

RECONSTRUCTION OF WAR DAMAGED BUILDINGS - A PROBLEM THAT STILL STANDS. THE CASE OF THE NATIONAL ECONOMY BANK IN WARSAW RESTORED DURING THE SECOND WORLD WAR

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Abstract

The Polish national historiography remains silent on the reconstruction of damaged towns and cities that was undertaken by the German administration after capturing Poland in September 1939. This paper, on the war-time restoration of the National Economy Bank's headquarters in Warsaw, is an attempt to at least partially fill the gap. Designed by celebrated architect Rudolf Świerczyński in the late 1920s in accordance with contemporary air raid defence regulations, it was bombed and nevertheless seriously damaged during the September Campaign. Under the German management of the bank, the building was reconstructed and even modernized by commissioned Polish engineers.

Keywords: reconstruction, war damages, reinforced concrete, modernism

1. INTRODUCTION

An entire chapter in Stefan Bryła's 'Engineering Technology Handbook', published in 1936, concerns the question of air raid defence in the construction industry. Until recently, recommendations on how to design buildings to withstand artillery fire or aerial bombardment might have seemed a historical curiosity, a memory of Europe's troubled past. But now, in the face of worsening international security in Europe and the rest of the world, the question posed in the title again becomes - unfortunately - valid.

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'The Engineering Technology Handbook' told us that in terms of resistance to destruction caused by explosions, "... *steel frames (welded) and steel-reinforced concrete frames are the most appropriate building designs*" [3]. In a chapter entitled 'Air defence in construction', the author, Col. Józef Siłakowski, Head of the Office of Engineers and Inspector of General Staff of the Polish Armed Forces, recommended that in order to reduce the devastating effect of aerial bombardment, it is necessary "...*to create the conditions for an internal explosion in an empty space (unsealed)*". *The most appropriate solution here is a building frame with the greatest possible surface for windows and light walls, so that the internal explosion does not encounter any great resistance blowing out the walls.*" Such a frame could be made either of reinforced concrete or steel, and in fact in interwar Poland many buildings were constructed using these modern - and at the time - relatively new techniques. Nevertheless, without additional studies it is difficult to assess to what extent this was prompted by the need for defence, or by the then-current modernist fashion. Despite this, the Second World War, which broke out just a few years after publication of the 'Handbook', quickly confirmed the validity of Colonel Siłakowski's recommendations. The structures built of reinforced concrete or with steel frameworks seemed better able to withstand air raids, and so their reconstruction was also easier and cheaper.

The National Economy Bank (pol. Bank Gospodarstwa Krajowego - BGK) in Warsaw is an interesting example of the kinds of repairs made as a result of bombing. It is also a significant case, as its reconstruction was performed in 1940, under Nazi occupation. The works were carried out by a team of Polish engineers working for the bank's German management board. The observations made at the time not only confirmed the validity of the adopted design decisions, but also helped develop a general method for use in such cases. This experience also proved invaluable later on, during the reconstruction of the country post-liberation.

Another question addressed in this paper concerns a certain gap in Polish historiography, which has generally remained silent as to what was happening with the damaged Polish towns and cities under German administration, after the failed September 1939 campaign. According to the official national narrative, which was to a large extent driven by the policy of settlements with Germany, reconstruction of the damaged towns took off only after the liberation in 1945. This line of thought obviously serves to justify and strengthen the notion of Nazi Germany as a truly barbarian, destructive power, which is particularly true of the end-stage of the war, when the retreating Germans literally razed the Polish capital to the ground for no reason whatsoever, other than vengeance for the Warsaw Uprising. In this context, bringing up the fact that between 1939 and 1945 the Germans put significant efforts into rebuilding Polish towns after taking control, may sound at best like heresy, inasmuch as it seems logical. Recently, the

problem has been given some attention, but again, the Nazis' reconstruction plans are portrayed as a tool for exercising power over the occupied territories, and a means of fulfilling the German strategy of "Drang nach Osten" [5].

After the military campaign in the Autumn of 1939, and as they consolidated their reign over the occupied Polish territories, the Germans consequently pursued their goal of colonizing the "Lebensraum" in the East, which was not about turning it into a wasteland of no value to Aryan settlers. However, the notion of the "German reconstruction" - or "deutsche Aufbauwerk", as the German supremacy over Poland was officially termed - was quite different among Poles, and was seen as just another neologism coined by the Nazis to justify their crimes [1].

The reconstruction works under the German management were mainly carried out by a Polish workforce, and this could raise charges of collaboration. Naturally, no one would ever blame the simple workers, who were forced to take the job either literally or by the simple will to live by all means necessary. However, as the BGK case proves, sometimes such reconstruction work was initiated by the Polish engineers themselves, which might again lead to the posing of questions about their motives. Why would they do this, when during the occupation it was these same Poles (more specifically, the Polish Home Army (pol. Armia Krajowa - AK)), who, to weaken the occupier's position and make their time in Poland difficult and dangerous, blew up vital communication lines and institutional buildings, sabotaged production and undermined work efficiency across the country? Since these activities had been approved by the Polish government in exile in London and were seen as a patriotic virtue by most of the population then, initiating the reconstruction of an important element of the infrastructure of power should possibly have been considered as helping strengthen the occupiers' position. This might then have brought infamy to the initiator of these works, and quite possibly even a charge of collaboration - the worst crime an individual could have been accused of at the time. It is not without reason that even today, Poles boast of not having had their national version of Pétain or Quisling, who would have collaborated with the Nazi occupiers on a governmental level, but instead suffered repressions as a nation that are unparalleled in the experience of other European nations. Significantly, the engineers employed in the war-time reconstruction of the BGK restrained from speaking out about their involvement in the venture, being most likely very much uncertain about how such confessions could have been received. This uncertainty may also explain why we have known so little about other undertakings of this kind until now.

In this paper I will argue that the engineers and lower rank technical staff took on such risky challenges for two reasons. Firstly, they were struggling to survive, just like everyone else during the war, and were looking for any opportunity for paid work. Secondly - and this I deem to be a virtue in itself - they sought challenges, as engineers always do. In this way, intentionally or not, by continuing

to practice their trade, or even improve their professional skills, they stood ready to rebuild the country when the liberation came.

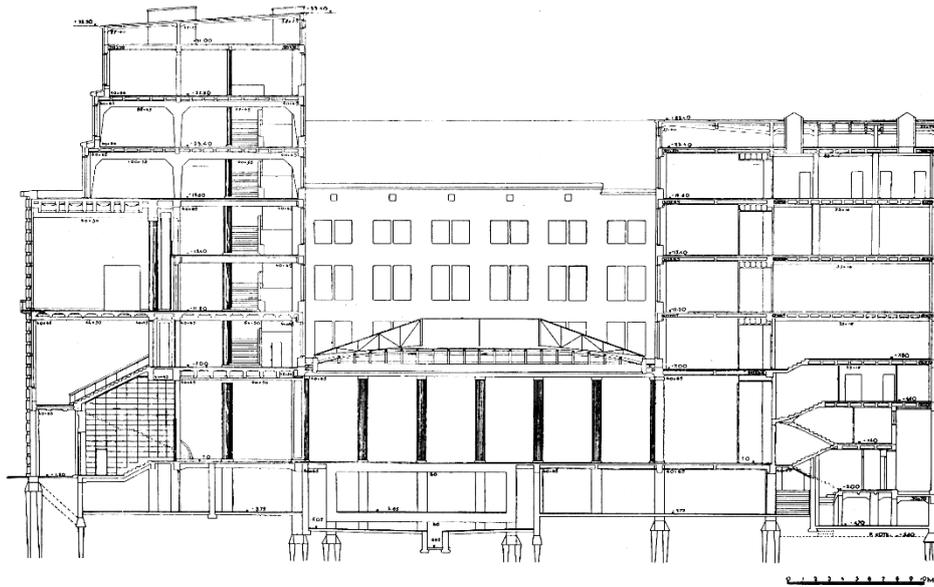


Fig. 1. Cross-section of the BGK building. On the left, the reinforced concrete framework of the main wing along Jeruzolimskie Avenue is shown [7]

2. DESIGN AND CONSTRUCTION

The BGK building is located on Jeruzolimskie Avenue, between Nowy Świat and Bracka streets. The architect for the initial construction project, selected as a result of a 1927 competition, was Professor Rudolf Świerczyński, one of the co-founders of the Faculty of Architecture at the Warsaw University of Technology. His design obtained mostly positive reviews, although there were also some critical opinions. Professor Edgar Norwerth, Świerczyński's colleague from the same faculty, for example, criticised him for a somewhat unemphasised entry to the bank. In Norwerth's opinion, the design of the staircases' offsets in the part of the building facing onto Jeruzolimskie Avenue were too thin and narrow in relation to the total mass of the building. Norwerth also questioned the purpose of placing reliefs on the side walls of those onsets, criticising them for not harmonising with the design of the rest of the building. Professor Norwerth wrote that "... faulty holes cut into the sculpture are very similar to the 'Kunstgewerbe', and hardly suit the strong architectonics of the building". In conclusion he stated, however, ... "that the author's care for the appearance of the building should be

recognised, which is visible in the amount of work and attention to detail, and the stone façade.”[7].

PRZEDSIĘBIORSTWO ROBÓT FUNDAMENTOWYCH



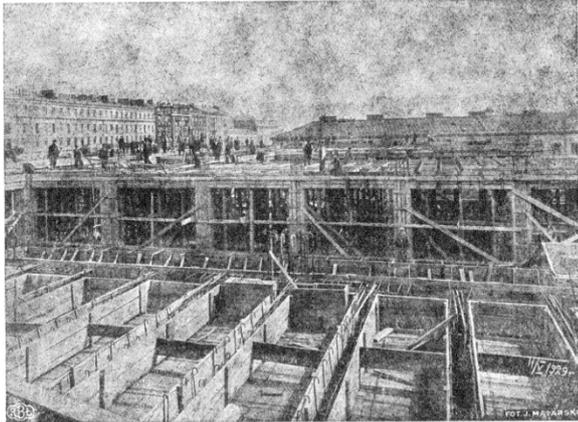
„RAYMOND”
Inż. EDWARD ROMAŃSKI
WARSZAWA, ZGODA 9,
TELEFON 192-68.

Pale drewniane, betonowe,
żelbetonowe.
Pale syst. „Raymond”, syst.
„Straussa”, syst. „Simplex”
i inne.
Ścianki wpustpalowe. Studnie
opuszczane.
Badanie gruntu.
Rekonstrukcja fundamen-
tów.
KAFARY PAROWE — sprze-
daż, wynajem.

Fundamentowanie gmachu Banku Gospodarstwa Krajowego w Warszawie.

Fig. 2. The foundation works, as shown in the promotional materials of Raymond company [7]

Przedsiębiorstwo Robót Inżynieryjno-Budowlanych



**H. SOSONKO
i W. WOJCIECHOWSKI**
INŻYNIEROWIE
Siedziba KRUCZA 8, tel. 401-84.
Rach. w B. G. K. 1858

**Specjalność: roboty żelbetowe, dro-
gowe, mostowe.**
Obecnie wykonuje budowę Banku
Gospodarstwa Krajow. w Warszawie.

Właściciele firmowi dotąd wykonywa-
li, razem lub oddzielnie, cały szereg
robót, wchodzących w zakres inżynie-
rii lądowej i budownictwa zwykłego,
mając za sobą między innymi praca-
mi: budowy odcinków kolejowych na
kolei Altajskiej, Uralskiej i Murmań-
skiej, basenu amunicyjnego na Wester-
platte w Gdańsku, szkoły powszechnej
przy ul. Bema, całej żelbetowej kon-
strukcji Pawilonu Akademickiego przy
ulicy Grójeckiej, gmachu Ministerstwa
Oświaty przy Alei Suchoa i t. p.

Budowa Banku Gospodarstwa Krajowego w Warszawie, Al. Jerozolimska 1, tel 35-47, skład 330-33.

Fig. 3. The timbering ready for concreting, as seen in the promotional materials of the general contractor, the H. Sosonko and W. Wojciechowski Engineers [7]

The building was founded on piles, with the complete foundation works conducted by the 'Raymond' company of Warsaw, led by engineer Edward Romański. The rest of the construction works were assigned to 'H. Sosonko and W. Wojciechowski Engineers', also from Warsaw. The BGK's building was designed with a monolithic reinforced concrete frame, with bricks filling the curtain walls. For finishing of the exterior walls, slabs of andesite were used.

2.1. The bank during the war

Shortly after the outbreak of the war, the Board of BGK moved its headquarters to London. Some of the most important documents were also evacuated from Warsaw, as well as cash and deposits (including unique collections from the National Library and the Diocesan Museum in Pelplin). In October, just after Poland's surrender, the occupying authorities established a new, German board of governors at the BGK. Initially, Dr. M. Frank. held the position of president of the bank. In 1940 he was succeeded by an Austrian, Dr. Dank, who held this position until the outbreak of the Warsaw Uprising in 1944. It is worth noting that Dank showed a relatively positive attitude to his Polish subordinates, and that his staff policy was not guided by nationality, but rather by competence. As a result, nearly all of the lower-level positions continued to be filled by the same Poles who had worked at the BGK before the war.

Poles were also in charge of the bank's technical department, which was led by Deputy Director Osuchowski. He was an outstanding specialist and a great patriot who had graduated in Germany, and was able to fluently speak the language of the occupier. He soon established a close professional relationship with director Dank, and it was Osuchowski who convinced him of the need to repair the war damage to the bank. The planned reconstruction also included the nearby residential Pension Fund buildings, managed by BGK, which had also been hit by bombs. Multiple experts and about 10 construction and assembly companies from in and around Warsaw were employed in the works. One of the engineers engaged in the project, Władysław Danilecki, was a member of the teaching staff of the Chair of Bridge Construction at the Technical University of Lviv before the war broke out. Later, he left a detailed description of the repairs carried out at the time. It is intriguing that in the reports, published in 1946, there is no mention of relevant personal or organizational issues, which seems to be quite understandable given the political atmosphere of the time, when any involvement of this kind could have been seen as evidence of collaboration [4].

2.2. Destruction

During the inspections of the premises, a reinforced concrete structure constituting 55% of the roof area was found to have been completely destroyed by artillery fire and aerial bombardment. Damage to beams, columns and slabs in

about 10% of the area were so great, that their repair turned out to be uneconomical. In the remaining part, in spite of the scratches and cracks, the structural elements were suitable for repair.



Fig. 4. Damage caused by the German bombing in September 1939. An entire span and part of the floor is missing [4]

It was also observed that the bomb damage had a specific character. The bombs first pierced the roofing slabs, travelling down through the floors and then exploding. At the points of detonation and in their immediate vicinity, the structure was completely collapsed, while elements located radially around the epicentre of the blast were damaged to a lesser extent. As a result of the blast, within the horizontal plane between the floor and ceiling of the level on which the explosions occurred, supporting columns were displaced, resulting in horizontal cracking at their bases and in their heads. The exploding bombs also caused vertical forces between the floors. These lifted the ceiling slabs, bending the main floor beams upwards and cracking them along their bottoms, which had been reinforced for normal operation under compression conditions. Flooring slabs that were lifted with the blast waves were detached from the beams and after the self-collapse of the main floor structure, the beams often remained raised up, their surfaces bulging out. Just how powerful the destructive forces affecting the

construction were, could be seen in the reinforced concrete bars exposed in the beams bent by the blast waves.

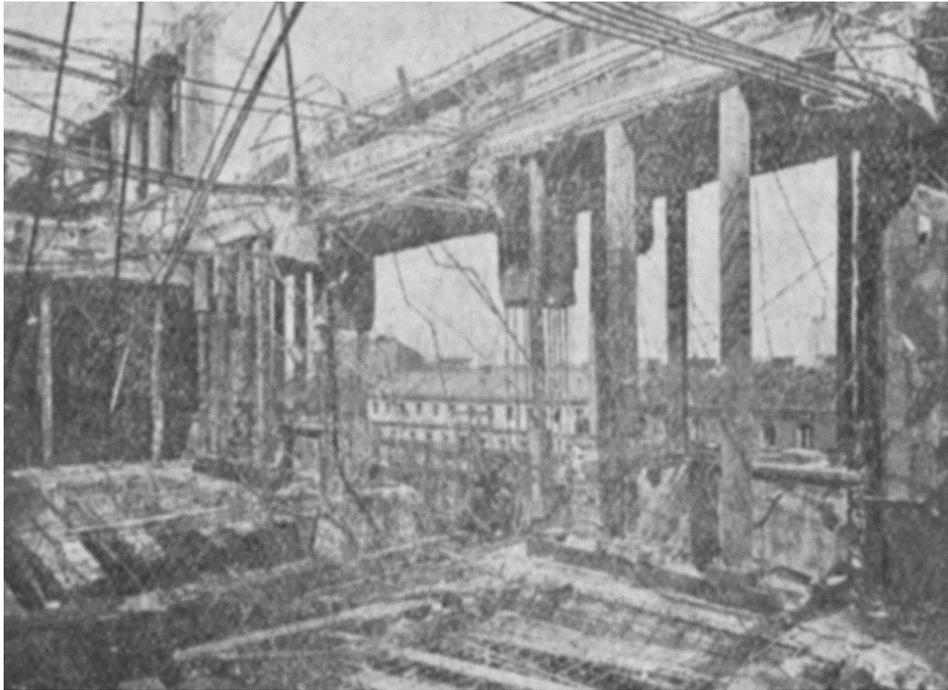


Fig. 5. Damage caused by the German bombing in September 1939. The damaged pillars being removed from the fifth floor [4]

Usually, the bombs would explode on the top two floors, and the stresses carried by the frame structure nodes to the lower floors were not that significant. As a result, the number of elements that needed to be exchanged or repaired decreased on subsequent floors, and the ground floor did not require any work.

3. REPAIRS

Immediately after the capture of Warsaw by the Germans, the structural damage threatening the safety of the streets and pavements surrounding the BGK was repaired. Further safety operations within the building, such as underpropping of ceilings and beams that rested on damaged columns, or columns that showed significant cracks and fissures, was conducted before full renovation works were commenced. These were usually initiated by cutting out and removing the damaged parts, during which it was necessary to support the structure to avoid further collapse of the ceilings. It was also important to appropriately plan the

joints between the preserved parts and the new elements, where possible, so that they corresponded with the general principles of making construction joints during concreting.

Difficulties in obtaining supplies during the occupation forced the need to use materials from demolition works as much as possible, mainly structural steel. To check whether rods obtained from damaged structural elements had not lost their strength, a number of samples were collected, which then underwent laboratory tear testing. The test results were successful, and only elongated rods, broken and damaged by shrapnel, were rejected.

Damaged reinforced concrete elements were removed by hand, using chisels and hammers. Broken rods, anchored at both ends in the old concrete, and those that were excessively elongated were first cut out, then extended by adding new inserts. Each insert overlapped the remaining rod by a length of approx. 40 diameters of replaced rod. Where two or more steel rods had to be repaired in beams and columns, the engineers tried to avoid doing this in one place, instead cutting out the damaged elements at different lengths. When merging old and new rods, which always means weakening an element's durability, the engineers always tried to choose a spot as close to the point where the lowest bending force was calculated as possible.

Some rods were not cut out of the damaged parts, and after hammering-off the existing concrete they were only straightened in place, boarded and concreted anew. In general, only 10% of the reinforcement needed to be made of new steel. In their reports, the engineers leading the works emphasised that the increase in labour costs associated with the preparation of old rods for re-use was significantly lower than the cost of buying the right amount of reinforced steel new.

Concrete from damaged structural elements also underwent laboratory tests. Samples were crushed at the lab of the Warsaw University of Technology, which had been closed by the occupying forces. We do not know precisely what kind of procedures were used, but the strengths obtained ranged from 18.33 to 31.18 MPa. In 1940, 10 years after the initial construction of the building, these values were considered *"...not very large, but sufficient to provide for the safety of the structure, and so it was decided to use it in order to make savings in the reconstruction of reinforced concrete, which means that slightly damaged structures were left, even those showing harmless fissures, and that work on these*

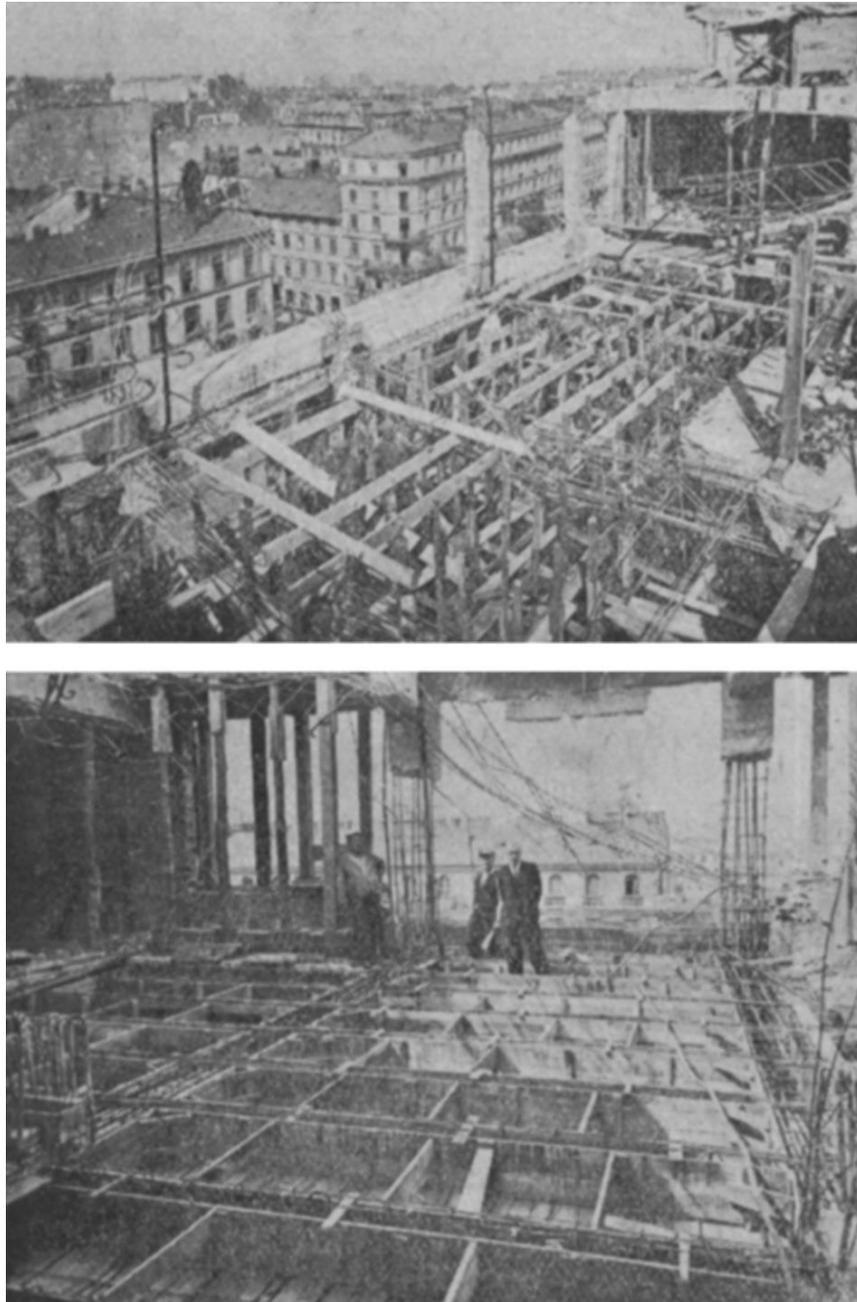


Fig. 6. Top: the roofing, which suffered the most during the bombing, has been entirely replaced. Bottom: the restoration of a less damaged slab on a lower floor [4]

parts were limited to pumping cement grouting under pressure into the cracks, followed by finishing with cement mortar ” [4].

This method was used in the repair of main floor beams throughout the building and of the least damaged parts of the roof on the Nowy Świat street side. Cement grout was pumped under pressure with few or several atmospheres of pressure by means of a specially-constructed apparatus using compressed air from a cylinder. Cracks to be filled were sealed on the outside with plaster, and then a hole was drilled into them, in which the pipe feeding the grout was inserted. In the case of the largest cracks, the mixture pumped in over several tens of centimetres.

3.1. Works management

The specific nature of the damage caused by aerial bombardment required a specific approach to preparation of the repair work. As mentioned previously, the top levels of the BGK's buildings suffered the greatest damage, with the damage parts tapering as the damage travels down through the floors to form a kind of funnel. Therefore, the underpropping and boarding of the damaged ceilings on the upper floors was made possible because the lower floors had been damaged to a somewhat lesser extent. Renovation works on each floor were conducted in a cascade, moving closer to the centre of the explosion. Sometimes, as with the ceiling over the 2nd and 3rd floors, the concreting was done at the same time. This was possible because the main floor beams on the 3rd floor did not show any serious damage, so the boarded ceilings could be suspended on them. At the same time, the ceiling over the 2nd floor was boarded using traditional means.

In addition to the technical aspects of the building site's management, it is worth mentioning the "employment policy" and functioning of the BGK's Technical Department under German occupation and management. For the renovation works, the Department's principle was to employ the largest number of Polish engineers and local contracting companies as possible, to ensure their livelihoods. This wasn't just about financial resources from salaries or fees for expertise. Under occupation, in the General Government the ability to obtain a contract of employment was even more important as having it prevented employees from being arrested during the German round-ups. The documents, sometimes proving fictitious employment, were arranged for by Polish clerks in many institutions and companies.

As we know now, the majority of the BGK's employees were members of the Home Army. Thanks to their operations, many Polish army officers, partisans, scientists and underground activists in hiding were saved. The BGK's Technology Department even looked for tasks that would hire more Poles. One such task was the installation of an air conditioning system in the main bank building, the need for which Deputy Director Osuchowski convinced the Austrian Director Dank.

The air conditioning project was executed by engineers Paczlewicz and Jarasz, with the assembly works alone lasting almost two years. This might look like sluggardly work, but evidently was meant to keep the workers busy - and thus safe - for as long as possible [2].

4. CONCLUSIONS

The example of the BGK building in Warsaw, damaged by bombing in the early days of the war and rebuilt in 1940, is a supremely significant one. Here, in a practical way, the theoretical assumptions made in defining the optimal design for buildings erected to better withstand aerial bombardment were verified. The type and extent of the damage observed in the BGK building confirmed the validity of the recommendations, which have guided the construction industry since the early 1930s, including those made in the 'Engineering Technology Handbook' by Stefan Bryła.

The reconstruction of the BGK building is also an example of renovation work carried out under conditions of war, with limited possibilities in terms of financial and material resources. Even though the BGK was then under German management, the project was a great achievement for Polish engineers, as well as proof of their great determination and high professional skills. They worked despite the daily terror of life under occupation and uncertainty about the final result of the ongoing war. By taking on the task of repairing and rebuilding the bank's physical structure, they also ran the risk of being accused of collaborating with the enemy. Today we know that their decision to do so was led by many different factors. The first was a natural desire to ensure the continued existence and relative safety of themselves and their families via the *Ausweis*, a German proof of employment issued by the BGK's Technical Department. The second factor, typical of engineers, was the drive to take on challenges and difficult tasks - which repair of the damaged building certainly represented [6].

The engineers involved in the repair of the BGK bank building, as described in this article, were not the only ones who had remained active during the occupation, and were developing their qualifications and skills all the while. Alongside those who had also survived the war, they were more than ready for the task of rebuilding the country after its liberation.

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NAPRAWA USZKODZEŃ POWSTAŁYCH W WYNIKU BOMBARDOWANIA - PROBLEM (ZNOWU) AKTUALNY. PRZYKŁAD BUDYNKU BANKU GOSPODARSTWA KRAJOWEGO ODBUDOWANEGO W CZASIE DRUGIEJ WOJNY ŚWIATOWEJ.

Streszczenie

Artykuł dotyczy remontu budynku Banku Gospodarstwa Krajowego w Warszawie, uszkodzonego w wyniku bombardowań w trakcie kampanii wrześniowej 1939 roku. Budynek w stylu modernistycznym wzniesiono według projektu Rudolfa Świerczyńskiego w końcu lat 20. XX wieku. Budynek spełniał wymogi stawiane obiektom wznoszonym w dobie zagrożenia nalotami bombowymi. Wybuch wojny światowej wkrótce zweryfikował słuszność tych założeń. Remont budynku banku będącego wówczas pod zarządem niemieckim przeprowadzili polscy inżynierowie i polskie firmy budowlane.

Słowa kluczowe: remont, uszkodzenia wojenne, modernizm

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