Discussion on Transport of
ILC Cryomodules

ILC-TOT 3 days Meeting at CERN

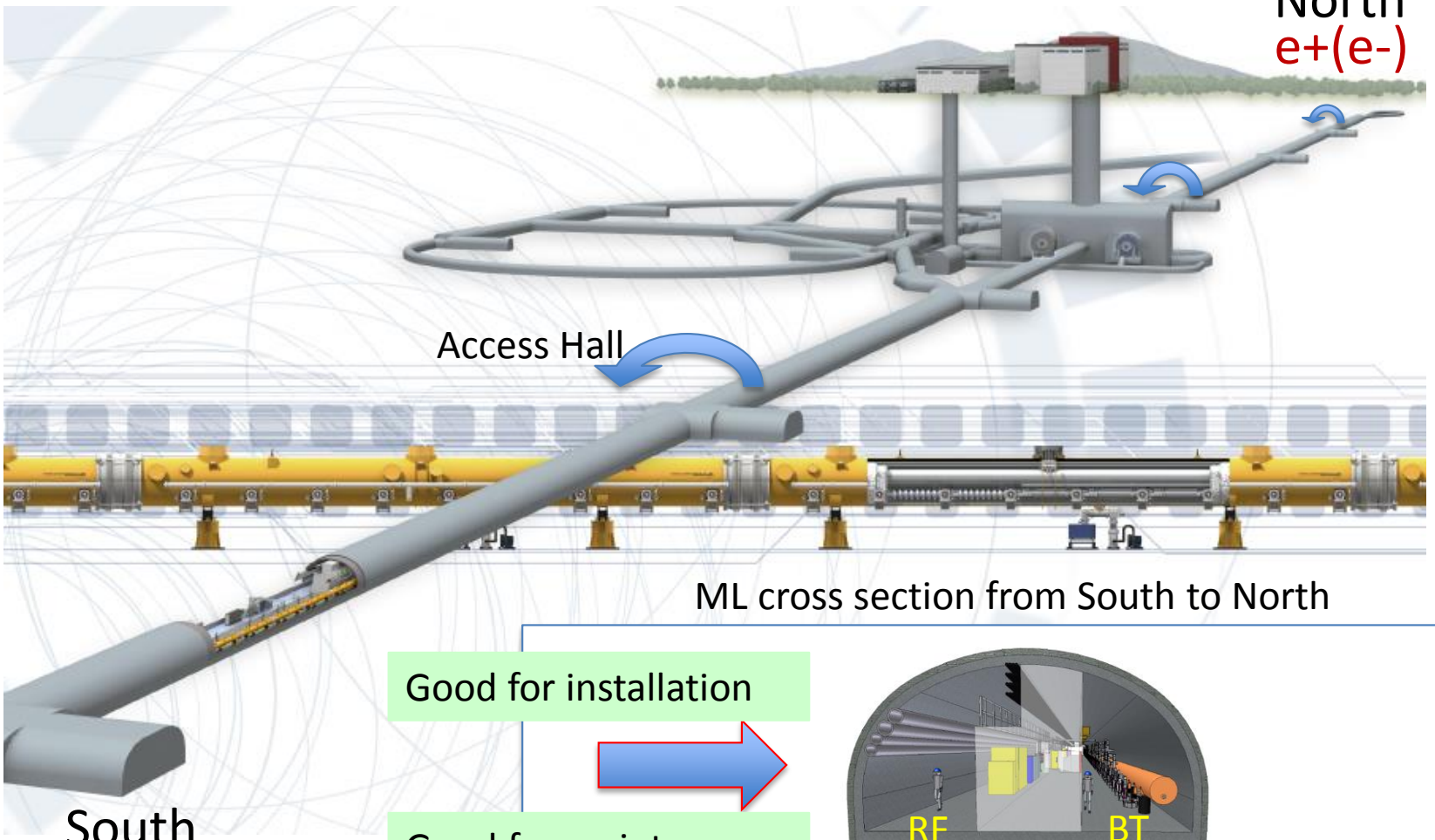
2016.02.29 @CERN

Discussion on Transport of ILC Cryomodules

Contents :

- ML Tunnel Cross-section
- Access Hall Configuration
- CFS Issues towards ECWS2016

Consideration on ML Tunnel Access



ML cross section from South to North

Good for installation

Good for maintenance

Discussion Points

ML Access & Cryomodule Installation

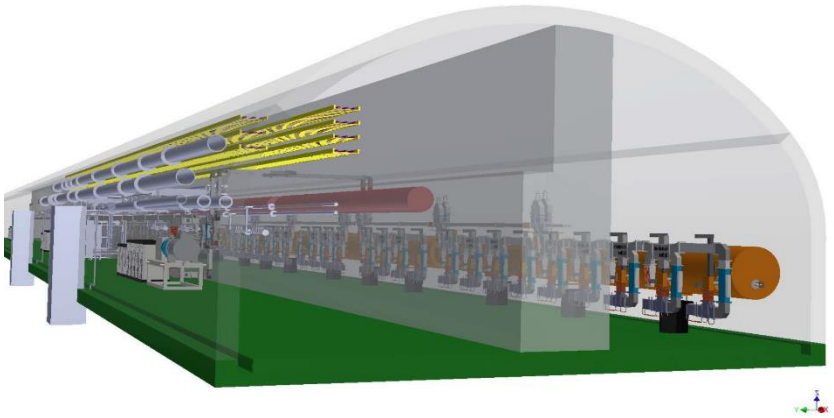
CFS Issues on the planning

- ML Tunnel Cross-section
  - New Cross-section of the ML Tunnel
  - Layout of the KLYSTRON & CRYOMODULE
- Installation of Cryomodule
  - How to install? (Transport Vehicle,)
  - Access Hall structure for Cryomodule Installation
  - Additional equipment？ (Crane, Shield door, etc.)

Review of ML Tunnel Configuration

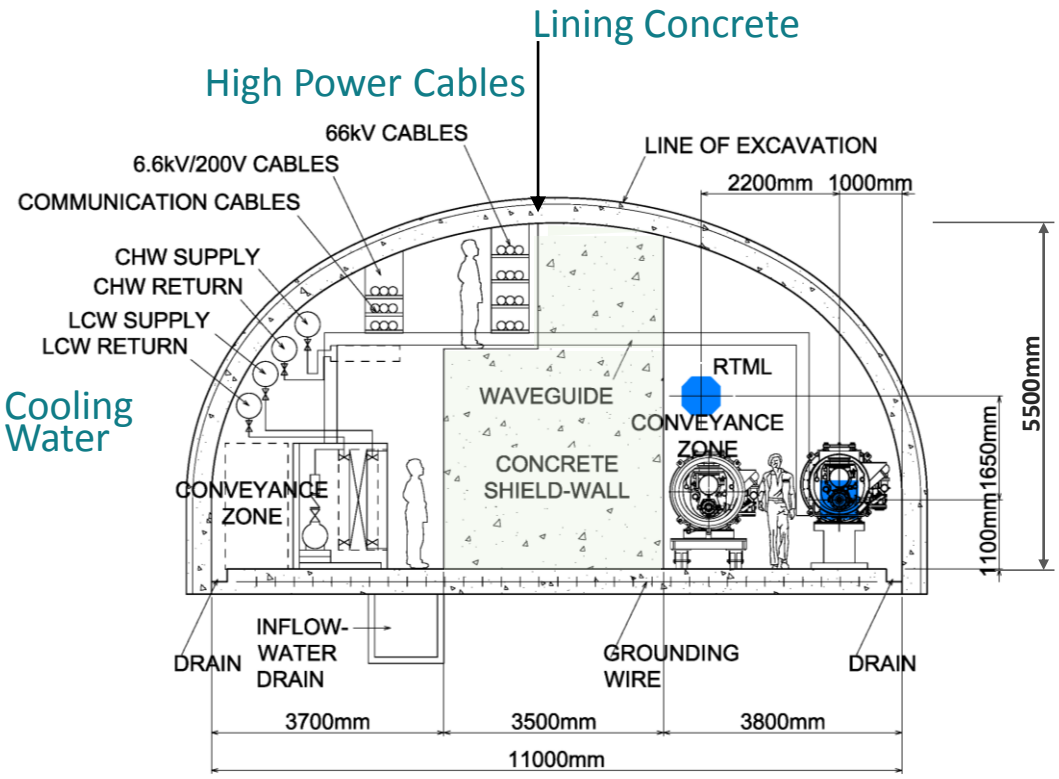
ML Tunnel Cross-section

- New Cross-section of the ML Tunnel
- Layout of the CLYSTRON & CRYOMODULE

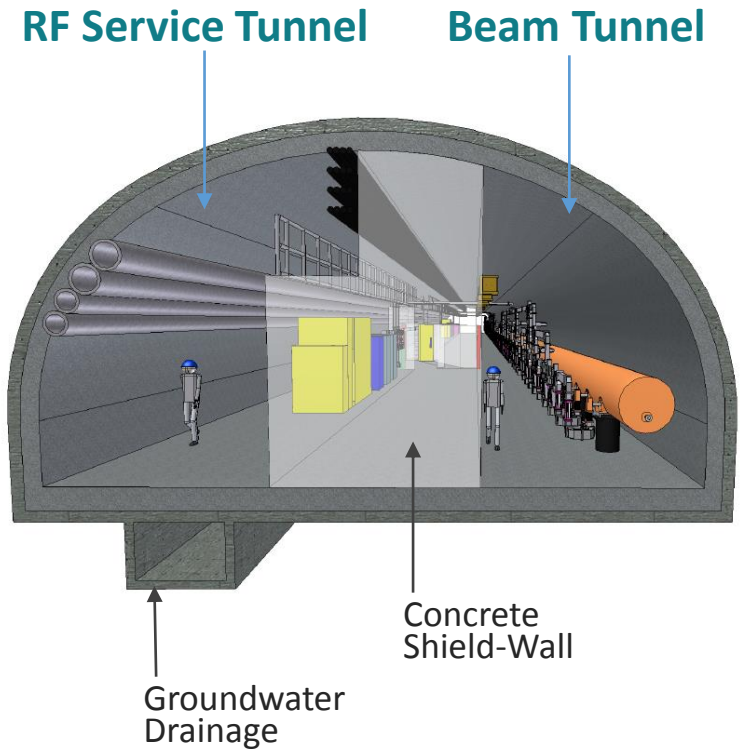


ML Tunnel Cross-section

ML Tunnel Standard Section



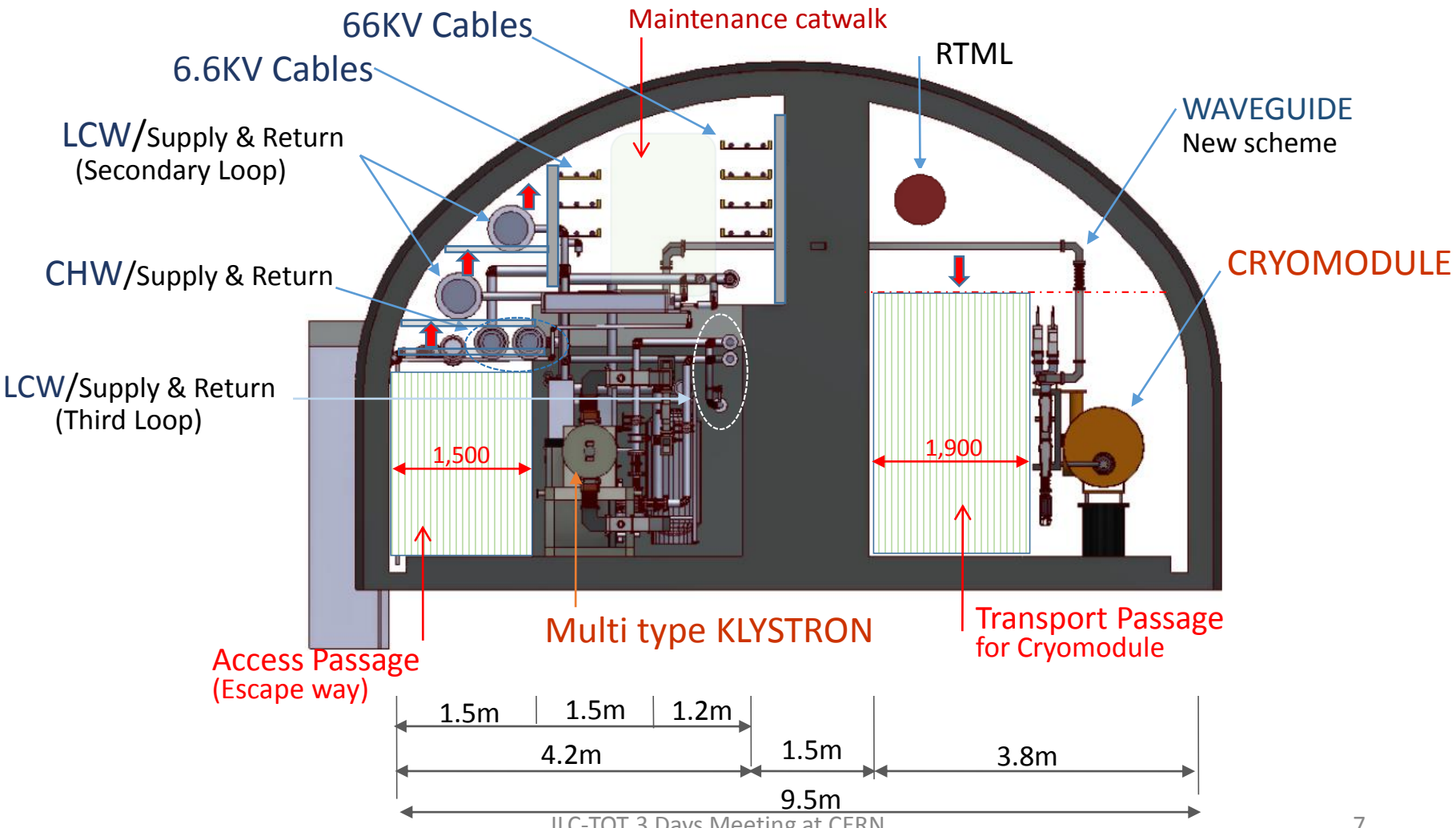
3D Image



ML Tunnel Cross-section

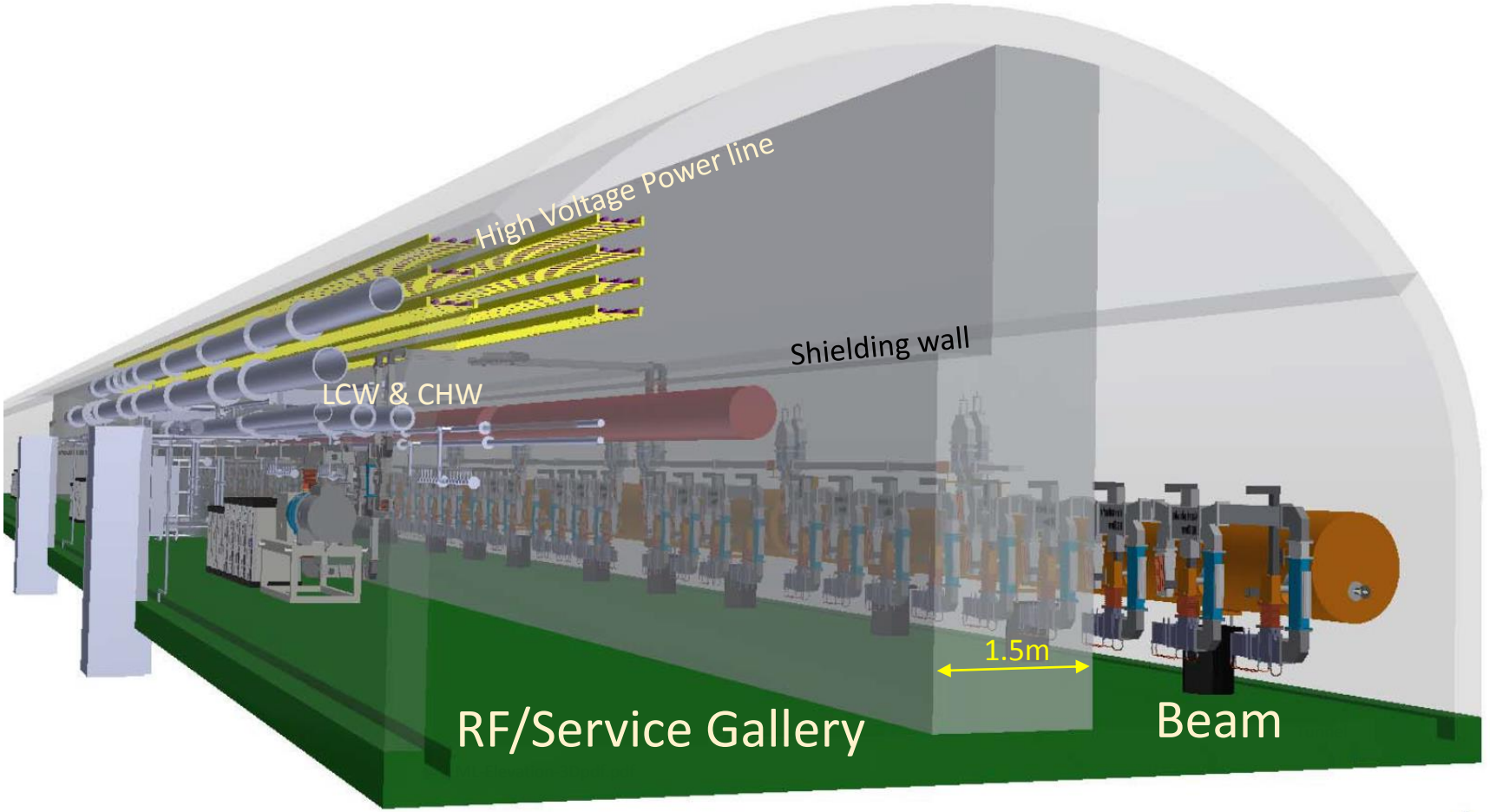
Previous Cross-section

previous version :
Report by CFS Regular Meeting /2.10



ML Tunnel Cross-section

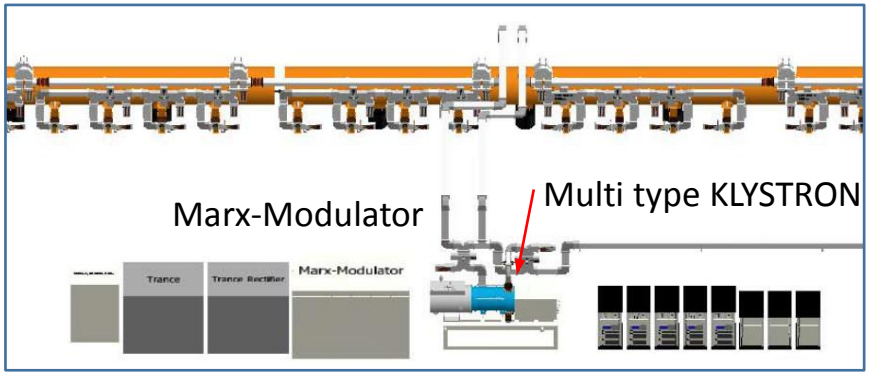
New Proposal Scheme Image

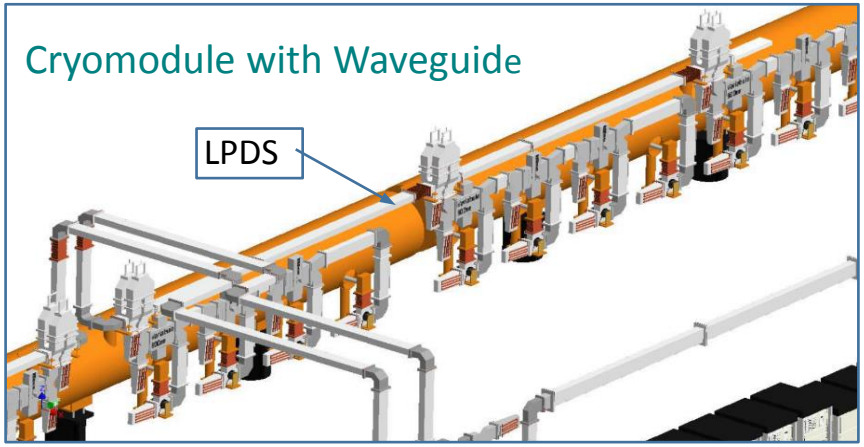


ML Tunnel Cross-section

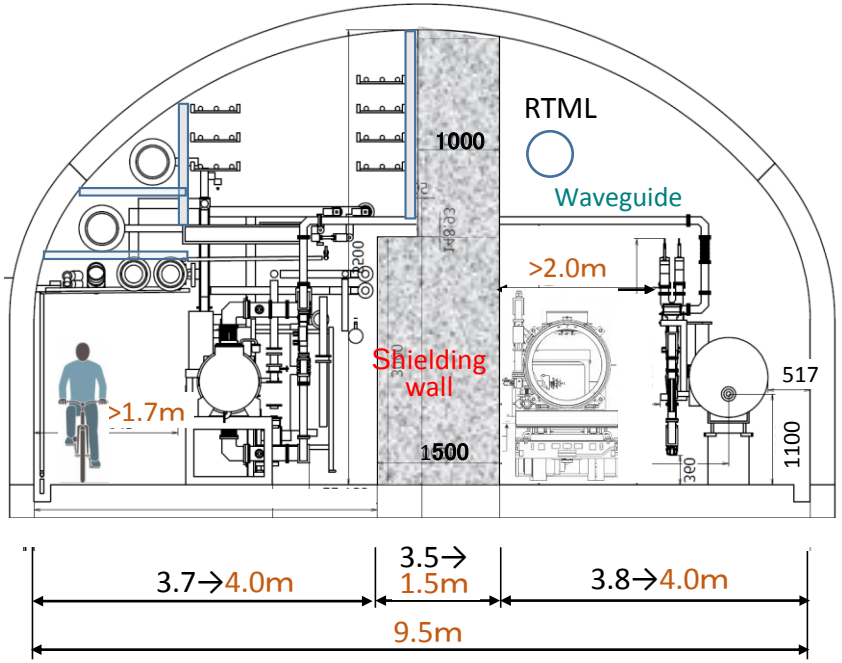
Equipment layout of ML tunnel

Latest Waveguide Design :
after TDR



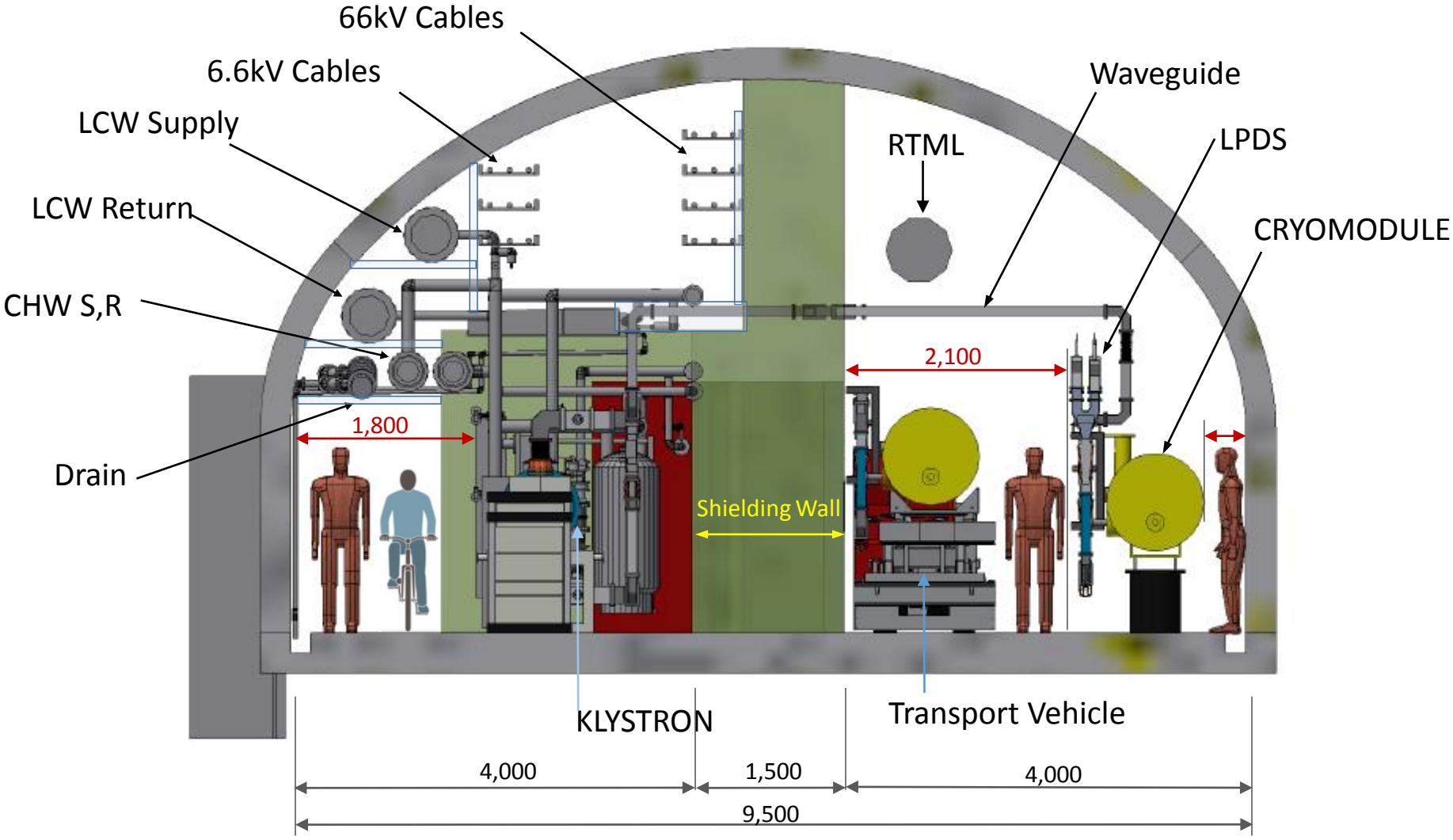


Revised Cross-section:
W-9.5m H-5.5m 55.75㎡



ML Tunnel Cross-section

Latest Proposal Plan



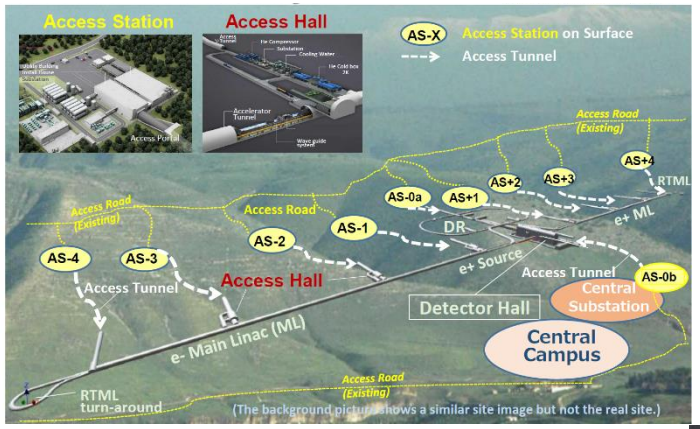
Review of Access Hall Configuration

- Installation of Cryomodule
  - How to install?
  - Review plan of Access Hall
  - Additional equipment？
    - Crane, -Shielding door, etc.

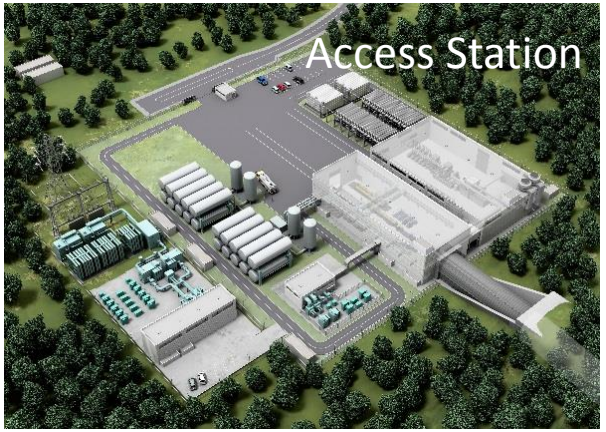
Access Hall Configuration

AS

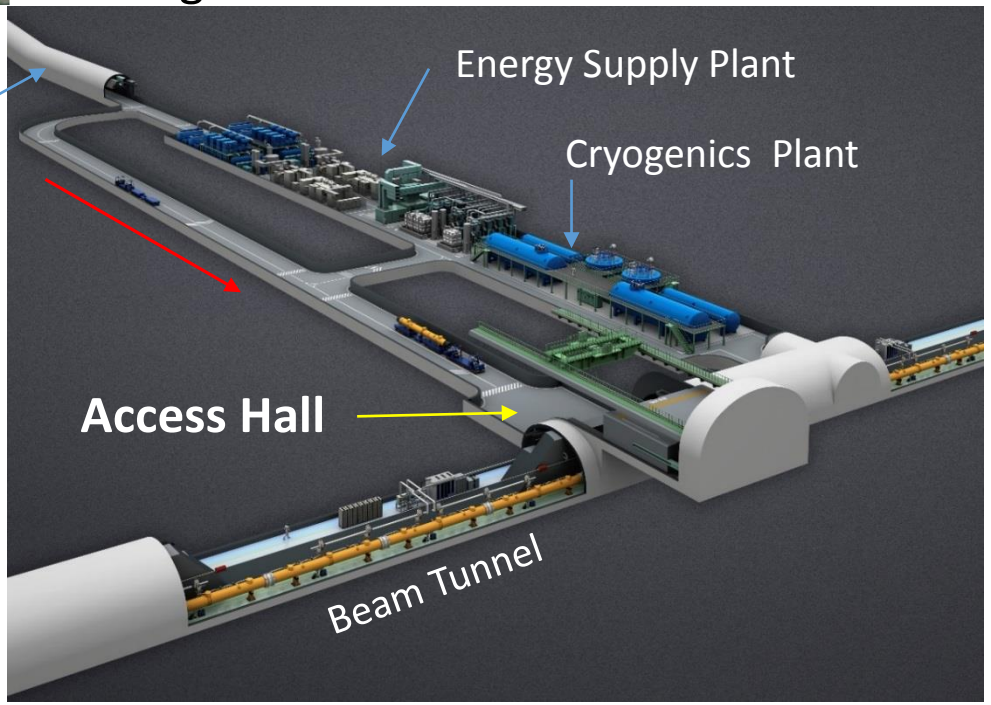
Access Facilities in mountain site



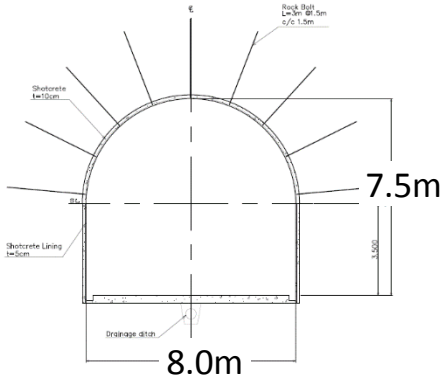
Surface



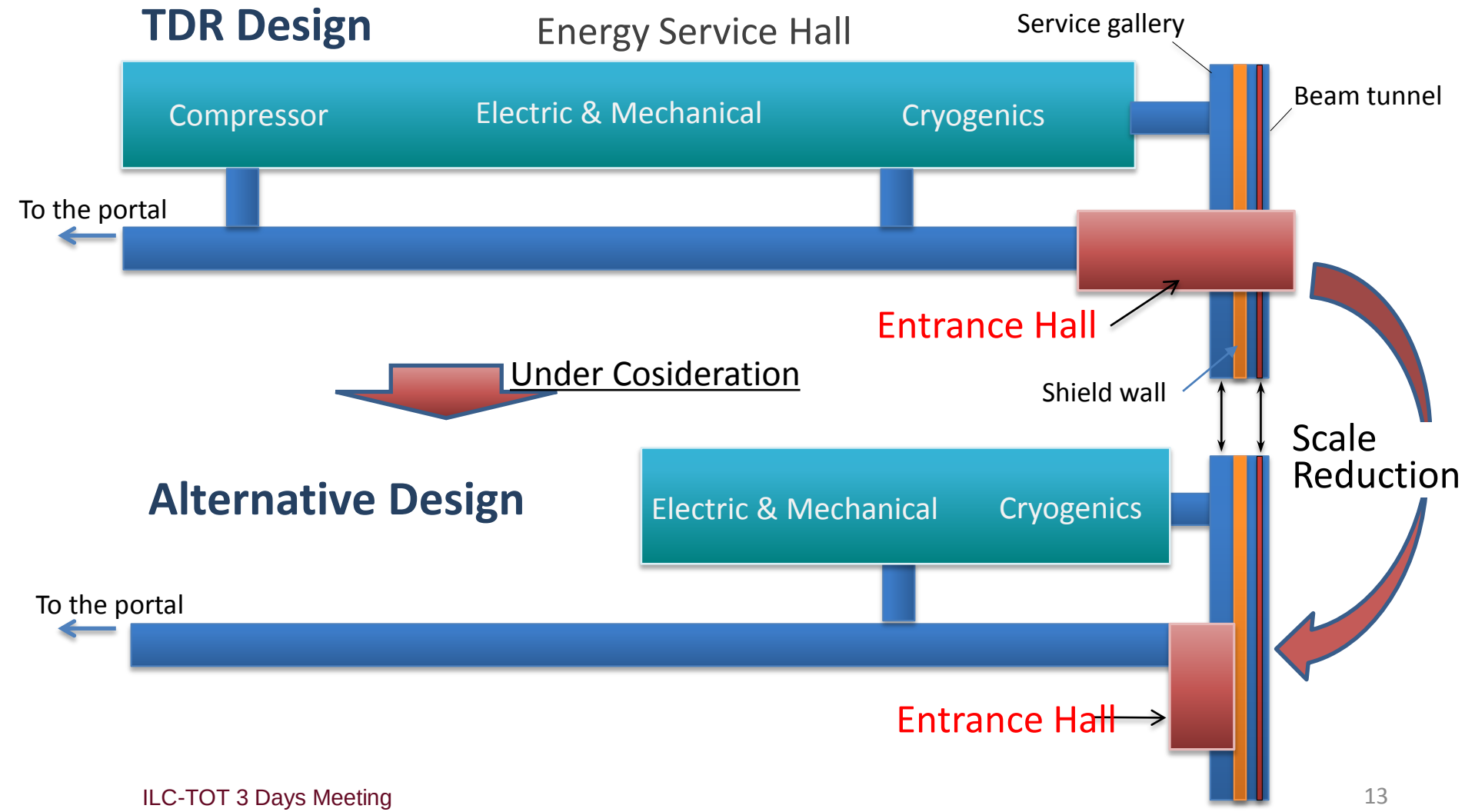
Underground



Access Tunnel



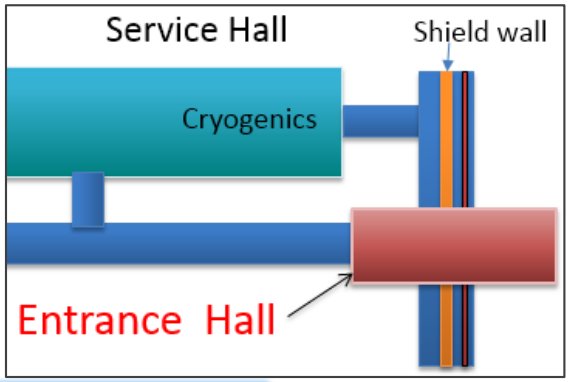
Comparison TDR and Alternative Scheme



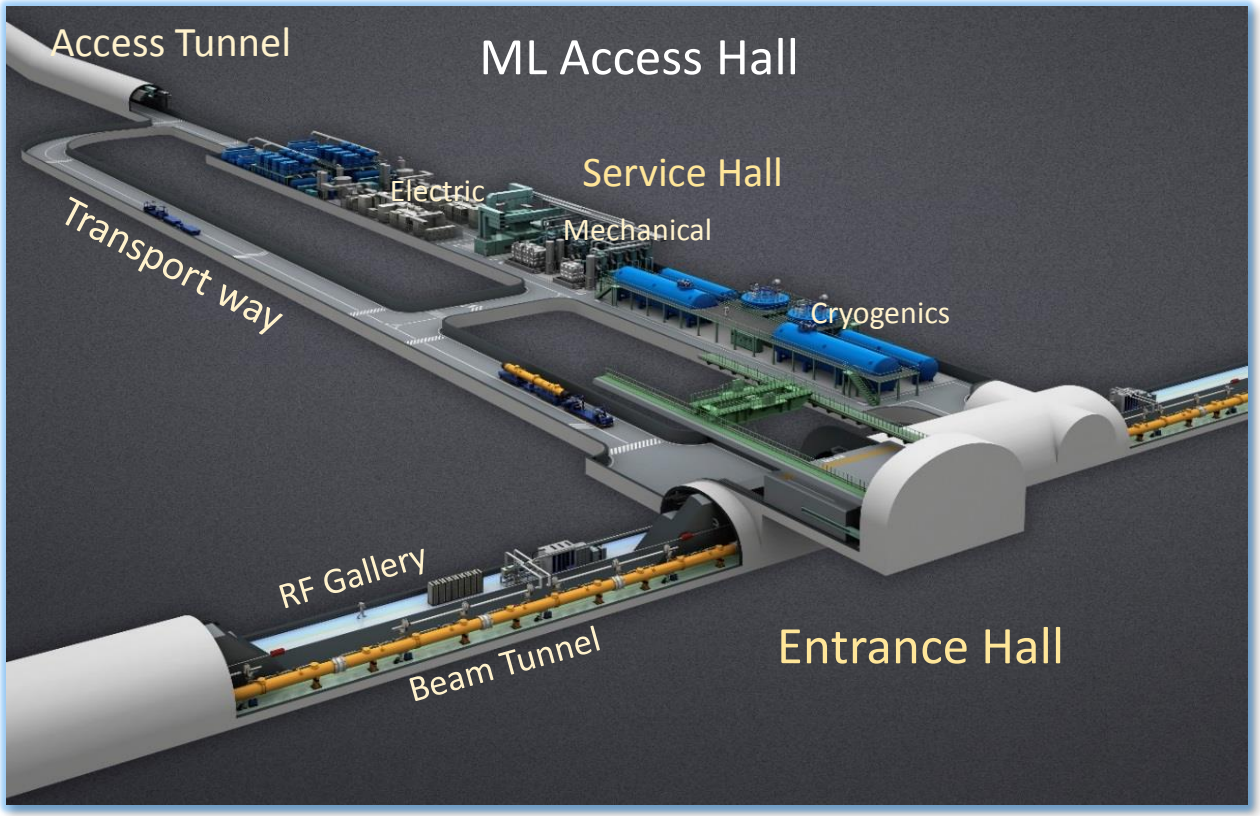
Access Hall Configuration

- Equipment Installation method :

  Lifting & Carrying method by the crane

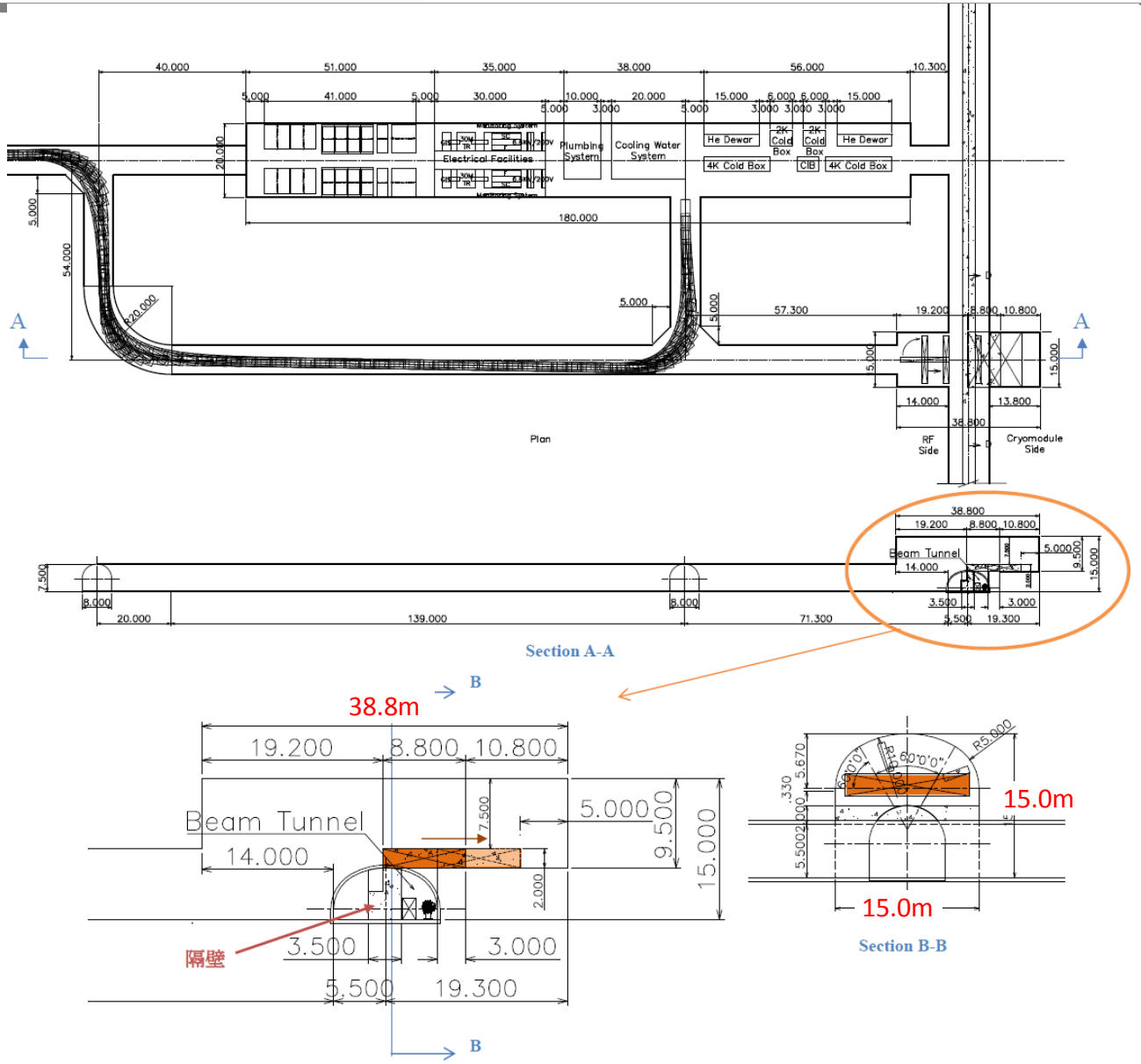


TDR Design Scheme Case-A



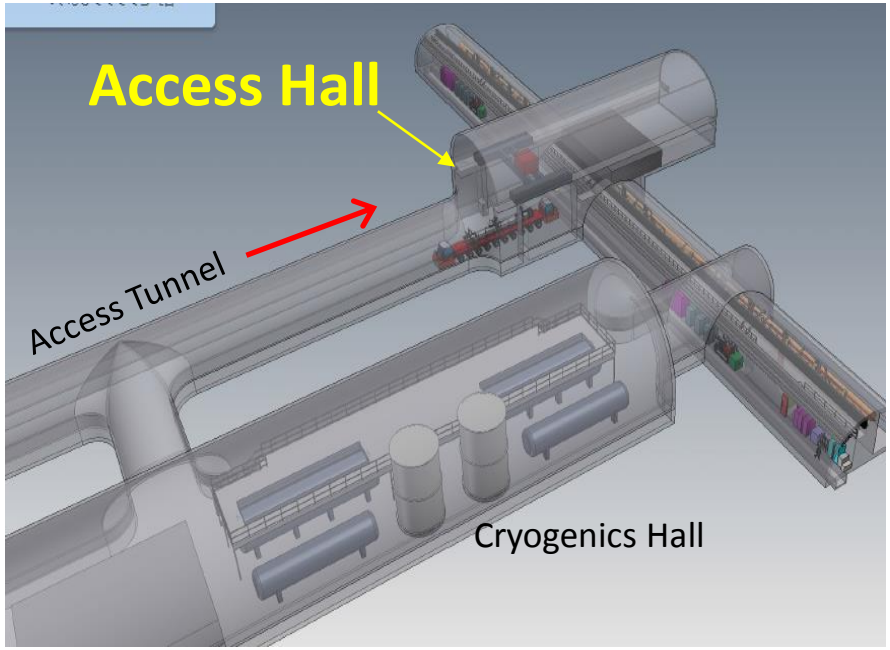
TDR-Baseline

Case-A

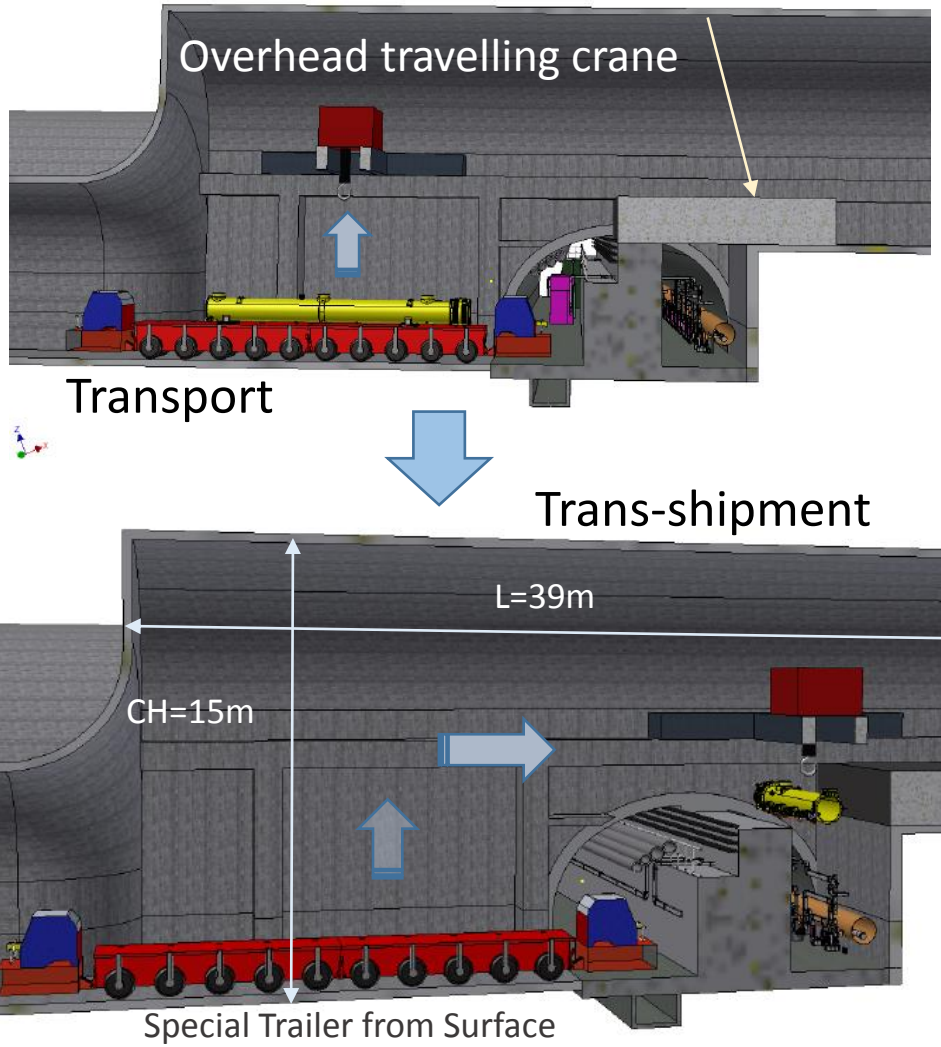


Case-A : Lifting & Carrying method by the Overhead Crane

TDR Study/2012



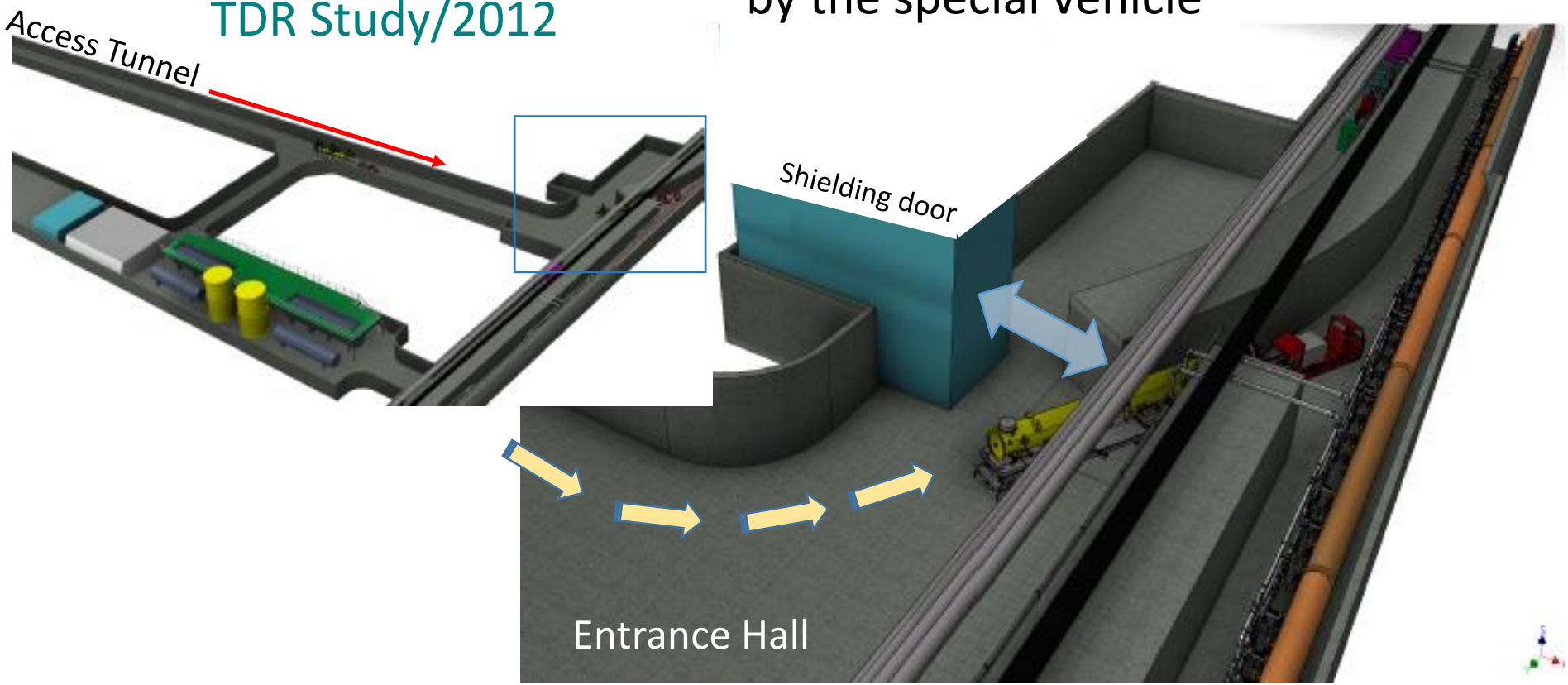
Shield Block/ for Beam operation



- Some Issues:
  - Need the big caverns (w15m*h15m*L39m) (6 places?)
  - BT upper shield required
  - Storage space of the shield blocks ?
  - Construction Cost & Schedule ?

Case-B : Floor traveling method by the special vehicle

TDR Study/2012



- Some Issues :
  - Shielding gate structure and storage ?
  - The arrangement of the supply line ?
  - Need a considerable scale of Cavern in this case.

Cryomodule transport in XFEL @DESY

Report By Y. Yamamoto/KEK

AMTF?

Transport from AMTF To XFEL

Packing on the trailer

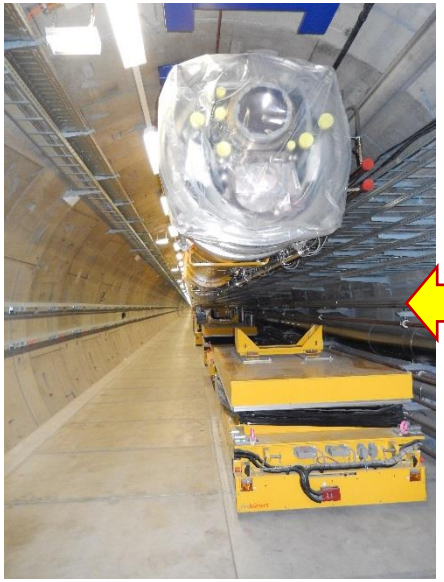
Unloading work

Unloading work

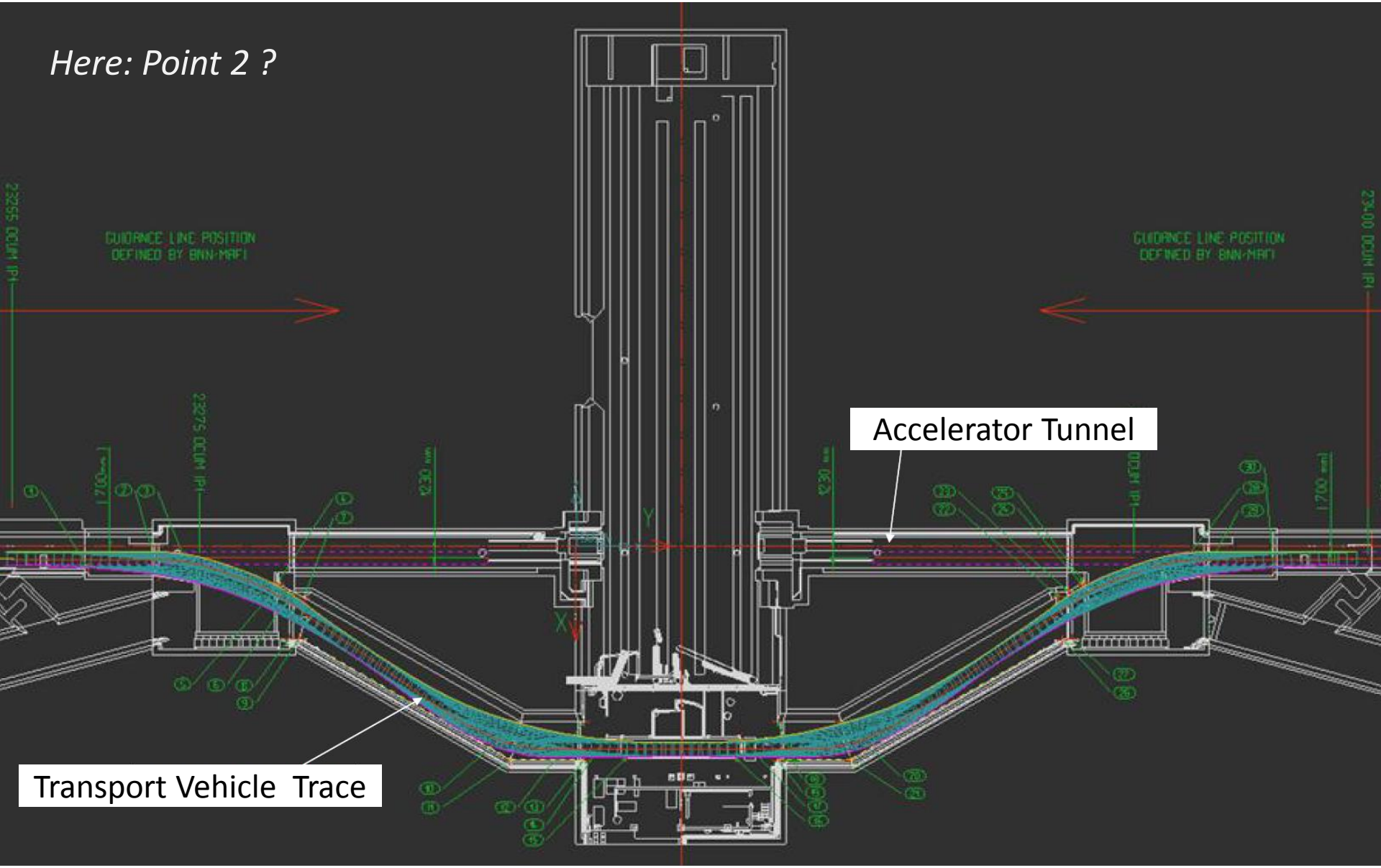
Transportation in the Tunnel

Installation work

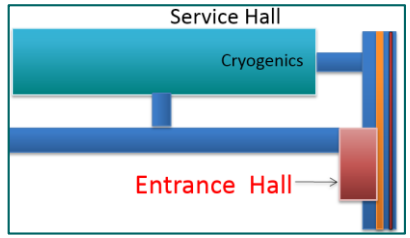
Install Completion

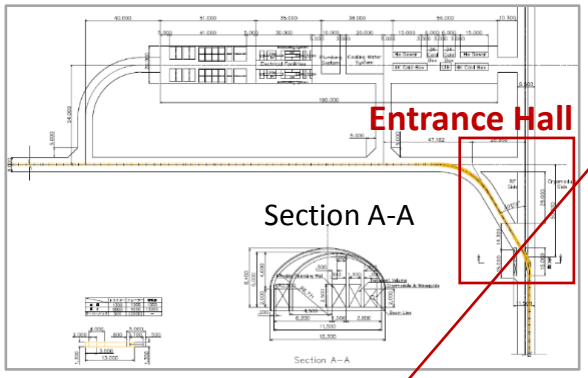


Reference: CERN (LHC) carrying study plan

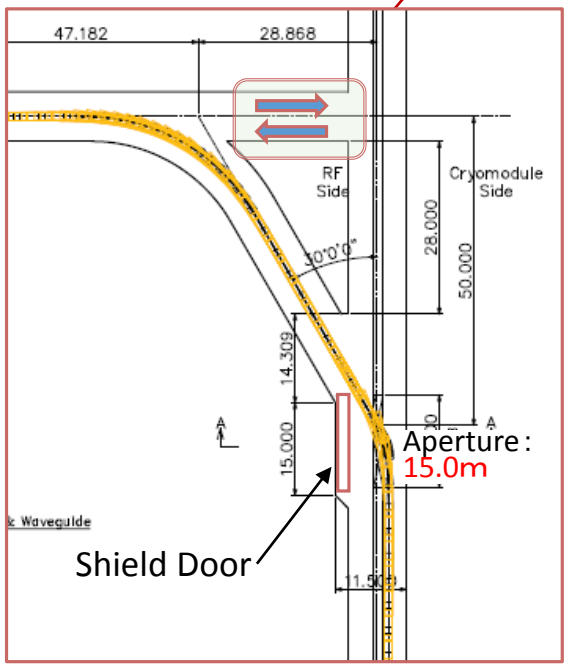


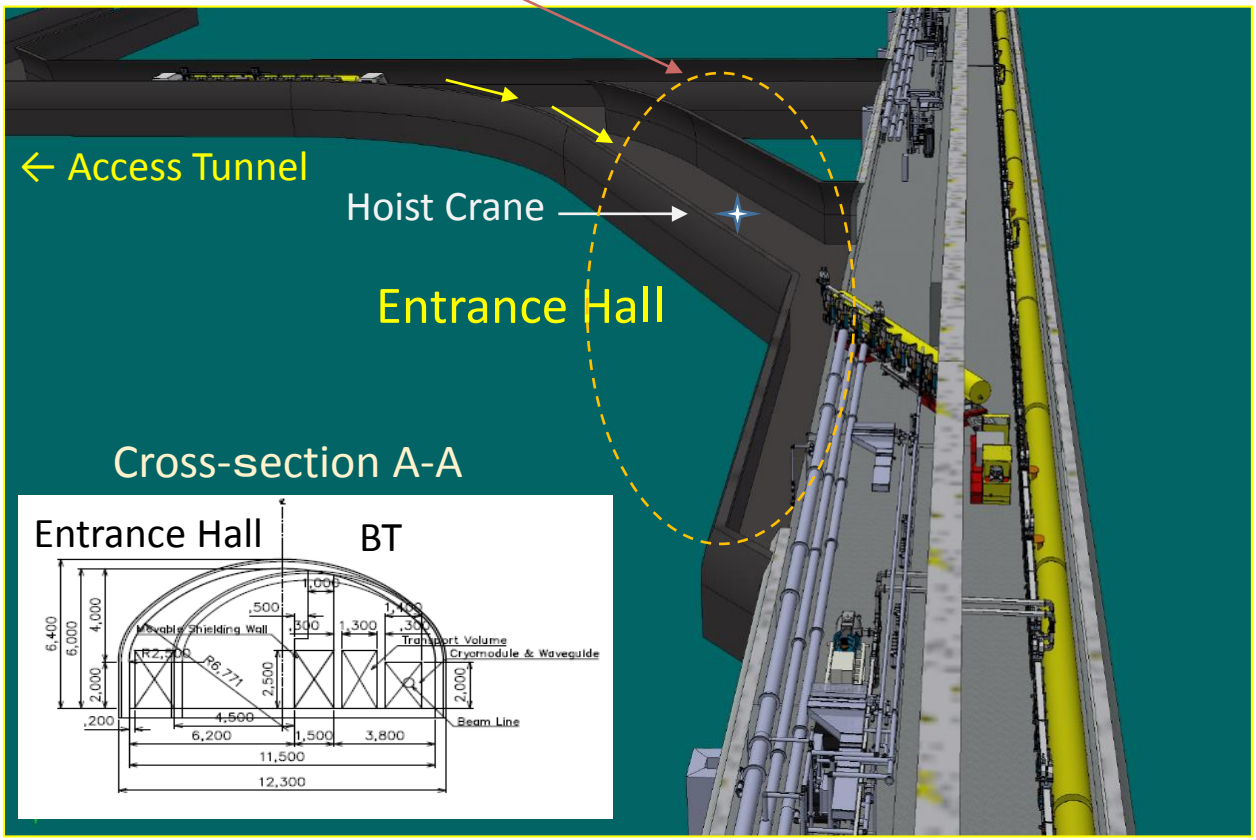
Latest Proposal Plan of the Entrance Hall





- During Construction: Tunneling work passage
- After completion: Air Duct, Smoke extraction path





Summary

- ML Tunnel Cross-section
  - Tunnel width: 9.5m BT:4.0m, RF:4.0m, SW:1.5m
  - Transport Passage for Cryomodule >2.1m
  - Access & Escape Passage of RF-gallery >1.8m
  - Adjustment of Facility design & Installation method

- Access hall Configuration
  - New proposal plan: Scale reduction from TDR
  - precondition for CM installation: Waveguide integrated
  - Reconsideration: Shielding system design
  - Access Hall really need six places?

CFS Agenda towards ECWS2016

Subject	Change Contents	Review Items
ML Tunnel Cross-section	**Shielding conditions**: Central wall thickness /3.5m→1.5m - CR working	• RF service Gallery: RF Components layout • Beam Tunnel: Cryomodule transport • Connecting Passage (BT-RF) • Arrangement of the supply lines(CFS)
Access Hall (Entrance hall)	**Install method:** - Underground facilities - Surface facilities	• Installation method -Access route, -Transport vehicle • Access Hall Configuration -Entrance Hall, Shielding Door equipment
Cryogenics Cavern	**Components Layout**: - Underground facilities - Surface facilities - CR working	• Main components Layout -Cold Box (4K?), -Compressor, -He & N_2 Tank • Facility scale & Location -Dimension: Underground Cavern, Building -Supply Facilities: Cable, LCW, CHW, Ventilation
BDS Tunnel Configuration	**Beamline Configuration**: -Win tunnel ? or Single tunnel ? - CR & CRWG working	• Components Layout -Beam Diagnostic, -Beam Collimation, -Energy Collimation, -Final Focus, -Beam Damp system • Tunnel Configuration & Supply service

END