

VI. Applied and Environmental Science

1. **Gabriela Ecaterina Proca: Land measurements in residential construction engineering in the context of changing the law 10/1995 on construction quality**

Track changes imposed by amending Law 10 on construction quality by Law 177/2015, residential buildings with reduced height ($P, P + 1$) are subject to the general rules on quality assurance in construction. This requires the preparation of the technical design verified by law, the execution is mandatory supervised by the technical manager and project supervisor certified by categories of skills. Sensitive execution stages: teaching and landmarks site levelling, excavation for foundations, marking and redrawing, check the verticality and horizontality as the case of structural elements; slopes for sewers and surface platforms can be addressed with great fidelity by using high technology in the field of terrestrial measurements while the specification contains details in this regard.

2. **Costel Boariu, Constantin Bofu: Structural design for embankment dam bottom-discharge conduit. Case study**

The article refers to the calculation of bottom-discharge conduits used in locally sourced dams. In such cases, the foundation terrain is usually elastic. The conduits themselves have either a circular or polygonal cross-section and are made up of reinforced concrete. The length of the conduit is split into sections that are joined together with sealant tape. The article showcases the calculation for the Ibaneasa dam bottom-discharge conduit using the finite element method. There are two scenarios being considered: one in which the conduit is split up into several shorter sections, and one in which only two sections are taken into account one upstream and one downstream on the dam, with the two being joined in the dam's axis. The bending momentum is smaller when the number of sections is greater (and their size is diminished).

3. **Iulian Nichersu, Iuliana Nichersu, Marian Mierla: Applications of fractal geometry in morpho-hydrographic network of the Danube Delta Potamology**

Fractal geometry is a tool in the analysis and interpretation in Potamology. Delta, is a typical case of alluvial river that occurs at the mouth of the great rivers loaded with a large amount of silt and opens into smooth waters, usually saline (seas and oceans) which has shallow waters and a shelf extended where tides (in most of the cases) are of low intensity and where currents coastline, with different meanings are weak, allowing the appearance, submersible or on surface of bars or a flat surface cone of dejection on which the river it spreads its waters in a web of streams, canals and lakes. A fractal is a geometric entity which, in its spatial development, is multiplying more and more on a smaller scale. An essential characteristic of fractals is that if you look with a magnifying glass, any part thereof, is

reproducing at a smaller scale, the figure of the whole fractal. Fractal Analysis of the mouths of the Danube show a particular hydromorphological dynamics with specific mechanisms important for the exchange of energy and matter. The high degree of complexity of the Danube course determines the occurrence of several degrees of freedom in the course of the bed, reflected in an intense development and decreased predictability. On the other hand, the fractal dimension analysis of morphologically homogeneous sections of the course, emphasizes the geometric homogeneity of the lower Danube by similar values thereof. As engineers and scientists, we have become aware that water management involves a holistic and integrated view of a number of distinct systems that would previously have been dealt separately, and consequently there is a need for collaboration with experts from a number of other disciplines. Also we have to take into account the requirement of a range of stakeholders who have a direct interest in Danube Delta ecosystems functions. We have to note the Danube Delta water circulation (DDWCS) system deal with very complex interactions that are not immediately apparent. Simulation modeling has therefore become an important tool in order to understand the behavior under changes to various boundary conditions or internal conditions, such as parameters or even functional representations of different identified phenomena.

4. Anca Balan, Mihail Luca, Olga-Adelina Pop, Mihaela Avram: Research the morphological processes in the riverbed Moldova through topographical measurements

In the period 2004-2015 there were a large number of floods on the river Moldova. They have substantially altered the morphology of the riverbed in the Soci town, Iasi County. This area is located undercrossing construction of adduction pipes Iasi - Timisesti. Morphological change affecting the stability of the section of riverbed under-crossing horizontal and the vertical plane. Morphological changes were followed by topographical measurements. The area of research was included in a topographical study plan. It was updated at intervals and after each flood. On the riverbed of the study were drawn transverse and longitudinal profiles. By processing the resulting topographical plans of how they have evolved over time under the action riverbed floods. Longitudinal and transverse profiles indicated hydrodynamic parameters erosion of the riverbed. The data collected and processed design allowed the regularization of under-crossing the river in the construction of adduction pipes.

5. Cristian Florin Scripcariu, Mihail Luca, Ioan Vladut Apetroi: Considerations on hydraulic rehabilitation of sewer accessible collectors

Accessible sewer collectors in operation present a high degree of wear. Rehabilitation collectors visitor geometric differentiated by size and type of wastewater transported. Accessible collectors (large and circular, ovoid, bell, mixed) present specific measures for rehabilitation. Rehabilitation Technology can be with or without digging trenches. Accessible collectors may rehabilitate the interior and exterior works. Hydraulic rehabilitation requires flow analysis parameters for modified geometric sections. Hydraulic rehabilitation requires manifold walls roughness analysis and its influence on the speed and flow. Research has indicated important changes to the flow through silting and erosion hydrodynamic processes. The sections were transformed geometric flow of the mixed curved shapes (curves + line) . Changing sectional geometry and flow caused slowing transported about 15 ... 28 %.

6. Loredana Andreea Popoiu, Raluca Mitroi: *Evaluation of ecological potential of barrier lakes on phytoplankton and phytobenthos as required by the Water Directive 2000/60/EC*

The principle on which biological analysis is based in order to assess water quality is that throughout organisms evolution, they have adapted to particular environmental conditions. Biological quality elements used to evaluate the ecological potential of barrier lakes are phytoplankton and phytobenthos. The evaluation of the ecological potential in terms of biological elements is obtained by applying the worst element principle. The worst potential given by biological elements is the moderate potential. During the analysis of the quality state of barrier lakes in the Prut-Barlad basin, based on biological elements, it was observed a favorable trend in terms of water quality. So if in 2012 there were 4 barrier lakes (with good ecological potential) reaching the environmental objective, in 2014 their number increased to 15 (4 barrier lakes with maximum potential and 11 with good potential).

7. Ion Giurma, Marius Telisca: *Schemes of torrential formations arrangement in order to prevent the effects of extreme hydrometeorological phenomena*

Romania is located in an area with multiple external climatic influences and has a wide variety of climatic hazards and risks, including strong rainfalls. Following heavy rain or sudden snowmelt, the water leakage can concentrate fast, leading to torrential floods that cause huge damage. Cross hydraulic works are considered the most important torrent planning works and are aimed to reduce runoff, reducing transport of sediments and defending the objectives endangered by floods. It is required the use of new types of works instead of the known cross filter, which are adaptable to bed, with structural flexibility, high degree of prefabrication for quick implementation and minimal maintenance cost prices.