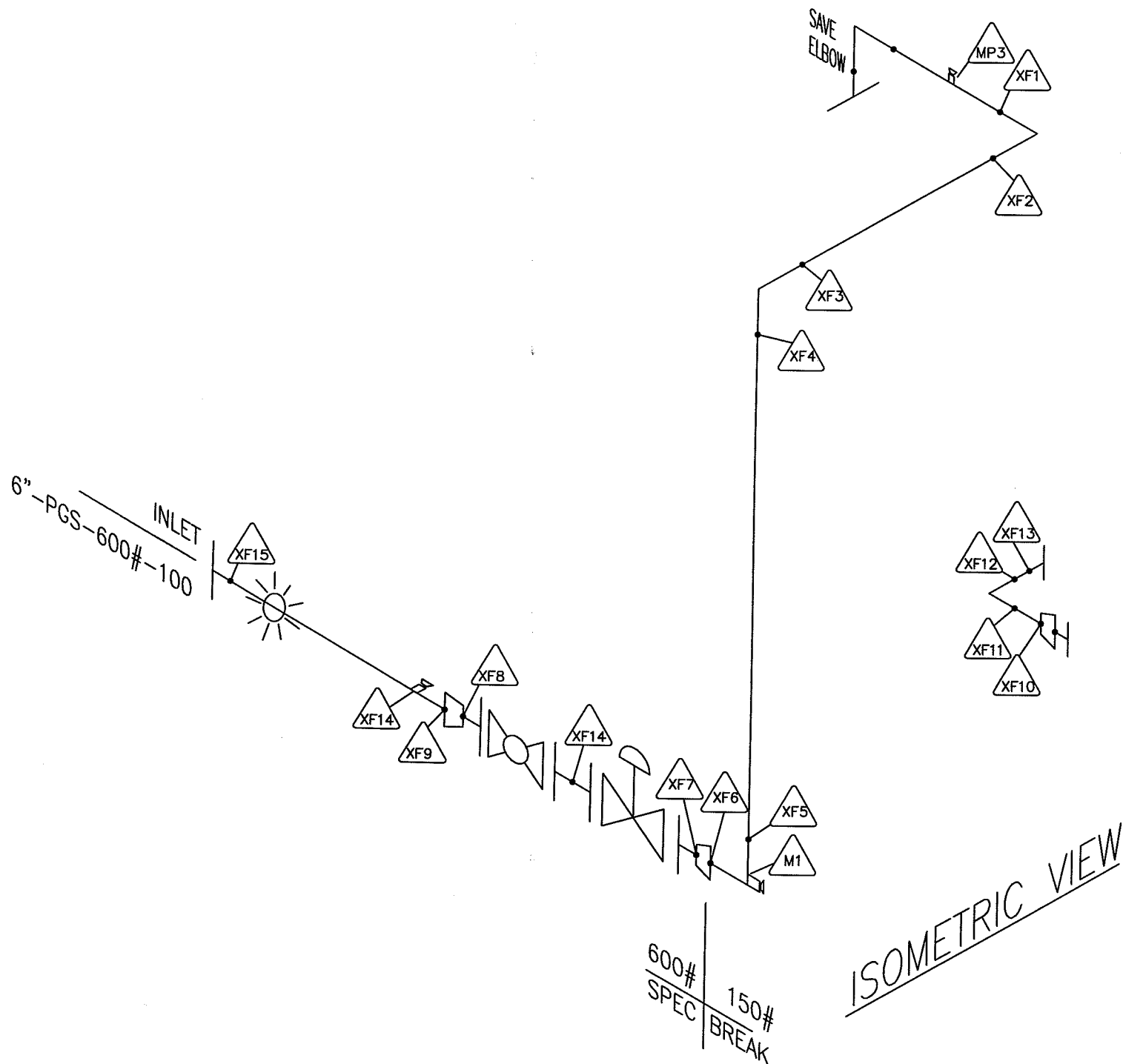
PIPE SCHEDULE							STUD BOLTS c/w HEX NUTS B7M STUDS / 2HM NUTS			
ITEM	QTY	SIZE	TYPE	SCH	DESCRIPTION	HEAT#	ITEM	QTY	SIZE	DESCRIPTION
1	20'	6"	SMLS	40	SA-106B		35	4	3"	150# BOLT UP
2	1'	3"	SMLS	XH	SA-106B		36			
3	3'	6"	SMLS	XH	SA-106B		37			
4							38			
5							39			

VALVES							NIPPLES			
ITEM	QTY	SIZE	RATING	DESCRIPTION	SERIAL#		ITEM	QTY	SIZE	DESCRIPTION
6	1	3"	600#	ACTUATED BALL V.			40			
7	1	3"	600#	ET BODY w I TO P			41			
8							42			
9							43			
10										

FLANGES							GASKETS				
ITEM	QTY	SIZE	RATING	SCH	DESCRIPTION	TYPE	ITEM	QTY	SIZE	RATING	DESC.
11	1	6"	600#	80	RF WN	SA-105N	44				
12	4	3"	600#	80	RF WN	SA-105N	45				
13							46				
14							47				
15							48				
16							49				
17							50				
18							51				

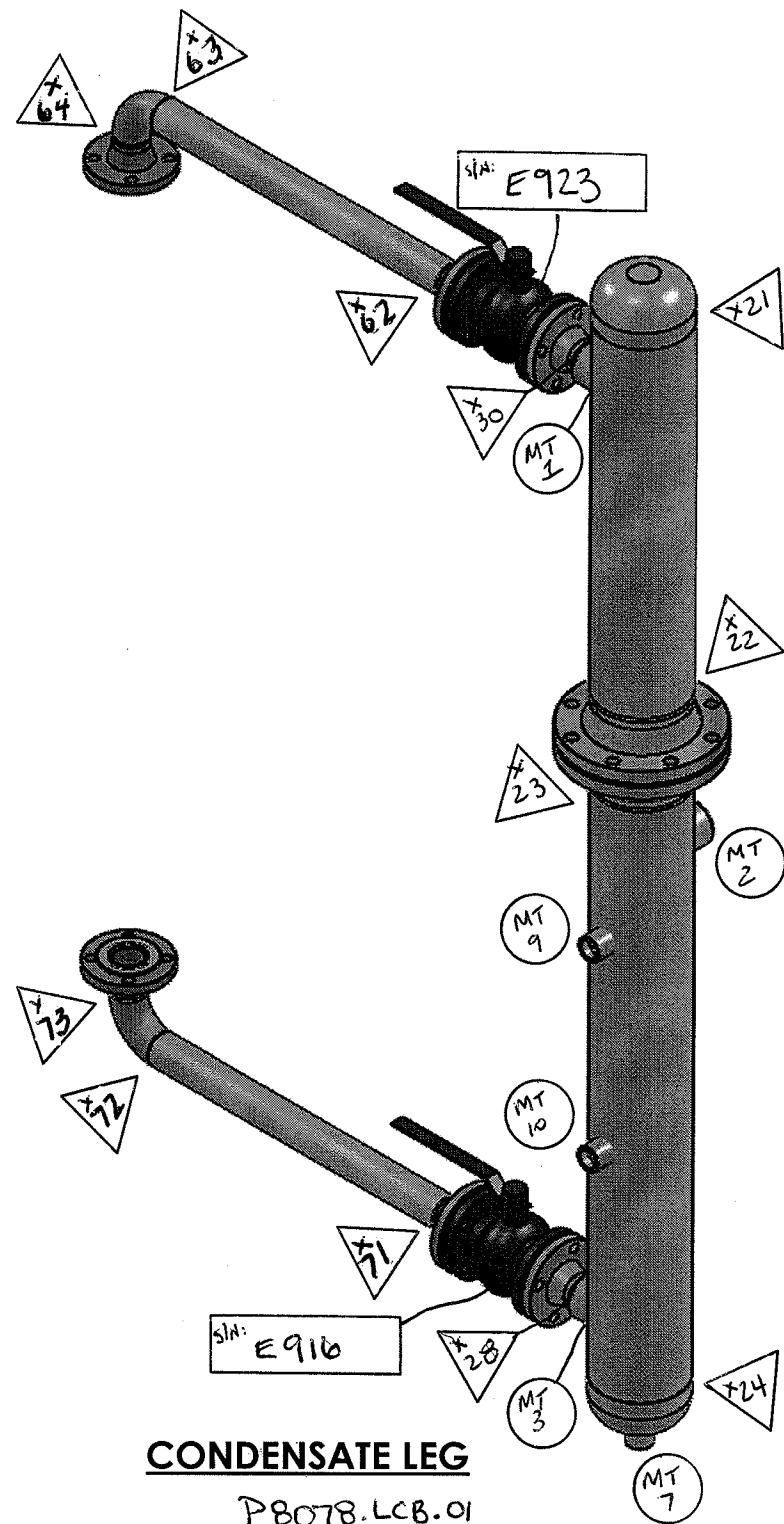
FITTINGS BUTT WELD							MISCELLANEOUS			
ITEM	QTY	SIZE	SCH	DESCRIPTION	TYPE		ITEM	QTY	SIZE	DESCRIPTION
19	3	6"	40	90° ELBOW LR	WPB		52			
20	2	6X3"	80	CONC. REDUCER	WPB		53			
21							54			
22							55			
23							56			
24							57			
25							58			
26							59			

FITTINGS, SCREWED, SOCKET WELD								REFERENCE DRAWINGS:		
ITEM	QTY	SIZE	RATING	SCH	DESCRIPTION	HEAT#				
27	2	1"	3M		T.O.L					
28	3	1"	3M		HEX PLUG					
29	1	1"	3M		E.O.L					
30										
31										
32										
33										
34										

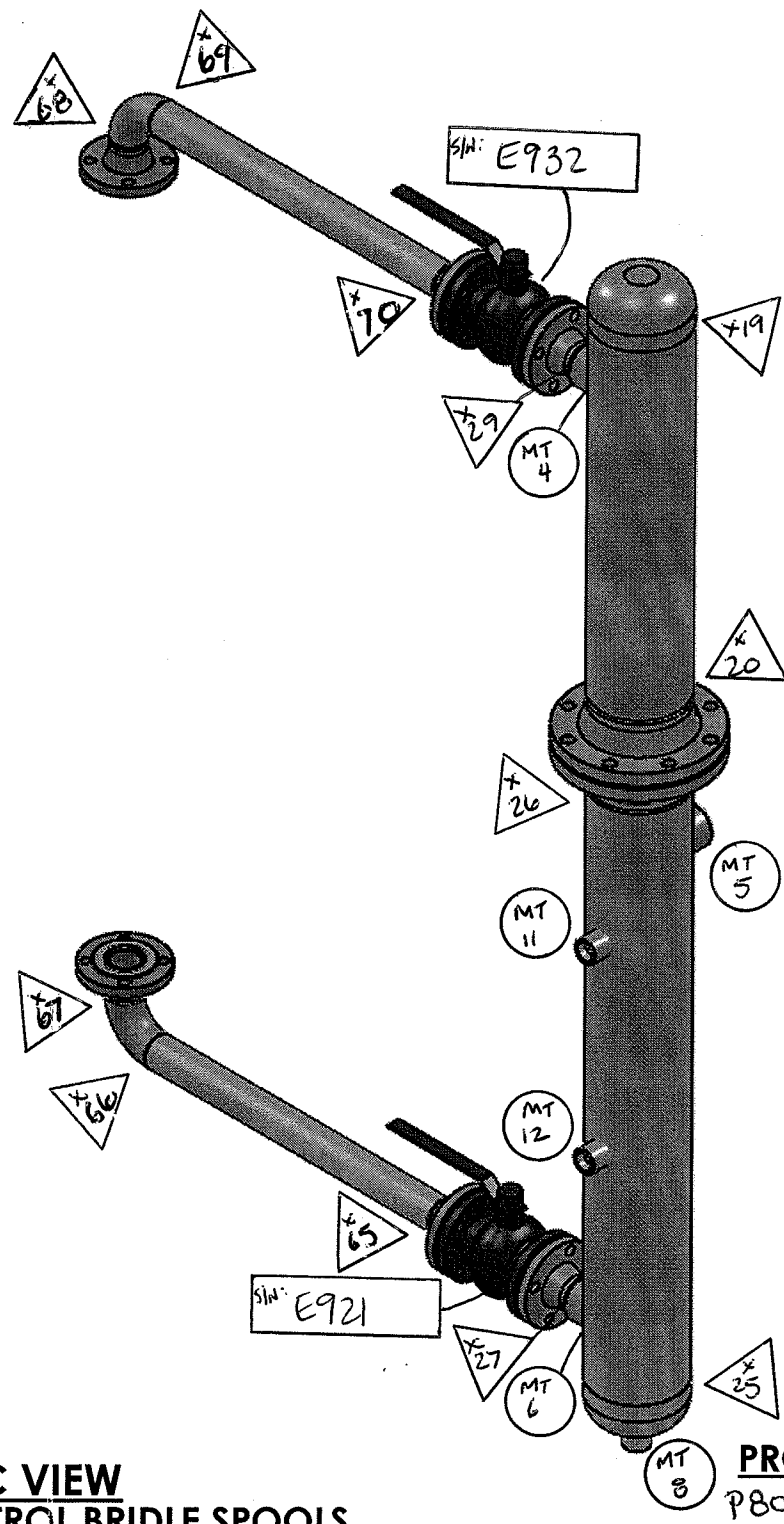


VESSEL TAG No:							CRN: TBA											
SPOOL DATA:							NOTES:				REVISIONS:							
SPOOL #	WEL PROC.	X-RAY	STRESS RELIEVED	SERVICE	PRESSURE		1.	ALL MEASUREMENTS ARE IN FEET AND INCHES.	2.	WELD PROCEEDURE AML-1	3.	MATERIAL LIST REFERS TO THIS DRAWING ONLY.	4.	FABRICATORS TO VERIFY ALL DIMENSIONS.	ASB	FOR AS BUILT	TL	21/02/12
					DESIGN	TEST												
INLET 6"	AML 1	100%	NO	SOUR SERVICE B31.3	285 psig	428 psig												
INLET 6"	AML 1	100%	NO	SOUR SERVICE B31.3	1440 psig	2160 psig												
DO NOT SCALE FROM THIS DRAWING																		
</																		

TITLE:				ACCESS MANUFACTURING LTD.			
ARKTEK EXPLORTION UPGRADE 48" 285 PSIG INLET SEPERATOR X - RAY MAP				DRAWN BY:		TL	SCALE: NTS
				CHECKED BY:		TL	PROJ.#: P12014
				APPROVED BY:		TL/ SJ	DWG.#: 48HSEP.P12014.01.R0
				SHEET 5 OF: 6			REV.: 0



CONDENSATE LEG
P8078.LCB.01



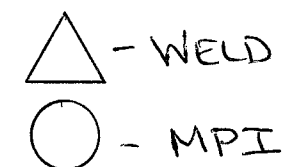
ISOMETRIC VIEW
LEVEL CONTROL BRIDLE SPOOLS

PRODUCED WATER LEG
P8078.LCB.02

BRIDLE SPOOL - BILL OF MATERIALS			
ITEM NO.	QTY.	PART NUMBER	PUP LENGTH
1	12	FLEX GASKET 150#, 2	
2	8	WNeck Flange 150-NPS2	
3	4	90L LR Inch 2 Sch80	
4	4	2 in, Schedule 80	25"

NOTE:

1. 100% X-RAY.
2. HYDROTEST TO 427.5 PSI



ALL WELDS BY 'X' ~
DEREK MULLIGAN.
X-RAY MAP

Access Manufacturing Ltd.
SHOP: 10828-269 RD.

COMMENTS:

PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ACCESS MANUFACTURING LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ACCESS MANUFACTURING LTD. IS PROHIBITED.

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/16"

MATERIAL
SA 106B
FINISH
PRIME: PAINT TAN
WEIGHT (LBS)
120

DEPARTMENT	CHK.	INITIAL	DATE
DRAFT			
OCM. APPR.			
QCM. APPR.			
PRC. APPR.			
INST. APPR.			
WELD. APPR.			

DRAWING ISSUE STATUS

ASBO	DESCRIPTION	BY:	DATE:
CO	ISSUED FOR CONSTRUCTION	TL	07.04.09
AO	ISSUED FOR APPROVAL	WM	07.04.09
QO			
NO.			

DO NOT SCALE FROM DRAWING

TITLE:

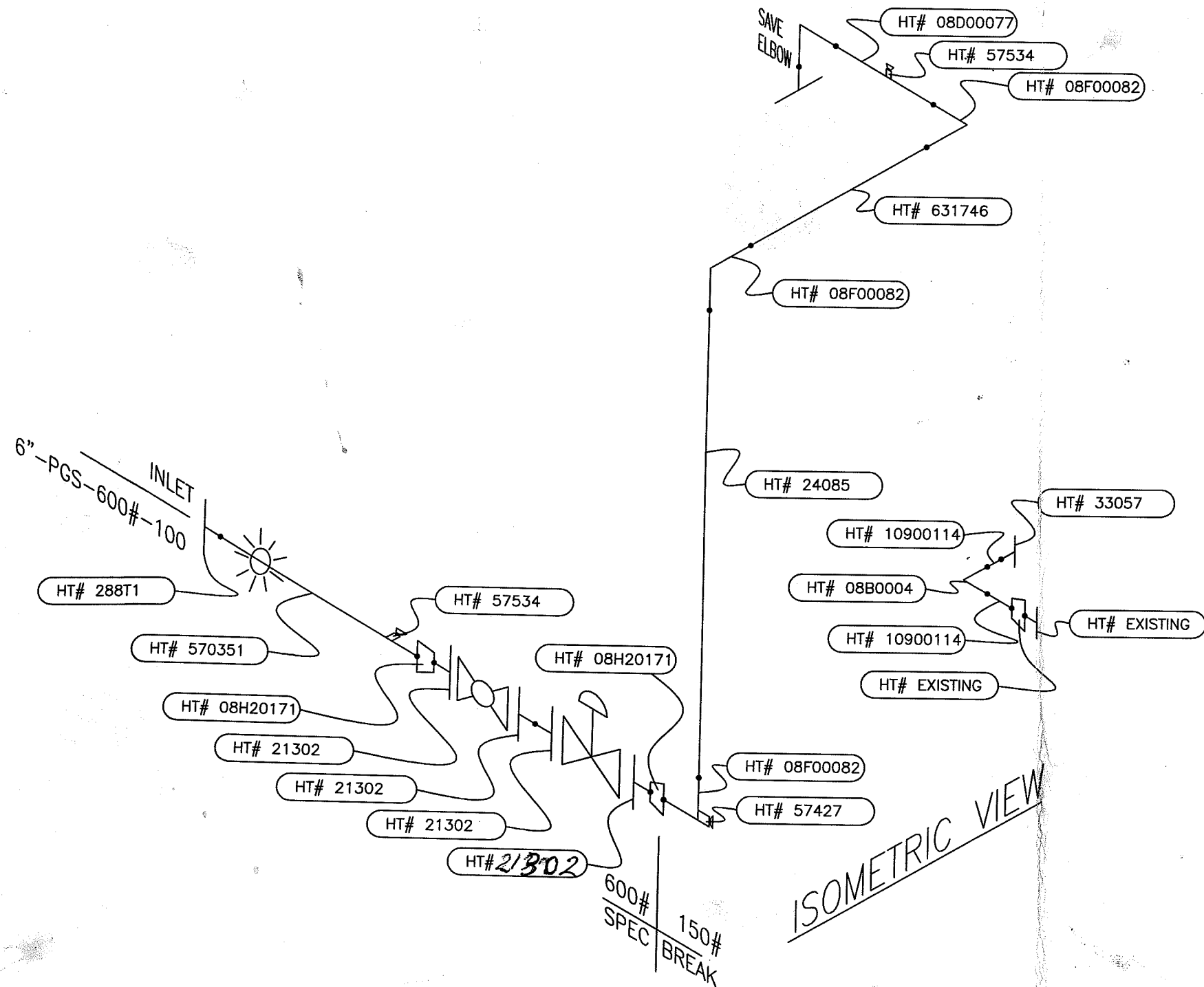
ACCESS MFG. LTD.
48" 285 PSI HORIZONTAL SEPARATOR UNIT
BRIDLE SPOOL LAYOUT

DRAWN BY: TL
CHECKED BY: RS
APPROVED BY: WM
SHEET 7 OF 7

SCALE: 1:50
DWG NO.: 48HSEP.P8078.01.R0
SERIAL NO.: 48HSEP.P8078.01
REV NO.: 0

PROJECT NO.

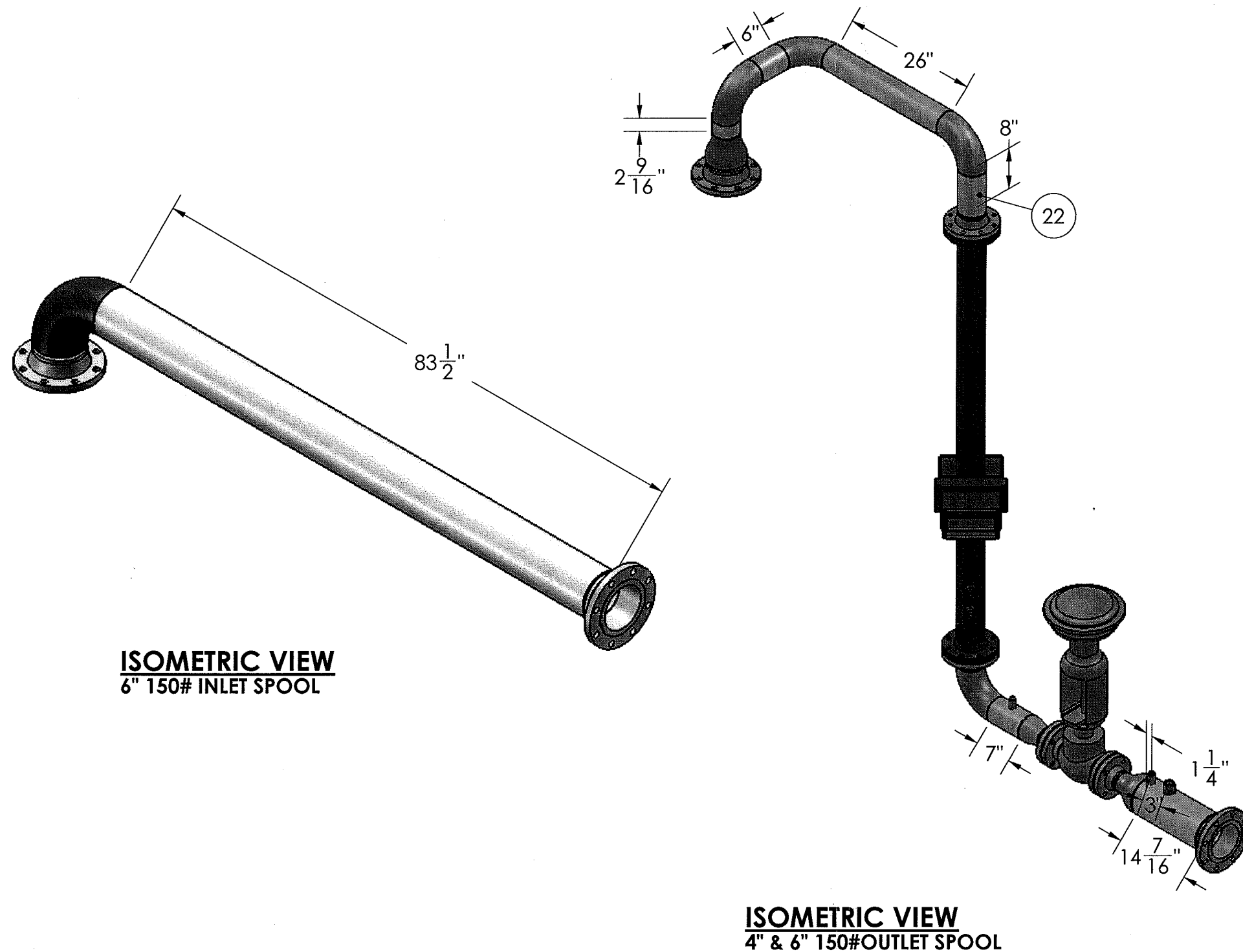
P8078



PIPE SCHEDULE							STUD BOLTS c/w HEX NUTS B7M STUDS / 2HM NUTS				
ITEM	QTY	SIZE	TYPE	SCH	DESCRIPTION	HEAT#	ITEM	QTY	SIZE	DESCRIPTION	
1	20'	6"	SMLS	40	SA-106B		35	4	3"	150# BOLT UP	
2	1'	3"	SMLS	XH	SA-106B		36				
3	3'	6"	SMLS	XH	SA-106B		37				
4							38				
5							39				
VALVES											
ITEM	QTY	SIZE	RATING	DESCRIPTION		SERIAL#	NIPPLES				
6	1	3"	600#	ACTUATED BALL V.			ITEM	QTY	SIZE	DESCRIPTION	
7	1	3"	600#	ET BODY w I TO P			40				
8							41				
9							42				
10							43				
FLANGES							GASKETS				
ITEM	QTY	SIZE	RATING	SCH	DESCRIPTION	TYPE	ITEM	QTY	SIZE	RATING	DESC.
11	1	6"	600#	80	RF WN	SA-105N	44				
12	4	3"	600#	80	RF WN	SA-105N	45				
13							46				
14							47				
15							48				
16							49				
17							50				
18							51				
FITTINGS BUTT WELD							MISCELLANEOUS				
ITEM	QTY	SIZE	SCH	DESCRIPTION		TYPE	ITEM	QTY	SIZE	DESCRIPTION	
19	3	6"	40	90° ELBOW LR		WPB	52				
20	2	6X3"	80	CONC. REDUCER		WPB	53				
21							54				
22							55				
23							56				
24							57				
25							58				
26							59				
FITTINGS, SCREWED, SOCKET WELD											
ITEM	QTY	SIZE	RATING	SCH	DESCRIPTION	HEAT#	REFERENCE DRAWINGS:				
27	2	1"	3M		T.O.L						
28	3	1"	3M		HEX PLUG						
29	1	1"	3M		E.O.L						
30											
31											
32											
33											
34											

SPOOL DATA:							VESSEL TAG No:		CRN: TBA		
POOL #	WEL PROC.	X-RAY	STRESS RELIEVED	SERVICE	PRESSURE		NOTES:	REVISIONS:			
					DESIGN	TEST					
INLET 6"	AML 1	100%	NO	SOUR SERVICE B31.3	285 psig	428 psig	1. ALL MEASUREMENTS ARE IN FEET AND INCHES. 2. WELD PROCEEDURE AML-1 3. MATERIAL LIST REFERS TO THIS DRAWING ONLY. 4. FABRICATORS TO VERIFY ALL DIMENSIONS.				
INLET 6"	AML 1	100%	NO	SOUR SERVICE B31.3	1440 psig	2160 psig					
DO NOT SCALE FROM THIS DRAWING											
							ASB	FOR AS BUILT	TL	28/02/12	
							C	FOR CONSTRUCTION	TL	21/02/12	
							A	FOR APPROVAL	SJ/TL	01/01/12	
							NO.:	DESCRIPTION:	BY:	YR/MM/DD	

TITLE:				ARKTEK EXPLORTION UPGRADE 48" 285 PSIG INLET SEPERATOR HEAT MAP			
ACCESS MANUFACTURING LTD.		DRAWN BY:		TL	SCALE: NTS		
		CHECKED BY:		TL	PROJ.#: P12014		
		APPROVED BY:		TL/ SJ	DWG.#: 48HSEP.P12014.01.R0		
		SHEET 5 OF: 6			REV.: 0		



ISOMETRIC VIEW
6" 150# INLET SPOOL

ISOMETRIC VIEW
4" & 6" 150# OUTLET SPOOL

INLET SPOOL-BOM

ITEM NO.	QTY.	PART NUMBER	PIPE LENGTH
1	1	FLEX GASKET 150#, 6	
2	2	WNeck Flange 150-NPS6	
3	1	90L LR Inch 6 Sch40	
4	1	6 in, Schedule 40	83 1/2"

OUTLET SPOOL-BOM

ITEM NO.	QTY.	PART NUMBER	PIPE LENGTH
1	1	FLEX GASKET 150#, 6	
2	2	WNeck Flange 150-NPS6	
3	1	REDUCER 6 x 4	
4	2	WNeck Flange 150-NPS4	
5	4	90L LR Inch 4 Sch40	
6	1	REDUCER 4 x 3	
7	2	WNeck Flange 150-NPS3	
8	1	REDUCER 6 x 3	
9	1	4 in, Schedule 40, 2	2 9/16"
10	1	4 in, Schedule 40	26"
11	1	4 in, Schedule 40, 3	7"
12	1	6 in, Schedule 40	14 7/16"
13	1	4 in, Schedule 40, 4	6"
14	1	4 150 DUAL CHAMBERED METER RUN	
15	2	FLEX GASKET 150#, 4	
16	2	FLEX GASKET 150#, 3	
17	1	3 150 E BODY CONTROL VALVE	
18	1	CLASS 3000 COUPLING, 1.00 IN	
19	2	CLASS 3000 COUPLING, .50 IN	
22	1	4 in, Schedule 40, 5	8"
23	1	0.5 in, Schedule 40, 2	

Access Manufacturing Ltd.
 SHOP: 10828-269 RD.
 BILLING: 7904 -101ST AVE,
 FORT ST. JOHN, BC. V1J2A3

COMMENTS:

PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF ACCESS MANUFACTURING LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF ACCESS MANUFACTURING LTD. IS PROHIBITED.

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
 TOLERANCES:
 FRACTIONAL $\pm 1/16"$

MATERIAL

SA 106B

FINISH

PRIME: PAINT TAN.

WEIGHT (LBS)

150

DEPARTMENT

DRAFT

OCM. APPR.

QCM. APPR.

PRC. APPR.

INST. APPR.

WELD. APPR.

DRAWING ISSUE STATUS

ASB0			
CO	ISSUED FOR CONSTRUCTION	TL	FEB 5, 2009
A0	ISSUED FOR APPROVAL	WM	FEB 5, 2009
Q0			
NO.	DESCRIPTION	BY:	DATE:

DO NOT SCALE FROM DRAWING

TITLE:

ACCESS MFG LTD.

48" 285 PSI HORIZONTAL SEPARATOR UNIT
 INLET & OUTLET SPOOLS

DRAWN BY: TL

CHECKED BY: RS

APPROVED BY: WM

SHEET 4 OF 7

SCALE: 1:50

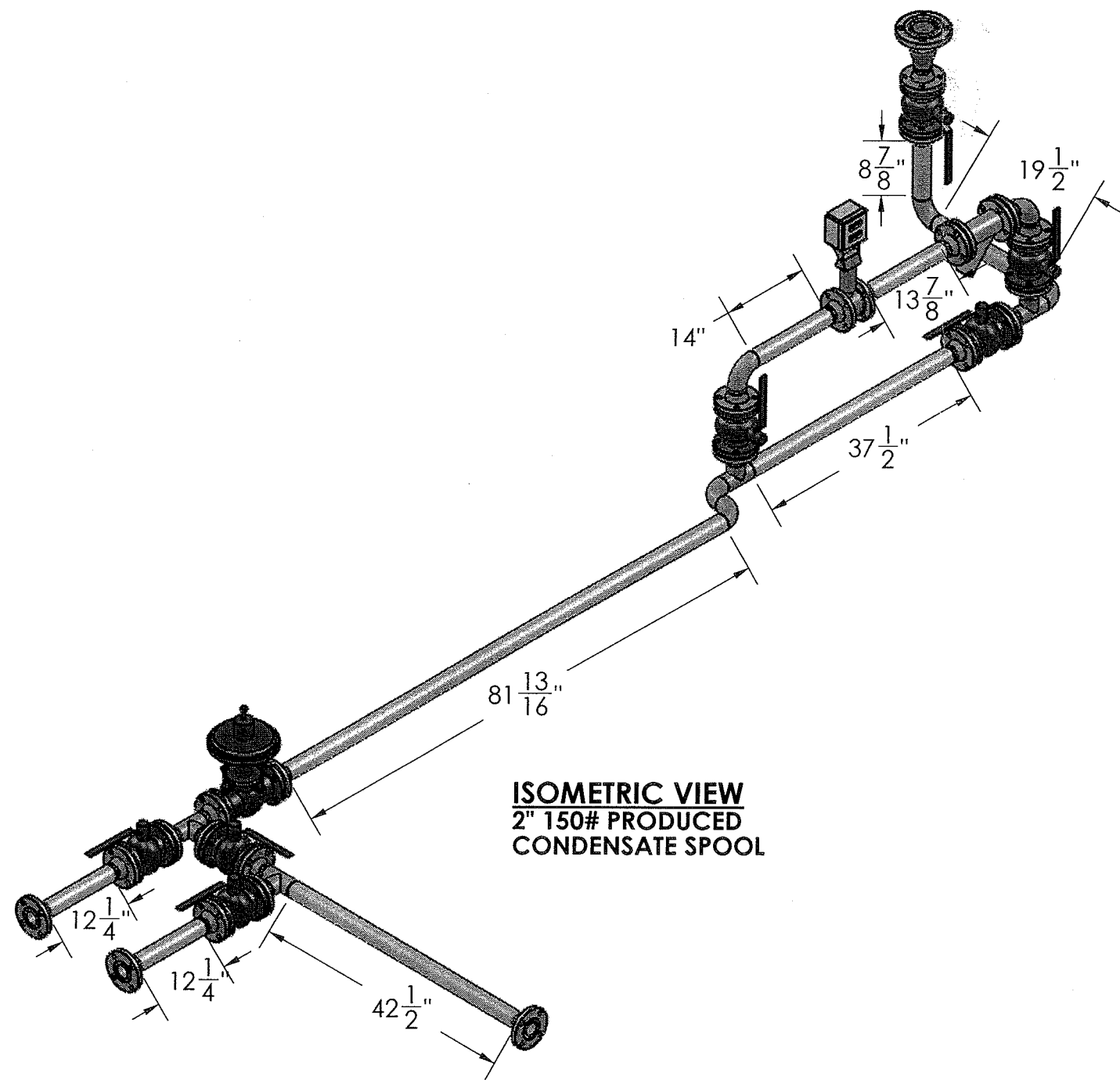
DWG NO.: 48HSEP.P8078.01.R0

SERIAL NO.: 48HSEP.P8078.01

REV NO.: 0

PROJECT NO.

P8078



PRODUCED CONDENSATE SPOOL-BOM			
ITEM NO.	QTY.	PART NUMBER	PIPE LENGTH
1	1	FLEX GASKET 150#, 3	
2	1	WNeck Flange 150-NPS3	
3	1	REDUCER 3 x 2	
4	23	WNeck Flange 150-NPS2	
5	4	Tee Inch 2 Sch80	
6	6	90L LR Inch 2 Sch80	
7	20	FLEX GASKET 150#, 2	
8	7	2 150 BALL VALVE,SLDPRT	
9	1	2 in, Schedule 80	8 7/8"
10	1	2 in, Schedule 80, 1	19 1/2"
11	1	2 in, Schedule 80, 5	37 1/2"
12	1	2 in, Schedule 80, 6	14"
13	1	Pipe 3 in, Sch 80	12 1/4"
14	1	2 in, Schedule 80, 2	81 13/16"
15	1	2 in, Schedule 80, 3	42 1/2"
16	1	2 in, Schedule 80, 8	12 1/4"
17	1	2 NUFLO TURBINE WAFER STYLE	
18	1	2 NORRISEAL 2220 150 CONTROL VALVE w SIZE 9 ACTUATOR	
19	1	NUFLOW-MC-1FLOW ANALYSER	
20	1	2 in, Schedule 80, 7	13 7/8"
21	1	2 150 Y STRAINER	

Access
Manufacturing
Ltd.

SHOP: 10828-269 RD.

COMMENTS:

PROPRIETARY AND CONFIDENTIAL

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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/16"

MATERIAL
SA 106B

FINISH
PRIME:PAINT TAN
WEIGHT(LBS)
511

DEPARTMENT

DRAFT

OCM. APPR.

QCM. APPR.

PRC. APPR.

INST. APPR.

WELD. APPR.

CHK.

INITIAL

DATE

DRAWING ISSUE STATUS

ASB			
CD	ISSUED FOR CONSTRUCTION	TL	FEB 5, 2009
A0	ISSUED FOR APPROVAL	WM	FEB 5, 2009
QO			
NO.	DESCRIPTION	BY.	DATE.

DO NOT SCALE FROM DRAWING

TITLE:

ACCESS MFG. LTD.

48" 285 PSI HORIZONTAL SEPARATOR UNIT
2" 150# PRODUCED CONDESATE SPOOL

DRAWN BY: TL

CHECKED BY: RS

APPROVED BY: WM

SHEET 7 OF 8

SCALE: 1:50

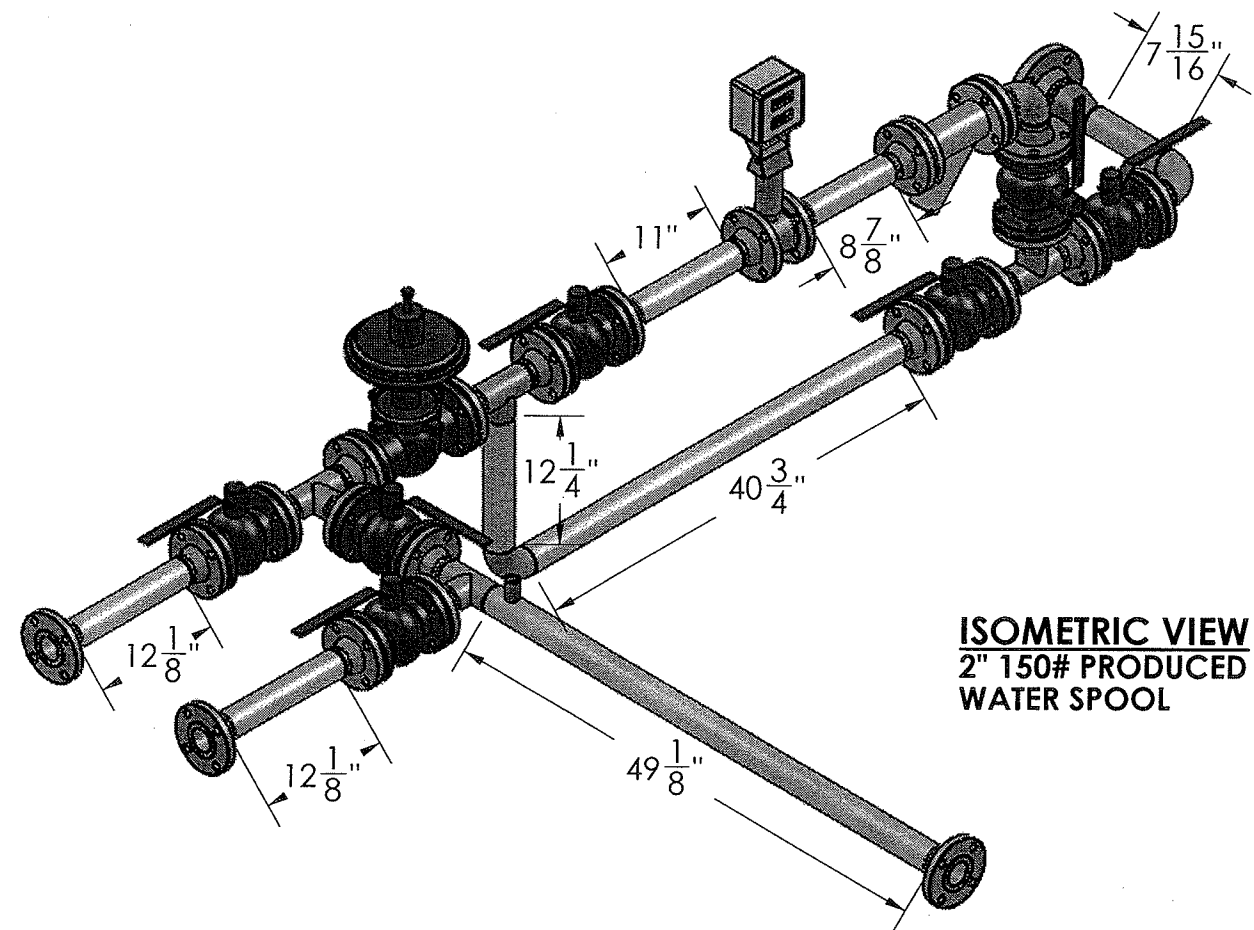
DWG NO.: 48HSEP.P8078.01.R0

SERIAL NO.: 48HSEP.P8078.01

REV NO.: 0

PROJECT NO.

P8078



PRODUCED WATER SPOOL-BOM			
ITEM NO.	QTY.	PART NUMBER	PIPE LENGTH
1	1	FLEX GASKET 150#, 3	
2	1	WNeck Flange 150-NPS3	
3	1	REDUCER 3 x 2	
4	23	WNeck Flange 150-NPS2	
5	4	Tee Inch 2 Sch80	
6	3	90L LR Inch 2 Sch80	
7	1	2 in, Schedule 80	40 3/4"
8	1	2 in, Schedule 80, 1	8 7/8"
9	1	2 in, Schedule 80, 6	11"
10	1	2 in, Schedule 80, 2	12 1/4"
11	1	2 in, Schedule 80, 3	7 15/16"
12	1	2 in, Schedule 80, 5	49 1/8"
13	20	FLEX GASKET 150#, 2	
14	7	2 150 BALL VALVE.SLDPRT	
15	1	2 NUFLO TURBINE WAFER STYLE	
16	1	NUFLOW-MC-1FLOW ANALYSER	
17	1	2 NORRISEAL 2220 150 CONTROL VALVE w SIZE 9 ACTUATOR	
18	1	CLASS 3000 COUPLING, .50 IN	
20	2	2 in, Schedule 80, 7	12 1/8"
21	1	2 150 Y STRAINER	

Access Manufacturing Ltd.
SHOP: 10828-269 RD.

COMMENTS:

PROPRIETARY AND CONFIDENTIAL
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UNLESS OTHERWISE SPECIFIED:				DEPARTMENT	CHK.	INITIAL	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± 1/16"				DRAFT			
MATERIAL SA 106B				OCM. APPR.			
FINISH PRIME:PAINT TAN				QCM. APPR.			
WEIGHT(LBS) 472				PRC. APPR.			
				INST. APPR.			
				WELD. APPR.			

DRAWING ISSUE STATUS			
ASB0			
C0	ISSUED FOR CONSTRUCTION	TL	FEB 5, 2009
A0	ISSUED FOR APPROVAL	WM	FEB 5, 2009
Q0			
NO:	DESCRIPTION	BY:	DATE:
DO NOT SCALE FROM DRAWING			

TITLE: ACCESS MFG. LTD. 48" 285 PSI HORIZONTAL SEPARATOR UNIT 2" 150# PRODUCED WATER SPOOL		
DRAWN BY: TL	SCALE: 1:50	PROJECT NO. P8078
CHECKED BY: RS	DWG NO.: 48HSEP.P8078.01.R0	
APPROVED BY: WM	SERIAL NO.: 48HSEP.P8078.01	
SHEET 1 OF 2	REV NO.: 0	

Date: 12-05-10
Client: Access Manufacturing Ltd.
Project Number: 3893
Drawing Number: 6-LC-Bridle-P8078.09
Description: LC Bridle - 6 5/8" OD x 80 3/8" S/S

Rev: 1

Design in accordance with ASME B31.3, 2010 Edition

Calculations for a Branch Connection in a Run of Pipe

Design Data

Design Pressure 285 psig
 Minimum Design Temperature -20 ° F
 Maximum Design Temperature 100 ° F
 Flange MAWP 285 psig
 Corrosion Allowance 0.125 in

Run Data

Outside Diameter 6.625 in

Branch Data

Outside Diameter 2.375 in

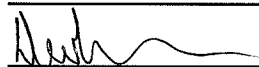
Calculation Revision No.	1	12-05-10	Updated to 2010 Code	PJD...
Calculation Revision No.	0	09-02-02	Issued For Registration	PJD...

Drawing Number	Revision	Comments
6-LC-Bridle-P8078.09	0, 1	Calculations created based on design information provided.
6-LC-Bridle-P8078.09	2	Calculations revised and updated for submission to BCSA.

Engineering Manager:

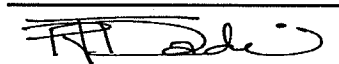
Date: _____

Quality Control Manager:



Date: July 18, 2012

Authorized Inspector:



Date: _____

Approved by Designer:

Date: 12-05-10

Blue Diamond Design Ltd.

1977 Valley View Place
 Victoria, BC V9B 6H8
 Phone: (250) 391-4612
 Fax: (250) 391-4613

Date: 12-05-10
Client: Access Manufacturing Ltd.
Project Number: 3893
Drawing Number: 6-LC-Bridle-P8078.09
Description: LC Bridle - 6 5/8" OD x 80 3/8" S/S

Rev: 1

Design in accordance with ASME B31.3, 2010 Edition

Design Data

Design Pressure	P	285 psig
Minimum Design Temperature		-20 ° F
Maximum Design Temperature		100 ° F
Flange MAWP		285 psig
Ratio of Material Stress Values	fr	1
Corrosion Allowance	c	0.125 in

Run Data

Outside Diameter	Dh	6.625 in	
Run Material Stress Value	Sh	20,000 psi	SA-106-B Pipe
Quality Factor - Table A-1B	Eh	1.00	
Coefficient - Table 304.1.1	Yh	0.40	

Branch Data

Outside Diameter	Db	2.375 in	
Branch Material Stress Value	Sb	20,000 psi	SA-106-B Pipe
Quality Factor - Table A-1B	Eb	1.00	
Coefficient - Table 304.1.1	Yb	0.40	

304.1.2 Straight Pipe Under Internal Pressure

Shall not be less than that determined by the formulas below:

Run: 6.625 in
 $PD_h / 2 (ShE_h + PY_h) = (285 * 6.625) / (2 * ((20000 * 1) + (285 * 0.4)))$
 $th = 0.0469 \text{ in}$
 $th + c = 0.0469 + 0.125$
 $t_{mh} = 0.1719 \text{ in}$

Run Nominal Thickness:		0.2800 in	SA-106-B Pipe
Run Minimum Thickness:	Th	0.2450 in	

Branch: 2.375 in
 $PD_b / 2 (SbE_b + PY_b) = (285 * 2.375) / (2 * ((20000 * 1) + (285 * 0.4)))$
 $tb = 0.0168 \text{ in}$
 $tb + c = 0.0168 + 0.125$
 $t_{mb} = 0.1418 \text{ in}$

Branch Nominal Thickness:		0.2180 in	SA-106-B Pipe
Branch Minimum Thickness:	Tb	0.1908 in	

Schedule STD =	0.1540 in
0.7 Tb =	0.1526 in
tc =	0.1526 in

Date: 12-05-10
 Client: Access Manufacturing Ltd.
 Project Number: 3893
 Drawing Number: 6-LC-Bridle-P8078.09
 Description: LC Bridle - 6 5/8" OD x 80 3/8" S/S

Rev: 1

Design in accordance with ASME B31.3, 2010 Edition

304.3.3 Reinforcement of Welded Branch Connections

Reinforcement Data

Angle Between Run and Branch $O = 90^\circ$

$$\begin{aligned}
 \text{Inside Corroded Opening in Run } d1 &= (2.375 - (2 \times (0.1908)) + 0.125 + 0.125) / \sin(90^\circ \text{PI}) = 2.2435 \text{ in} \\
 (Tb - c) + (Th - c) + d1 / 2 &= (0.1908 - 0.125) + (0.245 - 0.125) + (2.2435 / 2) = 1.3075 \text{ in}
 \end{aligned}$$

$$\text{Half Width of Reinforcement Zone } d2 = 2.2435 \text{ in}$$

$$\text{Min Thickness of Reinforcing Pad } Tr = 0.0000 \text{ in}$$

$$2.5 (Th - c) = 2.5 \times (0.245 - 0.125) = 0.3000 \text{ in}$$

$$2.5 (Tb - c) + Tr = (2.5 \times (0.1908 - 0.125)) + 0 = 0.1644 \text{ in}$$

$$\text{Height of Reinforcement Zone } L4 = 0.1644 \text{ in}$$

304.3.3b Required Reinforcement Area

$$A1 = th \, d1 (2 - \sin O) = (0.0469 \times 2.2435) \times (2 - \sin(90^\circ \text{PI})) \quad A1 = 0.1053 \text{ in}^2$$

304.3.3c Available Reinforcement Area

Area Available in Pipe Run

$$(2d2 - d1) (Th - th - c) = ((2 \times 2.2435) - 2.2435) \times (0.245 - 0.0469 - 0.125) \quad A2 = 0.1639 \text{ in}^2$$

Area Available in Pipe Branch

$$(2L4 (Tb - tb - c) / \sin O) \text{ fr} = (((2 \times 0.1644) \times (0.1908 - 0 - 0.125)) / \sin(90^\circ \text{PI})) \times 1 \quad A3 = 0.0161 \text{ in}^2$$

Outside Fillet Weld Size 0.3750 in

Minimum Fillet Weld Size 0.2158 in

Height of Reinforcement Zone $L4 = 0.1644 \text{ in}$

$$\text{leg x leg x fr} = 0.375 \times 0.375 \times 1 \quad A41 = 0.0963 \text{ in}^2$$

Reinforcing Pad Fillet Weld Size 0.0000 in

Minimum Fillet Weld Size 0.0000 in

Height of Reinforcement Zone $L4 = 0.1644 \text{ in}$

$$\text{leg x leg x fr} = 0 \times 0 \times 1 \quad A42 = 0.0000 \text{ in}^2$$

$$A2 + A3 + A41 + A42 = 0.1639 + 0.0161 + 0.0963 + 0 \quad \text{Total} = 0.2763 \text{ in}^2$$

$$\text{Required Reinforcement Area} = A1 = 0.1053 \text{ in}^2$$

No Reinforcing Pad Required

$$\text{Area Req'd in Reinforcing Pad} = -0.1710 \text{ in}^2$$

Total Weld Thk, Fig 328.5.4D Sketch 1 : 0.3706 in

Total Weld Thk, Fig 328.5.4D Sketch 2 : 0.4326 in

No PWHT Required per 331.1.3

Date: 12-05-10
 Client: Access Manufacturing Ltd.
 Project Number: 3893
 Drawing Number: 6-LC-Bridle-P8078.09
 Description: Class 3000 Thredolet MAWP Calculations

Rev: 0

Design in accordance with ASME B31.3, 2010 Edition

All calculations are based on the following formula:

$$MAWP = S E t / (R + 0.6 t)$$

Where: S = Stress Value at the Service Temperature
 E = Joint Efficiency (1.0)
 R = Inside Radius
 t = Corroded wall thickness

Class 3000 Thredolet Design Data

Nominal Diameter: 3/4 in
 Minimum Outside Diameter: 1.4375 in
 Maximum Inside Diameter: 1.0500 in
 Nominal Wall Thickness: 0.1938 in
 Dimension 'C' : 1.1250 in
 Material: SA-105/105N/350-LF2-1

Service Temp - F	Stress Value	CA 0	CA 1/16	CA 1/8
100	20,000	5709	3730	1886

Class 3000 Thredolet Design Data

Nominal Diameter: 1 in
 Minimum Outside Diameter: 1.7500 in
 Maximum Inside Diameter: 1.3150 in
 Nominal Wall Thickness: 0.2175 in
 Dimension 'C' : 1.4375 in
 Material: SA-105/105N/350-LF2-1

Service Temp - F	Stress Value	CA 0	CA 1/16	CA 1/8
100	20,000	5122	3545	2057

Nominal Diameter: 2 in
 Minimum Outside Diameter: 2.9375 in
 Maximum Inside Diameter: 2.3750 in
 Nominal Wall Thickness: 0.2813 in
 Dimension 'C' : 2.5625 in
 Material: SA-105/105N/350-LF2-1

Service Temp - F	Stress Value	CA 0	CA 1/16	CA 1/8
100	20,000	3879	2966	2083

3 Phase Separator: 47" ID x 15'-0" S/S
Drawing Number: HSEP-WB-48x285.125.08 Rev 2
Calculation Number: 3797acc-r0

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Title Page

Access Manufacturing Ltd.
Box 339, 9420 - 93 Avenue
Fort St. John, BC
V1J 6W7

3 Phase Separator
47" ID x 15'-0" S/S
285 psig at -20 F / 100 F

Notes:

1. These calculations were prepared to answer questions
ABSA had with the original design submission.

Engineering Manager: _____ Date: _____

Quality Control Manager: _____ Date: _____

Authorized Inspector: _____ Date: _____

Approved by Designer: **Phil Dade** _____
Digitally signed by Phil Dade
DN: cn=Phil Dade, o=BDD, ou,
email=dade@shaw.ca, c=CA
Date: 2012.03.07 10:04:29 -08'00' _____

3 Phase Separator: 47" ID x 15'-0" S/S
Drawing Number: HSEP-WB-48x285.125.08 Rev 2
Calculation Number: 3797acc-r0
PV Elite 2012 Licensee: BLUE DIAMOND DESIGN LTD.
FileName : 3797acc-r0

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Input Echo :

Step: 1 10:02a Mar 7,2012

Consider External Loads for Nozzle Des. N
Use ASME VIII-1 Appendix 1-9 N

Material Database Year Current w/Addenda or Code Year

Configuration Directives:

Do not use Nozzle MDMT Interpretation VIII-1 01-37 No
Use Table G instead of exact equation for "A" Yes
Shell Head Joints are Tapered Yes
Compute "K" in corroded condition Yes
Use Code Case 2286 No
Use the MAWP to compute the MDMT Yes
Using Metric Material Databases, ASME II D No

Complete Listing of Vessel Elements and Details:

Element From Node	10
Element To Node	20
Element Type	Elliptical
Description	Head
Distance "FROM" to "TO"	2.0000 in
Inside Diameter	47.000 in
Element Thickness	0.4600 in
Internal Corrosion Allowance	0.1250 in
Nominal Thickness	0.5000 in
External Corrosion Allowance	0.0000 in
Design Internal Pressure	285.00 psig
Design Temperature Internal Pressure	100 F
Design External Pressure	0.0000 psig
Design Temperature External Pressure	0 F
Effective Diameter Multiplier	1.2
Material Name [Normalized]	SA-516 70
Allowable Stress, Ambient	20000. psi
Allowable Stress, Operating	20000. psi
Allowable Stress, Hydrotest	34200. psi
Material Density	0.2800 lbm/in ³
P Number Thickness	1.2500 in
Yield Stress, Operating	38000. psi
UCS-66 Chart Curve Designation	D
External Pressure Chart Name	CS-2
UNS Number	K02700
Product Form	Plate
Efficiency, Longitudinal Seam	1.0
Efficiency, Circumferential Seam	1.0
Elliptical Head Factor	2.0

Element From Node	20
Element To Node	30
Element Type	Cylinder
Description	Shell
Distance "FROM" to "TO"	180.00 in
Inside Diameter	47.000 in
Element Thickness	0.5000 in

3 Phase Separator: 47" ID x 15'-0" S/S
Drawing Number: HSEP-WB-48x285.125.08 Rev 2
Calculation Number: 3797acc-r0
PV Elite 2012 Licensee: BLUE DIAMOND DESIGN LTD.
FileName : 3797acc-r0

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Input Echo :

Step: 1 10:02a Mar 7,2012

Description	Manway Head	
Distance "FROM" to "TO"	2.0000	in
Inside Diameter	47.0000	in
Element Thickness	0.4600	in
Internal Corrosion Allowance	0.1250	in
Nominal Thickness	0.5000	in
External Corrosion Allowance	0.0000	in
Design Internal Pressure	285.00	psig
Design Temperature Internal Pressure	100	F
Design External Pressure	0.0000	psig
Design Temperature External Pressure	0	F
Effective Diameter Multiplier	1.2	
Material Name [Normalized]	SA-516 70	
Efficiency, Longitudinal Seam	1.0	
Efficiency, Circumferential Seam	1.0	
Elliptical Head Factor	2.0	
Element From Node	30	
Detail Type	Nozzle	
Detail ID	A1 Manway	
Dist. from "FROM" Node / Offset dist	0.0000	in
Nozzle Diameter	24.0	in.
Nozzle Schedule	None	
Nozzle Class	150	
Layout Angle	0.0	
Blind Flange (Y/N)	Y	
Weight of Nozzle (Used if > 0)	0.0000	lb
Grade of Attached Flange	GR 1.1	
Nozzle Matl [Normalized]	SA-516 70	

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3 Phase Separator: 47" ID x 15'-0" S/S
Drawing Number: HSEP-WB-48x285.125.08 Rev 2
Calculation Number: 3797acc-r0
PV Elite 2012 Licensee: BLUE DIAMOND DESIGN LTD.
FileName : 3797acc-r0

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Internal Pressure Calculations : Step: 3 10:02a Mar 7, 2012

Straight Flange Required Thickness:

$$\begin{aligned} &= (P \cdot R) / (S \cdot E - 0.6 \cdot P) + c \quad \text{per UG-27 (c) (1)} \\ &= (285.000 \cdot 23.6250) / (20000.00 \cdot 1.00 - 0.6 \cdot 285.000) + 0.125 \\ &= 0.465 \text{ in} \end{aligned}$$

Straight Flange Maximum Allowable Working Pressure:

$$\begin{aligned} &= (S \cdot E \cdot t) / (R + 0.6 \cdot t) \quad \text{per UG-27 (c) (1)} \\ &= (20000.00 \cdot 1.00 \cdot 0.3750) / (23.6250 + 0.6 \cdot 0.3750) \\ &= 314.465 \text{ psig} \end{aligned}$$

Factor K, corroded condition [Kcor]:

$$\begin{aligned} &= (2 + (\text{Inside Diameter} / (2 \cdot \text{Inside Head Depth}))^2) / 6 \\ &= (2 + (47.250 / (2 \cdot 11.875))^2) / 6 \\ &= 0.993001 \end{aligned}$$

Percent Elong. per UCS-79, VIII-1-01-57 $(75 \cdot t_{nom} / R_f) \cdot (1 - R_f / R_o)$ 4.551 %

MDMT Calculations in the Knuckle Portion:

Govrn. thk, $t_g = 0.460$, $t_r = 0.335$, $c = 0.1250$ in, $E^* = 1.00$
Stress Ratio = $t_r \cdot (E^*) / (t_g - c) = 0.999$, Temp. Reduction = 0 F

Min Metal Temp. w/o impact per UCS-66 -55 F

MDMT Calculations in the Head Straight Flange:

Govrn. thk, $t_g = 0.500$, $t_r = 0.340$, $c = 0.1250$ in, $E^* = 1.00$
Stress Ratio = $t_r \cdot (E^*) / (t_g - c) = 0.905$, Temp. Reduction = 9 F

Min Metal Temp. w/o impact per UCS-66 -55 F

Cylindrical Shell From 20 To 30 SA-516 70, UCS-66 Crv. D at 100 F

Shell

Material UNS Number: K02700

Required Thickness due to Internal Pressure [tr]:

$$\begin{aligned} &= (P \cdot R) / (S \cdot E - 0.6 \cdot P) \quad \text{per UG-27 (c) (1)} \\ &= (285.000 \cdot 23.6250) / (20000.00 \cdot 1.00 - 0.6 \cdot 285.000) \\ &= 0.3396 + 0.1250 = 0.4646 \text{ in} \end{aligned}$$

Max. Allowable Working Pressure at given Thickness, corroded [MAWP]:

$$\begin{aligned} &= (S \cdot E \cdot t) / (R + 0.6 \cdot t) \quad \text{per UG-27 (c) (1)} \\ &= (20000.00 \cdot 1.00 \cdot 0.3750) / (23.6250 + 0.6 \cdot 0.3750) \\ &= 314.465 \text{ psig} \end{aligned}$$

Maximum Allowable Pressure, New and Cold [MAPNC]:

$$\begin{aligned} &= (S \cdot E \cdot t) / (R + 0.6 \cdot t) \quad \text{per UG-27 (c) (1)} \\ &= (20000.00 \cdot 1.00 \cdot 0.5000) / (23.5000 + 0.6 \cdot 0.5000) \\ &= 420.168 \text{ psig} \end{aligned}$$

Actual stress at given pressure and thickness, corroded [Sact]:

$$\begin{aligned} &= (P \cdot (R + 0.6 \cdot t)) / (E \cdot t) \\ &= (285.000 \cdot (23.6250 + 0.6 \cdot 0.3750)) / (1.00 \cdot 0.3750) \\ &= 18126.000 \text{ psi} \end{aligned}$$

3 Phase Separator: 47" ID x 15'-0" S/S
 Drawing Number: HSEP-WB-48x285.125.08 Rev 2
 Calculation Number: 3797acc-r0
 PV Elite 2012 Licensee: BLUE DIAMOND DESIGN LTD.
 FileName : 3797acc-r0

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Internal Pressure Calculations : Step: 3 10:02a Mar 7, 2012

Stress Ratio = $tr * (E^*) / (tg - c) = 0.999$, Temp. Reduction = 0 F

Min Metal Temp. w/o impact per UCS-66

-55 F

MDMT Calculations in the Head Straight Flange:

Govrn. thk, $tg = 0.500$, $tr = 0.340$, $c = 0.1250$ in, $E^* = 1.00$

Stress Ratio = $tr * (E^*) / (tg - c) = 0.905$, Temp. Reduction = 9 F

Min Metal Temp. w/o impact per UCS-66

-55 F

Note: Heads and Shells Exempted to -20F (-29C) by paragraph UG-20F

Hydrostatic Test Pressure Results:

Pressure per UG99b	= 1.3 * M.A.W.P. * Sa/S	370.500	psig
Pressure per UG99b[34]	= 1.3 * Design Pres * Sa/S	370.500	psig
Pressure per UG99c	= 1.3 * M.A.P. - Head(Hyd)	370.500	psig
Pressure per UG100	= 1.1 * M.A.W.P. * Sa/S	313.500	psig
Pressure per PED	= 1.43 * MAWP	407.550	psig

UG-99(b) Note 34, Test Pressure Calculation:

= Test Factor * Design Pressure * Stress Ratio
 = 1.3 * 285.000 * 1.000
 = 370.500 psig

Horizontal Test performed per: UG-99b (Note 34)

Please note that Nozzle, Shell, Head, Flange, etc MAWPs are all considered when determining the hydrotest pressure for those test types that are based on the MAWP of the vessel.

Stresses on Elements due to Hydrostatic Test Pressure:

From To	Stress	Allowable	Ratio	Pressure
Head	26101.7	34200.0	0.763	372.20
Shell	23671.7	34200.0	0.692	372.20
Manway Head	26101.7	34200.0	0.763	372.20

Elements Suitable for Internal Pressure.

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3 Phase Separator: 47" ID x 15'-0" S/S
 Drawing Number: HSEP-WB-48x285.125.08 Rev 2
 Calculation Number: 3797acc-r0
 PV Elite 2012 Licensee: BLUE DIAMOND DESIGN LTD.
 FileName : 3797acc-r0

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Nozzle Calcs. : B1 Boot

Nozl: 5 10:02a Mar 7, 2012

INPUT VALUES, Nozzle Description: B1 Boot From : 20

Pressure for Reinforcement Calculations	P	285.000	psig
Temperature for Internal Pressure	Temp	100	F
Shell Material [Normalized]		SA-516 70	
Shell Allowable Stress at Temperature	S	20000.00	psi
Shell Allowable Stress At Ambient	Sa	20000.00	psi
Inside Diameter of Cylindrical Shell	D	47.0000	in
Shell Finished (Minimum) Thickness	t	0.5000	in
Shell Internal Corrosion Allowance	c	0.1250	in
Shell External Corrosion Allowance	co	0.0000	in
Distance from Bottom/Left Tangent		92.0000	in
User Entered Minimum Design Metal Temperature		-20.00	F

Type of Element Connected to the Shell : Nozzle

Material		SA-106 B	
Material UNS Number		K03006	
Material Specification/Type		Smls. pipe	
Allowable Stress at Temperature	Sn	17100.00	psi
Allowable Stress At Ambient	Sna	17100.00	psi
Diameter Basis (for tr calc only)		OD	
Layout Angle		180.00	deg
Diameter		16.0000	in.
Size and Thickness Basis		Nominal	
Nominal Thickness	tn	80	
Corrosion Allowance	can	0.1250	in
Joint Efficiency of Shell Seam at Nozzle	E1	1.00	
Joint Efficiency of Nozzle Neck	En	1.00	
Outside Projection	ho	27.1250	in
Weld leg size between Nozzle and Pad/Shell	Wo	0.3750	in
Groove weld depth between Nozzle and Vessel	Wgnv	0.5000	in
Inside Projection	h	0.0000	in
Weld leg size, Inside Element to Shell	Wi	0.0000	in
Pad Material [Normalized]		SA-516 70	
Pad Allowable Stress at Temperature	Sp	20000.00	psi
Pad Allowable Stress At Ambient	Spa	20000.00	psi
Diameter of Pad along vessel surface	Dp	23.0000	in
Thickness of Pad	te	0.5000	in
Weld leg size between Pad and Shell	Wp	0.3750	in
Groove weld depth between Pad and Nozzle	Wgpn	0.5000	in
Reinforcing Pad Width		3.5000	in
ASME Code Weld Type per UW-16		C	

The Pressure Design option was Design Pressure + static head.

3 Phase Separator: 47" ID x 15'-0" S/S
 Drawing Number: HSEP-WB-48x285.125.08 Rev 2
 Calculation Number: 3797acc-r0
 PV Elite 2012 Licensee: BLUE DIAMOND DESIGN LTD.
 FileName : 3797acc-r0

Nozzle Calcs. : B1 Boot Nozl: 5 10:02a Mar 7,2012 Page 14 of 38

= 0.855

Results of Nozzle Reinforcement Area Calculations:

AREA AVAILABLE, A1 to A5	Design	External	Mapnc
Area Required	Ar	5.016	NA in ²
Area in Shell	A1	0.509	NA in ²
Area in Nozzle Wall	A2	0.939	NA in ²
Area in Inward Nozzle	A3	0.000	NA in ²
Area in Welds A41+A42+A43		0.261	NA in ²
Area in Element	A5	3.500	NA in ²
TOTAL AREA AVAILABLE	Atot	5.208	NA in ²

The Internal Pressure Case Governs the Analysis.

Nozzle Angle Used in Area Calculations 90.00 Degr.

The area available without a pad is Insufficient.
 The area available with the given pad is Sufficient.

SELECTION OF POSSIBLE REINFORCING PADS:	Diameter	Thickness
Based on given Pad Thickness:	22.6250	0.5000 in
Based on given Pad Diameter:	23.0000	0.5000 in
Based on Shell or Nozzle Thickness:	22.6250	0.5000 in

Area Required [A]:

$$= (d * tr * F + 2 * tn * tr * F * (1 - fr1)) \text{ UG-37(c)}$$

$$= (14.5640 * 0.3396 * 1.0 + 2 * 0.7180 * 0.3396 * 1.0 * (1 - 0.86))$$

$$= 5.016 \text{ in}^2$$

Reinforcement Areas per Figure UG-37.1

Area Available in Shell [A1]:

$$= d (E1 * t - F * tr) - 2 * tn (E1 * t - F * tr) * (1 - fr1)$$

$$= 14.564 (1.00 * 0.3750 - 1.0 * 0.340) - 2 * 0.718$$

$$(1.00 * 0.3750 - 1.0 * 0.3396) * (1 - 0.855)$$

$$= 0.509 \text{ in}^2$$

Area Available in Nozzle Wall Projecting Outward [A2]:

$$= (2 * Tlwp) * (tn - trn) * fr2$$

$$= (2 * 0.938) * (0.7180 - 0.1325) * 0.8550$$

$$= 0.939 \text{ in}^2$$

Area Available in Welds [A41 + A42 + A43]:

$$= Wo^2 * fr3 + (Wi - can / 0.707)^2 * fr2 + Wp^2 * fr4$$

$$= 0.3750^2 * 0.86 + (0.0000)^2 * 0.86 + 0.3750^2 * 1.00$$

$$= 0.261 \text{ in}^2$$

Area Available in Element [A5]:

$$= (min(Dp, DL) - (Nozzle OD)) * (min(tp, Tlwp, te)) * fr4$$

$$= (23.0000 - 16.0000) * 0.5000 * 1.0000$$

$$= 3.500 \text{ in}^2$$

UG-45 Minimum Nozzle Neck Thickness Requirement: [Int. Press.]

Wall Thickness for Internal/External pressures	ta = 0.2575 in
Wall Thickness per UG16(b),	tr16b = 0.1875 in
Wall Thickness, shell/head, internal pressure	trb1 = 0.4646 in

3 Phase Separator: 47" ID x 15'-0" S/S
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Nozzle Calcs. : B1 Boot Nozl: 5 10:02a Mar 7, 2012

Weld Size Calculations, Description: B1 Boot

Intermediate Calc. for nozzle/shell Welds Tmin 0.5000 in
Intermediate Calc. for pad/shell Welds TminPad 0.3750 in

Results Per UW-16.1:

	Required Thickness	Actual Thickness
Nozzle Weld	0.2500 = Min per Code	0.2651 = $0.7 * W_o$ in
Pad Weld	0.1875 = $0.5 * T_{minPad}$	0.2651 = $0.7 * W_p$ in

Maximum Allowable Pressure for this Nozzle at this Location:

Converged Max. Allow. Pressure in Operating case 290.378 psig

The Drop for this Nozzle is : 1.4036 in

The Cut Length for this Nozzle is, Drop + Ho + H + T : 29.0286 in

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3 Phase Separator: 47" ID x 15'-0" S/S
Drawing Number: HSEP-WB-48x285.125.08 Rev 2
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Nozzle Calcs. : N1 Inlet

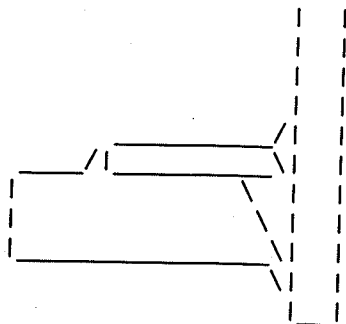
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Class of attached Flange
Grade of attached Flange

150
GR 1.1

The Pressure Design option was Design Pressure + static head.

Nozzle Sketch (may not represent actual weld type/configuration)



Insert Nozzle With Pad, with Inside projection

Reinforcement CALCULATION, Description: N1 Inlet

ASME Code, Section VIII, Division 1, 2010, 2011a, UG-37 to UG-45

Actual Outside Diameter Used in Calculation
Actual Thickness Used in Calculation

6.625 in.
0.718 in.

Nozzle input data check completed without errors.

Reqd thk per UG-37(a) of Cylindrical Shell, Tr [Int. Press]

$$\begin{aligned} &= (P \cdot R) / (S \cdot E - 0.6 \cdot P) \text{ per UG-27 (c) (1)} \\ &= (285.00 \cdot 23.6250) / (20000 \cdot 1.00 - 0.6 \cdot 285.00) \\ &= 0.3396 \text{ in} \end{aligned}$$

Reqd thk per UG-37(a) of Nozzle Wall, Trn [Int. Press]

$$\begin{aligned} &= (P \cdot R_o) / (S \cdot E + 0.4 \cdot P) \text{ per Appendix 1-1 (a) (1)} \\ &= (285.00 \cdot 3.3125) / (17100 \cdot 1.00 + 0.4 \cdot 285.00) \\ &= 0.0548 \text{ in} \end{aligned}$$

UG-40, Limits of Reinforcement : [Internal Pressure]

Parallel to Vessel Wall (Diameter Limit)	D1	10.8780	in
Parallel to Vessel Wall, opening length	d	5.4390	in
Normal to Vessel Wall (Thickness Limit), pad side Tlwp		0.9375	in
Normal to Vessel Wall, Inward		0.3750	in

Weld Strength Reduction Factor [fr1]:

$$\begin{aligned} &= \min(1, S_n / S) \\ &= \min(1, 17100.0 / 20000.0) \\ &= 0.855 \end{aligned}$$

Weld Strength Reduction Factor [fr2]:

$$\begin{aligned} &= \min(1, S_n / S) \\ &= \min(1, 17100.0 / 20000.0) \\ &= 0.855 \end{aligned}$$

3 Phase Separator: 47" ID x 15'-0" S/S

Drawing Number: HSEP-WB-48x285.125.08 Rev 2

Calculation Number: 3797acc-r0

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Nozzle Calcs. : N1 Inlet

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Area Available in Welds [A41 + A42 + A43]:

$$\begin{aligned} &= (W_o^2 - Ar \text{ Lost}) * Fr3 + ((W_i - can / 0.707)^2 - Ar \text{ Lost}) * fr2 + Trapfr4 \\ &= (0.1406) * 0.86 + (0.0000) * 0.86 + 0.0789^2 * 1.00 \\ &= 0.199 \text{ in}^2 \end{aligned}$$

Area Available in Element [A5]:

$$\begin{aligned} &= (\min(D_p, D_L) - (\text{Nozzle OD})) * (\min(t_p, T_{lwp}, t_e)) * fr4 \\ &= (10.6250 - 6.6250) * 0.3750 * 1.0000 \\ &= 1.125 \text{ in}^2 \end{aligned}$$

Note: Per user request, A5 multiplied by 0.75, see UG-37(h).

UG-45 Minimum Nozzle Neck Thickness Requirement: [Int. Press.]

Wall Thickness for Internal/External pressures	ta = 0.1798 in
Wall Thickness per UG16(b),	tr16b = 0.1875 in
Wall Thickness, shell/head, internal pressure	trb1 = 0.4646 in
Wall Thickness	tb1 = max(trb1, tr16b) = 0.4646 in
Wall Thickness	tb2 = max(trb2, tr16b) = 0.1875 in
Wall Thickness per table UG-45	tb3 = 0.3699 in

Determine Nozzle Thickness candidate [tb]:

$$\begin{aligned} &= \min[tb3, \max(tb1, tb2)] \\ &= \min[0.370, \max(0.465, 0.188)] \\ &= 0.3699 \text{ in} \end{aligned}$$

Minimum Wall Thickness of Nozzle Necks [tUG-45]:

$$\begin{aligned} &= \max(ta, tb) \\ &= \max(0.1798, 0.3699) \\ &= 0.3699 \text{ in} \end{aligned}$$

Available Nozzle Neck Thickness = $0.875 * 0.718 = 0.628 \text{ in}$ --> OK

Nozzle Junction Minimum Design Metal Temperature (MDMT) Calculations:

MDMT of the Nozzle Neck to Flange Weld,

Curve: B

Govrn. thk, tg = 0.628, tr = 0.055, c = 0.1250 in, E* = 1.00
Stress Ratio = $tr * (E^*) / (tg - c) = 0.109$, Temp. Reduction = 140 F

Min Metal Temp. w/o impact per UCS-66	7 F
Min Metal Temp. at Required thickness (UCS 66.1)	-133 F
Min Metal Temp. w/o impact per UG-20(f)	-20 F

MDMT of Nozzle Neck to Pad Weld for the Nozzle,

Curve: B

Govrn. thk, tg = 0.375, c = 0.1250 in, E* = 1.00
Stress Ratio = $tr * (E^*) / (tg - c) = 0.905$, Temp. Reduction = 9 F
Pad governing, Conservatively assuming Pad stress = Shell stress(Div. 1 L-9.3)

Min Metal Temp. w/o impact per UCS-66	-20 F
Min Metal Temp. at Required thickness (UCS 66.1)	-29 F

MDMT of Nozzle Neck to Pad Weld for Reinforcement pad,

Curve: D

Govrn. thk, tg = 0.375, c = 0.1250 in, E* = 1.00
Stress Ratio = $tr * (E^*) / (tg - c) = 0.905$, Temp. Reduction = 9 F

3 Phase Separator: 47" ID x 15'-0" S/S

Drawing Number: HSEP-WB-48x285.125.08 Rev 2

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Nozzle Calcs. : N1 Inlet

Nozl: 6 10:02a Mar 7, 2012

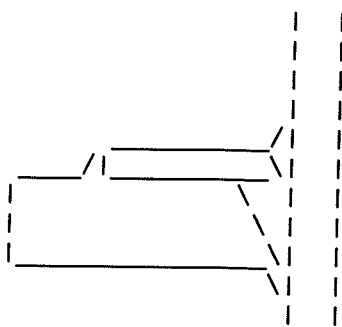
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3 Phase Separator: 47" ID x 15'-0" S/S
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 Nozzle Calcs. : N2 Outlet Nozl: 7 10:02a Mar 7,2012

Class of attached Flange 150
 Grade of attached Flange GR 1.1

The Pressure Design option was Design Pressure + static head.

Nozzle Sketch (may not represent actual weld type/configuration)



Insert Nozzle With Pad, with Inside projection

Reinforcement CALCULATION, Description: N2 Outlet

ASME Code, Section VIII, Division 1, 2010, 2011a, UG-37 to UG-45

Actual Outside Diameter Used in Calculation 6.625 in.
 Actual Thickness Used in Calculation 0.718 in.

Nozzle input data check completed without errors.

Reqd thk per UG-37(a) of Cylindrical Shell, Tr [Int. Press]
 $= (P \cdot R) / (S \cdot E - 0.6 \cdot P)$ per UG-27 (c) (1)
 $= (285.00 \cdot 23.6250) / (20000 \cdot 1.00 - 0.6 \cdot 285.00)$
 $= 0.3396$ in

Reqd thk per UG-37(a) of Nozzle Wall, Trn [Int. Press]
 $= (P \cdot R_o) / (S \cdot E + 0.4 \cdot P)$ per Appendix 1-1 (a) (1)
 $= (285.00 \cdot 3.3125) / (17100 \cdot 1.00 + 0.4 \cdot 285.00)$
 $= 0.0548$ in

UG-40, Limits of Reinforcement : [Internal Pressure]

Parallel to Vessel Wall (Diameter Limit)	D1	10.8780	in
Parallel to Vessel Wall, opening length	d	5.4390	in
Normal to Vessel Wall (Thickness Limit), pad side Tlwp		0.9375	in
Normal to Vessel Wall, Inward		0.3750	in

Weld Strength Reduction Factor [fr1]:
 $= \min(1, S_n / S)$
 $= \min(1, 17100.0 / 20000.0)$
 $= 0.855$

Weld Strength Reduction Factor [fr2]:
 $= \min(1, S_n / S)$
 $= \min(1, 17100.0 / 20000.0)$
 $= 0.855$

3 Phase Separator: 47" ID x 15'-0" S/S

Drawing Number: HSEP-WB-48x285.125.08 Rev 2

Calculation Number: 3797acc-r0

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Nozzle Calcs. : N2 Outlet

Nozl: 7 10:02a Mar 7, 2012

Area Available in Welds [A41 + A42 + A43]:

$$\begin{aligned} &= (W_o^2 - A_r \text{ Lost}) * Fr_3 + ((W_i - c_{an}/0.707)^2 - A_r \text{ Lost}) * fr_2 + Trapfr_4 \\ &= (0.1406) * 0.86 + (0.0000) * 0.86 + 0.0789^2 * 1.00 \\ &= 0.199 \text{ in}^2 \end{aligned}$$

Area Available in Element [A5]:

$$\begin{aligned} &= (\min(D_p, D_L) - (\text{Nozzle OD})) * (\min(t_p, T_{lwp}, t_e)) * fr_4 \\ &= (10.6250 - 6.6250) * 0.3750 * 1.0000 \\ &= 1.125 \text{ in}^2 \end{aligned}$$

Note: Per user request, A5 multiplied by 0.75, see UG-37(h).

UG-45 Minimum Nozzle Neck Thickness Requirement: [Int. Press.]

Wall Thickness for Internal/External pressures	$t_a = 0.1798 \text{ in}$
Wall Thickness per UG16(b),	$tr_{16b} = 0.1875 \text{ in}$
Wall Thickness, shell/head, internal pressure	$tr_{b1} = 0.4646 \text{ in}$
Wall Thickness	$tb_1 = \max(tr_{b1}, tr_{16b}) = 0.4646 \text{ in}$
Wall Thickness	$tb_2 = \max(tr_{b2}, tr_{16b}) = 0.1875 \text{ in}$
Wall Thickness per table UG-45	$tb_3 = 0.3699 \text{ in}$

Determine Nozzle Thickness candidate [tb]:

$$\begin{aligned} &= \min[tb_3, \max(tb_1, tb_2)] \\ &= \min[0.370, \max(0.465, 0.188)] \\ &= 0.3699 \text{ in} \end{aligned}$$

Minimum Wall Thickness of Nozzle Necks [tUG-45]:

$$\begin{aligned} &= \max(t_a, t_b) \\ &= \max(0.1798, 0.3699) \\ &= 0.3699 \text{ in} \end{aligned}$$

Available Nozzle Neck Thickness = $0.875 * 0.718 = 0.628 \text{ in}$ --> OK

Nozzle Junction Minimum Design Metal Temperature (MDMT) Calculations:

MDMT of the Nozzle Neck to Flange Weld,

Curve: B

$$\begin{aligned} \text{Govrn. thk, } t_g &= 0.628, tr = 0.055, c = 0.1250 \text{ in}, E^* = 1.00 \\ \text{Stress Ratio} &= tr * (E^*) / (t_g - c) = 0.109, \text{Temp. Reduction} = 140 \text{ F} \end{aligned}$$

Min Metal Temp. w/o impact per UCS-66	7 F
Min Metal Temp. at Required thickness (UCS 66.1)	-133 F
Min Metal Temp. w/o impact per UG-20(f)	-20 F

MDMT of Nozzle Neck to Pad Weld for the Nozzle,

Curve: B

$$\begin{aligned} \text{Govrn. thk, } t_g &= 0.375, c = 0.1250 \text{ in}, E^* = 1.00 \\ \text{Stress Ratio} &= tr * (E^*) / (t_g - c) = 0.905, \text{Temp. Reduction} = 9 \text{ F} \\ \text{Pad governing, Conservatively assuming Pad stress} &= \text{Shell stress (Div. 1 L-9.3)} \end{aligned}$$

Min Metal Temp. w/o impact per UCS-66	-20 F
Min Metal Temp. at Required thickness (UCS 66.1)	-29 F

MDMT of Nozzle Neck to Pad Weld for Reinforcement pad,

Curve: D

$$\begin{aligned} \text{Govrn. thk, } t_g &= 0.375, c = 0.1250 \text{ in}, E^* = 1.00 \\ \text{Stress Ratio} &= tr * (E^*) / (t_g - c) = 0.905, \text{Temp. Reduction} = 9 \text{ F} \end{aligned}$$

3 Phase Separator: 47" ID x 15'-0" S/S

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Nozzle Calcs. : N2 Outlet

Nozl: 7 10:02a Mar 7, 2012

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3 Phase Separator: 47" ID x 15'-0" S/S
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Nozzle Calcs. : A1 Manway Nozl: 8 10:02a Mar 7,2012

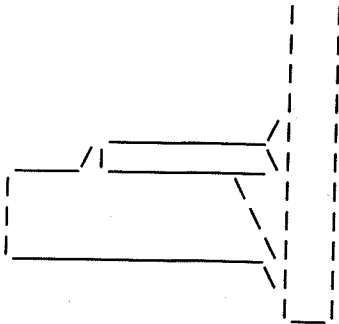
ASME Code Weld Type per UW-16
 This is a Manway or Access Opening.

C

Class of attached Flange 150
 Grade of attached Flange GR 1.1

The Pressure Design option was Design Pressure + static head.

Nozzle Sketch (may not represent actual weld type/configuration)



Insert Nozzle With Pad, with Inside projection

Reinforcement CALCULATION, Description: A1 Manway

ASME Code, Section VIII, Division 1, 2010, 2011a, UG-37 to UG-45

Actual Outside Diameter Used in Calculation 24.000 in.
 Actual Thickness Used in Calculation 1.250 in.

Nozzle input data check completed without errors.

Reqd thk per UG-37(a) of Elliptical Head, Tr [Int. Press]
 $= (P \cdot D \cdot K) / (2 \cdot S \cdot E - 0.2 \cdot P)$ Appendix 1-4(c)
 $= (285.00 \cdot 47.2500 \cdot 0.993) / (2 \cdot 20000.00 \cdot 1.00 - 0.2 \cdot 285.00)$
 $= 0.3348$ in

Reqd thk per UG-37(a) of Nozzle Wall, Trn [Int. Press]
 $= (P \cdot R_o) / (S \cdot E + 0.4 \cdot P)$ per Appendix 1-1 (a)(1)
 $= (285.00 \cdot 12.0000) / (20000 \cdot 1.00 + 0.4 \cdot 285.00)$
 $= 0.1700$ in

UG-40, Limits of Reinforcement : [Internal Pressure]

Parallel to Vessel Wall (Diameter Limit)	D1	43.5000	in
Parallel to Vessel Wall, opening length	d	21.7500	in
Normal to Vessel Wall (Thickness Limit), pad side Tlwp		0.8375	in
Normal to Vessel Wall, Inward		0.8375	in

Weld Strength Reduction Factor [fr1]:

$= \min(1, S_n/S)$
 $= \min(1, 20000.0/20000.0)$
 $= 1.000$

Weld Strength Reduction Factor [fr2]:

$= \min(1, S_n/S)$

3 Phase Separator: 47" ID x 15'-0" S/S
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Nozzle Calcs. : Al Manway Nozl: 8 10:02a Mar 7, 2012

$$= 1.675 \text{ in}^2$$

Area Available in Welds [A41 + A42 + A43]:

$$\begin{aligned} &= (W_o^2 - A_r \text{ Lost}) * Fr_3 + ((W_i - \text{can}/0.707)^2 - A_r \text{ Lost}) * fr_2 + W_p^2 * fr_4 \\ &= (0.5955) * 1.00 + (0.3286) * 1.00 + 0.1406^2 * 1.00 \\ &= 1.065 \text{ in}^2 \end{aligned}$$

Area Available in Element [A5]:

$$\begin{aligned} &= (\min(D_p, D_L) - (\text{Nozzle OD})) * (\min(t_p, T_{lwp}, t_e)) * fr_4 \\ &= (32.0000 - 24.0000) * 0.3750 * 1.0000 \\ &= 3.000 \text{ in}^2 \end{aligned}$$

Nozzle Junction Minimum Design Metal Temperature (MDMT) Calculations:

MDMT of the Nozzle Neck to Flange Weld, Curve: D

Govrn. thk, $t_g = 1.250$, $t_r = 0.170$, $c = 0.1250$ in, $E^* = 1.00$
Stress Ratio = $t_r * (E^*) / (t_g - c) = 0.151$, Temp. Reduction = 140 F

Min Metal Temp. w/o impact per UCS-66 -20 F
Min Metal Temp. at Required thickness (UCS 66.1) -155 F

MDMT of Nozzle Neck to Pad Weld for the Nozzle, Curve: D

Govrn. thk, $t_g = 0.375$, $c = 0.1250$ in, $E^* = 1.00$
Stress Ratio = $t_r * (E^*) / (t_g - c) = 0.999$, Temp. Reduction = 0 F
Pad governing, Conservatively assuming Pad stress = Shell stress(Div. 1 L-9.3)

Min Metal Temp. w/o impact per UCS-66 -55 F

MDMT of Nozzle Neck to Pad Weld for Reinforcement pad, Curve: D

Govrn. thk, $t_g = 0.375$, $c = 0.1250$ in, $E^* = 1.00$
Stress Ratio = $t_r * (E^*) / (t_g - c) = 0.999$, Temp. Reduction = 0 F
Pad governing, Conservatively assuming Pad stress = Shell stress(Div. 1 L-9.3)

Min Metal Temp. w/o impact per UCS-66 -55 F

MDMT of Shell to Pad Weld at Pad OD for pad, Curve: D

Govrn. thk, $t_g = 0.375$, $c = 0.1250$ in, $E^* = 1.00$
Stress Ratio = $t_r * (E^*) / (t_g - c) = 0.999$, Temp. Reduction = 0 F
Pad governing, Conservatively assuming Pad stress = Shell stress(Div. 1 L-9.3)

Min Metal Temp. w/o impact per UCS-66 -55 F

MDMT of Nozzle-Shell/Head Weld for the Nozzle (UCS-66(a)1(b)), Curve: D

Govrn. thk, $t_g = 0.460$, $t_r = 0.335$, $c = 0.1250$ in, $E^* = 1.00$
Stress Ratio = $t_r * (E^*) / (t_g - c) = 0.999$, Temp. Reduction = 0 F

Min Metal Temp. w/o impact per UCS-66 -55 F

Governing MDMT of the Nozzle : -55 F
Governing MDMT of the Reinforcement Pad : -55 F
Governing MDMT of all the sub-joints of this Junction : -55 F

3 Phase Separator: 47" ID x 15'-0" S/S
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Nozzle Schedule :

Step: 12 10:02a Mar 7, 2012

Nozzle Schedule:

Description	Nominal Size in.	Flange Sch/Type Cls	Noz. O/Dia in.	Wall Thk in	Re-Pad ODia in	Re-Pad Thick in	Cut Length in
N1 Inlet	6.000	160 WNF	6.625	0.718	10.62	0.375	3.50
N2 Outlet	6.000	160 WNF	6.625	0.718	10.62	0.375	3.50
B1 Boot	16.000	80 None	16.000	0.843	23.00	0.500	29.03
A1 Manway	24.000	150 SlipOn	24.000	1.250	32.00	0.375	8.18

General Notes for the above table:

The Cut Length is the Outside Projection + Inside Projection + Drop + In Plane Shell Thickness. This value does not include weld gaps, nor does it account for shrinkage.

In the case of Oblique Nozzles, the Outside Diameter must be increased. The Re-Pad WIDTH around the nozzle is calculated as follows:
 Width of Pad = (Pad Outside Dia. (per above) - Nozzle Outside Dia.)/2

For hub nozzles, the thickness and diameter shown are those of the smaller and thinner section.

Nozzle Material and Weld Fillet Leg Size Details:

Nozzle	Material	Shl Grve Weld in	Noz Shl/Pad Weld in	Pad OD Weld in	Pad Grve Weld in	Inside Weld in
N1 Inle	SA-106 B	0.500	0.375	0.375	0.375	-
N2 Outl	SA-106 B	0.500	0.375	0.375	0.375	-
B1 Boot	SA-106 B	0.500	0.375	0.375	0.500	-
A1 Manw	SA-516 70	0.460	0.875	0.375	0.375	0.750

Note: The Outside projections below do not include the flange thickness.

Nozzle Miscellaneous Data:

Nozzle	Elevation/Distance From Datum in	Layout Angle deg.	Projection Outside in	Projection Inside in	Installed In Component
N1 Inlet	18.000	0.00	2.50	0.50	Shell
N2 Outlet	160.000	0.00	2.50	0.50	Shell
B1 Boot	90.000	180.00	27.12	0.00	Shell
A1 Manway		0.00	6.00	1.00	Manway Head

Weld Sizes for Slip On Nozzle Flanges per UW-21:

Nozzle to Flange Fillet Weld Leg dimension [xmin]:
 = min(0.7 * Hub Thickness, Nozzle Thickness-Corrosion)/0.7 for Socket Welds
 = min(1.4 * tmin, Hub Thickness) / 0.7 for Slip on Flanges.

The Nozzle Wall thicknesses shown below are in the corroded condition. Hubs are considered to be straight.

3 Phase Separator: 47" ID x 15'-0" S/S
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Nozzle Summary :

Step: 13 10:02a Mar 7, 2012

Nozzle Calculation Summary:

Description	MAWP psig	Ext	MAPNC psig	UG45 [tr]	Weld Path	Areas or Stresses
B1 Boot	290.38	...	...	OK 0.453	OK	Passed
N1 Inlet	314.47	...	...	OK 0.370	OK	Passed
N2 Outlet	314.47	...	...	OK 0.370	OK	Passed
A1 Manway	285.19	...	...	...	OK	Passed
Min. - Nozzles	285.19	A1 Manway				
Min. Shell&Flgs	285.00					

Computed Vessel M.A.W.P. 285.00 psig

Note: MAWPs (Internal Case) shown above are at the High Point.

Check the Spatial Relationship between the Nozzles

From Node	Nozzle Description	X Coordinate,	Layout Angle,	Dia. Limit
20	B1 Boot	92.000	180.000	29.128
20	N1 Inlet	20.000	0.000	10.878
20	N2 Outlet	162.000	0.000	10.878
30	A1 Manway	0.000	0.000	43.500

The nozzle spacing is computed by the following:

= $\text{Sqrt}(l_l^2 + l_c^2)$ where

l_l - Arc length along the inside vessel surface in the long. direction.

l_c - Arc length along the inside vessel surface in the circ. direction

If any interferences/violations are found, they will be noted below.

No interference violations have been detected !

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3 Phase Separator: 47" ID x 15'-0" S/S
 Drawing Number: HSEP-WB-48x285.125.08 Rev 2
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 FileName : 3797acc-r0

Vessel Design Summary : ----- Page 38 of 38
 Step: 15 10:02a Mar 7, 2012

Design Code: ASME Code Section VIII Division 1, 2010, 2011a

Diameter Spec : 47.000 in ID
 Vessel Design Length, Tangent to Tangent 184.00 in
 Specified Datum Line Distance 2.00 in
 Shell Material Specification SA-516 70 [Normalized]
 Nozzle Material Specification SA-106 B
 Nozzle Material Specification SA-516 70 [Normalized]
 Re-Pad Material Specification SA-516 70 [Normalized]
 Internal Design Temperature 100 F
 Internal Design Pressure 285.000 psig
 External Design Temperature 0 F
 Maximum Allowable Working Pressure 285.000 psig
 Hydrostatic Test Pressure 370.500 psig
 Required Minimum Design Metal Temperature -20 F
 Warmest Computed Minimum Design Metal Temperature -20 F
 Wind Design Code No Wind Loads
 Earthquake Design Code No Seismic

Element Pressures and MAWP: psig

Element Desc	Design Pres. + Stat. head	External Pressure	M.A.W.P	Corrosion Allowance
Head	285.000	0.000	285.190	0.1250
Shell	285.000	0.000	314.465	0.1250
Manway Head	285.000	0.000	285.190	0.1250

Element Type	"To" Elev in	Length in	Element Thk in	Req'd Thk Int.	Joint Eff Ext. Long	Circ
Ellipse	0.00	2.000	0.500	0.460	0.188	1.00
Cylinder	180.00	180.000	0.500	0.465	No Calc	1.00
Ellipse	182.00	2.000	0.500	0.460	0.188	1.00

Element thicknesses are shown as Nominal if specified, otherwise are Minimum

Weights:

Fabricated - Bare W/O Removable Internals 7053.4 lbm
 Shop Test - Fabricated + Water (Full) 19562.7 lbm
 Shipping - Fab. + Rem. Intls.+ Shipping App. 7053.4 lbm
 Erected - Fab. + Rem. Intls.+ Insul. (etc) 7053.4 lbm
 Empty - Fab. + Intls. + Details + Wghts. 7053.4 lbm
 Operating - Empty + Operating Liquid (No CA) 7053.4 lbm
 Field Test - Empty Weight + Water (Full) 18330.3 lbm

ACCESS MANUFACTURING LTD.

10828 -269 Road
Fort St. John, BC V1J 2A3

Phone: (250) 785-5578
Fax: (250) 785-5997

QW-484

WELDER/WELDING OPERATOR PERFORMANCE QUALIFICATIONS (WPQ) (See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name: Derek Mulligan Reg# 24241		Clock No.		ID. No. "X"	
Welding Process(es) Used: SMAW DCRP			Type: Groove & Fillet		
Identification of WPS followed by welder during welding test coupon: AML-1, AML-2					
Base material(s) welded: SA-106 Gr. B			Thickness: 2" SCH.80 (0.218") & 6" XXH		
Manual ☒ or Semi-auto.		Variables for each Process (QW-350)		Actual Values	Range Qualified
Backing (metal, weld metal, welded from both sides, flux, etc.) (QW-402)				NONE	With or without
ASME P-No. to ASME P-No. (QW-403)				P1 Gr.1 TO P1 Gr.1	P1 Gr.1 TO P1 Gr.1
() Plate (X) Pipe (enter diameter, if pipe)				2" SCH.80 (0.218") & 6" XXH	MAX TO BE WELDED
Filler metal specification (SFA): Classification (QW-404) E6010, E6011, E7018, E7018-1				5.1	5.1
Filler metal F-No.				F3, F4	F3, F4
Consumable insert for GTAW or PAW				N/A	N/A
Weld deposit thickness for welding process per pass:				F3, F4	F3, F4
Welding position (1G, 5G, etc.)				2" XH IN 6G; 6"XXH IN 1G	All Positions
Progression (uphill ↑ downhill ↓)				2" XH IN 6G	F3 ↑ ↓ F4 ↑
Backing gas for GTAW, PAW, or GMAW; fuel gas for OFW (QW-408)				N/A	
GMAW transfer mode (QW-409)				N/A	
GTAW welding current type/polarity				N/A	
Machine Welding Variables for the Process Used (QW-360)				Actual Values	Range Qualified
Direct/remote visual control				N/A	
Automatic voltage control (GTAW)				N/A	
Automatic joint tracking				N/A	
Welding position (1G, 5G, etc.)				N/A	
Consumable insert				N/A	
Backing (metal, weld metal, welded from both sides, etc.)				N/A	
Guided Bend Test Results					
Guided Bend Test Results: () QW-462.2 (S1, S2, S3, S4) Results () QW-462.3(a) Trans. R&F Type () QW-462.3(b) Long. R&F Type					
Visual examination results (QW-302.4) PASS					
Radiographic test results (QW-304 and QW-305) PASS					
(For alternative qualification of groove welds by radiography) <i>See 2- TA-33</i>					
Fillet Weld - fracture test		Length and percent of defects in.			
Macro test fusion	Fillet leg size in.	x in.	Concavity/convexity in.		
Welding test conducted by: ACCESS MANUFACTURING LTD.			Laboratory test No.		
Mechanical tests conducted by:			Laboratory test No.		
We certify that the statements in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of Section IX, of the ASME Code. BY: <i>[Signature]</i> Richard Strebchuk QCM Access Manufacturing Ltd.					

Revision 0

September 7, 2006

Revision Approval: _____

ACCESS MANUFACTURING LTD.

10828 -269 Road
Fort St. John, BC V1J 2A3

Phone: (250) 785-5578
Fax: (250) 785-5997

QW-484

WELDER/WELDING OPERATOR PERFORMANCE QUALIFICATIONS (WPQ)
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name: Derek Mulligan		Clock No.		ID. No. X
Welding Process(es) Used: SMAW DCRP			Type: Grove & Fillet	
Identification of WPS followed by welder during welding test coupon: AML-2				
Base material(s) welded: P1 (SA-36, SA-106 Gr. B, SA-105, SA-516-70, etc)			Thickness: (0.188" to 8.00") Inclusive	
Manual ☒ or Semi-auto.	Variables for each Process (QW-350)		Actual Values	Range Qualified
Backing (metal, weld metal, welded from both sides, flux, etc.) (QW-402) None				With or without
ASME P-No. P1 to ASME P-No. (QW-403) P1 (SA-36, SA-106 Gr. B, SA-105, SA-516-70, etc)				P1 to P1
() Plate (☒) Pipe (enter diameter, if pipe)			6" XXH	0.188 to 8.00"
Filler metal specification (SFA): 5.1 Classification (QW-404) E6010, E6011, E7018, E7018-1				As noted:
Filler metal F-No.				F3, F4
Consumable insert for GTAW or PAW			N/A	
Weld deposit thickness for welding process per pass: F3 - 0.188 MAX, F4 - 0.500" MAX				As noted:
Welding position (1G, 5G, etc.)			1G	All Positions
Progression (uphill ↑ downhill ↓)				F3 ↑ ↓ F4 ↑
Backing gas for GTAW, PAW, or GMAW; fuel gas for OFW (QW-408)			N/A	
GMAW transfer mode (QW-409)			N/A	
GTAW welding current type/polarity			N/A	
Machine Welding Variables for the Process Used (QW-360)			Actual Values	Range Qualified
Direct/remote visual control			N/A	
Automatic voltage control (GTAW)			N/A	
Automatic joint tracking			N/A	
Welding position (1G, 5G, etc.)			N/A	
Consumable insert			N/A	
Backing (metal, weld metal, welded from both sides, etc.)			N/A	
Guided Bend Test Results				
Guided Bend Test Results: () QW-462.2 (S1, S2, S3, S4) Results () QW-462.3(a) Trans. R&F Type () QW-462.3(b) Long. R&F Type				
Visual examination results (QW-302.4) PASS				
Radiographic test results (QW-304 and QW-305) PASS				
(For alternative qualification of groove welds by radiography) TEST AGENCY TA-0033 <i>Paul</i> 07-01-11				
Fillet Weld - fracture test		Length and percent of defects in.		
Macro test fusion	Fillet leg size in.	x in.	Concavity/convexity in.	
Welding test conducted by: ACCESS MANUFACTURING LTD.			Laboratory test No.	
Mechanical tests conducted by:			Laboratory test No.	
We certify that the statements in this record are correct and that the test coupons were prepared, welded, and tested in accordance with the requirements of Section IX, of the ASME Code. BY: <i>Richard Strebchuk</i> Richard Strebchuk QCM Access Manufacturing Ltd.				

Revision 0

September 7, 2006

Revision Approval: _____

1

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's name DON FAULKNER Identification Number Q
BCSA Registration #: 66944

Test Description

Identification of WPS followed AML-2 ☒ Test coupon ☐ Prod. weld
Specification of base metal (s) SA-106 B to SA-106 B Thickness 0.685"
(type/grade or UNS Number of base metals)

Testing Variables and Qualification Limits

Welding Variables (QW-350)

Welding process(es)
Type (ie; manual, semi-auto) used
Backing (with/without)
☐ Plate ☒ Pipe (enter diameter if pipe or tube)
Base metal P Number to P Number
Filler metal or electrode specifications(s) (SFA) (info. only)
Filler metal or electrode classification(s) (info only)
Filler metal F-Number(s)
Consumable insert (GTAW or PAW)
Filler Metal Product Form (solid/metal or flux cored/powder) (GTAW or PAW)
Deposited thickness for each process
Process 1: SMAW 3 layers min. ☒ Yes ☐ No
Process 2: SMAW 3 layers min. ☒ Yes ☐ No
Positions qualified (2G, 6G, 3F etc.)
Vertical progression (uphill or downhill)
Type of fuel gas (OFW)
Inert gas backing (GTAW, PAW, GMAW)
Transfer mode (spray/globular or pulse to short circuit-GMAW)
GTAW Current type/polarity (AC, DCEP, DCEN)

Actual Values		Range Qualified	
SMAW	SMAW	SMAW	SMAW
Manual	Manual	Manual	Manual
Without	With	Without	With
4" XXH		2 7/8" TO NO LIMIT	
P1-P1		P1-P1	
5.1	5.1		
E6010	E7018-1		
F3	F4	F3	F4
NO	NO	NO	NO
COVERED	COVERED	SOLID	COVERED
		0.188" to 0.8.0"	
0.255"	0.44"	0.51"	0.88"
6G		ALL	
DOWNHILL	UPHILL	DOWNHILL	UPHILL
NO	NO	NO	NO
NO	NO	NO	NO
NO	NO	NO	NO
DCEP	DCEP	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4)

ACCEPTABLE

☐ Transverse root & face [QW-462.3(a); ☐ Longitudinal root & face [QW-462.3(b); ☐ Side (QW-462.2);
☐ Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)]; ☐ Plate bend spec. corrosion-resistant overlay [QW-452.5(d)];
☐ Pipe Specimen, macro test for fusion [QW-462.5(b)]; ☐ Plate specimen, macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternate Volumetric Examination Results (QW-191)

RT ☒ UT ☐ (check one)

Fillet weld-fracture test (QW-181.2)

Length and percent of defects

Macro examination (QW-184)

Fillet size (in) x Concavity/convexity (in)

Other tests

Film or specimens evaluated by

DEAN OWEN

Company ACCESS MANUFACTURING LTD.

Mechanical tests conducted by

NONE

Laboratory test no.

TEST ID# 021

SO ID 655A

Welding supervised by

DEAN OWEN / RICHARD STREBCHUK

We certify that the statements in this record are correct and that the test coupons were prepared, welded and tested in accordance with the requirements of Section IX of the ASME BOILER AND PRESSURE VESSEL CODE.

Manufacturer or Contractor: ACCESS MANUFACTURING LTD.

Date:

May 7, 2012.

Certified by:

Dean Owen-Quality Control Manager

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's name DON FAULKNER Identification Number Q
BCSA Registration #: 66944

Test Description

Identification of WPS followed AML-2 ☒ Test coupon ☐ Prod. weld
Specification of base metal (s) SA-106 B to SA-106 B Thickness 0.218"
(type/grade or UNS Number of base metals)

Testing Variables and Qualification Limits

Welding Variables (QW-350)

Welding process(es)
Type (ie; manual, semi-auto) used
Backing (with/without)
☐ Plate ☒ Pipe (enter diameter if pipe or tube)
Base metal P Number to P Number
Filler metal or electrode specifications(s) (SFA) (info. only)
Filler metal or electrode classification(s) (info only)
Filler metal F-Number(s)
Consumable insert (GTAW or PAW)
Filler Metal Product Form (solid/metal or flux cored/powder) (GTAW or PAW)
Deposited thickness for each process
Process 1: SMAW 3 layers min. ☐ Yes ☒ No
Process 2: SMAW 3 layers min. ☐ Yes ☒ No
Positions qualified (2G, 6G, 3F etc.)
Vertical progression (uphill or downhill)
Type of fuel gas (OFW)
Inert gas backing (GTAW, PAW, GMAW)
Transfer mode (spray/globular or pulse to short circuit-GMAW)
GTAW Current type/polarity (AC, DCEP, DCEN)

Actual Values		Range Qualified	
SMAW	SMAW	SMAW	SMAW
Manual	Manual	Manual	Manual
Without	With	Without	With
NPS 2		1" to No Limit	
P1-P1		P1-P1	
5.1	5.1		
E6010	E7018-1		
F3	F4	F3	F4
NO	NO	NO	NO
Covered	Covered	Covered	Covered
0.098"	0.120"	0.188" to 0.436"	0.196" 0.240"
6G		ALL	
Uphill	Uphill	Uphill	Uphill
NO	NO	NO	NO
NO	NO	NO	NO
NO	NO	NO	NO
DCEP	DCEP	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4)

ACCEPTABLE

☐ Transverse root & face [QW-462.3(a); ☐ Longitudinal root & face [QW-462.3(b); ☐ Side (QW-462.2);
☐ Pipe bend specimen, corrosion-resistant overlay [QW-462.59 c]; ☐ Plate bend spec. corrosion-resistant overlay [QW-462.5(d)];
☐ Pipe Specimen, macro test for fusion [QW-462.5(b)]; ☐ Plate specimen, macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternate Volumetric Examination Results (QW-191)

RT ☒ UT ☐ (check one)

Fillet weld-fracture test (QW-181.2)

Length and percent of defects

Macro examination (QW-184)

Fillet size (in) x Concavity/convexity (in)

Other tests

Film or specimens evaluated by

COLIN MUSSEAU

Company

RADIUS INSPECTION SERVICES

Mechanical tests conducted by

NONE

Laboratory test no.

TEST ID# 016

Welding supervised by

DEAN OWEN / RICHARD STREBCHUK

We certify that the statements in this record are correct and that the test coupons were prepared, welded and tested in accordance with the requirements of Section IX of the ASME BOILER AND PRESSURE VESSEL CODE.

Date:

April 23, 2012

Manufacturer or Contractor:

ACCESS MANUFACTURING LTD.

Certified by:

Dean Owen
Dean Owen-Quality Control Manager

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's name DON FAULKNER Identification Number Q
BCSA Registration #: 66944

Test Description

Identification of WPS followed AML-2 ☒ Test coupon ☐ Prod. weld
Specification of base metal (s) SA-106 B to SA-106 B Thickness 0.218"
(type/grade or UNS Number of base metals)

Testing Variables and Qualification Limits

Welding Variables (QW-350)

Welding process(es)
Type (ie; manual, semi-auto) used
Backing (with/without)
☐ Plate ☒ Pipe (enter diameter if pipe or tube)
Base metal P Number to P Number
Filler metal or electrode specifications(s) (SFA) (info. only)
Filler metal or electrode classification(s) (info only)
Filler metal F-Number(s)
Consumable insert (GTAW or PAW)
Filler Metal Product Form (solid/metal or flux cored/powder) (GTAW or PAW)
Deposited thickness for each process
Process 1: SMAW 3 layers min. ☐ Yes ☒ No
Process 2: SMAW 3 layers min. ☐ Yes ☒ No
Positions qualified (2G, 6G, 3F etc.)
Vertical progression (uphill or downhill)
Type of fuel gas (OFW)
Inert gas backing (GTAW, PAW, GMAW)
Transfer mode (spray/globular or pulse to short circuit-GMAW)
GTAW Current type/polarity (AC, DCEP, DCEN)

Actual Values		Range Qualified	
SMAW	SMAW	SMAW	SMAW
Manual	Manual	Manual	Manual
Without	With	Without	With
NPS 2		1" to No Limit	
P1-P1		P1-P1	
5.1	5.1		
E6010	E7018-1		
F3	F4	F3	F4
NO	NO	NO	NO
Covered	Covered	Covered	Covered
		0.188" to 0.436"	
0.128"	0.090"	0.256"	0.180"
6G		ALL	
Downhill	Uphill	Downhill	Uphill
NO	NO	NO	NO
NO	NO	NO	NO
NO	NO	NO	NO
DCEP	DCEP	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4)

ACCEPTABLE

☐ Transverse root & face [QW-462.3(a); ☐ Longitudinal root & face [QW-462.3(b); ☐ Side (QW-462.2);
☐ Pipe bend specimen, corrosion-resistant overlay [QW-462.59 c]; ☐ Plate bend spec. corrosion-resistant overlay [QW-462.5(d)];
☐ Pipe Specimen, macro test for fusion [QW-462.5(b)]; ☐ Plate specimen, macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternate Volumetric Examination Results (QW-191)

RT ☒ UT ☐ (check one)

Fillet weld-fracture test (QW-181.2)

Length and percent of defects

Macro examination (QW-184)

Fillet size (in) x Concavity/convexity (in)

Other tests

Film or specimens evaluated by

COLIN MUSSEAU

Company

RADIUS INSPECTION SERVICES

Mechanical tests conducted by

NONE

Laboratory test no.

TEST ID# 014

Welding supervised by

DEAN OWEN / RICHARD STREBCHUK

We certify that the statements in this record are correct and that the test coupons were prepared, welded and tested in accordance with the requirements of Section IX of the ASME BOILER AND PRESSURE VESSEL CODE.

Manufacturer or Contractor:

ACCESS MANUFACTURING LTD.

Date:

April 23, 2012

Certified by:

Dean Owen
Dean Owen-Quality Control Manager

ALTEC

INSPECTION LTD.

RECEIVED

APR 05 2012

Ph: (250) 785-6295

Box 283, Charlie Lake, B.C. V0C 1H0

Fax: (250) 785-4395

FIELD REPORT

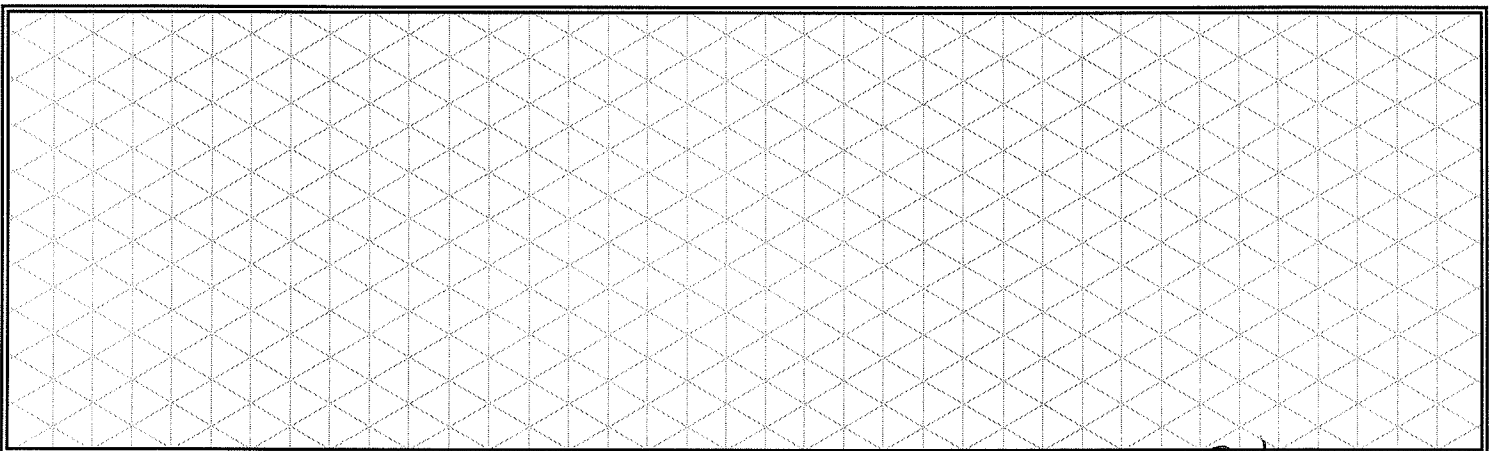
CLIENT: <u>Access MFG. Ltd.</u>	INSPECTION DATE: <u>Feb 25th 2012</u>
ATTN: <u>Don Faulkner</u>	JOB #: <u>P/2014</u>
P.O.# (A.F.E.): <u>6312</u>	
FIELD LOCATION: <u>Access yard, Fort St. John</u>	1284

JOB TYPE: ult & M/T JOB DESCRIPTION: magnetic Particle inspection of fillet welds associated with the manway & shear wave ult inspection on the seam welds associated with the manway, boot, inlet & outlet reboils.

REMARKS: Magnetic Particle inspection of the welds associated with the manway. Revealed no significant indications.

Shear wave ult was completed on the seam welds associated with the inlet, outlet, boot & manway reboils. The inspection was completed using 45° & 60° Perspex angle shoes.
No indications were found during the inspection

DRAWING (IF APPLICABLE):



TECHNICIAN(S): Declan Scully cgab ult I SR. TECHNICIAN SIG: [Signature] CGSB 2, ult

TOTAL FIELD HRS: _____ R.T. KM: _____ SUBSIS.: _____ REPORT TO FOLLOW: _____

_____ O.T. CO. REPRESENTATIVE: _____

9004-107 STREET

FORT ST. JOHN, B.C. V1J 5R5

PHONE: (250) 787-0336

FAX: (250) 787-0733

Client: ACCESS MANUFACTURING

Date: 12.03.01

Attention:

Page 1 of 1

Charge Code:

JOB# P12014

RECEIVED Ticket #: 14287

Location:

FORT ST John

~~MAR 19 2012~~

RADIOGRAPHIC REPORT

[illegible]

DEFECT LEGEND:

ES - Elongated Slag

IS - Isolated Slag

P - Porosity

IP - Incomplete Penetration

LF - Lack of Fusion

BT - Burn Through

C - Crack

AB - Arc Burn

IC - Internal Concavity

HB - Hollow Bead

IUC - Internal Undercut

EUC - External Undercut

WHITE - Client

GREEN - Film Copy

YELLOW - Office

PINK - Invoice

GOLD - Technician

Name

Signature _____

Technician CGSB/ASNT Level Reg. #:

CP7912

The above is an interpretation of film images in conjunction with the following specification and does not guarantee the absolute integrity of the weld(s):

ASMP B31.3 Normal Service

Date: 09-04-28

EXHIBIT #17 – Revision 0
ACCESS MANUFACTURING LTD.Issue #: 1
Page 1 of 1**HEAT TREATMENT INSTRUCTIONS**

Job Number: P12014 Date: February 24, 2012
Serial Number: P8078-01 Client: Access Manufacturing
Drawing Number: HSEP-WB-48x285.125.08 CRN: K6964.1
Diameter: 48" Length: 15" Width: _____
Shell Thickness: 1/2" Material: SA-516-70N
Head Thickness: 1/2" Material: SA-516-70N
Misc. Thickness: _____ Material: _____
Type of Heat Treatment: Electric Resistance: ☒ Open Flame: ☐
(Check applicable type)

INSTRUCTIONS:

*** At no time will the flame touch any surface of the item being Heat Treated. ***

***The maximum distance between thermo couplers is 15 Feet ***

1. Temperature to be raised from **800°F** to **1100°F** at maximum rate of 500 °F per hour.

NOTE: Must not exceed 400°F per hour

2. Temperature to be held at **1100°F + -10°F** for 30 minutes.

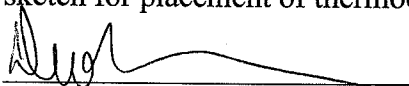
3. Temperature must be lowered from **1100 °F** to **800°F** at a rate of 500 °F per hour.

NOTE: Must not exceed a drop of 500°F per hour

4. Additional requirements:

*****Items cooling below 800 °F after heat treatment are to be left in still air or if this is not practicable, are to be left wrapped with insulation until cool enough to touch with a bare hand. *****

(When required, see attached sketch for placement of thermocouples and supports)


Quality Control Manager

Feb 24/12
Date

Furnace Heat Number

Operator's Signature

Date

A black and white cartoon illustration of a devil character. The character has a round head with two small horns, large eyes, and a mischievous grin showing small teeth. It has a small body with a large, prominent diaper. The character is holding a pitchfork in its right hand and has a long, pointed tail. The style is simple and playful.

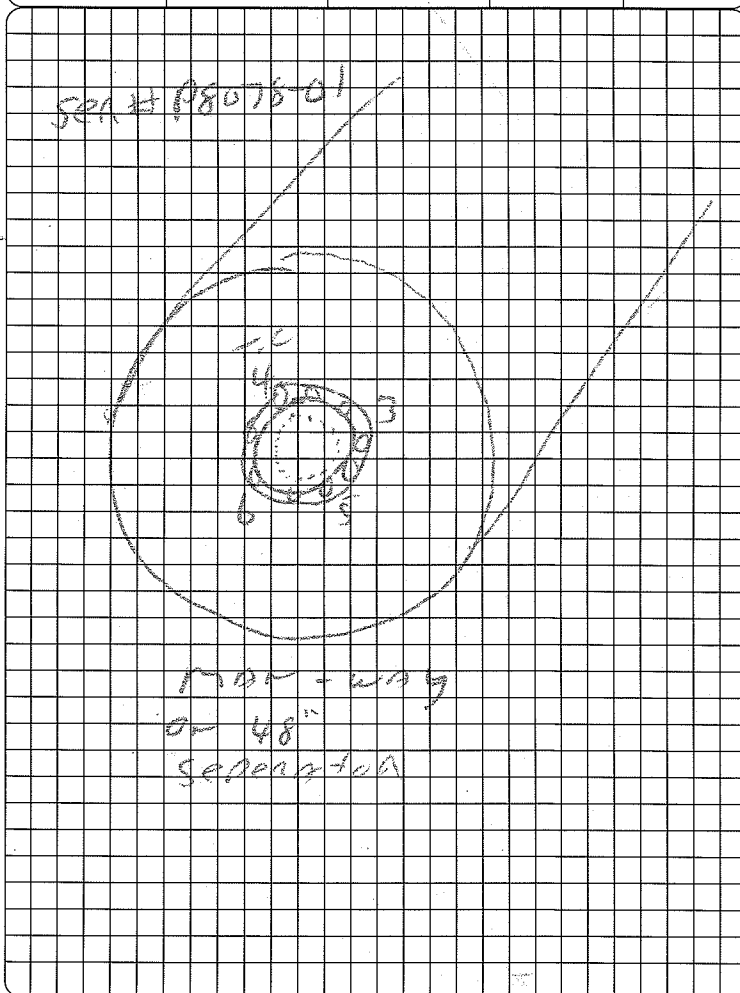
FAX: (780) 539-5916

[illegible]

EQUIPMENT CONSUMABLES	QUANTITY
SINERT WITH # 211	
SINERT RELIEVE MAN-WAY	
WELD BUILD-UP ON 48"	
SEPARATOR	

SIGHT TIME					HOURS	
TECH	DATE	START	FINISH	REGULAR	O.T.	D.T.
G.M.C	02-27-12	8:00 AM	2:00 PM	6		
J.T	02-27-12	8:00 AM	2:00 PM	6		

TRAVEL TIME		HOURS	VEHICLE	MILEAGE
TECH	DATE			



SIGNED (TECHNICIAN)

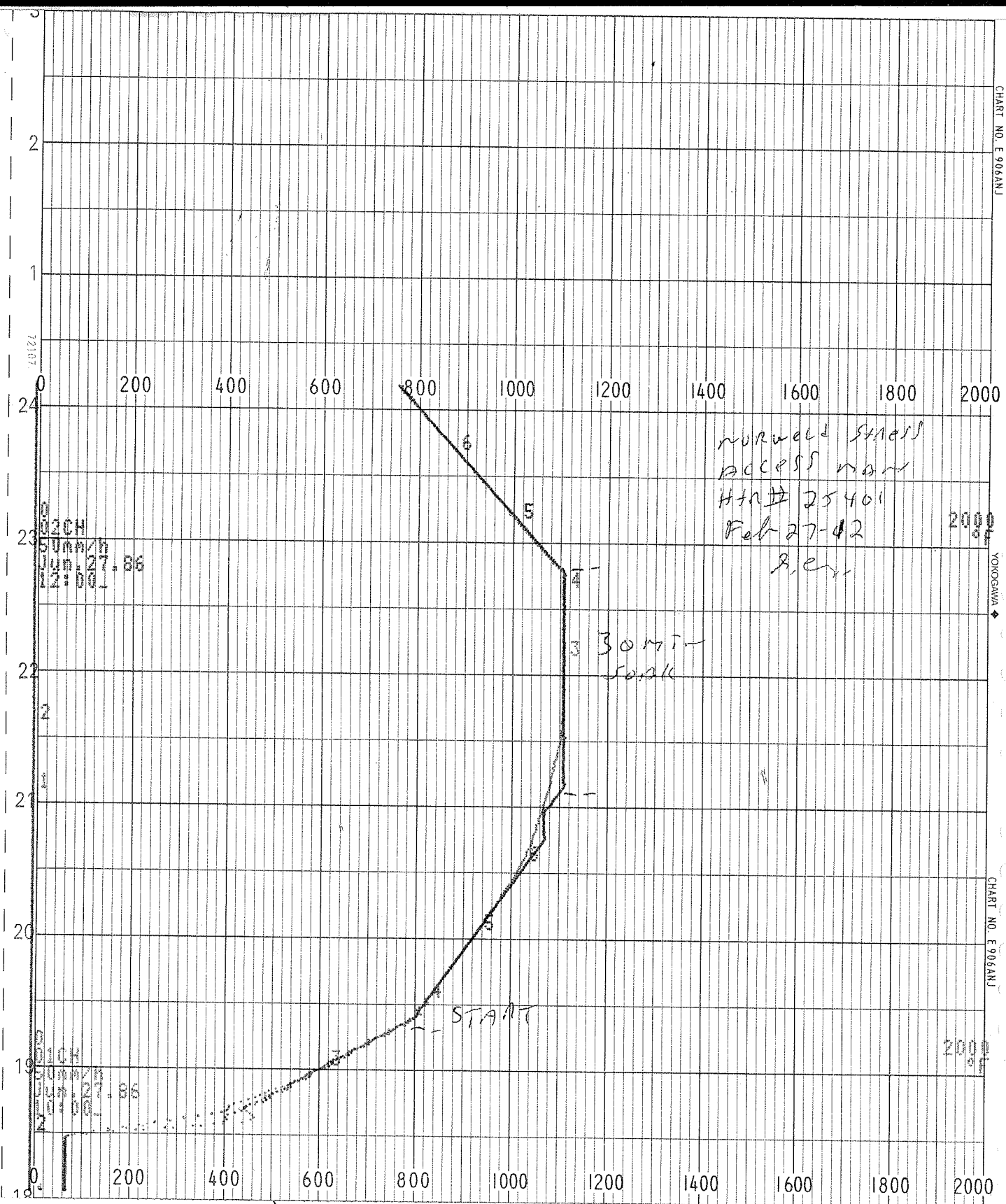
NAME

SIGNED (ACCEPTING AUTHORITY)

NAME

DATE _____

DATE _____



Access Manufacturing

Ltd. TEST REPORT

Client

Locations

Access Shop

Description of Piping (Vessel) Tested

Prag 12014

48⁰¹ thomomys superstes

ie: size, schedule, series, length, spool id etc...

HYDRO Pressure Specified on ENG'D DWG:

min 371 max

Name of Tester Roger Rath

Date of Test March 6 2012

Time on 1:30 Pm

Time off 4:55 PM

Leak Test please circle **YES** or NO

Pressure 371

Remarks

1st DEADWEIGHT / Gauge

Supplier Access

Deadweight ID No. A 711

Last Calibration Date Jan 4/12

1st PRESSURE RECORDER

Supplier Process

Recorder ID No. 1-1212
A 725-2

Hydro Pressure Range 0 - 1000 psi

Last Calibration Date Nov 9 / 11

Line #s Tested

2nd DEADWEIGHT / Gauge

Supplier

Deadweight ID No. _____

Last Calibration Date

2nd PRESSURE RECORDER

Supplier

Recorder ID No. _____

Hydro Pressure Range

Last Calibration Date

[illegible]

Supervised/Witnessed by _____

Print

Sign

Client's Representative

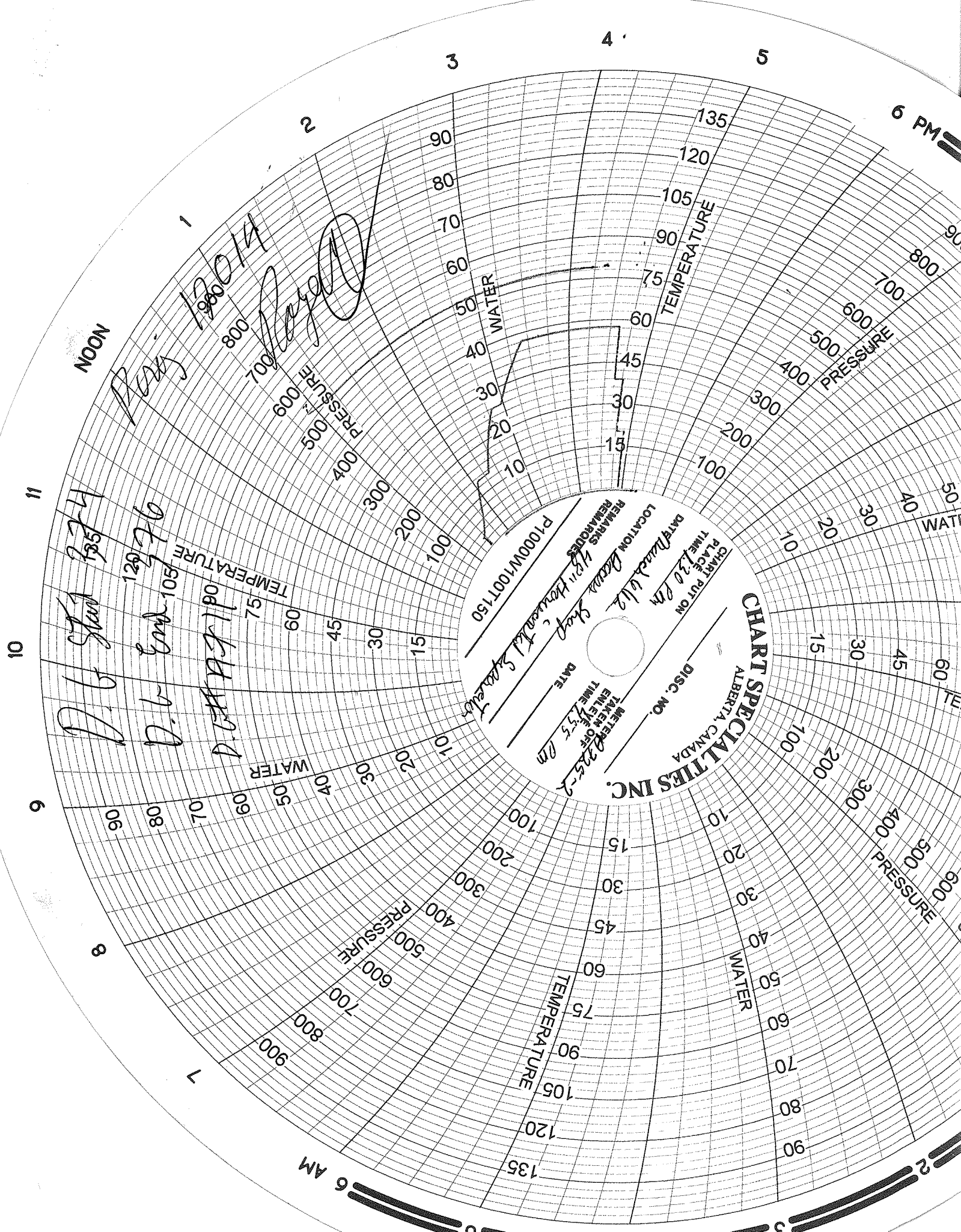


CHART SPECIALTIES INC.
ALBERTA CANADA

DATE: 12/15/12
TIME: 1:55 PM
LOCATION: Shop - 11 Howard St. S. 1000W100T150
REMARKS: P1000W100T150

DISC. NO.:
TAKEN OFF:
ENTERED:

12014
D.6 Start 1354
D.6 End 1057
D.6 #1 17180

Access Manufacturing

TEST REPORT

Locations:

Access Shop

6" Inlet & Outlet Spools

ie: size, schedule, series, length, spool id etc...

HYDRO Pressure Specified on ENG'D DWG:

min 427 max 450

Name of Tester Bogus Rath

Date of Test March 2 2012

Time on 1:30 PM

Time off 3:25 P.m.

Leak Test ☐ please circle ☒ YES or NO

Pressure

Remarks

1st DEADWEIGHT / Gauge

Supplier Access

Deadweight ID No. A711

Last Calibration Date 11/7/11
Jan 4 / 11

1st PRESSURE RECORDER

Supplier Access

Recorder ID No. A225-4

Hydro Pressure Range 0 - 1000 psi

Last Calibration Date Nov 2/11

Line #s Tested

2nd DEADWEIGHT / Gauge

Supplier

Deadweight ID No.

Last Calibration Date

2nd PRESSURE RECORDER

Supplier

Recorder ID No.

Hydro Pressure Range

Last Calibration Date

[illegible]

Supervised/Witnessed by _____

Print

Sign

Client's Representative

MIDNIGHT

900

800

700

600

500

400

300

200

100

PRESSURE

WATER

CHART SPECIALTIES INC.
ALBERTA, CANADA

DISC. NO.

CHART PUT ON

PLACE

TIME 7:30 PM

METER 0325-4

TAKEN OFF

ENLEVÉ

TIME 3:25 PM

DATE March 2/12

DATE

LOCATION Access Shop

REMARKS 6" Inlet + Outlet Spools

REMARQUES

P1000W100T150

PRESSURE

TEMPERATURE

NOON

Access Manufacturing

TEST REPORT

Client _____

Location: Process Shop

Description of Piping (Vessel) Tested 6" Inlet Pipe
Peroj 12014

ier: size, schedule, series, length, spool id etc...

HYDRO Pressure Specified on ENG'D DWG:

min 2160 max 2225

Name of Tester Roger Roth

Date of Test March 2 2012

Time on 10:20 AM

Time off 12.25 PM

Leak Test please circle YES or NO

please circle

YES

or NO

Pressure

Remarks

1st DEADWEIGHT / Guage

Supplier Acme

Deadweight ID No. A211

Last Calibration Date: 7/7/11
Jan 4 2011

1st PRESSURE RECORDER

Supplier Acass

Recorder ID No. A725-2

Hydro Pressure Range 0 - 5000 psi

Last Calibration Date Nov 8 2011

Line #s Tested—

2nd DEADWEIGHT / Gauge

Supplier

Deadweight ID No.

Last Calibration Date _____

2nd PRESSURE RECORDER

Supplier

Recorder ID No. _____

Hydro Pressure Range _____ psi

Last Calibration Date _____

[illegible]

Supervised/Witnessed by.

Print

Sign

Client's Representative

6 AM

7

8

9

10

11

NOON

1

2

PRINTED IN U.S.A.

3

4

5

6 PM

9

GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK

CHART NO. MC M-5000-H-150F

METER *0725-2*

TAKEN OFF *12:25* PM

CHART PUT ON *10:20* AM

LOCATION *Access Shop*

REMARKS *6" x 3" Jacket Speed*

Boyer

Nov 12/14

2/16/14
2/16/14
2/16/14

Pimm's

PRODUCTION EQUIPMENT
INSTRUMENTATION
ELECTRICAL

Pimm's Production Equipment Ltd.

Fort St. John
10924 Alaska Rd.
1 (250) 787-0808

Grande Prairie
#103, 12002 101st Avenue
1 (780) 513-2883

Edmonton
5319 91st Street
1 (780) 465-9965

Deadweight.

vc

DEADWEIGHT TESTER CALIBRATION REPORT

CUSTOMER: ACCESS MANUFACTURING

UNIT NO. A711

MAKE: CRYSTAL

MODEL XPi2 10KPSI

SERIAL: 72933

MAX. PRES. 10,000 PSI

TEST PRESSURE	DEADWEIGHT INITIAL.	DEADWEIGHT FINAL	
0	0	0	OK
2000	2000	2000	OK
4000	3999	3999	OK
6000	5998	5998	OK
8000	7996	7996	OK
10000	9997	9997	OK
9000	8997	8997	OK
7000	6998	6998	OK
5000	4999	4999	OK
3000	3001	3001	OK
1000	1001	1001	OK
0	0	0	OK

COMMENTS: Gauge calibrates within tolerances.

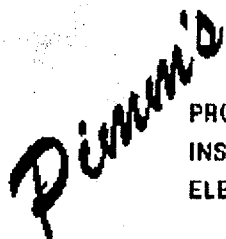
CERTIFICATION # 35255-01K DEADWEIGHT TESTER
S/N 449
CODE 13

Note Calibration Standard DWT
Make Refinery Supply Company
Model 55-10
Serial # 449
Traceable by N.I.S.T. Standards

DATE: January 4, 2012 ✓

TESTED BY: Jordan Elliott

F:/info/common/deadwts



PRODUCTION EQUIPMENT
INSTRUMENTATION
ELECTRICAL

10924 Alaska Rd.
Fort St. John, B.C.
V1J 5T5
1-250-787-0808

<http://www.pimms.ca>

#103, 12002 - 101 Ave.
Grande Prairie, AB
T8V 8B1
1-780-513-2883

9536 - 27 Ave.
Edmonton, AB
T6N 1B2
1-780-465-9965

Date: Nov 8, 2011

Pressure Recorder #1

make: Barton
serial number: A725-2 range: 0-5000 PSI
chart number: P5000W100 rotation: 24 Hr

Pressure Recorder #2

make: Barton
serial number: A725-2 range: 0-1000 psi
chart number: P1000W100 rotation: 24 Hr

Temperature Test-Farenheit

Point	Thermometer	Init.
1	32	32
2	65	65
3	100	100

ambient room temp. 70 degrees F

Pressure Test #1 - psi

Point	DWT	Init.
1	0	0
2	1000	1000
3	2000	2000
4	3000	3000
5	4000	4000
6	5000	5000
7	4500	4500
8	3500	3500
9	2500	2500
10	1500	1500
11	500	500
12	0	0

Pressure Test #2 - psi

Point	DWT	Init.
1	0	0
2	200	200
3	400	400
4	600	600
5	800	800
6	900	900
7	1000	1000
8	700	700
9	500	500
10	300	300
11	100	100
12	0	0

Inspected by: Michael A.

Note

Calibration Standard DWT
Make Refinery Supply Company
Model 55-10
Serial # 449
Calibration Standard Temp
Make Fluke
Model 50S
Serial # 80910066
NIST Traceable



PRODUCTION EQUIPMENT
INSTRUMENTATION
ELECTRICAL

10924 Alaska Rd.
Fort St. John, B.C.
V1J 5T5
1-250-787-0808

<http://www.pirmins.ca>

#103, 12002 - 101 Ave.
Grande Prairie, AB
T8V 8B1
1-780-513-2883

9536 - 27 Ave.
Edmonton, AB
T6N 1B2
1-780-465-9965

Date: Nov 8, 2011

Pressure Recorder #1

make: Barton
serial number: A725-4
chart number: P10000W100

range: 0-10,000 PSI
rotation: 24 Hr

Pressure Recorder #2

make: Barton
serial number: A725-4
chart number: P1000W100

range: 0-1000 psi
rotation: 24 Hr

Temperature Test-Farenheit

<u>Point</u>	<u>Thermometer</u>	<u>Init.</u>
1	32	32
2	65	65
3	100	100

ambient room temp. 70 degrees F

Pressure Test #1 - psi

<u>Point</u>	<u>DWT</u>	<u>Init.</u>
1	0	0
2	2000	2000
3	4000	4000
4	6000	6000
5	8000	8000
6	10000	10000
7	9000	9000
8	7000	7000
9	5000	5000
10	3000	3000
11	1000	1000
12	0	0

Pressure Test #2 - psi

<u>Point</u>	<u>DWT</u>	<u>Init.</u>
1	0	0
2	200	200
3	400	400
4	600	600
5	800	800
6	1000	1000
7	900	900
8	700	700
9	500	500
10	300	300
11	100	100
12	0	0

Inspected by: Jordan E.

Note Calibration Standard DWT
Make Refinery Supply Company
Model 55-10
Serial # 449
Calibration Standard Temp
Make Fluke
Model 50S
Serial # 80910066
NIST Traceable