

# 17. Liquefaction control and earthquake resistance measures using steel sheet piles (Embankment Structure)

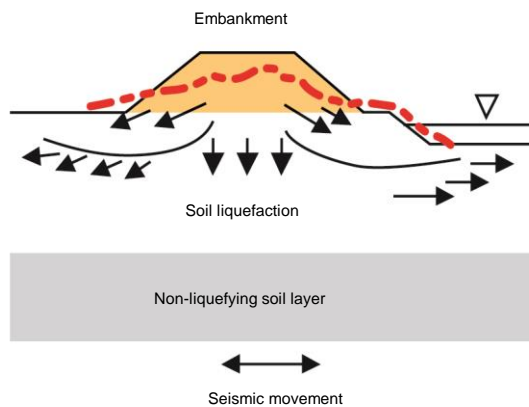
## Earthquake resistance measures of embankment structure on liquefying soil foundation

### ■ Merits

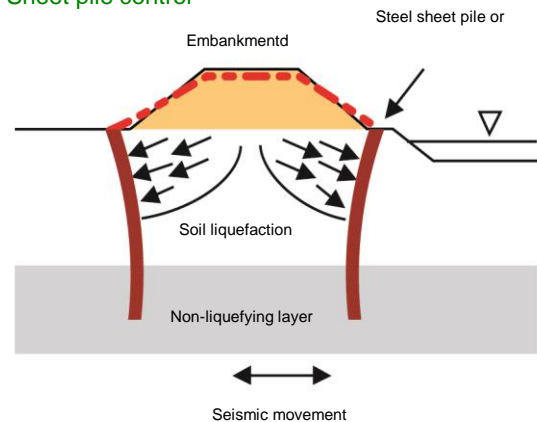
1. Swift and easy seismic resistance reinforcement is possible.
2. Applicability to narrow space.

Steel sheet piling Construction work is applicable to the narrow construction space and the site houses are nearly built.

#### No corrective action



#### Sheet pile control



• Embankment structures slip and collapse, sink, crack or change in other ways if the foundation liquefies.

• Steel sheet piles are installed by driving them deep into non-liquefying soil layer at locations near the foot of the slope of embankment on liquefying soil foundation.

• Driving high-quality steel sheet piles at the foot of embankment declining in foundation rigidity control the deformation of liquefying soil foundation and collapse of embankment structures.

# Summary from "Liquefaction Prevention and Seismic Resistance Measures Employing Steel Materials," Japanese Technical Association for Steel Pipe Piles and Sheet Piles

## Applicable Sector

River structure, Railway, Road

## Features

1. Ease of work at narrow construction space
  - Work with steel sheet piles minimizes the required work width compared with soil improvement method.
  - Work is fast and easy even in narrow space.
  - Work is possible while the facilities such as railway are in operation.
2. Environment-friendliness
  - Without producing industrial waste
  - Low-vibration and low-noise work can be applied.
  - Setting the hole for seepage at steel sheet piles can avoid influence of groundwater cutoff
3. Reduction of construction cost and period.
  - Construction cost and period can be reduced by applying steel materials.

Standard applicable condition

Applicable height of mound : 3~8m  
Applicable depth : 30m

## Track Record



Example of embankment railway



Example of press-in pile driving

In Japan : many records  
rubble mound at railroad : Musashino Line, Tokaido Shinkansen (Nagoya)  
rubble mound at river : Tone River, Yodo River, Shinano River, Sira River, Midori River etc.

## Cost

Refer to the under-mentioned contact section about details.

## Contact

The Japan Iron and Steel Federation  
Market Development Group

MAIL:sunpou@jisf.or.jp  
TEL:+81-3-3669-4815

FAX:+81-3-3667-0245