

## BIM as a working method for 800 engineering students

Thomas Graabæk, BIM Equity

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The new headquarter of Aarhus University, School of Engineering, Denmark

At Aarhus University, School of Engineering in Denmark, there are 800 construction engineering students at the Bachelors level. Here, Building Information Modeling (BIM) is a regular part of the curriculum, with a focus on structural and MEP modeling with model exchange between applications for analysis and calculations via IFC.

As the Bachelors program already is compressed, it is important to focus basic BIM skills, which is why ArchiCAD is the only BIM modeling program being taught. At the same time, ArchiCAD built-in functionalities make it ideal for educating future engineers:

- Built-in library of construction elements, i.e. International standard steel profiles
- Specially developed "MEP Modeler" for model installations
- IFC import and export of high quality
- Built-in tools to enrich IFC models with special properties
- BIM Server for project sharing and collaboration between students

In 2002, when Aarhus University, School of Engineering chose to use ArchiCAD over other BIM programs on the market, it was mainly because of ArchiCAD's intuitive interface, which makes it quick and easy to learn. In the course, the university focuses on classical engineering skills rather than training in specific programs. After only a few days with ArchiCAD, the students work independently with their BIM projects.

## BIM SERVER AS THE CORE OF PROJECTS

The most visible value of BIM at Aarhus University, School of Engineering is that all projects are managed and structured with "BIM Server" technology.

***"The students can all work in groups on the same Model, regardless of where they are located."***

Jørgen Korsgård, Lecturer & Engineer

In order to prepare the students for the necessary teamwork needed for creating buildings in collaboration among teams, all school projects are set up as teamwork tasks. It is, therefore, essential for each project that the students can share models and that the students can work as an integrated team on each of their projects.

Teamwork is an ArchiCAD function that manages the work between participants. "This ArchiCAD feature is a unique tool for controlling a project when several people work on the same building model," says Jørgen Korsgård, who is responsible for the BIM Server at Aarhus University, School of Engineering. Almost all projects at the university are conducted in groups, and with Teamwork, groups of students work on the same model at the same time. Teamwork offers a unique way to manage objects belonging to each person on the project. With a very simple "reservation" system, team members can work on the project in a dynamic and simple environment where productivity and control is the result of utilizing the Teamwork function.

The students are divided into six different BIM servers for each semester. Normally, the students work on the same server throughout the entire program. When asked how it is possible to keep track of so many users and projects, Jørgen Korsgård explains: "I try to limit the number of users on each server to approximately 120 students. Users are identified by their unique student ID's and are, therefore, not mixed up with other users."



Aarhus University, School of Engineering  
Photo: © Henrik Olsen

Compared with how to manage employees' rights to change building models in a studio, all the students have full access to all functions, otherwise it would be impossible to manage who should have the rights to change the model. "This means that the student must send and receive updates more frequently than if the modeling was done in a drawing for a more traditional setup with a Lead Architect - Architect - Draftsman - Viewer," says Jørgen Korsgård.

***"The goal is to get students to think 'full BIM' every time they are modeling."***

Jørgen Korsgård, Lecturer & Engineer

Already from the first semester, the students are introduced to BIM thinking. "The goal is to get students to think 'full BIM' every time they are modeling," says Jørgen Korsgård and continues, "it means that the model must contain information for later use, such as price calculations, structural calculations, energy simulations, scheduling, etc."



Aarhus University, School of Engineering  
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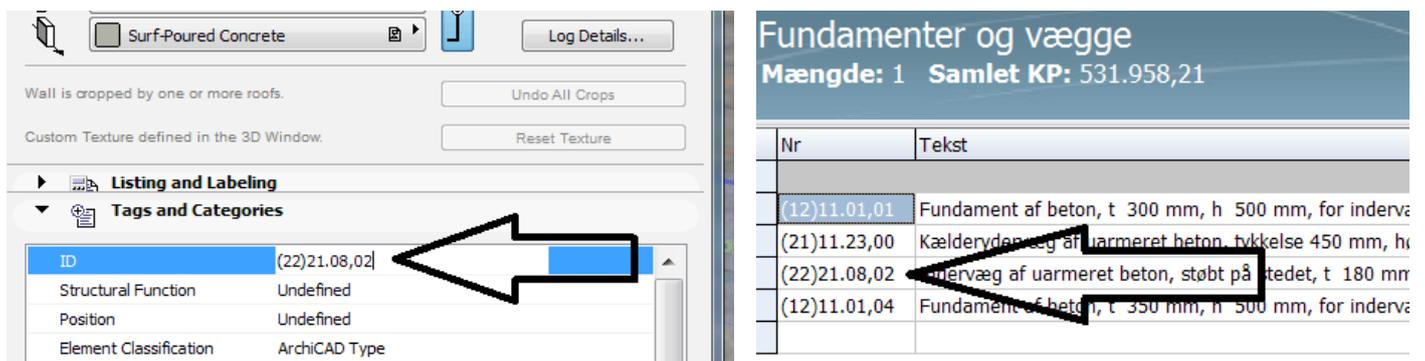
Teamwork gives students the freedom to work with the model for different purposes, and from the first semester, the students work consciously with energy performance in buildings, i.e. energy simulation directly on the building model. The simulation is the first step towards a better understanding of how to optimize for energy, by addressing issues in the design phase. The built-in EcoDesigner tool in ArchiCAD makes it easy to understand the relationship between building design, material composition, and external factors affecting the energy calculation.



Aarhus University, School of Engineering  
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## A COMPLETE BIM STRATEGY

Jørgen Korsgård has taught CAD programs for more than 20 years. He also works with the integration of BIM in education at the Aarhus University, School of Engineering. It is clear that a lot of thought has gone into the way the course is organized, and Jørgen Korsgård explains: "The idea behind the strategy is that all students should acquire skills in the concept of BIM, so they are educated with proper BIM methodology to change the culture in the AEC industry."



ArchiCAD is very strong in IFC, thus the exchange with many of the structural applications engineer will be working with. Teamwork is an enormous help to our students when working in teams on their projects. Combined with the simulation of energy, structural analysis, and the calculation of time and cost of projects, Teamwork gives unique and new insight on how AEC consultants can provide added value by exploiting the possibilities of BIM.

New technologies are rapidly taking over our everyday lives. It is remarkable how technology is enhancing the professional skills of young graduates. It's not just about calculations and simulations, but also the exchange of ideas in an integrated project environment. Aarhus University, School of Engineering, has managed to create this integrated project environment, preparing students for a future with Virtual Design and Construction.

## The Company - BIM Equity

[www.bimequity.com](http://www.bimequity.com)

BIM Equity is a company dedicated to making BIM a robust option for the Danish construction industry. We are BIM enthusiasts with a background in the architectural and construction industries.

BIM Equity enables Danish consultants, contractors, and builders to consider BIM as a working method that strengthens their skills, efficiency, and businesses. We have the necessary experience and tools to inspire, advise, implement, and deliver technology and services for all phases of construction projects. Given our unique ownership structure, we can also demonstrate the significant gains derived by a facility that has been constructed with the well-planned implementation of digital tools.

## About GRAPHISOFT

GRAPHISOFT® ignited the BIM revolution with ArchiCAD®, the industry first BIM software for architects. GRAPHISOFT continues to lead the industry with innovative solutions such as the revolutionary GRAPHISOFT BIM Server™, the world's first real-time BIM collaboration environment, and the GRAPHISOFT EcoDesigner™, the world's first fully integrated building energy modeling application. GRAPHISOFT's innovative solutions have fundamentally changed the way architects around the world design and collaborate. GRAPHISOFT® has been part of the Nemetschek Group, since its acquisition in 2007.