

Theoretical aspects of using fragments of destroyed buildings and structures of Iraq

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The relevance of the work is determined with the search for alternative sources of raw materials for the construction industry, associated with the utilization of technogenic waste. The novelty of the paper is to identify the scientific regularities of the influence of concrete scrap from fragments of destroyed buildings and structures on the formation of the micro-structure of light and heavy concrete. Concrete scrap was prepared as both fillers of cement materials and small aggregates, based on which concretes with high mechanical properties were created. The compositions were designed from the point of view of geonics (geodaetica), in particular, taking into account the law of affinity of structures. The strength characteristics of concrete mixes were studied in accordance with EN 12390-3. In addition, microstructural, morphological and thermal properties of raw materials and concretes were determined during 28-day of curing. For the first time, a dense microstructure of the composite was provided, both by products of Portland cement and hydration, and, in part, by products of hydration of previously unreacted clinker, whose minerals are present in concrete waste and are activated when they are crushed. The use of fragments of destroyed buildings and structures as a filler of cementing material when replacing Portland cement up to 20% allows getting better compressive strength, both heavy and light concretes.