

https://dspace.org/

Critical factors in effective construction waste minimisation at the design stage: a Gauteng region case study

Wortmann, Anine Eschberger

2015-04-28
http://hdl.handle.net/10539/17544

Downloaded from a DSpace repository. https://dspace.org/

CRITICAL FACTORS IN EFFECTIVE CONSTRUCTION WASTE MINIMISATION AT THE DESIGN STAGE: A GAUTENG REGION CASE STUDY.

Anine Eschberger Wortmann

ABSTRACT

Construction waste minimisation and avoidance at the design stage of a construction project is the most favourable solution in the existing waste management hierarchy triangle. However, there are currently only a limited number of exploratory and context-specific studies that state effective construction waste minimisation factors which can be implemented during the design stage. This can be regarded as a relatively new concept and new research topic, especially as no studies have been done in a South African or a Gauteng region context. This research report aims to address this local knowledge gap.

The research method included an initial conceptual framework of factors (identified from surveying both global and local literature) as a launch pad in order to quantitatively survey design consultants in Gauteng with regards to both the *significance* and *ease of implementation* of the identified factors. The research target population consisted of; architects, architectural technologists, architectural draughtsman, structural engineers, structural technologists, structural draughtsman and finally sustainability consultants. The target population was further narrowed by only including designers who have both attempted to minimise construction on greenfield projects in Gauteng and who have received Green Building Council of South Africa (GBCSA) accreditation on the same project.

This report presents a hierarchical list of twenty-six critical factors that can be implemented during the design stage in order to minimise or avoid construction waste in the context of Gauteng, South Africa. The report further indicates which of these factors will be easier to implement than others. These factors are aimed mainly at clients of construction projects, as they are in essence the stakeholders who will contractually enforce designers to implement these construction waste minimisation factors in order to lower project costs. Furthermore; these factors will also serve as valuable references for the Gauteng Provincial Government as the factors can be utilized in order to drive provincial construction waste regulations and eventually national reform.

This report concludes that the overall most favoured critical factors (which are both *significant* as well as *easy to implement*) in effective construction waste minimisation at the design stage of Gauteng projects are (in order of the most favoured to the least favoured solutions); designers should make use of standardization; designers should specify off-site preparation, pre-assembly, prefabrication & precast components; designers should communicate and co-ordinate efficiently and effectively with other consultants at the design stage; designers should supply adequate information on drawings and avoid lacking or incorrect design and detailing packages; designers should specify re-usable, reclaimed, salvaged or recycled materials and designers should implement Building Information Modelling (BIM) at the design stage.

These factors are most likely to be utilized as part of a context-specific and robust waste minimisation strategy in Gauteng.