

Summaries

MAREK CAŁA, PIOTR CZAJA, DANUTA FLISIAK, MICHAŁ KOWALSKI

Estimation of Discontinuous Surface Deformations Hazard for Selected Caverns of Stat Mine Wieliczka with Numerical Methods • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The Ryncarz criterion is usually applied for estimation of discontinuous surface deformations hazard for underground caverns of Salt Mine Wieliczka. The criterion assumes that the broken zone slowly advances from cavern roof to surface level. This paper confirms that application of three-dimensional (3D) numerical modelling of processes occurring in the salt rock mass may be much better tool for that purpose. It must however utilise properly evaluated mechanical and time-dependant properties of the salt rock mass. The 3D modelling also allows to take under consideration the size and shape of caverns. The Finite Difference code FLAC3D was applied for numerical calculations and shear strength reduction method was selected to estimate discontinues deformations hazard. Two cases were analysed: one cavern Neustadter and a group of caverns consisted of Rainer I Upper, Rainer I Lower and Skoczylas. The application of developed analysis method and factor of safety values allowed to confirm that discontinues deformations hazard for analysed cases is very low.

Keywords: chambers stability, 3D FEM analysis

MAREK CAŁA, MARIAN PALUCH, ANTONI TAJDUŚ

Non-Linear Deformation of Isotropic Trick-Walled Sphere • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

Liquid and gas fuels or other fluids may be stored in containers of several shapes. This paper deals with spherical reservoirs located overground or underground. The walls of the container are made from Mooney material. In case of overground containers, the internal fluid pressure may be much higher from external pressure (from atmospheric pressure). In case of underground ones, internal and external pressures may differ depending on reservoir size, location and virgin stress field. That's why, four different cases of pressure conditions were analysed with application of non-linear elasticity theory. The presented solution may be applied in initial stages of design of spherical reservoirs located overground or underground

Keywords: design of underground reservoirs, nonlinear elasticity theory

JANUSZ CHMURA

Preservation Operations in Archeological Areas — the Preservation of the Cave in Oblazowa • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The archeological investigations that were conducted in the valley of the Białka river in the Oblazowa cave in 1985–95 resulted in many significant discoveries. Among them were the world oldest boomerang made of the mammoth tusks and many objects with magical significance to the prehistoric man. The discoveries were dated from 30 thousand years BC. After a few-year break in the investigations, preparations to the next stage of archeological investigations started that aimed at reaching the rock bottom of the cave. However, they had to be preceded by preservation operations as the present technical condition of the cave posed a danger to people inside. Preservation operations were carried out aiming at the stability of the walls and the roof. They did not destroy the initial looks of the working but at the same time they ensured full safety to people inside. What is more the safety elements

were masked and invisible when the work was completed. The materials applied had suitable certificates that allowed them to be used in difficult conditions, and were neutral to the surrounding environment.

Keywords: *archeological investigations, mining preservation, special methods*

JANUSZ CHMURA, TADEUSZ MIKOŚ

The Medieval Intercepting Sewer in Przemyśl as an Element of the Underground Tourist Route • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The construction plans of an underground tourist route that joins the cellar of several buildings in the area of the Przemyśl Market Square have been under preparation for some years now. The opening of the cellars to the public and connecting them into one underground system together with the historic intercepting sewer will create an attractive route, both from the tourist but also from the business and teaching points of view. The first stage of the project includes the connection of the cellars of the Town Hall, the exit to the Market Square and a passage to the cellars of the 11, Market Square building. Thus an interesting tourist route will be created, showing a part of the underground city.

Keywords: *urban engineering, underground tourist route*

JANUSZ CHMURA, ANDRZEJ WÓJCIK

The Adaptation of the Szttygarka Training Mine into an Underground Tourist Route • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The training mine in Dąbrowa Górnicza was for years a place where the students of mining schools had the opportunity to get acquainted with the machines and technologies applied in underground mining. At present it is a specific mining object that may and should serve as a museum. The creation of a historic object, an experimental mine including, is a very difficult task. It involves both the economic (relevant preservation and adaptation of the workings) and legal issues (adaptation of the geological, mining and building regulations). When planning the adaptation of an industrial object, its specific features have to be considered. All these operations will result in the transformation of a typical industrial object into a museum, a tourist educational attraction that promotes industrial places of interest and the history of the region.

Keywords: *history of mining, the Szttygarka town museum, underground tourist route*

MIROŚLAW CHUDEK, HENRYK KLETA, ANDRZEJ WOJTUSIAK, MIROŚLAW DARIUSZ CHUDEK

Shaft Lining in Conditions of Substantial Rock Mass Pressure • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

In the case of occurrence of substantial rock mass pressures on a shaft lining practically impossible is protect a shaft breakout with the aid of the typical construction of a rigid lining. Especially large pressure can occurs in the case of shaft driving through the thick layers of salt, where on the great depth, primary vertical stress exceeds the strength of salt. Increased rock mass stresses also should be taken in to consideration in the case of influence of deformation generated by mining exploitation. The paper presents the constructional solution of shaft lining by make use its load capacity to braking creep of rock mass just after moment of its execution and the solution of lining making possible creep of a shaft cheek with maintain a constant diameter of shaft.

Keywords: *mining, shaft, lining*

JERZY CIEŚLIK, JERZY FLISIAK, ANTONI TAJDUŚ

Stability Analysis of Selected KS Wieliczka Caverns With 3D Numerical Calculations • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

This paper presents results of 3D stability analysis of selected KS Wieliczka caverns performed by numerical calculations. In first part of this paper results of geometrical modeling of caverns Warszawa, Wisła, Budryka and its

vicinity were presented. In the second part, the results of numerical calculations allowed evaluation of the conditions of Warszawa, Wisła and Budryka chambers stability.

Keywords: *chambers stability, 3D FEM analysis*

PIOTR CZAJA

Evaluation of the Shaft Liquidation Design Solutions Applied in the Polish Coal Mining Restructuring Process • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The significant changes in the mining potentials of the Polish mining industry can be characterized by a substantial number of mines that were closed down and particularly by a big number of shafts that were liquidated. In the past 30 years 35 hard coal mines have been closed down, which resulted in the necessity to liquidate 392 shafts, including 41 shafts in metal ore mines and 7 in salt mines. The remaining ones were located in hard coal mines. Thus, in the past 50 years the Polish mining industry has been first the place of a massive construction of shafts and then of a similarly massive liquidation. Such experience should not be forgotten and must be passed on to the future generations of engineers responsible for the Polish mining industry. The paper constitutes a preliminary evaluation of the design solutions that were applied in this period of substantial transformation.

Keywords: *mining shafts, restructuring of mining*

PIOTR CZAJA, JOANNA HYDZIK, DANIEL WAŁACH

Economical Aspects with Application High Performance Concrete in Underground Construction • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

High Performance Concrete could be applying to working lining in underground construction, such as shafts, caverns and tunnels. The shaft construction is making of ordinary concrete now. Introduction High Performance Concrete allows change designing and realizing such workings. This paper presents results of analyses theoretical possibilities costs reduction shafts lining after changed ordinary concrete C25/30 to High Performance Concrete C70/85.

Keywords: *High Performance Concrete, shaft lining, cost of shaft sinking*

DANUTA DOMAŃSKA

Use of Sclerometry Measurements to Determine Strength Parameters of Shaft Lining • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

Determination of current bearing capacity of shaft support, on the base of conducted tests, is the basis for an assessment of roadway stability during its operation. The work refers to non-destructive sclerometry measurements, presenting general principles of taking measurements and the method of estimation of the support strength basing on test results. Proper selection of the correlation between strength of shaft lining material and rebound number, that from rational point of view should be based on tests of the samples from a discussed structure, carried out on strength testing device, is very important as regards accuracy of the method.

Keywords: *shaft lining, sclerometry measurements, technical conditions*

STANISŁAW DUŻY

Diagnostic Elements and Methods of Underground Buildings Construction State Evaluation • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The goal of quality analysis is the definition of the quantity and distribution of deviation from design parameters values that characterise the heading. This goal is achieved by measurements of the selected parameters that characterise the construction quality in all of the buildings existence phases. The specification of parameters that characterise

the buildings construction workmanship quality is dependent on the character of the analysed construction and the used stability evaluation method. The requirements, in the area of quality in designing, reception attempts, usage and maintenance and the buildings liquidation should be regulated by rules that correspond to the requirements of the PN-ISO 9001-9003 norm. In the article, the requirements in the area of quality management in all phases of the building existence point to the usable methods and tools are discussed.

Keywords: *mining engineering, underground structures, quality management*

LUDWIK FIUTKA, BRONISLAW POWROŚLO

Modernization of „Zygmunt” Shaft, „Murcki” Coal Mine • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

Paper talks over full scope of effectuated mining constructional, mechanical and electrical works involved in modernization of „Zygmunt” shaft that were undertaken in order to change shaft purpose from ventilation only to ventilation and material shaft with large dimension cage. This task was accomplished by two companies: Prinżbud-5 Sp. z o.o. and Przedsiębiorstwo Budowy Szybów SA. The task included: the winding machine and the headframe modernization, rearrangement of the headframe equipment, realization and reconstruction of mine excavations installation of plant and equipment on mine levels and surface infrastructure accomplishment. All operations and machines had been approved and allowed to work.

Keywords: *winding machine, underground mining construction, construction works*

ROMAN KINASH

Investigations of Fatigue of Partially Prestressed Reinforced Concrete Beams • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The executed researches are directed on studying of designs with the mixed reinforcing at static and repeatedly repeating loadings. In the article influence of parameters of repeatedly repeating loading for work of reinforced concrete bent elements with the mixed reinforcing is studied, materials, a design and manufacturing of experimental samples are described, the technique of carrying out of experimental researches and results of researches of beams, and also their analysis are resultated.

Keywords: *partial prestressing reinforcement, fatigue, reinforced concrete beam*

ZDZISŁAW B. KOHUTEK

Conformity Testing for Strength Properties of Concrete • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

This article presents the principles of samples collecting and of appointing of concrete strenght. It describes the procedures and criteria of conformity testing under norm PN-EN 206-1. Numerical examples along with groups of overlapping and non-overlapping consecutive results have also been contained in its contents. Final remarks explain the consequences of new defectiveness risk ratio. This article and the item [6] from bibliography bring the complete set of publications concerning the assessment of concrete properties conformity to an end.

Keywords: *concrete, strenght, conformity*

KRZYSZTOF KOTWICA

Conception of Common Machine for Mining of Mini Tunnels with Diameter up to 2500 mm in Rock Massive with Different Physic Mechanical Conditions • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The paper presents conception of common machine designed for using in mining of mini tunnels with diameter up to 2500 mm in rock massive with different physic mechanical conditions. The models of mining modules for using in mining of rock with different conditions, modules for moving and stabilization of machine and for delivery of

mining spoil were described. On the basis of their models the conceptions of common machine with technology of its functioning were designed

Keywords: *rock, mechanical conditions, mini tunnels, mining, common machine*

ROBERT KOZŁOWSKI

Last Tunnel Projects of Przedsiębiorstwo Budowy Kopalń Pebeka SA Including end of Warsaw Metro Line I • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

In the article author describes previous tunnel projects executed by company Przedsiębiorstwo Budowy Kopalń PeBeKa SA. Tunnels done in different methods are presented (in open trench, cut-and-cover and mining methods). Warsaw metro line I project, which has been just finished takes important place. In Warsaw Bielany district tunnels were executed in shield method, or in deep trench protected by berliner wall or in use of diaphragm walls.

Keywords: *tunnel, metro, shield, lining*

J. ROBERT KUDELSKI, ZBIGNIEW REKUĆ

Selected Problems Concerning Subterranean Defensive Architecture That Occurred During Construction Works of E-1 Sewage Collector Tunnel in the Area of Żoliborz and Nowe Miasto, Between Zakroczymska Street and Inwalidów Square • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

During the construction works of E-1 sewage collector canal in the area of Żoliborz and Nowe Miasto, fragments of subterranean installations have been found. The unexpected discovery disturbed the accomplishment of the project. Further inspection proved the existence in the area old fragments of sewage systems and fortifications that have not been included in contemporary plans of subterranean installations. Therefore, it seems reasonable that similar projects, to be realized in historical places or formerly fortified cities, were consulted at the planning stage with experts in subterranean defensive architecture. That will reduce the number of obstacles influencing the punctual completion of the scheduled works.

Keywords: *fortification, microtunneling technology, underground construction*

RAFAŁ KUSZYK, ANNA SIEMIŃSKA-LEWANDOWSKA

Evaluation of Subsiding Trough Expansion over Tunnel Bored by TBM • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The main problem of tunneling with use of TBM is to assign the range of subsiding trough and its influence on existing buildings and underground or road infrastructure. In the paper empirical methods of analysis of settlements due to TBM works and an example case are described.

Keywords: *TBM, subsiding trough, settlements*

TADEUSZ MAJCHERCZYK, ZBIGNIEW NIEDBALSKI, PIOTR MAŁKOWSKI

Analysis of Geotechnical Conditions around Tunnel in Laliki • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The geotechnical conditions accepted for the project of Laliki road tunnel under real conditions observed during its drifting were shown in the paper. The results comparison points, that it was estimating discrimination and differed from the real geology. It concerns most of all lithology, a layers dip and present geological discontinuities. The effectiveness of a temporary support was evaluated with the help of convergence measurements. They were carried on in three different planes by surveying. Authors did the analysis of these results in a characteristic geological cross-sections with three types of rock mass there: with predominance of sandstones, predominance of laminated shales

and predominance of shales. The analysis allowed to verify an empirical formula for estimating the vertical displacement in Carpathian Flysch rocks. It was found that the exponential function can anticipate subsidence of benchmarks fixed to the tunnel contour quite precisely. The correlation ratio is 92%.

Keywords: *tunnel drifting, Carpathian Flysch, evaluation geotechnical condition, convergence measurement*

HANNA MICHALAK

Selected Problems of Spatial and Structural Planning of Underground Garages in Highly Industrialized Areas • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

Increasing demand for greater numbers of motor vehicle parking spaces has become the source of garage structures development in recent years. The study comprises a synthesis of issues devoted to the spatial and structural planning of underground garages erected in compact urban building developments as well as presents the results of personal research in the scope of structural planning of such structures, including how they affect the building development of neighbouring districts.

Keywords: *underground garages, architectural arrangement, structural planning*

MARIAN MICHAŁEK

Conception of the Temporary Lining for the Railroad Tunnel Formed in the Missed Forms at a Place of Its Localization at the Small Depth • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The conception of temporary lining for tunnel construction in open trench technology was showed here. In this case the train tunnel is constructed with prefabricated sections formed partially at a place of its localization. Section of the tunnel consists of form filled with concrete directly in the trench. The construction which make possible manipulation of the empty forms in the trench was also presented.

Keywords: *tunnelling, trench stabilisation*

MARIAN PALUCH

Benefits from Applying the Principle of Virtual Works Based on Example of General Mechanics • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

Following John Ziman's motto: „The goal of science is to understand, not to collect data and formulas”, it has been presented how important role the principle of virtual work plays in general mechanics. On the base of some examples it has been proved that this principle can be also applied to the problems occur in mining practice.

Keywords: *material body, material restriction, balance of body, balance of forces, principle of virtual works*

DOROTA PAWLUŚ

The Geotechnical Virtual Laboratory • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

This paper presents new opportunity to do research which is created by virtual laboratories. These systems allow to make measurements remotely, monitor, do laboratory research, access expensive or advanced equipment and help research centres to interact, without regard to their physical location. It describes work on the Geotechnical Virtual Laboratory in the Department of Geomechanics, Civil Engineering and Geotechnics at AGH — University of Science and Technology, Cracow. The system enables scientists and students to access department's apparatus, computational software and databases through Internet. It allows to do research and solve educational problems as well. This paper provides a brief overview of system's structure, its functions, activities, instruments and software within it.

Keywords: *virtual laboratory, geotechnics*

WOJCIECH PREIDL

Tunnel Facilities on the Galician Railroads • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

Misadventures of the Austro-Prussian war showed limited transportation abilities of the existing railroads between Kingdom of Galicia and Lodomeria and the rest of Habsburg-Austrian empire. So was born an idea of extension of the railroads crossing Carpathian mountains on the north-south direction, by connecting them to already existing railroad from Kraków by Przemyśl and Lwów, with the railroads on the Hungarian Kingdom territory. Construction of those railroads, in complicated and challenging terrain, caused necessity of many bridges and tunnels construction. In this paper have shown, on the basis of sources available for the author, story of the construction, localization and current state of many tunnels constructed during those railroads constructing. Talked over the objects placed currently on the territory of Poland as well as the tunnels located on the territory of Slovakia, Hungary, Romania which belonged to the Galicia — province of the former Habsburg-Austrian empire.

Keywords: *tunnel, rail, history, underground construction*

TADEUSZ REMBIELAK, JACEK KUDELA, JANUSZ ROSIKOWSKI, FRANCISZEK WALA

Injectory Rock Mass Firming Preceding Rebuilding of Dog Headings' Forks as a Way to Prevent from Rocks Falling and from the Results of These Fallings • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The occurring mineral water in KWK „Piast” cause corrosion of the excavations' lining. In order to increase safety during rebuilding of dog headings' forks forthcoming injectory firming of the rock mass in its surrounding were applied, which prevents from occurring the fall of rocks and from the results of these fallings. An exemplary technology of fork rebuilding in KWK „Piast” at the level of 500 m was presented in the paper.

Keywords: *mining industry, excavations drilling, preceding rockmass firming, sealing and firming, mining safety*

TADEUSZ REMBIELAK, JACEK KUDELA, JAN KRELLA, JANUSZ ROSIKOWSKI, BOGDAN ZAMARLIK

Increasing Safety During Starting the Wall 375–1353 in KWK „Piast” by Injectory Firming of the Seam 209 Before Its Face • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

In order to safely reinforce and perform the movement of the wall 375–1353 in the seam 209 in KWK „Piast”, injectory firming of the seam before its face was designed. Applying the injectory firming of the wall's face eliminated movement of loose rocks from the cutting, and the roof to the wall's cross-cut during reinforcing and starting of the wall, and as a result of that the aim of work was achieved.

Keywords: *mining industry, preceding rockmass firming, sealing and firming, mining safety*

KAROL RYŻ

Selected Structural and Technological Problems of Construction of First Tram Tunnel in Poland • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

Structural and technological characteristic of the first tram tunnel in Poland (Cracow) is presented in the paper. The tram tunnel (1538 m length) together with stations belong to the first fast tram line in Cracow. Shallow tunnel has non uniform structure. Single chamber cross section was used at south-east part of tunnel, built with various methods of construction. Milan method was applied under Lubomirskiego Street. Vertical walls were made using secant piles (big diameters) and the ceiling is monolithic (reinforced concrete deck). Diaphragm walls were used at the end part of tunnel near Mogiłskie traffic-circle. Part of the tunnel under main railway station as well as under Rakowicka street was built in open excavation. Hamburg method with Berlin walls was effective for western part of tunnel (along Pawia street). „Politechnika” station was erected in open excavation with Berlin walls for vertical temporary soil support. In the case of „Dworzec Główny” station open wide excavation without soil protection was used for erection of underground part of structure. Finally, information on applied safety systems in tunnel are given.

Keywords: *underground transport construction, shallow structures, tram tunnel, underground stations, structural systems, Berlin walls, secant pile walls, diaphragm walls, construction methods, Hamburg method, Milan method, safety systems*

KRZYSZTOF STYPULA

Chosen Problems of Protection of Buildings on the Ground Surface Against Vibrations Generated by Underground Transport • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

Chosen problems of the influence of vibrations generated by underground transport to buildings and to people in buildings are presented in the paper. Diagnostics of these influences is also discussed. Algorithm of analysis of these influences in the case of transport investments is given. The exemplary applications of the vibroinsulation in a construction of rail track in train tunnel in Warsaw and in Warsaw metro are presented with examples of the vibration influence prediction and former verification of it.

Keywords: *metro, building vibrations, transport vibrations*

MAREK SZEBESTA, WIESŁAW GRZYBOWSKI

Atypical Project and Technology of the Pump Chamber Construction in the Level 950 m in „Borynia” Coal Mine • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

Construction of the new mining level 950 m in „Borynia” Coal Mine caused that a new complex of headings of the main supply and drainage system must have been built. Pump Chamber is one of the headings of this complex. Taking into account both the heading section in the breakout which equals ~50 m² and the peculiar construction of the V36 support, the construction works of this chamber required preparation of atypical technology to drive this heading. In the article, the process of construction of the whole heading complex has been presented starting from the final stage of the bidding up to hanging over the finished construction to the Investor. Enterprise of Mining Works in Rybnik, which acts within Consortium of Polish enterprises for underground works and shaft sinking Join-stock company, was charged with this construction. All the stages of driving the pump chamber, made in a special lining — 6.5 m in width and 7.0 m in height, have been precisely described as the technology is unusual.

Keywords: *pump chamber, technology, construction, consortium*

HENRYK SZELĄG WIESŁAW KURDOWSKI

Special Cements for Underground Construction • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The paper describes properties of special cements and prepared concrete blends elaborated and produced in the Division of Mineral Building Materials in Cracow. Shown properties emphasize exceptional features of these materials which guarantee durability of constructions under extreme conditions of exploitation load and environmental effects. It concerns very high resistances, small porosity and advantageous pore size distribution, resistance to chemical corrosion, freeze resistance and controlled values of very low contraction and expansion for expansive concretes. These properties predispose above mentioned materials to accomplishment and repair of concrete constructions in road infrastructure building, especially in applications of underground construction as well as in constructions of mining industry.

Keywords: *expansive cement, High Performance Concrete, shrinkage, expansion, corrosion*

ANDRZEJ SZUMIŃSKI, ROBERT KLISOWSKI

Material Age Effect on the Post-Failure Characteristics of Cement Mortar Specimens • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

As indicated by the results of most laboratory tests concerning the post-failure behaviour of concrete, the nature of the material failure corresponds to class I after Wawersik, which points to stable failure propagation. The results presented hereby ensue a research conducted to verify the thesis, that in cement binder based materials (concretes, mortars) the degree of cement grout hydration, advancing along with material age, may cause the change from class I to class II post-failure behaviour. This means, having exceeded the compression strength, the accumulated energy will be released in ruptures.

Keywords: *post failure properties, laboratory tests, concrete*

JAN WALASZCZYK, STANISŁAW HACHAJ, ANDRZEJ BARNAT

Analysis of Digital Modeling Effectiveness of Building Vibrations Caused by Mining Quakes • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

Dynamic occurrences caused by mining exploitation (e.g. the loss of rock mass stability) result in vibrations of both the rock mass and the building situated on its surface. There are many projects concentrating on measuring or predicting quakes mentioned above and vibrations caused by them. One of the ways of predicting vibrations is digital modeling (e.g. using the Finite Element Method). This type of modeling is restricted in many ways. The most important restrictions include difficulties in identifying digital model of rock mass and buildings, which makes the quality of test results in digital modeling still inefficient. In this paper, the quality of digital modeling is based on the comparison of building vibrations (modeled with FEM) with vibrations recorded with suitable geophysical devices. The basis of the comparison of modeled and measured vibrations is their spectral analysis.

Keywords: *mining quakes, measurement of velocity, digital modeling, spectral analysis*

ANDRZEJ WICHUR

Problems of the Design of the Long-Term Excavations' Support • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

Underground construction in Poland underwent a rapid development over the period of prosperity in mining and the worsening geological-mining conditions became the incentive to create new constructions of support. A particular role was taken by long-term excavations' support and lining (shafts, crosscuts, chambers etc.). The paper constitutes the review of base achievements in this field. The types of the support and lining presented and the methods for their calculations were the results of many years of research and practical experiments. Many calculation models were used in the design process. The designing practice related allow to use these in statical calculations of other underground structures, like communication tunnels, hydroengineering objects etc.

Keywords: *long-term underground excavations, shaft lining, dog headings' support, support design, lining design*

ANDRZEJ WICHUR, KORNEL FRYDRYCH, MACIEJ BOBER

Comparison of the Standard Designing Methods of Steel Arch Support Used in Underground Mining Works • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

The steel arch support is recognized as the most useful type of structure for the protection of underground excavations. This paper presents results of comparative analysis of the three standard methods of designing and selection of steel arch support. For each of method were counted 81 sets of data. The bar charts of load and set span were prepared according to calculation results. From the analysis comes out that the third method has the widest application from three of compared ones. Using this method is possible to select the steel arch support for the excavations and junction and crossings of working as well. Differences between the results of the each method result from lack of the knowledge about rockmass effects around of designed working.

Keywords: *steel arch support, support design, load*

TOMASZ WIEJA, JANUSZ CHMURA

The Methodology of Project Works and Organizational Near Adaptation of Antique Excavations on Underground Touristic Routs • Kwartalnik Górnictwo i Geoinżynieria • z. 3/1, 2009

Process of investigation of antique excavations, their protecting as well as it requires the throw open as underground, attractive touristic routs the numerous studies: Scientifically — investigative, technical, economic and project. Process this be compiled and folded, and except final result, what the technical executive project is the servant to realization of works the building — conservatory, the most essential they are also got near this the results of works scientifically — investigative.

Keywords: *project records, underground touristic routs*