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4, Barbu Ștefănescu Delavrancea Street, 410058 – ORADEA – ROMÂNIA
www.uoradea.ro * <http://arhicon.uoradea.ro>
Phone/Fax: 004-0259-408447

CONSTRUCTIONS AND HYDRO-UTILITY INSTALLATIONS

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Prefață

Aprecierile pozitive și interesul științific manifestate de către comunitatea academică de profil, atât pe plan național, cât și internațional, referitoare la *Analele Universității din Oradea – Fascicula Construcții și Instalații Hidroedilitare*, a motivat *Colegiul de redacție* al acesteia de a depune eforturi în vederea apariției unei ediții intermediare.

Lucrările științifice incluse în acest număr al revistei sunt atent analizate de către un comitet științific format din profesori universitari români și străini, cu recunoaștere internațională în domeniile de competență pe care le acoperă, contribuind la menținerea prestigiului revistei.

Această ediție păstrează tematica de interes a revistei anuale editată în urma Conferinței Științifice, „Tehnologii Moderne pentru Mileniul III”, drept pentru care cuprinde aceleași domenii de interes, și anume: Cadastru, Arhitectură și Construcții, Inginerie Sanitară și Protecția Mediului, la care s-a adăugat secțiunea Miscellaneous.

Perpetuarea apariției bianuale a *Revistei Facultății de Arhitectură și Construcții* va oferi celor interesați posibilitatea consacrării lor științifice, contribuind la creșterea prestigiului comunității academice de profil.

Colegiul de redacție

Preface

The positive feedback and scientific interest manifested by the academic community profile, both nationally and internationally, regarding the Annals of University of Oradea – Constructions and hydro-utility Installations Fascicle has motivated the Editorial Team to take any effort for having a biannual edition.

Papers included in this issue of the Magazine are carefully reviewed by a Romanian and foreign professors scientific committee, which have a competence with international recognition in that domains they work, contributing, in the same time, to maintaining the prestige of the Magazine.

This edition kept the interest thematic of the annual Magazine published after "Modern Technologies for the Third Millennium" Scientific Conference, that is why it covers the same areas of interest, namely: Survey, Architecture and Engineering, Sanitary Engineering and Environmental Protection, and now it was also added the Miscellaneous Section.

The biannual occurrence perpetuation of the Faculty of Architecture and Construction Magazine will provide to the interested parties the opportunity of their scientific consecration, contributing to increasing the prestige of the high-profile academic community.

Editorial Board

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team's role being to read around round the topic and verify the accuracy of the information included in
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I. SECTION

ARCHITECTURE, CONSTRUCTIONS

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ASSESSMENT OF REINFORCED CONCRETE PRECAST STRUCTURES WITH RIGID CONNECTIONS

BOB Corneliu, BOGDĂNESCU Daniel

ABSTRACT

Here are presented the solutions of rigid joints between columns and beams for precast concrete structures like halls with one level. In the paper are analyzed the aspects concerning test on site on a main beam with rigid connection and the monitoring of soil settlement under foundation.

Keywords: *RC precast structures, rigid connection, on site test, soil settlement, difference settlements*

MODERN REHABILITATION SOLUTIONS FOR THE OLD BRIDGES

BOTA Adrian, TECȘA Alexandra, BOTA Dorian

ABSTRACT

In the last twenty years numerous bridges from the road network of Romania, built in localities or outside of them, on national or county roads or even on roads for local use were rehabilitated. Even though the technical and financial effort was appreciable, it is far from being sufficient considering the necessity of works imposed by the precarious stage of many of the passing structures. Their stage is a consequence, on one hand, of the quality of execution and the used materials, and on the other hand, of the, in many cases, total lack of maintenance. Very often the rehabilitation is not enough, consolidation works being also needed. We have always considered that the chosen solutions have to have a high technical and quality level in order to insure a good behaviour in time for the longest period.

Keywords: *structure rehabilitation, footway, expansion joints, anticorrosive protection*

DUCTILITY OF SEMIRIGID STEEL FRAMES

CĂTĂRIG Alexandru, MATHE Aliz , CHIRA Nicolae

ABSTRACT

Semirigid connectivity is an efficient technique in the larger objective of imposing a controlled behaviour of buildings under seismic actions. Several numerical comparative studies are conducted on six steel multi-storey planar frames semirigidly connected at beam – column sections with the aim of selecting optimum design solutions for multi-storey real steel structures. The structures selected for the present study are part of an interactive design job. The first component of this job is to convince the beneficiary to agree to semirigid connectivity technique. The second component of the job is to obtain real steel structures placed somewhere in the “immediate occupancy” performance level. Two cases of semirigidity level for two planar frames are considered. Also, the reference case of classical rigid beam – column connections for each frame is considered. The location of the buildings is in the Southern Romania, therefore the analyzed frames are subjected to a time history (Romania, Vrancea –1977) loading and, also to a pushover type both in the presence of corresponding gravitational loads. Computed parameters are specific to performance based analysis: pushover (base shear – lateral top displacement) curves, plastic collapse mechanisms, global and joint ductility coefficients, bending moment – relative rotation curves and the story drifts. Relevant – for the authors' objective – conclusions are drawn for the semirigidly connected steel frames.

Key words: *steel frames, semirigid, ductility, collapse mechanism*

COMPOSITE STEEL – CONCRETE SHEAR WALLS WITH STEEL ENCASED PROFILES. EXPERIMENTAL PROGRAM

FABIAN Alexandru, STOIAN Valeriu, DAN Daniel

ABSTRACT

The composite steel concrete structural shear walls with steel encased profiles are elements that can be used as lateral load resisting system for high rise buildings that require considerable large lateral load resistance. Five different types of composite steel concrete shear walls and a typical reinforced concrete wall were analyzed and will be tested in laboratory in order to study the nonlinear behavior, stress distribution, crack distribution, structural stiffness at various loads, and load bearing capacity of these elements. This paper presents partial results from experimental tests on composite steel-concrete shear walls with steel encased profiles, which is one of the innovative systems studied in a research program started at the Department of Civil Engineering from Politehnica University of Timișoara.

Keywords: *composite elements, nonlinear behavior, experimental test*

METHODS FOR THE ANALYSIS OF THE STABILITY OF EMBANKMENTS. FELLENIIUS METHOD

GUGU R. Sabina

ABSTRACT

Constructions and communication roads situated on a declivous field may lead to sliding both during construction works and during the exploitation period.

Following sliding may result important material damage but also losses of human lives. Romanian landscape presents several instable slopes, some of them being crossed by communication roads and on others, social and industrial constructions have been built. Taken these aspects into account, we must make an assessment of the stability degree of those slopes.

Keywords: *Fellenius method, industrial constructions, slopes*

THE ENERGY PERFORMANCE OF EXISTING BUILDINGS AND ITS INFLUENCE ON THE INTERIOR COMFORT

IANCA Sevastean

ABSTRACT

During the cold season, which in Romania is characterized by very difficult climate parameters, the suitable building thermal insulation is a very important factor for the interior comfort quality. The interior comfort within the built space is the result of a sum of functional, technical and environmental elements which can ensure favourable conditions for human life. The main component of the building interior comfort is the “thermal comfort”, which means ensuring temperature and humidity parameters inside the building according to the needs of the human body. The obtainment of an optimum interior thermal comfort is confronted with the necessity of the energy consumption reduction, and the solving of this problem rests upon the way in which the building envelope is made, from the point of view of the composition, form and execution technology. The paper presents an overview of the parameters that influence the interior comfort of residence buildings.

Keywords: *Conductivity, Insulation, Thermal bridge, Comfort, Performance*

DESIGN CONCEPTS FOR ECOSTRUCTURES

KOPENETZ Ludovic, CĂTĂRIG Alexandru

ABSTRACT

Intensive use of traditional structural materials is a consequence, besides the consumption of fuel reserves and release of particulate matter in the environment (air, water worldwide), and that requires financial resources hard provided by the society. In this context the ecostructures, representing the human relationship with the environment, represents the essence of the ecological architecture event and considering also the special effects that are not taken into account by the designers of our time. The ecostructures are structures that are different from the current construction through the features they are fit. The concept, design and their implementation requires solving problems that are different by the solutions used for the common structures. The constructors materials belonging to the category of organic materials, characterized by low power consumption for their production, materials that do not deliver exhaustible reserves of raw materials, extensive use of local traditional materials. Organic materials considered in this paper are: the stream of air, paper, textiles and stabilized earth. The concepts presented in the paper contain both theoretical elements and examples of significant resolution.

Keywords: *ecostructures, structural materials, environment, physical element, biological element*

AN EARTHEN DWELLING IN SINTEU

LEPĂDATU Dan

ABSTRACT

In this document we are describing the blueprints of a new dwelling in Sinteu, in Bihor County. The concept that rules our project is related with the use of natural materials, as adobes. The indoor climate is controlled by Trombe walls and ventilation channels. The work presents the concept of a solar passive house. The principles of the passive solar houses and sustainable architecture are present in the design of this dwelling.

Keywords: *Passive solar houses, mud bricks, adobes*

SOME CONSIDERATIONS CONCERNING SOLAR PASSIVE DWELLINGS. THE GREEN IGLOO HOUSE

LEPĂDATU Dan

ABSTRACT

This study has a very specific feature with practical application for those architects who are concerned in the design of the ecological houses, buildings using renewable resources. Focusing on some examples of architecture few known, of Innuits houses from Arctic places, we have identified an ancestral but very subtle way to understand the process of adapting of these houses at the conditions of a very hostile climate.

Keywords: *Passive solar houses, heat pump, Innuits dwellings*

DECORATIONS 1900 AT HOTEL “PARC” FROM ORADEA

MARIAN Daniela-Georgeta

ABSTRACT

The buildings named hotels have built for Art Nouveau the luxury edifices, true works of architecture, art, done for a rich clientele. In Oradea, the city from the Crisul Repede River, there is a great formal and plastic compositional variety with function of public accommodation, obtaining synthesis of monuments 1900.

Keywords: 1900 architecture, compositional variety, public accommodation

DECORATIONS 1900 AT THE “POYNAR PALACE” FROM ORADEA

MARIAN Daniela-Georgeta

ABSTRACT

A curved formula, sustained by the corrugated attics and a softened corner, underlined by two balconies from forged iron, a flare eaves and a girth sustained by neo-baroque columns represent architectural pieces which transform the architectural object into decor. In Oradea, the city located on Crisul Repede River there is a great compositional and plastic variety of the buildings created in the spirit of the Art 1900.

Keywords: 1900 architecture, curved formula, decor

THE SEMANTIC OF THE ORNAMENT AT THE SALONTA’S TOWER CITY HALL

MARIAN Daniela-Georgeta

ABSTRACT

The reason to appeal for decorate, asked of the necessity of function representation of the architecture programme in the epoch, on the facade of the buildings in the inside areas, give a individuality for each construction, characteristic given by the involve the stylistic with the culturale shape in the geographical areas.

Keywords: facade, inside areas, city planning

SHAPE AND SEMANTIC ORNAMENT CASE OF SALONTA HOUSE

MARIAN Daniela-Georgeta

Abstract

The charm of the 1900 architecture is due, mainly to architectural ornaments, as they are codes loaded with meanings, and they provide us with information on the historical age, fashion, used techniques, on brief, with the life characteristics and personal desires of a the inhabitants of a certain settlement.

Keywords: 1900 Style, ornament, symbolic decoration

ASPECTS OF DEVELOPMENT OF COMMUNICATION SYSTEMS OF THE CITY OF ORADEA AT THE BEGINNING OF THE XXTH CENTURY

MARIAN Daniela-Georgeta

ABSTRACT

What science and technique achieved, the leap to urban comfort, at the end of the XIXth century, was the introduction of communication systems (railway, tram, mail, telephone, telegraph) electric power systems, public lightning, and not the least, town systems of water adduction and sewerage.

Key words: railway, tram, mail, telephone, telegraph

BUILDINGS STYLE 1900 WHICH REQUIRE RESTORATION ROTH ARMIN HOUSE FROM SALONTA CITY

MARIAN Daniela-Georgeta

ABSTRACT

The analysis of buildings done in the spirit of Art Nouveau trend from the geographical areas of the country, Crisana and Banat, of the sculptural decor, of materials used, of ornamental symbols, of types of artisans, architects, artists involved in their construction, emphasizes their high compositional number and variety on this area, but also the issues of preservation, restoration, maintenance, under the original form their aspect.

Keywords: preservation, restoration, maintenance

SUBURBAN FANTASY

MOLDOVAN Ioana, MOLDOVAN Mircea, MOLDOVAN Silivan

ABSTRACT

The word suburbia, represented both by the form of settlement as well as a certain type of life style, is often associated with different economic, social, spatial, cultural and political characteristics of the city, and depending on the period to which it refers to, the suburbs can have positive or negative connotations.

The massive expansion of the suburbs is a phenomenon that started at the end of the 19th century, early 20th century, when the English and American model was adopted with much enthusiasm by the developed or developing countries. The spreading out phenomenon resulting from a variety of factors: the free market for land, the development of transportation (train → carriage → car → subway), city growth, social, ethnic and racial stratification of the population, etc.

Keywords: suburb, villafication, resources, urban expansion

A NEW JEWISH COMMUNITY CENTRE FOR ORADEA

MOLDOVAN Mircea-Sergiu, JULEAN Dan-Ionuț

ABSTRACT

After the end of The Holocaust, we have been writing a long funereal panegyric, confronting a cruel reality: the Jewish population that has drastically decreased and the decimated communities, leaving behind an immense heritage, needing today a lot of conservation, restoration and rehabilitation work to do. Regarding the built patrimony, the most important issue consists of finding the best utilization possible for

each type of building (i.e. cultural, educational, religious or private use). All the work is done to support and revitalize the local Jewish communities, through the help of community centres, cultural centres, national and international trusts, funds, and grants. The role of community centres is undoubted. Jewish patrimony is a worldwide subject to reconsider, especially in Eastern Europe countries. Oradea, once representing the most important Jewish community of Hungary, and after 1918 of Romania, is nowadays a true, silent witness of the immense impact of Jewish culture, in almost all aspects of native society life.

Keywords: Jewish heritage, Central and Eastern Europe countries, Community centres, Oradea

THE PATHOLOGY OF WET BUILDINGS

MOLNAR Luminița-Monica, MANEA Daniela-Lucia

ABSTRACT

This paper describes the identification problem and the resolution of moisture of construction elements. Here, we analyze the causes that determine the degradations apparition due to moisture: constructive and unconstructive, the physical, chemical, and the biological. Building diagnosis determines the status of elements and construction materials after browsing some well-defined stages. To identify the moisture status of construction elements are presented the classical methods and the last generation method based on magnetic resonance.

Keywords: Moisture, Degradations, Classical Methods

THE INFLUENCE OF CONSTRUCTION RADON ON HEALTH

MUNTEAN Lavinia-Elena, MANEA Daniela-Lucia

ABSTRACT

Radon is a colorless, odorless, radioactive gas that can leak into the house through cracks in the concrete walls or floors and through the drainage pipes in the floors. The most common source of radon is uranium that normally exists in some soils on which houses are built. Problems occur when radon concentrations increase inside houses or buildings. Both old and new houses are vulnerable if they do not have a barrier against radon leakage between the soil and the inside, i.e. those with unpaved basements or technical spaces. Radon exposure is the second cause of lung cancer (after smoking). The risk of cancer associated with the exposure to radon and cigarette smoking is 25-fold higher in smokers than in non-smokers.

Keywords: Radon, Emanation, Building materials

STRENGTHENING OF REINFORCED CONCRETE COLUMNS BY WRAPPING WITH FRP EXPERIMENTAL RESEARCHES

POP Mariana, TOADERE Mihaela-Teodora, POP T. Maria

ABSTRACT

The present work aimed to compare the efficacy of different FRP-based confinement strategies for reinforced concrete columns available in the literature. The main results of some experimental programs are presented and compared. These results demonstrate that confinement by wrapping with FRP composites is an efficient technique used to increase the load carrying capacity, strength or ductility of a column.

Keywords: reinforced concrete columns, confinement, FRP strengthening, ductility, rehabilitation

II. SECTION

CADASTRAL SURVEY

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IRRIGATION IN ARAD COUNTY – PRESENT AND PERSPECTIVES

CÎMPAN Gabriela

ABSTRACT

Irrigations are an area of interest in deepening drought conditions and global warming. If in 1989 there were eight irrigation systems in Arad County, currently there are four functional. Of these, systems Fântânele-Sagu and Semlac-Pereg benefit, along with other five facilities in Romania, the support for rehabilitation and modernization of the project "Rehabilitation and Irrigation Sector Reform".

Keywords: *irigation, county Arad, irrigated areas*

INTERACTIVE VECTORIZATION – AN USEFUL TOOL IN CREATING DIGITAL MAPS

DIDULESCU Caius

ABSTRACT

This paper presents a method of converting traditional maps to digital format using interactive vectorization. The article presents the advantages and disadvantages of different methods of converting a paper map to digital format. The choice of the specific method of conversion depends on quality of the map, availability of a specialized software program and requirements for quality and completeness of the data against the costs of the project.

Keywords: *digital maps, conversion analog maps, interactive vectorization*

EVALUATION OF THE RECONSTRUCTION PRECISES OF THE 3D MODEL OF THE ST. LADISLAU CHURCH FROM ORADEA OBTAINED THROUGH PHOTOGRAMMETRY METHODS

FETEA Ioana

ABSTRACT

In this paper is presented a statistic analyse against the precises obtained in realizing a 3D model for a church, which is a historical monument, respectivelly St. Ladislau Church from Oradea.

Keywords: *close range photogrammetry, non-metric camera, model*

PHOTOGRAMMETRIC METHODS AND LASER SCANNING FOR OBTAINING OF THE 3D MODELS

FETEA Ioana

ABSTRACT

In this paper are presented the methods of obtaining 3D models of the buildings that are historical monuments giving as example St. Ladislau church from Oradea. 3D model was obtained using a photogrammetric method in a set of consecutive images worked in a circle around an object and using laser scanning method. The instrument Trimble VX was used for obtaining the 3D model.

Keywords: *model, modelling, camera calibration, laser scanning*

USING ALGORITHMS NURBS AND RBF TO THE 3D MODELLING OF ARCHITECTURAL BUILDINGS

FETEA Ioana

ABSTRACT

In this paperwork there are presented 3 algorithms which can be used to 3D modeling of big architectural buildings. The study was done on details of construction for the Sf. Ladislau church from Oradea. Points object were obtained by terrestrial laser scanning.

Keywords: 3D modeling, interpolation, mesh, NURBS, RBF

THE USE OF G.I.S. IN ORDER TO A SUSTAINABLE DEVELOPMENT OF THE LOCALITIES

HERBEI Mihai

ABSTRACT

Known as GIS (Geographical Informatics Systems), the instruments of visualizing and analyzing the geographical information constitute today a field with a spectacular evolution. The special GIS operations over the spatial information make from these instruments not only some efficacy instruments for making maps, but especially, irreplaceable instruments for analyzing the information that refer to the terrestrial surfaces. Also, the existent information can be reused, due to the fact that one of the main purposes of introducing the GIS technology consists in creating – by conversion in digital form – some efficient possibilities of maintaining and updating the information. During the last quarter of century, the GIS applications have been extended quickly into the following fields: natural resources, energy, transports, business, and public safety.

Keywords: Geographical Informatics Systems, spatial information, maps

MANAGING THE DATA USED IN A G.I.S.

HERBEI Octavian, HERBEI Mihai, ULAR Roxana

ABSTRACT

The digital map must be made by valorizing all the existent resources based on a rigorous analyze of their content and their costs following to be assured the necessary quality in conditions of maximum efficiency. Each source of data presumes the existence of some special programs which we should bring the respective data in shape correspondent to the digital map by starting from assuring the necessary equipments crossing through the technological problems and conversion ones of the data, reaching to correspondent training of the staff. In this paper it is presented the way of transforming the data from analogical form into digital form in order to be able to be presented and used by a GIS.

Keywords: geographic data, non-geographical data, attributes, GIS, coordinate transformation

COORDINATE AND DATUM TRANSFORMATION

IŽVOLTOVÁ Jana

ABSTRACT

Basic idea of the paper is in analyses of a coordinate precision of various approaches of coordinate transformations. Paper contains the principles of coordinate transformations with using global and local transformation parameters and the precision comparison. There are shown the possibilities to evaluate the local transformation parameters and to estimate their accuracy.

Keywords: Datum transformation, ETRS-89, Global navigation system, Coordinate accuracy

MEASUREMENT OF SURFACES USING THE LASER TRACKER SYSTEM

JOCEA Andreea-Florina, BUDA Aurelian-Stelian

ABSTRACT

An important field of measurement technique is the determination of position in the kinematic regime.

In this case the trajectory of an object is described by a vector of time-dependent position and defined in a suitable coordinate system. Essential in determining the kinematic path is to be determined the frequency of object position acquisition in order to describe closely the route map.

Another characteristic to describe the kinematic processes could be considered the degree of automation of measurement, depending on the category of sensors and measurement methods, supported in turn by recording and processing of electronic data.

Coordinate measuring devices such as Photogrammetry Systems and Manual Theodolite systems have been introduced already at the beginning of 1990 years. A Laser Tracker system has been developed for 3D measurements of object points with a single sensor-head.

In this paper will be explained the principles of the Laser Tracker system. Accuracy is derived taken into account the resolution of the interferometer and of the angle encoders. Typical positioning accuracy of a static point is better than 10 ppm.

Keywords: sensors, laser tracker, interferometer

GIS, WATER MODELS AND SEWER MODELS

KELLER Iulius-Eduard, DOHOTAR Vasile, BILAȘCO Ștefan

ABSTRACT

One of the biggest challenges in the big cities with aging water, wastewater, and stormwater infrastructures is managing information about maintenance of existing infrastructure and construction of new infrastructure. More than 80% of all the information used by water and wastewater utilities is geographically referenced. Making informed infrastructure improvement decisions requires a large amount of diverse information on a continuing basis. If information is the key to fixing infrastructure problems, the first step of any infrastructure improvement project should be the development of an information system. GIS applications have the potential to enhance the management of our water, wastewater, and stormwater systems and prepare them for the operational challenges of the 21st century.

Keywords: GIS, Water Models, Sewer Models

APPLICABILITY OF GIS IN NOMINAL ASSETS VALUATION

**MANCIA Aurora, DROJ Gabriela, DROJ Laurențiu,
MANCIA Mircea**

ABSTRACT

The usage of Geographic Information Systems (GIS) has been rapidly increased and it became the main tool for analyzing spatial data in many engineering applications and decision making activities. The change from paper maps to digital data, in various kinds of geographical data analysis and applications, has made easier to use identical spatial data for different applications and also for combining several information layers into complex spatial models. In the recent years, the usage of geographical informational systems have been rapidly increased and it became an essential tools not only in assisting daily work but as a decision support tool especially for planning, resource management and in economic informatics field. In this paper, we are analyzing the applicability of GIS in nominal asset land valuation.

Keywords: GIS, nominal assets valuation

WASTE DEPOSITS IN EUROPE

MANCIA Mircea, MANCIA Aurora

ABSTRACT

Paper we want to present in this volume make an introduction into the field of waste. Thus, we all know that waste is generated universally and is a direct consequence of all human activities. In the same time, wastes are generally classified into solid, liquid and gaseous. From this perspective, our paper purpose is to outline the risk that waste disposal presents to groundwater quality and the information that is required to assess this risk.

Keywords: *waste, consequence, processing methods*

DRĂGAN DAM MONITORING BY CORRELATION ANALYSIS OF THE HORIZONTAL DEFORMATIONS

MODOG Traian, TEUȘDEA Alin-Cristian

ABSTRACT

Horizontal deformations monitoring of Drăgan dam is done by physically methods (i.e. inverse pendulum) and topographically methods (i.e. optoelectronic). The existence of different conclusions drawn from these deformations reveals the correlation importance of the two deformation systems. If there is a correlation then the deformations values differences will be provided by measuring errors; if the correlation is not present then the deformations values differences will be provided by coarse errors. This paper is intended to compare the deformations for the 3D representation of deformations: 1D for the deformations along the upstream-downstream direction, 1D for the deformations along the left-right direction, 1D for the dam height. Fourier analysis is used to generate the correlations of deformations measured by the two different methods mentioned before for all studied dam plots at the same time – i.e. dam crust.

Keywords: *deformation analysis, Fourier correlation, dam monitoring*

LASER SCANNING. APPLICATION IN INDUSTRIAL ENVIRONMENT

NISTOR Sorin, SUBA Norbert-Szabolcs

ABSTRACT

Laser scanners are used more and more as surveying instruments for various applications. With the advance of high precision systems, capable of working in most real world environments under a variety of conditions, numerous applications have opened up. In the field of surveying laser scanners open up a new dimension with data capturing. Different industrial sectors require precise data of the environment in order to be able to have a as-build documentation of the facility. Especially as build documentation of plants (automotive, chemical, pharmaceutical etc.) has become a very sensitive and important new segment, as companies need to document their facilities.

This is a basic requirement to plan and evaluate emergency situations (evacuation scenarios etc.) but also for simulation purposes of specific manufacturing cycles (car assembly etc.) as well as design studies. Having the environment in 3D as a CAD model (“digital factory”) open up design studies without changing anything in the real environment and therefore causing no down time of production lines.

Keywords: *laser scanning, high precision system, documentation of plants*

TECHNIQUES OF INSPECTING THE QUALITY OF MAPS

SUBA Stefan, SUBA Norbert-Szabolcs

ABSTRACT

The collection of spatial data is influenced by random errors, methodic errors and gross errors.

The quality in GIS applications depends on the quality of stored data. In GIS applications, the data quality has a great influence over the results. The data are used without considering the contained errors, and this can lead to erroneous results, disorienting informations and bad decisions at high costs.

The notation „map” is used as an abbreviation in this paper, but it refers both to the maps on paper support at large scales and to the digital map, and the database of the digital maps.

The graphical and non-graphical database in case of the digital maps (or derived from them) must satisfy well defined requirements or requirements which appeared from the behalf of the users.

Keywords: mapping, data quality, GIS database, quality control

III. SECTION

SANITARY ENGINEERING AND ENVIRONMENTAL PROTECTION

Advisory Board:

PhD.Prof.Eng. **I. BORDEAȘU**

PhD.Prof.Eng. **G. C. IONESCU**

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PhD.Prof.Eng. **TH. MATEESCU**

PhD.Prof.Eng. **A. RETEZAN**

TRAFFIC AND AIR QUALITY IN BUCHAREST METROPOLIS

ARDELEAN Florinela

ABSTRACT

The state of deterioration of exterior air quality in large urban centers due mainly to traffic demands a thorough analysis of different atmospheric pollutants. For this, the quality of air in Bucharest has been monitored with the help of the monitoring network, in eight different locations. The analyzed pollutants were nitrous oxides (NO_x/NO_2) and ozone (O_3), as main chemical species linked to the photochemical smog appearance. Besides this, carbon monoxide (CO), was added, that characterizes the pollution produced by traffic. Higher values of nitrous oxides and carbon monoxide were recorded in the center of the city and lower to its periphery. For ozone, the values recorded were, in average lower in the center of the city, while going to the periphery, the concentrations increase. We can notice the fact that ozone concentrations and the nitrous oxides ones are reversed correlated.

Keywords: *traffic, outside air pollution, correlation coefficient, nitrous oxides, ozone*

URBAN POLLUTION AND THE ACCENTUATION OF THE GREEN HOUSE EFFECT

ARDELEAN Florinela

ABSTRACT

The article starts by presenting the causality link between the accentuation of the green house effect and global warming in strong relationship with the dynamics of natural variability of the climate. The most recent predictions regarding the global climate change are emphasized. In this paper a study has been done that will track the variation tendencies of different categories of pollutant concentrations and of the primary weather parameters in an urban congestion. Weather factors influence variation, and the forming or disappearance of pollutant species. The necessary database is obtained by recent measurements done with the help of equipment found in the station's endowment, stations that form the air quality monitoring network existent in Bucharest's territory.

Keywords: *global warming, urban pollution, weather parameters, air quality Bucharest*

RAM PRESSURE IN WATER ADDUCTION PIPELINES FUNCTIONNING BY PUMPING

BOERIU Lucia-Maria, HORNEȚ Mircea

ABSTRACT

Protection of water adduction pipelines working under pressure to ram pressure effects requires detailed knowledge of the phenomenon, choosing the appropriate method of calculation and determination devices as well as technical means of protection. In most of the cases, protective measures are combined, taking into account the installation's behaviour in normal operating conditions and manoeuvres in cases of accidental damage, followed by the occurrence of dangerous pressure variations.

Keywords: *Ram pressure*

CONSIDERATIONS ABOUT THE ACTUAL FIRE SAFETY STATUS IN ROMANIA

DÂRMON Ruxandra

ABSTRACT

The article is a brief review of the actual regulations in fire safety design in Romania. A series of eurocodes were enacted as a consequence of the essential requirement "fire safety", required by European Directive 89/106/CEE. The Romanian fire safety design norm P118/89 is based on requirements being an inflexible design code.

Keywords: fire safety, fire reaction, fire resistance

CALCULATING MODEL FOR THE PROFILE OF WIND TURBINE BLADES

DUBĂU Călin

ABSTRACT

The calculation of the blade profile has been made by determining the geometrical outline of the aerodynamic profile, defined analytically through the combination of two mathematical functions, the skeleton and the thickness functions. The model presented has been illustrated in seven calculation sections, which have configured the final shape of the blade, taking into account the running of the aerodynamic profile which has been placed in air draught, based on a calculation algorithm.

Keywords: wind turbine, blade, aerodynamic profiles

MUD TREATMENT PROCESSES AND BIOGAS PRODUCTION AT ORADEA WASTEWATER TREATMENT PLANT

GLIGOR Emil, IONESCU Gheorghe-Constantin, DAN Florin,
IONESCU George-Lucian, SÂMBETEANU Aurora

ABSTRACT

The goal of treating sludge is mineralization of organic matter mainly to reduce the volume, which can more easily be treated and therefore reducing the important quantities of methane gas, used primarily in the treatment plant needs.

Fermented sludge is almost free of odour and can be used alone or in various purposes, after being treated. The quantity and composition of sludge varies depending on the original wastewater or the nature in which the sewage treatment process are applied.

The final products of sludge fermentation are solid materials, water sludge (including colloidal solid materials) and also gas.

The process of sludge fermentation is considered complete when were obtained 90% of theoretical gas production and sludge has lost a great deal of water, is stable and has a virtually imperceptible odour.

Keywords: mud treatment, biogas production, wastewater treatment plant, automation

OPTIMIZATION AND PROFITABILITY OF FERMENTATION GAS PRODUCTION FACILITIES IN WASTEWATER TREATMENT PLANTS, USING UNCONVENTIONAL SOURCES

GLIGOR Emil, IONESCU Gheorghe-Constantin, DAN Florin,
Ionescu George-Lucian, SÂMBETEANU Aurora

ABSTRACT

This paper deals with the possibility of using and exploiting solar and geothermal energy resources, considered as an alternatives to electricity for process optimization and profitability of gas production facilities in fermentation wastewater treatment plants. These facilities provide fuel gas, but they are large

energy consumers. By using non-conventional energy sources we can increase their profitability.

Keywords: solar energy, geothermal energy, wastewater treatment, sludge fermentation

CONSIDERATIONS REGARDING THE POSSIBILITIES OF DURABLE EXPLOITATION OF GEOTHERMAL DEPOSITS IN THE PANNONIC HOLLOW

GOMBOȘ Dan, PRADA Marcela-Florina

ABSTRACT

The processing of the available data has been focused upon two of the major structural units with geothermal potential of the Pannonic Hollow.

The hidrogeological parameters have been determined following the efficacy tests, performance tests and depth measurements, performed in the bores, which have opened thermal aquifers from the permeable formations of the geological units that form the Pannonic Hollow.

Keywords: exploitability, deposit, aquifer, geothermal

HYDROTECHNIC CONSTRUCTIONS BEHAVIOUR IN HYDRO POWER SCHEMES DRAGAN – IAD AND CRISUL REPEDE DOWNSTREAM

GROZA Othilia-Mariana, GUGU R. Sabina

ABSTRACT

The follow-up activity of constructions' behaviour within the Subsidiary Hidrocentrale Oradea is accomplished by specialised divisions which provide the compliance with the regulations that refer to this specific activity.

The activity mainly consists of establishing the building' response following loadings that act upon them by:

-direct observations (routine follow-up),

-measurements at measurement and monitoring devices they are equipped with (special follow-up) by means of a program stipulated by "Special Follow-up Projects".

S.H.Oradea provides with its own resources or with specialized units – with which it has signed a contract – an "Annual analysis documentation" regarding the behavior of all units in its patrimony. The role of these AAD documentations is to highlight both non-compliances with stipulations of "Special Follow-up Projects" and identifying of some phenomena that might affect the safety of the buildings.

TOWARDS LOW ENERGY BUILDINGS

IANCĂU Marcel

ABSTRACT

Awareness of the challenges associated with climate change, energy security and prudent natural resource use has provided stimulus for change in a number of sectors. The building sector is one example of where the environmental impact of energy use and potential for improvement has been acknowledged. At EU level the response has been, inter alia, the Energy Performance of Buildings Directive (EPBD). As buildings use approximately 40% of Europe's energy the potential positive contribution of this sector to change is clear (EC, 2003).

Keywords: Energy efficiency, Energy Performance of Buildings Directive, Barriers, Obstacles, Energy security

FAILURE MODE AND EFFECT ANALYSIS OF WATER SUPPLY SYSTEMS

IONESCU George-Lucian, GLIGOR Emil, SÂMBETEANU Aurora

ABSTRACT

The present paper intends to overview the problems of the failure mode and effect analysis of water supply systems. The author's efforts were channeled to systemizing, classifying and adapting the content to the hydraulics engineering field.

Key words: water supply system, failure modes, local effect

AERATION CONTROL AND DISSOLVED OXYGEN AT ORADEA WASTEWATER TREATMENT SYSTEM

**IONESCU George-Lucian , GLIGOR Emil , IONESCU Gheorghe-Constantin ,
BLAGA Casian-Alin, DAN Florin**

ABSTRACT

In the activated sludge process, dissolved oxygen control is of primary importance. The control of aeration has attracted considerable research for over 40 years. Then the dissolved oxygen sensors (DOS) reached a level of precision and reliability suitable for use in the wastewater treatment systems. At the Oradea wastewater treatment plant, the control using the dissolved oxygen (DO) can be considered a mature technology from the methodological point of view, though in reality it still suffers from under performance and even encounters occasional failures due to physical limitations. With the development of nutrient sensors in recent years, the primary focus of aeration control has been the on-line adjustment of the level of oxygen supply. For a continuous system, the problem is primarily the on-line determination of appropriate the dissolved oxygen (DO), although there has also been some research on the on-line control of the aerobic volume.

Keywords: Dissolved oxygen, wastewater treatment plant, automation

OBSERVATION REGARDING THE CHEMICAL PRECIPITATION AT ORADEA WASTEWATER TREATMENT SYSTEM

**IONESCU Gheorghe-Constantin, GLIGOR Emil , IONESCU George-Lucian,
BLAGA Casian-Alin
DAN Florin**

ABSTRACT

Chemical precipitation processes are a lot faster than the biological reactions. Compared to the time-scale of the variations in wastewater flow rate and composition, chemical precipitation can be assumed to occur instantaneously. Regarding also trough the flow variability that appears at Oradea during the four seasons, and during each day we should analyze the control practice used in the Oradea wastewater treatment plant. Either before or after the biological treatment step the chemical precipitation can take place. Chemicals can also be added directly into the aerator, a so-called simultaneous precipitation.

Keywords: chemical precipitation, wastewater treatment plant, automation

OPTIMAL DESIGN OF WATER SUPPLY NETWORKS

SÂRBU Ioan, OSTAFE Gabriel

ABSTRACT

In this paper, a new nonlinear optimization model is developed which enables us to design a water distribution systems supplied by pumping or gravitation from one or more node sources, which satisfies all constraints including pipe diameters, flow velocities, and nodal pressure heads with a minimum total cost. This model could be applied to any looped or tree-shaped network. The hydraulic analysis of the water distribution system is performed by the iterative Newton-Raphson method. This analysis is coupled with a nonlinear optimization technique in order to minimize the design total cost. This technique has the advantage that it uses a specialized optimization algorithm which minimizes directly an objective multivariable function without constraints, implemented in a computer program for IBM-PC compatible systems. This program is capable of handling nonstandard network components such as booster pumps, reservoirs, check valves and pressure-reducing valves. The advantages to use the proposed program are explained from the numerical application for a complex water distribution network. The new optimization model can serve as guidelines to supplement existing procedures of network design.

Keywords: Water supply, Distribution, Network, Optimization, Computational model

NOISE POLLUTION IN RESIDENTIAL AREAS - CASE STUDY

TĂMAȘ-GAVREA Daniela-Roxana, MUNTEANU Constantin

ABSTRACT

This paper will present a noise study realized for a residential area located in Cluj-Napoca town. The study was designed to determinate the indoor and outdoor ambient noise levels of a residential building, adjacent to an extended restaurant, by using a Bruel&Kjaer acoustic equipment. The sound level measurements were conducted during evening live entertainment performances developed in the restaurant.

The major noise sources included noise from music, people talking and traffic noise. Data were recorded on site and saved by a computerized software equipment.

The results demonstrate that the measured noise levels inside the residential building were higher than the maximum admissible limits allowed by standards.

Keywords: noise level, restaurant, residential area

IV. SECTION

MISCELLANEOUS

Advisory Board:

PhD.Prof.Eng. **C. BOB**
PhD.Prof.Eng. **T.E. MAN**
PhD.Prof.Arch. **A. MATEI**
PhD.Prof.Eng. **A. SZEPES**

THE BOND BETWEEN SOCIAL INTERACTION AND INTERACTIVE METHODS OF TEACHING IN ENGINEERING EDUCATION (VOCATIONAL EDUCATION)

BORDEIANU Ioana , FETEA Ioana

ABSTRACT

The present paper is trying to highlight the importance of some new concepts that are influencing vocational and engineering education and suggests that there is a strong bond between social interaction in the terms of achieving social capital and the way students are taught at university level. The globalization and the new structure of the European society implies the need of interoperability in education and the use of integrated active methods in training.

Keywords: *flexicurity, interoperability, interactive methods, social capital, engineering education/vocational education*

ROYAL CADET SCHOOL. A HISTORY. AN EXHIBITION

NOVICOV Ramona-Adela

ABSTRACT

Captured in documentary or artistic pictures, the history of a building is granted the concreteness and plasticity of a visual adventure that invites the viewer to embark on a dialogue. Pictures previously unseen pave the way towards new perspectives related to the life of those who have inhabited this garrison, which has constantly preserved its architectural majesty. The building, which was meant to guard borders, houses today an institution belonging to the family of the largest and most substantiate European venues of the sort, Țării Crișurilor Museum, with a quite tormented past. We are all subjects living in a time when a spectacular project is being brought to completion, namely an architectural complex with a purposely military destination is before our eyes being converted into a contemporary "Museion". Metaphorically speaking, one could locate this whole process in between the thin line between the battlefield of Mars and the Muses' Garden.

Keywords: *guard borders, linearity, balance, history*

METHODS OF TEACHING AND DEVELOPING TECHNICAL VOCABULARY

STURZA Amalia

ABSTRACT

Vocabulary is acquired incidentally through indirect exposure to words and intentionally through explicit instruction in specific words and word-learning strategies. Vocabulary was an area which was arguably neglected in foreign language teaching for a number of years, but it now seems very much back on the agenda. Vocabulary knowledge is not something that can ever be fully mastered; it is something that expands and deepens over the course of a lifetime. Instruction in vocabulary involves far more than looking up words in a dictionary and using the words in a sentence.

Keywords: *vocabulary development, strategy, teaching, word meaning, word formation*

ENGLISH AS A SECOND LANGUAGE – CHALLENGES IN TEACHING AND LEARNING VOCABULARY

STURZA Amalia

ABSTRACT

This article aims at discussing some key strategies in vocabulary teaching and learning. This paper reveals the complexity of teaching vocabulary. Different questions may help teachers plan vocabulary teaching. One of the questions that must be taken into consideration is What do students need English for? Although everyone agrees that words such as speak, write, man, father, good are examples of basic words, it is undeniable that a larger vocabulary can make communication easier and richer. As a consequence, students should be exposed to a lot of strategies to learn and use vocabulary, inside and outside the classroom, both for general and specific purposes.

Keywords: vocabulary, English as a second language, teaching, learning