

# **KAGRA tunnel**

**KAGRA tunnel sub-group  
2012/02/03**

- Definition of the tusk of Tunnel sub-group.
- Design tunnels for the LCGT experiment rooms placed under the Mt. Ikenoyama.
  - It includes access tunnels from the outside.
- Gather requirements from other subgroups and design experiment room in the tunnel.
- Share information about the tunnel design with all sub-groups.

- What's happened from the last f2f meeting.
- We revised the tunnel design again. (Main topic of the last meeting.)
  - Low cost, fit to iLCGT plan and more convenience.
  - 3km arm length was kept.
  - Two layer experiment rooms for the test mass suspension were kept.
- Main topic of this meeting.
  - The bid announce was planned in the last April originally.
  - Unfortunately, it was postponed due to the earthquake at 3/11.
  - As a result, the bid was taken in December 2011.
  - The company for tunnel excavation was decided to Kajima corporation.
  - Although the arm tunnels were planned to be excavated by the TBM method, the current Kajima's plan is using the NATM method.
  - We need to know detail of Kajima's plan.
  - Anyhow, the tunnel excavation will complete till the end of March 2014.
- Minor changes of the design.
  - The sloop tunnels to the 2nd floor connects to the front room for cleanness.
    - The parking areas were the connection point in the old design.
- Iwasaki-san made a 3D model of the current tunnel design.





## Location of Center (BS)

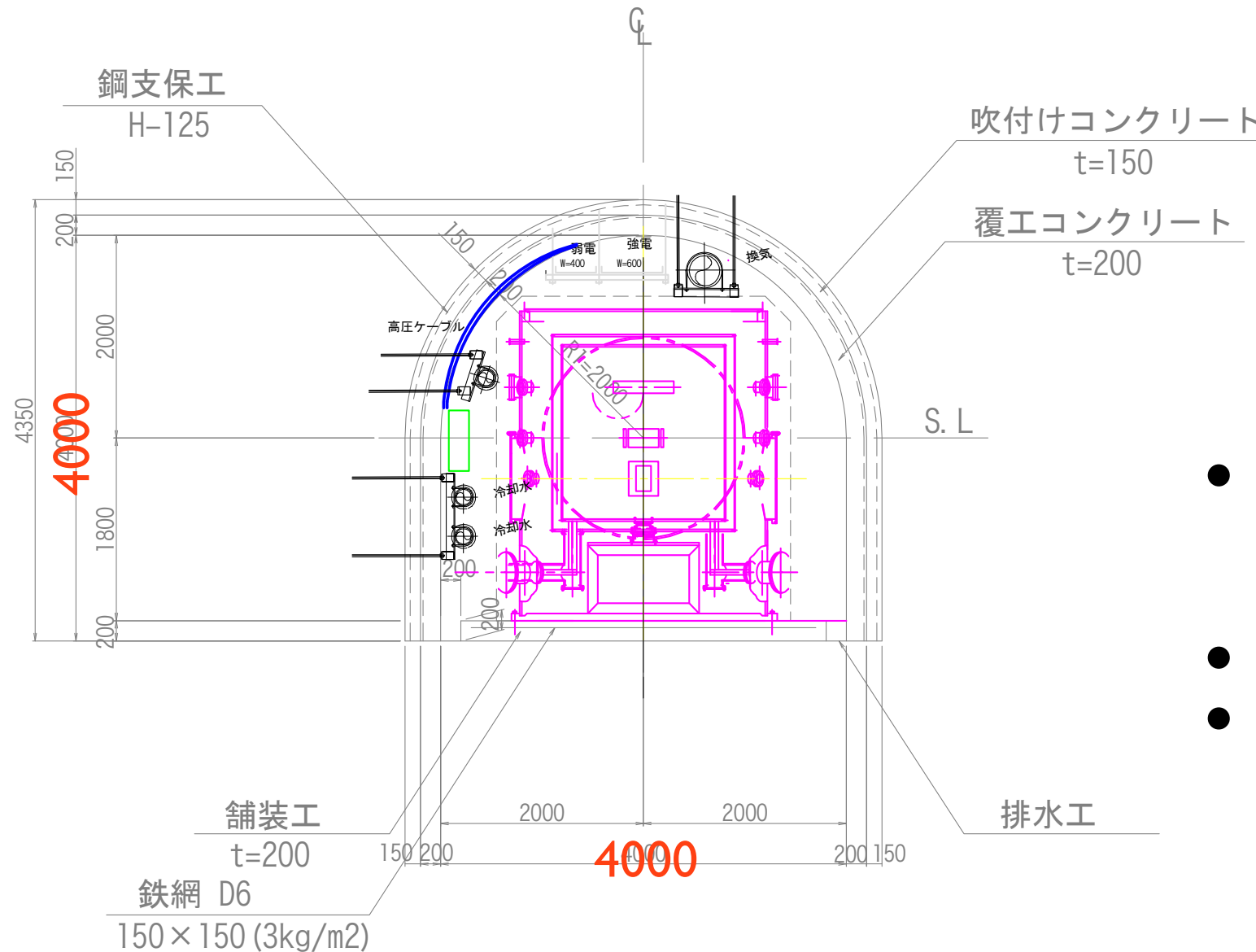
- latitude:  $36.42^{\circ}\text{N}$ , longitude:  $137.30^{\circ}$ .
- X arm direction:  $300^{\circ}$ , Y arm direction:  $30^{\circ}$ .
- Height from the sea level : about 372m.

- 2 entrances for the experiment room.
- Center, Xend, Yend are inside more than 200m from the surface of the mountain.
- Tunnel floor is tilted by 1/300 for natural water drainage.
- Height of the Xend: 382.095m.
- Height of the Yend: 362.928m.





# Standard cross-sectional figures of the tunnels made by the NATM method



- Access tunnels
- New Atotsu
- Mozumi
- X arm & Y arm.
- Sloop tunnel for the 2nd floor.

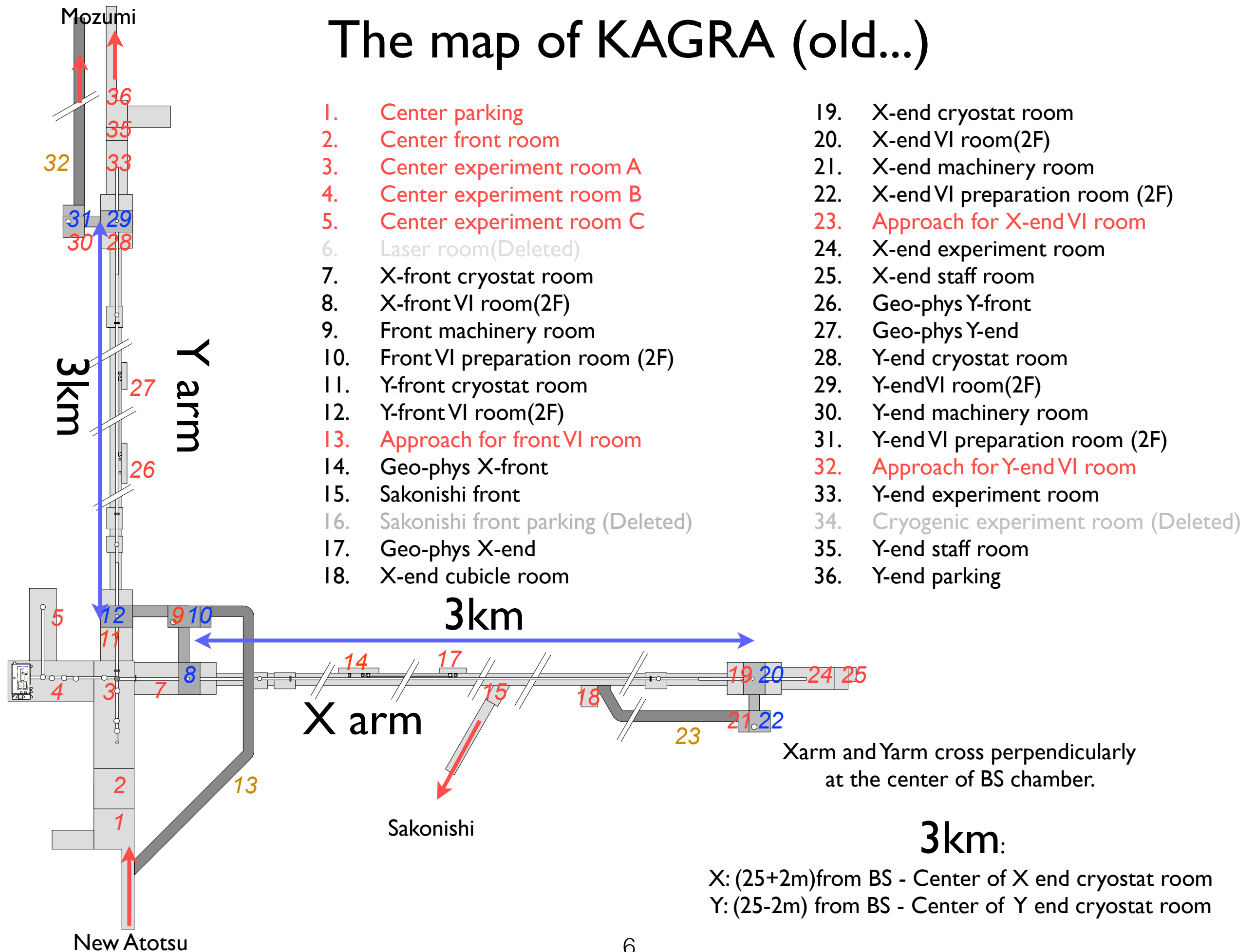
## 1.4 (つづき) 全体工事 概要

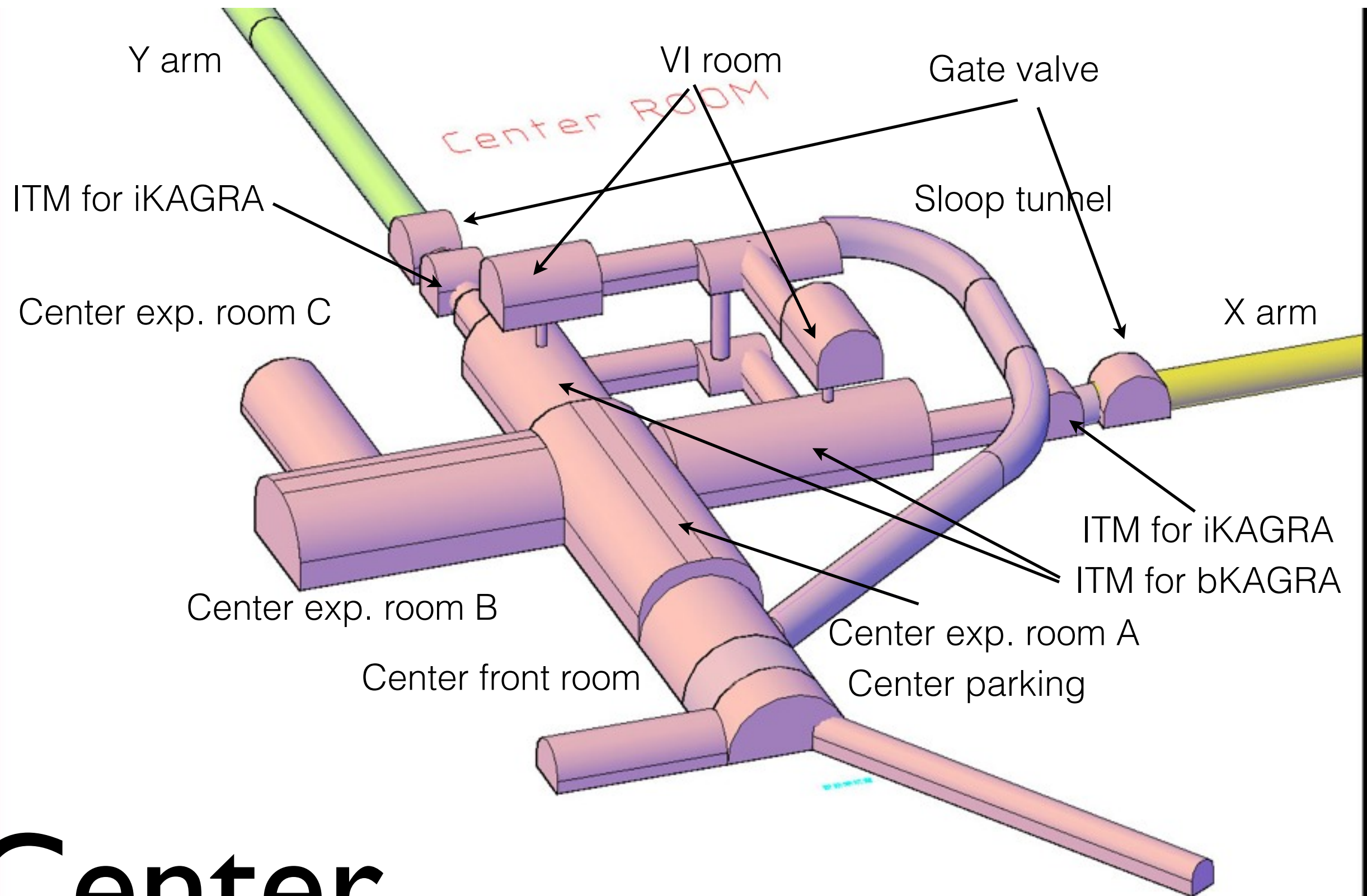
なお、掘削工法等によりトンネル形状を変更できるものとするが、以下に示す基本規格を満足させるものとする。

### 【アームトンネルの基本規格】

- ・ TBM工法による場合は、掘削径  $\phi$  4.5m以上、内径  $\phi$  4.3m以上
- ・ NATM工法による場合は、内空幅 4.0m以上、内空高さ 3.8m以上(床コンクリート厚さを除く)

# The map of KAGRA (old...)

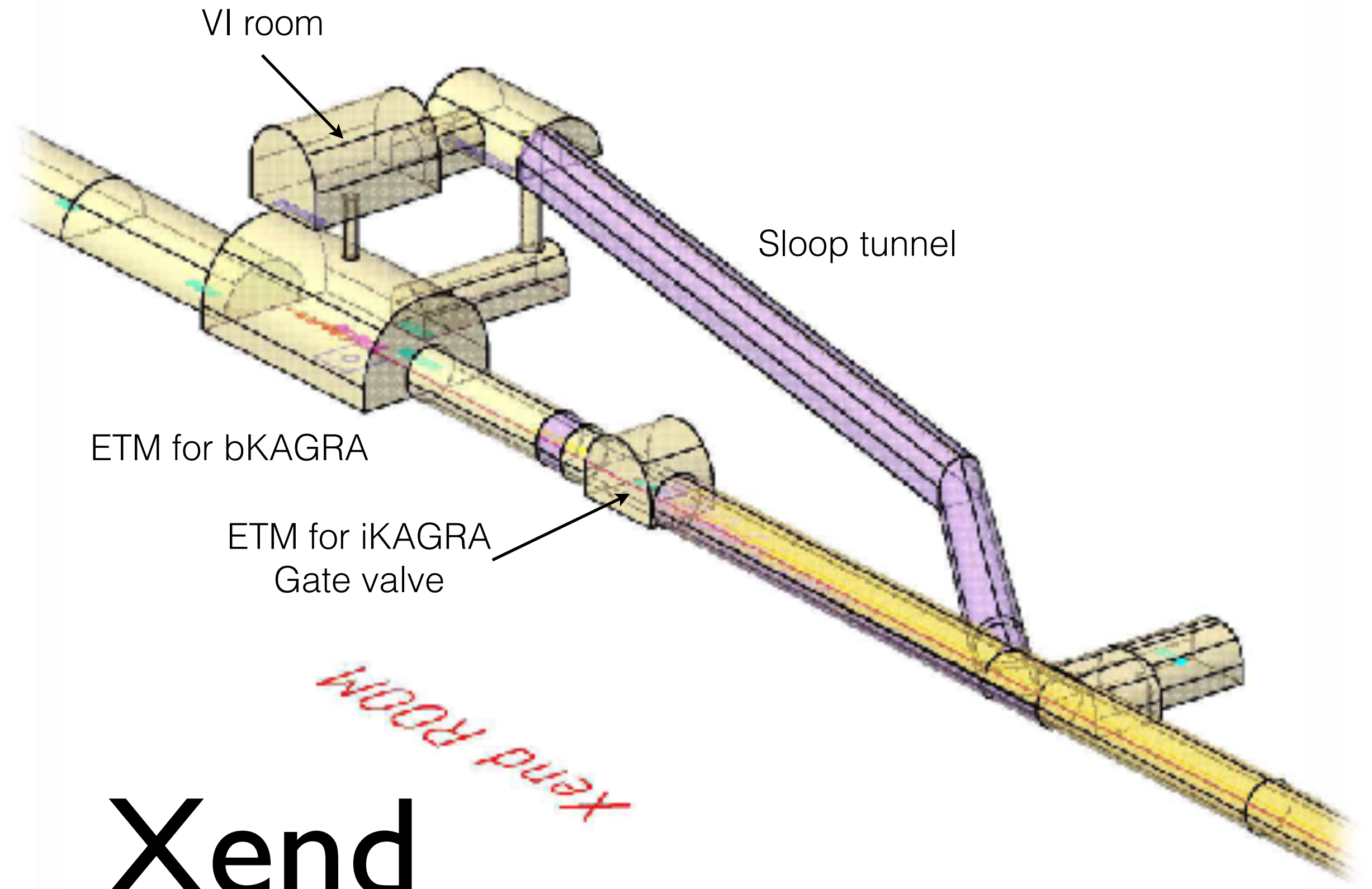




# Center

by Iwasaki.

New Atotsu



# Xend

by Iwasaki.



