EXPERT’S OPINION

of

Doctoral dissertation of Mr. Ing. Li Wei „ Mechanical behaviors of recycled aggregate concrete reinforced by steel rebars „

adresa: Rybí č. 155, PŠČ 742 65

Massive reconstruction of old concrete constructions in some industrial countries voids to obtain a lot of concrete waste from used concrete. One of possibility of use this special waste can be as a filling part of natural concrete aggregate. Dissertation work of Mr. Wei deals with a comparison of special properties and behavior of recycled aggregate concrete (RAC) and nature aggregate concrete (NAC), and possibility their mixing for industrial utilization.

The author divided his work into two principal parts- Theoretical and Experimental. In the Theoretical part is described the survey of mechanical and physical properties and durability of recycled aggregate concrete. The author demonstrates high level of his knowledges in this area and capability of research work. The experimental part of thesis is concerned to obtain serious data for using RAC as the filling material at practical build. This chapter brings a large number of original results that have been obtained though a number of suitable experimental methods. There were tested mechanical and physical properties, microstructure, formation mechanism of interface rust layer at steel/concrete interface, corrosion cracking process in recycled aggregate concrete and their verification. The results can be applied in practice. For example - the determination of optimal amount of recycled concrete as filling into new one. Formally, the work is written in a clear way, the results and their interpretation are demonstrated in suitable tables, pictures and diagrams with a very good graphic layout.

To own defence of dissertation thesis, I would like to make selected comments or statements:
1) The work contains a lot of acronyms, for example RAC, RCA, NAC, SEM, etc., nevertheless without special table of acronyms. I could not find the explanation of acronym ITZ! Can you do it now?
2) Can the different thermal expansivity of reinforced bars and solid concrete mixture has the influence on cracking of recycled aggregate concrete?
3) What, according to the author, can increase the corrosion resistance of reinforced steel bars and significantly prolongate service life of special concrete constructions, (high buildings, towers, bridges etc.)?
4) Can you compare economic market prices of recycled aggregate concrete with natural concrete without mixing? Do you know at least, rough estimate of application of recycled aggregate concrete in the People’s republic of China or in the World?
Conclusion

Dissertation work of Mr. Ing. Li Wei in clear and comprehensible form confirms the high scientific level of author and fully corresponds to the requirement of doctoral dissertation. In addition, to good theoretical knowledges, the thesis are supported by scientific and research activities with ability to practical application. The thesis I recommend for dissertation procedure and after its successful defense to award scientific title – PhD., according to Czech Act 111/1998.Col.

In Rybí, 2.6. 2018

Prof. Jaroslav Purmenský,Eng.,PhD., DSc.