Summaries

WACŁAW ANDRUSIKIEWICZ

Inter-chamber Pillars in Polish Salt Mining — Chosen Dimensioning Methods in Theory and Practice • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The paper shows, using the example of the chosen theoretical methods, the dimensioning procedure for the width of inter-chamber pillars in underground mines, in salt means by of a chamber system. The appropriate calculations were done for the made assumptions, and the results obtained were compared in graphs with the actual dimension of pillars and chambers, which were used in the salt mine 'Kłodawa'. It was demonstrated that in the practical case under discussion, the use of the mentioned empirical formulas leads to obtaining results, which show significant re-dimensioning of the pillars in proportion to the state, in which existing mining area is stable, with significantly narrower pillars.

Keywords: *salt mining, geo-mechanics, chamber system*

ANDRZEJ BATOG, MACIEJ HAWRYSZ

Consideration of the Rigidity of Structure in the Calculation of Settlement of the Foundation According to Eurocode 7 • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

This article presents a discussion on a method of including the rigidity of the construction of a foundation in the calculation of settlements of the foundation soil carried out in accordance with Eurocode 7.

For a typical task involving two foundations in the form of rectangular plates placed in a wide excavation, assessments of the settlements were conducted with two of the three calculation methods given by Eurocode 7. In addition, an alternative engineering method for determining the size of foundation settlements in regard to an assumed rigidity, which takes into account the stress distribution in the soil under the foundation depending on its rigidity, is presented.

The article indicates differences in the evaluation of settlements depending on the method of deformation of the foundation soil assumed in the calculation, the impact of the adjacent foundation and the manner in which the rigidity of its structure is included.

There was a significant difference of around 50% in settlement ratings with the assumption of a one-dimensional settlement and methods of triaxial deformation. While comparing the assessment of the elastic foundation settlement and the settlement of the foundation while including the rigidity of its structure, much smaller differences were obtained, amounting to about 15%.

The results obtained using the proposed by the authors method were compared and positively verified on the basis of literature data.

Keywords: *Eurocode, foundation, settlement*

PRZEMYSŁAW BUKOWSKI, MIROSŁAWA BUKOWSKA

Changes of Some of the Mechanical Properties of Rocks and Rock Mass in Conditions of Mining Exploitation and Mine Workings Flooding • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

Mining exploitation exerts on influence within rock mass, which manifests itself in rock mass destruction and dewatering. These processes have on influence on the properties of rocks forming rock mass and causing their alteration, and change of the state of natural hazards and conditions of carrying out mining activities. The dewatering of rock mass leads to increase of values and of strength parameters of rocks, which can once more be decreased, for instance under the influence of their saturation with water in the process of mine workings flooding. The relationships between the changes of the geomechanical and hydrogeological conditions taking place in rock mass under the influence of mining exploitation have been presented in this paper. Against a background of comparative results of laboratory and field testing carried out before and after going through exploitation, changes of compressive strength of rocks located within the impact area of the undermining and the overmining seam have been characterized. With reference to the changes in the mining situation in the Upper Silesian Coal Basin (USCB) after 1945, changes in the hydrogeological conditions and their influence on geomechanical conditions in the area of the mine workings have all been characterized. The significance of the change in the hydrogeological and geomechanical conditions in order that a proper assessment method for conditions of safe running of mining operations has also been addressed.

Keywords: *USCB, rock mass, rocks, mechanical properties, hydrogeological properties*

MAREK CAŁA, JERZY FLISIAK, JUSTYNA ADAMCZYK,
MALWINA KOLANO, MICHAŁ KOWALSKI, AGNIESZKA STOPKOWICZ

The Analysis of the Slope Stability in a Basalt Strip Mine by Means of the Back Analysis Method to Determine Strength Parameters • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

In the article, the example of a rock slope affected by the landslide process is observed and the possibility of using back analysis to estimate the features of the rock mass has been shown. Such an approach is possible when it is impossible to apply field research, and laboratory tests do not enable a complete mapping of the rock mass characteristics. The analysis of landslide mechanisms and, in particular, the comparison of the state before and after the landslide occurrence may enable to estimate reliably the features of the rock mass. On the presented example, a verification of specified strength properties have been carried out in two stages: for the landslide area in 2004, which has actually been stabilized, and for the area of a newly created landslide which took place in 2011. In both cases, good results' convergence with the factual course of landslide processes have been obtained.

Keywords: *rock slope, stability analysis, back analysis*

MARIUSZ CHOLEWA

Analysis of the Stability of the Slope of the Hydraulic Embankment Made of the Ash-slag Mixture • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The paper presents the results of tests, physical model and computations relating to slope stability. The physical model of the hydraulic embankment was erected in a semi-technical scale of ash-slag mixture from a power plant. Initially, the basic physical and mechanical parameters of the soil necessary for erecting the model embankment were determined in the laboratory tests. Obtained in laboratory density parameters, the angle of internal friction and cohesion as well as piezometric surfaces attained from the

model tests were introduced to numerical calculations in order to determine safety factor for the outer slope. The calculations were performed using the Bishop method for six computational schemes, at the changeable location of the filtration curve in the body of the embankment. The results of the conducted works show the relationship between the location of the depression curve, geotechnical parameters of the saturated ash-slag mixture and the obtained value of the safety factor.

Keywords: *ash-slag, hydraulic embankments, slope stability*

WOJCIECH CHUDZIK

The Process of Mined Land Reclamation in Natural Aggregate Quarries Exemplified by the Sand and Gravel Quarry Dębina Łętowska • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

This articles looks at the formal and legal aspects of mined land reclamation, as exemplified by the sand and gravel open pit Dębina Łętowska. In addition to the formal side, the practical aspect of planning and designing mined land reclamation will also presented here, along with the impact of the process of mined land reclamation on costs with the optimum designing which takes into account both mining and reclamation. This paper also deals with the importance of discussion about mined land development with the local community and the impact of changes of the mined land reclamation. Finally the paper looks at the purpose of mining operations and tasks the faced by the designers.

Keywords: *natural aggregates, mined land reclamation, mining enterprise liquidation fund, mined land development*

BARTŁOMIEJ CZADO, JAN S. PIETRAS

Comparison of the Cone Penetration Resistance Obtained in Static and Dynamic Field Tests • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

Soil field testing performed with the static method of CPT/CPTU is increasingly being used in Poland to examine the ground for the purposes of foundation design. The results of this test may be used directly in the calculations of foundation piles, but also of spread foundations. The use of a static test becomes problematic when coarse soils (sandy gravels, gravels) are found in the subsoil. In these situations a dynamic probing may be performed to supplement the results of CPT in the soil strata where the CPT examination is impossible. This requires the development of appropriate correlation between the soil parameters obtained in static (q_c) and dynamic tests (q_d).

This paper presents an analysis of the results of field tests conducted in Kraków, Poland. Results were obtained in the test nodes, which included: cone penetration test (CPT), dynamic probing (DPH) and a borehole. The derived correlations were compared with the results of similar studies performed in Hungary and Lithuania.

Keywords: *field tests of soil, cone penetration test, CPT, CPTU, dynamic probing, DP, DPH*

KAJETAN D'OBYRN, WIESŁAW WIEWIÓRKA

Selection of Backfilling Technology Works in the Ksawer Chambers Complex of the Wieliczka Salt Mine • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The article presents the concept of the first phase of works aimed at liquidating part of the Ksawer chamber complex located in the Higher Level II and the Lower Level II at the "Wieliczka" Salt Mine.

These chambers can be eliminated by way of applying one of the methods which do not cause an increase of humidity in the excavations and do not contribute to the degradation of the historic substance. The slurry injection method seems to be the most useful of all the presented ones. This paper presents technical issues concerning the selection of backfilling material, its transportation and the construction of backfill barriers.

Keywords: *liquidation of chambers, selection of backfilling materials, transporting backfill, construction of backfill barriers*

JAN DRZEWIECKI

The Basic Technological Conditions of Underground Coal Gasification (UCG) • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The article presents basic information relating to the evaluation of coal deposits in terms of its relevance to underground gasification technology due to the use of mining and coal gasification process in situ. The above is determined mainly by the natural conditions of occurrence of the deposit and the balance of economic and technical means used gasification technologies for coal seam. The article proposes a division of the deposit whereas only mining technologies and timing of its release. Suggested that resources be classified for coal underground gasification technology as a resource-or off-balance, based on information known at time of drilling and drill test wells from the surface of land, resources, or non-tech industry, highlighted during the deposit available through a network of roadways, drilling and occasionally vertical excavation technology and resources, or reserves highlighted during the construction and maintenance of the UCG plant roadways used for the underground gasification of coal seam. The proposed allocation may be changed in case of new mining technology, ie technology, sealing the rock mass at high temperatures and insulation of the UCG plant legacy operating in the area.

Keywords: *technologies for mining, underground coal gasification, the classification of deposits to the UCG*

JÓZEF DUBIŃSKI, GRZEGORZ MUTKE

Application of PPV Method for the Assessment of Stability Hazard of Underground Excavations Subjected to Rock Mass Tremors • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

Results of measurement and interpretation of velocity amplitudes of rock mass particles vibrations (PPV) registered on side walls of excavations of longwall 3/503 in the Bobrek-Centrum mine are presented in order to assess the potential stability hazard of these excavations. During the exploitation of longwall 3 strong tremors have occurred of energies higher than 106 J and it was essential to estimate the level of dynamic loads affecting excavations. This assessment was carried out by continuous registration of tremors and PPV vibrations measurements and their analyses on side walls of active excavations and comparison of measured values with empirical values of elaborated criteria of the assessment of potential hazard (Mutke 2008, 2011). The elaborated PPV method enabled one to state that strong tremors of rock mass occurring in the final stage of longwall 3/503 exploitation caused low level of vibrations and dynamic load in mine excavation. In accordance with the criteria of PPV method, these were vibrations at the level of a lack, or at the most, low hazard of mine excavation stability.

Keywords: *PPV method, dynamic load of excavations, mining seismic events, stability of underground excavation, peak particle velocity of rock mass*

JOANNA DULIŃSKA

Application of Response Spectrum Method for Dynamic Analysis of Spatial Earth Structures • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The paper presents the results of dynamic analysis of an earth dam to a seismic shock and a tailings dam to a mining tremor. Numerical calculation of equations of motion was used basing upon the assumption of uniform and non-uniform excitation as well as the response spectrum method. Effects of non-uniformity of excitation on the dynamic response of earth spatial structures were examined. The possibility of applying the response spectrum method for calculations of dynamic response of spatial earth structures was considered. The obtained results indicate that the response spectrum method does not always lead to conservative assessment of dynamic response of spatial earth structures subjected to kinematic excitation.

Keywords: *earth dam, tailings dam, dynamic analysis, non-uniform kinematic excitation, response spectrum method*

LIDIA FEDOROWICZ, JAN FEDOROWICZ

Safety Assessment of Linear Structures in Areas at Risk of Large Mining Deformities • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

Safety assessment of the system 'structure–mining subsoil' results from the evaluation process of formation and areas with a range of changes in the ground state and local changes in stiffness of the subsoil.

The paper presents, based on a constitutive model describing the behavior of soil Modified Cam-Clay (MCC), the following:

— transmission mechanism of mining deformation from substrate to linear structure which cooperates with a layer (or layers) protecting its failure-free work, while proposing,

— how to create description of protection layers behavior in a critical state model (MCC).

Appropriate for the protected structure state of stresses and strains was obtained for the subsoil (with determined preconsolidation) and for the protective layer (with given parameters), by fulfilling the equation (1) with the determined critical strain $\varepsilon_x = \varepsilon_0$ ‰.

It is a condition accompanied by stress state, neglecting tension in the material of the protective layer (with the reserve of stresses provided for grids "strapping").

The thickness of critical layer (in which we do not allow tensioning) is determined due to preconsolidation state of the subsoil, and not by the state (stiffness) of the top layer.

The predicted strain state of protective layer in the model does not provide any hazard for the work of the linear structure.

Keywords: *numerical models, mining subsoil, critical state models, linear structures*

LIDIA FEDOROWICZ, MARTA KADELA

Model Calibration of Line Construction — Subsoil Assisted by Experimental Research • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

Reliable description of the interaction proceeding in a system road construction–subsoil should be in such a case one of the basic requirements of the assessment of the size of the internal forces of structure and its durability. There is no definition, which allows for synonymous determination of the thickness of the cooperating with structure subsoil, which is a major problem in creating numerical computational models.

The paper presents the essence of the calibration process of the cooperating subsystem in the calculation model of the system “road construction – subsoil”, created for mechanical analysis. The calibration process was directed to show the impact of certain elements of the model created on its deformation and stress response. The proper comparative base for assessing the reliability of created models should exist, however, the actual, monitored system road construction – subsoil. The trial of this monitoring and the first experience with the results are shown in the last chapter of this paper.

The fundamental task of monitoring is the role of the “supporting” construction to the rational computational models for systems “road structure-subsoil”.

Keywords: *system road construction — subsoil, mechanistic analyses, monitored system*

LUCYNA FLORKOWSKA, JAN WALASZCZYK, AGNIESZKA MAJ

Determining Mechanical Properties and Material Models of Subsoil for Buildings in Mining Areas
• AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

This paper discusses issues related to determining impact of mining exploitation on buildings – the analytical process supported by numerical modelling. Numerical simulation tools are used to analyze the interaction between buildings and deforming soil i.a. to accurately forecast the impact of mining work. In order to carry out those analyses correctly, mining, geological and construction conditions have to be investigated reliably.

In this paper, issues related to modelling soil have been presented. Particularly in terms of determining mining influences, investigating foundation conditions and assuming a material model. Deformation processes taking place in soil and caused by mining exploitation have been characterized, and forecasting the impact of mining exploitation on surface has been generally discussed. Moreover, requirements concerning identification of subsoil beneath buildings founded on mining areas have been cited and the most important methods have been listed. Then, by concentrating on issues related to accurate analysis of mining influences, numerical modelling has been proposed as a tool to carry out such analysis. In that respect, examples of selecting constitutive equations and determining their values have been presented. Those examples concern two geologic materials: sandy loam and sandstone. Laboratory experiments were carried out for each. Their results and selected constitutive equations have been presented along with determined parameter values. The impact of basic mechanical parameters of soil: elastic modulus and Poisson’s ratio on stress distribution beneath wall footing have also been presented.

Keywords: *subsoil, mining damage, material model, mechanical properties, forecasting, geotechnical conditions for foundations*

GRZEGORZ GALINIAK, ANDRZEJ BIK

The Reclamation of Post-mining Areas of Lubuski Region (Poland) on Example of Sieniawa Lignite Mine
• AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

Lignite Mine “Sieniawa” is one of the oldest mine in Poland, which extracted lignite using both underground and open pit method. The latter process has been carried out until present day. The effects of the lignite mining extraction are most evident in transformation of the landscape, and therefore systematic approach to the rehabilitation of brownfield sites is a very important element of the mine’s environmental policy. The article presents the actual state of land reclamation for forestry of the post-mining areas of the lignite opencast mine of KWB “Sieniawa”.

Keywords: *lignite, land reclamation, open pit mining, Sieniawa Lignite Mine*

KRZYSZTOF GASIDŁO, BARBARA STANKIEWICZ, ZBIGNIEW SĄSIADEK

Concept of Redevelopment the Inundations in the Szotkówka River Valley in Mszana and Jastrzębie-Zdrój Local Communities • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

Reclamation and redevelopment of subsidence and inundation resulting from mining excavation are different from procedures adopted in the case of mining gobs and workings, the former cannot be pre-designed with such accuracy as subsurface excavations yet, they occur at areas that do not belong to mining companies. The reclamation and redevelopment of subsidence and inundation areas is, in many cases, undertaken, after several years of abandoning underground mining works. As far as subsidence and inundations are concerned, there is a need of a specific approach and activities concerning programming and cooperation of the stakeholders. The scope of the paper is the description of the case of the land inundation caused by underground hard coal mining excavation by Jastrzębska Coal Mining Company in the area of Mszana and Jastrzębie-Zdrój. The problem is to designate the modes of redevelopment the degraded areas in consideration of the possibilities of stone deposition, preservation of the biological qualities and land development plans of local governments and communities. The methodology of research adopted by the authors facilitates the indication of spatial management development directions and, in addition, coordination of the objectives to be adopted by Jastrzębska Coal Mining Company towards the said local communities on the grounds of operational planning. The elaboration will provide the grounds for further activities to be undertaken by Jastrzębska Coal Mining Company and implementation of changes in the local land use plans of the two local communities.

Keywords: *reclamation of post-mining areas, revitalisation, spatial development planning, operational plan*

JANUSZ P. KOGUT, JAKUB ZIĘBA

Numerical Modeling of Response of the Ancient Pottery Kiln from Marea (Egypt) Due to the Soil Loading • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The paper deals with the developing of the numerical model of a unique ancient pottery kiln. This construction is located at the Marea site in Egypt and was uncovered by the Polish Archaeological Mission. The Mission has been investigating the Byzantine basilica built on the bank of the Lake of Maryut. The geometrical numerical model of the pottery kiln has been developed based on the in-situ measurements and further analysis of its remarkable properties. Actually, the pottery kiln has been found under the level of foundations of basilica. Due to the size of the construction there are several questions regarding the kiln and the foundations arisen, among them the influence of the soil on the internal forces of the kiln and overall stability.

Keywords: *numerical model, pottery kiln, Marea ancient site*

MILOSLAV KOPECKÝ, MARTIN ONDRÁŠIK, DARINA ANTOLOVÁ

Atlas of Landslides in Slovakia • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The paper presents the results of a unique geological project “Atlas of slope stability maps of Slovak Republic in the scale 1:50 000”. The atlas includes 132 map sheets compiled by method of engineering geological zoning and covers the whole territory of Slovakia. Totally 21 190 slope deformations with the area of 2 575,912 km² was registered in the atlas. The area damaged by the slope deformations takes 5,25% of the total area of Slovak Republic. Each slope deformation has its own passport with 28 different data types enabling detail analyses of the deformations in relation to geological and geomorphologic environment. The maps are now available on internet to anybody interesting in geological hazards in particular localities of Slovakia.

Keywords: *landslides, slope stability, engineering-geological mapping*

TADEUSZ MAJCHERCZYK, ZBIGNIEW NIEDBALSKI, KATARZYNA KRYZIA

Changes to the Range of Exploitation Impact when Mining the Next Coal Deposit on the Basis of Geodetic Measurements • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

Forecasting deformation factors of land surface caused by mining exploitation is a complex issue, depending on many factors. The most important of them include variable geological condition, and the changing mining situation of the multi-layer exploitation. The successfully applied Budryk-Knothe theory requires the adoption of appropriate theory parameters, such as angle of main impact range or exploitation factor. This is usually carried out based on geodetic measurements. The analysis of geodetic measurements on the observation line, as presented in the article, indicates that during the exploitation of consecutive deposit, the angle of major impact range changes, and the exploitation factor grows.

Keywords: *Geo-mechanics, underground exploitation, mining area, surface deformations*

PIOTR MAŁKOWSKI, PAWEŁ KAMIŃSKI, KRZYSZTOF SKRZYPKOWSKI

Impact of High Temperature on Mechanical Parameters of Carboniferous Rocks • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

This article presents the results of strength and deformation tests of carboniferous rocks — mudstones, siltstones, sandy mudstones and sandstones after kilning at a temperature of 1000°C. The rocks studied originate from the site of the underground geo-reactor designed in Poland from "Wieczorek" mine. The article presents the values of compression strength and tensile strength of the rocks, modulus of elasticity and changes to the above parameters due to impact of high temperatures. Also, ignition losses have been presented, as experienced by the rocks, and the above studies have been carried out in order to assess to the change in the physical properties of the rocks due to heating.

Keywords: *mechanical properties of rocks, rock furnacing, underground coal gasification (UCG)*

PIOTR MAŁKOWSKI, TADEUSZ MAJCHERCZYK, ZBIGNIEW NIEDBALSKI

Multi-criterion Analysis of Factors Affecting Maintenance of Roadways • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The article analyses factors affecting the possibility of maintaining roadways in Polish coal mines. The authors divided the factors into three groups – natural, mining and technical, as well as two sub-groups – geomechanical properties and type of support. The analysis was performed based on the AHP method, on the basis of surveys completed by experts in mines and R&D units. The selected methodology allowed for determining the hierarchy of importance of selected factors for working maintenance, as well as for pointing to universal factors, namely those important in all mines, and local factors which are important in specific mining-geological conditions.

Keywords: *AHP analysis, longwall working maintenance, mining support, working stability*

MARIUSZ MŁYNARCZUK, ŁUKASZ MAZURKIEWICZ

Description of the Fracture Path by Computer Image Analysis • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The paper describes the possibilities of using a computer image analysis system for the identification and description of the path of a fracture in a crystalline rock. For the purposes of this research two types

of cracks have been defined: the intercristalline crack (the crack goes between two different grains) and the trancrystalline (crack that goes through one grain and cut it into two or more parts). So far those types of researches were conducted in a non-automatic way, what was time-consuming and quite inconvenient. The algorithm proposed in this paper uses a range of image analysis and image processing operations. The proposed algorithm has been successfully tested on the fractures which occurred in two types of rock: the sandstone from Wisniówka and the dolomite from Rędziny.

Keywords: *rock fracture, image analysis, mathematical morphology*

KRZYSZTOF OLESZKO, MARIUSZ MŁYNARCZUK

Application of Computer Image Analysis to Imaging and Analysis of the Grains in 3D Space • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The article proposes imaging and measurement method of grains in 3D space. In order to represent analyzed objects in 3D space an optical profilometer was used. The profilometer measures those part of the grain which are visible to a measuring head placed above it. However, the most important parts of the proposed method is approximation of the bottom part of the grain, which is not visible to the measuring device. The method is based on the highest and the smallest heights of the analyzed grain and information about heights placed on circumference of the grain. In order to verify the proposed method computations were processed on a few test grains. A comparison of results obtained from this method and with results obtained from methods commonly used, based on substitute diameters, proved that the proposed method gives values which are closely related to the real more ones. During research, coal grains were measured with a grain class of over 1 mm. Grains were reconstructed in 3D space and carefully analyzed. The usage of this kind of measurements could be applied, for instance, to investigate methane issues in coal mines.

Keywords: *3D reconstruction, image analysis, grain volume*

ELŻBIETA PIETRZYK-SOKULSKA

Geological Environment as an Important Element of the Reclamation and Revitalization of the Quarries • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

Poland is a country rich in rock complexes which differ both in their origin and stratigraphy. Technical and decorative characteristics of rocks forming these complexes, decide upon their acquisition and use as a raw material for various sectors of the economy. Result of mining activity resulted in the creation of excavations (quarries) differing in type. They constituted a to a new anthropogenic form in the local landscape, transforming it permanently. Long periods of operation (up to 100 years with breaks), caused the quarries to become an inseparable parts of the landscape. After the excavation, quarries were a subject to a natural, uncontrolled succession and very quickly turned into woodland or grassland. Later on, stricter legislation on the environment forced quarry operators to conduct technical and biological reclamation. This was done to reduce the range of environmental changes and to restore the utility functions of the quarries such as forestry, agricultural or aquatic areas. Very often, reclamation activities irrevocably destroyed the values of the geological environment hidden inside the quarries. The geological environment includes not only the top layer of the lithosphere along with the phenomena and processes shaping it, but also the cultural and historical values as well as the infrastructure necessary for conducting mining operations. Taking these values into consideration should determin the direction of the reclamation and subsequent revitalization.

Keywords: *geological environment, quarries, reclamation, revitalization*

JOANNA PINIŃSKA, ANDRZEJ DOMONIK

Rock Mining Industry in History. Geosites and Geological and Engineering Assessment Thereof • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

Historical development of the Vistula River Valley is connected with the historical rock mining industry. The region represents a unique example of co-existence of the mining, building industry and rock workings. The roots of today's industries in the region reach as far back as medieval times and even further back – the Paleolithic. Cherts from chalky limestones in the Vistula River Valley, until the beginning of Iron Age, were the basic supply for various tools and weaponry. Prehistoric artisans, knowing the mechanical properties of chert-bearing rocks and knowing how to mechanically tool hard cherts, became precursors of today's geomechanics. The availability of common Upper Cretaceous and Neogene carbonate rocks made a significant impact on the building industry. The defense heavy fortresses, sacral monumental buildings and magnificent residential and common buildings are typically made of white, chalky and siliceous limestone blocks all over the Vistula River Valley and adjacent areas. In the XIX century the Lublin region was pioneering in the cement industry. The paper outlines geological and contemporary aspects as well as the geomechanical assessment of historical rock resources that recently represent geosites. Under special consideration is the vulnerability of rock to physical deterioration, rock slope and massifs stability with the passage of time. The geomechanical comprehensive assessment of geosites was exemplified by Bochotnica exposure.

Keywords: *raw stone materials, mining, geosite, monument, conservation, geological and engineering assessment, geomechanical properties*

STANISŁAW PRUSEK, WOJCIECH MASNY, MAREK ROTKEGEL, KRZYSZTOF SKRZYŃSKI

Optimizing a Support of a Face-roadway Junction Located under Goafs • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The paper contains results of underground tests of support load in the area of a face-roadway junction. Results of numeric computations of the influence of placing steel horseheads, props and the preparing technological niches ahead of the face of the wall on the support load-bearing capacity near the junction are presented.

Keywords: *support of a face-roadway junction, coal exploitations*

ANNA SZEWCZYK

Sowliny — the Center of the Petroleum Industry at the Very West End of the Carpathian-Galician Petroleum Route. Current Condition, Problems with Revitalization • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The paper discusses the problems of preservation and revitalisation of the post-industrial heritage in a small town, as a problematic but necessary processes in maintaining cultural continuity and identity. The history of the oil refinery complex in Sowliny, founded at the beginning of the 20th century as a branch of an international company is presented. The situation regarding the industrial site is discussed, the landscape, land morphology, and the transportation systems. The location and spatial composition of the plant in relation to the town of Limanowa is shown as evidence of care and commitment to harmony and the spatial order of the original designers. The original functional layout of the plant and its changes in time are presented, as well as the most important buildings and their individual characteristics. The paper's focus is the criticism of the local government's policy, which promotes modern industrial investments, not congruent in scale and production specificity with the historical buildings — examples of old technology. Revitalisation projects and works in the area are presented, and their

effects are discussed. *Edutainment* tourism, which combines education with entertainment, is indicated as a prospective new usage of the post-industrial complex, an efficient method for its regeneration. The potential of grassroots civic initiatives, which might positively influence the urban planning and architectural design in order to enable the survival of post-industrial heritage is also pointed out.

Keywords: *Sowliny, Limanowa, Carpathian-Galician Petroleum Route, revitalisation, post-industrial areas, oil refinery, architecture, edutainment*

JAN WALASZCZYK, DARIUSZ WIEWIÓRKA

Modeling the Impact of Active Fault on the Excavation Chambers under Conditions of Legnica Glogow Copper Area • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The paper presents selected issues related to computer modeling of dynamic phenomena in rock mass. There are examples of calculation results presented for the model, where the effects of the releasement of a large fault at different angles of inclination as with conditions found in the Legnica-Glogow Copper Area (LGOM) which have been observed. The illustration of these results are variable in time: displacement, velocity and acceleration, which are all noted at selected points of the model. To complement the picture of the rock mass behavior, observations due to changes in stress were performed, with particular emphasis on the stability of the pillars between chambers.

Keywords: *rock mechanics, dynamics, faults, numerical methods*

DANIEL WAŁACH, PIOTR DYBEŁ, KACPER OZIOMEK

Non-invasive Tests of High Performance Concretes in the Context of Their Application in Underground Construction Industry • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

Due to the possibility of using high performance concrete in the underground construction industry, e.g. for casing of tunnels and wells, the authors of this article have undertaken an attempt to check whether existing standards and instructions allow for assessing the strength of high performance concrete during its curing with non-invasive methods. This paper presents the results of non-invasive tests performed on high performance concrete samples in various curing periods (3, 7, 14, 21 and 28 days). On the basis of the results obtained, the compressive strength of the samples was estimated using base curves from the literature. The existing base curves were also scaled according to the recommendations contained in the standards and sectoral instructions. In order to be able to carry out a full analysis of test results, also authors' base curves were set. As a result, comparative material was obtained, which allows for assessing the possibility of applying the aforementioned methods for the tested high performance concrete in the time function.

Keywords: *high performance concrete, non-invasive tests*

DANIEL WAŁACH, ANDRZEJ SZUMIŃSKI, PIOTR DYBEŁ

Influence of Specimen Size on the Characteristic of Strain in High-Performance Concrete • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

Due to the wide prospects of use and varied capabilities of high-performance concrete (HPC), both in civil and underground construction, and to the use of numeric calculations in the designing process, are necessary to determine the exact deformational properties of the HPC. The stress-strain relations in concrete are of great significance in the design process and the method of determination depends on

many factors, such as: the rate of stress, number of load cycles, the age of concrete since the moment of its production, load duration, temperature and environment humidity changes. Another significant factor seem to be the size of the specimens, used to determine the said relations. This specification is of particular concern in regards to HPC which, due to its modified formula, may behave in a different way to regular concretes. This study presents the results of tests conducted on cylindrical specimens of high-performance concrete, in a uniaxial stress state. Specimens subjected to the tests were of significantly differing dimensions, however all shared the same aspect ratio (height/diameter). Based on the research conducted, one determined the influence of specimen size on the obtained values of modulus of elasticity. The comparison was made both for the tangent as well as the secant modulus of elasticity.

Keywords: *high-performance concrete, deformational properties, modulus of elasticity*

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The State Coal Mine Jawiszowice in Brzeszcze. History, Present State, Architecture, Vision of the Revitalization with the Participation of Creative Industries • AGH Journal of Mining and Geoengineering • Vol. 36, No. 1, 2012

The paper presents industrial complex of the State Coal Mine Jawiszowice in Brzeszcze. The story of the founding of the mine, the existing state and modernist architecture of selected objects is described. The author draws attention to the issue of protection of industrial heritage and points to the revitalization as its best form. Presented a vision of the revitalization with the participation of creative industries, which would lead to the transformation of SCM Jawiszowice complex into creative and innovative center being the driving force of development not only for Brzeszcze, but the whole region.

Keywords: *Jawiszowice, Brzeszcze, industrial heritage, revitalization, creative industries*