

ENGINEERING SERVICE CENTER

Prepared for

NAVAL FACILITIES ENGINEERING COMMAND **ENGINEERING SERVICE CENTER** Port Hueneme, California

Technical Submittal for Project:

Project Title: CLEAN, INSPECT, AND REPAIR STORAGE TANKS 5 & 17 Location: PEARL NAVAL BASE - REDHILL COMPLEX, Pearl Harbor, HI Task Order No.: N62583-09-D-0132/0003 WGS Project Number: 54118 Date: August 19, 2014

TANK 5 HYDROSTATIC TEST RESULTS FOR 18-INCH AND 32-INCH LINES

Submitted By: Willbros Government Services, LLC 2087 E. 71st Street Tulsa, OK 74136

Rev	Date	Description	Reviewed	Approved
A	8/19/2014	For Approval	TDA	RGG



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1. WILLBROS CONCLUSIONS AND RECOMMENDATIONS

The preliminary report completed by Pipeline Petroleum Services, Inc. and issued to the Navy concluded that the both the 18-inch and 32-inch lines for Tank-5 at Red Hill passed the contract required volume correction calculations as set forth by the California State Fire Marshal's office. Pipeline Petroleum Services stated that the entire test was considered inconclusive in their opinion because each test failed the temperature – pressure evaluation and their thoughts were that there is trapped air into the system and that is why the system failed the temperature – pressure evaluation.

During Willbros review of the report prepared by Pipeline Petroleum Services, it was noted that during testing, the temperature probe in the tunnel recorded a 0.1 °F drop in temperature and the temperature probe in the tank recorded a 2.0 °F rise in temperature.

James Hagen the Project Manager for the Red Hill Tank-5 work informed us that there can easily be a 2.0 °F temperature change in the tank from the tunnel based on air movement from the ventilation system.

Based on the fact that the majority of these pipes are installed where the temperature of the tunnel would have more of an effect on the temperature – pressure evaluation than the area inside the tank, Willbros asked Pipeline Petroleum Services to re-run their calculations and re-evaluate their inconclusive opinion on the 18-inch and 32-inch lines for Tank-5 by removing the temperature recorded from the tank, in their temperature – pressure evaluation. Petroleum Pipeline Services did that and stated that their conclusions are the same as before. The 18-inch and 32-inch lines passed the volume correction calculations as set forth by the California State Fire Marshal's office but were inconclusive based on the temperature – pressure evaluation.

Willbros spoke to the management of Pipeline Petroleum Services about their conclusions and Pipeline Petroleum Services told Willbros that because of the scrutiny and liability that they would accept with passing these tests, they would not pass if there were any interpretations to be made.

Pipeline Petroleum Services recommendation was to perform a pneumatic test on the lines, to determine if their inconclusive evaluation was correct or not. Willbros was informed by the Navy that a pneumatic test would not be allowed.

Willbros then began analyzing the data supplied by Pipeline Petroleum Services, to determine if the tests were indeed inconclusive or an error was made.



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Willbros performed an analysis of the data and determined the accuracy of the testing equipment to determine if the un-explained $\Delta P/\Delta T$ is within the accuracy of the testing equipment.

Based on the accuracy of the equipment used during the test and applying these accuracies to the test data, we feel that any test should be deemed acceptable if the unexplained pressure loss or gain that falls within ¹/₄ degree.

Test ID Number: 14-332-02 had an unexplained pressure loss of (-3.2 + 1.73) - 1.47 psig and is within ¹/₄ degree Δ T accuracy of 3.57 psig.

Test ID Number 14-332-01A had an unexplained pressure loss of (-3.2 + 1.63) - 1.57 psig and is within ¹/₄ degree Δ T accuracy of 5.104 psig.

Test ID Number 14-332-01B had an unexplained pressure loss of - 0.10 psig and is within $\frac{1}{4}$ degree ΔT accuracy of 5.104 psig.

Based on the fact that Pipeline Petroleum Services found that all tests passed the volume correction calculations established by the California State Fire Marshal's office and Willbros determined that all three test performed by Pipeline Petroleum Services falls within ¼ degree of the accuracy of the equipment, Willbros deems that the three tests passed and no test should be considered inconclusive.

It is Willbros recommendation that no further testing of these lines need to be conducted, until the next API 653 examination of Tank-5 is due.



Redhill Complex TK 5 Project - Pressure Test Log

ompany: NAVFAC	ESC	Redhill Complex - NAVSTA Pearl Harbor	Location:	Location	n: Project I	No.:	54118	3	Date:	2/23/2010	thru	6/4/201	3 r3	
quip, No. / Location	Test No.	Description	Test Media	Test Duration	ANSI Flg Class Rating	Design MAWP PSI	Oper Pressure I PSI	Max Op MAOP PSI	PSV Set Pressure PSI	Req'd Test PSI @ 150% MAOP	Reg'd Test PSI @ 110% PSV	High Test Press PSI Note (5)	Final Test Press PSI Note (1)(2)	Remarks
		Integrity Pressure Test												
K5 - Redhill Complex	1	20" Inlet / 32" Internal Piping	Water	4hr	150#	Atmos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 11/06/10 Pass
K5 - Redhill Complex	2	12" Inlet / 16" Internal Piping	Water	4hr	150#	Almos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 11/02/10 Pass
K5 - Redhill Complex	3	6" Slop Line / Drain	Water	4hr	150#	Almos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 10/11/10 Fail
K5 - Redhill Complex	4	Sample Line 1 - 10'	Water	4hr	150#	Almos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 10/07/10 Fail
K5 - Redhill Complex	5	Sample Line 2 - 75'	Water	4hr	150#	Almos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 10/08/10 Fail
K5 - Redhill Complex	6	Sample Line 3 - 135'	Water	4hr	150#	Almos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 10/08/10 Fail
K5 - Redhill Complex	7	Sample Line 4 - 190'	Water	4hr	150#	Almos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 10/08/10 Fail
		Repair / New Plping - Pressure Test								Da la constante		E 144		
K5 - Redhill Complex	8	4" Slop Line / Drain - Internal	Water	4hr	150#	Atmos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 10/19/12 Pass
K5 - Redhill Complex	9	Sample Line 1 - 20' - Internal	Water	4hr	150#	Atmos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 10/19/12 Pass
K5 - Redhill Complex	10	Sample Line 2 - 60' - Internal	Water	4hr	150#	Atmos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 10/22/12 Pass
K5 - Redhill Complex	11	Sample Line 3 - 120' - Internal	Water	4hr	150#	Atmos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 10/22/12 Pass
K5 - Redhill Complex	12	Sample Line 4 - 180' - Internal	Water	4hr	150#	Atmos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 10/23/12 Pass
K5 - Redhill Complex	13	4" Slop Line / Drain - External	Water	4hr	150#	Atmos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 5/22/13 Pass
K5 - Redhill Complex	14	Sample Lines & Header - External	Water	4hr	150#	Atmos (3)	0-100 (4)	100	N/A	150	N/A	N/A	150	Test 5/22/13 Pass
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- 2 2 1 1 1 1 1 1.						10		0.0		1. T.K. 4		- 1 <u>.</u> 50-		
			- 14 - 24 - 27 - 26 - 27 - 27 - 27 - 27 - 27 - 27	-	-					615 0040			1	
hecked By: Gene Humes				1	Approved		T. Anderso			Date:		10 00 00 00 00 00 00 00 00 00 00 00 00 0		

Note(s) -

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(1) - The final test pressure is the greater of the two (2) test requirements.
(2) - Ensure test gauge(s) are located and the pressure(s) are adjusted to compensate for any elevation static head pressure.
(3) - Atmospheric Design & Static Head Pressure

(4) - Due to Static Head

(5) - High test pressure >2000 PSI or as specified by the Test Engineer, will require special depressuring and reinspection for potential structural changes or damage.



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WILLBROS GOVERNMENT SERVICES (U.S.), LLC

PROJECT N62583-09-D-0132/0003		LOCATION TAN	K 5	JOB NUMBER 54	118	
CONTRACTOR WILLBROS GOVERNMENT S	ERVICES	P&IDNo.		244(i		
SERVICE NORMAL			N	/A		
TEST PACK NUMBER. TANK 5 FINAL HYDRO	4" DRAIN in CASING	DRAWING No.	54118-00	3-07-400s		
SYSTEM NUMBER			1	c	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	
MARK No. N/A		ISO No.				
LINE No.			N	/A		
4" DRAIN LINE					814877	
LINE SPECIFICATION CASING SECTION	1999 - 200 - 200 1999 - 1999 - 1999	TEST MEDIUM	WATER			
DESIGN PRESSURE (MAWP) 100	PSI	TEST PRESSURE	150		PSI	
STRESS RELIEVED YES NO	INTERNAL	LINING	YES NO	2 10 10 100010 10		
ALL PRE- TEST NDE COMPLETE AND ACCEPTED	SIGNATURE	and the second		DATE		
MATERIAL RECORDS COMPLETE	SIGNATURE			DATE	North 21 Ada	
WELDING HISTORY RECORDS COMPLETE	SIGNATURE	1 1	7	DATE		
and the second s	MAN SIGNATURE	Chel SI	1	DATE 10	119/12	
WELDING OF PRESSURE PARTS COMPLETE		SYSTEM FILLED A	ND PURGED OF A	11//	YES	
PROPER GASKETS, BOLTS AND BLINDS	YES	TEMPERATURE W		Ca.	YES	
TEMPORARY VENTS AND DRAINS INSPECTED	YES	HYDRO EQUIPME	NAMES OF AN ADDRESS OF	CARLS .	YES	
TEST PLUGS INSPECTED AND SECURED	YES	OPERATORS PROP			YES	
INSTUMENTATION BLOCKED OR REMOVED	YES	BARRACADES IN PLACE YES				
VALVES IN THE RIGHT POSITION (OPEN/CLOSEI	YES	AREA CLEARED OF PERSONEL YES				
TEST MEDIUM WITHIN SPECIFICATION	YES					
	e				× 0	
QUALITY CONT	ROL SIGNATURE			DATE	W	
PRESSURE TEST	DATE OF TEST		AMBIENT 85 F	START	FINISH	
4 HOUR						
duration 4 HOUR	10/19/2012	2	TEMP.	12:23 PM	4:23 PM	
4 HOUR COMMENTS (TO INCLUDE GAUGE NUMBER A 4" CASING DRAIN LINE PASSED TESTING	10/19/2012	TE)	TEMP.	12:23 PM	4:23 PM	
4 HOUR DURATION 4 HOUR COMMENTS (TO INCLUDE GAUGE NUMBER A 4" CASING DRAIN LINE PASSED TESTING WGS	10/19/2012 IND CALIBRATION DA GAUGE #: 16531 CA	TE)	/2012 / V	2 100 Colora & 2000		
4 HOUR DURATION 4 HOUR COMMENTS (TO INCLUDE GAUGE NUMBER A 4" CASING DRAIN LINE PASSED TESTING COMPANY WGS A.	10/19/2012 IND CALIBRATION DA GAUGE #: 16531 CA	TE)	/2012	Witnessed by		
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4 HOUR DURATION 4 HOUR COMMENTS (TO INCLUDE GAUGE NUMBER A 4" CASING DRAIN LINE PASSED TESTING COMPANY WGS SIGNATURE A HOUR	10/19/2012 IND CALIBRATION DAT GAUGE #: 16531 CA Inspected by JAMES HAGEN	TE) ALIBRATION: 06/07	ТЕМР. /2012 У	Witnessed by VGS-JOHN SEBC	ж K	
4 HOUR DURATION 4 HOUR COMMENTS (TO INCLUDE GAUGE NUMBER A 4" CASING DRAIN LINE PASSED TESTING COMPANY WGS SIGNATI'RE UT PRINT NAME UT DATE OCTO POST HYDRO RESTORATION	10/19/2012 IND CALIBRATION DA GAUGE #: 16531 CA Inspected by JAMES HAGEN	TE) ALIBRATION: 06/07	ТЕМР. /2012 V О	Witnessed by VGS-JOHN SEBO N. S.C. John S.C. CTOBER 19th, 20	ж K	
4 HOUR DURATION COMMENTS (TO INCLUDE GAUGE NUMBER A 4" CASING DRAIN LINE PASSED TESTING COMPANY SIGNATI'RE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY YES YES	10/19/2012 IND CALIBRATION DA GAUGE #: 16531 CA Inspected by JAMES HAGEN	TE) ALIBRATION: 06/07	TEMP. /2012 V J O CK VALVES INST.	Witnessed by VGS-JOHN SEBO CLASSIC John Self CTOBER 19th, 20 ALLED	ок <u>К</u> 112	
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4 HOUR DURATION COMMENTS (TO INCLUDE GAUGE NUMBER A 4" CASING DRAIN LINE PASSED TESTING COMPANY SIGNATI'RE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED YES	10/19/2012 IND CALIBRATION DA GAUGE #: 16531 CA Inspected by JAMES HAGEN	TE) ALIBRATION: 06/07 () () CONTROL & CHE HIGH POINT PLUG NDE ON PLUG SE	ITEMP. 1/2012 V V CK VALVES INST. OS SEAL WELDED AL WELDS COMPI	Witnessed by VGS-JOHN SEBO A Sill Toda Sill CTOBER 19th, 20 ALLED & INSPECTED .ETE PLUGGED	DK K D12 YES N/A N/A	
4 HOUR DURATION COMMENTS (TO INCLUDE GAUGE NUMBER A 4" CASING DRAIN LINE PASSED TESTING 4" CASING DRAIN LINE PASSED TESTING COMPANY WGS SIGNATI'RE Image: Company PRINT NAME Image: Company DATE OCTO POST HYDRO RESTORATION YES HYDRO BLOWN DOWN & DRY YES PROPER GASKETS INSTALLED YES PROPER BOLTING & TIGHTNESS YES	10/19/2012 IND CALIBRATION DA GAUGE #: 16531 CA Inspected by JAMES HAGEN	TE) ALIBRATION: 06/07 () () CONTROL & CHE HIGH POINT PLUG NDE ON PLUG SE	TEMP. //2012 V //20 V //20 V //20 V //20 V //20 V //20 V //20	Witnessed by VGS-JOHN SEBO To La Silla CTOBER 19th, 20 ALLED & INSPECTED ETE	X M12 YES N/A N/A YES	
4 HOUR DURATION COMMENTS (TO INCLUDE GAUGE NUMBER A 4" CASING DRAIN LINE PASSED TESTING 4" CASING DRAIN LINE PASSED TESTING COMPANY WGS SIGNATI'RE Image: Company PRINT NAME Image: Company DATE OCTO POST HYDRO RESTORATION YES HYDRO BLOWN DOWN & DRY YES PROPER GASKETS INSTALLED YES PROPER BOLTING & TIGHTNESS YES COMPANY WGS	10/19/2012 IND CALIBRATION DA GAUGE #: 16531 CA Inspected by JAMES HAGEN AMES HAGEN AMES HAGEN AMES HAGEN DBER 19th, 2012	TE) ALIBRATION: 06/07 () () CONTROL & CHE HIGH POINT PLUG NDE ON PLUG SE	TEMP. //2012 V //20 V //20 V //20 V //20 V //20 V //20 V //20	Witnessed by VGS-JOHN SEBO A Self Self Self CTOBER 19th, 20 ALLED & INSPECTED ETE PLUGGED Witnessed by	X MI2 YES N/A N/A YES	
4 HOUR DURATION COMMENTS (TO INCLUDE GAUGE NUMBER A 4" CASING DRAIN LINE PASSED TESTING 4" CASING DRAIN LINE PASSED TESTING COMPANY WGS SIGNATI'BE 0 T PHINT NAME 0 T DATE OCTO POST HYDRO RESTORATION YES HYDRO BLOWN DOWN & DRY YES PROPER GASKETS INSTALLED YES PROPER BOLTING & TIGHTNESS YES COMPANY WGS SIGNATURE YES	10/19/2012 IND CALIBRATION DA GAUGE #: 16531 CA Inspected by JAMES HAGEN AMES HAGEN AMES HAGEN AMES HAGEN DBER 19th, 2012	TE) LIBRATION: 06/07 NOTROL & CHE HIGH POINT PLUG NDE ON PLUG SE DRAIN / VENT VA	TEMP. //2012 V //20 V //20 V //20 V //20 V //20 V //20 V //20	Witnessed by VGS-JOHN SEBO A Self Self Self CTOBER 19th, 20 ALLED & INSPECTED ETE PLUGGED Witnessed by	ок <u>K</u> M/A YES N/A YES OK	



WILLBROS GOVERNMENT SERVICES (U.S.), LLC A WILLBROS COMPANY

PROJECT N62583-09-D-0132/0003		LOCATION TAN	K 5	JOB NUMBER	54118	
CONTRACTOR WILLBROS GOVERNMENT SE	RVICES	P & ID No.			1995 - 1 99	
ERVICE NORMAL		1	N	I/A		
TEST PACK NUMBER. TANK 5 FINAL HYDRO EX	TERNAL 4" DRAIN	DRAWING No.	54118-00	3-07-400s		
YSTEM NUMBER			1rC, 2	rC, 3rC	100 CO	
MARK No.	No na	ISO No.	A . 2000		-	
INE No.	1915 A 1916 1917		N	IIA		
4" DRAIN LINE						
LINE SPECIFICATION		TEST MEDIUM	WATER			
DESIGN PRESSURE (MAWP) 100	PSI	TEST PRESSURE	150		PSI	
STRESS RELIEVED YES NO	INTERNAL	LINING	es no			
ALL PRE- TEST NDE COMPLETE AND ACCEPTED	SIGNATURE			DATE		
MATERIAL RECORDS COMPLETE	SIGNATURE	851975 51		DATE	2011	
WELDING HISTORY RECORDS COMPLETE	SIGNATURE	1,7	1	DATE		
PRE-TEST INSPECTION FOREMA	N SIGNATURE	Soul In	4(DATE 5	122/13	
WELDING OF PRESSURE PARTS COMPLETE	YES	SYSTEM FILLED A	ND PURGED OF	AIR 7	YES	
PROPER GASKETS, BOLTS AND BLINDS	YES	TEMPERATURE WI			YES	
TEMPORARY VENTS AND DRAINS INSPECTED	YES	- HYDRO EQUIPMEN	T AND GAGES I	NSPECTED	YES	
TEST PLUGS INSPECTED AND SECURED	YES	OPERATORS PROPERLY INSTRUCTED YES				
NSTUMENTATION BLOCKED OR REMOVED	YES	BARRACADES IN PLACE YES				
VALVES IN THE RIGHT POSITION (OPEN/CLOSED)	YES	AREA CLEARED OF PERSONEL YES			A CONTRACTOR OF A CONTRACTOR	
TEST MEDIUM WITHIN SPECIFICATION	YES	- 100 - 10			80.000.000 (*****	
		No.	1286	DATE		
QUALITY CONTRO	na wantazi				FINISH	
PRESSURE TEST 4 HOURS	DATE OF TEST 5/22/13		AMBIENT TEMP. 85 F	12:01 PM	4:01 PM	
14 14 14 14 14 14 14 14 14 14 14 14 14 1	D CALIBRATION DA	TE)				
COMMENTS-(TO INCLUDE GAUGE NUMBER AN						
COMMENTS-(TO INCLUDE GAUGE NUMBER AN 4" EXTERNAL DRAIN LINE PASSED TESTING		CALIBRATION: 4/25	/2013			
4° EXTERNAL DRAIN LINE PASSED TESTING	GAUGE #: 8966699	CALIBRATION: 4/25		Witnessed by		
4° EXTERNAL DRAIN LINE PASSED TESTING	GAUGE #: 8965699	CALIBRATION: 4/25		NGS- OHN SEI	зок	
4° EXTERNAL DRAIN LINE PASSED TESTING	GAUGE #: 8966699	CALIBRATION: 4/25		NGS- OHN-SEI	вок	
4" EXTERNAL DRAIN LINE PASSED TESTING (In COMPANY WGS-J SIGNATURE // January PRINT NAME // JANUARY	SAUGE #: 8965699	CALIBRATION: 4/25		NGS- OHINSER GA SAN John S	зок гвок	
4" EXTERNAL DRAIN LINE PASSED TESTING (In COMPANY WGS-J SIGNATURE // January PRINT NAME // JANUARY	GAUGE #: 8965699	CALIBRATION: 4/25		NGS- OHN-SEI	зок гвок	
4" EXTERNAL DRAIN LINE PASSED TESTING (COMPANY WGS-J SIGNATURE JOW PRINT NAME JATE DATE MAY POST HYDRO RESTORATION	SAUGE #: 8965699	CALIBRATION: 4/25		NGS- OHINSER GA SAN John S	ерк еро К 13	
4° EXTERNAL DRAIN LINE PASSED TESTING (COMPANY WGS-J SIGNATURE JANN PRINT NAME JA-133 DATE MAY POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY YES	SAUGE #: 8965699	CALIBRATION: 4/25		NGS-OHN-SEL AL JAC Je42 MAY 22nd, 20	зок гвок	
4" EXTERNAL DRAIN LINE PASSED TESTING (COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED YES	SAUGE #: 8965699		TK VALVES INST	MGS- OHIV-SEL Q John Sel MAY 22nd, 20 ALLED	ерк еро К 13	
4" EXTERNAL DRAIN LINE PASSED TESTING (COMPANY WGS-J SIGNATURE JANC PRINT NAME JANC DATE MAY POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY YES HYDRO BLINDS PULLED YES PROPER GASKETS INSTALLED YES	SAUGE #: 8965699	CONTROL & CHE	CK VALVES INST	MGS-OHN-SEL ALLED & INSPECTED	YES	
4" EXTERNAL DRAIN LINE PASSED TESTING (COMPANY WGS-J SIGNATURE JANC PRINT NAME JATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY YES HYDRO BLINDS PULLED YES	SAUGE #: 8965699	CONTROL & CHEC HIGH POINT PLUG	CK VALVES INST S SEAL WELDED AL WELDS COMP	MGS-OHIV-SEI ALLED ALLED A INSPECTED LETE	ерк еро К 13	
4° EXTERNAL DRAIN LINE PASSED TESTING (COMPANY WGS-J SIGNATURE JW PRINT NAME JATES PROFER GASKETS INSTALLED YES PROPER BOLTING & TIGHTNESS YES	SAUGE #: 8965699	CONTROL & CHEC HIGH POINT PLUG NDE ON PLUG SEA	CK VALVES INST S SEAL WELDED AL WELDS COMP LVES CLOSED &	MGS-OHIV-SEI ALLED ALLED ALLED A INSPECTED LETE PLUGGED Witnessed by	YES	
4" EXTERNAL DRAIN LINE PASSED TESTING (COMPANY WGS-J SIGNATURE JW PRINT NAME JATES PROFER GASKETS INSTALLED YES PROPER BOLTING & TIGHTNESS YES	GAUGE #: 8965699	CONTROL & CHEC HIGH POINT PLUG NDE ON PLUG SEA	CK VALVES INST S SEAL WELDED AL WELDS COMP LVES CLOSED &	ALLED A INSPECTED LETE PLUGGED	YES	
4" EXTERNAL DRAIN LINE PASSED TESTING (COMPANY WGS-J SIGNATURE // /////////////////////////////////	SAUGE #: 8965699	CONTROL & CHEC HIGH POINT PLUG NDE ON PLUG SEA	CK VALVES INST S SEAL WELDED AL WELDS COMP LVES CLOSED &	MGS-OHIV-SEI ALLED ALLED ALLED A INSPECTED LETE PLUGGED Witnessed by	YES	
4" EXTERNAL DRAIN LINE PASSED TESTING A COMPANY WGS-J SIGNATURE // January PRINT NAME // January POST HYDRO RESTORATION HYDRO BLINDS PULLED YES PROPER GASKETS INSTALLED YES PROPER BOLTING & TIGHTNESS // YES III COMPANY WGS SIGNATURE // January PRINT NAME // JAnuary	SAUGE #: 8965699	CONTROL & CHEC HIGH POINT PLUG NDE ON PLUG SEA	CK VALVES INST S SEAL WELDED AL WELDS COMP LVES CLOSED &	MGS-OHIV-SEI ALLED ALLED ALLED A INSPECTED LETE PLUGGED Witnessed by	BOK YES BOK	



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WILLBROS GOVERNMENT SERVICES (U.S.), LLC A WILLBROS COMPANY

PROJECT No2583-09-D-01	32/0003		LOCATION TANK TK5	JOB NUMBER	54118		
CONTRACTOR WILLBROS	OVERNMENT SER	VICES	P & ID No.				
SERVICE NORMAL - ASME E	331.3	50 m		N/A			
TEST PACK NUMBER. TANK			DRAWING No.	NONE	<u> </u>		
SYSTEM NUMBER			Diatorito				
MARK No.	N/A	and a real and	ISO No.				
LINE No.	E ANGELE E			N/A	-		
INTEGRIT	Y TEST 6" PIPING			N/A			
LINE SPECIFICATION SLOP	LINE		TEST MEDIUM WATER				
DESIGN PRESSURE (MAWP) 1	100	PSI	TEST PRESSURE 150		PSI		
STRESS RELIEVED	YES NO	INTERNA	LLINING YES NO				
ALL PRE- TEST NDE COMPLETI	E AND ACCEPTED	SIGNATURE		DATE	100 C 100		
MATERIAL RECORDS COMPLI	FIE	SIGNATURE		DATE	<u> </u>		
WEEDING HISTORY RECORDS		SIGNATURE		DATE	911 - C		
PRE-TEST INSPECTION		N SIGNATURE		DATE			
WELDING OF PRESSURE PART		N/A	SYSTEM FILLED AND PURGED		YES		
PROPER GASKETS, BOLTS AND		YES	TEMPERATURE WITHIN SPECI		YES		
TEMPORARY VENTS AND DRA		YES	HYDRO EQUIPMENT AND GAC		YES		
TEST PLUGS INSPECTED AND		YES	OPERATORS PROPERLY INSTR				
NSTUMENTATION BLOCKED (YES	-	<u>YES</u>			
VALVES IN THE RIGHT POSITIC		YES	BARRACADES IN PLACE YES				
FEST MEDIUM WITHIN SPECIFI		YES	AREA CLEARED OF PERSONEL <u>YES</u>				
	OUAL ITY CONTROL	SIGNATURE		DATE	33		
PRESSURE TEST 4 HOUR	QUALITY CONTROL	DATE OF TEST	AMBIENT 7	DATE START	FINISH		
DURATION 4 HOUR	S	DATE OF TEST 10/13/201	TEMT.		FINISH 3:19 PM		
DURATION 4 HOUR	S AUGE NUMBER AND ITING WOULDNT MAINTA Inst	DATE OF TEST 10/13/201 CALIBRATION D/	TE)	START	3:19 PM		
4 HOUR DURATION 4 HOUR COMMENTS (TO INCLUDE GA 6° DRAIN PIPING LINE FAILED TES	S AUGE NUMBER AND ITING WOULDNT MAINTA Inst	DATE OF TEST 10/13/201 CALIBRATION DA IN PRESSURE GAUGE	TE)	3 F START 8:23 AM	3:19 PM		
4 HOUR DURATION 4 HOUR COMMENTS (TO INCLUDE GA 6* DRAIN PIPING LINE FAILED TES	S AUGE NUMBER AND ITING WOULDNT MAINTA Inst	DATE OF TEST 10/13/201 CALIBRATION DA IN PRESSURE GAUGE	TE)	3 F START 8:23 AM	3:19 PM		
4 HOUR DURATION COMMENTS (TO INCLUDE GA 6° DRAIN PIPING LINE FAILED TES COMPANY SIGNATURE PRINT NAME	S AUGE NUMBER AND STING WOULDN'T MAINTA Inst WGS -	DATE OF TEST 10/13/201 CALIBRATION DA IN PRESSURE GAUGE	TE)	3 F START 8:23 AM	3:19 PM		
DURATION 4 HOURS	S AUGE NUMBER AND STING WOULDN'T MAINTA Inst WGS -	DATE OF TEST 10/13/201 CALIBRATION D/ IN PRESSURE GAUGE Merted by Pat Collins	TE)	3 F START 8:23 AM Witnessed by WGS - Reed Ca	3:19 PM		
4 HOURS	S AUGE NUMBER AND STING WOULDN'T MAINTA Inst WGS -	DATE OF TEST 10/13/201 CALIBRATION D/ IN PRESSURE GAUGE Merted by Pat Collins	- TEMIF. NTE) #: 45-1279 #1 CALIBRATION:	3 F START 8:23 AM Witnessed by WGS - Reed Ca WGS - Reed Ca 10/13/2010	3:19 PM		
4 HOUR DURATION COMMENTS (TO INCLUDE GA 6" DRAIN PIPING LINE FAILED TES COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY	S AUGE NUMBER AND STING WOULDNT MAINTA Insy WGS - 10/	DATE OF TEST 10/13/201 CALIBRATION D/ IN PRESSURE GAUGE Merted by Pat Collins	CONTROL & CHECK VALVES	3 F START 8:23 AM Witnessed by WGS - Reed Ca WGS - Reed Ca 10/13/2010	3:19 PM		
4 HOUR DURATION COMMENTS (TO INCLUDE G/ 6° DRAIN PIPING LINE FAILED TES COMPANY SIGNATURE PRINT NAME DATE COST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED	S AUGE NUMBER AND STING WOULDNT MAINTA WGS - 10/ N/A YES VES	DATE OF TEST 10/13/201 CALIBRATION D/ IN PRESSURE GAUGE Merted by Pat Collins	CONTROL & CHECK VALVES HIGH POINT PLUGS SEAL WEL	3 F START 8:23 AM Witnessed by WGS - Reed Ca WGS - Reed Ca 10/13/2010	3:19 PM		
4 HOURS	S AUGE NUMBER AND ITING WOULDNT MAINTA WGS - 10/ 10/ N/A YES YES	DATE OF TEST 10/13/201 CALIBRATION D/ IN PRESSURE GAUGE Merted by Pat Collins	CONTROL & CHECK VALVES HIGH POINT PLUGS SEAL WELDS CON	3 F START 8:23 AM Witnessed by WGS - Reed Ca WGS - Reed Ca 10/13/2010 INSTALLED DED & INSPECTED DMPLETE	3:19 PM		
4 HOURS	S AUGE NUMBER AND STING WOULDNT MAINTA WGS - 10/ 10/ N/A YES YES SS YES	DATE OF TEST 10/13/201 CALIBRATION DA IN PRESSURE GAUGE Pat Collins 13/2010	CONTROL & CHECK VALVES HIGH POINT PLUGS SEAL WEL	START 8:23 AM Witnessed by WGS - Reed Ca WGS - Reed Ca 10/13/2010 INSTALLED DED & INSPECTED DED & INSPECTED DMPLETE D & PLUGGED	3:19 PM vin YES N/A N/A YES		
4 HOURS	S AUGE NUMBER AND STING WOULDNT MAINTA WGS - 10/ 10/ N/A YES YES SS YES	DATE OF TEST 10/13/201 CALIBRATION D/ IN PRESSURE GAUGE Merted by Pat Collins	CONTROL & CHECK VALVES HIGH POINT PLUGS SEAL WELDS CON	START 8:23 AM Witnessed by WGS - Reed Ca WGS - Reed Ca 10/13/2010 INSTALLED DED & INSPECTED DED & INSPECTED DMPLETE D & PLUGGED Witnessed by	3:19 PM vin YES N/A N/A YES		
4 HOURS	S AUGE NUMBER AND STING WOULDNT MAINTA WGS - 10/ 10/ N/A YES YES SS YES	DATE OF TEST 10/13/201 CALIBRATION DA IN PRESSURE GAUGE Pat Collins 13/2010	CONTROL & CHECK VALVES HIGH POINT PLUGS SEAL WELDS CON	START 8:23 AM Witnessed by WGS - Reed Ca WGS - Reed Ca 10/13/2010 INSTALLED DED & INSPECTED DED & INSPECTED DMPLETE D & PLUGGED	3:19 PM vin YES N/A N/A YES		
4 HOUR: DURATION COMMENTS (TO INCLUDE GA 6" DRAIN PIPING LINE FAILED TES COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNES	S AUGE NUMBER AND STING WOULDNT MAINTA WGS - 10/ 10/ N/A YES YES SS YES	DATE OF TEST 10/13/201 CALIBRATION DA IN PRESSURE GAUGE Pat Collins 13/2010	CONTROL & CHECK VALVES HIGH POINT PLUGS SEAL WELDS CON	START 8:23 AM Witnessed by WGS - Reed Ca WGS - Reed Ca 10/13/2010 INSTALLED DED & INSPECTED DED & INSPECTED DMPLETE D & PLUGGED Witnessed by	3:19 PM vin YES N/A N/A YES		



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WILLBROS GOVERNMENT SERVICES (U.S.), LLC

ROJECT N62583-09-D	-0132/0003		LOCATION	TANK 5	JO	B NUMBER	54118
CONTRACTOR WILLBRO	S GOVERNMENT SER	VICES	P&IDNo				
SERVICE NORMAL					N/A		
TEST PACK NUMBER. TAN	K SEINAL HYDRO CASIN	G SAMPLE PIPING	DRAWING	No. 5	4118-003-0	7-400s	<u></u>
SYSTEM NUMBER	IN 3 FINAL REDNO CASIN	S SHAT LET IT ING	DRAWING	NU	7rC		
n ne ne la seconda de la se	N/A		ISO No.				
MARK No.	0:0		130 140.	and the second sec	N/A		
	SAMPLE PIPING		-		N/A		
	O FEET		TEST MED	UM WATE	R		
DESIGN PRESSURE (MAW	P) 100	PSI	TEST PRES	SURE 150			PSI
STRESS RELIEVED	YES NO	INTERNAL	LINING	YES	NO		
ALL PRE- TEST NDE COMPI	LETE AND ACCEPTED	SIGNATURE				DATE	
MATERIAL RECORDS CON		SIGNATURE	-			DATE	
WELDING HISTORY RECO		SIGNATURE	1	17 .		DATE	1
PRE-TEST INSPECTION	www.collection.collect	SIGNATURE	dit	Sell		DATE /	11:1.2
WELDING OF PRESSURE P.			SYSTEM FIL	LED AND PURC	ED OF AIR		YES
PROPER GASKETS, BOLTS		YES	•2	URE WITHIN SPI			YES
TEMPORARY VENTS AND		YES	•				YES
TEST PLUGS INSPECTED A		YES	HYDRO EQUIPMENT AND GAGES INSPECTED YES OPERATORS PROPERLY INSTRUCTED YES				
NSTUMENTATION BLOCK		YES	BARRACADES IN PLACE YES				
VALVES IN THE RIGHT POS		YES	AREA CLEARED OF PERSONEL YES				
TEST MEDIUM WITHIN SPE		YES	AREA CLEAKED OF PERSONEL				
TEST MEDION WITHIN STL	curcanon		-				3 .
(A) = = (A40)	QUALITY CONTROL	L SIGNATURE				DATE	
PRESSURE TEST	QUALITY CONTRO	L SIGNATURE		AMBIEN	Tare	DATE	FINISH
PRESSURE TEST DURATION 4 HO		And States	2	AMBIEN TEMP.	OFF		FINISH 11:25 AM
DURATION 4 HOU	URS	DATE OF TEST 10/19/2012 CALIBRATION DA	TE)	TEMP.	OFF	START	12.040.049.049.0
DURATION 4 HOU	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531 pected by	TE)	TEMP.	^{85 F} [7:	START 25 AM	11:25 AM
2 HOU DURATION 20 COMMENTS (TO INCLUE 3/4" SAMPLE PIPING 20	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531	TE)	TEMP.	^{85 F} [7:	start 25 AM	11:25 AM
2 HOI DURATION 20 COMMENTS (TO INCLUE 3/4* SAMPLE PIPING 20 COMPANY	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531 pected by MES HAGEN	TE) CALIBRATIO	TEMP.	^{85 F} [7:	START 25 AM Witnessed by S-JOHN SE	11:25 AM
4 HOU DURATION 4 HOU COMMENTS (TO INCLUE 3/4" SAMPLE PIPING 20 COMPANY SIGNATURE	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING WGS-JA	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531 pected by MES HAGEN	TE) CALIBRATIO	TEMP.	85 F 7: WG	START 25 AM Witnessed by S-JOHN SE	11:25 AM
4 HOU DURATION 4 HOU COMMENTS (TO INCLUE 3/4" SAMPLE PIPING 20 COMPANY SIGNATURE PRINT NAME	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING WGS-JA	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531 pected by MES HAGEN	TE) CALIBRATIO	TEMP.	85 F 7: WG	START 25 AM Witnessed by S-JOHN SE	11:25 AM
2 HOI DURATION 20 COMMENTS (TO INCLUE 3/4* SAMPLE PIPING 20 COMPANY	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING WGS-JA UNA UNA OCTOBI	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531 pected by MES HAGEN	TE) CALIBRATIO	TEMP.	85 F 7: WG	START 25 AM Witnessed by S-JOHN SE	11:25 AM
4 HOU DURATION 4 HOU COMMENTS (TO INCLUE 3/4* SAMPLE PIPING 20 COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING WGS-JA WGS-JA	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531 pected by MES HAGEN	TE) CALIBRATIO	TEMP.	WG	START 25 AM	11:25 AM
4 HOU DURATION 4 HOU COMMENTS (TO INCLUE 3/4* SAMPLE PIPING 20 COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING WGS-JA WGS-JA	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531 pected by MES HAGEN	TE) CALIBRATIO	TEMP.	WG WG Joy OCT VES INSTALL	START 25 AM Witnessed by S- JOHN SE OBER 19th	11:25 AM
4 HOU DURATION COMMENTS (TO INCLUE 3/4* SAMPLE PIPING 20 COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & 1 HYDRO BLINDS PULLED	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING WGS-JA WGS-JA OCTOBI ON DRY N/A YES YES	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531 pected by MES HAGEN	TE) CALIBRATION To J CONTROL HIGH POIN	TEMP.	WG WG G OCT VES INSTALL WELDED & I	START 25 AM	11:25 AM
4 HOU DURATION COMMENTS (TO INCLUE 3/4* SAMPLE PIPING 20 COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & I HYDRO BLOWN DOWN & I HYDRO BLINDS PULLED PROPER GASKETS INSTAL	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING WGS-JA WGS-JA OCTOBI ON DRY N/A YES LED YES	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531 pected by MES HAGEN	TE) CALIBRATION E) CONTROL HIGH POIN NDE ON PL	TEMP.	WG WG OCT VES INSTALL WELDED & I SS COMPLET	START 25 AM Witnessed by S-JOHN SE OBER 19th, OBER 19th, LED INSPECTED	11:25 AM
4 HOU DURATION COMMENTS (TO INCLUE 3/4* SAMPLE PIPING 20 COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & 1 HYDRO BLINDS PULLED	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING WGS-JA WGS-JA OCTOBI ON DRY N/A YES LED YES TNESS YES	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531 Pected by MMES HAGEN	TE) CALIBRATION E) CONTROL HIGH POIN NDE ON PL	TEMP.	WG WG OCT VES INSTALL WELDED & I SS COMPLET	START 25 AM	11:25 AM
4 HOU DURATION COMMENTS (TO INCLUE 3/4" SAMPLE PIPING 20 COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & I HYDRO BLOWN DOWN & I HYDRO BLOWN DOWN & I HYDRO BLOWN DOWN & I HYDRO BLOWN DOWN & I	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING WGS-JA WGS-JA OCTOBI ON DRY N/A YES LLED YES TNESS YES	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531 pected by MES HAGEN	TE) CALIBRATION E) CONTROL HIGH POIN NDE ON PL	TEMP.	WG WG G OCT VES INSTALL WELDED & I VS COMPLET OSED & PLU	START 25 AM Witnessed by S-JOHN SE OBER 19th, OBER 19th, LED INSPECTED	11:25 AM
4 HOU DURATION COMMENTS (TO INCLUE 3/4" SAMPLE PIPING 20 COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & 1 HYDRO BLOWN DOWN W & 1 HYDRO BLOWN DOWN W M HYDRO BLOWN DOWN & 1 HYDRO BLOWN DOWN W HYDRO BLOWN DOWN HYDRO BLOWN DOWN W HYDRO BLOWN DOWN HYDRO BLOWN DOWN HYDRO BLOWN DOWN W HYDRO BLOWN DOWN W HYDRO BLOWN DOWN W HYDRO BLOWN DOWN HYDRO BLOWN DOWN HYDRO BLOWN DOWN HYDRO BLOWN HYDRO BLOWN DOWN HYDRO BLOWN DOWN HYDRO BLOWN DOWN HYDRO BLOWN DOWN HYDRO BLOWN HYDRO BLOWN HYDRO BLOWN DOWN HYDRO BLOWN HYDRO BLOWN DOWN HYDRO BLOWN DOWN HYDRO BLOWN DOWN HYDRO BLOWN HYDRO	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING WGS-JA WGS-JA OCTOBI ON DRY N/A YES LLED YES TNESS YES	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531 MES HAGEN LAF 4 HAGEN ER 19th, 2012	TE) CALIBRATION E) CONTROL HIGH POIN NDE ON PL	TEMP.	WG WG G OCT VES INSTALL WELDED & I VS COMPLET OSED & PLU	START 25 AM Witnessed by S-JOHN SE OBER 19th, OBER 19th, LED INSPECTED TE JGGED	11:25 AM
4 HOU DURATION COMMENTS (TO INCLUE 3/4" SAMPLE PIPING 20 COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & I HYDRO BLOWN DOWN & I HYDRO BLOWN DOWN & I HYDRO BLOWN DOWN & I HYDRO BLOWN DOWN & I	URS DE GAUGE NUMBER AND D'LINE PASSED TESTING WGS-JA USS-JA OCTOBI ON DRY N/A YES LLED YES TINESS YES In WGS-JA	DATE OF TEST 10/19/2012 CALIBRATION DA GAUGE #: 16531 pected by MES HAGEN LAF & HAGEN ER 19th, 2012	TE) CALIBRATION E) CONTROL HIGH POIN NDE ON PL	TEMP.	WG WG G OCT VES INSTALL WELDED & I VS COMPLET OSED & PLU	START 25 AM Witnessed by S-JOHN SE OBER 19th, OBER 19th, LED INSPECTED TE JGGED	11:25 AM



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WILLBROS GOVERNMENT SERVICES (U.S.), LLC

PROJECT N62583-09-D-0132/0003		LOCATION TANK	< 5	JOB NUMBER	54118	
CONTRACTOR WILLBROS GOVERNMENT	SERVICES	P & ID No.			-	
SERVICE NORMAL			N	/Α	*****************	
TEST PACK NUMBER. TANK 5 FINAL HYDRO CA	ASING SAMPLE PIPING	DRAWING No.	54118-00	3-07-400s		
SYSTEM NUMBER			7	c		
MARK No N/A		ISO No.		6K A. (2005)		
LINE No.			N	IA		
3/4" SAMPLE PIPING			N	/A		
LINE SPECIFICATION 120 FEET	2 ¹	TEST MEDIUM	WATER			
DESIGN PRESSURE (MAWP) 100	PSI	TEST PRESSURE	150	Mar .	PSI	
STRESS RELIEVED YES NO	INTERNAL	LINING Y	TES NO	72 72 92 980		
ALL PRE- TEST NDE COMPLETE AND ACCEPTEI	D SIGNATURE	in the second		DATE		
MATERIAL RECORDS COMPLETE	SIGNATURE	1545cr inte		DATE	17991.AL - 189	
WELDING HISTORY RECORDS COMPLETE	SIGNATURE		1	DATE	,	
	MAN SIGNATURE	91 911	phone the second se	DATE 14	1/22/12	
WELDING OF PRESSURE PARTS COMPLETE	N/A	SYSTEM FILLED AL	ND PURGED OF A	IR	YES	
PROPER GASKETS, BOLTS AND BLINDS	YES	TEMPERATURE WI			YES	
TEMPORARY VENTS AND DRAINS INSPECTED	YES	HYDRO EQUIPMEN			YES	
TEST PLUGS INSPECTED AND SECURED	YES	OPERATORS PROPI			YES	
INSTUMENTATION BLOCKED OR REMOVED	YES	BARRACADES IN PLACE YES				
VALVES IN THE RIGHT POSITION (OPEN/CLOSE	D) YES	i and the international states and the states and the states of the stat			YES	
TEST MEDIUM WITHIN SPECIFICATION	YES					
		-0				
OUALITY CON	TROL SIGNATURE			DATE		
Kount L Con						
PRESSURE TEST 4 HOURS	DATE OF TEST 10/22/2013	o	AMBIENT TEMP. 85 F	START 7:11 AM	FINISH 11:11 AM	
PRESSURE TEST DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER	DATE OF TEST 10/22/2013 AND CALIBRATION DA	2 <u>-</u>	85 F		MAR 11058 1200-0404	
PRESSURE TEST DURATION 4 HOURS	DATE OF TEST 10/22/2013 AND CALIBRATION DA	2 <u>-</u>	85 F		MAR 11058 1200-0404	
PRESSURE TEST DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120' LINE PASSED TES	DATE OF TEST 10/22/2013 AND CALIBRATION DA TING GAUGE #: 16531	2 <u>-</u>	85 F	7:11 AM Witnessed by	11:11 AM	
PRESSURE TEST DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120' LINE PASSED TES	DATE OF TEST 10/22/2011 AND CALIBRATION DA TING GAUGE #: 16531	2 <u>-</u>	85 F	7:11 AM Witnessed by WGS- JOHN/SE	11:11 AM	
PRESSURE TEST DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120" LINE PASSED TES	DATE OF TEST 10/22/2013 AND CALIBRATION DA TING GAUGE #: 16531 Inspected by S- JAMES HAGEN	2 <u>-</u>	85 F	7:11 AM Witnessed by	11:11 AM	
PRESSURE TEST DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120" LINE PASSED TES COMPANY SIGNATURE PRINT NAME	DATE OF TEST 10/22/2011 AND CALIBRATION DA TING GAUGE #: 16531 Inspected by JAMES HAGEN	2 TE) CALIBRATION: 6/7/	85 F	7:11 AM Witnessed by WGS- JOHN SE	11:11 AM	
PRESSURE TEST DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120" LINE PASSED TES COMPANY SIGNATURE PRINT NAME	DATE OF TEST 10/22/201: AND CALIBRATION DA TING GAUGE #: 16531 Inspected by S- JAMES HAGEN	2 TE) CALIBRATION: 6/7/	темр. 85 F	7:11 AM Witnessed by WGS- JOHN SE	11:11 АМ вок б. К	
PRESSURE TEST DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120" LINE PASSED TES COMPANY SIGNATURE PRINT NAME DATE OCTO	DATE OF TEST 10/22/2011 AND CALIBRATION DA TING GAUGE #: 16531 Inspected by JAMES HAGEN	2 TE) CALIBRATION: 6/7/	темр. 85 F	7:11 AM Witnessend by WGS-JOHN SE Selector	11:11 АМ вок б. <u>б</u> . 2012	
PRESSURE TEST DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120" LINE PASSED TES COMPANY SIGNATURE PRINT NAME	DATE OF TEST 10/22/2011 AND CALIBRATION DA TING GAUGE #: 16531 Inspected by JAMES HAGEN	2 TE) CALIBRATION: 6/7/	темр. 85 F	Vitanssed by Witanssed by VGS- JOHN SE Sul CTOBER 22nd,	11:11 AM вок 2012 YES	
PRESSURE TEST DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120" LINE PASSED TES COMPANY WGS SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION	DATE OF TEST 10/22/2011 AND CALIBRATION DA TING GAUGE #: 16531 Inspected by JAMES HAGEN	2 TE) CALIBRATION: 6/7/	2012 2012 CK VALVES INST	Vitnessed by WGS-JOHN SE	11:11 AM вок б. <u>б</u> . 2012	
PRESSURE TEST DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120" LINE PASSED TES COMPANY WGS SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED YES	DATE OF TEST 10/22/2011 AND CALIBRATION DA TING GAUGE #: 16531 Inspected by JAMES HAGEN	2 TE) CALIBRATION: 6/7/ CONTROL & CHEC HIGH POINT PLUG	2012 2012 CK VALVES INST S SEAL WELDED	7:11 AM	11:11 AM вок 2012 YES 	
PRESSURE TEST DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120' LINE PASSED TES COMPANY WGS SIGNATURE COMPANY SIGNATURE SIGNATU	DATE OF TEST 10/22/2011 AND CALIBRATION DA TING GAUGE #: 16531 Inspected by JAMES HAGEN	2 TE) CALIBRATION: 6/7/	85 F TEMP. 2012 CK VALVES INST S SEAL WELDED LL WELDS COMP	7:11 AM	11:11 AM вок 2012 <u>YES</u> <u>N/A</u>	
PRESSURE TEST DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120" LINE PASSED TES COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED YES	DATE OF TEST 10/22/2013 AND CALIBRATION DA TING GAUGE #: 16531 Inspected by S-JAMES HAGEN S-JAMES HAGEN S-JAMES HAGEN OBER 22nd, 2012	2 TE) CALIBRATION: 6/7/ CALIBRATION: 6/7/ CONTROL & CHEC HIGH POINT PLUG NDE ON PLUG SEA	85 F TEMP. 2012 CK VALVES INST S SEAL WELDED LL WELDS COMP	Vitansand by WGS-JOHN SE Sur CTOBER 22nd, ALLED & INSPECTED LETE PLUGGED	11:11 AM вок 2012 YES <u>N/A</u> YES	
PRESSURE TEST DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120" LINE PASSED TES COMPANY SIGNATURE PRINT NAME DATE DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS VES	DATE OF TEST 10/22/2011 AND CALIBRATION DA TING GAUGE #: 16531 Inspected by JAMES HAGEN	2 TE) CALIBRATION: 6/7/ CALIBRATION: 6/7/ CONTROL & CHEC HIGH POINT PLUG NDE ON PLUG SEA	85 F TEMP. 2012 2012 CK VALVES INST S SEAL WELDED L WELDS COMP LVES CLOSED &	7:11 AM	11:11 AM вок 2012 YES <u>N/A</u> YES	
PRESSURE TEST DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120" LINE PASSED TES COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS COMPANY SIGNATURE COMPANY WGS SIGNATURE COMPANY	DATE OF TEST 10/22/2013 AND CALIBRATION DA TING GAUGE #: 16531 Inspected by S- JAMES HAGEN AS A A A OBER 22nd, 2012	2 TE) CALIBRATION: 6/7/ CALIBRATION: 6/7/ CONTROL & CHEC HIGH POINT PLUG NDE ON PLUG SEA	85 F TEMP. 2012 2012 CK VALVES INST S SEAL WELDED L WELDS COMP LVES CLOSED &	7:11 AM	11:11 AM вок 2012 YES <u>N/A</u> YES	
PRESSURE TEST DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING 120" LINE PASSED TES COMPANY SIGNATURE PRINT NAME DATE DATE POST HYDRO RESTORATION HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS COMPANY SIGNATURE COMPANY SIGNATURE	DATE OF TEST 10/22/2013 AND CALIBRATION DA TING GAUGE #: 16531 Inspected by S- JAMES HAGEN AS A A A OBER 22nd, 2012	2 TE) CALIBRATION: 6/7/ CONTROL & CHEO HIGH POINT PLUG NDE ON PLUG SEA DRAIN / VENT VAI	85 F TEMP. 2012 2012 CK VALVES INST S SEAL WELDED L WELDS COMP LVES CLOSED &	7:11 AM	11:11 AM вок 2012 YES <u>N/A</u> YES	



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WILLBROS GOVERNMENT SERVICES (U.S.), LLC

Winkert	D-0132/0003		LOCATION TAN	NK 5	JOB NUMBER	54118	
CONTRACTOR WILLBRO	OS GOVERNMENT SEF	VICES	P & ID No.		5401	24%2.8%	
SERVICE NORMAL			20 12	N	I/A	1000000	
TEST PACK NUMBER. TA	NK 5 FINAL HYDRO CASIN	IG SAMPLE PIPING	DRAWING No.	54118-06	03-07-400s	- 30	
SYSTEM NUMBER				7	rC		
MARK No.	N/A	14	ISO No.		in of anti-territory		
LINE No.				N	VA		
3/	4" SAMPLE PIPING			N	I/A		
LINE SPECIFICATION	50 FEET		TEST MEDIUM	WATER		504773	
DESIGN PRESSURE (MAW	VP) 100	PSI	TEST PRESSURE	150		PSI	
STRESS RELIEVED	YES NO	INTERNAL	LINING	YES NO			
ALL PRE- TEST NDE COMP	PLETE AND ACCEPTED	SIGNATURE			DATE		
MATERIAL RECORDS CO	MPLETE	SIGNATURE	2 (1) 2000	19. 19.	DATE		
WELDING HISTORY RECO	DRDS COMPLETE	SIGNATURE	10	1	DATE		
PRE-TEST INSPECTION	FOREMA	N SIGNATURE	Ged St.	(DATE /	1/22/12	
WELDING OF PRESSURE	PARTS COMPLETE	N/A	SYSTEM FILLED	AND PURGED OF A	NR .	YES	
ROPER GASKETS, BOLTS	AND BLINDS	YES	• TEMPERATURE V	VITHIN SPECIFICA	TION	YES	
EMPORARY VENTS AND	DRAINS INSPECTED	YES	HYDRO EQUIPMENT AND GAGES INSPECTED YES				
EST PLUGS INSPECTED	AND SECURED	YES	OPERATORS PRO	YES			
NSTUMENTATION BLOCK	KED OR REMOVED	YES	BARRACADES IN PLACE YES				
ALVES IN THE RIGHT PO	SITION (OPEN/CLOSED)	YES	AREA CLEARED OF PERSONEL YES				
TEST MEDIUM WITHIN SP	ECIFICATION	YES					
-	QUALITY CONTRO	L SIGNATURE			DATE		
PRESSURE TEST		DATE OF TEST	ANS 10 P	AMBIENT	START	FINISH	
DURATION 4 HO	URS	10/22/2012	2	TEMP. 85 F	11:40 AM	3:40 PM	
n 10 100 market have been been been been been been been be							
COMMENTS (TO INCLUI		GAUGE #: 16531	52000 7 0	-	Witnessed by		
COMMENTS (TO INCLUI 3/4" SAMPLE PIPING 6	0' LINE PASSED TESTING	GAUGE #: 16531	52000 7 0	-	Witnesserd by VGB-JOHN SE	ŚOK	
COMMENTS (TO INCLUI 3/4" SAMPLE PIPING 6	0' LINE PASSED TESTING	GAUGE #: 16531 period by AMES HAGEN AMES HAGEN	CALIBRATION: 6	-	NGS-JOHN SE		
COMMENTS (TO INCLUI 3/4" SAMPLE PIPING 6	0' LINE PASSED TESTING	GAUGE #: 16531 period by AMES HAGEN here hagen here hagen	CALIBRATION: 6	Jun	vge-john sei (SA) (SA)	.K	
COMMENTS (TO INCLUI	0' LINE PASSED TESTING	GAUGE #: 16531 period by AMES HAGEN AMES HAGEN	CALIBRATION: 6	Jun	NGS-JOHN SE	ik .	
COMMENTS (TO INCLUI 3/4" SAMPLE PIPING 6 COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & HYDRO BLINDS PULLED PROPER GASKETS INSTAL	O' LINE PASSED TESTING WGS-JA WGS-JA OCTOBE ON DRY N/A YES LLED YES	GAUGE #: 16531 period by AMES HAGEN here hagen here hagen	CALIBRATION: 6/	Jun	ALLED	.K	
COMMENTS (TO INCLUI 3/4" SAMPLE PIPING 6 COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & HYDRO BLINDS PULLED PROPER GASKETS INSTAL	O'LINE PASSED TESTING WGS-JA WGS-JA OCTOBE ON DRY N/A YES LLED YES TINESS YES	GAUGE #: 16531	CALIBRATION: 6/	ECK VALVES INST GS SEAL WELDED EAL WELDS COMP	ALLED ALLED ALLED ALLED ALLED ALLETE PLUGGED	YES N/A N/A YES	
COMMENTS (TO INCLUI 3/4" SAMPLE PIPING 6 COMPANY SIGNATIIRE	O' LINE PASSED TESTING WGS-JA WGS-JA OCTOBE ON DRY N/A YES LLED YES TTNESS YES	GAUGE #: 16531 period by AMES HAGEN here hagen here hagen	CALIBRATION: 6/	ECK VALVES INST GS SEAL WELDED EAL WELDS COMP ALVES CLOSED &	ALLED	YES N/A N/A YES	
COMMENTS (TO INCLUI 3/4" SAMPLE PIPING & COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & HYDRO BLINDS PULLED PROPER GASKETS INSTAL PROPER BOLTING & TIGH	O' LINE PASSED TESTING WGS-JA WGS-JA OCTOBE ON DRY N/A YES LLED YES TTNESS YES	GAUGE #: 16531	CALIBRATION: 6/	ECK VALVES INST GS SEAL WELDED EAL WELDS COMP ALVES CLOSED &	ALLED & INSPECTED LETE PLUGGED Witnessed by	YES N/A N/A YES	
COMMENTS (TO INCLUI 3/4" SAMPLE PIPING 6 COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & HYDRO BLOWN DOWN & HYDRO BLINDS PULLED PROPER GASKETS INSTAL PROPER BOLTENG & TIGH	O' LINE PASSED TESTING WGS-JA WGS-JA OCTOBE ON DRY N/A YES LLED YES TTNESS YES	GAUGE #: 16531	CALIBRATION: 64	ECK VALVES INST GS SEAL WELDED EAL WELDS COMP ALVES CLOSED &	ALLED & INSPECTED LETE PLUGGED Witnessed by	YES N/A N/A YES	



WILLBROS GOVERNMENT SERVICES (U.S.), LLC

PROJECT N62583-09-D-0132/0003		LOCATION TAN	K 5	JOB NUMBER	54118	
CONTRACTOR WILLBROS GOVERNMEN	SERVICES	P & ID No.				
SERVICE NORMAL			N	/A	0	
and the second se	CASING SAMPLE PIPING	DRAWING No.	54118-00	3-07-400s	Al	
SYSTEM NUMBER			7	c	1	
MARK No. N/A		ISO No.				
INE No.	· · · · ·		N	/A	100 100	
3/4" SAMPLE PIPIN	G		N	IA		
LINE SPECIFICATION 175 FEET		TEST MEDIUM	WATER	\$		
DESIGN PRESSURE (MAWP) 100	PSI	TEST PRESSURE	150	distantin a constant	PSI	
STRESS RELIEVED YES NO	INTERNAL		TES NO	15 200 CT 100		
ALL PRE- TEST NDE COMPLETE AND ACCEPT	ED SIGNATURE			DATE		
MATERIAL RECORDS COMPLETE	SIGNATURE			DATE		
WELDING HISTORY RECORDS COMPLETE	SIGNATURE			DATE	999 - C	
	EMAN SIGNATURE	al Su	/	DATE /	123/12	
WELDING OF PRESSURE PARTS COMPLETE	N/A	SYSTEM FULED A	ND PURCED OF	7	YES	
PROPER GASKETS, BOLTS AND BLINDS	YES	TEMPERATURE W		unnune Jacobarto	YES	
TEMPORARY VENTS AND DRAINS INSPECTE					YES	
184	YES	HYDRO EQUIPMENT AND GAGES INSPECTED YES				
TEST PLUGS INSPECTED AND SECURED	YES					
INSTUMENTATION BLOCKED OR REMOVED		BARRACADES IN PLACE YES AREA CLEARED OF PERSONEL YES				
VALVES IN THE RIGHT POSITION (OPEN/CLO	YES					
TEST MEDIUM WITHIN SPECIFICATION	10	ant sexuals an t diffe	e 105 - 53	94 94	-	
OUALITY CC	NTROL SIGNATURE			DATE		
	DATE OF TEST		AMBIENT 85 F	START	FINISH	
PRESSIRE TEST			05 5			
PRESSURE TEST 4 HOURS	10/23/201:	2	TEMP.	8:35 AM	12:35 PM	
DURATION 4 HOURS	10/23/201:		TEMP.	8:35 AM	12:35 PM	
DURATION 4 HOURS	10/23/2012 R AND CALIBRATION DA	те)		8:35 AM	12:35 PM	
duration 4 HOURS	10/23/2012 R AND CALIBRATION DA	те)		8:35 AM	12:35 PM	
DURATION 4 HOURS	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531	те)				
4 HOURS DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175' LINE PASSED TI	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531	те)	/2012	Witnessed by		
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175' LINE PASSED TI COMPANY W	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531	те)	/2012	Witnessed by VGS-JOHN-SE		
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175' LINE PASSED TI COMPANY WO SIGNATURE	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531 Inspected by GS- JAMES HAGEN	TE) CALIBRATION: 6/7	/2012	Witnessed by VGS-JOHN-SE	вок	
4 HOURS DURATION OURATION COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175' LINE PASSED TI COMPANY SIGNATURE PRINT NAME	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531 Inspected by SS- JAMES HAGEN A	TE) CALIBRATION: 6/7	/2012 V	Witnessed by VGS-JOHNSE	вок Бевек	
4 HOURS DURATION OURATION COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175' LINE PASSED TI COMPANY SIGNATURE PRINT NAME DATE OC	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531 Inspected by GS- JAMES HAGEN	TE) CALIBRATION: 6/7	/2012 V	Witnessed by VGS-JOHN-SE	вок Бевак	
4 HOURS DURATION OURATION COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175' LINE PASSED TI COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531 Insperted by SS- JAMES HAGEN A TALAPS HAGEN TALAPS HAGEN	TE) CALIBRATION: 6/7	/2012 V	Witnessed by VGS-JOHNSE	вок Бевек 2012	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175' LINE PASSED TO COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531 Insperted by SS- JAMES HAGEN A TALAPS HAGEN TALAPS HAGEN	TE) CALIBRATION: 6/7	/2012 /2012	Witnessed by VGS-JOHN-SE Jul Sul Jul Sul Jul Sul CTOBER 23rd,	вок 5.eb.=K_ 2012 YES	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175" LINE PASSED TO 3/4" SAMPLE PIPING 175" LINE PASSED TO SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531 Insperted by SS- JAMES HAGEN A TALAPS HAGEN TALAPS HAGEN	TE) CALIBRATION: 6/7	/2012 V V CK VALVES INST	Witnessed by VGS-JOHN SE Z.(J.(J.(J.) CTOBER 23rd, ALLED	вок 2012 YES N/A	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175' LINE PASSED TO 3/4" SAMPLE PIPING 175' LINE PASSED TO SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531 Insperted by SS- JAMES HAGEN A TALAPS HAGEN TALAPS HAGEN	TE) CALIBRATION: 6/7	/2012 /2012 /2012 // // // // // // // // // // // // //	Witnessed by VGS-JOHNSE 2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.	вок 5	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175' LINE PASSED TO 3/4" SAMPLE PIPING 175' LINE PASSED TO COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531 Insperted by SS- JAMES HAGEN A TALAPS HAGEN TALAPS HAGEN	TE) CALIBRATION: 6/7 ربر CONTROL & CHE HIGH POINT PLUC	/2012 /2012 V CK VALVES INST IS SEAL WELDED AL WELDS COMP	Witnessed by VGS-JOHN-SE Zuland Tober 23rd, CTOBER 23rd, ALLED & INSPECTED LETE	вок 2012 YES N/A	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175" LINE PASSED TO 3/4" SAMPLE PIPING 175" LINE PASSED TO SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531 Insperted by SS- JAMES HAGEN A TALAPS HAGEN TALAPS HAGEN	TE) CALIBRATION: 6/7 مرا CONTROL & CHE(HIGH POINT PLUG NDE ON PLUG SE/	/2012 /2012 V CK VALVES INST IS SEAL WELDED AL WELDS COMP	Witnessed by VGS-JOHN-SE Zuland Tober 23rd, CTOBER 23rd, ALLED & INSPECTED LETE	вок 2012 YES N/A N/A YES	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175' LINE PASSED TO 3/4" SAMPLE PIPING 175' LINE PASSED TO COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531 Inspected by GS-JAMES HAGEN A	TE) CALIBRATION: 6/7 مرا CONTROL & CHE(HIGH POINT PLUG NDE ON PLUG SE/	/2012 /2012 V CK VALVES INST IS SEAL WELDED AL WELDS COMP LVES CLOSED &	Witnessed by VGS-JOHN-SE Jack Jack TOBER 23rd, ALLED & INSPECTED LETE PLUGGED	BOK 2012 YES N/A N/A YES	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175" LINE PASSED TO SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TICHTNESS	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531 Inspected by GS- JAMES HAGEN A TA APS HAGEN TA APS HAGEN TA APS HAGEN A Inspected by Inspected by	TE) CALIBRATION: 6/7 مرا CONTROL & CHE(HIGH POINT PLUG NDE ON PLUG SE/	/2012 /2012 V CK VALVES INST IS SEAL WELDED AL WELDS COMP LVES CLOSED &	Witnessed by VGS-JOHN SE J- J- CTOBER 23rd, ALLED & INSPECTED LETE PLUGGED Witnessed by	BOK 2012 YES N/A N/A YES	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBE 3/4" SAMPLE PIPING 175' LINE PASSED TO 3/4" SAMPLE PIPING 175' LINE PASSED TO COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS YES COMPANY SIGNATURE	10/23/2012 R AND CALIBRATION DA ESTING GAUGE #: 16531 Inspected by GS- JAMES HAGEN A TA APS HAGEN TA APS HAGEN TA APS HAGEN A Inspected by Inspected by	TE) CALIBRATION: 6/7 CONTROL & CHEC HIGH POINT PLUC NDE ON PLUG SE/ DRAIN / VENT VA	/2012 /2012 V CK VALVES INST IS SEAL WELDED AL WELDS COMPILIVES CLOSED &	Witnessed by VGS-JOHN SE J- J- CTOBER 23rd, ALLED & INSPECTED LETE PLUGGED Witnessed by	вок 2012 YES <u>N/A</u> <u>YES</u> вок	



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WILLBROS GOVERNMENT SERVICES (U.S.), LLC

PROJECT N62583-09-D-0132/0003		LOCATION TAN	< 5	JOB NUMBER	54118	
CONTRACTOR WILLBROS GOVERNMENT	SERVICES	P & ID No.	1. 523		1.1	
SERVICE NORMAL			N	/A		
TEST PACK NUMBER. TANK 5 FINAL HYDRO EX	TERNAL SAMPLE PIPING	DRAWING No.	54118-00	3-07-400s	1.994	
SYSTEM NUMBER			1rC, 2	-C, 3/C		
MARK No. N/A		150 No.			1115	
LINE No.			N	/A	10 10/10/20 101 - 2010	
3/4" & 1" SAMPLE PIPI	NG		N	IA	200 B	
LINE SPECIFICATION	- that the second the s	TEST MEDIUM	WATER			
DESIGN PRESSURE (MAWP) 100	PSI	TEST PRESSURE	150		PSI	
STRESS RELIEVED YES NO	INTERNAL	LINING	'ES NO			
ALL PRE- TEST NDE COMPLETE AND ACCEPTE	D SIGNATURE			DATE	70 Clothe	
MATERIAL RECORDS COMPLETE	SIGNATURE			DATE	10000	
WELDING HISTORY RECORDS COMPLETE	SIGNATURE			DATE		
	EMAN SIGNATURE	atx	2	DATE	/22/13	
WELDING OF PRESSURE PARTS COMPLETE	N/A	SYSTEM FILLED A	ND PURGED OF A		YES	
PROPER GASKETS, BOLTS AND BLINDS	YES	TEMPERATURE WI			YES	
TEMPORARY VENTS AND DRAINS INSPECTED		News in in consumate			YES	
TEST PLUGS INSPECTED AND SECURED	YES	HYDRO EQUIPMENT AND GAGES INSPECTED ICS OPERATORS PROPERLY INSTRUCTED YES				
INSTUMENTATION BLOCKED OR REMOVED	YES	BARRACADES IN PLACE YES				
VALVES IN THE RIGHT POSITION (OPEN/CLOS		The star best four stars when we shall be a star to see a star of the star of			YES	
TEST MEDIUM WITHIN SPECIFICATION	YES					
		- Servitates			6555	
QUALITY COM	TROL SIGNATURE	*		DATE		
			and the second se	the second s	and the second se	
PRESSURE TEST	DATE OF TEST		AMBIENT	START	FINISH	
PRESSURE TEST DURATION 4 HOURS	DATE OF TEST 5/22/13		AMBIENT 85 F	START 7:51 AM	FINISH 11:51 AM	
4 HOURS DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4* & 1* SAMPLE PIPING PASSED TESTIN	5/22/13 AND CALIBRATION DA G GAUGE #: 8966699	TE)	2013	Witnessed by	11:51 AM	
4 HOURS DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4*& 1* SAMPLE PIPING PASSED TESTIN	5/22/13 AND CALIBRATION DA G GAUGE #: 89666699	TE)	2013		11:51 AM	
4 HOURS DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4* & 1* SAMPLE PIPING PASSED TESTIN COMPANY	5/22/13 AND CALIBRATION DA G GAUGE #: 8966699	TE)	2013	Witnessed by VGS-JOHN-SE	11:51 AM вок	
4 HOURS DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4*& 1* SAMPLE PIPING PASSED TESTIN COMPANY SIGNATURE PRINT NAME	5/22/13 AND CALIBRATION DA G GAUGE #: 8966699 Inspected by S- JAMES HAGEN	TE)	2013	Witnessed by VGS-JOHN-SE UN July July July	11:51 АМ вок	
4 HOURS DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4*& 1* SAMPLE PIPING PASSED TESTIN COMPANY SIGNATURE PRINT NAME	5/22/13 AND CALIBRATION DA G GAUGE #: 89666699 Inspected by S- JAMES HAGEN	TE)	2013	Witnessed by VGS-JOHN-SE	11:51 АМ вок	
4 HOURS DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4*& 1* SAMPLE PIPING PASSED TESTIN COMPANY SIGNATURE PRINT NAME	5/22/13 AND CALIBRATION DA G GAUGE #: 8966699 Inspected by S- JAMES HAGEN	TE)	2013	Witnessed by VGS-JOHN-SE UN July July July	11:51 АМ вок	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4*& 1* SAMPLE PIPING PASSED TESTIN COMPANY SIGNATE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY	5/22/13 AND CALIBRATION DA G GAUGE #: 8966699 Inspected by S-JAMES HAGEN	TE)	2013 V	Witnessed by VGS-JOHN-SE LA July July MAY 22ND, 20	11:51 AM вок осы (113 YES	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4* & 1* SAMPLE PIPING PASSED TESTIN COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLOWN DOWN & DRY YES	5/22/13 AND CALIBRATION DA G GAUGE #: 8966699 Inspected by S-JAMES HAGEN	TE) CALIBRATION: 4/25/	2013 V SK VALVES INST	Witnessed by VGS-JOHN-SE July July MAY 22ND, 20 ALLED	11:51 AM вок 264 (113 <u>YES</u> 	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4*& 1* SAMPLE PIPING PASSED TESTIN COMPANY SIGNATURE PRINT NAME DATE NOST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED	5/22/13 AND CALIBRATION DA G GAUGE #: 8966699 Inspected by S-JAMES HAGEN	TE) CALIBRATION: 4/25/	2013 V CK VALVES INST S SEAL WELDED	Witnessed by VGS-JOHN-SE John John MAY 22ND, 20 ALLED & INSPECTED	11:51 AM вок оси (113 YES N/A N/A	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4*& 1* SAMPLE PIPING PASSED TESTIN COMPANY SIGNATE PRINT NAME DATE N/A YES	5/22/13 AND CALIBRATION DA G GAUGE #: 8966699 Inspected by S-JAMES HAGEN	TE) CALIBRATION: 4/25/ CALIBRATION: 4/25/ CONTROL & CHEC HIGH POINT PLUG	2013 V CK VALVES INST S SEAL WELDED L WELDS COMPI	Witnessed by VGS-JOHN-SE Jo4-1 MAY 22ND, 20 ALLED & INSPECTED LETE	11:51 AM вок 5264 (113 <u>YES</u> 	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4*& 1* SAMPLE PIPING PASSED TESTIN SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED	5/22/13 AND CALIBRATION DA G GAUGE #: 8966699 Inspected by S-JAMES HAGEN	TE) CALIBRATION: 4/25/ CONTROL & CHEC HIGH POINT PLUG NDE ON PLUG SEA	2013 V CK VALVES INST S SEAL WELDED L WELDS COMPI	Witnessed by VGS-JOHN-SE Jo4-1 MAY 22ND, 20 ALLED & INSPECTED LETE	11:51 AM вок 7266 (113 YES N/A N/A YES	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4*& 1* SAMPLE PIPING PASSED TESTIN COMPANY WG SIGNATE WG PRINT NAME WG DATE WG POST HYDRO RESTORATION M/A HYDRO BLOWN DOWN & DRY N/A PROPER GASKETS INSTALLED YES PROPER BOLTING & TIGHTNESS YES	5/22/13 AND CALIBRATION DA G GAUGE #: 8966699 Inspected by S- JAMES HAGEN INFO HIGTISIN HIGTISIN HIGTISIN	TE) CALIBRATION: 4/25/ CONTROL & CHEC HIGH POINT PLUG NDE ON PLUG SEA	2013 V CK VALVES INST S SEAL WELDED L WELDS COMPI LVES CLOSED &	Witnessed by VGS-JOHN-SE J. J. J. J. J. MAY 22ND, 20 ALLED & INSPECTED LETE PLUGGED	11:51 AM вок УЕS <u>N/A</u> <u>YES</u>	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4*& 1* SAMPLE PIPING PASSED TESTIN SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS	5/22/13 AND CALIBRATION DA G GAUGE #: 8966699 Inspected by S-JAMES HAGEN INSPECTED by INSPECTED by INSPECTED by INSPECTED by Inspected by	TE) CALIBRATION: 4/25/ CONTROL & CHEC HIGH POINT PLUG NDE ON PLUG SEA	2013 V CK VALVES INST S SEAL WELDED L WELDS COMPI LVES CLOSED &	Witnessed by VGS-JOHN-SE Jo4-1 MAY 22ND, 20 ALLED & INSPECTED LETE PLUGGED Witnessed by	11:51 AM вок УЕS <u>N/A</u> <u>YES</u>	
4 HOURS DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4*& 1* SAMPLE PIPING PASSED TESTIN COMPANY WG SIGNATURE WG PRINT NAME VTA DATE M POST HYDRO RESTORATION M/A HYDRO BLOWN DOWN & DRY YES PROPER GASKETS INSTALLED YES PROPER BOLTING & TIGHTNESS YES COMPANY WG SIGNATURE YES	5/22/13 AND CALIBRATION DA G GAUGE #: 8966699 G Inspected by S-JAMES HAGEN AT THE STREET MAY 22ND, 2013 Inspected by S-JAMES HAGEN	TE) CALIBRATION: 4/25/ CONTROL & CHEC HIGH POINT PLUG NDE ON PLUG SEA	2013 V CK VALVES INST S SEAL WELDED L WELDS COMPI LVES CLOSED &	Witnessed by VGS-JOHN-SE Jo4-1 MAY 22ND, 20 ALLED & INSPECTED LETE PLUGGED Witnessed by	11:51 AM вок УЕS <u>N/A</u> <u>YES</u>	



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WILLBROS GOVERNMENT SERVICES (U.S.), LLC A WILLBROS COMPANY

PROJECT N62583-09-D-0132/0003	125000	LOCATION TANK TK5 JOB NUMBER 54118				
CONTRACTOR WILLBROS GOVERNMENT SE	RVICES	P & ID No.				
SERVICE NORMAL - ASME B31.3				N/A		
TEST PACK NUMBER. TANK 5 CASING SAMPL	E PIPING	DRAWING No.	N	ONE		
SYSTEM NUMBER				533 - 8	ti dete un	
MARK No. N/A		ISO No.				
LINE No.	2	152		N/A		
INTEGRITY TEST 3/4" SAMPLE P	PING			N/A		
LINE SPECIFICATION 10 FEET	11 	TEST MEDIUM	WATER			
DESIGN PRESSURE (MAWP) 100	PSI	TEST PRESSURE	150	<i>0</i> 2	PSI	
STRESS RELIEVED ¥6S NO	INTERNA	L LINING	¥ES NO	5 		
ALL PRE- TEST NDE COMPLETE AND ACCEPTED	SIGNATURE	1000		DATE		
MATERIAL RECORDS COMPLETE	SIGNATURE	5035 - FS		DATE		
WELDING HISTORY RECORDS COMPLETE	SIGNATURE		and the second se	DATE		
PRE-TEST INSPECTION FOREM/	AN SIGNATURE			DATE		
WELDING OF PRESSURE PARTS COMPLETE	N/A	SYSTEM FILLED	AND PURGED OF	AIR	YES	
PROPER GASKETS, BOLTS AND BLINDS	YES	TEMPERATURE W	ITHIN SPECIFICA	TION	YES	
TEMPORARY VENTS AND DRAINS INSPECTED	YES	HYDRO EQUIPME	NT AND GAGES I	NSPECTED	YES	
TEST PLUGS INSPECTED AND SECURED	YES	OPERATORS PRO	PERLY INSTRUCT	ED	YES	
INSTUMENTATION BLOCKED OR REMOVED	YES	BARRACADES IN PLACE AREA CLEARED OF PERSONEL			YES	
VALVES IN THE RIGHT POSITION (OPEN/CLOSED)	YES				YES	
TEST MEDIUM WITHIN SPECIFICATION	YES		with the second s		6	
QUALITY CONTRO	OL SIGNATURE	Nor.		DATE		
PRESSURE TEST	DATE OF TEST	1000 VOA	AMBIENT 72 F		FINISH	
duration 4 HOURS	10/07/201	0	72 F	8:05 AM	4:58 PM	
COMMENTS (TO INCLUDE GAUGE NUMBER AN 3/4" SAMPLE PIPING 10" LINE FAILED TESTING WOULDN'T MA			ATION			
2 (1997) 1998 Mar 2010 - 1973	spected by			Witnessed by		
COMPANY WGS-1	PAT COLLINS			WGS-REED CA		
SIGNATURE	(P)			(7.6)	in	
PRINT NAME	C				-	
DATE 1	/07/2010			10/07/2010	22. Margathermore	
POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY	_	CONTROL & CHE	CK VALVES INST	ALLED	YES	
HYDRO BLINDS PULLED YES		HIGH POINT PLUC	SS SEAL WELDED	& INSPECTED	N/A	
PROPER GASKETS INSTALLED YES	_	NDE ON PLUG SE	AL WELDS COMP	LETE	N/A	
PROPER BOLTING & TIGHTNESS YES		DRAIN / VENT VA	LVES CLOSED &	PLUGGED	YES	
In	spected by		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	Witnessed by		
COMPANY WGS-1	PAT COLLINS			WGS- REED CA	Chickensel 1999	
SIGNATURE				~		
PRINT NAME	8					
DATE 10	/07/2010			10/07/2010	3 19 19 19 19 19 19 19 19 19 19 19 19 19	



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WILLBROS GOVERNMENT SERVICES (U.S.), LLC A WILLBROS COMPANY

PROJECT N625	583-09-D-0132/0003		LOCATION TAN	JK TK5	JOB NUMBER	5/118	
TROJECT TITE	WILLBROS GOVERNMENT SER	VICES	P & ID No.		JOB HUMBER	04110	
and the second se	IAL - ASME B31.3		F & ID NO.	h	V/A		
	BER. TANK 5 CASING SAMPLE	PIPING	DRAWING No.		ONE	2 3 18 - 0101	
SYSTEM NUMBER	AND AND DESCRIPTION OF A PARTY	FIEING	DRAWING NO.	1.1			
MARK No.	N/A		IFO No.	14 <u>8</u> -			
LINE No.	N/O		150 No.		N/A	- 1 10 - 1 1	
	TEGRITY TEST 3/4" SAMPLE PI	PING		5.	V/A		
LINE SPECIFICA			TEST MEDIUM	WATER	<u> </u>		
	RE (MAWP) 100	PSI	TEST PRESSURE			PSI	
STRESS RELIEVI		INTERNAL	LINING	¥ES NO			
ALL PRE- TEST N	DE COMPLETE AND ACCEPTED	SIGNATURE			DATE		
MATERIAL RECO	ORDS COMPLETE	SIGNATURE		1.00	DATE		
	ORY RECORDS COMPLETE	SIGNATURE			DATE	a - 6	
PRE-TEST INSPE		SIGNATURE	5-63-4 inc.		DATE	the Ma	
	ESSURE PARTS COMPLETE	N/A	SYSTEM FILLED	AND PURGED OF		YES	
PROPER GASKETS	S. BOLTS AND BLINDS	YES		VITHIN SPECIFICA		YES	
	TS AND DRAINS INSPECTED	YES	•6	ENT AND GAGES I		YES	
	ECTED AND SECURED	YES		PERLY INSTRUCT		YES	
	N BLOCKED OR REMOVED	YES		Particular and			
	IGHT POSITION (OPEN/CLOSED)	YES	AREA CLEARED OF PERSONEL				
1568998956517575962639 - 3019655868 95669775261155759689896699755666	THIN SPECIFICATION	YES	-	of TERGOREE		YES	
Dation "		1	-		2	 .	
	QUALITY CONTROL	L SIGNATURE			DATE		
PRESSURE TEST	4 HOURS	DATE OF TEST 10/08/201	0	AMBIENT TEMP. 71 F	start 7:58 AM	FINISH 9:15 AM	
10/545-025300000000102500 10/54900	D INCLUDE GAUGE NUMBER AND IG LINE FAILED TESTING WOULDN'T MAINT				Witnessed by		
COMPANY	WGS-	Pat Collins			WGS - Reed Ca	vin	
SIGNATURE	R				Accin		
PRINTNAME	<u> </u>					99	
DATE	10/(08/2010	-		10/08/2010		
POST HYDRO RES	N/A		CONTROL & CUS	CK VALVES INST	ALLED	YES	
HYDRO BLINDS P	YES	-				N/A	
PROPER GASKETS	VES			SS SEAL WELDED		N/A	
PROPER BOLTING	YES	2		AL WELDS COMP		YES	
	r			1			
COMPANY	2 2000 2000 2000 2000 2000	Pat Collins			Witnessed hy WGS - Reed Ca	vin /	
SIGNATURE							
PRINT NAME			21 1000				
DATE			e 69	f	/		
DATE	100000 1000 - 1000	18 - 1 <u>9</u>		2	3074		



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WILLBROS GOVERNMENT SERVICES (U.S.), LLC A WILLBROS COMPANY

PROJECT N62583-09-D-0132/0003		LOCATION TAN	K TK5	JOB NUMBER	54118
CONTRACTOR WILLBROS GOVERNMENT	SERVICES	P& ID No.			
SERVICE NORMAL - ASME B31.3		N/A			
TEST PACK NUMBER. TANK 5 CASING SAM		DRAWING No.		ONE	West -
SYSTEM NUMBER		DIGATING NO.			
MARK No. N/A		ISO No.	907850-		
LINE No.		100 110		N/A	
INTEGRITY TEST 3/4" SAMPL	E PIPING	N/A			
LINE SPECIFICATION 135 FEET		TEST MEDIUM	WATER		<u> </u>
DESIGN PRESSURE (MAWP) 100	PSI	TEST PRESSURE	150		PSI
STRESS RELIEVED	INTERNA		YES NO		
ALL PRE- TEST NDE COMPLETE AND ACCEPTE	D SIGNATURE			DATE	
MATERIAL RECORDS COMPLETE	SIGNATURE	177.5		DATE	
WELDING HISTORY RECORDS COMPLETE	SIGNATURE			DATE	
	EMAN SIGNATURE	12	5.07 M. B. N.	DATE	
WELDING OF PRESSURE PARTS COMPLETE	N/A	SYSTEM FILLED A	ND PURGED OF	NUMBER OF STREET	YES
PROPER GASKETS, BOLTS AND BLINDS	YES	TEMPERATURE W	91911 (1955 A FOTA ART FA		YES
TEMPORARY VENTS AND DRAINS INSPECTED	YES	- HYDRO EQUIPMEI			YES
TEST PLUGS INSPECTED AND SECURED	YES	OPERATORS PROP			YES
INSTUMENTATION BLOCKED OR REMOVED	YES	BARRACADES IN I	가가 있는 것이다. 이야지 않는 것이 있는 것이다. 		10 10 10 10 10 10 10 10 10 10 10 10 10 1
VALVES IN THE RIGHT POSITION (OPEN/CLOSE	ED) YES	AREA CLEARED O			YES
TEST MEDIUM WITHIN SPECIFICATION	YES	AREA CLEARED OF PERSONEL YES			150
1.446-91.022-022-022-022-022-022-022-022-022-022					2 - 40-
QUALITY CON	TROL SIGNATURE			DATE	10 10
PRESSURE TEST	DATE OF TEST 10/08/201	0	AMBIENT 72 F	START 10:08 AM	FINISH 12:05 AM
duration 4 HOURS		0	TEMP.		12.00741
4 HOURS DURATION 4 HOURS COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDN'T	AND CALIBRATION DA	TE)			
DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDN'T	AND CALIBRATION DA	TE)	TION	Witnessed by WGS - Reed Car	
DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDN'T	AND CALIBRATION DA MAINTAIN PRESSURE GAUGE	TE)	TION	Witnessed by	
DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDN'T COMPANY SIGNATURE	AND CALIBRATION DA MAINTAIN PRESSURE GAUGE	TE)	TION	Witnessed by	
DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDNT COMPANY SIGNATIURF PRINT NAME	AND CALIBRATION DA MAINTAIN PRESSURE GAUGE	TE)	TION	Witnessed by	
DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDNT COMPANY SIGNATIURF PRINT NAME	AND CALIBRATION DA MAINTAIN PRESSURE GAUGE Inspected by GS - Pat Collins	TE)	TION	Witnessed by WGS - Reed Ca	vin
DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDNT COMPANY SIGNATURE PRINT NAME DATE	AND CALIBRATION DA MAINTAIN PRESSURE GAUGE Inspected by GS - Pat Collins	TE)	TION:	Witnesseri by WGS - Reed Car CCC 10/08/2010	
DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDNT COMPANY SIGNATIURF PRINT NAME DATE POST HYDRO RESTORATION	AND CALIBRATION DA MAINTAIN PRESSURE GAUGE Inspected by GS - Pat Collins	TE) E#: 45-1279 #1 CALIBRA	TION:	Witnessed by WGS - Reed Ca Co 10/08/2010 ALLED	vin
DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDNT COMPANY SIGNATIURF PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED VES	AND CALIBRATION DA MAINTAIN PRESSURE GAUGE Inspected by GS - Pat Collins	TE) =# 45-1279 #1 CALIBRA 	TION CK VALVES INST S SEAL WELDED	Witnessed by WGS - Reed Car BCCC 10/08/2010 ALLED & INSPECTED	vin
DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDNT COMPANY W SIGNATIURF PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED VES	AND CALIBRATION DA MAINTAIN PRESSURE GAUGE Inspected by GS - Pat Collins	TE) #* 45-1279 #1 CALIBRA CONTROL & CHEC HIGH POINT PLUG	CK VALVES INST S SEAL WELDED	Witnessed by WGS - Reed Ca Control 10/08/2010 ALLED & INSPECTED LETE	vin YES N/A
DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDNT COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED YES	AND CALIBRATION DA MAINTAIN PRESSURE GAUGE Inspected by GS - Pat Collins	TE) #* 45-1279 #1 CALIBRA CONTROL & CHER HIGH POINT PLUG NDE ON PLUG SEA	CK VALVES INST S SEAL WELDED	Witnessed by WGS - Reed Ca 2000 10/08/2010 ALLED & INSPECTED LETE PLUGGED	vin
DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDNT COMPANY COMPANY W SIGNATURF PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS YES	AND CALIBRATION DA MAINTAIN PRESSURE GAUGE Inspected by GS - Pat Collins	TE) #* 45-1279 #1 CALIBRA CONTROL & CHER HIGH POINT PLUG NDE ON PLUG SEA	CK VALVES INST S SEAL WELDED	Witnessed by WGS - Reed Ca Control 10/08/2010 ALLED & INSPECTED LETE	VIN YES N/A N/A YES
DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDNT COMPANY COMPANY W SIGNATURF PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS YES	AND CALIBRATION DA MAINTAIN PRESSURE GAUGE Inspected by GS - Pat Collins 10/08/2010	TE) #* 45-1279 #1 CALIBRA CONTROL & CHER HIGH POINT PLUG NDE ON PLUG SEA	CK VALVES INST S SEAL WELDED	Witnessed by WGS - Reed Car 10/08/2010 ALLED & INSPECTED LETE PLUGGED Witnessed by	VIN YES N/A N/A YES
DURATION COMMENTS (TO INCLUDE GAUGE NUMBER 3/4" SAMPLE PIPING LINE FAILED TESTING WOULDNT COMPANY SIGNATIURF PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS YES COMPANY W	AND CALIBRATION DA MAINTAIN PRESSURE GAUGE Inspected by GS - Pat Collins 10/08/2010	TE) #* 45-1279 #1 CALIBRA CONTROL & CHER HIGH POINT PLUG NDE ON PLUG SEA	CK VALVES INST S SEAL WELDED	Witnessed by WGS - Reed Car 10/08/2010 ALLED & INSPECTED LETE PLUGGED Witnessed by	VIN YES N/A N/A YES



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WILLBROS GOVERNMENT SERVICES (U.S.), LLC A WILLBROS COMPANY

PROJECT N62583-09-D-0132/0003	LOCATION TANK TK5 JOB NUMBER 54118				
CONTRACTOR WILLBROS GOVERNMENT	SERVICES	P & ID No.			
SERVICE NORMAL - ASME B31.3			I/A	-	
TEST PACK NUMBER. TANK 5 CASING SAM			DNE	100 M	
SYSTEM NUMBER					
MARK No. N/A	219-052.	ISO No.	1723		
LINE No.	ale <u>t</u> et		I/A	- · · · · · · · · · · · · · · · · · · ·	
INTEGRITY TEST 3/4" SAMPLE	EPIPING	N/A			
LINE SPECIFICATION 190 FEET		TEST MEDIUM WATER			
DESIGN PRESSURE (MAWP) 100	PSI	TEST PRESSURE 150	10 - 1 Pa	PSI	
STRESS RELIEVED ¥ES NO	INTERNAL	LINING YES NO	in where a		
ALL PRE- TEST NDE COMPLETE AND ACCEPTEI	D SIGNATURE		DATE		
MATERIAL RECORDS COMPLETE	SIGNATURE		DATE		
WELDING HISTORY RECORDS COMPLETE	SIGNATURE		DATE	····	
PRE-TEST INSPECTION FORE	MAN SIGNATURE	1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 - 1990 -	DATE		
WELDING OF PRESSURE PARTS COMPLETE	N/A	SYSTEM FILLED AND PURGED OF A	· · · · · · · · · · · · · · · · · · ·	YES	
PROPER GASKETS, BOLTS AND BLINDS	YES	TEMPERATURE WITHIN SPECIFICA		YES	
TEMPORARY VENTS AND DRAINS INSPECTED	YES	HYDRO EQUIPMENT AND GAGES IN		YES	
TEST PLUGS INSPECTED AND SECURED	YES	OPERATORS PROPERLY INSTRUCT		YES	
NSTUMENTATION BLOCKED OR REMOVED	YES	BARRACADES IN PLACE		100	
VALVES IN THE RIGHT POSITION (OPEN/CLOSE		AREA CLEARED OF PERSONEL		YES	
TEST MEDIUM WITHIN SPECIFICATION	YES	- AREA CELARED OF PERSONEE		YES	
				tor n na	
QUALITY CON	TROL SIGNATURE		DATE		
PRESSURE TEST DURATION 4 HOURS	DATE OF TEST 10/08/2010	O AMBIENT 72 F	start 1:54 PM	FINISH 4:21 PM	
COMMENTS (TO INCLUDE GAUGE NUMBER A 3/4* SAMPLE PIPING LINE FAILED TESTING WOULDN'T N		leased a	Re Witnessed by	Gi-	
	and a balance in the Charles of the		WILLBESSED DV		
COMPANY	SS - Pat Collins		WGS - Reed Ca	vin	
	S - Pat Collins		52	vin	
SIGNATURE	35 - Pat Collins		52	vin	
SIGNATURE	25 - Pat Collins		52	vin	
SIGNATURE C	j)		WGS - Reed Ca		
SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION	j)	CONTROL & CHECK VALVES INST.	WGS - Reed Ca 10/08/2010	YES	
SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRYN/A YES	j)		WGS - Reed Ca 10/08/2010 ALLED		
SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED VES	j)	CONTROL & CHECK VALVES INST.	WGS - Reed Ca 10/08/2010 ALLED & INSPECTED	YES	
SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED YES	j)	CONTROL & CHECK VALVES INST. HIGH POINT PLUGS SEAL WELDED	WGS - Reed Ca 10/08/2010 ALLED & INSPECTED LETE	YES N/A	
SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED YES	j)	CONTROL & CHECK VALVES INST. HIGH POINT PLUGS SEAL WELDED NDE ON PLUG SEAL WELDS COMPI	WGS - Reed Ca 10/08/2010 ALLED & INSPECTED LETE	YES N/A N/A	
SIGNATHIRE PRINT NAME, DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS YES	10/08/2010	CONTROL & CHECK VALVES INST. HIGH POINT PLUGS SEAL WELDED NDE ON PLUG SEAL WELDS COMPI DRAIN / VENT VALVES CLOSED & I	WGS - Reed Ca 10/08/2010 ALLED & INSPECTED JETE PLUGGED	YES N/A N/A YES	
SIGNATHIRE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS COMPANY WC	10/08/2010	CONTROL & CHECK VALVES INST. HIGH POINT PLUGS SEAL WELDED NDE ON PLUG SEAL WELDS COMPI DRAIN / VENT VALVES CLOSED & I	WGS - Reed Ca 10/08/2010 ALLED & INSPECTED JETE PLUGGED Witnessed by	YES N/A N/A YES	
SIGNATHIRE PRINT NAME, DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS YES	10/08/2010	CONTROL & CHECK VALVES INST. HIGH POINT PLUGS SEAL WELDED NDE ON PLUG SEAL WELDS COMPI DRAIN / VENT VALVES CLOSED & I	WGS - Reed Ca 10/08/2010 ALLED & INSPECTED JETE PLUGGED Witnessed by	YES N/A N/A YES	



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WILLBROS GOVERNMENT SERVICES (U.S.), LLC A WILLBROS COMPANY

PROJECT N62583-09-D-0132/0003	1997	LOCATION TANK TK5	JOB NUMBER	54118	
CONTRACTOR WILLBROS GOVERNMI	ENT SERVICES	P & ID No.			
SERVICE NORMAL - ASME B31.3			I/A		
TEST PACK NUMBER. TANK 5 12"/16" IN			DNE		
SYSTEM NUMBER		DRAWING No.		No. 12	
MARK No. N/A		ISO No.	·	.	
LINE No.		225	VA		
INTEGRITY TEST 12" / 16"	INLET PIPING		/A		
LINE SPECIFICATION JP-8		TEST MEDIUM WATER			
DESIGN PRESSURE (MAWP) 100	PSI	TEST PRESSURE 150		PSI	
STRESS RELIEVED YES N	IO INTERNA	L LINING ¥ES NO	-		
ALL PRE- TEST NDE COMPLETE AND ACCI	EPTED SIGNATURE		DATE		
MATERIAL RECORDS COMPLETE	SIGNATURE		DATE		
WELDING HISTORY RECORDS COMPLETE	E SIGNATURE		DATE		
PRE-TEST INSPECTION	FOREMAN SIGNATURE		DATE		
WELDING OF PRESSURE PARTS COMPLET		SYSTEM FILLED AND PURGED OF A	And	YES	
PROPER GASKETS, BOLTS AND BLINDS	YES	TEMPERATURE WITHIN SPECIFICA	58595	YES	
TEMPORARY VENTS AND DRAINS INSPECT	TED YES	HYDRO EQUIPMENT AND GAGES IN		YES	
TEST PLUGS INSPECTED AND SECURED	YES	OPERATORS PROPERLY INSTRUCT		YES	
INSTUMENTATION BLOCKED OR REMOVE	D YES	BARRACADES IN PLACE		YES	
VALVES IN THE RIGHT POSITION (OPEN/C	Processing Processing	AREA CLEARED OF PERSONEL		YES	
TEST MEDIUM WITHIN SPECIFICATION	YES	-		160	
-		■ 11 (2.3.7.1) - 32		24 <u>500000</u>	
QUALITY	CONTROL SIGNATURE		DATE		
PRESSURE TEST DURATION 4 HOURS	DATE OF TEST 11/02/201	0 AMBIENT 74 F	start 9:32 AM	FINISH 3:17 PM	
COMMENTS (TO INCLUDE GAUGE NUM PIPING PASSED TESTING GAU			Witnessed by		
PIPING PASSED TESTING GAU	GE #: 45-1279 #1 CAL	IBRATION: 10/15/10	Witnessed by WGS - Reed Ca	vin	
PIPING PASSED TESTING GAU	GE #: 45-1279 #1 CAL	IBRATION: 10/15/10		vin	
PIPING PASSED TESTING GAU	GE #: 45-1279 #1 CAL	IBRATION: 10/15/10	WGS - Reed Ca	vin	
PIPING PASSED TESTING GAU	GE #: 45-1279 #1 CAL	IBRATION: 10/15/10	WGS - Reed Ca	vin	
PIPING PASSED TESTING GAU	GE #: 45-1279 #1 CAL Inspected by WGS - Pat Collins	IBRATION: 10/15/10	WGS - Reed Ca		
PIPING PASSED TESTING GAU	GE #: 45-1279 #1 CAL Inspected by WGS - Pat Collins	JBRATION: 10/15/10	WGS - Reed Ca	vin YES	
PIPING PASSED TESTING GAU COMPANY SIGNATHIRE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY	GE #: 45-1279 #1 CAL Inspected by WGS - Pat Collins 11/02/2010	UBRATION: 10/15/10	MGS - Reed Ca ALLED		
PIPING PASSED TESTING GAU COMPANY SIGNATIURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED	GE #: 45-1279 #1 CAL Inspected by WGS - Pat Colline 11/02/2010 N/A S	IBRATION: 10/15/10	WGS - Reed Ca ALLED & INSPECTED	YES	
PIPING PASSED TESTING GAU COMPANY SIGNATHE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED YES	GE #: 45-1279 #1 CAL Inspected by WGS - Pat Collins 11/02/2010 N/A S S	CONTROL & CHECK VALVES INST/	ALLED & INSPECTED ETE	YES N/A	
PIPING PASSED TESTING GAU COMPANY SIGNATHE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED YES	GE #: 45-1279 #1 CAL Inspected by WGS - Pat Collins 11/02/2010 N/A S S S	IBRATION: 10/15/10	ALLED AL	YES N/A N/A	
PIPING PASSED TESTING GAU COMPANY SIGNATHIRE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED YES	GE #: 45-1279 #1 CAL Inspected by WGS - Pat Collins 11/02/2010 N/A S S	IBRATION: 10/15/10 CONTROL & CHECK VALVES INST/ HIGH POINT PLUGS SEAL WELDED NDE ON PLUG SEAL WELDS COMPL DRAIN / VENT VALVES CLOSED & F	ALLED & INSPECTED ETE	YES N/A N/A YES	
PIPING PASSED TESTING GAU COMPANY SIGNATURE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS YES COMPANY	GE #: 45-1279 #1 CAL Inspected by WGS - Pat Collins 11/02/2010 N/A S S S Inspected by	IBRATION: 10/15/10 CONTROL & CHECK VALVES INST/ HIGH POINT PLUGS SEAL WELDED NDE ON PLUG SEAL WELDS COMPL DRAIN / VENT VALVES CLOSED & F	MGS - Reed Ca ALLED & INSPECTED .ETE PLUGGED Witnessed by	YES N/A N/A YES	
PIPING PASSED TESTING GAU COMPANY SIGNATHIRE PRINT NAME DATE POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY HYDRO BLINDS PULLED PROPER GASKETS INSTALLED PROPER BOLTING & TIGHTNESS	GE #: 45-1279 #1 CAL Inspected by WGS - Pat Collins 11/02/2010 N/A S S S Inspected by	IBRATION: 10/15/10 CONTROL & CHECK VALVES INST/ HIGH POINT PLUGS SEAL WELDED NDE ON PLUG SEAL WELDS COMPL DRAIN / VENT VALVES CLOSED & F	MGS - Reed Ca ALLED & INSPECTED .ETE PLUGGED Witnessed by	YES N/A N/A YES	



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WILLBROS GOVERNMENT SERVICES (U.S.), LLC A WILLBROS COMPANY

PROJECT N62583-09-D-0132/0003		LOCATION TANK TK5 JOB NUMBER	54118		
CONTRACTOR WILLBROS GOVERNMENT SI	ERVICES	P&ID No.			
SERVICE NORMAL - ASME B31.3		N/A	<u> </u>		
TEST PACK NUMBER. TANK 5 20"/32" INLETPI	IPING	DRAWING No. NONE			
SYSTEM NUMBER	<u></u>	Did wind no.			
MARK No. N/A	00 <u>= 1</u>	ISO No.			
LINE No.	10.000 and 10.000	N/A			
INTEGRITY TEST 20"/32" INLET	PIPING	N/A			
LINE SPECIFICATION JP-8		TEST MEDIUM WATER			
DESIGN PRESSURE (MAWP) 100	PSI	TEST PRESSURE 150	PSI		
STRESS RELIEVED YES NO	INTERNA	L LINING YES NO			
ALL PRE- TEST NDE COMPLETE AND ACCEPTED	SIGNATURE	DATE			
MATERIAL RECORDS COMPLETE	SIGNATURE	DATE			
WELDING HISTORY RECORDS COMPLETE	SIGNATURE	DATE			
PRE-TEST INSPECTION FOREM	IAN SIGNATURE	. DATE			
WELDING OF PRESSURE PARTS COMPLETE	N/A	SYSTEM FILLED AND PURGED OF AIR	YES		
PROPER GASKETS, BOLTS AND BLINDS	YES	TEMPERATURE WITHIN SPECIFICATION	YES		
TEMPORARY VENTS AND DRAINS INSPECTED	YES	HYDRO EQUIPMENT AND GAGES INSPECTED	YES		
TEST PLUGS INSPECTED AND SECURED	YES	OPERATORS PROPERLY INSTRUCTED	YES		
NSTUMENTATION BLOCKED OR REMOVED	YES	BARRACADES IN PLACE	10 10		
VALVES IN THE RIGHT POSITION (OPEN/CLOSED)		AREA CLEARED OF PERSONEL	YES		
TEST MEDIUM WITHIN SPECIFICATION	YES	- AREA CLEARED OF TERSORED	YES		
QUALITY CONTR PRESSURE TEST		DATE			
duration 4 HOURS	DATE OF TEST 11/06/201	0 AMBIENT 74 F START TEMP. 74 F 8:10 AM	6:12 PM		
COMMENTS (TO INCLUDE GAUGE NUMBER AN PIPING PASSED TESTING GAUGE #:					
I	nspected by	Witnessed by			
WC	nspected by	Holen	53321		
COMPANY WGS	nspected by	Witnessert by	5337		
COMPANY WGS SIGNATURE PRINT NAME	nspected by S - Pat Collins	Witnessert by	5337		
COMPANY WGS SIGNATURE	nspected by	Witnessert by	avin		
COMPANY WGS NGNATHRE PRINT NAME DATE 1	nspected by S - Pat Collins	Witnessed by WGS - Reed Ca	avin		
COMPANY WGS SIGNATHRE PRINT NAME DATE 1 POST HYDRO RESTORATION	nspected by S - Pat Collins	Witnessed by WGS - Reed Ca	avin		
COMPANY WGS NGNATHRE PRINT NAME DATE 1 POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY N/A YES	nspected by S - Pat Collins	Witnessed by WGS - Reed Cz	avin		
COMPANY WGS NGNATHRE PRINT NAME DATE 1 POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY <u>N/A</u> HYDRO BLINDS PULLED YES	nspected by S - Pat Collins	Witnessed by WGS - Reed Ca WGS - Reed Ca 11/06/2010 CONTROL & CHECK VALVES INSTALLED	YES		
COMPANY WGS SIGNATHRE PRINT NAME DATE 1 POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY <u>N/A</u> HYDRO BLOWN DOWN & DRY <u>YES</u> PROPER GASKETS INSTALLED <u>YES</u>	nspected by S - Pat Collins	Witnessed by WGS - Reed Ca WGS - Reed Ca WGS - Reed Ca 11/06/2010 CONTROL & CHECK VALVES INSTALLED HIGH POINT PLUGS SEAL WELDED & INSPECTED	YES		
COMPANY WGS SIGNATHRE	nspected by S - Pat Collins 1/06/2010	Witnessed by WGS - Reed Ca Witnessed by WGS - Reed Ca UK 11/06/2010 CONTROL & CHECK VALVES INSTALLED HIGH POINT PLUGS SEAL WELDED & INSPECTED NDE ON PLUG SEAL WELDS COMPLETE	YES N/A N/A YES		
COMPANY WGS SIGNATHRE PRINT NAME DATE 1 POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY <u>N/A</u> HYDRO BLINDS PULLED <u>YES</u> PROPER GASKETS INSTALLED <u>YES</u> PROPER BOLTING & TIGHTNESS <u>YES</u>	nspected by S - Pat Collins 1/06/2010	Witnessed by WGS - Reed Ca WGS - Reed Ca N1/06/2010	YES N/A N/A YES		
COMPANY WGS SIGNATHRE PRINT NAME DATE 1 POST HYDRO RESTORATION HYDRO BLOWN DOWN & DRY N/A HYDRO BLINDS PULLED YES PROPER GASKETS INSTALLED YES PROPER BOLTING & TIGHTNESS YES	nspected by S - Pat Collins 1/06/2010	CONTROL & CHECK VALVES INSTALLED HIGH POINT PLUGS SEAL WELDED & INSPECTED NDE ON PLUG SEAL WELDED & INSPECTED NDE ON PLUG SEAL WELDS COMPLETE DRAIN / VENT VALVES CLOSED & PLUGGED Witnessed by	YES N/A N/A YES		
COMPANY WGS SIGNATHRE	nspected by S - Pat Collins 1/06/2010	CONTROL & CHECK VALVES INSTALLED HIGH POINT PLUGS SEAL WELDED & INSPECTED NDE ON PLUG SEAL WELDED & INSPECTED NDE ON PLUG SEAL WELDS COMPLETE DRAIN / VENT VALVES CLOSED & PLUGGED Witnessed by	YES N/A N/A YES		



Certificate of Calibration

Traceability Job No 109320.001

Prepared For WILLBROS GOVERNMENT SERVICES

99–2500 HALWA VALLEY ST AIEA, HI 96701

P.O. No: VERBAL CASEY/SALES Data Reqd: Yes

Instrument Information

Inst Descrip: PRESSURE GAUGE	Calibration Site IN SHOP	As Received	Acloft
Manufacturer ASHCROFT	Date Rec 25-Apr-2013	AS RECEIVED	As Left
Model 45-127955-04L-400#	Date of Cal 25-Apr-2013	IN TOLERANCE	IN TOLERANCE
Serial No. 8966699	Next Cal Due: 25-Apr-2014	OPERATIONAL	OPERATIONAL
Cust ID No: 8966699	Procedure S01491		FULL CAL
Accuracy ± 0.5% F.5.	Cal Result PASS		NOT ADJUSTED
Remarks SEE ATTACHED DATA SH	EET		

Calibration Standards Used

ID No	Model No	Manufacturer	Description	Serial No	Cal Date	Cal Due
F436	ST-2H	HEISE	CALIBRATOR	50055	25-Jan-2013	25-Jan-2014
F487	HQS-2	HEISE	PRESSURE MODULE	HQS-15614	05-Feb-2013	05-Feb-2014

Calibration	Deem	Environment
Calibration	KOOM	Environment

Temperature: 70F/21.1C

Relative Humidity: 49 %

Barometric Pressure: N/A

This item meets published specifications. It has been calibrated using standards traceable to the National Institute of Standards and Technology. Alternatively, accuracies have been derived from accepted values of natural physical constants, or derived by the ratio type of self-calibration techniques. This certificate may be reproduced in full. Partial reproduction may be done only with written prior consent. All calibration activities are performed in compliance with ANSI/NCSL 2540.3-2006, ISO 10012, and MIL-STD-45662A.

FLW Service Corporation

Issued On April 25, 2013 By:

5672 Bolsa Avenue Huntington Beach, CA 92649 (800) 576-6308 Fax: (714) 622-2002

Ygnacio Garcia, Technician

FORM P370-15.2 Mar 2012



FLW Service Corporation

5672 Bolsa Avenue Huntington Beach, CA 92649 Ph 714-751-7512 Fax 714-755-7332 http://www.flw.com

Job/Traceability #: 109320.001

DATA REPORT

ID: 8966699

Date: 04/25/13

Unit of Measurement:		1
0	to _	-400
racy:	0.5	°o FS
	asurement: 0 racy:	0 to

UUT Resolution: 1

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STANDARD READING PS1	UUT AS FOUND PSI	ERROR %		UUT AS LEFT PSI	ERROR %	
0	0	0.000	Pass	0	0.000	Pass
80	81	0.250	Pass	81	0.250	Pass
160	160	0.000	Pass	160	0.000	Pass
240	239	0.250	Pass	239	0,250	Pass
320	318	0.500	Pass	318	0.500	Pass
400	400	0.000	Pass	400	0.000	Pass
					n - San Alexandro - L	
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				Contra da		

PSI

Remarks:

Data Taken By:

Auc

FORM P370-30

Form RD001/ Pg 1

RD Technology of Hawaii

134 Nakolo Piace Honolulu, HI 96819 (808) 833-3499

Certificate of Calibration

Willbros C	Government Serv	ices		
집을 즐기 뒤 봐.	vernment Services			
99-2500 Hal	lawa Valley St.			
Aiea	HI 96701-	(808) 352-0528		
Ashcroft			0-300 PSI	
Manufact	urer		Madel	
16531			Pressure Gauge	
Serial Nu		The second second	Description	
06/07/201	12		112,776	
Calibratio		10 x 2 4 1	Test Number	
06/07/201	13		the state of the s	
Recalibra	and the second of the second s		Asset Number	
NAVAIR	17-20MP-06		23 °C	43 % RH
No. of Concession, No. of Conces	nt Accuracy Pro	cedure	Temperature	Humidity

RD Technology of Hawaii certifies that the above listed instrument meets or exceeds all published specifications and has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology within the limitations of the Institutes calibration services, or have been derived from accepted values of natural physical constants, or have been by the ratio type of self-calibration techniques. Our "Calibration System Requirements" is in compliance with ANSI/NCSL Z540-1 standards.

Calibration Standards Used:

Fouin #	Manufacturer	Description	Model	Serial	Date Calibrated	Date Due
10,009	DH Instruments	Pressure Control Calibrator	PPC2 AF	190	04/24/2012	04/24/2013

In Tolerance Condition Received In Tolerance Condition Returned

RD Technology of Hawaii / DB ertified B AL

This calibration document shall not be reproduced in part or full, without written approval of the issuer.

Form RD001/ Pg 1

RD Technology of Hawaii

134 Nakolo Place Honolulu, HI 96819 (808) 833-3499

Certificate of Calibration

Willbros Government Services	
Willbros Government Services	
99-2500 Halawa Valley St.	
Alea HI 96701- (808) 352-0528	
Ashcroft	0-300 PSI
Manufacturer	Model
16567	Pressure Gauge
Serial Number	Description
06/21/2012	112,896
	Test Number
Calibration Date	
06/21/2013	A DE MARKET N AND A DE MARKET OF THE REAL OF
Recalibration Due	Asset Number
NAVAIR 17-20MP-06	25 °C 45 % RH
Instrument Accuracy Procedure	Temperature Humidity

RD Technology of Hawaii certifies that the above listed instrument meets or exceeds all published specifications and has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology within the limitations of the Institutes calibration services, or have been derived from accepted values of natural physical constants, or have been by the ratio type of self-calibration techniques. Our "Calibration System Requirements" is in compliance with ANSI/NCSL Z540-1 standards

Calibration Standards Used:

Fouio #	Manufacturer	Description	Model	Serial	Date Calibrated	Date Due	
10,009	OH Instruments	Pressure Control Calibrator	PPC2 AF	190	04/24/2012	04/24/2013	

In Tolerance Condition Received In Tolerance RD Technology of Hawaii / DB Certified By Con Br. 200

Condition Returned

This calibration document shall not be reproduced in part or full, without written approval of the issuer



Caltrol, Inc. 91-110 Hanua Street Kapolei, HI 96701 Ph 808-487-7717 Fax 808-488-3343

CALIBRATION CERTIFICATE

This is to certify that the following pressure instruments were checked at various pressure points for accuracy with a Keller LEO 1 Manometer SN: 14734, traceable to the National Institute of Standards and Technology, NIST and found to be within calibration specifications.

Date: October 15, 2010

Purchase order #: CC, Ann Manners

Customer: Willbros Government Services

Sale Order #: 398716

Ashcroft 45-1279SS-04L-300 0-300# PSI Gauge #2

Actual:	Up scale <u>reading:</u>	Down scale <u>reading:</u>
50 psig	49.5 psig	49.6 psig
100 psig	101.2 psig	101.2 psig
150 psig	152 psig	152 psig
200 psig	202.2 psig	202 psig
250 psig	252.2 psig	252.4 psig

Authorized Signatur Shaon Fergueson/



Caltrol, Inc. 91-110 Hanua Street Kapolei, HI 96701 Ph 808-487-7717 Fax 808-488-3343

CALIBRATION CERTIFICATE

This is to certify that the following pressure instruments were checked at various pressure points for accuracy with a Keller LEO 1 Manometer SN: 14734, traceable to the National Institute of Standards and Technology, NIST and found to be within calibration specifications.

Date: October 15, 2010

Purchase order #: CC, Ann Manners

Customer: Willbros Government Services

Sale Order #: 398716

Ashcroft 45-1279SS-04L-300 0-300# PSI Gauge #/

<u>Actual:</u>	Up scale <u>reading:</u>	Down scale reading:
50 psig	50.5 psig	50.6 psig
100 psig	100.7 psig	100.2 psig
150 psig	151.2 psig	150.7 psig
200 psig	201.9 psig	202 psig
250 psig	251.9 psig	252.2 psig

Authorized Signature Shaun Fergueson



Certificate of Calibration

Traceability Job No 108644.001

Prepared For WILLBROS GOVERNMENT SERVICES

99-2500 HALWA VALLEY ST AIEA, HI 96701

P.O. No: 54118-641/SALES Data Reqd: Yes

Instrument Information

Inst Descrip PRESSURE GAUGE	Calibration Site IN SHOP	A. Deserved	A
Manufacturer ASHCROFT	Date Rec: 15-Nov-2012	As Received	As Left
Model 45-127955-04L-300#	Date of Cal 15-Nov-2012	IN TOLERANCE	IN TOLERANCE
Serial No: 8966476	Next Cal Due 15-Nov-2013	OPERATIONAL	OPERATIONAL
Cust ID No: 8966476	Procedure S01491		FULL CAL
Accuracy ± 0.5% F.S.	Cal Result PASS		NOT ADJUSTED
Remarks SEE ATTACHED DATA SH	EET		

Calibration Standards Used

ID N	o Model No	Manufacturer	Description	Serial No	Cal Date	Cal Due
F486	PTE-I /FM	HEISE	PRESSURE CALIBRATOR	9999	18-jan-2012	18-Jan-2013
F447	HQS-2	HEISE	PRESSURE MODULE	HQ5-29535	17-May-2012	17-May-2013

Ca	libration Room Environn	nent
Temperature: 72F/22.2C	Relative Humidity: 42 %	Barometric Pressure: N/A
Technology. Alternatively, accuracies have be	een derived from accepted values of natura te may be reproduced in full. Partial rep	eable to the National Institute of Standards and Il physical constants, or derived by the ratio type production may be done only with written prior 2006, ISO 10012, and MIL-STD-45662A,
FLW Service Corporat	tion Issued O	n November 15, 2012 By:
5672 Bolsa Avenue		11
Huntington Beach, CA 926	549 441	mis America
(800) 576-6308 Fax: (714) 62	2-2002 Y90a	utico Africian

FORM P370-15 2 Mar 2012



C

FLW Service Corporation

5672 Bolsa Avenue Huntington Beach, CA 92649 Ph 714-751-7512 Fax 714-755-7332 http://www.flw.com

Job/Traceability #:	108644.001	DATA REPORT	ID:	8966476	

Date:	11/	15/12
_		

Unit of Me	asurement:	PS	1
Range:	0	to	300
UUT Accu	racy:	0.5	°o FS
UUT Resol	ution:	0.1	PSI

	ERROR %	UUT AS LEFT PSI		ERROR	UUT AS FOUND PSI	STANDARD READING PSI
Pas	0.000	0.0	Pass	0.000	0.0	0
Pas	0.033	60.1	Pass	0.033	60,1	60
Pas	0.000	120.0	Pass	0.000	120.0	120
Pas	0.000	180.0	Pass	0.000	180.0	180
Pas	0.000	240.0	Pass	0.000	240.0	240
Pas	0.000	300.0	Pass	0.000	300.0	300
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Remarks:

Data Taken By:

Amin yamio

FORM P370-30

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Page I of I (Data)

June 2006

AMENDMENT OF SOLICIT		FICATION OF CONTRACT	1 CONTRACT	ID CODE	PAGE OF PAGES
AMENDMENT OF SOLICIT	AHON/MODI	FICATION OF CONTRACT	J		1 <u>1</u> 9
2 AMENDMENT/MODIFICATION NO	3 EFFECTIVE DATE	4 REQUISITION/PURCHASE REQ NO	12	5 PROJECT	NO (Ifapplicable)
09	15-Dec-2011	ACQR1305421			
6 ISSUED BY CODE	N62583	7 ADMINISTERED BY (Ifother than item 6)	CO	DE	
NAVAL FACILITIES ENG NEER NG COMMAND SPECIALTY CENTER ACQUISITIONS NAVFAC CODE AQ00/NAVAL BASE VENTURA COUNTY 1100 23RD AVE BLDG 1100 PORT HUENEME CA 93043-4347		See Item 6			
8. NAME AND ADDRESS OF CONTRACTOR	(No., Street, County,	State and Zip Code)	9A. AMENDM	ENT OF SO	LICITATION NO.
WILBROS GOVERNMENT SERVICES (U.S.), ILC 2087 E 71ST ST STE 101			9B. DATED (S	EE ITEM 11)
TULSA OK 74136-5462			X 10A. MOD. OF N62583-09-D-0	CONTRAC 0132-0003	T/ORDER NO.
			10B. DATED	(SEE ITEM	13)
CODE 1KPK4	FACILITY CO		X 13-Jan-2010		
		APPLIES TO AMENDMENTS OF SOLI	F	-	nevra II
The above numbered solicitation is amended as set for	rth in Item 14 The hour and	date specified for receipt of Offer	is extended,	is not exten	ıded
Offer must acknowledge receipt of this amendment pr			2. The second		
(a) By completing Items 8 and 15, and returning or (c) By separate letter or telegram which includes a	State and the state of the second state of the state of the second	ent; (b) By acknowledging receipt of this amendment		A CONTRACTOR OF	
RECEIVED AT THE PLACE DESIGNATED FOR T				IO BE	
REJECTION OF YOUR OFFER Ifby virtue of this	amendment you desire to ch	ange an offer already submitted, such change may	be made by telegramor le	tter,	
provided each telegram or letter makes reference to th	e solicitation and this amen	idment, and is received prior to the opening hour a	and date specified		
12. ACCOUNTING AND APPROPRIATION I	OATA (If required)				
See Schedule					
		TO MODIFICATIONS OF CONTRACT CT/ORDER NO. AS DESCRIBED IN IT			
A. THIS CHANGE ORDER IS ISSUED PURS CONTRACT ORDER NO. IN ITEM 10A	UANT TO: (Specify			MADE IN TH	Æ
B. THE ABOVE NUMBERED CONTRACT/ office, appropriation date, etc.) SET FOR				as changes ir	1 paying
X C. THIS SUPPLEMENT AL AGREEMENT 1 FAR 43.103(a)(3)	IS ENTERED INTO P	URSUANT TO AUTHORITY OF:			
D. OTHER (Specify type of modification and	d authority)				
E. IMPORTANT: Contractor is not,	X is required to si	gn this document and return 1	copies to the issuin	g office.	
14. DESCRIPTION OF AMENDMENT/MODIL where feasible.) Modification Control Number: brooksa1.		d by UCF section headings, including solid	itation/contract subj	ect matter	
The purpose of this supplemental modificatio mandatory repairs on Tank 5 in accordance			inding in order to pe	rform all	
Acceptance of this modification by the Contr money and for any and all costs, impact effo			the second s		
Event as provided herein all terms and conditions of the	document referenced in Iter	19A or 10A as heretofire changed some	nged and in full free and	effect	
Except as provided herein, all terms and conditions of the 15A. NAME AND TITLE OF SIGNER (Type of	in consistence	16A. NAME AND TITLE OF CC			or print)
TOR THE AND TITLE OF SUMER (1 ype 0	a princy	MARIA R. MILLER / CONTRACTS TEL: 805-982-2515	EMAL: maria.mille	3. 5.5 	or hume)
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNE	ED 16B. UNITED STATES OF AME	C. Martine	160	C. DATE SIGNED
(Signature of person authorized to sign)	-	BY (Signature of Contracting Of	ficer)	22	2-Dec-2011
EXCEPTION TO SF 30		30-105-04		NDARD FC	ORM 30 (Rev. 10-83)
ADDROVED BY OIPM 11 84		30-103-04	51 /	TUDARD PC	(ICev. 10-63)

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

The following have been added by full text:

In accordance with contract clause 52.243-4 "Changes (JUN 2007)", as negotiated between the Contractor and the Government, the Contractor is hereby to provide all labor, materials, equipment, supervision, inspection, and related work necessary to perform the following additional work as provided in the Statement of Work and as outlined in the following Contractor RFIs:

RFI #07: Refurbish isolation and skin valves, dated 20 OCT 2010	\$34,463.00
RFI #08: Install Datum Plate, dated 20 OCT 2010	\$1,550.00
RFI #22: Immediate Repairs, dated 20 OCT 2010	\$291,798.39
RFI #22: Short Term Repairs, dated 07 JAN 2011	\$353,895.46
RFI #22: Long Term Repairs, dated 07 JAN 2011	\$294,025.97
RFI #23: Preparation and Coating, dated 03 FEB 2011	\$1,021,333.22
RFI #26: Remove and Replace Sample Lines, dated 31 MAR 2011	\$51,806.72

Total Cost: \$2,048,872.76

SECTION A - SOLICITATION/CONTRACT FORM

The total cost of this contract was increased by \$2,048,872.76 from \$4,608,288.92 to \$6,657,161.68.

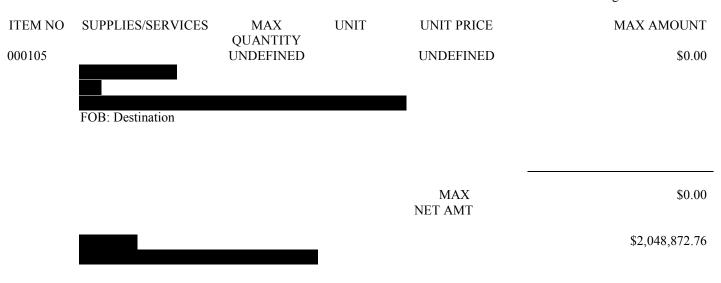
SECTION B - SUPPLIES OR SERVICES AND PRICES

CLIN 0001

The pricing detail quantity has increased by 2,048,872.76 from 4,608,288.92 to 6,657,161.68. The total cost of this line item has increased by \$2,048,872.76 from \$4,608,288.92 to \$6,657,161.68.

SUBCLIN 000105 is added as follows:

N62583-09-D-0132 000309 Page 3 of 19



SECTION C - DESCRIPTIONS AND SPECIFICATIONS

The following have been added by full text:

NEW TASKING

STATEMENT OF WORK ENGINEERING SERVICES POST API 653 INSPECTION REPAIR OF RED HILL TANK 5 NAVSUP FLC PEARL HARBOR PEARL HARBOR, OAHU, HAWAII

1.0 INTRODUCTION

1.1 LOCATION

The work is located at the Red Hill Underground Fuel Storage Facility, Naval Supply Fleet Logistics Center (NAVSUP FLC), Pearl Harbor, Hawaii.

1.2 DESCRIPTION OF WORK

The work includes all mandatory, short term, long term repairs recommended from the modified out of service API 653 inspection report for Red Hill Tank 5. Also included are the additional repairs listed in section 4.1.1. The major repair entails patch plate repairs and weld repairs of suspected thin spots, hollow spots, refurbish skin valves, and new coating system for lower dome. The Contractor shall provide all facilities, labor, transportation, equipment, tools, materials, incidentals, supervision and inspection necessary to perform the work.

1.3 FACILITY DESCRIPTION

The Red Hill Underground Fuel Storage Facility is located on the Island of Oahu, Hawaii. The Red Hill Underground Fuel Storage Facility consists of multiple underground storage tanks constructed in 1942-1943. The Red Hill Tanks have a coated welded steel liner backed up by concrete which bears against the solid rock from which the Tanks were carved. Each tank's nominal capacity is 302,000 barrels, and the

entire facility is capable of holding up to 252 million gallons of three different products, JP-5, JP-8 and F-76. The facility is used to store fuel in support of military operation on Oahu, in the mid-Pacific area and other area as required. The configuration of these vertical cylindrical tanks is 100 feet in diameter and 250 feet in height. The tank is domed on the lower and upper ends. Access to the Tanks is provided by an upper access tunnel 190 feet above the tank bottoms and a lower access tunnel just below the tank bottoms. Both upper and lower access tunnels are located between the two rows of ten (10) tanks. The lower tunnel extends over three miles to Pumphouse 59 at Kuahua and contains three fuel lines. And there are three entrances to the Harbor Tunnel – at the Underground Pump House (Adit 1), at Makalapa Adit 2, and the Red Hill Complex Tankage (Adit 3, Adit 4 and Adit 5).

1.4 **OPERATIONS**

The Red Hill Tanks are under the control of NAVSUP FLC Pearl Harbor. NAVSUP FLC Pearl Harbor personnel perform operation, patrol, and maintenance of the Red Hill Facility including the tanks. NAVSUP FLC Pearl Harbor will provide personnel and equipment needed to operate the tanks when previously notified by the Contractor. At no time shall the Contractor operate the tanks or any other government equipment, unless given prior approval from the Government fuels manager.

1.5 BACKGROUND

Tank 5 was constructed in 1942. It was converted from storage of Navy Distillate to JP-5 in 1974. Last time cleaning was performed in 2010 and inspected under modified API 653 in Nov 2010.

2.0 <u>SCOPE</u>

2.1 GENERAL

The Contractor shall provide the necessary qualified personnel, equipment and materials to perform all of the following work concerning repair of Tank 5.

2.2 WORK TO BE ACCOMPLISHED

Work under this Contract includes API 653 recommended (immediate, short term, and long term) and other repairs for Red Hill Tank 5. This work shall include, but not be limited to:

- a. Develop Work Plan, including detail coating plan, to perform the Work. An addendum to the current Work Plan is acceptable.
- b. Develop and Submit submittals as required by the approved Work Plan
- c. Develop Health and Safety Plan to perform the Work. An addendum to the current Health and Safety Plan is acceptable.
- d. Develop Environmental Protection Plan which shall include Hazardous Waste Disposal Plan. An Addendum to the current Environmental Protection Plan is acceptable.
- e. Perform required Work in accordance with the approved Work Plan. Detail of how to accomplish the work shall be determined by the Contractor, and the approved Work Plan shall include the sequence of work items to accomplish the work items listed on SOW.
- f. Any repair recommended in the inspection report shall be performed.
- g. Any additional repair as outlined further in section 4.0 shall be performed.
- h. Post-repair inspection shall be performed to serviceability statement.

These tasks are further specified in paragraphs 4.0 and 5.0.

3.0 GOVERNMENT FURNISHED INFORMATION (GFI) AND MATERIALS (GFM)

3.1 GOVERNMENT FURNISHED INFORMATION

a. N/A

3.2 GOVERNMENT FURNISHED MATERIAL

a. N/A

4.0 ENGINEERING SERVICES

4.1 PRE ON-SITE WORK DOCUMENTATION

4.1.1 Work Plan

a. Prior to performing the cleaning/inspection to Tank 5, as listed in Paragraph 2.2, the Contractor shall prepare a Work Plan. The Work Plan shall include, but not limited to:

- (1) Scope of Work & Procedures
- (2) Detailed Work Schedule
- (3) Subcontractors
- (4) Responsibilities of all parties
- (5) Required Permitting
- (6) Applicable Unified Facilities Guide Specifications and API Standards and Recommended Practice (RP), to include, but not limited to:
 - i. 01 11 00 (01110) Summary of Work
 - ii. 01 14 00 (01140) Work Restrictions
 - iii. 01 32 16.00 20 (01320) Construction Progress Documentation
 - iv. 01 33 00 (01330) Submittal Procedures
 - v. 01 45 00.00 20 (01450) Construction Quality Control
 - vi. 01 35 29 (01525) Safety Requirements
 - vii. 02 41 00 (02220) Demolition
 - viii. 23 14 00 (15996) Commissioning of Fuel Facility Systems
 - ix. 13219N Cleaning Petroleum Storage Tanks
 - x. 09 07 13.15 Epoxy/Fluoropolyurethane Interior Coatings of Welded Steel Petroleum Fuel Tanks
 - xi. 09 97 13.27 Exterior Coating of Steel Structures
 - xii. API 650 Welded Steel Tanks for Oil Storage
 - xiii. API 653 Tank Inspection, Repair, Alteration, and Reconstruction
 - xiv. API 2015 Safe Entry and Cleaning of Petroleum Storage Tanks
 - xv. API RP 2016 Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks
 - xvi. API RP 651 Cathodic Protection of Aboveground Petroleum Storage Tanks
 - xvii. SNT-TC-1A Personnel Qualification and Certification in Nondestructive Testing
 - xviii. API MPMS Manual of Petroleum Measurement Standards Chapter 2 Tank Calibration
 - xix. NACE Recommended Practice, RP 0169 Control of External Corrosion on Underground or Submerged Metallic Piping Systems
 - xx. NACE Recommended Practice, RP0184-97 Repair of Lining Systems
 - xxi. NACE Recommended Practice, RP0193 External Cathodic Protection of On-Grade Carbon Steel Storage Tank Bottoms
 - xxii. NACE Recommended Practice, RP0288-94, Inspection of Linings on Steel and Concrete
- (7) Transportation of Material and Equipment (including to location of work)
- (8) Mobilization and Demobilization

- (9) Submittal Register
- b. The Work Plan shall incorporate all Local, State, and Federal regulations.

c. Tank 5 has been remained empty since the last out-of-service API 653 inspection in November 2010. No cleaning is required. However, ventilation/degasing and gas free certification of Tank 5 prior to start any work inside of the tank shall be in accordance with API Standard 2015 and RP 2016 as required. The Contractor shall maintain a vapor-free condition throughout the project period, inside of the tank. Before tank repair operations begin and before workers enter the tank, the Contractors shall develop and implement written tank entry programs, including a Confined Space Program.

- d. Perform following repairs in accordance to API 650, 653, UFGS 09 97 13.15 and UFC 3-460-03.
 - i. Perform welding repairs on 138 locations identified with weld flaws.
 - ii. Perform 6" patch plate repairs on 532 locations identified with holes, gouges, or pits.
 - iii. Perform 12" patch plate repairs on 36 locations identified with corrosion or pits.
 - iv. Perform 24" patch plate repairs on 3 locations identified with corrosion or pits.
 - v. Perform 20" x 37" patch plate repair at 1 location identified with corrosion or pits.
 - vi. Minimum preparation work shall be required for welding patch plates on all locations. After requested repairs, all required NDTs shall be performed, including vacuum box test and MT. NDE personnel shall be certified in accordance with ASME B31.3
 - vii. Remove and replace all interior and exterior sample lines. New interior sample tubes shall be installed along the tank center tower. The end of those sample tubes in the lower access tunnel shall be isolated with skin valves and be of similar configuration to the updated sampling systems on other tanks. The updated sampling stations shall include the installation of a funnel return system (provided by others). The new piping shall have pipe tracing, asbuilt documentation, and permanent labeling at the sample station. The system shall be hydrotested to 1.5 MAOP. All required NDT's shall be performed after required repairs. NDE personnel shall be certified in accordance with ASME B31.3
 - viii. Install new datum plate with ½"-thick CS plate on the bottom of Tank 5. Dimension and location shall be determined at the site to accommodate the existing MTG probe and potential future automatic tank gauging system. All required NDTs shall be performed after required repairs. NDE personnel shall be certified in accordance with ASME B31.3
 - ix. Replace 6" slop line with new 4" flexible line from tank bottom to the isolation skin valve in lower access tunnel.
 - x. Clean, refurbish, and re-coat 20" Double Block and Bleed Valve. The valve shall be refurbished as required by Manufacturer standards. Once completed the valve shall be hydrotested to 1.5 times the flange class rating. Results shall be included in tank completion report and provided upon request.
 - xi. Clean, refurbish, and re-coat 12" Double Block and Bleed Valve. The valve shall be refurbished as required by Manufacturer standards. Once completed the valve shall be hydrotested to 1.5 times the flange class rating. Results shall be included in tank completion report and provided upon request.
 - xii. Clean, refurbish, and re-coat 6" Double Block and Bleed Valve. The valve shall be refurbished as required by Manufacturer standards. Once completed the valve shall be hydrotested to 1.5 times the flange class rating. Results shall be included in tank completion report and provided upon request.
 - xiii. Clean, refurbish, and re-coat 12" Ball Valve. The valve shall be refurbished as required by Manufacturer standards. Once completed the valve shall be hydrotested to 1.5 times the flange class rating. Results shall be included in tank completion report and provided upon request.
 - xiv. Remove existing coating from the lower to accommodate new coating system. The coating shall be removed and the surface to be prepared to minimum SSPC SP 10 level. Submit

documentation that the blaster is qualified by SSPC to the SSPC C-7 Dry Abrasive Blaster Qualification Program.

- xv. Current coating samples shall be collected and tested for any hazardous content. Abrasive blasting procedure must be determined based on the test result.
- xvi. New coating system shall be applied to lower dome up to 36" above the spring/expansion joint. Coating procedure shall be in accordance to UFGS 09 97 13.15. All coating material submittal shall be submitted to the government for review and approval prior to any issuance of purchase order. Minimum qualification requirements for coating contractor include SSPC QP-1 certification and verifiable previous coating application experience in steel tank with fluoropolyurethane coating material. All relevant qualifications of coating contractor shall be submitted to the government for review and approval.
- xvii. Humidity control unit may not be required for this coating application. It is the Contractor's responsibility to prove that the interior condition of Tank 5 can remain under the manufacturer's recommended relative humidity level inside the tank.
- xviii. Level III inspector from a SSPC QP-5 certified coating Inspection Company shall be hired to perform blasting and coating application inspection. All qualifications of the company and individual inspector shall be submitted to the government for review and approval.
- xix. If conventional abrasive blasting method is employed, disposal of used abrasive blast material shall be done in accordance to all local, state and federal regulations. Disposal issue shall be addressed in waste management plan under Environmental Protection Plan.
- xx. Abrasive blasting is considered as hot work. The contractor is responsible to obtain all necessary permits prior to any abrasive blasting work. Refer section 5.2 b

e. Center tower has been inspected by a licensed structural engineer and was repaired based on the structural engineer's assessment recommendations. Inspection report and repair report shall be available upon request.

f. The Government will provide train assistance at their discretion to a maximum of four hours on any work day in the Lower Access Tunnel only. <u>Train support shall only be provided during standard</u> <u>Government work hours of 8 am to 4 pm</u>, <u>Monday thru Friday</u>. The Contractor shall notify the Government no less than one (1) day in advance of the time and location that the contractor requires the train support. All loading, unloading and securing of material onto flat beds shall be the Contractor's responsibility. Contractor retains responsibility for all items during Government transport.

g. Any hazardous material collected shall be disposed of off-base. The Contractor is to provide a Hazardous Waste Manifest or Waste Shipment Record of all material removed from Tank 5 to on-base authority. A copy of the manifest or record shall be provided to Region Environmental on as necessary.

h. The Work Plan's format shall be in accordance with paragraph 8.0 and submitted in accordance with paragraph 9.0 for Government Review and Approval.

- i. No work is to start on-site prior to review and approval by the Government for this Document.
- j. New strapping table will be prepared under previous clean/inspection contract.

k. Post repair inspection shall be performed by a certified API 653 inspector. Statement for serviceability shall be submitted in two working days after post repair inspection.

4.1.2 Health and Safety Plan

a. The Contractor shall submit a Health and Safety Plan detailing such items as briefings, training, hazard control, general housekeeping, protective equipment, etc.

b. The Health and Safety Plan shall be in accordance with EM 385-1-1, and follow the outline provided in Appendix A: Minimum Basic Outline for Accident Prevention.

c. The Health and Safety Plan shall incorporate the Safety Plans from all subcontractors.

d. The Heath and Safety Plan's format shall be in accordance with paragraph 8.0 and submitted in accordance with paragraph 9.0 for Government Review and Approval.

e. No work is to start on-site prior to review and approval by the Government for this Document.

4.1.3 Environmental Protection Plan and Hazardous Waste Disposal Plan

a. The Contractor shall submit a Environmental Protection Plan and Hazardous Waste Disposal Plan detailing such items as hazard control, storing, transporting,, disposal, spill prevention, containment, clean-up contingency measures, and etc.

b. The Hazardous Waste Disposal Plan shall comply with applicable requirements of Federal, State, and local hazardous waste regulations.

c. The Environmental Protection Plan and Heath and Safety Plan's format shall be in accordance with paragraph 8.0 and submitted in accordance with paragraph 9.0 for Government Review and Approval.

d. No work is to start on-site prior to review and approval by the Government for this Document.

4.2 **POST ON-SITE WORK DOCUMENTATION**

4.2.1 Construction Certification Report

a. The Contractor shall provide a written Construction Certification Report, detailing the following: inspection that was done, all applicable test records and reports, and list of all materials incorporated and records.

b. The Construction Certification report shall include all permits and reports required, NDT results, vendor purchased equipment certification (to include serial and model number), and all relevant maintenance manuals.

c. The Construction Certification Report shall also contain the as-built drawings indicating the locations and type of repair.

d. This Report shall be generated while the work is being performed. The Construction Certification Report's format shall be in accordance with paragraph 8.0 and submitted in accordance with paragraph 9.0 for Government Review.

5.0 <u>ON-SITE SERVICES</u>

5.1 CONSTRUCTION IMPLEMENTATION

a. The Contractor shall provide all equipment, personnel and material necessary, and perform the Work listed in paragraph 2.2, per the plans developed in paragraph 4.1.1, 4.1.2 and 4.1.3 above.

b. Prior to Demobilizing, the Contractor shall provide a statement certifying that the tanks can be placed back into active fuel service. The Contractor shall observe the tank being put back into service. The Contractor shall stand by until the fuel level reaches full capacity of tank. When the tanks are filled to their

normal operating levels, the Contractor shall be responsible for weeps or operation of MOVs. The Contractor shall be responsible for any damage caused to the system due to debris left in the tank during inspection.

5.2 PERMITS

a. The Contractor shall obtain all Federal, State, Local, and EPA permits required for all work that is to be done on the Tanks.

b. The Contractor shall obtain a Hot Work Permit from Federal Fire Department for all Hot Work that is to be performed on the tanks. The FFD will require the Contractor to obtain the service of a Marine Chemist to certify the area for hot work. Contractor shall be responsible for his own fire watches. The contractor shall provide a fire watch for each hot work operation who will remain in clear view of the hot work at all time and close enough to provide emergency aid if needed. Sand blasting is considered hot work which requires a Marine Chemist to certify the areas before work is started.

NOTE: The Contractor shall identify permits required for all work that is planned on the tanks. Completed permits will have to be coordinated with FLC Pearl Harbor and/or local NAVFAC for a final determination.

5.3 SUBCONTRACTORS AND PERSONNEL

a. The Contractor shall employ professionally and technically qualified personnel to perform the tasks and ensure the quality of services meet the standards specified. The subcontractor shall have the following qualifications but not limited to;

- a. Successfully accomplished similar tank repair/coating work within in five years.
- b. Submit evidence that the Contractor/subcontractor's project manager, superintendent, foreman, quality control manager, and other key personnel have previous experience in similar work in tank reconstruction.

b. Non-destructive examination Inspector Qualifications: Submit certification that inspection and nondestructive testing personnel, including inspectors performing visual inspections, and qualified in accordance with the requirements of API 650 and ASNT SNT-TC-1A for Level II in the applicable nondestructive testing method. And AWS certified weld inspector, qualified in accordance with AWS QC 1, shall be considered qualified to perform visual inspections only, in lieu of an ASNT Level II visual inspector.

c. Furnish a list of contact personnel of the Contractor and subcontractors including addresses and telephone numbers for use in the event of an emergency. As changes occur and additional information becomes available, correct and change the information contained in the previous lists.

d. The Contractor employees and representatives performing work under this contract are required to be United States citizens.

e. Identification badges, if required, will be furnished. The Contractor shall apply for and use the identification badges as directed. The Contractor shall immediately report instances of lost or stolen badges to the Contracting Officer. Refer section 5.4 Contractor Access and Use of Premises.

f. Change and/or substitution of subcontractor approved on the Work Plan during execution of the project shall be requested through the Contracting Officer with providing proper proof of qualification of new subcontractors.

5.4 INSTALLATION ACCESS (GENERAL) AND USE OF PREMISES

5.4.1 Contractor/Subcontractor Pass and ID Requirements

- a. Each installation maintains specific pass / identification requirements. In general, installation access requests must be submitted to the NTR at least five (15) business days prior to arrival at Installation. Installation-specific Contractor / Subcontractor Pass and ID forms / information / requirements may be requested from the NTR. Contractor shall submit information for themselves and for their subcontractors. Contractor shall also be aware that additional Installation access regulations may be in effect for non-U.S. personnel and for use of rental vehicles or privately owned vehicles (POV's).
- b. Contractor shall understand that the process to obtain passes or ID's for Contractor or subcontractor personnel is not within the purview of NAVFAC ESC and may take up to 30 days or longer depending on specific military installation requirements and/or the individual's nationality or background.

5.4.2 Base Access (JBPHH Specific)

- a. Commander, Navy Installations Command (CNIC), has established the Navy Commercial Access Control System (NCACS), a standardized process for granting unescorted access privileges to vendors, contractors, suppliers and service providers not otherwise entitled to the issuance of a Common Access Card (CAC) who seek access to and can provide justification to enter Navy installations and facilities. Visiting vendors may obtain daily passes directly from the individual Navy installations by submitting identification credentials for verification and undergoing a criminal screening/ background check. Alternatively, if the vendor so chooses, it may voluntarily elect to obtain long-term credentials through enrollment, registration, background vetting, screening, issuance of credentials, and electronic validation of credentials at its own cost through a designated independent contractor NCACS service provider. Credentials will be issued every five years and access privileges will be reviewed/renewed on an annual basis. The costs incurred to obtain Navy installation access of any kind are not reimbursable, and the price(s) paid for obtaining long-term NCACS credentials will not be approved as a direct cost of this contract. Further information regarding NCACS can be found at http://cnic.navy.mil/CNIC_HQ_Site/index_htm (under "Popular Links").
- b. Normal process time for base access is approximately 4 weeks.
- c. The contractor and the subcontractors may also be required to submit a signed personnel and vehicle access request form to a designated NAVFAC HI FEAD contract specialist along with transmittal letter, and copy of certificate of liability insurance
- d. Any personnel request from out of the State of Hawaii shall be submitted in a separate request package, if requested by NAVFAC.
- e. A NAVFAC ESC representative may not be available at all times to sponsoring the issuance of daily badges. Contractors must submit the requests for a daily badge at least one week in advance. The Government is not responsible for any resulting delays due to the lack of sponsorship for daily badges.

5.4.3 NAVSUP FLC/Red Hill Access

- a. The contractor and the subcontractors shall submit a Contractor Verification System Form (CVS) to a designated Government Employee. The request shall include name, address, SS#, place of birth, and citizenship.
- b. The contractor and the subcontractors will be notified to provide three other supporting documents, a completed SF85, SF85P, or SF86, fingerprints, and proof of US Citizenship, to the Designated

Security Office. Once there is confirmation of no issues with the fingerprints and an OPM investigation has begun processing, a temporary NAVSUP FLC access badge will be issued.

- c. The SF85, SF85P, or SF86 will be processed by OPM with approximately 4 months of process time. A "No Determination" or "Unfavorable" result of the OPM investigation based off the SF85, SF85P, or SF86 could result in the revocation of the temporary NAVSUP FLC access badge. Revocation of such badge will further deny access to the NAVSUP FLC fuel facility.
- d. Upon issuance of the NAVSUP FLC fuels access badge, the badge must be activated via the Supply Information System Analyst at NAVSUP FLC Pearl Harbor. For Red Hill access a recent photo of each person is required. A digital photo will be acceptable.

5.4.4 Restrictions

- a. The Red Hill Underground Fuel Storage Facility is secured area for 24/7. All access gates to Red Hill are controlled by Base Security Force. The Contractor and the subcontractors shall obtain access to Red Hill through the procedure described in Section 5.4.2.
- b. Work Hours: Regular working hours shall consist of a period established by the Contracting Officer between 0700 hours and 1600 hours, Monday through Friday, excluding Government holidays. Working outside regular working hours requires Contracting Officer approval. Working extended hours will be only authorized under task driven reasons.

5.4.5 Work Outside Regular Hours

Work outside regular working hours requires Contracting Officer approval. Provide written requests ten (10) calendar days prior to such work to allow arrangements to be made by the Government for inspecting the work in progress. During periods of darkness, the different parts of the work shall be lighted in a manner approved by the Contracting Officer.

5.4.6 Utility Cutovers and Interruptions

Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays, and Government holidays. Conform to procedures required in paragraph 5.5.3.

5.5 EQUIPMENT AND MATERIAL

5.5.1 List of Equipment and Materials

a. The contractor shall provide all equipment required to perform clean/inspection.

b. Materials shall be of US manufacture. <u>NO FOREIGN</u> materials will be used without prior notice to and approval from the Contracting Officer.

5.5.2 Shipment of Equipment and Materials

Contractor shall notify Installation at least three (3) days in advance regarding delivery of all materials and equipment. All shipping, loading, unloading and securing of materials and equipment shall be Contractor's responsibility. The contractor may utilize the area outside of Adits 3 and 4 for equipment laydown and onsite storage. Contractor retains responsibility for all items through project completion, including the security of all materials and equipment.

5.6 OTHER CONTROLS

5.6.1 Utilities

The Contractor shall provide all utilities, including power, compressed air and potable water.

5.6.2 Temporary Sanitary Facilities

Provide adequate sanitary conveniences of a type approved for the use of persons employed on the work, properly secluded from public observation, and maintained in such a manner as required and approved by the Contracting Officer. Maintain these conveniences at all times without nuisance. Upon completion of the work, remove the conveniences from the premises, leaving the premises clean and free from nuisance. Dispose of sewage through connection to a municipal, district, or station sanitary sewage system. Where such systems are not available, use chemical toilets or comparably effective units, and periodically empty wastes into a municipal, district, or station sanitary sewage to a commercial facility. Include provisions for pest control and elimination of odors.

5.6.3 Storage Areas

The contractor shall be responsible for security of his property.

5.6.4 Waste Disposal

Contractor shall be responsible for packaging, transporting, and disposing of all waste using an approved off-base waste disposal company. Contractor shall dispose of all waste as hazardous waste, unless appropriate testing shows that the waste can be disposed of as non-hazardous waste by other approved means. Hazardous waste shall be disposed according to Hazardous Waste Disposal Plan/Environmental Plan. The work site shall be kept clean of all debris and garbage.

Contractor shall manifest all waste and shall coordinate with the Installation's environmental department, as required, to ensure that all waste is properly accounted for and disposed of.

5.6.5 Interruption of Vehicular Traffic

If during the performance of work, it becomes necessary to modify vehicular traffic patterns at any locations, notify the Contracting Officer at least15 calendar days prior to the proposed modification date, and provide a Traffic Control Plan detailing the proposed controls to traffic movement for approval. The plan shall be in accordance with State and local. Make all notifications and obtain any permits required for modification to traffic movements outside Station's jurisdiction. Provide cones, signs, barricades, lights, or other traffic control devices and personnel required to control traffic. Do not use foil-backed material for temporary pavement marking because of its potential to conduct electricity during accidents involving downed power lines.

6.0 <u>MEETINGS</u>

6.1 GENERAL

a. The Contractor shall schedule and conduct the following meetings for the purpose of transferring information between the Contractor and Government personnel. These meetings will be at an agreed upon time (TBD) between the Government and the Contractor. The Contractor shall submit minutes of these meetings in accordance with paragraph 9.0.

b. The Contractor shall submit the following information for all personnel, one week prior to arriving onsite: Full Name with middle initial, SSN, Date of Birth, Driver's License Number and State of Issuance, Company name, address, phone number, date of arrival, and date of departure. Anyone arriving at FLC Pearl Harbor without submitting this information and who cannot produce a valid picture ID will not be allowed onto the facility.

6.2 SITE VISIT/WORK PLAN/QC PLAN MEETING

The Contractor shall conduct a site visit during the development of the Work Plan to obtain information required to complete the Work Plan. The QC Plan Meeting shall be included during this meeting. This site visit will be at FISC Pearl Harbor, HI.

6.3 PRECONSTRUCTION CONFERENCE AND QC COORDINATION AND MUTUAL UNDERSTANDING MEETING

TWO weeks prior to work commencement, a meeting with the Contracting Officer, FLC Pearl Harbor Fuel Manager and pertinent Government representatives will be held to discuss and develop a mutual understanding of administration of value engineering and safety programs, drawings, execution of the work, and schedules. In addition, the QC Manager will meet with the Government to present the QC program required by this Contract. Major subcontractors shall also attend. Location of this meeting will be at FLC Pearl Harbor, HI.

6.4 **PROGRESS/QC MEETINGS**

The QC Manager shall meet with the NTR and the FLC Pearl Harbor Fuel Manager on a regular (weekly) basis to discuss the progress and any other requirements during the on-site implementation phase of this Contract. The contractor shall also meet with the NTR and Fuel Manager at the conclusion of the work for the final QA walk-thru.

7.0 GOVERNMENT POINTS OF CONTACT

7.1 TITLES

Government technical points of contact include a Contracting Officer's Representative (COR) and a Naval Technical Representative (NTR) appointed by the Contracting Officer (KO).

7.2 CONTRACTING OFFICER

The Contracting Officer for this contract is Ms. Maria Miller.

SPECIALTY CENTER ACQUISITIONS NAVFAC CODE AQ01/NAVAL BASE VENTURA COUNTY 1100 23RD AVE., BLDG. 1100 PORT HUENEME, CA 93043-4301 PHONE: (805) 982-2515, FAX: (805) 982-3015

7.3 CONTRACT SPECIALIST

The Contract Specialist for this contract is Andrea Brooks. Contractual Correspondence shall be sent to:

SPECIALTY CENTER ACQUISITIONS NAVFAC CODE AQ01/NAVAL BASE VENTURA COUNTY 1100 23RD AVE., BLDG. 1100 PORT HUENEME, CA 93043-4301 PHONE: (805) 982-2515, FAX: (805) 982-5234

7.4 CONTRACTING OFFICER'S REPRESENTATIVE

The COR for this contract is **Example 1**, NAVFAC ESC, PW54. The COR is responsible to the Contracting Officer for all matters requiring technical interface with the Contractor. All technical correspondence shall be addressed to:

NAVAL FACILITIES ENGINEERING SERVICE CENTER 1100 23RD AVE., BLDG. 1100 PORT HUENEME, CA 93043-4370 , PW54 PHONE: (805) 982-1436, FAX: (805) 982-5388

7.5 NTR

The NTR for this contract is **an example of the NTR**, NAVFAC ESC, PW54. The NTR is the Naval Technical Representative and shall represent matters regarding technical interface with the Contractor on the jobsite.

NAVAL FACILITIES ENGINEERING SERVICE CENTER 1100 23RD AVENUE PORT HUENEME, CA 93043-4370 , PW54 PHONE: (805) 982-4992, FAX: (805) 982-5388

8.0 <u>REPORT FORMAT</u>

8.1 CONTENTS

Reports shall provide a comprehensive description of work performed. Drawings, charts, illustrations, and other material needed to clarify the design shall be included. Calculations and computer output, if applicable, shall be included as appendices to the report.

Repair Certification Reports

This report will include thorough documentation all work performed. Hard copies of each tank shall be bind in plastic ring binding with a plastic sleeve inside to hold electronic copy of each report. NAVFAC ESC will provide the cover and report number.

Repair Reports Shall Include:

- 1.1.1.1 Executive Summary
- 1.1.1.2 Suitability for Service Statement
- 1.1.1.3 Work Performed
- 1.1.1.4 Timeline

Appendices:

- 1.1.1.5 Documenting Photographs
- 1.1.1.6 Personnel Certifications
- 1.1.1.7 NDT Documentation

1.1.1.8	QC Documentation
1.1.1.9	Materials and Coating Data
1.1.1.10	As-built Drawings
1.1.1.11	API 653 follow up inspection

8.2 QUALITY

Reports describing the work shall be clearly written, adequately detailed, well edited with no errors, and acceptable for release as a quality document. Draft reports shall be finished products requiring only technical changes after Government review.

8.3 COVER SHEET

The title/cover sheet shall be provided by the contractor. The cover and back of each final report shall be on white cover stock. All reports shall have clear plastic covers both front and back. The reports shall be spiral bound with black spines, or in 3-hole binders.

8.4 CD-ROM FORMAT

All reports are to be submitted on a CD-ROM, in addition to hard copies, in accordance with Paragraph 9.0. All documents on the CD-ROM are to be in an editable type format (i.e.: .doc, .xls, .dwg, etc.). Only scanned documents such as mill certs, x-ray reports, etc. are to be submitted as a .pdf file.

8.5 **PROJECT NUMBERS**

All reports and CD-ROMs are to include the DESC project numbers on the title sheet.

9.0 <u>SUBMITTAL SCHEDULE AND DISTRIBUTION</u>

All reports, documents, and drawings shall be delivered according to the list provided in Attachment #1.

10.0 <u>PERIOD OF PERFORMANCE</u>

The Period of Performance for this Contract is 20 weeks.

ATTACHMENT #1

SUBMITTAL LIST, SCHEDULE, AND DISTRIBUTION

SUBMITTAL	SUBMI	SUBMITTAL SCHEDULE		DISTRIBUTION - NUMBER OF COPIES		
	DRAFT (WACA)	GOVT Review	FINAL (WAGR)	Fuels	NFESC 2	DESC
WORK PLAN	4	2				
DRAFT			2		EC	
FINAL					1/EC	
HEALTH AND SAFETY PLAN						
DRAFT	4	2			EC	
FINAL	-		1		1/EC	
ENVIORNMENTAL PROTECTION PLAN/HAZARDOUS WASTE DISPOSAL PLAN						
DRAFT	4	2			EC	
FINAL			1		1/EC	
CONSTRUCTION SUBMITTALS						
FINAL					4/ 4 CDs	
QUALITY CONTROL DAILY			-	FO		
REPORTS		ē.	-	EC	EC	
MEETING MINUTES 6, 4		-			EC	

SUBMITTAL LIST, SCHEDULE, AND DISTRIBUTION

NOTES:

WACA - Weeks after Contract Award

GOVT Review - Number of weeks for Government review after receipt of submittal.

WAGR - Weeks after Government Review

• Include 1 CD-ROM with each FINAL report

Include 2 CD-ROMs with each report

• Daily reports shall be e-mailed daily, by 0900 HAST, the following day.

• Minutes of meetings may be e-mailed. Minutes shall be submitted no later than three (3) working days following each meeting.

DISTRIBUTION LIST MAILING ADDRESSES:

NAVAL FACILITIES ENGINEERING SERVICE CENTER 1100 23RD AVENUE PORT HUENEME, CA 93043-4370 , PW54 PHONE: (805) 982-4992, FAX: (805) 982-5388

SECTION E - INSPECTION AND ACCEPTANCE

The following Acceptance/Inspection Sch	edule was added fo	or SUBCLIN 000105:	
INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
N/A	N/A	N/A	Government

SECTION F - DELIVERIES OR PERFORMANCE

The following Delivery Schedule item for CLIN 0001 has been changed from:

DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
29-JUN-2012	4,608,288.92	N/A FOB: Destination	

To:

DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
29-JUN-2012	6,657,161.68	N/A FOB: Destination	

The following Delivery Schedule item has been added to SUBCLIN 000105:

DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
29-JUN-2012		N/A FOB: Destination	

SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation

Summary for the Payment Office

As a result of this modification, the total funded amount for this document was increased by \$2,048,872.76 from \$4,608,288.92 to \$6,657,161.68.

SUBCLIN 000105: Funding on SUBCLIN 000105 is initiated as follows:



Increase: \$2,048,872.76

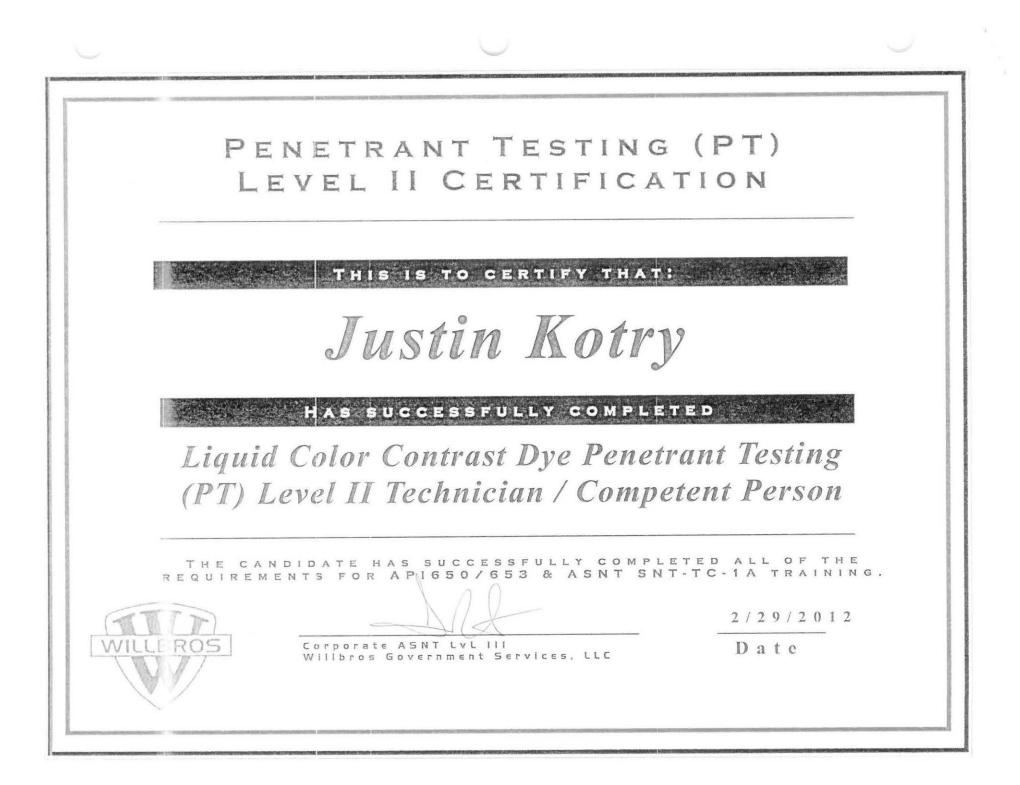
Total: \$2,048,872.76

Cost Code:

The following have been added by full text:

(End of Summary of Changes)

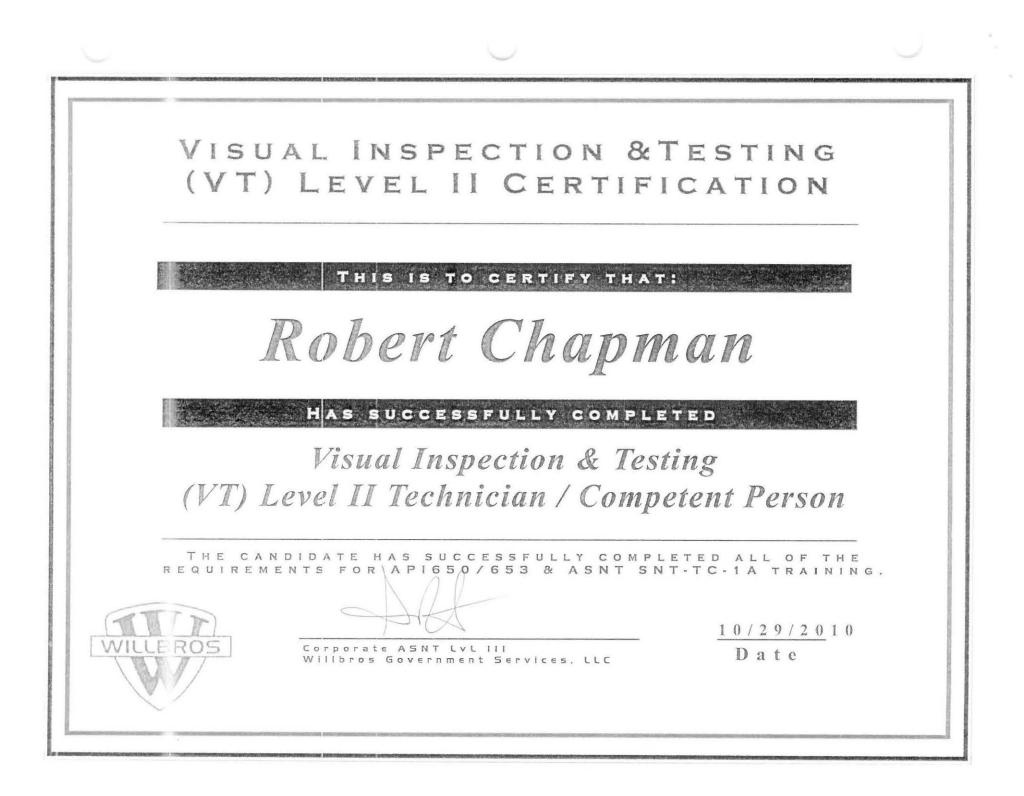
VISUAL INSPECTION & TESTING (VT) LEVEL II CERTIFICATION THIS IS TO CERTIFY THAT: Justin Kotry HAS SUCCESSFULLY COMPLETED Visual Inspection & Testing (VT) Level II Technician / Competent Person THE CANDIDATE HAS SUCCESSFULLY COMPLETED ALL OF THE REQUIREMENTS FOR API650/653 & ASNT SNT-TC-1A TRAINING. 2/29/2012 WILLE ROS Corporate ASNT LVL III Date Willbros Government Services, LLC



	VISUAL INSPECTION & TESTING (VT) LEVEL II CERTIFICATION	
	THIS IS TO CERTIFY THAT:	
	Donald Clark	
	HAS SUCCESSFULLY COMPLETED Visual Inspection & Testing	
	(VT) Level II Technician / Competent Person	
WIL	THE CANDIDATE HAS SUCCESSFULLY COMPLETED ALL OF THE REQUIREMENTS FOR APIG50/653 & ASNT SNT-TC-1A TRAININ Corporate ASNT LVL III Willbros Government Services LLC Date	G.
1	Willbros Government Services, LLC Date	

PENETRANT TESTING (PT) LEVEL II CERTIFICATION	
THIS IS TO CERTIFY THAT:	
Donald Clark	
HAS SUCCESSFULLY COMPLETED	an a
	0
THE CANDIDATE HAS SUCCESSFULLY COMPLETED ALL OF QUIREMENTS FOR API650/653 & ASNT SNT-TC-1A TRAI 9/30/20 Corporate ASNT LVL 111 Date	
	LEVEL II CERTIFICATION THIS IS TO CERTIFY THAT: Donald Clark Has successfully completed Liquid Color Contrast Dye Penetrant Testim PT) Level II Technician / Competent Person THE CANDIDATE HAS SUCCESSFULLY COMPLETED ALL OF AUTREMENTS FOR APIGBO/655 & ASNT SNT.TC. 14 TRAN 9/30/20

PENETRANT TESTING (PT) LEVEL II CERTIFICATION THIS IS TO CERTIFY THAT: Robert Chapman HAS SUCCESSFULLY COMPLETED Liquid Color Contrast Dye Penetrant Testing (PT) Level II Technician / Competent Person THE CANDIDATE HAS SUCCESSFULLY COMPLETED ALL OF THE REQUIREMENTS FOR AP1659/653 & ASNT SNT-TC-1A TRAINING. 11/30/2010 Corporate ASNT LVL III Date Willbros Government Services, LLC





A WILLBROS COMPANY

APPENDIX B

PROJECT CHECKLIST Tank Inspection Checklist Section B-2

Rev	Date	Description	Reviewed	Approved
Α	6/02/2011	Preliminary - For Approval	DB	TDA
В		10 - Vener		
0				
1				
2				
3				



	Tank Out-of-service Inspection Checklist			
	Item	Completed X	Comments	
.2.1	Overview			
)	Check that tank has been cleaned, is gas free, and safe for entry.	X		
)	Check that the tank is completely isolated from product lines, all electrical power, and steam lines.	х		
:)	Check that roof is adequately supported, including fixed roof structure and floating roof legs.	X		
1)	Check for presence of falling object hazards, such as corroded-through roof raffers, asphalt stalactites, and trapped hydrocarbons in unopened or plugged equipment or appurtenances, ledges, etc.	Х		
:)	Inspect for slipping hazards on the bottom and roof decks.	Х		
<u>,</u>	Inspect structural welds on accessways and clips.	X		
)	Check surfaces needing inspection for a heavy-scale buildup and check weld seams and oily surfaces where welding is to be done. Note areas needing more cleaning, including blasting.	x		
)	Review cathodic protection potential readings.	NA	NA=Not applicable/accessible	
.2.2.	Tank Exterior	NA	NA=Not applicable/accessible	
)	Inspect appurtenances opened during cleaning such as lower floating swing sheave assemblies, nozzle interiors (after removal of valves).	NA	4.0%	
)	Hammer test or ultrasonically test he roof.	NA		
)	Enter and inspect he floating roof pontoon compartments.	NA		
.2.3.	Bottom Interior Surface			
	Using a flashlight held close to and parallel to the bottom plates, and using the bottom plate layout as a guide, visually inspect and hammer test the entire bottom.	X	See inspection report	
1)))	Measure the depth of pitting and describe the pitting appearance (sharp edged, lake type, dense, scattered, etc.)	х	See inspection report	
:)	Mark areas requiring patching or further inspection.	Х	See inspection report	
) I)	Mark locations for turning coupons for inspection.	NA		
:)	Inspect all welds for corrosion and leaks, particularly he shell-to-bottom weld.	X	See inspection report	
)	Inspect sketch plates for corrosion.	x	See inspection report	
1)	Check condition of internal sump, if applicable. Standing liquid should be removed from he sump to allow for complete inspection and vacuum testing of weld seams as appropriate. Sump bottom and sidewall plate and seams need to be evaluated for both product-side and soil-side corrosion.	NA		
1)	Locate and mark voids under the bottom.	Х	See inspection report	
<u>, , , , , , , , , , , , , , , , , , , </u>	Record bottom data on a layout sketch using the existing bottom plates as a grid. List he number and sizes of patches required.	X	See inspection report	
)	Vacuum test the bottom lap welds.	NA		
)	Hammer test or ultrasonically examine any slightly discolored spots or damp areas.	X		
()	Check for reinforcing pads under all bottom attached clips, brackets, and supports.	х		
) n)	Inspect floating roof leg pads for pitting or cutting, and excessive dimpling (indicating excessive loading).	NA		
n)	Check the column bases of fixed roof supports for adequate pads and restraining clips.	Х		
)	In earthquake Zones 3 and 4, check that roof supports are not welded down to the tank bottom, but are only restrained from horizontal movement.	х		
)	Check area beneath swing line cable for indications of cable cutting or dragging.	NA		
)	Mark old oil and air test connection for removal and patching.	NA		
)	Identify and report low areas on the bottom that do not drain adequately.	Х	Î	
;)	Inspect coating for holes, disbonding, deterioration, and discoloration.	Х		
.2.4.	Shell Seams and Plate	1.0.0		
28	On cone up bottoms, closely inspect and gauge the depth of metal loss on the lower 2 in. to 4 in. of the shell (area of standing water).	NA		
a)	Measure the depth of pitting on each course.		See inspection report	



	Tank Out-of-service Inspection Checklist		
	Item	Completed X	Comments
:)	Inspect and es imate the amount of metal loss on the heads of rivets and bolts.	NA	NA=Not applicable/accessible
)	Inspect shell-to-bottom riveted lap joints.	NA	NA=Not applicable/accessible
)	Inspect for vertical grooving damage from seal assembly protrusions.	NA	NA=Not applicable/accessible
)	Inspect existing protective coa ings for damage, deterioration, and disbonding.	X	See inspection report
	Check for areas of rubbing (indicating too much pressure by the seal assembly shoes	NA	
1)	or inadequate annular space).		
1)	Visually inspect the shell plates and seams for indications of leakage.	X	See inspection report
)	If the shell has riveted or bolted seams, record the leak locations by film or chart in case he locations are lost during surface preparation for painting.	NA	
)	Measure annular space at 40-ft intervals.	NA	
()	Survey the shell to check for roundness and plumb.	X	
C.2.5	Shell-mounted Overflows	NA	NA=Not applicable/accessible
a)	Inspect overflow for corrosion and adequate screening.	NA	
))	Check location of overflow that it is not above any tank valves or equipment.	NA	
0.2.6	Roof Interior Surface		
0.2.6.1	General	NA	NA=Not applicable/accessible
a)	Visually inspect the underside surface of the roof plates for holes, scale buildup, and pitting.	NA	
))	Hammer test or ultrasonically examine to check for thin areas, particularly in the vapor space of floating roofs and at edge of roof on cone roof tank.	NA	
:)	Check all clips, brackets, braces, etc., welded to he roof deck plate for welded reinforcing pads and see that they have not broken free.	NA	
I)	If no pad is present, penetrant test for cracking of he weld or deck plate.	NA	
2)	Inspect for protective coating for breaks, disbondment, and deterioration.	NA	1
	Spark test the interior surface coating if recoating is not planned.	NA	1
2.2.6.2	C.2.6.2 Fixed Roof Support Structure	NA	
a)	Inspect the support columns for thinning in the upper 2 ft.	NA	
a)	On API columns (two channels welded together) check for corrosion scale breaking the tack welds, unless the joint between he channels is completely seal welded.	NA	
b)	Check that the reinforcing pad on the bottom is seal-welded to the tank bottom with	NA	
;) -/	horizontal movement restraining clips welded to the pad. Determine if pipe column supports are concrete filled or open pipe. If open pipe, check for a drain opening in the bottom of the pipe.	NA	
(t	Inspect and gauge rafters for thinning, particularly near the center of the roof. Report metal loss.	NA	
2)	Check for loose or twisted rafters.	NA	
)	Inspect girders for thinning and check that they are attached securely to the top of the columns.	NA	
3) 1)	Report if the columns have cross bracing in the area between the low pump out of the top of the shell (for future internal floating roof installation).	NA	
1	Inspect and report presence of any roof-mounted swing line bumpers.	NA	<u> </u>
	Photograph the roof structure if no rafter layout drawing exists.	NA	<u>†</u>
207	Fixed Roof Appurtenances	NA	NA=Not applicable/accessible
0.2.7			inc-not applicable/accessible
2.2.7.1	Inspection and Light Hatches Inspect the hatches for corrosion, paint and coating failures, holes, and cover sealing.	NA NA	
a)	On loose covers, check for a safety chain in good condition.	NA	ļ
)	On light hatches over 30 in. across, check for safety rods.	321/20045.21	ł
:)		NA	<u> </u>
1)	Inspect the condition of the gaskets on bold or latched down hatch covers.	NA	<u> </u>
3.2.7.2	Staging Support Connection	NA	
	Inspect the condition of the staging support for corrosion.	NA	ļ
C.2.7.3	Breathers and Vents	NA	
a)	Inspect and service the breather.	NA	
)	Inspect screens on vents and breathers.	NA	
C.2.7.4	Emergency P/V Hatches	NA	



	Tank Out-of-service Inspection Checklist				
	Item	Completed X	Comments		
a)	Inspect and service pressure/vacuum hatches. (Setting should be high enough to pre- vent chattering of breather during normal operation. See breather manufacturer's guide.)	NA			
b)	Inspect liquid seal hatches for corrosion and proper liquid level in the seal.	NA			
C.2.7.5	Sample Hatch	NA	5		
a)	Inspect sample hatch for corrosion.	NA			
a) b)	Check that the cover operates properly.	NA			
c)	If the tank has no gauge well, check for a hold-off distance marker and check mea- surement.	NA			
C.2.8	Floating Roof	NA	NA=Not applicable/accessible		
C.2.8.1	Roof Deck	NA			
a)	Hammer test the area between roof rim and shell. (If access for hammer testing is inadequate, measure the distance from he bottom edge of he roof to the corroded area and then hammer test from inside the pontoon.)	NA			
b)	In sour water service, clean and test all deck plate weld seams for cracking unless the lower laps have been seal-welded.	NA			
c)	Check that either the roof drain is open or the drain plug in the roof is open in case of unexpected rain.	NA			
d)	On flat bottomed and cone bottom roof decks, check for a vapor dam around the periphery of the roof. The dam should be continuous without break to prevent escape of vapors to the seal area from under the center of he roof.	NA			
C.2.8.2	Floating Roof Pontoons	NA			
a)	Visually inspect each pontoon for liquid leakage.	NA			
b)	Run a light wire through the gooseneck vents on locked down inspection hatch covers to make sure they are open.	NA			
c)	Inspect lockdown latches on each cover.	NA			
d)	Check and report if each pontoon is:	NA			
1)	vapor tight (bulkhead seal welded on one side on bottom, sides, and top),	NA			
2)	liquid tight (seal-welded on bottom and sides only), or	NA	1		
3)	unacceptable (minimum acceptable condition is liquid tight).	NA			
C.2.8.3	Floating Roof Cutouts	NA	с		
a)	Inspect underside of cutouts for mechanical damage.	NA	1		
b)	Inspect welds for cracks.	NA			
	Inspect plate for thinning, pitting, and erosion.	NA			
c)	Measure mixer cutouts and record plate thickness for future mixer installation or replacement.	NA			
d) C.2.8.4	Plate thickness Floating Roof Supports	NA			
229	Inspect fixed low and removable high floating roof legs for thinning.	NA			
a)	Inspect for notching at bottom of legs for drainage.	NA			
b)	Inspect for leg buckling or felling at bottom.	10000			
c)	Inspect for leg buckling of realing at bottom.	NA			
d)	Check plumb of all legs.	2010			
e)	Inspect for adequate reinforcing gussets on all legs through a single portion of the roof.	NA			
f)	Inspect the area around the roof legs for cracking if there is no internal reinforcing pad	NA			
g)	or if the topside pad is not welded to the deck plate on the underside.				
h)	Inspect the sealing system on the two-position legs and the vapor plugs in the fixed low leg for deterioration of the gaskets.	NA			
1)	On shell-mounted roof supports, check for adequate clearance based on he maxi- mum floating roof movement as determined by the posi ion of the roof relative to he gauge well and/or counter-rotational device.	NA			
C.2.9	Floating Roof Seal Assemblies	NA			
C.2.9.1	Primary Shoe Assembly	NA			
	Remove four sections of foam log (foam-filled seals) for inspection on 90° locations.	NA			



	Tank Out-of-service Inspection Checklist		
	Item	Completed X	Comments
b)	Inspect hanger attachment to roof rim for thinning, bending, broken welds, and wear of pin holes.	NA	
c)	Inspect clips welded to roof rim for thinning.	NA	
1) (t	Shoes—inspect for hinning and holes in shoes.	NA	
e)	Inspect for bit-metal bolts, clips, and attachments.	NA	1
	Seal fabric—inspect for deterioration, stiffening, holes, and tears in fabric.	NA	+
)	Measure length of fabric from top of shoe to roof rim, and check against maximum	NA	ł
g)	anticipated annular space as roof operates. Inspect any modification of shoes over shell nozzles, mixers, etc., for clearance.	NA	
I) I			
)	Inspect shoes for damage caused by striking shell nozzles, mixers, etc.	NA	
0.2.9.2	Primary Toroidal Assembly	NA	1
2722 (2828 2 3	Inspect seal fabric for wear, deterioration, holes, and tears.	NA	4
a)	Inspect hold-down system for buckling or bending.	NA	ł
))	Inspect foam for liquid absorption and deterioration.	BATANT S.	
:)		NA	
0.2.9.3	Rim-mounted Secondaries	NA	
a)	Inspect the rim-mounted bolting bar for corrosion and broken welds.	NA	
))	Measure and chart seal-to-shell gaps.	NA	
:)	Visually inspect seam from below, looking for holes as evidenced by light.	NA	
i)	Inspect fabric for deterioration and stiffness.	NA	
e)	Inspect for mechanical damage, corrosion, and wear on tip in contact with shell.	NA	
1	Inspect for contact with obstructions above top of shell.	NA	
) C.2.10	Floating Roof Appurtenances	NA	ł
w.oveneka.ww	Roof Manways	NA	<u> </u>
C.2.10.1	Inspect walls of manways for pit ing and thinning.		<u>.</u>
a)		NA	ļ
)	On tanks with interface autogauges, check seal around gauge tape cable and guide wires through manway cover.	NA	
:)	Inspect cover gasket and bolts.	NA	
0.2.10.2	Rim Vent	NA	
a)	Check rim vent for pitting and holes.	NA	
))	Check vent for condi ion of screen.	NA	
c)	On floating roof tanks where the environmental rules require closing off the vent, check he vent pipe for corrosion at the pipe-to-rim joint and check that the blinding is adequate.	NA	
0.2.10.3	Vacuum Breaker, Breather Type	NA	
a)	Service and check operation of breather valve.	NA	1
))	Check that nozzle pipe projects no more than 1/2 in. below roof deck.	NA	1
	Vacuum Breaker, Mechanical Type	NA	<u> </u>
0.2.10.4	Inspect the stem for thinning. Measure how far the vacuum breaker cover is raised off he pipe when he roof is resting on high or low legs.	NA	
a)	On high legs:	NA	
-	On low legs:	NA	<u> </u>
<u>)</u>	Roof Drains: Open Systems, Including Emergency Drains	NA	NA=Not applicable/accessible
C.2.10.5	Check liquid level inside open roof drains for adequate freeboard. Report if there is	NA	INA-NOT applicable/accessible
a)	insufficient distance between liquid level and top of drain. If tank comes under Air Quality Monitoring District rules, inspect the roof drain vapor	N L A	
))	plug.	NA	
:)	If emergency drain is not at the center of the roof, check that there are at least hree emergency drains.	NA	
0.2.10.6	Closed Drain Systems: Drain Basins	NA	NA=Not applicable/accessible
a)	Inspect for hinning and pitting.	NA	
1	Inspect protective coating (topside).	NA	<u> </u>
) :)	Inspect basin cover or screen for corrosion.	NA	<u> </u>



	Tank Out-of-service Inspection Checklist	2 TAXO	No.
	Item	Completed X	Comments
)	Check for presence of check valve where bottom of basin is below product level.	NA	
	Inspect drain basin(s) to roof deck welds for cracking.	NA	
	Check drain basin(s) outlet pipe for adequate reinforcement to roof deck (including	NA	
)	reinforcing pad).		ļ
.2.10.7	Closed Drain Systems: Fixed Drain Line on Tank Bottom	X	ļ
)	Hammer test fixed drain line on tank bottom for thinning and scale/debris plugging.	Х	
)	Inspect supports and reinforcing pads for weld failures and corrosion.	Х	
E	Check that pipe is guided, not rigidly locked to support, to avoid tearing of tank bottom plate.	Х	
)	Closed Drain Systems: Flexible Pipe Drain	NA	NA=Not applicable/accessible
)	Inspect for damage to exterior of pipe.	NA	
)	Check for obstructions that pipe could catch on.	NA	1
)	Inspect shields to protect pipe from snagging.	NA	<u>8</u>
)	Inspect results of hydrostatic test on flexible roof drain system.	NA	
.2.10.9	Closed Drain Systems: Articulated Joint Drain	NA	NA=Not applicable/accessible
)	Hammer test rigid pipe in flexible joint systems for thinning and scale/debris plugging.	NA	
)	Inspect system for signs of bending or strain.	NA	1
)	Inspect results of system hydrostatic test.	NA	1
)	Inspect landing leg and pad.	NA	1
.2.10.10	Autogauge System and Alarms	NA	NA=Not applicable/accessible
)	Check freedom of movement of tape through autogauge tape guide.	NA	F.C.
)	Inspect sheaves for freedom of movement.	NA	1
)	Test operation checker.	NA	
)	Inspect tape and tape cable for twisting and fraying.	NA	
	Test the tape's freedom of movement through guide sheaves and tape guide pipe.	NA	
)		20000	
)	On open-top tanks, check that gate tapes with cables have no more than one foot of tape exposed with float at lowest point.	NA	
)	Check float for leakage.	NA	
)	Test float guide wire anchors for spring action by pulling on wire and releasing.	NA	
	Inspect floatwells in floating roofs for thinning and pitting of walls just above the liquid level.	NA	
n .	Check that the autogauge tape is firmly attached to the float.	NA	1
)	Inspect the tape cable and float guide wire fabric seals through the float well cover.	NA	
	Inspect the bottom guide wire attachment clip: inspect for a temporary weighted bar instead of a permanent welded down clip.	NA	
n)	Inspect board-type autogauge indicators for legibility and freedom of movement of indicator.	NA	
)	Measure and record these distances to determine if seal damage will occur if tank is run over from:	NA	
)	Shell top angle to underside of tape guide system.	NA	1
)	Liquid level on floating top to top of secondary seal.	NA	1
)	Identify floating roofs where the tape is connected directly to the roof.	NA	1
)	Overfill alarm: Inspect tank overfill prevention alarm switches for proper operation.	NA	
.2.11	Common Tank Appurtenances		
.2.11.1	Gauge Well	NA	NA=Not applicable/accessible
ı)	Inspect gate well pipe for thinning at about two-thirds distance above the bottom: look for thinning at the edge of the slots.	NA	
))	Check for corrosion on the pipe joint. Check that sample cords, weights, thermome- ters, etc., have been removed from the pipe.	NA	
:)	Check for cone at bottom end of pipe about one foot above he bottom.	NA	<u> </u>



	Tank Out-of-service Inspection Checklist	C 1400 C 1400 C	87-007 Mc
	Item	Completed X	Comments
)	Check condition of well washer pipe and that its flared end is directed at the near side of the hold off pad.	NA	
)	Check that supports for gauge well are welded to pad or to shell and not directly to bottom plate.	NA	
	Check operation of gauge well cover.	NA	
25	Check presence of a hold-off distance marker in well pipe and record hold-off distance. Hold-off distance	NA	
)	Identify and report size and pipe schedule, and whether pipe is solid or slotted. Report slot size.	NA	
)	Check that the hold-off distance plate is seal-welded to he bottom and hat any gauge well supports are welded to the plate and not directly to the bottom.	NA	
	Inspect vapor control float and cable.	NA	
(Check for presence and condition of gauge well washer.	NA	
)	Check for bull plug or plate blind on gauge well washer valve.	NA	
)	Inspect gauge well guide in floating roof for pitting and thinning.	NA	
) 	Inspect the guide rollers and sliding plates for freedom of movement.	NA	
)	Inspect condition of gauge well pipe seal system.	NA	
)	On black oil and diesel services: if gauge well is also used for sampling, check for presence of a thief- and gauge-type hatch to avoid spillage.	NA	
	Visually inspect inside of pipe for pipe weld protrusions which could catch or damage vapor control float.	NA	
2.11.2	Sampling Systems: Roof Sample Hatches	NA	NA=Not applicable/accessible
k -	Inspect roof-mounted sample hatches for reinforcing pads and cracking.	NA	
1	Inspect cover for operation.	NA	
	For tanks complying with Air Quality Monitoring District rules, inspect sample hatch covers for adequate sealing.	NA	
)	Check horizontal alignment of internal floating roof sample hatches under fixed roof hatches.	NA	
Ř 👖	Inspect the sealing system on the internal floating roof sample hatch cover.	NA	
	Inspect floating roof sample hatch cover recoil reel and rope.	NA	
2.11.3	Shell Nozzles		
	Inspect shell nozzles for thinning and pitting.	Х	See inspection report
(Inspect hot tap nozzles for trimming of holes.	Х	See inspection report
	Identify type of shell nozzles.	Х	See inspection report
2	Identify and describe internal piping, including elbow-up and elbow-down types.	x	See inspection report
2.11.4	For Nozzles Extended Into the Tank		
	Inspect pipe support pads welded to tank bottom.	Х	See inspection report
))	Inspect to see that pipe is free to move along support without strain or tearing action on bottom plate.	X	See inspection report
6 []	Inspect nozzle valves for packing leaks and damaged flange faces.	Х	See inspection report
	Inspect heater stream nozzle flanges and valves for wire cutting.	X	See inspection report
	Report which nozzles have thermal pressure relief bosses and valves.	X	See inspection report
)	In internal elbow-down fill line nozzles, inspect the wear plate on the tank bottom.	X	See inspection report
	On elbow-up fill lines in floating roof tanks, check that opening is directed against		
	underside of roof, not against vapor space. Inspect impact are for erosion.	X	See inspection report
2.11.5	Diffusers and Air Rolling Systems	NA	NA=Not applicable/accessible
(Inspect diffuser pipe for erosion and thinning.	NA	
	Check holes in diffuser for excessive wear and enlargement.	NA	
ő	Inspect diffuser supports for damage and corrosion.	NA	
(<mark> </mark>	Check that diffuser supports restrain, not anchor, longitudinal line movement.	NA	İ
)	Inspect air spiders on bottom of lube oil tanks for plugging and damaged or broken hreaded joints.	NA	
.2.11.6	Swing Lines	NA	NA=Not applicable/accessible



	Tank Out-of-service Inspection Checklist		
	Item	Completed X	Comments
)	Inspect flexible joint for cracks and leaks.	NA	
	Scribe the flexible joint across the two moving faces and raise end of swing line to check the joint's freedom of movement, indicated by separa ion of scribe marks.	NA	
i <u> </u>	Check that flexible joints over 6 in. are supported.	NA	
	Inspect the swing pipe for deep pitting and weld corrosion.	NA	
	Loosen the vent plugs in the pontoons and listen for a vacuum. Lack of a vacuum indicates a leaking pontoon.	NA	
	Check the results of air test on pontoons during repairs.	NA	
	Inspect the pontoons for pitting.	NA	
	Inspect the pull-down cable connections to the swing.	NA	
	Inspect the condition of the bottom-mounted support, fixed roof limiting bumper, or shell- mounted limiting bumper for wood condition, weld and bolt corrosion, and seal welding to bottom or shell.	NA	
1	Inspect safety hold-down chain for corrosion and weak links.	NA	
	Check that there is a welded reinforcing pad where the chain connects to the bottom.	NA	
í		82928074	
	If the floa ing swing in a floating or internal floating roof tank does not have a limiting device preventing the swing from exceeding 60 degrees, measure and calculate the maximum angle possible with the roof on overflow. Max. angle on overflow (If the calculated angle exceeds 65 degrees, recommended installation of a limiting bracket.)	NĂ	
)	Inspect pull-down cable for fraying.	NA	
D	Inspect for hree cable clamps where cable attaches to end of swing line (single- reeved) or to roof assembly (double-reeved). Inspect sheaves for freedom of move-	NA	
)	ment. Inspect winch opera ion and check the height indicator for legibility and accuracy.	NA	
)	Inspect bottom-mounted sheave assembly at end of pontoon for freedom of rotation of sheave.	NA	
)	Inspect shell-mounted lower sheave assembly for freedom of rotation of sheave, corrosion thinning, and pitting of sheave housing.	NA	
	Inspect upper sheave assembly for freedom of movement of sheave.	NA	2
16 Y 2	Inspect the cable counterbalance assembly for corrosion and freedom of operation.	NA	
2.11.7	Manway Heater Racks	NA	NA=Not applicable/accessible
1	Inspect the manway heater racks for broken welds and bending of the sliding rails.	NA	
	Measure and record the length of the heater and length of the track.	NA	
2.11.8	Mixer Wear Plates and Deflector Stands	NA	NA=Not applicable/accessible
2.11.0	Inspect bottom and shell plates and deflector stands.	NA	
)	Inspect for erosion and corrosion on the wear plates. Inspect for rigidity, structural soundness, corrosion, and erosion of deck plates and reinforcing pads that are seal- welded to the bottom under the deflector stand legs.	NA	
0	Measure for propeller clearance between the bottom of deflector stand and roof when he roof is on low legs.	NA	
2.12	Access Structures		
.2.12.1	Handrails	Х	See inspection report
	Identify and report type (steel pipe, galvanized pipe, square tube, angle) and size of handrails.	Х	
6	Inspect for pitting and holes, paint failure.	Х	
	Inspect attachment welds.	Х	İ
	Identify cold joints and sharp edges. Inspect the handrails and midrails.	Х	
)	Inspect safety drop bar (or safety chain) for corrosion, func ioning, and leng h.	X	
s	Inspect the handrail between the rolling ladder and the gaging platform for a hazard- ous opening when the floating roof is at its lowest level.	Х	
.2.12.2	Platform Frame	Х	See inspection report



	Item	Completed	Comments
		X	
))	Inspect the attachment of frame to supports and supports to tank for corrosion and weld failure.	Х	
c)	Check reinforcing pads where supports are attached to shell or roof.	X	
d)	Inspect the surface that deck plate or grating rests on, for thinning and holes.	Х	1
e)	Check that flat-surface-to-flat-surface junctures are seal-welded.	X	
C.2.12.3	Deck Plate and Grating	X	See inspection report
a)	Inspect deck plate for corrosion-caused hinning or holes (not drain holes) and paint failure.	x	
b)	Inspect plate-to-frame weld for rust scale buildup.	X	1
c)	Inspect gra ing for corrosion-caused thinning of bars and failure of welds.	Х	1
d)	Check grating tie down clips. Where grating has been retrofitted to replace plate,	х	
270	measure the rise of the step below and above the grating surface and compare with other risers on the stairway.	х	
C.2.12.4	Stairway Stringers	NA	NA=Not applicable/accessible
a)	Inspect spiral stairway stringers for corrosion, paint failure, and weld failure. Inspect attachment of stairway treads to stringer.	NA	
b)	Inspect stairway supports to shell welds and reinforcing pads.	NA	
c)	Inspect steel support attachment to concrete base for corrosion.	NA	
C.2.12.5	Rolling Ladder	NA	NA=Not applicable/accessible
a)	Inspect rolling ladder stringers for corrosion.	NA	
b)	Identify and inspect ladder fixed rungs (square bar, round bar, angles) for weld attachment to stringers and corrosion, particularly where angle rungs are welded to stringers.	NA	
c)	Check for wear and corrosion where rolling ladder attaches to gaging platform.	NA	
d)	Inspect pivot bar for wear and secureness.	NA	
e)	Inspect operation of self-leveling stairway treads.	NA	
f)	Inspect for corrosion and wear on moving parts.	NA	I
g)	Inspect rolling ladder wheels for freedom of movement, flat spots, and wear on axle.	NA	
h)	Inspect alignment of rolling ladder with roof rack.	NA	
i)	Inspect top surface of rolling ladder track for wear by wheels to assure at least 18 in. of unworn track (track long enough).	NA	
))	Inspect rolling ladder track welds for corrosion.	NA	1
k)	Inspect track supports on roof for reinforcing pads seal-welded to deck plate.	NA	
I)	Check by dimensioning, the maximum angle of the rolling ladder when the roof is on low legs.	NA	
m)	If rolling ladder track extends to within 5 ft of the edge of the roof on the far side, check for a handrail on the top of the shell on that side.	NA	
NOTES -			

FY-78 MILCON P-060, Repair Red Hill Fuel Storage Facility – Scope of Work

- 1. Basic repairs by contractor:
 - a. Mobilize electrical power, compressed air, water, and tank ventilation/dehumidification equipment. Note: electric power supplied from Hawaiian Electric Co. (HECO) directly to contractor substation at Red Hill.
 - b. Isolate tank(s) to be repaired from in-service tanks connected to the Red Hill tank vent system.
 - c. Drain residual fuel from nozzle pipes, remove skin valves, and install blinds on skin valve nozzle flanges except for the low-point drain line (slop line) to isolate tank(s) to be repaired from the fuel piping system.
 - d. Drain tank bottom residual fuel and waste oil via the slop line to the waste oil/oily waste Stilling Basin outside Adit 3. Transport waste oil/oily waste by tank truck from the Adit 3 Stilling Basin to the Waste Oil Reclamation Facility at the Naval Supply Center on the Pearl Harbor Naval Base.
 - e. Ventilate tank to condition of gas-free safe for entry. Continue ventilation throughout work in tank.
 - f. Remove the 8-foot diameter flanged dished head for access to tank from Upper Tunnel. Use extreme care in handling to avoid damage to the 72-bolt flange face. Store the dished head in a protected area.
 - g. Install lighting adequate for initial tank cleaning.
 - h. Working from the catwalk, wash down the catwalk, center tower, and tank walls.
 - i. Drain tank wash water, and oily waste from tank bottom via the slop line. Water and oily waste to the Adit 3 Stilling Basin.
 - j. Squeegee, shovel, and pump sludge from the tank bottom to the Lower Access Tunnel (LAT) and load it into 55-gallon drums. Load drums onto GFE rail flat cars and coordinate with Fuel Department Operations to use the government owned locomotive to tow the flat cars to Adit 3. Contractor unload the drums and dispose of sludge off-site In accordance with environmental regulations.
 - k. Flush and drain all liquid and solid material from the slop line nozzle pipe, remove skin valve, and install blinds on nozzle flanges to isolate tank from slop piping system.
 - Hydrostatically test all manually operated skin (gate-type) valves and repair gate, valve seat, and packing as necessary to meet leakage criteria. Rehab valve motor operator on first valve downstream of each skin valve.
 - m. Install additional lighting in tank.
 - n. Check center tower for missing/loose bolting and missing structural members, and replace/tighten as necessary.
 - o. Rehab/replace the elevator cab locked in place in the center tower at the catwalk level, and install new cables, safety stops, counterweights, power climbers, etc. to make it operational in accordance with appropriate safety codes. Remove and dispose of wooden stopping rails in center tower.

- p. Permanently install structural members to stiffen and strengthen the upper end of the center tower to accommodate rotating dome truss scaffold.
- q. Install rotating dome truss scaffold to provide access to tank shell in Upper Dome of tank.
- r. Install trolley rail just above spring line level to support hanging scaffold platforms for access to tank shell in Barrel and Lower Dome of tank.
- s. Remove and dispose of tell-tale pipes and pipe supports from tank walls in the Upper Dome, Barrel, and Lower Dome, and weld patch plates over thru-shell holes. Remove and dispose of tell-tale jumper pipes and the collector ring in the Lower Dome and weld patch plates over thru-shell holes.
- t. Remove and dispose of steam lines and supports from tank bottom, and seal openings at the tank bottom for the steam supply line and steam condensate return line.
- Brush blast the entire tank shell to expose welds and remove most rust from plate surfaces.
 During sand blasting and tank shell coating operations, tank ventilation is exhausted to the LAT via the 32-inch dia. pipe nozzle and through an air filter bank.
- v. Inspect all existing welds; and test, grind, re-weld, and/or patch leaks (and suspected leaks) as required. Test welds with MT and/or PT. All existing welds, repaired welds, and new patch plate welds tested with soap film and vacuum box.
- w. Inspect all areas of tank shell plates; and test, grind, weld, and/or patch holes (and suspected holes) as required. Test welds with MT and/or PT. All welds tested with soap film and vacuum box.
- x. Seal weld channels over all vertical and horizontal joints connecting shell plates in the Upper Dome. Test all new welds.
- y. Install fuel sample lines from various levels on tank shell to the Lower Access Tunnel.
- z. Hydrostatically test fuel nozzle pipes and slop line nozzle pipe from tank bottom to first flange in Lower Access Tunnel, and repair or in the case of the slop line, slip-line, as required.
- aa. Sandblast tank shell to white metal, clean all surfaces of sandblast residue, treat with acid wash primer, and coat with NRL polyurethane coating system. Note: After sandblast to white metal, apply flame sprayed aluminum to circular 20-foot diameter bottom plate at center of Lower Dome and lower half of first course of sloping plates adjacent to circular bottom plate prior to application of polyurethane coating system.
- bb. De-mobilize and close tank
 - (1) Remove rotating boom truss.
 - (2) Remove trolley rail and handing scaffold platforms.
 - (3) Lock elevator cab in place in the center tower at the catwalk level and remove cables, counterweights, power climbers, etc.
 - (4) Remove lights, electrical power, compressed air, water, and tank ventilation equipment.
 - (5) Reinstall 8-foot diameter bolted dished head at entryway to tank with new gasket.
 - (6) Remove blinds from tank skin valve nozzle flanges and install repaired skin valves.
 - (7) Reconnect tank to Red Hill tank vent system.

- 2. Fill test /leak check by Naval Supply Center Fuel Department:
 - a. Reinstall and calibrate Asteroid float/tape/telemeter/counterweight level gauging system. Gauging system measures fuel level to nearest 0.001-foot (approx. 0.005-foot = 1/16-inch).
 - b. Refill tank with fuel.
 - (1) Use "old" thermally stable fuel from another Red Hill tank as much as possible. Avoid using fuel from tanks that are exposed to the sun in the Upper and Middle Tanks Farms.
 - (2) Transfer fuel slowly by gravity as much as possible to:
 - (a) avoid pumping which adds energy (heat) to fuel, and
 - (b) avoid cavitation which can entrain air in the fuel
 - (3) Fill tank to maximum fill level, 235-feet for Tanks 1-4 and 242-feet for Tanks 5-16. At that level a 0.001-foot change in tank level equals a volume change of approx. 2.35 gallons. Use strapping table for Upper Dome to compute precise volume per 0.001-foot level change.
 - c. Close and tighten skin valves.
 - d. Monitor skin valves for leakage.
 - e. Gauge tank for water, if any, accumulated at bottom of tank. Measure quantity of water/fuel drawn off tank bottom via low-point drain (slop) line.
 - f. Monitor and record telemeter reading on each 8-hour shift 24/7.
 - g. Plot telemeter reading (y-axis) versus time (x-axis).
 - (1) A straight line plot, i.e. a constant level drop with time most likely indicates a leak from either a hole(s) in the tank shell or a leak through a skin valve.
 - (2) A curved line plot asymptotic to x-axis indicates most likely indicates fuel shrinkage over time due to fuel cooling.
 - h. If indicated by leak test monitoring data, remove fuel from tank in stages to bring fuel level below the level of the hole through the shell.
 - i. If monitoring data indicates probable leakage, transfer all fuel out of tank via main fuel pipelines except for fuel/water/residue in tank bottom.
 - j. Slack main fuel pipelines in Lower Access Tunnel and drain residual fuel in nozzle pipelines from tank bottom to skin valves into main fuel pipelines.
 - k. Drain fuel/water/residue from tank bottom via slop line to another fuel tank or to Adit 3 slop tank depending on fuel quality.
 - I. Pull up and secure gauge float as high as possible in the tank to get it out of the way and preclude damage during leak rework.
- 3. Leak search and rework by contractor:
 - a. Mobilize electrical power, compressed air, water, and tank ventilation systems.
 - b. Isolate tank from in-service tanks in Red Hill tank vent system.
 - c. Insert blinds at skin valve nozzle flanges except for the low-point drain line (slop line) to isolate tank from fuel piping system.

- d. Ventilate tank to gas-free safe for entry condition. Continue ventilation throughout work in tank.
- e. Remove 8-foot diameter dished head for access to tank from Upper Tunnel.
- f. Install lighting adequate for tank cleaning.
- g. Working from the catwalk wash down center tower and tank walls.
- h. Drain tank wash water and residual sludge from tank bottom via the slop line.
- i. Drain all liquid and solid material from slop line nozzle pipe, and insert a blind on nozzle flange at skin valve to isolate tank from slop piping system.
- j. Install additional lighting.
- k. Install two pad mounts on opposite legs of center tower to attach and support two telescoping box booms.
- I. Fabricate and install two telescoping box booms each with a hanging man basket to provide access to all areas of the tank shell except the tank shell located below the catwalk.
- m. Install a hanging scaffold platform beneath the catwalk to access the portion of tank shell inaccessible from the telescoping box booms.
- Inspect all welds for leaks (backseepage of fuel); and test, grind, re-weld, and/or patch leaks (and suspected leaks) as required. Test repaired and suspect welds with MT and PT. All welds re-tested with vacuum box.
- Inspect all areas of tank shell plates for leaks (backseepage of fuel); and test, grind, weld, and/or patch holes (and suspected holes) as required. Test repaired and suspect welds with MT and PT. All welds re-tested with vacuum box.
- p. Prepare surface and recoat all repaired areas.
- q. If no leaks found in tank shell, hydrostatically re-test fuel nozzle pipes and slop line nozzle pipe from tank bottom to first flange in Lower Access Tunnel, and repair or in the case of the slop line, slip-line, as required.
- r. De-mobilize and close tank
 - (1) Remove two spider booms and man baskets.
 - (2) Remove lights, electrical power, compressed air, water, and tank ventilation equipment.
 - (3) Reinstall 8-foot diameter bolted dished head at entryway to tank with new gasket.
 - (4) Remove insert blinds from nozzle flanges at skin valves.
 - (5) Reconnect tank to Red Hill tank vent system.
- 4. Fill test /leak check by Naval Supply Center Fuel Department:



WILLBROS GOVERNMENT SERVICES

JOB NO.:	54118		PREPARED BY:	TDA	DATE:	1/27/2010	Rev 1
CLIENT NAME:	NAVFA	AC	CHECKED BY:	GH	SHEET:	1	OF1
SUBJECT:	Weldin	g Procedure Specific	cations (WPS) & Pro	cedure Qualific	ation Record (PQ	R)	
Material	P No.	Process	Consumable/ Rod	Required Position	Progression	WGS / InServ Weld Procedure	Remarks
(see P No.)	ī	SMAW	7018	6G	↑ UP (ALL)	1-S-1	
(see P No.)	1	SMAW	E7024	1F	F	1-S-10	
(see P No.)	1	SMAW	5P (6010)	6G	↓DOWN(ALL)	1-S-6	
(see P No.)	1	SMAW	5P / 7018	6G	↑ UP (ALL)	1-S-4	
(see P No.)	1	GTAW/SMAW	ER70S / 7018	6G	ALL	1-TS-1	
(see P No.)	1	FCAW		1G/2G	ALL	1-F-1	
							-
				1			

Per ASME IX Code Requirements.
 System - Tanks, Piping & Pipe Attachments or Supports.



INTEGRATED SERVICE COMPANY, L.L.C. 1900 N. 161st. E. AVENUE TULSA, OKLAHOMA 74116

Welding Procedure Specification (WPS)

WPS No.: 1-S-1	Date: 6/28/1	1994 Rev. No	.: 0		Page 1 of 2
Supporting PQR(s): P1-E-1					
Weld Type: Groove and fill	et welds				
BASE METALS (QW-403) P-No. 1 Thickness Ram to P-No. 1	ge:0.1875 in.	to 1.5000 in.			
PREHEAT (QW-406) Minimum Preheat Temperature:	50	°F	POSTWELD HI PWHT Type: N	MENT (QW-407) be performed	
Maximum Interpass Temperature:	500	°F	PWHT Tempera	None	٥F
	None after weld	ment	PWHT Holding	None	*
Weld Process / Method Weld Deposit Limit POSITION (QW-405)	0.	1st Process SMAW / Manua 0000 in. to 1.5000			
Position of Joint		All Positions			
Weld Progression		Vertical up			
FILLER METAL (OW-404)		* critical up			
AWS Classification		E7018			
SFA Spec. / F-No.		5.1	/ 4		
A-No. or Chemical Composition		1			
Filler Metal Trade Name		n/r			
Pass Greater Than 1/2":		No			
Filler Metal Size (in.)	1/8	5/32	3/16		
ELECTRICAL (QW-409)					
Welding Amperage Range	90-160	110-200	200-300		
Welding Voltage Range	n/r	n/r	n/r		
Travel Speed (in/min)	Var.	Var.	Var.		
Max. Heat Input (J/in)		None			
Current Type and Polarity		DCEP (reverse)			
TECHNIQUE (QW-410)					
Peening		None			
Stringer or Weave Bead	Str	inger and weave b	ead	 	
(1) No peening done with this proc	edure.				
No pass greater than 1/2" allow			A REPORT OF A REPORT OF A REPORT OF A REPORT OF A REPORT OF A REPORT OF A REPORT OF A REPORT OF A REPORT OF A R		
Preheat to 175F if "T" > 1" and	C > 0.30%;To 2	200F if 1.25 < "T	' <= 1.5"	 	

INTEGRATED SERVICE COMPANY, L.L.C.

Welding Procedure Specification (WPS)

JOINT DESIGN (QW-402)					
the state of the s	nd fillet welds				
Joint Type	Backing	Root Opening	Groove Angle	Root Face	Groove Radius
Single-V groove	no backing	3/16" max.	50 degree min.	1/8" max.	
Single-bevel groove	no backing	3/16" max.	45 degree min.	1/8" max.	
Single-V groove	gouged & back welded	1/4" max.	50 degree min.	3/16" max.	
Double-bevel groove	gouged & back welded	1/4" max.	45 degree min.	3/16" max.	
Double-V groove	gouged & back welded	1/4" max.	45 degree min.	3/16" max.	
Square groove	T-joint	1/32" max.			
Square groove	no backing	3/32" max.			
	NS SHOWN ARE NOT INCLU EERING SPECIFICATION OR 'PS.				
	With wire brush clean 1" both ind until all defects are removed				
and welding operations.	ntained during thermal cutting, t n each pass. When completed, re				

We certify that the statements in this specification are correct and in accordance with the requirements of Section IX of the ASME Code.

By: Quil & flows

David S. Glaves

6/28/1994 Date

QC Manager



INTEGRATED SERVICE COMPANY, L.L.C. 1900 N. 161st. E. AVENUE TULSA, OKLAHOMA 74116

Procedure Qualification Record (PQR)

PQR No.: P1-E-1	Date: 3/17/1	975 WPS No.:	1-S-1			Page 1 of 2
Groove Type: S Backing: Open b	Groove weld Single-V groove putt, no back weld			pe and Grade: 70 froup No 2	to <u>SA-515, 0</u> to P-No. 1	
Root Opening: 1/8 in.	Root Face:	1/16 in.	Thickness (in.):	0.7500		
Groove Angle: 60 ° PREHEAT (QW-406)			POSTWELD HI Type:		IENT (QW-40 WHT performed	
Minimum Preheat Temperature:	50	٥F	PWHT Temperat	ture.	None	°F
Maximum Interpass Temperature:	500	°F	PWHT Holding		None	r hr.
Preheat Maintenance:	None after weld	ment			Tione	III.
Weld Process / Method POSITION (QW-405) Position of Joint		lst Process SMAW / Manual 3G - Vertical				
Weld Progression		Vertical up				
FILLER METAL (QW-404) AWS Classification		E7018				
SFA Spec. / F-No.		5.1	1 4			
A-No. or Chemical Composition		1				
Filler Metal Trade Name		n/r				
Weld Deposit 't' (in.)		0.7500				
Pass Greater Than 1/2":		No				
Filler Metal Size (in.)	1/8	5/32	-			
ELECTRICAL (QW-409) Amperage Used	90-110	110-150	-			
Voltage Used	20	22-23				
Travel Speed (in/min)	4-9	4-9	-			
Max. Heat Input (J/in) None Current Type and Polarity DCEP (reverse)						
TECHNIQUE (QW-410) Stringer or Weave Bead	Stri	nger and weave bea	ıd			
(1) Peening was not used with this No Pass > 1/2" t.	weld test.		inter contraction and the factor			

INTEGRATED SERVICE COMPANY, L.L.C.

Procedure Qualification Record (PQR)

PQR No.: P1-E-1

Page 2 of 2

(in.) 0.521 0.521	(in ²) 0.213		Load (lb)		Failure Type	
	0.213		LUQU (10)	Stress (PSI)	and Location	
0.521			17100	80300	Weld metal	
	0.213		17400	81700	Weld metal	
	0	Guided B	end Tests (QW-16	0)		
lo.	Result	t	Туре	and Figure No.	Result	
nd	Satisfact	огу	QW-4	62.2 Side bend	Satisfactory	
nd	Satisfact	tory QV		62.2 Side bend	Satisfactory	
	Ha	rdness 7	fest - Brinell hard	ness		
			Re	adings		
187	185	180				
180	170	185				
Cohlmeyer			1.D.:	Stamp	No.: K	
g of coupon was v	itnessed by:	Cust-O-	Fab Inc			
Testing Services	2			Lab Test N	o.: P1-E-1	
		ect and th	at the test welds we		d tested in accordance with Manager	
	180 Cohlmeyer g of coupon was w D Testing Services tements in this rec on IX of the ASMI	nd Satisfact nd Satisfact Ha 187 185 180 170 Cohlmeyer g of coupon was witnessed by: o Testing Services tements in this record are correction IX of the ASME Code.	nd Satisfactory nd Satisfactory Hardness 7 187 185 180 180 170 185 Cohlmeyer g of coupon was witnessed by: Cust-O- o Testing Services tements in this record arc correct and th on IX of the ASME Code.	Ind Satisfactory QW-4 Id Satisfactory QW-4 Hardness Test - Brinell hard Re 187 185 180 180 170 185 Cohlmeyer I.D.: g of coupon was witnessed by: Cust-O-Fab Inc 0 Testing Services Its is record arc correct and that the test welds we on IX of the ASME Code.	Ind Satisfactory QW-462.2 Side bend Ind Satisfactory QW-462.2 Side bend Hardness Test - Brinell hardness Readings 187 185 180 180 170 185 2 Statisfactory Item of the second and	

David S. Glaves

3/17/1975 QC Manager



INTEGRATED SERVICE COMPANY, L.L.C. 1900 N. 161st. E. AVENUE TULSA, OKLAHOMA 74116

Welding Procedure Specification (WPS)

WPS No.: 1-S-10	Date: 7/30/2	008 Rev. No	o.: 0			Page 1 of 2
Supporting PQR(s): 7024-A						
Weld Type: Groove and fill	et welds					
BASE METALS (QW-403) P-No. 1 Thickness Ran to P-No. 1	ge:0.0625 in.	to 0.7500 in.				
PREHEAT (QW-406)			POSTWELD HI	EAT TREATM	IENT (QW-407)	
Minimum Preheat Temperature:	60	°F	PWHT Type: N	o PWHT will	be performed	
Maximum Interpass Temperature:	400	°F	PWHT Tempera	ture :	None	°F
Preheat Maintenance:	None		PWHT Holding	Fime:	None	
Weld Process / Method Weld Deposit Limit	0	1st Process SMAW / Manu 0.7500 in. maximu				
POSITION (QW-405) Position of Joint		Flat only				
Weld Progression		N/A				
FILLER METAL (QW-404)		1.971				
AWS Classification		E7024				
SFA Spec. / F-No.		5.1	/ 1			
A-No. or Chemical Composition		1				
Pass Greater Than 1/2":		No				
Filler Metal Size (in.)	5/32	3/16	1/4			
ELECTRICAL (QW-409)						
Welding Amperage Range	170-240	220-300	260-350			
Welding Voltage Range	n/r	n/r	n/r			
Travel Speed (in/min)	Var.	Var.	Var.			
Max. Heat Input (J/in)		None	14 			
Current Type and Polarity		DCEP (reverse))			
TECHNIQUE (QW-410) Peening		None	_			
Stringer or Weave Bead	Str	inger and weave I	bead			
Multiple / Single Pass (per side)		Multipass				

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INTEGRATED SERVICE COMPANY, L.L.C.

Welding Procedure Specification (WPS)

VPS No.: 1-S-10	Rev. No.: 0				Page 2 of 2
JOINT DESIGN (QW-402) Weld Type: Groove a	and fillet welds				
Joint Type	Backing	Root Opening	Groove Angle	Root Face	Groove Radius
Single-V groove	No backing	3/16" max	50 deg min	1/8" max	
Single bevel	No backing	3/16" max	45 deg min	1/8" max	
Single-V groove	Gouged & back welded	1/4" max	50 deg min	3/16" max	
Double bevel	Gouged & back welded	1/4" max	45 deg min	3/16" max	
Double-V groove	Gouged & back welded	1/4" max	45 deg min	3/16" max	
Square groove	T-joint	1/32" max			
Square groove	No backing	3/32" max			
Fillet Welds: All fillet sizes of Retainers: None	on all base metal thicknesses and	all diameters.	N		
	NS SHOWN ARE NOT INCLU NEERING SPECIFICATION OR VPS.				
	With wire brush clean 1 inch (/hen required, grind until all defec		of weld joint		
Minimum preheat must be Welds shall be cleaned be	maintained during thermal control to the second sec	utting, tacking, and ppleted, remove all	l welding operation slag and projection	ns.	

We certify that the statements in this specification are correct and in accordance with the requirements of Section IX of the ASME Code.

By: David Hans

David Haas

7/30/2008 QC Process Manager Date



INTEGRATED SERVICE COMPANY, L.L.C. 1900 N. 161st. E. AVENUE TULSA, OKLAHOMA 74116

Procedure Qualification Record (PQR)

PQR No.: 7024-A	Date: 10/21/19	87 WPS No	.: 1-S-10		Page 1 of 2
JOINT DESIGN (QW-402) Weld Type: Groove Type: S		BASE METALS (QW-403) Specification Type and Grade: SA-36 to SA-36			
Backing: Open b		P-No. 1 Gr	oup No. 1 to P-No.	1 Group No. 1	
Root Opening: 3/32 in.	Root Face:	1/8 in.	Thickness (in.):	0.3750	
Groove Angle: 60 °			POSTWELD HEAT TREATMENT (QW-407)		
PREHEAT (QW-406)			Type: No PWHT performed		
Minimum Preheat Temperature:	100	°F	PWHT Temperatu	ire: None	۰F
Maximum Interpass Temperature:	400	°F	PWHT Holding T	ime: None	hr.
Preheat Maintenance:	None after weldin	g			
		1st Process			
Weld Process / Method	SI	MAW / Manual			
POSITION (QW-405)					
Position of Joint		1G - Flat	and the second se		
Weld Progression		N/A			
FILLER METAL (QW-404)					
AWS Classification		E7024			
SFA Spec. / F-No.	5.1	the second second second second second second second second second second second second second second second s	/1		
A-No. or Chemical Composition	1				
Filler Metal Trade Name	n/r				
Weld Deposit 't' (in.)	0.3750				
Pass Greater Than 1/2":		No			
Filler Metal Size (in.)	1/8	5/32	3/16		
ELECTRICAL (QW-409)	105	225	255		
Amperage Used	195	225	255		
Voltage Used	3-5	27 5-7	6-8		
Travel Speed (in/min) Max. Heat Input (J/in)	3-3	None	0-0		
Current Type and Polarity	Г	DCEP (reverse)			
TECHNIQUE (OW-410)	Delli (levelse)				
Stringer or Weave Bead	String	ger and weave be	ad		
(1) Peening was not used with this	weld test.				

Procedure Qualification Record (PQR)

PQR No.: 7024-A

Page 2 of 2

Specimen No.	Width (in.)		kness n.)	Area (in ²)	Ultimate Total Load (lb)	Ultimate Unit Stress (PSI)	Failure Type and Location		
1	1.000	0.3	375	0.375	28000	74700	Base metal		
2	1.000	0.3	375	0.375	28000	74700	Base metal		
				Guided Ben	d Tests (QW-160)				
Type and Fi	gure No.		Rest	ult	Type and Fig	gure No.	Result		
QW-462.3(a) Face bend Acceptable		able	QW-462.3(a)		Acceptable				
QW-462.3(a)	Face bend		Accept	able	QW-462.3(a)	Root bend	Acceptable		
			I	lardness Tes	t - Brinell hardness				
Location			0.7		Readings				
SA-36 B1	M	198	181	196					
SA-36 HA	Z	188	182	190					
Weld meta	1	160	163	188					
isual Examination: iquid Penetrant Te: dded hardness, vis	st: Satisfactor		January 12	, 2009.					
elder's Name: Ch	arlie Wood				I.D.:	Stamp No.:	A		
QR was done and v	velding of cou	pon was wi	tnessed by	: Cust-O-Fal	5	- 52 50			
4 4 4 4	Tulsa Testing	and Insp.				Lab Test No.: 70)24-A		

By: Duvid & Gloves

David S. Glaves

10/21/1987 QC Manager

C - PQR IX - W - WPW 2010.1.0 Form 1999 Rev. 0



Welding	Procedure	Specification	(WPS)
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WPS No.: 1-S-6	Date: 2/24/	1999 Rev. No	o.: 2 Date	7/16/1999		Page 1 of 2
Supporting PQR(s): 99-010016-2						And the second sec
Weld Type: Groove and fill	let welds					
BASE METALS (QW-403) P-No. 1 Thickness Ran to P-No. 1	ge: <u>0.1875 in</u> .	to 0.8640 in.				
PREHEAT (QW-406)			POSTWELD HE	AT TREATM	ENT (QW-407)	
Minimum Preheat Temperature:	60	°F	PWHT Type: No	PWHT will b	e performed	
Maximum Interpass Temperature:	550	°F	PWHT Temperat		None	°F
Preheat Maintenance:	None after weld	Iment	PWHT Holding T	ime:	None	
Weld Process / Method Weld Deposit Limit	0.	1st Process SMAW / Manua .0000 in. to 0.2500				(8)
POSITION (QW-405)						
Position of Joint		All Positions	and the second second			
Weld Progression		Any				
FILLER METAL (QW-404)						
AWS Classification	and the state of the	E6010				
SFA Spec. / F-No.		5.1	/3			
A-No. or Chemical Composition		1				
Filler Metal Trade Name		n/r				
Pass Greater Than 1/2":		No				
Filler Metal Size (in.)	3/32	1/8	5/32			
ELECTRICAL (QW-409) Welding Amperage Range	60-90	80-120	110-165			
Welding Voltage Range	n/r	n/r	n/r			
Travel Speed (in/min)	Var.	Var.	Var.			
Max. Heat Input (J/in)		None				
Current Type and Polarity		DCEP (reverse)				
TECHNIQUE (QW-410)	_		······································			
Peening		None				
Stringer or Weave Bead	Str	inger and weave b	bead			
(1) No peening done with this proc Revision 2: Progression. Preheat to 175F if "T" > 1" and	edure.					

Welding Procedure Specification (WPS)

INTER PROTOST INTER	Rev. No.: 2				Page 2 of 2
JOINT DESIGN (QW-402)	1 611				
	nd fillet welds				
Joint Type	Backing	Root Opening	Groove Angle	Root Face	Groove Radius
Single-V groove	no backing	3/16" max.	50 degree min.	1/8" max.	
Single-bevel groove	no backing	3/16" max.	45 degree min.	1/8" max.	
Single-V groove	gouged & back welded	1/4" max.	50 degree min.	3/16" max.	
Double-bevel groove	gouged & back welded	1/4" max.	45 degree min.	3/16" max.	
Double-V groove	gouged & back welded	1/4" max.	45 degree min.	3/16" max.	
Square groove	T-joint	1/32" max.			
Square groove	no backing	3/32" max.			
Fillet Welds: All (QW-451.4)				
Retainers: None					
See fabrication drawing.					
WELD JOINT DESCRIPTIO	NS SHOWN ARE NOT INCLU	ISIVE OF ALL THO	SE FOUND ON A 1	OR WELD IOU	UT DESIGN
	EERING SPECIFICATION OR				
IOINTS SHOWN IN THIS W			into ora tob miteb	INDEDDITEL	VER WEED
Initial and Interneous Classings	Milel and a local star and a	11 C 111 1 1	(and ()	and the second second	
	With wire brush clean 1" both				
	hen required, grind until all defee	and the second contract and the second contract of the second secon	AND THE REPORT OF THE		
	ntained during thermal cutting, t	acking,			
ind welding operations.					
Welds shall be cleaned betwee:	n each pass. When completed, re	move all			
slag and projections.					

We certify that the statements in this specification are correct and in accordance with the requirements of Section IX of the ASME Code.

By: Duvid & Slaves

David S. Glaves

2/24/1999 QC Manager Date

C - WPS IX - W - WPW 2010.1.0 Form 1999 Rev. 0



Procedure Qualification Record (PQR)

JOINT DESIGN (QW-402) Weld Type: G	roove weld		BASE METALS (QW-403) Specification Type and Grade:				
	ngle-V groove		SA-106, Grade B to SA-106, Grade B				
	tt, no back weld		P-No. 1 G	roup No. 1 t	o P-No. 1	Group No. 1	
Root Opening:1/8in.Groove Angle:75°	Root Face:	<u>1/16</u> in	Thickness (in.): 0.4320 Diameter (in.): 6.6250				
PREHEAT (QW-406) Minimum Preheat Temperature:	60	٥F	POSTWELD HE Type:	EAT TREATMEN	T (QW-407 HT performed)	
Maximum Interpass Temperature: 350 °F			PWHT Temperat		None	°F	
Preheat Maintenance:	None		PWHT Holding		None	hr.	
Weld Process / Method POSITION (QW-405) Position of Joint	Ist Process SMAW / Manual 6G - 45 degree pipe				2nd Process SMAW / Man G - 45 degree	ual	
Weld Progression	Ver	tical up and do	wn	Vertical up and down			
FILLER METAL (QW-404) AWS Classification		E6010			E7019		
SFA Spec. / F-No.	5.1	and the second se	/ 3	<u> </u>			
A-No. or Chemical Composition	5.1	1	_ /		1	/ 4	
Filler Metal Trade Name		n/r			n/r		
Weld Deposit 't' (in.)		0.1250		0,3070			
Pass Greater Than ½":		No			No		
Filler Metal Size (in.)	3/32	-	1 -	1/8	-	-	
ELECTRICAL (QW-409)	I I I		1				
Amperage Used	90	-	-	100	-	-	
Voltage Used	23	-	-	24	-	-	
Fravel Speed (in/min)	Var.	15	· ·	Var.			
Max. Heat Input (J/in)		None			None	, 200	
Current Type and Polarity	E	OCEP (reverse)			DCEP (revers	e)	
TECHNIQUE (QW-410)							
Stringer or Weave Bead		Stringer bead	Stringer bead				

2

Procedure Qualification Record (PQR)

PQR No.: 99-010016-2

Page 2 of 2

				Tensile 7	fest (QW-150)			
Specimen No.	Width (in.)	Thick (in		Area (in ²)	Ultimate Total Load (lb)	Ultimate Unit Stress (PSI)	Failure Type and Location	
1	0.743	0.39	99	0.296	24110	81500	Ductile - BM	
2	0.745	0.3	84	0.286	23890	83500	Ductile - BM	
				Guided Ben	l Tests (QW-160)			
Type and Fi	Type and Figure No. Result			Type and Fig	ure No.	Result		
QW-462.2 S	ide bend		Satisfac	tory	QW-462.2 Side bend		Satisfactory	
QW-462.2 S	QW-462.2 Side bend		Satisfactory		QW-462.2 Side bend		Satisfactory	
			Н	ardness Tes	t - Brinell hardness			
Location			Н	ardness Tes	t - Brinell hardness Readings			
Location SA-106 Bl	М	150	H 150	ardness Tes 160				
		150 185						
SA-106 BI	Z		150	160				
SA-106 BI SA-106 HA	lZ	185	150 185	160 190		Stamp No.: J	H	
SA-106 BI SA-106 HA Weld Meta	AZ Il se Hobbs	185 190	150 185 190	160 190 185	Readings	Stamp No.: J	H	

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

By: Dwid & Alars

David S. Glaves

Date

1/8/1999 QC Manager



Welding Procedure Specification (WPS)

WPS No.: 1-S-4	Date: 1/8/19	199 Rev. No.	.:_0			Page 1 of	
Supporting PQR(s): <u>99-010016-2</u>			1000 No. 10 N	B11 - 11 - X			
Weld Type: Groove and fille	et welds						
BASE METALS (QW-403) P-No. 1 Thickness Rang to P-No. 1	ge: <u>0.1875 in</u> .	to 0.8640 in.		•			
PREHEAT (QW-406) Minimum Preheat Temperature:	60	°F		IEAT TREATME			
Maximum Interpass Temperature:	350	°F	PWHT Temper		None	۰F	
Preheat Maintenance:	None	WW Hand H	PWHT Holding	Time:	None		
Weld Process / Method Weld Deposit Limit	Ist Process SMAW / Manual 0.2500 in. maximum		(33)33-	2nd Process SMAW / Manual 0.6140 in. maximum			
POSITION (QW-405) Position of Joint		All Positions		All Positions			
Weld Progression		Any		Vertical up			
FILLER METAL (QW-404) AWS Classification		E6010			E7018		
SFA Spec. / F-No.		5.1	/ 3		5.1	/ 4	
A-No. or Chemical Composition		1			1		
Pass Greater Than 1/2":		No			No		
Filler Metal Size (in.)	3/32	1/8	5/32	3/32	1/8	5/32	
ELECTRICAL (QW-409) Welding Amperage Range	60-90	80-120	110-165	70-110	90-160	1 130-220	
Welding Voltage Range	n/r	n/r	n/r	n/r	n/r	n/r	
Travel Speed (in/min)	Var.	Var.	Var.	Var.	Var.	Var.	
Max. Heat Input (J/in)		None			None	1 <u></u>	
Current Type and Polarity		DCEP (reverse)		DCEP (reverse)		
TECHNIQUE (QW-410) Peening		None			None		
Stringer or Weave Bead		Stringer bead			Stringer bead		
Multiple / Single Pass (per side)		Multipass			Multipass	Multipass	

Welding Procedure Specification (WPS)

WPS No.: 1-S-4	Rev. No.: 0				Page 2 of 2
JOINT DESIGN (QW-402) Weld Type: Groove a					
Joint Type	Backing	Root Opening	Groove Angle	Root Face	Groove Radius
Single-V groove	No backing	3/16" max	50 deg min	1/8" max	
Single bevel	No backing	3/16" max	45 deg min	1/8" max	
Single-V groove	Gouged & back welded	1/4" max	50 deg min	3/16" max	
Double bevel	Gouged & back welded	1/4" max	45 deg min	3/16" max	
Double-V groove	Gouged & back welded	1/4" max	45 deg min	3/16" max	
Square groove	T-joint	1/32" max			
Square groove	No backing	3/32" max			
Fillet Welds: <u>All fillet sizes o</u> Retainers: <u>None</u>	on all base metal thicknesses and	all diameters.			
	ONS SHOWN ARE NOT INCLU IEERING SPECIFICATION OR VPS.				
and the second	With wire brush clean 1 inch (/hen required, grind until all defec		of weld joint		
	maintained during thermal c etween each pass. When con				

We certify that the statements in this specification are correct and in accordance with the requirements of Section IX of the ASME Code.

By: Duvid & Slans

David S. Glaves

1/8/1999 Date

QC Manager



21	iroove weld		BASE METALS Specification Typ	pe and Grade:		
	ngle-V groove		SA-106, Grade B to SA-106, Grade B			
	tt, no back weld	the lite property of the second second	- Sold Strategy - Contraction of the	COLORIDA CONTRACTOR CONTRACTOR	o P-No. 1	Group No. 1
Root Opening: <u>1/8</u> in. Groove Angle: <u>75</u> °	Root Face:	<u>1/16</u> in.	Diameter (in.):	0.4320 6.6250		
PREHEAT (QW-406) Ainimum Preheat Temperature:	60	°F	POSTWELD HI Type:	EAT TREATMEN No PW	NT (QW-407 HT performed	
Maximum Interpass Temperature: 350 °F			PWHT Temperat		None	٥F
reheat Maintenance:	None		PWHT Holding		None	hr.
Veld Process / Method POSITION (QW-405) Position of Joint Weld Progression	6	1st Process SMAW / Manual 6G - 45 degree pipe			2nd Process SMAW / Man	ual pipe
TLLER METAL (QW-404)	V	ertical up and dov E6010	/ 3 5.1		Vertical up and down	
FA Spec. / F-No.	5	1			/ 4	
-No. or Chemical Composition		1	- '	//4		/ 4
iller Metal Trade Name		n/r	and the second sec	n/r 0.3070 No		
Veld Deposit 't' (in.)	No	0.1250				
ass Greater Than 1/2":		No				
iller Metal Size (in.)	3/32	-	-	1/8		1 -
CLECTRICAL (QW-409)						
mperage Used	90	-	-	100		-
/oltage Used	23	1	-	24	19	-
'ravel Speed (in/min)	Var.			Var,	(*)	-
fax. Heat Input (J/in)		None			None	
Current Type and Polarity	e	DCEP (reverse)			DCEP (revers	e)
TECHNIQUE (QW-410) tringer or Weave Bead		Stringer bead	Stringer bead			

Procedure Qualification Record (PQR)

PQR No.: 99-010016-2

Page 2 of 2

pecimen No.	Width (in.)	Thickness (in.)	Area (in ²)	Ultimate Total Load (lb)	Ultimate Unit Stress (PSI)	Failure Type and Location	
1	0.743	0.399	0.296	24110	81500	Ductile - BM	
2	0.745	0.384	0.286	23890	83500	Ductile - BM	
			Guided Bend	Tests (QW-160)			
Type and Figure No. Re		Result	Type and Fig	ure No.	Result		
QW-462.2 Side bend		Sa	tisfactory	QW-462.2 Si	de bend	Satisfactory	
QW-462.2 Si	ide bend	Sa	tisfactory	QW-462.2 Si	de bend	Satisfactory	
			Hardness Test	- Brinell hardness			
Leasting				Readings			
Location		150 15	0 160				
SA-106 BI	VI					the second second second second second second second second second second second second second second second se	
		185 18	15 190				
SA-106 BM	Z	185 18 190 19					
SA-106 BI SA-106 HA	NZ 1l		0 185	I.D.:	Stamp No.: J	Н	
SA-106 BI SA-106 HA Weld Meta Ider's Name: _Jess	AZ al se Hobbs	190 19	0 185		Stamp No.: J	H	

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

By: Durid & Slaves

David S. Glaves

_____ <u>1/8/1999</u> QC Manager Date

> C • PQR IX - W - WPW 2010.1.0 Form 1999 Rev. 0



Welding Procedure Specification (WPS)

eld Type: Groove and fille	t welds					el canno con la civili
BASE METALS (QW-403) P-No. <u>1</u> Thickness Rang o P-No. <u>1</u>	e: 0.1875 in. to	1.5000 in				
PREHEAT (QW-406)			POSTWELD HI	EAT TREATME	NT (QW-407)	
Ainimum Preheat Temperature:	200	°F		o PWHT will be		
Aaximum Interpass Temperature:	550	°F	PWHT Tempera		None	°F
Preheat Maintenance:	None after weldm	ient	PWHT Holding	Time:	None	
		1st Process			2nd Process	
Veld Process / Method		GTAW / Manu:			SMAW / Manua	
/eld Deposit Limit	0.00	000 in. to 0.375	0 in.	0.0	0000 in. to 1.1250	in.
OSITION (QW-405)					All Destat	
osition of Joint /eld Progression		All Positions Any	onu contanta se contanta d		All Positions Vertical up	
GAS (QW-408)		лцу			ventear up	
hielding Gas / CFH	100%	Argon	/ 27-36			
railing Gas / CFH	No	Warren Wassesser	1 -			
acking Gas / CFH	None /		1 -			
ILLER METAL (QW-404)						
WS Classification		ER70S-2		E7018		
FA Spec. / F-No.	5.	and the second s	/6	and the second second second second second second second second second second second second second second second		_ / 4
-No. or Chemical Composition	0	1 n/r			1 n/r	
iller Metal Product Form		Bare (Solid)			Π/F	
onsumable Insert		None				
ass Greater Than ½":					No	
iller Metal Size (in.)	1/16	3/32	1/8	5/32	3/16	7/32
LECTRICAL (QW-409)						
/elding Amperage Range	70-150	80-180	130-275	130-220	200-300	250-350
/elding Voltage Range	n/r	n/r	<u>n/r</u>	n/r	n/r	n/r
ravel Speed (in/min)	Var.	Var. None		Var.	Var. None	Var.
lax. Heat Input (J/in) urrent Type and Polarity		DCEN (straight	· · · · · · · · · · · · · · · · · · ·		DCEP (reverse)	
ungsten Type / Size	EWTh		/ 1/16" ~ 3/16"		DOLI (levelse)	
ulsed Current		None				
ECHNIQUE (QW-410)						
eening		None			None	
tringer or Weave Bead	Strin	iger and weave l	bead	Str	inger and weave b	ead
Iultiple / Single Pass (per side)	CHARLES AND SECOND	Multipass				
fozzle / Gas Cup Size	The Contexture of the second	# 5 to # 10				19 M
) No peening done with this proc						
No pass greater than 1/2" allows	d.					

Welding Procedure Specification (WPS)

WPS No.: 1-TS-1	Rev. No.: 0				Page 2 of 2
JOINT DESIGN (QW-402) Weld Type: Groove a	nd fillet welds				
Joint Type	Backing	Root Opening	Groove Angle	Root Face	Groove Radius
Single-V groove	no backing	3/16" max.	50 degree min.	1/8" max.	
Single-bevel groove	no backing	3/16" max.	45 degree min.	1/8" max.	
Single-V groove	gouged & back welded	1/4" max.	50 degree min.	3/16" max.	
Double-bevel groove	gouged & back welded	1/4" max.	45 degree min.	3/16" max.	
Double-V groove	gouged & back welded	1/4" max.	45 degree min.	3/16" max.	
Square groove	T-joint	1/32" max.			
Square groove	no backing	3/32" max.			
	NS SHOWN ARE NOT INCLU EERING SPECIFICATION OR				
JOINTS SHOWN IN THIS W		A DESIGN DRAW	INO STIALE TARE	INCODENCE	JALK WELD
	With wire brush clean 1" both ind until all defects are removed				WW HINK SALE
and welding operations.	intained during thermal cutting, t n each pass. When completed, re				

We certify that the statements in this specification are correct and in accordance with the requirements of Section IX of the ASME Code.

By: Duvid & Slows

ų,

David S. Glaves

7/20/1994 QC Manager Date



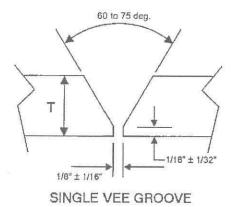
PQR No.: 92-159-1	Date: 1/10/199	2 WPS No.:	1-TS-1			Page 1 of 3
JOINT DESIGN (QW-402)			BASE METAL	S (OW-403)		
	Groove weld		Specification T			
	ingle-V groove		SA-516, Grade	Contraction and an and a second second	to SA-516, Gr	ade 70
	utt, no back weld				to $P-No.$ 1	
Root Opening: 1/8 in.	Freedow (Self) - Self- Robert - Self-	1/32 in.			10 1-110. 1	
Groove Angle: 60-70 °			None	0.7500		
None	1					
and the second s				IEAT TREATME		
PREHEAT (QW-406)	anaran		Type:		/HT performed	
Minimum Preheat Temperature:	175	°F	PWHT Temper		None	°F
Maximum Interpass Temperature:		°F	PWHT Holding	Time:	None	hr.
	None after weldme	ent	<u>N/A</u>			
None						
		1st Process			2nd Process	
Weld Process / Method	G	TAW / Manual			SMAW / Manu	al
POSITION (QW-405)						
Position of Joint		1G - Flat			1G - Flat	
Weld Progression		N/A			N/A	
Notes		None			None	
GAS (QW-408)	4446 - 4 - 200 - 10 - 10 - 10 - 10 - 10 - 10 - 1					111 - 11
Shielding Gas / CFH	100% A	Virgon	/ 30			
Trailing Gas / CFH	Nor	range Want over a sume bie summation on summit second comm	- / -			
Backing Gas / CFH	Nor	and the second s	1 -			
FILLER METAL (QW-404)			-			
AWS Classification		ER70S-2		12	E7018	
SFA Spec. / F-No.	5.1		/ 6		5.1	/ 4
A-No. or Chemical Composition		1			1	_ ^
Filler Metal Trade Name		n/r			n/r	
Filler Metal Product Form	and the second s	Bare (Solid)		A CONTRACTOR OF THE OWNER	4.0.4	
Consumable Insert		None				
GTAW Flux		N/A	and provide the second state of the second			
Weld Deposit 't' (in.)	- 1910	0.1875			0.5625	
Pass Greater Than 1/2":					No	and the second second
Filler Metal Size (in.)	3/32	- 1	*	5/32	3/16	1 -
ELECTRICAL (QW-409)		······				_ 1
Amperage Used	120	- 1		175	225	-
Voltage Used	18	-		24	28	-
Travel Speed (in/min)	Var.	- 1	-	Var.	Var.	-
Max. Heat Input (J/in)		NR			NR	
Current Type and Polarity	D	CEN (straight)			DCEP (reverse)
Tungsten Type / Size	EWTh-		1/8		Debr (revenue	/
Pulsed Current		None				
TECHNIQUE (QW-410)		110110				
Thermal Processes:		No			No	
Stringer or Weave Bead		Stringer bead			Stringer bead	
Multiple / Single Pass (per side)	and a survey provide some second strained	Multipass		· ·/·····	Multipass	
Nozzle / Gas Cup Size		# 8			Withipuss	
(1) (1) Peening was not used with the	nic wald that	and the second sec		1		
(1) (1) Peening was not used with the (2) No Pass $> 1/2$ " t.	ns werd test.		Contra grande warden			
(2) No Pass > $1/2$ 1. 10-20-08; corrected typo "No T	"harmal Processes"				an II. a marta haanna	
10-20-08, conceled type No 1	normal i focesses				han the second second second second second second second second second second second second second second second	
(2) None						

Procedure Qualification Record (PQR)

PQR No.: 92-159-1

Page 2 of 3

Joint Detail Image



Inc.: - Stamp No.: R Stamp No.: R R was done and welding of coupon was witnessed by: Integrated Service Company LLC st conducted by: Metlab Testing Services Lab Test No.: 92-159-1 We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.	Specimen No.	Width (in.)		ckness in.)	Area (in²)	est (QW-150) Ultimate Total Load (lb)	Ultimate Unit Stress (PSI)	Failure Type and Location
Guided Bend Tests (QW-160) Guided Bend Tests (QW-160) Type and Figure No. Result Type and Figure No. Result QW-462.2 Side bend Satisfactory QW-462.2 Side bend Satisfactory QW-462.2 Side bend Satisfactory QW-462.2 Side bend Satisfactory Hardness Test - Brinell hardness Location Readings SA-516 BM 140 156 146 Image: Satisfactory Satisfactory Wetable Metal 149 156 146 Image: Satisfactory Satisfactory Satisfactory Guide Metal Satisfactory Use Metal Satisfactory Metal Metal 149 140 156 Image: Satisfactory Satisfactory Satisfactory One Clocation Satisfactory Satisfactory Satisfactory One Clocation Satisfactory One Clocation <th< td=""><td>1</td><td>1</td><td></td><td>and all sectors and and and and and and and and and and</td><td>V2.5.00.076</td><td></td><td>70 COL 10 20 MR</td><td></td></th<>	1	1		and all sectors and and and and and and and and and and	V2.5.00.076		70 COL 10 20 MR	
Type and Figure No. Result Type and Figure No. Result QW-462.2 Side bend Satisfactory QW-462.2 Side bend Satisfactory Use Statisfactory QW-462.2 Side bend Satisfactory Satisfactory SA-516 BM 140 156 146 SA-516 HAZ SA-516 HAZ 167 174 174 Satisfactory Satisfactory Satisfactory Satisfactory Satisfactory Satisfactory Sone Identified Metal 149 140 156 Identified Metal Satisfactory Satisfactory Satisfactory Satisfactory Identified Metal Identified Metal Identi	2	0.750	0.	.755	0.566	43000	76000	Base metal
QW-462.2 Side bend Satisfactory QW-462.2 Side bend Satisfactory QW-462.2 Side bend Satisfactory QW-462.2 Side bend Satisfactory Wardness Test - Brinell hardness Location Readings SA-516 BM 140 156 146 156 SA-516 HAZ 167 174 174 174 174 Weld Metal 149 140 156 146 167 174 sual Examination: Satisfactory Satisfactory 156 167 174 174 174 167 sual Examination: Satisfactory Satisfactory 156 160 160 160 160 160 160 160 160 160 160 160 174 <t< td=""><td></td><td></td><td></td><td></td><td>Guided Bend</td><td>Tests (QW-160)</td><td></td><td></td></t<>					Guided Bend	Tests (QW-160)		
QW-462.2 Side bend Satisfactory QW-462.2 Side bend Satisfactory Hardness Test - Brinell hardness Location Readings SA-516 BM 140 156 146 SA-516 HAZ 167 174 174 174 Weld Metal 149 140 156 166 167 sual Examination: Satisfactory Satisfactory 167 174 174 one I.D.: - Stamp No.: R 167 clder's Name: Paul Stokes I.D.: - Stamp No.: R QR was done and welding of coupon was witnessed by: Integrated Service Company LLC Stamp No.: 92-159-1 We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with requirements of Section IX of the ASME Code. Image: Code image: Code	Type and F	igure No.		Rest	ılt	Type and Fig	gure No.	Result
Hardness Test - Brinell hardness Location Readings SA-516 BM 140 156 146				Satisfac	ctory	QW-462.2 Si	de bend	Satisfactory
Location Readings SA-516 BM 140 156 146 167 SA-516 HAZ 167 174 174 174 Weld Metal 149 140 156 167 sual Examination: Satisfactory 167 174 174 one ID:: Stamp No.: R clder's Name: Paul Stokes I.D.: - Stamp No.: R QR was done and welding of coupon was witnessed by: Integrated Service Company LLC st conducted by: Metab Testing Services Lab Test No.: 92-159-1 We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with trequirements of Section IX of the ASME Code. Image: Code dot for the ASME Code.	QW-462.2 5	Side bend		Satisfac	ctory	QW-462.2 Si	de bend	Satisfactory
SA-516 BM 140 156 146 SA-516 HAZ 167 174 174 Weld Metal 149 140 156 isual Examination: Satisfactory one				I	lardness Test	- Brinell hardness		
SA-516 HAZ 167 174 174 Weld Metal 149 140 156 sual Examination: Satisfactory one	Location	n				Readings		
Weld Metal 149 140 156 sual Examination: Satisfactory one I.D.: - Stamp No.: R clder's Name: Paul Stokes I.D.: - Stamp No.: R QR was done and welding of coupon was witnessed by: Integrated Service Company LLC	SA-516 E	BM	140	156	146			
sual Examination: Satisfactory Define clder's Name: Paul Stokes I.D.: - Stamp No.: R QR was done and welding of coupon was witnessed by: Integrated Service Company LLC est conducted by: Metlab Testing Services Lab Test No.: 92-159-1 We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with t requirements of Section IX of the ASME Code.					11 - NTOTOS			
elder's Name: Paul Stokes I.D.: - Stamp No.: R QR was done and welding of coupon was witnessed by: Integrated Service Company LLC est conducted by: Metlab Testing Services Lab Test No.: 92-159-1 We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with a requirements of Section IX of the ASME Code.	Weld Me	tal	149	140	156			
QR was done and welding of coupon was witnessed by: Integrated Service Company LLC est conducted by: Metlab Testing Services Lab Test No.: 92-159-1 We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with requirements of Section IX of the ASME Code.	one				1			
We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with requirements of Section IX of the ASME Code.	elder's Name: Pa	ul Stokes			I	.D.: -	Stamp No.: _I	2
We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with requirements of Section IX of the ASME Code.	R was done and	welding of cou	ipon was w	itnessed by	: Integrated S	ervice Company LLC		
requirements of Section IX of the ASME Code.	est conducted by:	Metlab Testin	g Services				Lab Test No.: 92	2-159-1
		the statements			rect and that th	e test welds were prep	ared, welded, and test	ed in accordance with tl
By: 1/10/1992 MFG QC Manager		f Section IX of	the ASME	s Code.				



Welding Procedure Specification (WPS)

WPS No.: <u>1-F-1</u> Supporting PQR(s): <u>90-1884-6</u> ; 92-	Date: 7/13/1 -2474	994 Rev. No	b.: <u>0</u>			Page 1 of 2
Weld Type: Groove and fille			**************************************	ennesettnowerness With a MR 1993		
BASE METALS (QW-403) P-No. 1 Thickness Rang to P-No. 1	ge:0.0625 in. (to 1.5000 in				
PREHEAT (QW-406)			POSTWEL	D HEAT TREAT	MENT (QW-407)
Minimum Preheat Temperature:	50	°F		e: No PWHT wil	l be performed	
Maximum Interpass Temperature:	600	°F	PWHT Tem		None	°F
Preheat Maintenance:	None after weld	ment	PWHT Hold	ling Time:	None	
		1st Process				
Weld Process / Method	FC	AW / Semiauto	matic			
Weld Deposit Limit	0.0	0000 in. to 1.500	0 in.			
POSITION (QW-405)						
Position of Joint		All Positions				
Weld Progression		Vertical up				
GAS (QW-408)						
Shielding Gas / CFH	75% Argo	n, 25% CO2	/ 23-30			
Trailing Gas / CFH	N	lone	/ -			
Backing Gas / CFH	N	lone	/			
FILLER METAL (QW-404)						
AWS Classification		E71T-1				
SFA Spec. / F-No.	5	5.20	/ 6			
A-No. or Chemical Composition		1				
Filler Metal Trade Name		n/r				
Filler Metal Product Form		Flux cored				
Supplemental Filler Metal		None		time -		
Pass Greater Than 1/2":	0.005	No	1 7/14			
Filler Metal Size (in.)	0.035	0.045	_ 1/16		·	
ELECTRICAL (QW-409)	120 200	170.070	1 005 200			
Welding Amperage Range	120-200	170-270 22-26	225-300			
Welding Voltage Range	Var.	Var.				
Travel Speed (in/min)	var.	None	Vai.			
Max. Heat Input (J/in)		DCEP (reverse	3			
Current Type and Polarity		Globular are	/			
Transfer Mode TECHNIQUE (QW-410)		Giobular arc				
Peening		None				
Stringer or Weave Bead	Str	inger and weave	bead			
Multiple / Single Pass (per side)		Multipass	bedd			
Nozzle / Gas Cup Size		1/2"-3/4"				
Contact Tube to Work Distance		1/2"-1"				
(1) No peening done with this proc		entra de la composición de la				
No pass greater than 1/2" allow Preheat to 175F if "T" > 1" and	C > 0 200/.T~	DODE : 61 25 - 12	CH 1 5"			
$rreneat to 1/5r ti 1 > 1^{\circ} and$	C = 0.3070,10 2	1.20 N II 1.20 ~ 1	-1.5			

Welding Procedure Specification (WPS)

JOINT DESIGN (QW-402)					Page 2 of 2
	nd fillet welds				
Joint Type	Backing	Root Opening	Groove Angle	Root Face	Groove Radius
Single-V groove	no backing	3/16" max.	50 degree min.	1/8" max.	
Single-bevel groove	no backing	3/16" max.	45 degree min.	1/8" max.	
Single-V groove	gouged & back welded	1/4" max.	50 degree min.	3/16" max.	
Double-beyel groove	gouged & back welded	1/4" max.	45 degree min.	3/16" max.	
Double-V groove	gouged & back welded	1/4" max.	45 degree min.	3/16" max.	
Square groove	T-joint	1/32" max.			
Square groove	no backing	3/32" max.			
Retainers: None See fabrication drawing. WELD JOINT DESCRIPTIO	NS SHOWN ARE NOT INCLL	JSIVE OF ALL THO	SE FOUND ON A J	OB. WELD JOI	NT DESIGN
REFERENCE IN AN ENGIN JOINTS SHOWN IN THIS W	EERING SPECIFICATION OR	A DESIGN DRAW	ING SHALL TAKE	PRECEDENCE (OVER WELD
	With wire brush clean 1" both ind until all defects are removed				
and welding operations.	ntained during thermal cutting, t				<u></u>

We certify that the statements in this specification are correct and in accordance with the requirements of Section IX of the ASME Code.

By: Dwid & Slaves

David S. Glaves

7/13/1994 QC Manager Date

T - WPS IX - W - WPW 2010.1.0 Form 1999 Rev. 0



Procedure Qualification Record (PQR)

PQR No.: 90-1884-6	Date: 4/4/1990	WPS No .:	1-F-1			Page 1 of 2
JOINT DESIGN (QW-402)			BASE METALS			
	Groove weld		Specification Type			
	Single-V groove		SA-516, Grade 70	and the second se	to <u>SA-516</u> , (
	outt, no back weld			oup No. 2	to P-No. 1	Group No. 2
Root Opening: <u>1/8</u> in.	Root Face:	1/16 in.	Thickness (in.):	0.7500		6. U 4
Groove Angle:60°			POSTWELD HEA	T TREATMI	ENT (QW-40'	7)
PREHEAT (QW-406)			Type:		WHT performed	
Minimum Preheat Temperature:	50	°F	PWHT Temperatu	re:	None	°F
Maximum Interpass Temperature:	400	°F	PWHT Holding Tit		None	hr.
Preheat Maintenance:	None after weldmen	it				
		1st Process	· · · · · · · · · · · · · · · · · · ·			
Weld Process / Method		/ / Semiautom	atic			
POSITION (QW-405)		, octimation	ALL			
Position of Joint		1G - Flat				
Weld Progression		N/A				
GAS (QW-408)		1971				
Shielding Gas / CFH	75% Argon, 2	5% CO2	/ 25			
Trailing Gas / CFH	None		1			
Backing Gas / CFH	None		1 -			
FILLER METAL (QW-404)	THOM					
AWS Classification		E71T-1				
SFA Spec. / F-No.	5.20	1./11-1	/ 6			
A-No. or Chemical Composition	0.20	1	· /			
Filler Metal Trade Name		n/r	and the second second second second second second second second second second second second second second second			
Filler Metal Product Form		Flux cored				
Supplemental Filler Metal	anne an an an an an an an an an an an an an	None				
Weld Deposit 't' (in.)		0.7500	and the second second second second second second second second second second second second second second second			
Pass Greater Than ½":		No				
Filler Metal Size (in.)	0.0450	- 1				
ELECTRICAL (QW-409)	0.0100 1	1				
Amperage Used	200-225	- 1	-			
Voltage Used	20-24					
Travel Speed (in/min)	12-22					
Max. Heat Input (J/in)		27000				
Current Type and Polarity	D	CEP (reverse)				
Transfer Mode		Globular arc				
TECHNIQUE (QW-410)						
Stringer or Weave Bead	Stringe	r and weave be	ad			
Multiple / Single Pass (per side)		Multipass				
Nozzle / Gas Cup Size		5/8"				
Contact Tube to Work Distance	esen 9 mil de l'olivita post de	1/2"-1"				
	wald tast			and the second second second	8 March 19 Sec. 19	
 Peening was not used with this No Pass > 1/2" t. 	s weld lest.		25 Mind Alexandrawy star		WH WH. 19-19-19	

Added Impact Test per Lab#99-050033-1

Procedure Qualification Record (PQR)

PQR No.: 90-1884-6

Page 2 of 2

Liquid Penetrant Test: Satisfactory Deposit Chemistry:C=0.06.Mn=1.35,P=0.009,S=0.016,Si=0.58,Cu=0.01, Ni=0.05,Cr=0.03,Mo=0.02 No addition/deletion of supplemental filler metal or powder filler metal. Vickers hardness test performed by Weeks Lab. 8-21-08 for Inserv. Welder's Name: Ron Cody I.D.: Stamp No.: T PQR was done and welding of coupon was witnessed by: Cust-O-Fab Inc					Tensile T	'est (QW-1	50)				
2 0.982 0.755 0.741 65500 88400 Base metal Hardness Test - Vickers hardness Location Readings SA-516 BM 167 156 168 156 167 156 SA-516 HAZ 174 170 170 173 170 173 175 170 Weld Metal 172 176 174 166 167 158 165 Visual Examination: Satisfactory Liquid Penetrant Test: Satisfactory Deposit Chemistry:C=0.06.Mn=1.35,P=0.009,S=0.016,Si=0.58,Cu=0.01, Ni=0.05,Cr=0.03,Mo=0.02 No addition/deletion of supplemental filler metal or powder filler metal. Vickers hardness test performed by Weeks Lab. 8-21-08 for Inserv. I.D.: Stamp No.: T Welder's Name: Ron Cody I.D.: Stamp No.: T	Specimen No.								Contraction of the second second second second second second second second second second second second second s		
Hardness Test - Vickers hardness Location Readings SA-516 BM 167 156 167 156 SA-516 HAZ 174 170 170 173 175 170 Weld Metal 172 176 174 166 167 158 165 Visual Examination: Satisfactory Satisfactory 168 165 165 Deposit Chemistry:C=0.06,Mn=1.35,P=0.009,S=0.016,Si=0.58,Cu=0.01, Ni=0.05,Cr=0.03,Mo=0.02 Viskers hardness test performed by Weeks Lab. 8-21-08 for Inserv. Vickers hardness test performed by Weeks Lab. 8-21-08 for Inserv. Welder's Name: Ron Cody I.D.: Stamp No.: T PQR was done and welding of coupon was witnessed by: Cust-O-Fab Inc Stamp No.: T	1	0.982	0	.760	0.746	66	5200	88700)	Base me	etal
Location Readings SA-516 BM 167 156 168 156 167 156 SA-516 HAZ 174 170 170 173 170 173 175 170 Weld Metal 172 176 174 166 167 170 168 165 Visual Examination: Satisfactory Satisfactory 172 176 174 166 167 170 168 165 Usual Examination: Satisfactory Satisfactory 165 167 170 168 165 Deposit Chemistry:C=0.06.Mn=1.35,P=0.009,S=0.016,Si=0.58,Cu=0.01, Ni=0.05,Cr=0.03,Mo=0.02 No 156 167 170 168 165 No addition/deletion of supplemental filler metal or powder filler metal. Vickers hardness test performed by Weeks Lab. 8-21-08 for Inserv. Vickers hardness test performed by Weeks Lab. 8-21-08 for Inserv. Welder's Name: Ron Cody I.D.: Stamp No.: T PQR was done and welding of coupon was witnessed by: Cust-O-Fab Inc Stamp No.: T	2	0.982	0	.755	0.741	65	500	88400)	Base m	etal
SA-516 BM 167 156 168 156 167 156 SA-516 HAZ 174 170 170 173 170 173 175 170 Weld Metal 172 176 174 166 167 170 168 165 Visual Examination: Satisfactory				Н	ardness Test	- Vickers I	ardness				
SA-516 HAZ 174 170 170 173 170 173 175 170 Weld Metal 172 176 174 166 167 170 168 165 Visual Examination: Satisfactory	Location	r					Readings				
Weld Metal 172 176 174 166 167 170 168 165 Visual Examination: Satisfactory Liquid Penetrant Test: Satisfactory Deposit Chemistry:C=0.06.Mn=1.35,P=0.009,S=0.016,Si=0.58,Cu=0.01, Ni=0.05,Cr=0.03,Mo=0.02 No addition/deletion of supplemental filler metal or powder filler metal. Vickers hardness test performed by Weeks Lab. 8-21-08 for Inserv. Welder's Name: Ron Cody I.D.: Stamp No.: T PQR was done and welding of coupon was witnessed by: Cust-O-Fab Inc	SA-516 B	M	167	156	168	156	167	156			
Visual Examination: Satisfactory Liquid Penetrant Test: Satisfactory Deposit Chemistry:C=0.06.Mn=1.35,P=0.009,S=0.016,Si=0.58,Cu=0.01, Ni=0.05,Cr=0.03,Mo=0.02 No addition/deletion of supplemental filler metal or powder filler metal. Vickers hardness test performed by Weeks Lab. 8-21-08 for Inserv. Welder's Name: Ron Cody I.D.: Stamp No.: T PQR was done and welding of coupon was witnessed by: Cust-O-Fab Inc	SA-516 H/	AZ	174	170	170	173	170	173	175	170	168
Liquid Penetrant Test: Satisfactory Deposit Chemistry:C=0.06.Mn=1.35,P=0.009,S=0.016,Si=0.58,Cu=0.01, Ni=0.05,Cr=0.03,Mo=0.02 No addition/deletion of supplemental filler metal or powder filler metal. Vickers hardness test performed by Weeks Lab. 8-21-08 for Inserv. Welder's Name: Ron Cody I.D.: Stamp No.: T PQR was done and welding of coupon was witnessed by: Cust-O-Fab Inc	Weld Met	al	172	176	174	166	167	170	168	165	
PQR was done and welding of coupon was witnessed by: Cust-O-Fab Inc	Ni=0.05,Cr=0.03,M No addition/deletion	o=0.02 of supplement	ntal filler m	etal or powe	ler filler meta						
	Welder's Name: Ro	n Cody				I.D.:		Stam	p No.: T		
Test conducted by: Metlab Testing Services Lab Test No.: 90-1884-6	PQR was done and v	velding of cou	upon was v	vitnessed by	: Cust-O-Fal	o Inc					
Test conducted by: Metlab Testing Services Lab Test No.: 90-1884-6	Test conducted by:	Metlab Testin	ng Services					Lab Test	No.: 90-18	84-6	
We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance wit requirements of Section IX of the ASME Code.	requirements of	Section IX of			ect and that t	he test weld	s were prep	arcd, welded,	and tested in	n accordance	with the

By: Dwith & Allowers		8/21/2008	QC Manager
nars	David S. Glaves	Date	



PQR No.: 92-2474	Date: 4/22/1992	WPS No .:	1-F-1		Page 1 of 2
JOINT DESIGN (QW-402) Weld Type: Groove Type:	Groove weld Single-V groove		BASE METALS (QW-403) Specification Type and Grade: SA-516, Grade 70	to SA-516, G	
	outt, no back weld		P-No. 1 Group No. 2	to P-No. 1	Group No. 2
Root Opening: 1/8 in.		1/16 in.	Thickness (in.): 0.3750	10 1-110. 1	
Groove Angle: 60 °			POSTWELD HEAT TREATM	TENT (OUL 107	
PREHEAT (QW-406) Minimum Preheat Temperature: Maximum Interpass Temperature: Preheat Maintenance:	60 450 None after weldment	_°F °F		PWHT performed None None	orr hr.
	1	st Process			
Weld Process / Method POSITION (QW-405) Position of Joint Weld Progression		/ Semiautoma 1G - Flat N/A	stic		
GAS (QW-408)					
Shielding Gas / CFH Trailing Gas / CFH	75% Argon, 25	% CO2	/25		
Backing Gas / CFH	None		1		
FILLER METAL (QW-404)	INONC		/		
AWS Classification		E71T-1			
SFA Spec. / F-No.	5.20	L/11-1	/ 6		
A-No. or Chemical Composition	5.20	1	70		
Filler Metal Trade Name		n/r			
Filler Metal Product Form	F	lux cored			
Supplemental Filler Metal		None			
Weld Deposit 't' (in.)		0.3750			
Pass Greater Than 1/2":		No			
Filler Metal Size (in.)	0.0450	-			
ELECTRICAL (QW-409)					
Amperage Used	170-270		-		
Voltage Used	24-28	<u> </u>	-		
Travel Speed (in/min)	Var.	-			
Max. Heat Input (J/in)		None			
Current Type and Polarity		EP (reverse)			
Transfer Mode	Gl	obular arc			
TECHNIQUE (QW-410) Stringer or Weave Bead	0.2				
Multiple / Single Pass (per side)		and weave bea	<u>d</u>		
Nozzle / Gas Cup Size	IV	fultipass 5/8"			
Contact Tube to Work Distance	1	5/8" /2"-3/4"			
		12 "01"			
(1) Peening was not used with this Revised to indicate globular arc					

Procedure Qualification Record (PQR)

PQR No.: 92-2474

Page 2 of 2

			Tensile T	est (QW-150)		
Specimen No.	Width (in.)	Thickness (in.)	Area (in ²)	Ultimate Total Load (lb)	Ultimate Unit Stress (PSI)	Failure Type and Location
1	0.758	0.354	0.268	23800	88800	Base metal
2	0.756	0.334	0.253	22400	88500	Base metal
			Guided Bend	Tests (QW-160)		
Type and Figure No. Result		ult	Type and Figure No.		Result	
QW-462.2 Side bend		Satisfa	ctory	QW-462.2 Si	de bend	Satisfactory

QW-462.2 Side bend		Satisfac	tory	QW-462.2 Side	bend	Satisfactory
		H	ardness Test -	Brinell hardness		
Location				Readings		
SA-516 BM	156	170	159			
SA-516 HAZ	163	183	174			
Weld Metal .	187	192	200			
's Name: Rick Barbee			I.I	D.:	Stamp No.:	YY
vas done and welding of co	oupon was w	vitnessed by:	Cust-O-Fab In	nc		
onducted by: Metlab Test	ing Services				Lab Test No .:	92-2474

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

wid & Alano By: 8

QW-462.2 Side bend

David S. Glaves

Satisfactory

4/22/1992 QC Manager Date

QW-462.2 Side bend

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