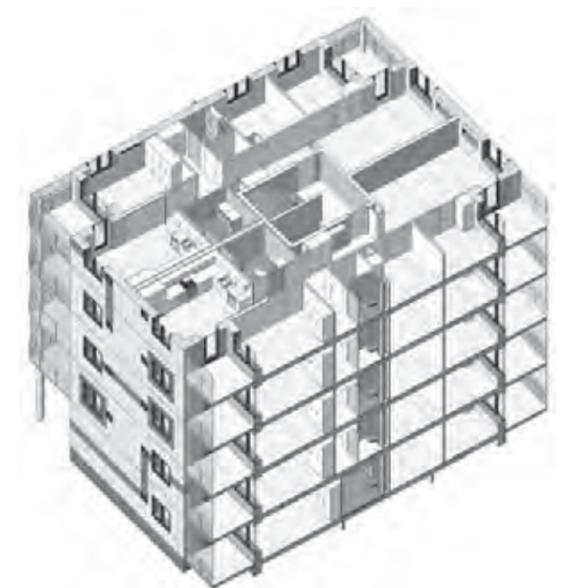


BIM in Building Projects

Nyhamn Apartment Complex

Gävle, Sweden



BIM was initially used on the project in addition to idea sketches. The architect designed the whole house in architectural modeling software and the installation spaces were taken into consideration from the start.

Nyhamn Apartment Complex	
Gross area	3,557m ² (38,000sf)
Sellable area	Apartments 2,316m ² (25,000sf), Business 120m ² (1,300sf)
Production cost	SEK 41 million (USD 5.9 million, EUR 4.4 million)
Architect	Johan Skogh Arkitektkontor Gävle AB
Other designers	Skanska Teknik

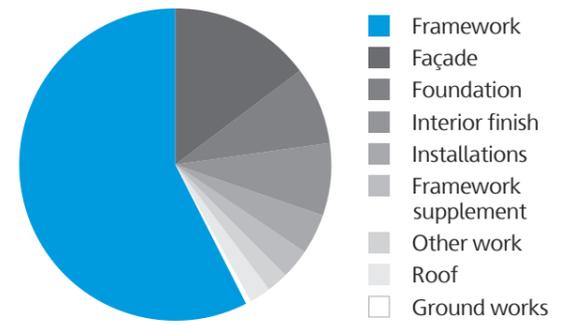
Installation planners went on to design the installations in 3-D based on the architect's model. A clash control was performed, after which the installation planners were able to correct the installation design. Even the prefabricate concrete structure was designed from BIM-based architect models. Thanks to that, no installation crashes took place during the construction. Furthermore, there were no missed holes in the concrete frame.

BIM design was also used for sales purposes, for example 3-D images in sales brochures could be obtained at an early stage. Having exact 3-D images from different angles that paint an accurate picture of what the apartment will look like provides considerable security for potential occupants. Thanks to BIM, they could even see the view from the balcony.

3-D models of the finished building were also shown to all the construction workers on site so that they had a visualization of the finished building. Even detailed

solutions were revealed in a better way than 2-D drawings.

A carbon footprint can be embodied carbon or operational carbon. Embodied carbon covers construction materials and construction activities and equates to approximately 20 percent of building total life cycle carbon dioxide emissions. The remaining carbon dioxide emissions are produced in the operational phase (heating and electricity consumption). Both CO₂ calculations were made for the Nyhamn Apartment Complex project, which was designed to consume 35 percent less energy than the Swedish building standards. This saving turns to direct financial saving for the buildings occupants. In embodied CO₂ calculations the greatest carbon footprint was steel and concrete, which turned out to be more than half of the building's embodied carbon. Calculations cover a 50-year operation lifespan.



A diagram of calculated carbon emissions from the Nyhamn residential project. The biggest carbon emission comes from the concrete framework.