



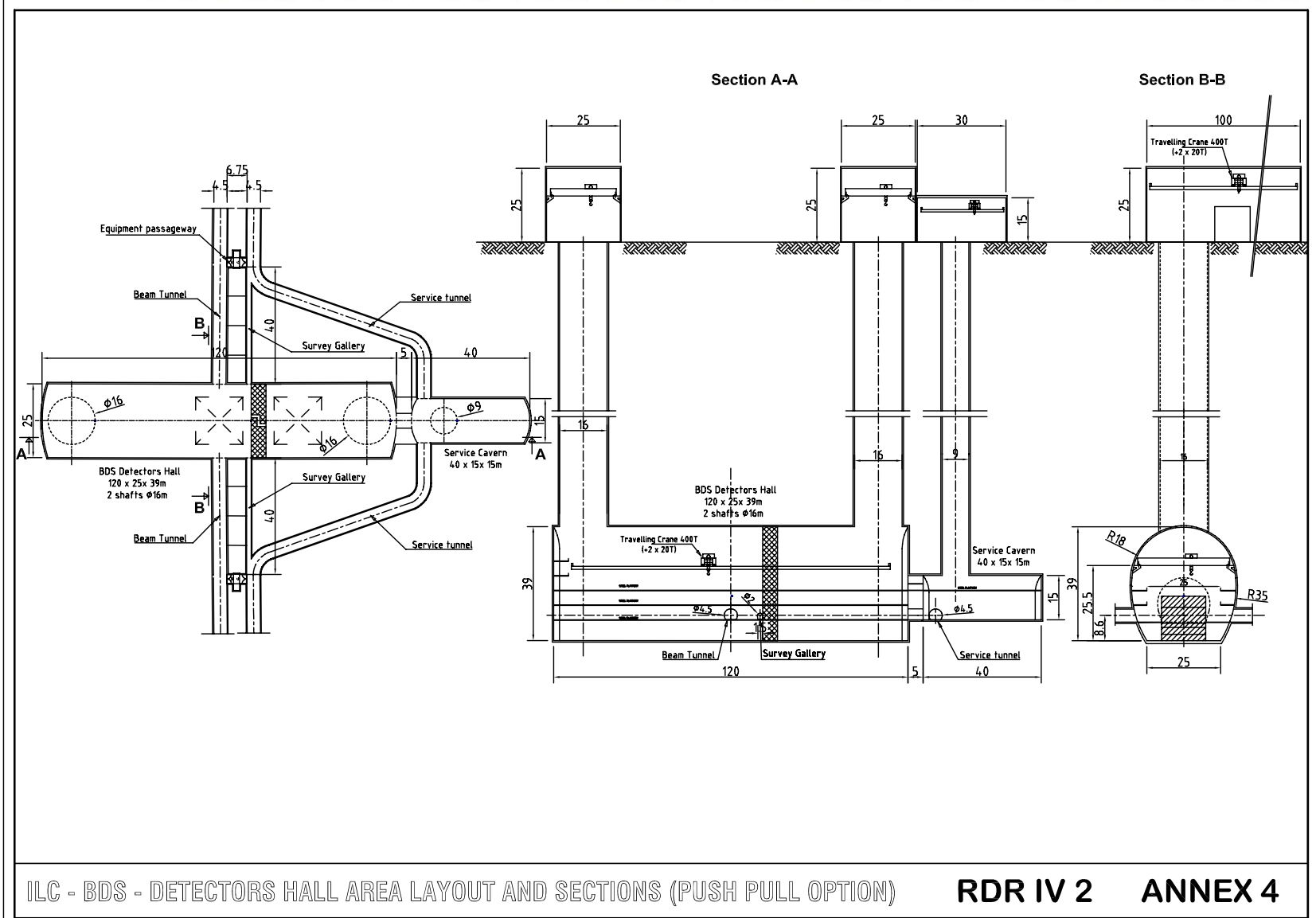
# Possibilities for optimization of conventional construction of IR hall and external systems for push-pull IR

BDS - KOM October 12, 2007

Atsushi Enomoto, Vic Kuchler, John Osborne for CF&S Team  
+ A.Herve (CMS)



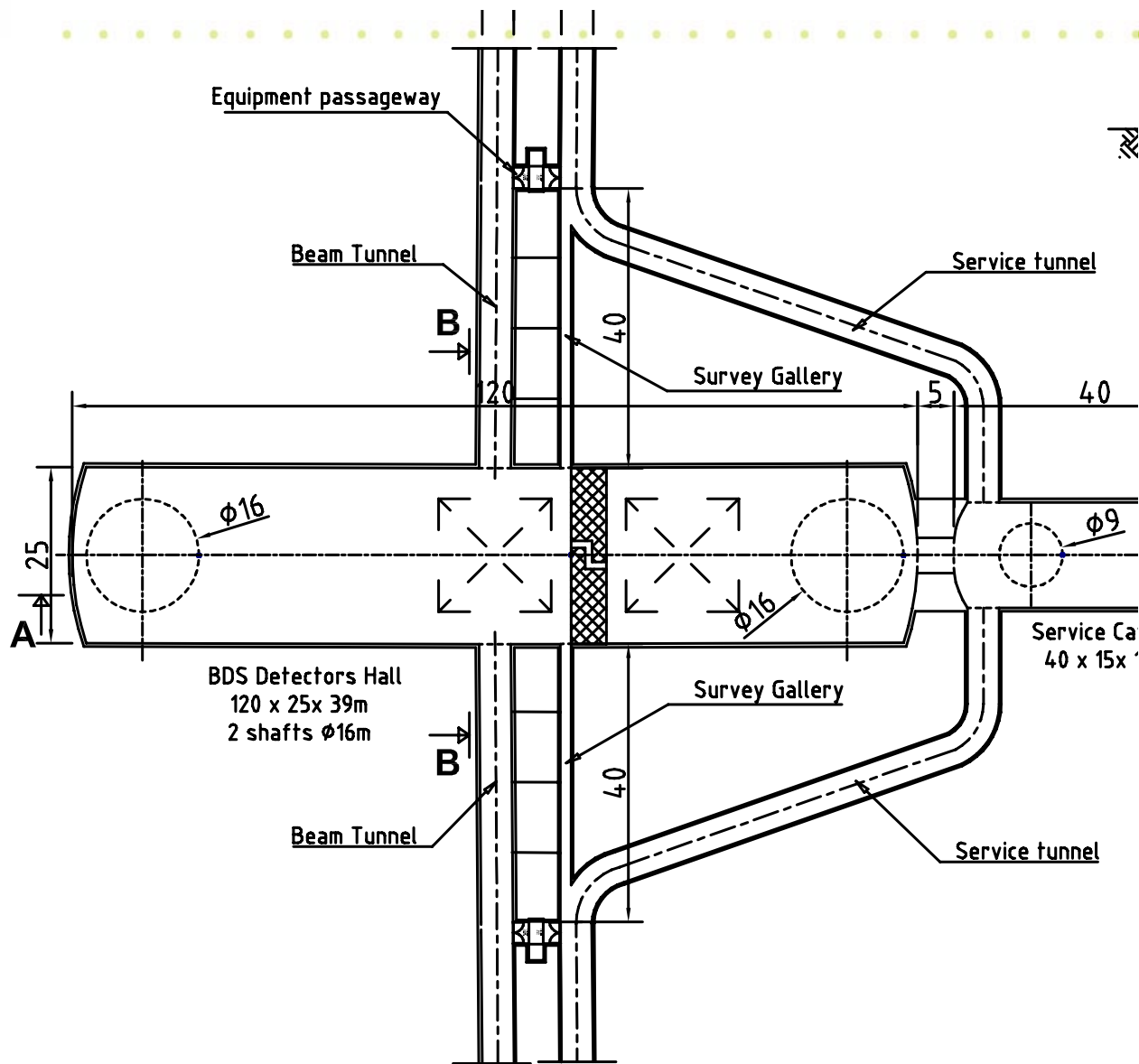
- Contents :
  - RDR Baseline
  - IR Cavern Cross Section
  - Two Shaft Diagonal Option
  - Additional Access Shaft Option
  - Conclusions



ILC - BDS - DETECTORS HALL AREA LAYOUT AND SECTIONS (PUSH PULL OPTION)



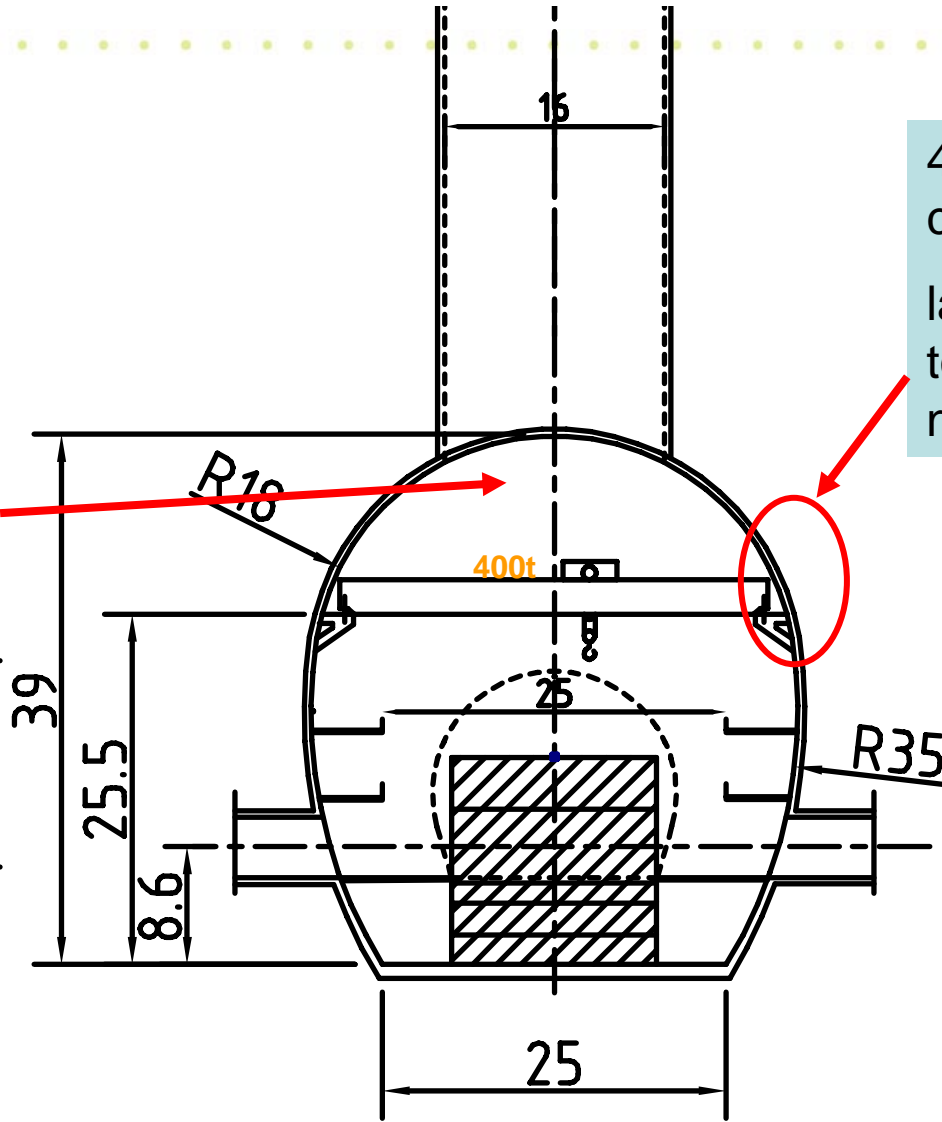
# RDR Baseline Layouts for Interaction Region





# Value Engineering : Reduce height and widen cavern

Lot of lost space



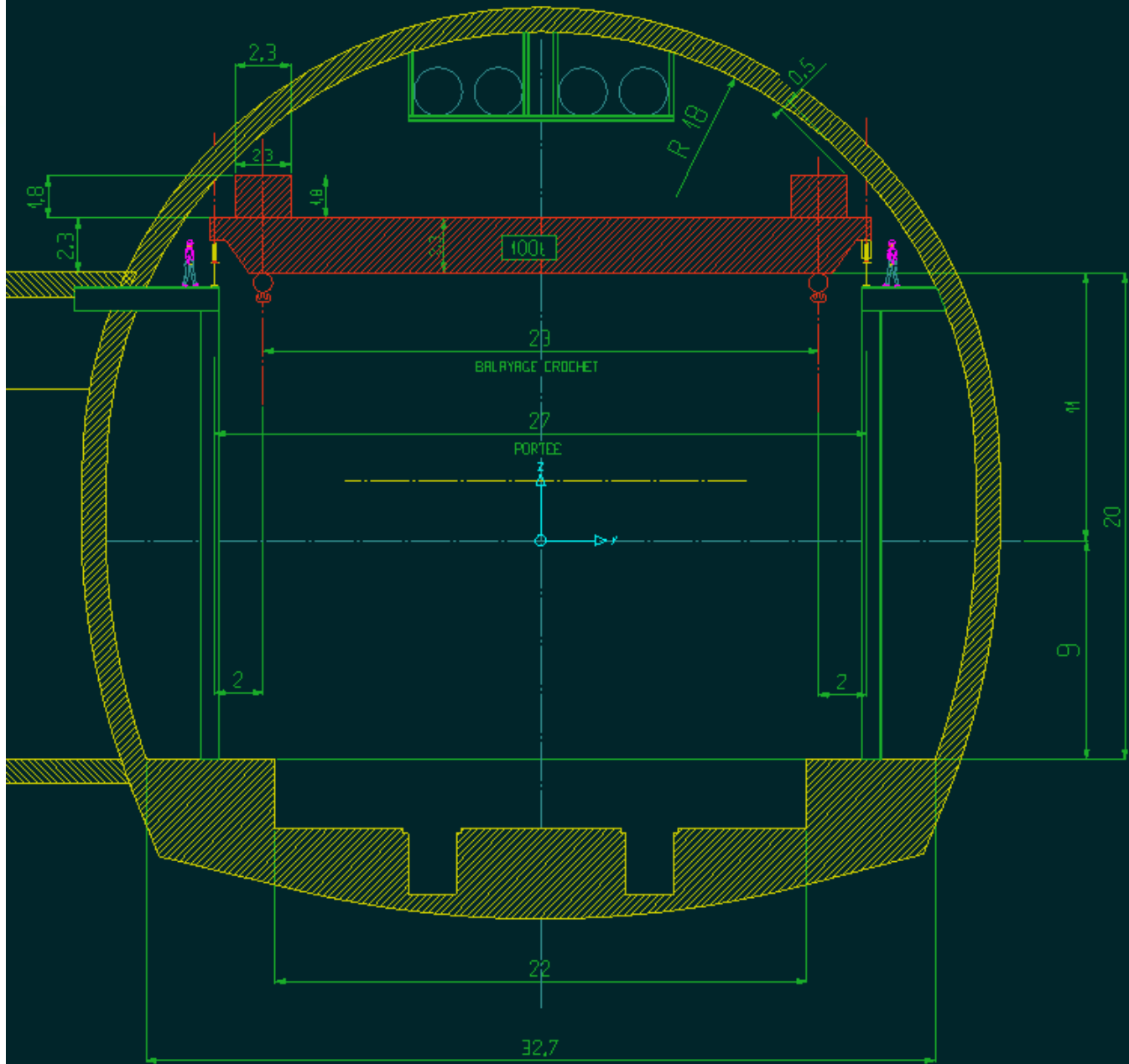
400 ton gantry crane is the cost driver

large steel columns down to floor level would be needed





# Modified CERN layout for cavern, with 100ton crane

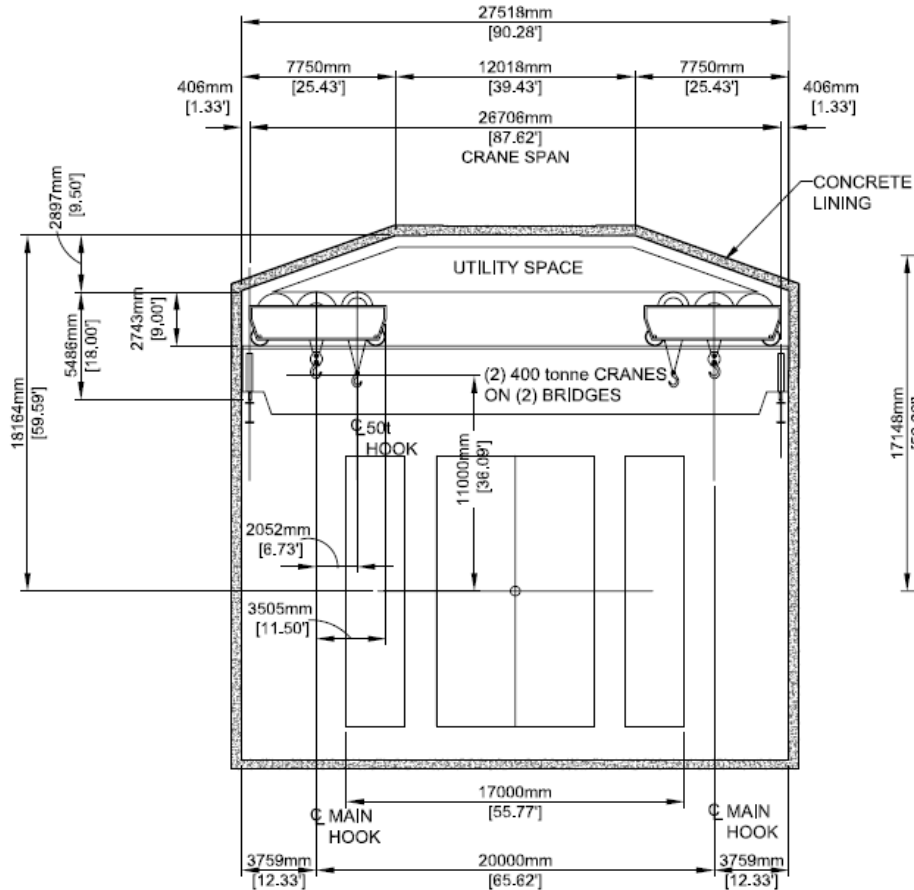




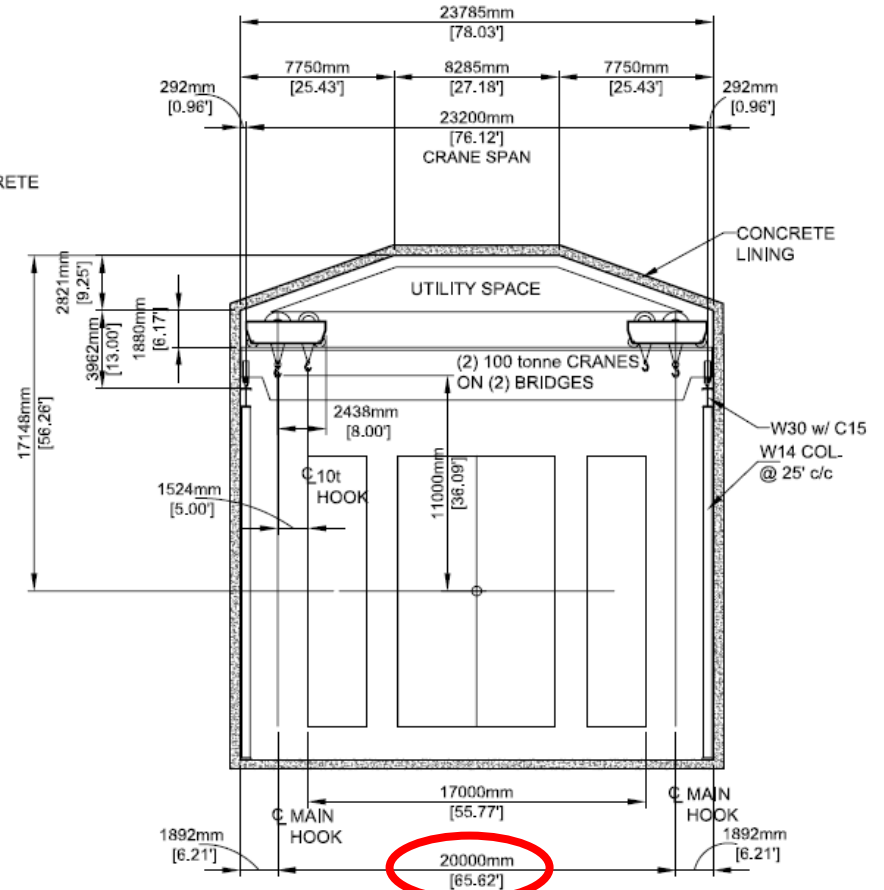




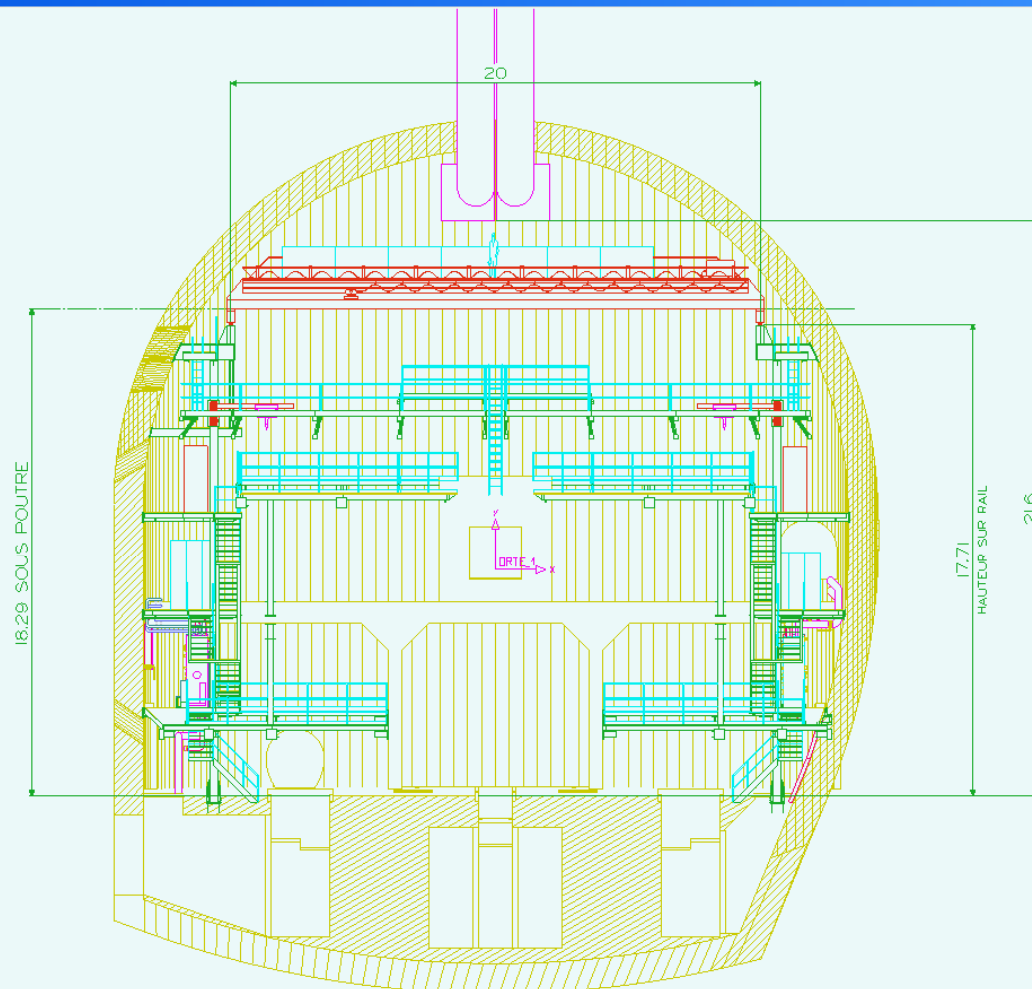
# Fermilab : Experimental Cavern Cross Sections



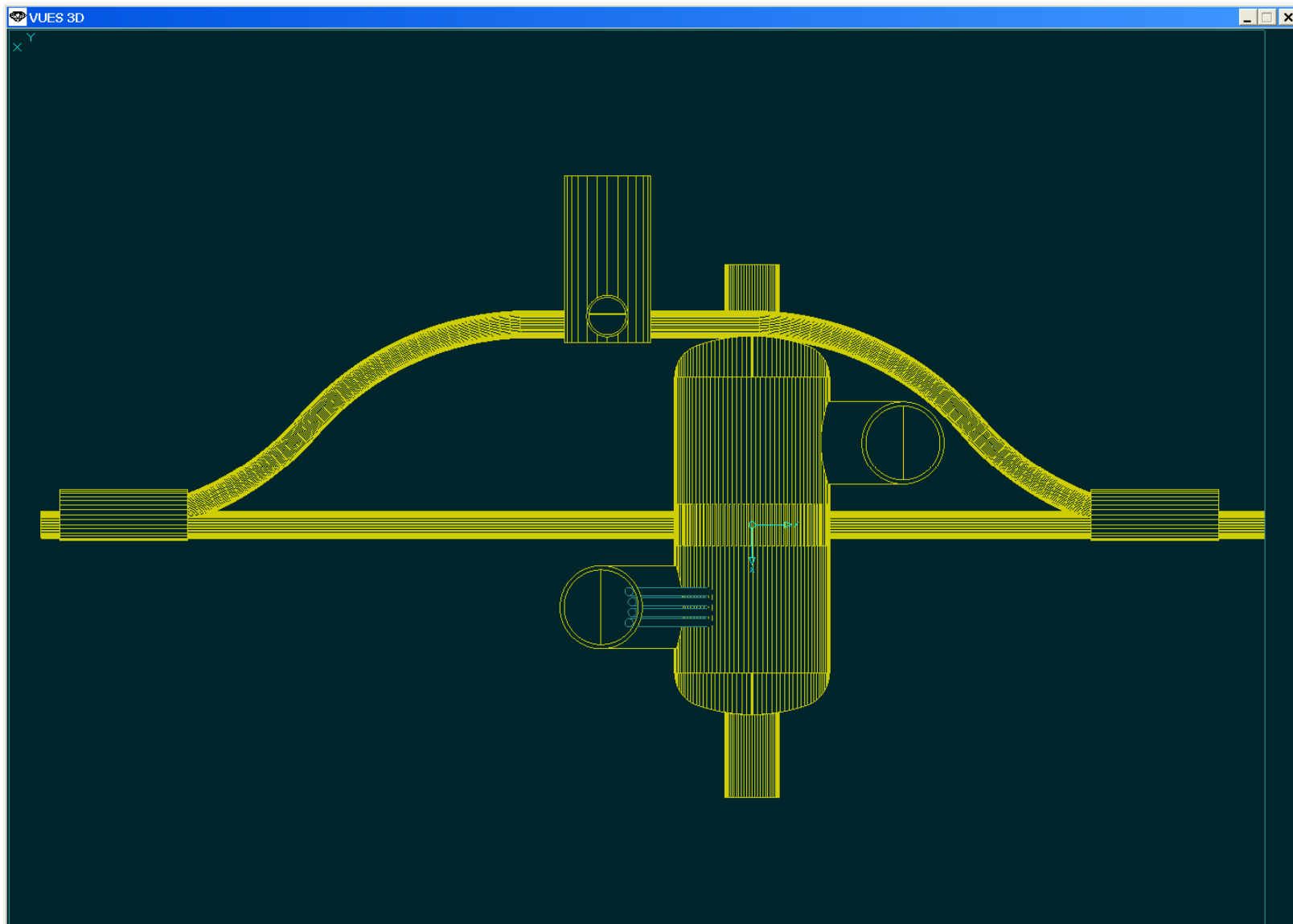
**SECTION @ IR HALL - 400t CRANE**

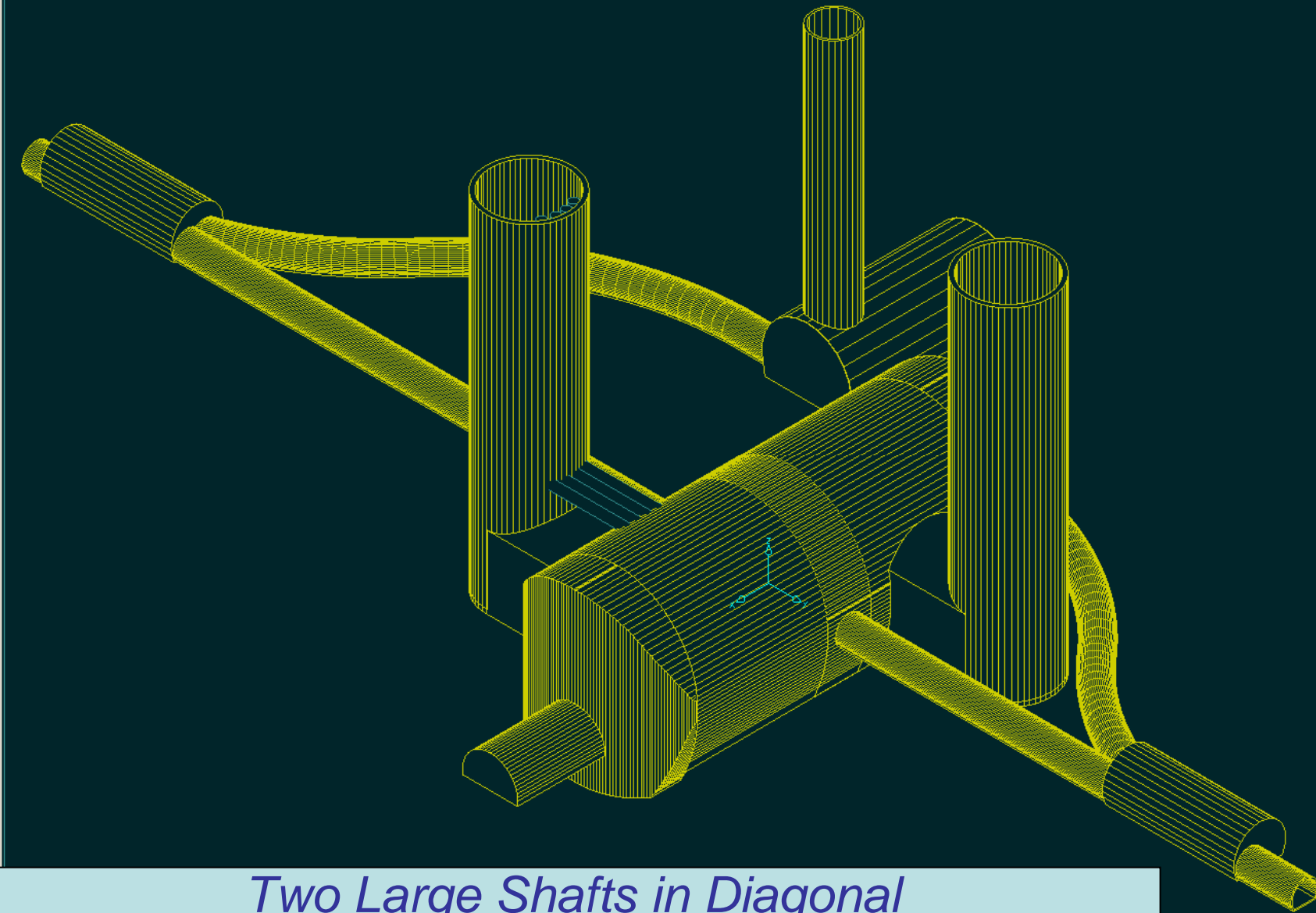


**SECTION @ IR HALL - 100t CRANE**



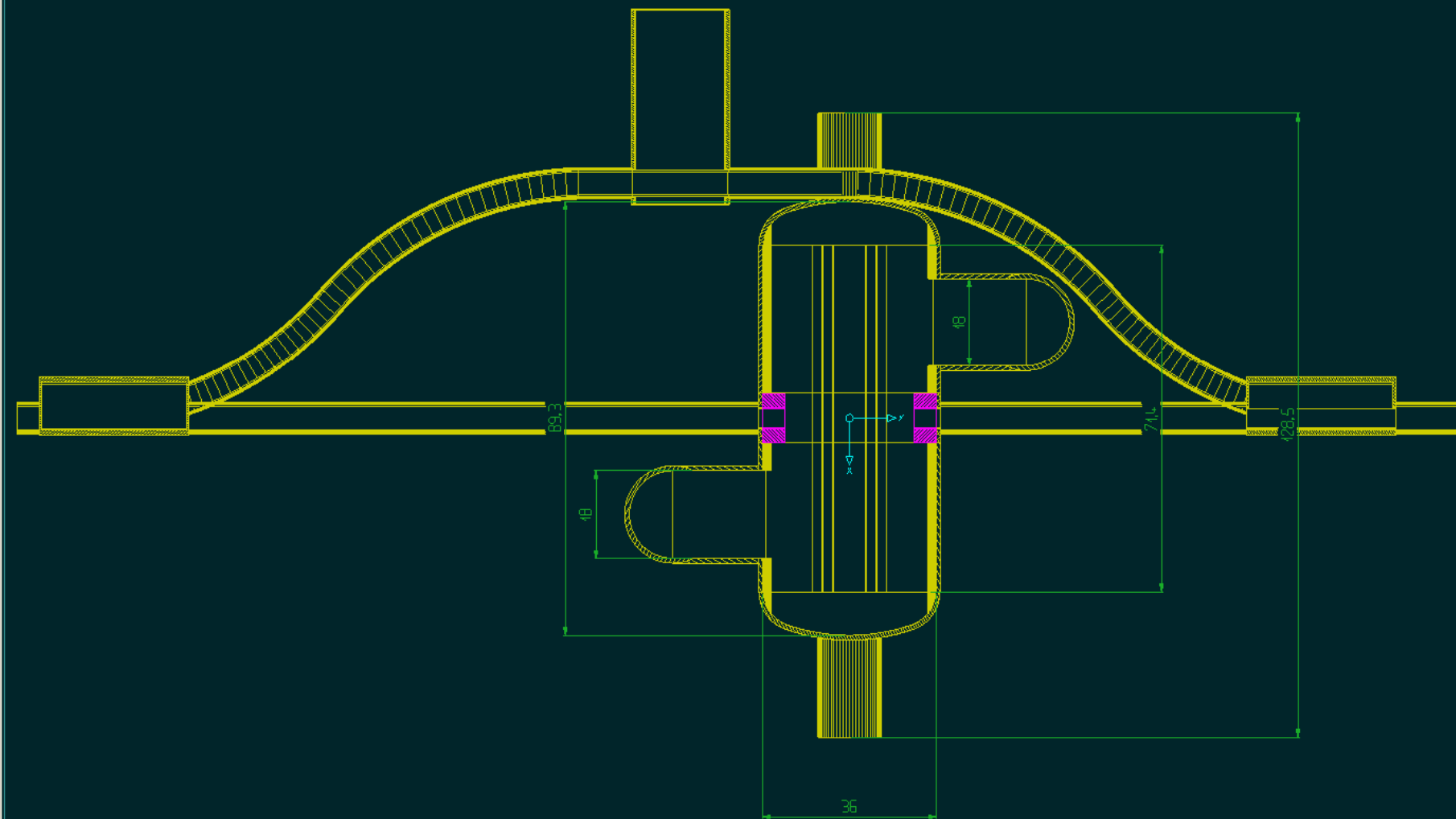
**CMS – 20ton crane with 20m span**

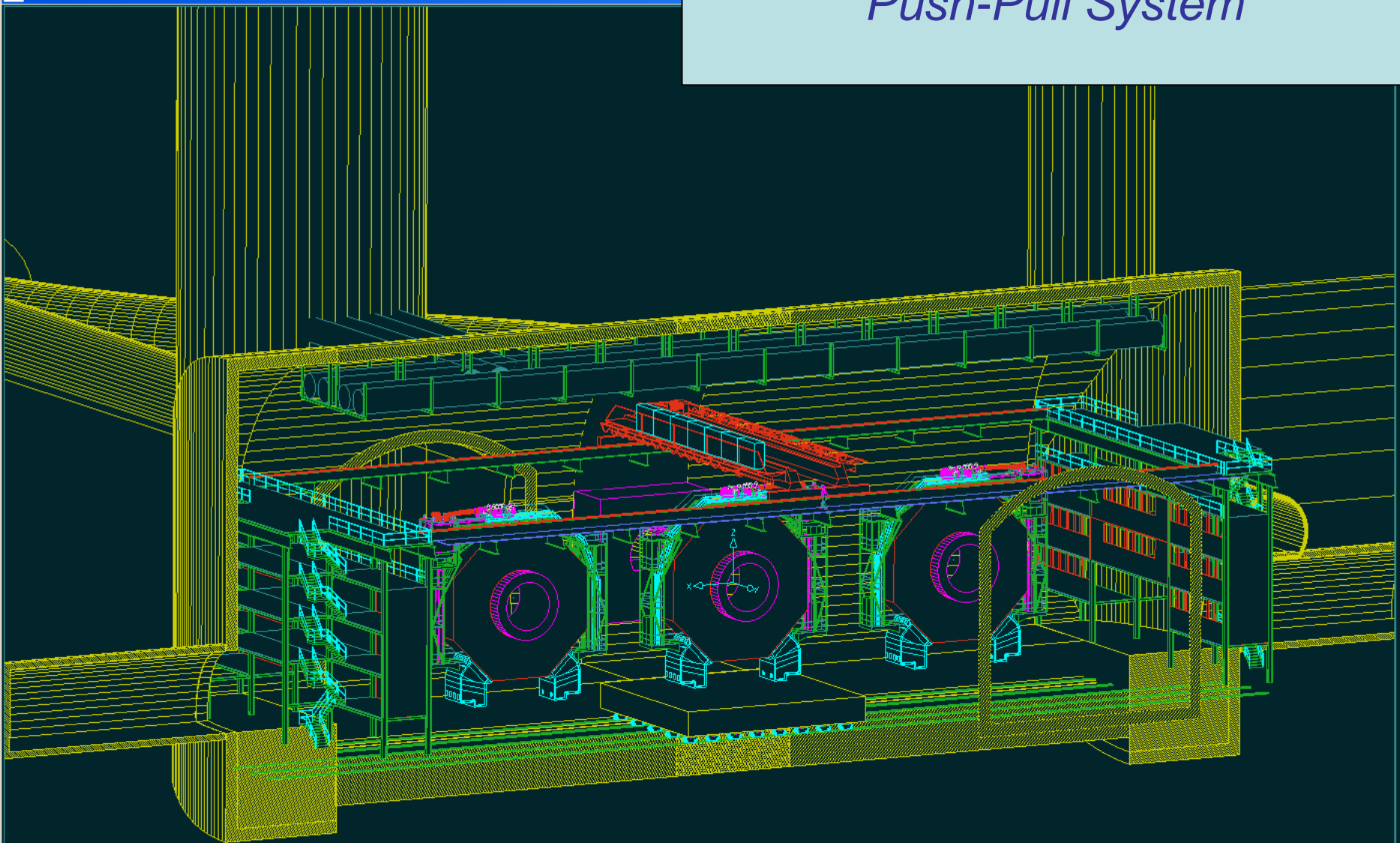




*Two Large Shafts in Diagonal*

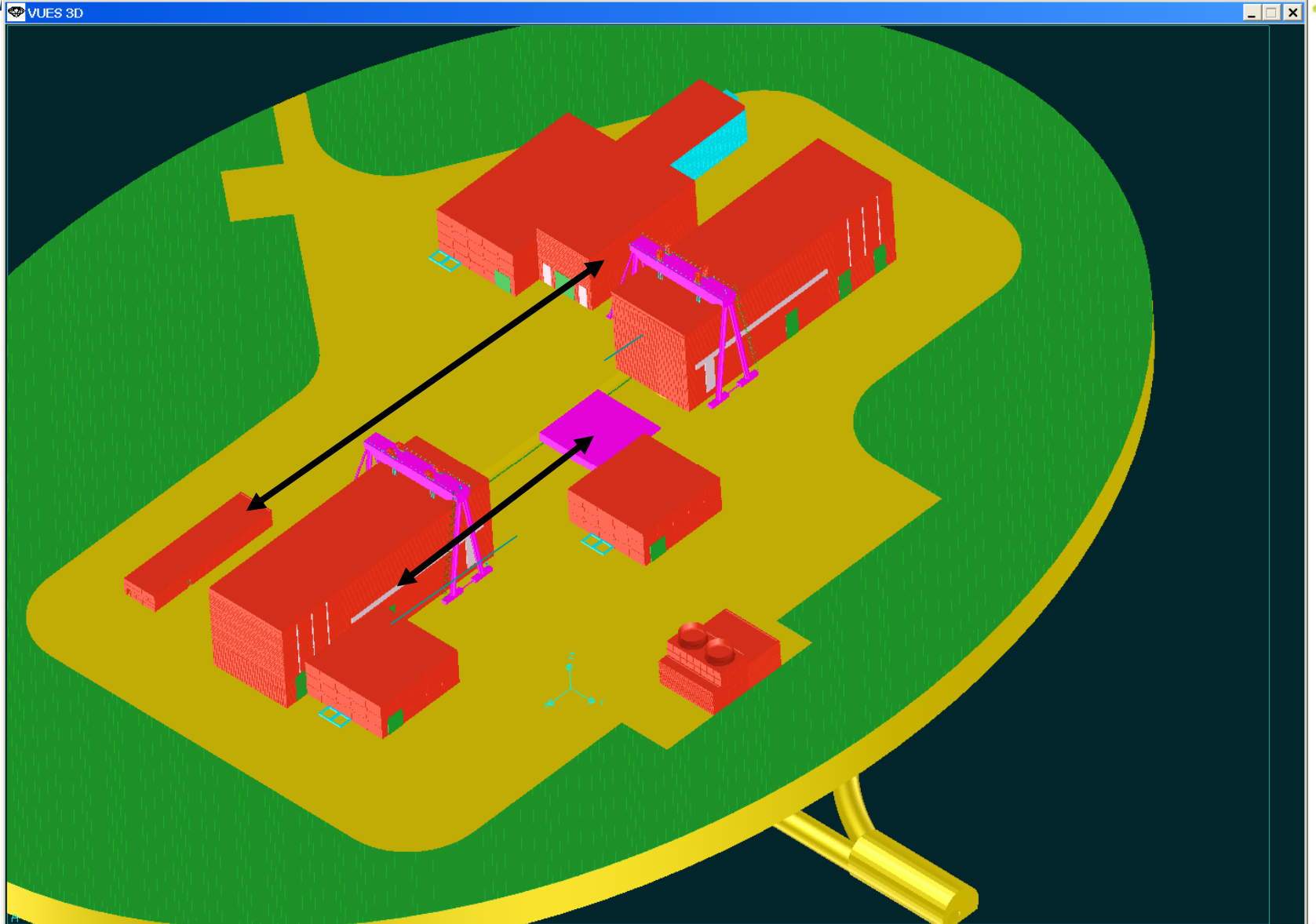
# Two Large Shafts in Diagonal

x  
y



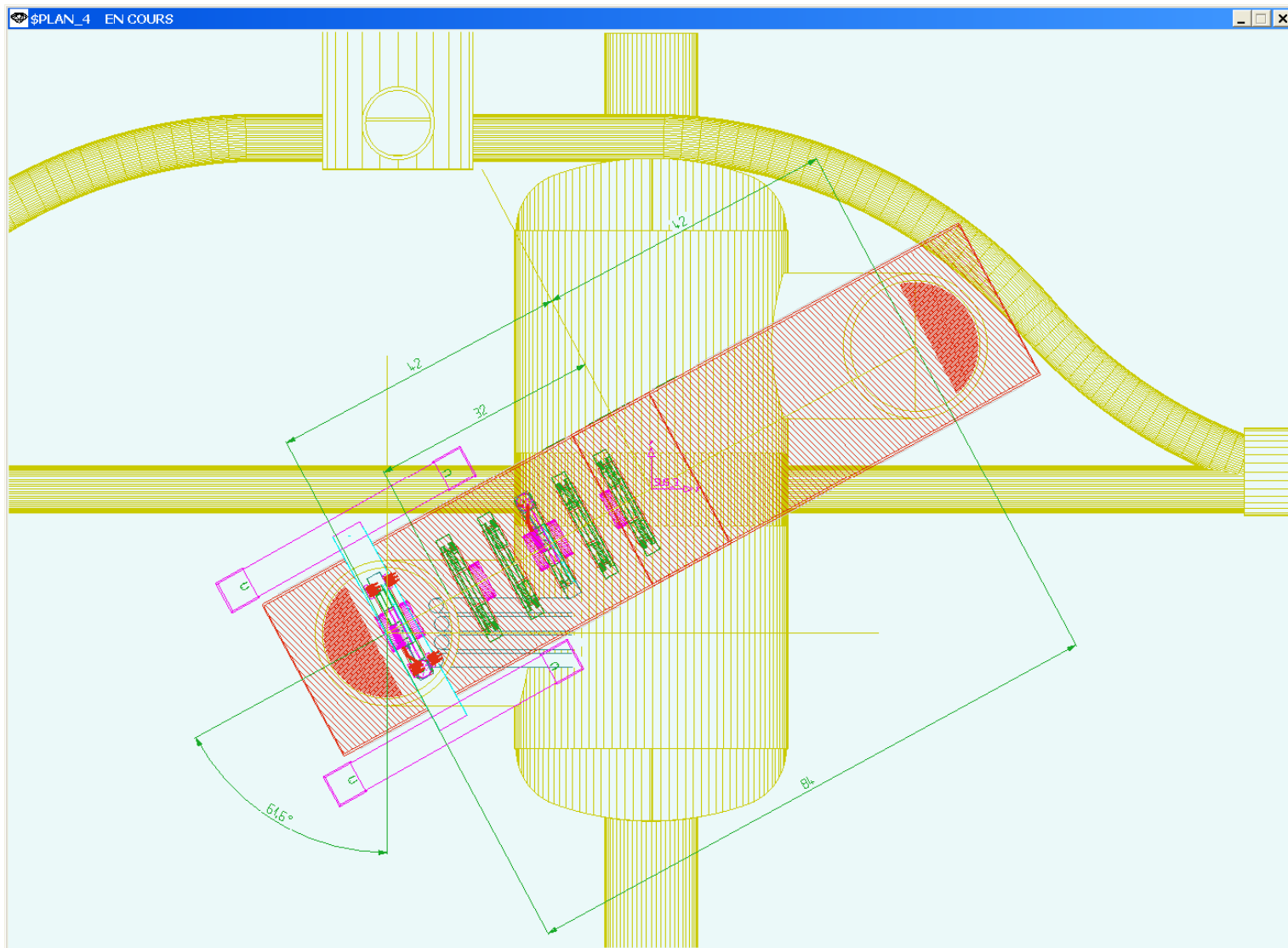


*Two Halls can be separated, and still  
Gantry (possibly cover) could be shared*

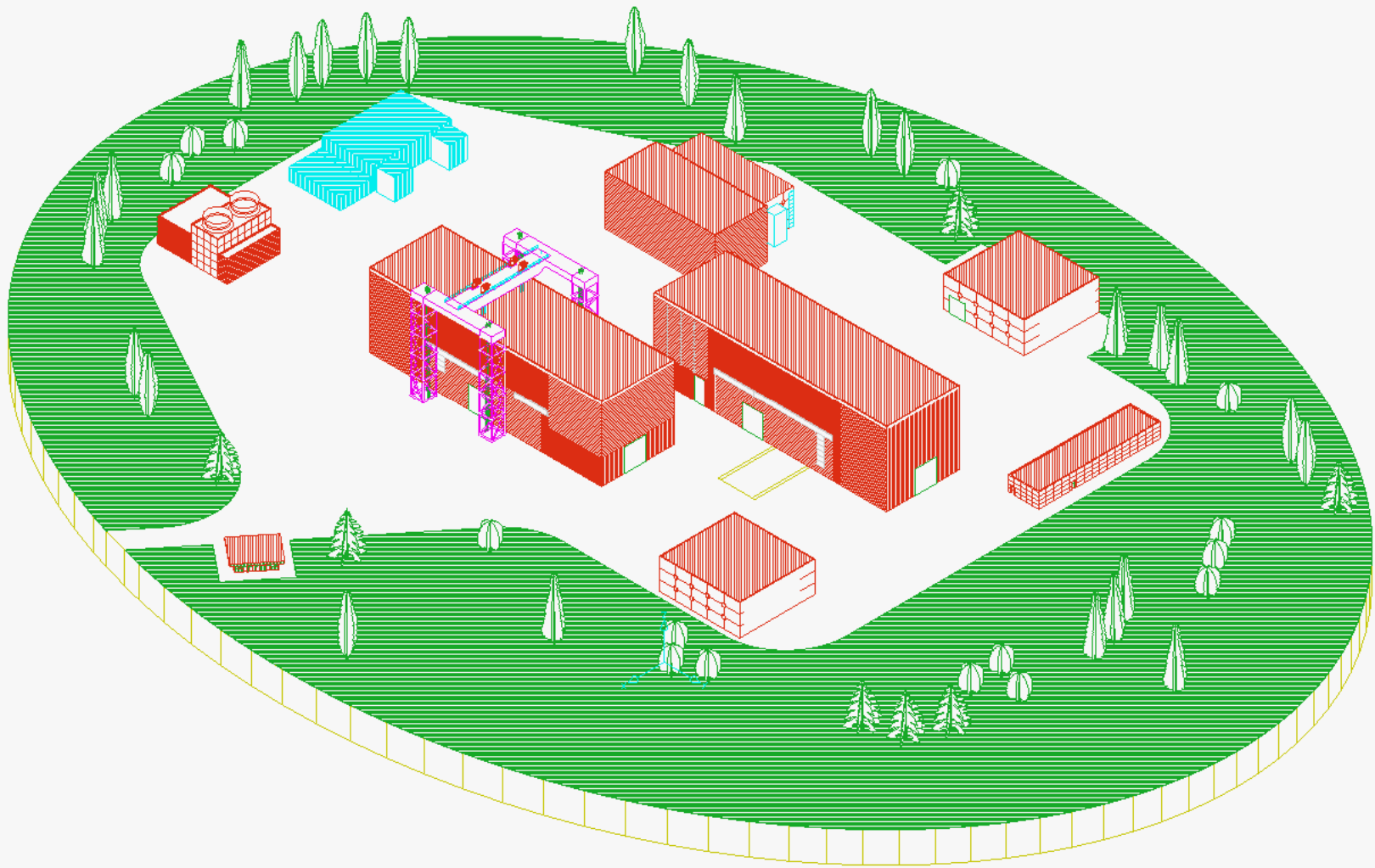




*With 'diagonal surface building, the space in between the two shafts looks insufficient*

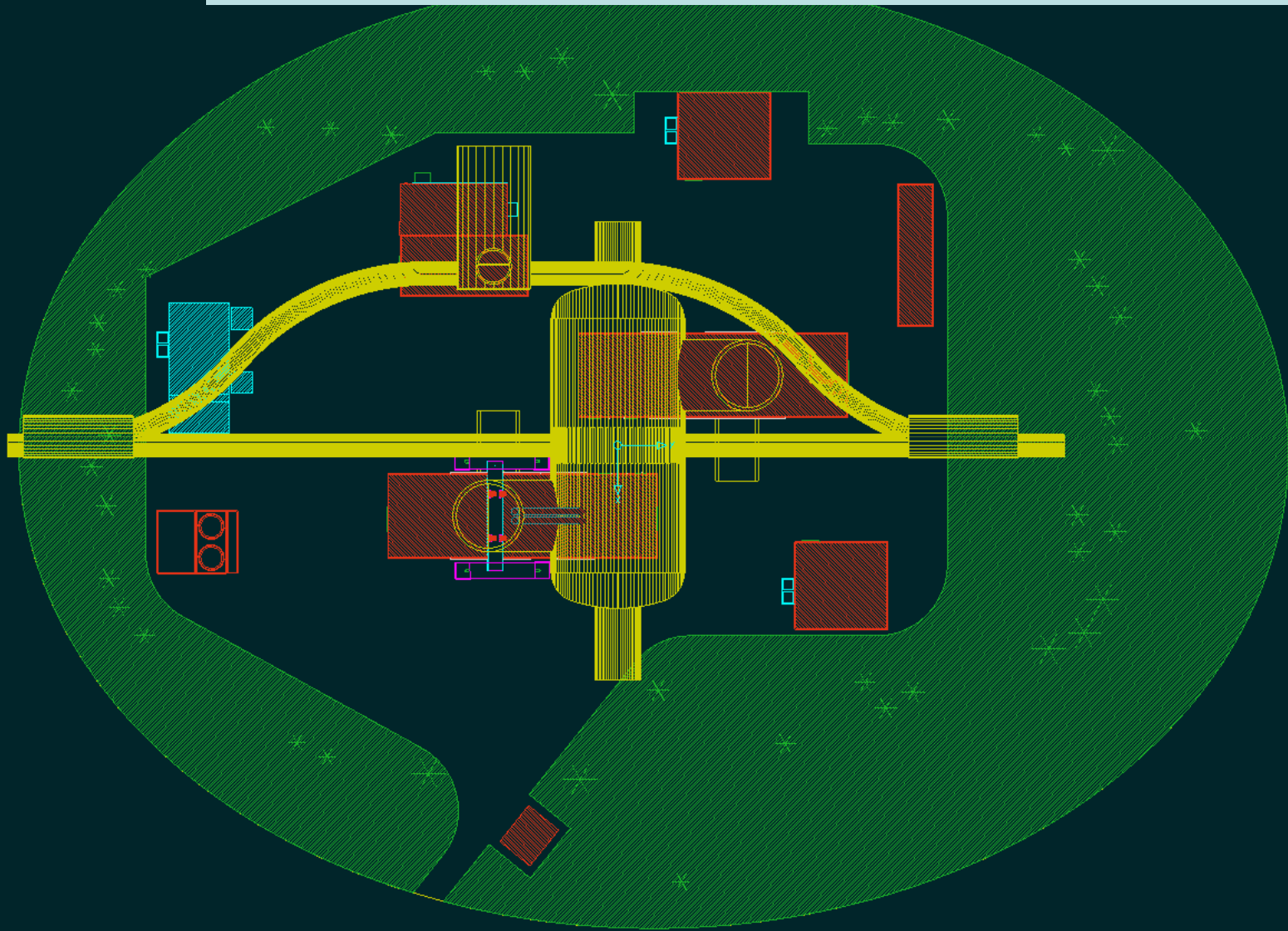


# Possible New Surface Layout for Experimental Area with 2 smaller, surface assembly halls



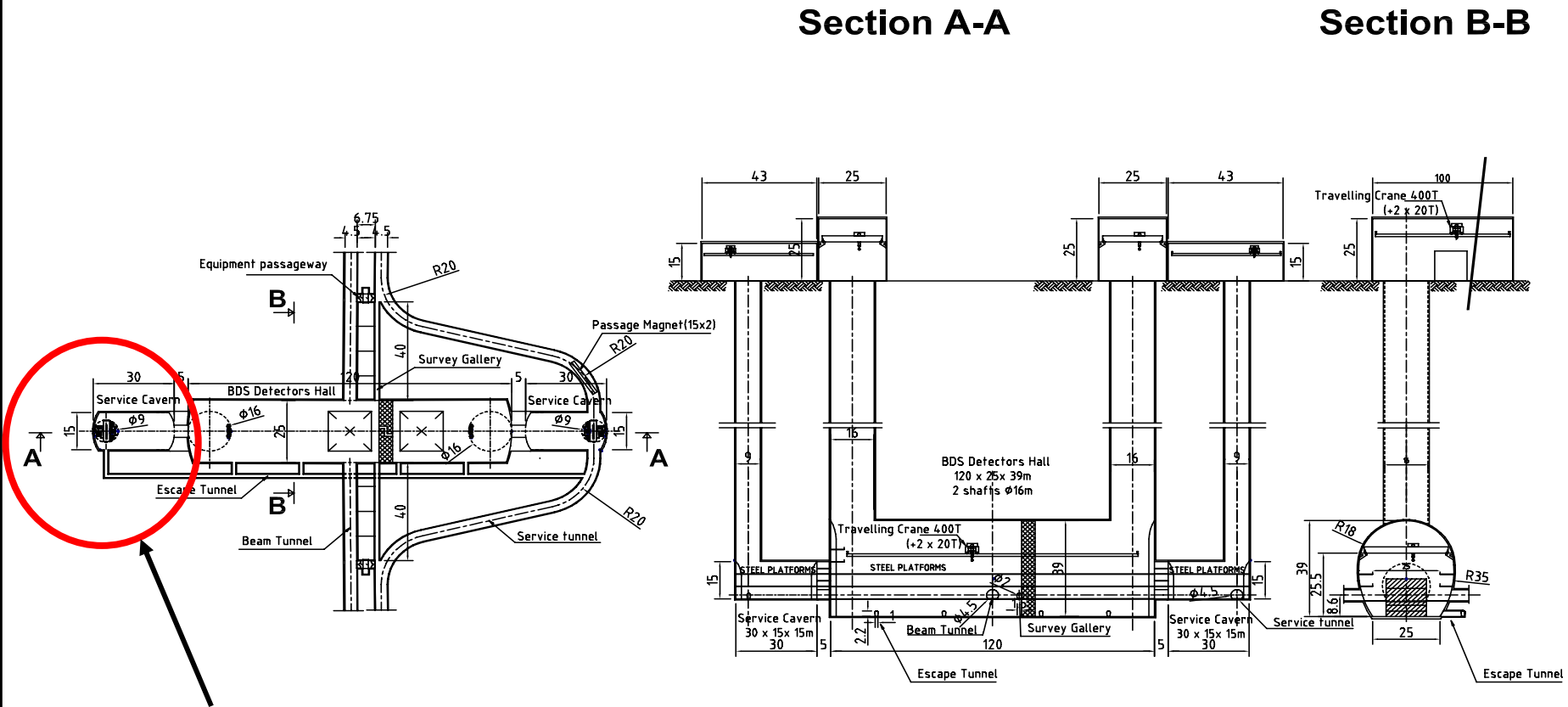


# Possible New Surface Layout for Experimental Area with 2 smaller, surface assembly halls





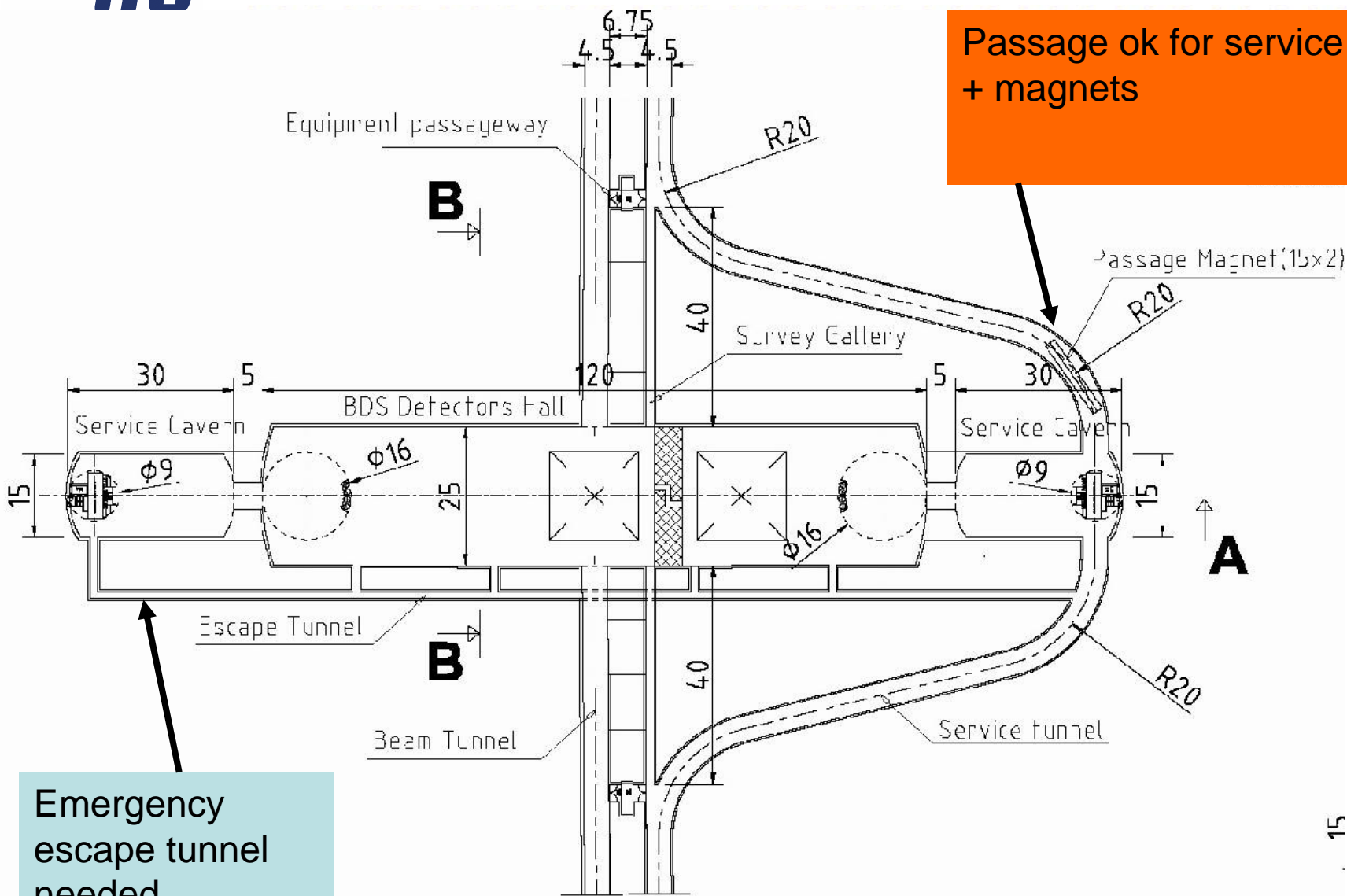
# Value Engineering : Two service caverns ?



Ideal World = Additional Service Caverns 30metres long ?  
Extra costs for cavern v savings in services need to be assessed  
With 2 service caverns, perhaps lifts, staircase could be removed in Exp. Cavern ?

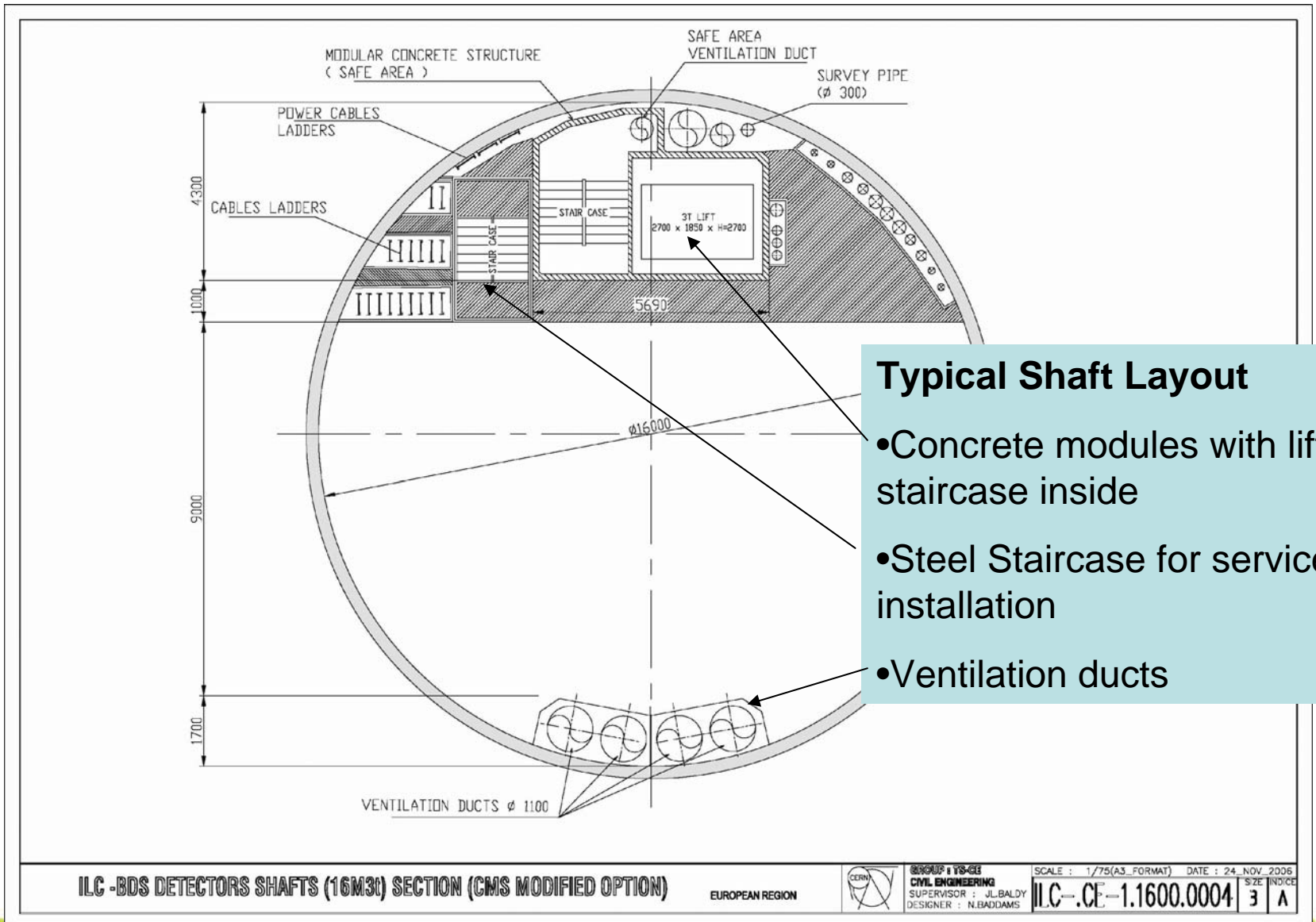
Experimental shafts could be smaller diameter

SCALE : 1/1000(A2) FORMAT DATE : 30 AUG 2007  
SUPERVISOR : J.L.BALDY  
DESIGNER : N.BADDAMS  
ILC-CE-1.1600.0008 2 A





# Value Engineering : With Two service cavern shafts, Lift & staircases can be deleted from experimental caverns ?



**Typical Shaft Layout**

- Concrete modules with lift & staircase inside
- Steel Staircase for services installation
- Ventilation ducts

ILC -BDS DETECTORS SHAFTS (16M3t) SECTION (CMS MODIFIED OPTION)

EUROPEAN REGION

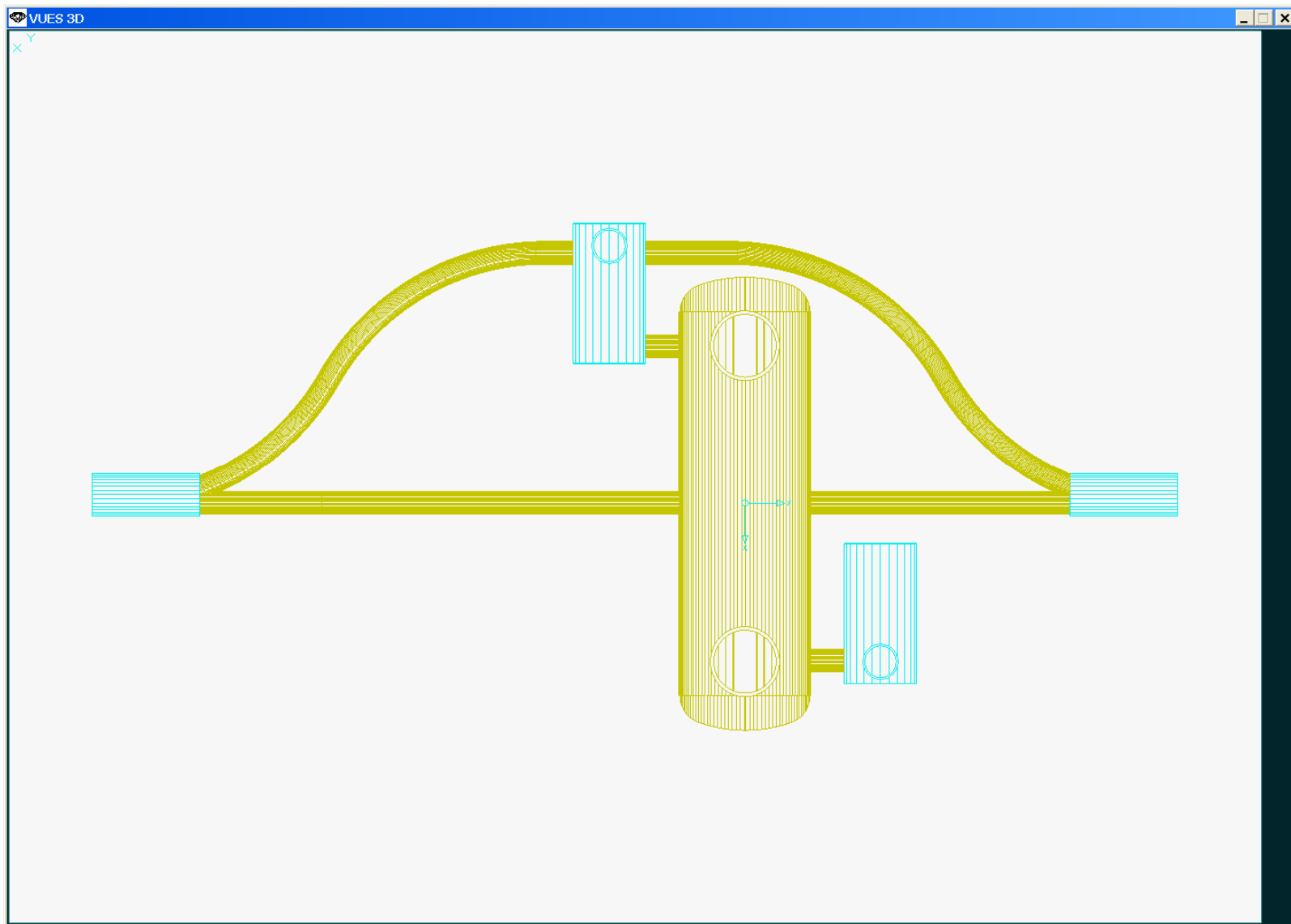


ILC-VS-CE  
**CIVIL ENGINEERING**  
 SUPERVISOR : J.L.BALDY  
 DESIGNER : N.BADDAMS

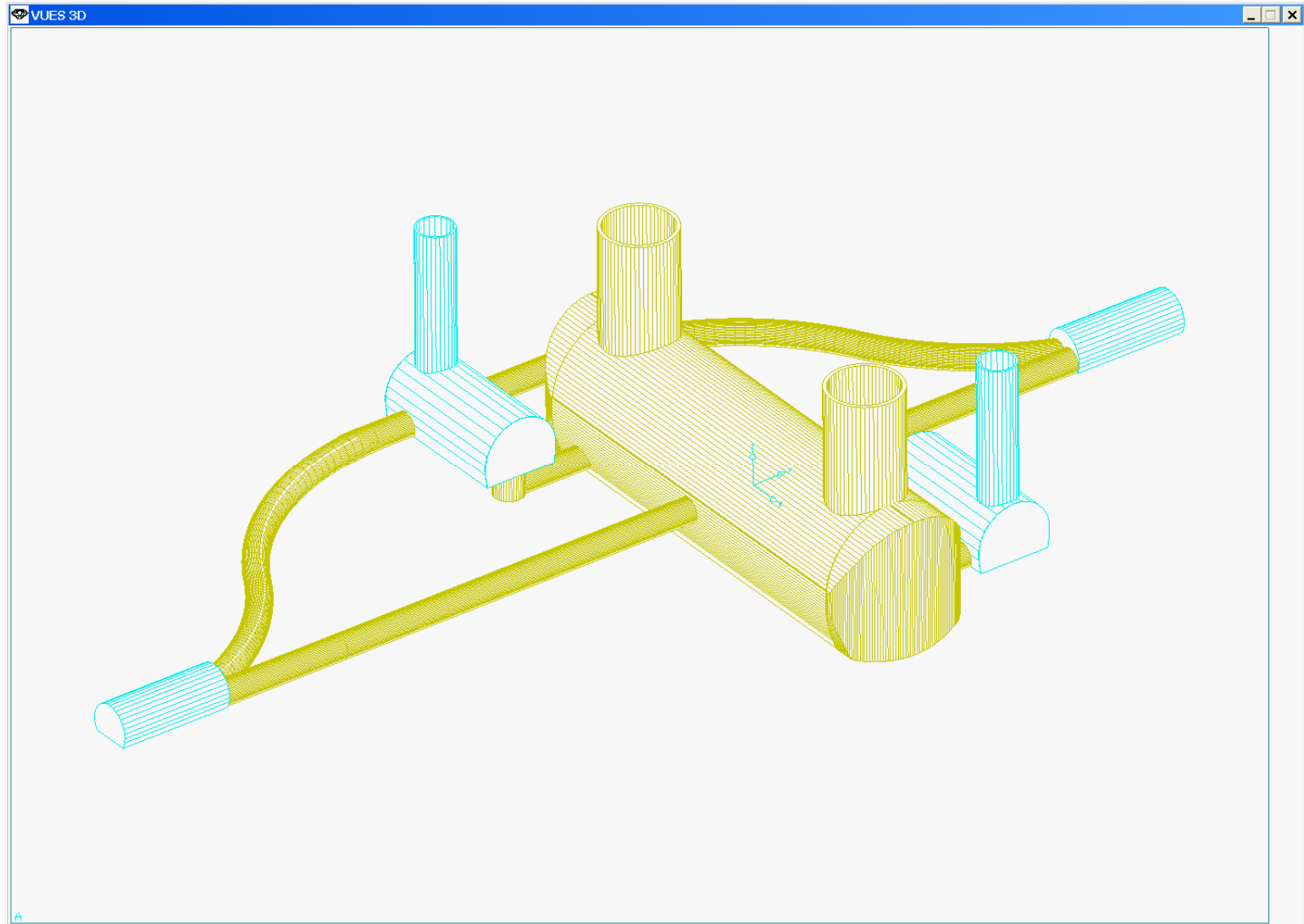
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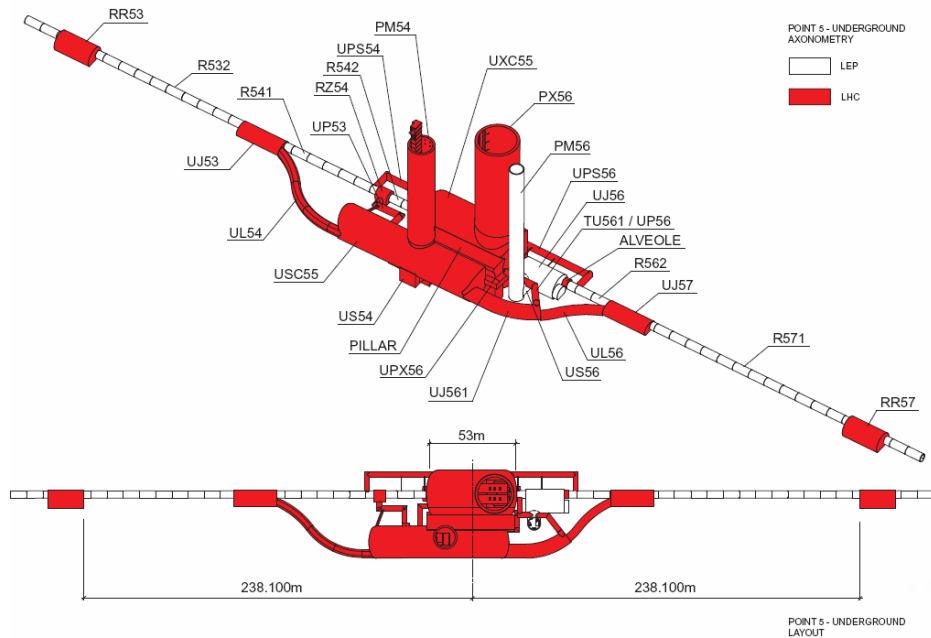


# Value Engineering : Two service caverns ?

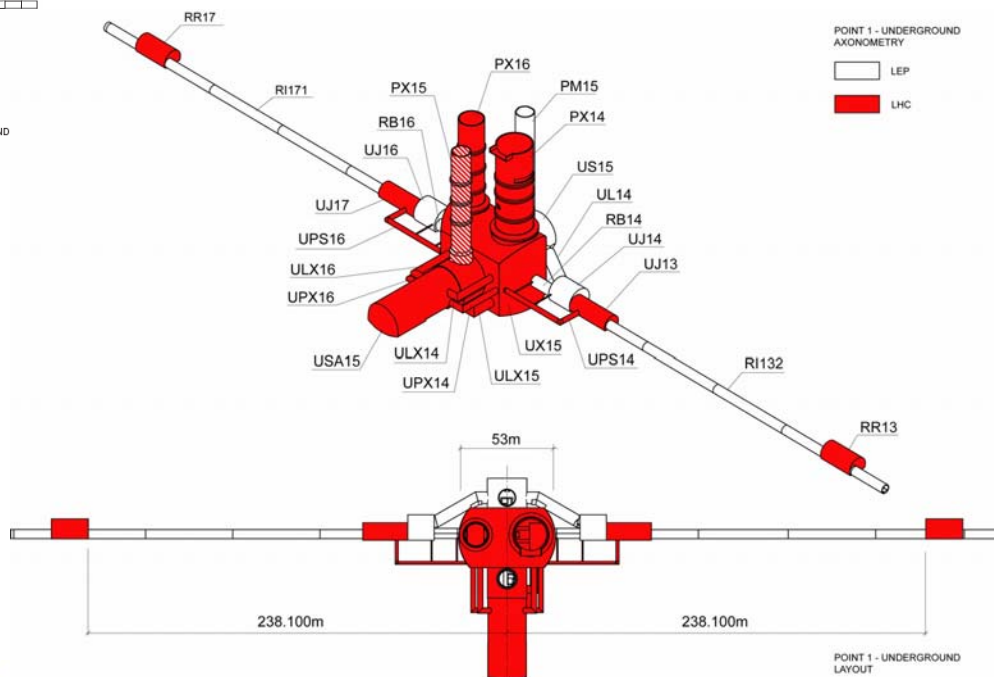








# ATLAS 4 shafts



CMS : 3 shafts



# Conclusions

- New Cross Section is maturing for IR Cavern
  - (Change Request eventually needed)
- 3 shaft solution with 'Diagonal Layout' for experimental shafts being developed
- 4 shaft solution with 2 service caverns to be further studied
- All solutions need further study for pressurised escape galleries