

Vectorworks' BIM Streamlines

# Project Hammaren

for SAT Architects

*In 1996, Conny Hammar founded SAT Architects Ltd. on Finland's Åland Islands. Today, the architecture and construction engineering firm focuses on projects that range from creating small summer homes on the Åland Islands to designing and building larger, more complex buildings in the commercial, residential, hospitality, education, and industrial sectors.*



## Dreaming of Boats

Hammar grew up on these same rocky islands, which form an archipelago between Finland and Sweden. The area is dominated by the shipping and fishing trades, and as a boy, Hammar watched hulking car and passenger ferries trek back and forth across the Baltic Sea. Fascinated by their forms, he pored over shipyard drawings, teaching himself to draw ferries in this same manner. As he grew older, Hammar even built working, radio-controlled scale models of the ferries, feeding his love of drawing, architecture, and construction—and his dream of becoming an architect.

Hammar received his bachelor's degree in technological science in Västerås, Sweden at Mälardalen University (MDH) and then continued his studies at The Royal Institute of Art (KTH) on a postgraduate education in architecture. After several years of working experience, he went on to achieve his master's in architecture with a focus on design and construction in Stockholm, Sweden at the Royal Institute of Technology (KTH). The works of contemporary architects Le Corbuiser and Alvar Aalto have influenced his thinking, but he always starts from his own experience and imagination. Of his firm's overall approach, Hammar says, "Our guiding vision is to take care of the customer and to deliver good architecture and technical solutions."

## Marrying Architecture and Engineering

With its background in both architecture and civil engineering, SAT Architects can tackle any project from both angles. The team applies their engineering skills to troubleshoot design issues early in the process. "I'm fascinated by the idea of being not only the architect but also the developer. In this expanded role, I can both realize my ideas better and fully take part in the financial and other project-related issues surrounding a project," notes Hammar. He expounds on this two-fold

method, which the firm implements through CAD. "When executing a project, one goal is to have a straightforward working process where each moment happens just once," he says. "We make the first sketches to test different ideas, and soon after we try to find a solution that leads to completion. Early in the process, we draw up the sketches in Vectorworks software and then modify and add more information like wall types, windows and door accessories,

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and materials for illustrations to the model during the project's different stages. CAD allows the work to proceed effectively, allowing more time for studies of the design and special solutions for a project."

## Adopting a BIM Approach

Hammar has been using Vectorworks® Architect software to design all of his projects since 2007. At the time, he also worked for a 60-person architecture firm and was selected as part of a CAD-technology team tasked with finding viable alternatives to the AutoCAD® software the firm used. Hammar and his team compared a number of software applications, and the Vectorworks program was among the choices.

He carried this knowledge with him back to his own firm that same year. "When I continued to work at my own architecture firm, I chose Vectorworks because the program was very competitive and gave me all the tools I needed," explains Hammar. He and his team use the software application for all design, modeling, and presentation stages, from sketch to documentation, and then for rendering illustrations for presentations. "I use it from start to finish, which is the strength of the program," Hammar notes. "There is no need for other CAD programs." Hammar also finds the software useful for working with DWG formats. He says, "I have found it worthwhile to use Vectorworks in old projects made in the DWG format, instead of struggling in other CAD programs since it's more comfortable to work in one CAD environment instead of jumping between different ones and maintaining their settings and templates."



The location inspired two fronts: an urban façade facing the street, and a more natural side abutting the garden.



The Project Hammaren, one of several buildings planned for the lot, will house 23 residential apartments and sit atop a tranquil, gardenlike area.

Taking advantage of the Building Information Modeling (BIM) approach is important to the firm because BIM saves Hammar and his team substantial time, yet it is easy to implement. He uses the same model to create drawings for plans, sections, and façades, and he considerably reduces the risk of errors and differences between the drawings since a change in one place automatically updates the sections and façades in another.

Hammar still executes the very first drawings in pen. He jokes, “I think it’s the fastest tool invented for this so far.” He then starts to draw in Vectorworks to get some real measurements and to test his concept. The early model slowly evolves, gets more details, and becomes more and more accurate. “I generate sections and façades from the model and create the details as 2D drawings, normally with the generated sections below as a support for the contours,” Hammar says. “I also enter BIM data for the worksheets for windows, doors, and others. In the final stage, I add more details, text, and dimensions to get the drawings completed.” Hammar continues, “During the design process, I study the project in 3D, and, if needed, I can export out some illustrations and perhaps fix them in a photo editing program early on.” Working with a BIM workflow has considerably streamlined his processes.

All in all, Hammar says that Vectorworks software offers a great value and technology that supersedes AutoCAD and other competitors. “Vectorworks software allows me to work seamlessly through all design phases, which is not possible in the other programs I tested—and the price for the program is competitive. The program also offers excellent import and export possibilities to interact with other CAD programs.”



Fasad mot Norr (Mot Lotsgatan)



Fasad mot Öster

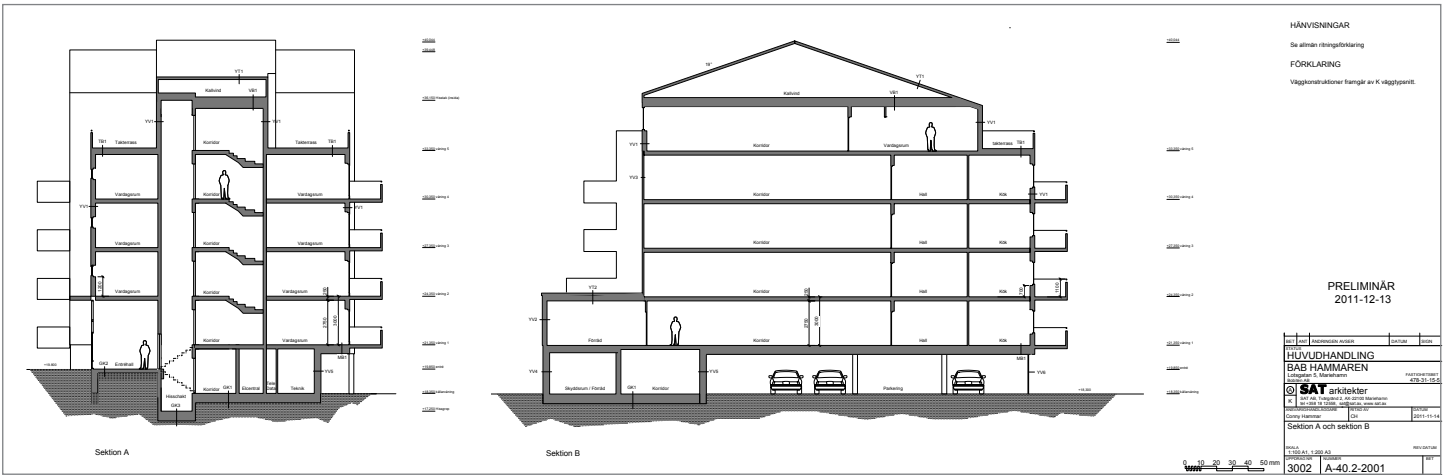


Fasad mot Söder



Fasad mot Väster

The elevations show how Hammar grouped the windows into an interesting, dynamic expression with unexpected breaks to elevate the look.



The organization of the building, both interior and exterior, reflects the classic building tradition used in the city.

### The Project Hammaren: Buildings with Mass Appeal but Exclusive Features

The Project Hammaren’s planned site is located just 1.5 kilometers from the center of Fasta Åland’s main port and capital, Mariehamn, and only 450 meters from the sea. SAT Architects recently designed

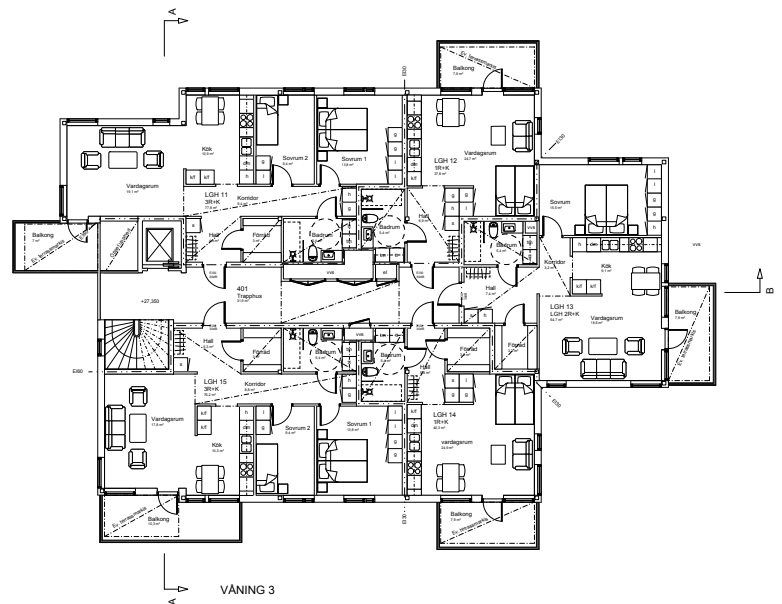
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a building that will house 23 residential apartments and sit atop a tranquil, gardenlike area. The spaces range in size from one to four rooms, and each contains a kitchen. Inspired by the location, Hammar and his team created a building with two fronts: an urban façade facing the street, and a more natural side abutting the garden and softened with a grove of mostly pines and birches, as well as a verdant lawn. Built to attract a wide range of potential residents, the first challenge was to create an architectural design that would be suitable for a large audience yet feature unique add-ons that would make the building stand out from the competition.

To this end, Hammar adapted his modern architectural design to the classic building tradition used in the city. The classic tradition in Mariehamn is ornate, with façades of plaster or wood panels, trims, pitched or hipped roofs with deep eaves, and transoms and windows arranged in strict vertical rows. The Project Hammaren varies the

positions of the windows and does not include eaves. Additionally, the roof material partially continues down on the façade, and the balconies are attached to the façade without visible columns. The design strays slightly from what is regulated by the city, yet it was approved for construction. Project Hammaren is plain with a coherent shape, Hammar explains. Once constructed, the building’s frame will be concrete with 170 millimeters of outside insulation and 30 millimeters of plaster on a net of steel. The inner walls between apartments will be concrete, and inside apartments will be composed of plasterboards on a steel frame. The roof will be constructed of steel strip panels. Light façades will come with darker areas for a balanced feel, and solid rails that match the wall’s surface structure will tie the balconies to the overall design.



The units range in size from one to four rooms, and each contains a kitchen.



Hammar used renderings to communicate and market the design of the units.

In the design, Hammar also grouped the windows into an interesting and dynamic expression with unexpected breaks to elevate the look.

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SAT Architects consistently focuses on achieving sustainability when approaching all of its projects, and The Project Hammaren was no different. Whenever possible, designers chose materials that would be recyclable. They selected district heating since it is powered by 70% bio-fuel (wood chips) and 30% oil. The local heating company plans to add a new wood chip boiler, so the building will eventually have zero oil dependency. The Project Hammaren will also incorporate a

ventilation system that reuses approximately 85% of the exhaust ventilation’s heat energy for the fresh incoming air. The windows will be energy efficient with a u-value of 0.9.

Once 60% of the apartments are sold, construction will commence. The building phase is expected to last for 18 months and cost approximately 4.1 million euros (VAT and administrative costs excluded). The Project Hammaren is just the first of several buildings planned for this site. Ultimately, four similar buildings will be erected on the lot, spanning a building period of about six to 10 years, based on market demand. The total value for the entire project is 16-18 million euros, and it will create almost 100 new apartments in the area. In fact, Hammar believes so strongly in the finished building that he became a partner with the developer, Bobiten Ltd. This new company was founded for this particular endeavor.

### Seamless Collaboration Improves Productivity

Hammar and his team have been collaborating closely with other companies to move this housing project along smoothly. They’ve exported their files to DWG, so that the building contractor can open and work with them in AutoCAD. They stored final materials and

distributed them as PDF files, which is also the format they give to their customers. "We have experience working in a mixed CAD environment from past projects," says Hammar. "It has worked well."

He credits his choice in CAD application for increasing his firm's efficiency with this project. "By using Vectorworks, the project has been implemented seamlessly between the various stages," Hammar says. "It is a great benefit and time-saver to use the same drawing from sketch to finished construction documents in a single program. BIM has not only transformed the way we work but has also saved us a considerable amount of time. It is out of the question for us to return back to past ways of working."

Back then, the 2D drawings were made in a drawing program like AutoCAD or IntelliCAD. If Hammar and his team wanted 3D illustrations, a model was built in another program like SketchUp and then perhaps a photo rendering was done in a third program.

"Even a small change involved a lot of work when corrections had to be made in several different files and drawings," Hammar says. "In addition, the operation was complicated and time-consuming, and it meant high costs when using multiple programs, where some were also quite expensive. With Vectorworks, we have a versatile modern tool that can handle the entire process with a competitive price."

## Looking Ahead

As The Hammaren Project unfolds over the next decade, Hammar and his firm will continue to embrace the BIM workflow to greatly streamline and optimize their processes. His selection of Vectorworks software, with its BIM capabilities, will continue to pay him dividends. From building boats to building residences on his native island, he's helping to build the community.

## Acknowledgements

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Founded by Conny Hammar in 1996, the architecture and construction engineering firm SAT Architects Ltd. applies its unique, two-pronged approach to designing and building many residential and commercial buildings primarily in Finland. Using BIM workflows to drastically streamline their processes, the team is able to boost productivity while still creating beautiful work.

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Courtesy of SAT Architects Ltd.

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Case Study FD1: SAT Architects Ltd. The Project Hammaren