5. Recycled Concrete Aggregate Incorporating Blast Furnace Slag

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The recycled aggregates produced from concrete blocks remaining after the demolition of a structure absorb and immobilize CO_2 during the re-resourcing process. Concrete made with blast furnace slag cement type C equivalent and recycled aggregate allows the production of concrete that combines low-carbon characteristics and resource circulation. We performed practical studies of recycled concrete aggregate incorporating ground granulated blast furnace slag, confirming quality in terms of fresh properties and compressive strength. We also estimated the CO_2 emissions generated by this recycled concrete aggregate and the reduction in CO_2 emissions achieved. As a result, the fresh properties and the required quality standards were satisfactorily met. It was also confirmed that a CO_2 reduction effect of 65 to 71% can be expected compared to ordinary concrete.

The concrete we developed meets JIS standards for recycled concrete aggregate. Based on the results of this study, we established manufacturing and quality control standards for recycled concrete aggregate. In collaboration with a ready-mix concrete plant, we obtained performance evaluations from a third-party organization and certification from the Ministry of Land, Infrastructure, Transport and Tourism (MCON-4754 and 4755).

Keywords: recycled aggregate concrete, blast furnace slag, CO_2 emissions