Enhanced environmental analysis during design Queensferry High School

INFRASTRUCTURE TECHNOLOGY

Overview

The Queensferry High School project developed an innovative new process to link the 3D design model (Revit) and the environmental performance software (IES) dynamically to enable real time feedback in how the environmental performance would be effected when a design change was made in the 3D model. This overcame interoperability issues and automated the process to save design time and ultimately improve the environmental performance of the design.

		Planning			Invest
☐			☐		
☑		Delivery	☑		Manage

Benefits & ROI

This approach provided a more informed design approach where the designers could understand quickly how changes to the building impacted on meeting environmental design criteria. This allowed the team to quickly demonstrate that the environmental design targets of the project have been satisfied. This innovative approach will continue to be refined to realise further benefits.

" The approach allowed the design team to better understand the environmental impact of design changes quickly"

RELEVANT BENEFIT

☑	Reduce Waste & Carbon		☐	Reduce cost
☑	Improve outcomes for users		☐	Improve delivery time
☑	Improve asset performance		☐	Increased social value
☐	Improve construction quality		☐	Support upskilling & training

Project	Queensferry High School
Client	City of Edinburgh Council /Hub South East
Contractor	Morrison Construction
Suppliers	Revit/ BIM Academy/ Ryder Architecture /IES/ Rambolls

Data

The key innovation was to overcome the interoperability of different systems and automate the transfer of accurate geometric data through a number of systems for checking, validation and analysis.

The process required the project to be developed within a federated building information model. The innovation was in how the base Revit model information was transferred to the IES software. The approach is continuing to be refined on future projects to fully convert the data and reduce the impact of human errors when transferring data between systems.
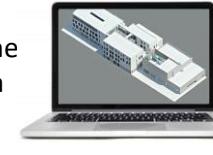
People & Process

A collaborative approach was taken by the wider team to develop a innovative modelling workflow.

The revised workflow avoided the use of 2D plans and elevations that had to be recreated manually in Rhino software. The revised optimised workflow automated the geometry creation direct into IES as shown on the process diagram.

Technology

AUTODESK → IFC → SOLIBRI → Rhinoceros → IES
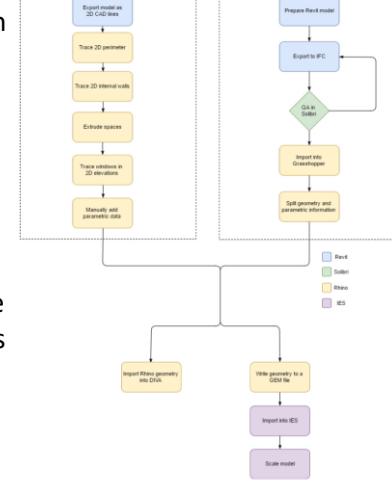
The workflow sought to align and resolve interoperability issues across 7 technology systems. The key advantage to the optimised workflow is that the geometry that is written to the GEM file is actually taken from the IFC file that in turn reflects the Revit model. This removes possible human error, automates the process of IES geometry creation and ensures the model being analysed accurately reflects the original model.

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