



Assembling, lowering and moving around 14000 tons



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CMS Experiment
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CMS at LHC versus CLIC-SiD



Both detectors are **solenoids**

Have **comparable** diameter and fields

Design in **slices** for opening and maintenance

Airpads for horizontal x and y movement

The **CMS plug** could serve as example for a CLIC platform



Why assembly at the surface ?

Some pictures instead of arguments



Why assembly at the surface 1



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Why assembly at the surface 2



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Why assembly at the surface 3



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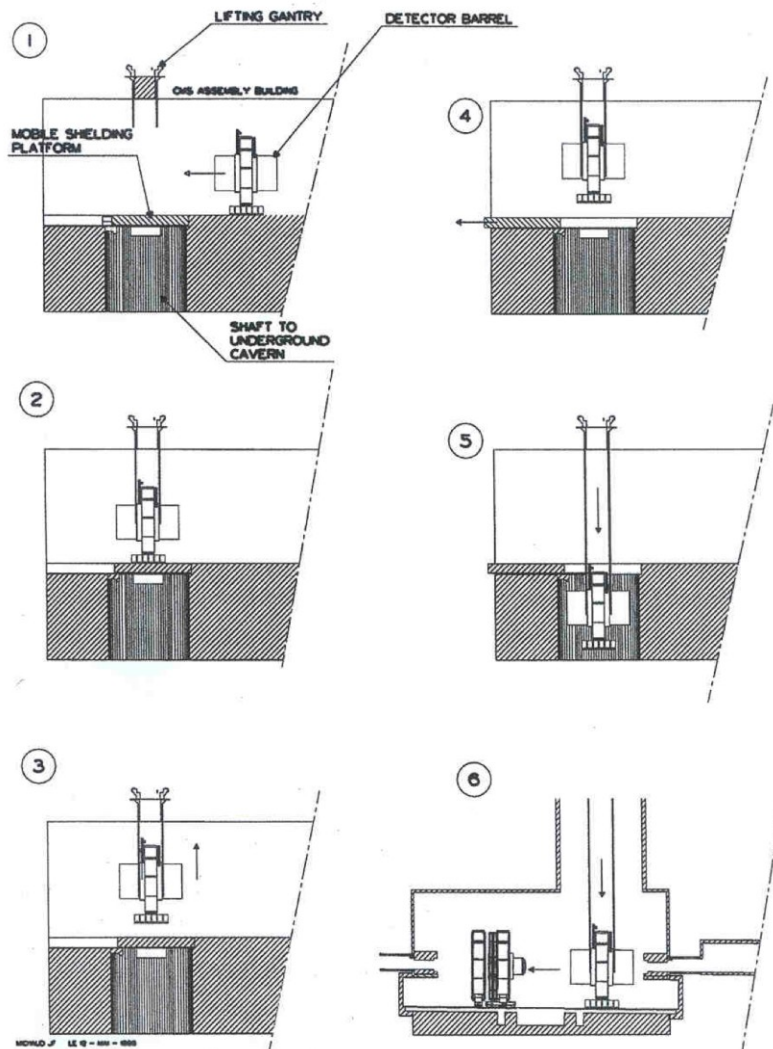
.....I see you understand



KR450447PL

STAGES OF INSTALLATION OF CMS DETECTOR

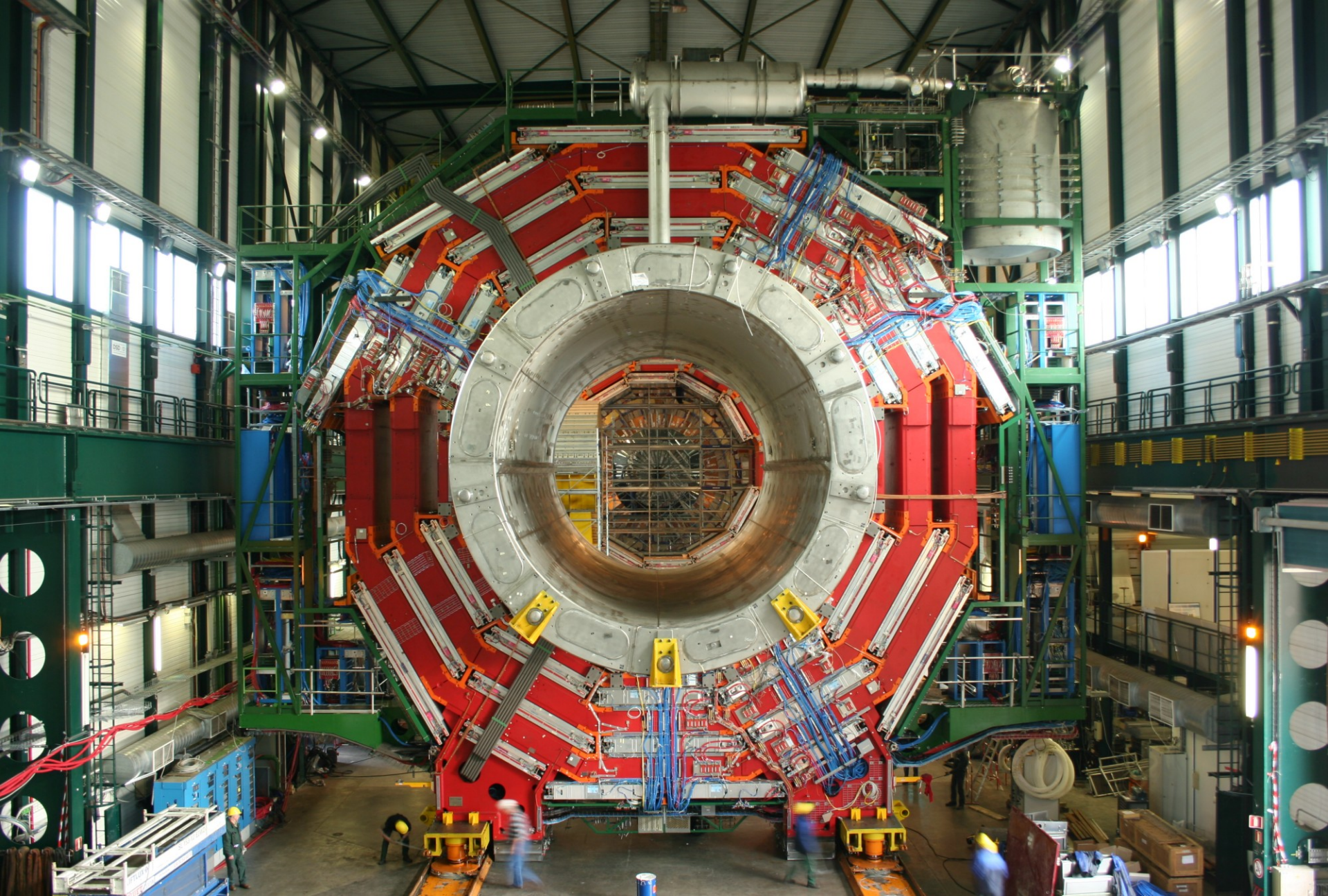
start



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Fig. 26.15.: Lifting scenario for the central barrel ring YB0, using the shielding plug closing the main access shaft PX56.

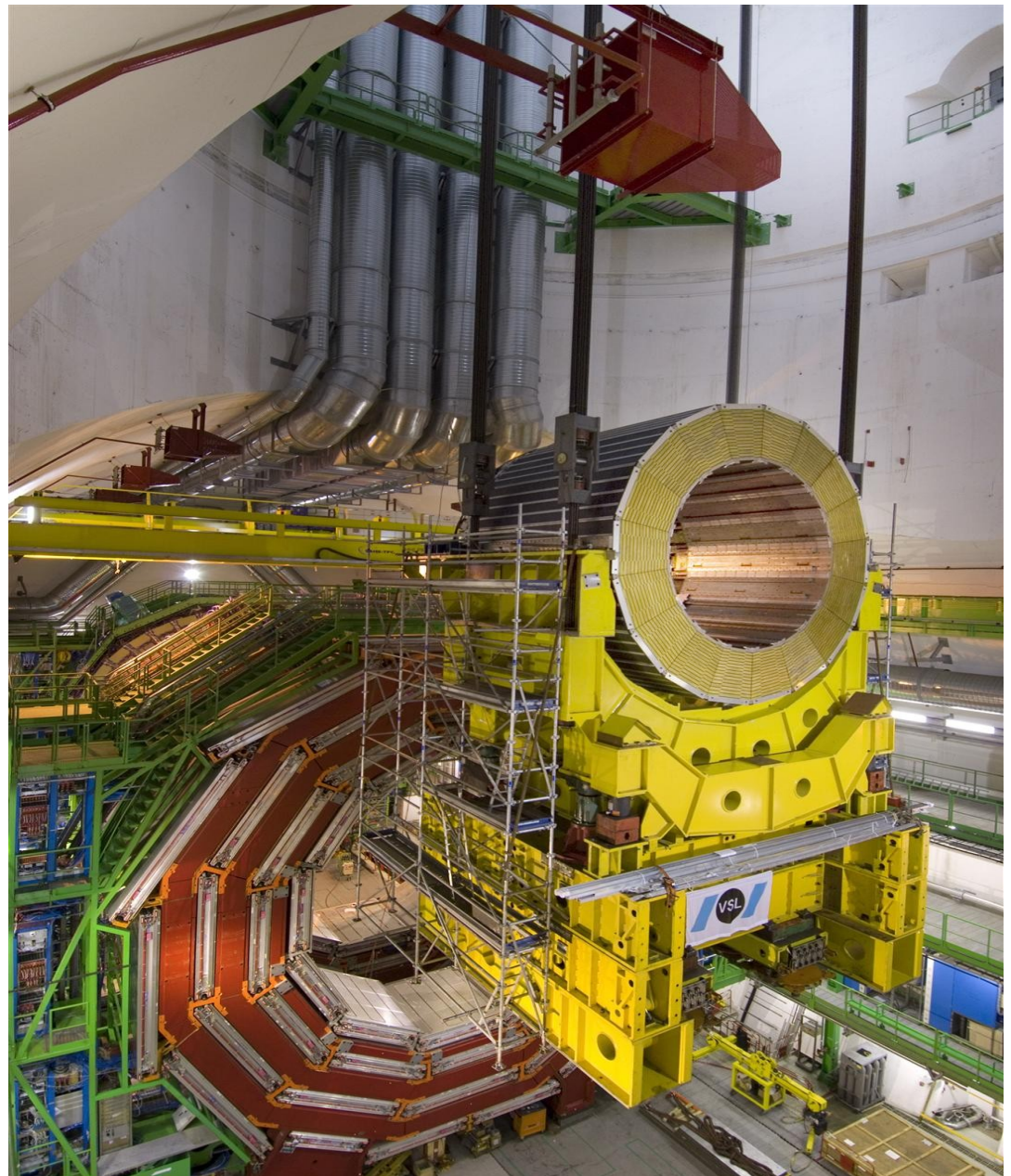


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Hadronic Calorimeter
arriving in the cavern

Some 700 tonnes



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Gantry Installation

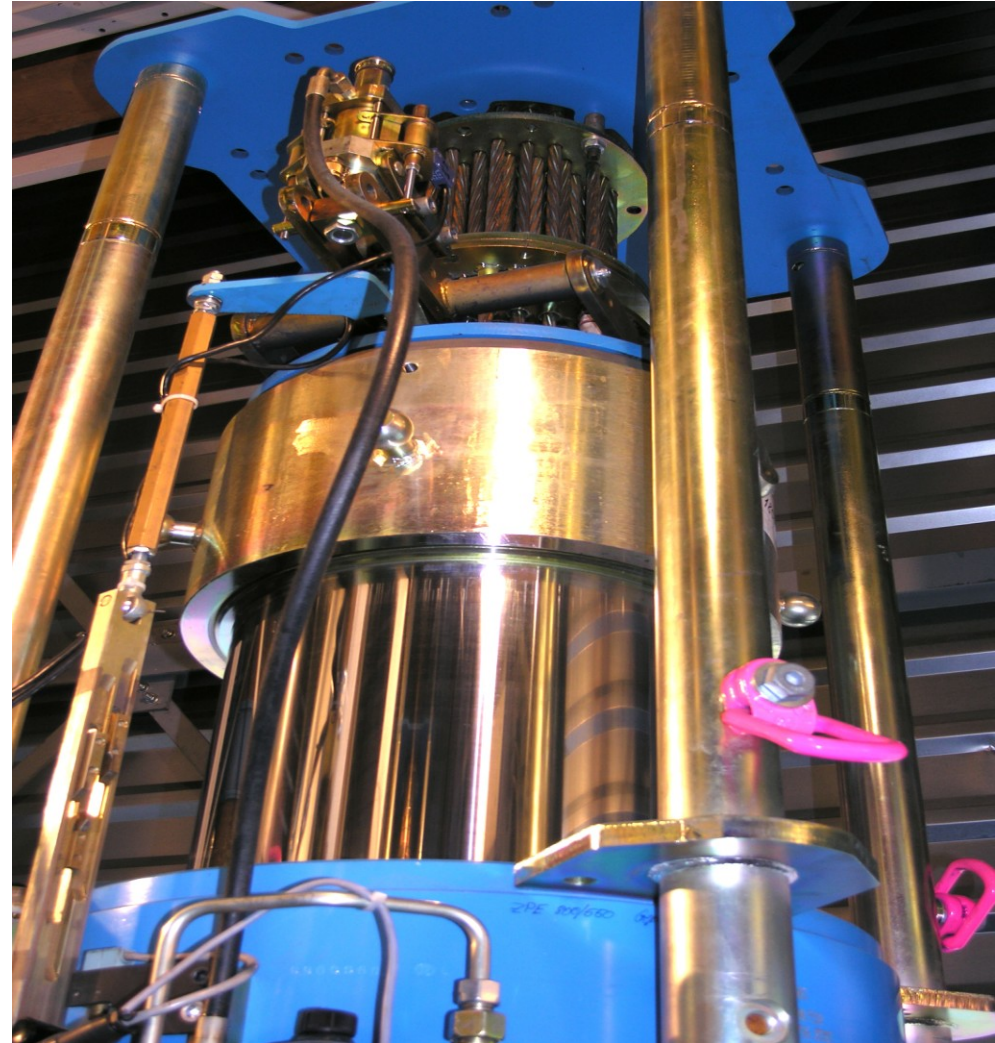


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Strand coils and hydraulic jack



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Central Barrel + coil = 2000 tons

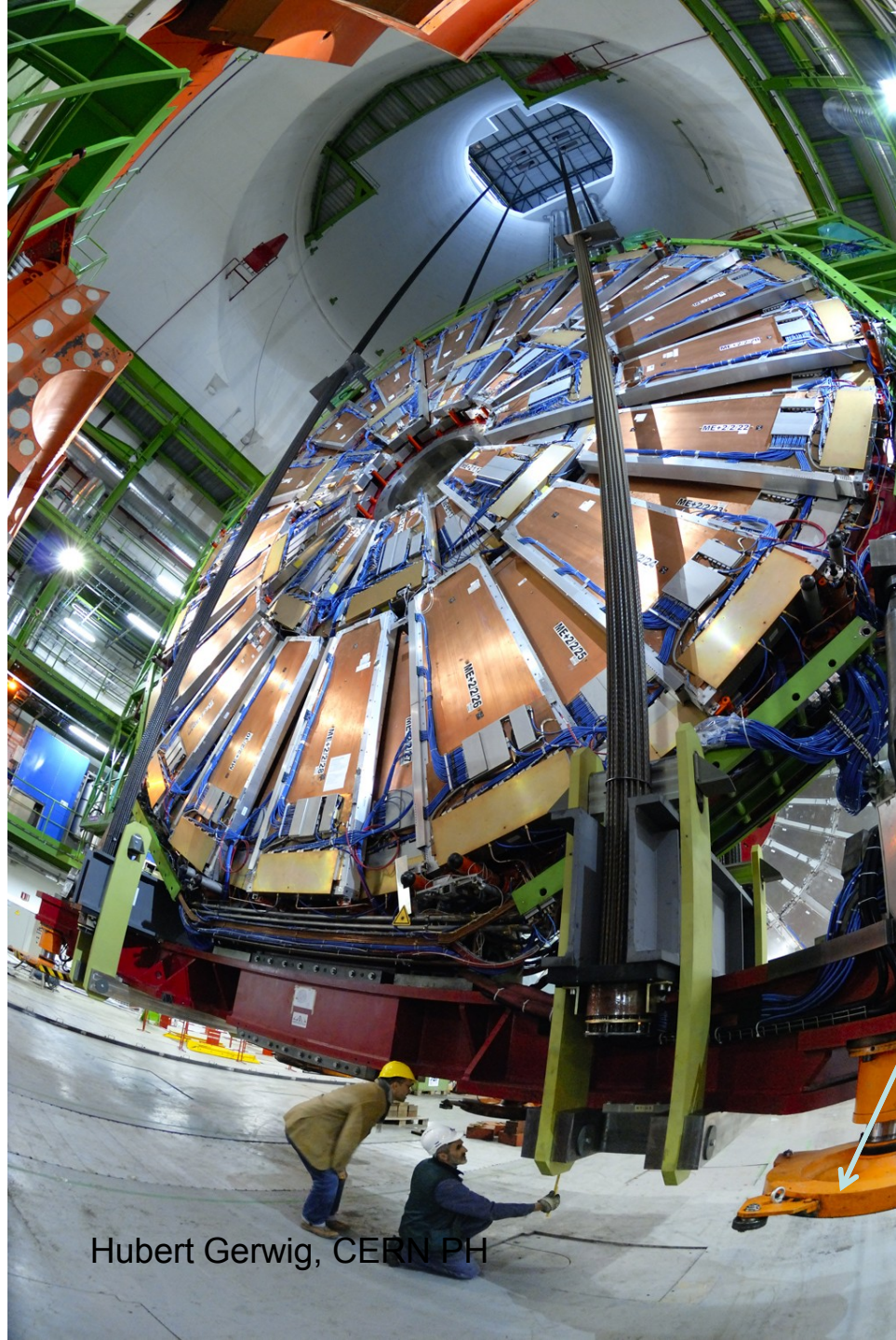


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End-cap YE+2

880 tons



Airpad

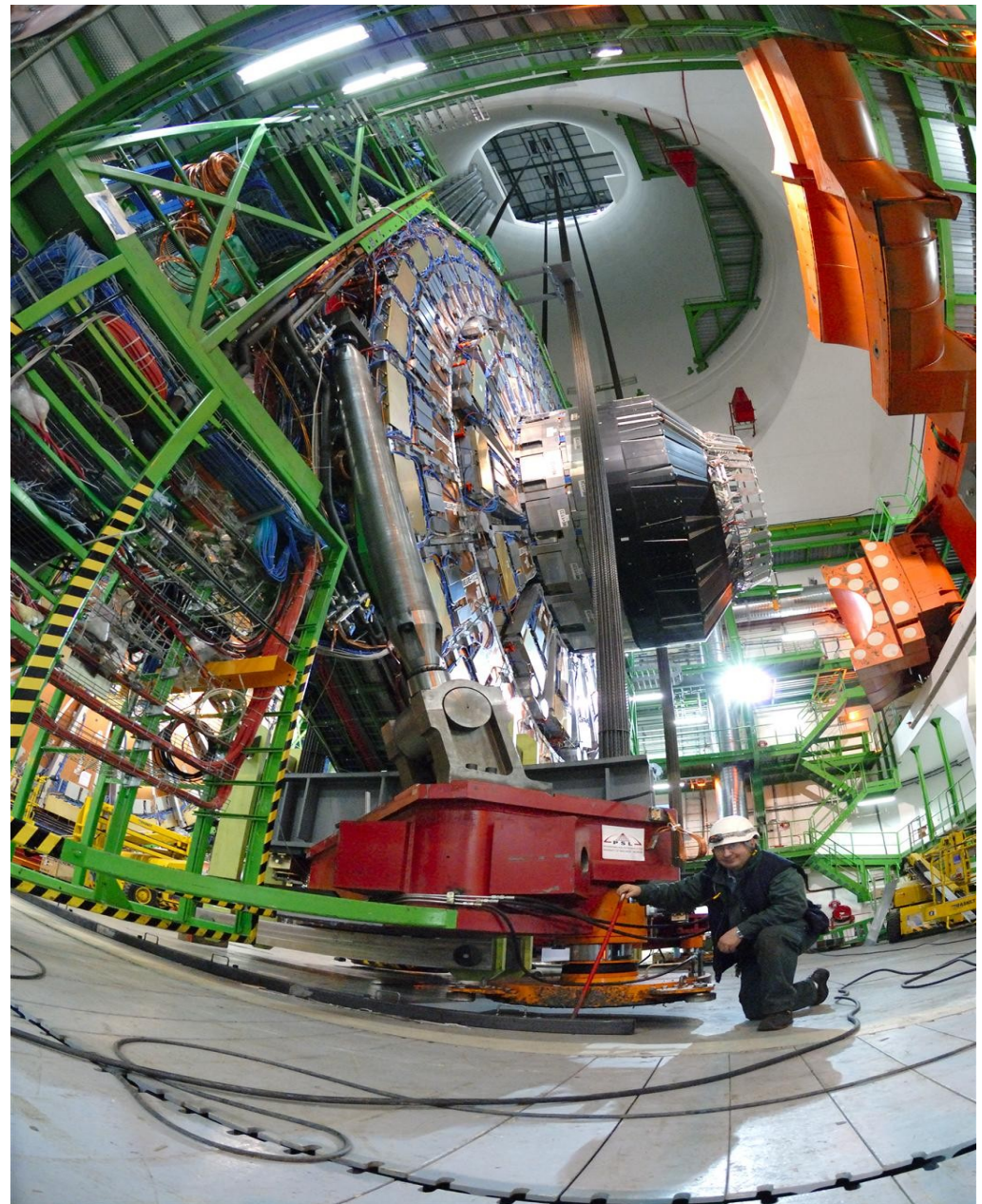
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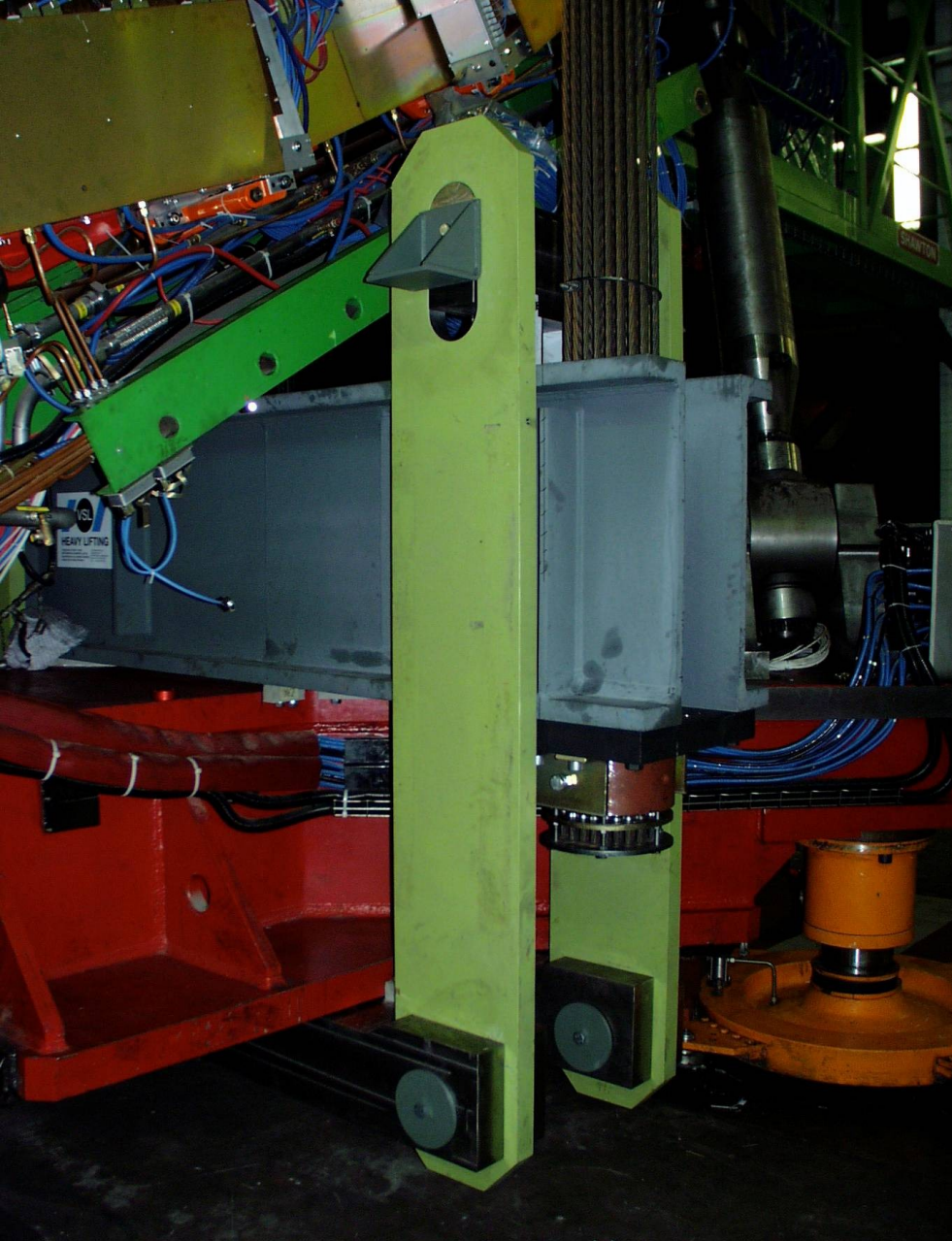
14

End-cap YE+1

1430 tonnes



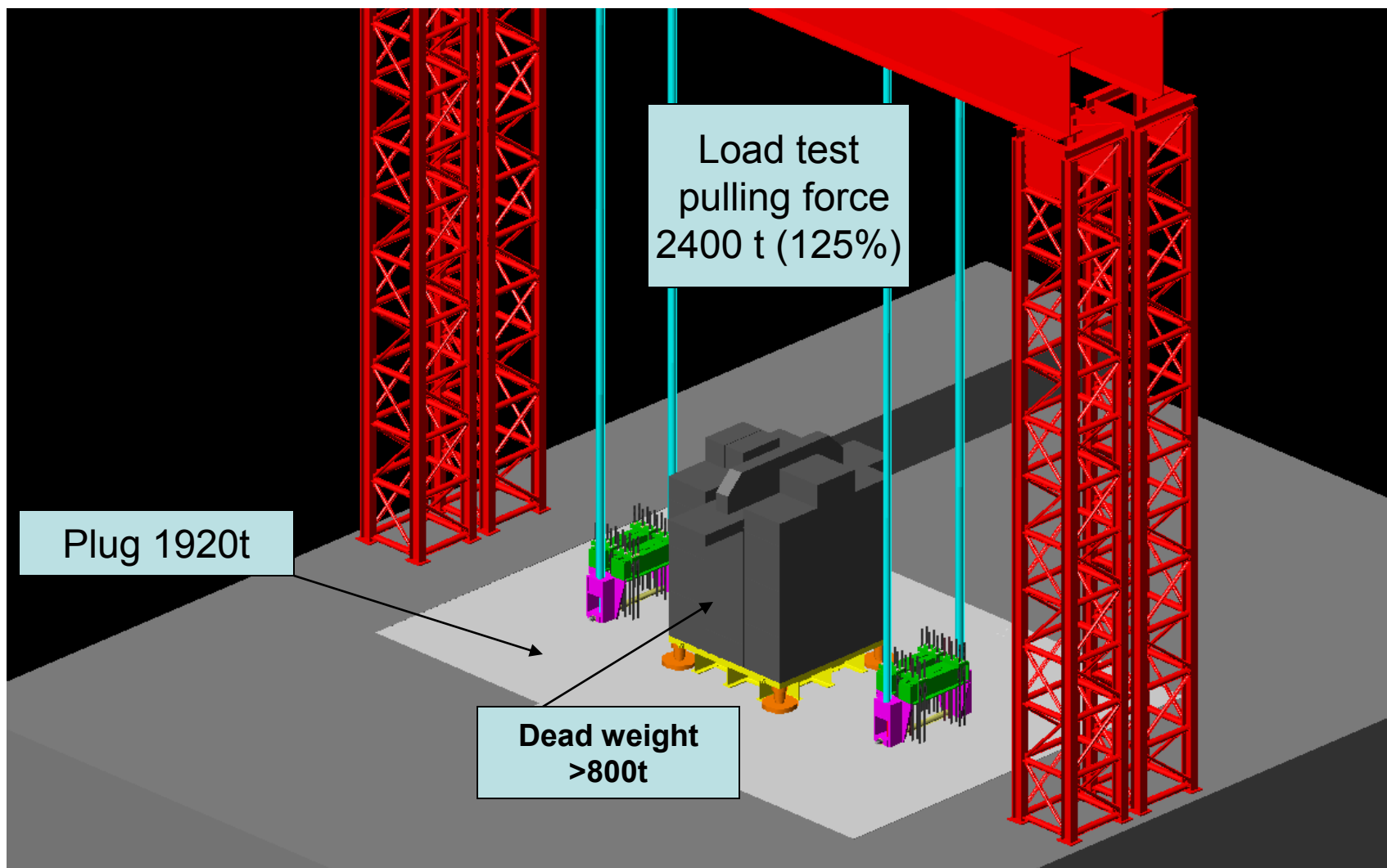




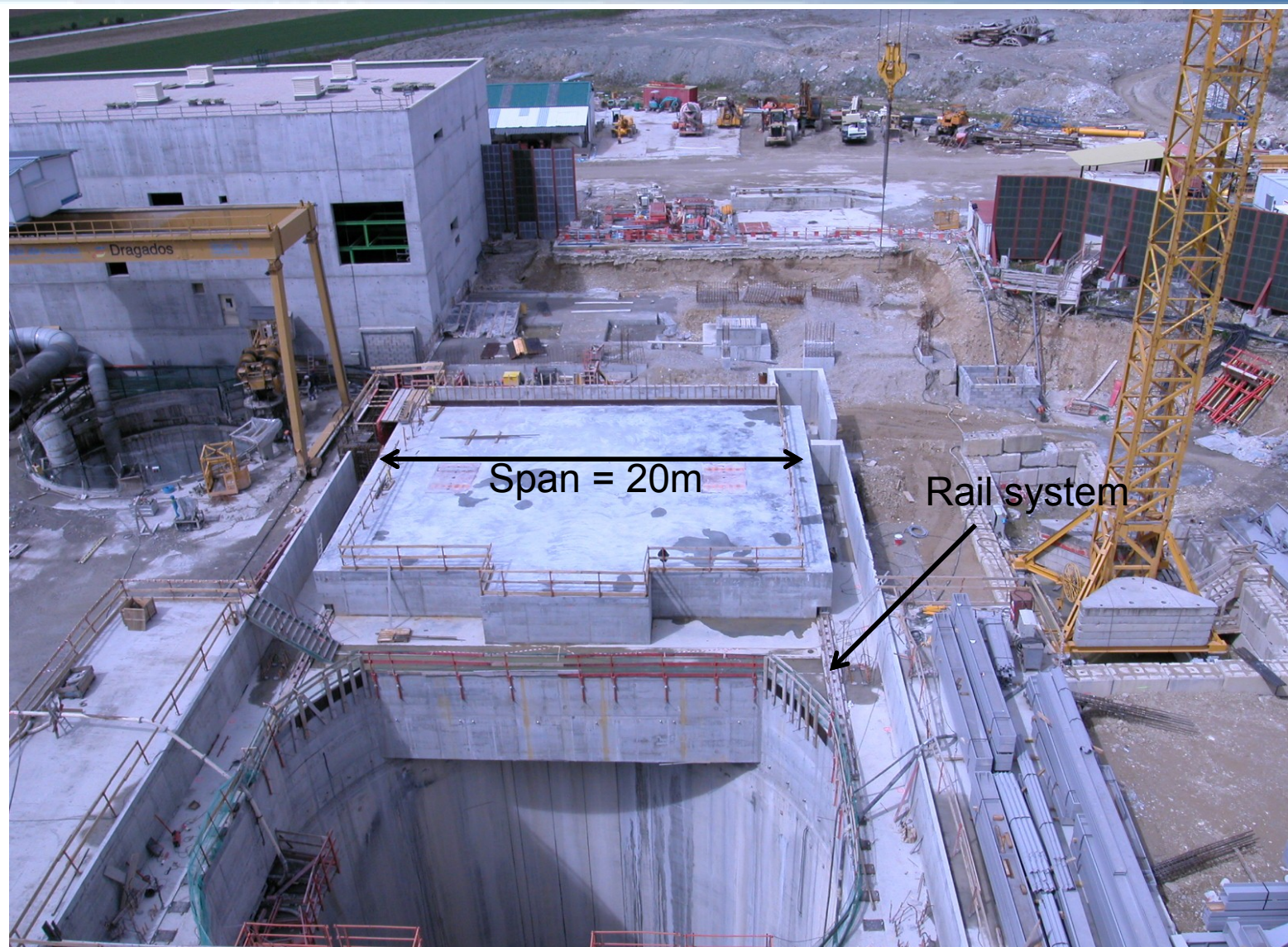
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Gantry load test using the plug



Plug manufacture on surface

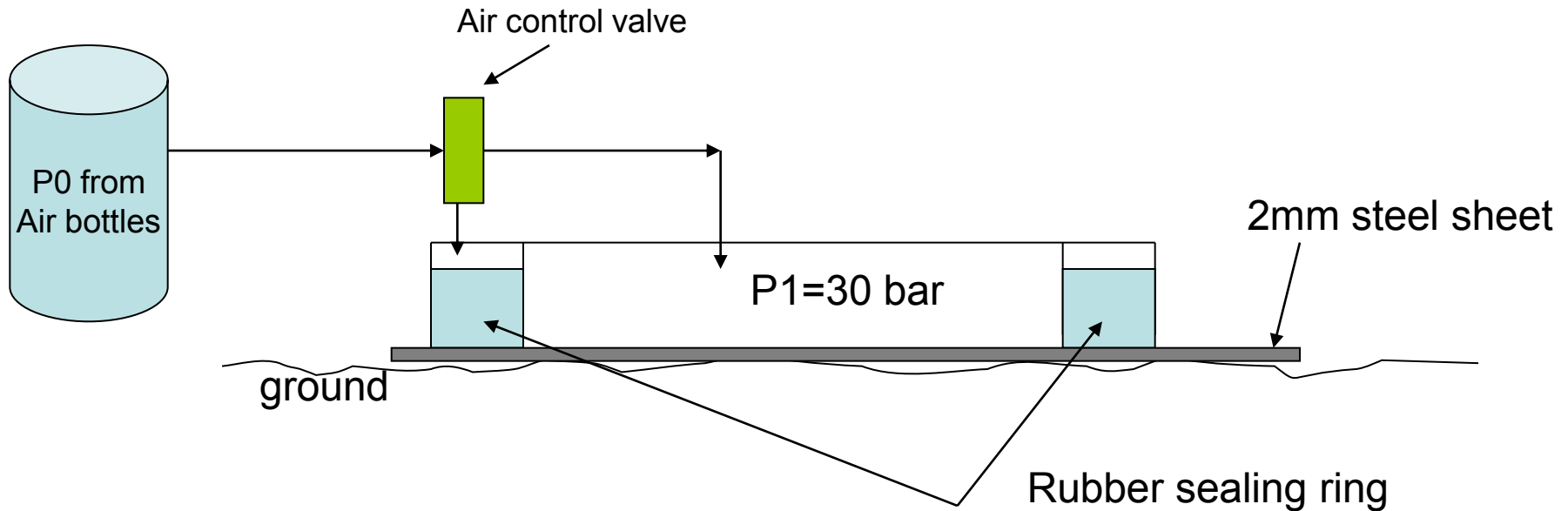


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CMS is built in a surface hall and moves on air pads

These air pads are not really comparable to classical air cushions as they have nearly no air losses due to a sealing ring



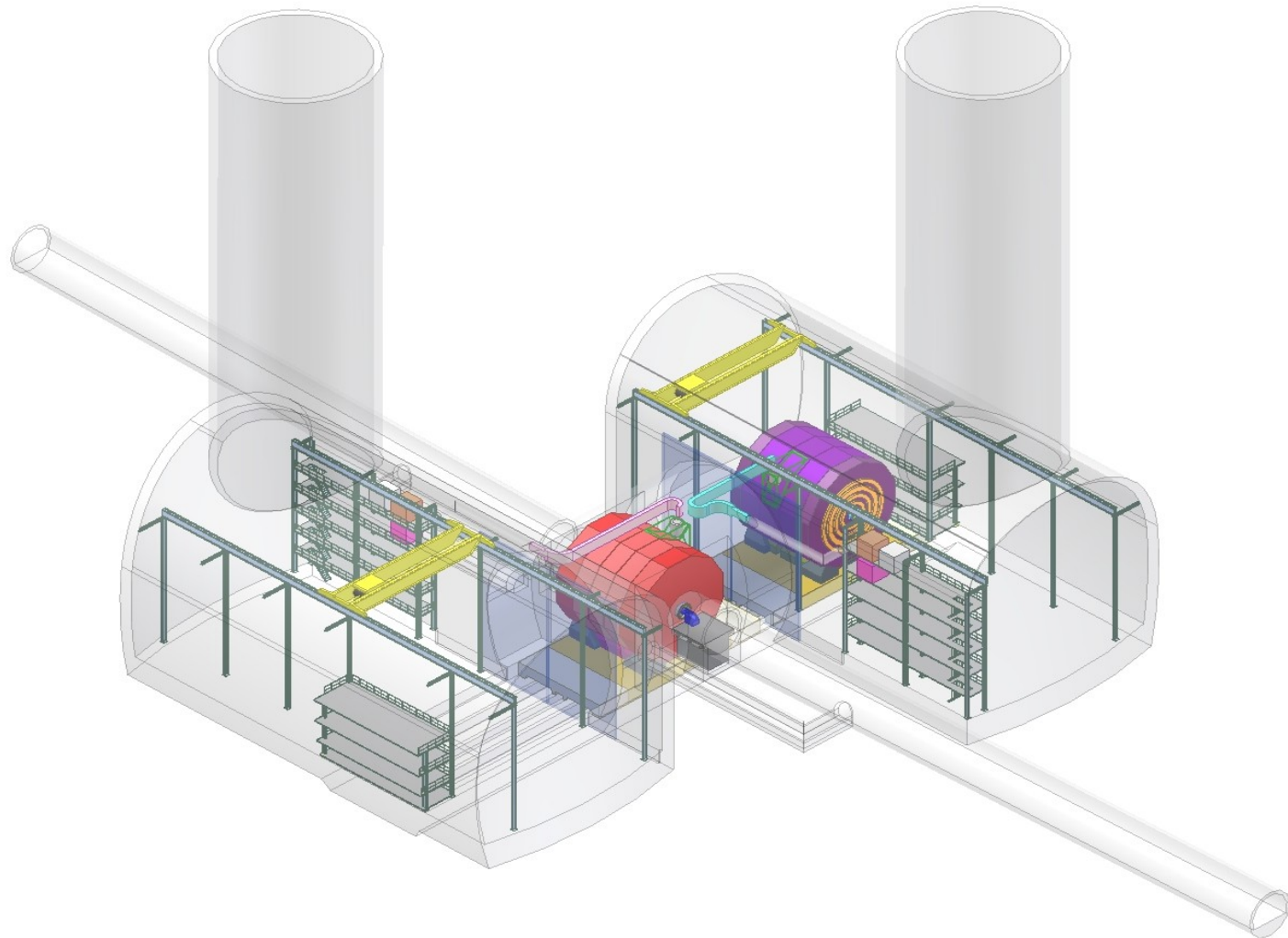


Air pad photo



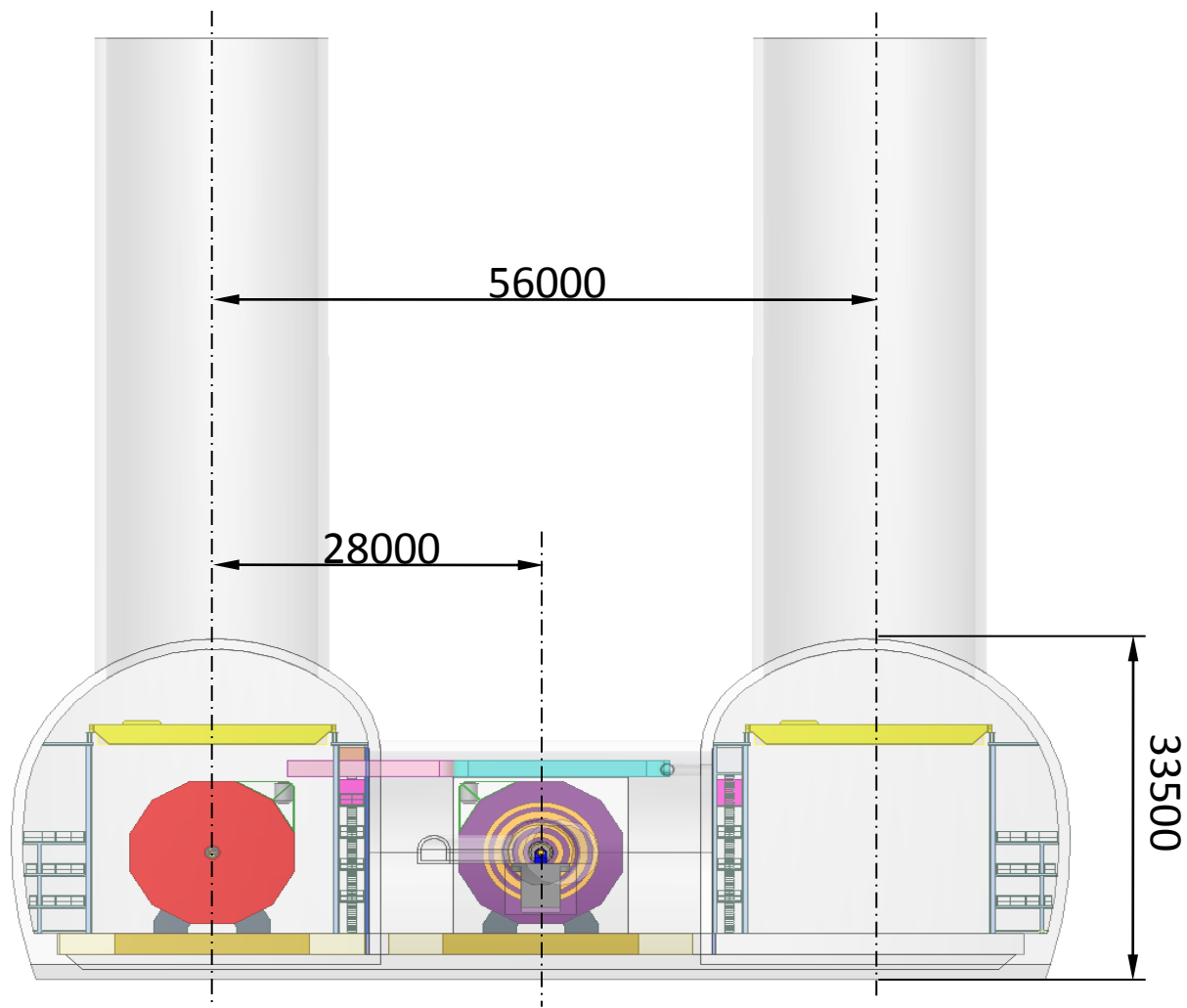


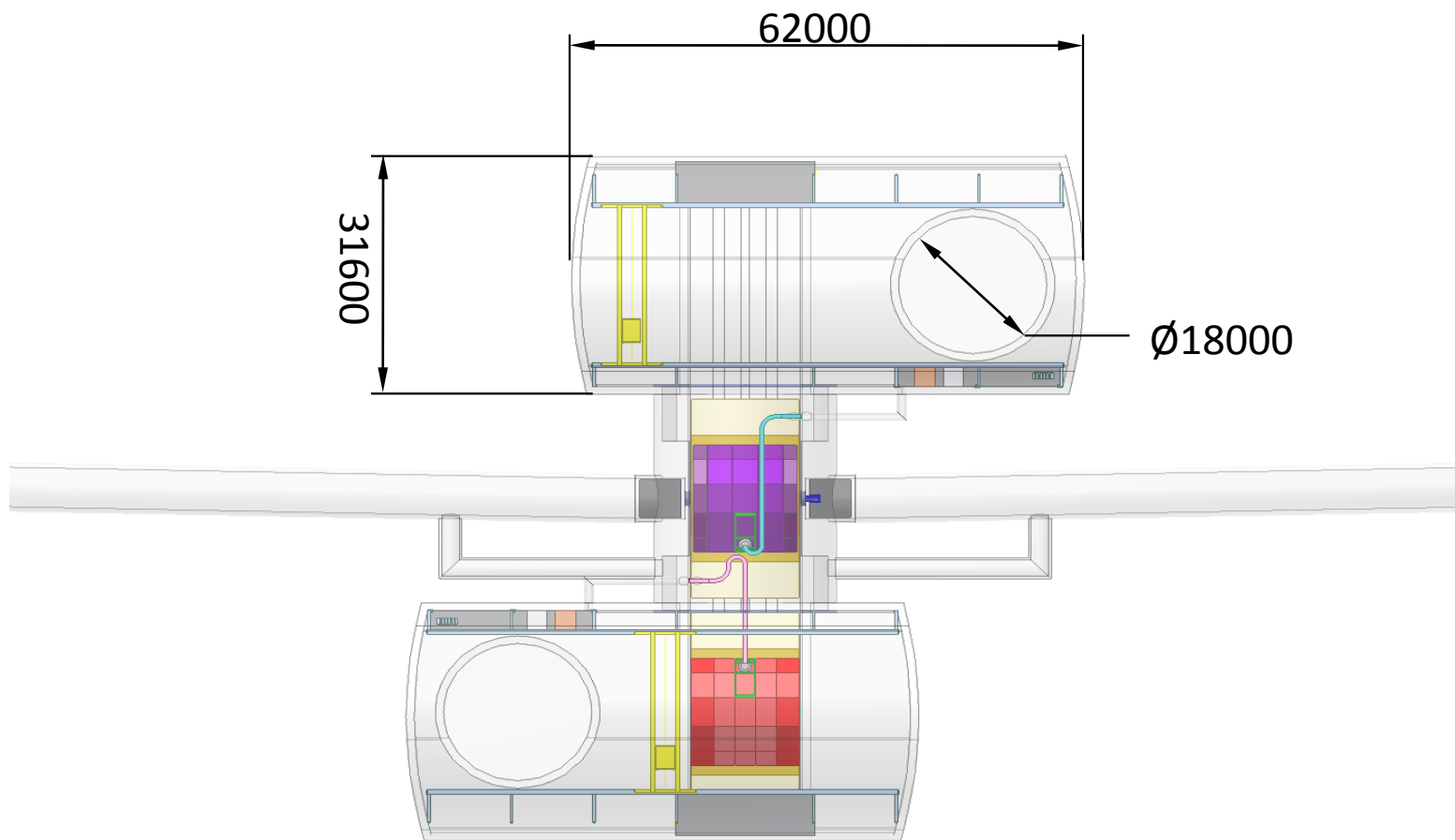
CLIC cavern at a deep site



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Last slide



- A CLIC detector may weigh 12000 tonnes
- Its platform 2000 tonnes
- Friction factor of an airpad is $<1\%$
- Seen my experience on CMS there is no problem to move the whole experiment on a platform BUT it has to be engineered
- And even with one experiment only you have to bring it on IP (via a platform)!