

## Workable and robust concrete using high volume construction and demolition waste in sub tropical climate

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Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=9999920527941&lokasi=lokal>

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### Abstrak

Full fledged use of construction & demolition (C&D) waste in the construction industry is inevitable. Concrete technologists across the world are engaged to scale its properties and potential uses since last 65 years. The general consensus for the mechanical property is to some extent is acceptable however the workability and durability properties are still under a scanner and needs to be improved. The present paper reports the optimistic results of series of experimental work carried out using high range replacement of normal aggregates (NA) with recycled aggregates (RA) (50-80%) from C&D waste for producing sustainable and durable concrete (water cement ratio 0.4) using C&D waste. Multiple strategies were used in research to enhance workability and durability properties of concrete produced by using C&D waste. Firstly the RA was used as an internal curing (IC) agent to enhance the micro structure and Interfacial Transition Zone (ITZ) of concrete. Secondly by apparently lowering the water cement ratio by using additional low-lime fly ash similar to class F of ASTM C 618 mainly to improve workability, packing of concrete, later age strength and durability. The results show that water diffusion in concrete with RA being used as an IC agent was delayed leading to decrease in shrinkage and micro cracks development; also increase the hydration, compressive strength and improvement of durability indexes such carbonation depth and electrical resistivity is seen. The Scanning Electron Microscope (SEM) result illustrated the considerable improvement in the microstructure. By adopting these strategies which are economical & sustainable, mixtures show additional benefits that should permit their broader application.