AFIPE-13

AC/AS INTELLIGENCE-PHOTOGRAPHIC DIVISION
PHOTO INTELLIGENCE SECTION

BUILDING CONSTRUCTION ANALYSIS

CONFIDENTIAL
PAGE 1 OF 6 PAGES
DATE: 26 Dec. 1944
REVISED: 19 Apr. '45

TARGET: NAKAJIMA AIRCRAFT CO., (KOIZUMI PLANT)
LOCATION: Takasaki Area, Koizumi, Japan COORDINATES: 36°15' N 139°29' E

AREA & TARGET NO.
90.13/1545

	DATE	MISSION	PRINT NOS	PLAN SCALE	SHADOW SCALE	QUALITY
PHOTOGRAPHY	7 Nov. '44	3PR/414	V:4,29,30	1:16,550	1:9599	Good
	24 Mar. '45	3PR/598	3L: 35-41 (38)	1:9600	1:7780	Good

SUMMARY
(SEE FOLLOWING PAGES FOR DETAILS)

TOTALS

NO OF BLDGS	TOTAL PLAN AREA OF BUILDINGS		TOTAL FLOOR AREA OF BUILDINGS		TOTAL SITE AREA	
58-20 38	2380.0	1000'S OF SQ FT	2539.3	1000'S OF SQ FT	7650.0.	1000'S OF SQ FT

SUBTOTALS AND PERCENTAGES

REVISED ITEM	CLASSIFICATION	PLAN AREA, SUBTOTAL		PERCENT OF TOTAL PLAN AREA	
	COMBUSTIBILITY	2380.0		100.0%	31.18% built-up
	Combustible		662.8	27.8	
	Non-combustible		1646.5	69.2	
	Resistive		70.7	3.0	
	H. E. VULNERABILITY	2380.0			
	V1		70.7	3.0	
	V2		73.9	3.1	
	V3		51.6	2.2	
	V4		1052.9	44.2	

PREPARED FROM A STUDY OF AERIAL PHOTOGRAPHS AND A CONSIDERATION OF EVALUATED GROUND INFORMATION SUPPLIED BY THE JOINT TARGET GROUP

INTERPRETER C. H. Towne, Lt. USNR
JTG CONSULTANT

LEGEND: CONSTRUCTION TYPE SYMBOLS

1-STORY, AREA > 10,000 SQ FT, NO CRANES
SPAN < 75 FT.

SAWTOOTH
- ALL SAWTOOTH EXCEPT A1.2, A1.3, A1.4 — A1.1
- R C FRAME & ROOF SLAB — A1.2
- TOP CHORDS EXPOSED — A1.3
- STRESSED SKIN R C — A1.4

NON SAWTOOTH
- BEAMS & COLUMNS — A2.1
- ARCHES & RIGID FRAMES — A2.2
- TRUSSES — A2.3
- R C FRAME & ROOF SLAB — A2.4
- STRESSED SKIN INCL R C SHELL — A2.5

1-STORY, AREA > 10,000 SQ FT, NO CRANES
SPAN > 75'

2-WAY FRAME
- WITH HEAVY TRAV CRANE, EAVE HT > 30' — B1
- WITH LIGHT TRAV CRANE, EAVE HT < 30' — B2

CRANES
- COLUMNS 1 SIDE, LONG TRUSSES 3 SIDES — C1.1
- TRUSSES CONTINUOUS, 1 OR 2 DIRECTIONS — C1.2
- SAWTOOTH, TOP CHORDS EXPOSED — C1.3
- DIAMOND MESH ARCH — C1.4

1-WAY
- ARCHES — C2.1
- TRIANGULAR & BOWSTRING TRUSSES — C2.2
- FLAT TRUSSES (INCL EXP CHORD SAWTOOTH) — C2.3

- STRESSED SKIN INCL R C SHELL — C3

MULTI-STORY
- FRAMED, EARTHQUAKE RESISTANT — E1
- FRAMED, OTHER — E2
- WALL-BEARING, EARTHQUAKE RESISTANT — F1
- WALL-BEARING, OTHER — F2

- 1-STORY, < 10,000 SQ FT, ANY CONSTR'N — D
- SPECIAL INDUSTRIAL STRUCTURES — S

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BUILDING CONSTRUCTION ANALYSIS CONTINUED

AREA & TARGET NO: 90.13-1545

CONFIDENTIAL
PAGE 2 OF 6 PAGES
DATE: 26 DEC 44
REVISED: 19 APRIL 45

R=REVISED	SECTION	REF NUMBER	REF SUBDIVISION	OCCUPANCY	LENGTH, FT	WIDTH, FT	PLAN AREA 1000'S OF SQ FT	NO OF FLOORS	FLOOR AREA 1000'S OF SQ FT	HEIGHT TO EAVES	HEIGHT TO RIDGE	SIZE OF BAY	ROOF MATERIAL	CONSTRUCTION TYPE	COMBUSTIBILITY*	H E VULNERABILITY**
R		1		UNIDENTIFIED	200	60	12.0	1	12.0	15'	-	30'	LT.	D	C	V4
R	X	2		RAZED												
R		3		UNIDENTIFIED			23.4		23.4				LT	B-2	N	V2
			a		180	20	3.6	1		23	30	20				
			b		180	60	10.8	1		29	39	60				
			c		180	50	9.0	1		23	-	50				
R		4		STORAGE			13.1	1	13.1				LT.	A2.3	C	V4
			a		60	30	1.8			10'	-	30				
			b		155 45	50 25	8.9			10'	-	50				
			c		60	40	2.4			14'	-	40				
R		5		UNIDENTIFIED	345	105	36.2	1	36.2	25	-	32 40 32	LT.	A2.3	C	V4
R		6		STORAGE	340	35	11.9	1	11.9	10'	-	35	LT	A2.3	C	V4
R	X	7.		RAZED												
R		8		STORAGE	125	60	7.5	1	7.5	12	20	60	LT	D	C	V4
R		9		STORAGE	95	50	4.7	1	4.7	16	-	50	LT.	D	C	V4
R		10	a	RAZED												
			b	UNIDENTIFIED	95	30	2.9	1	2.9	10	15	30 30	LT	D	C	V4
R	P	11	a	SUB-ASSEMBLY & ASSEMBLY	1050	360	378.0	1	378.0	35	46	75x180	LT	C1.3	N	V4A
			d		1050	30	31.5	1	31.5	16	-	30'	LT	A2.3	C	V4
			b	STORAGE (0.9 REMAINING)												
			c	REMAINING UNITS BELOW ESTABLISHED MIN SIZES.												
R	P	12	a	SUB-ASSEMBLY & ASSEMBLY	950	180	171.0	1	171.0	29	39	120x180	LT	C1.3	N	V4A
			d		180	180	32.4	1	32.4	37	47	180x180	LT	C1.3	N	V4A
			e		1130	25	28.3	1	28.3	15	-	25	LT	A2.3	C	V4
			b	STORAGE	380	40	15.2	1	15.2	14	22	40	LT.	A2.3	C	V4
			c	REMAINING UNITS BELOW ESTABLISHED SIZES.												
							768.1		768.1							

*R=FIRE-RESISTANT, N=NON-COMBUSTIBLE, C=COMBUSTIBLE; C/R (MULTI-STORY BLDGS ONLY) ="C" ROOF, REMAINDER "R"
**V1 IS LEAST VULNERABLE TO H E ATTACK, V2 IS MORE VULNERABLE AND SO ON. SEE JTG MEMO NO JTG/M/3/1, REVISED.

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BUILDING CONSTRUCTION ANALYSIS CONTINUED

AREA & TARGET NO: 90.13-1545

CONFIDENTIAL
PAGE 3 OF 6 PAGES
DATE: 26·12·44
REVISED: 19 APRIL 45

R=REVISED	SECTION	REF NUMBER	REF SUBDIVISION	OCCUPANCY	LENGTH, FT	WIDTH, FT	PLAN AREA 1000'S OF SQ FT	NO OF FLOORS	FLOOR AREA 1000'S OF SQ FT	HEIGHT TO EAVES	HEIGHT TO RIDGE	SIZE OF BAY	ROOF MATERIAL	CONSTRUCTION TYPE	COMBUSTIBILITY*	H E VULNERABILITY**
R	P	13	a	SUB-ASSEMBLY & ASSEMBLY	715	240	171.5	1		29	39	71X120	LIGHT	C1.3	N	V4A
			d	↓	715	25	17.9	1		14	-	25X	LIGHT	A2.3	C	V4
			b	STORAGE ·	60	40	2.4	1		12'	20'	40	LIGHT	D	C	V4
			c	REMAINING UNITS BELOW ESTABLISHED MIN. SIZE.												
									191.8							
R	P	14	a	SUB-ASSEMBLY & ASSEMBLY	575	240	138.0	1	138.0	29	39	72X120	LIGHT	C1.3	N	V4A
			f	↓	285	25	7.1	1	15.1	12	23	25	"	A2.3	C	V4
			e		145	30	4.4	1		12	26'	30	"			
			d		145	25	3.6	1		12	23	25	"			
			b	REMAINING UNITS BELOW ESTABLISHED MIN SIZES												
			c	↓												
R	X	15		COMPLETELY RAZED												
R	X	16		↓												
R	X	17														
R	X	18														
R	X	19									1					
R		20		STORAGE ·	405	70'	28.4	1	28.4	16'	-	35'	LT	A2.3	C	V4
R		21	a	STORAGE	200	210	42.0	1	42.0	16	29	35	LT	A2.3	C	V4
			b	RAZED ·												
R	P	22		MACHINE SHOP	95	135	12.8	1	12.8	16	39	27X135	LT	A1.1	C	V4
R		23		UNIDENTIFIED			15.6	1	15.6				LT	A2.3	C	V4
			a		75	80	6.0					50 30				
			b		120	60	7.2					60				
			c		120	20	2.4					20				
R	X	24		RAZED												
R	P	25	a	PRESSING · SMALL PARTS MFG ·	925	240	222.0	1	222.0	18	25	30'x -	LT	A1.1	N	V4
			b	UNITS REMAINING, BELOW ESTABLISHED MIN. SIZE												
			c	↓												
							665.7		665.7							

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AFIPR-19A

BUILDING CONSTRUCTION ANALYSIS CONTINUED

AREA & TARGET NO: 90.13-1545

CONFIDENTIAL
PAGE 4 OF 6 PAGES
DATE: 26 DEC 44
REVISED: 19 APRIL 45

R=REVISED	SECRET/SECURITY	REF NUMBER	REF SUBDIVISION	OCCUPANCY	LENGTH, FT	WIDTH, FT	PLAN AREA 1000'S OF SQ FT	NO OF FLOORS	FLOOR AREA 1000'S OF SQ FT	HEIGHT TO EAVES	HEIGHT TO RIDGE	SIZE OF BAY	ROOF MATERIAL	CONSTRUCTION TYPE	COMBUSTIBILITY*	H E VULNERABILITY**
R	P	26	a	SUB-ASSEMBLY	895	290	260.0	1	260.0	19	30	29x -	LT	A1.1	N	V4
			b	STORAGE	60	50	3.0	2	6.0	23	33	12'	LT	E2	C	V3
			c	REMAINING UNITS BELOW ESTABLISHED MIN. SIZE												
R		27	a	UNIDENTIFIED	205	75	15.4	1	15.4	22	31	75	LT	A2.3	N	V4
R	X	28		DITTO (RAZED)												
R		29		UNIDENTIFIED	170	75	12.8	1	12.8	16	25	75	LT	A2.3	N	V4
R	P	30	a	SUB-ASSEMBLY	1010	230	232.3	1	232.3	23	31	30x84'	LT	A1.1	N	V4
			b	REMAINING UNITS BELOW ESTABLISHED MIN SIZES												
			c	↓												
R		31	a	SUB-ASSEMBLY & ASSEMBLY	540	300	162.0	1	162.0	38	47	90x 53x 150	LT	C1.3	N	V4A
			e		540	30	16.2	1	16.2	-	-	30	LT	A2.3	C	V4
			b	STORAGE	80	40	3.2	2	6.4	23	33	12'	LT	E2	C	V3
			c	RAZED												
			d	RAZED												
R		32		UNIDENTIFIED			4.8	2	9.6				LT	E2	C	V3
					60	40	2.4			31	-	20				
					60	40	2.4			31	-	20				
R		33		BOILER HOUSE	100	95	9.5	1	9.5	30	47	20 30 20	LT	D	N	V4
R		34	a	STORAGE (RAZED)												
			b	↓	85	50	4.3	2	8.6	23	31	12'	LT	E2	C	V3
R	X	35	a	RAZED												
			b													
		36		UNIDENTIFIED												
			a		145	40	5.8	1	5.8	16	27	40	LT	B2	N	V2
			b		145	70	10.5	1	10.5	31	43	70	LT	B2	N	V2
			c		60	110	6.6	2	13.2	-	47	12	LT	E2	C	V3
			d		115	50	5.8	1	5.8	-	-	-	LT	E2	C	V3
			e		85	50	4.3	2	8.6	30	-	12'	LT	E2	C	V3
							756.5		782.7							

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BUILDING CONSTRUCTION ANALYSIS CONTINUED

AREA & TARGET NO: 90.13-1545

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DATE: 26 DEC 44
REVISED: 19 APRIL 45

R=REVISED	SCRAMBLED	REF NUMBER	REF SUBDIVISION	OCCUPANCY	LENGTH, FT	WIDTH, FT	PLAN AREA 1000'S OF SQ FT	NO OF FLOORS	FLOOR AREA 1000'S OF SQ FT	HEIGHT TO EAVES	HEIGHT TO RIDGE	SIZE OF BAY	ROOF MATERIAL	CONSTRUCTION TYPE	COMBUSTIBILITY*	H E VULNERABILITY**
R	X	37		RAZED												
R		38		STORAGE	200	60	12.0	2	24.0	18'	28	30 30	LT	E2	C	V3
R		39		STORAGE			11.6	2	232	30	30'		HEAVY	E1	R	V1
			a		65	20	1.3					20				
			b		40 25	30 20	1.2 2.5					15 TO 20				
			c		220	30	6.6					15'				
R		40		OFFICE	285	50	14.3	2	28.6	30	30	18'	HEAVY	E1	R	V1
R		41		UNIDENTIFIED	180	50	9.0	1	9.0	14'	23	50	LT	D	C	V4
R		42		ADMINISTRATION			44.8	3	134.4	39	39	20	HEAVY	E1	R	V1
			a		340	60	21.4									
			b		340	60	21.4									
			c		50	40	2.0									
R	X	43		RAZED												
R		44		UNIDENTIFIED												
			a		95	30	2.9	2	5.8	19	-	14'	LT	E2	C	V3
			b		95	30	2.9	2	5.8	19	-	14	LT	E2	C	V3
			c		120	60	7.2	1	7.2	19	31	60	LT	D	C	V4
			d		120	15	1.8	2	3.6	19	-	15'	LT	E2	C	V3
R		45		STORAGE	140	50	7.0	1	7.0	14'	24'	50'	LT	D	C	V4
R	X	46		RAZED												
R		47		STORAGE	115	50	5.8	1	5.8	14	24	50	LT	D	C	V4
							119.3		254.4							

*R = FIRE-RESISTANT, N = NON-COMBUSTIBLE, C = COMBUSTIBLE; C/R (MULTI-STORY BLDGS ONLY) = "C" ROOF, REMAINDER "R"
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BUILDING CONSTRUCTION ANALYSIS CONTINUED

AREA & TARGET NO

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PAGE 6 OF 6 PAGES
DATE: 26 DEC 44
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R=REVISED	SEGMENT	REF NUMBER	REF SUBDIVISION	OCCUPANCY	LENGTH, FT	WIDTH, FT	PLAN AREA 1000'S OF SQ FT	NO OF FLOORS	FLOOR AREA 1000'S OF SQ FT	HEIGHT TO EAVES	HEIGHT TO RIDGE	SIZE OF BAY	ROOF MATERIAL	CONSTRUCTION TYPE	COMBUSTIBILITY*	H E VULNERABILITY**
R		48		PROD FOUNDRY & STORAGE												
			a		165	75 20	12.4 3.3	1	15.7	23	36	75 20	LT	B2	N	V2
			b	STORAGE	70	30	2.1	1	2.1	14	19	30	LT	D	C	V4
			c	STORAGE	70	30	2.1	1	2.1	14	19	30	LT	D	C	V4
			d		50	145	7.3	1	7.3	-	36		LT	B2	N	V2
			e													
			f													
			g		65	35	2.3	1	2.3	-	-	35	LT	D	C	V4
			h		95	30	2.9	1	2.9	23	-	30	LT	B2	N	V2
			j		165	50	8.3	1	8.3	23	-	50	LT	B2	N	V2
R	X	49		RAZED												
R	X	50		RAZED												
R	X	51		RAZED												
R	X	52		RAZED												
R	X	53		RAZED												
R		54		UNIDENTIFIED												
			a		250	60	15.0	1	15.0	14'	23'	60	LT	A2 3	C	V4
			b													
			c													
R	X	55		RAZED												
R	X	56		RAZED												
R	X	57		RAZED												
		58		STORAGE												
			a	THESE LIMITS BELOW ESTABLISHED MIN. SIZE.												
			b													
			c		145 140	50 10	7.3 1.4	1	8.7	10	-	50	LT	D	C	V4
			d		240	25'	6.0	1	6.0	10	-	25'	LT	D	C	V4
							70.4		70.4							

*R=FIRE-RESISTANT, N=NON-COMBUSTIBLE, C=COMBUSTIBLE; C/R (MULTI-STORY BLDGS ONLY) ="C" ROOF, REMAINDER "R"
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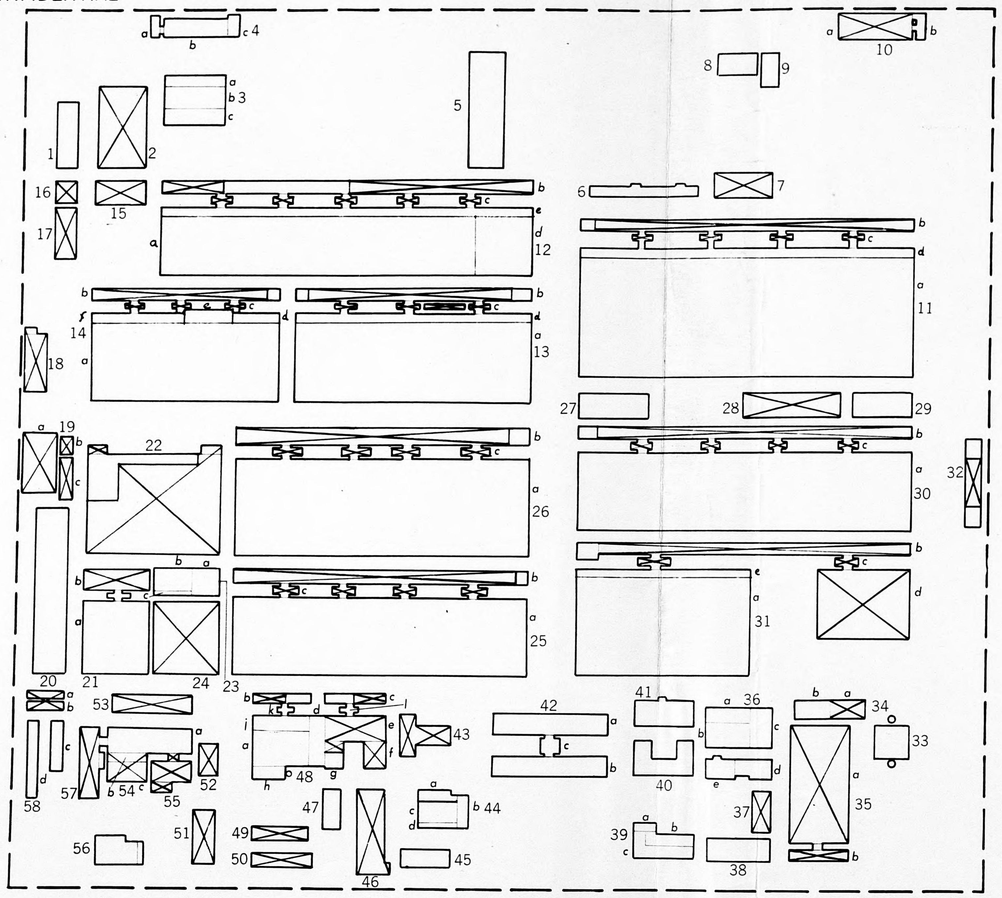

WORKERS QUARTERS AND RECREATION AREA

CONFIDENTIAL

SCALE IN FEET

0 200 400 600 800 1000

AC/AS INTELLIGENCE PHOTOGRAPHIC DIVISION
PHOTO INTELLIGENCE SECTION

NAKAJIMA AIRCRAFT CO.

KOIZUMI . JAPAN

TARGET NO. 90.13/1545

PHOTOGRAPHY OF 24 MAR 1945

C.F.L. 744.021

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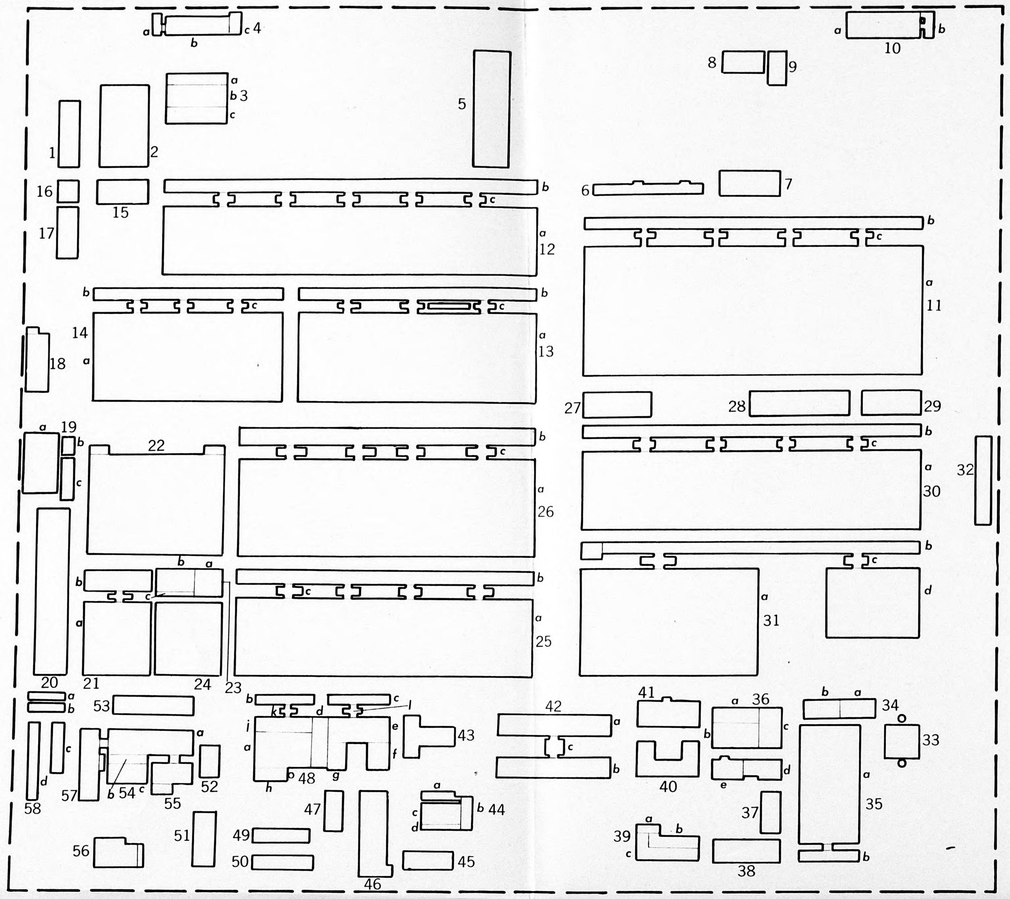


WORKERS QUARTERS AND RECREATION AREA

CONFIDENTIAL

SCALE IN FEET

1:3600

0 200 400 600 800 1000

AC/AS INTELLIGENCE PHOTOGRAPHIC DIVISION
PHOTO INTELLIGENCE SECTION

NAKAJIMA AIRCRAFT CO.

KOIZUMA, JAPAN

TARGET NO. 90.13/1545

PHOTOGRAPHY OF 7 NOV. 1944

C.F.L. 744.021

COVER USED								
MISSION	PRINTS	DATE	QUALITY	SCALING DATA				
				PRINT	BEARING	SHAD. RAT.	PLAN SC.	SHAD. SC.
SPR/MAY	V-4, 29, 30	7 Nov 44	6000	30		0.58	1:16550	1:9599
LAT. 36° 15 N	LONG. 139° 29 E	ENL. NO.		ENL. RAT.		SCALE 1:3600		

AC/AS INTELLIGENCE - PHOTOGRAPHIC DIVISION
JOINT P/I GROUP

BUILDING CONSTRUCTION ANALYSIS

TARGET NAKAJIMA AIRCRAFT CO - KOIZUMI PLANT
LOCATION TAKASAKI AREA, JAPAN

CONFIDENTIAL

T/V

DATE DEC 23, 1944
INTERPRETER Towne
SHEET NO. 1 OF 7 SHEETS

AREA NO. 90.13 / TARGET NO. 1545

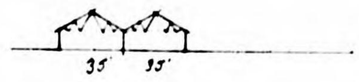
Checked 3 Jan 45
W. F. Swiger

ALL BUILDINGS

REF. NUMBER (1)	REF. SUBDIVISION (2)	OCCUPANCY (3)	LENGTH (4)	WIDTH (5)	PLAN AREA (6)	NO. OF FLOORS (7)	TOTAL AREA (8)	HEIGHT EAVES (9)	HEIGHT RIDGE (10)	ROOF SPAN IN FT. (11)	ROOF COMBUSTIBLE (12)	ROOF NON-COMBUST. (13)	ROOF RESISTANT (14)	FLOORS COMBUSTIBLE (15)	FLOORS NON-COMBUST. (16)	FLOORS RESISTANT (17)	TYPE STL. FRAME (18)	TYPE WD. FRAME (19)	TYPE LD. BEARING (20)
1		UNIDENTIFIED	.19	.07	13.3	1	13.3	12	19	35	✓							✓	
2		DITTO	.25	.15	37.5	1	37.5	12	19	37	✓							✓	
3	a	DITTO	.19	.03	5.7	1		-	-	30		✓					✓		
	b		.19	.07	13.3	1		-	-	70		✓					✓		
	c		.19	.05	9.5	1		-	-	50		✓					✓		
	#						28.5												
4	a	STORAGE	.07	.03	2.1	1	2.1	12	19	30'	✓							✓	
	b		.20	.05	10.0	1	10.0	12	-	25'	✓							✓	
	c		.07	.03	2.1	1	2.1	12	19	30'	✓							✓	
5		UNIDENTIFIED	.35	.12	42.0	1	42.0	18	26	40'	✓							✓	
6		STORAGE	.34	.03	10.2	1	10.2	12	19	30'	✓							✓	
7		UNIDENTIFIED	.18	.07	12.6	1	12.6	-	19	23		✓					✓		
8		STORAGE	.13	.07	9.1	1	9.1	12		23	✓							✓	
9		DITTO	.10	.05	5.0	1	5.0	18	24'	25'	✓							✓	
10	a	UNIDENTIFIED	.22	.08	17.6	1	17.6	-	-	16'	✓							✓	
	b		.10	.02	2.0	1	2.0	12	19	20	✓							✓	
	#																		
TOTALS THIS PAGE					192.0		192.0												

PLAN AREA OF BUILDINGS 3409.2 1000'S OF SQ. FT. TOTAL FLOOR AREA OF BUILDINGS 3546.1 1000'S OF SQ. FT. TOTAL SITE AREA 180.4 ACRES

PRIMARY & SECONDARY BUILDINGS ONLY

REF. NUMBER (21)	REF. SUBDIVISION (22)	STRUCTURAL DETAILS [redacted] (23)
1		

NOTE: ALL WOOD FRAME BUILDINGS ARE ASSUMED TO HAVE SPANS APPROXIMATING 20 TO 30' OR LESS.

COVER USED								
MISSION	PRINTS	DATE	QUALITY	SCALING DATA: PRINT	BEARING	SHAD. RAT.	PLAN SC.	SHAD. SC.
LAT.	LONG.	ENL. NO.	ENL. RAT.	SCALE				

AC/AS INTELLIGENCE - PHOTOGRAPHIC DIVISION
JOINT P/I GROUP

BUILDING CONSTRUCTION ANALYSIS

TARGET NAKAJIMA AIRCRAFT CO. - KOIZUMI PLANT
LOCATION TAKASAKI AREA, JAPAN

CONFIDENTIAL

T/V

DATE DEC. 23, 1944
INTERPRETER Towne
SHEET NO. 2 OF 7 SHEETS

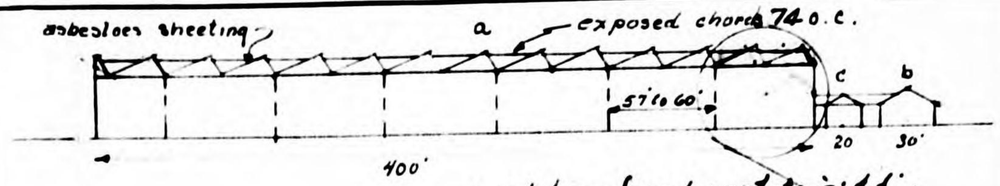
AREA NO. 90.13 / TARGET NO. 1545

ALL BUILDINGS

REF. NUMBER	SUBDIVISION	OCCUPANCY	LENGTH	WIDTH	PLAN AREA	NO. OF FLOORS	TOTAL AREA	HEIGHT EAVES	HEIGHT RIDGE	ROOF SPAN IN FT.	ROOF COMBUSTIBLE	ROOF NON-COMBUST.	ROOF RESISTANT	FLOORS COMBUSTIBLE	FLOORS NON-COMBUST.	FLOORS RESISTANT	TYPE STL. FRAME	TYPE WD. FRAME	TYPE LD. BEARING
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
TOTALS BROUGHT FORWARD					192.0		192.0												
** 11	a	SUB-ASSEMBLY & ASSEMBLY	1.04	.40	416.0	1	416.0	-	46 48	74		✓				✓	✓		
	b	STORAGE	1.04	.03	31.2	1	31.2	12		30'	✓							✓	
	c	(4)	.08	.02	6.4	1	6.4	-	-	20'	✓							✓	
** 12	a	SEE 11 a	1.16	.19	220.4	1		-	48	115		✓					✓		
	b	SEE 11 b	1.16	.03	34.8	1		12		30	✓							✓	
	c	(5)	.08	.02	8.0	1	263.2	-	-	20	✓							✓	
** 13	a	SEE 11 a	.56	.27	151.2	1		-	38	74		✓					✓		
	b	SEE 11 b	.56	.03	16.8	1		12	-	30	✓							✓	
	c	(3)	.08	.02	4.8	1	226.8	-	-	20	✓							✓	
** 14	a	SEE 11 a	.74	.27	199.8	1		-	38	74		✓					✓		
	b	SEE 11 b	.74	.03	22.2	1		12	-	30	✓							✓	
	c	(3)	.08	.02	4.8	1	226.8	-	-	20	✓							✓	
15		STORAGE	.07	.17	11.9	1	11.9	12	19	40	✓							✓	
16		DITTO	.07	.07	4.9	1	4.9	12	19	35	✓							✓	
17		DITTO	.16	.07	11.2	1	11.2	12	19	35	✓							✓	
18		DITTO	.17	.07	11.9	1	11.9	12	-	18	✓							✓	
TOTALS THIS PAGE					1402.3		1402.3												

PLAN AREA OF BUILDINGS — 1000'S OF SQ. FT. | TOTAL FLOOR AREA OF BUILDINGS — 1000'S OF SQ. FT. | TOTAL SITE AREA — ACRES

PRIMARY & SECONDARY BUILDINGS ONLY

REF. NUMBER	SUBDIVISION	STRUCTURAL DETAILS [redacted]
21	22	23
11		
12		See building 11.
13		See building 11
14		See building 11

COVER USED								
MISSION	PRINTS	DATE	QUALITY	SCALING DATA				
				PRINT	BEARING	SHAD. RAT.	PLAN SC.	SHAD. SC.
LAT.	LONG.	ENL. NO.	ENL. RAT.	SCALE				

AC/AS INTELLIGENCE - PHOTOGRAPHIC DIVISION
JOINT P/I GROUP

BUILDING CONSTRUCTION ANALYSIS

TARGET NAKAJIMA AIRCRAFT CO. - KOIZUMI PLANT
LOCATION TAKASAKI AREA, JAPAN

CONFIDENTIAL | T/V

DATE DEC. 23, 1944
INTERPRETER Towne
SHEET NO. 3 OF 7 SHEETS

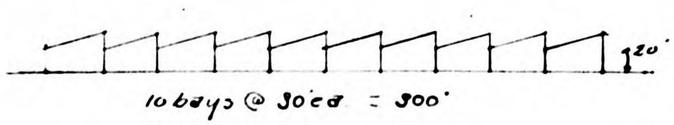
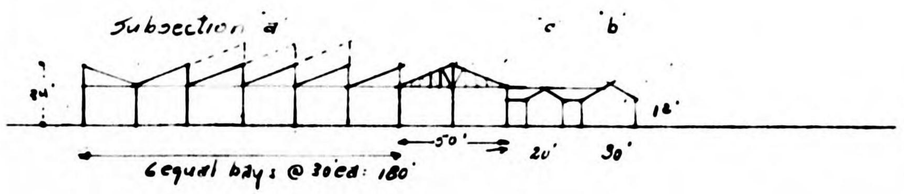
AREA NO. 9013 | TARGET NO. /1545

ALL BUILDINGS

REF. NUMBER	REF. SUBDIVISION	OCCUPANCY	LENGTH	WIDTH	PLAN AREA	NO. OF FLOORS	TOTAL AREA	HEIGHT: EAVES	HEIGHT: RIDGE	ROOF: SPAN IN FT.	ROOF: COMBUSTIBLE	ROOF: NON-COMBUST.	ROOF: RESISTANT	FLOORS: COMBUSTIBLE	FLOORS: NON-COMBUST.	FLOORS: RESISTANT	TYPE: STL. FRAME	TYPE: WD. FRAME	TYPE: LD. BEARING
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
TOTALS BROUGHT FORWARD					1402.3		1402.3												
19	a	STORAGE	.17	.12	20.4	1		12	19	24	✓							✓	
	b		.05	.03	1.5	1		14	22	30	✓							✓	
	c		.13	.03	3.9	1	25.8	14	22	30	✓							✓	
20		DITTO	.51	.10	51.0	1	51.0	12	-	33	✓							✓	
21	a	DITTO	.20	.22	44.0	1		12		35	✓							✓	
	b		.20	.07	14.0	1		12		35	✓							✓	
	c						58.0												
** 22		MACHINE SHOP	.41	.30	123.0	1	123.0	20'		30		✓					✓		
23	a	UNIDENTIFIED	.08	.08	6.4	1		19'	-	-	✓							✓	
	b		.12	.06	7.2	1		"	-	-	✓							✓	
	c		.12	.02	2.4	1	16.0	—	—	20	✓							✓	
24		MACHINE SHOP	.20	.22	44.0	1	44.0	-	-	30'		✓					✓		
** 25	a	PRESSING SMALL PARTS MFG.	.91	.23	209.3	1			34	30		✓					✓		
	b		.91	.03	27.3	1		12		30	✓							✓	
	c	(4)	.08	.02	7.2	1	244.8	12		20	✓							✓	
** 26	a	SUB ASSEMBLY	.91	.30	273.0	1			34	30		✓					✓		
	b	STORAGE	.91	.05	45.5	1		12		50	✓							✓	
	c	(4)	.08	.02	7.2	1		12		20	✓							✓	
							325.7												
TOTALS THIS PAGE					2290.6		2290.6												

PLAN AREA OF BUILDINGS	1000'S OF SQ. FT.	TOTAL FLOOR AREA OF BUILDINGS	1000'S OF SQ. FT.	TOTAL SITE AREA	ACRES

PRIMARY & SECONDARY BUILDINGS ONLY

REF. NUMBER	REF. SUBDIVISION	STRUCTURAL DETAILS [redacted]
21	22	23
22		
25		
26		• See building 23 •

COVER USED								
MISSION	PRINTS	DATE	QUALITY	SCALING DATA: PRINT	BEARING	SHAD. RAT.	PLAN SC.	SHAD. SC.
LAT.	LONG.	ENL. NO.	ENL. RAT.	SCALE				

AC/AS INTELLIGENCE - PHOTOGRAPHIC DIVISION
JOINT P/I GROUP

BUILDING CONSTRUCTION ANALYSIS

TARGET NAKAJIMA AIRCRAFT CO. - KOIZUMI PLANT
LOCATION TAKASAKI AREA, JAPAN

CONFIDENTIAL T/V

DATE DEC 23, 1944
INTERPRETER Towne
SHEET NO. 4 OF 7 SHEETS

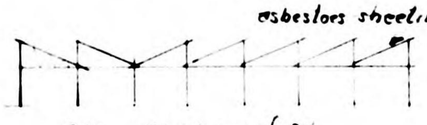
AREA NO. 90.13 TARGET NO. 1545

ALL BUILDINGS

REF. NUMBER	REF. SUBDIVISION	OCCUPANCY	LENGTH	WIDTH	PLAN AREA	NO. OF FLOORS	TOTAL AREA	HEIGHT: EAVES	HEIGHT: RIDGE	ROOF: SPAN IN FT.	ROOF: COMBUSTIBLE	ROOF: NON-COMBUST.	ROOF: RESISTANT	FLOORS: COMBUSTIBLE	FLOORS: NON-COMBUST.	FLOORS: RESISTANT	TYPE: STL. FRAME	TYPE: WD. FRAME	TYPE: I.B. BEARING
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
TOTALS BROUGHT FORWARD					2290.6		2290.6												
27		UNIDENTIFIED	.21	.08	16.8	1	16.8	14'	-	20	✓							✓	
28		DITTO	.31	.08	24.8	1	24.8	12'	-	40	✓							✓	
29		DITTO	.18	.08	14.4	1	14.4	12	-	20	✓							✓	
30	a	SUB ASSEMBLY	1.03	.24	247.2	1	247.2	-	34'			✓					✓		
	b	STORAGE	1.03	.03	30.9	1	30.9	12	-	30	✓							✓	
	c	4	.08	.02	7.2	1	7.2	12'	-	20	✓							✓	
31	a	SUB-ASSEMBLY & ASSEMBLY	.55	.33	181.5	1			46	50'		✓					✓		
	b	STORAGE	1.02	.03	30.6	1		12		30'	✓							✓	
	c	MACHINE SHOP. 2	.08	.02	3.2	1		12	-	20	✓							✓	
	d		.28	.21	58.8	1			34'	30		✓					✓		
	e						274.1												
32		UNIDENTIFIED	.28	.05	20.0	2	40.0	24'	-	25	✓							✓	
33		BOILER HOUSE	.10	.10	10.0	1	10.0	-	28'	33		✓					✓	✓	
34	b	STORAGE	.12	.05	6.0	2	12.0	12'	-	25	✓							✓	
	a		.10	.05	5.0	1	5.0	24'	-	25	✓							✓	
35	a	WORKSHOP	.19	.35	66.5	1	66.5	14	-	50		✓						✓	
	b		.19	.03	5.7	1	5.7	12	-	30	✓							✓	
TOTALS THIS PAGE					3019.2		3045.2												

PLAN AREA OF BUILDINGS 1000'S OF SQ. FT. | TOTAL FLOOR AREA OF BUILDINGS 1000'S OF SQ. FT. | TOTAL SITE AREA ACRES

PRIMARY & SECONDARY BUILDINGS ONLY

REF. NUMBER	REF. SUBDIVISION	STRUCTURAL DETAILS [redacted]
21	22	23
30		See building 25.
31	a b	See building 11.
31	d	 34' . probable exterior walls of concrete.

COVER USED								
MISSION	PRINTS	DATE	QUALITY	SCALING DATA				
				PRINT	BEARING	SHAD. RAT.	PLAN SC.	SHAD. SC.
LAT.	LONG.	ENL. NO.	ENL. RAT.	SCALE				

AC/AS INTELLIGENCE - PHOTOGRAPHIC DIVISION
JOINT P/I GROUP

BUILDING CONSTRUCTION ANALYSIS

TARGET NAKAJIMA AIRCRAFT CO. - KOIZUMI PLANT
LOCATION TAKASAKI AREA, JAPAN

CONFIDENTIAL T/V

DATE DEC 23, 1944
INTERPRETER Towne
SHEET NO. 5 OF 7 SHEETS

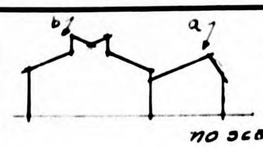
AREA NO. 9013 TARGET NO. 1545

ALL BUILDINGS

REF. NUMBER	REF. SUBDIVISION	OCCUPANCY	LENGTH	WIDTH	PLAN AREA	NO. OF FLOORS	TOTAL AREA	HEIGHT: EAVES	HEIGHT: RIDGE	ROOF: SPAN IN FT.	ROOF: COMBUSTIBLE	ROOF: NON-COMBUST.	ROOF: RESISTANT	FLOORS: COMBUSTIBLE	FLOORS: NON-COMBUST.	FLOORS: RESISTANT	TYPE: STL. FRAME	TYPE: WD. FRAME	TYPE: I.B. BEARING
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
TOTALS BROUGHT FORWARD			3019.2		3043.2														
36	a	UNIDENTIFIED	.14	.04	5.6	1		-	-	40		✓					-		
	b		.14	.07	9.8	1		-	-	35		✓					-		
	c		.07	.12	8.4	1		-	-	24		✓					-		
	d		.12	.06	7.2	1		-	-	20			✓			✓	R_d		
	e		.09	.06	5.4	1		-	-	20		✓					✓		
							31.4												
37		STORAGE	.12	.05	6.0	1	6.0	12	-	25	✓			✓				✓	
38		DITTO	.20	.07	14.0	1	14.0	12	-	18	✓			✓				✓	
39	a	DITTO	.07	.02	1.4	2	2.8	-	-	20			✓			✓	R_d		
	b		.17	.02	3.4	2	6.8	-	30	20			✓			✓	R_d		
	c		.22	.03	6.6	2	13.2	-	-	15			✓			✓	R_d		
40		OFFICE	.30	.04	12.0	2	24.0	-	30	20			✓			✓	R_d		
41		UNIDENTIFIED	.18	.08	14.4	1	14.4	12	19	25/30	✓			✓				✓	
42	a	ADMINISTRATION	.35	.07	18.5	3	55.5	-	38	-			✓			✓	R_d		
	b	DITTO	.35	.07	18.5	3	55.5	-	38	-			✓			✓	R_d		
	c		.07	.05	3.5	3	10.5	-	-	-			✓			✓	R_d		
43		STORAGE	.23	.05	11.5	2	23.0	24	34	25	✓			✓				✓	
TOTALS THIS PAGE					31654		33023												

PLAN AREA OF BUILDINGS — 1000'S OF SQ. FT.
TOTAL FLOOR AREA OF BUILDINGS — 1000'S OF SQ. FT.
TOTAL SITE AREA — ACRES

PRIMARY & SECONDARY BUILDINGS ONLY

REF. NUMBER	REF. SUBDIVISION	STRUCTURAL DETAILS
21	22	23
36		 no scale · Section c is a 5 bay saw-tooth · · Section b is a simple gable · } separate structure · Section d is a flat roof · } from 36 a-b-c ·

COVER USED								
MISSION	PRINTS	DATE	QUALITY	SCALING DATA: PRINT	BEARING	SHAD. RAT.	PLAN SC.	SHAD. SC.
LAT.	LONG.	ENL. NO.	ENL. RAT.	SCALE				

AC/AS INTELLIGENCE - PHOTOGRAPHIC DIVISION
JOINT P/I GROUP

BUILDING CONSTRUCTION ANALYSIS

TARGET NAKAJIMA AIRCRAFT CO · KOIZUMI PLANT
LOCATION TAKASAKI AREA, JAPAN

CONFIDENTIAL

T/V

DATE DEC 26, 1944
INTERPRETER Towne
SHEET NO. 6 OF 7 SHEETS

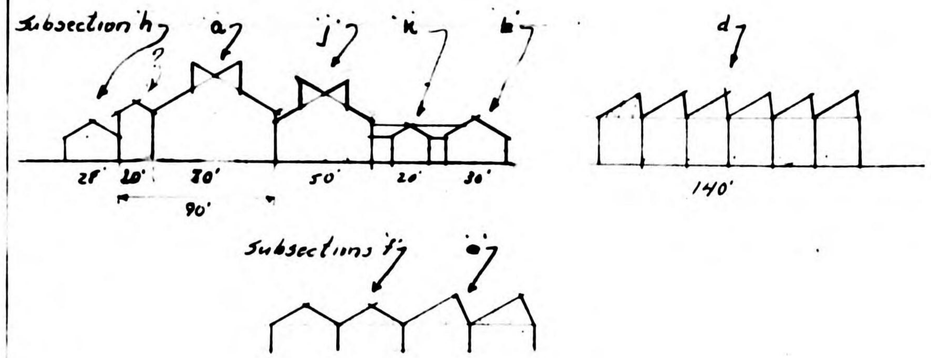
AREA NO. 90.13 / TARGET NO. 1545

ALL BUILDINGS

REF. NUMBER	REF. SUBDIVISION	OCCUPANCY	LENGTH	WIDTH	PLAN AREA	NO. OF FLOORS	TOTAL AREA	HEIGHT EAVES	HEIGHT RIDGE	ROOF SPAN IN FT.	ROOF COMBUSTIBLE	ROOF NON-COMBUST.	ROOF RESISTANT	FLOORS COMBUSTIBLE	FLOORS NON-COMBUST.	FLOORS RESISTANT	TYPE STL. FRAME	TYPE WD. FRAME	TYPE LD. BEARING
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
TOTALS BROUGHT FORWARD					3165.4		3302.3												
44	a	UNIDENTIFIED	.10	.03	3.0	1		-	-	30	✓							✓	
	b		.09	.03	2.7	1		-	-	30	✓							✓	
	c		.10	.07	7.0	1		-	-	23	✓							✓	
	d		.10	.02	2.0	1		-	-	20	✓							✓	
							14.7												
45		STORAGE	.15	.05	7.5	1	7.5	12	-	25 to 50	✓							✓	
46		UNIDENTIFIED	.25	.09	22.5	1	22.5	12	-	40/50	✓							✓	
47		STORAGE	.12	.05	6.0	1	6.0	-	-	25	✓							✓	
48	a	PROBABLE FOUNDRY	.17	.09	15.3			28'		90		✓					✓		
	b	STORAGE	.17	.03	5.1					30	✓							✓	
	c	DITTO	.20	.03	6.0					30	✓							✓	
	d		.05	[illegible]	7.0				28'	30'		✓					✓		
	e		.18	.07	12.6					35		✓					✓		
	f		.07	.07	4.9				28	18	✓							✓	
	g		.07	.07	4.9				28	18	✓							✓	
	h		.10	.03	3.0			12	19	30		✓					✓		
	j		.17	.05	8.5					50'		✓					✓		
	k	2-	.08	.02	3.2	1				20	✓							✓	
							72.2												
49		STORAGE	.17	.04	6.8	1	6.8	-	-	20	✓							✓	
50		DITTO	.19	.04	7.6	1	7.6	-	-	20	✓							✓	
TOTALS THIS PAGE					3302.7		3439.6												

PLAN AREA OF BUILDINGS — 1000'S OF SQ. FT. — TOTAL FLOOR AREA OF BUILDINGS — 1000'S OF SQ. FT. — TOTAL SITE AREA — ACRES

PRIMARY & SECONDARY BUILDINGS ONLY

REF. NUMBER	REF. SUBDIVISION	STRUCTURAL DETAILS [redacted]
21	22	23
48		

COVER USED								
MISSION	PRINTS	DATE	QUALITY	SCALING DATA				
				PRINT	BEARING	SHAD. REF.	PLAN SC.	SHAD. SC.
LAT.	LONG.	ENL. NO.	ENL. RAT.	SCALE				

AC/AS INTELLIGENCE - PHOTOGRAPHIC DIVISION
JOINT P/I GROUP

BUILDING CONSTRUCTION ANALYSIS

TARGET NAKAJIMA AIRCRAFT CO - KOIZUMI PLANT
LOCATION TAKASAKI AREA JAPAN

CONFIDENTIAL T/V

DATE DEC 26, 1944
INTERPRETER Towne
SHEET NO. 7 OF 7 SHEETS

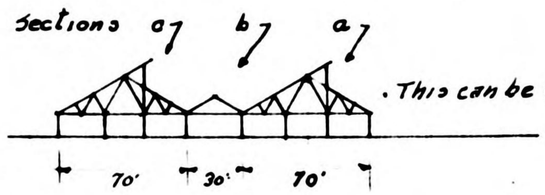
AREA NO. 90.13 TARGET NO. 1545

ALL BUILDINGS

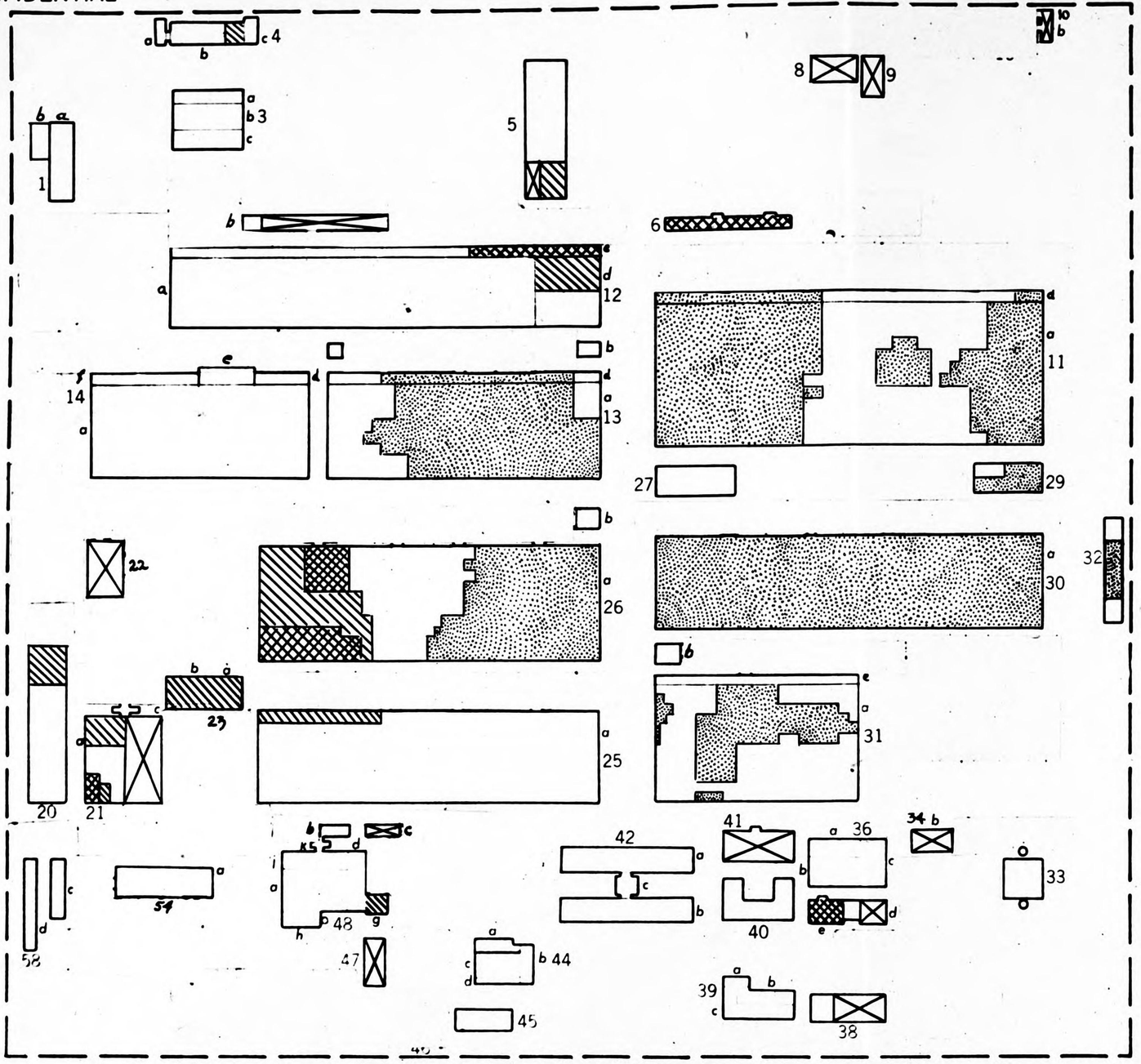
REF. NUMBER	REF. SUBDIVISION	OCCUPANCY	LENGTH	WIDTH	PLAN AREA	NO. OF FLOORS	TOTAL AREA	HEIGHT EAVES	HEIGHT RIDGE	ROOF SPAN IN FT.	ROOF COMBUSTIBLE	ROOF NON-COMBUST.	ROOF RESISTANT	FLOORS COMBUSTIBLE	FLOORS NON-COMBUST.	FLOORS RESISTANT	TYPE STL. FRAME	TYPE WD. FRAME	TYPE L.B. BEARING
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
TOTALS BROUGHT FORWARD					3302.7		3439.6												
51		STORAGE	.16	.07	11.2	1	11.2	12	19	35	✓			✓					✓
52		DITTO	.09	.05	4.5	1	4.5	12	-	25 TO 30	✓			✓					✓
53		DITTO	.25	.04	10.0	1	10.0	12	19	40	✓			✓					✓
54	a	UNIDENTIFIED.	.26	.07	18.2	1		12	-		✓			✓					✓
	b		.12	.03	3.6	1		"	-		✓			✓					✓
	c		.13	.07	9.1	1	30.9	"	-		✓			✓					✓
55	a	DITTO	.13	.07	9.1	1	9.1	12	-		✓			✓					✓
	b																		
56	a	STORAGE	.13 .09	.06 .03	7.8 2.7	1	10.5	12	-	30	✓			✓					✓
	b																		
57		DITTO	.22	.06	13.2	1	13.2	12	19	30	✓			✓					✓
58	a	DITTO	.12	.02	2.4	1		12	-	20	✓			✓					✓
	b		.12	.02	2.4	1		12	-	20	✓			✓					✓
	c		.18	.03	5.4	1		12	-	30	✓			✓					✓
	d		.23	.03	6.9	1	17.1	12	-	30	✓			✓					✓
TOTALS THIS TARGET.					3409.2		3546.1												

PLAN AREA OF BUILDINGS — 1000'S OF SQ. FT. | TOTAL FLOOR AREA OF BUILDINGS — 1000'S OF SQ. FT. | TOTAL SITE AREA — ACRES

PRIMARY & SECONDARY BUILDINGS ONLY

REF. NUMBER	REF. SUBDIVISION	STRUCTURAL DETAILS [redacted]
21	22	23
54		Sections a, b, a.  . This can be either steel or wood frame.
55		Similar to above.

CONFIDENTIAL



WORKERS QUARTERS AND RECREATION AREA

CONFIDENTIAL
SCALE IN FEET

0 200 400 600 800 1000

STATUS OF PLANT 13 APRIL

STRUCTURAL DAMAGE

SUPERFICIAL DAMAGE

DAMAGE OF 24 MARCH, NOT REPAIRED

RAZED

AC/AS INTELLIGENCE PHOTOGRAPHIC DIVISION
PHOTO INTELLIGENCE SECTION

NAKAJIMA AIRCRAFT CO.

KOIZUMI . JAPAN

TARGET NO. 90.13/1545

PHOTOGRAPHY OF 13 APR 1945

C.F.L. 744.021 -D3

NOT TO BE TAKEN INTO AIR

CONFIDENTIAL

JOINT TARGET GROUP, WASHINGTON, D.C.

Sheet No. 90.13-1545 BA
Date 30 March 1945
Page No. 1 (pages)

ECONOMIC DAMAGE ASSESSMENT REPORT NO. 9

NAKAJIMA AIRCRAFT, KOIZUMI PLANT

(Target 90.13-1545)

Note: The poor quality of available post attack photography limits the determination of the extent and severity of building damage and also precludes an estimate of internal destruction. This report should, therefore, be considered a preliminary estimate of economic damage. A revised report will be issued if subsequent photography reveals major differences.

PARTICULARS OF ATTACK

This plant was attacked by Navy carrier based dive bombers in the second Navy Tokyo attack of 25 February 1945. No data are at present available on bomb tonnages dropped or the number of planes attacking.

PREVIOUS REPORTS

None.

SUMMARY OF CONCLUSIONS

(1) Moderate damage was suffered by this plant. Of the almost 3 million square feet of plan area, at least 6 per cent received structural damage while superficial damage was roughly twice as extensive. Damage was concentrated upon the more important production sections of the plant. Better quality photography may reveal that much of the apparent superficial damage is in fact structural.

(2) Estimates of aircraft loss are extremely tentative not only because of the poor photography but also because of insufficient ground intelligence as to the production layout and even as to the plane types being manufactured at this plant. For the plant as a whole a loss of about 6 weeks' output at the estimated pre-attack production rate of 455 per month appears likely. This amounts to roughly 670 planes.

(3) Aircraft loss and recuperation will not be uniform throughout the plant. The Eastern half, believed to be engaged in the manufacture of multiple-engined planes, has probably suffered a production loss of more than two months' pre-attack output and will probably require at least 4 months to return to pre-attack production levels. The Western half, thought to manufacture the plant's single-engined planes, has been less severely damaged--perhaps one month's net loss--and could probably be back to pre-attack production rates within 2 - 3 months.

(4) It is not possible to estimate the extent to which this plant will be repaired. Dispersal of the plant's production may have been underway even before the attack as evidenced by the fact that approximately 500,000 square feet of building area (mostly storage-type buildings) had been removed shortly before the attack and that at least two of the planes thought to be manufactured at this plant (Jill and Myrt) may have been transferred to the firm's aircraft plant at Handa (Target 90.20-1635). On the other hand removal may have been intended merely to reduce the fire hazard by clearing away the more combustible buildings.

PROBABLE PLANT FUNCTION

(Reference Target Illustration No. 90.13-1545, P3) There is insufficient ground intelligence to establish definitely the internal production flow and even to determine with certainty the aircraft types being manufactured. It appears likely, however, that the single-engined planes, Zeke, Myrt and Jill (the latter two perhaps having already been transferred to the Nakajima Aircraft plant at Handa) are manufactured in the western part of the plant (buildings 12, 13, 14 and 26) while twin-engined Irving and Frances are manufactured in the eastern part of the plant (buildings 11 and 30). Nakajima's four-engined aircraft (Liz, Renzan, etc.) are reported to be assembled in building 31. Buildings 22 and 25 appear to house metal-cutting, pressing, and shaping for the plant as a whole, and may also do some small parts manufacture. From ground reports and captured equipment, it appears that many aircraft parts and smaller sub-assemblies are received from subcontractors scattered through the surrounding country.

PHYSICAL DAMAGE

Estimated building damage is shown in Table I following. As previously pointed out it is not possible to determine the extent of content damage.

ECONOMIC ASSESSMENT

Although the combined structural and superficial damage constitutes only 17 per cent of the total plan area of buildings, this damage has been concentrated in the major production sections of the plant, centering primarily in the important sub-assembly areas which received 7% structural and 21% superficial damage. The loss of production, consequently, is likely to be considerably heavier than indicated by the extent of damage only. Damage to the sub-assembly areas is certain to be the controlling factor in the recovery of this plant.

Loss of Single-engined Aircraft Production

Since the manufacture of the three aircraft types believed to be carried on in the western part of the plant cannot be assigned to specific buildings, it is arbitrarily assumed that each type has suffered the same relative production loss, and the breakdown of losses by type given in Table II following is based on this highly arbitrary assumption. Loss of work in process will probably be equivalent to between one and two weeks' output while repair and recuperation of the sub-assembly sections of the plant will probably add an additional three to four weeks' production loss. Since the final assembly sections of this part of the plant do not appear to have been damaged, planes on the final assembly lines--perhaps one to two weeks' output--were probably completed despite the attack.

Loss of Twin-engined Aircraft Production

The same relative production loss must be assigned Frances and Irving since the production flow of these planes is not known. As in the case of the single-engined plane production loss, this breakdown is highly arbitrary. The heavier structural and superficial damage received by sub-assembly areas, stores, and certain other buildings in this section of the plant has probably cost between two and three weeks' production loss of work in process. During repair and recuperation production loss is not likely to be much below 2 months' pre-attack output. Damage to final assembly may have cost an additional week's production loss.

Loss of Four-engined Aircraft Production

While damage to this part of the plant (building 31a) has not been particularly great, it is logical to assume that production of these relatively unimportant types will be sacrificed in the attempt to bring back production of the more important planes manufactured here. A month's output loss is, therefore, arbitrarily established although the damage does not warrant such a loss.

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TABLE I

Plant Section Function (and Building No.)	Total Plan Area (1000 sq ft)	Structural Damage (1000 sq ft)	Structural Damage Percent of Function	Superficial Damage (1000 sq ft)	Superficial Damage Percent of Function
A. Serving Plant as a Whole					
Forge, Foundry (48a)	15.3	0	0	0	0
Machine Shops, Heat Treatment, Pressing, Shaping, and Cutting, Tool shops (22, 25, 31c, 35)	341.8 a/	0	0	0	0
Stores (4, 6, 8, 9, 11b, 12b, 13b, 14b, 18, 20, 21, 25b, 25c, 26b, 30b, 34, 37, 38, 39, 45, 47, 48b-k, 49, 56, 58)	452.8 b/	12.0 d/	2.7	0	0
Others	357.7	38.8 d/	10.8	0	0
B. Single-Engined (Western) Portion of Plant					
Sub-Assembly (12a, 13a, 14a, 26a)	704.3 c/	48.8	6.9	116.7	16.6
Assembly (12a, 14a)	140.1 c/	0	0	0	0
C. Twin-Engined (Eastern) Portion of Plant					
Sub-Assembly (11a, 30a)	524.5 c/	44.8	8.5	156.4	29.8
Assembly (11a)	138.7 c/	17.6	12.7	26.0	18.7
D. Four-Engined (Building 31a) Portion of Plant					
Sub-Assembly (31a)	121.0 c/	0	0	15.0	12.4
Assembly (31a)	60.5	0	0	5.4	8.9
TOTAL	2816.7	162.0	5.7	319.5	11.4

a/ By 9 February 1945 buildings aggregating 203.2 thousand square feet had been removed.

b/ By 9 February 1945 buildings aggregating 254.3 thousand square feet had been removed.

c/ Where Sub-Assembly and Assembly appear to be performed in the same building it has arbitrarily been assumed that two-thirds of the area is diverted to Sub-Assembly.

d/ The majority of this damage has been received by buildings in the section of the plant manufacturing twin engine aircraft.

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The estimated aircraft production losses are shown in the following table:

TABLE II

ESTIMATED AIRCRAFT LOSS FROM ATTACKS
ON NAKAJIMA AIRCRAFT, KOIZUMI PLANT

Plane Type	Pre-Attack Monthly Output	Estimated Aircraft Loss Work in Process	Loss in Repair	Total
Zeke	265	65	200	265
Myrt	15	4	11	15
Jill	50	15	35	50
Frances	75	60	150	210
Irving	45	35	90	125
Four-engined planes	5	1	4	5
TOTAL	455	180	490	670

EVIDENCE OF DISPERSAL AND REPAIR

As previously pointed out, there is evidence that this plant may have been undergoing dispersal when it was attacked. Roughly 500,000 square feet of building area had been removed by 9 February 1945. Nakajima is known to have several other new aircraft plants, the largest of which may be the plant at Handa where Myrt and Jill are reported to be produced and to which Rufe production was transferred several years previously. It is possible, however that removal was designed to clear away the more combustible buildings in order to reduce the fire hazzard. The fact that most of the buildings removed are thought to be storage buildings supports this possibility.

The post-strike photography was taken too soon after the strike to show any repairs.

FUTURE TARGET VALUE

This plant still appears to have considerable target value since four-fifths of it is still intact and within six weeks or two months it could again be producing on a substantial scale. During the next month it is not likely to turn out many completed aircraft, although it may still be manufacturing parts for itself and other plants. Even if fully repaired it will probably be three months before this plant can return to pre-attack production.

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AF IPH-3

COVER USED	
MISSION	3 PR '5M 60' 2V
PRINTS	23, 24
DATE	27 Feb 1945
QUALITY	Fair
SCALE	1/17,850
DATE OF ATTACK	17 Feb 1945 (Navy)

AC/AS INTELLIGENCE
PHOTOGRAPHIC DIVISION
PHOTO-INTELLIGENCE SECTION

LIMITED DAMAGE INTERPRETATION

NO. 11

CONFIDENTIAL | D/P

DATE 13 March 1945

INTERPRETER Stearns

SHEET NO. 1 OF 4

AREA NO. 90.13 / TARGET NO. 1545

TARGET: NAKAJIMA AIRCRAFT CO

LOCATION: KOIZUMI, JAPAN

This Limited Damage Interpretation has been undertaken in accordance with the conditions as checked below:

- ☐ *Photography is inadequate in scale*
- ☐ *Photography is indequate in quality*
- ☐ *Stereo coverage is lacking or incomplete*
- ☐ *Detailed interpretation is not required*
- ☐ *Damage is below 10% of built-up area*
- ☐ *Total damage is less than 50,000 sq. ft.*
- ☐ *Excessive time between attack and photography*
- ☒ *Other factors as noted below*

BUILDING REF. NO.		AREA	VISIBLE DAMAGE STRUCT'L	VISIBLE DAMAGE SUPERF'L	DESCRIPTION OF DAMAGE
					NOTE: Area of plant is snow-covered, thereby including a bomb-count and assignment of cause, and limiting determination of extent and severity of damage. This report should be considered only a preliminary estimate of damage. The actual damage is probably greater than shown. 25 buildings were wholly or partially removed from the target area prior to 9 Feb 1945. Most of these were small, combustible structures. Three had been identified as machine shops.
1	a	13.3			No visible damage.
	b	3.5			Addition constructed by 9 Feb 1945. No visible damage.
2		37.5			Removed by 9 Feb 1945
3	a	5.7			No visible damage
	b	13.3			" " "
	c	9.5			" " "
4	a	2.1			" " "
	b	10.0			" " "
	c	2.1			" " "
5		42.0	3.6		Damaged section is demolished
6		10.2			No visible damage
7		12.6			" " "
8		9.1			" " "
9		5.0			" " "
10	a	17.6			" " "
	b	2.0			" " "
11	a	416.0	17.6	126.1	Superficial damage in center and at west-end may be more severe.
	b	31.2-10.7=20.5	2.1		Two sections removed by 9 Feb 1945. Direct hit near center

TOTALS					
SITE	SITE AREA	180.4 acres			
	BUILT-UP AREA	2816.7 (27 Feb)			
	% OF SITE BUILT-UP				
DAMAGE	AREA OF DAMAGE	162.0 Struct	319.5 Super	481.5 Total	
	% OF BUILT-UP AREA	5.7%	11.4%	17.1%	

APPROVED BY:

LEWIS E. STEVENS
Major, Air Corps
Chief, Photo Intelligence Section
Evaluation Br., Photographic Division
Office of the Ass't Chief of Air Staff
Intelligence

ALL AREAS ARE PLAN AREAS IN THOUSANDS OF SQUARE FEET

5-6122, AF

AF IPH-3A

AREA NO. / TARGET NO.					LIMITED DAMAGE INTERPRETATION NO. 11	CONFIDENTIAL	D/P
90.13 / 1545						SHEET NO. 2 OF 4	

6		10.2			No visible damage
7		12.6			" " "
8		9.1			" " "
9		5.0			" " "
10	a	17.6			" " "
	b	2.0			
11	a	416.0	17.6	126.1	Superficial damage in center and at west-end may be more severe.
	b	31.2-10.7=20.5	2.1		Two sections removed by 9 Feb. 1945
	c	6.4			Direct hit near center
					Removed by 9 Feb 1945
12	a	220.4			No visible damage
	b	34.8-11.8=23.0			Sections at each end removed by 9 Feb '45.
	c	8.0			No visible damage to remainder
					Removed by 9 Feb '45.
13	a	199.8	48.8	56.0	
	b	22.2-19.5=2.7			All but two small and sections removed by 9 Feb 1945.
	c	4.8-3.6=1.2			Removed by 9 Feb 1945
14	a	151.2			No visible damage
	b	16.8-15.5=1.3			All but small end section removed by 9 Feb '45.
	c	4.8-3.6 = 1.2			Removed by 9 Feb 1945.
15		11.9			Removed by 9 Feb 1945
16		4.9			Removed by 9 Feb 1945
17		11.2			Removed by 9 Feb 1945
18		11.9			No visible damage
19	a	20.14			Removed by 9 Feb 1945
	b	1.5			" " " "
	c	3.9			" " " "
20		51.0-10.0=41.0			North end in process of removal 9 Feb '45; removed by 21 Feb. No visible damage to remainder.
21	a	44.0			No visible damage
	b	14.0			" " "
22		123.0-62.3=60.7			No visible damage. Half of building removed by 9 Feb '45.
23	a	6.4			No visible damage
	b	7.2			Possibly damaged, but discoloration believed to be area of melted snow
	c	2.4			No visible damage
24		44.0			Removed by 9 Feb 1945
25	a	209.3			No visible damage
	b	27.3-14.7=12.6			Two sections removed by 9 Feb '45. No visible damage to remainder.

5-6122a, AF

AF IPH-3A

AREA NO.	TARGET NO.
90.13	1545

LIMITED DAMAGE INTERPRETATION NO. 11

CONFIDENTIAL | D/P

25	c	7.2-5.4= 1.8		
26	a	273.0	60.7	Largely removed by 9 Feb 1945. No visible damage to remainder.
	b	45.5-2.7= 42.8	1.6	Some of this damage is probably structural. Photography is inadequate for accurate assessment.
	c	7.2-5.1= 2.1		One section removed by 9 Feb '45. Additional adjacent section demolished by 27 Feb '45.
27		16.8		Largely removed by 9 Feb 1945; one small section removed between 9 and 27 Feb '45.
28		24.8	24.8	No visible damage to remainder.
29		14.4		No visible damage
30	a	247.2	44.8	Demolished; possibly civil removal after 9 Feb '45.
	b	30.9-23.1= 7.8	2.7	Possibly damaged superficially; photography inadequate for accurate assessment.
	c	7.2-5.1= 2.1	0.4	
31	a	181.5	56.3	Largely removed by 9 Feb '45. Additional section demolished.
	b	30.6-28.9= 1.7		Largely removed by 9 Feb '45. One small section demolished.
	c	3 2 -1.6= 1.6	20.4	Photography is inadequate for accurate assessment
	d	58.8		Removed by 9 Feb '45; no visible damage to remainder
32		20.0		One half removed by 9 Feb 1945. No visible damage to remainder.
33		10.0	10.0	Removal practically complete by 9 Feb 1945, complete 27 Feb 1945.
34	a	6.0		Center half of building demolished by blast.
	b	5.0		No visible damage
35	a	66.5-38.0 = 28.5		No visible damage " " "
	b	5.7		South half removed by 9 Feb 1945; no visible damage to remainder
36	a	5.6		No visible damage
	b	9.8		" " "
	c	8.4		" " "
	d	7.2		" " "
	e	5.4		" " "
37		6.0		No visible damage
38		14.0		" " "
39	a	1.4		" " "
	b	3.4		" " "
	c	6.6		" " "
40		12.0		" " "
41		14.4		" " "
42	a	18.5		" " "
	b	18.5		" " "
	c	3.5		" " "
43		11.5		Removed by 9 Feb 1945
44	a	3.0		No visible damage
	b	2.7		" " "
	c	7.0		" " "
	d	2.0		" " "
45		7.5		" " "
46		22.5		" " "
47		6.0		" " "
48	a	15.3		" " "
	b	5.1-3.4= 1.7		Partially removed by 9 Feb '45; no damage to remainder

AF IPH-3A

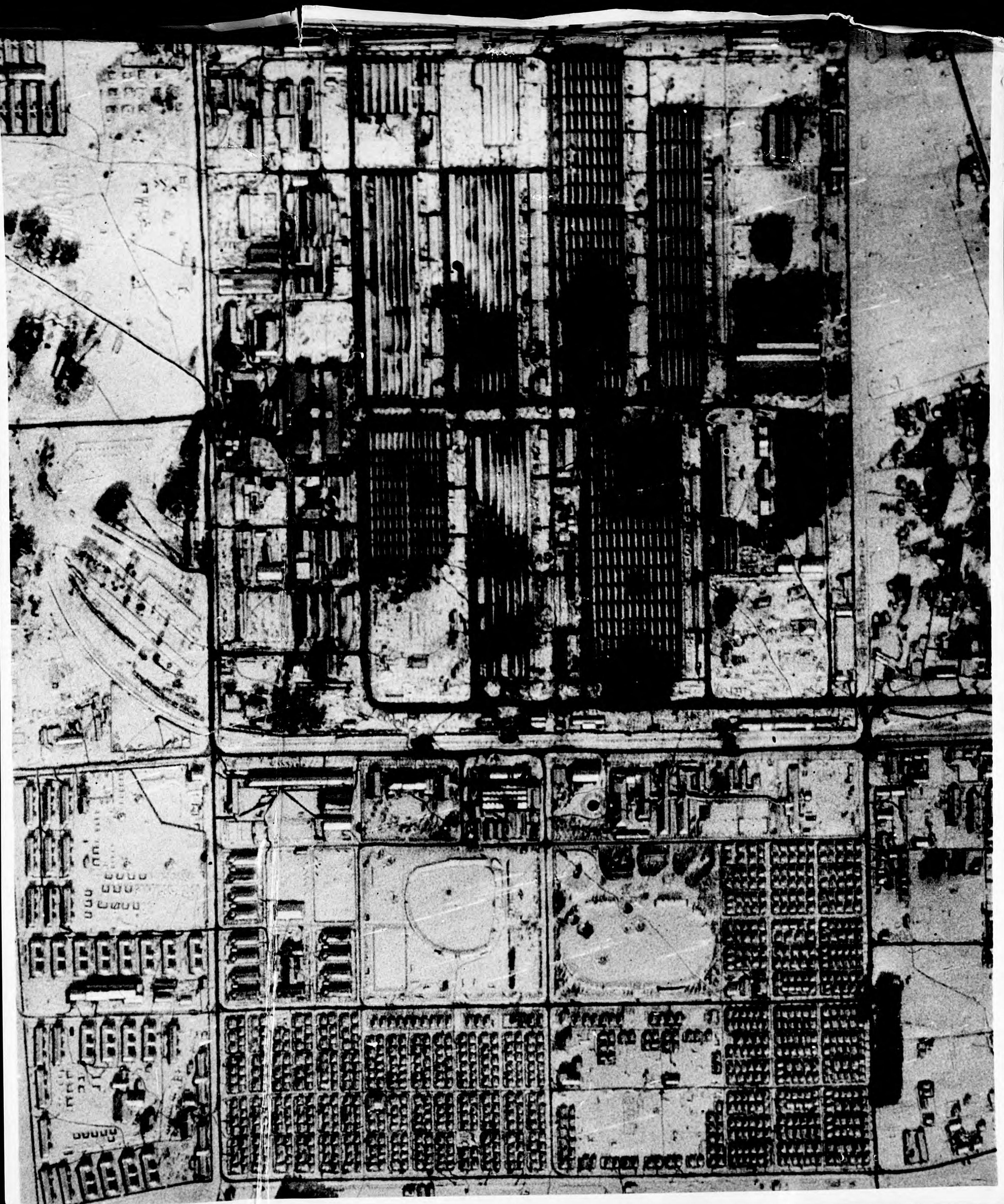
AREA NO. 90.16 TARGET NO. 1545

LIMITED DAMAGE INTERPRETATION NO. 11

CONFIDENTIAL D/P

48	c	6.0-4.0= 2.0			Partially removed by 9 Feb '45; no damage to remainder.
	d	7.0			No visible damage
	e	12.6			" " "
	f	4.9			" " "
	g	4.9			" " "
	h	3.0			" " "
	j	8.5			" " "
	k	3.2-0.2= 3.0			Small section removed by 9 Feb '45; no visible damage to remainder.
49		6.8			No visible damage
50		7.6			Removed by 9 Feb 1945
51		11.2			" " " "
52		4.5			" " " "
53		10.0			" " " "
54	a	18.2			No visible damage
	b	3.6			Removed by 9 Feb 1945
	c	9.1			No visible damage
55		9.1			No visible damage
56		10.5	5.6		Damaged portion is demolished
57		13.2			Removed by 9 Feb 1945
58	a	2.4			No visible damage
	b	2.4			Possibly damaged; photography not adequate to assess
	c	5.4			No visible damage
	d	6.9			" " "

5-6122a, AF



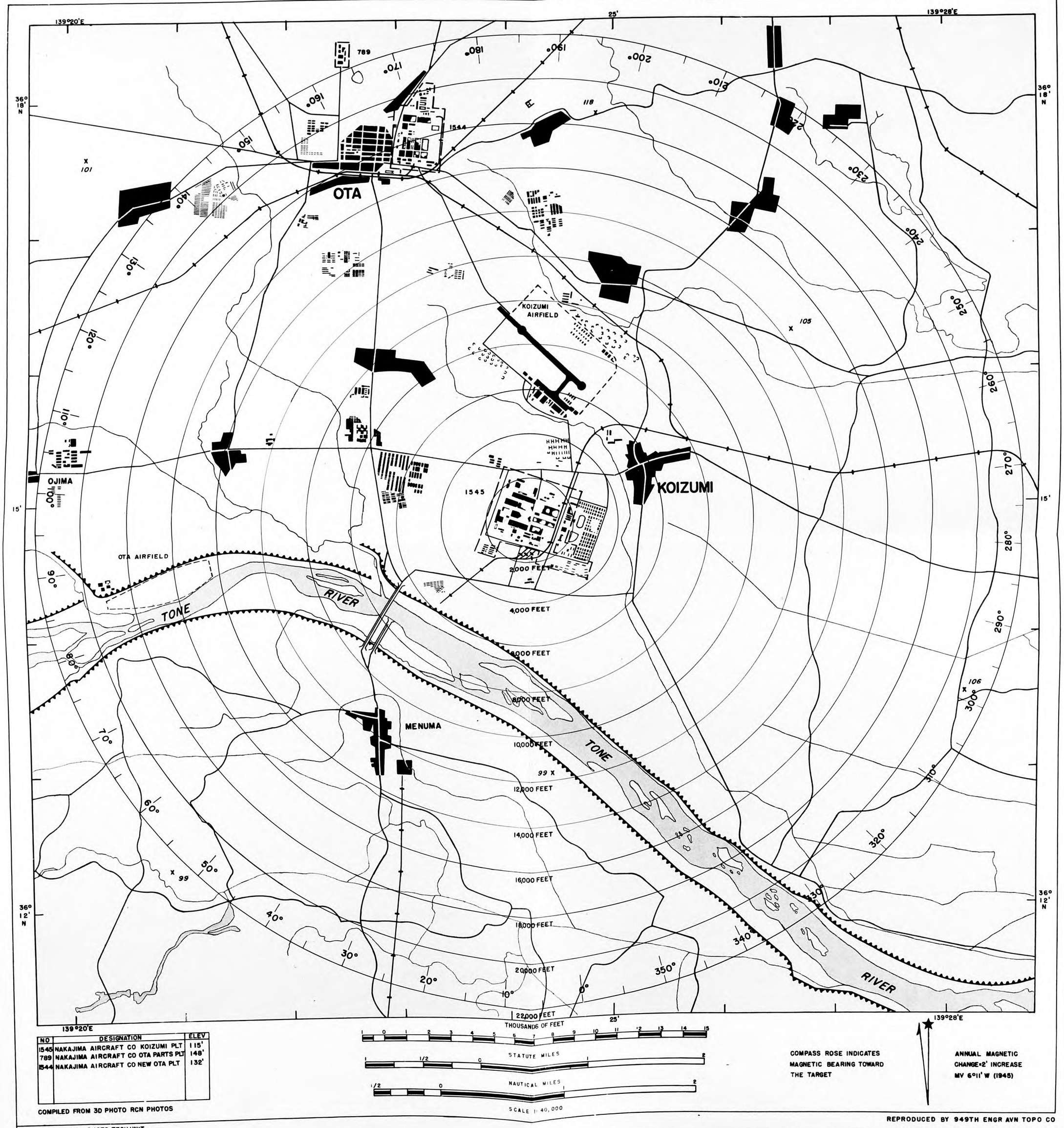
A-2 SECTION
XXI BOMBER COMMAND

OTA-KOIZUMI AREA

NAKAJIMA AIRCRAFT CO KOIZUMI PLANT - TARGET NO 90.13 - 1545

MARCH, 1945

TARGET CHART NO 6B
RESTRICTED



NO	DESIGNATION	ELEV
1545	NAKAJIMA AIRCRAFT CO KOIZUMI PLT	115'
789	NAKAJIMA AIRCRAFT CO OTA PARTS PLT	148'
1544	NAKAJIMA AIRCRAFT CO NEW OTA PLT	132'

COMPILED FROM 3D PHOTO RCN PHOTOS

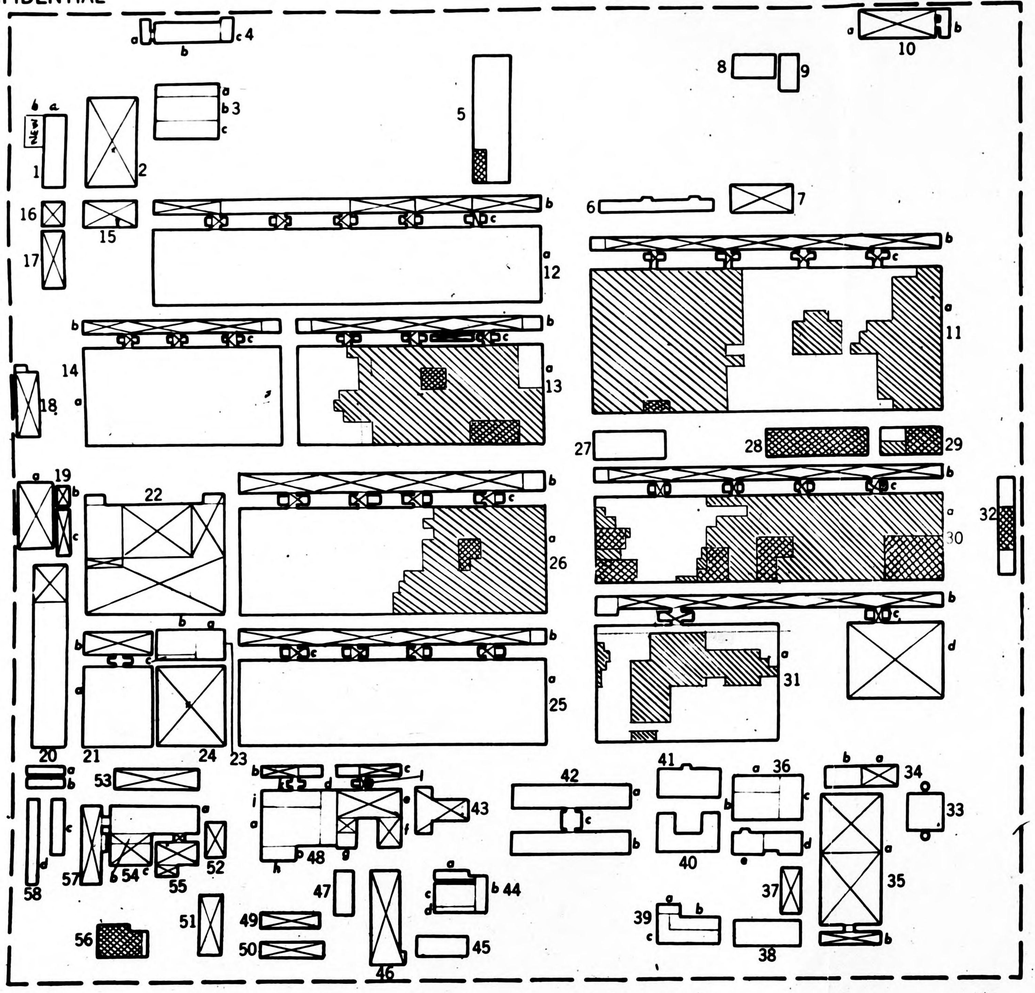
COMPASS ROSE INDICATES MAGNETIC BEARING TOWARD THE TARGET

ANNUAL MAGNETIC CHANGE=2' INCREASE
MV 6°11' W (1945)

COMPILED BY 35TH PHOTO TECH UNIT

REPRODUCED BY 949TH ENGR AVN TOPO CO

CONFIDENTIAL



WORKERS QUARTERS AND RECREATION AREA

AREAS OF DAMAGE

STRUCTURAL DAMAGE

SUPERFICIAL DAMAGE

CIVIL REMOVAL

CONFIDENTIAL

SCALE IN FEET

0 200 400 600 800 1000

AC/AS INTELLIGENCE PHOTOGRAPHIC DIVISION
PHOTO INTELLIGENCE SECTION

NAKAJIMA AIRCRAFT CO.

KOIZUMI, JAPAN

TARGET NO: 90.13/1545

PHOTOGRAPHY OF 24 MAR 45

C.F.L. 744.021 - D2

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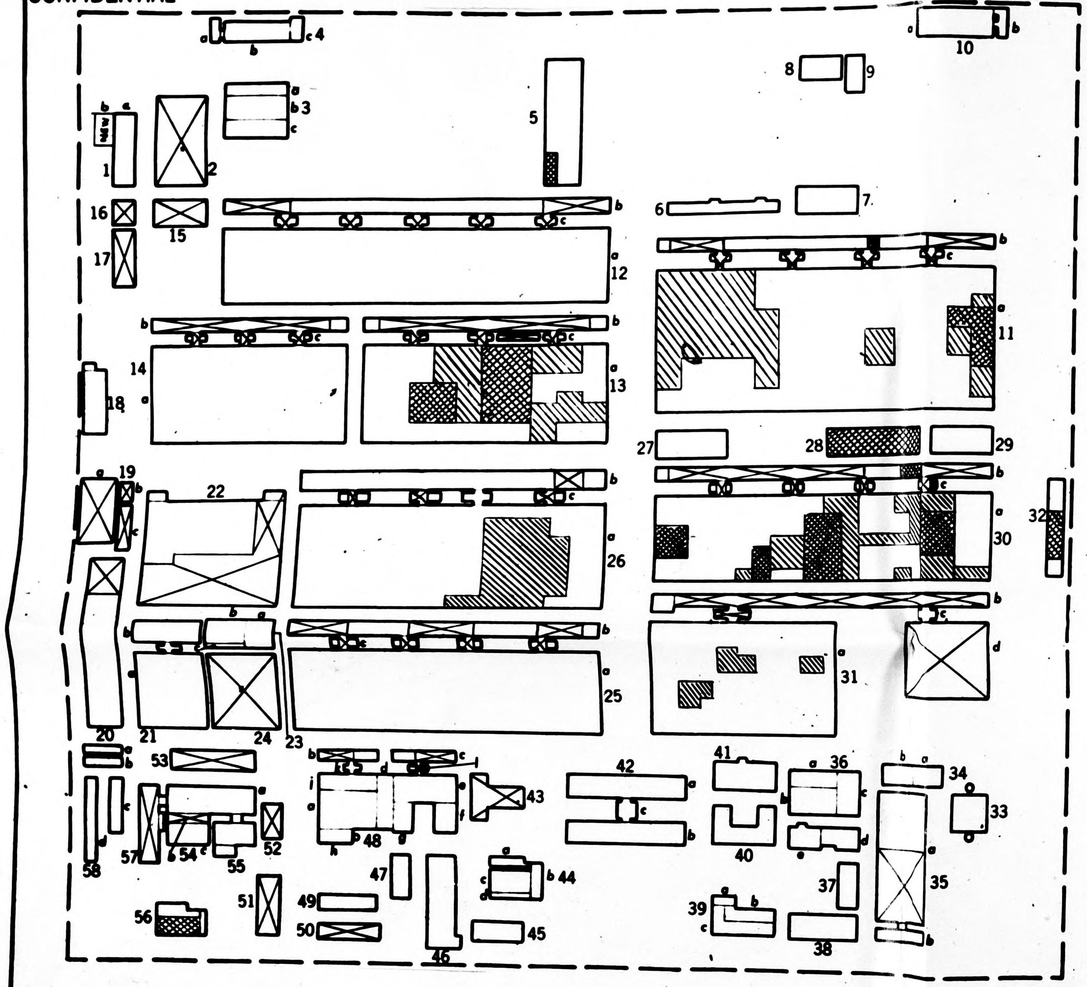

WORKERS QUARTERS AND RECREATION AREA

INDUSTRIAL DAMAGE PLAN
AREAS OF VISIBLE DAMAGE

STRUCTURAL DAMAGE

SUPERFICIAL DAMAGE

CIVIL REMOVAL

CONFIDENTIAL

SCALE IN FEET
1:3600

0 200 400 600 800 1000

AC/AS INTELLIGENCE PHOTOGRAPHIC DIVISION
PHOTO INTELLIGENCE SECTION

NAKAJIMA AIRCRAFT CO.

KOIZUMI, JAPAN

TARGET NO. 90.13/1545

PHOTOGRAPHY OF 27 FEB. 45

C.F.L. 744.021 - DI

A8/H1

UNITED STATES PACIFIC FLEET
AND PACIFIC OCEAN AREAS
HEADQUARTERS OF THE COMMANDER IN CHIEF

Serial: 06063

28 May 1945

CONFIDENTIAL

From: Commander in Chief, U. S. Pacific Fleet
and Pacific Ocean Areas.
To: DISTRIBUTION LIST.

Subject: Attack Assessment Report No. 4 - Forwarding of.

Enclosure: (A) Subject Report, dated 24 May 1945.

1. Enclosure (A) is forwarded herewith for information.

O. L. THORNE,
By Direction.

DISTRIBUTION LIST

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CINCPOA ADVANCE HEADQUARTERS
Care of Fleet Post Office
San Francisco, California

CONFIDENTIAL

24 May 1945

ATTACK ASSESSMENT REPORT No. 4
TASK FORCE 58 - 25 February 1945.

TARGET: No. 90.13-1545, NAKAJIMA AIRCRAFT CO., KOIZUMI Assembly Plant, JAPAN. (36° 15' N., 139° 25' E.)

SUMMARY:

1. The strike on NAKAJIMA KOIZUMI was made by 64 naval carrier aircraft on 25 February 1945. The weight of attack was 137 bombs totalling 36.75 tons and including 22x250 lb. G.P., 94x500 lb. G.P., and 21x1000 lb. G.P. All bombs had 0.025 second delay tail fuzing.

2. Accuracy of bombing on this strike was nearly up to pre-raid expectations. Of 129 bomb hits and probable hits located, 64% fell within the designated Vital Area* of the plant. Excluding 43 probable hits, at least 51% were in the Vital Area. These figures compare with 67% as the estimated accuracy standard.

3. There was a tendency to overshoot the target. The bombing runs were from west to east and most all hits missing the target fell beyond the northern and eastern limits.

4. Nine buildings in the Vital Area sustained total visible damage of 736,900 sq. ft. or 38% of the total plan area of buildings in the Vital Area. Visible structural damage was 113,400 sq. ft. or 6%, which is approximately 5500 sq. ft. per ton of bombs hitting the target.

5. Anticipated structural damage from the weight of attack received is calculated as 16% of the Vital Area. The disparity between 16% and 6% structural damage actually achieved may due to:

(a) The failure to use optimum bomb and fuze combinations; and

(b) Overestimating the vulnerability of certain structures to bomb damage.

6. Steel-framed sawtooth buildings with long spans, external boom bracings, and medium or high eaves proved less vulnerable to structural damage than steel-framed sawtooth buildings with short spans, low eaves, and lacking external boom bracings. Vulnerability of the latter type building is approximately as predicted.

7. In an economic damage assessment the Joint Target Group has estimated that this attack has caused a plant loss of about 6 weeks output or roughly 670 planes. Photos taken one month after the strike show that no repairs were being made but that building removal was continuing.

I. GENERAL:

The KOIZUMI Aircraft Assembly Plant of the NAKAJIMA Aircraft Company is located approximately 40 miles NNW of TOKYO and less than three miles south of the NAKAJIMA OTA Assembly Plant. It was attacked as an alternate target on 25 February 1945 at 1035 by 64 aircraft from the three carriers, U.S.S. BUNKER HILL, U.S.S. ESSEX, and U.S.S. COWPENS, all of Task Group 58.3. The

* The Vital Area consists of the most important buildings of the plant as designated in CINCPAC-CINCPOA Bulletin 169-44.

weather was clear and the ground was covered with snow. There had been no previous attacks with the exception of 18 rockets fired against the target by three fighter planes from the U.S.S. SAN JACINTO on 16 February 1945.

II. WEIGHT OF ATTACK:

A total of 137 bombs weighing 36.75 tons was dropped on the target according to action reports. This figure included 22x250 lb. G.P. bombs, 94x500 lb. G.P., and 21x1000 lb. G.P. The weight of the average bomb was 536 lbs. The division of the ordnance between the various aircraft is indicated in Table I.

TABLE I

DATE	SHIP	AIRCRAFT No.	AIRCRAFT Type	5-INCH ROCKETS	NO. G.P. BOMBS 250#	NO. G.P. BOMBS 500#	NO. G.P. BOMBS 1000#	TONS OF BOMBS	ALTITUDE OF RELEASE
16 Feb.	SAN JACINTO	3	VF	18	-	-	-		
25 Feb.	BUNKER HILL	19	VF	-	-	19	-	4.75	2000'
25 Feb.	BUNKER HILL	13	VB	-	22	-	12	8.75	2500'
25 Feb.	BUNKER HILL	13	VT	-	-	47	-	11.75	3500'
25 Feb.	ESSEX	11	VF	-	-	2	9	5.0	?
25 Feb.	COWPENS	8	VT	-	-	26	-	6.5	5000'
TOTALS		67		18	22	94	21	36.75	
TOTAL TONS					2.75	23.5	10.5	36.75	

SOURCE: Aircraft action and ship action reports of Task Group 58.3.

All bombs were fuzed with .025 second delay tail fuzes, and it appears from action reports that no nose fuzes were employed. Rockets had non-delay base fuzes.

III. ACCURACY OF BOMBING (Fig. 1)

Of the 137 bombs expended against this target, 129 or 94% have been located. Of the total located bombs 83 (or 64%) fell within the Vital Area of the plant which fact represents a very creditable accuracy.

The limitations of this accuracy figure of 64% should be noted. Included in the 129 located hits are 43 probable hits, 39 of which are in the Vital Area. The difficulty of identifying bomb hits on the photographs is due largely to the absence of visible craters in the buildings. Reliance has been placed on strike photos and on locating hits at the center of areas of damage. However, if probable hits are eliminated, at least 51% of the certain hits were in the Vital Area which is still creditable.

The accuracy is substantiated by observable damage to buildings. There was a total damage of 736,900 sq. ft. in the Vital Area of the plant compared with only 21,500 sq. ft. of damage outside the Vital Area. On the other hand, it must be noted that the Vital Area is very large and compact (over 2,200,000 sq. ft.).

It is obvious from the bomb plot (Figure 1) that there was a tendency to overshoot the target. The attack was made from west to east or from southwest to northeast and almost without exception the bombs fell in the northern and eastern portions of the plant or beyond in the recreation area or in the open fields. A comment on this phase of the bombing accuracy is made in the aircraft action report of VT46 on the USS COWPENS and is quoted:

> "The attack on the KOIZUMI Aircraft Plant was made deliberately and should have resulted in more thorough damage to the target. The center of impact of all bombs was too far to the east, the attack being made from west to east. The first hits appear near the target center with succeeding hits falling over and eastward. Apparently the first wave of a sizeable strike

should select the near side of large targets to obtain maximum accuracy in placing the center of impact of all bombs released."

The number of hits, probable hits, and near misses received by the various buildings are tabulated in Table II.

TABLE II

BUILDING NUMBER	CERTAIN HITS	PROBABLE HITS	NEAR MISSES	TOTAL
11a	10	11	1	22
13a	6	7	0	13
26a	5	7	1	13
26b	1	1	0	2
28	1	0	0	1
29	1	0	0	1
30a	9	10	0	19
30b	1	0	0	1
31a	4	1	0	5
ON BUILDINGS IN VITAL AREA	38	37	2	77
OTHER HITS IN VITAL AREA	4	2	0	6
TOTAL HITS IN VITAL AREA	42	39	2	83
HITS ON OTHER TARGET BUILDINGS	4	1	1	6
OTHER HITS LOCATED	37	3	0	40
TOTAL HITS OBSERVED	83	43	3	129

IV. DAMAGE TO BUILDINGS (Fig. 1)

Nine buildings or building divisions lying in the Vital Area were hit for a total visible damage of 736,900 sq. ft. or 38.2% of the total plan area of buildings in the Vital Area. Of this total visible damage, structural damage was 113,400 sq. ft. or 5.9% of the total plan area. Visible damage outside the Vital Area was small, totaling only 21,500 sq. ft.

TABLE III

SUMMARY OF DAMAGE

	VITAL AREA Sq. Ft.	%	OUTSIDE VITAL AREA Sq. Ft.	%	TOTAL TARGET AREA Sq. Ft.	%
PLAN AREA OF BUILDINGS	1,925,600	-	891,100	-	2,816,700	-
STRUCTURAL DAMAGE	113,400	5.9	18,600	2.1	132,000	4.7
SUPERFICIAL DAMAGE	623,500	32.3	2,900	0.3	626,400	22.2
TOTAL DAMAGE	736,900	38.2	21,500	2.4	758,400	26.9

A damage and bomb plot is presented in Figure 1. The damage assessment is not the first one that has been made for this attack (See Reference (c), (d) and (e)), but it is the first to have used the reconnaissance photographs of the XXIBC taken on 24 March. The earlier reconnaissance photos of XXIBC taken on 27 February were of small scale, fair quality, and obscured by a recent fall of snow. The later photos are of a larger scale and reveal less structural damage. The exact extent of structural damage is, even in the later photographs, very difficult to delimit. Partly as a result of roof stripping and partly due to weathering

action on damaged roofs, the area of superficial damage is considerably greater than it was earlier judged to be.

TABLE IV

DAMAGE SCHEDULE, BY BUILDINGS
(Area in thousands of sq. ft.)

BUILDING	OCCUPANCY	ORIGINAL* PLAN AREA	PLAN AREA REMOVED	NET PLAN AREA	STRUCTURAL DAMAGE	SUPERFICIAL DAMAGE
11a	Sub-assembly and assembly	416.0		416.0	8.0	223.4
13a	Sub-assembly	199.8		199.8	4.0	140.0
26a	Sub-assembly	273.0		273.0	24.0	88.9
26b	Storage	45.5	2.7	42.8	6.0	0.0
28	Unidentified	24.8	12.4	12.4	12.4	0.0
29	Unidentified	14.4		14.4	0.0	4.7
30a	Sub-assembly	247.2		247.2	55.5	110.5
30b	Storage	30.9	23.1	7.8	3.5	0.0
31a	Sub-assembly and assembly	181.5		181.5	0.0	56.0
BLDGS. HIT IN VITAL AREA		1433.1	38.2	1394.9	113.4	623.5
OTHER BLDGS. IN VITAL AREA		701.0	168.7	532.3	0.0	0.0
TOTAL BLDGS IN VITAL AREA		2134.1	206.9	1927.2	113.4	623.5
OTHER DAMAGED TARGET BLDGS		116.0	10.7	105.3	18.6	2.9
OTHER UNDAMAGED TARGET BUILDINGS		1105.9	341.7	764.2	0.0	0.0
TOTAL		3356.0	559.3	2796.7	132.0	626.4

*Figures from JTG, Reference (e).

TABLE V

CONSTRUCTION NOTES

BUILDING	CONSTRUCTION TYPE	I.P.*
11a	External booms, sawtooth, high eaves, long span	10
13a	External booms, sawtooth, medium eaves, long span	5
26a	Ordinary sawtooth, low eaves, short span	10
26b	Load-bearing shed	-
28	Load-bearing shed	-
29	Load-bearing shed	-
30a	Ordinary sawtooth, low eaves, short span	9
30b	Load-bearing shed	
31a	External booms, sawtooth, high eaves, long span	4

*Index of Importance to Production, Reference (j).

The average area of structural damage per bomb was approximately 1500 sq. ft. or 5500 sq. ft. per ton.

Two pre-raid estimates were made concerning the levels of structural damage to be expected from various weights of attack against the KOIZUMI plant.

The earlier of these was presented in the CINCPAC - CINCPOA Target Bulletin, Tokyo Area, No. 169 - 44. For glide and dive bombing using 500 lb. G.P. bombs with 0.1 second nose fuzing and 0.01 second tail fuzing it was estimated that 85 tons of bombs would achieve a damage level of 33% in the vital area. On this basis the actual weight of attack, 36.75 tons should have caused 16% structural damage. Such damage, however, was only 6%. Since bombing accuracy closely approached the anticipated results, 64% in comparison with 67%, the disparity between damage expected and damage attained must be due to: (a) that the optimum fuzings were not used, and (b) that the force requirements were underestimated for the type of structures to be hit.

Pre-raid damage estimates were based on the use of only 500 lb. bombs or larger. Only bombs of these sizes were used with the exception that some 250 lb. bombs were expended as wing bombs. Obviously a bonus is obtained by the use of wing bombs as a supplement to bomb bay loads. In the computation of results the inclusion of the 250 lb. bombs in the total weight of attack will of course lower the area of structural damage per ton. The substitution of 0.025 second delay tail fuzes for 0.01 second delay tail fuzes was probably a factor in the reduction of the amount of structural damage per ton.

The second estimate of force requirements for a carrier attack on KOIZUMI was made by the Joint Target Group in Target Information Sheet, Annex 1 (T1-1-A). Here, the number of hits required to achieve 30, 50 and 70% serious damage to individual buildings has been estimated for 500 lb. G.P., 1000 lb. G.P. and 2000 lb. G.P. bombs with optimum fuze combinations. A comparison of the number of hits and the damage suffered by five of the larger buildings at KOIZUMI with anticipated damage as given in the above-mentioned publication indicates that some of the buildings were less vulnerable than was anticipated.

TABLE VI

BUILDING DAMAGE EXPECTED FROM HITS RECEIVED

	30a	26a	11a	13a	31a
Total Hits Received.	19	13	22	13	5
Structural Damage Received.	22%	9%	2%	2%	0%
Hits (500 lb. G.P.) Required for 30% Structural Damage.*	25	28	21	10	9
Damage to have been expected from hits received.	23%	14%	31%	37%	17%
Sawtooth with external booms long spans, medium and high eaves.			X	X	X
Ordinary sawtooth short span.	X	X			

* JTG, Reference (h)

While the hits estimated to inflict a required damage level on the ordinary sawtooth assembly buildings appear to be fairly accurate, the same estimates for sawtooth buildings with external booms, long spans, and medium to high eaves are considerably short. In this respect, it must be pointed out again that the Joint Target Group estimates are based on the optimum fuze selection. The optimum fuze combination as given by the Joint Target Group is 0.01 nose and 0.01 tail, with the 0.1 nose as alternate if the 0.01 nose fuze is not available. Preference is also expressed for the larger bombs, the order of bomb size priority being 2000, 1000, and 500 lb. The 0.01 second delay fuze initiated on the roof will cause greatest structural damage since detonation will occur among the roof trusses. Against the heavier structural members found in high, long span buildings such as 11a, 13a, and 31a large bombs are better for damage leading to major structural collapse.

There is very little evidence of fire. Some smoke is observed in the strike photos, but it clears rapidly from the centers of damage.

Eighteen rackets with non-delay fuzes were fired at the Target on 16 February by three fighter planes from the U.S.S. SAN JACINTO, but it is believed that practically none of the observable damage could have resulted from this attack.

V. EFFECT ON PRODUCTION

The Joint Target Group has estimated (See Reference (e) a production loss of about 6 weeks output at the estimated pre-attack production rate of 455 per month assuming a normal rate of repair. This amounts to roughly 670 planes. The eastern half of the plant, believed to be engaged in the manufacture of mutiple-engined planes, has suffered a greater production loss than the western half which is thought to manufacture the plant's single-engined planes.

On March 24, almost one month after the strike, photos show no evidence of repairs in progress with the exception of some roof stripping of partly damaged roof areas.

The removal of buildings which was in progress before the strike, was continuing in addition, other of the smaller buildings were being dismantled.

REFERENCES

(a) Commander, First Carrier Task Force Operation Order No. 1-45 SECRET.

(b) CINCPAC - CINCPOA Bulletin 169 - 44, CONFIDENTIAL.

(c) C.I.U. XXI B.C. Damage Assessment Report No. 12, CONFIDENTIAL.

(d) Interpron Two Photographic Intelligence Report No. 460, CONFIDENTIAL.

(e) J.T.G, Economic Damage Assessment Report No. 9, CONFIDENTIAL.

(f) J.T.G, Fire Susceptibility Plan, Illustration No. 90.13-1545 - P5, CONF.

(g) J.T.G, Functional Identification Sheet No. 90.13-1545 - P6, CONFIDENTIAL.

(h) J.T.G, Target Information Sheet No. 90.13-1545 - T1/1 and T1/1-A, CONFIDENTIAL,

(i) Aircraft Action Reports, Ship Action Reports, and Group Action Reports for Strike of 25 February 1945 - USS BUNKERHILL, USS ESSEX, USS COWPENS, and USS SAN JACINTO , Task Group 58.3, CONFIDENTIAL.

(j) J.T.G, Explanation of Weapon Recommendations, J.T.G. M-3/1 CONFIDENTIAL.

PHOTO REFERENCES

(a)	3PR 4M4-4	7 Nov.	24	33,800'	Exps. 29-31,5,9	Good
(b)	3PR 5M45-2	12 Feb.	24	33,000'	Exps. 50-52	Good
(c)	CVL 25 - 115	25 Feb.	24	10,000'	Exps 9 - 11	Strike
(d)	CVL 25 - 114	25 Feb.	12	10,000'	Exps. 9 - 10	Strike
(e)	CVL 25-116	25 Feb.	6-3/8	2,000' 3,000'	Exps. 1 - 2	Strike obliques
(f)	BKHL - 404P	25 Feb.	24	12,000'	Exps. 10 - 13	Strike
(g)	BKHL -- 404S	25 Feb.	24	12,000'	Exps. 10 - 14	Strike
(h)	3PR 5M60-2	27 Feb.	24	34,000'	Exps. 23 - 24	Fair.
(i)	3PR 5M 98-2	24 Mar.	24	????	Exps. 21 - 25	Good
(j)	3PR 5M 98-3L	24 Mar.	40	????	Exps. 43 - 54	Good

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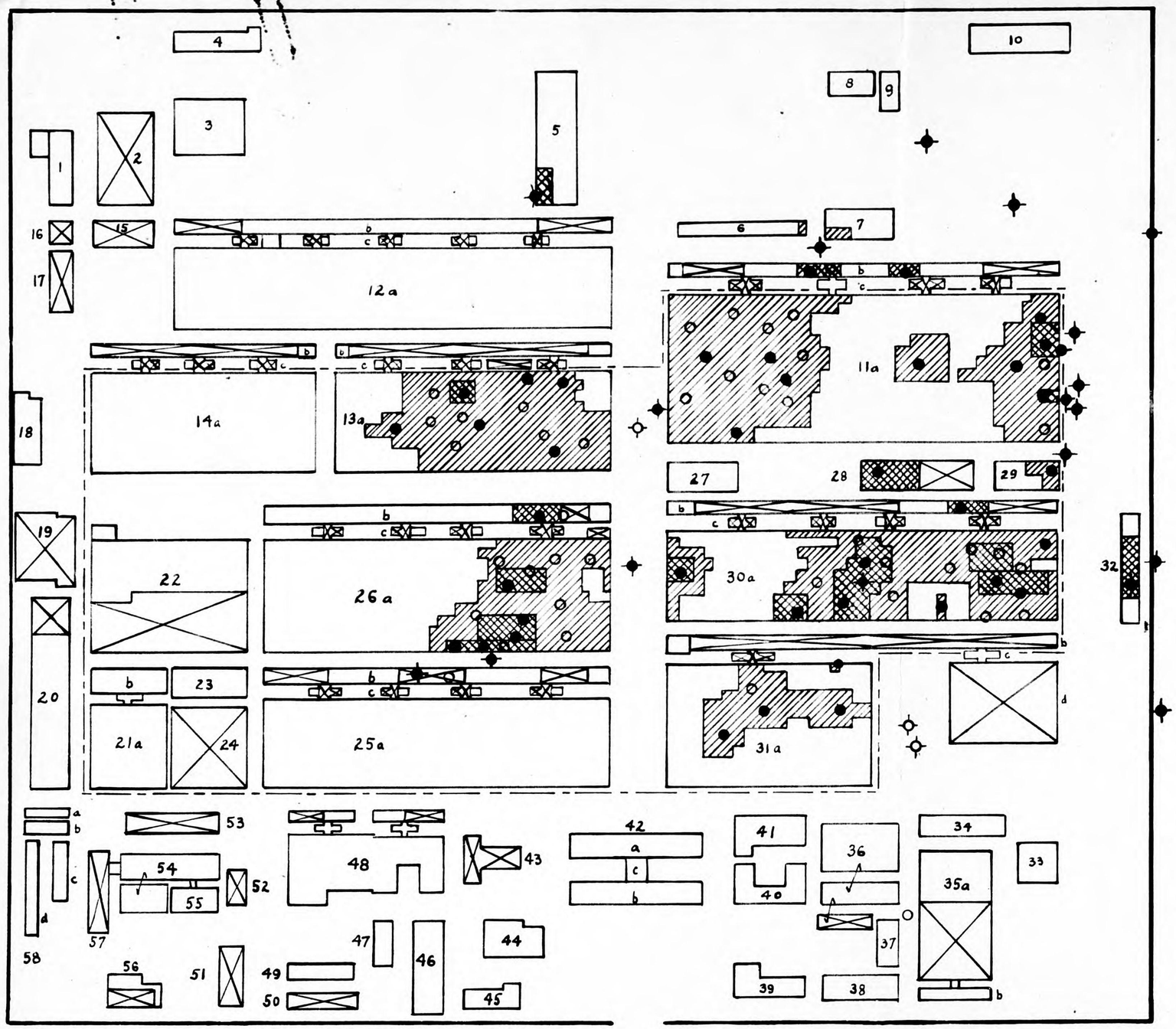


NAKAJIMA AIRCRAFT CO.

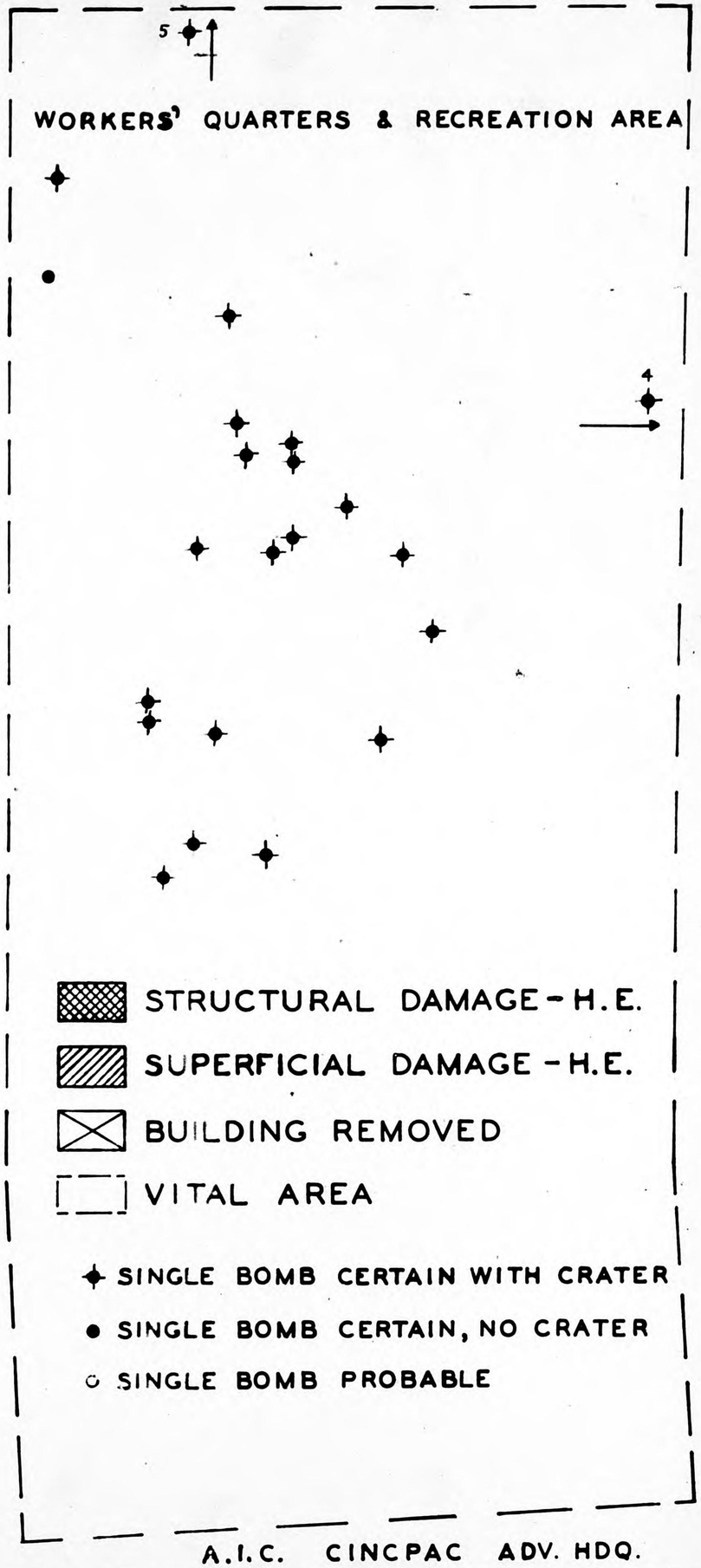
KOIZUMI ASSEMBLY PLANT

90.13 – 1545

U.S. CARRIER STRIKE OF 25 FEB. '45

0 500 1000
feet

FIG. 1. ATTACK ASSESSMENT REPORT NO. 4



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Sheet No. 90.13-1545-TI/1-A
Date 21 Feb. 1945
Page No. 1 (2 pages)

JOINT TARGET GROUP, WASHINGTON, D.C.

TARGET INFORMATION SHEET

ANNEX I

Obj. Folder 90.12, 13
Obj. Area 90.13
AAF Target No. 90.13-1545

Place Koizumi (Japan)
Air Target System Aircraft

Lat.: 36°15'N
Long: 139°25'E
Alt.: 125 feet

NAME OF TARGET - NAKAJIMA AIRCRAFT, KOIZUMI PLANT
(Nakajima Hikoki K.K., Koizumi Seisakusho)

(Note: This annex is issued for use by the Navy in conjunction with Target Information Sheet 90.13-1545 TI/1, dated by the Joint Target Group on 21 Feb. 1945,)

ALL PREVIOUS SHEETS CANCELLED

NAVAL CARRIER-BASED AIR ATTACK

Introduction: This sheet is for the use of Naval carrier-based aircraft which are better adapted for attacking the important individual buildings rather than the target as a whole. In view of the complexities involved in estimating bombing accuracies and stowage capabilities of carrier-based aircraft, this discussion is limited to stating the number of hits with various bombs required to achieve given levels of damage on individual buildings. No attempt is made to convert these to number of bombs or planes to be dispatched.

Buildings and Their Importance to Production: Only those buildings rated as "Primary" or "Secondary" on the Fire Susceptibility Plan, Illustration No. 90.13-1545 P5, are taken into consideration; other buildings are of minor productive value and do not merit specific attack. The buildings are listed in Table I below in the order of their importance to production, the relative value of which is indicated by the numbers in the column headed "I.P." (Index of Importance to Production). These indices, based on a scale 10 to 1 (buildings rated 10 being of greatest importance), refer to this target only and should not be used to compare buildings in different targets.

Number of Hits: Table I below gives the number of hits by various HE bombs to achieve 30, 50, and 70 percent serious damage to specific buildings. For other levels of damage within this range, the required number of hits can be obtained by interpolation.

Table I

Number of Hits Required to Achieve 30, 50 and 70 Percent Serious Damage to Individual Buildings
(Refer to Illustration No. 90.13-1545 P5)

Building No.	I.P.	Fraction of Serious Damage	Number of Hits 500-lb GP	1000-lb GP	2000-lb GP	Area Construction
11a	10	30%	21	9	4	E 416.0
		50%	41	17	8	
		70%	61	26	11	
26a	10	30%	28	16	8	S 273.0
		50%	55	32	16	
		70%	81	48	23	
30a	9	30%	25	15	7	S 247.2
		50%	49	29	14	
		70%	73	43	21	
25a	7	30%	21	13	6	S 209.3
		50%	42	25	12	
		70%	62	36	17	
12a	5	30%	11	5	2	E 220.4
		50%	22	9	4	
		70%	32	14	6	
14a	5	30%	8	3	1	E 151.2
		50%	15	6	3	
		70%	22	9	4	

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JOINT TARGET GROUP - WASHINGTON, D.C.

Sheet No. 90.13-1545-T1/1-A
Date 21 Feb. 1945
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ANNEX I *(Cont'd)*

TARGET INFORMATION SHEET

	Building No.	I.P.	Fraction of Serious Damage	Number of Hits 500-lb GP	1000-lb GP	2000-lb GP	
E	13a	5	30%	10	4	2	199.8
			50%	19	8	4	
			70%	29	12	5	
E	31a	4	30%	9	4	2	181.5
			50%	17	7	3	
			70%	26	11	5	
S	22	3	30%	12	7	3	123.0
			50%	24	14	6	
			70%	36	21	10	
Removed	31c	2	30%	6	3	2	0
			50%	11	6	3	
			70%	17	10	4	
Removd	24	1	30%	4	2	1	0
			50%	8	5	2	
			70%	12	7	3	

Examples of Use of Table I:

1. Problem: To obtain the required number of hits with 500-lb GP bombs on Building 30a to achieve 30 percent serious damage.
   Solution: The table gives 25 hits as the number required to achieve 30 percent serious damage.

2. Problem: To obtain the required number of hits with 2000-lb GP bombs on Building 11a to achieve 60 percent serious damage.
   Solution: The table gives 8 hits for 50 percent and 11 hits for 70 percent serious damage. By interpolation 10 hits are required for 60 percent serious damage.

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(P)

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JOINT TARGET GROUP, WASHINGTON, D.C.

TARGET INFORMATION SHEET

ANNEX I

Obj. Folder 90.12, 13
Obj. Area 90.13
AAF Target No. 90.13-1545

Place Koizumi (Japan)
Air Target System Aircraft

Lat.: 36°15'N
Long: 139°25'E
Alt.: 125 feet

NAME OF TARGET - NAKAJIMA AIRCRAFT, KOIZUMI PLANT
(Nakajima Hikoki K.K., Koizumi Seisakusho)

(Note: This annex is issued for use by the Navy in conjunction with Target Information Sheet 90.13-1545 TI/1, dated by the Joint Target Group on 21 Feb. 1945,)

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		70%	81	48	23
30a	9	30%	25	15	7
		50%	49	29	14
		70%	73	43	21
25a	7	30%	21	13	6
		50%	42	25	12
		70%	62	36	17
12a	5	30%	11	5	2
		50%	22	9	4
		70%	32	14	6
14a	5	30%	8	3	1
		50%	15	6	3
		70%	22	9	4

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TARGET INFORMATION SHEET

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		50%	19	8	4
		70%	29	12	5
31a	4	30%	9	4	2
		50%	17	7	3
		70%	26	11	5
22	3	30%	12	7	3
		50%	24	14	6
		70%	36	21	10
31c	2	30%	6	3	2
		50%	11	6	3
		70%	17	10	4
24	1	30%	4	2	1
		50%	8	5	2
		70%	12	7	3

Examples of Use of Table I:

1. Problem: To obtain the required number of hits with 500-lb GP bombs on Building 30a to achieve 30 percent serious damage.
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   Solution: The table gives 8 hits for 50 percent and 11 hits for 70 percent serious damage. By interpolation 10 hits are required for 60 percent serious damage.

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Sheet No. 90.13-1545-TI/1
Date 21 Feb. 1945
Page No. 1 (6 pages)

JOINT TARGET GROUP, WASHINGTON, D.C.
TARGET INFORMATION SHEET

Obj. Folder 90.12, 13
Obj. Area 90.13
AAF Target No. 90.13-1545
NAME OF TARGET

Place Koizumi (Japan)
Air Target
System Aircraft

Lat.: 36° 15'N
Long: 139° 25'E
Alt.: 125 feet

NAKAJIMA AIRCRAFT, KOIZUMI PLANT

(Nakajima Hikoki KK, Koizumi Seisakusho)

ALL PREVIOUS SHEETS CANCELLED

SIGNIFICANCE

This Nakajima assembly plant for Navy planes ranks as one of the largest in Japan, probably accounting for more than 20 per cent of the total production of combat aircraft. In addition to final assembly, this plant manufactures some major components and sub-assemblies but no engines. It produces fighters, torpedo bombers, medium bombers, reconnaissance, and possibly a 4-engine heavy bomber. It is of more recent construction than the nearby New Ota Plant (TARGET 90.13-1544), specializing in Army types. Engines are largely supplied by the company's Musashino-Tama (Musashi) Engine Plant (TARGET 90.17-357) in the W outskirts of Tokyo.

Nakajima is the oldest privately-owned aircraft company in Japan and, with Mitsubishi, is one of the two leading producers of aircraft and engines for both the Army and Navy.

LOCATION

Approximately 40 miles NNW of Tokyo in the intensively cultivated plain drained by the Tone River, which flows generally SSE about one mile S of the target. Ota village, with a 10-mile wooded ridge extending NW, is less than 3 miles to the NW; the major Kumagaya Air Base (TARGET 90.13-1644) lies 6 miles SW.

The plant is approximately one mile SW of Koizumi, and one mile E of the highway leading due S from Ota across Tone River. The electrified RR entering Koizumi from the E has been extended to the plant and on to Ota. Barracks and administrative buildings adjoin the plant site on the E. About 4900 feet N of the target is an airfield from which assembled planes are flight tested. Approximately 2.7 miles NNW and directly E of Ota village is Nakajima's New Ota assembly plant (TARGET 90.13-1544).

DESCRIPTION AND LAYOUT

(Refer to Illustration No. 90.13-1545 P3, P5, and P6). The total target area is about 2900 x 2400 feet, rectangular in shape with the major axis lying E-W. The built-up plan area is approximately 3.3 million square feet. Floor area is 3.5 million square feet making this the second largest airframe plant in Japan, although only half as large as the Mitsubishi Aircraft Works airframe plant in Nagoya (TARGET 90.20-194). Both the target site and floor area of Koizumi are greater than that of the New Ota plant (TARGET 90.13-1544). One of the newer airframe plants in Japan, Koizumi is of modern construction. The large assembly and sub-assembly buildings, the important press shops, machine shops, and small parts fabrication units are concentrated in the center section of the plant. Available intelligence is not sufficient to relate buildings with individual plane types or to permit a more extensive breakdown of functions than is given in Illustration 90.13-1545 P6.

PRIMARY OBJECTIVES

(Refer to Illustration No. 90.13-1545 P3, P5, and P6). Listed in order of productive importance, buildings: 11a, 26a, 30a, 25a, 12a, 14a, 13a, 31a, 22, 31c, and 24.

The destruction of these buildings and their contents would halt production in the sub-assembly, assembly, press and machine shops, and small parts fabrication processes, and would seriously cripple the plant.

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TARGET NO. 90.13-1545

APPROX. COORDINATES 36°15′ NORTH
139°25′ EAST

PHOTOGRAPHED 27 FEBRUARY 1945

JOINT TARGET GROUP - WASHINGTON, D. C.

NAKAJIMA AIRCRAFT, KOIZUMI PLANT

KOIZUMI, JAPAN

SCALE 1:6,000

500 0 500 1000 FEET

ILLUSTRATION NO. 90.13-1545-DP

ISSUED 21 APRIL 1945

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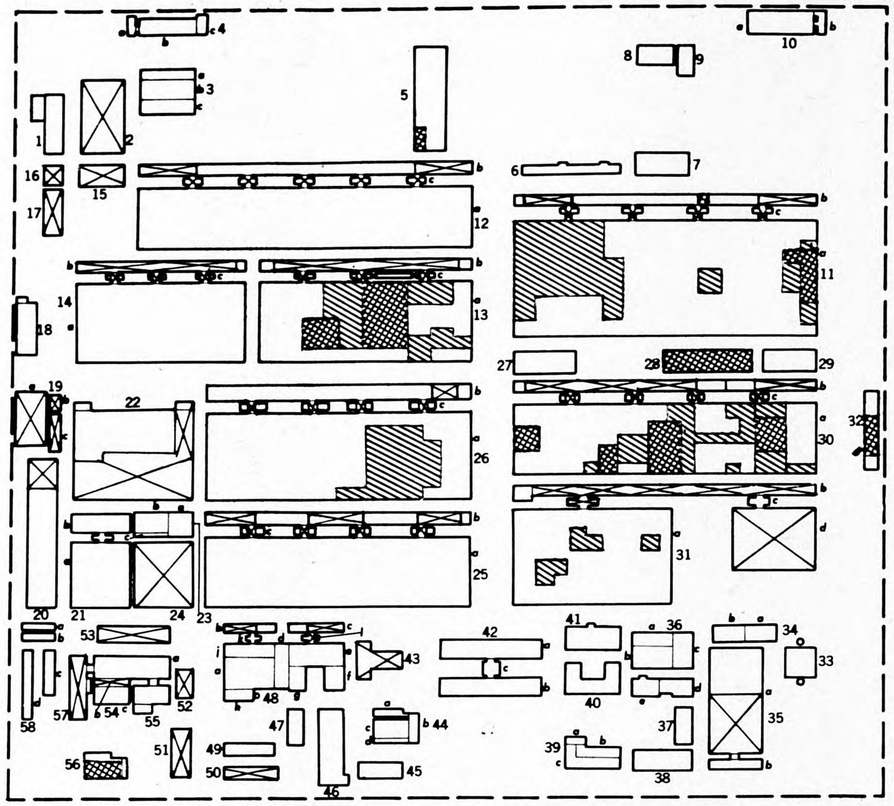

WORKERS QUARTERS AND RECREATION AREA

DATE OF ATTACK-24; 25 FEB. 1945

INDUSTRIAL DAMAGE PLAN

AREAS OF VISIBLE DAMAGE

STRUCTURAL DAMAGE

SUPERFICIAL DAMAGE

CIVIL REMOVAL

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT WITH OTHER 90.13-1545 MATERIAL

PREPARED BY AERONAUTICAL CHART SERVICE, AAF.

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The combustible portion of the contents is well dispersed, requiring multiple hits for maximum fire damage. The majority of the buildings are non-combustible (exposed steel trusses and columns, subject to structural fire damage). Ninety-eight per cent of the roofs are either lightweight non-combustible corrugated sheeting or fairly light combustible material. Thus, the AN-M69 is recommended as the most effective incendiary. A detailed analysis of each building indicates that the AN-M69 will be approximately 15 per cent more effective than the AN-M50 4-lb bomb, the alternate incendiary weapon. Fire damage also may be expected from the effects of high explosive bombs.

The following Loading Table shows the per cent of serious damage to the target which can be expected for different weights of attack and different accuracies of bombing. Accuracy is measured by the per cent of bombs dispatched expected to fall within 1000 feet of the recommended aiming point. Allowance has been made in the table for the fact that the whole target lies within a circle of 1700 feet radius. (Reference should be made to Joint Target Group Memorandum No. 3, "Explanation of Weapon Recommendations and Loading Tables Given in Target Information Sheets", dated 27 December 1944).

Table I

LOADING TABLE - MOST EFFECTIVE WEAPONS (1)

HE: AN-M66 2000-lb G.P., fuzed 0.01 sec. nose/0.01 sec. tail (if M139 nose fuzes unavailable, 0.1 sec. nose delay is recommended).

IB: AN-M69 6-lb (in M18 aimable clusters)

NAKAJIMA AIRCRAFT, KOIZUMI PLANT

Total Load in Tons (4)	Per cent of bombs dispatched expected to fall within 1000 feet of the aiming point (2)											
	10%			15%			20%			30%		
	H. E.	I. B.	F	H. E.	I. B.	F	H. E.	I. B.	F	H. E.	I. B.	F
75							25	50	15%	20	55	17%
100				30	70	16%	25	75	19	20	80	22
150	40	110	17%	30	120	22	25	125	24	35	115	27
200	40	160	21	30	170	25	60	140	28	85	115	31
300	70	230	26	130	170	31	160	140	35	185	115	40
400	170	230	31	230	170	37	260	140	41	285	115	47
500	270	230	35	330	170	42	360	140	47	385	115	54
600	370	230	39	430	170	47	460	140	52	485	115	59
700	470	230	43	530	170	51	560	140	57	585	115	64
800	570	230	46	630	170	55	660	140	61	685	115	68
900	670	230	50	730	170	59	760	140	65	785	115	72

NOTES:

(1) The 1000-lb G.P. is 95 cent as effective against this target as the 2000-lb bomb; the 500-lb bomb 85 per cent. The AN-M50 is estimated to be 85 per cent as effective as the AN-M69.

(2) In the examples following this table, this quantity is called the "Index of Mission Efficiency". It is a measure of bombing accuracy, and bears no relation to the size of the target.

(3) Expected fraction (per cent) of structural damage to the target. Allowance has been made for the fact that this whole target lies within a circle of 1700 feet radius.

(4) Load is given in tons of actual (not nominal) weight of bombs.

Holders of JTG Folders should insert this sheet in Air Target System Folder Japanese Aircraft in place of sheet No. 90.13-1545-TI

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Method of Use:

1. Determine Index of Mission Efficiency:

   (a) Estimate per cent of dispatched planes bombing primary target.
   (b) Estimate per cent of bombs over target expected to fall within 1000 feet of aiming point.
   (c) Multiply (a) by (b) and round off to nearest percentage figure in table.

2. Read under computed Index of Mission Efficiency and opposite the total load dispatched the recommended high explosive - incendiary loading and the expected per cent of damage.

Examples Illustrating Use of Loading Table:

1. To find the best HE-IB combination and resulting per cent of damage for a given force:

   Given: Planes expected to bomb primary target, 70 per cent of mission. Per cent of bombs over target, expected to fall within 1000 feet of aiming point, 30 per cent. Mission of 100 planes with total load of 400 tons.

   Solution: 70 per cent x 30 per cent equals 21 per cent; i.e., 20 per cent is Index of Mission Efficiency. Opposite 400 tons in 20 per cent columm find loading:
   HE 260 tons equals 65 plane loads at 4 tons per plane
   IB 140 tons equals 35 plane loads at 4 tons per plane
   Fraction of damage: 41 per cent.
   Hence, for optimum loading 65 planes will carry HE and 35 planes IB, but if groups of 12 are to carry only one kind of bomb per group, this may be revised to 5 groups of HE and 3 groups of IB.

2. To find force required to achieve recommended level of damage:

   Given: Recommended level of damage, 50 per cent. Same Index of Mission Efficiency as in Example 1. Individual A/C bomb load 4 tons.

   Solution: In 20 per cent Mission Efficiency column take:
   F equals 52 per cent and find loading:
   HE 460 tons
   IB 140 tons
   Total 600 tons
   requiring a total force of 150 A/C or 13 groups of 12 A/C.

The Loading Table has been prepared from an analysis of the target before attack. If the important buildings of the target have suffered only slight damage in previous attacks, this table still can be used for determining the best loading. However, after substantial damage to the important buildings has resulted, a new analysis of the target should be made and a new Loading Table prepared.

If the target has suffered substantial damage in earlier attacks, and no new Loading Table is available, the following general rules can be applied:

a. If previous attacks have destroyed most of the important combustible buildings (or buildings with highly combustible contents) on the site, as indicated in the Fire Susceptibility Plan, Illustration No. 90.13-1545 P5, loads carried on subsequent attacks should consist wholly of the recommended HE weapon.

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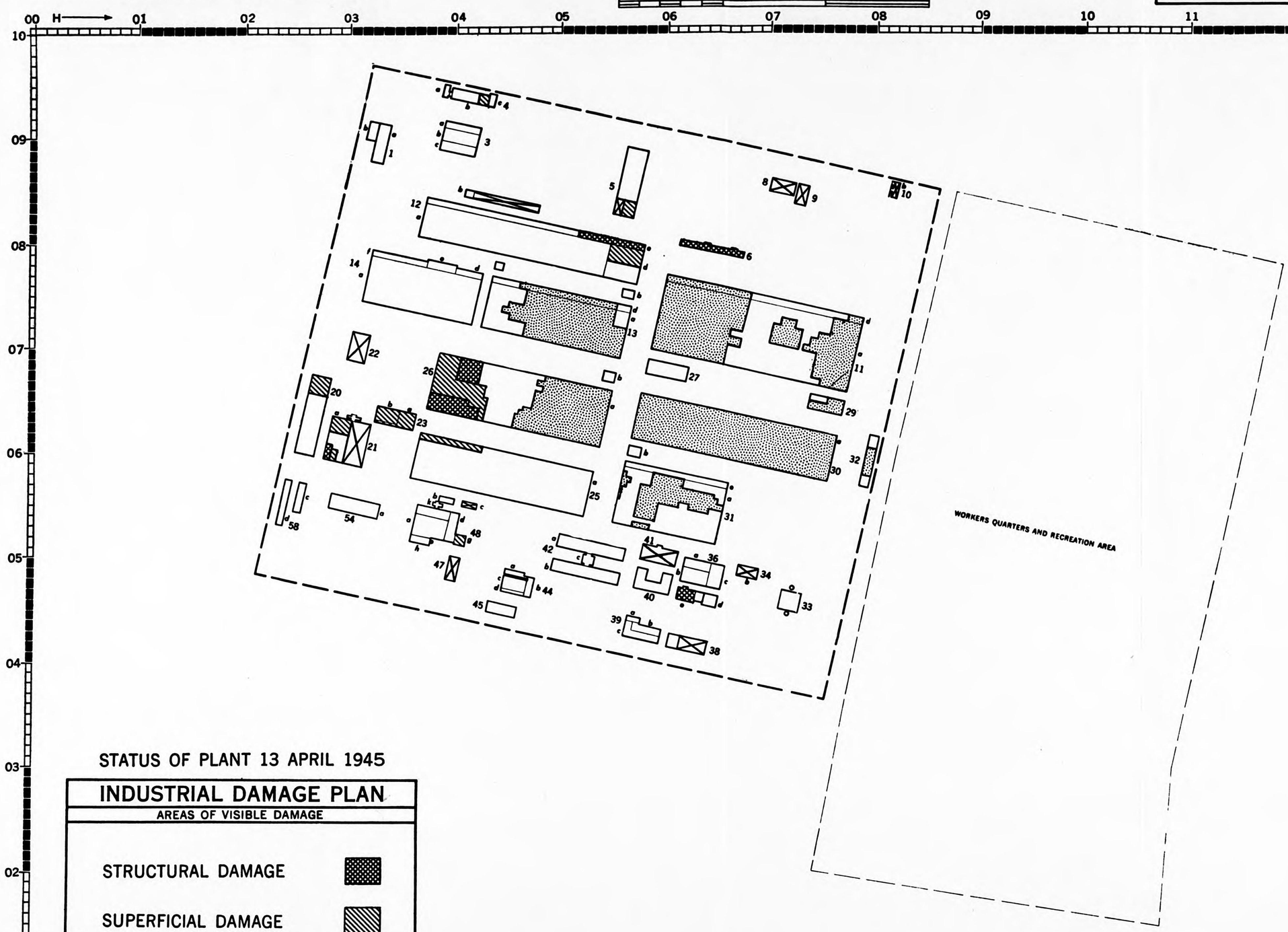
JOINT TARGET GROUP
WASHINGTON, D.C.
INDUSTRIAL DAMAGE PLAN

NAKAJIMA AIRCRAFT
KOIZUMI PLANT
KOIZUMI, JAPAN

SCALE 1:6,000

500 0 500 1000 FEET

SHEET 90:13-1545-DP
DATE 7 JULY 1945
TARGET 90:13-1545
COORDINATES 36°15′ NORTH 139°25′ EAST
PHOTOGRAPHED 13 APRIL 1945



STATUS OF PLANT 13 APRIL 1945

INDUSTRIAL DAMAGE PLAN
AREAS OF VISIBLE DAMAGE

- STRUCTURAL DAMAGE
- SUPERFICIAL DAMAGE
- CIVIL REMOVAL
- DAMAGE OF 24 MARCH, NOT REPAIRED

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File No. 502,545.9

S E C R E T

FROM DISPATCH 272309 (Feb.) XXI BOM COM

TARGET 1545 NAHAJIMA A/C CO. (Kaizumi Plant)
Reference print 3PR 4M4 4:6

130,000 sq. ft. of plan area damaged building at V 6.4 H 7.5

61,000 sq. ft. of plan area damaged building at V 6.4 H 7.15

142,000 sq. ft. of plan area damaged building at V 5.6 H.7.6

88,000 sq. ft. of plan area damaged building V5.6 H 7.2

29,500 sq. ft. of plan area damaged building at V 5.8 H 6.9

Target No. 90.13-1545

NAKIJIMA AIRCRAFT CO. KOIZUMI ASSEMBLY PLANT - 36-15 N. - 139-25 E.

SUMMARY OF ATTACK DATA

DATE	SHIP	GROUP OR SQUADRON	ACA REPT NO.	WEAPONS NO.	TYPE	FUZING NOSE	FUZING TAIL
25 Feb 1945	San Jacinto			18	HVAR	-	ND
	Bunker Hill			22	250# GP	-	.025
	Essex			94	500# GP	-	.025
	Cowpens			21	1000# GP	-	.025
10 Jul 1945	Hancock	CVG-6	31	2	500# GP	VT	I
				2	HVAR	-	-

Target No. 90.13-1545

NAKIJIMA AIRCRAFT CO. KOIZUMI ASSEMBLY PLANT - 36-15 N. - 139-25 E.

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NAKIJIMA AIRCRAFT CO. KOIZUMI ASSEMBLY PLANT - 36-15 N. - 139-25 E.

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	Essex			94	500# GP	-	.025
	Cowpens			21	1000# GP	-	.025
10 Jul 1945	Hancock	CVG-6	31	2	500# GP	VT	I
				2	HVAR	-	-

NOT TO BE TAKEN INTO AIR

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Sheet No.90.13-1545 P6
Date 21 Feb. 1945
Page No. 1 (1 pages)

JOINT TARGET GROUP, WASHINGTON, D.C.
FUNCTIONAL IDENTIFICATION SHEET
(To be read in conjunction with Illustration No. 90.13-1545 P5)

Obj. Folder 90.12, 13
Obj. Area 90.13
AAF Target No. 90.13-1545

Place Koizumi (Japan)
Air Target System Aircraft

Lat.: 36° 15'N
Long: 139° 25'E
Alt.: 125 feet

NAME OF TARGET **NAKAJIMA AIRCRAFT, KOIZUMI PLANT**
(Nakajima Hikoki KK, Koizumi Seisakusho)

ALL PREVIOUS SHEETS CANCELLED

Building No.	Function of Building
1-3	Unidentified
4	Storage
5	Unidentified
6	Storage
7	Unidentified
8-9	Storage
10	Unidentified
11a	Sub-assembly and assembly
11b	Storage
12a	Sub-assembly and assembly
12b	Storage
13a	Sub-assembly
13b	Storage
14a	Sub-assembly and assembly
14b, 15-21b	Storage
22	Machine shop, small parts manufacture
23	Unidentified
24	Machine shop, small parts manufacture
25a	Pressing and small parts manufacture
25b	Storage
26a	Sub-assembly
26b	Storage
27-29	Unidentified
30a	Sub-assembly
30b	Storage
31a	Sub-assembly and assembly
31b	Storage
31c	Machine shop, small parts manufacture
32	Unidentified
33	Boiler house
34	Storage
35	Workshop
36	Unidentified
37-39	Storage
40	Offices
41	Unidentified
42a, b	Administration
43	Storage
44	Unidentified
45	Storage
46	Unidentified
47	Storage
48a	Probable foundry
48b, c, 49-53	Storage
54-55	Unidentified
56-58	Storage

(Based on F/A Report No. 6, AC/AS, Intelligence, Photographic Division, dated 27 November 1944).

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CONSTRUCTION & VULNERABILITY

The primary objectives lie within a 1300-foot radius of the NE corner of building 26a, the recommended aiming point for a high level attack.

(Refer to Illustration No. 90.13-1545 P3, P5, and P6).

	PRIMARY OBJECTIVES	WHOLE TARGET
Area of Buildings	2,125,000 square feet	3,350,000 square feet
Construction Type	54% medium span, exposed chord, sawtoothed roof buildings exceeding 25 feet high to the eaves. 42% short span, sawtoothed roof buildings less than 25 feet high to the eaves. 4% double pitch roofs less than 20 feet high to the eaves. All buildings steel framed.	35% steel framed, medium span buildings exceeding 25 feet high to the eaves. 34% steel frame, short to medium span buildings, less than 25 feet high to the eaves. 29% wood frame, short to medium span buildings. 2% short span, reinforced concrete framed buildings.
Roofs	All light weight, non-combustible sheet roofing over exposed framing.	69% light weight, non-combustible, sheet roofing over exposed steel. 29% combustible roofs. 2% resistant, reinforced concrete 4 to 6 inches thick.
Floors	Generally fire resistant.	
Number of Stories	All single story	97% single story 3% multi-story
Number of Fire Divisions	11 in 11 buildings	58 in 117 buildings

The Fire Susceptibility Plan indicates the vulnerability to fire of each building and its contents. Contents, with the exception of administration and storage units, are of slight combustibility (i.e., average industrial fire occupancy). It is estimated that 32 per cent of the plant's productive capacity can be destroyed by fire.

WEAPON RECOMMENDATIONS

The most effective weapons for a high level attack on this target are a combination of the following:

AN-M66 2000-lb G.P., fuzed 0.01 sec. nose/0.01 sec. tail (if M139 nose fuzes are unavailable, 0.1 sec. delay nose fuzes are recommended).
AN-M69 6-lb incendiary (in M18 aimable clusters).

Blast will cause the maximum damage in the relatively high, medium span aircraft assembly-type buildings. The 2000-lb bomb provides the necessary charge weight (1117 lbs TNT) to initiate structural collapse either by direct hit or near miss. Bombs fuzed to explode 6 to 10 feet beneath the roof will produce maximum damage to the contents as well as the structure. The 1000-lb G.P., weight for weight, is 95 per cent as effective against this target as the 2000-lb bomb; the 500-lb bomb is 85 per cent as effective.

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b. If the proportion of combustible buildings remaining is about the same as before attack (because the bomb pattern has covered only part of the site), the original Loading Table may again be used to calculate the best mixture of HE and IB for a subsequent attack.

c. If it has not been possible to assess damage in the earlier attack, the Loading Table should be used to determine the cumulative load. For example, if 300 tons have previously been dispatched, and 200 tons are to be sent in a second attack, and the Index of Mission Efficiency is 20 per cent, the Loading Table indicates that the cumulative load of 500 tons should be divided 360 tons of HE and 140 tons of IB. If 160 tons of HE and 140 tons of IB were dispatched in the first attack, 200 tons of HE and no IB should be sent in the second.

LEVEL OF DAMAGE

Serious damage (structural plus severe internal fire damage) of the following approximate levels will result in the net production losses shown below:

Fraction of Serious Damage	Months of Net Loss
20 per cent	1 month
30-40 per cent	2-4 months
50 per cent	5-6 months

The 50 per cent level is desirable, particularly in sub-assembly sections, as it will destroy or warp a considerable proportion of the highly specialized assembly jigs. This level also will destroy a high percentage of the material in production as well as heavily damaging vital machinery in sections of the plant other than sub-assembly.

At lesser levels of damage, production loss is not as certain but will depend upon the extent to which vital processes are struck. Moreover, the plant will have a great opportunity to effectively use duplicative and undamaged jigs and machinery or to disperse equipment. Damage of less than 20 per cent can usually be repaired rather quickly and does not normally result in serious production loss.

The total tonnage which must be dispatched to cause these levels of damage may be estimated from the Loading Table.

CAMOUFLAGE, DECOYS AND SMOKE SCREENS

Photography of 9 February 1945 shows all major buildings camouflaged with disruptive paint. A few of the small buildings are not camouflaged.

ADDITIONAL INFORMATION

Among the planes believed to have been assembled at this location are:

1. Type 0 fighter ZEKE.
   a. With SAKAE engines 21 and 31 series supplied by the Nakajima Aircraft, Musashino-Tama (Musashi) plant. (TARGET 90.17-357).
   b. With wing tips supplied by Nakajima's Kumagaya plant (TARGET 90.13-1550).
   c. With ailerons and flaps manufactured by Nippon Kentetsu Kogyo.

2. Torpedo bomber JILL, Model 12.
   a. With KASEI 25 engines supplied by Mitsubishi Aircraft Engine Works, Nagoya (TARGET 90.20-193).

3. Type 2 two engined reconnaissance-fighter IRVING.
   a. With SAKAE 21 engines supplied by the Nakajima Aircraft, Musashino-Tama (Musashi) plant (TARGET 90.17-357).
   b. With SAKAE 21 engines supplied by the Ishikawajima Engine Plant, Tomioka (TARGET 90.17-1391).

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4. Type 2 four engined bomber LIZ or successor.
   a. With MAMORU 11 engine supplied by Nakajima Aircraft, Musashino-Tama (Musashi) plant (TARGET 90.17-357).

5. Two engine bomber FRANCES.
   a. With HOMARE 11 engine supplied by Nakajima Aircraft, Musashino-Tama (Musashi) plant (TARGET 90.17-357).
   b. With KASEI 25 engine supplied by Mitsubishi Aircraft Engine Works, Nagoya (TARGET 90.20-193).

6. Single engined reconnaissance MYRT.
   a. With HOMARE 21 engine supplied by Nakajima Aircraft, Musashino-Tama (Musashi) plant (TARGET 90.17-357).

Several new types are also believed to be in production on a limited scale.

Dispersal: (Refer to Illustration No. 90.13-1545 P3, P5, and P6).

Reconnaissance photography of 9 February 1945, indicates that large-scale dispersal is probably already underway, although no bombing attacks had been directed to the plant as of that date. The removal and/or dismantling of 23 buildings with an approximate roof coverage of 450,000 square feet - almost 15 per cent of the total building area is reported to be in progress. Although most of the buildings removed to date have been identified as storage, the dismantling of more important buildings and the dispersal of important production processes may be contemplated. Cabled reports from the field indicate that the buildings removed or dismantled are: 1, 2, 12b, (partially), 11b (partially), 13b, 14b, 15, 19c, 20 (partially), 22 (partially), 21a, 25b (partially), 30b, 31b, 31c, 35a (partially), 43, 49, 56, 53, 54a (partially). Two other small buildings, not shown on the Illustrations have also been removed.

Holders of JTG Folders should insert this sheet in Air Target System Folder Japanese Aircraft in place of sheet No. 90.13-1545-TI.

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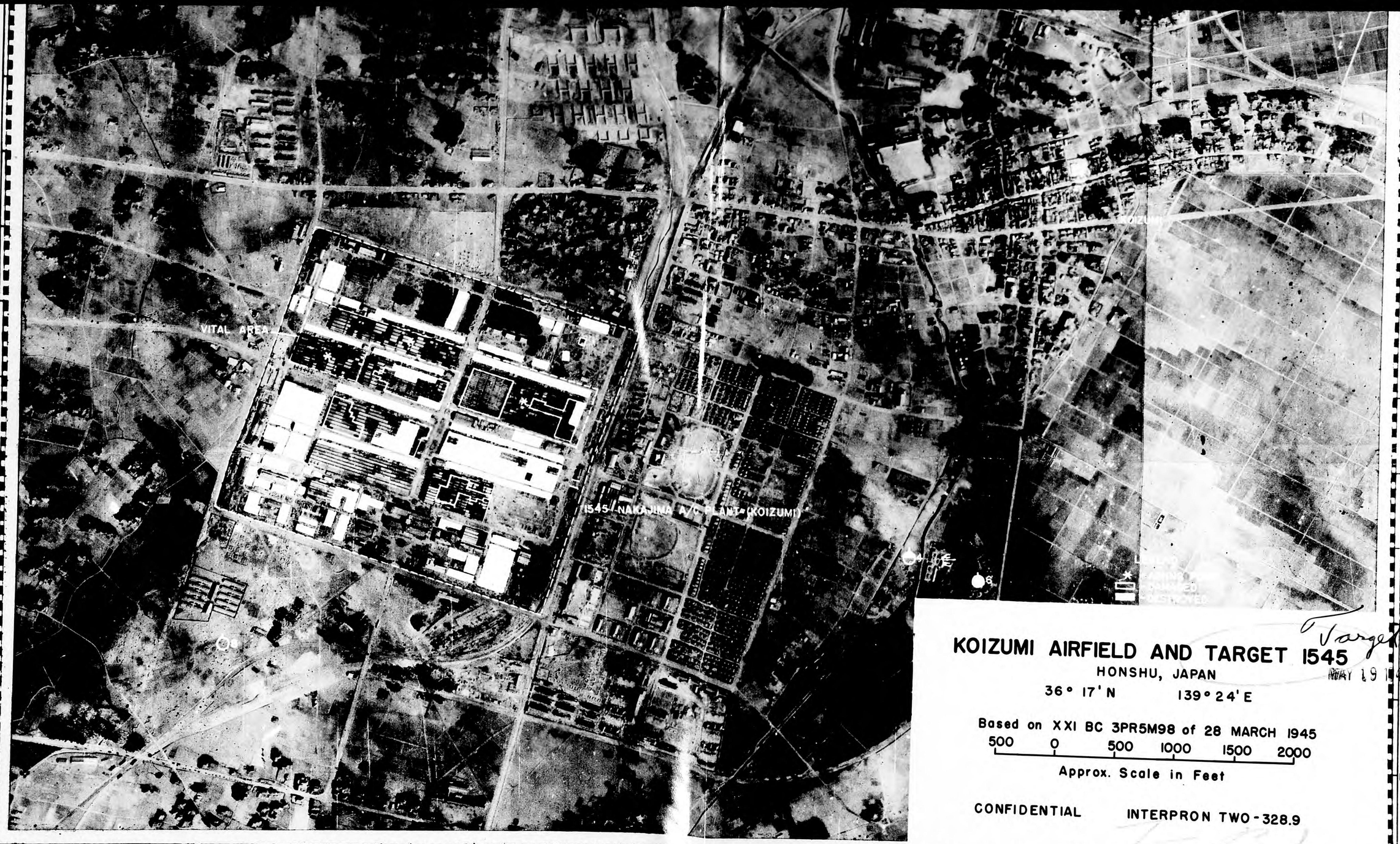
2772
AIRFIELD



KOIZUMI AIRFIELD AND TARGET 1545

HONSHU, JAPAN

36° 17' N 139° 24' E

Based on XXI BC 3PR5M98 of 28 MARCH 1945

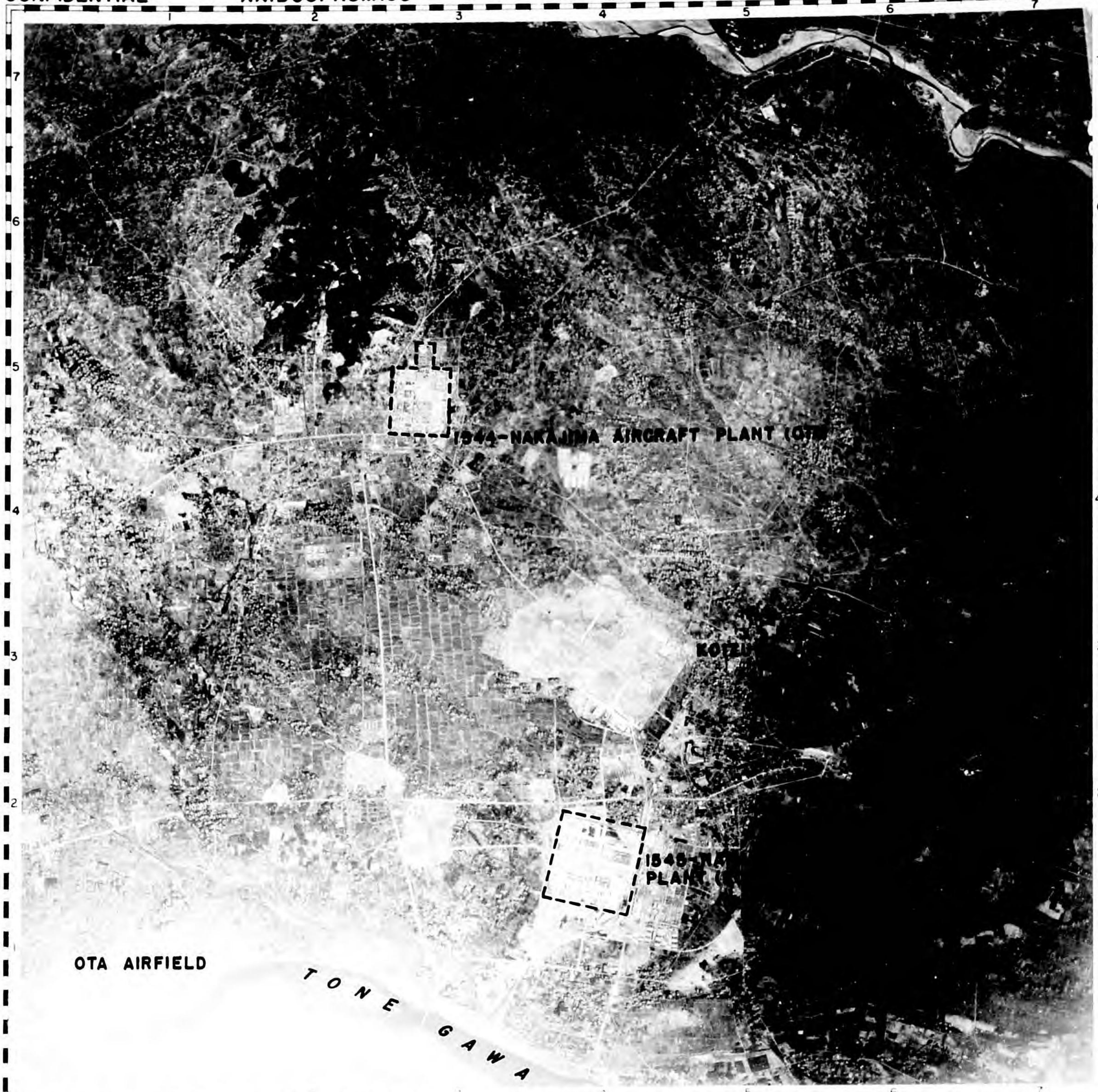
500 0 500 1000 1500 2000

Approx. Scale in Feet

CONFIDENTIAL INTERPRON TWO-328.9

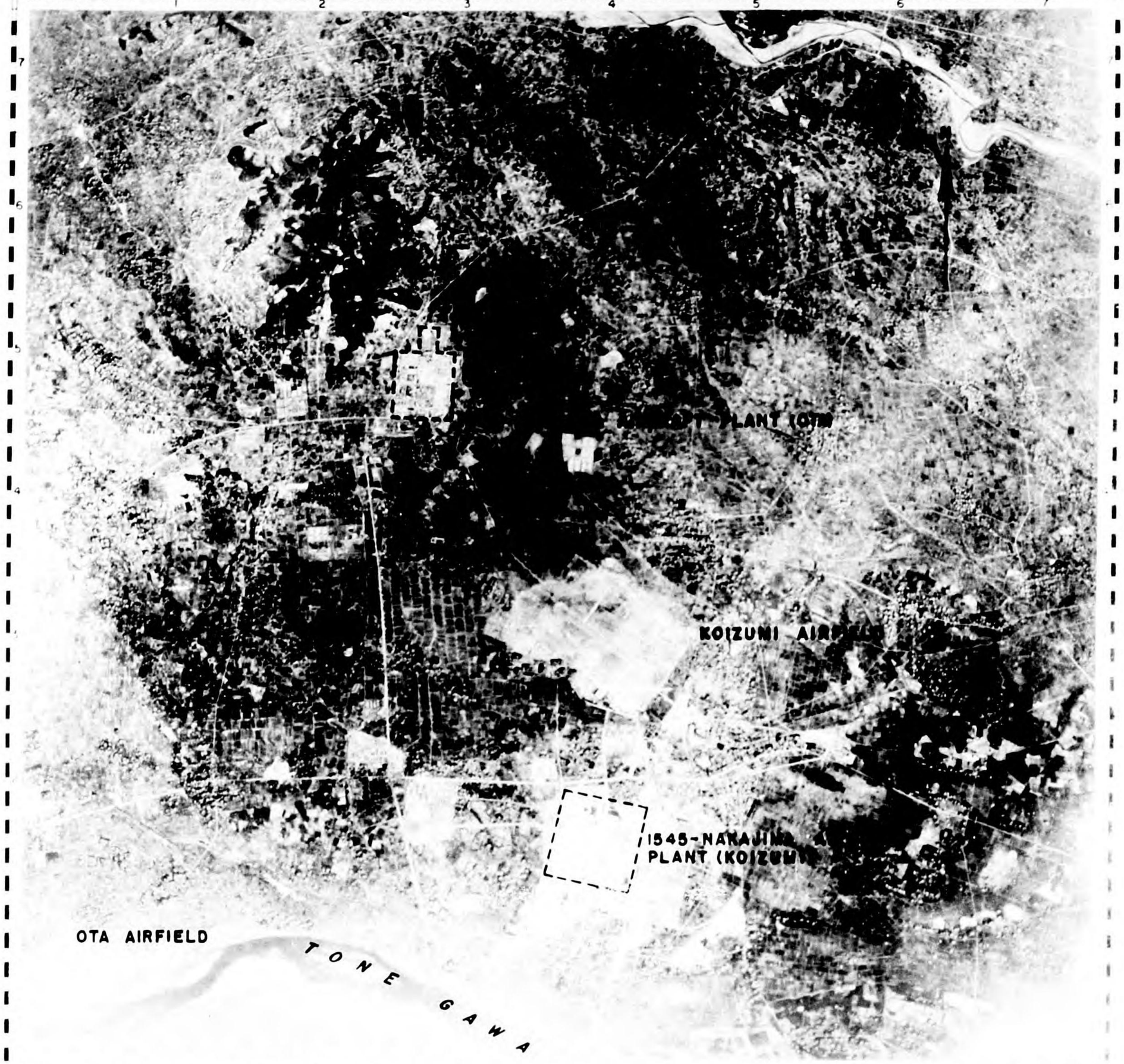
Target

MAY 19 1945



36° 15'N 139° 25'E TAKASAKI, HONSHU 1545-NAKAJIMA AIRCRAFT PLANT (KOIZUMI)

CONFIDENTIAL XXIBC3PR5M193 7 MAY 1945 INTERPRON TWO-186.411B



36° 15'N 139° 25'E TAKASAKI, HONSH 1545-NAKAJIMA AIRCRAFT PLANT PROPER

Walter
Copy in A/C parts folder
following Koizumi

FOR FILE MUTILATION

JFO/mp

JOINT INTELLIGENCE CENTER
PACIFIC OCEAN AREAS
Commandant, Navy 128
c/o Fleet Post Office
San Francisco, Calif.

SECRET

A/C

3 August 1945 Serial TAS 030900.

From: Officer-in-Charge.
To : Officer-in-Charge, A.I.C.

parts for Koizumi

Attention: Target Analysis Section.

Subject: Daily Report of Target Information from POW Interrogation.

References: (a) Print JPR5M60-2131, dated 27 Feb. 1945.

Ref.

1. POW SASE Kobe has supplied the following information on the TATEBAYASHI Plant of the NAKAJIMA Aircraft Company, located about 5 miles east of KOIZUMI. POW was employed here for 6 months until July 1944; he was cooperative but unobservant. Information as given is considered reliable.

2. The subject plant is located on reference (a) at 046-110, 048-106, 048-104, 048-108. It was formerly a silk-weaving company, name unknown to POW, and was converted by the NAKAJIMA Company in June 1943.

3. POW knew only the production and equipment of his own building (046-108 on reference (a)). This building was divided into two sections producing spars for outboard wings and horizontal stabilizers. Production in each section was for 3 planes daily. Completed parts were for the FRANCES 11 and were sent to the NAKAJIMA KOIZUMI Plant (target 1545). POW did not know any production details for the other buildings but assumed that other parts for FRANCES 11 were being made there. Duralumin was used exclusively for the horizontal stabilizers, and as far as POW knew, for all other parts produced at this plant. Equipment in POW's section included 5 bench drills, 30 electric drills, 2 pressors, and a variety of hand tools. All parts were riveted.

4. Building construction for the 5 shops was concrete and wood walls, concrete floors and tile roofs. Buildings were all one-story though of different heights.

5. Employees in June 1944 totaled 400, 50% of whom were women and 25% children. There was only one shift daily: city residents worked from 0730 to 2000 and others from 0730 to 1830, with 2 days off per month.

6. The 7 medium size buildings at the southeast corner of the plant area are barracks; the miscellaneous structures along the west side are offices.

7. POW also reported the existence of the OUBA HIKOKI KK (OUBA Aircraft Co., Ltd.) on the west side of TATEBAYASHI, near the railroad station. This plant also produced parts that were sent to target 1545. POW had never seen this plant and could not locate it exactly, but a row of factory type buildings can be seen in this location on reference (a).

JFC/mp

JOINT INTELLIGENCE CENTER
PACIFIC OCEAN AREAS
Commandant, Navy 128
c/o Fleet Post Office
San Francisco, Calif.

SECRET

26 July 1945 Serial TAS 261500.

From: Officer-in-Charge.
To : Officer-in-Charge, A.I.C.

Attention: Target Analysis Section.

For File Mutilation

Subject: Daily Report of Target Information from POW Interrogation.

References: (a) CinCPac-CinCPOA Bulletin 147-145, Preliminary POW Report 141.
(b) Sortie 3PR5M140-3826, dated 12 April 1945.

1. POW RYUHAI Shiuya has supplied the following information on installations in the OTA-KOIZUMI area, which he left in June 1944. He was cooperative and his information may be considered reliable.

2. POW stated that most of the barracks-type concentrations around the NAKAJIMA OTA (target 1544) and KOIZUMI (target 1545) plants had been at least partially converted to parts manufacture. Although these buildings were of typical barracks construction, POW was positive of this fact.

3. This substantiates information supplied by a POW previously interrogated here (see reference (a)), which has since been proven to be extremely reliable. Thus it would seem that barracks-type areas adjacent to factories should not be neglected simply because of their appearance.

4. POW stated that most of the important functions of at least the KOIZUMI plant had been placed underground by April 1944. He heard this from a schoolmate who had worked as an engineer at this plant. He had heard additional reports of underground construction in the immediate vicinity of target 1545, but could supply no details as to precise locations.

5. POW stated that a new railroad connecting line was planned between the OTA-KOIZUMI and KUMAGAYA-MINOMA rail lines. This information is corroborated by reference (b), which shows recent work on caissons and approaches for a rail bridge across the TONE River. This would indicate that activity in the OTA-KOIZUMI area is increasing despite the destruction of targets 1544 and 1545.

M. LEGENDRE
By direction

CC:
ComGenAAF, AC/AS, Intelligence, Collection Div., Reception Board (5).
Joint Target Group (2).

File F7B7 #1545

CONFIDENTIAL

DAMAGE ASSESSMENT

Target area 90.13 No. 1545 Description Koizumi

Site area 1850 All areas in units of 1000 sq. ft..

Date of attack	Navy 25 Feb.	4 Apr.					
Building areas							
Repairs between attacks	* 592						
Total before this attack	2817						
Serious damage	252						
Remaining after attack	2565						
Structural damage area							
By H.E.							
By fire							
Mixed							
Total structural	162						
Internal fire damage	90						
Total serious damage	252						
Light superficial damage							
By H.E.							
By fire							
Mixed							
Total light damage	230						

* Removed prior to attack. Original area was 3409.

CONFIDENTIAL

DAMAGE ASSESSMENT

Target area 40.13 No. 1545 Description Koizumi

Site area 1850 All areas in units of 1000 sq. ft.

Date of attack	Many 25 Feb.	4 Apr.					
Building areas							
Repairs between attacks	* 512						
Total before this attack	2817						
Serious damage	252						
Remaining after attack	2565						
Structural damage area							
By H.E.							
By fire							
Mixed							
Total structural	102						
Internal fire damage	40						
Total serious damage	252						
Light superficial damage							
By H.E.							
By fire							
Mixed							
Total light damage	230						

* Removed prior to attack. Original area was 3409.

CONFIDENTIAL

JTG Special Study No. PV-S25
1 May 1945

BOMB FALL DATA

Target area 90.13 No. 1545 Description Koizumi

Date of attack	Navy 25 Feb.	4 Apr.					
Mission number		56					
Visual or Radar		Night R					
H.E. bombs							
Number dropped		736					
Kind		5" AF					
Fuzing							
I.B. bombs							
Number dropped		0					
Kind							
Fuzing							
H.E. bombs within 1000 ft. of A.P							
B.C. count							
P.I. count							
J.T.G. est.							
H.E. bombs on site							
B.C. count							
P.I. count							
J.T.G. est.							
I.B. bombs (est.)							
Within 1000 ft. of A.P.							
On site							

BOMB FALL DATA

Target area 90.13 No. 1546 Description Koizumi

Date of attack	Army 25 Feb.	4 Apr.					
Mission number		56					
Visual or Radar		Night R					
H.E. bombs							
Number dropped		936.					
Kind		50 G.P.					
Fuzing							
I.B. bombs							
Number dropped		0					
Kind							
Fuzing							
H.E. bombs within 1000 ft. of A.P							
B.C. count							
P.I. count							
J.T.G. est.							
H.E. bombs on site							
B.C. count							
P.I. count							
J.T.G. est.							
I.B. bombs (est.)							
Within 1000 ft. of A.P.							
On site							

UNITED STATES PACIFIC FLEET
AND PACIFIC OCEAN AREAS
HEADQUARTERS OF THE COMMANDER IN CHIEF

SOG/aat

CONFIDENTIAL

27 December 1944 Serial DIS-270800.

From: Commander in Chief, U.S. Pacific Fleet and Pacific Ocean Areas.
To : Distribution List.

Subj: CINCPAC-CINCPOA Special Advance Report, NAKAJIMA AIRCRAFT FACTORIES.
(A) Photograph of MITAKA Aircraft Engine Plant; Exposure No. 100, JICPOA No. A-9030-12.
(B) Photograph of OTA-KOIZUMI AREA; Exposure TV-87, JICPOA No. 8944-11.
(C) Sketch Map of OTA-KOIZUMI AREA.

1. Subject Report, forwarded herewith, need not be reported and when no longer of value should be destroyed. No report of destruction is necessary.

S. O. GIVENS, Jr.,
By direction.

Encl:
1. Subject Special Advance Report.

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(Continued Reverse Side)

NAKAJIMA AIRCRAFT FACTORIES
CINCPAC-CINCPOA SPECIAL REPORT

CONFIDENTIAL
15 Dec 1944

SPECIAL ADVANCE REPORT

NAKAJIMA Aircraft Factories

This is a brief preliminary report locating the factories connected with the manufacture of aircraft for NAKAJIMA in the MUSASHINO-TAMA area and the OTA-KOIZUMI area. For background information on these areas see:

Army Air Objective Folder 90.17, TOKYO Area.
Army Air Objective Folder 90.12, 13, NAGANO and TAKASAKI Area.
Aircraft Engine and Assembly Plants, Japanese Empire, CINCPAC-CINCPOA, 112-44, and Supplements 1 and 2 thereto.

CINCPAC-CINCPOA, SPECIAL ADVANCE REPORT, TOKYO AREA TARGETS. 1682, 357, 356 and 1392.

Enclosures:

(A) Photograph of MITAKA Aircraft Engine Plant; Exposure No. 100, JICPOA No. A-9030-12.
(B) Photograph of OTA-KOIZUMI AREA; Exposure TV-87, JICPOA No. 8944-11.
(C) Sketch Map of OTA-KOIZUMI Area.

Note: Photo interpretation and POW interrogations in this report were made from photos taken by the XXI Bomber Command.

-CONFIDENTIAL-

SPECIAL ADVANCE REPORT

NAKAJIMA Aircraft Factories

Identifications listed below were made by a POW who until September 1942 worked for a jobbing house which supplied machine tools to regular NAKAJIMA plants and those which were handling sub-contracts from NAKAJIMA. In the course of his work, POW visited all the plants in question. His identifications have been checked by photographic interpretation and those unable to be verified have been so noted.

MUSASHINO-TAMA Area

(Target numbers not yet assigned)

MITAKA Engine Factory (Lat. 35° 41'N, Long. 139° 33' E)

Location: The plant is approximately ten miles west of the Imperial Palace, TOKYO, and 2.7 miles southwest of the TAMA and MUSASHINO A/C Engine Plants.

Summary: The plant is on an irregular area containing approximately 158 acres, nine per cent of which is built up. POW's report that engines are manufactured here cannot be verified by photographic interpretation. However, it is possible that this plant furnishes engine parts to the NAKAJIMA TAMA, MUSASHINO or OGIKUBO plants since there are direct rail and road connections therewith.

Buildings: The total built-up area is approximately 600,000 sq. ft. Three large buildings, 425' x 380', 370' x 210', and 425' x 305', probably house machine tools. An electric power line passing nearby provides power for the plant.

Communications: A spur connects the factory with a mainline railroad to the north. A well-traveled road bears to the northeast with a branch entering the NAKAJIMA MUSASHINO and TAMA A/C Engine Plants.

NIHON MUSENKI

Reported to be manufacturing aircraft radio and electrical equipment used by NAKAJIMA and MITSUBISHI. Said to be one of the chief producers of this equipment.

TOKYO SEIKI

Reported to be making small parts for A/C engines.

SHIODA Engine Plant

Reported to be making A/C engine parts (probably used later at TAMA, MUSASHINO, or OGIKUBO).

SHOWA JUKOGYO (engine plant)

Reported to be making A/C engine parts which are later shipped to TAMA, MUSASHINO or OGIKUBO.

OTA-KOIZUMI Area

There are four NAKAJIMA plants in this area. A full report on the two principal plants will appear later in CINCPAC-CINCPOA Bulletin No. 169-44. The present report is limited to the identification of their location and some general interpretation of the OJIMA A/C Machine Tool Factory which has not been discussed in available publications.

OTA A/C Assembly Plant (Target 1544)

OTA Parts Plant (Target 789)

This plant reportedly turns out small aircraft parts which are shipped to the OTA A/C Assembly plant for assembly.

KOIZUMI A/C Assembly Plant (Target 1545)

→ OJIMA A/C Machine Tool Factory (Lat. 36° 15'N, Long. 139° 20'E; no target number assigned)

Location: This factory is located just east of the town of OJIMA, 1.4 miles north of the OTA Airfield and the TONE River, 4 miles west of the KOIZUMI A/C Assembly Plant (Target No. 1545), and five miles south of the OTA A/C Assembly Plant (Target No. 1544). As reported by the POW referred to above, the plant is engaged in the production of machine tools used principally in A/C construction. This includes drills, cutters, gauge blocks, and other precision tools. The factory was built in 1939. Photographic coverage is complete but at a scale of 1/64,000.

Buildings: The plant has 16 major buildings and includes a built-up area of about 515,000 square feet. The

buildings are of saw-tooth construction and all except Building No. 2 are camouflaged with disruptive painting. Building No. 2 is reported to be a testing shop and was readily recognized by POW because it is painted white both inside and out. It appears to be a two-story building and is reported to be constructed of reinforced concrete. Building No. 3 was identified as a machine shop. The two buildings just north and the two west of No. 3 are probably additional machine shops. A possible power plant is located as Building No. 4 POW information indicates the presence of a foundry within the area, possibly just west of the power plant.

Communications: The factory may be reached by first-class highways south from OTA, west from KOIZUMI, and north from the OTA Airfield.

3PR4M4-2 7NOV44 0359-0414GCT 24" 33800' HONSHU [redacted] JICPOA 9030-12

N (APPROX.)

GAS PLANT

HOSPITAL

NAKAJIMA TAMA & MUSASHINO AIRCRAFT FACTORIES

SHOWA JUKOGYO (ENGINE PLANT)

SHIODA ENGINE PLANT

SEDIMENTATION BASINS

NIHON MUSENKI

TOKYO SEIKI

MITAKA RR. STATION

CENTRAL ELECTRIC TROLLEY TERMINAL

MUSASHI SAKAI RR. STATION

WORKERS HOUSING

100

MITAKA ENGINE FACTORY

APPROX. SCALE IN FEET

1000 0 1000 2000 3000 4000

JICPOA A 9030-12 EXP. No. 100

CONFIDENTIAL

APRIL 1NOV44 0344-0450CT 154.4MM 33800' HONSHU WEST JICPOA 8944-11

OTA AIRCRAFT PARTS PLANT
TARGET No. 789

OTA AIRCRAFT ASSEMBLY PLANT
TARGET No. 1544

bldg. 2 testing shops.
3 machine shops
Nos 1 3 " "
" 4 P.P.
No 1 P foundry

OTA

KOIZUMI AIRFIELD

KOIZUMI

KOIZUMI AIRCRAFT
ASSEMBLY PLANT
TARGET No. 1545

LEGEND

① ADMINISTRATION

② TESTING

③ MACHINE SHOPS

④ PROBABLE POWER PLANT

⑤ PROBABLE FOUNDRY

OJIMA AIRCRAFT
MACHINE TOOL FACTORY

OJIMA

OTA AIRFIELD

TONEGAWA

LEVEE

LEVEE

SKETCH MAP OF

OTA-KOIZUMI AREA, JAPAN

LAT. 36°15' N., LONG. 139°22' E.

TARGET Nos. 1544, 789, 1545 AND
OJIMA AIRCRAFT MACHINE TOOL FACTORY.

N. (APPROX.)

APPROXIMATE SCALE IN FEET

1000 0 1000 2000 3000 4000 5000

CONFIDENTIAL

L-41214-5

KOIZUMI AIRCRAFT ASSEMBLY PLANT

Target No. 1545

BOMB AND FUSE RECOMMENDATIONS

Type of Attack	Bomb	Fuze Delay Nose	Tail	Weight of Attack Tons 33 1/3 % Structural Damage	50% Struc. Dam.
Glide & Dive	500-lb. GP	0.1	0.01	85	145
Medium Alt.	500-lb. GP	0.1	0.01	225	375
High Altitude	500-lb. GP	0.1	0.01	400	675

Note:

For medium or high altitude bombing, the center of the group of assembly and sub-assembly buildings is the recommended aiming point. THESE ESTIMATES INCLUDE NO ALLOWANCE FOR ABORTIVE SORTIES OR FOR GROSS AIMING ERRORS.

12-15-44

KOIZUMI AIRCRAFT ASSEMBLY PLANT

Target No. 1545

Dive or glide

Most important structures are buildings numbered 1 + 2, a total of 10 bldgs. in which final or main assembly and sub-assembly takes place.

Area of these bldgs (including) = 1300 x 1000 + 900 x 800 + 500 x 400

= 2,220,000 sq. ft.

For 500# GP

M.A.E. = 4000 sq. ft. or D = 1.0135 x 10^{-4} bombs/sq. ft. for 1/3 damage

= 1.7329 x 10^{-4} bombs/ " " " 1/2 "

2,220,000 x 1.0135 x 10^{-4} = 225 bombs

50% for spillover = 113

Total for 1/3 damage = 338 bombs

2,220,000 x 1.7329 x 10^{-4} = 384 bombs

50% for spillover = 192

Total for 1/2 damage = 576 bombs.

Medium altitude: σ = 800' CEP = 940 $\frac{1000}{800}$ = 1.25 density = .183

Prob. at 1000' R. on area of 4000 sq. ft. =

$$\frac{4000 \times .183 \times .398}{800 \times 800} = .46 \times 10^{-3} = .00046$$

For 33 1/3%, n = 900

For 50%, n = 1500 ✓

AP is center of above bldg. group.

High altitude: CEP = 1650 σ = 1400 $\frac{1000}{1400}$ = .71 Ord = .310

$$p = \frac{4000 \times .310 \times .398}{1400 \times 1400} = 25.2 \times 10^{-5} = .000252$$ ✓

For 33 1/3%, n = 1600 AP is center of above bldg. group.

For 50%, n = 2700

DAMAGE COVER USED				
MISSION	PRINTS	DATE	QUALITY	SCALE
ATTACK DATE 25/2/45	ENL. NO.		RATIO 3600	

INDUSTRIAL DAMAGE SCHEDULE

TARGET Koizumi -

LOCATION

CONFIDENTIAL P/L

DATE May 1945

INTERPRETER RCK

SHEET NO. 3 OF 3 SHEETS

AREA NO. 90.13 TARGET NO. 1545

BUILDINGS				AREAS OF VISIBLE DAMAGE									DESCRIPTION OF DAMAGE		
REF.				STRUCTURAL				SUPERFICIAL							
NUMBER	SUBDIVISION	OCCUPANCY	AREA	H.E.	FIRE	H.E.+FIRE	CAUSE NOT ASSIGNED	H.E.	FIRE	H.E.+FIRE	CAUSE NOT ASSIGNED	PRIOR DAMAGE NOT REPAIRED	Removed	Net Area	% Structural
1	2	3	4	5	6	7	8	9	10	11	12	13		14	
		SUB-TOTALS BROUGHT FORWARD								Certain hits	Probable hits	Near Misses			
		Vital Area													
11	a	Sub-assembly & assembly	416.0	8.0				223.4		10	11	1	—	416.0	2%
13	a	Sub-assembly	199.8	4.0				140.0		6	7	—	—	199.8	2%
14	a	Sub-assembly & assembly	151.2										—	151.2	
21	a	Storage	44.0										—	44.0	
	b	Storage	14.0										—	14.0	
22		Machine shop, small parts mfg.	123.0										62.3	60.7	
23		Unidentified	16.0										—	16.0	
24		Machine shop, small parts mfg.	44.0										44.0	0.0	
25	a	Pressing & small parts mfg.	209.3										—	209.3	
	b	Storage	27.3										14.7	12.6	
	c	Unidentified	7.2										5.4	1.8	
26	a	Sub-assembly	273.0	24.0				88.9		5	7	1	—	273.0	9%
	b	Storage	45.5	6.0						1	1	—	2.7	42.8	
	c	Unidentified	7.2										5.1	2.1	
27		"	16.8										—	16.8	
28		"	24.8	12.4						1	—	—	12.4	12.4	
29		"	14.4					4.7		1	—	—	—	14.4	
30	a	Sub-assembly	247.2	55.5				110.5		9	10	—	—	247.2	22%
	b	Storage	30.9	3.5						1	—	—	23.1	7.8	
	~~c~~	Unidentified	7.2										6.7	0.5	
31	a	Sub-assembly & assembly	181.5					56.0		4	1	—	—	181.5	
	b	Storage	30.6										28.9	1.7	
	c	Unidentified	~~1.6~~ 3.2										1.6	~~0.1~~ 1.6	
				113.4				623.5		38	37	2	- 77	1925.6	
		Other hits in Vital Area								4	2	—			
		Total hits in Vital Area								42	39	2	= 83		
		~~Hits outside Vital Area~~													
		Hits on bldgs. outside Vital Area within Target								4	1	1			
		Other bombs								37	3	—			
										83	43	3	= 129 Total.		
		SUB-TOTALS													
GRAND TOTALS	FIRST AND LAST SHEETS ONLY												ALL AREAS TO BE GIVEN IN 1000'S OF SQ. FT. TO ONE DECIMAL PLACE		

L-50124-29

NND 71007

DAMAGE COVER USED				
MISSION	PRINTS	DATE	QUALITY	SCALE
ATTACK DATE 25/2/45	ENL. NO.		RATIO 3600	

INDUSTRIAL DAMAGE SCHEDULE

TARGET Koizumi

LOCATION

CONFIDENTIAL P/L

DATE May 1945

INTERPRETER RCK

SHEET NO. 2 OF 3 SHEETS

AREA NO. 90.13 TARGET NO. 1545

BUILDINGS				AREAS OF VISIBLE DAMAGE									
REF.				STRUCTURAL				SUPERFICIAL					
NUMBER	SUBDIVISION	OCCUPANCY	AREA	H.E.	FIRE	H.E.+FIRE	CAUSE NOT ASSIGNED	H.E.	FIRE	H.E.+FIRE	CAUSE NOT ASSIGNED	PRIOR DAMAGE NOT REPAIRED	DESCRIPTION OF DAMAGE
								459.9					Removed / Not Area
1	2	3	4	5	6	7	8	9	10	11	12	13	14
		SUB-TOTALS BROUGHT FORWARD	2295.1	~~65.6~~ 58.6				~~459.9~~ 336.8					327.0 / 1968.1
30	a		247.2	55.5				110.5					247.2
	b		30.9	3.5									23.1 / 7.8
	c		7.2										~~5.1~~ 6.7 / .5
31	a		181.5					56.0					181.5
	b		30.6										28.9 / 1.7
	c		3.2										~~2.5~~ 1.6 / 1.6
	d		58.8										58.8 / 0.0
32			20.0	7.5									20.0
33			10.0										10.0
34	a		6.0										6.0
	b		5.0										5.0
35	a		66.5										38.0 / 28.5
	b		5.7										5.7
36	a		5.6										5.6
	b		9.8										9.8
	c		8.4										8.4
	d		7.2										7.2
	e		5.4										5.4
37			6.0										6.0
38			14.0										14.0
39			11.4										11.4
40			12.0										12.0
41			14.4										14.4
42	a		18.5										18.5
	b		18.5										18.5
	c		3.5										3.5
43			11.5										11.5 / ~~11.5~~ 0.0
44			14.7										14.7
45			7.5										7.5
46			22.5										22.5
47			6.0										6.0
48			70.5										7.6 / 62.9
49			6.8										6.8
50			7.6										7.6 / 0.0
51			11.2										11.2 / 0.0
52			4.5										4.5 / 0.0
53			10.0										10.0 / 0.0
54			30.9										3.6 / 27.3
55			9.1										9.1
56			10.5										6.0 / 4.5
57			13.2										13.2 / 0.0
58	a		2.4										2.4
	b		2.4										2.4
	c		.54										5.4
	d		6.9										6.9
		SUB-TOTALS		~~25.1~~				~~503.3~~					559.3 / 2796.7
GRAND TOTALS		FIRST AND LAST SHEETS ONLY	3356.0	~~32.6~~				~~496.4~~					ALL AREAS TO BE GIVEN IN 1000'S OF SQ.FT. TO ONE DECIMAL PLACE

~~596.4~~ 626.4

L-50124-29

* JTG figures

DAMAGE COVER USED				
MISSION	PRINTS	DATE	QUALITY	SCALE
ATTACK DATE 25/2/45	ENL. NO.		RATIO 3600	

INDUSTRIAL DAMAGE SCHEDULE

TARGET Koizumi

LOCATION

CONFIDENTIAL

P/L

DATE May 1945

INTERPRETER RCK

SHEET NO. 1 OF 3 SHEETS

AREA NO. 90.13 TARGET NO. 1545

BUILDINGS				AREAS OF VISIBLE DAMAGE									
REF.				STRUCTURAL				SUPERFICIAL					
NUMBER	SUBDIVISION	OCCUPANCY	AREA *	H.E.	FIRE	H.E.+FIRE	CAUSE NOT ASSIGNED	H.E.	FIRE	H.E.+FIRE	CAUSE NOT ASSIGNED	PRIOR DAMAGE NOT REPAIRED	DESCRIPTION OF DAMAGE: Removed / Net Area
1	2	3	4	5	6	7	8	9	10	11	12	13	14
		SUB-TOTALS BROUGHT FORWARD											
1	a		13.3										13.3
	b		3.6										3.5
2			37.5										37.5 / —
3			28.5										28.5
4			14.2										14.2
5			42.0	4.3									42.0
6			10.2	.				.8					10.2
7			12.6					2.1					12.6
8			9.1										9.1
9			5.0										5.0
10	a		17.6										17.6
	b		2.0										2.0
11	a		416.0	8.0				223.4					416.0
	b		31.2	6.8									20.5 / 10.7
	c		6.4										— / 6.4
12	a		220.4										220.4
	b		34.8										23.0 / 11.8
	c		8.0										— / 8.0
13	a		199.8	4.0				140.0					199.8
	b		22.2										2.7 / 19.5
	c		4.8										1.2 / 3.6
14	a		151.2										151.2
	b		16.8										1.3 / 15.5
	c		4.8										1.2 / 3.6
15			11.9										— / 11.9
16			4.9										— / 4.9
17			11.2										— / 11.2
18			11.9										11.9
19			25.8										— / 25.8
20			51.0										41.0 / 10.0
21	a		44.0										44.0
	b		14.0										14.0
22			123.0										60.7 / 62.3
23			16.0										16.0
24			44.0										— / 44.0
25	a		209.3										209.3
	b		27.3										12.6 / 14.7
	c		7.2										1.8 / 5.4
26	a		273.0	~~24.0~~ ~~17.1~~				~~88.9~~ ~~95.8~~					273.0
	b		45.5	6.0									42.8 / 2.7
	c		7.2										2.1 / 5.1
27			16.8										16.8
28			24.8	12.4									12.4 / 12.4
29			14.4					4.7					14.4
		SUB-TOTALS	2296.7	~~58.6~~				336.8					1963.1 / 327.0
		GRAND TOTALS FIRST AND LAST SHEETS ONLY	2295.1	65.5				~~429.9~~ 459.9					1968.1 / 327.0

ALL AREAS TO BE GIVEN IN 1000'S OF SQ.FT. TO ONE DECIMAL PLACE

L-50124-29

NAKAJIMA AIRPLANE COMPANY at KOIZUMI (Target 1545) (May '42)

Employees: Approx 2,500 men.
PW's Occupation: Riveter
Training: All new employees went through a special training course for three months then took an exam. Future positions were decided by results of these exams.
Efficiency Although his job could be done in less than one hour, he had, on occasions, to prolong it for two days as was the case with many workers, because work was not synchronized between depts.
Production On an average, five or six fuselages were completed per day.

Power Electric power was supplied from the KANTO HAIDENSHO. PW heard that two-thirds of all electric power of GUMMA-KEN was used by NAKAJIMA CO.

Extracts from: ATIS, Interrogation Report No 644 - Serial No. 805
14 March 1945 AIC R/S 3710

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90.13-1545
NAKAJIMA, KOIZUMI

ORIGINAL PLANT:	3PR5M 45-2: 50,51 (See 90.13-1544)
PRE NAVY STRIKE:	3PR5M 193:2, 31,32,33 - 24", 32,500' - 7 May (See 90.13-1544)
NAVY STRIKE:	BKHL 404 P 11,12, 25 Feb, K10 - 12,000' CV19 137 (See 90.13-1544) CV15 148 L.O., 30 July, 24" - 15,000' - Prints 9-10
POST NAVY STRIKE:	3PR5M 356 2 (See 90.13-1544) 3PR5M 60, 23,24 - 24" - 34,000' - 27 Feb.

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arch 1945
JIG

SPOT DAMAGE ASSESSMENT REPORT NO. 15

NAKAJIMA AIRCRAFT, KOIZUMI PLANT

(Target 90.13-1545)

PARTICULARS OF ATTACK — This plant was bombed by carrier planes in the second Navy Tokyo attack of 25 February. This report is based upon damage shown in XXI Bomber Command reconnaissance photography of 27 February.

PREVIOUS REPORTS — None

PHYSICAL DAMAGE — (Reference Target Illustration No. 90.13-1545, P3) No damage plot has yet been made. Examination of photography, however, shows fairly extensive damage with five of the seven buildings classified as "sub-assembly and assembly" considerably damaged. From the photography it is not possible to distinguish definitely between structural and superficial damage, so that the following classifications are highly tentative. Building 30a has sustained structural damage in its central portion and western end; building 11a has been structurally damaged in the western section and in addition has suffered superficial damage in the eastern part; some structural and some superficial damage has been inflicted on the eastern half of buildings 13a and 26a; several hits were made on building 31a. Buildings 12a, 14a, 22, and 25a, accounting for roughly 25 percent of the total floor area of the plant, are the only major buildings which were not damaged. Approximately 450,000 square feet of buildings, principally storage, had been removed prior to the attack.

PROBABLE FUNCTION OF PLANT — (Reference Target Illustration No. 90.13-1545, P3) There is insufficient ground intelligence to establish definitely the internal breakdown of this plant. However, the following production flow appears reasonable. Metal cutting, pressing and shaping and small parts manufacture takes place in buildings 22 and 25a. The major buildings in the western half of the plant are believed to be engaged in fabrication, sub-assembly and assembly of the plant's single-engined planes (Zeke and possibly Myrt and Jill)[1]. In the major buildings of the eastern half of the plant, Nakajima's multi-engined Navy planes (Frances, Irving, and Renzan or other 4-engined planes) are believed to be manufactured.

ECONOMIC ASSESSMENT — (Reference Target Illustration No. 90.13-1545, P3) In the absence of more definite information on the internal production flow of this plant, the estimates of aircraft loss must be considered as highly tentative. Damage in the western half of the plant has probably not resulted in any immediate loss, since there does not appear to be any destruction of planes on the final assembly lines. However, a sizeable proportion of the area believed to be engaged in sub-assembly has suffered considerable damage which may result

---

[1] - There is some indication that Myrt and Jill may not be made at other plants.

in a net loss of between 1 and 2 months' output. In the eastern half of the plant a substantial proportion of the area believed to be engaged in parts manufacture and sub-assembly of Frances and Irving has been heavily damaged. Depending upon the exact extent of damage, there will probably be a net loss of between 2 and 4 months' output. In addition, there will probably be some immediate loss of output as a result of the damage ~~to the damage~~ to the final assembly area of building 11a. The several hits on building 31a, believed to be engaged in the manufacture of Nakajima's four-engined planes, should interrupt production somewhat, although the net loss will probably not be very great - perhaps a week to two weeks' output.

If this breakdown of buildings by plane types as previously indicated is correct, the following output loss appears to have been accomplished by the attack:

Type	Net Output Loss
Zeke	265 - 400
Myrt/1	15
Jill/2	25
Frances	150 - 300
Irving	90 - 180
4-engined plane(s)	1
Total	646 - 921

FUTURE TARGET VALUE

Except for aircraft which can be assembled from undamaged parts already fabricated, there will be little production of completed planes for at least one month following the attack. Full production will not be attained for three or four months regardless of whether an attempt is made to bring the plant back to pre-attack output or whether, as seems more likely, extensive repairs are not undertaken and the plant is brought back to a much lower output than the pre-attack level.

/1 - As previously pointed out, Myrt may no longer be manufactured at this plant.

/2 - There are recent indications that Jill also may no longer be manufactured at the Koizumi plant. The damage to Jill if it is still manufactured at this plant, and to a lesser extent Frances, is in a small measure duplicated by earlier attacks on the Mitsubishi Engine Plant in Nagoya (Target 90.20-193).

R E F E R E N C E

XXIBC Telecon message of 3PR5M45 on Targets Number 1544 (Ota A/C Assembly) and 1545 (Koizusui A/C Works)

This print is filed in 1544 Ota A/C Assembly and to be reference in 1545 Koizusui A/C Works.

Smith.

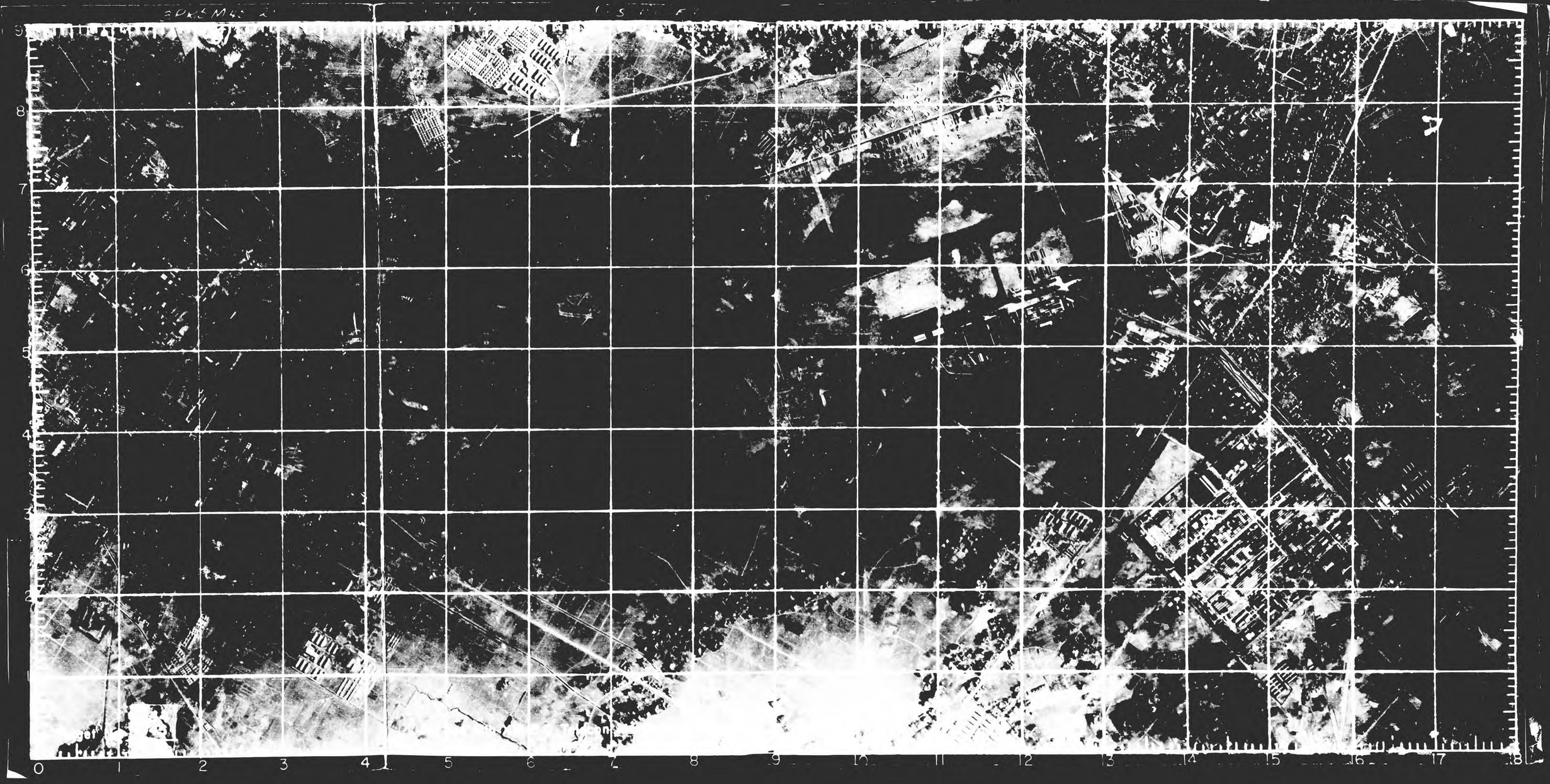
3PR5M98:5 (TEMP. No.)

CONFIDENTIAL
KOIZUMI AIRFIELD
* 1545

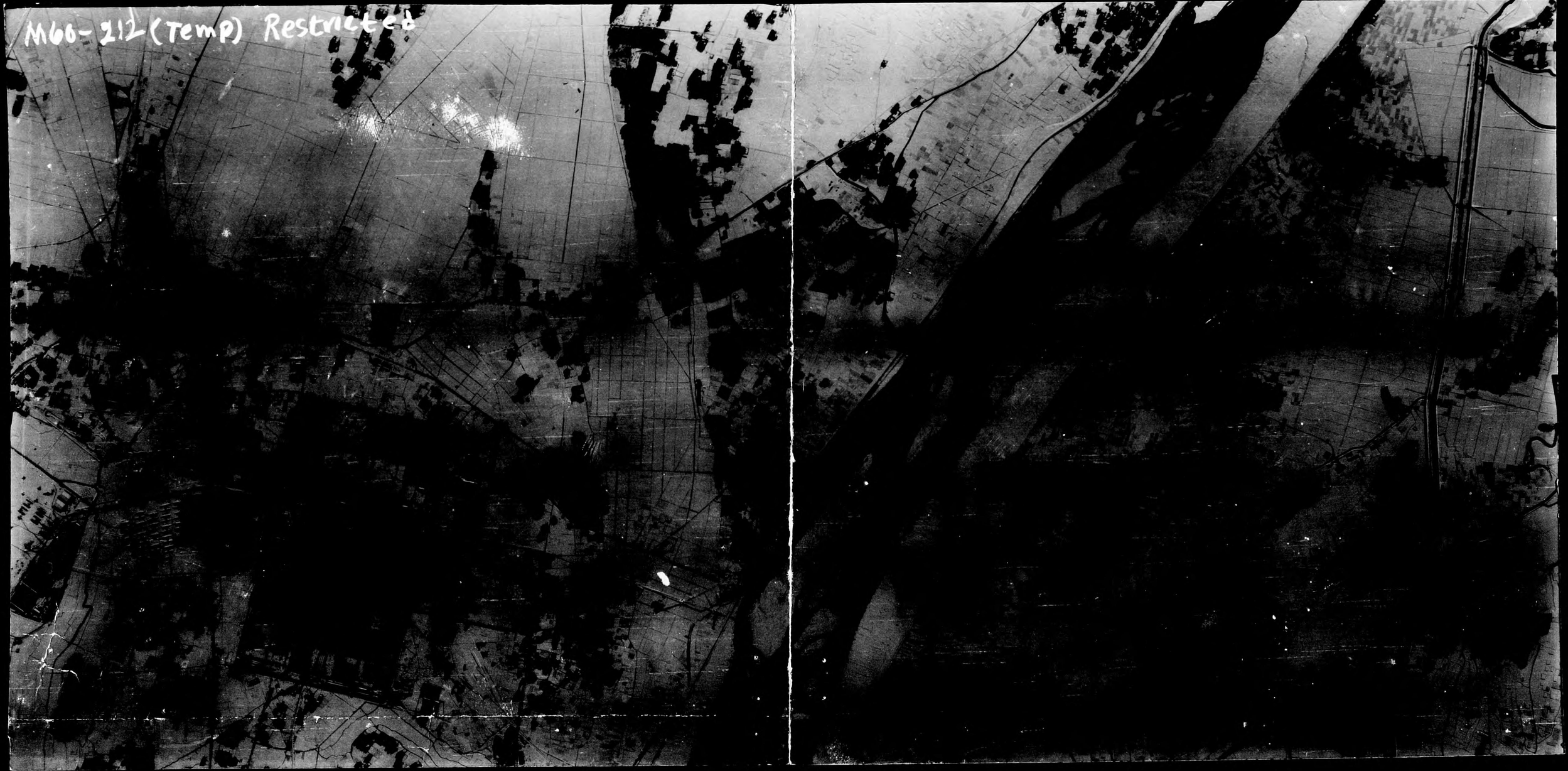
EASTMAN TOPOGRAPHIC SAFETY

DII:3-09W

KOBE (JAPAN) AIRCRAFT FACTORY



M66-212 (Temp) Restricted

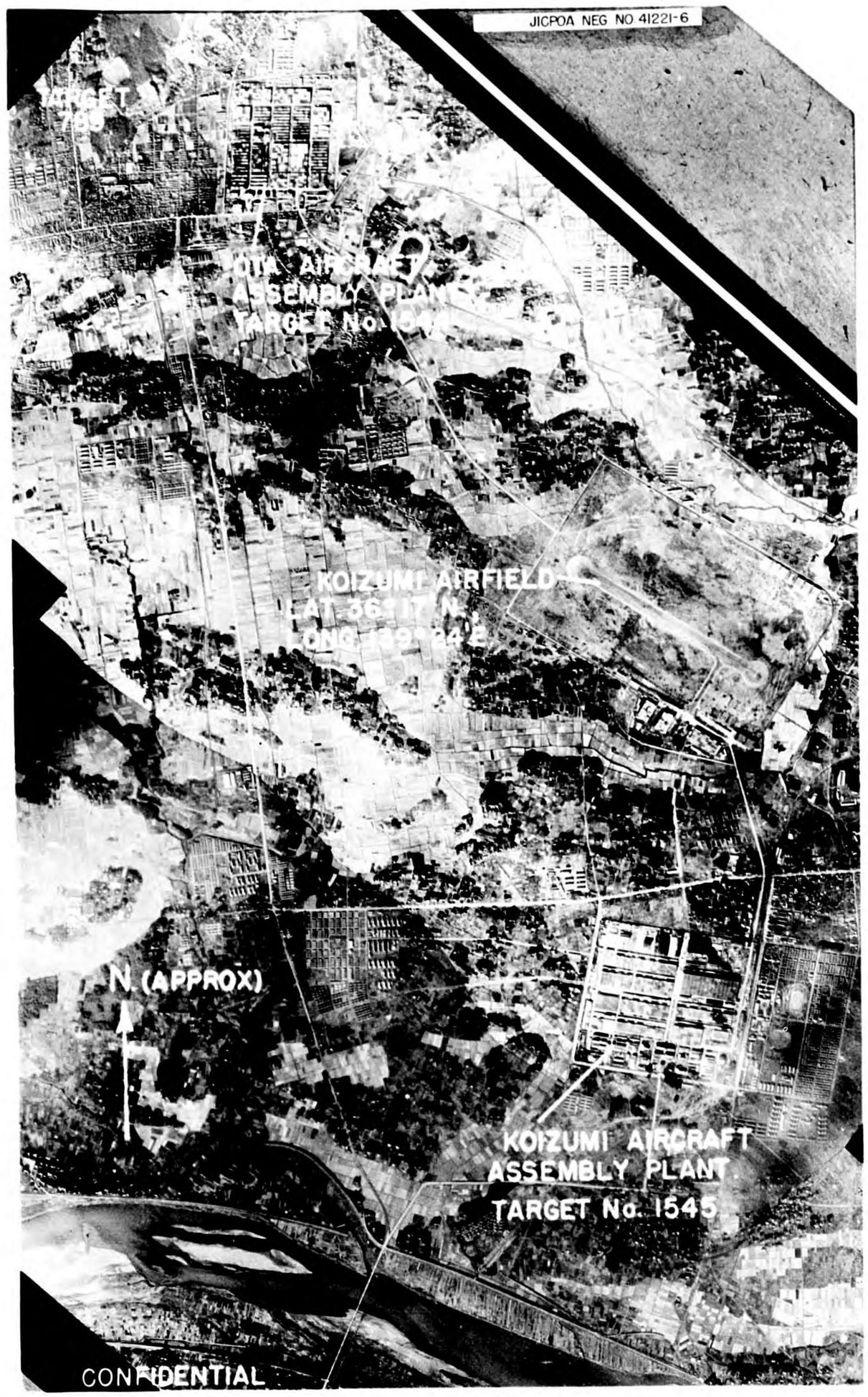


CONFIDENTIAL
TARGET 1545
DAMAGE ASSESSMENT REPORT NO. 12
C.I.U. XXI BOM. COM.

3PRSM198:4 (TEMP. No.)

CONFIDENTIAL
KOIZUMI
AIRFIELD
1545
SURVEY REPORT NO. 21
BOM COM.

PHOTOGRAPHS FOR TARGET 90.13-1545 NAKAJIMA AIRCRAFT PLANT KOIZUMI - INCLUDED IN JACKET FOR TARGET 90.13-1544 NAKAJIMA AIRCRAFT PLANT OTA.


JICPOA NEG NO 41221-6
TARGET No. 1545
KOIZUMI AIRFIELD
AT 36° 17' N.
ONG 139° 24' E.
N. (APPROX)
KOIZUMI AIRCRAFT
ASSEMBLY PLANT
TARGET No. 1545
CONFIDENTIAL

SEE FOLDER 90.17-2009 FOR REPORT FROM PHYSICAL VULNERABILITY SECTION, JOINT TARGET GROUP ON "NAVY CARRIER ATTACKS ON TWO JAPANESE INDUSTRIAL TARGETS."

FILE: 90.13-1545 -I B,1

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Sheet No.90.13-1545 P6
Date 21 Feb. 1945
Page No. 1 (1 pages)

JOINT TARGET GROUP, WASHINGTON, D.C.
FUNCTIONAL IDENTIFICATION SHEET
(To be read in conjunction with Illustration No. 90.13-1545 P5)

Obj. Folder 90.12, 13 — Place Koizumi (Japan) — Lat.: 36° 15'N
Obj. Area 90.13 — Air Target System Aircraft — Long: 139° 25'E
AAF Target No. 90.13-1545 — Alt.: 125 feet

NAME OF TARGET **NAKAJIMA AIRCRAFT, KOIZUMI PLANT**
(Nakajima Hikoki KK, Koizumi Seisakusho)

ALL PREVIOUS SHEETS CANCELLED

Building No.	Function of Building
1-3	Unidentified
4	Storage
5	Unidentified
6	Storage
7	Unidentified
8-9	Storage
10	Unidentified
11a	Sub-assembly and assembly
11b	Storage
12a	Sub-assembly and assembly
12b	Storage
13a	Sub-assembly
13b	Storage
14a	Sub-assembly and assembly
14b, 15-21b	Storage
22	Machine shop, small parts manufacture
23	Unidentified
24	Machine shop, small parts manufacture
25a	Pressing and small parts manufacture
25b	Storage
26a	Sub-assembly
26b	Storage
27-29	Unidentified
30a	Sub-assembly
30b	Storage
31a	Sub-assembly and assembly
31b	Storage
31c	Machine shop, small parts manufacture
32	Unidentified
33	Boiler house
34	Storage
35	Workshop
36	Unidentified
37-39	Storage
40	Offices
41	Unidentified
42a, b	Administration
43	Storage
44	Unidentified
45	Storage
46	Unidentified
47	Storage
48a	Probable foundry
48b, c, 49-53	Storage
54-55	Unidentified
56-58	Storage

(Based on F/A Report No. 6, AC/AS, Intelligence, Photographic Division, dated 27 November 1944).

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JOINT TARGET GROUP, WASHINGTON, D.C.
TARGET INFORMATION SHEET

Sheet No. 90.13-1545-TI/1
Date 21 Feb. 1945
Page No. 1 (6 pages)

Obj. Folder 90.12, 13
Obj. Area 90.13
AAF Target No. 90.13-1545

Place Koizumi (Japan)
Air Target System Aircraft

Lat.: 36° 15'N
Long: 139° 25'E
Alt.: 125 feet

NAME OF TARGET

NAKAJIMA AIRCRAFT, KOIZUMI PLANT

(Nakajima Hikoki KK, Koizumi Seisakusho)

ALL PREVIOUS SHEETS CANCELLED

Holders of JTG Folders should insert this sheet in Air Target System Folder Japanese Aircraft in place of 90.13-1545-TI

SIGNIFICANCE

This Nakajima assembly plant for Navy planes ranks as one of the largest in Japan, probably accounting for more than 20 per cent of the total production of combat aircraft. In addition to final assembly, this plant manufactures some major components and sub-assemblies but no engines. It produces fighters, torpedo bombers, medium bombers, reconnaissance, and possibly a 4-engine heavy bomber. It is of more recent construction than the nearby New Ota Plant (TARGET 90.13-1544), specializing in Army types. Engines are largely supplied by the company's Musashino-Tama (Musashi) Engine Plant (TARGET 90.17-357) in the W outskirts of Tokyo.

Nakajima is the oldest privately-owned aircraft company in Japan and, with Mitsubishi, is one of the two leading producers of aircraft and engines for both the Army and Navy.

LOCATION

Approximately 40 miles NNW of Tokyo in the intensively cultivated plain drained by the Tone River, which flows generally SSE about one mile S of the target. Ota village, with a 10-mile wooded ridge extending NW, is less than 3 miles to the NW; the major Kumagaya Air Base (TARGET 90.13-1644) lies 6 miles SW.

The plant is approximately one mile SW of Koizumi, and one mile E of the highway leading due S from Ota across Tone River. The electrified RR entering Koizumi from the E has been extended to the plant and on to Ota. Barracks and administrative buildings adjoin the plant site on the E. About 4900 feet N of the target is an airfield from which assembled planes are flight tested. Approximately 2.7 miles NNW and directly E of Ota village is Nakajima's New Ota assembly plant (TARGET 90.13-1544).

DESCRIPTION AND LAYOUT

(Refer to Illustration No. 90.13-1545 P3, P5, and P6). The total target area is about 2900 x 2400 feet, rectangular in shape with the major axis lying E-W. The built-up plan area is approximately 3.3 million square feet. Floor area is 3.5 million square feet making this the second largest airframe plant in Japan, although only half as large as the Mitsubishi Aircraft Works airframe plant in Nagoya (TARGET 90.20-194). Both the target site and floor area of Koizumi are greater than that of the New Ota plant (TARGET 90.13-1544). One of the newer airframe plants in Japan, Koizumi is of modern construction. The large assembly and sub-assembly buildings, the important press shops, machine shops, and small parts fabrication units are concentrated in the center section of the plant. Available intelligence is not sufficient to relate buildings with individual plane types or to permit a more extensive breakdown of functions than is given in Illustration 90.13-1545 P6.

PRIMARY OBJECTIVES

(Refer to Illustration No. 90.13-1545 P3, P5, and P6). Listed in order of productive importance, buildings: 11a, 26a, 30a, 25a, 12a, 14a, 13a, 31a, 22, 31c, and 24.

The destruction of these buildings and their contents would halt production in the sub-assembly, assembly, press and machine shops, and small parts fabrication processes, and would seriously cripple the plant.

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CONSTRUCTION & VULNERABILITY

The primary objectives lie within a 1300-foot radius of the NE corner of building 26a, the recommended aiming point for a high level attack.

(Refer to Illustration No. 90.13-1545 P3, P5, and P6).

	PRIMARY OBJECTIVES	WHOLE TARGET
Area of Buildings	2,125,000 square feet	3,350,000 square feet
Construction Type	54% medium span, exposed chord, sawtoothed roof buildings exceeding 25 feet high to the eaves. 42% short span, sawtoothed roof buildings less than 25 feet high to the eaves. 4% double pitch roofs less than 20 feet high to the eaves. All buildings steel framed.	35% steel framed, medium span buildings exceeding 25 feet high to the eaves. 34% steel frame, short to medium span buildings, less than 25 feet high to the eaves. 29% wood frame, short to medium span buildings. 2% short span, reinforced concrete framed buildings.
Roofs	All light weight, non-combustible sheet roofing over exposed framing.	69% light weight, non-combustible, sheet roofing over exposed steel. 29% combustible roofs. 2% resistant, reinforced concrete 4 to 6 inches thick.
Floors	Generally fire resistant.	
Number of Stories	All single story	97% single story 3% multi-story
Number of Fire Divisions	11 in 11 buildings	58 in 117 buildings

The Fire Susceptibility Plan indicates the vulnerability to fire of each building and its contents. Contents, with the exception of administration and storage units, are of slight combustibility (i.e., average industrial fire occupancy). It is estimated that 32 per cent of the plant's productive capacity can be destroyed by fire.

WEAPON RECOMMENDATIONS

The most effective weapons for a high level attack on this target are a combination of the following:

AN-M66 2000-lb G.P., fuzed 0.01 sec. nose/0.01 sec. tail (if M139 nose fuzes are unavailable, 0.1 sec. delay nose fuzes are recommended).
AN-M69 6-lb incendiary (in M18 aimable clusters).

Blast will cause the maximum damage in the relatively high, medium span aircraft assembly-type buildings. The 2000-lb bomb provides the necessary charge weight (1117 lbs TNT) to initiate structural collapse either by direct hit or near miss. Bombs fuzed to explode 6 to 10 feet beneath the roof will produce maximum damage to the contents as well as the structure. The 1000-lb G.P., weight for weight, is 95 per cent as effective against this target as the 2000-lb bomb; the 500-lb bomb is 85 per cent as effective.

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The combustible portion of the contents is well dispersed, requiring multiple hits for maximum fire damage. The majority of the buildings are non-combustible (exposed steel trusses and columns, subject to structural fire damage). Ninety-eight per cent of the roofs are either lightweight non-combustible corrugated sheeting or fairly light combustible material. Thus, the AN-M69 is recommended as the most effective incendiary. A detailed analysis of each building indicates that the AN-M69 will be approximately 15 per cent more effective than the AN-M50 4-lb bomb, the alternate incendiary weapon. Fire damage also may be expected from the effects of high explosive bombs.

The following Loading Table shows the per cent of serious damage to the target which can be expected for different weights of attack and different accuracies of bombing. Accuracy is measured by the per cent of bombs dispatched expected to fall within 1000 feet of the recommended aiming point. Allowance has been made in the table for the fact that the whole target lies within a circle of 1700 feet radius. (Reference should be made to Joint Target Group Memorandum No. 3, "Explanation of Weapon Recommendations and Loading Tables Given in Target Information Sheets", dated 27 December 1944).

Table I

LOADING TABLE - MOST EFFECTIVE WEAPONS (1)

HE: AN-M66 2000-lb G.P., fuzed 0.01 sec. nose/0.01 sec. tail (if M139 nose fuzes unavailable, 0.1 sec. nose delay is recommended).

IB: AN-M69 6-lb (in M18 aimable clusters)

NAKAJIMA AIRCRAFT, KOIZUMI PLANT

Total Load in Tons (4)	Per cent of bombs dispatched expected to fall within 1000 feet of the aiming point (2)											
	10%			15%			20%			30%		
	H. E.	I. B.	F	H. E.	I. B.	F	H. E.	I. B.	F	H. E.	I. B.	F
75							25	50	15%	20	55	17%
100				30	70	16%	25	75	19	20	80	22
150	40	110	17%	30	120	22	25	125	24	35	115	27
200	40	160	21	30	170	25	60	140	28	85	115	31
300	70	230	26	130	170	31	160	140	35	185	115	40
400	170	230	31	230	170	37	260	140	41	285	115	47
500	270	230	35	330	170	42	360	140	47	385	115	54
600	370	230	39	430	170	47	460	140	52	485	115	59
700	470	230	43	530	170	51	560	140	57	585	115	64
800	570	230	46	630	170	55	660	140	61	685	115	68
900	670	230	50	730	170	59	760	140	65	785	115	72

NOTES:

(1) The 1000-lb G.P. is 95 cent as effective against this target as the 2000-lb bomb; the 500-lb bomb 85 per cent. The AN-M50 is estimated to be 85 per cent as effective as the AN-M69.

(2) In the examples following this table, this quantity is called the "Index of Mission Efficiency". It is a measure of bombing accuracy, and bears no relation to the size of the target.

(3) Expected fraction (per cent) of structural damage to the target. Allowance has been made for the fact that this whole target lies within a circle of 1700 feet radius.

(4) Load is given in tons of actual (not nominal) weight of bombs.

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Method of Use:

1. Determine Index of Mission Efficiency:

   (a) Estimate per cent of dispatched planes bombing primary target.
   (b) Estimate per cent of bombs over target expected to fall within 1000 feet of aiming point.
   (c) Multiply (a) by (b) and round off to nearest percentage figure in table.

2. Read under computed Index of Mission Efficiency and opposite the total load dispatched the recommended high explosive - incendiary loading and the expected per cent of damage.

Examples Illustrating Use of Loading Table:

1. To find the best HE-IB combination and resulting per cent of damage for a given force:

   Given: Planes expected to bomb primary target, 70 per cent of mission. Per cent of bombs over target, expected to fall within 1000 feet of aiming point, 30 per cent. Mission of 100 planes with total load of 400 tons.

   Solution: 70 per cent x 30 per cent equals 21 per cent; i.e., 20 per cent is Index of Mission Efficiency. Opposite 400 tons in 20 per cent columm find loading:
   HE 260 tons equals 65 plane loads at 4 tons per plane
   IB 140 tons equals 35 plane loads at 4 tons per plane
   Fraction of damage: 41 per cent.
   Hence, for optimum loading 65 planes will carry HE and 35 planes IB, but if groups of 12 are to carry only one kind of bomb per group, this may be revised to 5 groups of HE and 3 groups of IB.

2. To find force required to achieve recommended level of damage:

   Given: Recommended level of damage, 50 per cent. Same Index of Mission Efficiency as in Example 1. Individual A/C bomb load 4 tons.

   Solution: In 20 per cent Mission Efficiency column take:
   F equals 52 per cent and find loading:
   HE 460 tons
   IB 140 tons
   Total 600 tons
   requiring a total force of 150 A/C or 13 groups of 12 A/C.

The Loading Table has been prepared from an analysis of the target before attack. If the important buildings of the target have suffered only slight damage in previous attacks, this table still can be used for determining the best loading. However, after substantial damage to the important buildings has resulted, a new analysis of the target should be made and a new Loading Table prepared.

If the target has suffered substantial damage in earlier attacks, and no new Loading Table is available, the following general rules can be applied:

a. If previous attacks have destroyed most of the important combustible buildings (or buildings with highly combustible contents) on the site, as indicated in the Fire Susceptibility Plan, Illustration No. 90.13-1545 P5, loads carried on subsequent attacks should consist wholly of the recommended HE weapon.

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b. If the proportion of combustible buildings remaining is about the same as before attack (because the bomb pattern has covered only part of the site), the original Loading Table may again be used to calculate the best mixture of HE and IB for a subsequent attack.

c. If it has not been possible to assess damage in the earlier attack, the Loading Table should be used to determine the cumulative load. For example, if 300 tons have previously been dispatched, and 200 tons are to be sent in a second attack, and the Index of Mission Efficiency is 20 per cent, the Loading Table indicates that the cumulative load of 500 tons should be divided 360 tons of HE and 140 tons of IB. If 160 tons of HE and 140 tons of IB were dispatched in the first attack, 200 tons of HE and no IB should be sent in the second.

LEVEL OF DAMAGE

Serious damage (structural plus severe internal fire damage) of the following approximate levels will result in the net production losses shown below:

Fraction of Serious Damage	Months of Net Loss
20 per cent	1 month
30-40 per cent	2-4 months
50 per cent	5-6 months

The 50 per cent level is desirable, particularly in sub-assembly sections, as it will destroy or warp a considerable proportion of the highly specialized assembly jigs. This level also will destroy a high percentage of the material in production as well as heavily damaging vital machinery in sections of the plant other than sub-assembly.

At lesser levels of damage, production loss is not as certain but will depend upon the extent to which vital processes are struck. Moreover, the plant will have a great opportunity to effectively use duplicative and undamaged jigs and machinery or to disperse equipment. Damage of less than 20 per cent can usually be repaired rather quickly and does not normally result in serious production loss.

The total tonnage which must be dispatched to cause these levels of damage may be estimated from the Loading Table.

CAMOUFLAGE, DECOYS AND SMOKE SCREENS

Photography of 9 February 1945 shows all major buildings camouflaged with disruptive paint. A few of the small buildings are not camouflaged.

ADDITIONAL INFORMATION

Among the planes believed to have been assembled at this location are:

1. Type 0 fighter ZEKE.
   a. With SAKAE engines 21 and 31 series supplied by the Nakajima Aircraft, Musashino-Tama (Musashi) plant. (TARGET 90. 17-357).
   b. With wing tips supplied by Nakajima's Kumagaya plant (TARGET 90. 13-1550).
   c. With ailerons and flaps manufactured by Nippon Kentetsu Kogyo.

2. Torpedo bomber JILL, Model 12.
   a. With KASEI 25 engines supplied by Mitsubishi Aircraft Engine Works, Nagoya (TARGET 90. 20-193).

3. Type 2 two engined reconnaissance-fighter IRVING.
   a. With SAKAE 21 engines supplied by the Nakajima Aircraft, Musashino-Tama (Musashi) plant (TARGET 90. 17-357).
   b. With SAKAE 21 engines supplied by the Ishikawajima Engine Plant, Tomioka (TARGET 90. 17-1391).

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4. Type 2 four engined bomber LIZ or successor.
   a. With MAMORU 11 engine supplied by Nakajima Aircraft, Musashino-Tama (Musashi) plant (TARGET 90.17-357).

5. Two engine bomber FRANCES.
   a. With HOMARE 11 engine supplied by Nakajima Aircraft, Musashino-Tama (Musashi) plant (TARGET 90.17-357).
   b. With KASEI 25 engine supplied by Mitsubishi Aircraft Engine Works, Nagoya (TARGET 90.20-193).

6. Single engined reconnaissance MYRT.
   a. With HOMARE 21 engine supplied by Nakajima Aircraft, Musashino-Tama (Musashi) plant (TARGET 90.17-357).

Several new types are also believed to be in production on a limited scale.

Dispersal: (Refer to Illustration No. 90.13-1545 P3, P5, and P6).

Reconnaissance photography of 9 February 1945, indicates that large-scale dispersal is probably already underway, although no bombing attacks had been directed to the plant as of that date. The removal and/or dismantling of 23 buildings with an approximate roof coverage of 450,000 square feet - almost 15 per cent of the total building area is reported to be in progress. Although most of the buildings removed to date have been identified as storage, the dismantling of more important buildings and the dispersal of important production processes may be contemplated. Cabled reports from the field indicate that the buildings removed or dismantled are: 1, 2, 12b, (partially), 11b (partially), 13b, 14b, 15, 19c, 20 (partially), 22 (partially), 21a, 25b (partially), 30b, 31b, 31c, 35a (partially), 43, 49, 56, 53, 54a (partially). Two other small buildings, not shown on the Illustrations have also been removed.

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BRITISH SERVICES FOR THE USE OF ALLIED FORCES.

90.13 - 1545 - Nakajima aircraft Co;
(Koizumi Plant)

TARGET 1545: (36/18 N--139/25 E) Nakajima Aircraft Co. (Koizumi Plant) Approximately 30 small buildings being disassembled (See 3PR PIR No. 16, 7 November 1944). All of the main buildings appear to be still intact.

CV 21st Bomber Command Survey Rpt #21 flown 9/1/45

Total roof or ground area affected - 450,000 sq. ft. (approx.)

AIRFIELDS:

Koizumi: (36/17 N--139/24 E)

Aircraft visible: 160

146 single-engine
12 twin-engine
2 four-engine

CIU 21 BomCon Survey Rpt 21 flown 2/9/45

Prints 4R:88, 89, 90 for reference
No prints attached.

Last previous report - CIU Airdrome Report No. 5, 23 January 1945

TARGET 1545. Koizumi Plant, Nakajima Aircraft Company: Approximately 529,300 square feet (or 16.9 percent of roof area) damaged and/or destroyed. A detailed assessment will be found in damage assessment report No. 12, 2 March 1945.
(From. Survey Report 37-Dated 2 Mar. 45-Sortie Flown 27 Feb. 45-
21 Bomber Command.)

TARGET NO. 90.13-1545

ILLUSTRATION NO. 90.13-1545 PI

APPROX. COORDINATES 36° 15' N

ISSUED NOVEMBER 1944

PHOTOGRAPHED 7 NOVEMBER

CONFIDENTIAL

AC/AS, INTELLIGENCE

TYPE A

90.13 - 1545 - Nakajima Aircraft Co, Koizumi Plant

Functional Analysis Report No. F/A-6 - date 27 Nov. 44 -
photography ~~xxx~~ 7 Nov. 44 - detailed information filed TAS section with Photo.

AF IPH-3

MIPI 56.505

COVER USED	
MISSION	3PR/5M98 3L
PRINTS	37, 39
DATE	24 March 1945
QUALITY	Good
SCALE	1/9600
DATE OF ATTACK	25 Feb 1945

AC/AS INTELLIGENCE
PHOTOGRAPHIC DIVISION
PHOTO-INTELLIGENCE SECTION

LIMITED DAMAGE INTERPRETATION

NO. 11.1

CONFIDENTIAL | D/P

DATE 14 April 1945

INTERPRETER Stearns

SHEET NO. 1 OF 4

AREA NO. 90.13 / TARGET NO. 1545

TARGET: Nakejima Aircraft Co.

LOCATION: Koizumi, Japan

This Limited Damage Interpretation has been undertaken in accordance with the conditions as checked below:

[ ]	*Photography is inadequate in scale*	[ ]	*Damage is below 10% of built-up area*
[ ]	*Photography is indequate in quality*	[ ]	*Total damage is less than 50,000 sq. ft.*
[ ]	*Stereo coverage is lacking or incomplete*	[X]	*Excessive time between attack and photography*
[ ]	*Detailed interpretation is not required*	[ ]	*Other factors as noted below*

BUILDING			VISIBLE DAMAGE		DESCRIPTION OF DAMAGE
REF. NO.		AREA	STRUCT'L	SUPERF'L	
		(as of 27 Feb.)			Note: Photography of 24 March provides a more adequate basis for assessing damage inflicted in the attack of 25 February. Although the extent of damage was greater than previously reported, its severity is not as great. Bomb-count and assignment of cause are still not possible. Lacking adequate coverage in February, it cannot be determined whether repair is in progress. Some of the increase in damaged areas is probably clearance in anticipation of repair; it is not known whether or not any damaged structural members have been replaced. Civil removal of buildings, which was in progress prior to attack, has continued.
1	a	13.3			No visible damage
	b	3.5			Addition constructed by 9 February. No visible damage
2		(37.5)			Removed by 9 February
3		28.5			No visible damage
4		14.2			No visible damage
5		42.0	3.6		Damaged section is demolished. Debris cleared by 24 March
6		10.2			No visible damage
7		12.6			Removed between 27 February and 24 March
8		9.1			No visible damage
9		5.0			No visible damage
10	a	17.6			Removed between 27 Feb and 24 Mch
	b	2.0			No visible damage
11	a	416.0	2.3	256.2	Extensive roof stripping but main framing members appear to be intact.
	b	31.2-10.7 = 20.5	2.1		An additional 10,300 sq. ft. including damaged section removed between 27 Feb and 24 Mch

TOTALS				
SITE	SITE AREA	180.4 acres		
	BUILT-UP AREA	2318.7 (27 Feb)		
	% OF SITE BUILT-UP			
DAMAGE	AREA OF DAMAGE	133.8 Struct.	696.1 Super.	829.9 Total
	% OF BUILT-UP AREA	4.8%	24.7%	29.5%

ALL AREAS ARE PLAN AREAS IN THOUSANDS OF SQUARE FEET

APPROVED BY: Walter Harrington

WALTER HARRINGTON
Major, Air Corps
Chief, Evaluation Branch
Photographic Division
Office of Ass't Chief of Air Staff, Intelligence

5-6122, AF

AFIPH-3A

AREA NO.	TARGET NO.	LIMITED DAMAGE INTERPRETATION NO. 11.1	CONFIDENTIAL	D/P
90.13	1545		SHEET NO. 2 OF 4	

Building Ref. No.	Area	Visible Damage: Struct'l	Visible Damage: Superf'l		
	c	6.4-5.6 = 0.8			
12	a	220.4			Almost completely removed by 9 February. No visible damage
	b	34.8-11.8 = 23.0			Sections at each end removed by 9Feb. An additional 12,500 sq.ft. removed between 27 Feb and 24 March.
	c	8.0-6.8 = 1.2			
13	a	199.8	13.3	143.2	Largely removed by 9 Feb. Extensive roof stripping, but main framing members appear intact except in two places.
	b	22.2-19.5 = 2.7			All but two small end sections removed prior to 9 Feb.
	c	4.8-3.6 = 1.2			
14	a	151.2			Largely removed by 9 Feb. No visible damage
	b	16.8-15.5 = 1.3			All but small end section removed by 9 Feb.
	c	4.8-3.6 = 1.2			
15		(11.9)			Largely removed by 9 Feb.
16		(4.9)			Removed by 9 Feb 1945
17		(11.2)			Removed by 9 Feb 1945
18		11.9			Removed by 9 Feb 1945
19		(25.8)			11,500 sq. ft removed between 27 Feb and 24 Mch.
20		51.0-10.0 = 41.0			Removed by 9 Feb 1945
21	a	44.0			North end in process of removal 9 Feb; removed by 27 February. No visible damage to remainder.
	b	14.0			No visible damage
22		123.0-73.8 = 49.2			Removed between 27 Feb and 24 Mch.
23		16.0			Half of bldg removed by 27 Feb. One additional 33,300 square feet removed between 27 Feb and 24 Mch.
24		(44.0)			No visible damage
25	a	209.3			Removed by 9 Feb.
	b	27.3-14.7 = 12.6			No visible damage
	c	7.2-5.4 = 1.8			Two sections removed by 9 Feb. An additional 11,400 sq. ft removed between 27 February and 24 March.
26	a	273.0	4.5	120.0	Largely removed by 9 Feb.
	b	45.5-2.7 = 42.8	1.6		One section removed by 9 Feb. An additional 41,500 sq. ft including damaged section, removed between 27 Feb and 24 March.
	c	7.2-5.1 = 2.1			
27		16.8			Largely removed by 27 Feb.
28		24.8	24.8		No visible damage
29		14.4	9.0	2.7	Site cleared between 27 Feb and 24 Mch. Severe distortion of framework at east end. No evidence of attempt to repair.
30	a	247.2	49.9	135.0	
	b	30.9-23.1 = 7.8	2.7		Largely removed by 9 Feb. An additional 6500 sq ft including damaged section removed by 24 Mch.

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AREA NO. / TARGET NO.	LIMITED DAMAGE INTERPRETATION NO.____	CONFIDENTIAL	D/P
90.13 / 1545		SHEET NO. 3 OF 4	

30	c	7.2-5.1 = 2.1	0.4		Largely removed by 9 February. One section demolished by attack.
31	a	81.5		39.0	Roof stripping, etc.
	b	30.6-28.9 = 1.7			Largely removed by 9 Feb.
	c	3.2-1.6 =1.6			One half removed by 9 Feb.
	d	(58.8)			Removed by 9February
32		20.0	10.0		Center section demolished. Debris has been cleared
33		10.0			No visible damage
34	a	6.0			Removed between 27 Feb and 24 Mch
	b	5.0			No visible damage
35	a	66.5-38.0 = 28.5			South half removed by 9 Feb. Remainder removed between 27 Feb and 24 March.
	b	5.7			Removed between 27 Feb and 24 March.
36	a-c	23.8			No visible damage
	d-e	12.6			Dismantling in progress 24 March
37		6.0			Removed between 27 Feb and 24 March
38		14.0			Eastern two-thirds being dismantled 24 March.
39		11.4			No visible damage
40		12.0			No visible damage
41		14.4			No visible damage
42		40.5			Between 27 Feb and 24 Mch, sections "A" and "B" camouflaged by a painted pattern resembling stripped timber framing.
43		(11.5)			Removed by 9 Feb 1945
44		14.7			No visible damage
45		7.5			No visible damage
46		22.5			Removed between 27 Feb and 24 Mch.
47		6.0			No visible damage
48	a	15.3			No visible damage
	b	5.1-3.4 = 1.7			Partially removed by 9 Feb
	c	6.0-4.0 = 2.0			Partially removed by 9 Feb. Dismantling of remainder in progress 24 Mch.
	d	7.0			No visible damage
	e	12.6			Removed between 27 Feb and 24 Mch
	f	4.9			Removed between 27 Feb and 24 March
	g	4.9			One-half removed, remainder being dismantled on 24 Mch
	h	3.0			No visible damage
	j	8.5			No visible damage
	k	3.2-0.2 = 3.0			Small section removed by 9 Feb
49		6.8			Removed between 27 Feb and 24 Mch
50		(7.6)			Removed by 9 Feb
51		(11.2)			" " "
52		(4.5)			" " "
53		(10.0)			" " "
54	a	18.2			No visible damage
	b	(3.6)			Removed by 9 Feb
	c	9.1			Removed between 27 Feb and 24 Mch
55		9.1			Removed between 27 Feb and 24 Mch
56		10.5	9.6		Damage is possibly civil removal in process 27 Feb. Site now clear.
57		(13.2)			Removed by 9 Feb
58		17.1			No visible damage

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AFIPH-3A

AREA NO.	TARGET NO.	LIMITED DAMAGE INTERPRETATION NO. 11.1	CONFIDENTIAL	D/P
90.13	1545		SHEET NO. 4 OF 4	

Built-up area as of 27 February: 2813.7

Damage by attack of 25 February:

(a)	Structural	133.8
(b)	Superficial	696.1
	Total	829.9

Civil removal 27 February to 24 Mch: 287.9
(not including areas of damage)

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3PR/5M98 3L 3-24 F/40 32000 REST

AEROFLOT MAP

3PR/5M98 3L 3-24 F/40 32000 REST

3PR75M98 3L 3-24 F/40 32000 REST
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