



ORIGINAL
RED COLOF
STAMP ONL

TIME OF FLIGHT INSTALLATION PROCEDURE

PHENIX Procedure No. PP-2.5.5.4-08

Revision B **Date: 9-2-99**
SEE ECN # PHX-0208-009

Hand Processed Changes

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

<u>W. STOKES</u>	<u>6/23/99</u>	<u>SUSUMU SATO</u>	<u>7/21/99</u>
PHENIX S.E. & I.	Date	Cognizant Scientist/ Engineer/Activity Manager	Date

<u>E KILLIAN</u>	<u>6/23/99</u>	<u>M. GAFFNEY</u>	<u>6/24/99</u>
PHENIX QA/Safety	Date	RHIC ES&H	Date

REVISION CONTROL SHEET

LETTER	DESCRIPTION	DATE	WRITTEN BY	APPROVED BY	CURRENT OVERSIGHT
A	First Issue	4/21/1999	n/a	Stokes, S. Sato, W. Lenz, M. Gaffney	n/a
B	See ECN PHX-0208-009	9/2/1999	n/a	Stokes, S. Sato, W. Lenz, M. Gaffney	n/a
RETIRED	Installation completed	3/19/2007	n/a	D. Lynch, P. Giannotti, R. Pisani for PHENIX	D.Lynch

Time of Flight Installation Procedure

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Purpose and Scope

This document shall describe the method to safely handle and install the Time of Flight (ToF) detector onto the East Carriage using a custom designed installation fixture.

1. Responsibilities

Only trained BNL technicians and/or riggers shall perform the tasks described herein, under the supervision of the building 510 hi-bay PIC (for handling in building 510), the building 1008 PIC (for handling in building 1008), and/or a lead rigger.

2. Prerequisites

- 2.1. All personnel performing tasks described herein shall possess a current BNL Safety Awareness Certificate (SAC).
- 2.2. All personnel performing tasks described herein shall possess a current training certifications for the equipment used, per BNL ES&H standard 1.6.0.
- 2.3. All personnel performing tasks described herein shall wear proper personal protective equipment, per BNL ES&H standard 1.16.0.
- 2.4. All materials handling equipment shall have been maintained and inspected per BNL ES&H standard 1.6.0.
- 2.5. Only personnel actually involved with the handling or installation process shall be permitted in the work area.

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3. Required equipment

Four slings, rated 1 ton min., 6 ft. long min. (for horizontal lifting)

One sling, rated 2 tons min., any length suitable (for installation lifts)

One shackle, rated 2 tons min.

Building crane, rated 2 tons min.

Two tag lines of sufficient strength

Ten C-clamps

Twelve 3/8-16 x 1" long hex socket head cap screws

One 5/16 hex wrench

Four 3/8-16 x 1 1/4 long st. stl. hex head machine screws

Four 5/16-18 x 1 1/4 long st. stl. hex head cap screws.

ToF hoist, BNL drawing no. 002-0208-500

Splice Plate and shims, BNL drawing no. 002-0208-530

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4. Procedure

4.1. Handling

4.1.1. Before installing the lifting fixture onto the ToF, verify that **all** of the ToF's top bearings have been shimmed properly to ensure proper engagement of the bearings into the lift fixture groove. See figure 4.

CAUTION: Do not proceed beyond this point unless 4.1.1 has been accomplished.

4.1.2. With the fixture lying horizontally on cribbing with I-beam and C-channels on topside, attach the 1 ton x 6' slings choker style around the outermost channels at the four corners. See figure 1.

4.1.3. Attach four slings to crane hook and move the fixture to a position abutting the end of the ToF panel assembly with the fixture grooves aligned horizontally to the ToF's mounting bearings.

4.1.4. Carefully move the fixture horizontally engaging the ToF's top and bottom mounting bearings into the bearing grooves in the fixture allowing the slings to support the fixture weight. Little or none of the weight of the fixture's weight should be supported by the TOF.

4.1.5. When ToF is fully installed in the fixture, **before lifting**, install the top rail to TOF safety jackscrews then the safety retaining screws. Install four C-clamps onto the fixture at each end of the TOF (top and bottom) to prevent movement of the ToF within the fixture.

4.1.6. Lay and fasten cables with cable ties to the back of the lift fixture C-channels evenly distributed for equal weight distribution.

CAUTION: Do not lift assembly without c-clamps, jackscrews, and safety screws installed.

4.1.7. Verify C-clamps to be tight and safety screws installed and lift the assembly to transfer it to a storage table or assembly table for delivery to building 1008

4.1.8. Once the TOF is resting on the table, remove the C-clamps, jackscrews, and safety screws. Then remove the lift fixture from the TOF assembly.

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4.2. Installation

- 4.2.1. The ToF assembly shall arrive via flat bed truck, strapped to a rolling assembly table.
- 4.2.2. Remove the TOF assembly and rolling table together from the flat bed.
- 4.2.3. Remove strapping from the TOF and assembly table.
- 4.2.4. Install the lift frame as described in Section 4.1 (Handling).
- 4.2.5. Verify that all four C-clamps holding the ToF in position within the fixture are secure and tight and that the jackscrews and safety screws have been installed. Verify that the lift rings are in the proper location along the slide according to Figs 2.
- 4.2.6. Lift the assembly, using a 10' foot long 2 ton sling attached to the fixture lift rings, rotating it to its installation position as the bottom of the fixture rotates on the cribbing blocks on the flat bed truck.

CAUTION: Be aware of the lower fixture kicking out when CG is passed over by the crane hook.
- 4.2.7. Using duct tape or sash rope, bring cables, that were cable tied to the fixture, around to the front of the ToF panel and secure appropriately, evenly distributed.
- 4.2.8. Move the assembly adjacent to the NORTH side of the east carriage and to the appropriate sector level.
- 4.2.9. Readjust the position of the hoist rings on the fixture to fine-tune the hanging position to match the appropriate sector if necessary. Figures 2 & 3.
- 4.2.10. Connect the fixture's upper and lower rails to the ToF's permanent mounting rails using the twelve 3/8-16 bolts.
- 4.2.11. Install a C-clamp to the far end of the permanent installation track on the carriage to prevent over travel of the TOF assembly while rolling it into position.
- 4.2.12. Check and adjust, if necessary the alignment of the fixture to the tracks.

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- 4.2.13. From the lift fixture, remove the two C-clamps closest to the permanent tracks and remove the four jackscrews and four safety screws.
- 4.2.14. Roll the ToF panel into its appropriate position. Pushing or pulling **ONLY** on its lower continuous plate.
- 4.2.15. Install another C-clamp to the permanent tracks to temporarily secure the TOF assembly until both panels have been installed onto the tracks.
- 4.2.16. Remove the fixture from the ToF permanent rails.

Caution should be heeded to the shift of the center of gravity of the fixture without the weight of the ToF panel installed in it. The bottom of the fixture will tend to move forward to achieve equilibrium when hanging from the lift rings.

5. References

- 5.1. BNL ES&H Standard 1.6.0
- 5.2. BNL ES&H Standard 1.16.0
- 5.3. ToF Hoist Assembly drawing 002-0208-500

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6. Attachments

6.1. Drawings

002-0208-500

002-0208-502

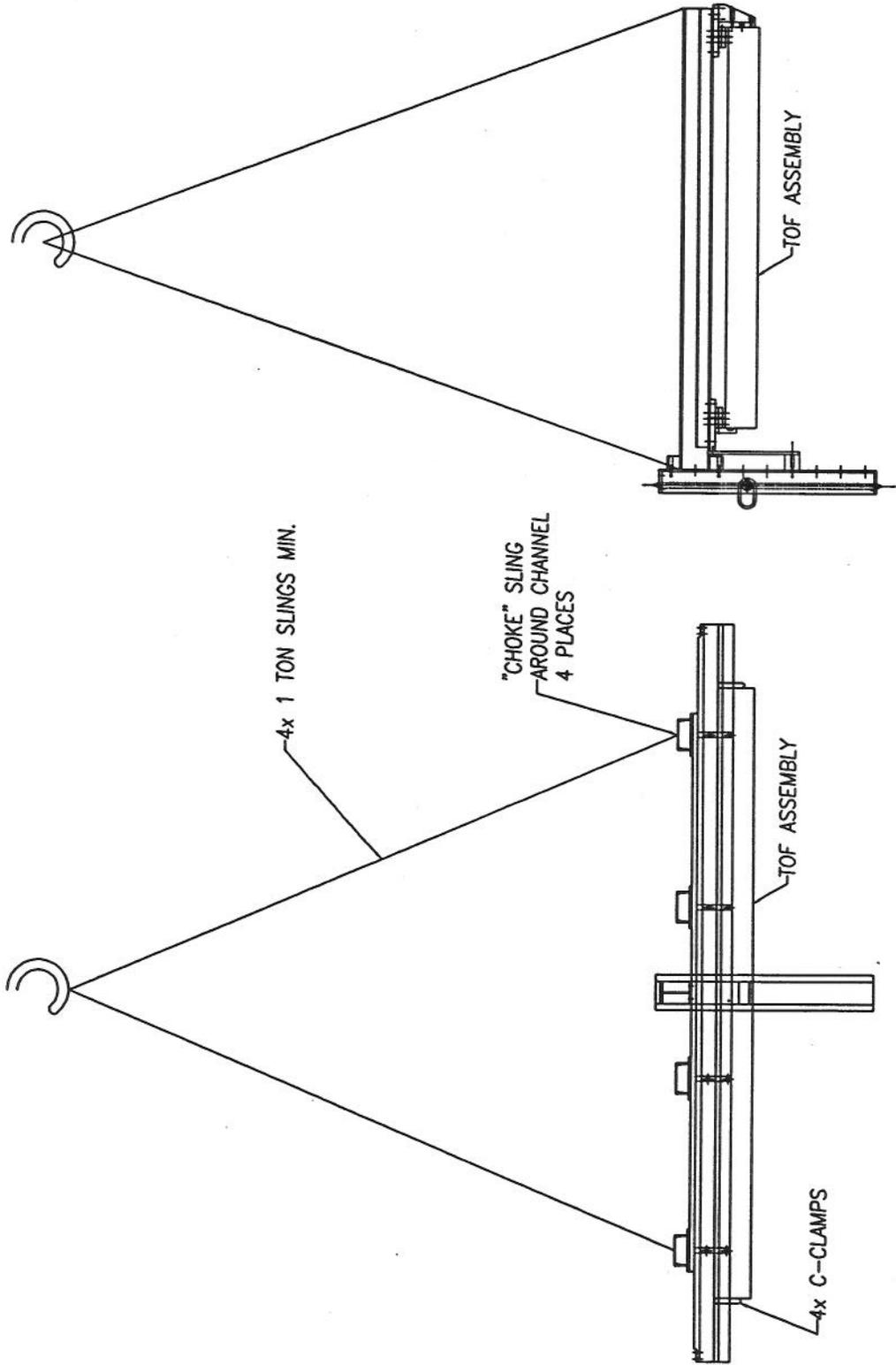
Figures 1 - 4

Distribution:

Sal Marino (file)
Sal Marino (group)
Steve Mulhall
Bill Lenz
Pete Kroon
W. Stokes
Mike Gaffney
Susumu Sato

REV	DATE	BY	CHKD
A			
B			

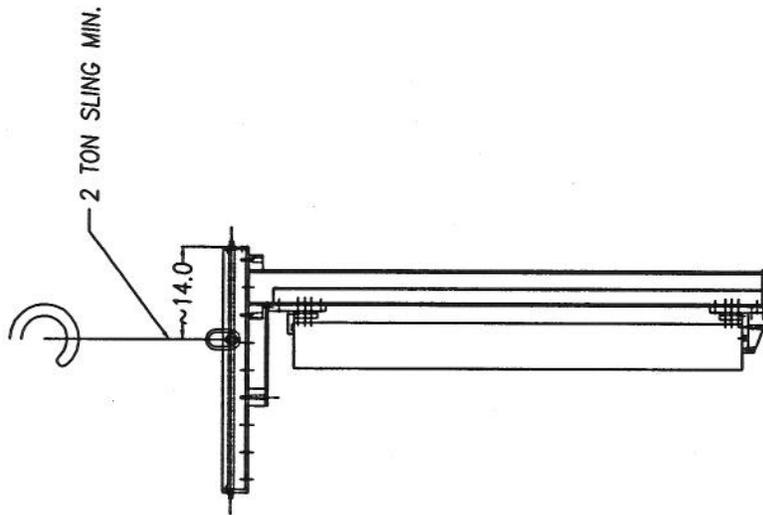
WEIGHTS
 FIXTURE = 900 LB.
 ToF = 900 LB.
 TOTAL = 1800 LB.



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RHIC		ROCKWELL INTERNATIONAL LABORATORY	
10000		SPRING, N.J. 07081	
DATE	REV	BY	CHKD
11/11/11	1		
FIGURE 1			

REV	DATE	BY	CHKD
A			
B			



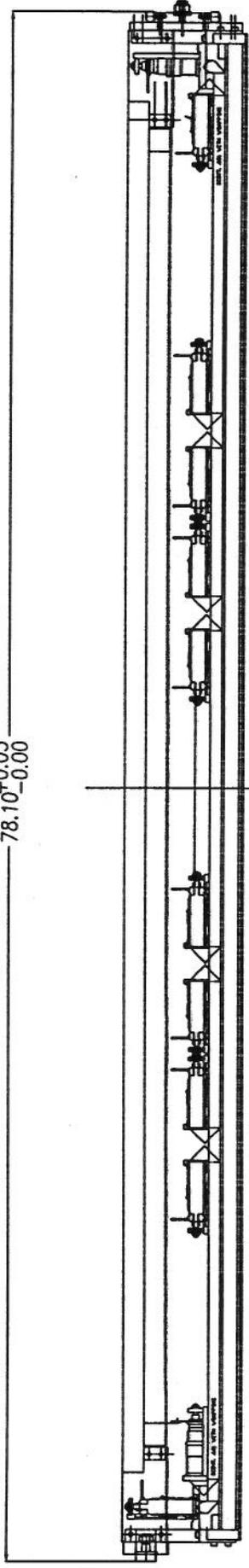
WEIGHTS
 FIXTURE = 900 LB.
 PLATES = 1328 LB.
 TOTAL = 2150 LB.

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		RHEONICS INTERNATIONAL LABORATORY 1000 N. 10TH ST. SUITE 100 DENVER, CO 80202
PROJECT NO. DRAWING NO. DATE	TITLE FIGURE 3	SHEET NO. OF NO.

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78.10^{+0.03}
-0.00



BROOKHAVEN NATIONAL LABORATORY MPS-100, U.S. 2023		FIGURE 4	
PROJECT NO.	78-10	DATE	1/28/78
DESIGNER	...	BY	...
CHECKED	...	DATE	...
APPROVED	...	DATE	...
SCALE	AS SHOWN	INCHES	...
MATERIALS		...	
FINISHES		...	
TOLERANCES		...	
DIMENSIONS		...	
NOTES		...	
REVISIONS		...	
DRAWN BY		...	
CHECKED BY		...	
APPROVED BY		...	
DATE		...	
SCALE		...	
SHEET NO.		...	
TOTAL SHEETS		...	
PROJECT NO.		...	
DRAWING NO.		...	
REVISION NO.		...	
DATE		...	
SCALE		...	
SHEET NO.		...	
TOTAL SHEETS		...	

REV	DATE	BY	CHKD
1	10/10/00	JK	JK
2	10/10/00	JK	JK
3	10/10/00	JK	JK
4	10/10/00	JK	JK
5	10/10/00	JK	JK

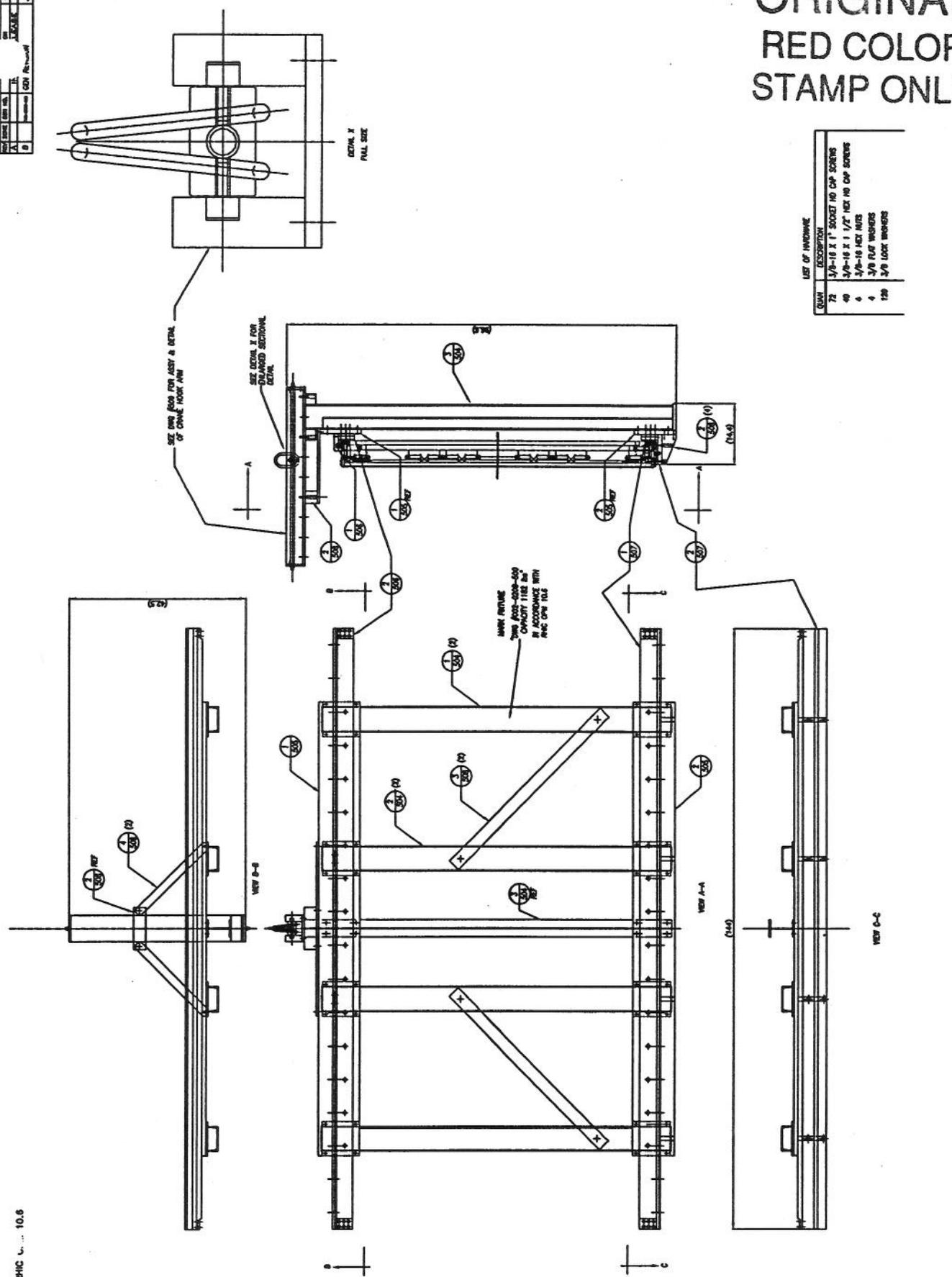
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LIST OF MATERIALS

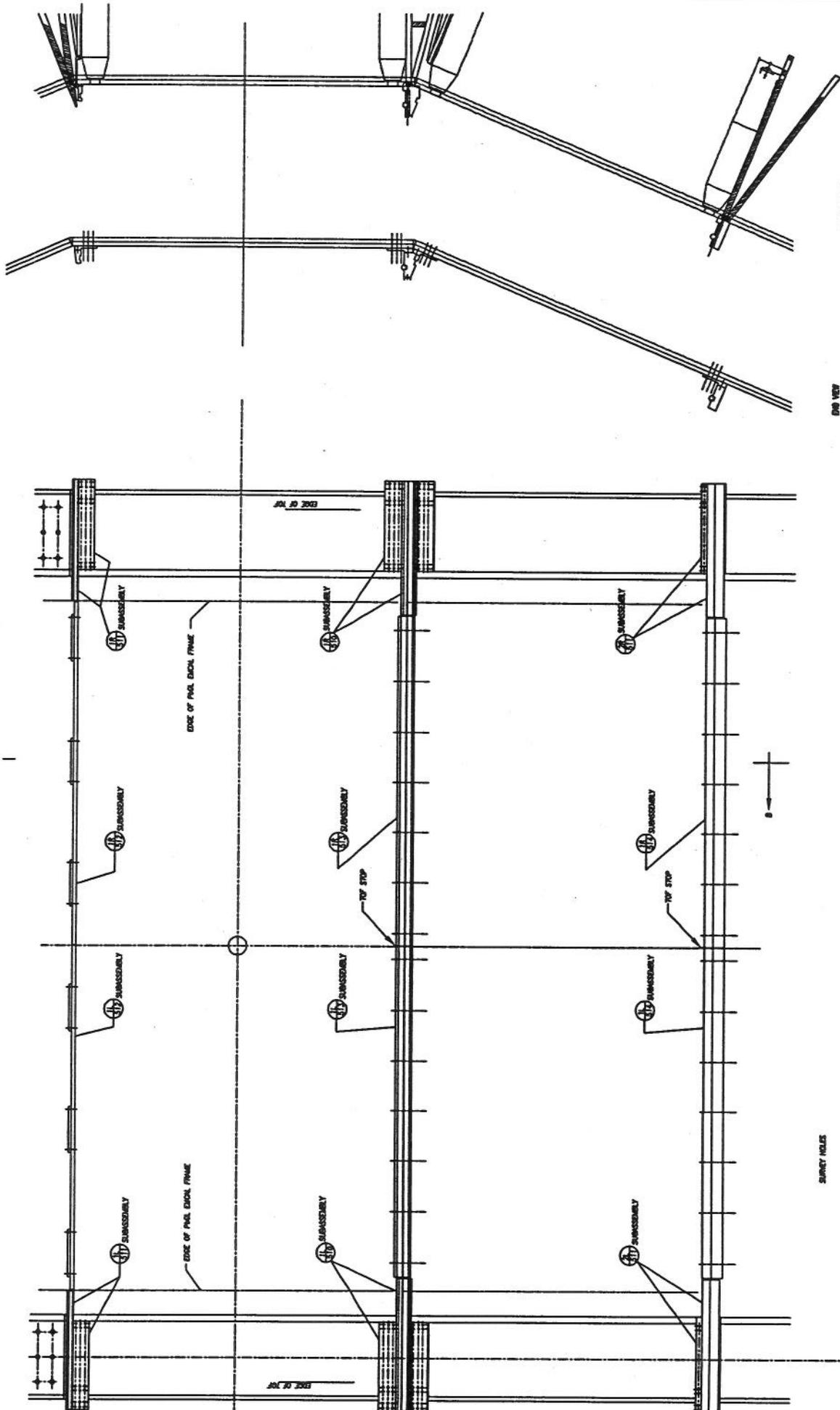
QTY	DESCRIPTION
72	3/8-18 X 1" SOCKET HD CAP SCREWS
48	3/8-18 X 1 1/2" HEX HD CAP SCREWS
4	3/8-18 HEX NUTS
4	3/8 FLAT WASHERS
120	3/8 LOCK WASHERS

RHIC
 RHOUGHAWAY NATIONAL LABORATORY
 1000 RHOUGHAWAY BLVD
 WEST POINT, NY 10994
 PHONE: 845-335-1000
 FAX: 845-335-1001
 WWW: WWW.RHIC.ORG

PHENIX
 T O F HOIST FRAME
 ASSEMBLY
 002-0208-500 B
 1 of 1



NOTES:
1-LABEL AS PER RHIC 10.6



SECTION B-B

SIDE VIEW
OUTSIDE CURVING

SECTION A-A
(FROM END VIEW)

BURNER HOLES

USE THE DIMENSIONS WITH ONE FOOT-008-001-3

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RITC RICHMOND NATIONAL LABORATORY SPRING, NEW YORK		PROJECT T O P CARRIAGE TRACK ASSEMBLY	
DATE 10-15-51	BY E J	SCALE 1/8" = 1"	REV. 1
APPROVED A. J. ...		DRAWING NO. 002-0208-502	