



RICH INSTALLATION PROCEDURE

procedure name

PHENIX Procedure No. PP-2.5.5.4-01

Revision: B

Date: 10-28-98

Hand Processed Changes

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
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Approvals

W. Stokes 10/28/98
PHENIX S E & I Date

[Signature] 10/28/98
Cognizant Scientist/Engineer Date
/Activity Manager

W. McCabe 10/29/98
PHENIX QA/Safety Date

[Signature] 11/24/98
RHIC ES&H Date

REVISION CONTROL SHEET

LETTER	DESCRIPTION	DATE	WRITTEN BY	APPROVED BY	CURRENT OVERSIGHT
A	First Issue (No record of this revision is available)	n/a	n/a	n/a	n/a
B	Latest active version. No record of revisions	10/28/1998	n/a	W. Stokes, W. McCabe, (2 unintelligible)	n/a
RETIRED	Installation completed	3/16/2007	n/a	D. Lynch, R. Pisani, P. Giannotti for PHENIX	R. Pisani

RICH Installation Procedure

1.0 Purpose and Scope

This document shall describe the method of safely installing the RICH detector onto the PHENIX detector carriage. It shall describe steps following the delivery of the vessel through the roll-up entry door to building 1008.

2.0 Responsibilities

Only trained and authorized BNL technicians and/or riggers shall perform the tasks described herein under the supervision of the building 1008 PIC and/or lead rigger.

3.0 Prerequisites

- 3.1 All persons performing tasks described herein shall possess a current BNL Safety Awareness Certificate (SAC).
- 3.2 All persons performing tasks described herein shall possess current training certifications for equipment used per BNL ES&H standard 1.6.0.
- 3.3 All persons performing tasks described herein shall wear proper personal protective equipment per BNL ES&H standard 1.16.0.
- 3.4 All materials handling equipment used shall have been maintained and inspected per BNL ES&H standard 1.6.0.

4.0 Required Equipment

- 4.1 Two Pivot Pins, P/N 002-0501-303
- 4.2 Four Insulating Washers, P/N 002-0501-304
- 4.3 Two ½-13x1" long socket set screws, BNL Stock No T-64260

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- 5.3 Raise the spreader bar above the RICH vessel and attach the chain falls connected to the doubled slings to the lifting frame's swivel shackles nearest the vessel top, attach the other two chain falls to the lifting frame's swivel shackles nearest the vessel bottom. See Fig. 1.
- 5.4 Adjust the chain falls to the proper length to position the spreader bar over the vessel's center of gravity. (Fig. 1)
- 5.5 Lift the vessel, move it to the PHENIX detector carriage, and align the holes of the vessel and carriage pivot mounts.
- 5.6 Install the pivot pins (P/N 002-0501-303) through the holes in the pivots and one insulating washer (P/N 002-0501-304) in each space between the male and female pivot.
- 5.7 Lock each pivot pin in place with one ½-13x1" long set screw (BNL stock # T-64260).

NOTE: The following three steps are an alternate to and replace the prior three steps (5.5, 5.6, 5.7) if the pivot pin cannot be engaged while the vessel is suspended from the crane.

5.5A Remove the carriage pivots (002-0501-301) from the carriage and install them, the insulating washers (002-0501-304), the pivot pins (002-0501-303) and the ½-13 set screws onto the vessel pivots (002-0501-300) on the vessel.

5.6A Move the vessel to the detector carriage and align the carriage pivot mounting holes with the pivot mounting plate holes.

5.7A Install five 1"-8 socket head cap screws (omit the top center bolt directly covered by the pivot pin) to fasten each pivot to the carriage.

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- 5.8 While maintaining the vessel's position with the crane, relieve tension on the chain falls nearest the pivots transferring the full load to the chain falls nearest the vessel top.
- 5.9 Remove the chain falls nearest the pivots from the lifting frame and spreader bar and secure the long slings from dangling freely.
- 5.10 Relocate chain falls to have one end attached to slings looped around the upper transition plates and one end anchored to the bottom of the carriage tracks or swivel shackle (2.5 ton) bolted to the floor. The distance from the front of the carriage to this anchor point must be a minimum of 20 feet to maintain an angle $<45^\circ$ between the chain fall and the floor when the vessel is near vertical. See Fig. 2
- 5.11 Slowly raise the vessel with the crane while, simultaneously lengthening the chain falls until the vessel rests upon the rear mounts.

CAUTION

Do not allow chain falls to become slack. This will cause a rapid movement of the vessel and shock loading as its center of gravity passes over the pivots.

- 5.12 Stabilize the vessel with two come-alongs each having one end anchored to the vessel and one to the carriage crossbar.
- 5.13 Remove chain falls from the transition plates and floor anchor.
- 5.14 Reinstall the chain falls to their original position from the spreader bar to the lifting frame's lower swivel shackles. See Fig. 3.
- 5.15 Position the spreader bar over the lifting frame center of gravity (CG)
- 5.16 Tighten chain falls to assume the load.

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- 5.17 Attach tag lines to the lower end of the lifting frame.
- 5.18 Remove the bolts attaching the upper transition plates to the vessel.
- 5.19 Carefully remove the bolts attaching the lower transition plates to the vessel pivot.

CAUTION

Removing these bolts will allow the lifting frame to swing free of the vessel. Control the swing of the frame with tag lines and the crane to prevent harm to personnel and to prevent damage to the RICH window.

- 5.20 Remove the come-alongs stabilizing the vessel.
- 5.21 Install stabilizing bars (P/N 002-0207-082) to top of vessel.

6.0 References

- 6.1 BNL ES&H Standard 1.6.0
- 6.2 BNL ES&H Standard 1.16.0
- 6.3 Pivot Pin Drawing 002-0501-303
- 6.4 Insulating Washer Drawing 002-0501-304
- 6.5 RICH Lifting Frame Drawing 002-0207-019
- 6.6 Upper Transition Plate Drawing 002-0207-018 Part 2
- 6.7 Lower Transition Plate Drawing 002-0207-081
- 6.8 Vessel Pivot Drawing 002-0501-300

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- 6.9 Vessel Stabilizing Bar Drawing 002-0207-082
- 6.10 Detector Carriage Assembly Drawings, 002-0501-001 & 002-0501-002.
- 6.11 Carriage Pivot Drawing 002-0501-301

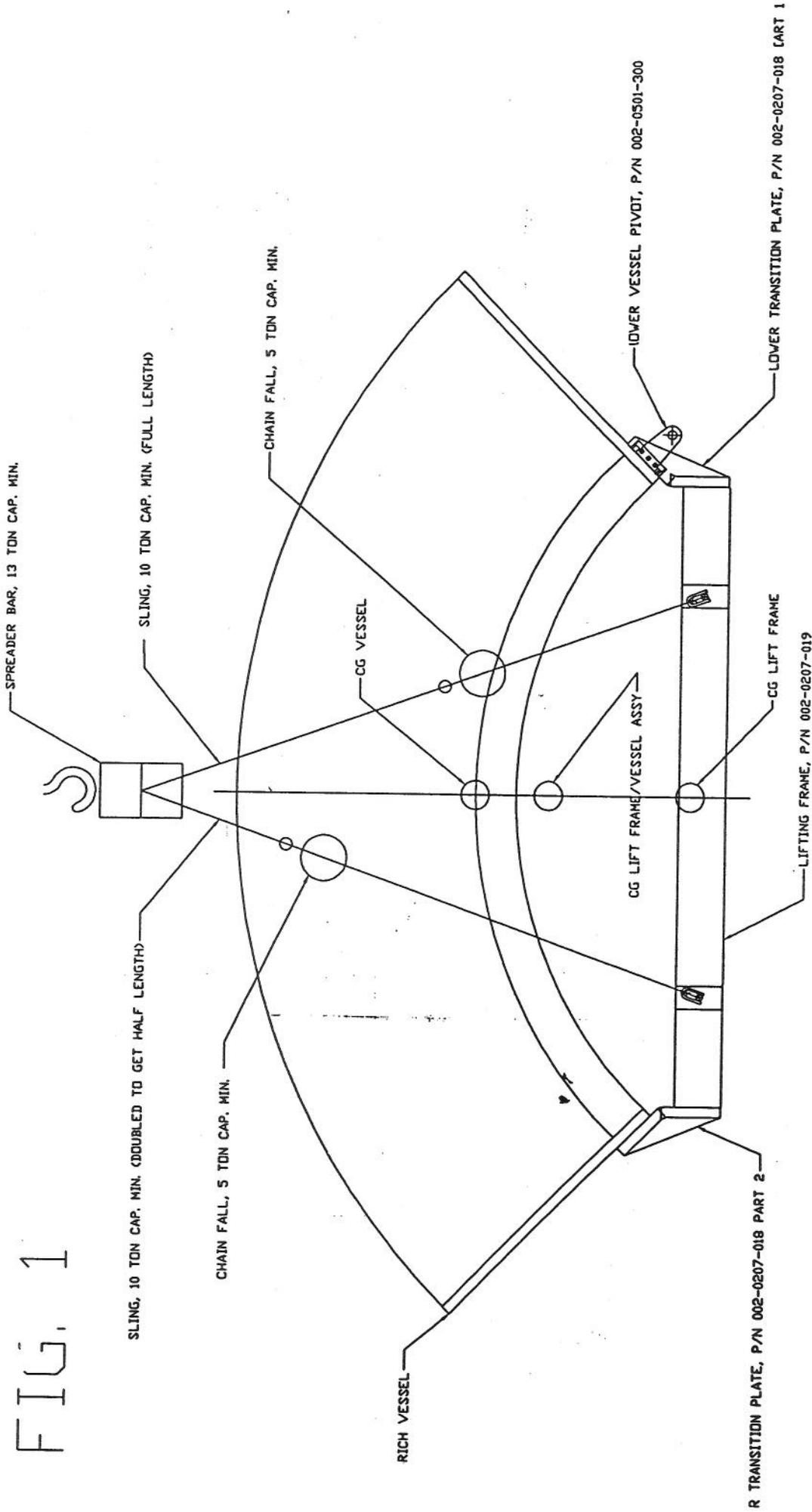
7.0 Attachments

7.1 Drawings

- 002-0501-001
- 002-0501-002
- 002-0501-300
- 002-0501-301
- 002-0501-303
- 002-0501-304
- 002-0207-018
- 002-0207-019
- 002-0207-081
- 002-0207-082

7.2 Figures 1 through 3

FIG. 1



SPREADER BAR, 13 TON CAP. MIN.

RICH VESSEL

CG LIFT FRAME/VESSEL ASSY

CG RICH VESSEL

SLING, 10 TON CAP. MIN.

CHAIN FALL 2.5 TON MIN.

SLING, 2.5 TON CAP. MIN.

CHAIN FALL, 2.5 TON CAP MIN.

CG LIFT FRAME

20 FEET MIN.

REAR MOUNT

CARRIAGE ARM

SWIVEL SHACKLE, 2.5 TON CAP MIN.

FLOOR

FIG. 2

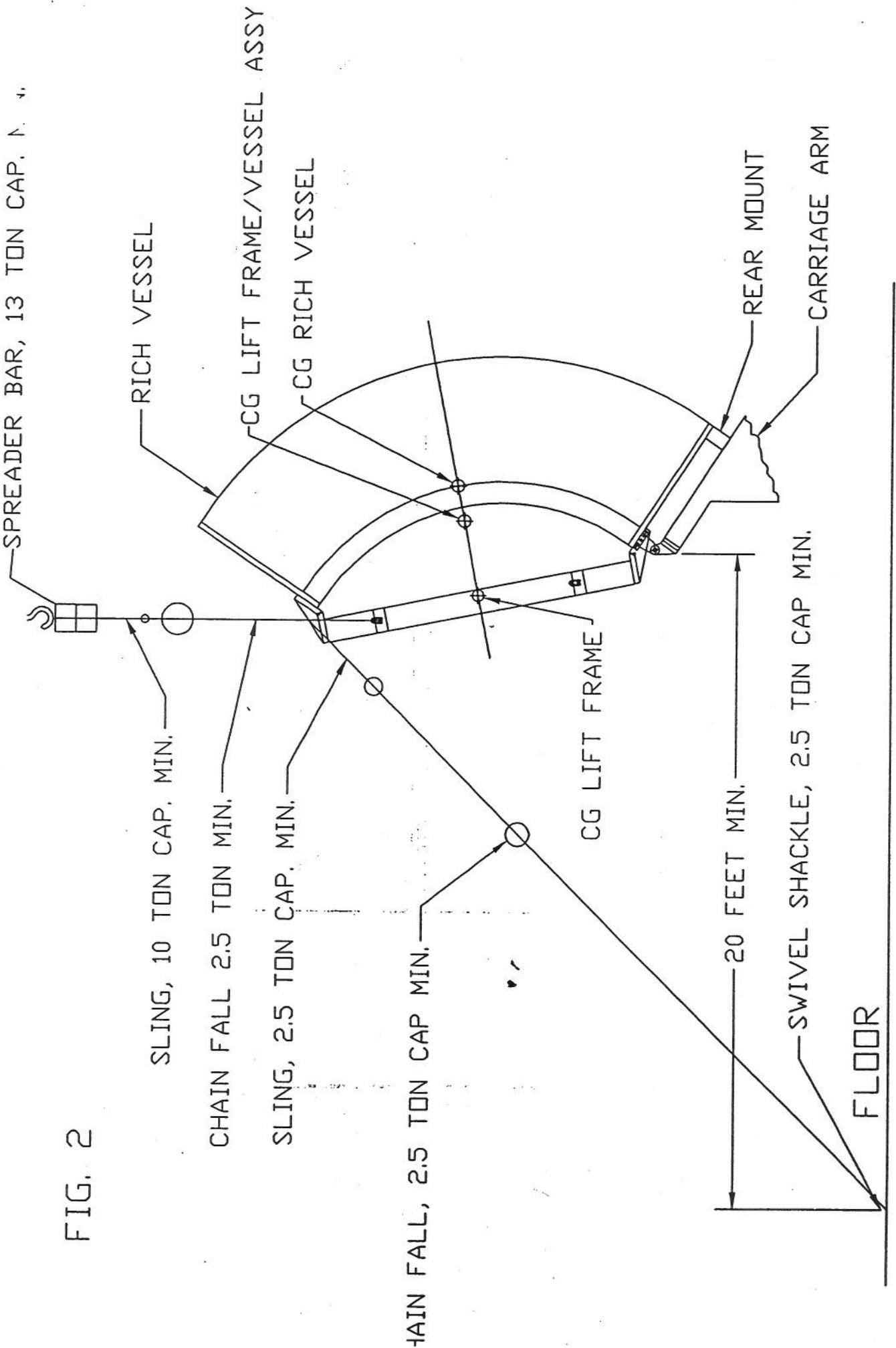


FIG. 3

SLING, 10 TON CAP. MIN.

CHAIN FALL, 5 TON MIN.

RICH VESSEL

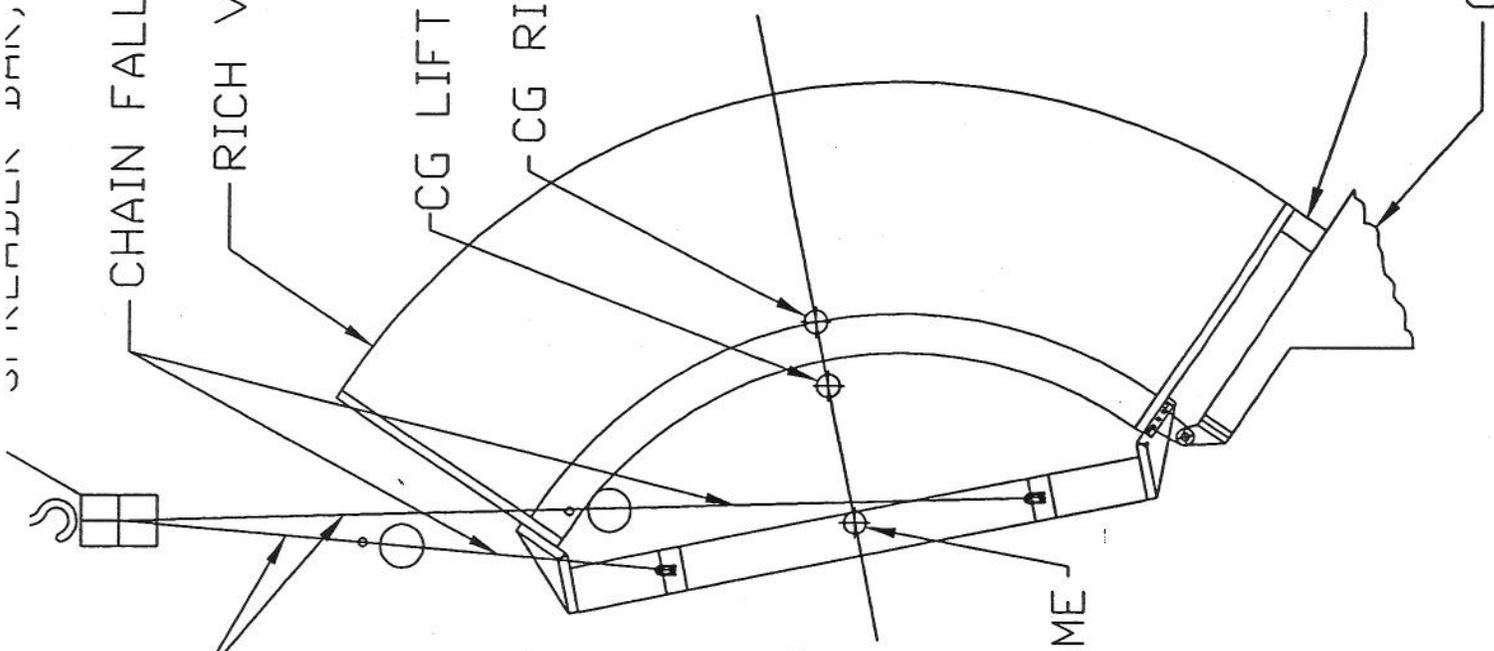
CG LIFT FRAME/VESSEL ASSY

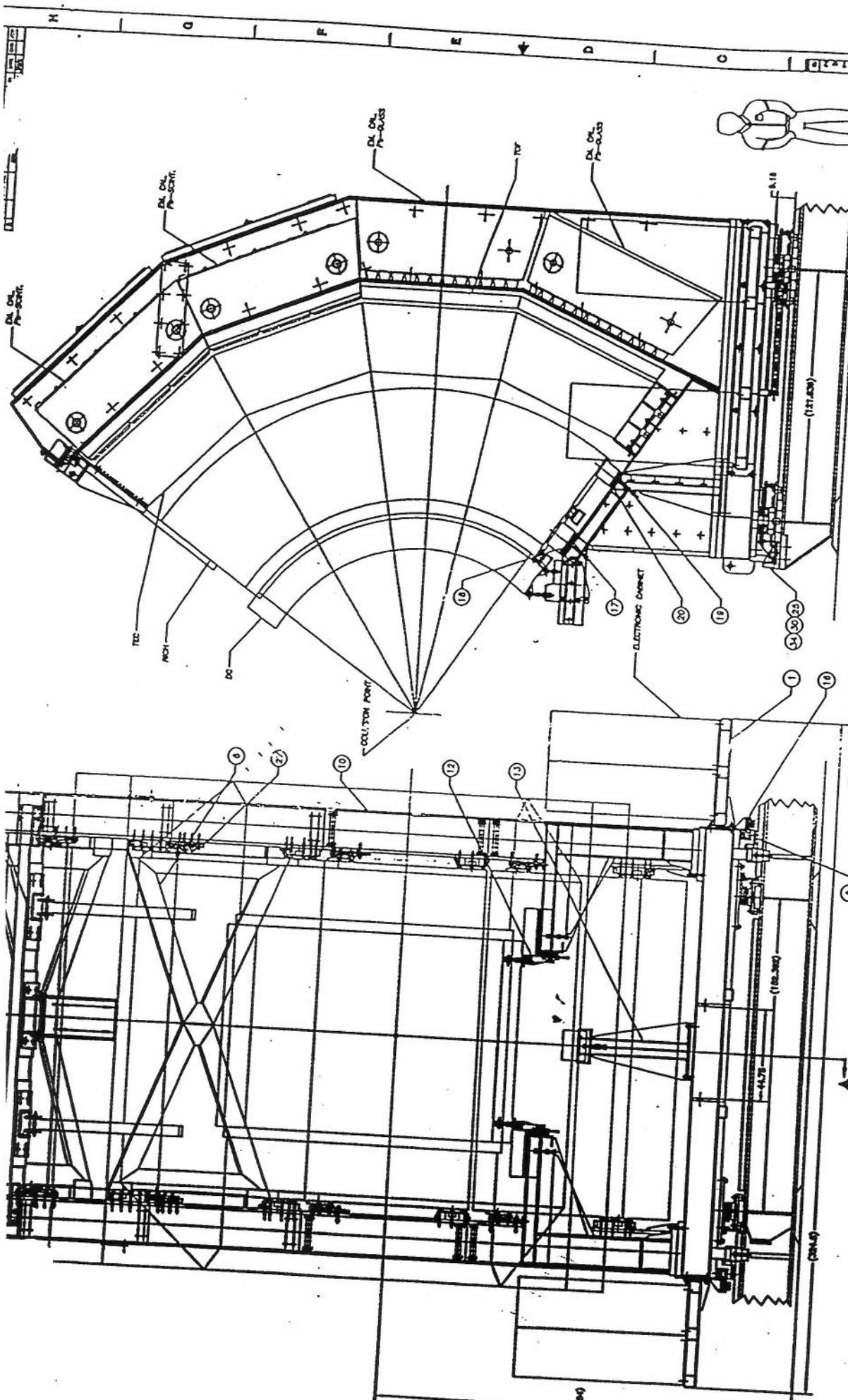
CG RICH VESSEL

CG LIFT FRAME

REAR MOUNT

CARRIAGE ARM





NO.	QTY	DESCRIPTION	REV.
1	1	DL P-OUTS	
2	2	DL P-OUTS	
3	2	DL P-OUTS	
4	2	DL P-OUTS	
5	2	DL P-OUTS	
6	2	DL P-OUTS	
7	2	DL P-OUTS	
8	2	DL P-OUTS	
9	2	DL P-OUTS	
10	2	DL P-OUTS	
11	2	DL P-OUTS	
12	2	DL P-OUTS	
13	2	DL P-OUTS	
14	2	DL P-OUTS	
15	2	DL P-OUTS	
16	2	DL P-OUTS	
17	2	DL P-OUTS	
18	2	DL P-OUTS	
19	2	DL P-OUTS	
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22	2	DL P-OUTS	
23	2	DL P-OUTS	
24	2	DL P-OUTS	

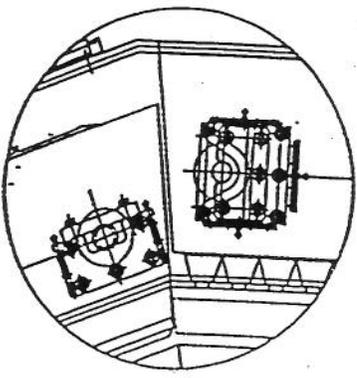
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6	2	DL P-OUTS	
7	2	DL P-OUTS	
8	2	DL P-OUTS	
9	2	DL P-OUTS	
10	2	DL P-OUTS	
11	2	DL P-OUTS	
12	2	DL P-OUTS	
13	2	DL P-OUTS	
14	2	DL P-OUTS	
15	2	DL P-OUTS	
16	2	DL P-OUTS	
17	2	DL P-OUTS	
18	2	DL P-OUTS	
19	2	DL P-OUTS	
20	2	DL P-OUTS	
21	2	DL P-OUTS	
22	2	DL P-OUTS	
23	2	DL P-OUTS	
24	2	DL P-OUTS	

NO.	QTY	DESCRIPTION	REV.
1	1	DL P-OUTS	
2	2	DL P-OUTS	
3	2	DL P-OUTS	
4	2	DL P-OUTS	
5	2	DL P-OUTS	
6	2	DL P-OUTS	
7	2	DL P-OUTS	
8	2	DL P-OUTS	
9	2	DL P-OUTS	
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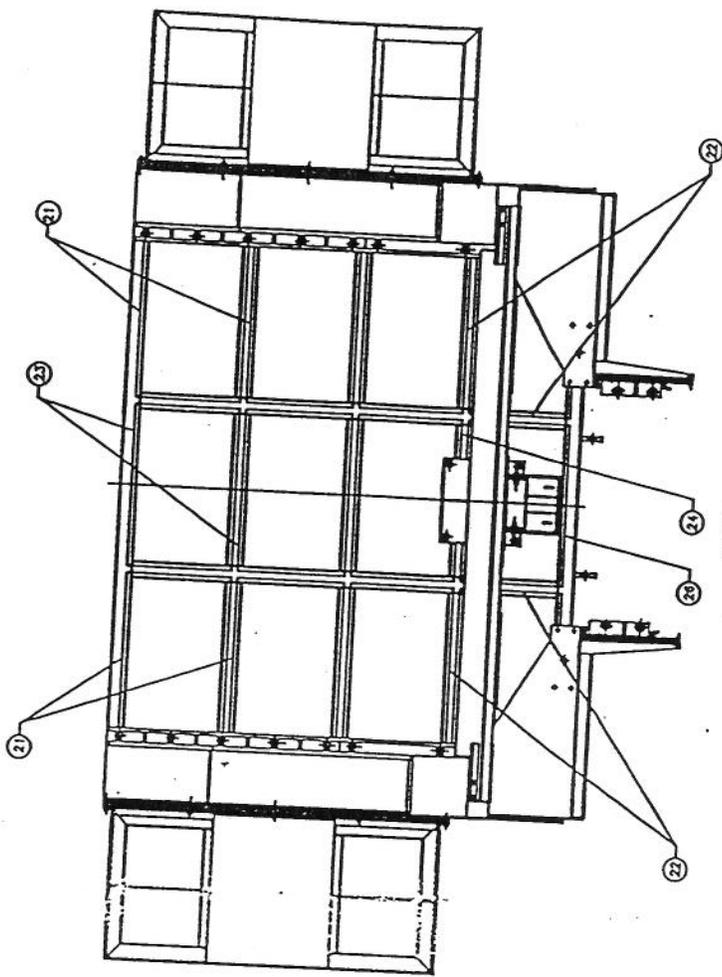
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22	2	DL P-OUTS	
23	2	DL P-OUTS	
24	2	DL P-OUTS	

APPROVED BY: [Signature] DATE: [Date]
 DRAWN BY: [Signature] DATE: [Date]
 CHECKED BY: [Signature] DATE: [Date]
 TITLE: DETECTOR CARTRIDGE - WCST ASSEMBLY
 PART NUMBER: RD002-0501-001 B
 REV. 1
 SHEET 2 OF 2

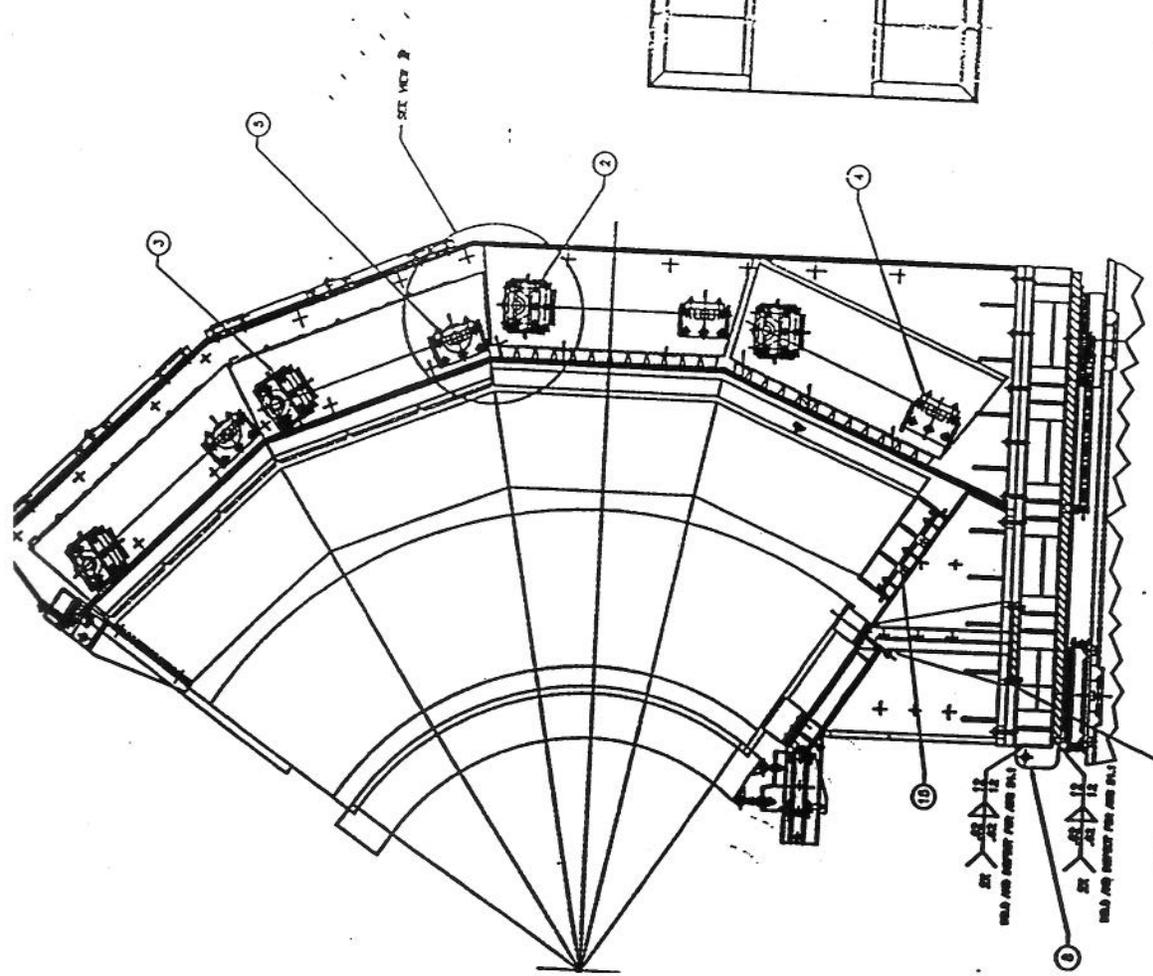
H D E F G O



KEY B
SCALE 1/8



PLAN VIEW
(DIMENSIONS NOT SHOWN FOR CLARITY)



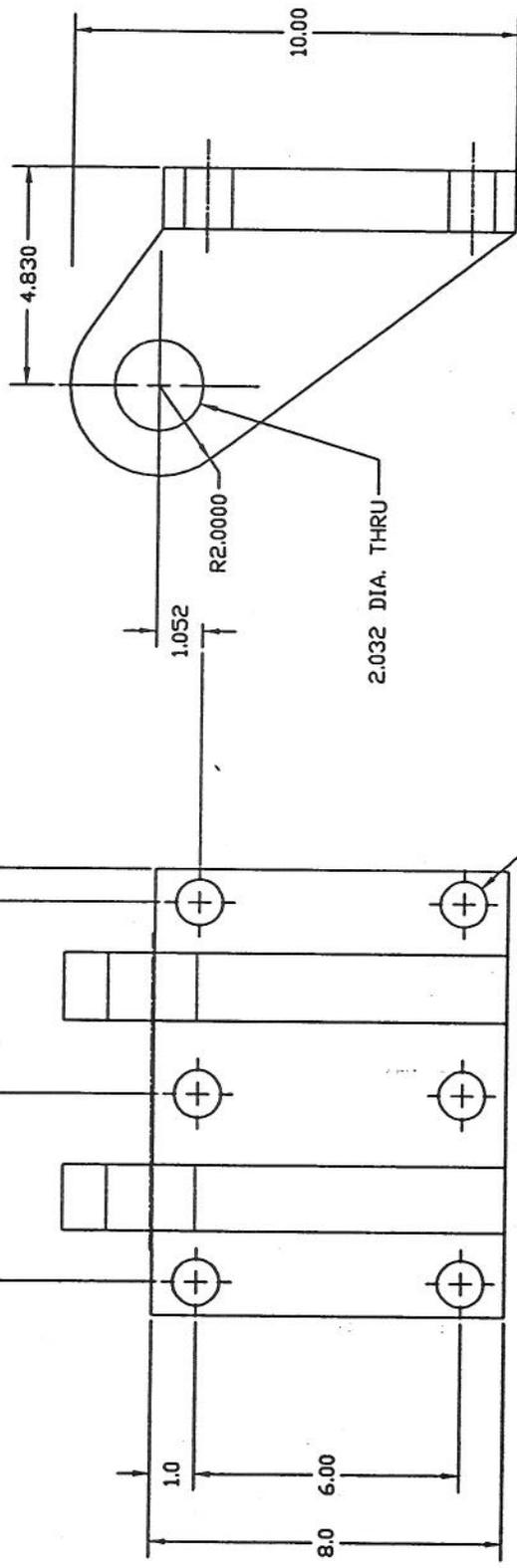
SECTION A-A
SEE SHEET 1

		PROGRAMMA WITH THE WESTERN LABORATORY PHOENIX DETECTOR CARRIAGE - WEST ASSEMBLY RD002-0501-001 B
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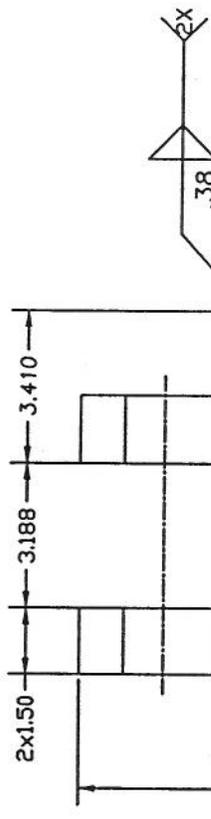
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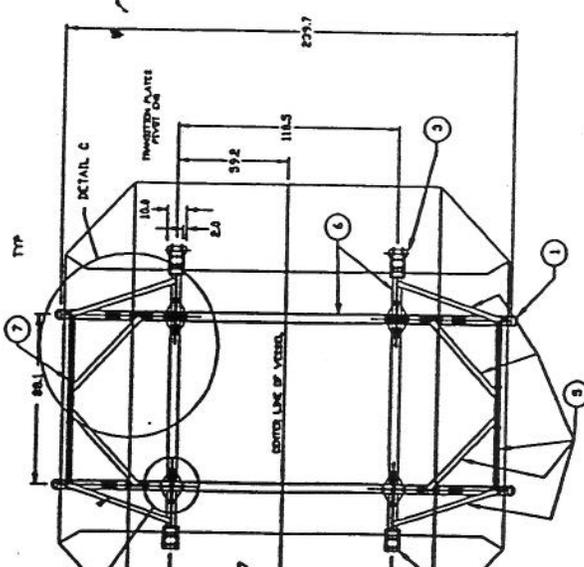
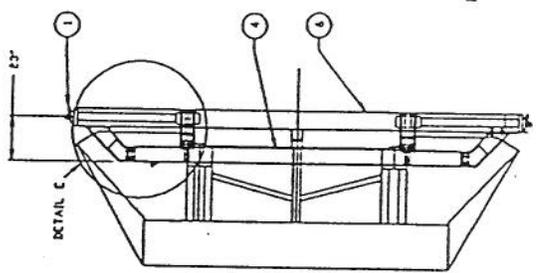
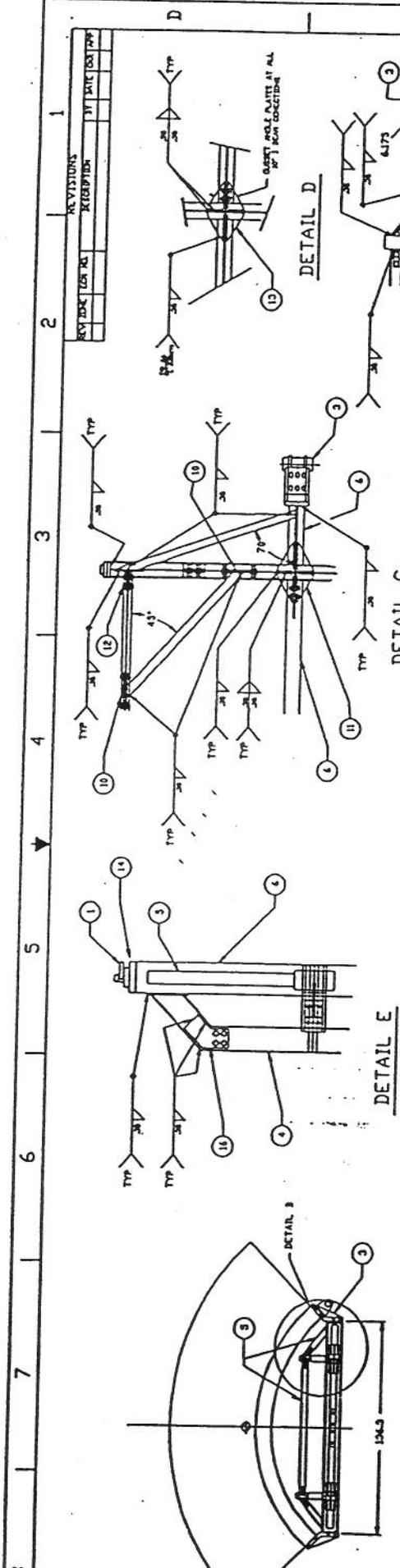
REV	ZONE	ECN NO.	DESCRIPTION	BY	DATE	CHK APP
A			INITIAL RELEASE			
B	02A3	02-601-001.830	WAS 5.080, 1.375 WAS 1.30	DC	10/16/78	WS/WS



6X 1.062 DIA. THRU



4	3	2	1	
D	C	B	A	A
				DWC NO 002-0501-301 Sht 1 of 1 REV B
				BROOKHAVEN NATIONAL LABORATORY UPTON, N.Y. 11973
				PHENIX RICH MOUNTING PIVOT (CARRIAGE)
				REV. B 002-0501-301 DRAWING NUMBER
				SCALE: 1/2 SHEET 1 OF 1
				W. STOKES 5/29/78 W. STOKES 5/29/78
				IRIDIUM
				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DECIMAL TOLERANCES FRACTIONS ANGULAR TOLERANCE ± 1° 125/ PROBT BREAK SHARP EDGES MAX. .03 UNL. .01
				INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.2M-1989
				OUTSTANDING ECN NUMBERS



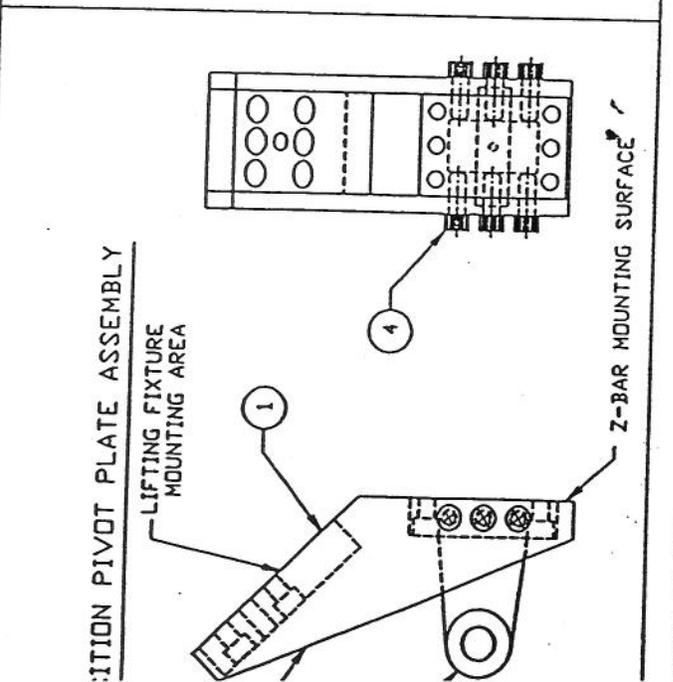
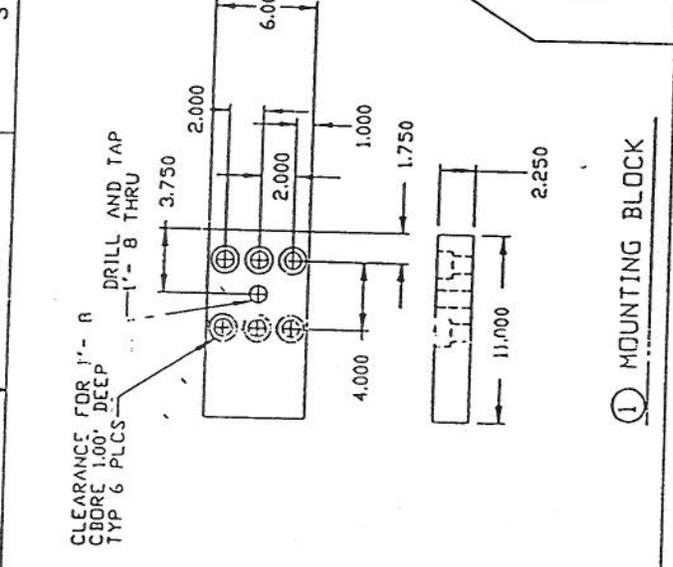
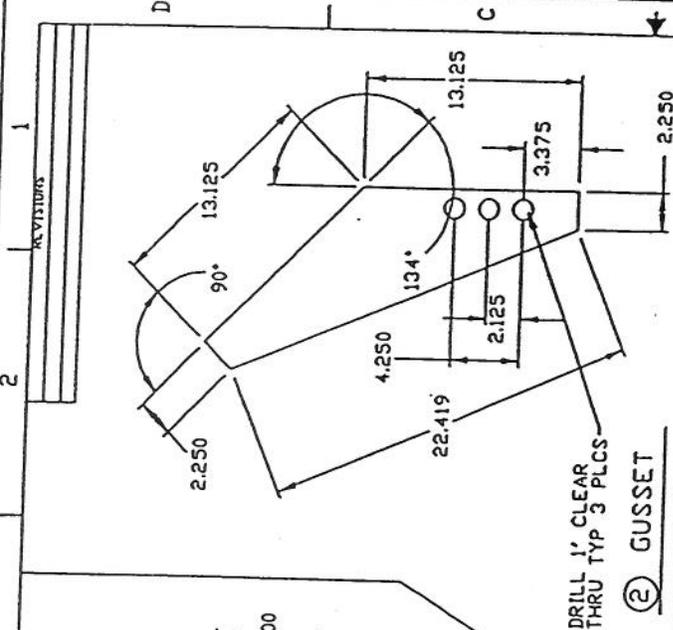
QTY	DESCRIPTION	STANDARD
4	16" I-BEAM CLIP 0020207019 SH 2	ASTM A36
4	15" TRANSITION I-BEAM END PLATE 0020207019 SHEET 2	ASTM A36
4	14" SWIVEL EYE END PLATE 0020207019 SHEET 2	ASTM A36
4	13" SWIVEL ANGLE PLATES FULL VELD 0020207019 SHEET 2	ASTM A36
4	12" ANGLE CLIPS 0020207019 SHEET 2	ASTM A36
4	11" GUSSET ANGLE PLATES 101-VELD 0020207019 SHEET 2	ASTM A36
8	10" BOLT PLATES 0020207019 SHEET 2	ASTM A36
64	9" 3/4" WASHERS	ASTM A36
64	8" 3/4" NUTS	ST
64	7" 3/4" X 3" BOLTS	ST
-	6" 10 S I-BEAM	A-325
-	5" 4 S I-BEAM	ASTM A36
-	4" 8 S I-BEAM	ASTM A36
2	3" PIVOT END TRANSITION PLATE 0020207018 PART 1	ASTM A314
2	2" TOP TRANSITION PLATE 0020207018 PART 2	ASTM A314
4	1" SWIVEL EYE RATED 10000 LBS MCMASTER CARB 1-8 3052766	ST
01	RICH LIFTING FRAME	HATL

NOTES:
 ESTIMATES WEIGHT OF LIFTING
 FIXTURE 3500 POUNDS
 ESTIMATED WEIGHT OF RICH
 2000 POUNDS

REV	DATE	BY	CHKD	DESCRIPTION

AUTHORIZED FOR CONSTRUCTION:
 APPROVED FOR CONSTRUCTION:
 CHECKED:
 DRAWN:
 DESIGNED:
 PROJECT NO.: 0020207019
 SHEET NO.: 1 OF 1

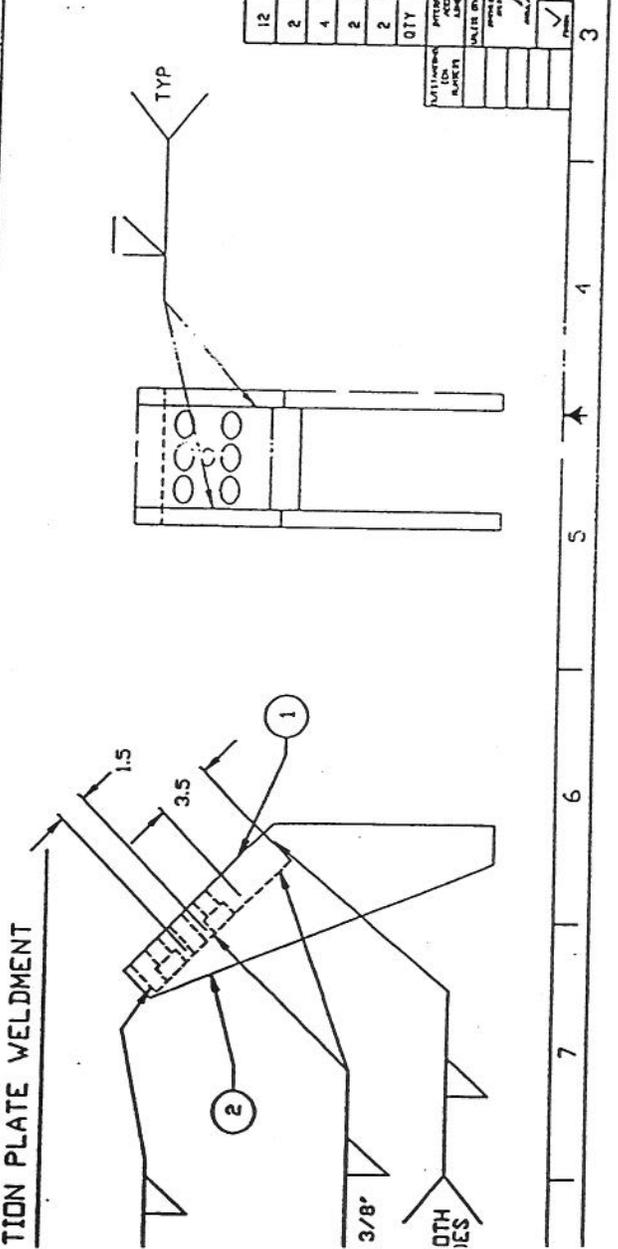
FLORIDA STATE UNIVERSITY
 TALLAHASSEE, FLORIDA 32304-3041
 RICH
 LIFTING FRAME WELDMENT AND
 ASSEMBLY



NOTES

- WELD PROCEDURES AND INSPECTION SHALL BE PERFORMED IN ACCORDANCE WITH D.I.J. STRUCTURAL WELDING CODE-STEEL.

QTY	DESCRIPTION	MATL
12	1"-8 SOCKET HEAD BOLT	A325
2	MOUNTING PIVOT (VESSEL)	ATL AX
4	PLATE GUSSET	ATL AX
2	MOUNTING BLOCK	ATL AX
2	01 TRANSITION PLATE ASSEMBLY	ATL AX



REVISIONS

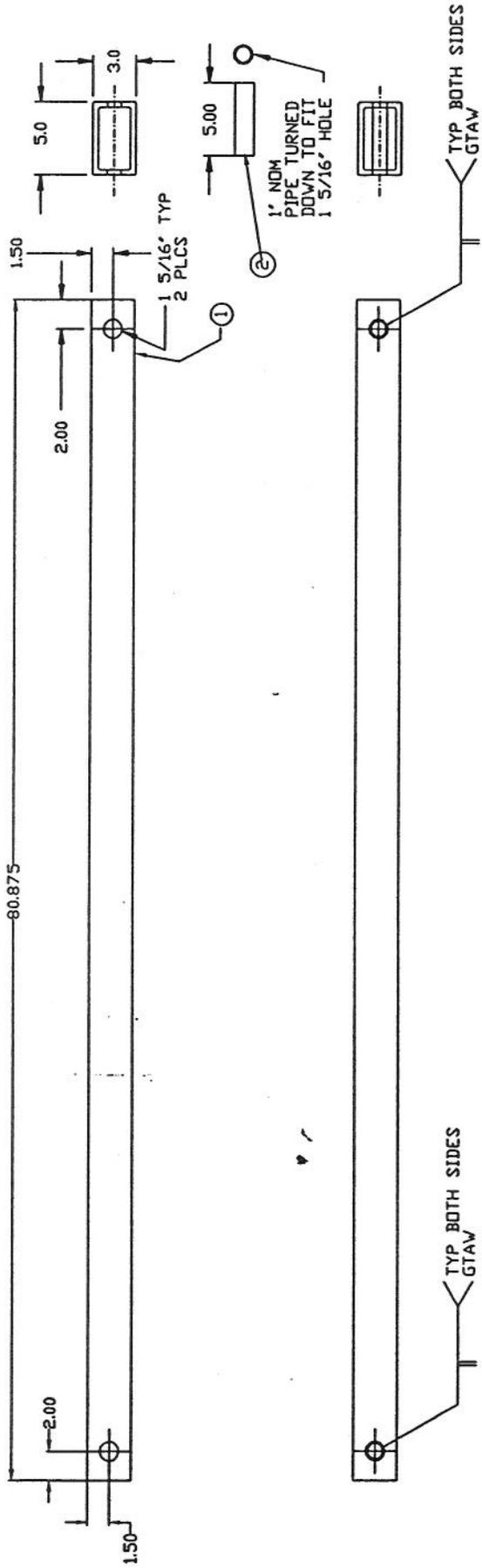
NO.	DATE	BY	APP.	DESCRIPTION
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2				
3				
4				
5				
6				
7				

NATIONAL BOARD
 REGISTERED DESIGNER
 DATE: 10/15/2010
 PROJECT: TRANSITION PLATE ASSEMBLY
 DRAWING NO: 002027001
 SHEET NO: 1 OF 1

DESIGNER: RICH
 CHECKER: RICH
 APPROVER: RICH

FLORIDA STATE UNIVERSITY
 TALLAHASSEE, FLORIDA 32304-3046

RICH TOP BAR ATTACHMENT



4	2	1' SCH 40 PIPE	ADN KB
2	1	3" X 5" X 60.875" BOX BEAM	ADN KB
	01	TOP SUPPORT BAR	
QTY			MATL

PROJECT NO.	PROJECT NAME	DATE
ISSUED BY	DESIGNED BY	CHECKED BY
APPROVED BY	DATE	SCALE
RICH FLORIDA STATE UNIVERSITY TALLAHASSEE, FLORIDA 32304-3045 TOP SUPPORT BARS DETAILS AND WELDMENT SEE DRAWING NUMBER 0020207082		

8 7 6 5 4 3 2 1

REVISIONS

8 7 6 5 4 3 2 1