

Contents and abstracts

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O. Bancea¹, M. Cinca² *Options about the Selection Criteria for Heating Systems* 5

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***Abstract** – In this paper the authors presents some aspects regarding the choosing of the optimal heating system. The most important decision criteria’s in the selection of a heating supply system for buildings with low energy consumption, must be the specific heating necessity, the number of apartments, the disposability, the storage possibility for solid combustibles, the cost for fuel, as well as the cost during his functioning and for maintenance.*

***Keywords:** heating pump, solar collector, radiant heating, efficiency, heating coils, storage tank, low temperature, isolation, environment, energy saving.*

O. Bancea¹, S. Dorhoi² *Low Energy Consumption and Heat Recovering System in Ventilation* 11

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***Abstract** – In this paper the authors presents some aspects regarding the reduce of the necessary heating for ventilation, this is achieved only by using heat recovering components and a combined heating-ventilating system, assuring both comfort and human health. The floor imbedded systems together with air outlets elements could fulfill all the esthetically desires, as well as comfort and they are ideal for family houses.*

***Keywords:** fresh air system, ventilation, flexible duct, floor installed, heat recovering, low energy consume, supply air distribution unit.*

S. Ianca¹, I. Pavel² *Case Study Concerning the Old Building Behaviour from Deva Town* 17

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***Abstract** – The paper presents the structural and functional rehabilitation solution for a historical building with two levels, situated in Deva Town. The building, having a rigid structure, by masonry walls, will be modified by rearrangement from the functional point of view, and will be strenghtened from the structural poit of view. The building of the Premises of the Hunedoara County Directorate for Youth is a historical monument from the 18th century with a structure made of brick masonry. In spite of the fact that, by its conception and architecture, the building does not have any spectacular characteristics, the building solution chosen by the designer for the safety of the structural system is original and very efficient.*

***Keywords:** historical building, functional rehabilitation, structural safety, structural rehabilitation.*

A. Cristea¹ *Environmental Considerations during Cutting with Abrasive and Diamond Coated Discs Used in Installations* 25

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Abstract – Pipes and profiles used in installations made of materials such as steel, stainless steel, cast iron, copper, aluminum or plastic can be cut in order to partially or completely separate a section of the pipe or profile. From the great variety of techniques which can be used in cutting pipes and profiles, those must be chosen that best protect the environment in which the cutting is to take place, whether open or closed, as well as the staff that carries out or supervises the cutting. The pollution of environment consists of contaminating the air and the ground in the working area with dust, abrasive particles, metal splinters, noise and vibration, heat dissipated into the atmosphere, metal, concrete, brick waste. Several considerations regarding the technological process and the impact on the environment are presented.

Keywords: abrasive discs, diamond coated discs, installations.

A. Cristea¹ *The Memory of the Form at the Assemblage of the Cross-Linked Polyethylene Pipes with Sliding Sleeves* 31

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Abstract – After a voluntary distortion while using the uniform distortion, PE-Xa polyethylene pipes benefit of the so-called form memory property which consists in the reversion at the initial form after removing the strained force. This phenomenon is used for the bonding with sliding sleeve of both the pipe and linking pieces made of brass or polypropylene. The bonding can be realized in optimum conditions with a 2,5-3 mm exploitation clenching for a relative enlargement λ of 25%. By using hot air with a temperature of 80°C the reversion process at the initial form is accelerated at least three times then in the case of a reversion at a 23°C temperature of the circumambience.

Keywords: cross-linked polyethylene, pipes, sliding sleeves.

I. Dimoiu¹, O. Mocian² *Fuzzy Logic Modelling of Seismic Performance of Reinforced Concrete Frame* 37

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Abstract – Based on Fuzzy Logic Inference Diagram, (FLID) a method in establishing the performance level of a seismic damaged construction is presented. Method The framed structure computer modelling is performed: time history process on inelastic range. The dynamic characteristics and damage types are noticed: The damage indices are noticed too. The engineering entities of inputs and outputs analyzing process are interpreted in fuzzy logic. Based on a couple of fuzzy logic rules, the Fuzzy Logic Inference Diagrams are built. Results The FLID relieves the values of damage indices. The function of the global damage indices is accomplished. The FLID justifies a different degrading case. Conclusions A supposed damage or a real one of a construction may be interpret on a FLID. The inelastic time history process applied on a reinforced concrete structure allows to state a performance level prediction.

Keywords: inelastic, time history, performance state, fuzzy logic inference diagram.

C. Grecea¹, A. C. Bala² *Perspective for the Development of Virtual GPS Permanent Stations Network* 49

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Abstract – Recent development in differential GPS (DGPS), services have concentrated mainly on the reduction of the number of permanent reference stations required to cover a certain area and the extension of the possible ranges between reference and rover stations. Starting from networked DGPS stations where all stations are linked to a central control station for data correction and modeling,, the

most advanced technique nowadays is based on the virtual reference station (VRS) network concept. In this case, observation data for a non-existing “virtual” station are generated at the control center and transmitted to the rover. This leads to a significant improvement in positioning accuracy over longer distances compared to conventional DGPS networks.

Keywords: GPS, Real-Time Kinematic, Reference Stations, Virtual Reference Station, Rover.

S. Bordea¹ *Retrofitting Of Reinforced Concrete Frames in Seismic Areas with a Buckling Restrained Bracing System and Fibre Reinforced Polymers* 55

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Abstract – This paper presents the structural analysis of a RC frame GLD according to 50 years old Romanian standards. The design of the RC frame is followed by the structural analysis of the same frame strengthened by means of two methods. The first strengthening method is using a dissipative system represented by a BRB system applied in the middle spans of the frame as an inverted V system, pinned at the ends. The second method of strengthening is the confining of the columns, from the first two stories, by means of FRP techniques. In the first step the two methods are applied and analyzed separately on the frame, then a combination of them is applied and analyzed.

Keywords: Buckling Restrained Bracings (BRB), Fiber Reinforced Polymers (FRP), Gravity Load Design (GLD), Reinforced Concrete (RC) Frame, Retrofitting

D. Dubina¹, N. Muntean², A. Stratan³, D. Grecea⁴, R. Zaharia⁵ *Performance of Dual Steel Connection and Moment Resisting Joints* 65

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Abstract – Multi-storey steel buildings in seismic areas are assigned to one of the following structural types, depending to the behaviour of their lateral force resisting systems:

- Moment Resisting Frames (MRF), in which the horizontal forces are mainly resisted by members acting in an essentially flexural manner;
- MRF + Concentrically Braced Frames (CBF), in which the horizontal forces are mainly resisted by members subjected to axial forces;
- MRF+ Eccentrically Braced Frames (EBF), in which the horizontal forces are mainly resisted by axially loaded members, but where the eccentricity of the layout is such that energy can be dissipated in seismic links by means of either cyclic bending or cyclic shear.

Each of these structural systems dissipates a part of the seismic energy imparted in the structure through plastic deformations in the dissipative zones of the ductile members (i.e. beams in MRF, links in EBF or braces in CBF). Other members should respond predominantly in elastic range. To be able to provide by design a reliable control of structural control during earthquake, the basic idea is to use Mild Carbon Steel (S235, S275, S355) in dissipative members (e.g. beams in MRF, braces in CBF, links in EBF), and High Strength Steel (S460, S690) in non-dissipative members. The robustness of structures to severe seismic action is ensured by their global performance, in terms of ductility, stiffness and strength, i.e. the “plastic” members will dissipate the seismic energy, acting like structural fuses, while the “elastic” members, provided with relevant overstrength, by higher resistance of material and appropriate size of sections, will have the capacity to carry the supplementary stresses, following the redistribution of forces, after appearance of plastic hinges.

For all structural systems the performance of Moment Beam-to -Column systems is crucial.

On the purpose to evaluate the characteristics of these joints, when different steel grade components are connected, a large experimental programme, including welding details, T-stubs and MR joints is presented in this paper.

Keywords: dual steel connection, high strength steel, monotonic, cyclic loading.