the pressure equipment safety authority

9410 - 20 Ave N.W.
Edmonton, Alberta, Canada T6N 0A4
Tel: (780) 437-9100 / Fax: (780) 437-7787

November 22, 2022

Attention: Craig Hardy
HARDCORE WELDING LTD
9471 49 STREET
EDMONTON, AB T6B 2L8

The design submission, Tracking Number 2022-05334, originally received on September 21, 2022 was surveyed and accepted for registration as follows:

CRN : 0A12671.2 **Accepted on:** November 22, 2022

Reg Type: RENEWAL **Expiry Date:** November 22, 2032

Drawing No. : Table 1 – Scope of Fitting Designs (four pages) As Noted

Fitting type: Laterals and Sweep Tees

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

The scope of this registration is the renewal of CRN 0A12671.2 and includes the following laterals and sweep tees:

a) Laterals, sizes 2" thru 8", schedules Std and XH, construction codes ASME B31.1 and B31.3, drawings E124311LP-M-GA-001/002 Rev 0, original tracking number 2012-04313.
b) Sweep tees, sizes 2" thru 8", schedules Std and XH, construction code ASME B31.3 only, drawings E124365LP-M-SK-001/002 Rev 1/2, original tracking numbers 2012-07905 and 2015-06070.
c) Reinforced laterals, sizes 2" thru 8", schedule XH, construction codes ASME B31.1 and B31.3, drawing E124366LP-M-GA-002 Rev 2, original tracking numbers 2012-07585, 2013-04159, and 2015-06070.
d) Reinforced laterals, sizes 2" thru 8", schedule Std, construction codes ASME B31.1 and B31.3, drawing E124366LP-M-GA-001 Rev 0, original tracking number 2013-04159.
e) Wye laterals, sizes 10" & 12", schedules Std and XH, construction code ASME B31.3 only, drawings HC-10YSTD-1, HC-10YXH-1, HC-12YSTD-1, and HC-12YXH-1 Rev D, original tracking number 2019-04439.

Additional details are provided in Table 1 and the drawings for each type including the sizes, schedules, materials, and pressure-temperature ratings.

The sweep tees may be placed in cyclic pressure service. The maximum number of pressure cycles allowed is 20,000 and the maximum pressure cycle permissible is the design pressure as listed in the drawing tables.

The material substitutions listed in the drawings have been accepted as part of this design registration.

As per our phone conversation on October 5 and your emails on October 9 and 24:

a) The code of construction for the sweep tees and wye laterals is ASME B31.3 only. A note has been added to the AB-41 forms indicating this.
b) The edition for ASME B31.1 and B31.3 is 2020:
  - A note has been added to the AB-41 forms indicating this.
  - Sweep tee drawings E124365LP-M-SK-001/002 and reinforced lateral drawing E124366LP-M-GA-002 have been corrected accordingly.
c) Lateral drawings E124311LP-M-GA-001/002: The stress ratio for the B31.3 hydrotest pressure should be 20.0 / 19.0. The drawing has been corrected accordingly.
d) Reinforced lateral drawing E124366LP-M-GA-001: The reinforced pad is attached with a full pad thickness fillet weld on the outside only. A note has been added to the drawing indicting this.

Continued on the next page…

the pressure equipment safety authority

9410 - 20 Ave N.W.
Edmonton, Alberta, Canada T6N 0A4
Tel: (780) 437-9100 / Fax: (780) 437-7787

November 22, 2022

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

It is our understanding that the fittings included in the scope of this registration that are subject to the Safety Codes Act shall comply with the requirements of the code of construction on the AB-41 Statutory Declaration form as supported by the attached data which identifies the dimensions, materials of construction, pressure/temperature ratings and the basis for such ratings, and the identification marking of the fittings.

This registration is valid only for fittings fabricated at the location(s) covered by the QC certificate attached to the accepted AB-41 Statutory Declaration form.

This registration is valid only until the indicated expiry date and only if the Manufacturer maintains a valid quality management system approved by an acceptable third-party agency, and maintains a valid Certification of Authorization Permit if required by the jurisdiction where manufacturing takes place, 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 3303 or fax (780) 437-7787 or e-mail Rudolf@absa.ca.

Sincerely,

Keith Rudolf

RUDOLF, KEITH, P. Eng.
DOP Cert. No. D00008862

Alberta Municipal Affairs

ABSA
the pressure equipment safety authority

AB-41 2019-08

STATUTORY DECLARATION
Registration of Fittings
Single or Multiple Fitting Designs within one Fitting Category

In this space, show facsimile of manufacturer's logo or trademark as it will appear on the fitting.
HCW

I, CORY GRUNDBERG (name of applicant), PRESIDENT (position title) (must be in a position of authority)

of HARDCORE WELDING LTD. (name of manufacturer)

located at 9471-49 ST, EDMONTON AB, T6B 2L8 (plant address)

do solemnly declare that the fittings listed hereunder, which are subject to the Safety Codes Act (select only one)

☑ comply with the requirements of ASME B31.1, B31.3 Note #1 (KR) (title of recognized North American Standard) which specifies the dimensions, materials of construction, pressure/temperature ratings and identification marking of the fittings, or

☐ are not covered by the provisions of a recognized North American standard and are therefore manufactured to comply with _____ (title of code of construction or other applicable document) as supported by the attached data which identifies the dimensions, materials of construction, pressure/temperature ratings and the basis for such ratings, and the identification marking of the fittings.

I further declare that the manufacture of these fittings is controlled by a quality control program which has been verified as described in the below Table as being suitable for the manufacturing of these fittings to the stated standard, regulation, code, guideline or other applicable document. The fittings covered by the declaration for which I seek registration are as provided in the Supplementary Sheet(s) attached.

Quality Program Verification and Manufacturing Sites

A copy of the Quality Certificate from each manufacturing site must be included

Item #	Product Description, Model or Series	Quality Program	Scope of Certification	Expiry Date	Verifying Organization	Location(s) Plant Name and address
1.	LATERALS 2-8" STD & XH	AQP-5131	CAT A FITTING (ALT, MFR, REPAIR)	2024-10-12	ABSA	HARDCORE WELDING LTD. 9471-49 ST EDM.
2.						

Tracking #:_____

In support of this application, the following information, calculations and/or test data are attached:

DRAWINGS E124311LP-M-GA-001, E124311LP-M-GA-002

(Signature of the Declarant) Sept 19 2022 (Date)

DECLARED before me at Edmonton (city) in the province of Alberta (province, territory, or state)

this 19 day of September (Month), 2022 (Year)

(print) JACKIE-LOU GUEVARRA (a Commissioner of Oaths or Notary Public)

(sign) _____ (a Commissioner of Oaths or Notary Public)

JACKIE-LOU GUEVARRA
A Commissioner for Oaths
in and for Alberta
My Commission Expires Oct. 26, 2024

October 26, 2024 (expiry date (mm/dd/yy))

Commissioner of Oaths / Notary Public in and for: ALBERTA (province, territory, or state)

For ABSA Office Use Only:

NOTES: Note #1: The edition for ASME B31.1 and B31.3 is 2020. (KR)

To the best of my knowledge and belief, the application meets the requirements of the Safety Codes Act and CSA Standard B51, Part 1, Clause 4.2, and is accepted for registration in Category _____.

CRN: _____

Registered Date: _____

Expiry Date: _____

Signature: _____
(Signature of the Administrator/SCO)

The information you provide is necessary only for the administration of the programs as required by the Alberta Safety Codes Act and Regulations in the Pressure Equipment Discipline

2022-05334
ABSA
SAFETY CODES ACT - PROVINCE OF ALBERTA
ACCEPTED: 0A12671.2
See acceptance letter for conditions of registration.
Date: 2022-11-22 By: Keith Rudolf
KEITH RUDOLF, P. Eng
DOP: D00008862

This stamp and signature have been affixed electronically to this registered design as required by Section 20(1) of the Pressure Equipment Safety Regulation, in accordance with the Electronic Transactions Act.

Tracking #: _____

Table 1 Scope of Fitting Designs**

Item #	Primary Pressure Bearing / Retaining Component	Material of Construction	Port Connections and Size Range	MDMT	Rated Pressure		Pressure Class(es) / Schedule(s)	Design Code(s) of Construction	Reference Catalogue (pages) or Drawing(s)
					At Ambient Temperature	At Maximum Temperature			
1	LATERALS	A106B/A333	NPS 2"-8"	See drawing			SCH40	B31.3/31.1	E124311LP-M-GA-001
2	LATERALS	A106B/A333	NPS 2"-8"	See drawing.			SCH80	B31.3/31.1	E124311LP-M-GA-002

Table 2 Additional Scope Information

List/Attach Additional Detail and References (Product Configurations, Options, Illustrations, etc.)
Example:
Series X Options

** For additional alternatives of Table 1, refer to Form AB-41a, Guide for Completing Form AB-41

2022-05334
ABSA
SAFETY CODES ACT - PROVINCE OF ALBERTA
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KEITH RUDOLF, P. Eng
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Tracking #:_____

Alberta Municipal Affairs

ABSA
the pressure equipment safety authority

AB-41 2019-08

STATUTORY DECLARATION
Registration of Fittings
Single or Multiple Fitting Designs within one Fitting Category

In this space, show facsimile of manufacturer's logo or trademark as it will appear on the fitting.
HCW

I, CORY GRUNDBERG (name of applicant), PRESIDENT (position title) (must be in a position of authority)

of HARDCORE WELDING LTD. (name of manufacturer)

located at 9471-49 ST, EDMONTON AB, T6B 2L8 (plant address)

do solemnly declare that the fittings listed hereunder, which are subject to the Safety Codes Act (select only one)

Notes #1 & 2 (KR)

☑ comply with the requirements of ASME B31.1, B31.3 (title of recognized North American Standard) which specifies the dimensions, materials of construction, pressure/temperature ratings and identification marking of the fittings, or

☐ are not covered by the provisions of a recognized North American standard and are therefore manufactured to comply with _____ (title of code of construction or other applicable document) as supported by the attached data which identifies the dimensions, materials of construction, pressure/temperature ratings and the basis for such ratings, and the identification marking of the fittings.

I further declare that the manufacture of these fittings is controlled by a quality control program which has been verified as described in the below Table as being suitable for the manufacturing of these fittings to the stated standard, regulation, code, guideline or other applicable document. The fittings covered by the declaration for which I seek registration are as provided in the Supplementary Sheet(s) attached.

Quality Program Verification and Manufacturing Sites

A copy of the Quality Certificate from each manufacturing site must be included

Item #	Product Description, Model or Series	Quality Program	Scope of Certification	Expiry Date	Verifying Organization	Location(s) Plant Name and address
1.	SWEEP TEES & REINFORCED LATERALS	AQP-5131	CAT A FITTING (ALT, MFR, REPAIR)	2024-10-12	ABSA	HARDCORE WELDING LTD. 9471-49 ST EDM.
2.						

Tracking #: _____

In support of this application, the following information, calculations and/or test data are attached:

DRAWINGS E124365LP-M-SK-001, E124365LP-M-SK-002, E124366LP-M-GA-002

(Signature of the Declarer) Sept 19 2022 (Date)

DECLARED before me at Edmonton (city) in the province of Alberta (province, territory, or state)

this 19 day of September (Month), 2022 (Year)

(print) JACKIE-Lou GUEVARRA (a Commissioner of Oaths or Notary Public)

(sign) _____ (a Commissioner of Oaths or Notary Public)

October 26, 2024 (expiry date (mm/dd/yy))

JACKIE-LOU GUEVARRA
A Commissioner for Oaths
in and for Alberta
My Commission Expires Oct. 26, 2024

Commissioner of Oaths / Notary Public in and for: Alberta (province, territory, or state)

For ABSA Office Use Only:

NOTES: Note #1: The code of construction for the sweep tees is ASME B31.3 only. (KR)

Note #2: The edition for ASME B31.1 and B31.3 is 2020. (KR)

To the best of my knowledge and belief, the application meets the requirements of the Safety Codes Act and CSA Standard B51, Part 1, Clause 4.2, and is accepted for registration in Category _____.

CRN: _____

Registered Date: _____

Expiry Date: _____

Signature: _____
(Signature of the Administrator/SCO)

The information you provide is necessary only for the administration of the programs as required by the Alberta Safety Codes Act and Regulations in the Pressure Equipment Discipline

2022-05334

ABSA

SAFETY CODES ACT - PROVINCE OF ALBERTA

ACCEPTED: 0A12671.2

See acceptance letter for conditions of registration.

Date: 2022-11-22 By: Keith Rudolf

KEITH RUDOLF, P. Eng.
DOP: D00008862

This stamp and signature have been affixed electronically to this registered design as required by Section 20(1) of the Pressure Equipment Safety Regulation, in accordance with the Electronic Transactions Act.

Tracking #: _____

Table 1 Scope of Fitting Designs**

Item #	Primary Pressure Bearing / Retaining Component	Material of Construction	Port Connections and Size Range	MDMT	Rated Pressure		Pressure Class(es) / Schedule(s)	Design Code(s) of Construction	Reference Catalogue (pages) or Drawing(s)
					At Ambient Temperature	At Maximum Temperature			
1	SWEEP TEES	See drawing	NPS 2"-8"	See drawing	See drawing	See drawing	SCH40	B31.3	E1243654P-M-SK-001
2	SWEEP TEES	See drawing	NPS 2"-8"	See drawing	See drawing	See drawing	SCH80	B31.3	E1243654P-M-SK-002
3	LATERALS	See drawing	NPS 2"-8"	See drawing	See drawing	See drawing	SCH80	B31.3/31.1	E1243664P-M-GA-002

Table 2 Additional Scope Information

List/Attach Additional Detail and References (Product Configurations, Options, Illustrations, etc.)
Example:
Series X Options

** For additional alternatives of Table 1, refer to Form AB-41a, Guide for Completing Form AB-41

2022-05334
ABSA
SAFETY CODES ACT - PROVINCE OF ALBERTA
ACCEPTED: 0A12671.2
See acceptance letter for conditions of registration.
Date: 2022-11-22 By: Keith Rudolf
KEITH RUDOLF, P. Eng
DOP: D00008862

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Tracking #:_____

Alberta Municipal Affairs

ABSA
the pressure equipment safety authority

AB-41 2019-08

STATUTORY DECLARATION
Registration of Fittings
Single or Multiple Fitting Designs within one Fitting Category

In this space, show facsimile of manufacturer's logo or trademark as it will appear on the fitting.
HCW

I, CORY GRUNDBERG (name of applicant), PRESIDENT (position title) (must be in a position of authority)

of HARDCORE WELDING LTD. (name of manufacturer)

located at 9471-49 ST, EDMONTON AB, T6B 2L8 (plant address)

do solemnly declare that the fittings listed hereunder, which are subject to the Safety Codes Act (select only one)

☑ comply with the requirements of ASME B31.1, B31.3 Note #1 (KR) (title of recognized North American Standard) which specifies the dimensions, materials of construction, pressure/temperature ratings and identification marking of the fittings, or

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Quality Program Verification and Manufacturing Sites

A copy of the Quality Certificate from each manufacturing site must be included

Item #	Product Description, Model or Series	Quality Program	Scope of Certification	Expiry Date	Verifying Organization	Location(s) Plant Name and address
1.	REINFORCED LATERALS	AQP-5131	CAT A FITTING (ALT, MFR, REPAIR)	2024-10-12	ABSA	HARDCORE WELDING LTD. 9471-49 ST EDM.
2.						

Tracking #: _____

In support of this application, the following information, calculations and/or test data are attached:

DRAWINGS E124366LP-M-GA-001

(Signature of the Declarer) Sept 19 2022 (Date)

DECLARED before me at Edmonton (city) in the province of Alberta (province, territory, or state)

this 19 day of September (Month), 2022 (Year)

(print) JACKIE-LOU GUEVARRA (a Commissioner of Oaths or Notary Public)

(sign) (a Commissioner of Oaths or Notary Public)

October 26, 2024 (expiry date (mm/dd/yy))

JACKIE-LOU GUEVARRA
A Commissioner for Oaths
in and for Alberta
My Commission Expires Oct. 26, 2024

Commissioner of Oaths / Notary Public in and for: Alberta (province, territory, or state)

For ABSA Office Use Only:

NOTES: Note #1: The edition for ASME B31.1 and B31.3 is 2020. (KR)

To the best of my knowledge and belief, the application meets the requirements of the Safety Codes Act and CSA Standard B51, Part 1, Clause 4.2, and is accepted for registration in Category _____.

CRN: _____

Registered Date: _____

Expiry Date: _____

Signature: _____
(Signature of the Administrator/SCO)

The information you provide is necessary only for the administration of the programs as required by the Alberta Safety Codes Act and Regulations in the Pressure Equipment Discipline

2022-05334

ABSA

SAFETY CODES ACT - PROVINCE OF ALBERTA

ACCEPTED: 0A12671.2

See acceptance letter for conditions of registration.

Date: 2022-11-22 **By:** Keith Rudolf

KEITH RUDOLF, P. Eng
DOP: D00008862

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Tracking #: _____

Table 1 Scope of Fitting Designs**

Item #	Primary Pressure Bearing / Retaining Component	Material of Construction	Port Connections and Size Range	MDMT	Rated Pressure		Pressure Class(es) / Schedule(s)	Design Code(s) of Construction	Reference Catalogue (pages) or Drawing(s)
					At Ambient Temperature	At Maximum Temperature			
1	LATERALS	A106B/A333	NPS 2"-8"	See drawing			SCH40	B31.3/31.1	E1243664P-M-GA-001

Table 2 Additional Scope Information

List/Attach Additional Detail and References (Product Configurations, Options, Illustrations, etc.)
Example:
Series X Options

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2022-05334

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KEITH RUDOLF, P. Eng
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AB-41 2019-08

STATUTORY DECLARATION
Registration of Fittings
Single or Multiple Fitting Designs within one Fitting Category

In this space, show facsimile of manufacturer's logo or trademark as it will appear on the fitting.
HCW

I, CORY GRUNDBERG (name of applicant), PRESIDENT (position title) (must be in a position of authority)

of HARDCORE WELDING LTD. (name of manufacturer)

located at 9471-49 ST, EDMONTON AB, T6B 2L8 (plant address)

do solemnly declare that the fittings listed hereunder, which are subject to the Safety Codes Act (select only one)

Notes #1 & 2 (KR)

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A copy of the Quality Certificate from each manufacturing site must be included

Item #	Product Description, Model or Series	Quality Program	Scope of Certification	Expiry Date	Verifying Organization	Location(s) Plant Name and address
1.	LATERALS 10&12" STD & XH	AQP-5131	CAT A FITTING (ALT, MFR, REPAIR)	2024-10-12	ABSA	HARDCORE WELDING LTD. 9471-49 ST EDM.
2.						

Tracking #:_____

In support of this application, the following information, calculations and/or test data are attached:

DRAWINGS: HC-10YSTD-1, HC-10YCH-1, HC-12YSTD-1, HC-12YXH-1

(Signature of the Declarer) Sept 19 2022 (Date)

DECLARED before me at Edmonton (city) in the province of Alberta (province, territory, or state)

this 19 day of September (Month), 2022 (Year)

(print) JACKIE-lou GUEVARRA (a Commissioner of Oaths or Notary Public)

(sign) _____ (a Commissioner of Oaths or Notary Public)

October 26, 2024 (expiry date (mm/dd/yy))

JACKIE-LOU GUEVARRA
A Commissioner for Oaths
in and for Alberta
My Commission Expires Oct. 26, 2024

Commissioner of Oaths / Notary Public in and for: Alberta (province, territory, or state)

For ABSA Office Use Only:

NOTES: Note #1: The code of construction for the wye laterals is ASME B31.3 only. (KR)

Note #2: The edition for ASME B31.3 is 2020. (KR)

To the best of my knowledge and belief, the application meets the requirements of the Safety Codes Act and CSA Standard B51, Part 1, Clause 4.2, and is accepted for registration in Category _____.

CRN: _____

Registered Date: _____

Expiry Date: _____

Signature: _____
(Signature of the Administrator/SCO)

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2022-05334
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Tracking #: _____

Table 1 Scope of Fitting Designs**

Item #	Primary Pressure Bearing / Retaining Component	Material of Construction	Port Connections and Size Range	MDMT	Rated Pressure		Pressure Class(es) / Schedule(s)	Design Code(s) of Construction	Reference Catalogue (pages) or Drawing(s)
					At Ambient Temperature	At Maximum Temperature			
1	LATERALS	A106B/A333-6	NPS 3-10	-29c	see drawings	see drawings	sch.40/80	csa b51/b31.3	HC-10YxH-1 HC-10STD-1
2	LATERALS	A106B/A333-6	NPS 3-12	-29c	see drawings	see drawings	sch.40/80	csa b51/b31.3	HC-12YxH-1 HC-12STD-1

Table 2 Additional Scope Information

List/Attach Additional Detail and References (Product Configurations, Options, Illustrations, etc.)
Example:
Series X Options

** For additional alternatives of Table 1, refer to Form AB-41a, Guide for Completing Form AB-41

2022-05334

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SAFETY CODES ACT - PROVINCE OF ALBERTA

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DOP: D00008862

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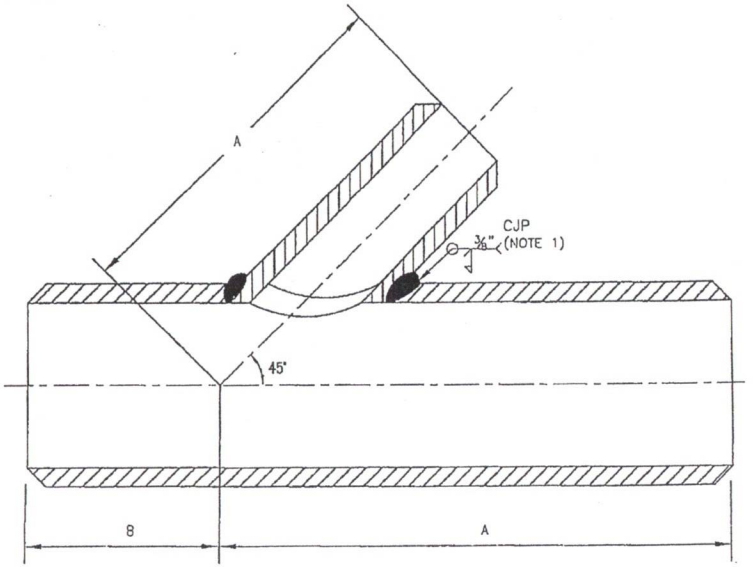
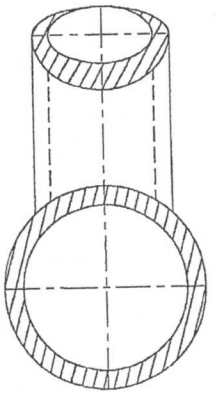
Tracking #:_____





RUN SIZE (NPS)	BRANCH SIZE (NPS)	A (in.)	B (in.)	DESIGN PRESSURE (PSIG) ASME B31.1 c.a.=0"	c.a.=1/16"	c.a.=1/8"	ASME B31.3 c.a.=0"	c.a.=1/16"	c.a.=1/8"	DESIGN TEMPERATURE (°F) ASME B31.1	ASME B31.3	MDMT (ASME B31.3 ONLY) (°F) A106-B	A333 GR.6
2	2	8	2.5	960	504	140	1265	765	155	650	500	-20	-50
3	2	10	3	1005	650	140	1235	840	155	650	500	-20	-50
3	3	10	3	830	510	255	1015	665	385	650	500	-20	-50
4	2	12	3	850	570	140	1040	725	155	650	500	-20	-50
4	3	12	3	850	565	310	1010	690	410	650	500	-20	-50
4	4	12	3	655	425	230	785	525	315	650	500	-20	-50
6	2	14.5	3.5	670	470	140	810	585	155	650	500	-20	-50
6	3	14.5	3.5	675	480	305	790	575	380	650	500	-20	-50
6	4	14.5	3.5	655	470	300	760	555	365	650	500	-20	-50
6	6	14.5	3.5	475	330	205	555	395	255	650	500	-20	-50
8	2	17.5	4.5	580	425	140	695	520	155	650	500	-20	-50
8	3	17.5	4.5	585	430	300	685	515	365	650	500	-20	-50
8	4	17.5	4.5	570	425	295	660	500	355	650	500	-20	-50
8	6	17.5	4.5	550	410	280	625	470	330	650	500	-20	-50
8	8	17.5	4.5	400	295	200	460	340	235	650	500	-20	-50

BILL OF MATERIAL

ITEM	REQ.	DESCRIPTION	MATERIAL/PART #	WT.(lb)
-	-	-	-	-

NOTES

1) WELDING SHALL MEET REQUIREMENTS IN ASTM B31.1-10 Section 127.4.8 & ASTM B31.3-10 Section 328.5.4

MATERIAL: ASTM A106-B SEAMLESS, STD WALL OR ASTM A333 GR.6 SEAMLESS, STD WALL

CODE: ASME B31.1 OR ASME B31.3

DESIGN TEMPERATURE: SEE TABLE

DESIGN PRESSURE (D.P.): SEE TABLE

CORROSION ALLOWANCE (C.A.): SEE TABLE

MDMT: SEE TABLE

HYDROTEST PRESSURE:
(ASME B31.1) 1.5 x D.P.
(ASME B31.3) 1.5 x 20.0/~~19.0~~ x D.P.
19.0 (KR)

Drawing No.	Description
REFERENCE DRAWINGS	

No.	Date	Issued For	By	Eng	Chk	App
0	12/06/15	ISSUED FOR CONSTRUCTION	HW	JE	DK	DK
A	12/06/01	ISSUED FOR REVIEW	HW	JE	DK	DK

REVISIONS

Stamp: PROFESSIONAL ENGINEER ALBERTA DAVID KNOX Rev 0 Jun 15 / 2012 P-7364

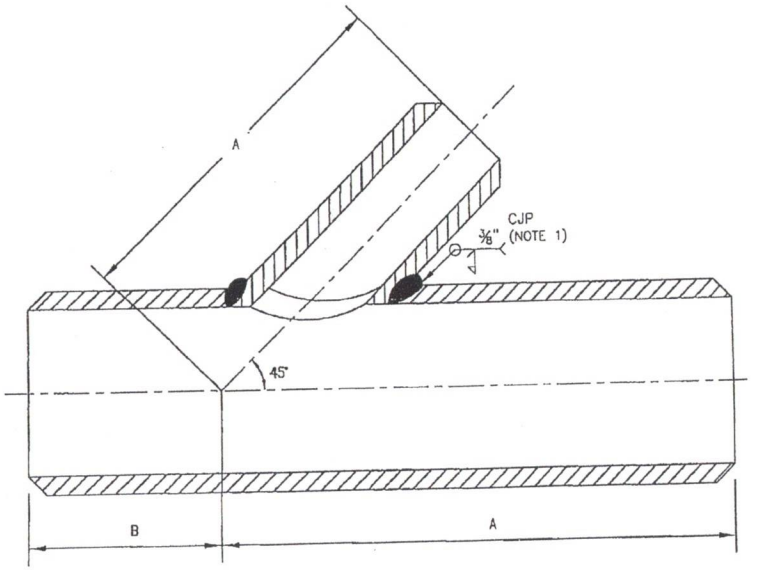
ECO TECHNICA ECO-Technica Inc. Edmonton, Alberta, Canada www.eco-technica.com

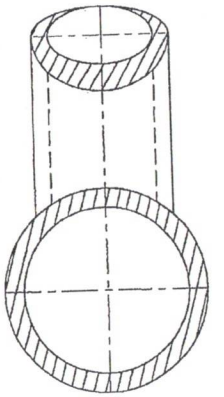
Drawn By:	HW	Checked by:	DK
Engineered By:	JE	Approved By:	DK
Scale:	NTS	Date:	2012/05/21
Job No.	E124311LP		

Client: HARDCORE WELDING LTD.

Title: WELDING LATERALS STANDARD WALL

Dwg. No. E124311LP-M-GA-001 REV. 0





RUN SIZE (NPS)	BRANCH SIZE (NPS)	A (in.)	B (in.)	DESIGN PRESSURE (PSIG) ASME B31.1 c.a.=0"	ASME B31.1 c.a.=1/16"	ASME B31.1 c.a.=1/8"	ASME B31.3 c.a.=0"	ASME B31.3 c.a.=1/16"	ASME B31.3 c.a.=1/8"	DESIGN TEMPERATURE (°F) ASME B31.1	ASME B31.3	MDMT (ASME B31.3 ONLY) (°F) A106-B	A333 GR.6
2	2	8	2.5	1655	1085	650	1835	1205	725	650	500	-20	-50
3	2	10	3	1560	1145	795	1735	1275	885	650	500	-20	-50
3	3	10	3	1355	975	645	1510	1080	720	650	500	-20	-50
4	2	12	3	1340	1005	725	1490	1120	810	650	500	-20	-50
4	3	12	3	1315	1005	715	1465	1115	795	650	500	-20	-50
4	4	12	3	1090	805	560	1210	895	625	650	500	-20	-50
6	2	14.5	3.5	1115	875	685	1235	975	760	650	500	-20	-50
6	3	14.5	3.5	1105	880	680	1225	975	755	650	500	-20	-50
6	4	14.5	3.5	1065	860	670	1185	955	745	650	500	-20	-50
6	6	14.5	3.5	865	685	520	960	760	580	650	500	-20	-50
8	2	17.5	4.5	965	780	630	1075	865	700	650	500	-20	-50
8	3	17.5	4.5	960	785	625	1065	870	700	650	500	-20	-50
8	4	17.5	4.5	930	770	620	1035	855	690	650	500	-20	-50
8	6	17.5	4.5	915	765	620	1020	850	690	650	500	-20	-50
8	8	17.5	4.5	725	590	470	805	660	525	650	500	-20	-50

BILL OF MATERIAL

ITEM	REQ.	DESCRIPTION	MATERIAL/PART #	WT.(lb)
-	-	-	-	-

NOTES

1) WELDING SHALL MEET REQUIREMENTS IN ASTM B31.1-10 Section 127.4.8 & ASTM B31.3-10 Section 328.5.4

MATERIAL: ASTM A106-B SEAMLESS, XS WALL OR ASTM A333 GR.6 SEAMLESS, XS WALL

CODE: ASME B31.1 OR ASME B31.3

DESIGN TEMPERATURE: SEE TABLE

DESIGN PRESSURE (D.P.): SEE TABLE

CORROSION ALLOWANCE (C.A.): SEE TABLE

MDMT: SEE TABLE

HYDROTEST PRESSURE:
(ASME B31.1) 1.5 x D.P.
(ASME B31.3) 1.5 x 20.0/~~19.9~~ x D.P.
19.0 (KR)

Drawing No.	Description
	REFERENCE DRAWINGS

No.	Date	Issued For	By	Eng	Chk	App
0	12/06/15	ISSUED FOR CONSTRUCTION	HW	JE	DK	DK
A	12/06/01	ISSUED FOR REVIEW	HW	JE	DK	DK

REVISIONS

Stamp: PROFESSIONAL ENGINEER ALBERTA DAVID KWOK Rev 0 Jun 15/2012 P-7364

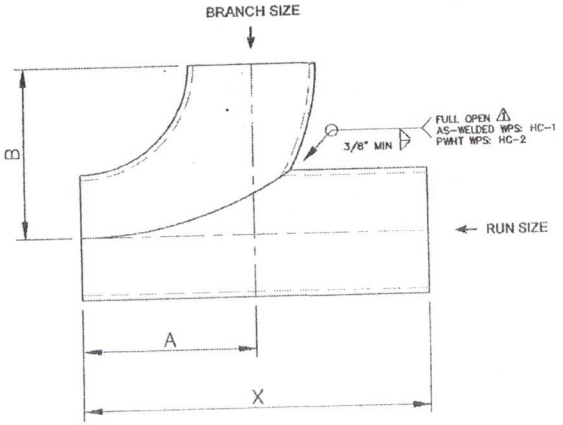
ECO-Technica Inc.
Edmonton, Alberta, Canada
www.eco-technica.com

Drawn By:	HW	Checked by:	DK
Engineered By:	JE	Approved By:	DK
Scale:	NTS	Date:	2012/05/21
Job No.	E124311LP		

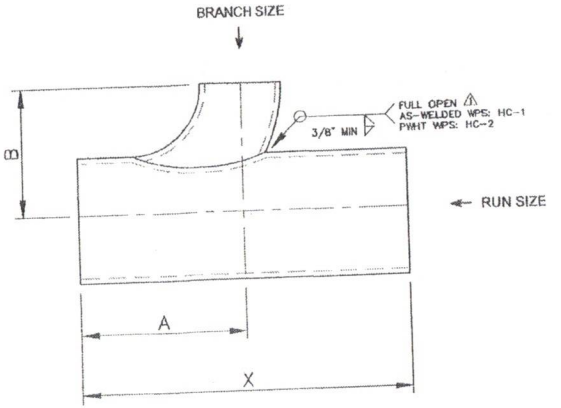
Client: HARDCORE WELDING LTD.

Title: WELDING LATERALS EXTRA HEAVY WALL

Dwg. No. E124311LP-M-GA-002 REV. 0



STANDARD SWEEP TEE



REDUCING SWEEP TEE

SCHEDULE STD SWEEP TEES DIMENSIONS & PRESSURE RATING

RUN SIZE (NPS) (IN)	BRANCH SIZE (NPS) (IN)	DIMENSION (A) (IN)	DIMENSION (B) (IN)	DIMENSION (X) (IN)	DESIGN PRESSURE (psig) CA= 0	CA= 1/16"	CA= 1/8"
2	2	3.0	3.0000	6.0	930	500	N/A
3	2	4.5	3.5625	9.0	1080	866	N/A
⚠ 3	3	4.5	4.5000	9.0	1630⚠	1288⚠	946⚠
4	2	6.0	4.0625	12.0	822	538	N/A
4	3	6.0	5.0000	12.0	842	550	285
4	4	6.0	6.0000	12.0	719	447	222
6	2	9.0	5.1250	18.0	733	503	N/A
6	3	9.0	6.0625	18.0	755	527	327
6	4	9.0	7.0625	18.0	739	524	329
6	6	9.0	8.0000	18.0	488	337	204
8	2	12.0	6.1250	24.0	700	485	N/A
8	3	12.0	7.0625	24.0	659	482	326
8	4	12.0	8.0625	24.0	647	480	327
8	6	12.0	10.0000	24.0	550	410	280
8	8	12.0	12.0000	24.0	458	333	221

NOTES:

1. PIPE: A-106-B STD MDMT -20°F; A-333-GR6 STD MDMT -50°F
2. ELBOW: A-234-WPB LR STD MDMT -20°F; A-105 MDMT -20°F; A-350-LF2 CL 1 MDMT -50°F; A-420-WPL6 STD MDMT -50°F
3. DESIGN TEMPERATURE: 400° F 2020 (KR)
⚠ 4. DESIGN CODE: ASME B31.3, ~~2014~~ EDITION
5. RATED CYCLE: 2000@ CYCLES
6. HYDROTEST PRESSURE: 1.5 x 20.0/19.9 x DESIGN PRESSURE
⚠ 7. RADIOGRAPHY: NO
8. MILL TOLERANCE: 12.5% OR LESS
⚠ 9. WELDING PROCEDURE REGISTRATION NUMBER: WP-3280.2
⚠ 10. POST WELD HEAT TREATMENT MAY BE ADDED PROVIDED A PWHT WELDING PROCEDURE IS USE (SEE WELD SYMBOL). TEMPERATURE AND TIME: 1150° F ±50° F FOR 20 MINUTES MINIMUM

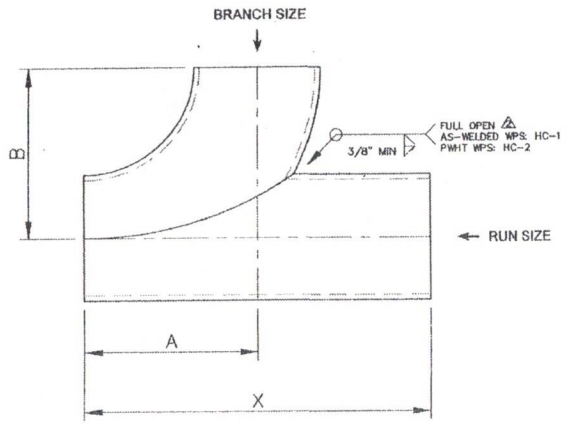
REV	DATE	REVISION	BY	APP
1	15/08/06	REDRAWN, NEW VALUES FOR 3"x3", ADD WPS	LDG	PJD...
0	12/11/14	ISSUED FOR CONSTRUCTION	CL	DK
B	12/11/09	RE-ISSUED FOR REVIEW	KM	DK
A	12/10/19	ISSUED FOR REVIEW	KM	DK

HARDCORE WELDING LTD.
9471 - 49 ST NW, EDMONTON, AB T6B 2L8
TELEPHONE: (780) 490-4447

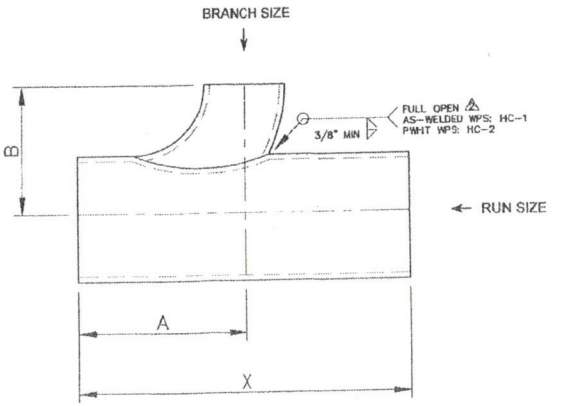
CLIENT:	N/A
DATE:	12/11/06
JOB NO:	4813
DRAWN BY:	KM
CHECKED BY:	JM
APP BY:	DK

SWEEP TEES
SCHEDULE STANDARD

DWG NO: E124365LP-M-SK-001 REV 1



STANDARD SWEEP TEE



REDUCING SWEEP TEE

SCHEDULE XH SWEEP TEES DIMENSIONS & PRESSURE RATING							
RUN SIZE (NPS) (IN)	BRANCH SIZE (NPS) (IN)	DIMENSION (A) (IN)	DIMENSION (B) (IN)	DIMENSION (X) (IN)	DESIGN PRESSURE (psig) CA= 0	CA= 1/16"	CA= 1/8"
2	2	3.0	3.0000	6.0	1348	962	575
3	2	4.5	3.5625	9.0	1597	1120	715
⚠2 3	3	4.5	4.5000	9.0	2316⚠2	1957⚠2	1598⚠2
4	2	6.0	4.0625	12.0	1230	904	624
⚠2 4	3	6.0	5.0000	12.0	1971⚠2	1665⚠2	1359⚠2
⚠2 4	4	6.0	6.0000	12.0	2046⚠2	1829⚠2	1612⚠2
6	2	9.0	5.1250	18.0	1117	908	685
6	3	9.0	6.0625	18.0	1210	950	719
6	4	9.0	7.0625	18.0	1186	945	725
6	6	9.0	9.0000	18.0	983	840	698
8	2	12.0	6.1250	24.0	990	850	650
8	3	12.0	7.0625	24.0	1060	855	678
8	4	12.0	8.0625	24.0	1044	854	680
8	6	12.0	10.0000	24.0	1025	840	670
8	8	12.0	12.0000	24.0	822	668	525

NOTES:

1. PIPE: A-106-B XH MDMT -20°F; A-333-GR6 XH MDMT -50°F
2. ELBOW: A-234-WPB LR XH MDMT -20°F; A-105 MDMT -20°F; A-350-LF2 CL 1 MDMT -50°F; A-420-WPL6 XH MDMT -50°F
3. DESIGN TEMPERATURE: 400° F 2020 (KR)
⚠4. DESIGN CODE: ASME B31.3, ~~2011~~ EDITION
5. RATED CYCLE: 20000 CYCLES
6. HYDROTEST PRESSURE: 1.5 x 20.0/19.9 x DESIGN PRESSURE
⚠7. MILL TOLERANCE: 12.5% OR LESS
⚠B. WELDING PROCEDURE REGISTRATION NUMBER: WP-3280.2
⚠9. POST WELD HEAT TREATMENT MAY BE ADDED PROVIDED A PWHT WELDING PROCEDURE IS USE (SEE WELD SYMBOL). TEMPERATURE AND TIME: 1150° F ±50° F FOR 30 MINUTES MINIMUM

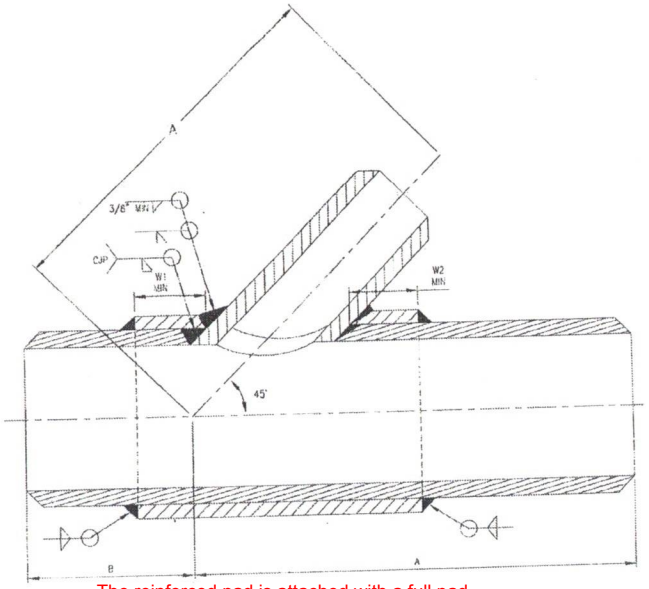
REV	DATE	REVISION	BY	APP
2	15/08/06	REDRAW, NEW VALUES 3"x3",4"x3",4"x4", ADD WPS	LDG	PJD..
1	13/01/18	RE-ISSUED FOR CONSTRUCTION	PE	DK
0	12/11/14	ISSUED FOR CONSTRUCTION	KM	DK
A	12/11/09	ISSUED FOR REVIEW	KM	DK

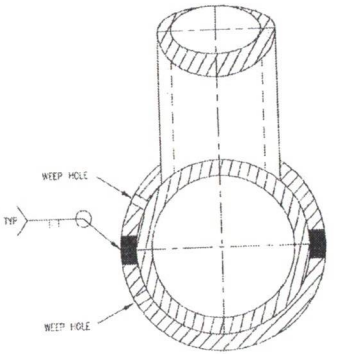
HARDCORE WELDING LTD.
9471 - 49 ST NW, EDMONTON, AB T6B 2L8
TELEPHONE: (780) 490-4447

CLIENT:	N/A
DATE:	12/11/06
JOB NO:	4813
DRAWN BY:	KM
CHECKED BY:	JM
APP BY:	DK

SWEEP TEES
SCHEDULE XH

DWG NO: E124365LP-M-SK-002 REV 2





The reinforced pad is attached with a full pad thickness fillet weld on the outside only. (KR)

RUN SIZE (NPS)	BRANCH SIZE (NPS)	A (in.)	B (in.)	W1 (in.)	W2 (in.)	DESIGN PRESSURE (PSIG) ASME B31.1 c.a.=0"	c.a.=1/16"	c.a.=1/8"	ASME B31.3 c.a.=0"	c.a.=1/16"	c.a.=1/8"	DESIGN TEMPERATURE (°F) ASME B31.1	ASME B31.3	MDMT (ASME B31.3 ONLY) (°F) A106-B	A333 GR.6	
2	2	8	2.5	1	2	2101	1242	--	2101	1242	--	650	400	-20	-50	NOTE 2
3	2	10	3	1.5	1.5	1800	1066	--	2090	1240	--	650	400	-20	-50	NOTE 2
3	3	10	3	1	3	1898	1345	800	1898	1345	800	650	400	-20	-50	
4	2	12	3	1.5	1.5	1522	1066	--	1759	1240	--	650	400	-20	-50	
4	3	12	3	2	2	1475	1130	633	1630	1170	640	650	400	-20	-50	NOTE 2
4	4	12	3	1	3	1668	1225	788	1668	1225	788	650	400	-20	-50	
6	2	14.5	3.5	1.5	1.5	1226	963	--	1405	1100	--	650	400	-20	-50	
6	3	14.5	3.5	2.5	2.5	1200	963	628	1380	1121	728	650	400	-20	-50	
6	4	14.5	3.5	3	3	1170	963	628	1355	1121	731	650	400	-20	-50	NOTE 2
6	6	14.5	3.5	1	3	1246	966	690	1246	966	690	650	400	-20	-50	
8	2	17.5	4.5	1.5	1.5	1074	887	--	1225	995	--	650	400	-20	-50	
8	3	17.5	4.5	2.5	2.5	1050	887	628	1210	1032	732	650	400	-20	-50	
8	4	17.5	4.5	3	3	1025	887	628	1190	1032	724	650	400	-20	-50	NOTE 2
8	6	17.5	4.5	2	3	1057	819	585	1057	819	585	650	400	-20	-50	NOTE 2
8	8	17.5	4.5	1	4	1008	811	617	1008	811	617	650	400	-20	-50	

BILL OF MATERIAL

ITEM	REQ.	DESCRIPTION	MATERIAL/PART #	WT.(lb)
--	--	--	--	--

NOTES

1) WELDING SHALL MEET REQUIREMENTS IN ASTM B31.1-10 Section 127.4.8 & ASTM B31.3-10 Section 328.5.4

MATERIAL: ASTM A106-B SEAMLESS, STD WALL OR ASTM A333 GR.6 SEAMLESS, STD WALL

CODE: ASME B31.1 OR ASME B31.3

DESIGN TEMPERATURE: SEE TABLE

DESIGN PRESSURE (D.P.): SEE TABLE

CORROSION ALLOWANCE (C.A.): SEE TABLE

MDMT: SEE TABLE

HYDROTEST PRESSURE:
(ASME B31.1) 1.5 x D.P.
(ASME B31.3) 1.5 x 20.0/19.9 x D.P.

2) DUE TO LIMITATION ON REINFORCEMENT SIZE, DESIGN PRESSURE IS VERIFIED BY PROOF TEST.

Drawing No.	Description
	REFERENCE DRAWINGS

No.	Date	Issued For	By	Eng	Chk	App
		REVISIONS	CL	CL	DK	DK
0	13/05/24	ISSUED FOR CONSTRUCTION	CL	CL	DK	DK
C	13/04/29	CHANGED VALUE W2 VALUE	CL	CL	DK	DK
B	12/12/14	ISSUED FOR REVIEW	CL	CL	DK	DK
A	12/12/03	ISSUED FOR REVIEW	CL	CL	DK	DK

Stamp: PROFESSIONAL ENGINEER ALBERTA DAVID KWOK Rev 0 May 24/13

P-7364

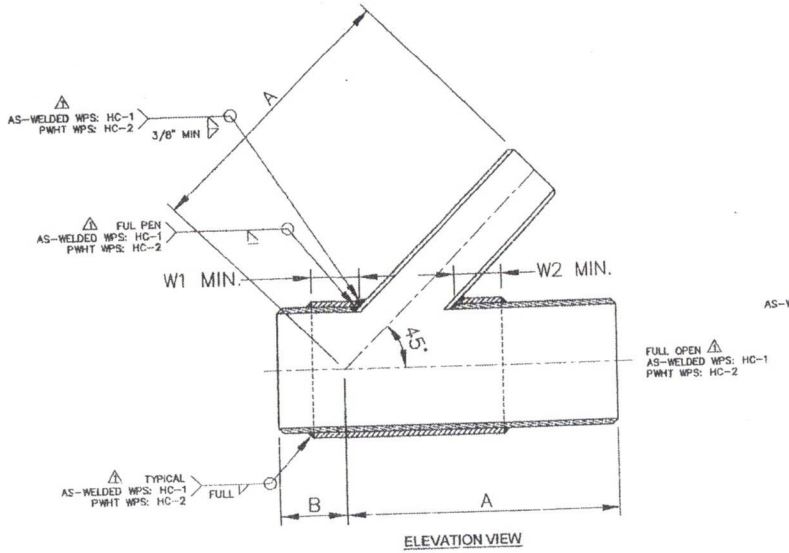
ECO-Technica Inc.
Edmonton, Alberta, Canada
www.eco-technica.com

Drawn By:	CL	Checked by:	DK
Engineered By:	CL	Approved By:	DK
Scale:	NTS	Date:	2012/12/03
Job No.	E124366LP		

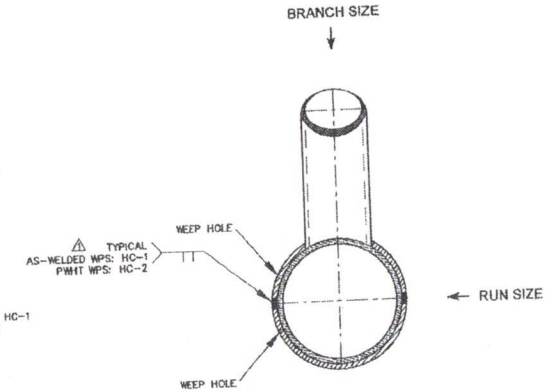
Client: HARDCORE WELDING LTD.

Title: WELDING LATERALS STANDARD WALL

Dwg. No. E124366LP-M-GA-001 REV. 0



ELEVATION VIEW



END VIEW

NOTES:

1. WELDING SHALL MEET REQUIREMENTS IN ASME B31.1–10 SECTION 127.4.8 & ASME B31.3–10 SECTION 328.5.4

   MATERIAL: A–106–B SEAMLESS, XH WALL
   OR
   A–333 GR 6 SEAMLESS, XH WALL

   CODE: ASME B31.1 OR ASME B31.3, ~~2014~~ 2020 (KR) EDITION

   DESIGN TEMPERATURE: SEE TABLE

   DESIGN PRESSURE (D.P.): SEE TABLE

   CORRISION ALLOWANCE (C.A.): SEE TABLE

   MDMT: SEE TABLE

   HYDROTEST PRESSURE:
   (ASME B31.1) 1.5 x D.P.
   (ASME B31.3) 1.5 x 20.0/19.9 x D.P.

2. DUE TO LIMITATION ON REINFORCEMENT SIZE, DESIGN PRESSURE IS VERIFIED BY PROOF TESTS.
3. WELDING PROCEDURE REGISTRATION NUMBER: WP–3280.2
4. THE REPAD THICKNESS IS THE SAME AS THE PIPE RUN THICKNESS.
5. POST WELD HEAT TREATMENT MAY BE ADDED PROVIDED A PWHT WELDING PROCEDURE IS USE (SEE WELD SYMBOL). TEMPERATURE AND TIME: 1150° F ±50° F FOR 30 MINUTES MINIMUM

RUN SIZE (NPS) (IN)	BRANCH SIZE (NPS) (IN)	DIMENSION (A) (IN)	DIMENSION (B) (IN)	DIMENSION (W1) (IN)	DIMENSION (W2) (IN)	DESIGN PRESSURE (psig) ASME B31.1 CA=0	CA=1/16"	CA=1/8"	DESIGN PRESSURE (psig) ASME B31.3 CA=0	CA=1/16"	CA=1/8"	DESIGN TEMPERATURE (°F) ASME B31.1	ASME B31.3	MDMT (ASME B31.3 ONLY) (°F) SA–106–B	SA–333–GR6	
2	2	8	2.5	1	2	2614	1859	1115	2614	1859	1115	650	400	–20	–50	NOTE 2
3	2	10	3	1.5	1.5	2450	1926	965	2512	2138	1120	650	400	–20	–50	NOTE 2
3	3	10	3	1	3	2198	1736	1282	2198	1736	1282	650	400	–20	–50	
4	2	12	3	1.5	1.5	2150	1833	965	2230	2130	1026	650	400	–20	–50	
4	3	12	3	2	2	2050	1800	1331	2323	1983	1602	650	400	–20	–50	NOTE 2
4	4	12	3	1	3	2340	1903	1472	2340	1903	1472	650	400	–20	–50	
6	2	14.5	3.5	1.5	1.5	1850	1650	965	1957	1760	1120	650	400	–20	–50	
6	3	14.5	3.5	2.5	2.5	1800	1620	1330	2006	1710	1439	650	400	–20	–50	
6	4	14.5	3.5	3	3	1770	1590	1330	1972	1855	1540	650	400	–20	–50	NOTE 2
6	6	14.5	3.5	1	3	1769	1511	1257	1769	1511	1257	650	400	–20	–50	
8	2	17.5	4.5	1.5	1.5	1830	1468	965	1674	1600	1120	650	400	–20	–50	
8	3	17.5	4.5	2.5	2.5	1610	1468	1260	1753	1670	1480	650	400	–20	–50	
8	4	17.5	4.5	3	3	1580	1430	1260	1770	1680	1480	650	400	–20	–50	NOTE 2
8	6	17.5	4.5	2	3	1387	1185	986	1387	1185	986	650	400	–20	–50	NOTE 2
8	8	17.5	4.5	1	4	1533	1340	1150	1533	1340	1150	650	400	–20	–50	

REV	DATE	REVISION	BY	APP
2	15/08/06	REDRAWN, NEW VALUES FOR 4"x3", ADD WPS	LDG	PJD...
1	13/05/24	ISSUED FOR CONSTRUCTION	CL	DK
0C	13/04/25	CHANGED VALVE ON W2	CL	DK
0B	12/12/14	ISSUED FOR REVIEW	CL	DK
0A	12/12/04	ISSUED FOR REVIEW	CL	DK
0	12/11/01	ISSUED FOR CONSTRUCTION	KM	DK
A	12/10/29	ISSUED FOR REVIEW	CL	DK

HARDCORE WELDING LTD.
9471 – 49 ST NW, EDMONTON, AB T6B 2L8
TELEPHONE: (780) 490–4447

CLIENT:	N/A
DATE:	12/10/29
JOB NO:	4813
DRAWN BY:	KM
CHECKED BY:	JM
APP BY:	DK

45° LATERALS
SCHEDULE XH

DWG NO: E124366LP-M-GA-002 REV 2

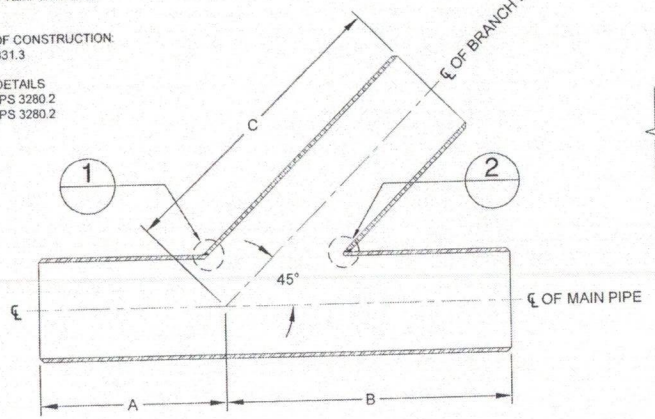
NOTE:
1. ALL PIPE MATERIAL IS SEAMLESS

MATERAIL:
A106 GRADE 'B' PIPE STANDARD WALL THICKNESS
A333 GRADE '6' PIPE STANDARD WALL THICKNESS

DESIGN TEMPERATURE:
500 °F

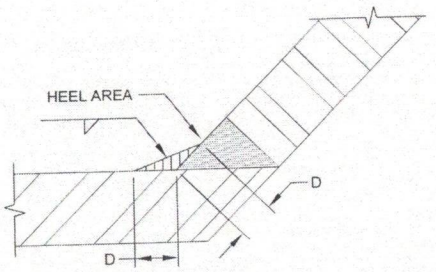
CODE OF CONSTRUCTION:
ASME B31.3

WELD DETAILS
HC-1 WPS 3280.2
HC-2 WPS 3280.2



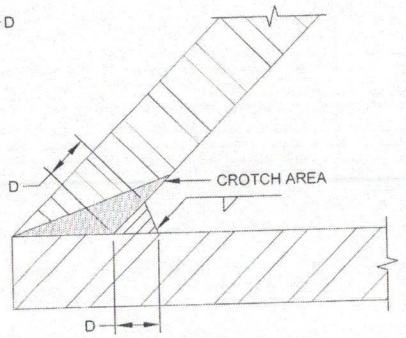
LATERAL BRANCH CONNECTION

SCALE: N.T.S.



DETAIL 1

SCALE: N.T.S.



DETAIL 2

SCALE: N.T.S.

STANDARD WALL							
LATERAL TEE SIZE (in)	A	B	C	D	PRESSURE (PSI)		
					0 CA	1/16 CA	1/8 CA
10x10	5.000	20.500	20.500	0.375	355	280	205
10x8	5.000	20.500	20.500	0.375	485	390	285
10x6	5.000	20.500	20.500	0.375	560	455	340
10x4	5.000	20.500	20.500	0.375	580	475	355
10x3	5.000	20.500	20.500	0.375	595	490	370

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REV	DESCRIPTION	DATE Y-M-D	BY	CHK'D	APP'D
5					
4					
3	RE-ISSUED FOR CRN	19-07-22	CH	KH	
2	ISSUED FOR CRN	19-06-17	CH	KH	
1	ISSUED FOR CONSTRUCTION	19-05-14	CH	KH	
0	ISSUED FOR REVIEW	19-05-13	CH	KH	

PROJECT: HARDCORE WELDING
WYE LATERAL BRANCH CONNECTION DETAILS
NOMINAL NPS 10 STANDARD WEIGHT

BY	CH	Y-M-D 19-04-30	SCALE	AS NOTED	JOB NO. HCW-19-100
CHK'D	KH	Y-M-D 19-04-30	PLOT SCALE	1:1	FILE NO. HC-10YSTD-1
PRES ENG.		Y-M-D	DWG. NO.	HC-10YSTD-1	REV. 5
ENG. APP'D		Y-M-D			

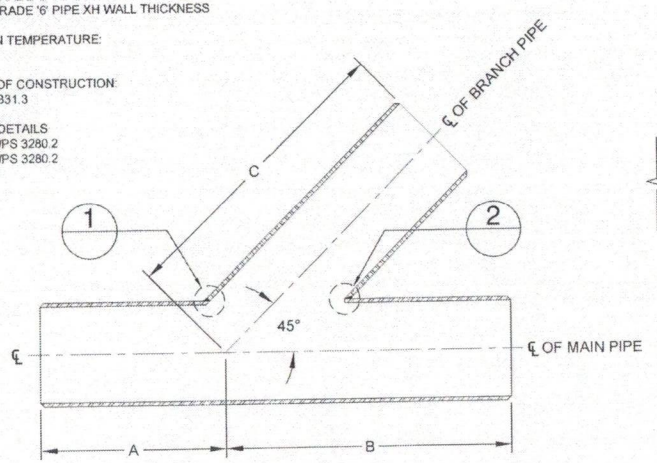
NOTE:
1. ALL PIPE MATERIAL IS SEAMLESS

MATERAIL:
A106 GRADE 'B' PIPE XH WALL THICKNESS
A333 GRADE '6' PIPE XH WALL THICKNESS

DESIGN TEMPERATURE:
500 °F

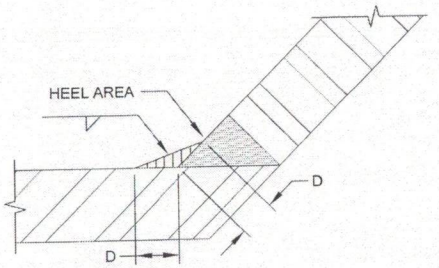
CODE OF CONSTRUCTION:
ASME B31.3

WELD DETAILS
HC-1 WPS 3280.2
HC-2 WPS 3280.2



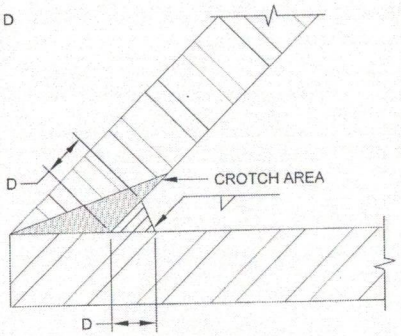
LATERAL BRANCH CONNECTION

SCALE: N.T.S.



DETAIL 1

SCALE: N.T.S.



DETAIL 2

SCALE: N.T.S.

EXTRA HEAVY (XH) WALL							
LATERAL TEE SIZE (in)	A	B	C	D	PRESSURE (PSI)		
					0 CA	1/16 CA	1/8 CA
10x10	5.000	20.500	20.500	0.375	525	440	350
10x8	5.000	20.500	20.500	0.375	745	630	505
10x6	5.000	20.500	20.500	0.375	820	700	570
10x4	5.000	20.500	20.500	0.375	830	705	570
10x3	5.000	20.500	20.500	0.375	850	725	580

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REV	DESCRIPTION	DATE Y-M-D	BY	CHK'D	APP'D
3					
2					
1					
0	RE-ISSUED FOR CRN	15-07-22	CH	KH	
A	ISSUED FOR CRN	15-06-17	CH	KH	
A1	ISSUED FOR CONSTRUCTION	15-05-14	CH	KH	
A	ISSUED FOR REVIEW	15-02-13	CH	KH	

PROJECT: HARDCORE WELDING
WYE LATERAL BRANCH CONNECTION DETAILS
NOMINAL NPS 10 EXTRA HEAVY WALL

DR	CH	Y-M-D 15-04-30	SCALE	AS NOTED	JOB NO. HCW-13-109
CHECK	KH	Y-M-D 15-05-30	PLOT SCALE	1:1	FILE NO. HC-10YXH-1
PROJ. ENG.		Y-M-D	DWG. NO.	HC-10YXH-1	REV. 3
ENG. APP.		Y-M-D			

SIZE A3

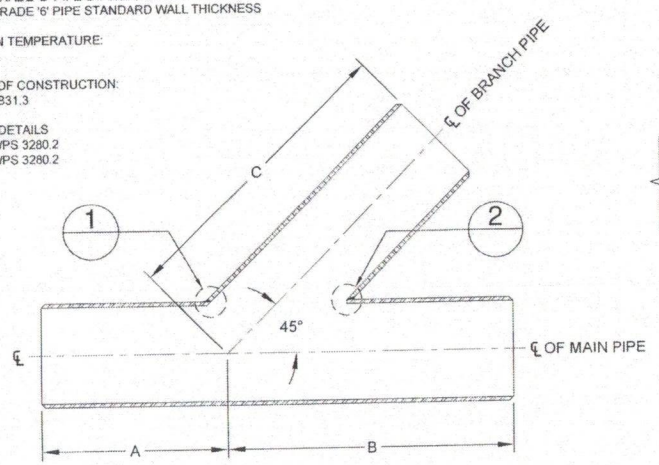
NOTE:
1. ALL PIPE MATERIAL IS SEAMLESS

MATERAIL:
A106 GRADE 'B' PIPE STANDARD WALL THICKNESS
A333 GRADE '6' PIPE STANDARD WALL THICKNESS

DESIGN TEMPERATURE:
500 °F

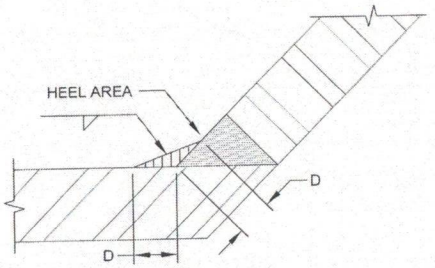
CODE OF CONSTRUCTION:
ASME B31.3

WELD DETAILS
HC-1 WPS 3280.2
HC-2 WPS 3280.2



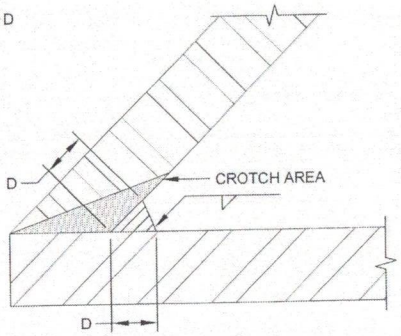
LATERAL BRANCH CONNECTION

SCALE: N.T.S.



DETAIL 1

SCALE: N.T.S.



DETAIL 2

SCALE: N.T.S.

STANDARD WALL							
LATERAL TEE SIZE (in)	A	B	C	D	PRESSURE (PSI)		
					0 CA	1/16 CA	1/8 CA
12x12	5.500	24.500	24.500	0.375	275	220	160
12x10	5.500	24.500	24.500	0.375	375	305	225
12x8	5.500	24.500	24.500	0.375	480	390	290
12x6	5.500	24.500	24.500	0.375	485	395	300
12x4	5.500	24.500	24.500	0.375	500	410	310
12x3	5.500	24.500	24.500	0.375	515	425	320

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REV	DESCRIPTION	DATE Y-M-D	BY	CHK'D	APPR.
2	RE-ISSUED FOR CRN	19-07-22	CH	KH	
1	ISSUED FOR CRN	19-05-17	CH	KH	
0	ISSUED FOR CONSTRUCTION	19-05-14	CH	KH	
A	ISSUED FOR REVIEW	19-02-13	CH	KH	

PROJECT: HARDCORE WELDING
WYE LATERAL BRANCH CONNECTION DETAILS
NOMINAL NPS 12 STANDARD WEIGHT WALL

BY	CH	Y-M-D 19-04-30	SCALE	AS NOTED	JOB NO. HCW-19-100
CHECK	KH	Y-M-D 19-04-30	PLOT SCALE	1:1	FILE NO. HC-12YSTD-1
PROJ. ENG.		Y-M-D	ENG. NO.	HC-12YSTD-1	
ENG. APPR.		Y-M-D			

ENG. SIZE A3 | REV. 2

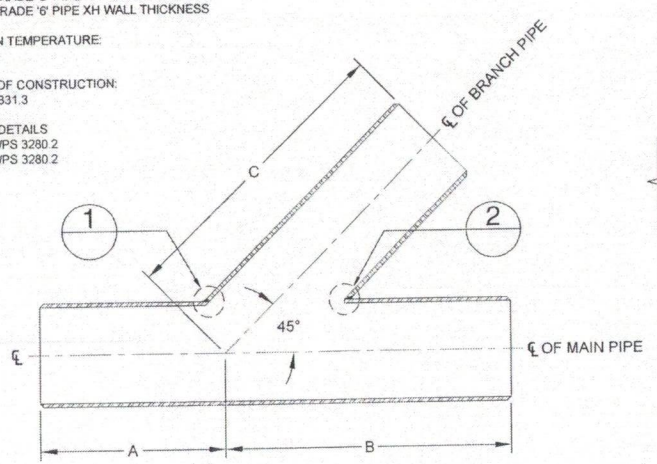
NOTE:
1. ALL PIPE MATERIAL IS SEAMLESS

MATERAIL:
A106 GRADE 'B' PIPE XH WALL THICKNESS
A333 GRADE '6' PIPE XH WALL THICKNESS

DESIGN TEMPERATURE:
500 °F

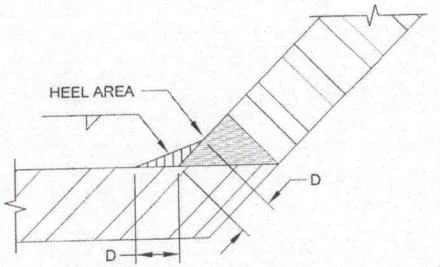
CODE OF CONSTRUCTION:
ASME B31.3

WELD DETAILS
HC-1 WPS 3280.2
HC-2 WPS 3280.2



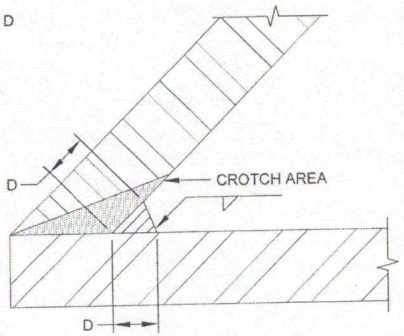
LATERAL BRANCH CONNECTION

SCALE: N.T.S.



DETAIL 1

SCALE: N.T.S.



DETAIL 2

SCALE: N.T.S.

EXTRA HEAVY (XH) WALL							
LATERAL TEE SIZE (in)	A	B	C	D	PRESSURE (PSI)		
					0 CA	1/16 CA	1/8 CA
12x12	5.500	24.500	24.500	0.375	395	330	260
12x10	5.500	24.500	24.500	0.375	540	455	365
12x8	5.500	24.500	24.500	0.375	690	590	485
12x6	5.500	24.500	24.500	0.375	700	595	485
12x4	5.500	24.500	24.500	0.375	705	600	485
12x3	5.500	24.500	24.500	0.375	720	610	490

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6	RE-ISSUED FOR CRN	19-07-22	CH	KH	
5	ISSUED FOR CRN	19-06-17	CH	KH	
4	ISSUED FOR CONSTRUCTION	19-05-14	CH	KH	
3	ISSUED FOR REVIEW	19-05-13	CH	KH	

PROJECT: HARDCORE WELDING
WYE LATERAL BRANCH CONNECTION DETAILS
NOMINAL NPS 12 EXTRA HEAVY WALL

BY	CH	Y-M-D 19-04-30	SCALE	AS NOTED	JOB NO. HCW-19-100	DWG. A3
CHK'D	KH	Y-M-D 19-04-30	PLOT SCALE	1:1	FILE NO. HC-12YXH-1	REV. 6
APP'D		Y-M-D	DWG. NO.	HC-12YXH-1		REV. 6
DWG. APP'D		Y-M-D				