RECORD SHEET OF AN IMMOVABLE HISTORICAL MONUMENT
ENTERED IN THE REGISTER OF HISTORICAL MONUMENTS

RUDA ŚLĄSKA

1. Name

The “Friedens-Eisenhütte” compound — BLAST FURNACE “A” COMPOUND
THE FACILITY IS EXCLUDED FROM OPERATION IN “STALMAG” Sp. z o.o. PERIMETER

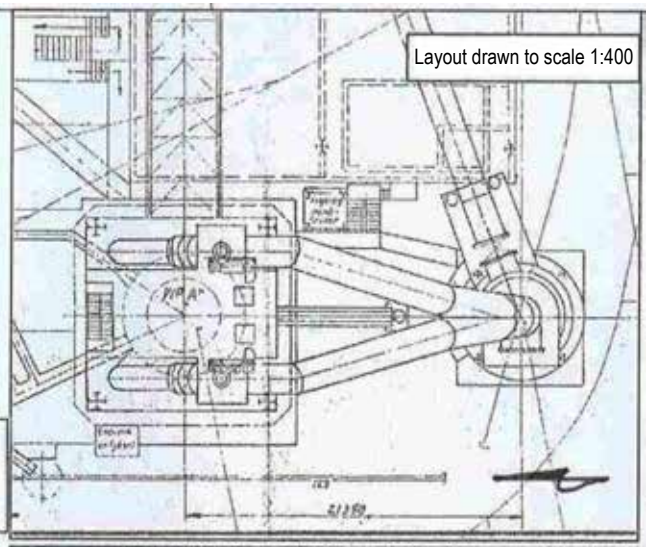
2. Date of creation

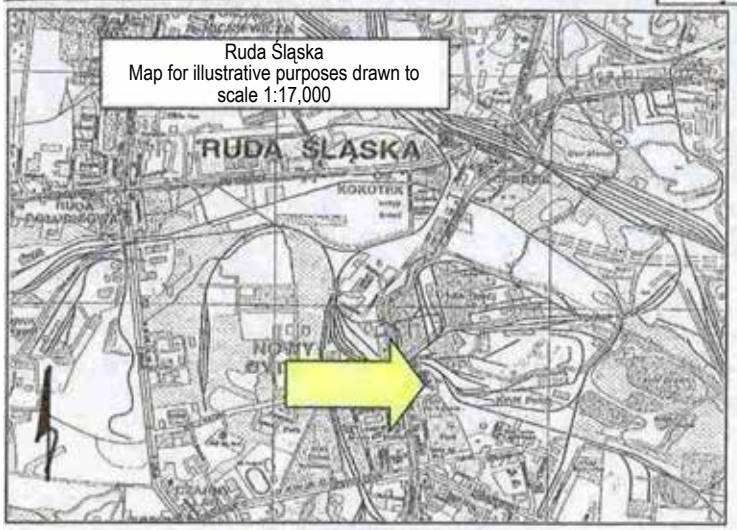
1968, 1971, 1987, 1995, 1997, 1998, 2004

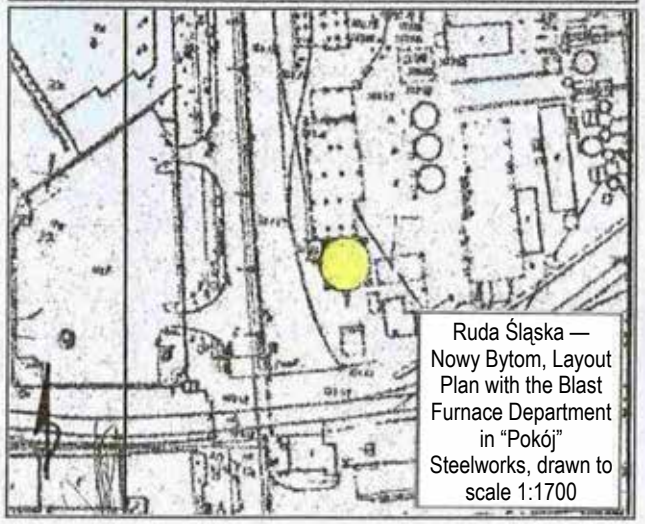
4. Address
Ruda Śląska
Nowy Bytom
79 Niedurnego Street
plot no. 3.1-3131/215

no. of entry in the land and mortgage register: KW 15861R
GL1S/000015861/0-8

View of the Blast Furnace “A” with the Cast House from the north-west







Ruda Śląska — Nowy Bytom, Layout Plan with the Blast Furnace Department in “Pokój” Steelworks, drawn to scale 1:1700

5. Administrative district

Voivodeship of Silesia

Poviat of Ruda Śląska

Commune of Ruda Śląska

6. Geographical coordinates
5573074.01
6562355.07

7. Previous names of the city
Friedens-Hütte
Nowy Bytom

8. Owner and their address

“Stalmag” Sp. z o.o.
2 Hutnicza Street Ruda Śląska

9. User and their address

“Stalmag” Sp. z o.o.
2 Hutnicza Street Ruda Śląska

10. Protection forms

12. History

In 1840 three merchants from Bytom, i.e. Moryc Friedenlander, Szymon Löwy and Dawid Löwenfel founded ironworks called “Friedens-Eisenhütte” in Czarny Las. It was a plant with a coke-fuelled furnace, charge tower, burden hall, foundry, forging shop, woodworking shop and warehouses. The air to the blast furnace was supplied by means of steam fans. Starting from 1851, the steelworks belonged to Count Andrzej Renard who initiated its increase and expansion. The second blast furnace with steam-driven fans and a separate burden hall was started in it. In 1855 the plant became property of a company called “Forst–Hütten und Bergbaugesellschaft Minerva”, established by Renard in Berlin. In 1856, it was extended with a third blast furnace. Two years later the steelworks manufactured pig iron in four blast furnaces, each of them supplied by steam fans. In the subsequent period, the prosperity decreased which resulted in pausing production in 1858. The steelworks was started again in 1862. It was accompanied by investments, including e.g. modernisation of air heaters and charge tower equipment with consecutive steam machines installed. In 1867–1869 two more blast furnaces were erected. However, the adverse market situation resulted in another stoppage of the plant, accompanied by “Minerva” company bankruptcy. Consequently, in 1871 the steelworks was taken over by “Oberschlesische Eisenbahn Bedarfs Aktien Gesellschaft” (“Oberbedarf”) connected with Ballestrem, becoming the major pig iron manufacturer for its plants. In subsequent years, the production profile was retained and the modernisation and investment covered, first and foremost, the blast furnace plant, extended with another blast furnace. At the following stage, in 1883–85, four new blast furnaces were added. Simultaneously, in July 1887, a disaster occurred as a result of the explosion in the boiler room. The explosion of the blast furnace gas brought there destroyed a significant part of the plant. The resulting production downtime lasted till August when the plant was started again. In consecutive years, the steelworks production facilities were extended further. In 1904, the fifth blast furnace with an inclined skip bridge, mechanical charge and a fan with a gas motor was built.

More information in Enclosure no. 1.

13. Description

The Blast Furnace “A” was erected in 1968. After startup, it was designed for pig iron melting in a reduction process. In 1987, it was adapted to ferro-manganese production. It worked in a closed circuit, in a continuous cycle. It is free-standing. The shaft blast furnace with a usable volume Vu 490 m^3. (483 m^3, total nominal production capacity 200/100 thousand. Mg/year. — data from 2005, included in the study called *Najlepsze dostępne techniki — Wytyczne dla produkcji żelaza i stali — Huty zintegrowane*)

The blast furnace was charged through the blast furnace throat, using skip carriages, supplied from bunkers with the capacity of 90 m3 for ore and 160 m3 for coke in the burden hall. The loading was controlled automatically. The charge entered the weighing carriage used to fill the wheeled carriage, drawn along the inclined skip bridge by ropes to the charging platform. The volume of the skip carriage transporting the charge directly to the blast furnace was 4 m^3. The spacing of poles of the steel structures erected round the blast furnace is 11.000 x 11.000 m at the base. The highest platform within it is situated at 58.00 m. The remaining platforms and process levels at 48,040 m and 44,750 m. — The skip pulley platform at 38,650 m. — Level of the skip carriage inclination axis, 32,500 m and 32,300 m — platforms at the interbell space closure level 28,900 m. — Platform at the throat level, as well as platforms at 25,500 m, 22,100 m, 18,700 m, 15,300 m, 8,500 m and 7,645 m. — level of the tapping holes’ axis and 7120 m. (6535 m ?) — support level for the hearth bottom. The outside housing of the blast furnace is composed of a steel sheet jacket (the jacket sheet thickness in the boshes area 36 mm). The jacket has connector pipes for measuring instruments connection. Thermocouples installed at the following levels: 15,770 m, 17,797 m, 20,197 m, 22,597 m, 27,094 m. Under the jacket, there is a boiler brickwork made from refractory materials, with an enclosed water cooling system. In the upper part of the blast furnace, there is a dome with an internal jacket, enclosed to protect it from overheating and the abrasive action of the discharged dust-laden gas. The inner jacket of the dome is made from cast steel in the form of ribbed casts, with shapes profiled according to the jacket curvature. At them, there are distance risers marking the crevice, with the plates fixed to the dome jacket. The distance crevices filled with insulating concrete in rebars situated in the casts. Extra insulation and sealing is made from ceramic fiber mat, laid between the protective panels filled with concrete and the blast furnace dome jacket. At the dome, there is a two-bell charging device, with a large and a small bell, “Mc-Kee-Brown” closure, as well as a rotary charging chute (the hopper rotation controlled by means of the proximity sensors installed as well as a brake on the distributor drive). Above the throat closure, there are two exhaust hoods installed, covering the hopper and skip carriages. To capture any gases and dusts emitted to the atmosphere in the course of the blast furnace charging, there is an additional exhaust system. In the lower part of the throat closure, there are exhaust devices installed, connected with the pipeline and the throttle connecting the upper section of the exhaust system with the collecting pipe going to the dust extraction site. The interbell space of the charging device was sealed using steam. When the charge materials were poured on the large bell, the small one remained closed, and the interbell space was filled with steam from the system led there. When the small bell was opened, the three-way valve was shifted with an actuator. This resulted in connecting the interbell space with the atmosphere, with equalised pressure values under and above the small bell. Pressure equalisation made it possible to open the small bell with reduced quantity of dust and gases leaving the interbell space. Steam was delivered to the space above the large bell when the charge was poured and the small bell was closed, to counteract dust emission from the throat. The steam flow took place until the small bell was opened again. The last modernisation included a change to control the hopper rotation in order to charge “pointwise” by installing proximity sensors and a brake on the distributor drive, with reinforced sensor screen structure, including the handle. The pointwise control of the hopper rotation made it possible to add the charge in the appropriate place of the throat.

Continued in Enclosure no. 4.

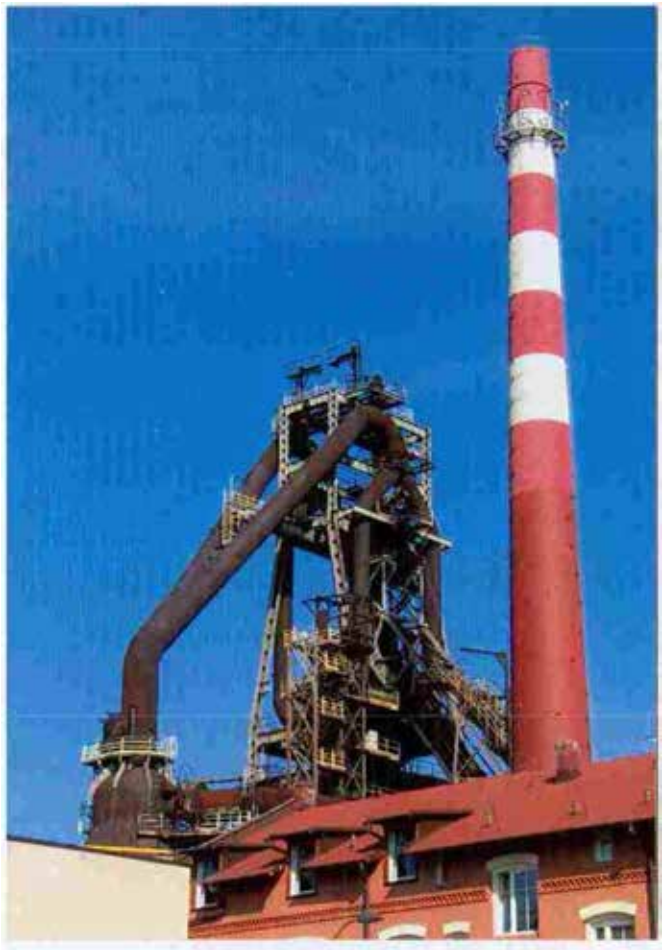
14. Cubage	15. Usable area	16. Original intended use	17. Present use
Blast Furnace ~500 m^3 Static dust catcher ~1356 m^3 heater ~1000 m^3	Blast Furnace footprint area ~144m^2 Static dust catcher ~ 50 m^2 heater ~ 50 m^2	Blast Furnace for pig iron melting	Blast Furnace for ferro-manganese production, inactive at present

18. Conservation state

The Blast Furnace is preserved in the state as it was when the last campaign was stopped, i.e. on 1–2 February 2005 when the ferro-manganese production was terminated and the Blast Furnace was damped. The last campaign was started in 2004 following a few years' pause. The devices were made operable again. In 1995–1997, the Blast Furnace modernisation was designed and implemented in two stages, including its adaptation to the environmental protection requirements. The scope of works designed at both stages of that last modernisation did not necessitate any changes in the existing Blast Furnace building structures, connected with it directly, illustrating the engineering ideas and solutions used when it was constructed in 1968. During the first modernisation stage, designs were developed for the Blast Furnace jacket, internal jacket of the dome, internal jacket of the throat, plate coolers, carbon liner of the hearth and the crucible, Blast Furnace lining, Blast Furnace cooling with process water, throat closure, extraction from the throat closure, steam supply, tuyere assembly Ø130 and hot blast pipe. For the second stage of the Blast Furnace "A" modernisation, the documents comprising connection pipes' designs and the distribution of the thermocouples on the jacket, lower inner throat jacket, carbon lining, Blast Furnace lining, plate cooling, extraction from the throat closure, steam supply to the interbell space, extraction from the Blast Furnace throat closure (lower part), plate cooler compensatory system in the boshes area, water cooling of the Blast Furnace hearth, thermocouple installation in the Blast Furnace hearth were developed.

19. Existing hazards, most urgent Conservation Officer's requests

Entering the Blast Furnace into the Register of Historical Monuments — the last one in the voivodeship of Silesia and one of three in Poland



20. Archived files (file type, number and storage location)

— Przedsiębiorstwo Inżynierskie “Biprohut” Sp. z o.o. Archive. Gliwice ul. Dubois 16

21. Comments

The stopped Blast Furnace “A” in the perimeter of “Stalmag” Sp. z o.o. in Ruda Śląska, erected in 1968, is the last facility of that type (with small capacity) in the voivodeship of Silesia and one of three similar facilities in Poland (two operating units, started in 1960s and 1970s in Tadeusz Sendzimir Steelworks in Krakow). The Blast Furnace “A” in Ruda Śląska is an industrial landscape component rooted for some areas in Nowy Bytom. What is more, it is the most important facility for a raw material plant. Its location facilitates opening it to the public.

22. Information on inspections, information on changes (dates and full names of the persons filling in)

23. Reference works

- Huta „Pokój" / Śląskie Zakłady Górniczo-Hutnicze S.A. Katowice — Nowy Bytom, 1937
- Eugeniusz Mazanek. Wielki piec: konstrukcja i urządzenia pomocnicze. Wydawnictwo Górniczo-Hutnicze. Katowice 1959.
- Stanisław Holewiński, Eugeniusz Mazanek. Wielki piec: proces i technologia. Wydawnictwo Górniczo-Hutnicze. Katowice 1961.
- Leszek Król, Eugeniusz Mazanek. Nowoczesny wielki piec. Śląsk. Katowice 1973.
- Huta „Pokój" Dzieje zakładu i załogi 1840-1990, Joint publication. Editor H. Rolo, Katowice, Śląski Instytut Naukowy 1989

24. Record Sheet development (author, date and signature)

Text AS

Plans, drawings AS

photos AS

September 2011

25. Iconographic sources (type, storage location)

26. Enclosures

Enclosures to the Record Sheet, no. of pieces 8

ENCLOSURE TO THE RECORD SHEET No. 1

1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address

The “Friedens-Eisenhütte” compound — BLAST FURNACE “A” COMPOUND THE FACILITY IS EXCLUDED FROM OPERATION IN “STALMAG” Sp. z o.o. PERIMETER Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content

continued history, figures

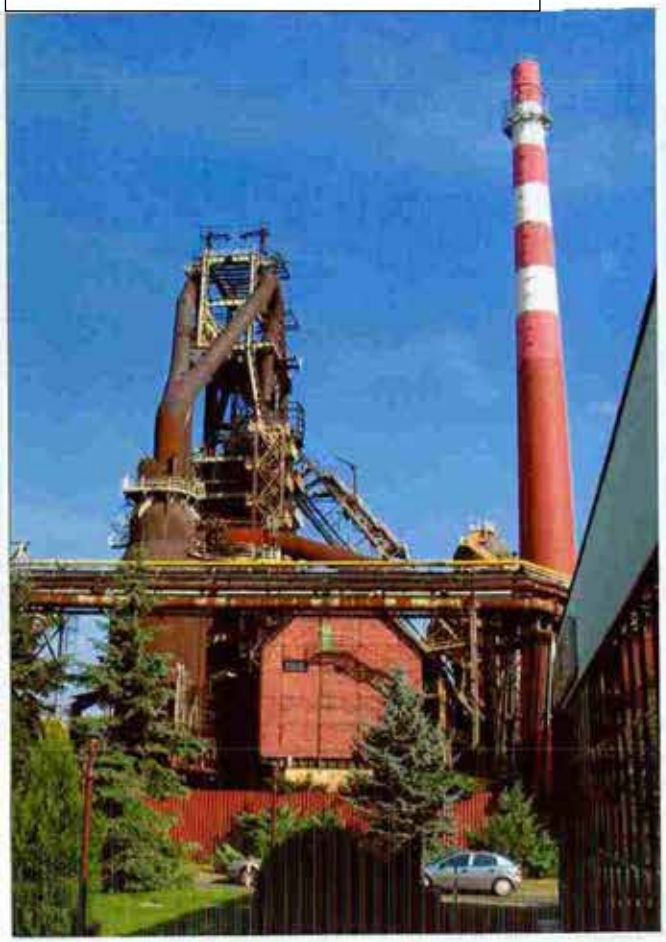
History, continued Its capacity was 400 m^3. For pig iron processing, there was an open-hearth plant and an electric melting shop opened, while the charge preparation for the Blast Furnace plant took place in the ore preparation plant and the sintering plant. By 1906, a turbofan hall was created for the blast furnaces, added to the new boiler plant. In late 1906 and early 1907, there was a sixth Blast Furnace added, and in 1924 ferro-manganese production started in the steelworks. In 1937, at a subsequent modernisation stage, a Blast Furnace of the European type was started, 0 with the capacity of 400 m3, with an inclined skip bridge. The Blast Furnace documents were prepared by inż. B. Chudziński.

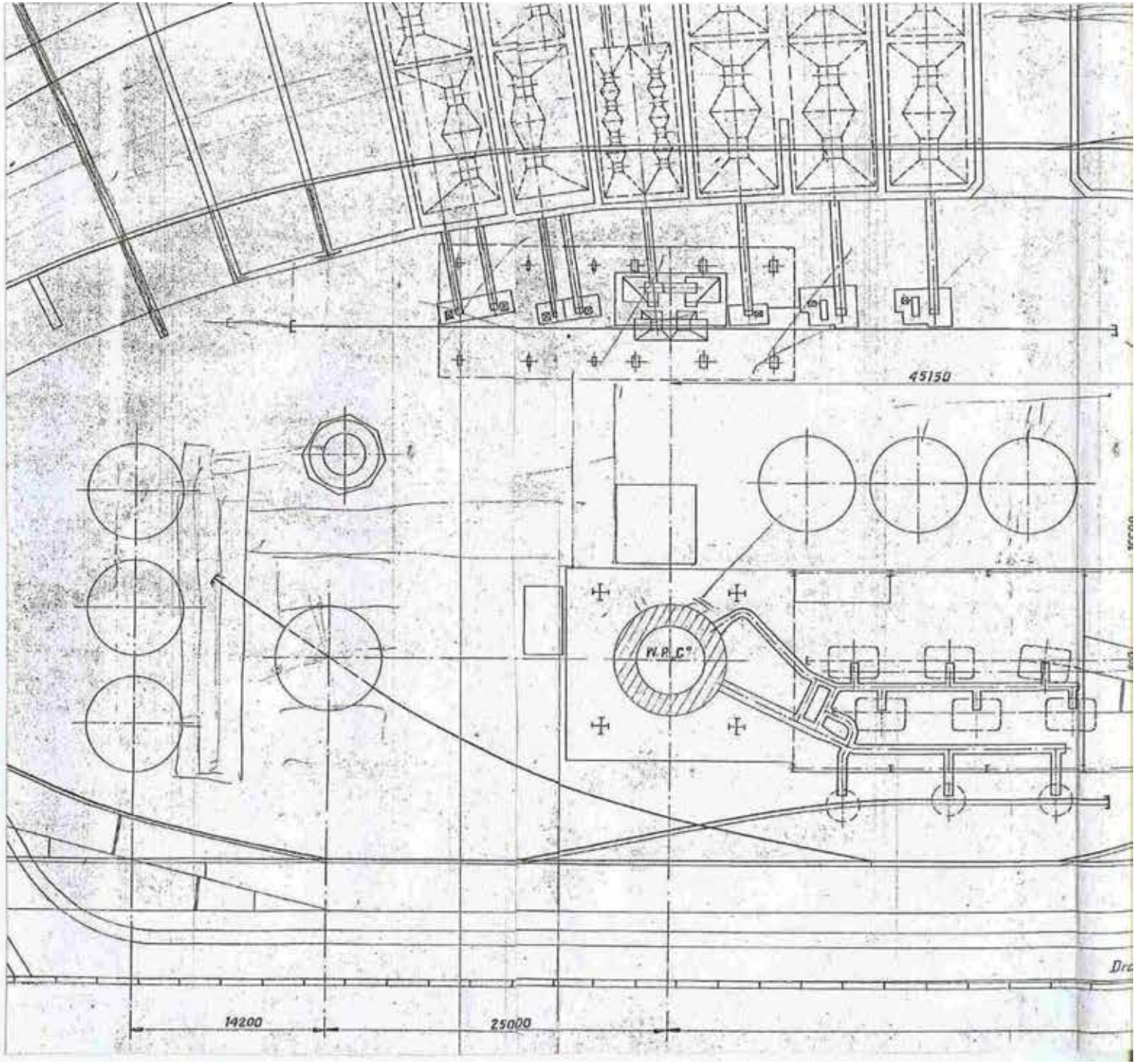
During World War II, the steelworks was incorporated in the Ballestrem corporation and operated as “Friedenshütte SchlesischeBergu. Hüttenwerke” A.G. Starting from 1942, it was a part of “Oberhütten”. During World War II, the plant manufactured for the army. Its production output was intensified but the technical facilities of major production departments were not expanded. After the front line passed, the plant resumed production. Those days, the steelworks formed a part of the enterprise comprising also plants in Gliwice and Łabędy. Right after the end of World War II, “Pokój” Steelworks became the largest producer of iron and steel in Poland. In 1949, the modernised blast furnace, marked D”, was lit off, with wet granulation of iron introduced. The following year the blast furnace marked “C” was modernised. Its capacity was increased to 565.44 m^3. In 1952, there were new “Dingler” disintegrators built for the blast-furnace gas cleaning plant. Starting from 1956, the blast furnaces operated with blast humidification. This change contributed to reduced coke consumption. In 1958, there was a coke screen installed at the blast furnace “C”. One year later, the blast furnace “D” was modernised. Its modernisation comprised a two-bell Mc-Kee-Brown closure. In 1963, the blast furnace “C” was modernised. It was situated in the blast furnace shed, to the north of the Blast Furnace “A”. The modernisation works comprised erection of a new blast furnace, near the operating old one. After the new unit was erected, the old blast furnace was dismantled and the new one was moved to its site. This procedure was started on 17 October 1963. The weight of the blast furnace moved to the new site was more than 2 thousand tonnes. The task completion meant a significantly reduced time when the production could be started again, calculated to reach 46 days, and the production of 24 thousand tonnes of pig iron more. The works were to be performed by Hutnicze Przedsiębiorstwo Remontowe. The new blast furnace was entirely automatic. Its usable capacity was 483 m^3. The blast furnace required less coke despite increased production output, as well as a reduced number of operators. Starting from 1965, it was fuelled partially with mazut. The blast furnace charge bunkers were situated to the east of the blast furnace shed, with a new part added to the south. Behind it, to the east, there was a blast furnace gas compressor station. The new charge bunkers, rebuilt during the modernisation carried out, were situated at the axis of the skip bridge supplying the charge to the Blast Furnace “A”. In the southern part of the blast furnace department facilities, there was also a stack discharging fumes from the heaters, and behind it, to the west, there were three steel heaters for the Blast Furnace “A” blast, situated in a row. The dust catcher in the blast furnace “A” was situated to the west, at the winch building. In 1966, there was a modification designed on the layout plan, at the Blast Furnace “A”. There were plans to build three new blast heaters to the north-east of the Blast Furnace “A”. Their height was to be 33,750 m, with outer diameters of Ø7,028 mm. Consequently, the old heaters were dismounted. Their site was occupied by a new static dust catcher with a steel jacket, connected with a gas pipeline coming from the top from the Blast Furnace “A”. A pipeline from the dust catcher towards the blast furnace gas compressor station was designed to discharge gas. The outer diameter of the dust catcher was 7,674 m, while the height of the highest platform on it was 27,214 m. What is more, there was a new passenger and cargo lift tower, 35.90 m high, situated at the south-eastern corner of the Blast Furnace, while the taphole gun cabin was left in the previous place. The new bunkers, built previously, were to be used to supply the charge material to the Blast Furnace “A”. The bunker tanks’ capacity was 90 m^3 for the ore and 160 m^3 for the coke. They were supplied from the railway carriages. Next, the charge entered the weighing carriage used to fill the wheeled carriage, drawn along the inclined skip bridge by ropes to the charging platform. In the design, the Blast Furnace “A” had the usable capacity Vu 490 m^3. It was equipped with 12 tuyeres. Its inner diameters were Ø4,200 mm at the throat, Ø6,450 mm in the belly, and Ø5,250 in the crucible. The modernisation comprised also the technical facilities adjacent to the Blast Furnace “A”, housing the water filtering and pump station, cabin holding oxygen cylinders as well as the converter room. In 1967, there were further modernisations designed for the Blast Furnace “A”. The documents were developed in Upper Silesia, by Biuro Projektów Przemysłu Hutniczego, Blast Furnace Department, “Biprohut”. Eventually, in the designs dated 1967, the Blast Furnace “A” gained the structure with the highest platform at 58.00 m, the skip pulley platform at 44.750 m, the skip carriage inclination level at 38.650 m, platforms at the interbell space closure at 32,500 m and 32,300 m, the throat platform at 28,900 m, the crucible bottom support level at 7,120 m.

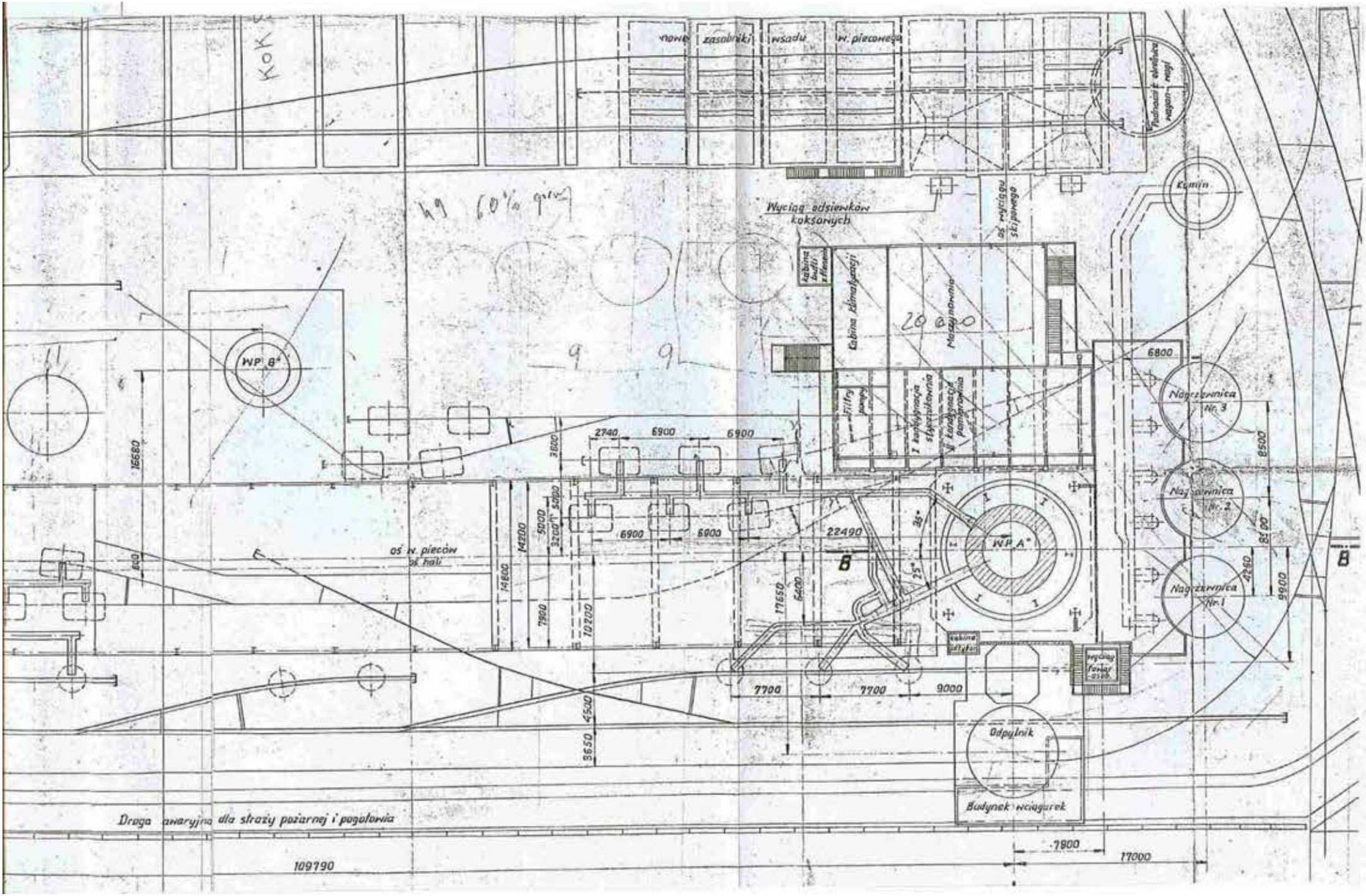
Continued in Enclosure no. 2

The Layout Plan of the Blast Furnace Department in 1964

The view of the Blast Furnace “A” with the static dust catcher, filtering, pump and converter building from the south






nowe zasobniki wsadu
w. pieconego
Wyciąg odsiewków koksowych
Kabina klimatyzacji
Maszynownia
Kabina sterowania wyciągu skipowego
Komin
Nagrzewnica Nr 3
Nagrzewnica Nr 2
Nagrzewnica Nr 1
WP B
WP A
oś w. piecow
oś hali
Droga awaryjna dla straży pożarnej i pogotowia
Odpylnik
Budynek wciągurek
109790
17000

ENCLOSURE TO THE RECORD SHEET No. 2

1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address

The "Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND THE FACILITY IS EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content

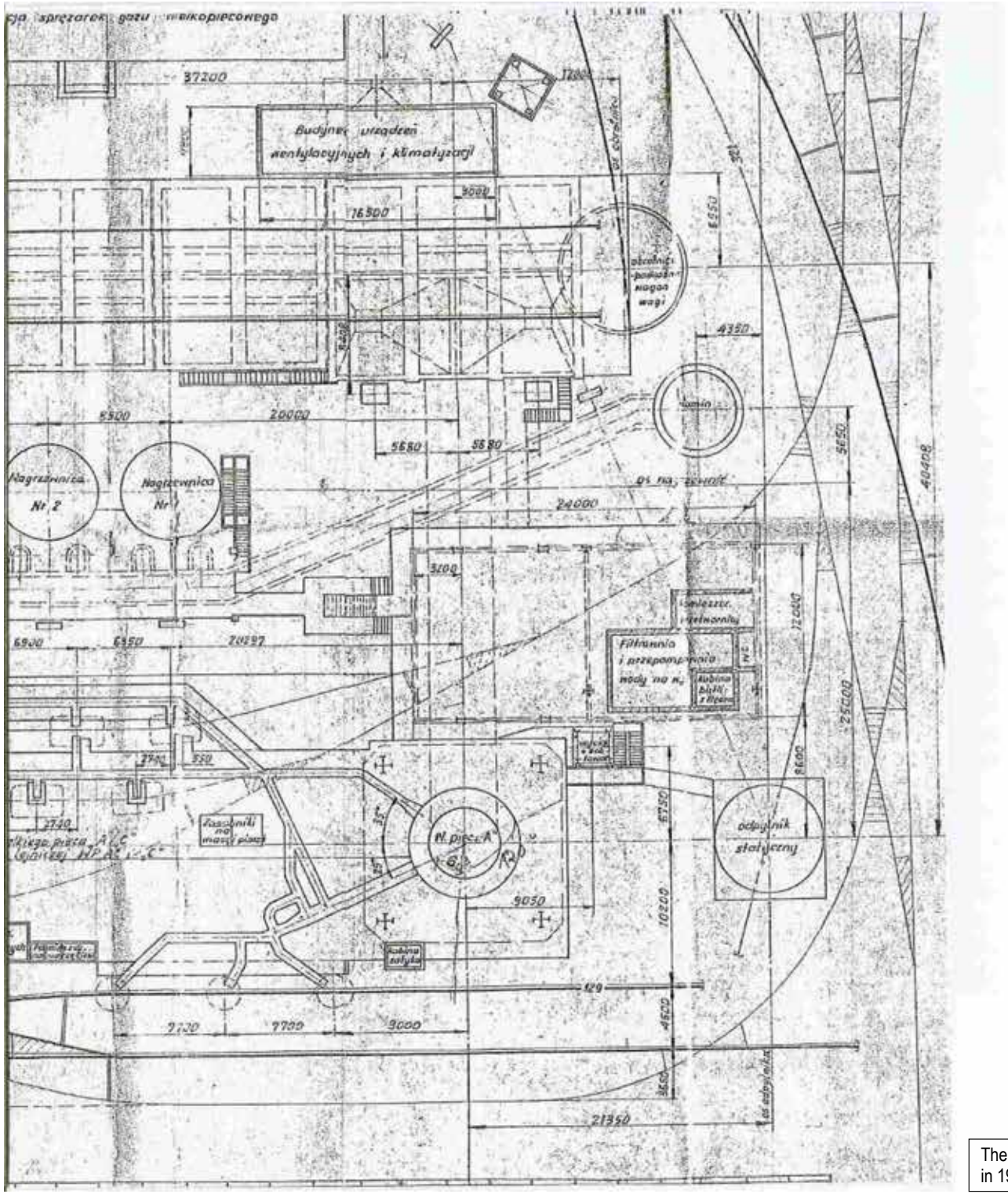
continued history, figures

History, continued A new, free-standing unit was erected based on the developed designs. It was built in the heart of the plant, 19 m from the operating Blast Furnace "A". It gained an enclosure structure which all the platforms, the above-throat structure and the skip bridge structure were supported on. The weight of the whole structure was 2,300 tonnes. In 1968, its moving with steel ropes to the site of the Blast Furnace "A" which was dismantled soon before was started. The works were carried out, as before, with the participation of Hutnicze Przedsiębiorstwo Remontowe, which had already completed similar tasks three times. When the works were completed, the new blast furnace replaced the old unit. According to the Polish Film Chronicle, the erection of the new Blast Furnace "A" took 105 days which meant minimised production downtime which would usually be 1.5 year. According to the spoken information, the idea to move the furnace came from inż. Bogdan Matla. Starting from 1970, the Blast Furnace "A" operation was controlled by a digital machine. The modifications were accompanied by the use of an X-ray quantometer in the laboratory and the implementation of the pneumatic pig iron sample handling to facilitate fast analysis. The documents for the semi-automatic check and control of the blast furnace operation were developed at the AGH University of Technology by the team of academics and "Pokój" Steelworks workers, led by professor R. Benesz. The Blast Furnace "A" was switched to the new control system on 1 December 1971 and the blast furnace "C" in June 1973. In subsequent years of the "Pokój" Steelworks existence, the blast furnaces were liquidated gradually. In 1973, the blast furnace "B" was eliminated and the consecutive ones were removed in subsequent years. Following those changes, in 1976 the steelworks production was carried out by four blast furnace assemblies. By 1988, two more blast furnaces were eliminated. The last one operated for production purposes was the Blast Furnace "A", erected in 1968. At the same time, it turned out to have insufficient capacity and to be outdated in terms of its structural solutions. Besides, just like all the blast furnaces damped before, its energy consumption was too high when compared to the Polish average. Also the Blast Furnace location was inconvenient as its operation entailed increased noise and significant dust increase in the city centre. Some of that nuisance was reduced when another major overhaul was completed in 1987. Thanks to that, the Blast Furnace service life was extended for other 8–10 years. It was accompanied by changing its production profile to ferro-manganese melting. The change was to exert a favourable impact on the deficit recorded in the blast furnace department before. In 1991, the "Pokój" Steelworks was converted into a sole-shareholder company of the Treasury. At that time, during a medium-size overhaul, there were plans to replace the lining in the Blast Furnace "A". The technical documents were developed by the Design and Inspection Department of "Pokój" Steelworks. According to the second version of the design, the following diameters were assumed in the Blast Furnace inner spaces: Ø4,200 mm at the throat, Ø7,610 mm at the shaft bottom, Ø6,658 mm in the belly, Ø4,600 in the crucible. According to the design, the lining replacement was to increase the Blast Furnace capacity by ca. 90 m^3. Two turbofans were maintained to generate the blast furnace pass. The blast was supplied by three heaters, in a series, with the pressure of 0.1 MPa. In 1994, "Pokój" Steelworks signed an agreement with Przedsiębiorstwo Inżynierskie "Biprohut" Sp. z o.o. for the development of technical dossier concerning modernisation of the Blast Furnace "A". The development was planned for 1995, within the major modernisation overhaul. At the time, the usable capacity of the Blast Furnace "A" was still specified as Vu 490 m^3. The diameters in the internal spaces, assumed in the developed design of the blast furnace lining, reached respectively Ø4,200 mm at the throat, Ø7,538 mm in the shaft bottom, and Ø5,250 in the crucible. The modernisation was designed with no changes of the existing building structures connected with the Blast Furnace directly. In 1997, Huta "Pokój" S.A. carried out the second stage of the Blast Furnace "A" modernisation, adapting it also to the environment protection requirements. The dossier was prepared in PI "Biprohut" in Gliwice. The design studio developed also designs for the first stage of the started modernisation, with the processing part comprising the blast furnace jacket, internal jacket of the dome, internal jacket of the throat, plat coolers, carbon lining of the hearth and crucible, blast furnace lining, blast furnace cooling with process water, throat closure, extraction from the throat closure, steam supply, tuyere assembly Ø130 and hot blast pipe. For the measurement and automation part, there were designs developed for the equipment and systems, and for the electrical, control and systems part there were other designs developed, comprising electrical equipment of the blast furnace charging, of the devices controlling the blast furnace charging, electrical systems of devices connected with the blast furnace charging and control, software, testing, equipment and electrical systems for increased pressure pumps in the blast furnace cooling system. At the second modernisation stage, the new process part was designed.

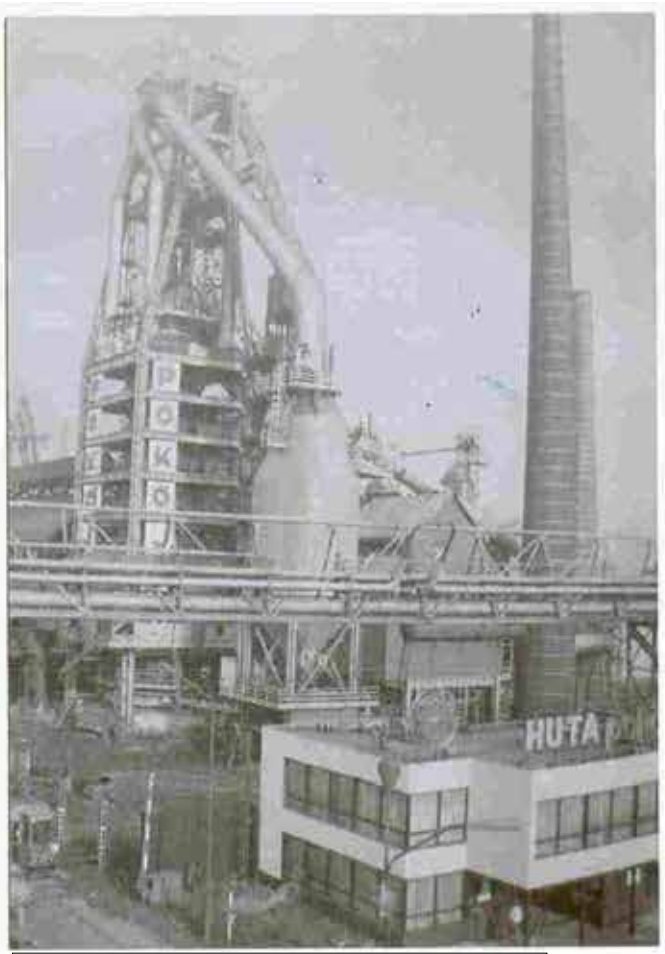
Continued in Enclosure no. 3

Enclosure developed by:
(Date and signature)

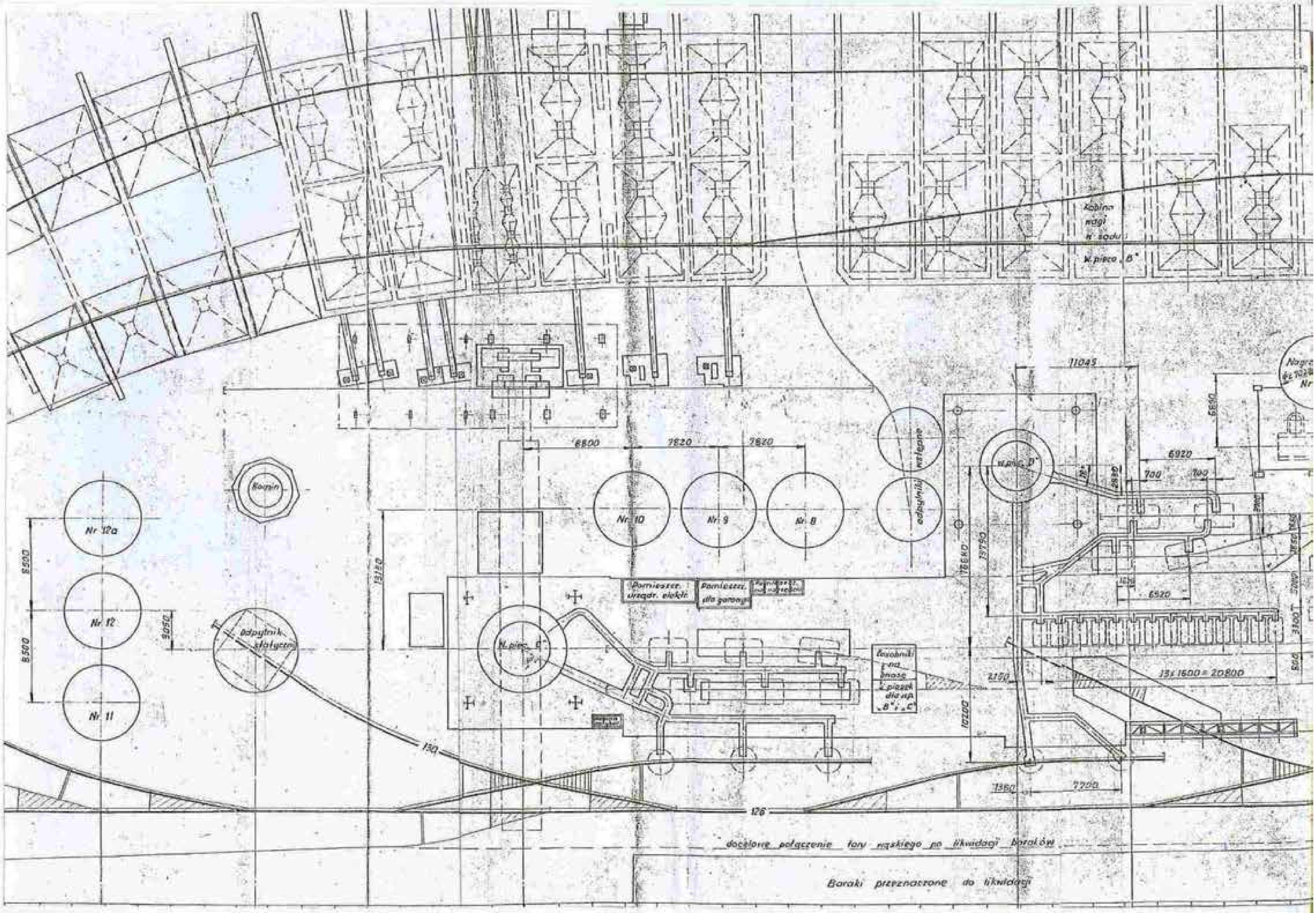
September 2011



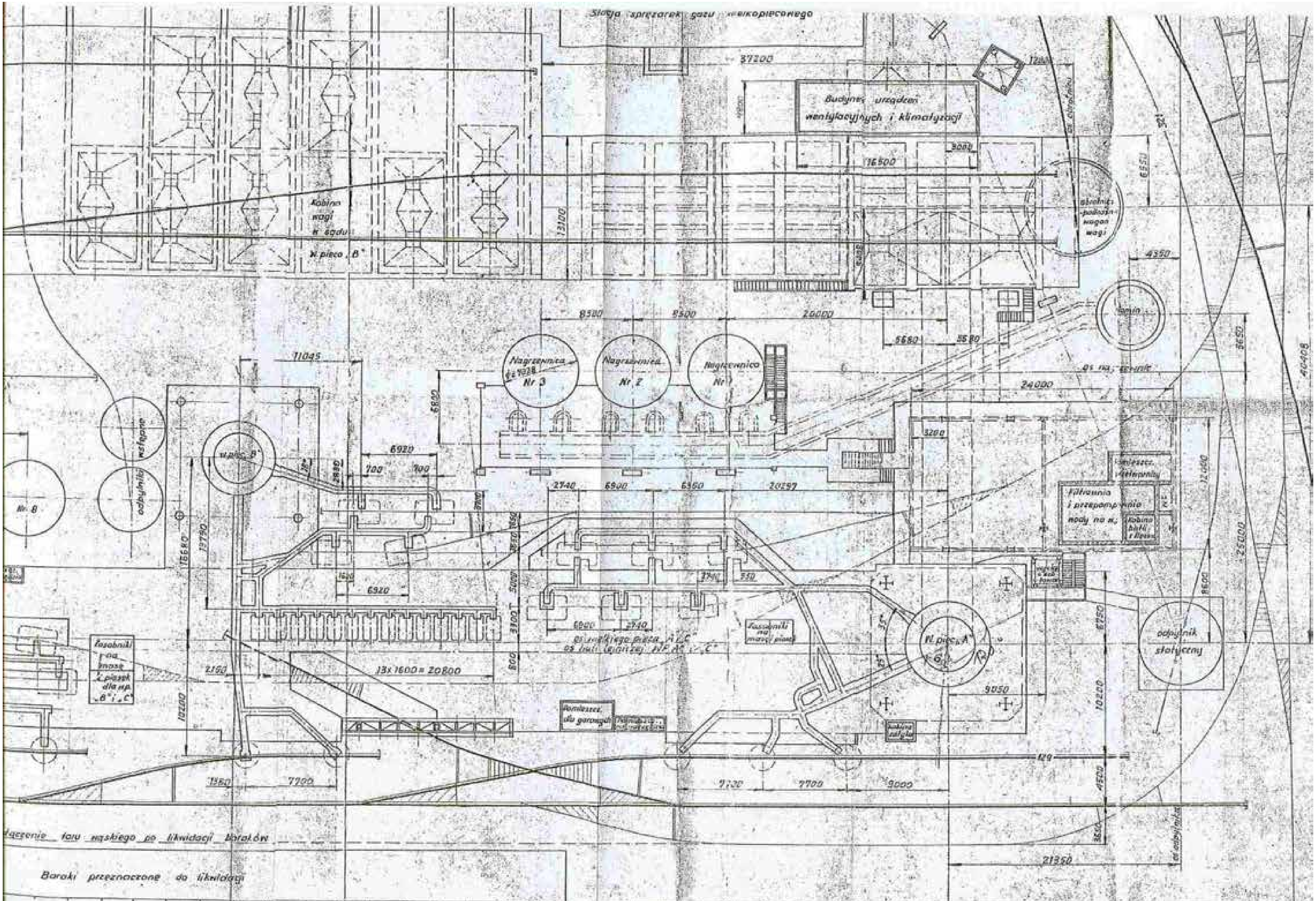
The Layout Plan of the Blast Furnace Department facilities in 1966 Drawn to scale 1:400



The Blast Furnace “A” compound in 1980s



Kabina
wagi
w sodu
W. pieca „B”
Nr 12a
Nr 12
Nr 11
8500
8500
9050
Komin
Odpylnik statyczny
13130
6800
7820
7820
Nr 10
Nr 9
Nr 8
odpylniki wstępne
11045
6920
700
700
6520
W. pieca „D”
W. pieca „C”
16640
13790
10200
Pomieszcz. urządz. elektr.
Pomieszcz. dla garowy
Zasobniki na
piasek dla w.p. „B” i „C”
13x1600 = 20800
2150
1360
7700
130
126
docelowe połączenie toru wąskiego po likwidacji baraków
Baraki przeznaczone do likwidacji



Budynek urządzeń wentylacyjnych i klimatyzacji
Kabina wagi w sądu w. pieca „B"
Nagrzewnica Nr 3
Nagrzewnica Nr 2
Nagrzewnica Nr 1
odpylnik wstępny
W. piec „B"
W. piec „A"
Zasobniki na masę z piasek dla w.p. „B" i „C"
Zasobniki na masę piasku
13x1600 = 20800
Pomieszcz. dla garowych
odpylnik statyczny
Filtrownia i przepompownia wody na w.
Kominy
Baraki przeznaczone do likwidacji

ENCLOSURE TO THE RECORD SHEET No. 3

1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address

The "Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND THE FACILITY IS EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content

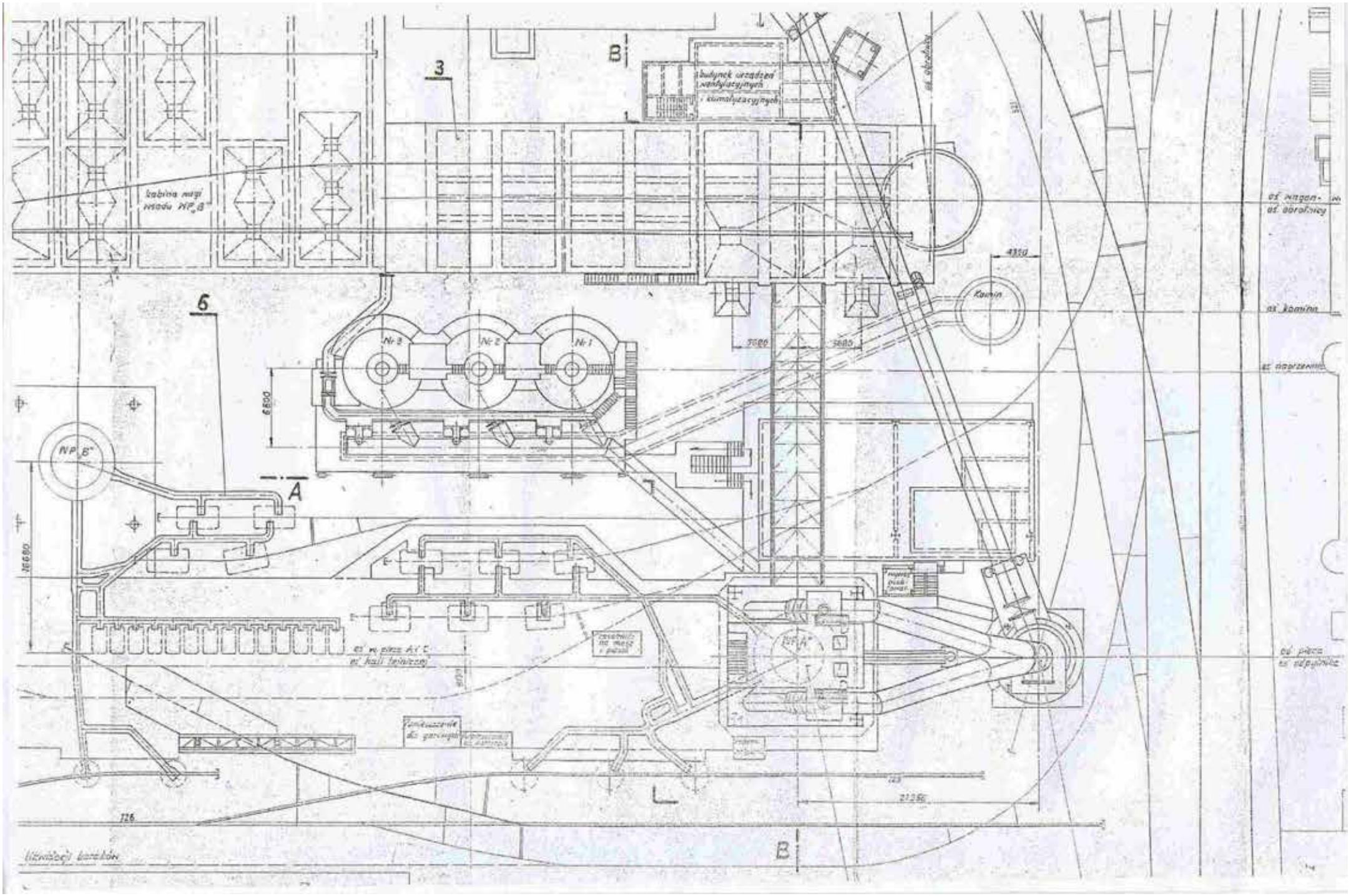
continued history, figures

History, continued It comprised connection pipes' designs and the distribution of the thermocouples on the jacket, lower inner throat jacket, carbon lining, Blast Furnace lining, plate cooling, extraction from the throat closure, steam supply to the interbell space, extraction from the Blast Furnace throat closure (lower part), plate cooler compensatory system in the boshes area, water cooling of the Blast Furnace hearth, thermocouple installation in the Blast Furnace hearth). At the second modernisation stage, in the documents prepared for the first stage, the changes referred to the jackets of the inner jacket of the throat, blast furnace cooling and of the throat closure. Additionally, designs for the measurement and automation and for the system part were developed. In 1997, the Blast Furnace "A", according to the documents developed by PI "Biprohut" Sp. z o.o. in Gliwice, had a structure with its highest platform at 58.00 m, the skip pulley platform at 44,750 m, the skip carriage inclination axis platform at 38,650 m, the platforms at the interbell space closure at 32,500 m and 32,300 m, the throat platform at 28.900 m, subsequent platforms at 22,500 m, 22,100 m, 18,700 m, 15,300 m, 8,500 m, the tapping hole axis level at 7,645 m and the crucible bottom support level at 6,535 m. The blast furnace capacity was still 490 m3, supplied with hot air via 12 tuyeres. The inner diameters of the blast furnace were as follows: Ø4,200 mm at the throat, Ø7,538 mm at the junction between the shaft space and the boshes, and Ø5,250 in the crucible. The blast was still heated by three heaters built in 1966–1967. Their height was 33,750 m. The blast furnace gas was dedusted by the existing static dust catcher. The capacity of the skip carriage used to transport the charge to the blast furnace was 4 m3. In 1997, the ferro-manganese production in "Pokój" Steelworks was terminated. In 1999–2000, some assets of Huta "Pokój" SA, being the owner of the whole plant, were put up for sale by the National Investment Funds. The facilities in the former blast furnace department, including the Blast Furnace "A", were purchased by "Żelazostopy" Sp. z o.o. with its seat in Ruda Śląska, at 79 Niedurnego Street. The subsequent owner of the facilities of the former blast furnace department was the "Eurostal Inwestycje" Sp. z o.o. consortium, with its seat in Warsaw (a third-party company, not a "daughter" of Huta Pokój SA). Its new branch was created on 28 November 2003 in Ruda Śląska, at 79 Niedurnego Street. "Eurostal Inwestycje" Sp. z o.o. consortium decided to resume ferro-manganese production in the blast furnace. There were plans to start it for seven or eight thousand tonnes of raw material a month, with five thousand tonnes for Polish steelworks. Ferro-manganese was used for melting steel and other metal alloys, as well as for producing welding electrode covers. At that time, it was the only ferro-manganese manufacturer in Poland. Next, "Eurostal Inwestycje" Sp. z o.o. consortium was transformed in "Stalmag" Sp. z o.o. with its seat in Ruda Śląska at 2 Hutnicza Street, And the Blast Furnace "A" belonging previously to "Pokój" Steelworks became an asset of that company. In 2004, the blast furnace was lit off again following many years' pause, with the effort of "Stalmag". Its start-up took place in March and April, and the production was to be started mid-May. The devices were made operable, the charge materials were prepared, and the staff mostly employed. Starting from mid-May, the raw material was discharged to the carriages filled with liquid ferro-manganese. However, the blast furnace operation was interrupted by faults. In 2005 the blast furnace products offered by "Stalmag" comprised iron alloys, i.e. high-carbon ferro-manganese (FeMn HC), ferrosilicon (FeSi70), ferro-silico-manganese (FeSiMn), and also blast furnace slag and manganese slag. According to the study funded in 2005 by the Ministry of Environmental Protection (Najlepsze dostępne techniki — BAT — Wytyczne dla produkcji żelaza i stali — Huty zintegrowane), the average period from the last modernisation of the blast furnace owned by "Stalag" Sp. z o.o. reached 6 years. The usable capacity of the blast furnace stipulated in it reached 483 m3, and the total nominal production capacity was 200–100 thousand Mg/year. At the same time, the ferro-manganese production in "Stalmag" was stopped on 1–2 February 2005, with the blast furnace damped and the workers sent on a leave. One of the stipulated reasons for the blast furnace damping was the use of incorrect technology for blast furnace gas cleaning which was to result in the penetration of high amount of cyanides to the ponds, being components of the process. "Pokój" Steelworks executed an agreement with "Stalmag", obliging itself to collect and clean the blast furnace gases. The cleaning took place in the closed water circuit, and the precipitation was discharged to the ponds. The situation did not change and it became impossible to start the blast furnace again because of the environmental hazard. It was quoted as the official reason for terminating the production. However, the unofficial reason could be the difficulties resulting from low sale volumes of ferro-manganese. At the same time, "Stalmag" authorities believed the production was terminated temporarily. At present, some systems required for the blast furnace startup were removed permanently.

Enclosure developed by:
(Date and signature)

September 2011

The Layout Plan of the Blast Furnace “A” compound – Alteration and modernisation of the Blast Furnace “A” – 1967, scale 1:400



ENCLOSURE TO THE RECORD SHEET No. 4

1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address

The “Friedens-Eisenhütte” compound — BLAST FURNACE “A” COMPOUND THE FACILITY IS EXCLUDED FROM OPERATION IN “STALMAG” Sp. z o.o. PERIMETER Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content

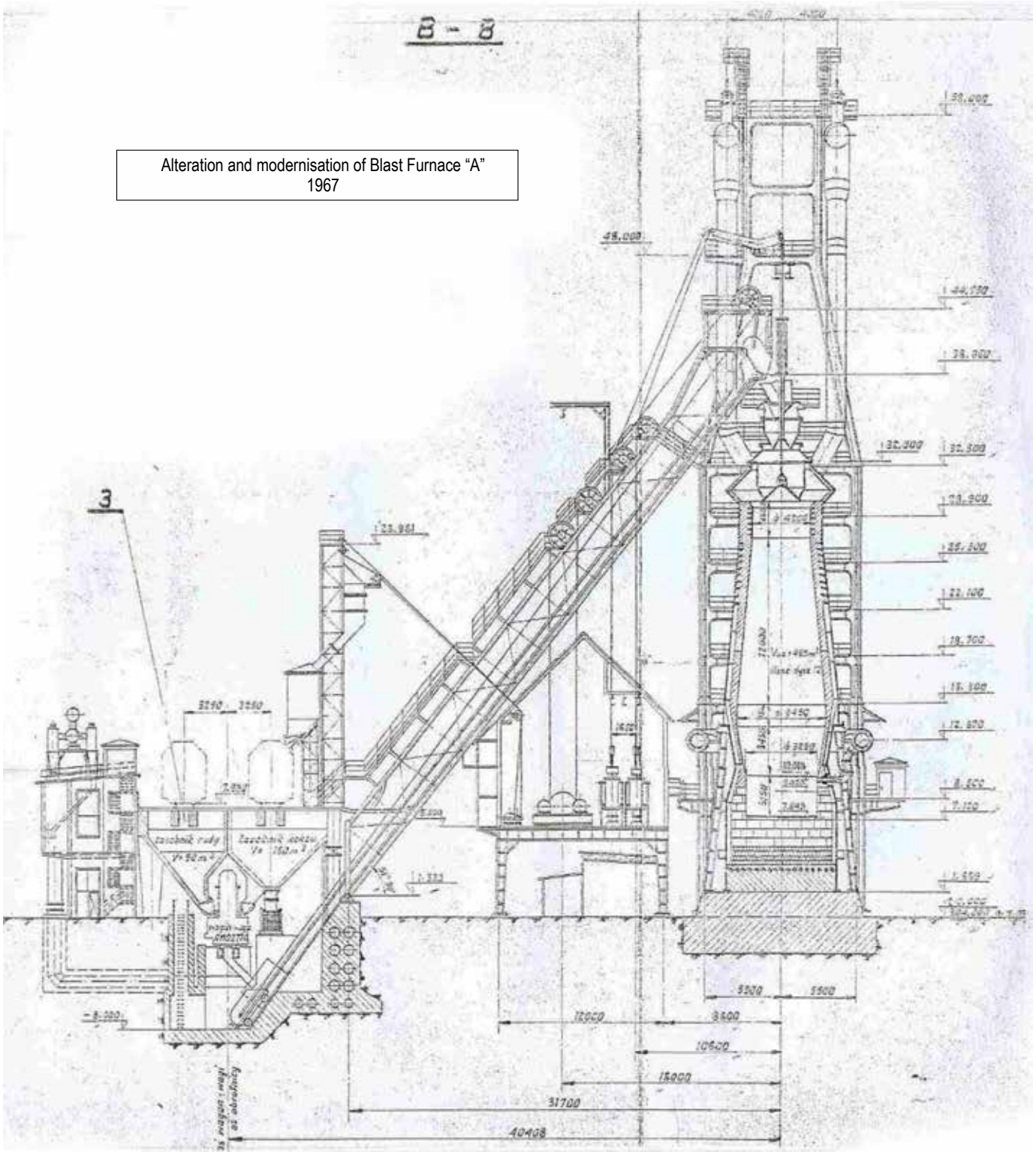
continued history, figures

Description, continued According to the details included in the Technical Design of the major modernisation overhaul dating back to 1994, the Blast Furnace had the following diameters of the internal spaces in the lining section: Ø4,200 mm at the throat, Ø7,538 mm in the shaft bottom, and Ø5,250 in the crucible. One layer of the lining at the blast furnace base was made from refractory concrete. The consecutive layers of the base were made from chamotte mortar, graphite compound, carbon lining. In the hearth and the crucible space, there is an inner carbon lining, comprising graphite blocks, carbon blocks, graphite compound, carbon compound and lining cement. The graphite lining has two layers. The outer ring comprises graphite blocks at the diameter width of 1.5 m and carbon blocks in the remaining part of the second layer. The lining of the other part of the second layer comprises carbon blocks making up also consecutive layers, from the third to the eighth. The blast furnace lining was made from refractory materials: the hearth (3 brick layers with the total thickness of 834 mm, directly above the carbon blocks), the crucible (protective brick layer 230 mm thick, with layers laid directly on the carbon blocks, as well as the lining supported on the carbon blocks, i.e. crucible walls, 800–500 mm thick), the boshes (the lining 230 mm thick), the belly (the lining 650–345 mm thick), lower shaft part (the lining 345 mm thick), the medium shaft part (the lining 345 mm thick), the upper shaft part (the lining 345–830 mm thick), the throat (the lining 830 mm thick), the lower part of the dome (the lining 230 mm thick). In the crucible, the tapping hole axis was designed at 7,645 m. Directly above the crucible, in the hearth lined with the hearth compound, there was a tuyere level designed at 10,020 m. The blast furnace lining is supported on a dedicated system of shelves. It is made from blocks, flat wedges, straight blocks, ground chamotte, chamotte mortar, sodium liquid glass, insulating refractory fibres, Portland cement and graphite compound. The total lining height is 32,500 m. In the throat zone, to protect the lining with the refractory layer against mechanical damage caused by the charge materials falling from the high bell, there was an internal jacket installed. It is composed of a lower part 695 mm high (single row), cooled, and the non-cooled upper part 1,890 m high (five rows). In the lower part of the jacket, there are 15 cast steel protective panels installed, with a coil made from pipes. In the upper part of the jacket, there are three types of shaped cast steel protective plates laid in five rows. The entire structure is supported on 15 brackets welded to the inner surface of the throat jacket. To cool the lining and protect the blast furnace jacket from overheating, there are plate coolers installed in the crucible, boshes and belly, making the internal blast furnace cooling system. The coolers are made from flat, cast iron plates with coil pipes embedded (one in the hearth and crucible each, and 2 in the tuyere strip) for water flow. The coolers are 110 mm thick between the hearth and the tuyere strip. At the tapping hole, the coolers are 170 mm thick, with double coils. In the belly, there are plate coolers 240 mm thick, equipped with 2 coils. In the boshes, there are plate coolers 265 mm thick, with three coils. The coolers in the boshes and the belly, from the blast furnace interior, are ribbed. The recesses between the ribs are in the “dovetail” shape and filled with ceramic blocks made from refractory material. To compensate for the thermal expansion of the plate cooler coils towards the blast furnace jacket, and to ensure tightness where the coil ends penetrate the jacket, there was a compensatory system of plate coolers designed in the blast furnace boshes. The cooling system was supplied from the blast pipe. The water cooling circuit, replacing the air one, was designed also in the blast furnace hearth. The system is made from high-alloy steel seamless pipes, laid in the grooves of the first graphite block layer, at 4,220 m. The water to supply cooling was drawn from the pipe feeding the coolers in the upper part of the blast furnace and discharged via the compensatory system to the water trough at 2,200 m. The cooling method changes introduced to the lower protective panel strip were designed as a departure from the original idea of immersing the coils in the jacket protective panels for the benefit of the direct cooling of the lower protective panel strip with coils immersed in the lining. To measure the temperature of the carbon lining of the blast furnace hearth, non-replaceable thermocouples, installed at three levels, i.e. 4,280 m, 4,780 m and 5,365 m were used. The external cooling system of the blast furnace comprised the spray cooling of the jacket covering all its zones. The water is distributed from the blast pipe. It flows to the manifolds of the equipment cooling the coolers of the hearth, crucible, tuyere strip and the tuyere coolers, as well as to spray the lower part of the blast furnace jacket. In the hearth, directly above the crucible, there is a set of 12 tuyeres, supplying compressed hot blast, i.e. air in the temperature of 900÷1,200°C.

Enclosure developed by:
(Date and signature)

September 2011

The fuel, i.e. natural gas, was supplied together with the blast. In the lower part of the blast furnace, ferro-manganese, filling the crucible, was discharged via the tapping hole. Starting from 1970, the Blast Furnace “A” operation was controlled by a digital machine. The modifications were accompanied by the use of an X-ray quantometer in the laboratory and the implementation of the pneumatic pig iron sample handling to facilitate fast analysis. The documents for the semi-automatic check and control of the blast furnace operation were developed at the AGH University of Technology by the team of academics and “Pokój” Steelworks workers, led by professor R. Benesz. The Blast Furnace “A” was switched to the new control system on 1 December 1971. The ladles – carriages were used for the discharge and transport of the liquid metal. The Blast Furnace was equipped with the required measurement instruments, enabling to control the jacket cooling system, the charge burdening system, loading system, as well as to carry out the required process measurements. In 1997, “Pokój” Steelworks, carried out the second stage of the Blast Furnace “A” modernisation, adapting it also to the environment protection requirements. The documents prepared for the first stage, with the process part comprising amendments to the designs of the internal throat jacket, blast furnace cooling and throat closure. At the second stage, the new process part was developed. It comprised connection pipes’ designs and the distribution of the thermocouples on the jacket, lower inner throat jacket, carbon lining, Blast Furnace lining, plate cooling, extraction from the throat closure, steam supply to the interbell space, extraction from the Blast Furnace throat closure (lower part), plate cooler compensatory system in the boshes area, water cooling of the Blast Furnace hearth, thermocouple installation in the Blast Furnace hearth).



Alteration and modernisation of Blast Furnace “A”
1967

ENCLOSURE TO THE RECORD SHEET

No. 5

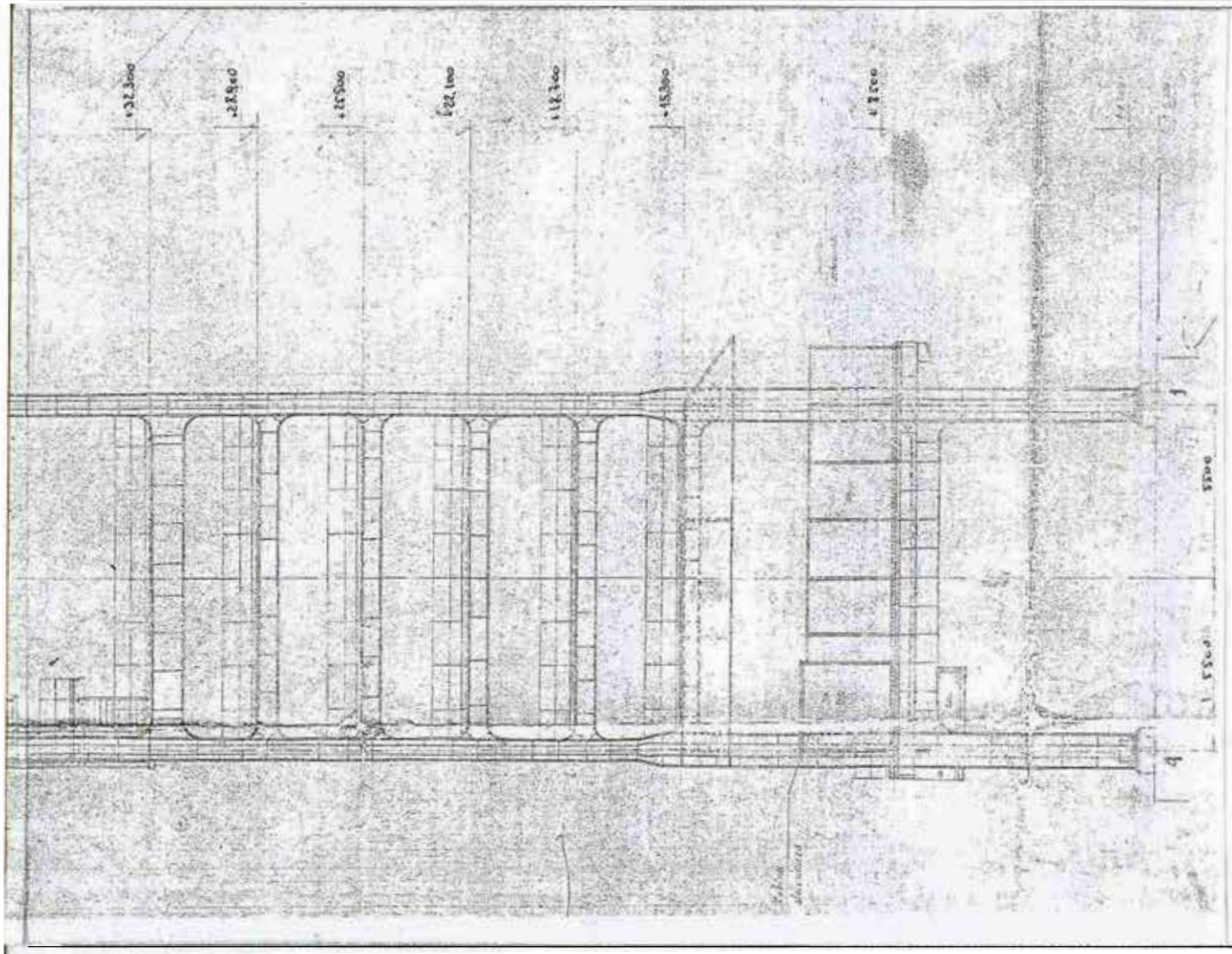
1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address

The “Friedens-Eisenhütte” compound — BLAST FURNACE “A” COMPOUND THE FACILITY IS EXCLUDED FROM OPERATION IN “STALMAG” Sp. z o.o. PERIMETER Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content

Figures — Alteration and modernisation of Blast Furnace “A” — Structure of the Blast Furnace “A” platforms and walkways — 1967



View of the Blast Furnace “A” from the west

Enclosure developed by:
(Date and signature)

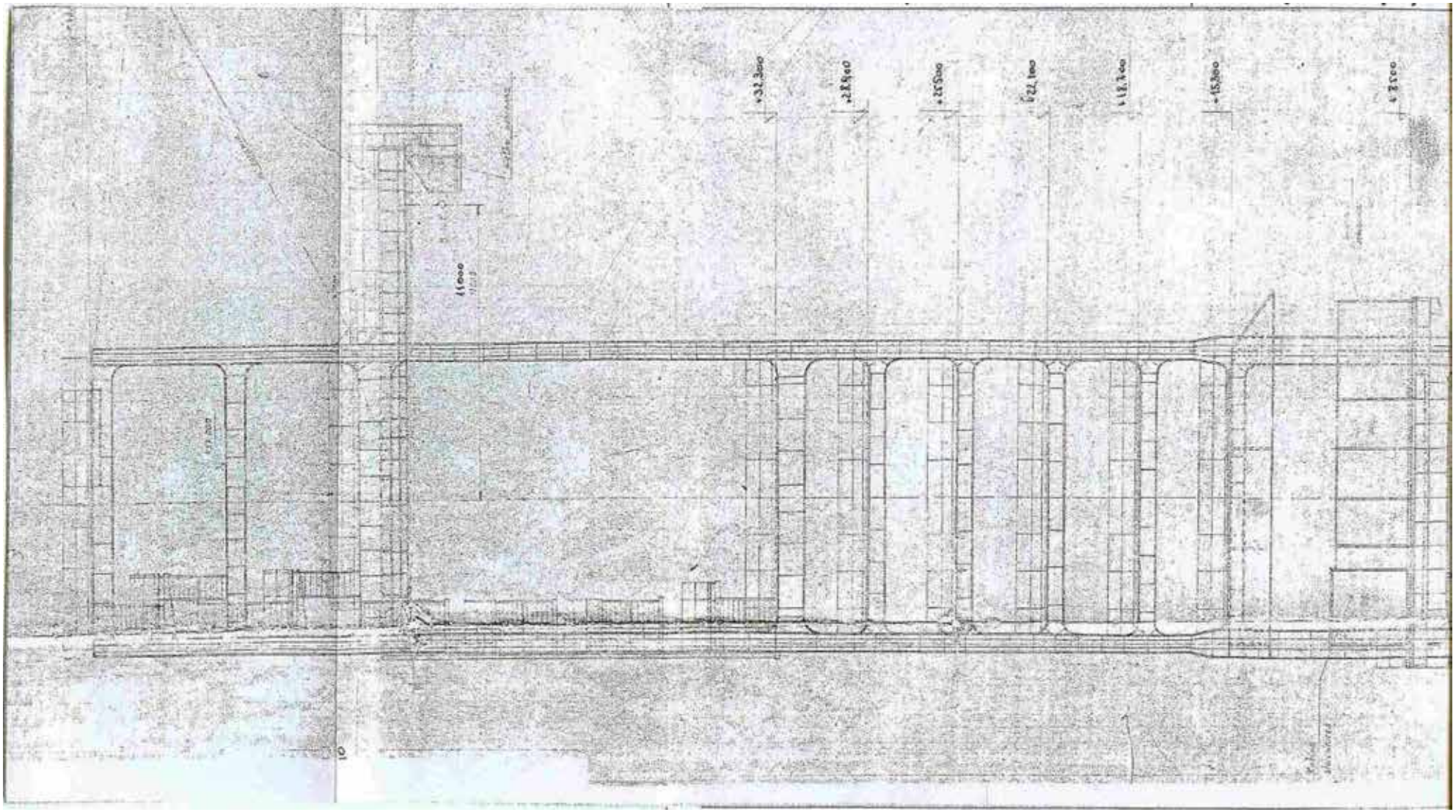
September 2011

ENCLOSURE TO THE RECORD SHEET

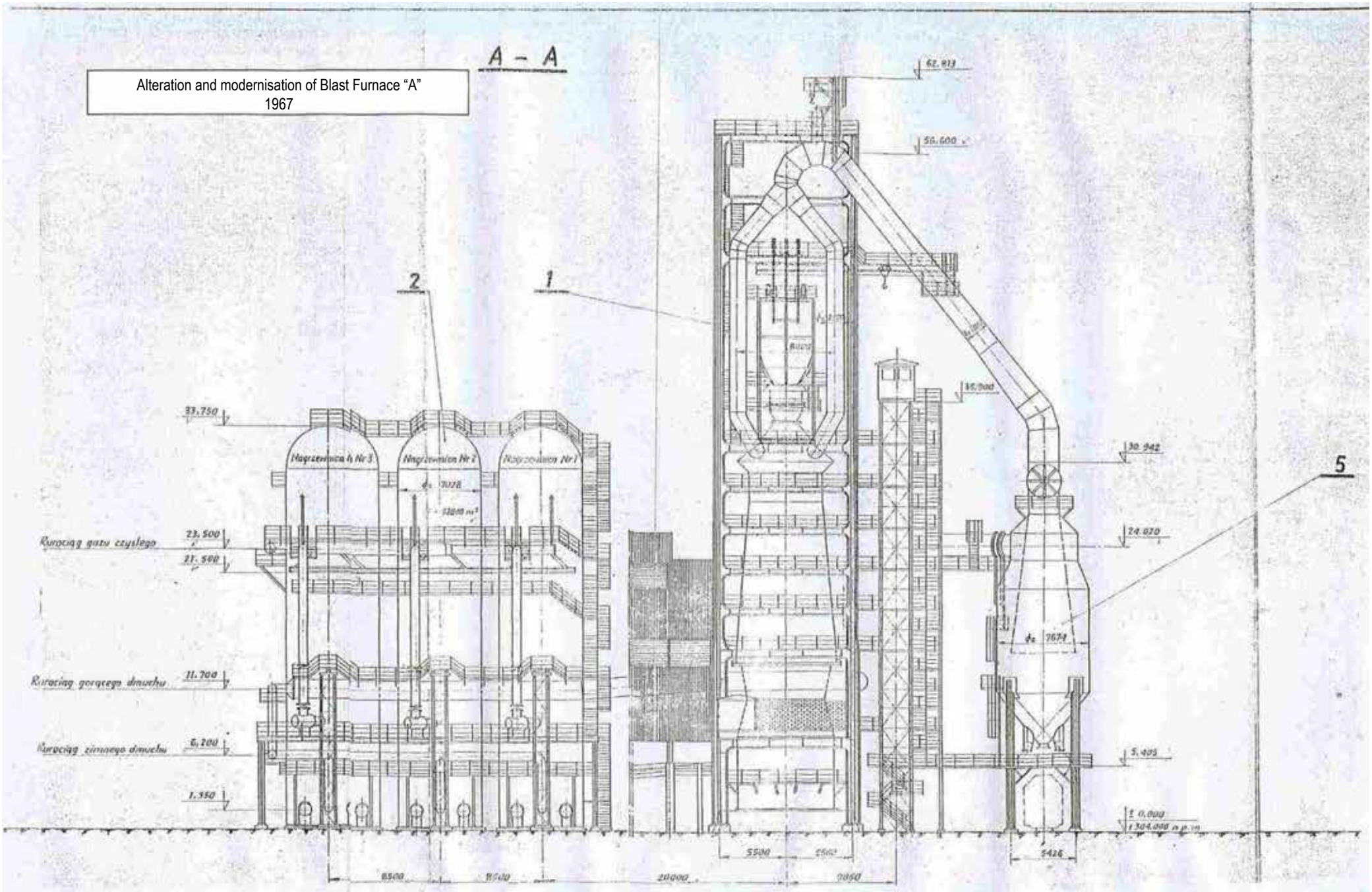
1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address

The “Friedens-Eisenhütte” compound — BLAST FURNACE “A” COMPOUND THE FACILITY IS EXCLUDED FROM OPERATION IN “STALMAG” Sp. z o.o. PERIMETER Ruda Śląska — Nowy Bytom, 79 Niedurnego Street



Alteration and modernisation of Blast Furnace “A”
1967



ENCLOSURE TO THE RECORD SHEET

No. 6

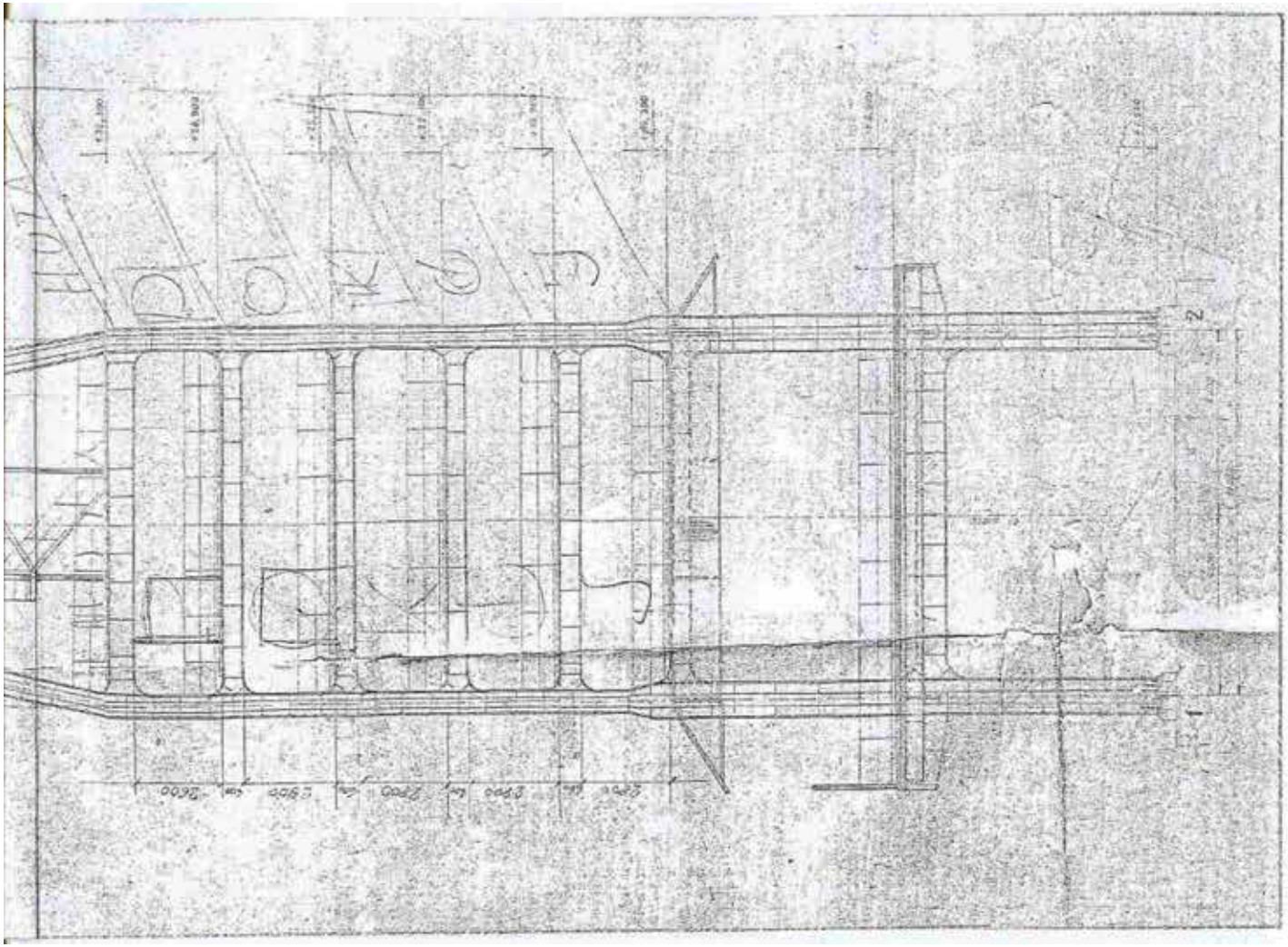
1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

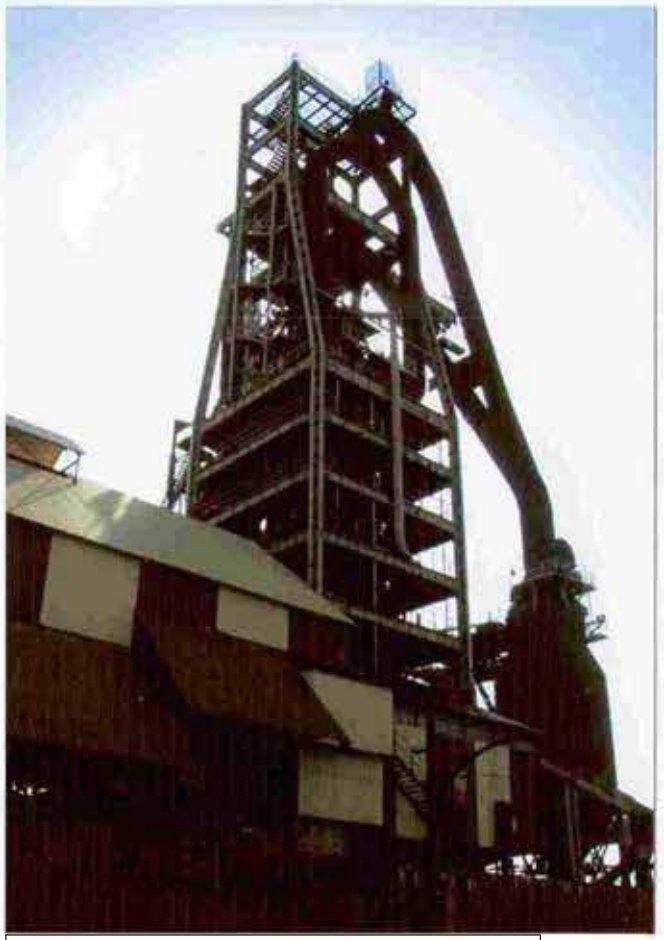
5. Name of the historical monument (as in the record sheet), address

The “Friedens-Eisenhütte” compound — BLAST FURNACE “A” COMPOUND THE FACILITY IS EXCLUDED FROM OPERATION IN “STALMAG” Sp. z o.o. PERIMETER Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content

Figures — Alteration and modernisation of Blast Furnace “A” — Structure of the Blast Furnace “A” platforms and walkways — 1967





View of the Blast Furnace “A” from the north-west

Enclosure developed by:
(Date and signature)

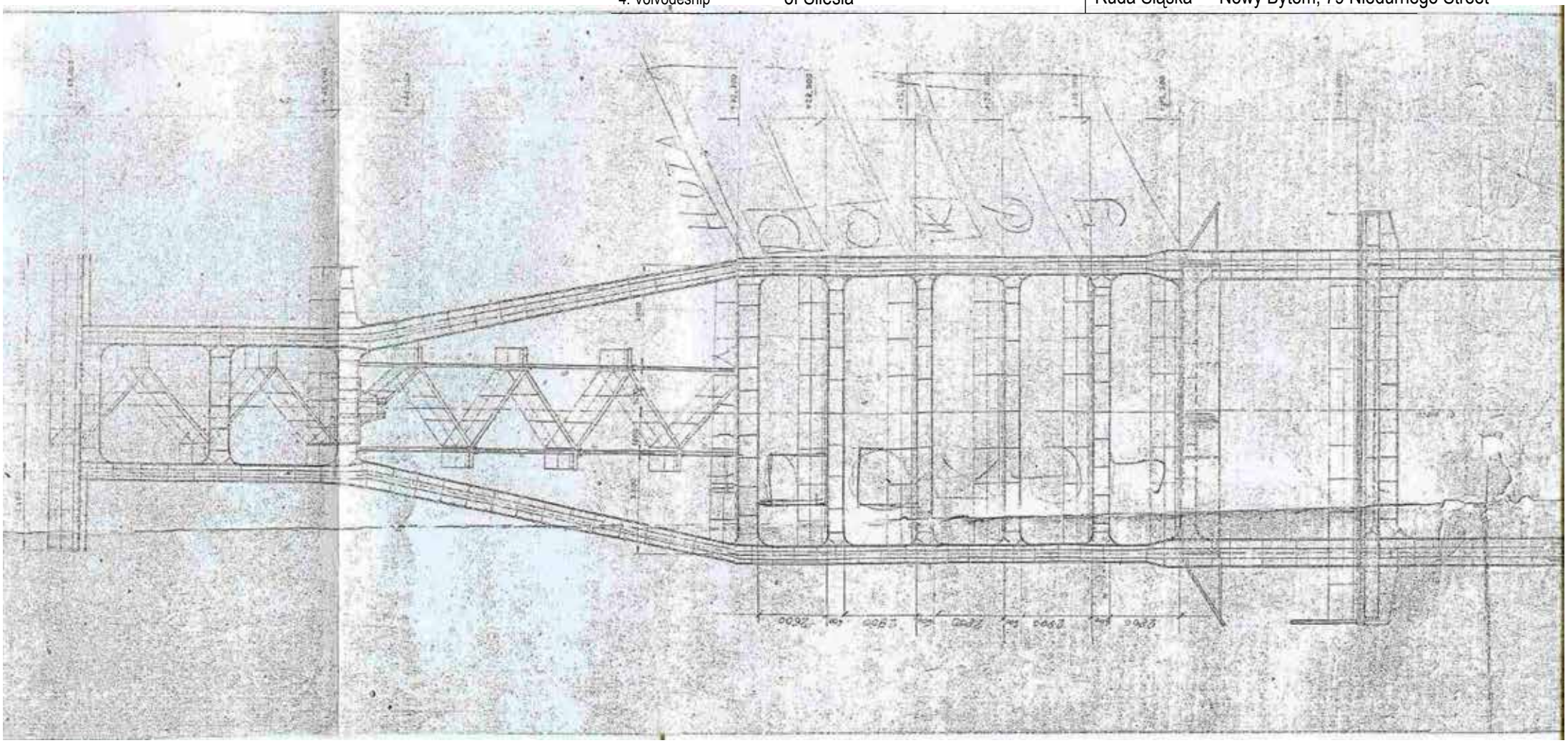
September 2011

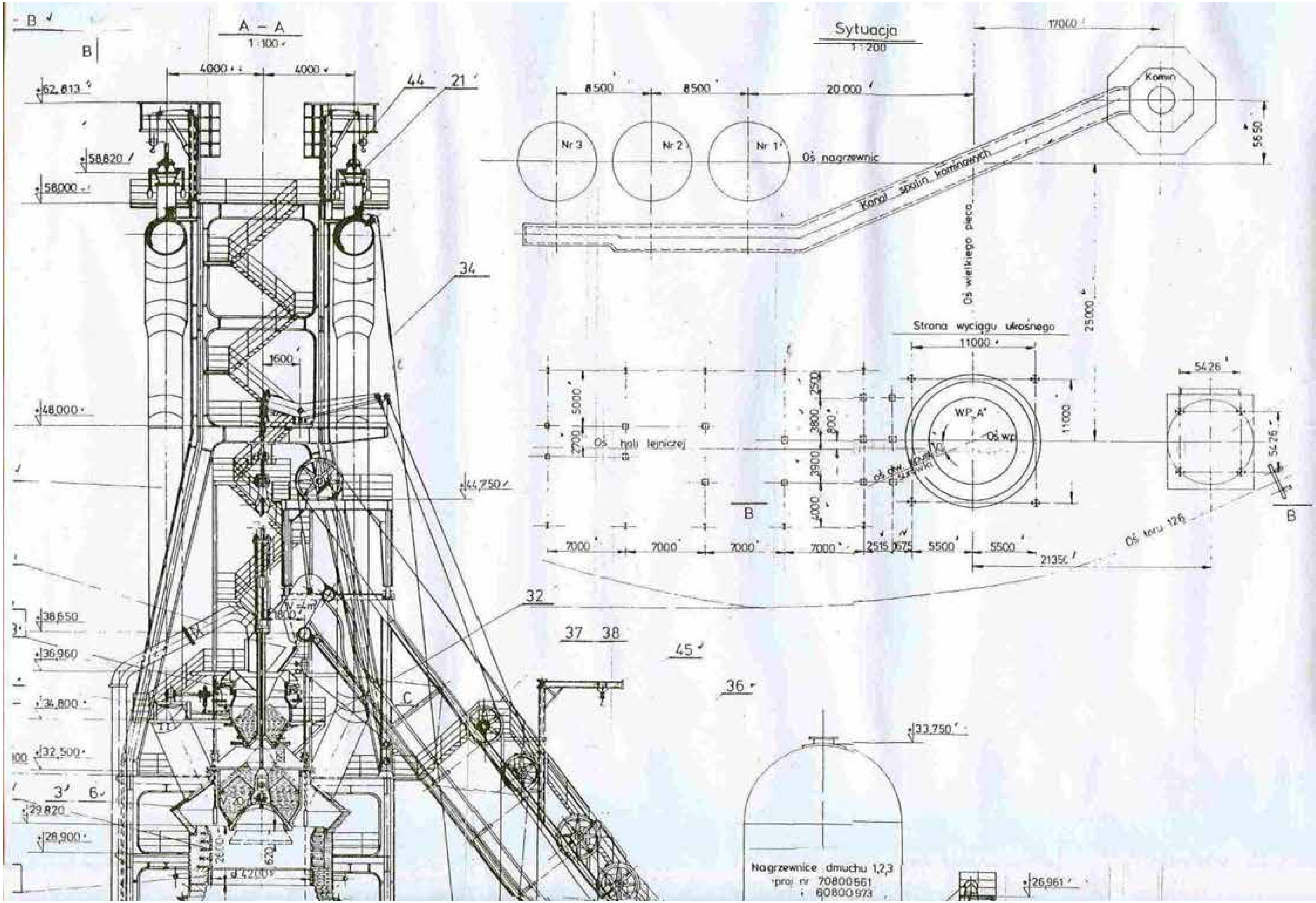
ENCLOSURE TO THE RECORD SHEET

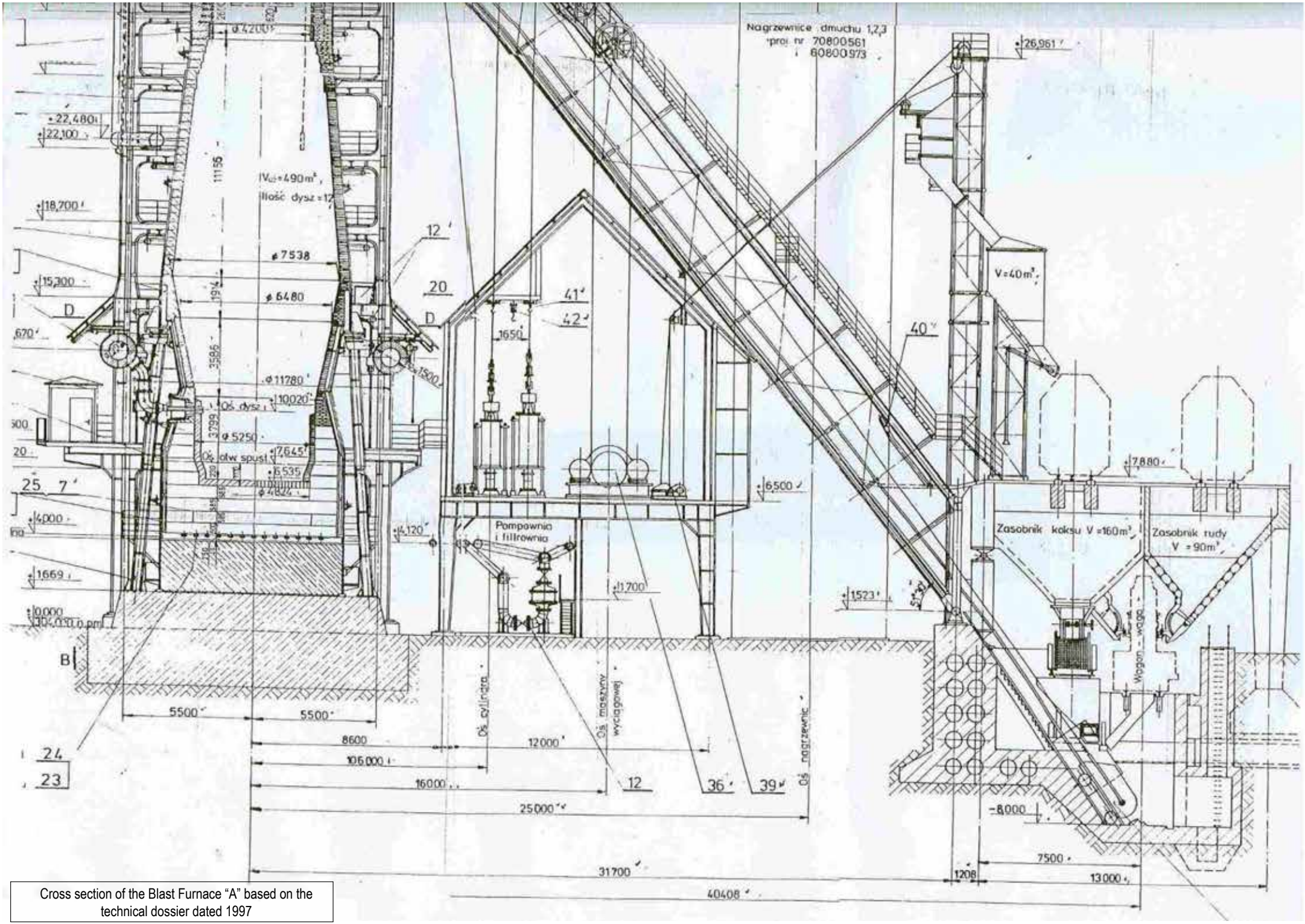
1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address

The “Friedens-Eisenhütte” compound — BLAST FURNACE “A” COMPOUND THE FACILITY IS EXCLUDED FROM OPERATION IN “STALMAG” Sp. z o.o. PERIMETER Ruda Śląska — Nowy Bytom, 79 Niedurnego Street




A – A
1:100
B
Sytuacja
1:200
17060
Komin
8500
8500
20 000
Nr 3
Nr 2
Nr 1
Oś nagrzewnic
Kanał spalin kominowych
5650
Oś wielkiego pieca
25000
Strona wyciągu ukośnego
11000
5426
WP „A”
Oś wp
Oś hali lejniczej
Oś teru 126
7000
7000
7000
7000
2515
3675
5500
5500
21350
4000
4000
1600
62,813
58,820
58,000
48,000
44,750
38,650
36,960
34,800
32,500
29,820
28,900
33,750
26,961
44
21
34
32
37
38
45
36
3
6
C
Nagrzewnice dmuchu 1,2,3
proj. nr 70800561
60800973



Cross section of the Blast Furnace “A” based on the technical dossier dated 1997

ENCLOSURE TO THE RECORD SHEET

No. 7

1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address

The “Friedens-Eisenhütte” compound — BLAST FURNACE “A” COMPOUND THE FACILITY IS EXCLUDED FROM OPERATION IN “STALMAG” Sp. z o.o. PERIMETER
Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content

Figures, photos

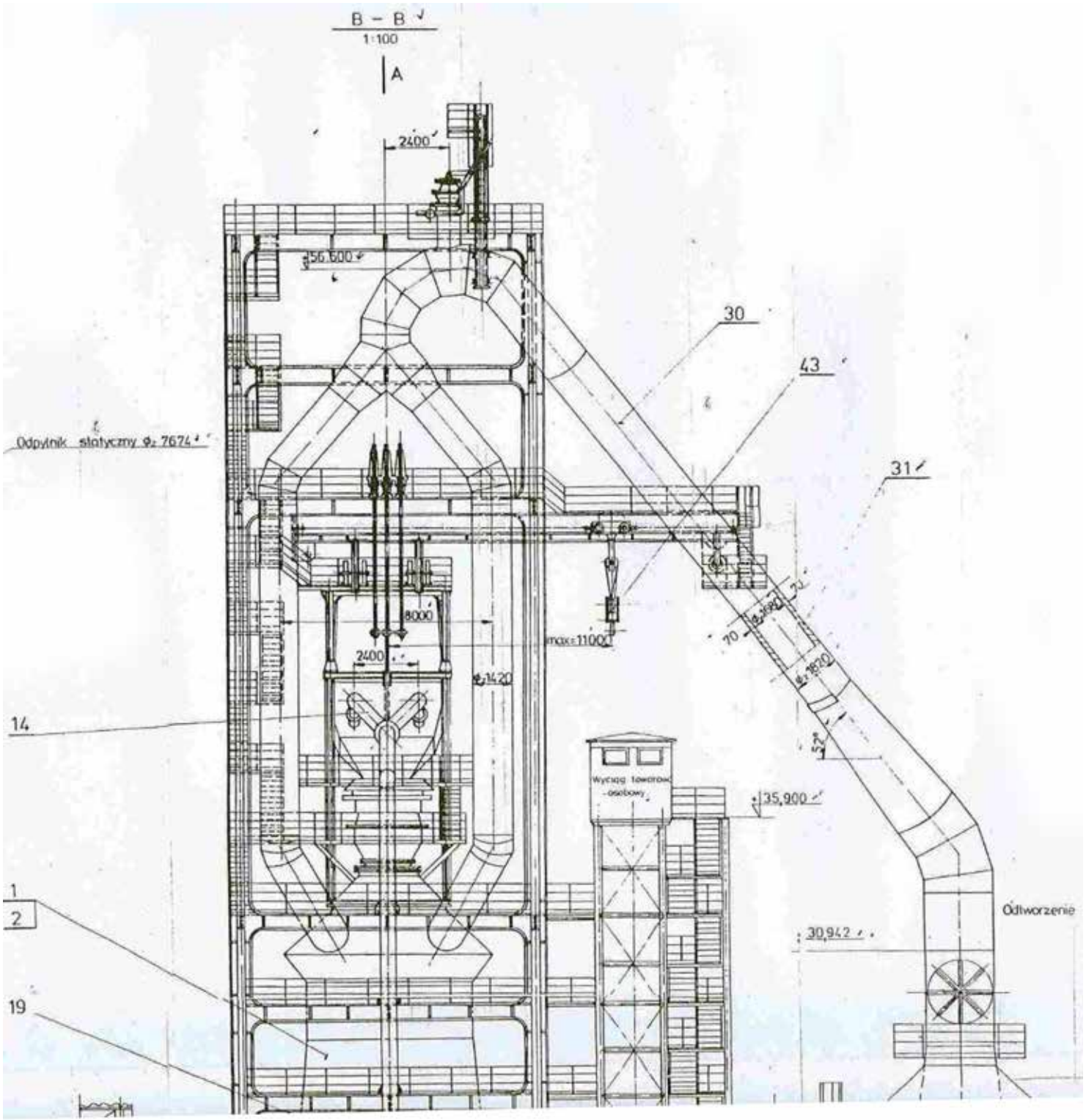
VIEW OF THE BLAST FURNACE “A” COMPOUND FROM THE SOUTH IN THE FOREGROUND, THERE IS THE STATIC DUST CATCHER AND THE BUILDING HOUSING THE PUMP ROOM, FILTERS AND CONVERTER

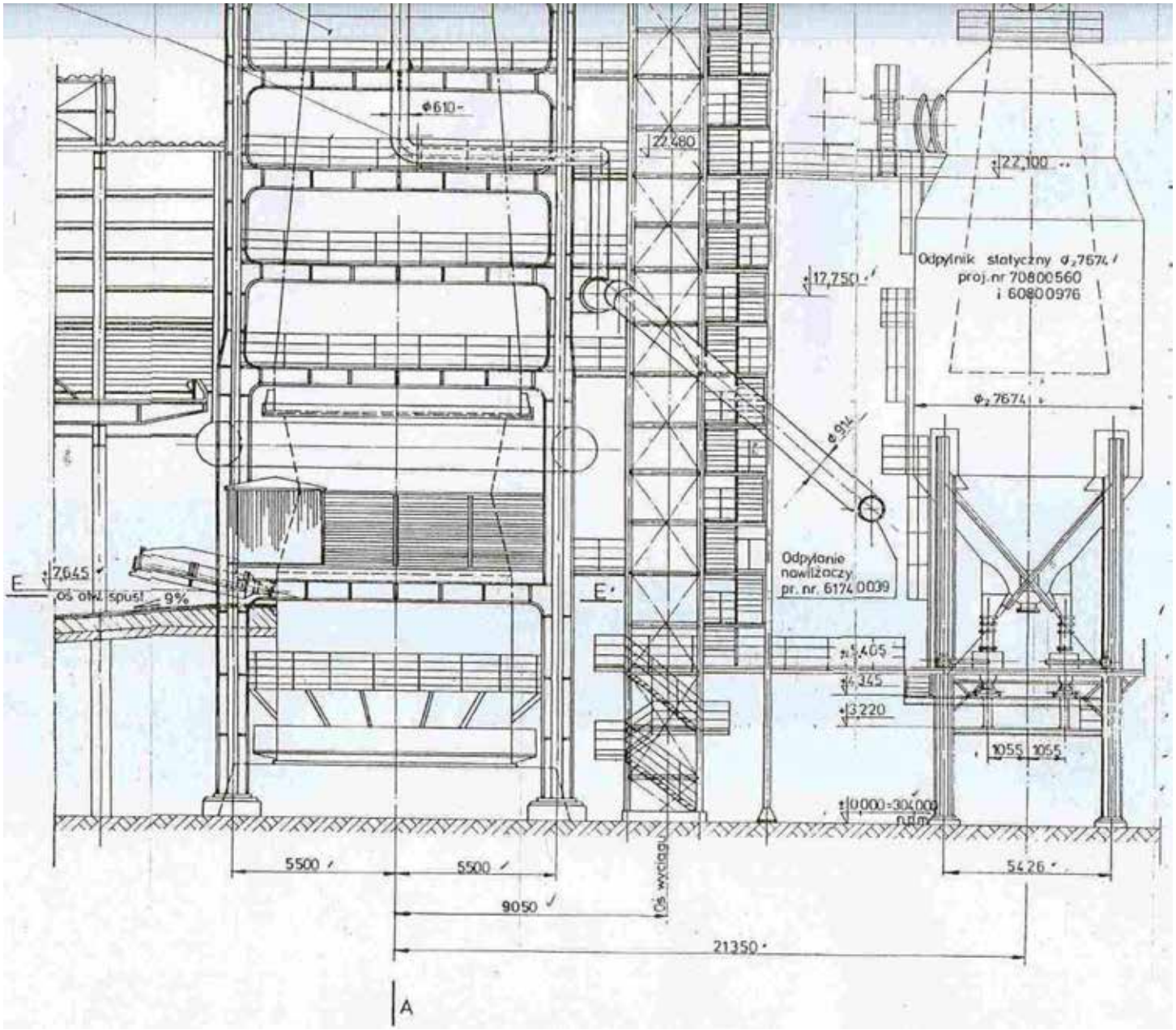
VIEW OF THE BLAST FURNACE “A” COMPOUND FROM THE SOUTH IN THE FOREGROUND, THERE IS THE STATIC DUST CATCHER

VIEW OF THE BLAST FURNACE “A” COMPOUND FROM THE SOUTH-WEST

Enclosure developed by:
(Date and signature)

September 2011


B – B
1:100
A
2400
56,600
30
43
Odpylnik statyczny Φ= 7674
31
8000
2400
Φ 1420
max=11000
70
Φ 1870
52°
14
Wyciąg towarowo
-osobowy
35,900
1
2
19
30,942
Odtworzenie



Cross section of the Blast Furnace “A” based on the technical dossier dated 1997

ENCLOSURE TO THE RECORD SHEET

No. 8

1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address

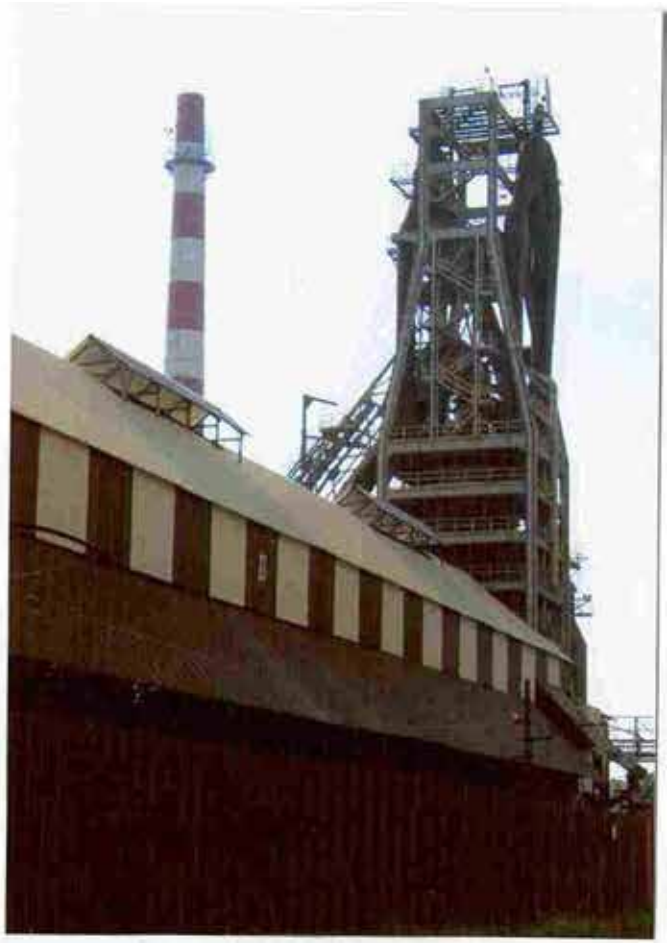
The “Friedens-Eisenhütte” compound — BLAST FURNACE “A” COMPOUND THE FACILITY IS EXCLUDED FROM OPERATION IN “STALMAG” Sp. z o.o. PERIMETER
Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content

photos

VIEW OF THE BLAST FURNACE “A” COMPOUND FROM THE SOUTH-WEST

VIEW OF THE BLAST FURNACE “A” COMPOUND FROM THE WEST



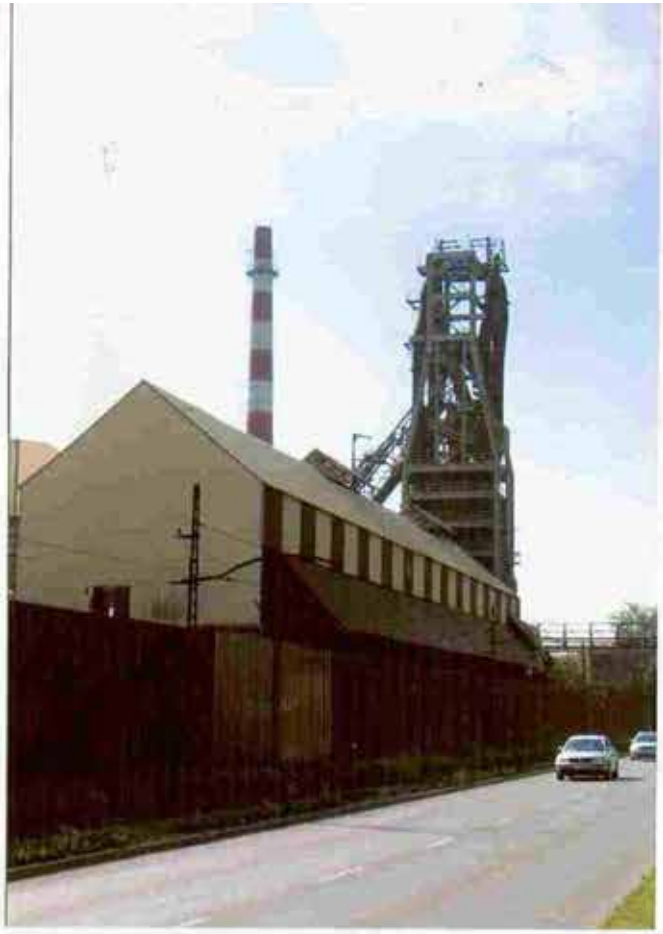
VIEW OF THE BLAST FURNACE “A” COMPOUND FROM THE NORTH-WEST

Enclosure developed by:
(Date and signature)

September 2011

VIEW OF THE BLAST FURNACE “A” COMPOUND FROM THE WEST

VIEW OF THE BLAST FURNACE “A” COMPOUND FROM THE NORTH-WEST



VIEW OF THE BLAST FURNACE “A” COMPOUND FROM THE NORTH-WEST

RECORD SHEET OF AN IMMOVABLE HISTORICAL MONUMENT
ENTERED IN THE REGISTER OF HISTORICAL MONUMENTS

3. Location
RUDA ŚLĄSKA

1. Name

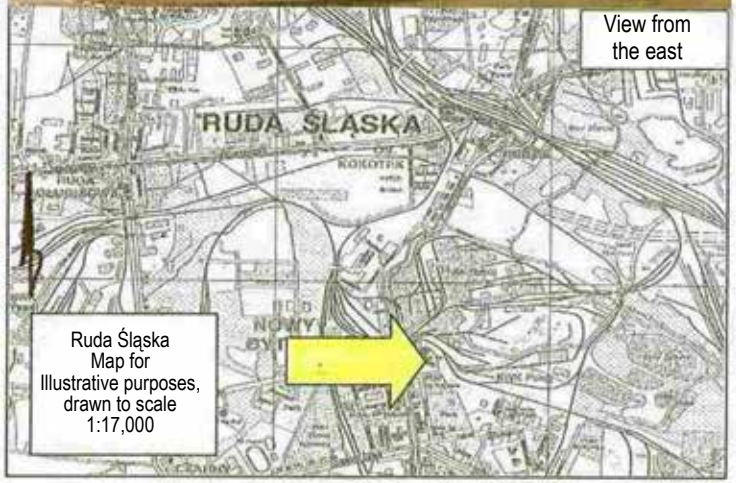
"Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND — STATIC DUST CATCHER, HEATER ASSEMBLY 1,2,3, INCLINED SKIP BRIDGE, PASSENGER AND CARGO LIFT, THE FACILITIES ARE EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER

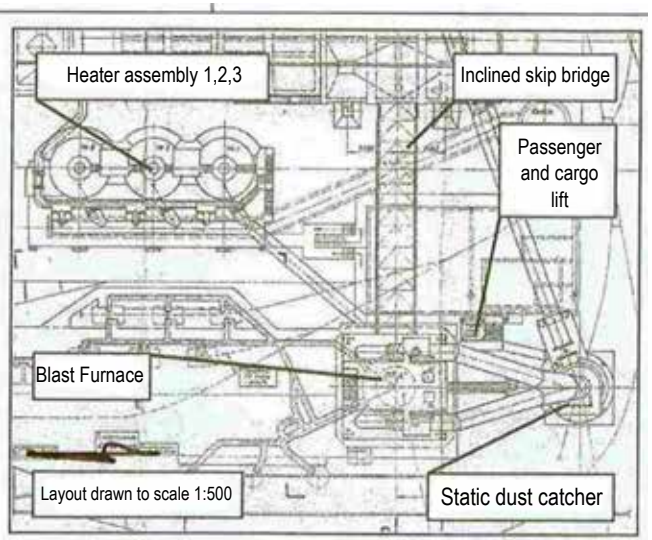
2. Date of creation

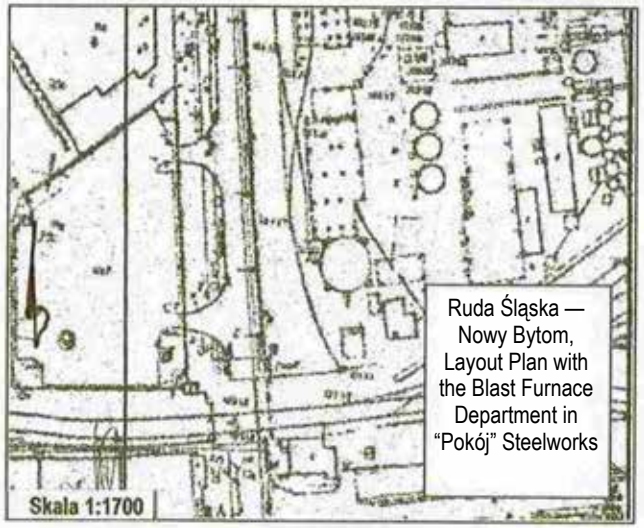
1966–1967 — regenerative blast heaters 1,2,3
1966–1968 — static dust catcher
11967–1968 — tower of the passenger and cargo lift
1966–68 — inclined skip bridge

4. Address
Ruda Śląska
Nowy Bytom
79 Niedurnego Street
plot no. 3.1-3131/215

no. of entry in the land and mortgage register KW 15861R
GL1S/000015861/0-8







5. Administrative district

Voivodeship of Silesia

Poviat of Ruda Śląska

Commune of Ruda Śląska

6. Geographical coordinates
5573074.01 6562355.07 N50°17' 24.8355" E18° 52'30.0772"

7. Previous names of the city
Friedens-Hütte
Nowy Bytom

8. Owner and their address

"Stalmag" Sp. z o.o.
2 Hutnicza Street Ruda Śląska

9. User and their address

"Stalmag" Sp. z o.o.
2 Hutnicza Street Ruda Śląska

10. Protection forms

12. History

Modernisations of the raw material section of “Pokój” Steelworks after World War II comprised largely the Blast Furnace Department. Right after the end of World War II, the Steelworks became the largest producer of iron and steel in Poland. In 1949, the modernised blast furnace, marked "D", was lit off, with wet granulation of iron introduced. The following year the blast furnace marked “C” was modernised. Its capacity was increased to 565.44 m^3. In 1952, there were new “Dingler” disintegrators built for the blast-furnace gas cleaning plant. Starting from 1956, the blast furnaces operated with blast humidification. This change contributed to reduced coke consumption. In 1958, there was a coke screen installed at the blast furnace “C”. One year later, the blast furnace “D” was modernised. Its modernisation comprised a two-bell Mc-Kee-Brown closure. In 1963, the blast furnace “C” was altered using an innovative method. The furnace was situated in the blast furnace shed, to the north of the Blast Furnace “A”. The modernisation works comprised erection of a new blast furnace, near the operating old one. After the new unit was erected, the old blast furnace was dismantled and the new one was moved to its site. The procedure was started on 17 October 1963. The works were to be performed by Hutnicze Przedsiębiorstwo Remontowe. The new blast furnace was entirely automatic. Its usable capacity was 483 m^3. The blast furnace required less coke despite increased production output, as well as a reduced number of operators. Starting from 1965, it was fuelled partially with mazut. The blast furnace charge bunkers were situated to the east of the blast furnace shed, with a new part added to the south. Behind the shed, to the east, there was a blast furnace gas compressor station. The new charge bunkers, rebuilt during the modernisation carried out, were situated at the axis of the skip bridge supplying the charge to the Blast Furnace “A”. In the southern part of the Blast Furnace Department facilities, there was also a stack discharging fumes from the heaters, and behind it, to the west, there were three steel heaters for the Blast Furnace “A” blast, situated in a row.

Continued in Enclosure no. 2.

13. Description

The process structures and devices of the blast furnace “A”, erected and handed over for operation gradually in 1966–1968.
The static dust catcher dating back to 1966–1968, made based on the design dated December 1966, developed by “Biprohut” Biuro Projektów Przemysłu Hutniczego Blast Furnace Department (the team composed of Chwota — designer, Rudomina — verification, Jarzębski -— leader, project manager, Dyakowski — Department head). The dust catcher operated in line with its intended use until ferro-mangenese production was terminated in the Blast Furnace “A”, with its damping, on 1–2 February 2005.
The dust catcher was situated at the axis of the Blast Furnace “A", to the south, at 21.35 m. Its original intended use was the pre-cleaning of the blast furnace gas in the course of producing open-hearth pig iron and foundry pig iron. It cooperated with other gas cleaning devices, installed in the wet part of the cleaning plant. Dust content in the raw gas was ca. ~ 25 g/Nm^3, with gas temperature ranging 120 –2000°C. The dust had different granularity. The dust catcher was installed on a foundation, with the support structure composed of four steel columns spaced 5,426 mm. At the support structure, there was a part of the steel jacket installed, in the shape of a vertical cylinder with the diameter Ø7,674 mm (from the level of +11,744 to ca. +22,100, below). The lower part of the jacket is the enclosure with the conically narrowing shape. In its upper section, two conical narrowings are separated by another low zone of the cylindrical enclosure. At the support structure, at +5.405 m, there was a process walkway installed to check the dust valves and humidifiers, water system, motor, rolls, damper, as well as to control the goggle valve Ø1,800. Above, at +11,744, there is the level where the steel dust catcher jacket is supported, designed for the cylindrical enclosure part. To inspect the jacket and to operate the dust catcher, there are the platforms designed at +12,000, +17,050, +22,100 (platform for operating the thermal goggle valve Ø180, operated manually). Above the platform at +22,100, there is a section of the raw gas pipeline laid, led to the thermal goggle valve. A saddle with a support connected to the jacket was installed to fix it. At the raw gas pipeline, there are water and steam systems installed. Above, at +24,970, at the raw gas pipeline, there is another platform installed. The highest platform is situated at +27,214. It rests on ribs (designed for operating the venting device with a vertical pipe Ø400 mm and the damper Ø200 mm). The total height of the dust catcher is 27,342 m. Steel ladders are enclosed, fixed vertically to the jacket, to ensure moving between particular platforms. The dust catcher is reached by gas pipelines, running from four places in the upper jacket section of the blast furnace “A”in two sections, with the outer inlet diameters of Ø1,420 mm. Those sections are then joined to make the same section of the pipeline reaching the dust catcher, with the diameter of Ø1,820 mm. Because of the high temperature of the inflow gas, the refractory concrete lining layer was made inside the steel jacket. The inner diameter of the cylindrical enclosure part is Ø7,640 mm. The blast furnace gas, coming from above, having left the space of the internal conical diffuser (with the diameter increasing towards the base), reduced its flow and was led upwards, to the opening at the inlet of the raw gas pipeline, run to the blast furnace gas compressor station. Because of the reduced gas velocity in the diffuser, heavier dust fractions fell to the tank bottom. The dust was transported using humidifiers, via a belt conveyor (or screw conveyors following the modernisation) to the carriage. The dust catcher was emptied daily, based on the process schedule of the steelworks. The weight of the dust catcher structure was 236,865 kg. The capacity of the part where the dust collected was 130 m^3 (given the maximum dust catcher fill-up 2 m below the lower edge of the diffuser). The dust catcher capacity, i.e. 130 m3, was filled with dust in 6 days. The time required to empty the dust and transport it to the carriage was ca. 2 hours a day, using 2 transport lines, or 4 hours a day using a single line a day.

Continued in Enclosure no. 4.

14. Cubage	15. Usable area	16. Original intended use	17. Present use
static dust catcher ~1,356 m^3 heater ~1,000 m^3	static dust catcher footprint ~50m^2 heater ~50m^2	The compound of process structures and devices supplying the Blast Furnace “A” with charge, hot blast, gas and fume discharge, protection of the passenger and cargo transport	The compound of process structures operation and devices of the Blast Furnace “A” at excluded from present

18. Conservation state

The blast furnace, with the blast heaters, static duct catcher, inclined skip bridge and the passenger and cargo lift is preserved in the state it was left when the last campaign was stopped, i.e. on 1–2 February 2005 when the ferro-manganese production was terminated and the blast furnace was damped. The last campaign was started in 2004 following a few years' pause. The devices were made operable again. In 1995–1997, the Blast Furnace modernisation was designed and implemented in two stages, including its adaptation to the environmental protection requirements.

Static dust catcher: the basic structural components are preserved in the state conforming to the design dated 1966. The drives and the control units for the dust valves and humidifiers, and for the damper were modernised. In 1995, during the major modernisation overhaul, changes were introduced to the dust catching system, including providing hermetic dust transport to the carriage (installation of dust dampers, rotary valves, screw conveyors, improvement of drives and electrical systems, dust extraction system from above the carriage, improved quality of the water and steam system as well as the condition of the inner concrete lining of the jacket).

— Major modernisation overhaul of the Blast Furnace “A”. Static dust catcher Ø7,674 — Przedsiębiorstwo Inżynierskie “Biprohut”, July 1993, developed by the team composed of J. Chwoła (project manager), inż. M. Adamkiewicz (studio head),

Blast heater assembly 1–3: the basic structural components preserved in the state conforming to the design dated 1994

— Major modernisation overhaul of the Blast Furnace “A”. Blast heater assembly 1–3 — Przedsiębiorstwo Inżynierskie “Biprohut”, June 1994, developed by the team composed of Maśnica (designer, project manager), Lattka (verification), Adamkiewicz (studio head),

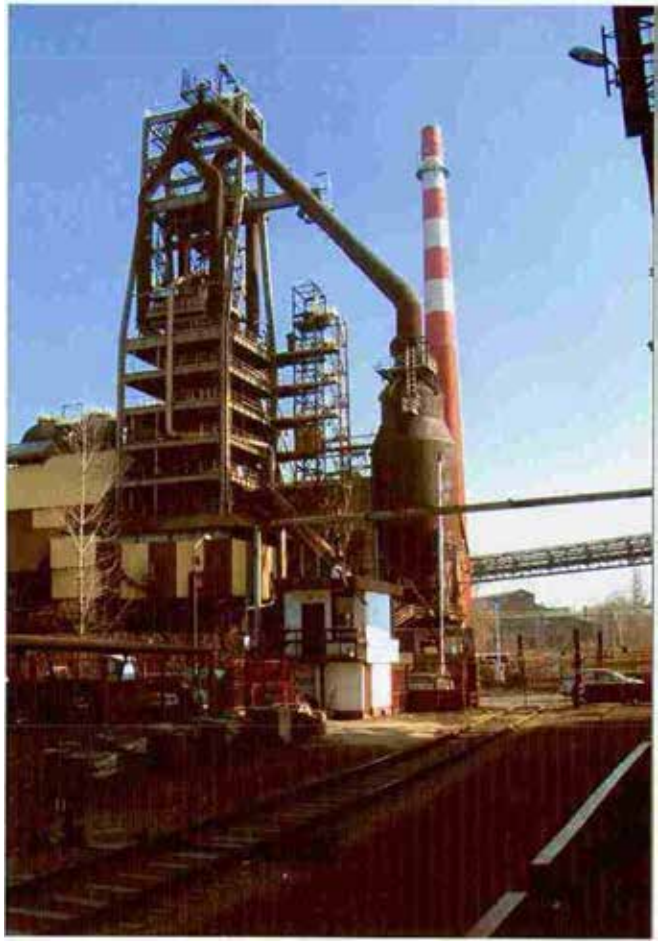
— Design of the Blast Furnace “A” modernisation, including adaptation to the environmental protection requirements, 2nd stage. Blast heater assembly, Przedsiębiorstwo Inżynierskie “Biprohut”, May 1997, developed by team composed of Gołąb, Adamkiewicz, Kłos

Passenger and cargo lift; the lift tower core retained including the vertical circulation route with stairs. The machine cabin removed.

Inclined skip bridge; — arm structure preserved

19. Existing hazards, most urgent Conservation Officer's requests

Entering the Blast Furnace “A” with the static dust catcher, the assembly of three blast heaters, inclined skip bridge and the tower of the passenger and cargo lift in the Register of Historical Monuments. This is the last facility of that type in the voivodeship of Silesia and one of three in Poland



20. Archived files (file type, number and storage location)

— Przedsiębiorstwo Inżynierskie “Biprohut” Sp. z o.o. Archive. Gliwice ul. Dubois 16

21. Comments

The stopped Blast Furnace “A” in the perimeter of “Stalmag” Sp. Z o.o. in Ruda Śląska, erected in 1968, is the last facility of that type (with small capacity) in the voivodeship of Silesia and one of three similar facilities in Poland (two operating units, stated in 1960s and 1970s in Tadeusz Sendzimir Steelworks in Krakow). The Blast Furnace “A” in Ruda Śląska, including the static dust catcher, the assembly of three blast heaters, and the inclined skip bridge and the lift structures is a component of the industrial landscape rooted for a part of Nowy Bytom area. What is more, it is the most important facility for a raw material plant. Its location facilitates opening it to the public.

22. Information on inspections, information on changes (dates and full names of the persons filling in)

23. Reference works

- Huta „Pokój" / Śląskie Zakłady Górniczo-Hutnicze S.A. Katowice — Nowy Bytom, 1937
- Eugeniusz Mazanek. Wielki piec: konstrukcja i urządzenia pomocnicze. Wydawnictwo Górniczo-Hutnicze. Katowice 1959.
- Stanisław Holewiński, Eugeniusz Mazanek. Wielki piec: proces i technologia. Wydawnictwo Górniczo-Hutnicze. Katowice 1961.
- Leszek Król, Eugeniusz Mazanek. Nowoczesny wielki piec. Śląsk. Katowice 1973.
- Huta „Pokój" Dzieje zakładu i załogi 1840-1990, Joint publication. Editor H. Rolo, Katowice, Śląski Instytut Naukowy 1989

24. Record Sheet development (author, date and signature)

Text AS

Plans, drawings AS

photos AS

August 2012

25. Iconographic sources (type, storage location)

26. Enclosures

Enclosures to the Record Sheet, no. of pieces ... 12

ENCLOSURE TO THE RECORD SHEET

No. 1

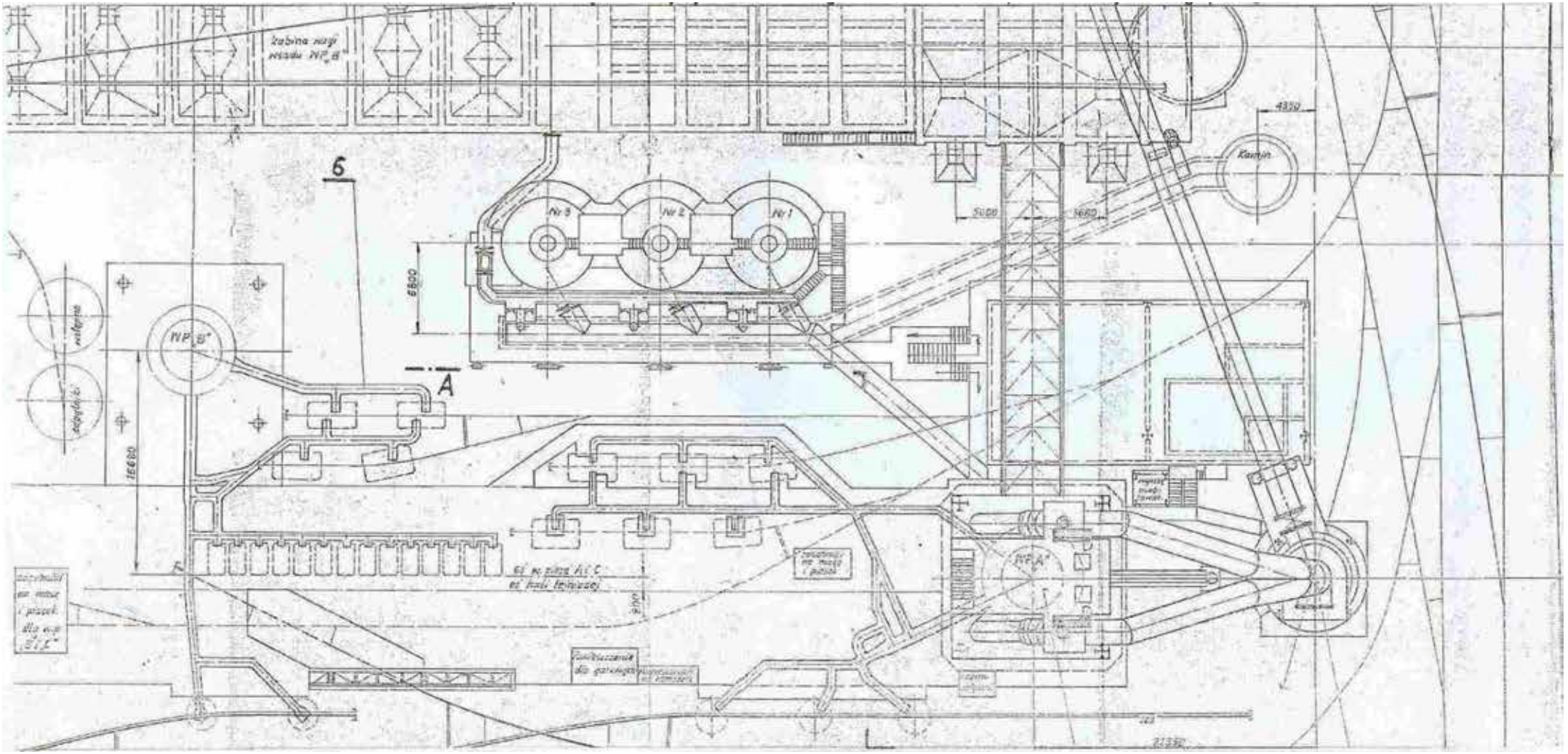
1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address
"Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND — STATIC DUST CATCHER, HEATER ASSEMBLY 1,2,3, INCLINED SKIP BRIDGE, PASSENGER AND CARGO LIFT, THE FACILITIES ARE EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER
Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content

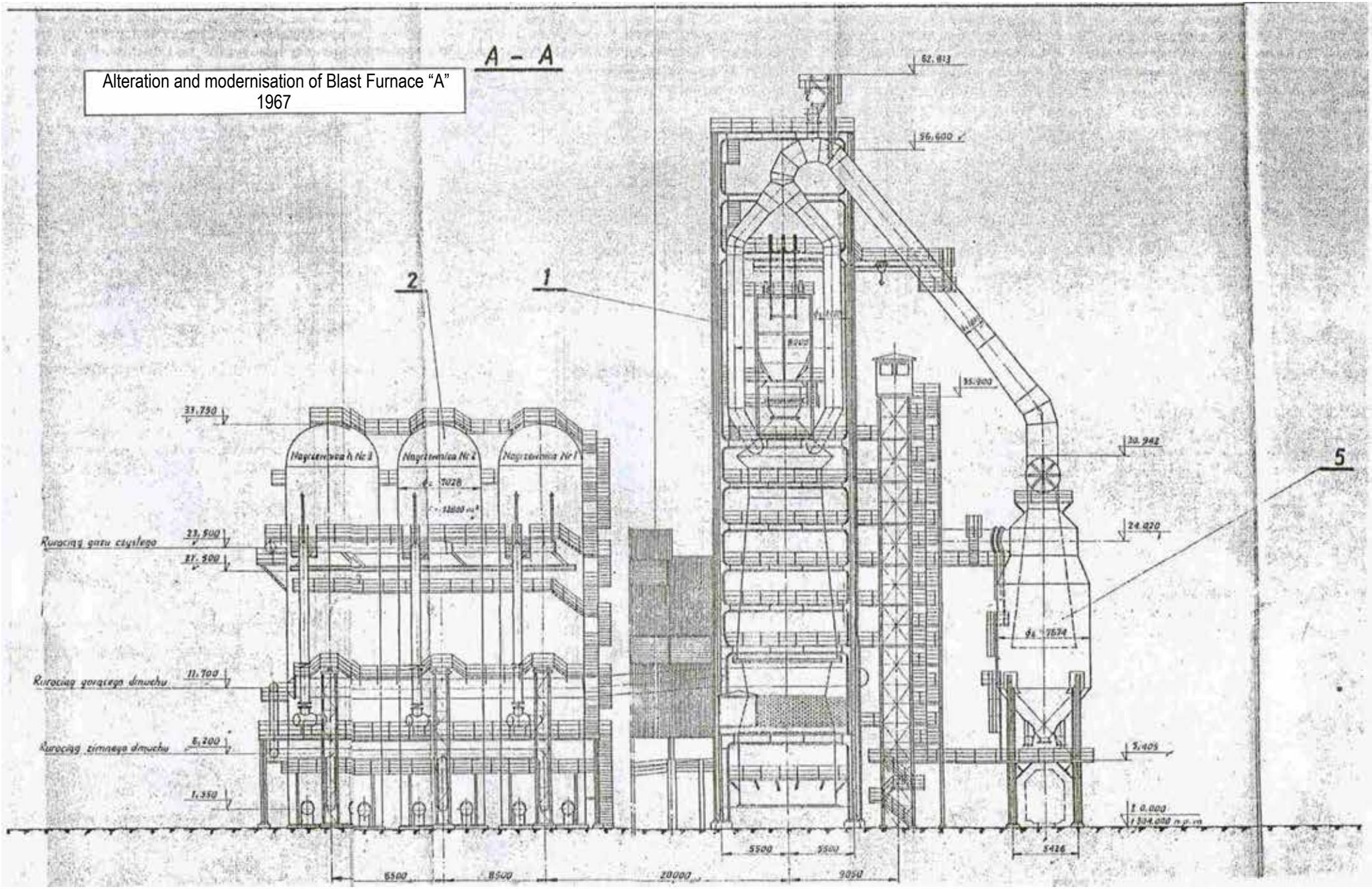
figures

Layout Plant of the Blast Furnace "A" compound Alteration and modernisation of Blast Furnace "A" 1967 Drawn to scale 1:400



(Date and signature)
August 2012

Alteration and modernisation of Blast Furnace “A”
1967



ENCLOSURE TO THE RECORD SHEET No. 1

1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address
"Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND — STATIC DUST CATCHER, HEATER ASSEMBLY 1,2,3, INCLINED SKIP BRIDGE, PASSENGER AND CARGO LIFT, THE FACILITIES ARE EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER
Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content

figures

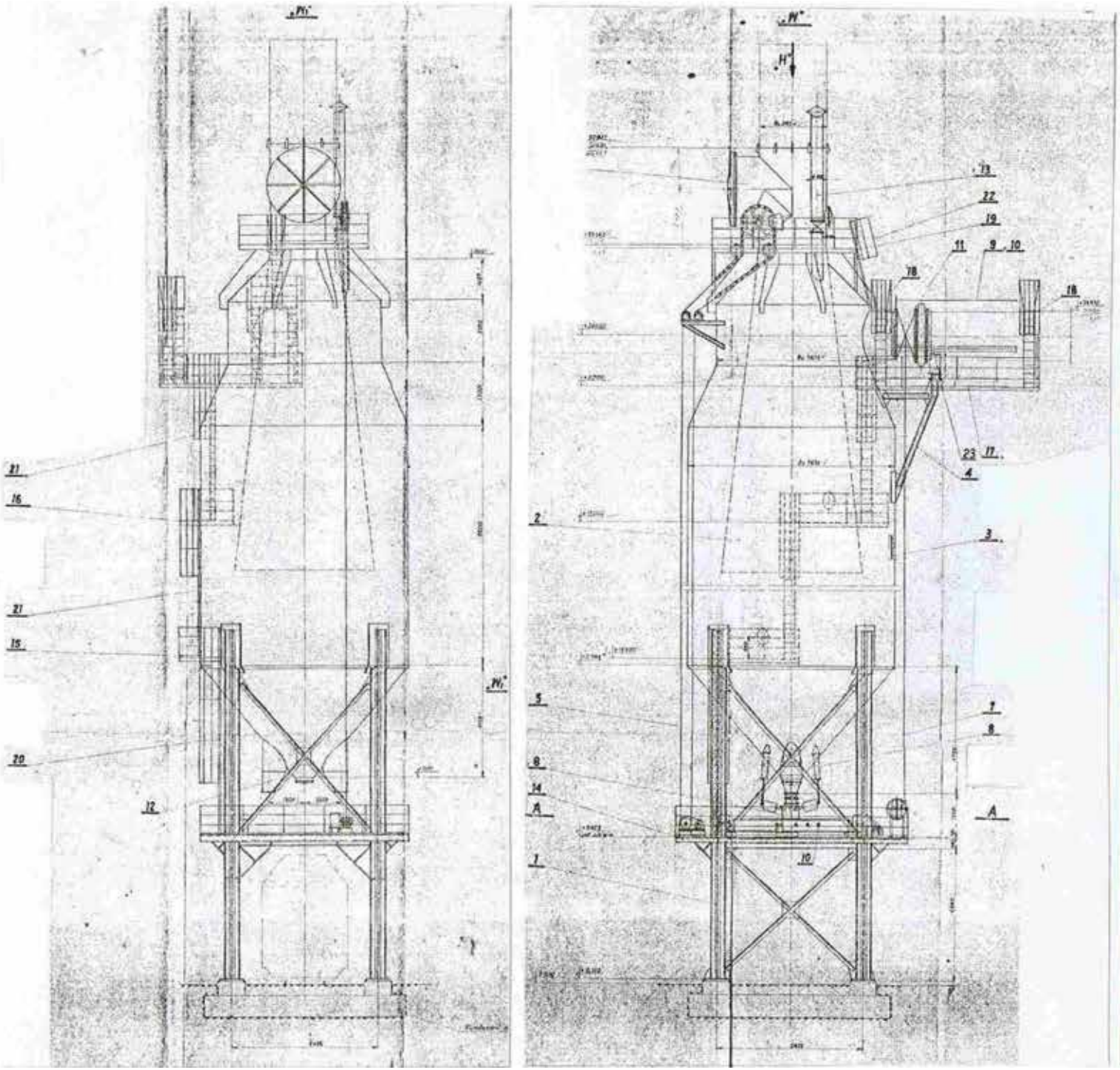
Layout Plant of the Blast Furnace "A" compound Alteration and modernisation of Blast Furnace "A" 1967 Drawn to scale 1:400

History, continued

The dust catcher in the blast furnace "A" was situated to the west, at the winch building. Its outer diameter was Ø7,674 mm and it had a bunker holding 600 tonnes. Between the heater no. 1 and the dust catcher, there was a tower of the passenger and cargo lift with the flights of stairs entwining it from outside. In 1966, there was a modification designed on the layout plan, at the Blast Furnace "A". There were plans to build three new blast heaters to the north-east of the Blast Furnace "A". Their height was to be 33,750 m, with outer diameters of Ø7,028 mm. Consequently, the old heaters were dismounted. A new dust catcher was created on their site. The works were performed based on the design developed in December 1966 in "Biprohut" Biuro Projektów Przemysłu Hutniczego, Blast Furnace Department (the team composed of Chwota — designer, Rudomina — verification, Jarzębski -— leader, project manager, Dyakowski — Department head). The dust catcher was situated at the axis of the blast furnace "A" to the south. It was designed for preliminary purging of the blast furnace gas created during production of the open-hearth and foundry pig iron. The basic part of the dust catcher was a steel jacket, connected with a gas pipeline coming from the top from the Blast Furnace "A". A pipeline from the dust catcher towards the blast furnace gas compressor station was designed to discharge gas. The outer diameter of the dust catcher was 7,674 m, while the height of the highest platform on it was 27,214 m. The dust from the dust catcher was transported, following humidification by means of humidifiers, via a belt conveyor to the carriage, in line with the process cycles adopted. The stage of development and modernisation carried out in late 1960s comprised also the tower of the passenger and cargo lift which was erected near the dust catcher, at the south-eastern corner of the Blast Furnace "A". It was indispensable for handling purposes. It was 35,90 m high. The original tower of the passenger and cargo lift was dismantled. The new bunkers, modernised previously, were to be used to supply the charge material to the Blast Furnace "A". The bunker tanks' capacity at that time was 90 m^3 for the ore and 160 m^3 for the coke. They were supplied from the railway carriages. The charge delivered by rail entered the weighing carriage used to fill the wheeled carriage, drawn along the inclined skip bridge by ropes to the charging platform. In the design, the Blast Furnace "A" had the usable capacity Vu 490 m^3. The modernisation comprised also the technical facilities adjacent to the Blast Furnace "A", housing the water filtering and pump station, cabin holding oxygen cylinders as well as the converter room. In 1967, there were further modernisations designed for the Blast Furnace "A". The documents were also developed by Biuro Projektów Przemysłu Hutniczego, Blast Furnace Department, "Biprohut". Eventually, in the designs dated 1967, the Blast Furnace "A" obtained a structure with a platform of the skip pulley at 44,750 m and skip carriage inclination axis at 38,650 m. A new, free-standing unit was erected based on the developed designs. It was built in the heart of the plant, 19 m from the operating Blast Furnace "A". It gained an enclosure structure which all the platforms, the above-throat structure and the skip bridge structure were supported on. The weight of the whole structure was 2,300 tonnes. In 1968, its moving with steel ropes to the site of the Blast Furnace "A" which was dismantled soon before was started. The works were carried out, as before, with the participation of Hutnicze Przedsiębiorstwo Remontowe, which had already completed similar tasks three times. When the works were completed, the new blast furnace replaced the old unit. According to the Polish Film Chronicle, the erection of the new Blast Furnace "A" took 105 days which meant minimised production downtime which would usually have been 1.5 year. According to the spoken information, the idea to move the furnace came from inż. Bogdan Matla. In subsequent years of "Pokój" Steelworks existence, the oldest blast furnaces were eliminated gradually. In 1973, the blast furnace "B" was eliminated and the consecutive ones were removed in subsequent years. Following those changes, in 1976 the steelworks production was carried out by four blast furnace assemblies. By 1988, two more blast furnaces were eliminated. The last one operated for production purposes was the Blast Furnace "A", erected in 1968. At the same time, it turned out to have insufficient capacity and to be outdated in terms of its structural solutions. Besides, just like all the blast furnaces damped before, its energy consumption was too high when compared to the Polish average. Also the Blast Furnace location turned out inconvenient as its operation entailed increased noise and significant dust increase in the city centre. Some of that nuisance was reduced when another major overhaul was completed in 1987. Thanks to that, the Blast Furnace service life was extended for other 8–10 years. It was accompanied by changing its production profile to ferro-manganese melting.

Continued in Enclosure no. 3

(Date and signature)
August 2012



Static dust catcher according to the design dated 1966 by "Biprohut" Biuro Projektów Przemysłu Hutniczego. Blast Furnace Department

View from the south-west

ENCLOSURE TO THE RECORD SHEET No. 3

1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address
"Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND — STATIC DUST CATCHER, HEATER ASSEMBLY 1,2,3, INCLINED SKIP BRIDGE, PASSENGER AND CARGO LIFT, THE FACILITIES ARE EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER
Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content
continued description, history, figures

Layout Plant of the Blast Furnace "A" compound Alteration and modernisation of Blast Furnace "A" 1967 Drawn to scale 1:400

Description continued

Heater assembly of the Blast Furnace "A" of Pokój Steelworks, no. 1, 2, 3

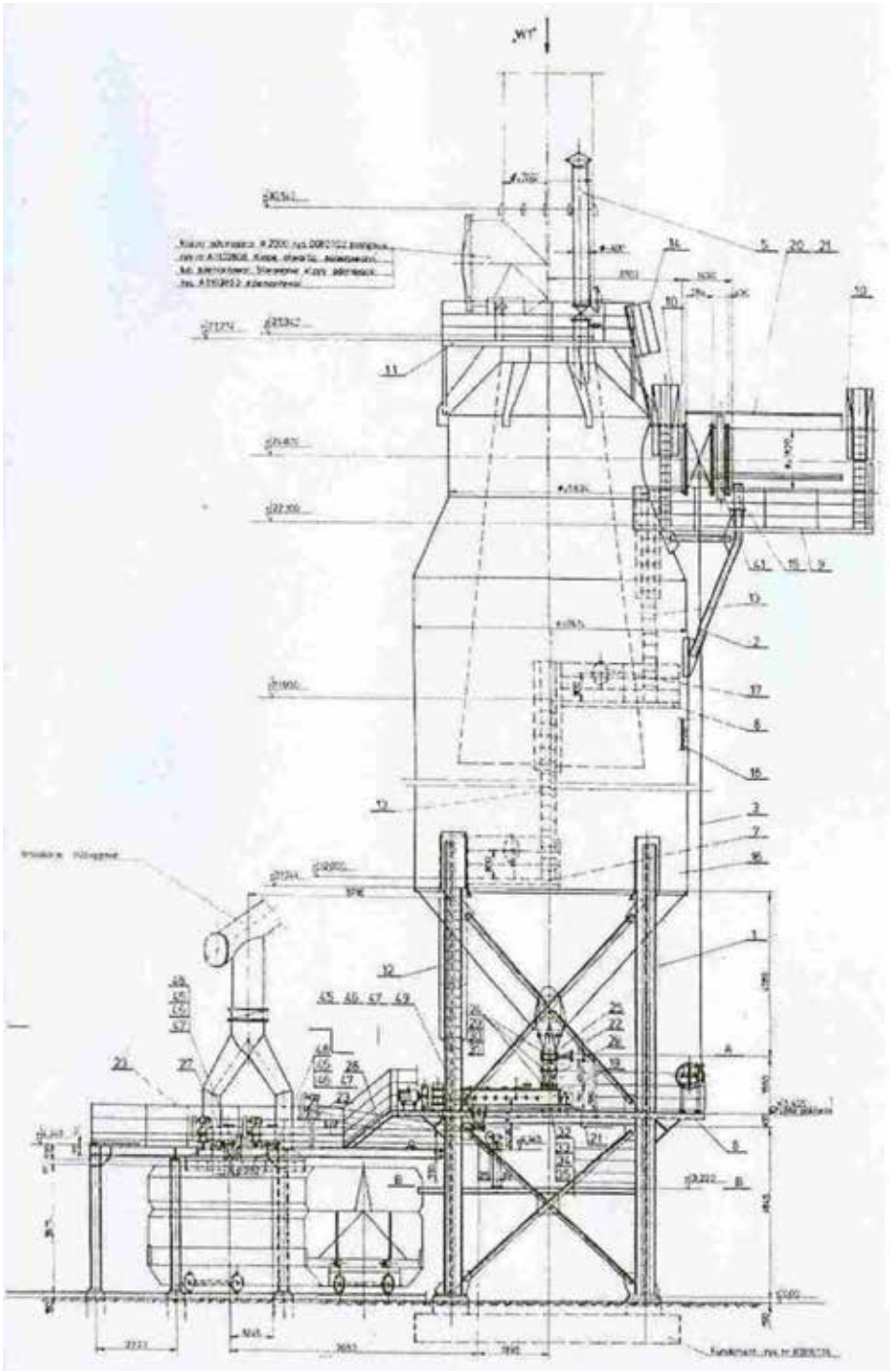
When the first blast furnace in "Pokój" Steelworks ("Friedenshütte") was started, the blast furnace gases could be discharged to the atmosphere. Those days, the Silesian steelworks were already using heaters. Their widespread use dates back to mid-19th century (in England the hot blast was used from 1827). In Silesia, Caldera units were considered most useful. Here, they were used for the first time in 1834 in Królewska Huta. Caldera heaters enabled to heat the air up to 400°C. Besides them, also Hoppe's heaters, and then Cowper heaters with chamotte lining were employed. The heaters of the latter type were used in metallurgy starting from 1880s (patent by E.A. Cowper in 1857). They were fuelled with purified blast furnace gas. Gas was transferred through scrubbers in the form of high towers. The filtering agent in the scrubbers was liquid. In early 1900s, Cowper's units were 22.5–28 m tall. Their diameter reached 7 m, and the heating area ranged 4–4.8 thousand m^2. In 1920s, the heating area of those heaters reached 5,500 m^2.

During the designed modernisation of the Blast Furnace "A", there was also the start-up of new blast heaters provided for. Their designed location was to the north-east of the Blast Furnace "A". The new units were created in 1966–1967. The heaters were fuelled with the blast furnace or mixed gas. Once the new heaters were completed, the old ones were removed.

The heater assembly no. 1, 2, 3 of the Blast Furnace "A" in "Pokój" Steelworks was created 20,000 m off the blast furnace, with the axis of the heater no. 1 moved, along the blast furnace axis, by 20,000 m to the north and 25.00 m to the east (with the heater axis moved when compared to the blast furnace axis). The heater distance to one another was 8.50 m. The heater jacket was 33,910 m high (starting from the upper platform base). The internal height of the jacket was 33,425 m. The heaters were built on the foundations, with a buried and closed flue gas duct to the west. The outer heater enclosure is made from steel jackets with diameters Ø7,028. At the heater no. 1, to the south, there was a steel two-flight stair structure with landings added along the entire height. The additional stair flight was built at the end of the main stair flight, leading directly above the rounded surface of the heater no. 1 jacket to the ring-shaped upper platform situated above. At that height, there were consecutive separate landings of a similar shape added, connecting the upper levels of heaters no. 2 and 3. To the west, at the heaters no. 1, 2, 3, there are individual braced steel I-beam posts. When compared to the heater axis, the posts were moved 8.98 m. The posts constitute the support structure for the hot blast pipeline, with a massive insulation, the horizontal section of which was suspended at the platform at 12.60 m. At the shifted hot blast pipeline support structure, consecutive platforms were installed at 7.56 m and 12.60 m (to support clean gas and burner air pipelines, hot blast dampers, in the structure elevation). At the heaters' base, there are individual stack valves Ø1,000 (right and left) and cut-off valves on the jacket. Between the stack valves, there are cold blast pipeline inlets Ø800, with vertical sections from the horizontal pipeline at 6.20 m, suspended from the platform at 7.56 m. The stack valves are controlled by devices installed on the additional steel platform, constructed under the hot blast pipeline support structure, at 4.70 m. At 8.98 m, there are gas burner enclosures, installed diagonally, with the sections of the burner air pipeline coming from the top, led from the horizontal section of the pipeline installed on the elongated external structure supporting the hot blast pipeline (shifted 8.98 m from the axis) at 19,500 m, and vertical sections of clean gas pipelines, coming from above, for which the horizontal pipeline section (at 23.50 m) was suspended from the platform installed at 24.11 m. Above, at 12.60 m, there is a platform supporting the hot blast pipeline.

Continued in Enclosure no. 4

Enclosure developed by:
(date and signature)
August 2012



Static dust catcher according to the technical dossier dated 1997 by Przedsiębiorstwo Inżynierskie "Biprohut" Sp. z o.o.

History, continued

The change was to exert a favourable impact on the deficit recorded in the Blast Furnace Department before. In 1991, the "Pokój" Steelworks was converted into a sole-shareholder company of the Treasury. At that time, a medium-size overhaul of the Blast Furnace "A" was carried out. Two turbofans were maintained to generate the blast furnace pass. The blast was received from three heaters, in the series, with the pressure of 0.1 MPa, used starting from their completion in 1966–1967. In 1994, "Pokój" Steelworks signed an agreement with Przedsiębiorstwo Inżynierskie "Biprohut" Sp. z o.o. for the development of technical dossier concerning modernisation of the Blast Furnace "A". The development was planned for 1995, within the major modernisation overhaul. The technical dossier covered also the static dust catcher Ø7,674 mm. For the scope of design works covering the dust catcher, the project manager was J. Chwoła, while the studio head was inż. M. Adamkiewicz. For the modernisation prepared, the scope connected with the environmental protection requirements was provided for the static dust catcher. Converting the Blast Furnace "A" to manufacture high-carbon ferro-manganese FeMnC in 1987 necessitated modernisation of dust catching and ensuring hermetic transport of dust from the dust catcher to the railway carriage. The gas pollution increased during ferro-manganese production, and its momentary temperature at the blast furnace throat level could reach 500°C. The scope of changes carried out during the dust catcher modernisation comprised erection of steel structures above the screw conveyors and platforms, adding two dust dampers (ZP-315), two rotary valves (B-315/17.5) and two screw conveyors (8 and 10 m long respectively). At the same time, dust humidifiers were made tighter, dust moisturising was 50% greater when compared to the previous situation (humidifiers with the capacity of 50 tonnes/h), the drives and electric systems were improved, and so was the dust extraction system from above the carriage, water and steam system quality as well as the inner jacket concrete lining was improved. After the works were completed, the dust catcher was emptied with switched-on water supply for the dust humidifier, switched-on screw conveyor, dust humidifier installed above the rotary valve, the rotary valve above the dust damper and with the open dust damper. The previous belt conveyor was eliminated. In 1997, "Pokój" Steelworks, carried out the second stage of the Blast Furnace "A" modernisation, adapting it also to the environment protection requirements. The dossier was prepared in PI "Biprohut" in Gliwice. At that time, according to the documents developed by PI "Biprohut" Sp. z o.o. in Gliwice, the Blast Furnace "A" had a structure with its highest platform at 58.00 m, the skip pulley platform at 44,750 m, the skip carriage inclination axis platform at 38,650 m, the platforms at the interbell space closure at 32,500 m and 32,300 m, the throat platform at 28,900 m, subsequent platforms at 22,500 m, 22,100 m, 18,700 m, 15,300 m, 8,500 m, the tapping hole axis level at 7,645 m and the crucible bottom support level at 6,535 m. The blast furnace capacity was still 490m^3, supplied with hot air via 12 tuyeres. The blast was still heated by means of three heaters 33,750 m high, made in 1966–1967. The blast furnace gas was dedusted by the existing static dust catcher.

Continued in Enclosure no. 5

ENCLOSURE TO THE RECORD SHEET No. 4

1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address
"Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND — STATIC DUST CATCHER, HEATER ASSEMBLY 1,2,3, INCLINED SKIP BRIDGE, PASSENGER AND CARGO LIFT, THE FACILITIES ARE EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER
Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content

continued description, figures

Drawing from the technical dossier PI "Biprohut" Sp. z o. o. — Major modernisation overhaul of the Blast Furnace "A", Assembly of blast heaters no. 1–3, 1994, drawn to scale 1:200

Description continued

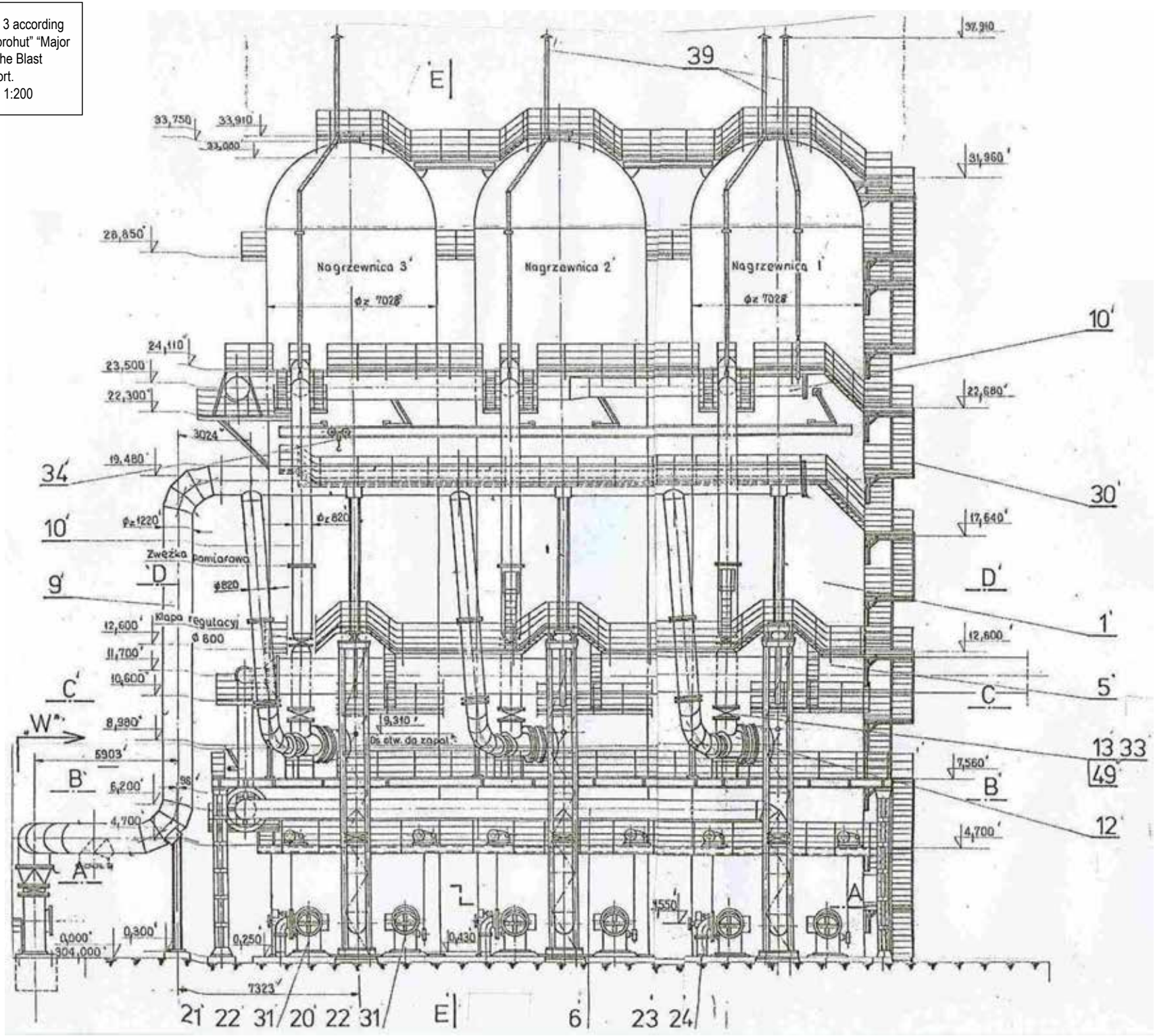
To the east of the heaters, there are circulation platforms connected with the main process platforms situated to the west, by means of stairs added to the heater no. 1, as well as vertical flights between the heaters no. 1 and 2, and between 2 and 3. The circulation platforms were installed at 5,025 m, 9.79 m, 14.55 m, 19.32 m, 24,085 m and 28,850 m. At the closure of the heater jackets, the levels for the connected upper platforms are as follows: 33.00 m, 33,750 m and 33,910 m. The thermal insulation inside the heaters is composed of a lining along the entire perimeter, with the diameters narrowed in the cross-section clearance to Ø5,940 m. At the heaters' bases, the workspaces in the jackets are filled by grates with the inlets at the end of pipe sections Ø800, coming from the cold blast pipeline, from below. In every heater, there are sections of individual, insulated pipes (inner Ø 1,860 mm, outer Ø 2,920 mm) at the lining, to the west. Heater trusses were made from refractory materials. They are heated periodically with the burnt blast furnace gas to heat the air supplying the hot blast. The trusses were made from NFK blocks.

The heaters have the following parameters: diameters of ducts in trusses Ø 40 mm, truss cross-section area 18.46/18.30 m^2, horizontal area of combustion shafts 2.72/3.14 m^2, truss space volume 494 m^3, heating area for 1 m of the truss 36 m^2/m^3, total heating area 18,000 m^2, inner height of the heater jackets 44,425 mm. During the operation, the heaters maintained the pressure of 0.1 MPa, hot blast temperature of 1,100°C, hot blast demand 55,000 Nm^3/h, burner gas demand 2x17,500 Nm^3/h, (calorific value of the gas ~1,200 kcal/Nm^3, burner gas pressure ~250 mm water 2column with the combustion air demand of 2x19,000 Nm3/h, combustion air pressure ~300 mm water column, for the gas burner size of 18,000 Nm^3/h. The F parameter of the heaters was 1,380 m^2. In 1995, before the major modernisation overhaul of the heaters was carried out, there was a combustion air fan WPW-80/1.8-A operated at the units, manufactured by Fabryka Wentylatorów in Chełm Śląski (pressure increase 360 kG/m^2, capacity 50,000 m^3/h, motor power 75 kW, 980 rpm

Continued in Enclosure no. 8

View from the south-west

Blast heater assembly 1, 2, 3 according to the documents by PI "Biprohut" "Major modernisation overhaul of the Blast Furnace "A". Summary report.
1994 Drawn to scale 1:200



ENCLOSURE TO THE RECORD SHEET No. 5

1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address
"Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND — STATIC DUST CATCHER, HEATER ASSEMBLY 1,2,3, INCLINED SKIP BRIDGE, PASSENGER AND CARGO LIFT, THE FACILITIES ARE EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER
Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content

continued history, figures

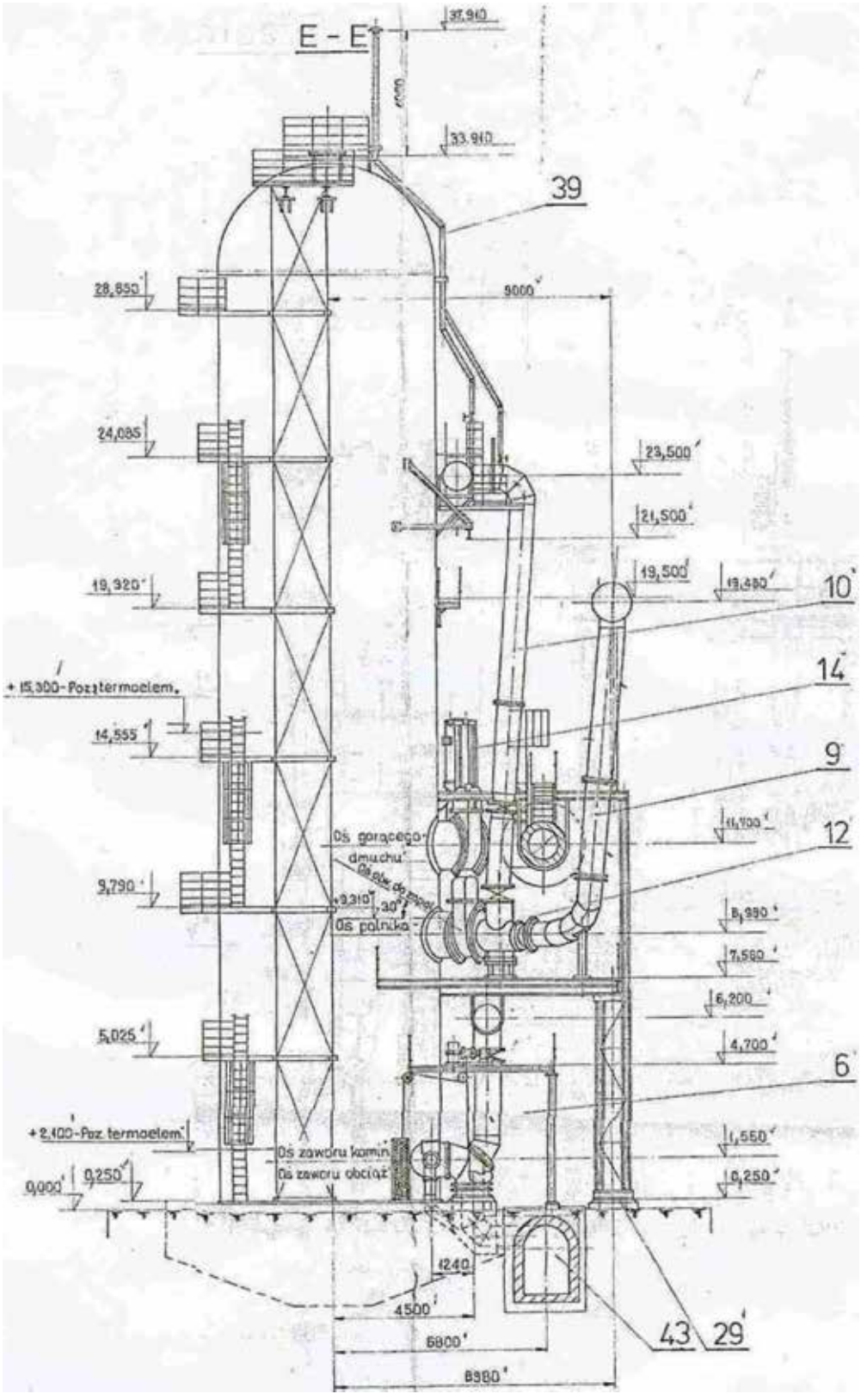
Drawing from the technical dossier PI "Biprohut" Sp. z o. o. — Major modernisation overhaul of the Blast Furnace "A", Assembly of blast heaters no. 1–3, 1994, drawn to scale 1:200

Description continued

The major modernisation overhaul of the Blast Furnace "A" carried out in 1995 comprised also the blast heaters 1–3. It was based on the documents developed in June 1994 by Przedsiębiorstwo Inżynierskie "Biprohut" (the team composed of: Maśnica — designer, project manager; Łattka — verification; Adamkiewicz — studio head). In 1997, ferro-manganese production in "Pokój" Steelworks was terminated. In 1999–2000, some assets of Huta "Pokój" SA, being the owner of the whole plant, were put up for sale by the National Investment Funds. The facilities in the former blast furnace department, including the Blast Furnace "A", were purchased by "Żelazostopy" Sp. z o.o. with its seat in Ruda Śląska, at 79 Niedurnego Street. The subsequent owner of the facilities of the former blast furnace department was the "Eurostal Inwestycje" Sp. z o.o. consortium, with its seat in Warsaw (a third-party company, not a "daughter" of Huta Pokój SA). Its new branch was created on 28 November 2003 in Ruda Śląska, at 79 Niedurnego Street. "Eurostal Inwestycje" Sp. z o.o. consortium decided to resume ferro-manganese production in the blast furnace. There were plans to start it for seven or eight thousand tonnes of raw material a month, with five thousand tonnes for Polish steelworks. Ferro-manganese was used for melting steel and other metal alloys, as well as for producing welding electrode covers. At that time, it was the only ferro-manganese manufacturer in Poland. Next, "Eurostal Inwestycje" Sp. z o.o. consortium was transformed into "Stalmag" Sp. z o.o. with its seat in Ruda Śląska at 2 Hutnicza Street, and the Blast Furnace "A" belonging previously to "Pokój" Steelworks became an asset of that company. In 2004, the blast furnace was lit off again following many years' pause, with the effort of "Stalmag". Its start-up took place in March and April, and the production was to be started mid-May. The devices were made operable, the charge materials were prepared, and the staff mostly employed. Starting from mid-May, the raw material was discharged to the carriages filled with liquid ferro-manganese. However, the blast furnace operation was interrupted by faults. In 2005 the blast furnace products offered by "Stalmag" comprised iron alloys, i.e. high-carbon ferro-manganese (FeMn HC), ferrosilicon (FeSi70), ferro-silico-manganese (FeSiMn), and also blast furnace slag and manganese slag. According to the study funded in 2005 by the Ministry of Environmental Protection (Najlepsze dostępne techniki — BAT — Wytyczne dla produkcji żelaza i stali — Huty zintegrowane), the average period from the last modernisation of the blast furnace owned by "Stalag" Sp. z o.o. Reached 6 years. The usable capacity of the blast furnace stipulated in it reached 483 m3, and the total nominal production capacity was 200–100 thousand Mg/year. At the same time, the ferro-manganese production in "Stalmag" was stopped on 1–2 February 2005, with the blast furnace damped and the workers sent on a leave. One of the stipulated reasons for the blast furnace damping was the use of incorrect technology for blast furnace gas cleaning which was to result in the penetration of high amount of cyanides to the ponds, being components of the process. "Pokój" Steelworks executed an agreement with "Stalmag", being obliged to collect and clean the blast furnace gases. The cleaning took place in the closed water circuit, and the precipitation was discharged to the ponds. The situation did not change and it became impossible to start the blast furnace again because of the environmental hazard. It was quoted as the official reason for terminating the production. However, the unofficial reason could be the difficulties resulting from low sale volumes of ferro-manganese. At the same time, "Stalmag" authorities believed the production was terminated temporarily. At present, some systems required for the blast furnace startup were removed permanently.

(date and signature)
August 2012

Blast heater assembly 1, 2, 3 according to the documents by PI "Biprohut" "Major modernisation overhaul of the Blast Furnace "A". Cross-section E-E 1994 r. Drawn to scale 1:200



ENCLOSURE TO THE RECORD SHEET

No. 6

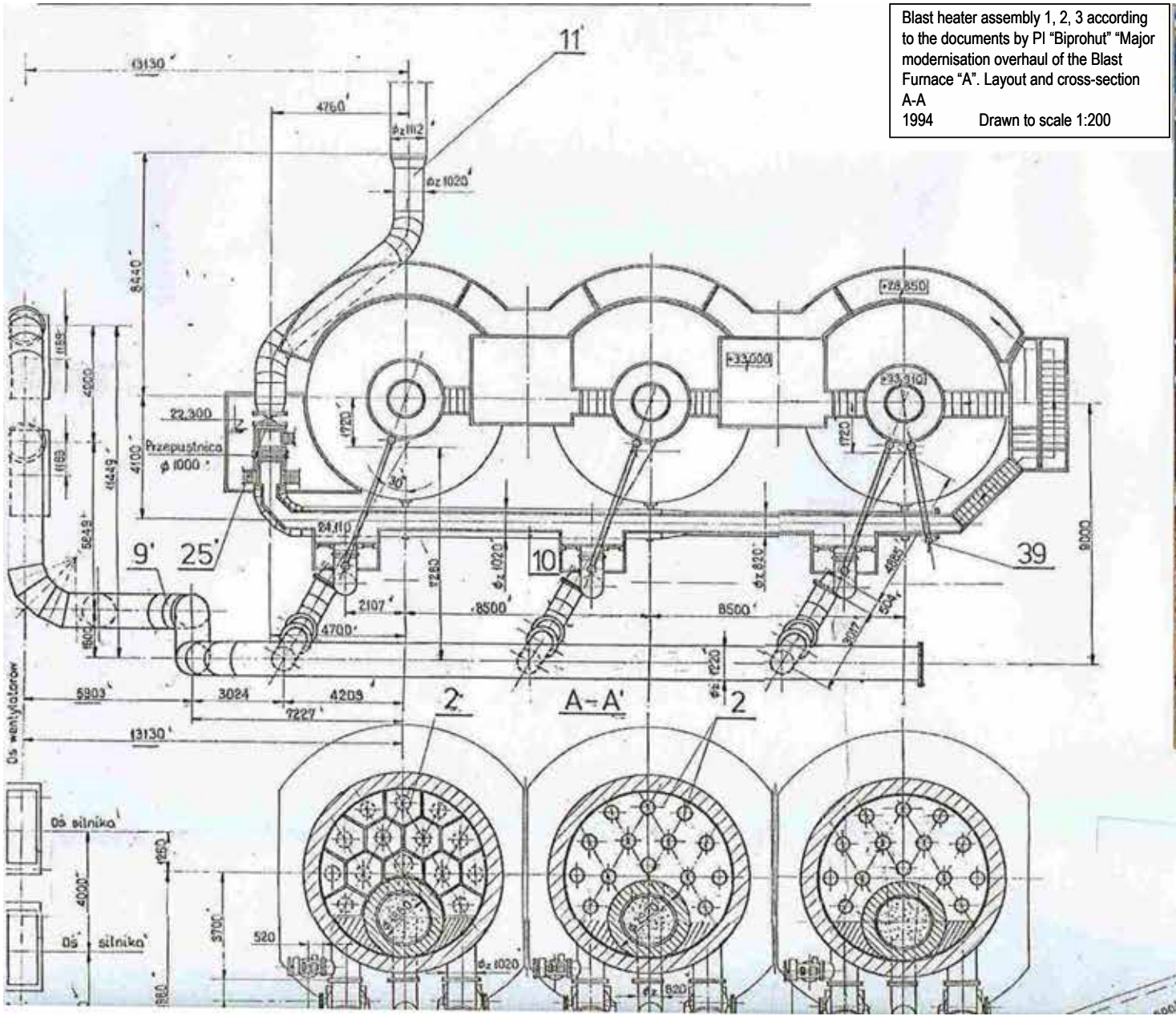
1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address
"Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND — STATIC DUST CATCHER, HEATER ASSEMBLY 1,2,3, INCLINED SKIP BRIDGE, PASSENGER AND CARGO LIFT, THE FACILITIES ARE EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER
Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

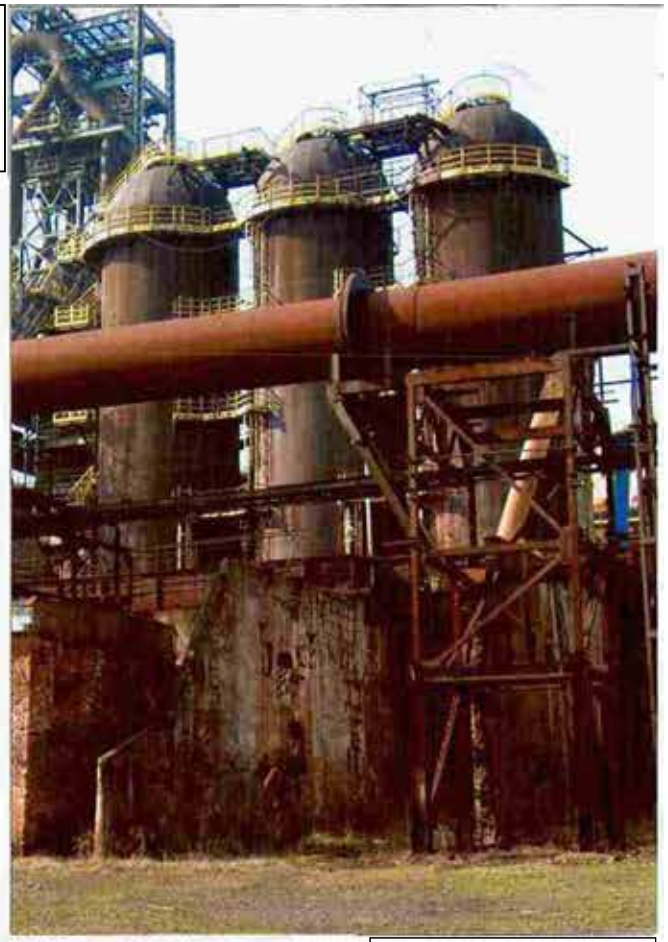
6. Enclosure content

figures

Drawing from the technical dossier PI "Biprohut" Sp. z o.o. — Major modernisation overhaul of the Blast Furnace "A" — Blast heater assembly 1–3, 1994, drawn to scale 1:200

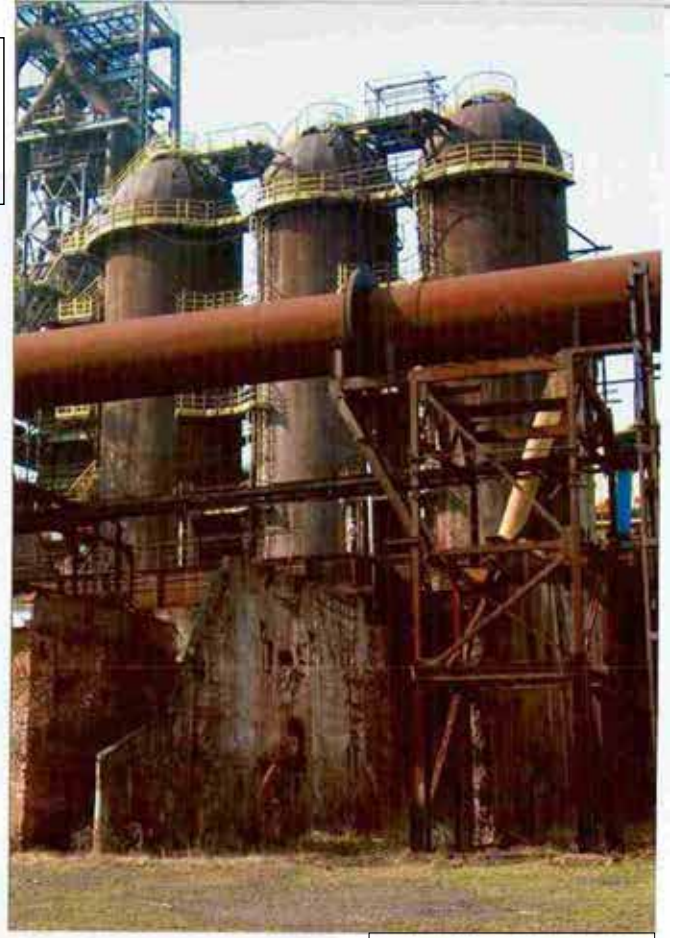


Blast heater assembly 1, 2, 3 according to the documents by PI "Biprohut" "Major modernisation overhaul of the Blast Furnace "A". Layout and cross-section A-A
1994 Drawn to scale 1:200



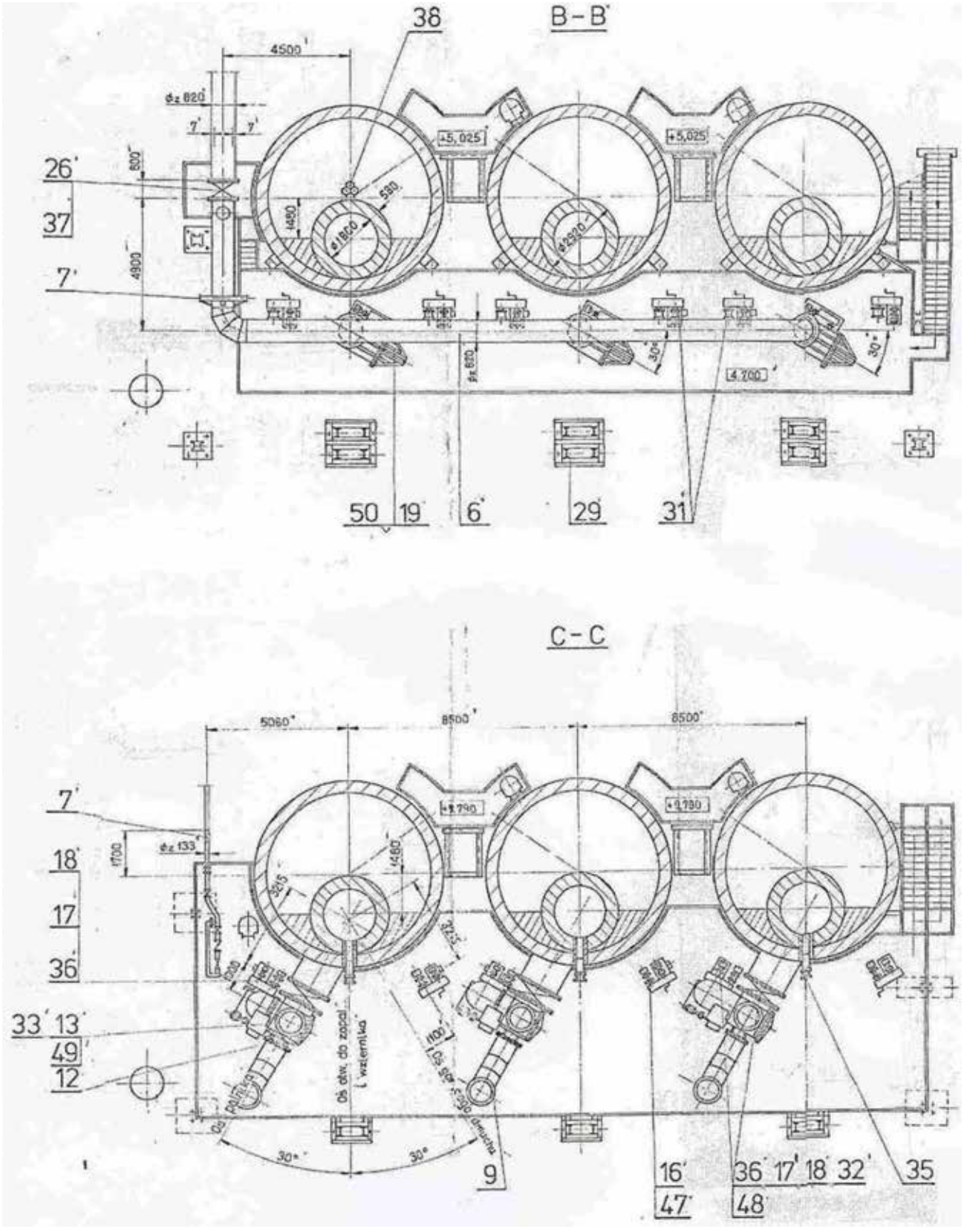
Blast heater assembly 1,2,3
View from the east

Blast heater assembly 1, 2, 3 according to the documents by PI "Biprohut" "Major modernisation overhaul of the Blast Furnace "A". Layout and cross-section A-A
1994 Drawn to scale 1:200



Blast heater assembly 1,2,3
View from the east

Blast heater assembly 1, 2, 3 according to the documents by PI "Biprohut" "Major modernisation overhaul of the Blast Furnace "A". Cross-section B-B and C-C
1994 Drawn to scale 1:200



ENCLOSURE TO THE RECORD SHEET

No. 7

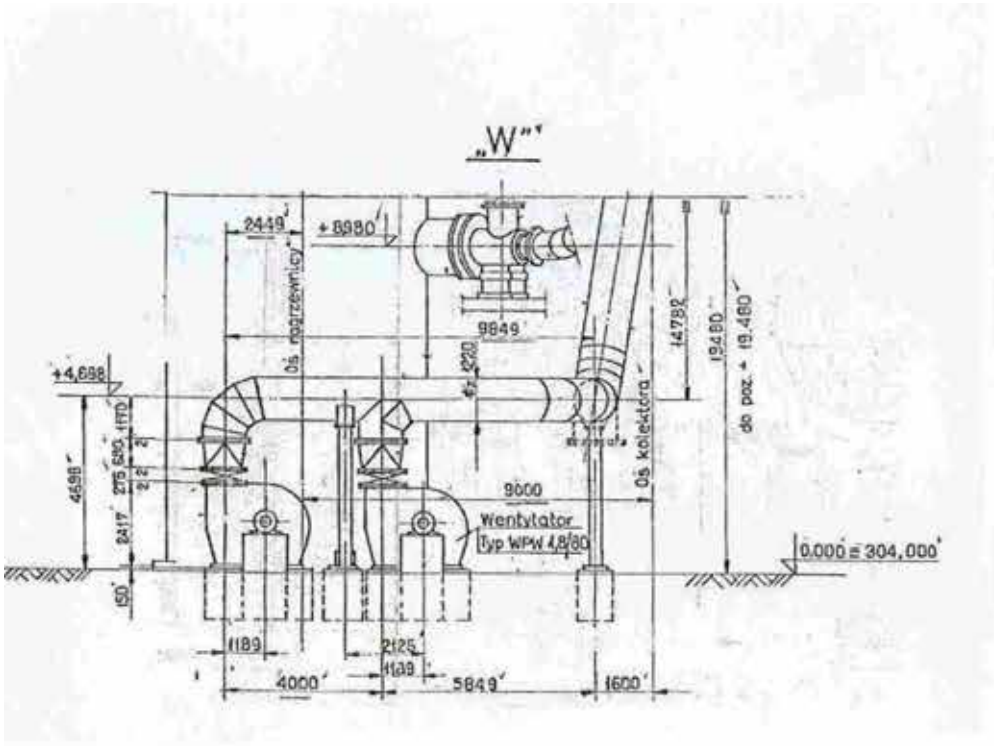
1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address
"Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND — STATIC DUST CATCHER, HEATER ASSEMBLY 1,2,3, INCLINED SKIP BRIDGE, PASSENGER AND CARGO LIFT, THE FACILITIES ARE EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER
Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

6. Enclosure content

Photos, figures

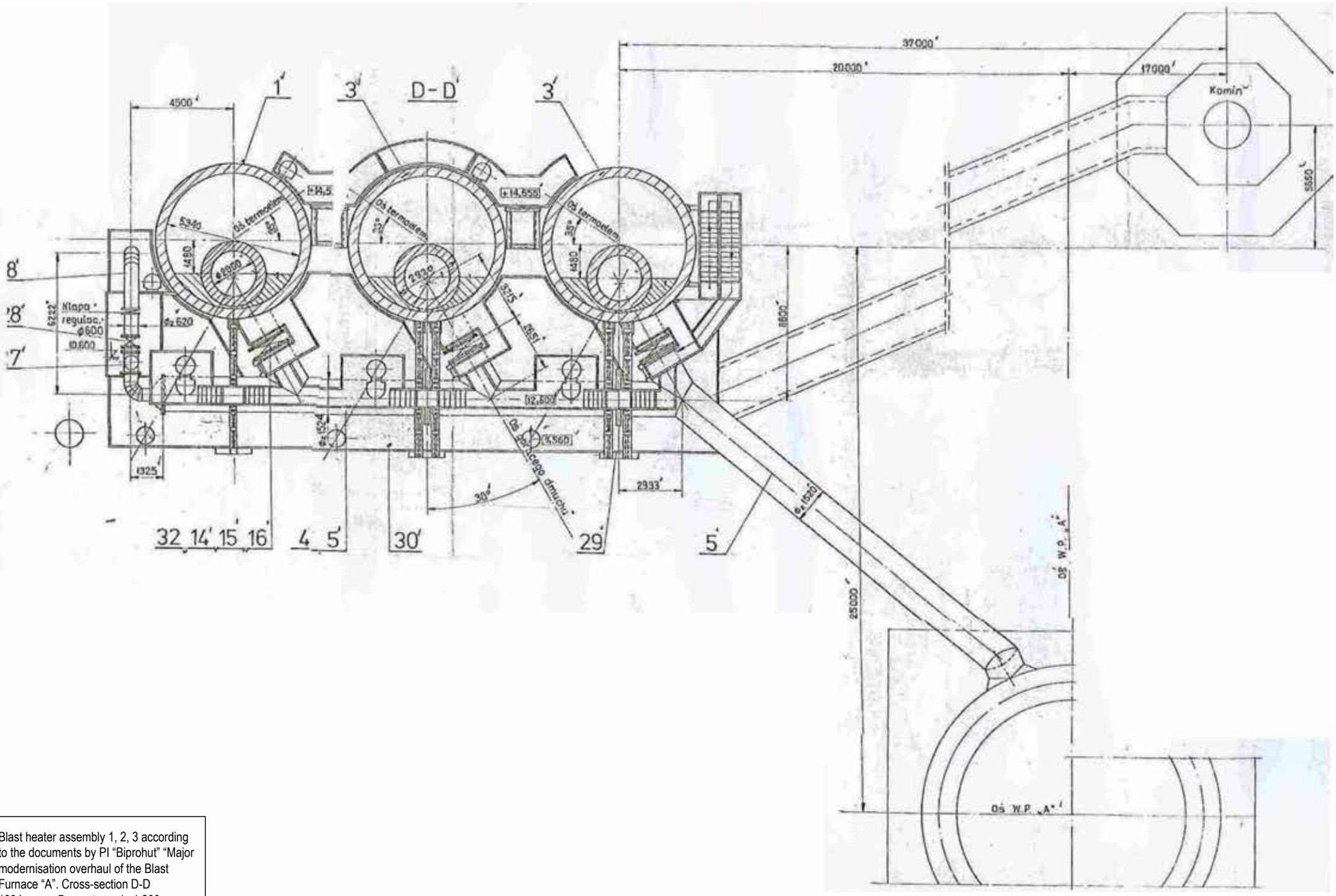
Drawing from the technical dossier PI "Biprohut" Sp. z o. o. — Major modernisation overhaul of the Blast Furnace "A", Assembly of blast heaters 1–3, 1994, drawn to scale 1:200



Blast heater assembly 1, 2, 3 according to the documents by PI "Biprohut" "Major modernisation overhaul of the Blast Furnace "A". View along the fan axis
1994 Drawn to scale 1:200

Blast heater assembly 1,2,3
View from the east

(date and signature)
August 2012



Blast heater assembly 1, 2, 3 according to the documents by PI "Biprohut" "Major modernisation overhaul of the Blast Furnace "A". Cross-section D-D
1994 Drawn to scale 1:200

ENCLOSURE TO THE RECORD SHEET No. 8

1. Location	Ruda Śląska	5. Name of the historical monument (as in the record sheet), address "Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND — STATIC DUST CATCHER, HEATER ASSEMBLY 1,2,3, INCLINED SKIP BRIDGE, PASSENGER AND CARGO LIFT, THE FACILITIES ARE EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER Ruda Śląska — Nowy Bytom, 79 Niedurnego Street	6. Enclosure content continued description, figures
2. Commune	Ruda Śląska		
3. Poviat	Township of Ruda Śląska		
4. Voivodeship	of Silesia		

View of the passenger and cargo lift tower (between the static dust catcher and the blast furnace) to the south-west.

Description continued

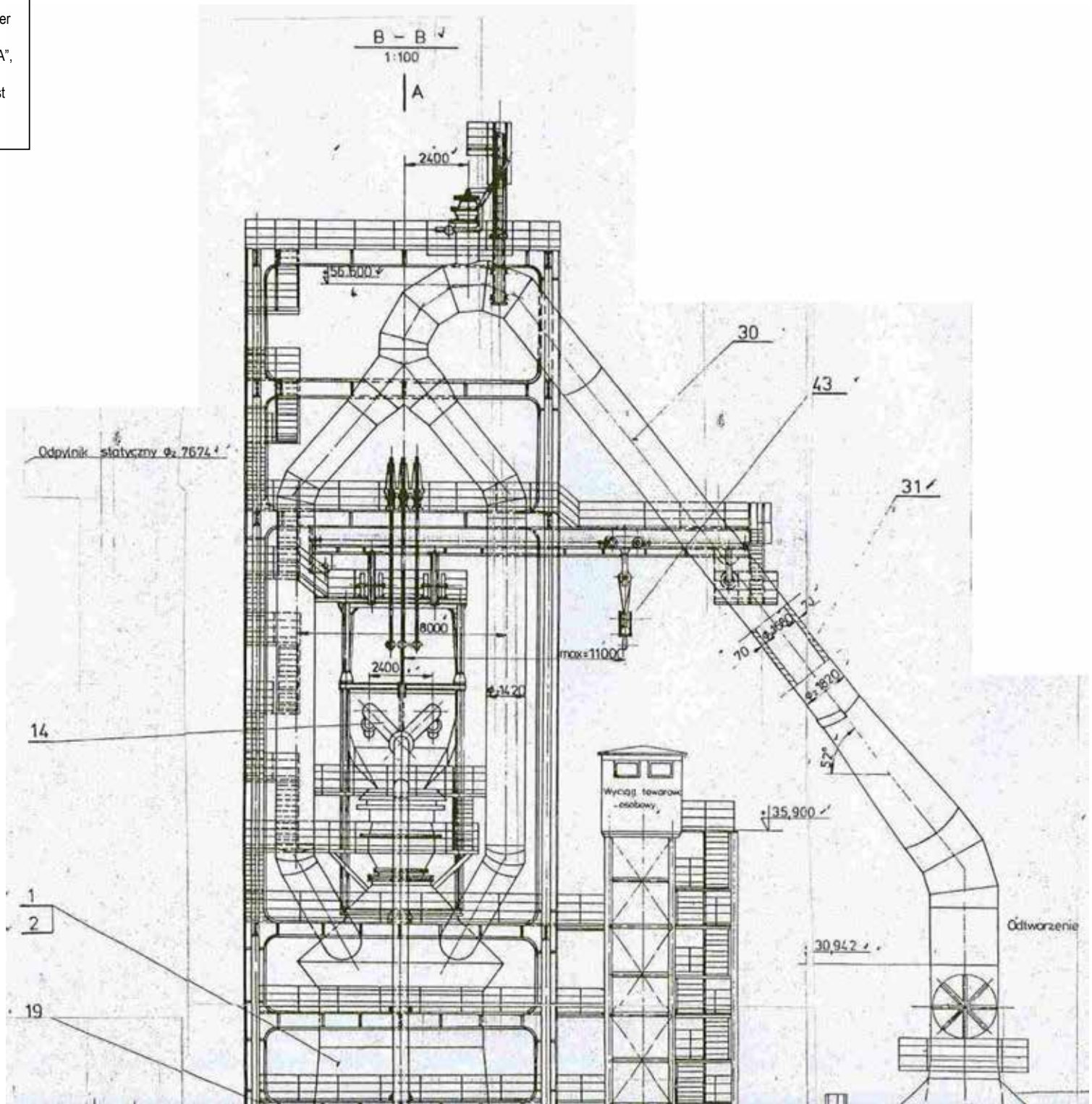
Passenger and cargo lift (according to the documents by PI "Biprohut" Sp. z o.o. — Major modernisation overhaul of the blast furnace "A" in 1994 — Pawlik (designer), Wloka (verification), Szary (project manager), Adamkiewicz (studio head).

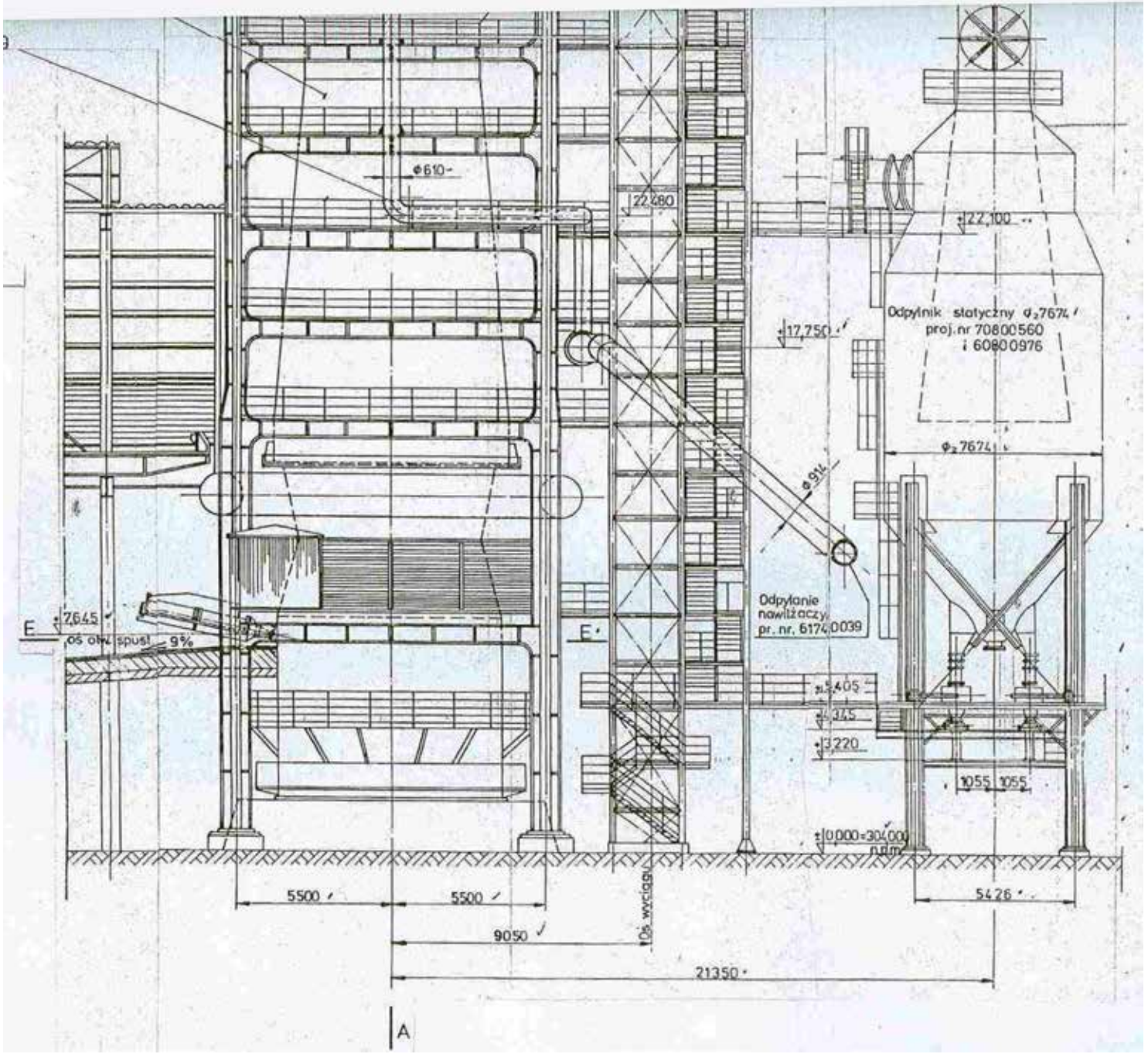
The lift tower is situated directly at the south-eastern corner of the Blast Furnace "A", with axial shift along the Blast Furnace axis by 9.05 m. It is a steel structure, with the shaft for the lift to the south of the Blast Furnace, and a structure for the staircase, added to it to the south. The core structure is composed of corner and central columns, beams connecting them (in four planes at 20 levels), as well as bracings. At the first three levels, the stair flights surround the core, with a longer landing at +5,405 m, extended to reach the static dust catcher platform at +4,345 m. Above, the vertical circulation route is included solely in the stair core structure, to the south of the lift core, leading to the upper platform at +35.90 m. At +22.10 m, there is an additional platform leading to the static dust catcher. From the Blast Furnace "A", the platforms were erected at +8.5 m (tapping hole axis +7,645), +15.3 m, +18.7 m, +22.10 m, +25.5 m, +28.9 m (at the throat level), +32.3 m (at the closure of the interbell space and at the charging level). At the lift core structure end there was a cabin of a small machine room, with walls having a brick core, closed with a pyramidal roof. To lit it, there were pairs of small, rectangular window openings designed in the walls. At present, the machine room cabin does not exist.

Continued in Enclosure no. 9

(date and signature)
August 2012

The cross-section of the Blast Furnace “A” with the passenger and cargo lift tower according to the technical dossier by PI “Biprohut”, Huta “Pokój” SA “Modernisation of the Blast Furnace “A”, adapting it to the environmental protection requirements, stage II. Blast Furnace “A”.
1997 Drawn to scale 1:200




Ø610
22,480
+22,100
Odpylnik statyczny Ø 7674
proj. nr 70800560
i 60800976
+17,750
Ø 914
Ø 7674
Odpylanie
nawilżaczy
pr. nr. 6174.0039
E
+7,645
oś obw. spust 9%
E'
+5,405
+4,375
+3,220
1055 1055
±0,000=30,000
5500
5500
9050
21350
5426
oś wyciągu
A

ENCLOSURE TO THE RECORD SHEET No. 9

1. Location	Ruda Śląska	5. Name of the historical monument (as in the record sheet), address "Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND — STATIC DUST CATCHER, HEATER ASSEMBLY 1,2,3, INCLINED SKIP BRIDGE, PASSENGER AND CARGO LIFT, THE FACILITIES ARE EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER Ruda Śląska — Nowy Bytom, 79 Niedurnego Street	6. Enclosure content continued description, figures
2. Commune	Ruda Śląska		
3. Poviat	Township of Ruda Śląska		
4. Voivodeship	of Silesia		

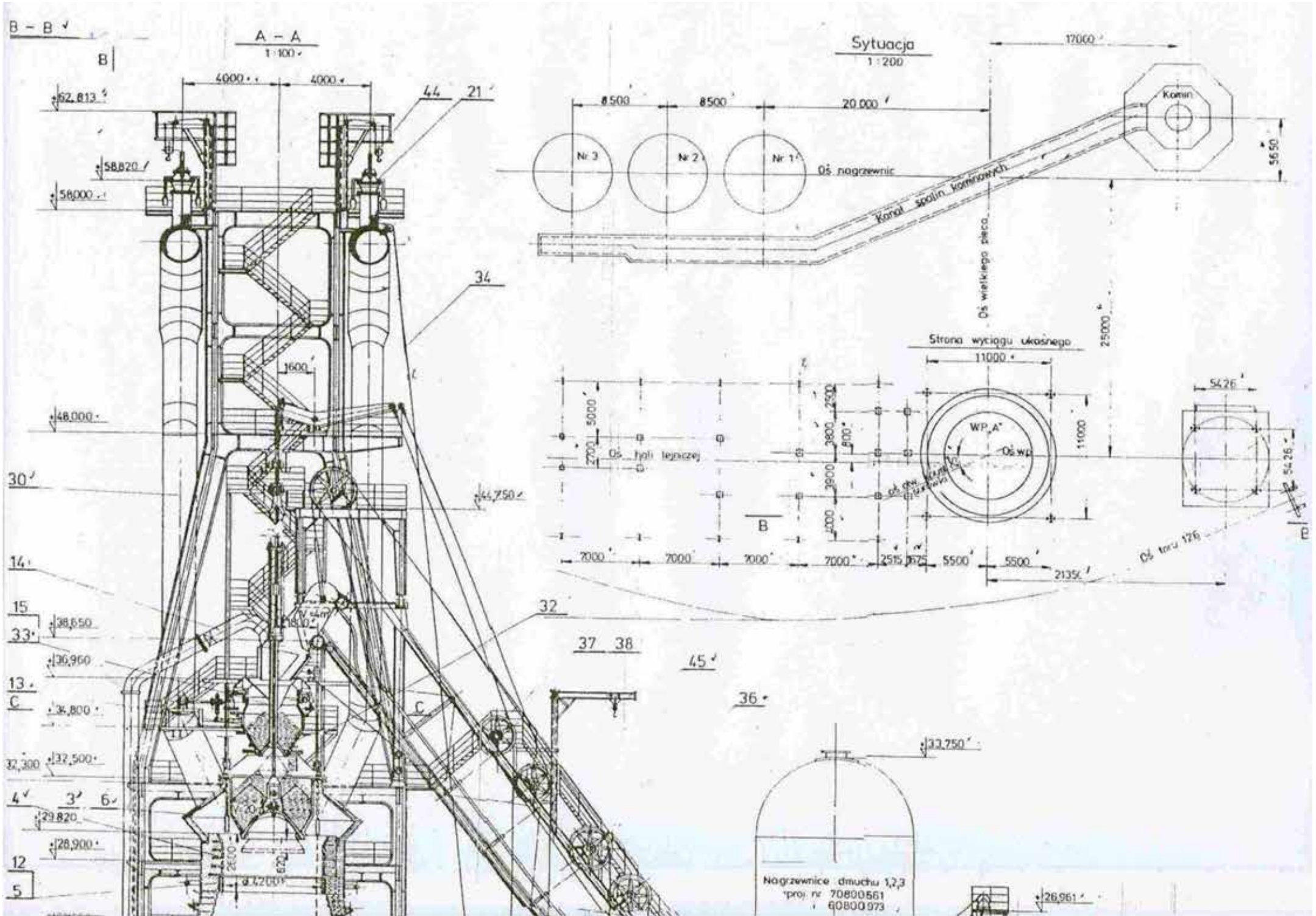
Description continued

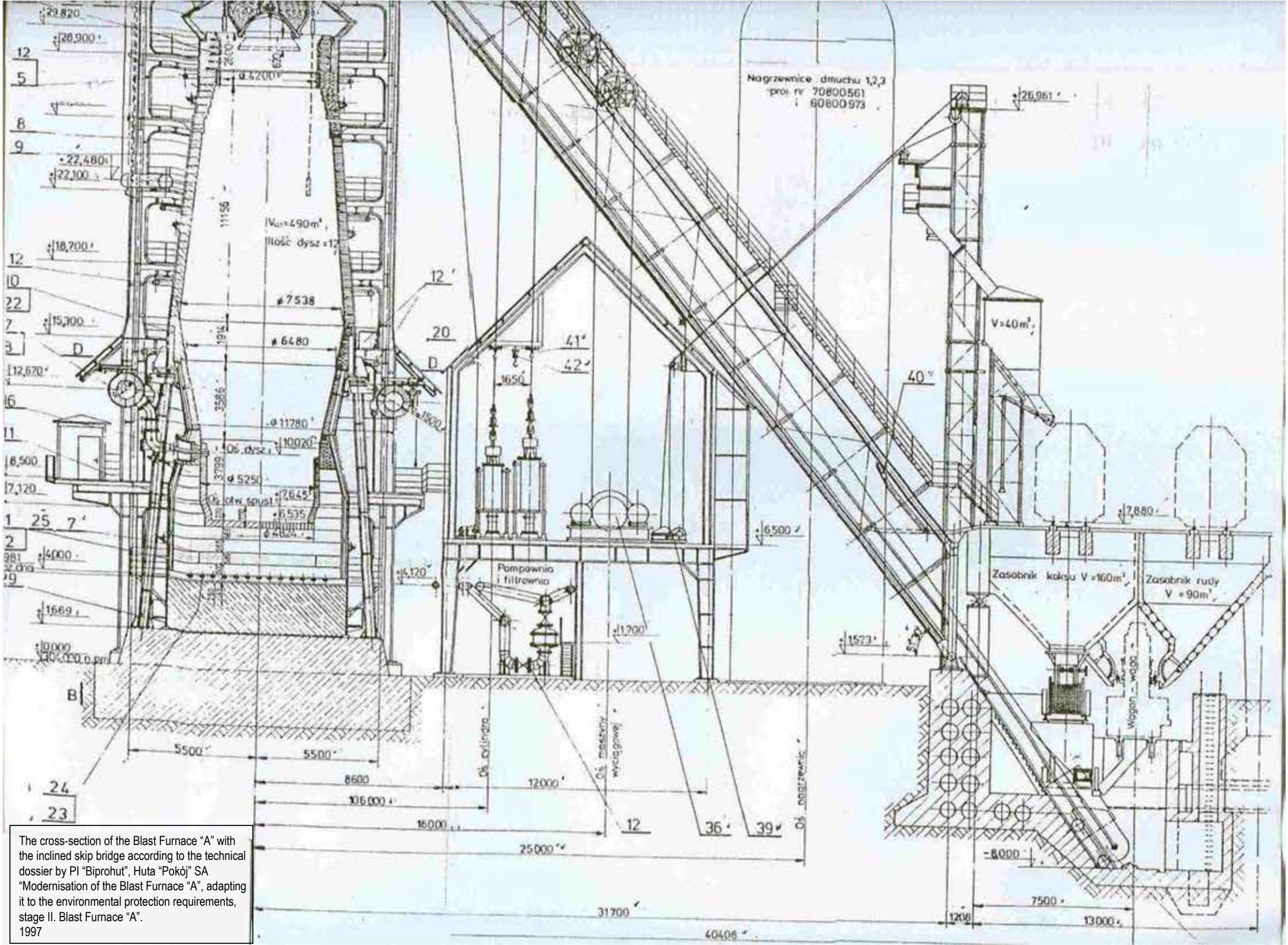
Inclined skip bridge

(Inclined skip bridge (according to the documents by PI "Biprohut" Sp. z o.o. — Major modernisation overhaul of the blast furnace "A" in 1994 — Pawlik (designer), Wloka (verification), Szary (project manager), Adamkiewicz (studio head)). It is situated to the east of the Blast Furnace. The arm is a steel structure made from trusses, covering a narrow space in four planes. It was installed diagonally, at the junction between the coke and ore bunkers and the closure of the blast furnace interbell space, to enable to transport the charge. There were four pairs of pulleys installed on the upper arm. The blast furnace was charged through the blast furnace throat, using wheeled skip carriages, supplied from bunkers with the capacity of 90 m3 for ore and 160 m3 for coke situated in the burden hall. The axis of the scales carriage situated above the skip carriage used to charge the ore and the coke is shifted 40.408 m when compared to the blast furnace axis. The skip carriage, filled at -8.00 m, was pulled by ropes to the level of the interbell space closure and charging, where it tipped (the skip carriage inclination axis at the level of +38,650 m). The carriage moved on rails in the lower arm structure plane. The line attached to the carriage reached the pulley installed directly on the blast furnace structure, above the platform at +44,750 m, through which it returned to the control gear installed below, to the steel structure of the skip arm, leading to the drum of the hoisting unit in the room above the pump and 1 filtering room at +6.5 m (the axis of the hoisting unit drum shifted by 16.00 m when compared to the blast furnace axis). Above the pair of pulleys which controlled the skip, there was a pair of pulleys controlling the bell lever. The skip carriage had two wheel sets. The loading was controlled automatically. The volume of the skip carriage transporting the charge directly to the blast furnace was 4 m^3.

A part of the arm structure of the inclined skip bridge to the South

(date and signature)
August 2012


B – B
A – A
1:100
B
4000
4000
62,813
58,820
58,000
48,000
44,750
38,650
36,960
34,800
32,300
32,500
29,820
28,900
44
21
34
30
14
15
33
13
C
4
3
6
12
5
1600
2600
620
ø 4200
Sytuacja
1:200
17000
8500
8500
20 000
Nr 3
Nr 2
Nr 1
Oś nagrzewnic
Kanał spalin kominowych
Komin
5650
Oś wielkiego pieca
25000
Strona wyciągu ukośnego
11000
5426
WP „A"
Oś wł.
Oś hali lejniczej
5000
2700
2500
3800
800
3900
2000
11000
7000
7000
7000
7000
2515
2625
5500
5500
2135
Oś toru 126
B
32
37
38
45
36
33,750
Nagrzewnice dmuchu 1,2,3
proj. nr 70800561
60800973
26,961



The cross-section of the Blast Furnace “A” with the inclined skip bridge according to the technical dossier by PI “Biprohut”, Huta “Pokój” SA “Modernisation of the Blast Furnace “A”, adapting it to the environmental protection requirements, stage II. Blast Furnace “A”.
1997

ENCLOSURE TO THE RECORD SHEET

No. 10

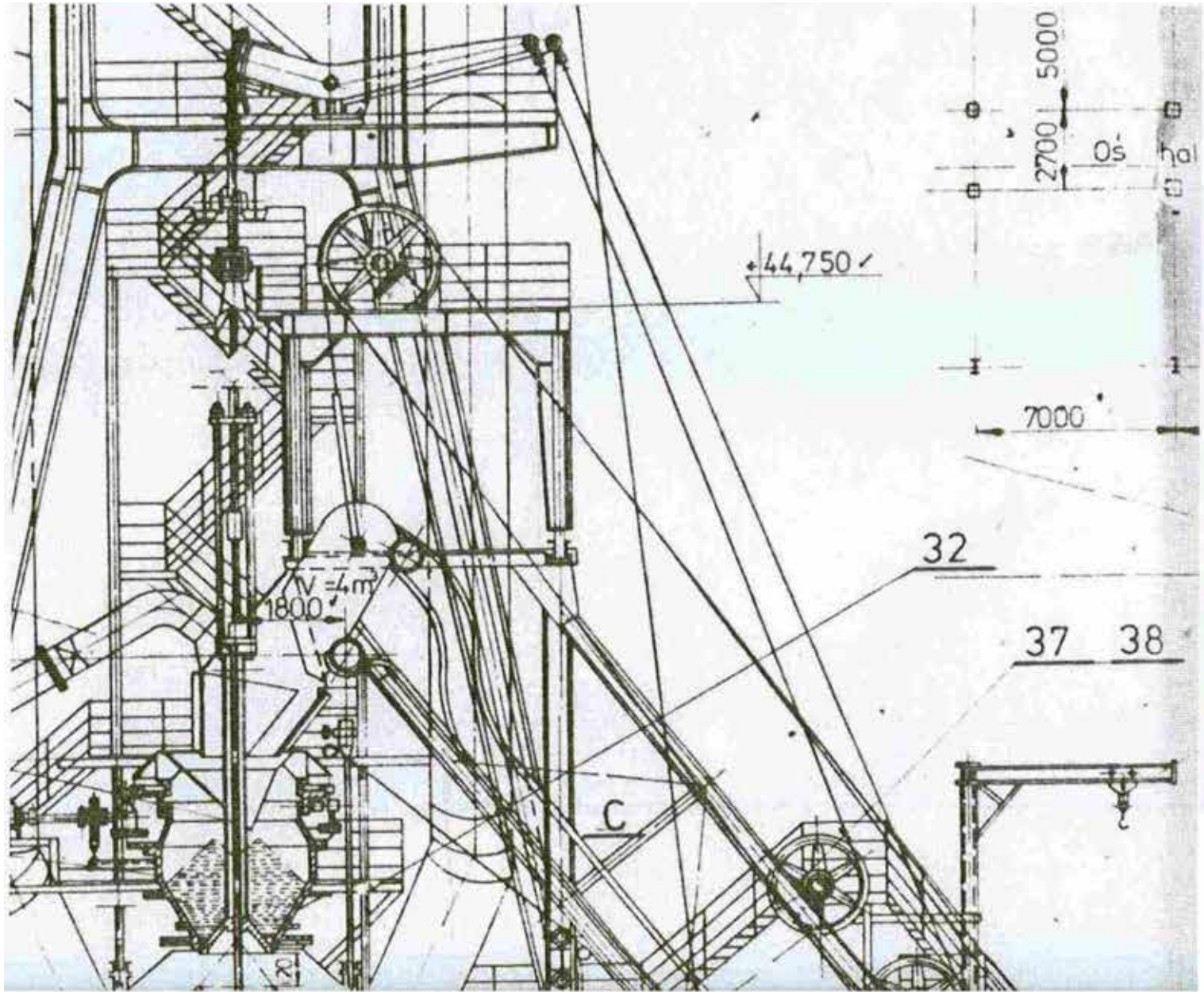
1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address
"Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND — STATIC DUST CATCHER, HEATER ASSEMBLY 1,2,3, INCLINED SKIP BRIDGE, PASSENGER AND CARGO LIFT, THE FACILITIES ARE EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER
Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

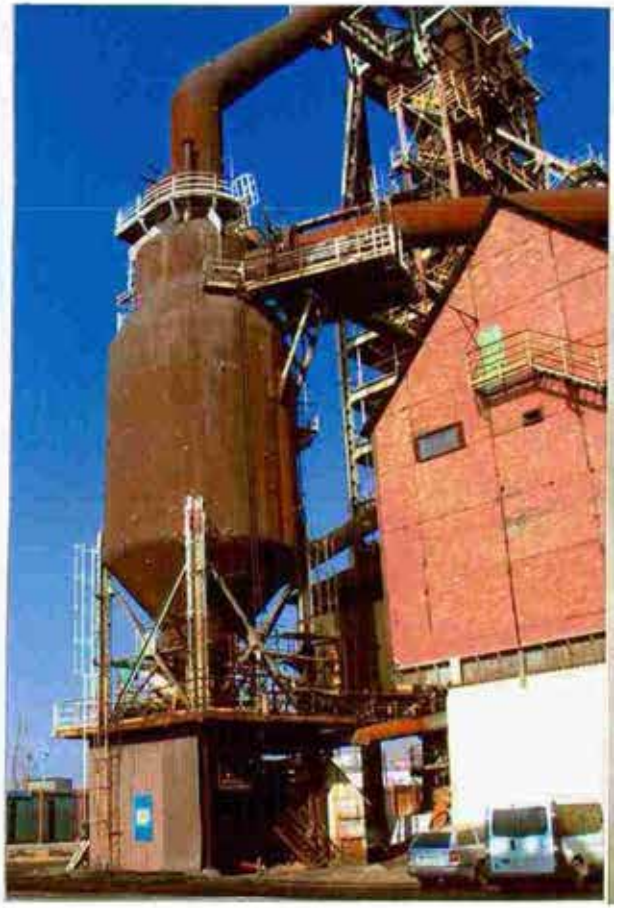
6. Enclosure content

figures

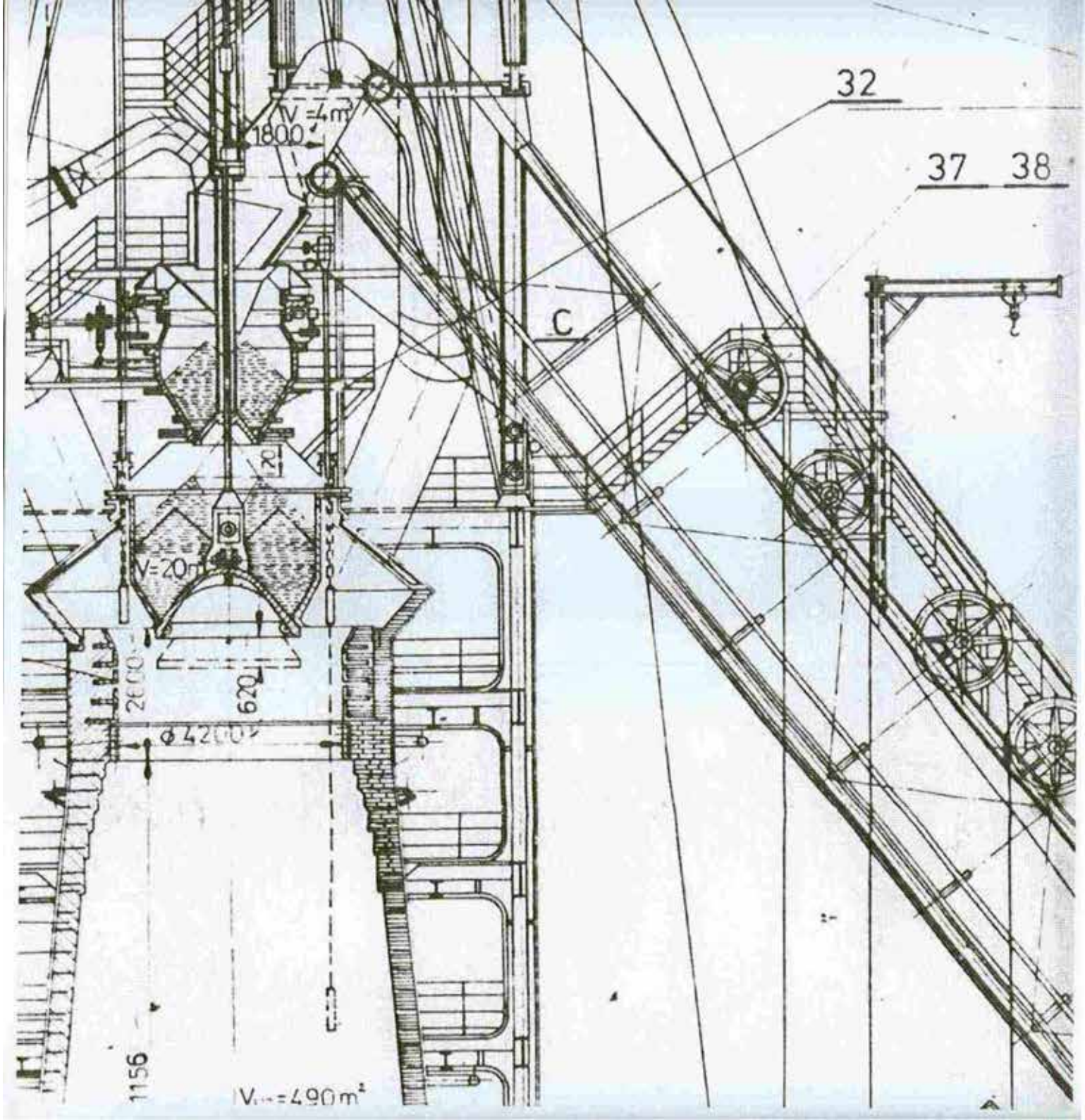
Drawing from the technical dossier Pi "Biprohut" Sp. z o.o. — "Modernisation of the Blast Furnace "A", adapting it to the environmental protection requirements, stage II. Blast Furnace "A", 1997 Drawn to scale 1:100



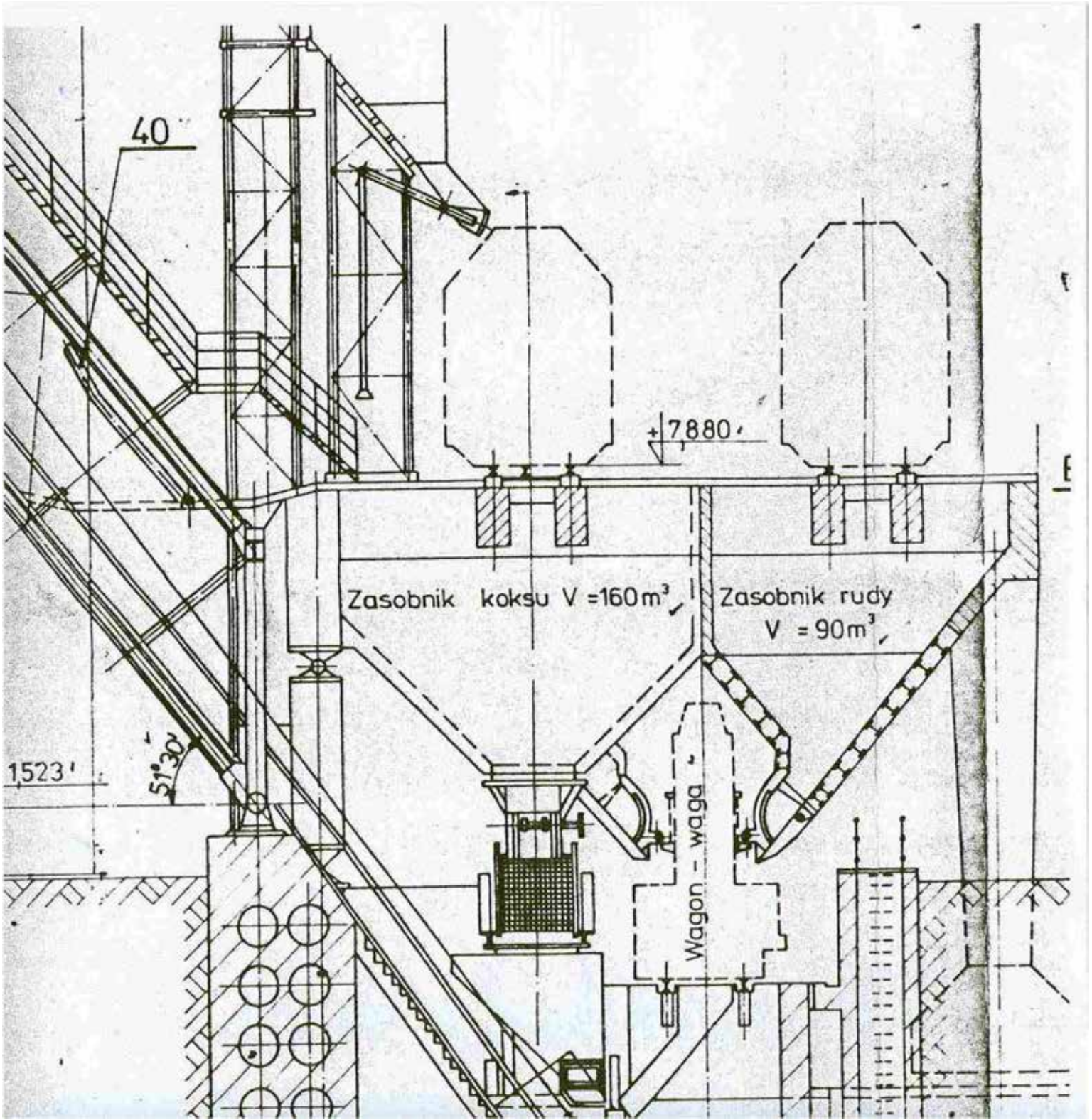
A part of the structure of the inclined skip bridge with pulleys at the Blast Furnace throat.



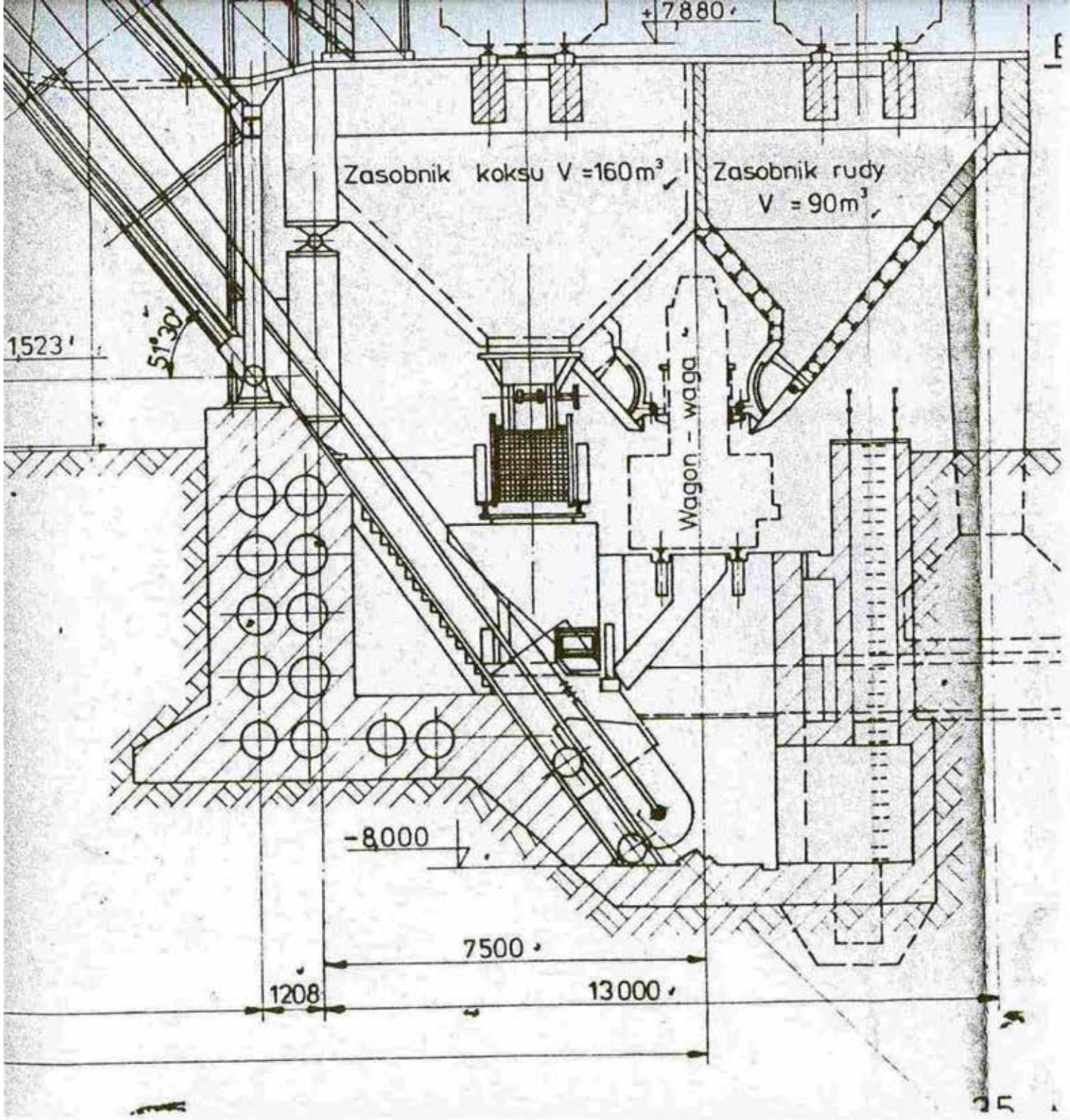
View of the static dust catcher from the south- east



View of the static dust catcher from the south- east



A part of the inclined skip bridge structure at the burden hall bunkers.


+7,880
Zasobnik koksu V =160m³
Zasobnik rudy
V = 90m³
Wagon - waga
1523
51°30'
-8,000
7500
1208
13000

ENCLOSURE TO THE RECORD SHEET

No. 11

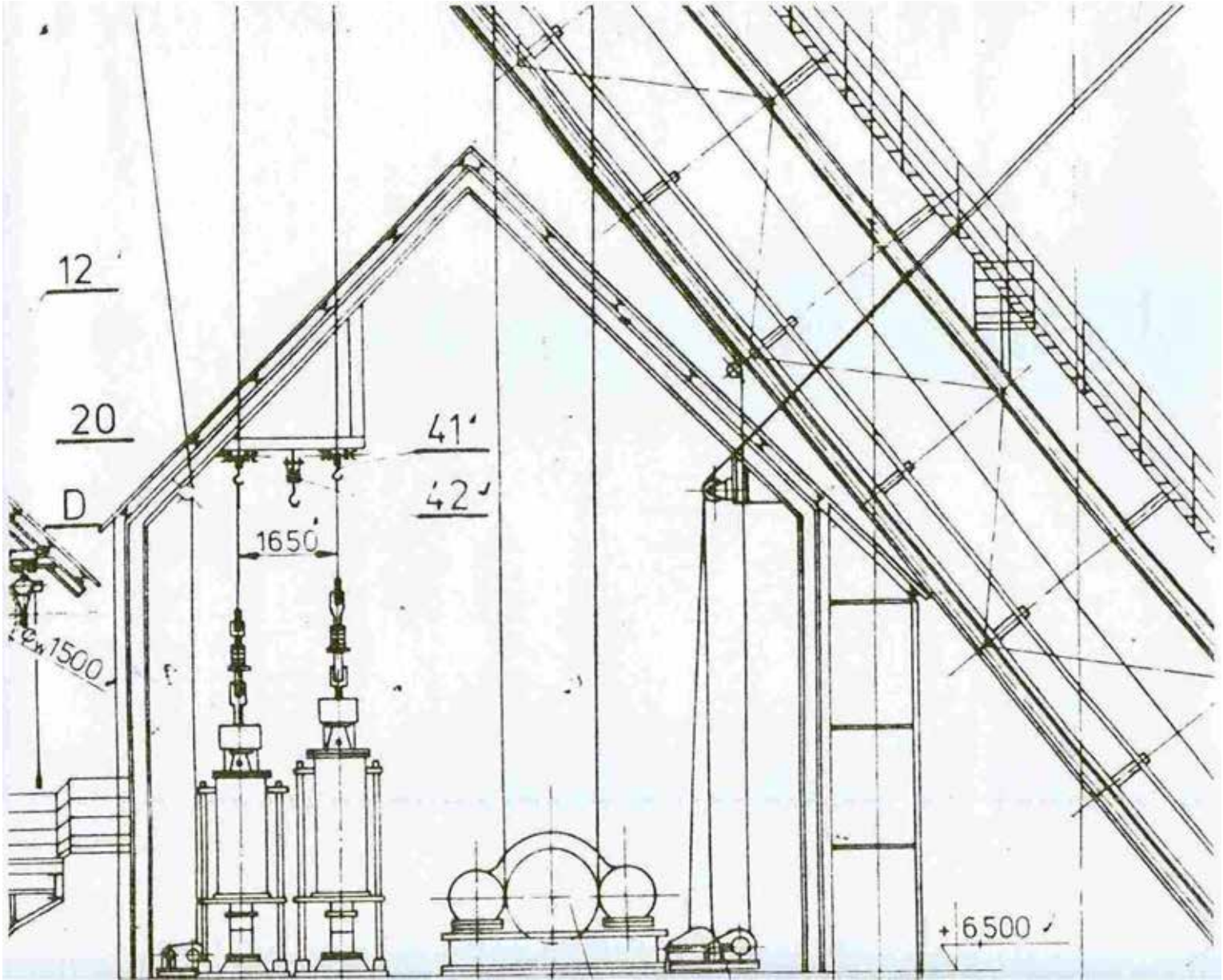
1. Location	Ruda Śląska
2. Commune	Ruda Śląska
3. Poviat	Township of Ruda Śląska
4. Voivodeship	of Silesia

5. Name of the historical monument (as in the record sheet), address
"Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND — STATIC DUST CATCHER, HEATER ASSEMBLY 1,2,3, INCLINED SKIP BRIDGE, PASSENGER AND CARGO LIFT, THE FACILITIES ARE EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER
Ruda Śląska — Nowy Bytom, 79 Niedurnego Street

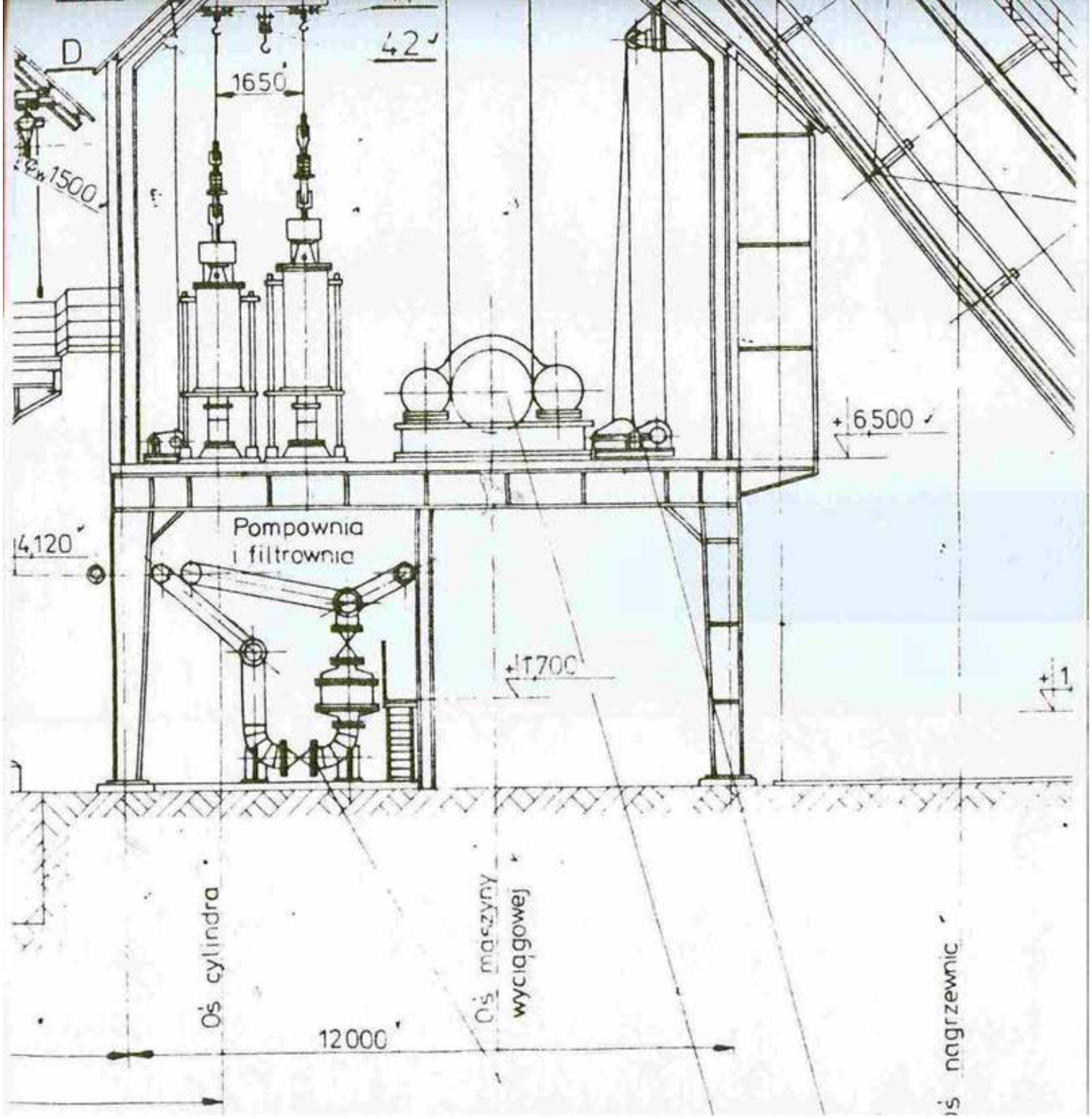
6. Enclosure content

Figures, photos

Drawing from the technical dossier PI "Biprohut" Sp. z o. o. — "Modernisation of the Blast Furnace "A", adapting it to the environmental protection requirements, stage II. Blast Furnace "A", 1997 Drawn to scale 1:100



A part of the structure of the inclined skip bridge, including the cross-section of the pumping and filtering building and the machine room part.


D
42
1650
1500
+6,500
Pompownia
i filtrownia
4,120
+1,700
+1
12000
Oś cylindra
Oś maszyny
wyciągowej
Oś nagrzewnic

Heater assembly 1,2,3 View from the east

ENCLOSURE TO THE RECORD SHEET

No. 12

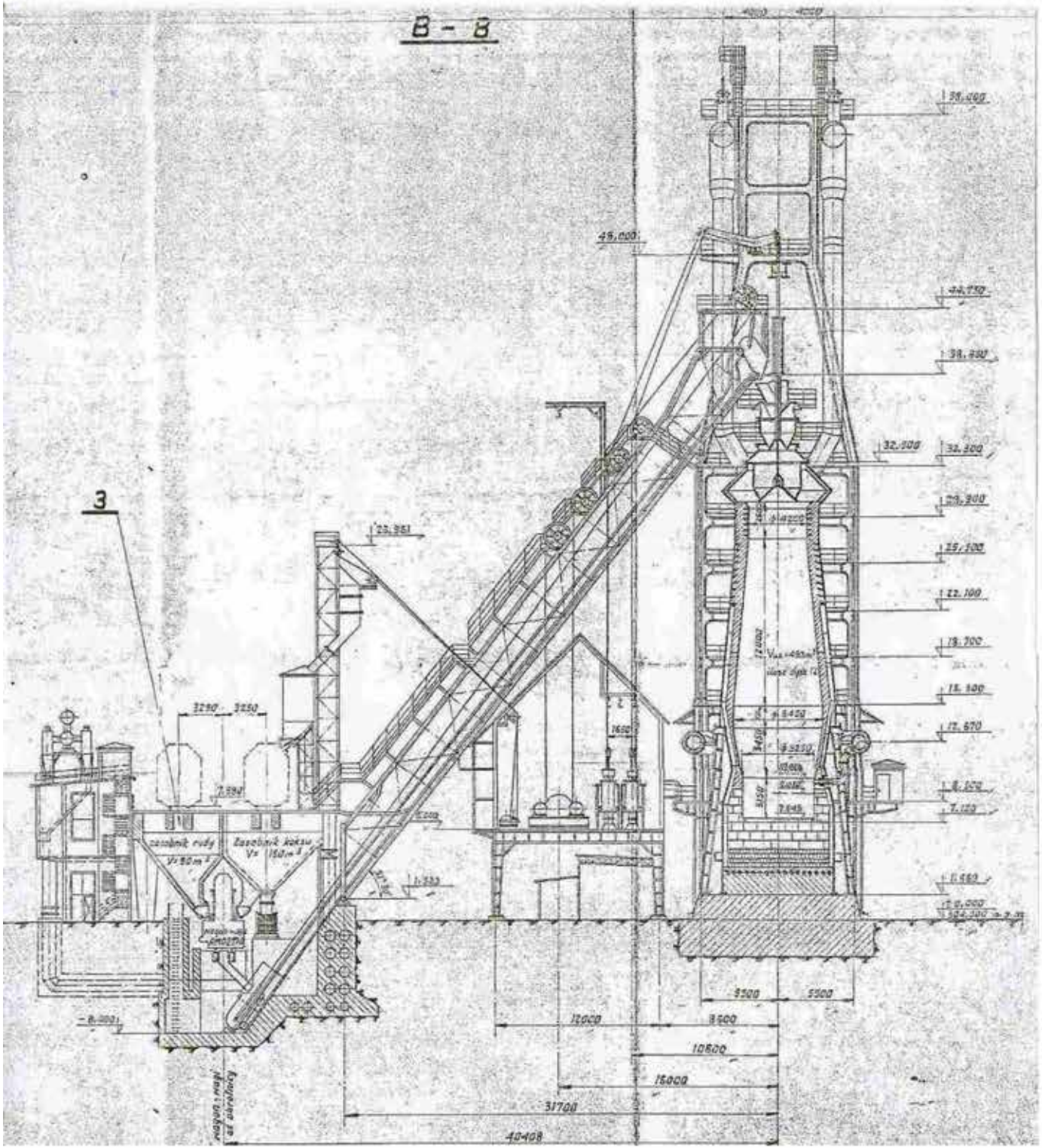
1. Location	Ruda Śląska	5. Name of the historical monument (as in the record sheet), address "Friedens-Eisenhütte" compound — BLAST FURNACE "A" COMPOUND — STATIC DUST CATCHER, HEATER ASSEMBLY 1,2,3, INCLINED SKIP BRIDGE, PASSENGER AND CARGO LIFT, THE FACILITIES ARE EXCLUDED FROM OPERATION IN "STALMAG" Sp. z o.o. PERIMETER Ruda Śląska — Nowy Bytom, 79 Niedurnego Street	6. Enclosure content photos
2. Commune	Ruda Śląska		
3. Poviat	Township of Ruda Śląska		
4. Voivodeship	of Silesia		

View of the heater no. 1 stair structure at the base. View from the south

View of the heater no. 1 stair structure in the upper part. View from the south

View of the heater no. 3 from the north

(date and signature)
August 2012



Cross-section of the Blast Furnace "A" compound according to the technical dossier dated 1967 and the photos of the stack valves, cut-off valves and the intake sections of the cold blast pipelines at the heaters.