

Development of Environmentally Friendly Concrete Using Biochar to Contribute to Carbon Removal

Shimizu Corporation

Reasons for the Award

In recent years, the development of various environmentally friendly concrete types has advanced toward realizing a carbon-neutral society. However, existing environmentally



friendly concrete types face challenges such as limited ready-mix concrete plants capable of manufacturing them, difficulties in on-site casting, and uncertainty regarding the reliability of CO₂ absorption and fixation levels. This study developed an environmentally friendly concrete that incorporates "biochar"—a carbonized form of woody biomass—into the mix, enabling carbon storage within concrete structures. This biochar concrete can be manufactured using existing ready-mix concrete plant equipment and possesses equivalent quality (workability, durability, etc.) to conventional concrete, making it highly versatile. It is also suitable for pumped delivery at construction sites, enabling in-situ casting. Furthermore, third-party verification confirms it can achieve carbon negativity even when accounting for CO₂ emissions from raw material production and construction. Based on the above, it is judged to offer advantages over existing environmentally conscious concrete in terms of cost, quality, and environmental performance. This research has also received numerous awards from other academic societies and associations, indicating high societal recognition.

For the reasons stated above, this research is expected to significantly contribute to the advancement of civil engineering technology and the realization of a carbon-neutral society. It is therefore deemed worthy of receiving the Japan Society of Civil Engineers Environmental Award.