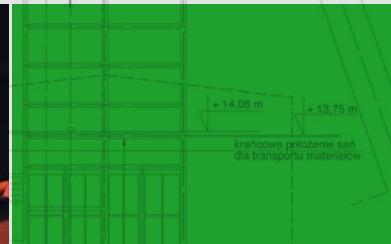
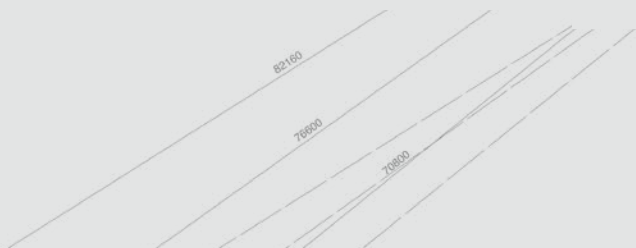
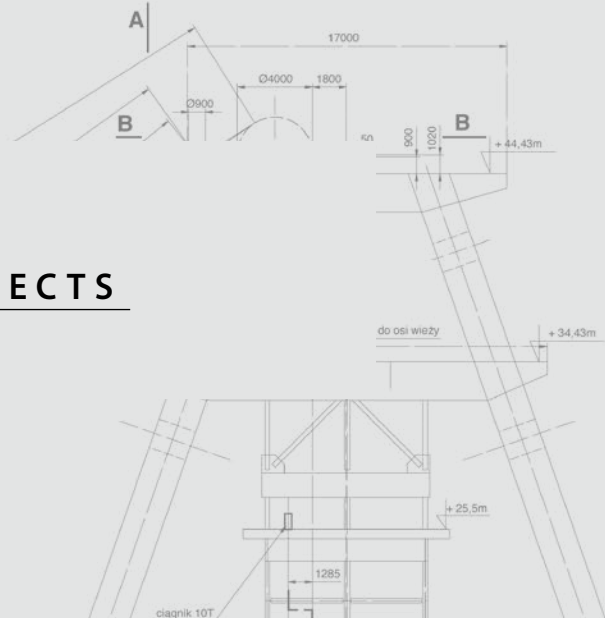




MWM ELEKTRO

COMPLETED PROJECTS



INSTALLATION OF THE MACHINES AND EQUIPMENT SYSTEM FOR THE DEEPENING AND SERVICING OF THE SHAFT VI AT THE JSW S.A. KWK "BUDRYK" HARD COAL MINE

Jastrzębska Spółka Węglowa S.A. is the leading producer of high quality coking coal in the European Union and a large supplier of coke. There are 5 hard coal mining plants in its structure: KWK "Borynia-Zofiówka-Jastrzębie", KWK "Budryk", KWK "Knurów-Szczygłowice", KWK "Krupiński" and KWK "Pniówek".

In order to access a new level and increase coking coal production in the "Budryk" mine, a decision was taken to deepen shaft VI to the depth of 1,290.



D - D

Pomost roboczy





1 2

Objective of the project

MWM Elektro Sp. z o.o. was a leader of a Consortium of companies which took part in the deepening of shaft VI at JSW S.A. KWK BUDRYK.

MWM designed, manufactured, installed and handed over a set of structures, equipment and systems for the performance of tasks related to the deepening and equipping the shaft from level 1050 to 1290.

Innovativeness of the project

The task of deepening the shaft during the operation of the hoisting machine in the adjacent compartment of the shaft was not typical because of the following requirements:

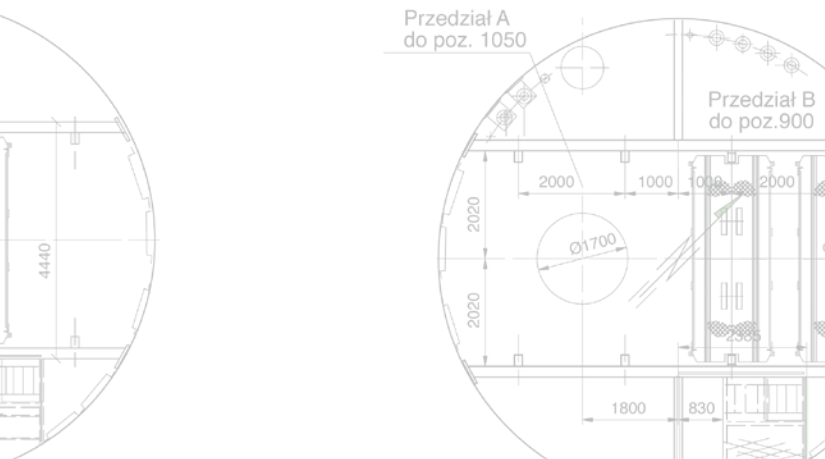
- shaft deepening using the southern compartment while the hoisting machine was operating in the northern compartment of the same shaft,
- transport of the output from deepening to level 1050, transport of concrete and materials for shaft lining – from the surface,
- lowering the personnel directly to their work stations from the surface, using a bucket hoist.

The assumed technical and organisational requirements for the deepening enforced the development of new technological solutions – the production and supply of new equipment adapted for these requirements.

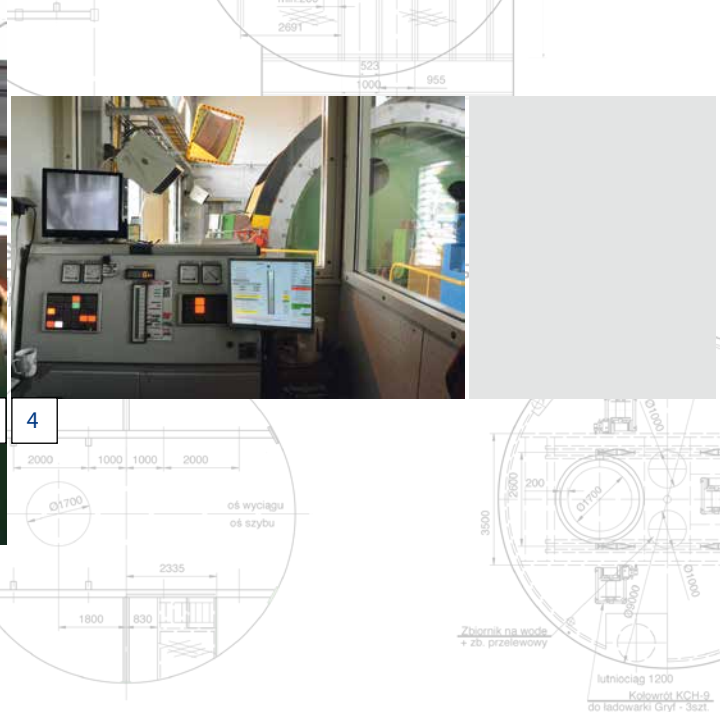
Stages of the project

The performance of tasks included the following stages:

- preparation of the complete technical, detailed and approval designs for new machines and equipment, i.e. B-4300/DC-8m/s hoisting machine and WBW 35T slow-speed winch, completion of the attestation and approval procedures for the approval of the use of these machines and equipment in underground mining plants,
- preparation of technical designs for all disciplines as well as technological designs,
- production of elements and equipment included in: the power supply system, hoisting machine, slow-speed winches, shaft signalling and communication equipment, shaft facilities and other elements of the shaft equipment during the deepening,
- obtaining appropriate permits and performance of construction works at the site,
- delivery and assembly of the elements and equipment,
- start-up and participation in investor's and official commissioning.



7



Project tasks

The installation of two 6 kV power supply lines from the existing main switching station to the container power supply system for the equipment used in the shaft deepening process

For the purpose of providing power supply to shaft deepening equipment, two 6 kV cable lines and a substation were constructed.

The container power supply system for the equipment and substation includes:

- the 6/0.5/0.4/0.23 kV substation,
- 6 kV power supply for inverter and auxiliary transformers,
- 690 V supply to inverter cabinets,
- main drive motors power supply,
- 500 V supply of the R500 distribution board.

photo 1, 2 – Container power supply system

Construction of the building and installation of the B-4300/DC-8m/s hoisting machine equipment

Design, obtaining appropriate permits, construction and commissioning of a hoisting machine foundation and the entire building, where all the required elements and subassemblies of the B-4300/DC-8m/s hoisting machine were installed, including:

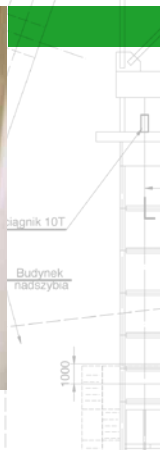
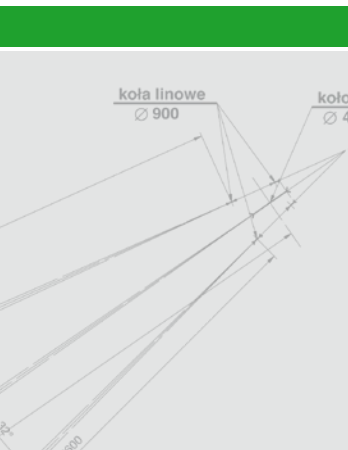
- hoisting machine's main shaft unit,
- hoisting machine's drive unit,
- hoisting machine's control, regulation and monitoring system,
- hoisting machine's braking system,
- hoisting machine operator's booth.

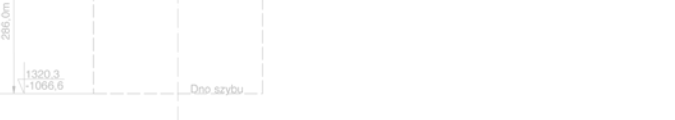
photo 3 – B-4300/DC-8m/s hoisting machine

photo 4 – Hoisting machine operator's booth

photo 5 – Braking unit + machine's drive unit (left)

photo 6 – Hoisting machine's drive unit





The construction of umbrella roofs and the installation of 2 complete sets of WBW-35T slow-speed winches with a central control system

Design, construction and commissioning of umbrella roofs with foundations, the installation of two WBW-35T slow-speed winches with operator's booths on the foundations. Controlling each of the winches separately for repair/maintenance and technological reasons is possible from the operator's station (winch umbrella roof). Controlling two winches together or separately is possible from the central control station (shaft machine operator's booth).

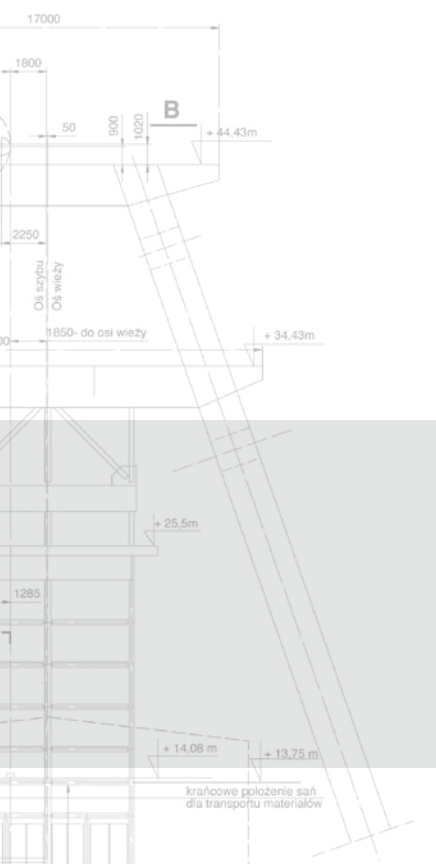
photo 7, 8 – Umbrella roof with WBW-35T winch
photo 9 – Booth with local control station for WBW-35T

Installation of the shaft signalling and communication equipment

Shaft signalling and communication equipment (USSz) was adapted to the developed technology of shaft deepening and simultaneous compliance with the requirements regarding the operation of two hoisting machines in one shaft.

The USSz services the following stations: shaft entry, working platform (1050), unloading station, suspended platform (moved with deepening advance), force pumps platform, shaft bottom, moving station in the container (bucket) and inspection stations. The USSz provides that all the assumed technological functions, its design and working algorithm are fully compliant with the relevant regulations.

photo 10 – USSz control and signalling station



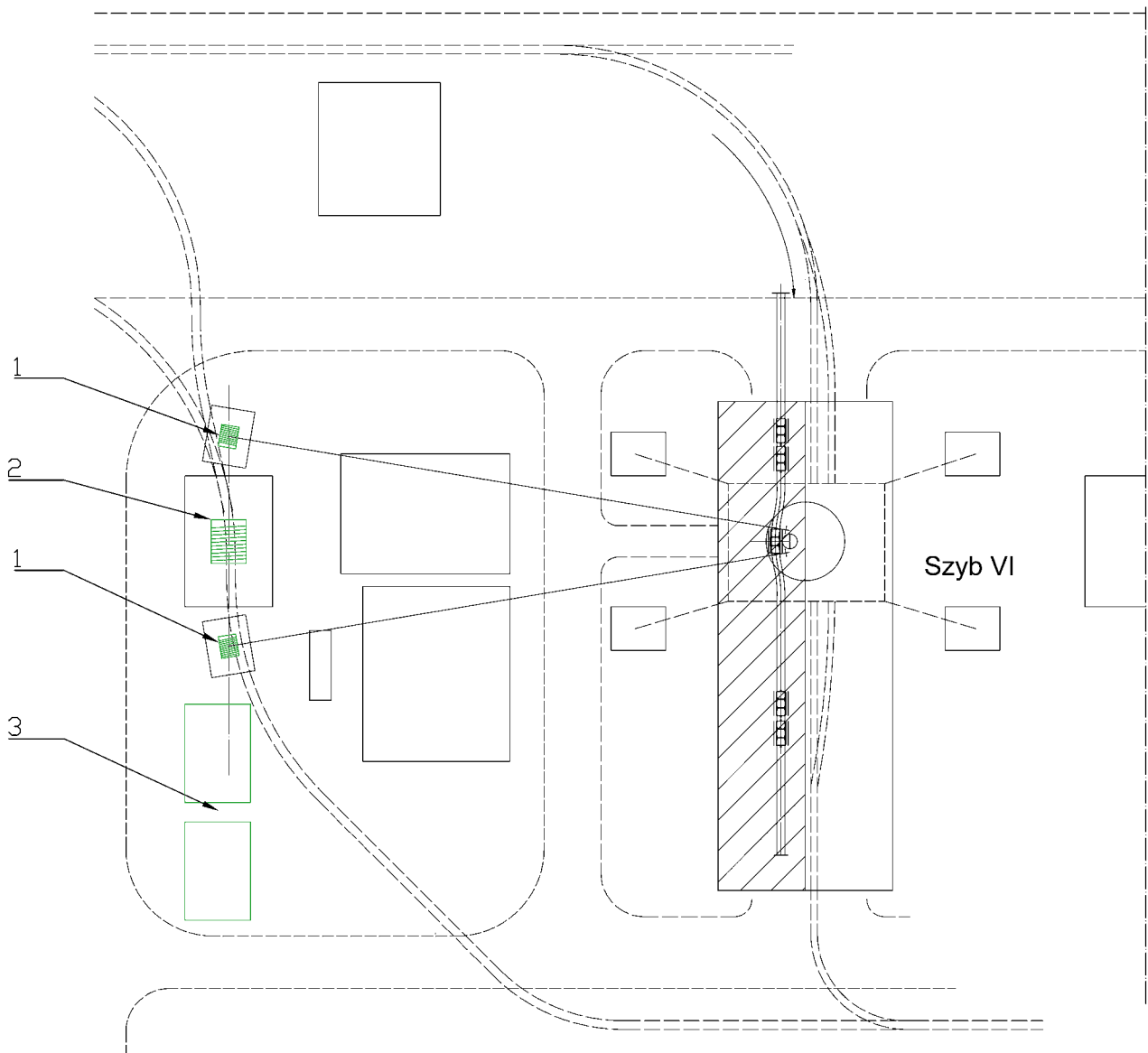
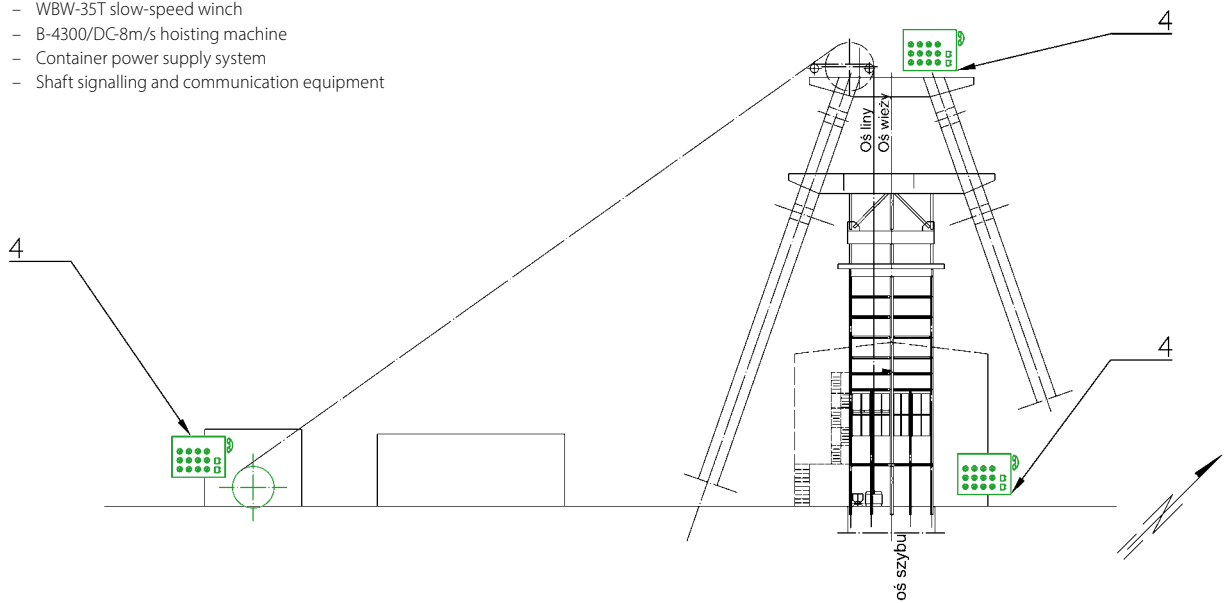
E - E



Schematic representation of the layout of the deepening equipment for shaft VI at JSW S.A. KWK "Budryk".

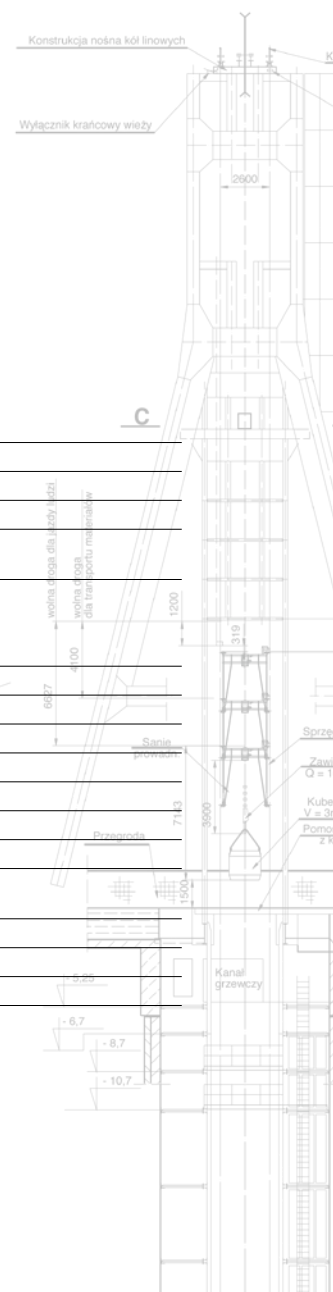
Green is used to indicate the installation locations of the equipment manufactured by MWM:

- 1 - WBW-35T slow-speed winch
- 2 - B-4300/DC-8m/s hoisting machine
- 3 - Container power supply system
- 4 - Shaft signalling and communication equipment



Technical specifications of the mine shaft hoist installed in the S compartment of shaft VI, JSW S.A. KWK "Budryk" mine

machine type	B-4,300/DC-8m/s
machine location	shaft entry
machine use	mine shaft hoist – drive
control types	manual control
operation modes	haulage, materials transport, personnel transport, individual transport, inspections
travel speeds	6 m/s for haulage and materials transport 6 m/s for personnel transport up to 1 m/s for inspections
acceleration / deceleration	0.6 m/s ² / 0.8 m/s ²
main / auxiliary power supply	6,000/690/500V
drive	inverter
maximum static force in the rope	240 kN
winding reel diameter	Dn = 4,300 mm
quantity / diameter of the rope	1 / 41 mm
number of layers	4
brake	disc-type, hydraulic control two discs; four brake columns
number of actuators	8 pairs
brake control and supply system	H-C MWM-4/VER.IID
drawing depth	1,350 m



Summary

All works were provided according to the agreed schedule and contract between the parties.

During the design and installation of the shaft deepening equipment, new machines were developed (B-4300/DC-8m/s hoisting machine, WBW 35T slow-speed winch and WBW 45T winch as extension, 2–4 winches control system) and new technical and technological solutions were implemented.

Apart from the aforementioned primary equipment, the following facilities were designed and installed in order to deepen the shaft to the required depth safely and in a timely fashion: power supply and control of the equipment on levels 950 and 1050, sump ventilation and drainage equipment set, systems for power supply, control and monitoring of the shaft facilities and others.



Headquarters

MWM Elektro Sp. z o.o.

Armii Krajowej 24
32–540 Trzebinia, Poland

tel. +48 32 625 87 00

fax +48 32 625 87 01

info@mwm.com.pl

Lubin Branch

Wójta Henryka 47
59–300 Lubin, Poland

tel. +48 76 749 09 30–31

fax +48 76 749 09 32