

## **Final category: Technical Report**

**5**

### **Development of a BIM-based technique for modeling construction waste in the design and early planning phase of construction waste management (Case study: Tartous housing projects - Syria)**

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#### **Abstract**

construction waste is a major problem in the construction industry, as it causes environmental issues and resource depletion. Building Information Modeling (BIM) has emerged as a potential solution to address the challenges associated with construction waste. BIM allows virtual modeling of construction projects, enabling optimization of materials and resources. This research aims to study a practical approach to construction waste modeling using BIM and its potential impact on reducing waste generation in the construction industry. Housing projects in Tartous, Syria, were selected as a case study.

In this paper, we present a BIM-based methodology during the design phase, through which construction waste is modeled for 20 building elements or items, such as concrete, walls, floor tiles, wall ceramics, etc. Quantitative and qualitative data were obtained for the waste related to the project's time plan. The new model also provided the possibility of reducing the project implementation time by up to 6.28% and reducing the cost by up to 3.85%, which demonstrates great potential for construction waste management strategies and ways to manage and benefit from waste during the project implementation period.

The availability of both quantitative and qualitative waste data enables early planning for construction waste management by linking BIM to the project implementation plan, which contributes to improving sustainability standards by preserving resources and reducing waste.