

Installation tools

Dimitar MLADENOV - CERN EP/NU
LBNF Cryostat, final design review
SURF, 21-22 August 2017

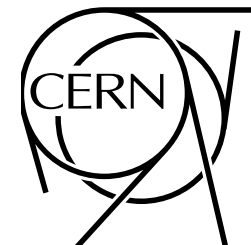


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Who Am I and Where Have I Been?

Chief Project Engineer of the CERN Neutrino Platform.
Member of the LBNF/DUNE Collaboration.

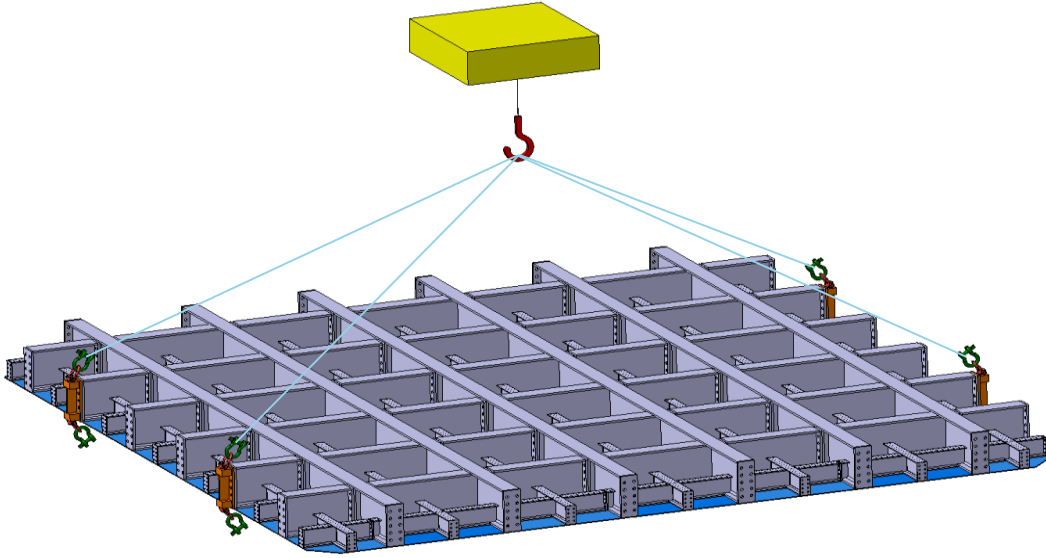
Mechanical Engineer at the ATLAS LHC project at CERN during construction and operation.

Experience includes 17 years as a project engineer for support structures for large scale physics detectors, from its conceptual stage to the final commissioning.

Large experience on design, manufacturing, underground installation, assembly and logistics.

Education as Mechanical Engineer (PhD).

ProtoDUNE experience

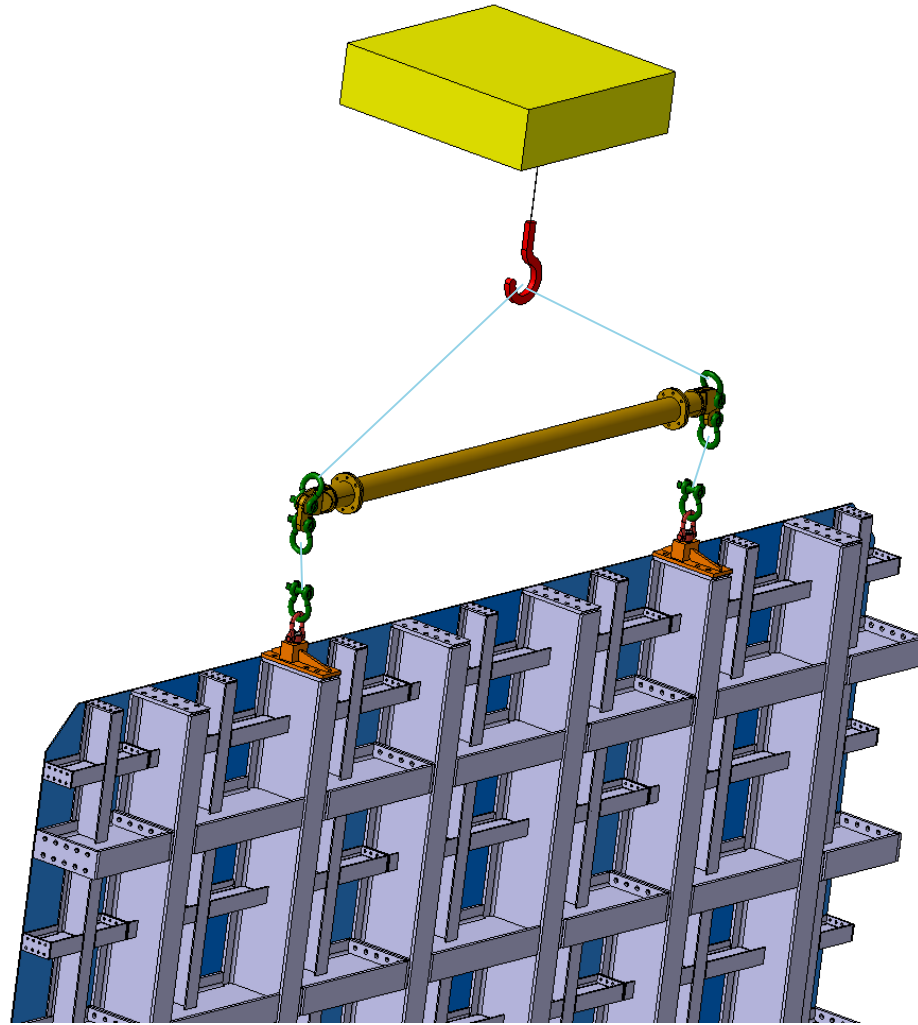


ProtoDUNE floor
Weight: 40T

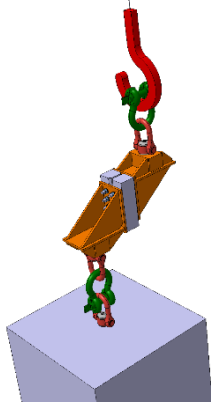


ProtoDUNE experience

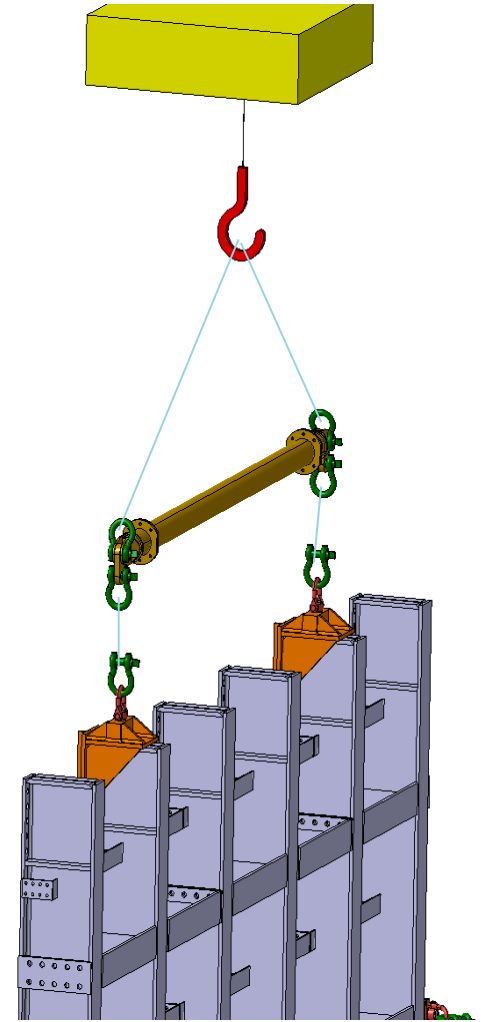
ProtoDUNE roof
Weight: 40T



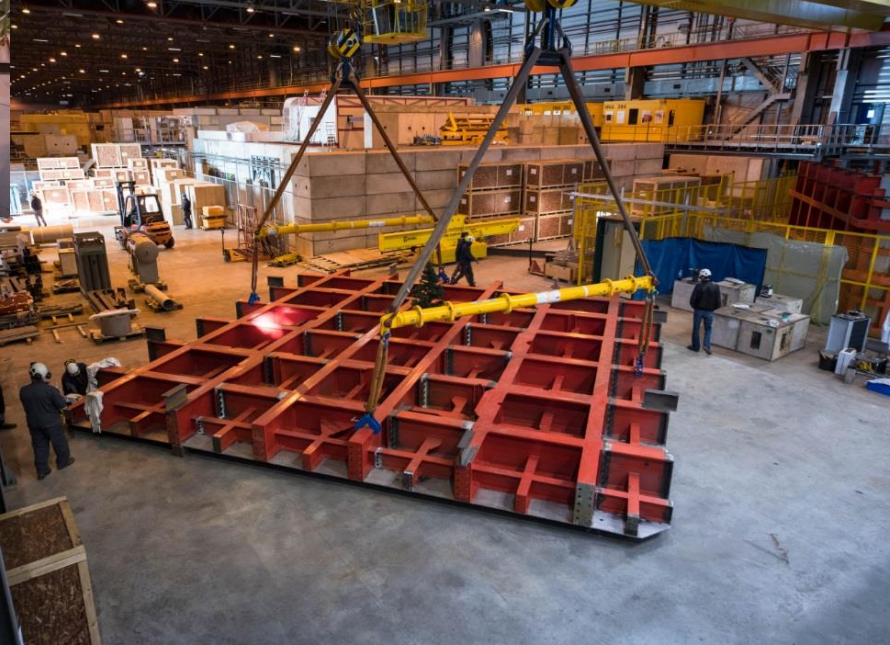
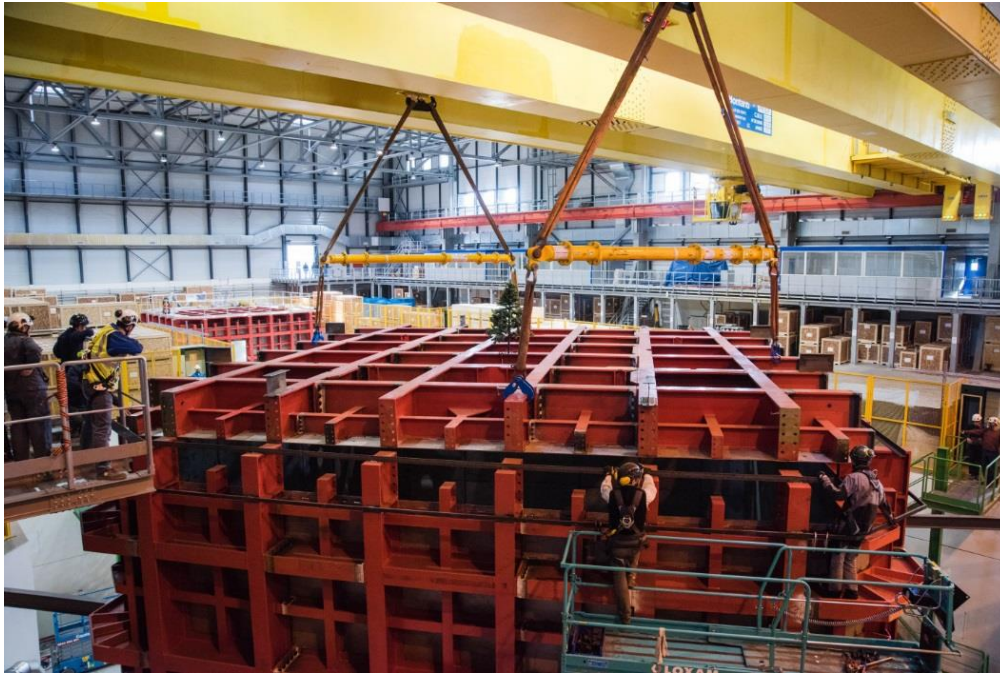
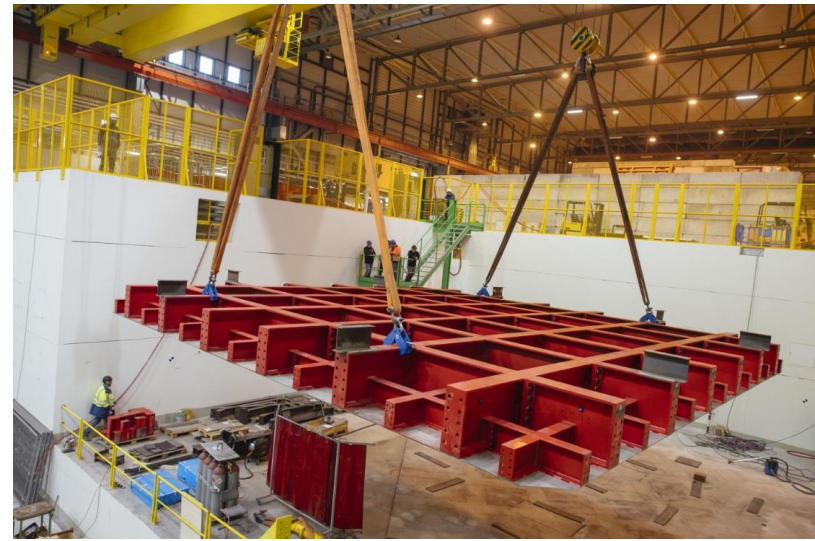
ProtoDUNE experience



ProtoDUNE wall
Weight: 25T

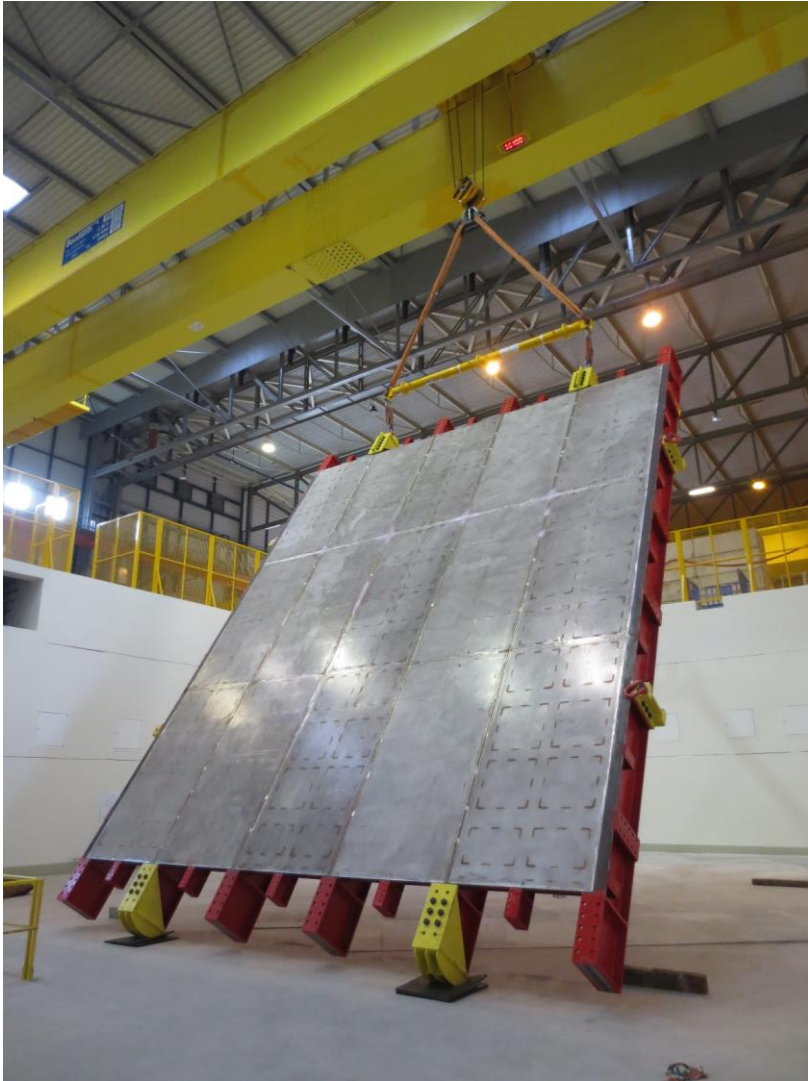


ProtoDUNE experience

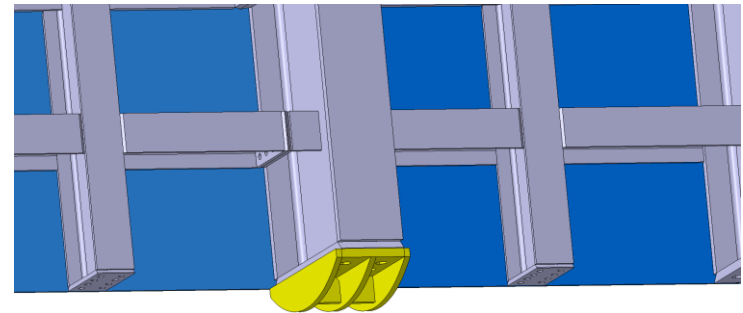


ProtoDUNE roof
Weight: 40T

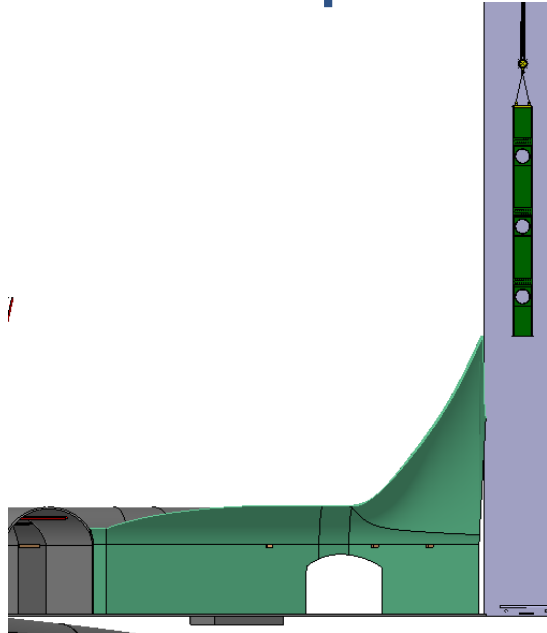
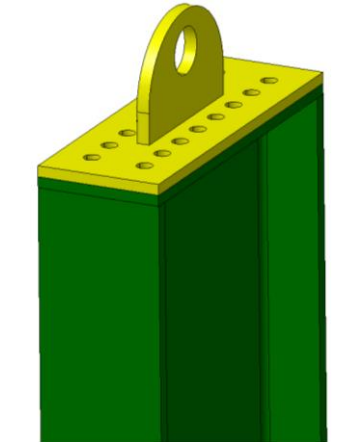
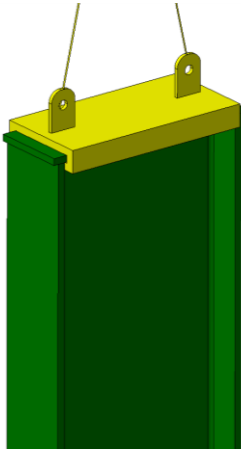
ProtoDUNE experience



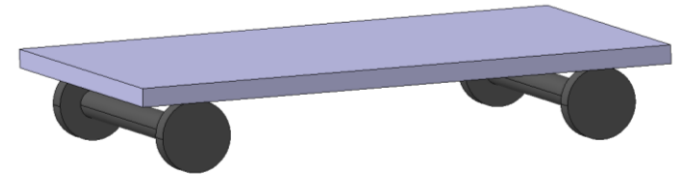
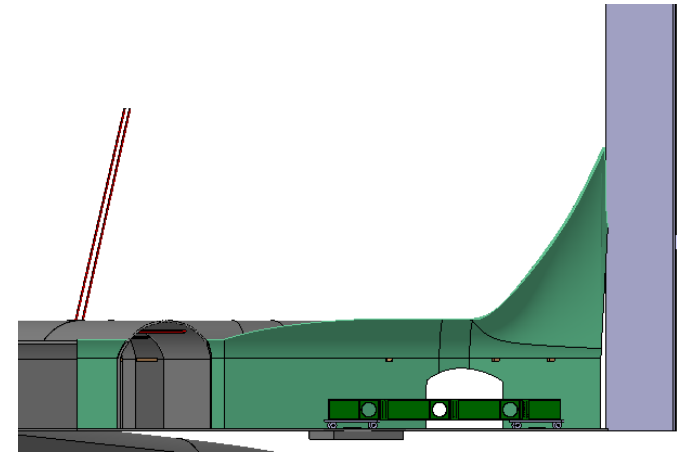
ProtoDUNE wall – rotation
Weight: 25T



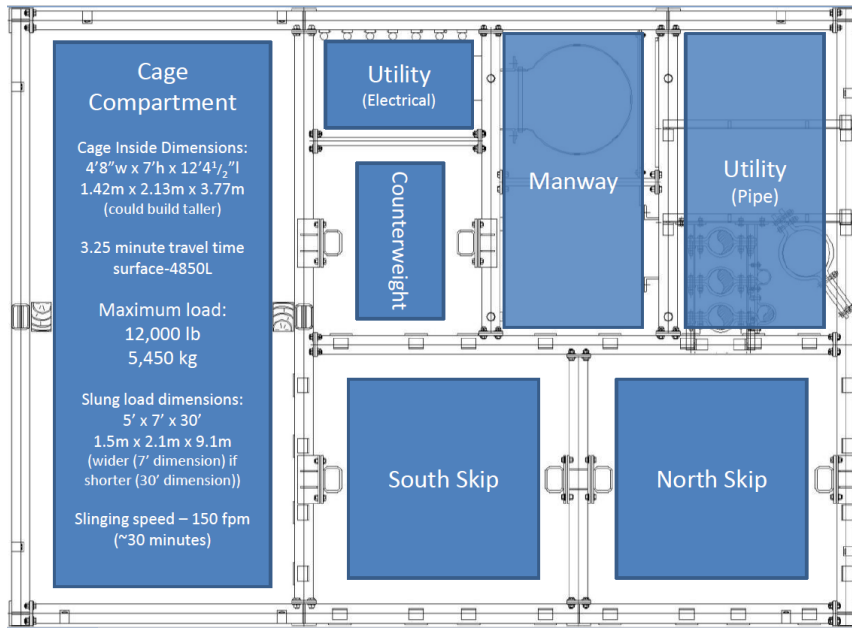
Lowering tools & Tunnel transportation tools



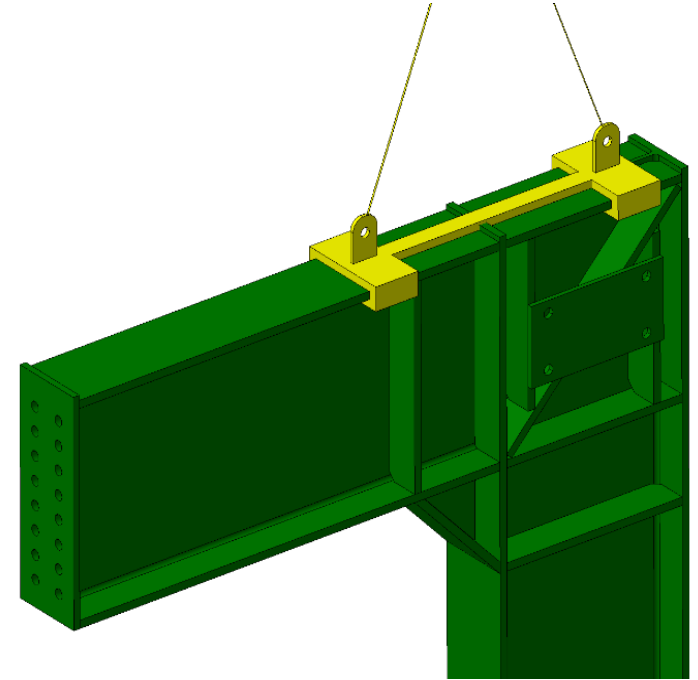
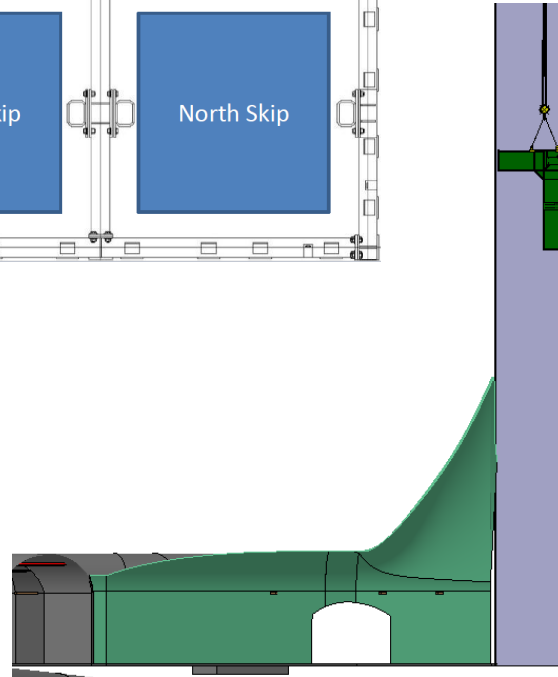
LBNF long vertical beam
Weight: 7.5T



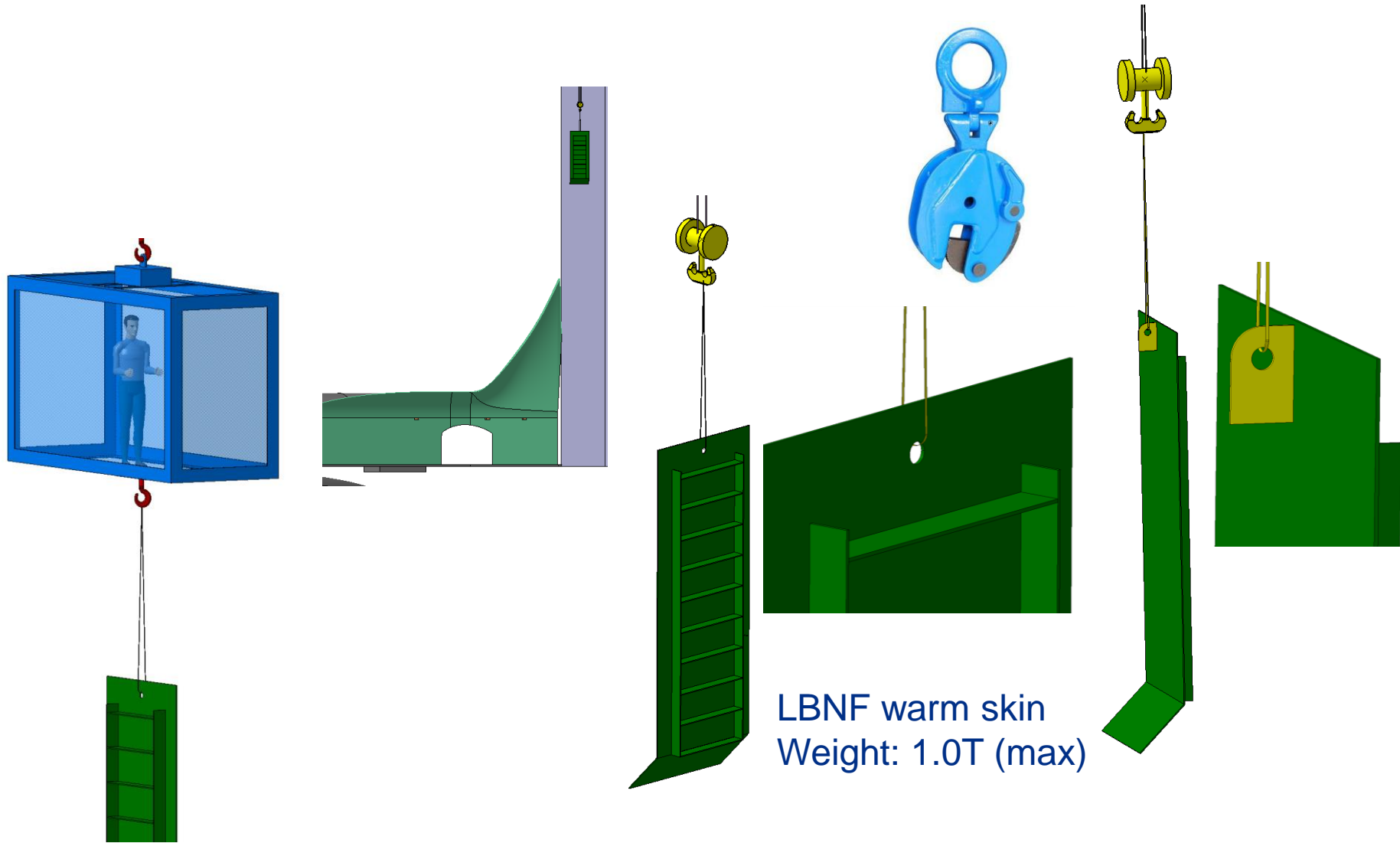
Lowering tools & Tunnel transportation tools



LBNF corner beam
Weight: 5.5T

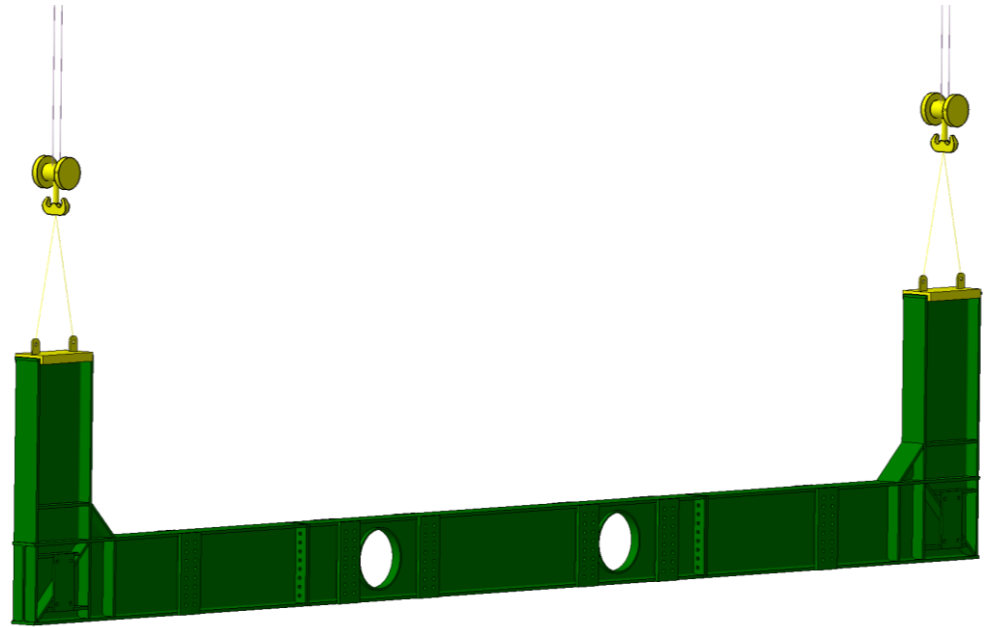
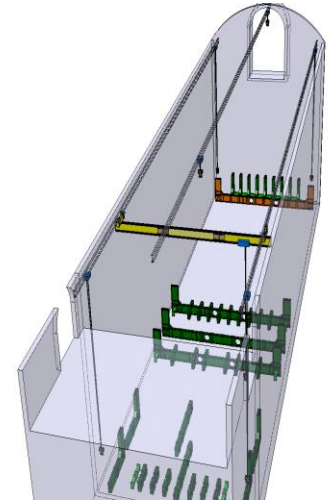
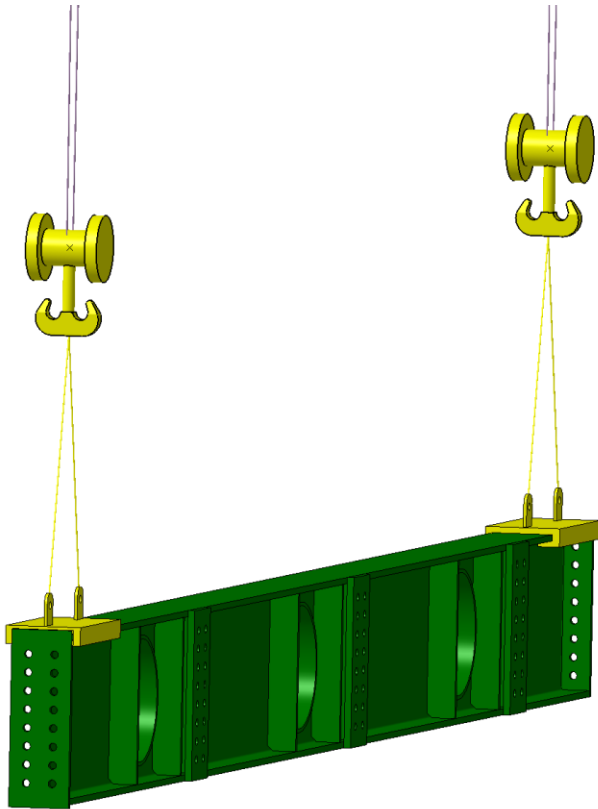


Lowering tools & Tunnel transportation tools

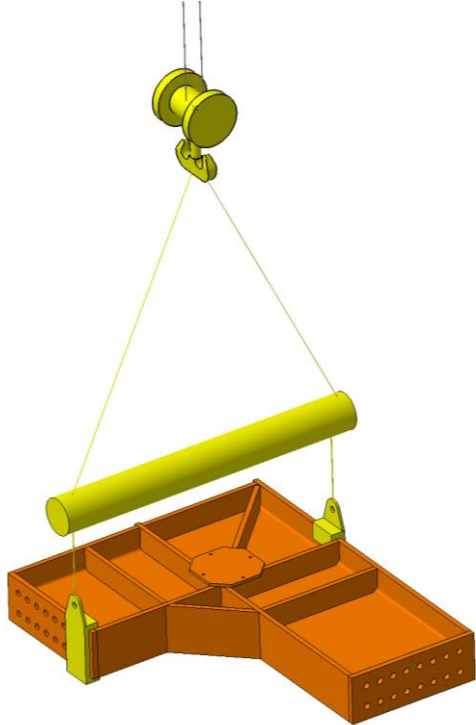
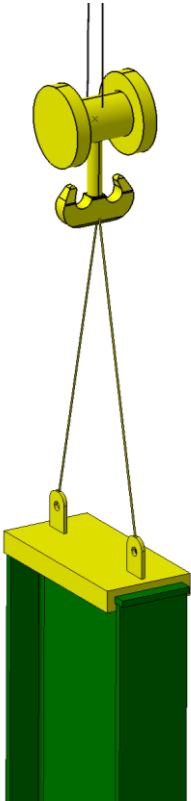
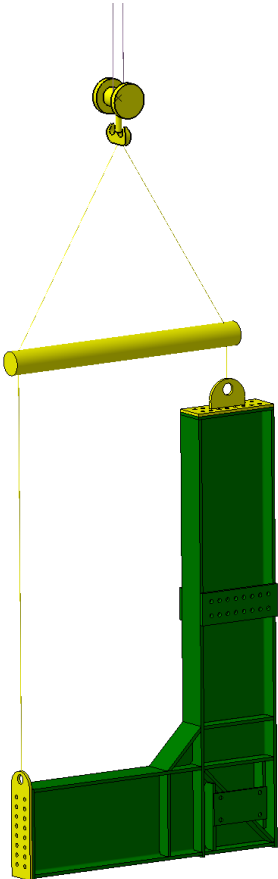
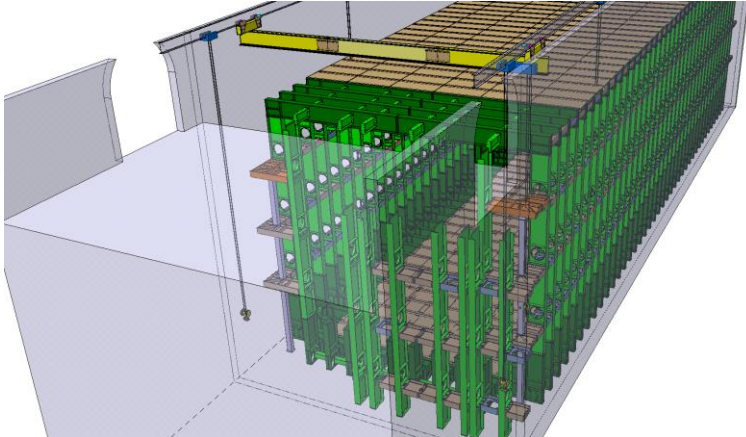


Cavern installation tools

LBNF floor subassembly
Weight: 30T



Cavern installation tools



Documents and references

- EDMS

Summary

- CERN will provide all tools necessary for the lowering, tunnel transportation and cavern installation of all 1'800 pieces per cryostat.
- The tools will be designed, validated, manufactured, tested and certified as per relevant standards in force.
- Tools for handling much heavier pieces, were produced and successfully used at CERN for the ProtoDUNE cryostats.