

## Disaster prevention - Building-soil interaction analysis -

The impact on buildings from ground deformation is assessed by modeling analysis in which buildings (structures) and ground are integrated.

- Construction work close to railways (neighboring construction) is evaluated for repercussions such as railway subsidence, tilt and other factors
- Ground and building behavior during earthquakes are simulated for predicting damages from liquefaction to buildings and adjacent facilities associated with liquefaction and displacement of ground

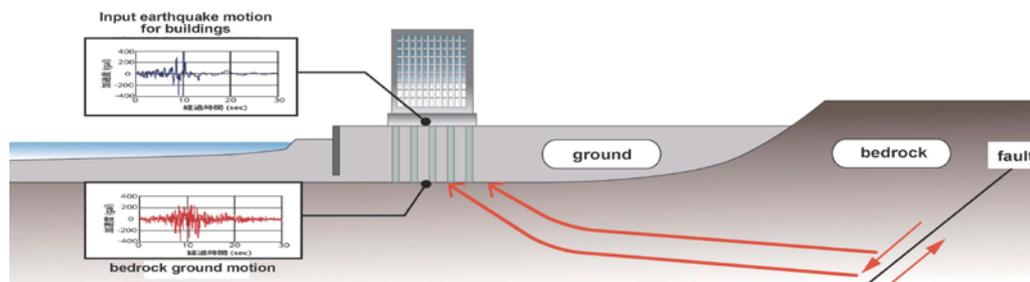
### Impact assessment of neighboring construction

- Construction works close to railways or the like need to show to railway operators that impact of the work is small
- The impact on existing structures from excavating works and other work (subsidence, tilt, etc.) is evaluated

If deformation is deemed to exceed tolerable levels, countermeasures are studied.

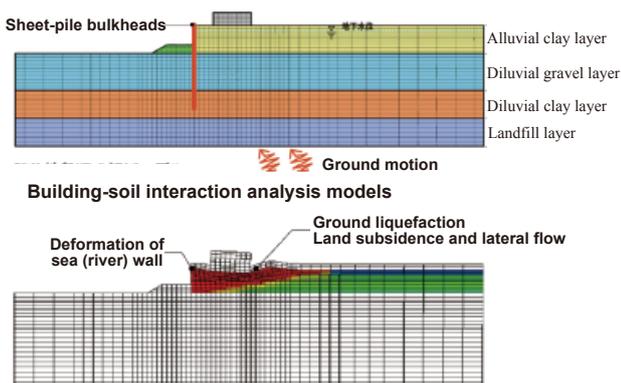
### Cooperation with earthquake-resistant designs for buildings (preparation of input earthquake motion for buildings)

- Obtaining "bedrock ground motion" transmitted from dislocation earthquake close to a building, we prepare "input earthquake motion for building", taking ground liquefaction into consideration.
- Bedrock ground motion is analyzed from distance to the fault, depth and terrain characteristics.
- Input earthquake motion for buildings is obtained by using analytical programs which are able to take liquefaction into account.



### Predicting liquefaction damage levels

Earthquake damage varies considerably depending on earthquake motion, terrain, ground and building conditions. We compile these data, carry out "building-soil interaction analysis" by analytical models, and forecast the extent of damages from liquefaction to nearby buildings.



### Cooperation with liquefaction measures

When liquefaction from earthquakes causes considerable damage to buildings, measures for minimizing liquefaction can prevent or reduce the damages.

Cooperation with liquefaction measures can ensure building safety against earthquakes.

