



NUUKI

LIVING. WORKING. MOVING.



**ENERGY-EFFICIENT STEEL
SOLUTIONS FOR BETTER LIVING,
WORKING AND MOVING.**



Agenda

- S420 Doublegrade
- OPTIM højstyrke
- Corten

Vi er tæt på vores kunder

Hjemmemarked

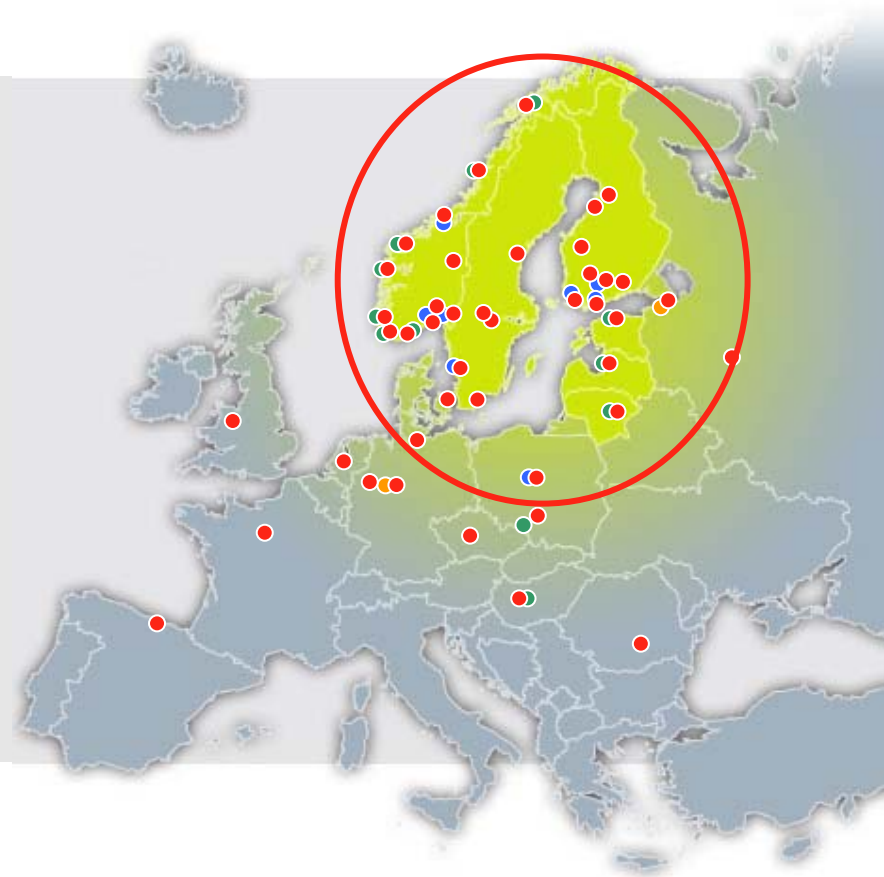
Skandinavien og CEE lande

Nøgletal 2011

- Omsætning 2,8 mia. €
- Ansatte 11 800 i 27 lande
- 2,8 mio. tons

Koncernens aktier er noteret på den finske børse
OMX Nordic Exchange Helsinki (Rautaruukki Oyj:
RTRKS).

- Salgs kontor
- Service centre
- Lager



Ruukki produkter og ydelser

Produkter

Varmvalsede Produkter



Varmgalvaniserede produkter



Rør og Profiler



Koldtvalsede Produkter



Prælakerede Produkter



Externe Produkter



Services

Komponenter



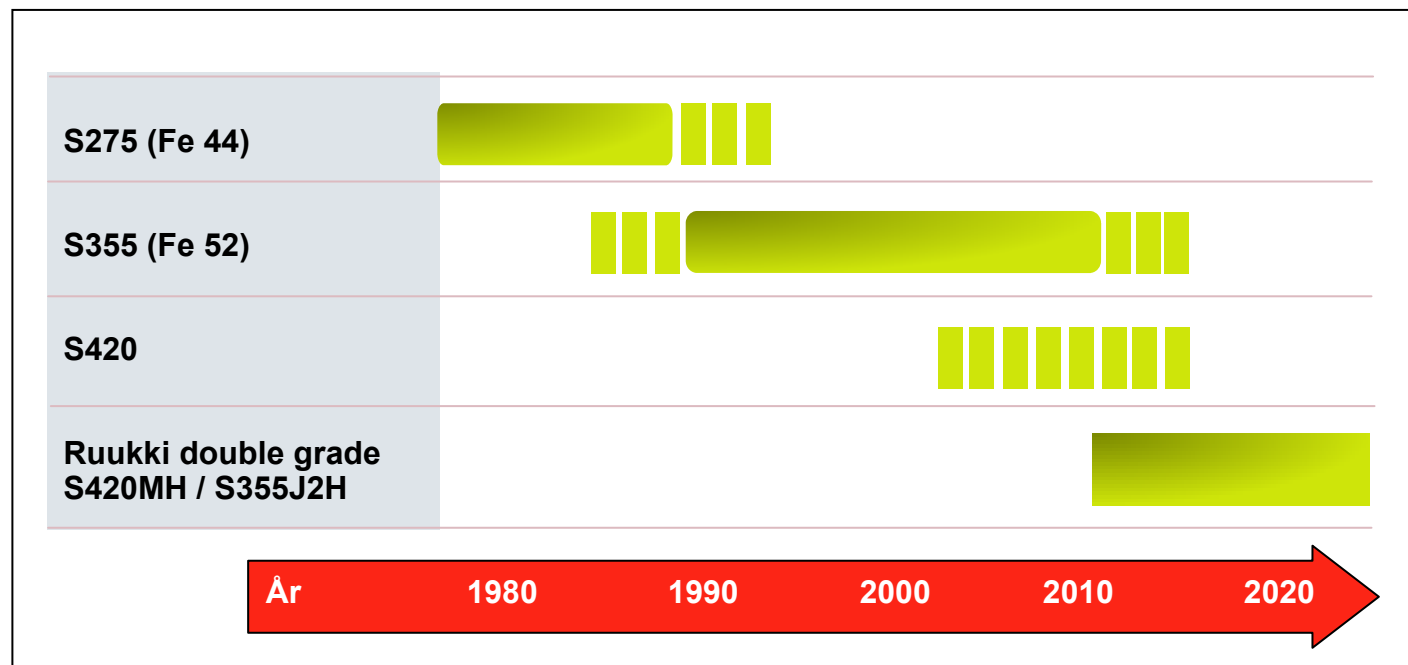
Logistik og lager løsninger



Teknisk support og materiale knowhow



Konstruktionsrør - udvikling



 Standard kvalitet på markedet

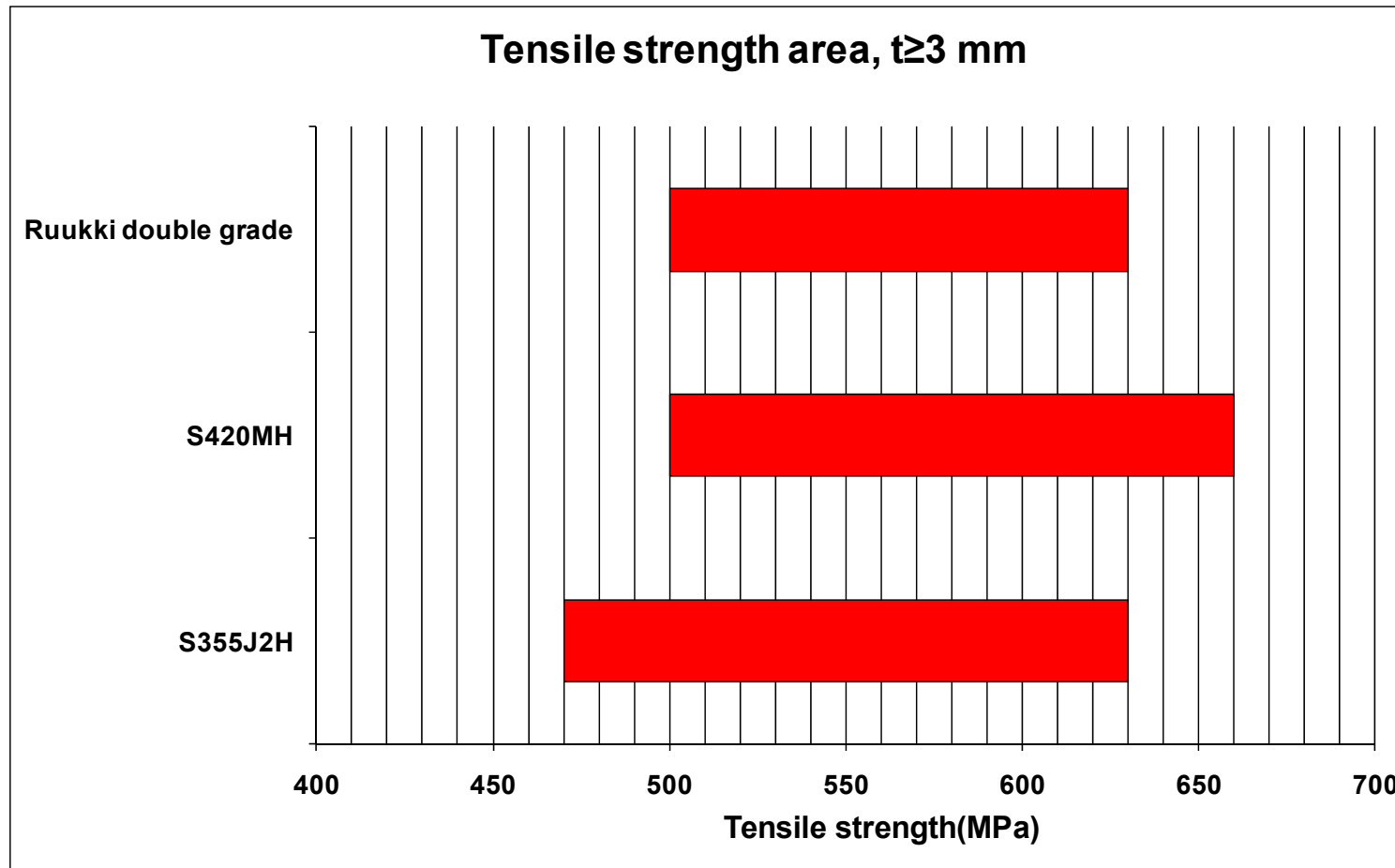


Double grade S420MH / S355J2H - konstruktionsstål

- Moderne stålmateriale, som er udviklet til rørproduktion
- Opfylder EN 10219, CE mærkning
- Den nominelle strækgrænse 18% højere end for S355
 - Bedre ydeevne, lettere konstruktioner og gunstige helhedsløsninger
- Lige så gode egenskaber som for S355
 - formbarhed
 - svejsebarhed
 - bearbejdning
 - varmtgalvanisering

Ruukki double grade

S420MH / S355J2H



Vægtbesparelse

- Ved at designe en konstruktion med S420, kan man mindske konstruktionens vægt med over 15% sammenlignet med S355. Dette har særlig stor betydning når man arbejder med kraftige konstruktioner og resulterer i betydelige lavere materialeomkostninger.



Eksempel på vægtbesparelse



Hvis rammen konstrueres i kvalitet S355 vejer den 1500 kg, men hvis materialet ændres til S420 vil vægten være 1275 kg → vægtbesparelse på 15%

Case: Teräselementti Oy

Steel trusses for a freedom of space

Reference: Ruukki double grade S420MH / S355J2H hollow section

- Teräselementti Oy specializes in manufacturing metallic structures and their elements, 125 employees
- The expansion of Helsinki Exhibition and Convention Centre required a steel grade that would allow a 78-metre column-free area.
- Ruukki double grade S420MH / S355J2H hollow section was the material used for the frame's space trusses. As the segments were very strong and light, the material needs were approx. 100 tonnes smaller than if S355 steel had been used.
- Ruukki supplied the steel sections cut to length, eliminating substantial welding costs.
- *"Double grade's benefits for the contractee were clear during the expansion project: it resulted in a lighter, more economical solution",* commented Markku Laine, who is in charge of Teräselementti Oy's steel construction operation.



Project goals and the products supplied by Ruukki:

- Teräselementti Oy used Ruukki double grade S420MH / S355J2H hollow sections as the material for the space trusses of Exhibition Hall 7's frame.
- Ruukki's double grade structural hollow sections can make structures over 15% lighter.
- During the project, Teräselementti and Ruukki co-operated seamlessly. Ruukki was able to deliver all material on time, even when orders came at a moment's notice.
- Using double grade steel in steel structures results in substantially lower material costs, providing a financially attractive option, which also lowers the environmental loads caused by material use and production.

Additional information: info.metals@ruukki.com



Konklusion

- Double grade S420MH / S355J2H kombinerer de tekniske standarder for begge stålkvaliteter og erstatter S355J2H som standard.
- Produktet giver forbedret priskonkurrence og mindre materialeomkostninger for kunden.
- Double grade er beregnet til stålkonstruktioner og landbrug og andet tung maskinindustri, men egner sig til alle konstruktioner, hvor man tidligere har anvendt S355.



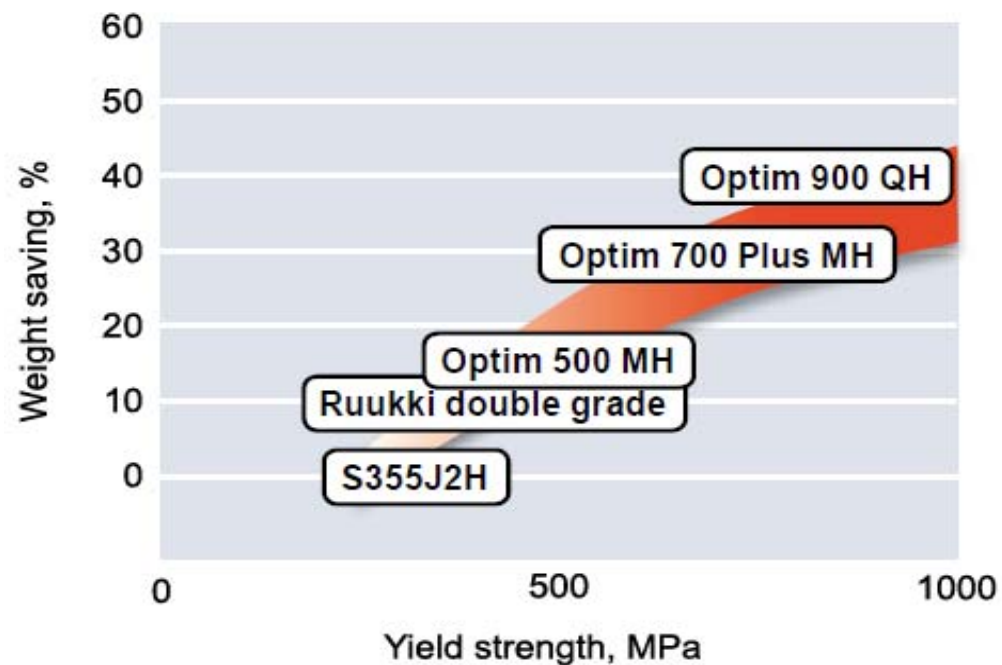
OPTIM Højstyrkerør

- Giver mulighed for yderligere vægtbeparelse

Structural hollow sections

Optim® Hollow sections - Weight saving potential

OPTIM® HOLLOW SECTIONS – WEIGHT SAVING POTENTIAL



MECHANICAL PROPERTIES

	Yield strength $R_{p0.2}$ MPa minimum	Tensile strength R_m MPa	A5 %, minimum	Impact strength		Hardness HBW
				T °C	J	
Ruukki double grade S420MH / S355J2H	420	500 – 630 ¹⁾	20 ²⁾	-40 ³⁾	40	–
S460 MH	460	530 – 720	17	-20	40	–
Optim 500 MH	500	550	14	-20	40	–
Optim 550 WH	550	600 – 760	18	-40	40	–
Optim 700 Plus MH	700	750	10	-40	40	–
Optim 900 QH	900	1050	6	-20	27	–
Raex 400 Tube	1100 – 1300	1250 – 1400	–	–	–	380 – 430 ⁴⁾

¹⁾ Tensile strength, R_m MPa: 510 – 660, when $T < 3$.

²⁾ The hollow sections with $D/T < 15$ (round) or $(B + H)/2T < 12,5$ (rectangular and square), the minimum value of elongation is 2 % lower than normal.

³⁾ Value guaranteed by Ruukki (the EN 10219 requirement for testing temperature is -20 °C).

⁴⁾ The Brinell values correspond approximately to a Vickers hardness of 400-450 HV10 and Rockwell hardness of 40-45 HRC.

EXPLANATION OF THE DESIGNATION AND SYMBOLS

M = Delivered as thermomechanically rolled steel

H = Hollow section

W = Weather resistant steel

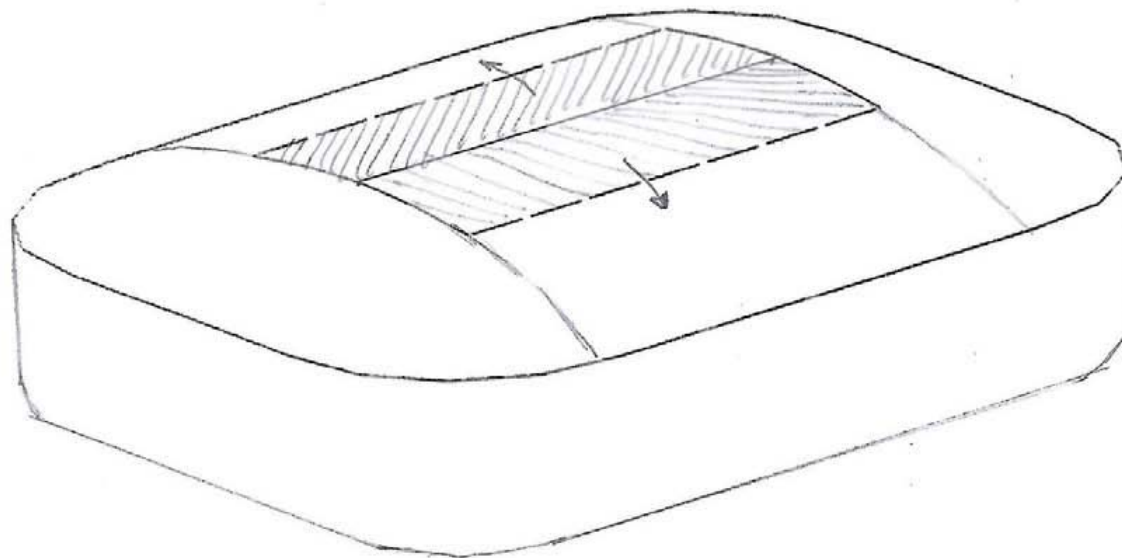
Q = Delivered as hardened or hardened and tempered steel

Friends Arena

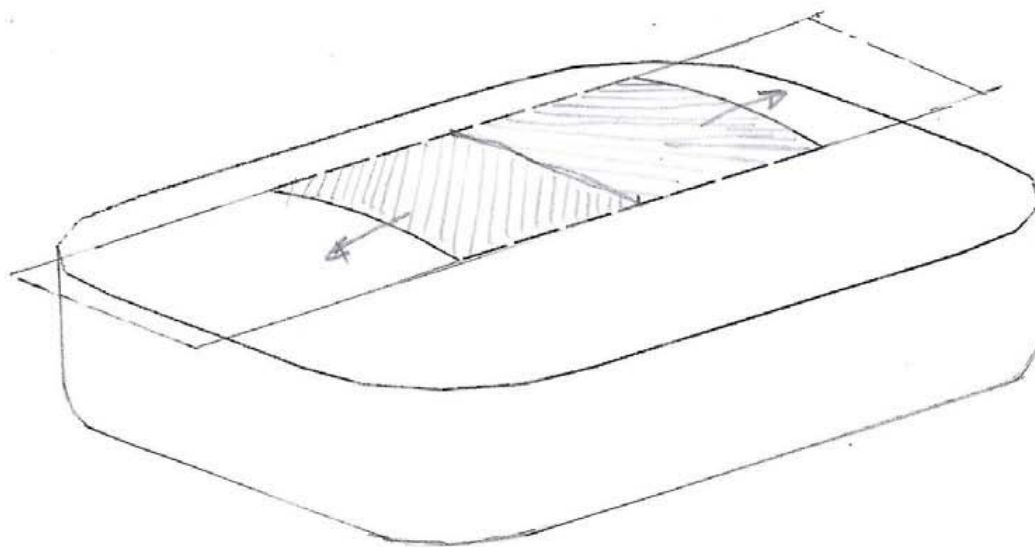




Retractable roof, Parked long side

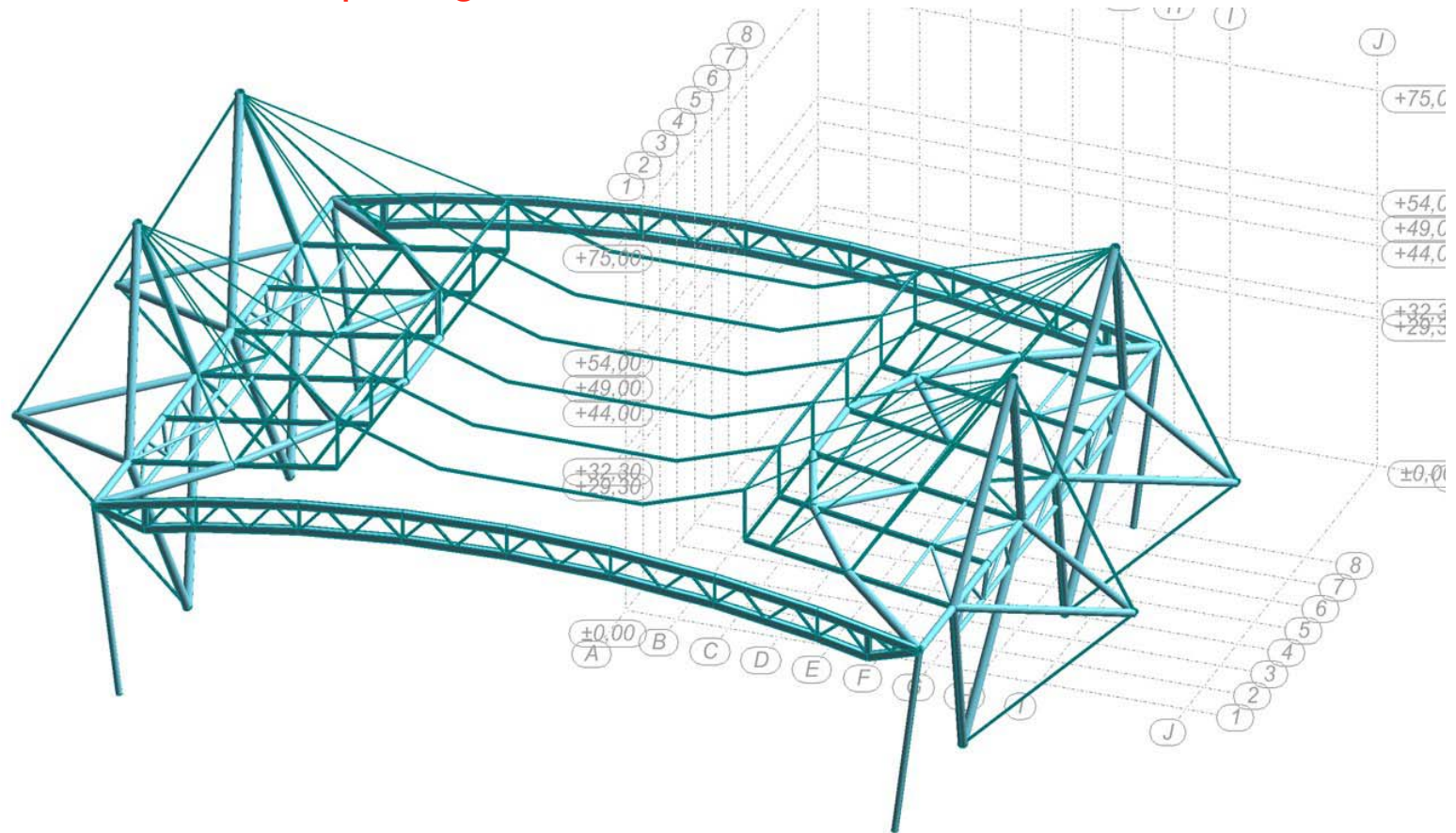


Retractable roof, Parked short ends



Conceptual design Cables

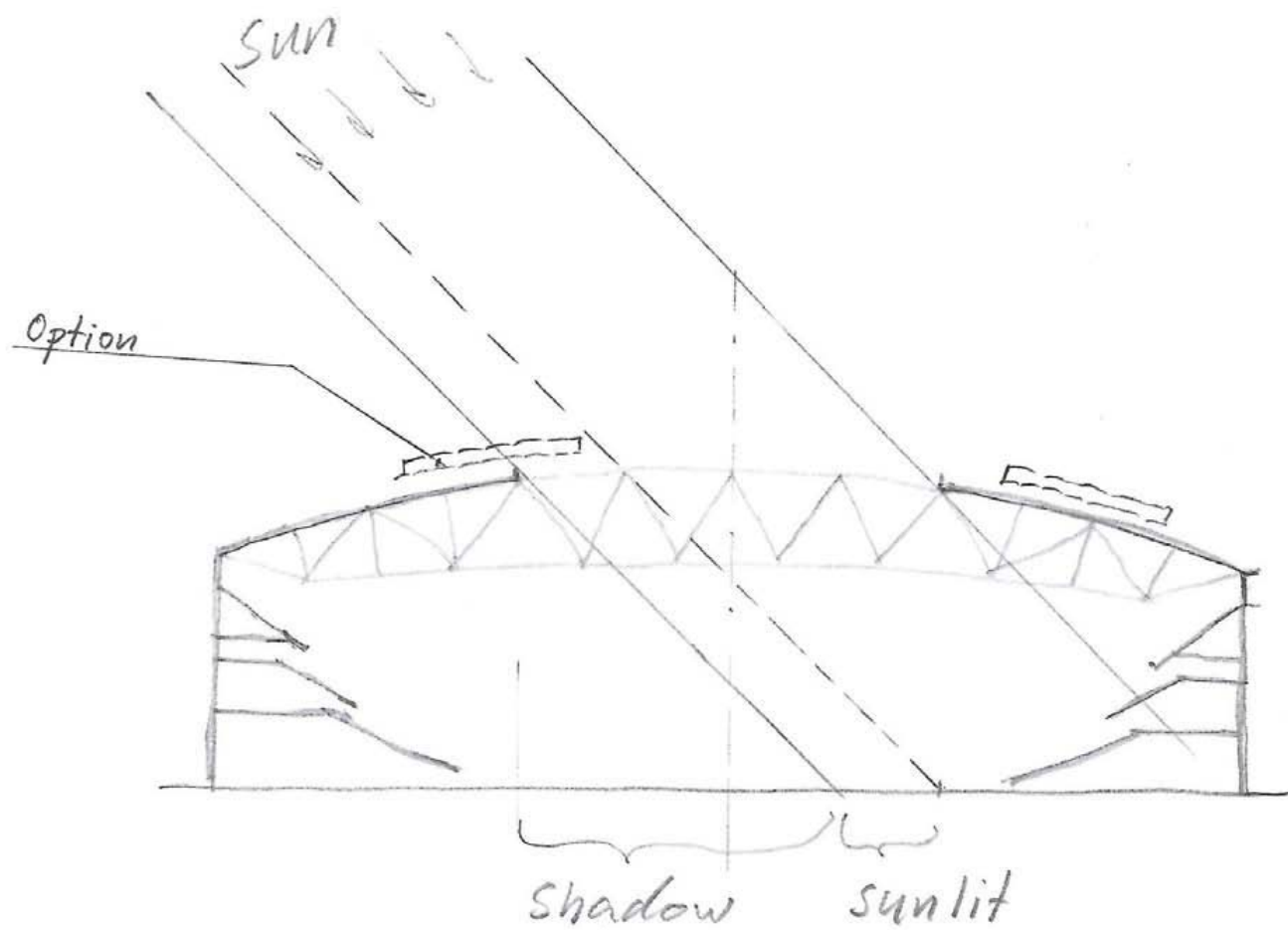
Invisible Steel in the opening



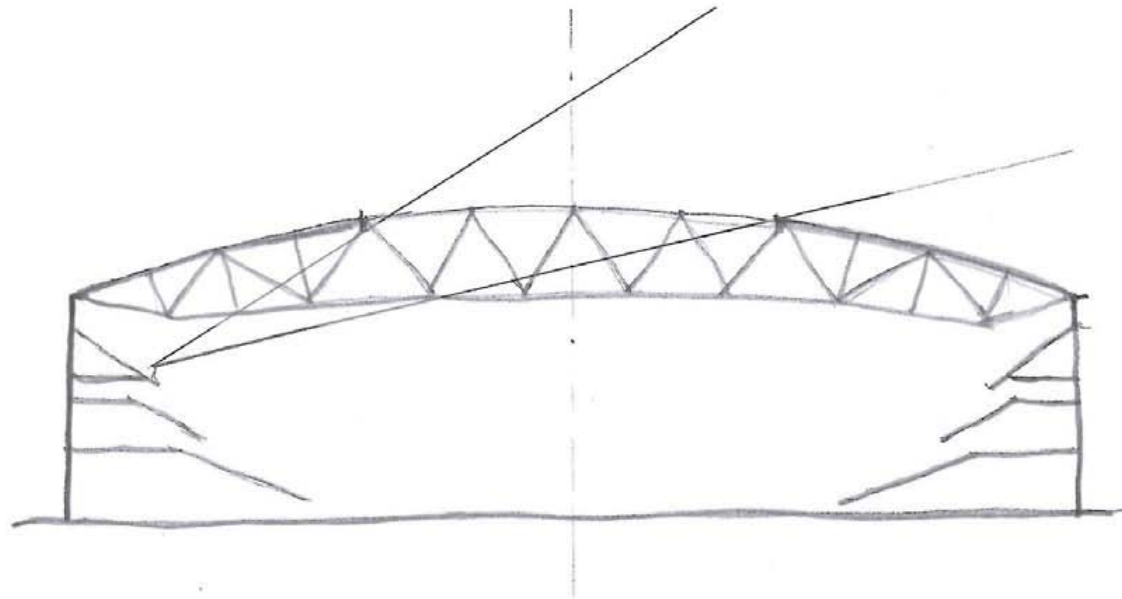
Arch 1

Arch 1



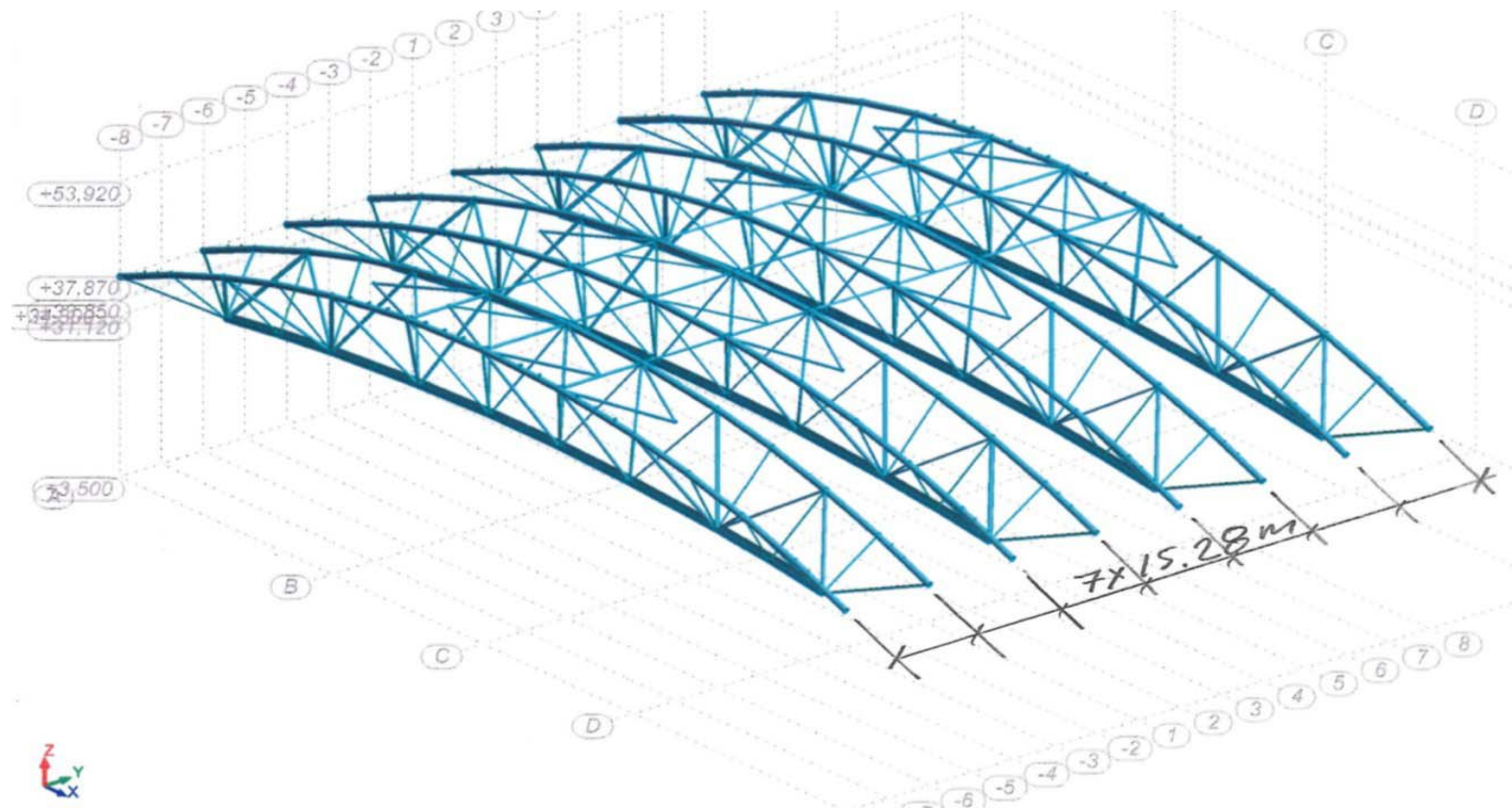


Structure through opening

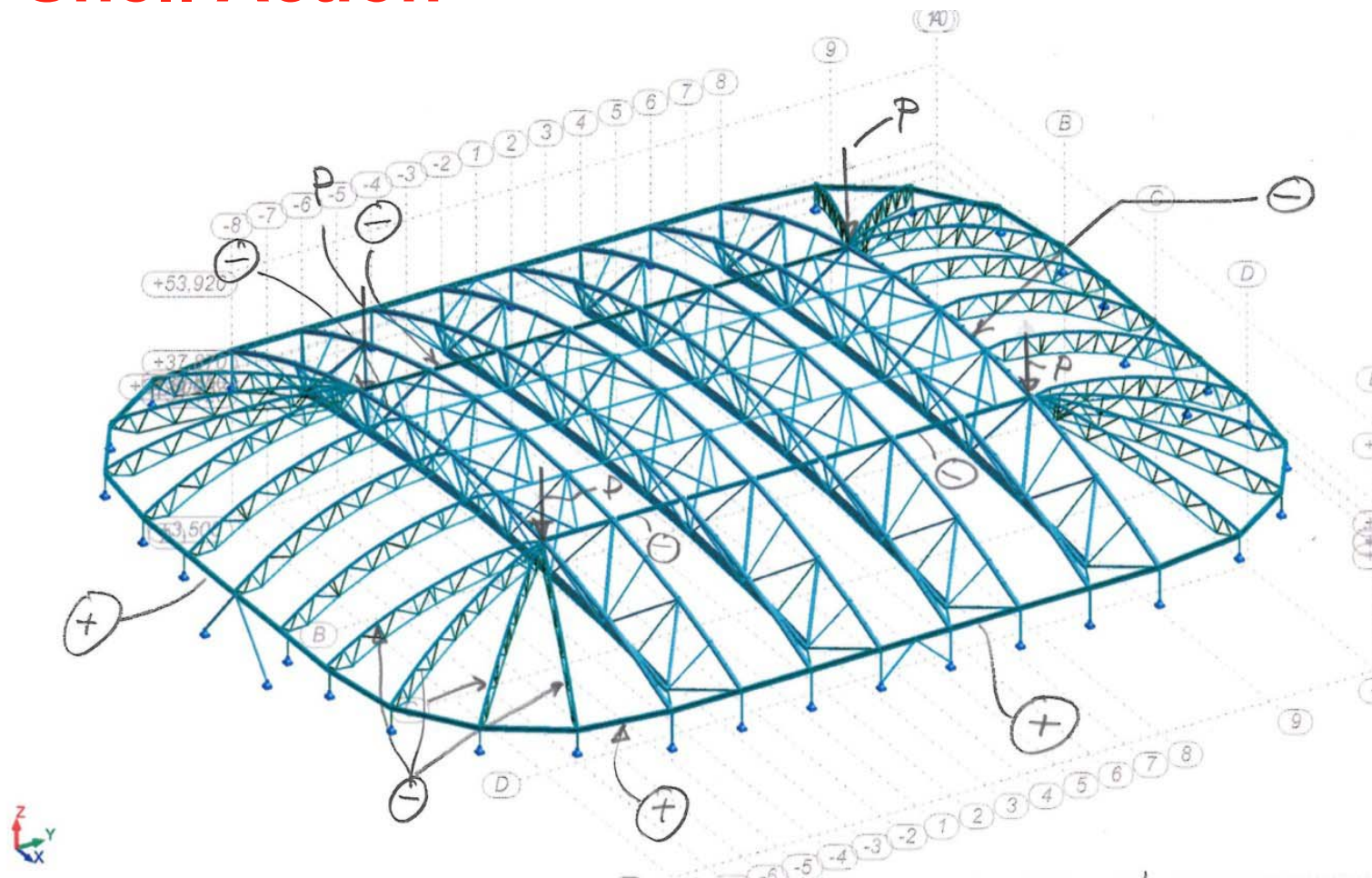


Conceptual Design

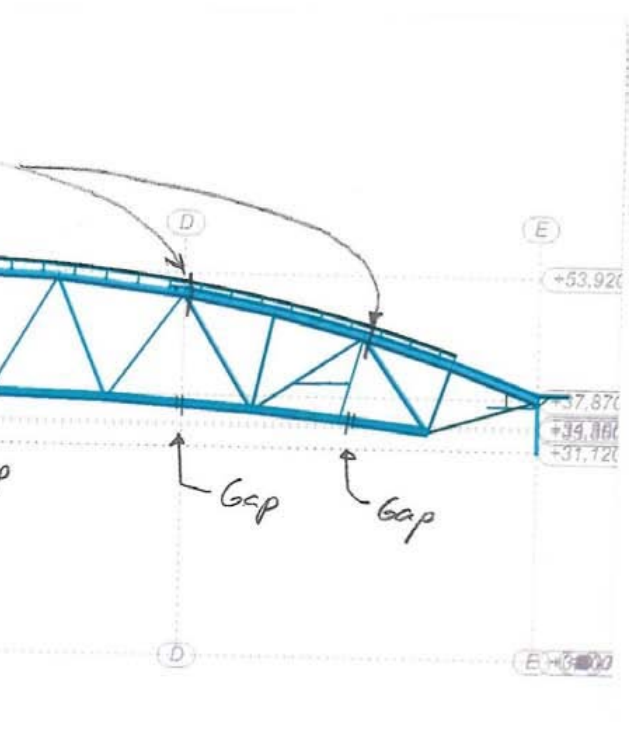
Four Trusses



Shell Action

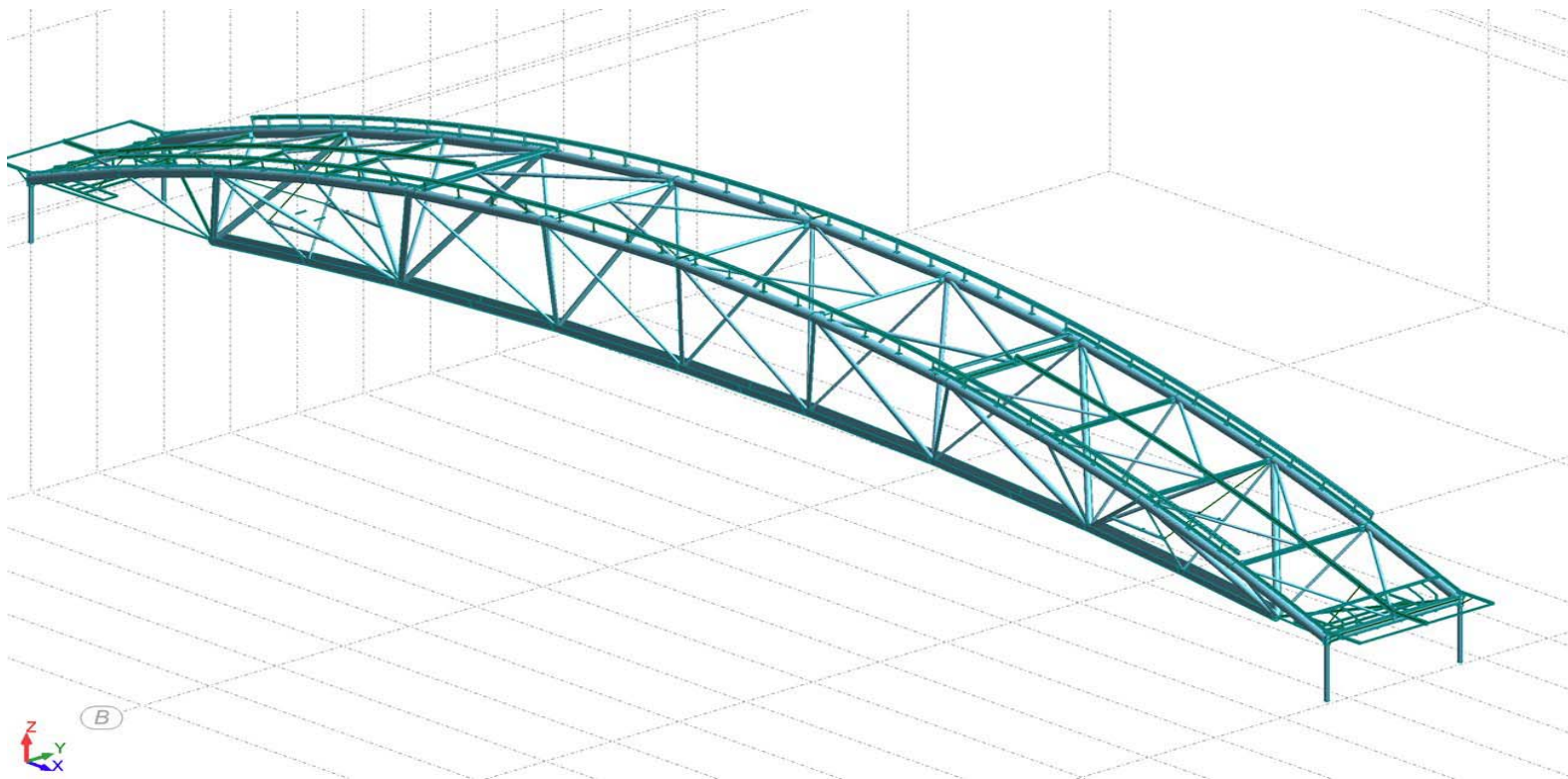


Camb



Main truss

Span 162 m, Height 16m, Width 15,3m









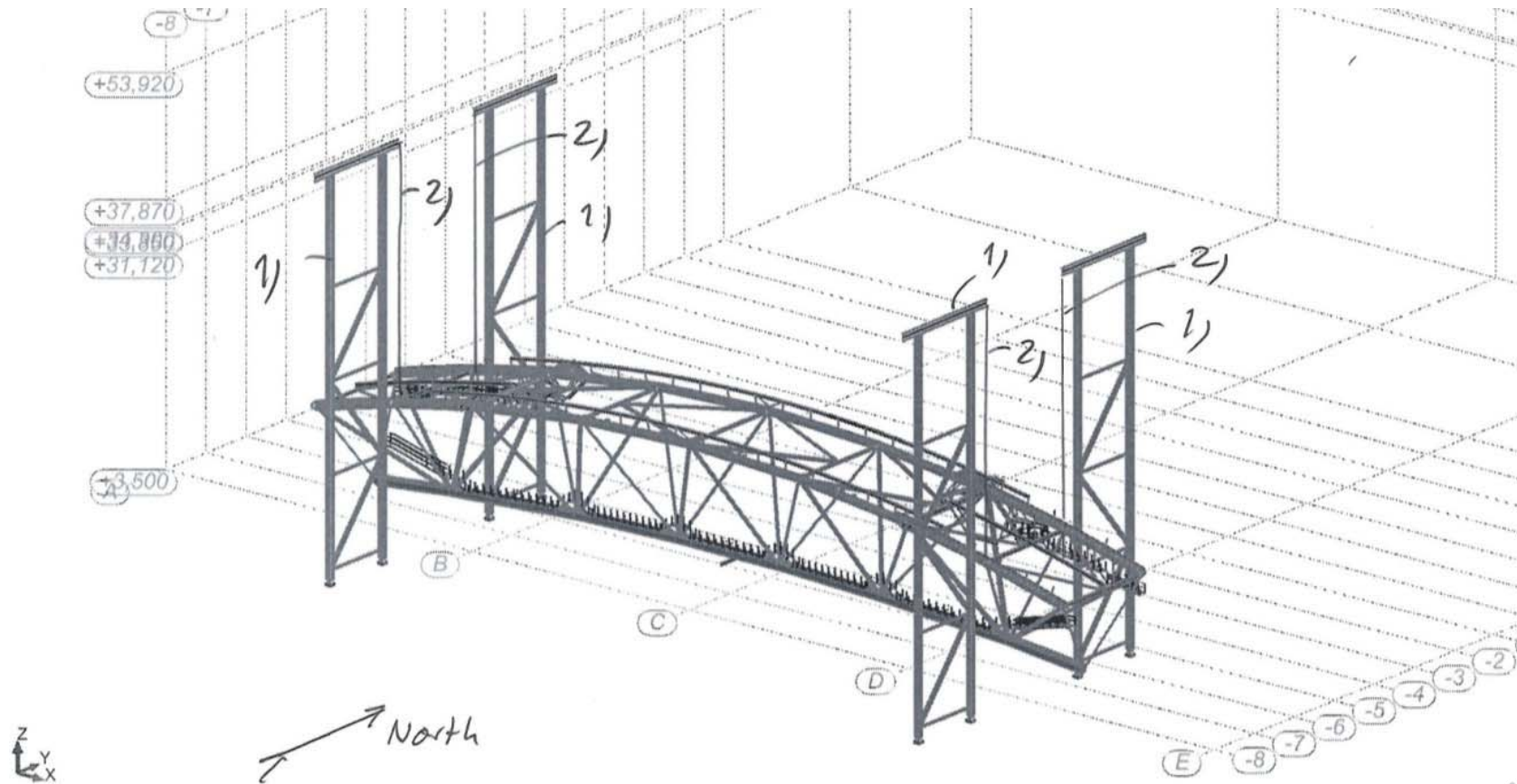






Truss, Lifted in four points

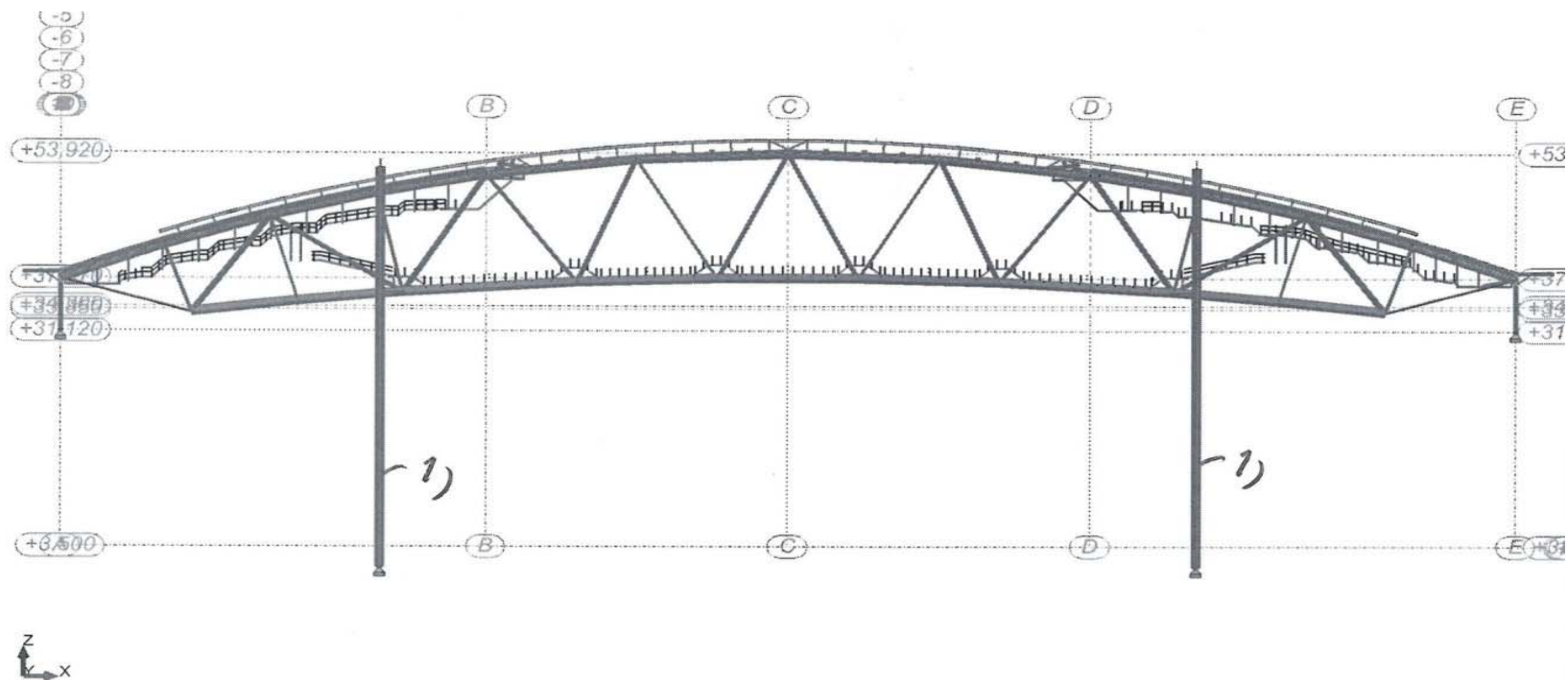
- 1) Lifting tower. Stabilizing cables not shown
- 2) Lifting cables. Maximum Force 220 ton.





End parts of the trusses added.

Structure ready for setting down on the pendulum columns



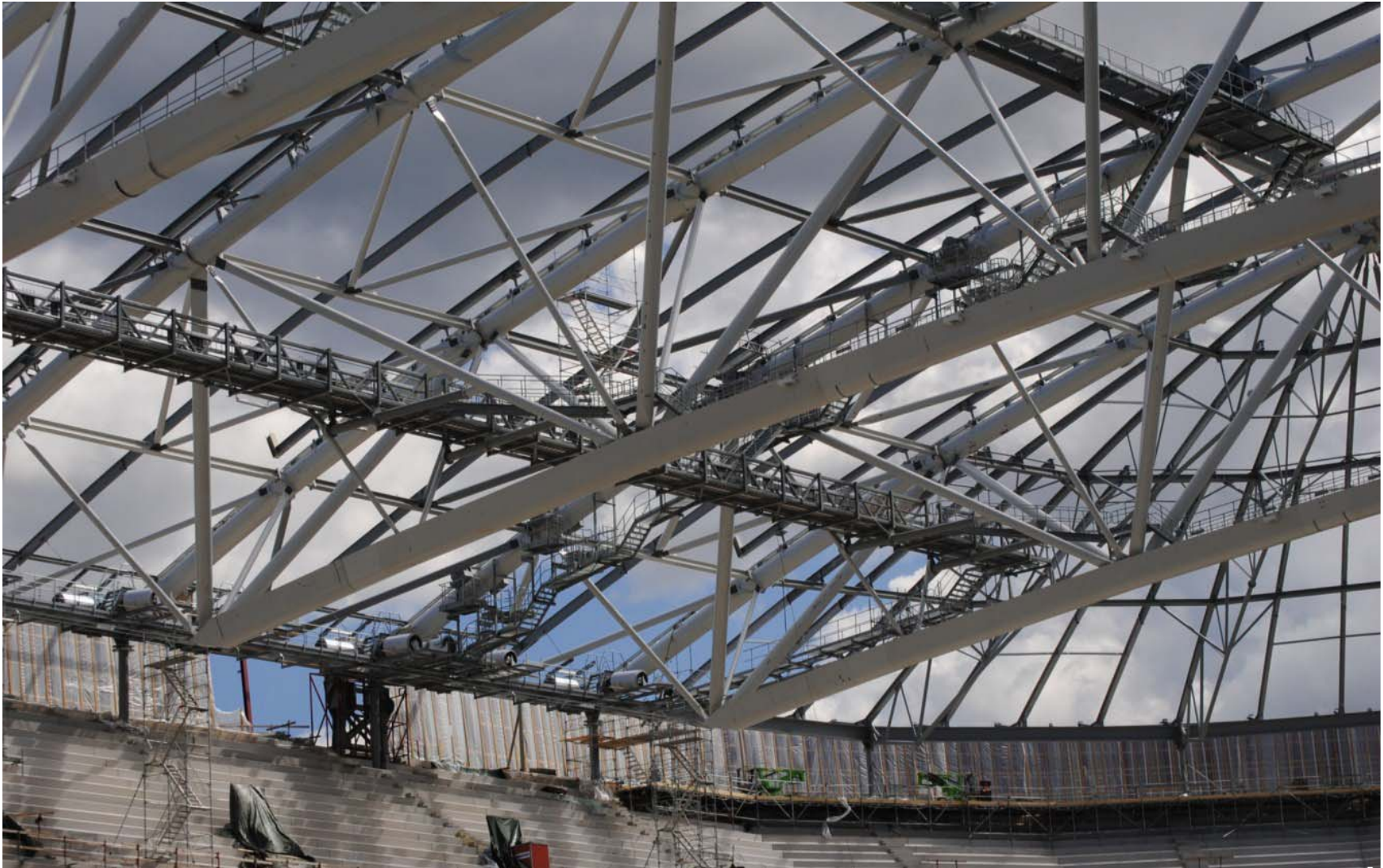


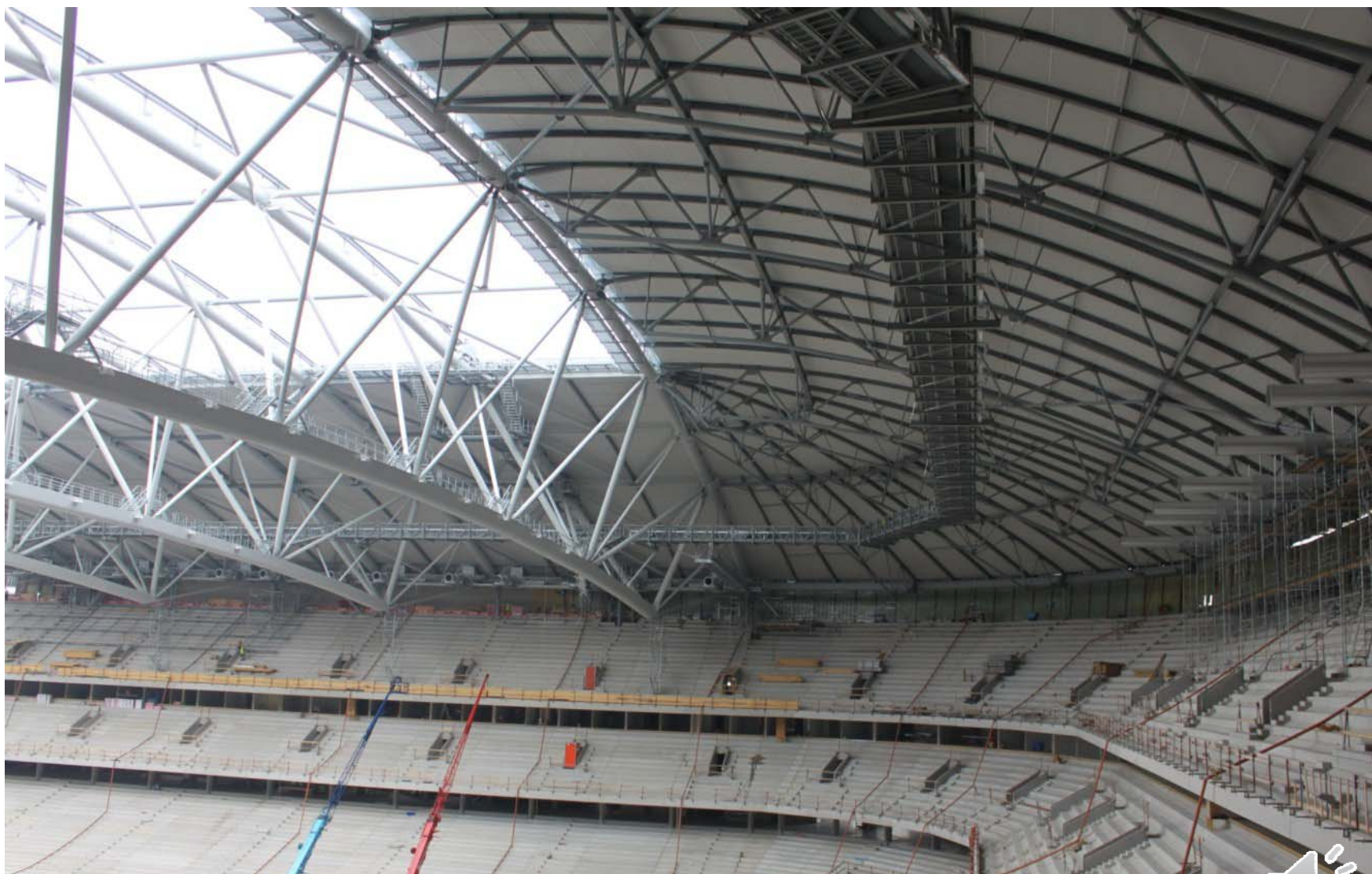




























Friends Arena

- Developer
- Design-build contractor
- Architect Krook & Tjäder
- Structural Design

Arenabolaget

Peab AB

Bergs Arkitekter

Sweco



Hvilke kvaliteter er brugt?

- OPTIM 500 Cold formed Purlins in the retractable roof
- OPTIM 700 Bottom chords in the main trusses
- OPTIM 900 Tension bars for the main trusses
- S460 Top chords for the main trusses



Besparelse i tons

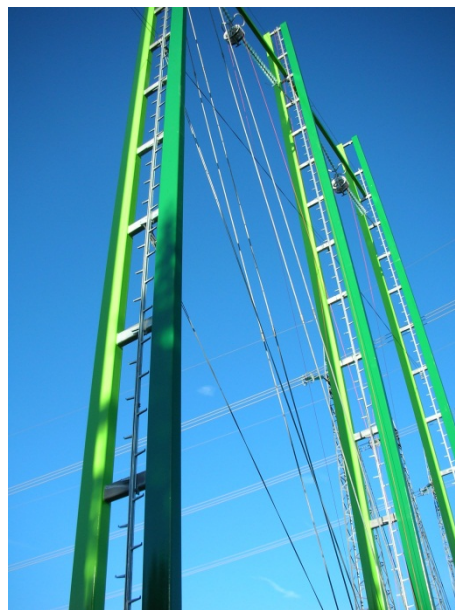
- Konstruktionen vejer 4,000 ton
- Vægt ved brug af S355 4,585 ton
- Vægtbesparelse 585 ton



COR-TEN Rør

- Design
- Minimal vedligehold
- Fåes også i højstyrkestål OPTIM 550WH

COR-TEN





Tak

