

INSPECTION REPORT

Pressure Vessel Survey			
Location:	Point Tupper	EM&I Report No.:	PT-D2105C-090707-CR-R0
Client Name:		Client Ref No.:	PT-11564912-002-D2105C
Client Rep.:		Inspector Name:	Colin Robinson
WO No.:		Inspection Date:	July 07, 2009
SPO No.:		System:	Butane
Workscope No.:	PT-2009-D2105C-INT-01	EM&I Job No:	EMJ0132.43
Tag No.:	D2105C	Equipment Description:	Butane Storage Vessel D-2105C
Date of Last Inspection:	N/A	Previous Records Seen:	N/A
Drawing No.:	LA-B23-F-22-8062-01-Z4, 98-CA-399735E-4		

Inspection Summary					
Item	Condition				Comments
External Ladders, Access and Support Structure	Good	Fair	Poor	NA	Internal inspection only
1. If applicable, check ladders, stairways, platforms and walkways that are connected to, or bearing on the vessel for signs of corrosion, missing components, or deterioration.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. If applicable, check vessel supports for signs of deterioration, settlement, deflection, and/or corrosion.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. If applicable, check coatings for signs of deterioration, rusts spots, cracks, blistering, and/or coating disbondment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. a) For horizontally mounted vessels, check for signs of trapped moisture, resulting in corrosion between cradle support and vessel shell.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) For vertically mounted vessels on skirt support or support legs, check for condensation, resulting in corrosion on the bottom cap/ inside skirt support surface or area of attachment of the support legs to the bottom cap.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Check the grounding connection is correctly installed, with cable connections tight and ground wires in good condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6. Check all bolted connections for any signs of corrosion or mechanical damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7. If applicable, check the vessel sliding foot free to move and hold-down bolts are free.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Vessel External Surfaces	Good	Fair	Poor	NA	Internal inspection only
1. Check permanent identifying tags on vessel are legible and present the required information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. If applicable, check that all bolts/studs extend fully through their nuts, having a protrusion beyond the nut of not less than one thread; flange bolts have bolt heads all on the side of the joint.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. If applicable, check bolted connections are in full contact with connected elements and connections for any signs of rust, corrosion or mechanical damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. If applicable, check insulation support bands and clips for signs of corrosion or breakage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Check all welded seams and connections for any signs of deterioration, corrosion, cracking, pitting or other sign of failure. Specify.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6) If applicable, check insulation type, condition for any insulation damage and ingress of water. Record insulation type.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7. Carry out visual inspection of the exterior surface of the vessel, including coatings for any signs of leaks, cracks, deformation, distortion, pitting, corrosion or other forms of deterioration. If so, specify type, location and extent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8. If applicable, check weep holes in reinforcement plates are not plugged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
External Piping / Instrument Attachments	Good	Fair	Poor	NA	Internal inspection only
1. If applicable, check vessel trim, such as gauges, sight glasses, valves and other appurtenances, show signs of deterioration, or missing components, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. If applicable, check if the PSV on the vessel is in calibration. Record tag number of PSV and calibration date.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Inspect fittings, nozzles and other connections, including the surrounding vessel shell / head for any signs of distortion or cracks, wall loss, leakage, deterioration of coatings, etc. Specify extent and location.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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Inspection Summary					
Item	Condition				Comments
Vessel Internal Surfaces	Good	Fair	Poor	NA	
1. Check for signs of corrosion, erosion, cracks, blisters, pitting, distortion, or other forms of deterioration on the internal vessel surfaces. If any, specify type, location and extent.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2 areas of grinding marks were located between circ weld 6 and 7 from south end
2. Check all welded joints for any signs of deterioration, corrosion, cracking, pitting or other sign of failure. Specify.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All welded seams in good condition
3. Check all man-ways, nozzles and connections for distortion, cracks, corrosion, wall loss and other type of defects or failures. If any defects are noted, specify type, extent and location.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. If applicable, compare the results of performed wall thickness survey with previous reports for areas of wall thickness loss. Identify areas on inspection report.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UT measurements carried out as part of the external inspection completed prior to the internal inspection
5. Where applicable, check vessel internal cladding for signs of bulging, buckling, cracks, holes, etc. If any, specify type, location and extent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Vessel had no cladding
6. Where applicable, check the vessel internal coating for signs of deterioration, such as: rust spots, blisters, coating disbandment, etc. If any, specify type, location and extent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Vessel not coated
7. If possible, check gasket seals on all flanges for signs of corrosion and/or mechanical damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Vessel fully isolated with spades fitted during inspection
Internal Equipment/Piping /Supports	Good	Fair	Poor	NA	
1. Where applicable, check supports for vessel's internal equipment and components for signs of corrosion, distortion and deterioration.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2. If applicable, check vessel's internals for signs of corrosion, distortion and deterioration, missing components etc.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Vortex breaker in good condition
3. If applicable, check if bolted connections are in full contact with connected elements and connections are free from rust or other deleterious material that may prohibit full contact.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Detail of Findings
<p>Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings</p> <p>A thorough inspection was carried out in accordance with API 510 and 572.</p> <p>The vessel was in good condition with no evidence of any distortion or cracking on the shell, dome ends or welded seams.</p> <p>Two areas of grinding marks, presumably from the original construction stage were located on the shell between the 6th and 7th circumferential weld seams from the south end of the vessel. Facing north, the areas were located just before the 6 O'clock position and were approximately 260mm x 80mm and 250mm respectively, both less than 1mm deep.</p> <p>A Magnetic Particle Inspection was carried out on sample areas of circumferential and longitudinal welds. Where accessible, the intersection of the welds were tested. In addition, a Magnetic Particle Inspection was carried out on all accessible nozzles to shell welds. No defect indications noted.</p>

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Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings



Photo 1 – View looking south on side shell 3 o'clock



Photo 2 – View looking at south dome to shell weld

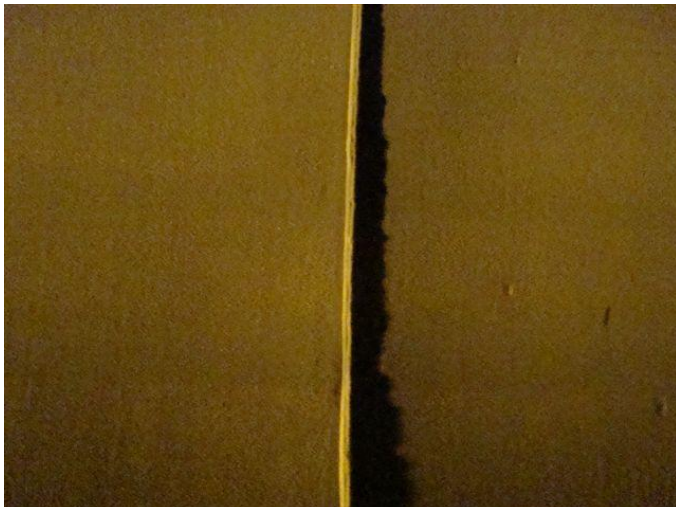


Photo 3 – Typical circ weld

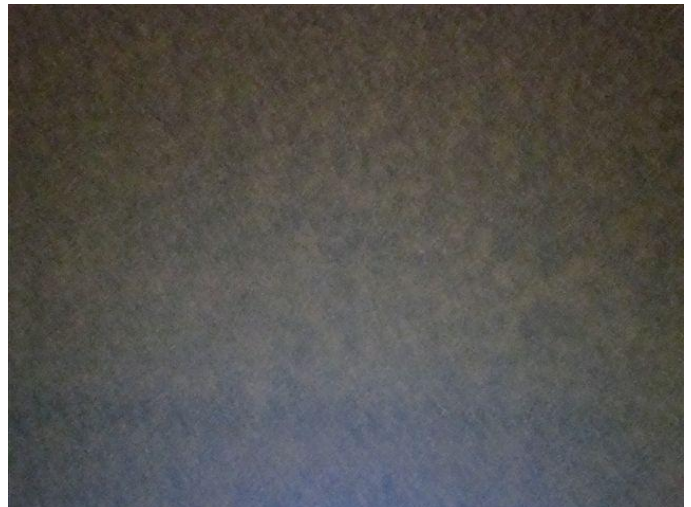


Photo 4 – Typical shell plating

INSPECTION REPORT

Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings



Photo 5 – View looking at top nozzles, south end



Photo 6 – View of south bottom nozzle N6



Photo 7 – View of south bottom nozzles N4B & N3B



Photo 8 – Vortex breaker above nozzle N2

Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings



Photo 9 – Grind marks between 6 and 7 circ welds

INSPECTION REPORT



List of Attachments

Attachment 1: PT-D2105C-090706-NE-MPI (hinges)

Attachment 2: PT-D2105C-090707-NE-MPI

Attachment 3: 98-CA-399735-1E-4

End of Report.

INSPECTION REPORT



Magnetic Particle Inspection

Location:	Point Tupper	EM&I J Report No.:	PT-D2105C-090706-NE-MPI
Client Name:	Exxon Mobil Sable	Client Ref No.:	PT-11564912-001-D2105C
Client Rep.:	Dale Groves	Inspector Name:	Neil English
WO No.:	11564912	Inspection Date:	July 6, 2009
SPO No.:	4501905471	Inspection Time:	Various
Workscope No.:	PT-2009-D2105C-INT-01	System:	Butane Storage Vessel D-2105C
Previous Report No.	NA	EM&I J Job No:	EMJ0132.43
Ref. Drawing No.:	DS-D2105C-01	Item Inspected:	D-2105C
Technician Certifications:	CGSB MPI LVL 2	Certification Expiry Date:	December 31, 2011
Inspection Code:	ASME VIII	Inspection Procedure:	MT401ASME
Acceptance Criteria:	ASTM Section III		
Material:	C/S	Surface Condition:	Wire Brush Cleaned
Temp.:	Ambient	Field Indicator:	
Lighting Type:	Natural	Black Light S/N:	NA
Light Level:	1000 LUX		
Contrast:	White	Manufacturer:	Ardrox
Type:	8901W		Batch: 65082407
Ink:	8031, Black Ink		Batch: 32111507
Equipment:	Type: Electro Spec ES-X	S/N: 12768	Calibration Due: 10 Lb Cal Lift
			Current Type: AC

Inspection Summary

Restriction?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	Comments:
<p>Comments:</p> <p>Black on white Magnetic Particle Inspection was conducted on Butane Storage Vessel D-2105C on the 24" manway hinges.</p> <p>At time of inspection, no relevant indicators were observed.</p> <p>Foil Strip Type 1 Indicator (brass finish) was used to test sensitivity.</p>			

End of Report

Inspector Name:	Neil English	Signature:	See Field Copy	Date:	
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INSPECTION REPORT



MPI Survey

Location:	Point Tupper	EM&IJ Report No.:	PT-D2105C-090707-NE-MPI
Client Name:	Exxon Mobil Sable	Client Ref No.:	PT-11564912-002-D2105C
Client Rep.:	Dale Groves	Inspector Name:	Neil English
WO No.:	11564912	Inspection Date:	July 07, 09
SPO No.:	4501905471	Inspection Time:	Various
Workscope No.:	PT-2009-D2105C-INT-01	System:	Butane
Previous Report No.	N/A	EM&IJ Job No:	EMJ0132.43
Ref. Drawing No.:	98-CA-399735-1E-4		
Technician Certifications:	CGSB MPI LVL 2	Certification Expiry Date:	December 31, 2011
Inspection Code:	ASME VIII	Inspection Procedure:	MT401ASME
Material:	C/S	Surface Condition:	Wire brush cleaned
Consumables:	Contrast: White	Type: 8901W	Manufacturer: Ardrex
	Type: Electro Spec ES-X	S/N: 12764	Batch: 65082407
Equipment:		Calibration Due: 10 Lb Cal lift	Current Type: AC

Inspection Summary

Comments:

Black on white Magnetic Particle Inspection was conducted on the butane storage vessel D 2105C. Nozzles N6, N5B, N4B, N5, N10 and M were inspected. Also, two foot spot checks on every second circular seam were inspected in the 3, 6, and 9 O'clock positions, as well as any accessible Tee joint.

At time of Inspection no relevant Indications were observed.

Foil strip Type 1 indicator (Brass finish) used to test sensitivity.

Neil English
CGSB: #11752

Ink

Manufacturer: Ardrex
Type: 8031 Black Ink
Solution: Prepared bath, Aerosol
Batch: 32111507

End of Report

Inspector Name:	Neil English	Signature:	See field report	Date:	July-7-09
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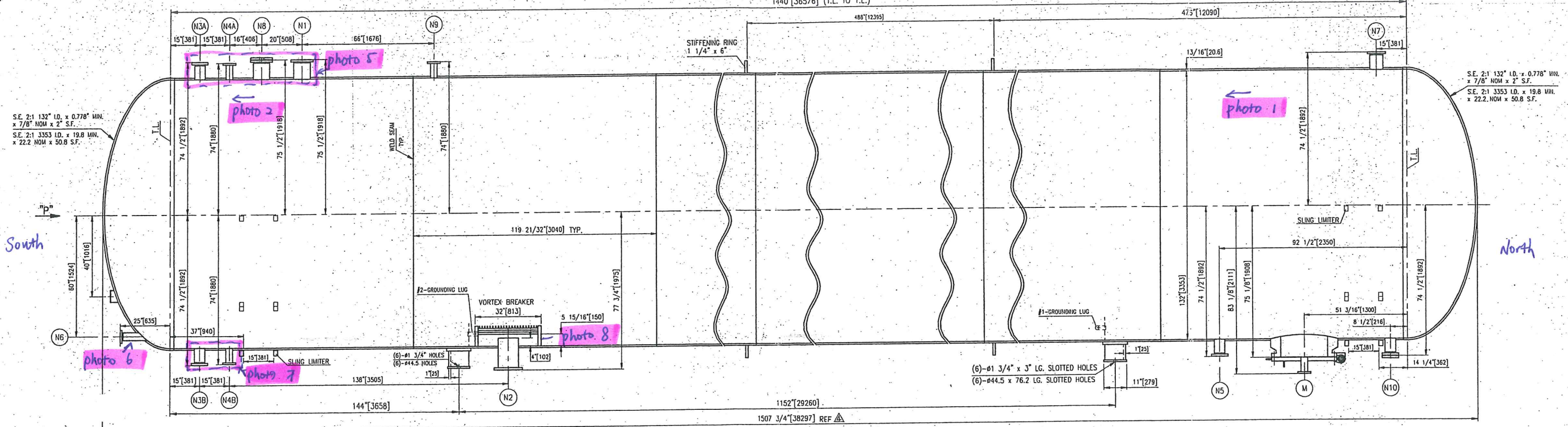
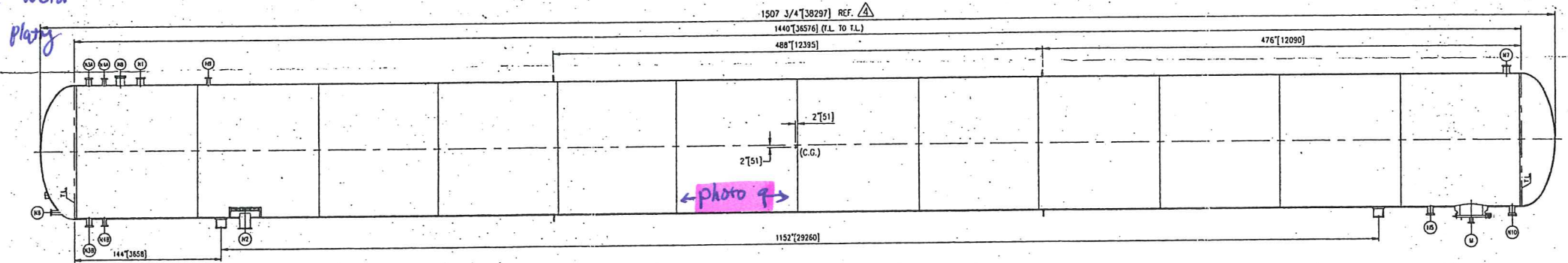
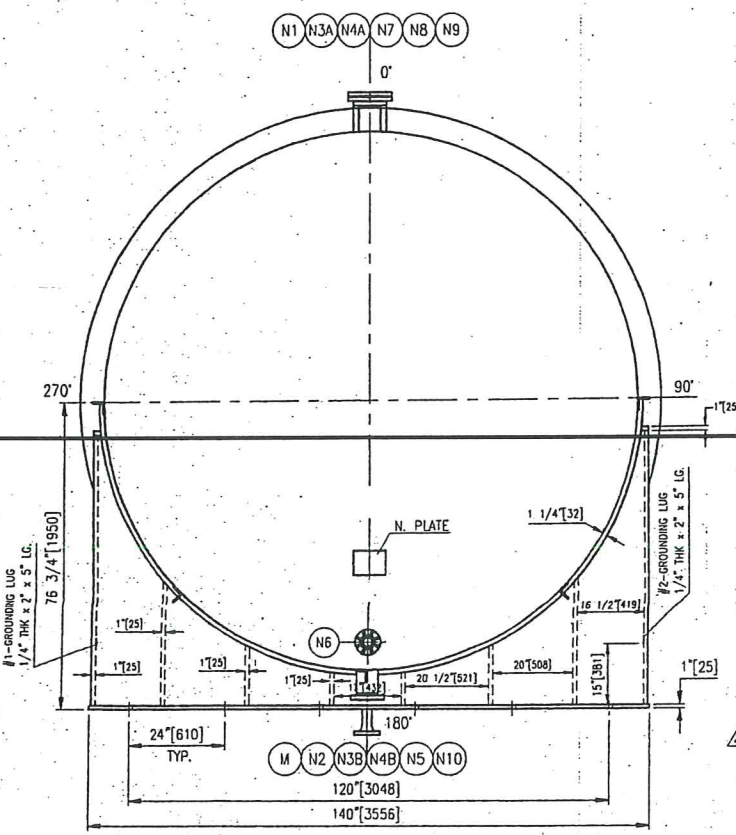


photo 3: Typical Circ Weld
photo 4: Typical shell plating



SCALE : 1"=72"

NOZZLE SCHEDULE									
MARK	QUAN	SIZE	RATING	TYPE	ID	SCV/THK	STRENGTH WALL THICKNESS	REMARKS	
N1	1	8"	150	INTEGRAL	3.828	1.2445	7.195	1.057	INLET
N2	1	8"	150	RFLWIF	8"	0.875	9.812	0.875	LIQUID OUTLET
N3A, N3B	2	3"	300	INTEGRAL	2.90	1.2375	6.07	1.05	LEVEL CONTROL
N4A, N4B	2	2"	300	RFLWIF	2"	0.6563	6.312	0.6563	LEVEL INDICATION/TRIP
N5	1	3"	300	INTEGRAL	2.90	1.2375	6.07	1.05	TRANSFER
N6	1	2"	300	INTEGRAL	1.938	1.00	5.977	0.812	THEMOWELL
N7	1	4"	150	INTEGRAL	3.828	1.305	6.258	1.117	RELIEF
N8	1	6"	150	INTEGRAL	5.761	1.2445	7.195	1.057	VENT C/W BLIND WITH 2" NPT
N9	1	2"	300	RFLWIF	2"	0.6563	6.312	0.6563	PRESSURE VENT TO FLARE
N10	1	3"	300	INTEGRAL	2.90	1.2375	6.07	1.05	PURGE C/W BLIND & HINGE
M	1	24"	150	INTEGRAL	24"	3.35	1.937	1.937	WAYWAY C/W BLIND & HINGE & 2-3000 RFLWIF

CODE: ASME SECT VIII DIV I 1995 & A96
PARA: UW12(a)

DESIGN PRESSURE: 185 & -9 PSIG/1275 & -62 kPag
DESIGN TEMPERATURE: 149° F/65° C
MIN DESIGN METAL TEMP: -16.6° F/-27° C
AT PRESSURE: 185 & -9 PSIG/1275 & -62 kPag
HYDRO TEST PRESSURE: 278 PSIG/1913 kPag
CORROSION ALLOWANCE: 0.063"/1.6 mm
RADIOGRAPHY: FULL

MATERIAL:
SHELL : SA516-70N
HEADS : SA516-70N
FLANGES : SA105N, SA350-LF2, SA516-70N
NOZZLES : SA105N, SA350-LF2
SADDLE : SA516-70
GASKET : 316 S.S. SPIRAL WOUND GRAFOIL FILLED
STUDS & NUTS : SA193-B7 TEFLON COATED, SA194-2H TEFLON COATED

WEIGHT EMPTY: 160000 LB WEIGHT FULL OF WATER: 892000 LB
SERIAL NO.: 98CA9735E OPERATING WEIGHT: 650000 LB
REGISTRATION BY: PROVINCE OF NOVA SCOTIA
INSPECTION BY: TSSA ONTARIO, PATTERSON INDUSTRIES

FINISH:
INTERNAL---PLATES WITH MILL FINISH,
WELDS WITH FLUX AND SPATTER REMOVED.
EXTERNAL---PLATES WITH MILL FINISH,
WELDS WITH FLUX AND SPATTER REMOVED.

SURF. PREP. & PAINTING:
PER SPEC. XA-400-Y-15-0005 TABLE 1.

NOTE : 1) HYDROSTATIC TEST PRESSURE TO BE HELD FOR ONE HOUR.
2) ALL WELDS TO BE FULL PENETRATION

D2105C BUTANE STORAGE VESSEL

CERTIFIED BY PATTERSON INDUSTRIES (CANADA) LIMITED

MAX ALLOWABLE W.P. **185 & -9 PSIG**

AT TEMP. **149° F**

MIN DESIGN METAL TEMP **-16.6° F**

AT PRESSURE **185 & -9 PSIG**

SERIAL NO. **98CA9735E** YEAR BUILT **1998**

C.R.N. **9097.8** O.I.N. **-**

PATTERSON INDUSTRIES (CANADA) LIMITED
SCARBOROUGH (TORONTO) ONTARIO, CANADA
MADE IN CANADA

D2105C BUTANE STORAGE VESSEL

CERTIFIED BY PATTERSON INDUSTRIES (CANADA) LIMITED

MAX ALLOWABLE W.P. **1275 & -62 kPa**

AT TEMP. **65° C**

MIN DESIGN METAL TEMP **-27° C**

AT PRESSURE **1275 & -62 kPa**

SERIAL NO. **98CA9735E** YEAR BUILT **1998**

C.R.N. **9097.8** O.I.N. **-**

PATTERSON INDUSTRIES (CANADA) LIMITED
SCARBOROUGH (TORONTO) ONTARIO, CANADA
MADE IN CANADA

REV. 1. CUSTOMER'S CHANGES M.L. MAY 27/98	REV. 2. C.G. ADDED M.L. JUN 12/98	REV. 3. CUSTOMER'S CHANGES M.L. AUG 12/98	REV. 4. AS MARKED M.L. NOV 13/98
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PATTERSON INDUSTRIES (CANADA) LIMITED
SCARBOROUGH (TORONTO), ONTARIO, CANADA

BUTANE STORGE VESSEL

GENERAL ARRANGEMENT

ITEM NO. : **D2105C**

DRAWN M.L. APR 6/98
CHECKED S.L. NOV 17/97
APPROVED S.L. NOV 17/97
SCALE 1"=24"

D 98-CA-399735-1E 4

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