The background of the slide features a low-angle shot of a dark, industrial steel beam with several bolts, extending from the bottom left towards the center. In the background, a modern building with a facade of white and blue geometric panels is visible. A red diagonal stripe runs from the top left corner towards the center. A dark blue/black rectangular box is positioned in the upper right quadrant, containing white text.

Showcase

Bella Congress hall 2020

Bella Center Copenhagen:
Largest congress center in Northern Europe

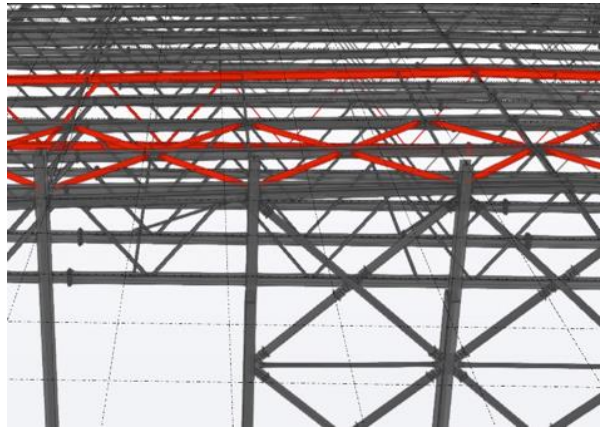


Our Partners

Builder:
Solstra Capital and BC
Hospitality Group

Engineering: Oluf Jørgensen

Architect: COBE



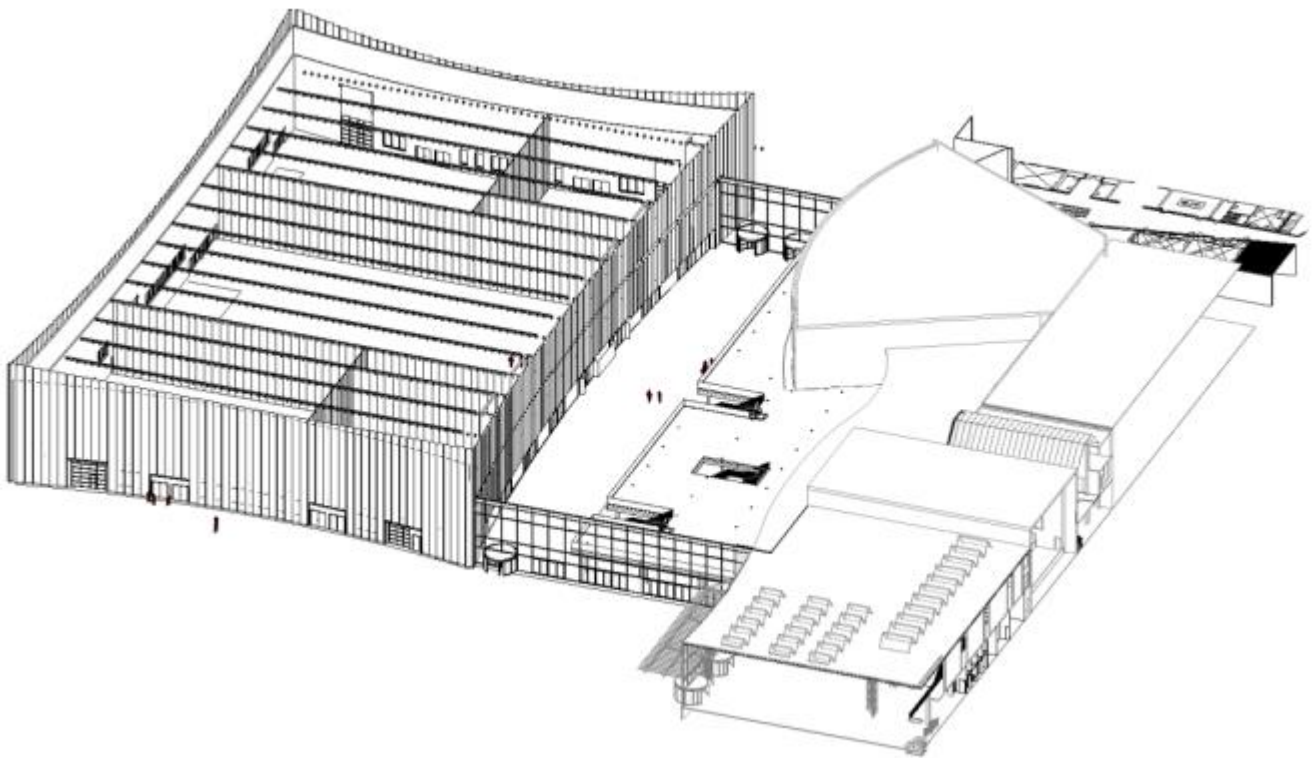
Design and BIM Modeling: Give Steel Poland

Project information

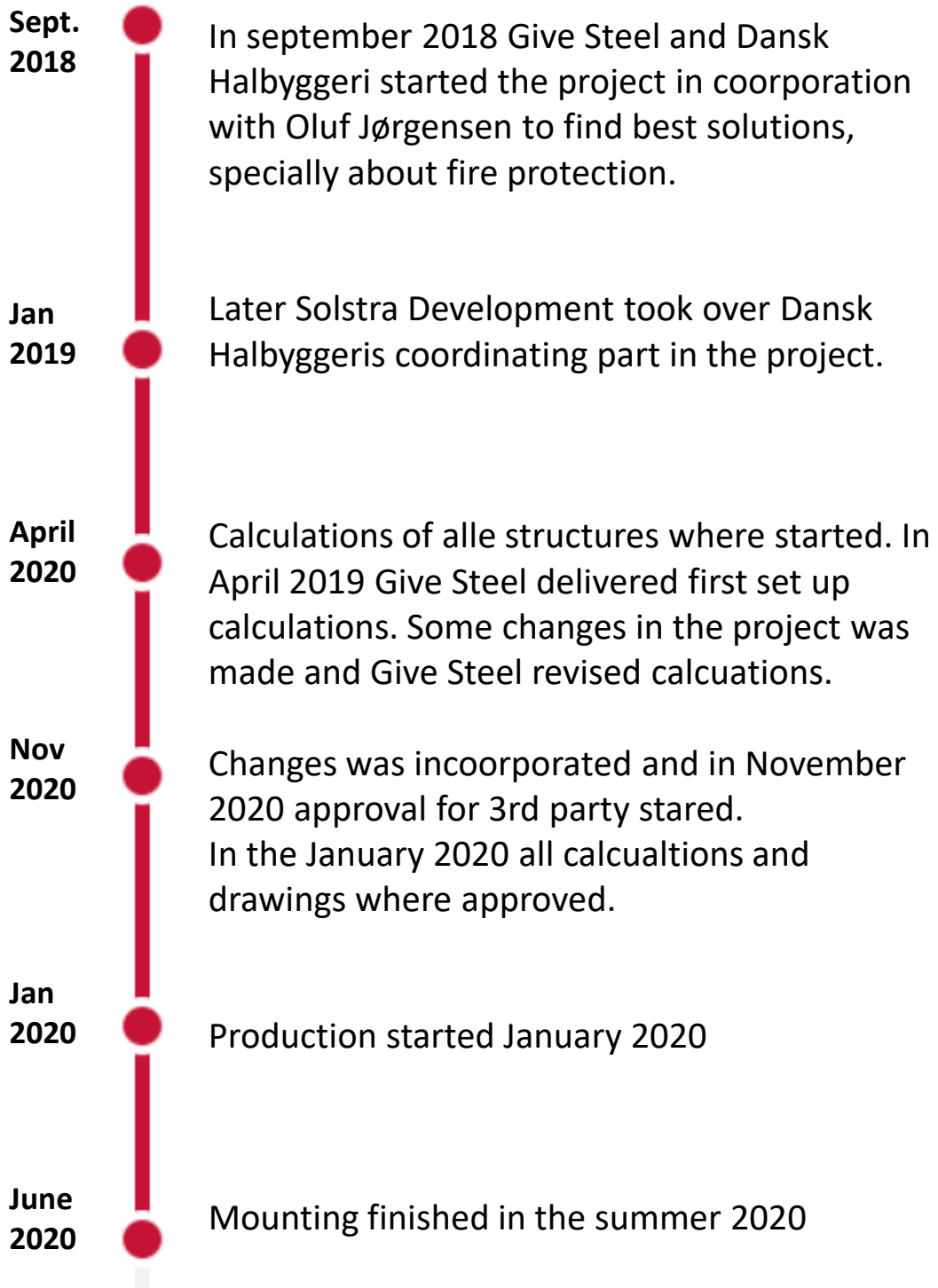
Foyer and congress hall are both calculated and designed by Give Steels Static department.

Both structures where calculated in CC3+

3rd party check where done by Sweco



Design of steel structures / Time Line



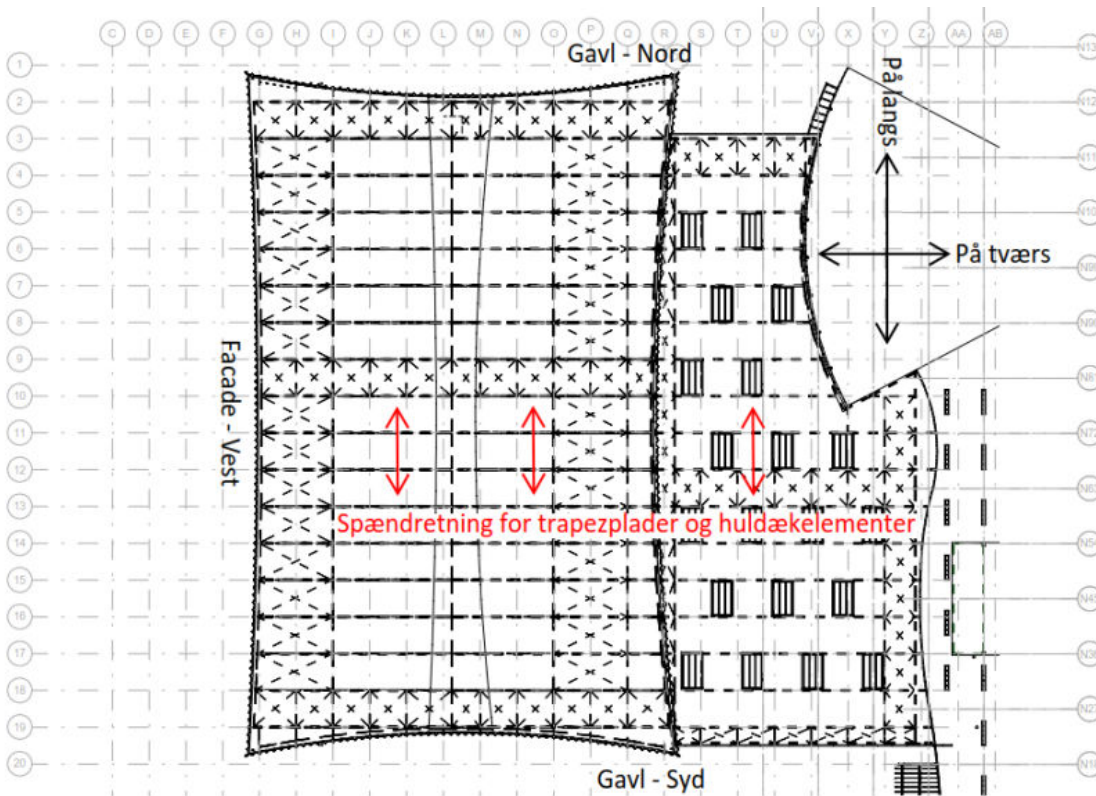
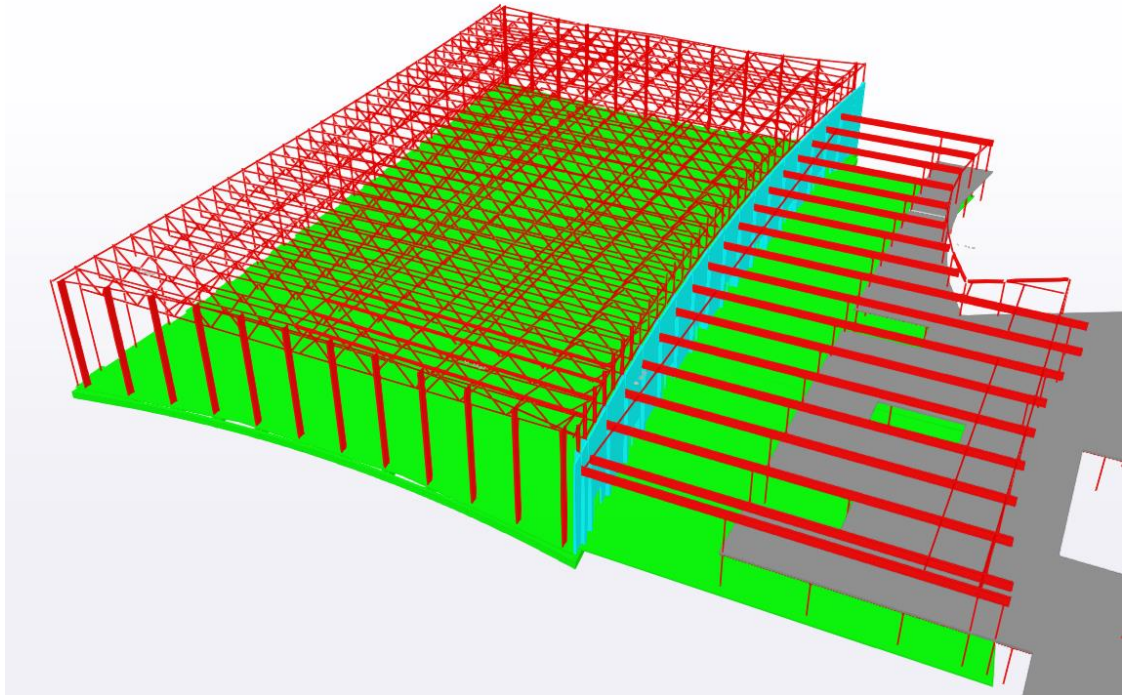
Air Photos



Static system

The steel structure on sight is divided into two parts. The congress hall and the Foyer.

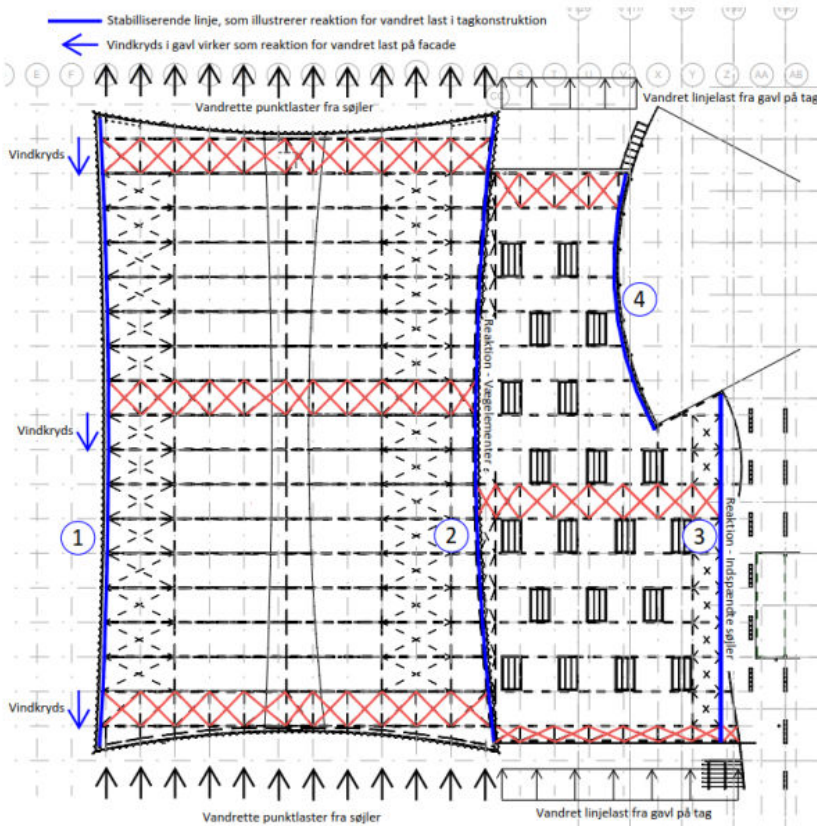
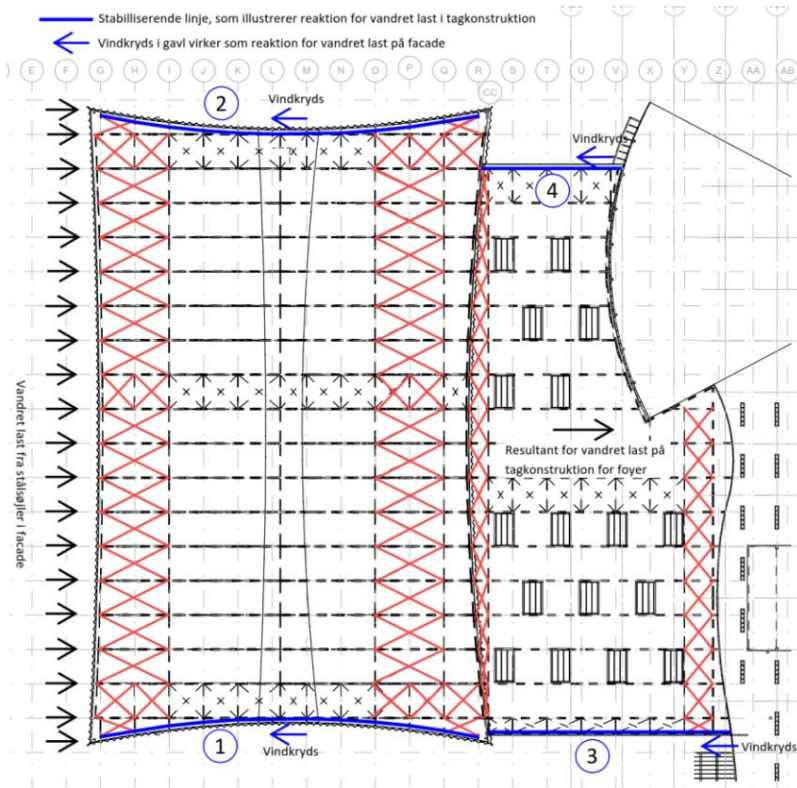
The concrete wall between the two parts combines the building into one.



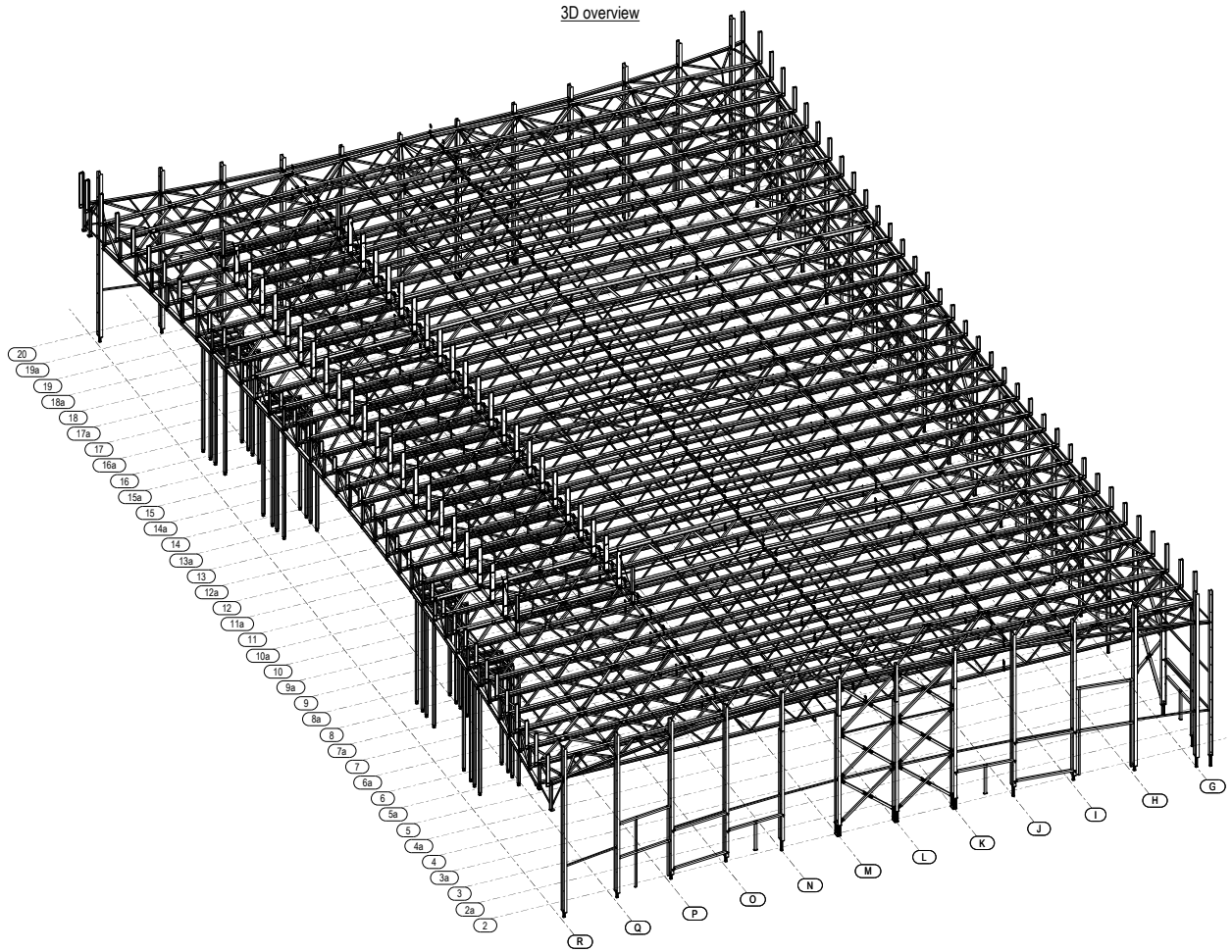
Horizontal loads are moved from roof cladding, to steel trusses, to steel and / or composites columns and to foundations.

Static system

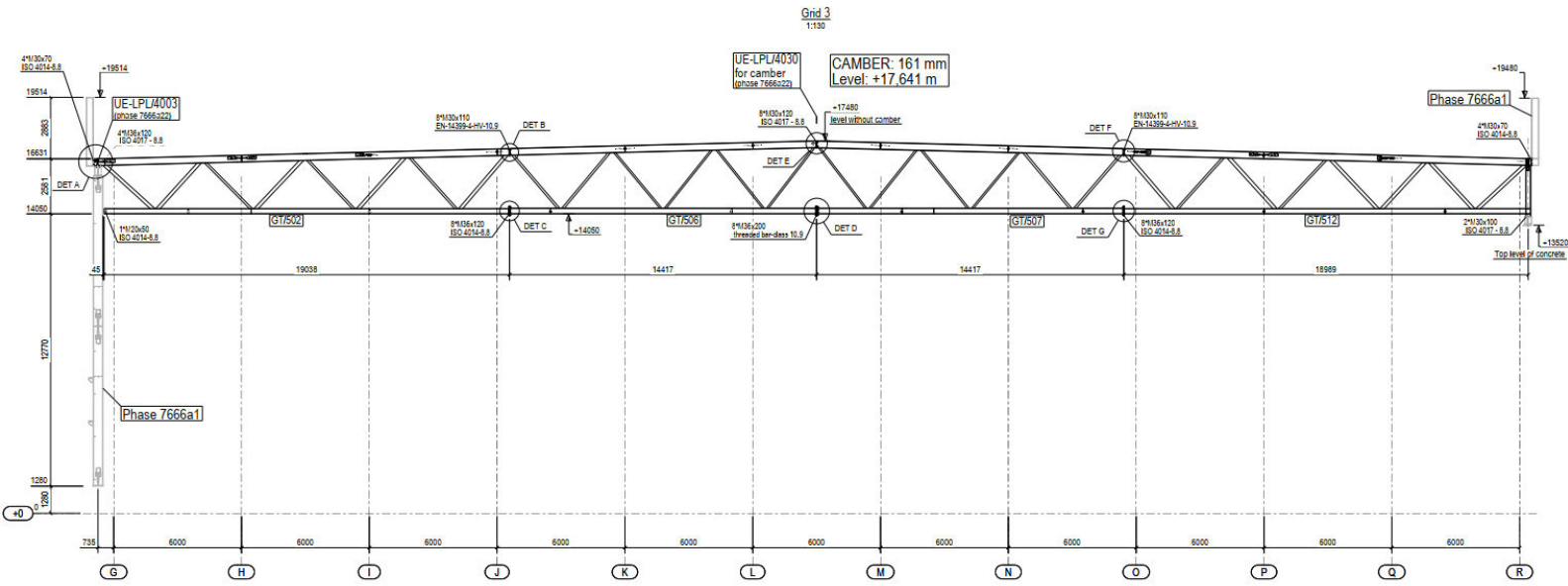
Stability of the building is created with steel bracing in the roof and facades together with the concrete wall between the two buildings.



Overview



Truss in congress hall



Span:

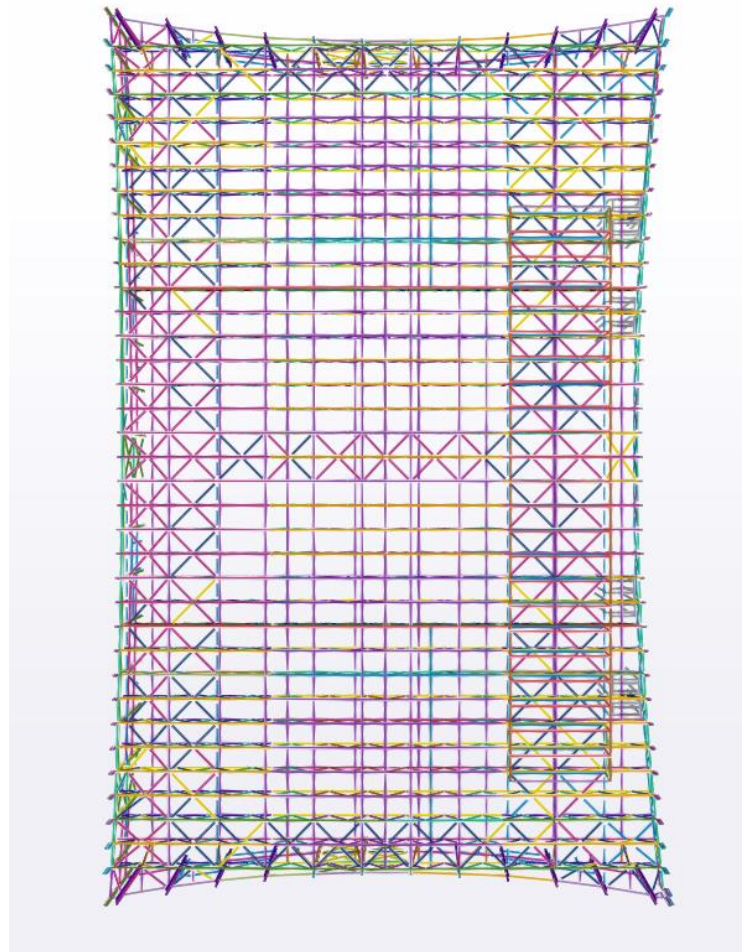
Between 64m and 68m due to shape of building

Special loads:

- Point loads from equipment
- Line loads from sliding doors
- Loads from roof house

Camber:

Individual cambers were created to all trusses to match specific requirements for the different loads.



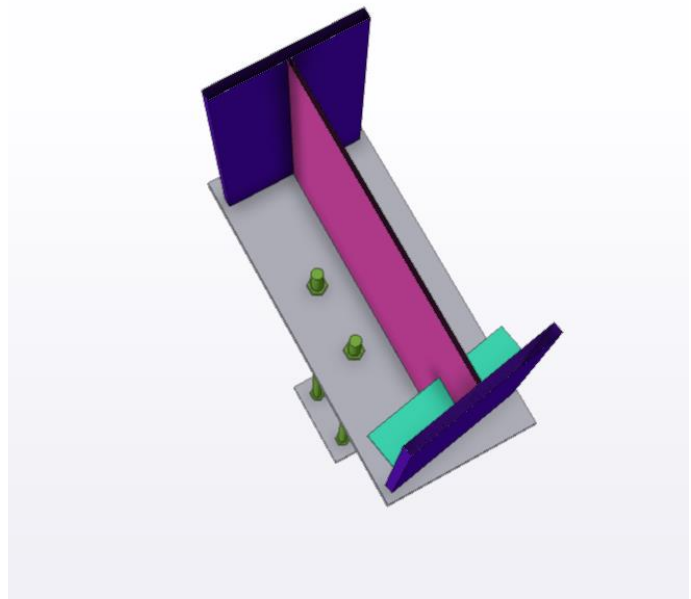
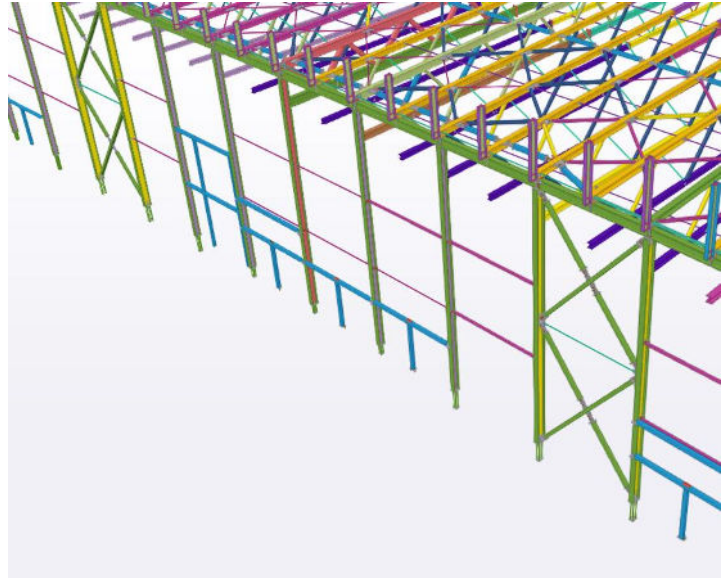
Columns

Placement:

Below every other truss a beam was mounted to eliminate half the columns in the facade

Special designed profiles:

Due to the rounded facades of the building outer flanges of the columns were rotated to create the optimal support for the facade elements.



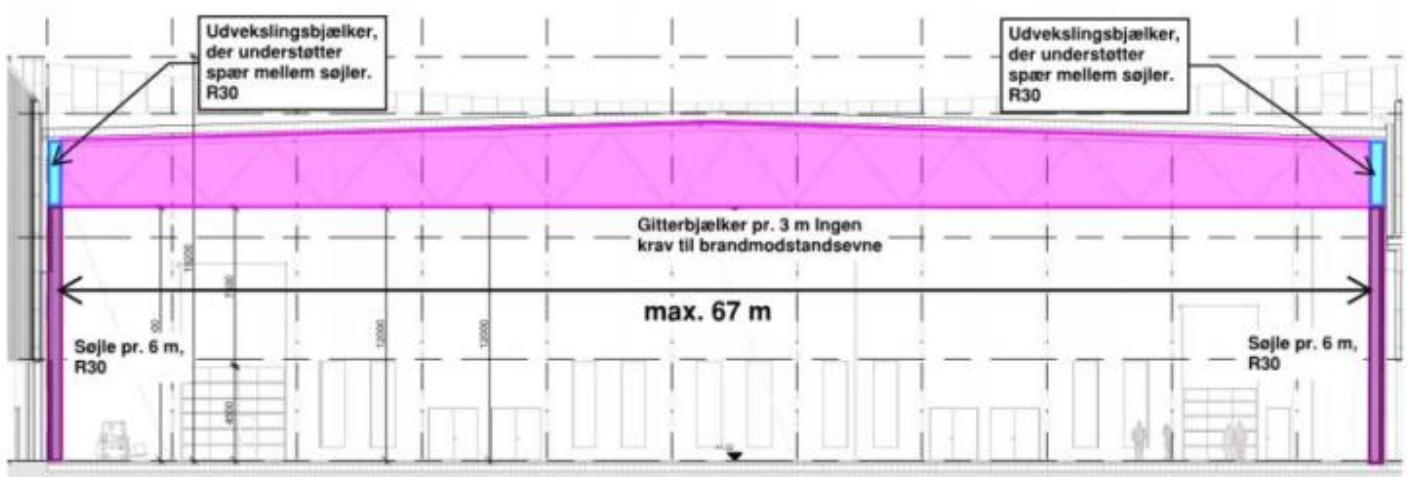
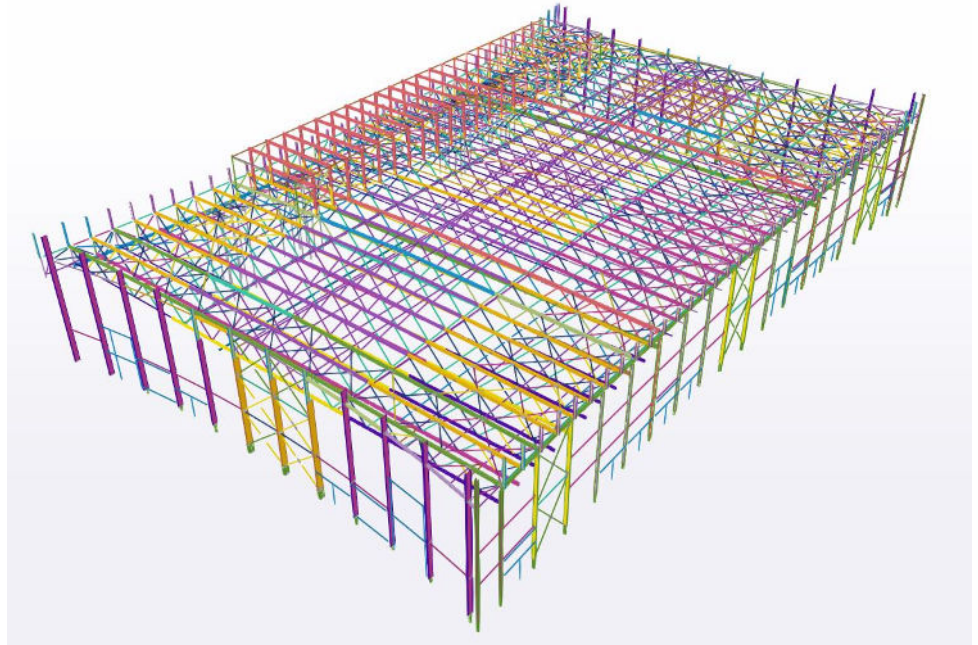
Fire Protection

Trusses:

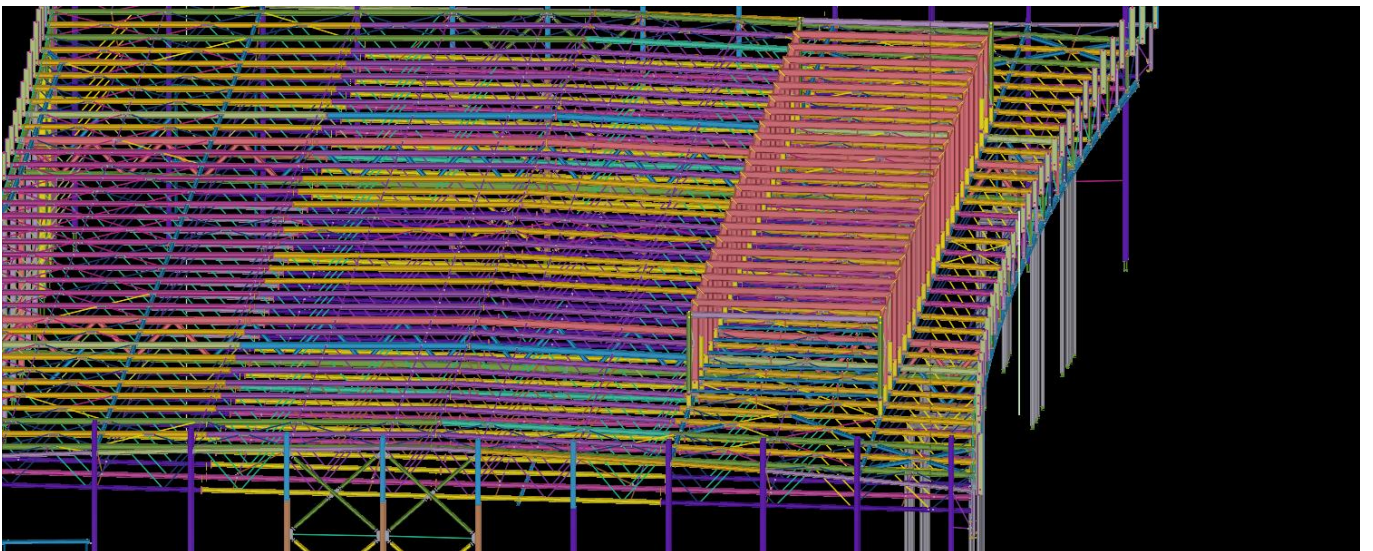
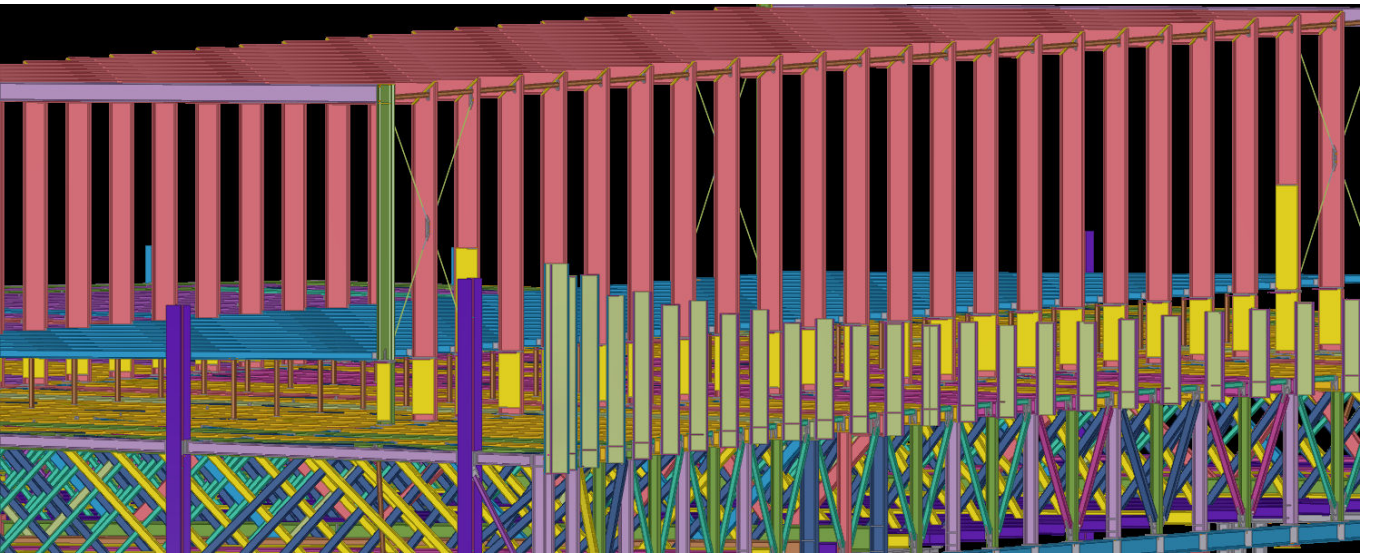
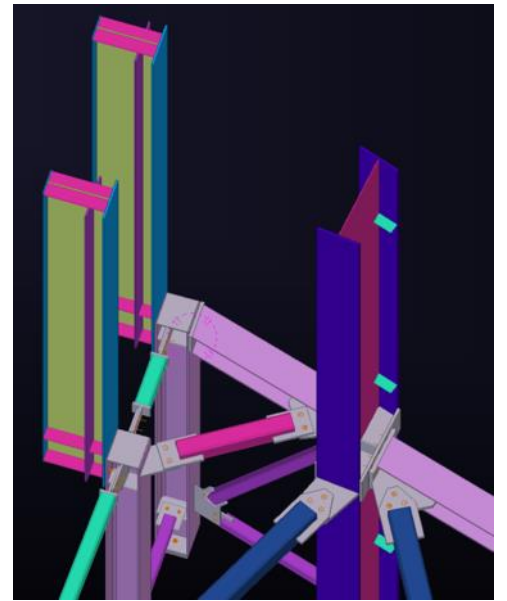
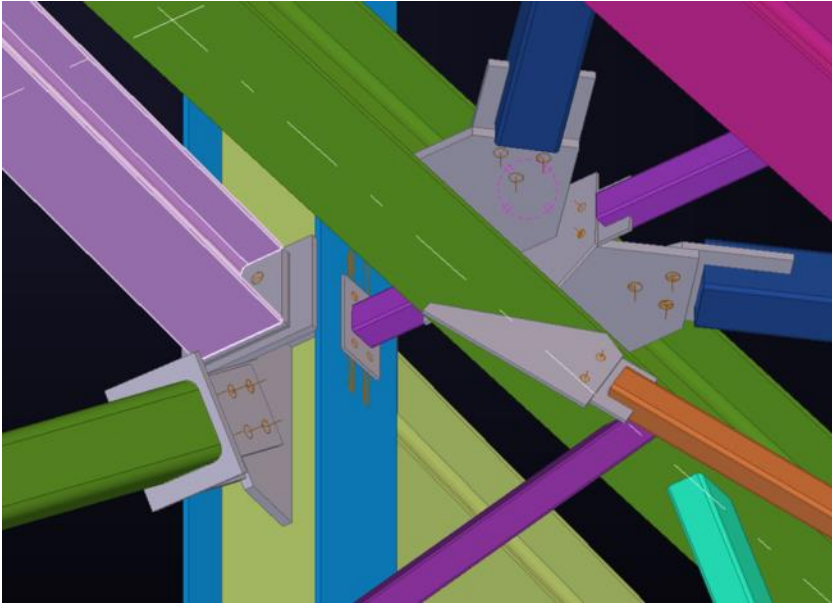
The trusses were delivered without any fire protection. By doubling the number of trusses the supported roof area was decreased below the accept limit for active protection.

Exchange beams and columns:

Because the supported area of beams and columns exceeded the limit, the elements were fire painted.

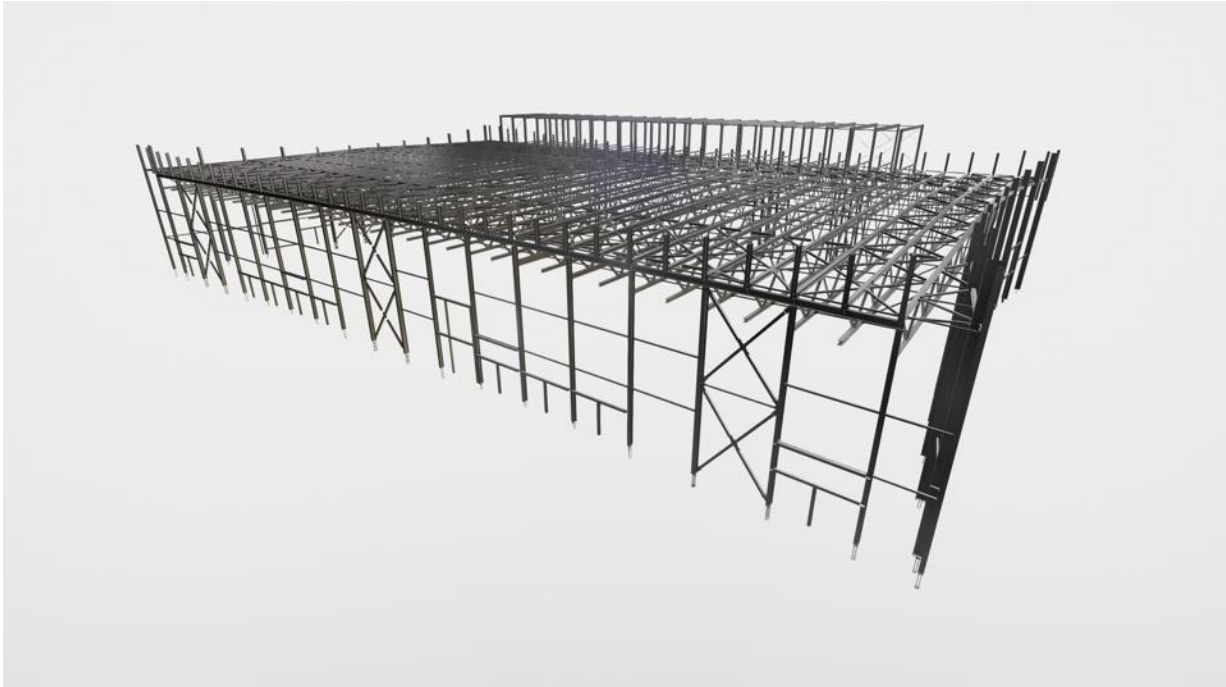


Details



GIVE STEEL A/S

Show case - Bella Congress Hall



Composite columns

Usage:

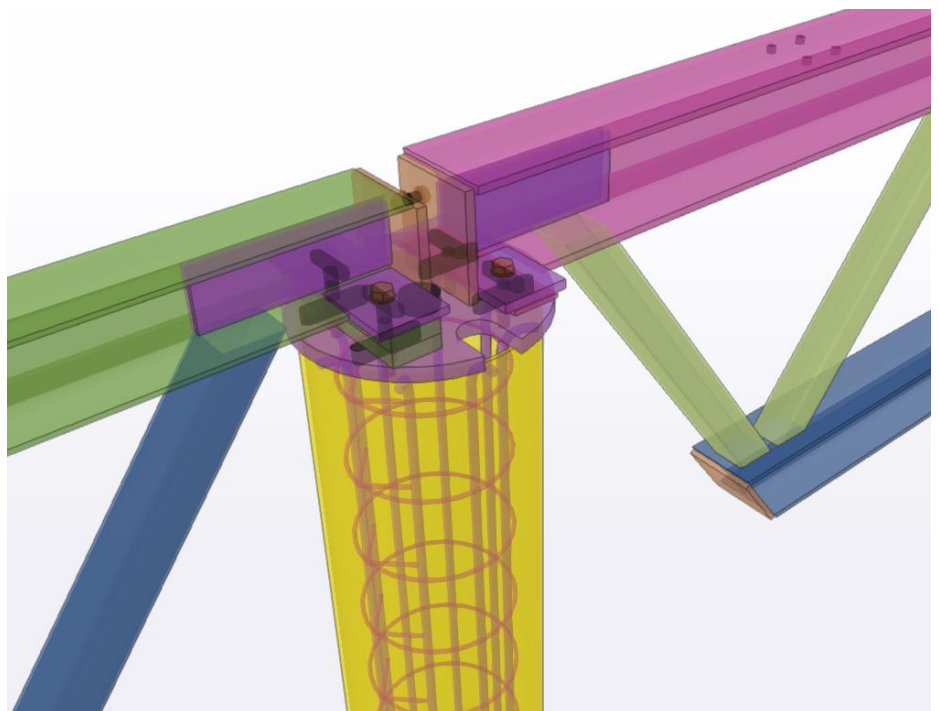
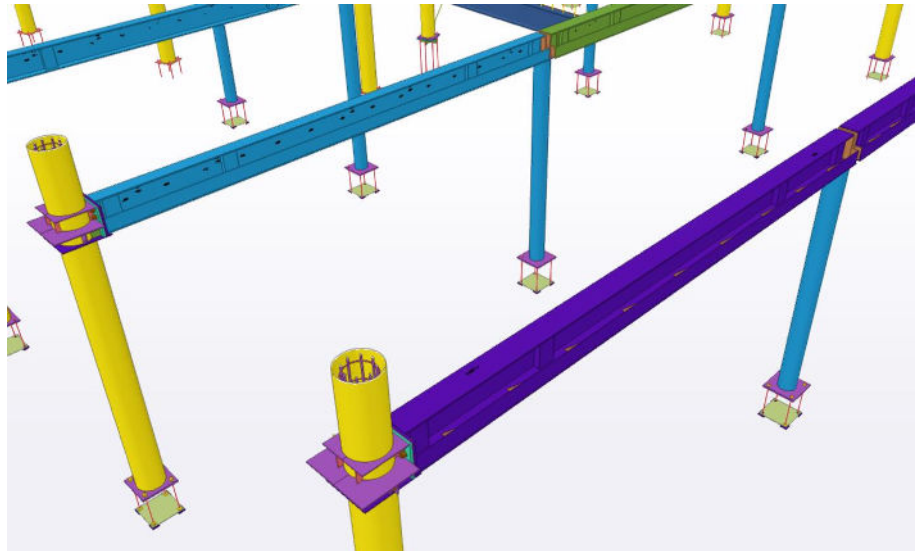
All columns in Foyer was created as composite columns. Composite columns where used due to their fire resistance.

Static systems:

In the stabilizing lines columns where cantilivered to support building for horizontal forces. This solution was chosen to reduce amount of visible bracing.

Finished elements:

Composite columns are delivered with reinforcement from the factory.



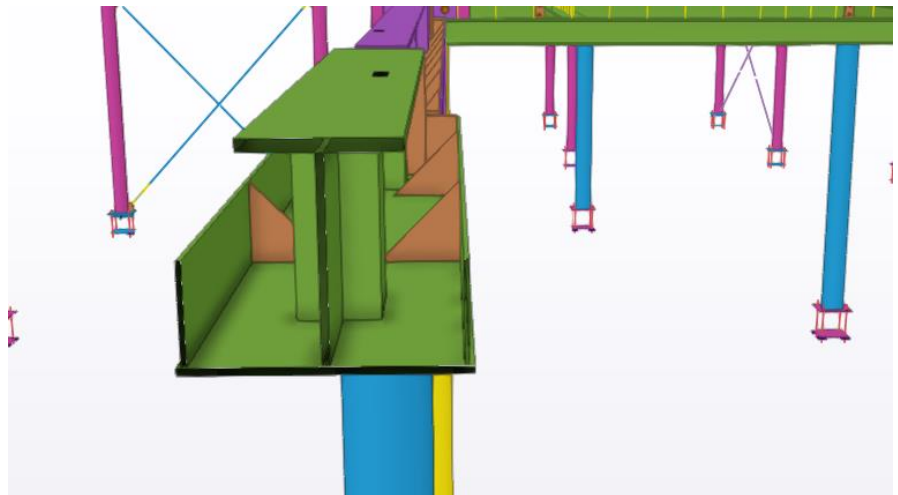
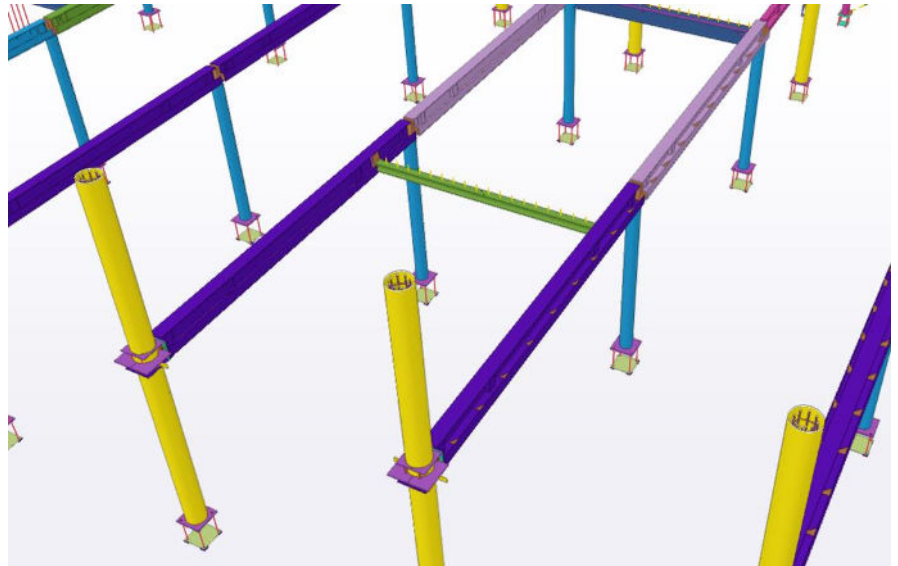
Static system – GSY BEAMS

Placement:

In the new part of the Foyer and in at part of the old foyer a new mezzanine was incorporated using the GSY BEAMS

Advantages:

Slimmer structure



Assembly



Congress Hall



Foyer



FACTS : Steel structures for congress hall and foyer



Bella Center Copenhagen:

Price: Winner of Tekla BIM Award 2020, Poland

Year 2019- 2020

Tonnes:

Congress hall: 1303 tonnes.

Foyer: 350 tonnes

Trusses weight approx. 20 tonnes each.

Location: Bella Kvarter,
Center Blvd, 2300 Copenhagen.

Assembly: Spring 2020

6-8 trusses pr. Week.



Building, Area: Head building and Foyer
14.000 m2 – the largest congress center in Northern Europe, seating 7.000 guests/ 30.000 guests per congress.

Building measures:

108 meter, 66 meters wide

All structures are produced at our factory in Brande, Denmark.