



the pressure equipment safety authority

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

December 13, 2006

Ron Sobie
PAINTEARTH ENERGY SERVICES INC
BOX 24
HALKIRK, AB

Dear Ron Sobie,

The welding procedures received on December 06, 2006 are accepted for registration as follows:

Reg. No. : WP-1684.2

Accepted on: December 13, 2006

Tracking No. : 2006-09151

Reg Type : New Design

Spec. No. : PESI-4 REV 0

Registered under owner / manufacturer name PAINTEARTH ENERGY SERVICES INC

Please note the acceptance of the registration does not allow the use of this welding procedure in the construction, modification, or repair of any boiler, pressure vessel, pressure piping system or fitting in Alberta unless the contractor/manufacturer has registered a Quality Control system for such work with ABSA.

Welding procedures, which specify impact testing, have been accepted in accordance with A.S.M.E. Section IX only. Other A.S.M.E. Code Sections may have additional requirements respecting impact testing.

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

Enclosed is a stamped welding procedure for your reference.

Sincerely,

ROSEBERG, BOB, P. Eng.
Design Survey Engineer

WELDING PROCEDURE SPECIFICATION NO: PESI-4 (Rev.0)

WELDING PROCEDURE QUALIFICATION RECORD NO(S): COS-1-1, COS-P1-A,
DEML-4-1, IPS-4-1

QUALIFIED FOR

Base Metal (Typical): P1 to P1 (SA 53 Gr. B, SA 106 Gr. B, SA 105, SA 234 WPB,
SA 516 Gr. 70, etc.)
Process(es): SMAW Weld Types: GROOVE & FILLET
Position: ALL POSITIONS Diameter: ALL DIAMETERS
Filler Metal: E6010, E6011, E7018, E7018-1

BASE METAL CONDITIONS & GROOVE THICKNESS RANGE QUALIFIED:

STANDARD APPLICATIONS AS WELDED

BASE METAL THICKNESS RANGE 1.6 to 203 mm (0.062 to 8.00 in.) inclusive

COMBINED DEPOSITED WELD METAL THICKNESS

| | |
|------------------------|------------------------------------|
| ASME B31.1 | <u>19.1 mm (0.750 in.) maximum</u> |
| ASME B31.3 | <u>19.1 mm (0.750 in.) maximum</u> |
| ASME SECT. VIII, DIV.1 | <u>38.1 mm (1.50 in.) maximum</u> |

| | |
|---|------------------------------|
| ALBERTA BOILERS SAFETY ASSOCIATION | |
| PROVINCE OF ALBERTA | |
| SAFETY CODES ACT | |
| WELDING PROCEDURE | |
| Reg. No. WP | <u>1684.2</u> |
| Spec No. | <u>PESI-4</u> |
| Weld Process | <u>SMAW</u> |
| Matl. Gr. P No. | <u>1</u> to P No. <u>1</u> |
| Elec. Gr. F No. | <u>3+4</u> A No. <u>1</u> |
| Th. Qual. For | <u>203mm</u> PWHT. <u>NO</u> |
| Yr. <u>06</u> Mo. <u>12</u> Day <u>13</u> Signed <u>R. ROSEBERG, P.ENG.</u> | |
| WELDING SPECIALIST | |

PROVINCIAL REGISTRATION

QW-482 WELDING PROCEDURE SPECIFICATION (WPS)

Paintearth Energy Services Inc.

Welding Procedure Specification No. PESI-4 (Rev.0) Date November 22, 2006
Revision(s) Rev.0 - (Non-Essential) Format update, company name change, (formerly IPS Manufacturing Limited) & WPS No. change, formerly IPS-4 (Rev.1)
November 6, 2003
Supporting PQR No.(s) COS-1-1, COS-P1-A, DEML-4-1, IPS-4-1
Welding Process(es) SMAW Type(s) Manual

JOINTS (QW-402)

Joint Design All ASME groove & fillet, reference construction drawing for joint details.
Where joint details are not specified, see figures 1 to 15 attached.
Root Opening As per attached typical groove designs, see figures 1 to 15 attached.
Backing With or without Retainers: Not Required

BASE METALS (QW-403)

P-Number P1 To P-Number P1
Thickness Range: Groove See cover page for thickness qualified by governing code
Fillet All base metal thicknesses
Base Metal 1.6 to 203 mm (0.063 to 8.00 in.) inclusive
Pipe Diameter Ranges: Groove All diameters
Fillet All diameters
Deposited Weld Metal (Per Pass) F3: 6.35 mm (0.250 in.) maximum
F4: 12.7 mm (0.500 in.) maximum

FILLER METALS (QW-404)

| | | |
|---------------------------------------|--|----------------------------------|
| Specification No. (SFA) | <u>SFA 5.1</u> | <u>SFA 5.1</u> |
| AWS No. (Class) | <u>E6010, E6011</u> | <u>E7018, E7018-1</u> |
| F-No. | <u>F3</u> | <u>F4</u> |
| A-No. | <u>A1</u> | <u>A1</u> |
| Size | <u>3/32 to 3/16 in. inclusive</u> | <u>3/32 to 1/4 in. inclusive</u> |
| Deposited Weld Metal Thickness Range: | | |
| Groove | <u>6.35 mm (0.250 in.) max.*</u> | <u>38.1 mm (1.50 in.) max.*</u> |
| Fillet | <u>All fillet sizes</u> | <u>All fillet sizes</u> |
| Other | <u>* Combined deposited weld metal thickness shall not exceed 19.1 mm (0.750 in.) for ASME B31.1 & B31.3 and 38.1 mm (1.50 in.) for ASME Section VIII, Div.1</u> | |

POSITION (QW-405)

Position of Groove All positions Position of Fillet All positions
Weld Progression F3: Vertical up or vertical down F4: Vertical up

PREHEAT (QW-406)

Preheat Temperature (Min.) 38°C (100°F) or per attached preheat sheet, whichever is greater
Interpass Temperature (Max.) 371°C (700°F)
Preheat Maintenance Per above min preheat temperature prior to welding. Preheat maintenance is not required if welding is interrupted or after the completion of welding. Unless required by the code of construction.

POST WELD HEAT TREATMENT (QW-407)Temperature Range None Time Range N/A**ELECTRICAL CHARACTERISTICS (QW-409)**

Current Direct Polarity Reverse, electrode positive
 Amps See Table #1 Volts See Table #1
 Maximum Heat Input N/A

TECHNIQUE (QW-410)

String or Weave Either Travel Speed See Table #1
 Initial & Interpass Cleaning Brushing, chipping or grinding as required
 Method of Back Gouging Air carbon arc, back-grind as required
 Multiple or Single Pass Per Side Either
 Multiple or Single Electrodes Multiple
 Peening Not permitted

TABLE 1 - WELDING PARAMETERS

| Process | Filler Metal | Diameter mm (in.) | Current Type & Polarity | Amperage Range | Voltage Range | Travel Speed mm/min. (i.p.m.) |
|---------|---------------|----------------------|----------------------------|-------------------|------------------|----------------------------------|
| SMAW | E6010/E6011 | 2.4 (3/32) | DCRP | 50 - 100 | 18 - 26 | 38 - 300 (1.5 - 12) |
| SMAW | E6010/E6011 | 3.2 (1/8) | DCRP | 60 - 140 | 19 - 28 | 38 - 350 (1.5 - 14) |
| SMAW | E6010/E6011 | 4.0 (5/32) | DCRP | 115 - 200 | 20 - 30 | 50 - 400 (2.0 - 16) |
| SMAW | E7018/E7018-1 | 2.4 (3/32) | DCRP | 60 - 110 | 18 - 26 | 38 - 300 (1.5 - 12) |
| SMAW | E7018/E7018-1 | 3.2 (1/8) | DCRP | 90 - 150 | 19 - 28 | 38 - 350 (1.5 - 14) |
| SMAW | E7018/E7018-1 | 4.0 (5/32) | DCRP | 110 - 220 | 20 - 28 | 50 - 400 (2.0 - 16) |
| SMAW | E7018/E7018-1 | 5.0 (3/16) | DCRP | 160 - 320 | 21 - 30 | 75 - 500 (3.0 - 20) |
| SMAW | E7018/E7018-1 | 5.5 (7/32) | DCRP | 240 - 350 | 22 - 32 | 125 - 550 (5.0 - 22) |
| SMAW | E7018/E7018-1 | 6.4 (1/4) | DCRP | 300 - 400 | 22 - 32 | 125 - 550 (5.0 - 22) |

Note: Size of electrode, filler metal, number of passes, voltage, amperage, and travel speed will vary with position, joint thickness, joint type etc.

TYPICAL JOINT DESIGNS

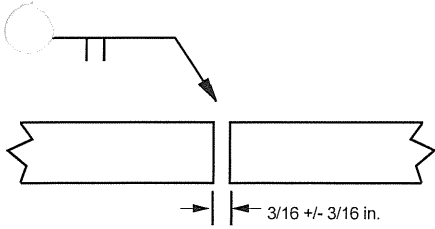


Figure 1
Single Square Butt

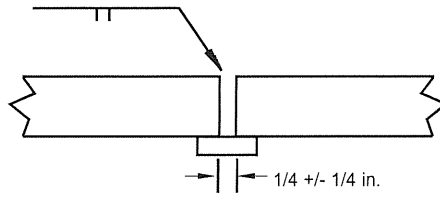


Figure 2
Single Square Butt with Backing Strip

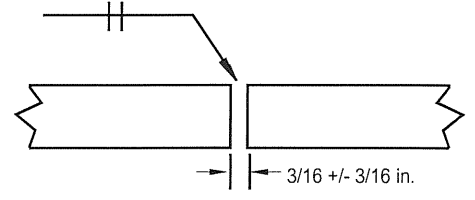


Figure 3
Double Square Butt

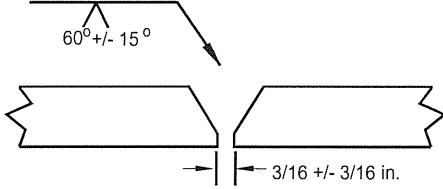


Figure 4
Single Vee Butt

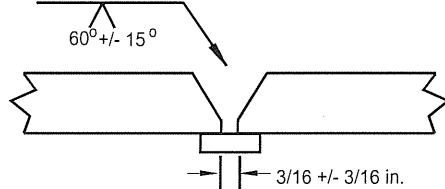


Figure 5
Single Vee Butt with Backing Strip

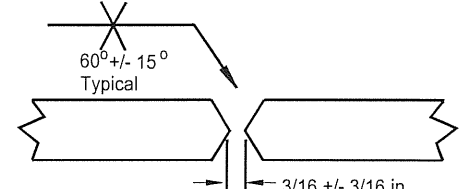


Figure 6
Double Vee Butt

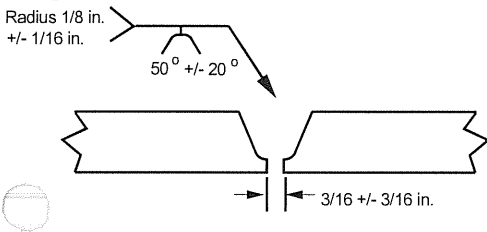


Figure 7
Single U Butt

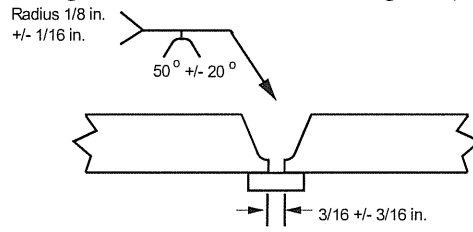


Figure 8
Single U Butt with Backing Strip

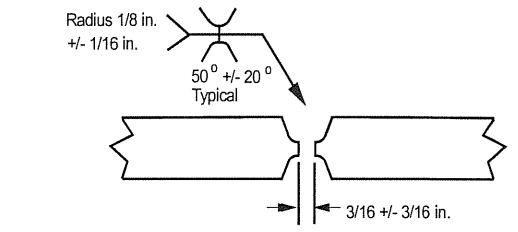


Figure 9
Double U Butt

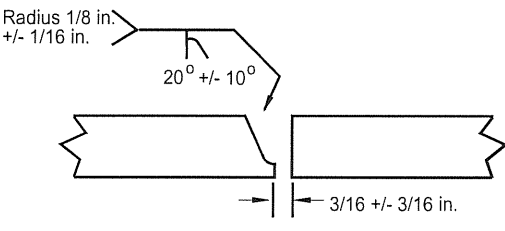


Figure 10
Single J Butt

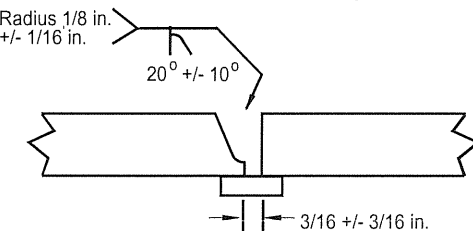


Figure 11
Single J Butt with Backing Strip

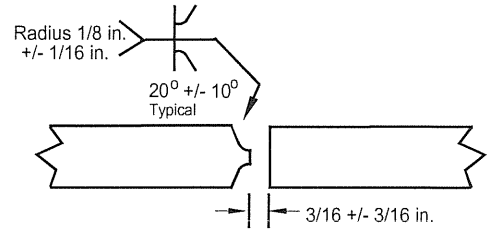


Figure 12
Double J Butt

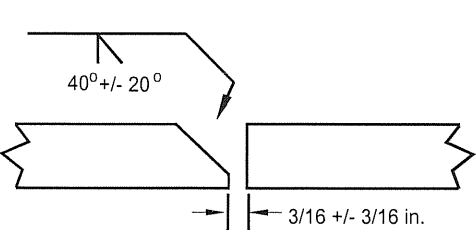


Figure 13
Single Bevel Butt

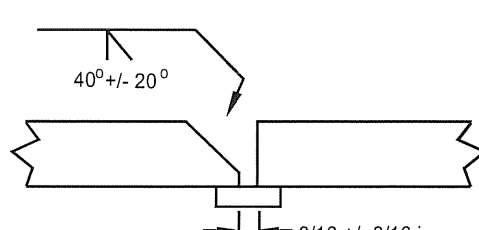


Figure 14
Single Bevel Butt with Backing Strip

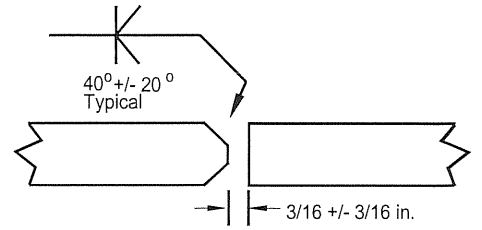


Figure 15
Double Bevel Butt

Or as per the joint design on the approved construction drawing.

Prepared By Ludwig & Associates Ltd.

PREHEAT**P-No. 1**

1. Welds joining pressure parts or attachments shall be preheated to not less than the minimum preheat temperatures stated in paragraph 5.
2. The preheat temperature shall be maintained during welding.
3. If welding is interrupted, the weld joint and adjacent areas shall be reheated to the minimum preheat temperature stated in paragraph 5, prior to the start of welding.
4. Preheat temperatures shall be checked by the welder or inspector, using temperature indicating crayons or other reputable methods.
5. Minimum preheating temperatures shall be as follows:

PRESSURE VESSELS IN ACCORDANCE WITH ASME SECTION VIII, DIV. 1

| NOMINAL WALL THICKNESS | MINIMUM PREHEAT TEMPERATURE |
|---|-----------------------------|
| 0 to 31.8 mm (0 to 1.25 in) | 10°C (50°F) |
| Over 31.8 mm (Over 1.25 in.) | 93°C (200°F) |
| Over 25.4 mm (1.0 in.) & specified maximum carbon content in excess of 0.30%. | 80°C (175°F) |

- The conditions of UW-30 shall apply for base metal temperatures below 0°C (32°F).
- The preheat zone shall extend at least 50.8 mm (2.0 in.) beyond each edge of the weld.

PROCESS PIPING IN ACCORDANCE WITH ASME B31.3

| NOMINAL WALL THICKNESS | MINIMUM SPECIFIED BASE METAL TENSILE STRENGTH | MINIMUM PREHEAT TEMPERATURE |
|------------------------|---|-----------------------------|
| < 25.4 mm (1.0 in.) | ≤ 490 MPa (71 ksi) | 10°C (50°F) |
| ≥ 25.4 mm (1.0 in.) | All | 80°C (175°F) |
| All | > 490 MPa (71 ksi) | 80°C (175°F) |

- The preheat zone shall extend at least 25.4 mm (1.0 in.) beyond each edge of the weld.
- The interruption of welding shall be subject to the requirements of paragraph 320.2.4.

POWER PIPING IN ACCORDANCE WITH ASME B31.1

| NOMINAL WALL THICKNESS | MINIMUM PREHEAT TEMPERATURE |
|---|-----------------------------|
| Over 25.4 mm (1.0 in.) & specified maximum carbon content in excess of 0.30%. | 80°C (175°F) |
| All others | 10°C (50°F) |

- The preheat zone shall extend at least 76.2 mm (3.0 in.) beyond each edge of the weld.

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Paintearth Energy Services Inc.

Procedure Qualification Record No. COS-1-1 Date May 31, 1994
PQR Revision(s) Format update, company name change,
(formerly Chadco Oilfield Services Ltd.) November 22, 2006
Welding Procedure Specification No. PESI-4 (Rev.0)
Welding Process(es) GMAW / SMAW Type(s) Semi -Auto / Manual

JOINTS (QW-402)

Type Butt joint, single vee groove, see next page

BASE METALS (QW-403)

Material Spec. SA 516 Type or Grade Grade 70
P-No. P1 To P-No. P1 Thickness 19.1 mm (0.750 in.)
Diameter N/A Other Plate

FILLER METALS (QW-404)

| | GMAW | SMAW |
|--------------------------------|--|----------------------------|
| Specification No. (SFA) | <u>SFA 5.18</u> | <u>SFA 5.1</u> |
| AWS No. (Class) | <u>ER70S-6</u> | <u>E7018-1</u> |
| Filler Metal F-No. | <u>F6</u> | <u>F4</u> |
| Filler Metal A-No. | <u>*</u> | <u>A1</u> |
| Size of Electrode | <u>0.035 in.</u> | <u>1/8, 5/32, 3/16 in.</u> |
| Other | <u>*Chemical composition meets the requirements of ASME Sec. II, Part C, for ER70S-6</u> | |
| Deposited Weld Metal Thickness | <u>3.2 mm (0.125 in.)</u> | <u>15.9 mm (0.625 in.)</u> |

POSITION (QW-405)

Position of Groove 3G
Weld Progression GMAW: Vertical down SMAW: Vertical up

PREHEAT (QW-406)

Preheat Temperature 10°C (50°F) Interpass Temp. (Max.) 316°C (600°F)

POSTWELD HEAT TREATMENT (QW-407)

Temperature None Time N/A

GAS (QW-408)

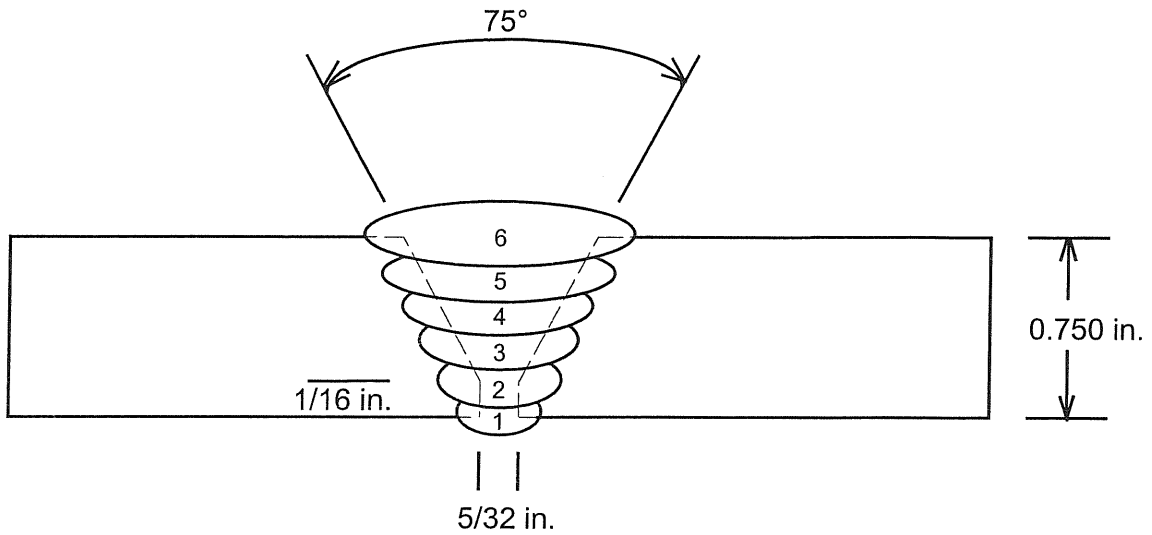
Shielding 75% Argon, 25% CO₂, 15 liters per minute (30 cfph)
Backing None Trailing Without

ELECTRICAL CHARACTERISTICS (QW-409)

Current Direct Polarity Reverse, electrode positive
Amps GMAW: 140 - 160 SMAW: 120 - 210 Volts GMAW: 25 SMAW: 20 - 29
Heat Input N/A

TECHNIQUE (QW-410)

String or Weave Both Travel Speed GMAW: 10 SMAW: 2 - 7 ipm
Multiple or Single Pass Per Side Multipass from groove side
Multiple or Single Electrodes Single



| Pass | Process | Filler Metal | Diameter in. | Current & Polarity | Amperage Range | Voltage Range | Travel Speed mm/min (ipm.) |
|-----------|---------|--------------|-----------------|--------------------|----------------|---------------|----------------------------|
| 1 | GMAW | ER70S-6 | 0.035 | DCRP | 140 - 160 | 25 | 254 (10) |
| Remainder | SMAW | E7018-1 | 1/8, 5/32, 3/16 | DCRP | 120 - 210 | 20 - 29 | 51 - 178 (2.0 - 7.0) |

PQR NO. COS-1-1

TENSILE TEST (QW-150)

| Specimen No. | Width in. | Thickness in. | Area Sq. in. | Ultimate Load lbs. | Ultimate Stress Psi | Character & Fracture Location |
|--------------|-----------|---------------|--------------|--------------------|---------------------|-------------------------------|
| FKT1 | 0.753 | 0.743 | 0.559 | 44,200 | 79,000 | Ductile |
| | | | | | | Parent Metal |
| FKT2 | 0.760 | 0.745 | 0.566 | 45,100 | 79,700 | Ductile |
| | | | | | | Parent Metal |

GUIDED BEND TEST (QW-160)

| Type & Figure No. | Result | Type & Figure No. | Result |
|----------------------|--------|----------------------|--------|
| QW-462.2, FKB1 - TSB | Pass | QW-462.2, FKB3 - TSB | Pass |
| QW-462.2, FKB2 - TSB | Pass | QW-462.2, FKB4 - TSB | Pass |

OTHER TESTS

See attached Rockwell hardness test report 83-4001(FK)

Welders Name Brock Hutt Certificate File No. W-5406
 Tests Conducted By QC Inspection Services Ltd.
 Laboratory Test No. 83-4001(FK)

We hereby recertify that the statements in this record have been revised in accordance with paragraph QW-200.2 and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer PAINTEARTH ENERGY SERVICES INC., formerly
Chadco Oilfield Services Ltd.

Date DEC 1/06. Signed [Signature]

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Paintearth Energy Services Inc.

Procedure Qualification Record No. COS-P1-A Date July 2, 1993
PQR Revision(s) Format update, company name change,
(formerly Chadco Oilfield Services Ltd.) November 22, 2006
Welding Procedure Specification No. PESI-4 (Rev.0)
Welding Process(es) SMAW Type(s) Manual

JOINTS (QW-402)

Type Butt joint, single vee groove, see next page

BASE METALS (QW-403)

Material Spec. SA 106 Type or Grade Grade B
P-No. P1 To P-No. P1 Thickness 8.5 mm (0.337 in.)
Diameter 114.3 mm (4.50 in.) O.D. Other 4 in. Schedule 80

FILLER METALS (QW-404)

| | | |
|--------------------------------|---------------------------|-----------------------|
| Specification No. (SFA) | <u>SFA 5.1</u> | <u>SFA 5.1</u> |
| AWS No. (Class) | <u>E6010</u> | <u>E7018-1</u> |
| Filler Metal F-No. | <u>F3</u> | <u>F4</u> |
| Filler Metal A-No. | <u>A1</u> | <u>A1</u> |
| Size of Electrode | <u>3/32, 1/8 in.</u> | <u>3/32 in.</u> |
| Deposited Weld Metal Thickness | <u>4.0 mm (0.157 in.)</u> | <u>4.5 mm (0.177)</u> |

POSITION (QW-405)

Position of Groove 6G
Weld Progression Vertical up

PREHEAT (QW-406)

Preheat Temperature 16°C (60°F) Interpass Temp. (Max.) 204°C (400°F)

POSTWELD HEAT TREATMENT (QW-407)

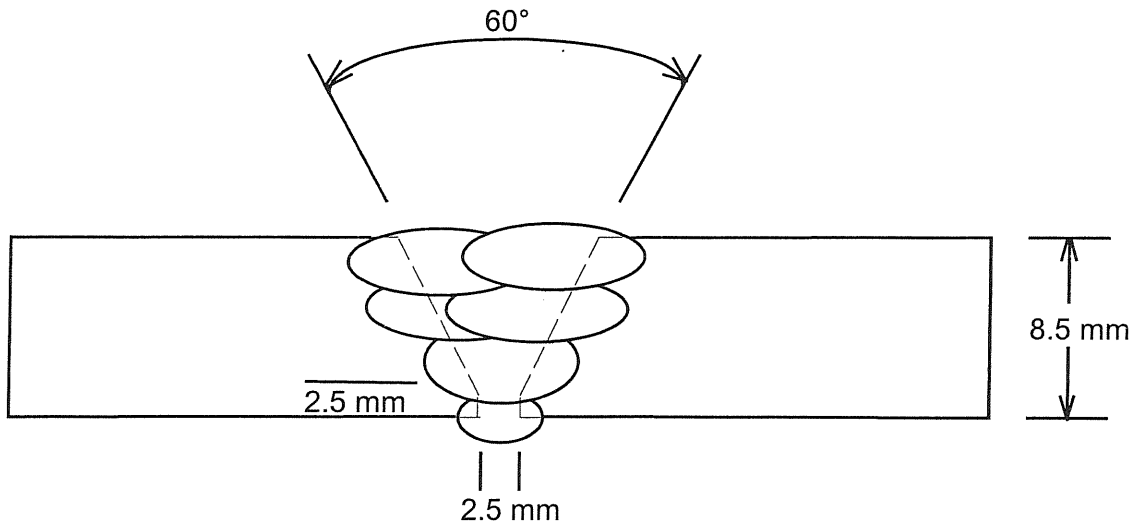
Temperature None Time N/A

ELECTRICAL CHARACTERISTICS (QW-409)

Current Direct Polarity Reverse, electrode positive
Amps 60 - 120, see next page Volts 22 - 32, see next page
Heat Input N/A

TECHNIQUE (QW-410)

String or Weave Both Travel Speed 3 - 6 ipm, see next page
Multiple or Single Pass Per Side Multipass from groove side
Multiple or Single Electrodes Single



| Pass | Process | Filler Metal | Diameter in. | Current & Polarity | Amperage Range | Voltage Range | Travel Speed mm/min (ipm.) |
|-----------|---------|--------------|--------------|--------------------|----------------|---------------|----------------------------|
| 1 | SMAW | E6010 | 3/32, 1/8 | DCRP | 60 - 120 | 22 - 32 | 76 - 152 (3.0 - 6.0) |
| Remainder | SMAW | E7018-1 | 3/32 | DCRP | 60 - 120 | 22 - 32 | 76 - 152 (3.0 - 6.0) |

PQR NO. COS-P1-A

TENSILE TEST (QW-150)

| Specimen No. | Width in. | Thickness in. | Area Sq. in. | Ultimate Load lbs. | Ultimate Stress Psi | Character & Fracture Location |
|--------------|-----------|---------------|--------------|--------------------|---------------------|-------------------------------|
| T1 | 0.741 | 0.223 | 0.165 | 12,390 | 75,000 | Ductile |
| | | | | | | Parent Metal |
| T2 | 0.741 | 0.224 | 0.166 | 12,330 | 74,300 | Ductile |
| | | | | | | Parent Metal |

GUIDED BEND TEST (QW-160)


| Type & Figure No. | Result | Type & Figure No. | Result |
|--------------------|--------|--------------------|--------|
| QW-462.3a, TRB - 1 | Pass | QW-462.3a, TFB - 2 | Pass |
| QW-462.3a, TRB - 3 | Pass | QW-462.3a, TFB - 4 | Pass |

OTHER TESTS

Welders Name Curtis Clausen Certificate File No. W-12290
 Tests Conducted By Alfor Metallurgical Company Ltd.
 Laboratory Test No. 93-399

We hereby recertify that the statements in this record have been revised in accordance with paragraph QW-200.2 and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer PAINTEARTH ENERGY SERVICES INC., formerly
Chadco Oilfield Services Ltd.

Date DEC 1 / 06. Signed 

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Paintearth Energy Services Inc.

Procedure Qualification Record No. DEML-4-1 Date October 2, 2000
PQR Revision(s) Format update & company name change,
(formerly Delaney Energy Manufacturing Ltd.), November 22, 2006
Welding Procedure Specification No. PESI-4 (Rev.0)
Welding Process(es) SMAW Type(s) Manual

JOINTS (QW-402)

Type Butt joint, single vee groove, see next page

BASE METALS (QW-403)

Material Spec. SA 36 Type or Grade ---
P-No. P1 To P-No. P1 Thickness 12.7 mm (0.500 in.)
Diameter N/A Other Plate

FILLER METALS (QW-404)

| | | |
|--------------------------------|---------------------------|----------------------------|
| Specification No. (SFA) | <u>SFA 5.1</u> | <u>SFA 5.1</u> |
| AWS No. (Class) | <u>E6010</u> | <u>E7018-1</u> |
| Filler Metal F-No. | <u>F3</u> | <u>F4</u> |
| Filler Metal A-No. | <u>A1</u> | <u>A1</u> |
| Size of Electrode | <u>See next page</u> | |
| Deposited Weld Metal Thickness | <u>3.2 mm (0.125 in.)</u> | <u>9.52 mm (0.375 in.)</u> |

POSITION (QW-405)

Position of Groove 1G
Weld Progression N/A

PREHEAT (QW-406)

Preheat Temperature 10°C (50°F) Interpass Temp. (Max.) Weld build up

POSTWELD HEAT TREATMENT (QW-407)

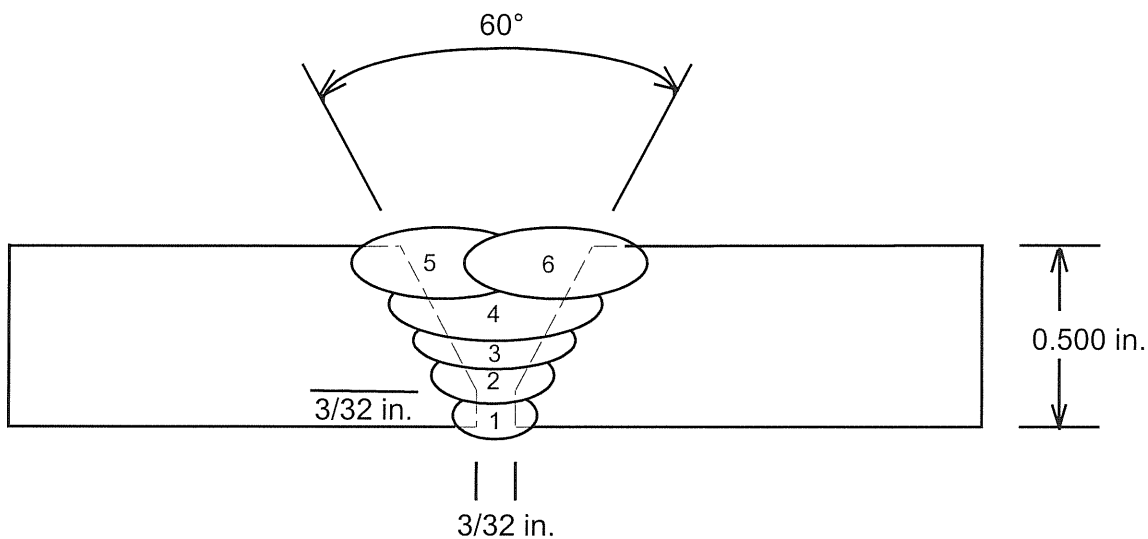
Temperature None Time N/A

ELECTRICAL CHARACTERISTICS (QW-409)

Current Direct Polarity Reverse, electrode positive
Amps See next page Volts See next page
Heat Input N/A

TECHNIQUE (QW-410)

String or Weave Both Travel Speed See next page
Multiple or Single Pass Per Side Multipass from groove side
Multiple or Single Electrodes Single



| Pass | Process | Filler Metal | Diameter mm (in.) | Current & Polarity | Amperage Range | Voltage Range | Travel Speed mm/min (ipm.) |
|------|---------|--------------|-------------------|--------------------|----------------|---------------|----------------------------|
| 1 | SMAW | E6010 | 3.2 (1/8) | DCRP | 90 - 100 | 27 | 187 (7.36) |
| 2 | SMAW | E7018-1 | 3.2 (1/8) | DCRP | 120 - 130 | 25 - 27 | 152 (6.00) |
| 3 | SMAW | E7018-1 | 4.0 (5/32) | DCRP | 150 - 180 | 25 - 27 | 150 (5.91) |
| 4 | SMAW | E7018-1 | 5.0 (3/16) | DCRP | 200 - 230 | 25 - 27 | 145 (5.71) |
| 5 | SMAW | E7018-1 | 5.0 (3/16) | DCRP | 230 - 240 | 24 - 26 | 187 (7.36) |
| 6 | SMAW | E7018-1 | 5.0 (3/16) | DCRP | 220 - 230 | 24 - 27 | 203 (8.00) |

TENSILE TEST (QW-150)

| Specimen No. | Width mm (in.) | Thickness mm (in.) | Area Sq. mm (Sq. in.) | Ultimate Load N (lbs.) | Ultimate Stress MPa (Psi) | Character & Fracture Location |
|--------------|----------------|--------------------|-----------------------|------------------------|---------------------------|-------------------------------|
| T1 | 18.9 | 10.7 | 202 | 102 700 | 508 | Partial cup & cone |
| | (0.744) | (0.423) | (0.315) | (23,100) | (73,600) | Parent metal |
| T2 | 19.1 | 11.0 | 210 | 105 700 | 503 | Partial cup & cone |
| | (0.752) | (0.433) | (0.326) | (23,800) | (73,000) | Parent metal |

GUIDED BEND TEST (QW-160)

| Type & Figure No. | Result | Type & Figure No. | Result |
|--------------------|--------|--------------------|--------|
| QW-462.2, TSB - S1 | Pass | QW-462.2, TSB - S3 | Pass |
| QW-462.2, TSB - S2 | Pass | QW-462.2, TSB - S4 | Pass |


OTHER TESTS

See attached Vickers hardness test report C00-856.1

Welders Name Lee Evans Certificate File No. W-17233
 Tests Conducted By Ludwig & Associates Ltd.
 Laboratory Test No. C00-856.1

We hereby recertify that the statements in this record have been revised in accordance with paragraph QW-200.2 and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer PAINTEARTH ENERGY SERVICES INC., formerly
Delaney Energy Manufacturing Ltd.

Date Dec 1 / 06. Signed 

QW-483 PROCEDURE QUALIFICATION RECORD (PQR)

Paintearth Energy Services Inc.

Procedure Qualification Record No. IPS-4-1 Date October 7, 2003
PQR Revision(s) Format update & company name change,
(formerly IPS Manufacturing Limited) November 22, 2006
Welding Procedure Specification No. PESI-4 (Rev.0)
Welding Process(es) SMAW Type(s) Manual

JOINTS (QW-402)

Type Butt joint, single vee groove, see next page

BASE METALS (QW-403)

Material Spec. SA 516 Type or Grade Gr. 70N
P-No. P1 To P-No. P1 Thickness 38.1 mm (1.50 in.)
Diameter N/A Other Plate

FILLER METALS (QW-404)

Specification No. (SFA) SFA 5.1 SFA 5.1
AWS No. (Class) E6010 E7018-1
Filler Metal F-No. F3 F4
Filler Metal A-No. A1 A1
Size of Electrode See next page
Deposited Weld Metal Thickness 3.2 mm (0.125 in.) 34.9 mm (1.375 in.)

POSITION (QW-405)

Position of Groove F3: 3G F4: 1G & 3G
Weld Progression F3: Vertical Up F4: N/A & Vertical Up

PREHEAT (QW-406)

Preheat Temperature 93°C (200°F) Interpass Temp. (Max.) 371°C (700°F)

POSTWELD HEAT TREATMENT (QW-407)

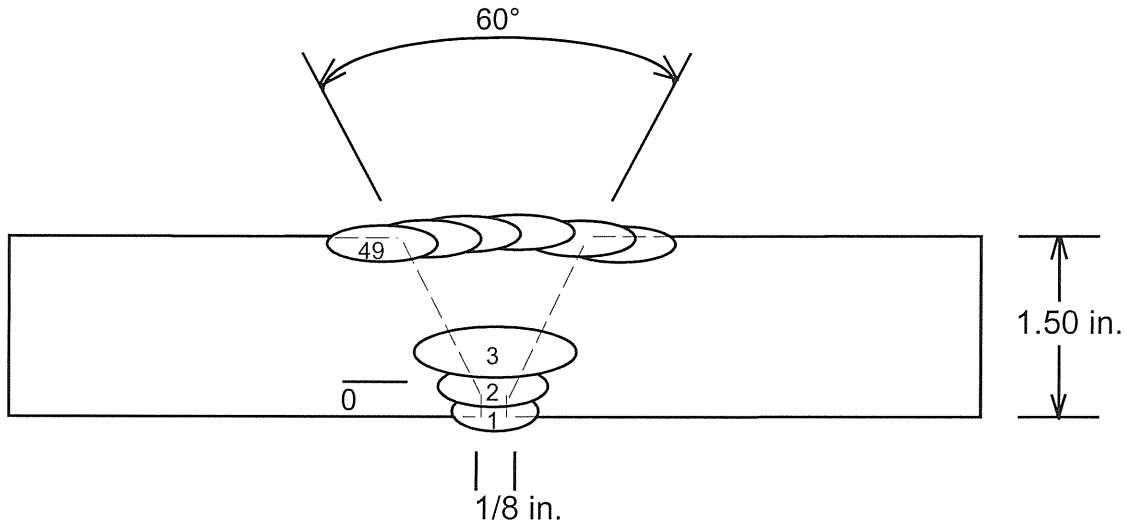
Temperature None Time N/A

ELECTRICAL CHARACTERISTICS (QW-409)

Current Direct Polarity Reverse, electrode positive
Amps See next page Volts See next page
Heat Input N/A

TECHNIQUE (QW-410)

String or Weave Both Travel Speed See next page
Multiple or Single Pass Per Side Multipass from groove side
Multiple or Single Electrodes Single



| Pass | Process | Filler Metal | Diameter mm (in.) | Current & Polarity | Amperage Range | Voltage Range | Travel Speed mm/min (ipm.) |
|---------|---------|--------------|-------------------|--------------------|----------------|---------------|----------------------------|
| 1 | SMAW | E6010 | 3.2 (1/8) | DCRP | 56 - 62 | 20 - 28 | 86.4 (3.4) |
| 2 - 3 | SMAW | E7018-1 | 2.4 (3/32) | DCRP | 79 - 98 | 20 - 28 | 72 - 84 (2.8 - 3.3) |
| 4 - 24 | SMAW | E7018-1 | 3.2 (1/8) | DCRP | 108 - 141 | 18 - 29 | 92 - 209 (3.6 - 8.2) |
| 25 - 49 | SMAW | E7018-1 | 4.0 (5/32) | DCRP | 169 - 215 | 20 - 28 | 143 - 300 (5.6 - 11.8) |

PQR NO. IPS-4-1**TENSILE TEST (QW-150)**

| Specimen No. | Width mm (in.) | Thickness mm (in.) | Area Sq. mm (Sq. in.) | Ultimate Load N (lbs.) | Ultimate Stress MPa (Psi) | Character & Fracture Location |
|--------------|----------------|--------------------|-----------------------|------------------------|---------------------------|-------------------------------|
| T1 | 19.1 | 37.1 | 709 | 383 900 | 542 | Partial cup & cone |
| | (0.752) | (1.46) | (1.10) | (86,300) | (78,600) | Parent metal |
| T2 | 18.9 | 37.0 | 699 | 383 200 | 548 | Partial cup & cone |
| | (0.744) | (1.46) | (1.08) | (86,100) | (79,500) | Parent metal |

GUIDED BEND TEST (QW-160)

| Type & Figure No. | Result | Type & Figure No. | Result |
|--------------------|--------|--------------------|--------|
| QW-462.2, TSB - S1 | Pass | QW-462.2, TSB - S3 | Pass |
| QW-462.2, TSB - S2 | Pass | QW-462.2, TSB - S4 | Pass |

OTHER TESTS

See attached Rockwell hardness test report C03-1036.1

Welders Name James Hildreth Stamp No. A
 Tests Conducted By Ludwig & Associates Ltd.
 Laboratory Test No. C03-1036.1

We hereby recertify that the statements in this record have been revised in accordance with paragraph QW-200.2 and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer PAINTEARTH ENERGY SERVICES INC., formerly
IPS Manufacturing Limited

Date DEC 1 / 06. Signed 

HARDNESS TEST REPORT
for Procedure Qualification Record #COS-1-1

Date:

May 31, 1994

Client:

Job No.: 83-4001(FK)

Address:

Chadco Oilfield Services Ltd.

Material:

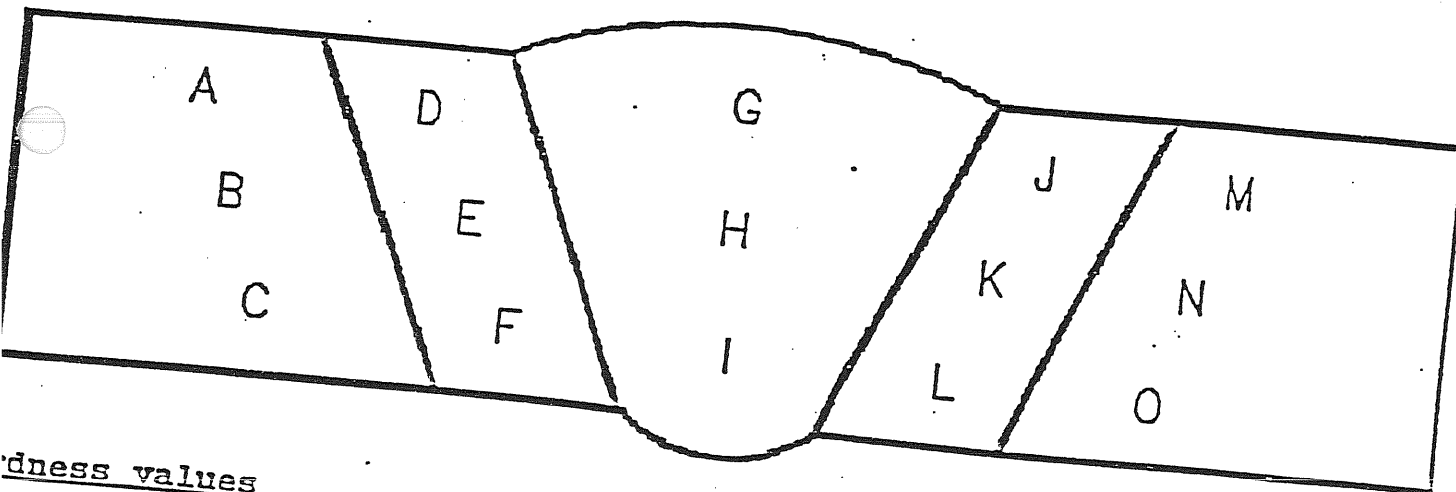
Box 24, Hackirk, AB

Size:

ASME SA-516-70
Plate, 0.750" thick

Test Method:

Hardness testing performed using the Rockwell "B" scale
(HRB)



Hardness values

95.0

94.5

94.5

D= 92.5

E= 92.0

F= 93.0

G= 88.0

H= 86.0

I= 87.5

J= 95.0

K= 92.5

L= 93.0

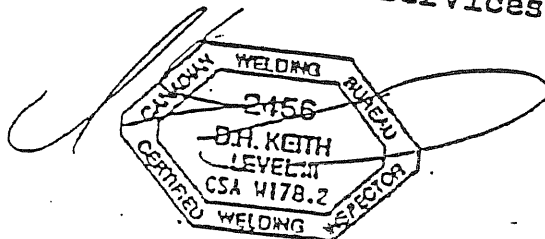
M= 92.5

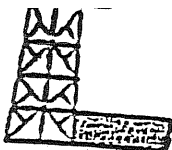
N= 89.0

O= 89.0

Hardness values do not exceed 22 HRC (22 HRC = 99.5 HRB)

Results Certified by: QC Inspection Services Ltd.





ALFOR METALLURGICAL COMPANY LTD.
CONSULTING ENGINEERS

FILE #93-399

Chedco Oilfield Services Ltd.
P.O. Box 24
Halkirk, Alberta T0C 1M0

POR #CDS-PI-A

July 6, 1993

METAL TEST REPORT

Material Description: ASME SA-106, Grade B; NPS4 X 0.337" W.T. pipe; SMAW welded.

Specimen Type: Reduced-section tensile, as per Figure QW-462.1(b) of the ASME Code; guided face and root bend, as per Figure QW-462.3(a) of the ASME Code.

Results:

Width:

Thickness:

Area:

Ultimate Load:

Ultimate Tensile Strength:

Fracture Character:

Fracture Location:

Sample 5

0.741 in.

0.223 in.

0.165 sq. in.

12 390 lb

75 000 psi

Ductile

Parent

Sample 6

0.741 in.

0.224 in.

0.166 sq. in.

12 330 lb

74 300 psi

Ductile

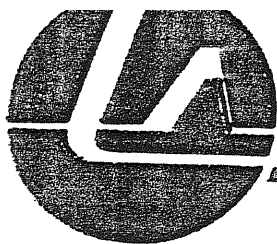
Parent

Guided face bend samples 2 and 4: Pass Tests;
Guided root bend samples 1 and 3: Pass Tests.

Yours very truly,

ALFOR METALLURGICAL COMPANY

7/6/93
CHARLES E. MOZESON, P. Eng.



LUDWIG & ASSOCIATES LTD.

Materials and Welding Engineering

LABORATORY TEST REPORT

CUSTOMER: Delaney Energy Manufacturing
Box 24, Highway 855 North
Halkirk, Alberta
T0C 1M0

Laboratory Test No.: C00-856.1
Date: October 4, 2000

Attention: Christine Kelly

PQR Number: DEML-4-1
Material: SA 36
Thickness: 12.7 mm (0.500 in.)
Thermal Condition: As Welded

TENSILE TEST QW-150

| SAMPLE NUMBER | T1 QW-462.1(a) | T2 QW-462.1(a) |
|--------------------|--------------------|--------------------|
| WIDTH mm (in) | 18.9 (0.744) | 19.1 (0.752) |
| THICKNESS mm (in) | 10.7 (0.423) | 11.0 (0.433) |
| AREA sq mm (sq in) | 202 (0.315) | 210 (0.326) |
| ULT. LOAD N (lbs) | 102 700 (23,100) | 105 700 (23,800) |
| UTS MPa (psi) | 508 (73,600) | 503 (73,000) |
| FRACTURE TYPE | Partial Cup & Cone | Partial Cup & Cone |
| FRACTURE LOCATION | Parent Metal | Parent Metal |

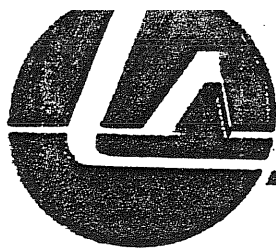
GUIDED-BEND TEST QW-160

| | | | |
|------------------|---------------------|-------------------|---------------------|
| SAMPLE WIDTH: | 9.52 mm (0.375 in.) | SAMPLE THICKNESS: | 12.7 mm (0.500 in.) |
| PLUNGER SIZE: | 38.1 mm (1.50 in.) | YOKE SIZE: | 60.3 mm (2.375 in.) |
| QW-462.2 | Side Bend | | Side Bend |
| SAMPLE NUMBER(S) | S1 | | S4 |
| RESULTS | Pass | | Pass |

We certify the test results in this report and that the specimen(s) were prepared and tested in accordance with the requirements of ASME Section IX, 1998 edition and latest addenda. The information regarding material identification (i.e. size, thickness, heat number, etc.) has been provided by the customer whose name appears on this report.

Laboratory Test Conducted By:

Andrew Elash, T.T. / Troy Drummond, C.E.T.



LUDWIG & ASSOCIATES LTD.

Materials and Welding Engineering

LABORATORY TEST REPORT

CUSTOMER: Delaney Energy Manufacturing
Box 24, Highway 855 North
Halkirk, Alberta
T0C 1M0

Laboratory Test No.: C00-856.1
Date: October 4, 2000

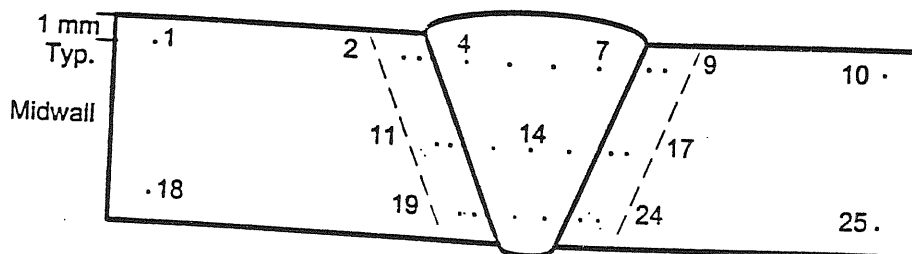
Attention: Christine Kelly

PQR Number: DEML-4-1
Material: SA 36
Thickness: 12.7 mm (0.500 in.)
Thermal Condition: As Welded

HARDNESS TEST

TYPE OF TEST: Vickers
INSTRUMENT TYPE: Mitutoyo AVK-C1

LOAD: 500 g



| | | | |
|-----------|------------|------------|------------|
| 1) 181 HV | 8) 196 HV | 15) 178 HV | 22) 175 HV |
| 2) 191 HV | 9) 185 HV | 16) 181 HV | 23) 171 HV |
| 3) 189 HV | 10) 188 HV | 17) 190 HV | 24) 165 HV |
| 4) 196 HV | 11) 167 HV | 18) 173 HV | 25) 169 HV |
| 5) 212 HV | 12) 169 HV | 19) 160 HV | |
| 6) 181 HV | 13) 163 HV | 20) 164 HV | |
| 7) 207 HV | 14) 173 HV | 21) 171 HV | |

We certify the test results in this report and that the specimen(s) were prepared and tested in accordance with the requirements of ASTM E384 - 99. The information regarding material identification (i.e. size, thickness, heat number, etc.) has been provided by the customer whose name appears on this report.

Laboratory Test Conducted By:

Andrew Elash, T.T. / Troy Drummond, C.E.T.



LUDWIG & ASSOCIATES LTD.

Materials and Welding Engineering

LABORATORY TEST REPORT

LABORATORY
ACCREDITATION
BUREAU
ISO/IEC 17025 ACCREDITED
Certificate Number L2057

CUSTOMER: IPS Manufacturing Limited
Box 24, Hwy. 855 North
Halkirk, Alberta
T0C 1M0

Laboratory Test No.: C03-1036.1
Date: October 10, 2003

Attention: Christine Kelly

PQR Number: IPS-4-1
Material: SA 516 Gr. 70N (Ht. No.: 9490A-65638)
Thickness: 38.1 mm (1.50 in.)
Thermal Condition: As Welded

TENSILE TEST QW-150

| SAMPLE NUMBER | T1 QW-462.1(a) | T2 QW-462.1(a) |
|--------------------|--------------------|--------------------|
| WIDTH mm (in) | 19.1 (0.752) | 18.9 (0.744) |
| THICKNESS mm (in) | 37.1 (1.46) | 37.0 (1.46) |
| AREA sq mm (sq in) | 709 (1.10) | 699 (1.08) |
| ULT. LOAD N (lbs) | 383 900 (86,300) | 383 200 (86,100) |
| UTS MPa (psi) | 542 (78,600) | 548 (79,500) |
| FRACTURE TYPE | Partial Cup & Cone | Partial Cup & Cone |
| FRACTURE LOCATION | Parent Metal | Parent Metal |

GUIDED-BEND TEST QW-160

| | | | |
|------------------|---------------------|-------------------|---------------------|
| SAMPLE WIDTH: | 9.52 mm (0.375 in.) | SAMPLE THICKNESS: | 38.1 mm (1.50 in.) |
| PLUNGER SIZE: | 38.1 mm (1.50 in.) | YOKE SIZE: | 60.3 mm (2.375 in.) |
| QW-462.2 | Side Bend | Side Bend | Side Bend |
| SAMPLE NUMBER(S) | S1 | S2 | S3 |
| RESULTS | Pass | Pass | Pass |

We certify the test results in this report and that the specimen(s) were prepared and tested in accordance with the requirements of ASME Section IX, 2001 edition and latest addenda. The information regarding material identification (i.e. size, thickness, heat number, etc.) has been provided by the customer whose name appears on this report.

Laboratory Test Conducted By:

Troy Drummond, C.E.T. / Troy Lanz, C.E.T.



LUDWIG & ASSOCIATES LTD.

Materials and Welding Engineering

LABORATORY TEST REPORT

LABORATORY
ACCREDITATION
BUREAU
ISO/IEC 17025 ACCREDITED
Certificate Number L2057

CUSTOMER: IPS Manufacturing Limited
Box 24, Hwy. 855 North
Halkirk, Alberta
T0C 1M0

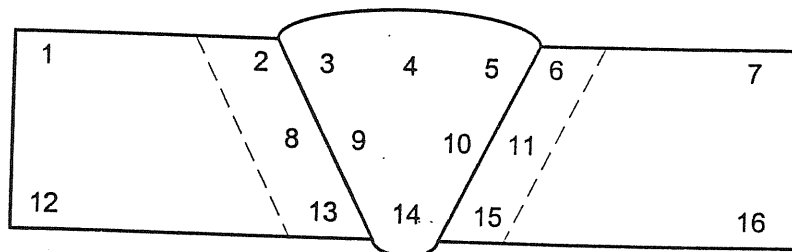
Laboratory Test No.: C03-1036.1
Date: October 14, 2003

Attention: Christine Kelly

PQR Number: IPS-4-1
Material: SA 516 Gr. 70N (Ht. No.: 9490A-65638)
Thickness: 38.1 mm (1.50 in.)
Thermal Condition: As Welded

HARDNESS TEST

TYPE OF TEST: Rockwell
INSTRUMENT TYPE: NewAge Digital Versitron
SCALE: B

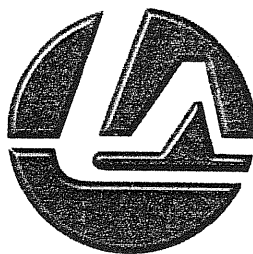


| | | | |
|-----------|-----------|------------|------------|
| 1) 80 HRB | 5) 82 HRB | 9) 86 HRB | 13) 91 HRB |
| 2) 93 HRB | 6) 93 HRB | 10) 86 HRB | 14) 88 HRB |
| 3) 84 HRB | 7) 80 HRB | 11) 89 HRB | 15) 89 HRB |
| 4) 83 HRB | 8) 90 HRB | 12) 89 HRB | 16) 80 HRB |

We certify the test results in this report and that the specimen(s) were prepared and tested in accordance with the requirements of ASTM E18 - 02. The information regarding material identification (i.e. size, thickness, heat number, etc.) has been provided by the customer whose name appears on this report.

Laboratory Test Conducted By:

Troy Drummond, C.E.T. / Troy Lanz, C.E.T.



LUDWIG & ASSOCIATES LTD.

Materials and Welding Engineering

LABORATORY TEST REPORT



LABORATORY
ACCREDITATION
BUREAU
ISO/IEC 17025 ACCREDITED
Certificate Number L2057

CUSTOMER: IPS Manufacturing Limited
Box 24, Hwy. 855 North
Halkirk, Alberta
T0C 1M0

Laboratory Test No.: C03-1036.1

Date: October 10, 2003

Attention: Christine Kelly

PQR Number: IPS-4-1
Material: SA 516 Gr. 70N (Ht. No.: 9490A-65638)
Thickness: 38.1 mm (1.50 in.)
Thermal Condition: As Welded

TENSILE TEST QW-150

| SAMPLE NUMBER | T1 QW-462.1(a) | T2 QW-462.1(a) |
|--------------------|--------------------|--------------------|
| WIDTH mm (in) | 19.1 (0.752) | 18.9 (0.744) |
| THICKNESS mm (in) | 37.1 (1.46) | 37.0 (1.46) |
| AREA sq mm (sq in) | 709 (1.10) | 699 (1.08) |
| ULT. LOAD N (lbs) | 383 900 (86,300) | 383 200 (86,100) |
| UTS MPa (psi) | 542 (78,600) | 548 (79,500) |
| FRACTURE TYPE | Partial Cup & Cone | Partial Cup & Cone |
| FRACTURE LOCATION | Parent Metal | Parent Metal |

GUIDED-BEND TEST QW-160

| | | | |
|------------------|---------------------|-------------------|---------------------|
| SAMPLE WIDTH: | 9.52 mm (0.375 in.) | SAMPLE THICKNESS: | 38.1 mm (1.50 in.) |
| PLUNGER SIZE: | 38.1 mm (1.50 in.) | YOKE SIZE: | 60.3 mm (2.375 in.) |
| QW-462.2 | Side Bend | Side Bend | Side Bend |
| SAMPLE NUMBER(S) | S1 | S2 | S3 |
| RESULTS | Pass | Pass | Pass |

We certify the test results in this report and that the specimen(s) were prepared and tested in accordance with the requirements of ASME Section IX, 2001 edition and latest addenda. The information regarding material identification (i.e. size, thickness, heat number, etc.) has been provided by the customer whose name appears on this report.

Laboratory Test Conducted By:

Troy Drummond, C.E.T. / Troy Lanz, C.E.T.



LUDWIG & ASSOCIATES LTD.

Materials and Welding Engineering

LABORATORY TEST REPORT



LABORATORY
ACCREDITATION
BUREAU
ISO/IEC 17025 ACCREDITED
Certificate Number L2057

CUSTOMER: IPS Manufacturing Limited
Box 24, Hwy. 855 North
Halkirk, Alberta
T0C 1M0

Laboratory Test No.: C03-1036.1

Date: October 14, 2003

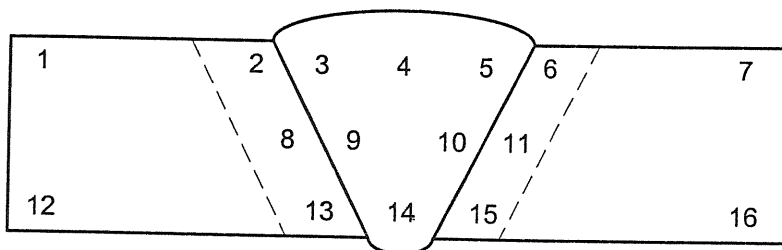
Attention: Christine Kelly

PQR Number: IPS-4-1
Material: SA 516 Gr. 70N (Ht. No.: 9490A-65638)
Thickness: 38.1 mm (1.50 in.)
Thermal Condition: As Welded

HARDNESS TEST

TYPE OF TEST: Rockwell
INSTRUMENT TYPE: NewAge Digital Versitron

SCALE: B



| | | | |
|-----------|-----------|------------|------------|
| 1) 80 HRB | 5) 82 HRB | 9) 86 HRB | 13) 91 HRB |
| 2) 93 HRB | 6) 93 HRB | 10) 86 HRB | 14) 88 HRB |
| 3) 84 HRB | 7) 80 HRB | 11) 89 HRB | 15) 89 HRB |
| 4) 83 HRB | 8) 90 HRB | 12) 89 HRB | 16) 80 HRB |

We certify the test results in this report and that the specimen(s) were prepared and tested in accordance with the requirements of ASTM E18 – 02. The information regarding material identification (i.e. size, thickness, heat number, etc.) has been provided by the customer whose name appears on this report.

Laboratory Test Conducted By:

Troy Drummond, C.E.T. / Troy Lanz, C.E.T.