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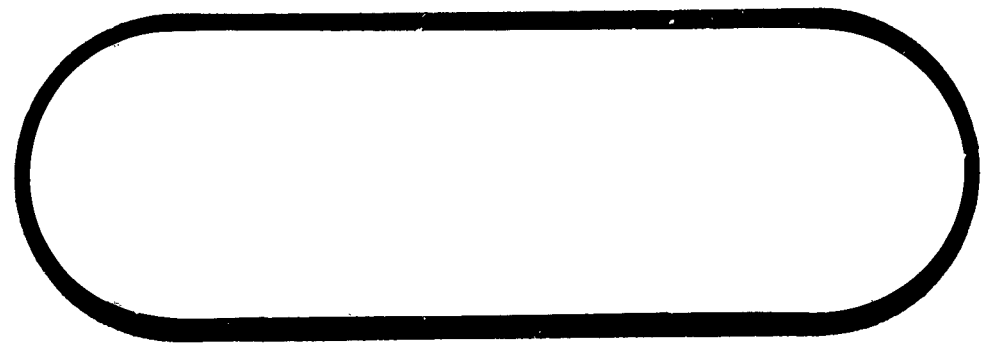
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CODE IDENT NO. 81205

NUMBER D2-14827

TITLE TECHNICAL FACILITY CRITERIA FOR THE MINUTEMAN LAUNCH
CONTROL FACILITIES, FRANCIS E. WARREN AFB, WYOMING (U)

MODEL NO. WS-133A CONTRACT NO. AF04(694)-107

ISSUE NO. 30 ISSUED TO COSTIA

Specification S-133-30-25

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APPROVED BY G. A. Gutkowski (DATE)

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VOL. NO. _____ OF _____
SECT. _____ PAGE 1 OF 46

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ACTIVE PAGE RECORD

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SECT. PAGE 2

FOREWORD

The original requirements for the WS-133A Launch Control Facilities were initially presented in STL document GM 60-A001-04703 (S-133-30-20). The STL document covered facilities design criteria as well as the form, fit, and function requirements of the Associated Contractors' equipment for Minuteman Wing I at Malmstrom AFB, Montana.

State of the art progress had dictated numerous changes and improvements to the original Launch Control Facility requirements. A large number of these variations were incorporated into Wing I by a revised and updated GM 60-A001-04703 (S-133-30-20) issued as Boeing document D2-14325. Variations peculiar to Minuteman Wing II at Ellsworth AFB, South Dakota, were included in Boeing document D2-10693 which was issued as a supplement to the Wing I criteria document and was limited to changes and additions thereto.

Subsequent revisions to the Launch Control Facility requirements and improvements to the Weapon System, dictated the need for an original documentation of the facilities criteria for Wing III, North Dakota, in Boeing Document D2-13798. The first revision to Boeing Document D2-13798 incorporated criteria variations peculiar to Wing IV facilities at Whiteman AFB, Missouri.

Normal sequence of events would have placed the facilities design criteria in the hands of the Air Force agency awarding the facility contracts prior to the start of facilities design. Because of the Minuteman program concept of design and construction concurrency and also due to compressed schedules, this action did not occur for Wings III, IV, and V. Nevertheless, the necessity for this document as a base line for control of the form, fit, and function of the Associate Contractors' equipment, is most significant if existing facilities are to be used to the maximum extent practical.

Wing IV criteria has been modified and updated to indicate Wing V requirements as a result of the following actions:

1. Collation of facility requirements which were developed through MIL-D-9412c Functional Analysis of the Wing V Weapon System (S-133-11-0-5 and S-133-12-0-5);
2. Incorporation of basic design and equipment compatibility changes as designated by the Configuration Control Board;
3. Incorporation of MCL/FCR changes through 15 May 1963;
4. Incorporation of facility design improvements resulting from criteria and concept review meetings;
5. Review and analysis of existing plans and specifications and "Basis of Design" for Wing V.

This specification describes the facility requirements necessary to make the Weapon System operable within established goals, with due consideration given to the existing facilities and associated conditions.

The following table of contents and list of illustrations are changes, additions, and deletions to the technical criteria of referenced document D2-13798 (Revision A) and these changes supersede the identical paragraph, drawings, and tables, of the referenced Document.

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1.0 SCOPE

The technical facility criteria document for the Minuteman Launch Control Facilities at Francis E. Warren AFB is issued as a supplement to the Wing IV Launch Control Facility Criteria presented in Boeing Document D2-13798 (Revision A).

The complete Wing V Launch Control Facility criteria consists of the following:

- a. Document D2-13798 (Revision A) sections one (1) through ten (10) and twelve (12).

Section eleven (11) of Document D2-13798 identifies Wing III peculiar criteria only, and is not applicable to Wing V.

- b. Document D2-14827 identifies the revised or additional requirements to site adapt and upgrade the Minuteman Launch Control Facilities for Francis E. Warren AFB in accordance with the latest Weapon System improvements. These requirements are identified by paragraph and figure notations corresponding to those in Document D2-13798 (Revision A).

Technical Revisions to Document D2-13798 (Revision A)

The following changes, additions and deletions shall be made to the applicable sections of Document D2-13798 (Revision A) as required to upgrade and site adapt the fourth deployment criteria to the fifth deployment area criteria.

3.0 GENERAL CRITERIA

3.1 DESCRIPTION OF FACILITY

3.1.3 Physical Description

Delete the words "Minot Air Force Base (MTAFB)" and in lieu thereof insert the words "Francis Warren Air Force Base (FWAFB)".

3.3 ENVIRONMENT

3.3.1 Geographical

Delete the paragraph in its entirety and in lieu thereof insert the following:

Wing V, the fifth Minuteman Operational Deployment Area, shall be sited in the vicinity of Francis Warren Air Force Base, (FWAFB) at Cheyenne, Wyoming.

DRAWING REVISIONS

1. Figure 3-1 revised per conduit changes.

2. Table 3-1 Failure Rates

Delete the words "150 missile wing" and in lieu thereof insert the words "200 missile wing".

Also delete the words "(Failure/month/15 LCF's)" and in lieu thereof insert the words "(Failure/month/20 LCF's)".

5.0 INTEGRATED CRITERIA

5.3 ELECTRICAL SYSTEM

5.3.2.2 Delete the words "(see paragraph 5.3.2.10)".

5.3.2.7 Delete the words "(see paragraph 5.3.2.10)".

5.4 COMMUNICATIONS SYSTEMS

5.4.2 Radio Communication

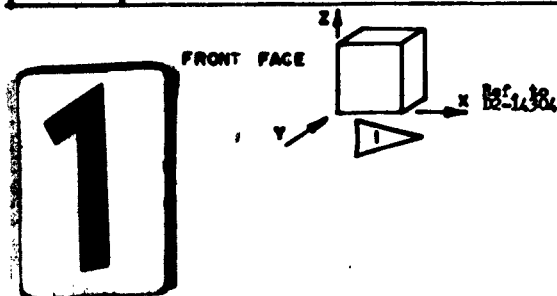
Delete the sentence "e". in its entirety and in lieu thereof insert the following:

e. A soft HF Transmit-Receive antenna.

DRAWING REVISIONS

1. Figures 5-5, 5-6, 5-7, 5-8 and 5-8.1 revised per conduit changes.
2. Table 5-1 Equipment List LCF revised per LCEB equipment changes.

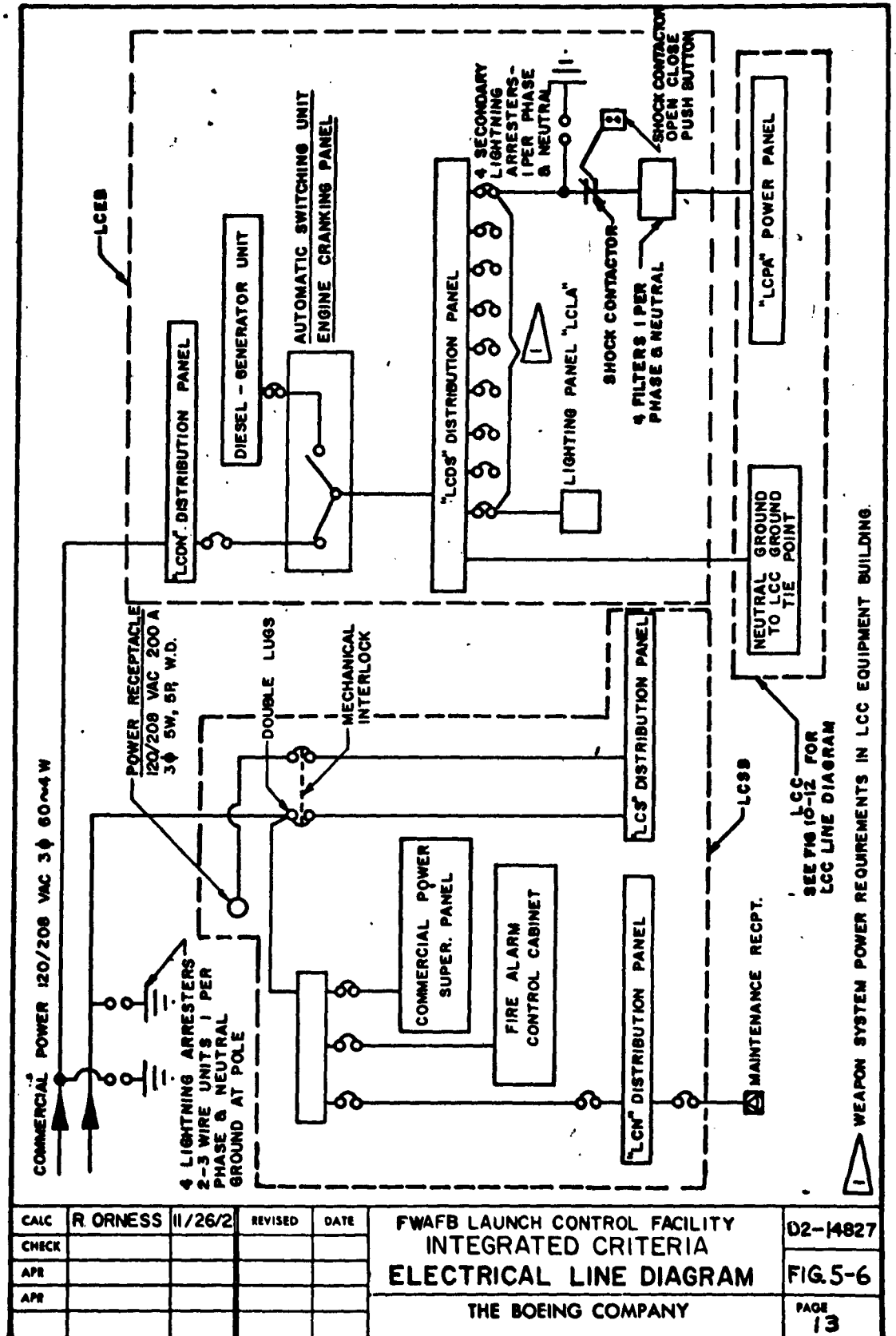
ITEM NO.	EQUIPMENT	UNIT REQ'D	SIZE W x D x H	WT LBS	C.B. LOCATION			POWER REQ		
					X	Y	Z	AC	DC	N AVG.
15	26	Engine Switching & Cranking Panel	42x14x							
16	27	Distribution Panel "LCDS"								
17	28	Drier Air Compressor Hardened Cable								
18	29	Circulating Fan	27x33x							
19	30	Instrument Air Compressor								
20	31	Electrical Filter	24x20x							
21	32	Distribution Panel "LCIN"	38x19x							
22	33	Expansion Tank								
23	34	Vent System Control Panel								
24	35	Panel Installation Meter Air Flow								
25	36	CER Filter	40x34x							
26	37	Battery	36x11x	2						
27	38	Exhaust Blower								
28	39	LCES Alarm Panel								
29	40	Shock Isolators								
30	41	Engine Cranking Panel								
31	41a	SH/TTE Rack								
32	41b	Air Bottles								
33	41c	Battery Charger								
	41d	Jack Box J-1308/GTC-8								
	41e	Sump Pump - Tunnel Junction								
	41f	Intake Blower Starter	18x8x8x							
	41g	Exhaust Blower Starter								
		LAUNCH CONTROL CENTER								
1	42	Console Launch Control OA-3384/GWS-4	60x30x49.1	611					28	345
	43	Communication Control Panel on LC Panel	31x57x 15 1/2	36					28	31
	44	Top Hat on Console Launch Control		125				120		0
2	45	Seat, Operators FN-127GWS-4	23x31x60	112						
2	46	Seat Operators FN-128GWS-4	23x31x60	112						
3	47	Power Supply Group, OA-3385/GWS-4	24x26x68	1080				4	2	6800
4	48	Digital Data Group, OA-3541(v)/GYK-1(V)	24x26x68	876					28	23
5	49	Command Message Processing Group	24x26x68	940					28	410
6	50	Status Message Processing Group	24x26x68	945					28	430
7	51	Console Communication Control (2nd Operator)	42x26x44	397					28	28*
	52	Communication Control Panel on Item 10	42x15x14	112					28	28



2	POWER REQUIRED TO OPERATE ONLY	5	See
3	120/208 400 CFS 3		
4	180/208 60 CFS 3		

OPERATE ONLY 5 Essential for Launch

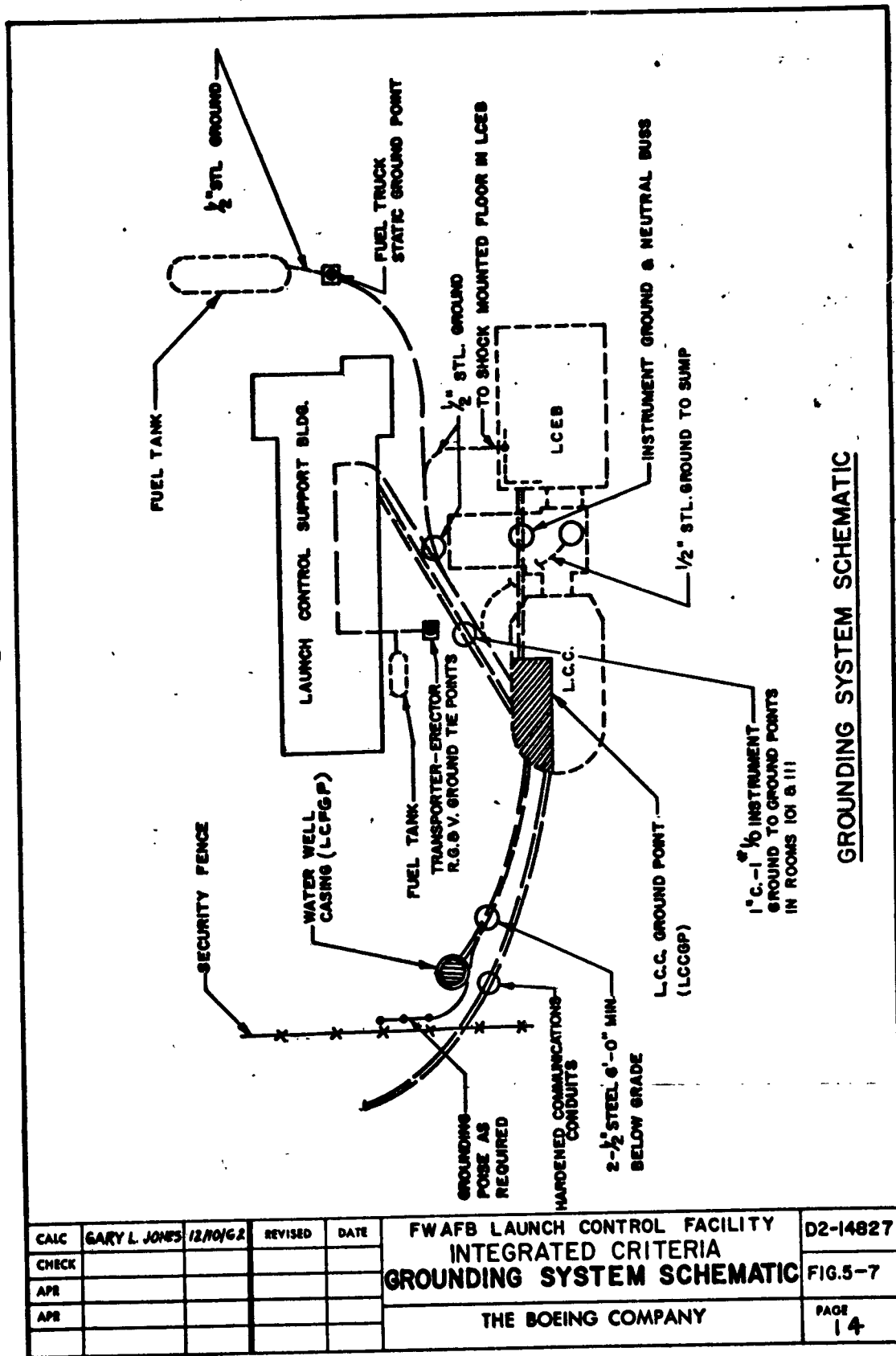
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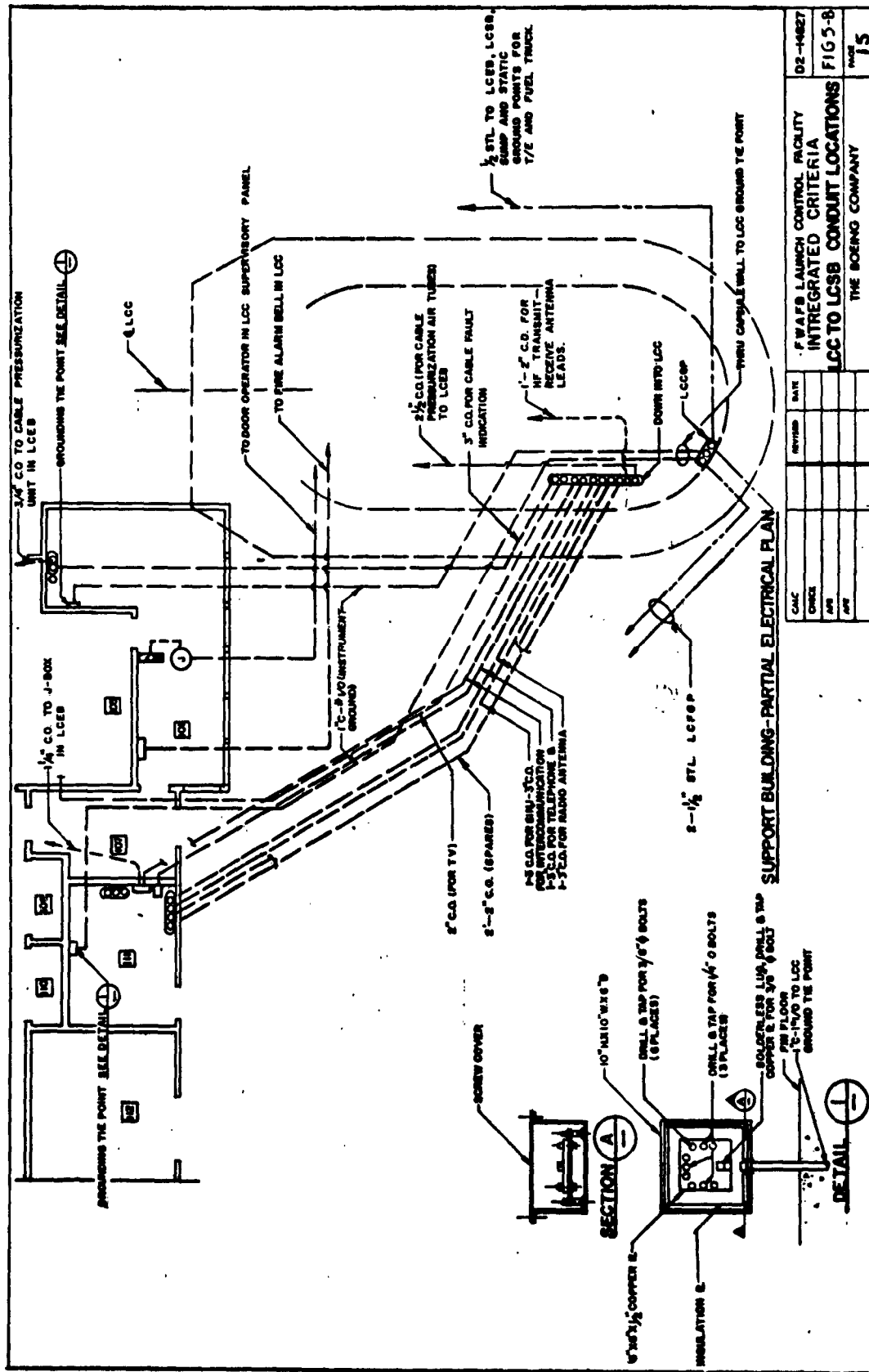
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FWAFB LAUNCH CONTROL FACILITY
INTEGRATED CRITERIA
ELECTRICAL LINE DIAGRAM
THE BOEING COMPANY

D2-14827
FIG.5-6
PAGE
13



CAIC	GARY L. JONES	12/10/62	REVISED	DATE	FWAFB LAUNCH CONTROL FACILITY INTEGRATED CRITERIA GROUNDING SYSTEM SCHEMATIC THE BOEING COMPANY	D2-14827
CHECK						FIG.5-7
APR						
APR						PAGE 14



CMC	DATE	REVISED	DATE	FIG 5-8	15
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APP					
APP					
FWAFB LAUNCH CONTROL FACILITY INTEGRATED CRITERIA LCC TO LCCB CONDUIT LOCATIONS					THE BOEING COMPANY
D2-14627					

6.0 SOFT LAUNCH CONTROL SUPPORT FACILITY CRITERIA

6.1 FUNCTION

6.1.4.1 Security Control

Delete the paragraph in its entirety and in lieu thereof insert the following:

Capability shall be provided to maintain control over personnel entering the security-fenced compound and surveillance over entrance to the Soft Access Facility, the secured vehicle Parking Area, and the LCSB. Control to access shaft is by crew in LCC.

6.3 STRUCTURAL

6.3.1 Interfaces

Add to the list of interfaces the following:

Figure A 2914 Electronic Rack

6.6. COMMUNICATIONS

6.6.1.1 Delete in "a." the words "One, 2-inch conduit for HF Antenna Cable".

6.6.1.4 Delete the words "4-inch conduit" and in lieu thereof insert the words "3-inch conduit".

6.6.1.5 Delete the words "4-inch conduit" and in lieu thereof insert the words "2-inch conduit". Also delete the words "figure 6-4" and in lieu thereof insert the words "Figure 6-3".

DRAWING REVISIONS

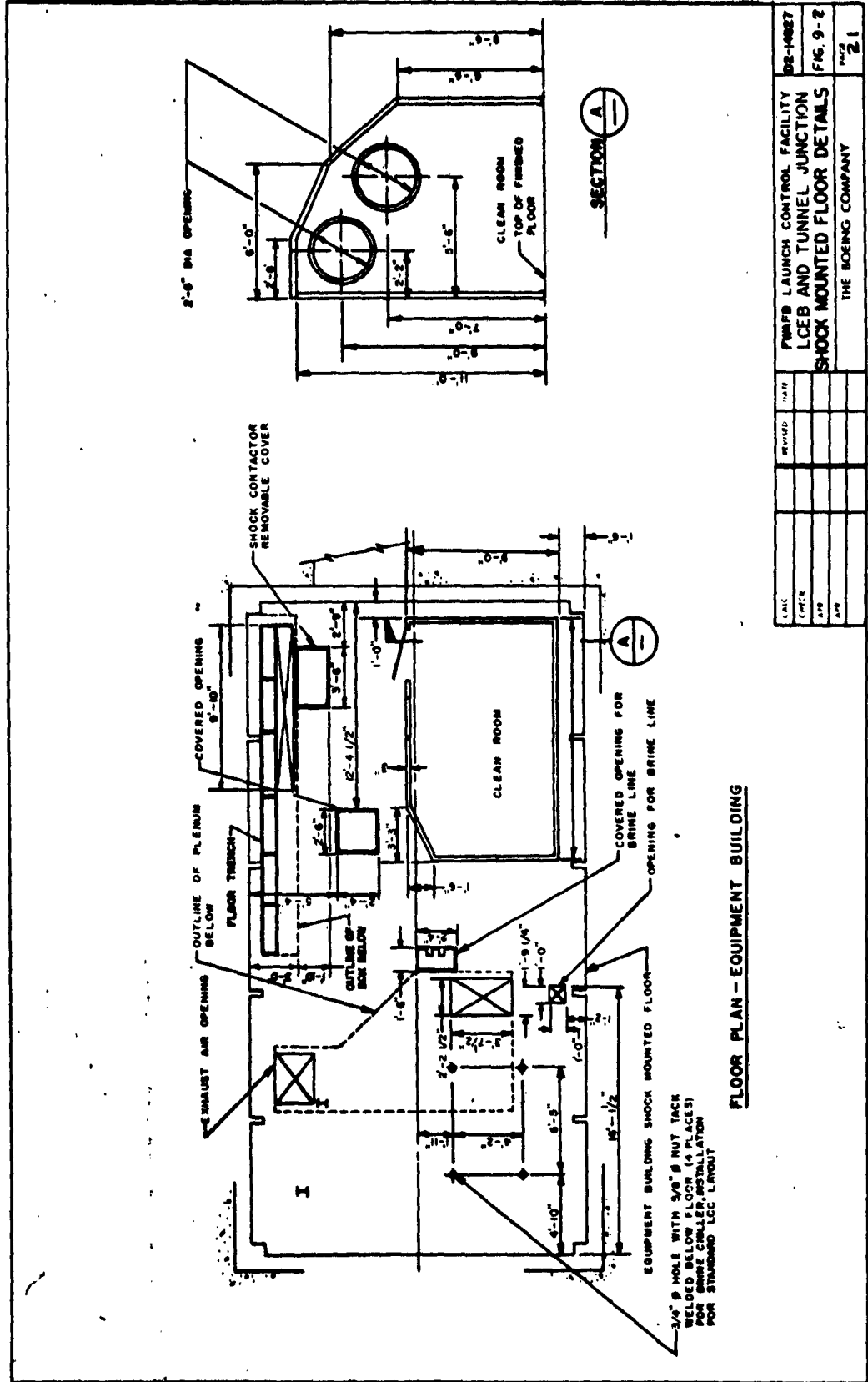
1. Figure 6-1.1 revised per dimension change.
2. Figure 6-3 revised per conduit changes.

9.0 HARDENED TUNNEL JUNCTION AND LAUNCH CONTROL EQUIPMENT BUILDING CRITERIA

Space reservations for environmental control equipment, and equipment by others in all LCEB's, to be identical to that specified for Wing IV in D2-13798 (Revision A). Particularly note the requirements for the SIN/TTE rack, blast valve control panel, and blast valve installations.

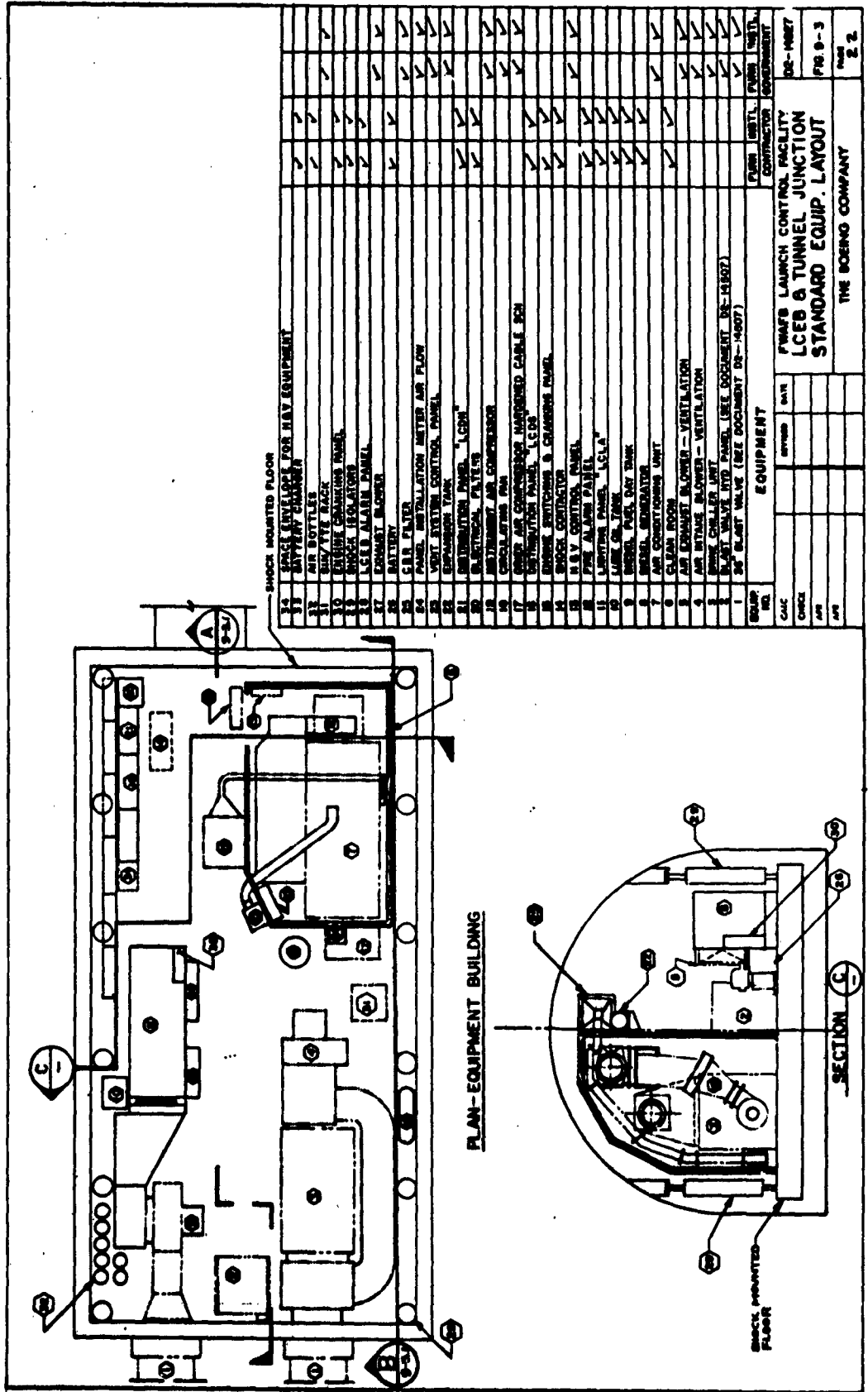
DRAWING REVISIONS

1. Figures 9-2, 9-3, 9-3.1, 9-3.2, 9-3.5, 9-3.6, 9-3.7, 9-4 and 9-7 revised per RPIE changes.
2. Figures 9-6 and 9-6.1 revised per blast valve changes.



FLOOR PLAN - EQUIPMENT BUILDING

DATE	REVISED	BY	THE BOEING COMPANY	DS-14827
1967				FIG. 9-2
1967				21



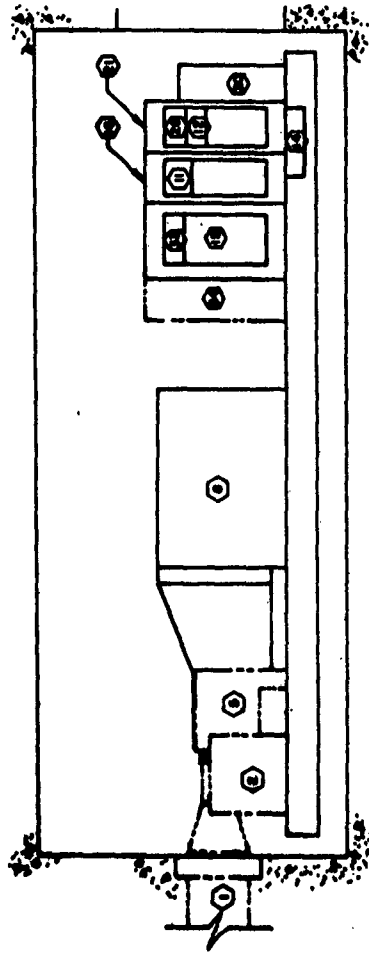
FWAFB LAUNCH CONTROL FACILITY
LCFB & TUNNEL JUNCTION
STANDARD EQUIP. LAYOUT

THE BOEING COMPANY

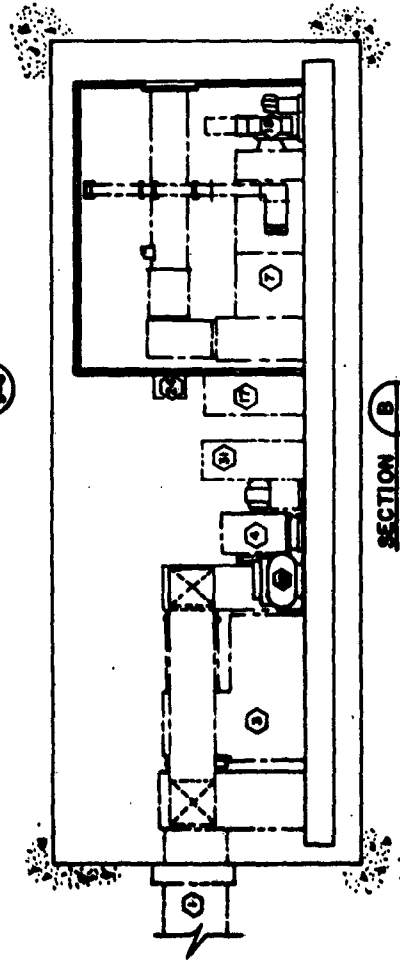
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FIG. 9-3

Page 2

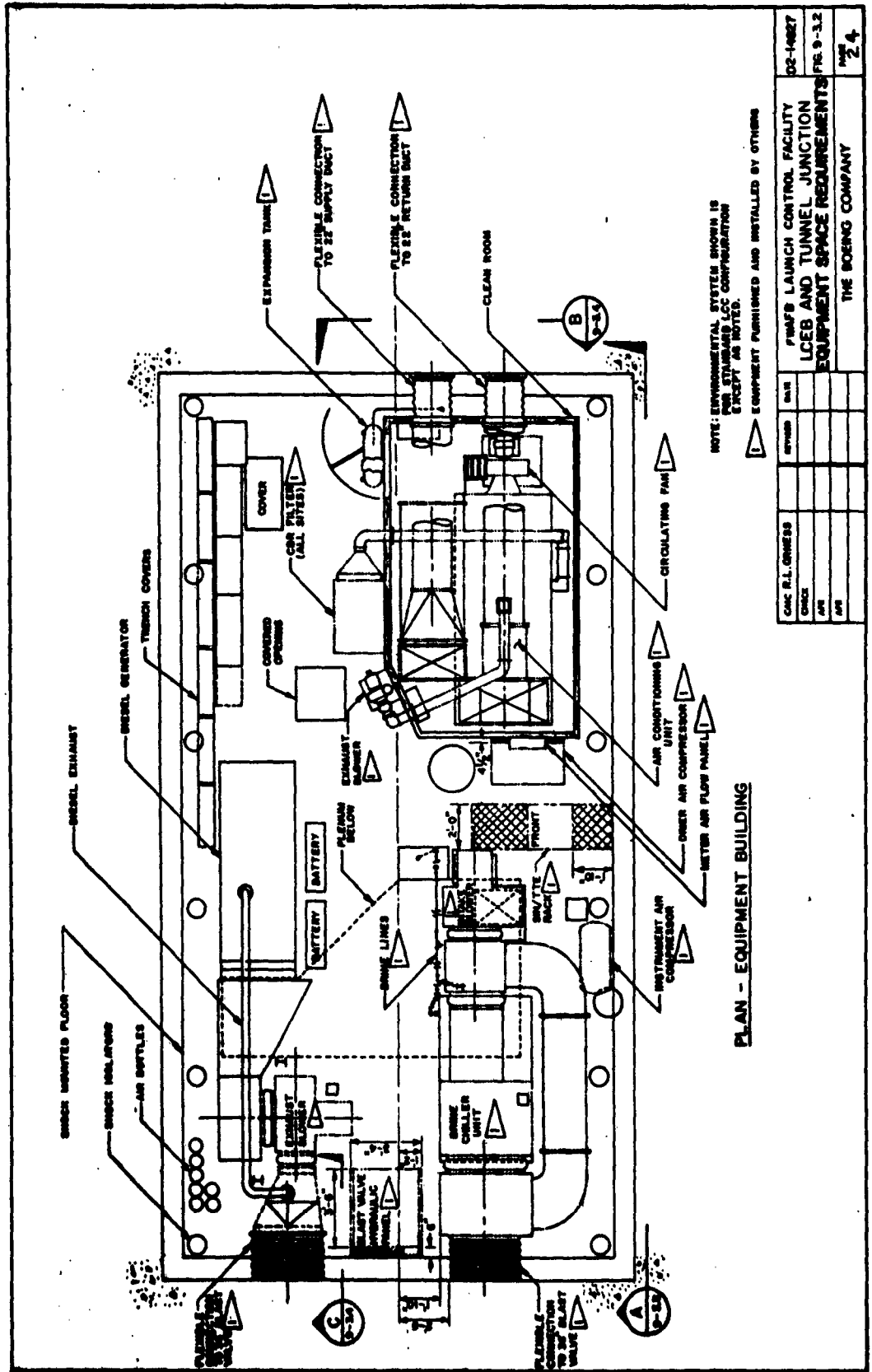


SECTION A
A 1-1



SECTION B
B 2-2

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F169-3.1	LECB AND TUNNEL JUNCTION									
PAGE	STANDARD EQUIP. LAYOUT									
23	THE BOEING COMPANY									

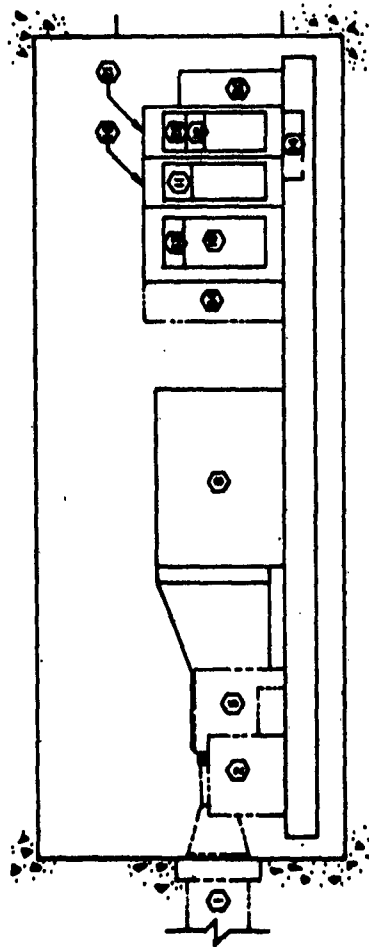


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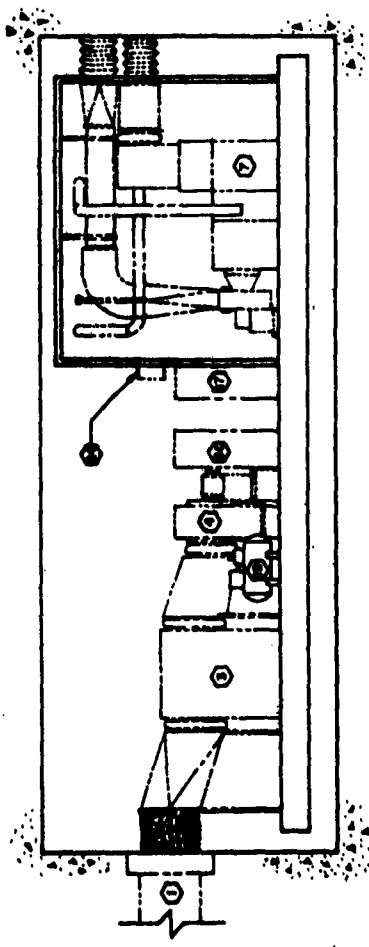
FWAFB LAUNCH CONTROL FACILITY
LCEB AND TUNNEL JUNCTION
EQUIPMENT SPACE REQUIREMENTS

02-14827
FIG 9-3.2
PAGE 24

THE BOEING COMPANY

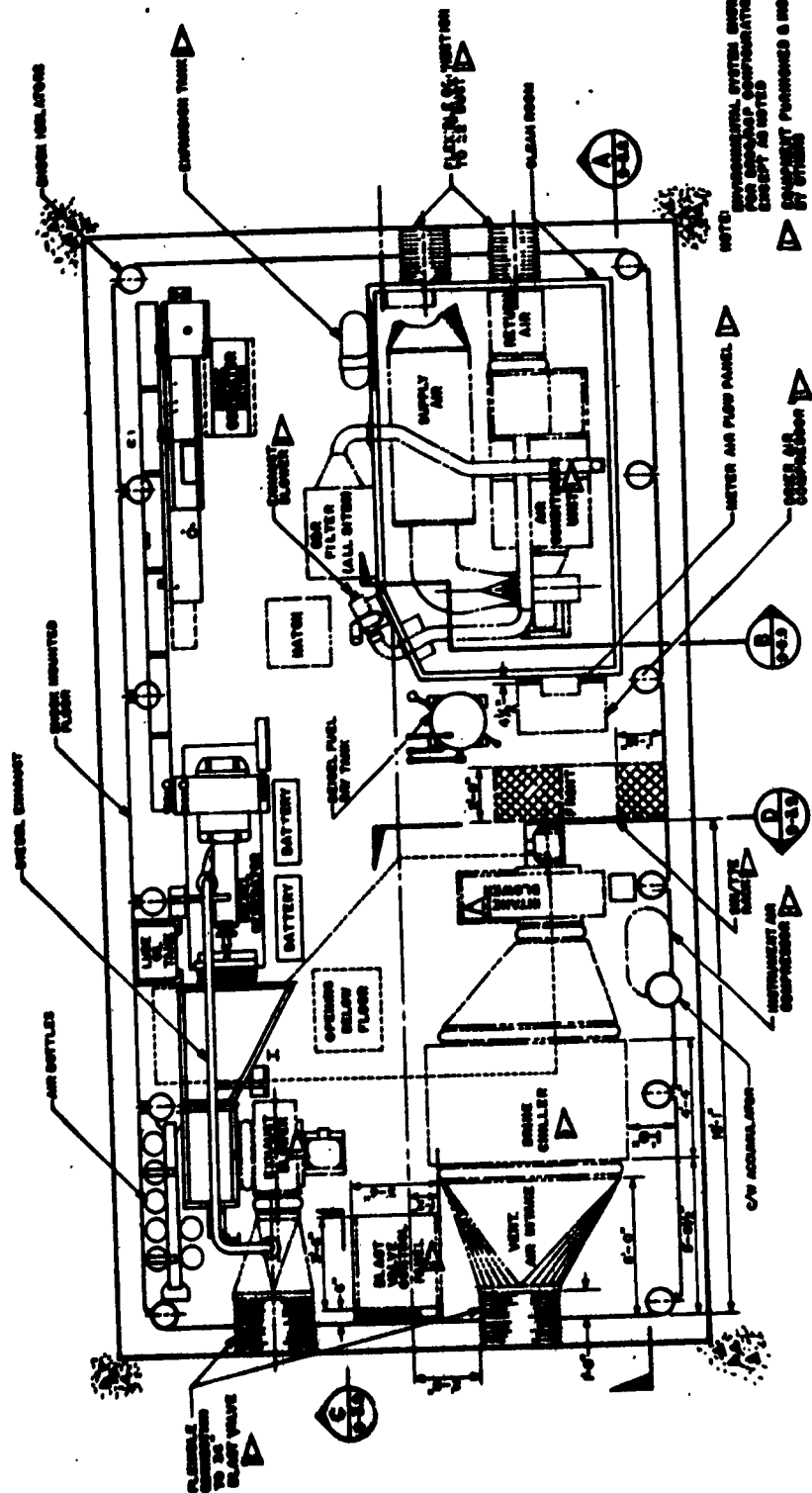


SECTION A (2-33)



SECTION B (2-33)

FMARS LAUNCH CONTROL FACILITY				DD-14827	
LCES AND TUNNEL JUNCTION				FIG. 9-3.6	
SRCC/ACP EQUIP. LAYOUT				REV. 2.6	
THE BOEING COMPANY					
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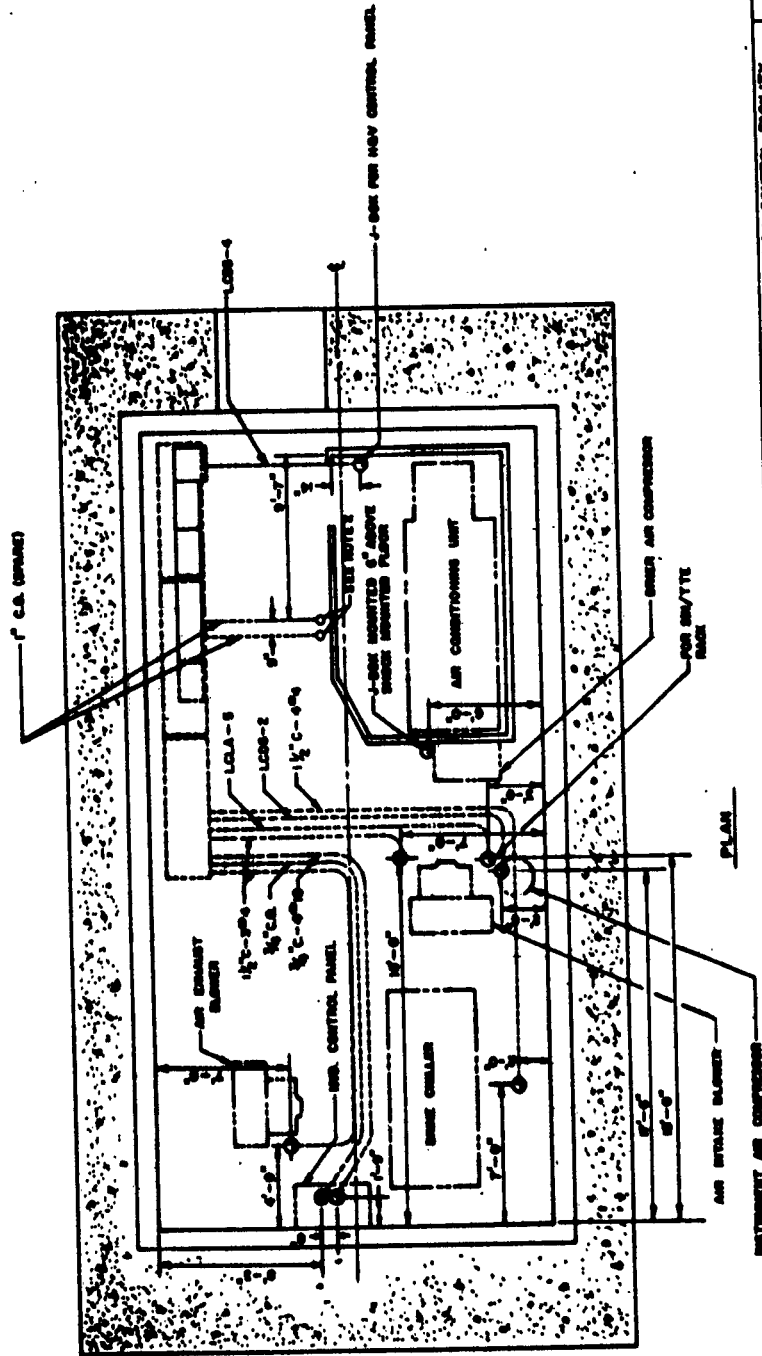
2. THE/THE BACK REQUIRES ACCESS FRONT AND BACK AS NOTED BY MATCHED AREA.

NOTE: ENVIRONMENTAL SYSTEM SHOWN IS FOR SENSORS/COMPENSATION EXCEPT AS NOTED

Δ EQUIPMENT FURNISHED & INSTALLED BY OTHERS

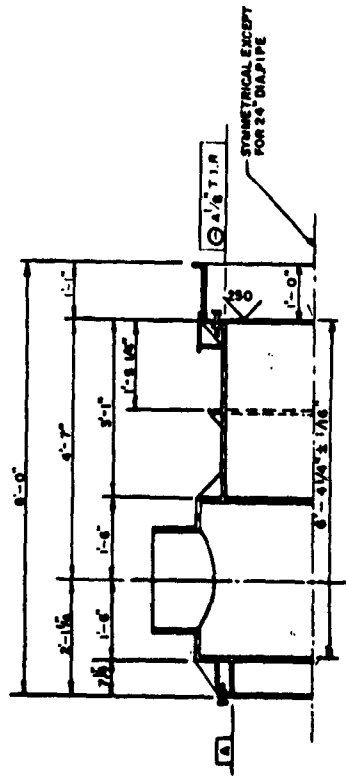
PLAN EQUIPMENT BUILDING

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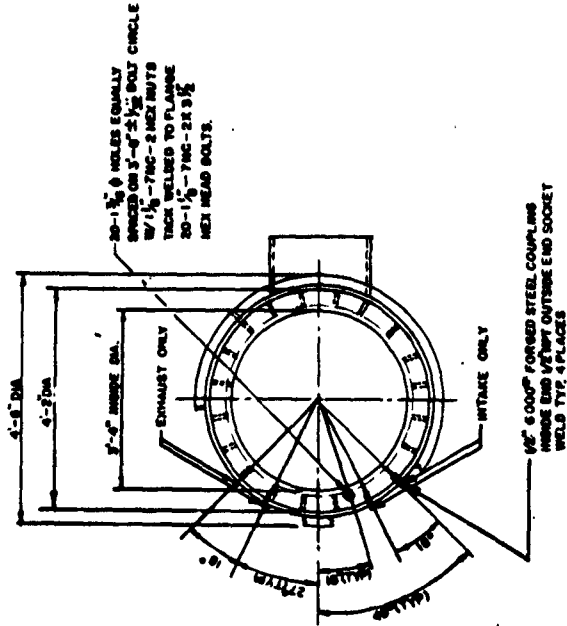


NOTES
1. 6" x 4" J-BOLTS TO BE MOUNTED FLUSH WITH TOP OF FLOOR UNLESS NOTED.
2. WELD COUPLING FLUSH WITH TOP OF FLOOR AND PLUG.

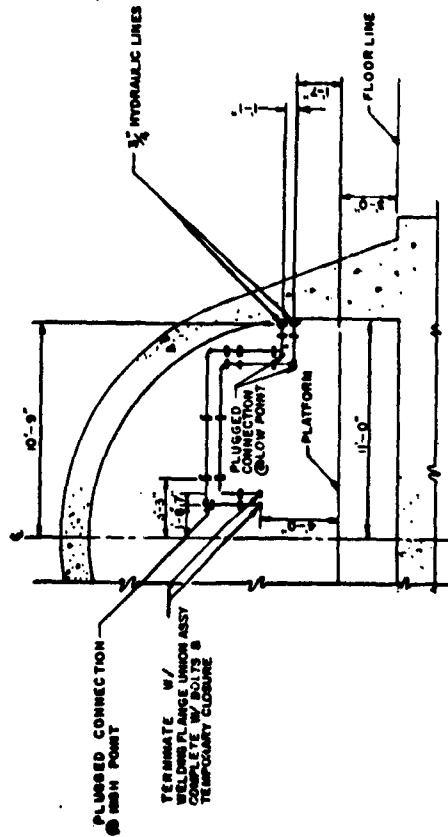
DE-10827	FMAFB LAUNCH CONTROL FACILITY LCES AND TUNNEL JUNCTION EQUIPMENT POWER RECEPTACLE LOCATIONS						PAGE 26
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	C. POWERS	9-8-82					
THE BOEING COMPANY							



SECTION-BLAST VALVE INSERT

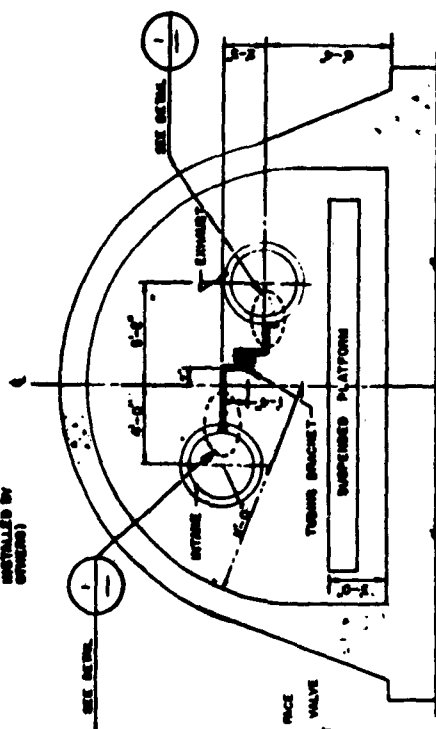
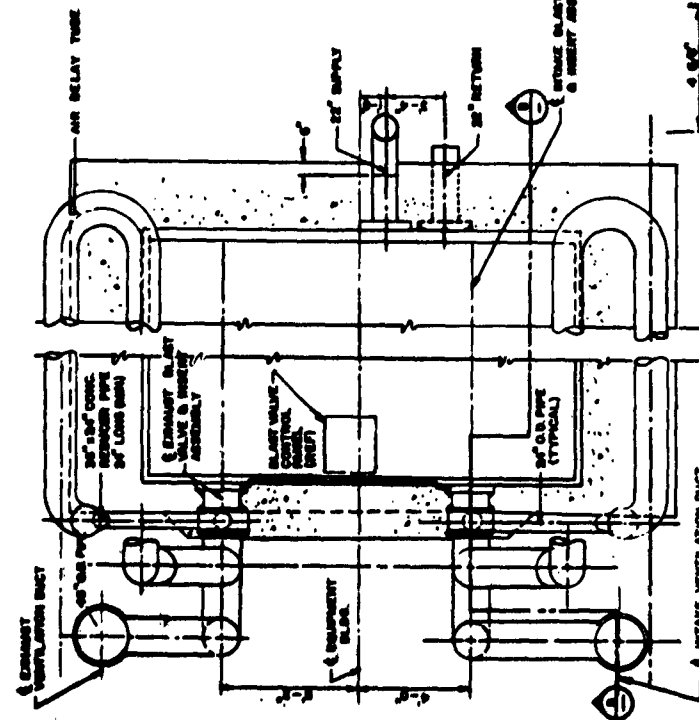
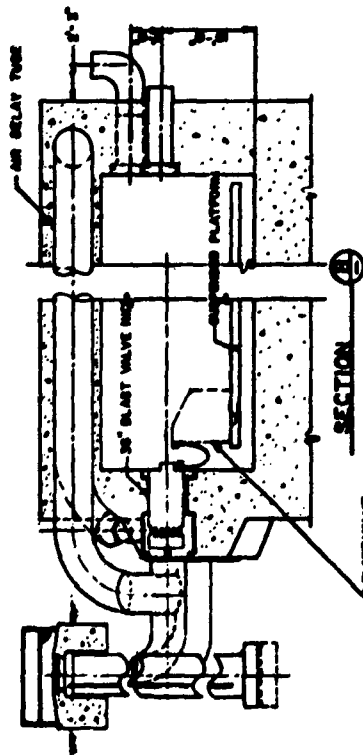


END VIEW - BLAST VALVE INSERT

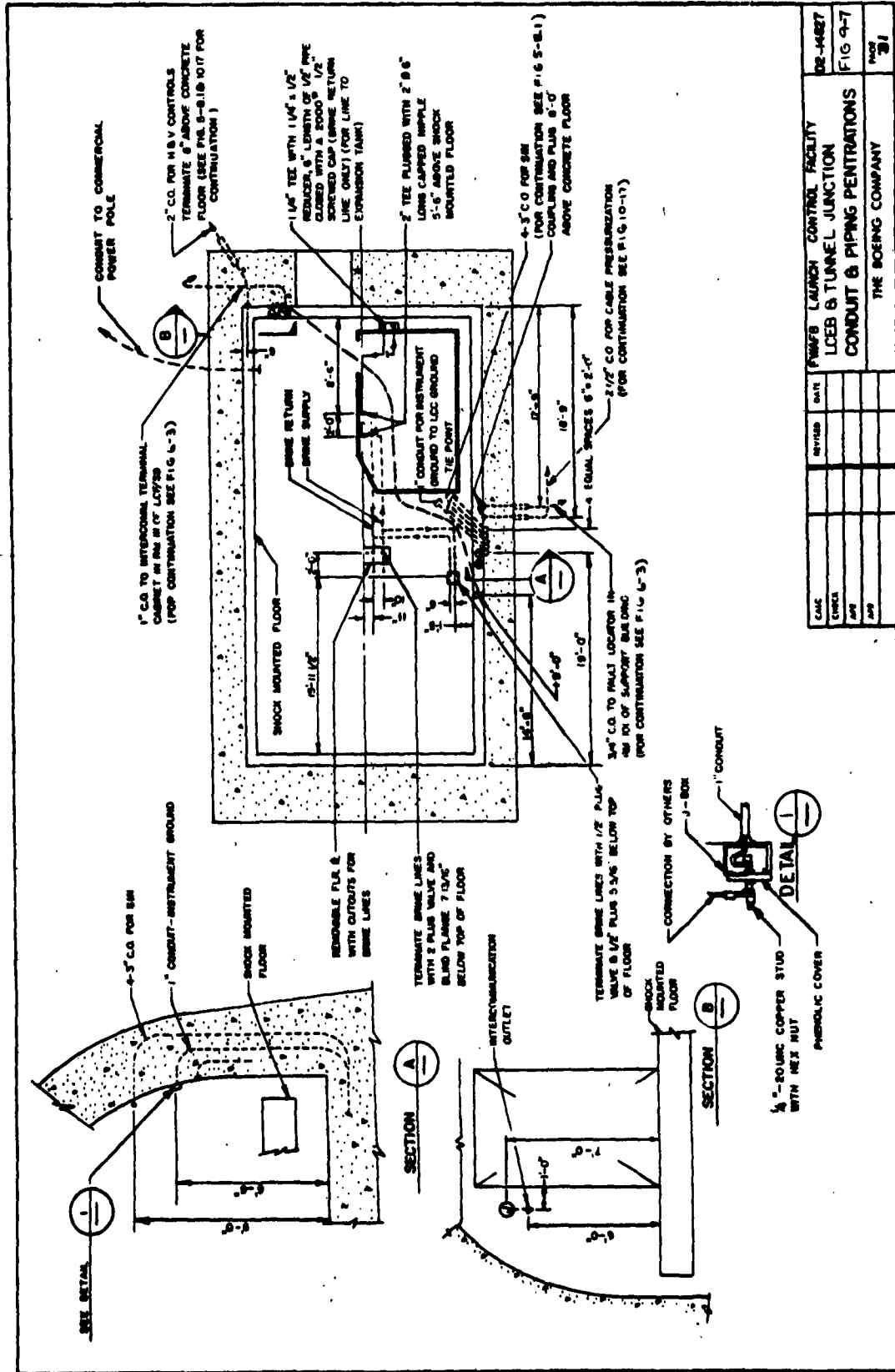


PIPING SECTION - LCEB

DATE	REVISED	DATE	FWAFB LAUNCH CONTROL FACILITY	22-14827
CHECK			LCEB AND TUNNEL JUNCTION	
APP			36" BLAST VALVE REQUIREMENTS	FIG 9-6
AW			THE BOEING COMPANY	PAGE 29



CASE	DATE	PWA'S LAUNCH CONTROL FACILITY LCEB AND TUNNEL JUNCTION 36" BLAST VALVE REQUIREMENTS THE SOCRING COMPANY	02-19827
CASE			148 8-61
APP			PAGE
APP			30
APP			30



CASE	DATE	REVISED	DATE	FIG 9-7	02-44827
CHECK				FIG 9-7	
APP					
APP					
THE BOEING COMPANY					FIG 9-7
CONDUIT & PIPING PENETRATIONS					FIG 9-7
LCEB & TUNNEL JUNCTION					FIG 9-7
FMAFB LAUNCH CONTROL FACILITY					FIG 9-7
					FIG 9-7

10.0 HARDENED LAUNCH CONTROL CENTER FACILITY CRITERIA

10.2 ARCHITECTURAL

10.2.1 Layout

Delete the words "figure 9-1" and in lieu thereof insert the words "figure 10-1".

10.2.1.1 Type

Delete the paragraph in its entirety and in lieu thereof insert the following:

The shock mounted floor area provided for the personnel and equipment stated shall be identical in size and configuration for three types of LCC's in a wing of twenty (20) LCC's namely:

- a. one Alternate Command Post (ACP) per figure 10-2;
- b. one Simplex Remote Communication Complex (SRCC) per figure 10-3;
- c. eighteen (18) "Standard" LCC's per figure 10-4.

Table 5-1 is a summary of major equipment requirements in the three (3) types of LCC's.

10.6 COMMUNICATIONS

10.6.1 Sensitive Command Network (SCN)

Delete the sentence "b". in its entirety and in lieu thereof insert the following:

- b. From LCC to hard UHF Antenna, to hard HF Receive Antenna, and to hard HF Transmit Antenna.

Three (3) 5-inch diameter conduits, hardened, extending from the EM shielded area of LCC to a stub-up point (see figures 11-8, 11-8.1 and 11-8.2)

10.6.3 Intercommunications

Delete the sentence "b." in its entirety and insert the following:

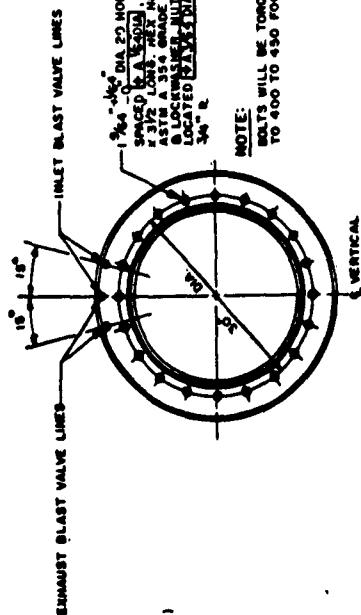
- b. Two (2) 2-inch conduits from EM shielded area in LCC to Telephone Room in ECSEB to be used as spares.

Also add the following:

- d. One 2-inch conduit from EM shielded area in LCC to soft HF Transmit-Receive Antenna.

DRAWING REVISIONS

- 1. Figures 10-9 and 10-9.1 revised per blast valve changes.
- 2. Figure 10-10 revised to provide cable tray opening.
- 3. Figure 10-14.1 and 10-17 revised per conduit changes.
- 4. Figures 10-15 and 10-16.3 revised per cable tray changes.

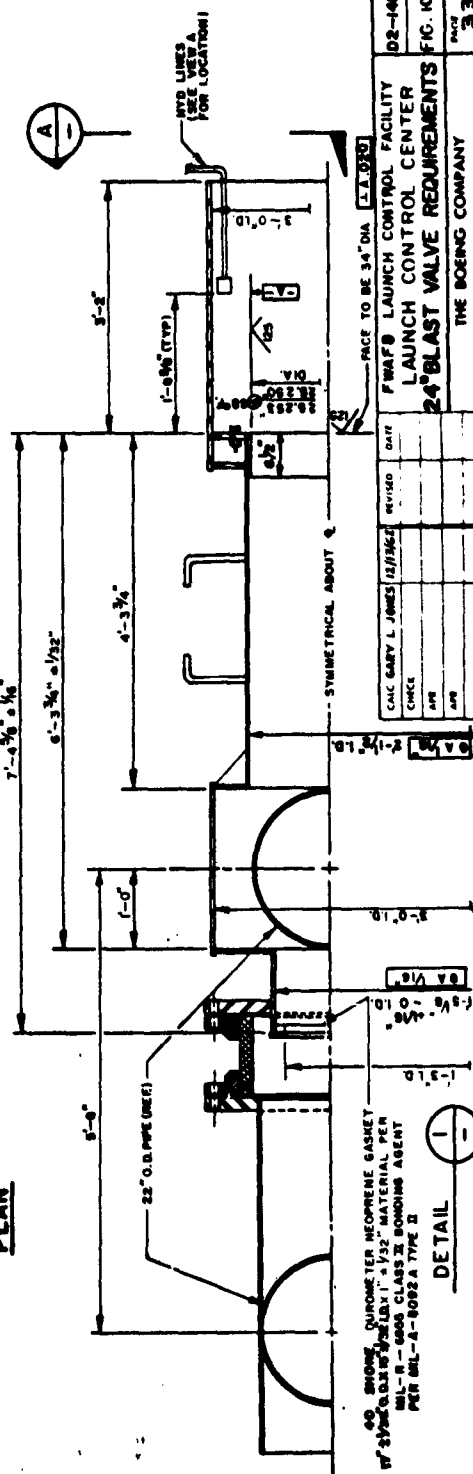


NOTE:

**BOLTS WILL BE TORQUED BY OTHERS
TO 400 TO 430 FOOT POUNDS.**

MAIN

PLAN



40. SHOWS GYROMETER NEOPRENE GASKEY -
ST 3/16" O.D. x 1/2" I.D. x 1/32" MATERIAL PEN
ML-R - 6805 CLASS II BONDING AGENT
PCE ML-A - 6092 A TYPE II

-FACE TO BE 34" DIA

**FWAFB LAUNCH CONTROL FACILITY
LAUNCH CONTROL CENTER**

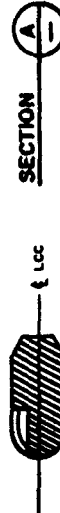
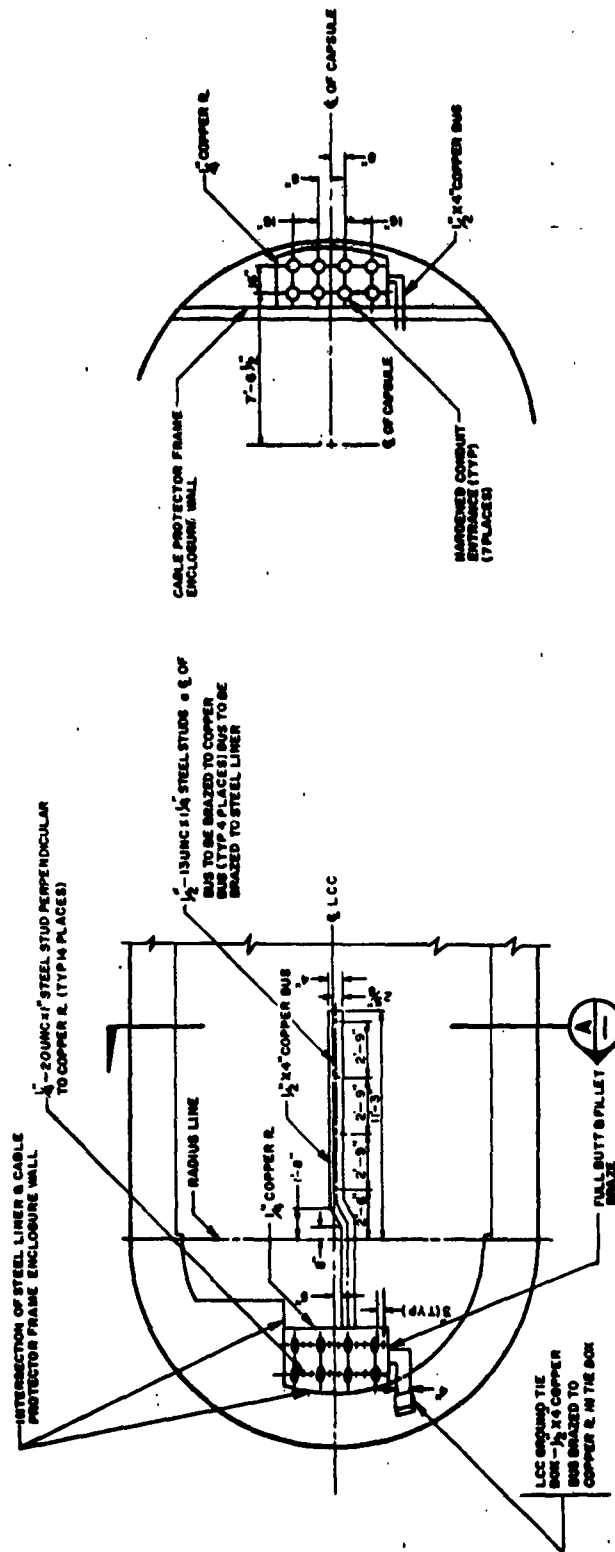
LAUNCH CONTROL CENTER 24" BLAST VALVE REQUIREMENTS

DETAIL

THE BOEING COMPANY

100

1



SECTION A

PARTIAL ELEVATION

NOTE:
PROVIDE MIN BRAZING OF 25 % OF THE PERIMETRY
OF THE 1/2" X 1/2" COPPER BUS, 2" BRAZE EVERY 8" OF
PERIMETRY

DATE	REVISED	DATE	REVISED	DATE	REVISED
CHECK	DATE	CHECK	DATE	CHECK	DATE
DATE	DATE	DATE	DATE	DATE	DATE
DATE	DATE	DATE	DATE	DATE	DATE

FWAFB LAUNCH CONTROL FACILITY
LAUNCH CONTROL CENTER
GROUNDING SYSTEM

THE BOEING COMPANY

D2-14927

FIG. 10-11

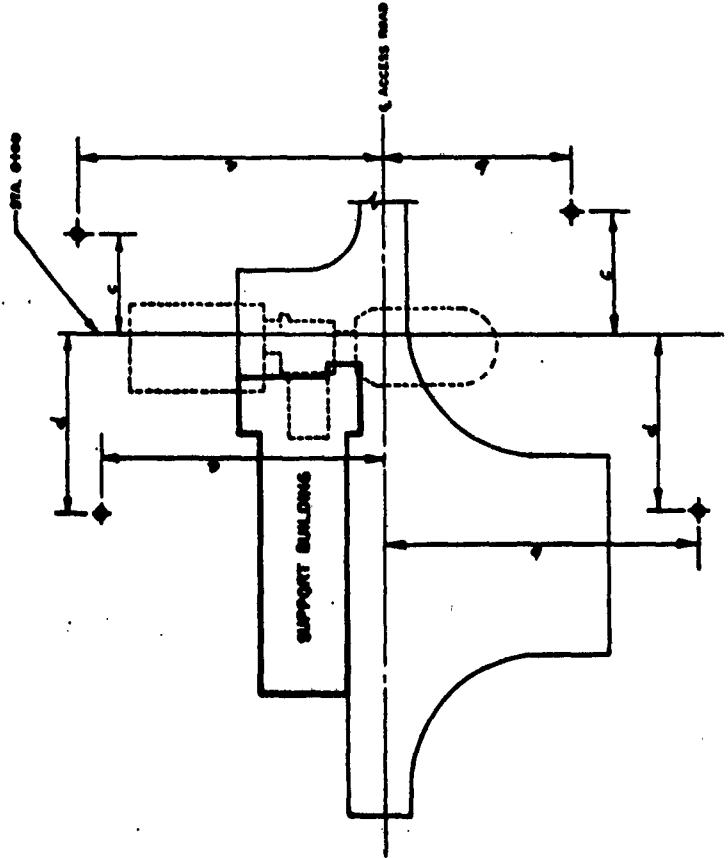
PAGE 3

12.0 WING IV CRITERIA

DRAWING REVISIONS

1. Figures 11-8, 11-9, and 11-9.1 revised per new siting requirements.
2. Figures 11-8.1, 11-8.2 added per new siting requirements.
3. Figure 11-9.2 deleted per new siting requirements.
4. Figure 11-1 revised per conduit changes.

SITE		A-1	B-1	C-1	D-1	E-1	F-1	G-1	H-1	I-1	J-1	K-1	L-1	M-1	N-1	O-1	P-1	Q-1	R-1	S-1	T-1
HARD TRANSMIT RECEIVE CONDUIT STUD-OUTS	a	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	105'-0"	105'-0"	95'-0"	95'-0"	95'-0"	95'-0"
	b	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	105'-0"	105'-0"	95'-0"	95'-0"	95'-0"	95'-0"
	c	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	105'-0"	105'-0"	95'-0"	95'-0"	95'-0"	95'-0"
	d	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	105'-0"	105'-0"	95'-0"	95'-0"	95'-0"	95'-0"
HARD TRANSMIT RECEIVE CONDUIT STUD-OUTS	a	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	105'-0"	105'-0"	95'-0"	95'-0"	95'-0"	95'-0"
	b	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	105'-0"	105'-0"	95'-0"	95'-0"	95'-0"	95'-0"
	c	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	105'-0"	105'-0"	95'-0"	95'-0"	95'-0"	95'-0"
	d	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	95'-0"	95'-0"	105'-0"	105'-0"	95'-0"	105'-0"	105'-0"	105'-0"	105'-0"	95'-0"	95'-0"	95'-0"	95'-0"

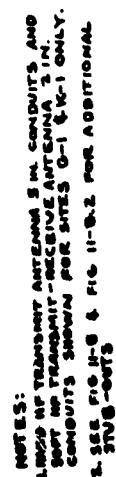


◆ 2" CO. 4" O.D. STUD-OUT FOR SOFT HF
TRANSMIT-RECEIVE & HARD HF TRANSMIT.
SEE TABULATION FOR LOCATING DIMENSIONS
OF INDIVIDUAL CONDUIT STUD-OUTS.

NOTES:

1. SEE PHS 11-B.1 FOR SITES 8-1 AND 4-1.
2. SEE PHS 11-B.2 FOR ADDITIONAL STUD-OUTS.

CASE	DATE	REVISED	DATE	PHAF'S LAUNCH CONTROL FACILITY HF/UHF ANTENNA FACILITY CONDUIT-STUD-OUT POINTS	02-14-82
CHIEF					
APP					
APP					
THE BOEING COMPANY					02-14-82
					02-14-82
					02-14-82

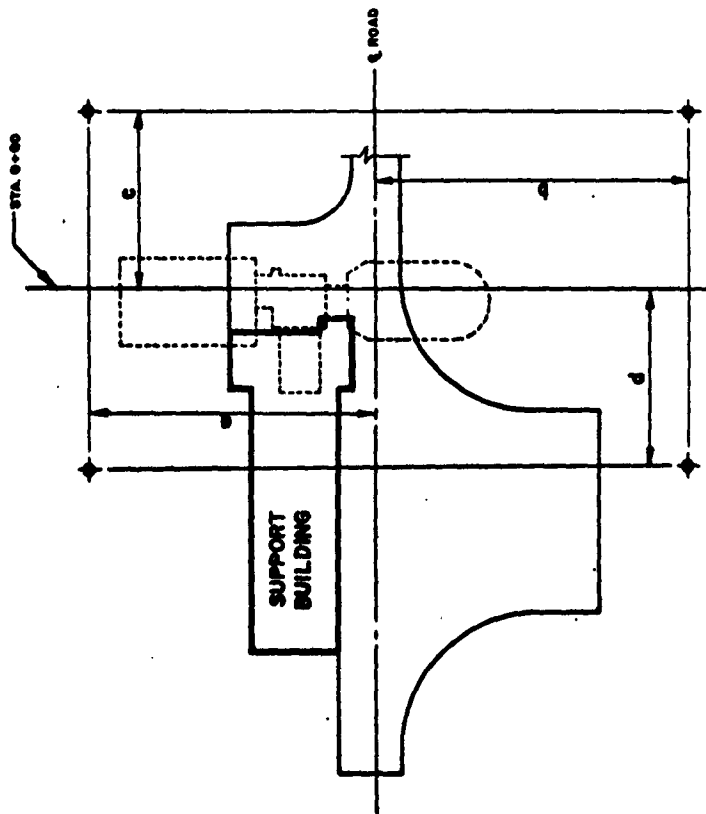


CAC						PMA/B LAUNCH CONTROL FACILITY M9/UHF ANTENNA FACILITY CONDUIT-STUBOUT POINTS	DE-H827
CMR							PIC-11-BJ
MN							PAGE
MR						THE BORG COMPANY	43



NAME	DATE	FNAFB LAUNCH CONTROL FACILITY HF/UHF ANTENNA FACILITY CONDUIT-STUBOUT POINTS	02-4482-7
CLASS	REVISED		
ORIGIN			
APP			PAGE 1482
APP			PAGE 44
		THE BOEING COMPANY	

SITE	A-I	B-I	C-I	D-I	E-I	F-I	G-I	H-I	I-I	J-I	K-I	L-I	M-I	N-I	O-I	P-I	Q-I	R-I	S-I	T-I
HF TRANSMIT-RECEIVE ANTENNA LOCATION	193'	150'	204'	190'	189'	307'	243'	150'	178'	230'	222'	195'	170'	210'	207'	172'	150'	194'	150'	243'
HF TRANSMIT-RECEIVE ANTENNA LOCATION	160'	160'	160'	70'	144'	144'	111'	144'	144'	144'	144'	144'	144'	144'	144'	144'	144'	144'	144'	144'
HF TRANSMIT-RECEIVE ANTENNA LOCATION	75'	75'	75'	75'	75'	75'	75'	75'	75'	75'	75'	75'	75'	75'	75'	75'	75'	75'	75'	75'
HF TRANSMIT-RECEIVE ANTENNA LOCATION	24.8'	185'	249.8'	225.7'	235'	311.2'	194'	185.7'	243.8'	245.7'	245.7'	235'	215.8'	249.8'	225.7'	185.7'	243.8'	185.7'	243.8'	245.7'
HF TRANSMIT-RECEIVE ANTENNA LOCATION	31'	31'	31'	31'	31'	31'	31'	31'	31'	31'	31'	31'	31'	31'	31'	31'	31'	31'	31'	31'
HF TRANSMIT-RECEIVE ANTENNA LOCATION	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'
HF TRANSMIT-RECEIVE ANTENNA LOCATION	190'	190'	190'	190'	190'	190'	190'	190'	190'	190'	190'	190'	190'	190'	190'	190'	190'	190'	190'	190'
HF TRANSMIT-RECEIVE ANTENNA LOCATION	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'
HF TRANSMIT-RECEIVE ANTENNA LOCATION	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'
HF TRANSMIT-RECEIVE ANTENNA LOCATION	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'	26'
HF TRANSMIT-RECEIVE ANTENNA LOCATION	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'	109'
HF TRANSMIT-RECEIVE ANTENNA LOCATION	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'	20'

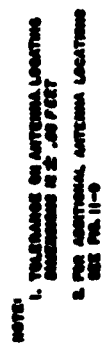


♦ SOFT HF TRANSMIT-RECEIVE & HARD HF TRANSMIT ANTENNA. SEE TABULATION FOR LOCATING DIMENSIONS OF INDIVIDUAL ANTENNA.

NOTES:

1. FOR CONDUIT SUBROUTS SEE FIG. 11-8
2. TOLERANCE ON ANTENNA LOCATING DIMENSIONS IS ± 0.5 FEET
3. FOR ADDITIONAL ANTENNA LOCATIONS SEE FIG. 11-9.1

DATE	REVISIONS	BY	DATE	FWAFB LAUNCH CONTROL FACILITY	DC-14827
0000				HF/UHF ANTENNA FACILITY	FIG. 11-9
0000				ANTENNA LOCATIONS	PAGE 45
0000				THE BOEING COMPANY	



NAME		STATUS	DATE	FWAB'S LAUNCH CONTROL FACILITY HF/UHF ANTENNA FACILITY ANTENNA & LOCATIONS	98-14927 FIG 11-25
CHICK					
AGE					
AGE					
				THE BOEING COMPANY	AGE 74

