◆ **SIP “Enhancement of Social Resiliency against Natural Disasters” supports the development of a new technology for disaster management by the local government and the implementation and spread of research products in society.**

◆ For more information ◆

■ Ground investigation, seismic safety evaluation, and countermeasures
■ Liquefaction investigation, diagnosis, and sealing measure system

National Research and Development Agency
National Institute of Maritime, Port and Aviation Technology
Port and Airport Research Institute (PARI)
Sugano, Kohama, Itoh
Tel : +81-46-844-5058

■ Liquefaction investigation, diagnosis, and sealing measure system

Fire and Disaster Management Agency
National Research Institute of Fire and Disaster
Nishi
Tel : +81-422-44-8331

◆ SIP “Enhancement of Social Resiliency against Natural Disasters” HP ◆

http://www.jst.go.jp/sip/k08.html

内閣府

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SIP Cross-ministerial Strategic Innovation Promotion Program

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Liquefaction response technologies

Enhancement of Social Infrastructure against Major Earthquakes

Southern Hyogo Earthquake 1995（Kobe Port）

Reduction of construction cost and period through the developingment of ground investigation, seismic safety evaluation, and countermeasure technologies

Combining existing ground investigation, seismic safety evaluation , and countermeasure technologies enables

Significant Reduction of Construction Costs and Period.

Seismic safety evaluation

Liquefaction test with
Piezo Drive Corn (PDC)

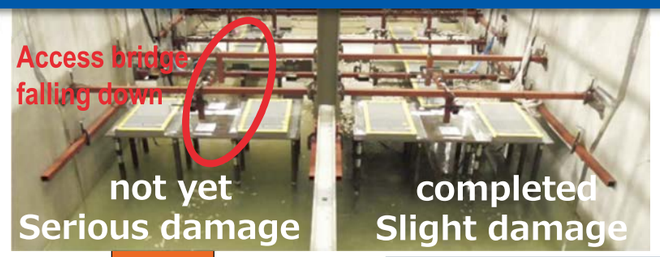
Simple evaluation method for liquefaction

Seismic safety evaluation
(GIS platform)

Support industrial complex operators

Diagnosis will be entered into a database of liquefaction investigation, diagnosis, and sealing measure systems.

Large-scale shake table test (E-defense)



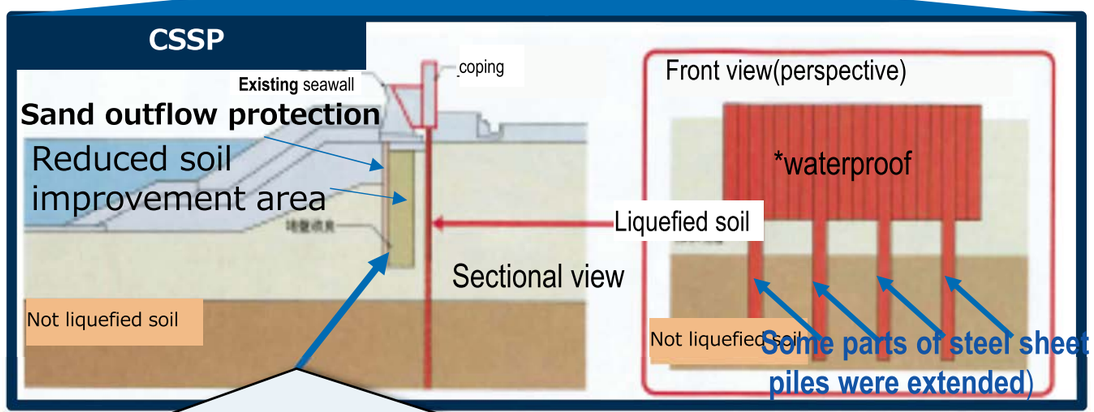
Typical countermeasure

Cement jet grout

Cost : 1/2
C. period : 3/5

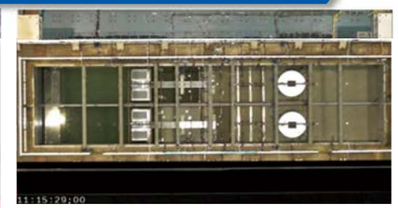
SIP proposed

Comb-shaped steel sheet pile method (CSSP)



As a result of applying the proposed SIP liquefaction measures package and the large-scale shake table test result, the CSSP showed good performance.

Ex.1 Chiba Petrochemical industrial complex



Petrochemical complex (Chiba pref.)

Ex.2 Oita Port shore

Oita Port shore protection facilities upgrade project (Total length: 21 km)

- **SIP proposed package and the comb-shaped steel sheet pile method (CSSP) were adopted in the Oita Port shore protection facilities upgrade project.**
  Total cost : 60 billion Yen →30 billion Yen
  Construction period : 32 years→19 years
  Damage reduction : 276 billion Yen