Advances in Civil Engineering

Special Issue on

Recycling of Construction and Demolition Wastes for Durable Transportation Infrastructure

CALL FOR PAPERS

Construction and demolition waste (CDW) refers to the debris generated during the construction, renovation and demolition of buildings, roads and bridges which consist of asphalt and cement concrete, brick, wood, metal, gypsum, glass and plastic among other materials. Recycling and reuse of CDW has been a global challenge faced by all countries. For developing countries like China and India, CDW is being massively generated due to rapid urbanization, with 1.5 and 0.75 billion tons per year for China and India, respectively. Their low recycling rates (<5%) lead to significant material waste, farmland occupation and high PM2.5 air pollution. For developed countries like the United Kingdom and the United States, the challenge lies in how to more efficiently reuse CDW when 70% of CDW is currently used for landfilling. This applies only to inert CDWs (concrete, stones and bricks), instead of mixed CDWs such as plastics and organic fractions. Meanwhile, another challenge results from the high demand for high-quality soils and aggregates to construct the embankment, subgrade and top layers of transportation infrastructures such as highways, railways and airports. This becomes even more serious for developing countries like China and India which are rapidly constructing their national road and railway networks. These mineral aggregates are in short supply in developed countries due to the strict preservation of farmland and mineral resources. Accordingly, a sustainable materials management approach is needed to identify certain CDWs as commodities that can be used for the construction of durable transportation infrastructures.

This Special Issue aims to attract solutions to the above challenges, including original research and review articles that address the recycling and re-engineering of CDW to make its engineering durable, environmentally friendly and economically feasible for constructing transportation infrastructures. A durable CDW-built transportation infrastructure with economic feasibility and environmental sustainability will significantly promote the efficient recycling of CDWs to achieve sustainable economic development across the globe.

Potential topics include but are not limited to the following:

- Improvement of recycling efficiency and life cycle assessment of CDW management
- Economic feasibility for recycling and reusing of CDW in transportation infrastructure
- Laboratory evaluation of engineering properties of recycled CDW, including mechanical triaxial test, suction test, aggregate imaging test, x-ray diffraction test, x-ray fluorescence test, scanning electron microscope test, leaching test, etc.
- Re-engineering of CDW for use in durable transportation infrastructures, including road, railway, airport, bridge, tunnel, etc.
- Field assessment of transportation infrastructure containing recycled CDW, including in-situ stiffness test, structural health test, environmental test, long-term performance monitor, etc.
- Multiphysical and multiscale modeling of road materials containing recycled CDW, including finite element modelling, discrete element modeling, molecular dynamic simulation, analytical modelling, etc.
- Durability analysis and performance prediction of CDW-built transportation infrastructure

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/ace/rcdw/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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