March 22, 2012

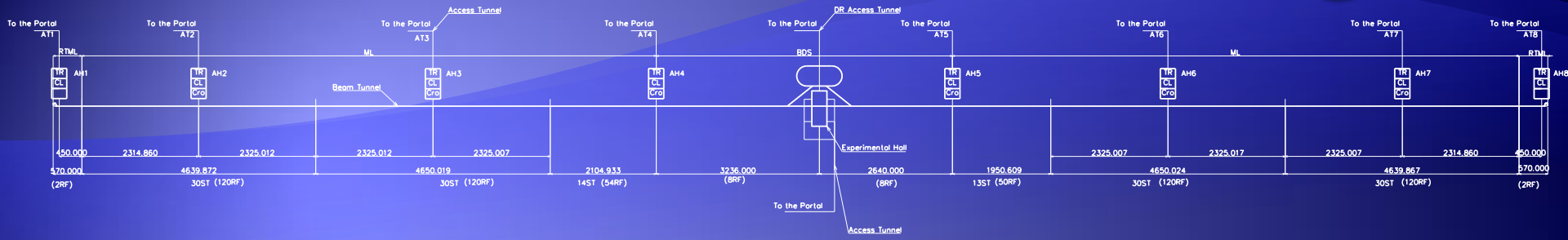
920 - 950

ASIAN REGION CIVIL DESIGN

Outline

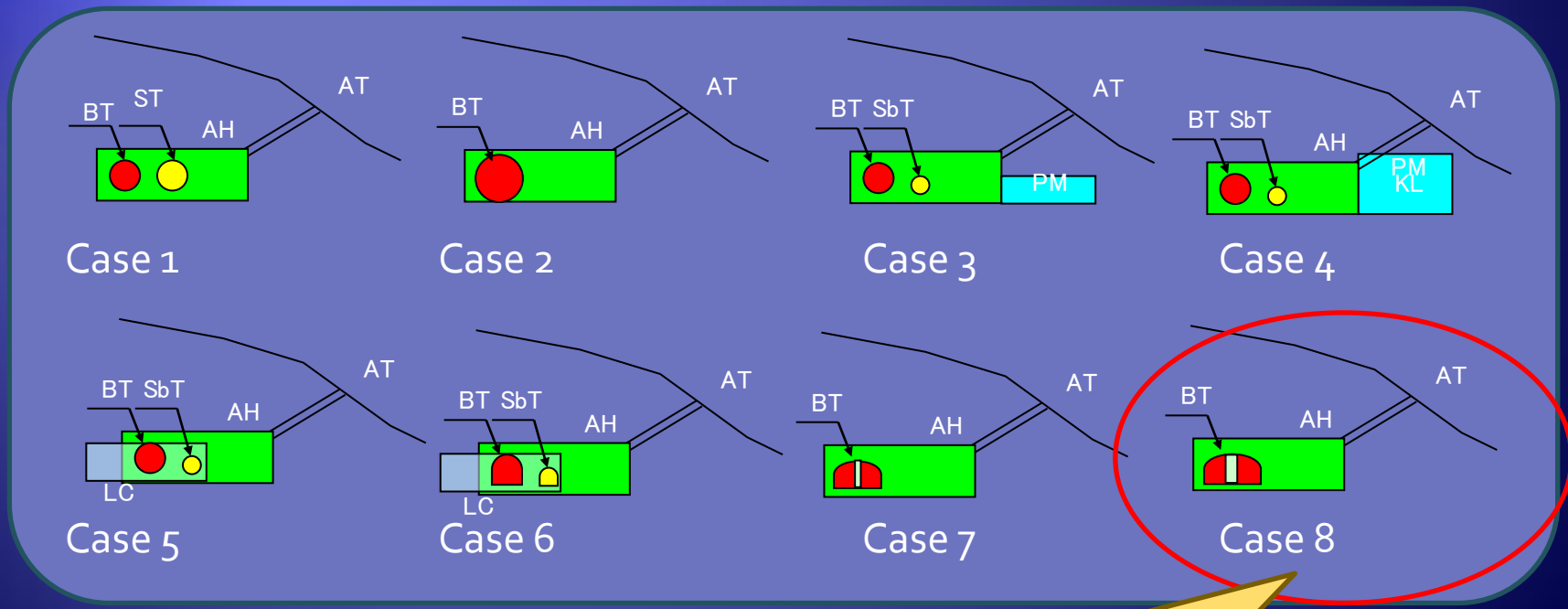
- Overview of Asian Civil Design
  - Previous Case Study
- Feature of Beam Tunnel
- Tunnel Typical Cross Section
  - Beam Tunnel
  - RTML
  - Damping Ring
- Access Hall and Access Tunnel
- Central Region Layout

Overview of Asian Civil Design



- Beam Tunnel
  - 'Kamaboko' shape (by NATM)
  - Separated by concrete radiation shield wall (t=3.5m)
- Access Tunnel
  - Sloped tunnel
  - Two access tunnel for central region (for DR and D/H)
- Access Hall
  - Eight access halls for electric facilities, cooling water plant, cryogenic plant, and the others
  - 5km intervals is maximum because of He supply
- Detector Hall
  - IP point → will be explained later

Case Study (Earlier Conclusion)



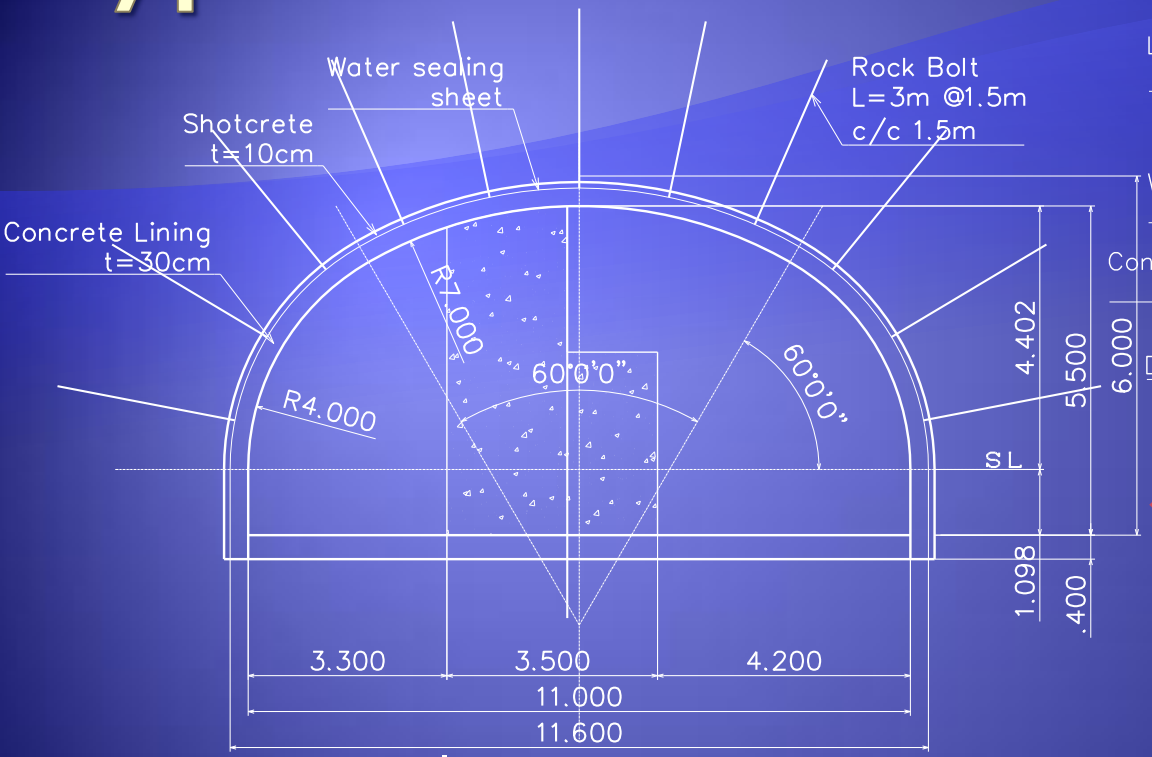
Adopted

Having the advantage with considering a comprehensive view point (cost, schedule, convenience..)

Feature of Beam Tunnel

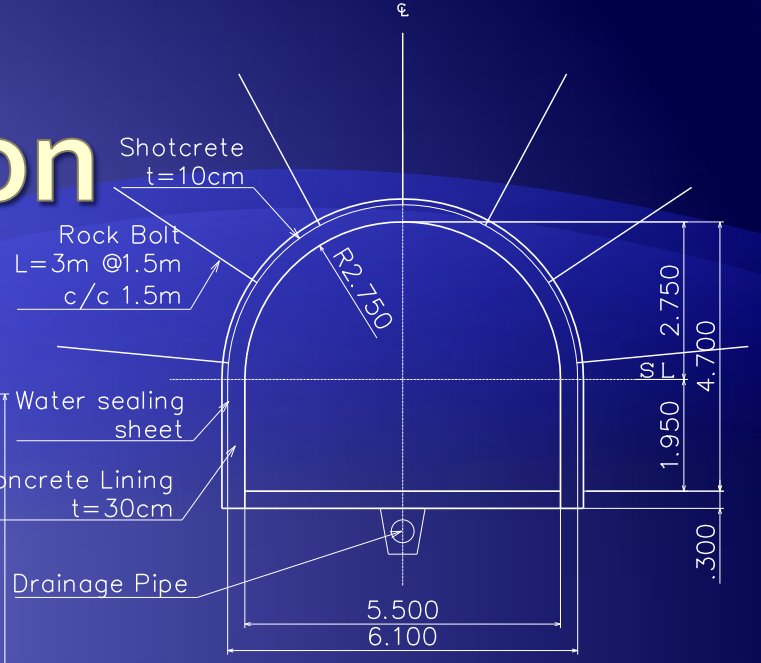
- NATM (drill and blasting method) is adopted
- Single tunnel with concrete shield wall (t=3.5m)
- Two galleries for beam line and service tunnel (klystron)
- Help access to klystron side easily and safely during operation and in case of evacuation

Typical tunnel section

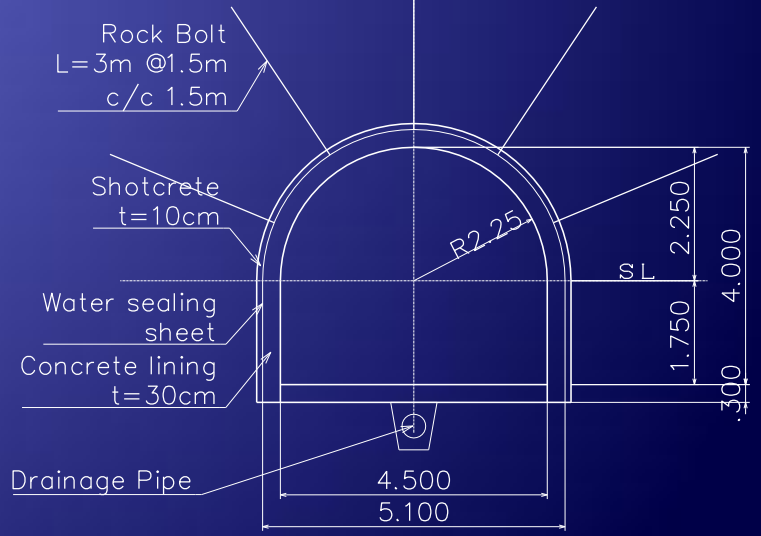


- Beam Tunnel
- Damping ring tunnel (straight part)

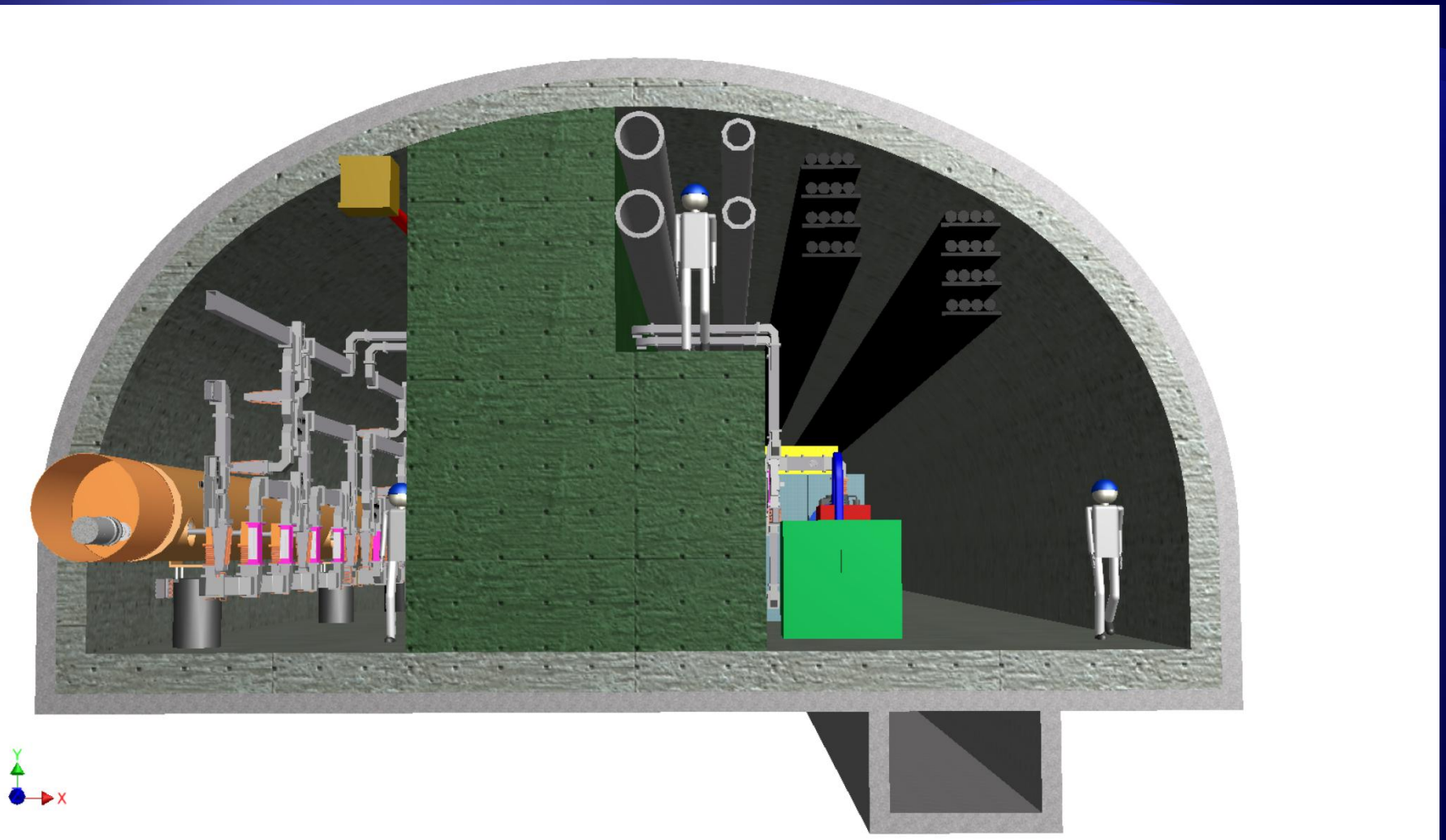
Shape is called Kamaboko



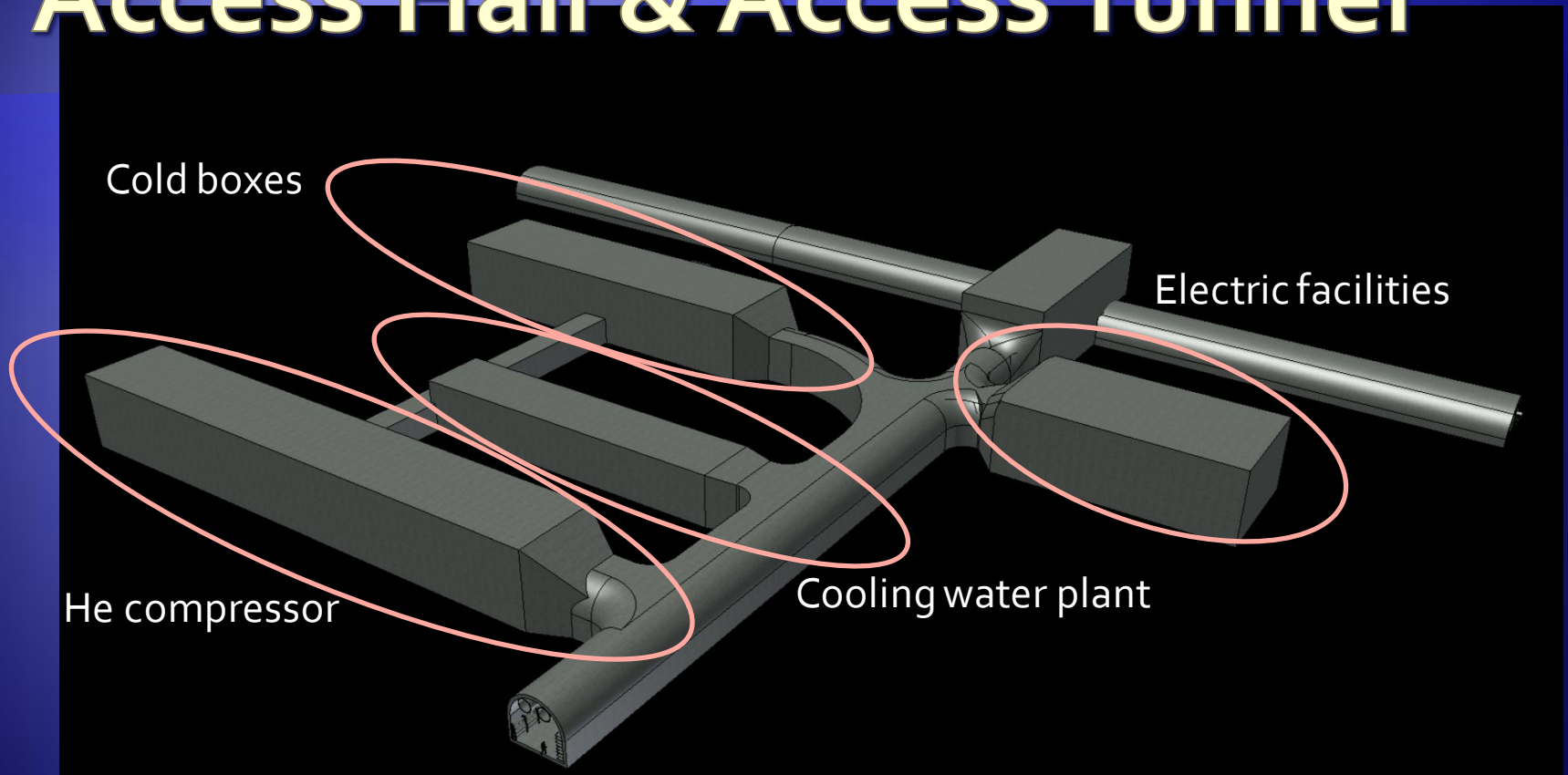
- Damping Ring Tunnel (arc part)



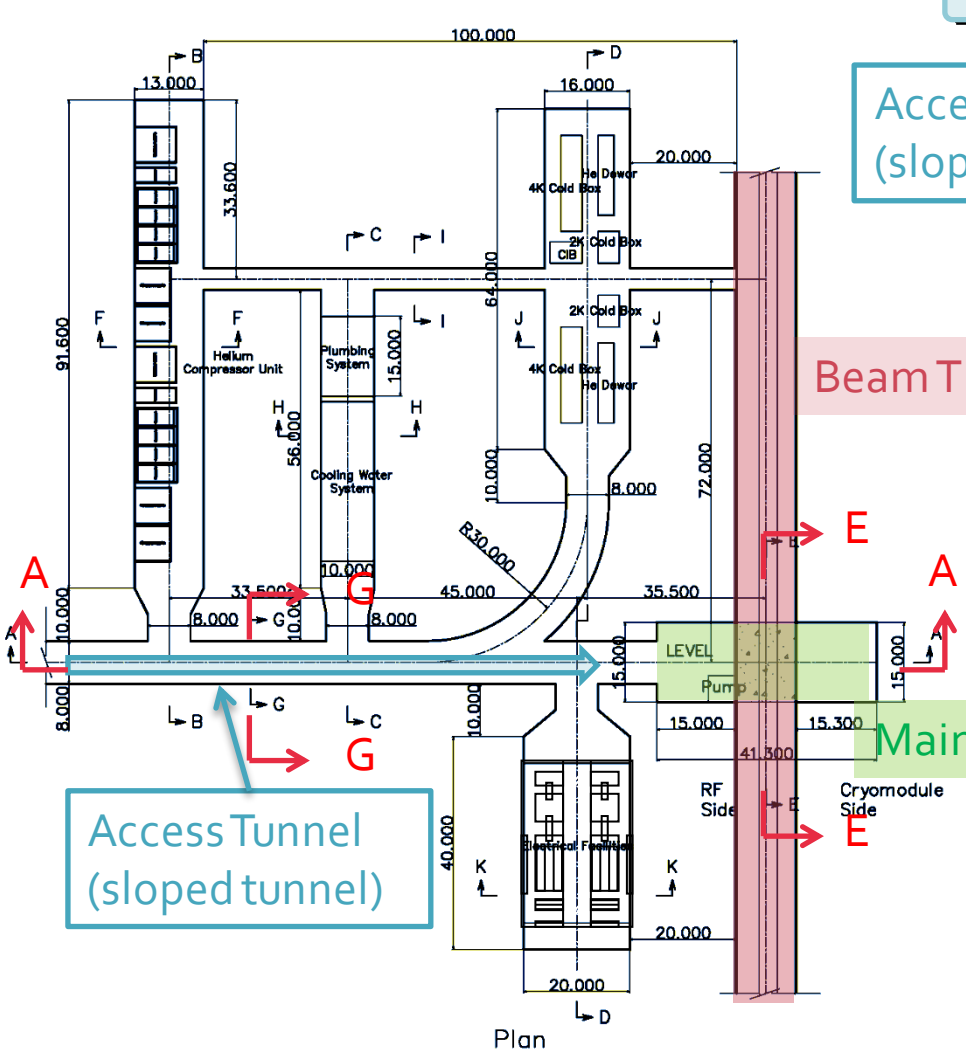
- RTML part of Beam Tunnel

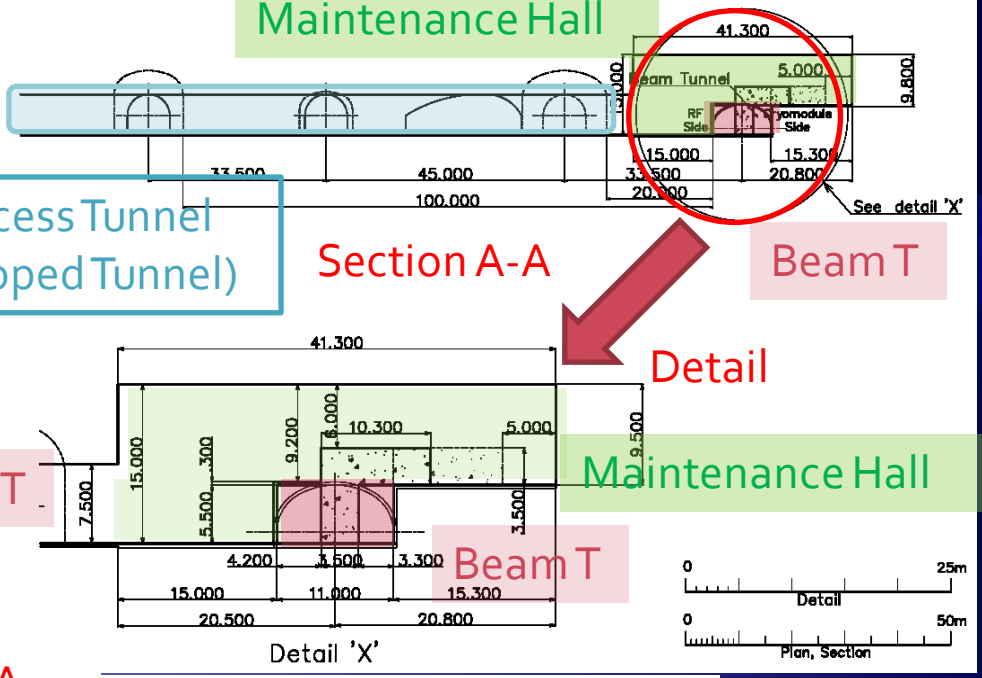

Y
X

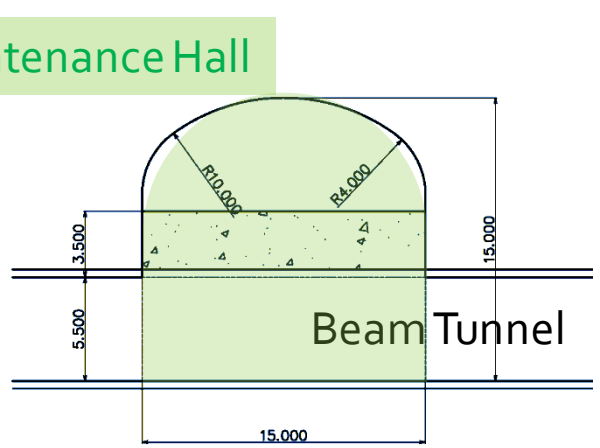
Access Hall & Access Tunnel

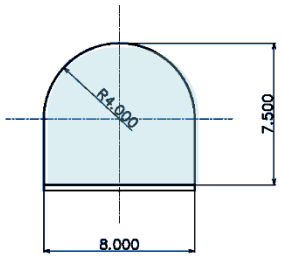


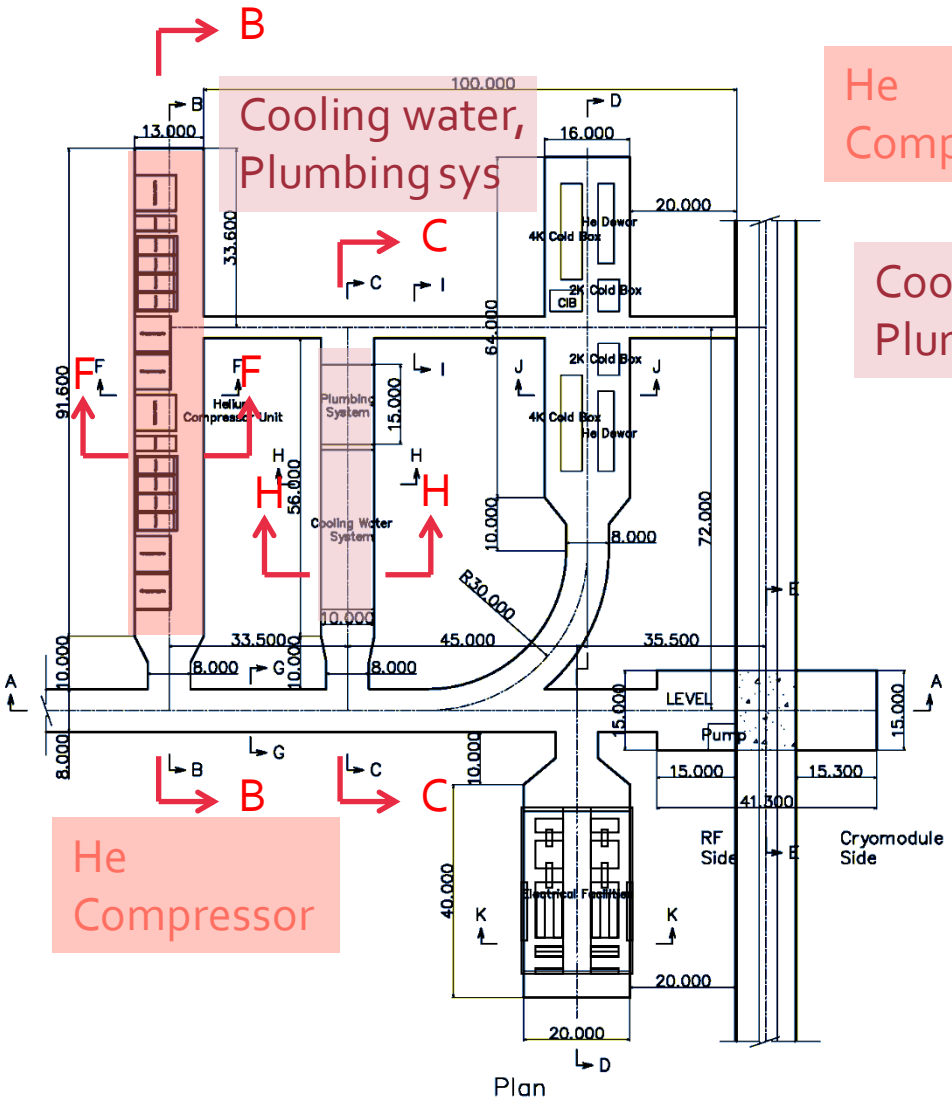
- Access hall consists of individual cavern
- Vibration source is installed away from beam line
- Cold boxes are near beam line


Plan
Access Tunnel
(sloped tunnel)
Maintenance Hall
Beam T
Cryomodule Side
RF Side
Helium Compressor Unit
Plumbing System
Cooling Water System
Electrical Feedbox
4K Cold Box
2K Cold Box
He Dewer
LEVEL
Pump

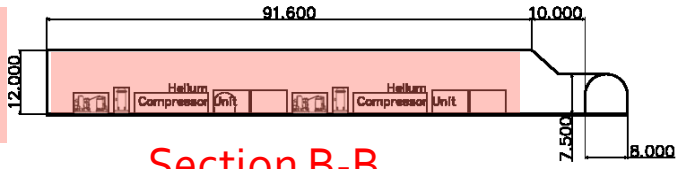

Maintenance Hall
Access Tunnel
(sloped Tunnel)
Section A-A
Beam T
Detail
Maintenance Hall
Beam T
Beam T
Detail 'X'
See detail 'X'
Beam Tunnel
RF Side
Cryomodule Side


Maintenance Hall
Beam Tunnel
Section E-E
(Maintenance Hall)


Section G-G
(Access Tunnel)

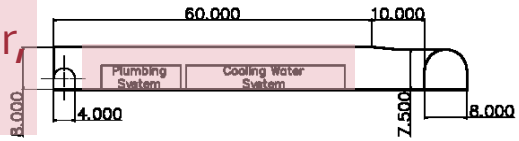


He Compressor

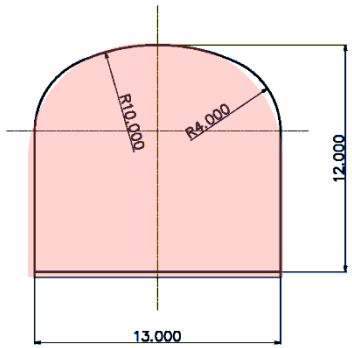


Section B-B

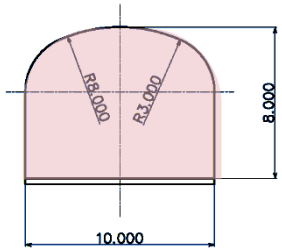
Cooling water, Plumbing sys



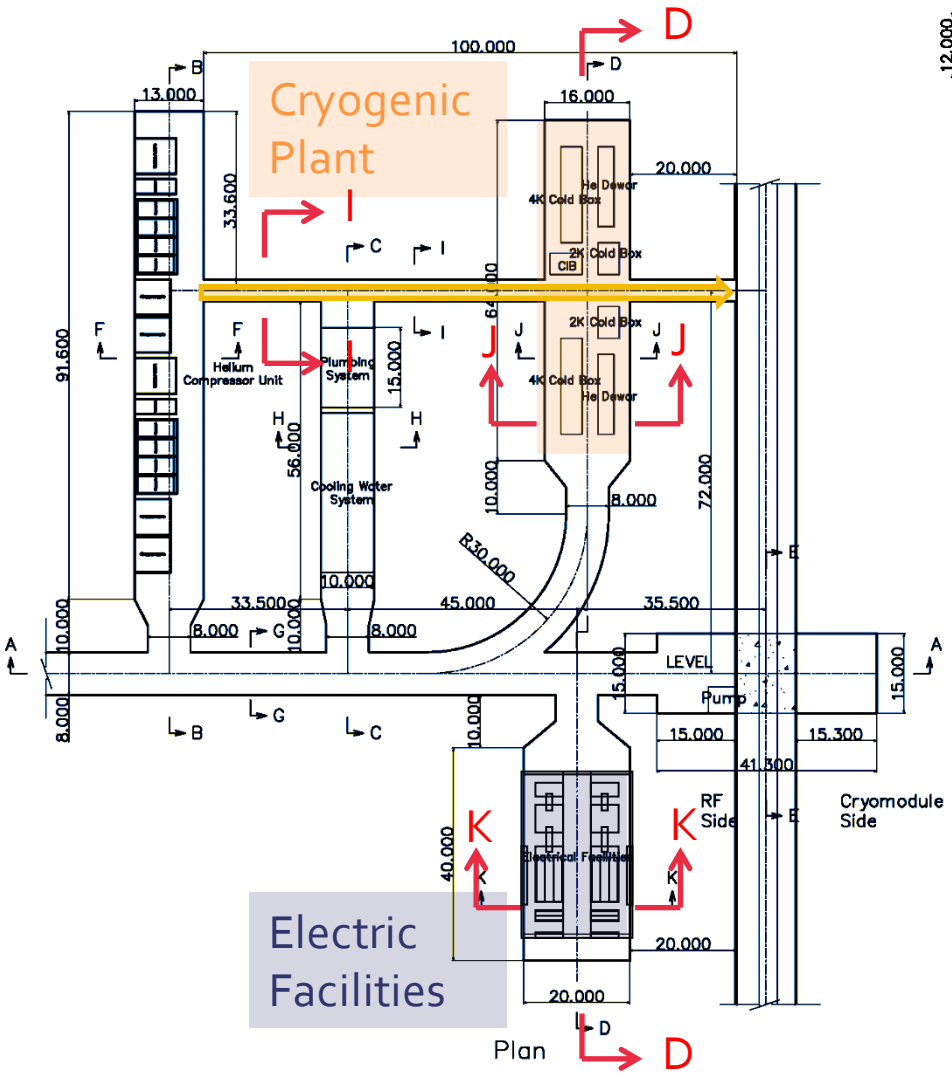
Section C-C

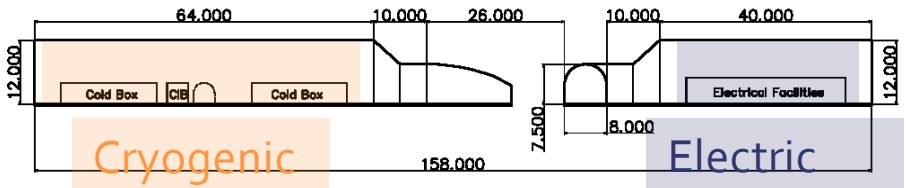


Section F-F
(He Compressor)



Section H-H
(Cooling water, Plumbing sys)

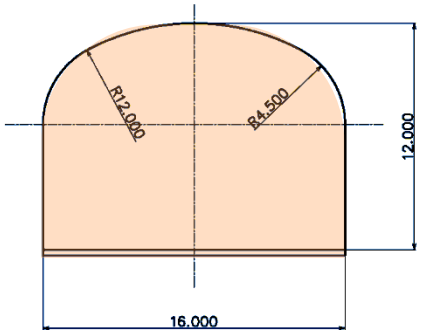




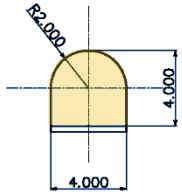
Cryogenic Plant

Section D-D

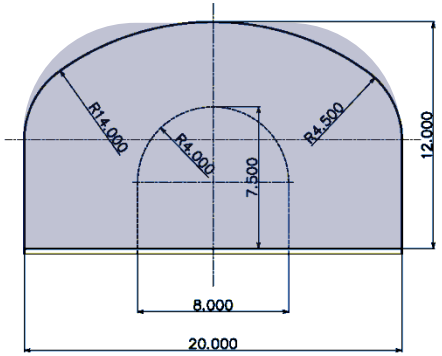
Electric Facilities



Section J-J
(Cryogenic Plant)

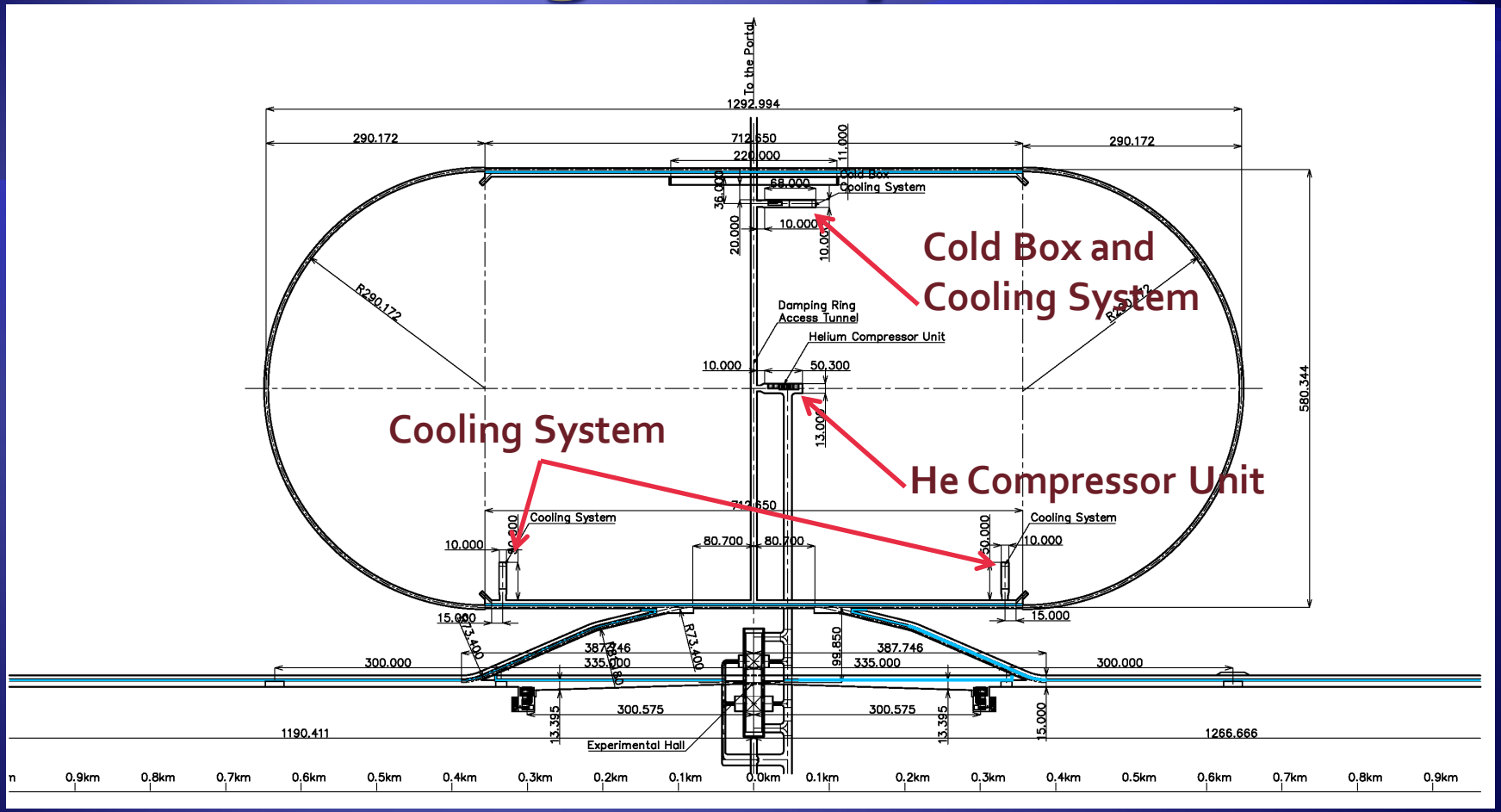


Section I-I
(Connection Tunnel)



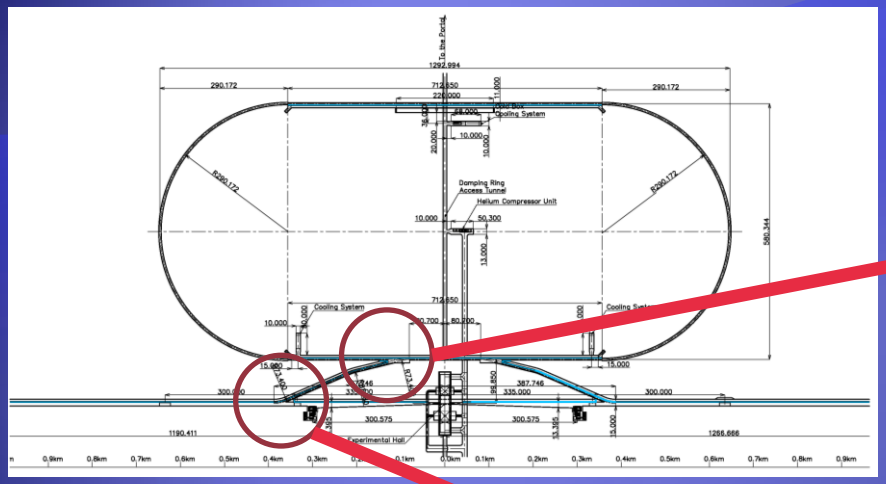
Section K-K
(Electric Facilities)

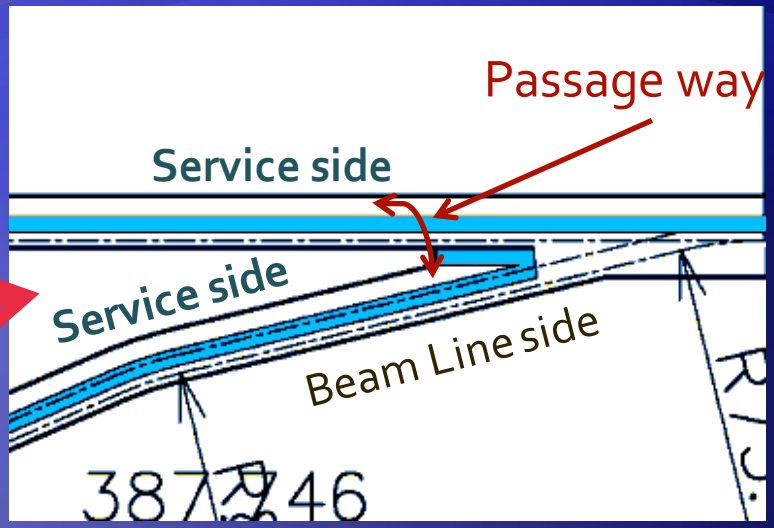
Central Region layout

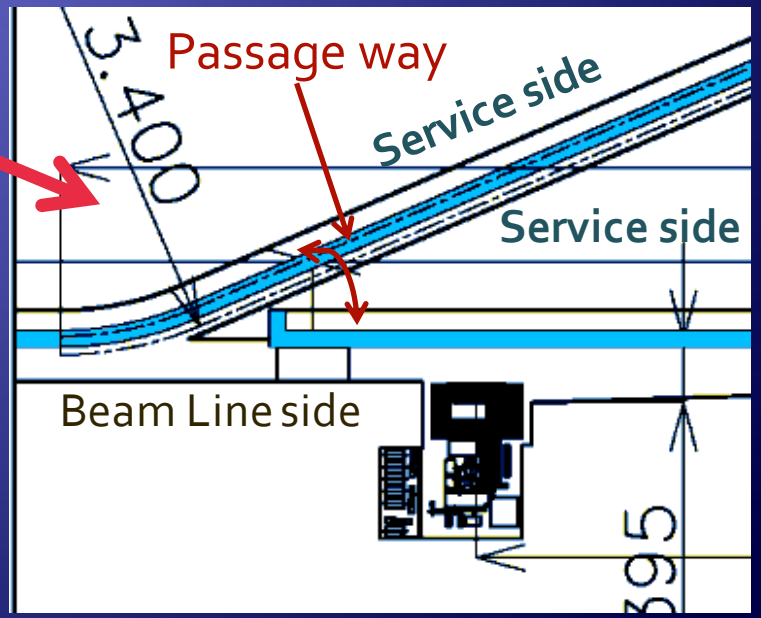


- Cooling systems for normal conduction area (arc portion)
- He compressor unit for detector is installed at center of dumping ring region
- Cold box is installed near superconducting area

Detail of junctional region







- At junction part, service side is connected to opposite side by over-pass passage ways

Summary

- Kamaboko shape tunnel with concrete shield wall is adopted for Beam Tunnel and straight part of Damping Ring
- Sloped access tunnel is adopted
- Access hall consists of individual 4 caverns