Appendix II

JSCE's Policy on Development of Technologies and Their Applications

The civil engineers must develop construction technologies and utilize them in constructing the infra-structures for the welfare and happiness of the people.

JSCE is now focusing on the following topics

1. Technology for the reduction of natural disasters
2. Technology for the protection and recovery of natural and urban environment
3. Developing new energy alternatives
4. Technology for inspection, maintenance and repair of infra-structures engineering structures
5. Technology for underground development for renewal of urban areas

1. Technologies for Reduction of Natural Disasters

(1) Inspection and reinforcement of existing infra-structures

(2) Reinforcement of vulnerable residential houses and buildings

(3) Prediction of earthquakes and damage assessment

(4) Development of hazard maps by utilizing advanced technologies

(5) Evacuation and emergency response system

(6) Real time earthquake warning system

Reinforcement of Existing Buildings

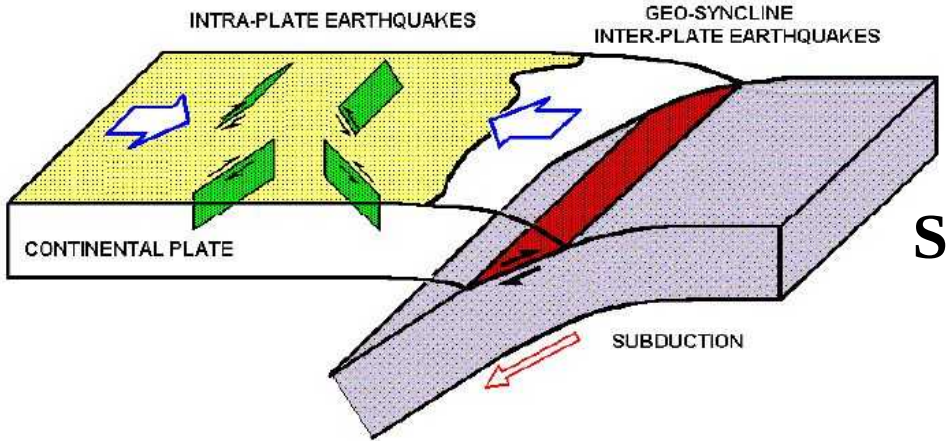
Active control

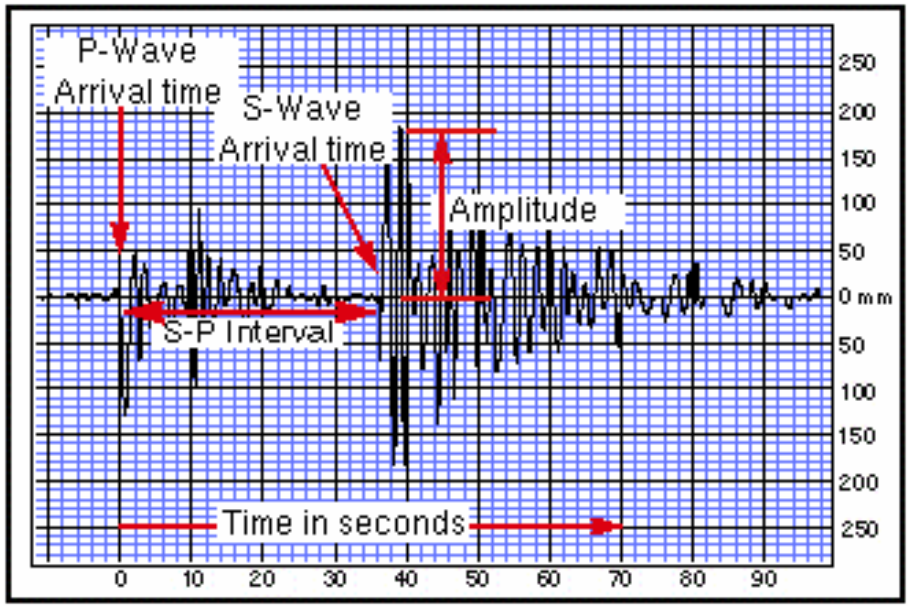
Bracing outside

Passive Control

Bracing inside

Real-time Earthquake Warning System (REWS)





Basic Concept

S-P Wave Arrival Time Difference

①Inference of Magnitude and Hypocenter from P-wave records at multiple stations

②Sending alarms before S-waves arrival to various organizations

- Railway operation office
- Highway and road signal
- Hospital
- Complex plant
- Public space
- School
- Construction fields etc

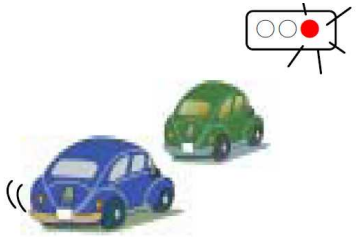
Example of Usage of REWS

Control of train

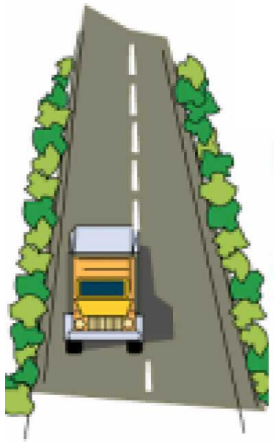
Operation of lock gate

Refuge and guidance in public place

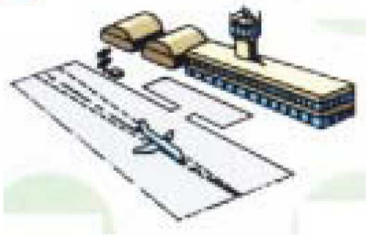
Control of signals



Guidance for driving cars including ITS system



Control of aircraft



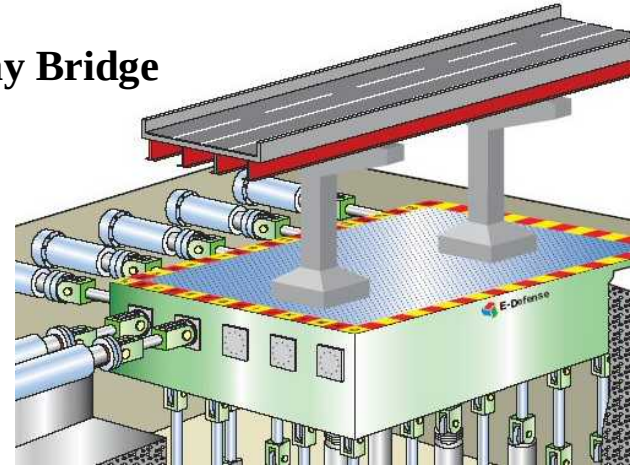
Refuge from Tsunami

Construction of Large Shaking Table for Study on Earthquake Resistant Design

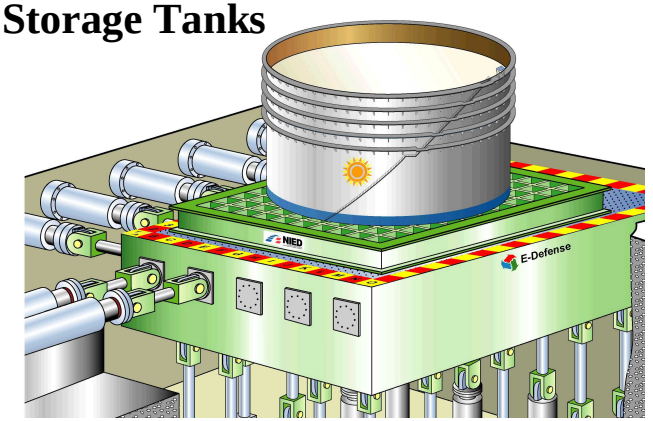
Wooden House

RC Building

Highway Bridge



Storage Tanks



2. Technologies for Assessment, Protection and Recovery of Natural and Urban Environment

(1) Water (River, lakes, underground water, sea)

(2) Ground (Industrial areas)

(3) Air (Heat island phenomena around mega cities)

(4) Industrial and nuclear waste disposal

(5) Construction of infra-structures with low energy consumption

3. Technologies for Inspection, Maintenance and Repair of Infra-structures

(1) Performance based design method by taking service life time into consideration

(2) Technology for asset management

(3) Development of sensors and systems for inspection of existing infra-structures

(4) Methods for rehabilitation, reclamation and demolishment

4. Technologies for Deep Underground Development for Renewal of Urban Areas

(1) Long distance tunneling

(2) Rapid construction

(3) Automation and safety

(4) Construction of complex underground junctions