SUMMARIES

Karol Firek, Krzysztof Zgórski: **Selected Legal Problems Associated with Road Investment Preparations Procedures** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

This article presents an analysis of the legal acts, which regulate road investment preparation procedures. The aim of this study was to identify the problems emerging upon the application of the current legal provisions, as well as to assess the effects of recent legislative amendments in this regard. The paper presents basic legal acts relating to the preparation of Road Development Projects and a general description of the procedures for obtaining the most important permissions. The assessment of the effects of latest legislative amendments has been conducted based on a comparison analysis of the current regulations with the previous ones. An example provided here was that of the construction of a grade separated motorway junction located in a traffic route over a motorway, i.e. a project prepared before 2006, and executed in 2008–2010.

Keywords: road development project preparations, *Special Roads Act*, *Environmental Protection Law*, *Public Procurement Law*

Rafał Kocierz, Łukasz Ortyl: **Using Reflectorless Total Stations in Surveying of Industrial Chimney Inclinations** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

The surveying of inclinations and shape of the axis of industrial chimney structure is one of the most frequently carried out surveys in industrial plants. For this purpose, a trigonometric method is commonly applied. However, to ensure high reliability of the final product, the surveying should be carried out from more than two positions. Thanks to the development of reflectorless distancemeters (increasingly greater range as well as increasing accuracy), it is possible to develop methods which will fulfil all the accuracy requirements, while being competitive in terms of workload. In this article the author intends to present methods which could be used in measuring the inclination of the axis of industrial chimney structure. The results of conducted experimental studies were presented, showing consistency of the results which were obtained from the proposed methods with the results obtained from the classical method.

Keywords: reflectorless distancemeters, inclinations, industrial chimneys, trigonometric method

Rafał Kocierz, Łukasz Ortyl, Robert Mołoń: **Accuracy of Determining the Volume of Road Salt Storage Based on Surveying with Reflectorless Total Stations** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

This article presents the possibility of using reflectorless total station in the process of determining the volume of road salt. Salt of this type is stored in warehouses intended for storage of loose materials that are a part of the road infrastructure of the country. In order to perform this task, the test of three different Leica reflectorless distancemeters was conducted by carrying out surveys for a specially prepared sample of salt. The possibilities of surveying the distance for various sight line lengths and different angles of incidence of the beam on the surveyed object were examined. After the conducted test, one of the reflectorless total stations was used as an alternative tool for the hitherto surveying the inventory of road salt volume carried out using the measure to prism method. The comparative works were carried out in a warehouse located at the town of Rudno near the A-4 motorway, which was owned by the company STALEXPORT Transroute Autostrada S.A. The surveys of station poles at the salt dump were conducted on the same day, for the two instruments independently, using the polar method. The first survey was performed with the use of the ELTA R55 instrument, with the measure to prism method, and the second one with TCR407Power total station in a reflectorless mode. As a result of this test, data were obtained, which became grounds for determining the volume of the salt mass using two models reflecting the measured surface in three different computational programs. The values of the volume determined from both surveys for different models and programs were compared in order to verify the compatibility of the results with a criterion provided in the form of the values of the relative error of determining the volume, which were specified in the *Survey Manual of Ministry of Heavy Industry*. Additionally, a survey of the volumetric weight of road salt was carried out, which allowed the calculation of the total mass of road salt stored in the warehouse. The obtained result was compared with the inventory present in the records.

Keywords: reflectorless distancemeters, road salt, loose materials storage facilities, density

Wojciech Kocot, Aleksander Wodyński: **Impact of Mining Exploitation on the Road Viaduct Situated in the Immediate Vicinity of the Edge of a Mined Wall** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

The article presents the results of the research conducted on the behaviour of the statically undetermined steel road viaduct, located in the immediate vicinity of the edge of a mined wall. The study allowed

the comparison of the predicted area deformation indices with those measured directly on the structure during the occurrence of the impacts associated with the fall of the roof, which occurred in the course of coal exploitation.

Keywords: bridge, mining area, mining damages

Przemysław Kuras, Rajmund Oruba, Rafał Kocierz: **Application of IBIS Microwave Interferometer for Measuring Normal-Mode Vibrational Frequencies of Industrial Chimneys** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

The frequency values of normal mode of vibrations constitute one of the key elements of the technical characteristics of high industrial chimneys. The article presents the surveying of chimneys normal modes of vibrations with the use of a microwave interferometer. The system *IBIS Image by Interferometric Survey* is a modern measuring device, operating on the principle of microwave interferometry. This innovative surveying technique can be used for precise measurements of dislocations and strains of building structures. It allows remote measurements from the distance up to 1000 m. The high frequency of recording allows the use of this particular device for dynamic surveying of building structures. The paper presents a general technical characteristics of the interferometer. The need for conducting dynamic monitoring of industrial chimneys has been discussed. The article also presents the results of Poland's first frequency measurements of normal modes of vibrations carried out on two reinforced concrete chimneys of the height of 260 m with an interferometric radar.

Keywords: industrial chimneys, dynamic measurements, microwave interferometric radar

Anita Kwartnik-Pruc, Anna Szafarczyk, Anna Trembecka: **Analysis of Changes in Procedure of Designating Agricultural and Forest Lands for Investment Purposes** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

The possibility of utilization of agricultural and forest lands for the investment purposes is associated both with the change in their purpose, as set forth in a local development plan, as well as with administrative proceedings which would allow their actual exclusion from production. The *Agricultural and Forest Land Protection Act*, amended at the end of 2008, liberated the hitherto regulations by excluding agricultural lands utilized as crop lands and located within the cities corporate limits from the regulations of this act. At the same time, the necessity to obtain permission of higher competent authorities to designate land for investment purposes in the local development plan was limited. The article presents: the authorities who grant

their approval to alter the purpose of the land in a local plan, the changes in the scope crop land types requiring a decision on exclusion, as well as the changes in competences of the authorities and the possibilities of reducing fees for exclusion of lands from agricultural production and forestry over the past 15 years.

Keywords: agricultural and forest lands, exclusion of lands from agricultural production, investment purposes

Paulina Lewińska: **A Usage of 3D Modeling for Visualizing Problems with GPS Measurements on Urbanized Area** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

This article revolves around a project that was set to check the ability of use 3D imagining in estimating the possibility of GPS measurements in difficult area. The fast grow of GPS technology has become an incredibly useful for survey process. More and more jobs are being done with use of that technique. Unfortunately there are limits to that use. GPS survey in urbanized are can be extremely difficult or almost impossible to do. That is why it would be prudent to have a technique of assuming the conditions before the survey. *Visualization of GPS survey on a Town Square in Gorlice* shows the possible use of that tool in towns square of a small town. Places like that due to its relatively big area can be suspected to be useful in GPS measurements. The animation shows the right time and place to set the GPS receivers on a certain date. What is more a big emphasis has been put on giving a photorealistic look of the situation. The article also gives a basic idea of automating the process. It also shows the problems that might occur during realizing the process.

Keywords: geodesy, visualization, 3D imagining, Gorlice, GPS survey

Tomasz Owerko, Przemysław Kuras, Anna Szafarczyk: **Comparison of the Effectiveness of Automatic Targeting, Using Systems of ATR Type, with Manual Targeting, Based on Full Test Procedure ISO 17123-3** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

The subject of the article is to compare the accuracy of targeting implemented in two manners – manual and automatic. The study was conducted based on international standard ISO 17123-3 for two theodolites equipped with the automatic target recognition system. The paper discusses surveying procedure – a full testing procedure, which allows to determine the actual accuracy of the tested instruments. The obtained values are the basis for conducting statistical tests that allow to verify the presented hypothesis.

Keywords: automatic target recognition, ISO, accuracy

Janusz Rusek, Aleksander Wodyński: **Creating a Model of Technical Wear of Buildings in Mining Areas with the Use of Fuzzy Inference Systems** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

This paper presents procedure of creating model of progress of technical wear of buildings in mining areas using fuzzy inference systems. Three stage procedure was described and simulation example of technical state assessment for fixed model was analyzed. Final results showed that this type of approach is effective especially in buildings technical state assessment in case when input data are given as inexact linguistic forms.

Keywords: technical state, technical wear, mining areas, fuzzy inference system

Michał Strach, Arkadiusz Kampczyk: **Surveys of Creep--Susceptible Locations Using the Method of Fixed Points in Jointless Rail Track** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

The article deals with the problems as well as principles of conducting surveys and observations of creep-susceptible locations of rail courses in a jointless rail track using the method of fixed points. The paper presents and discusses the results of authors' surveys of rail courses creep of the No. 1 jointless rail track of the railway line No. 161 Katowice-Szopienice Północne – Chorzów Stary, which were carried out in the spring of 2008 and 2009. The total length of the jointless rail track covered by the monitoring was 5.227 km. The distribution velocity at this section equaled to 80 km/h. In addition, photographs and own observations on the relevant issues were presented. Due to the limitations in size, the article sets out the most important aspects of conducting surveying works, which are to determine the occurring shifts as well as to mark the fixed points and reference points. It also presents the manner of carrying out the analysis and final assessment of the jointless rail track operation.

Keywords: jointless rail track, neutral temperature, fixed point, base point, rail micro-shifts, rail creep, track shift

Anna Szafarczyk, Anita Kwartnik-Pruc: **The Concept of an Integrated Monitoring System for Surface Mass Dislocations Using Terrestrial Radar Interferometry** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

Geodetic monitoring of surface mass movements is based upon conducting observations of observation network points fixed in the analysed area. The authors suggested the improvement of the surveying

methodology by means of applying terrestrial radar interferometer. The manner of operation of the appliance, the parameters of the obtained results and the potential uses were shortly presented against the example of monitoring a landslide. Implementation of comprehensive research, additionally complemented with the use of ground penetrating radar, as well as execution of geological and engineering surveying will provide the warning possibility of the loss of landslide stability, which in turn will allow to enhance safety measures.

Keywords: mass movements, terrestrial radar interferometr, landslide stability

Anna Trembecka: **Purchase of Property Plots Parcelled out for Roads by the State Treasury or Local Authorities under the *Real Estate Management Act*** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

This article deals with the issues related to the acquisition of property rights regarding plots of land parcelled out for roads by the State Treasury and local government units. It also points to the consequences arising during practical applications of vague provisions of law in this regard, illustrated with an example of the area of the city of Cracow.

Keywords: division of a real estate, public roads

Andrzej Uznański: **Analysis of RTN Measurement Results Referring to ASG-EUPOS Network** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

The paper presents the analysis results of the precision and accuracy of the coordinates of 27 points determined in 149 series of the RTN measurements with reference to the NAWGEO service of the ASG-EUPOS network system. A total of 4,475 positions of these points were analysed. The basis for the analysis of point coordinates from the RTN measurements were the results of the GPS static surveying, precise tachymetric surveying, as well as the precise levelling. The precision of the horizontal horizontal coordinates of the points from the RTN measurements has to be assessed as high. The vast majority of the results was characterized by the precision of the horizontal coordinates which was not worse than 5 mm. The accuracy of surveying results was lower, but generally fell within the ranges specified on the website of the ASG-EUPOS network system.

Keywords: RTN measurements, ASG-EUPOS System, NAWGEO servis

Alina Wróbel, Andrzej Wróbel: **Determinants of Thermal Insulating Properties of Walls Using Thermographic Method** • Geomatics and Environmental Engineering 2010, Vol. 4, No. 1/1

Heat transmission coefficient U is a measure of thermal insulating properties of walls. Its value should be determined in a stable state of heat exchange. During the *in situ* measurements the temperature of wall surface and heat flux density are measured with the use of a heat flow meter. These are single-point measurements and thus they do not provide a complete view of a thermal insulation of the surface. Thermographic measurement allows to achieve a surface temperature distribution. It lasts too short to conclude on its basis that the state of heat exchange was really stable. Therefore, for quantitative thermographic measurements, it is important to identify the exact conditions of heat exchange and to carefully select the time of conducting imaging procedure.

Keywords: thermal insulation, thermographic camera, thermographic control conditions