ILC Interaction Region Configuration Change Request

LCWS14, Belgrade
Karsten Buesser
07.10.2014

ILC Change Control Process

- ILC Baseline Design as described in TDR is now under change control
- Design changes need to follow a defined process and need approval by LCC directorate

1. Proposing a design change

- Change Request (CR)
- Change Request Creater (CRC)
- Written document
- Submitted to Change Management Board (CMB)

2. Expert review

- Reviewed by CMB with additional experts as needed
- CMB defines the scope of the review
- Communication with all stakeholders
- Capture relevant documents

3. Decision

- Results with recommendation from (2) presented to ILC Director
- Written summary document
- ILC Director (in consultation with the CMB) makes final decision, or
- Decision is escalated to LCC directorate.

4. Updating TDD to reflect the change

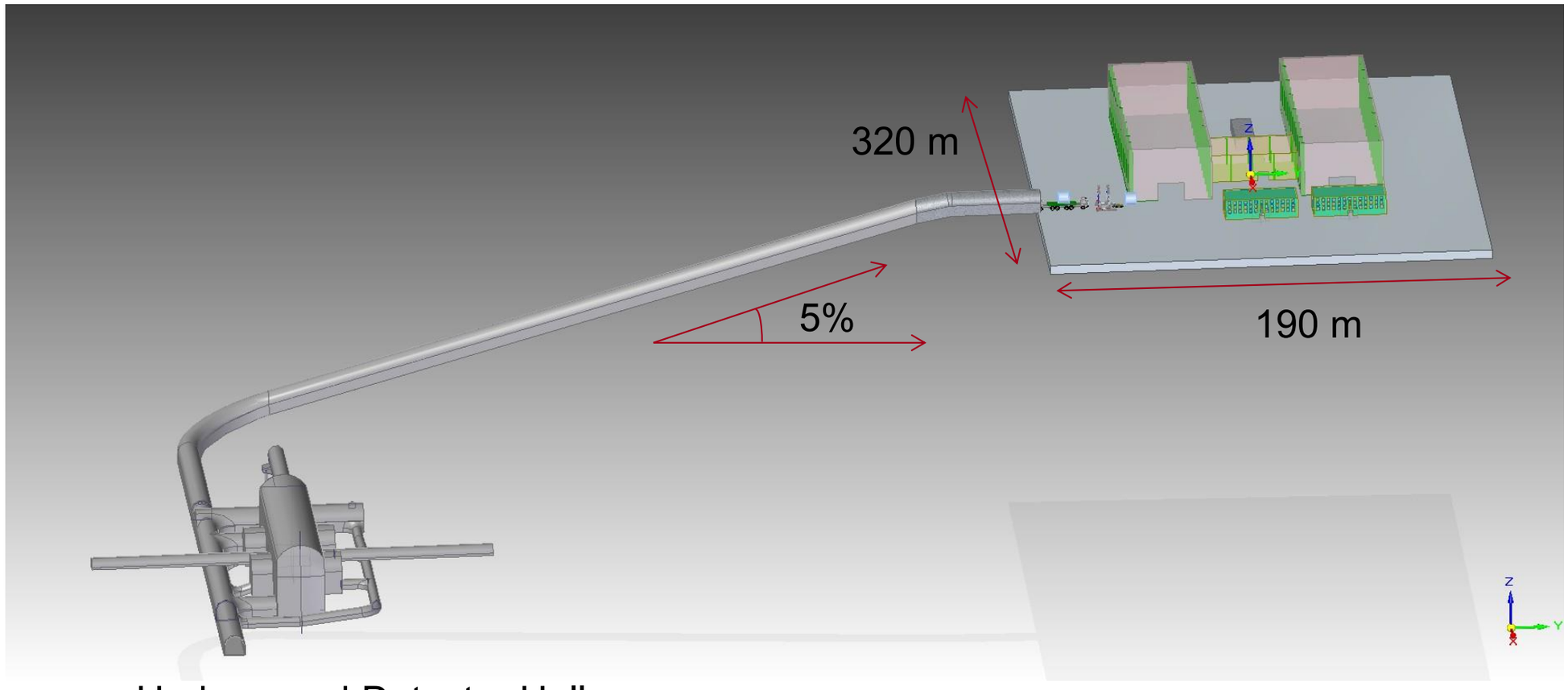
- CMB identiifies team (and team leader) to implement change.
- Generate scope of work
- Develope implementation plan
- Release of updated TDD

- MDI experts testing the change control conflict resolution tools…

The Interaction Region (proud home of ILD and SiD…)

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

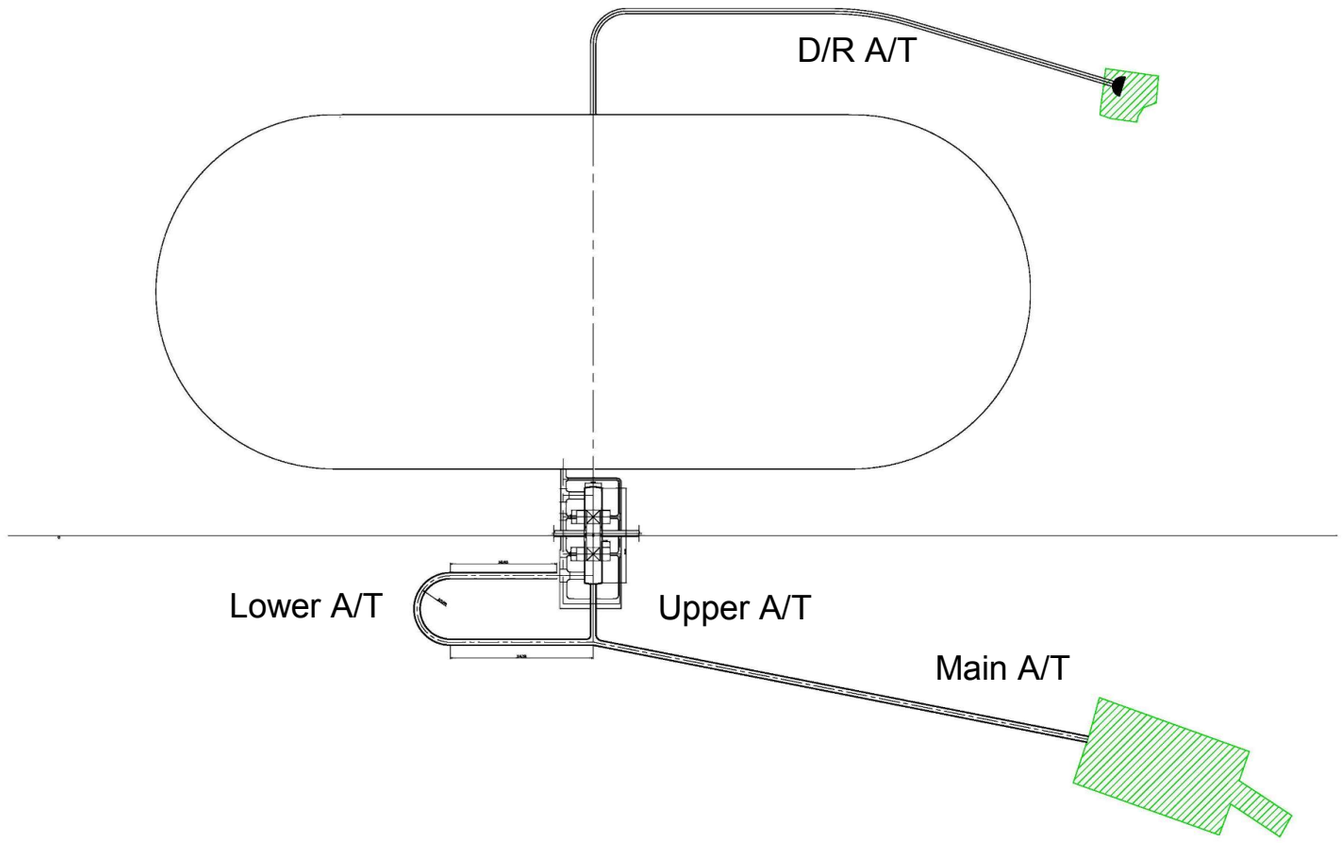


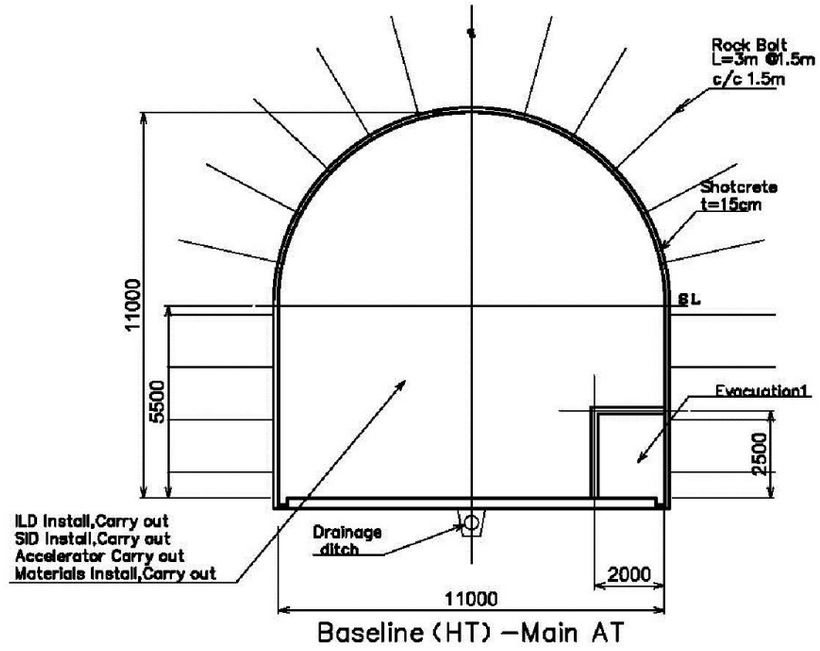
Undergound Detector Hall

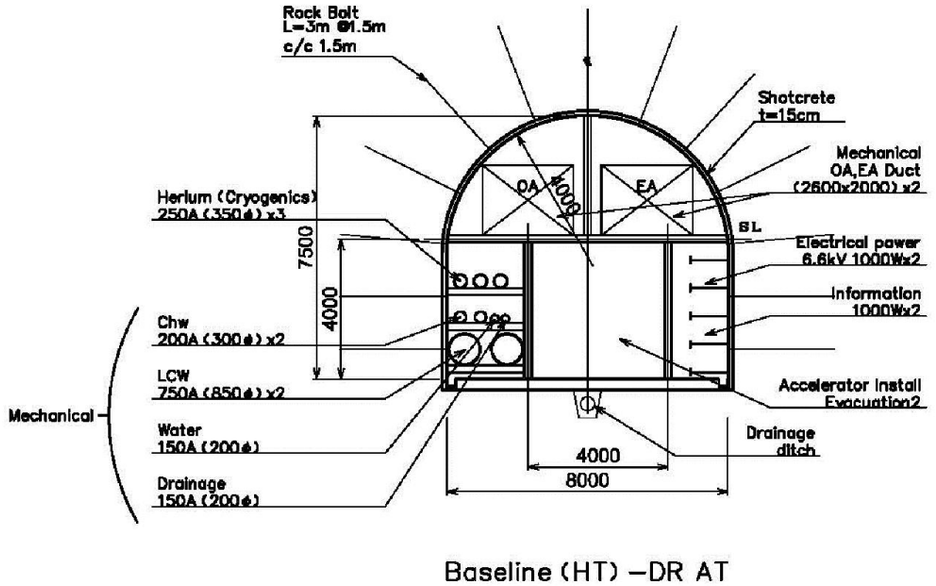
Baseline General layout

Tunnel access for D/H

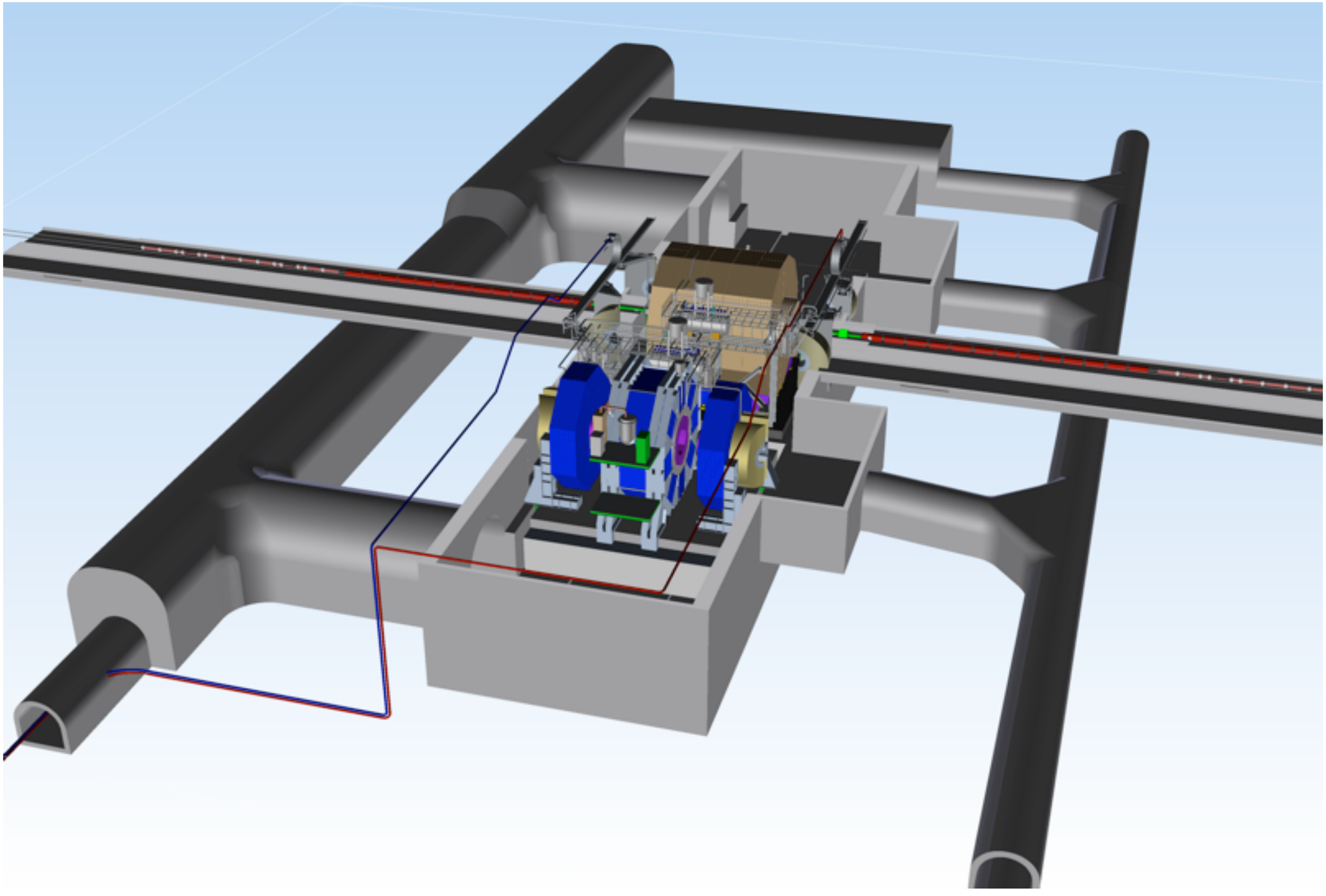
D/H access tunnels : D:11m , grad:7%
  Detectors assembling and access to D/H
D/R access tunnels : D:8m , grad:10%
  Accelerators transportation and utility lines for D/H and D/R





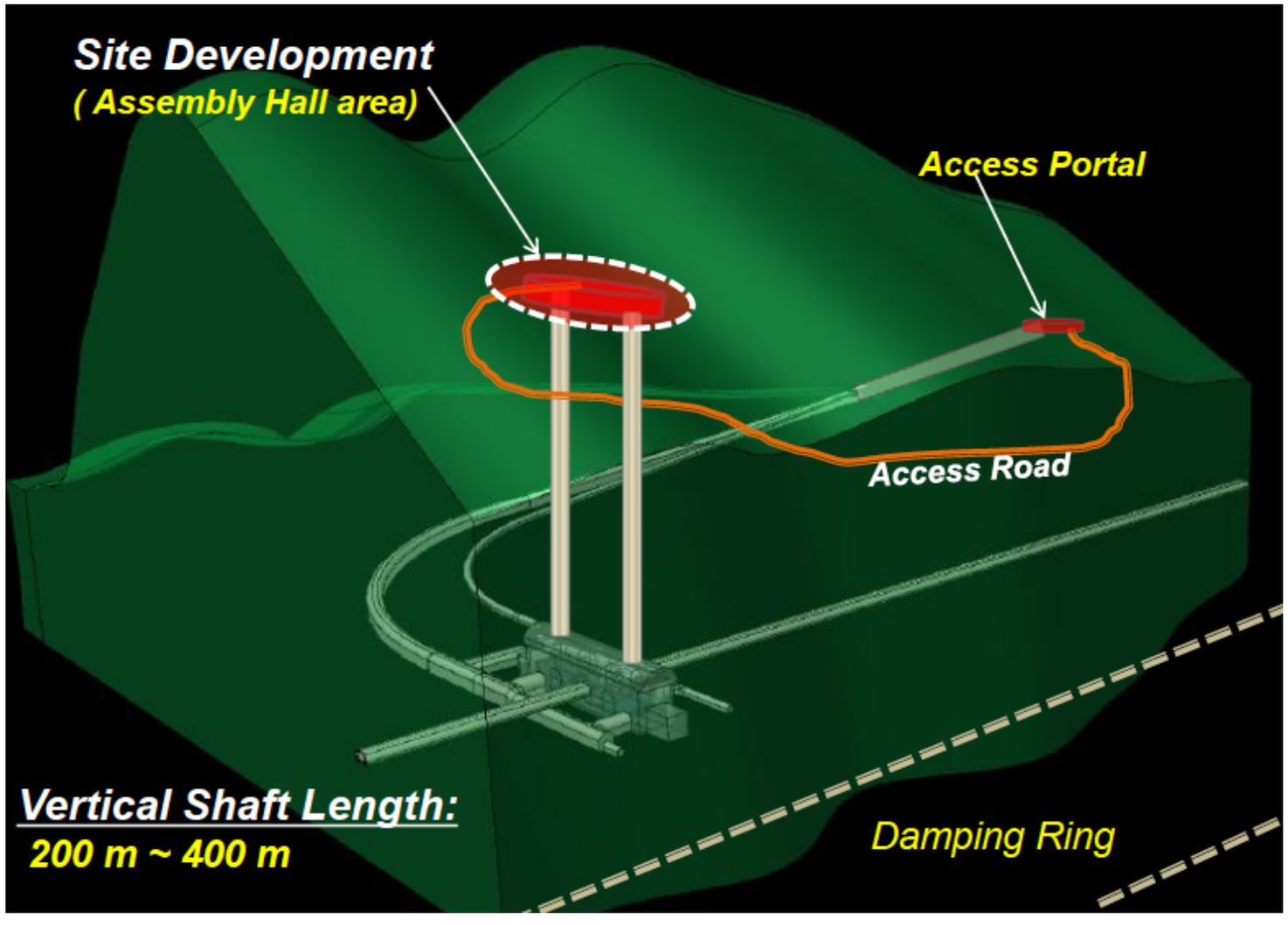


TDR Interaction Region



Kitakami Site

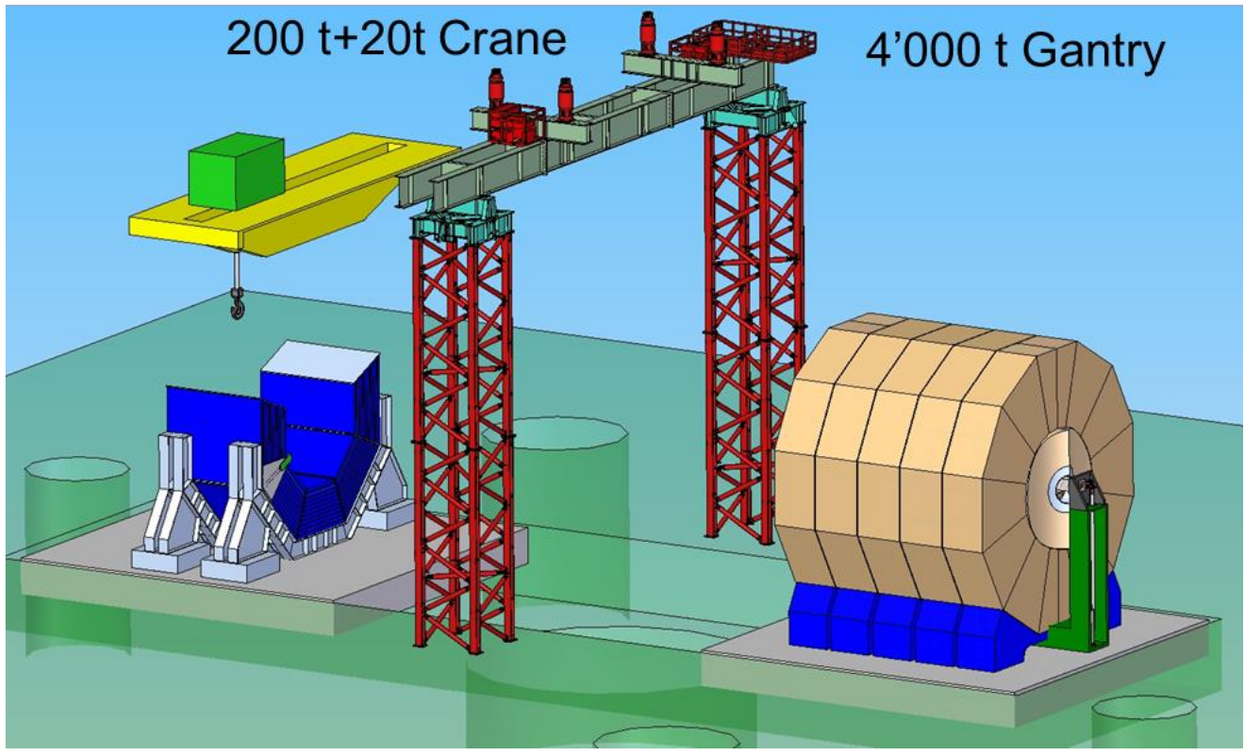
- Site in Kitakami has no steep mountains around the interaction area
- Vertical access to underground areas seems possible
- CFS and MDI groups started initiative at LCWS13 to look into this

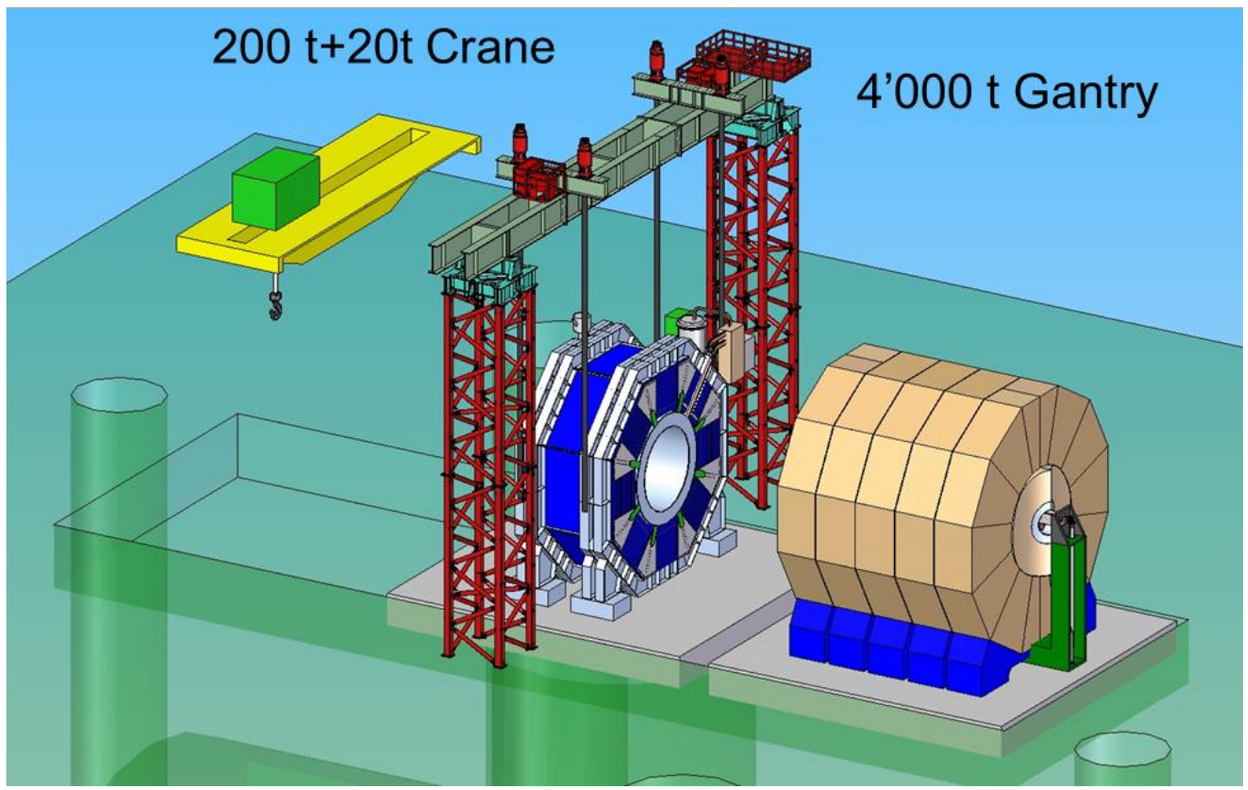


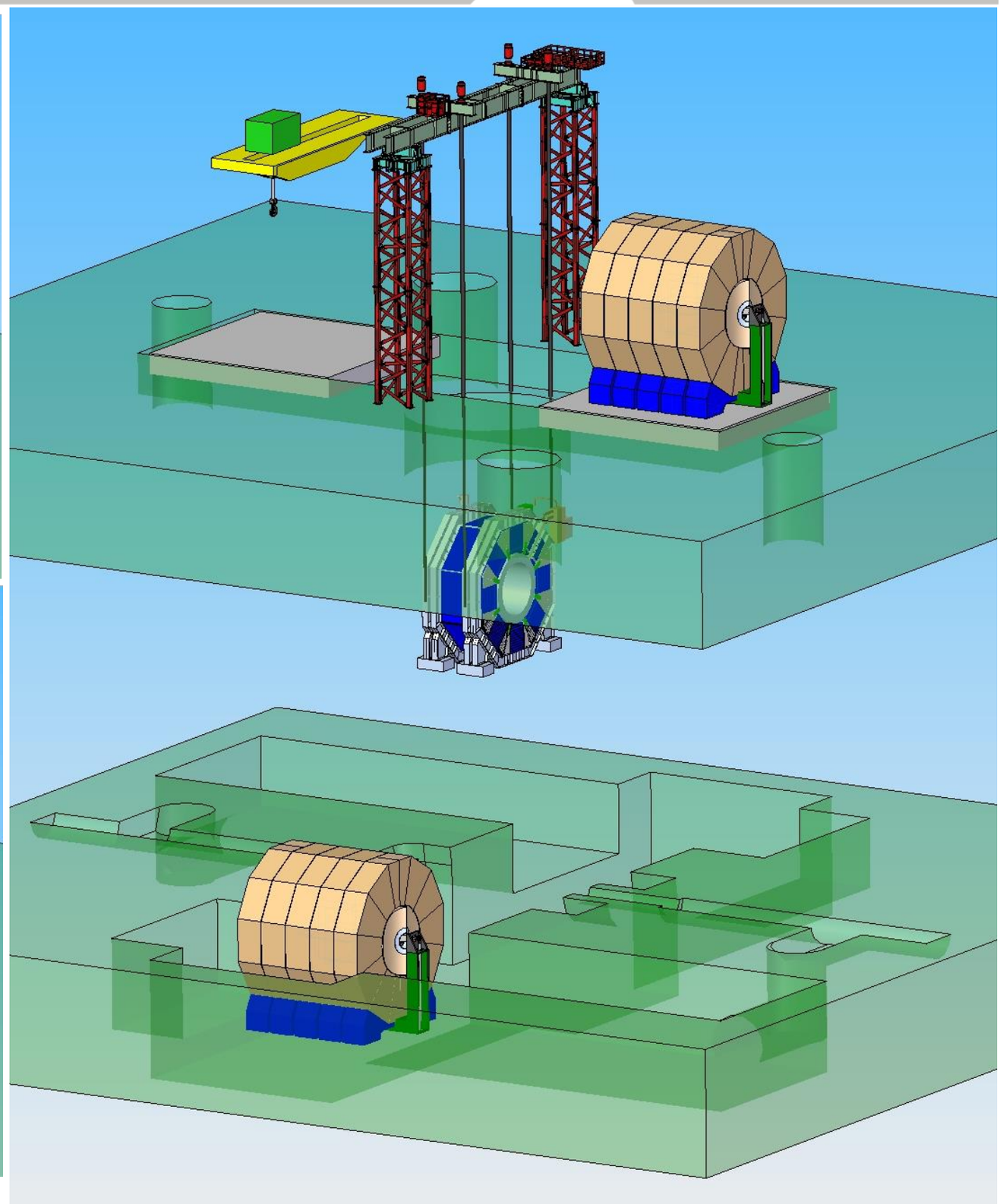
Option #1: Vertical shafts

M. Oriunno

SLAC

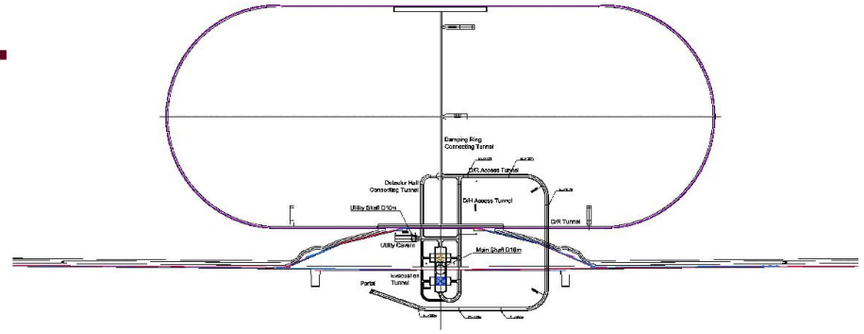


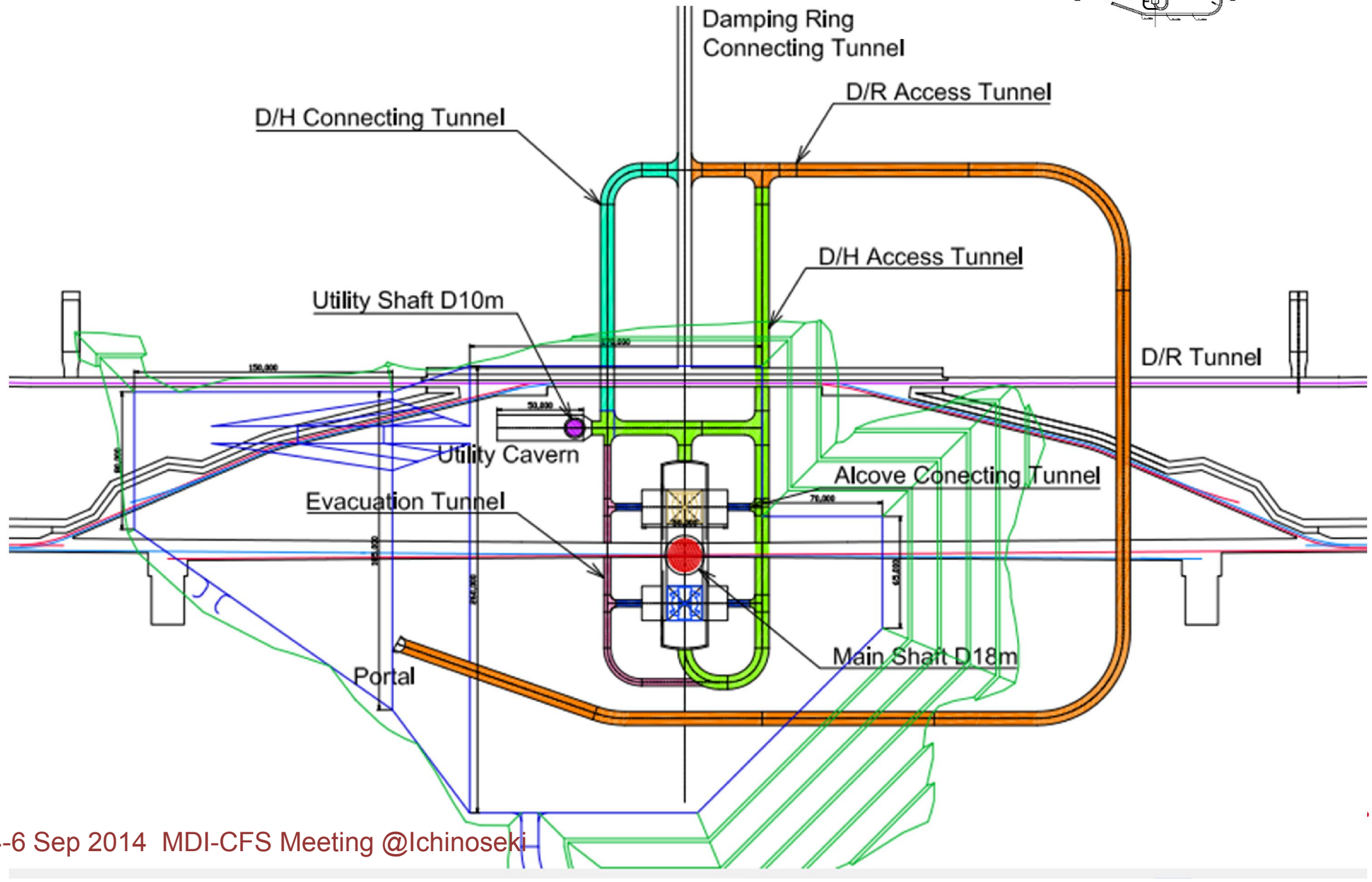


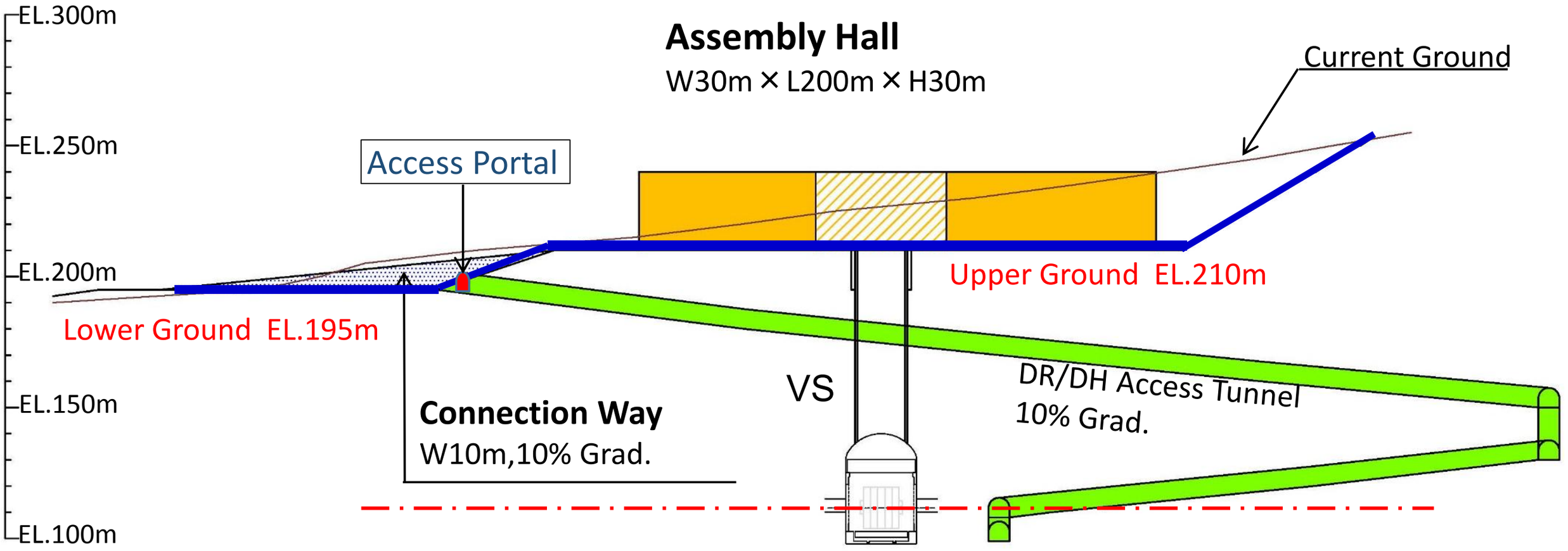


Y. Nishimoto

Hybrid-A’ General layout

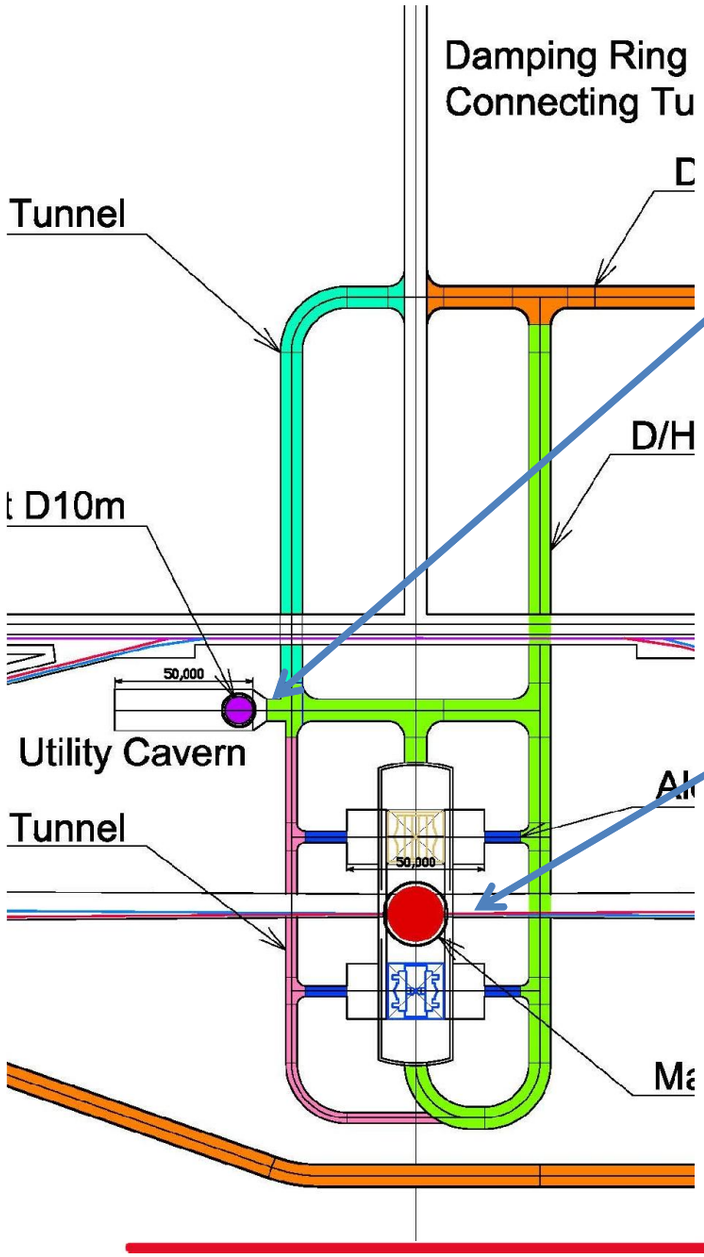






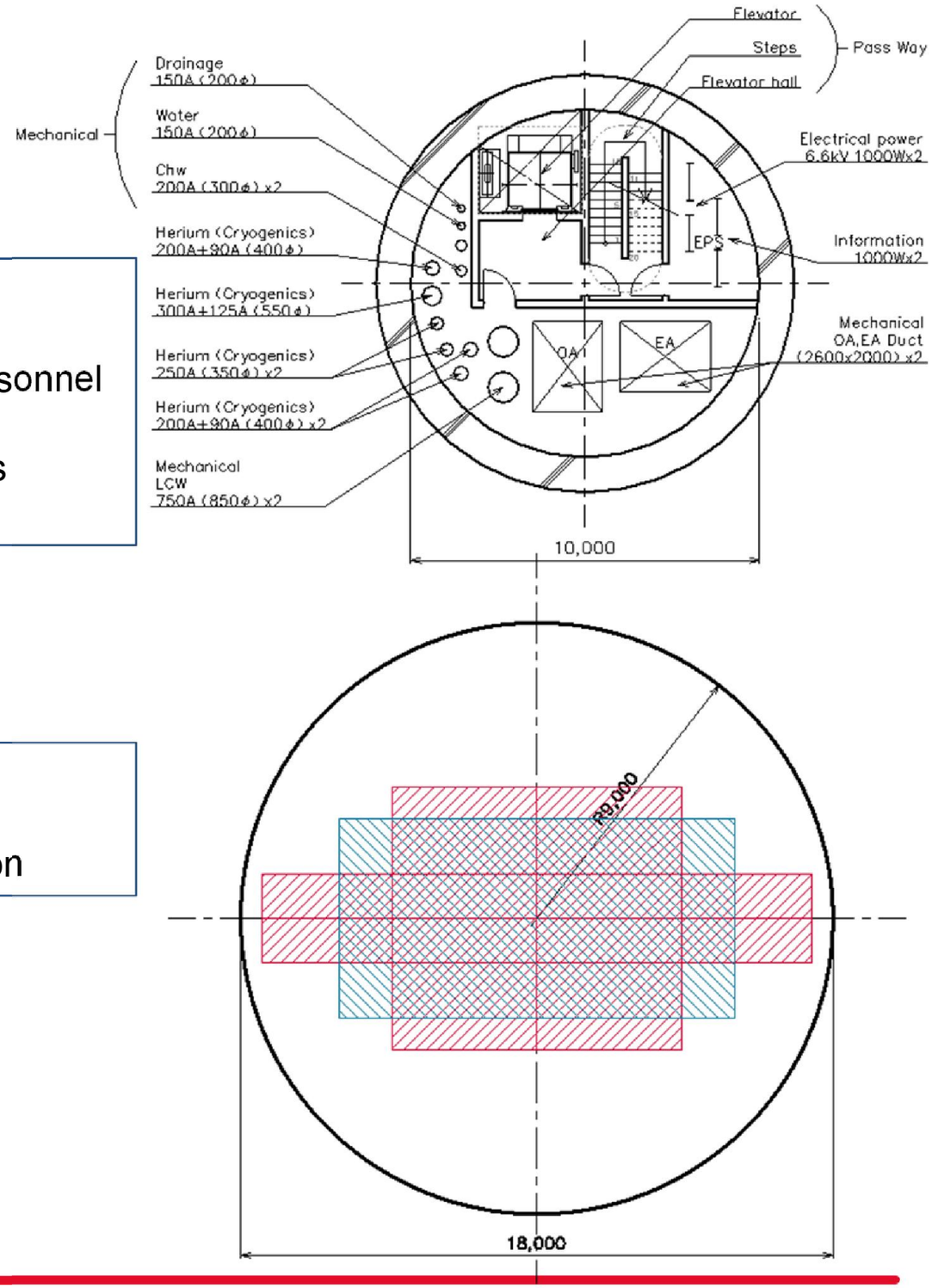
Longitudinal section

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

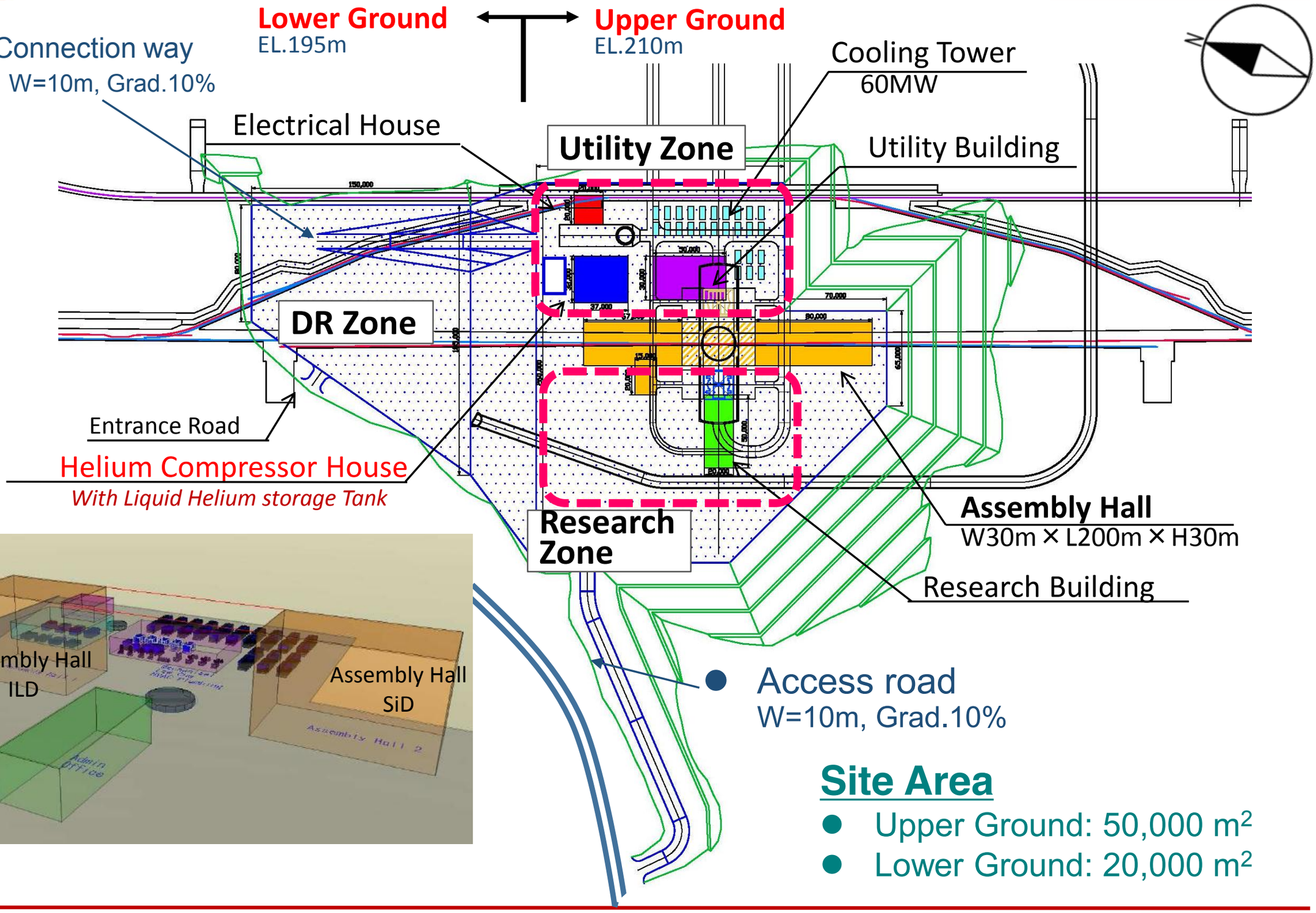


N. Miyahara

Facility Arrangement Plan

Lower Ground EL.195m ⟷ **Upper Ground** EL.210m

- Connection way
  W=10m, Grad.10%

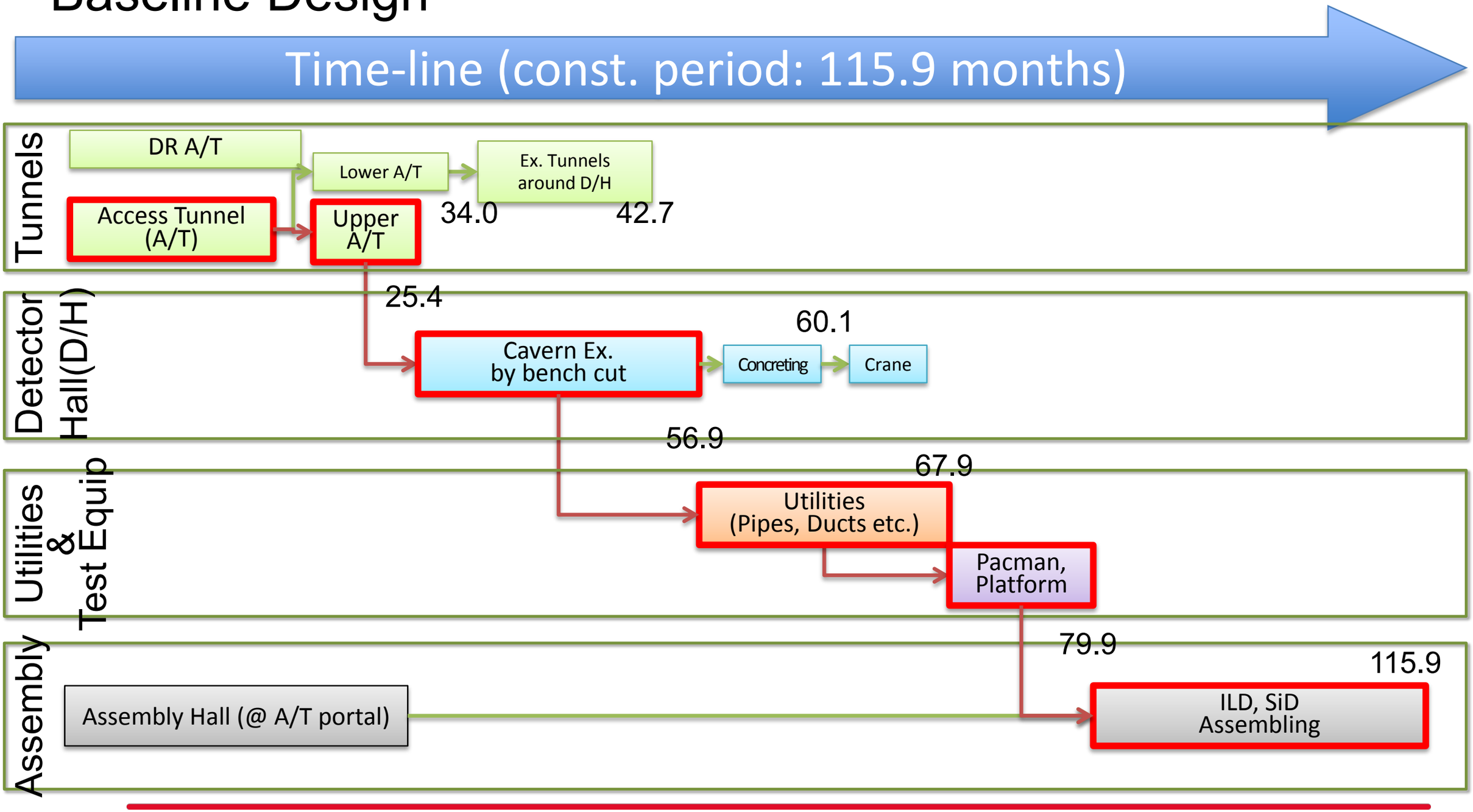


- Access road
  W=10m, Grad.10%

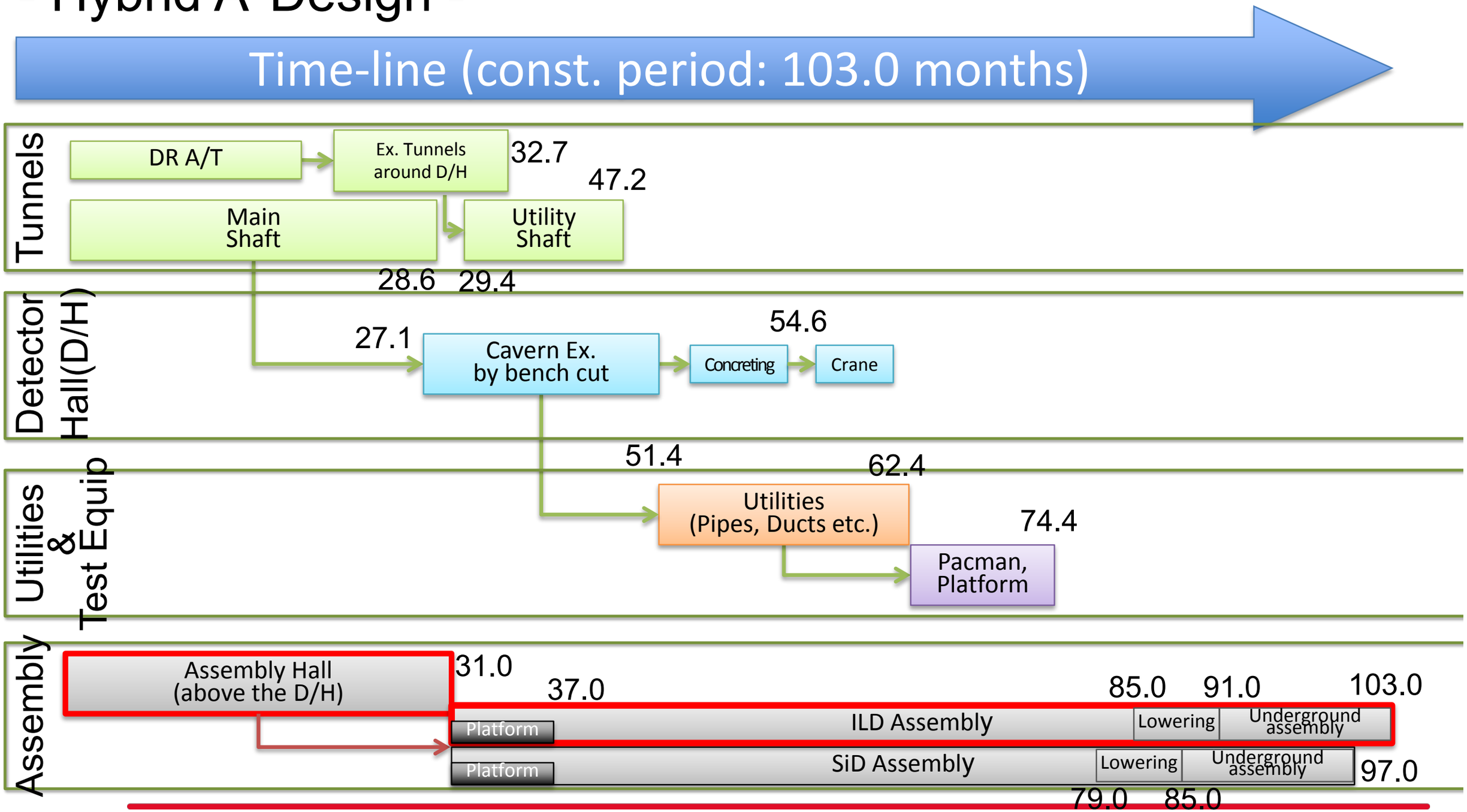
Site Area

- Upper Ground: 50,000 m²
- Lower Ground: 20,000 m²

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



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



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 phone meeting
- Received some technical comments recently from SiD
  - only editorial
- If no objections in this session, I will submit this document later this week.

LINEAR COLLIDER COLLABORATION
Designing the world's next great particle accelerator

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

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

- 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