Machine-Detector Interface / Polarisation / Detector Engineering

LCWS14, Belgrade
Karsten Buesser
10.10.2014

Change Management
- common misconceptions -


Eugène Delacroix
1830.


We have to change the management!


We have to change the management!
✗ wrong


毛泽东选集
红小兵
红小兵


We have to manage the change!
毛泽东选集

(✔) almost right

Change Management
- ILC Version 3.0 -

Change Management - ILC Version 3.0

- 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

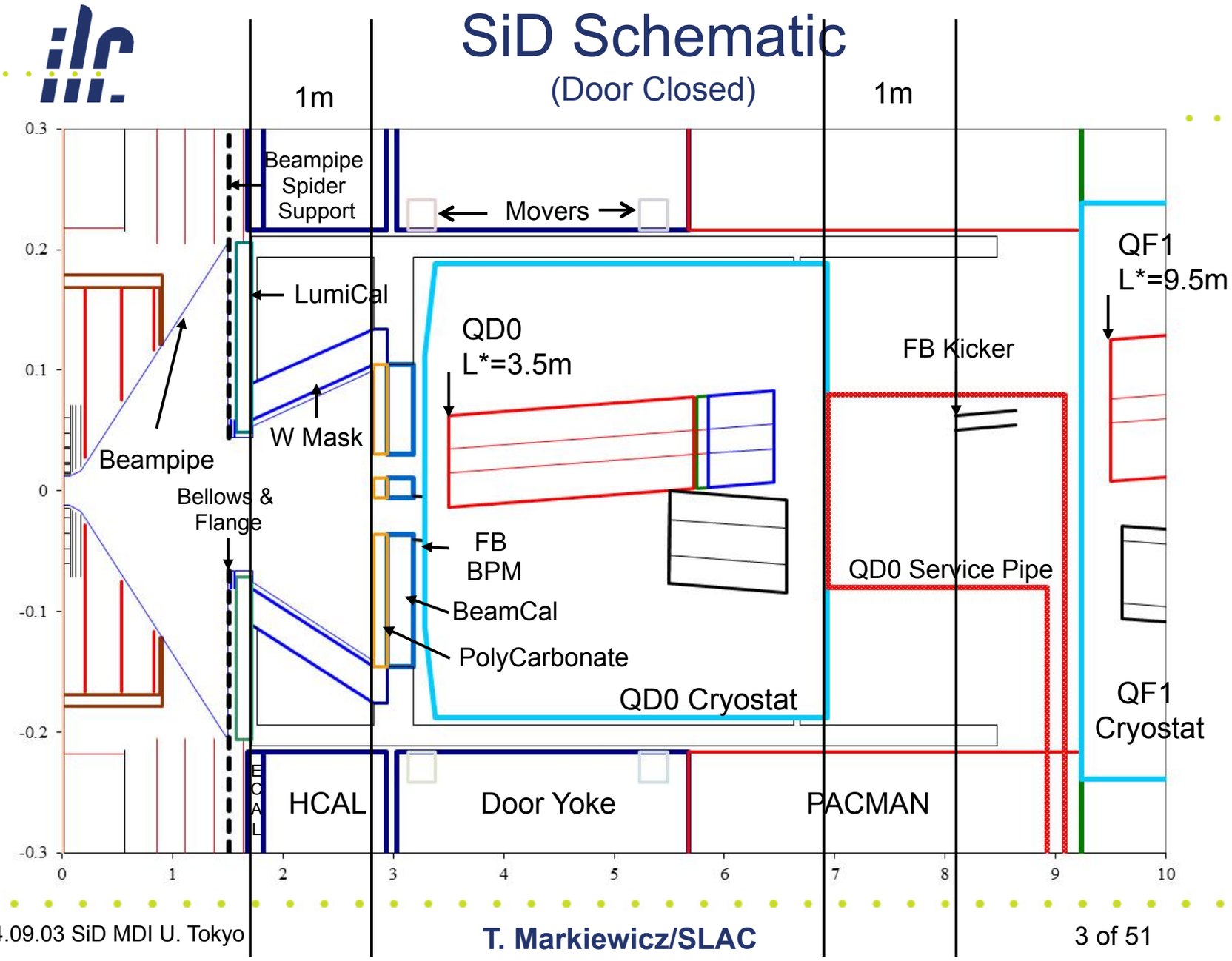
- CMB identiifies team (and team leader) to implement change.
- Generate scope of work
- Develope implementation plan
- Release of updated TDD

Change Requests

- Two change requests have impact on machine and detectors:
  - Common QD0 L*<=4m for both detectors
  - Vertical shaft detector assembly at Kitakami site

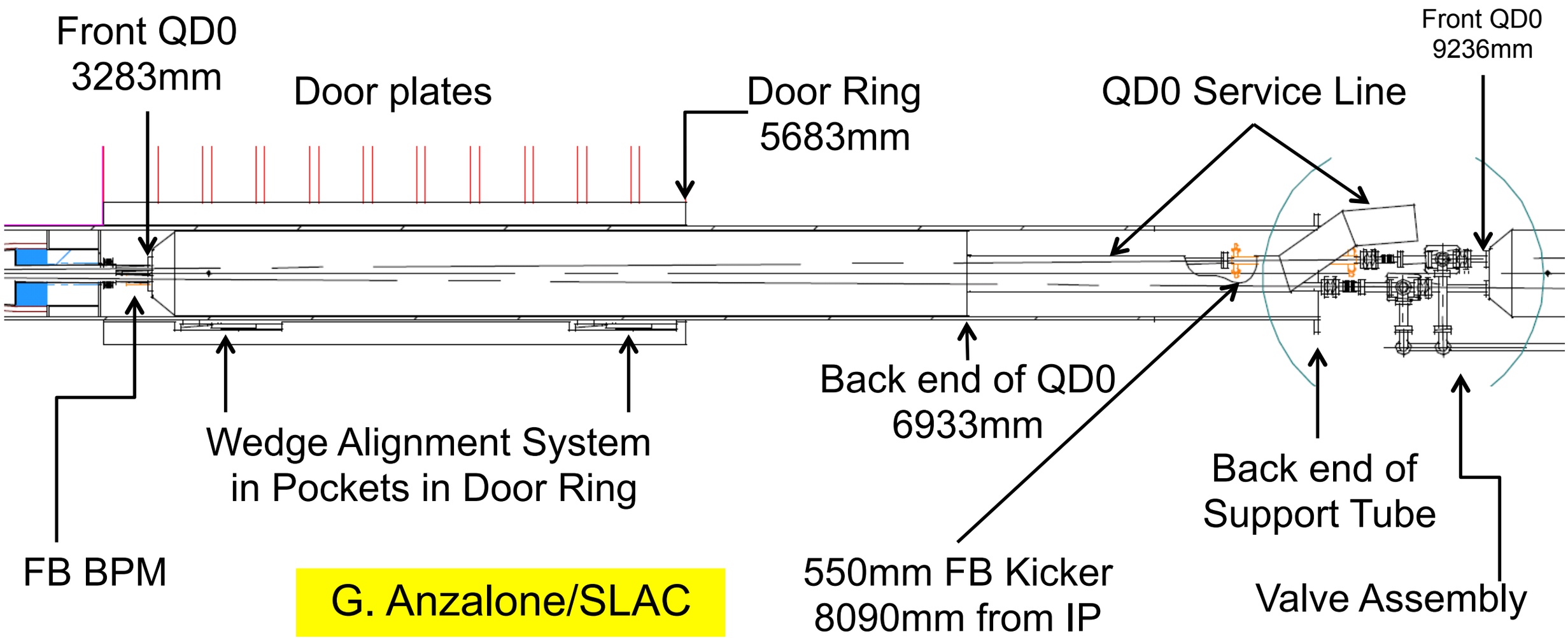
L* at SiD

- SiD has actually L*=3.5m
- Can accommodate anything between 2.6 and 4.5m
- SiD supports the ILC change request and prefers small L*
- „the smaller the L* the easier the beam tuning“
  - also QF1 plays a role



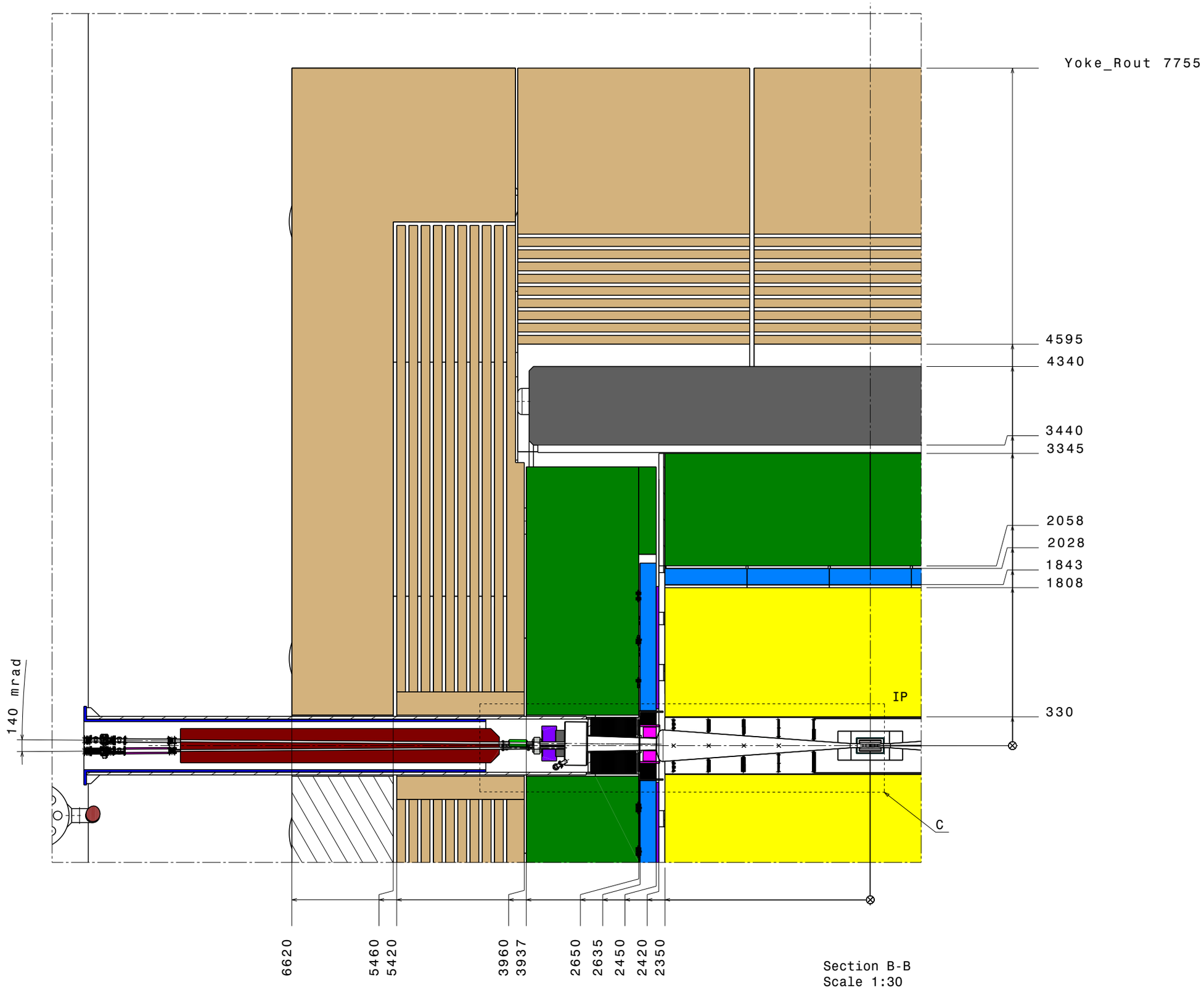
Evolution of QD0-QF1 region

- Valve/Pump Out/RGA assemblies near QF1 end
- QD0 Service Line to 2K chiller extended maximally to rear
- Support tube behind QD0 extends to allow 2.8m door opening transitioning to a half-cylinder for access

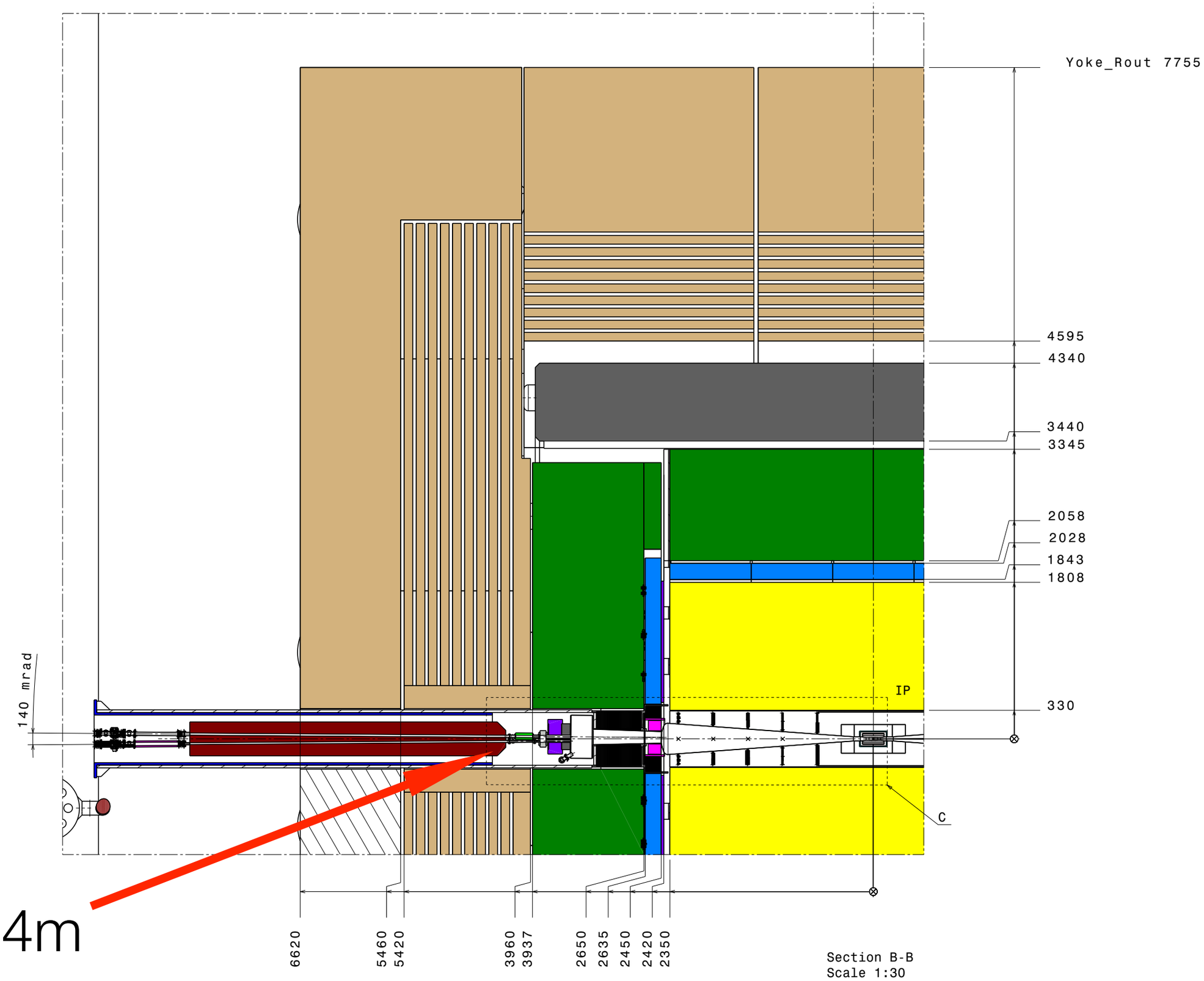


G. Anzalone/SLAC

ILD Dimensions

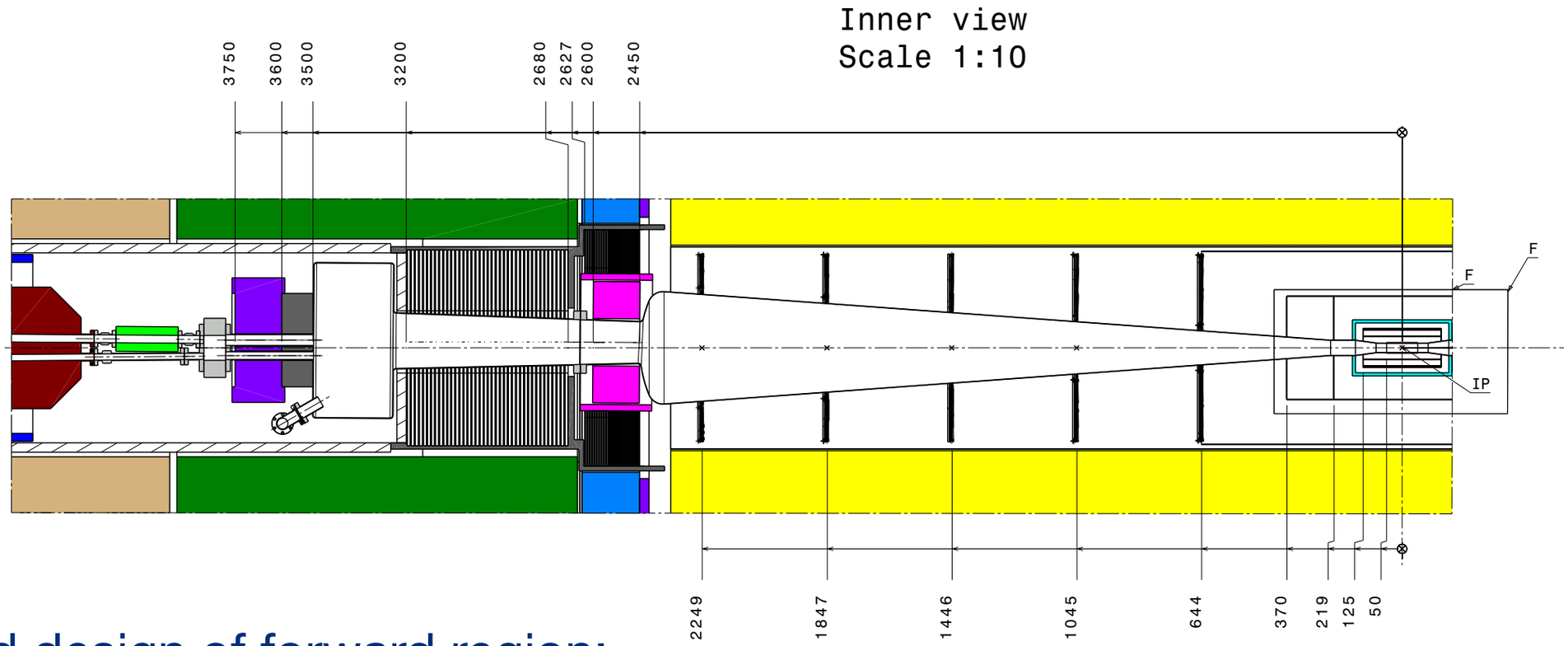


ILD Dimensions



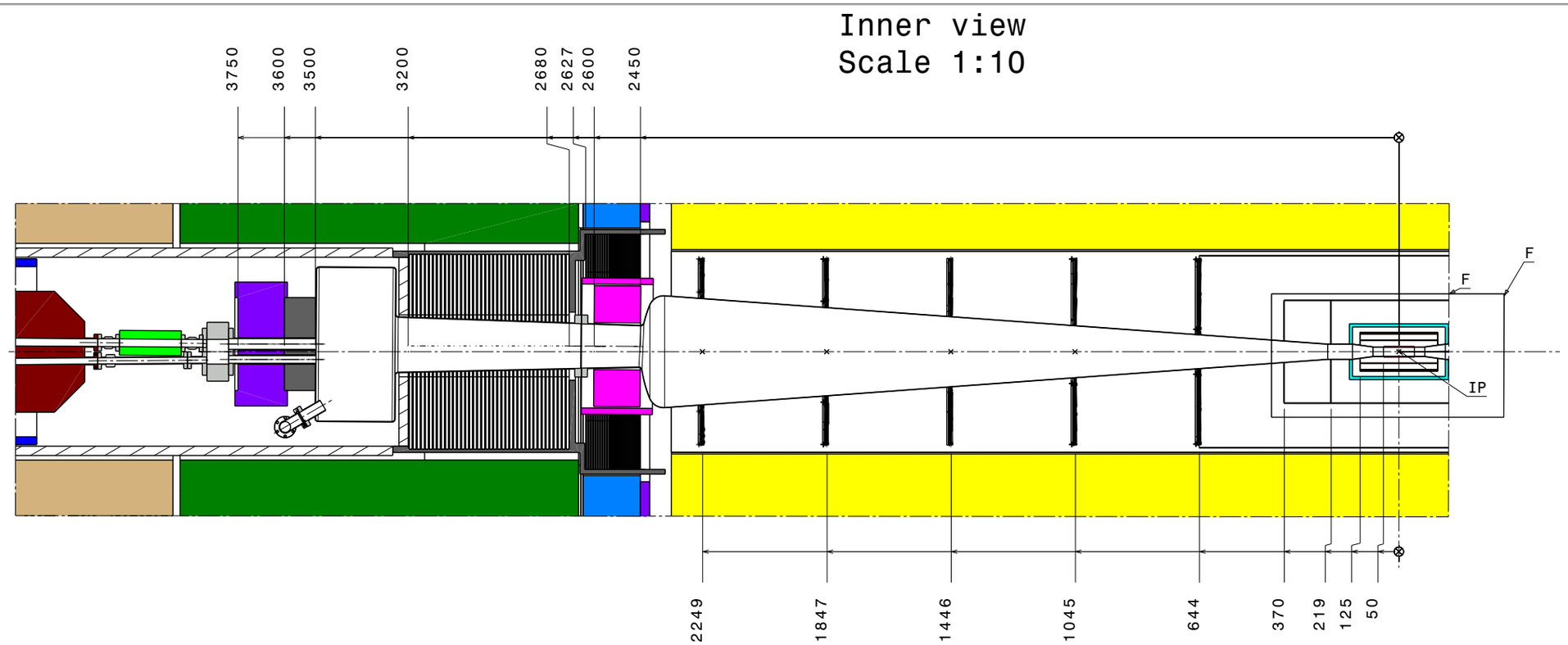
L*=4.4m

ILD: Current Lower Constraints on L*



- Detailed design of forward region:
  - LumiCal, LHCAL, BeamCal
  - Beam Pipe, Bellows, Flanges, Vacuum Pumps
  - Optimised (many FTEs in the last ~10y) for
    - operations: no FCAL or masks inside the tracking volume
    - assembly and maintenance
    - physics: VTX (occupancies and layer radii), FCAL performance, hermeticity

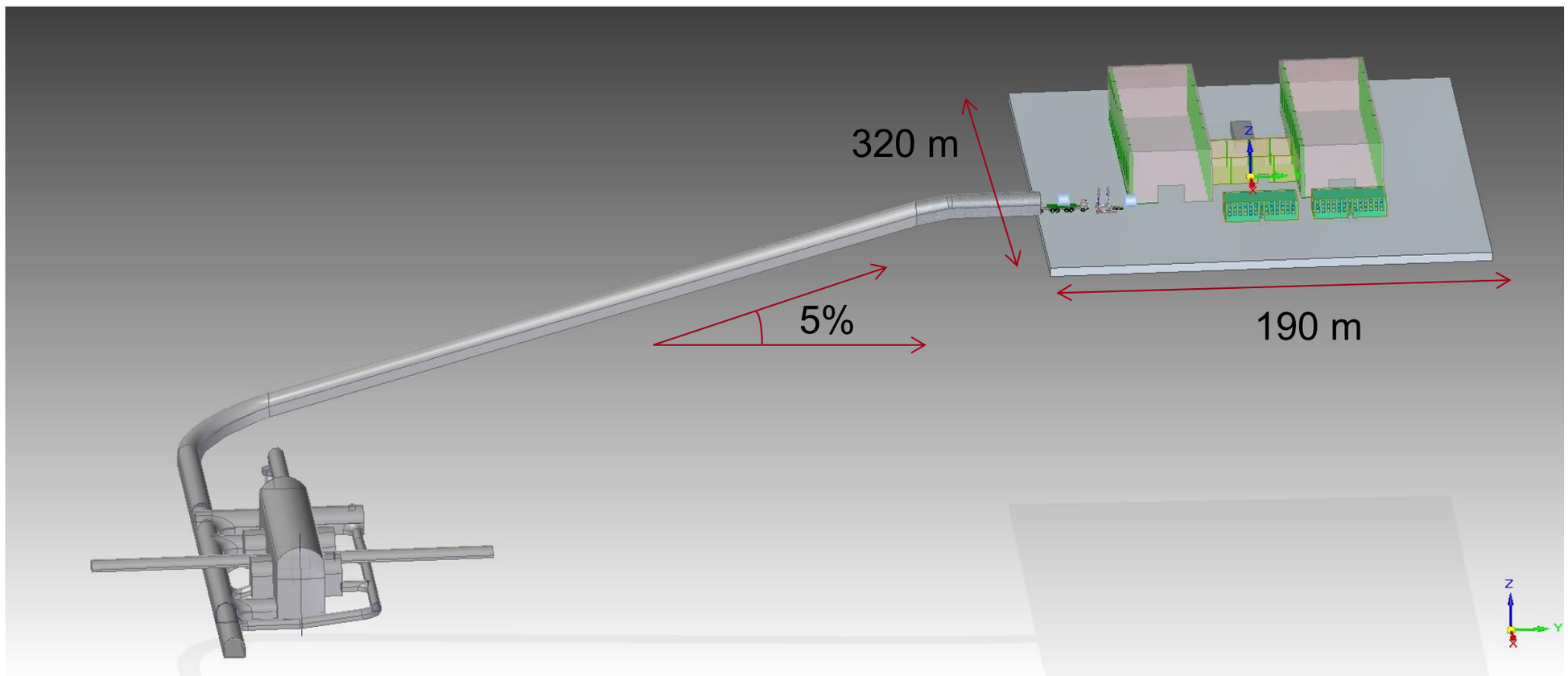
ILD: Discussion Items



- What needs to be done to go to L* of 4m?
  - Is the pump needed at this location?
    - revisit vacuum requirements and conditions
    - impact on cold QD0?
  - Revisit FCAL design
- Discussions have started at this LCWS

Baseline Detector Hall Scenario (TDR)

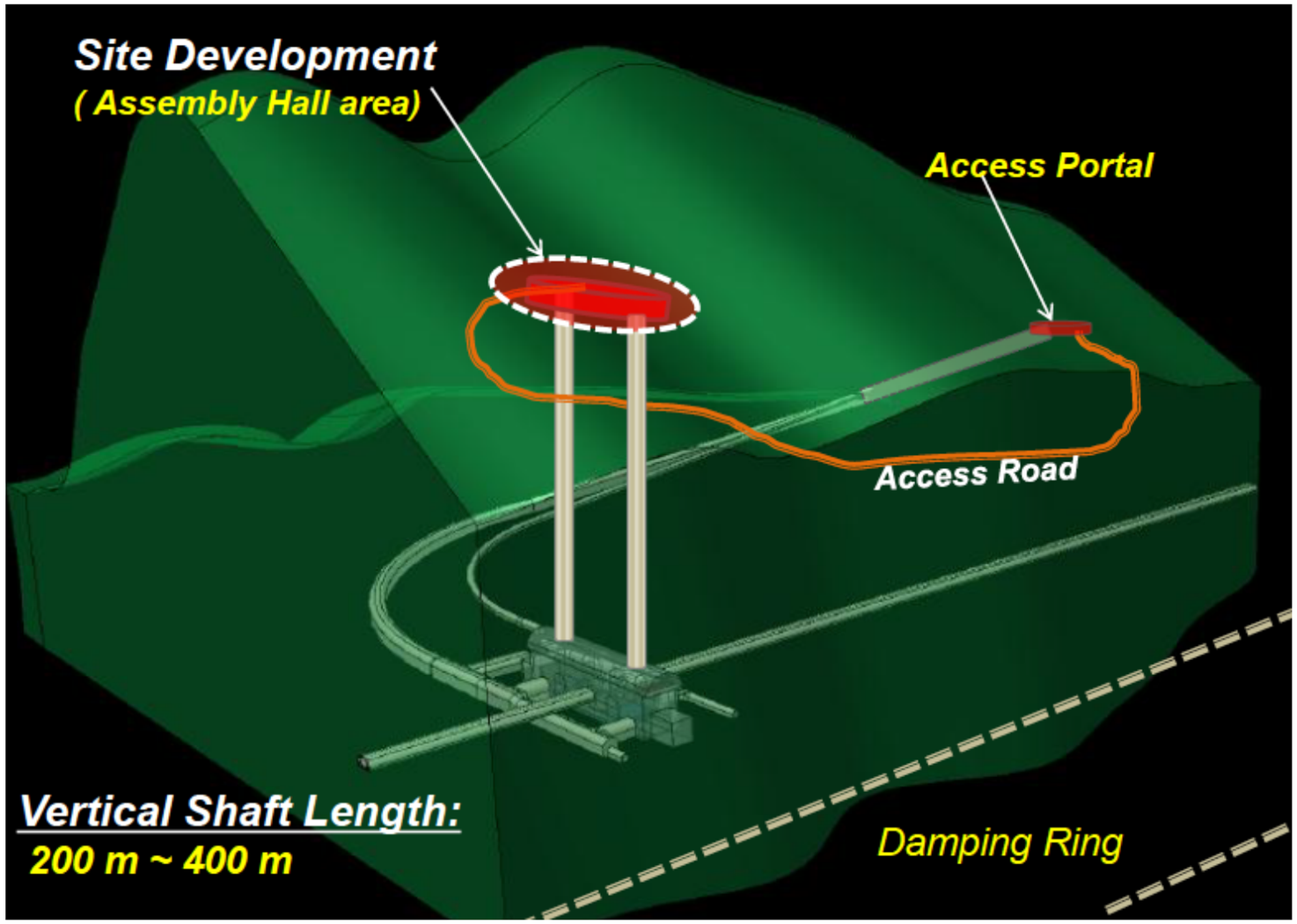
- TDR assumed Japanese site would be very mountainous - no flat top area to place a surface installation atop the underground areas
- Access to underground areas via horizontal tunnel of ~1km length and up to 10% slope
- Detector installation mostly underground



Undergound Detector Hall

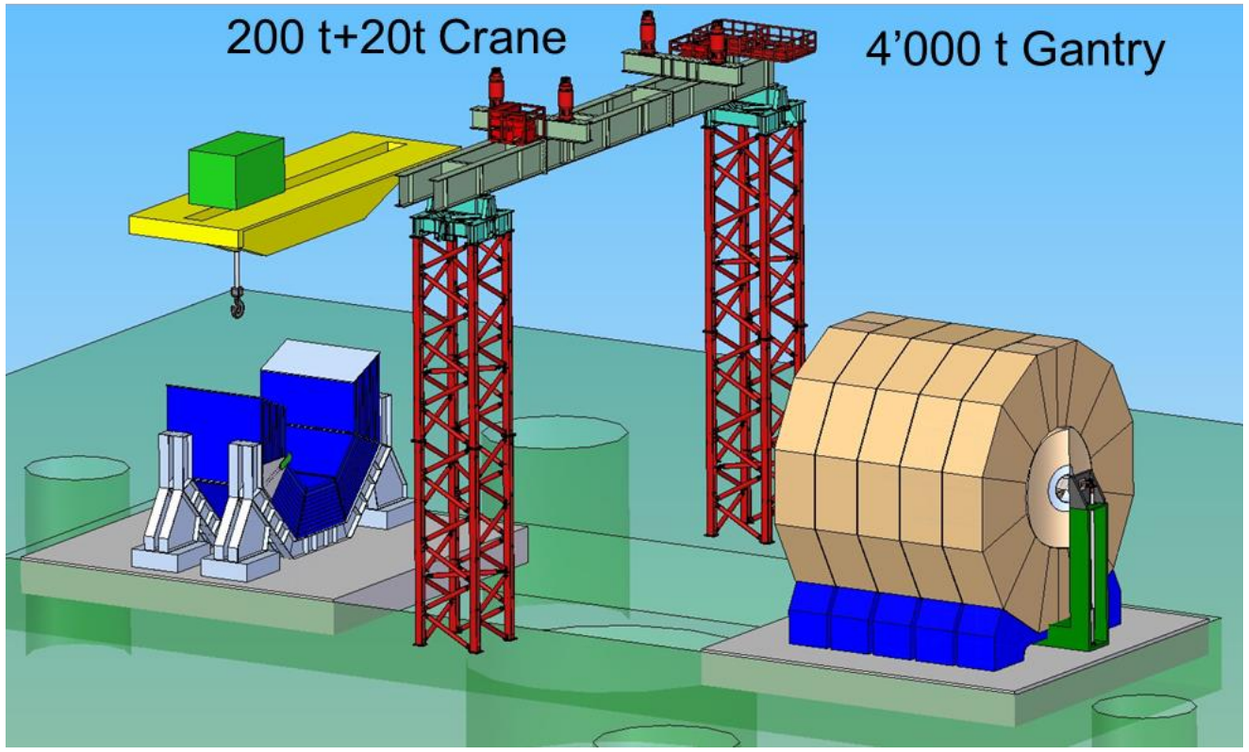
Kitakami Site

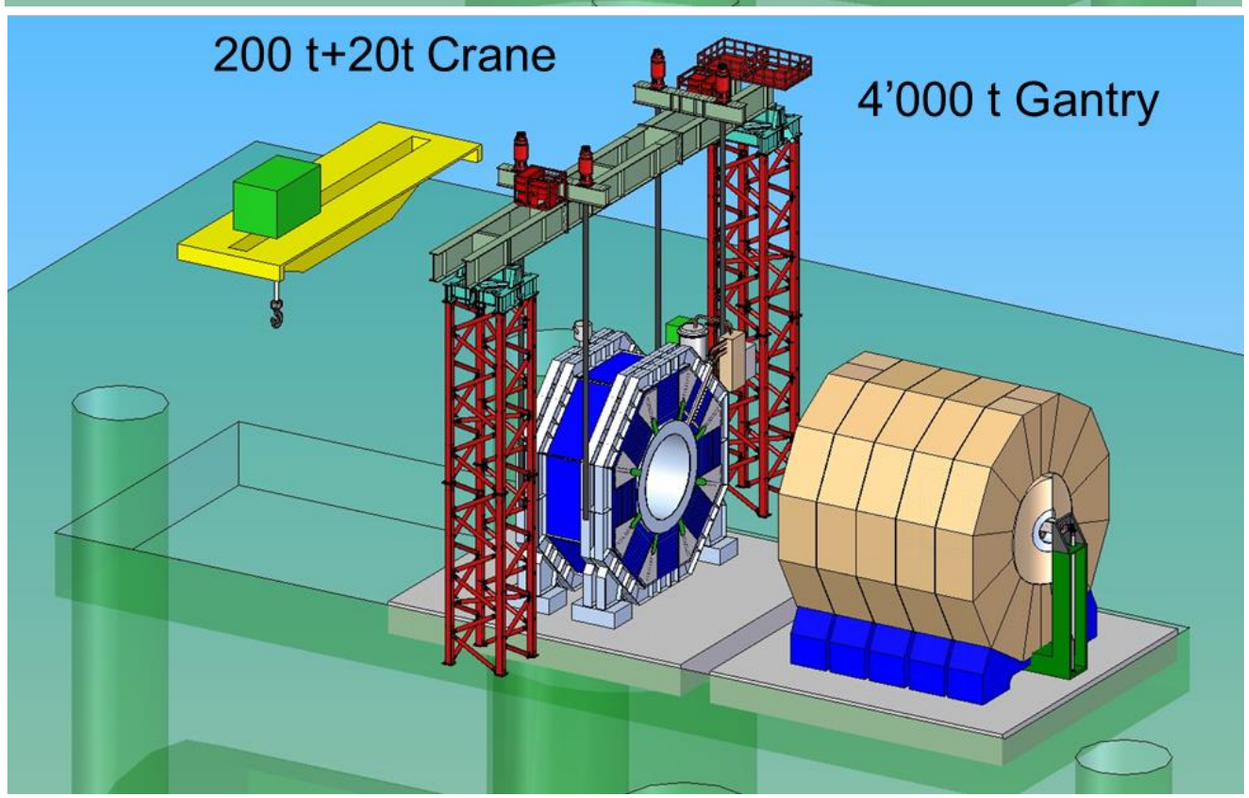
- Site in Kitakami has no steep mountains around the interaction area
- Vertical access to underground areas seems possible
- CFS and MDI groups started initiative at LCWS13 to look into this

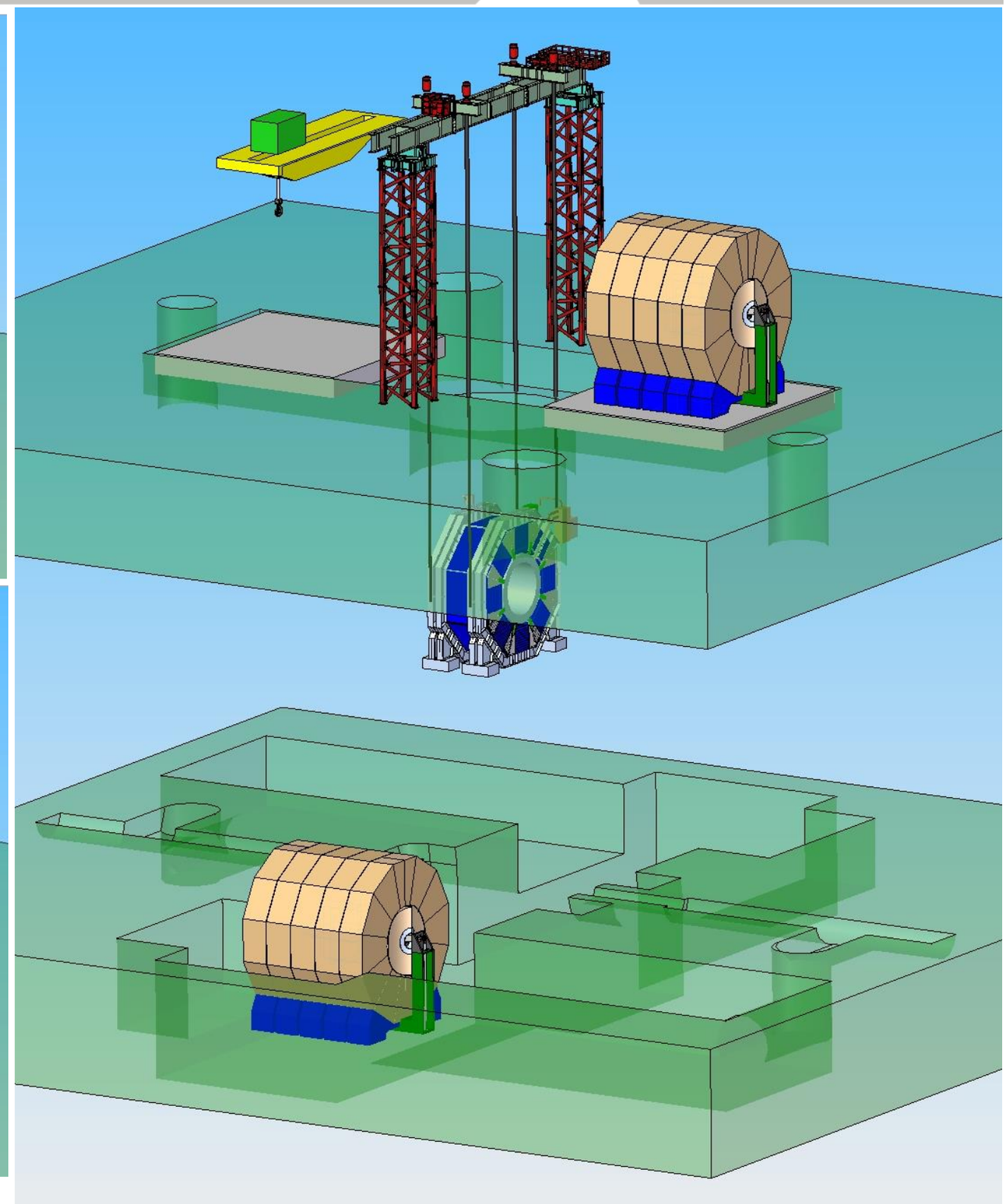


Option #1: Vertical shafts

M. Oriunno

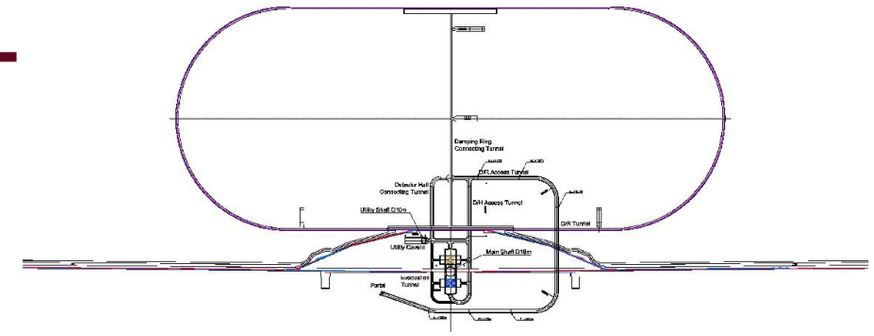


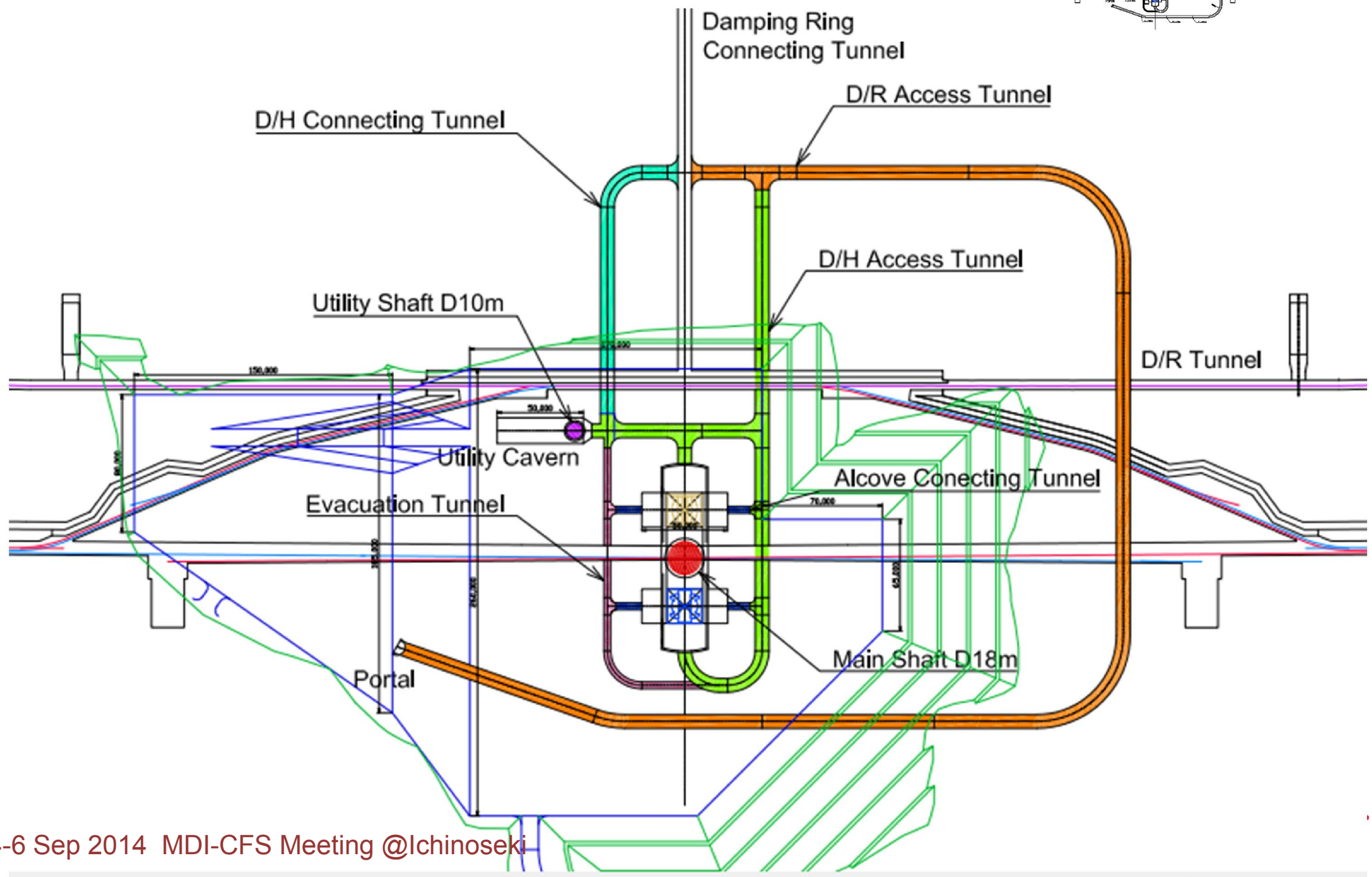




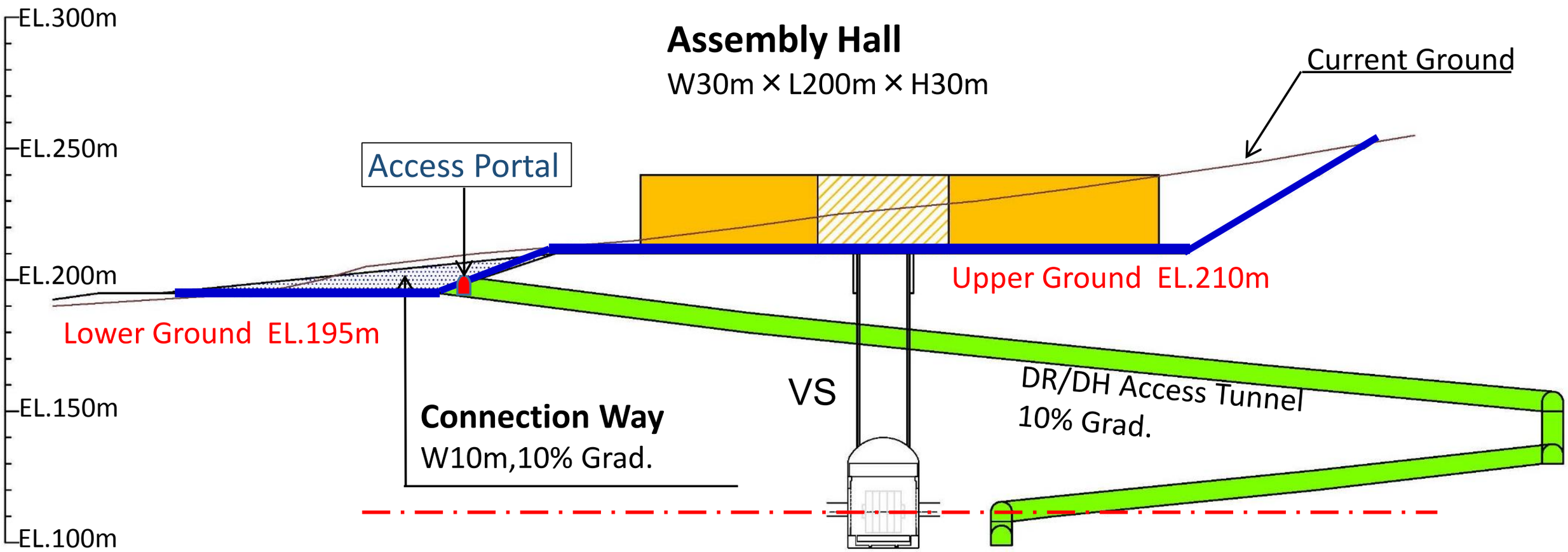
Y. Nishimoto

Hybrid-A' General layout



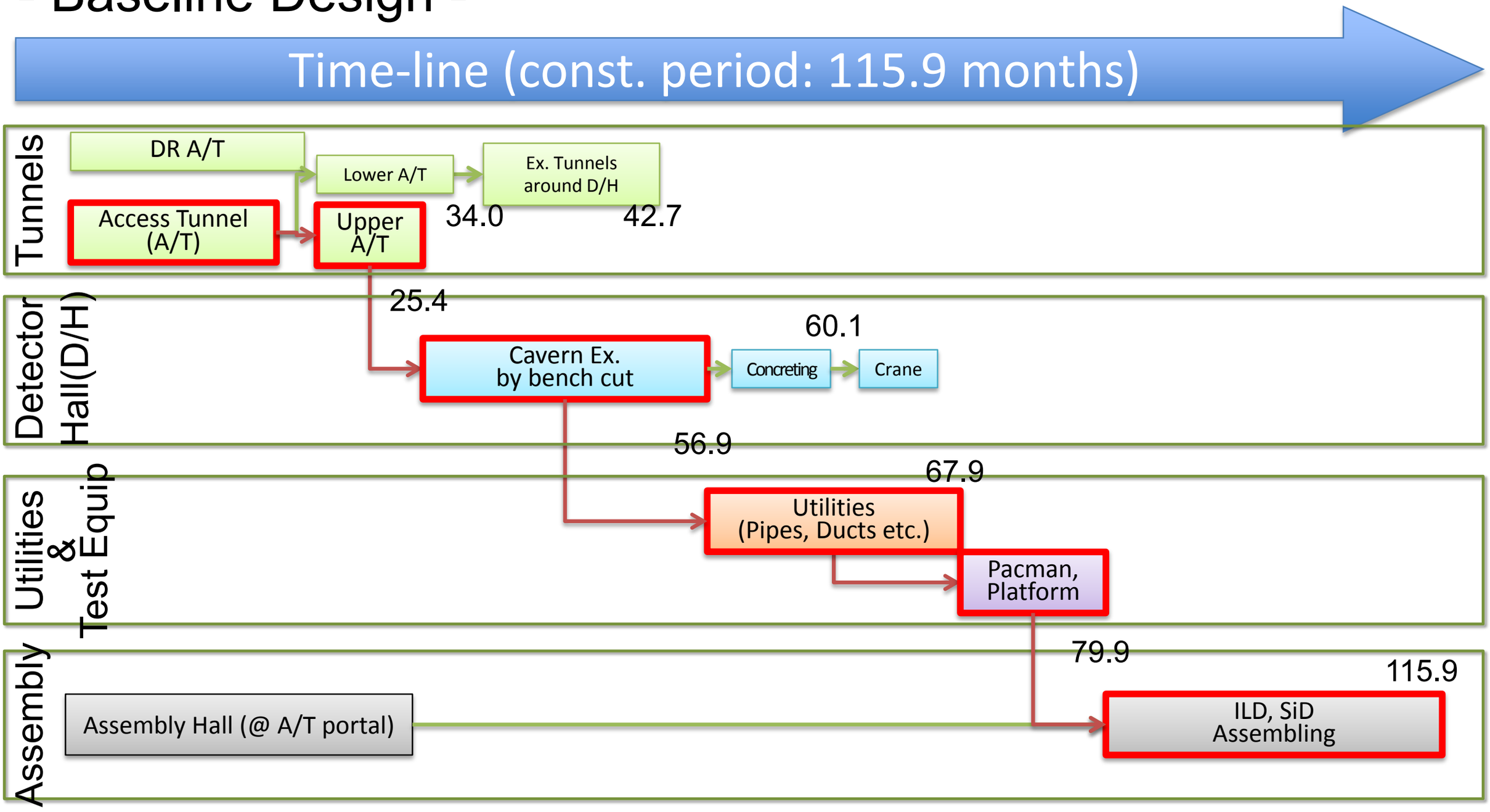


M. Miyahara

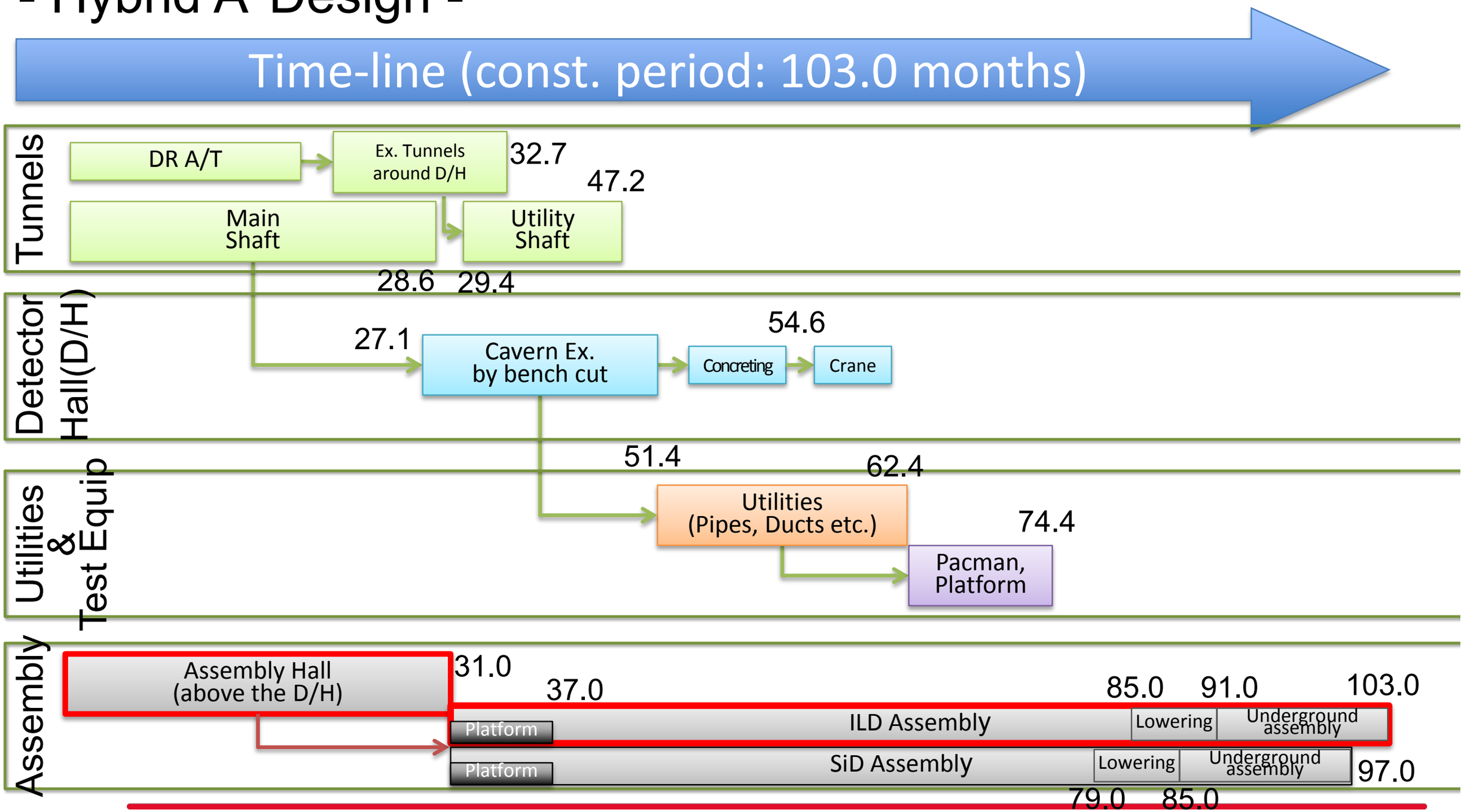


Longitudinal section

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
  - technical meetings (CFS, MDI)
  - LCCPDeb
  - detector concepts
  - at this workshop
- We have consensus!
- Submitted as CR-003 on Tuesday 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

- Two change requests to the ILC baseline have impact on machine and detectors
  - Common L*<= 4m
    - easier beam tuning, lower risks
    - work plan defined, come to conclusion until next WS (spring 2015)
  - Vertical shaft assembly of detectors at Kitakami
    - broad consensus reached before submission
    - makes detector assembly easier
    - decouples construction work for machine and detectors
  - Both CRs under review of the Change Management Board now
- Apologies for leaving out the very interesting and important other MDI/Pol/Eng topics that have been discussed at this workshop!

- Lessons learned:

How to collaborate?

„Until someone cries!“

How to collaborate?

✗ wrong

„Until someone cries!“


KEEP
CALM
AND
WORK
TOGETHER

(✔) almost right