



**OOPPERA
BALETTI**

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3D-scanning in set production

Case: Jää

JS / 24.04.2019



3D-scanner Specs

Model:

- 3D Systems Sense 2



Benefits and Challenges

Benefits:

- Fast
- Accurate
- Options for future use (3D-printing, AR, VR)

Challenges:

- Shiny and transparent surfaces are tricky to scan
- Difficulties in processing the scanned 3D-model to actual "Dumb" Solid Mechanical design 3D-model
- Scanning errors will follow with the 3D-model
- Limited scanning sizes
- Finding the balance between what to do and what not to do with 3D-scanning
- 3D-scanner operator should have experience in 3D-modelling

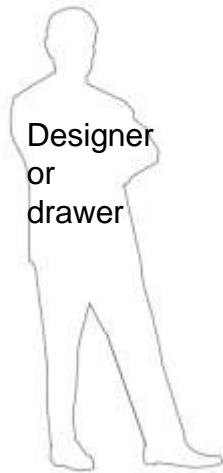


Set up – Before CNC

AUTODESK VAULT
- 3D-models (.ipt, .iam)
- Drawings (Part) (.dwg)
- Drawings (Assembly) (.dwg)

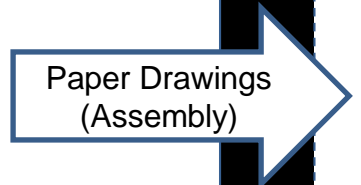
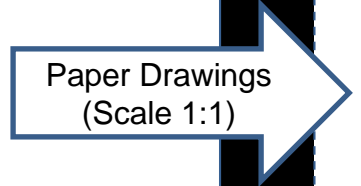
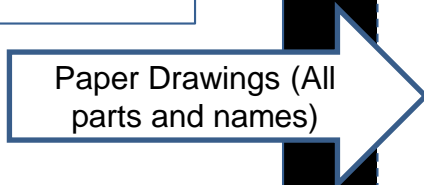


SET WORKSHOP
TECHNICAL DESIGN OFFICE

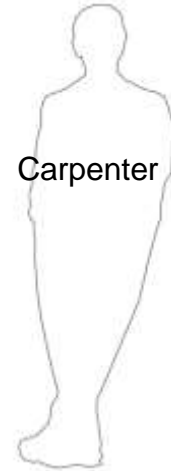


PC
- Autodesk Inventor
- Autodesk Autocad

- Tasks:
- 3D-modelling
 - 3D-conversions
 - Drawing (Part)
 - Nesting Drawing (All parts and numbers)
 - Printing drawings



SET WORKSHOP
CARPENTER WORKSHOP



Manual Machines

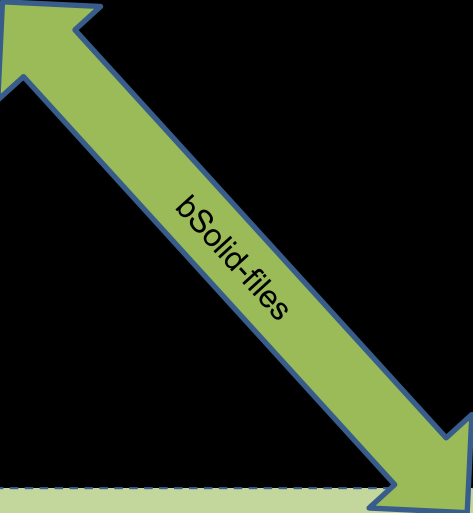
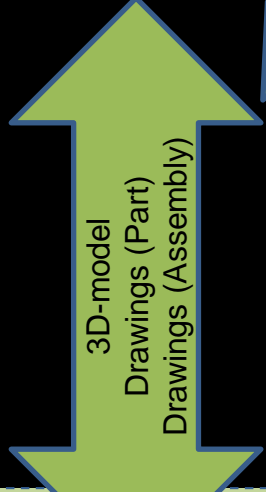
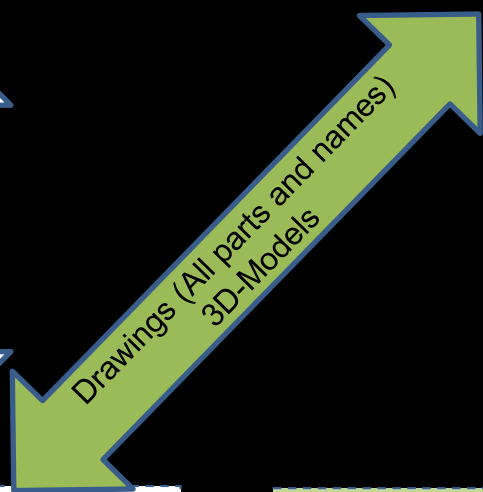
- Tasks:
- Manual machining (All pieces)
 - Finishing machined pieces
 - Assembling machined pieces



Set up – Now with CNC

- AUTODESK VAULT**
- 3D-models (.ipt, .iam)
 - Drawings (Part) (.dwg)
 - Drawings (Assembly) (.dwg)

- T:\TEKNIikka\LAVASTAMO**
- Drawings (All parts and names) (.dwg)
 - bSolid files
 - 3D-models (.stl)



**SET WORKSHOP
TECHNICAL DESIGN OFFICE**

Designer or drawer

PC

- Autodesk Inventor
- Autodesk Autocad

Paper Drawings (All parts and names)

Tasks:

- 3D-modelling
- 3D-conversions
- Drawing (Part)
- Nesting Drawing (All parts and numbers)
- Printing drawings

**SET WORKSHOP
CNC**

CNC-Carpenter

PC

- Biesse bSolid
- Autodesk Autocad

CNC-Machine

Test piece

All machined pieces (Attached to boards)

Tasks:

- CAM-modelling
- CNC-machining (test piece)
- CAM-modelling (Adjustments)
- CNC-machining (All pieces)

Paper Drawings (Assembly)

**SET WORKSHOP
CARPENTER WORKSHOP**

Carpenter

Manual Machines

Finished machined pieces

Assembly

Tasks:

- Severing machined pieces from boards
- Finishing machined pieces
- Assembling machined pieces

Jää – Floor structure



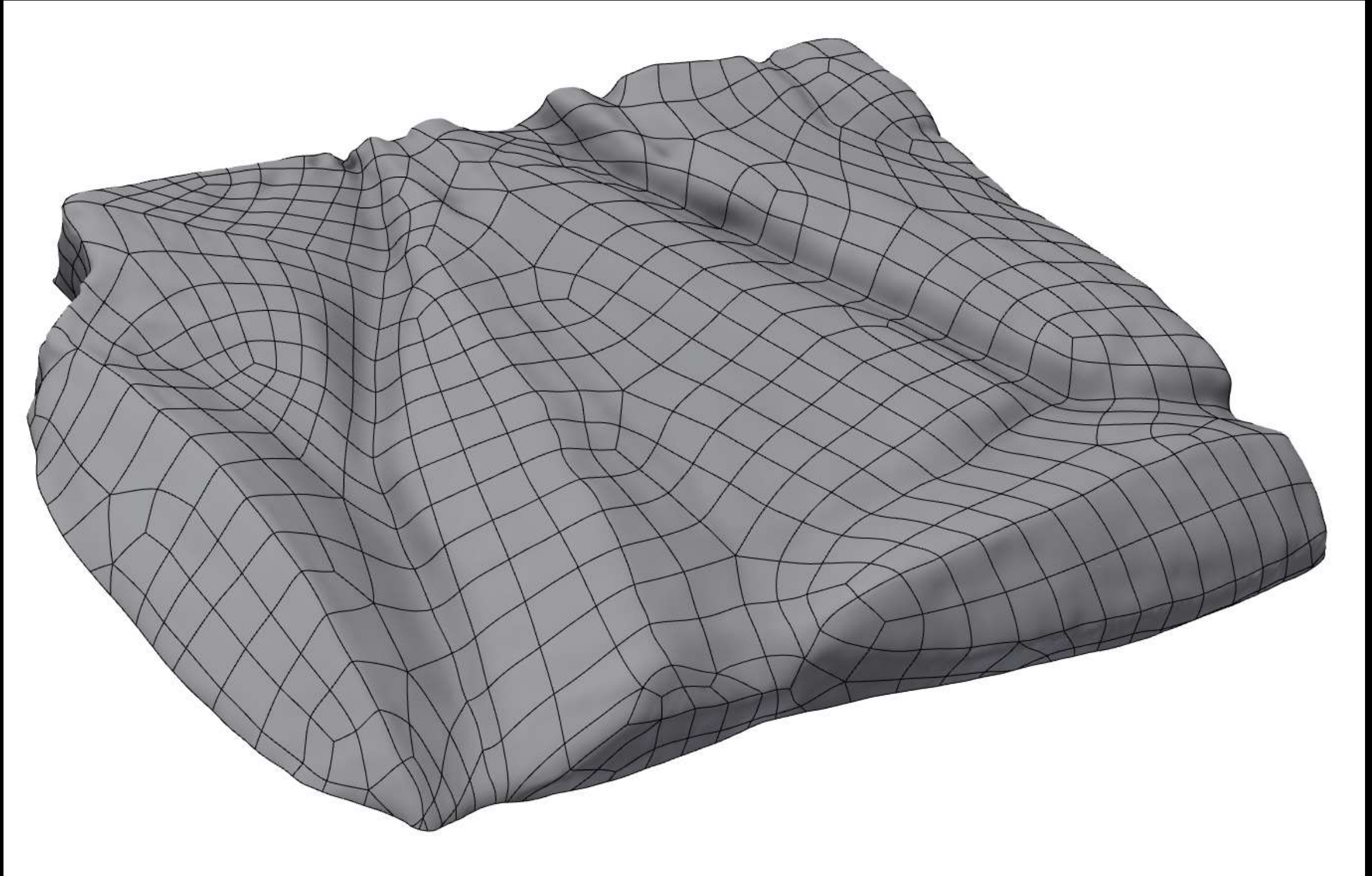
Jää – Floor structure



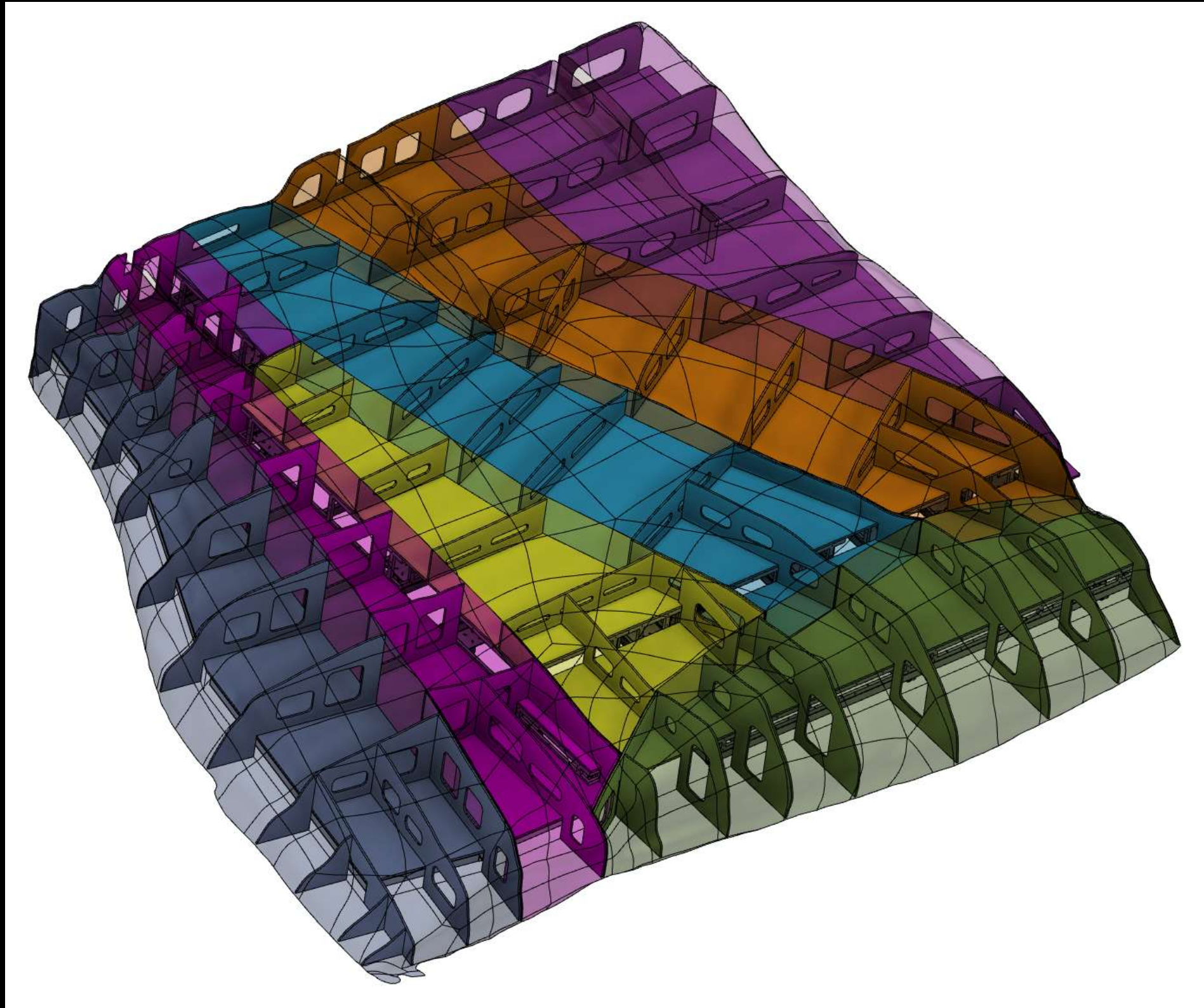
Jää – Floor structure



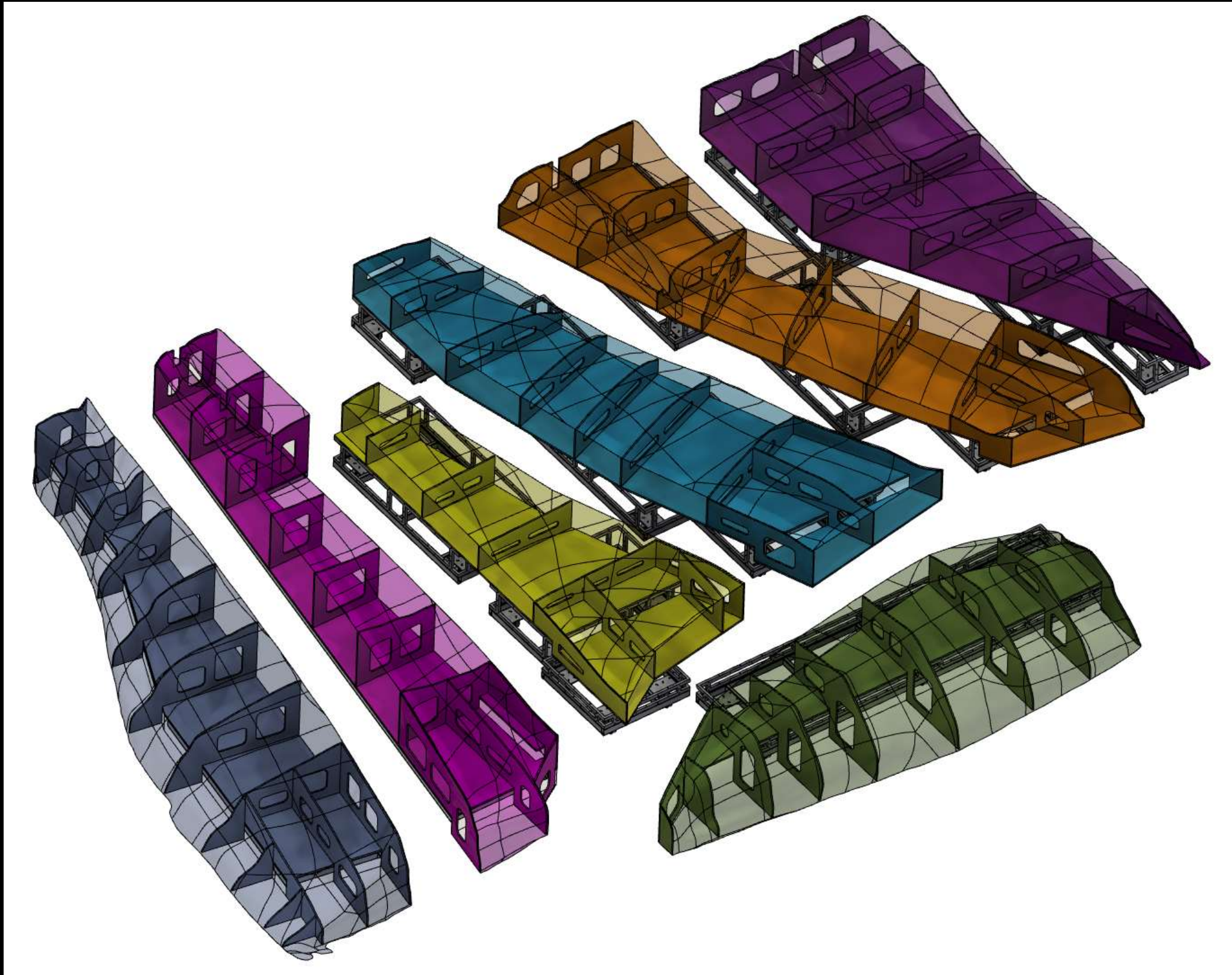
Jää – Floor structure



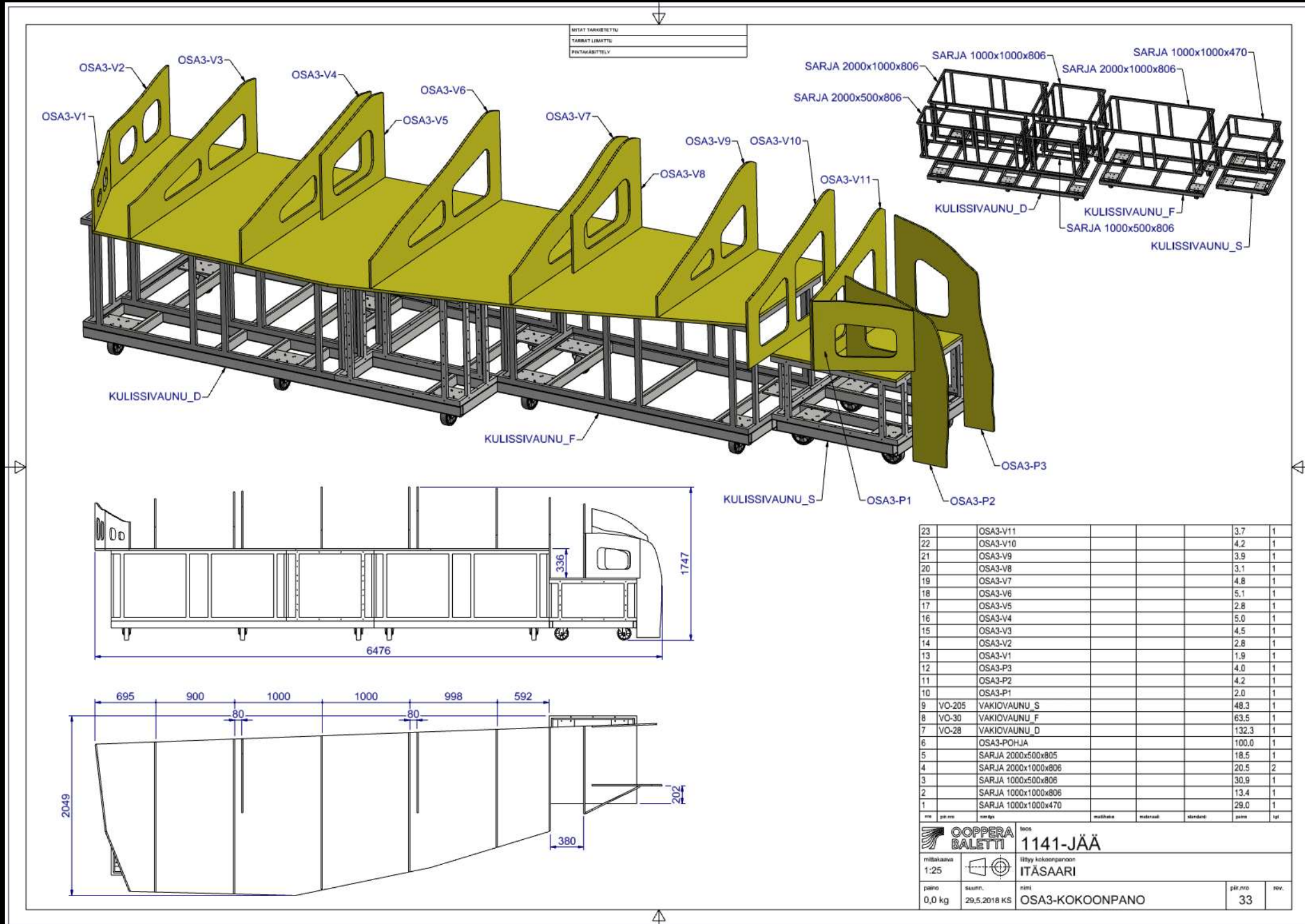
Jää – Floor structure



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Jää – Floor structure



Old Set up vs. 3D-scanner Set up

This is only an rough estimate of some benefits:

- The whole process ~40% faster
- Material costs ~34% lower
- Weight of the set ~37% lower

