ANNEX 3.—*Summary of duties and organization of plants*—Continued

Name of plant	Name of shop	Main works	Location
Iwami plant	Office		Gotsu Cho, Naga Gun, Shimane prefecture
	Osaka branch	Management and administration of civilian plants in the vicinity of Osaka.	Arsenal, Higashi Ku, Osaka.
	Shop No. 1	Tools, jigs, and gages, matériel for shell casings	Gotsu Cho, Naga Gun, Shimane prefecture.
	Shop No. 2	Artillery shells	Do.

ANNEX 4.—*Outline and organizational chart of supervisory sections*

Designation	District supervised	Headquarters
Kinki supervisory bureau	Fukui, Shiga, Nara, Kyoto, Osaka, Wakayama, Hyogo prefecture.	Osaka Army Arsenal, Sugiyama Cho, Higashi Ku, Osaka.
Joto supervisory section	Aasahi Ku, Joto Ku, Kitakawachi Gun, Nakakawachi Gun, Nara prefecture.	Seiken National School, Joto Ku, Osaka.
Josei supervisory section	Osaka City (less Asahi, Joto, Higashiyodogawa, and Nishi-Yodogawa Ku).	First floor Dojima Building, Kinukasa Cho, Kita Ku, Osaka.
Yodogawa supervisory section	Osaka prefecture (north above the Yodogawa)	Osaka Machinery Factory, 208 Tsukuda Cho, Nishiyodogawa Ku, Osaka.
Sakai supervisory section	Sakai, Minamikawachi Gun, Senboku Gun, Sennan Gun Kishiwada, Kaizuka, Osaka prefecture, Wakayama prefecture.	Osaka "Diamond" Ho Cho, Sakai (city).
Kyoto supervisory section	Kyo, Shiga, and Fukui prefecture	72–2 Kawabe Cho. Higashi Kyujo, Shimokyo Ku, Kyoto.
Permanently assigned personnel at Fukui	Fukui prefecture	Sakai Signal Equipment Manufacturing Co., Ltd., Seiren Plant; Kado Cho, Fukui (city).
Kobe supervisory section	Hyogo prefecture	Room No. 17 (No. 3), Kobe Steel Factory, Mikage Cho, Muko Gun, Hyogo prefecture.
Chugoku branch office	Okayama, Hiroshima, Yamaguchi, Shimane Tottori prefecture, Kyushu.	Gion Cho, Asagun, Hiroshima.
Hiroshima supervisory section	Hiroshima and Okayama prefecture	Hiroshima Factory, Nippon Steel Manufacturing Co., 2186 Funakoshi Cho, Irigawa, Aki Gun, Hiroshima prefecture.
Kudamatsu supervisory section	Yamaguchi prefecture, Kyushu	Hidachi Factory, Oji Higashi Toyoi, Kudamatsu (city).
Permanently assigned personnel at Okayama	Okayama	
Permanently assigned personnel at Fukuyama	Okayama prefecture, vicinity of Fukuyama	
Matsue supervisory section	Shimane and Tottori prefecture	Shimane prefecture, Iron Works Building, Teramachi Cho, Kamiichi, Tottori prefecture.
Shikoku branch office	Kagawa, Tokushima, Kochi, Ehime prefecture	Noda Heavy Industries, Ltd., 4 Cho Me, Matsushima Cho, Takamatsu (city of).
Permanently assigned personnel at Matsuyama	Ehime prefecture	Tachibana Shop, Okada Manufacturing Plant; 317 Nishi Tachibana Cho, Matsuyama.
Permanently assigned personnel at Tokushima		Toho Precision Tool Industries, Ltd., 345 Takami, Amami Cho, Tokushima (city).
Permanently assigned personnel at Kochi	Kochi prefecture	Tosa Motorboat Industries, Ltd., 1617 Niida, Kochi (city).
Fukushima supervisory section	Fukushima, and Miyagi prefecture	Fukushima Manufacturing Factory Ltd., I Mikawa Kita Cho, Fukushima.
Maebashi supervisory section	Gunma prefecture	Riken Industries, Ltd., Motososharrin aza Sosha, Gunma Gun. Gunma prefecture.
Tokyo supervisory section	Tokyo, Kanagawa prefecture	Tokyo Arsenal No. 1, Shimojujo, Oji Ku, Tokyo.
Nagoya supervisory section	Aichi, Gifu prefecture	1600 Nakajima Cho, Hamamatsu, Shizuoka prefecture.

ANNEX 5.—*Government-operated installations (ground structures)*

Designation	Location	Land area (square meters)	Residences	Shops	Miscellaneous [1]	Total	Remarks
Osaka arsenal	Sugiyama Cho, Higashi Ku, Osaka	1,176,545		79,104	15,880	94,984	
Area adjoining Osaka arsenal	Detachable equipment in various locations	(27,901)		7,328	690	8,018	
Hirakata plant	Hirakata Cho, Kitakawachi Gun, Osaka prefecture.	1,187,513	18,790	(5,739)	(7,030)	(12,769)	
Hirakata plant, Amanogawa shop	do			122,826	76,214	217,830	
Hirakata plant, Nakajima shop	Shibajima Cho, Higashi Yodogawa Ku, Osaka prefecture.	(43,069)	(2,772)	(7,437)	(8,139)	(18,348)	
Hirakata plant, Fushimi shop	Tsuda Cho, Mukojima, Fushimi Ku, Kyoto.	(58,803)	(8,395)	(8,190)	(16,962)	(33,547)	
Hirakata plant, Yonago shop		610			822	822	
Harima plant	Arai Mura, Kago Gun, Hygoo prefecture	(54,658)	(3,007)	(3,378)	(4,366)	(10,751)	
Iwami plant	Gotsu Cho, Naga Gun, Shimane prefecture	75,874					
Shirahama plant	Shirahama Cho, Shikuma Gun, Hygo prefecture.	(56,836)	(3,274)	(1,314)	(11,451)	(16,039)	Under construction.
Sonobe district	Sonobe Cho, Funai Gun, Kyoto prefecture	1,601,643	22,123	102,000	51,882	176,005	
Aino district	Ai Mura, Arima Gun, Hyogo prefecture	(264,470)			2,882	2,882	
Nagao district	Kono Mura, Kita Kawachi Gun, Osaka prefecture.	142,780	(249)	(30,926)	(39,025)	(70,200)	
Kisaichi district	Tsuda Cho, Kita Kawachi Gun, Osaka prefecture.	(247,500)	1,504	34,514	9,038	45,056	Do.
Otsukawa firing range	Udá, Izumiotsu (city of)	(267,540)	660	2,699	2,680	6,039	Being vacated. Work still going on.
Yura firing range	Ura Cho, Tuna Gun, Hyogo prefecture	(18,150)	2,060	396	551	3,007	Do.
Kitajima powder magazine	Kitajima Cho, Sumiyoshi Ku, Osaka	100,693		191	677	868	Do.
		35,583		231	1,816	2,047	
		50,407	112	152	910	1,174	Now closed.
					1,215	1,215	

[1] Indicates the totals of warehouses, offices, and miscellaneous structures.
Total within parentheses are rented private structures.

ANNEX 6.—*Table of essential equipment and machinery c. 15 Aug. 1945*

Classification	Osaka arsenal (including others outside of structure)	Hirakata plant units					Harima	Iwami	Shirahama	Total
		Hirakata	Fushimi	Yonago	Amanogawa	Nakajima				
Machine tools	3,618	2,938	183	0	503	16	300	407	447	8,412
Production machinery	1,181	670	2	0	26	63	606	196	32	2,776
Machinery and equipment for explosives	0	16	0	1	1	0	0	0	0	18
Machinery for loading powder charges	0	0	0	0	0	0	0	0	0	0
Vehicles	262	87	0	0	1	2	53	37	24	466
Electrical machinery	850	448	5	0	32	13	416	99	272	2,135
Woodworking tools	56	4	0	0	0	0	7	7	62	136
Precision machine gages	314	96	0	0	21	0	22	49	9	511
Total	6,281	4,259	190	1	584	94	1,404	795	846	14,454

Record of equipment and machinery (under assistance law) 15 August 1945

Classification	Kobe Steel & Ordnance Factory			Nippon Steel Manufacturing		
	Akashi	Agei	Kurayoshi	Musashi	Muroran and Hiroshima	Total
ARTICLE NO. 3						
Machine tools	552	10	128	428	203	1,291
Production tools	112	19	33	104	0	268
Vehicles	0	0	0	0	0	0
Electrical machinery	91	20	20	75	1	207
Woodworking tools	0	4	0	0	0	4
Precision machine gages	16	0	2	11	0	29
Total	771	53	183	618	204	1,799

ANNEX 7

(Omitted as not pertinent)

ANNEX 8.—*Value of public property*

Classification	Value (yen)
Land and structures:	
Land	28,848,000
Structures	48,820,000
Construction matériel	16,160,000
Total	93,828,000
Tools and machinery:	
Tools	7,624,000
Machinery	122,661,000
Construction matériel	35,564,000
Ships	518,000
Total	166,367,000
Grand total	260,195,000

NOTES.—Above amounts are generally those of the end of March 1945.

ANNEX 9

Record of facilities (under assistance law) 15 August 1945

(1) LAND AND STRUCTURES

	Land	Structures
Kobe Steel & Ordnance Factory:	*Square miles*	*Square miles*
Akashi	123,337	43,949
Agei	101,320	36,422
Kurayoshi	66,669	33,028
Nippon Steel Manufacturing:		
Musashi	304,514	56,553
Total	595,840	169,952

ANNEX 9.—Continued

(2) MACHINERY AND TOOLS

	Article No.	Machinery and tools	Production machinery	Vehicles	Electrical machinery	Woodworking tools	Precision machine gauges	Grand Total
Kobe Steel & Ordnance Factory:								
Akashi	3	522	112	0	91	0	16	741
Agei	3	10	19	0	20	4	0	53
Do	5	136	27	0	240	0	3	406
Kurayoshi	3	128	33	0	20	0	2	183
Do	5	13	3	0	89	0	0	105
Nippon Steel Manufacturing:								
Musashi	3	428	104	0	75	0	11	618
Muroran Hiroshima	3	203	0	0	1	0	0	204
Grand total		1,440	298	0	536	4	32	2,310

ANNEX 10.—*Table showing damages due to air raids*

1. ORDNANCE CLASSIFICATION (MAJOR ITEMS)

a. Weapons:
- 6 model 92 heavy machine guns lost by fire or bombing.
- 3 model 2 stationary machine cannons lost by bombing.

b. Ammunition:
- Approximately 3,820 rounds for model 92 heavy machine gun lost by fire and bombing.
- Approximately 800 rounds for model 1 stationary machine cannon lost by bombing.
- Approximately 4,000 rounds for model 2 stationary machine cannon lost by bombing.

2. MATÉRIEL CLASSIFICATION (MAJOR ITEMS).

(Entirely lost by fire or bombing)

		Approximately
a. Matériel:		
Ores	tons	11,000
Raw material for steel manufacturing	tons	600
Lumber	koku	38,000
Ordnance parts	tons	5,000
Electrical parts	do	1,000
Water-works parts	do	4,000
Automobile parts (for)	vehicles	1,000
Lacquer goods	tons	900
Explosives	do	300
Paper	do	3,000
Boxes	each	160,000
Wood and charcoal	tons	220
Fiber:		
Cloth	yards	43,600,000
Thread	pounds	7,600,000
Cotton	tons	60
Clothing	pairs	8,000

ANNEX 10.—*Table showing damages due to air raids*—Con.

2. MATÉRIEL CLASSIFICATION (MAJOR ITEMS)—Continued

		Approximately
b. Finished products:		
Various binoculars		2,100
Various binocular tubes		1,700
Various gages		42,000
Model 96 15-centimeter howitzer	pieces	3
Model "Yasu" 12-centimeter cannon	pieces	3
Model 99 8-centimeter antiaircraft gun	pieces	5
Model 3 75-millimeter tank gun	do	2
Model 1 47-millimeter gun	do	2
Model 3 12-centimeter antiaircraft gun	pieces	2
c. Unfinished products:		
Model 99 8-centimeter antiaircraft gun	pieces	32
Model 3 75-millimeter tank gun	do	31
Model 1 47-millimeter gun	do	79
Model 1 47-millimeter tank	do	235
Model 92 infantry gun	do	36
Model 41 mountain gun	do	19
12-centimeter mortar	do	70
Small 37-millimeter gun	do	35
Shell cases		100,000

3. DAMAGE TO FACILITIES (MAJOR ITEMS)

		Approximately
a. Buildings:		
Completely destroyed (15 buildings)	tsubo	5,800
Seriously damaged (25 buildings)	tsubo	28,100
Moderately damaged (52 buildings	tsubo	44,000
Slightly damaged (18 buildings)	do	11,800
Completely burned (105 buildings)	tsubo	42,500
Half burned (3 buildings)	do	1,700
b. Miscellaneous:		
Warehouses:		
Completely burned	places	39
Partially burned	do	3
Quarters:		
Completely burned	do	1
Partially destroyed	do	1
Completely burned	do	34
Partially burned	do	1

Machinery:

	Machinery	Tools	Construction equipment	Automobiles	Total
Loss by bombing		290			290
Seriously damaged	535	33	129	14	711
Partly damaged	208		36	3	247
Slightly damaged	145		29	1	175
Damaged by fire	1,245	882	107	13	2,245
Total	2,133	1,205	301	31	3,668

Appendix 2

OSAKA ARMY ARSENAL ORGANIZATION AND LOCATION OF FACTORIES AND WAREHOUSES

The Organization of Headquarters, Osaka Army Arsenal

Name of department	Supervision of—	Chief duties
General affairs department	Correspondence	Documents, orders, reports, morale, and discipline.
	Personnel	Personnel, organization within the arsenal and education.
	Labor	Labor, military deferment, safety measures.
	Defense	Air defense, security measures.
Administration department	Technology	Methods of manufacture, design and planning of ordnance, technology.
	Inspection	Inspection of ordnance, gages, supplies, ordnance records.
	Standards	Manufacturing methods for ordnance, regulations and procedure of inspections, various standards.
Operations	Production	Management of operations, manufacturing and standardization of ordnance production, plans for munitions mobilization, standardization of facilities.
	Materials	The supplying and requisitioning of basic raw materials and production supplies. Collection and use of commodities, war materials.
	Supervision	Control and administration of employment of utilized civilian plants.
Technical department	Machinery	Installation of tools and machinery, maintenance, repairs, inspection, and materials to be used in installations.
	Installations	Installation and maintenance of ground works.
	Construction Unit	Installating and maintenance of facilities within arsenal.
Finance department	Accounts	Examination of budget; settlement of receipts and disbursements.
	Requisition	Expenditures and receipts of cash. Handling of goods, loan transactions, supervision of finances.
	Warehouse	Supervision of warehouse transaction.
Medical affairs department	Sanitation dispensary	Labor sanitation. Treatment and care (of patients).

Summary of duties and organization of plants

Name of plant	Name of shop	Main works	Location
Plant No. 1	Office		Main arsenal, Higashi Ku Osaka.
	Shop No. 1	Large caliber guns	Do.
	Shop No. 2	Sighting instruments, machinery repair	Do.
	Shop No. 3	Antiaircraft guns, field and mountain guns (including gun repairing).	Do.
	Shop No. 4	Aircraft parts	Do.
	Shop No. 5	Forgings, sheet metal, springs, smelting	Do.
	Shop No. 6	Woodworking, saddles, wheels	Do.
	Shop No. 7	Large caliber guns	Do.
	Shop No. 8	Antiaircraft guns, small caliber guns, tools, jigs, and gages.	Main arsenal, Joto Ku Osaka.
	Shop No. 9	Antiaircraft guns, small caliber guns	Do.
	Shop No. 10	Large caliber guns	Do.
	Tonda shop	Automobile repairs	Tonda cho, Joto Ku Osaka.
Plant No. 4	Office		Main arsenal, Higashiku Osaka.
	Shop No. 1	Tools, jigs, and gages	Sonobe cho, Funai Gun, Kyoto.
	Shop No. 2	Steel manufactures, casts, forges, lathe, smelting	Arsenal, Higashi Ku, Osaka.
	Shop No. 3	Wood mold for forgings, plating tools	Do.
	Shop No. 4	Cartridge cases for large caliber guns, helmets, nonferrous metal castings, press and roller.	Do.
Hirakata plant	Office		Hirakata cho, Kita Kawachi Gun, Osaka prefecture.
	Shop No. 1	Lathe for shells and bombs	Do.
	Shop No. 2	Press for shells and bombs	Do.
	Shop No. 3	Tools, jigs, and gages, press and roller for large caliber gun shells.	Do.
	Shop No. 4	Press and roller, and roller for fuze parts	Do.
	Shop No. 7	Fuse assembly	Do.

Summary of duties and organization of plants—Continued

Name of plant	Name of shop	Main works	Location
Hirakata plant	Shop No. 8	Filling and coverting of power shells, lathes	Higashi Ku Osaka, Arsenal.
Nakajima	Shop	Fuse assembly	Shibajima cho, Higashi yodogaw a Ku Osaka.
Amanogawa	Shop	Lathe work and assembly for fuze parts, sabres	Hirakata cho, Kitakawachi Gun, Osaka, prefecture.
Fushimi	Shop	Lathe for fuse parts	Mukojima cho, Fushimi Ku Kyoto city.
Yonago	Shop	Fuse assembly	Yonago, Nishiki cho, Tottri, prefecture.
Hirima plant	Office		Arai Mura, Kago Gun, Hyogo prefecture.
	Shop No. 1	Steel and castings	Do.
	Shop No. 2	Forges	Do.
	Shop No. 3	Lathes	Do.
	Shop No. 4	Smelter and press	Do.
Shirahama plant	Office		Shirahama cho, Shikumei Gun, Hyogo prefecture.
	Osaka branch—Supervision and administration of civilian plants in Keihan area.		Temma, Higashi Ku, Osaka.
	Ujina branch—Supervision and administration of civilian plants in Chugoku area.		Ujina cho, Hiroshima city.
	Shop No. 1—Assembly of large steel LMC's		Shirahama cho, Shikama Gun, Hyogo prefecture.
	Shop No. 3—Manufacture of accessories (parts)		Do.
Iwami plant	Office		Kozu cho, Naga Gun, Shimane prefecture.
	Osaka branch—Management and administration of civilian plants in the vicinity of Osaka:		
	Shop No. 1, tools, jigs, and gages, material for shell castings		Arsenal, Higashi Ku, Osaka.
	Shop No. 2, artillery shells		Kozu cho, Nago Gun, Shimane prefecture.

LIST A.—*List of warehouses belonging to Osaka Army Arsenal*

(See list B for addresses)

1 Tazuke Building warehouse.
2 Tamurakoma warehouse.
3 Utsubo warehouse.
4 Kokyo warehouse.
5 Seika warehouse.
6 Kobayashi warehouse.
7 Kitsugawa warehouse.
8 Dai ichi Chohei kan warehouse.
9 Hidachikan warehouse.
10 Momodani warehouse.
11 Ikuno Dai-san bank warehouse.
12 Nakagawa-bunko warehouse.
13 Shinonome warehouse.
14 Tamatsukuri warehouse.
15 Nakamoto school warehouse.
16 Imazato warehouse.
17 Nakamoto warehouse.
18 Showa Oil Ltd., Co.
19 Higashi-Nakamoto warehouse.
20 Nakahama warehouse.
21 Nakamoto bank warehouse.
22 Hanaten warehouse.
23 Shigino coal depot.
24 Shigino warehouse.
25 Shigino school warehouse.
26 Enomoto school warehouse.
27 Seiken school warehouse.
28 Namazue school warehouse.
29 Higashinoda school warehouse.
30 Sekime warehouse.
31 Ohmiya warehouse.
32 Furuichi warehouse.
33 Ohsumi school warehouse.
34 Minamikata school warehouse.
35 Hirano school warehouse.
36 Takadono school warehouse.
37 Osaka christian church in shimanouchi warehouse.
38 Fukumichi warehouse.
39 Suwa school warehouse.
40 Shirokita banks warehouse.
41 Ohmiya school warehouse.
42 Ohmiya nishi school warehouse.
43 Morimachi warehouse.
44 Yura warehouse.
45 Ozaki warehouse.
46 Hineno warehouse.
47 Tadaoka warehouse.
48 Ohtsu warehouse.
49 Hamadera warehouse.
50 Ishizu warehouse.
51 Sakai-Minato warehouse.
52 Sakai warehouse.
53 Middle commercial school of Sakai.
54 Girls school of Sakai.
55 Onchi warehouse.
56 Tokuan warehouse.
57 Shigino warehouse.
58 Futashima school.
59 Shinomiya school.
60 Neyagawa warehouse.
61 Hoshida warehouse.
62 Kaida warehouse.
63 Sakurai warehouse.
64 Tonda warehouse.
65 Ibaraki warehouse.
66 Ibaraki girls school warehouse.
67 Gozei school warehouse.
68 Kunei girls school warehouse.
69 Naniwa technical school warehouse.
70 Seikei girls school warehouse.
71 Senriyama warehouse.
72 Toyonaka girls school warehouse.

73 Hachiryoba warehouse.
74 Goma warehouse.
75 Uji warehouse.
76 Sakai girls school warehouse.
77 Shiko-Kizoku Co. warehouse.
78 Uree warehouse.
79 Shirahama warehouse.
80 Sakurajima warehouse.
81 Tsujibayashi warehouse.
82
83 Togo Cotton Co., Ltd.

LIST B.—*Address of warehouses*

1 2 chome Bingo machi, Higashiku, Osaka:
Glossy silk.
Cloth for cartridge bag.
Silk thread.
Bearing.
Cotton thread.
2 3 chome Bingo machi, Higashiku, Osaka.
Cloth for cartridge bag.
Cotton cloth.
Hemp rope.
Hemp canvas.
Hemp thread.
Felt.
Paper.
3 Utsubo 3 chome, Nishiku, Osaka:
Boxes.
Welding stick.
4 Kokyo school Nishiku, Osaka:
Rubber tires.
Whetstone.
Rubber belt.
5 Seika girls school Nishiku, Osaka:
Textile goods.
6 Kobayashicho Taisho ku, Osaka:
Lumber yards.
7. Kitsugawa cho Taisho Ku, Osaka:
Lumber yards.
8 Junkeimachi Minami Ku, Osaka:
Belt.
Whetstone.
9 Nagahoribashi 2-chrome Minamiku, Osaka:
Boxes.
10 Momodani cho Tennoji Ku, Osaka:
Sand for steel product.
Black-lead powder.
11 Hayashideracho Ikunoku, Osaka:
Wooden hammer.
Boxes.
Whetstone.
Paper.
12 Nakagawacho Ikuno Ku, Osaka:
Straw rope.
13 Shinonomecho Higashiku, Osaka:
Straw mat.
Paints.
14 Tamatsukuri Tennoji Ku, Osaka:
Paints.
Sands.
Brick.
15 Nakamoto cho Higashinari Ku, Osaka:
Felt.
Fibre article.
Hemp rope.
16 Imazato 2-chome Higashinari Ku, Osaka:
All kinds steel.
17 Nakamoto-cho Higashinari Ku, Osaka:
Steel plates.
Rails.
Shape steel.
18 Showa Oil Ltd., Co.
Rape oil.
19 Higashi-Nakamoto cho Jyoto Ku, Osaka:
Shovel.
Curtain.
20 Nakahama-cho Jyoto Ku, Osaka:
Steels.
Steel pipe.
21 Nakamoto-cho Jyoto Ku, Osaka:
Steel.
22 Tennoda-cho Jyoto Ku, Osaka:
Steel.
High speed steel.
Metals.
23 Shigino cho Jyoto Ku,Osaka:
Coke.
24 Shigino cho Jyoto Ku, Osaka:
Noniron metals.
25 Shigino cho Jyoto Ku, Osaka:
Straw bag.
Stick rack.
26 Imazu-cho Joto Ku, Osaka:
Konnyaku powder.
Welding sticks.
Triangle paper.
27 Gamou-cho Jyoto Ku, Osaka:
Paper.
Strawboard.
Fiber.
28 Higashinoda-8-chome Miyakojima Ku, Osaka:
Triangle paper.
Cement.
29 Higashinoda-8-chome Miyakojima Ku, Osaka:
Sticklike.
Triangle paper.
30 Sekime cho Asahi Ku, Osaka:
All kinds steel.
Pig iron.
Noniron metals.
Cores.
Lumber.
Paints.
Mud and sand.
Electrical wires.
Oils.
Fuels.
31 Ohmiya cho Asahi Ku, Osaka:
Lumber.
32 Morishoji-cho Asahi Ku, Osaka:
Lumber.
33 Morishoji-cho Asahi Ku, Osaka:
Carbites.

34 Yamaguchi-cho Higashiyodogawa Ku, Osaka:
Konnyaku powder.
Paints.
35 Hirano-cho Higashisumiyoshi Ku, Osaka:
Damarls.
36 Ohmiya-cho 2-chome Asahi Ku, Osaka:
Cotton.
Black carbon.
37 Shimanouchi Minami Ku, Osaka:
Leather scrap.
38 Hanaten-cho Jyoto Ku, Osaka:
Straw rope.
39 Sasendo-cho Jyoto Ku, Osaka:
Rubber scrap.
40 Akagawa 3-chome Asahi Ku, Osaka:
Rags.
41 Morishoji cho Asahiku, Osaka:
Rags.
42 Ohmiya-nishino cho Asahiku, Osaka:
Cotton rags.
43 Morinomiya Higashi Ku, Osaka:
Wire material.
Welding sticks.
44 Yura-cho Tsuna gun Hyogo prefecture:
Hard oil.
45 Ozaki cho Osaka prefecture:
Nickel rup.
46 Hineno-cho Sennangu Osaka prefecture:
Textiles.
Paints.
Welding sticks.
Hemp skin.
47 Tadaoka-cho Izumiohtsu city Osaka prefecture:
Steel.
Oils.
48 Uta-cho Izumiohtsu city, Osaka prefecture:
Oils.
Pine-tree resin.
49 Hamadera cho, Senboku Gun, Osaka prefecture:
Nails.
50 Ishizu cho, Sakai city, Osaka prefecture:
Paints.
51 Sakai city, Osaka prefecture:
Steels.
Noniron metals.
52 Sakai city, Osaka prefecture:
Noniron metals.
53 Sakai city, Osaka prefecture:
Fiber.
Hemp thread.
Cotton.
54 Sakai city, Osaka prefecture:
Fiber.
Hemp.
55 Onchi Nakagawachi Gun, Osaka prefecture:
Refine cotton.
Oils.
56 Tokuan cho, Nakagawachi Gun, Osaka prefecture:
Welding sticks.
Hemp.
57 Shigino cho, Jyoto Ku, Osaka prefecture:
Hemp cloth.
Paper.
Scrap.
58 Futashima village, Kitagawachi Gun, Osaka prefecture:
Clothes.
59 Shinomiya Kitagawachi Gun, Osaka prefecture:
Paraffin.
Light oils.
60 Neyagawa cho, Nakagawachi Gun, Osaka prefecture:
Crude petroleum.
Light oils.
61 Hoshida cho, Kitagawachi Gun, Osaka prefecture:
Oils.
Fire tools.
Blank shots.
62 Hirakata cho, Kitagawachi Gun, Osaka prefecture:
Mercury.
Paulownia oil.
Pine resin.
63 Shimamoto cho, Mishima Gun, Osaka prefecture:
Lumber.
64 Tonda cho, Mishima Gun, Osaka prefecture:
Box cases.
65 Ibaraki cho, Mishima Gun, Osaka prefecture:
Box cases
66 Ibaraki cho, Mishima Gun, Osaka prefecture:
Fiber.
Cotton clothes.
Wire.
Bearings.
67 Ibaraki cho, Mishima Gun, Osaka prefecture:
Imitation paper.
Paper for blueprint.
Dexitoline.
68 Mashita village, Mishima Gun, Osaka prefecture:
Fiber.
Strings.
Electrical wires.
Wires.
Bearings.
69 Mashita village, Mishima Gun, Osaka prefecture:
Refine cotton.
Fiber.
Imitation paper.
Bearings.
70 Aioi cho, Higashiyodogawa Ku, Osaka prefecture:
Fiber.
Hemp thread.
Hemp sash cloths.
Hemp handing rope.
71 Senriyama Suita city, Osaka prefecture:
Oils.
Paraffin.
72 Toyonaka city, Osaka prefecture:
73 Mikage cho, Muko Gun, Hyogo prefecture:
Oils.
74 Gomago village, Funaigun, Kyoto prefecture:
Oils.

717207—47——17

74 Gomago village, etc.—Continued
Fiber.
Hides and skins.
75 Ujihara village, Tsuzuki Gun, Kyoto prefecture:
Cotton cloth.
76 Sakai city, Osaka prefecture:
Fiber.
Hose.
Manila hemp.
Cotton thread.
77 Shinko Kinzoku Ltd., Co.:
Brass scrap.
78 Urae cho, Fukushima Ku, Osaka:
Brick.
Steel pipe.
Steel.
80 Shirahama manufactory warehouse:
Steel scrap.
Noniron metal scrap.
81 Sabayashi village, Sepoku Gun, Osaka prefecture:
Pine resin.
83 Togo Cotton Ltd., Co.
Minerals.

PART 7

EFFECTS OF THE 500-POUND BOMB ON THE KONAN PLANT OF THE KAWANISHI AIRCRAFT CO., LTD., KOBE, JAPAN

Target 90.25-1702

Dates of Survey: 18 November–20 November 1945

TABLE OF CONTENTS

I. OBJECT OF STUDY

This survey was made to determine the amount of structural damage caused by 500-pound bombs in three representative buildings of the Konan plant of the Kawanishi Aircraft Co., Ltd.

II. GENERAL INFORMATION

1. The study was begun on 18 November 1945 and completed on 20 November 1945.

2. The personnel of the team which gathered the information for this study is listed under part 4, section III, paragraph 2. The assessment of machine damage was made by Lt. (jg) W. H. Gorham, USNR, of the equipment division USSBS.

3. All data were obtained from Twentieth Air Force operational reports and visual observation.

III. THE TARGET

1. Located about 15 miles west of Osaka at Honjo village, the Kawanishi Konan plant was built in February 1942 at the request of the Japanese Navy.

2. Four-engine flying boats were manufactured at this plant until May of 1944, but from that time until the Japanese capitulation the two-engine medium bomber Frances was the principal item of production.

IV. THE ATTACKS

1. On 11 May 1945, 92 aircraft of the Twentieth Air Force attacked the Kawanishi Konan plant as a primary target. All aircraft bombed by radar; however, some planes near the end of their bomb run were able to make last-minute, visual corrections. Bombing altitudes ranged between 15,700 and 20,000 feet. Axis of attack was 23° T.

2. The weapon employed in this attack was the 500-pound, general-purpose, AN–M64 bomb. Because of the type of building construction at the target larger bombs had been considered, but the time between mission planning and take off was too short to permit changing bomb racks to enable aircraft to carry the larger bombs.

3. A total of 459.5 tons (1,838 bombs) was dropped over the target, 191.5 tons were fuzed instantaneous nose and nondelay tail; 268 tons were fuzed 0.01-second-delay nose and nondelay tail.

V. ANALYSIS OF DAMAGE

1. Three large buildings of this target were surveyed for bomb hits and resultant damage. The damage assessment is shown on the damage plot, figure 1, and in table A.

2. Figure 1 shows the bomb plot, damage plot, and the size and orientation of the buildings. Table A gives descriptions of the buildings and areas of structural and superficial damage.

3. The bombs striking the buildings of this target consistently exploded in the roof steel, damaging or severing structural members in the immediate vicinity by either fragmentation or blast. No collapse of the structures occurred because of the very limited extent of damage from each bomb. Moreover, in several instances, fairly heavy built-up members close to the point of detonation were not severely damaged.

a. Notes on individual bomb hits are shown on figure 1. Illustrations of typical damage are shown in the photographs which are referenced on figure 1.

TARGE

NO. OF BLDG.	NAME OF BLDG.	ROOF	STRUCTURAL DAMAGE TO BLDG. SQ FT FLOOR AREA	REMARKS
1	FINAL ASSEMBLY	CORR. ASBESTOS TILE ON WOOD PURLINS	5,850	SUPERFICIAL DAMAGE 20%
2	FABRICATION AND ASSEMBLY	CORR. ASBESTOS TILE ON WOOD PURLINS	21,600	SUPERFICIAL DAMAGE 85%
3	MACHINE SHOP'	CORR. ASBESTOS TILE ON WOOD PURLINS	39,350	SUPERFICIAL DAMAGE 80%

717207 O - 47 (Face p. 254)

Photo 1.—Building 1, Bombs 1 and 2; damaged exterior column and roof steel.

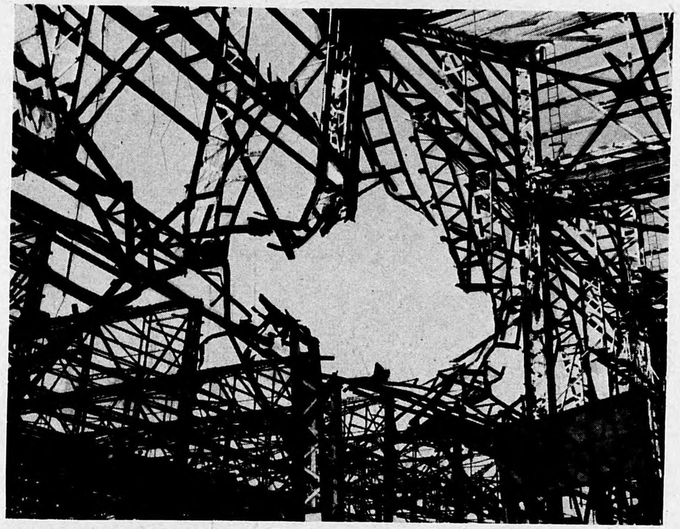


Photo 2.—Building 1, Bomb 1, column cut; lower chord of exterior stiffening truss cut.

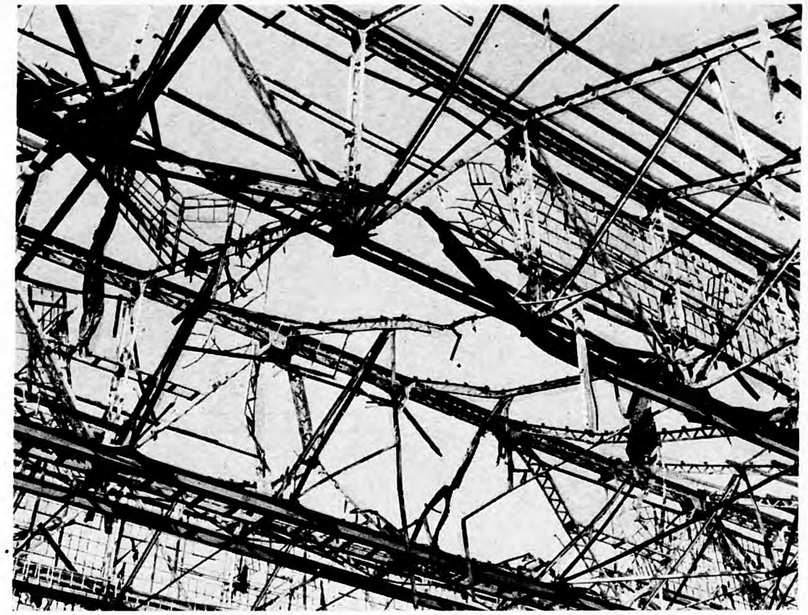


Photo 3.—Building 1, Bomb 2; damaged roof steel.

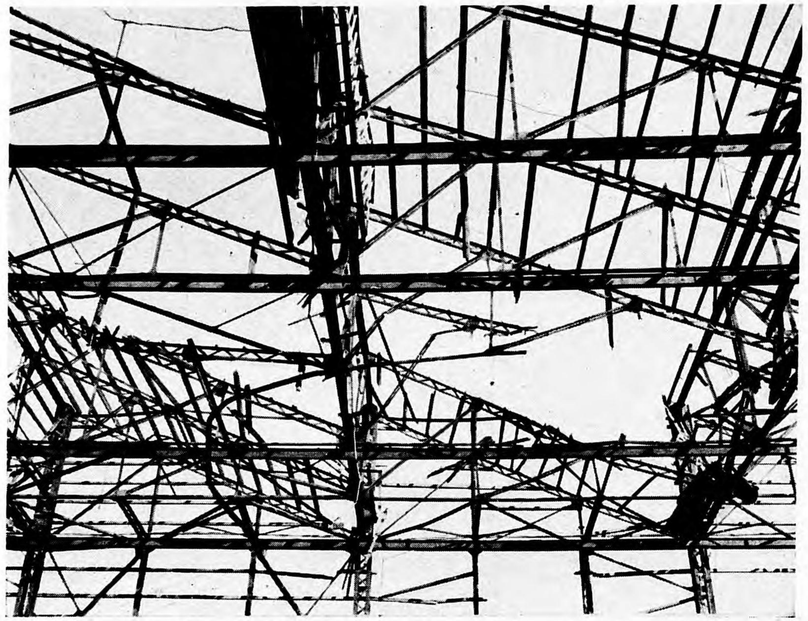


Photo 4.—Building 2, Bomb 4; damage to roof steel.

Photo 5.—Building 2, Bomb 6; damage to roof steel; bent hoist runway.

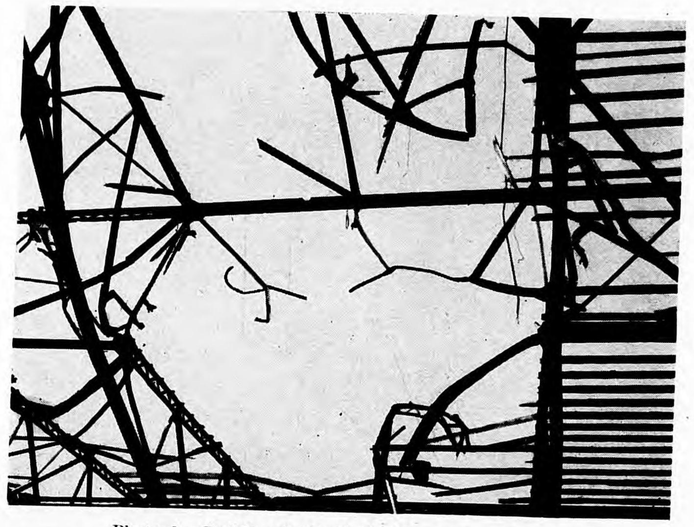


Photo 6.—Building 2, Bomb 7; damage to roof steel.

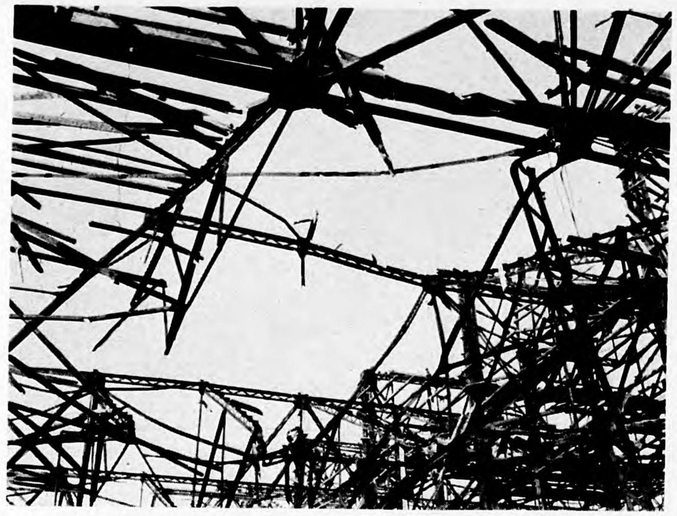


Photo 7.—Building 2, Bomb 8; damage to roof steel.

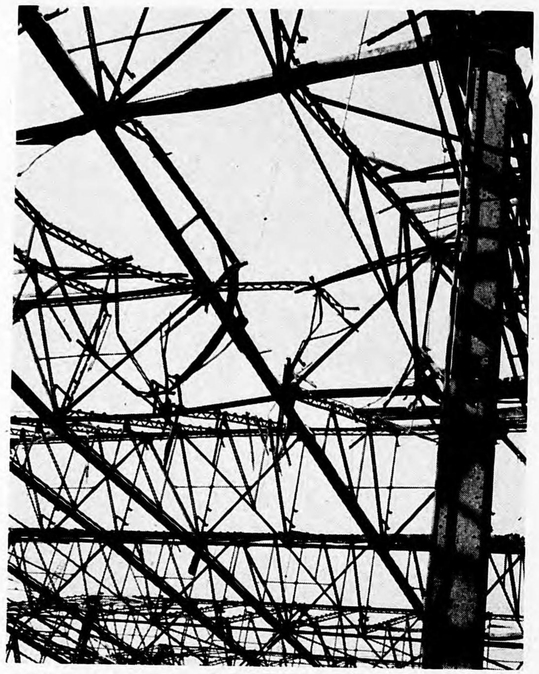


Photo 8.—Building 2, Bomb 9; damage to roof steel.

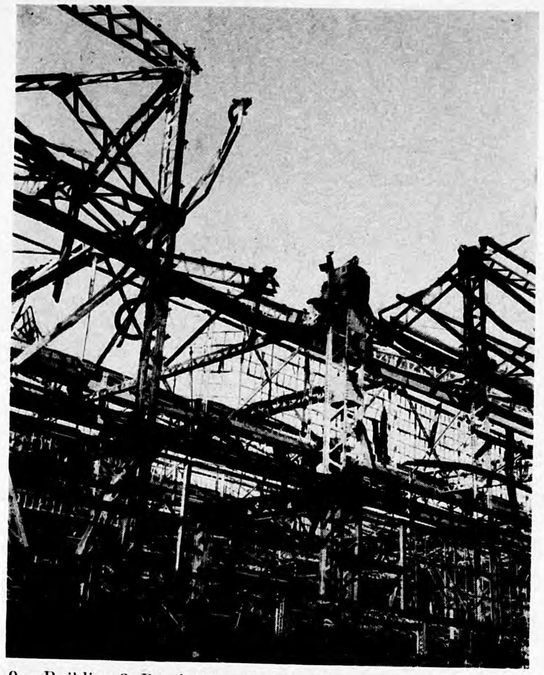


Photo 9.—Building 3, Bomb 10; exterior column cut; roof steel damaged.

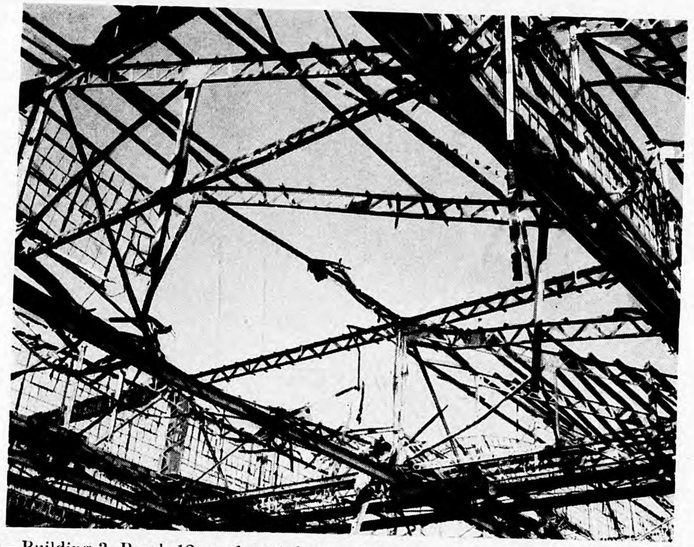


Photo 10.—Building 3, Bomb 12; roof steel damaged; horizontal members intact. (Image reversed).

Photo 11.—Building 3, Bomb 15; damaged roof steel; bent crane runway.

Photo 12.—Building 3, Bomb 17; column destroyed; view of damage and debris.

Photo 13.—Building 3, Bomb 17; detail of destroyed column.

Photo 14.—Building 3, Bomb 22; bomb hit above crane; roof damage; crane knocked down.

Photo 15.—Building 3, Bomb 28; roof damage; heavy members intact.

PART 8

EFFECTS OF THE 500-POUND BOMB ON THE SUMITOMO METAL CO., NAGOYA, JAPAN

Target 90.20–2040

Dates of Survey: 5–10 November 1945

TABLE OF CONTENTS

I. OBJECT OF STUDY

A group of single-story, steel-frame buildings at the Sumitomo Metal Co. (Nagoya) plant was studied for the purpose of observing the effects of the 26 June 1945 attack on the structures. The weapons falling upon the target were of the following type:

Weapon type	Fuze (nose)	Fuze (tail)
500-pound general-purpose	0.025 second	Nondelay.

II. SUMMARY

1. This study deals with the effects of 500-pound, general-purpose bombs, fuzed with 0.025-second nose and nondelay tail, upon a group of several buildings of the Sumitomo Metal Co. (Nagoya plant). Most of the buildings housed crane runways and were single-story, steel-frame buildings with double-pitched and saw-tooth roofs, averaging about 35 feet in height to the eaves or valleys (exhibit A). The area was approximately 83 percent built-up.

2. Structural roof damage caused to the buildings within an area of approximately 7 acres was equal to 0.095 acre per ton of high explosives. Superficial roof damage equal to about 0.41 acre per ton of high explosives was also caused by the attack.

3. Heavy equipment inside buildings 301, 302, and 304 was not seriously damaged except for two cranes, one of which was dislodged from the rails and damaged beyond repair.

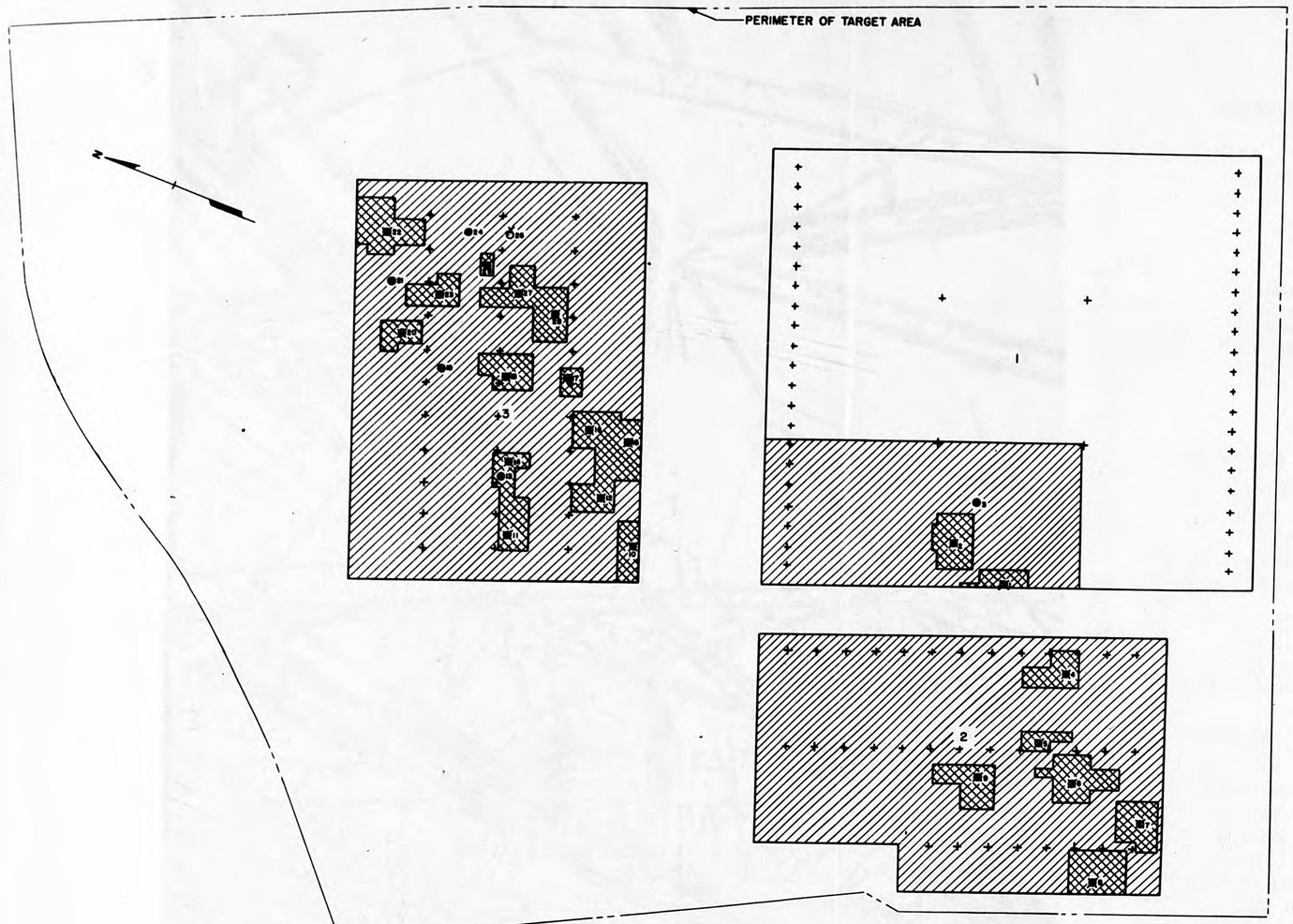
III. THE TARGET

1. The buildings studied were located in the south portion of the area occupied by the Sumitomo Metal Co. (Nagoya light alloy plant) in Nagoya city, 4½ miles south of Nagoya castle. The buildings were used in the production of aluminum forgings, and consisted principally of single-story structures with double-pitched and saw-tooth roofs. In them were crane runways on which cranes of 5- and 10-ton capacity were operated. With the exception of the roofs of several small buildings, the roofs of the group studied were contiguous, forming a compactly built-up target. The area occupied by this part of the plant was approximately 7 acres, of which about 83 percent was built up (exhibit A).

IV. THE ATTACK

1. Table 1 gives the recorded attack data of mission 230. It should be noted that the group of buildings under study received only a part of the total bomb fall, but complete attack data were included for reference purposes.

2. Table 2 gives statistics of the actual bomb fall on the building group under discussion.



SCALE IN FEET
0 50
25 100

BOMB NO.	BOMB NOTES	DAMAGE NOTES	PHOTO NO.	PHOTO DIR.
1	Air burst 20' from Ground	Bomb exploded at truck for sliding hangar door; approx. 20' elev. One ext. col. cut; roof steel damaged.	1	15
			2	340
2	Air burst roof level-at main beam	Roof steel and secondary truss only damaged	1	15
			3	360
3	Crater - Possible UYB or LO			
4	Air burst roof level	Roof steel damaged; light hoist runway fragmented, bent 4" out of line, not knocked down.	4	290
5	Air burst roof level-just under sawtooth	Top of col. bent; diagonals of truss knocked out, hoist runways not knocked down.		
6	Air burst roof level		5	25
7	Air burst roof level		6	20
8	Air burst - Inst. action on roof		7	10
9	Air burst roof level	Roof steel damaged; hoist runways bent, not knocked down.	8	280
10	Air burst inst. action	One ext. col. cut; roof steel distorted; crane runway fragmented and bent.	9	25
11	Air burst roof level			
12	Air burst roof level		10	10
13	Crater; slight frag.	Bomb cratered; column bent near floor; no other failure evident		
14	Air burst roof level		11	90
15	Air burst roof level			
16	Air burst roof level			
17	Air burst 6' from floor	Bomb exploded near ground level, cut col., no other failure of structure evident.	12	20
			13	80
18	Air burst roof level			
19	Crater			
20	Air burst roof level			
21	Crater			
22	Air burst 4' below peak of S.T. over crane	Direct hit above crane; crane runway badly bent, not down; roof steel bent or destroyed; heavy members not heavily damaged.	14	15
23	Air burst roof level			
24	Crater			
25	Air burst roof level	Steel heavily fragmented		
26	Crater - possible low order			
27	Air burst roof level			
28	Air burst roof level	Light members bent and knocked out, heavy members and crane runway O.K.	15	5

—LEGEND—

BLDG. NO.	NAME	TYPE
1	FINAL ASSEMBLY	STEEL
2	FAB. & ASSEMBLY	STEEL
3	MACHINE SHOP	STEEL

NOTE: ALL OTHER BUILDINGS ON TARGET OMITTED.

BOMB NOTES

▣ AIRBURST (ACTIVATED BY SOLID OBJECT ABOVE GROUND LEVEL)

● CRATER

ŏ LOW-ORDER DETONATION

NOTES: (1) ALL BOMBS 500-LB. G.P. AN-M64
(2) FUZING .01 NOSE N.D. TAIL
(3) ONLY BOMBS STRIKING THREE MAIN BUILDINGS PLOTTED.

▨ STRUCTURAL DAMAGE

▨ SUPERFICIAL DAMAGE

U.S. STRATEGIC BOMBING SURVEY

KAWANISHI AIRCRAFT CO. LTD.
KONAN PLANT

DAMAGE, BOMB, & PHOTO PLOTS FIG. 1

717207 O - 47 (Face p. 262)

PART 8

EFFECTS OF THE 500-POUND BOMB ON THE SUMITOMO METAL CO., NAGOYA, JAPAN

Target 90.20-2040

Dates of Survey: 5–10 November 1945

TABLE OF CONTENTS

I. OBJECT OF STUDY

A group of single-story, steel-frame buildings at the Sumitomo Metal Co. (Nagoya) plant was studied for the purpose of observing the effects of the 26 June 1945 attack on the structures. The weapons falling upon the target were of the following type:

Weapon type	Fuze (nose)	Fuze (tail)
500-pound general-purpose	0.025 second	Nondelay.

II. SUMMARY

1. This study deals with the effects of 500-pound, general-purpose bombs, fuzed with 0.025-second nose and nondelay tail, upon a group of several buildings of the Sumitomo Metal Co. (Nagoya plant). Most of the buildings housed crane runways and were single-story, steel-frame buildings with double-pitched and saw-tooth roofs, averaging about 35 feet in height to the eaves or valleys (exhibit A). The area was approximately 83 percent built-up.

2. Structural roof damage caused to the buildings within an area of approximately 7 acres was equal to 0.095 acre per ton of high explosives. Superficial roof damage equal to about 0.41 acre per ton of high explosives was also caused by the attack.

3. Heavy equipment inside buildings 301, 302, and 304 was not seriously damaged except for two cranes, one of which was dislodged from the rails and damaged beyond repair.

III. THE TARGET

1. The buildings studied were located in the south portion of the area occupied by the Sumitomo Metal Co. (Nagoya light alloy plant) in Nagoya city, 4½ miles south of Nagoya castle. The buildings were used in the production of aluminum forgings, and consisted principally of single-story structures with double-pitched and saw-tooth roofs. In them were crane runways on which cranes of 5- and 10-ton capacity were operated. With the exception of the roofs of several small buildings, the roofs of the group studied were contiguous, forming a compactly built-up target. The area occupied by this part of the plant was approximately 7 acres, of which about 83 percent was built up (exhibit A).

IV. THE ATTACK

1. Table 1 gives the recorded attack data of mission 230. It should be noted that the group of buildings under study received only a part of the total bomb fall, but complete attack data were included for reference purposes.

2. Table 2 gives statistics of the actual bomb fall on the building group under discussion.

V. ANALYSIS OF DAMAGE

1. The structural roof damage was approximately 0.71 acre, which was equal to about 12.2 percent of the built-up area (5.8 acres). In addition to the structural damage, 3.06 acres of the roof area suffered superficial damage (table 3 and exhibit A). The effectiveness of the attack is shown in the following table:

Total tons high-explosive on target area	Total structural roof damage (acres)	Structural roof damage in acres per ton of high-explosive
7.5	0.71	0.095

2. *Fuzings.*—The roof structure of steel framing covered with corrugated iron apparently activated the nondelay tail fuze of most of the bombs which were direct hits on the buildings; certain of them, however, which formed craters in the floors may have had their tail fuzes activated by the side-wall

Summary of nondelay tail fuze functionings (500-pound general-purpose)

(1) Non-cratering bombs (direct hits)	Cratering bombs (direct hits)		(4) Near-misses and misses	(5) Total number of bombs
Detonation 10–15 feet below roof level (activated by roof)	(2) Not activated by roof	(3) Activated by side wall		
16	4	3	7	30
[1] 69.5	[1] 17.4	[1] 13.1		

[1] Percentages.

structure of similar construction, and they then reached floor level before detonating. The figures in column 1 show the number of bomb fuzings (direct hits) which functioned normally. Those in Column 2 show number of bombs which probably entered portions of the roof incapable of exerting sufficient resistance to activate the fuzes. The percentages given at the foot of the table are based on the total number of 23 direct hits on the buildings.

3. One type of damage was noted to saw-tooth roof trusses in buildings 301a and 304 in which the diagonal in the end panels of certain trusses was damaged, thereby causing a perceptible sagging of the truss between columns. This was responsible for a considerable area of structural roof damage as in most cases the trusses would have to be taken down for repairs. The end members were two light angles tied with batten plates (exhibit A) and where one angle was damaged by fragmentation the inclined member was seriously weakened. Photos 1 and 2 indicate failures of the member in building 301a. Photos 5, 6, and 20 show similar failures of the member in building 304.

4. Photo 9 indicates a crater formed by bomb 24 (500-pound, general-purpose) without causing serious damage to an adjacent hydraulic press or its foundation. A longer-delay fuze would probably have been required to obtain maximum effect of the weapon.

5. The double-pitched roof trusses in buildings 301b and 302a were composed of light members, and fragmentation of the air bursts were effective in causing damage to the light sections used in their construction.

6. Photographs showing damage are included; their locations are indicated in exhibit A.

TABLE 1.—*Recorded attack data*

SUMITOMO-NAGOYA

(1 ton=2,000 pounds)

Mission No.	Date of attack	Type of target	Aircraft: Type	Aircraft: Number of airborne	Aircraft: Number of bombings	Type of bombings	Altitude (feet)	Cloud cover	Type	Fuzing (sec.)	Dispatched: Number	Dispatched: Tons	Released: Number	Released: Tons
230	26 Jun 1945	Primary target	B–29	33	29	13 visual 16 radar	17,000–24,000	0/10 to 1/10	AN–M64, 500-pound general-purpose.	0.025 nose, nondelay tail.				150

TABLE 2.—*Bomb fall summary (target area=6.95 acres. One ton=2,000 pounds)*

Date of attack	Size of bomb	Functioning of bombs: Direct hit	Functioning of bombs: Near-miss	Functioning of bombs: Miss	Malfunctions: Unexploded bomb	Malfunctions: Low-order detonation	Total number of bombs	Total tons	Density of target area [1]: Bombs per acre	Density of target area [1]: Tons per acre
26 Jun 1945	500-pound general-purpose	[2] 23	5	2	0	1	30	7.5	4.32	1.08

[1] Includes only the portion of target under study. (See exhibit A.)
[2] Includes 1 low-order detonation.

TABLE 3.—*Weapon analysis*

(Target name: Sumitomo Metal Co., Nagoya—90:20–2040. Attack date: 26 June 1945)

(NM=Near-miss, showing minimum distance in feet between bomb detonation point and nearest point of the building involved)

(Areas in 1,000 (M) square feet)

Building data: No.	Function	Plan area	Total floor area	Bomb data: Bomb No.	Size and type	Fuze setting: Nose (sec.)	Fuze setting: Tail (sec.)	DH or NM NM distance (feet)	Crater and dimension (feet)	Areas of damage—Roof: Structural—High-explosive	Areas of damage—Roof: Superficial
151b [1]	Auxiliaries	1.0	1.0	12	500-pound, general-purpose	0.025	Nondelay	NM–22	Crater, 23		1.0
301a	Light metal forgings.	44.6	44.6	25	do	.025	do	DH	No crater	6.5	21.7
				26				DH	do		
				27				NM–5	Crater		
				28				NM–8	do		
				29				NM–8	do		
				30				DH	No crater		
301b	do	88.5	88.5	12	do	.025	do	DH	Crater, 23	19.4	38.4
				15							
				16							
				18							
				19							
				20				DH	No crater	19.4	38.4
				21							
				22							
				23							
				24	do	.025	do	DH	Crater, 20	19.4	38.4
302a	do	44.2	44.2	6	do	.025	do	DH	No crater		25.9
				7				DH	do		
				8				DH	do		
				9				DH	do		
				10				DH	Crater, 18		
				11				NM–12	Crater, 15		
				[2] 2				NM–14	Crater		
302b	do	44.6	44.6	3	do	.025	do	DH	Crater		22.0
				4				DH	Crater, 16		
				5				DH	Crater, 23		
304	do	28.9	28.9	1	do	.025	do	NM–5	No crater	4.8	24.1
				5				DH	Crater, 25		
				17				DH	No crater		
								DH	do		
	Total	[3] 251.8	251.8							[4] 30.7	[5] 133.1

[1] Building 151b was wood framed, single-story with double-pitched roof covered with corrugated iron. All other buildings were single-story steel-framed buildings with double-pitched and saw-tooth roofs covered with corrugated iron. (See exhibit A.)
[2] Low-order detonation.
[3] 5.77 acres.
[4] 0.71 acres.
[5] 3.06 acres.

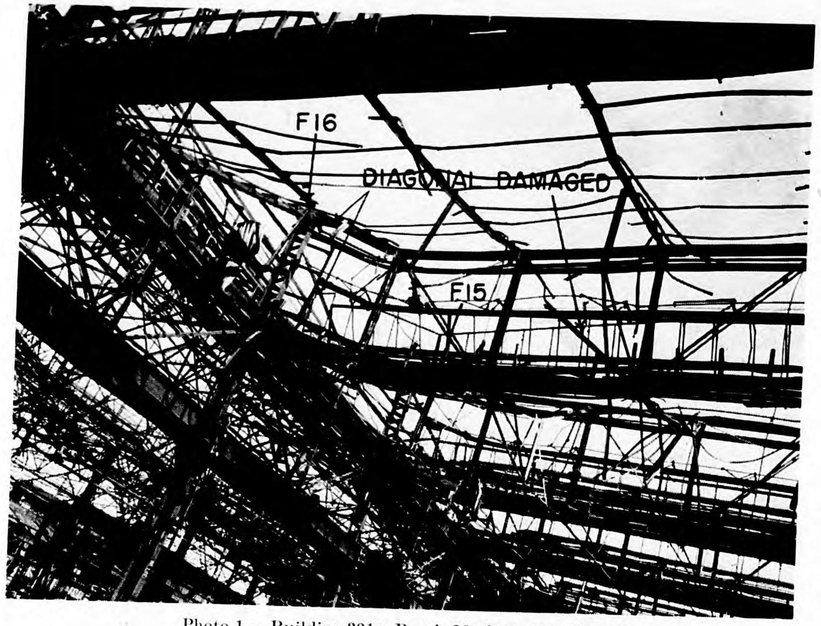
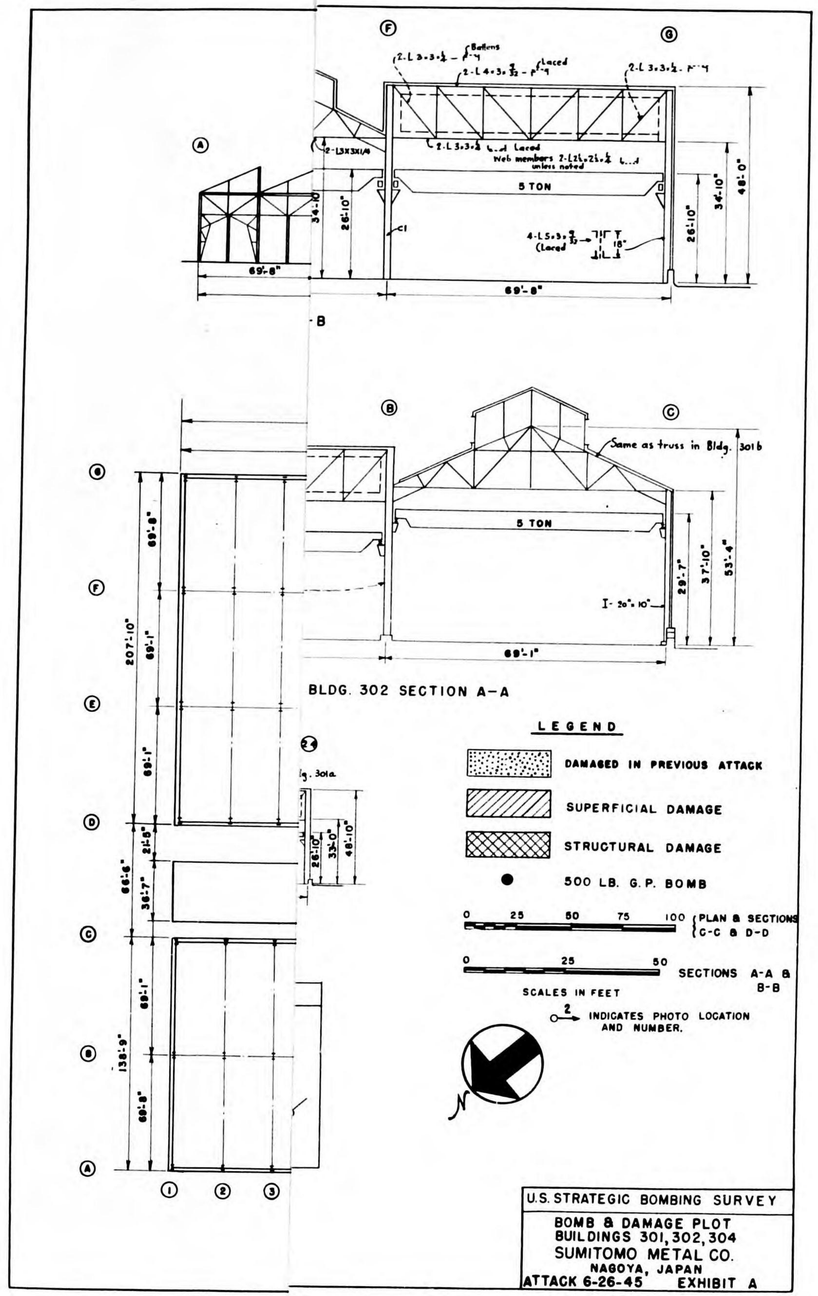
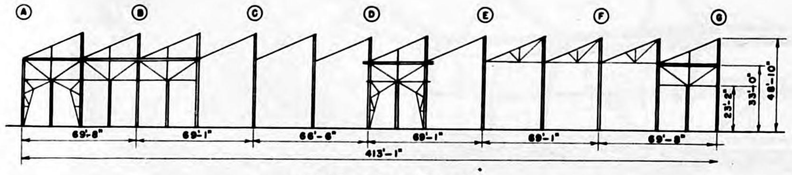


Photo 1.—Building 301a, Bomb 26; damage looking N.

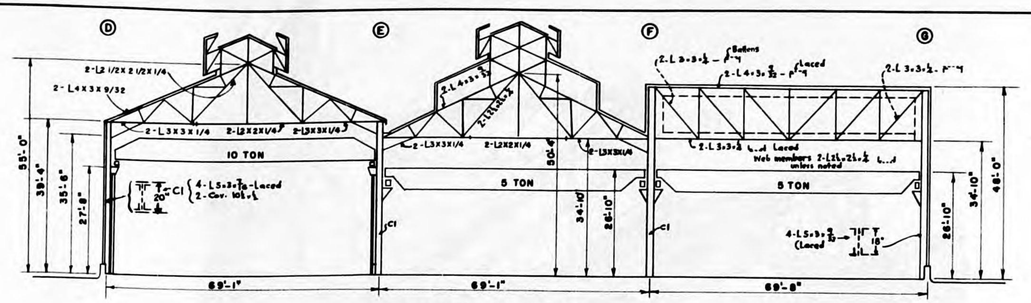
Photo 2.—Building 301a, sagging of truss connecting to Column (G15) looking NE.



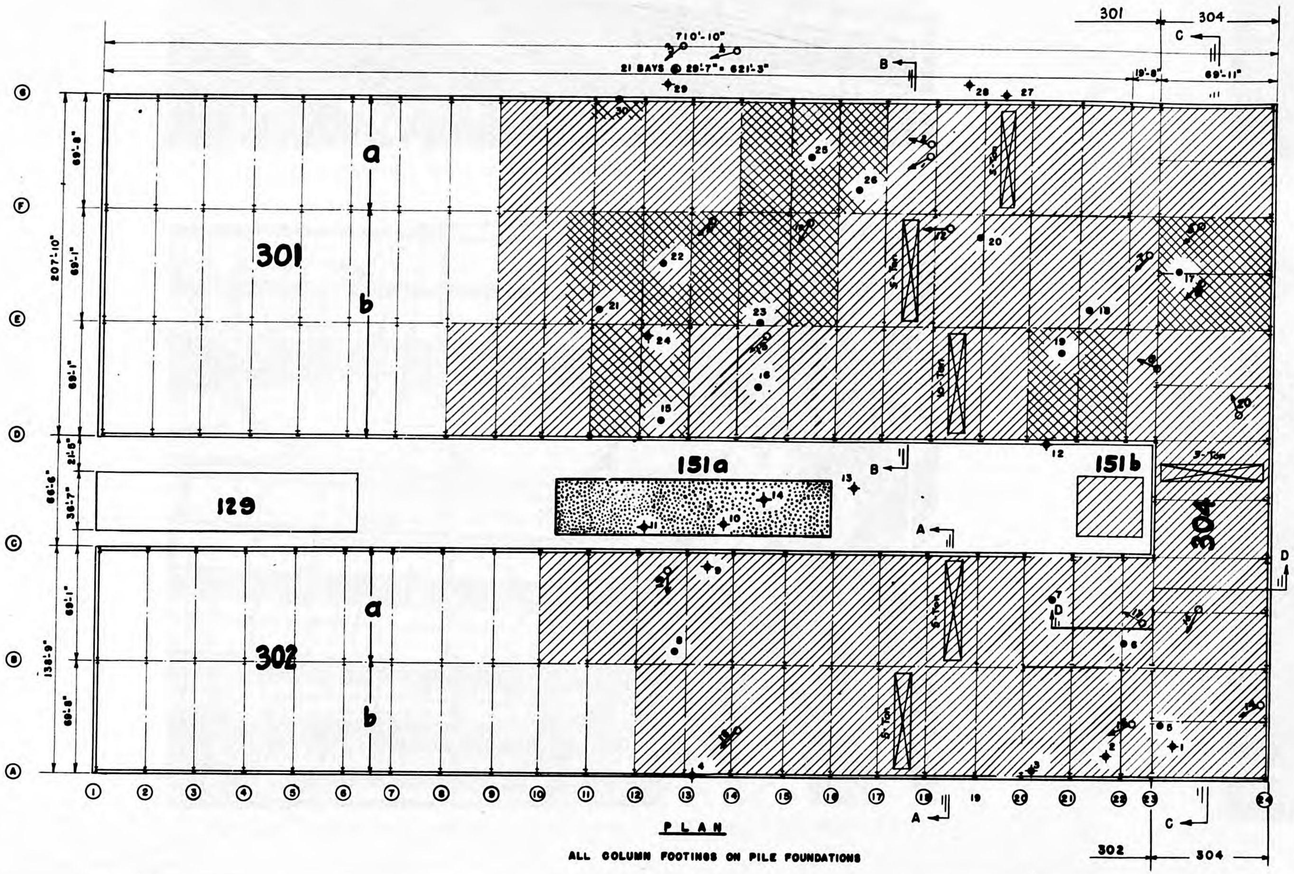
717207 O - 47 (Face p. 266)

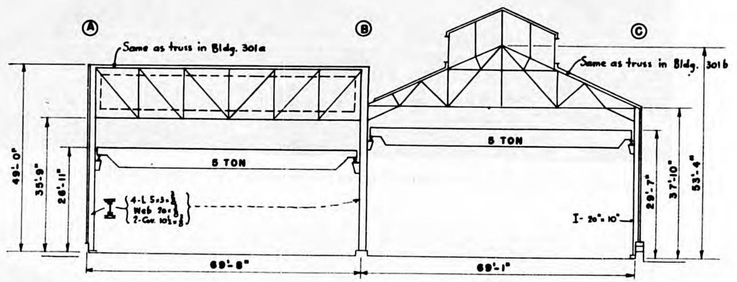


BLDG. 304 SECTION C-C

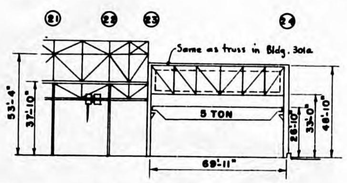


BLDG. 301 SECTION B-B



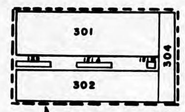


BLDG. 302 SECTION A-A



BLDG. 304 SECTION D-D

KEY PLAN



AREA = 7 ACRES, APPROX.

LEGEND

- DAMAGED IN PREVIOUS ATTACK
- SUPERFICIAL DAMAGE
- STRUCTURAL DAMAGE
- 500 LB. G.P. BOMB

0 25 50 75 100 PLAN & SECTIONS C-C & D-D

0 25 50 SECTIONS A-A & B-B

SCALES IN FEET

2 INDICATES PHOTO LOCATION AND NUMBER.

U.S. STRATEGIC BOMBING SURVEY
BOMB & DAMAGE PLOT BUILDINGS 301, 302, 304 SUMITOMO METAL CO. NAGOYA, JAPAN ATTACK 6-26-45 EXHIBIT A

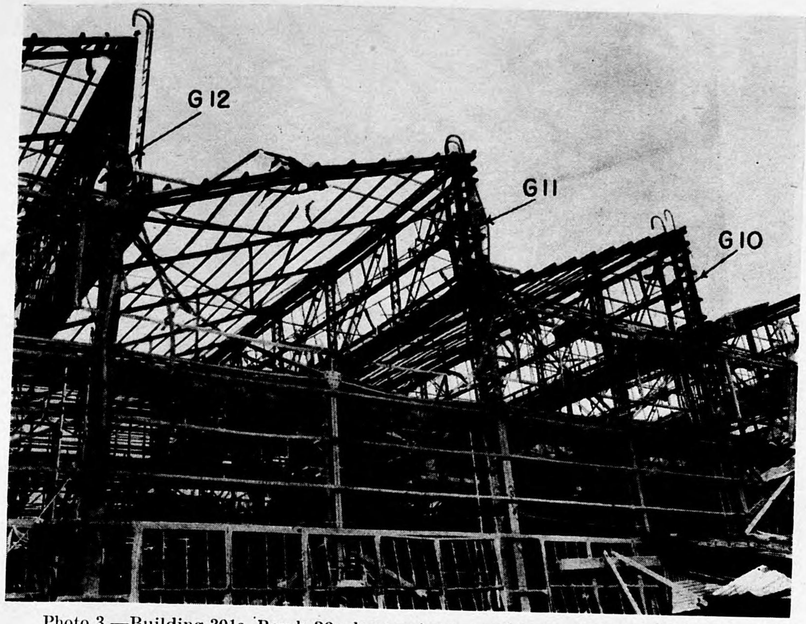


Photo 3.—Building 301a, Bomb 30; damage between Columns G12 and G11 looking N.

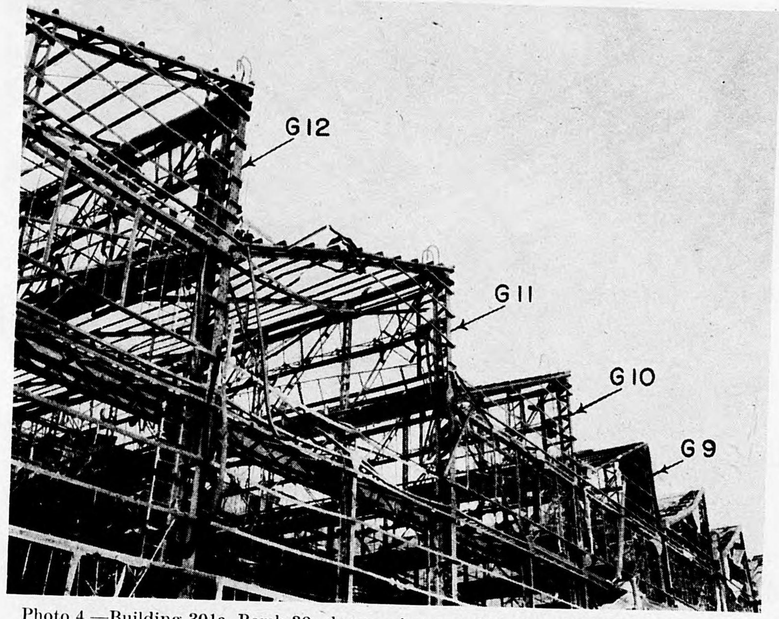


Photo 4.—Building 301a, Bomb 30; damage between Columns G12 and G11 looking NE.

717207—47——18

Photo 5.—Building 304; damage to truss connecting to Column E23 looking NNW.

Photo 6.—Building 304; damage to truss Connecting to Column E23 looking N.

Photo 7.—Building 301b; roof damage caused by Bomb 18 adjacent to Column E21 looking N.

Photo 8.—Building 301b; damage caused by Bomb 19 to roof trusses adjacent to Column E21 looking NE.

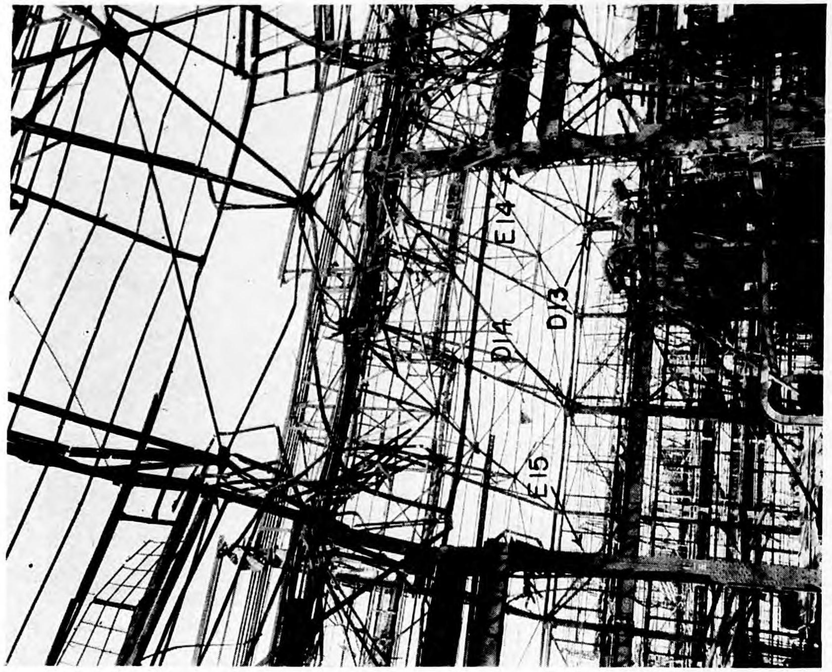


Photo 10.—Building 301b; damage caused by Bomb 23 between Columns E15 and E14 looking NNW.

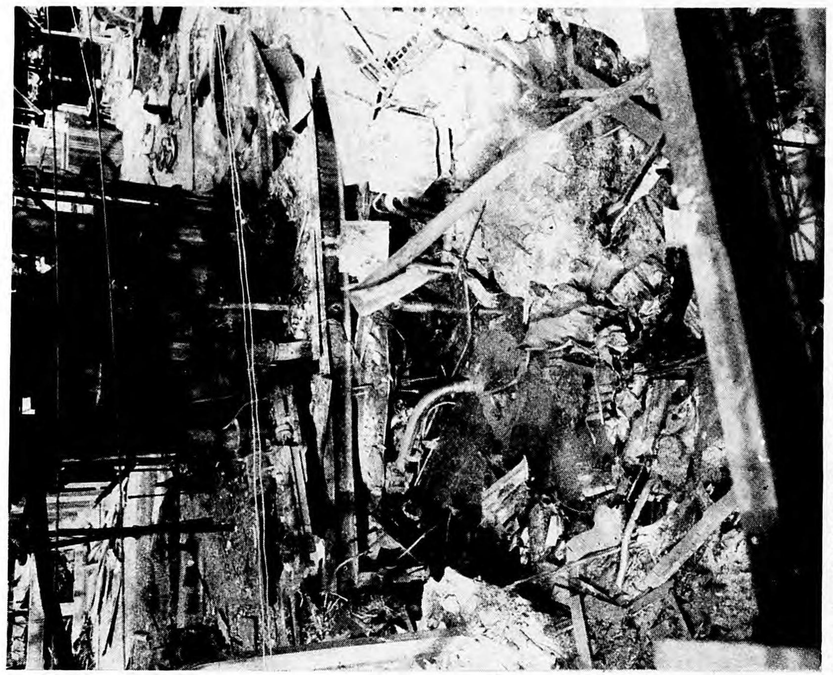


Photo 9.—Building 301b; Bomb 24 crater at hydro press adjacent to Column E12 looking NNW.

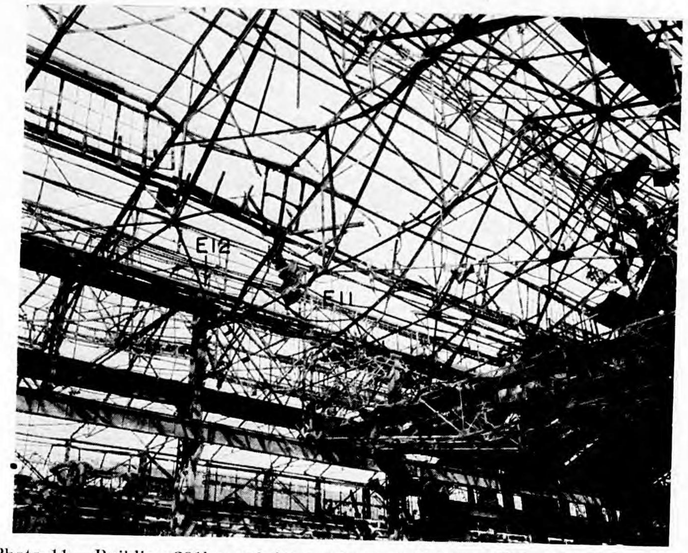


Photo 11.—Building 301b; roof damage between Columns E12 and E11 looking N.

Photo 12.—Building 301b; roof damage between Columns E15 and E16 looking NE.

Photo 13.—Building 301b; damage to crane girder and roof members between Columns D13 and D11 looking NNW.

Photo 14.—Building 304; damage to crane girder looking NNE.

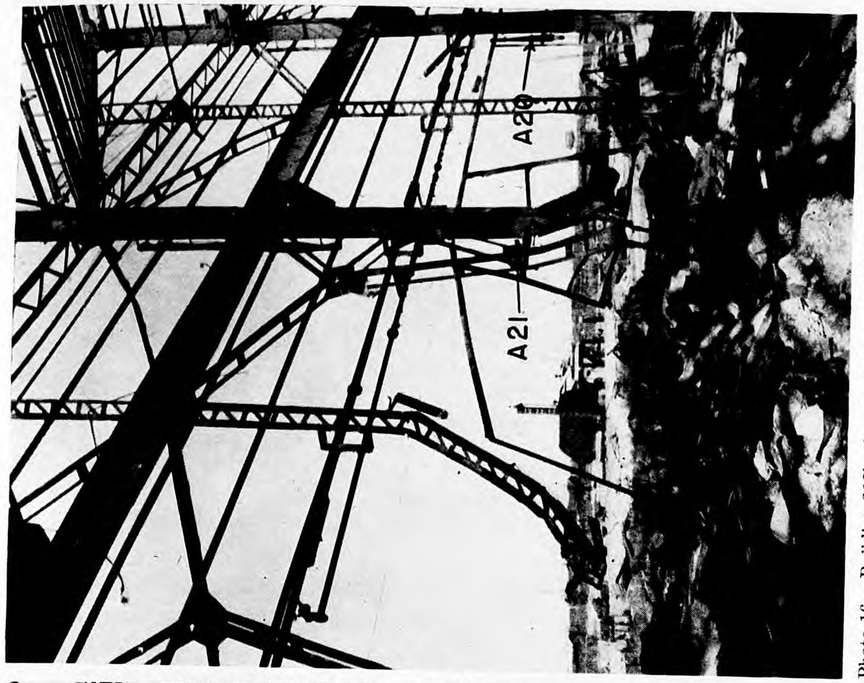


Photo 16.—Building 302b; damage to base of Column A21 caused by bomb 3 looking N.

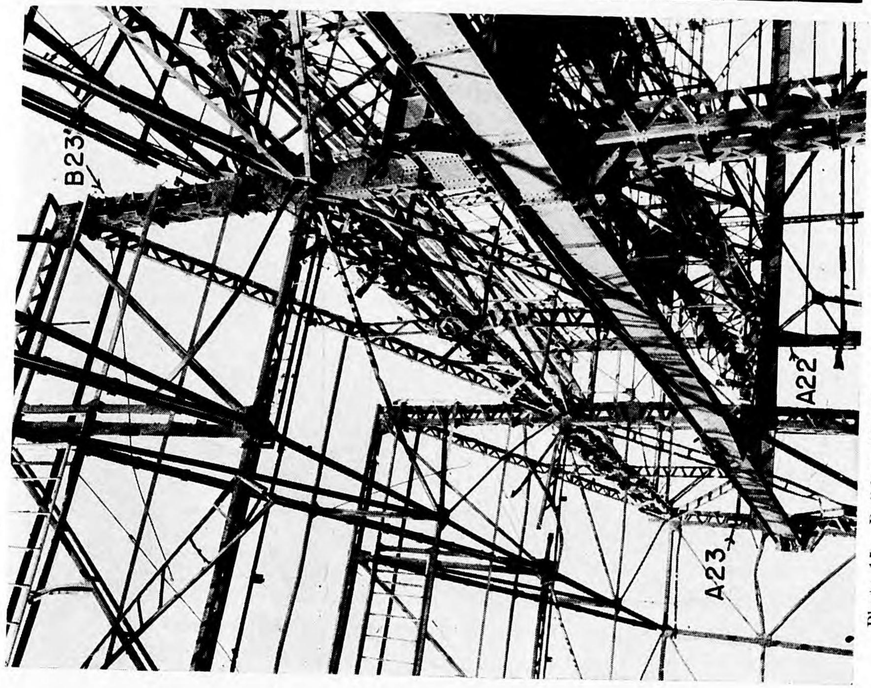


Photo 15.—Building 304; damage to crane girder looking NNW.

Photo 17.—Building 302a; damage to roof trusses adjacent to Columns C21 and C20 looking ENE.

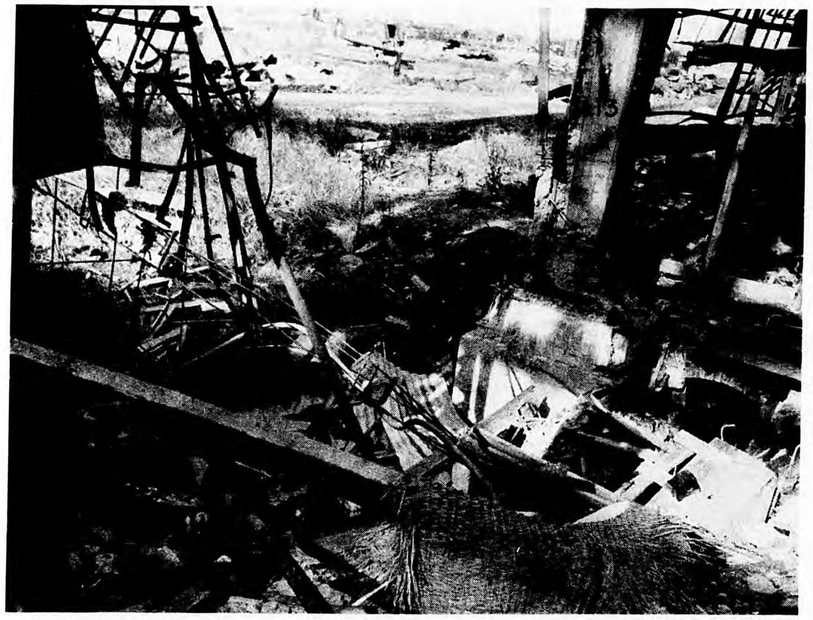


Photo 18 —Building 302b; base of Column A13 undamaged by cratering bomb looking N.

Photo 19.—Building 302a; damage to roof trusses and crane girders between Columns B13 and B12 looking NW.

Photo 20.—Building 304; damage to trusses connecting to Columns E23 and F23 looking ESE.

UNITED STATES STRATEGIC BOMBING SURVEY

LIST OF REPORTS

The following is a bibliography of reports resulting from the Survey's studies of the European and Pacific wars. Those reports marked with an asterisk (*) may be purchased from the Superintendent of Documents at the Government Printing Office, Washington, D. C.

European War

OFFICE OF THE CHAIRMAN

*1 The United States Strategic Bombing Survey: Summary Report (European War)
*2 The United States Strategic Bombing Survey: Over-all Report (European War)
*3 The Effects of Strategic Bombing on the German War Economy

AIRCRAFT DIVISION

(By Division and Branch)

*4 Aircraft Division Industry Report
5 Inspection Visits to Various Targets (Special Report)

Airframes Branch

6 Junkers Aircraft and Aero Engine Works, Dessau, Germany
7 Erla Maschinenwerke G m b H, Heiterblick, German
8 A T G Maschinenbau, G m b H, Leipzig (Mockau), Germany
9 Gothaer Waggonfabrik, A G, Gotha, Germany
10 Focke Wulf Aircraft Plant, Bremen, Germany
11 Messerschmitt A G, Augsburg, Germany { Over-all Report; Part A; Part B; Appendices I, II, III }
12 Dornier Works, Friedrichshafen & Munich, Germany
13 Gerhard Fieseler Werke G m b H, Kassel, Germany
14 Wiener Neustaedter Flugzeugwerke, Wiener Neustadt, Austria

Aero Engines Branch

15 Bussing NAG Flugmotorenwerke G m b H, Brunswick, Germany
16 Mittel-Deutsche Motorenwerke G m b H, Taucha, Germany
17 Bavarian Motor Works Inc, Eisenach & Durrerhof, Germany
18 Bayerische Motorenwerke A G (BMW) Munich, Germany
19 Henschel Flugmotorenwerke, Kassel, Germany

Light Metal Branch

20 Light Metals Industry of Germany { Part I, Aluminum; Part II, Magnesium }
21 Vereinigte Deutsche Metallwerke, Hildesheim, Germany
22 Metallgussgesellschaft G m b H, Leipzig, Germany
23 Aluminumwerk G m b H, Plant No. 2, Bitterfeld, Germany
24 Gebrueder Giulini G m b H, Ludwigshafen, Germany
25 Luftschiffbau, Zepellin G m b H, Friedrichshafen on Bodensee, Germany
26 Wieland Werke A G, Ulm, Germany
27 Rudolph Rautenbach Leichmetallgiessereien, Solingen, Germany
28 Lippewerke Vereinigte Aluminumwerke A G, Lunen, Germany
29 Vereinigte Deutsche Metallwerke, Heddernheim, Germany
30 Duerener Metallwerke A G, Duren Wittenau-Berlin & Waren, Germany

AREA STUDIES DIVISION

*31 Area Studies Division Report
32 A Detailed Study of the Effects of Area Bombing on Hamburg
33 A Detailed Study of the Effects of Area Bombing on Wuppertal
34 A Detailed Study of the Effects of Area Bombing on Dusseldorf
35 A Detailed Study of the Effects of Area Bombing on Solingen
36 A Detailed Study of the Effects of Area Bombing on Remscheid
37 A Detailed Study of the Effects of Area Bombing on Darmstadt
38 A Detailed Study of the Effects of Area Bombing on Lubeck
39 A Brief Study of the Effects of Area Bombing on Berlin, Augsburg, Bochum, Leipzig, Hagen, Dortmund, Oberhausen, Schweinfurt, and Bremen

CIVILIAN DEFENSE DIVISION

40 Civilian Defense Division—Final Report
41 Cologne Field Report
42 Bonn Field Report
43 Hanover Field Report
44 Hamburg Field Report—Vol. I, Text; Vol. II, Exhibits
45 Bad Oldesloe Field Report
46 Augsburg Field Report
47 Reception Areas in Bavaria, Germany

EQUIPMENT DIVISION

Electrical Branch

*48 German Electrical Equipment Industry Report
49 Brown Boveri et Cie, Mannheim Kafertal, Germany

Optical and Precision Instrument Branch

*50 Optical and Precision Instrument Industry Report

Abrasives Branch

*51 The German Abrasive Industry
52 Mayer and Schmidt, Offenbach on Main, Germany

Anti-Friction Branch

*53 The German Anti-Friction Bearings Industry

Machine Tools Branch

*54 Machine Tools & Machinery as Capital Equipment
*55 Machine Tool Industry in Germany
56 Herman Kolb Co., Cologne, Germany
57 Collet and Engelhard, Offenbach, Germany
58 Naxos Union, Frankfort on Main, Germany

MILITARY ANALYSIS DIVISION

59 The Defeat of the German Air Force
60 V-Weapons (Crossbow) Campaign
61 Air Force Rate of Operation
62 Weather Factors in Combat Bombardment Operations in the European Theatre
63 Bombing Accuracy, USAAF Heavy and Medium Bombers in the ETO
64 Description of RAF Bombing
64a The Impact of the Allied Air Effort on German Logistics

MORALE DIVISION

*64b The Effects of Strategic Bombing on German Morale (Vol. I and Vol. II)

Medical Branch

*65 The effect of Bombing on Health and Medical Care in Germany

MUNITIONS DIVISION

Heavy Industry Branch

*66 The Coking Industry Report on Germany
67 Coking Plant Report No. 1, Sections A, B, C, & D
68 Gutehoffnungshuette, Oberhausen, Germany
69 Friedrich-Alfred Huette, Rheinhausen, Germany
70 Neunkirchen Eisenwerke A G, Neunkirchen, Germany
71 Reichswerke Hermann Goering A G, Hallendorf Germany
72 August Thyssen Huette A G, Hamborn, Germany
73 Friedrich Krupp A G, Borbeck Plant, Essen, Germany
74 Dortmund Hoerder Huettenverein, A G, Dortmund, Germany
75 Hoesch A G, Dortmund, Germany
76 Bochumer Verein fuer Gusstahlfabrikation A G, Bochum, Germany

Motor Vehicles and Tanks Branch

*77 German Motor Vehicles Industry Report
*78 Tank Industry Report
79 Daimler Benz A G, Unterturkheim, Germany
80 Renault Motor Vehicles Plant, Billancourt, Paris
81 Adam Opel, Russelheim, Germany
82 Daimler Benz-Gaggenau Works, Gaggenau, Germany
83 Maschinenfabrik Augsburg-Nurnberg, Nurnberg, Germany
84 Auto Union A G, Chemnitz and Zwickau, Germany
85 Henschel & Sohn, Kassel, Germany
86 Maybach Motor Works, Friedrichshafen, Germany
87 Voigtlander, Maschinenfabrik A G, Plauen, Germany
88 Volkswagenwerke, Fallersleben, Germany
89 Bussing NAG, Brunswick, Germany
90 Muehlenbau Industrie A G (Miag) Brunswick, Germany
91 Friedrich Krupp Grusonwerke Magdeburg, Germany

Submarine Branch

92 German Submarine Industry Report
93 Maschinenfabrik Augsburg Nurnberg A G, Augsburg, Germany
94 Blom and Voss Shipyards, Hamburg, Germany
95 Deutschewerke A. G, Kiel, Germany
96 Deutsche Schiff und Maschinenbau, Bremen, Germany
97 Friedrich Krupp Gemaniawerft, Kiel, Germany
98 Howaldtswerke A. G, Hamburg, Germany
99 Submarine Assembly Shelter, Farge, Germany
100 Bremer Vulkan, Vegesack, Germany

Ordnance Branch

*101 Ordnance Industry Report
102 Friedrich Krupp Grusonwerke A. G, Magdeburg, Germany
103 Bochumer Verein fuer Gusstahlfabrikation A G, Bochum, Germany
104 Henschel & Sohn, Kassel, Germany
105 Rheinmetall-Borsig, Dusseldorf, Germany
106 Hermann Goering Werke, Braunschweig, Hallendorf, Germany
107 Hannoverische Maschinenbau, Hanover, Germany
108 Gusstahlfabrik Friedrich Krupp, Essen, Germany

OIL DIVISION

*109 Oil Division, Final Report
*110 Oil Division, Final Report, Appendix
*111 Powder, Explosives, Special Rockets and Jet Propellants, War Gases and Smoke Acid (Ministerial Report #1)
112 Underground and Dispersal Plants in Greater Germany
113 The German Oil Industry, Ministerial Report Team 78
114 Ministerial Report on Chemicals

Oil Branch

115 Ammoniakwerke Merseburg G m b H, Leuna, Germany—2 Appendices
116 Braunkohle Benzin A G, Zeitz and Bohlen, Germany
Wentershall A G, Leutzkendorf, Germany
117 Ludwigshafen-Oppau Works of I G Farbenindustrie A G, Ludwigshafen, Germany
118 Ruhroel Hydrogenation Plant, Bottrop-Boy, Germany, Vol. I, Vol. II
119 Rhenania Ossag Mineraloelwerke A G, Harburg Refinery, Hamburg, Germany
120 Rhenania Ossag Mineraloelwerke A G, Grasbrook Refinery, Hamburg, Germany
121 Rhenania Ossag Mineraloelwerke A G, Wilhelmsburg Refinery, Hamburg, Germany
122 Gewerkschaft Victor, Castrop-Rauxel, Germany, Vol. I & Vol. II
123 Europaeische Tanklager und Transport A G, Hamburg, Germany
124 Ebano Asphalt Werke A G, Harburg Refinery, Hamburg, Germany
125 Meerbeck Rheinpreussen Synthetic Oil Plant—Vol. I & Vol II

Rubber Branch

26 Deutsche Dunlop Gummi Co., Hanau on Main, Germany
127 Continental Gummiwerke, Hanover, Germany
128 Huels Synthetic Rubber Plant
129 Ministerial Report on German Rubber Industry

Propellants Branch

130 Elektrochemischewerke, Munich, Germany
131 Schoenebeck Explosive Plant, Lignose Sprengstoff Werke G m b H, Bad Salzemen, Germany
132 Plants of Dynamit A G, Vormal, Alfred Nobel & Co Troisdorf, Clausthal, Drummel and Duneberg, Germany
133 Deutsche Sprengchemie G m b H, Kraiburg, Germany

OVER-ALL ECONOMIC EFFECTS DIVISION

134 Over-all Economic Effects Division Report
Gross National Product
Kriegseilberichte
Herman Goering Works
Food and Agriculture
} Special papers which together comprise the above report
134a Industrial Sales Output and Productivity

PHYSICAL DAMAGE DIVISION

134b Physical Damage Division Report (ETO)
135 Villacoublay Airdrome, Paris, France
136 Railroad Repair Yards, Malines, Belgium
137 Railroad Repair Yards, Louvain, Belgium
138 Railroad Repair Yards, Hasselt, Belgium
139 Railroad Repair Yards, Namur, Belgium
140 Submarine Pens, Brest, France
141 Powder Plant, Angouleme, France
142 Powder Plant, Bergerac, France
143 Coking Plants, Montigny & Liege, Belgium
144 Fort St. Blaise Verdun Group, Metz, France
145 Gnome et Rhone, Limoges, France
146 Mjchelin Tire Factory, Clermont-Ferrand, France
147 Gnome et Rhone Aero Engine Factory, Le Mans, France
148 Kugelfischer Bearing Ball Plant, Ebelsbach, Germany
149 Louis Breguet Aircraft Plant, Toulouse, France
150 S. N. C. A. S. E. Aircraft Plant, Toulouse, France
151 A. I. A. Aircraft Plant, Toulouse, France
152 V. Weapons in London
153 City Area of Krefeld
154 Public Air Raid Shelters in Germany
155 Goldenberg Thermal Electric Power Station, Knapsack, Germany
156 Brauweiler Transformer & Switching Station, Brauweiler, Germany
157 Storage Depot, Nahbollenbach, Germany
158 Railway and Road Bridge, Bad Munster, Germany
159 Railway Bridge, Eller, Germany
160 Gustloff-Werke Weimar, Weimar, Germany
161 Henschell & Sohn G m b H, Kassel, Germany
162 Area Survey at Pirmasens, Germany
163 Hanomag, Hanover, Germany
164 M A N Werke Augsburg, Augsburg, Germany
165 Friedrich Krupp A G, Essen, Germany
166 Erla Maschinenwerke G m b H, Heiterblick, Germaey
167 A T G Maschinenbau G m b H, Mockau, Germany
168 Erla Maschinenwerke G m b H, Mockau, Germany
169 Bayerische Motorenwerke, Durrerhof, Germany
170 Mittel-Deutsche Motorenwerke G m b H, Taucha, Germany
171 Submarine Pens Deutsche-Werft, Hamburg, Germany
172 Multi-Storied Structures, Hamburg, Germany
173 Continental Gummiwerke, Hanover, Germany
174 Kassel Marshalling Yards, Kassel, Germany
175 Ammoniawerke, Merseburg-Leuna, Germany
176 Brown Boveri et Cie, Mannheim, Kafertal, Germany
177 Adam Opel A G, Russelsheim, Germany
178 Daimler-Benz A G, Unterturkheim, Germany
179 Valentin Submarine Assembly, Farge, Germany
180 Volkswaggonwerke, Fallersleben, Germany
181 Railway Viaduct at Bielefeld, Germany
182 Ship Yards Howaldstwerke, Hamburg, Germany
183 Blohm and Voss Shipyards, Hamburg, Germany
184 Daimler-Benz A G, Manheim, Germany
185 Synthetic Oil Plant, Meerbeck-Hamburg, Germany
186 Gewerkschaft Victor, Castrop-Rauxel, Germany
187 Klockner Humboldt Deutz, Ulm, Germany
188 Ruhroel Hydrogenation Plant, Bottrop-Boy, Germany
189 Neukirchen Eisenwerke A G, Neukirchen, Germany
190 Railway Viaduct at Altenbecken, Germany
191 Railway Viaduct at Arnsburg, Germany
192 Deurag-Nerag Refineries, Misburg, Germany
193 Fire Raids on German Cities
194 I G Farbenindustrie, Ludwigshafen, Germany, Vol. I & Vol. II
195 Roundhouse in Marshalling Yard, Ulm, Germany
196 I G Farbenindustrie, Leverkusen, Germany
197 Chemische-Werke, Huels, Germany
198 Gremberg Marshalling Yard, Gremberg, Germany
199 Locomotive shops and Bridges at Hamm, Germany

TRANSPORTATION DIVISION

*200 The Effects of Strategic Bombing on German Transportation
201 Rail Operations Over the Brenner Pass
202 Effects of Bombing on Railroad Installations in Regensburg, Nurnberg and Munich Divisions
203 German Locomotive Industry During the War
204 German Military Railroad Traffic

UTILITIES DIVISION

*205 German Electric Utilities Industry Report
206 1 to 10 in Vol. I "Utilities Division Plant Reports"
207 11 to 20 in Vol. II "Utilities Division Plant Reports"
208 21 Rheinische-Westfalische Elektrizitaetswerk A G

Pacific War

OFFICE OF THE CHAIRMAN

*1 Summary Report (Pacific War)
*2 Japan's Struggle to End The War
*3 The Effects of Atomic Bombs on Hiroshima and Nagasaki

CIVILIAN STUDIES

Civilian Defense Division

4 Field Report Covering Air Raid Protection and Allied Subjects, Tokyo, Japan
5 Field Report Covering Air Raid Protection and Allied Subjects, Nagasaki, Japan
*6 Field Report Covering Air Raid Protection and Allied Subjects, Kyoto, Japan
7 Field Report Covering Air Raid Protection and Allied Subjects, Kobe, Japan
8 Field Report Covering Air Raid Protection and Allied Subjects, Osaka, Japan
9 Field Report Covering Air Raid Protection and Allied Subjects, Hiroshima, Japan—No. 1
*10 Summary Report Covering Air Raid Protection and Allied Subjects in Japan
*11 Final Report Covering Air Raid Protection and Allied Subjects in Japan

Medical Division

*12 The Effects of Bombing on Health and Medical Services in Japan
*13 The Effects of Atomic Bombs on Health and Medical Services in Hiroshima and Nagasaki

Morale Division

*14 The Effects of Strategic Bombing on Japanese Morale

ECONOMIC STUDIES

Aircraft Division

*15 The Japanese Aircraft Industry
*16 Mitsubishi Heavy Industries, Ltd.
Corporation Report No. I
(Mitsubishi Jukogyo KK)
(Airframes & Engines)
*17 Nakajima Aircraft Company, Ltd.
Corporation Report No. II
(Nakajima Hikoki KK)
(Airframes & Engines)
*18 Kawanishi Aircraft Company
Corporation Report No. III
(Kawanishi Kokuki Kabushiki Kaisha)
(Airframes)
*19 Kawasaki Aircraft Industries Company, Inc.
Corporation Report No. IV
(Kawasaki Kokuki Kogyo Kabushiki Kaisha)
(Airframes & Engines)
*20 Aichi Aircraft Company
Corporation Report No. V
(Aichi Kokuki KK)
(Aiframes & Engines)
*21 Sumitomo Metal Industries, Propeller Division
Corporation Report No. VI
(Sumitomo Kinzoku Kogyo KK, Puropera Seizosho)
(Propellers)
*22 Hitachi Aircraft Company
Corporation Report No. VII
(Hitachi Kokuki KK)
(Airframes & Engines)
*23 Japan International Air Industries, Ltd.
Corporation Report No. VIII
(Nippon Kokusai Koku Kogyo KK)
(Airframes)
*24 Japan Musical Instrument Manufacturing Company
Corporation Report No. IX
(Nippon Gakki Seizo KK)
(Propellers)
*25 Tachikawa Aircraft Company
Corporation Report No. X
(Tachikawa Hikoki KK)
(Airframes)
*26 Fuji Airplane Company
Corporation Report No. XI
(Fuji Hikoki KK)
(Airframes)
*27 Showa Airplane Company
Corporation Report No. XII
(Showa Hikoki Kogyo KK)
(Airframes)
*28 Ishikawajima Aircraft Industries Company, Ltd.
Corporation Report No. XIII
(Ishikawajima Koku Kogyo Kabushiki Kaisha)
(Engines)
*29 Nippon Airplane Company
Corporation Report No. XIV
(Nippon Hikoki KK)
(Airframes)
*30 Kyushu Airplane Company
Corporation Report No. XV
(Kyushu Hikoki KK)
(Airframes)
*31 Shoda Engineering Company
Corporation Report No. XVI
(Shoda Seisakujo)
(Components)
*32 Mitaka Aircraft Industries
Corporation Report No. XVII
(Mitaka Koku Kogyo Kabushiki Kaisha)
(Components)
*33 Nissan Automobile Company
Corporation Report No. XVIII
(Nissan Jidosha KK)
(Engines)
*34 Army Air Arsenal & Navy Air Depots
Corporation Report No. XIX
(Airframes and Engines)
*35 Underground Production of Japanese Aircraft
Report No. XX

Basic Materials Division

*36 Coal and Metals in Japan's War Economy

Capital Goods, Equipment and Construction Division

*37 The Japanese Construction Industry
*38 Japanese Electrical Equipment
*39 The Japanese Machine Building Industry

Electric Power Division

*40 The Electric Power Industry of Japan
*41 The Electric Power Industry of Japan (Plant Reports)

Manpower, Food and Civilian Supplies Division

*42 The Japanese Wartime Standard of Living and Utilization of Manpower

Military Supplies Division

*43 Japanese War Production Industries
*44 Japanese Naval Ordnance
45 Japanese Army Ordnance
*46 Japanese Naval Shipbuilding
*47 Japanese Motor Vehicle Industry
*48 Japanese Merchant Shipbuilding

Oil and Chemical Division

49 Chemicals in Japan's War
50 Chemicals in Japan's War—Appendix
51 Oil in Japan's War
52 Oil in Japan's War—Appendix

Over-all Economic Effects Division

*53 The Effects od Strategic Bombing on Japan's War Economy (Including Appendix A: U. S. Economic Intelligence on Japan—Analysis and Comparison; Appendix B: Gross National Product on Japan and Its Components; Appendix C: Statistical Sources).

Transportation Division

54* The War Against Japanese Transportation, 1941–1945

Urban Areas Division

*55 Effects of Air Attack on Japanese Urban Economy (Summary Report)
*56 Effects of Air Attack on Urban Complex Tokyo-Kawasaki-Yokohama
*57 Effects of Air Attack on the City of Nagoya
*58 Effects of Air Attack on Osaka-Kobe-Kyoto
59 Effects of Air Attack on the City of Nagasaki
60 Effects of Air Attack on the City of Hiroshima

MILITARY STUDIES

Military Analysis Division

61 Air Forces Allied with the United States in the War Against Japan
62 Japanese Air Power
63 Japanese Air Weapons and Tactics
64 The Effect of Air Action on Japanese Ground Army Logistics
65 Employment of Forces Under the Southwest Pacific Command
66 The Strategic Air Operations of Very Heavy Bombardment in the War Against Japan (Twentieth Air Force)
67 Air Operations in China, Burma, India—World War II
68 The Air Transport Command in the War Against Japan
69 The Thirteenth Air Force in the War Against Japan
70 The Seventh and Eleventh Air Forces in the War Against Japan
71 The Fifth Air Force in the War Against Japan

Naval Analysis Division

*72 The Interrogations of Japanese Officials (Vols. I and II)
*73 Campaigns of the Pacific War
*74 The Reduction of Wake Island
*75 The Allied Campaign Against Rabaul
76 The American Campaign Against Worje, Maloelap, Mille, and Jaluit (Vols. I, II, and III)
*77 The Reduction of Truk
78 The Offensive Mine Laying Campaign Against Japan
79 Report of Ships Bombardment Survey Party—Foreword, Introduction, Conclusions, and General Summary
80 Report of Ships Bombardment Survey Party (Enclosure A), Kamaishi Area
81 Report of Ships Bombardment Survey Party (Enclosure B), Hamamatsu Area
82 Report of Ships Bombardment Survey Party (Enclosure C), Hitachi Area
83 Report of Ships Bombardment Survey Party (Enclosure D), Hakodate Area
84 Report of Ships Bombardment Survey Party (Enclosure E), Muroran Area
85 Report of Ships Bombardment Survey Party (Enclosure F), Shimizu Area
86 Report of Ships Bombardment Survey Party (Enclosures G and H), Shinomi-Saki and Nojima-Saki Areas
87 Report of Ships Bombardment Survey Party (Enclosure I), Comments and Data on Effectiveness of Ammunition
88 Report of Ships Bombardment Survey Party (Enclosure J), Comments and Data on Accuracy of Firing
89 Reports of Ships Bombardment Survey Party (Enclosure K), Effects of Surface Bombardments on Japanese War Potential

Physical Damage Division

90 Effect of the Incendiary Bomb Attacks on Japan (a Report on Eight Cities)
91 The Effects of the Ten Thousand Pound Bomb on Japanese Targets (a Report on Nine Incidents)
92 Effects of the Atomic Bomb on Hiroshima, Japan
93 Effects of the Atomic Bomb on Nagasaki, Japan
94 Effects of the Four Thousand Pound Bomb on Japanese Targets (a Report on Five Incidents)
95 Effects of Two Thousand, One Thousand, and Five Hundred Pound Bombs on Japanese Targets (a Report on Eight Incidents)
96 A Report on Physical Damage in Japan (Summary Report)

G–2 Division

97 Japanese Military and Naval Intelligence
98 Evaluation of Photographic Intelligence in the Japanese Homeland, Part I, *Comprehensive Report*
99 Evaluation of Photographic Intelligence in the Japanese Homeland, Part II, *Airfields*
100 Evaluation of Photographic Intelligence in the Japanese Homeland, Part III, *Computed Bomb Plotting*
101 Evaluation of Photographic Intelligence in the Japanese Homeland, Part IV, *Urban Area Analysis*
102 Evaluation of Photographic Intelligence in the Japanese Homeland, Part V, *Camouflage*
103 Evaluation of Photographic Intelligence in the Japanese Homeland, Part VI, *Shipping*
104 Evaluation of Photographic Intelligence in the Japanese Homeland, Part VII, *Electronics*
105 Evaluation of Photographic Intelligence in the Japanese Homeland, Part VIII, *Beach Intelligence*
*106 Evaluation of Photographic Intelligence in the Japanese Homeland, Part IX, *Artillery*
*107 Evaluation of Photographic Intelligence in the Japanese Homeland, Part X, *Roads and Railroads*
108 Evaluation of Photographic Intelligence in the Japanese Homeland, Part XI, *Industrial Analysis*

U. S. GOVERNMENT PRINTING OFFICE: 1947