Summary of my Research work:

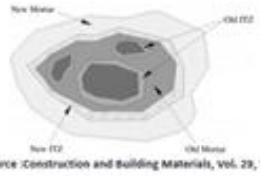
The Concrete is mankind stone materials where aggregates are embedded in the cement matrix. Concrete is quasi brittle material. Concrete construction is assumed to be monolithic in nature, but actual practice it is not possible to construct structure in one time, due to practical challenges. In the construction of some important structure like dams, nuclear construction, cooling towers, bridges, piers and in Mass concrete structures application concrete works done in phases. The joint created between harden old concrete to new concrete are inevitable and is called as interface in concrete. These joints between successive layer (old and new layer) are potential site for crack formation and propagation.

The performance structure is strongly depend on the interphase behavior and is important for the safety and durability of the repaired structures. Research involving concrete-concrete interface along across the specimen can provide very useful information in the field of interfacial fracture mechanics of concrete. The present study is mainly focus on the study of fracture behavior concrete to concrete interface through Size-effect method (SEM).

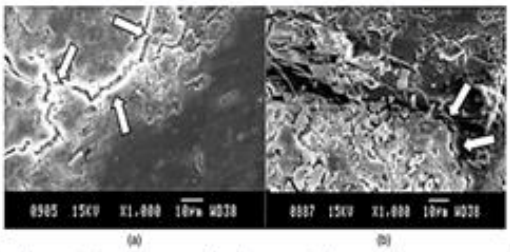
Globally, 480 CUMT of solid waste produces from construction industry. In India , almost 48 Million tones per annum , solid waste produces, which compresses of 60- 70 % by the aggregates. The use of Recycled Aggregate (RA) in construction promotes sustainability in two ways, hence it is planned to consider RAC for the concrete to concrete interface material study.

The present work is planned to study the fracture behaviour of Recycled Aggregate Concrete (RAC) and its interfaces under flexure loading with pre-defined crack for self-similar specimen. The study will investigate non-linear fracture parameters of RAC through work fracture method and size effect method. Parameters such as fracture energy, length of fracture process zone and CMOD for single material and bi-material interface for distinct grades of RAC shall be found and validated with digital image co-relation techniques (DIC).

The interface in Concrete Recycled aggregate



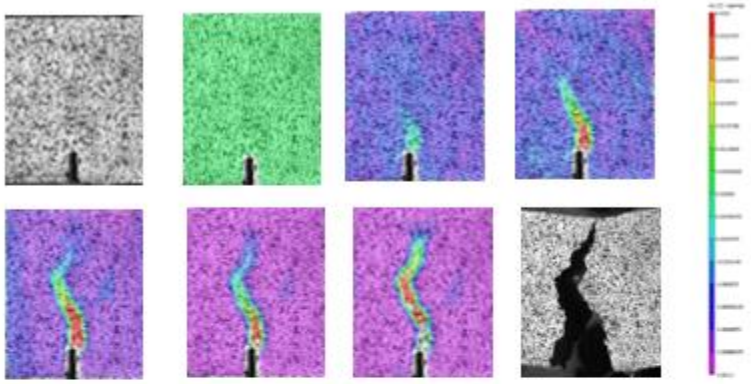
(Source :Construction and Building Materials, Vol. 29, 78-84,2012)



Cracks in the remaining mortar attached to a typical recycled aggregate specimen.

Strain Distrubution along pre-crack in bending for CAC & RAC using DIC.

Conventional aggregate Concrete (CAC): Small Series (D- 76 mm, S/D – 2.5, a/D- 0.2)



Recycled aggregate Concrete (RAC) : Small Series (D- 76 mm, S/D – 2.5, a/D- 0.2)