Tim Watson

ST-CE

CE Experience with External Consultants for the LHC Project

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Why?

How?

Costs

Performance

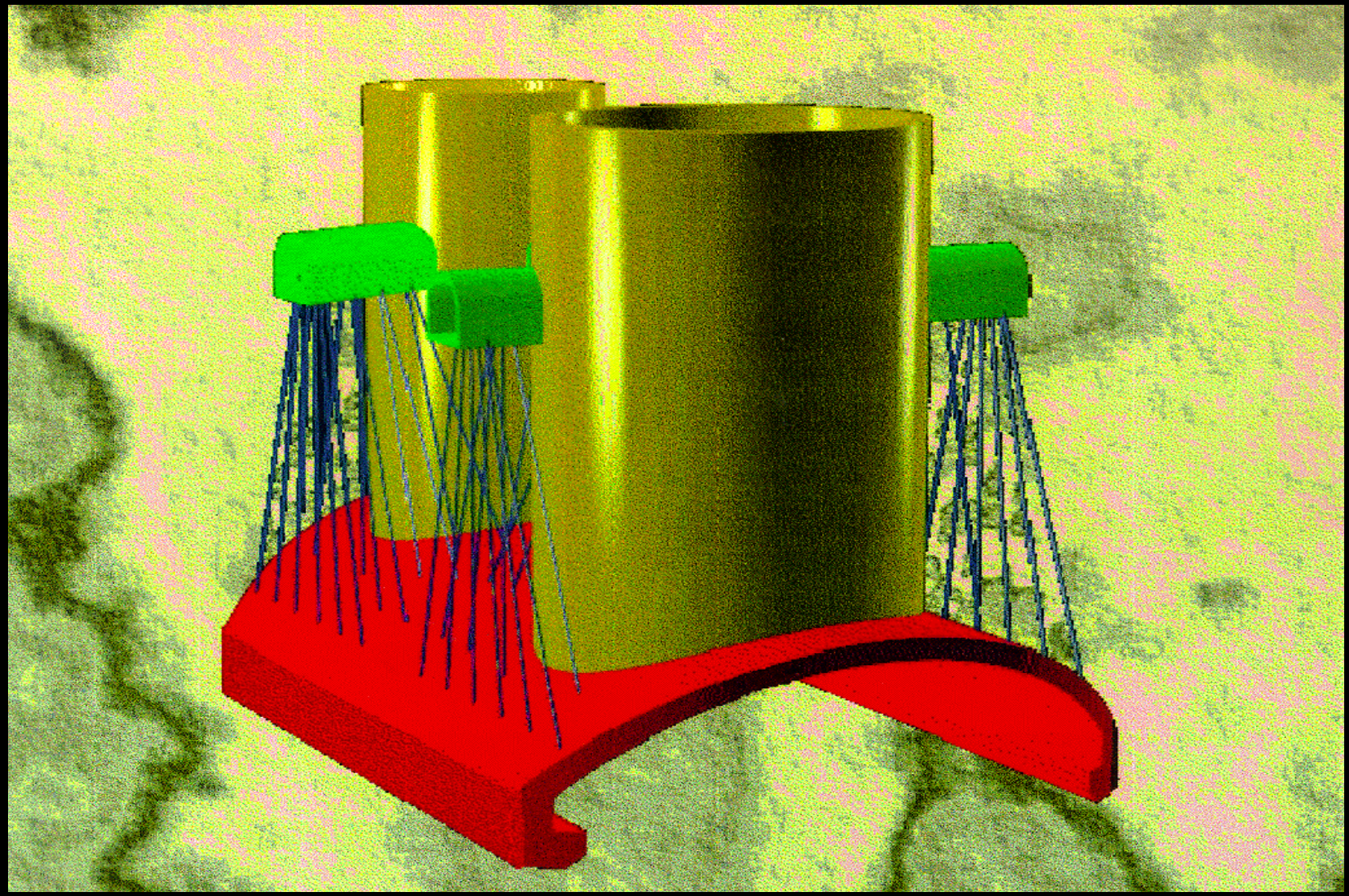
Problems

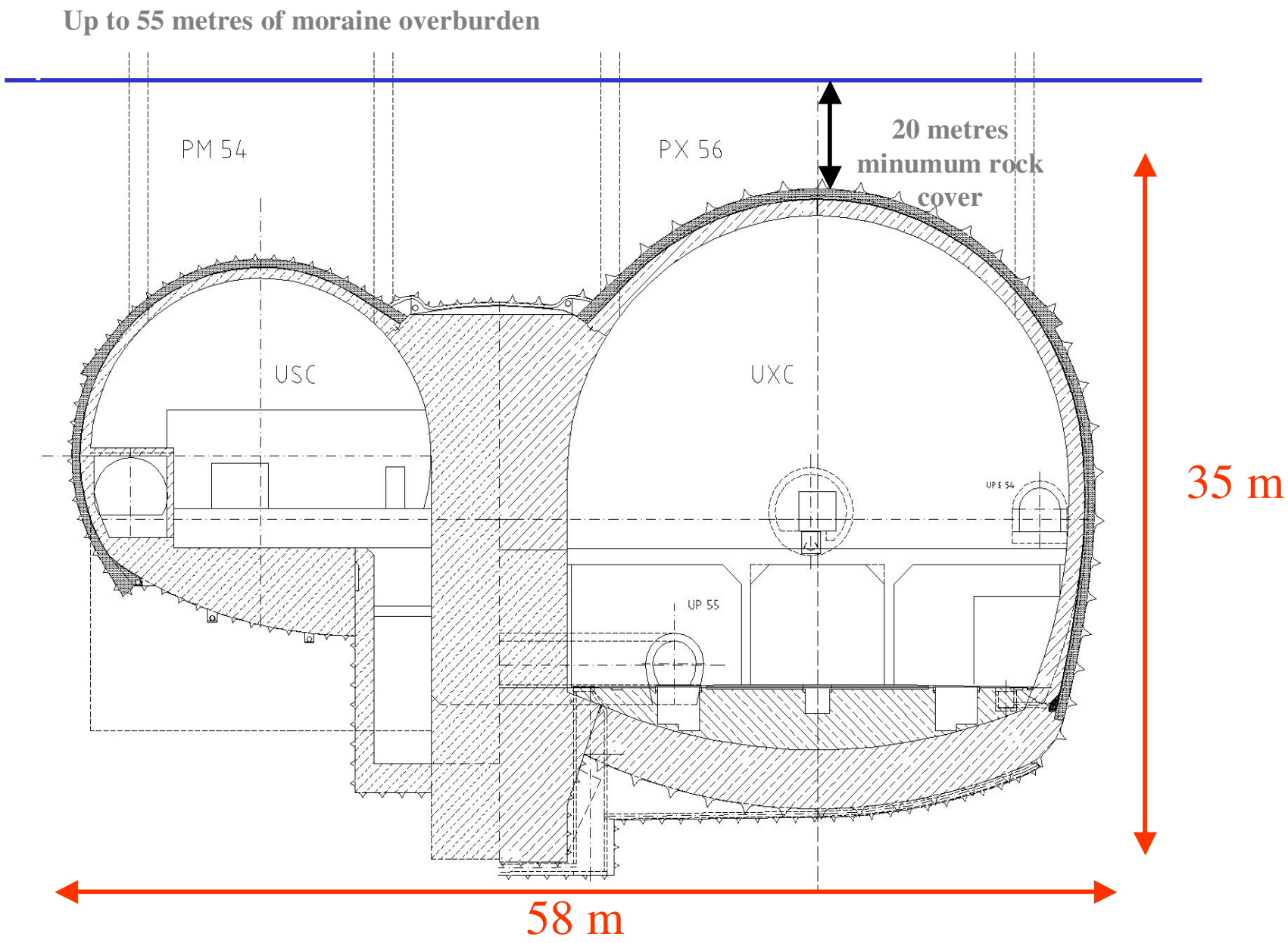
Again?

Why ?

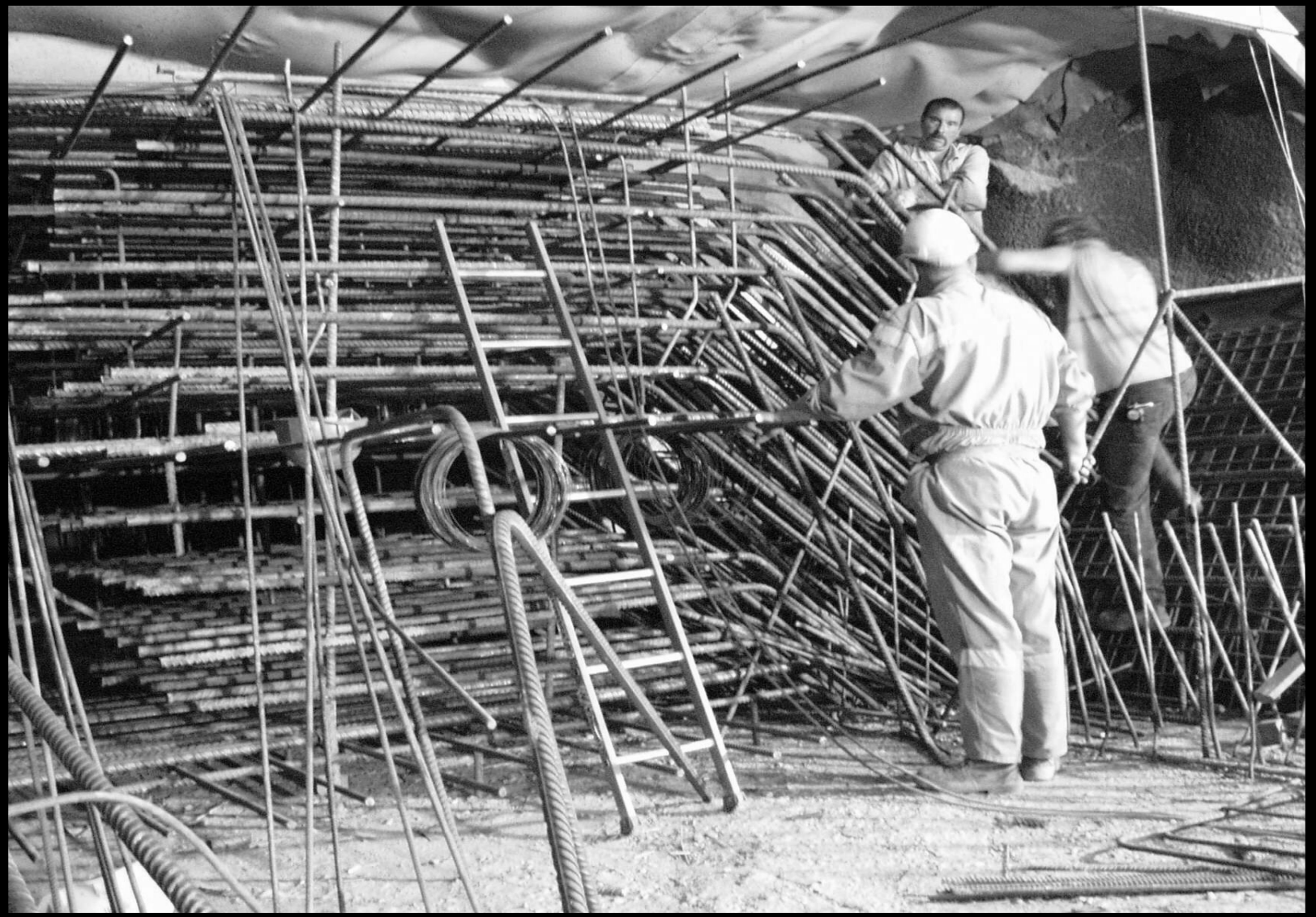
- Global CERN policy to reduce staff numbers
- Background of “Fair Return”
- Only two qualified civil engineers in CE group
- Intense design resources required
- Specialist designers required

Point 1 – Vault Construction




Up to 55 metres of moraine overburden
PM 54
PX 56
20 metres
minumum rock
cover
USC
UXC
UP 54
UP 55
35 m
58 m

Point 5 Pillar Reinforcement



How ?

- 120 firms contacted in 17 member states
- 100 companies in 46 joint ventures from 16 member states responded
- 3 external assessors
- 46 reduced down to 17 joint ventures from 11 member states
- All 17 joint ventures submitted bids

How cont..

- “Two envelope” system adopted.
- External panel again
- 11 joint ventures rejected from contracts 1 and 2
- 4 joint ventures rejected from contract 3
- Final 3 joint ventures represented 6 member states
- Total contract value at signature 33 MCHF

Costs

- 150 k man-hours for design tendered
- 336 k man-hours for construction management and supervision
- Design Services contracted at 9 MCHF. Final cost 14 MCHF.
- Supervision services contracted at 24 MCHF. Final cost 28 MCHF.
- Total cost increase of 9 MCHF or 27% over 8 years
- Over 300 Design Variations instigated by CERN

Total resources finally used 350 man years

Design Deliverables

- > 1000 Tender drawings
- > 2500 Construction drawings
- Reports on:
  - Geotechnical interpretation
  - Quality
  - Planning
  - Cost
  - Risk assessment
  - Contractor assessment
  - Specification
  - Bills of quantities

Performance

- Deliverables generally provided on time
- Design solutions adopted generally good although cautious
- Good reaction time to CERN changes
- Willing to incorporate CERN ideas

Problems

- Quality of deliverables sometimes poor
- Cost put before quality
- Pressure always required from CERN
- Internal JV friction caused problems
- Financial problems caused difficulty with site staff
- “Responsibility “ issues probably resulted in cautious designs.
- Cost impact feedback not good
- Unwilling to co-ordinate

Same Again?

- Responsibility split could be better defined.
- More integrated CERN/Consultant team?
- CERN Project Manager?
- Secondment?
- More detailed initial risk assessment
- Management definition of risk/cost balance
- Control over site team personnel?
- Stricter application of selected currencies

Summary

Experience generally good

- Shown that CERN cannot delegate responsibility
- For future projects, limit external consultants to technical input only?
- One team only?
- Demonstrated that CERN needs a CE group !