

Access Tunnel to the Detector Hall at the Japanese Site

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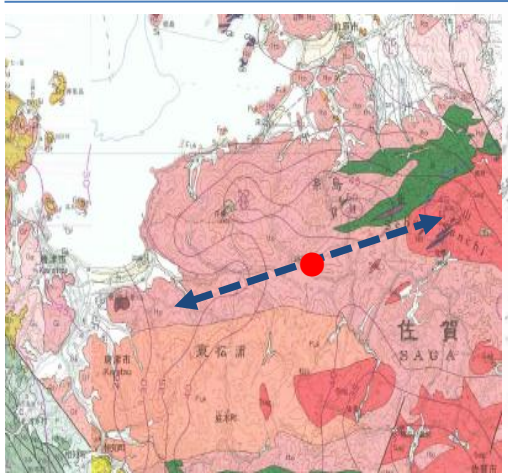
Common Features of Both Candidate Sites

Geographical Feature of the Detector Hall Area

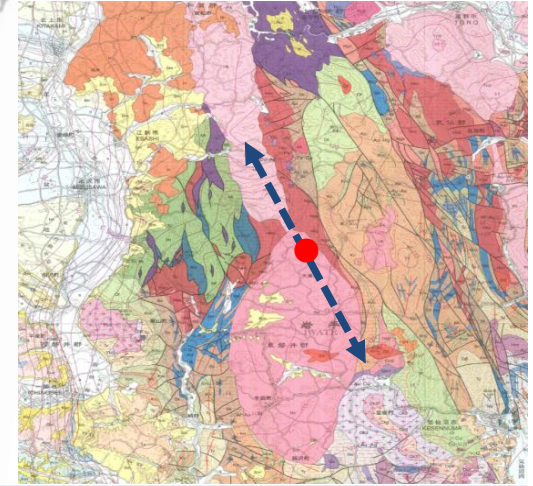
- Location: in Mountainous Area
- Surface: almost Forest Zone
- Earth Covering Depth is Large:
200 m ~ 400 m

SEBURI

Site-B



Site-A



KITAKAMI

Geology of the Whole Region

- Located in the Stable **Granite Rock**
- no Active Faults, no Volcano
- no source of vibration

■ Access Tunnel Examples in a Large Tunnel (Railway)

Project	Tunnel	Length	Type	Size	Length	Slope	Mucking
TOHOKU-SHINKANSEN	ICHINOHE (2002)	25.8 km	Sloped	W6.3*H4.8	411 m	6.0 %	Dump Truck
			Sloped	W6.3*H4.8	524 m	10.0 %	Dump Truck
			Sloped	W6.1*H4.7	552 m	10.0 %	T. Container
			Sloped	W6.6*H6.0	1,015 m	10.0 %	Dump Truck
			Sloped	W6.1*H4.9	1,251 m	10.0 %	Dump Truck
	HAKODA (2005)	26.5 km	Sloped	W6.4*H5.0	718 m	8.7 %	Dump Truck
			Sloped	34.0 m ²	738 m	6.8 %	Dump Truck
			Sloped	30.0 m ²	1,331 m	1.1 %	Dump Truck
Sloped			W6.4*H5.0	948 m	3.6 %	T. Container	
HOKURIKU-SHINKANSEN	IIYAMA (2007)	22.2 km	Sloped	26.5 m ²	230 m	9.7 %	B. Conveyor
			Sloped	32.0 m ²	765 m	12.0 %	Dump Truck
			Sloped	27.0 m ²	270 m	12.0 %	Dump Truck
			Sloped	34.0 m ²	710 m	10.0 %	B. Conveyor
			Sloped	27.0 m ²	523 m	7.5 %	D.T+B.C

From the Literature Research of the Large Tunnel Cases in 2002~2008

■ from the Japanese Tunneling Experience

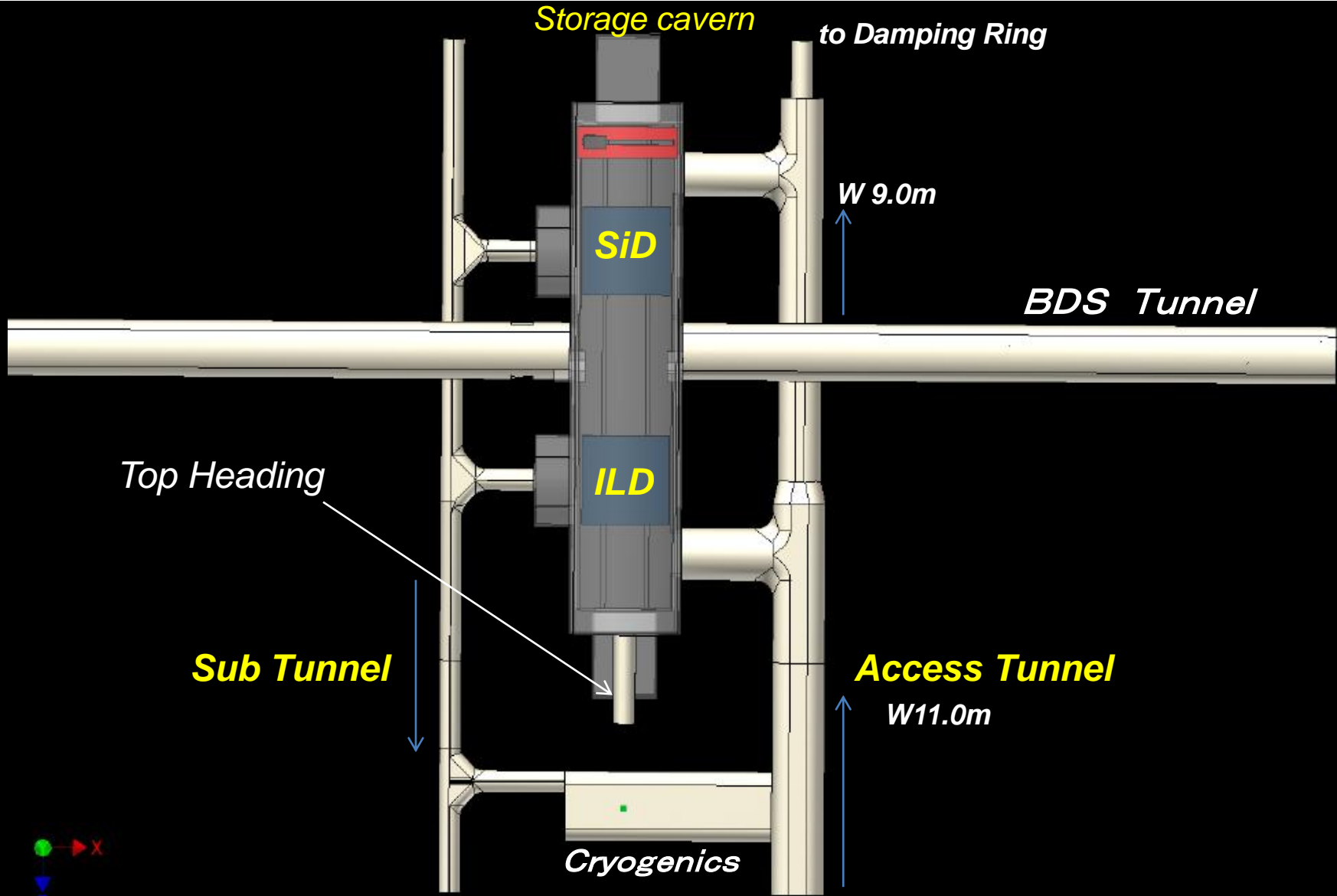
1. Background

- Upsizing ; the tunnel section (Expressway, Railway) , and the construction machine.
- **Tire Method** is in use for rapid construction
- Serious consideration of **Life safety**

2. Actual condition in recent years

- All access examples are **sloped tunnel** by NATM.
- Tunnel slope: Max. 12%

From the Literature Research in2002~2007 Completion



Top Heading Tunnel

Cryogenics Cavern

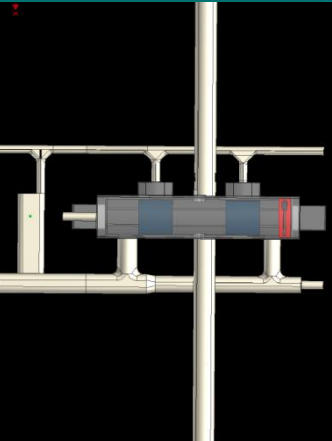
Access Tunnel

ILD

SiD

Sub Tunnel

Storage cavern





Access Tunnel

Top Heading Tunnel

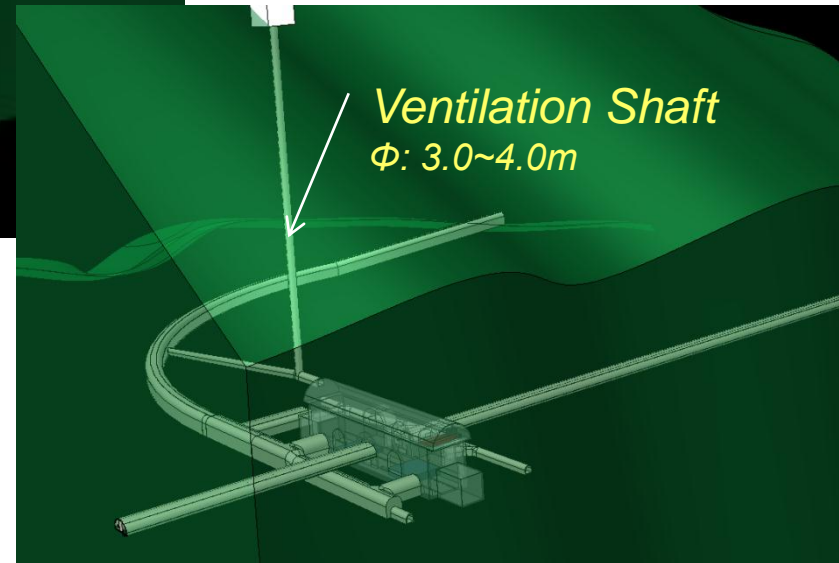
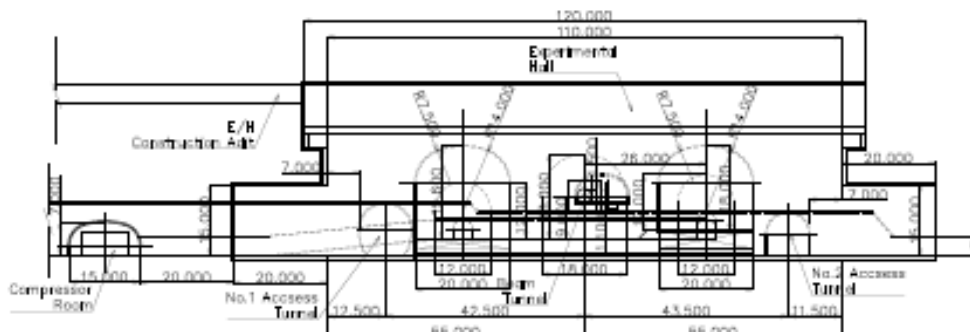
BDS Tunnel

To Damping Ring

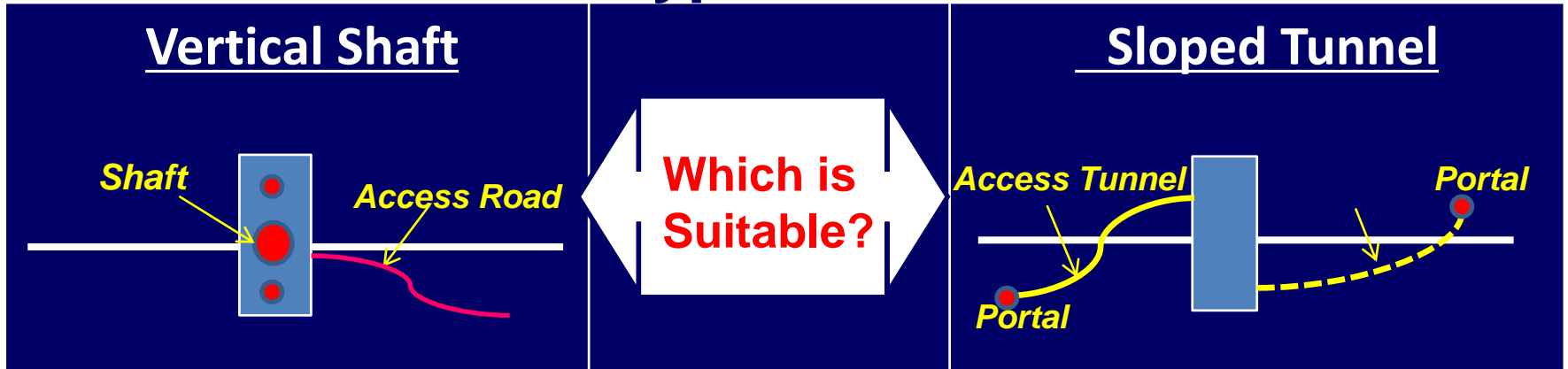
Scheme of Only Access Tunnel

Optional Scheme With Vertical Shaft

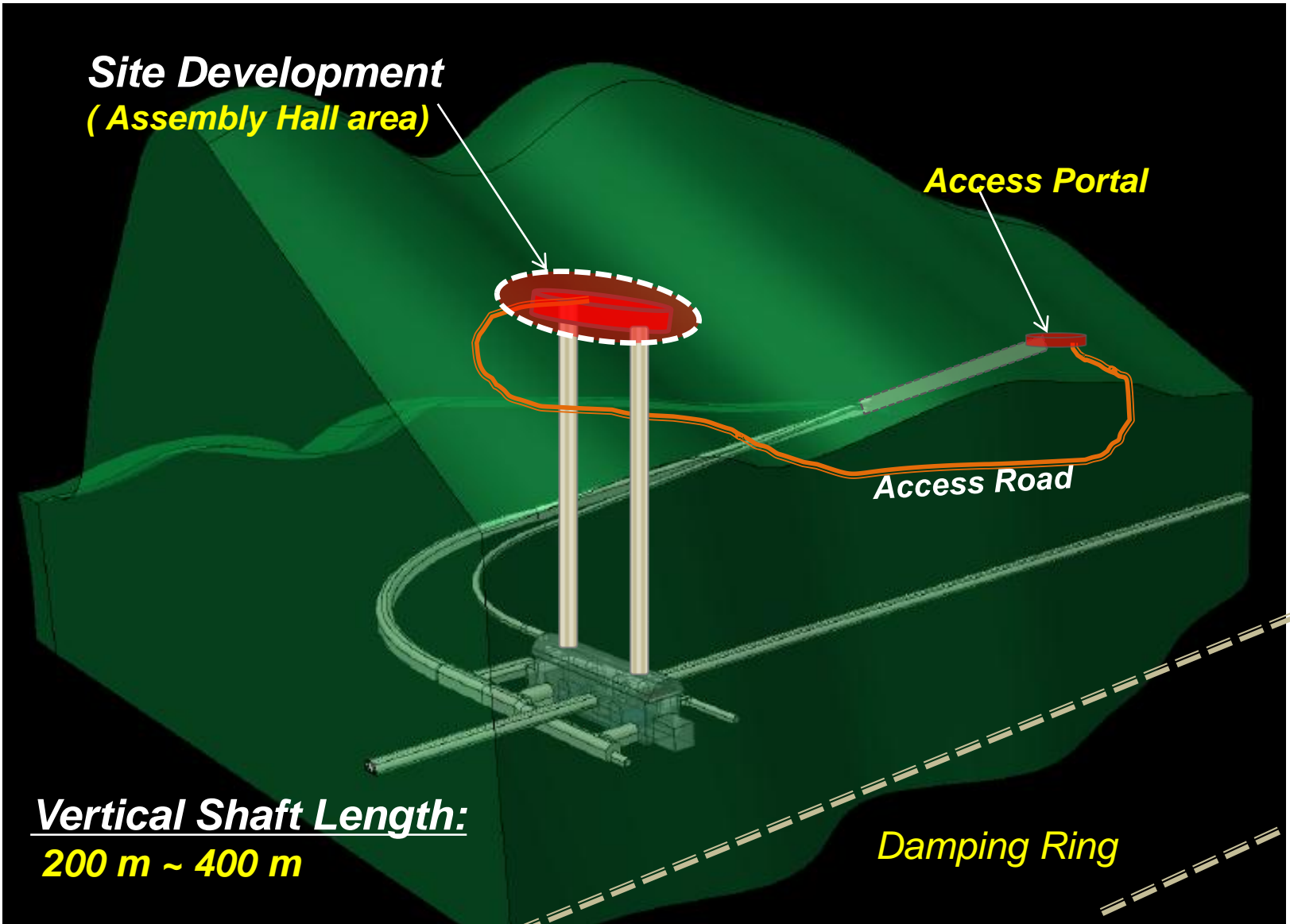
Ventilation Shaft
 $\Phi: 3.0\sim 4.0m$



■ Features: Two Typical Access Methods



Feature	Subject	Feature
By Crane Work	Installation	by a Special Trailer, or Other Transport-system
Considerably High	Environmental Impact	Relatively Low
by an Emergency Stairs	Life Safety (Refuge way)	by an Evacuation Vehicle
Comparatively Expensive	Construction Cost	Comparatively Cheap



Summary

Background on the Japanese Site

- Japanese site is on the stable Bed-Rock in Geology, and Surface is covered in the Natural Forest Zone.
- Earth Covering Depth in the Detector-hall area is considerably large.

Present Status (toward TDR)

- Access Method by a Sloped Tunnel is suitable for the Installation to the Detector-hall in Japanese Site.
- Determination Factor
 - Experimental Function
 - Cost Reduction
 - Safety System
 - Environmental Impact