

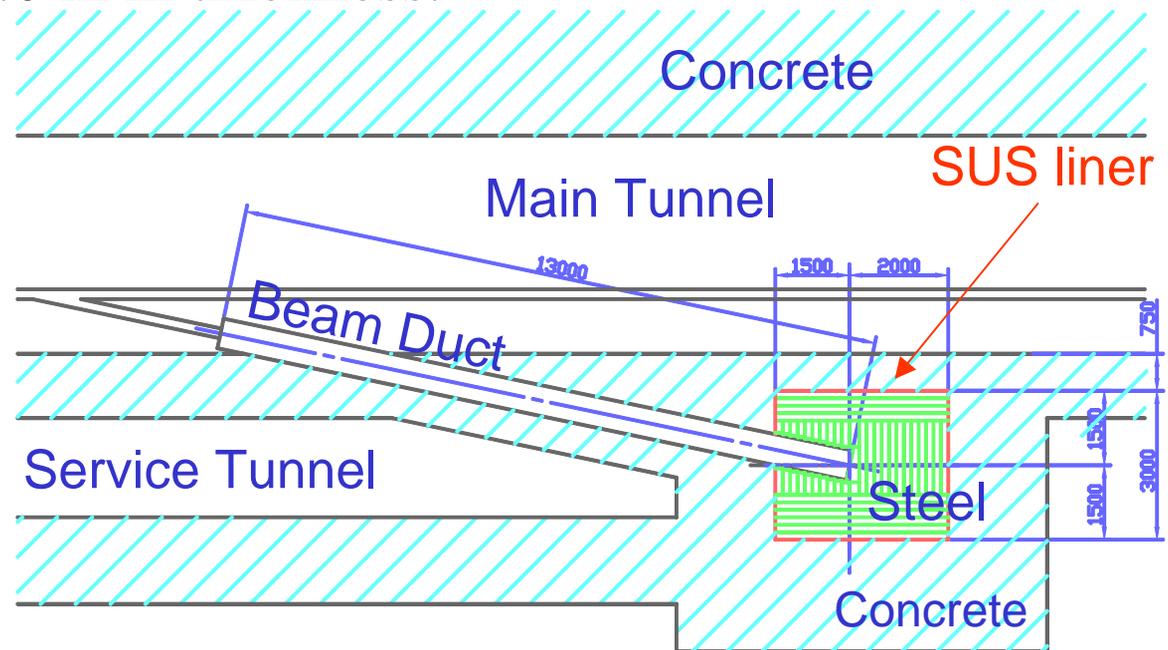
3 GeV Extraction Beam Dump

Y. Kasugai and H. Kogawa

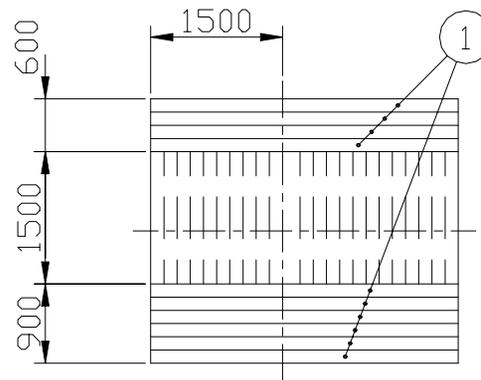
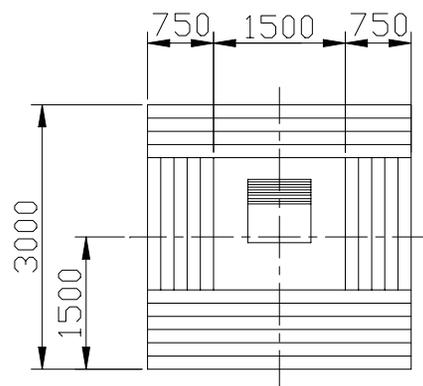
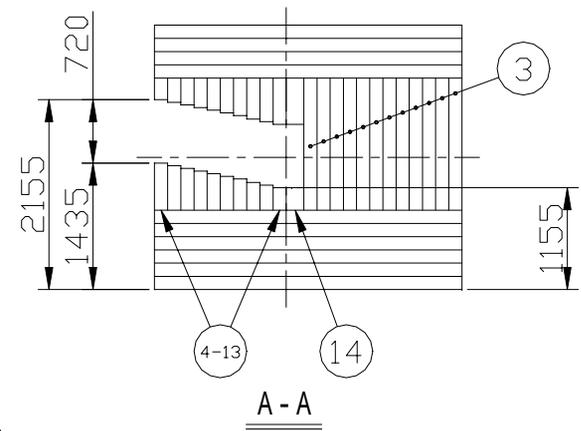
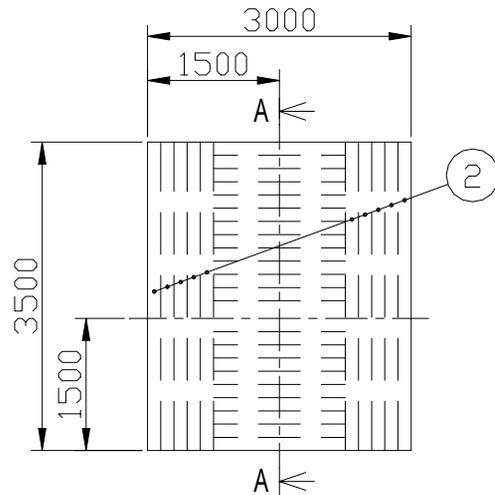
JAERI

Specification

- Maintenance free and passive cooling
- Maximum proton beam power: 4 kW
- Configuration
 - Steel: 3.5 m × 3.0 m × 3.0 m, type 304-SS liner.
 - Concrete: 2.0 m in thickness.
 - Beam duct



Configuration of Steel

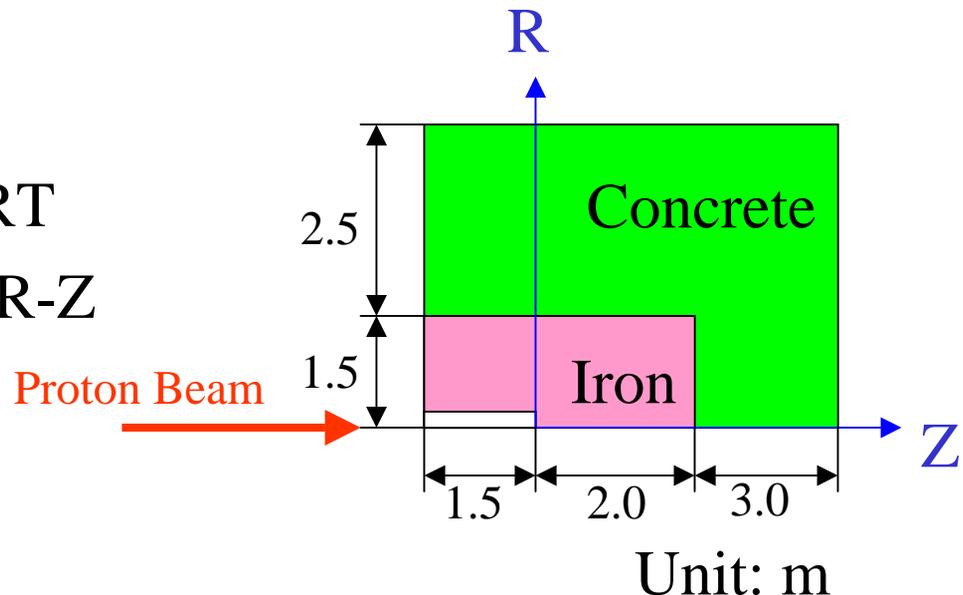


Radiation Dose

- Technical requirement
 - Radiation dose limit at boundary of concrete and soil is set to be less than 11 mSv/hr.
 - Safety margin of factor 2 should be considered for calculation.
 - That means less than 5 mSv/hr is required for shielding calculation.

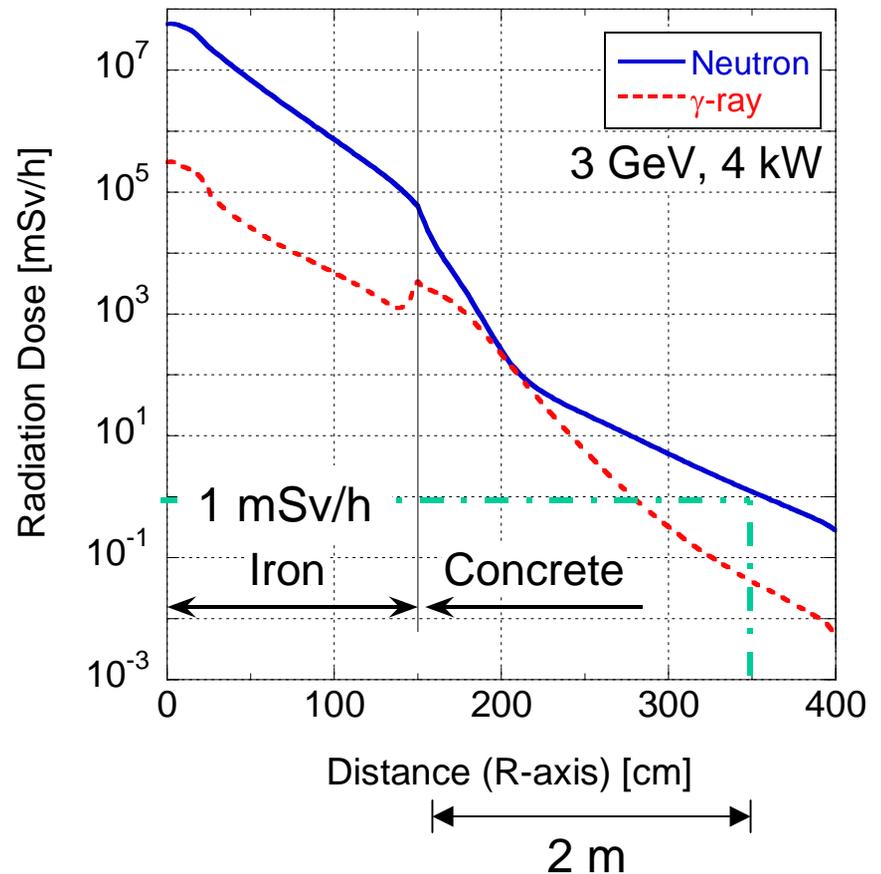
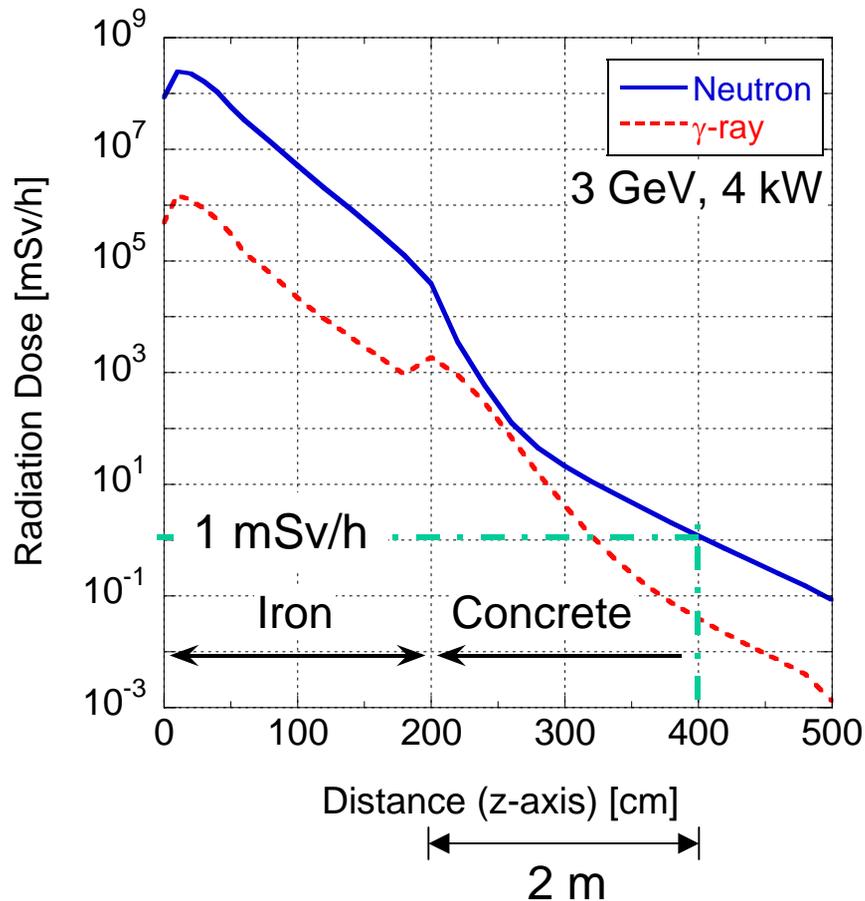
- Calculation

- NMTC/JAM + DORT
- Calculation Model: R-Z



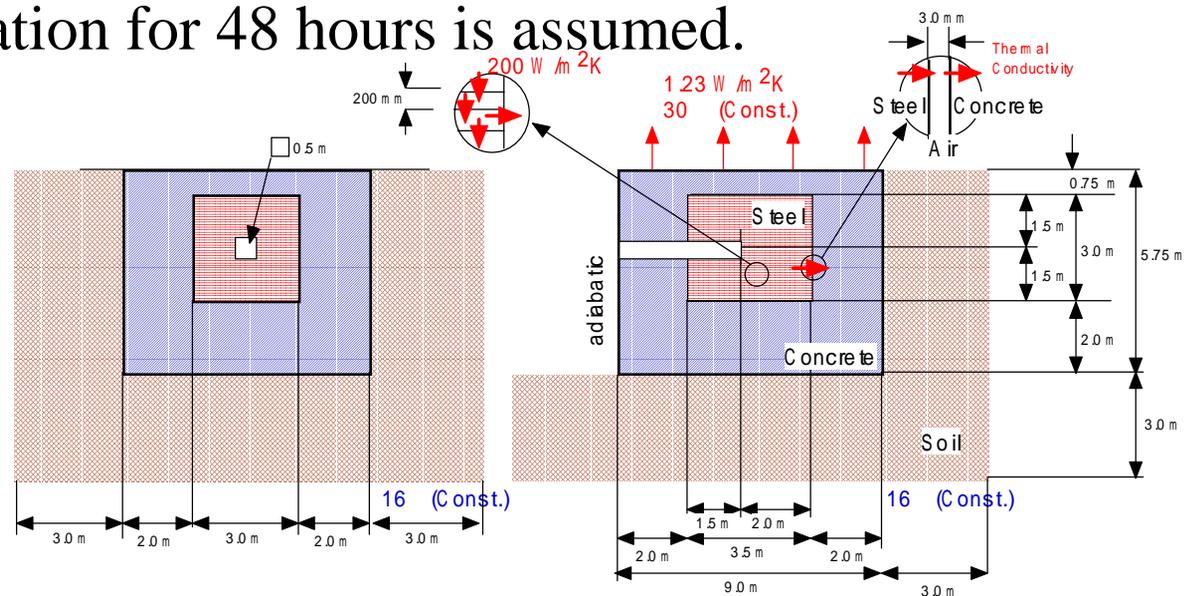
Radiation Dose

- Calculation results
 - Concrete with 2 m thickness is sufficient.



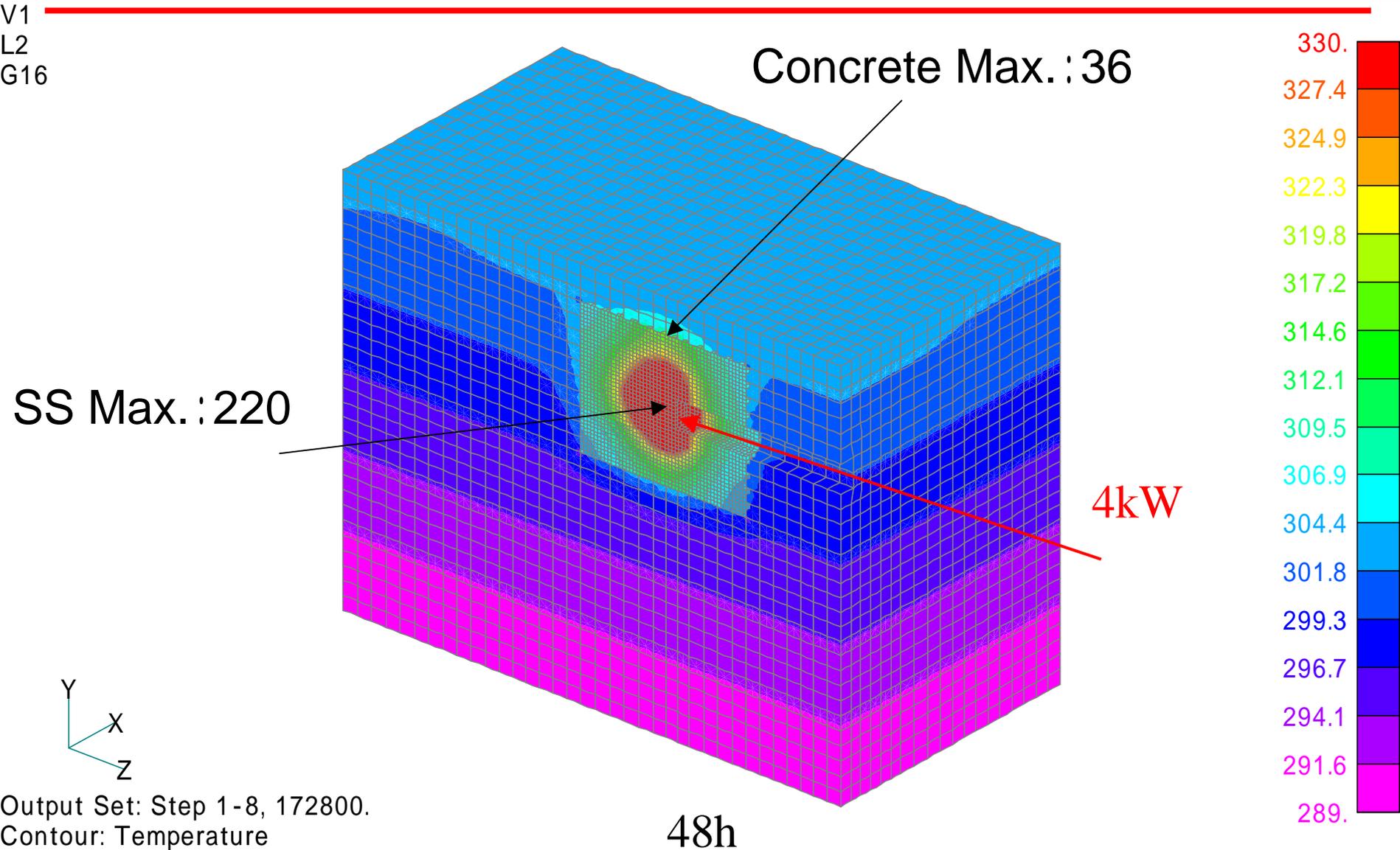
Thermal Distribution

- Technical requirement
 - Temperature of concrete should be kept less than 60°C in order to keep the structural strength.
- Calculation
 - Heat deposition: NMTC/JAM
 - Thermal conduction: ABAQUS
 - Continuous operation for 48 hours is assumed.



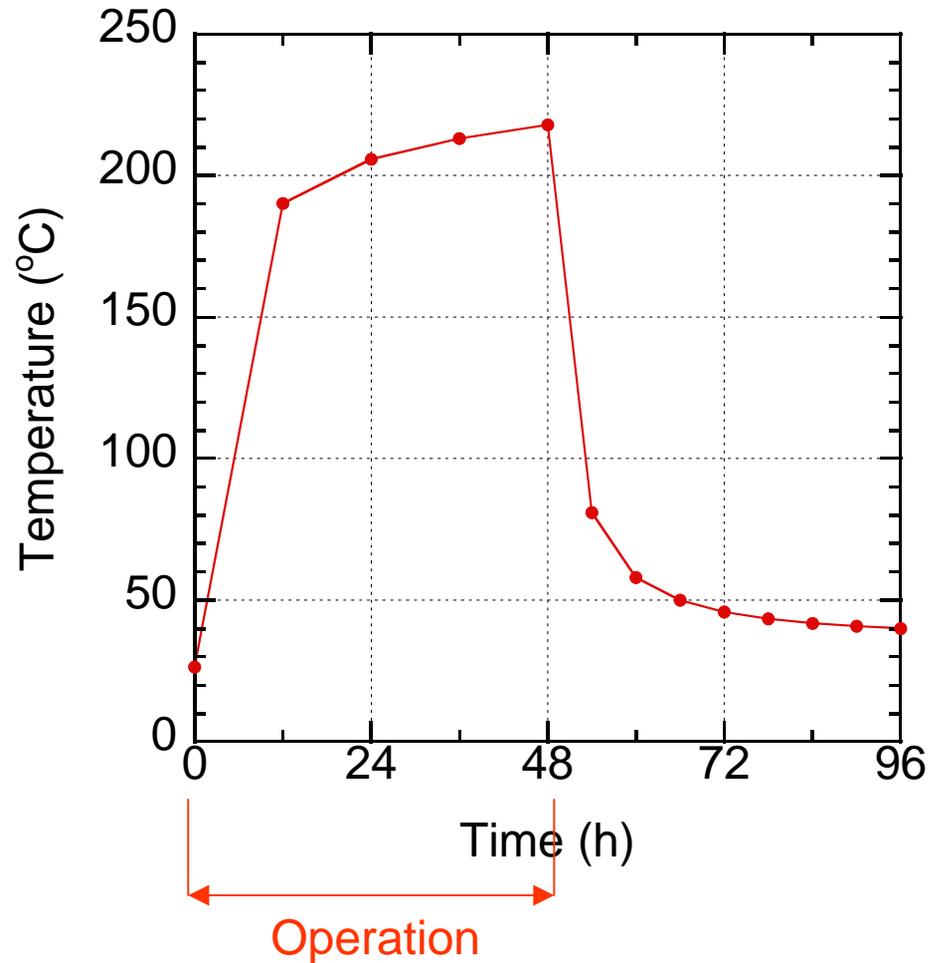
Thermal Distribution at 48 hours

V1
L2
G16



Temperature History

SS Temp. history



Concrete Temp. history

