

DH in Hybrid-A and ILD

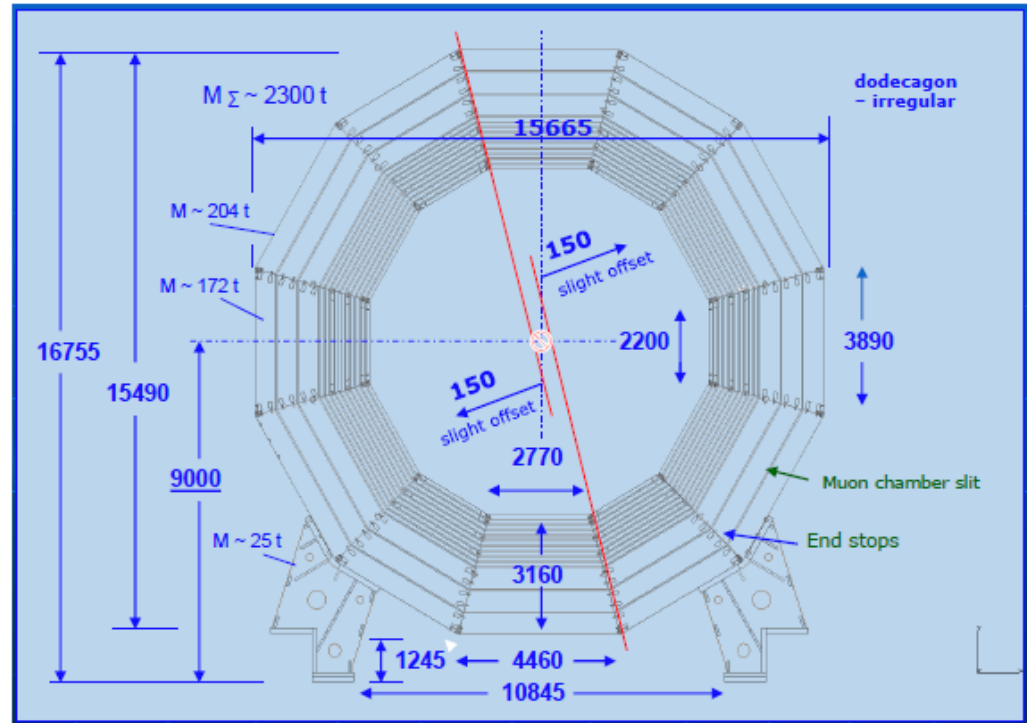
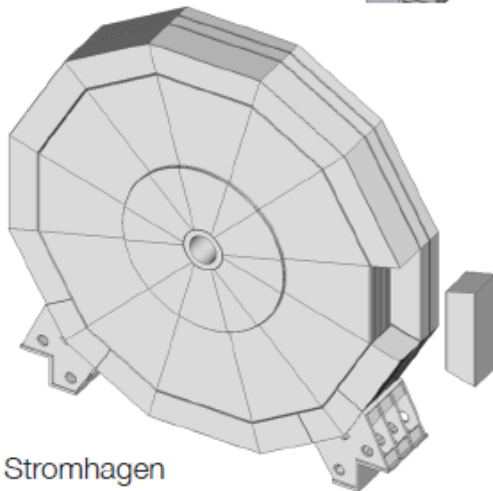
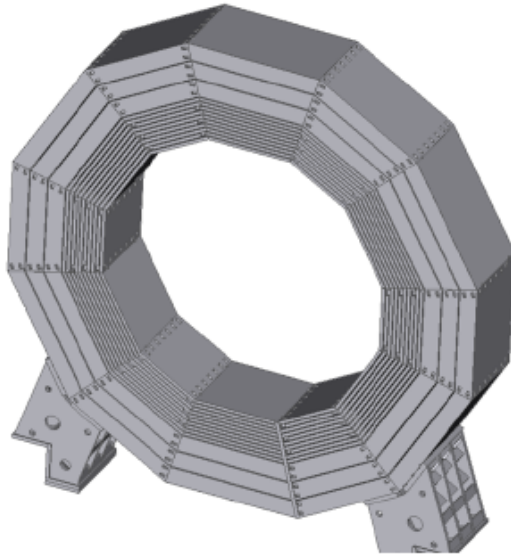
2014/9/5

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ILD assembly scheme

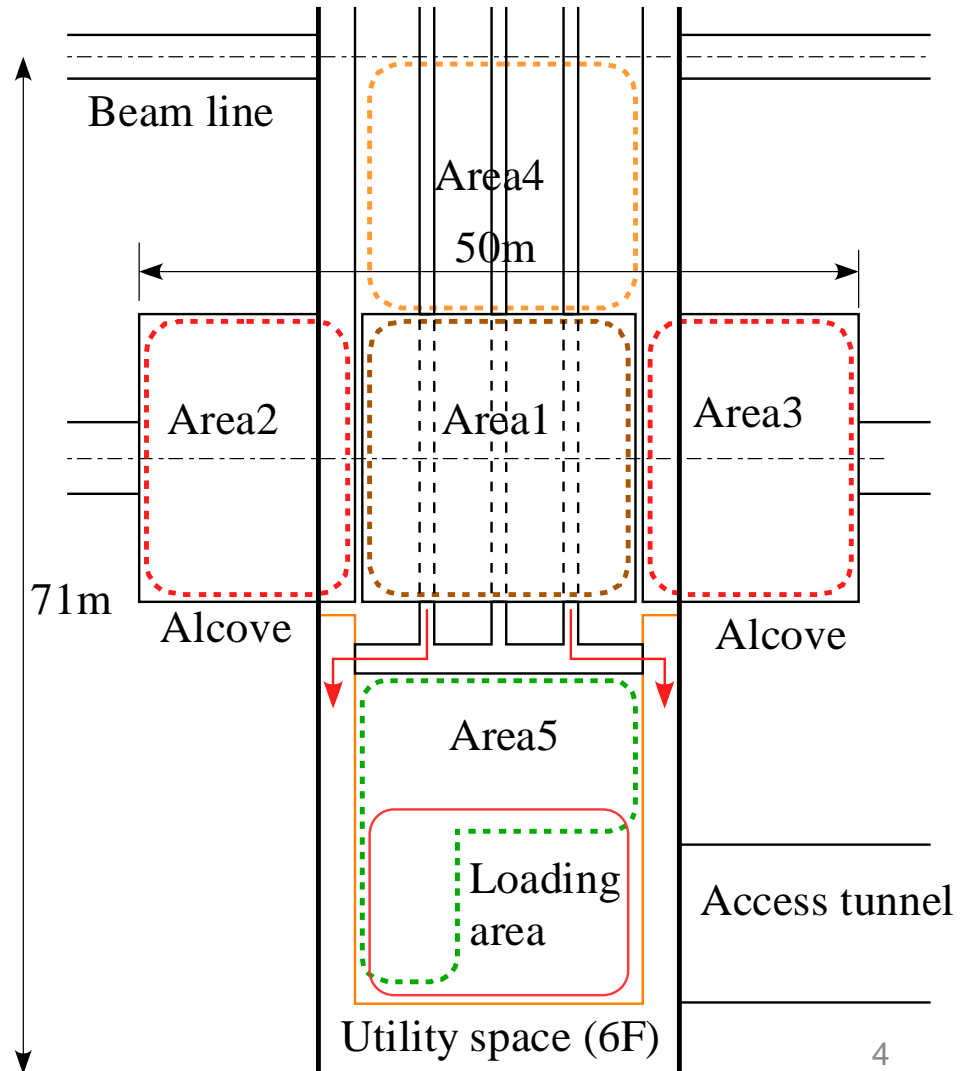
- Baseline option
 - Detector is pre-assembled on surface up to <200 ton (400 ton for solenoid) pieces
 - These pieces are transported to DH and assembled to a complete detector
 - Sub-detectors are installed in DH
 - Magnetic field measurement is carried out in DH
 - We need plenty of space for detector assembly and installation in DH
- Hybrid-A' option
 - Detector consisting of 5 rings is mostly assembled on surface
 - Each ring is lowered to DH using 4000 ton gantry crane
 - Muon detector, solenoid, and calorimeters are installed on surface
 - Magnetic field measurement is carried out on surface after barrel calorimeter installation
 - Trackers are installed in DH

ILD yoke



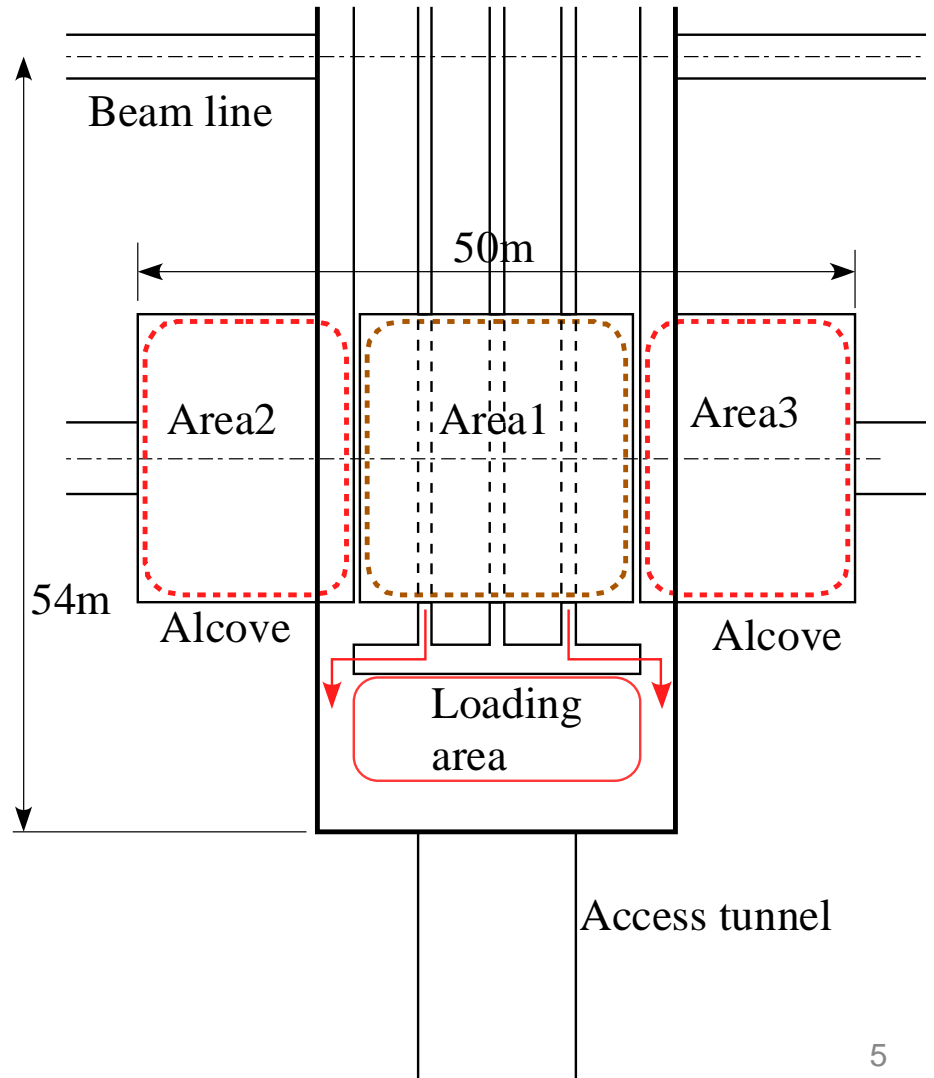
DH assembly area in Baseline option

- Area 1: Platform
 - YB0 assembly
 - Barrel detectors installation/cabling
 - Endcap calorimeters installation
- Area 2/3: Alcoves
 - Endcap calorimeters cabling
 - QD0 support tube assembly
 - FCAL install/cabling
- Area 4: Tentative platform on beam line side
 - YE, YB+, YB- (iron yoke and muon detector) assembly/install/cabling
- Area 5: Loading area side
 - HCAL rings assembly
 - Tooling assembly
 - Storage area



DH assembly area in Hybrid-A' option

- Area 1: Platform
 - Landing of lowered detector rings
 - Barrel trackers installation/cabling
- Area 2/3: Alcoves
 - QD0 support tube assembly
 - FCAL install/cabling



Requirements for cryogenics

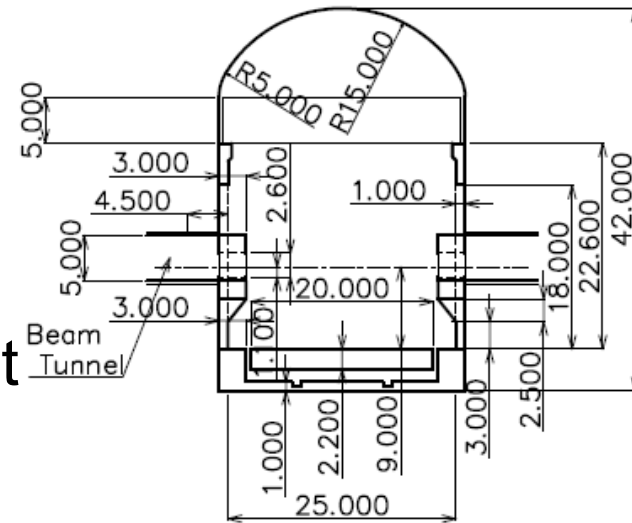
- Baseline option
 - He compressor in a compressor cavern located near the center of damping ring
 - Cold box on the detector platform or on the utility floor (6F)
- Hybrid-A' option
 - He compressor on surface
 - He gas pipes through 18m shaft
 - Cold box on the detector (YB0)

Cranes in DH for ILD

- Baseline option
 - One 250 ton crane for yoke assembly
 - One 80 ton crane for CAL installation
 - Another 250 ton crane (borrowed from SiD) for solenoid installation
 - 5 ton cranes in alcoves for end-cap CAL and FCAL installation
- Hybrid-A' option
 - One 40 ton crane for tracker installation
 - Another 40 ton crane (borrowed from SiD) for CAL maintenance, if needed
 - 5 (or 2.5?) ton cranes in alcoves for FCAL installation
 - (If a >80 ton piece has to be taken out from DH, 250 ton crane of assembly hall will be used)

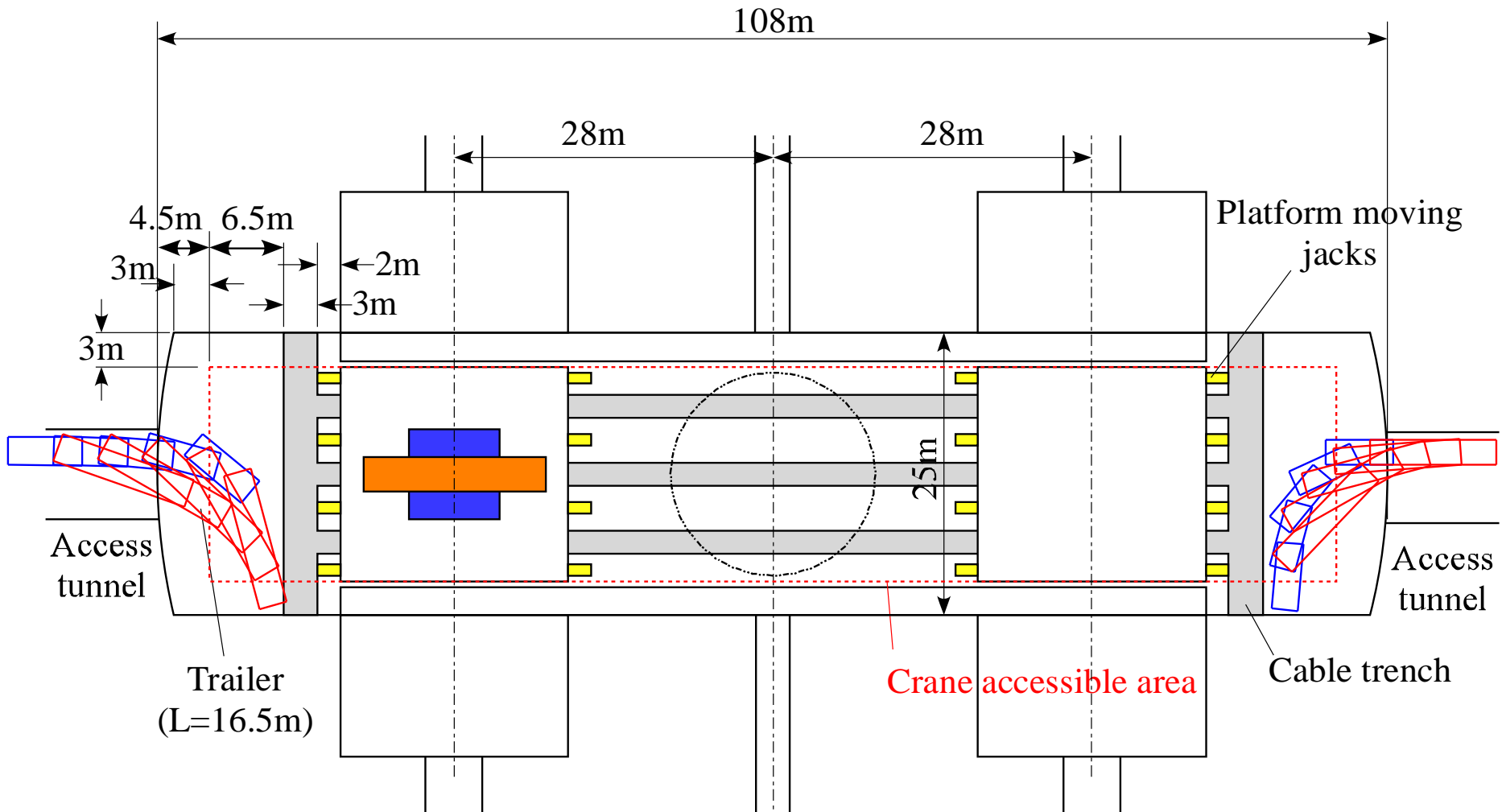
DH size

- Height
 - In Hybrid-A' option, smaller cranes than baseline option are needed
 - Therefore DH height (space above crane rails) could be slightly smaller than Baseline option (by ~2.4m?)
- Length
 - In Hybrid-A' option, assembly area at both ends of DH needed in Baseline option can be reduced
 - Loading area at both ends is still necessary for sub-detector installation and detector maintenance
 - L=108m seems OK (track of trailer in the loading area has to be seriously studied)



DH in Baseline option

DH size



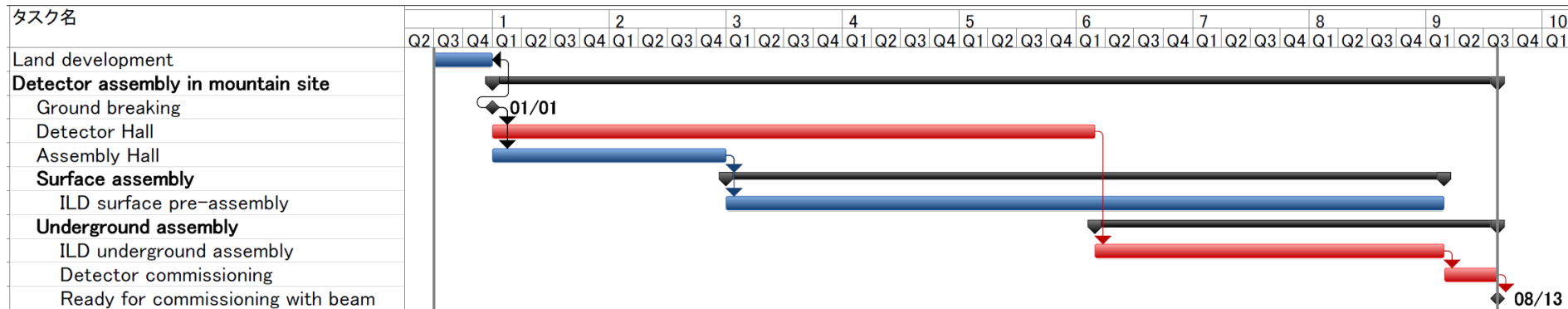
Assembly schedule

- Baseline option
 - In the new estimate by J-Power (ALCW2014), DH construction takes much longer time than TDR: 54 months → 68 months (62 months if land forming period is subtracted)
 - ILD will be ready for commissioning with beam in 9 year from the beginning of land forming (8.5 years from the beginning of excavation)
- Hybrid-A' option
 - In the estimate by J-Power at ALCW2014, DH construction takes 62 months, which is not the critical path
 - Assembly hall construction period and detector assembly period on surface are critical
 - If assembly hall can be constructed in 2 years, ILD will be ready for commissioning with beam 8.5 year from the beginning of land forming (8 years from the beginning of excavation)

Hybrid-A' option can make ILD schedule earlier by 0.5 year

Assembly schedule

Baseline



Hybrid-A'

