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RECYCLING OF CONCRETE AND AGGREGATES – STRATEGIES AND DEVELOPMENTS WITH A VIEW TO GERMANY

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Abstract

The minor importance of concrete with recycled aggregates has various reasons in Germany. Contrary to other countries, additional incentives or specifications for the application of these materials in form of legal enactments or ratings for certification systems do not exist in Germany. In contrast, relevant standards and regulations for concrete with recycled aggregates include several limitations, which do not provide incentives but offer instead many obstacles. Furthermore, natural aggregates are available in large volumes in many regions and require, compared to recycled aggregates, less inspection effort and thereby less costs. Therefore, it is no wonder, that although mass flows should be kept in the cycle of materials and be reused as equivalent as possible, still most of the occurring construction waste is reused in road construction. To reduce the strong dependence on the road construction industry and to increase the application of recycling aggregates, the existing barriers were analysed. The connected questions were examined within the context of partly still running current research projects, being part of a national research project "R-concrete", supported by the German government. Within the scope of this research project, not only basic issues of concrete composition or development of new concrete admixtures are approached, but also a holistic view under consideration of practical requirements and aspects of ecological balance should be given. Additional studies deal with aggregates, consisting of residues of concrete plants, that actually can only replace up to 5 wt.-% of the entire amount of aggregates, according to German rules. Up to now, there is a lack of basic scientific investigations, concerning the reuse of higher proportions of recycled aggregates coming directly from the production process of concrete and concrete goods. Due to numerous benefits of these materials, compared with recycled aggregates coming from construction and demolition wastes, it is expected that the usage of 10 - 20 wt.-% is possible without any limitations and additional processing efforts. Finally, the aim is to create a base for the widespread use of R-concrete.

Keywords: recycling, concrete, aggregates, recycled aggregates, standard, guideline.