Customer reference case - From design to calculation

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The story

Different type of users today

1. Sceptical person – Employee who is happy to double insert data in the different softwares because the lack of trust in new solutions/technology.

2. The pioneer - Employee that keeps an open mind to new solutions and does not fear to exit the comfort-zone.

3. Control freak – Person who does solo presentation both PPT and live demo.
The rumour is true!
Customer overview

- **Structural Engineers**: Helge Andreassen Ing. Byrå
- **Project name**: Askim Köpcentrum (Shopping mall)
- **User experience of Revit and Robot link in a live project**

Customer vision: Expand Autodesk products usage and eliminate time consuming moments.

3D-modelling was a requirement from their customer – take advantage of its benefits as much as possible.
- Approx. 5 000 sqm (53 800 sqft)
- 1 984 objects (Steel frame/Trusses) + shell elements
- 3D/BIM modelling and Calculation – Steel/Concrete structure + detailing
Why did they choose this workflow?

Project → Steel → Piles → Concrete → Calc.
First time challenge!

Many find it quite tricky and time consuming to...

- Keep track of the analytical model (Levels, analytical connection).
- Colleague might cause some changes which affects the analytical model.
- Larger models will result to a lot of time-waste if it’s not planned right..

Don’t focus on 1 step, focus on the final outcome!
Preperation of analytical model
Prepereration of the analytical model

• Importance of keeping the links together.
• Define tolerances – Analytical Settings (Can cause unwanted changes aswell)
• Do a consistency check
• Later versions allows us to manipulate the analytical lines more freely.
Preperation of the analytical model (Revit/Naviate)

- Steel detailing – Naviate Structure
- Regular checks to ensure no changes has been accidentally made.
Preperation of the analytical model (RSA)
After the Revit export to RSA
Plan it right!

- Doublecheck the physical data for imported objects.

- Claddings for load-distribution.
  - Roof
  - Foundation beams which the piles is connected too.

- Define load-cases and combination after you’ve controlled that the model is ok!
Results after calculation

- Static forces is produced for bars (M, N, V)

- Reaction forces will define the forces that goes to the piles, in our case the results was delivered to the pilesupplier.

- Results for shell objects which will be used for the reinforcement part.
Required/Provided reinforcement

- Define right member type.
- Reinforcement check (what is required).
- Results for shell objects which will be used for the reinforcement part.
Applying the reinforcement

- Provided Reinforcement – Reinf. Pattern, Calculation options
  - Reinforcement pattern – Wire fabric
  - Calc. options – Type of wire fabric

- Visualization view of the applied fabrics
  - Tables of quantity
  - Detailed information of the wire fabric
Steel design

- Member type – Defines the behavior of the object(s).
  - Buckling length/curve
  - Moment definition
  - Limit deflections
Steel design

- Groups – by inserting steelframes in groups it was much easier for us to get control and which data has been applied on the objects.
  - Groups were broken down framewise in our case.

- Calculation options – Configure the calculation process
Steel connections

- Calculation of connections for trusses and frames.
- Results is presented in detail, also referring to right location in Eurocode.
Summary

Benefits

• Total outcome was positive – we managed to reduce the planned time in the calculation process with more than expected.

• Calculation software which manages the structure in all required aspects (Steel, Concrete, detailing etc)

• Reinforcement schedules was easy to bring out, quantity and a good overview was received.

Limitations

• Steel connections is not supported in the export to Revit.
• Complex connections is not possible to manage (was manually done).

• Movements/rotations of the building causes problem in the export.
• Fabric area reinforcement would be great to have in the export as an option.
THANK YOU

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