THE UNITED STATES
STRATEGIC BOMBING SURVEY

Bayerische Motorenwerke A G (BMW) Munich, Germany

AIRCRAFT DIVISION

JANUARY 1947

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This report was written primarily for the use of the U. S. Strategic Bombing Survey in the preparation of further reports of a more comprehensive nature. Any conclusions or opinions expressed in this report must be considered as limited to the specific material covered and as subject to further interpretation in the light of further studies conducted by the Survey.

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Foreword

The United States Strategic Bombing Survey was established by the Secretary of War on 3 November 1944, pursuant to a directive from the late President Roosevelt.

The officers of the Survey were:

Franklin D'Olier, Chairman.
Henry C. Alexander, Vice-Chairman.

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Theodore P. Wright, Directors.

Charles C. Cabot, Secretary.

The Table of Organization provided for 300 civilians, 350 officers and 500 enlisted men. The Survey operated from headquarters in London and established forward headquarters and regional headquarters in Germany immediately following the advance of the Allied armies.

It made a close examination and inspection of several hundred German plants, cities and areas, amassed volumes of statistical and documentary material, including top German government documents; and conducted interviews and interrogations of thousands of Germans, including virtually all of the surviving political and military leaders. Germany was scoured for its records which were found sometimes, but rarely, in places where they ought to have been; sometimes in safe-deposit vaults, often in private houses, in barns, in caves; on one occasion, in a hen house and, on two occasions, in coffins. Targets in Russian-held territory were not available to the Survey.

Some two hundred detailed reports were made. During the course of its work, the Survey rendered interim reports and submitted studies and suggestions in connection with the air operations against Japan.

While the European War was going on, it was necessary, in many cases, to follow closely behind the front; otherwise vital records might have been irretrievably lost. Survey personnel suffered several casualties, including four killed.

The Survey studied the effects of the air attack on Japan and further reports have been submitted to the Secretary of War and the Secretary of the Navy.

AIRCRAFT DIVISION

AERO ENGINE PLANT REPORT NO 4

AERO ENGINE AND AUTOMOBILE FACTORIES OF BMW

MUNICH (OBERWIESENFELD AND ALLACH), GERMANY

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BMW (MUNICH)

I SUMMARY

1. The two aero-engine and automobile factories of Bayerische Motorenwerke A.G., commonly called BMW Plants of Munich, were located in Oberwiesenfeld and Allach, small Munich suburbs on the north and northwest outskirts of the city.

a. The Oberwiesenfeld plant covered an area of 92 acres, with more than 1,100,000 square feet of floor space under cover. Approximately 50 per cent of it was devoted to assembly processes. Had these been knocked out by bombing, production would have been seriously or perhaps completely disrupted.

b. The Allach plant covered an area of 235 acres, with 1,500,000 square feet of floor space under cover.

c. The principal product of the two plants was aero-engines for Junkers-52 transport planes and FW-190 fighters. Experimental engines, including jet engines, rocket engines, and their components were also produced in both plants and represented a major phase of the company's operations.

2. The attacks which definitely resulted in hits on the plants are tabulated as follows:

Target	Date	Air Force	Tonnage Dropped	Number of Hits in Area
Oberwiesenfeld Plant				
Plant	9/10 Mar 43	RAF	648	An undetermined number of IBs
Plant	13 June 44	15th AF	371	89
Area	11 July 44	8th AF	2126	17 (on bldgs)
Area	31 July 44	8th AF	1424	4 (on bldgs)
Allach Plant				
Plant	13 June 44	15th AF	184	27
Plant	19 July 44	15th AF	70	34
Plant	31 July 44	8th AF	266	24
Plant	12 Sept 44	15th AF	180	45
Marshalling yards	7 Jan 45	15th AF	Unknown	11

3. Physical damage sustained was from both HE and incendiary bombs and was extensive. Damage to the large buildings was due mainly to blast. Fire damage was much greater at the Oberwiesenfeld plant than at the Allach plant.

Low oblique of Oberwiesenfeld (BMW) Munich taken on 7 June 1945.

4. From the time of the first heavy raid on the Oberwiesenfeld plant to the end of the war, production of BMW-801 aero-engines throughout Germany as a whole was only 75 per cent of planned schedules. This was due primarily to air attacks on the Munich plants.

5. After heavy raids, there was some degree of recuperation in the following one or two months, often in the face of further raids. However, production never reattained previous peaks after May 1944. (Exhibit N)

6. Because of their proximity to a large city which was destined to become a prime target, the company's plants were particularly susceptible to air attacks. Further, as a known pre-war manufacturer of automobile and motorcycle engines, the company could logically be expected to convert to the production of aircraft engines to meet the growing demands of the plane program. In addition, the nature of the company's operations called for structural facilities which were conspicuous from the air.

7. The intelligence check on these plants as to pnysical damage was essentially correct. However, intelligence information as to production loss was conservative in all cases.

8. It may be surmised safely that if the plants had been undisturbed by the raids and uninterrupted in their experimental work, they would have been able to enter on large scale production of anti-aircraf rockets which might have developed into a serious menace.

II THE PLANT AND ITS FUNCTION IN ENEMY ECONOMY

1. Product

a. The Munich Oberwiesenfeld plant and its related dispersal factories manufactured aero-engines and engine components. From 1939 to March 1943 it produced BMW-801 engines on a line basis, but after March 1943 it became strictly an aero-engine development factory. It did not mass-produce, but only performed experimental work which could be used for broadening production experience in the manufacture of aero engines and jet-engine instruments. The plant was the headquarters of the management and administration of the BMW concern which controlled numerous factories dispersed throughout Germany. The dispersed plants produced aero-engines and components on a line basis until Germany's collapse.

2. Because of its experimental and research work on aero-engines, jet-engines and anti-aircraft rockets, the Oberwiesenfeld plant was very important in Germany's overall aircraft production plan. It furnished designs andpertinent data to all other BMW plants throughout

Germany. It delivered experimental engines to all BMW mass-production works, to various other BMW experimental plants, to the Reich's experimental organizations, to Junkers and Focke-Wulf (engines), to Henschel in Berlin and to the Brinker Iron Works at Hovelhof (rockets).

3. Manufactured engines were delivered for Junkers-52 transport planes and FW-190 fighters. But after the March 1943 raid line production was confined to the Allach plant andOberwiesenfeld devoted its activities to experimental work only.

4. Description of Oberwiesenfeld and Allach Plants

a. The Oberwiesenfeld plant was situated in Oberwiesenfeld, a suburb of Munich on the northern outskirts of the city. It covered a rectangular area of 92 acres. There was a total of 52 buildings, with 1,156,000 sq ft of floor space under cover. (Exhibit A, Exhibit B, Photograph 1 and Frontispiece)

(1) Approximately 50 per cent of the building area was devoted to assembly processes, the interruption of which would seriously or completely disrupt production.

(2) The buildings were of varying design, with some constructed of wood and brick and others of concrete and steel.

(3) The plant was served by a railroad and a motor highway. There was also an airport nearby. Power came from commercial sources in Munich. No power was generated in the plant proper.

b. The Allach plant was situated in Allach, a small suburb northwest of Munich. The site covered a roughly square area of 235 acres. The northeast corner was cut off by a motor highway which gave the appearance of a fifth side to the general shape. There was a total of 29 buildings with an aggregate of 1,500,000 square feet of floor space under cover. (Exhibit D, Exhibit B, Photograph 2)

(1) The buildings were of various designs, most of them being well-built concrete and steel structures. There was one very large "bomb-proof" bunker-type machine shop building, and the foundation for a similar building had been completed at the time of occupation by the Allies. (Exhibits B and C, Photographs 3,4,8,9,10.)

(2) The plant was served by a railroad and a motor highway. Power was supplied by commercial sources in Munich.

5. Ownership and Management

a. The BMW concern was privately owned and operated, the State having no financial interest in it whatsoever. It was capitalized at RM 100,000,000.

b. The Board of Directors was made up of several German nationals, all of whom disclaimed any connection with the State. The chairman was Mr Hans Rammel, a member of the executive committee of the Reichsbank. The vice-chairman was Dr Richard Bruhn, a chemist and a member of the executive committee of Auto-Union.

c. The members of the executive committee and their functions were as follows:

(1) W. Schaaf, chairman of the committee, director of the entire concern and in charge of personnel and sales.

(2) B. Bruckmann, director of development of engines in the aeronautical field.

(3) F. Fiedler, director of development in the field of power driven vehicles.

(4) Th. Scholl, in charge of finance, auditing, buying, and administration.

(5) Dr Stoffregen, director of assembly.

c. The principal Germans interviewed during the course of plant investigation were: B. Bruckmann; Th. Scholl; Donath, who was technical director of the company; Dorls, technical works manager at the Allach plant. Minor officials and other employees were called in for specific questioning.

6. Employees

a. The peak number of employees at the Oberwiesenfeld plant and its dispersal factories were reached in December 1943 when there were 11,056 productive and nonproductive wage earners and 4,304 administrative or salaried employees, making a total of 15,360 employees on the payroll. Until 1943 the number of employees climbed steadily. By March 1945 the number of employees had declined to 11, 274 (Figure I).

b. The Germans asserted that there had never been any strikes. Dissatisfaction among the workers was noticeable only in isolated instances and never took the form of a large demonstration. With reference to foreign workers, it was alleged, "we were helped by the activities of

BMW (MUNICH)

EMPLOYEES
MUNICH PLANT AND ITS DISPERSAL FACTORIES

FIGURE I

Productive and non-productive Wage Earners		Dec 1939	Dec 1940	Dec 1941	Dec 1942	Dec 1943	Dec 1944	Mar 1945
German	Male	5,829	6,493	6,116	4,902	4,817	3,689	3,520
	Female	1,125	1,397	1,456	1,159	1,223	1,016	848
Foreigners	Male		506	2,115	4,522	4,444	3,667	2,574
	Female			100	204	329	629	486
POW						243	46	48
Civil Prisoners							298	277
Total		6,954	8,396	9,787	10,787	11,056	9,345	7,753
Administrative or Salaried Employees								
German	Male	1,469	1,712	2,087	2,198	2,427	2,111	1,930
	Female	863	1,038	1,401	1,679	1,745	1,590	1,487
Foreigners	Male			19	57	105	99	77
	Female			4	10	27	33	27
Total		2,332	2,750	3,511	3,944	4,304	3,833	3,521
Total Employees		9,286	11,146	13,298	14,731	15,360	13,178	11,274

FLUCTUATION OF EMPLOYEES

Productive and non-productive Wage Earners	Year 1940	Year 1941	Year 1942	Year 1943	Year 1944	1st Qtr 1945
Incoming		3,245	5,880	5,437	5,538	
Outgoing (includes transfer to other factories)		1,854	4,880	5,168	7,249	
Net change	+ 1,442	+ 1,391	+ 1,000	+ 269	- 1,711	- 1,592
Administrative or Salaried Employees						
Net change	+ 418	+ 761	+ 433	+ 360	- 471	- 312
Total Employees						
Net change	+ 1,860	+ 2,152	+ 1,433	+ 629	- 2,182	- 1,904

trusted members among these workers. The attitude of the German workers to the foreign ones, on the whole, was good." In general, absenteeism was not a great problem. The average for the period 1939-1944 was 11 per cent. An upward trend from a mid-1943 low of eight per cent to a high of 19 per cent in August 1944 is discernible (Exhibit E).

c. Until 1940 the plant was operated on a 48-hour week basis with overtime when necessary. Due to the increase in the production schedule in the fall of 1940 the work week was increased to 54 hours with overtime when specially necessary. This weekly time schedule was maintained until March 1944 when the time was increased to 69 hours per week for men and 60 hours per week for women workers. This schedule was maintained until the last of October 1944 when it was decreased to 60 hours per week for men and 57 hours per week for women. This drop in time per week was caused by transportation difficulties and by the inability of individual workers to get necessary food rations when working such long hours. The company tried the expedient of operating a food commissary for the workers, but this proved unsatisfactory and was discontinued. In March 1945 the work week for all general workers was decreased again to 54 hours, but in the production departments the schedule was maintained at the 60 hour level in two shifts. However, for emergency employees there was only one 60-hour shift per week.

III ATTACKS

1. The Oberwiesenfeld and Allach plants were the subject of raids as listed in Figures II and III.

IV EFFECTS OF BOMBING

1. Physical Damage

a. The bomb plots of the Oberwiesenfeld and Allach plants (Exhibits A and D) show all HE bombs in the target area for 13 June 1944 and only those bombs causing damage in subsequent raids. The extent of damage in all raids to both plants is revealed in Exhibits F,G,H,J.)

b. Damage to the new buildings at Oberwiesenfeld and the large structures at Allach was due mainly to blast. These buildings were completely fire resistant and their contents were never of a nature to cause a major fire. The failures of the structures of the Allach plant are evident in Exhibit C, Photographs 5,6,7,15 and 21. The structural failures of Oberwiesenfeld are depicted in Exhibit C, Photographs 11, 12,13 and 16. In all cases, it is clearly discernible that the spreading collapse was great because the concrete members had been only lightly reinforced.

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AIR ATTACKS
Oberwiesenfeld, Munich

Raid No	Air Force	Date of Attack	Time of Attack	No of Aircraft	Altitude of Release	Sighting	Bombs Dropped Type	Number	Size	Tons	Fuzing Nose	Fuzing Tail	Impact on Plant Hits in Area	Impact on Plant Hits on Bldgs
1	RAF	1-2/9/40		1			HE	7		2			0	0
2	RAF	9-10/3/43	2358	226	14,500		HE	270	Various	329			Undetermined Number of Lbs.	
			0009				IB	9,783	"	319				
3	15	9/6/44	1009	37	21,000		HE	207	1,000	104	.1	Inst	0	0
4	15	13/6/44	1020	36	22,100		ITS	1,397	100	70				
			1030	102	22,800					301	0	Inst	89	41
5	8	11/7/44	1220	975	21,500	PFF	HE	11,938	Various	1,839				17
		(area)	1406		27,100		IB	8,303		287				
6	8	12/7/44	1301	1,117	22,300	PFF	HE	5,288	500	1,330	Inst	Inst		
		(area)	1406				IB	5,500	500	1,397				
7	8	13/7/44	0928	592	22,800	Visual &								
			0954		26,600	PFF	HE	2,498	500	627	.1			
							IB	666	100					
							IB	3,144	500	818				
8	8	16/7/44	0944	35	25,000	PFF	IB	1,386	100	48	Inst	Inst		
			1044		28,500									
9	8	31/7/44	1310	565	22,700	PFF	HE	2,590	500	648				
					26,900		HE	273	1,000	137	Inst	Inst		
							IB	2,539	500	635				
10	15	22/9/44	1226	75	22,100	PFF	HE	744	500	187	.1	.1		
			1246		26,000									

Source: Air attacks in Europe, USSBS
Hits on plant from plant study.

Figure III

Raid No	Air Force	Date of Attack	Time of Attack	No. of Aircraft	Altitude of Release	Sighting	Bombs Dropped Type	Number	Size	Tons	Fusing Nose	Fusing Tail	Impact on Plant Hits in Area	Impact on Plant Hits on Bldgs
1	15	9/6/44												
	City Area		1004	117	21,500	PFF	HE	480	500	120	.1	.025		
			1012		25,500		HE	120	500	30	.1	.1		
							HE Frag	6,576	20	65		inst		
	Allach		1030	27	23,500	-	HE	135	1,000	68	.1	inst (.1-	0	0
2	15	13/6/44	1030	56	20,500-22,000	Visual	HE	302	1,000	151	.1	(inst	27	4
			1034	24	22,500		IB	648	100	33				
3	15	19/7/44	1142	28	22,600	Visual	HE	280	500	70	.1	.01	34	8
4	8	21/7/44												
	City Area		1038	79	20,000	PFF	HE	52	100	3	inst	inst	-	-
			1123		24,000		HE	470	500	117	.1	.01		
							IB	1,089	100	55				
							IB	100	500	25				
	Allach		1037	35	22,400	PFF	HE	214	500	54	.1	.01	0	0
							IB	120	500	30				
5	8	31/7/44	1335	108	26,000	PFF	HE		500		.1	.01	24	7
							IB	1,065	500	266	inst	inst		
6	15	12/9/44	1242-1248	91	22,700-24,500	-	HE	359	1,000	180	.1	.01	45	10
7	15	22/9/44	1255	26	26,000	PFF	HE	300	500	75	.1	.01	0	0
8	15	23/9/44	1150-1153	44	18,000-25,000	PFF	HE	248	500	62	.1 inst	.01		
9	15	7/1/45	2119 (Target of opportunity)				HE IB		1,505				11	2

Source: Air attacks on Europe, USSBS. Hits on plant from plant study.

c. Damage resulting from fire was much greater at the Oberwiesenfeld plant than at Allach. A major fire caused severe damage the night of 9/10 March 1943 to buildings 32 and 33 at Oberwiesenfeld. This was an RAF attack (Exhibit A.)

(1) Office buildings and canteens at both plants suffered from extensive fire damage in some raids because of their construction and contents. Most of these buildings were of wood.

(2) At Allach one fire-proof storage building which held a stock of light metals was hit and penetrated by a large incendiary bomb in the raid of 31 July 1944. The intense fire which resulted completely destroyed the building and its contents. (Exhibit C, Photographs 14 and 19.)

(3) Other buildings damaged by fire at both plants are shown in Exhibit C, Photographs 17, 18, and 20.

d. The contents of buildings were never severely damaged by blast or debris. However, where the damage was due to fire, the contents were 100 per cent destroyed.

e. Two buildings at the Allach plant, numbers 2010 and 2011, suffered extensive failures of heavy steel columns. This was because the column sections had been bolted rather than riveted together. (Exhibit C, Photographs 22 and 23.)

f. Many types of protective measures had been taken at both the Oberwiesenfeld and Allach plants (Exhibit C, Photographs 24 to 30 inclusive.) Additional brick columns were built in many buildings and some steel columns were bricked in for protection. Important machine tools, power equipment and transformer stations were protected by blast walls of two types. One type was a solid brick wall andthe other was a "U" shaped precast concrete block laid without mortar and filled with gravel. (Photographs 24 and 28.) This heavy type of blast wall construction offered very good protection against blast, fragmentation and debris. (Exhibit C, Photographs 25 and 26.)

g. Attention is directed to Exhibits K and L which show the number of bomb hits in the plant areas, the number of bomb hits on buildings and the bomb density per acre where available. This information is given for both the Oberwiesenfeld and Allach plants.

2. Production Loss

a. The Oberwiesenfeld plant was primarily an aero-engine develop-

ment factory, and there was no mass production program of aerial engines in effect. The attached chart shows the planned program and the number of engines actually delivered. (Exhibit M.)

b. The first heavy raid on Oberwiesenfeld was made on 9/10 March 1943. This attack completely gutted Hall No 32 which housed the assembly shop and component stores for the BMW-801 engine and destroyed 340 engines in process of being assembled. There were no scheduled production figures available for this engine, therefore it is not known just how the raid affected planned delivery. In February 1943 the plant delivered 400 BMW-801's and in March only 225.

c. A conservative estimate of the output lost at the Allach plant can be obtained by taking the highest output actually achieved (May 1944) and considering the discrepancies between this peak figure and the actual output in the following months as a minimum loss of output due to bombing. During the ten months from June 1944 through March 1945, actual production was only about 4,700 BMW-801 engines compared with the 10,000 which would have been produced had the peak production of 1,000 in the month of May been maintained. The lost production was 53 percent of potential. The loss amounts to 47 per cent when figured on the basis of the production plans which called for 8,800 engines during the 10 month period. However, there is evidence that production planning took into account the effects of past raids and therefore discounts some of the loss of output due to bombing. By March 1945 the monthly loss of output amounted to 62 per cent of the peak level, and 58 per cent of the March plans (Exhibit N). There can be no doubt that despite partial recoveries from air raids, loss of output at Allach was very serious from June 1944 on.

3. The quality of the products manufactured at Oberwiesenfeld, Allach and other dispersal plants did not seem to be affected by the bombing raids, and there were no material substitutions reported except the switch-over, in the construction of the 801E engine, to simplified methods of raw material part production permitting less tolerance of single parts in the finishing procedure. No information was obtainable as to how this new constructive procedure affected the performance of this engine. The Oberwiesenfeld plant, which became an experimental development factory after the first raid on 9/10 March 1943, was not subject to large design modification problems.

4. There were no specific data available on physical damage to finished products and raw materials at either the Oberwiesenfeld or Allach plants, except as noted. The total value of raw and plant material stocks destroyed in all raids was approximately RM 9,071,000. Damage to components and embodiment stocks was assessed at approximately RM 12,420,000. Damage to work in process and to finished stocks was estimated at RM 12,203,000. This aggregated a total estimated loss of

BMW (MUNICH)

RM 33,694,000.

5. There were no data available on loss of production caused by the dispersal program. However, the following dispersal of production units was carried out as a result of the attacks:

a. After the raid of 9/10 March 1943 manufacture and assembly of the BMW-801 was moved to Allach (Exhibit N for planned and actual deliveries of BMW-801 engines), and the Oberwiesenfeld plant was turned into an experimental plant for engine assembly and development. For a time Oberwiesenfeld also manufactured various components for Allach and other dispersed plants in the vicinity of Munich which were as follows:

Munich, Cenovis Keller
Munich, Hofbraeu Keller
Fellnach, Priller Wood Factory
Kolbermoor, Cotton Mill
Bruckmuehl, Bavarian Wool Blanket Factory
Fuerstenfeldbruck
Feldafing, Schoolhouse
Berg, Castle Elscholz
Esting
Wasserburg

b. To makefore room for experimental work and to reduce the continued danger of air raids, the components manufacture was moved in March 1944 to Sachse K.G. at Kempsten. The BMW company had a half interest in this plant, but Sachse was not listed as one of the main dispersal plants of the company.

c. After the raid of 9/10 March 1943 an experimental serial assembly line was built in Hall 98 where work continued until the construction of Hall 84, where it remained till the Allied occupation. The raid of 13 June 1944 totally destroyed Hall 16 which housed the machine tool making plant. Immediately after this raidthe tool making plant was moved to the Cenovis Keller plant in Munich.

d. In March 1944 the large light metal component parts plant was moved to Allach and the model carpentry shop to Leilnbach. In May 1944 the oil-pump manufacture was moved to Landshut, then later to Allach. In June 1944 the experimental workshop and the construction offices for engine development were moved to Kolbermoor. The latter lost their accomodation at this new location in the daylight bombing attack of 13 June 1944. In August 1944 the cog-wheel plant was moved to the Hofbrau Keller, Munich. In October 1944 the small component parts plant was moved first to the Franziskanerkeller and then a short time later to Allach.

6. The plant officials questioned did not attribute any loss of production to protection measures as they had special labor crews to build blast walls and re-arrange the machine tools which they were trying to protect.

7. The loss of productive labor through absenteeism became a problem only in 1944, but the inefficiency of inexperienced foreign slave labor did cause a small loss until the foreigners were trained by experienced German workers.

8. The loss attributed to shortages of raw materials such as bar steel, light metal, etc., was at times very acute although the plants at first had large reserve stocks. As time went on these reserves were depleted, and new materials received were of inferior quality. This caused a large loss in production of certain component parts because of the number of rejects. The inability of the producers of raw material to get their products to the plant, due to transportation difficulties, became a very grave problem. There are no figures available as to the actual loss due to this cause.

a. It was stated by the German plant officials that there was no loss of production caused by the disruption of utilities such as electric power and gas.

b. The transportation difficulties experienced by the BMW plants in the Munich area were caused by the strategic bombing of rail marshalling yards and rail transportation throughout Germany.

9. According to the directors, the Reichs Air Ministry cancelled all war contracts in April 1945. Thereupon the factory started to retool for the manufacture of motor cars, bicycle spare parts and building fittings.

10. Recuperability Cycle

a. Following heavy raids, there was some degree of recuperation within one or two months, although output never reattained the immediately preceding peaks (Exhibit N.) After the RAF raid of 9/10 March 1943 all line engine manufacturing was moved immediately from Oberwiesenfeld to Allach. However, it was May 1943 before the Allach plant produced 400 BMW-801 engines (Exhibit M) which was the number which had been produced in February at Oberwiesenfeld. A steady climb in production was maintained at Allach until May 1944 with a production figure of 1000 engines. The two raids in June 1944 cut production down to 625 for that month, then the two raids in July 1944 cut it still further to 450 for July. During August production climbed to 540 engines and continued to 715 for September, despite two raids in that month.

The results of these two raids brought production down to 325 engines for October, and the one raid on October continued the curve down to 310 engines for November. Production was brought back up to 525 engines for December, and 500 for January 1945. In February there was a big drop to 310 and then a slight rise to 375 engines for March 1945.

b. The number of man-hours required to repair damage was not available.

c. The recuperability of production after raids can be attributed to the success of the dispersal plan in the manufacturing of components and to intensive use of undamaged portions of the plant.

11. Vulnerability

a. The Oberwiesenfeld and Allach plants were particularly vulnerable both due to their locations and to large assembly and numerous test cell buildings which were easily recognisable from the air.

V INTELLIGENCE CHECK

1. The Oberwiesenfeld plant was an automobile and motorcycle factory before the war. The oblong test track made an ideal identification marker. When this plant was turned into an aero-engine factory engine test cell buildings were constructed. Aerial reconnaissance showed that the plant was manufacturing aero-engines and that the large plant buildings already in existence could be used as machine shops and assembly buildings (Exhibit B, Photograph 1.)

a. At the Allach plant, too, the existence of engine test cell buildings and extremely large single story facilities indicated that the plant was manufacturing aero-engines (Exhibit B, Photograph 2.)

2. The photo interpretation of damage done to important buildings and subsidiary damage elsewhere was essentially accurate. The intelligence information stated that these plants were producing 400 engines per month in January 1944, yet the plant records show that there were 620 engines produced and delivered that month. Intelligence information gives an estimate of 900 engines as the total loss of production due to the raids of June and July 1944. Records show, however, that there was an actual loss of 1,042 engines (based on scheduled production) due to these raids. The intelligence information was correct in the statement that there was very little machine tool damage.

3. Photo interpretation of recuperation shows that after the June and July raids the plants had fully recovered their pre-raid production by 1 September 1944. On the other hand production figures show that there were 740 engines delivered for September as against 1000 for May 1944.

4. Photo interpretation of damage to dispersal plants was not available.

VI DATA RELEVANT TO OTHER STUDIES

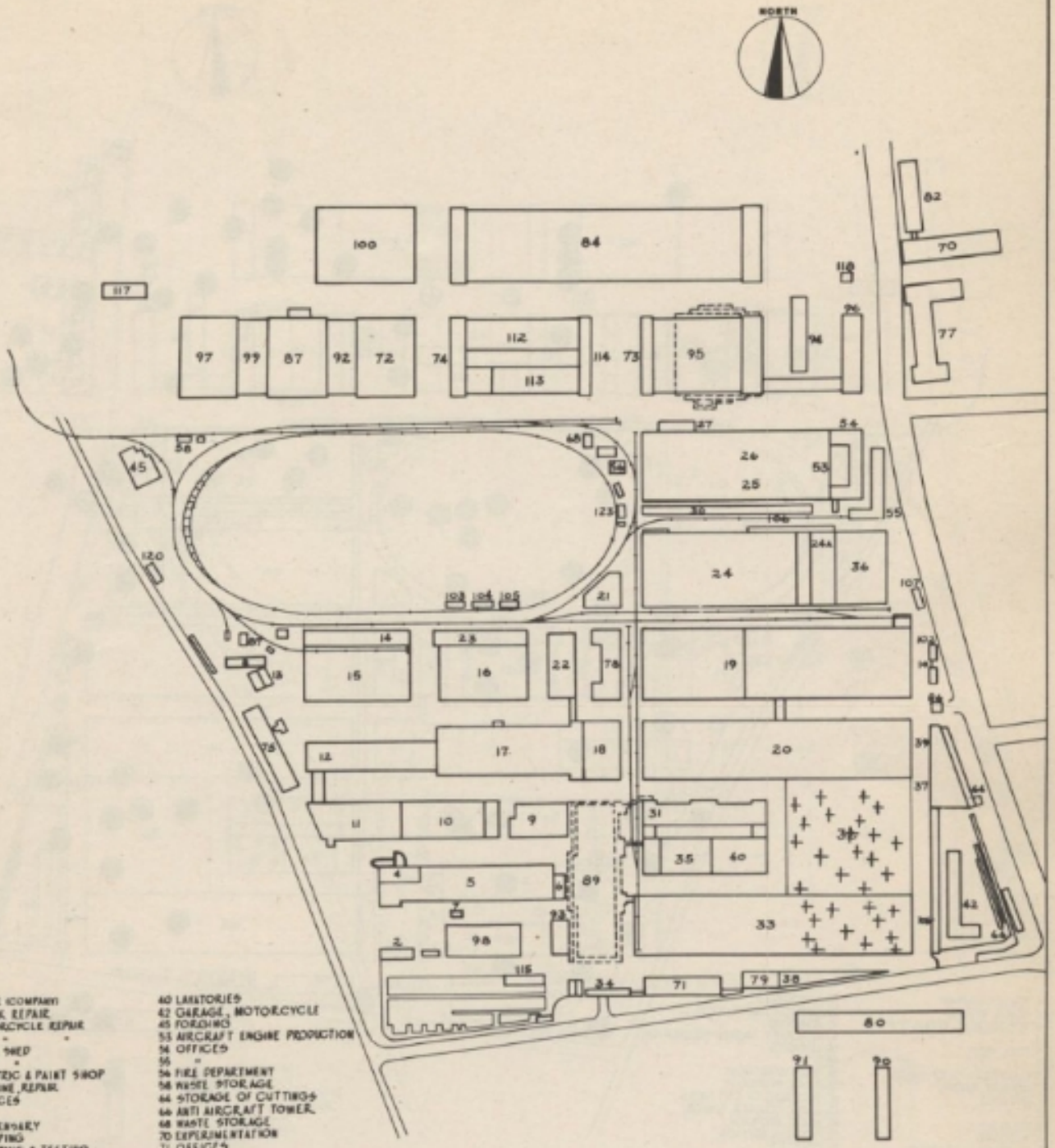
1. No inquiries were made for information as to morale or overall effects. The results of inquiries about the effect of bombing on the German transportation system have been noted under Production Loss (Part IV, Paragraph 8.)

VII EVALUATIONS AND IMPRESSIONS

1. The impressions gained from this study are that this concern was well organized and well managed. Its dispersal plan was worked out efficiently. Given another 60 days, its experimental work on jets and rockets would have reached a point where production could have been started on a large scale.

BMW (MUNICH) EXHIBIT A

BOMB PLOT, OBERWIESEN FELD PLANT



2 HORSE (COMPANY)
4 TRUCK REPAIR
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7 TOOL SHED
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9 ELECTRIC & PAINT SHOP
10 MACHINE REPAIR
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18 HARDENING
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20 PRODUCTION OF A/C ENGINES
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24a "
25 AIRCRAFT ENGINE PRODUCTION
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30 STORAGE FOUNDRY
31 RECREATION HALL
32 MACHINE SHOP
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36 TEST STANDS
37 TRANSPORTATION
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114 " "
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118 NORTH GATE
120 STORAGE SHELTER
123 FOUNDRY SAND STORAGE

SCALE IN FEET

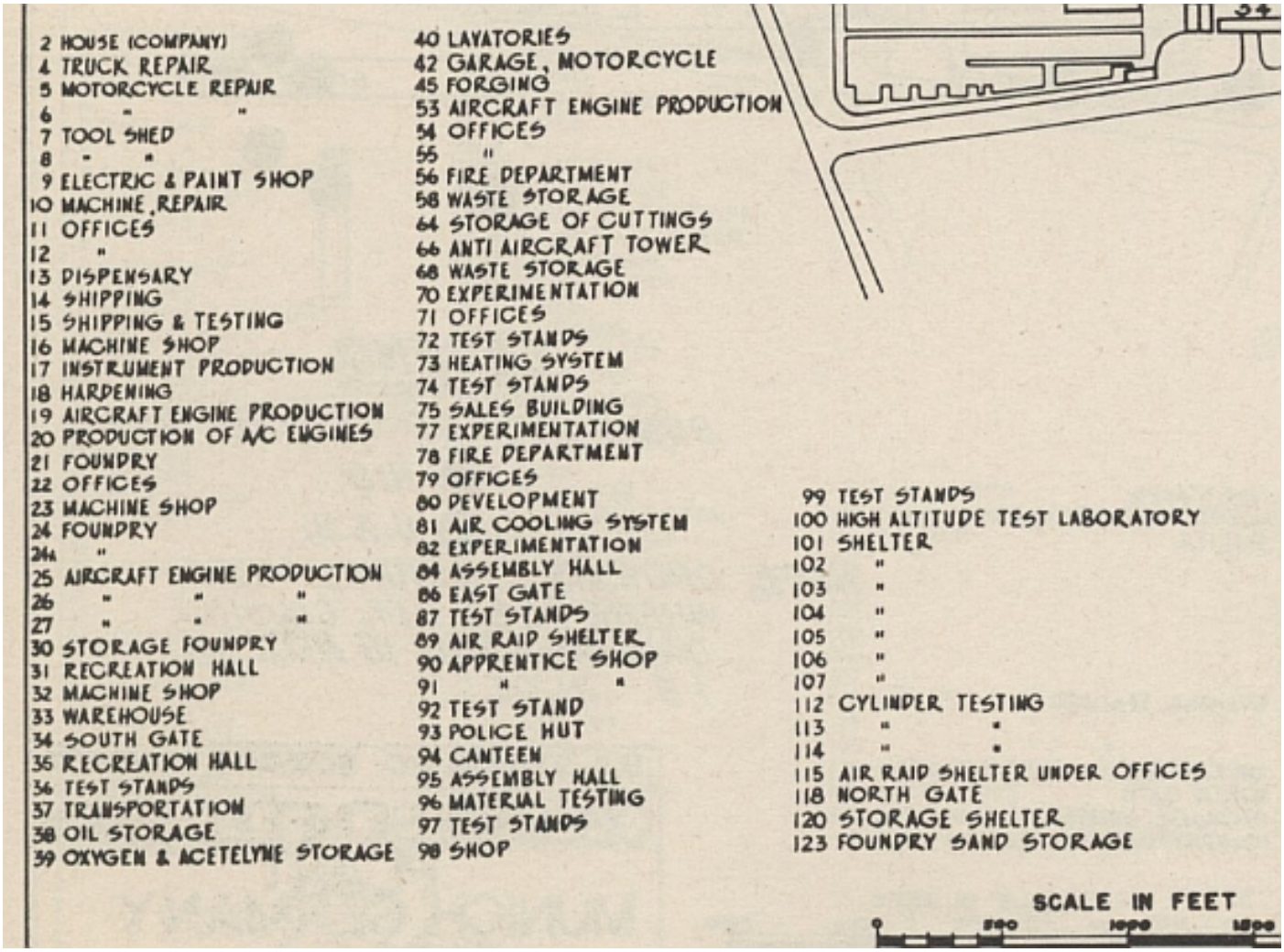
BOMB PLOT OF 9-10 MARCH, 1943 (RAF)

NOTE:
CROSSES INDICATE AREA WHERE I.B. HIT, CAUSING DAMAGE, AND IS NOT AN I.B. PLOT

U.S. STRATEGIC BOMBING SURVEY

OBERWIESENFELD B.M.W. PLANT MUNICH, GERMANY

EXHIBIT A-1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SCALE IN FEET
500
1000
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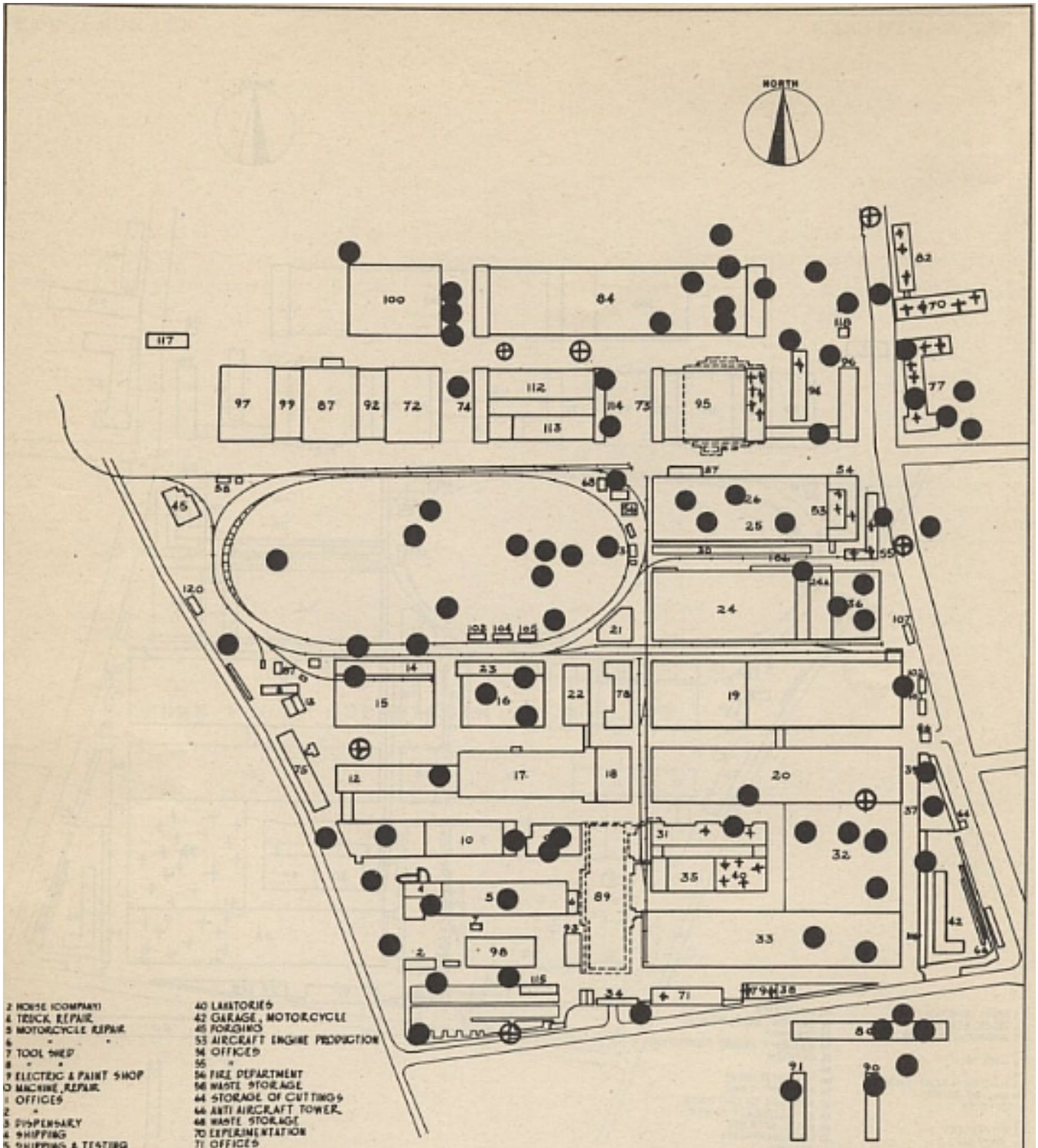

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SCALE IN FEET

LEGEND

BOMB PLOT OF 13 JUNE, 1944

● H.E.

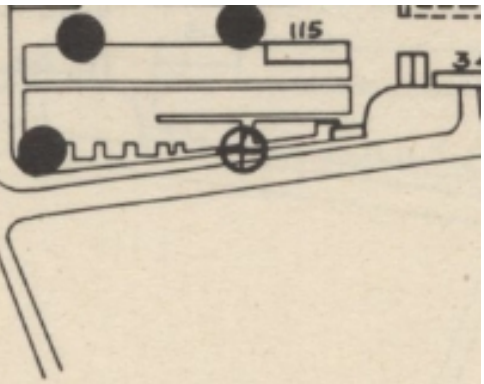
⊕ U.X.B.

NOTE: CROSSES INDICATE AREA WHERE I.B. HIT, CAUSING DAMAGE, AND IS NOT AN I.B. PLOT

U.S. STRATEGIC BOMBING SURVEY

OBERWIESENFELD BMW PLANT MUNICH, GERMANY

EXHIBIT A-2



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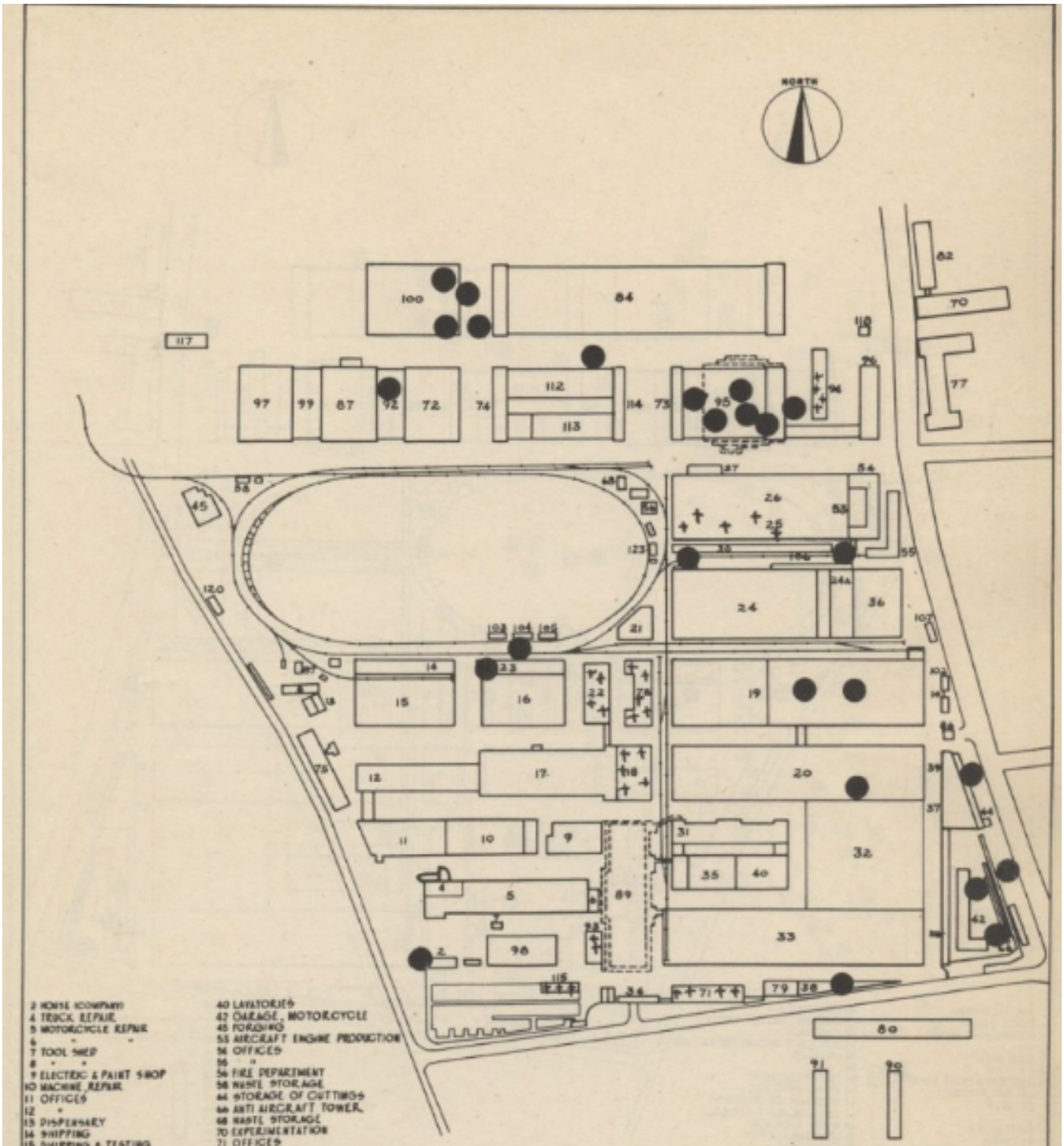
123 FOUNDRY SAND STORAGE

SCALE IN FEET



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115 AIR RAID SHELTER UNDER OFFICES
118 NORTH GATE
120 STORAGE SHELTER
123 FOUNDRY SAND STORAGE

SCALE IN FEET

BOMB PLOT OF 11-12-13 JULY, 1944

LEGEND

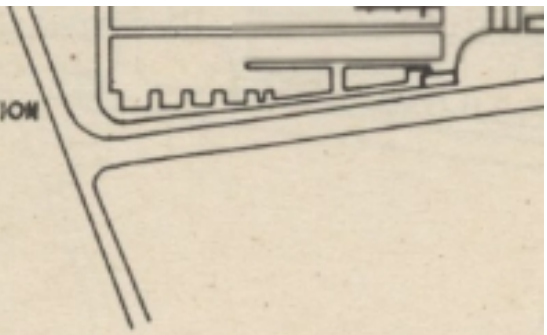
● H.E.

NOTE: 1-CROSSES (+) INDICATE AREA WHERE I.B. HIT, CAUSING DAMAGE AND IS NOT AN I.B. PLOT
2-ONLY H.E. BOMBS CAUSING DAMAGE ARE INDICATED

U.S. STRATEGIC BOMBING SURVEY

OBERWIESENFELD BMW PLANT MUNICH, GERMANY

EXHIBIT A-3



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16 MACHINE SHOP
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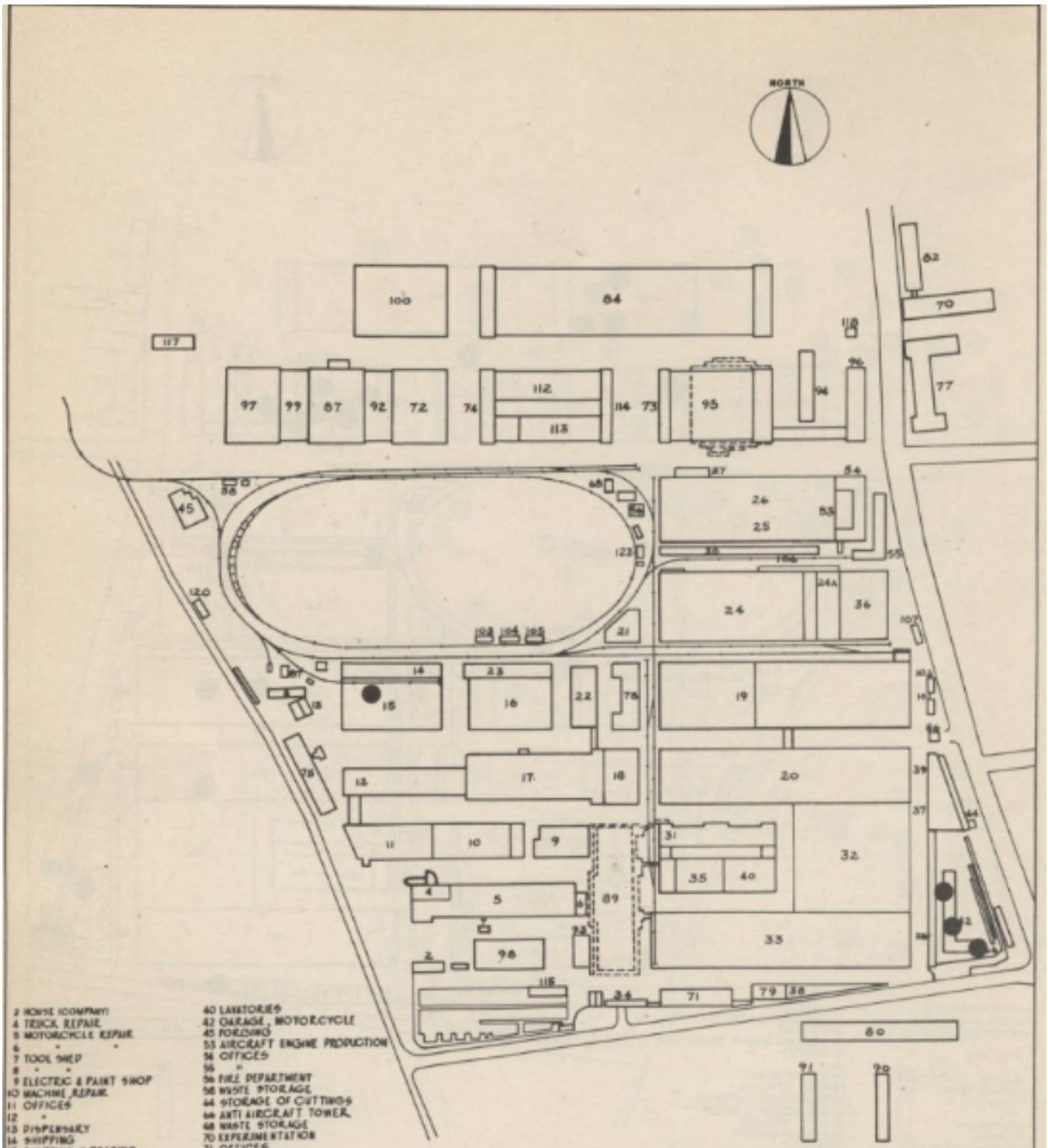
118 NORTH GATE
120 STORAGE SHELTER
123 FOUNDRY SAND STORAGE



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9 ELECTRIC & PAINT SHOP
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116 NORTH GATE
120 STORAGE SHELTER
123 FOUNDRY YARD STORAGE

SCALE IN FEET
0 1000 2000 3000

BOMB PLOT OF 31 JULY, 1944

LEGEND

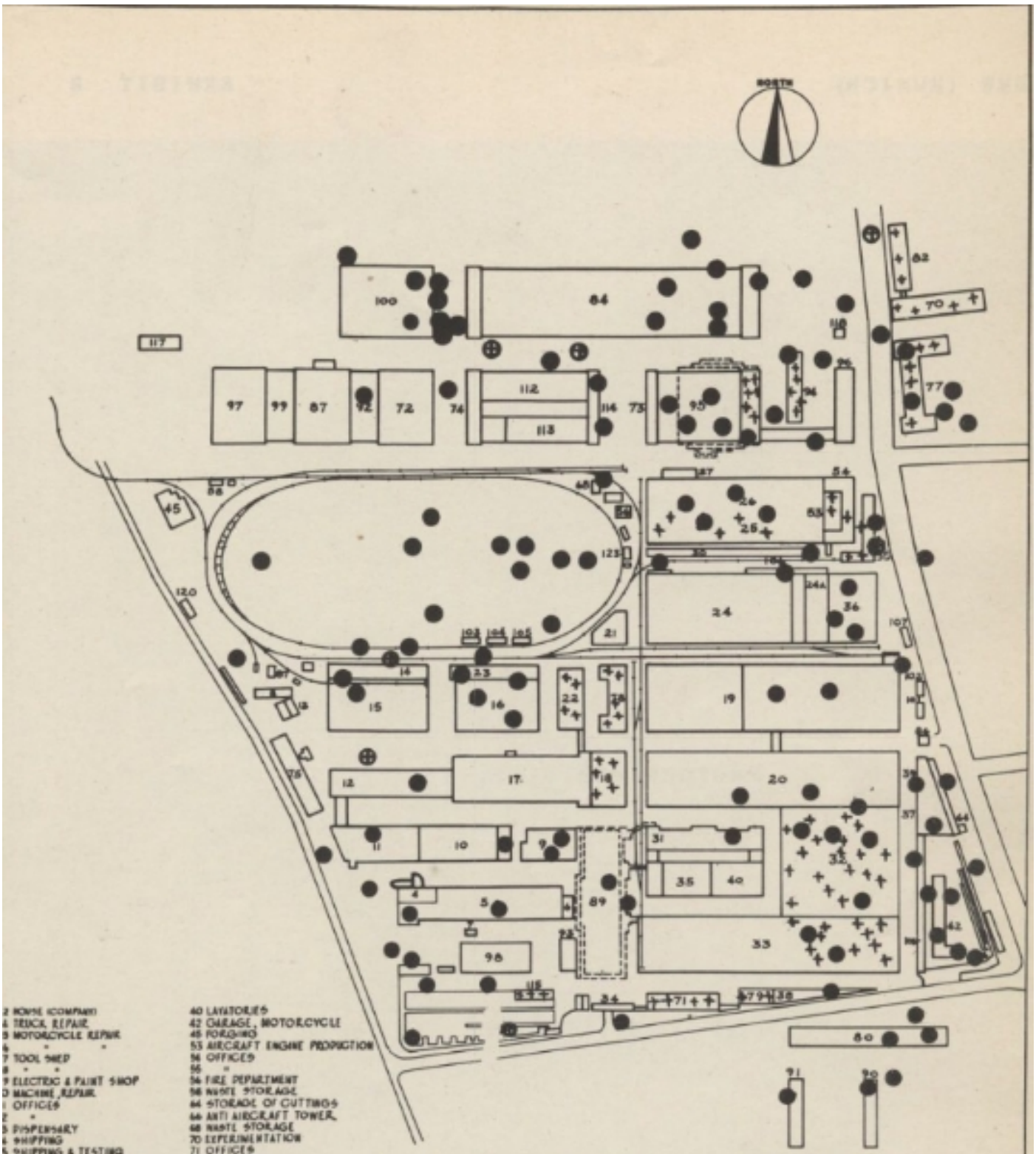
● H.E.

NOTE:
ONLY H.E. BOMBS CAUSING DAMAGE ARE INDICATED.

U.S. STRATEGIC BOMBING SURVEY

OBERWIESENFELD B.M.W. PLANT MUNICH, GERMANY

EXHIBIT A-4



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118 NORTH GATE
120 STORAGE SHELTER
123 FOUNDRY YARD STORAGE

SCALE IN FEET

BOMB PLOT

DATES

9-10 MARCH, 1943 (RAF)
13 JUNE 1944
11-12-13 JULY 1944
31 JULY 1944

NOTE: CROSSES (+) INDICATE AREA WHERE I.B. HIT, CAUSING DAMAGE, AND IS NOT AN I.B. PLOT

U.S. STRATEGIC BOMBING SURVEY

OBERWIESENFELD B.M.W. PLANT
MUNICH, GERMANY
EXHIBIT A-5

BMW (MUNICH) EXHIBIT B

PHOTOGRAPHS 1, 2, 3

Photo 1 - Vertical photo of Oberwiesenfeld showing plant area.

1094

Photo 2 - Vertical photo of Oberwiesenfeld showing BMW plant.

Photo 3 - Low oblique of Oberwiesenfeld (BMW) Munich taken on 7 June 1945.

PHOTOGRAPHS 4 TO 30 INCLUSIVE

Photo 4 - Allach - Heavy bunker type construction used as a machine shop.

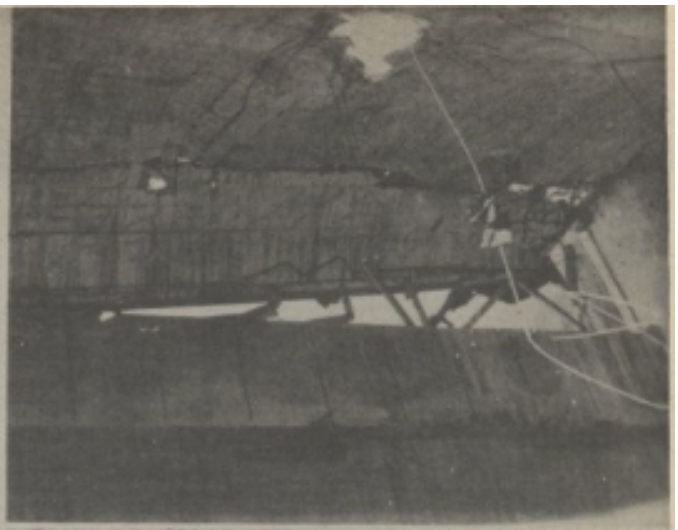


Photo 5 - Allach - New reinforced concrete construction. Note hole of entry of bomb.

Photo 6 - Allach - New construction, 1940; new brick wall to isolate damaged portion.

Photo 7 - Allach - Completely destroyed canteen in foreground. Several bays of large assembly hall in background.

Photo 8 - Allach - Protection to entrance of bunker structure.

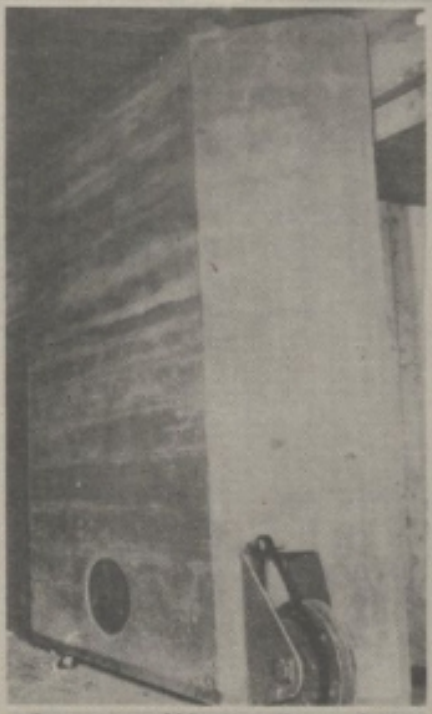


Photo 9 - Allach - Heavy door to bunker, closed during air attacks.

Photo 10 - Allach - Inside of bunker showing machine tools.

Photo 11 - Oberwiesenfeld - Spreading collapse. Note how external wall remained standing.

Photo 12 - Oberwiesenfeld - General view of area where collapse due to blast occurred.

Photo 13 - Oberwiesenfeld - Complete collapse of lightly reinforced concrete structure. Result of taree bomb strikes.

Photo 14 - Allach - Bldg 2091 where storage of light metals burned. Complete destruction of reinfroced concrete bldg.

Photo 15 - Allach - Type of failure of lightly reinforced concrete. Bldg 2003.

Photo 16 - Oberwiesenfeld - Failure due to blast. New construction.

Photo 17 - Allach - Packing bldg destroyed by fire. Debris had been cleaned up.

Photo 18 - Oberwiesenfeld - Light steel structure destroyed by fire.

Photo 19 - Allach - Same as 14, showing top of bldg 2091.

Photo 20 - Allach - Bldg destroyed by fire. Walls left standing.

Photo 21 - Allach - Spreading collapse, light reinforcing in column.

Photo 22 - Allach - Failure of heavy steel structure, bldg 2011. Bolted joints failed.

Photo 23 - Allach - Failure of heavy steel structure, bldg 2010. Bolted sections failed.

Photo 24 - Oberwiesenfeld. Top view of precast concrete blocks and gravel, used as blast walls.

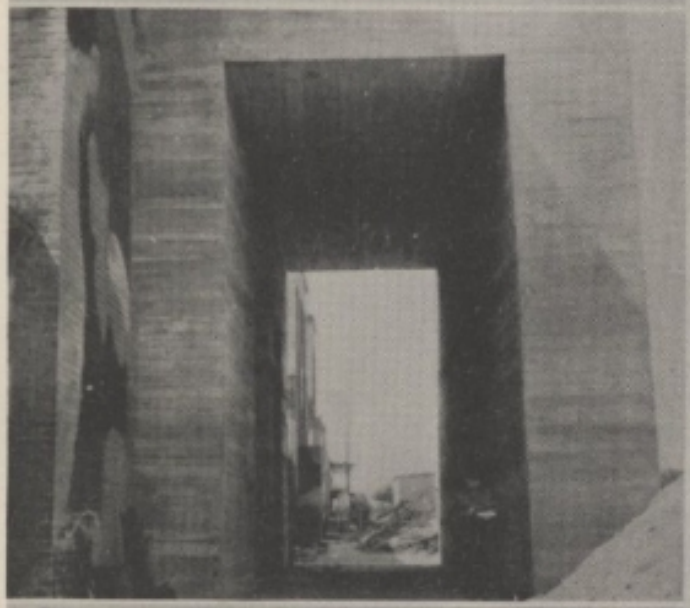


Photo 25 - Oberwiesenfeld. Heavy reinforced concrete structure to house transformer station.

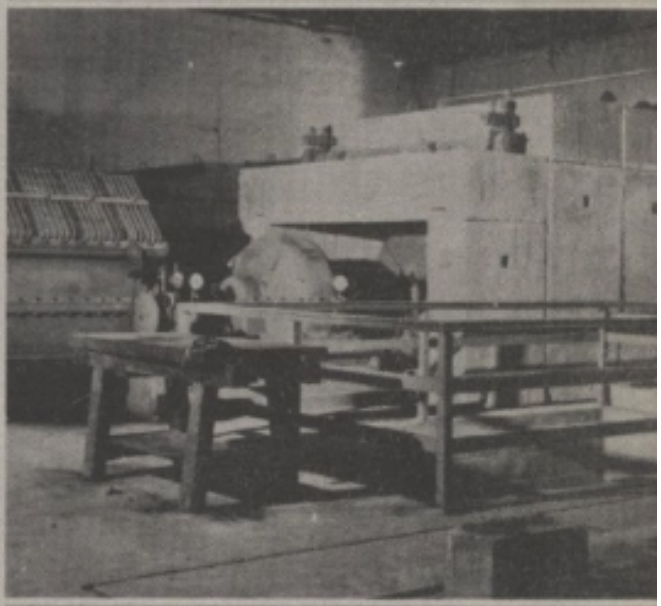
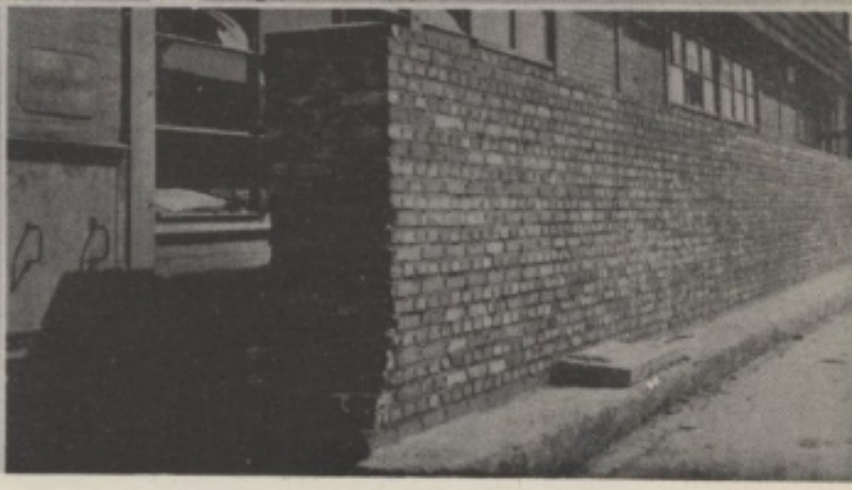


Photo 26 - Oberwiesenfeld. Heavy precast concrete blocks used to protect generator.

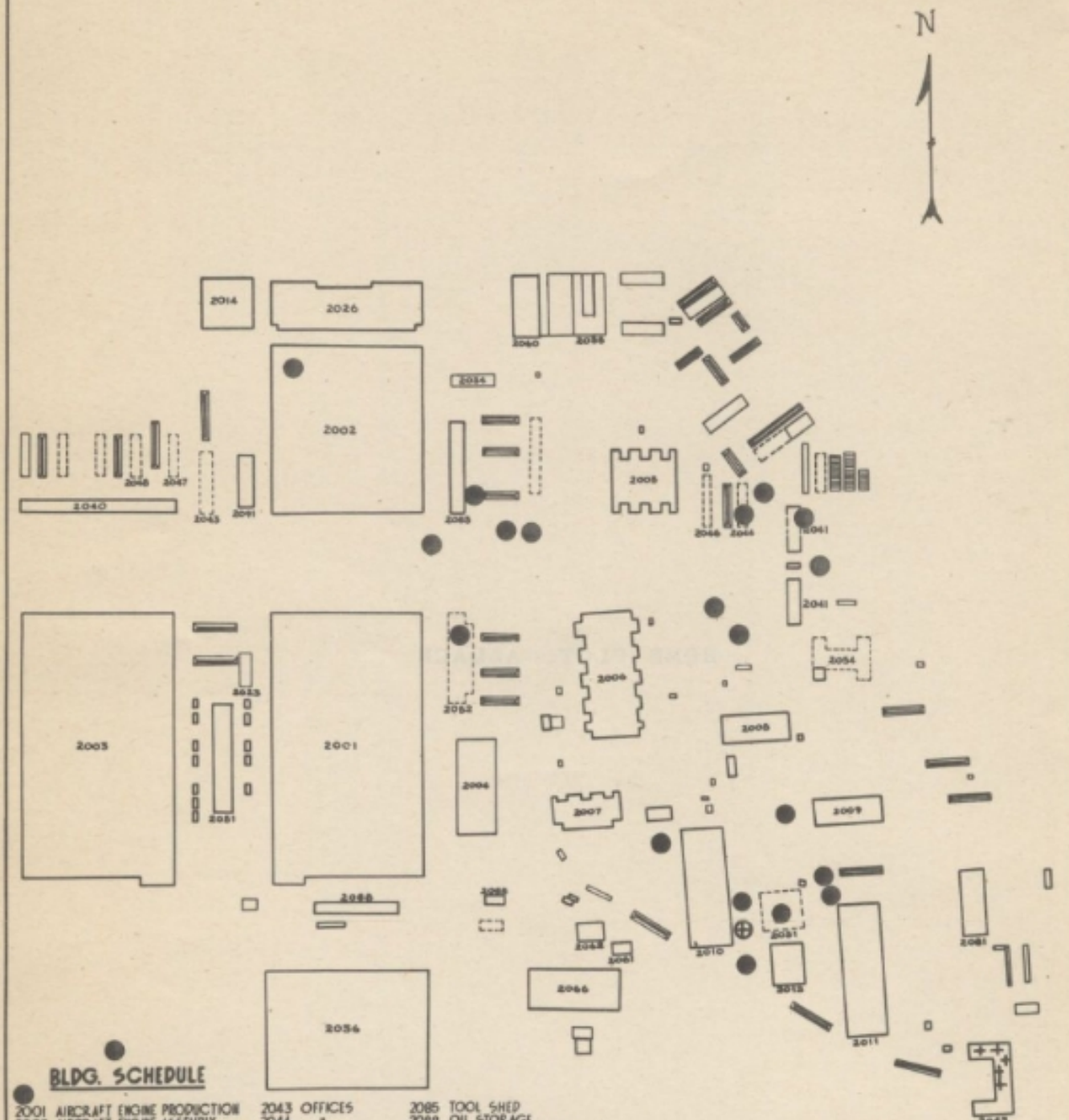
Photo 27 - Oberwiesenfeld. Brick blast wall around bldg conteining machine tools.



BMW (MUNICH)

EXHIBIT D

BOMB PLOT, ALLACH



BLDG. SCHEDULE

2001 AIRCRAFT ENGINE PRODUCTION
2002 AIRCRAFT ENGINE ASSEMBLY
2003 AIRCRAFT ENGINE PRODUCTION
2004 WAREHOUSE
2005 TEST STANDS
2006 " "
2007 " BLOCKS
2008 WAREHOUSE
2009 REPAIR SHOPS
2010 ROCKET DEVELOPMENT
2011 " "
2012 STORAGE BLDG.
2014 PACKING AND SHIPPING
2023 STORAGE BLDG.
2026 PACKING & STORAGE
2031 WAREHOUSE
2034 STORAGE BLDG.
2035 COAL RECEIVING
2036 MACHINE SHOP
2040 OFFICES
2041 OFFICES
2042 OFFICE BLDG.
2043 OFFICES
2044 "
2046 "
2047 "
2048 "
2051 WAREHOUSE
2052 CANTEEN
2053 CANTEEN
2054 KITCHEN
2060 POWER HOUSE
2061 SHELTER
2062 "
2066 REPAIR SHOP
2081 GARAGE
2085 TOOL SHED
2088 OIL STORAGE
2091 LIGHT METALS STORAGE

÷ LEGEND ÷

● H.E.

⊕ U.X.B.

NOTE: CROSS(++) INDICATE WHERE I.B. HIT CAUSING DAMAGE (NOT AN I.B. PLOT)

SCALE IN FEET

BOMB PLOT OF 13 JUNE 1944

U.S. STRATEGIC BOMBING SURVEY

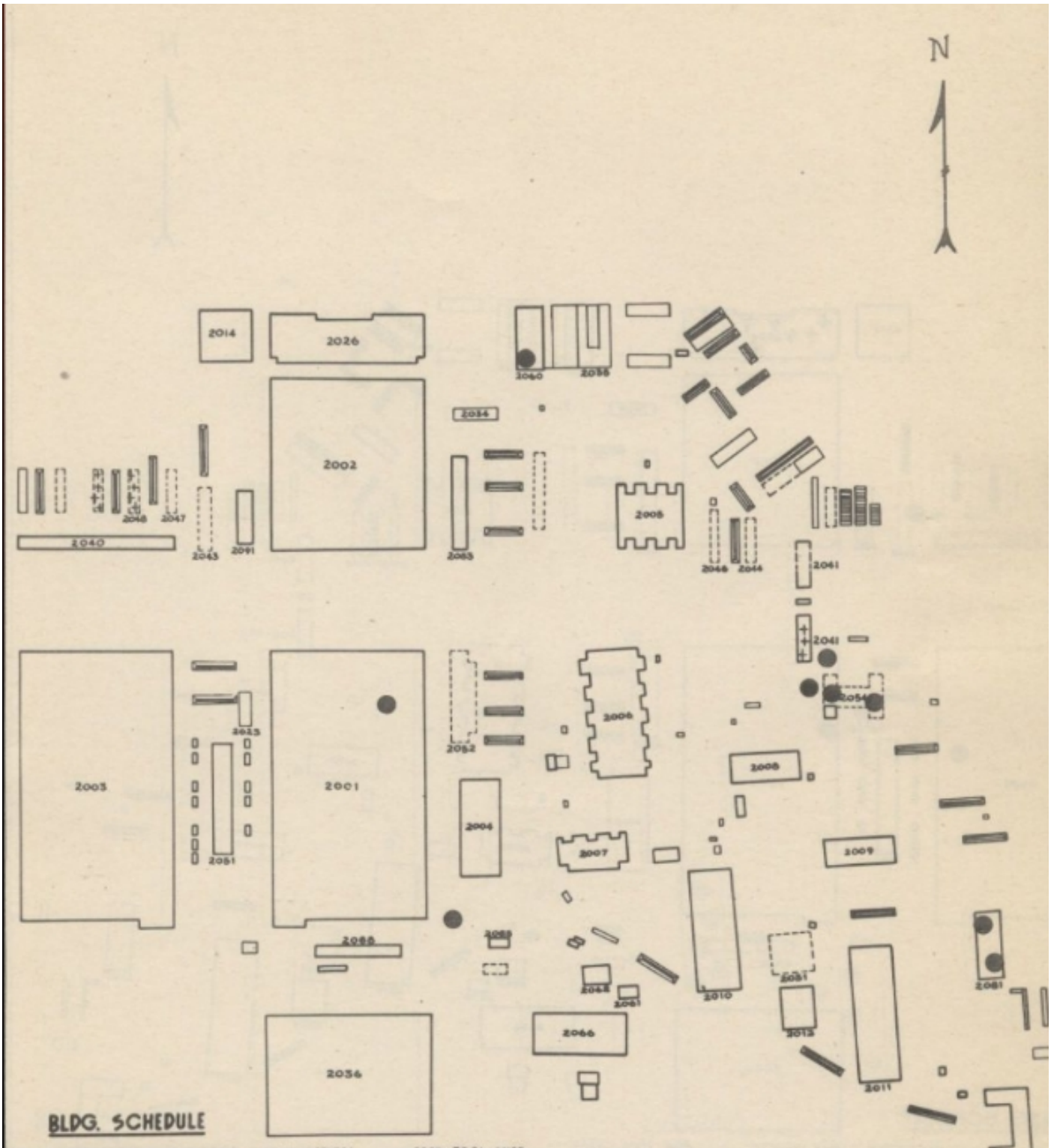
ALLACH B.M.W. PLANT
MUNICH, GERMANY

EXHIBIT D-1

2036

BLDG. SCHEDULE

2001	AIRCRAFT ENGINE PRODUCTION
2002	AIRCRAFT ENGINE ASSEMBLY
2003	AIRCRAFT ENGINE PRODUCTION
2004	WAREHOUSE
2005	TEST STANDS
2006	" "
2007	" BLOCKS
2008	WAREHOUSE
2009	REPAIR SHOPS
2010	ROCKET DEVELOPMENT
2011	" "
2012	STORAGE BLDG.
2014	PACKING AND SHIPPING
2023	STORAGE BLDG.
2026	PACKING & STORAGE
2031	WAREHOUSE
2034	STORAGE BLDG.
2035	COAL RECEIVING
2036	MACHINE SHOP
2040	OFFICES
2041	OFFICES
2042	OFFICE BLDG.
2043	OFFICES
2044	"
2046	"
2047	"
2048	"
2051	WAREHOUSE
2052	CANTEEN
2053	CANTEEN
2054	KITCHEN
2060	POWER HOUSE
2061	SHELTER
2062	"
2066	REPAIR SHOP
2081	GARAGE



BLDG. SCHEDULE

2001 AIRCRAFT ENGINE PRODUCTION
2002 AIRCRAFT ENGINE ASSEMBLY
2003 AIRCRAFT ENGINE PRODUCTION
2004 WAREHOUSE
2005 TEST STANDS
2006 " "
2007 " BLOCKS
2008 WAREHOUSE
2009 REPAIR SHOPS
2010 ROCKET DEVELOPMENT
2011 " "
2012 STORAGE BLDG.
2014 PACKING AND SHIPPING
2023 STORAGE BLDG.
2026 PACKING & STORAGE
2031 WAREHOUSE
2034 STORAGE BLDG.
2035 COAL RECEIVING
2036 MACHINE SHOP
2040 OFFICES
2041 OFFICES
2042 OFFICE BLDG.
2043 OFFICES
2044 "
2046 "
2047 "
2048 "
2051 WAREHOUSE
2052 CANTEEN
2053 CANTEEN
2054 KITCHEN
2060 POWER HOUSE
2061 SHELTER
2062 "
2066 REPAIR SHOP
2081 GARAGE
2085 TOOL SHED
2088 OIL STORAGE
2091 LIGHT METALS STORAGE

LEGEND

● H.E.

BOMB PLOT of 19 JULY 194

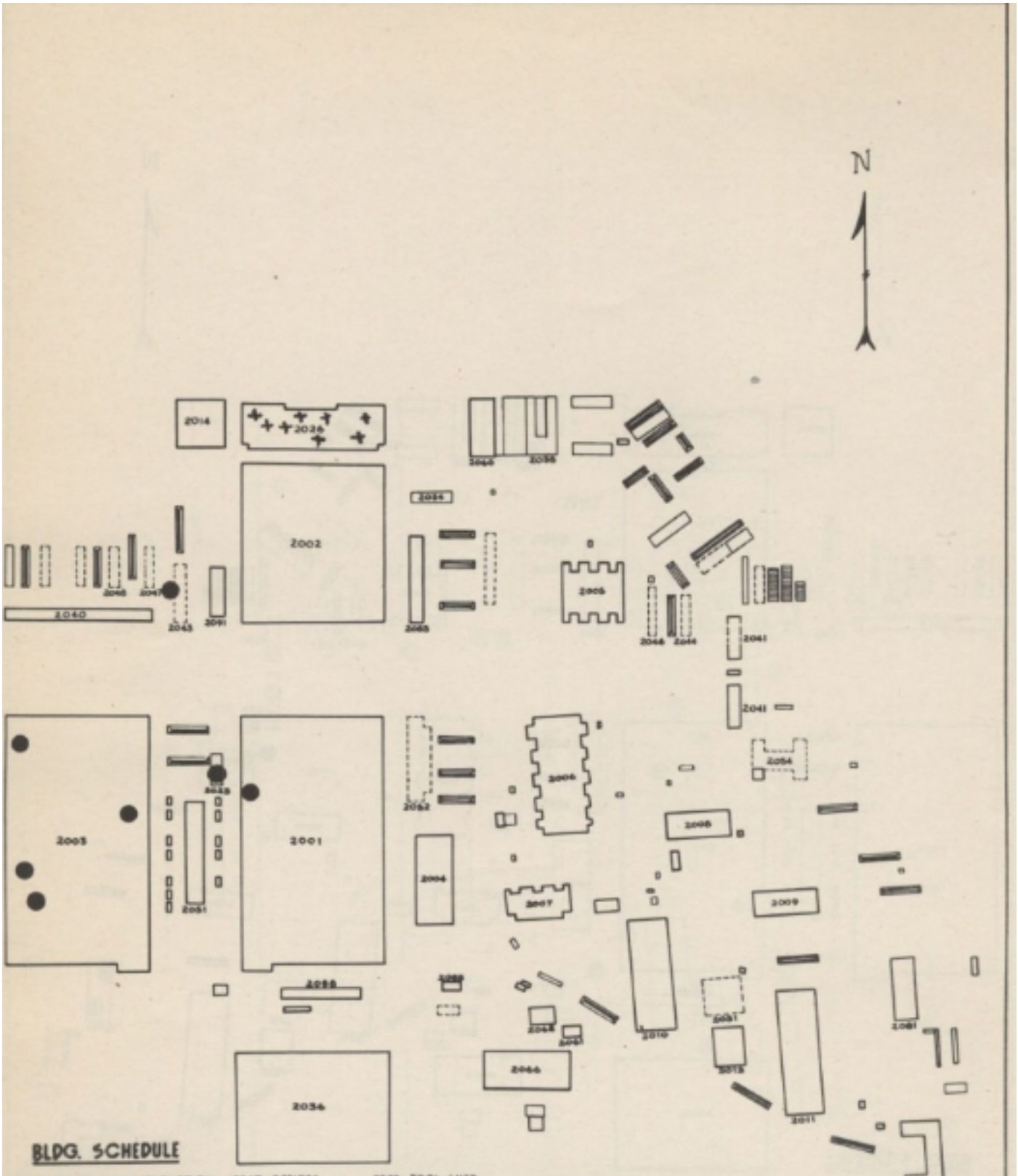
NOTES:

1. CROSSES (+) INDICATE WHERE I.B. HIT CAUSING DAMAGE BUT NOT AN I.B PLOT. 2. ONLY H.E. BOMBS CAUSING DAMAGE ARE INDICATED.

SCALE IN FEET

U.S. STRATEGIC BOMBING SUR

ALLACH B.M.W. PLAN
MUNICH, GERMANY
EXHIBIT D-2



BLDG. SCHEDULE

2001 AIRCRAFT ENGINE PRODUCTION
2002 AIRCRAFT ENGINE ASSEMBLY
2003 AIRCRAFT ENGINE PRODUCTION
2004 WAREHOUSE
2005 TEST STANDS
2006 " "
2007 " BLOCKS
2008 WAREHOUSE
2009 REPAIR SHOPS
2010 ROCKET DEVELOPMENT
2011 " "
2012 STORAGE BLDG.
2014 PACKING AND SHIPPING
2023 STORAGE BLDG.
2026 PACKING & STORAGE
2031 WAREHOUSE
2034 STORAGE BLDG.
2035 COAL RECEIVING
2036 MACHINE SHOP
2040 OFFICES
2041 OFFICES
2042 OFFICE BLDG.

2043 OFFICES
2044 "
2046 "
2047 "
2048 "
2051 WAREHOUSE
2052 CANTEEN
2053 CANTEEN
2054 KITCHEN
2060 POWER HOUSE
2061 SHELTER
2062 "
2066 REPAIR SHOP
2081 GARAGE

2085 TOOL SHED
2088 OIL STORAGE
2091 LIGHT METALS STORAGE

÷LEGEND÷

● H.E.

SCALE IN FEET

NOTES:

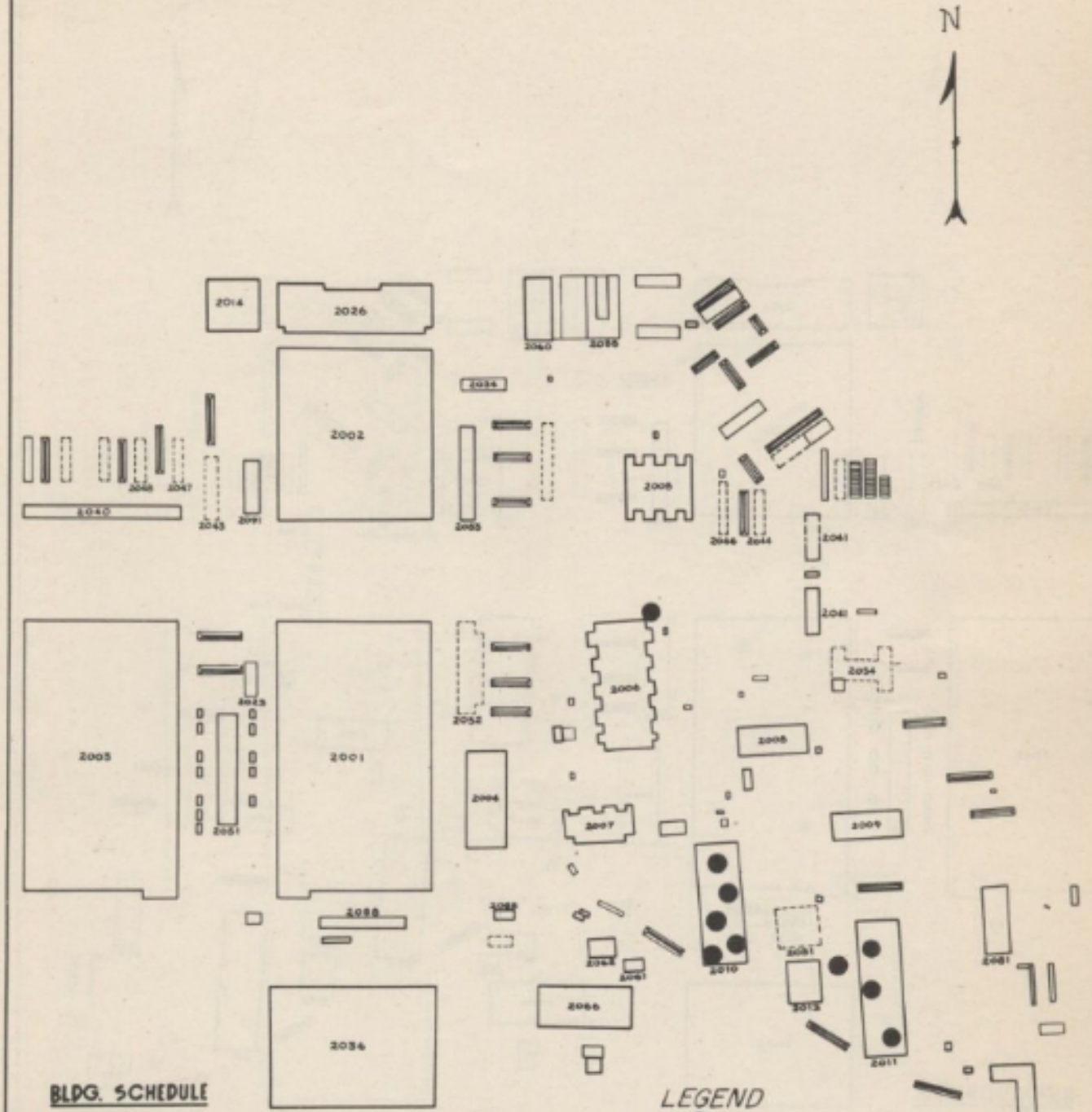
1. CROSSES (+) INDICATE WHERE I.B. HIT CAUSING DAMAGE BUT NOT AN I.B. PLOT
2. ONLY H.E. BOMBS CAUSING DAMAGE ARE INDICATED

BOMB PLOT OF 31 JULY 1944

U.S. STRATEGIC BOMBING SURVEY

ALLACH B.M.W. PLANT
MUNICH, GERMANY

EXHIBIT D-3



BLDG. SCHEDULE

2001 AIRCRAFT ENGINE PRODUCTION
2002 AIRCRAFT ENGINE ASSEMBLY
2003 AIRCRAFT ENGINE PRODUCTION
2004 WAREHOUSE
2005 TEST STANDS
2006 " "
2007 " BLOCKS
2008 WAREHOUSE
2009 REPAIR SHOPS
2010 ROCKET DEVELOPMENT
2011 " "
2012 STORAGE BLDG.
2014 PACKING AND SHIPPING
2023 STORAGE BLDG.
2026 PACKING & STORAGE
2031 WAREHOUSE
2034 STORAGE BLDG.
2035 COAL RECEIVING
2036 MACHINE SHOP
2040 OFFICES
2041 OFFICES
2042 OFFICE BLDG.
2043 OFFICES
2044 "
2046 "
2047 "
2048 "
2051 WAREHOUSE
2052 CANTEEN
2053 CANTEEN
2054 KITCHEN
2060 POWER HOUSE
2061 SHELTER
2062 "
2066 REPAIR SHOP
2081 GARAGE
2085 TOOL SHED
2088 OIL STORAGE
2091 LIGHT METALS STORAGE

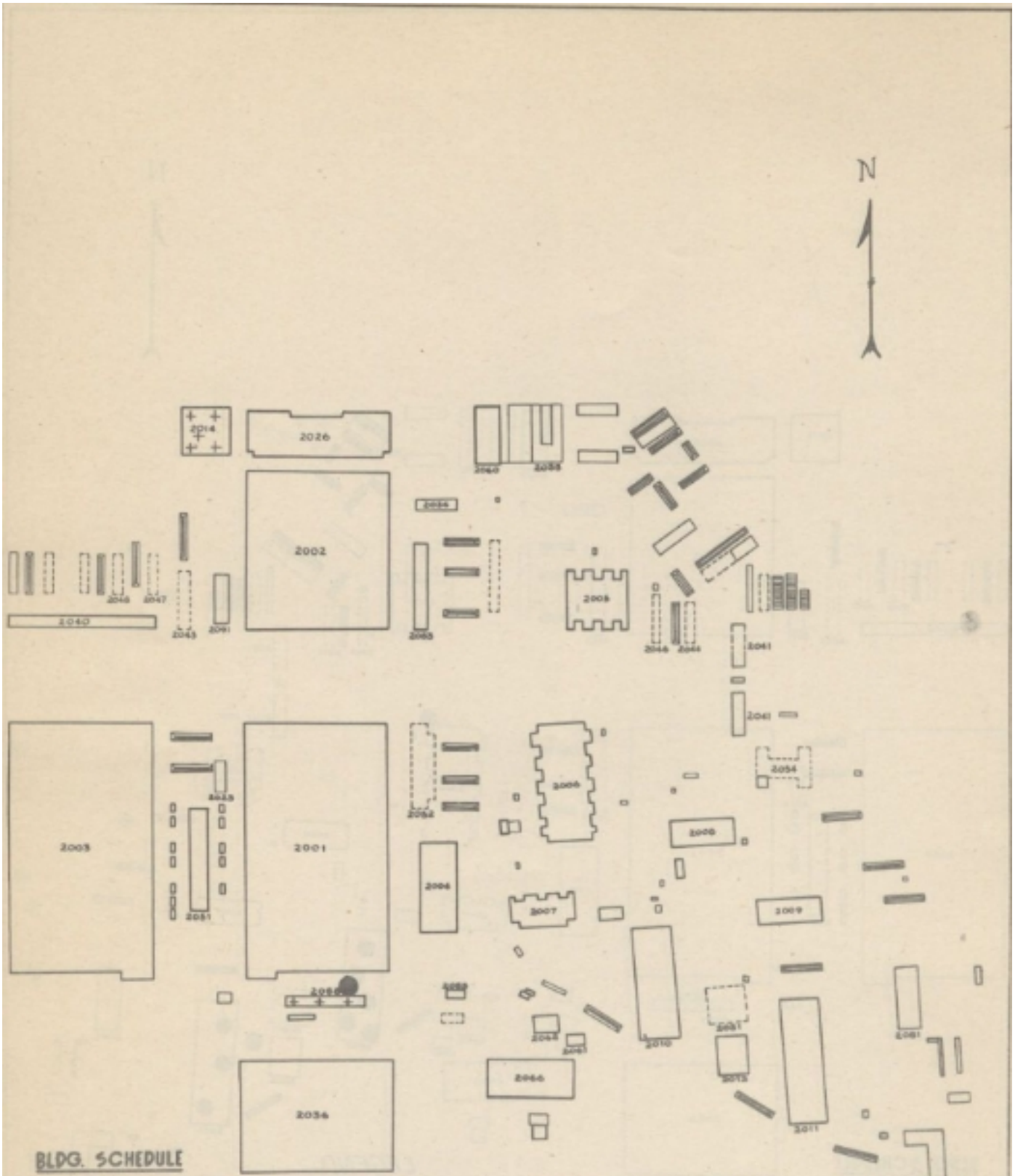
LEGEND
● H.E.

NOTE: 1. CROSSES( ) INDICATE WHERE I.B. HIT CAUSING DAMAGE (NOT AN I.B. PLOT)
2. ONLY H.E. BOMBS CAUSING DAMAGE ARE INDICATED

BOMB PLOT OF 12 SEPT. 1944

SCALE IN FEET

U.S. STRATEGIC BOMBING SURVEY
ALLACH B.M.W. PLANT
MUNICH, GERMANY
EXHIBIT D-4



BLDG. SCHEDULE

2001 AIRCRAFT ENGINE PRODUCTION
2002 AIRCRAFT ENGINE ASSEMBLY
2003 AIRCRAFT ENGINE PRODUCTION
2004 WAREHOUSE
2005 TEST STANDS
2006 " "
2007 " BLOCKS
2008 WAREHOUSE
2009 REPAIR SHOPS
2010 ROCKET DEVELOPMENT
2011 " "
2012 STORAGE BLDG.
2014 PACKING AND SHIPPING
2023 STORAGE BLDG.
2026 PACKING & STORAGE
2031 WAREHOUSE
2034 STORAGE BLDG.
2036 COAL RECEIVING
2036 MACHINE SHOP
2040 OFFICES
2041 OFFICES
2042 OFFICE BLDG.
2043 OFFICES
2044 "
2046 "
2047 "
2048 "
2051 WAREHOUSE
2052 CANTEEN
2053 CANTEEN
2054 KITCHEN
2060 POWER HOUSE
2061 SHELTER
2062 "
2066 REPAIR SHOP
2081 GARAGE
2085 TOOL SHED
2088 OIL STORAGE
2091 LIGHT METALS STORAGE

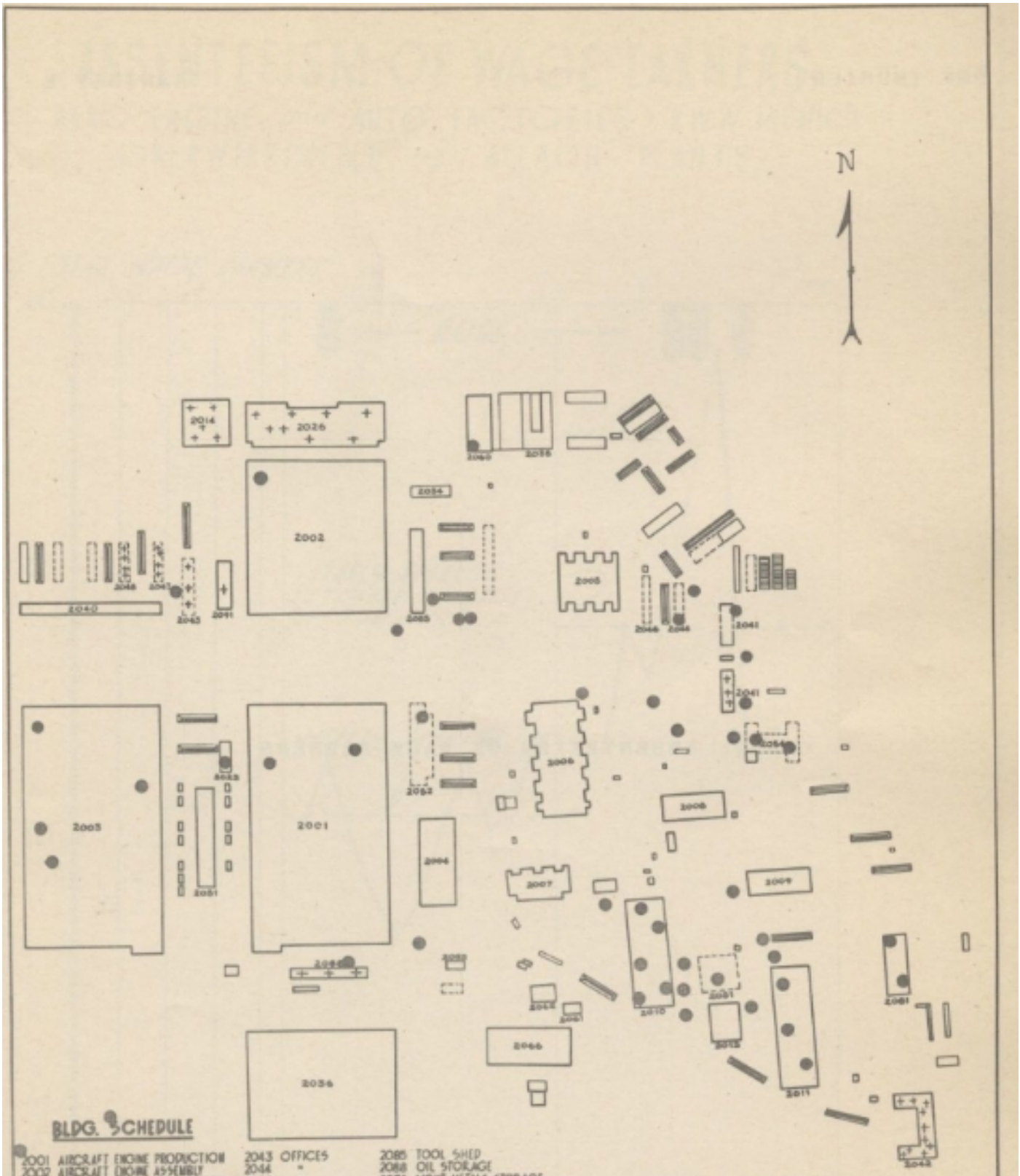
LEGEND
● H.E.

BOMB PLOT of 7 JAN. 1945

NOTES:
1. CROSSES (+) INDICATE WHERE I.B. HIT CAUSING DAMAGE (NOT AN I.B. PLOT.)
2. ONLY H.E. BOMBS CAUSING DAMAGE ARE INDICATED.

SCALE IN FEET

U.S. STRATEGIC BOMBING SURVEY
ALLACH B.M.W. PLANT
MUNICH, GERMANY
EXHIBIT D-5



BLDG. SCHEDULE

2001 AIRCRAFT ENGINE PRODUCTION
2002 AIRCRAFT ENGINE ASSEMBLY
2003 AIRCRAFT ENGINE PRODUCTION
2004 WAREHOUSE
2005 TEST STANDS
2006 " "
2007 " BLOCKS
2008 WAREHOUSE
2009 REPAIR SHOPS
2010 ROCKET DEVELOPMENT
2011 " "
2012 STORAGE BLDG.
2014 PACKING AND SHIPPING
2023 STORAGE BLDG.
2026 PACKING & STORAGE
2031 WAREHOUSE
2034 STORAGE BLDG.
2035 COAL RECEIVING
2036 MACHINE SHOP
2040 OFFICES
2041 OFFICES
2042 OFFICE BLDG.
2043 OFFICES
2044 "
2046 "
2047 "
2048 "
2051 WARDROBE
2052 CANTEEN
2053 CANTEEN
2054 KITCHEN
2060 POWER HOUSE
2061 SHELTER
2062 "
2066 REPAIR SHOP
2081 GARAGE
2085 TOOL SHED
2088 OIL STORAGE
2091 LIGHT METALS STORAGE

LEGEND

● - H.E.
⊕ - U.X.B.

NOTE:
CROSSES (+) INDICATE WHERE I.B. HIT CAUSING DAMAGE. (NOT AN I.B. PLOT.)

SCALE IN FEET

BOMB ATTACKS

13 JUNE 1944
19 JULY 1944
31 JULY 1944
12 SEPT 1944
7 JAN 1945

U.S. STRATEGIC BOMBING SURVEY

ALLACH B.M.W. PLANT MUNICH, GERMANY

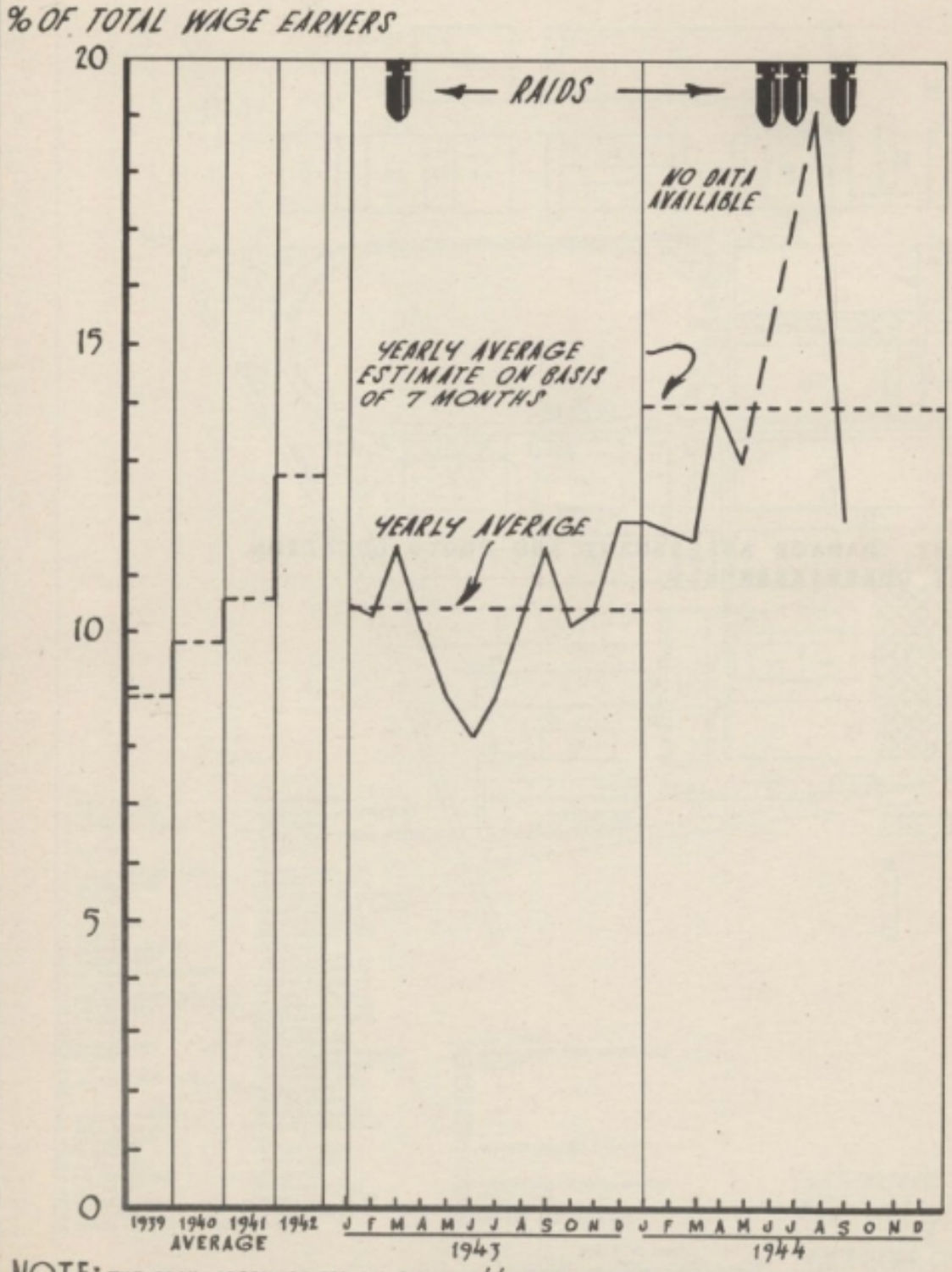
EXHIBIT D - 6

BMW (MUNICH) EXHIBIT E

CHART, ABSENTEEISM OF WAGE EARNERS

ABSENTEEISM OF WAGE EARNERS

AERO ENGINE and AUTO FACTORIES - BWW MUNICH
OBERWIESENFELD & ALLACH PLANTS



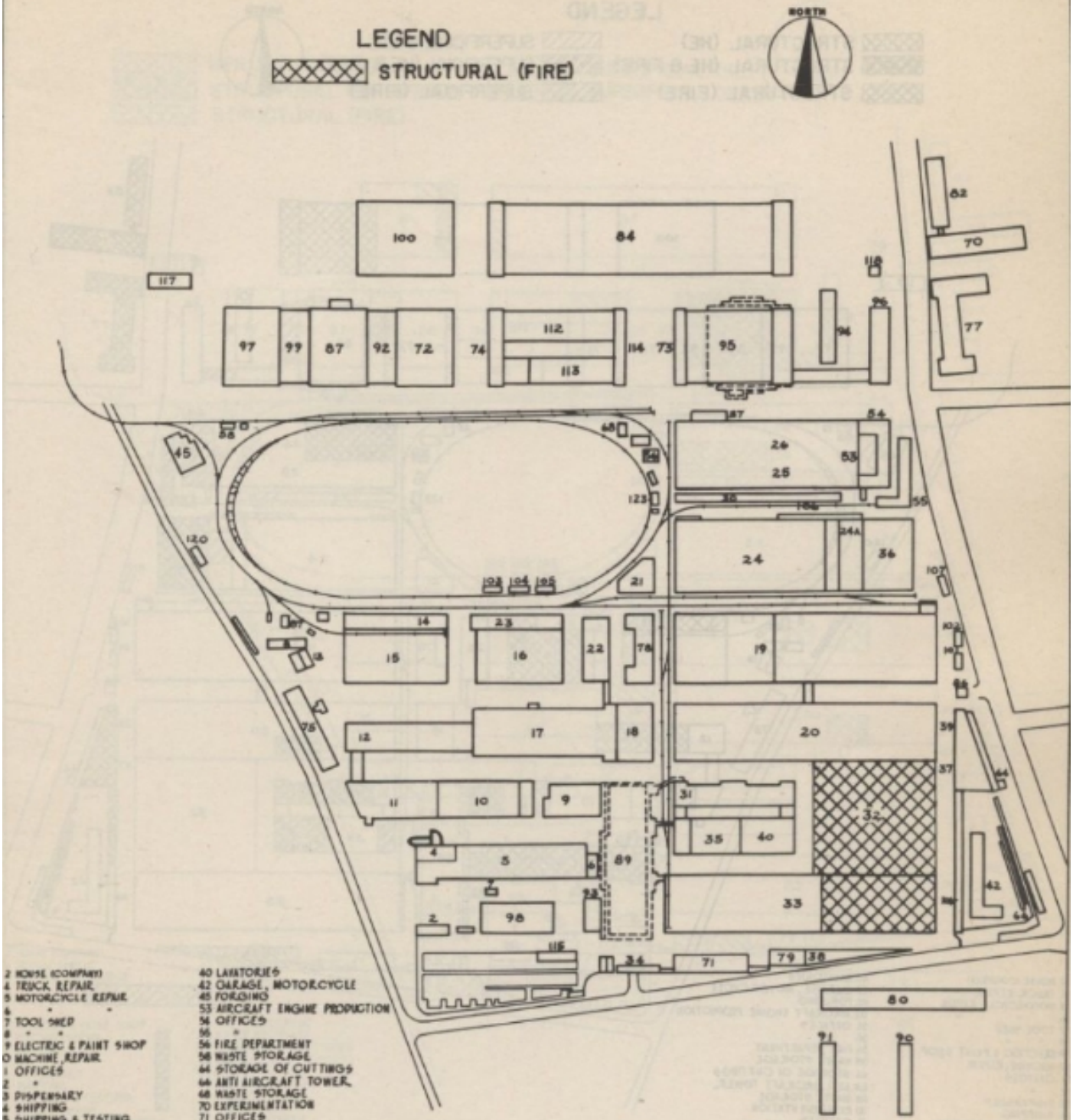
NOTE: THE PEAK ABSENTEEISM IN AUG. 1944 FOLLOWED THE ATTACKS IN THE MUNICH AERA DURING MONTH OF JULY 1944

EXHIBIT - E

BMW (MUNICH) EXHIBIT F

CHART, DAMAGE ASSESSMENT AND PHOTO LOCATION
PLOT OBERWIESENFELD

DAMAGE PLOT OF 9-10 MARCH 1943 RAID - (RAF)



2 HORSE (COMPANY)
4 TRUCK, REPAIR
5 MOTORCYCLE REPAIR
6 " "
7 TOOL SHED
8 " "
9 ELECTRIC & PAINT SHOP
0 MACHINE, REPAIR
1 OFFICES
2 "
3 DISPENSARY
4 SHIPPING
5 SHIPPING & TESTING
6 MACHINE SHOP
7 INSTRUMENT PRODUCTION
8 HARDENING
9 AIRCRAFT ENGINE PRODUCTION
0 PRODUCTION OF A/C ENGINES
1 FOUNDRY
2 OFFICES
3 MACHINE SHOP
4 FOUNDRY
4 "
5 AIRCRAFT ENGINE PRODUCTION
6 " " "
7 " " "
8 STORAGE FOUNDRY
1 RECREATION HALL
2 MACHINE SHOP
3 WAREHOUSE
4 SOUTH GATE
6 RECREATION HALL
6 TEST STANDS
7 TRANSPORTATION
8 OIL STORAGE
9 OXYGEN & ACETELYNE STORAGE

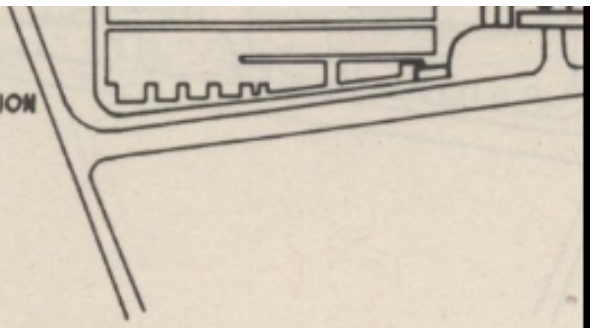
40 LAVATORIES
42 GARAGE, MOTORCYCLE
45 FORGING
53 AIRCRAFT ENGINE PRODUCTION
54 OFFICES
56 "
56 FIRE DEPARTMENT
58 WASTE STORAGE
64 STORAGE OF CUTTINGS
66 ANTI AIRCRAFT TOWER
68 WASTE STORAGE
70 EXPERIMENTATION
71 OFFICES
72 TEST STANDS
73 HEATING SYSTEM
74 TEST STANDS
75 SALES BUILDING
77 EXPERIMENTATION
78 FIRE DEPARTMENT
79 OFFICES
80 DEVELOPMENT
81 AIR COOLING SYSTEM
82 EXPERIMENTATION
84 ASSEMBLY HALL
86 EAST GATE
87 TEST STANDS
89 AIR RAID SHELTER
90 APPRENTICE SHOP
91 " "
92 TEST STAND
93 POLICE HUT
94 CANTEEN
95 ASSEMBLY HALL
96 MATERIAL TESTING
97 TEST STANDS
98 SHOP

99 TEST STANDS
100 HIGH ALTITUDE TEST LABORATORY
101 SHELTER
102 "
103 "
104 "
105 "
106 "
107 "
112 CYLINDER TESTING
113 " "
114 " "
115 AIR RAID SHELTER UNDER OFFICES
118 NORTH GATE
120 STORAGE SHELTER
123 FOUNDRY SAND STORAGE

SCALE IN FEET

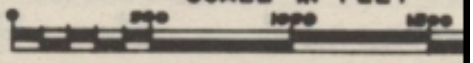
U.S. STRATEGIC BOMBING SURVEY

OBERWIESENFELD B.M.W. PLANT
MUNICH, GERMANY
EXHIBIT F 1



2 HOUSE (COMPANY)
4 TRUCK REPAIR
5 MOTORCYCLE REPAIR
6 " "
7 TOOL SHED
8 " "
9 ELECTRIC & PAINT SHOP
10 MACHINE, REPAIR
11 OFFICES
12 "
13 DISPENSARY
14 SHIPPING
15 SHIPPING & TESTING
16 MACHINE SHOP
17 INSTRUMENT PRODUCTION
18 HARDENING
19 AIRCRAFT ENGINE PRODUCTION
20 PRODUCTION OF A/C ENGINES
21 FOUNDRY
22 OFFICES
23 MACHINE SHOP
24 FOUNDRY
24a "
25 AIRCRAFT ENGINE PRODUCTION
26 " " "
27 " " "
30 STORAGE FOUNDRY
31 RECREATION HALL
32 MACHINE SHOP
33 WAREHOUSE
34 SOUTH GATE
36 RECREATION HALL
36 TEST STANDS
37 TRANSPORTATION
38 OIL STORAGE
39 OXYGEN & ACETELYNE STORAGE
40 LAVATORIES
42 GARAGE, MOTORCYCLE
45 FORGING
53 AIRCRAFT ENGINE PRODUCTION
54 OFFICES
55 "
56 FIRE DEPARTMENT
58 WASTE STORAGE
64 STORAGE OF CUTTINGS
66 ANTI AIRCRAFT TOWER
68 WASTE STORAGE
70 EXPERIMENTATION
71 OFFICES
72 TEST STANDS
73 HEATING SYSTEM
74 TEST STANDS
75 SALES BUILDING
77 EXPERIMENTATION
78 FIRE DEPARTMENT
79 OFFICES
80 DEVELOPMENT
81 AIR COOLING SYSTEM
82 EXPERIMENTATION
84 ASSEMBLY HALL
86 EAST GATE
87 TEST STANDS
89 AIR RAID SHELTER
90 APPRENTICE SHOP
91 " "
92 TEST STAND
93 POLICE HUT
94 CANTEEN
95 ASSEMBLY HALL
96 MATERIAL TESTING
97 TEST STANDS
98 SHOP
99 TEST STANDS
100 HIGH ALTITUDE TEST LABORATORY
101 SHELTER
102 "
103 "
104 "
105 "
106 "
107 "
112 CYLINDER TESTING
113 " "
114 " "
115 AIR RAID SHELTER UNDER OFFICES
118 NORTH GATE
120 STORAGE SHELTER
123 FOUNDRY SAND STORAGE

SCALE IN FEET

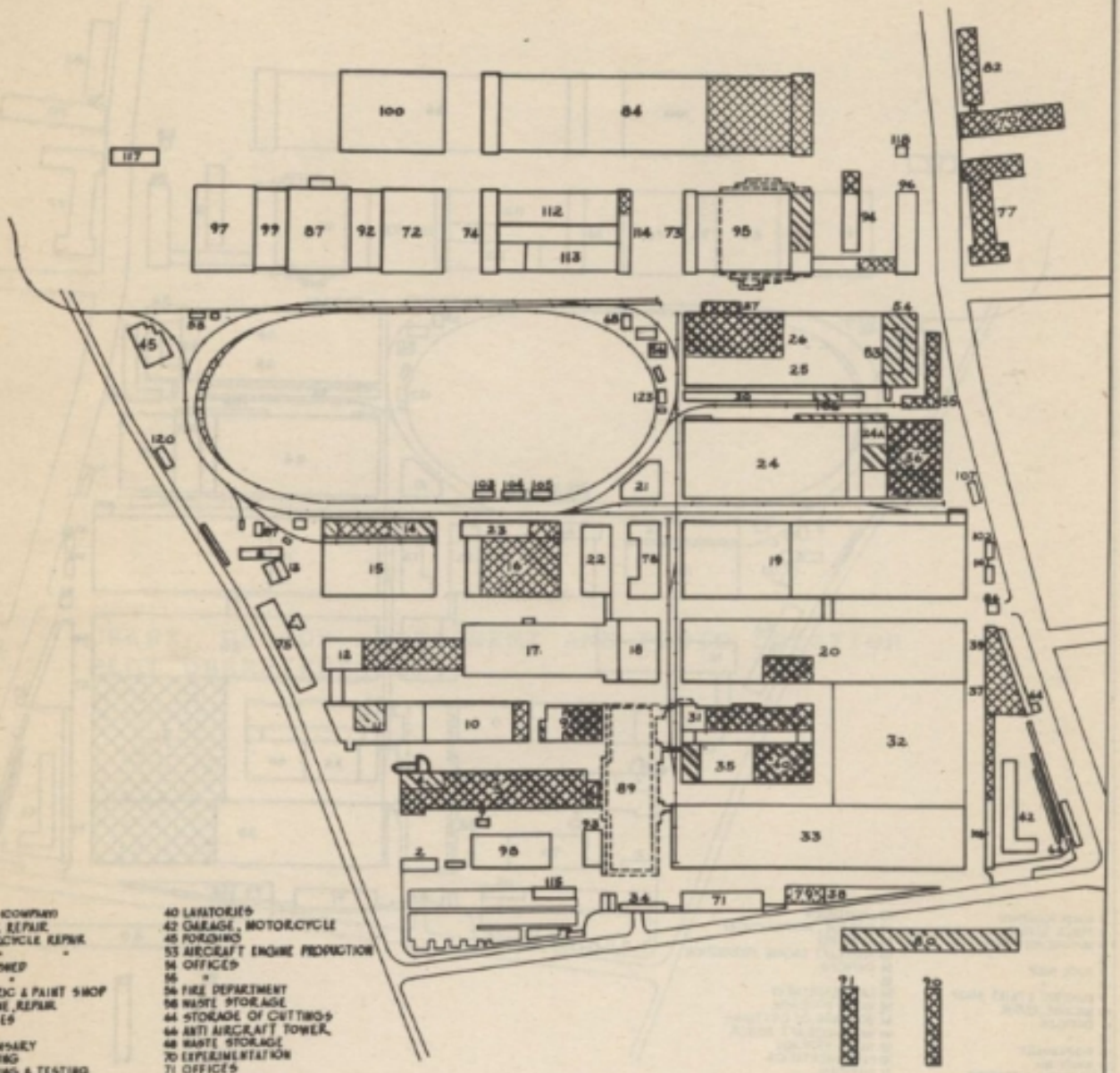


DAMAGE PLOT OF 13 JUNE 1944 RAID

LEGEND

- STRUCTURAL (HE)
- STRUCTURAL (HE & FIRE)
- STRUCTURAL (FIRE)
- SUPERFICIAL (HE)
- SUPERFICIAL (HE & FIRE)
- SUPERFICIAL (FIRE)

NORTH



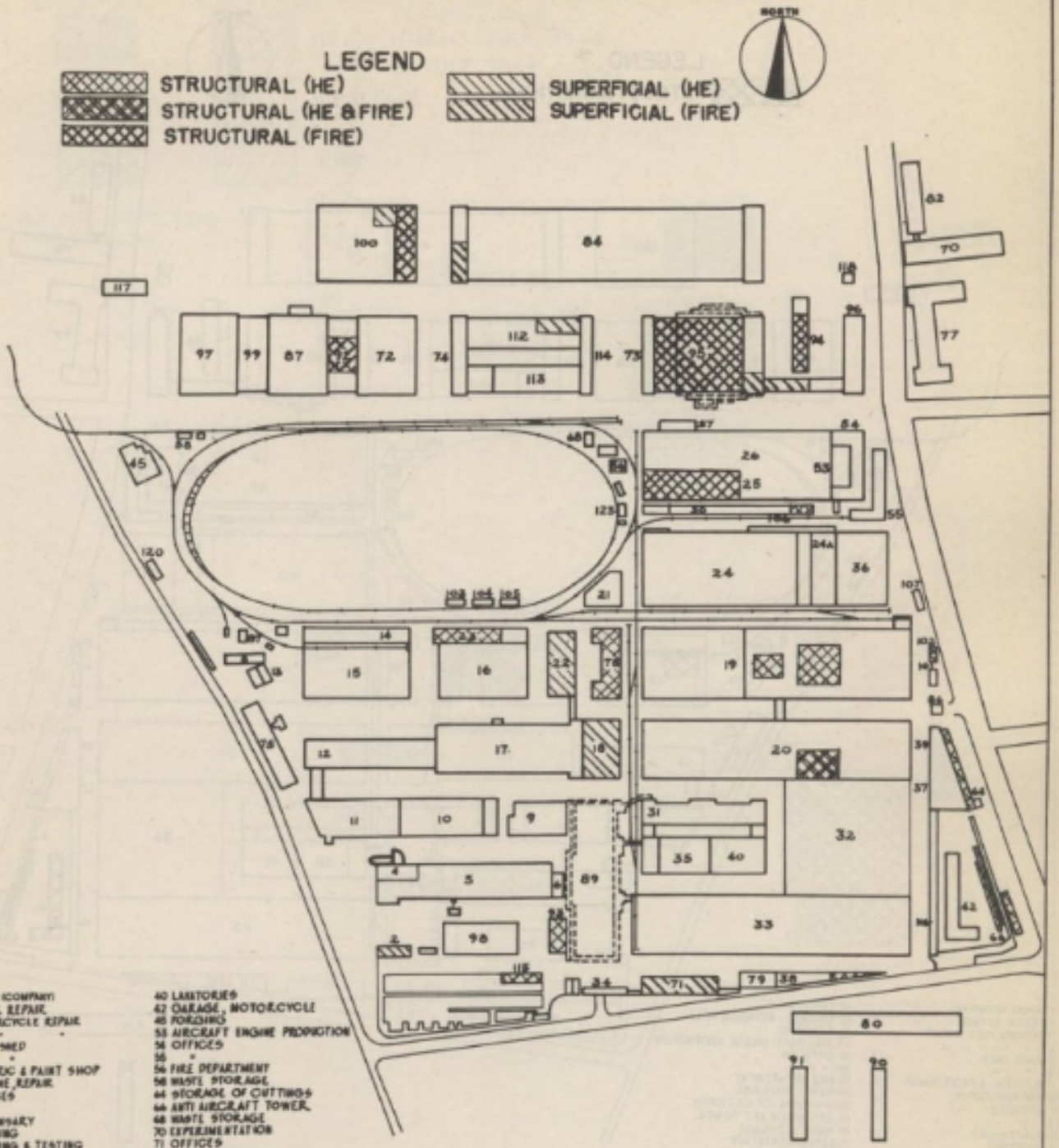
2 HORSE (COMPANY)
4 TRUCK REPAIR
5 MOTORCYCLE REPAIR
6 " "
7 TOOL SHOP
8 " "
9 ELECTRIC & PAINT SHOP
10 MACHINE REPAIR
11 OFFICES
12 "
13 DISPENSARY
14 SHIPPING
15 SHIPPING & TESTING
16 MACHINE SHOP
17 INSTRUMENT PRODUCTION
18 HARDENING
19 AIRCRAFT ENGINE PRODUCTION
20 PRODUCTION OF A/C ENGINES
21 FOUNDRY
22 OFFICES
23 MACHINE SHOP
24 FOUNDRY
24A "
25 AIRCRAFT ENGINE PRODUCTION
26 " " "
27 " " "
30 STORAGE FOUNDRY
31 RECREATION HALL
32 MACHINE SHOP
33 WAREHOUSE
34 SOUTH GATE
35 RECREATION HALL
36 TEST STANDS
37 TRANSPORTATION
38 OIL STORAGE
39 OXYGEN & ACETELENE STORAGE
40 LAVATORIES
42 GARAGE, MOTORCYCLE
45 FORGING
53 AIRCRAFT ENGINE PRODUCTION
54 OFFICES
55 "
56 FIRE DEPARTMENT
58 WASTE STORAGE
64 STORAGE OF CUTTINGS
66 ANTI AIRCRAFT TOWER
68 WASTE STORAGE
70 EXPERIMENTATION
71 OFFICES
72 TEST STANDS
73 HEATING SYSTEM
74 TEST STANDS
75 SALES BUILDING
77 EXPERIMENTATION
78 FIRE DEPARTMENT
79 OFFICES
80 DEVELOPMENT
81 AIR COOLING SYSTEM
82 EXPERIMENTATION
84 ASSEMBLY HALL
86 EAST GATE
87 TEST STANDS
89 AIR RAID SHELTER
90 APPRENTICE SHOP
91 " "
92 TEST STAND
93 POLICE HUT
94 CANTEEN
96 ASSEMBLY HALL
98 MATERIAL TESTING
97 TEST STANDS
98 SHOP
99 TEST STANDS
100 HIGH ALTITUDE TEST LABORATORY
101 SHELTER
102 "
103 "
104 "
105 "
106 "
107 "
112 CYLINDER TESTING
113 " "
114 " "
115 AIR RAID SHELTER UNDER OFFICES
118 NORTH GATE
120 STORAGE SHELTER
123 FOUNDRY SAND STORAGE

SCALE IN FEET

U.S. STRATEGIC BOMBING SURVEY

OBERWIESENFELD B.M.W. PLANT
MUNICH, GERMANY
EXHIBIT F 2

DAMAGE PLOT OF 11-12-13 JULY 1944 RAID



2 HORSE (COMPANY)
4 TRUCK REPAIR
5 MOTORCYCLE REPAIR
6 " "
7 TOOL SHED
8 " "
9 ELECTRIC & PAINT SHOP
10 MACHINE REPAIR
11 OFFICES
12 "
13 DISPENSARY
14 SHIPPING
15 SHIPPING & TESTING
16 MACHINE SHOP
17 INSTRUMENT PRODUCTION
18 HARDENING
19 AIRCRAFT ENGINE PRODUCTION
20 PRODUCTION OF A/C ENGINES
21 FOUNDRY
22 OFFICES
23 MACHINE SHOP
24 FOUNDRY
24a "
25 AIRCRAFT ENGINE PRODUCTION
26 " " "
27 " " "
30 STORAGE FOUNDRY
31 RECREATION HALL
32 MACHINE SHOP
33 WAREHOUSE
34 SOUTH GATE
36 RECREATION HALL
54 TEST STANDS
57 TRANSPORTATION
58 OIL STORAGE
59 OXYGEN & ACETELYNE STORAGE

40 LABATORIES
42 GARAGE, MOTORCYCLE
45 FORGING
53 AIRCRAFT ENGINE PRODUCTION
54 OFFICES
55 "
56 FIRE DEPARTMENT
58 WASTE STORAGE
64 STORAGE OF CUTTINGS
66 ANTI AIRCRAFT TOWER
68 WASTE STORAGE
70 EXPERIMENTATION
71 OFFICES
72 TEST STANDS
73 HEATING SYSTEM
74 TEST STANDS
75 SALES BUILDING
77 EXPERIMENTATION
78 FIRE DEPARTMENT
79 OFFICES
80 DEVELOPMENT
81 AIR COOLING SYSTEM
82 EXPERIMENTATION
84 ASSEMBLY HALL
86 EAST GATE
87 TEST STANDS
89 AIR RAID SHELTER
90 APPRENTICE SHOP
91 " "
92 TEST STAND
93 POLICE HUT
94 CANTEEN
95 ASSEMBLY HALL
96 MATERIAL TESTING
97 TEST STANDS
98 SHOP

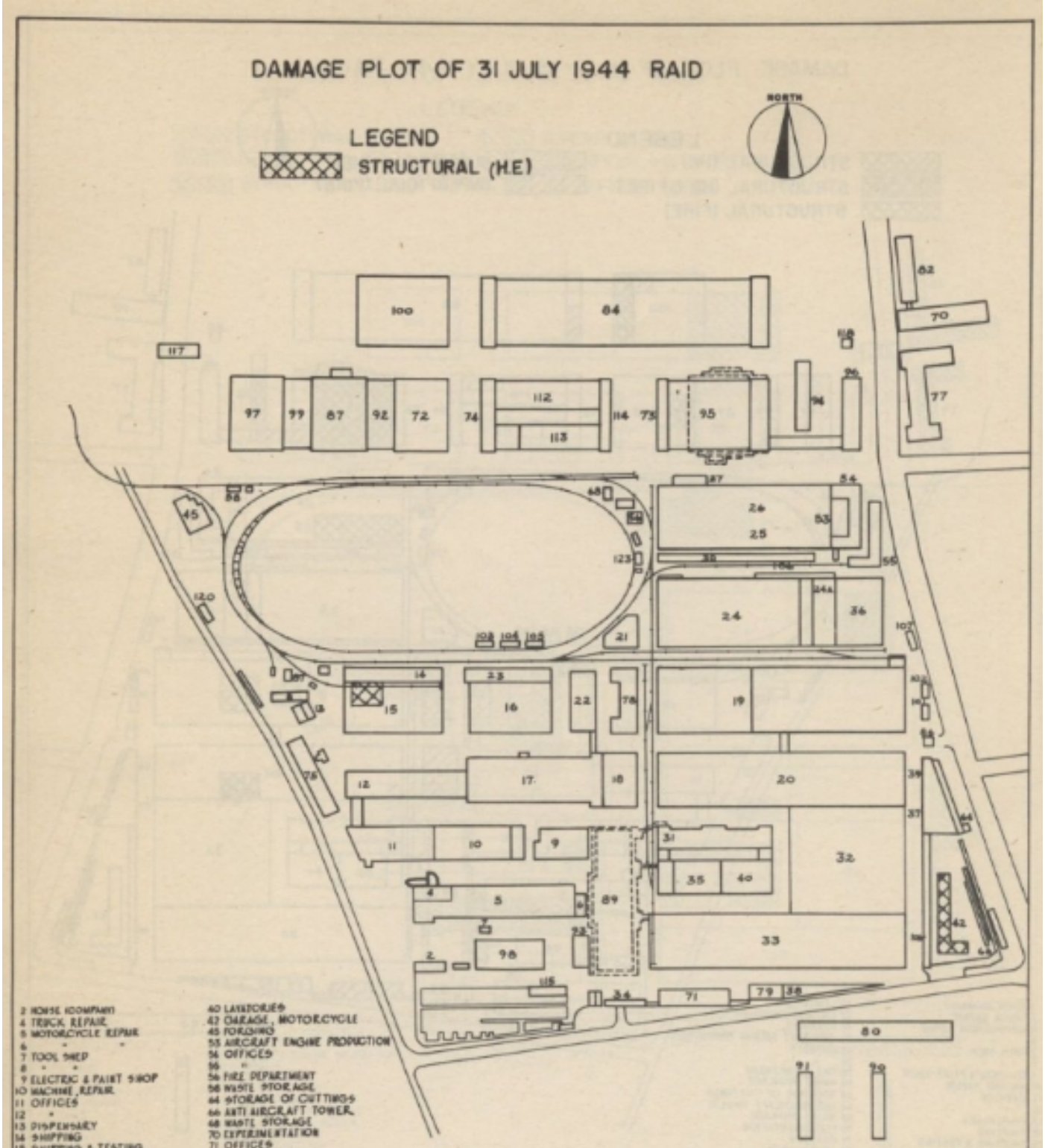
99 TEST STANDS
100 HIGH ALTITUDE TEST LABORATORY
101 SHELTER
102 "
103 "
104 "
105 "
106 "
107 "
112 [illegible] TESTING
113 " "
114 " "
115 AIR RAID SHELTER UNDER OFFICES
118 NORTH GATE
120 STORAGE SHELTER
123 FOUNDRY SAND STORAGE

SCALE IN FEET

U.S. STRATEGIC BOMBING SURVEY

OBERWIESENFELD B.M.W. PLANT
MUNICH, GERMANY
EXHIBIT F 3

DAMAGE PLOT OF 31 JULY 1944 RAID



2 HORSE ROOM(MAN)
4 TRUCK REPAIR
5 MOTORCYCLE REPAIR
6 " "
7 TOOL SHOP
8 " "
9 ELECTRIC & PAINT SHOP
10 MACHINE REPAIR
11 OFFICES
12 "
13 DISPENSARY
14 SHIPPING
15 SHIPPING & TESTING
16 MACHINE SHOP
17 INSTRUMENT PRODUCTION
18 HARDENING
19 AIRCRAFT ENGINE PRODUCTION
20 PRODUCTION OF A/C ENGINES
21 FOUNDRY
22 OFFICES
23 MACHINE SHOP
24 FOUNDRY
24A "
25 AIRCRAFT ENGINE PRODUCTION
26 " " "
27 " " "
30 STORAGE FOUNDRY
31 RECREATION HALL
32 MACHINE SHOP
33 WAREHOUSE
34 SOUTH GATE
36 RECREATION HALL
36 TEST STANDS
37 TRANSFORMATION
38 OIL STORAGE
39 OXYGEN & ACETELYNE STORAGE
40 LAVATORIES
42 GARAGE, MOTORCYCLE
45 FORGING
53 AIRCRAFT ENGINE PRODUCTION
54 OFFICES
56 "
56 FIRE DEPARTMENT
58 WASTE STORAGE
64 STORAGE OF CUTTINGS
66 ANTI AIRCRAFT TOWER
68 WASTE STORAGE
70 EXPERIMENTATION
71 OFFICES
72 TEST STANDS
73 HEATING SYSTEM
74 TEST STANDS
75 SALES BUILDING
77 EXPERIMENTATION
78 FIRE DEPARTMENT
79 OFFICES
80 DEVELOPMENT
81 AIR COOLING SYSTEM
82 EXPERIMENTATION
86 ASSEMBLY HALL
86 EAST GATE
87 TEST STANDS
89 AIR RAID SHELTER
90 APPRENTICE SHOP
91 " "
92 TEST STAND
93 POLICE HUT
94 CANTEEN
95 ASSEMBLY HALL
96 MATERIAL TESTING
97 TEST STANDS
98 SHOP
99 TEST STANDS
100 HIGH ALTITUDE TEST LABORATORY
101 SHELTER
102 "
103 "
104 "
105 "
106 "
107 "
112 CYLINDER TESTING
113 " "
114 " "
115 AIR RAID SHELTER UNDER OFFICES
118 NORTH GATE
120 STORAGE SHELTER
123 FOUNDRY SAND STORAGE

SCALE IN FEET

U.S. STRATEGIC BOMBING SURVEY

OBERWIESENFELD B.M.W. PLANT
MUNICH, GERMANY
EXHIBIT F 4

DAMAGE PLOT & PHOTO-LOCATION PLOT OF

LEGEND

STRUCTURAL — SUPERFICIAL

HE

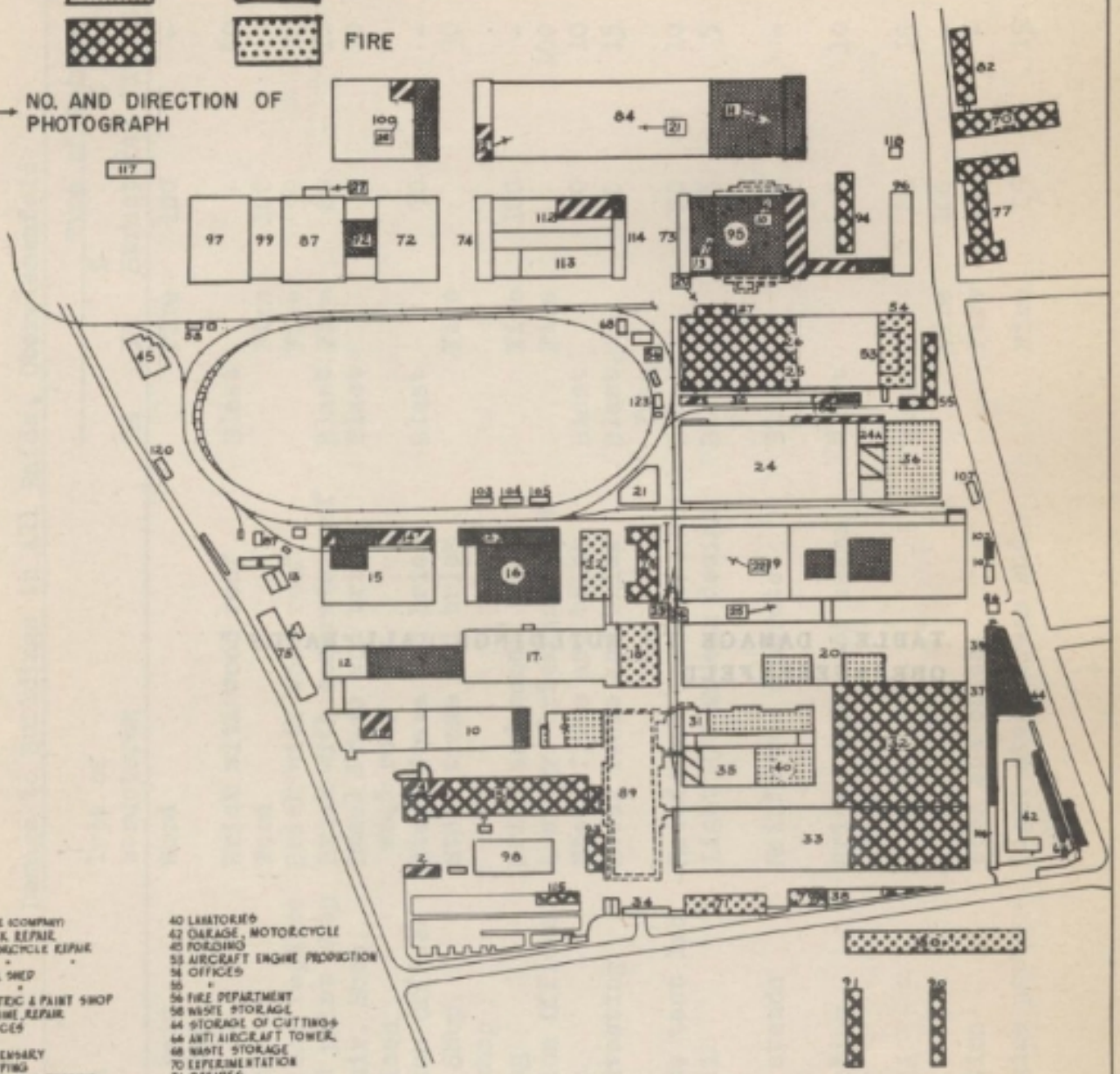
HE & FIRE

FIRE

NO. AND DIRECTION OF PHOTOGRAPH

9-10 MARCH, 1943 (RAF)
13 JUNE, 1944
11-12-13 JULY, 1944
31 JULY, 1944

NORTH



2 HORSE (COMPANY)
4 TRUCK REPAIR
5 MOTORCYCLE REPAIR
6 " "
7 TOOL SHED
8 " "
9 ELECTRIC & PAINT SHOP
10 MACHINE REPAIR
11 OFFICES
12 "
13 DISPENSARY
14 SHIPPING
15 SHIPPING & TESTING
16 MACHINE SHOP
17 INSTRUMENT PRODUCTION
18 HARDENING
19 AIRCRAFT ENGINE PRODUCTION
20 PRODUCTION OF A/C ENGINES
21 FOUNDRY
22 OFFICES
23 MACHINE SHOP
24 FOUNDRY
24a "
25 AIRCRAFT ENGINE PRODUCTION
26 " " "
27 " " "
30 STORAGE FOUNDRY
31 RECREATION HALL
32 MACHINE SHOP
33 WAREHOUSE
34 SOUTH GATE
35 RECREATION HALL
36 TEST STANDS
37 TRANSPORTATION
38 OIL STORAGE
39 OXYGEN & ACETELYNE STORAGE
40 LAVATORIES
42 GARAGE, MOTORCYCLE
45 FORGING
53 AIRCRAFT ENGINE PRODUCTION
54 OFFICES
55 "
56 FIRE DEPARTMENT
58 WASTE STORAGE
64 STORAGE OF CUTTINGS
66 ANTI AIRCRAFT TOWER
68 WASTE STORAGE
70 EXPERIMENTATION
71 OFFICES
72 TEST STANDS
73 HEATING SYSTEM
74 TEST STANDS
75 SALES BUILDING
77 EXPERIMENTATION
78 FIRE DEPARTMENT
79 OFFICES
80 DEVELOPMENT
81 AIR COOLING SYSTEM
82 EXPERIMENTATION
84 ASSEMBLY HALL
86 EAST GATE
87 TEST STANDS
89 AIR RAID SHELTER
90 APPRENTICE SHOP
91 " "
92 TEST STAND
93 POLICE HUT
94 CANTEEN
95 ASSEMBLY HALL
96 MATERIAL TESTING
97 TEST STANDS
98 SHOP
99 TEST STANDS
100 HIGH ALTITUDE TEST LABORATORY
101 SHELTER
102 "
103 "
104 "
105 "
106 "
107 "
112 CYLINDER TESTING
113 " "
114 " "
115 AIR RAID SHELTER UNDER OFFICES
118 NORTH GATE
120 STORAGE SHELTER
123 FOUNDRY SAND STORAGE

SCALE IN FEET

U.S. STRATEGIC BOMBING SURVEY

OBERWIESENFELD B.M.W. PLANT
MUNICH, GERMANY
EXHIBIT F 5

BMW (MUNICH) EXHIBIT G

TABLE, DAMAGE TO BUILDINGS, ALL RAIDS
OBERWIESENFELD

BMW (MUNICH) EXHIBIT G

Damage to Buildings in All Raids, Oberwiesenfeld

Bldg No	Area of Bldg. Sq. ft.	Activity in building	Type of structures	Type of Damage HE	IB	% Structural	% Superficial	% of Total Destruction
115	2,500	Office, Air raid shelter, under	Wood		Fire	100	-	100
2	2,080	Staff House	Brick with wood roof	Blast		-	50	20
93	3,470	Guard station	Wood		Fire	100	-	100
4-5-6	38,850	Garage, Vehicle repairs	Brick with wood roof		Fire	90	10	95
9	12,500	Electric and paint shop	Brick with concrete roof	Blast	Fire	60	10	65
10-11	45,000	Machine repair, Shop, Admin. Offices	Steel frame and brick, wood roof	Blast		5	10	10
12	22,200	Administration Offices	Steel frame and brick	Blast		70	-	70
17-18	60,000	Inst. Prod. Shop, Hardening shop	Steel frame and brick		Fire		30	10
78	11,100	Fire fighting	Brick and wood		Fire	100	-	100
22	11,100	Administration Offices	4 story, brick and wood		Fire		100	25
16-23	39,700	Machine shop	Steel frame and brick	Blast		90	10	92
14-15	48,600	Shipping andtesting	Steel frame and brick	Blast, Frag		20	15	25
100	45,800	High Altitude test lab	Reinforced concrete & brick	Blast		20	10	25
84	140,300	Assembly Hall	Light R/C Modern design	Blast, Frag		35	5	35
72-87-92-97-99	112,000	Engine test stands	Reinforced concrete	Blast		8	-	8
74-112-113-114	66,600	Cylinder testing	Brick, wood roof beams, tile	Blast		5	10	12
73-95	65,100	Assembly Hall	Light R/C	Blast		80	15	95
94	6,600	Canteen	Wood		Fire	100	-	100
70-77-82	39,250	Experimentation	Wood and brick		Fire	100	-	100
25-26-27-53-54	91,500	Aircraft engine production	Light steel frame and brick		Fire	45	15	50

BMW (MUNICH) EXHIBIT G

Damage to Buildings in All Raids, Oberwiesenfeld (Cont'd)

Bldg No	Area of Bldg. Sq. Ft.	Activity in building	Type of Structures	Type of Damage HE	IB	% Structural	% Superficial	% of Total Destruction
55	4,860	Office	Wood		Fire	100	-	100
30-106	6,930	Storage for foundry	Sheet iron storage sheds	Blast		5	25	10
24-24a-36	111,000	Foundry and testing	Steel frame, brick wood plank roof	Blast	Fire	25	10	30
19	119,400	Aircraft engine production	Light steel frame, sheet iron roof	Blast		10	-	10
102	555	Air raid shelter	Concrete	Blast		100	-	100
20	98,600	Aircraft engine production	Light steel frame, sheet iron roof	Blast	Fire	15	-	15
31-35-40	56,500	First aid, canteen, recreation hall	Light steel frame, brick	Blast	Fire	60	10	52
37-39-64	18,050	Storage and fire station	Light steel frame, brick	Blast		100	-	100
42	8,880	Motor cycle garage	Brick, wood roof	Blast	Fire	100	-	100
66	5,500	Storage and Anti Aircraft tower	Wood sheds, steel tower		Fire	100	-	100
32	90,000	Aircraft production shop	Light steel frame, brick		Fire	100	-	100
33	102,400	Storage andreceiving	Light steel frame, brick	Blast	Fire	40	-	40
71	9,570	Offices (4-story)	Concrete and brick, wood, tile roof		Fire	Top story and roof destroyed - Reroofed making 3-story		25
38-79	11,100	Offices, Oil storage	Concrete and wood	Blast	Fire	50	-	50
80	20,800	Offices	Concrete and brick	Blast		-	100	25
90-91	12,200	Apprentice shop	Wood		Fire	100	-	100

BMW (MUNICH) EXHIBIT H

CHART, DAMAGE ASSESSMENT AND PHOTO LOCATION

PLOT, ALLACH

DAMAGE PLOT OF 13 JUNE, 1944 RAID

LEGEND

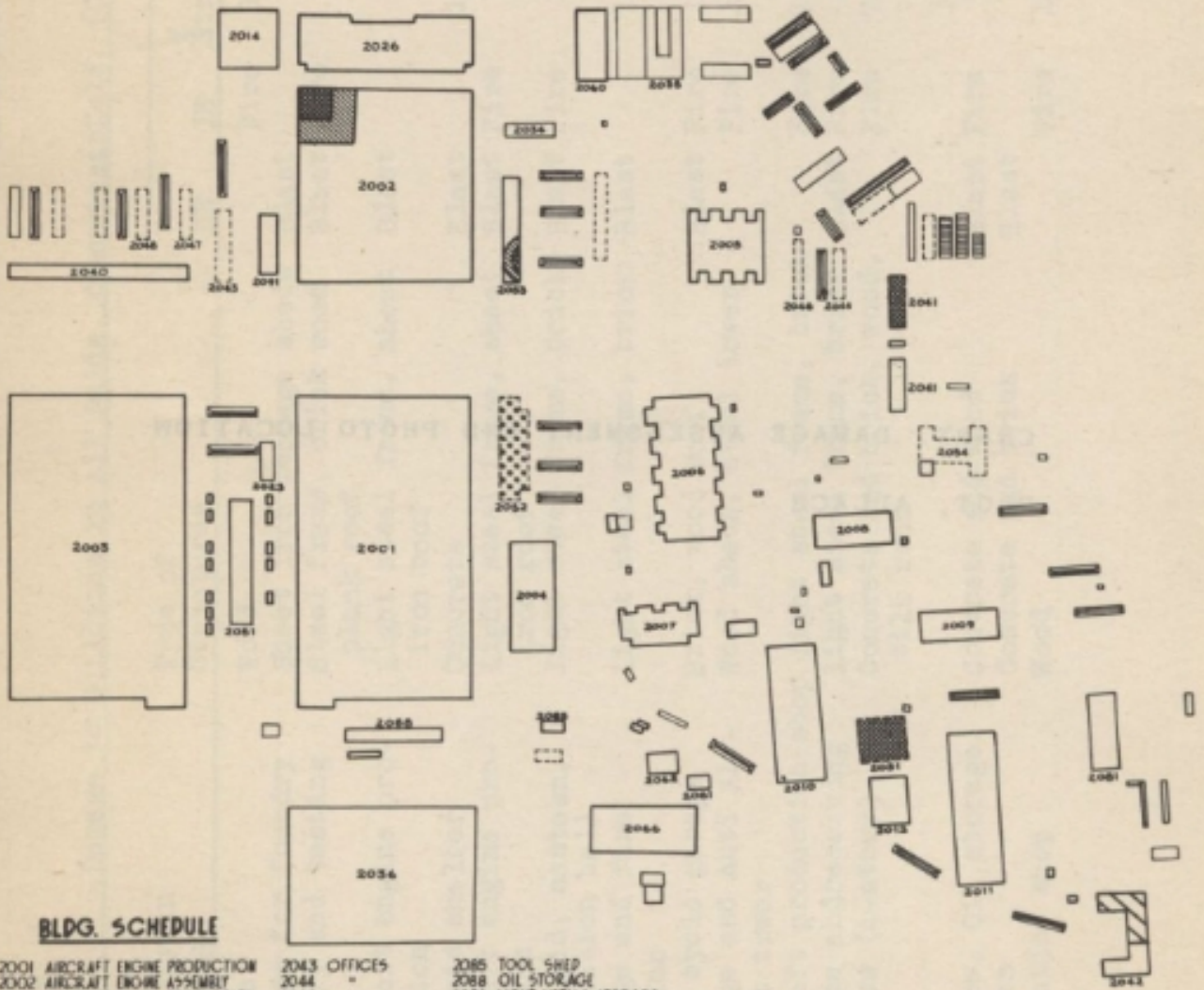
STRUCTURAL (FIRE)

STRUCTURAL (HE & FIRE)

SUPERFICIAL (HE)

SUPERFICIAL (FIRE)

N



BLDG. SCHEDULE

2001 AIRCRAFT ENGINE PRODUCTION
2002 AIRCRAFT ENGINE ASSEMBLY
2003 AIRCRAFT ENGINE PRODUCTION
2004 WAREHOUSE
2005 TEST STANDS
2006 " "
2007 " BLOCKS
2008 WAREHOUSE
2009 REPAIR SHOPS
2010 ROCKET DEVELOPMENT
2011 " "
2012 STORAGE BLDG.
2014 PACKING AND SHIPPING
2023 STORAGE BLDG.
2026 PACKING & STORAGE
2031 WAREHOUSE
2034 STORAGE BLDG.
2035 COAL RECEIVING
2036 MACHINE SHOP
2040 OFFICES
2041 OFFICES
2042 OFFICE BLDG.
2043 OFFICES
2044 "
2046 "
2047 "
2048 "
2051 WAREHOUSE
2052 CANTEEN
2053 CANTEEN
2054 KITCHEN
2060 POWER HOUSE
2061 SHELTER
2062 "
2066 REPAIR SHOP
2081 GARAGE
2085 TOOL SHED
2088 OIL STORAGE
2091 LIGHT METALS STORAGE

SCALE IN FEET

U.S. STRATEGIC BOMBING SURVEY

ALLACH B.M.W. PLANT

MUNICH, GERMANY

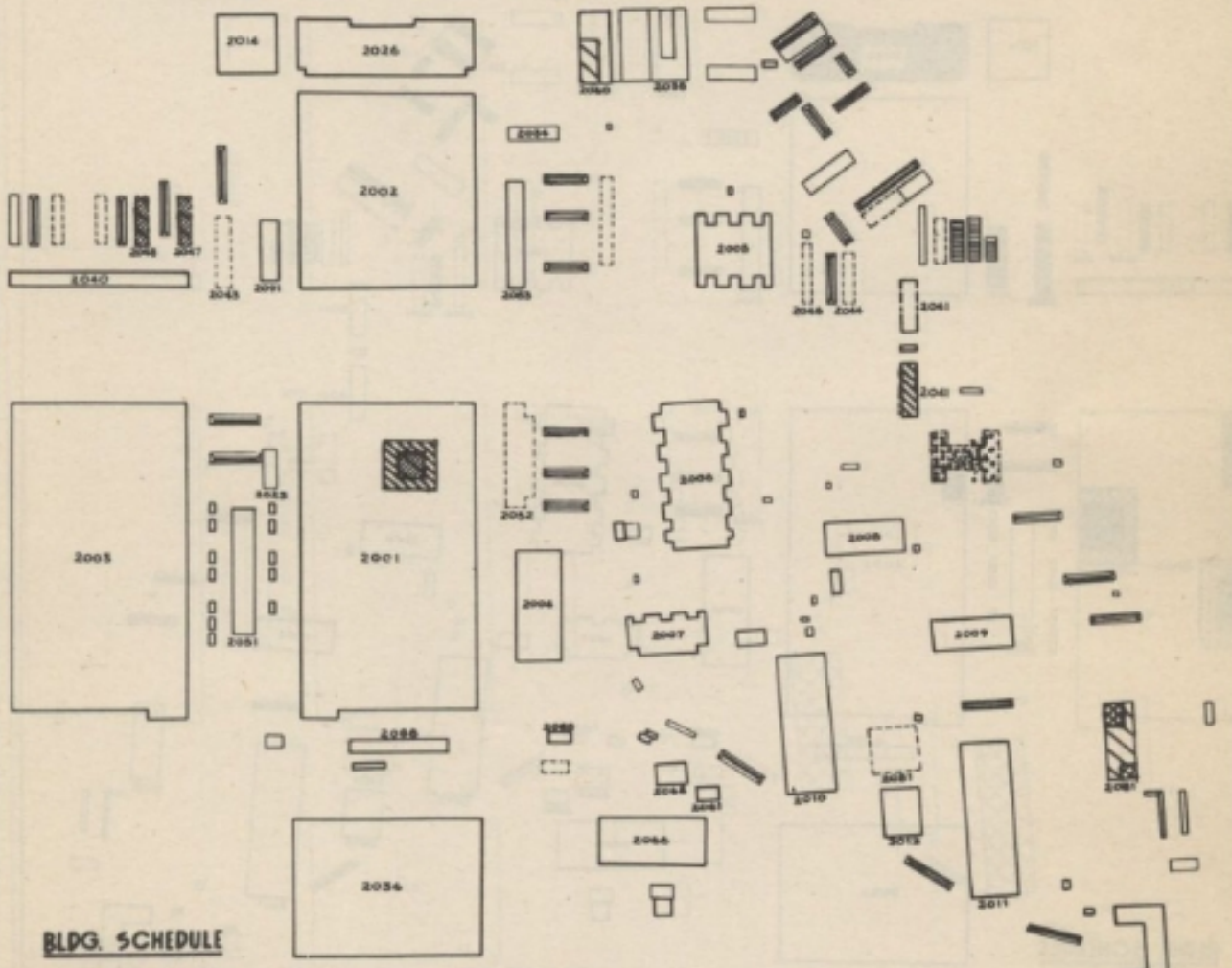
EXHIBIT H 1

DAMAGE PLOT OF 19 JULY, 1944 RAID

LEGEND

- STRUCTURAL (HE)
- STRUCTURAL (HE & FIRE)
- SUPERFICIAL (HE)
- SUPERFICAL (FIRE)
- STRUCTURAL (FIRE)

N



BLDG. SCHEDULE

2001 AIRCRAFT ENGINE PRODUCTION
2002 AIRCRAFT ENGINE ASSEMBLY
2003 AIRCRAFT ENGINE PRODUCTION
2004 WAREHOUSE
2005 TEST STANDS
2006 " "
2007 " BLOCKS
2008 WAREHOUSE
2009 REPAIR SHOPS
2010 ROCKET DEVELOPMENT
2011 " "
2012 STORAGE BLDG.
2014 PACKING AND SHIPPING
2023 STORAGE BLDG.
2026 PACKING & STORAGE
2031 WAREHOUSE
2034 STORAGE BLDG.
2036 COAL RECEIVING
2036 MACHINE SHOP
2040 OFFICES
2041 OFFICES
2042 OFFICE BLDG.
2043 OFFICES
2044 "
2046 "
2047 "
2048 "
2051 WAREHOUSE
2052 CANTEEN
2053 CANTEEN
2054 KITCHEN
2060 POWER HOUSE
2061 SHELTER
2062 "
2066 REPAIR SHOP
2081 GARAGE
2085 TOOL SHED
2088 OIL STORAGE
2091 LIGHT METALS STORAGE

SCALE IN FEET

U.S. STRATEGIC BOMBING SURVEY
ALLACH B.M.W. PLANT
MUNICH, GERMANY
EXHIBIT H 2

DAMAGE PLOT OF 31 JULY, 1944 RAID

LEGEND

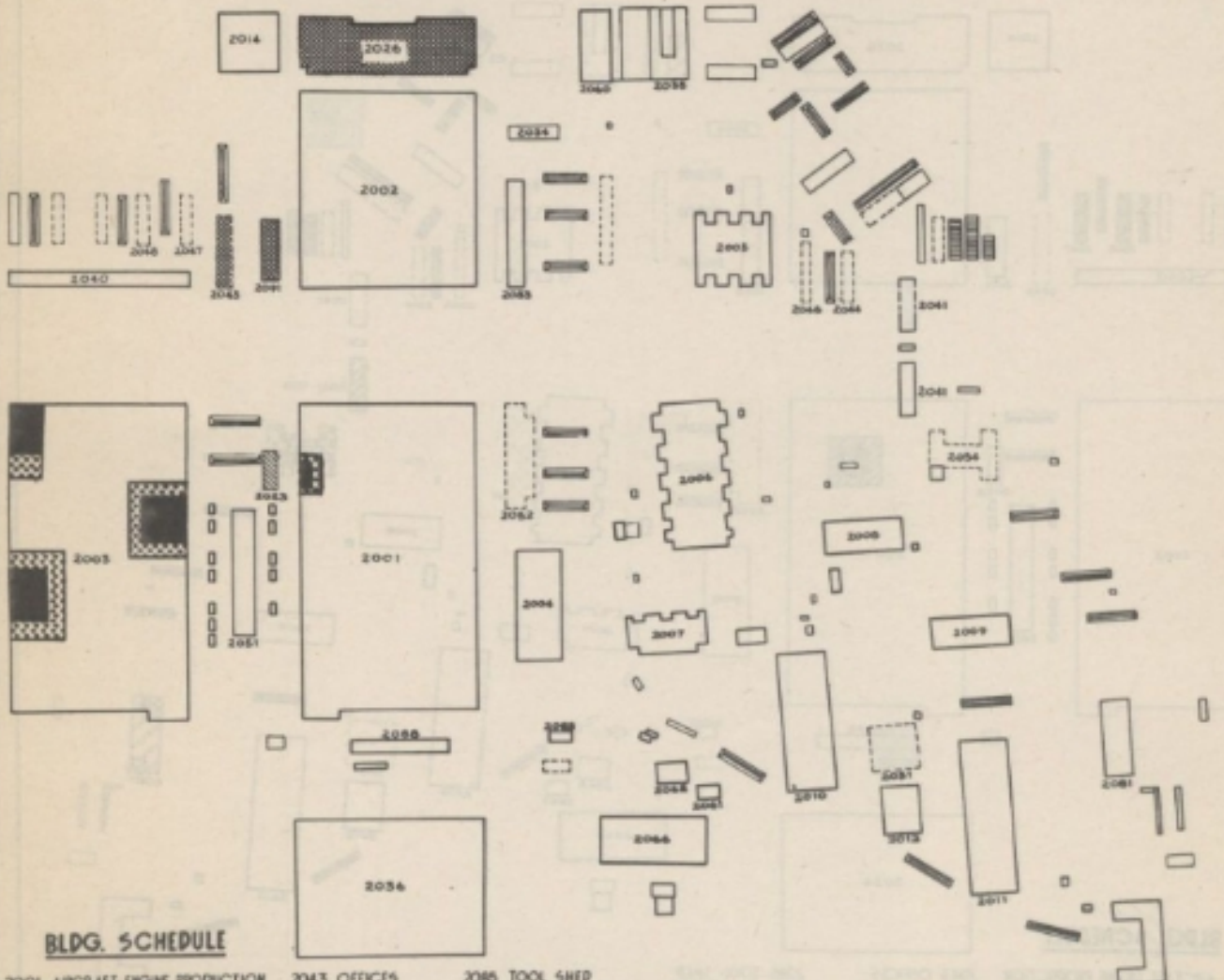
STRUCTURAL (HE)

STRUCTURAL (FIRE)

STRUCTURAL (HE & FIRE)

SUPERFICIAL (HE)

N



BLDG. SCHEDULE

2001 AIRCRAFT ENGINE PRODUCTION
2002 AIRCRAFT ENGINE ASSEMBLY
2003 AIRCRAFT ENGINE PRODUCTION
2004 WAREHOUSE
2005 TEST STANDS
2006 " "
2007 " BLOCKS
2008 WAREHOUSE
2009 REPAIR SHOPS
2010 ROCKET DEVELOPMENT
2011 " "
2012 STORAGE BLDG.
2014 PACKING AND SHIPPING
2023 STORAGE BLDG.
2026 PACKING & STORAGE
2031 WAREHOUSE
2034 STORAGE BLDG.
2035 COAL RECEIVING
2036 MACHINE SHOP
2040 OFFICES
2041 OFFICES
2042 OFFICE BLDG.
2043 OFFICES
2044 "
2046 "
2047 "
2048 "
2051 WAREHOUSE
2052 CANTEEN
2053 CANTEEN
2054 KITCHEN
2060 POWER HOUSE
2061 SHELTER
2062 "
2066 REPAIR SHOP
2081 GARAGE
2085 TOOL SHED
2088 OIL STORAGE
2091 LIGHT METALS STORAGE

SCALE IN FEET

U.S. STRATEGIC BOMBING SURVEY

ALLACH B.M.W. PLANT
MUNICH, GERMANY

EXHIBIT H 3

DAMAGE PLOT OF 12 SEPT., 1944 RAID

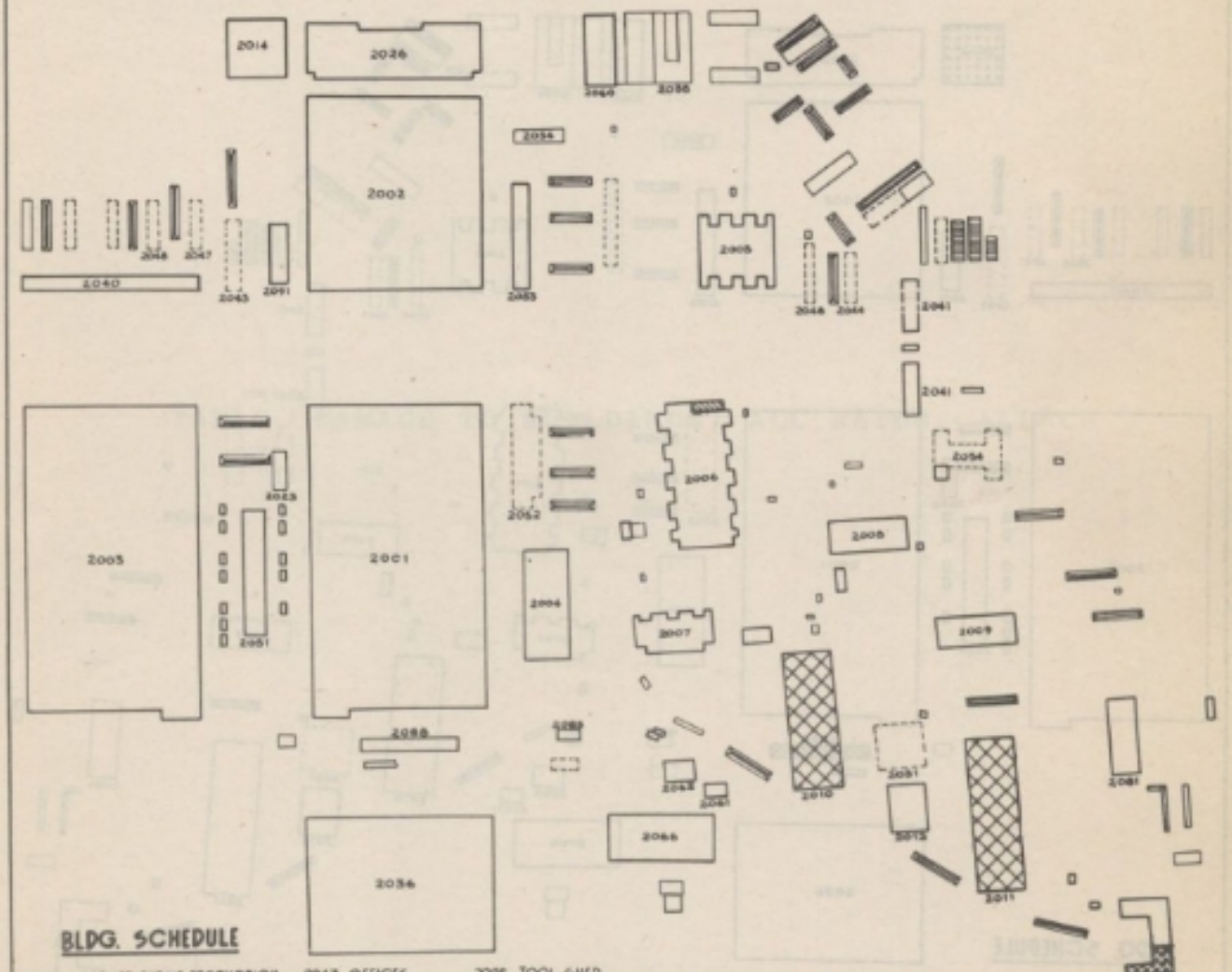
LEGEND

STRUCTURAL (HE)

SUPERFICIAL (HE)

SUPERFICIAL (FIRE)

N



BLDG. SCHEDULE

2001 AIRCRAFT ENGINE PRODUCTION
2002 AIRCRAFT ENGINE ASSEMBLY
2003 AIRCRAFT ENGINE PRODUCTION
2004 WAREHOUSE
2005 TEST STANDS
2006 " "
2007 " BLOCKS
2008 WAREHOUSE
2009 REPAIR SHOPS
2010 ROCKET DEVELOPMENT
2011 " "
2012 STORAGE BLDG.
2014 PACKING AND SHIPPING
2027 STORAGE BLDG.
2026 PACKING & STORAGE
2031 WAREHOUSE
2034 STORAGE BLDG.
2036 COAL RECEIVING
2036 MACHINE SHOP
2040 OFFICES
2041 OFFICES
2042 OFFICE BLDG.
2043 OFFICES
2044 "
2046 "
2047 "
2048 "
2051 WAREHOUSE
2052 CANTEEN
2053 CANTEEN
2054 KITCHEN
2060 POWER HOUSE
2061 SHELTER
2062 "
2066 REPAIR SHOP
2081 GARAGE
2085 TOOL SHED
2088 OIL STORAGE
2091 LIGHT METALS STORAGE

SCALE IN FEET

U.S. STRATEGIC BOMBING SURVEY

ALLACH B.M.W. PLANT
MUNICH, GERMANY

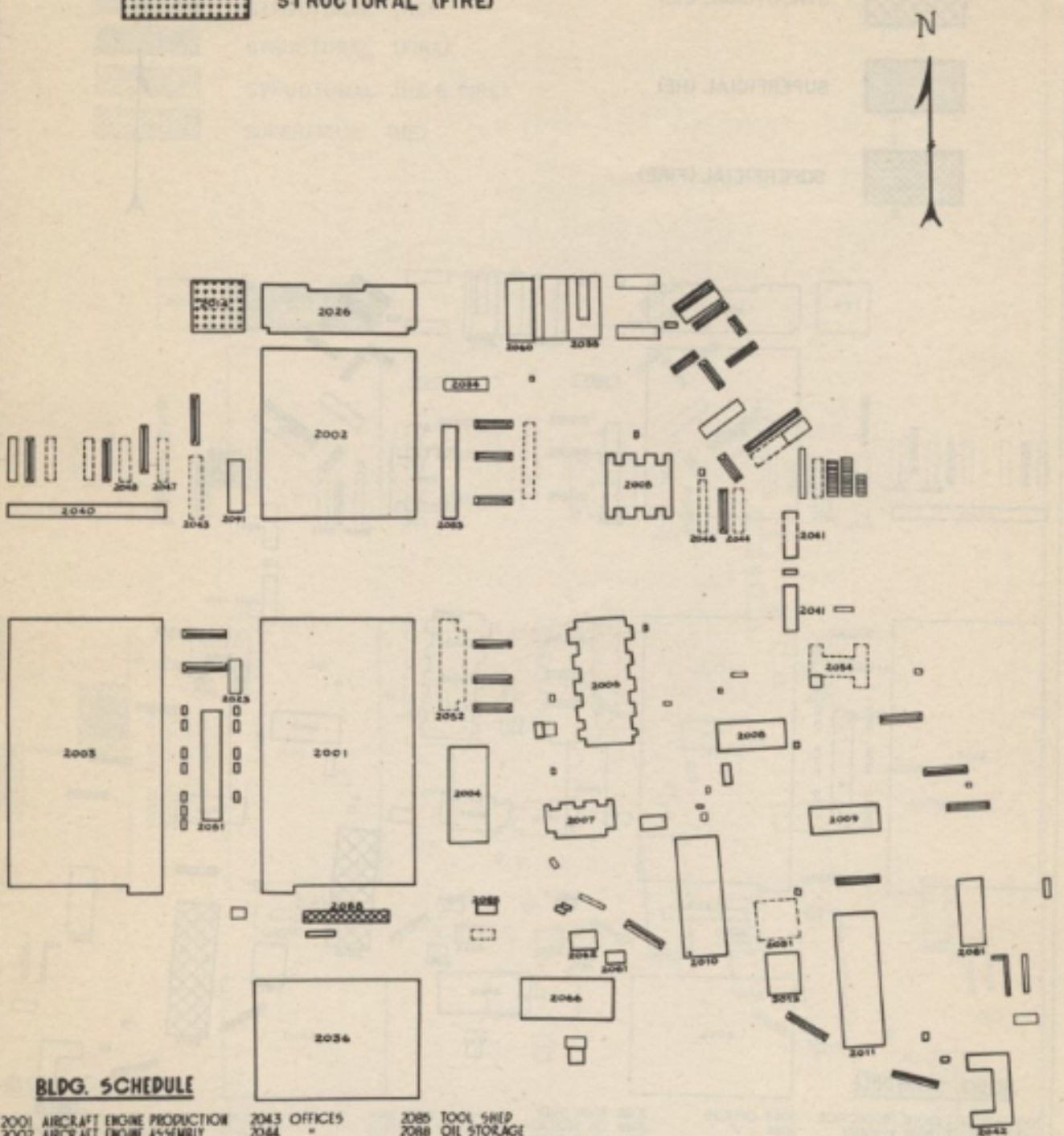
EXHIBIT H 4

DAMAGE PLOT OF 7 JAN., 1945 RAID

LEGEND

STRUCTURAL (HE & FIRE)

STRUCTURAL (FIRE)



BLDG. SCHEDULE

2001 AIRCRAFT ENGINE PRODUCTION
2002 AIRCRAFT ENGINE ASSEMBLY
2003 AIRCRAFT ENGINE PRODUCTION
2004 WAREHOUSE
2005 TEST STANDS
2006 " "
2007 " BLOCKS
2008 WAREHOUSE
2009 REPAIR SHOPS
2010 ROCKET DEVELOPMENT
2011 " "
2012 STORAGE BLDG.
2014 PACKING AND SHIPPING
2023 STORAGE BLDG.
2026 PACKING & STORAGE
2031 WAREHOUSE
2034 STORAGE BLDG.
2035 COAL RECEIVING
2036 MACHINE SHOP
2040 OFFICES
2041 OFFICES
2042 OFFICE BLDG.
2043 OFFICES
2044 "
2046 "
2047 "
2048 "
2051 WAREHOUSE
2052 CANTEEN
2053 CANTEEN
2054 KITCHEN
2060 POWER HOUSE
2061 SHELTER
2062 "
2066 REPAIR SHOP
2081 GARAGE
2085 TOOL SHED
2088 OIL STORAGE
2091 LIGHT METALS STORAGE

SCALE IN FEET

U.S. STRATEGIC BOMBING SURVEY

ALLACH B.M.W. PLANT
MUNICH, GERMANY

EXHIBIT H 5

BMW (MUNICH) EXHIBIT J

TABLE,' DAMAGE TO BUILDINGS,' ALL RAIDS,' ALLACH

B2W (MUNICH) EXHIBIT J

Damage to Buildings in All Raids, Allach

Bldg No	Area of Bldg. Sq. ft.	Activity in building	Type of Structures	Type of Damage: HE	IB	% Structural	% Superficial	% of Total Destruction
2001	364,000	Production Machine Shop	Reinforced Concrete, brick	Blast		3	3	4
2002	243,000	Assembly Shop	Reinforced Concrete, brick	Blast		4	7	10
2003	364,000	Production Machine Shop	Reinforced Concrete, brick	Blast		7	5	11
2026	67,400	Shipping and Storage	Brick, wood roof		Fire	100	-	100
2014	25,000	Packing and Storage	Brick, wood roof		Fire	100	-	100
2043	7,770	Offices	Brick, wood roof		Fire	100	-	100
2047	4,440	Offices	Wood		Fire	100	-	100
2048	4,440	Offices	Wood		Fire	100	-	100
2091	8,330	Light metal storage	Reinforced Concrete		Fire	100	-	100
2060	15,250	Steam Power station	Reinforced concrete, brick	Blast		5	20	22
2023	4,000	Storage	Wood	Blast	Fire	100	-	100
2052	18,330	Canteen	Brick, wood roof	Blast	Fire	100	-	100
2053	14,150	Canteen	Brick, wood roof	Blast		10	30	25
2088	8,320	Oil Storage	Reinforced Concrete, brick	Blast	Fire	100	-	100
2041	33,300	Offices	Reinforced Concrete, brick	Blast	Fire	50	20	55
2057	13,880	Kitchen	Reinforced Concrete, brick	Blast	Fire	100	-	100
2006	66,600	Engine Test Stands	Reinforced Concrete, brick	Blast		-	5	2
2010	48,800	Motor Repair	Steel frame, brick	Blast		100	-	100
2011	51,100	Rocket Research	Steel frame, brick	Blast		100	-	100
2087	16,650	Garage	Steel frame, brick	Blast		20	60	40
2042	17,350	Offices (3-story)	Reinforced concrete, brick		Fire	Top story and roof destroyed - reroofed making 2-story		30

BMW (MUNICH) EXHIBIT K

TABLE,' BOMB DENSITY,' PER ACRE,' OBERWIESENFELD

BMW (MUNICH) EXHIBIT K

Bomb Density Per Acre, Oberwiesenfeld

Note: The Oberwiensenfeld (BMW) Plant covered an area of 92 acres.

Date of Attack	Number of Bombs in Area	Number of Bombs on Bldgs	Bomb density per acre
1-2 Sept 40	0	0	-
9-10 Mar 43	An undetermined number of IBs		-
9 June 44	0	0	-
13 June 44	89	41	.95
11 July 44)) 12 July 44)) 13 July 44)	No Data	17	No Data
16 July 44	0	0	-
31 July 44	No Data	4	No Data
22 Sept 44	0	0	-

BMW (MUNICH) EXHIBIT L

TABLE BOMB DENSITY, PER ACRE, ALLACH

BMW (MUNICH) EXHIBIT L

Table, Bomb Density, Per Acre, Allach

Note: The Allach (BMW) plant covered an area of 235 acres.

Date of Attack	Number of Bombs in Area	Number of Bombs on Bldgs	Bomb density per acre
9 June 44			
13 June 44	27 HE	4	.111
19 July 44	34 HE	8	.114
21 July 44	0	0	-
31 July 44	24 HE	7	.102
12 Sept 44	45 HE	10	.191
22 Sept 44	0	0	-
23 Oct 44	0	0	-
7 Jan 45	11 HE	2	.047

BMW (MUNICH) EXHIBIT M

TABLE, PLANNED AND ACTUAL DELIVERY OBERWIESENFELD

[illegible] ([illegible])

EXHIBIT M

[illegible] PLANT

Planned and actual Delivery 1942

	1942 Aug	Sept	Oct	Nov	Dec	1943 Jan	Feb	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered
Engine 801	250	375	365	310	351	381	400								
Engine 801 J											10 / -	10 / -	10 / 4	15 / 10	15 / -
Engine 801 E												5 / -	10 / -	15 / -	15 / 4
Engine 323 R															
Engine 503															
Rocket Instruments (1980)									10 / -	10 / -	10 / -	10 / -	10 / -	10 / -	20 / -
Rocket Cylinder Compression Chamber (109, 558)															
Jet Engine Instruments (109, 710)															

	1944 Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered
Engine 801											
Engine 801 J	10 / 14	- / -	- / 15	- / 25	- / 5	- / -	- / 10	- / 32	- / 8	- / 1	- / -
Engine 801 E	20 / 2	20 / 18	- / 6	- / 18	- / 7	- / -	- / -	- / -	- / 5	- / 1	- / 1
Engine 323 R		5 / -	15 / -	15 / -	15 / -	- / -	- / -	- / -	- / -	- / -	- / -
Engine 503			5 / -	5 / -	10 / -	10 / -	15 / -	20 / -	30 / -	40 / -	50 / -
Rocket Instruments (1980)	5 / -										
Rocket Cylinder Compression Chamber (109, 558)	The program called for 300 per month from May 1945)										
Jet Engine Instruments (109, 710)	The program for these instruments was to begin in July 1945)										

	1945 Jan	Feb	Mar	Apr
	Planned / Delivered	Planned / Delivered	Planned / Delivered	Planned / Delivered
Engine 801				
Engine 801 J	- / -	- / -	- / -	- / -
Engine 801 E	- / -	- / -	- / 3	- / -
Engine 323 R	- / -	- / -	- / -	- / -
Engine 503	This motor was to be increased to 75 per month by April 1945			
Rocket Instruments (1980)				
Rocket Cylinder Compression Chamber (109, 558)		13 / -	17 / -	23 / -
Jet Engine Instruments (109, 710)				

	1942									
	Aug		Sept		Oct		Nov		Dec	
	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered
Engine 801	255		375		285		312		351	
Engine 801 J										
Engine 801 E										
Engine 323 S										
Engine 803										
Rocket Instruments (3390)										
Rocket Cylinder Compression Chamber (109, 558)										
Jet Engine Instruments (109, 718)										

EXHIBIT M

OBERWIESENFELD PLANT

Planned and Actual Delivery 1942

1943

Jan		Feb		Apr		May		Jun		Jul		Aug		Sept		Oct		Nov		Feb	
Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered
381		400																			
										10	-	10	-	10	4	15	10	15	-	10	14
												5	-	10	-	15	-	15	4	20	2
						10	-	10	-	10	-	10	-	10	-	10	-	20	-	5	-

1944

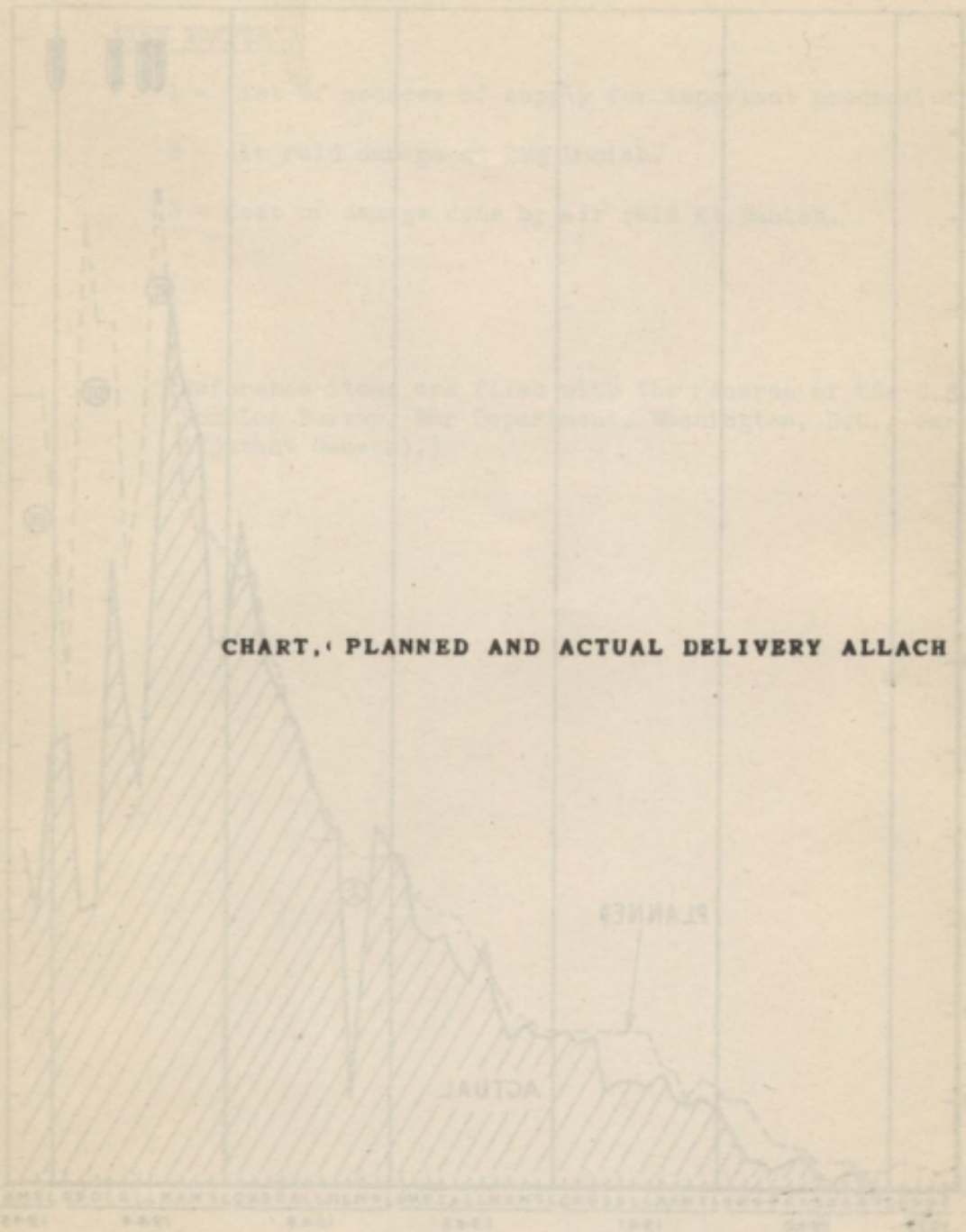
Feb		Mar		Apr		May		Jun		Jul		Aug		Sept		Oct		Nov		Dec	
Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered
10	14	-	-	-	15	-	25	-	5	-	-	-	10	-	12	-	8	-	1	-	-
20	2	20	18	-	6	-	10	-	3	-	-	-	-	-	-	-	5	-	1	-	1
		5	-	15	-	15	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-
				5	-	5	-	10	-	10	-	15	-	20	-	30	-	40	-	50	-
5	-																				

The program called for 300 per month from May 1945)

The program for these instruments was to begin in July 1945)

													1945						
Jul		Aug		Sept		Oct		Nov		Dec		Jan		Feb		Mar		Apr	
Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered	Planned	Delivered
"	"	"	10	"	12	"	8	"	1	"	"	"	"	"	"	"	"	"	"
"	"	"	"	"	"	"	5	"	1	"	1	"	"	"	"	"	3	"	"
"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
10	"	15	"	20	"	30	"	40	"	50	"	This motor was to be increased to 75 per month by April 1945							
00 per month from May 1945)																			
														13	"	17	"	23	"
struments was to begin in July 1945)																			

BMW (MUNICH) EXHIBIT N

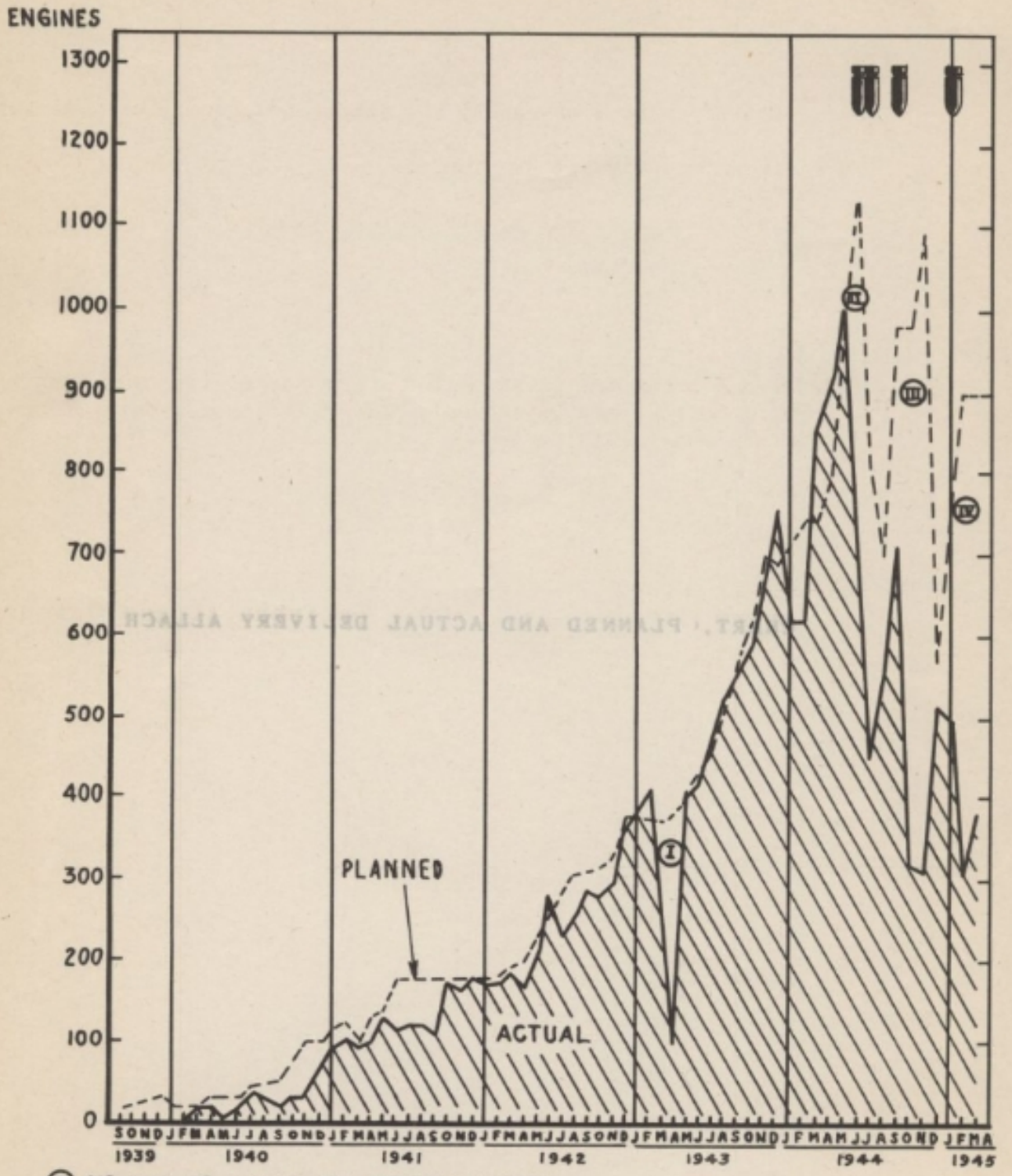


CHART, PLANNED AND ACTUAL DELIVERY ALLACH

ENGINE DELIVERIES

AERO ENGINE AND AUTO FACTORIES - BMW, MUNICH

ALLACH PLANT



(I) AIR RAID OF 9-3-43 ON OBERWIESENFELD.

(II) APRIL 1944: BEGINNING OF OUTLYING DISPERSAL PRODUCTION.

(III) SEPT. 1944: BEGINNING OF PRODUCTION AFTER COMPLETION OF THE "BUNKERHALLE" MACHINE SHOP.

(IV) SPECIAL TRANSPORT & SUPPLY DIFFICULTIES AS A RESULT OF AIR RAIDS.

EXHIBIT N

BMW (MUNICH)

LIST OF REFERENCE NOTES

ITEM NUMBER

1 - List of sources of supply for important production materials.

2 - Air raid damage at BMW Munich.

3 - Cost of damage done by air raid at Munich.

(Reference items are filed with the records of the U.S. Strategic Bombing Survey, War Department, Washington, D.C., care of the Adjutant General.)