

GROUNDBREAKING APPROACH TO BIM SUPPORTS GUILDFORD BOROUGH COUNCIL IN ITS CO₂ REDUCTION STRATEGY

CLIENT: Guildford Borough Council
SERVICE: BIM:SAM

THE CHALLENGE

Since 2011, Guildford Borough Council (GBC) has had a requirement in place to reduce carbon dioxide emissions by 10% through the use of Low and Zero Carbon (LZC) technologies. This is set out in Action 4 of its Sustainable Design and Construction Supplementary Planning Document (SPD).

To encourage sustainable growth, GBC set out what the additional cost would be for a developer if this target was strengthened to 15% and 20% against a 10% baseline cost.

OUR EXPERTISE



GBC commissioned EVORA EDGE to provide a report detailing the typical costs of implementing LZC technologies that would meet these standards. In doing so, it aims to support the policies contained in the new Local Plan and in the existing SPD.

A core part of our work involved the creation of a building information model (BIM) using IES engineering software - the Virtual Environment (VE).

Uniquely, EDGE used its BIM:SAM processes to undertake the project. Building costs were taken from SPONS Architects & Builders Price Book and SPONS Mechanical & Electrical Price Book – 2017 editions, and incorporated within our engineering software.

OUR APPROACH

In order to provide a detailed report and recommendations, we carried out the following:

- Undertook SAP modelling for domestic properties and SBEM/DSM modelling for non-domestic properties to determine each type of asset's possible built emissions rate - or baseline rate. This allowed us to measure CO₂ reductions against a baseline for any given technology
- Converted PDF drawings provided into DWG files and scaled using Autodesk AutoCAD
- Imported converted DXF drawings into the VE with additional models of commercial buildings from previous projects (using gbXML and/or GEM files) to create a 'virtual mixed use scheme'
- Modelled various types and numbers of buildings using a federated (level 2) BIM which was shared between two principal energy modellers – one dealing with SAP and one dealing with SBEM
- Undertook carbon dioxide emission calculations using the same model(s). This helped to ensure our approach and calculations were consistent and auditable
- Construction costs for domestic and non-domestic properties were all undertaken within the BIM using IMPACT software CostPlan - this is level 5D BIM
- BIM and the SAP outputs and models are available for future use and the nomenclature of itemised costs are based on the RICS New Rules of Measurement Order of cost estimating and cost planning for capital building works.

KEY OUTCOMES

As a result of our study, GBC has proposed in its consultation documents a reduction in CO₂ emissions of 20% to most new developments.