# A German war plant from 1944/45: The Aircraft Factory Weingut I and the Concentration Camp Waldlager 6 near Mühldorf/Inn

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ABSTRACT: In the last year of World War II, Hitler was still convinced to win the war by producing so called *Wun-derwaffen*, such as the V-2 rocket and the Messerschmitt 262 turbojet fighter. As the sovereignty over the air-space at that time had already passed over to the Allied Forces, hidden or bombproof production space had to be built.

In southern Germany several huge semi underground aircraft factories were designed by one of the most innovative civil engineers at the time, Franz Dischinger. As German manpower was rare in 1944, foreigners – most of them Jews from Eastern Europe – were sent via Auschwitz and Dachau into concentration camps around the building sites. This report includes investigations in the best-preserved and unaltered ensemble of this kind, Weingut I and Waldlager 6 in Mühldorf/Inn, carried out by students of architecture at the University of Applied Sciences, München.

### INSTRUCTION

In summer 1944 construction work started for a factory building under the Organisation Todt (OT) in a flat forest near Mühldorf/Inn (fig. 1). In this plant, given the secret name Weingut I by the Nazi Authorities, were to be produced parts of the Messerschmitt 262, the world's first turbojet fighter aircraft and one of Hitler's so called Wunderwaffen. The semi underground barrel vault made of reinforced concrete (fig. 3) had dimensions to resist six-ton aerial bombs (Joint Intelligence, 1945, part I, section I, appendix F, p. 1). With a span of 85 m the vault reached a length of 400 m. Under it a production area of 250.000 m<sup>2</sup> was planned on 9 storeys (fig. 4).

The idea for this barrel vault consisting of several arches comes from one of the most influential German civil engineers of the last century, *Franz Dischinger*, professor for reinforced concrete engineering at the *TH Berlin* from 1933-45 and again from 1946-51, with early sympathy for Adolf Hitler and his national socialist movement (Dischinger, F., 1934, p. 130). He not only invented the construction method of the famous thin concrete dome above the Zeiss planetary in Jena from 1925 (Günschel, G., 1966, p. 167), but also suggested a bomb-proof concrete dome with a restaurant on top for the congress hall designed by Albert Speer in 1942 in the centre of Berlin near the Reichstag: a dome for 200.000 people with a span of 250 m. In 1949 Dischinger speaks with admiration about this project (Dischinger, F., 1949, pp. 196-197). What he finds absurd is not the project itself, but Hitler's intention to construct the building in stone and brick instead of reinforced concrete! It is reported, that Hitler's disliked reinforced concrete, because he expected steel corrosion on buildings to last 1000 years. Investigations on the factory ruin (fig. 2) are the first part of the subject and consider the construction method documented by unpublished material from the National Archives in Washington D.C., new measured drawings of the building by students of the University of Applied Sciences, Munich and – most important – a report by the Joint Intelligence Objectives Agency Washington D.C. from September 1945.

Polenski & Zöllner, the building enterprise who was commissioned for the project by the OT, calculated manpower up to 10.000 labourers (fig. 5). As German building workers were not available at the end of the war, forced labourers were requested, mostly Jewish concentration camp internees from Hungary, who came to Mühldorf via Auschwitz and Dachau. The Mühldorf KZ-Aussenlager consisted of several smaller camps around the buildings site, amongst them Waldlager 5/6 near Ampfing (fig. 6). The forced labourers had to unload and transport building materials, carry 50 kg cement bags up a ramp to the concrete mixers, excavate foundation trenches, clear woodland and operate concrete pumps under danger of life, impressively described by Solly Ganor, 2005, pp. 186-189. The expectancy of life of a forced labourer at the *Bunkerbaustelle* was 40-60 days, more than 3000 mostly Jewish humans were killed through inhuman working conditions, insufficient food, lack of health care or mistreatment by *Schutzstaffel* (SS) members (first described by Müller, P., 1981-83, reedited 1999, pp. 54-72; more extensively Raim, E., 1992, pp. 142-278).

Investigations on the concentration camp "Waldlager 6" belong to the second part of the subject. Excavations in collaboration with archaeologists from the Buchenwald Memorials Foundation and measured drawings by students of architecture of the Munich University of Applies Sciences brought light in this area nearly completely covered by plants and trees.

## WEINGUT I



Figure 1: Weingut I, aerial photograph by the allied air forces from April 17, 1945; (BLAVG a)



Figure 2: Weingut I, after the demolition by American Forces in 1946, aerial photograph, 1957; (BLAVG b)



Figure 3: Weingut I, section. Original plan, Polenski&Zöllner; (Joint Intelligence, 1945, part I, section I, appendix D, fig. 34A)



Figure 4: Weingut I, section. Original plan, Polenski&Zöllner, with English translations; (Joint Intelligence, 1945, part I, section I, appendix D, fig. 41A)

The American Air forces discovered the huge construction site by studying aerial photographs, which were taken in February 1945 for preparing the destruction of the Mühldorf railway station. In March 1945 a bird's eye view was drawn marked "secret" with all building site equipment, but no hint to its purpose (fig. 9). In 1946 the U.S. Army blew up the semi underground barrel vault, which was completed up to the 7th arch (fig. 2). Walt Hylander, lieutenant in the U.S. Army Engineers, reports (letter to J. Fischer, major of Waldkraiburg/Inn from March 7, 1995): We had the job to destroy an unfinished Messerschmidt (sic!) factory near Muhldorf. It was the largest demolition project in all of Germany at the time. We used 125 tons of TNT (because that was all the explosives we could find in the US Army then). Only the 7th arch survived the explosion. Asset stripping is the common explanation for this action, but in the report given by US investigators (Joint Intelligence, 1945, part I, section I, p. 27) one may find another good reason for this explosion: It is recommended that the U.S. Army avail itself of the opportunity to test the resistance of this type of construction by actually subjecting one of he arches to a full scale bombing... Test bombing is recommended because: (1) This type of construction might be adopted for war-time industrial installations in the United States or its possessions, and; (2) this uncompleted building with little or no future utility provides a rare opportunity to conduct a full-scale bombing test.

for clearing the space for an industrial area. The local monument conservator Ernst Aicher prevented this with good reasons, since 1991 the arch and its near surroundings are a listed monument.

In 1998 archaeologist Klaus Vierneisel asked me, if I was able to provide a plan of the ruin as a basis for planning a Concentration Camp Memorial Site. I knew the place only from publications, *Winfried Nerdinger's Bauen im Nationalsozialismus Bayern* 1933 – 1945 (1993, pp. 426, 445, 447) describes the site as well as *Norbert Huse* in *Unbequeme Baudenkmale* (1997, pp. 49-51). We went to Mühldorf, visited the Waldlager 6 as well as the ruins of the aircraft factory and I must admit, that I was deeply affected by the significance of this ensemble. I am convinced, that there is no other place in Germany to explain better the coherence between the German mania for new weapons in the last year of World War II and the inhuman suffering in a nearby concentration camp.

On the other side I was helpless providing a plan of the aircraft factory: I had absolutely no experience in measuring a site consisting of blown up concrete constructions in such dimensions (15 football grounds).

I asked help through the students of Geoinformatics at our University: a digital three-dimensional model of the ruin based on conventional surveying was made. Later on, in 1998, about 50 students of architecture started within three days surveying the remains of *Waldlager 6* and the most significant parts of *Weingut I*. Here are the most important results:



Figure 5: Weingut I, provisional working plan, Polenski&Zöllner, May 18, 1944, with English translations; (Joint Intelligence, 1945, part I, section I, appendix D, fig. 47A)



Figure 6: Waldlager 6, after the liberation by the US Army in May 1945. Barrack Nr. 1/Block 3 on the right; (NARA a); Figure 7: Weingut I in May 1945. Abutment with measuring marks for arch settlement (NARA b)



Figure 8: Weingut I, first arch, reconstructed according to arch seven. Catenary y = 0,012 x<sup>2</sup>; (students of the University of Applied Sciences, Munich)



Figure 9: Weingut I, secret perspective drawing of the building site, March 1945; (NARA c)

Two groups measured the profile of the destroyed first and the remaining seventh arch (fig. 8): The span measures 85 m, the thickness ca. 3 m at the crown. A so-called Zerschellschicht (layer of lean concrete on top of the reinforced concrete construction to prevent destruction by bombs) must be added according to the surviving plans (fig. 14). Initially the ultimate thickness of the arch roofs of all similar plants in Germany had been reported to be 10 meters. Dischinger stated, that the OT desired to go to a 9-meter thickness, but since the arch abutments had already been built, he recommended an ultimate thickness of only 7 meters (including the Zerschellschicht) to avoid failure of the abutments (Joint Intelligence, 1945, part I, section I, appendix F, p. 1).

The shape of the arch is not a circular arc, but a catenary ( $y = 0.012 x^2$ ), statically slightly more efficient. Important and only visible on a photograph by the U.S Army from May 1945 (fig. 7): measuring marks to control the arch settlement at its abutment. In an interview given to the American investigators by the designer of the arches, Prof. Dischinger, in Berlin on 14 August and again on 25 August 1945, it is reported, that the settlements were calculated 4 cm and checked very closely with 4-5 cm (Joint Intelligence, 1945, part I, section I, appendix F, p. 1).

A third group of students was asked to survey the best preserved ventilating towers for the heating and ventilation system, designed by the firm Rudolph Otto Meyer, Hamburg, whose 150 year old chronicle proudly mentions inventions, patents and a heating system installed in the Vatican city in 1932 (www.imtech.de: 150jähriges Jubiläum), but no project in NS Germany. The towers are situated in every second section of the barrel vault (figs. 2, 4) to provide air conditioning for 250 000 m<sup>2</sup> underground production area. I asked the students to bring rope ladders with them, here is the result (fig. 10): the ventilation towers were not only designed for air conditioning, but also included entrances to the semi underground plant, locked by several heavy doors.

A fourth group of students was asked to study the construction technique. Because of permanent air attacks in 1944/45 it was not recommendable to construct arches upon conventional wooden scaffoldings. So gravel fill was used to form the underneath side of the long span concrete arch roofs. This technique was so innovative and unique, that the U.S. Army inspectors described these underground installations more detailed than any other technical plant in Germany (Joint Intelligence, 1945, part I, section I, pp. 1-27 with appendix A-E). Dischinger himself published his arch design proudly in 1949 (pp. 195-196). The construction firm Polensky&Zöllner follows at its 75 years jubilee (fig. 14). Fig. 13 shows, that on top of the gravel fill were laid prefabricated thin concrete slabs to provide a good subsurface.

A unique technique was also used for removing the fill underneath the centre of the arch: An arched precast concrete recovery tunnel, 13 ft wide x 13,3 ft high on the inside (Fig. 14), could accommodate a single track railroad (Joint Intelligence, 1945, part I, section I, pp. 21-22, figs. 35, 37-40). Square openings located in the top of the recovery tunnel with manually operated gates allowed the gravel to fall into dump cars. Fig. 11 shows how the prefabricated half-arch segments were set in 1944.



Figure 10: Weingut I, plan of the ventilation tower; (drawing by students of the University of Applied Sciences, Munich)



Figure 11: Weingut I, setting the recovery tunnel by precast concrete half-arch segments, 1944, photograph by Polenski&Zöllner(MS a); Figure 12: Weingut I, precast concrete parts for the recovery tunnel; (drawing by students of the University of Applied Sciences, Munich)



Figure 13: Weingut I, gravel fill for the first arch, 1944, photograph by Polensky&Zöllner; (MS b)



Figure 14: Weingut I, section showing the removal of the gravel fill by a concrete recovery tunnel, (Werner-Ehrenfeucht, W., 1955, p.2);

The students located staples of these half-arch segments at different places round the building site, measured all different types and explained their function, fig. 12 shows the result. As this work could be done quickly, there was time for more investigation. Curious to find parts of the tunnel in situ, they found a hole for entering the pitch-dark tunnel, borrowed a current generator and lamps and documented their discovery by photographs. Fig. 15 shows the western end of the tunnel completely preserved over a length of 50 m, only the iron railroad rails were missing. The corroded, but intact iron gates in the crown of the tunnel are preserved too. Sophisticatedly organised was the removal of fill: the distance of the openings in the crown corresponds exactly with the length of the dump cars and huge numbers indicate their position, so the locomotive driver knew exactly where to stop.

The shape of the recovery tunnel is highly sophisticated too. In a slightly earlier similar plant *Weingut II* at Kaufering/Lech erected by the construction firm Leonard Moll (so called *Mollbunker*), the double track tunnel with its rectangular section was build in place and had to be heavily dimensioned (Joint Intelligence, 1945, part I, section I, p. 10, figs. 17-18). In the Mühldorf tunnel the more advantageous shape of a parabola was chosen, designed as a statically determinate 3-hinged arch (Joint Intelligence, 1945, part I, section I, p. 22, figs. 38-40 with all calculations). Thus the use of iron and concrete could be reduced.

The U.S. investigators - without mentioning the concentration camps round the building site - acknowledged the new construction methods: German construction firms made rapid progress in building these underground factories; most of these factories were rapidly nearing completion after one year of construction. And they recognised the different standards at Kaufering and Mühldorf: The construction plant layout was usually not planned in detail, but developed with the job; this resulted in considerable confusion. The Weingut I factory near MUHLDORF ... is an exception, however, because the plant layout was well planned. (Joint Intelligence, 1945, part I, section I, pp. 2-3).

We also have precise information on the costs of the factories. The construction firm L. Moll calculated 20.179.700 Reichsmark for Weingut II. As only ca. 70% were completed, ca. 14.000.000 Reichsmark were paid (Raim, E., 1992, pp. 124-127). It is not clear, weather a payment request (Nachforderung) by L. Moll for March 1945 is included in this calculation. Fact is, that a diminution factor for non-German workers is supposed: 1.0 for Germans, 0.833 for foreigners, 0.714 for Italians, and 0.333 for Jews (Joint Intelligence, 1945, part I, section I, appendix D, fig. 27A, p. 6). The Mühldorf factory had a bigger volume with supposed costs of 25.867.592 Reichsmark to be paid by the German Reich. This was an extract of our investigations concerning Weingut I.



Figure 15: Weingut I, recovery tunnel, 1998 (photograph by Moritz Korn, University of Applied Sciences, Munich); Figure 16: Weingut I, unfinished semi underground barrack in May/June 1945 (NARA d)

### WALDLAGER 6

In our survey of Waldlager 6 not outstanding technical achievements were the subject, but inhuman living conditions in a German concentration camp. The Mühldorf Außenlager of the Dachau Concentrations Camp consisted of several smaller camps near the building site. Best preserved though overgrown by now are the ruins of Waldlager 6 (fig. 19). It lies about 1 km south west of the building site in a forest and was erected in several steps by the concentration camp prisoners since summer 1944. Because of its semi underground heatable barracks for 30 prisoners it was also called *Winterlager*. Photographs of the American liberators from May 1945 in the Nationals Archives Washington show the unhidden huts in the southeastern part of the camp, insufficiently camouflaged against air raids by evergreen boughs (fig. 6). Clearly visible are the chimneys of the wood stoves; a scanty electricity supply for the illumination of the camp surrounded by a double fence of barbed wire, and in the background the roof of a latrine barrack. On fig. 16 an unfinished hut belonging to an extension of the camp shortly before the end of the war is to be seen.

Important documents for the study of Waldlager 6 are an aerial photograph by the allied air forces dating from April 1945 (fig. 19) and an undated architect's plan in the Kreismuseum Mühldorf's exhibition (fig. 17). The plan, whose bottom right corner is cut away to hide the architect's identity, shows the rectangle camp divided in four quadrants by an intersection. In quadrant I (top left) you see an unfinished building on concrete foundations for the SS headquarters, in quadrant II (top right) the Apellplatz for the concentration camp prisoners, in the southern quadrants III and IV the camouflaged older part of the camp hidden under trees and the open part already shown on fig. 6.

These documents had to be compared with the ruins on the site by a drawn to scale plan (fig. 18). In quadrant III huts with a length of 8 and 16 m could be identified: wooden roof elements of 8 m length were used and added to each other. A bath barrack with showers, round washbowls, a changing room and a water basin were studied as well as a laundry barrack, the latrine barracks, a cellar to stock potatoes, a basement for an electric water pump and near the southern fence the semi underground one man prison documented by the US liberators. In the northern part of quadrant III the *Revierbaracke* could be identified, the camps so called hospital. Here dreaded camp doctor Erika Flocken (fig. 20) decided, who of the sickened concentration camp prisoners were sent to the gas chambers. Two transports to Auschwitz with Flocken's involvement are reported in 1944 with 831 men and four women in total. Flocken was the first woman sentenced to death by a US military court at the Mühldorf Trial. Later on her sentence was reduced to long life, in 1956 to 38 years, in 1957 she was released from Landsberg prison for war criminals (Raim, E., 1992, pp. 231, 235-240; Benz, W., Distel B., 2006, p. 395).



Figure 17: Waldlager 6, architects plan, winter 1945 (Müller, P., 1999, p. 40)



Figure 18: Waldlager 6, actual plan, 1998 (drawing by students of the University of Applied Sciences, finished by Valentina Hinz and Stefan Franz)

There are many arguments, that the architect's plan (fig. 17) was commissioned by the Organisation Todt for an amplification of the camp in Winter 1944/45. Thus the existing buildings had to be documented, less precisely the irregular huts in guadrant III, and more exactly the regular barracks in guadrant IV.

We not only studied the Waldlager's ruins on the surface. In 1999 we excavated several buildings assisted by archaeologists specialised it this field: Ronald Hirte (Buchenwald Memorial Site) and Thorsten Kleinschmidt (Universität Jena). A fairly well preserved semi underground barrack near the north-southern main road in quadrant IV was selected. After cleaning we uncovered to our surprise a package of 65 shoes scattered on the floor. Single pieces, no pairs, most of them men's shoes with a German shoe size from 39-42, amongst them fine leather shoes with toecaps wearing punched patterns at the seams (brogueing), so called *Budapester*. A third of all shoes have an average length of 23 cm corresponding to size 36-39 and narrow soles and therefore belonged to women. There were also coarse shoes used on building sites with iron wire instead of laces, and a sole with a length of 14 cm, apparently from a child's shoe. We were shocked and helpless too: how these shoes came into a barrack, whose purpose was to provide accommodation to the camps inmates?



Figure 19: Waldlager 6, aerial photograph from April 1945 (BLAVG c); Figure 20: Dr. Erika Flocken, photographed at the Internierungslager Regensburg (NARA e)

Reading in the memories of concentration camp prisoners, shoes with nearly no exception played an important role for surviving (Solly Ganor, 2005, pp. 199-203; Jehuda Garai, 2006, pp. 124-125; Viktor Frankl, 1999, p. 34; Primo Levi, 1988, p. 42; Raim, E., 1992, p. 220). Joseph Hausner, who survived the death camps at Kaufering, informed us in detail (1995, p. 47): Even though many of us had kept our shoes or boots since Auschwitz, eventually the best soles were through. The small camp cobblery could barely cope with fixing the footwear of the guards and the camp aristocracy. Ordinary mortals like me never had a chance to get a worn shoe repaired... There was a shoe replacement system of sorts, though. You lined up the Magazine, or camp warehouse, handed in your old shoes, told your size, and got a "new" pair handed to you. The new shoes were the ones taken from the dead or discarded by others, sometimes repaired, sometimes not. The pair didn't always match, and the good ones had already been taken by those higher up. You couldn't try the shoes on. You had no choice but to wear them next day and if they didn't fit, you could try again. With bad shoes one day's work and march were enough to ruin your feet.

After reading this report, it became clear, that we had found the repair-shop of the camps shoemaker, who is mentioned in the *Einsatzbericht* from March 15, 1945, a report by the *Waffen-SS* Dachau with work to be done within the camp by the inmates (AD a).

### CONCLUSIONS

Never before historical investigations affected me like those in Mühldorf. You meet politicians, who argue that nothing has remained from Waldlager 6, and inhabitants of the nearby villages, who reuse the camps round concrete washbowls as flowerpots and drinking bowls for their ducks. You talk to surviving camp prisoners, who under tears talk about their suffering in the camp, and you meet a 90 years old mechanical engineer engaged by the Organisation Todt, who pretends, that many of the forced labours at the building site died, because they did not know, that the nightshades from the nearby forest are poisonous. And you wonder about the Bayerisches Landesamt für Denkmalpflege, who listed the grandiose Weingut I as a historical monument, but rejected a petition by the politician Hans-Jochen Vogel (Gegen Vergessen – Für Demokratie), Max Mannheimer (president of the Lagergemeinschaft Dachau) and others to include the uncomfortable Waldlager 6. On the other hand, one is pleased by the still lasting interest of alumnae's, who ask, if our efforts to establish a Mühldorf Memorial Site was successful. And one admires the commitment of Mühldorf citizens, who do not conceal the local NS history in their Kreismuseum, organise guided tours to Weingut I and Waldlager 6, reedit publications, care for regular memorial performances at the day of the liberation and information panels on the site (www.kz-gedenk-mdf.de; Wagner, J., 2007: Erinnern oder Vergessen). Nevertheless, a Memorial Foundation, who also cares for maintenance and security of the site, has not come up yet. Till now public funds were only used for calculation the blasting of the remaining arch, removing concrete parts, planning fences, locking the recovery tunnel by pouring concrete on top of it - and not for a proper maintenance of this unique historical monument.

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