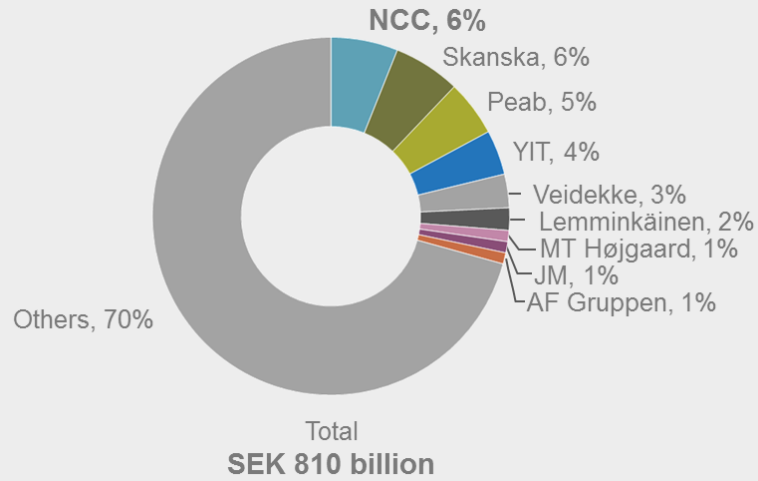


VDC in NCC – How we use technology to optimize our projects from early stage to completion

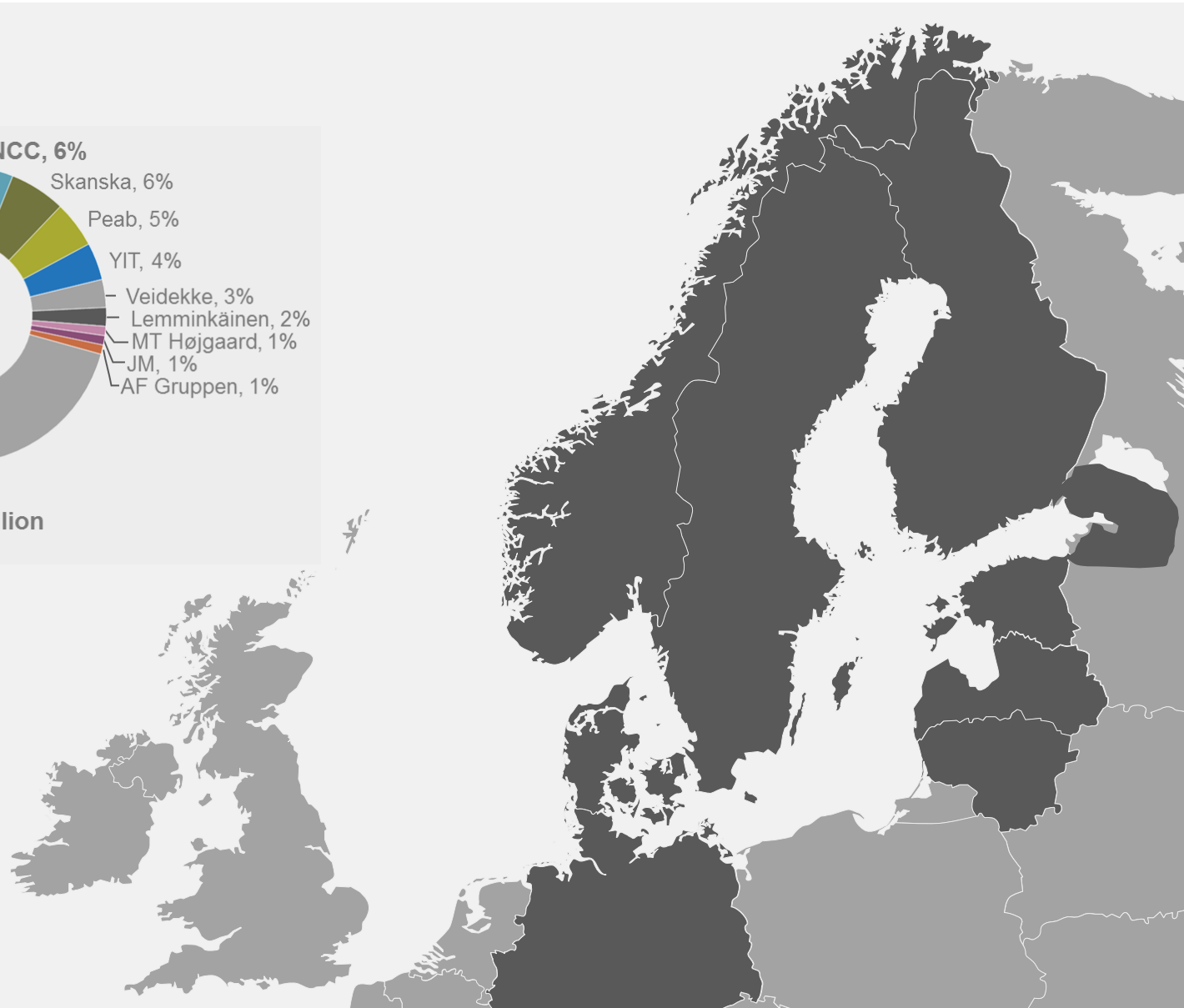
buildingSMART Norway Conference 2012 - 22.03.2012

Øyvind Børstad, Manager of VDC department, NCC Construction AS

NCC AB



Source: Euroconstruct



Nordic leader in construction and property development

Construction and civil engineering

Aggregates, asphalt, paving and road services

Housing development

Development of commercial properties



VDC in NCC

*“VDC in NCC is our ways, tools and processes
to capitalize on VDC”*

The Virtual Design & Construction Team(VDC)

Who we are



- Øyvind Børstad
 - VDC Manager
 - Revit A, Solibri, Navisworks, Tekla
 - Marketing
 - Workshops
 - Member VDC-Group



- Egil Sponland
 - VDC Consultant
 - Solibri, Navisworks, gProg, MAP, Calcus
 - Web solutions
 - Member MAPgroup
 - Support



- Terje Andersen
 - Project Manager VDC
 - ArchiCad, Solibri, gProg, MAP
 - Survey
 - buildingSMART



- Jenny Jørgenvik
 - VDC Consultant
 - Solibri, Navisworks, gProg, MAP, Calcus
 - Web solutions
 - Member MAPgroup
 - Support



- Magne Ganz
 - Project Manager VDC
 - Revit S, Robot Structural, FEM-design
 - New Technologies
 - Member Revitgroup

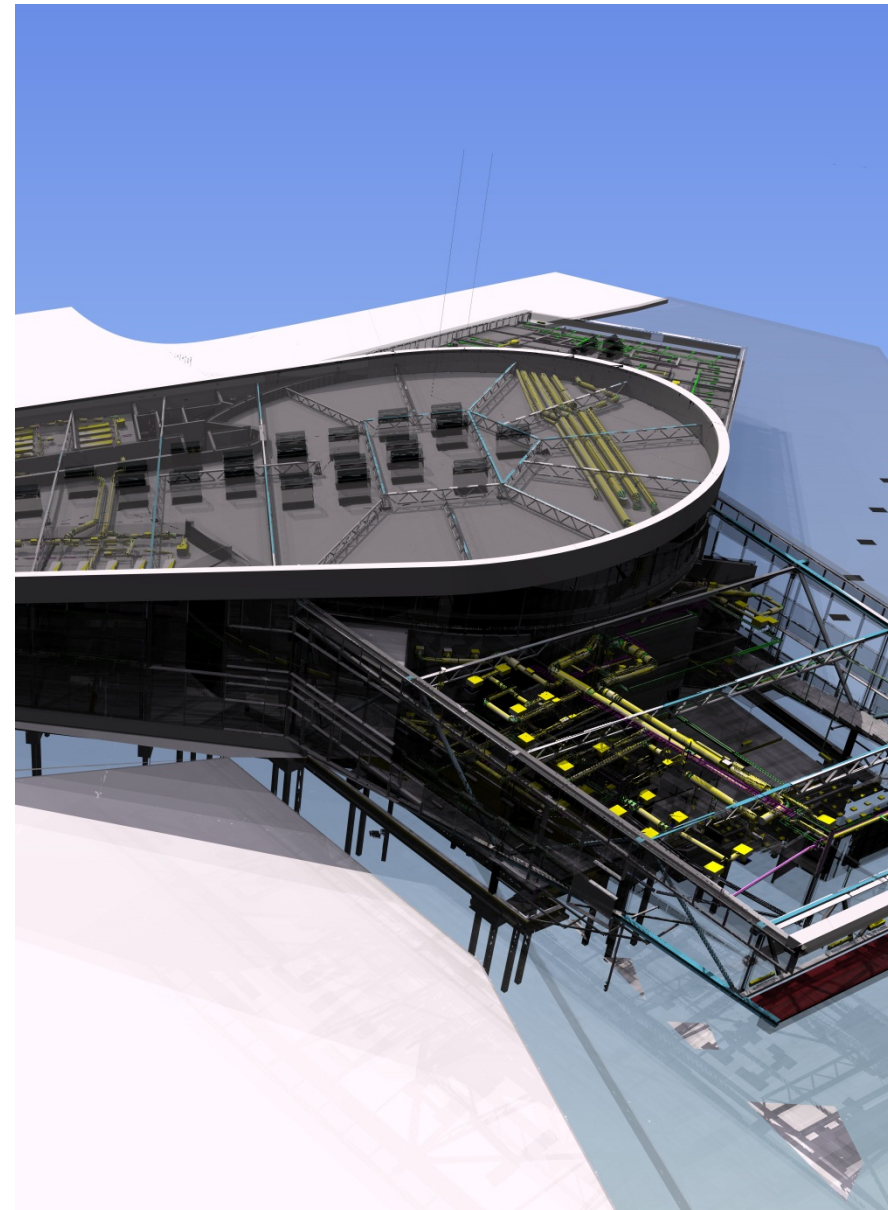


- Ekaterina Strelkova
 - VDC Consultant
 - Revit A, Solibri, Google SketchUp, Novapoint
 - Civil Engineering
 - Site planning

VDC-Departement

This is what we do

- ✓ Teaching
 - Courses and workshops in VDC
- ✓ Marketing
 - Customer meetings and visualization of ideas
- ✓ Survey
 - Development, estimation, tender, design, production and closing phase
- ✓ Support
- ✓ Development
 - Development of the subject VDC , participation in industry forums and development of teaching programs at colleges and universities



VDC-Network

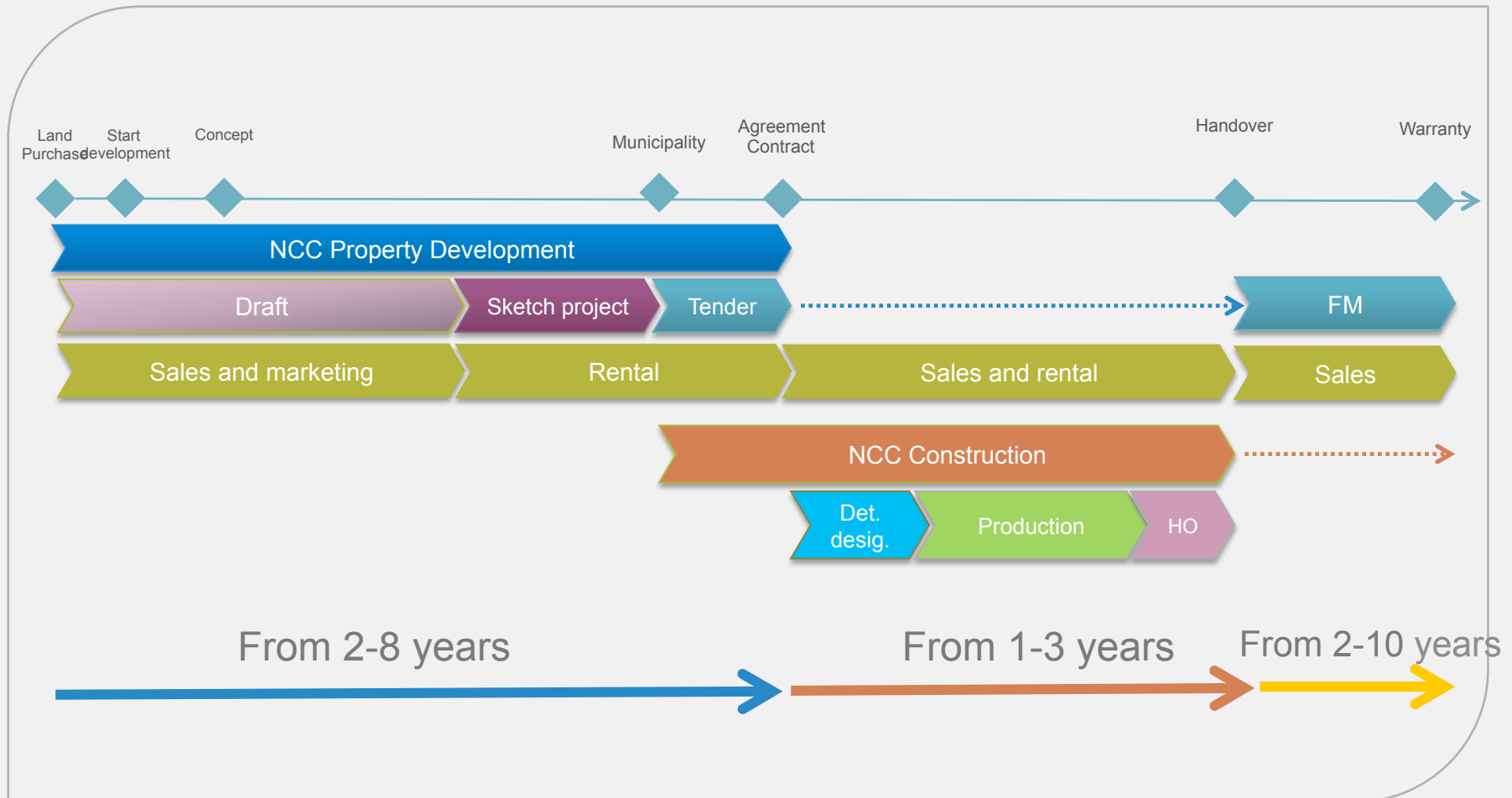
This is what we do

- ✓ Networking
- ✓ What's new in BIM
- ✓ BIM-manual
- ✓ Knowledge Documents
- ✓ New contact standards
- ✓ The right focus
- ✓ New tools
- ✓ Courses and conferences

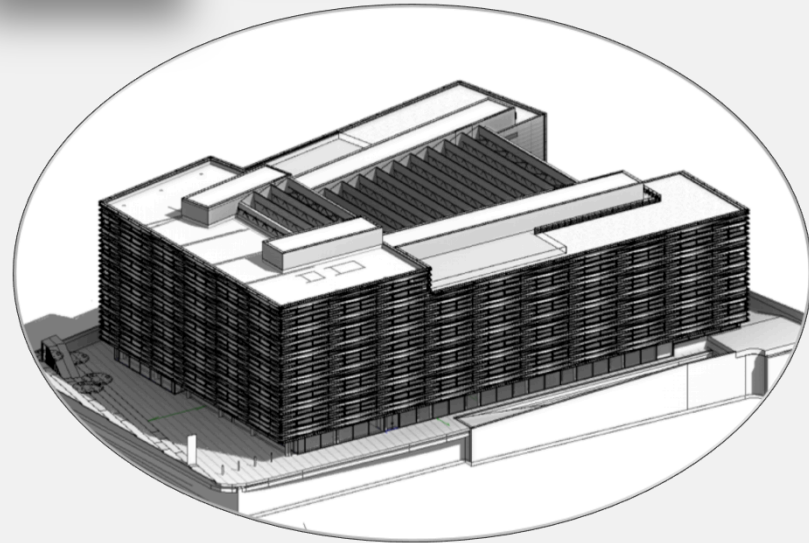
VDC-Network Norway

Navn	Funksjon	Region	Distrikt
Thomas Mosland	Kalkulasjonsleder	1 Nord Vest	Bergen
Øyvind Skaug	Kalkulasjonsleder	1 Nord Vest	Trondheim
Mona Ervik	VDC-Ansvarlig	1 Nord Vest	Trondheim
Anders Langvatn	Prosjekteringsleder	1 Nord Vest	Stavanger
Petter Hernes	Kalkulasjonsleder	1 Oslo ØST	Sarpsborg
Lars Erik Kultorp	Anleggsleder	1 Oslo ØST	Sarpsborg
Kai Arne Heimtun Falch	VDC-Ansvarlig	1 Oslo ØST	Asker
Øystein Bækkeli	Ingeniør	1 Oslo ØST	Hamar
Dennis Spinos	Prosjekteringsleder	1 Oslo ØST	Oslo
Tore Høgset	VDC-Ansvarlig	1 Anlegg	Nord
Frode Bryn	KS-leder	1 Anlegg	Vest
Fredrik Bakke Johansen	Stikningsingeniør	1 Anlegg	Vest
Espen Årberg	IT-Ingeniør	1 Anlegg	Vest
Finn Grinden	Stikningsingeniør	1 Anlegg	Øst
Christian Hvass	Utviklingsjef	1 PD	-
Skovholt Jens Petter	Prosjektleder	1 Housing	-
VDC-Avdelingen Norge			
Ekaterina Strelkova	VDC-Konsulent BIM	1 Alle	Alle
Jenny Jørgenvik	VDC-Konsulent 4D og 5D	1 Alle	Alle
Egil Sponland	VDC-Konsulent 4D og 5D	1 Alle	Alle
Terje Andersen	VDC-Konsulent Helhet	1 Alle	Alle
Øyvind Børstad	VDC-Konsulent Helhet	1 Alle	Alle
VDC-Group			
Andreas Ask	Chef VDC Group	1 Alle	Alle
Patrik Lindvall	Chef VDC Tools	1 Alle	Alle
Frank Hollinger	VDC-Manager Denmark	1 Alle	Alle
Ari Törrenen	VDC-Manager Finland	1 Alle	Alle
Antall		25	Antall

NCC Process



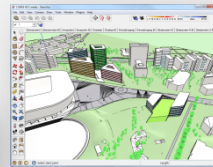
What is VDC?



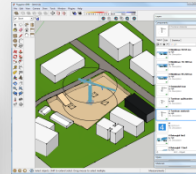
Concept development



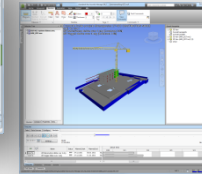
Land purchasing



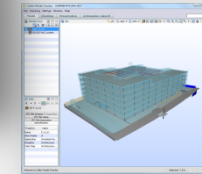
Site planning



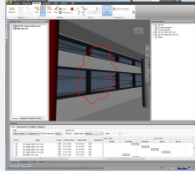
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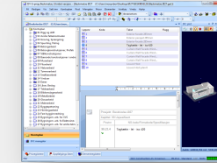
Coordination



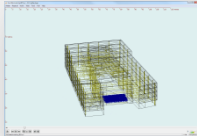
Communication



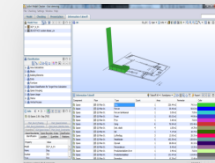
Description



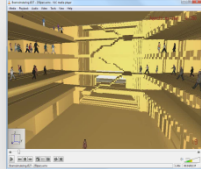
Acoustics simulation



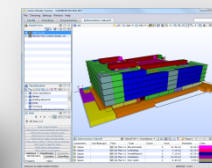
Design Review



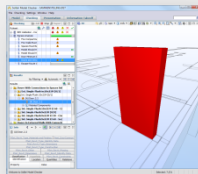
Fire simulation



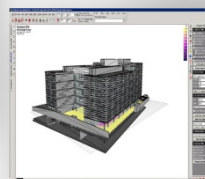
QTO



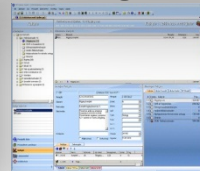
Model check



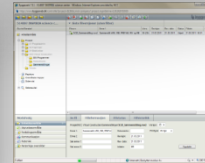
Sun and shadow



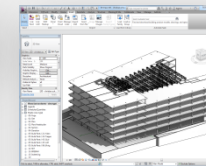
Budget



Byggeweb



Structure



Our new Head office: Østensjøveien 27

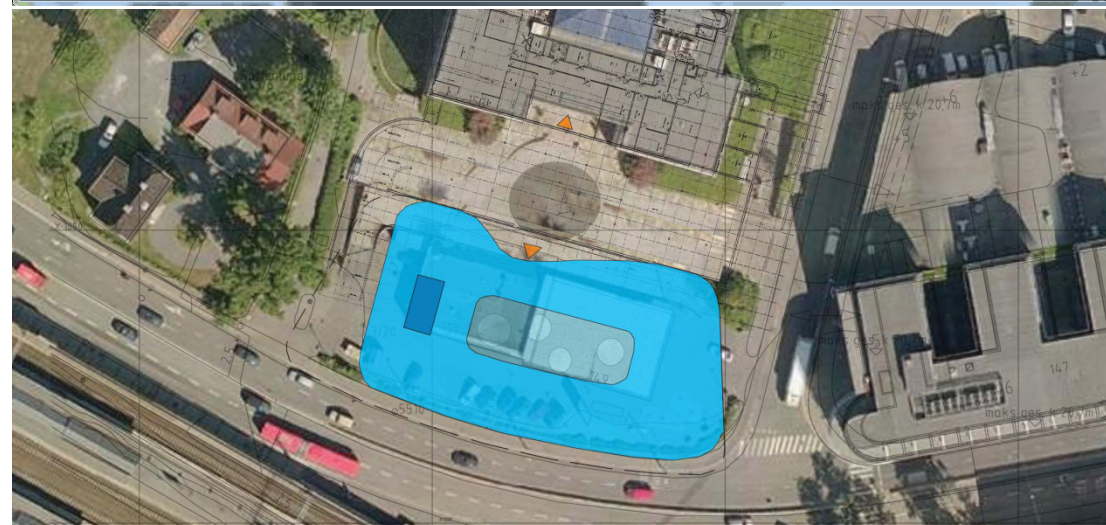
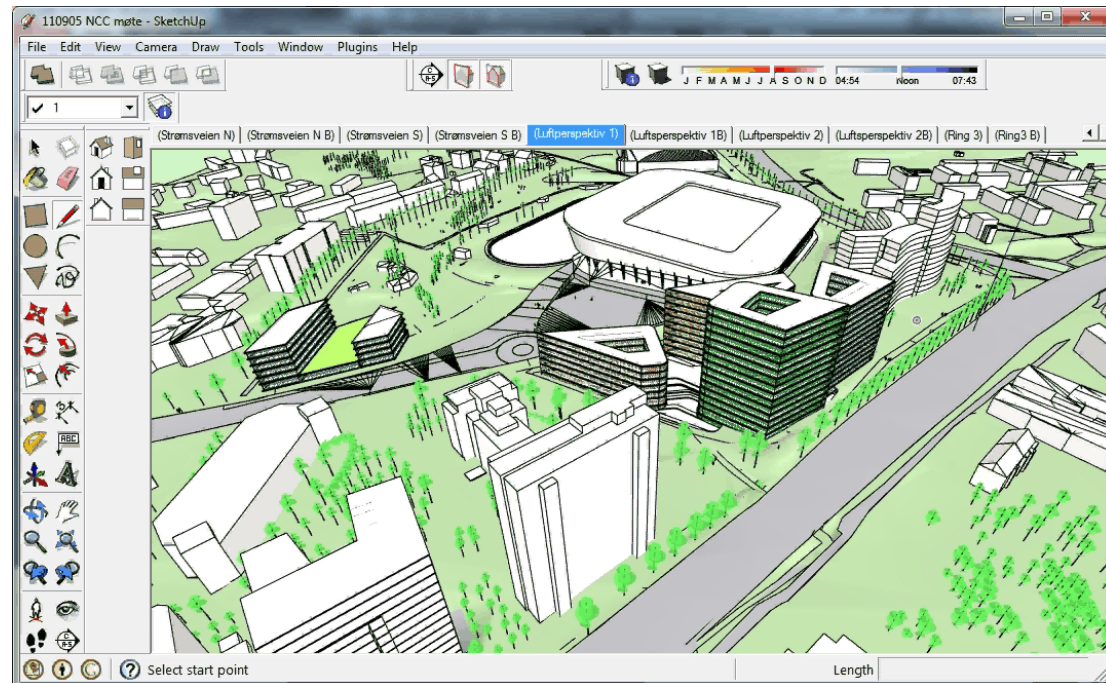


BREEAM «Very good» – Passive office building
Future Built project

16 examples

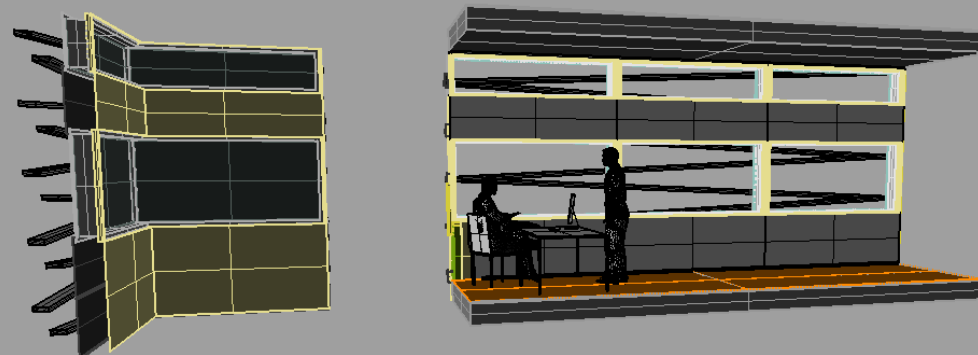
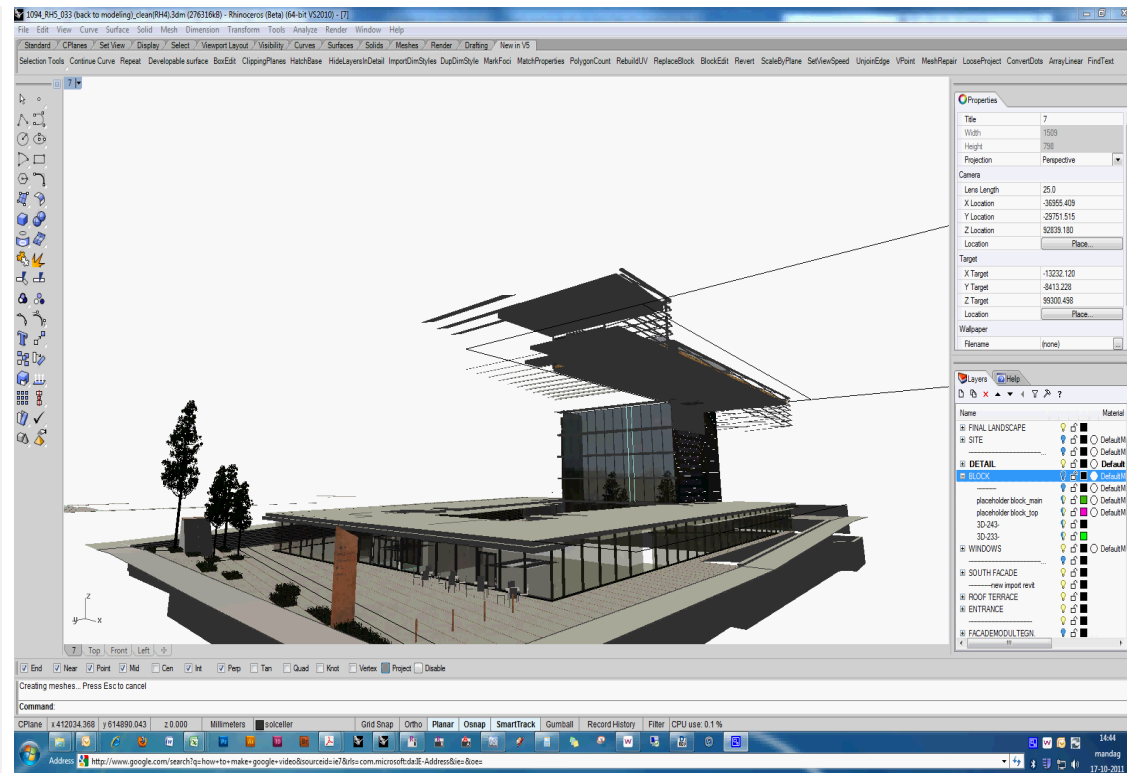
Land purchasing

- Easier analysis
- The market
- Authorities
- Constructability
- Aesthetics
- Environment



Concept development

- Everyone gets a shared understanding of the challenges in the project
- Easy to change
- Many possibilities
- Communication







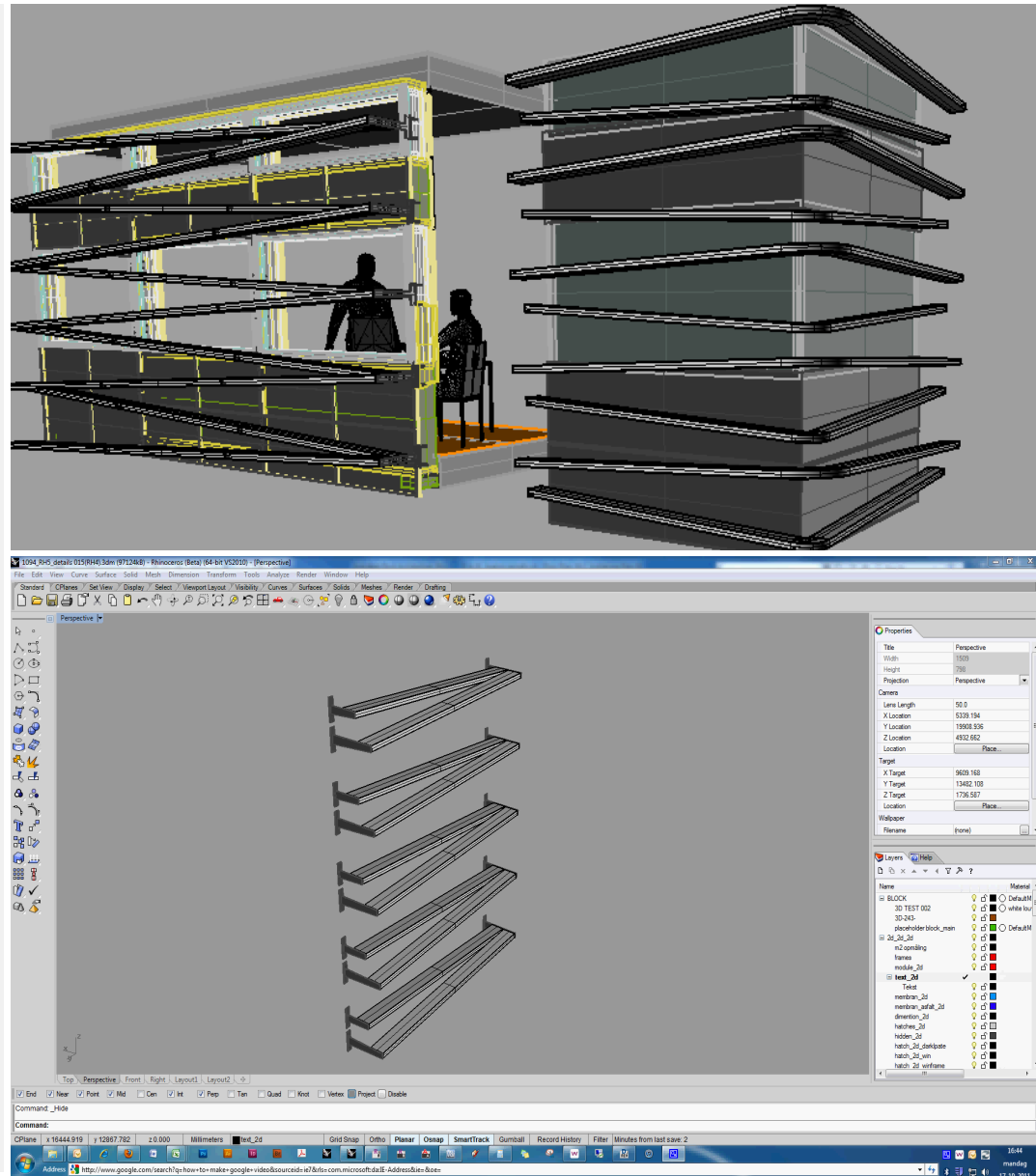


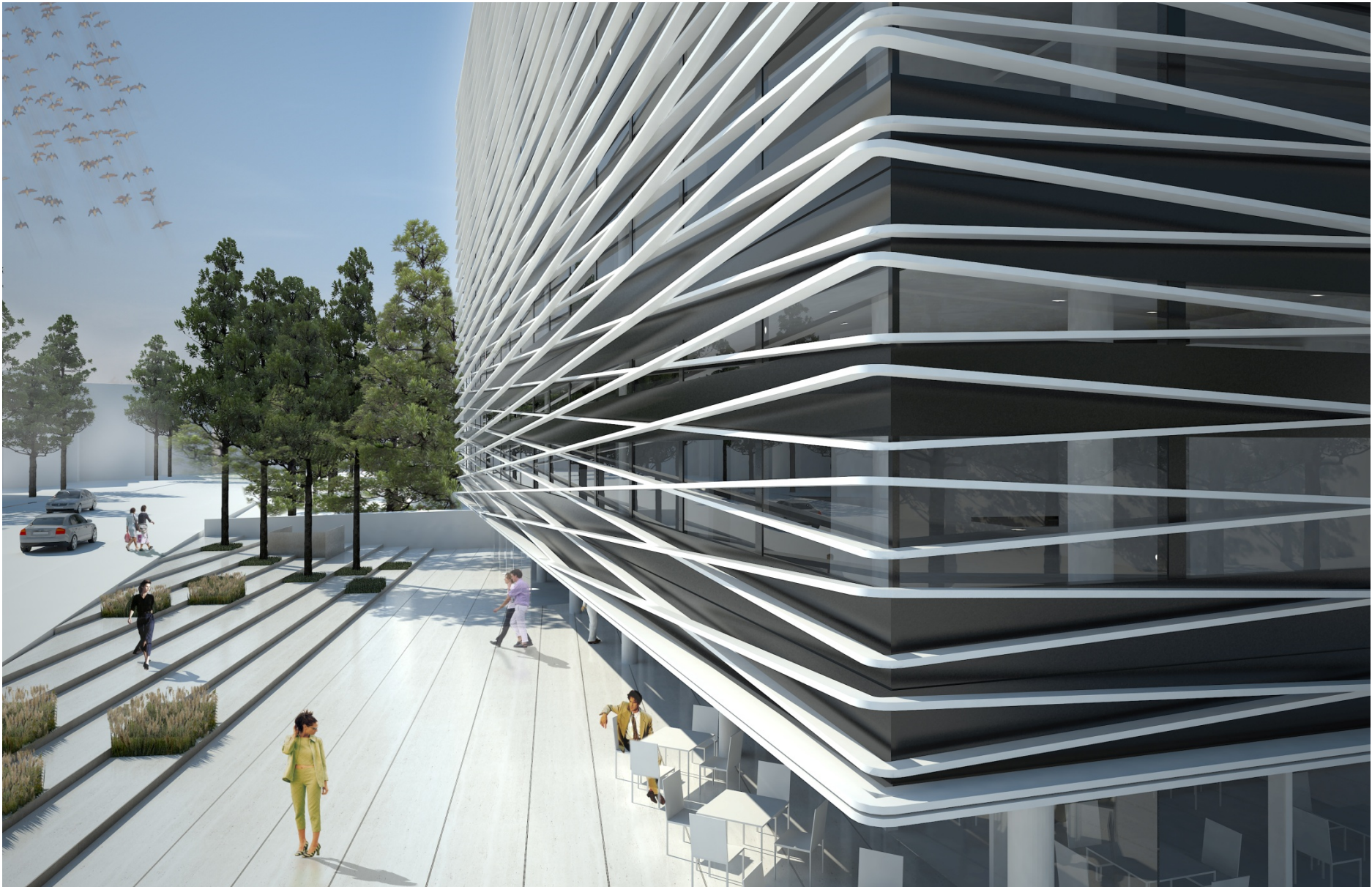




To understand the consequences

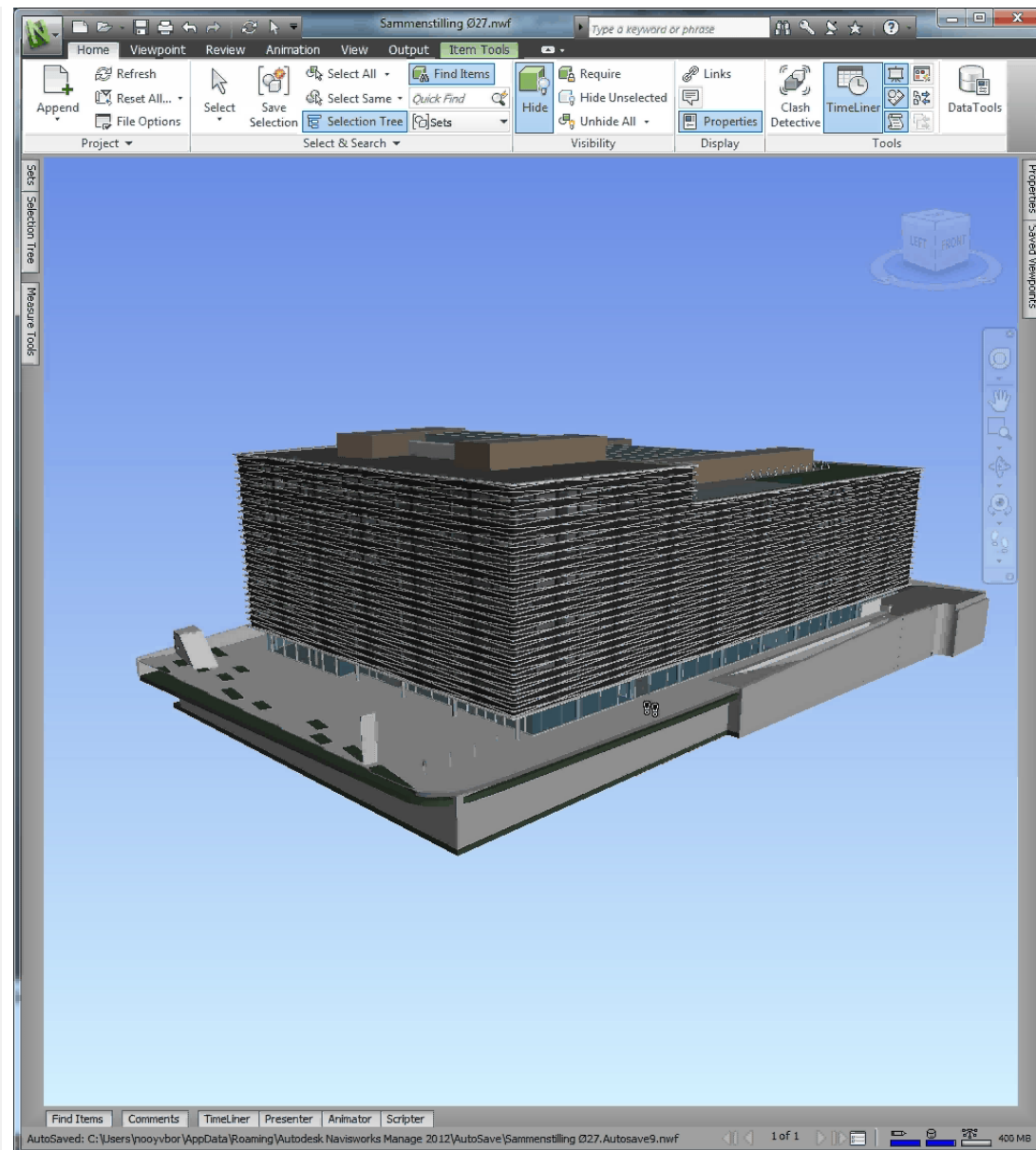
- Unusual solutions must be communicated clearly
- Broad support
- A better design
- More efficient process
- Faster decisions
- Rhino -> Revit -> IFC



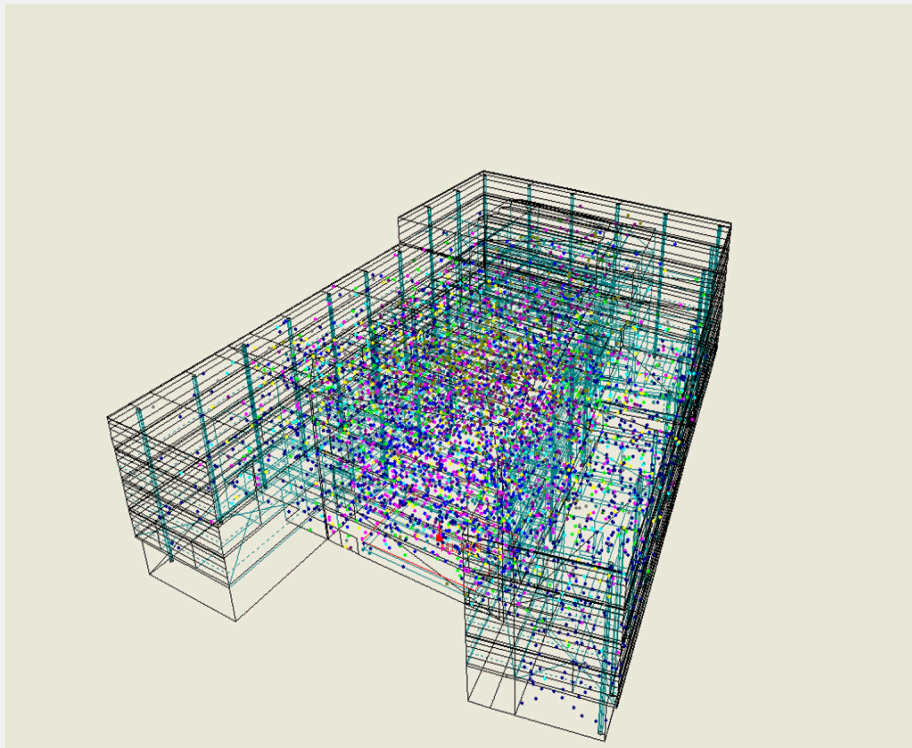


Internal communication

- Brokers
- Economists
- Lawyers
- Decision makers
- The project team
- A common understanding of solutions
- Support IFC

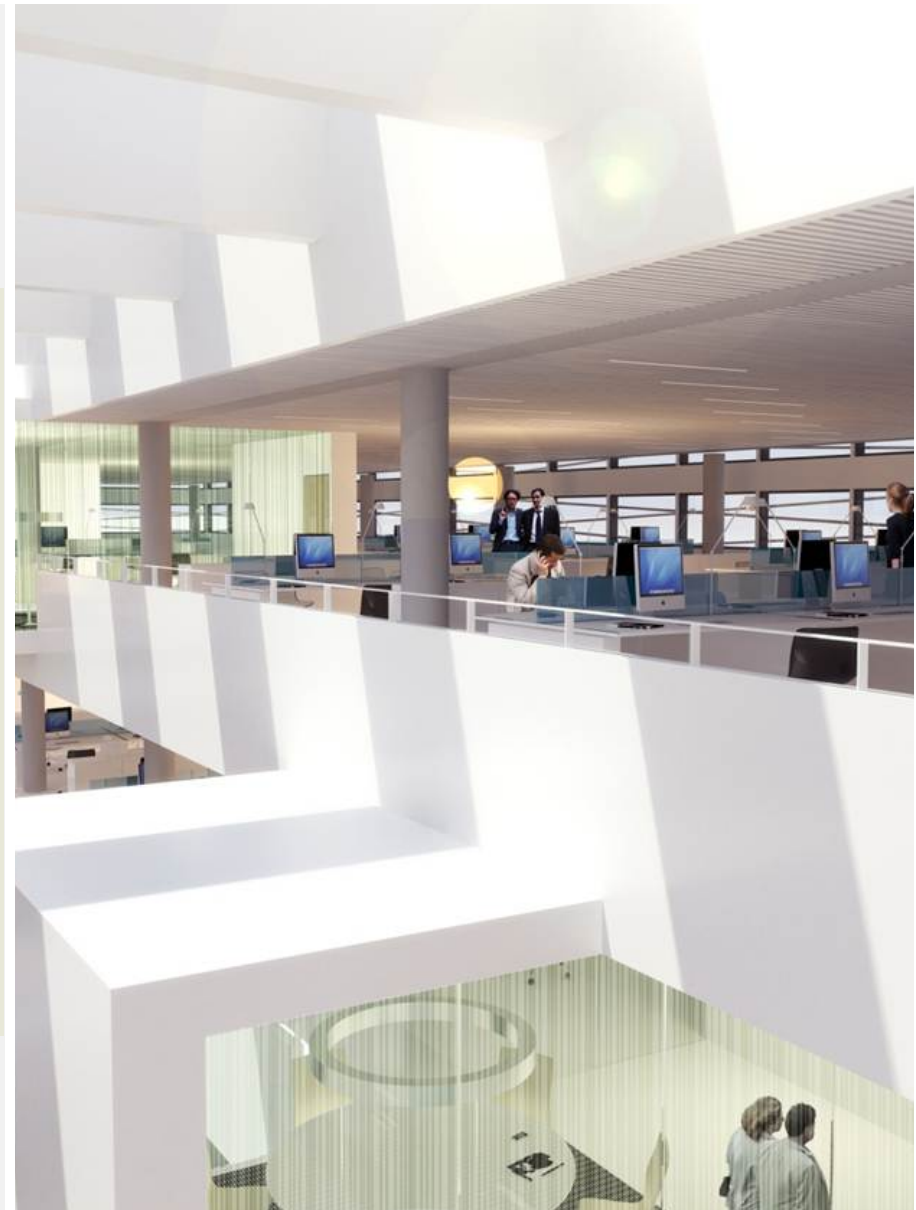


Acoustic Analysis



Preformed by Cowi

Support IFC -> Could be better







Fire Analysis



Preformed by Rambøll

Support IFC -> Could be better



Sun/shade analysis

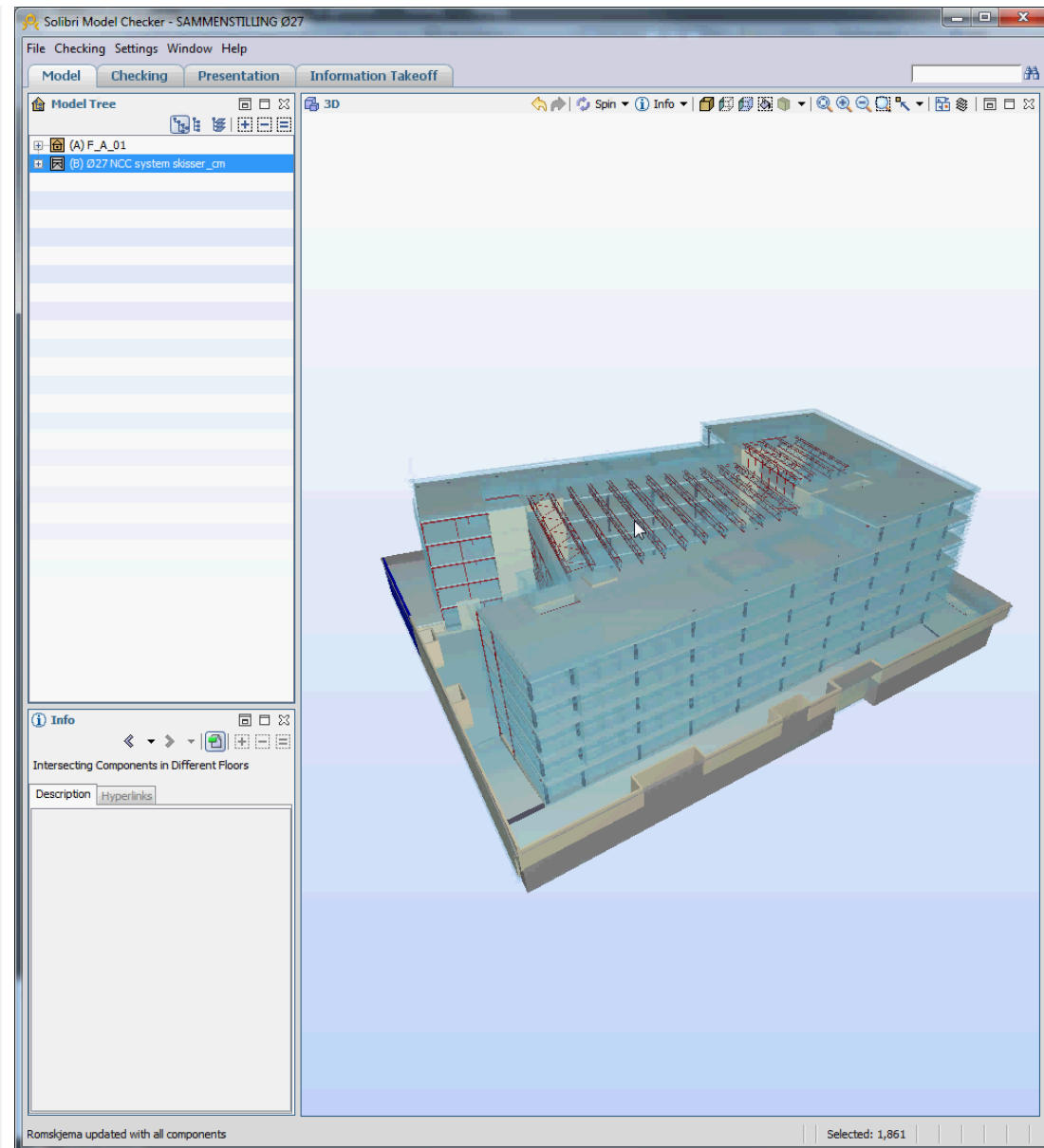
- Everything is connected with everything!
- Solar Blinds
- Window Placement
- Shadow
- Support IFC -> Could be better



Autodesk Ecotect – Henning Larsen Architects

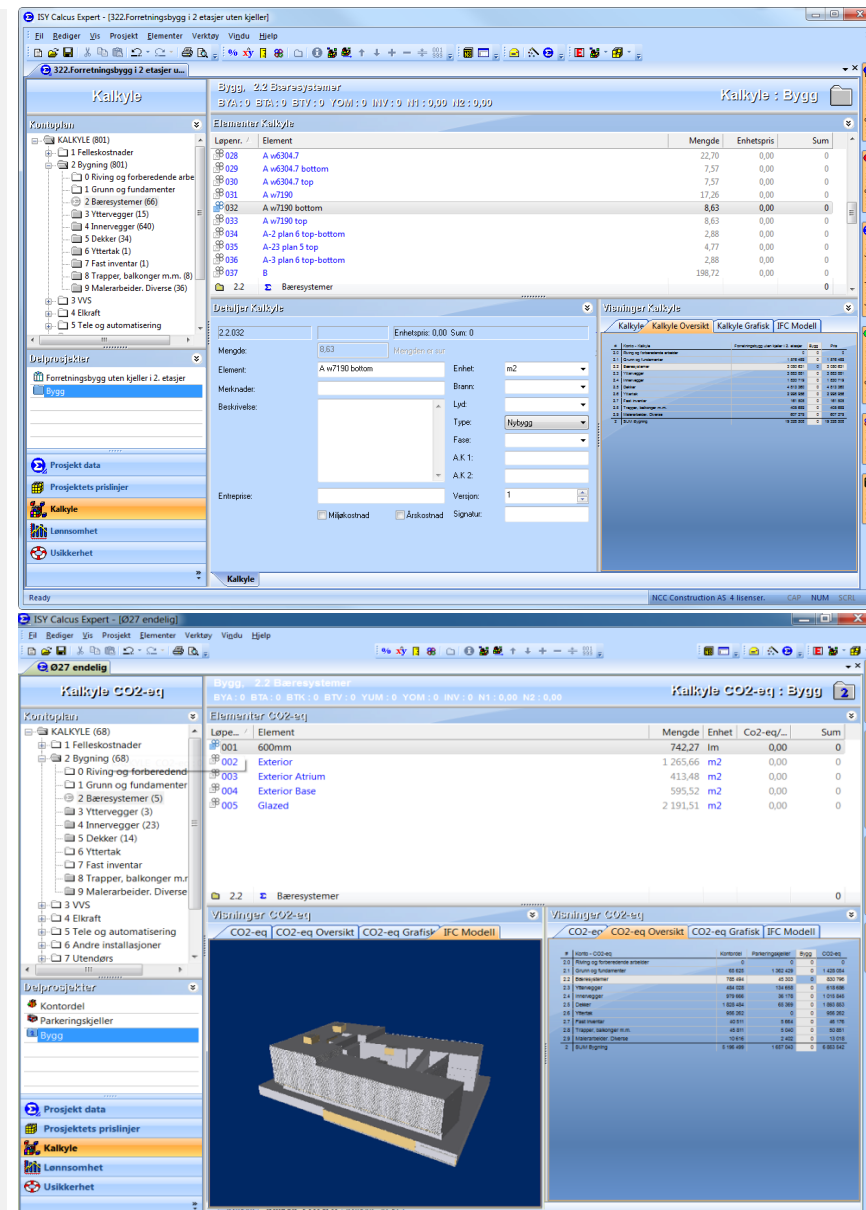
Model check in Solibri

- Quality of the Model
- Simple overview
- Energy Analysis
- QT for energy calculation
- QT for CO₂ reviews
- Perfect IFC-support



Budget in Calcus

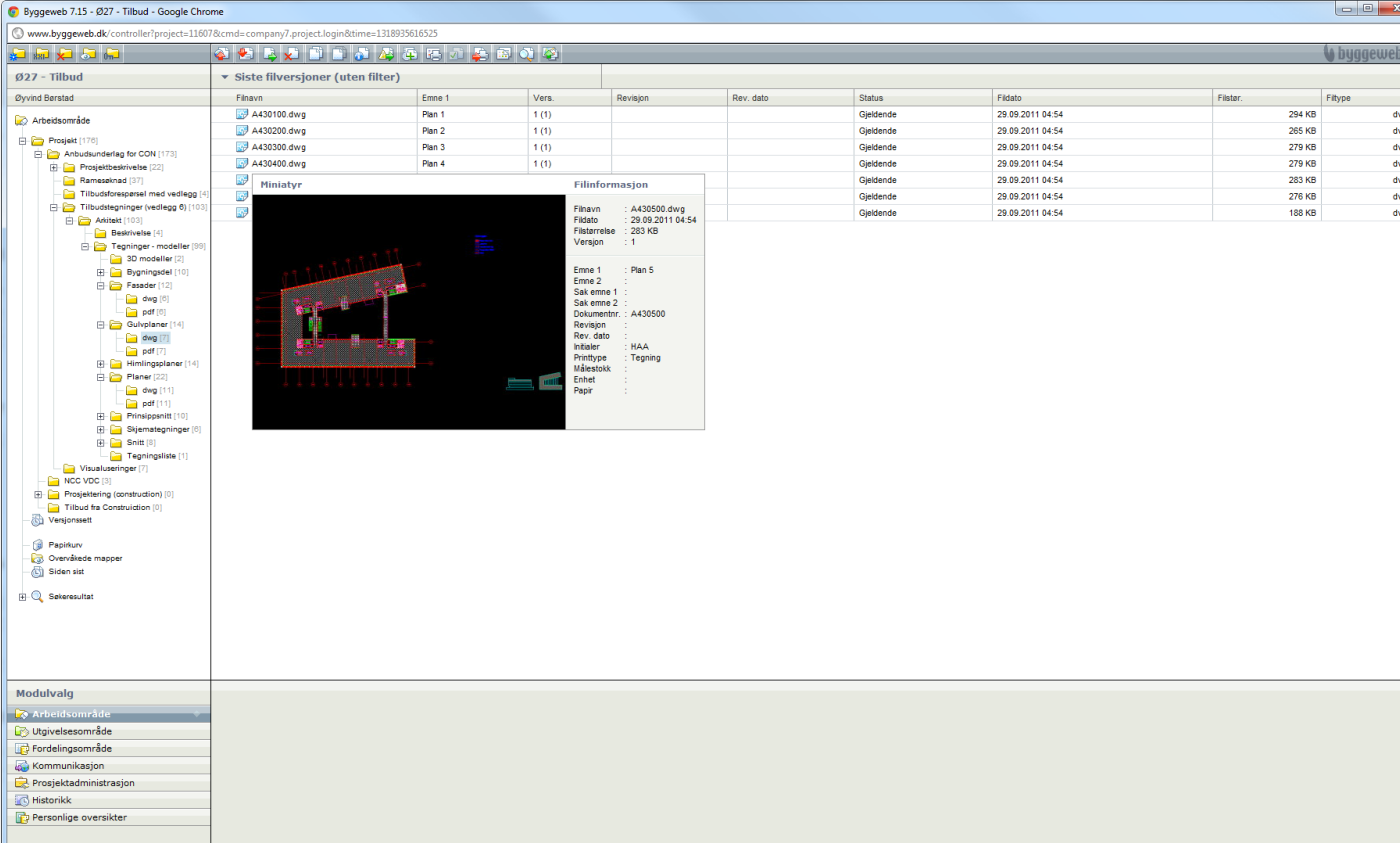
- Successive calculation
- Quantities from the model (import IFC)
- CO₂ emission
- Good overview!
- Easy to update
- What is included and what is not
- Perfect IFC-support



The top screenshot shows the 'Kalkyle' window for a building project. It displays a list of elements with columns for 'Løpnr.', 'Element', 'Menge', 'Enhet', and 'Sum'. The elements include various building components like 'A w6304.7', 'A w6304.7 bottom', 'A w6304.7 top', 'A w7190', 'A w7190 bottom', 'A w7190 top', 'A-2 plan 6 top-bottom', 'A-2 plan 5 top', 'A-3 plan 6 top-bottom', and 'B'. The 'Sum' column shows values like 2,270, 7,57, 7,57, 17,26, 8,63, 2,88, 4,77, 2,88, and 198,72.

The bottom screenshot shows the 'Kalkyle CO2-ut' window. It displays a list of elements with columns for 'Løpnr.', 'Element', 'Menge', 'Enhet', 'CO2-eq/...', and 'Sum'. The elements include '001 600mm', '002 Exterior', '003 Exterior Atrium', '004 Exterior Base', and '005 Glazed'. The 'Sum' column shows values like 742,27, 1,265,66, 413,48, 595,52, and 2,191,51.

Handover from PD to Construction



The screenshot displays the Byggeweb 7.15 software interface in Google Chrome. The main window shows a project overview for 'Ø27 - Tilbud'. A table lists the latest file versions (Siste filversjoner) for various drawing files. A 'Miniatyr' (Thumbnail) window is open, showing a 3D model of a building structure with a red bounding box. A 'Filinformasjon' (File Information) window is also open, providing details for the selected file 'A430500.dwg'.

Filnavn	Emne 1	Vers.	Revisjon	Rev. dato	Status	Fildato	Filstør.	Filtype
A430100.dwg	Plan 1	1 (1)			Ogjeldende	29.09.2011 04:54	294 KB	dwg
A430200.dwg	Plan 2	1 (1)			Ogjeldende	29.09.2011 04:54	265 KB	dwg
A430300.dwg	Plan 3	1 (1)			Ogjeldende	29.09.2011 04:54	279 KB	dwg
A430400.dwg	Plan 4	1 (1)			Ogjeldende	29.09.2011 04:54	279 KB	dwg
A430500.dwg	Plan 5	1 (1)			Ogjeldende	29.09.2011 04:54	283 KB	dwg
A430600.dwg	Plan 6	1 (1)			Ogjeldende	29.09.2011 04:54	276 KB	dwg
A430700.dwg	Plan 7	1 (1)			Ogjeldende	29.09.2011 04:54	188 KB	dwg

Miniatyr

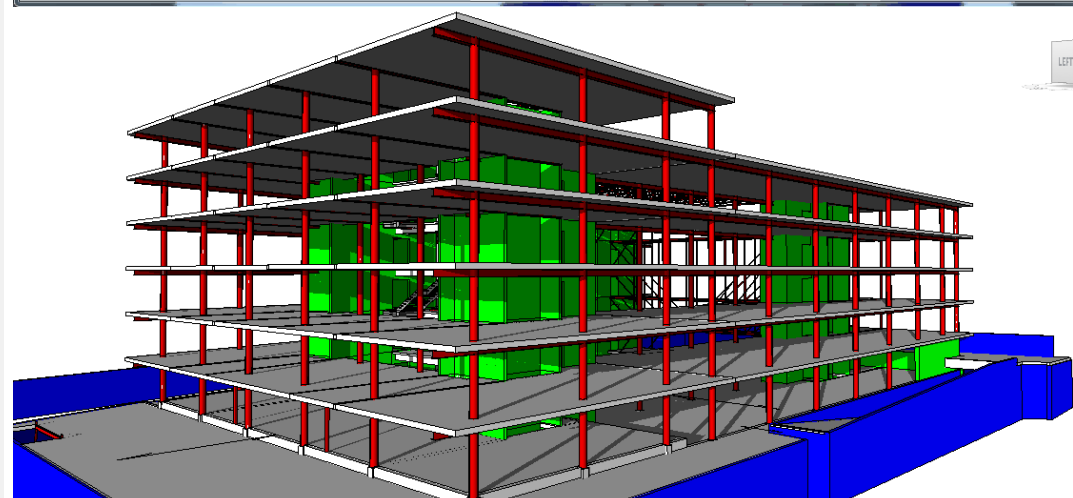
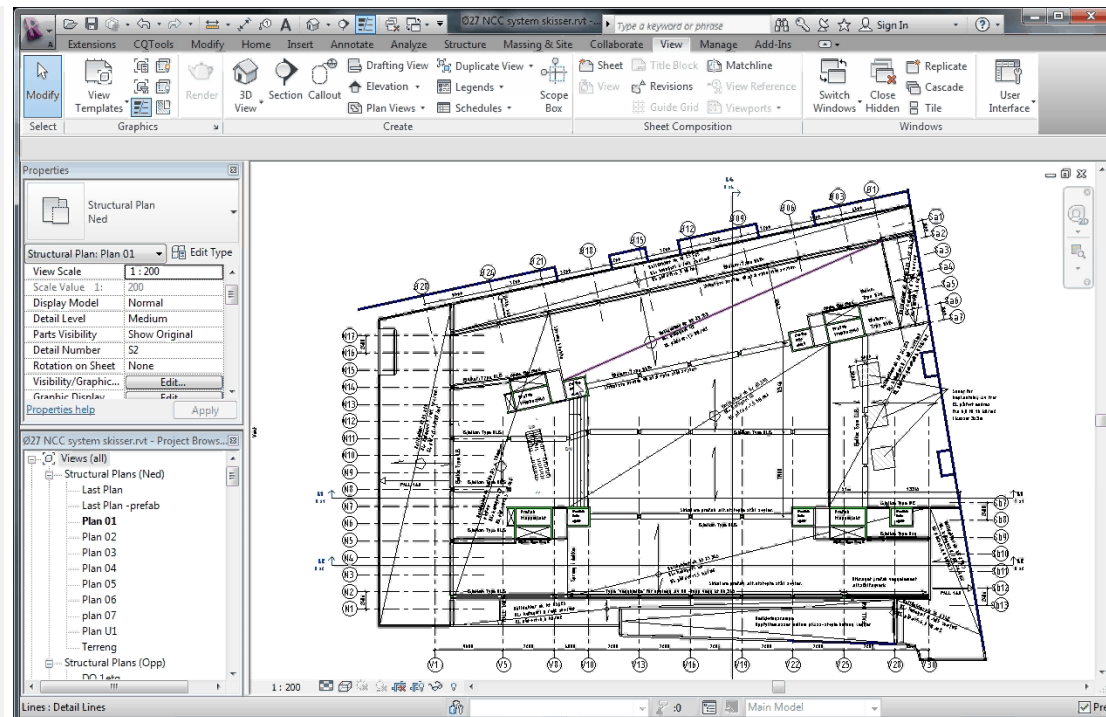
Filinformasjon

Filnavn : A430500.dwg
 Fildato : 29.09.2011 04:54
 Filstørrelse : 283 KB
 Revisjon : 1
 Emne 1 : Plan 5
 Emne 2 :
 Sak emne 1 :
 Sak emne 2 :
 Dokumentnr. : A430500
 Revisjon :
 Rev. dato :
 Initialer : HAA
 Printtype : Tegning
 Målestokk :
 Enhhet :
 Papir :

Support IFC

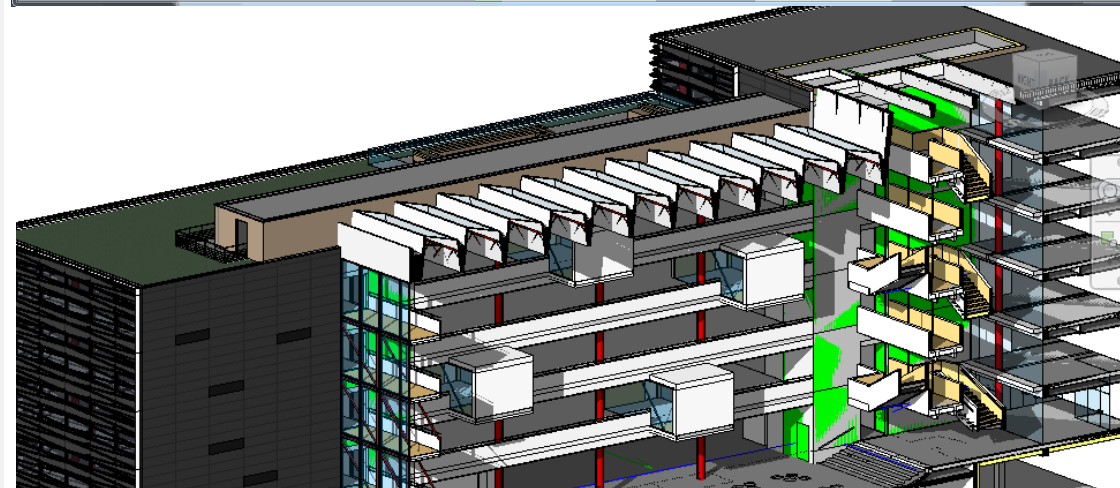
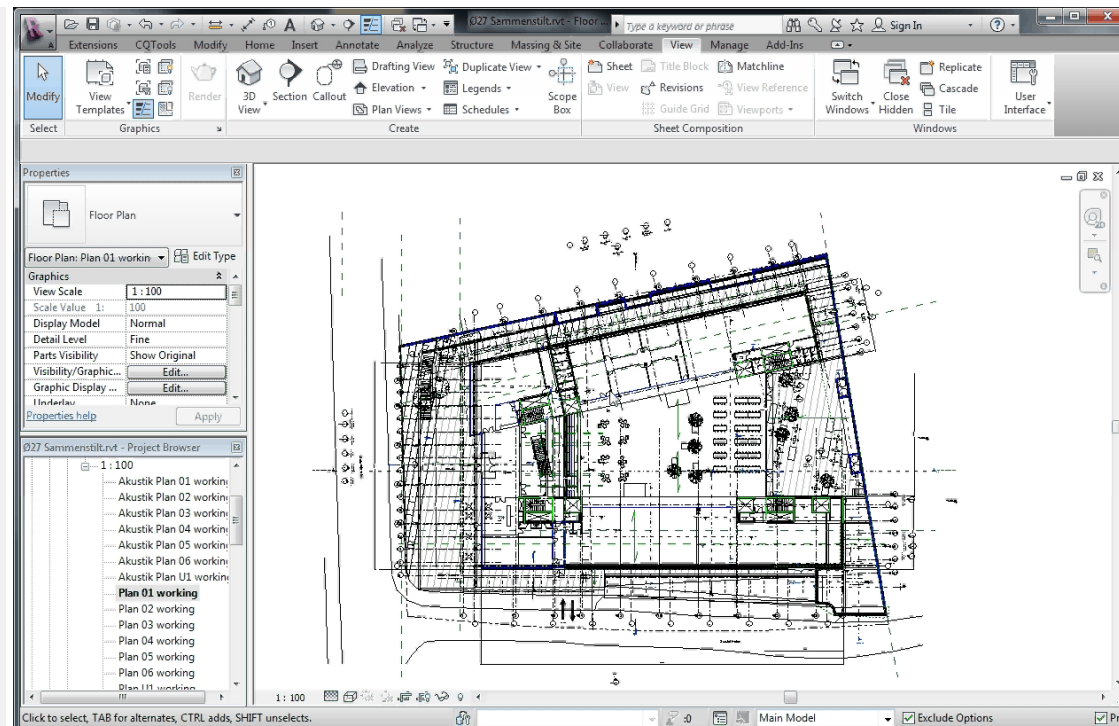
Structure in Revit Structure

- The correct concept
- Concept Reviews
- Purchasing
- Constructability
- CO₂
- Communication
- Reduction of risk
- Support IFC



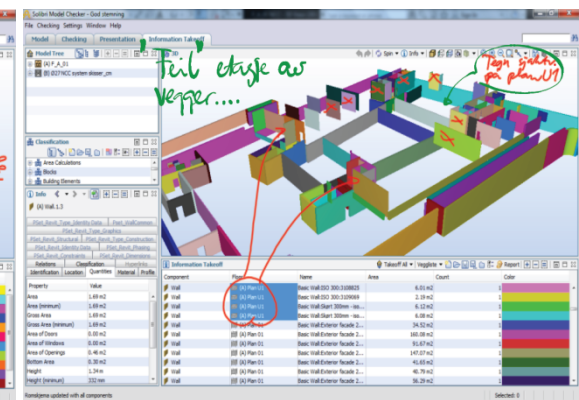
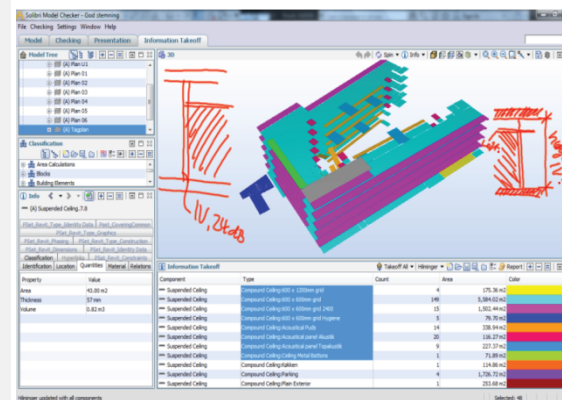
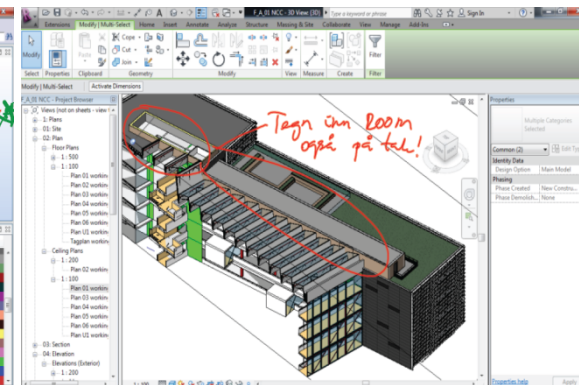
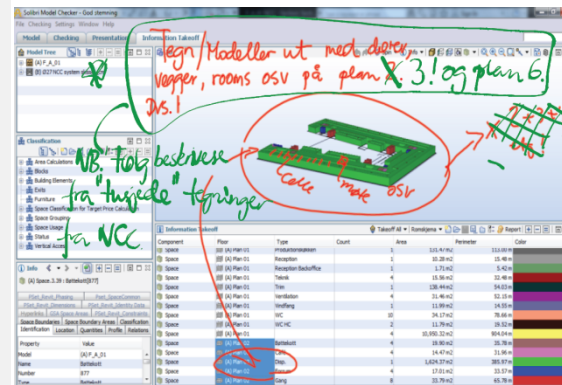
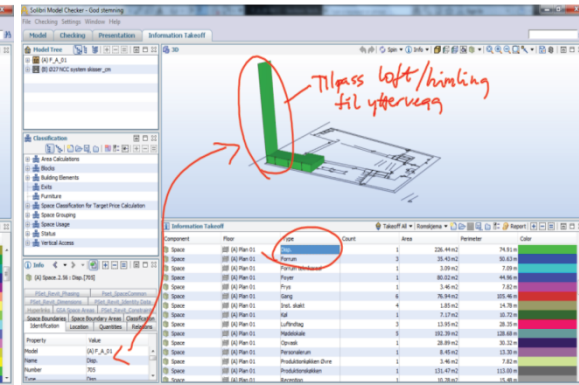
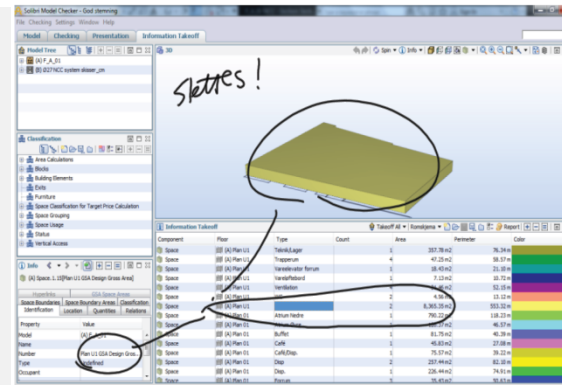
Coordination Architecture and Structure

- Exchange Structure-model to the Architect
- Review of changes
- Who are modeling what
- Level of detailing
- Support IFC



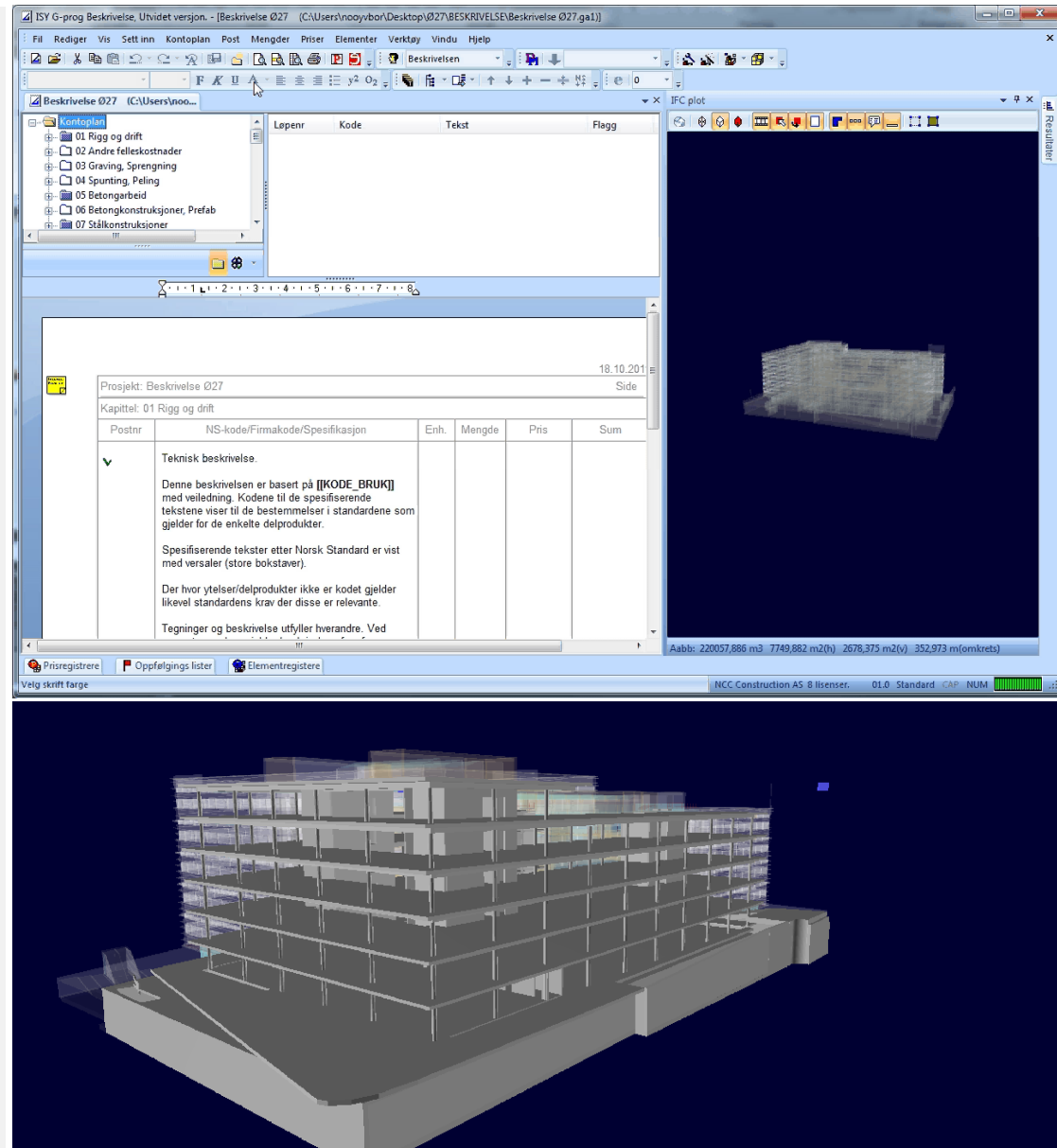
Design Review

- Design meeting with Smart Board
- What is the quality of the model
- What needs to be changed
- Minutes written on the screen



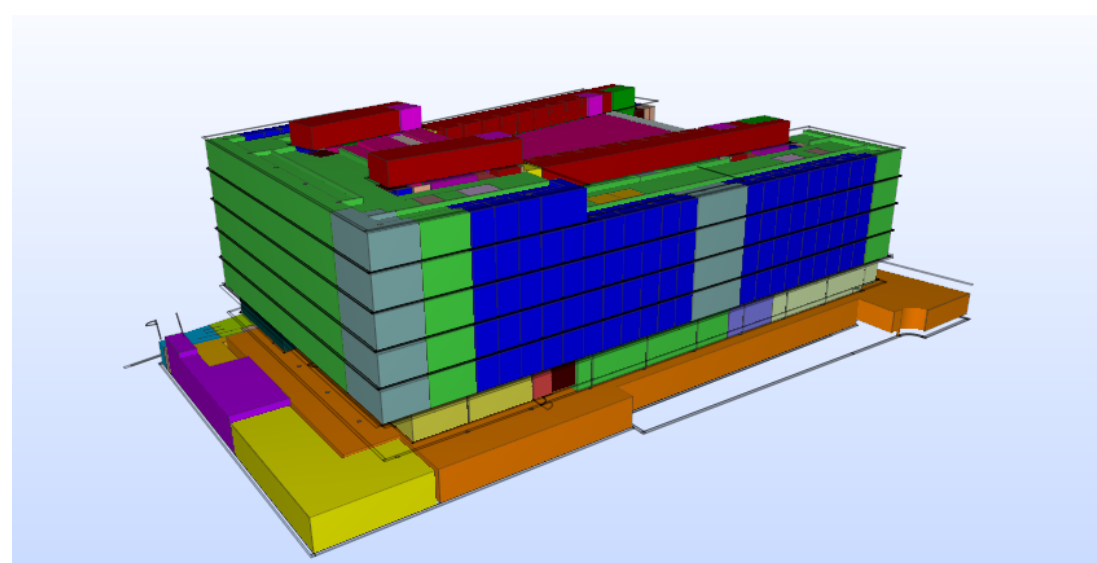
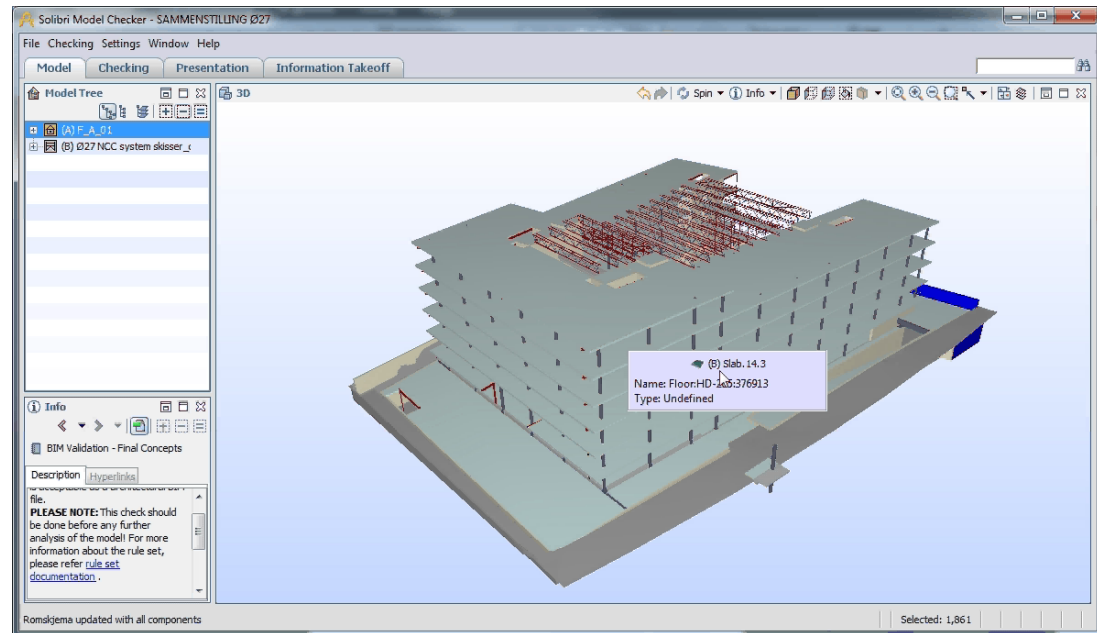
Description

- Direct import from Revit to g-Prog via IFC
- Complete overview
- Simplified description
- Faster
- Less errors
- Support IFC



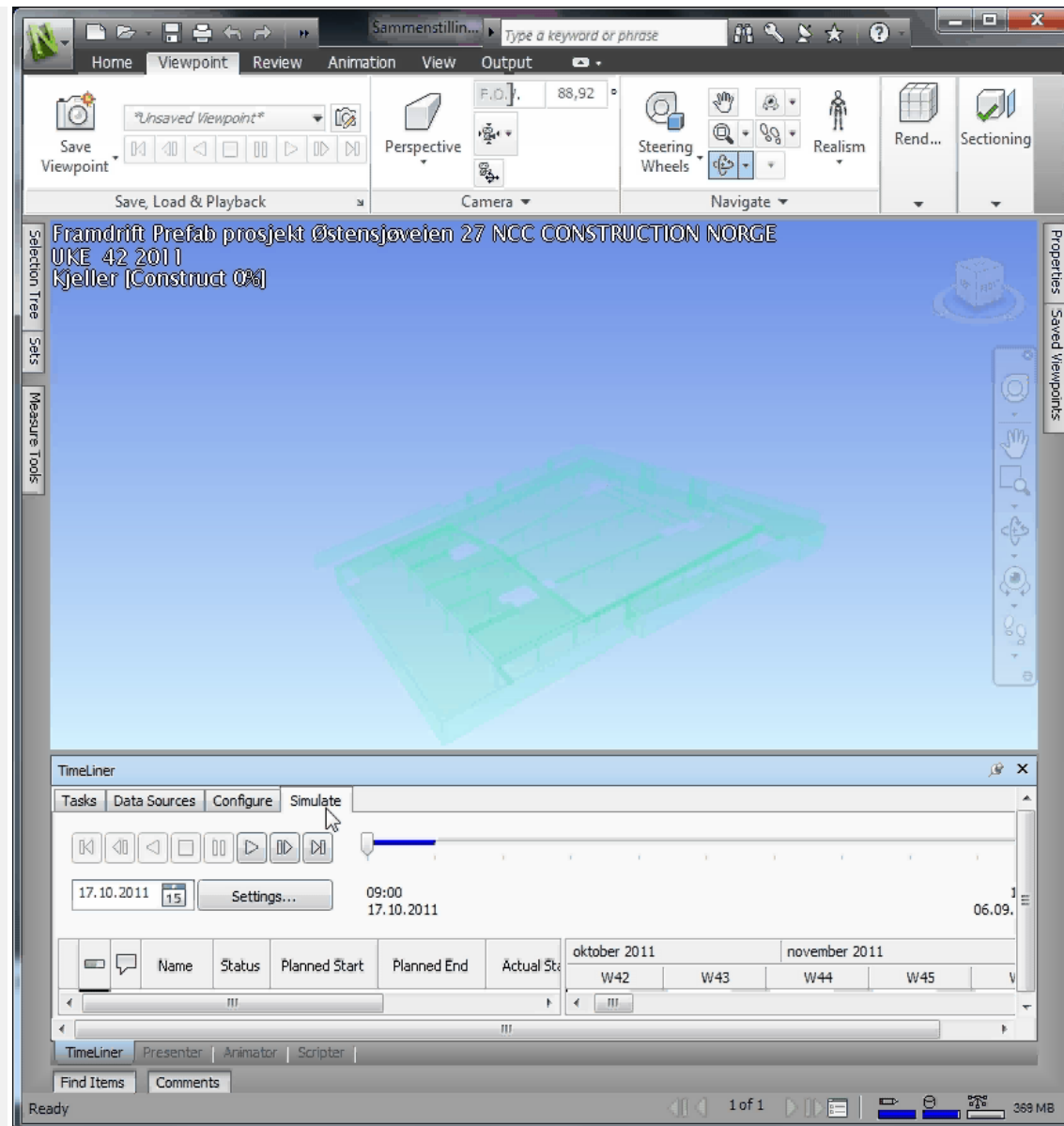
Coordination Solibri

- Structural Review
- QT
- Purchasing
- Ratings
- Communication
- Qualities
- Surfaces
- Updated every monday



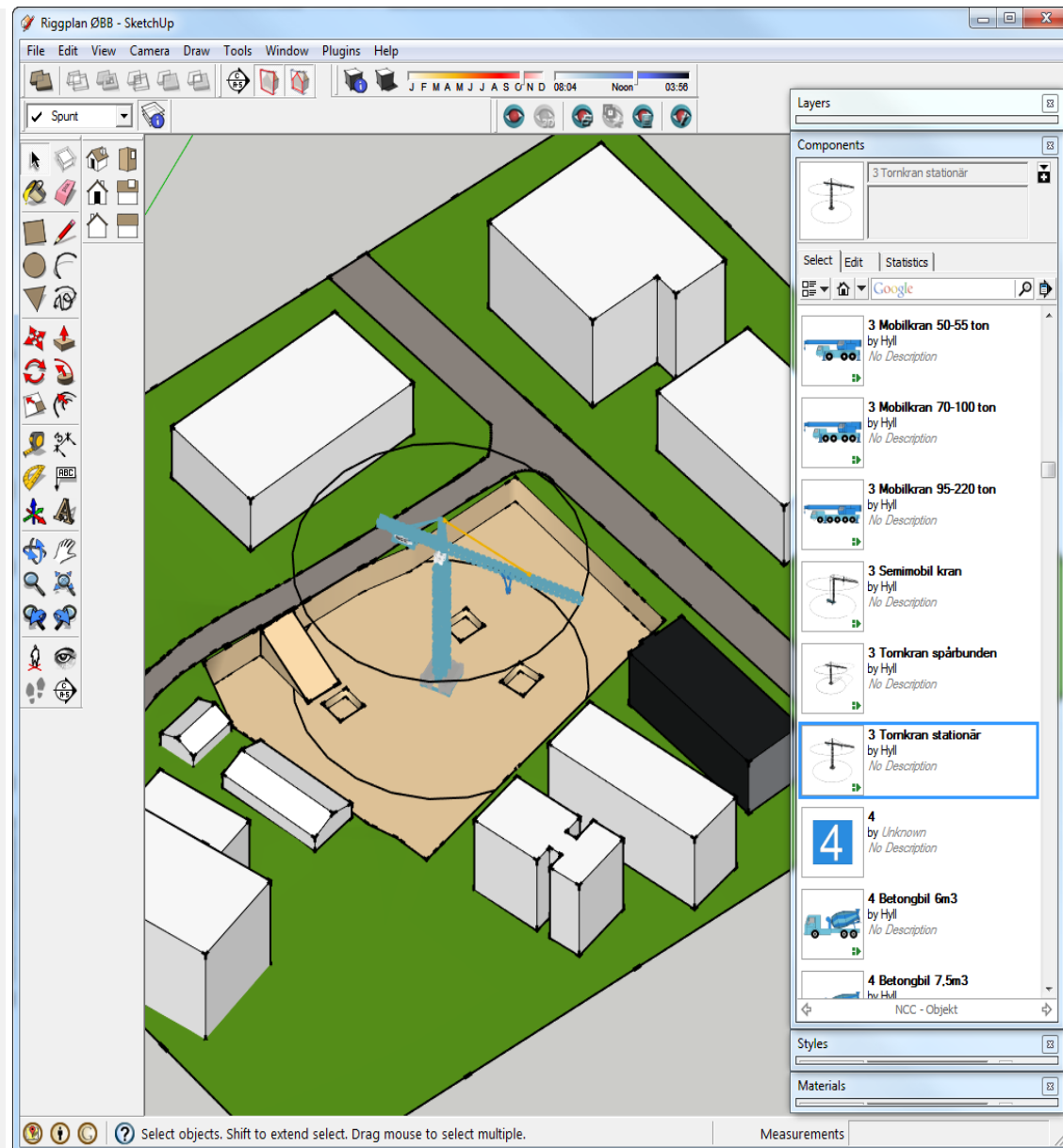
4D - Navisworks

- A good overview
- View the options
- Better overview
- Better communication
- Support IFC

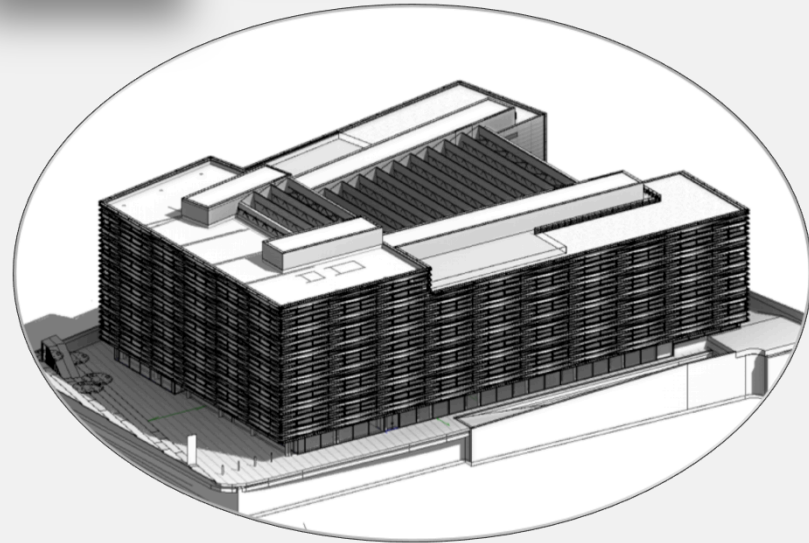


Site planning

- Good logistics
- Overview
- Communication
- Easier reviews
- Support IFC



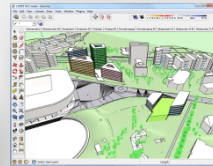
What is VDC?



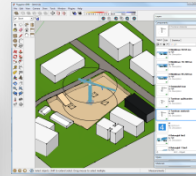
Concept development



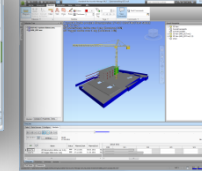
Land purchasing



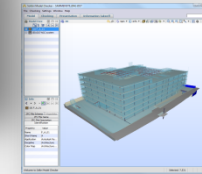
Site planning



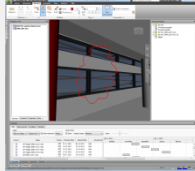
4 D



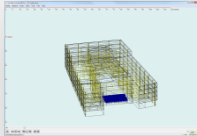
Coordination



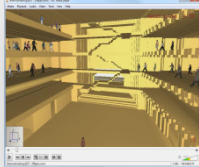
Communication



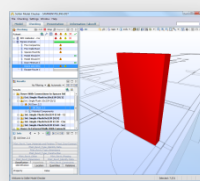
Acoustics simulation



Fire simulation



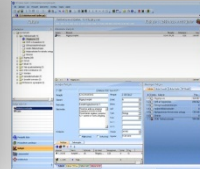
Model check



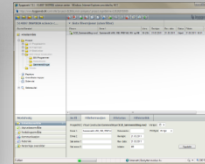
Sun and shadow



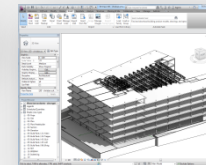
Budget



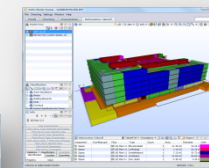
Byggeweb



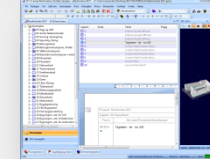
Structure



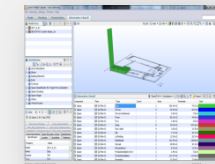
QTO



Description



Design Review



Summary

Economy is a consequence of the opportunities, utilization and design in relation to the market

Sales / rental is a consequence of communicating design

Quality is a consequence of structured processes

Construction cost is a consequence of the conditions to make right activity at the right time

Effective VDC provides good environmentally sound solutions

Thank you for your attention!!

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