

Construction and Installation of the CLIC Experimental Area

A very first draft schedule

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CLIC Experimental Area -overview



- → 2 experimental caverns
- → 2 access shafts
- → 2 surface assembly halls
- → 1 transfer tunnel for detectors (Push-Pull)
- → 1 bypass tunnel
- → 2 evacuation galleries
- → 2 survey galleries
- → 2 Modular
 Detectors (ILD,
 SiD like) 7
 elements

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Construction and installation schedule

\rightarrow Taking advantage of similarities with the CMS experimental area



- → 1 experimental cavern
- → 1 service cavern
- → 2 access shafts
- → 1 surface assembly hall
- → 1 bypass tunnel
- → 2 evacuation galleries
 - → 2 survey galleries
- → 1 modular detector – 13 elements

Year 1: Shafts + Caverns + Detector Assembly Halls



- → Excavation of 2 shafts in parallel: 1 year
- → Construction of 2 detector assembly halls in parallel, including services: 1 year
 - → Only 2/3 of their final size should be delivered initially to allow for detector assembly
 - → Will allow the assembly of the detectors while the underground facilities are being constructed





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20/10/10

Year 2: Caverns finishing + Detector Assembly



- → Excavation and finishing of caverns and transfer tunnel: 1st of 2 years
- → Detector assembly on the surface: 1st of 3.5 years
- → Construction of service buildings (Cooling & ventilation, Electrics, Gas, Counting rooms...): 1st of 2 years



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Year 3: Caverns finishing + Detector Assembly



- Finish the 2 Experimental Caverns and transfer tunnel: 2nd of 2 years
- → Detector assembly on the surface:
 2nd of 3.5 years total
- → Finish the construction of service buildings : 2nd of 2 years





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Year 4: Installation Caverns infrastructure + Detector Assembly & Test + Completion of Assembly Halls





- → Install infrastructure and services in 2 experimental caverns and transfer tunnel: 1st of 2 years
- → Detector assembly on the surface: 3rd of 3.5 years total
- → Complete Surface Assembly Halls: 1 year / hall; 15 months total



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Year 4: Completion of Surface Assembly Hall

- → Work in the remaining part of the Surface Assembly Hall would have to be interrupted to allow for the concrete and metallic modules to be lowered => 2 halls to be built with a 9 weeks offset
 - \rightarrow A 12 week window is needed to install technical infrastructure:
 - → Concrete lift modules
 - → Ventilation ducts
 - → Cooling pipes
 - → Cable trays
 - → Metallic staircase
- → Impact on work in Detector Hall
 - → Construction of the PPull platforms



13	⊟ Shaft access building	200 days	
14	Shaft Base Cavern construction complete	0 days	♦ 01/02
15	Concrete slab	9 wks	01/02 01/04
16	Install shaft with infrastructure	12 wks	04/0424/06
17	Build steelworks	8 wks	27/0619/08
18	Install overhead crane	1 wk	22/08 26/08
19	Install cooling and ventilation	10 wks	29/08 04/11
20	Install EL general services	5 wks	29/08



Year 5: Complete installation of cavern infrastructure





- → Complete installation of infrastructure and services in 2 experimental caverns and transfer tunnel: 2nd of 2 years
- → Installation of gantry crane for detector lowering: 1 month
- → Complete detector assembly and commissioning on the surface



Year 5: Lowering of the Detector and connection to underground services





- → Lowering of Detectors 6 months
- → Connection of detectors to the caverns' services (on-detector & cable chains) 10 months
- → Connection work can start as soon as 1 element has been lowered



Year 6: Commissioning of Detectors + Push-Pull system

- → Complete connection of detector services
- → Perform Magnet tests
- → Run with Cosmics
- → Commission safety systems
- → Test Push-pull system including forward shielding





Year 7: Complete commissioning of Detectors and of the Experimental Area infrastructure

- → Complete commissioning
- → Ready for 500GeV beam





Summary Schedule



 \rightarrow Years 4 and 5 should be interesting...

Conclusions

- → The CMS installation provides a good template to work out the final installation sequence of the CLIC Experimental Area
- → A lot more work will be needed to work out the details of the schedule
- → The current sequence seems to be compatible with the goal of being ready for beam at the beginning of the 7th year after the kick off of the project construction phase
- → The impact of the worksite setup time still has to be evaluated