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Sustainable Practices: The Production of Concrete Aggregates from Recycled Sources

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On March 1st to March 22nd, 2023, an activity to produce recycled fine aggregate (RCA) was conducted involving 21 students under the supervision of 6 lecturers. The aim of this activity was to produce recycled fine aggregate for wall panel construction and material testing. To conduct this test, a total of 3000 kg of RCA needed to be prepared. This was not an easy task, but with the help of many students and the use of a highly efficient jaw crusher, the work was successfully completed in just 7 days.



To produce RCA, test cubes were taken from the concrete mixing site. A total of 540 cubes were required to produce 3000 kg of fine RCA. With an average weight of 8 kg per cube, only 5.5 kg of fine RCA was successfully sieved out. On average, each concrete cube would produce approximately 70% of RCA passing through the 5 mm sieve, with the remaining retained at 5 mm.

The construction industry is constantly seeking ways to improve sustainability and reduce the impact of its activities on the environment. In this regard, recycling concrete to produce aggregates has emerged as a promising solution. The process to produce recycled concrete aggregate involves three main stages. The first stage is known as, split and break, involves splitting and breaking the concrete into manageable sizes. A hacking tool is used to split the concrete, followed by using a hammer to break it down into chunks of 5cm x 5cm. This stage is crucial in ensuring that the concrete is of the right size for further processing.

The second stage involves crushing the chunks of concrete into smaller pieces using a jaw crusher. This process produces fine aggregate with a size of less than 5mm, and it operates at a rate of approximately 3 kg per minute. The resulting product is a high-quality aggregate that can be used for a wide range of construction applications.

The work of splitting and breaking concrete cubes was carried out with great care and enthusiasm by the students



The lecturers and students were equally enthusiastic and worked together

The final stage of the process is the process sieve. A mechanical shaker is used to sieve the crushed concrete, and recycled aggregate that passes through a 5mm sieve is collected for use in construction. This stage ensures that the final product meets the required size and quality standards.



The RCA that passed through the 5 mm sieve was stored in containers

Although it was tiring, the valuable experience outweighed everything. Praise be to Allah, after a week, 3000 kg of RCA has been successfully loaded into 14 containers. May all our efforts be blessed and accepted by Allah.



The joyful faces of the students who contributed their energy with enthusiasm and responsibility were evident. On the last day, pizza was treated as a celebration

In conclusion, the process to produce recycled concrete aggregate involves three main stages: split and break, fine crushing, and sieving process. This process is an eco-friendly and sustainable solution that provides high-quality aggregates for construction projects. As the construction industry seeks to reduce its environmental impact, the use of recycled concrete aggregate is becoming more prevalent.



The process to produce recycled concrete aggregate is gaining popularity in the construction industry due to its numerous benefits. The use of recycled aggregates reduces the need for natural resources, saves energy, and decreases landfill waste. Additionally, the resulting product is often cheaper than using natural aggregates, which makes it an attractive option for many construction projects.



The 14 containers were a testament to the determination and pride of the PPKA students



Even on the last day, they were still smiling