IR Issues from IRENG07

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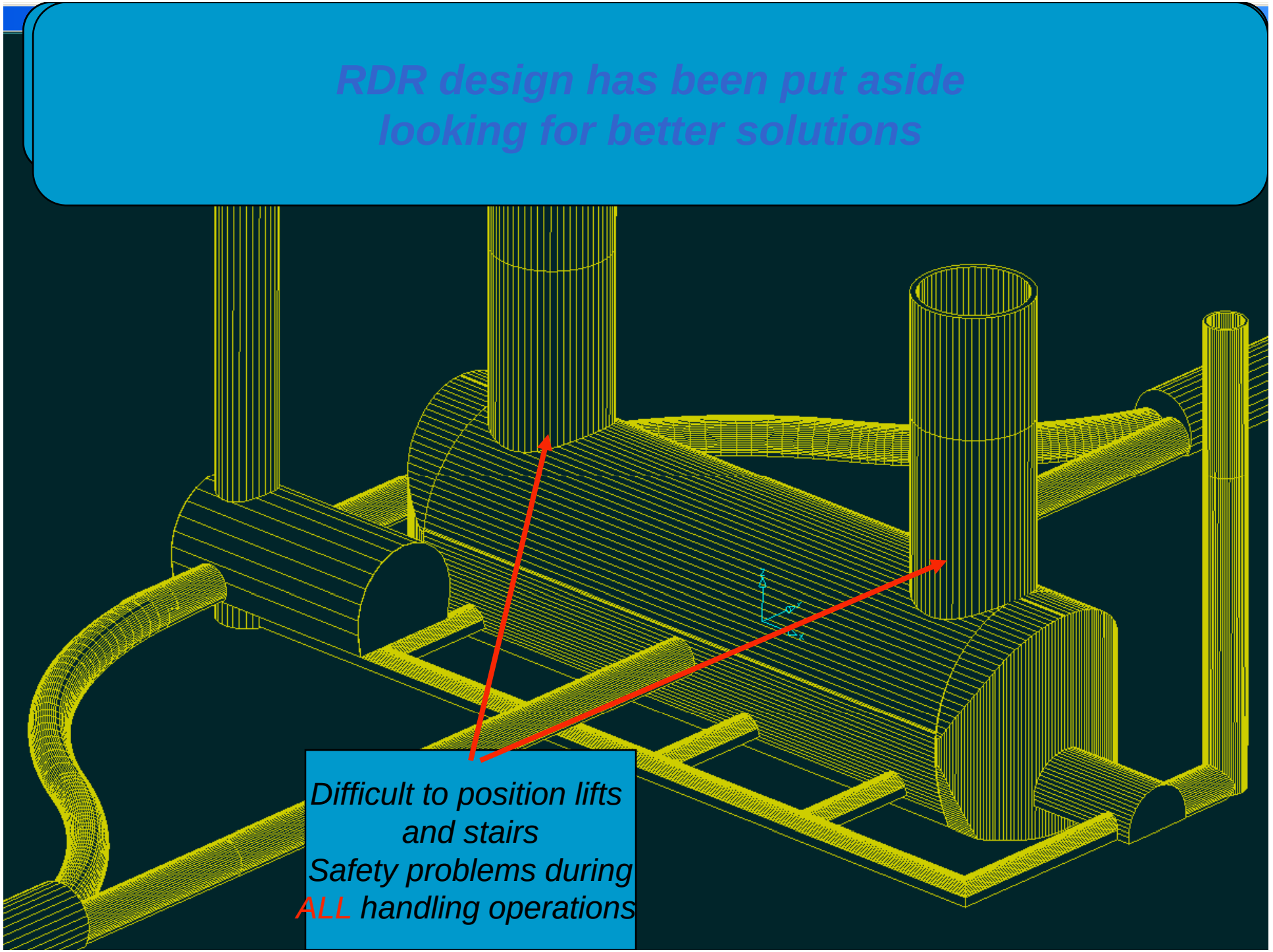
SiD-specific talks at IRENG07

- SiD concept overview (Kurt Krempetz)
- Mechanical model (Bob Wands)
- Beampipe and inner detector maintenance (Bill Cooper)
- Endcap / door design concepts (Jim Krebs)
- Preliminary assembly schemes (Marty Breidenbach)
- Beamcal / Gamcal (Bill Morse)
- …

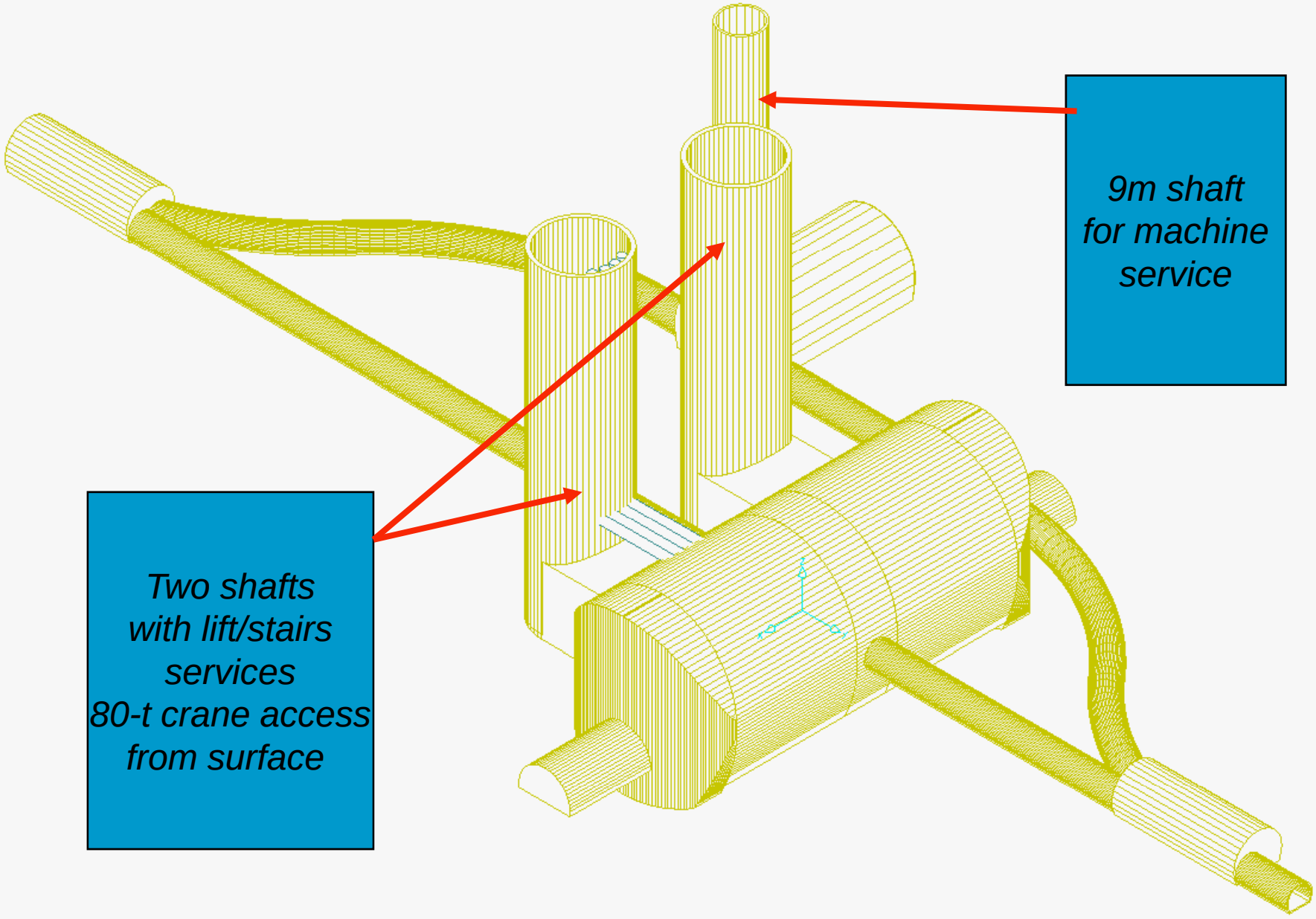
http://www-conf.slac.stanford.edu/ireng07/agenda.htm

RDR design has been put aside looking for better solutions



Difficult to position lifts and stairs
Safety problems during ALL handling operations

Two Large Shafts outside the Footprint

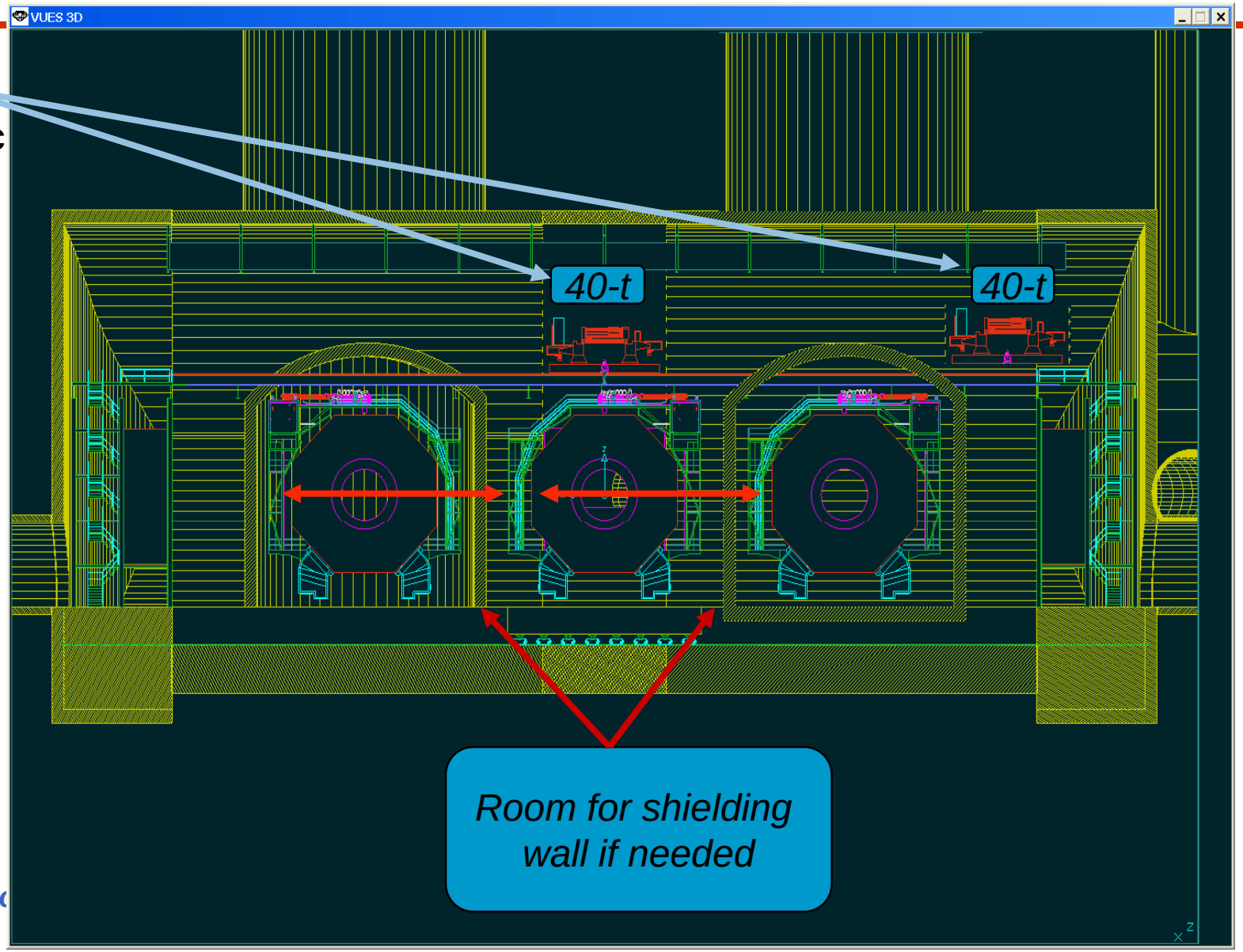


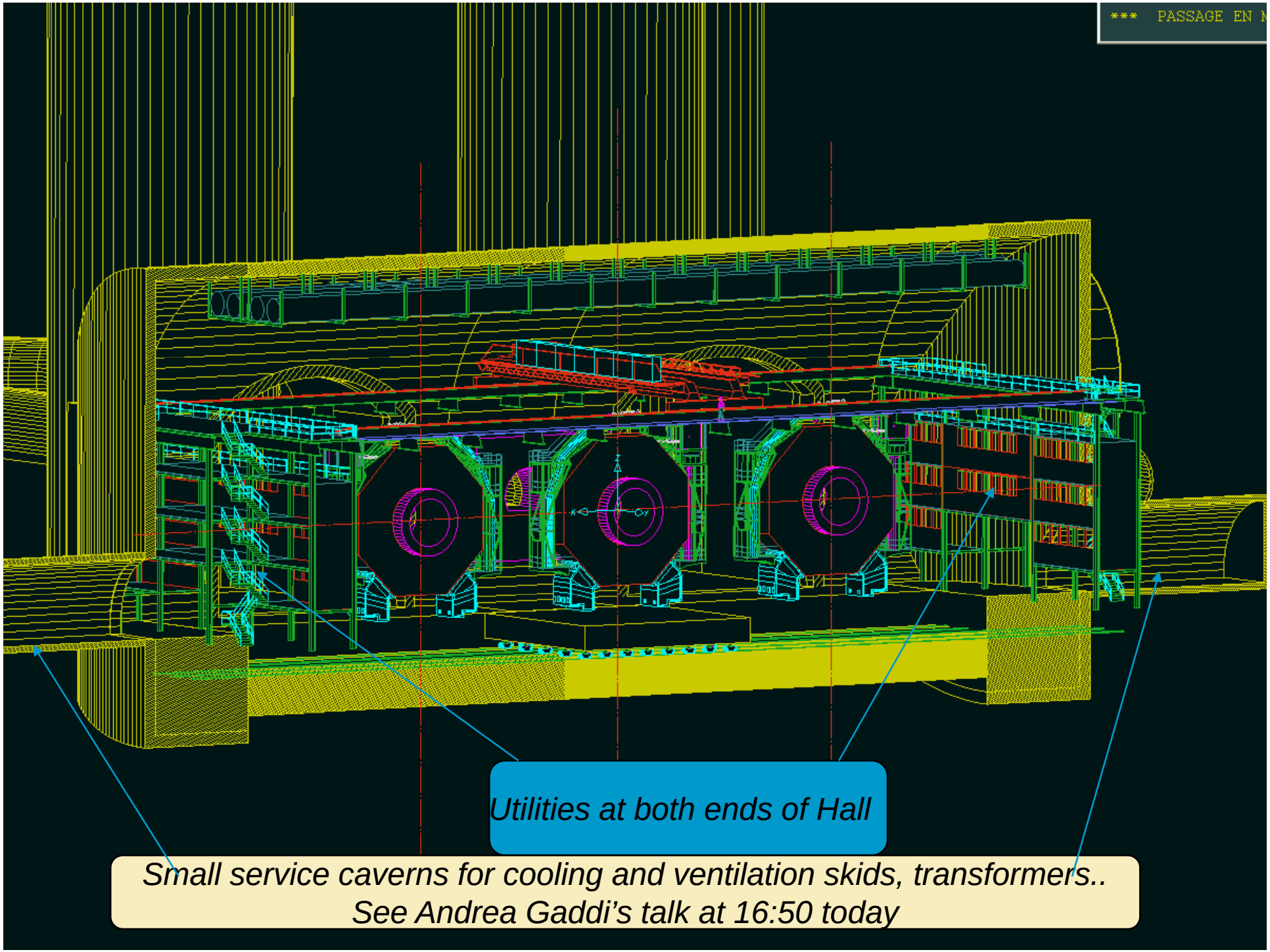
9m shaft for machine service

Two shafts with lift/stairs services 80-t crane access from surface

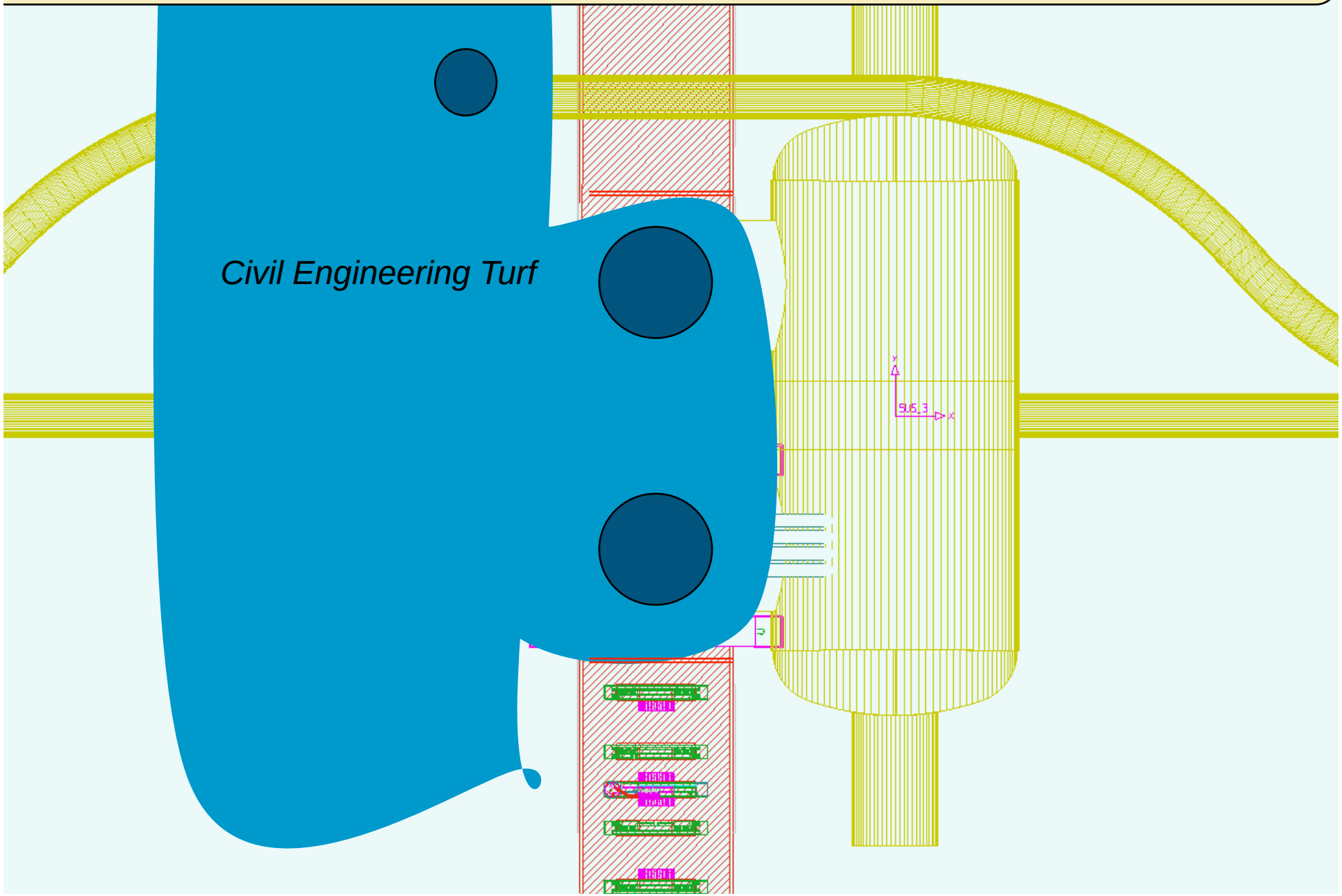
Two Large Shafts - With experiments

Two asymmetric 40-ton cranes can be ganged to move around 80-ton pieces



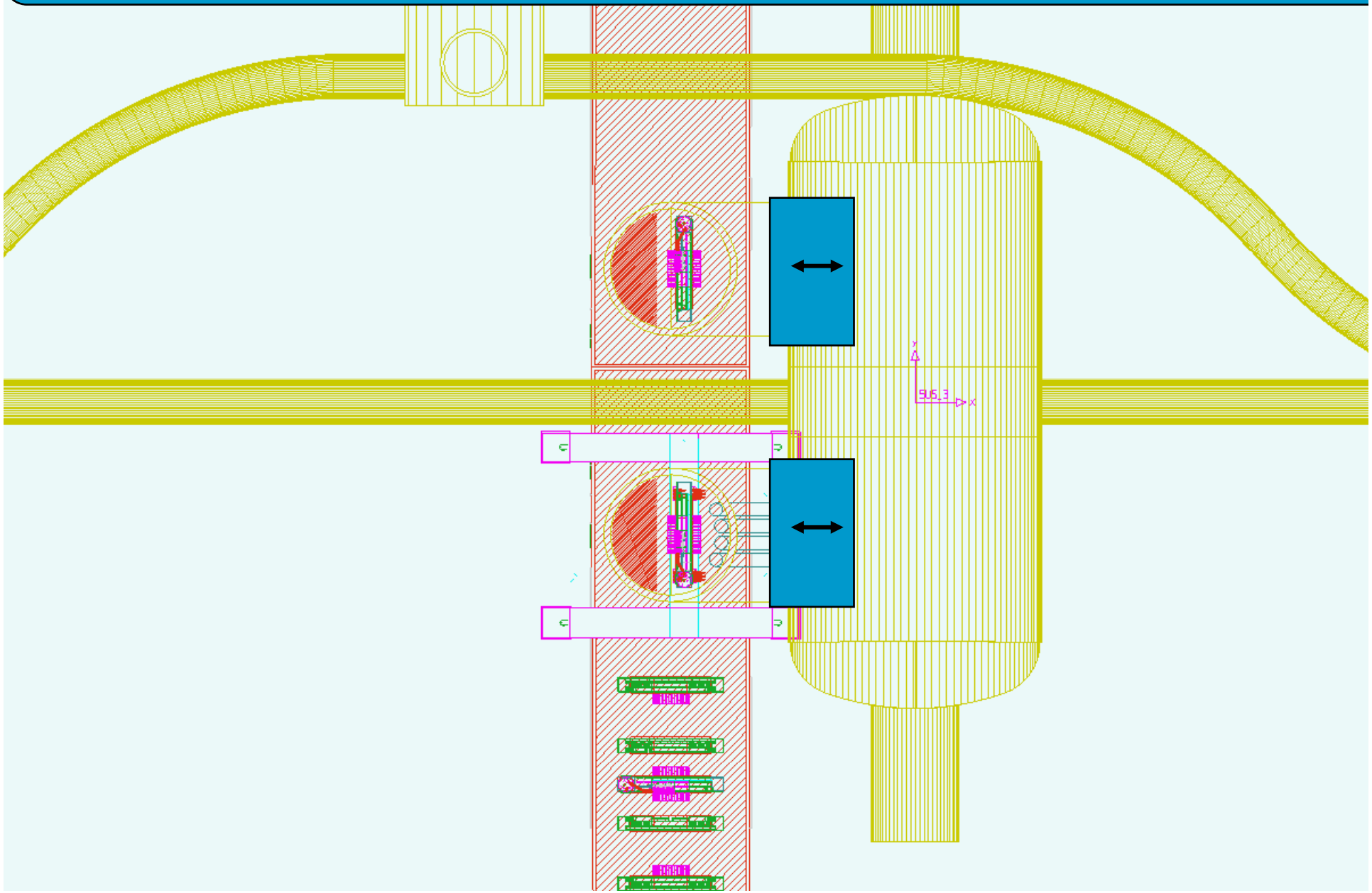

*** PASSAGE EN N
Utilities at both ends of Hall
Small service caverns for cooling and ventilation skids, transformers..
See Andrea Gaddi's talk at 16:50 today

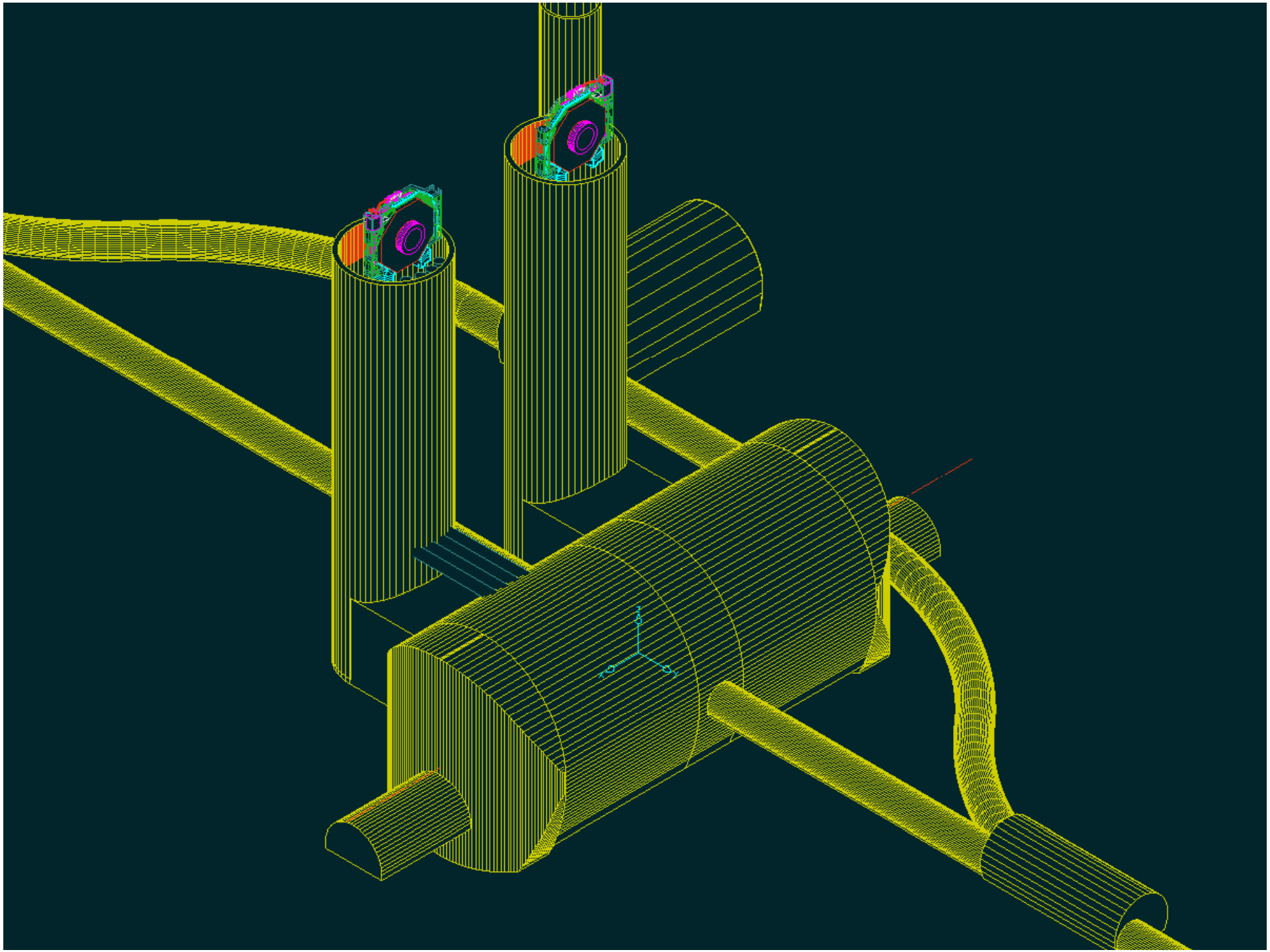
Two Large Shafts - Phase I

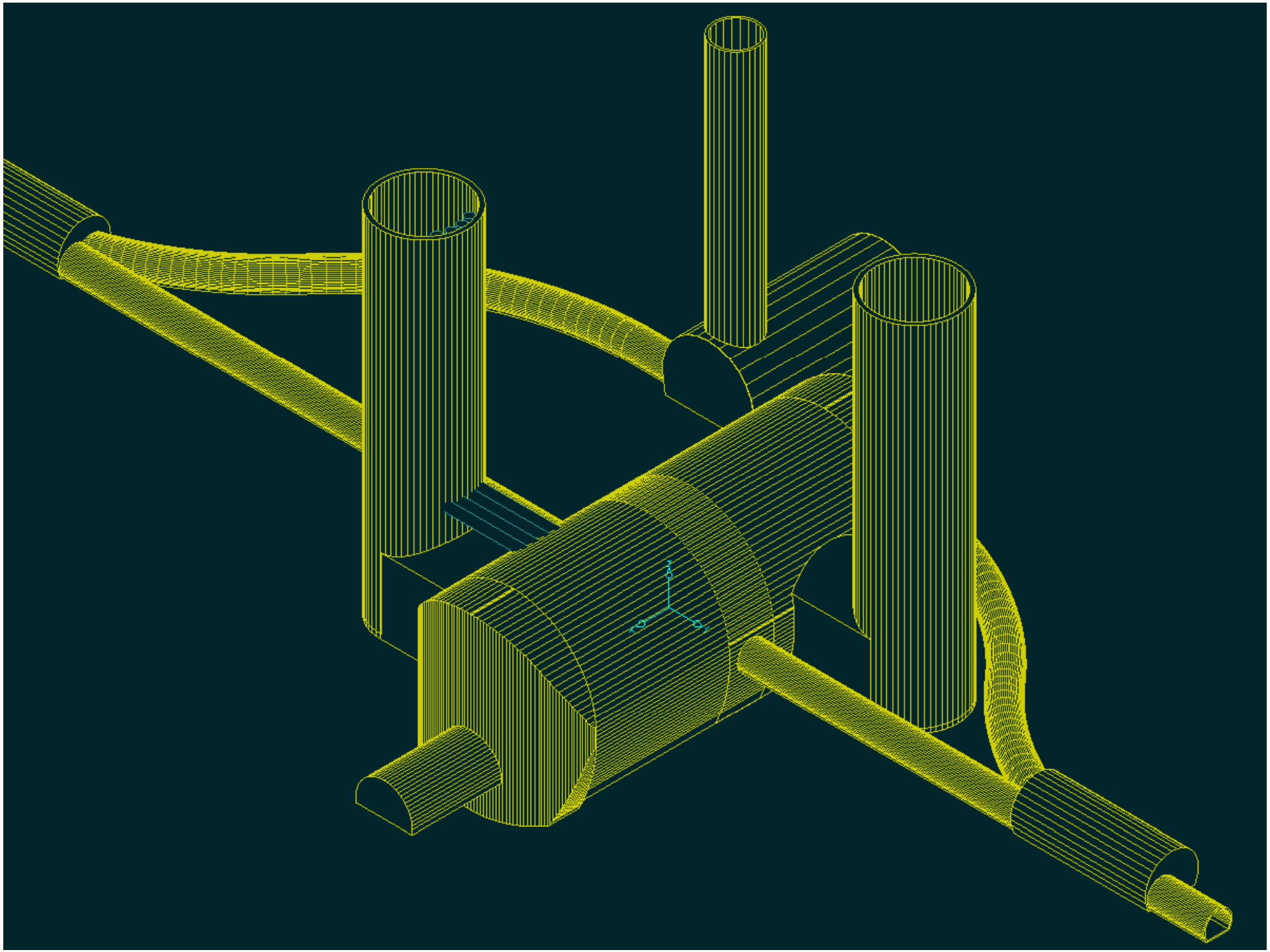


CMS – Surface buildings

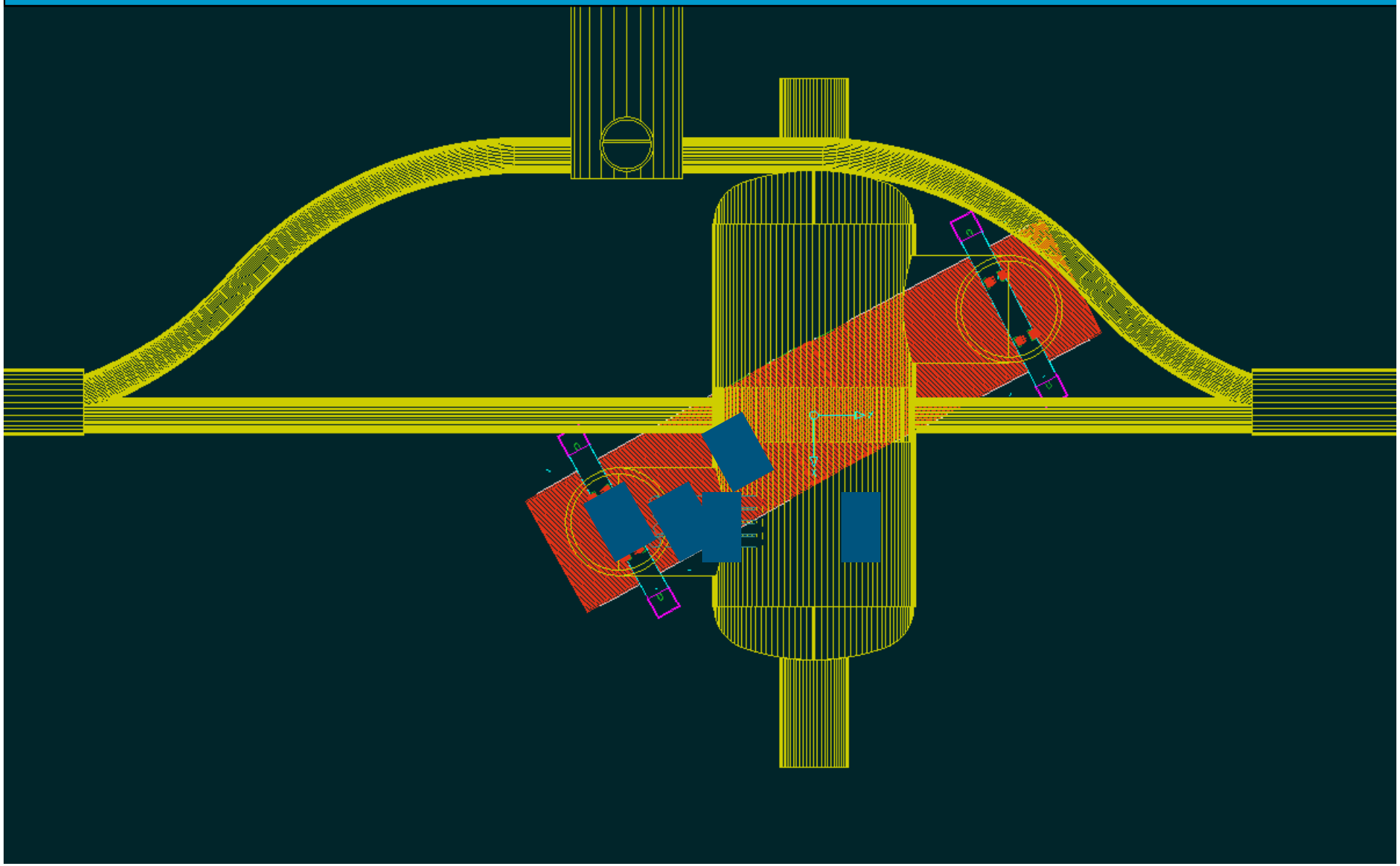
Two Large Shafts - Phase II

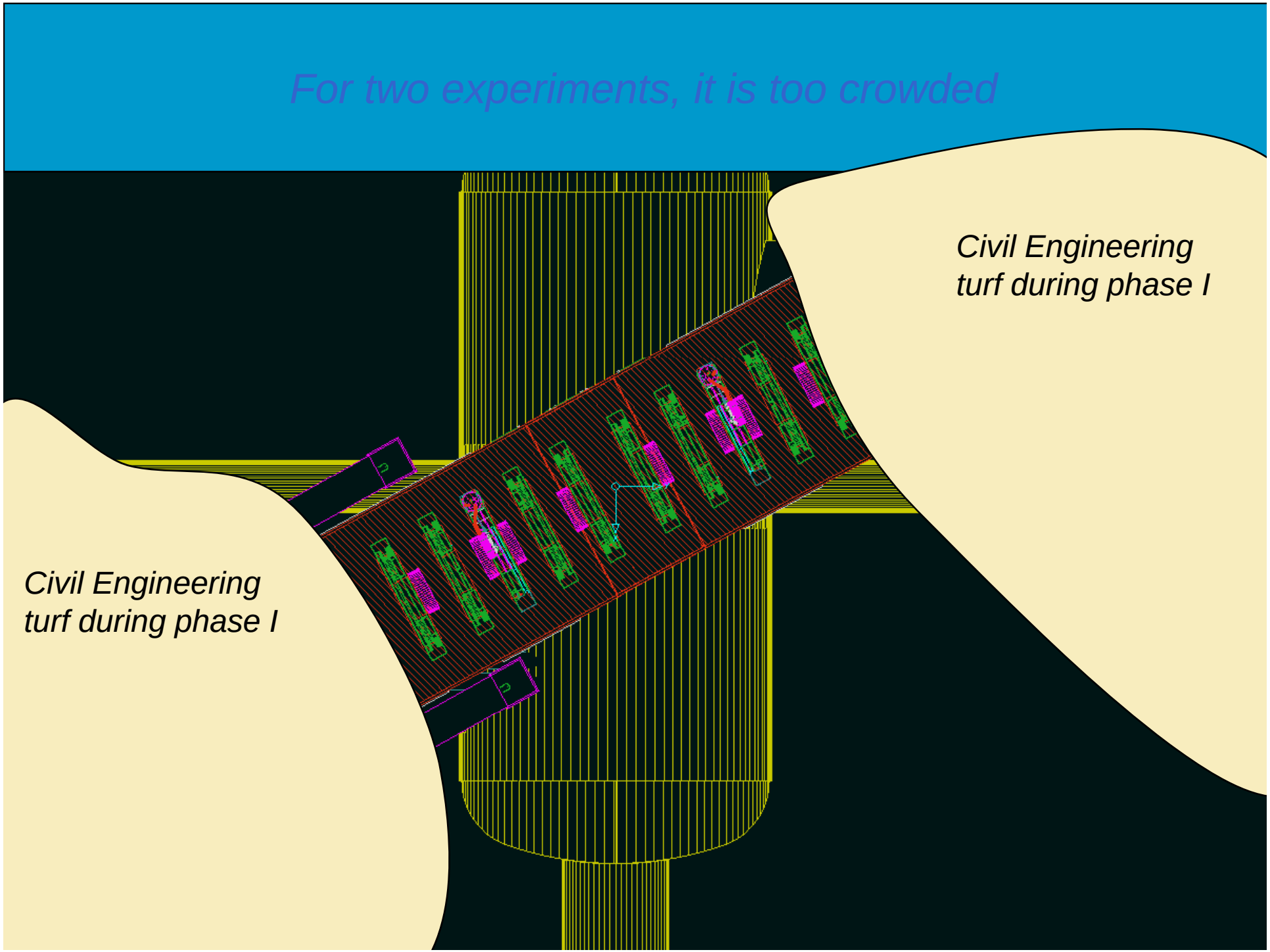




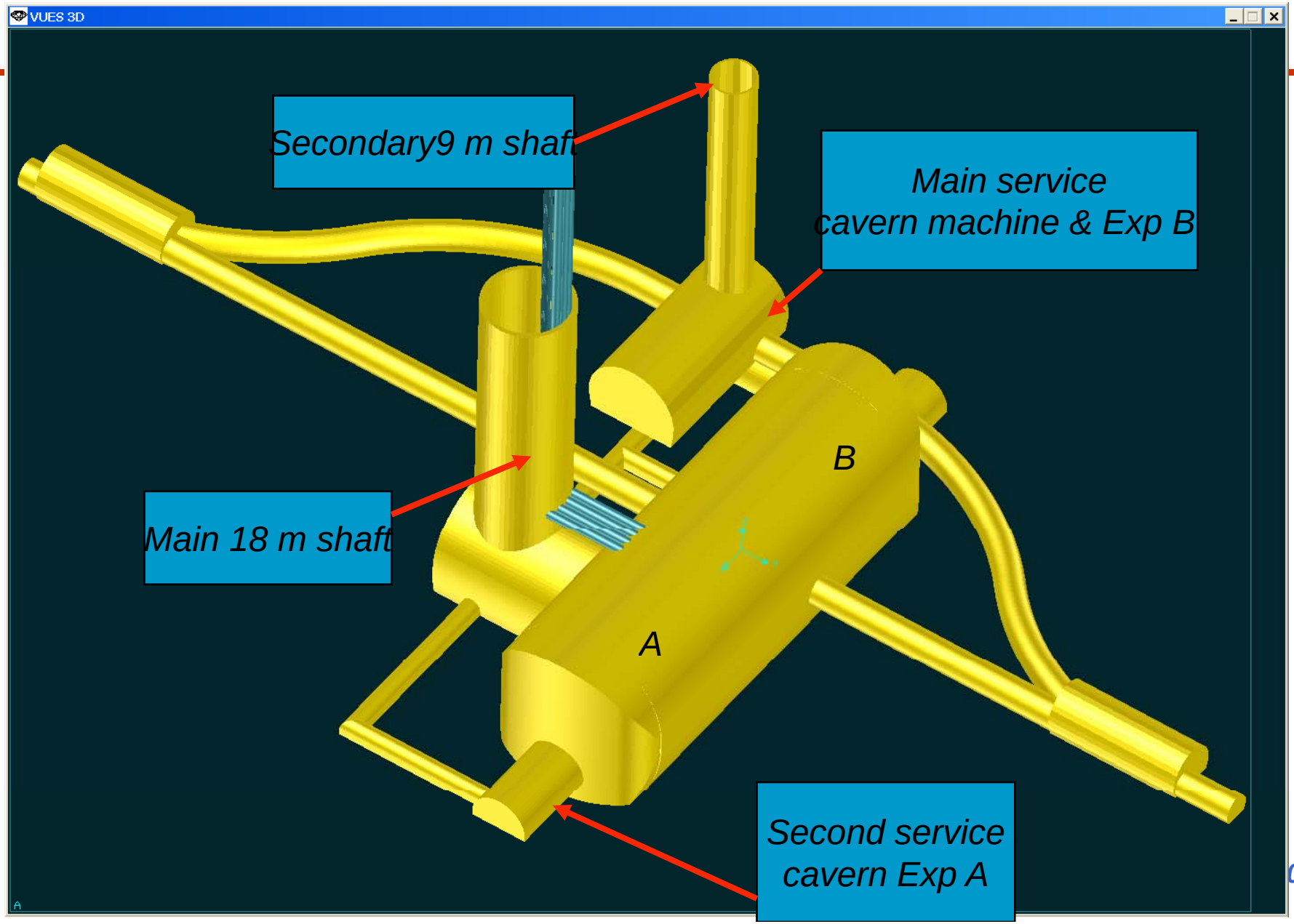


Elements could be lowered at an angle and rotated in the Transfer Tunnel

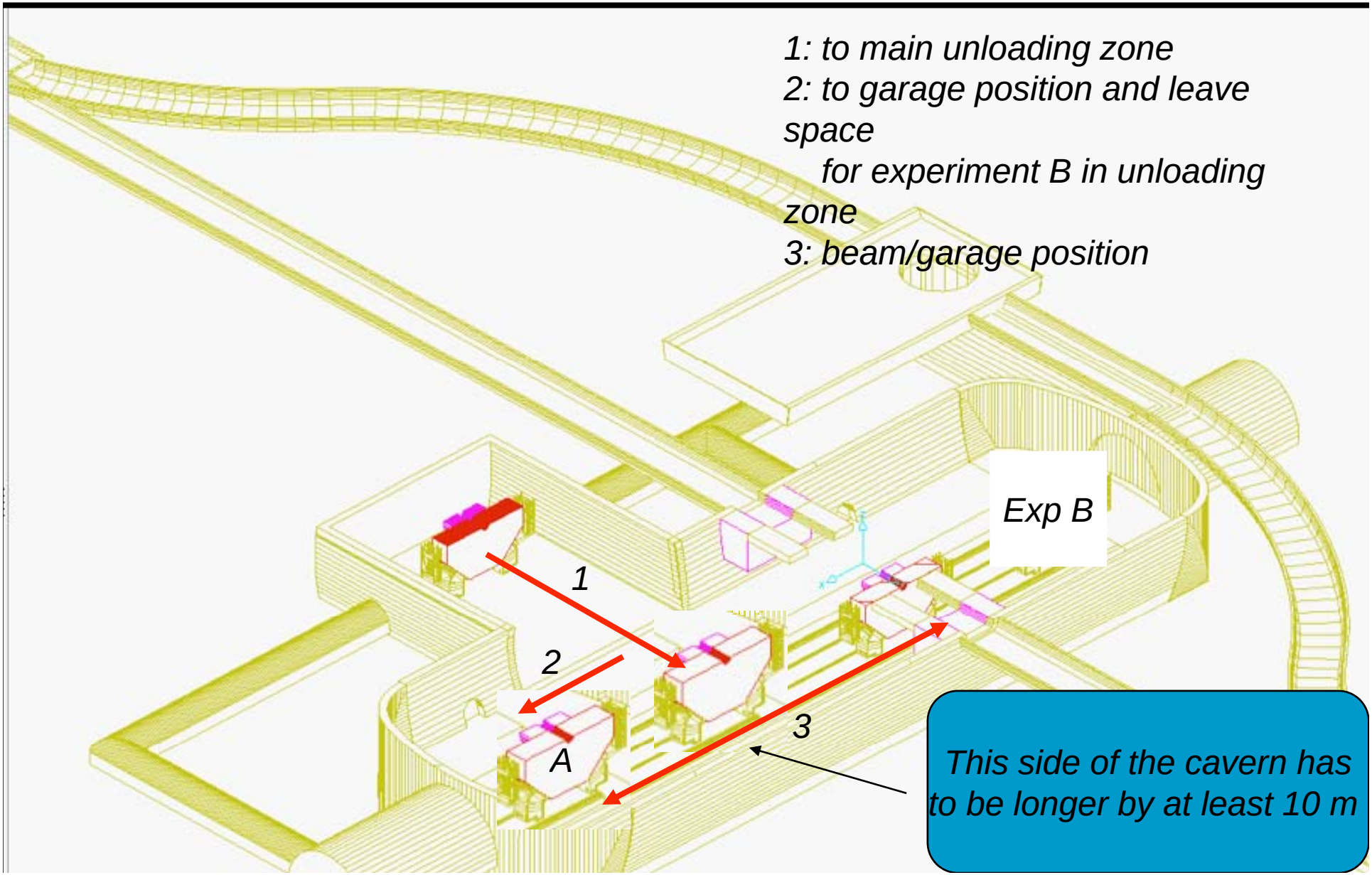



For two experiments, it is too crowded
Civil Engineering
turf during phase I
Civil Engineering
turf during phase I

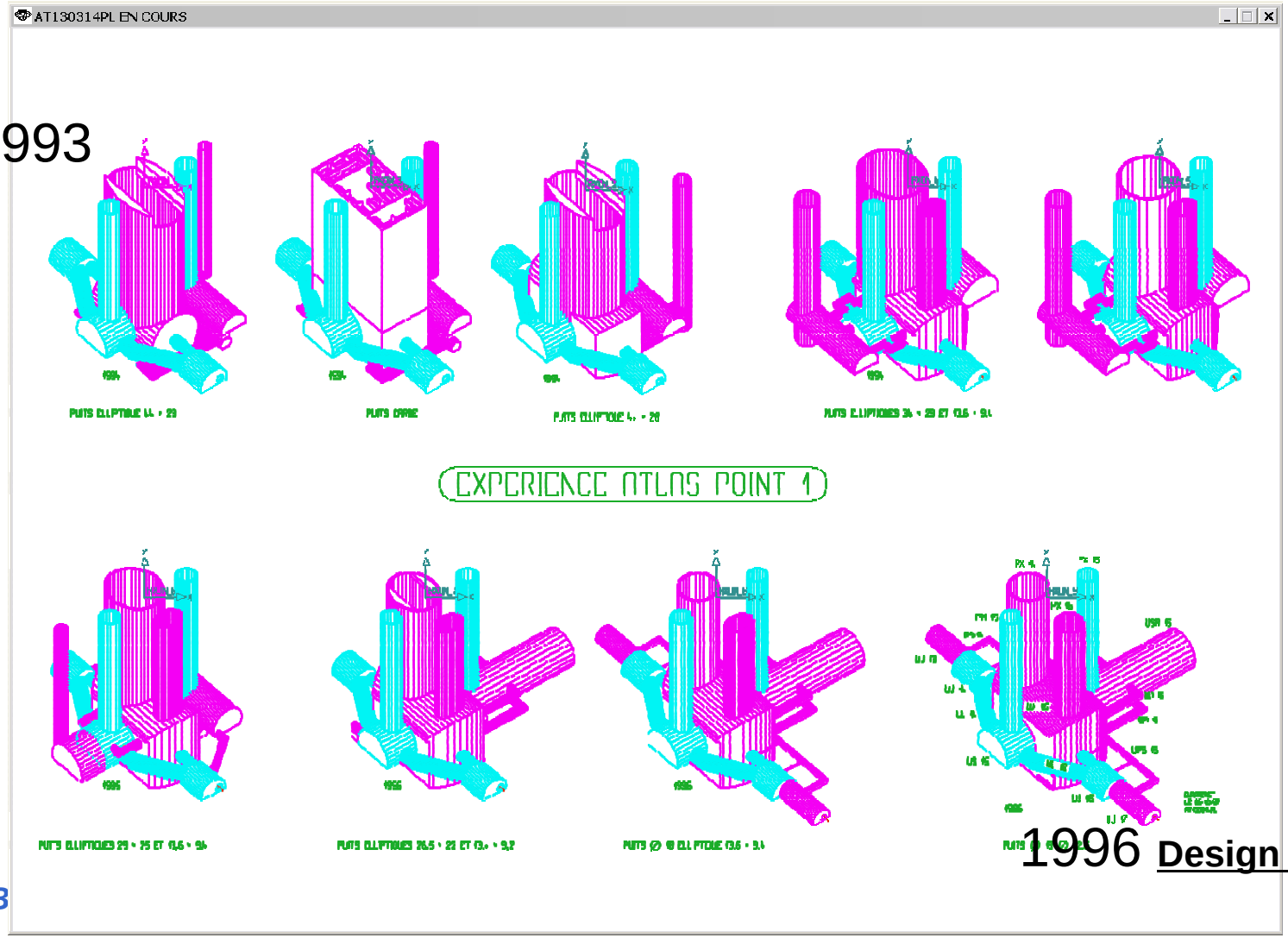
One Large Shaft - General view



Movements of Experiment A



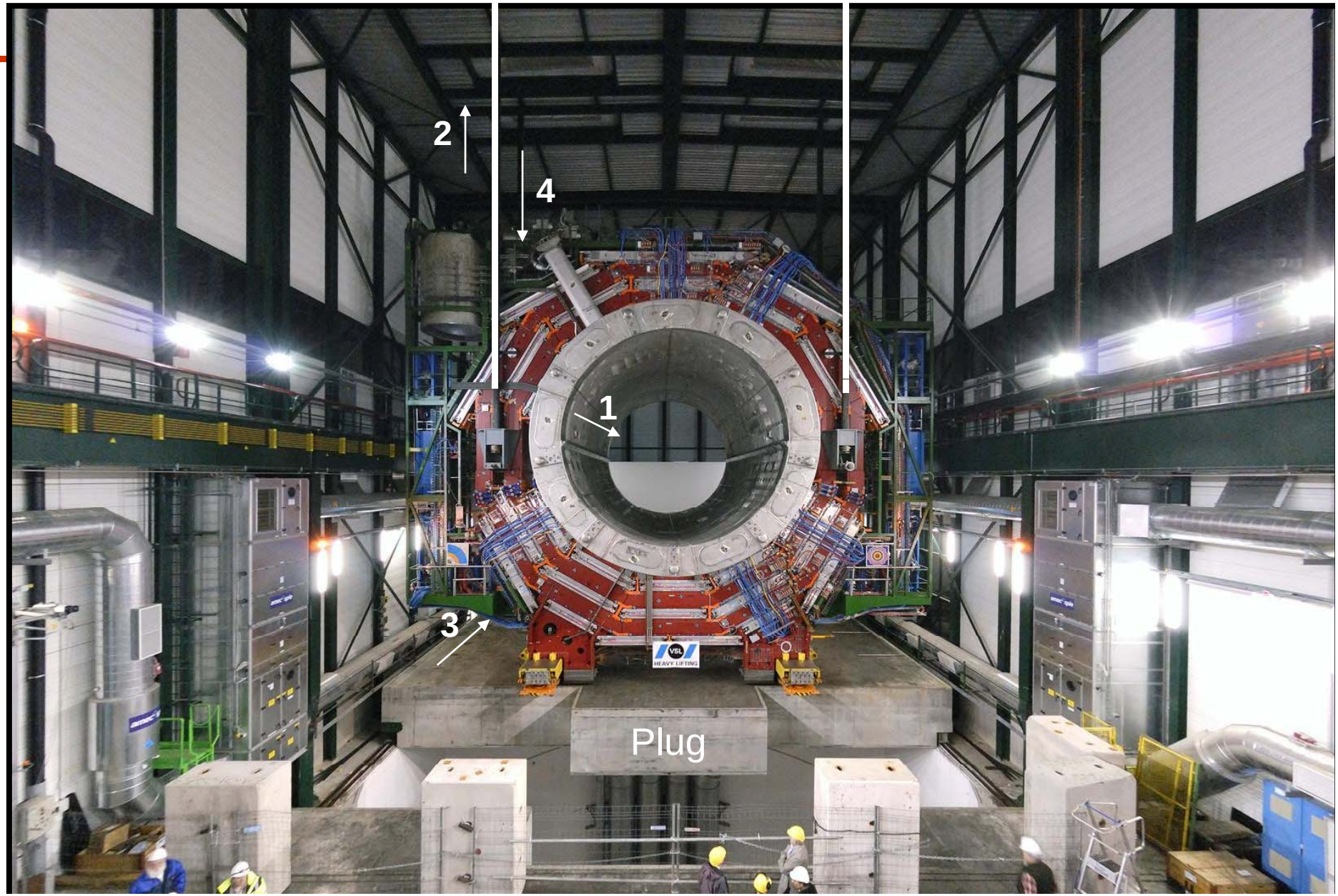
ATLAS design progression for experimental area prior to award of civil engineering contract (Osborne)



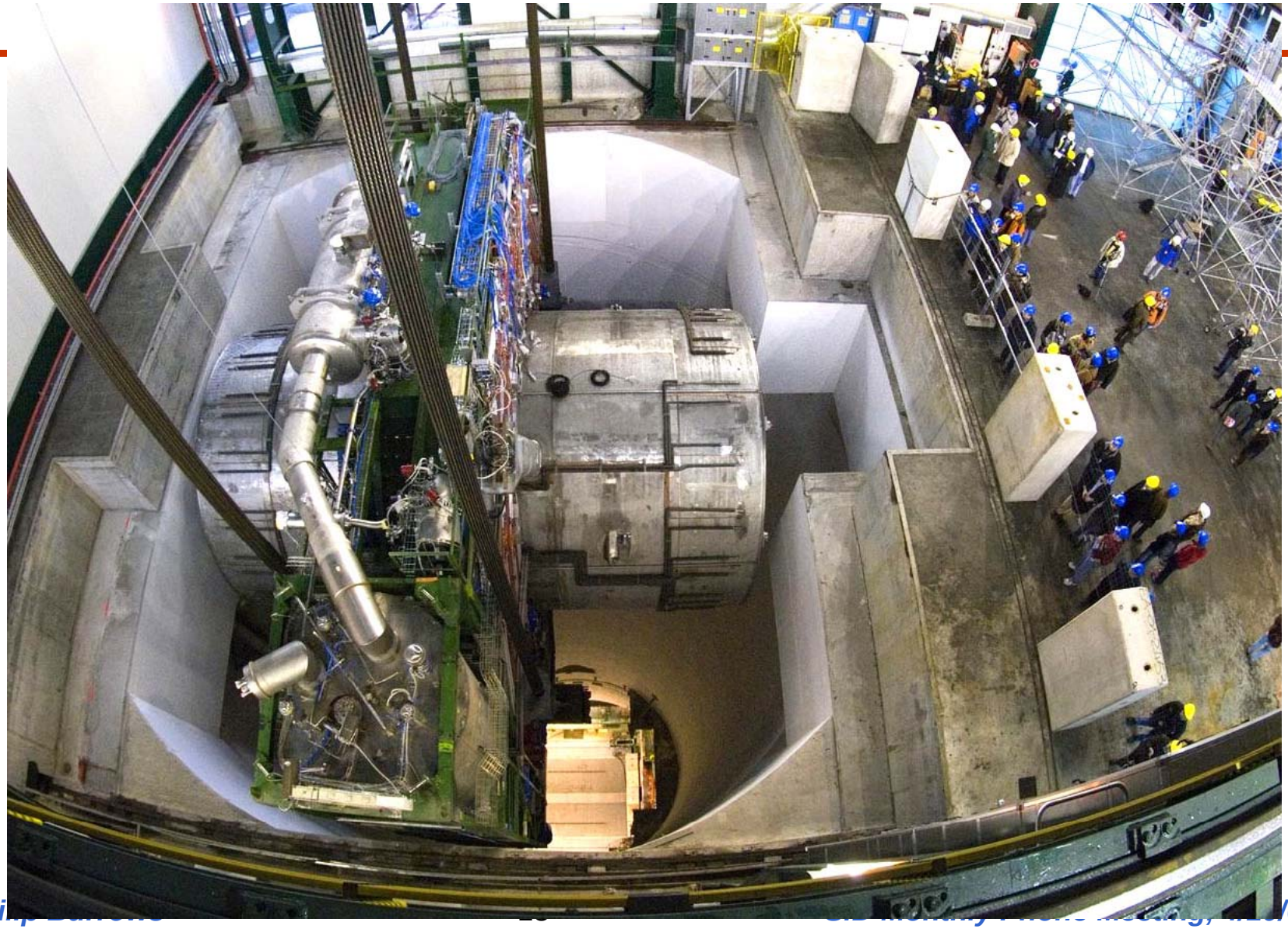
1993

1996 **Design Frozen**

Opening the plug under the 2000-ton load



Heavy Lifting reviewed by Hubert Gerwig



Push-pull (Alain Herve)

- …
- Exchange must be done quickly, say in three days.
- Goals are ambitious, however, I concluded that they can be met, but this cannot be for free.
- Part of the saving from doing away with a second IR will have to be invested to provide a well-engineered, efficient and safe push-pull system.
- …
- The ‘larger detector’ will drive the requirements …

Moving platform (Herve)

- **To move quickly and safely a 12’000-ton (or so) large composite object is not easy and a dedicated platform would do the trick.**
- **The two experiments will certainly be two projects largely independent from the machine, in organization and financing.**
- **It is thus very important to provide a well-defined interface from which all parties can design with different time scales (Civil Engineering needs to go in construction earlier than experiments).**
- **The platform would allow the detector to be commissioned in the garage position and moved in a nearly working state towards IP.**

… And a clear interface for organization

- **Collaboration could be responsible for opening, maintening, closing, and operating its experiment above the platform**
- **ILC machine could be responsible for moving the platform carrying a detector to the beam position, and from it to the garage positions.**
- **Mainly beam line would need to be re-connected (and re-aligned), in a common effort.**

Concrete platform example

- **See John Amman's talk**

A 2'500-ton load on the CMS cover : 20 m between supports and 3 mm sag

Expected Cavern Movements (Osborne)

For example for ATLAS Cavern* predictions :

- **Up to 2mm settlement after floor concreting**
- **Up to 5.5mm settlement predicted after ATLAS in place (during first 6 months)**
- **In the order of 1mm uplift per year thereafter**

Monitoring of cavern movements on-going.

These factors need to be considered at an early stage in detector/machine designs

***Extract from CERN EDMS Doc. *ATC-T-ER-0004* by C.Lasseur, D. Lissauer, M.Hatch**

Progress on many other issues …

Detector services

Temperature / humidity distributions in IR hall – stability?

Radiation safety

Personnel safety

PACMAN – see GLDC

Push-pull: platforms? Air pads? Rollers?

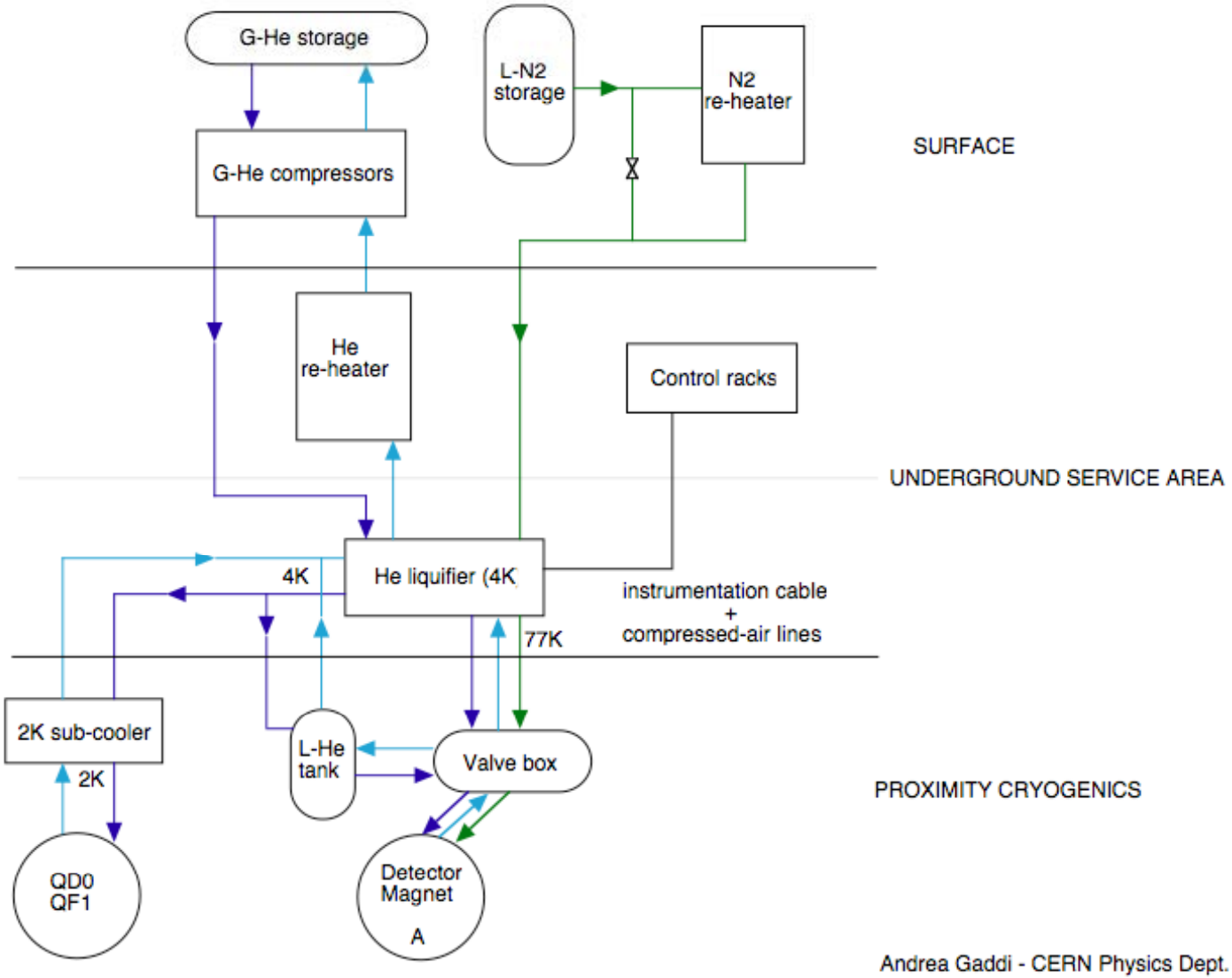
Detector installation / access / door opening

Alignment of detector, esp. after push-pull? Movers?

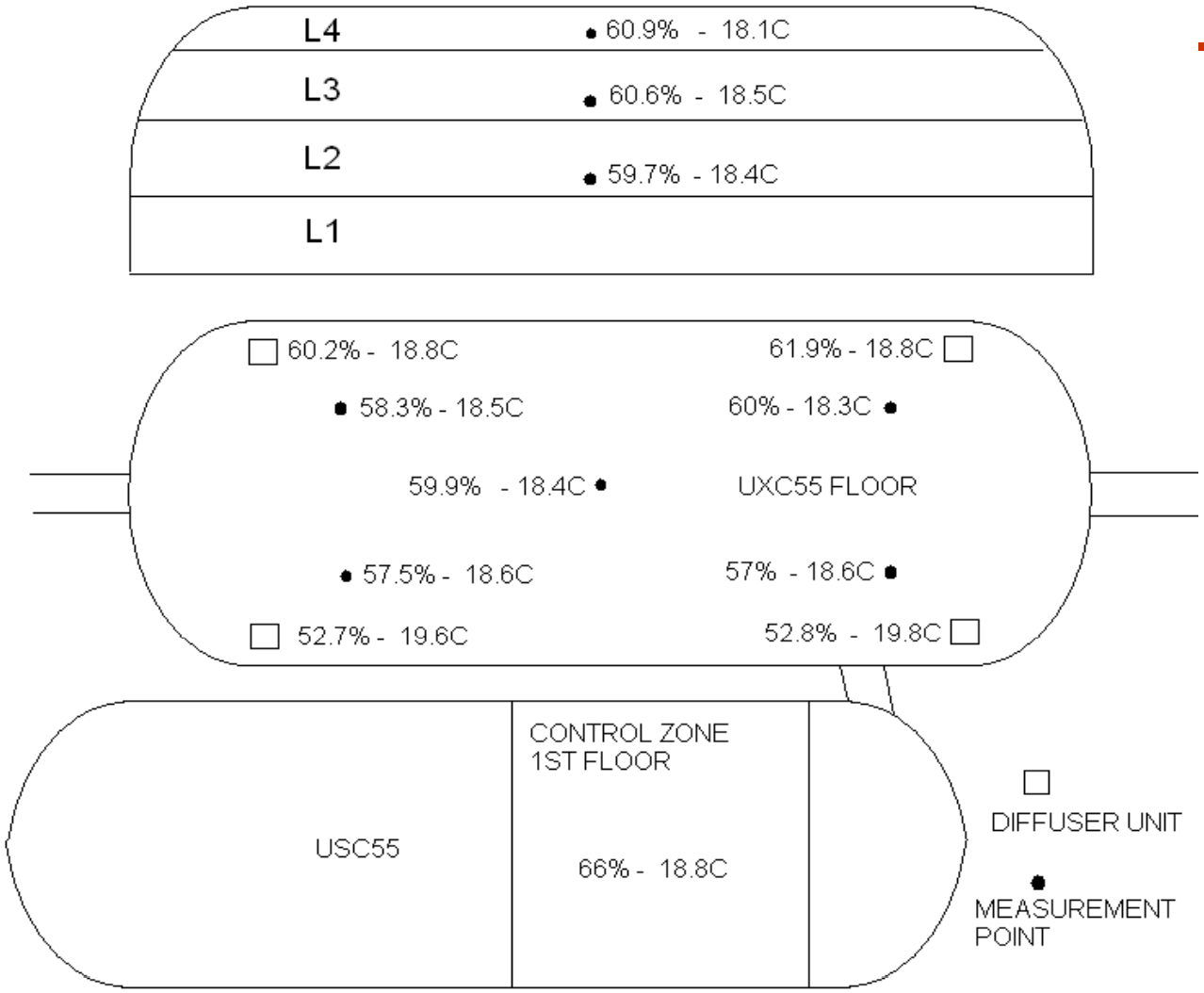
Inner IR design:

- **beampipe, QD0 cryostat + cryolines, vacuum, FB BPM …**
- **‘emerging consciousness’ on cables, electronics …**

Cryogenics block diagram (Gaddi)

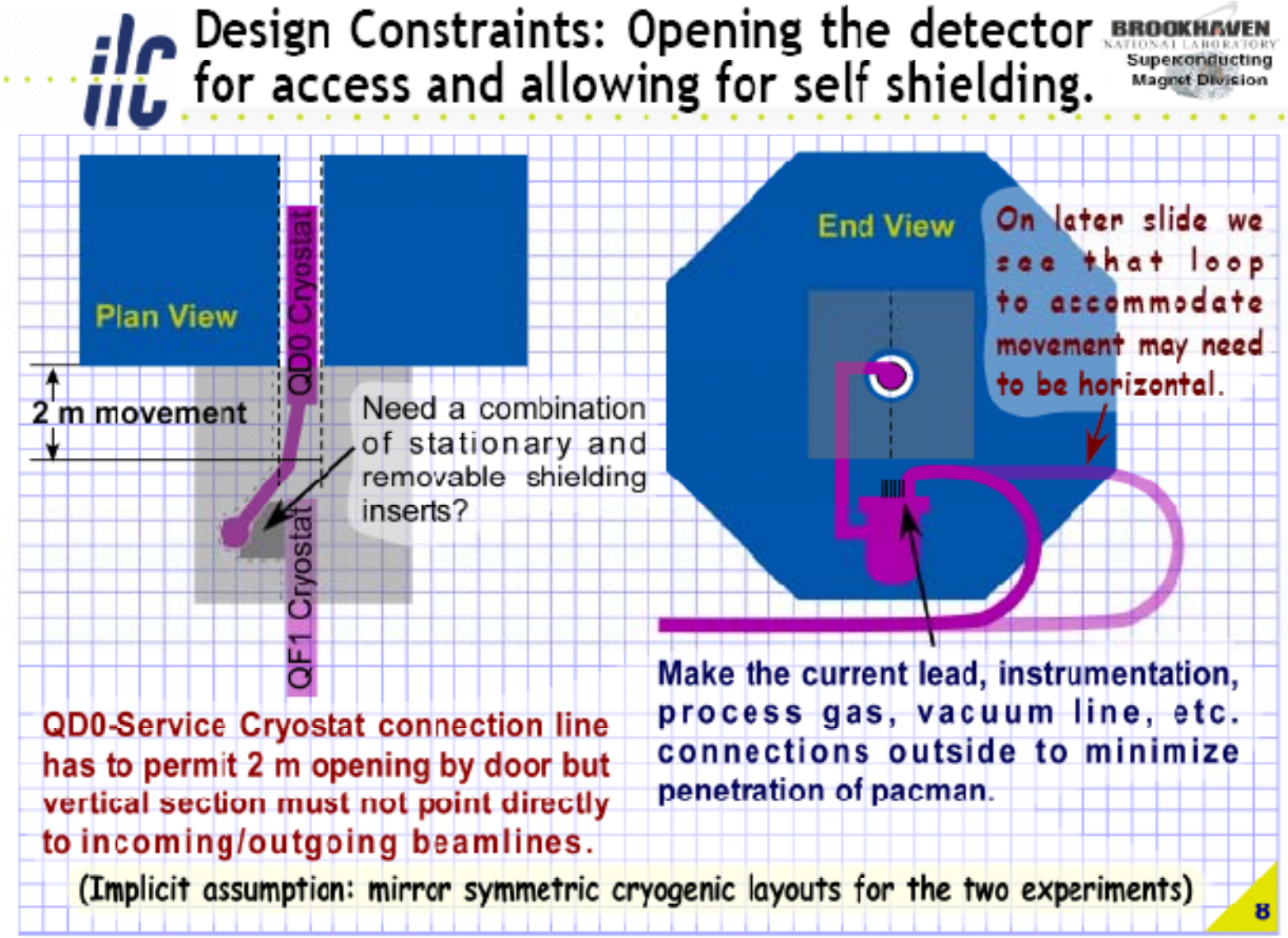


Temperature/humidity distribution – CMS (Gaddi)

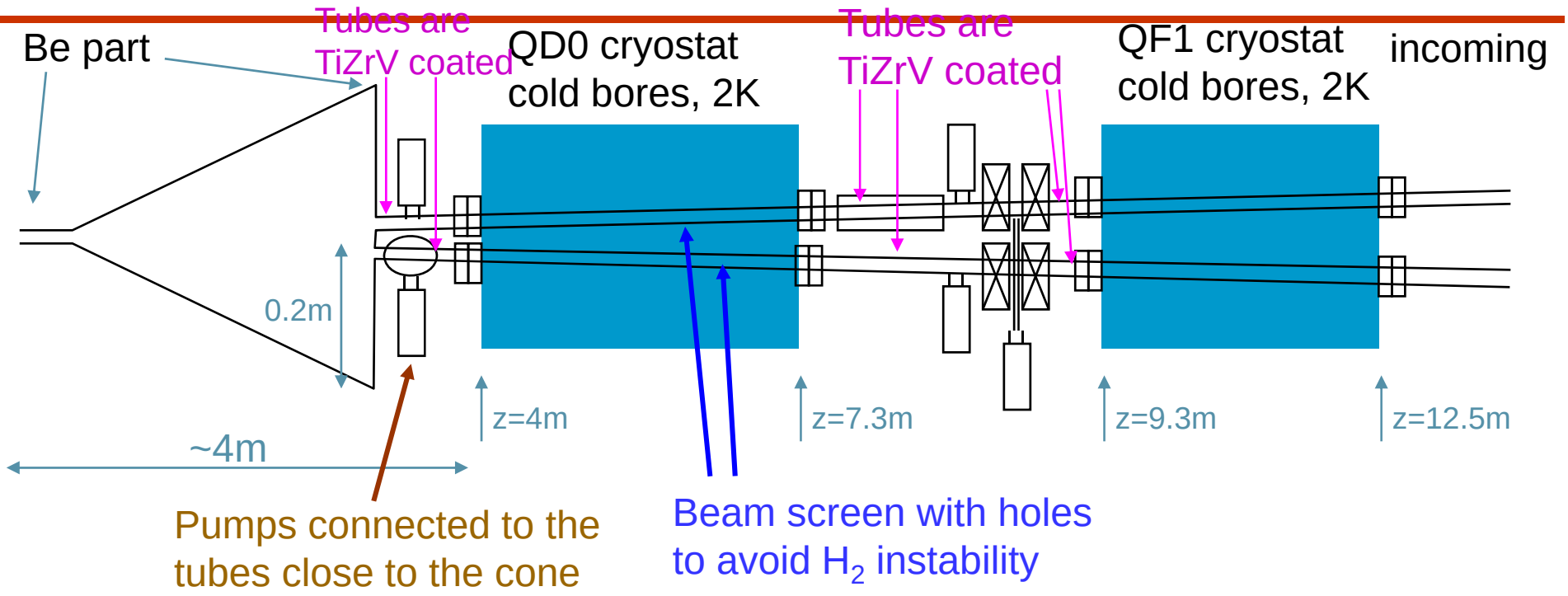


POINT 5 CAVERN TEMPERATURE/HUMIDITY VALUES
DATE 19/09/06 RECORDED BY: RDE
TIME 14:00

QD0 cryolines w. door opening (Parker)



Vacuum considerations (Malyshev)



Hall Parameters - Length around 90 m