HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM JAPANESE AIRCRAFT AFTER 90.17-356 TI/3

Table I

Number of Hits Required to Achieve 30, 50 or 70 Percent Serious Damage to Individual Buildings

(Refer to Illustration No. 90.17-356 P5)

Building No.	I.P.	Fraction of Serious Damage	Number of Hits 500-lb GP	1000-lb GP	2000-lb GP
7abc	10	30%	13	8	4
		50%	25	15	7
		70%	44	26	12
4bc	8	30%	12	7	3
		50%	24	14	7
		70%	42	24	11
11abc	7	30%	9	5	3
		50%	18	10	5
		70%	31	18	8

Examples of Use of Table I:

1. Problem: To obtain the required number of hits with 500-lb GP bombs on building No. 7abc to achieve 30 percent serious damage.

   Solution: The table gives 13 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 No. 4bc to achieve 60 percent serious damage.

   Solution: The table gives 7 hits for 50 percent and 11 hits for 70 percent serious damage. By interpolation 9 hits are required for 60 percent serious damage.

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TARGET NO. 90.17-356

JOINT TARGET GROUP-WASHINGTON, D. C.

NAKAJIMA AIRCRAFT, OGIKUBO PLANT

TOKYO, JAPAN

ILLUSTRATION NO. 90.17-356 P1

APPROX. COORDINATES 35° 42' N 139° 37' E

ISSUED JANUARY 1945

PHOTOGRAPHED 7 NOV. 1944

RESTRICTED

0 2000 4000 6000 FEET

0 1/2 1 MILE

1:32 000 APPROX.

0 H → 01 02 03 04 05 06 07 08 09 10 11 12 13 14

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TYPE A

TARGET NO. 90.17-356 ILLUSTRATION NO. 90.17-356 P1

TARGET NO. 90.17-356

APPROX. COORDINATES 35° 42' N 139° 37' E

PHOTOGRAPHED 7 NOV. 1944

JOINT TARGET GROUP-WASHINGTON, D. C.

NAKAJIMA AIRCRAFT, OGIKUBO PLANT

TOKYO, JAPAN

ILLUSTRATION NO. 90.17-356 P 2

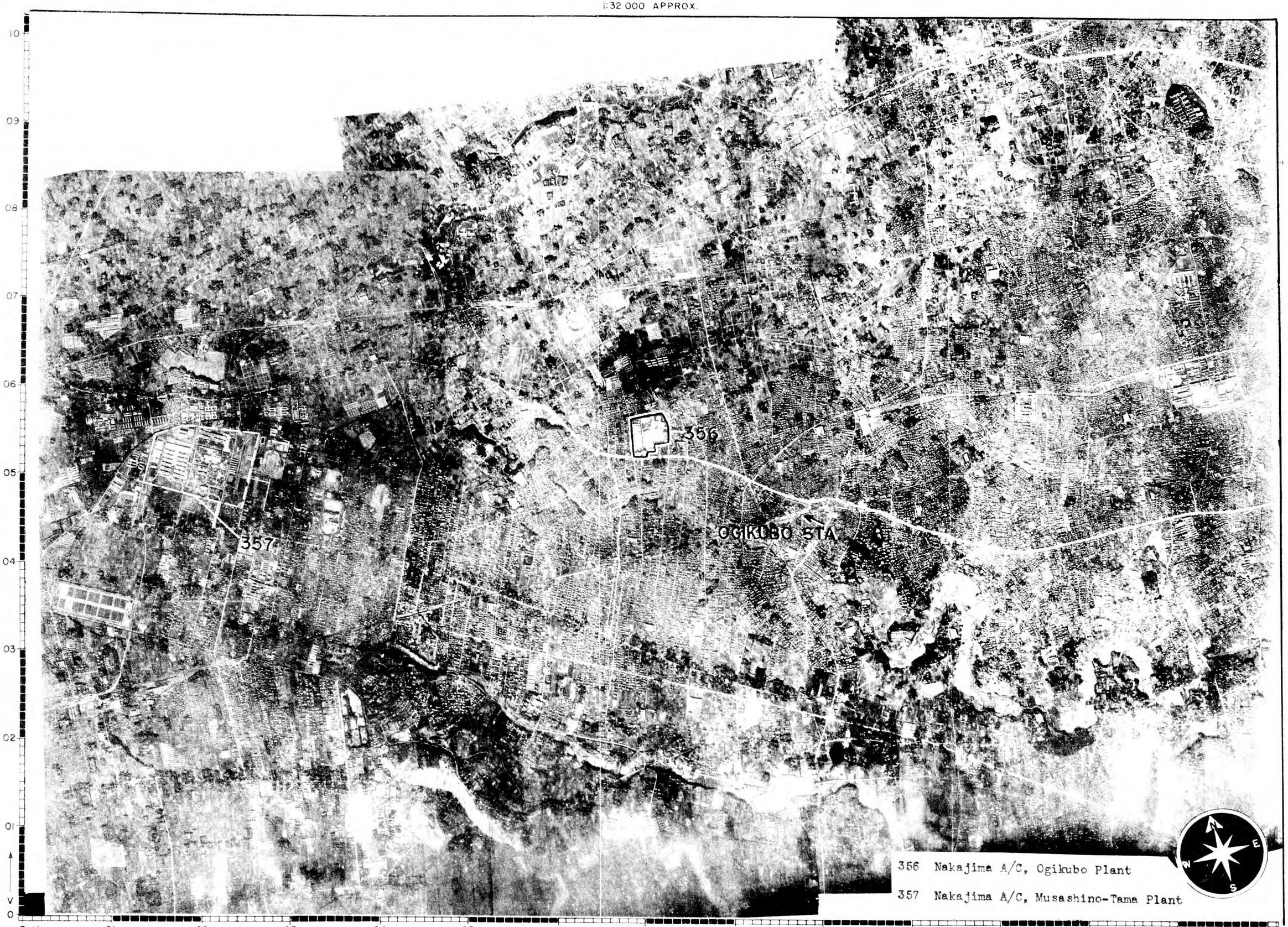
ISSUED JANUARY 1945

CONFIDENTIAL

0 2000 4000 6000 FEET

0 ½ 1 MILE

1:32 000 APPROX.



356 Nakajima A/C, Ogikubo Plant

357 Nakajima A/C, Musashino-Tama Plant

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MAY BE TAKEN INTO THE AIR IF DATA IS TRIMMED OFF

TYPE A

TARGET NO. 90.17-356 ILLUSTRATION NO. 90.17-356 P2

JOINT TARGET GROUP • WASHINGTON, D. C.

NAKAJIMA AIRCRAFT, OGIKUBO PLANT
TOKYO, JAPAN

TARGET No. 90.17–356

COORDINATES 35° 42′ N 139° 37′ E

PHOTOGRAPHED 7 NOVEMBER 1944

0 500 1000 1500 2000 2500 3000 FEET

0 ¼ 1:6000 APPROX. ½ MILE

ILLUSTRATION No. 90.17–356 P3/1

DATE 26 APRIL 1945

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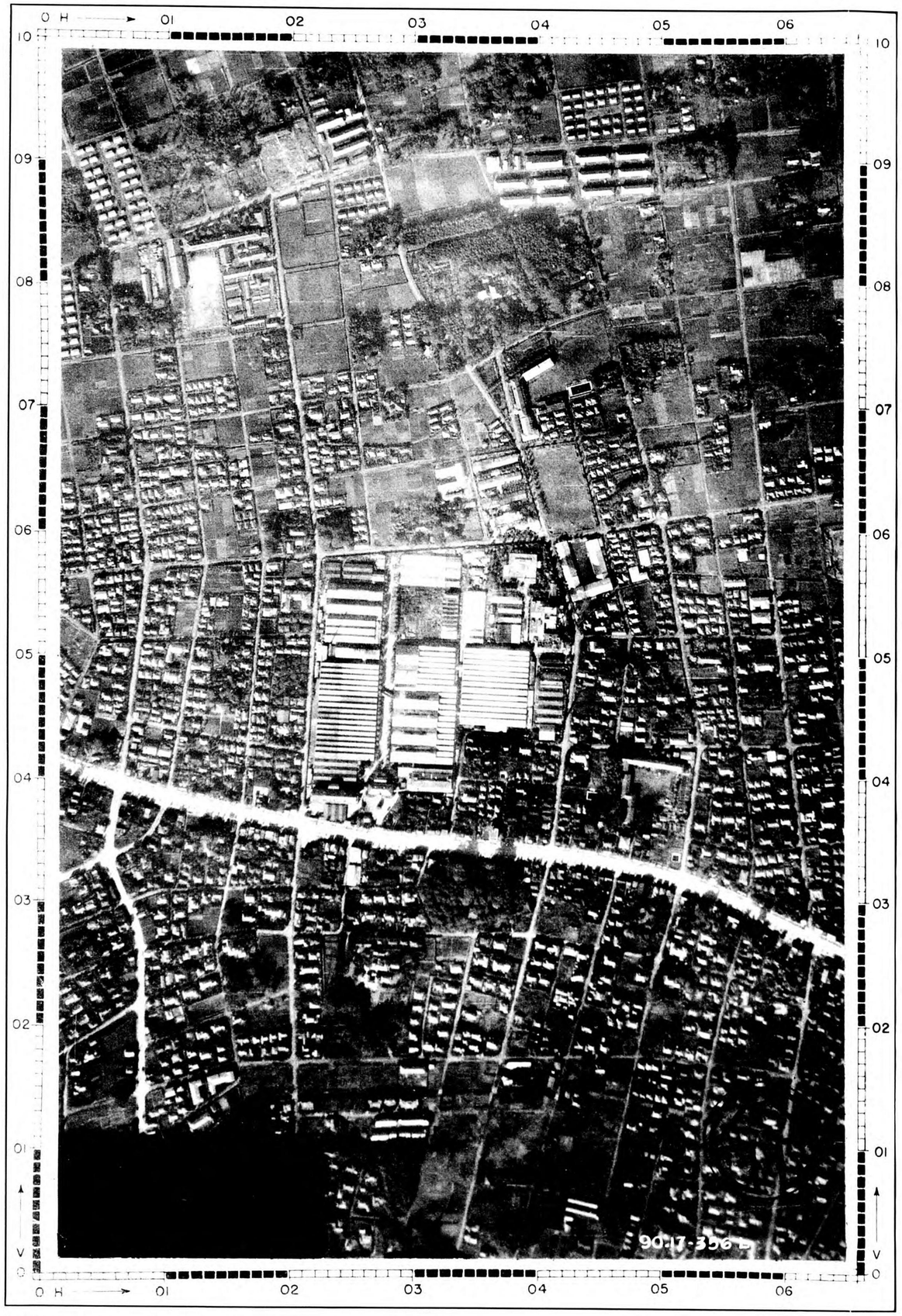

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JOINT TARGET GROUP–WASHINGTON, D. C.

NAKAJIMA AIRCRAFT
OGIKUBO PLANT
TOYKO, JAPAN

TARGET NO. 90.17-356
APPROX. COORDINATES 35°42′ NORTH 139°37′ EAST
PHOTOGRAPHED 7 NOVEMBER 1944

ILLUSTRATION NO. 90.17-356-P5/1
ISSUED **FEBRUARY 1945**
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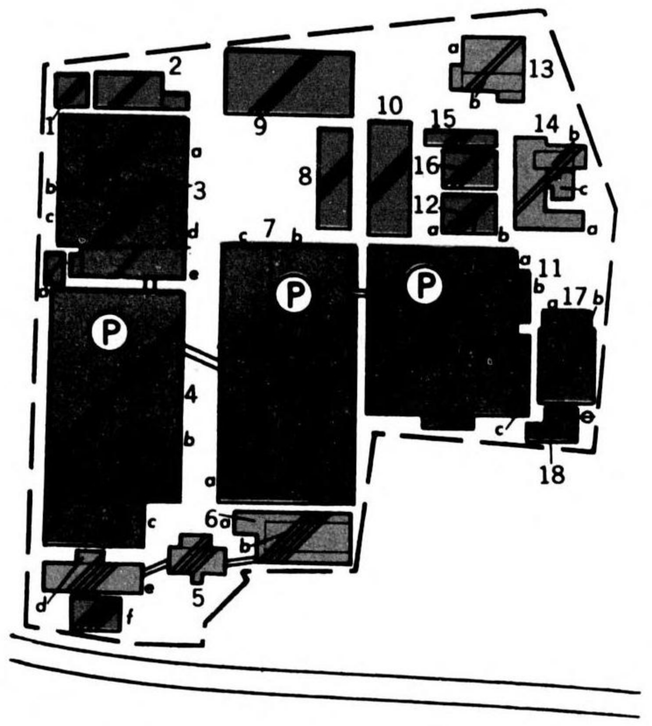
SCALE 1:6,000 APPROX
500 0 500 1000 FEET



HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT IN PLACE OF PAGE NO. 90.17-356-P5

FIRE SUSCEPTIBILITY PLAN

PRIMARY BUILDINGS	(P)	FIRE WALL, CERTAIN	
SECONDARY BUILDINGS	(S)	FIRE WALL, PROBABLE	

BUILDINGS		CONTENTS	
COMBUSTIBLE		NON-COMBUSTIBLE	
NON-COMBUSTIBLE		SLIGHTLY COMBUSTIBLE	
FIRE RESISTANT		MODERATELY COMBUSTIBLE	
COMBINATION I.E. COMBUSTIBLE ROOF RESISTANT FLOORS		HIGHLY COMBUSTIBLE	
		EXTREMELY COMBUSTIBLE	
WATER TANK	(W)	INTERMEDIATE VALUES	

AREA IN SQ. FT.	PRIMARY	ALL BLDGS. SHOWN
NO. OF BUILDINGS	3	21
NO. OF FIRE DIVISIONS	3	19
PLAN AREA	348,000	609,000
TOTAL FLOOR AREA	348,000	695,000
SITE AREA	1,045,000	

PREPARED BY AERONAUTICAL CHART SERVICE, AAF.

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Sheet No. 90.17-357-TI/2
Date 12 Jan. 1945
Page No. 1 (7 pages)

JOINT TARGET GROUP, WASHINGTON, D.C.

TARGET INFORMATION SHEET

Obj. Folder 90.17
Obj. Area 90.17
AAF Target No. 90.17-357

Place Tokyo (Japan)
Air Target
System - Aircraft

Lat.: 35° 43'N
Long: 139° 35'E
Alt.: 183 feet

NAME OF TARGET NAKAJIMA AIRCRAFT ENGINE PLANT, MUSASHINO-TAMA (MUSASHI) PLANT
(Nakajima Hikkoki K.K., Musashino Seisakusho)

ALL PREVIOUS SHEETS CANCELLED

SIGNIFICANCE

This plant is currently estimated to produce nearly 40 per cent of all Japanese operational aircraft engines. It is known to produce the Army Ha 45 and the Navy Homare (both 18 cylinder 1800-2000 HP engines) and is believed to be the largest Japanese maker of engines in this HP range. Production of the higher power engines is apparently increasing while output of the lower powered Type 2, 1150 and Sakae 21 is declining.

Early 1944 production is estimated by MID,WDGS to be 1100-1200 engines per month. The output at present is probably above 1500. Principle types are shown below.

Engine	*For Planes*	*Made At*
	Army Types	
Type 2 1150	Oscar	Tachikawa (90.17-792)
		Nakajima, Ota (90.13-1544)
Type 2 1450	Tojo 2 Helen	Nakajima, Ota (90.13-1544)
Ha 45	Frank	Nakajima, Ota (90.13-1544)
	Navy Types	
Sakae 21	Irving	Nakajima, Koizumi (90.13-1545)
	Rufe (?)	?
Sakae 31	Zeke 52	Nakajima, Koizumi (90.13-1545)
		Mitsubishi, Nagoya (90.20-194)
Homare	George	Kawanishi, Naruo (90.25-18)
	Grace	Aichi, Eitoku (90.20-1729)
	Frances	Nakajima, Koizumi (90.13-1545)

The ultimate capacity of this plant may not yet be reached. New construction under way (including 20 new test cells) suggests a considerable expansion in output. The conversion to new models may now, however, be causing a temporary reduction in output of engines.

As the above table indicates, this plant produces engines for the two large Nakajima airframe plants at Ota and Koizumi and for three others, Tachikawa Aircraft at Tachikawa, Mitsubishi Aircraft at Nagoya, and Aichi Aircraft (Eitoku plant) at Nagoya. The Nakajima, Ota and Koizumi plants depend upon this plant for nearly all engines, with the exception of 50-60 engines for Jill furnished Koizumi by Mitsubishi, while the others depend upon it for only certain types. Only one other plant, the Kawasaki Aircraft Co., Akashi plant, (TARGET 90.25-1547) makes Nakajima type engines, the Army Type 2-1150. The relatively low output of this model at Akashi could partially compensate for the loss of production at Musashino-Tama but only at the expense of engines for the Lily bomber.

LOCATION

Approximately 9.75 miles W by N of the Imperial Palace in Tokyo. It is located about midway between two main RR lines leading W from the city, and about 4000 feet NNE of a large reservoir. The Nakajima

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DESCRIPTION AND LAYOUT

Aircraft, Ogikubo Plant (TARGET 90.17-356) is about 2.2 miles to the E. The target is on the NW edge of a built-up area extending out from Tokyo.

(Refer to Illustration No. 90.17-357 P3, P5 and P6). The total target area is about 3000 x 2000 feet, roughly rectangular with the major axis lying in a WNW-ESE direction. The major units are compactly built. The plant is divided N-S into two sections.

The original Nakajima Plant at this location was in the eastern portion of the present site and included buildings 26-33 and 44-47. It was called the Musashino Plant and produced only Army type engines. Subsequent to 1939 it was expanded to the N (buildings 34-43) and the large plant on the western part of the site was built. The latter addition, originally known as the Tama Plant, was constructed to produce Navy aero-engines which up to this time had been made at the Nakajima Ogikubo Plant (TARGET 90.17-356). The Ogikubo Plant then was shifted to component production. The combined plant is called Musashi by the Japanese.

There is considerable evidence to suggest that some, if not all, of the facilities are used in common for the production of Army and Navy types:

1. The Musashino portion of the plant is about 40 per cent larger than the Tama portion, yet the output of engines for the Army is believed only equal to that of Navy types.

2. According to ground intelligence believed reliable, building 44 houses receiving and stores of raw materials. The new buildings (48-51) E of building 44 are apparently used for the same purpose. Since there are apparently no large storage buildings and no extensive railway spur on the Tama side of the plant it is probable that storing and receiving for the whole plant is done in these areas. Buildings 38-43 are believed to house foundry facilities; their proximity and connection to building 34 suggest that the castings (probably cylinder heads) are machined in this building for both portions of the plant. The well developed roadway leading from building 34 to building 11 strengthens the evidence of this probable tie.

3. Proximity to the storage area indicates (in conformity with usual plant layout) that the rough machining of stores for both sections of the plant is carried out in building 45-47 and then distributed to the rest of the plant.

4. The above distribution of function would bring the floor space devoted to Army and Navy types into equilibrium and thus into proportion with the estimated output figures. There is thus believed to be about 900,000 square feet in each section of the plant with some 500,000 square feet serving both.

5. The names of "Tama" and "Musashino" have been dropped by the Japanese and the plant is now referred to as the Musashi plant.

Further integration of these facilities may exist but this cannot be proved at present. The necessity for high levels of output suggests that components identical to both the Army and Navy types would be machined at one place. Such rationalization would increase

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the importance of this target, as partial damage to the factory might completely destroy the fabrication of one component used in both sections.

CONSTRUCTION AND VULNERABILITY

(Refer to Illustration No. 90.17-357 P3, P5 and P6). The buildings in the Musashino (eastern) portion of the plant are largely single-story, while those in the Tama (western) section are multi-story units.

Construction and Walls: One-story buildings: The majority of these buildings are steel framed with short to medium spans; some small buildings used for storage, receiving, etc., are timber framed. Wall panels are corrugated asbestos or iron.

Multi-story construction: These are of short span, reinforced concrete frame construction, with wall panels of reinforced concrete.

Roofs: One-story buildings: Roofs are predominantly non-combustible, of corrugated asbestos and iron over exposed steel.

Multi-story buildings: Roofs are cast-in-place, reinforced concrete, 4 to 5 inches in thickness.

Floors: Floors in all major buildings are of concrete, the floors in multi-story buildings being of reinforced concrete, 6 to 8 inches in thickness.

Number of stories: Seventy-two per cent of the entire target (plan area) consists of one-story buildings.

Number of fire divisions: Eighty-three in 51 buildings.

The Fire Susceptibility Plan shows the vulnerability to fire of each building and its contents. Contents are of low to moderate combustibility. It is estimated that 21 per cent of the productive capacity can be destroyed by fire. The target therefore is a fair choice for attack with a combination of high explosive and incendiary bombs.

PRIMARY OBJECTIVES

(Refer to Illustration No. 90.17-357 P3, P5, and P6). The principal machine shops (buildings 11e, f, g, h, j, k, m, p, 27, 32, 34, 45, 46, 47) are the primary objectives. With the exception of building 34, they lie in a compact area 1700 x 800 feet. Their dimensions are as follows:

Building	*Approximate Floor Area*
11e,f,g,h,j,k,m,p	370,000 square feet
27	120,000
32	126,000
34	126,000
45	44,000
46	44,000
47	52,000

The floor space of these buildings is 882,000 square feet, about 40 per cent of the total floor area. According to normal American practice, this should account for all machine tools in the plant. Total destruction in this area will cause the greatest overall reduction in plant output since the machine tools in these buildings will take the maximum time to repair or replace.

Destruction of final assembly buildings (32 and 12) will reduce output for a much shorter time as there is little machinery to be damaged and assembly can be resumed in temporarily repaired buildings

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or in any other building which has sufficient floor space. Equipment in the boiler houses (2, 30 and 37) and the heat treatment shop (31) is either more easily repaired or replaced than machine tools, or is not absolutely necessary for production.

The SW corner of building 32 is selected as the aiming point. All the principal buildings lie within a 1200 foot radius centering on this point.

WEAPON RECOMMENDATIONS

The most effective weapons for high level attack against his target are the AN-M66 2000-lb G.P. and the AN-M50 4-lb incendiary (in M17 clusters). Maximum damage to structures and contents will result if the high explosive bombs are fuzed 0.1 sec. nose and 0.025 sec. tail.

The presence of many fire walls and the wide dispersal of combustible material in the principal buildings require multiple hits in order to achieve a suitable level of damage. Thus, the 4-lb bomb is slightly more effective than the AN-M47 70-lb incendiary and much more effective than the AN-M76 500-lb bomb. The chance of fire spread is believed negligible due to the modern construction of the buildings and the presence of fire walls. (Allowance has been made in the analysis for the concrete roofs found in the Tama complex).

The 2000-lb bomb is recommended as it is equal in effectiveness to the AN-M64 500-lb G.P. on the short to medium span buildings in the Musashino plant, and twice as effective as the 500-lb bomb on the multi-story, reinforced concrete units of the Tama plant. Confined blast is the key factor in producing structural damage to buildings such as those found in the Tama complex, and the 2000-lb G.P., with its relatively high charge weight (1,117 lbs of TNT), thus has the best chance of causing maximum damage. The 0.025 fuzing gives the best expectancy of the bomb detonating beneath the top floor where it will be most effective. (If 0.025 sec. nose fuzes, M140, are available, they should be used in place of the 0.1 sec. nose setting).

The following Loading Table, computed for the most effective weapons, shows the per cent of structural damage to the target which can be expected for different weights of attack and various accuracies of bombing. Accuracy is measured by the per cent of bombs dispatched expected to fall within 1000 feet of the aiming point. (Allowance has been made for the fact that this target lies within a 1200-foot radius of the recommended aiming point).

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

Sheet No. 90.17-357-T1/3
Date 20 April 1945
Page 5

TABLE I.—*Loading table—Most effective weapons*

[High explosive: AN-M66 2000-lb. G. P.[1] Incendiary: AN-M50 4-lb. (in M17 clusters)[1]]

NAKAJIMA AIRCRAFT ENGINE PLANT, MUSASHINO-TAMA (MUSASHI) PLANT

Total load in tons[4]	Percent of bombs dispatched expected to fall within 1,000 feet of aiming point[2]											
	10 percent			15 percent			20 percent			30 percent		
	H. E.	I. B.	F[3]	H. E.	I. B.	F[3]	H. E.	I. B.	F[3]	H. E.	I. B.	F[3]
	Tons[4]			Tons[4]			Tons[4]			Tons[4]		
100	35	65	0.12	25	75	0.16	20	80	0.20	15	85	0.24
200	35	165	.20	30	170	.24	75	125	.27	115	85	.31
300	50	250	.24	130	170	.29	175	125	.32	215	85	.39
400	150	250	.28	230	170	.33	275	125	.37	315	85	.45
500	250	250	.31	330	170	.37	375	125	.42	415	85	.51
600	350	250	.34	430	170	.41	475	125	.46	515	85	.56
700	450	250	.36	530	170	.45	575	125	.51	615	85	.61
800	550	250	.39	630	170	.48	675	125	.55	715	85	.65
900	650	250	.42	730	170	.51	775	125	.59	815	85	.69
1,000	750	250	.44	830	170	.54	875	125	.61	915	85	.72
1,100	850	250	.47	930	170	.57	975	125	.64	1,015	85	.75
1,200	950	250	.49	1,030	170	.60	1,075	125	.67	1,115	85	.78
1,300	1,050	250	.50	1,130	170	.62	1,175	125	.69	1,215	85	.80
1,400	1,150	250	.52	1,230	170	.65	1,275	125	.71	1,315	85	.83
1,500	1,250	250	.54	1,330	170	.67	1,375	125	.73	1,415	85	.85
1,600	1,350	250	.56	1,430	170	.69	1,475	125	.76	1,515	85	.86
1,700	1,450	250	.57	1,530	170	.71	1,575	125	.78	1,615	85	.87

[1] Because of the considerable difference in effectiveness of the various G. P. bombs, this table should not be used for the 1,000- and 5,000-pound bombs. However, as there is only slight difference in the effectiveness of the AN-M50 and the AN-M47 against this target, the table is suitable for use with the AN-M47.

[2] In the examples following this table, this number is called "Index of Mission Efficiency"; it is a measure of bombing accuracy. In computing this loading table, allowance has been made for the fact that the target lies in a circle of 1,200 feet.

[3] Expected fraction (percent) of structural damage to the target.

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

HOLDERS OF J. T. G. FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT IN PLACE OF SHEET 90.17-357-T1/2, PAGE 5.

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199T

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 best H.E.-I.B. 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 a total load of 300 tons.
   Solution: 70% x 30% equals 21%; i.e., 20% is index of mission efficiency.
   Opposite 300 tons in 20% column find loading:
   H.E. *175 tons* (equal to 58 plane loads at 3 tons per plane)
   I.B. *125 tons* (equal to 42 plane loads at 3 tons per plane)

   Fraction of damage equals 32 per cent.
   Hence, for optimum loading 58 planes will carry H.E. and 42 planes I.B., but if groups of 12 are to carry only one kind of bomb per group, this may be revised to 5 groups with H.E.'s and 3 groups with I.B.'s.

2. *To find force required to achieve a 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% mission efficiency column take:
   F equal 51% and find load *H.E.* *575 tons*
   I.B. *125 tons*
   Total 700 tons
   requiring a total force of 175 A/C or
   16 groups of 12 A/C.

LEVEL OF DAMAGE

Approximately 20 per cent structural damage to the buildings housing machine tool processes will result in a net loss in production of three weeks to three months, varying on the concentration of bomb hits and upon the type of material destroyed. While some tools will be injured, the increased use of similar equipment already in the plant and other temporary expedients can be employed to restore full operations in a relatively short time.

Damage on the level of 50 per cent is far more serious, and probably will result in net production loss of five to eight months. Damage totaling 70 per cent would net seven to nine months production loss. At levels exceeding 50 per cent there would be a heavy loss of material in production.

Since this target is one of the foremost known producers of aero-engines in Japan, damage exceeding 50 per cent to the machine shops is recommended.

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CAMOUFLAGE, DECOYS AND SMOKE SCREENS	Photography of 7 Nov. 1944 shows camouflage by the use of disruptive painting on the Musashino part of the plant. A fairly effective smoke screen was used during December 1944 attacks. The nearby reservoir, 4000 feet to the S, is being concealed by netting.
ADDITIONAL INFORMATION	

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Sheet No.90.17-357 TI/2
Date Feb. 1945
Page No. 1 (2 pages)

JOINT TARGET GROUP, WASHINGTON, D.C.

TARGET INFORMATION SHEET

ANNEX I

Obj. Folder 90.17
Obj. Area 90.17
AAF Target No. 90.17-357

Place Tokyo (Japan)
AIR TARGET SYSTEM Aircraft
NAME OF TARGET NAKAJIMA AIRCRAFT, MUSASHINO-TAMA (MUSASHI) PLANT (Nakajima Hikkoki K.K., Musashino Seisakusho)

Lat.: 35 43'N
Long: 139 35'E
Alt.: 183 feet

(Note: This annex is issued for use by the Navy in conjunction with Target Information Sheet 90.17-357 TI/2, issued by the Joint Target Group on 12 January 1945.)

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" on the Fire Susceptibility Plan, Illustration No. 90.17-357 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 number 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 per cent serious damage to specific buildings. For other levels of damage within this range, the required number of hits can be obtained by interpolation.

Holders of J.T.G. Folders should insert this sheet in Air Target System Folder, Japanese Aircraft following 90.17-357 TI/2.

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Table I

Number of Hits Required to Achieve 30, 50 and 70 Percent Serious Damage to Individual Buildings

(Refer to Illustration No. 90.17-357 P5)

Building No.	I.P.	Fraction of Serious Damage	Number of Hits 500-lb GP	1000-lb GP	2000-lb GP
Iefghi kmp	10	30%	19	7	2
		50%	38	13	5
		70%	56	20	7
34	7	30%	13	7	3
		50%	25	14	7
		70%	36	21	10
32	6	30%	13	7	3
		50%	25	14	7
		70%	36	21	10
27	5	30%	12	7	3
		50%	23	13	6
		70%	35	20	10
47	2	30%	5	3	2
		50%	10	6	3
		70%	15	8	4
45	2	30%	4	2	1
		50%	8	5	2
		70%	12	7	3
46	2	30%	4	2	1
		50%	8	5	2
		70%	12	7	3

Examples of Use of Table 1:

1. Problem: To obtain the required number of hits with 500-lb GP bombs on Building 34 to achieve 30 percent serious damage.

   Solution: The table gives 13 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 27 to achieve 60 percent serious damage.

   Solution: The table gives 6 hits for 50 percent and 10 hits for 70 percent serious damage. By interpolation 8 hits are required.

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TARGET NO. 90.17-357

JOINT TARGET GROUP-WASHINGTON. D. C.

NAKAJIMA AIRCRAFT - MUSASHINO-TAMA (MUSASHI) PLANT

TOKYO, JAPAN

ILLUSTRATION NO. 90.17-357 PI

APPROX. COORDINATES 35° 43' N 139° 35' E

PHOTOGRAPHED 7 NOVEMBER 1944

ISSUED NOVEMBER 1944

RESTRICTED

0 2000 4000 6000 FEET

0 1/2 1 MILE

1:32 000 APPROX.

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RESTRICTED

TYPE A

JOINT TARGET GROUP WASHINGTON, D. C.

NAKAJIMA AIRCRAFT, MUSASHINO-TAMA PLANT
TOKYO JAPAN

RESTRICTED

ILLUSTRATION No.. 90.17-357 P2/1
DATE. . . . . 29 April 1945
TARGET No. 90.17-357
COORDINATES. . .35°43'N 139°35'E
PHOTOGRAPHED. 7 November 1944

0 2000 4000 6000 FEET
0 ½ 1 MILE
1:32 000 APPROX.

Holders of Joint Target Group Folders should insert this sheet in Air Target System Folder: Japanese Aircraft in place of 90.17-357 P2.

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May be taken into the air if data is trimmed off

TARGET NO. 90.17-357

APPROX. COORDINATES 35° 43' N 139° 35' E

PHOTOGRAPHED 7 NOVEMBER 1944

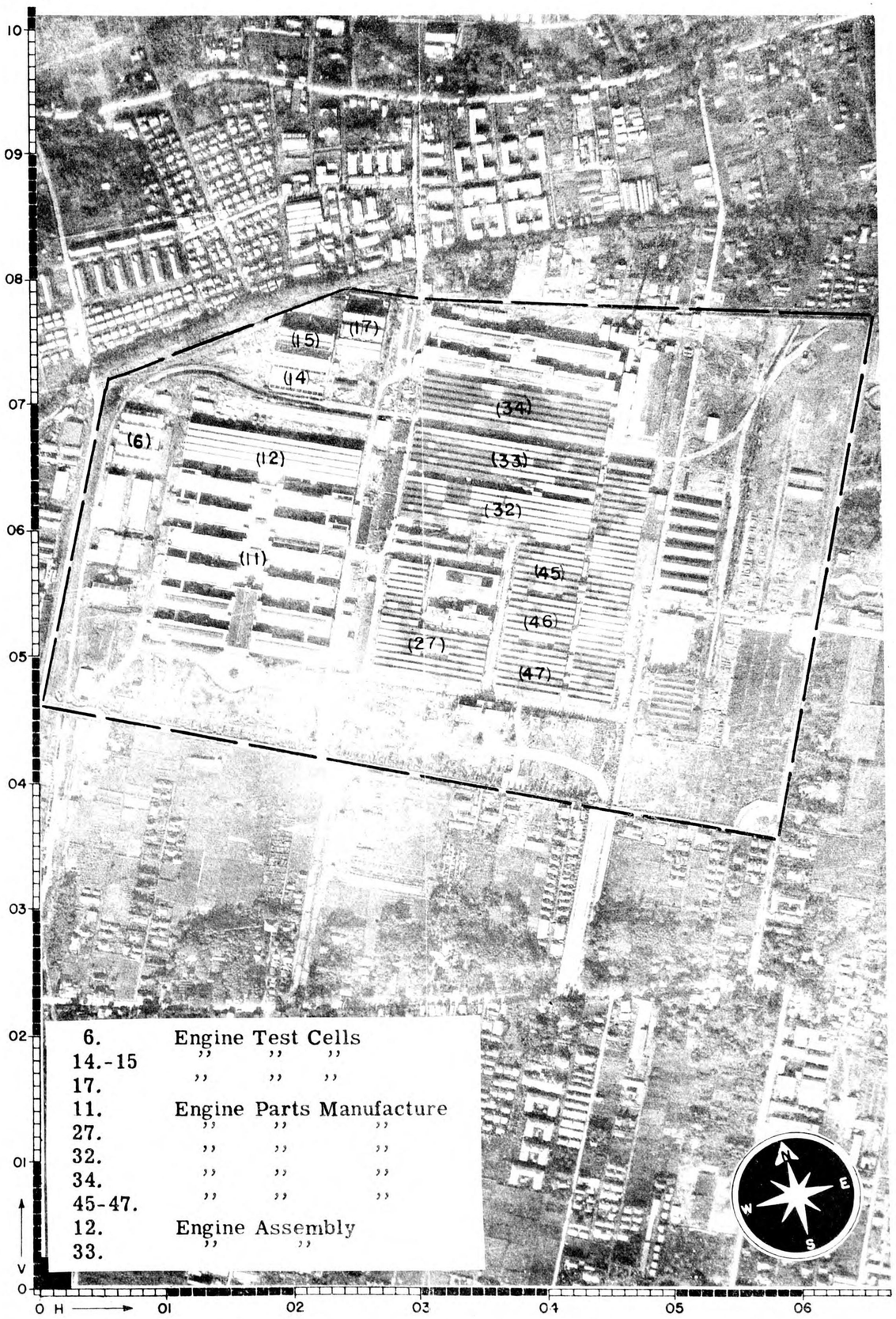
NAKAJIMA AIRCRAFT—MUSASHINO-TAMA (MUSASHI) PLANT
TOKYO JAPAN

0 500 1000 1500 2000 2500 3000 FEET
0 ¼ ½ MILE
1:6000 APPROX.

ILLUSTRATION NO. 90.17-357 P3

ISSUED NOVEMBER 1944

CONFIDENTIAL



6.	Engine Test Cells	
14.-15	,,	,, ,,
17.	,,	,, ,,
11.	Engine Parts Manufacture	
27.	,,	,, ,,
32.	,,	,, ,,
34.	,,	,, ,,
45-47.		
12.	Engine Assembly	
33.	,,	,,

AC/AS, INTELLIGENCE

CONFIDENTIAL

Target illustrations taken into the air on offensive missions must be trimmed to the photo line

TYPE B
C5-2604, AF

TARGET NO. 90.17-357

APPROX. COORDINATES 35°43′ NORTH 139°35′ EAST

PHOTOGRAPHED 7 NOVEMBER 1944

JOINT TARGET GROUP-WASHINGTON, D. C.

NAKAJIMA AIRCRAFT-MUSASHINO-TAMA (MUSASHI) PLANT

TOKYO, JAPAN

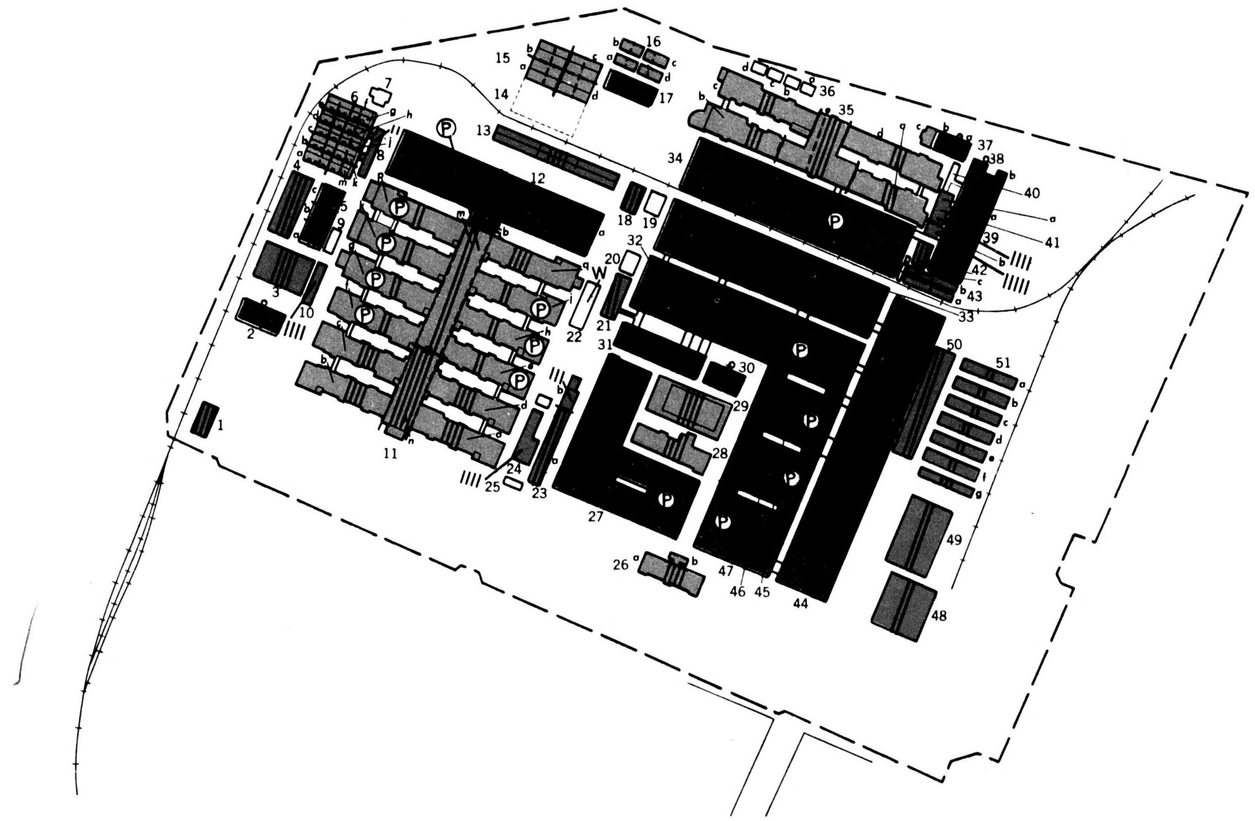
SCALE 1:6000

500 0 500 1000 Feet

ILLUSTRATION NO. 90.17-357-P5

ISSUED 1 JANUARY 1945

CONFIDENTIAL



FIRE SUSCEPTIBILITY PLAN

PRIMARY BUILDINGS	(P)	FIRE WALL, CERTAIN	
SECONDARY BUILDINGS	(S)	FIRE WALL, PROBABLE	

BUILDINGS		CONTENTS	
COMBUSTIBLE		NON-COMBUSTIBLE	
NON-COMBUSTIBLE		SLIGHTLY COMBUSTIBLE	
FIRE RESISTANT		MODERATELY COMBUSTIBLE	
COMBINATION I.E. COMBUSTIBLE ROOF RESISTANT FLOORS		HIGHLY COMBUSTIBLE	
		EXTREMELY COMBUSTIBLE	
WATER TANK	(W)	INTERMEDIATE VALUES	

AREA IN SQ. FT.	PRIMARY	ALL BLDGS. SHOWN
NO. OF BUILDINGS	7	51
NO. OF FIRE DIVISIONS	14	83
PLAN AREA	697,000	1,789,000
TOTAL FLOOR AREA	882,000	2,415,000
SITE AREA	5,275,000	

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Sheet No. 90.17-539-TI
Date 2 March 1945
Page No. 1 (2 pages)

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

Obj. Folder 90.17
Obj. Area 90.17
AAF Target No. 90.17-539
NAME OF TARGET

Place Tokyo (Japan)
Air Target System Aircraft
NAKAJIMA AIRCRAFT, TANASHI FOUNDRY

Lat.: 35° 44' N
Long: 139° 32' E
Alt.: 195 feet

ALL PREVIOUS SHEETS CANCELLED

SIGNIFICANCE

An important producer of rough castings and forgings for the main Nakajima Musashino-Tama engine plant (TARGET 90.17-357). It also has approximately 36 engine test cells (plus some believed used for experimental work) capable of testing about half of the engines produced at Musashino-Tama. Some of the buildings at this plant may be used for preliminary machining. Their small size, however, suggests that the probable function is connected with pattern making or engine tear-down.

The effect of the destruction of this plant on finished engine production would not be felt for 3 to 4 months. The degree to which it would curtail engine output would depend on how much Nakajima could call upon other foundry and forge capacity for this basic raw-material production. Destruction of the engine test cells would have only a short term effect.

LOCATION

About 13 miles NW of the Imperial Palace in Tokyo, one mile N of the town of Tanashi, and about 2 miles NW of the main Musashino-Tama plant. It is approximately halfway between 2 railroads running W from Tokyo: the Seibu Railroad to the S, and the Musashino Railroad to the N. The plant lies in the southeastern corner of a wooded area, immediately W of a N-S highway leading N from the town of Tanashi.

DESCRIPTION AND LAYOUT

(Refer to Illustration No. 90.17-539 P4). The total target area is irregular in shape, measuring about 3200 feet E-W by 1900 feet N-S at its longest dimensions. The main producing section (buildings 2-10, 27-33) is contained in a rectangle in the S central part of the compound, measuring about 1900 feet E-W by 900 feet N-S. The engine test cells are immediately N of the eastern end of this section in a rectangular area measuring about 1000 feet E-W by 450 feet N-S.

The main forge and foundry shops (buildings 31-33) are located near the SE corner of the plant. N and W of these are the various shop buildings identified as possible engine tear-down shops, but which may be pattern shops. A large new building is under construction on the western end of the compound.

A railroad spur enters the western end of the compound from the Musashino Railroad to the N. A new line, recently completed from the main Musashino-Tama Plant, runs N-S through the center of the compound and terminates immediately W of the engine test cells.

PRIMARY OBJECTIVES

(Refer to Illustration No. 90.17-539 P4).
The forge and foundry buildings 31, 32, and 33 in a compact 700 x 600 foot rectangle near the SE corner of the compound.

The smaller shop-type buildings 4, 5, and 30 should be included as primary objectives if positive identification as pattern shops can be made.

CONSTRUCTION & VULNERABILITY

(Refer to Illustration No. 90.17-539 P4). Buildings housing the principal processes are one-story, medium and long span, gable roof structures about 20 feet high to the eaves, together with a few one-story, short span, sawtooth roofed buildings of the same height. Some probably have travelling cranes. These buildings are fully framed in steel with roofs, and probably walls, of light weight sheet materials. Minor buildings are of wood frame construction with gable roofs. Engine test cells are of reinforced concrete.

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JOINT TARGET GROUP - WASHINGTON, D.C.

TARGET INFORMATION SHEET *(Contd.)*

WEAPON RECOMMENDATIONS

Instructions with regard to weapons will usually be given in Field or Operational Orders, but in the absence of such instructions and to assist Planners in formulating such orders the following information is given:

An attack with high explosive bombs only is recommended. A preliminary structural and occupancy analysis of the plant indicates the following bomb would be most effective:

AN-M66 2000-lb G.P., fuzed 0.1 nose/0.025 tail.

Against the heavy buildings, the 2000-lb bomb, producing a crater of 40 to 45 feet in diameter, has the best chance of undermining two or more main columns and thus causing primary collapse of the vital crane runway. The 0.025 tail fuzing gives best expectancy of causing maximum cratering effect. Detailed analyses of similar plants indicates that the 1000-lb G.P. is approximately 85 per cent as effective as the 2000-lb bomb on a weight for weight basis, and the 500-lb bomb 80 per cent.

Incendiaries are not recommended as the combustibility of the contents is low and the buildings are either non-combustible (exposed steel trusses and columns) or fire resistive.

LEVEL OF DAMAGE

CAMOUFLAGE DECOYS AND SMOKE SCREENS

Photography of 3 December 1944 shows some buildings with disruptive painting. No smoke screens or decoys have been reported or indicated.

ADDITIONAL INFORMATION

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(P)

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JOINT TARGET GROUP • WASHINGTON, D. C.

TARGET No. 90.17–539

NAKAJIMA AIRCRAFT, TANASHI FOUNDRY
TOKYO, JAPAN

ILLUSTRATION No. 90.17–539 P3

COORDINATES 35° 44′ N 139° 32′ E

PHOTOGRAPHED 3 DECEMBER 1944

0 500 1000 1500 2000 2500 3000 FEET

0 1/8 1:6000 APPROX. 1/2 MILE

ISSUED 14 MARCH 1945

RESTRICTED

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT.

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JOINT TARGET GROUP • WASHINGTON, D. C.

TARGET No. 90.17-539

NAKAJIMA AIRCRAFT, TANASHI FOUNDRY
TOKYO, JAPAN

ILLUSTRATION No. 90.17-539 P4

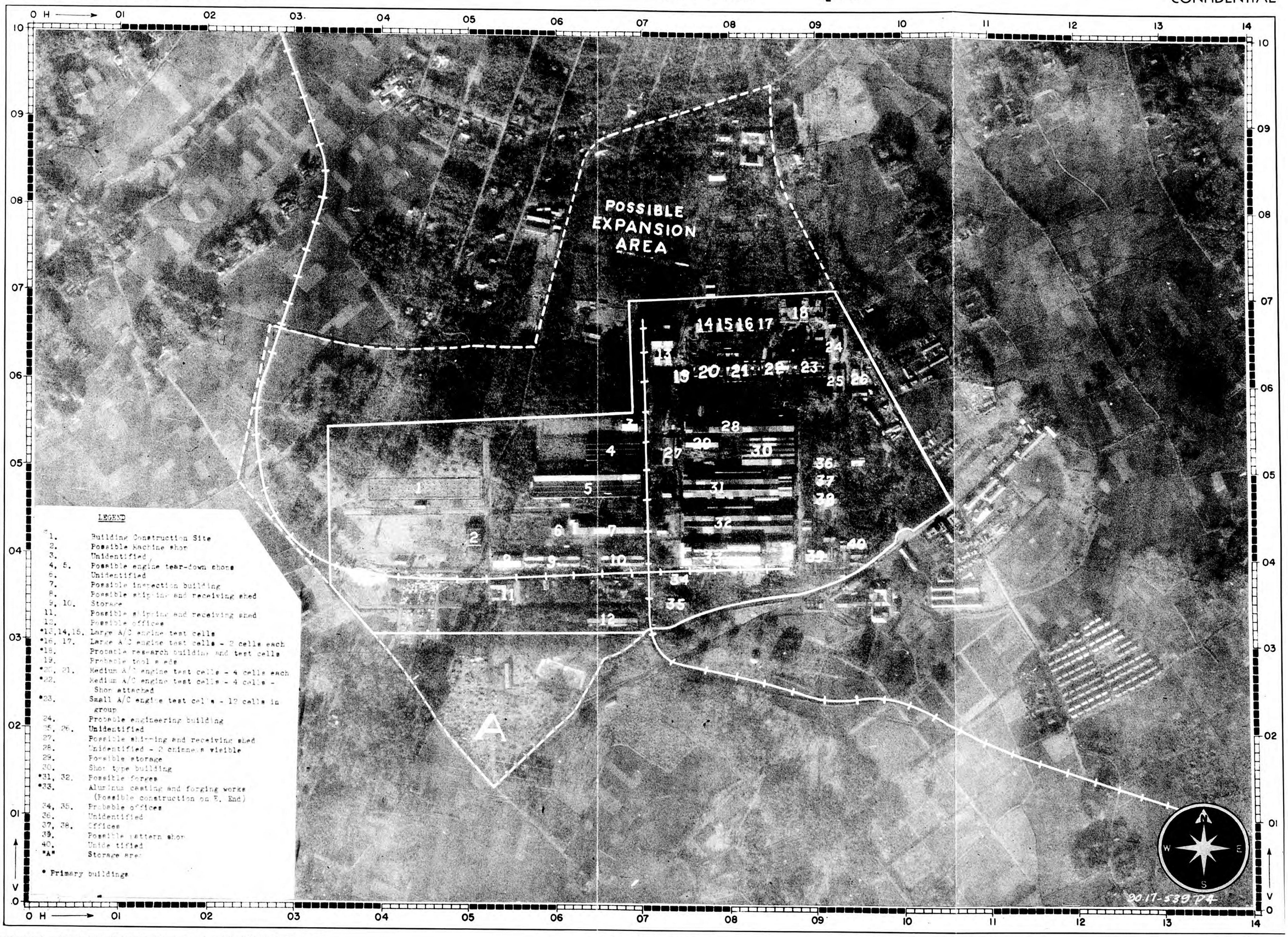
COORDINATES 35° 44′ N 139° 32′ E

PHOTOGRAPHED 3 DECEMBER 1944

0 500 1000 1500 2000 2500 3000 FEET
0 1/4 1:6000 APPROX. 1/2 MILE

ISSUED 14 MARCH 1945

CONFIDENTIAL



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May not be taken into the air.

Obj. Folder 90.17
Obj. Area 90.17
AAF Target No. 90.17–791
Air Target System Aircraft

Lat.: 35°43′N
Long.: 139°22′E
Alt.: 360′

SHOWA AIRCRAFT

TACHIKAWA JAPAN

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER—JAPANESE AIRCRAFT—IN PLACE OF SHEET NO. 90.17–791–TI/1

SIGNIFICANCE

Small plant believed producing the transport Tabby as well as some engine parts. Capacity for at least 60 planes per month with no sub-contracting is indicated from an analysis of floor space requirements.

LOCATION

(Refer to Illustration No. 90.17–791 P2.) Approximately 22 miles west of the Imperial Place in Tokyo, and 2 miles northwest of Tachikawa. The extensive Tachikawa Army Air Arsenal (Target 90.17–2008) is about 1 mile east, separated by the 4,000-foot wide Tachikawa Airfield from the Tachikawa Aircraft (Target 90.17–792) about 2.75 miles east of the Showa plant; Hitachi Aircraft, Tachikawa plant (Target 90.17–2009) is about 3.25 miles to the east-northeast. A large airfield is located 1.25 miles northwest of the target. Two branches of the Tama River junction about 1.5 miles to the southwest; the river flows generally east about 1 mile to the south. The Ome Electric Railroad, running generally east-west, bounds the plant compound on the south; it is bounded on the east by a 2,000- by 5,000-foot airfield. The target area is in open country.

DESCRIPTION AND LAYOUT

(Refer to Illustrations No. 90.17–791 P3, P5, and P6.) The target area is roughly triangular in shape extending about 3,500 feet east-west along the railroad and 2,400 feet north-south along the edge of the airfield. The major units are grouped north-south through the center of the compound. The largest building (26), believed chiefly used for sub and final assembly, has a plan area of approximately 259,400 square feet. The drop hammer shop (26c) is in the northwest corner of this building. The two parallel buildings immediately to the west are the metal fabrication shop (17) and subassembly and detail work unit (18). Building 21 and building 27 on the northwest edge of the compound are believed to be subassembly shops.

There are six hangars along the east side of the target area bordering the airfield. A number of small unidentified buildings are grouped along the south and west sides of the area.

PRIMARY OBJECTIVES

(Refer to Illustrations No. 90.17–791 P3, P5, and P6.) The primary and secondary objectives of this target, listed in order of productive importance are as follows:

Primary	*Secondary*
26	38
17	40
27	39
21	
18	

The loss of the primary buildings would halt production in the plant's metal fabrication, subassembly, and final assembly facilities. Secondary objectives house post assembly equipment, of lesser importance than primary processes. Other buildings are flight hangars, boiler house, forge and foundry, and maintenance, storage, administration, and training units.

CONSTRUCTION AND VULNERABILITY TARGET INFORMATION

(Refer to Illustrations No. 90.17–791 P3, P5, and P6.)

Primary and secondary objectives listed in order of importance:

Bldg. No.	Plan Area (sq. ft.)	Roof [1]	Combustibility	HE Vulnerability [2]
26	259,400	Light	Noncombustible	V4
17	132,300	Light	Noncombustible	V4
27	96,500	Light	Noncombustible	V4
21	76,800	Light	Noncombustible	V4
18	93,800	Light	Noncombustible	V4
38	37,800	Light	Noncombustible	V4
40	49,500	Light	Noncombustible	V4
39	49,500	Light	Noncombustible	V4

[1] Light weight roofs are readily penetrated by all types of incendiary bombs. Initiation of HE tail fuzes by these roofs cannot be depended upon except for bombs striking structural members (30 to 40 percent of bombs striking buildings).

[2] HE vulnerability classifications are explained in JTG Memorandum No. JTG/M/3/1 which is now in process of revision. In brief, a single vulnerability classification is assigned types of industrial buildings which behave in a similar manner when attacked with the same HE weapons. These vulnerability classes are arranged in order of vulnerability to HE attack, with very invulnerable, multistory, earthquake-proof structures assigned the classification V1. The other classifications V2, V3, V4, V5 are progessively more vulnerable types, V5 being the most vulnerable large span, arched hangar type structures. Most 1-story buildings fall in class V4.

Classification of buildings:

	Primary and secondary objectives	Whole target
Total Plan Area of buildings (square feet)	795,600	1,344,300
Combustibility:		
Fire resistant (R)		
Noncombustible (N)	100%	67%
Combustible (C)		33%
HE vulnerability:		
V1 (least vulnerable)		
V2		
V3		2%
V4	100%	98%
V5 (most vulnerable)		

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156–T—178–T

Combustibility of contents (whole target): Slight (i. e. average industrial fire occupancy). For detailed study of fire susceptibility of structures and contents refer to Illustration No. 90.17–791 P5.

WEAPON RECOMMENDATIONS

Reference should be made to Weapon Recommendations Sheet No. 90.17–791 WR1 for high and medium altitude attack and Weapon Recommendations Sheet No. 90.17–791 WR2 for low altitude attack.

TARGET INFORMATION

CAMOUFLAGE, DECOYS AND SMOKE SCREENS

Photography of 7 November 1944 shows an attempt to camouflage building 26 with disruptive painting. There are no decoy buildings reported and no use of smoke screens has been indicated.

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER—JAPANESE AIRCRAFT—AFTER SHEET NO. 90.17–791–TI/2, PAGE 1

TARGET NO.90.17-791

APPROX. COORDINATES 35° 43' N 139° 22' E

PHOTOGRAPHED 7 NOV. 1944

JOINT TARGET GROUP-WASHINGTON, D. C.
SHOWA AIRCRAFT

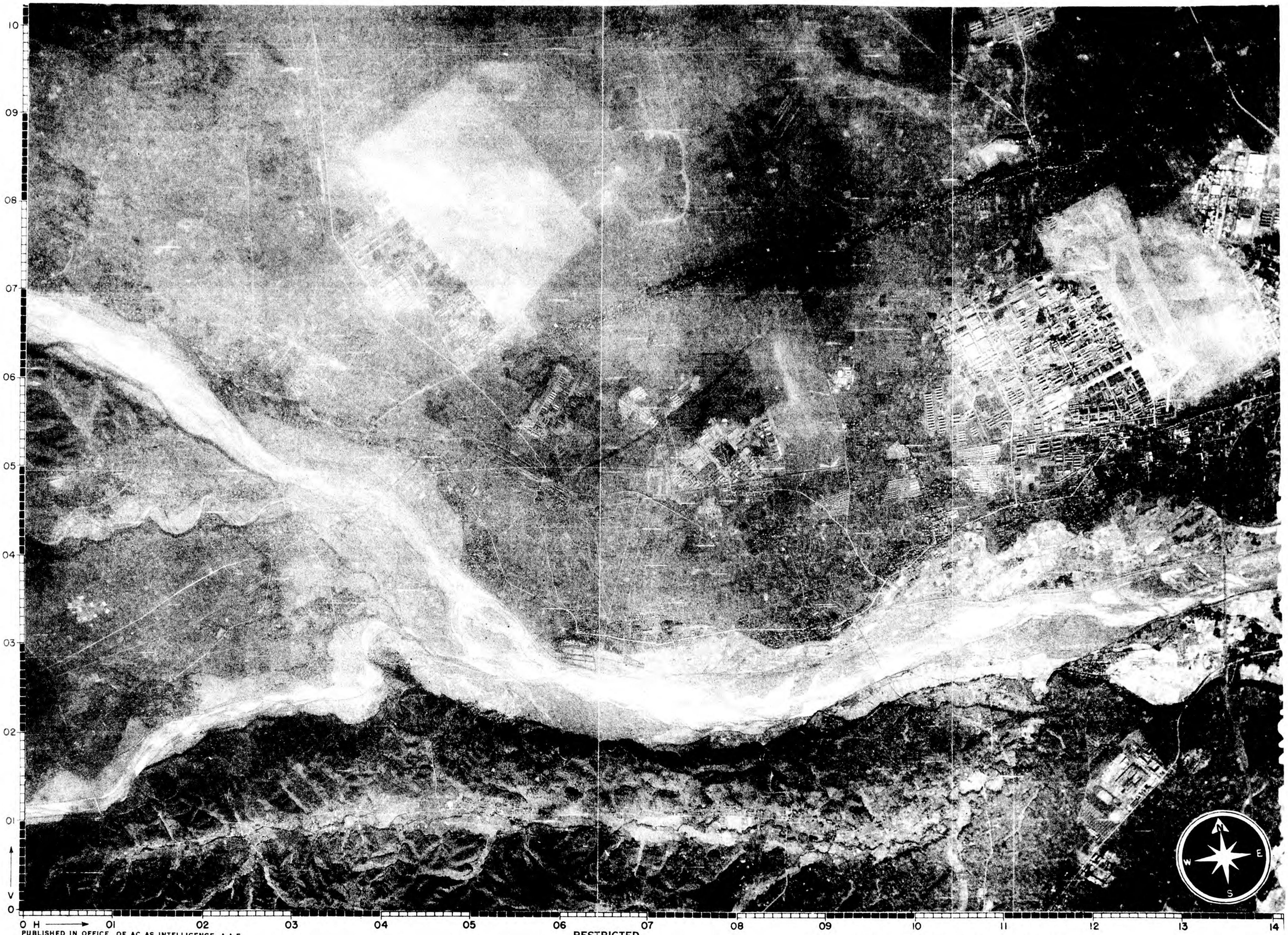
TOKYO, JAPAN

0 2000 4000 6000 FEET
0 ½ 1 MILE
1:32 000 APPROX.

ILLUSTRATION NO.90.17-791 P1

ISSUED JANUARY 1945

RESTRICTED



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TYPE A

TARGET NO. 90.17 -791 ILLUSTRATION NO. 90.17-791 P1

TARGET NO.90.17-791

APPROX. COORDINATES 35° 43' N 139° 22' E

PHOTOGRAPHED 7 NOV. 1944

JOINT TARGET GROUP-WASHINGTON, D. C.

SHOWA AIRCRAFT

TOKYO, JAPAN

0 2000 4000 6000 FEET

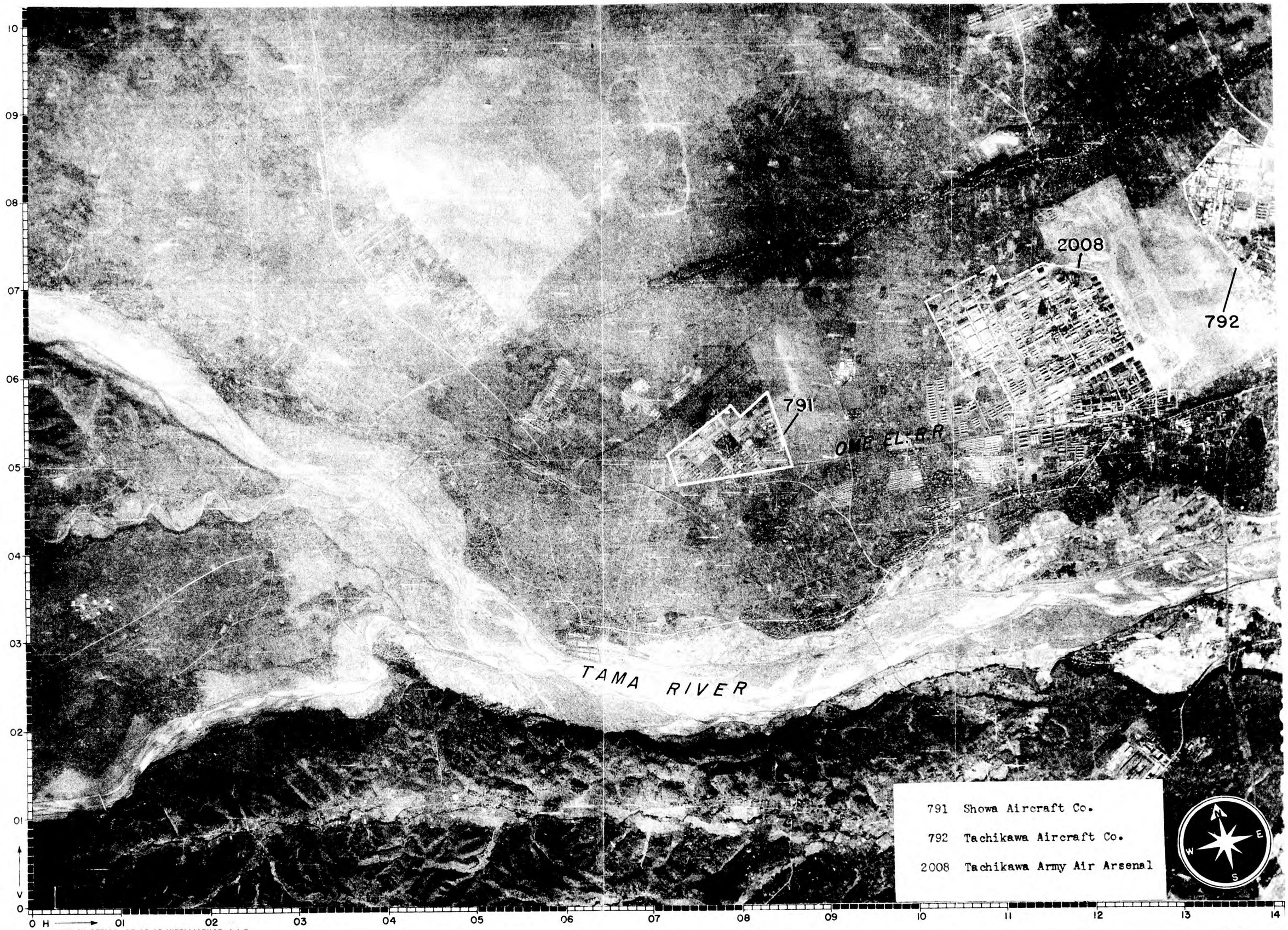
0 ½ 1 MILE

1:32 000 APPROX.

ILLUSTRATION NO. 90.17-791 P2

ISSUED JANUARY 1945

CONFIDENTIAL



10 09 08 07 06 05 04 03 02 01 0 V

0 H → 01 02 03 04 05 06 07 08 09 10 11 12 13 14

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TYPE A

TARGET NO. 90.17- 791 ILLUSTRATION NO. 90.17-791 P2

JOINT TARGET GROUP, WASHINGTON, D. C.
FUNCTIONAL IDENTIFICATION

(To be read in conjunction with Illustration No. 90.17-791-P5)

Obj. Folder 90.17
Obj. Area 90.17
AAF Target No. 90.17-791
Air Target System Aircraft

Lat.: 35°43'N
Long.: 139°22'E
Alt.: 360'

SHOWA AIRCRAFT

TACHIKAWA JAPAN

Building No.	Function of Building
1–7	Probable Storage Building.
8	Forge Shop.
9	Boiler Plant.
10–13	Warehouse.
14	Mess Hall.
15, 16	Warehouse.
17	Metal Fabrication.
18	Detail and Subassembly.
19, 20	Storage.
21	Subassembly.
22	Dispensary.
23	Student's Barracks.
24	Administration.
25	Storage.
26a	Subassembly in North Half of Building (Probably Fuselages) Final Assembly in South Half.
26b	Final Assembly.
26c	Drop Hammer Shop.
27	Probable Subassembly.
28–33	Training School Building.
34–37	Storage.
38	Shop Building.
39	Repair or Post Assembly Hangar.
40	Post Assembly.
41–46	Unidentified.
47–49	Flight Hangar.

(Based on F/A Report No. 25, AC/AS, Intelligence, Photographic Division, dated 23 December 1944.)

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER—JAPANESE AIRCRAFT—WITH CORRESPONDING MATERIAL

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156-T—178-T

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JOINT TARGET GROUP
WASHINGTON, D. C.

SHOWA AIRCRAFT
TACHIKAWA, JAPAN

ILLUSTRATION No.	90.17-791 P3/1
DATE	19 April 1945
TARGET No.	90.17-791
COORDINATES	35°43'N 139°22'E
PHOTOGRAPHED	17 November 1944

0 500 1000 1500 2000 2500 3000 FEET
0 1/4 1:6000 APPROX. 1/2 MILE

Holders of Joint Target Group folders should insert this sheet in Air Target System Folder: Japanese Aircraft Replacing Sheet 90.17-791 P3.

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TARGET NO. 90.17-791

APPROX. COORDINATES 35°43′ NORTH
139°22′ EAST

PHOTOGRAPHED 7 NOVEMBER 1944

JOINT TARGET GROUP WASHINGTON, D. C.

SHOWA AIRCRAFT PLANT
TACHIKAWA, JAPAN

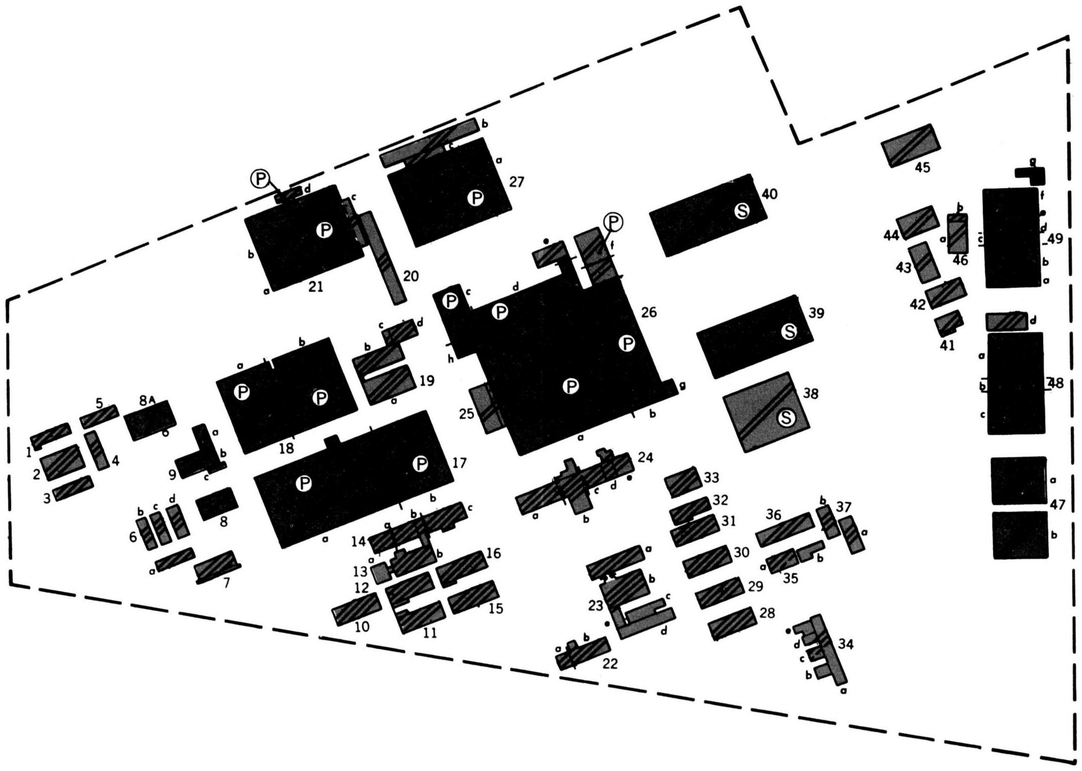
SCALE 1:6,000

500 0 500 1000 FEET

ILLUSTRATION NO. 90.17-791-P5

ISSUED 1 MAR 1945

CONFIDENTIAL



Aircraft

FIRE SUSCEPTIBILITY PLAN

PRIMARY BUILDINGS	(P)	FIRE WALL, CERTAIN	
SECONDARY BUILDINGS	(S)	FIRE WALL, PROBABLE	

BUILDINGS		CONTENTS	
COMBUSTIBLE		NON-COMBUSTIBLE	
NON-COMBUSTIBLE		SLIGHTLY COMBUSTIBLE	
FIRE RESISTANT		MODERATELY COMBUSTIBLE	
COMBINATION I.E. COMBUSTIBLE ROOF RESISTANT FLOORS		HIGHLY COMBUSTIBLE	
		EXTREMELY COMBUSTIBLE	
WATER TANK	(W)	INTERMEDIATE VALUES	

AREA IN SQ. FT.	PRIMARY	ALL BLDGS. SHOWN
NO. OF BUILDINGS	5	49
NO. OF FIRE DIVISIONS	15	77
PLAN AREA	665,500	1,344,300
TOTAL FLOOR AREA	665,500	1,376,300
SITE AREA	5,910,000	

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NOT TO BE TAKEN INTO THE AIR

JOINT TARGET GROUP, WASHINGTON, D. C.
WEAPON RECOMMENDATIONS SHEET

Sheet No.	90.17-791 WR1
Date	26 March 1945
Page No.	1
AAF Target No.	90.17-791
Obj. Folder	90.17
Obj. Area	90.17
Air Target System:	Aircraft
Lat.:	35°43'N
Long.:	139°22'E
Alt.:	360'

SHOWA AIRCRAFT

TACHIKAWA . . . . . JAPAN

High and Medium Altitude Attack

(See also TIS 90.17–791 TI/2 and associated target illustrations)

AIMING POINT

For maximum damage to primary objectives the aiming point should be building 26. (Illustrations No. 90.17–791 P3, P5.)

WEAPONS AND FUZING

	HE	Fuze	IB
Preferred	1,000-lb. GP	0.01 N/ND T.	AN-M50 4-lb. (in aimable clusters).
Alternative	500-lb. GP	0.01 N/ND T.	AN-M69 6-lb. (in aimable clusters).
	2,000-lb. GP	0.01 N/ND T.	AN-M47 70-lb. AN-M76 500-lb.

Not recommended: Smaller GP bombs.
SAP or AP bombs.
Depth bombs.

(*a*) Use 0.1 N fuzes, if 0.01 N fuzes are not available.

(*b*) The 500-lb. and 2,000-lb. GP bombs are respectively 95 and 90 percent as effective as the 1,000-lb. GP bomb.

LOADING TABLE FOR INITIAL ATTACK

Loading table for preferred combination of bombs [2]

[This table is prepared for an initial attack on this target. For its application to later attacks see JTG Memorandum No. 3/1]

Tons (actual) dispatched	Percent of bombs dispatched falling within 1,000 feet of aiming point											
	10 percent			15 percent			20 percent			30 percent		
	Tons		F[1] percent	Tons		F[1] percent	Tons		F[1] percent	Tons		F[1] percent
	HE	IB		HE	IB		HE	IB		HE	IB	
50				25	25	15	20	30	20	10	40	30
100	35	65	20	25	75	30	20	80	35	10	90	40
200	35	165	35	25	175	45	20	180	45	50	150	50
400	35	365	45	130	270	50	180	220	55	250	150	65
800	380	420	55	530	270	65	----	----	----	----	----	----
1,000	580	420	60	----	----	----	----	----	----	----	----	----

[1] Expected percent of serious damage to the whole target.

[2] If the alternative bombs are used, the distribution of the load between HE and IB should be the same. The expected percent of damage will, of course, be lower.

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER—JAPANESE AIRCRAFT—WITH OTHER 90.17-791 MATERIALS

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183–T

JOINT TARGET GROUP, WASHINGTON, D. C.

WEAPON RECOMMENDATIONS SHEET

Sheet No.	90.17–791 WR2
Date	28 March 1945
Page No.	1
Target No.	90.17–791
Obj. Area	90.17
Obj. Folder No.	90.17
Air Target System	Aircraft
Lat.	35°43′ N.
Long.	139°22′ E.
Alt.	360 feet.

SHOWA AIRCRAFT

TACHIKAWA . . . . . JAPAN

ALL PREVIOUS SHEETS CANCELLED

Low Level Attack

(See also 90.17–791 TI/2 and associated target illustrations)

TYPE OF ATTACK

This sheet applies primarily to an attack by carrier based aircraft, fighter bombers, or other similar aircraft which carry out dive, glide, low level, or minimum altitude attacks.

BUILDINGS CONSIDERED

Data are given below for attack on primary and/or secondary buildings only. (See Ill. No. 90.17–791 P3, P5.) Other buildings are of insufficient importance to merit specific attack.

WEAPONS AND FUZING

A pure HE attack (no incendiaries) may be launched against the buildings specified in table I; a pure IB attack (no HE) may be launched against the buildings specified in table II. The choice of a particular HE or IB weapon for attack on a given building can be made by considering both the number of hits on that building required for the various bombs (see the tables below) and the stowage capabilities of the aircraft to be used. The proper fuzings for the HE weapons to be used against the individual buildings are given in table I below, with the exception that for minimum altitude attacks a 4–5 second delay is required for safety to the aircraft. The use of SAP, AP, smaller GP, or depth bombs is not recommended for this target.

NUMBER OF HITS

Number of hits required to achieve 50 percent serious damage to individual important buildings [1]

TABLE I (HE)

Buildings in order of importance to production (Ill. No. 90.17–791 P3, P5)	Number of hits			Fuzing [2]
	500-lb. GP	1,000-lb. GP	2,000-lb. GP	
26	44	22	12	0.01 N/ND T
17	22	11	6	.01 N/ND T
27	17	8	5	.01 N/ND T
21	13	7	4	.01 N/ND T
18	16	8	4	.01 N/ND T
38	6	3	2	.01 N/ND T
40	8	4	2	.01 N/ND T
39	8	4	2	.01 N/ND T

TABLE II (IB)

Buildings (Ill. No. 90.17–791 P5)	Number of hits							
	Clusters				Individual bombs		Fire bombs	
	M–50		M–69					
	M–6	M–7	M–12	M–13	M–47	M–76	58 gal.	150 gal.
38	7	2	5	1	5	2	1	1

[1] To obtain the number of hits required to achieve 30 percent serious damage to individual important buildings, multiply the appropriate entry in the preceding tables by 0.5; for 70 percent damage, multiply by 1.7.

[2] Use 0.1 N fuzes; if 0.01 N fuzes are not available.

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179 T–1

CONFIDENTIAL

Sheet No. 90.17-792-TI/2
Date 13 March 1945
Page No. 1

Obj. Folder 90.17
Obj. Area 90.17
AAF Target No. 90.17-792
Air Target System Aircraft

Lat.: 35°42'N
Long.: 139°25'E
Alt.: 295'

TACHIKAWA AIRCRAFT

TACHIKAWA JAPAN

ALL PREVIOUS SHEETS CANCELLED

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER—JAPANESE AIRCRAFT—IN PLACE OF SHEET NO 90.17-792-TI/1

SIGNIFICANCE

The third largest airframe plant (in floorspace) in Japan and currently the fifth largest producer of combat aircraft. The combat aircraft produced are Army types and include the SEF Oscar, SER Ida or, its successor, the Ki 72, and the TER Clara or Edna. The plant is also reported to produce a new twin engine bomber-reconnaissance designated as Patsy.

In addition to combat aircraft production the plant is reported to assemble some advanced trainers and to produce fuel tanks.

There is no engine production; engines are supplied by Nakajima, Kawasaki, Mitsubishi, and possibly Hitachi.

LOCATION

(Refer to Illustration No. 90.17–792 P2.) Approximately 19 miles west of the Imperial Palace in Tokyo, and on the northern edge of Tachikawa about 2,600 feet north of the junction of the Ome Electric & Chuo Railroad. The extensive Tachikawa Army Air Arsenal (Target 90.17–2008) is on the west, separated from the target by the 4,000-foot wide Tachikawa Airfield; Hitachi Aircraft, Tachikawa Plant (Target 90.17–2009) is about 1 mile to the north. The Showa Airfield is about 2.25 miles west-northwest, adjacent to the Showa Aircraft plant (Target 90.17–791) about 2.75 miles to the west-northwest. A large airfield is located about 3.25 miles northwest of the compound. Two branches of the Tama River junction about 4.5 miles to the west; the river, flowing generally east to Tokyo Bay, is about 1.5 miles to the south at its nearest point. The target area is adjacent to Tachikawa town on the south, to Tachikawa Airfield on the west, and to open country on the north and east.

DESCRIPTION AND LAYOUT

(Refer to Illustrations No. 90.17–792 P3/1, P5; and P6.) The total target area is very irregular in shape, extending about 5,300 feet north-south and 2,600 feet east-west at its widest point, and covering an area of approximately 7,400,000 square feet. It is divided into two compactly built groups of buildings.

The northern group, area A, is the most important, extending approximately 3,000 feet northeast–south-southwest and 2,600 feet east-southeast–west-northwest. It is apparently divided into three production centers. The large building, 22, in the north center section is engaged in metal shaping and fabrication in support of two of the three production lines. Buildings 23, 30, and 31 are used for bench work, subassembly and component erection for a twin engine aircraft which is assembled in the south half of building 31. Buildings 24, 28, and 29, are the subassembly and component erection sections; the south end of building 32 is the final assembly building for a single engine plane, probably Oscar.

Buildings 34 (still under construction), 35, 36, and 37 form the third production line. These may be the facilities producing the new plane Patsy.

The functions of buildings 1–13 in the west end of the site have not been identified although they are probably warehouses. Buildings 14–21 in the north end of this area are also probably warehouses.

The southern group, Area B, extends about 2,300 feet north-south and 1,300 feet east-west. It is the older section of the plant and is thought to be used for fabrication of trainers and possibly transports, assembly, and component manufacture. Buildings 75–77 in the south side are component erection and subassembly buildings; building 65 in the southwest is the final assembly building.

PRIMARY OBJECTIVES

(Refer to Illustrations No. 90.17–792 P3/1, P5, and P6.) The primary objectives of Area A and secondary objectives of Area B, listed in order of productive value, are as follows:

Area A—Primary	*Area B—Secondary*
28	77
30	76
29	75
31	70
32	
35	
36	
22	
37	
34	

The destruction of the primary buildings in Area A would halt production in the three lines fabricating and assembling combat aircraft. The functions of the other buildings in the area are largely storage, maintenance, and administration. The loss of the secondary buildings in Area B would stop probable production of trainers and transports.

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156-T—178-T

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER—JAPANESE AIRCRAFT—FOLLOWING SHEET NO. 90.17–792–TI/2, PAGE 1

CONSTRUCTION AND VULNERABILITY TARGET INFORMATION SHEET

(Refer to Illustration No. 90.17–792 P3/1, P5, and P6.)

Primary and secondary objectives listed in order of importance:

Bldg. No.	Plan area (sq. ft.)	Roof [1]	Combustibility	HE vulnerability [2]
Area A:				
28	90,000	Light	Noncombustible	V4
30	90,000	Light	Noncombustible	V4
29	54,000	Light	Noncombustible	V4
31	182,500	Light	Noncombustible	V4
32	182,500	Light	Noncombustible	V4
35	125,000	Light	Noncombustible	V4
36	190,000	Light	Noncombustible	V4
22	280,800	Light	Noncombustible	V4
37	264,000	Light	Noncombustible	V4
34	432,000	Light	Noncombustible	V4
Area B:				
77	132,600	Light	Noncombustible	V4
76	48,100	Light	Noncombustible	V4
75	31,200	Light	Noncombustible	V4
70	28,800	Light	Noncombustible	V4

[1] Lightweight roofs are readily penetrated by all types of incendiary bombs. Initiation of HE tail fuzes by these roofs cannot be depended upon except for bombs striking structural members (30 to 40 percent of bombs striking buildings).

[2] HE vulnerability classifications are explained in JTG Memorandum No. JTG/M/3/1 which is now in process of revision. In brief, a single vulnerability classification is assigned types of industrial buildings which behave in a similar manner when attacked with the same HE weapon. These vulnerability classes are arranged in order of vulnerability to HE attack, with very invulnerable, earthquake-proof structures assigned the classification V1. The other classifications V2, V3, V4, V5 are progressively more vulnerable types; V5 being the very vulnerable large span, arched hangar type structures. Most single story industrial buildings fall in V4.

Classification of buildings:

	Area A		Area B		Areas A and B
	Primary objective	Whole target	Secondary objective	Whole target	Whole target
Total plan area of buildings (thousands of square feet)	1891	2455	241	853	3308
Combustibility:					
Fire resistant (R)				5%	1%
Noncombustible (N)	100%	88%	100%	63%	82%
Combustible (C)		12%		32%	17%
HE vulnerability:					
V1 (least vulnerable)				3%	1%
V2					
V3		1%		2%	1%
V4	100%	99%	100%	95%	98%
V5 (most vulnerable)					
Combustibility of contents, whole target	Slight		Slight		Slight

("Slight" combustibility is that of average industrial fire occupancy. For detailed study of fire susceptibility of structures and contents refer to Illustration No. 90.17–792 P5.)

WEAPON RECOMMENDATIONS

Reference should be made to Weapon Recommendations Sheet No. 90.17–792 WR1 for high and medium altitude attack and to Weapon Recommendations Sheet No. 90.17–792 WR2 for low altitude attack.

CAMOUFLAGE, DECOYS, AND SMOKE SCREENS

Photography of 16 January 1945 shows practically all buildings have been camouflaged with disruptive roof painting. No smoke screens or decoys have been reported.

ADDITIONAL INFORMATION

This plant is now thought to produce the entire output of the Army SEF Oscar which was formerly turned out by the Nakajima Aircraft, New Ota Plant (Target 90.13–1544). This plane has been the basic Army fighter in the past but has probably been succeeded in importance by the Frank and possibly newer types.

The Patsy which is thought will be produced here is expected to be powered with the Ha 214 engine in the 2,000-horsepower class.

Building 34, believed to be a sub and final assembly building for a new plane, possibly Patsy, was not completed at the time of 16 January 1945 photo cover. It appears from a study of the cover of 7 November and 16 January that the progress of construction of this building is very slow, possibly indicating that the Japanese do not assign a high priority to the plane intended to be assembled there.

This plant was attacked by carrier-borne bombers on 16, 17 February 1945. Moderate damage was done to buildings 35 and 36 and slight damage to building 37. Other damage was insignificant.

JOINT TARGET GROUP, WASHINGTON, D. C.

WEAPON RECOMMENDATIONS SHEET

TACHIKAWA AIRCRAFT

TACHIKAWA • • • • • JAPAN

Sheet No.	90.17–792 WR1
Date	23 March 1945
Page No.	1
AAF Target No.	90.17–792
Obj. Folder	90.17
Obj. Area	90.17
Air Target System:	Aircraft
Lat.:	35°42′ N
Long.:	139°24′ E
Alt.:	295 feet

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER—JAPANESE AIRCRAFT—AFTER SHEET NO. 90.17–792 TI/2.

High and Medium Altitude Attack

(See also Target Information Sheet No. 90.17–792 TI/2 and associated target illustrations)

AIMING POINT

Area A.—For maximum damage to primary objectives the aiming point should be in the vicinity of building 28. (Illustrations No. 90.17–792 P3, P5.)

Area B.—For maximum damage to secondary objectives the aiming point should be in the vicinity of building 68. (Illustration No. 90.17–792 P5.)

WEAPONS AND FUZING

	HE	Fuze	IB
Preferred	1,000-lb GP	.01N/.01T	AN-M50 4-lb (in aimable clusters).
Alternative	500-lb GP	.01N/.01T	AN-M69 6-lb (in aimable clusters).
	2,000-lb GP	.01N/.01T	AN-M47 70-lb; AN-M76 500-lb

Not recommended: Smaller GP bombs; SAP and AP bombs; Depth bombs

NOTES

(a) The weapons and fuzing above apply to both Area A and Area B.

(b) Use 0.1N fuzes, if 0.01N fuzes are not available.

(c) The 500-lb GP and 2,000-lb GP are respectively 95 and 90 percent as effective as the 1,000-lb GP bomb.

LOADING TABLE FOR INITIAL ATTACK

Loading table for preferred combination of bombs [1]

[This table is prepared for an initial attack on this target. For its application to later attacks see JTG Memorandum No. 3/1]

AREA A

Tons (actual) dispatched	Percent of bombs dispatched falling within 1,000 feet of aiming point											
	10%			15%			20%			30%		
	Tons		F [2] %	Tons		F [2] %	Tons		F [2] %	Tons		F [2] %
	HE	IB		HE	IB		HE	IB		HE	IB	
100	-----	-----	-----	25	75	15	20	80	20	10	90	25
200	35	165	20	25	175	25	50	150	30	100	100	35
500	200	300	30	300	200	40	350	150	45	400	100	55
1,000	700	300	45	800	200	55	-----	-----	-----	-----	-----	-----
1,500	1,200	300	60	-----	-----	-----	-----	-----	-----	-----	-----	-----

AREA B

100	30	70	20	20	80	30	15	85	35	10	90	40
200	30	170	35	20	180	40	50	150	45	100	100	50
400	100	300	45	200	200	50	250	150	55	300	100	60
600	300	300	50	400	200	55	450	150	60	-----	-----	-----
800	500	300	55	600	200	60	-----	-----	-----	-----	-----	-----
1,000	700	300	60	-----	-----	-----	-----	-----	-----	-----	-----	-----

[1] If alternative bombs are used, the distribution of the load between HE and IB should be the same. The expected percent of damage will, of course, be lower.

[2] Expected percent of serious damage to the whole target area.

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JOINT TARGET GROUP, WASHINGTON, D. C.

WEAPON RECOMMENDATIONS SHEET

Sheet No.	90.17–792 WR2
Date	28 March 1945
Page No.	1
Target No.	90.17–792
Obj. Folder	90.17
Obj. Area	90.17
Air Target System:	Aircraft
Lat.:	35° 42′ N.
Long.:	139° 25′ E.
Alt.:	295 feet

TACHIKAWA AIRCRAFT

TACHIKAWA . . . . . JAPAN

ALL PREVIOUS SHEETS CANCELLED

THIS SHEET IN AIRTARGET SYSTEM FOLDER: JAPANESE AIRCRAFT-WITH OTHER MATERIAL ON TARGET 90. 17–792

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIRTARGET SYSTEM FOLDERS OF JTG FOLDERS

Low Level Attack

(See also 90.17–792 TI/2 and associated target illustrations)

TYPE OF ATTACK

This sheet applies primarily to an attack by carrier based aircraft, fighter bombers, or other similar aircraft which carry out dive, glide, low level, or minimum altitude attacks.

BUILDINGS CONSIDERED

Data are given below for an attack on primary and/or secondary buildings only. (See Ill. No. 90.17–792 P3, P5.) Other buildings are of insufficient importance to merit specific attack.

WEAPONS AND FUZING

A pure HE attack (no incendiaries) may be launched against the buildings specified in the table below. The choice of a particular HE weapon for attack on a given building can be made by considering both the number of hits on that building required for the various bombs (see the table below) and the stowage capabilities of the aircraft to be used. The proper fuzings for the HE weapons to be used against the individual buildings are given in the table below, with the exception that for minimum altitude attacks a 4–5 second delay is required for safety to the aircraft. The use of SAP, AP, smaller GP, or depth bombs is not recommended for this target.

NUMBER OF HITS

Number of hits required to achieve 50 percent serious damage to individual important buildings [1]

Buildings in order of importance to production (Ill. No. 90.17–792 P3, P5)	Number of hits			Fuzing [2]
	500-lb. GP	1,000-lb. GP	2,000-lb. GP	
Area A				
22	47	24	13	Against all buildings use 0.01 N/ND T fuzing.
37	45	23	12	
36	32	16	9	
31	31	16	8	
32	31	16	8	
35	21	11	6	
28	15	8	4	
30	15	8	4	
29	9	5	2	
34	73	37	20	
Area B				
77	22	12	6	
76	33	4	2	
75	5	3	1	
70	5	2	1	

[1] To obtain the number of hits required to achieve 30 percent serious damage to individual important buildings, multiply the appropriate entry in the preceding table by 0.5; for 70 percent serious damage, multiply by 1.7.

[2] Use 0.1 N fuzes, if 0.01 N fuzes are not available.

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179 T-2

JOINT TARGET GROUP, WASHINGTON, D. C.
FUNCTIONAL IDENTIFICATION

Sheet No. 90.17-792-P6
Date 13 March 1945
Page No. 1

Obj. Folder 90.17
Obj. Area 90.17
AAF Target No. 90.17-792
Air Target System Aircraft

Lat.: 35°42'N
Long.: 139°24'E
Alt.: 295'

(To be read in conjunction with Illustration No. 90.17-792-P5)

TACHIKAWA AIRCRAFT

TACHIKAWA JAPAN

Building No.	*Function of building*
Area A:	
1–13	Unidentified.
14–21	Storage.
22	Metal shaping and fabrication.
23, 24	Possible bench work.
25, 26	Possible foundry.
27	Offices.
28–30	Subassembly and component erection.
31, 32	Sub and final assembly.
33	Storage.
34	Sub and final assembly.
35	Subassembly.
36	Metal shaping and fabrication.
37	Metal shaping and fabrication, and storage.

Building No.	*Function of building*
Area B:	
38–40	Flight hangars.
41–47	Unidentified.
48–55	Storage.
56, 57	Unidentified.
58	Hangar.
59	Possible paint shop.
60–62	Unidentified.
63	Post-assembly.
64	Unidentified.
65	Final assembly.
66	Possible metal shaping and fabrication.
67	Possible foundry.
68–70	Metal shaping and fabrication.
71–73	Possible storage.
74	Storage and metal shaping.
75–77	Subassembly and component erection.
78	Possible offices.
79–81	Possible storage.

(Based on F/A Report No. 7, AC/AS, Intelligence Photographic Division, dated 1 December 1944.)

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156-T—178-T

TARGET NO. 90.17-792

APPROX. COORDINATES 35° 42' N 139° 25' E

PHOTOGRAPHED 7 NOV. 1944

TACHIKAWA AIRCRAFT
TOKYO, JAPAN

0 2 00 4000 6000 FEET
0 ½ 1 MILE
1:32 000 APPROX.

ILLUSTRATION NO. 90.17-792 P1

ISSUED NOV. 1944

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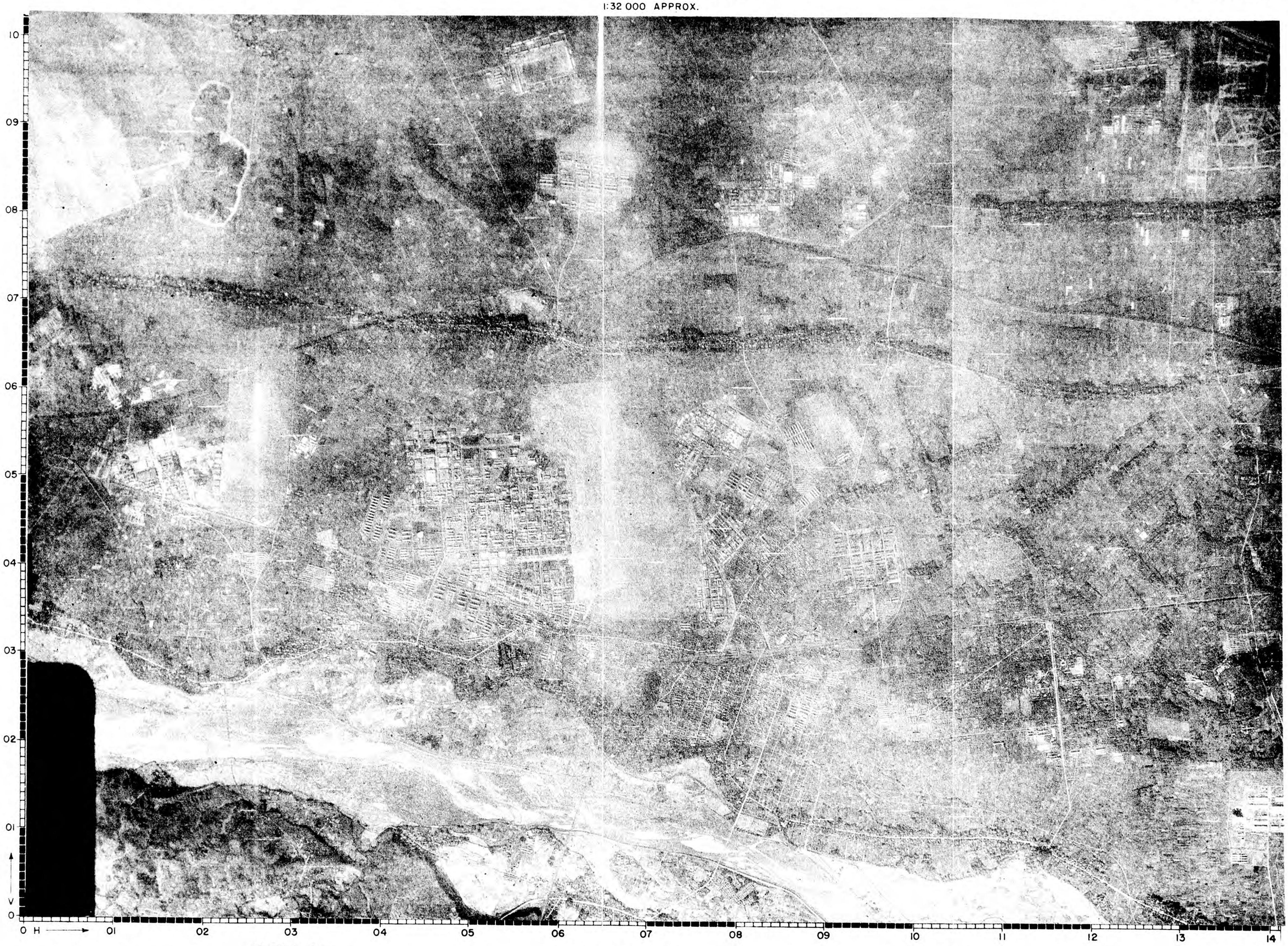

JOINT TARGET GROUP

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MAY BE TAKEN INTO THE AIR
IF DATA IS TRIMMED OFF

TYPE A

TARGET NO. 90.17-792

APPROX. COORDINATES 35° 42' N 139° 25' E

PHOTOGRAPHED 7 NOV. 1944

TACHIKAWA AIRCRAFT

TOKYO, JAPAN

ILLUSTRATION NO. 90.17-792 P2

ISSUED NOV. 1944

CONFIDENTIAL

0 2000 4000 6000 FEET

0 ½ 1 MILE

1/32 000 APPROX.

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WASHINGTON, D.C.

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MAY BE TAKEN INTO THE AIR
IF DATA IS TRIMMED OFF

TYPE A

JOINT TARGET GROUP • WASHINGTON, D. C.

TARGET No. 90.17–792

TACHIKAWA AIRCRAFT
TACHIKAWA, JAPAN

ILLUSTRATION No. 90.17–792 P3/1

COORDINATES 35° 42′ N 139° 25′ E

PHOTOGRAPHED 7 NOVEMBER 1944

0 500 1000 1500 2000 2500 3000 FEET
0 1/4 1:6000 APPROX. 1/2 MILE

DATE 26 APRIL 1945

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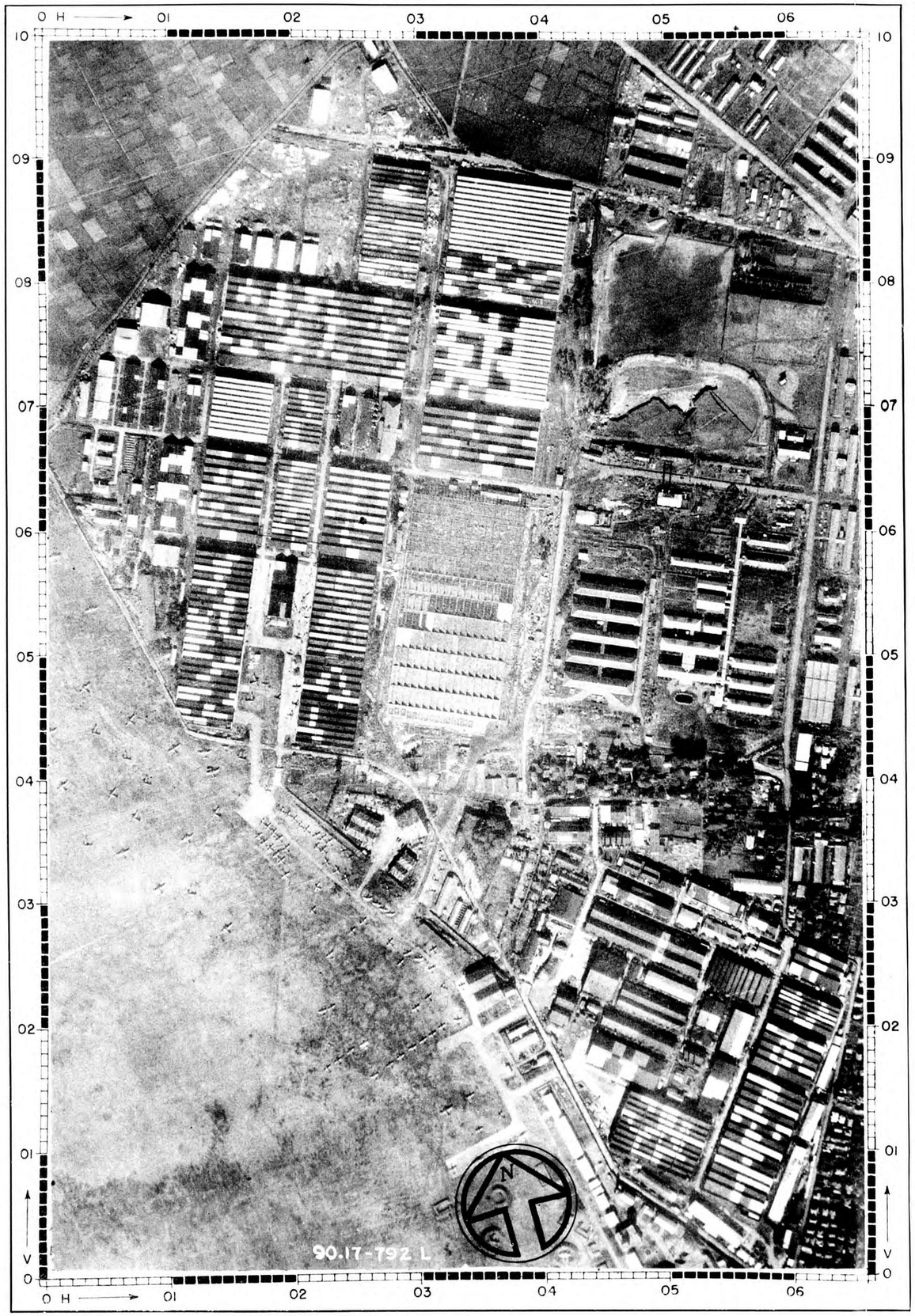

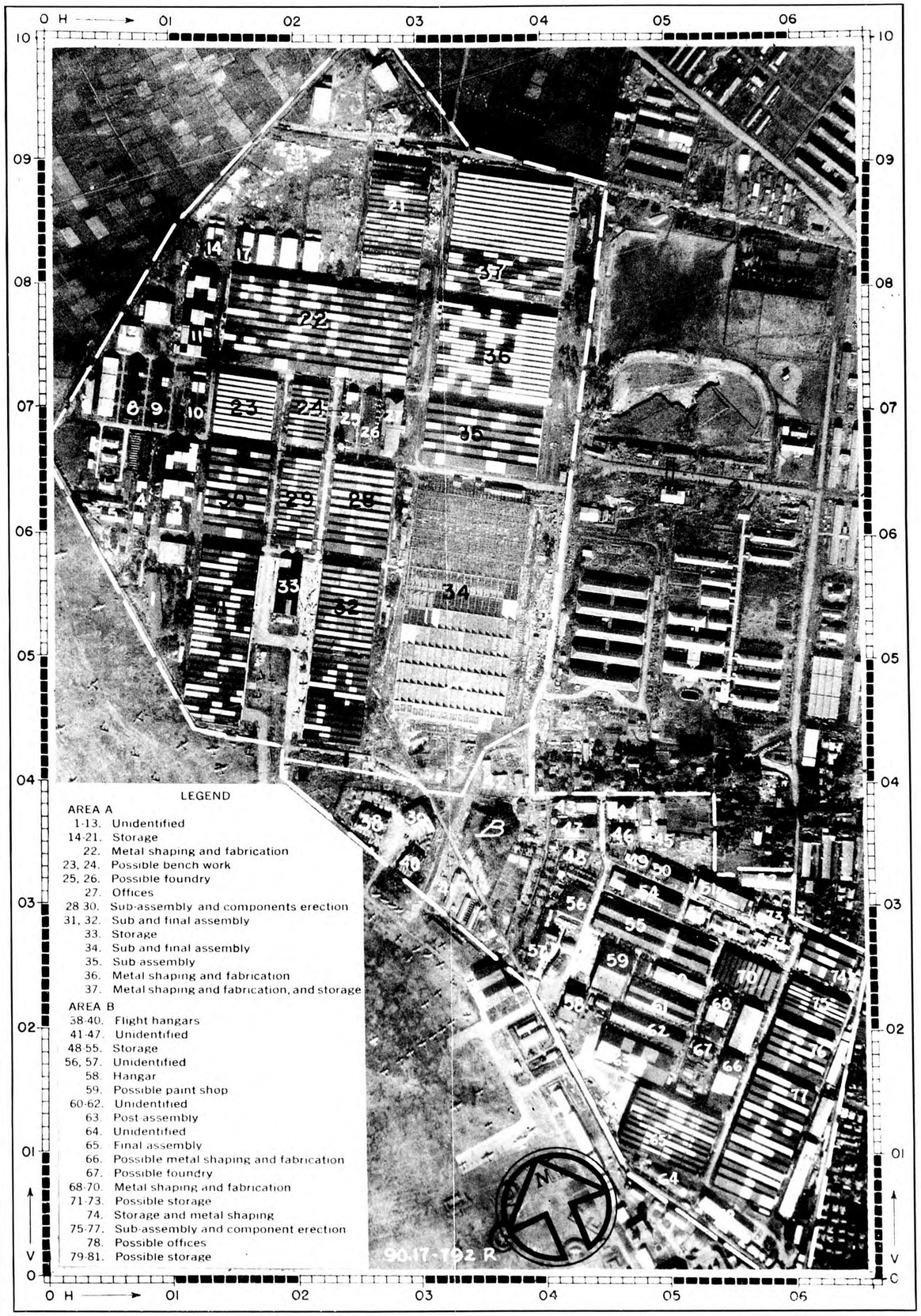

LEGEND

AREA A
1-13. Unidentified
14-21. Storage
22. Metal shaping and fabrication
23, 24. Possible bench work
25, 26. Possible foundry
27. Offices
28 30. Sub-assembly and components erection
31, 32. Sub and final assembly
33. Storage
34. Sub and final assembly
35. Sub assembly
36. Metal shaping and fabrication
37. Metal shaping and fabrication, and storage

AREA B
38-40. Flight hangars
41-47. Unidentified
48-55. Storage
56, 57. Unidentified
58. Hangar
59. Possible paint shop
60-62. Unidentified
63. Post assembly
64. Unidentified
65. Final assembly
66. Possible metal shaping and fabrication
67. Possible foundry
68-70. Metal shaping and fabrication
71-73. Possible storage
74. Storage and metal shaping
75-77. Sub-assembly and component erection
78. Possible offices
79-81. Possible storage

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UNANNOTATED HALF MAY BE TAKEN INTO THE AIR IF DATA IS TRIMMED OFF. ANNOTATED HALF IS NOT TO BE TAKEN INTO THE AIR.

TARGET NO. 90.17-792

APPROX. COORDINATES 35°42′ NORTH
139°25′ EAST

PHOTOGRAPHED 7 NOVEMBER 1944

JOINT TARGET GROUP - WASHINGTON, D. C.

TACHIKAWA AIRCRAFT CO.
TACHIKAWA, JAPAN

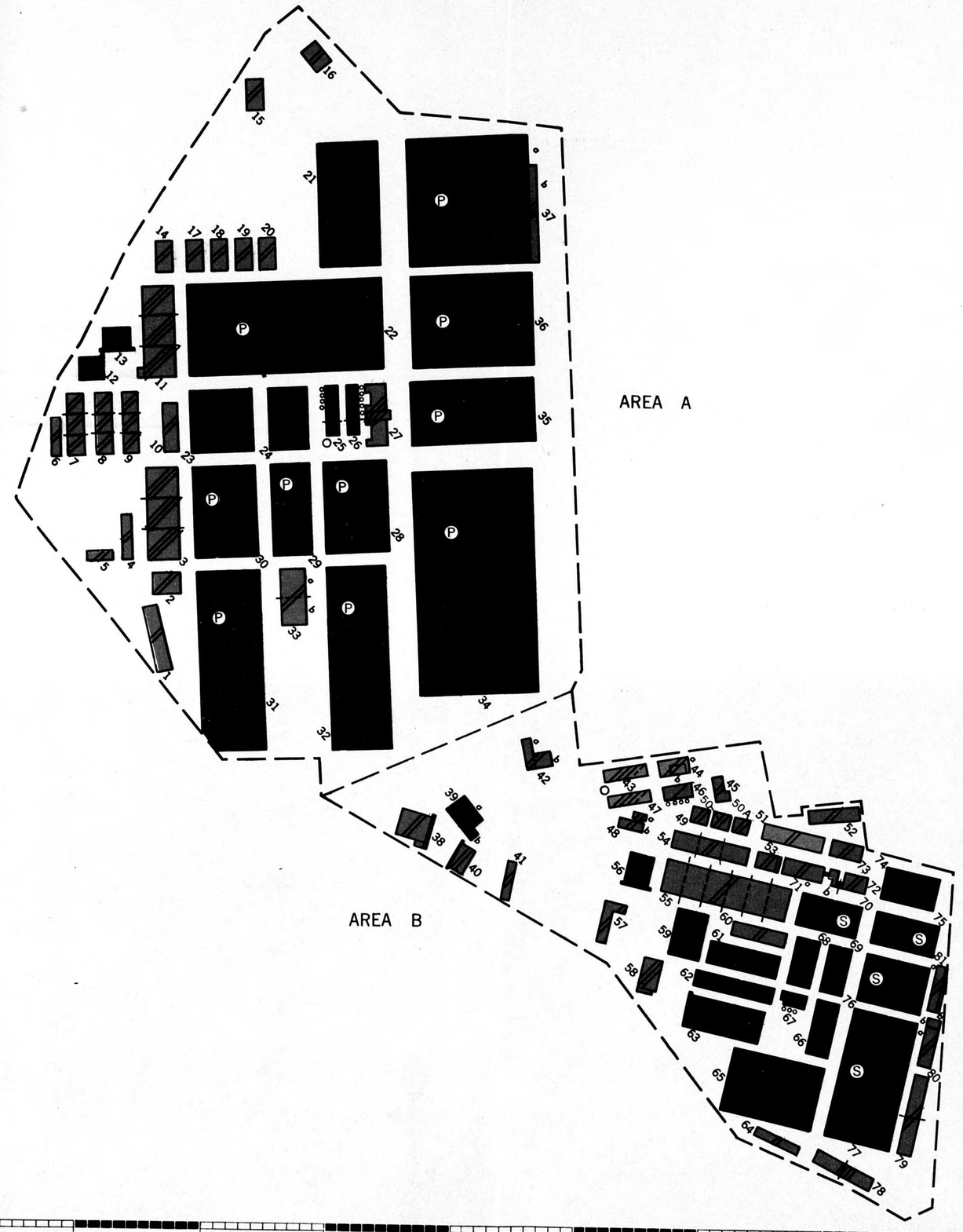
SCALE 1:6,000

500 0 500 1000 FEET

ILLUSTRATION NO. 90.17-792-P5

DATE 17 MARCH 1945

CONFIDENTIAL



FIRE SUSCEPTIBILITY PLAN

PRIMARY BUILDINGS	(P)	FIRE WALL, CERTAIN	
SECONDARY BUILDINGS	(S)	FIRE WALL, PROBABLE	

BUILDINGS	CONTENTS
COMBUSTIBLE	NON-COMBUSTIBLE
NON-COMBUSTIBLE	SLIGHTLY COMBUSTIBLE
FIRE RESISTANT	MODERATELY COMBUSTIBLE
COMBINATION I.E. COMBUSTIBLE ROOF RESISTANT FLOORS	HIGHLY COMBUSTIBLE
	EXTREMELY COMBUSTIBLE
WATER TANK (W)	INTERMEDIATE VALUES

AREA IN SQ. FT.	PRIMARY	ALL BLDGS. SHOWN
NO. OF BUILDINGS	AREA A-10 AREA B-	AREA A-37 AREA B-45
NO. OF FIRE DIVISIONS	AREA A-10 AREA B	AREA A-52 AREA B-53
PLAN AREA	AREA A-1,891,000 AREA B	AREA A-2,454,500 AREA B-853,500
TOTAL FLOOR AREA	AREA A-1,891,000 AREA B-	AREA A-2,481,900 AREA B-885,600
SITE AREA	AREA A-4,500,000	AREA B-2,340,000

PREPARED BY AERONAUTICAL CHART SERVICE, AAF.

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JOINT TARGET GROUP, WASHINGTON, D. C.
ECONOMIC DAMAGE ASSESSMENT

Sheet No.	90.17–792 DA
Date	24 March 1945
Page No.	1
Target No.	90.17–792
Obj. Area	90.17
Obj. Folder No.	90.17
Air Target System	Aircraft
Lat.	35°42' N
Long.	139°24' E
Alt.	295′

TACHIKAWA AIRCRAFT

TACHIKAWA • • • • • • • • • JAPAN

ALL PREVIOUS SHEETS CANCELLED

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER—JAPANESE AIRCRAFT WITH OTHER MATERIAL ON TARGET 90 17–792

PARTICULARS OF ATTACK

This plant was attacked by Navy carrier based dive bombers on 16–17 February 1945. No data are at present available on bomb tonnages dropped or the number of planes attacking.

PREVIOUS REPORTS

None.

PLANT FUNCTION

The northern section of this plant is producing Oscar MK3 fighters and a twin-engine plane. A new section (buildings 34–37) is still under construction. It is not known what plane types will be produced in this part of the plant, but it may be Patsy.

The southern section is believed producing trainer planes and a new twin-engined aircraft.

DAMAGE ASSESSMENT

1. The entire plant received about 66,000 square feet of structural and 73,000 square feet of superficial damage.

2. Almost all of this damage was concentrated on the northern section and in particular on that new portion as yet not believed in production. The new section received 55,000 square feet of structural damage (6 percent of its total) and 60,000 square feet of superficial damage (6 percent of total).

3. This, it is believed, will cause a 2-months' delay in bringing this part of the plant into production.

4. Only an incoming stores building (No. 21) was damaged in that portion believed making Oscar and Patsy planes. This will not have any appreciable effect on output.

FUTURE TARGET VALUE

Since that portion of the plant engaged in mass production of combat types was scarcely damaged, the plant retains substantially all of its former target value.

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176 T

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

KAYABA ENGINEERING COMPANY
TOKYO JAPAN

SHEET No. . . . . 90.17-1331—TL
DATE . . . . . 19 May 1945
TARGET No. 90.17-1331
CATEGORY . . . . End Prdt. Ind.—Aircraft
COORDINATES . . . . 35°39'N 139°45'E
ALTITUDE . . . . . 10 feet

SIGNIFICANCE:

Believed to be the most important plant of this company which is a major producer of landing gear for both Army and Navy aircraft. In addition to landing gear, other aircraft components and accessories are fabricated by this company.

LARGE SCALE ILLUSTRATION—SCALE APPROX.: 1:9,900

SMALL SCALE ILLUSTRATION—SCALE APPROX.: 1:66,000

Holders of Joint Target Group Folders should insert this sheet in Air Target System Folder: Japanese Aircraft.

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T A R G E T I N F O R M A T I O N S H E E T

Ref: Obj. Folder
Tokyo (90.17)
15 September 1943

Place: Yokohama
Objective Area: 90.17
Category: Aircraft

Lat. : 35°22'N
Long.: 139°38'E
Alt. : 25 ft.

ISHIKAWAJIMA ENGINE PLANT
(Ishikawajima Zosenjo)

AAF Target No. 90.17-1391

T I S

ALL PREVIOUS SHEETS ARE CANCELLED

NOTE: As an aid to planning, and evaluation of new reconnaissance and other intelligence, this TARGET INFORMATION SHEET is issued in advance of reconnaissance photography of the target. It is correspondingly subject to revision.

SIGNIFICANCE: This plant produces some complete engines as well as important engine components for other manufacturers.

Ishikawajima, which is also engaged in shipbuilding and the production of marine engines, is closely allied with the Okura interests, one of the great industrial and commercial organizations of Japan.

LOCATION: The plant is located on the W shore of TOKYO BAY in the TOMIOKA District in the S outskirts of YOKOHAMA, about 5 miles S of YOKOHAMA HARBOR.

DESCRIPTION: This is a modern factory with many machine tools reported installed in 1939. There have been reports of underground shops and a set of six underground, noise-proof, bomb-proof test stands. No details of size or construction are available.

CRITICAL POINTS: Currently available information does not permit evaluation of the relative importance or vulnerability of different parts or units of this installation. Generally speaking, the TEST BEDS and MACHINE SHOPS are the most vital part of an aircraft engine plant.

ADDITIONAL INFORMATION:

Among the engines believed to have been produced by this plant is the SAKAE 21 for use in the ZEKE 22 fighter.

Distribution:A

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

Sheet No.	90.17–1395–TI
Date:	13 April 1945
Page:	1
Target No.	90.17–1395
Obj. Area:	90.17
Obj. Folder No.	90.17
Air Target System:	Aircraft
Lat.:	35°41′ N
Long.:	139°34′ E
Alt.:	187 feet

SHODA AIRCRAFT
(Shoda Hikoki)
MIKATA . . . . . JAPAN

ALL PREVIOUS SHEETS CANCELLED

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT WITH OTHER 90.17–1395 MATERIAL

SIGNIFICANCE

The exact function and identity of this plant is not certain. It is unlikely that it occupies a relatively important position in the aircraft industry.

Trainer aircraft and aero-engines have been reported produced by Shoda Aircraft Co., but the layout of this plant suggests manufacture of parts and subassembly rather than production of completed aircraft or engines.

A Mitaka Aircraft Co. aero-engine plant and a Nakajima Experimental Station have also been reported at this approximate location. There is also a report of Mitsubishi Aircraft Co. taking over the Shoda Plant. The somewhat separated groups of buildings in the target area may be operated by different companies. An air research laboratory has also been reported to be in this neighborhood and has been tentatively identified with a large group of buildings SW of the target.

No combat aircraft or engines indicating manufacture by Shoda or Mitaka have been recovered.

LOCATION

(Refer to Illustration No. 90.17–1395 P2.) About 10 miles W of the Imperial Palace in Tokyo. It is situated about 2.2 miles E-NE of Chofu Airfield (Target 90.17–1412) and about 1.75 miles S-SE of the large Nakajima Aircraft, Mushashino-Tama Plant (Target 90.17–357). An E-W main railroad line runs about 4,000 feet N of the plant. The compound is bounded by secondary streets and highways which furnish its only access. The target is on the southern fringe of a built-up area extending out from Tokyo.

DESCRIPTION AND LAYOUT

(Refer to Illustration No. 90.17–1395 P3.) The target area is irregular in shape but the major part lies within a rough triangle with E-W base measuring about 3,500 feet and the sides about 3,000 feet. There are five distinct groups of buildings, each apparently doing machinery work, but possibly independent of the others. Area A has what approximates most closely a production line flowing from material preparation and small parts manufacture to final assembly. There are no engine test cells apparent in the plant, indicating that final assembly of engines is unlikely unless they are tested in the possible cells observed at the research laboratory SW of the plant.

PRIMARY OBJECTIVES

(Refer to Illustration No. 90.17–1395 P3.) The following machine shop-type buildings are the major targets:

Area A—2, 8, 9, 11, 15, and 19.
Area B—32, 33, 41–43, 51, 54, and 55.
Area C—59, 61–64, 78, and 80–82.
Area E—100–103, and 106.

The buildings tentatively identified as assembly buildings (10, 16, 94) may also contain valuable jig and fixture equipment.

CONSTRUCTION AND VULNERABILITY

(Refer to Illustration No. 90.17–1395 P3.) Practically all major buildings are one-story steel-framed structures of short to normal span, normal height, and sawtooth roofs. A few in area A appear to have exposed-chord roof trusses. Roof surfaces are probably of noncombustible lightweight sheet material. Minor buildings are generally small one-story structures, probably combustible.

WEAPON RECOMMENDATIONS

Instructions with regard to weapons will usually be given in Field or Operational Orders, but in the absence of such instructions and to assist Planners in formulating such orders the following information is given:

An attack with a combination of high explosive and incendiary bombs is recommended. A preliminary structural and occupancy analysis of the plant indicates weapons should be selected as follows:

	High explosive	Fuzing	Incendiary
Preferred	1,000-lb. GP	0.01 N/ND T	AN–M50 4-lb. (in aimable clusters for high altitude attack).
Alternative	500-lb. GP or 2,000-lb. GP.	0.01 N/ND T	AN–M69 6-lb. (in aimable clusters for high altitude attack). AN–M47 70-lb., AN–M76 500-lb.
Not recommended	Smaller GP bombs, SAP, AP bombs, Depth bombs.	----------	

NOTE.—(*a*) Use 0.1 N fuzes if 0.01 N fuzes are not available, and 0.01 T in ND T are not available. ND tail fuzing is recommended as most of the buildings have light roof material, and are best destroyed by blast effects.
(*b*) The above recommendations are on a weight for weight basis.

CAMOUFLAGE, DECOYS, AND SMOKE SCREENS

Photography of 13 December 1944 shows disruptive roof painting on most of the buildings in areas A, B, and C. Buildings in areas D and E are not camouflaged. No decoys or smoke screens are shown in the indicated photography and none have since been reported.

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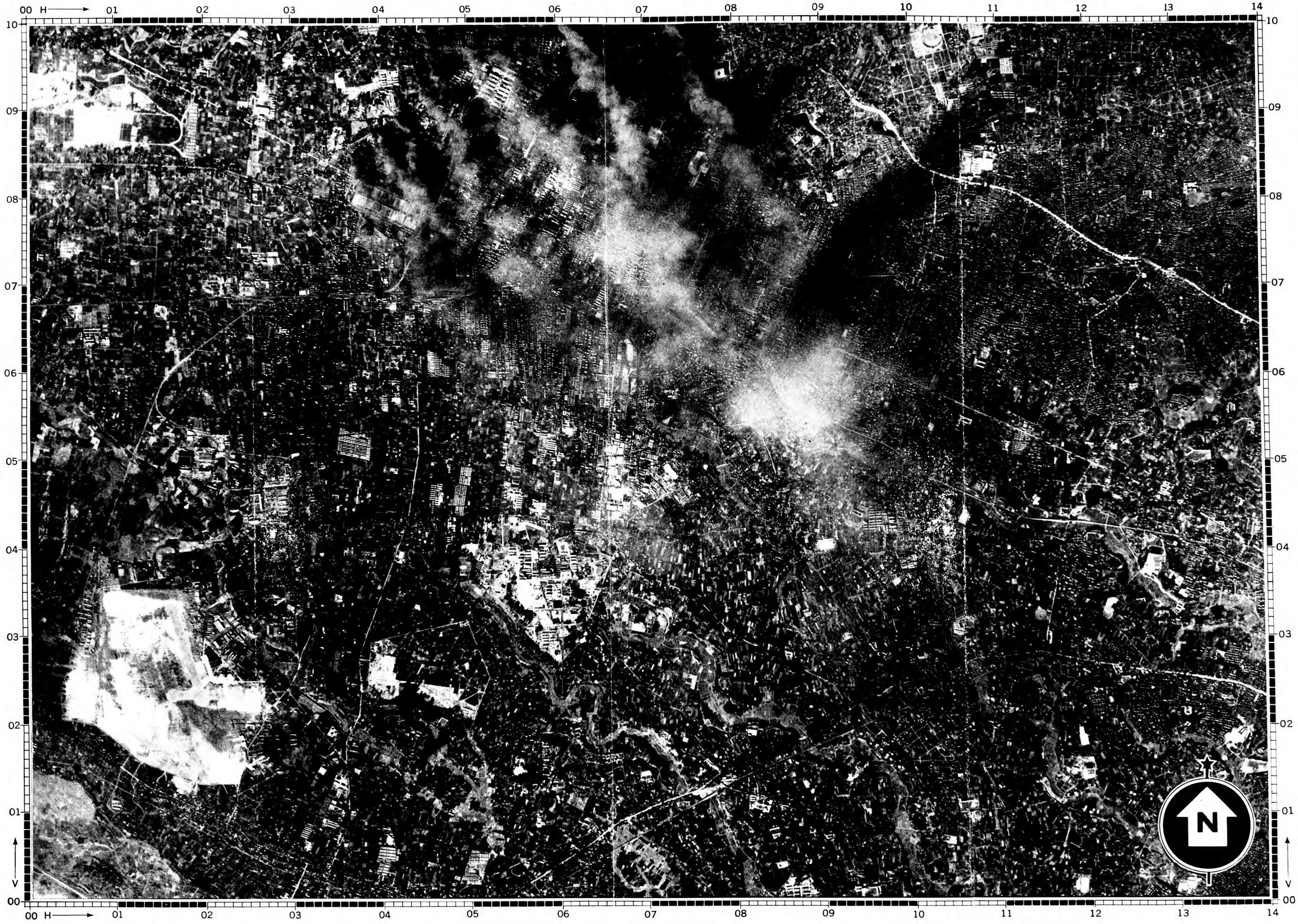
RESTRICTED

JOINT TARGET GROUP
WASHINGTON, D. C.

SHODA AIRCRAFT
MIKATA JAPAN

0 2000 4000 6000 FEET
0 ½ 1 MILE
1:32 000 APPROX.

ILLUSTRATION No... **90.17-1395 P1**
DATE..... **29 April 1945**
TARGET No..... **90.17-1395**
COORDINATES... **35°41'N 139°34'E**
PHOTOGRAPHED **13 December 1944**



Holders of Joint Target Group Folders should insert this sheet in Air Target System Folder; Japanese Aircraft with other 90.17-1395 material.

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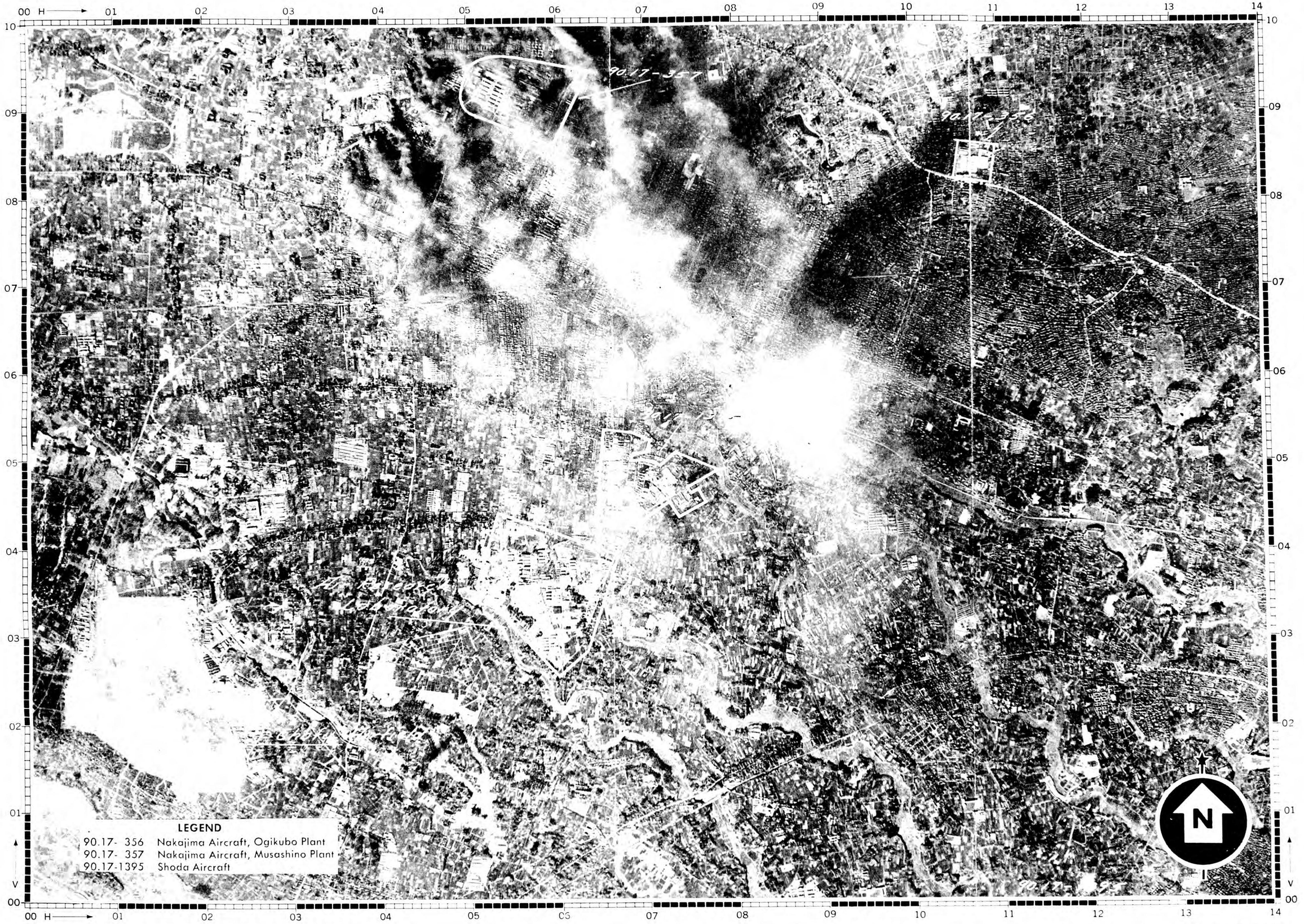
RESTRICTED

May be taken into the air if data is trimmed off

SHODA AIRCRAFT
MIKATA JAPAN

ILLUSTRATION No.	90.17-1395 P2
DATE	29 April 1945
TARGET No.	90.17-1395
COORDINATES	35° 41'N 139° 34'E
PHOTOGRAPHED	13 December 1944

0 2000 4000 6000 FEET
0 ½ 1 MILE
1:32 000 APPROX.



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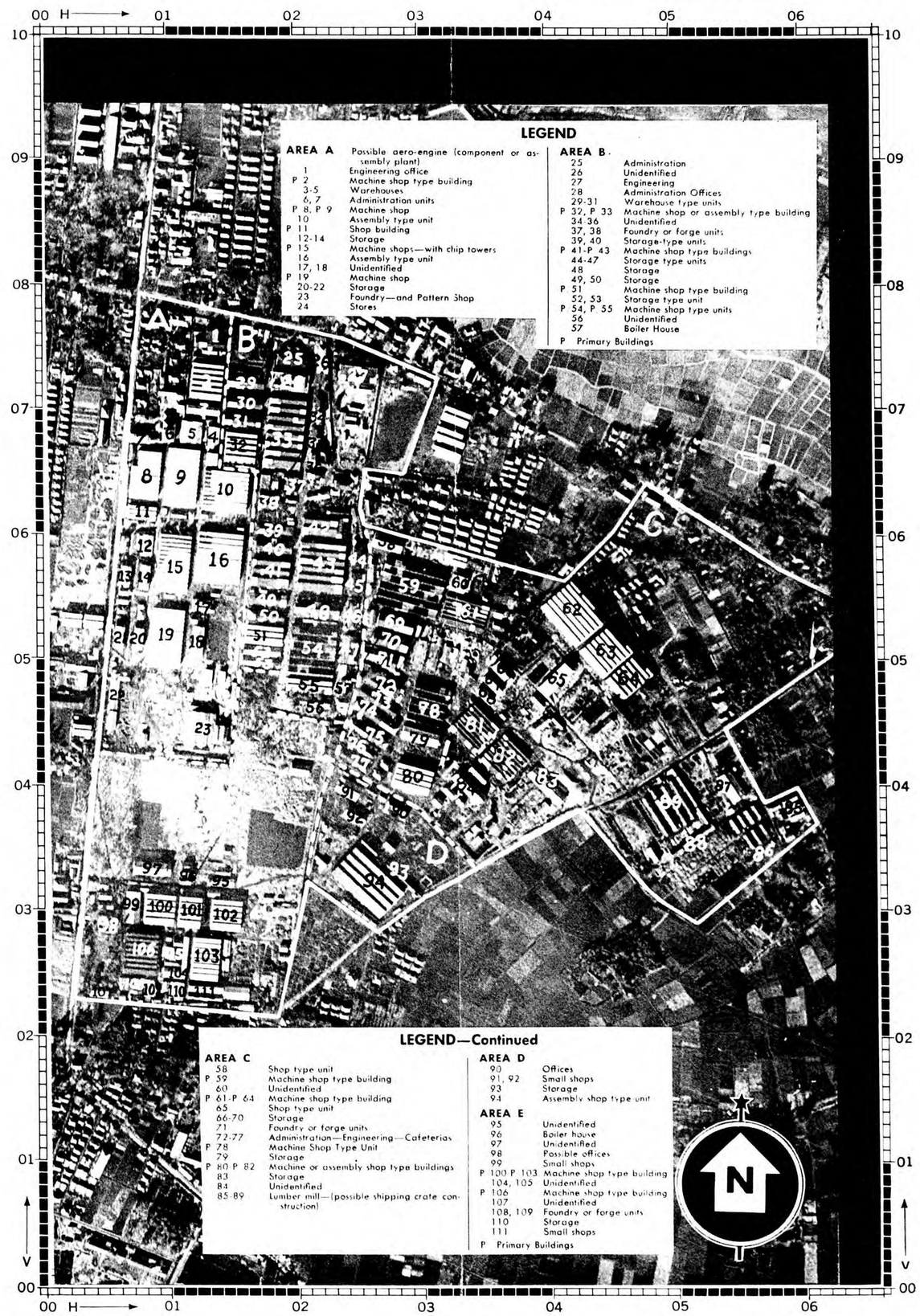
CONFIDENTIAL

JOINT TARGET GROUP
WASHINGTON, D. C.

SHODA AIRCRAFT
MIKATA JAPAN

0 500 1000 1500 2000 2500 3000 FEET
0 1/4 1:6000 APPROX. 1/2 MILE

ILLUSTRATION No.	90.17-1395 P3
DATE	29 April 1945
TARGET No.	90.17-1395
COORDINATES	35°41'N 139°34'E
PHOTOGRAPHED	13 December 1944



LEGEND

AREA A

	Possible aero-engine (component or assembly plant)
1	Engineering office
P 2	Machine shop type building
3-5	Warehouses
6, 7	Administration units
P 8, P 9	Machine shop
10	Assembly type unit
P 11	Shop building
12-14	Storage
P 15	Machine shops—with chip towers
16	Assembly type unit
17, 18	Unidentified
P 19	Machine shop
20-22	Storage
23	Foundry—and Pattern Shop
24	Stores

AREA B

25	Administration
26	Unidentified
27	Engineering
28	Administration Offices
29-31	Warehouse type units
P 32, P 33	Machine shop or assembly type building
34-36	Unidentified
37, 38	Foundry or forge units
39, 40	Storage-type units
P 41-P 43	Machine shop type buildings
44-47	Storage type units
48	Storage
49, 50	Storage
P 51	Machine shop type building
52, 53	Storage type unit
P 54, P 55	Machine shop type units
56	Unidentified
57	Boiler House

P Primary Buildings

LEGEND—Continued

AREA C

58	Shop type unit
P 59	Machine shop type building
60	Unidentified
P 61-P 64	Machine shop type building
65	Shop type unit
66-70	Storage
71	Foundry or forge units
72-77	Administration—Engineering—Cafeterias
P 78	Machine Shop Type Unit
79	Storage
P 80-P 82	Machine or assembly shop type buildings
83	Storage
84	Unidentified
85-89	Lumber mill—(possible shipping crate construction)

AREA D

90	Offices
91, 92	Small shops
93	Storage
94	Assembly shop type unit

AREA E

95	Unidentified
96	Boiler house
97	Unidentified
98	Possible offices
99	Small shops
P 100 P 103	Machine shop type building
104, 105	Unidentified
P 106	Machine shop type building
107	Unidentified
108, 109	Foundry or forge units
110	Storage
111	Small shops

P Primary Buildings

Holders of Joint Target Group Folders should insert this sheet in Air Target System Folder: Japanese Aircraft with other 90.17-1395 material.

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TARGET INFORMATION SHEET *(Contd.)*

CONSTRUCTION & VULNERABILITY

Buildings housing the major processes are predominantly one-story, short to medium span, steel framed buildings with roofs and walls of sheet asbestos. Saw-tooth roofed buildings, which predominate, are generally about 20 feet high to the eaves. Other buildings, mostly gable roofed structures, vary from 12 feet to about 25 feet high at the eaves. There are a few buildings of reinforced concrete and wood frame construction.

WEAPON RECOMMENDATIONS

Instructions with regard to weapons will usually be given in Field or Operational Orders, but in the absence of such instructions and to assist Planners in formulating such orders the following information is given:

An attack with high explosive weapons alone is recommended. A preliminary structural and occupancy analysis of the plant indicates weapons should be selected as follows:

	High Explosive	Incendiary
Preferred:	500-lb G.P. (0.01N/ 0.01T or 0.1N/0.01T)	None
Alternate:	2000-lb G.P. (fuzed as above) 1000-lb G.P. (fuzed as above)	None
Not recommended:	Smaller G.P. bombs SAP, AP, or Depth bombs Frag bombs	

CAMOUFLAGE, DECOYS AND SMOKE SCREENS

Photography of 26 November 1944 shows no effort to camouflage the target and no use of decoys. Use of smoke screens has not been reported in this area.

ADDITIONAL INFORMATION

The other Hitachi Plants manufacturing machinery and electrical equipment are:

Hitachi Engineering Works, Kaigan Plant (Sukegawa) (TARGET 90.14-1476).

Tokyo Gas and Electric Engineering Co. (Tokyo) (TARGET 90.17-331).

Hitachi Engineering Works, Kameido Plant (Tokyo) (TARGET 90.17-916).

Hitachi Machine Tool Co. (Kawasaki) (TARGET 90.17-1688).

Manchuria Hitachi Engineering Works (Mukden) (TARGET 93.3-182).

Shimomago Plant (Shimomago, Ibaraki-ken) (36° 33'N, 140° 38'E).

Yamate Plant (Shibauchi, Ibaraki-ken) (36° 36'N, 140° 39'E).

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE MACHINE TOOL INDUSTRY AND JAPANESE AIRCRAFT

(P)

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Sheet No. 90.17-2008-TI/1
Date 10 March 1945
Page No. 1 (4 pages)

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

New Target
Obj. Area 90.17
AAF Target No. 90.17-2008
NAME OF TARGET

Place Tachikawa (Japan)
Air Target
System Aircraft

Lat.: 35° 42' N
Long: 139° 24' E
Alt.: 295 feet

TACHIKAWA ARMY AIR ARSENAL
(Rikugun Koku Kosho)

ALL PREVIOUS SHEETS CANCELLED

SIGNIFICANCE

Principal Army Air Arsenal in Japan Proper with airframe and aero-engine production in addition to research, experimentation, repair, and modification facilities. This target is not considered a primary objective at this time, however, because current evidence does not indicate production of either important combat engines or airframe types.

It is known that the SER Sonia is produced here as well as at the Mitsubishi Aircraft Works (TARGET 90.20-194) in Nagoya. There is also evidence that some of the Type 1, 1050 engines used in Dinah, Nick, and Topsy are either produced or given complete overhaul at this plant. The presence of eight engine test cells suggests a new engine capacity of between 150 and 175 engines per month but there is no evidence to indicate production in this quantity. It is possible that these test cells are used for "running in" engines overhauled and rebuilt in the substantial repair and modification center located in the arsenal area.

(Refer to Illustration No. 90.17-2008 P4, P5, and P6). In the aircraft factory area (D) there are 1,201,200 square feet of floor space which is sufficient for a substantial production of either airframes and/or engines. If single engine airframes alone are produced, the capacity, measured by floor space, would be in the vicinity of 150 per month. If only engines are manufactured, floor space is available for approximately 500 engines per month although test cells for only a third of this number have been identified. It is thought, however, that some of the area may be used for fabricating prototype models of experimental army aircraft which would reduce availability of floor space for mass production. Two wind tunnels are located in the research and experimental area (B), an indication that new types may be developed here.

LOCATION

(Refer to Illustration No. 90.17-2008 P2/1). About 21 miles W of the Imperial Palace in Tokyo along the Ome Electric RR at the NW edge of Tachikawa. The target is separated from the **Tachikawa Aircraft** (TARGET 90.17-792) to the E by the 4000 feet wide Tachikawa Airfield; Hitachi Aircraft, Tachikawa Plant (TARGET 90.17-2009) is about 1.7 miles to the NE. The Showa Airfield is about 3100 feet WNW, adjacent to the **Showa Aircraft** (TARGET 90.17-791) about one mile to the WNW. A large airfield is located about 2 miles NNW of the target. Two branches of the Tama River junction about 3 miles to the W; the river flowing generally E to Tokyo Bay is about one mile to the S at its nearest point. The Ome Electric RR, running generally E-W, bounds the plant on the SW; it is bounded on the E by the Tachikawa Airfield; and on the N and W by open country.

DESCRIPTION AND LAYOUT

(Refer to Illustrations No. 90.17-2008 P4, P5, and P6). The total target area is irregular in shape measuring about 3900 feet E-W by 5000 feet N-S, and covering an area of approximately 21,500,000 square feet. The compound consists of four main functional divisions. Area A in the NE corner is an ordnance area used for gun testing, etc. Area B in the center of the plant site and extending to the airfield is a research and experimental area used for type testing and development work, together with some school facilities. Area C is an airplane repair and modification center, and Area D in the NW part of the compound is the aircraft factory area.

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER UNDER JAPANESE AIRCRAFT in place of sheet NO. 90.17-2008TI

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Area A contains gun shooting butts and a storage revetment, together with some aircraft storage revetments. Area B has two wind tunnels, one in the NE corner and the other in the E end separated from the airfield by a hangar. This is the original research section of the arsenal and may still be the major area devoted to experiment and type testing. There are test cells adjacent to the wind tunnel in the NE corner which may be used for engine testing but which were reported by one source as propeller test stands. They are not similar to test cells located in the aircraft factory area.

Area C contains a number of hangar-type buildings believed used for plane repair; photography shows a number of different types of aircraft in this area and on the airfield adjacent to the hangars. In the NW corner of Area C is an airplane graveyard which further supports the theory that this section is used for repair.

Area D, containing 1,201,000 square feet of floor space, is the airframe fabrication and engine production and/or overhaul section. Buildings 26, 27, 44 and 46 are probably engaged in aircraft fabrication and assembly, although 26 and 27 may be used for engine production. Building 15, to the W of 26, is believed to be a machine shop and building 25 just to the S of the engine test cells (24) may be used for final engine assembly.

PRIMARY OBJECTIVES

(Refer to Illustration No. 90.17-2008 P4, P5, and P6). The primary and secondary objectives of the three principal target areas, listed in order of productive importance, are as follows:

AREA A-B		AREA C		AREA D	
Primary	Secondary	Primary	Secondary	Primary	Secondary
211	None	333	343	45	46
214		326	332	44	25
195		330	345	26	23
200		339	347	27	
222		331	348		
217			258-261		
196			251		
194			255-257		
196A			323-325		
218					
213					
212					
202					
202A					
204					
205					
221					
216					
219					
203					
206					
208					
210					
215					
201					
220					

The primary objectives listed for Area A-B include the two wind tunnels, test cells, and other buildings important to probable research and testing. Their destruction would greatly delay development of new aircraft, engines, and improvements. In Area C, the loss of the primaries and secondaries would halt modification and repair activities and destroy aircraft and components in process. Area D primary and secondary buildings include aircraft fabrication and assembly facilities as well as engine parts and assembly processes.

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER FOLLOWING SHEET NO. 90.17-2008TI/1, PG 1 OF OLDER JAPANESE AIRCRAFT

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JOINT TARGET GROUP - WASHINGTON, D.C.

TARGET INFORMATION SHEET *(Contd.)*

Sheet No. 90.17-2008-TI/1
Date 10 March 1945
Page No. 3 (4 pages)

CONSTRUCTION & VULNERABILITY

(Refer to Illustration No. 90.17-2008 P4, P5, and P6). PRIMARY AND SECONDARY OBJECTIVES listed in order of importance:

	Bldg. No.	Plan Area (sq. ft.)	Roof*	Combustibility	HE vulnerability**
Area A-B	211	34,900	4-6" concrete	Fire resistant	VI
	214	13,800	4-6" concrete	Fire resistant	VI
	195	24,400	4-6" concrete	Fire resistant	Test beds
	200	15,100	4-6" concrete	Fire resistant	Test beds
	222	10,400	Light	Non-combustible	V3
	217	11,900	Light	Combustible	V4
	196	9,900	4-6" concrete	Fire resistant	Test beds
	194	18,900	4-6" concrete	Fire resistant	V4
	196A	6,900	4-6" concrete	Fire resistant	V4
	218	12,100	Light	Non-combustible	V4
	213	7,800	4-6" concrete	Fire resistant	VI
	212	5,600	4-6" concrete	Fire resistant	V4
	202	5,400	4-6" concrete	Fire resistant	V4
	202A	6,000	4-6" concrete	Fire resistant	V4
	204	5,200	4-6" concrete	Fire resistant	V4
	205	6,000	4-6" concrete	Fire resistant	V4
	221	5,600	4-6" concrete	Fire resistant	V4
	216	6,600	Light	Combustible	V4
	219	10,100	Light	Combustible	V4
	203	8,300	Light	Non-combustible	V3
	206	5,500	Light	Combustible	V4
	208	6,600	Light	Combustible	V4
	210	9,100	Light	Non-combustible	V4
	215	5,800	Light	Combustible	V4
	201	5,900	4-6" concrete	Fire resistant	VI
	220	3,900	Light	Combustible	V4
Area C	333	45,000	Light	Non-combustible	V4
	326	42,500	Light	Non-combustible	V4
	330	23,400	Light	Non-combustible	V4
	339	20,600	Light	Non-combustible	V4
	331	14,400	Light	Non-combustible	V4
	343	91,800	Light	Non-combustible	V4
	332	87,600	Light	Non-combustible	V5
	345	52,800	Light	Non-combustible	V4
	347	52,800	Light	Non-combustible	V4
	348	25,300	Light	Non-combustible	V5
	258-261	98,000	Light	Non-combustible	V4
	251	22,900	Light	Non-combustible	V4
	255-257	67,200	Light	Non-combustible	V4
	323-325	73,500	Light	Non-combustible	V4

(Continued on next page)

NOTES:

*Light weight roofs are readily penetrated by all types of incendiary bombs. Initiation of HE tail fuzes by these roofs cannot be depended upon except for bombs striking structural members (30% to 40% of bombs striking buildings).

**HE vulnerability classifications are explained in JTG Memorandum No. JTG/M/3/1 which is now in process of revision. In brief, a single vulnerability classification is assigned types of industrial buildings which behave in a similar manner when attacked with the same HE weapon. These vulnerability classes are arranged in order of vulnerability to HE attack, with very invulnerable, earthquake-proof structures assigned the classification VI. The other classifications V2, V3, V4, V5 are progressively more vulnerable types: V5 being the very vulnerable large span, arched hangar-type structures.

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER JAPANESE AIRCRAFT FOLLOWING SHEET NO. 90.17-2008TI/1, PG 2

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JOINT TARGET GROUP - WASHINGTON, D.C.

TARGET INFORMATION SHEET *(Contd.)*

	Bldg. No.	Plan Area (sq. ft.)	Roof	Combustibility	HE vulnerability
Area D	45	94,500	Light	Non-combustible	V4
	44	91,500	Light	Non-combustible	V4
	26	67,300	Light	Non-combustible	V4
	27	100,500	Light	Non-combustible	V4
	46	81,000	Light	Non-combustible	V4
	25	47,200	Light	Non-combustible	V4
	23	40,500	Light	Non-combustible	V4

CLASSIFICATION OF BUILDINGS:	Area A-B		Area C		Area D	
	Primary Objectives.	Whole Target	Primary & Sec. Obj.	Whole Target	Primary & Sec. Obj.	Whole Target
Total plan area of buildings (thousands of square feet).....	262	1569	718	1501	522	1165
Combustibility:						
Fire resistant (R).....	66%	20%	...	...	...	1%
Non-combustible (N).....	15%	22%	100%	73%	100%	74%
Combustible (C).....	19%	58%	...	27%	...	25%
HE Vulnerability:						
V1 (least vulnerable).....	24%	9%	...	...	...	...
V2.....	...	2%	...	3%	...	3%
V3.....	7%	26%	...	4%	...	2%
V4.....	50%	60%	84%	86%	100%	95%
V5 (most vulnerable).....	...	...	16%	7%	...	...
Special cases (test beds).....	19%	3%	...	...	...	...
COMBUSTIBILITY OF CONTENTS, whole target:	Slight to moderate		Slight		Slight	

("Slight" combustibility is that of average industrial fire occupancy. For detailed study of fire susceptibility of structures and contents refer to Illustration No. 90.17-2008 P5).

WEAPON RECOMMENDATIONS

Reference should be made to Weapon Recommendations Sheet 90.17-2008 WR1 for high and medium altitude attack and to Weapon Recommendations Sheet 90.17-2008 WR2 for low altitude attack.

CAMOUFLAGE, DECOYS AND SMOKE SCREENS

Photography of 7 November shows no camouflage. No decoys have been reported in the area and no smoke screens have been observed.

ADDITIONAL INFORMATION

(P)

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER JAPANESE AIRCRAFT FOLLOWING SHEET NO. 90.17-2008TI/1, PG 3

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By _____ NARA, Date 4-10-74

JOINT TARGET GROUP, WASHINGTON, D. C.

WEAPON RECOMMENDATIONS SHEET

Sheet No.	90.17–2008 WR 1
Date	26 March 1945
Page No.	1
Target No.	90.17–2008
Obj. Area	90.17
Obj. Folder No.	90.17
Air Target System	Aircraft
Lat.	35°42′ N
Long.	139°25′ E
Alt.	295′

TACHIKAWA ARMY AIR ARSENAL
(Rikugun Koku Kosho)

TACHIKAWA • • • • • • • • • JAPAN

ALL PREVIOUS SHEETS CANCELLED

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER—JAPANESE AIRCRAFT WITH OTHER MATERIAL ON TARGET 90.17–2008

High and Medium Altitude Attack

(See also Target Information Sheet 90.17–2008 TI/1 and associated target illustrations)

AIMING POINT

Area A.—Not considered for attack.

Area B.—For maximum damage to primary objectives the aiming point should be in the vicinity of building 202. (Illustration No. 90.17–2008 P5.)

Area C.—For maximum damage to primary objectives the aiming point should be in the vicinity of building 331. (Illustration No. 90.17–2008 P5.)

Area D.—For maximum damage to primary objectives the aiming point should be in the vicinity of building 26. (Illustrations No. 90.17–2008 P4, P5.)

WEAPONS AND FUZING

Area B	HE	Fuze	IB
Preferred	1,000-lb. GP	.01 N/.01 T	AN–M47, 70-lb.
	2,000-lb. GP	.01 N/.01 T	AN–M50, 4-lb. (in aimable clusters).
Alternative	500-lb. GP	.01 N/.01 T	AN–M76, 500-lb.
Not recommended	Smaller GP bombs		AN–M69 6-lb. (in aimable clusters).
	SAP or AP bombs		
	Depth bombs		

(*a*) Use 0.1 N fuzes, if 0.01 N fuzes are not available. The 0.01 T fuze has been selected rather than the ND T fuze since a high percentage of heavy concrete roofing in Area B insures positive tail fuze initiation.

(*b*) The 500-lb. GP is approximately 90 percent as effective as the 1,000-lb. and 2,000-lb. GP bombs.

Area C	HE	Fuze	IB
Preferred	1,000-lb. GP	.01 N/ND T	None.
Alternative	500-lb. GP	.01 N/ND T	None.
	2,000-lb. GP	.01 N/ND T	

Not recommended: Smaller GP bombs.
SAP or AP bombs.
Depth bombs.

(*a*) Use 0.1 N fuzes, if 0.01 N fuzes are not available.

(*b*) The 500-lb. and 2,000-lb. GP bombs are both approximately 90 percent as effective as the 1,000-lb. GP bomb.

Area D	HE	Fuze	IB
Preferred	1,000-lb. GP	.01 N/ND T	AN–M50, 4-lb. (in aimable clusters).
Alternative	500-lb. GP	.01 N/ND T	AN–M69, 6-lb. (in aimable clusters).
	2,000-lb. GP	.01 N/ND T	AN–M47, 70-lb. AN–M76, 500-lb.

Not recommended: Smaller GP bombs.
SAP or AP bombs.
Depth bombs.

(*a*) Use 0.1 N fuzes, if 0.01 N fuzes are not available.

(*b*) The 500-lb., and 2,000-lb. GP bombs are respectively 95 and 90 percent as effective as the 1,000-lb. GP bomb.

LOADING TABLE FOR INITIAL ATTACK

Loading table for preferred combination of bombs [1]

[This table is prepared for an initial attack on this target. For its application to later attacks see JTG Memorandum No. 3/1]

Tons (actual) dispatched	Percent of bombs dispatched falling within 1,000 feet of aiming point											
	10 percent			15 percent			20 percent			30 percent		
AREA B	Tons		F [2] percent	Tons		F [2] percent	Tons		F [2] percent	Tons		F [2] percent
	HE	IB		HE	IB		HE	IB		HE	IB	
100	30	70	15	20	80	25	15	85	25	10	90	30
200	30	170	25	20	180	30	50	150	35	100	100	40
400	100	300	35	200	200	40	250	150	45	300	100	50
800	500	300	45	600	200	50	650	150	55	700	100	70
1,200	900	300	50	1000	200	60	-----	-----	----	-----	-----	----
1,800	1500	300	60	-----	-----	----	-----	-----	----	-----	-----	----
AREA C	Attack with HE weapons only. Percent F [3] given below											
100	--			--			15			20		
200	15			20			25			35		
400	25			35			35			60		
600	35			50			60			--		
800	45			60			--			--		
1,000	50			--			--			--		
1,200	60			--			--			--		
AREA D	Tons		F [4] percent	Tons		F [4] percent	Tons		F [4] percent	Tons		F [4] percent
	HE	IB		HE	IB		HE	IB		HE	IB	
100	35	65	15	25	75	25	20	80	25	10	90	35
200	35	165	30	25	175	35	20	180	40	55	145	40
500	85	415	40	230	270	45	290	210	50	355	145	60
700	285	415	45	430	270	55	490	210	60	-----	-----	----
1,000	585	415	50	730	270	60	-----	-----	----	-----	-----	----
1,500	1085	415	60	-----	-----	----	-----	-----	----	-----	-----	----

[1] If alternative bombs are used, the distribution of the load between HE and IB (in mixed load attacks) should be the same. The expected percent of damage will, of course, be lower.

[2] Expected percent of serious damage to building area within a circle of 1,000-foot radius centered at building 202.

[3] Expected percent of serious damage to building area within a circle of 1,200-foot radius centered at building 331.

[4] Expected percent of serious damage to the whole target area.

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By _____ NARA, Date 4-11-77

JOINT TARGET GROUP, WASHINGTON, D. C.

WEAPON RECOMMENDATIONS SHEET

SHEET No. 90.17-2008-WR2
DATE.....19 May 1945
PAGE.....1

TACHIKAWA ARMY AIR ARSENAL

TACHIKAWA JAPAN

TARGET No...90.17-2008
OBJ. AREA.....90.17
OBJ. FOLDER No. New Target
CATEGORY End. Prdt. Ind. Aircraft

LAT.....35° 42′ N
LONG.....139° 25′ E
ALT.....295 feet

LOW ALTITUDE ATTACK

(See also 90.17-2008-TI/1 and associated target illustrations.)

Holders of Joint Target Group Folders should insert this sheet in Air Target System Folder: Japanese Aircraft with other 90.17-2008 material.

TYPE OF ATTACK

This sheet applies primarily to an attack by carrier based aircraft, fighter bombers, or other similar aircraft which carry out dive, glide, low level, or minimum altitude attacks.

(Refer to Illustrations No. 90.17-2008 P4, P5.) Data is given in Table I (right) for area attacks against the following areas of the target:

Area A—not considered for attack.
Area B—area within a circle of 1000 feet centered at building 202.
Area C—area within a circle of 1200 feet centered at building 331.
Area D—the entire area.

If it is desired to attack individual important buildings in the target, a pure HE attack (no incendiaries) may be launched against the primary and secondary buildings specified in Table II at the right (Illustrations No. 90.17-2008 P4, P5).

WEAPONS AND FUZING

For Area Attacks (Table I)

	High Explosive	Fuzing	Incendiary
Preferred:	1000-lb GP	0.01 N/ND T	AN-M50 4-lb (in clusters)
	or 2000-lb GP	0.01 N/ND T	AN-M69 6-lb (in clusters)
	or 500-lb GP	0.01 N/ND T	
Alternative:	250-lb GP	0.01 N/ND T	AN-M47 70-lb
Not recommended:	Smaller GP bombs SAP or AP bombs Depth bombs		AN-M76 500-lb

Notes: (a) *Area C should be attacked with HE bombs only.*

(b) Use 0.1 N or 0.025 N fuzes if 0.01 N fuzes are not available, and 0.01 fuzes if ND T fuzes are not available. ND tail fuzing is recommended since most of the buildings have light roof material and are best destroyed by blast effects. (The use of N/0.01 T fuzing would be preferable against Area B since a high percentage of heavy concrete roofing insures positive tail fuze initiation).

(c) The use of 8-15 sec. delay fuzing is necessary for minimum altitude attacks.

(d) The above recommendations are on a weight for weight basis.

For an Attack Against Individual Important Buildings (Table II)

The choice of a particular HE weapon for the attack against individual important buildings can be made by considering the recommendations above, the number of hits required for the various bombs (see Table II on page 2) and the stowage characteristics of the aircraft to be used. The proper fuzing for the HE weapon to be used is also given in Table II with the exception that for minimum altitude attacks on 8-15 sec. delay is required for safety of aircraft.

ATTACK DATA

The numbers of tons which must be delivered on the target areas to achieve various levels of serious damage are given in Table I below. These requirements assume that the bombing results in a random distribution of bombs over the area.

TABLE I

Number of Tons on Areas B, C, and D of the Target Required for Various Percentages of Serious Damage

COMBINATION HE-IB ATTACK

Areas(1)	Tons on Target								
	30% Serious Damage			50% Serious Damage			70% Serious Damage		
	HE	IB	Total	HE	IB	Total	HE	IB	Total
B	1	7	8	27	10	37	74	10	84
C	Combination recommended			HE-IB attack only. Use HE			not		
D	1	6	7	16	10	26	50	10	60
Total B, D	2	13	15	43	20	63	124	20	144
PURE HE ATTACK									
B	85			170			301		
C	50			97			113		
D	90			181			316		
Total B, C, D	225			448			730		

(1)As specified above under "TYPE OF ATTACK."

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By _____ NARA, Date 4-10-11

JOINT TARGET GROUP, WASHINGTON, D. C.
WEAPON RECOMMENDATIONS SHEET

SHEET No. 90.17-2008-WR2
DATE.....19 May 1945
PAGE.....2

TABLE II

Number of Hits Required to Achieve 50% Serious Damage to Individual Important Buildings(2)

Buildings in order of importance to production (Ill. No. 90.17-2008 P4, P5)	Number of Hits(4) 250-lb GP	500-lb GP	1000-lb GP	2000-lb GP	Fuzing(3)
Area B: 211	—	44	21	10	0.1 N/0.025 T
214	—	17	8	4	0.1 N/0.025 T
195	—	5	3	2	0.1 N/0.025 T
200	—	3	2	1	0.1 N/0.025 T
222	21	8	4	2	0.1 N/0.025 T
217	6	2	1	1	0.01 N/ND T
196	—	2	1	1	0.1 N/0.025 T
194	10	3	2	1	0.1 N/0.01 T
196 A	4	1	1	—	0.1 N/0.01 T
218	7	2	1	1	0.01 N/ND T
213	—	12	6	3	0.1 N/0.025 T
212	3	1	1	—	0.1 N/0.01 T
202	3	1	1	—	0.1 N/0.01 T
202 A	3	1	1	—	0.1 N/0.01 T
204	3	1	—	—	0.1 N/0.01 T
205	3	1	—	—	0.1 N/0.01 T
221	3	1	—	—	0.1 N/0.01 T
216	3	1	1	—	0.01 N/ND T
219	5	2	1	—	0.01 N/ND T
203	9	3	2	1	0.1 N/0.025 T
206	2	1	—	—	0.01 N/ND T
208	3	1	1	—	0.01 N/ND T
210	5	2	1	—	0.01 N/ND T
215	3	1	—	—	0.01 N/ND T
201	—	8	4	2	0.1 N/0.025 T
220	2	1	—	—	0.01 N/ND T

Buildings in order of importance to production (Ill. No. 90.17-2008 P4, P5)	Number of Hits(4) 250-lb GP	500-lb GP	1000-lb GP	2000-lb GP	Fuzing(3)
Area C: 333	24	8	4	2	0.01 N/ND T
326	23	7	4	2	0.01 N/ND T
330	13	4	2	1	0.01 N/ND T
339	11	3	2	1	0.01 N/ND T
331	7	2	1	1	0.01 N/ND T
343	49	16	8	4	0.01 N/ND T
332	24	8	4	2	0.01 N/ND T
345	28	9	5	2	0.01 N/ND T
347	28	9	5	2	0.01 N/ND T
348	7	2	1	1	0.01 N/ND T
258-261	53	17	8	4	0.01 N/ND T
251	12	4	2	1	0.01 N/ND T
255-257	36	12	6	3	0.01 N/ND T
323-325	39	12	6	3	0.01 N/ND T
Area D: 45	50	16	8	4	0.01 N/ND T
44	49	15	8	4	0.01 N/ND T
26	36	11	6	3	0.01 N/ND T
27	54	17	9	5	0.01 N/ND T
46	43	14	7	4	0.01 N/ND T
25	25	8	4	2	0.01 N/ND T
23	22	7	4	2	0.01 N/ND T

(2) To obtain the number of hits required to achieve 30% serious damage to individual important buildings, multiply the appropriate entry in the preceding table by 0.5; for 70% serious damage, multiply by 1.7.

(3) Use 0.1 N or 0.025 N fuzes if 0.01 N fuzes are not available, and 0.01 T fuzes if ND T fuzes are not available.

(4) If the number of hits with a particular bomb is not given, that bomb is not recommended.

Holders of Joint Target Group Folders should insert this sheet in Air Target System Folder: Japanese Aircraft after 90.17-2008 WR2 page 1.

JOINT TARGET GROUP-WASHINGTON, D. C.

TARGET NO. 90.17-2008

TACHIKAWA ARMY AIR ARSENAL (RIKUGUN KOKU KOSHO)

ILLUSTRATION NO. 90.17-2008 PI

APPROX. COORDINATES 35° 42'N 139° 24' E

TOKYO JAPAN

ISSUED NOVEMBER 1944

PHOTOGRAPHED 7 NOVEMBER 1944

0 2000 4000 6000 FEET

0 ½ 1 MILE

1:32 000 APPROX.

RESTRICTED

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RESTRICTED

TYPE A

JOINT TARGET GROUP WASHINGTON D. C.

TACHIKAWA ARMY AIR ARSENAL
TACHIKAWA JAPAN

0 2000 4000 6000 FEET
0 ½ 1 MILE
1:32 000 APPROX.

RESTRICTED

ILLUSTRATION No. **90.17-2008 P2/1**
DATE. . . . . **29 April 1945**
TARGET No. **90.17-2008**
COORDINATES. . . **35°42'N 139°24'E**
PHOTOGRAPHED. **7 November 1944**

Holders of Joint Target Group Folders should insert this sheet in Air Target System Folder: Japanese Aircraft in place of 90.17-2008 P2.

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May be taken into the air if data is trimmed off

TARGET NO. 90.17-2008

TACHIKAWA ARMY AIR ARSENAL (RIKUGUN KOKU KOSHO)

TOKYO JAPAN

ILLUSTRATION NO. 90.17-2008 P3

APPROX. COORDINATES 35° 42' N 139° 24'E

ISSUED NOVEMBER 1944

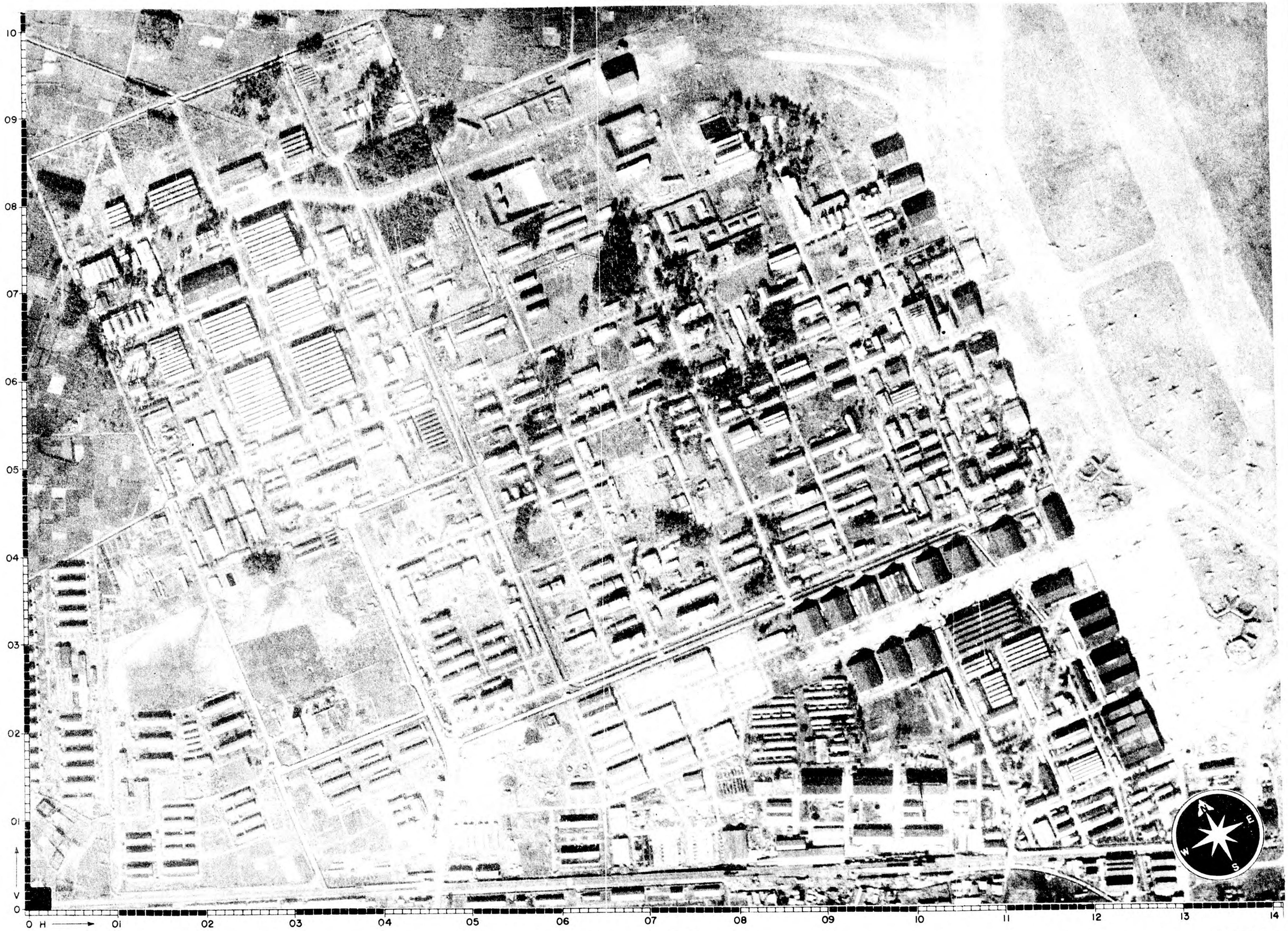
PHOTOGRAPHED 7 NOVEMBER 1944

CONFIDENTIAL

0 500 1000 1500 2000 2500 3000 FEET

0 1/4 1/2 MILE

1:6000 APPROX.



AC/AS, INTELLIGENCE

CONFIDENTIAL

TYPE B

TARGET No. 90.17–2008

COORDINATES 35° 42′ N 139° 24′ E

PHOTOGRAPHED 7 NOVEMBER 1944

JOINT TARGET GROUP • WASHINGTON, D. C.

TACHIKAWA ARMY AIR ARSENAL
TACHIKAWA, JAPAN

0 500 1000 1500 2000 2500 3000 FEET

0 1/4 1:6000 APPROX. 1/2 MILE

ILLUSTRATION No. 90.17–2008 P4/1

DATE 26 APRIL 1945

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LEGEND

Area A. Ordnance Area
Area B. Research and Experimental Area
Area C. Repair and or Modification Area
Area D. Aircraft Factory Area
1-13. Storage
14. Possible foundry
15. Probable machine shop
16. Unidentified
17. Possible heat treatment
18, 19. Unidentified
20. Probable storage
21. Unidentified
22, 23. Probable engine overhaul
24. Engine test beds
25. Probable engine overhaul
26. Sub-assembly
27. Metal shaping and fabrication
28. Storage
29-40. Administration
41-43. Probable metal stamping
44. Sub-assembly
45. Fuselage assembly
46. Final assembly
47, 48. Post assembly
49-64. Unidentified - possibly small machine shops and storage
65-89. Unidentified
90. Possible administration
91-105. Unidentified
106. Motor pool
107, 108. Unidentified
109. Motor pool
110-118. Unidentified
119. Machine gun range
120-123. Possible ordnance shops
124-137. Unidentified
138. Possible administration
139-156. Unidentified
157. Possible administration
158-162. Unidentified
163. Possible administration
164-170. Unidentified
171. Possible administration
172-186. Unidentified
187. Ammunition storage
188-190. Unidentified
191. Fuel storage
192. Probable ordnance installation
193. Unidentified
194. Wind tunnel
195, 196. Engine or propeller test stands
197-199. Hangar
200. Engine or propeller test stands
201, 201a. Unidentified
202-206. Unidentified
207. Hangar
208. Unidentified
209. Hangar
210-222. Unidentified
223, 224. Hangar
225-238. Unidentified
239. Hangar
240-250. Unidentified
251. Hangar
252-254. Unidentified
255-261. Hangar
262. Unidentified
263. Under construction
264. Storage
265. Under construction
266-268. Storage
269, 270. Under construction
271-273. Storage
274. Unidentified
275-280. Probable workers' huts
281-288. Unidentified
289-293. Storage
294-302. Unidentified
303-306. Storage
307. Unidentified
308-318. Workers' huts
319-322. Unidentified
323-325. Hangar
326. Shop
327-329. Unidentified
330, 331. Shop
332. Hangar
333, 334. Shop
335-338. Unidentified
339. Shop
340-342. Unidentified
343. Hangar
344. Unidentified
345. Hangar
346. Unidentified
347, 348. Hangar

ORDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT IN PLACE OF SHEET 90.17-2008 P4.

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JOINT TARGET GROUP, WASHINGTON, D.C.
FUNCTIONAL IDENTIFICATION SHEET
(to be read in conjunction with Illustration No. 90.17-2008 P5)

Sheet No. 90.17-2008P6
Date 10 March 1945
Page No. 1 (2 pages)

New Target
Obj. Area 90.17
AAF Target No. 90.17-2008
NAME OF TARGET

Place Tachikawa (Japan)
Air Target
System Aircraft

Lat.: 35° 42' N
Long: 139° 24' E
Alt.: 295 feet

TACHIKAWA ARMY AIR ARSENAL
(Rikugun Kiku Kisho)

ALL PREVIOUS SHEETS CANCELLED

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER JAPANESE AIRCRAFT WITH CORRESPONDING MATERIAL

Area A and B - Testing and Research Areas
Area C - Repairs and Modification Area
Area D - Airframe Fabrication and Engine Production Overhaul Area

Building No.	Function of Building
AREA D	
1-13	Storage
14	Possible foundry
15	Probable machine shop
16	Unidentified
17	Possible heat treatment
18, 19	Unidentified
20	Probable storage
21	Unidentified
22, 23	Probable engine overhaul
24	Engine test beds
25	Probable engine overhaul
26	Sub-assembly
27	Metal shaping and fabrication
28	Storage
29 - 40	Administration
41 - 43	Probable metal stamping
44	Sub-assembly
45	Fuselage assembly
46	Final assembly
47, 48	Post assembly
49, 64	Unidentified - possibly small machine shops and storage
AREA A and B	
65 - 89	Unidentified
90	Possible administration
91 - 105	Unidentified
106	Motor Pool
107, 108	Unidentified
109	Motor pool
110 - 118	Unidentified
119	Machine gun range
120 - 123	Possible ordnance shops
124 - 137	Unidentified
138	Possible administration
139 - 156	Unidentified
157	Possible administration
158 - 162	Unidentified
163	Possible administration
164 - 170	Unidentified
171	Possible administration
172 - 186	Unidentified
187	Ammunition storage

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JOINT TARGET GROUP - WASHINGTON, D.C.
FUNCTIONAL IDENTIFICATION SHEET *(Contd.)*

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER JAPANESE AIRCRAFT WITH CORRESPONDING MATERIAL

Building No.	Function of Building
AREA A and B (Cont'd.)	
188 - 190	Unidentified
191	Fuel storage
192	Probable ordnance installation
193	Unidentified
194	Wind tunnel
195, 196	Engine or propeller test stands
197 - 199	Hangar
200	Engine or propeller test stands
201 - 206	Unidentified
207	Hangar
208	Unidentified
209	Hangar
210	Unidentified
211	Probable wind tunnel
212 - 222	Unidentified
223, 224	Hangar
225 - 238	Unidentified
239	Hangar
240 - 250	Unidentified
AREA C	
251	Hangar
252 - 254	Unidentified
255 - 261	Hangar
262	Unidentified
263	Under construction
264	Storage
265	Under construction
266 - 268	Storage
269, 270	Under construction
271 - 273	Storage
274	Unidentified
275 - 280	Probable workers' huts
281 - 289	Unidentified
289 - 293	Storage
294 - 302	Unidentified
303 - 306	Storage
307	Unidentified
308 - 318	Workers' huts
319 - 322	Unidentified
323 - 325	Hangar
326	Shop
327 - 329	Unidentified
330 - 331	Shop
332	Hangar
333, 334	Shop
335 - 338	Unidentified
339	Shop
340 - 342	Unidentified
343	Hangar
344	Unidentified
345	Hangar
346	Unidentified
347, 348	Hangar

(Based on F/A Report No. 4, AC/AS, Intelligence, Photographic Division, dated 27 November 1944).

(P)

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TARGET NO. 90.17-2008

JOINT TARGET GROUP - WASHINGTON, D. C.

TACHIKAWA ARMY AIR ARSENAL

TOKYO, JAPAN

ILLUSTRATION NO. 90.17-2008-P5

APPROX. COORDINATES 35°42′ NORTH
139°24′ EAST

PHOTOGRAPHED 5 NOVEMBER 1944
7 NOVEMBER 1944

SCALE 1:6,000

500 0 500 1000 FEET

ISSUED 12 FEBRUARY 1945

CONFIDENTIAL

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT

AREA A

AREA B

AREA C

AREA D

FIRE SUSCEPTIBILITY PLAN

PRIMARY BUILDINGS	(P)	FIRE WALL, CERTAIN	
SECONDARY BUILDINGS	(S)	FIRE WALL, PROBABLE	

BUILDINGS		CONTENTS	
COMBUSTIBLE		NON-COMBUSTIBLE	
NON-COMBUSTIBLE		SLIGHTLY COMBUSTIBLE	
FIRE RESISTANT		MODERATELY COMBUSTIBLE	
COMBINATION I.E. COMBUSTIBLE ROOF RESISTANT FLOORS		HIGHLY COMBUSTIBLE	
		EXTREMELY COMBUSTIBLE	
WATER TANK	(W)	INTERMEDIATE VALUES	

AREA IN SQ. FT.	PRIMARY	ALL BLDGS. SHOWN
NO. OF BUILDINGS	35	336
NO. OF FIRE DIVISIONS	36	340
PLAN AREA	754,300	4,234,500
TOTAL FLOOR AREA	854,200	5,137,800
SITE AREA	21,510,000	

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By ____ NARA, Date 4-6-77

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Sheet No. 90.17-2009-TI
Date 20 Dec. 1944
Page No. 1 (2 pages)

JOINT TARGET GROUP, WASHINGTON, D.C.

TARGET INFORMATION SHEET

Obj. Folder 90.17
Obj. Area 90.17
AAF Target No. 90.17-2009
NAME OF TARGET HITACHI AIRCRAFT, TACHIKAWA PLANT

Place Tokyo
Category Aircraft

Lat.: 35°44'N
Long: 139°25'E
Alt.: 330 feet

ALL PREVIOUS SHEETS CANCELLED

SIGNIFICANCE

Believed to be one of the more important producers of aero-engines for trainer aircraft. Also probably manufacturing aero-engines for liaison-type planes and for reconnaissance aircraft. This is probably the most important aircraft plant of the Hitachi Company. Several other Hitachi plants have been reported producing aircraft components, and consequently the exact nature of the production at this plant can not be determined. There appears to be some relation between this engine plant and the Tachikawa Aircraft Factory (TARGET 90.17-792) and Tachikawa Army Air Arsenal (TARGET 90.17-2008) immediately to the S.

LOCATION

Approximately 23 miles W of Tokyo, slightly more than 1 mile due N of Tachikawa Aircraft Factory (TARGET 90.17-792) and Airport and roughly 2½ miles due S of the large Murayama Reservoir. A road leads directly S from the plant to the Tachikawa Aircraft Factory. A RR spur enters the S end of the compound from the E.

DESCRIPTION AND LAYOUT

(Refer to Illustration No. 90.17-2009 P3). The target area is irregular in shape, measuring about 2000 ft N-S by 2000 ft E-W at its longest dimensions. The built-up area is roughly 1 million square ft, about one-third of the compound, with its major axis lying in an E-W direction. Two large production buildings (Nos. 3 and 16) devoted to engine parts manufacture and assembly account for more than half of the built-up area. There are 14 engine test cells in the E portion of the plant site (Nos. 13 and 14).

CONSTRUCTION & VULNERABILITY

(Rerer to Illustration No. 90.17-2009 P3). Buildings 13 and 14, enclosing the engine test cells, are believed to be of reinforced concrete construction throughout. All other major buildings, including Nos. 3 and 16, are apparently steel-framed one-story structures less than 30 ft high to eaves, with short-span sawtooth roofs surfaced with corrugated steel or asbestos sheeting; wall surfacing material is not apparent. Some of the minor buildings in the compound are believed to be framed of wood, with combustible roofs.

PRIMARY OBJECTIVES

(Refer to Illustration No. 90.17-2009 P3). The two large buildings Nos. 3 and 16 containing the machine tools required for engine production.

WEAPON RECOMMENDATIONS

Instructions with regard to weapons will usually be given in Field or Operational Orders, but in the absence of such specific instructions and to assist Planners in formulating such orders the following information is given:

A combined attack with HE and IB is recommended. A preliminary structural and occupancy analysis of the plant indicates that the following weapons would be most effective:

AN M64 500 lb GP bomb fuzed .1 sec. nose/ .01 sec. tail.
AN M47 or AN M50 4 lb IB (in M17 aimable clusters).

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	The 500 lb GP is selected as the most effective weapon, weight for weight, in causing structural damage as the major buildings, housing machine shops, are of normal spans and therefore not subject to spreading collapse. The .01 sec. tail fuzing is recommended so that detonation will occur 6 to 10 feet beneath the roof and thereby greatly damage machines as well as structure. The buildings are in a compact group and the fire divisions are large. Therefore, multiple hits will be obtained in each fire division with either the AN M47 or the AN M50 IB.
LEVEL OF DAMAGE	
CAMOUFLAGE, DECOYS AND SMOKE SCREENS	Photography of 7 Nov. 1944 shows that all principal buildings have disruptive painting on their roof. No decoys or smoke screens were noted during reconnaissance flights.
ADDITIONAL INFORMATION	There is no definite information with respect to the specific engine types being manufactured at this Hitachi plant or the degree to which the plant is an integrated one.
SPECIAL NOTE	Distributees in receipt of this sheet with a heading 'Functional Identification' should destroy it and substitute this therefor.

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Sheet No.90.17-2009 TI/1
Date 20 FEB. 1945
Page No. 1 (2 pages)

JOINT TARGET GROUP, WASHINGTON, D.C.

TARGET INFORMATION SHEET

ANNEX I

Obj. Folder 90.17
Obj. Area 90.17
AAF Target No.90.17-2009
NAME OF TARGET

Place Tokyo (Japan)
AIR TARGET
SYSTEM Aircraft
HITACHI AIRCRAFT, TACHIKAWA PLANT

Lat.: 35°44'N
Long: 139°25'E
Alt.: 330 feet

(Note: This annex is issued for use by the Navy in conjunction with Target Information Sheet 90.17-2009 TI/1, issued by the Joint Target Group on 23 Jan. 1945.)

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" on the Fire Susceptibility Plan, Illustration No. 90.17-2009 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 number 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 per cent serious damage to specific buildings. For other levels of damage within this range, the required number of hits can be obtained by interpolation.

Holders of JTG Folders should insert this sheet in Air Target System Folder, Japanese Aircraft following 90.17-2009 TI/1.

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Table I

Number of Hits Required to Achieve 30, 50 and 70 Percent Serious Damage to Individual Buildings

(Refer to Illustration No. 90.17-2009 P5)

Building No.	I.P.	Fraction of Serious Damage	Number of Hits 500-lb GP	1000-lb GP	2000-lb GP
16	10	30%	19	11	5
		50%	36	21	10
		70%	54	31	15
3	6	30%	43	25	12
		50%	82	48	23
		70%	122	72	35

Examples of Use of Table I:

1. Problem: To obtain the required number of hits with 500-lb GP bombs on Building 16 to achieve 30 percent serious damage.

   Solution: The table gives 19 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 3 to achieve 60 per cent serious damage.

   Solution: The table gives 23 hits for 50 percent and 35 hits for 70 percent serious damage. By interpolation 29 hits are required.

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER:
JAPANESE AIRCRAFT AFTER 90.17-2009 TI/1

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By NARA, Date 4/30/11

JOINT TARGET GROUP-WASHINGTON. D. C.

TARGET NO. 90.17-2009

HITACHI AIRCRAFT- TACHIKAWA PLANT

TOKYO JAPAN

ILLUSTRATION NO. 90.17-2009 PI

APPROX. COORDINATES 35° 44'N 139° 25'E

PHOTOGRAPHED 7 NOVEMBER 1944

ISSUED NOVEMBER 1944

RESTRICTED

0 2000 4000 6000 FEET

0 ½ 1 MILE

1:32 000 APPROX.

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RESTRICTED

TYPE A

NARA. Date 4-24-77

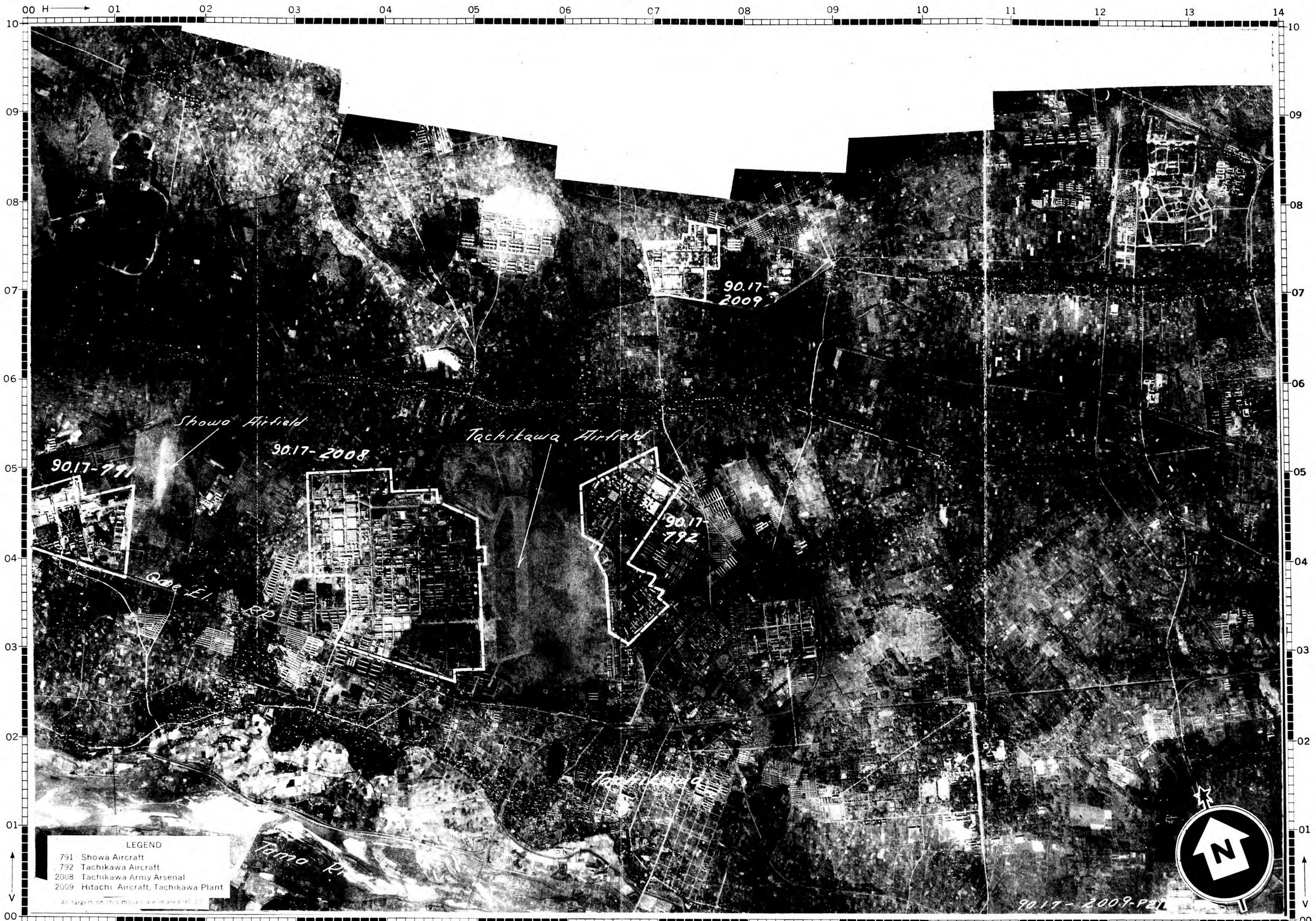
JOINT TARGET GROUP
WASHINGTON, D. C.

HITACHI AIRCRAFT — TACHIKAWA PLANT
TACHIKAWA JAPAN

0 2000 4000 6000 FEET
0 ½ 1 MILE
1:32 000 APPROX.

RESTRICTED

ILLUSTRATION No. **90.17-2009 P2/1**
DATE. . . . . **29 April 1945**
TARGET No. **90.17-2009**
COORDINATES. . **35°44'N 139°25'E**
PHOTOGRAPHED **7 November 1944**



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May be taken into the air if data is trimmed off

NARA Date 4-5-11

JOINT TARGET GROUP • WASHINGTON, D. C.

TARGET No. 90.17–2009

HITACHI AIRCRAFT, TACHIKAWA PLANT
TACHIKAWA, JAPAN

ILLUSTRATION No. 90.17–2009 P3/1

COORDINATES 35° 44′ N 139° 25′ E

PHOTOGRAPHED 7 NOVEMBER 1944

0 500 1000 1500 2000 2500 3000 FEET

0 1/4 1:6000 APPROX. 1/2 MILE

DATE 26 APRIL 1945

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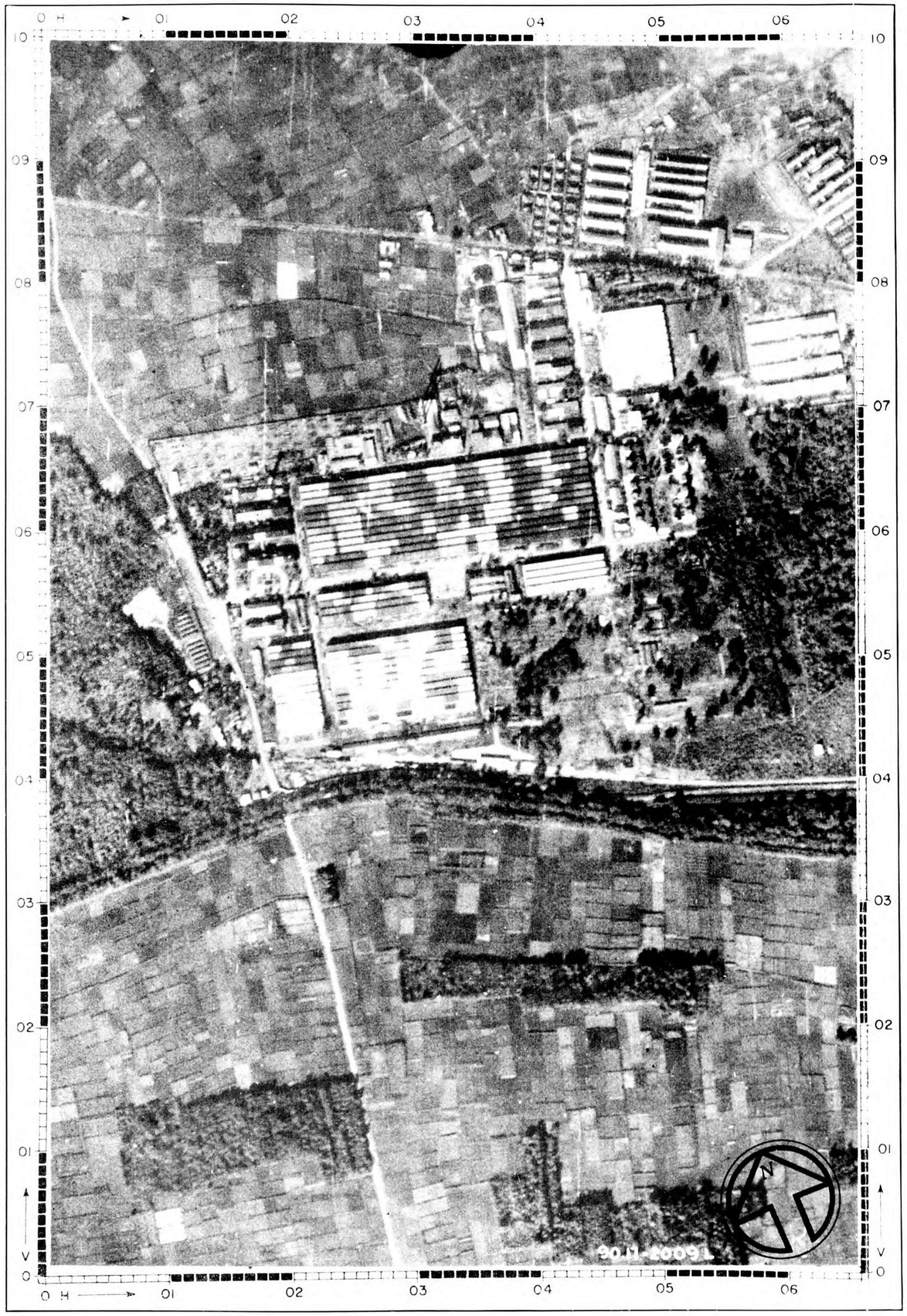

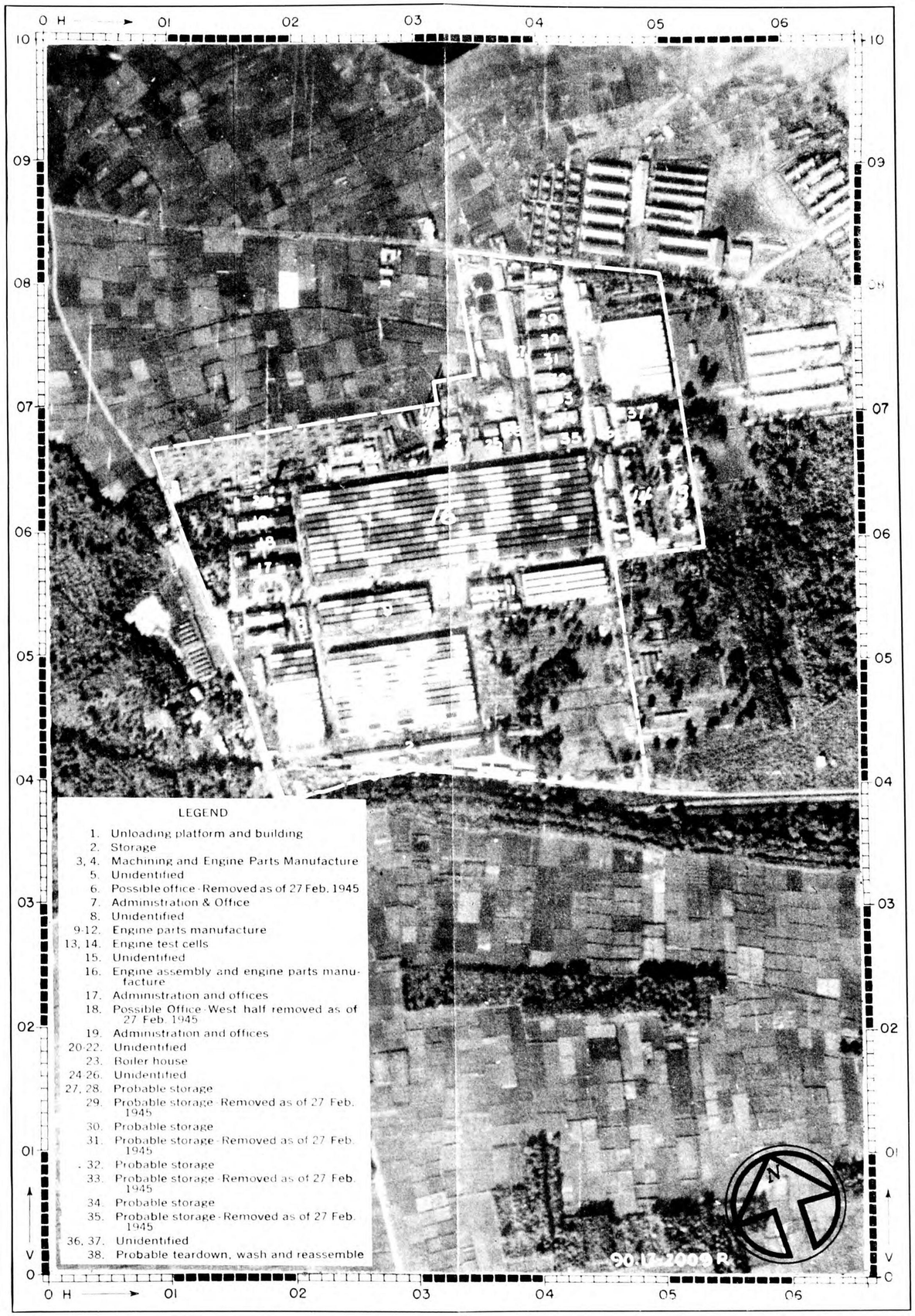

LEGEND

1. Unloading platform and building
2. Storage
3, 4. Machining and Engine Parts Manufacture
5. Unidentified
6. Possible office - Removed as of 27 Feb. 1945
7. Administration & Office
8. Unidentified
9-12. Engine parts manufacture
13, 14. Engine test cells
15. Unidentified
16. Engine assembly and engine parts manufacture
17. Administration and offices
18. Possible Office - West half removed as of 27 Feb. 1945
19. Administration and offices
20-22. Unidentified
23. Boiler house
24-26. Unidentified
27, 28. Probable storage
29. Probable storage - Removed as of 27 Feb. 1945
30. Probable storage
31. Probable storage - Removed as of 27 Feb. 1945
32. Probable storage
33. Probable storage - Removed as of 27 Feb. 1945
34. Probable storage
35. Probable storage - Removed as of 27 Feb. 1945
36, 37. Unidentified
38. Probable teardown, wash and reassemble

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT IN PLACE OF SHEET 90 17-2009 P3

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HITACHI AIRCRAFT
TACHIKAWA, JAPAN

TARGET NO. 90.17-2009
APPROX. COORDINATES 35°44′ N 139°25′ E
PHOTOGRAPHED **27 FEB 1945**

ILLUSTRATION NO. 90.17-2009-**DP**
ISSUED **5 APRIL 1945**
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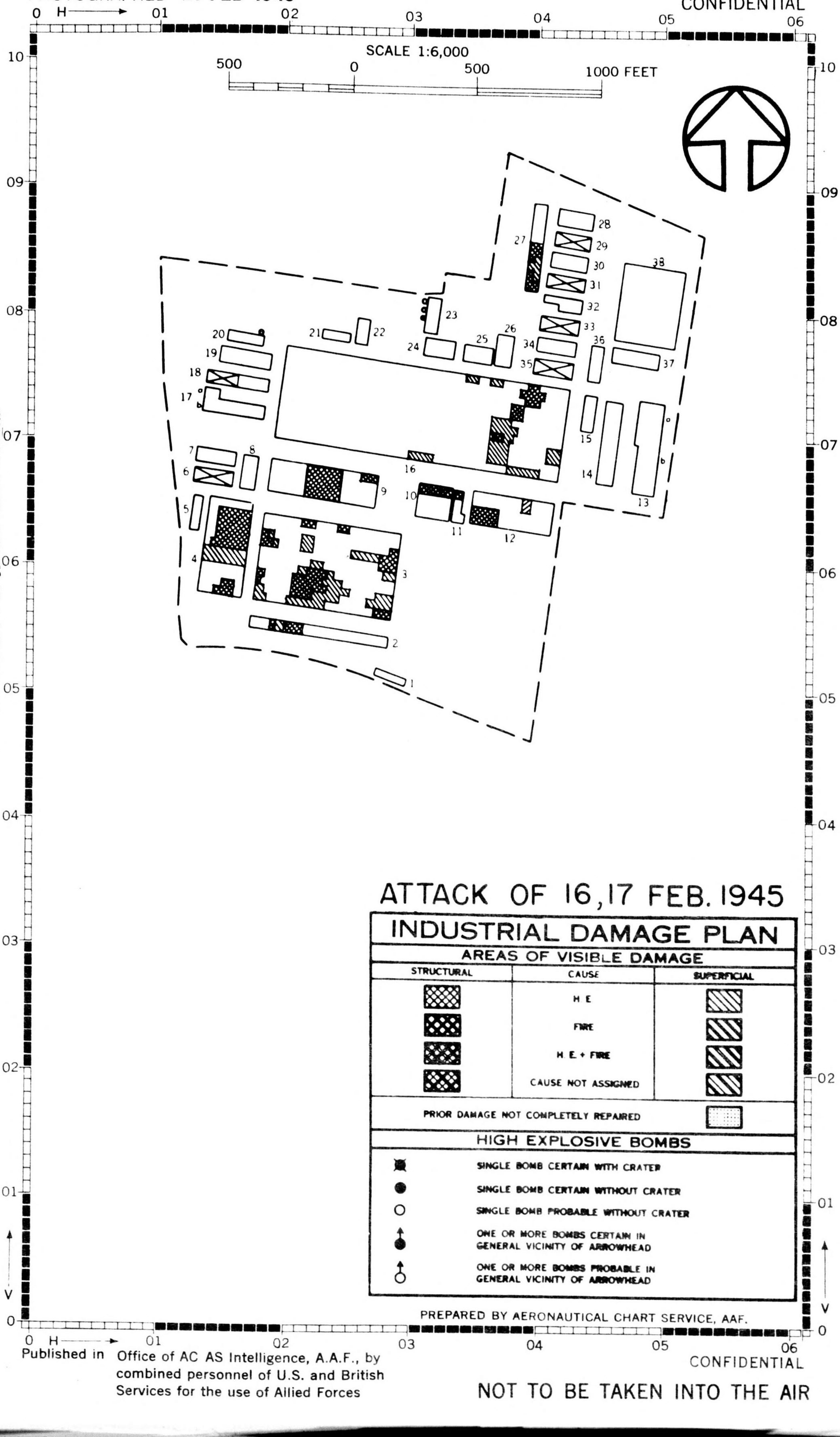

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT **WITH CORRESPONDING MATERIAL**

ATTACK OF 16,17 FEB. 1945

INDUSTRIAL DAMAGE PLAN

AREAS OF VISIBLE DAMAGE

STRUCTURAL	CAUSE	SUPERFICIAL
	H.E.	
	FIRE	
	H.E. + FIRE	
	CAUSE NOT ASSIGNED	

PRIOR DAMAGE NOT COMPLETELY REPAIRED

HIGH EXPLOSIVE BOMBS

- SINGLE BOMB CERTAIN WITH CRATER
- SINGLE BOMB CERTAIN WITHOUT CRATER
- SINGLE BOMB PROBABLE WITHOUT CRATER
- ONE OR MORE BOMBS CERTAIN IN GENERAL VICINITY OF ARROWHEAD
- ONE OR MORE BOMBS PROBABLE IN GENERAL VICINITY OF ARROWHEAD

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JOINT TARGET GROUP, WASHINGTON, D. C.

TARGET INFORMATION SHEET

SHEET No..90.17-2015-TI
DATE.....25 April 1945
PAGE 1

TARGET No. .90.17-2015
OBJ. AREA 90.17
OBJ. FOLDER No.
New Target
AIR TARGET SYSTEM
Aircraft

LAT.....35° 20′ N
LONG.....139° 21′ E
ALT.....25 feet

JAPAN INTERNATIONAL AIRCRAFT, HIRATSUKA PLANT

(Nippon Kokusai Koku Kogyo, Hiratsuka Kojo)

HIRATSUKA **JAPAN**

Holders of Joint Target Group folders should insert this sheet in Air Target System Folder—Japanese Aircraft with other 90.17-2015 material.

SIGNIFICANCE

This is the most important plant of one of the two companies recently reported to be making suicide rocket aircraft (possibly Baka). It may be producing parts for or assembling these aircraft; it is known to make fuselages of varying size for transports, trainers, and other aircraft, and its reported production of electric controlled propellers for Frank makes it the third most important propeller manufacturer in Japan.

LOCATION

(Refer to Illustration No. 90.17-2015 P2). Situated about 34 miles SW of the Tokyo Imperial Palace, and about 2 miles NW of the mouth of the Sagami River. The plant adjoins the SE corner of the Navy Arsenal (TARGET 90.17-1336) and is connected by a N-S highway to a station on the Tokaido Mainline Railroad about 2600 feet S. Open country extends to the NW, E, and SE, the built-up area of Hiratsuka to the W and SW.

DESCRIPTION AND LAYOUT

(Refer to Illustration No. 90.17-2015 P3, P5). The plant site is irregular in shape with two storage fingers extending W from main site and a separate small storage area to the SW. The main area measures about 1700 feet N-S and 1300 feet E-W.

The flow of production is apparently from S to N with storage buildings (4-7, 9) in the SE corner, small workshops (8, 13, 15-19) next N and W probably making small parts for propellers or rocket aircraft, and three large buildings (20-22) across the center of the site probably doing fuselage fabrication and also assembly work at the N end where they are higher. Two large buildings (23, 24) along the W side of the main area possibly contain machine lines for fuselage or other work. A large building (25) across the N end of the site had skylights placed in the roof between 13 December 1944 and 11 February 1945, and has possible test cells to the E. It may do hub and final assembly of propellers, or may have been altered to work on the rocket aircraft.

Fuselages after assembly are placed in open yards, and the majority appear to be for use with the transport Thalia, although others are of varying sizes. The absence of visible wing assemblies suggests that no planes except possibly the suicide rocket aircraft are assembled here.

PRIMARY OBJECTIVES

(Refer to Illustrations No. 90.17-2015 P3, P5). The primary and secondary objectives of this plant, listed in approximate order of productive importance, are as follows:

PRIMARY		SECONDARY	
Building No.	Function	Building No.	Function
25	Possible assembly shop	13	Workshop
24	Fabricating shop	17	Workshop
23	Fabricating shop	18	Workshop
20	Major assembly shop	19	Workshop
21	Major assembly shop	8	Workshop
22	Major assembly shop	15	Workshop
		16	Workshop

CONSTRUCTION AND VULNERABILITY

(Refer to Illustrations No. 90.17-2015 P3, P5). Primary and secondary objectives listed in order of importance:

Building No.	Plan area (sq. ft.)	Stories	Roof[1]	Combustibility	HE vulnerability[2]
25	129,600	1	Light	Combustible	V5
24	79,800	1	Light	Combustible	V4
23	97,200	1	Light	Combustible	V4
20a	31,500	1	Light	Combustible	V5
20b	119,000	1	Light	Combustible	V4
21a	22,000	1	Light	Combustible	V5
21b	74,800	1	Light	Combustible	V4
22a	22,000	1	Light	Combustible	V5
22b	37,500	1	Light	Combustible	V5
22c	37,500	1	Light	Combustible	V4
13	13,200	2	Light	Combustible	V3
17	22,000	1	Light	Combustible	V4
18	22,000	1	Light	Combustible	V4
19	16,000	1	Light	Combustible	V4
8	11,700	1	Light	Combustible	V4
15	8,100	2	Light	Combustible	V3
16a	13,500	1	Light	Combustible	V5
16b	7,500	1	Light	Combustible	V4

[1] Lightweight roofs are readily penetrated by all types of incendiary bombs. Initiation of HE tail fuzes by these roofs cannot be depended upon except for bombs striking structural members (30 to 40 per cent of bombs striking buildings).

[2] For explanation of HE vulnerability classifications refer to Joint Target Group Memorandum No. JTG/M3/1, dated 26 March 1945.

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By ____ NARA, Date 4-11-11

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

Classification of buildings:

	Primary and Secondary Objectives	Whole Target
Total plan area of buildings (square feet)	765,000	886,000
Total floor area of buildings (square feet)	786,000	964,000
HE vulnerability (per cent of total plan area in each class):		
V1 (least vulnerable)	.....	.....
V2	.....	.....
V3 2-stories	2%	9%
V3A	.....	.....
V4	64%	62%
V4A	.....	.....
V5 (most vulnerable)	34%	29%
Combustibility (per cent of total plan area in each class):		
Fire resistant (R)	.....	.....
Non-combustible (N)	.....	.....
Combustible 2-stories	2%	9%
1-story	98%	91%
Combustibility (per cent of total FLOOR area in combustible class	100%	100%
Susceptibility of contents to incendiary bombs (whole target)[3]	Fair	Fair

[3] Degrees: none, poor, fair (i.e., average industrial fire occupancy), good, excellent. For detailed study of fire susceptibility of structures and contents refer to Illustration No. 90.17-2015 P5.

WEAPON RECOMMENDATIONS

Reference should be made to Weapon Recommendations Sheet No. 90.17-2015 WR1 for high and medium altitude attack and to Weapon Recommendations Sheet No. 90.17-2015 WR2 for low altitude attack, which are now in process.

CAMOUFLAGE, DECOYS, AND SMOKE SCREENS

Photography of 11 February 1945 shows no camouflage. No decoys or smoke screens have been reported.

ADDITIONAL INFORMATION

The following are reported to be manufactured by Japan International Aircraft Company.

Japanese designation	Allied Code	Description
———	Thalia	Type RO 2E transport
KI 59	Teresa	2E transport
KI 76	——	Liaison
KI 86	——	Trainer
KU 1	——	6-passenger troop transport glider
KU 7	——	Large transport glider
KU 8	——	14 Passenger glider
———	possibly Baka	Rocket propelled suicide Aircraft

The largest of the company's other known plants is at Okubo (TARGET 90.23-1167) 4 miles S of Kyoto, and is believed to make parts for and assemble trainer aircraft and gliders.

Other plants of the company are reported to be in converted spinning mills in Osaka, Kyoto, Uji (1 mile NE of the Okubo plant), and Fukui (in N central Honshu). There is no photography of Fukui, and available photography of the other mills reported converted gives no indication of their functions.

There is some evidence that the company's plant working on suicide rocket aircraft is in Chigasaki, across the Sagami River E of Hiratsuka, and photography shows several plants there which could have been taken over for work on such aircraft without apparent exterior indications. These plants were not owned by Japan International prior to 1941, and there is no other direct evidence of the company having taken over any of them.

The other company recently reported to be working on suicide rocket aircraft is Fuji Aircraft Company. Its production is believed to be concentrated in its Ofuna plant (TARGET 90.17-2033) about 11 miles SW of Yokohama Harbor and 11 miles E of the Hiratsuka plant.

Holders of Joint Target Group folders should insert this sheet in Air Target System Folder—Japanese Aircraft after 90.17-2015-TI, page 1.

By _____ NARA, Date 4-10-77

JOINT TARGET GROUP, WASHINGTON, D. C.

WEAPON RECOMMENDATIONS SHEET

SHEET No. 90.17-2015 WR1
DATE.....27 April 1945
PAGE 1

JAPAN INTERNATIONAL AIRCRAFT, HIRATSUKA PLANT

(Nippon Kokusai Koku Kogyo, Hiratsuka Kojo)

HIRATSUKA JAPAN

TARGET No. .90.17-2015
OBJ. AREA 90.17
OBJ. FOLDER No. New Target
AIR TARGET SYSTEM Aircraft

LAT. .....35° 20′ N
LONG. .....139° 21′ E
ALT. .....25 feet

HIGH AND MEDIUM ALTITUDE ATTACK

(See also 90.17-2015 TI and associated Target Illustrations.)

AIMING POINT

For maximum damage to the primary and secondary objectives the aiming point should be in the vicinity of building 21 (see Illustrations No. 90.17-2015 P3, P5).

WEAPONS AND FUZING

	HE	Fuze	IB
Preferred:	500-lb GP 1000-lb GP	LDT and 0.1 N/0.025 T	AN-M50 4-lb or AN-M69 6-lb (in aimable clusters)
Alternative:	250-lb GP 100-lb GP	LDT and 0.1 N/0.025 T	AN-M47 70-lb
Not recommended:	SAP or AP bombs Depth bombs Fragmentation bombs Butterfly bombs		AN-M76 500-lb

Notes: (a) The above recommendations are on a weight for weight basis.

(b) High explosive weapons are recommended against this target to support the incendiary bombs expected to cause the major portion of the damage.

(c) If incendiary bombs with X or WP features are available, they should be used to assist the HE weapons in disrupting the fire-fighting facilities.

LOADING TABLE FOR INITIAL ATTACK

The table below is prepared for an initial attack against this target. For its application to later attacks see Joint Target Group Memorandum No. 3/1.

Loading Table for Preferred Combination of Bombs**

Tons (actual) Dispatched	Percent of bombs dispatched falling within 1000 feet of aiming point							
	10%		15%		20%		30%	
	Tons HE–IB	F* %	Tons HE–IB	F* %	Tons HE–IB	F* %	Tons HE–IB	F* %
100	60– 40	25	40– 60	50	15– 85	65	10–90	95
150	60– 90	50	40–110	75	15–135	95	.....	....
200	60–140	65	40–160	95	.....	....	.....	....
300	60–240	95	.....	....	.....	....	.....	....

*Expected percent of serious damage to the whole target.

**If alternative bombs are used, the distribution of the load between HE and IB should be the same. The expected percent of serious damage will, of course, be lower.

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WEAPON RECOMMENDATIONS SHEET

SHEET No. 90.17-2015 WR2
DATE. . . . . 27 April 1945
PAGE 1

JAPAN INTERNATIONAL AIRCRAFT, HIRATSUKA PLANT

(Nippon Kokusai Koku Kogyo, Hiratsuka Kojo)

HIRATSUKA JAPAN

TARGET No. . 90.17-2015
OBJ. AREA 90.17
OBJ. FOLDER No. New Target
AIR TARGET SYSTEM Aircraft

LAT. . . . . 35° 20′ N
LONG. . . . . 139° 21′ E
ALT. . . . . 25 feet

LOW ALTITUDE ATTACK

(See also 90.17-2015 TI and associated Target Illustrations.)

Holders of Joint Target Group folders should insert this sheet in Air Target System Folder — Japanese Aircraft with other 90.17-2015 material.

TYPE OF ATTACK

This sheet applies primarily to an attack by carrier based aircraft, fighter bombers, or other similar aircraft which carry out dive, glide, low level, or minimum altitude attacks.

Since the target consists entirely of combustible buildings and is well built up, with primary and secondary buildings covering 86 percent of the plan area, an attack is recommended against the target as a whole rather than against individual designated buildings. The data below apply to an area attack.

WEAPONS AND FUZING

	HE	Fuze	IB
Preferred:	500-lb GP 1000-lb GP	LDT and 0.1 N/0.025 T	AN-M50 4-lb or AN-M69 6-lb (in clusters)
Alternative:	250-lb GP 100-lb GP	LDT and 0.1 N/0.025 T	AN-M47 70-lb
Not recommended:	SAP or AP bombs Depth bombs Fragmentation bombs Butterfly bombs		AN-M76 500-lb

Notes: (a) The above recommendations are on a weight for weight basis.

(b) High explosive weapons are recommended against this target to support the incendiary bombs expected to cause the major portion of the damage.

(c) If incendiary bombs with X or WP features are available, they should be used to assist the HE weapons in disrupting fire-fighting facilities.

(d) The 8-15 sec. delay tail fuzing should be used in GP bombs during minimum altitude attacks.

TONS ON TARGET

The numbers of tons which must be delivered on the site area of the target to achieve various levels of damage are given in the table below. These requirements assume that the bombing results in a random distribution of bombs over the site area.

Number of Tons on Target Required for 30, 50, and 70 Percent Serious Damage

Percent Serious Damage	Tons on Target		
	Mixed Attack (Preferred Bombs)		
	HE	IB	Total
30%	3	2	5
50%	3	5	8
70%	3	8	11

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NARA Date 4-5-77

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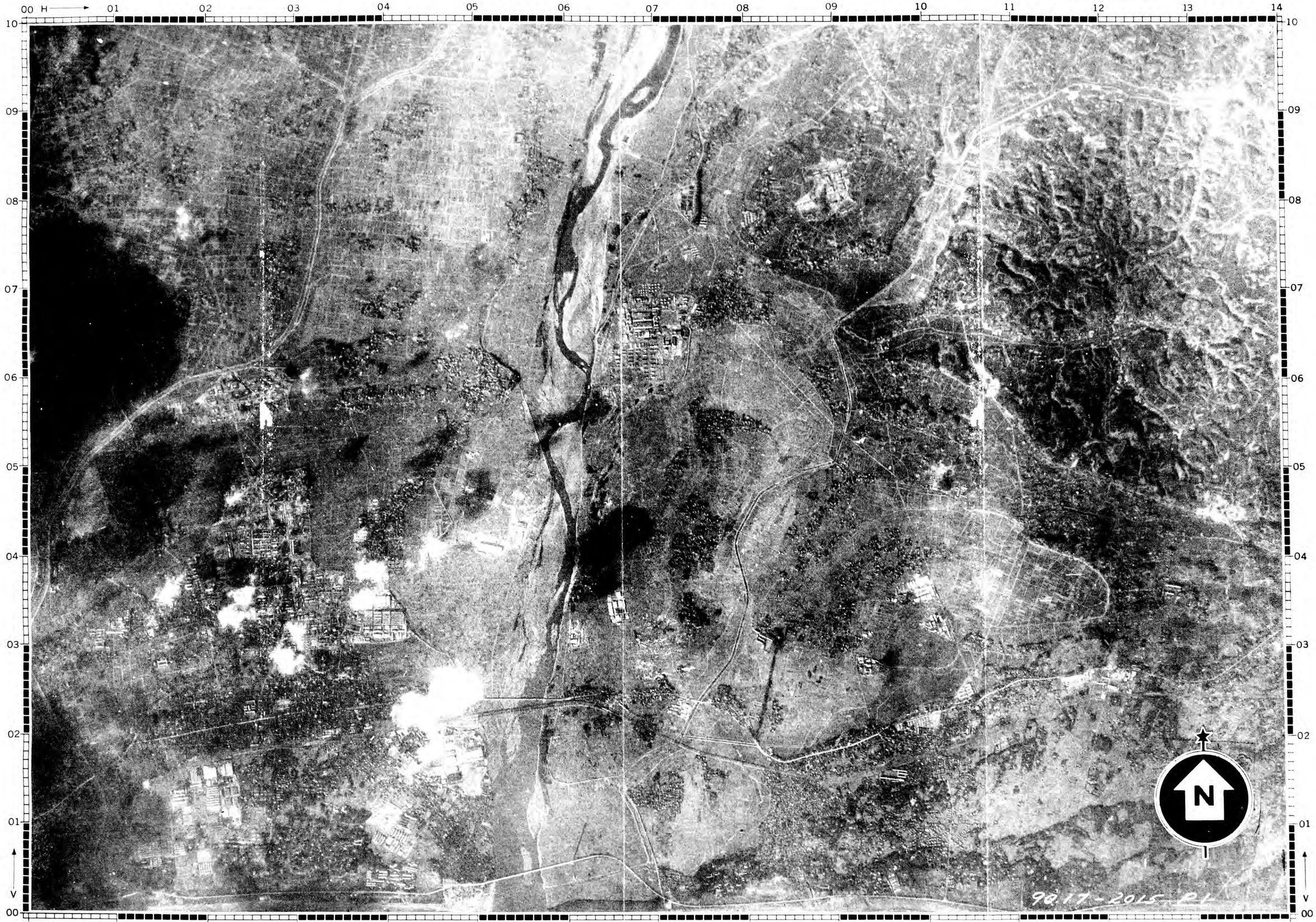
JAPAN INTERNATIONAL AIRCRAFT, HIRATSUKA PLANT

HIRATSUKA — JAPAN

0 2000 4000 6000 FEET
0 ½ 1 MILE
1:32 000 APPROX.

ILLUSTRATION No.	90.17-2015 P1
DATE	4 May 1945
TARGET No.	90.17-2015
COORDINATES	35° 20'N 139° 21'E
PHOTOGRAPHED	11 February 1945



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NARA, Date 4/30/77

JOINT TARGET GROUP
WASHINGTON, D. C.

JAPAN INTERNATIONA . AIRCRAFT, HIRATSUKA PLANT

HIRATSUKA JAPAN

RESTRICTED

ILLUSTRATION No. . . . **90.17-2015 P2**
DATE . . . . . **4 May 1945**
TARGET No. **90.17-2015**
COORDINATES . . . **35°20'N 139°21'E**
PHOTOGRAPHED . **11 February 1945**

0 2000 4000 6000 FEET
0 1 MILE
1:32 000 APPROX.

LEGEND

90.17—1336 Navy Arsenal
90.17—2015 Japan International Aircraft, Hiratsuka Plant

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JOINT TARGET GROUP
WASHINGTON, D. C.

JAPAN INTERNATIONAL AIRCRAFT, HIRATSUKA PLANT

HIRATSUKA — JAPAN

ILLUSTRATION No.	90.17-2015 P3
DATE	4 May 1945
TARGET No.	90.17-2015
COORDINATES	35°20'N 139°21'E
PHOTOGRAPHED	11 February 1945

0 500 1000 1500 2000 2500 3000 FEET
0 1/4 1:6000 APPROX. 1/2 MILE

LEGEND

1.	Workers' quarters
2-3.	Offices
4-7.	Warehouses
8.	Workshop
9.	Warehouse
10.	Workshop
11.	Unidentified
12.	Boiler house
13.	Workshop
14.	Unidentified
15-19.	Workshops
P 20-22	Major assembly shops
P 23-P 24	Fabricating shops
P 25	Possible assembly shop
26.	Possible test cells
27.	Warehouse

Holders of Joint Target Group Folders should insert this sheet in Air Target System Folder: Japanese Aircraft with other 90.17-2015 material.

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By _____ NARA, Date 4-6-77

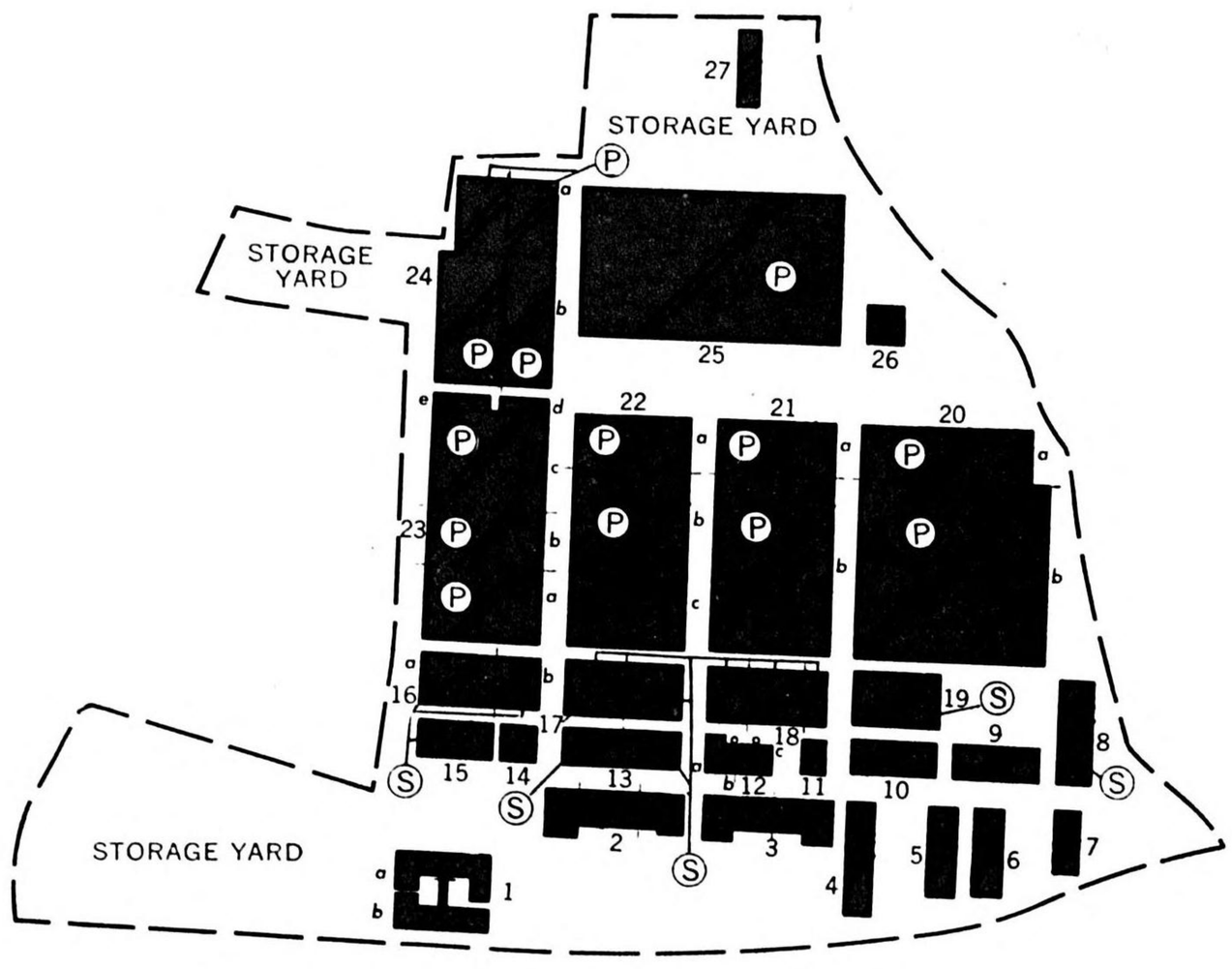
JOINT TARGET GROUP-WASHINGTON, D. C.
THE SUSCEPTIBILITY PLAN

CONFIDENTIAL

ILLUSTRATION NO. 90.17-2015-P5
DATE 23 APRIL 1945
TARGET NO. 90.17-2015
COORDINATES 35°20′N 139°21′E
PHOTOGRAPHED 11 FEBRUARY 1945

JAPAN INTERNATIONAL AIRCRAFT
HIRATSUKA PLANT
HIRATSUKA, JAPAN

SCALE 1:6,000
500 0 500 1000 FEET



HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER. JAPANESE AIRCRAFT WITH OTHER 90.17-2015 MATERIAL

LEGEND

1	Workers' quarters
2-3	Offices
4-7	Warehouses
8	Workshop
9	Warehouse
10	Workshop
11	Unidentified
12	Boiler house
13	Workshop
14	Unidentified
15-19	Workshops
P 20-22	Major assembly shops
P 23-24	Fabricating shops
P 25	Possible assembly shop
26	Possible test cells
27	Warehouse

P - denotes Primary Building.

FIRE SUSCEPTIBILITY PLAN

PRIMARY BUILDINGS (P) FIRE WALL, CERTAIN
SECONDARY BUILDINGS (S) FIRE WALL, PROBABLE

BUILDINGS	CONTENTS
COMBUSTIBLE	SUSCEPTIBILITY TO INCENDIARIES: NONE, POOR, FAIR, GOOD, EXCELLENT
WATER TANK (W)	

AREA IN SQ. FT.	PRIMARY	SECONDARY	ALL BLDGS. SHOWN
NO. OF BUILDINGS	6	7	27
NO. OF FIRE DIVISIONS	14	12	45
PLAN AREA	651,000	114,000	886,000
TOTAL FLOOR AREA	651,000	135,000	964,000
SITE AREA	2,300,000		

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FILE NO. AC745074

By _____ NARA, Date 4-6-11

JOINT TARGET GROUP, WASHINGTON, D. C.

TARGET INFORMATION SHEET

SHEET . . . 90:17-2033—TI
DATE . . . . . 14 April 1945
PAGE 1

TARGET 90:17-2033
OBJ. AREA 90:17
OBJ. FOLDER . . New Target
CATEGORY
End Prdt. Ind.—AIRCRAFT

LAT. . . . . 35° 20′ N
LONG. . . . . 139° 32′ E
ALT. . . . . 175 feet

ALL PREVIOUS SHEETS CANCELLED

FUJI AIRCRAFT, OFUNA PLANT
(Fuji Hikoki KK)

OFUNA **JAPAN**

Holders of Joint Target Group Folders should insert this sheet in Air Target System Folder: Japanese Aircraft with other 90:17-2033 material.

SIGNIFICANCE

One of the two plants recently reported to be making the Japanese Suicide Aircraft. The presence of fuselages outside two of the buildings in this plant, on photography of 13 December 1944, strongly suggests that they fabricate the metal fuselages and assemble the plane. There is some evidence indicating that this company also makes the wooden wings which are used on this aircraft.

This plant may also be engaged in the fabrication of various aircraft components. It was reported by a PW that the plant was to take over fabrication of a conventional combat type aircraft, but the size and layout does not appear suited for such work on a mass-production basis. It is probable that a substantial proportion of the facilities are used for making the suicide plane.

LOCATION

(Refer to Illustration No. 90:17-2033 P2.) About 4 miles NE of Eno Shima shrine in Sagami Bay, and about 11 miles SW of Yokohama Harbor. It is situated about 3,000 feet S of the railroad junction at Ofuna where the Yokosuka Branch Line from the SE joins the NE-SW Tokaido Mainline. The Tokaido bridges the Katase River about 2,500 feet W of the plant. Fujisawa Airfield is about 4 miles NNW. The compound is bounded on the NW by a main highway. The ground rises to nearby wooded hills on the W, S, and E.

DESCRIPTION AND LAYOUT

(Refer to Illustration No. 90:17-2033 P3.) The target area is generally rectangular in shape, extending about 1,250 feet S from the highway and measuring about 500 feet E-W. There is one large building (30) in the N part of the site identified as a final assembly building. A number of smaller buildings extending to the S are used for machining, bench work, and fuselage fabrication. Buildings 1, 2, and 3 in the SE corner of the site are the dormitory for workers, apprentice school, and cafeteria.

PRIMARY OBJECTIVES

(Refer to Illustration No. 90:17-2033 P3.) Shop buildings 11 through 21 and 23 through 26 and the assembly building (30).

CONSTRUCTION AND VULNERABILITY

(Refer to Illustration No. 90:17-2033 P3.) Most of building 30 is one-story, higher than normal, and steel or possibly wood framed with three parallel monitor-roofed subdivisions of long, short, and long span respectively; the remainder, a fourth subdivision, three stories high, across the E end, has frame, roof and floors of reinforced concrete. Practically all other buildings are smaller one-story structures of normal height, framed in steel or wood, with double-pitched roofs of short to normal span. Roofs, except for the concrete part of building 30, are generally surfaced with lightweight noncombustible sheet material; exterior walls are probably of stucco.

WEAPON RECOMMENDATIONS

Instructions with regard to weapons will usually be given in Field or Operational Orders, but in the absence of such instructions and to assist Planners in formulating such orders the following information is given:

An attack with a combination of high explosive and incendiary bombs is recommended. A preliminary structural and occupancy analysis of the plant indicates the following weapons should be selected:

	High explosive	Fuzing	Incendiary
Preferred.....	1,000-lb. GP or 500-lb. GP.	0.01 N/ND T.	AN-M50 4-lb. or AN-M69 6-lb. (in aimable clusters for high level attack).
Alternative.....	2,000-lb. GP	0.01 N/ND T.	AN-M47 70-lb. AN-M76 500-lb.
Not recommended..	Smaller GP bombs AP, SAP bombs, Depth bombs.	.....	

NOTES.—(a) Use 0.1 N fuzes if 0.01 N fuzes are not available, and 0.01 T if ND T fuzes are not available. ND tail fuzes are recommended since the greatest portion of the plant area consists of light roofed buildings which are best damaged by blast.
(b) The above recommendations are on a weight for weight basis.

CAMOUFLAGE, DECOYS, AND SMOKE SCREENS

Photography of 11 February 1945 shows the central buildings in the plant camouflaged with disruptive roof painting. No decoys or smoke screens have been reported.

ADDITIONAL INFORMATION

The other plant reported to be making the Suicide Aircraft is the Chigasaki Plant of the Japan International Aircraft Co. This company has a large plant (Target 90:17-2015) located some 9 miles W of the Ofuna Plant, in the outskirts of Hiratsuka on the W side of the Sagami River. Current intelligence is not sufficient to determine whether or not this is the Chigasaki Plant. The town of Chigasaki is located on the E side of the Sagami River and there is no known plant of Japan International Aircraft there.

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NARA Date 1-30-77

JOINT TARGET GROUP
WASHINGTON, D. C.

FUJI AIRCRAFT, OFUNA PLANT

OFUNA JAPAN

0 2000 4000 6000 FEET
0 ½ 1 MILE
1:32 000 APPROX.

RESTRICTED

ILLUSTRATION No. . . **90.17-2033 P1**
DATE . . . . . **28 April 1945**
TARGET No. **90.17-2033**
COORDINATES . . **35°20'N 139°32'E**
PHOTOGRAPHED . . **11 February 1945**

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NARA Date 4-5-77

JOINT TARGET GROUP WASHINGTON, D. C.

FUJI AIRCRAFT, OFUNA PLANT

OFUNA JAPAN

0 2000 4000 6000 FEET

0 ½ 1 MILE

1:32 000 APPROX.

RESTRICTED

ILLUSTRATION No. . . **90.17-2033 P2**
DATE . . . . . **28 April 1945**
TARGET No. **90.17-2033**
COORDINATES . . . **35°20'N 139°32'E**
PHOTOGRAPHED . . **11 February 1945**

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NARA. Date 4-4-77

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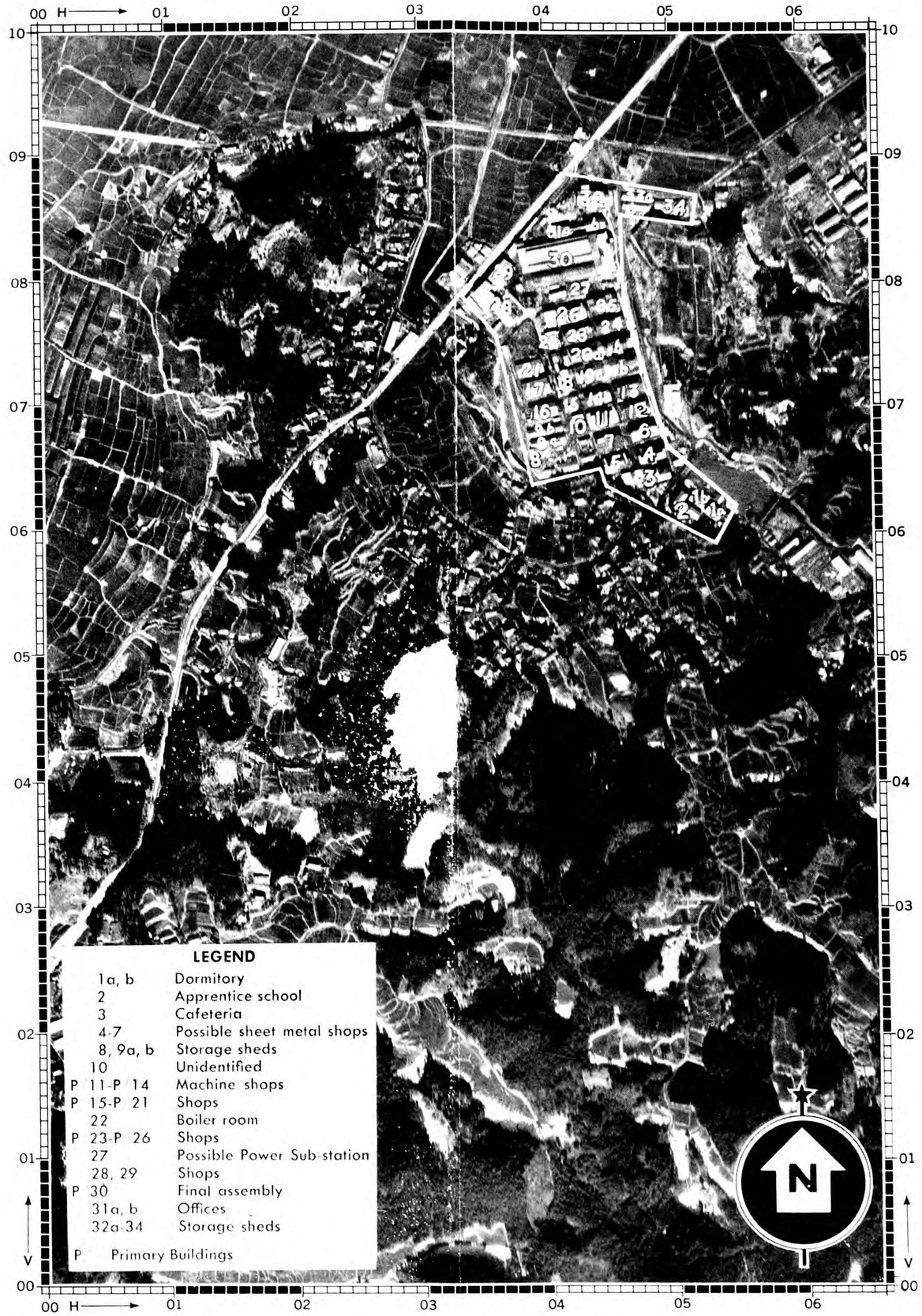
WASHINGTON, D. C.

FUJI AIRCRAFT, OFUNA PLANT
OFUNA JAPAN

CONFIDENTIAL

ILLUSTRATION No.	90.17-2033 P3
DATE	21 April 1945
TARGET No.	90.17-2033
COORDINATES	35°20'N 139°32'E
PHOTOGRAPHED	11 February 1945

0 500 1000 1500 2000 2500 3000 FEET
0 1/4 1:6000 APPROX. 1/2 MILE



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NARA Date 4-24-77

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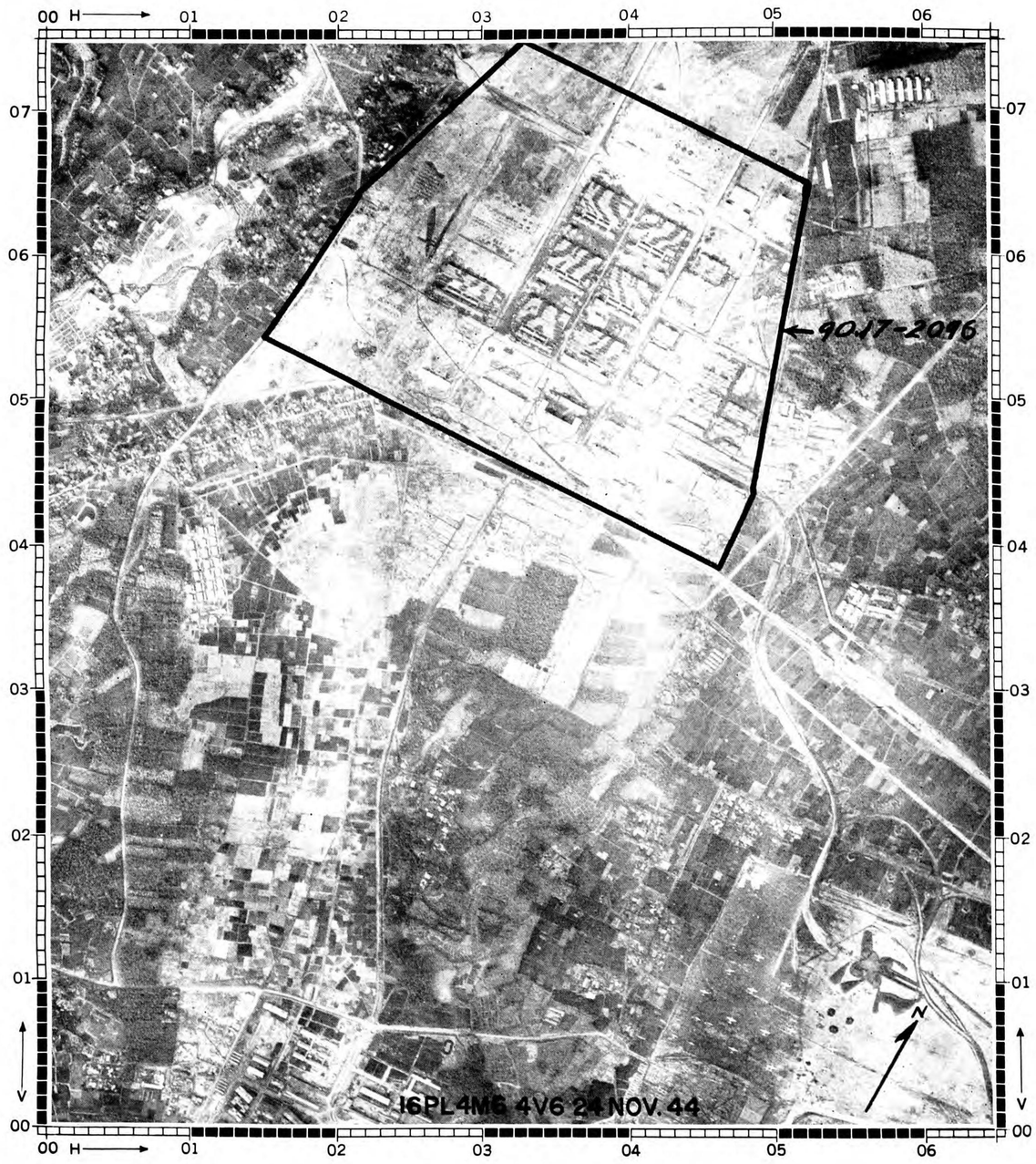
JOINT TARGET GROUP, WASHINGTON, D. C.
TARGET LOCATION SHEET

ATSUGI AIRCRAFT PLANT
ATSUGI JAPAN

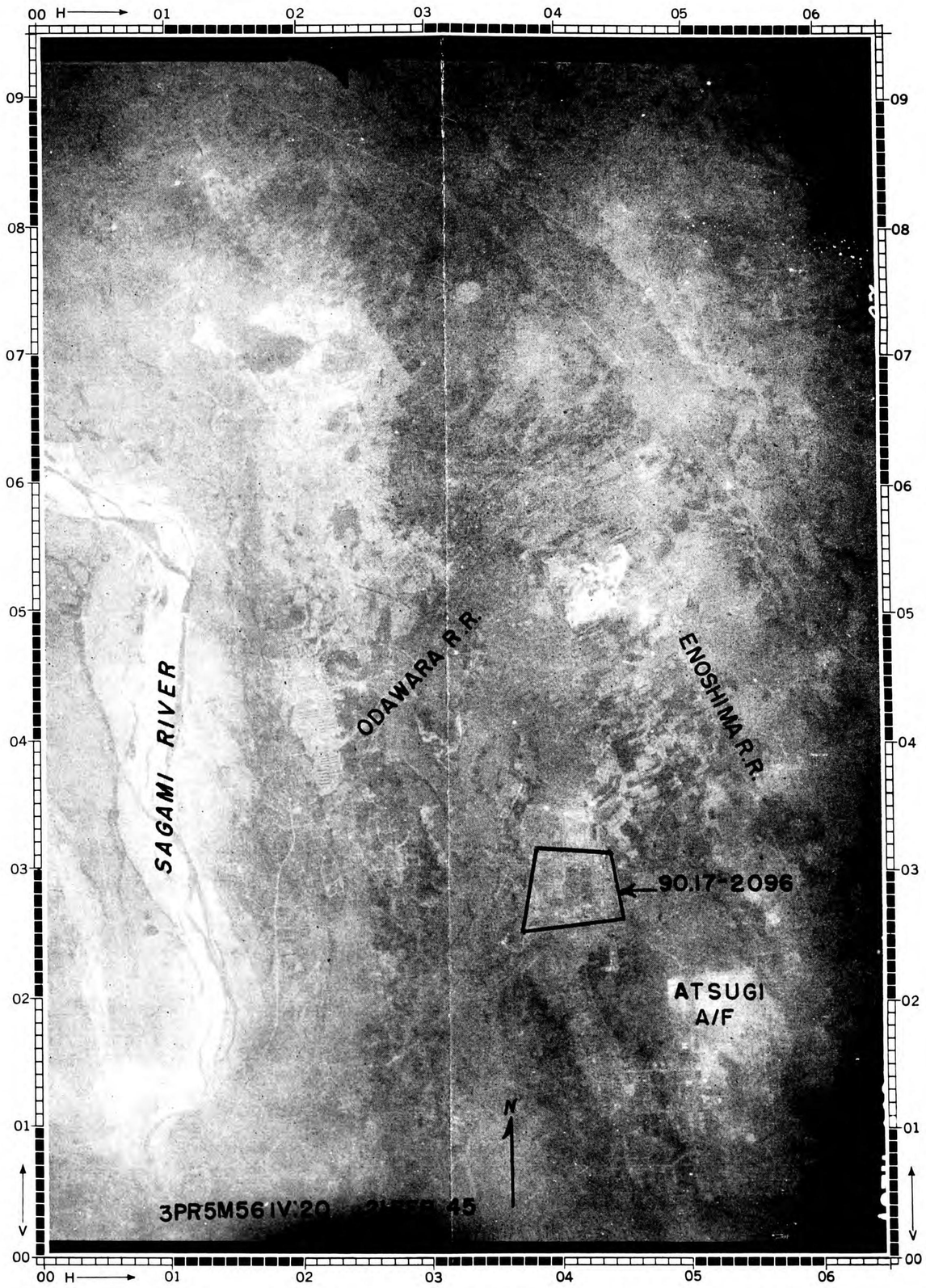
SHEET No. . . . . 90.17-2096—TL
DATE. . . . . 11 May 1945
TARGET No. 90.17-2096
CATEGORY . . . End Prdt. Ind.—Aircraft
COORDINATES . . . . 35°28'N 139°26'E
ALTITUDE . . . . . 240 feet

SIGNIFICANCE:

New plant that may assemble the transport type aircraft Thalia or make important aircraft components. There is no intelligence at present indicating what company this plant is associated with but its size suggests that it may be or may become an important dispersal site for a major producer.



LARGE SCALE ILLUSTRATION—SCALE APPROX.: 1:10,000



SMALL SCALE ILLUSTRATION—SCALE APPROX.: 1:33,000

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NARA Date 4-25-11

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

NAKAJIMA AIRCRAFT, OMIYA ENGINE PLANT

OMIYA — JAPAN

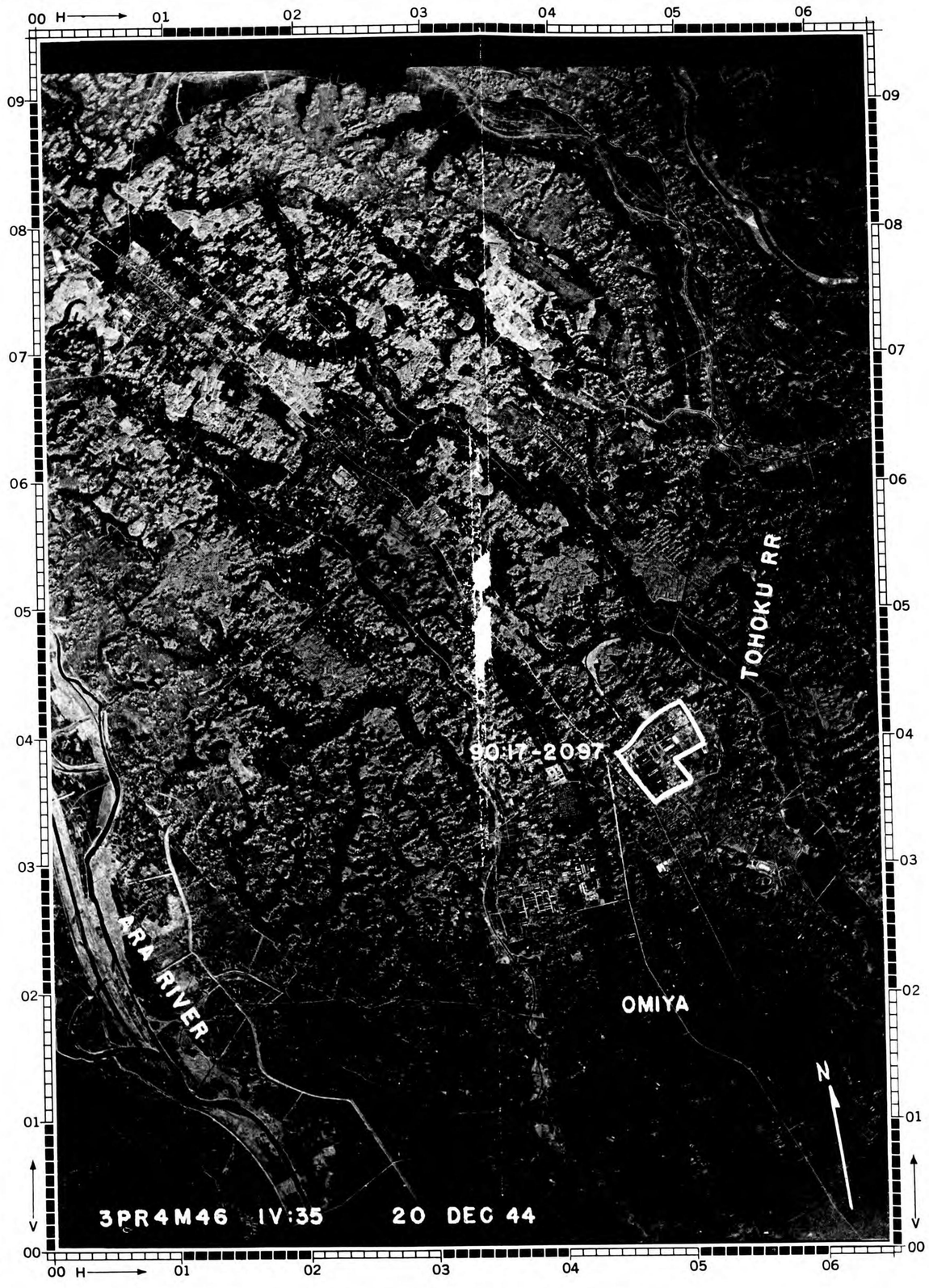
SHEET No. 90.17-2097–TL
DATE . . . . . 24 May 1945
TARGET No. 90.17-2097
CATEGORY . . End Product Ind.–Aircraft
COORDINATES . . . . 35°56'N 139°38'E
ALTITUDE . . . . . 60 feet

SIGNIFICANCE:

Refer to 90.17-2097–TI

The potential engine production of this new and small but expanding plant makes it of increasing importance as continued attacks on Nakajima's Musashino-Tama Plant (Target 90.17-357) reduce its production and force dispersal. No engines identified with the Omiya Plant have yet been reported recovered.

LARGE SCALE ILLUSTRATION–SCALE APPROX.: 1:16,750



SMALL SCALE ILLUSTRATION–SCALE APPROX.: 1:66,600

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NARA Date 4-24-77

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

FUJISAWA AIRCRAFT PLANT
FUJISAWA JAPAN

SHEET No. 90.17-2130–TL
DATE.....14 May 1945
TARGET No. 90.17-2130
CATEGORY....End Prdt. Ind.–Aircraft
COORDINATES ....35°21'N 139°29'E
ALTITUDE .....75 feet

SIGNIFICANCE:

The function of this plant, which appears to have underground facilities, is not known. A number of Navy-type aircraft are found outside some of the surface buildings which appear to be of the type usually associated with research. It may be an experimental station connected with the Yokosuka Naval Air Base or underground production facilities may be turning out aircraft or engines.

LARGE SCALE ILLUSTRATION–SCALE APPROX.: 1:16,700

SMALL SCALE ILLUSTRATION–SCALE APPROX.: 1:68,000

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NARA Date 4-24-77

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

JAPAN IRON WORKS, FUNABASHI PLANT

FUNABASHI JAPAN

SHEET No. .....90.17-2146—TL
DATE.....24 May 1945
TARGET No. 90.17-2146
CATEGORY..End Product Ind.—Aircraft
COORDINATES ....35°43'N 139°59'E
ALTITUDE .....10 feet

SIGNIFICANCE:

A major plant of this company which produces a number of aircraft parts such as ailerons, cowlings, fuel tanks, pumps, and other similar equipment. In addition the company produces special steel parts. The size of this plant indicates that it is one of the more important aircraft components plants in the empire.

LARGE SCALE ILLUSTRATION—SCALE APPROX.: 1:10,200

SMALL SCALE ILLUSTRATION—SCALE APPROX.: 1:68,000

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NARA, Date 9-27-77

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

SENJU AIRCRAFT PARTS PLANTS
TOKYO JAPAN

SHEET . . . . . 90:17-2222—TL
DATE . . . . . 4 June 1945
PAGE 1
TARGET 90:17-2222
CATEGORY . . End Prdt. Ind.—AIRCRAFT
COORDINATES . . . . 35°44'N 139°48'E
ALTITUDE . . . . . 10 feet

SIGNIFICANCE:

Two former spinning mills now believed to be producing aircraft parts for Nakajima and Hitachi. The large building in the NW of the site has been 85 percent destroyed by bomber attack. The W section of the site is a former Kanegafuchi Textile Mill and the E section a former mill of Dai Nippon Boseki.

LARGE SCALE ILLUSTRATION—SCALE APPROX.: 1:10,200

SMALL SCALE ILLUSTRATION—SCALE APPROX.: 1:67,000

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By _____ NARA, Date 4-6-77

JOINT TARGET GROUP, WASHINGTON, D. C.
ECONOMIC DAMAGE ASSESSMENT

HITACHI AIRCRAFT
TACHIKAWA PLANT
TACHIKAWA • • • • • • • JAPAN

Sheet No.	90.17–2009 DA
Date	26 March 1945
Page No.	1
Target No.	90.17–2009
Obj. Area	90.17
Obj. Folder No.	90.17
Air Target System	Aircraft
Lat.	35°44′ N
Long.	139°25′ E
Alt.	330′

ALL PREVIOUS SHEETS CANCELLED

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER—JAPANESE AIRCRAFT WITH OTHER MATERIAL ON TARGET 90.17–2009

PARTICULARS OF ATTACK

This plant was attacked by naval aircraft during the carrier-based strike against the main Japanese Islands on 16–17 February 1945. No data are available at present concerning the number of planes attacking, tonnage dropped, bombing heights, etc.

PREVIOUS REPORTS

None.

PLANT FUNCTION

There is no knowledge at present on the precise role played by this plant in the Hitachi complex. The firm is known to make trainer engines ranging from 150 to 900 horsepower, as well as two older operational models—the Type 99 900 and the Kinsei 43/44, used in the obsolescent Sonia and Jake reconnaissance planes.

Monthly output is estimated on the basis of floor space to be 750 engines in the 900–1,000 horsepower range.

DAMAGE ASSESSMENT

1. Ten percent of this plant received structural damage and an additional 7 percent received superficial damage.

2. Most of this damage was concentrated on machine shops which received 16 percent structural and 8 percent superficial damage. Three buildings housing half of the machine shop area were heavily hit; these buildings received 26 percent structural damage.

3. This damage will cause a loss of slightly more than 2 months' output (including the loss of material in process) over the next 4 months. This loss cannot be ascribed to any specific engines because of the lack of knowledge concerning this plant.

EVIDENCE OF DISPERSAL AND REPAIR

Superficial damage in the assembly building (east half of building 16) had been partially repaired 10 days after the strike. No repair was in evidence in the more severely damaged machine shops.

Prior to this attack, 6 storage buildings (Nos. 6, 29, 31, 33, 35, and the west half of 18) had been removed. This "dispersal" is consistent with a similar policy seen at other Japanese airframe and engine plants where attempts have been initiated to remove built-up areas of combustible contents and/or structures.

FUTURE TARGET VALUE

Assuming no great amount of repair to damaged shops, the future target value of this plant will largely be contingent upon the degree to which this plant will be converted to the manufacture of combat engines. Repair will, of course, increase the target value of this plant.

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Sheet No. 90.18-2011-TI/1
Date 9 March 1945
Page No. 1 (2 pages)

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

New Target
Obj. Area 90.18
AAF Target No. 90.18-2011
NAME OF TARGET **SHIZUOKA AIRCRAFT ENGINE WORKS**

Place Shizuoka (Japan)
Air Target System: Aircraft

Lat.: 34° 59' N
Long: 138° 25' E
Alt.: 45 feet

ALL PREVIOUS SHEETS CANCELLED

SIGNIFICANCE

This plant is currently thought to be just getting into production. Present output is not known, but since the plant is quite new it is not believed to exceed 20 per cent of ultimate capacity. Eventual capacity of the existing plant is estimated to be 500-600 aero-engines per month. It is not believed, however, that this figure will be reached before late 1945 or early 1946.

The relation between offices and main manufacturing buildings, and the large site area as yet not built-up suggests that further physical expansion was originally planned. The recent trend towards dispersal, however, suggests that this program may not be put into effect at this plant site.

There is little ground information concerning this plant. It is reported owned by Mitsubishi, but it is not known what engines are now in production or planned. It seems logical to assume that newly developed high powered engines will be produced here, but even this belief must await confirmation before it can be accepted.

While this plant is not now one of the very important plants in the Japanese aircraft industry, its importance will increase as production is brought up and the older engine plants with much higher current production are damaged or destroyed.

LOCATION

The plant lies about 1.3 miles E of Shizuoka Station. It is located in open countryside approximately midway between the city and mountain range which separates Shizuoka from Shimizu Bay. The plant is about two miles inland from Suruga Bay and about 3 miles NE of the mouth of the Abe River. A new plant (possibly associated with Sumitomo) lies 2200 feet to the SW.

DESCRIPTION AND LAYOUT

(Refer to Illustration No. 90.18-2011 P3, P5, and P6). The target area is irregular in shape measuring about 3000 feet NE - SW and 500 feet NW - SE. The northeastern half of this area contains the productive buildings. The southwestern half has large stores of what appear to be building materials probably for new construction. A workers colony is located just outside of the N edge of the compound.

The productive area at present occupies a square measuring 2500 feet NE-SW by 2500 feet NW-SE. This area contains about 1,312,600 square feet of buildings. The largest building is a shop (building 16) which contains most of the plant's machine shop areas and probably also contains the engine assembly area in its southern quarter. Since this is a new plant it can reasonably be assumed that a linear flow of materials from raw stock to finished products exists for each of the departments.

PRIMARY OBJECTIVES

(Refer to Illustration No. 90.17-2011 P3, P5, and P6). Buildings 16 and 42. Building 16, occupying 663,000 square feet, is the most important. It contains most of the machine processes as well as assembly. Building 42, occupying 114,000 square feet, produces engine parts.

Destruction of these two buildings and their equipment would virtually eliminate the productive facilities of this target. Other buildings on the site have testing, maintenance, storage, and administrative functions.

HOLDERS OF JTG FOLDER: JAPANESE AIRCRAFT IN PLACE OF SHEET NO. 90.18-2011-TI, ALL PAGES
HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER

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JOINT TARGET GROUP - WASHINGTON, D.C.

TARGET INFORMATION SHEET *(Contd.)*

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT FOLLOWING SHEET NO. 90.18-2011 TI/1, PG 1

CONSTRUCTION & VULNERABILITY

(Refer to Illustration No. 90.18-2011 P3, P5, and P6).

PRIMARY OBJECTIVES listed in order of importance:

Building No.	Plan Area (square feet)	Roof*	Combustibility	HE Vulnerability**
16	663,000	Light	Non-combustible	V4
42	114,000	Light	Non-combustible	V4

CLASSIFICATION OF BUILDINGS:

	Primary Objectives	Whole Target
Total plan area of buildings (square feet).....	777,000	1,312,600
Combustibility:		
Fire resistant (R).....	0%	3%
Non-combustible (N).....	100%	60%
Combustible (C).....	0%	37%
HE Vulnerability:		
V1 (least vulnerable).....	0%	3%
V2.....	0%	0%
V3.....	0%	0%
V4.....	100%	97%
V5 (most vulnerable).....	0%	0%

COMBUSTIBILITY OF CONTENTS (whole target): Slight (less than average industrial fire occupancy). For detailed study of fire susceptibility of structures and contents refer to Illustration No. 90.18-2011 P5.

WEAPON RECOMMENDATIONS

Reference should be made to Weapon Recommendations Sheet No. 90.18-2011 WR1 for high and medium altitude attack and to Weapon Recommendations Sheet No. 90.18-2011 WR2 for low altitude attack.

CAMOUFLAGE, DECOYS AND SMOKE SCREENS

Photography of 5 November 1944 shows only a slight amount of disruptive roof painting. No decoys or smoke screens have been reported.

NOTES:

*Light weight roofs are readily penetrated by all types of incendiary bombs. Initiation of HE tail fuzes by these roofs cannot be depended upon except for bombs striking structural members (30% to 40% of bombs striking buildings).

**HE vulnerability classifications are explained in JTG Memorandum No. JTG/M/3/1 which is now in process of revision. In brief, a single vulnerability classification is assigned types of industrial buildings which behave in a similar manner when attacked with the same HE weapon. These vulnerability classes are arranged in order of vulnerability to HE attack, with very invulnerable, earthquake-proof structures assigned the classification V1. The other classifications V2, V3, V4, V5 are progressively more vulnerable types; V5 being the very vulnerable large span, arched hangar type structures.

ADDITIONAL INFORMATION

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By _____ NARA, Date 4-11-11

JOINT TARGET GROUP, WASHINGTON, D. C.

WEAPON RECOMMENDATIONS SHEET

Sheet No.	90.18–2011 WR1
Date	26 March 1945
Page No.	1
Target No.	90.18–2011
Obj. Area	90.18
Obj. Folder	New target—not in any folder
Air Target System	Aircraft
Lat.	34° 59′ N.
Long.	138° 25′ E.
Alt.	45′

SHIZUOKA AIRCRAFT ENGINE WORKS

SHIZUOKA • • • • • • JAPAN

High and Medium Altitude Attack

AIMING POINT

For maximum damage to primary objectives the aiming point should be building 16. (Illustrations No. 90.18–2011 P3, P5.)

WEAPONS AND FUZING

	HE	Fuze	IB
Preferred	1,000-lb. GP	.01 N/ND T	AN–M50 4-lb. (in aimable clusters).
Alternative	500-lb. GP	.01 N/ND T	AN–M69 6-lb. (in aimable clusters).
	2,000-lb. GP	.01 N/ND T	AN–M47 70-lb. AN–M76 500-lb.

Not recommended: Smaller GP Bombs.
SAP or AP Bombs.
Depth Bombs.

(*a*) Use 0.1 N fuzes, if 0.01 N fuzes are not available.

(*b*) The 500-lb. GP and 2,000-lb. GP are respectively 95 and 90 percent as effective as the 1,000-lb. GP bomb.

LOADING TABLE FOR INITIAL ATTACK

Loading table for preferred combination of bombs [2]

[This table is prepared for an initial attack on this target. For its application to later attacks see JTG Memorandum No. 3/1]

Tons (actual) dispatched	Percent of bombs dispatched falling within 1,000 feet of aiming point											
	10 percent			15 percent			20 percent			30 percent		
	Tons		F [1] percent	Tons		F [1] percent	Tons		F [1] percent	Tons		F [1] percent
	HE	IB		HE	IB		HE	IB		HE	IB	
50	----	----	----	25	25	15	20	30	20	10	40	30
100	35	65	20	25	75	30	20	80	35	10	90	40
200	35	165	35	25	175	45	20	180	45	50	150	50
400	35	365	45	100	300	50	150	250	55	250	150	60
800	350	450	55	500	300	65	----	----	----	----	----	----
1,000	550	450	60	----	----	----	----	----	----	----	----	----

[1] Expected percent of serious damage to the whole target.

[2] If the alternative bombs are used, the distribution of the load between HE and IB should be the same. The expected percent of damage will, of course, be lower.

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT WITH OTHER 90.18–2011 MATERIALS

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175 T–5

By ____ NARA. Date 4-6-11

JOINT TARGET GROUP, WASHINGTON, D. C.
WEAPON RECOMMENDATIONS SHEET

SHIZUOKA AIRCRAFT ENGINE WORKS

SHIZUOKA . . . . . JAPAN

Sheet No.	90.18–2011 WR2
Date	28 March 1945
Page No.	1
Target No.	90.18–2011
Obj. Area	90.18
Obj. Folder	New target—not in any folder
Air Target System:	Aircraft
Lat.	34°59′ N.
Long.	138°25′ E.
Alt.	45 feet

ALL PREVIOUS SHEETS CANCELLED

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT WITH OTHER MATERIAL ON TARGET 90.18–2011

Low Level Attack

(See also 90.18–2011 TI/1 and associated target illustrations)

TYPE OF ATTACK

This sheet applies primarily to an attack by carrier based aircraft, fighter bombers, or other similar aircraft which carry out dive, glide, low level, or minimum altitude attacks.

BUILDINGS CONSIDERED

Data are given below for an attack on primary and/or secondary buildings only. (See Ill. No. 90.18–2011 P3, P5.) Other buildings are of insufficient importance to merit specific attack.

WEAPONS AND FUZING

A pure HE attack (no incendiaries) may be launched against the buildings specified in the table below. The choice of a particular HE weapon for attack on a given building can be made by considering both the number of hits on that building required for the various bombs (see the table below) and the stowage capabilities of the aircraft to be used. The proper fuzings for the HE weapons to be used against the individual buildings are given in the table below, with the exception that for minimum altitude attacks a 4–5 second delay is required for safety to the aircraft. The use of SAP, AP, smaller GP, or depth bombs is not recommended for this target.

NUMBER OF HITS

Number of hits required to achieve 50 percent serious damage to individual important buildings [1]

Buildings in order of importance to production (Ill. No. 90.18–2011 P3, P5)	Number of hits			Fuzing [2]
	500-lb. GP	1,000-lb. GP	2,000-lb. GP	
16	112	57	31	0.01 N/ND T
42	19	10	5	.01 N/ND T

[1] To obtain the number of hits required to achieve 30 percent serious damage to individual important buildings, multiply the appropriate entry in the preceding table by 0.5; for 70 percent serious damage, multiply by 1.7.
[2] Use 0.1 N fuzes, if 0.01 N fuzes are not available.

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Sheet No. 90.18-2011-P6
Date 9 March 1945
Page No. 1 (1 pages)

JOINT TARGET GROUP, WASHINGTON, D.C.
FUNCTIONAL IDENTIFICATION SHEET
(to be read in conjunction with Illustration No. 90.18-2011 P5)

New Target
Obj. Area 90.18
AAF Target No. 90.18-2011
Place Shizuoka (Japan)
Air Target System Aircraft
Lat.: 34° 59'N
Long: 138° 25'E
Alt.: 45 feet

NAME OF TARGET SHIZUOKA AIRCRAFT ENGINE WORKS

ALL PREVIOUS SHEETS CANCELLED

Building No.	Function of Building
1-5	Offices, Plant Administration
6-8	Unidentified
9-11	Storage, Receiving of Rough Material, Probably Some Shop Work, Cleaning, Cutting, etc.
12, 13	Offices, Some Storage
14, 15	Storage
16	Shop Building - Main Plant Building (663 x 1000 feet), Final Assembly, Dis-assembly and Shipping Probably Occupies 10 Bays at S End. Balance Contains Parts Machining and Sub-assembly.
17-28	Storage, Raw Materials, Parts etc.
29	Boiler House
30	Unidentified
31	Eight (8) Engine Test Cells
32	Twelve (12) Engine Test Cells
33, 34	Storage and Shop Probably Related to Engine Testing
35	Probable Utilities - Pumps For Water Supply, etc.
36	Possible Electric Generating from A/C Engines; a Transformer Yard Adjoins.
37	Garage
38	Storage
39	Unidentified Revetted Building
40, 41	Probable Storage
42	Machine Shop, Engine Parts Manufacture

(Based on F/A Report No. 26, AC/AS Intelligence, Photographic Division, dated 1 January 1945).

HOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT WITH CORRESPONDING MATERIAL

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JOINT TARGET GROUP • WASHINGTON, D. C.

TARGET No. 90.18–2011

COORDINATES 34° 59′ N 138° 25′ E

PHOTOGRAPHED 5 NOVEMBER 1944

SHIZUOKA AIRCRAFT ENGINE PLANT
SHIZUOKA, JAPAN

0 2000 4000 6000 FEET

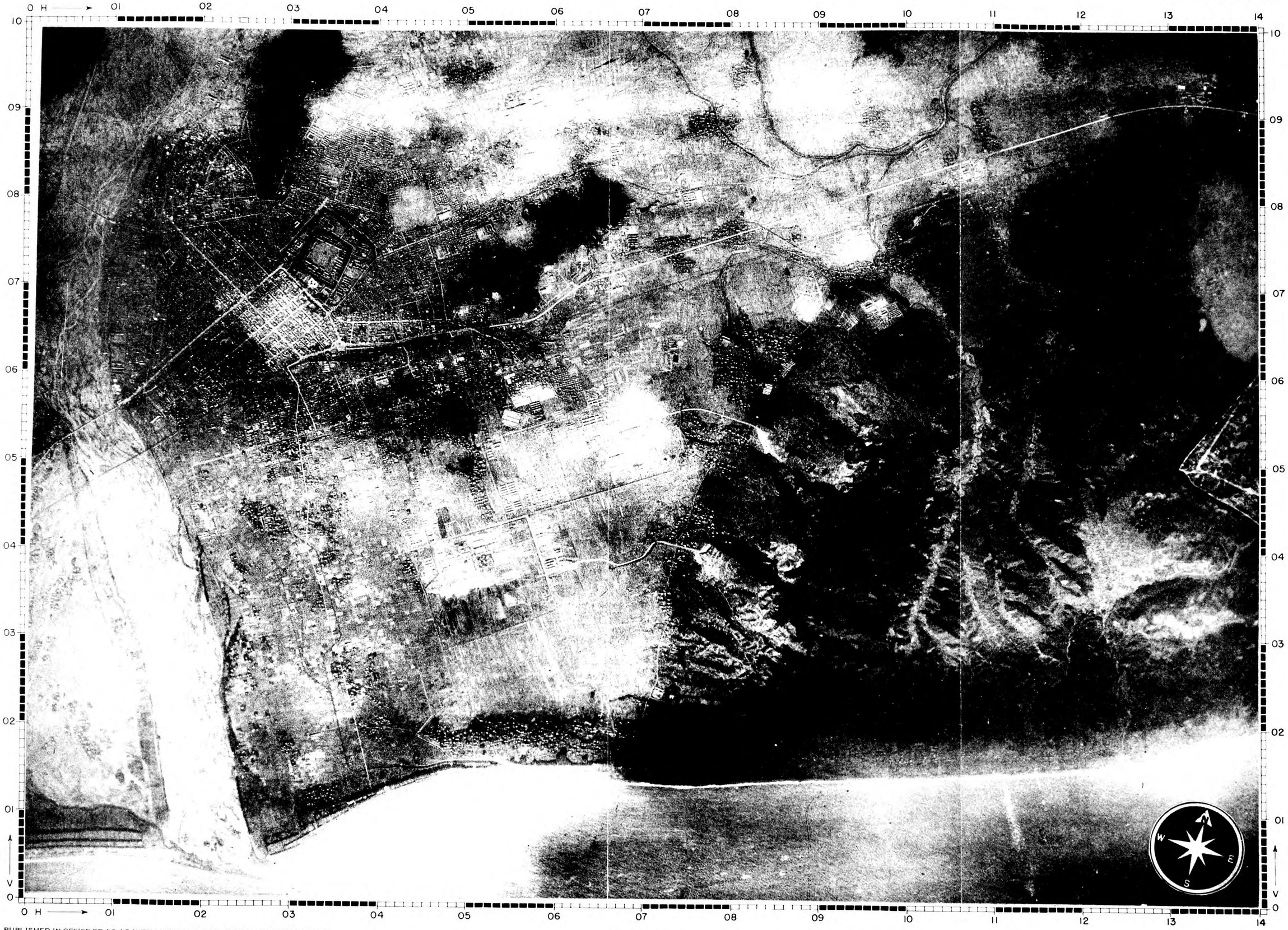
0 ½ 1 MILE

1:32 000 APPROX.

ILLUSTRATION No. 90.18–2011 P1

ISSUED 22 JANUARY 1945

RESTRICTED



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May be taken into the air if data is trimmed off

TYPE A

NARA Date 4/5/11

JOINT TARGET GROUP • WASHINGTON, D. C.

TARGET No. 90.18–2011

SHIZUOKA AIRCRAFT ENGINE WORKS
SHIZUOKA, JAPAN

ILLUSTRATION No. 90.18–2011 P3/1

COORDINATES 34° 59′ N 138° 25′ E

PHOTOGRAPHED 5 NOVEMBER 1944

0 500 1000 1500 2000 2500 3000 FEET

0 1/4 1:6000 APPROX. 1/2 MILE

DATE 26 APRIL 1945

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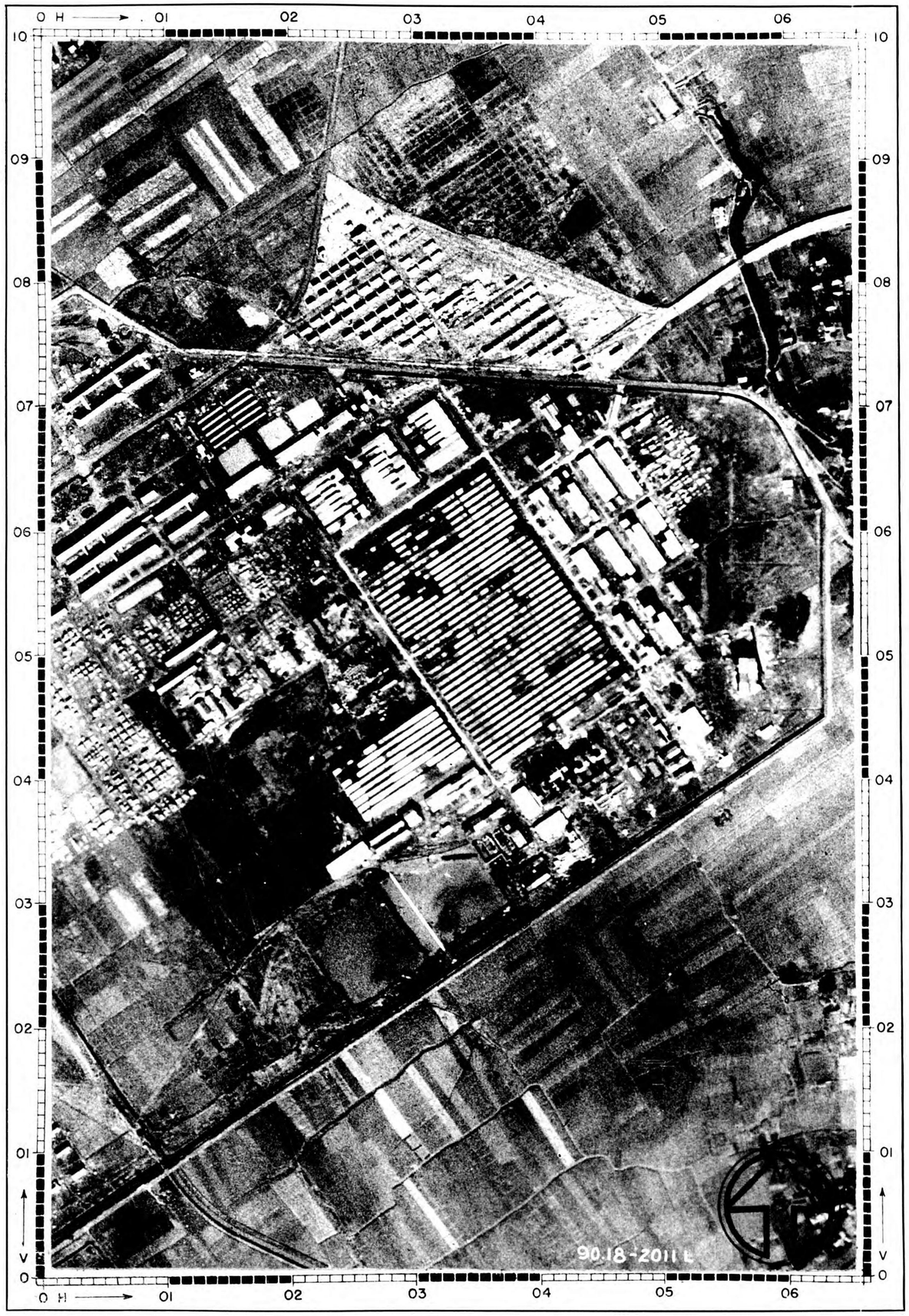

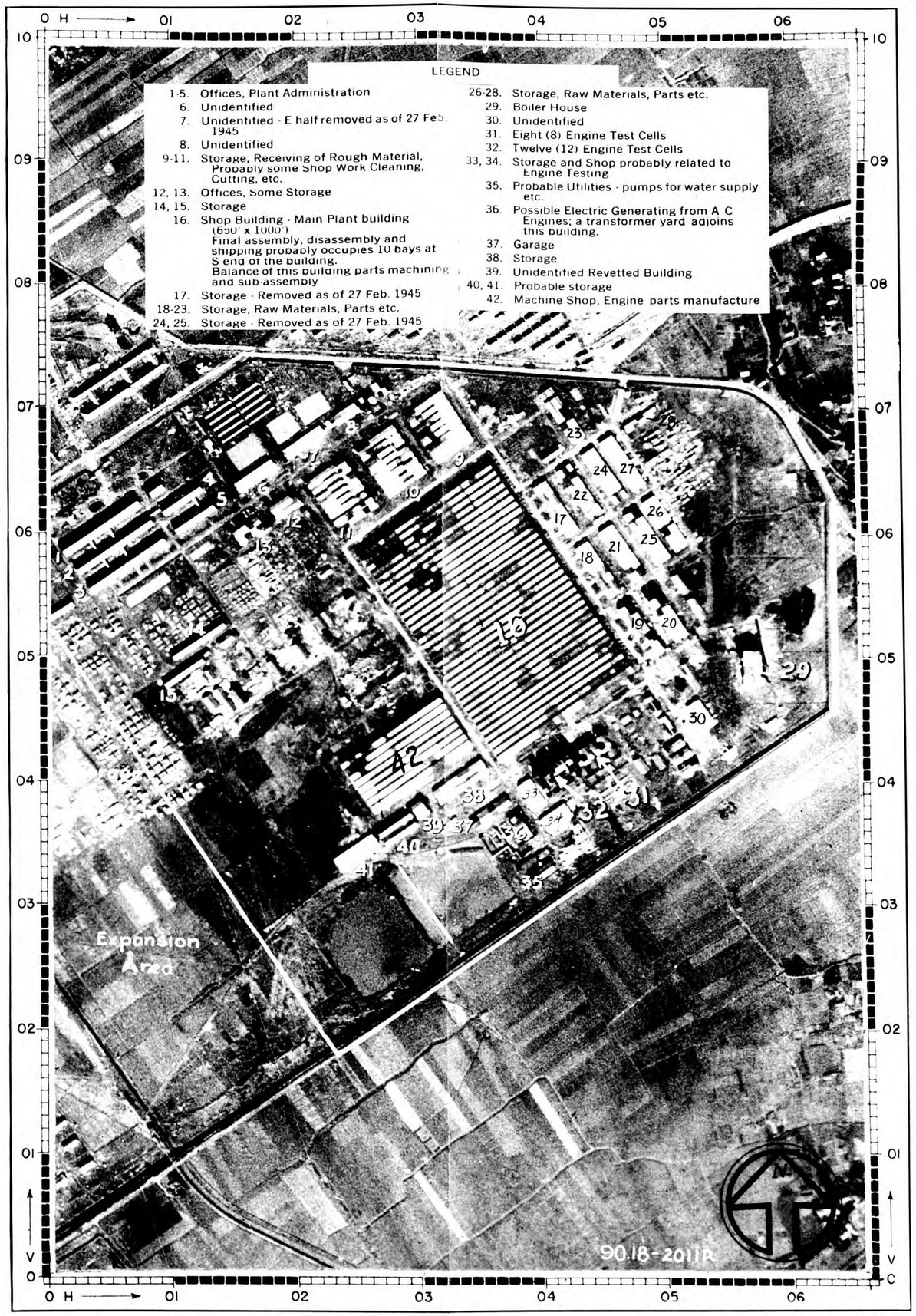

FOLDERS OF JTG FOLDERS SHOULD INSERT THIS SHEET IN AIR TARGET SYSTEM FOLDER: JAPANESE AIRCRAFT IN PLACE OF SHEET 90.18—2011 P3.

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NARA. Date 5-5-77

TARGET NO. 90.18-2011

APPROX. COORDINATES 34°59′ NORTH
138°25′ EAST

PHOTOGRAPHED 5 NOVEMBER 1944

JOINT TARGET GROUP - WASHINGTON, D. C.

SHIZUOKA AIRCRAFT ENGINE WORKS
SHIZUOKA, JAPAN

SCALE 1:6,000

500 0 500 1000 FEET

ILLUSTRATION NO. 90.18-2011-P5

ISSUED 20 FEB 1945

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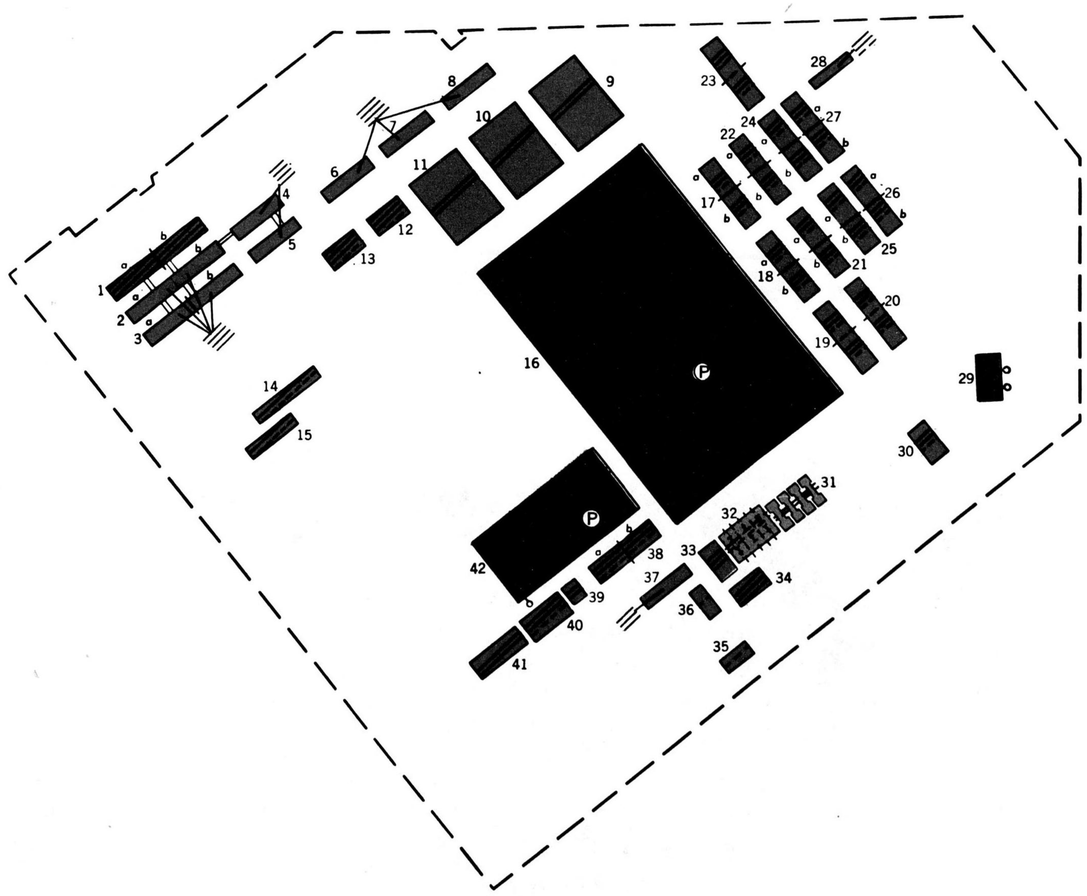

FIRE SUSCEPTIBILITY PLAN

PRIMARY BUILDINGS	(P)	FIRE WALL, CERTAIN	
SECONDARY BUILDINGS	(S)	FIRE WALL, PROBABLE	

BUILDINGS		CONTENTS	
COMBUSTIBLE		NON-COMBUSTIBLE	
NON-COMBUSTIBLE		SLIGHTLY COMBUSTIBLE	
FIRE RESISTANT		MODERATELY COMBUSTIBLE	
COMBINATION I.E. COMBUSTIBLE ROOF RESISTANT FLOORS		HIGHLY COMBUSTIBLE	
		EXTREMELY COMBUSTIBLE	
WATER TANK	(W)	INTERMEDIATE VALUES	

AREA IN SQ. FT.	PRIMARY	ALL BLDGS. SHOWN
NO. OF BUILDINGS	2	42
NO. OF FIRE DIVISIONS	2	78
PLAN AREA	777,000	1,312,600
TOTAL FLOOR AREA	777,000	1,327,000
SITE AREA	6,210,000	

PREPARED BY AERONAUTICAL CHART SERVICE, AAF.

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