WASHINGTON SITE INSTALLATION CONTRACTOR QA DATA

CONTRACT NO.:

PC 175730

PROGRAM I.D.:

LIGO VACUUM EQUIPMENT

PSI DOCUMENT NO.:

V049-8-863

V049-8-864

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V049-8-867

SUBMITTED TO:

California Institute of Technology 391 South Holliston Avenue Pasadena, CA 91125

SUBMITTED BY:

Process Systems International, Inc. 20 Walkup Drive Westborough, MA 01581



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214 E. ALBANY KENNEWICK WA 99336 PROCEDURE: #NDE-01 REV: 2

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RADIOGRAPHIC TECHNIQUE SHEET

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DOUBLE-WALL RADIOGRAPHIC TECHNIQUES

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RADIOGRAPHIC TECHNIQUE SHEET

SINGLE-WALL RADIOGRAPHIC TECHNIQUES

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RADIOGRAPHIC TECHNIQUE SHEET

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RADIOGRAPHIC TECHNIQUE SHEET

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DOUBLE-WALL RADIOGRAPHIC TECHNIQUES

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API		4 1/2 x 17	T - Tur	ngsten fr	nclusion	BT - Burn Through	OX - Oxidation	,	
AWS	s	7 x 17			Fusion	UC - Undercut	MM - Mismatch		
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RADIOGRAPHIC TECHNIQUE SHEET

SINGLE-WALL RADIOGRAPHIC TECHNIQUES

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COURTE-WALL RADIOGRAPHIC TECHNIQUES

DOUBLE-WALL RADIOGRAPHIC TECHNIQUE

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Radiographic

DATE	1-7-97	PAGE_	 _ of _	2	
CLIENT:	APOLLO)	 		
LOCATION:	SHOP		 		

PROCEDURE: #NDE-01

Evan	ination Report			PROCE	DURE: #NDE-01	REV:	2	
<u>Exam</u>	III lation report							
Acci ANS ASN API AWS OTH	AE <u>A3 /. 3</u> 4 x 10	P - Por T - Tur IF - Inc	igsten in amplete	clusion	Weld Discontinuity Code DT - Drop Through SI - Siag Inclusion BT - Burn Through UC - Undercut C - Crack	S CX - Root Conve CV - Root Conca OX - Oxidation MM - Mismatch HB - Hollow Bear	vity	
AREA	COMMENTS	ACC	REJ	AREA	COMMENT	s	ACC	RE_
	4"VA-257-1BI							
	4"VA-257-1BI w#13, welder 2-42							
e-1		Х						
1-2		X						
2-3		X				<u> </u>		
3-0		X						
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Radiographer / Mului Level II Interpreter_ 7 Martini Customer

Form RT-+

INSPECTION SERVICE INC.

Form RT -18
Proc. RT - 01 Rev _ 2_
RT. Report # ____

RADIOGRAPHIC TECHNIQUE SHEET

SINGLE-WALL RADIOGRAPHIC TECHNIQUES

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DOUBLE-WALL RADIOGRAPHIC TECHNIQUES

DOUBLE-WALL RADIOGRAPHIC TECHNIQUES

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ini	Economical St. 18 doing co East Other tor Comments Committee	rEmpure Same Other Searce Same Searce Jame Searce Imagers		F			Earer Sale		List and 19 Lists and 19 Aure Comment Comment	S		G		Frien Sado	Fion Side



DATE 9-23-97	PAGE / of Z
CLIENT: APOLLO	(LIGO TIL)
LOCATION: SHOP	

PROCEDURE: #NDE-01 REV: 2

	eptance Criteria	Film Cou	nt i				Weld Discontinuity Code	95		
ANS				SL - Sk	ag Lines	,	DT - Drop Through	CX - Root Conve	xitv	
X ASM		4 x 10		P - Por	_	•	SI - Slag Inclusion	CV - Root Concar		
API		4 1/2 x 17	— —		gsten in	clusion	BT - Burn Through	OX - Oxidation		
AWS		7 x 17				Fusion	UC - Undercut	MM - Mismatch		
AVV		14 x 17	ı			Penetration	C - Crack	HB - Hollow Bead	ı	
		<u>- 1,****</u>								
AREA	co	OMMENTS		ACC	REJ	AREA	COMMENT	'S	ACC	REJ
	4" VA-43	38-181	WE	DEA	? <u>Z</u> -	32				
	W #1									
6-1				\times				,		
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	4" VA-47	72-181	WE	(DE	0 Z	-46				
	W#6									
0-1				X					_	
1-2				X						
2.3				X						
3.0				X						
								<u></u>		
							<u> </u>			

Radiographer	Tomy	Martin	Level II	Interpreter	1 ouy	Moulu	Level II
Customer						•	Form RT



Form RT - 1B
Proc. RT - 01 Rev <u>2</u>
RT. Report #____

RADIOGRAPHIC TECHNIQUE SHEET

SINGLE-WALL RADIDGRAPHIC TECHNIQUES

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	35			0.0.	Technique	Antonial Acres	End Years	Side View	Selection	Place	Place
Pipe Diameter	4"				Same. Wall			, film		Source See	
Views	4			4-7	 	Supplier Man					Eitner Side
Distance Source to Film	5-"	-								Film Sier	
Focal Spot Size	.146"						A				
Material Type/Thickness	55 "	-			Samples Wast					Searce Saler	
Geometric Unsharpness	,01"	· · · · · · · · · · · · · · · · · · ·		٠ ا		Smeth. Wall) [[]	ļ		Film Seer
Penetrameter (s)	IOF	-				,	B	Film		Piere Siev	
Shim Thickness	.090*						*	~~ \$			
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1 echnique #	· · · · · · · ·					, n	DUBLE-WALL RADIOGRA				

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DOUBLE-WALL RADIOGRAPHIC TECHNIQUES

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0.0	T-0-	Virtuality	End Y-e	Sate Yara	Serection	Place	Placer	0.0.	Annabar .	Virusag	Erel Voya	Side View	Serection	Place	Place-
Mi be tres	Davidge Walk at Least 3 Expenses at 40 deg. to Least Diver for Complete Complete Complete Complete Complete	Develo- Wrat: Read Super- erransed Subject Side and From Side Images				Sports Side	Ejener Sær	4-7	Dischess Walt at Leart 3 Exercises 120 ang to Eacn Other Go Corrects Coverage	Sungia. Yeşal				Source Side Side	Firm Side
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APOLLO GENERAL INSPECTION/TEST REPORT					
Project:	Contractor:	Report No:			
LIGO II	Aforco	WHIZE ON MA			
Drawing or Specification:		Test Equipment Used (Incl ID):			
The V-049-2-029	}	NA.			
Item Inspected or Tested:	. 1	M. a & Ka a sile			
fat. Shop.	vax neverny w	vve: Mance at Kennenide			
Inspection or Test Description:	un A sal	ETAIN Alex Lander			
for WPS AWS-50 7-46 (Phillips)	ma-01. Weld	E7018 electrodes as ws 7-32 (Loftus)c			
Results: Wills are exce	ellent quality &	meet or exceed			
AWS DII Gect		,			
Deficiencies:					
- None-					
All of the items tested or incorporate contract unless noted otherwise.	d in the work are in complian	ce with the terms and conditions of the Reject			
Inspected by: white way		Date: 9/9/97			

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:	Report No:	· · · · · · · · · · · · · · · · · · ·	
LIGO_III	Africa		<u>-</u>	
Drawing or Specification:		Test Equipment Used (Incl ID):		
V-049-2-21		N/A		
Item Inspected or Tested:	,			
General observa	tion Gurveilla	ince of fifing		
Suffaits		. ,		
			-	
Inspection or Test Description:				
Welding Q. Ke E7018 electrod	anewick Shap	0: GMAN Using		
Popular				
Results:			· · · · · ·	
Satisfactory.	- welders ar	USING		
a Can 111 d	- welders are emods a frac	a duca 6		
wpproved ryv	vivas 4 yral	VIII 1/4]		
Deficiencies:				
7	•			
- Mone -	<u></u>			
			······································	
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in complian	nce with the terms and conditions of the	ne	
Inspected by:	etary	Date: 9 / 10/97		
,				

APOLLO GENERAL INSPECTION/TEST REPORT				
Project: LIGO III	Contractor: Afoiro	Report No:		
Drawing or Specification: $\sqrt{-049-2-02}$	ı	Test Equipment Used (Incl ID):		
Item Inspected or Tested:				
General object	vation/ Survei	Hance of Pipe		
suffert weld	ing Q. Kenneu	vick Shef.		
Inspection or Test Description:				
Vigual obses	vation			
Results: Satisfacta	ry - welders	are using approved		
methoda à procede	iveg, NoTE:	Per Gene Senecal, PGT, 15 AWS DI. I, However,		
suffert weld acce	stance Chiteria	is AWS DI. I, Honoror,		
wading may b Deficiencies:	e done under	Section IK' procedures.		
Deficiencies:	, —			
140700				
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in complian	ce with the terms and conditions of the		
Inspected by:	Jelon	Date: 9/11/97		

APOLLO GENERAL INSPECTION/TEST REPORT				
Project: LIGO_III	Contractor: Aforto	Report No:		
Drawing or Specification: $\sqrt{-c49-2-021}$		Test Equipment Used (Incl ID):		
Item inspected or Tested:				
- Pifing 5	ufforts-			
Inspection or Test Description:	Garant Vicus	observations of		
welding/welds	at the Kenn	observation of shop.		
Results: Noted excentions weldg. Advised game E agked	give rejutorce d welders of For remark a	the criteria for f the deficient items		
, , , , , , , , , , , , , , , , , , , ,				
Deficiencies:	bove)			
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in complian Accept	ce with the terms and conditions of the Reject		
Inspected by:	~y	Date: 9/12/97		

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:	Report No:		
LI GO III	Aporto	MA		
Drawing or Specification:		Test Equipment Used (Incl ID):		
1049-2-021		NA		
Item Inspected or Tested:	11 803			
Piping Suffor	-45			
Inspection or Test Description:				
General observa	tion of weldi	ng/weids of the		
Kenn-Shop.		٠		
Results: Welds/Wel	ding is being	s accomplished methods.		
VIII MARINE	y construction of			
Deficiencies:				
- None -				
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in complian Accept	ce with the terms and conditions of the		
Inspected by:	ley	Date: 9/15/97		

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:		Report No: //a	
LIGO III	Aforto		P/P	
Drawing or Specification:		Test Eq	uipment Used (Incl ID):	
y-049-2-021			~/A	
Item Inspected or Tested:				
i) Piping Support	5/181,GN	exh	aust piping.	
Inspection or Test Description:		<u> </u>		
moposition of Took 2 starting			set weld fit-up	
") General VIGUAL	observation o	Socia	et weld + t-vp	
e Xami.	,			
Results:		· . 		
1) SUPPORT WEL	d acality met	ned s	, c'materials ok. ANSI B31.3 -428-181 \$1)	
2) (16/2 Dige 5	Two Fit-up mee	fg '	ANEI 831.3.	
Marielmi	AT (6800 # 11)	GNA	-428-1B1 F1)	
Deficiencies:	109 6.4.00			
- NONE -	_			
, , , , , , , , , , , , , , , , , , ,				
	<u> </u>			
All of the items tested or incorporat contract unless noted otherwise.	ed in the work are in compliand Accept	nce with t	the terms and conditions of the Reject	
Inspected by:	Melay		Date: 9/16/47	

	APOLLO SENERAL INSPECTION/TES	ST REPORT	
Project:	Contractor:	Report No:	<u> </u>
Drawing or Specification:	<u> </u>	Test Equipment Used (Incl ID):	
Spec. V-049-2-	32g	N/A	
Item Inspected or Tested:			
PIPE WELDING	a @ KENNEWIC	ik 5 Holi	
Inspection or Test Description:			
VISUAL OBSERVA	TION/SURVEILLAN	JCE , ACLUDING:	VISUAL
Exam of FULL PE	N BUTT WELD	ROT PASSES; C	OUNTER
BORE OF SCH 40	BU FLANGE TO	SOH 10 15 CONF	iemeo.
Results:		· 	-
- JATISFACTORY -	_		
			·
Deficiencies:			
-HONE			
· ·			
All of the items tested or incorporated contract unless noted otherwise.	in the work are in compliant Accept	ce with the terms and conditions Reject	of the
Inspected by:	ny	Date: 9/18/97	

G	APOLLO SENERAL INSPECTION/TES	ST REPORT	
Project:	Contractor:	Report No:	
LIGO III	Aforro	N/A	
Drawing or Specification:	-	Test Equipment Used (Incl ID):	
SPEC. V-04a.2-02	.9	WA	
Item Inspected or Tested:			······
PIPE WEDING	À AT KENNEN	vick 5468.	,
Inspection or Test Description:	a) Esting (has	BACK) on 11/2"-GN=339-1.	<i>p</i> 1
FIT-UP & ROOT PAGE	i, and Cover ing	SPECTION OF 4" FULL	<u> </u>
PEN GTAW WELDG.			
Results:			
- GATISFACTORY.			
		<u> </u>	
Deficiencies:			
- NONE-			
All of the items tested or incorporated contract unless noted otherwise.	in the work are in compliand Accept	ce with the terms and conditions of the	
Inspected by:	long	Date: 9/19/97	

	APOLLO GENERAL INSPECTION/TES	ST REPORT	
Project: LIGO III	Contractor: Howco	Report No:	
Drawing or Specification:	029	Test Equipment Used (Incl ID):	
Item Inspected or Tested:			
Welding Sur	veillance at	Kennewide Shef.	
Inspection or Test Description:	GTAW of 1BI	Ne esnant figi. Vigual exam of	ngo
general observat	for including	visual exam of	
weld fit-up à Ren	ot passes.		
		M. Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Charles and Cha	****
Results:			
-5atistact	lay-		
Deficiencies:			
- None			
			<u>, , </u>
All of the items tested or incorporate contract unless noted otherwise.	d in the work are in compliand Accept	nce with the terms and conditions of the Reject	
Inspected by:	elay	Date: 9/22/97	

APOLLO GENERAL INSPECTION/TEST REPORT				
Project: LI Go III	Contractor: Aforco	Report No:		
Drawing or Specification: 5/ec. Vo49 -2	2-029	Test Equipment Used (Incl ID):		
item inspected or Tested:	ping: Systen	n [B].		
T-AD-34ion				
Fit-up/Kort/Cover for	Fit-up/Root/Cover lass inspection on lines/ spoces 48. VA. 372. (B) & 4"- VA-438-181. Checked amps & Volt			
gettings for GTAL Results:	V Process (70 °	lo respectively		
-Gatisfactor	<u> </u>			
Deficiencies: - Monc				
All of the items tested or incorporate contract unless noted otherwise.	d in the work are in complian	nce with the terms and conditions of the		
Inspected by:	<u> </u>	Date: 9/25/27		

G	APOLLO SENERAL INSPECTION/TES	ST REPORT	
Project:	Contractor:	Report No:	4
Drawing or Specification: らPEC、V049 -	-2-029	Test Equipment Used (Incl II	D):
Item Inspected or Tested: GHz Vent f.	ifing gyrten	~ B	
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Inspection or Test Description:			
General observ	ation Surveill	ance: GTAW.	
Advised welde	of of acceptance	e crituin for beno greater	PT. For
4 in sch 10 1	indications can	be no greater	than /gz"
Results:			
-9 at. stac	torn -		
	<i>y</i>		
		<u> </u>	Í
Deficiencies:			
- Hone			····
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in compliar Accept	Reject	ons of the
Inspected by:	Jelay	Date: 9/24/	a1

APOLLO GENERAL INSPECTION/TEST REPORT				
Project: LiGo III-	Contractor:	Report No:		
Drawing or Specification:	029	Test Equipment Used (Incl ID):		
Item Inspected or Tested: GN1 Vent Pip	ing: Typten	~ 1B1.		
Inspection or Test Description:		· · · · · · · · · · · · · · · · · · ·		
General observ	stion Kurveil	lance: GTAW.		
Includes vine	al weld exan	- of selected		
Conformate.		8		
Results:				
- Tatisfactory -				
Deficiencies:				
- None				
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject				
Inspected by:	Jelay	Date: 9/25/97		

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor: Afacco	Rep	ort No:	
Drawing or Specification: 7 PeC. Voula - 2 -	ozq		ent Used (Incl ID):	
Item Inspected or Tested: Grent	wal welding.	surves!	lano;	
1. pe 3 ufforts				
Inspection or Test Description:				
Visual observ	Visual observation of support welding; Conbon-to-Carbon. Base metal preheat			
Cowbou-to-	limits.	e met	al priheat	
- Salisfacto	v4 -			
Deficiencies:				
None				
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject				
Inspected by:	long	Date:	9/20/07	

APOLLO GENERAL INSPECTION/TEST REPORT			
Project: LIGO III	Contractor: Aforco	Report No:	NA
Drawing or Specification: SPEC- VO49 - 2	029	Test Equipment Us	ed (Incl ID):
Item Inspected or Tested: - 131 5496cm	n p.p.ing -		
Inspection or Test Description: General abso	eveation of co	anditions,	environmenta)
Results:			
-Gafisfactory			
Deficiencies: - None-			
All of the items tested or incorporated contract unless noted otherwise.	d in the work are in compliant Accept	ce with the terms and Reject	conditions of the
Inspected by:	day	Date:	1./97

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:	···	Report No:	
-140 III	APOLLO		N/D	
Drawing or Specification:		Test Ed	quipment Used (Incl ID):	
GREC, VOLGA	2-029	NA		
Item Inspected or Tested:		The same of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the company of the compa		
"Clear Tygtem" P EVENG, PGI WAS			PING. NOTE! PAVE	
Inspection or Test Description:			,	
F GOVER CONDITION. CLEANCINESS PROVISIONS, INCLUDING				
Results:				
- GATISFACTORY -				
Deficiencies: - No NE -				
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject				
Inspected by: Date: 10/2/97				

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor: Afores	Report No:		
Drawing or Specification: Vo44 - 2 - 029		Test Equipment Used (Incl ID):		
Item inspected or Tested:	0 - 1.			
181 GNZ VENS	rifinda.			
Inspection or Test Description:				
WELTS ON GUP ON FLANG	ONFILLED ACCEP NES! PERFORMED	FIT-UP & COVER PAGE		
EXAM OF TOCKET WE		•		
Results:				
- SATHFACTORY -				
Deficiencies: - NoNE -				
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject				
Inspected by:	lay	Date: 10/8/97		

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor.		Report No:	
LIGO Equip Set	Apollo		N/A	
Drawing or Specification:	<u> </u>	Test Ed	uipment Used (Incl ID):	
V049-2-02	21			
			N/A	
Item Inspected or Tested:				
1b1 System Piping				
Inspection or Test Description:				
	ing: visual observation of 1B			
welding, fit-up & root pass in	nspection of GN2 line full pen	etration v	weiding, and in-up of socker	
weld valve including remove	al of internal seals to protect	from weld	ting heat.	
Results:				
Satisfactory				
Deficiencies:				
– None –				
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject				
1 Com	1. Welay Meloy		Date: 13 Oct. 1997	

APOLLO GENERAL INSPECTION/TEST REPORT					
Project:	Contractor:	Re	port No:		
LIGO Equip Set	Apollo		N/A		
Drawing or Specification:	· .	Test Equipr	Test Equipment Used (Incl ID):		
V049-2-02	21	İ	N/A		
Item Inspected or Tested:		•			
1b1 System Piping					
	4-				
Inspection or Test Description:					
Welding surveillance includi	ing: visual observation of 1E	1 system (sta	ninless steel) GTAW		
welding, fit-up & root pass in	nspection of GN2 line full per	etration weld	ing.		
Results:					
Satisfactory					
Deficiencies:					
None					
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in complia		erms and conditions of the eject		
	J. M. Long Meloy	Da	nte: 14 Oct. 1997		

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor		Report No:	
LIGO Equip Set	Apolio		N/A	
Drawing or Specification:		Test Ed	quipment Used (Incl ID):	
V049-2-02	21		N/A	
Item Inspected or Tested:		<u> </u>	N/A	
r nenrinspected or rested.				
1B1 System Piping				
Inspection or Test Description:				
Welding surveillance includi	ng: visual observation of 1B	1 system	ı (stainless steel) GTAW	
welding, fit-up & root pass ir	nspection of GN2 line full per	etration	welding; and observation	
of flange alignment process	-			
Results:				
Satisfactory				
Deficiencies:				
None				
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject				
Inspected by: W.T.	T M leny Meloy		Date: 15 Oct. 1997	

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:		Report No:	
LIGO Equip Set	.Apollo		N/A.	
Drawing or Specification:		Test Eq	uipment Used (Incl ID):	
V049-2-03	21		N/A	
Item Inspected or Tested:				
T-3 System Piping				
Inspection or Test Description:				
moposition root boompatin.		····		
Welding surveillance includ	ing: visual observation of T-	-3 system	(stainless steel) GTAW	
welding, fit-up, root pass &	cover inspection of full pene	tration wel	ding; including observation of	
the 10-second post-weld tor	ch argon purge.			
Results:				
Catinfactany				
Satisfactory				
Deficiencies:				
Denocholes.				
		-		
None				
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the				
contract unless noted otherwise.	Accept		Reject	
Inspected by:	TWILDY Meloy		Date: 16 Oct. 1997	

APOLLO GENERAL INSPECTION/TEST REPORT Project: Contractor Report No: LIGO Equip Set Apollo N/A Test Equipment Used (Incl ID): Drawing or Specification: V049-2-021 N/A Item Inspected or Tested: T-3 System Piping Inspection or Test Description: Welding surveillance including: visual observation of T-3 system (stainless steel) GTAW welding root pass surveillance of full penetration welding; including observation of general welding practice. Results: -- Satisfactory --Deficiencies: - None --All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Reject Accept Date: Inspected by: 17 Oct. 1997 W.T. Meldy

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:	R	eport No:
LIGO Equip Set	Apollo		N/A.
Drawing or Specification:		Test Equip	ment Used (Incl ID):
V049-2-02	21		NIA
N			N/A
Item Inspected or Tested:			
T-3 System Piping			
		·	
Inspection or Test Description:			
	ing: visual observation of T-		
general welding practice.	-		
Results:	A CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR		
	<u> </u>		
Satisfactory			
			·
Deficiencies:			
None			
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in complia		terms and conditions of the Reject
Inspected by:	T. Welay.	[Date: 20 Oct. 1997

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APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:]	Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:	<u> </u>	Test Eq	uipment Used (Incl ID):
V049-2-02	21		N/A
Item Inspected or Tested:		· · · · · · · · · · · · · · · · · · ·	N/A
nem inspected of Tested.			
T-3 System Piping			·
Inspection or Test Description:			
Welding surveillance including: visual observation of T-3 system (stainless steel) GTAW welding root pass, and cover inspection of full penetration welding; observation of general			
welding practice.			
Results:			
Satisfactory			
Deficiencies:			
None			
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in compliar Accept	ce with t	he terms and conditions of the Reject
Inspected by:	T.W. Iny 1924 a7		Date: 21 Oct. 1997

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:	34	Test Eq	uipment Used (Incl ID):
V049-2-02	2 1		N/A
Item Inspected or Tested:			
T-3 System Piping			`.
Inspection or Test Description:			
Welding surveillance including: visual observation of T-5 system (stainless steel) GTAW welding fit-up, root pass, and cover inspection of full penetration welds; observation of general			
welding practice.			
Results:			
Satisfactory			
Deficiencies:			
None			
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in complian	ice with t	he terms and conditions of the Reject
Inspected by:	J. Malay 10/22/07 Meloy 10/22/07		Date: 22 Oct. 1997

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:	Report No:		
LIGO Equip Set	Apollo	N/A		
Drawing or Specification:		Test Equipment Used (Incl ID):		
V049-2-02	21			
Item Inspected or Tested:		N/A		
T-3 System Piping				
Inspection or Test Description:				
Welding surveillance includi	ng: visual observation of T-3	system (stainless steel) GTAW		
welding cover inspection of	conflat flange (at pipe interior) welds; observation of general		
welding practice. Results:				
results.				
Satisfactory				
Deficiencies:				
None				
All of the items tested or incorporate contract unless noted otherwise.	d in the work are in compliand Accept	ce with the terms and conditions of the Reject		
Inspected by: W.T. M	T-Wilmy Meloy	Date: 23 Oct. 1997		

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:	Donort No.		
LIGO Equip Set	Apollo	Report No: N/A		
Drawing or Specification:		Test Equipment Used (Incl ID):		
V049-2-02	21			
Item Inspected or Tested:		N/A		
ment hispected of Tested:				
T-3 System Piping				
Inspection or Test Description:				
Welding surveillance including	ng: visual observation of T-3	system (stainless steel) GTAW		
welding fit-up, root, and cove	er inspection of full penetration	on welds; observation of general		
		and the second of gonetar		
welding practice.				
Results:				
Satisfactory				
Decision				
Deficiencies:				
None				
All of the items tested or incorporated contract unless noted otherwise.	in the work are in compliand Accept	ce with the terms and conditions of the Reject		
Inspected by: W.T.N.	elon grulas	Date: 24 Oct. 1997		

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:	Report No:		
LIGO Equip Set	Apollo	N/A		
Drawing or Specification:		Test Equipment Used (Incl ID):		
V049-2-02	21			
Item Inspected or Tested:		N/A		
1B1 System Piping				
Inspection or Test Description:				
Welding surveillance including	ng: visual observation of 18	1 system (stainless steel) GTAW		
welding fit-up, and cover ins	pection of socket welds; obs	ervation of general welding practice.		
(Welding at site fabrication a	ırea)			
Results:				
Satisfactory				
Deficiencies:				
None				
All of the items tested or incorporated contract unless noted otherwise.	d in the work are in complian	ce with the terms and conditions of the		
Inspected by: Link W.T. N	Lay Jeloy	Date: 27 Oct. 1997		

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:		Report No:	
LIGO Equip Set	Apollo		N/A	
Drawing or Specification:		Test E	Equipment Used (Incl ID):	
V049-2-02	21		b.//a	
Item Inspected or Tested:			N/A	
1B1 System Piping				
Inspection or Test Description:				
Welding surveillance including	ng: visual observation of 1B	1 systen	n (stainless steel) GTAW	
welding fit-up & general weld	ling practice. Advised welde	rs of 50	degree minimum preheat	
for stainless steel welding. Results:				
Troduka,				
- Satisfactory -				
Deficiencies:				
None				
All of the items tested or incorporated contract unless noted otherwise.	in the work are in compliand Accept Lo/28/41	ce with ti	he terms and conditions of the Reject Date: 28 Oct. 1997	

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:	Report No:	
LIGO Equip Set	Apollo	N/A	
Drawing or Specification:		Test Equipment Used (Incl ID):	
V049-2-02	21	N/A	
Item inspected or Tested:		IWA	
Rem inspected of Tested.			
Piping fabrication			
Inspection or Test Description:			
Welding surveillance includi	ng: general visual observation	n of stainless steel GTAW welding.	
Results:			
Satisfactory			
Deficiencies:			
– None –			
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in compliance Accept	e with the terms and conditions of the Reject	
Inspected by: W.T.	m The lay cof so / 4	Date: 29 Oct. 1997	

APOLLO GENERAL INSPECTION/TEST REPORT Report No: Project: Contractor: LIGO Equip Set Apollo N/A Test Equipment Used (Incl ID): Drawing or Specification: V049-2-021 N/A Item Inspected or Tested: T-5 Piping fabrication Inspection or Test Description: Welding surveillance including visual observation of stainless steel GTAW welding as follows: general handling practice, C02 spray, and preheat. Preheat is accomplished using a hot air gun. Results: - Satisfactory -Deficiencies: -- None --All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Reject Accept Date: Inspected by: 30 Oct. 1997 W.T. Meloy

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:	1	Test Eq	quipment Used (Incl ID):
V049-2-02	(1)		N/A
Item Inspected or Tested:			
T-5 Piping fabrication			
Inspection or Test Description:			
Welding surveillance includi	ing visual observation of stair	iless stee	el GTAW welding as follows:
Final inspection of conflat fla	ange interior weld.		
Results:			
Satisfactory			
Deficiencies:			
None			
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in compliar Accept	ice with t	the terms and conditions of the Reject
Inspected by: www.T	Vilony 1/1/a7		Date: 3 Nov. 1997

	APOLLO GENERAL INSPECTION/TE	ST REPORT
ot:	Contractor: Apollo	Report No:
LIGO Equip Set		Test Equipment Used (Incl ID):
ing or Specification: V04	3-2-021	N/A
Inspected or Tested:		
T-5 Piping fabrication		
1-5 Fibling rabits		
·		
pection or Test Description	1:	
		tainless steel GTAW welding as follows:
Welding surveillance	including visual observation or	stainless steel GTAW welding as follows:
	er inspection of full penetration v	reld, CO2 prep of filler and base metal, and
Fit-up, root, and cov	01 11000	
preheat.		
esults:		
esults:		
- Satisfactory -		
esults:		
- Satisfactory -		
- Satisfactory		
- Satisfactory -		
Satisfactory eficiencies: None		
esults: Satisfactory eficiencies: None	ncorporated in the work are in co	mpliance with the terms and conditions of the

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:		Test Eq	uipment Used (Incl ID):
V049-2-02	21		N/A
Item Inspected or Tested:		<u> </u>	
1B1 Piping fabrication			
		<u> </u>	
Inspection or Test Description:			
	ng visual observation of stain		el GTAW welding as follows:
fit-up and cover pass exami	nation of SS socket weld fitti	ng.	
Dooulte			
Results:			
Satisfactory			
			·
Deficiencies:			
None			
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in compliar Accept	ice with t	he terms and conditions of the Reject
Inspected by: W.T.	Meloy 1/10/as	-	Date: 10 Nov. 1997

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:	1	Test Eq	uipment Used (Incl ID):
V049-2-02	21	Ì	A.//A
		<u> </u>	N/A
Item Inspected or Tested:			
1B1 Piping fabrication			
Inspection or Test Description:			
Welding surveillance includ	ing visual observation of stail	nless stee	el GTAW welding as follows:
fit-up and root pass examina	ation of thread-O-let fitting		
ne-up and 1001 pass examin	and of anoda O for mang.		
Results:			
Satisfactory			
		-	
Deficiencies:			
None			
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in complian Accept	nce with t	he terms and conditions of the Reject
Inspected by: W.T.	Meloy Meloy 1/11/a	7	Date: 11 Nov. 1997

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		. N/A
Drawing or Specification:		Test Equ	uipment Used (Incl ID):
V049-2-0	21	1	N/A
			N/A
Item Inspected or Tested:			
1B1 Piping fabrication			
Inspection or Test Description:			
	ling visual observation of stai		I GTAW welding as follows:
Results:			
Satisfactory			
Deficiencies:			
·			
		·	
None			
All of the items tested or incorporate contract unless noted otherwise.	ted in the work are in complia	ince with t	he terms and conditions of the Reject
Inspected by:	T. Muly Meloy		Date: 13 Nov. 1997

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:		Test Eq	uipment Used (Incl ID):
V049-2-02	21	:	N/A
Item Inspected or Tested:			
item inspected or rested.			
T-5 Piping fabrication			
Inspection or Test Description:			
	ing visual observation of stain		Į
Results:			
Satisfactory			
Deficiencies:			
None			
All of the items tested or incorporal contract unless noted otherwise.	ted in the work are in complia	nce with t	the terms and conditions of the Reject
Inspected by:	Meloy (1/8/47		Date: 18 Nov. 1997

APOLLO GENERAL INSPECTION/TEST REPORT Report No: Contractor. Project: N/A Apollo LIGO Equip Set Test Equipment Used (Incl ID): Drawing or Specification: V049-2-021 N/A Item Inspected or Tested: 1B1 Piping fabrication Inspection or Test Description: Welding surveillance including visual observation of stainless steel GTAW welding as follows: observation of welding including fit-up & cover pass visual weld exam. Results: Satisfactory — Deficiencies: - None -All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Reject Accept Date: Inspected by: 21 Nov. 1997 W.T. Meloy

APOLLO GENERAL INSPECTION/TEST REPORT			
Project: LIGO Equip Set	Contractor: Apollo		Report No:
Eldo Edinh Sei	Apollo		IVA
Drawing or Specification: V049-2-02	34	Test Ed	quipment Used (Incl ID):
V049-2-02			N/A
Item Inspected or Tested:			
1B1 Piping fabrication			
Inspection or Test Description:			
Welding surveillance including visual observation of stainless steel GTAW welding as follows:			
observation of welding inclu	ding fit-up & cover pass visua	al weld e	xam of socket welds.
		n in	
Results:			
Satisfactory			
Deficiencies:			100
None			
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in complian	ice with t	he terms and conditions of the Reject
Inspected by: W.T.	TWelay		Date: 24 Nov. 1997

APOLLO GENERAL INSPECTION/TEST REPORT Report No: Contractor: Project: N/A Apollo LIGO Equip Set Test Equipment Used (Incl ID): Drawing or Specification: V049-2-021 N/A Item Inspected or Tested: 1B1 Piping fabrication Inspection or Test Description: Welding surveillance including visual observation of stainless steel GTAW welding as follows: general observation of on-site 1B1 system welding (socket weld). Results: - Satisfactory --Deficiencies: - None -All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Reject Accept Date: Inspected by: W.T. Meloy 12 3 Dec. 1997

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:		Test Eq	uipment Used (Incl ID):
V049-2-02	21		N/A
Item Inspected or Tested:			
Trong moposition of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state o			
1B1 Piping fabrication			
Inspection or Test Description:			
Welding surveillance including visual observation of stainless steel GTAW welding as follows: general observation of on-site 1B1 system welding (socket weld). Welder Z-4 1 st on site.			
Results:			
Satisfactory			
Deficiencies:			
Deficiencies.	<u> </u>		
None			
All of the items tested or incorporat contract unless noted otherwise.	ted in the work are in complia	nce with	the terms and conditions of the Reject Date:
Inspected by: W.T	Willy 12/4/ay		4 Dec. 1997

APOLLO GENERAL INSPECTION/TEST REPORT				
Project: LIGO Equip Set	Contractor: Apollo		Report No: N/A	
Drawing or Specification: V049-2-02	21	Test Equ	nipment Used (Incl ID): N/A	
Item Inspected or Tested:				
T-3 Piping fabrication		······································		
Inspection or Test Description:				
Welding surveillance including observation of on-site welding Results:				
Satisfactory	·			
Deficiencies:				
None				
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in complia	ance with th	he terms and conditions of the Reject	
· ·	TM Jan 12/18/21		Date: 15 Dec. 1997	

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:		Test Ed	uipment Used (Incl ID):
V049-2-02	21		N/A
Item Inspected or Tested:		<u> </u>	NA
T-3 Piping fabrication			
Inspection or Test Description:			-
Welding surveillance including surveillance including surveillance including			el GTAW welding as follows:
Results:			
Satisfactory			
Deficiencies:			
None			
All of the items tested or incorporated contract unless noted otherwise.	d in the work are in compliand	ce with th	ne terms and conditions of the Reject
Inspected by: W.T. M	InTW day 12/10/07		Date: 16 Dec. 1997

APOLLO GÉNERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:		Test Ed	uipment Used (Incl ID):
V049-2-02	23	!	N/A
Item Inspected or Tested:			
T-3 Piping fabrication			
Inspection or Test Description:			
	ing visual observation of stair		
			-
Results:			
- Satisfactory -			
Deficiencies:			
None			
All of the items tested or incorporate contract unless noted otherwise.	d in the work are in complian	ce with th	ne terms and conditions of the Reject
Inspected by:	Mylay 12/18/17 Melloy		Date: 17 Dec. 1997

	APOLLO GENERAL INSPECTION/TE	EST REPORT
Project:	Contractor:	Report No:
LIGO Equip Set	Apollo	N/A
Drawing or Specification: V049-2-02	21	Test Equipment Used (Incl ID):
	., 	N/A
Item Inspected or Tested:		
T-3 Piping fabrication		
Inspection or Test Description:		
		nless steel GTAW welding as follows:
contamination control. Results:	g including root pass & cove	er pass visual weld exam. & carbon to stainles
Results.		
Satisfactory		
,		
		·
Deficiencies:		
		 -
None		
All of the items tested or incorporated contract unless noted otherwise.	in the work are in compliant	ce with the terms and conditions of the
Inspected by: W.T. Mo	New 12/13/27	Date: 18 Dec. 1997

	APOLLO	
•	GENERAL INSPECTION/TE	ST REPORT
Project:	Contractor:	Report No:
LIGO Equip Set	Apollo	N/A
Drawing or Specification:		Test Equipment Used (Incl ID):
V049-2-0.	21	N/A
Item Inspected or Tested:		I IVA
T-5 Piping fabrication		
	<u></u>	
Inspection or Test Description:		
Welding surveillance includ	ing visual observation of stair	nless steel GTAW welding as follows:
observation of weight inch	ding root & cover pass visual	weld exam.
Results:		
Caticfactor		
- Satisfactory		
Deficiencies:	·	
	<u> </u>	
None		
· —-		
All of the items tested or incorporate	d in the work are in complian	ce with the terms and conditions of the
contract unless noted otherwise.	Accept	Reject
Inspected by:	- 1/ // //	Date:
	Way 1/7/98	5 Jan. 98
	vieloy	

	APOLLO GENERAL INSPECTION/TI	FST REF	CORT
		EO1 NL.	OKI
Project: LIGO Equip Set	Contractor: Apollo		Report No: N/A
Drawing or Specification:		Test E	Equipment Used (Incl ID):
V049-2-0	21		
item Inspected or Tested:			N/A
T-3 Piping fabrication			
Inspection or Test Description:			
Welding surveillance includi observation of welding include			eel GTAW welding as follows:
Results:			
- Satisfactory		-	
Deficiencies:			
None			
All of the items tested or incorporated contract unless noted otherwise.	d in the work are in compliar Accept	ice with t	he terms and conditions of the Reject
Inspected by:	Way 1/7/18 Meloy		Date: 7 Jan. 98

	APOLLO GENERAL INSPECTION/TE	ST REPORT
Project: LIGO Equip Set	Contractor: Apollo	Report No: N/A
Drawing or Specification: V049-2-02	21	Test Equipment Used (Incl ID): N/A
Item Inspected or Tested:		
T5 System piping fabrication	n	
Inspection or Test Description:		
Welding surveillance includi	ing observation of stainless s	teel GTAW welding as follows:
purge, fit-up, & cover pass fi	inal visual. WPS-P8-004.	
Results:		
Satisfactory		
Deficiencies:		
None		
All of the items tested or incorporated contract unless noted otherwise.	_^	ce with the terms and conditions of the
Inspected by:	Accept	Reject Date:
	Meloy 2/2/4/	13 Jan. 98

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:		Report No:	
LIGO Equip Set	Apolio		N/A	
Drawing or Specification:		Test Ed	quipment Used (Incl ID):	
V049-2-02	!1		A1/A	
Item Inspected or Tested:		<u> </u>	N/A	
	<u>.</u>			
T3 System Annulus piping fa	abrication			
Inspection or Test Description:				
Welding surveillance includir	ng observation of stainless st	eel GTA	.W welding as follows:	
final visual conflat flange (inf	terior), use of carbide tooling.			
lina vioudi connec nemgo pine	tellor), use or carbide teeming.			
Results:				
Satisfactory				
Deficiencies:				
None				
All of the items tested or incorporated contract unless noted otherwise.	d in the work are in compliant	ce with th	he terms and conditions of the Reject	
Inspected by:	T. N.J 1/2/98		Date: 14 Jan. 98	
W.T. N	Vieldy		3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:		Report No:	
LIGO Equip Set	Apollo		N/A	
Drawing or Specification: V049-2-0		Test E	quipment Used (Incl ID):	
	21		N/A	
Item Inspected or Tested:				
General piping fabrication				
Inspection or Test Description:				
Welding surveillance includi	ing general observation of st	ainless st	teel GTAW welding as follows:	
general practice, SS isolatio				
Results:		· · · · · · · · · · · · · · · · · · ·		
Results.				
Satisfactory				
		•		
Deficiencies:				
				
None				
All of the items tested or incorporated contract unless noted otherwise.	d in the work are in compliand	ce with th	he terms and conditions of the Reject	
Inspected by:	W day 2/2/08		Date: 15 Jan. 98	
	<i>N</i> eloy			

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:	Report No:		
LIGO Equip Set	Apollo	N/A		
Drawing or Specification:		Test Equipment Used (Incl ID):		
V049-2-02	21	N/A		
Item Inspected or Tested:				
T3 Piping fabrication, annul	us tubing			
Inspection or Test Description:				
		nless steel GTAW welding as follows:		
(WPS-P8-004) Results:				
Satisfactory				
Deficiencies:				
- None -				
contract unless noted otherwise.	I in the work are in complian Accept	ce with the terms and conditions of the Reject		
Inspected by:	Welmy 1/21/82	Date: 21 Jan. 98		

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:		Report No:	
LIGO Equip Set	Apollo		N/A	
Drawing or Specification:		Test Equ	uipment Used (Incl ID):	
V049-2-02	21	N/A		
Item Inspected or Tested:		<u> </u>	IVA .	
T3 Piping fabrication				
Inspection or Test Description:				
Welding surveillance including visual observation of stainless steel GTAW welding as follows: observation of welding including fit-up for automatic SS full pen welding. Welder Loftus				
		-		
Results:				
- Satisfactory				
Deficiencies:	——————————————————————————————————————			
None				
All of the items tested or incorporated contract unless noted otherwise.	d in the work are in compliand Accept		e terms and conditions of the Reject	
Inspected by: W.T.	Melony Jayles		Date: 22 Jan. 98	

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:		Report No:	
LIGO Equip Set	Apollo		N/A	
Drawing or Specification:		Test Ed	quipment Used (Incl ID):	
V049-2-02	21		N/A	
Item Inspected or Tested:			147	
1B1 Piping fabrication - Rigl	ht Mid Station	<u></u>		
· · · · · · · · · · · · · · · · · · ·				
Inspection or Test Description:	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s			
	ng visual observation of stain	· ·		
observation of welding inclu	ding fit-up, and final weld exa	ım. VVel	der Lottus	
Results:				
Results.				
- Satisfactory -				
				
Deficiencies:				
- None -				
All of the items tested or incorporate contract unless noted otherwise.	d in the work are in complian	ce with ti	he terms and conditions of the Reject	
Inspected by:	Meloy /2+/4	y	Date: 26 Jan. 98	

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:		Report No:	
LIGO Equip Set	Apollo		N/A	
Drawing or Specification:		Test Equ	ipment Used (Incl ID):	
V049-2-02	21	1	N/A	
N/A			N/A	
Item Inspected or Tested:				
1B1 Piping fabrication, annulus tubing				
Inspection or Test Description:				
Welding surveillance including visual observation of stainless steel GTAW welding as follows:				
observation of welding inclu	ding preheat, & fit-up. Weld	er Kauer, v	VVPS-P6-004)	
Results:				
Satisfactory				
Deficiencies:				
None				
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise.				
Inspected by:	Meloy 2/2/98		Date: 28 Jan. 98	

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:	Report No		
LIGO Equip Set	Apollo		N/A	
Drawing or Specification:		Test Equipment Used (Incl ID):		
V049-2-02	21	Bua		
Item inspected or Tested:		<u> </u>	N/A	
nem moperated of Tested.				
T5 piping fabrication				
Increation of Test Description				
Inspection or Test Description:				
Welding surveillance includi	ng observation of stainless st	el GTAW welding a	as follows:	
fit-up, and cover pass inspec	ction. Welds made using WP	5-P8-004: Welder \	Nilliams	
Results:				
Satisfactory				
Deficiencies:				
Denotrices.				
None				
All of the items tested or incorporate contract unless noted otherwise.	d in the work are in compliand	e with the terms and	d conditions of the	
Inspected by:	Jelan	Date:	13 March 98	

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:		Report No:	
LIGO Equip Set	Apollo		N/A	
Drawing or Specification:		Test E	Equipment Used (Incl ID):	
V049-2-02	21			
Item Inspected or Tested:		<u> </u>	N/A	
	elder was fabricating exhaus	+ etaoks	for the Corner Station Mechanical	
Room vacuum pumps.	cidel was labilicating extiaus	l Sidurs	for the Comer Station Mechanical	
Inspection or Test Description:		-		
Welding surveillance includi				
root, and cover pass inspect	ion. Welds made using WP	S-P8-00	4; Welder Kauer	
Results:				
Satisfactory				
Deficiencies:				
None				
			•	
All of the items tested or incorporated contract unless noted otherwise.	d in the work are in complian Accept	ce with t	the terms and conditions of the Reject	
Inspected by:	Mon		Date: 13 March 98	
W.T. N	/leloy /			

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:		Test Ed	uipment Used (Incl ID):
V049-2-02	21	}	, , , ,
			N/A
Item Inspected or Tested:			
T3 Piping fabrication, annulu	us tubing		
Inspection or Test Description:			
Welding surveillance includi	ng visual observation of stain	iless stee	el GTAW welding as follows:
observation of welding include	ding fiture & final viewal - \M	akter I of	tue 14/PC P8 0041
Observation of werding moun	ang neup, & miai visuai. V	erder Lui	us, vvr 3-r 0-004)
Results:			
Satisfactory			
·			
Deficiencies:			
None			
All of the items tested or incorporate contract unless noted otherwise.	d in the work are in complian Accept	ce with th	ne terms and conditions of the Reject
Inspected by:	Muly 1/1/a (Date: 29 Jan. 98

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:		Test Eq	quipment Used (Incl ID):
V049-2-02	!1		N/A
Item Inspected or Tested:			
T3 Piping fabrication, annulu	us tubing		
		·	
Inspection or Test Description:			
Welding surveillance includi	ng visual observation of stain	less stee	el GTAW welding as follows:
observation of welding include	ding fit-up, & final visual. We	elder Lof	tus, WPS-P8-004)
Results:			
Satisfactory			
Deficiencies:			
		_ _ _	
None			
All of the items tested or incorporate contract unless noted otherwise.	d in the work are in compliand	ce with th	ne terms and conditions of the Reject
Inspected by: W.T.	T.W Wory 2/2/as		Date: 30 Jan. 98

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:		Report No:	
LIGO Equip Set	Apollo		N/A	
Drawing or Specification:		Test Equ	ipment Used (Incl ID):	
V049-2-02	21		N/A	
item inspected or Tested:				
1B1 System piping fabrication	on	<u>-</u>		
		. <u>-</u>		
Inspection or Test Description:				
Welding surveillance includ	ing observation of stainless s	teel GTAV	V welding as follows:	
nreheat & root pass final vis	sual. WPS-P8-004. Welder i	Kauer		
preheat & root pass final visual. WPS-P8-004. Welder Kauer				
Results:				
Satisfactory				
Deficiencies:				
None				
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject				
,	T. W day 2/2/a	K .	Date: 2 Feb. 98	

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:	1	Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:		Test Eq	uipment Used (Incl ID):
V049-2-02	?1		N/A
Item Inspected or Tested:			107
T3 System Annulus tubing fa	abrication		
			- : ::-
Inspection or Test Description:		- 	
Welding surveillance includi	ing observation of stainless st	eel GTA\	W welding as follows:
fit-up, & joint prep including	CO2 treatment. WPS-P8-00	7. Welde	er Loftus.
Results:			
Satisfactory			
Deficiencies:			
None			
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in complian	ce with th	he terms and conditions of the Reject
Inspected by:	Meloy 2/3/	ast	Date: 3 Feb. 98

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:		Report No:	
LIGO Equip Set	Apollo		N/A	
Drawing or Specification:		Test Ed	quipment Used (Incl ID):	
V049-2-02	21		N/A	
Item Inspected or Tested:		<u> </u>	N/X	
T3 System piping fabrication	1			
Inspection or Test Description:		- 		
moposition of rest Description.				
Welding surveillance including	ng observation of stainless st	eel GTA	W welding as follows:	
fit-up, root, & cover visual ex	kam. WPS-P8-004. Welder	Kauer		
Results:		<u>, = </u>		
Satisfactory				
Deficiencies:				
None				
All of the items tested or incorporated contract unless noted otherwise.	d in the work are in compliand Accept	ce with th	e terms and conditions of the Reject	
Inspected by: W.T. M	TWelony 2/4/a	as	Date: 4 Feb. 98	

APOLLO GENERAL INSPECTION/TEST REPORT					
Project:	Contractor:		Report No:		
LIGO Equip Set	Apolio		N/A		
Drawing or Specification:		Test E	quipment Used (Incl ID):		
V049-2-02	21		, ,		
Item Inspected or Tested:			N/A		
nem inspected of Tested.					
T3 System piping fabrication	1				
Inspection or Test Description:					
Welding surveillance including observation of stainless steel GTAW welding as follows: fit-up, root, & cover visual exam. WPS-P8-004. Welder Kauer Line 4"-PV-301-T3 for Right Mid.					
Results:					
Results:					
- Satisfactory					
On Find and a state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the stat					
Deficiencies:					
None	None				
All of the items tested or incorporated contract unless noted otherwise.	in the work are in compliand Accept	ce with th	ne terms and conditions of the Reject		
Inspected by:	T. Wilory 2/5/a Meloy	18	Date: 5 Feb. 98		

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apolio		N/A
Drawing or Specification:	<u> </u>	Test Ed	quipment Used (Incl ID):
V049-2-02	21		
Item Inspected or Tested:			N/A
T3 Piping fabrication			
Inspection or Test Description:			
Welding surveillance includi	ng observation of stainless st	teel GTA	W welding as follows:
fit-up, root & cover final visu	al exam WPS-P8-004; joint	prep (CC	02) and filler metal. Welder Kauer
Results:			
- Satisfactory -			
		<u> </u>	
Deficiencies:			
4			
None			
All of the items tested or incorporated contract unless noted otherwise.	d in the work are in compliand	ce with th	ne terms and conditions of the Reject
Inspected by:	1.Vacs		Date:
Chm I' N W.T. N	/ delov		6 Feb. 98

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:	Į F	Report No:	
LIGO Equip Set	Apolio		N/A	
Drawing or Specification: V049-2-0:	71	Test Equi	pment Used (Incl ID):	
			N/A	
Item Inspected or Tested:				
T5 System piping fabrication	n			
Inspection or Test Description:				
		·		
Welding surveillance includi	ing observation of stainless s	eel GTAW	welding as follows:	
conflat final visual exam (in	terior). WPS-P8-004. Welde	r Kauer, line	e for Right Mid.	
Results: .				
Satisfactory				
		<u> </u>		
Deficiencies:				
None				
			· · · · · · · · · · · · · · · · · · ·	
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject				
Inspected by:	Welow 2/9/06	D	ate: 9 Feb. 98	

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:	F	Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:		Test Equi	pment Used (Incl ID):
V049-2-02	<u> </u>		
Item Inspected or Tested:	1		N/A
item inspected of Tested.			
T5 System piping fabrication	1	-	
Inspection or Test Description:			
Welding surveillance including	ng observation of stainless ste	el GTAW	welding as follows:
root & cover final visual exa	m; WPS-P8-004; Welder Ka	uer, Line 4	"-CA-105-T5 Spool #6.
Results:			
Satisfactory			
Deficiencies:			
None			
None -		<u>, , , , , , , , , , , , , , , , , , , </u>	
All of the items tested or incorporated contract unless noted otherwise.	d in the work are in compliance		terms and conditions of the Reject
Inspected by: w.T. N	Jelony 2/11/98	D	Pate: 11 Feb. 98

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:	Report No:		
LIGO Equip Set	Apollo	N/A		
Drawing or Specification:		Test Equipment Used (Incl ID):		
V049-2-02	?1	N/A		
Item Inspected or Tested:	1,300) WO		
T3 & T5 Piping fabrication				
Inspection or Test Description:				
Welding surveillance includi	ng observation of stainless s	steel GTAW welding as follows:		
fit-up & cover final visual ex	am WPS-P8-004, & final vis	sual WPS-P8-007; Welders Kauer & Loftus		
respectively.				
Results:				
Satisfactory				
Deficiencies:				
None				
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise.				
Inspected by:	Welon 2/12/a	Date: 12 Feb. 98		

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:	Report No:		
LIGO Equip Set	Apollo	N/A		
Drawing or Specification:		Test Equipment Used (Incl ID):		
V049-2-	-021	N/A		
Item Inspected or Tested:				
1B1 LN2 Piping fabrication	on			
Inspection or Test Description:				
Welding surveillance incl	uding observation of stainless s	teel GTAW welding as follows:		
fit-up, & cover final visua	i exam WPS-P8-004; Welder i	Kauer		
-				
Results:				
Satisfactory				
- Gausiactory				
Deficiencies:				
None				
- 110110 -				
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the				
contract unless noted otherwise.	Accept	Reject	· · · · · · · · · · · · · · · · · · ·	
Inspected by:	T. Melay	Date: 16 Feb. 98	-	

APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:	$\overline{}$	Report No:	
LIGO Equip Set	Apollo		N/A	
Drawing or Specification:		Test Eq	uipment Used (Incl ID):	
V049-2-02	21			
	· · · · · · · · · · · · · · · · · · ·		N/A	
Item Inspected or Tested:				
1B1 Vent Piping fabrication				
Inspection or Test Description:				
Welding surveillance including observation of stainless steel GTAW welding as follows: cover final visual exam WPS-P8-004; Welder Kauer				
- Desulter				
Results:				
Satisfactory				
		<u> </u>		
Deficiencies:				
None				
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject				
Inspected by:	Meloy 1/17/43		Date: 17 Feb. 98	

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:	Rep	ort No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:		Test Equipm	ent Used (Incl ID):
V049-2-02	11		N/A
itom Inconstant or Tanted:			IWA
item Inspected or Tested:			
T3 System Piping fabrication	n		
Inspection or Test Description:		_ _	
Welding surveillance including observation of stainless steel GTAW welding as follows: fit-up, root, & cover final visual exam WPS-P8-004; Welder Williams			
Results:			
- Satisfactory -			
Deficiencies:			
None			
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in complia	nce with the te	erms and conditions of the ject
1900	Meloy 2/18/4	Dat	te: 18 Feb. 98

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo	1	N/A
Drawing or Specification:		Test Eq	uipment Used (Incl ID):
V049-2-02	21		N/A
Item Inspected or Tested:			IVA
nem mape accurate reason.			
Annulus tubing fabrication			
Inspection or Test Description:			
Welding surveillance includi	ing observation of stainless st	eel GTA\	N welding as follows:
fit up 9 cover final viewel A	xam WPS-P8-004; Welder K	auer	
in-up, & cover illias visual ex	XAIII VVF O-1 0-004, VVEIGEI N	.auci	
Results:			
Results.			
- Satisfactory			
Deficiencies:			
	-		
None			
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject			
Inspected by:	1 day 2/14/88		Date: 19 Feb. 98

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:	Report No:	
LIGO Equip Set	Apollo	N/A	
Drawing or Specification:		Test Equipment Used (Incl ID	D):
V049-2-02	21		
		<u>N/A</u>	
Item Inspected or Tested:			
Annulus tubing fabrication			
Inspection or Test Description:			
Welding surveillance includi	ng observation of stainless st	eel GTAW welding as follows:	
fit-up, & cover final visual ex	om WPS-P8-004: Welder K	Slier	
in-up, a cover ilitar visual co	Calif 881 0-1 0-00-1, 880,001 10	uuei	
Results:			
Satisfactory			
Deficiencies:			
None			· · · · · · · · · · · · · · · · · · ·
All of the items tested or incorporate contract unless noted otherwise.	d in the work are in complian	ce with the terms and condition Reject	ns of the
Inspected by:	Was	Date:	
May 1	· / / /	25 Feb.	. 98
	weley /		

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo	}	N/A
Drawing or Specification:	<u> </u>	Test Equ	uipment Used (Incl ID):
V049-2-02	21		ALIA
			N/A
Item Inspected or Tested:			
Annulus Tubing fabrication			
Inspection or Test Description:			
Welding surveillance includ	ing observation of stainless s	eel GTAV	N welding as follows:
fit-up, and cover pass inspe	ctions for WPS-P8-004; Wel	de <u>r K</u> auer	r
Results:			
Satisfactory			
Deficiencies:			
None			
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject			
Inspected by:	i W Jay Meloy		Date: 26 Feb. 98

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apolio		N/A
Drawing or Specification:		Test Eq	uipment Used (Incl ID):
V049-2-02	21	[
			N/A
Item Inspected or Tested:			!
T-5 Piping fabrication			
Inspection or Test Description:			
Welding surveillance includi	ing observation of stainless s	teel GTA	W welding as follows:
general procedure/process f	or WPS-P8-004; Welder Ka	uer	
Results:			
Satisfactory			
	<u>.</u>		
Deficiencies:			
None			
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise.			
Inspected by: Imilia	Jelon		Date: 27 Feb. 98
W.T./	Meloy/		

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:		Test Eq	uipment Used (Incl ID):
V049-2-02	21		N/A
Item Inspected or Tested:			
T-3 Piping fabrication: 6" P'	V-102-T3 Spool #8 and Spoo	#11	
Inspection or Test Description:			
Welding surveillance including observation of stainless steel GTAW welding as follows:			
fit-up, root and cover pass ii	nspections for WPS-P8-004;	<u>vvelder r</u>	Cauer
Results:			
Satisfactory			
Deficiencies:			
None			
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject			
Inspected by:	Milay		Date: 3 Mar. 98
W.T.	Meloy		

APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:		Test Eq	uipment Used (Incl ID):
V049-2-02	!1		N/A
None Increased on Torted.			N/A
Item Inspected or Tested:			
Annulus Tubing fabrication,	miter groove weld		
Inspection or Test Description:			
Welding surveillance including observation of stainless steel GTAW welding as follows: fit-up, and cover pass inspections for WPS-P8-004; Welder Kauer			
Results:			
- Satisfactory			
Deficiencies:			
None			
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject			
Inspected by:	Melby Melby		Date: 3 March 98

APOLLO GENERAL INSPECTION/TEST REPORT			
Project: LIGO Equip Set	Contractor: Apollo		Report No: N/A
Drawing or Specification: V049-2-02	21	Test Ed	uipment Used (Incl ID):
Item Inspected or Tested: T3 / T5 piping fabrication: co	onflat flange		
Inspection or Test Description:			
Welding surveillance including observation of stainless steel GTAW welding as follows: fit-up, and cover pass inspections for WPS-P8-004; Welder Kauer Results:			
Satisfactory			
Deficiencies:			
None			
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject			
Inspected by:	Meloy		Date: 5 March 98

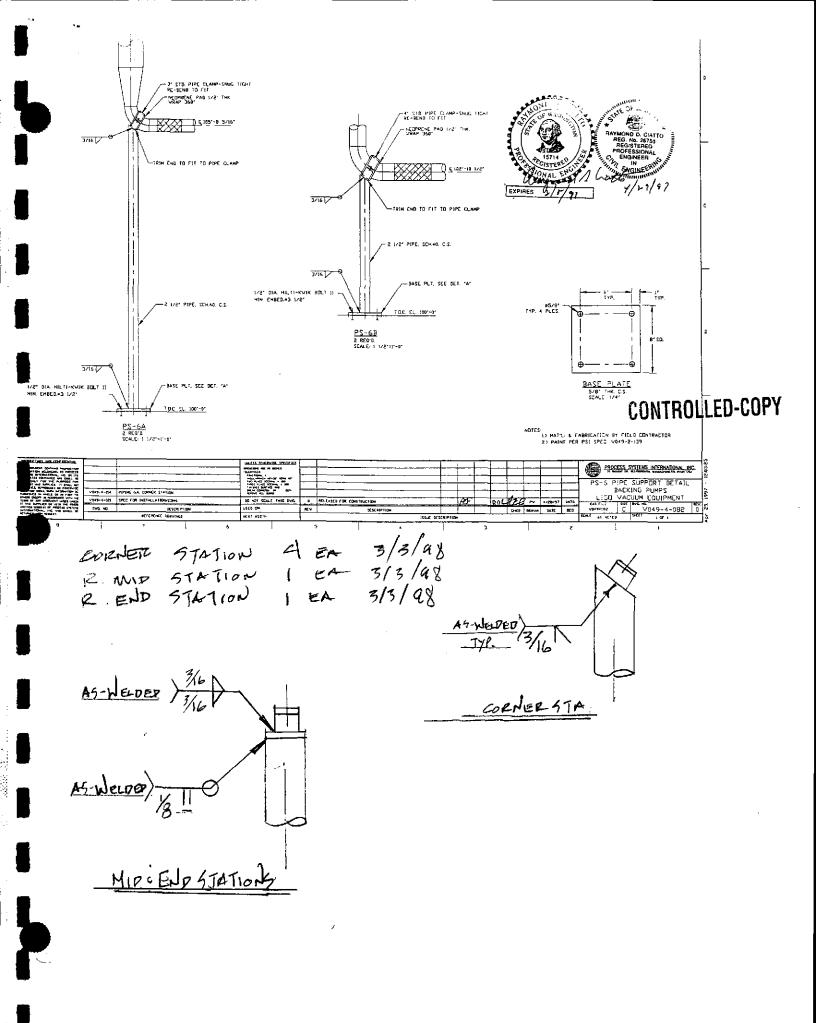
APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo	<u></u>	N/A
Drawing or Specification:		Test Ed	uipment Used (Incl ID):
V049-2-02	21		N/A
Item Inspected or Tested:			
T5 piping fabrication			
Inspection or Test Description:			
Welding surveillance including observation of stainless steel GTAW welding as follows: cover pass inspection. Welds made using WPS-P8-004; Welder Kauer			
Results:			
Satisfactory			
Deficiencies:	Deficiencies:		
None			
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject			
/ •	J. Wellow		Date: 10 March 98

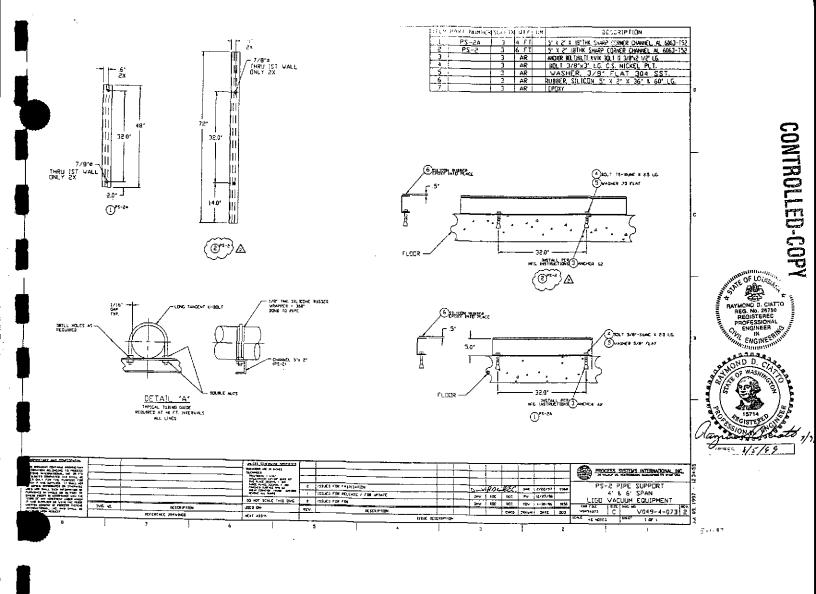
APOLLO GENERAL INSPECTION/TEST REPORT				
Project:	Contractor:		Report No:	
LIGO Equip Set	Apollo		N/A	
Drawing or Specification:		Test Ec	uipment Used (Incl ID):	
V049-2-02	21	 	N/A	
Item Inspected or Tested:				
T3 piping fabrication				
				
Inspection or Test Description:				
-	Welding surveillance including observation of stainless steel GTAW welding as follows:			
root, and cover pass inspec	tion. Welds made using WP	S-P8-004	; Welder Kauer	
Results:				
Satisfactory				
Deficiencies:				
None				
110110				
All of the items tested or incorporated in the work are in compliance with the terms and conditions of the contract unless noted otherwise. Accept Reject				
Inspected by:	at Weday		Date: 11March 98	
W.T.	Meloy /			

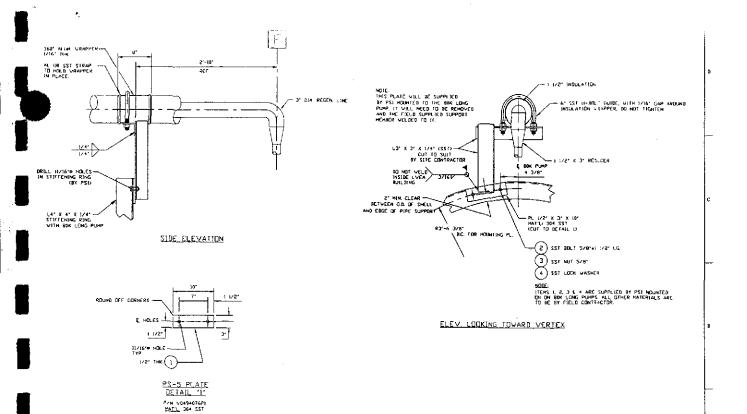
APOLLO GENERAL INSPECTION/TEST REPORT			
Project:	Contractor:		Report No:
LIGO Equip Set	Apollo		N/A
Drawing or Specification:		Test Ed	uipment Used (Incl ID):
V049-2-02	21		N/A
II I		<u> </u>	IVA
Item Inspected or Tested:			ļ
T5 piping fabrication			
Inspection or Test Description:		 	
Welding surveillance including observation of stainless steel GTAW welding as follows: fit-up, root, and cover pass inspection. Welds made using WPS-P8-004; Welder Kauer			
Results:			
Satisfactory			
Deficiencies:			
None			
All of the items tested or incorporate contract unless noted otherwise.	ed in the work are in complian	nce with	the terms and conditions of the Reject
Inspected by: W.T.	Meloy		Date: 12 March 98

	olio ction Record
Project: LIGO Equipment Installation	Drawing: V049-4-A7A
Code:	Date:
AWS D1.1	18 Jan. 1998
Welding Procedure: AWS SMA-01	Process: Manual SMAW
Welder Identification: Z-32	Filler Metal: E7018
Extent of Examination:	
Final visual weld examination as follows 1. 100% for modified support legs, Spo	11.1.1
Remarks:	
	in AWS D1.1 Section 8 and PSI Procedure
V049-2-128. phr / (8/ 4)	
•	
	Stamp:
Inspected by: W.T. Meloy	WILLIAM T. MELOY 92100521 CWI

Weld Inspe	oollo ction Record
Project: LIGO Equipment Installation	Drawing: V049-4-A7A
Code:	Date:
AWS D1.1 Welding Procedure:	12 Dec. 1997 Process:
AWS SMA-01	Manual SMAW
Welder Identification:	Filler Metal: E7018
Extent of Examination:	27010
Final visual weld examination as follows 1. 100% for modified support legs, Spo	
Remarks:	
All welds meet acceptance criteria given V049-2-128.	in AWS D1.1 Section 8 and PSI Procedure
Inspected by: Am T Mil my W.T. Meloy	Stamp: OC 1 WILLIAM T. MELGY 92100521 CW1







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•	ollo ction Record
Project:	Drawing:
LIGO Equipment Installation Code:	RFC V049-072 Date:
AWS D1.1	17 Oct. 1997
Welding Procedure: AWS SMA-01	Process: Manual SMAW
Welder Identification: Z-32	Filler Metal: E7018
Extent of Examination:	LIVIO
Visual examination 100% for shear bars	welded to base plate bottoms for components on RFC Sketch V049-073 Rev. 1:
V049-4-B2A, & V049-4-B2B	
V049-4-B3A	
V049-4-B5A	
V049-4-B6	
V049-4-B7	
V049-4-B9	
Remarks:	
All welds meet acceptance criteria given	in AWS D1.1 Section 8 and PSI Procedure
V049-2-128. Includes inspections done	10/16/97 and 10/17/97.
Inspected by: w.T. Weloy	Stamp: A'N S QC 1 WILLIAM T. MELOY 92100521 CW 1

Apo Weld Inspec	ollo tion Record
Project:	Drawing:
LIGO Equipment Installation	RFC V049-072
Code: AWS D1.1	Date: 13 Oct. 1997
Welding Procedure: AWS SMA-01	Process: Manual SMAW
Welder Identification: Z-10, Z-32	Filler Metal: E7018
Extent of Examination:	
Visual examination 100% for shear bars	welded to base plate bottoms for BSC8
S/N 08, and BSC7 S/N 05: Welded per	details shown on RFC Sketch V049-072
Remarks:	
All welds meet accentance criteria niven	in AWS D1.1 Section 8 and PSI Procedure
V049-2-128.	The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon
V045-Z-1ZU.	
Inspected by:	Stamp: A W S QC 1 WILLIAM T. MELOY 92100521
Inspected by: W.T. Meloy	CWI

Name of component affected: WB-6 & WB-7 WB-2A, 2B, 3A, & 5A, and WB-9A, & 5	Project Name: LIGO
See below	13. 110 ET 110 ET 110 ET 110 ET 110 ET 110 ET 110 ET 110 ET 110 ET 110 ET 110 ET 110 ET 110 ET 110 ET 110 ET 1
See below	CAD File Number:
Prepared By: R. D. Ciatto	Date Prepared: 10/6/97
Detailed description of change and reason for making same members of the above components, add	For base plates connected to diagonal dishear bars as shown below. Drawings
affected are: W049-4-B2A R4 Sh V049-4-B2B R5 Sh V049-4-B3A R4 Sh V049-4-B5A R4 Sh V049-4-B6 R6 Sh V049-4-B7 R5 Sh V049-4-B9 R4 Sh	. 5 Det. 15. 1 . 5 Det. 15. 1 . 5 Det. 15. 1 . 5 Det. 15. 1 . 2 Det. 9 2 Det. 9 4 Det. 8. APOLLO SHEET METAL, INC. ISED RY ELD OFFICE VERM TO
Underside of Base Plate	Beam Centerline
Note: 2 base plates per component Reason: Floor at WA corner planned. Bars rel grout pad.	station is more than 1" lower than lieve bolt bending due to higher
DISPOSITION - PROJECT MANAGER	ROUTE DISTRIBUTION/SIGN-OFF
IMMEDIATE DRAWING CHANGE IMMEDIATE BOM CHANGE HOLD FOR AS BUILT CHANGE HOLD FOR ACCUMULATION CHANGE NOT APPROVED (STATE REASON) BY: Date (6/14/57)	Quality Assurance Manufacturing Electrical X Civil/Structural Mechanical Process y Project R. Curtis EMS Date Date Date Date Date Date Date Date Date Date Date
ASME CODED EQUIPMENT YES X NO	RECNUMBER: VO49-073 Rev. 1
AI/ANI: DATE:	D.Tt. 10/14/97 Sheet 1 of 7

PROCESS SYSTEMS INTERNATIONAL, INC.

20 Walkup Drive, Westborough, Mass 01581

A Division of Nucor Corporation PLYMOUTH, UTAH

UNITED STATES OF AMERICA

BILL OF LADINE: 28133

INVITE HUMES:

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SHIP TO: PACIFIC IRON & STEEL 925 HORFH BRECOK AVENUE PASCA, MA 19381

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PACIFIC STEEL PASCO

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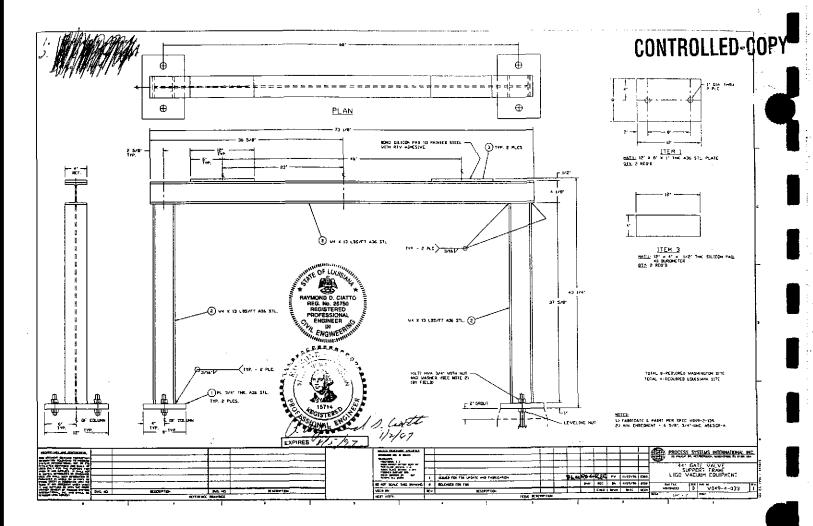
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REQUEST FOR CHANGE

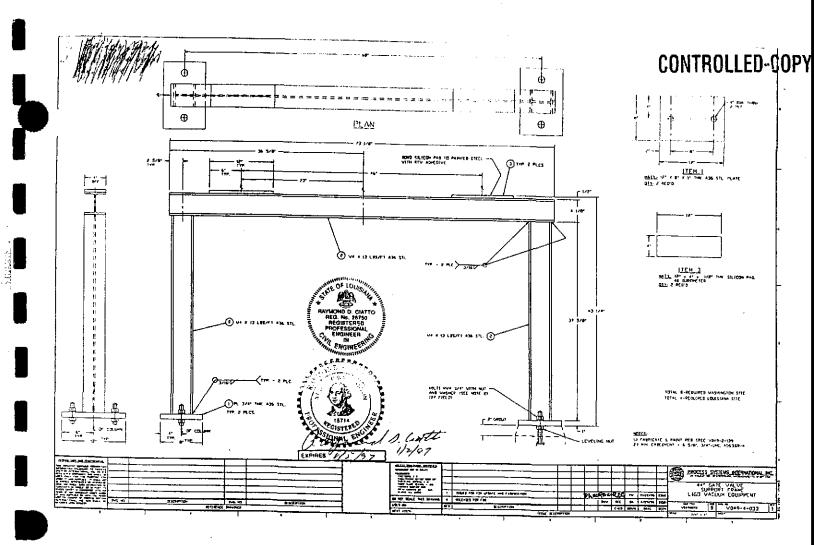
Name of component affected: WBSC7 & WBSC8 Project Name: LIGO Drawing Number: V049-4-023 PSI Project Number: V59049 Renz 4 CAD File Number: Prepared By: R. D. Diatto Date Prepared: 10/6/97 Detailed description of change and reason for making same; Add shear bars to bottom of each base plate for the above components OCT 08 1997 Bars 1"x1 1/2"x 8" long A36 Bars 1" x1 1/2"x 4" long Reason: Floor at WA corner station is more than l' lower than planned. Shear bars are required to relieve high bolt bending due to higher grout pad. See Calc. V049-1-160 DISPOSITION - PROJECT MANAGER ROUTE DISTRIBUTION/SIGN-OFF IMMEDIATE DRAWING CHANGE Quality Assurance IMMEDIATE BOM CHANGE Manufacturing Date _ Date ___ Electrical HOLD FOR AS BUILT CHANGE X Civil/Structural Date . X Date 46/ Mechanical HOLD FOR ACCUMULATION CHANGE Process Date ... NOT APPROVED (STATE REASON) Project R. Curtis Date . Date 10/7/97 **EMS** Date: 40/7/97 Date _ ASME CODED EQUIPMENT RFC NUMBER: V049-072 AI/ANI: DATE: DATE: Sheet 1 of 1 PROCESS SYSTEMS INTERNATIONAL, INC.

20 Walkup Drive, Westborough, Mass 01561

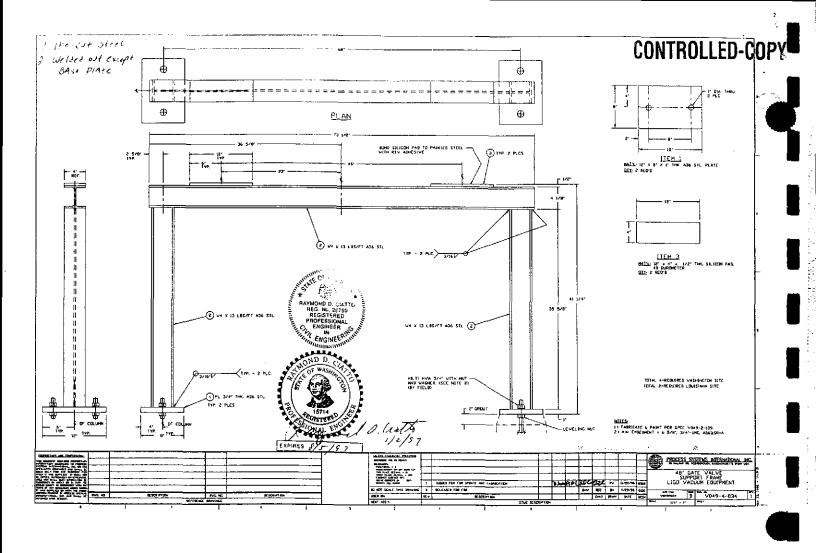
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02	CLEANLINESS	N/A	N/A	N/A	N/A	N/A	N/A	N/A			CUAM	/ DATE	00	MELOY
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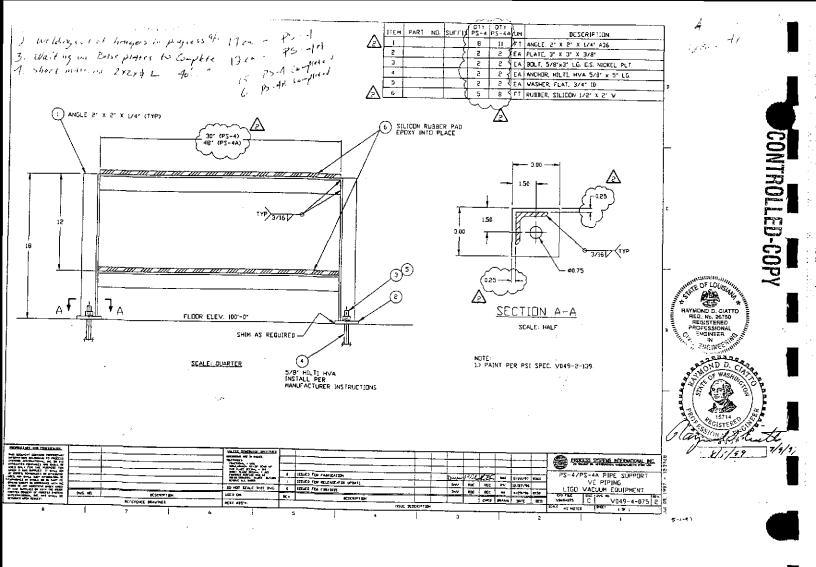
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	LEAK TEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A		(ACIA)	DATE		
	CLEANLINESS	N/A	N/A	N/A	NI / A	NIZA	N 74	N 44	2	MIN (DAM)	DATE	NW S	
<u>М</u> Ж	DIMENSIONS	N/A	N/A		N/A	N/A	N/A	N/A	×1	, la	I PAIR	, , , T W	ELOY
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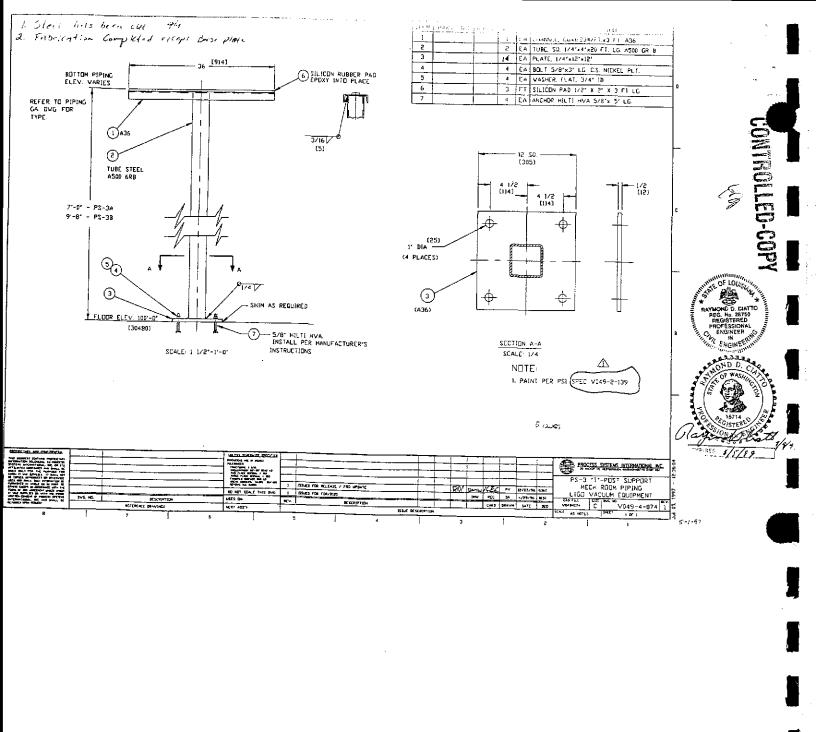


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1	VISUAL INSPECTION	N/A	N/A	who	N/A	N/A	N/A	N/A		· ·	ACCEPTANCE	-	
	RADIOGRAPHY	N/A	N/A	N/A	N/A	N/A	N/A	N/A			11 1		
NB	ULTRASONIC TEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A		pho	W Jan 10/1	197	
~ [LEAK TEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A		99	CIDI / DAI	/	
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2	CLEANLINESS	N/A	N/A	N/A	N/A	N/A	N/A	N/A		10	/ / /	OC VAL	
무	DIMENSIONS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	INCLUDE	es thefre	(TO)5	WILLIAM T	MELOY
DTHER	SURFACE PROFILE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Porte la	15 INSFER	12/01	9210	W 7
	TORQUE	N/A	N/A	N/A	N/A	N/A	N/A	N/A					w!
	Apc	11c)			Tit	le: SI	GN OF	SHEET/TRAVI	ELER	Job No.: M-	126	
	1207 W. Columbia Dr.			/a 993:	36	Pr	ojecti	LIGO	Equipment Se	t	Scale: None	Dwn Byi	In



									M/	ATERIAL	HT, NO.	QC	DATE
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		16	A CLIN	D OFFI	A COVE	AMSE'S	THE	AL AUS	Series Co.	***			
	VISUAL INSPECTION	N/A	N/A		N/A	N/A	N/A	N/A			TED PIECE PTANCE		
1.1	RADIOGRAPHY	N/A	N/A	N/A	N/A	N/A	N/A	N/A				1	
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4	LEAK TEST	N/A	N/A	N/A	N/A	N/A	N/A	N/A		SOCIO	DATE	· ·	
·										HTM.	sola!		
~	CLEANLINESS	N/A	N/A	N/A	N/A	N/A	N/A	N/A		(QAM)	DATE	A H S	
DTHER	DIMENSIONS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ENCLUBES ENGREO	ر ،	,	ac i	AFLOY 2
	SURFACE PROFILE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	LNCLUDES THATEC	16N5_	<u> </u>	WILLIAM T.	i /
	TORQUE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	DONE 10/1/97			C W	
	Apo	11c)	 		Tit	lei SI	GN DFF	SHEET/TRAVELER	Jab	No.: M-12	6	Y
	1207 W. Calumbia Dr.			a 9933	86	Pro	ojecti		Equipment Set	Scal	Т	Iwn Byi	_





MATERIAL HT. NO. QC DATE A4TM 436 45 Tm 4500 PIECE NUMBER/ID SUPPORT PS-1, 44 LONCH CODE OR STANDARD AWS 01.1 COMPLETED PIECE NIA VISUAL INSPECTION **ACCEPTANCE** A/A RADIOGRAPHY N/A N/A N/A N/A NE ULTRASONIC TEST N/A N/A N/A N/A N/A LEAK TEST NA 1/2 N/A NA NA **CLEANLINESS** N/A N/A N/A N/A DTHER DIMENSIONS N/A N/A N/A N/A NZA N/A PER PSI DRAWING YOUR - 4-072 R. (NA SURFACE PROFILE N/A N/A N/A NZA N/A TORQUE N/A N/A N/A N/A N/A NZA Apollo SIGN OFF SHEET/TRAVELER Job No. M-126

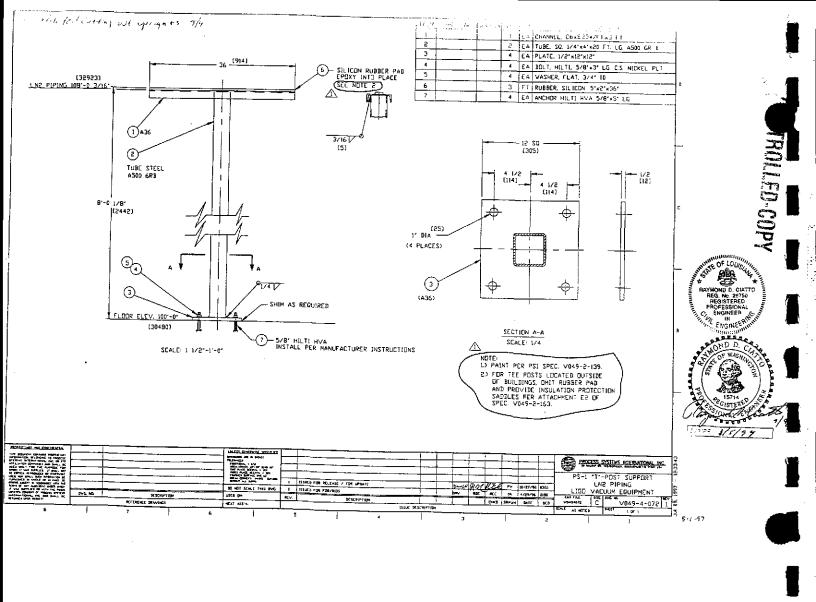
Project: LIGO Equipment Set

1207 W. Columbia Dr. Kennewick, Wa 99336

Scale

None

Dwn By



2424 SW ANDOVER

BIRMINGHAM STEEL CORP

SEATTLE, WA. 98106-1100

SEATTLE. WA STEEL DIVISION

The First Two Digits Of The Heat Number Denote Plant Of Origin:

55 - Kankakee, Illinois Steel Division

58 - Birmingham, Alabama Steel Division

70 - Seattle, Washington Steel Division

84 - Jackson, Mississippi Steel Division

CERTIFIED MILL TEST REPORT

DATE: 45510030

08/12/97

B.L. NO.: 70-W72906

LOAD NO.: 7000055455

1

SOLD PACTFIC IRON & STEEL

TO PO BOX 1549

GREAT FALLS, MT

ASTM A36-94 Charles ASME SA36-95

> ASTM A36-94 ASME SA36-95

59403-1549

SHIP PACIFIC IRON & STEEL

TO 3.2 925 NO FOREGON TO A STREET THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY

 PASCO was WARR and a recover shower should be set find to a given the goal of the role of substitutions. PHYSICAL TESTS CHEMICAL TESTS DESCRIPTION **HEAT NO.*** YIELD TENSILE ELONG Bend DEF C.E. P.S.I. P.S.I. М٥ ▼PO#: 33-62024時級 続き、 ないんいの ちゃりゅう パーパック かい コモコ ひ 51.655 71.130 28.9% Sections **1709810562** × SEATTLE WA. STEEL DIVISION OF STREET .15 ..72 .015 .025 .20 .41 .30% 490MPa 356MPa 1-1/2x1-1/2x1/8" Ang 20' (44W) .11 .10 .02 ASTM A36-94 (ex 56) April 1 CSA G40.21-87 GR 44W ASME SA36-95 46,500 370,420 27.3% 36 -2.6% 3.17 SEATTLE WA STEEL DIVISION 709810554 ...60 .007 .027 . 21 .29 .29% 1-1/2x1-1/2x3/16" Ang 20' (44 321MPa 486MPa .10 .07 .02 Saka ASTM, A36-94 Mariana ASME SA36-95 76 CSA G40:21-87 GR: 44W/2364 47.870 370.260 28.9% of have 44 SEATTLE WAS STEEL DIVISION SEASON i :18 .70 .009 .034 709810219 🕶 . 25 .34 .32% 330MPa 484MPa 2x2x1/4" Ang 20' (44W/A36) .09 .09 .02 ASTM: A36-94 deciment ASME SA36-95 CSA 6640.21-87 668 44W Armor 51,280 74,520 28.9% 100 4 4 400 1.17 ..73 .013 .036 1.24 , 709810220 SEATTLE WASSTEEL DIVISION CONTROL .40 .32% 2x2x1/4" Ang 20' (44W/A36) 354MPa 514MPa .11 .11 .02

49.300

340MPa

SEE REVERSE FOR PLANT OF ORIGIN

PO#: 33-62021

709714508

THEREBY CERTIFY THAT THE ABOVE FIGURES ARE CORRECT AS CONTAINED IN THE RECORDS OF THE CORPORATION ALL MANUFACTHRING PROCESSES OF THE STEEL MATERIALS IN THIS PRODUCT, INCLUDING

CSA G40.21-87 GR 44W ...

SEATTLE WA STEEL DIVISION

1/2x2" Fl 20' (44W/A36)

CSA G40.21-87 GR 44W

G. GIRALDO

72.100 22.7%

497MPa

100 100 400

.18

.09

.67

.08

.009 | .028

.02

. 20

.31%

.41

29May97 8:14

TEST CERTIFICATE No: MAR 38403

Sold By:

INDEFENDENCE TUBE CORPORATION

6226 W. 74TH STREET

CHICAGO : IL 60636

Tels 708-496-0380 Fax: 708-563-1950

P/O No 33111651

Kel

5/0 No MAR 4207-012

B/L No MAR 2838-012 Shp 27May97

Inv No Inv

Sold To: (1604) FACIFIC HIDE & FUR DEPOT 1401 3RD STREET N.W. P.O. BOX 1549

GREAT FALLS. MT ** 59403

Ship To: (002)

FACIFIC HIDE & FUR DEPOT

C/O MID COLUMBIA WHSE

PASCO, WA 99301

Tel: 406-727-6222 Fax: 406-727-9833

CERTIFICATE of ANALYSIS and TESTS Cert. No: MAR 38403

28Mav97

Wot

9768

Fart No TUBING

4" SQ X 1/4" X 40"

Pcs Wat 29304 **6**0

Heat Number

Tag No 7336

Fcs 20

M28572

7337

YLD=53966/TEN=67207/ELG=32.6

M28572 M28572

7343

9768 20 20 9765

MEETS THE REQUIREMENTS OF ASTM 4-500 GRADE B(C)-93

P-0. 126-PF

SOLD PACIFIC IRON & STEEL TO PO BOX 1549

• GREAT FALLS, MT :59403-1549

•

PACIFIC IRON & STEEL

SHIP PACIFIC IRON 8
TO 925 NO OREGON

. PASCO, WA



A.

The First Two Digits Of The Heat Number Denote Plant Of Origin:

- 55 Kankakee, Illinois Steet Division
- 58 Birmingham, Alabama Steel Division
- 70 Seattle, Washington Steel Division
- 84 Jackson, Mississippi Steel Division

BIRMINGHAM STEEL CORP SEATTLE, WA STEEL DIVISION 2424 SW ANDOVER SEATTLE, WA. 98106-1100 (206)933-2222

CERTIFIED MILL TEST REPORT

45510030

DATE: Ø8/27/97

B.L. NO.: 70-W73845

LOAD NO.: 7000056661

HEAT NO.*	DESCRIPTION		PHYSICA	L TESTS					СН	IEMICAL	TESTS		
	DESCRIPTION	YIELD P.S.I.	TENSILE P.S.I.	ELONG	Bend WT	% DEF	C	Mn Cr	PMo	S	Si	Çu	C.E.
PO#: 33-620	79									<u> </u>	<u> </u>		
709714855	SEATTLE WA STEEL DIVISION 6x8.2# Ch 20' (44W/A36) ASTM A36-94 ASME SA36-95	58,500 403MPa	78,500 541MPa			1.8%	.17	.60		.043	.25	.60	.30%
	CSA G40.21-87 GR 44W		ě.						Ì]	-		
PO#: 33-620	# 5		197			•		-	ļ			Ì	
709714866	SEATTLE WA STEEL DIVISION 6x8.2# Ch 40' (44W/A36) ASTM A36-94 A.A.A.A.A.A.A.A.A.A.A.A.A.A.A.A.A.A.A.	56,750 391MPa	78,500 541MPa			1.5%	.16	.60 .13	ľ	.036	.20	.56	.29%
	CSA G40.21-87 GR 44W		\$								İ		
PO#: 33-620	24		e e							ŀ			
709714506	SEATTLE WA STEEL DIVISION 1/2×2-1/2" F1 20' (44W/A36) ASTM A36-94 ASME SA36-95	51,600 356MPa	75,760 522MPa				.19 .09	.78 .08		.033	.20	.38	.34%
	CSA G40.21-87 GR 44W			{	1 1	1		1			!		
PO#: 33-620	1				1		·				1		
709714444	SEATTLE WA STEEL DIVISION 3x2x3/16" Ang 20' (44W/A36) ASTM A36-94 ASME SA36-95 CSA G40.21-87 GR 44W	54,700 377MPa	77,190 532MPa		-:	2.1%	.15	.73		.033	.20	.41	.30%
PO#: 33-620						i				}	1		
709810557	SEATTLE WA STEEL DIVISION 1-1/2x1-1/2x1/8" Ang 20' (44W ASTM A36-94	55,390 382MPa	77,490 534MPa	25.0%	-:	3.3%	.18	.61 .08	.009	.029	.19	.34	.30%

^{*} SEE REVERSE FOR PLANT OF ORIGIN

THEREBY CERTIFY THAT THE ABOVE FIGURES ARE CORRECT AS CONTAINED IN THE RECORDS OF THE CORPORATION.
ALL MANUFACTURING PROCESSES OF THE STEEL MATERIALS IN THIS PRODUCT INCLUDING

Sold By:

INDEPENDENCE TUBE CORPORATION

6226 W. 74TH STREET Rel PT 1 OF 11 CHICAGO, 1L 60638 S/O No CHI 1174 CHICAGO, IL 60638

P/O No 33111681

CHICAGO, IL 60638 S/O NO CHI 11742-006 Tel: 708-496-0380 Fax: 708-563-1950 B/L No CHI 8149-007 Shp 09Aug97 Inv No

Inv

Sold To: (1604) PACIFIC HIDE & FUR DEPOT 1401 3RD STREET N.V. P.O. BOX 1549 GREAT FALLS, MT ** 59403 Ship To: (002)
PACIFIC HIDE & FUR DEPOT
C/O MID COLUMBIA WHSE
PASCO, WA 99301

Tel: 406-727-6222 Fax: 406 727-9833

CERTIFICATE OF ANALYSIS and TESTS
Cert. No: CHI 46254
11Aug97
Part No
TUBING
6" X 4" X 1/4" X 40'
12 7498 6" X 4" X 1/4" X 40' 1.2 7498 Heat Number Tag No Pcs Wgt 872618 603408 - 1.2 7498 YLD=60571/TEN=74545/ELG=35

872618

Heat Number *** Chemical Analysis ***

C=0.2 Mn=0.69 P=0.01 S=0.007 Si=0.05 Al=0.026

MELTED AND MANUFACTURED I.T.C./U.S.A.

MEETS THE REQUIREMENTS OF ASTM A-500 GRADE B(C)-93

AMERICAN STEEL A DIVISION OF AMERICAN INDUSTRIES INC.

CERTIFICATE OF CONFORMANCE

DATE: 3-11-98 CUSTOMER: Apollo Sheet Metal Inc. PURCHASE ORDER NUMBER: M-126-PS A.S.I. INVOICE NUMBER: 5625
ITEM 4 1 X 8 " X 12 "
HEAT # MILL: SPECIFICATION TYPE AND NUMBER: A 36 HR ecolom 84. ITEM 5 /2 × 12" × 12"
HEAT # MILL: SPECIFICATION TYPE AND NUMBER: A36 AR Carbon Stee
ITEM
HEAT # MILL:
SPECIFICATION TYPE AND NUMBER:
THE ABOVE MATERIAL IS CERTIFIED TO MEET, AND COMPLIES IN ALL RESPECTS, TO THE REQUIRED SPECIFICATIONS IN ACCORDANCE TO YOUR PURCHASE ORDER. SIGNED: DATE: Mar. 1, 1998 (MATERIAL CERTIFICATION CLERK)
CERR)

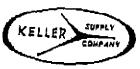
AMERICAN STEEL A DIVISION OF AMERICAN INDUSTRIES INC.

CERTIFICATE OF CONFORMANCE

DATE: 3-11-98
CUSTOMER: APOllo Sheet Metal INC.
PURCHASE ORDER NUMBER: M-126-P3
A.S.I. INVOICE NUMBER: 5625
ITEM 1 5/8 X 8" X 8"
HEAT # MILL:
SPECIFICATION TYPE AND NUMBER: A 3 L HR CARbon Stee
ITEM 2 1 X 8 " X 14 "
HEAT # MILL:
SPECIFICATION TYPE AND NUMBER: A 36 HR Carbon Stee!
ITEM 3 4x 12" x 12"
HEAT # MILL:
SPECIFICATION TYPE AND NUMBER: A36 HR Coabon Stee!
THE ABOVE MATERIAL IS CERTIFIED TO MEET, AND COMPLIES IN ALL RESPECTS, TO THE REQUIRED SECIFICATIONS IN ACCORDANCE TO YOUR PURCHASE ORDER.
SIGNED: Juff fouton DATE: Mar. 1,1998
(MATERIAL CERTIFICATION CLERK)

יסו דד וסו.

C1C1 171 CCC • YD



CERTIFICATE OF COMPLIANCE

SOLD TO

_Apollo Sheet Metal _1207 W. Columbia Drive _Kennewick, WA 99336

YOUR PURCHASE ORDER NUMBER
__M126-PFS-TW

WE CERTIFY THE MATERIAL FURNISHED TO YOU, MEETS THE REQUIREMENTS OF YOUR PURCHASE ORDER.

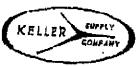
2-1/2" STO DOM A106 GR8 SMLS PIPE

MANAGER

KELLER SUPPLY CO. 6509 WEST DESCHUTES KENNEWICK, WA. 99336

PHONE: 1 509 738 1000 FAX: 1 509 736 1022

DATE: 3/3/98



CERTIFICATE OF COMPLIANCE

SOLO 70

Apollo Sheet Metal 1207 W Columbia Drive Kennewick, WA 99336

YOUR PURCHASE ORDER NUMBER MO92

WE CERTIFY THE MATERIAL FURNISHED TO YOU, MEETS THE REQUIREMENTS OF YOUR PURCHASE ORDER.

2" STD DOM A53 ERW PIPE

MANAGER

KELLER SUPPLY CO. 6509 WEST DESCHUTES KENNEWICK, WA. 99336

PHONE: 1 509 736 1000 FAX: 1 509 736 1022

3/3/98

DATE:

Customer: Keller Supply Co.

Invoice Number: 92694-1

Nor-Cal Job Number: 200937-000

Part Number(s) and Qty.(s): G-2WC-600 (qty. 8)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 2, 1997

Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- ♦ These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-6

Nor-Cal Job Number: 194736-000

Part Number(s) and Qty.(s): 800-600N (qty. 12)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 2, 1997

Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- ◆ The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-8

Nor-Cal Job Number: PO# 31189

Part Number(s) and Qty.(s): G-2WC-400 (qty. 33)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 2, 1997

Nor-Cal Products Inc. certifies that:

- ◆ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-9

Nor-Cal Job Number: PO# 31911

Part Number(s) and Qty.(s): G-2WK-400 (qty. 6)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 2, 1997

Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- ◆ These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-11

Nor-Cal Job Number: 196356-001

Part Number(s) and Qty.(s): 600-400N (qty. 57)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 2, 1997

Nor-Cal Products Inc. certifies that:

- ♦ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-12

Nor-Cal Job Number: 195292-000

Part Number(s) and Qty.(s): G-7w-400 (qty. 8)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 2, 1997

Nor-Cal Products Inc. certifies that:

- ♦ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- ♦ These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-19

Nor-Cal Job Number: PO# 33015

Part Number(s) and Qty.(s): G-2WC-250 (qty. 4)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 2, 1997

Nor-Cal Products Inc. certifies that:

- ◆ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- ♦ These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- ◆ The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-20

Nor-Cal Job Number: 188090-000

Part Number(s) and Qty.(s): G-7wr-250-150 (qty. 4)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 2, 1997

Nor-Cal Products Inc. certifies that:

- ♦ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- ♦ These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- ◆ The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-25

Nor-Cal Job Number: PO# 26420

Part Number(s) and Qty.(s): G-2wc-150 (qty. 23)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 2, 1997

Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street,
 P.O. Box 518, Yreka, California 96097, U.S.A.
- ♦ These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.



ABE Product Certificate No:

303197

Buver:

Avesta ABE Inc. 1800-J MacLeod Dr. Lawrenceville, GA 30043

3295 _ Noreal 129 27106804

90 elbow 45 albow Dimension

6°OD 14GA

Grade

304/304L

Specification Standard

Dimension Standard

B16.9

STRIP

Manufacturer

AVESTA

Die Stamped on Product 91341

Specification Standard

A240-96/SA240-95 TYPE

304/304L

CHARGE ANALYSIS % / LADLE ANALYSIS %

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Intergranular Corrosion Bend Test

ASTM A 282 Practice EX

SIS 117105

DIN 50914

Cold formed X

1050~C. 1h./in.,Water

Welded X

Heat Treated

Radiographic Examination

NO X-Ray

.Visual and Dimensional Inspection

We hereby certify that the above data is a true copy of the test results issued to us by the raw material supplier. Approved

ZO,7=NOX-RAY

=(NT

Z0,9=100%X-RAY Rp0,20,2proofstress Rp1,01,0proofstress R=ROCKWELL-B(HRB) B=BRINELL(HB) ZO,9=10%X-RAY Z1=SS219711/2197 Rm Ultimate tensile strength

C=ROCKWELL-C(HRC) V=VICKERS(HV)



EGMO LTD.
P.O.B. 1111
Tel.: 972-4-985 5121

Nahariya 22110 Israel Fax: 972-4-982 5810 ISO 9002 Certified



Experts in Stainless Steel

PRODUCT SPECIFICATION AND TEST REPORT FOR COMPONENTS

Tal- av 1

JOB NO.: 809428 ITEM: N2WC-90 SHORT 304 POL-2 2.5"

PAGE NO.: 1

HEAT NO. : NZ43

INCOMING INSPECTION NO.: 605989

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ITEM : TUBE 304 T=1.65 N.POL.ANN 2.5"

PRODUCTION

STAINLESS TYPE 304

STAINLESS TYPE 304

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ELEMENT	¹	SI			\\\	·
ELEMENT 8	S .007	SI .340				

TEST RESULT

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TEST NO	~~~~~~	* ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	~~~~~~~~~~		~~~~~~
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	_ :				

VISUAL AND DIMENTIONAL INSPECTION

: OK

EDDY CURRENT TEST

: OK

DATE : 16/06/97

APPROVED BY:- SHPITZER AHAHOA

Customer: Keller Supply Co.

Invoice Number: 93640-12

Nor-Cal Job Number: 204048-003

Part Number(s), Revision(s) and Qty.(s): 971231-2 rev. NC (qty. 5))

Purchase Order Number: 24-563791

Serial Number(s):

Date: January 16, 1998

#### Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-17

Nor-Cal Job Number: 200946-000

Part Number(s) and Qty.(s): 450-250R (qty. 8)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 3, 1997

Nor-Cal Products Inc. certifies that:

- ◆ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- ♦ These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- ♦ The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-18

Nor-Cal Job Number: 196804-000

Part Number(s) and Qty.(s): 450-250N (qty. 13)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 3, 1997

#### Nor-Cal Products Inc. certifies that:

- ♦ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-21

Nor-Cal Job Number: Inventory

Part Number(s) and Qty.(s): ISO-63-250-OF (qty. 9)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 3, 1997

Nor-Cal Products Inc. certifies that:

- ◆ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-24

Nor-Cal Job Number: 190071-000

Part Number(s) and Qty.(s): 338-200N (qty. 26)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 3, 1997

#### Nor-Cal Products Inc. certifies that:

- ◆ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-26

Nor-Cal Job Number: 200947-000

Part Number(s) and Qty.(s): 275-150R (qty. 7)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 2, 1997

Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- ♦ These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 92694-27

Nor-Cal Job Number: 195958-000

Part Number(s) and Qty.(s): 275-150N (qty. 16)

Purchase Order Number: 24-558975

Serial Number(s):

Date: December 3, 1997

#### Nor-Cal Products Inc. certifies that:

- ◆ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- ♦ These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.



# Slater Steels Corporation

Fort Wayne Specialty Alloys Division 2400 Taylor Street West Fort Wayne, Indiana 46802-4600 Telephone: (219) 434-2892 Fax: (219) 434-2905

. Product Certification Report

Report Number 1059410 ship with 1

Page 2 of 2

	_		·		
Slater Order	r I.D.	Order date	Commodity code	Customer I.D.	Customer Purchase Order
9700420	003	01-17-97	7152-9014	1354	47295
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Product Sha	rbe	Product su	irface	Customer grad	0
Rounds		Centerle	ss Ground	304/304L_	
Lifts: 0	006 000	07 0008			

Electroslag remelt.

No welding or weld repair done.

Free of mercury and low melting alloy contamination.

This material was produced in accordance with Slater Quality System Manual, Rev. 6, dated 11/30/94 Material conforms to listed specifications.

Quality system is registered to ISO 9002.

The recording of false, fictitious, or fraudulent statements on this document may be punished as a felony under federal statutes including Federal law, Title 18, Chapter 47. Please consult material safety data sheet (MSDS) for hazard information.

I hereby certify that the reported figures are correct as contained in the records of the corporation.

Ø S

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# Slater Steels Colporation

Fort Wayne Specialty Alloys Division 2400 Taylor Street West Fort Wayne, Indiana 46802-4600 Telephone: (219) 434-2892 Fax: (219) 434-2905

**Product Certification Report** 

Report Number 1059410 ship with 1

Page 1 of 2

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I hereby certify that the reported figures are correct as contained in the records of the corporation.

Met Lab Supervisor:

1.0

Dennis Hackett

医CET SEP 30 1997

Customer: Keller Supply Co.

Invoice Number: 89670-29

Nor-Cal Job Number: 195056-000.

Part Number(s) and Qty.(s): FH-300-24-2CF (qty. 1)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 25, 1997

### Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street,
   P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

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Jessop Specialty Products £00 Green SVest

Ship METAL BOOKS PA 19301

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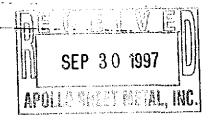
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SEP 30 1997

APOLLO SYSET METAL, INC.

Customer: Keller Supply Co.

Invoice Number: 89670-27

Nor-Cal Job Number: 195054-000

Part Number(s) and Qty.(s): FH-300-24-2CF (qty. 1)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 25, 1997

#### Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
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- ◆ The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

100 ASPEN HILL ROAD NORTH BRANCH, 1 ild To: Marhon/Keystons**Ca** **38876** (908)-218-1400 COPY #- 3 .035 P.O. BOX 2128 B.O. #: 67384-00 Customer Pol: **POMONA** cation: 0.750 O.D. X .035 Wall TP304 304L X Straight Length , WELDED/RSTH-R269-94R/R249-94R/RSHE-SR249/SR249H-92R 45-15366 Reverse . TENSILE TESTS: Flat Flattening Flange Bend Reverse Rockwell Eddy Hydrostatic . Tensile Str. Hardnese Current P.S.I. 20988 OK Yield Str. &Elong . P.S.I. OK 1938 OK OK P.S.I. OK **B71** In 2"" OK OK OK **B73** 81818 OK 41558 86486 63 41891 59 HEAT ANALYSIS. C BI " CR 0988 0.017 1.690 0.029 0.001 NI TI 1938 0.026 1.570 0.028 0.003 CD 0.610 18.230 9.130 0.250 0.290 18.160 8.450 0.230 AL. FE N CO 0.000 0.370 0.000 0.000 0.270 JAE. 0.038 0.130 0.000 0.000 0.000 0.00 BAL 0.600 0.000 0.000 0.000 0.00 ADDITIONAL INFORMATION aling---Bright Annealed Mir Test High Pressure Under Water Nitrogen P.S.I. P.S.Ī.

WARNING

AMILIA COST

RIAL SAFETY DATA SHEETS FOR THIS PRODUCT HAVE BEEN SUPPLIED TO YOUR ASING DEPARTMENT. FOR AN ADDITIONAL COPY PHONE 908-218-1400. ON: PROCESSING THAT HAKES FUMBS, DUST, OR SOLUTIONS HAY CAUSE LUNG SE. SEE MATERIAL SAFETY DATA SHEETS FOR PURTHER INFORMATION.

M#114 . /94

Customer: Keller Supply Co.

Invoice Number: 89670-22

Nor-Cal Job Number: 195051-000

Part Number(s) and Qty.(s): AN-NW-50-450 (qty. 5)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 25, 1997

Nor-Cal Products Inc. certifies that:

- Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- ◆ The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Quality Technician

SEP 30 1997

# Slater Steels Corporation

Fort Wayne Specialty Alloys Division Fort Wayne, Indiana 45702

Fort Wayne, Indiana 46802-4600 Telephone: (219) 434-2892 Fax: (219) 434-2905 Product Certification Report Report Number 1062790

applings : report tamaget 1003

9700420 002 Dim 1 Dim 2	Order data 01-17-97 Dim 3	Commodity code 7152-8010	Cu		1 of 2 Guelomer Purchase Order 47295
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Rounds	Centerles	s Ground		4/304L	
, VINCENT M	ETAL GOODS				

Ship to 1211 W. LORING ST PORTLAND, OR EAGLE METALS DIV

METAL GOODS

Sold DIV OF ALCAN ALUM. P.O. BOX 12187 PORTLAND, OR

97227

97212

Lifts: 0013

CONDITION A ASTMA 276-95A ASMESA 193 95 ED - 95 ADDENDA AMS 5639G

QQS 763 E Amend 1 ASTMA 320-84A ASMESA 320 95 ED - 95 ADDENDA

ASTMA 193-95 ASTMA 479-95B ASMESA 479 95 ED - 95 ADDENDA

PARENT HEAT CHEMICAL ANALYSIS

47846

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149

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GRAIN SIZE

ASTM A 262 PRACTICE E
OXALIC

PERCENT FERRITE
PERMIABILITY

-> 0.5

DECEIVED

SEP 30 1997

APOLLO

I hereby certify that the reported figures are correct as contained in the records of the corporation.

Customer: Keller Supply Co.

Invoice Number: 89670

Nor-Cal Job Number: 190497-000

Part Number(s) and Qty.(s): 275-1501 (qty. 20)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 25, 1997

Nor-Cal Products Inc. certifies that:

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   P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all
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Quality Technician

SEP 30 1997

#### Mill Certificate

### SAMMI

#### SAMMI STEEL CO., LTD.

Changwon Works P. O. Sox 95, Changevon, Kores Telefax:0551 84-2519

SEP 30 1997

Customer : 3101 DISTRIBUTOR (U.S.A)

Order No. : PSF-11545

Article

Specification: ASTM-A276

Steel Grade : T-304

: ROUND BAR

STM-A276 EDITION: 94B

Cert No. : 45445

Meiling Process : V.O.D.

Surface Condition: SMOOTH TURNED
Heat Transment: SOLUTION TREATED

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Additional Remarks :

FREE FROM MERCURY CONTAMINATION, MICBO, MACBO & INTERGRANULAR CORROSION (ASTM-262-91 PRACTICE-E) TRST:OK. CERT. TO:ASTM-A484-92,A182-92,A183-92 B8-CL-1,A320-92 B8-CL-1,A479-92 COND.-A,ASME-BA182-93,SA193-93 B8-CL-1,SA320-93 B8-CL-1,BA479-93 COND.-A,ASME-B39F,MIL-9862B, 99-3763E COND.-A. HEAT TREATMENT:1050 C & W.C.

We hereby certify, that the material described above has been tested and complies with the terms of the order contract,

MAR. 29 . 9

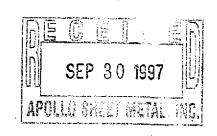
Quality Assurance Manager

Our quality system is certified in accordance with ISO 8002 by TÜV Hannover/Sachsen-Anheit - TÜV-CERT

3060-346(210×107)

SALES STEEL

PO 30874 L



Customer: Keller Supply Co.

Invoice Number: 89670

Nor-Cal Job Number: 189627-000

Part Number(s) and Qty.(s): 275-REC (qty. 20)

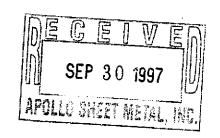
Purchase Order Number: 24-542920

Serial Number(s):

Date: September 25, 1997

### Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street,
   P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- ◆ The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.



Customer: Keller Supply Co.

Invoice Number: 89670-37

Nor-Cal Job Number: PO# 31149

Part Number(s) and Qty.(s): B-31W-200-150 (qty. 2)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

#### Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street,
   P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

SEP 30 1897

AFOLLO SHEET METAL, INC.

Customer: Keller Supply Co.

Invoice Number: 89670-21

Nor-Cal Job Number: Inventory

Part Number(s) and Qty.(s): NW-50-CP-R1 (qty. 10)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

#### Nor-Cal Products Inc. certifies that:

- ◆ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 89670-20

Nor-Cal Job Number: 195050-000

Part Number(s) and Qty.(s): B-275 (qty. 6)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Quality Technician

SEP 30 1997

APOLLO SHEET METAL, INC

SEP 30 1997

APOLLO SHEET METAL INC.

Customer: Keller Supply Co.

Invoice Number: 89670-17

Nor-Cal Job Number: 195047-000

Part Number(s) and Qty.(s): B-600 (qty. 47)

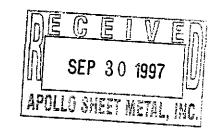
Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

#### Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.



Customer: Keller Supply Co.

Invoice Number: 89670-16

Nor-Cal Job Number: 195044-000

Part Number(s) and Qty.(s): B-800 (qty. 20)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- ◆ The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 89670-15

Nor-Cal Job Number: PO# 31484

Part Number(s) and Qty.(s): G-275-I (qty. 45)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Quality Technician

SEP 3 0 1997

APOLLO SHEET METAL, IN

Customer: Keller Supply Co.

Invoice Number: 89670-14

Nor-Cal Job Number: PO# 31243

Part Number(s) and Qty (s): G-338-I (qty. 86)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- ◆ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- ♦ These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Quality Technician

SEP 30 1997

APOLLO SHEET METAL, IN

Customer: Keller Supply Co.

Invoice Number: 89670-13

Nor-Cal Job Number: PO# 31105

Part Number(s) and Qty.(s): G-450-I (qty. 40)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- ◆ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Quality Technician

SEP 30 1997

Customer: Keller Supply Co.

Invoice Number: 89670-12

Nor-Cal Job Number: PO# 31912

Part Number(s) and Qty.(s): G-600-I (qty. 118)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- ♦ These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Quality Technician

SEP 30 1997

Customer: Keller Supply Co.

Invoice Number: 89670-11

Nor-Cal Job Number: PO# 31243

Part Number(s) and Qty.(s): G-800-I (qty. 20)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- ♦ The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Quality Technician

SEP 30 1997

APOLLO SHEET WETAL, II

Customer: Keller Supply Co.

Invoice Number: 89670-10

Nor-Cal Job Number: 188109-001

Part Number(s) and Qty.(s): 275-150N (qty. 20)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- ◆ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street,
   P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Quality Technician

SEP 30 1997

APOLLO SHEET METAL, IN

Customer: Keller Supply Co.

Invoice Number: 89670-6

Nor-Cal Job Number: 166298-000

Part Number(s) and Qty.(s): 450-250N (qty. 17)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- ◆ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- ◆ The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Customer: Keller Supply Co.

Invoice Number: 89670-5

Nor-Cal Job Number: 195013-000

Part Number(s) and Qty.(s): 450-250R (qty. 17)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- ◆ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Quality Technician

SEP 30 1997

Customer: Keller Supply Co.

Invoice Number: 89670-4

Nor-Cal Job Number: 185758-000

Part Number(s) and Qty.(s): 600-400N (qty. 55)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Quality Technician

SEP 30 1997

apollo sheet metal, ii

Customer: Keller Supply Co.

Invoice Number: 89670-3

Nor-Cal Job Number: 195008-000

Part Number(s) and Qty.(s): 600-400R (qty. 55)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Quality Technician

SEP 30 1997

Customer: Keller Supply Co.

Invoice Number: 89670-2

Nor-Cal Job Number: 185755-000

Part Number(s) and Qty.(s): 800-600N (gty. 12)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- ♦ The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Quality Technician

SEP 30 1997

APOLLO SHEET METAL.

Customer: Keller Supply Co.

Invoice Number: 89670-1

Nor-Cal Job Number: 195007-000

Part Number(s) and Qty.(s): 800-600R (qty. 12)

Purchase Order Number: 24-542920

Serial Number(s):

Date: September 18, 1997

Nor-Cal Products Inc. certifies that:

- ◆ These parts were manufactured at Nor-Cal Products Inc., 1967 South Oregon Street, P.O. Box 518, Yreka, California 96097, U.S.A.
- These parts were produced and functionally tested as required, in conformance with all contractually applicable drawing and/or purchase order specifications.
- The material and/or parts furnished under the above purchase order and on the above invoice were produced from materials for which Nor-Cal Products Inc., has available for examination, chemical and/or physical test reports or other evidence of conformance to applicable specifications.

Quality Technician

SEP 30 1997



#### [UN 06_197 01:04PM_RYERSON STEEL Stater Steels Corporation

Fort Wayne Specialty Alloys Division 2400 Taylor Street West

Fort Wayne, Indiana 46802-4600 Telephone: (219) 434-2892 Fax: (219) 434-2905

Product Certification Report

Report Number 750310 ship with 1

Page 1 of 2

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JOSEPH T RYERSON & SON INC

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JOSEPH T RYERSON & SON INC

Sold 65TH & HOLLIS STS to | EMERYVILLE, CA

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Lifts: 0032

CONDITION A

7125-T **ASTMA 479-95A** ASTMA 262-88 Practice E DUPONT SW300-M JAN 82 ASTMA 182-94C chem only

ASMESA 182 92 ED94ADDchem only

AMS 5639F

QQS 763 E Amend 1

**ASTMA 276-85** 

ASMESA 479 92 ED - 94 ADDENDA

CHEMICAL ANALYSIS

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TENSILE PROPERTIES

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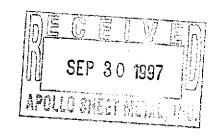
MACRO ASTM E381 MACRO

OK

GRAIN SIZE

ASTM A 262 PRACTICE E **OXALIC** 

---> OK



I hereby certify that the reported figures are correct as contained in the records of the corporation.

Met Lab Supervisor:

Dennis Hackett



リリケイレイナ Slater Steels Corporation

Fort Wayne Specialty Alloys Division 2400 Taylor Street West

Fort Wayne, Indiana 46802-4600 Telephone: (219) 434-2892 Fax: (219) 434-2905

Product Certification Report

Report Number 1056010

ship with 1

Page 1 of 2

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VINCENT METAL GOODS

Ship Ю

1211 W. LORING ST PORTLAND, OR EAGLE METALS DIV

**METAL GOODS** Sold

DIV OF ALCAN ALUM. P.O. BOX 12187 PORTLAND, OR

97227

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Lifts: 0003 0004 0005

CONDITION A **ASTMA 479-95B**  QQS 763 E Amend 1

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**ASTMA 276-95A** 

PARENT HEAT CHEMICAL ANALYSIS

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HEMICAL ANALYSIS

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TENSILE PROPERTIES

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MACRO

OK

GRAIN SIZE

ASTM A 262 PRACTICE E **OXALIC** 

1.0

PERCENT FERRITE PERMIABILITY

SEP 30 1997 APOLLO SWEET METAL, INC

I hereby certify that the reported figures are correct as contained in the records of the corporation.

SEP 30 1997

APOLIO SYEET WETAL,



### Slater Steels Corporation

Fort Wayne Specialty Alloys Division 2400 Taylor Street West Fort Wayne, Indiana 46802-4600

**Product Certification Report** 

Report Number 1053480 ship with 1

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**GRAIN SIZE** 

ASTM A 262 PRACTICE E

No mercury or low melting alloy contamination. Continuous carbide and intergranular corrosion test OK. Melted and manufactured in the United States.

Material conforms to listed specifications.

Quality system is registered to ISO 9002.

The recording of false, fictitious, or fraudulent statements on this document may be punished as a felony under federal statutes including Federal law, Title 18, Chapter 47. Please consult material safety data sheet (MSDS) for hazard information.

I hereby certify that the reported figures are correct as contained in the records of the corporation.

Met Lab Supervisor:

Dennis Hackett

A Avesta Sheffield

#### Avesta Sheffield East, inc.

## Certificate of Analysis and Tests

37706-3X 4/29/96 HEAT & PIECE OUR ORDER 81402 - 03 SHIP TO: VINCENT METAL GOODS SOLD TO: VINCENT HETAL GOODS DIV OF RIO ALGOM INC P O BOX 360 HINNEAPOLIS 4755 FIRST AVE SOUTH 206-762-0600 98134 SEATTLE MN 55440 937001-14 -*†*@ _____YOUR ORDER 6 DATE -----TAG# 39352 3/01/96 98-062019 ITEM DESCRIPTION ----HEAT & PIECE 37706 - 3A WEIGHT PINISH UNS-330400 304 GRADE .875 x 72.000 x 254.000 EXACT DIMENSIONS SPECIFICATIONS METAL GOODS SPECS FOR 304 NO GRIPPER MARKS ASTM A240-95A, ASME SA240-95 NO WELD REPAIR ON MATERIAL ASTM A480/A480H-94B ABTH A167-93
AMS 5513F EXCEPT LINE MARK ASTM A167-93 MIL-S-5059D WITH EXCEPTIONS ASTM A262-93 PRAC E ASTM A262-93 PRAC A PLATES & TEST PCS SOLUTION ANNUALED # 1950 DEGREES FARENHEIT MINIMUM. THEN WATER COOLED OR RAPIDLY COOLED BY AIR PREE OF MERCURY CONTAMINATION HOT ROLLED, ANNEALED & PICKLED (HRAP) - MECHANICAL & OTHER TESTS 80 HARDNESS RB GRAIN SIZE YIELD STRENGTH (PSI) 45200 TENSILE STRENGTH (PSI) 88100 BEND INTERGRANULAR CORROSION ELONGATION % IN 2" REDUCTION OF AREA % OK 59.0 67.0 ----- CHEMICAL COMPOSITION -CARBON .04 MARGANESE (MM) 1.52 .028 (P) PHOSPHORUS .004 SULFUR SILICON . 45 (SI) CHROMIUM (CR) 18.26 (NI) 8.13 MICKEL COBALT (co) .12

KNOWINGLY : WILLFULLY FALSIFYING OR CONCEALING A MATERIAL FACT ON THIS FORM, OR MAKING FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR REPRESENTATIONS HEREIN COULD CONSTITUTE A FELONY PUNISHABLE UNDER FEDERAL STATUTES.

J. BONGARDT, LAB MANAGER

P.O. BOX 1975 Baltimore, Maryland 21203 Telephone: (410) 522-6200 FAX # 410-522-6247

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HOLY

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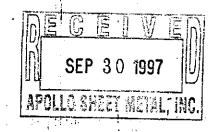
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#### STAINLESS STEEL PLATE AND PLATE PRODUCTS TOOL AND DIE STEELS:

THE COUNTRY'S MOST COMPLETE CUTTING SERVICE ORGANIZATION

ONE SANDMEYER LANE • PHILADELPHIA, PA 19116-3598 • 215-464-7100 • 800-523-3663 • FAX: 215-677-1430

BILL TO

CERTIFICATE OF TEST

NOR-CAL PRODUCTS, INC. 1967 S. OREGON STREET P. O. BOX 518 YREKA, CA 96097-0518

WE CERTIFY THAT THE CHEMICAL ANALY AND MECHANICAL TEST RESULTS APPEAR IN THIS CERTIFICATE ARE CORRECT AN TRUE AS REPORTED BY THE MANUFACTUR

SANDMEYER STEEL COMPANY

CUSTOMER ORDER NO.

E. GARDOSH - MANAGER, QUALITY ASSURAN QUALITY CONTROL DEPARTMENT

0.440

8.310

18.300

30037 DATE: 05/14/97 :RADE: SPECIFICATION: HEAT NO.: ASME SA-240 875327 PIECE? DESCRIPTION 6.03" OD X 3-3/4" ID X 7/8" PLATE NO. 1733 #1 R-600-400N SEP 30 1997 APOLLO SHEET METAL INC HEAT NO. Mn Νi Сr

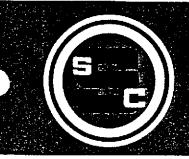
HEAT NO.	Yield *	Tensile *	Elong	Hardness	<del></del>
875327	45,800	90,200	į	' BHN 179	
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* LBS/IN2

875327

MATERIAL SOLUTION ANNEALED AT 1900 DEGREES F MINIMUM AND WATER QUENCHED OR RAPIDLY COOLED BY AIR MATERIAL MANUFACTURED BY ALLEGHENY LUDLUM STEEL CORP.

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Avesta Sheffield Plate Inc.  Detrificate of Analysis and Cests  Cur order 66742 - 01  Detrificate of Analysis and Cests  Sold to: Hetal goods/Div of Alcan Aluni Ship to: Netal course service center 7727-1187 ave. South  P. D. Box 344  ST LOVIS HO 63144  PROJECT 50231 402  VOUR ORDER & DATE  TAGG 317914 / C  PROJECT 50231 402  VOUR ORDER & DATE  TAGG 317914 / C  PROJECT 50231 402  VOUR ORDER & DATE  TAGG 317914 / C  PROJECT 50231 402  VOUR ORDER & DATE  TAGG 317914 / C  PROJECT 50231 402  VOUR ORDER & DATE  TAGG 317914 / C  PROJECT 50231 402  VOUR ORDER & DATE  TAGG 317914 / C  PROJECT 50231 402  VOUR ORDER & DATE  TAGG 317914 / C  PROJECT 50231 402  VOUR ORDER & DATE  TAGG 317914 / C  TAGG 317914 / C  PROJECT 50231 402  PROJECT 50231 402  RETH ASSOCRABLE AND ASSOCRABLE OF SERVICE OF HEAD REPAIR ASSOCRABLE OF SERVICE OF HEAD REPAIR ASSOCRABLE OF SERVICE OF HEAD REPAIR ASSOCRABLE OF SERVICE OF HEAD REPAIR ASSOCRABLE OF SERVICE OF HEAD REPAIR ASSOCRABLE OF SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVICE OF HEAD SERVIC	tal Goods Service Centers cs Order: 31-062761			Customer: norcal		E I V E	Page: 1 of 1
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EIGHT 1 140%  INTERIOR 304 A23 X 98:000 X 268:000 EXACT  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  ASTRONOMICAL COMPANIES  SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  SPECIFICATIONS  SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMICAL CONTROL SPECIFICATIONS  ASTRONOMIC	EAT & PIECE	15231		, JEDUNAP IALIM			- , , , , , , , , , , , , , , , , , , ,
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STH A240-94A, ADME CA240-95  ARTH A147-93  AND JOIST EXCEPT LINE MARK  IL-S-0550  STH A242-93 PRAC A  ASTM A242-93 PRAC E  PLATES & TEST PCS SULTION ANNEALED & 1980 DEGREES FARENMEIT MINIMUM.  THEN MATER COURD OR RAFIDLY DOOLED BY AIR  PRECE OF MERCURY CONTRACTION DOOLED BY AIR  RECHANICAL & OTHER TESTS  SATURATED ANNEALED & PICKLED BY AIR  ARRONS RS  IL-D STRENGTM (PSI) 9026  ARRON (PSI) 9026  END STRENGTM (PSI) 9027  ARRON (PSI) 9027  ARRON (CSI) 903  ARRON (CSI) 903  ARRON (CSI) 903  ARRON (CSI) 903  IL-OUR SI) 903  ARRON (CSI)		8PE	CIFICATIONS	~			
AND 50.37 EXCEPT LINE MARK  WASTH ABBA-73 PRAC A  ASTH ABBA-73 PRAC E  PLATES & TEST PCS SCLUTION ANNEALED & 1950 DEGREES FARENMENT DIVINION.  THEN HATER CORLED OR RAPIDLY COOLED BY AIR  THEN HATER CORLED & PICKLED (HRAP)  HOT ROLLED, ANNEALED & PICKLED (HRAP)  ARRONGESS R8  ARRONGESS R8  TECHANICAL & OTHER TESTS  TEST THENSITH (PSI) 47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47812  47	METAL COODE SPEC	E FOR 304	Av	NO ORIP MAR	KS-NO WELT	REFAIR	
ASTM ASAS—73 PRAC A  PLATES & TEST PCS SCLUTION ANNEALED 0.1950 DEGREES FARENMEIT MINIMUM.  PLATES & TEST PCS SCLUTION ANNEALED 0.1950 DEGREES FARENMEIT MINIMUM.  PREE DF MERCURY CONTANTINATION  MAD RESULT ON ANNEALED & PICKLED (MRAP)  MARCHESS RS  MECHANICAL & UTHER TESTS  MILL D STRENMENT (PSI) 9026  MARCHESS RS  MILL STRENMENT (PSI) 9026  ARBUN (C) 05 CHEMICAL COMPOSITION  ARBUN (C) 18 43  MISPHEMUS (P) 032  MARCHUM (C) 18 43  MISPHEMUS (P) 032  MARCHUM (C) 18 43  MISPHEMUS (P) 032  MARCHUM (C) 18 43  MICHEL (NI) 8.07  MARCHUM (C) 18 43  MICHEL (NI) 8.07  MARCHUM (C) 18 43  MICHEL (NI) 8.07  MARCHUM (C) 19 010  LUMINUM (AL) 007  MILL STRENMENT (C) 013  KNOWLINGLY & MILL FALLY MALSIFYING OR CONCEALING A MATERIAL FACT ON THIS FORM,  CR MARING FAIRE, FICTITIOUS OR FRAUDULENT STATEMENTS OR REPRESENTATIONS  MERCIN COULD CONSTITUTE A FELONY FUNISHABLE UNDER FEDERAL STATUTES  A. L. TRISSLER, LAB TESTING MANAGER  WERE IN COULD CONSTITUTE A FELONY FUNISHABLE UNDER FEDERAL STATUTES  A. L. TRISSLER, LAB TESTING MANAGER  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE IN MANAGER (PSI)  WERE I	43 [M 6430/64808=	74B	X5	ASTM A167-9	3 XCMEPT LINE	MARK	
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MECHANICAL & OTHER TESTS  MECHANICAL & OTHER TESTS  MATRIC STRENGTH (PSI) 90267  MINTERGRANULAR CORROSION OK  LINGGION OF IN 2" 53.7  MEDUCTION OF AREA I 68.1  ARBON (C) 05 CHEMICAL COMPOSITION  ANSARSES (MN) 1.43  ANSARSES (MN) 1.43  MINTERGRANUL (F) 032  MILTUR (S) 003  MILTUR (S) 003  MINTERGRANUL (F) 032  MILTUR (S) 003  MINTERGRANUL (F) 032  MILTUR (S) 003  MINTERGRANUL (F) 032  MILTUR (C) 12  MINTERGRANUL (F) 030  MINTERGRANUL (F) 030  MINTERGRANUL (F) 030  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F) 040  MINTERGRANUL (F)	PLATES & TEST P	es soumm					
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TELD TREMETH (PSI) 47812  EMBLIE STRENGTH (PSI) 90267  EMBLIE STRENGTH (PSI) 90267  EMBLIE STRENGTH (PSI) 90267  EMBLIE STRENGTH (PSI) 90267  EMBLIE STRENGTH (PSI) 90267  EMBLIE STRENGTH (PSI) 90267  ARBON OF AREA X 58 7  ARBON (C) 032  BLIFOR (S) 032  BLIFOR (S) 032  BLIFOR (S) 039  MRCHILM (CR) 18 43  ELICON (S) 39  MRCHILM (CR) 007  GLIMBIUM (CR) 010  LUMINUM (CR) 010  LUMINUM (AL) 007  GLIMBIUM (AL) 007  CLIMBIUM (AL) 007  CL	HOT ROLLED. ANN	EALED & PI	CHEAR	•			
THE D STRENGTH (PSI) 47812  EMET LE STRENGTH (PSI) 90267  END AND ANULAR CORROSION OK LUNGSTION OF AREA I 58 1  ARBON (C) 05 AND AND (C) 05 AND (C) 032 ULFUR (S) 032 ULFUR (S) 039 HRICHIUM (CR) 18 45  ILICON (S) 39 HRICHIUM (CR) 18 45  ILICON (S) 12  OFFR (CU) 34  OFFR (CU) 34  ITROCEN (N) 07  LUNINUM (AL) 007  LUNINUM (AL) 007  LUNINUM (AL) 007  LUNINUM (AL) 007  CR HARING FAISE, FILTY FALSIFYING OR CONCEALING A MATERIAL FACT ON THIS FORM, HEREIN COULD CONSTITUTE A FELONY PUNISHABLE UNDER FEDERAL STATUTES.  A. L. TRISSLER, LAB TESTING MANAGER	LASTAGE CO		- MECHANICA	L & OTHER TE	ere:	·	
NTERORANULAR CORROSION OK LINGATION IN 2" 357 EDUCTION OF AREA I 68 1  ARBON (C) 05 CHEMICAL COMPOSITION  ARBON (C) 05 CHEMICAL COMPOSITION  ARBON (C) 05 CHEMICAL COMPOSITION  ARBON (C) 05 CHEMICAL COMPOSITION  ARBON (C) 05 CHEMICAL COMPOSITION  ARBON (C) 1 33 CHEMICAL COMPOSITION  ARBON (C) 18 05 CHEMICAL COMPOSITION  ILICON (S) 000  ILICON (C) 18 07  OBAPI (C) 18 07  OBAPI (C) 18 07  OBAPI (C) 18 07  OBAPI (C) 18 07  OBAPI (C) 18 07  OBAPI (C) 18 07  OBAPI (C) 18 07  OBAPI (C) 18 07  OBAPI (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF COMPOSITION (C) 18 07  OF C	IELD STRENGTH	(P\$1)	7812		•		
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#### STANIE MIENE

### STAINLESS STEEL PLATE AND PLATE PRODUCTS TOOL AND DIE STEELS

THE COUNTRY'S MOST COMPLETE CUTTING SERVICE ORGANIZATION

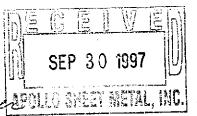
ONE SANDMEYER LANE • PHILADELPHIA, PA 19116-3598 • 215-464-7100 • 800-523-3663 • FAX: 215-677-1430

BILL TO

> NOR-CAL PRODUCTS, INC. 1967 S. OREGON STREET P. O. BOX 518

YREKA, CA 96097-0518

ath Shown Dalm



CERTIFICATE OF TEST

WE CERTIFY THAT THE CHEMICAL ANALYS AND MECHANICAL TEST RESULTS APPEARS IN THIS CERTIFICATE ARE CORRECT AND TRUE AS CONTAINED IN THE RECORDS OF THE COMPANY

SANDMEYER STEEL COMPANY

CUSTOMER ORDER NO.

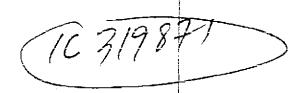
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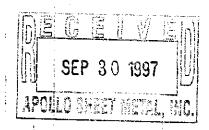
E. GARDOSH - MANAGER, QUALITY ASSURAN QUALITY CONTROL DEPARTMENT

DATE: 05/14/97 GRADE: SPECIFICATION: HEAT NO: ASME SA-240 161223 **PIECES** DESCRIPTION 8.03" OD X 5-3/4" ID X 1" 150 PLATE NO. 18682 1735 #2 - R - 800-600N HEAT NO. Si Νi 161223 0.460 029 0.001 0.07 HEAT NO. Yield * Tensile * Elong Hardness 161223 52,900 88.700 57% IN 2" RB

* LBS/IN2

MATERIAL SOLUTION ANNEALED AT 1900 DEGREES F MINIMUM AND WATER QUENCHED OR RAPIDLY COOLED BY AIR





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DS -053630 REPRINT			2/23/96	N	70	0.5	468 000	03726796	111
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8 .086 2 .009 Grain and Carrosian Size	CU -28 -42	CD .13 -10	CR HO 39 .25 34 .27 Red. of firea 79.0	26 1 Le Elo	32 8	gth Sti	•026 .(	C Hi -023 1.85 -022 1.65 Gauge 1.0000	
OK		8HN170 8HN170	79.0	58	6 KSI		43.3	NAS NOT WELD RE	870730 NATERIAL



#### Avesta Sheffield East, Inc.

### M102 Certificate of Analysis and Tests

OUR ORDER 80873 - 04 DUAL. BEAT & PIECE 37545-2A 4/20/96 SOLD TO: VINCENT METAL GOODS SHIP TO: VINCENT METAL GOODS: 4755 FIRST AVE. SOUTH 206-762-0600 0. BOX 346 ." ST LOUIS 63166 SEATTLE 98134 614001-31 ---- YOUR ORDER & DATE ナせ 98-056777 2/15/96 TAG# 334482 ITEM DESCRIPTION . HEAT 4 PIECE PINISH CRADE! UNS-8304001 DIMENSIONS 1.125 X 72.000 X 257.000 XXXCT SPECIFICATIONS METAL GOODS SPECS FOR 304L AMS 5513F EXCEPT LINE MARK HO GRIT HARKS-NO WELD REPAIR ASTH A240-95A, ASHE SA240-95 ASTM A167-93 ASTM A480/A480M-94B HIL-S-5059D WITH EXCÉPTIONS ASTH A267-93 PRAC A ASTN A262-93 PRAC E PLATES & TEST PCS SOLUTION ANNHALED # 1950 DEGREES FARENHEIT MINIMUM. THEE WATER COOLED OR RAPIDLY COOLED BY AIR PREE OF HERCURY CONTAMINATION BOT ROLLED, ANNIALED & PICKLED (RRAP) - MECHANICAL & OTHER TESTS HARDNESS RE 72 Grain Size YIELD STRENGTH (PSI) TEMSILE STRENGTH (PSI) 35400 81000 BEND OK INTERGRANULAR CORROSION OK ELONGATION 4 IN 2" 55.0 REDUCTION OF AREA & 68.0 ---- CHEMICAL COMPOSITION ---KOERAD (C) .01 NANGANESE (HR) 1.55 PHOSPHORUE (P!) .031 SULFUR (SI) .002 SILICON (SI) . 39 CHRONIUM (CR) 18.31 MICKEL (NI) 8.64 COBALT -11 (CO) COPPER (CO) . 48 NOLY (NO) .43 MITROGEN (N) . 07

RECWINGLY 6 WILLFULLY FALSIFYING OR CONCEALING A HATERIAL FACT ON THIS FORM, OR HAKING FALSE, PICTITIOUS OR FRAUDULENT STRTEMENTS OR REPRESENTATIONS HEREIN COULD CONSTITUTE A PELONY PUNISHABLE UNDER FEDERAL STATUTES.

J. BONGARDT, LAB MANAGER

P.O. 80X 1975 Beltimore, Maryland 21203 Telephone: (410) 522-6200 FAX # 410-522-6247

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NOR-CAL PRODUCTS, INC.

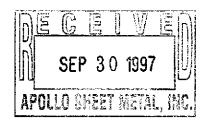
Manufacturers of High Vecuum Components

1967 S. Oregon St, P.O. Box 518 Yreka, Ca 96097

800-824-4166 916-842-4457 FAX: 916-842-9130

### **FAX COVER SHEET**

FAX: 916-842-9130



Please Deliver To:	P	ea	se	Del	liver	To:
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Name Mark	FAX 509-736-1022
Firm Keller Supply	Telephone
City	Mail Stop
From <u>Diana Tudor</u>	Date September 23, 1997
Total Pages Incl	uding Cover 5
Re: PO 24-542920	

Hi Mark:

Here are the certs I talked to you about. They are for Lines 48, 49, 50 and 51.

Please call me if you need "Tudoring".

Thanks,

Diana

PO BOX 1189, RT. 30 & MALIN ROAD PO BOX 1189, RT. 30 & MALIN ROAD DAMASCUS-BISHOF ULDS INDUSTRIAL PARK ROAD .02 DAELWALLE, PA 16125 FRAZER, PA 19355 PHONE (412) 645-1500 MILL ORDER NO. TUBE COMPANY INC. PHONE (610) 647-3450 FAX (412) 646-1505 (LAB) 680634-83 FAX (610) \$47-2640 PURCHASE ORDER NO. C1435 CERTIFICATE OF TEST MARCEGACE IA DATE SHIPPED EXCEL METALS DAGE 01/13/96 6490 FLEET STREET SPECIFICATIONS SANE CTY OF COMMERCE, CA SOME ASTM A249-94A, A-289-94A ARB ASHE SA-209-95 TIE HELDED HYDAO FLAT FLAM GODY REND 191684291 RFLT OTHER SPECIFICATIONS ADDITIONAL INFO. MATERIAL SOLUTION ANNEALED AT 2,010 F COMPRESED DELAN AGE F IN LESS THAN 3 NUMBERS. ANDEALER & PICELED FOR I HOUR PER INCH OF INICIALESS AND MATER ritM TYPE 0.0.4.9.5 GALISCH. HEAT NO. CARBON MANG TIT PHOS. SULPHUI SILLOGN CHROMILL NICKEL MOLY. COPPER **COBALT** n 17304/173041 045 7751 .021 1.61 .027 .017 .27 10.15 1.13 .17 .32 G Ē ISEP 130 1197 } APOLIO SHIET METAL, HOCKINELL MARCHESS YELO STRENGTH IPSO TTEM TEMSKE STRENGTH (PSI) HYDRO PSI FRONGATION MELT SOURCE APPLICABLE! # APPLICAN EL PRECES 874 FROPAGE 43,900 15,100 651 FL 150 3000 WE CERTIFY THAT THE CHEMICAL, PHYSICAL OR MECHANICAL TESTS

PHYSICAL OR MECHANICAL TESTS REPORTED HEREIN ARE CORRECT AS SHOWN ON OUR RECORDS.

DAMASCUS

Jame / Stattes

3970-B (RIV. 12/84)

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WE CEPTIFY THAT THE CHEMICAL, PHYSICAL OR MECHANICAL TESTS REPORTED HEREIN ARE CORRECT AS SHOWN ON OUR RECORDS.

DAMASCUS

Jame Stattes

FRAZER, PA 19355 PHONE (810) 647-3450 FAX (810) 847-2540

TUBE COMPANY, INC. &

CERTIFICATE OF TEST

GROUP

ible to

PHONE (412) 546-1500

FAX (412) 848-1505 (LAB)

Ö

EXCEL METALS 6440 FLEET STREET

ENCEL METALS \$440 FLEET STREET

CEY OF COMMERCE, CA 90040

CIT OF COMMERCE, CA 90010

HYDRO FLAN HOV

ADDITIONAL INFO.

MATERIAL SOLUTION AMBEALED AT 2,000 F QUENCHED BELOW GOO F IN LESS THAN 3 MINUTES.

FOR I HOME PER INCH OF THICKNESS AND MATER AMMEALED & PECKLED

PO BOX 1189, RT. 30 & MALIN ROAD

MILL CADER NO. 792026-00 PURCHASE ORDER NO. CISAS DATE BHIPPED 00/01/1997 SPECIFICATIONS

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ASTM A249-98A, A-269-98 AND ASME SA-245-95 EDITION 95 ADBENDA TIG MEIBEB OTHER SPECIFICATIONS

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WE CERTIFY THAT THE CHEMICAL PHYSICAL OR MECHANICAL TESTS REPORTED HEREIN ARE CORRECT AS SHOWN ON OUR RECORDS.

DAMASCUS