

# ABSTRACT

In the current scenario recycling is the most feasible solution available to sustain future infrastructural needs for construction materials. But presently the use of construction waste materials are limited to non-structural works like back filling. The present study focuses on viability of construction demolition waste (CDW) aggregates for use in base layers in pavements. Aggregates were prepared from crushing waste materials collected from various locations inside of IIT, Kanpur campus. An experimental module was formed to analyse the mechanical and performance parameters and comparisons were drawn with natural aggregates taken as control. Concepts of dissipated energy and shakedown theories were used to understand the permanent strain developed in CDW during load applications. Brick content were found to have a deteriorating effect on the properties of CDW. The permanent strain results were found to be dependent on stress ratios rather than axial stresses alone. Moisture fluctuations after compaction were found to have limited effect on resilient properties. In addition, performance of CDW were found to significantly improve with curing time. The physicothermal properties of CDW after curing were also investigated through indirect tensile tests, DSC/TGA and image analysis. Observations suggest that the improvement in engineering properties were possibly due to residual cementing action from unreacted cement present in demolished concrete.

Keywords: resilient modulus, permanent strain, dissipated energy, residual cementing action.