

A Floor Deformation of SACLA Building

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Generally, it is known that SPring-8 site is located on the very good ground, which is very stable and rigid bedrock. In contrast, the area of SACLA building is not rigid enough. Figure 1(a) shows schematic cross-section view of understructure of SACLA building and geological layers. The figure shows that the bedrock area (cutting area) is only 1/5 of the building and 4/5 of the building is located on the overlapping area. The maximum thickness of embankment is over 50 m.

The SACLA building consists of a light source building and an accelerator building. The light source building, where undulator section is installed, requires to being stable especially. For this building, a direct foundation on the bedrock and an artificial layer replaced with crusher stone were adopted for this building. The maximum thickness of that is 18 m. A civil engineering designer anticipated that its subsidence is less than 2 mm/10 years. On the other hand, for the accelerator building, pillar foundation was adopted. Total number of the pillar is 136, their diameters are 1.5 m, and maximum of their length is 52 m. The designer anticipated that its subsidence is 15 mm/ 10 years at 52 m pillar.

The building was completed at March 2009. From construction phase of the building, the deformation of the floor is being measured. Figure 1(b) shows history of floor subsidence from August 2008. Recent maximum subsidence is 1 mm/year. This value is within the prediction. The shape of the subsidence data is very similar to that of embankment. Then subsidence is proportional to the thickness of embankment, not to the length of pillar.

We will present the data of vertical and horizontal deformation of the floor and show a relationship between the deformation and the structure of SACLA building.

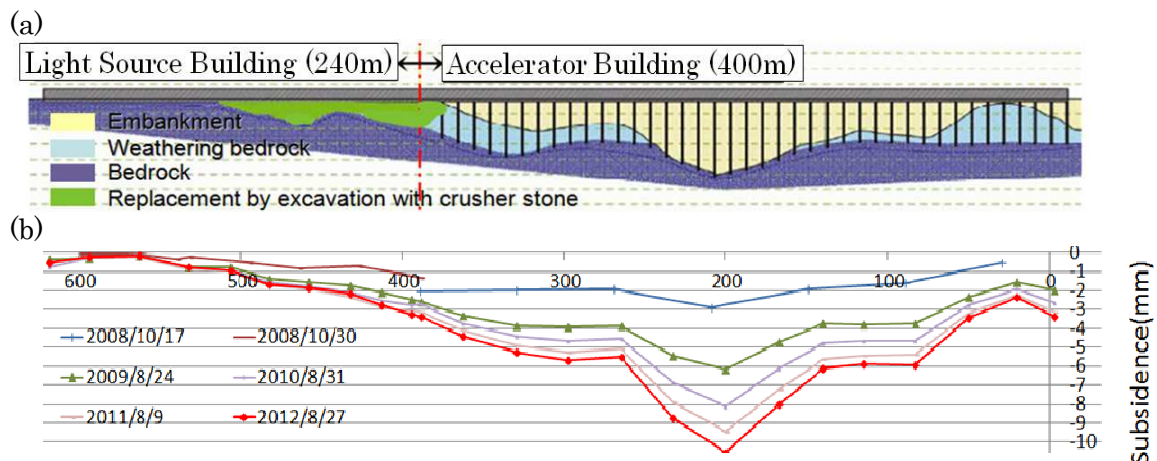


Figure 1: (a) Schematic view of understructure of SACLA building and geological layers.

(b) History of subsidence of the floor from August 2008.