Grzegorz KOWALEWSKI, Izabela KOSTECKA, Walery JEZIERSKI

Assessment of thermal comfort in the single-family residential building after its thermal-modernisation

The use of the parameters of fracture mechanics presents a new way of designing in civil engineering. Traditional The paper contains an assessment of the indoor thermal comfort in a single-family residential building after its thermal-modernisation. The building established in 1970 is located in Białystok at Cyprysowa street. Thermo-modernisation of the building was made according to the current requirements of thermal protection in year 2012. The thermo-modernization projects included additional insulation of external walls, ceiling, ceiling over unheated basement and replacement of windows, without change of heat source. Thermo-modernisation significantly changed the indoor comfort conditions in the building. Based on the data on the microclimate parameters in the building, the conditions of thermal comfort were analysed. The Fanger comfort assessment method using $PMV$ and $PPD$ indicators were used in the analysis. Significant improvements in comfort conditions were identified, which affected ambiguously the health of the inhabitants.

Kamil RAWSKI

Analysis of ventilating Białystok city

In cities with insufficient ventilation a tendency to excessive accumulation of pollutants in the air can be observed. In the paper, the area of Białystok city was analysed in terms of the air masses dynamics to evaluate the way of its air ventilation. Analyses were based on aerial photographs of the city detailing the following areas: with dominance of the processes of air regeneration, air ventilation and regeneration, boosting the exchange of air, with dominance of air stagnation and those that impede the exchange of air. There were also discussed issues related to the spatial planning aimed at improving the function of ventilation system of the city.

Błażej SMOLIŃSKI

Installation of geotubes based on laboratory and field tests

The paper presents the process of installation of geotubes-synthetic containers, used for the construction and renovation of flood embankments, water damming and sludge dewatering. The article discusses the course of selected stages of research and field works carried out on a research field located on the bank of the Vistula river in Warsaw. To determine the geotechnical parameters characterizing of soil filling the geotubes and the strength parameters of geosynthetic shell, a systematically implemented researched program was presented. The technical aspects related to the possibilities of using geotubes in construction of flood embankment were analyzed.

Marcin SZKOBODZIŃSKI, Czesław MIEDZIAŁOWSKI

Comparative analysis of wind pressure on a building based on wind tunnel study, computer simulations and design standards

The paper aim is to determine the wind loads on buildings by means of computer simulation (CFD), wind tunnel measurements and their comparison to the standard guidelines. The basic range of the theory with CFD simulations and selected models of turbulence are described. Comparison of wind pressure factors received from: wind tunnel research, computer simulations and the standard guidelines is shown on two examples: building with a pitched roof and structure in the shape of a circular cylinder.
Michał TARGOŃSKI

Low-cost, unmanned aerial vehicle with non-metric camera as a source of elevation data

The aim of the study was to assess the potential of nonmetric camera placed at the unmanned aerial vehicle as a source of elevation data. In the study the popular model of remote-controlled quadrocopter was used. The acquired imaging were processed to three-dimensional point cloud, which was next compared with the LiDAR data collected in the project ISOK.

Urszula WYDRO, Elżbieta WOLEJKO, Agata JABŁOŃSKA-TRYPUĆ, Andrzej BUTAREWICZ, Tadeusz ŁOBODA

The impact of sewage sludge on a biological activity of urban soil

The aim of this study was to determine the effect of using of granular sewage sludge to fertilize lawn soil in Białystok. The factors of the experiment were: a dose of the sewage sludge and the sampling time. In the soil samples total number of bacteria (without Actinomycetes), Actinomycetes and fungi, dehydrogenase activity, organic matter content and the soil pH in 1 M KCl were determined. The microbial activity was expressed by the ratio of the bacteria (with the Actinomycetes) number to the fungi. The dehydrogenase activity was used for assess of the soil enzymatic activity. The lowest ratio the number of the bacteria to fungi was from 3076 to 6809. The higher ratio of number bacteria to fungi shows smaller number of fungi, whose presence in the soil in large quantities is undesirable. The dehydrogenase activity ranged from 0.060 to 0.445 µmol TPF/ g d.m. x 20 h. The organic matter content in the soil depended on the dose of sewage sludge and ranged from 3.83 to 11.26% d.m. The soil biological activity in urban soil depended on granules dose, soil pH, weather conditions, sampling time and human activity.