

Abstracts Vol. 8 No. 3

Katarzyna GŁADYSZEWSKA-FIEDORUK, Tomasz BOBRYK

Modernization of a single-pipe water heating system into an air heating system in a single family house

The paper shows the possibility of modernization of the heating systems in single family houses. The air heating was compared with a radiator heating and underfloor heating in terms of energy sources, heating systems elements, inertia of system, failure rates, costs, an impact on the aesthetics of the interior area and the possibility of expansion of the functions for the ventilation and air-conditioning systems. Moreover the alternative ways for heating such as ground heat exchangers and solar collectors were described. The project for a single-family home heating were presented. It was an air heating using the air handling unit with heat recovery and the ground exchangers. The exhaust ventilation cooperated with a cooker hood. For a DHW system solar installation with DHW tank was proposed. The paper also stated capital and operating costs for the proposed solution.

Jacek KARPIESIUK, Tadeusz CHYŻY

The results of selected interface strength of lightweight radiant heater with dissipating elements

The paper presents selected results of interface strength tests for lightweight radiant heater with dissipating elements made of aluminum heat diffusers. Small height and lightweight structure are the main features of the heater. It has been achieved through eliminating layers of screeds. Comparing to heaters without dissipating elements the structure is more expensive to make, however, the advantage is faster and more uniform transfer of heat to the environment. The article presents the results of strength tests on used adhesives. The following factors have been tested: the shear strength, floating roller peel, pull-off strength and water absorption and frost resistance. The results confirm the possibility of using the radiator heaters on polyurethane adhesive with heat diffusers for heating interiors and in protection systems against ice and snow.

Michał MARCHACZ, Antonina ŻABA

Investigations of the reverberation time in interior of the Immaculate Conception of the Blessed Virgin Mary's chapel in Warsaw

Paper presents reverberation time investigations for interior of the monumental chapel of the Immaculate Conception of the Blessed Virgin Mary's in Warsaw, also called Res Sacra Miser (miserable is sainthood). Aim of measurements was determining acoustic parameters of interior (incl. reverberation time), and attempt to determines acoustic quality. Measurements were done with using decay method and sound source generating pink noise. Reverberation time for empty interior was 2.11 s (2.31 s for 500 Hz). Interior's filling by listeners will have positive effect on reverberation time by his shortening (optimum range for music is 1.6-1.8 s for this interior), also speech intelligibility will be better.

Justyna TOPOLAŃSKA, Dorota Anna KRAWCZYK

Ground air heat exchanger of gravel type as an example of using renewable energy sources in single family buildings – energy and economic effects

Numerous actions promoting the use of energy-saving and environmentally-friendly solutions and the related legal regulations mean that more and more installations using RES are used, both in large office-administration buildings or residential buildings as well as in single-family houses. One of the most popular solutions is the ground air heat exchanger (GAHE), which pre-prepares the air to be delivered to the indoor. In the winter the air is heated, and it is cooled in the summer. Ground heat exchangers are available in several types: gravel, plate, tubular, glycol and comb. The difference between them is in the way of heat exchange. Each of these solutions has its advantages and disadvantages. The paper discusses installation with GAHE of gravel type made in a single-family house located in the Podlaskie Voivodship. The results of air measurements were taken after passing through the exchanger depending on the outside temperature and the system was evaluated for energy and economic efficiency.

Daniel ZIELEPUZA

Economical analysis of a deep excavation supporting systems

The paper aim is to analyse the costs of support of a deep excavation. The paper presents two variants of support of a deep excavation: mixed wall and diaphragm wall, in designed building of commercial centre. Calculations of pressure for both solutions were performed by analytical method according to Eurocode 7 and means of programme GEO5. The support of excavation required two stages of designing, so calculations was divided into two phases. For both structures the economic analysis and displacement analysis were made. In was stated that mixed wall is more economical than diaphragm wall.

Antonina ŻABA, Michał MARCHACZ

Investigations of the reverberation time in Carmelite's chapel placed in Kazanowski's former palace in Warsaw

The paper presents acoustic investigations of the chapel placed in care facility of the Caritas of the Warsaw Archdiocese (Kazanowski's former palace). Chapel, due to 17th century unique collection of the polychromes, is valuable historical treasure. Aim of measurements was determining acoustic parameters of chapel's interior. It might be helpful in establishing exploitation ways in the future. Measurements were done with using decay method and sound source generating pink noise. Reverberation time for empty interior was 2.3 s (2 s for 500 Hz). Optimum reverberation time for interior depends on kind of propagating sound (music, speech). For considering interior reverberation time should be shorter. Interior's filling by listeners will have positive effect on reverberation time by his shortening.