

NA 660 N.Y. DEF AREA SAM

INDEX NUMBER OR SUBJECT

FROM:

NANVG

TO:

NAD-OCE

DATE

26 MAY 1958

FILED

SUMMARY

BULKY. (FOR OFFICIAL USE ONLY)
FOR OFFICIAL USE ONLY

DAMAGE REPORT, LEONARDO H.A.A.
SITE

INCL # 1-6

(FOR -OFFICIAL USE ONLY)

FOR OFFICIAL USE ONLY

DA FORM 1613-1 (TWO PART)
1 JAN 56

REPLACES DD FORM 334A, 1 MAR 50,
WHICH IS OBSOLETE (For Army Use)

1

CROSS REFERENCE
(AR 345-210)

Eric A. Horsford May 29, 1958
ACC 77-65A-0078 BOX 1 NEW YORK DEFENSE AREA SAM 1958 (NY 53)

DAMAGE REPORT - ENGINEER-CONSTRUCTED FACILITIES
STORAGE EXPLOSION OF 22 MAY 1958
LEONARDO AAA SITE

1. General: Representatives of the USAR District, New York, visited the Leonardo AAA Site at 1030 hours on 23 May 1958 to investigate and report on the extent of damage to Engineer-constructed facilities resulting from the explosion which occurred in the Launcher Area on 22 May 1958.

2. The initial explosion reportedly occurred at 1315 hours, at ground level above the most easterly located "type-C" underground storage structure. (Refer to attached Drawing File No. 9604-768 and Drawing File No. 7658-201). The damage in this area is considerable, as may be deduced from the attached New York Times photograph, 23 May 1958 edition (Neg. No. YA 1361-35).

3. Damage in the areas further remote from the aforementioned "type-C" structure is less severe. Little or no damage was observed in the second "type-C" and remaining "type-B" underground storage structures located west of the damaged "C" box. However, other buildings to the east (particularly the west sides facing the explosion area) were in many cases severely damaged. The structures affected are the Missile Assembly and Test Building (Drawing File No. 9604-848), the Generator Building and Operator's Shelter (Drawing File No. 9604-790), the Administration, Recreation and Storage Building (Drawing File No. 9604-774) and the Barracks Buildings (Drawing File No. 9604-751).

4. Description of Damages

a. Underground Missile Storage Structure (Drawing File No. 9604-810): Limited damage was found at ground level: and negligible structural damage in one "type-C" underground missile storage structure proper. Major reconstruction will be required of the elevator platform, launcher pads, walks, concrete curbs, grading, aboveground safety shower and hydrant, aboveground hose and hose rack, earth mounds, airline terminals, access doors, etc. Damage to the elevator could not be fixed accurately, since the elevator was in the raised position resting on the locking bars at the time of the explosion, and was found inoperative thereafter. Piping for the hydraulic power unit was ruptured with complete loss of hydraulic fluid: ventilation ducts were pierced, locking bars damaged, sump-pump was inoperative, floor drains clogged, and miscellaneous electrical repairs found necessary. (Refer to Neg. Nos. YA 1361-17, 18, 19, 20, 21, 22, 23, 25, 26 and 28).

b. Missile Assembly & Test Building (Drawing File No. 9604-828): Damage to the west side of building (facing the explosion area) was general. Doors and windows were blown out; the roof was raised and separated from the bond beam; the heater room (including breeching and warm air furnace) was severely damaged; the first-aid room was severely damaged, the metal chimney pierced by metal fragments; the west wall was displaced outward about four inches and other walls were cracked, plumbing and plumbing fixtures were damaged; miscellaneous electrical repairs required, warm air heating ductwork damaged. (Refer to Neg. Nos. YA 1361-5, 6, 7, 8 and 9).

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INCL TO LTR 26 MAY 1958 (NAF 660 N.Y. DEF AREA STAFF)

9/11/58

DAMAGE REPORT - ENGINEER-CONSTRUCTED FACILITIES, SURFACE EXPLOSION OF 22 MAY 1958
LEONARDO AAA SITE (Cont'd.)

c. Generator Building and Operator's Shelter (Drawing File No. 9604-700): The west exterior wall of Generator Building (facing the explosion area) was cracked. Windows and doors were blown out; one 100-KVA transformer was punctured by metal fragments; the transformer fence was damaged, exhaust and intake louvers damaged, interior ceiling damaged, and miscellaneous electrical repairs required. The three generators will require checking for possible realignment; generator exhaust mufflers were moved, requiring repacking at the exterior wall. In the Operator's Shelter, the windows and door were blown out, and interior electrical work slightly damaged. (Refer to Neg. Nos. XA-1361-14, 15, 16, 29 and 34).

d. Administration, Recreation and Storage Building (Drawing File No. 9604-774): The Administration, Recreation and Storage Building was generally damaged along the west wall. Windows and doors were damaged and the bond beam requires repointing. The main girder was separated from the anchors, requiring repairs and re-anchoring. (Refer to Neg. No. XA 1361-1, 2, 10 and 11).

e. E.M. Barracks and BCO (Drawing File No. 9604-751): The E.M. Barracks and Officers' Quarters were generally damaged along the west wall. Windows and doors were damaged, and the bond beam requires repointing. (Refer to Neg. No. XA 1361-3, 4, 12 and 13).

5. Photographs indicating damage to structures are inclosed herewith.

6. A preliminary cost estimate for corrective action is as follows:

Construction.....	\$43,000
Contingencies.....	8,600
Design, Specs., Admin., Overhead.....	8,400
Total Cost.....	\$60,000

7. A preliminary cost estimate for additional earth mounds is as follows:

Construction.....	\$53,000
Contingencies.....	10,600
Design, Specs., Admin., Overhead.....	5,300
Total Cost.....	\$68,900

Details of the costs noted herewith are attached as Inclosure No. 6.

8. Recommendations: The following suggestions are recommended for consideration by higher authority in future design to insure that damages to buildings due to explosive forces encountered (as in this instance) will be reduced:

a. Height of earth mounds: From observation it is believed that had the existing earth mounds been constructed 5 feet higher, damage to the Generator Building and Operator's Shelter would have been negligible. Refer to CCF Standard Drawing No. MF 16-06-196. The earth mound located between the Generator Building

DAMAGE REPORT - ENGINEER-CONSTRUCTED FACILITIES, SURFACE EXPLOSION OF 22 MAY 1958
LEONARD AKA SITE (Cont'd)

and Fueling Area should be raised at least 5 feet. An additional earth mound should be constructed in between the Launcher and the Missile Assembly and Test Building. A mound in this area of sufficient height would have eliminated most of the damage which occurred in the Missile Assembly & Test Building. (Refer to OCE Drawing No. ME 16-06-199 annotated in red).

b. Location of First Aid Room: The First Aid Room of the Missile Assembly and Test Building should be relocated from this structure to outside the 528-foot safety distance. However, if it is mandatory that the First Aid Room be collocated with the Missile Assembly and Test Building, it is imperative that this medical facility be relocated from the side facing the Launcher Area to the opposite side. (Refer to Drawing File No. 9604-828 annotated in red to show OCE location and in green to show WVD proposed location).

c. Safety Distances: Safety distance to inhabited structures should be increased from the present 528 foot limit. It is realized that additional real estate may be required but this is justified to eliminate future damage from possible explosions. If this is not feasible, additional safety mounds to protect the Adm. and Housing Facilities should be constructed in between these facilities and the Operational Area.

6 Incl

DRAWINGS (Prints)

1. OCE Std Dwg ME 16-06-199
2. Contract Dwg File Nos. 9604-743, 751, 768, 770, 774, 790, 810, 828
3. Basic Info Maps: File No. 7658-201

PHOTOGRAPHS (Prints)

4. USARF, NY Photos taken 23 May 58 (34 prints per set)
5. NY Times Photo, 23 May 58 Edition (A.P. Wirephoto)
6. Prel Cost Est, dtd 25 May 58, of repairs or replacement of damaged facilities.

DAMAGE REPORT
LEONARDO AAA SITE
PRELIMINARY COST ESTIMATE

A. ADMIN., REC. & STORAGE BLDG. #1 (Dwg. File No. 9604-774)

1. Remove and reset double hung window sash and install new sash guides and spring balances where necessary (west wall)	16 Ea.	\$ 15.00	\$ 240.
2. Remove and replace glazing (wire glass) in windows and exterior doors	60 S.F.	1.50	90.
3. Repair frame and install new interior wood door 2'-6" x 6'-6" x 1 3/8", complete	1 Ea.	100.00	100.
4. Repair frame and install new exterior wood door 3'-0" x 7'-0" x 1 3/4", w/glass and wood louver, complete	1 Ea.	120.00	120.
5. Clean mortar joint and repoint between bond beam and masonry block along west wall, both sides, complete	115 L.F.	2.00	230.
6. Clean mortar joint and repoint masonry block of interior partition including repairs to girder anchors at these partitions	50 L.F.	30.00	150.
7. Recaulk around windows and doors (west wall)	200 L.F.	.20	40.
8. Repaint masonry walls	500 S.F.	.20	100.
9. Paint wood doors	2 Ea.	5.00	10.
10. Miscellaneous	Allow		<u>120.</u>
Sub-Total (Bldg. #1)			\$1,200.

Incl To LTR 24 MAY 1958, NA 660 NK DEF AREA SPAN.

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DAMAGE REPORT
LEONARDO AAA SITE
PRELIMINARY COST ESTIMATE

E. E.M. BARRACKS & OFFICERS QUARTERS #2 (Dwg. File No. 9604-751)

1. Remove and reset double hung window sash and install new sash guides and spring balances where necessary	21 Ea.	\$ 15.00	\$ 315.
2. Remove and replace glazing (wire glass) in windows and exterior doors	40 S.F.	1.50	60.
3. Repair frame and install new exterior wood door 3'-0" x 6'-6" x 1 3/4", w/glass, complete	1 Ea.	120.00	120.
4. Repair frame and realign exterior wood doors 2'-2'-6" x 6'-6" x 1 3/4"	1 Ea.	50.00	50.
5. Clean mortar joint and repoint between bond beam and masonry block along west wall, both sides, complete	200 L.F.	2.00	400.
6. Recaulk around windows and doors (west wall)	275 L.F.	.20	55.
7. Repaint masonry walls	800 S.F.	.20	160.
8. Paint wood door	1 Ea.	5.00	5.
9. Miscellaneous	Allow		<u>135.</u>
Sub-Total (Bldg. #2)			\$1,300

DAMAGE REPORT
LEONARDO AAA SITE
PRELIMINARY COST ESTIMATE

G. GENERATOR BLDG. (Dwg. File No. 9604-790)

1. Repair chain link fence at outdoor transformer station	L.S.		\$ 20.
2. Remove and install new 100 KVA 1 ϕ transformer and check operation of outdoor transformer station	L.S.		2,000.
3. Check interior electrical installation and repair or replace damaged fixtures, etc.	L.S.		500.
4. Check operation and alignment of generators, repair where necessary	L.S.		1,000.
5. Repack exhaust port pipe sleeves	3 Ea.	5.00	15.
6. Remove and install new wood double hung window sash 5'- $\frac{1}{4}$ " x 3'-10" w/mullion & glazing	1 Ea.	60.00	60.
7. Remove and install new exterior wood doors 2'-2'-6" x 7'-0" x 1 3/ $\frac{1}{4}$ " w/glass and wood louver, complete	2 Ea.	200.00	400.
8. Check and repair wood exhaust louvers	4 Ea.	25.00	100.
9. Remove and install new wood louvers, batten doors, and screens, complete	3 Ea.	100.00	300.
10. Repair and replace metal gravel stop and closure	240 S.F.	1.50	360.
11. Realign, clean mortar joint and repoint masonry block along east wall, both sides, complete	300 S.F.	2.00	600.
12. Clean mortar joint and repoint between bond beam and masonry block along north, east, and south walls, both sides, complete	80 L.F.	2.00	160.
13. Repaint masonry walls	900 S.F.	.20	180.

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DAMAGE REPORT
LEONARDO AAA SITE
PRELIMINARY COST ESTIMATE

GENERATOR BLDG. (Cont'd.)

14. Paint wood doors, windows & louvers	6 Ea.	\$ 5.00	\$ 30.
15. Repair and paint interior ceiling and trim	L.S.	25.00	25.
16. Caulk around windows, louvers & doors	100 L.F.	.20	20.
17. Miscellaneous	Allow		<u>630.</u>
Sub-Total (Generator Bldg.)			\$6,400.

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DAMAGE REPORT
LEONARDO AAA SITE
PRELIMINARY COST ESTIMATE

D. OPERATORS SHELTER (Dwg. File No. 9604-790)

1. Remove and install new exterior wood door 3'-0" x 7'-0" x 1 3/4", w/glass, complete	1 Ea.	\$100.00	\$100.
2. Remove and install new wood double hung window sash 5'-4 x 3'-10 w/mullion & glazing	1 Ea.	60.00	60.
3. Repair and replace metal gravel stop	L.S.		20.
4. Check interior electrical installation and repair or replace damaged fixtures, etc.	L.S.		50.
5. Caulk around windows & door	L.S.		10.
6. Miscellaneous	Allow		<u>60.</u>
Sub-Total (Operators Shelter)			\$300.

DAMAGE REPORT
LEONARDO AAA SITE
PRELIMINARY COST ESTIMATE

E. MISSILE ASSEMBLY & TEST BLDG. (Dwg. File No. 9604-828)

1. Check interior electrical installation and repair or replace damaged fixtures, etc.	L.S.		\$ 750.
2. Check operation and alignment of warm air heating unit, repair where necessary	L.S.		400.
3. Remove and install new 1 $\frac{1}{2}$ " vent by lavatories, check plumbing in toilet room, and repair where necessary	L.S.		100.
4. Remove and install new 10'-2 x 12'-0 over-head type doors complete with frame	2 Ea.	\$500.00	1,000.
5. Remove and install new exterior wood door 3'-0 x 6'-6" x 1 $\frac{3}{8}$ " w/glass, complete	3 Ea.	150.00	450.
6. Remove and install new exterior wood doors 2'-2'-6" x 7'-0" x 1 $\frac{3}{4}$ " w/glass and wood louver, complete	1 Ea.	200.00	200.
7. Remove and install new wood double hung window sash 5'-2" x 3'-4" w/glazing	7 Ea.	60.00	420.
8. Remove and install new wood double hung window sash 4'-3 x 1'-10" w/glazing	1 Ea.	50.00	50.
9. Clean mortar joint and repoint between bond beam and masonry block, along east and west wall of missile assembly and test room both sides complete	80 L.F.	2.00	160.
10. Remove and install new exterior 8" masonry wall of first aid, toilet and heater rooms, anchor interior masonry walls	500 S.F.	2.00	1,000.
11. Remove salvage and replace existing present concrete sills and lintels	5 Ea.	10.00	50.
12. Bracing for support of roof during reconstruction of exterior wall	L.S.		200.
13. Patch and caulk metal jacket of stack and clean stack	L.S.		100.

DAMAGE REPORT
LEONARDO AAA SITE
PRELIMINARY COST ESTIMATE

MISSILE ASSEMBLY & TEST BLDG. (Cont'd.)

14. Check and repair roof joist spreaders	L.S.		\$ 20.
15. Painting of masonry	1,200 S.F.	\$.20	240.
16. Painting of doors & windows	6 Ea.	5.00	30.
17. Caulking around doors & windows	350 L.F.	.20	70.
18. Repair & replace metal gravel stop	100 L.F.	1.00	100.
19. Repair closure strip	180 S.F.	.50	90.
20. Miscellaneous	Allow		<u>570.</u>
Sub-Total (Missile Assembly & Test Bldg.)			\$6,000.

DAMAGE REPORT
LEONARDO AAA SITE
PRELIMINARY COST ESTIMATE

F. U.G. MISSILE STO. STRUCTURE TYPE C (Dwg. File No. 9604-810)

1. Remove and install new elevator platform	L.S.		\$8,000.
2. Repair hydraulic lift system and install new controls for elevator platform	L.S.		1,500.
3. Test and adjust doors, operators, controls, and elevator platform	L.S.		1,500.
4. Repair concrete roof curb and slab around elevator	L.S.		1,000.
5. Test and repair electrical system	L.S.		3,000.
6. Remove and install new frequency converter- Government furnished	1 U.	\$500.00	500.
7. Remove and install new safety shower and hydrant	1 U.	140.00	140.
8. Remove and install new hose rack and hose	1 U.	50.00	50.
9. Remove and install new access hatch cover	1 U.	100.00	100.
10. Remove and install new exhaust vent	3 U.	50.00	150.
11. Test and repair dehumidifiers, heaters and ducts	L.S.		500.
12. Remove and install new air intake lines	2 U.	25.00	50.
13. Clean and flush floor drains	3 Ea.	20.00	60.
14. Clean and repair sump pump	1 U.	150.00	150.
15. Clean floor slab	L.S.		150.
16. Repairs to launcher pads, walks, and stanchion piers	L.S.		500.
17. Miscellaneous			<u>1,750.</u>

Sub-Total (U.G. Missile Sto. Structure) \$19,100.

DAMAGE REPORT
LEONARDO AAA SITE
PRELIMINARY COST ESTIMATE

G. SITE WORK

1. Repair of revetment damage	L.S.	\$ 100.
2. Regrading around U.G. Missile Sto. Structure	L.S.	200.
3. General area clean-up	L.S.	<u>1,000.</u>
Sub-Total - This Item		1,300.

DAMAGE REPORT
LEONARDO AAA SITE
PRELIMINARY COST ESTIMATE

H. COST OF RECOMMENDED CONSTRUCTION (Earth Mound Work)

1. Furnish fill and compaction for construction of revetment	20,000 C.Y.	\$ 2.00	<u>\$40,000.</u>
2. Furnish topsoil and seeding of slopes	2 Ac.	2,000.00	<u>4,000.</u>
Sub-Total (This Item)			<u>\$44,000.</u>

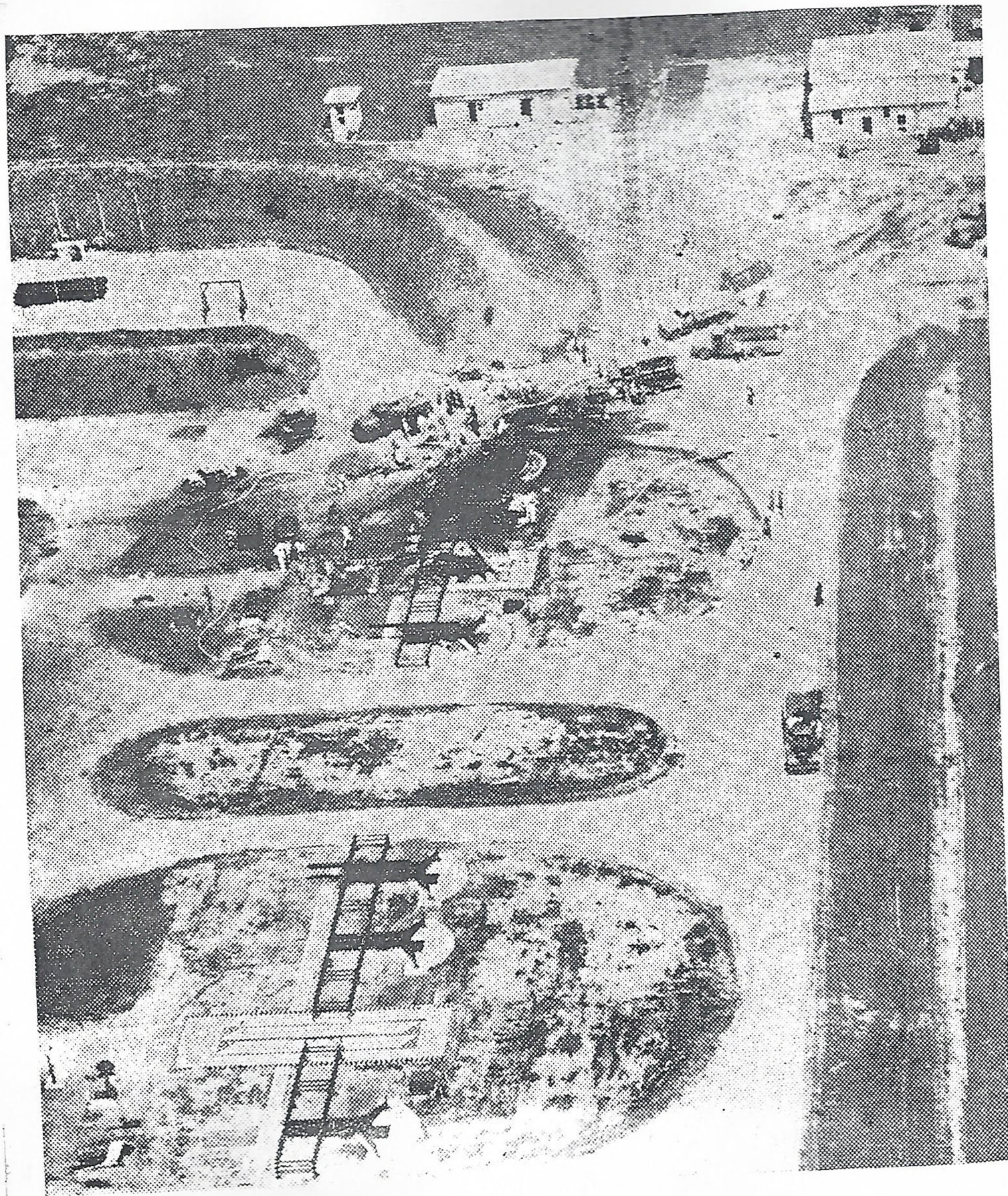
DAMAGE REPORT
LEONARDO AAA SITE
PRELIMINARY COST ESTIMATE

SUMMARY (Repair Work)

A. Administration & Recreation Bldg.	\$ 1,200.
B. E.M. Barracks & Off. Quarters	1,300.
C. Generator Bldg.	6,400.
D. Operators Shelter	300.
E. Missile Assembly & Test Bldg.	6,000.
F. U.G. Missile Storage Structure	19,100.
G. Site Work	<u>1,300.</u>
Sub-Total	\$35,600.
Contractors O.H., Profit & Bond	<u>7,400.</u>
Construction Cost	\$43,000.

SUMMARY (Earth Mound Work)

H. Revetments	\$44,000.
Contractors O.H., Profit & Bond	<u>9,000.</u>
Construction Cost	\$53,000.

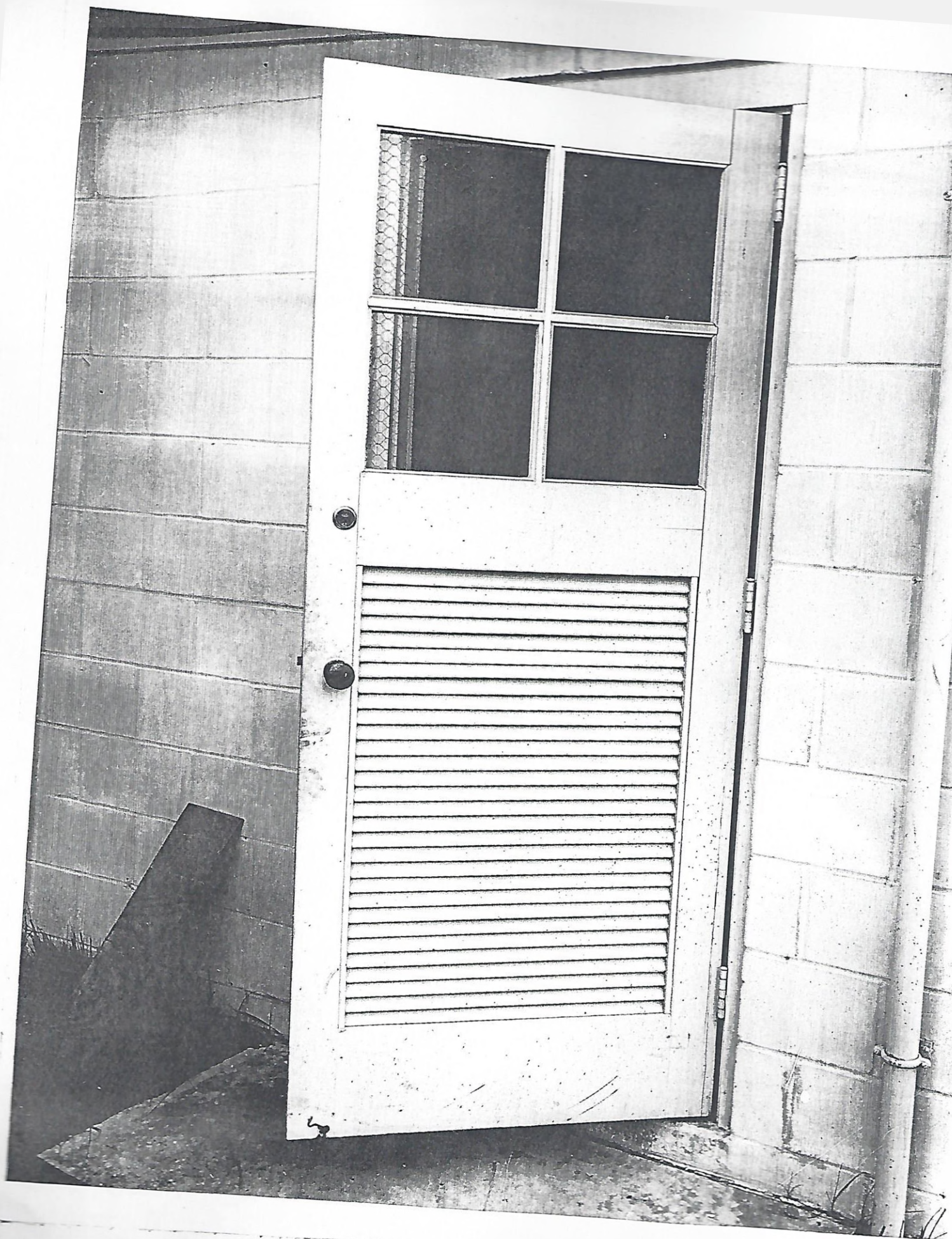


5-23-58

Leonardo, N. J.

Neg No XA 1361-35

Associated Press Wirephoto (N.Y. Times, 23 May 1958 Edition)
looking east, showing damaged auxiliary launcher No. 1 (upper
center) and operator's shelter, generator building, Missile
Assembly Test Bldg (upper l to r).



5-23-58

Locust St. N. J.
Boiler Room Door

Neg No KA 1361-4
Leonardo, N. J.
Rear of barracks showing bond beam break and
window separation.
5-23-58





5-23-58

Leonardo, N. J.
Missile Assembly Bldg. showing overall damage.

Neg No KA 1361-5



5-23-58

Leonardo, W. J.
Overhead door of Missile Assembly Bldg damaged.
(North side)

Neg No XA 1361-6



5-23-58

Leonardo, N. J.
Heater room damaged rear of Missile Assembly Bldg.

Neg No. XA 1361-7



5-23-56

Leonardo, N. J.
Missile Assembly Bldg. south side showing overall
damage.

Neg No KA 1361-8

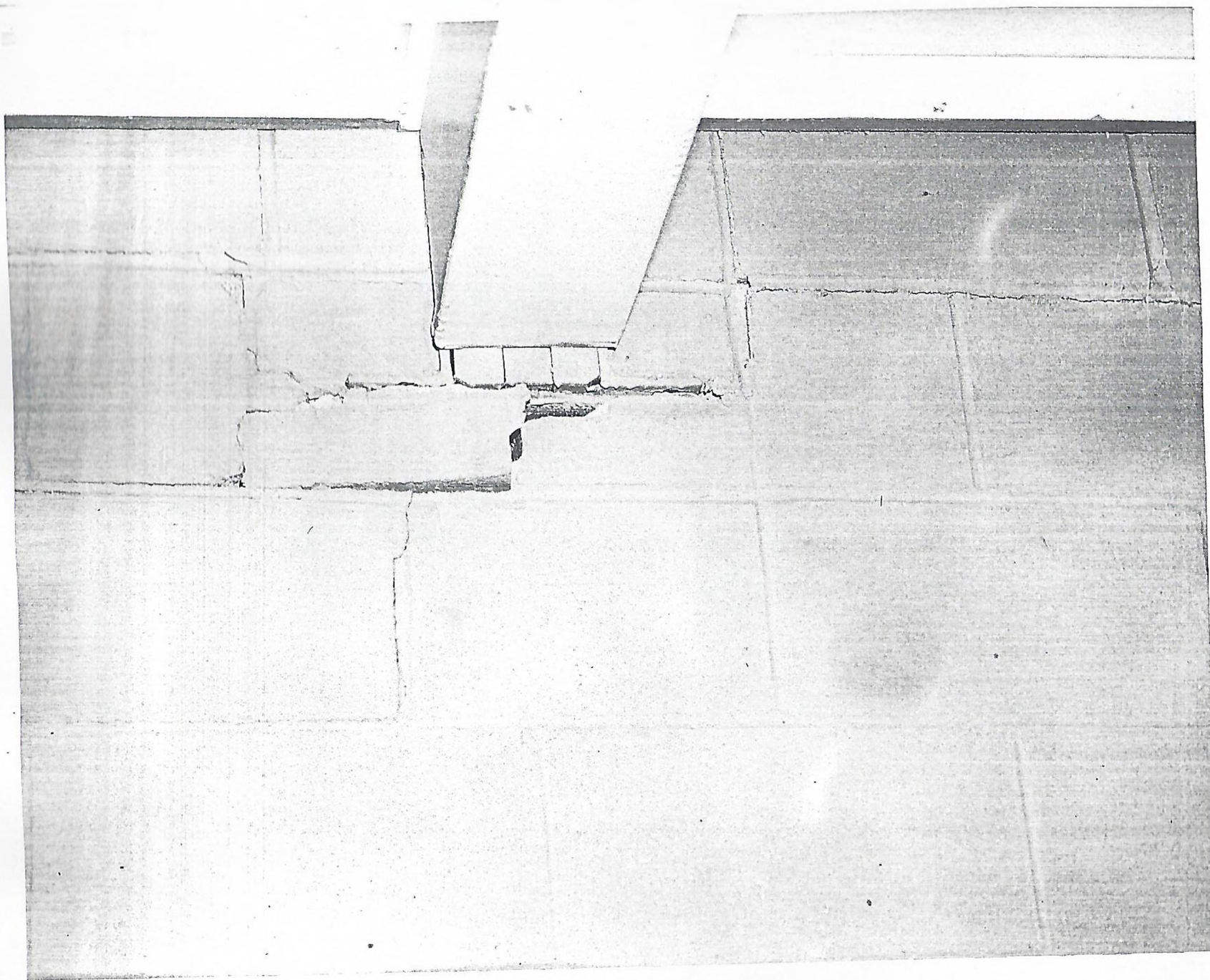


5-23-58

Leonardo, N. J.

Neg No KA 1361-9

East side of Missile assembly Bldg showing wall
and window damage.



5-23-58

Leonardo, W. J.

Neg No KA 3361-10

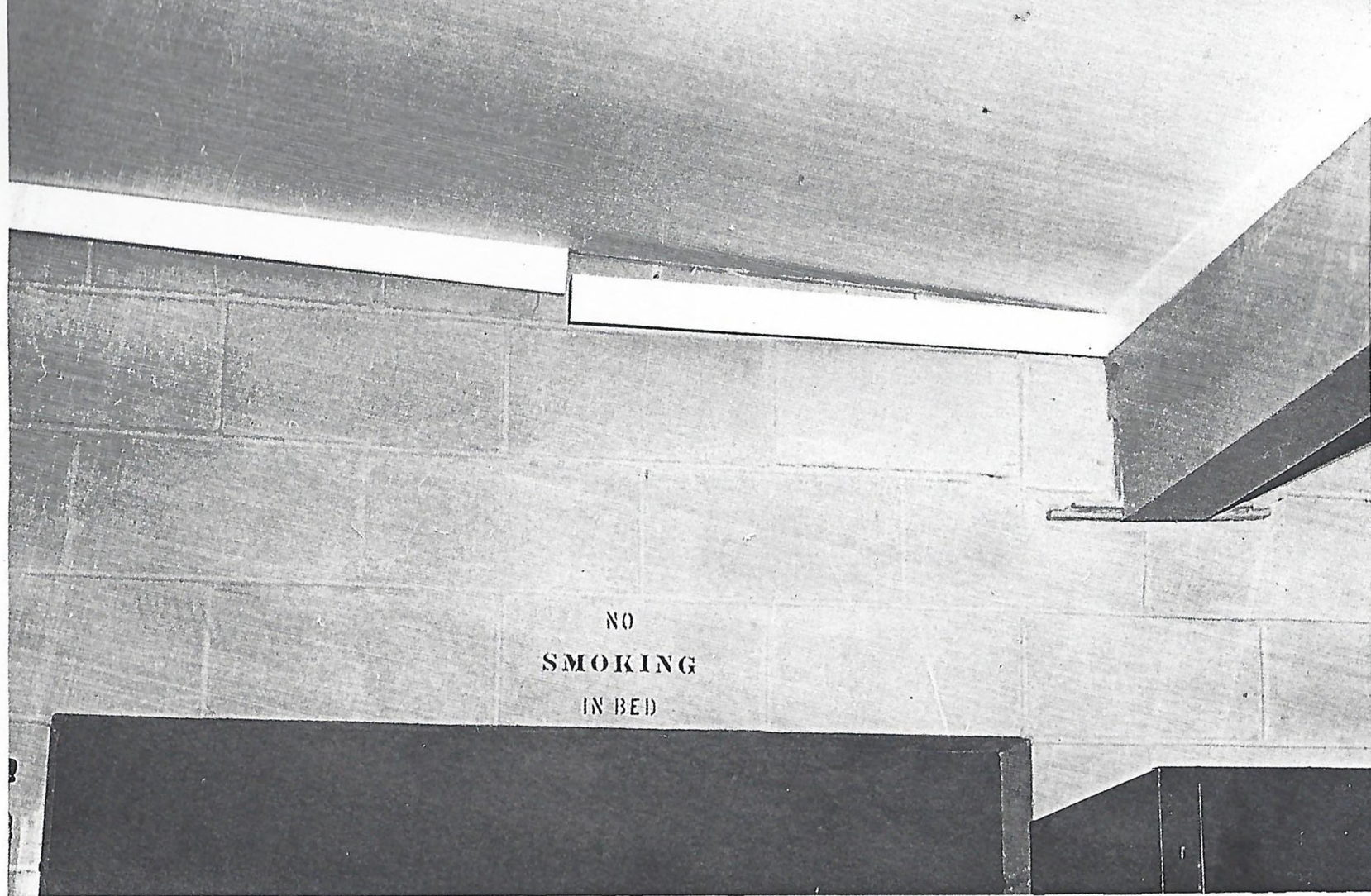
Admin. Bldg showing beam separation in orderly room.



5-23-58

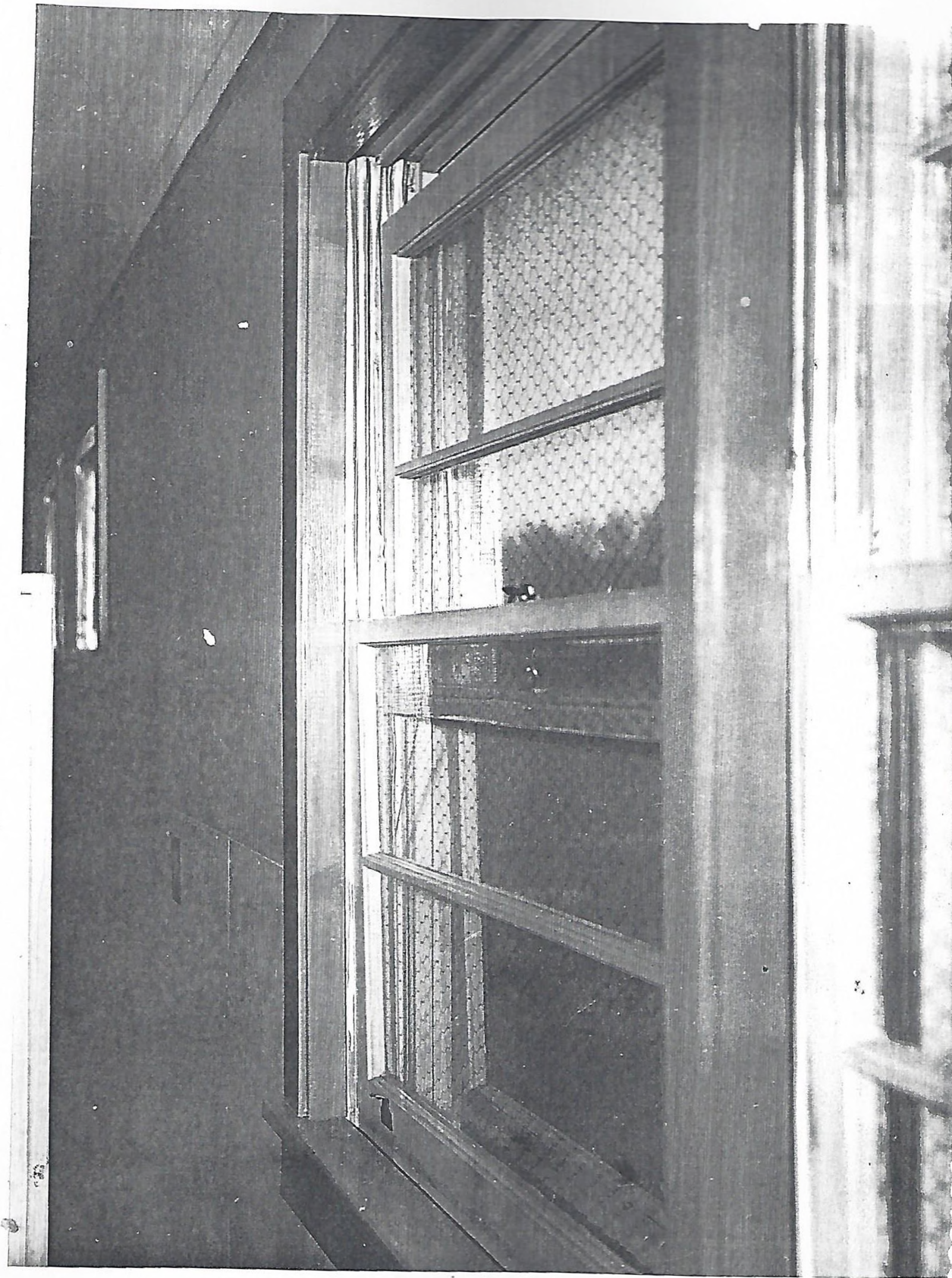
Leonardo, W. J.
Admin Bldg showing beam separation in Exec Office
and orderly room.

Neg No XA 1361-11



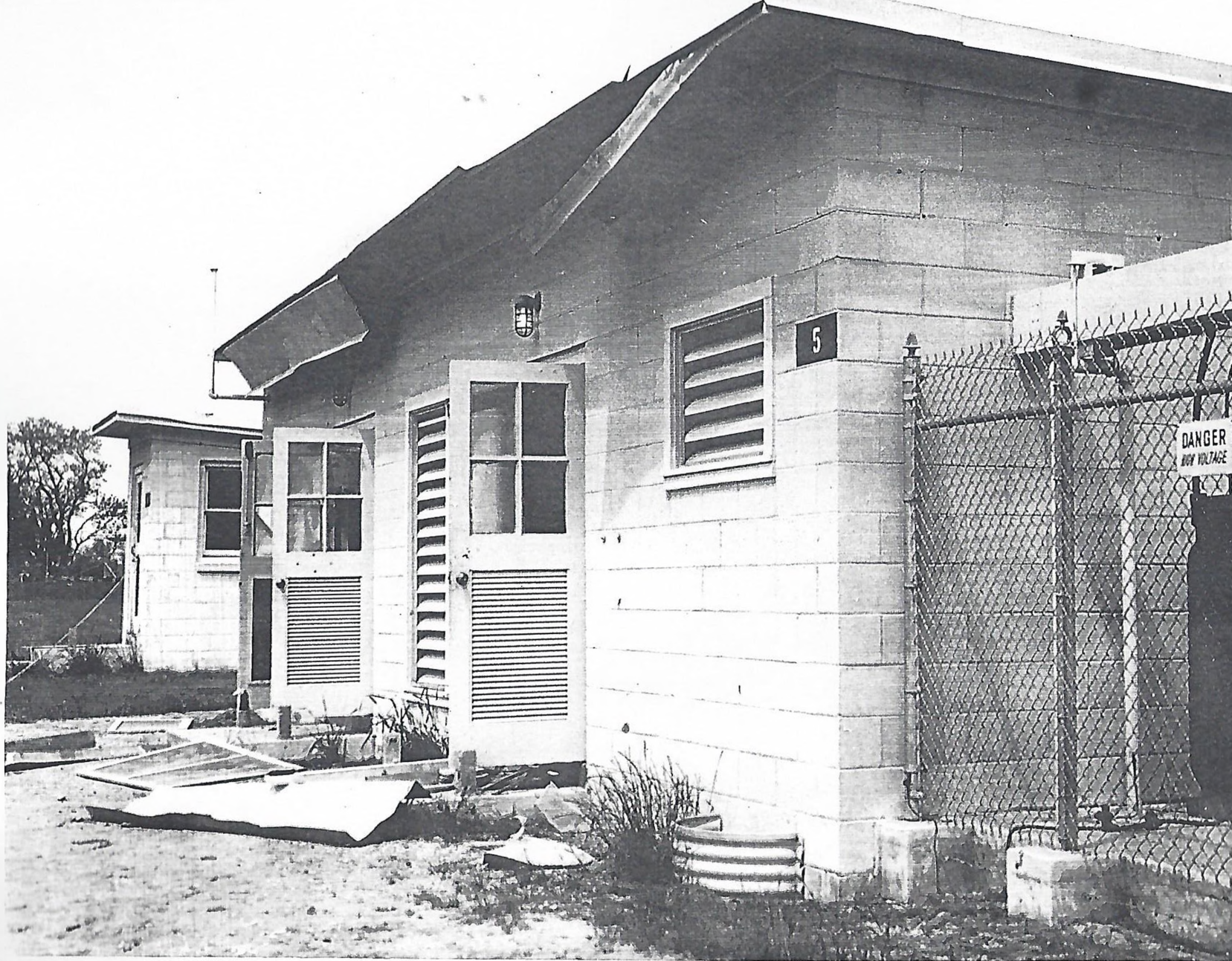
5-23-58

Leonardo, N. J. No Neg XA 1361-12
Interior of Barracks showing Interior beam damage.



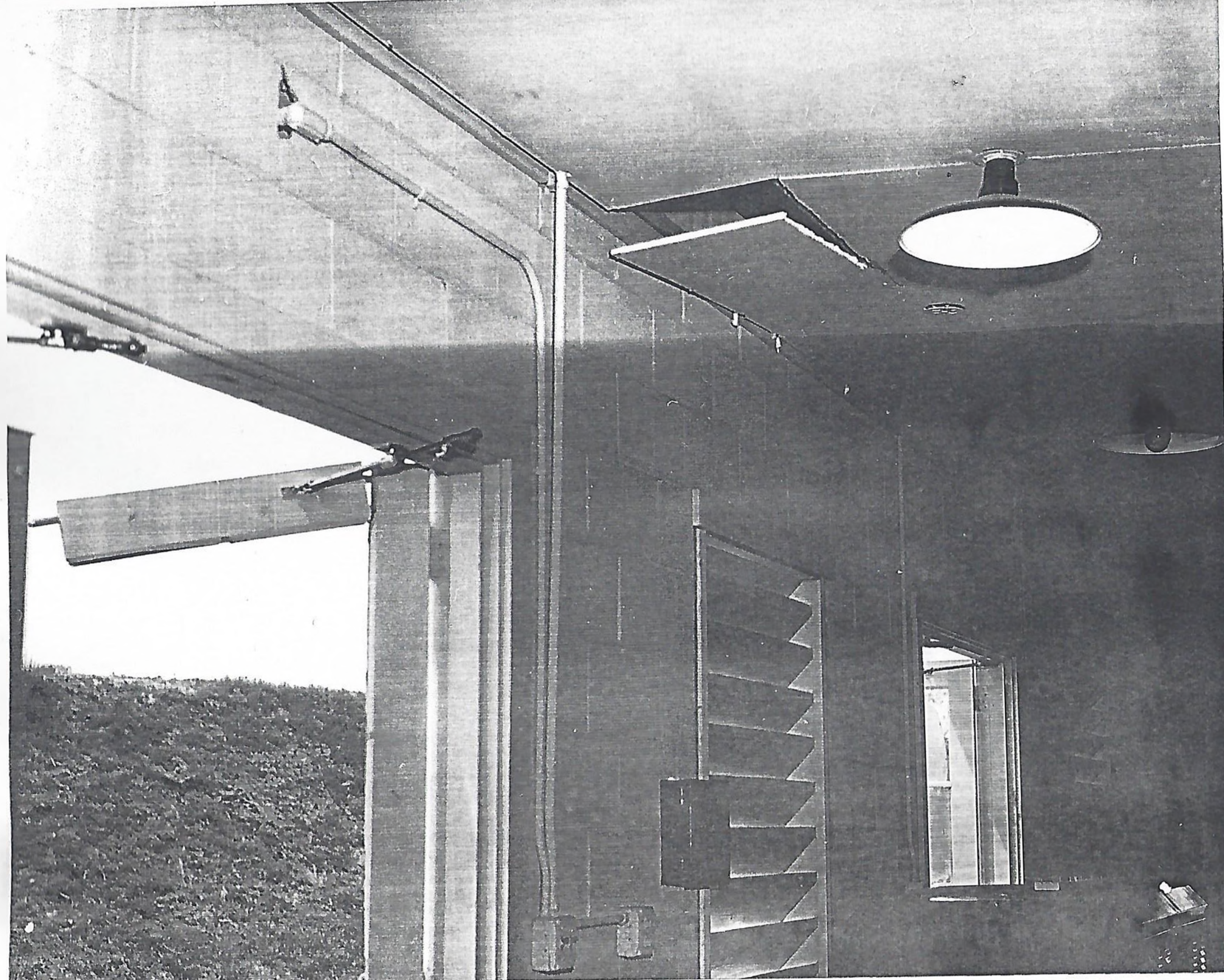
5-23-58

Leonardo, N. J. Neg No EA 1361-73
Interior of E M Barracks showing window damaged.



5-23-58

Leonardo, N. J. Neg No XA 1361-14
View showing damage to Generator Bldg. (front)



5-23-58

Leonardo, N. J.
Interior of Generator Bldg showing wall bulge
and damaged ceiling.

Neg No RA 1361-15



5-23-58

Leonardo, N. J.
Operators shelter Bldg.



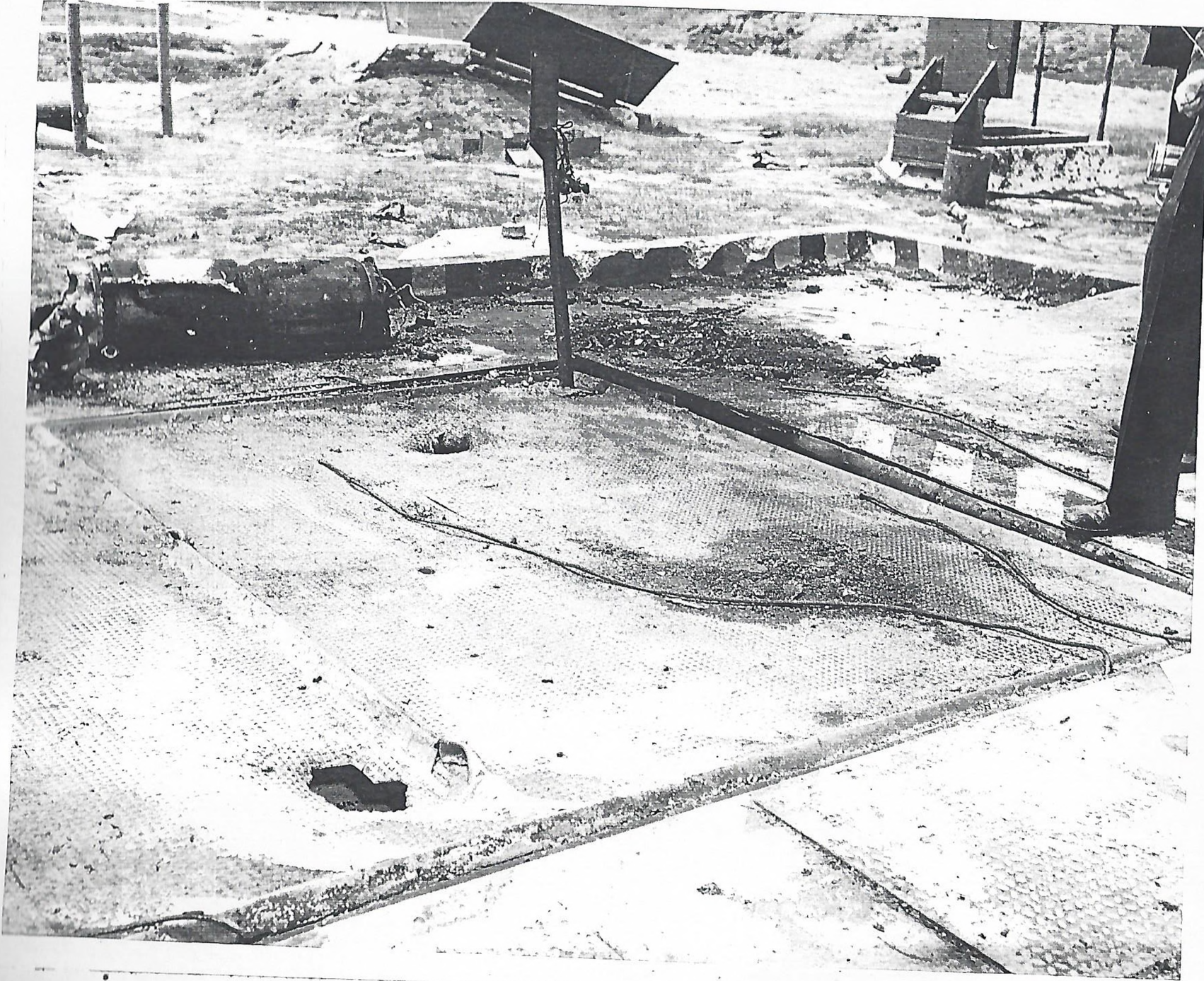
Neg No KA 1361-16



5-23-58

Leonardo, N. J.
View showing damage to underground box and
Elevator.

Neg No KA 1361-17

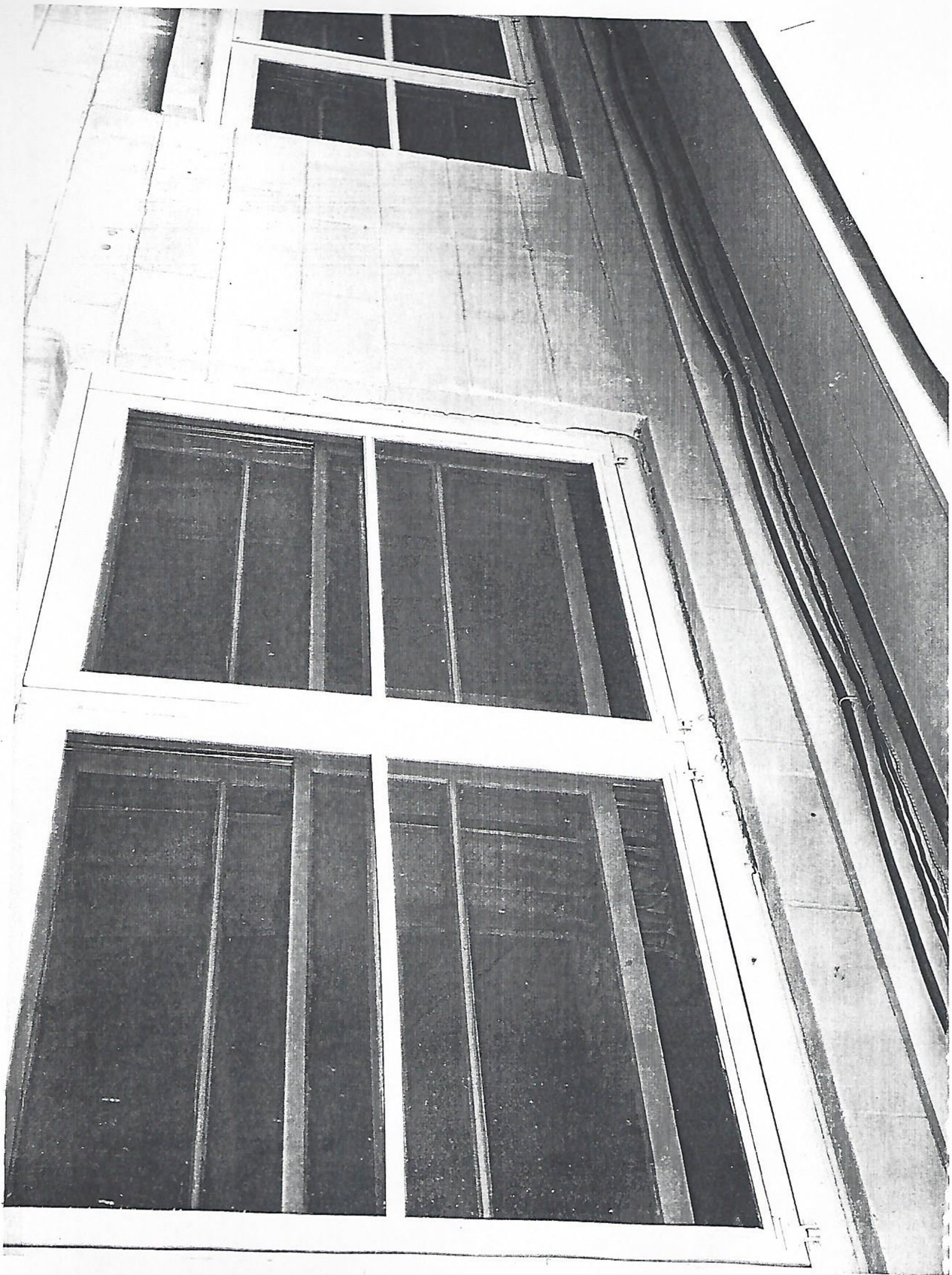


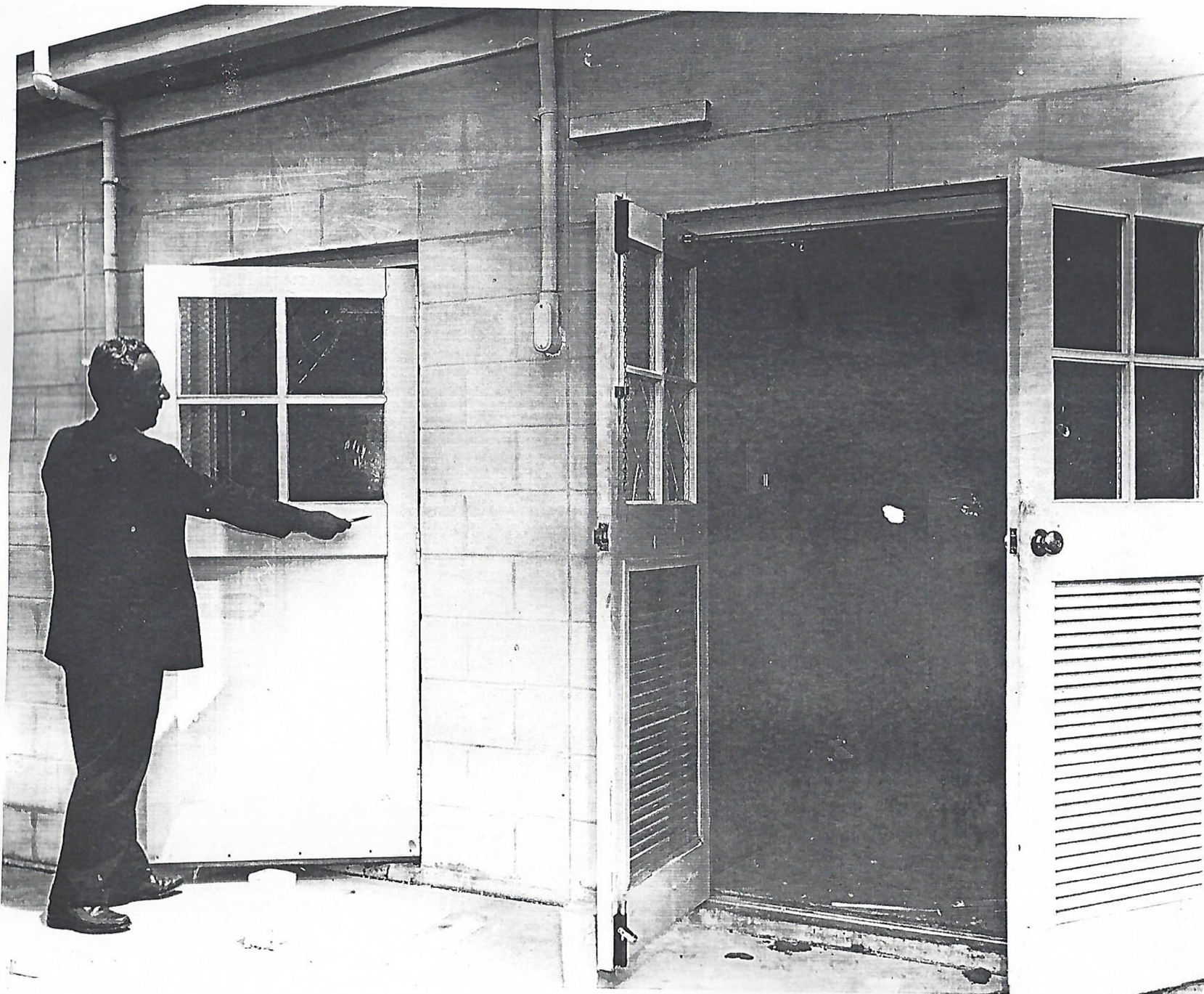
5-23-58

Leonardo, N. J.
Front of elevator showing holes and damaged
concrete.

Neg No XA 1361-18

5-23-58 Leonardo, W. J.
Rear of Admin. Bldg. showing beam break and window
separation. Neg No KA 1,261-2





5-23-58

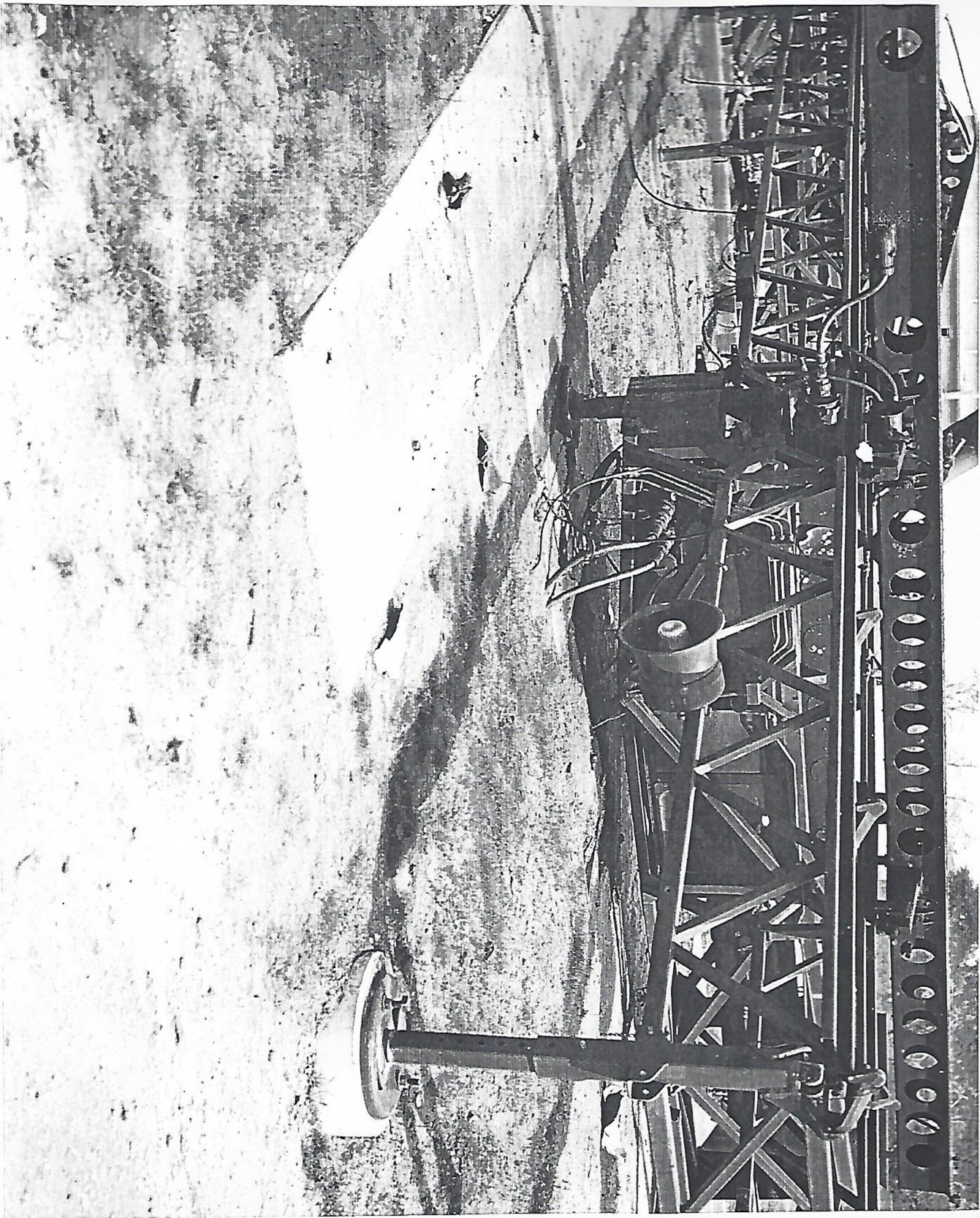
Leonardo, N. J.
Rear of Barracks Bldg. showing doors to Officers Quarters
and Boiler room damaged.

Neg No KA 1561-3



5-23-58

Leonardo, N. J. Neg No KA 1361-19
View showing hole in metal platform and damage
to elevator.



5-23-58

Leonardo, No. 1.
Pads of Launcher #1 in place.

Ref No KA 136A-20



5-23-58

Leonardo, H. J.

Neg No KA 1361-21

View showing damage to rear of Elevator platform
concrete chopped.



5-23-58

Leonardo, N. J. Neg No KA 1361-22
Rear of Launcher #3 showing pads and bolts
intact.



5-23-58

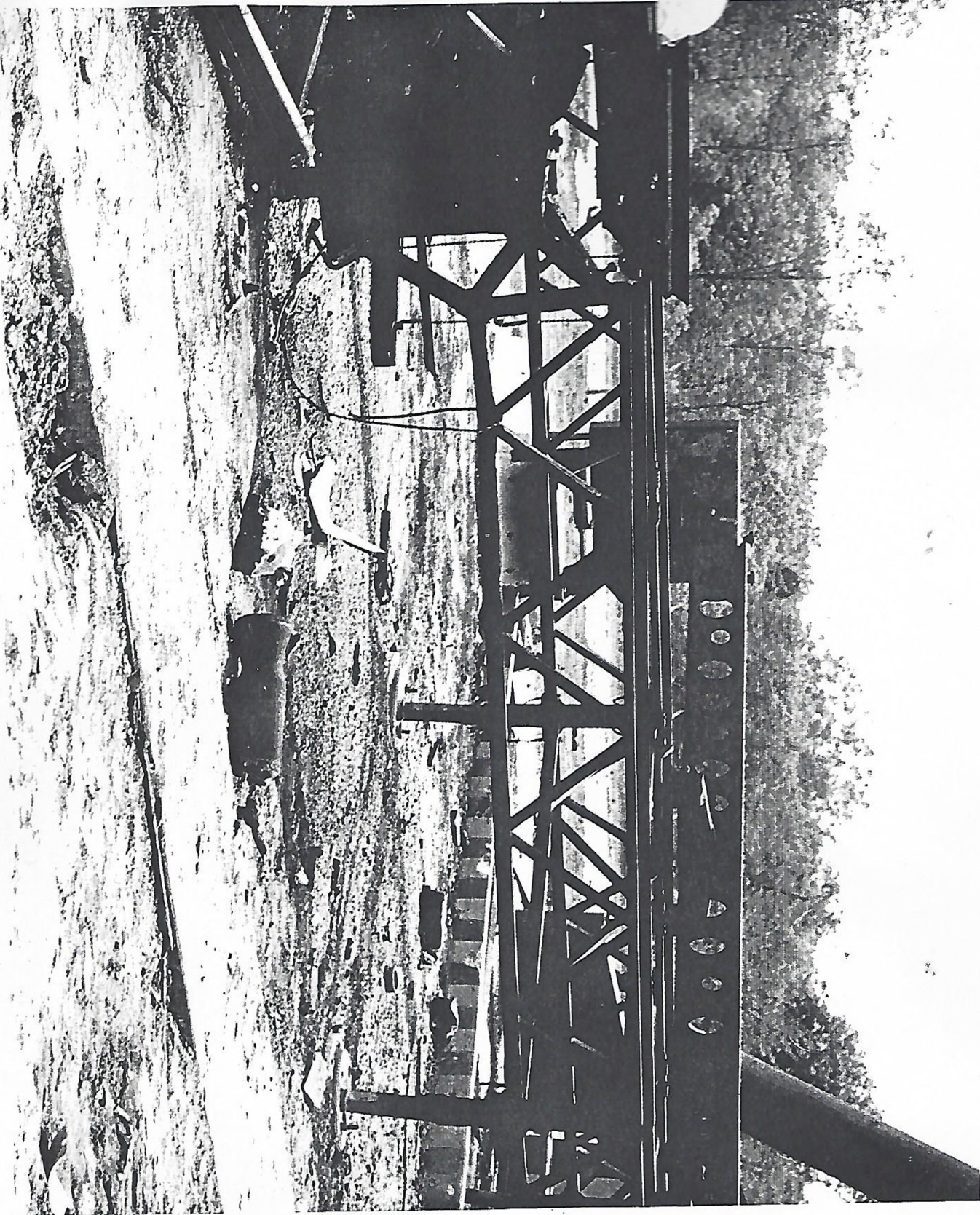
Leonardo, N. J. Neg No XA 1361-23
Front of Launcher #1, showing pads and bolts intact
concrete walk damaged.



5-23-58

Leonardo, N.J.
View showing hole dug in embankment.

Neg No KA 1361-24.



5-23-58

Leonardo, N. J.
Front of Launcher #3 showing damaged concrete walk
Neg No LA 1361-25



5-23-58

Leonardo, No. 3.

Front of Launchers showing concrete walk damaged.

Reg No LA 1361-26



5-23-58

View of Hol. ^{Ligonardo, M. J.} in front of launchers.

Box No RA 1361-27



5-23-58

Leonardo, N. J.
Gen. view showing overall damage.



Neg No XA 1361-28



5-23-58

Leonardo, N. J.
Gen. view of operator shelter and Generator Bldg.

Neg No XA 1361-29



5-23-58

Leonardo, W. J.
Gen. view of Minefield assembly Bldg.

NEG No KA 1361-30

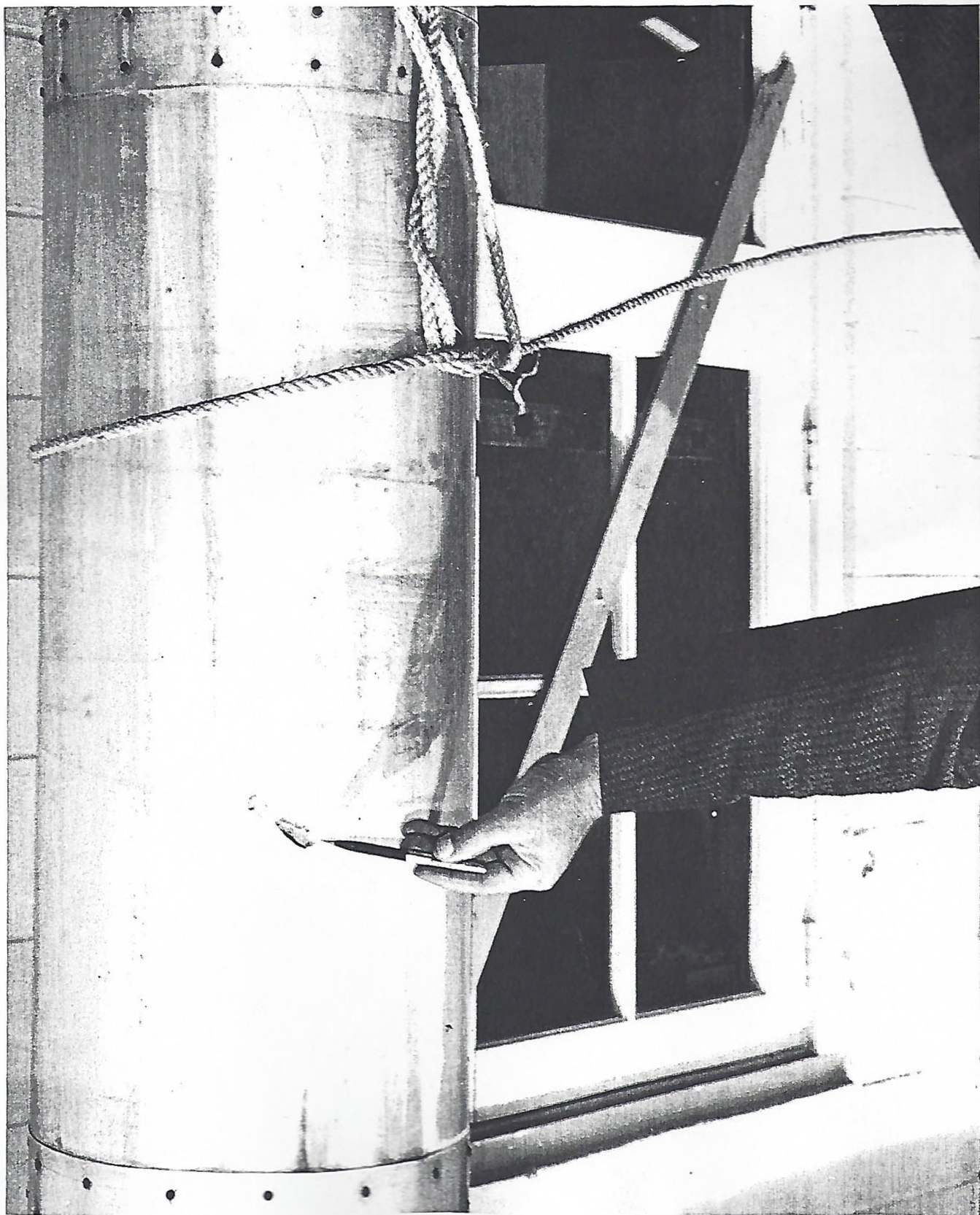


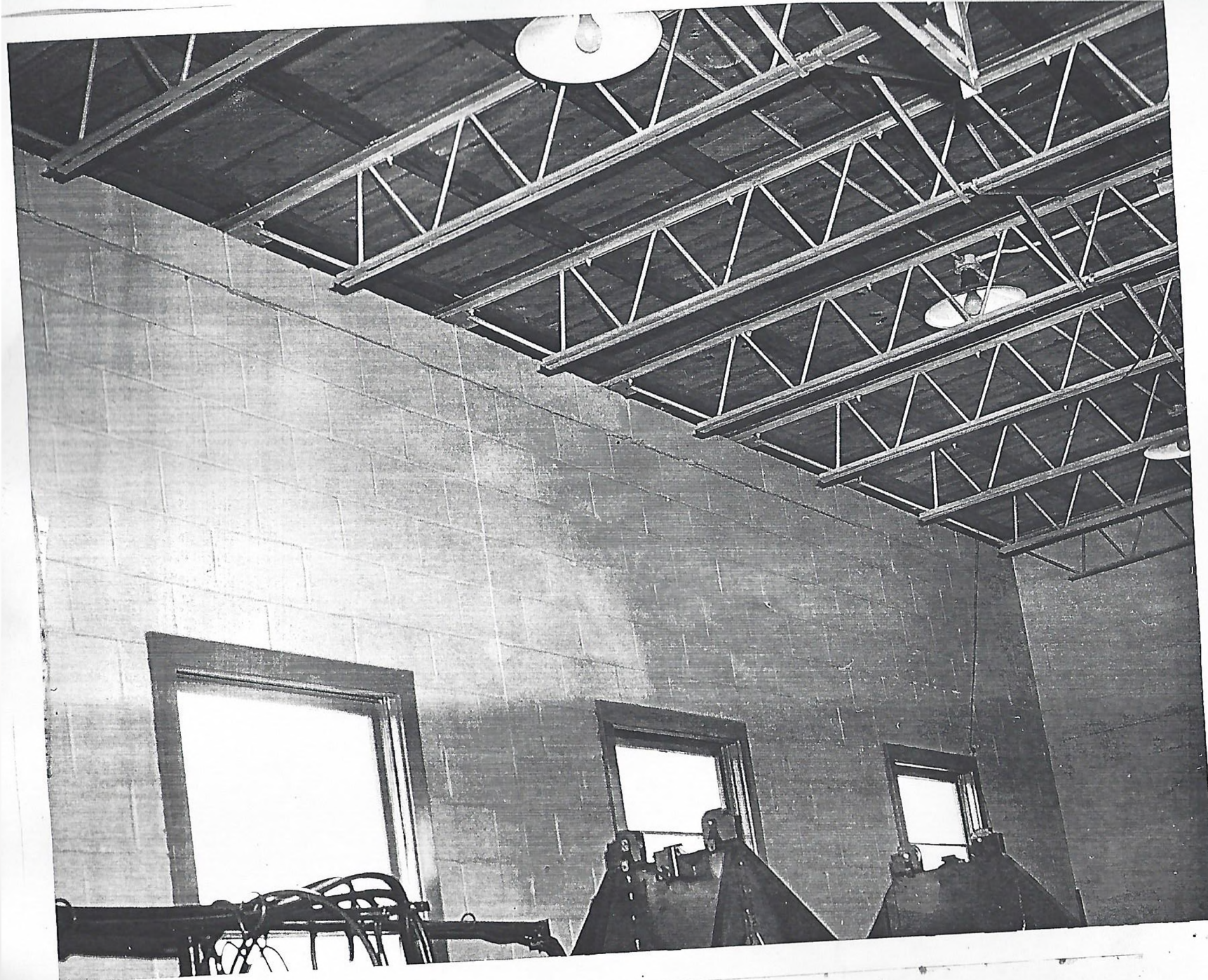
5-23-58

Leonardo, N. J. Neg No KA 1361-31
View of 1st and side of Missile Assembly Bldg
showing separation at roof and other damage.

Leonardo, H.J.
Neg No KA 1671-72
View showing damage to chimney, Missile Assembly
Bldg.

5-23-58





5-23-58

Leonardo, N. J. Neg No KA 1361-33
View showing break in wall of Missile Assembly
Bldg.

5-23-58

Leonardo, N. J.
Rear of Generator Hdg showing separation at
roof.
Neg No KA 1261-24

