



# Detector Hall Configuration Details Cost and Schedule

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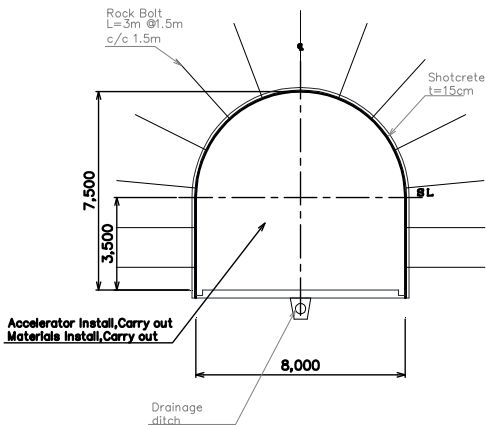
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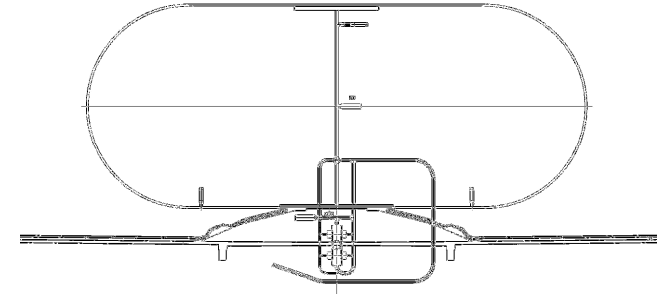
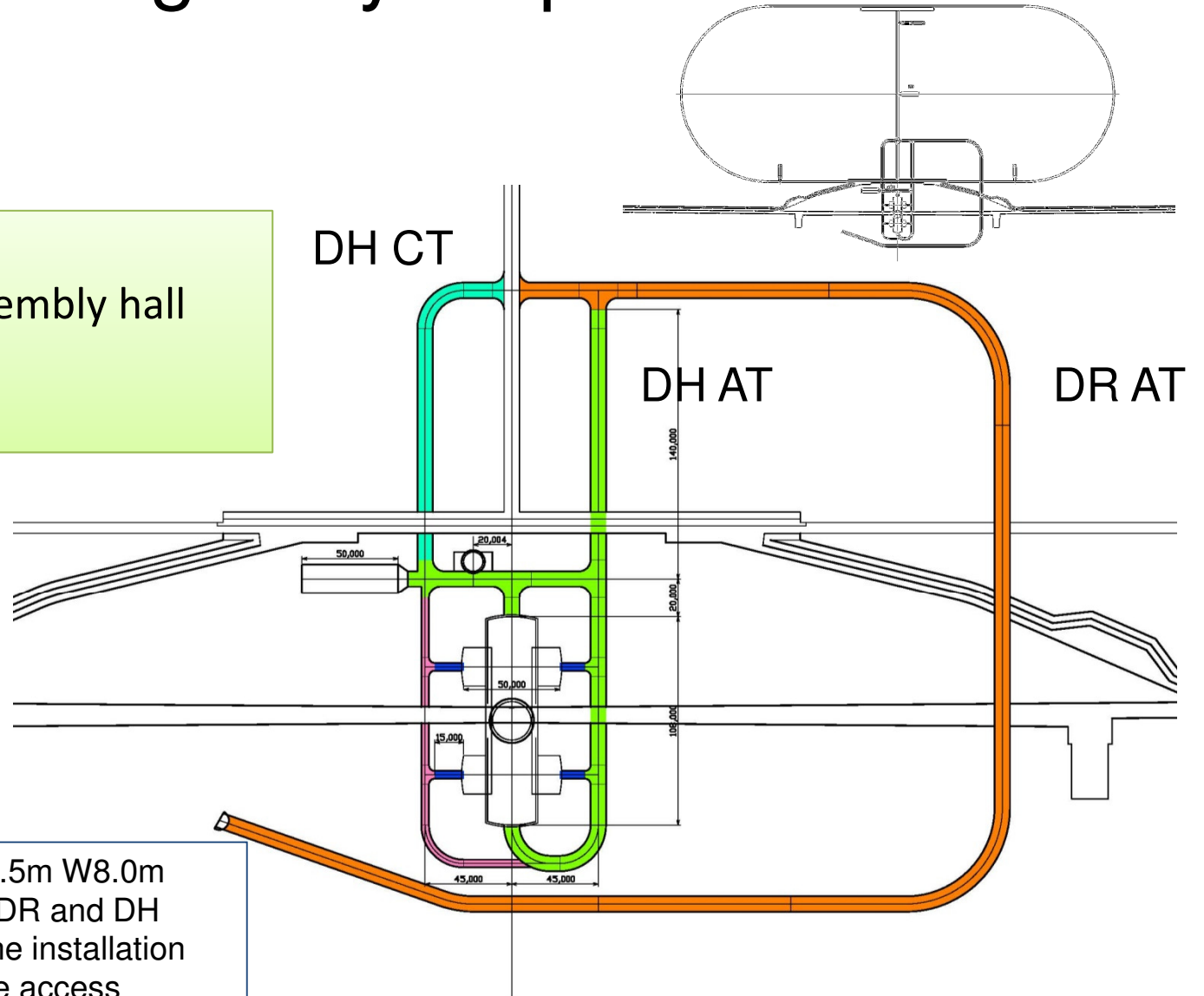


# New Baseline Design Layout plan

Shaft Access for D/H  
 Detectors assembled in Assembly hall  
 Two access ways  
 by elevator and by vehicle

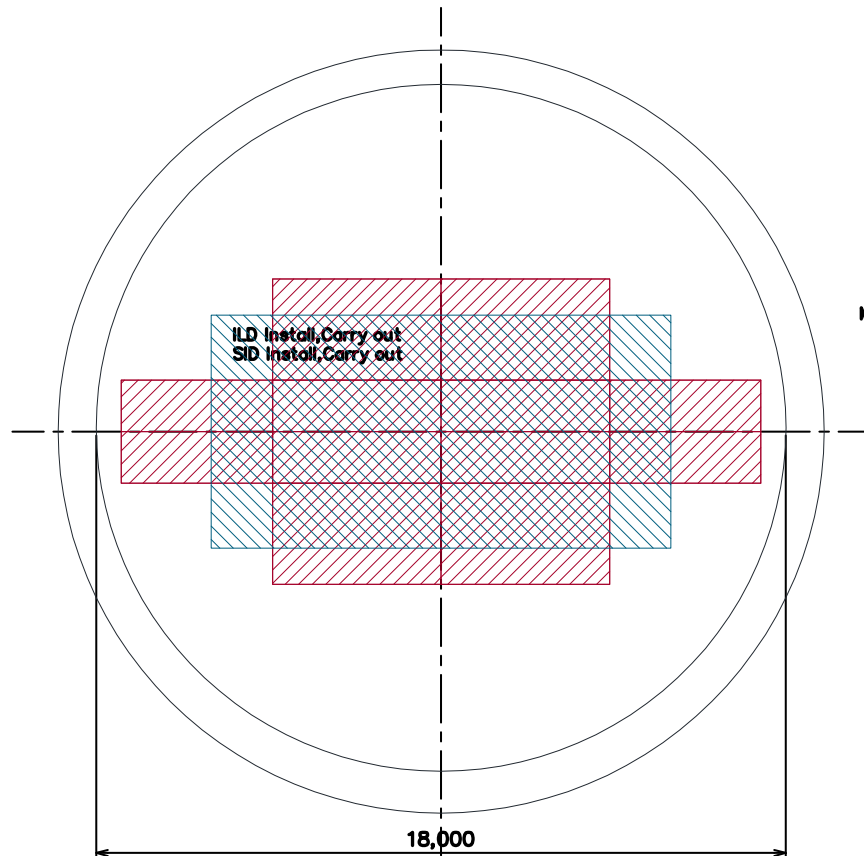


DR A/T H7.5m W8.0m  
 Access to DR and DH  
 DR machine installation  
 D/H vehicle access



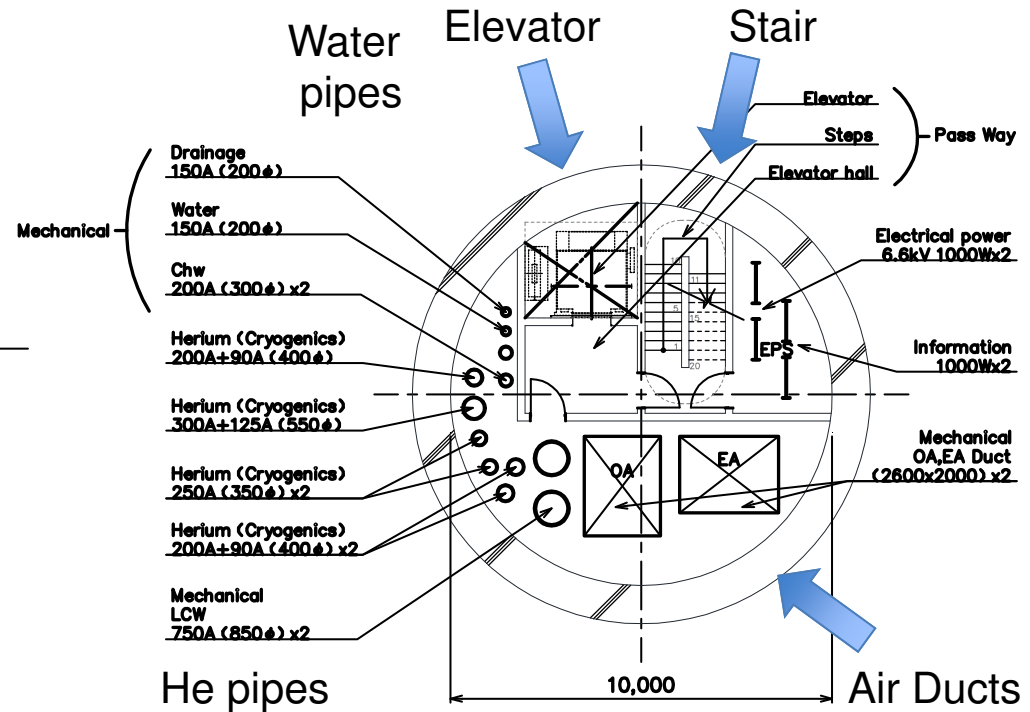


# New Baseline Design Shafts



Hybrid (HT-VS) –Main Shaft  
Real Circle

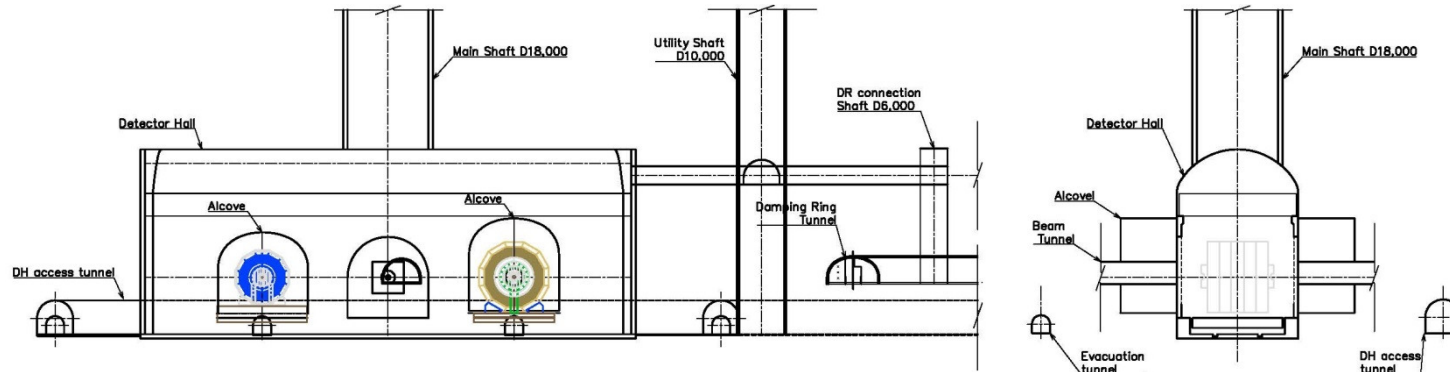
Main shaft D=18m  
Center of DH  
Detectors Installation



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

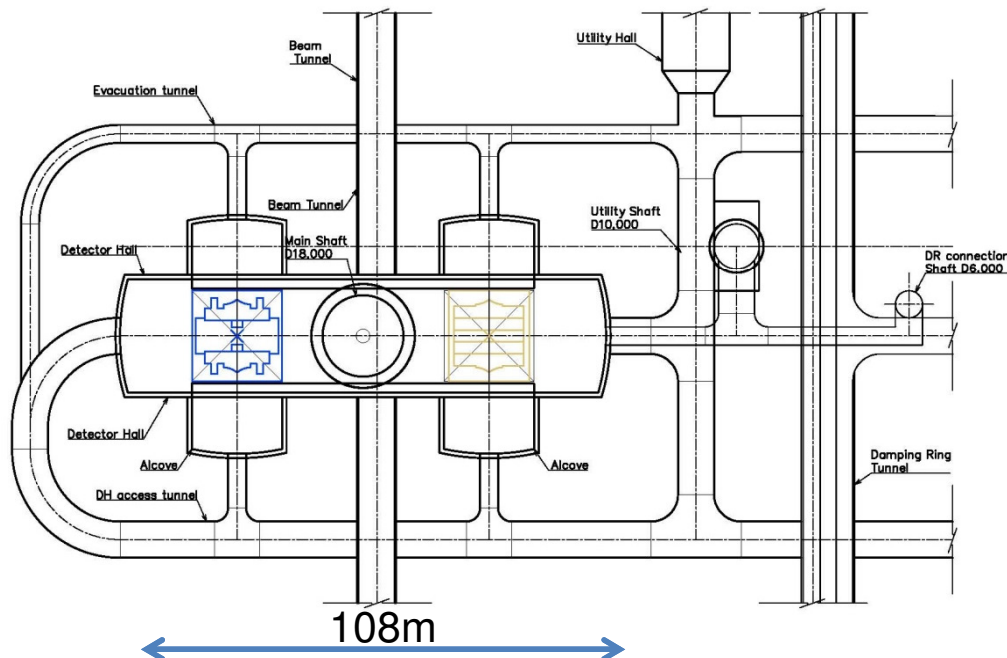


# New Baseline Design Detector Hall



SiD side

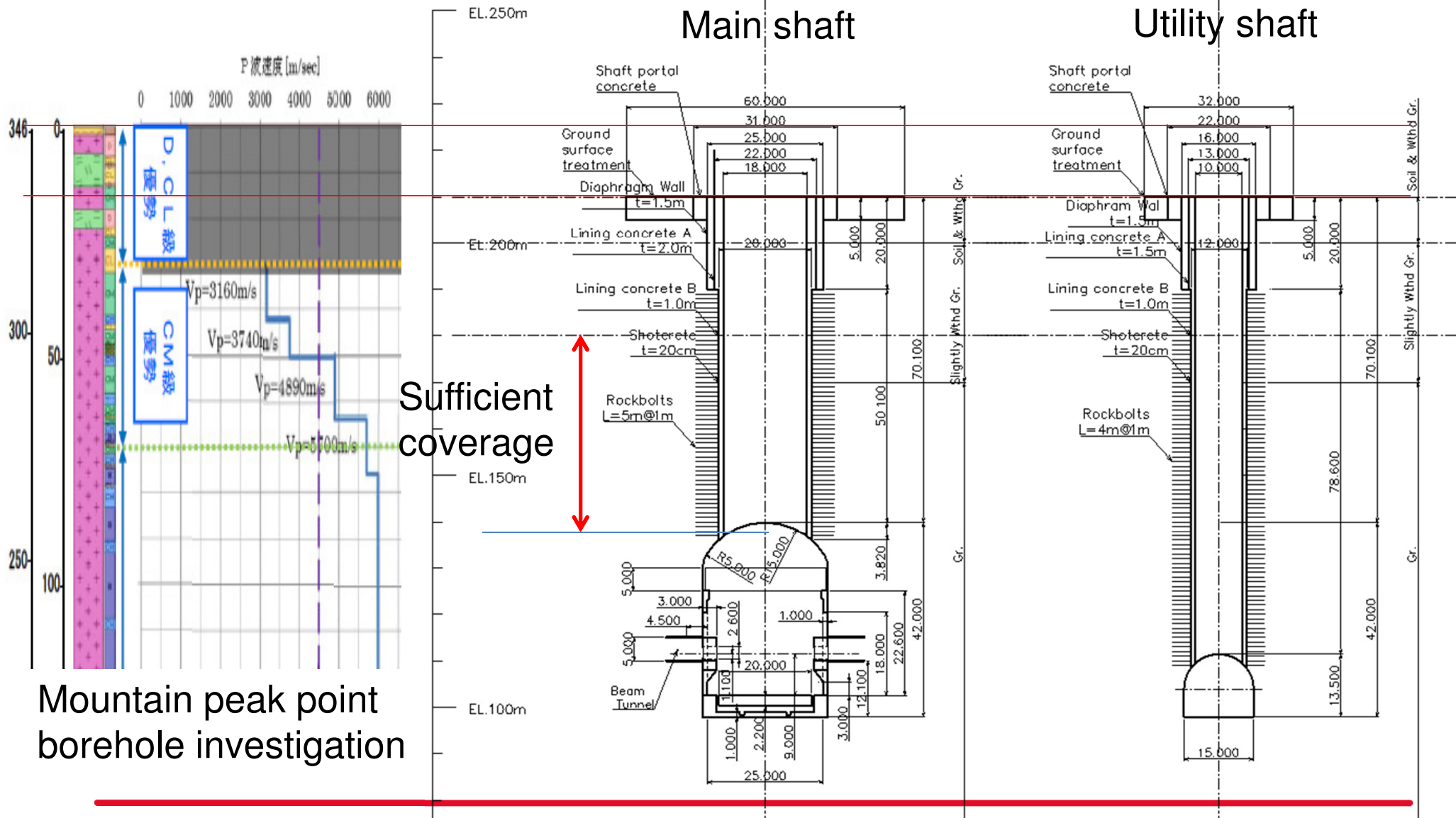
ILD side



- Main shaft locates IR position.
- DH length is reduced to 108m.
- Utility lines are in UT shaft
- Personnel entrance way is elevator installed in UT shaft
- Access tunnels connect at the both end of DH



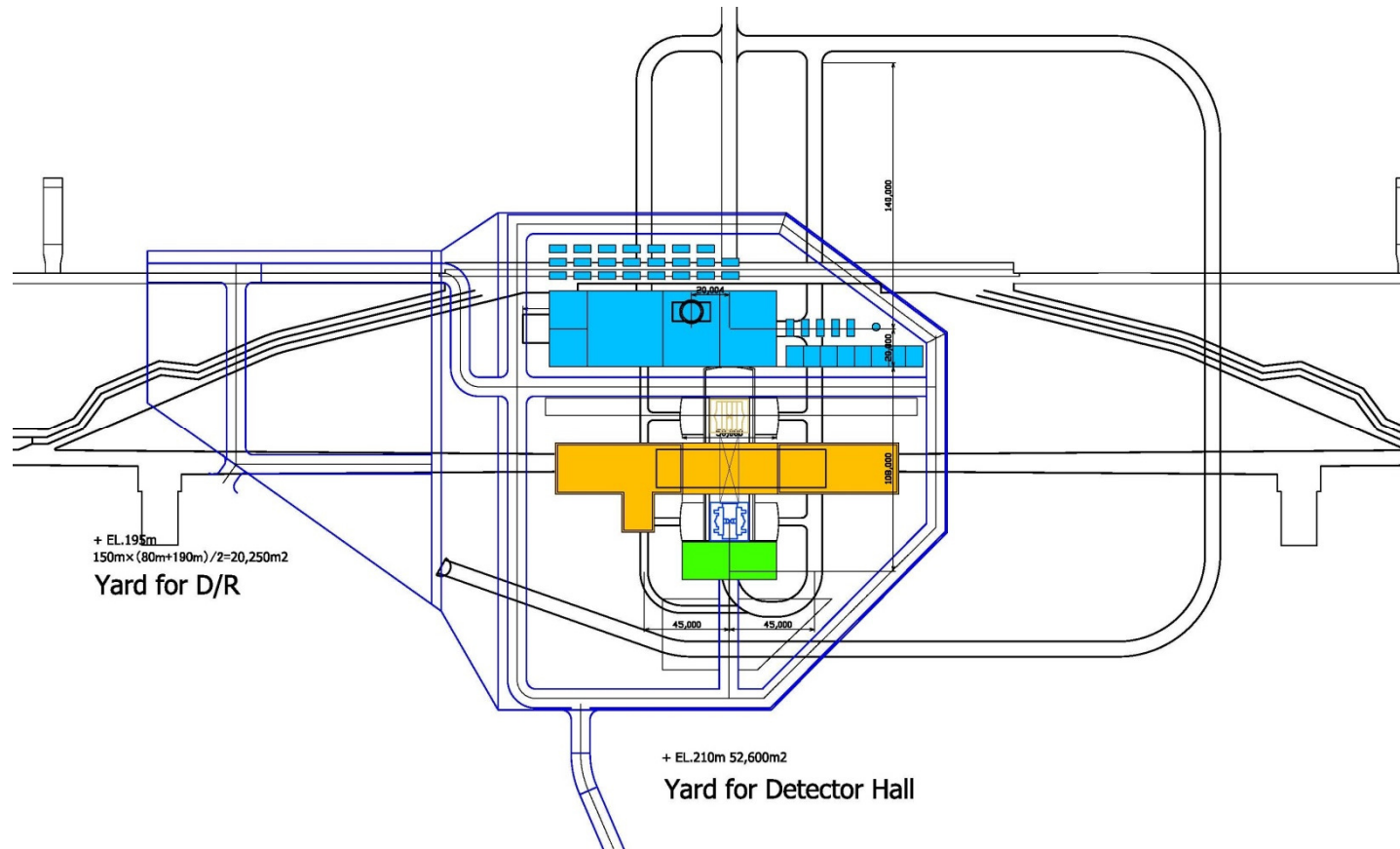
# New Baseline Design Assumed geology



Mountain peak point borehole investigation



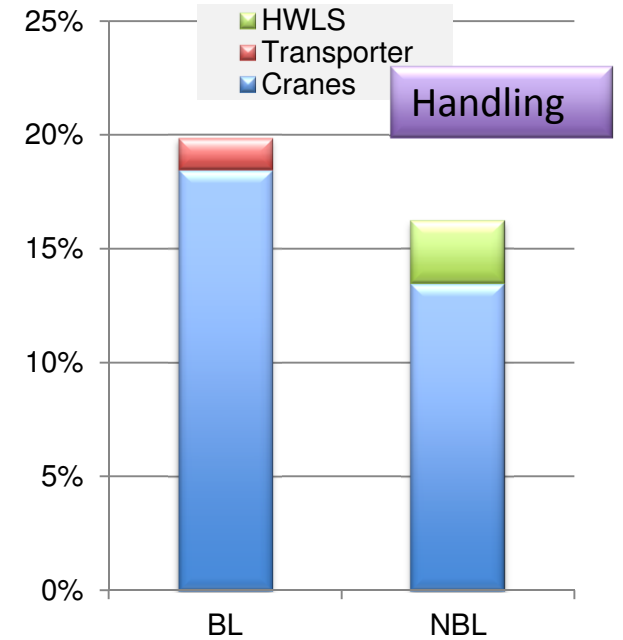
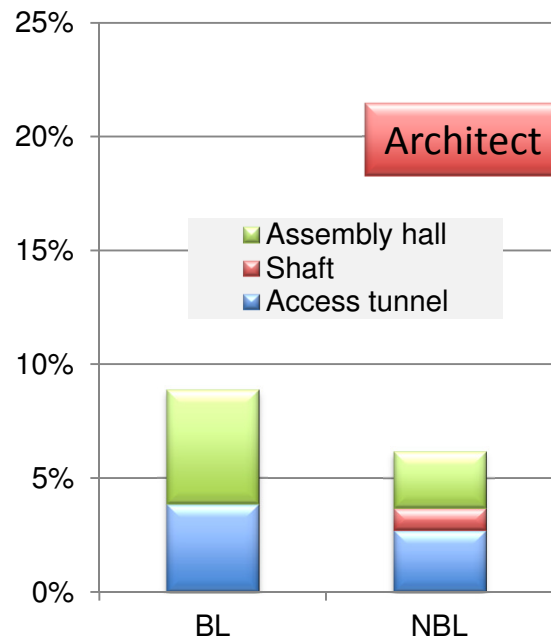
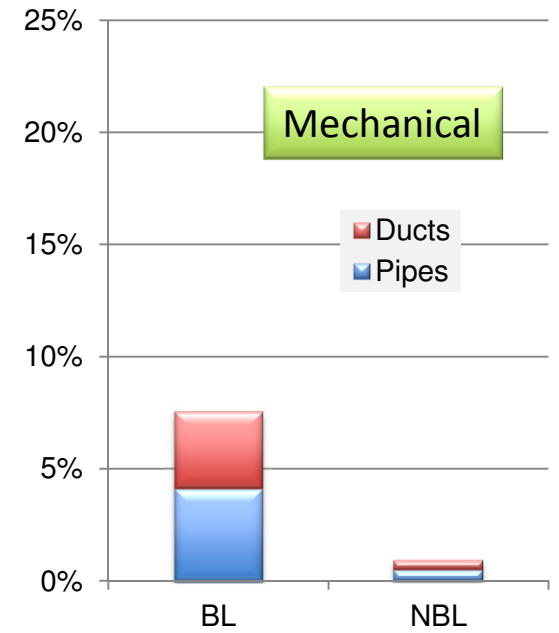
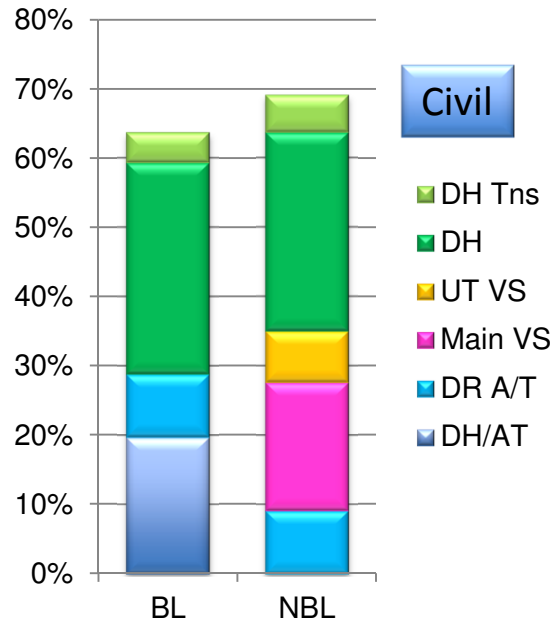
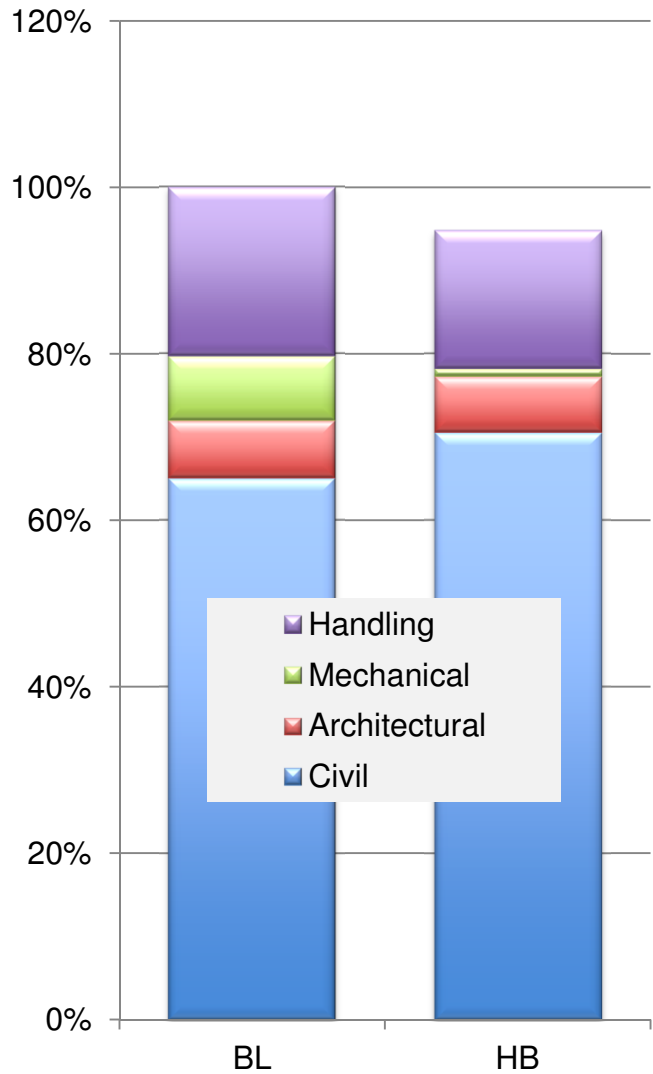
# New Baseline Design Assembly yard



- Assembly yard is based plot plan of assembly hall and other UT facilities
- About 53,000m<sup>2</sup> for Assembly yard



# Cost Summary







# Civil work cost estimation break down

Items	Unit	Baseline		New Baseline		Notes
		Spec	Qt.	Spec	Qt.	
Portal work	LS	W11.0 H11.0	1			TDR
Main A/T D2	m	W11.0 H11.0	150			TDR
Main A/T	m	W11.0 H11.0	610			TDR
Upper A/T	m	W8.0, H7.5	100			TDR
Lower A/T	m	W11.0 H11.0	540			TDR
Portal work	LS	W8.0, H7.5	1	W8.0, H7.5	1	TDR
DR A/T D2	m	W8.0, H7.5	150	W8.0, H7.5	150	TDR
DR A/T	m	W8.0, H7.5	870	W8.0, H7.5	870	TDR
Main Shaft D18m	LS			Portal	1	Newly estimated
	LS			Shelter	1	Newly estimated
	m			Soil	20.0	Newly estimated
	m			Rock	67.6	Newly estimated
UT Shaft D10m	LS			Portal	1	Newly estimated
	LS			Shelter	1	Newly estimated
	m			Soil	20.0	Newly estimated
	m			Rock	88.6	Newly estimated
DH	m3	W25.0, H42.0, L144	157,560	W25.0, H42.0, L108	115,500	TDR
DH ILD Alcove	m3	W20.0, H20.5, L12.5	9,100	W20.0, H20.5, L12.5	9,100	TDR
DH SiD Alcove	m3	W20.0, H18.0, L12.5	8,300	W20.0, H18.0, L12.5	8,300	TDR
Drainage for Hall	m	@10m mesh	910	@10m mesh	630	TDR
PS Anchor	pcs		1,850		1,400	TDR
Based Concrete	m3	t=1.0	4,550	t=1.0	3,700	TDR
Side Wall Concrete	m3	t=1.0 h30m	13,020	t=1.0 h30m	10,980	TDR
Connecting Tunnel	m	W8.0, H7.5	200	W8.0, H7.5	430	TDR
Evacuation Tunnel	m	W4.0, H4.0	270	W4.0, H4.0	210	TDR
Utility Cavern	m3	W15.0, H13.5	17,000	W15.0, H13.5	11,000	TDR
Alcove Tunnel	m	W4.0, H4.0	50	W4.0, H4.0	80	TDR



# Architectural facility

Architectural		Spec	Unit	Baseline	New Baseline
A/T	DH-A/T Evac. pass way	H2.5 x W2.0m	M	1,400	0
	DH-A/T Doors	4.5 m2	Pcs	28	0
	DR-A/T Evac. pass way	H2.5 x W2.0m	M	1,020	1,020
	DR-AT Doors	4.5 m2	Pcs	20	20
Shaft	Elevator	17 psn 150m/min	Set	-	1
	Evacuation Stair	120m	Set	-	1
	Evacuation Doors	4.5 m2	Pcs	-	55
Assembly Hall			M2	Same as NB	180 x 25 =4,500m2

# Mechanical facility

Mechanical	Spec	Unit	Baseline	New Baseline
LCW	φ750mm CS 2way	M	2,140	260
ChW	φ200mm CS 2way	M	2,140	260
Pipes for supply	φ100mm SUS	M	1,070	130
Pipes for return	φ200mm SUS	M	1,070	130
Ducts	2.6m × 2.0m 2way	M	2,140	260



# Handling equipment

## Permanent crane

Items	Specifications	Unit	Baseline	New Baseline
DH Main/H Crane	250t S25m h35m	pcs	2	
	80t S25m h35m	pcs	2	
	40t S25m h35m	pcs		2
DH Alcove Hoist Crane	2.5t S25m h25m	pcs	4	4
Assembly Hall	250t S25m h35m	pcs	2	
	250t S25m h130m	pcs		2
	80t S25m h35m	pcs	2	2

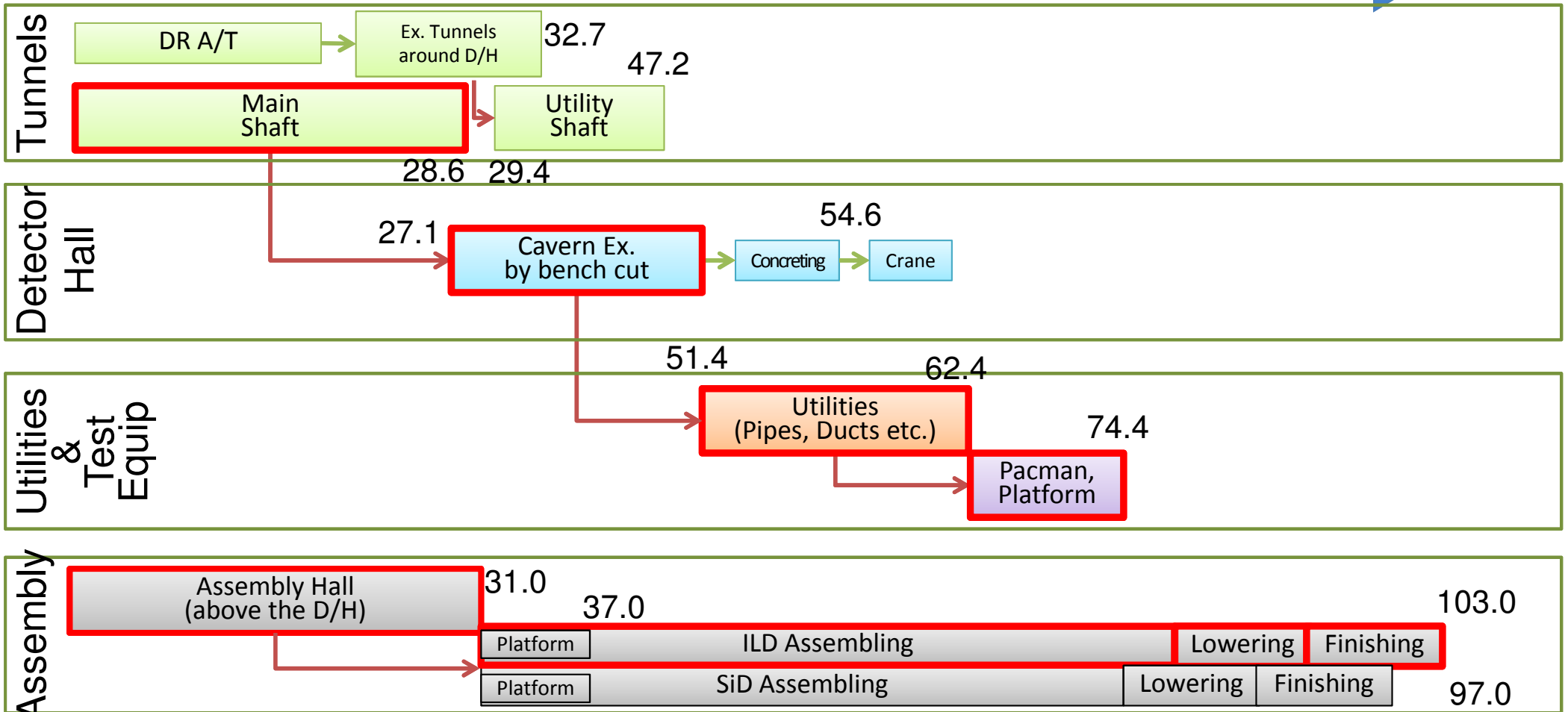
## Heavy equipment transportation

Items	Specifications	Unit	Baseline	New Baseline
Tunnel heavy transporter	220 t carrier	times	Many 12?	
Shaft Lowering system	4100t h130m gantry crane	pcs		1



# New Baseline Construction Procedure

Time-line (const. period: 103 month)



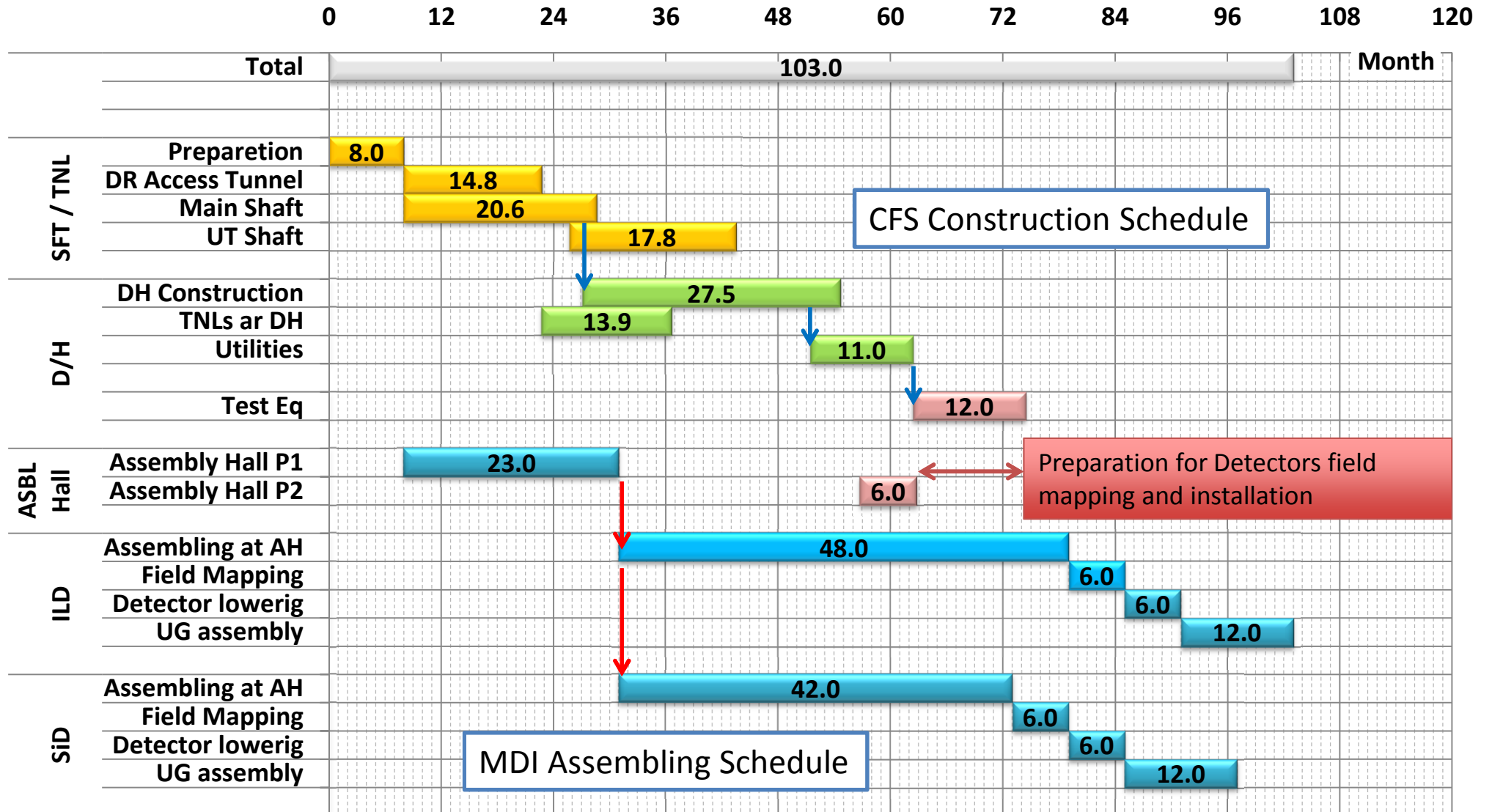


# Conditions for schedule estimation

- **Preparation work : not considered in TDR**
  - Land forming 6 months + temporary work 2 months
- **Detector excavation commencement :**
  - Baseline: After Upper A/T completion
  - Hybrid: After main shaft completion (by using the main shaft)
- **Tunnel and DH progress : same as the TDR**
- **Shaft progress : newly estimated including utility facilities**
- **Detector platform installation**
  - After D/H base floor work, it takes 12 months
- **Detector assembling**
  - Baseline: Assembling in the Detector Hall
    - : 36 months after DH construction completion
  - Hybrid: Assembling on the surface
    - : 36 months at Assembly hall + 12 Months after DH completion



# New Baseline Construction Chart





# Issues on adoption of New Baseline Design

- **Geological condition at IR point**
  - Sufficient fresh rock coverage above DH
  - No Undesirable geology distribution
- **Environment impact**
  - Noise influence during shaft and DH construction
  - Noise influence in operation, machinery noise (same as Baseline)

Noise reduction shelter





# Appendix

- **Baseline Design Cost**
- **Baseline Design Schedule**



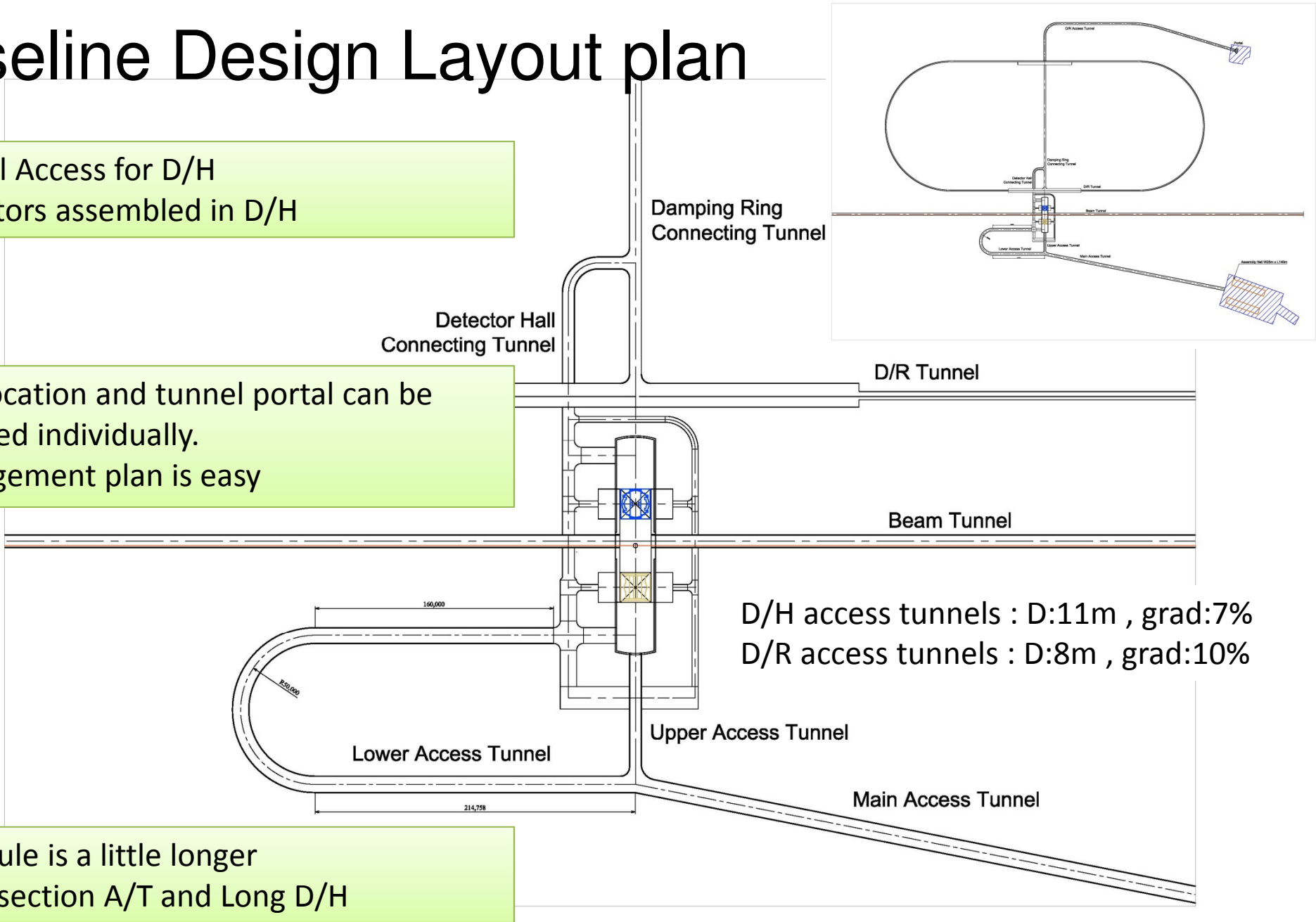


# Baseline Design Layout plan

Tunnel Access for D/H  
Detectors assembled in D/H

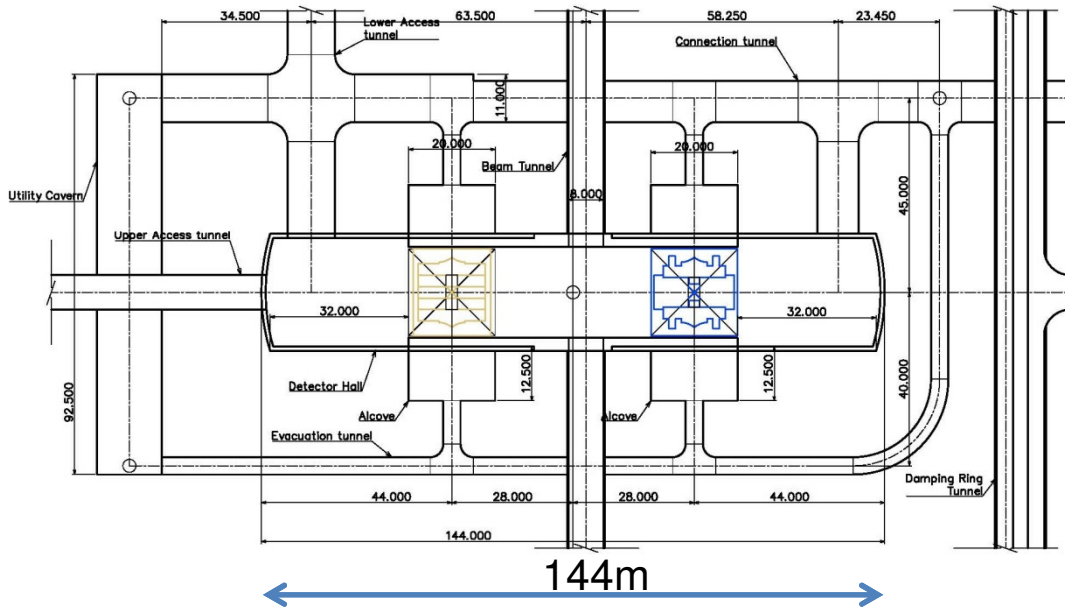
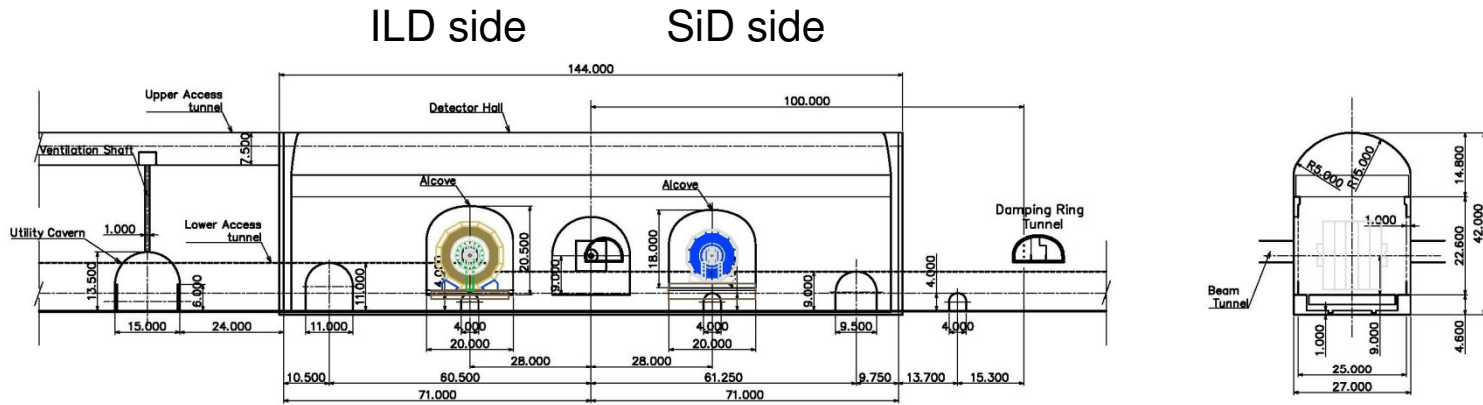
D/H location and tunnel portal can be selected individually.  
Arrangement plan is easy

Schedule is a little longer  
Large section A/T and Long D/H





# Baseline Design Detector hall



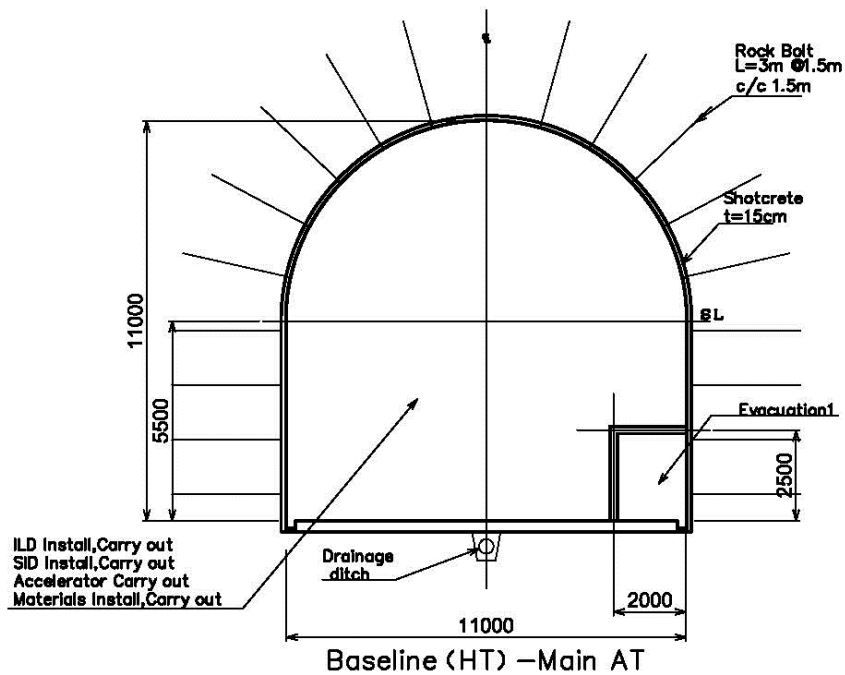
- Remarks
- AT connection is perpendicular to DH at ILD side
  - Assembling space is 33m outside of park position
  - SiD : DR side



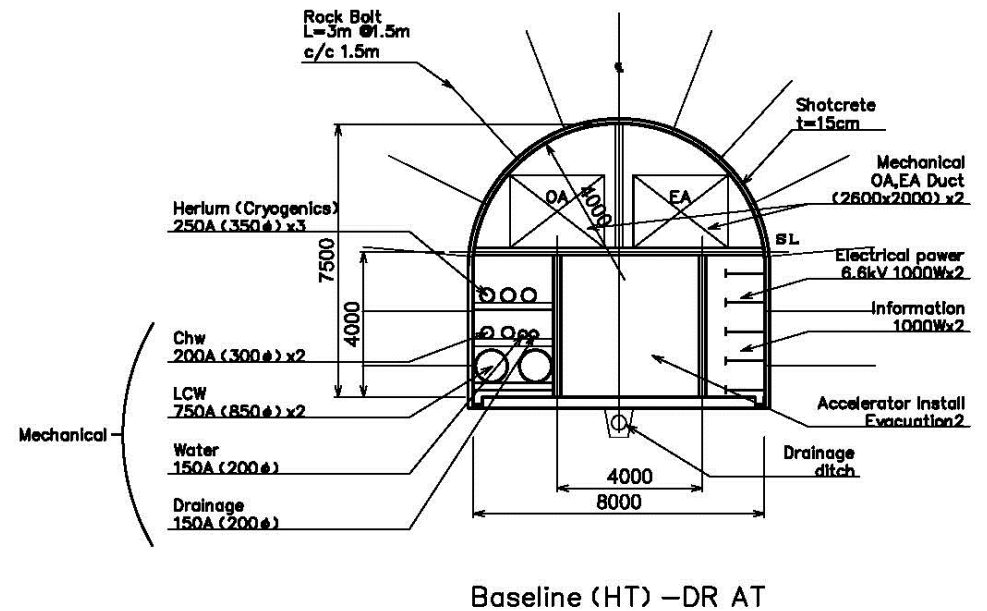


# Baseline Design Tunnel section

## Tunnel access for D/H



## Tunnel access for D/R

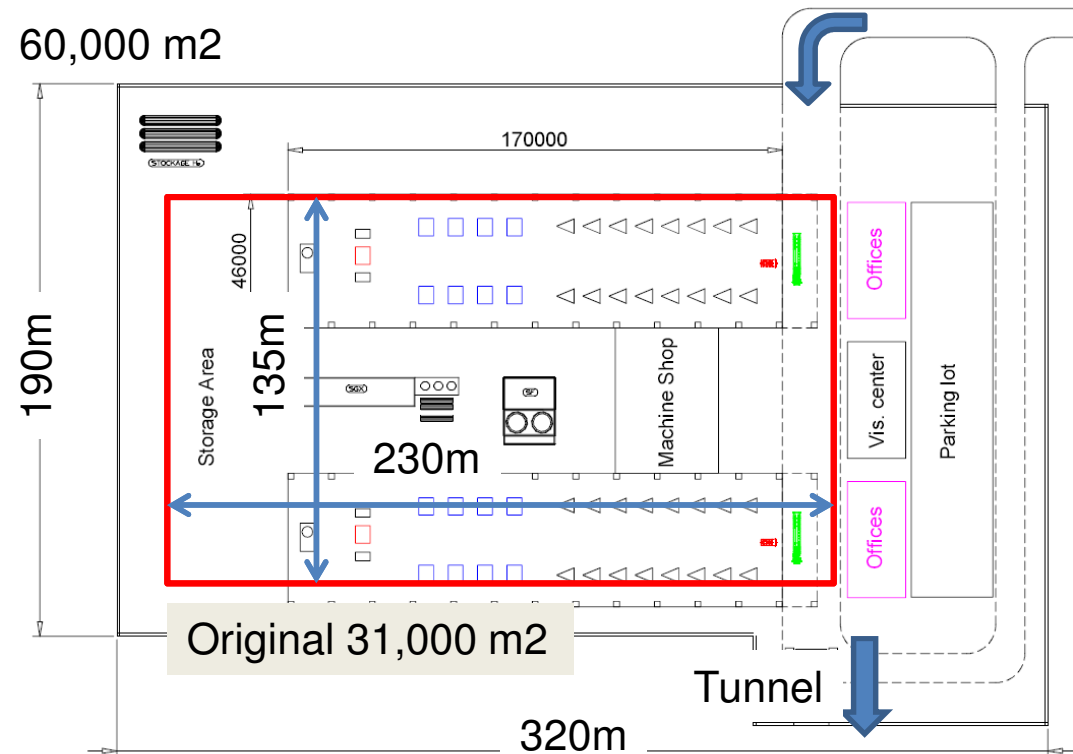
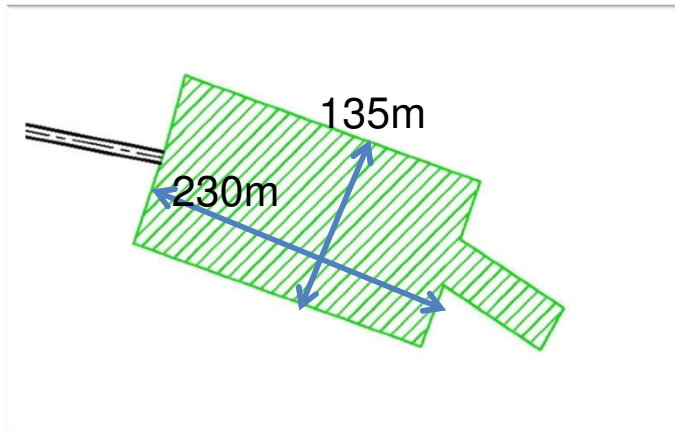




# Baseline Design Assembly yard

Kitakami baseline plan

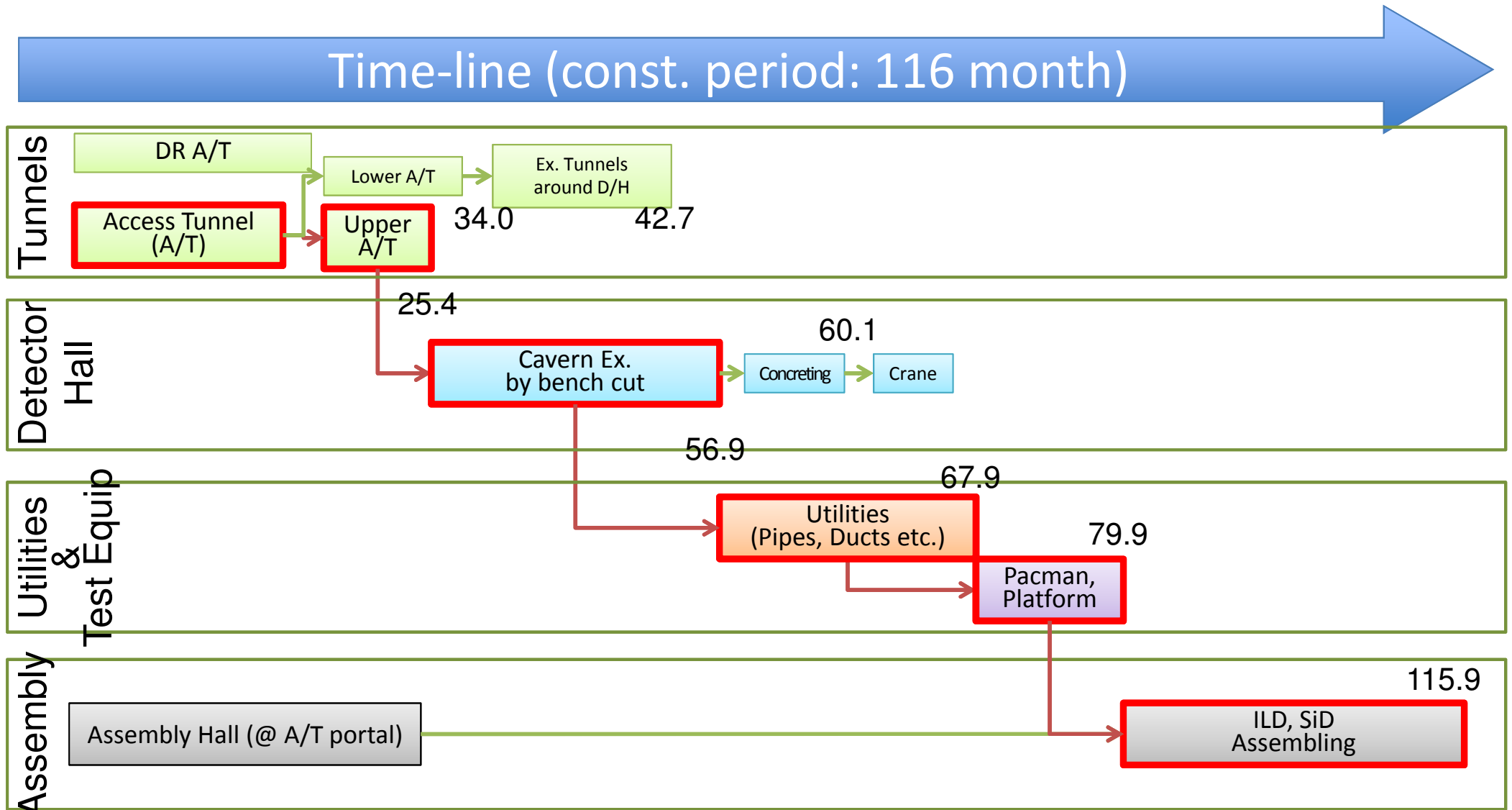
- Assembly yard is 31,000 m<sup>2</sup> according to TDR



- Planned area space is narrower than Detector assembling plan
- Tunnel portal area have to satisfy enough space “assembling” and “construction”.
- Further discussion and study should be necessary, depending on transportation plan?



# Baseline Construction Procedure





# Baseline Schedule Chart

