

# ILC Interaction Region Configuration Change Request

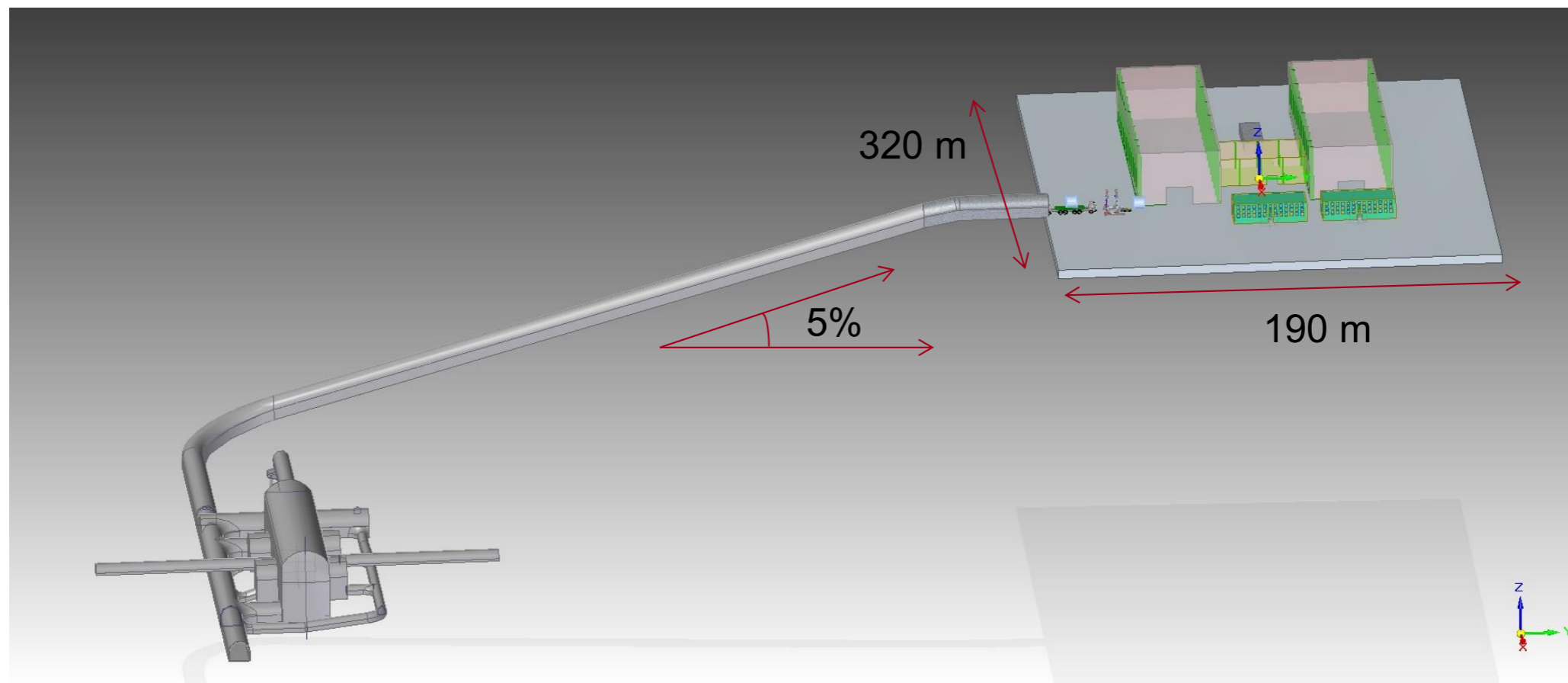
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LCWS14, Belgrade  
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09.10.2014



# Baseline Detector Hall Scenario (TDR)

- TDR assumed Japanese site would be very mountainous - no flat top area to place a surface installation atop the underground areas
- Access to underground areas via horizontal tunnel of ~1km length and up to 10% slope
- Detector installation mostly underground



Underground Detector Hall

# Baseline General layout

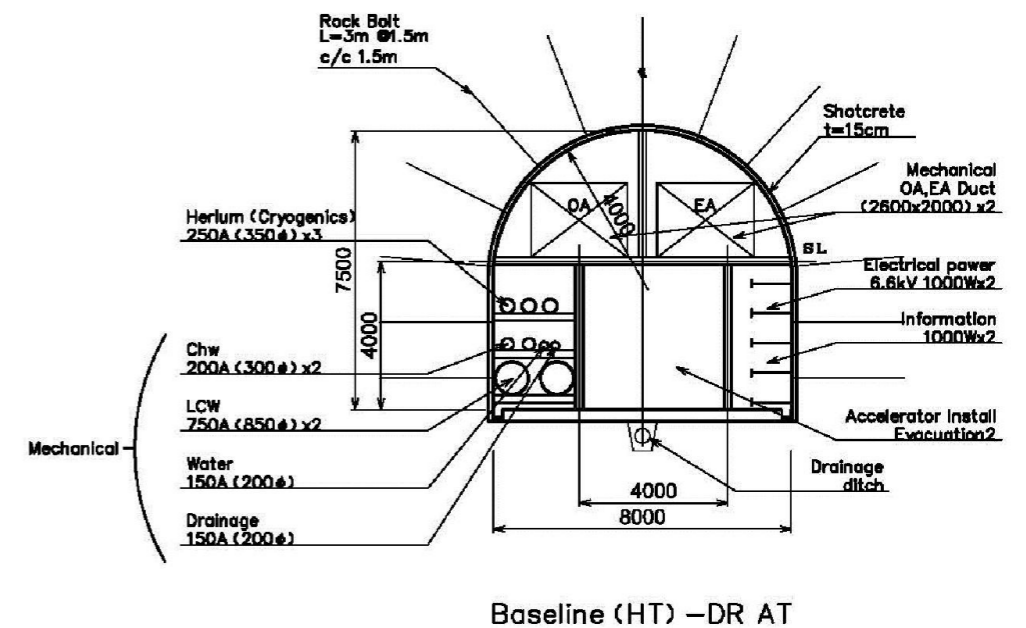
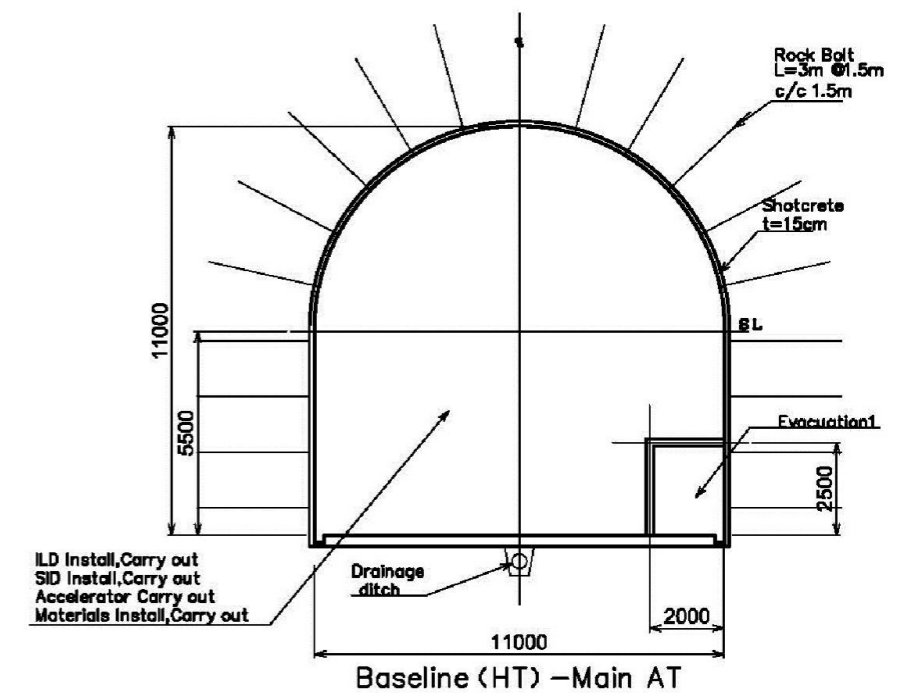
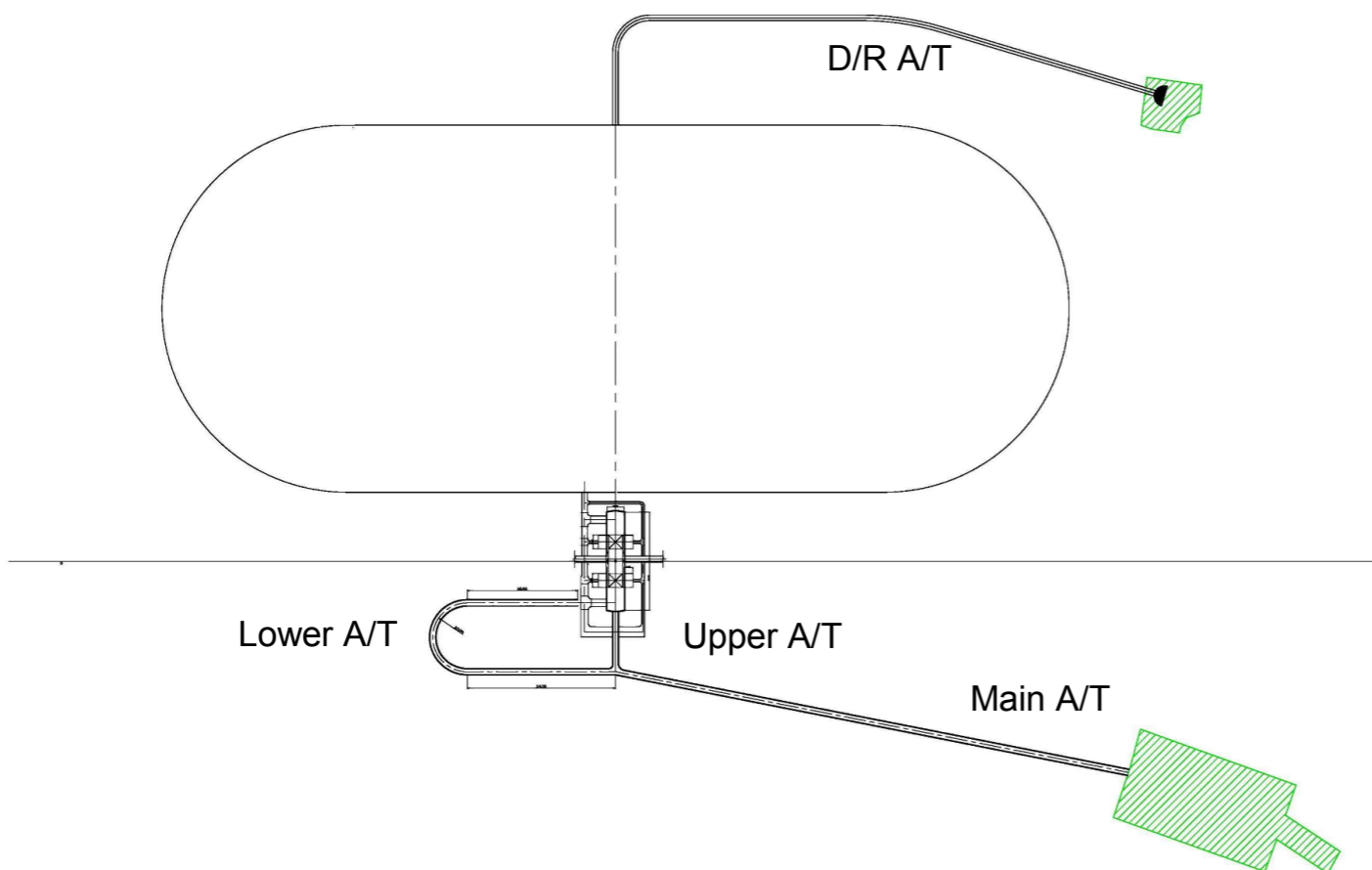
## Tunnel access for D/H

D/H access tunnels : D:11m , grad:7%

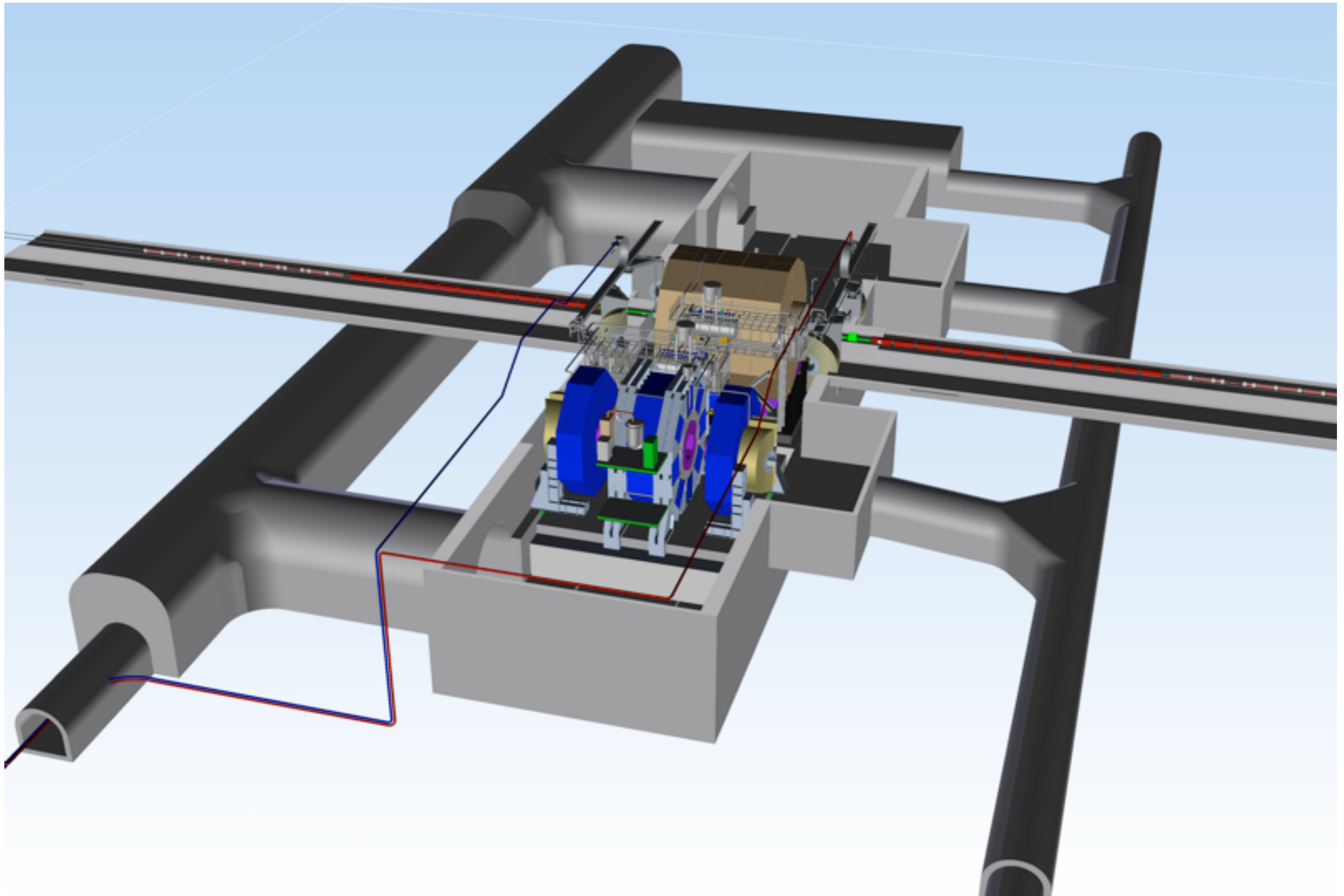
Detectors assembling and access to D/H

D/R access tunnels : D:8m , grad:10%

Accelerators transportation and utility lines for D/H and D/R



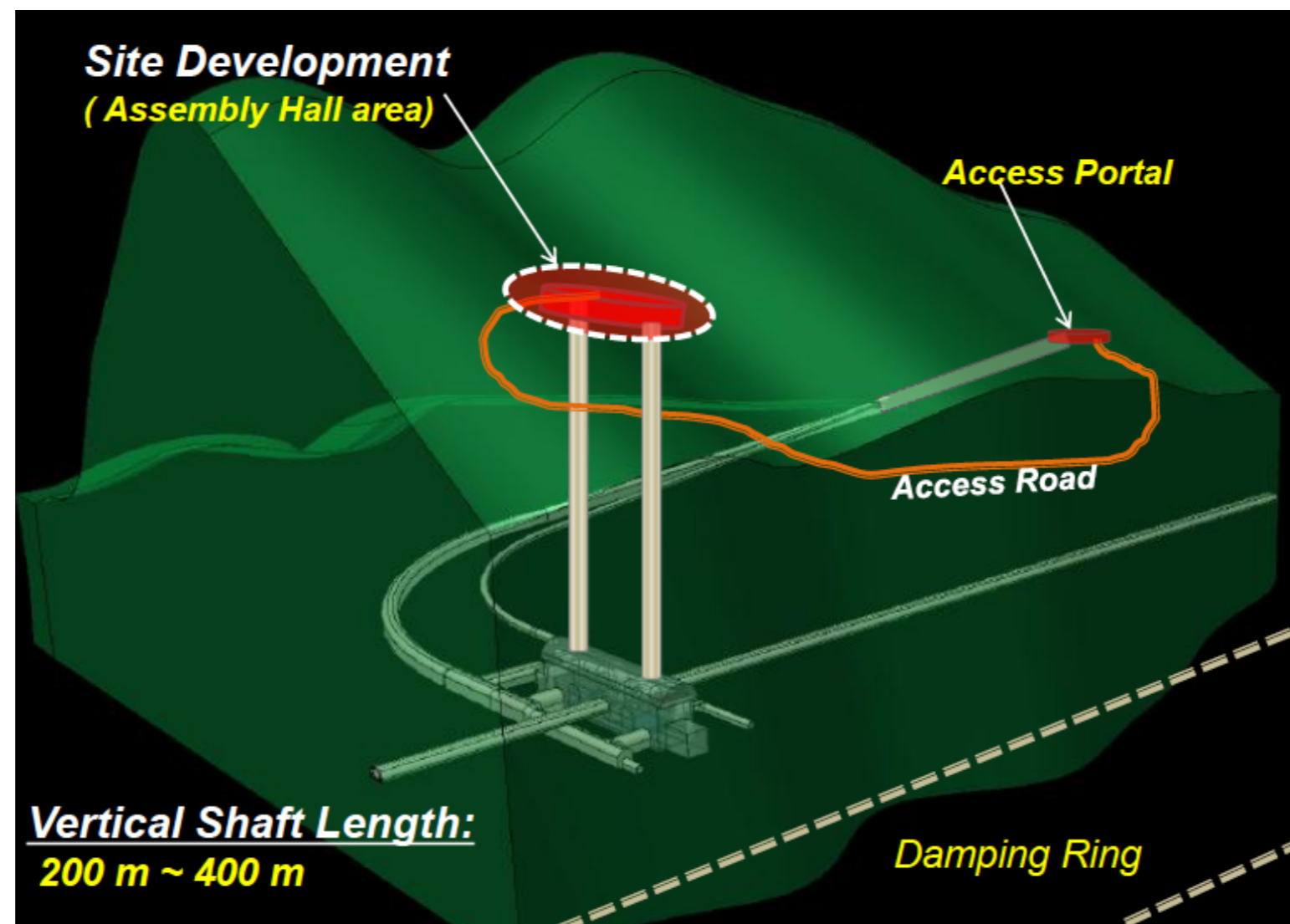
# TDR Interaction Region



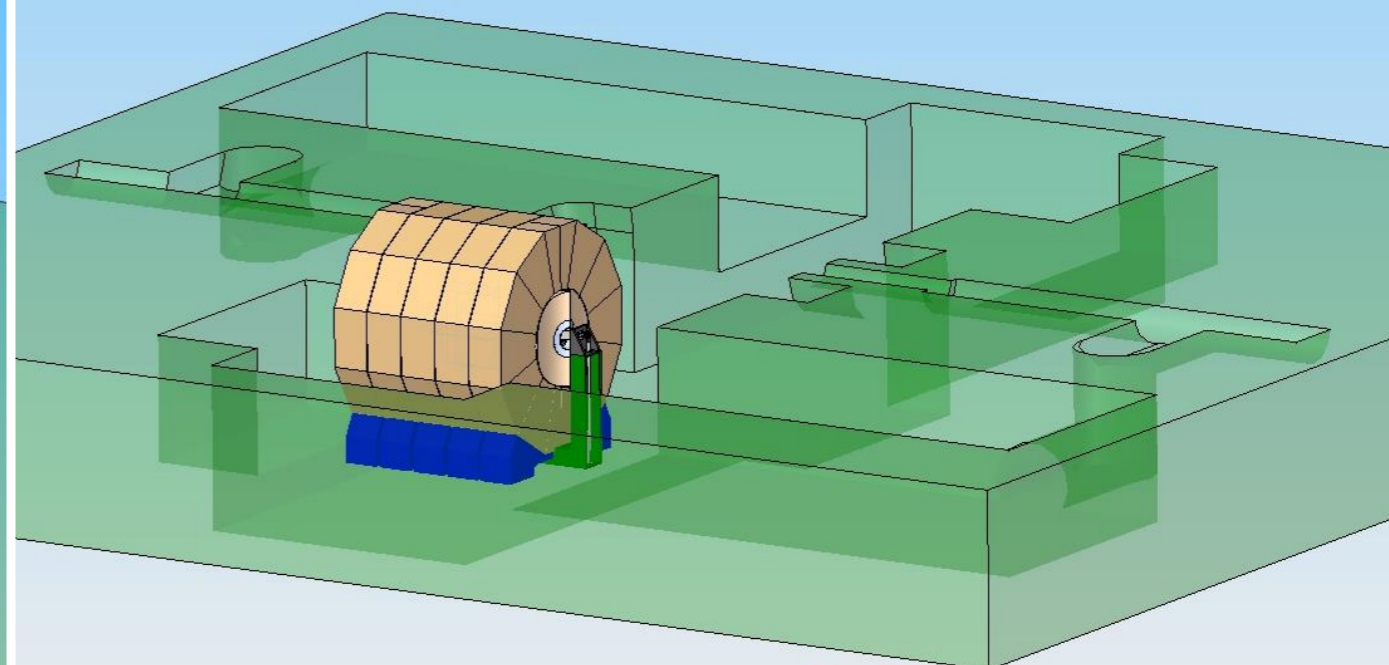
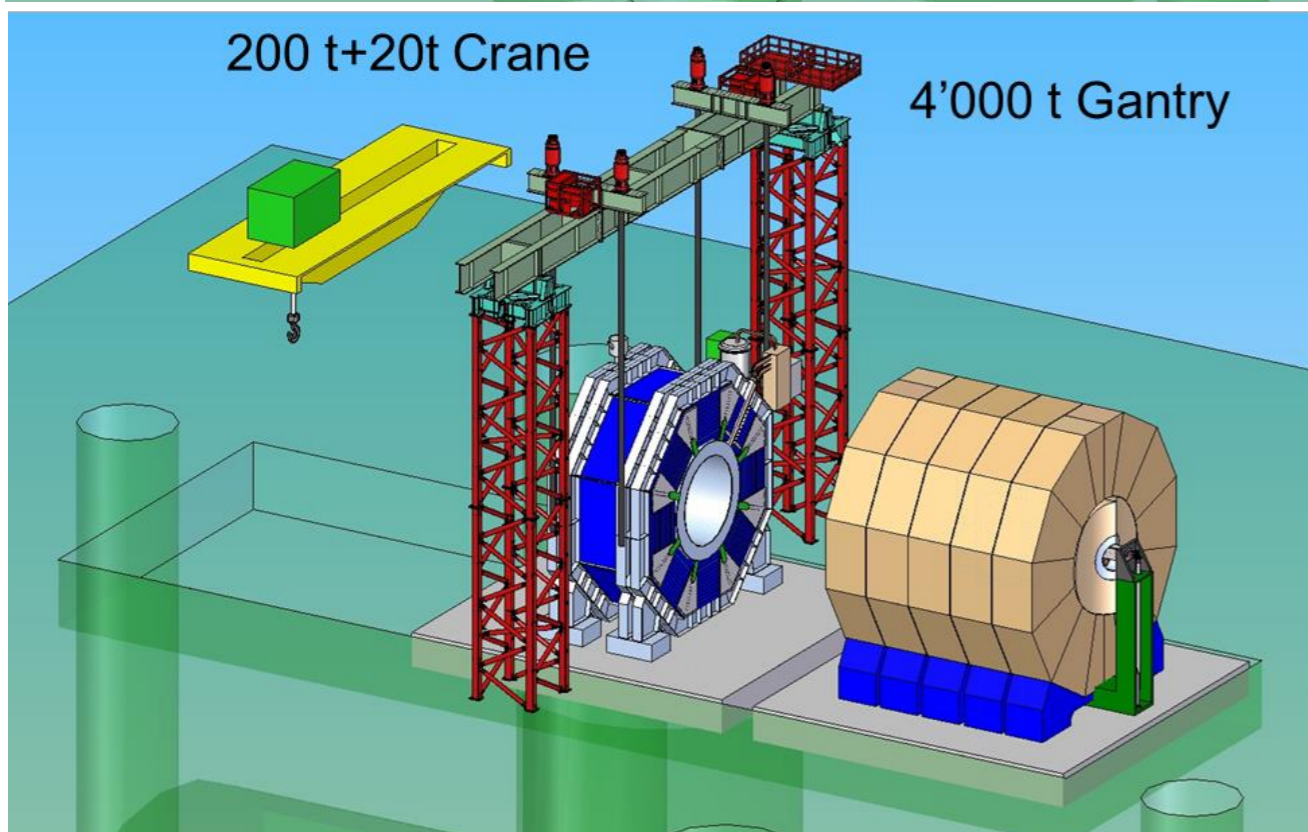
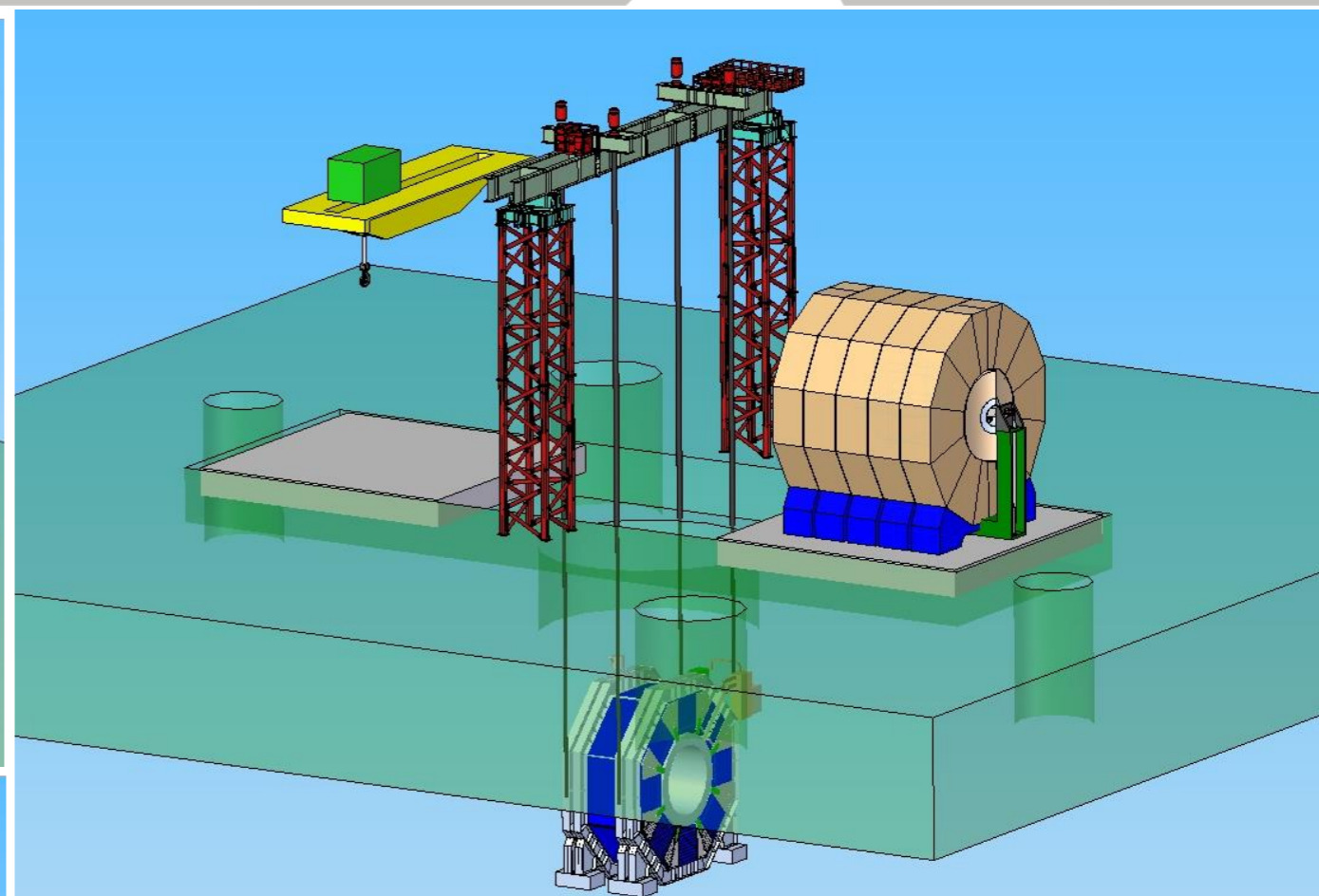
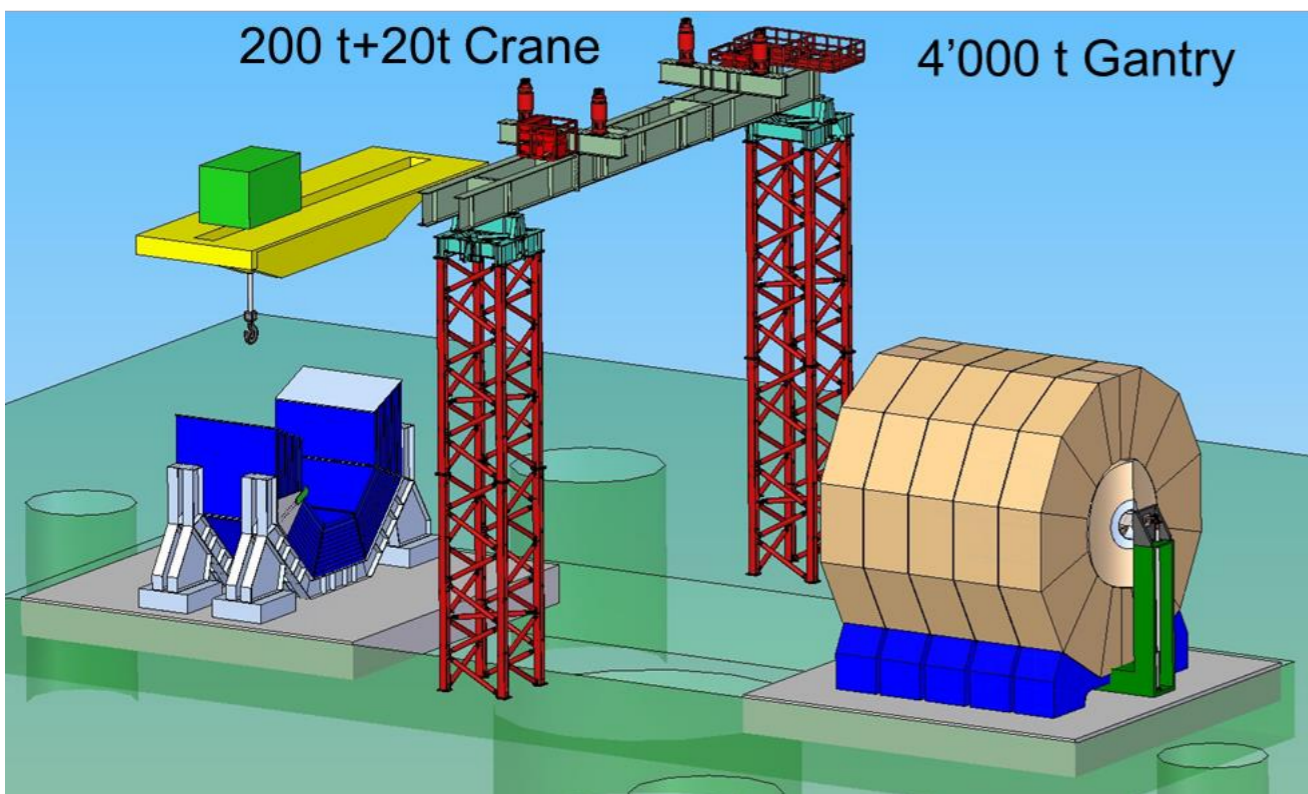
# Kitakami Site



- Site in Kitakami has no steep mountains around the interaction area
- Vertical access to underground areas seems possible
- CFS and MDI groups started initiative at LCWS13 to look into this

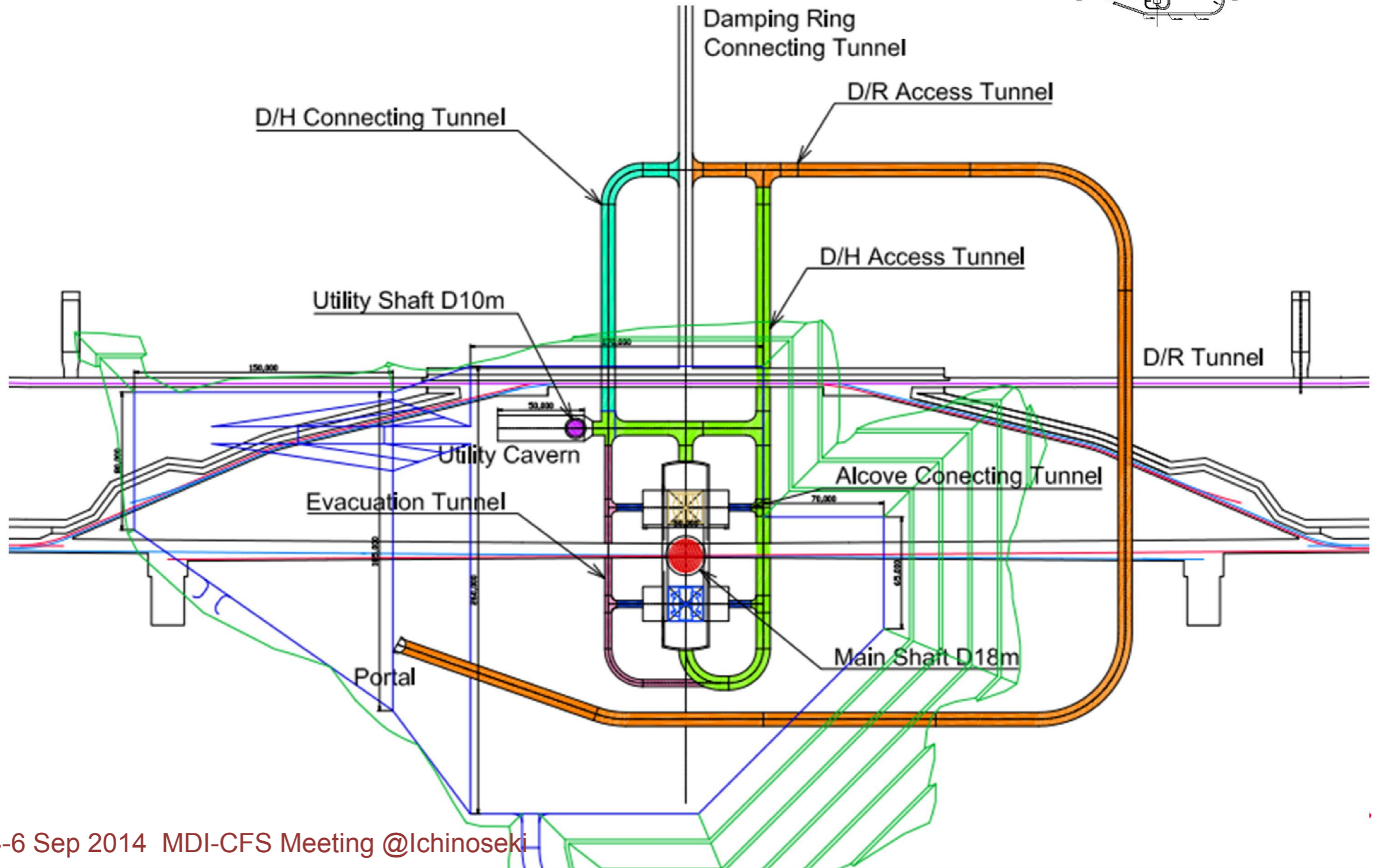


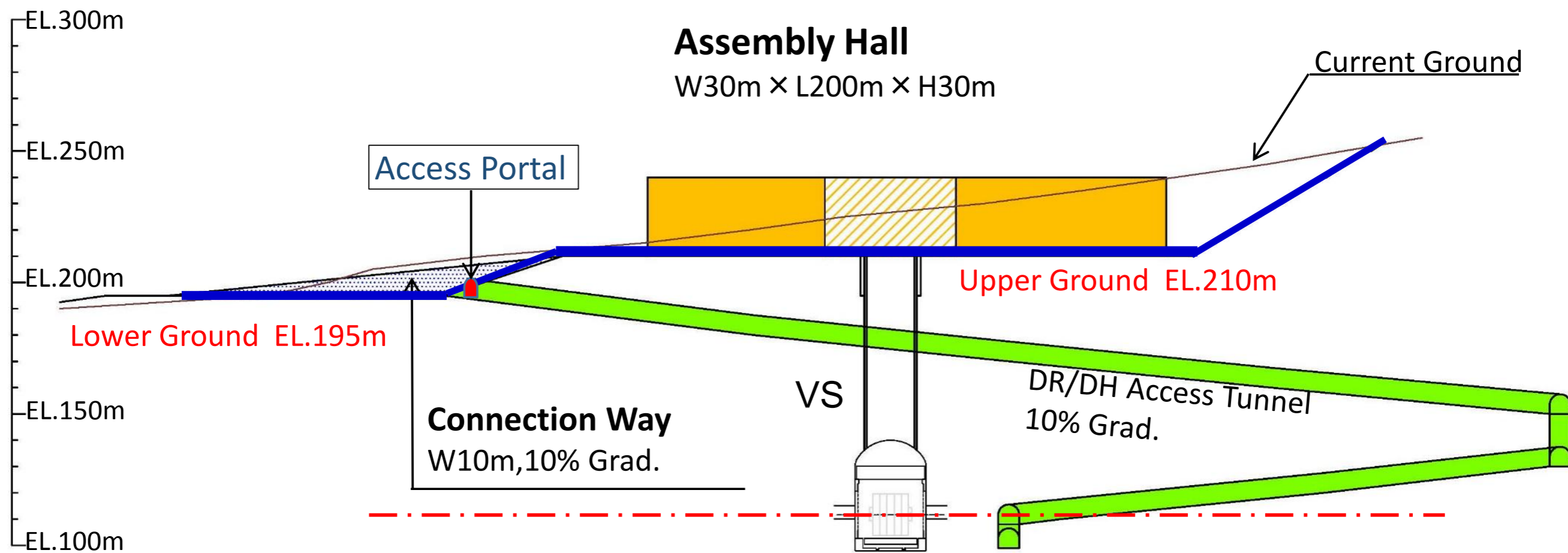
# Option #1: Vertical shafts





# Hybrid-A' General layout

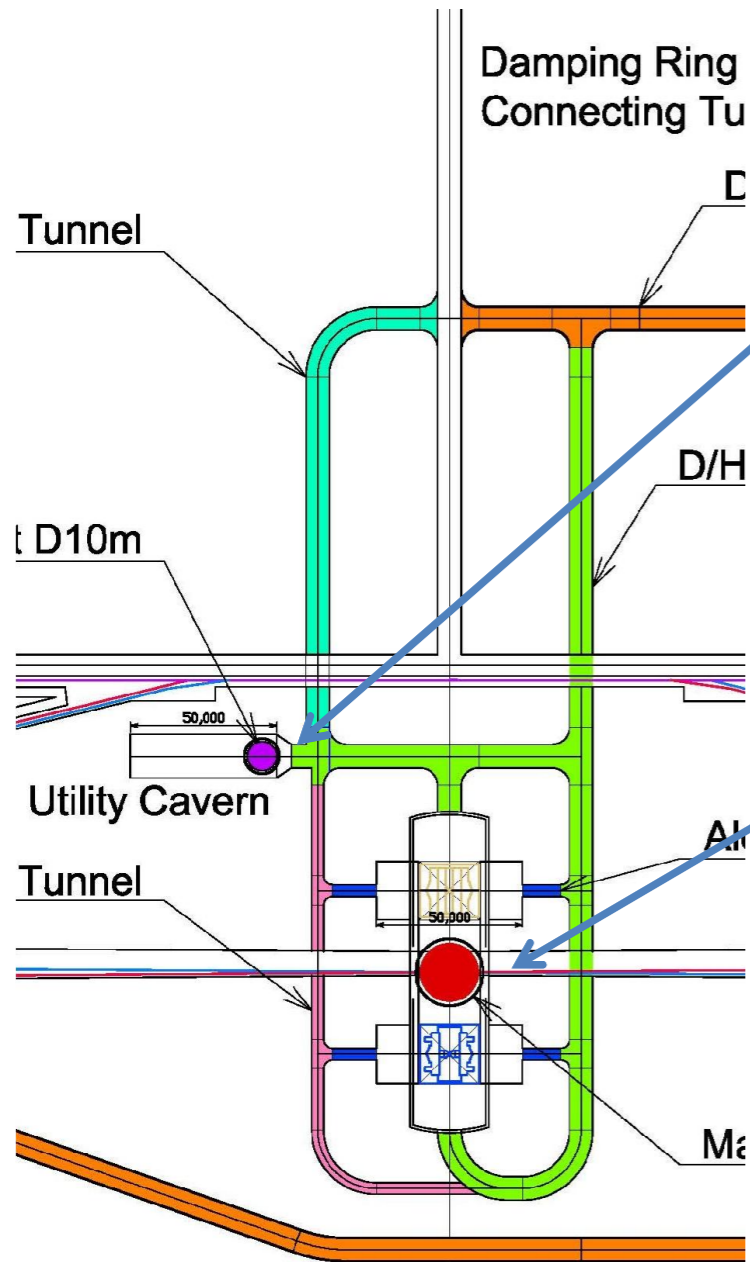




Longitudinal section

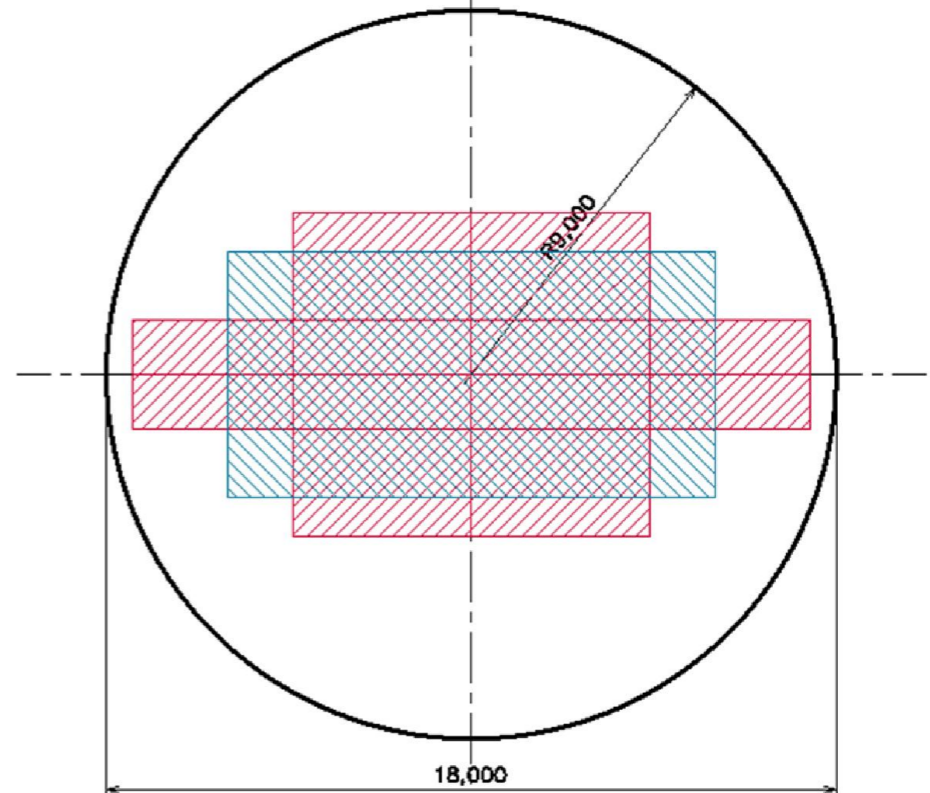
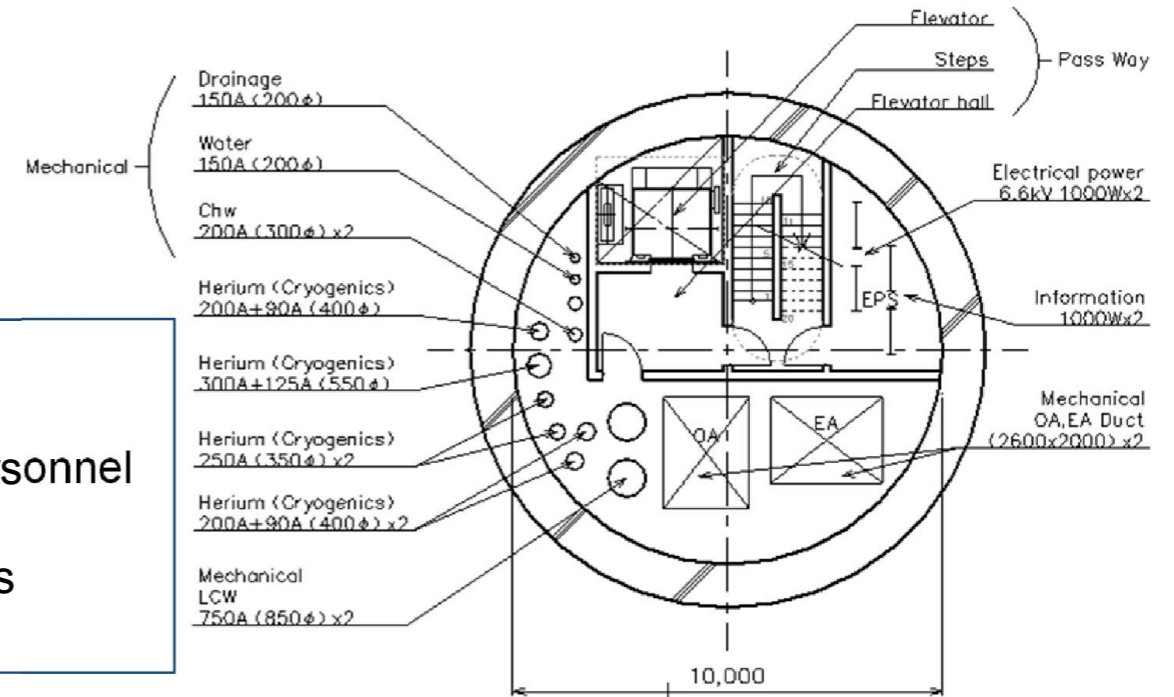


# Hybrid-A' Shafts



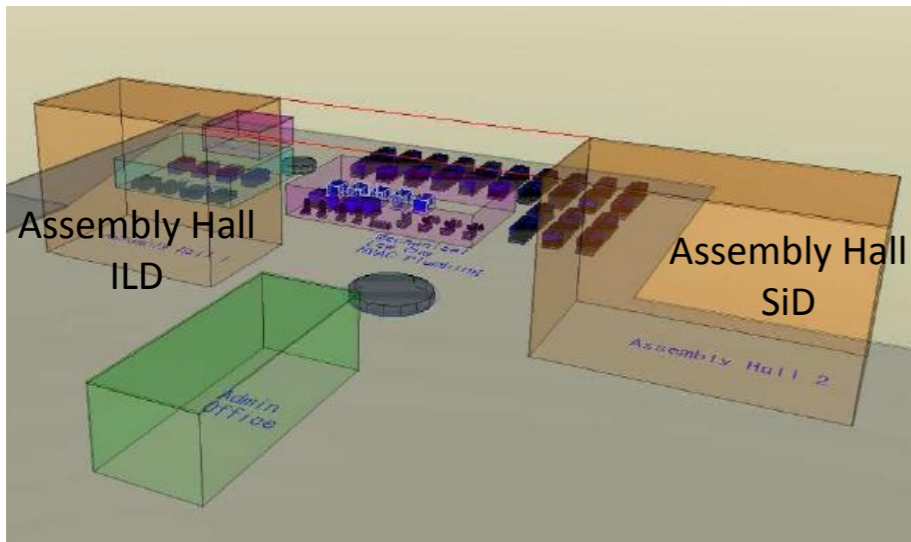
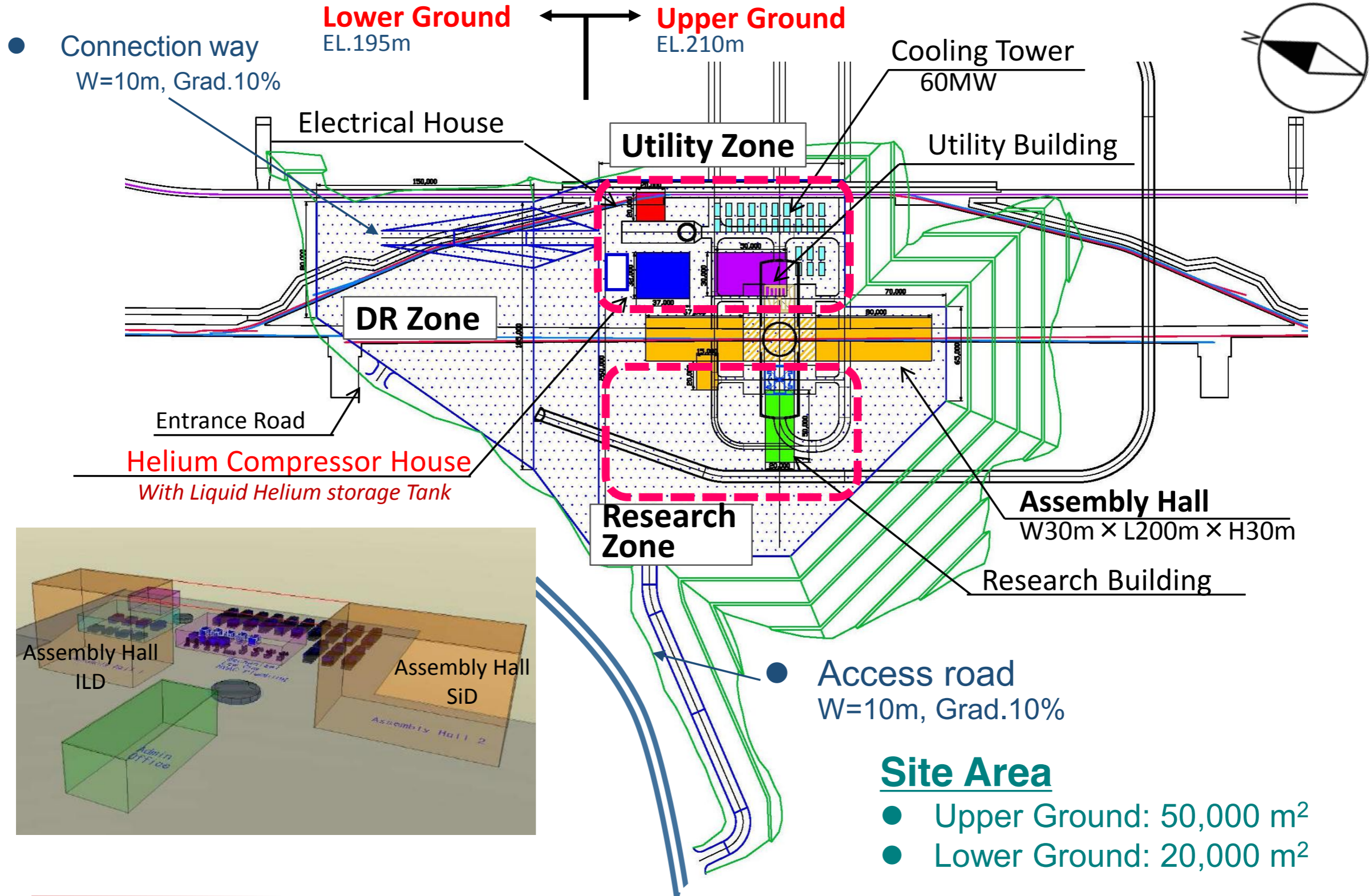
Utility shaft D=10m  
 Utility cavern  
 Utility lines and Personnel access to D/H  
 Pipes, ducts, cables  
 Elevator and stair

Main shaft D=18m  
 Center of DH  
 Detectors Installation



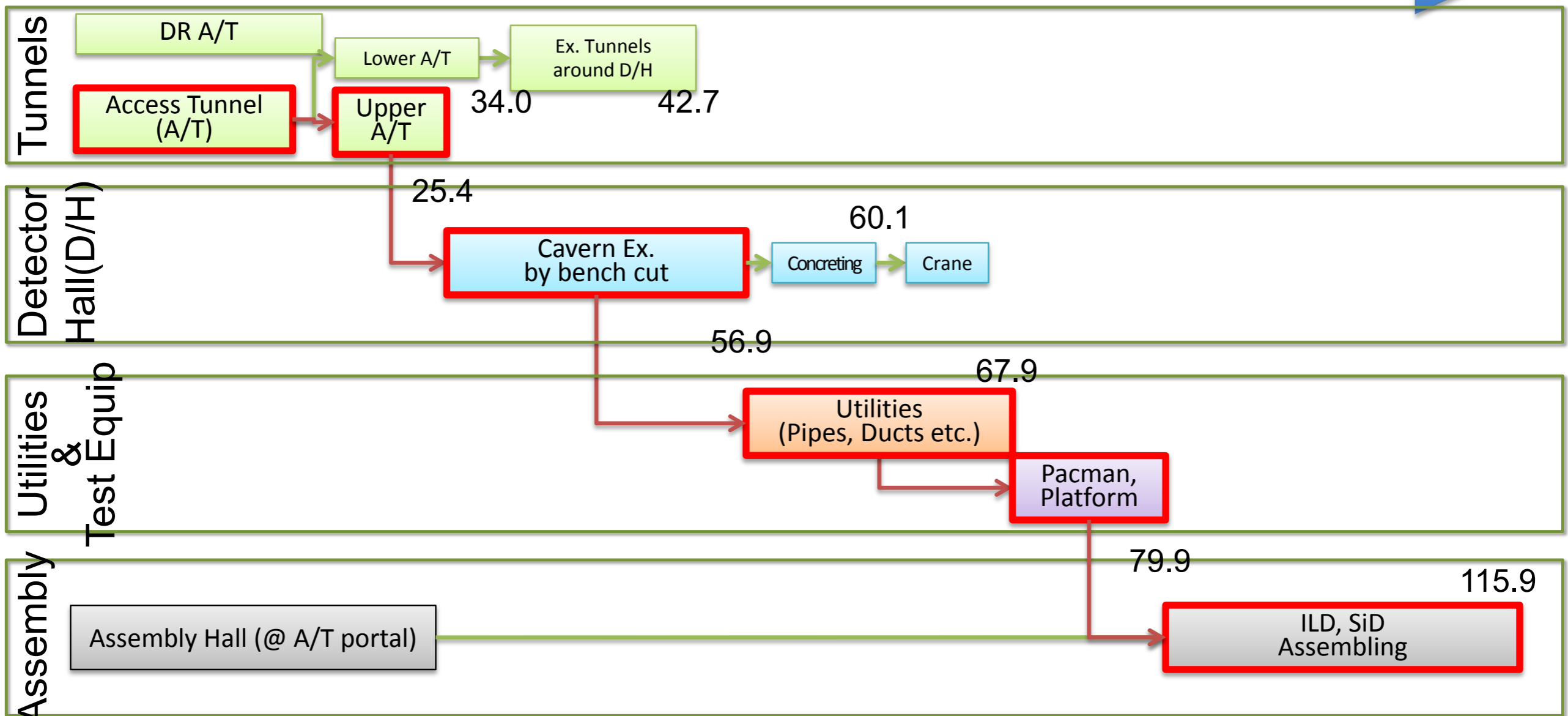


# Facility Arrangement Plan



# Outline of the Detector Hall (D/H) construction procedure - Baseline Design -

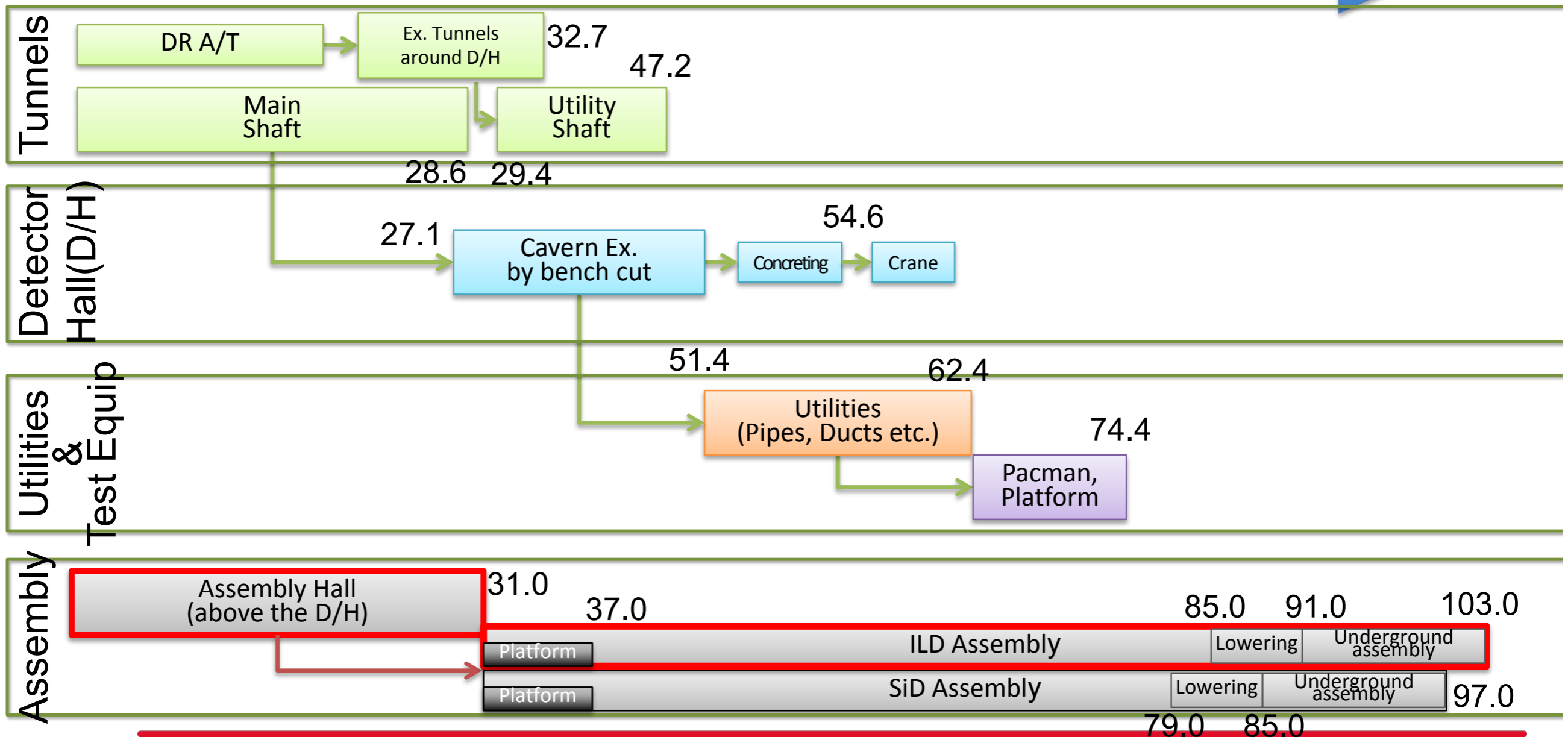
Time-line (const. period: 115.9 months)





# Outline of the Detector Hall (D/H) construction procedure - Hybrid A' Design -

Time-line (const. period: 103.0 months)



# Change Request Document



- Content is the result of the consensus that has been reached at the MDI/CFS workshop in Ichinoseki
- Draft has been discussed
  - in CFS/MDI phone meetings
  - within ILD, SiD
  - within LCCPDeb
  - at an open session in this workshop
- we have consensus!



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<b>CHANGE REQUEST NO. ILC-CR-000N</b>	EDMS No: <b>D0000000xxxxxxx</b>	Created: <b>16-09-2014</b>
		Last modified: <b>24-09-2014</b>

## **DETECTOR HALL WITH VERTICAL SHAFT ACCESS**

Change the underground experimental hall to a design that has a large vertical shaft and allows for the “CMS style” assembly of the detectors.

### **RATIONALE**

#### **Introduction**

The baseline (TDR) design of the interaction region (IR) for the ILC in Japan foresees an underground experimental hall that can be accessed only via a horizontal O(1km) long tunnel of ~11m width and a slope of O(7%). This has been defined before the Kitakami site has been selected for the ILC in Japan under the assumption that any Japanese site would be in a mountainous area that does not allow to have an assembly and maintenance area directly on top of the underground IR. The Kitakami site, however, allows to find a position for the IR that has a reasonably flat area above the IR and where a vertical shaft of O(70m) length could be built to access the underground areas.

# Summary

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- In very collaborative efforts we have found an optimised IR design for the Kitakami site
- Detectors assembled mostly on surface
  - especially the magnet systems - solenoids, yokes
- Underground area with
  - one central detector assembly shaft (18m)
  - service shaft for detectors and machine (10m)
  - horizontal tunnel (8m) for damping ring and detector hall access
- Agreement between all involved: MDI, CFS, ILD, SiD, ILC...
- Submission of change request document is first step in change control process
  - more detailed information will be provided on request by the Change Management Board