

ILC CFS Planning in Asian Region

Speaker

Takashi Kato, Nikken Sekkei Ltd.,

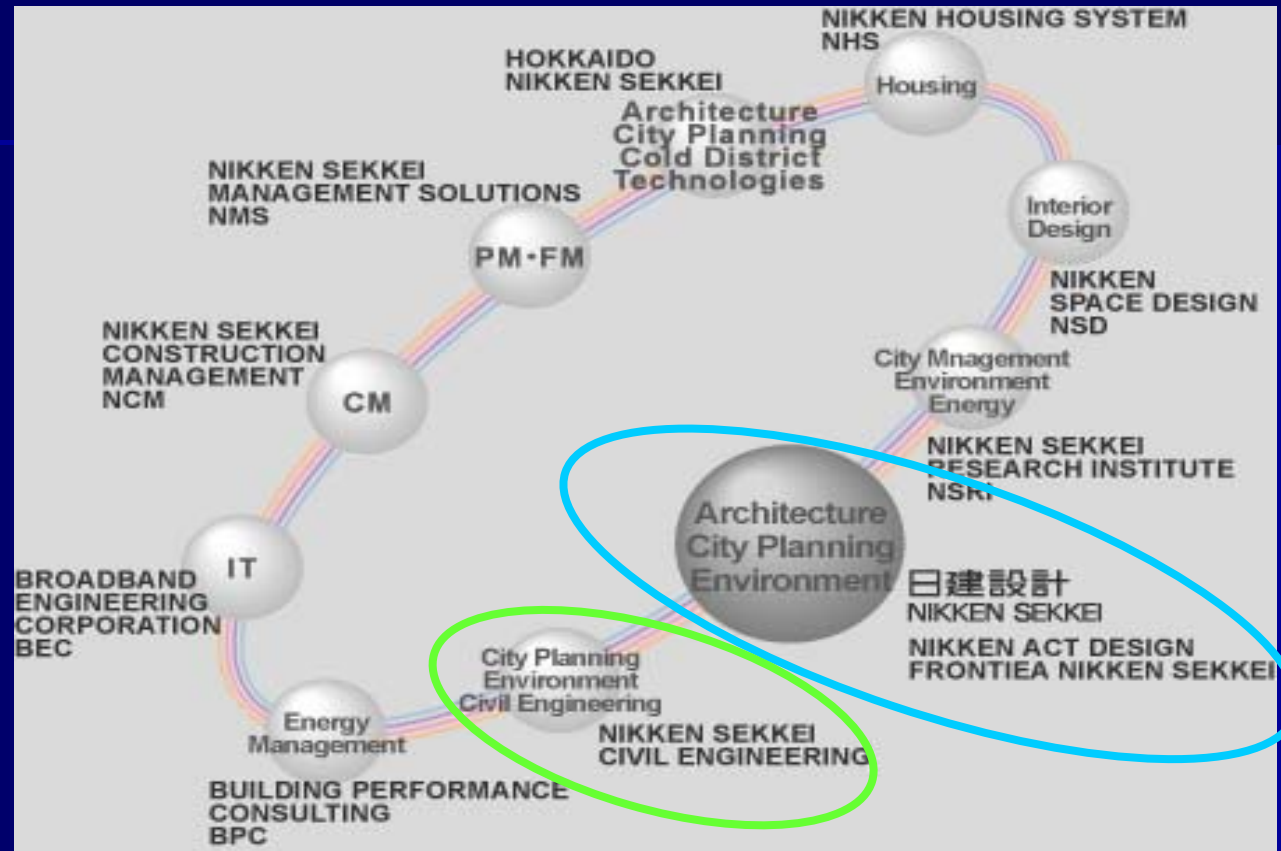
Akinori Tamura, Nikken Sekkei Civil Ltd.,

Hiroshi Fuse, Nikken Sekkei Ltd.,

Yoshimasa Matsuda, Nikken Sekkei Ltd.

2007.9.11

Nikken Sekkei Group



Nikken Sekkei is a comprehensive design firm with a group of experienced specialists providing a complete line of services including architectural design, engineering, urban planning, design and construction administration services, and other related services such survey, planning and general consultation.

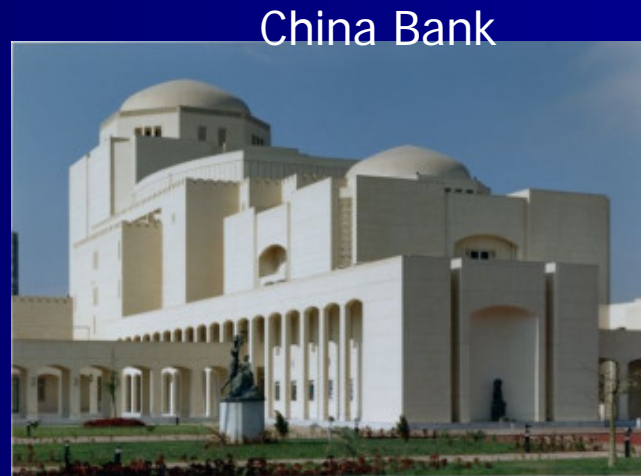
NIKKEN
WORKS
OVERSEAS



SHANGHAI



Isram Development Bank
Saudi Arabia



Cairo Opera House
Egypt



Information Center 3

NIKKEN
WORKS
DOMESTIC



Kyoto Geihinkan



Tokyo Midtown



Nihon Kagakumiraikan



New Tokyo Tower (Future)

NIKKEN WORKS ACCELERATOR RESEARCH LAB.



50GeV synchrotron



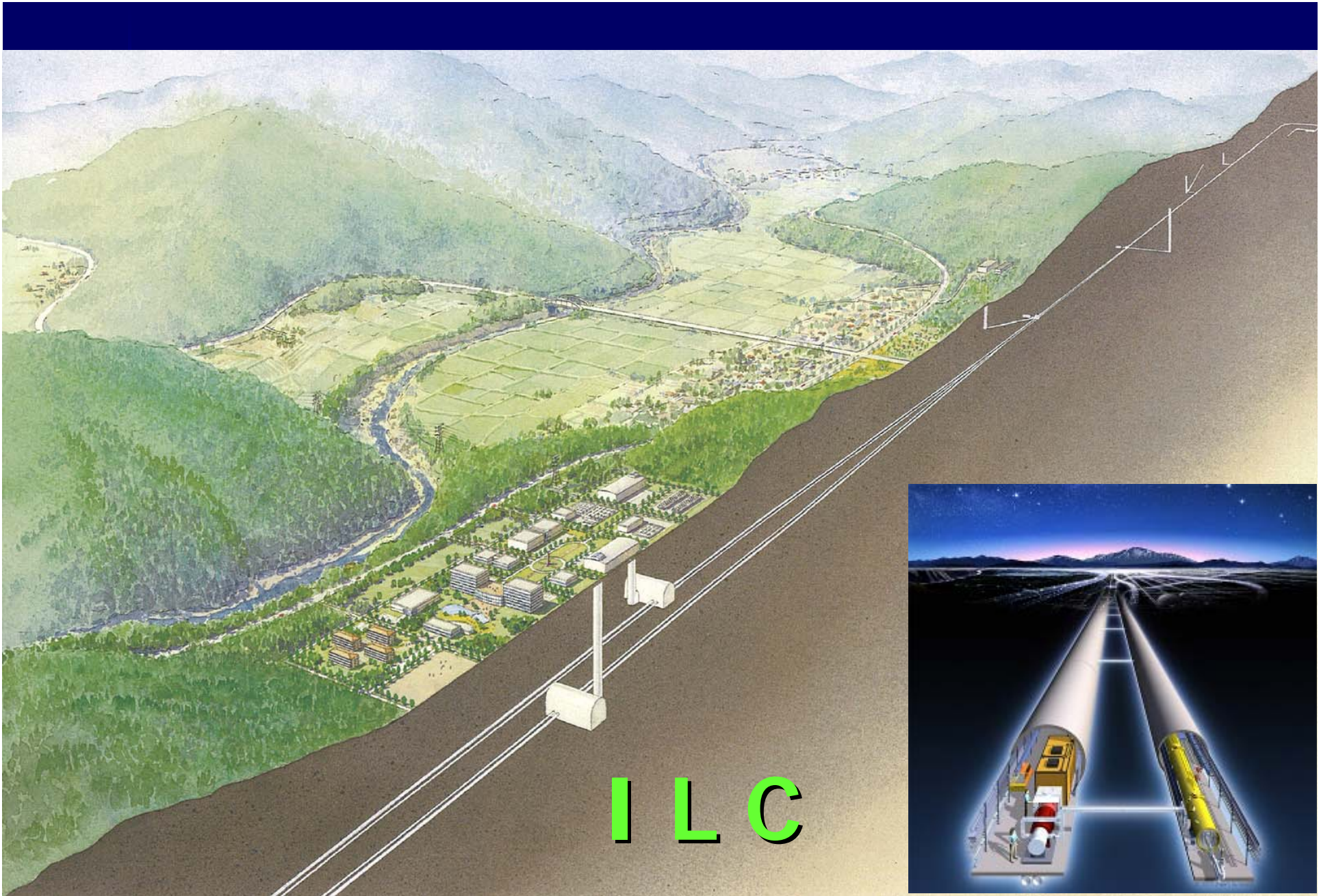
J-PARC

SPring8, X-FEL



GHMC





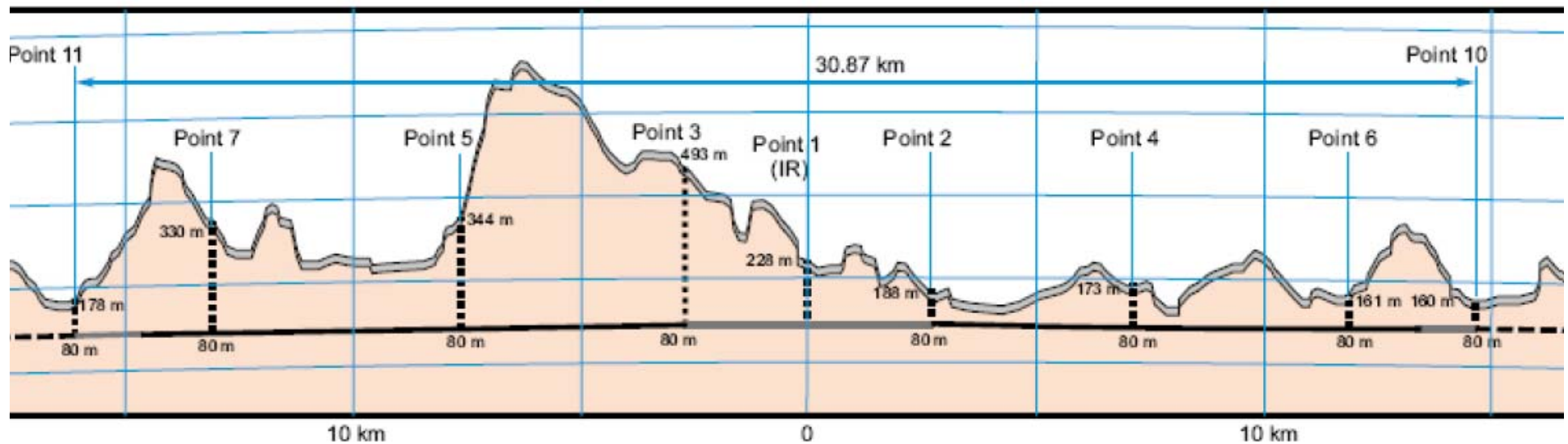
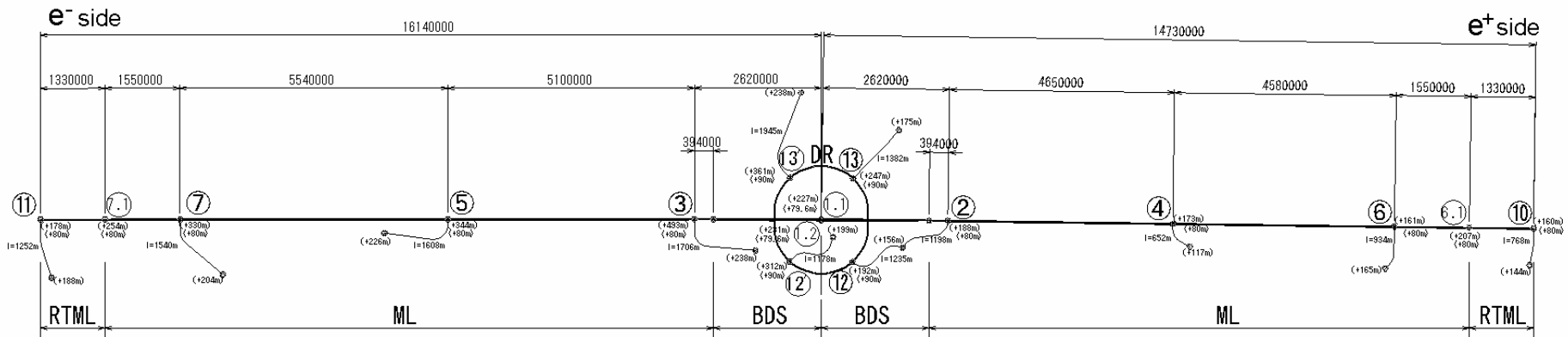
Main Consulting Services for ILC CFS in RDR

Today's Topics

- Overall planning of tunnel layout in sample site
- Study of Access Hall & Access Tunnel (Native to Asian site)
- Study of Smoke Exhausting System
- Schedule Estimation
- Cost Estimation

Layout of ILC Tunnel in Asian Region

The access to service tunnel and beam tunnel is provided by slope ramps except IR part.



Conditions of Access Tunnel

For the construction method, NATM by blasting excavation will be adopted all the distance from the ground surface to the access hall.

① Sectional dimensions

- During the construction, the size is large enough to carry in TBM for the main tunnel construction and apparatus/materials for experiments.
- After the start in operation, the passing space for the vehicles to transport apparatus/materials, maintenance cars and pedestrians, and the space to accommodate utility pipes will be secured.

② Longitudinal slope

- The slope will be 10% or less in accordance with the climbing ability of the construction vehicles during the access tunnel construction (NATM), limit of braking performance, capability to carry in TBM and machines/materials for experiments.

③ Minimum radius

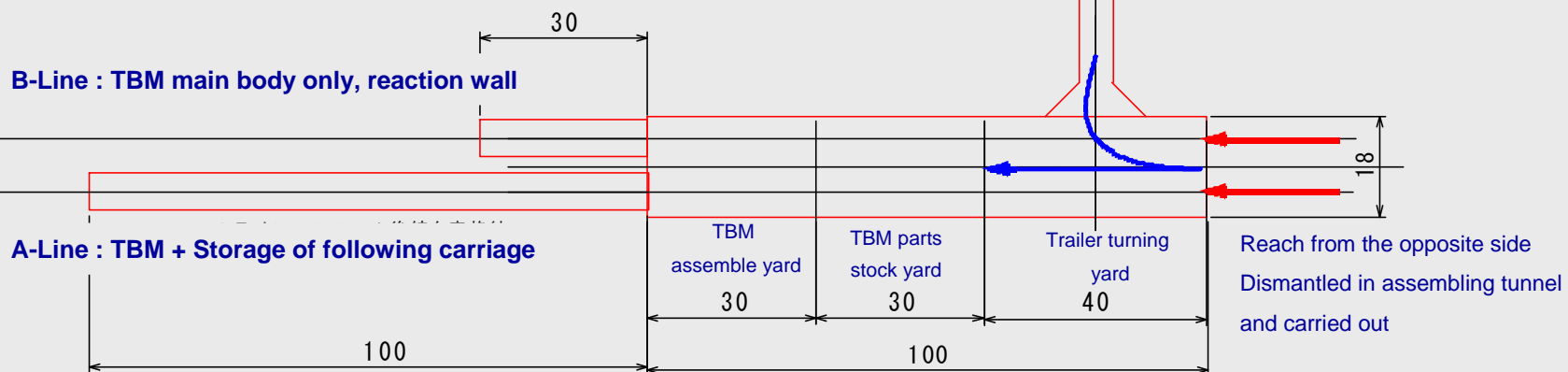
- It will be 300m based on the minimum radius of the TBM conveyor belt.

Study on Scale of Access Hall from Construction Viewpoint

Access tunnels will be constructed by NATM, and TBM for excavation of the beam tunnel, service tunnel will be assembled in the bottom yard.

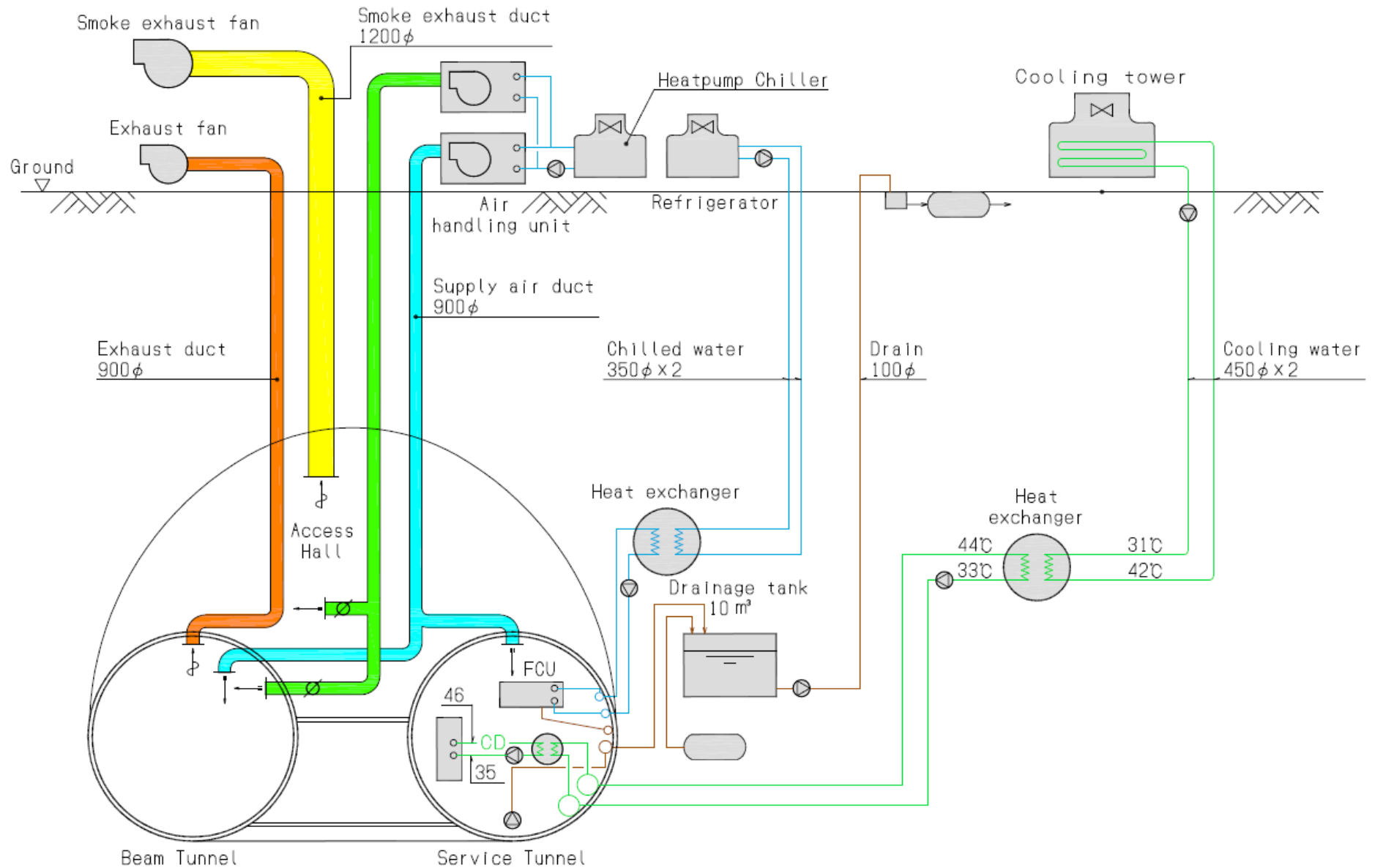
Storage tunnel (NATM)

Access tunnel (NATM)



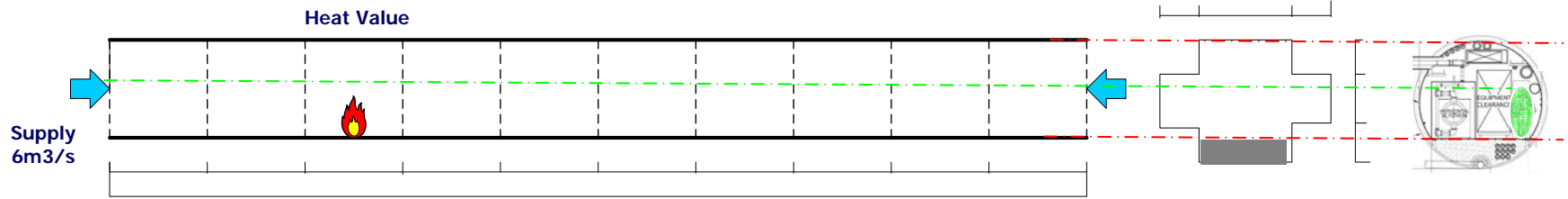
Assembling tunnel (NATM)

Air Treatment and Cooling Water

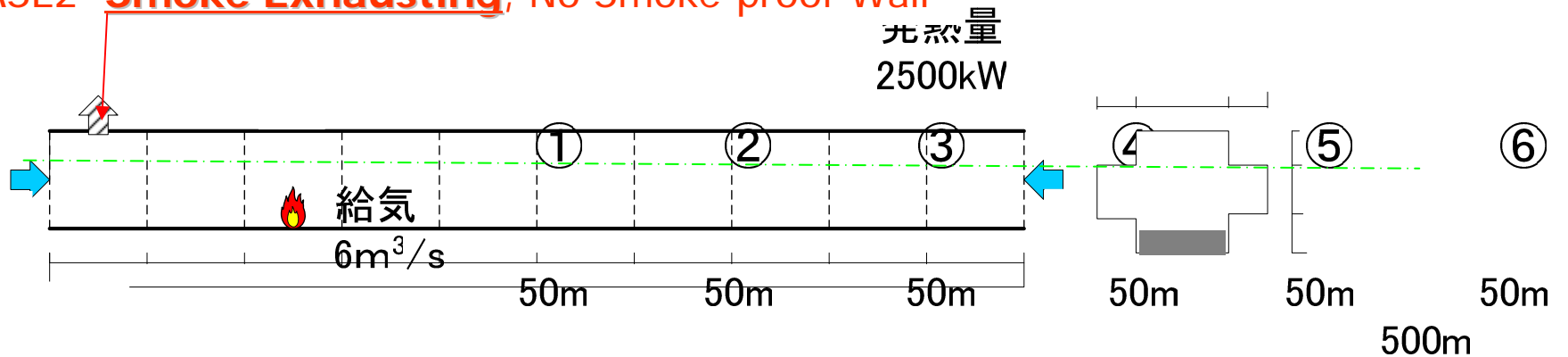


Study of Smoke Exhausting System of Service tunnel

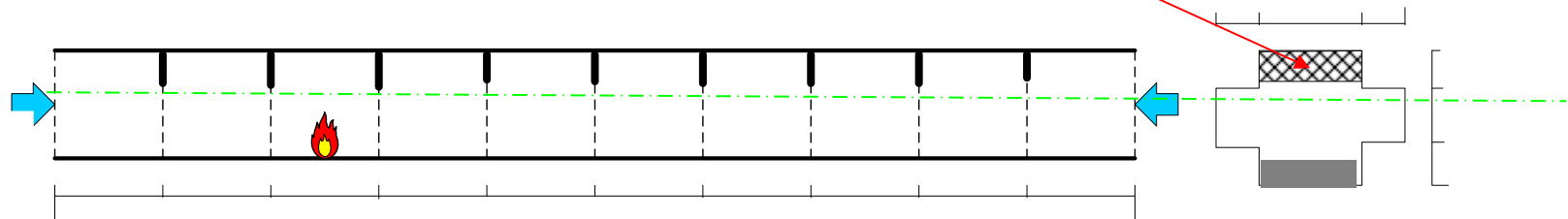
CASE1 No Smoke Exhausting, No Smoke-proof Wall



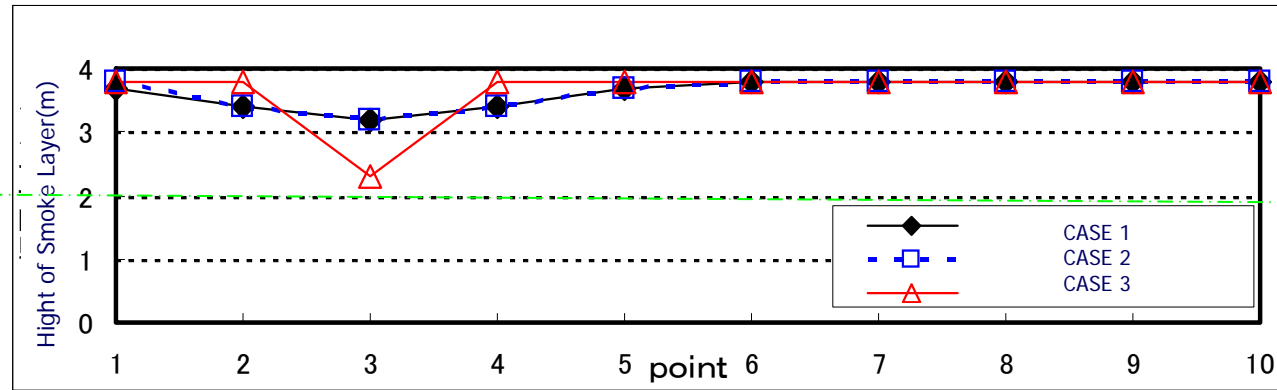
CASE2 Smoke Exhausting, No Smoke-proof Wall



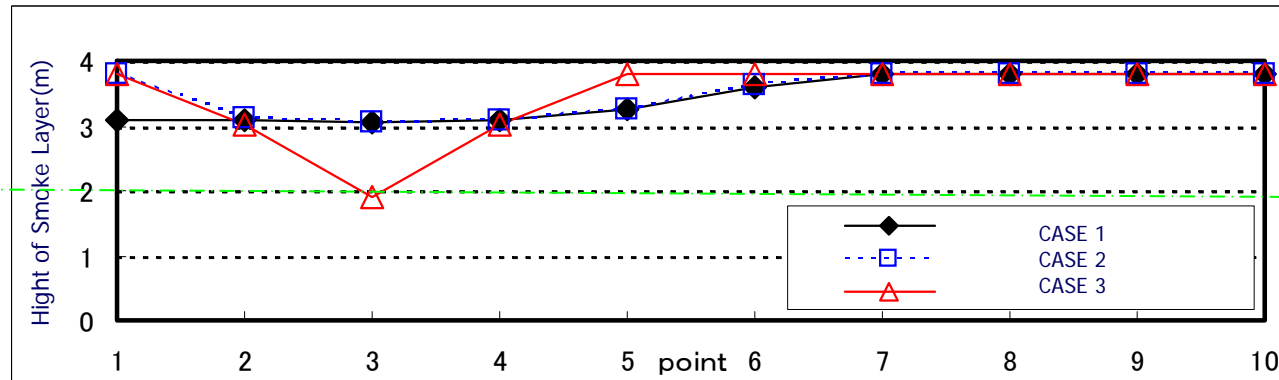
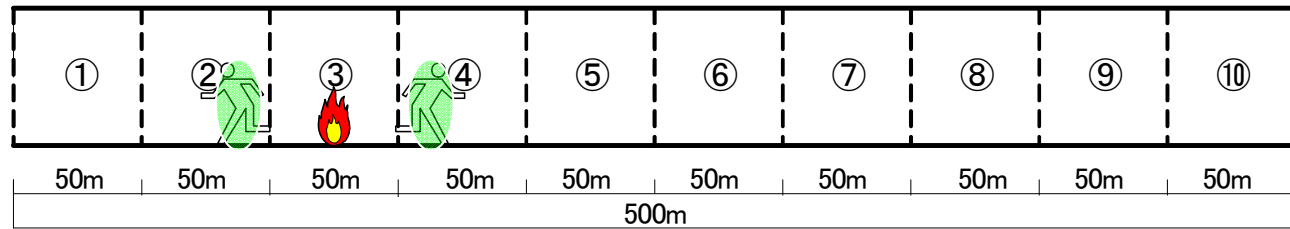
CASE3 No Smoke Exhausting, Smoke-proof Wall



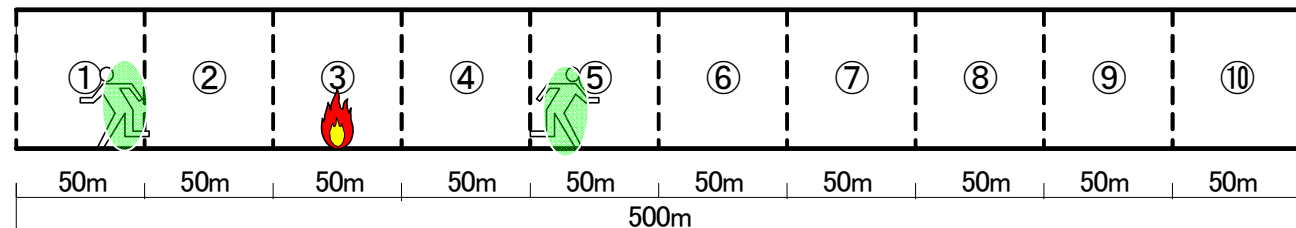
Simulation



80sec after fire outbreak
(50sec from start of refuge)

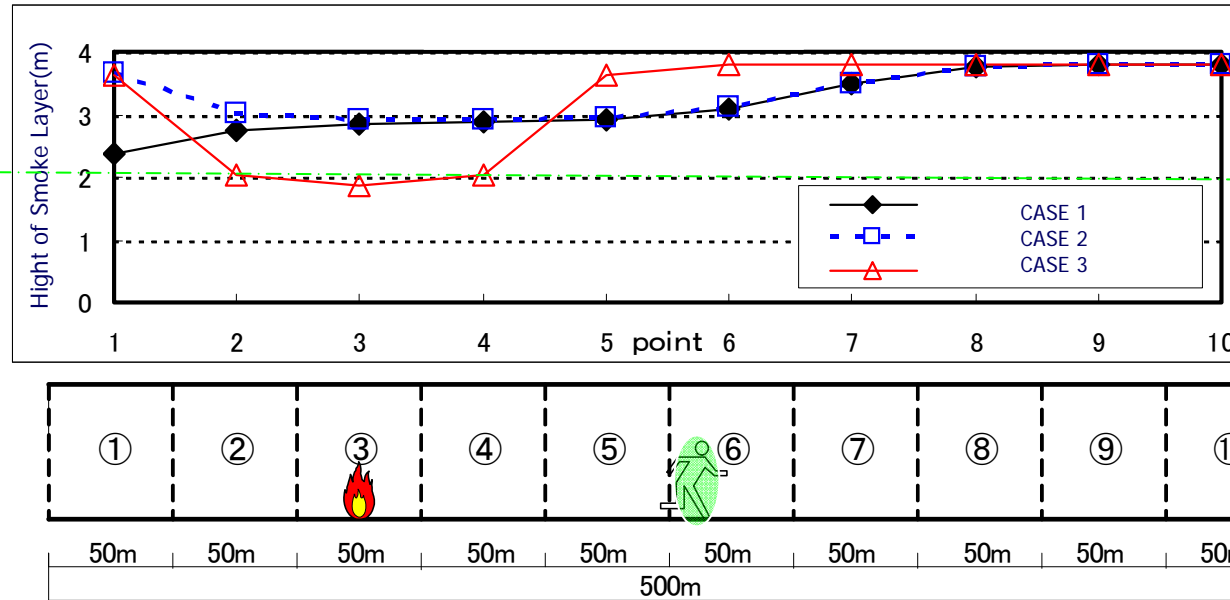


130sec after fire outbreak
(100sec from start of refuge)

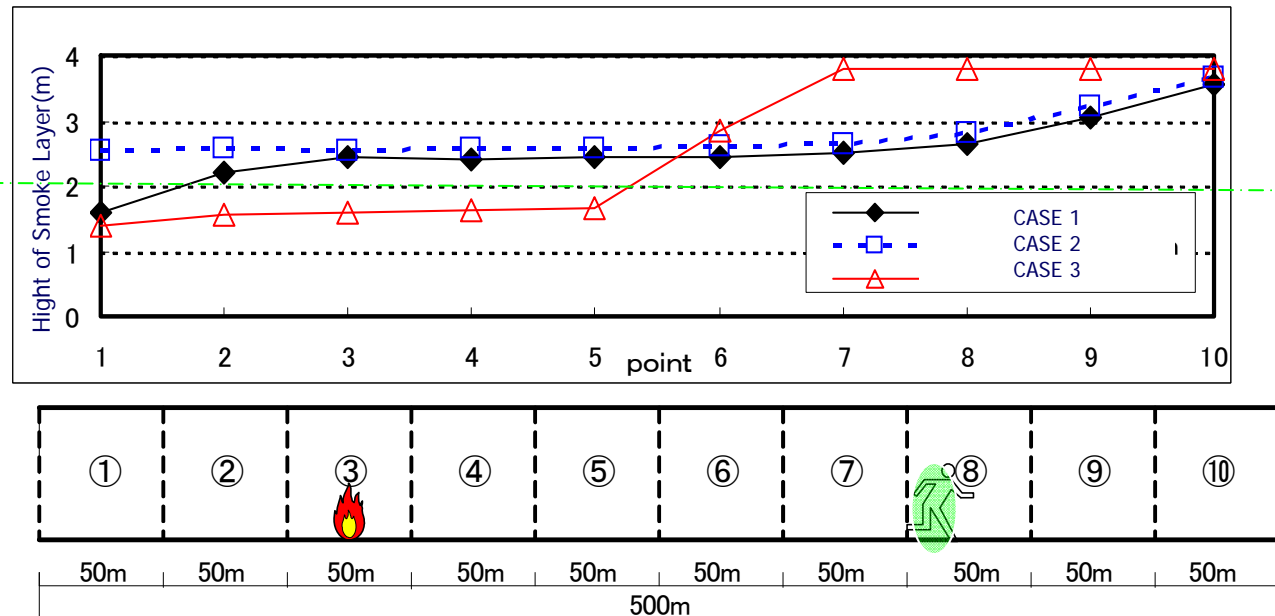


Simulation

180sec after fire outbreak
(150sec from start of refuge)

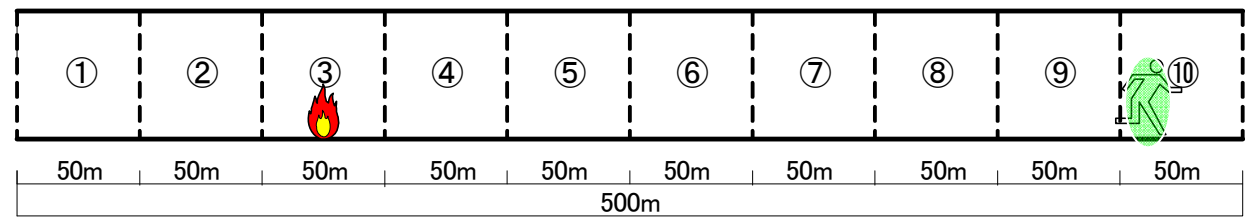
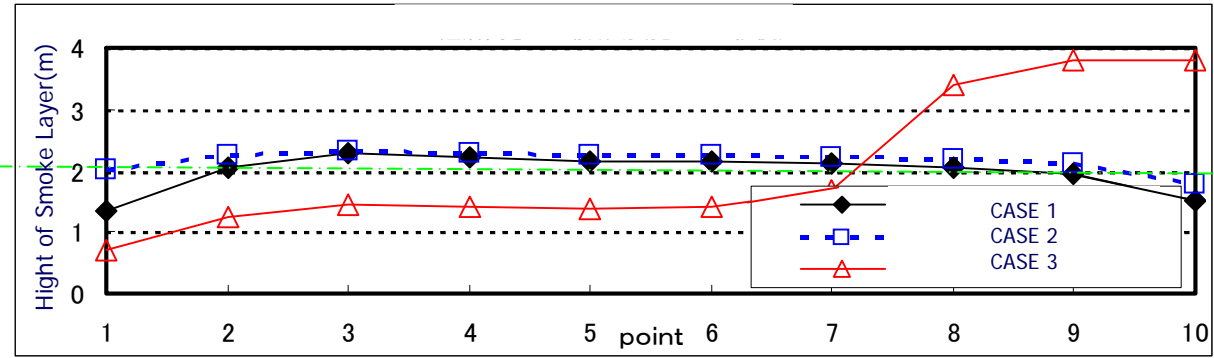


280sec after fire outbreak
(250sec from start of refuge)

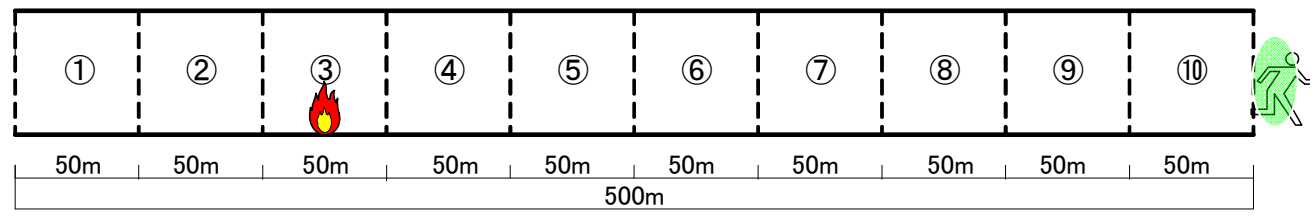
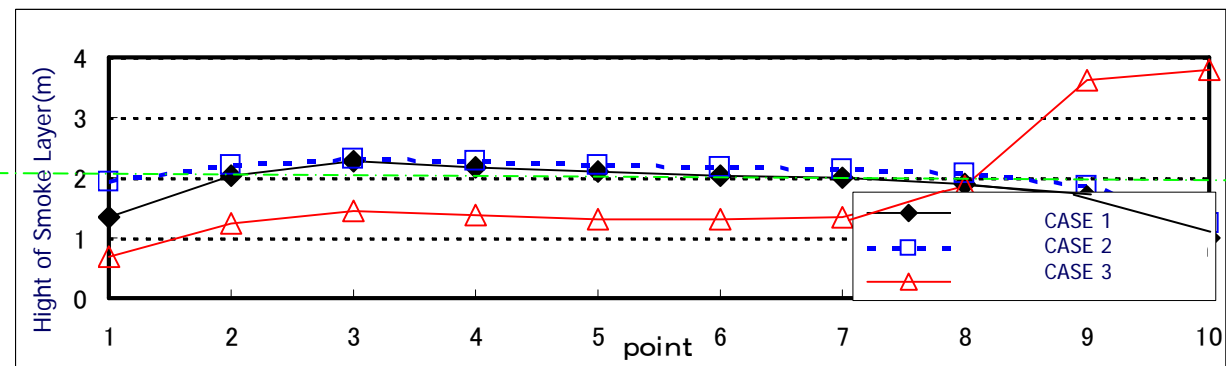


Simulation

380sec after fire outbreak
(350sec from start of refuge)



430sec after fire outbreak
(400sec from start of refuge)



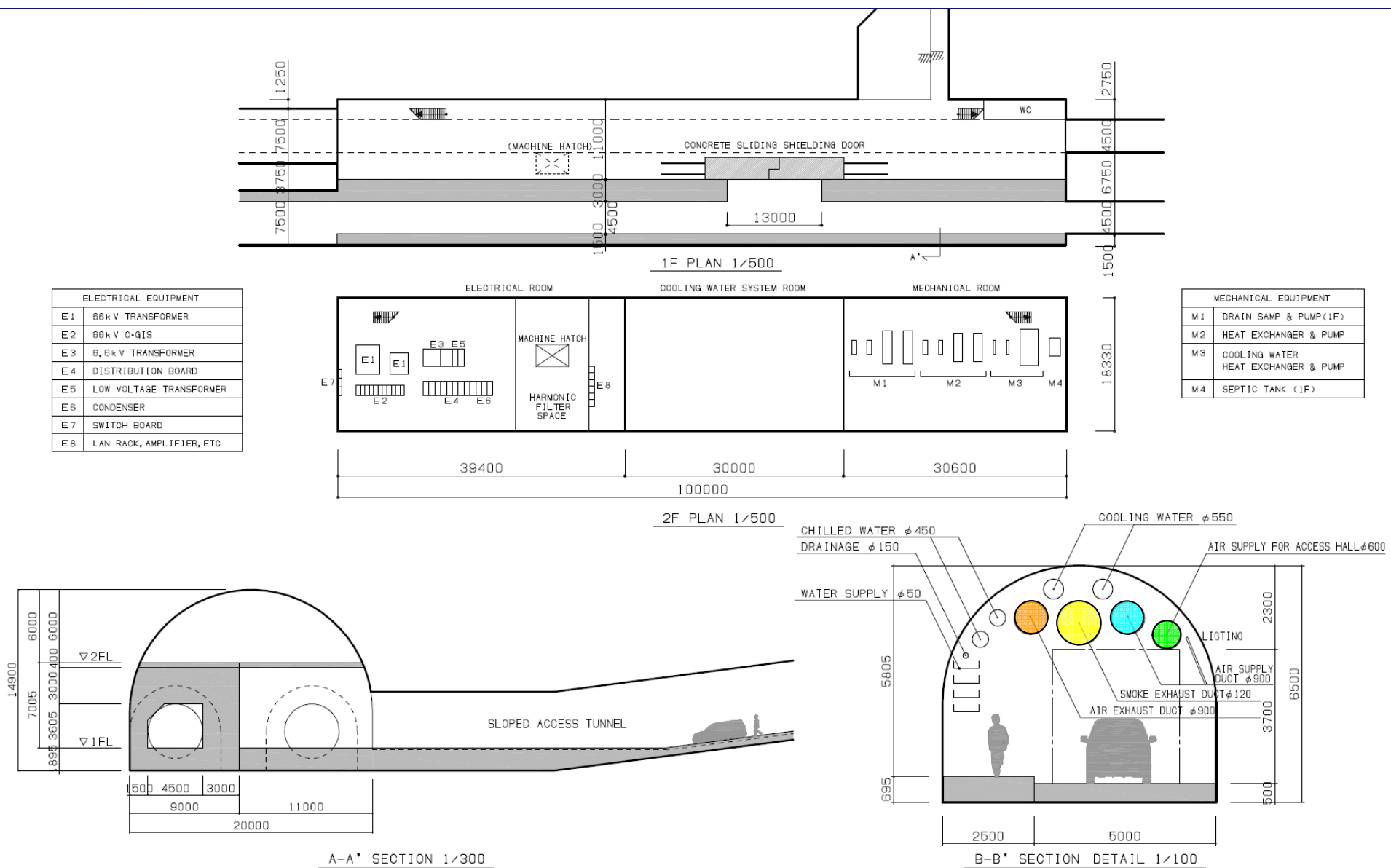


FIGURE 5.3-1. Detail of an access ramp for the Asian Sample Site.

Problems and Prospects of CFS in Asian site for EDR

- Picking out the site-specific problems in each stage from the site acquisition to the machine operation
- Making plans of site investigation for working out the solutions of site-specific problems in each stage

Site-specific Problems

- Geological features
 - Temperature
 - Temporary Excavated muck storage, Muck disposal
 - Infrastructure (Water, Electric Power, ...)
-
- Preparation of law
 - Reduction of cost
 - General contractors in Japan have high abilities and many achievements concerning with constructing long tunnels and big caverns in solid hard rock bed.

Thank you very much for your attention