

The use of recycled aggregate in concrete

Introduction

There is a public will to reduce the use of primary aggregates in construction, including concrete. Construction and demolition waste (and especially crushed concrete) forms a possible source for recycled aggregates. Over 60% of this type of waste is reused as aggregate or fill. This type of material is not liable to the Aggregate Levy. New British Standards permit the use of recycled aggregates in some forms of new construction. Around 17% of UK aggregate needs are already met from recycled material.

What is recycled aggregate?

Recycled aggregate is derived from crushing construction and demolition waste. It may be classified as recycled concrete aggregate (RCA) when consisting primarily of crushed concrete or more general recycled aggregate (RA) when it contains substantial quantities of materials other than crushed concrete. RCA is not the same as 'reclaimed aggregate' which is extracted from fresh ready-mixed concrete returned to the concrete batching plant. Currently, only the use of *coarse* aggregate derived from construction or demolition waste is recommended for use in new concrete construction.

How are recycled aggregates covered by existing standards?

There are no British or European Standards specifically covering recycled aggregates for concrete. The British Standard for Concrete, BS 8500 (the complementary UK Standard to BS EN 206-1), permits the use of recycled aggregates in new concrete construction in certain circumstances.

RCA conforming to the requirements of BS 8500-2 can be used in both Designated and Designed concretes. In Designated concretes RC25 to RC50, a maximum of 20% of the natural coarse aggregate can automatically be replaced by RCA. For Designated GEN concrete or Designed concrete there are no general restrictions in the standard on the proportion of RCA, as long as any aggregate durability criteria (e.g. frost resistance) are satisfied. RCA can be used in concretes of strength classes up to C 40/50 and in most exposure classes, except exposure to salt (XS, XD), severe freeze-thaw (XF2-4) or aggressive ground more severe than DC-1.

As the potential composition of RA is so wide the additional specification requirements should be assessed on a case-by-case basis taking into account the specific composition of the RA.

Where can I find out more?

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See, also, Building Research Establishment Digest 433 (1998), *Recycled Aggregates*

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