

## **Flexural behaviour of reinforced iron ore tailings concrete (IOTC) beams**

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### **Abstract**

*There is a need for alternative material for sand as fine aggregate in concrete. This study, therefore looks at the feasibility of using iron ore tailings (IOTs) as partial replacement for sand to produce reinforced concrete beams. Based on the output of normal weight concrete mix design, normal strength singly reinforced rectangular concrete beam made of conventional aggregates, which serve as control sample and four other types of beams that contains IOTs partially replacing sand as fine aggregate, were produced. The flexural performances of the beams were determined using Magnus frame testing set-up. The contribution of the iron ore tailings material to the flexural behaviour of the reinforced concrete beam elements are described in terms of load-concrete strain, load-steel strain, load-deflection relationships, cracking behaviour and the ultimate load at failure. The IOTs concrete sample BCZT30 recorded the highest ultimate load at failure and also produced better results, recording lower strain, compared with the control beam. The outcome of this research revealed that, the inclusion of iron ore tailings in concrete, improved the flexural performance of the reinforced concrete beams.*

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