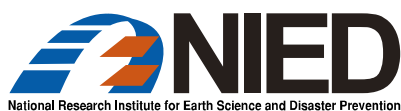


Recommendations of the Japanese Geotechnical Society and New Qualification System of Geotechnical Engineers

1. Lessons Learned from the Great East Japan Earthquake
2. Recommendations of Japanese Geotechnical Society
3. New Qualification System of Geotech. Engineers for Evaluation Ground Quality
4. Summary

Kazuo TANI

Hyogo Earthquake Engineering Research Center (E-Defense)



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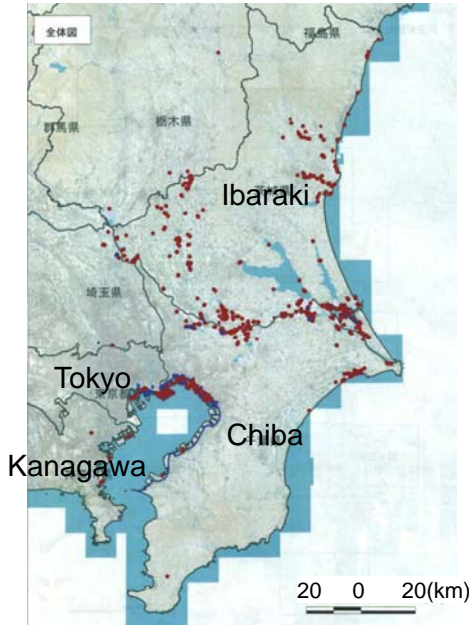
1. Lessons Learned from the Great East Japan Earthquake



Damaged houses by geo-hazards

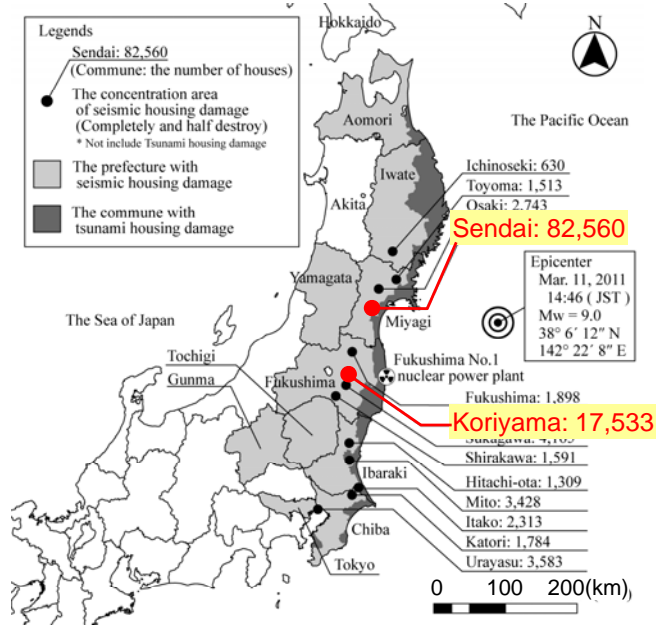
Liquefaction of ground

26,914 houses



Collapse of embankments & retaining walls in hilly areas

125,049 houses



Land, Infrastructure and Transportation Ministry (27 Sep. 2011)

Typical features of structural damages

	Civil engineering structures Large buildings	Houses Residential lands
Owners	<ul style="list-style-type: none"> Public organizations Large private institutions 	Ordinary citizens
Damage	None or minor	Serious <ul style="list-style-type: none"> Liquefaction of ground Collapse of embankments & retaining walls
Features	<ul style="list-style-type: none"> Latest technology standards, etc. Appropriate seismic diagnosis and seismic retrofitting Presence of in-house geotech. engineers 	<ul style="list-style-type: none"> Lack of mechanism to prevent disasters No appropriate measures nor seismic diagnosis Lack of support of geotech. engineers



2. Recommendations of JGS

Japanese Geotechnical Society

- ◆ National society of ISSMGE
- ◆ Member > 8,000

'Lessons and Recommendations from the Great East Japan Earthquake'
- Geo-Hazards during Earthquakes and Mitigation Measures -

Jul. 2011



Primary (Japanese)

Sep. 2011



Primary (English)

Jun. 2012



Secondary (Japanese)



5

9 Themes & 56 Recommendations

1. Damages of residential houses, life-lines, road facilities, etc. by liquefaction of ground
2. Damages of residential land in hilly areas and reclaimed lands
3. Damages caused by the huge tsunami
4. Ground subsidence in wide areas and flood control in lowland areas
5. Environmental issues of disaster wastes, tsunami deposits, and contaminated soils by radioactive materials
6. Advanced geotech. engineering for natural slopes, cut earth and various infrastructure facilities (roads, railways, rivers, sewers, ports, airports, power facilities etc.)
7. Restoration and reconstruction of industrial facilities
8. Severe accident measures for important infrastructures
9. Qualification system and education of geotech. engineers and public relations



6

Recommendations for qualification system of Geotech. Engineers

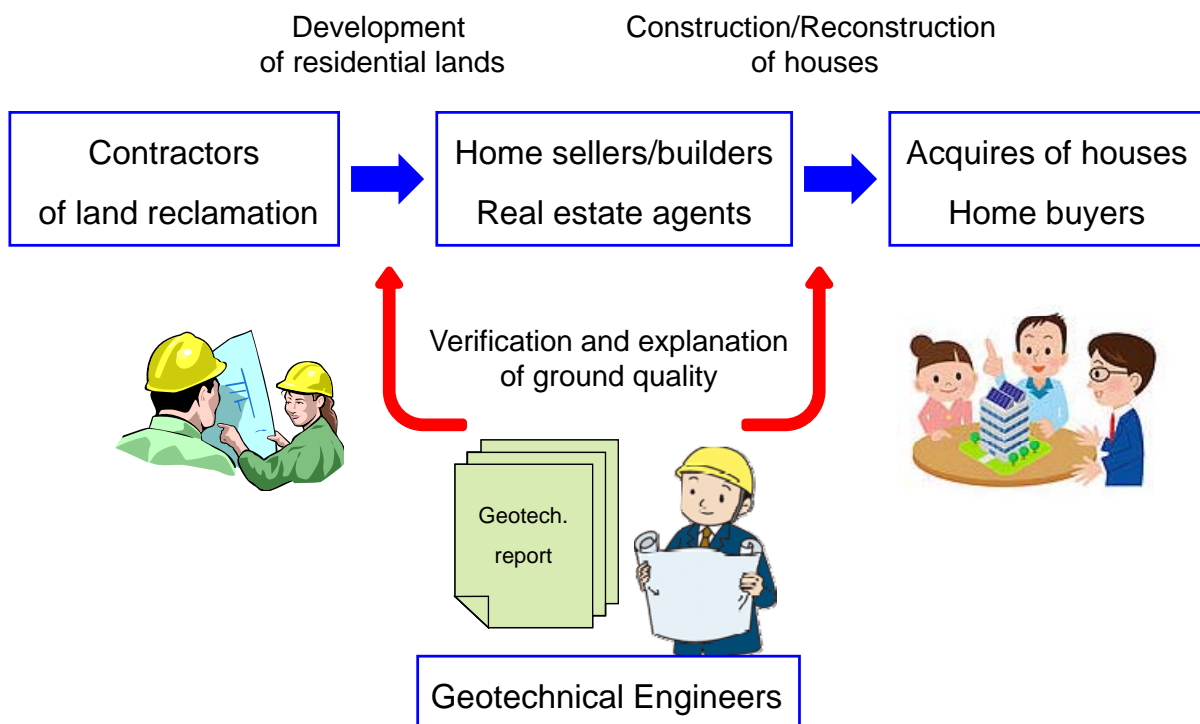
2.7 Accountability to the owners of new private houses

When building a house, the builders of houses (home seller) should explain the owners (home buyers) the safety of residential land and foundation ground, in addition to the safety of the houses. He or she should also explain the owners the effect and cost with a variety of seismic retrofitting measures which can be employed, as well as earthquake insurance as an alternative scheme.

9.1 Establishment of new qualification system of geotech. engineers

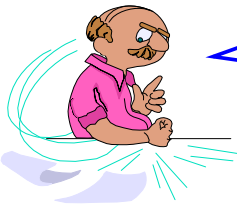
It is important that geotechnical engineers with ethics and expertise are appreciated properly in society, and work actively in explaining and check the quality of the ground. For this purpose, a new qualification system 'Geotechnical engineers for ground quality evaluation' should be established with the aim to contribute to the mitigation and prevention of geo-disasters.

3. New Qualification System of Geotech. Engineers for Evaluation of Ground Quality



Existing qualification system for Geotech. Engineers

Type of qualification	Name of qualified engineer	Certifying organization
Public-oriented	Professional Engineer (Sector: Construction, Applied Sciences)	Ministry of Education
	Architect	Land, Infrastructure and Transportation Ministry
	Designer based on Residential Development Regulation Law	Land, Infrastructure and Transportation Ministry
Private	Geological Engineer	Japan Geotechnical Consultants Association
	Registered Civil Engineering Consulting Manager (RCCM)	The Japan Civil Engineering Consultants Association
	Technical Officer of the Affected Residential Land Risk	Council for Risk Judgment of Affected Residential Land by Disaster
	Geotechnical Investigation Engineer	Ground Guarantee Inspection Association
	Housing Ground Engineer	Association of Ground Quality for Houses
	JSCE Certified Civil Engineers (Sector: Geotechnical Engineering)	Japan Society of Civil Engineers



Issues to be considered;

- 1) Range and level of technology to cover
- 2) Regal system relevant to the engineering qualification

The Japanese Association for Geotechnical Evaluation, JAGE

Jul. 2011: Primary recommendations from JGS

Aug. 2012 - Dec. 2012: Preparatory Committee

Jan. 2012 - Jul. 2012: Study Group

- ◆ Japanese Geotechnical Society
- ◆ Japan Geotechnical Consultants Association
- ◆ Architectural Institute of Japan
- ◆ Japan Society of Civil Engineers
- ◆ Association of Ground Quality for Houses
- ◆ Ground Guarantee Inspection Association
- ◆ The Japan Civil Engineering Consultants Association
- ◆ Japan Housing Industry Association



21 Jan. 2013: Preparatory Meeting for JAGE

4 Feb. 2013: Establishment of JAGE

Features of qualification system and examination

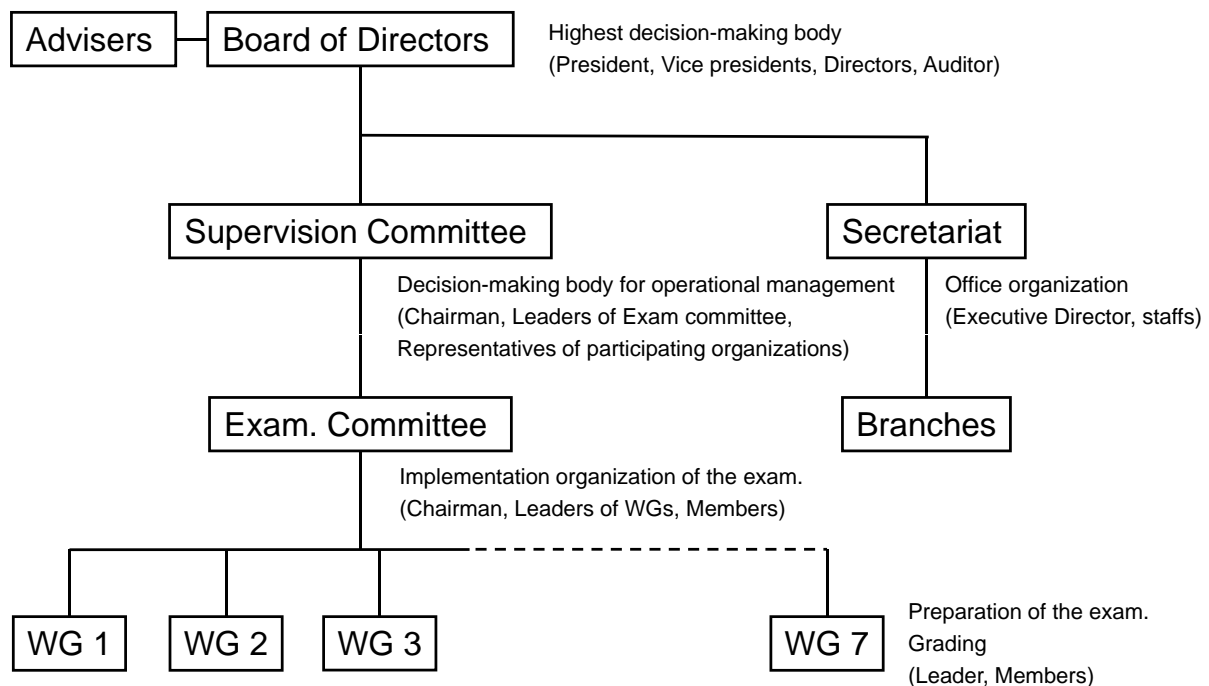
Qualification system

- ◆ Ownership of JAGE: Council with cooperation of the related organizations
- ◆ Private qualification system, in the beginning
but, aiming Public-oriented qualification system for business monopoly, in the future
- ◆ Use of qualification: Development of appropriate legal system
- ◆ Requirement for qualification: Comprehensive knowledge and technology for evaluation of ground quality
- ◆ Update system: Every 5 years, CPD system

Examination

- ◆ Date: Late September
- ◆ Applicants: Qualified engineers of the existing qualification systems
- ◆ Expected number of applicants: 500 to 1,000
- ◆ Expected number of those who pass the exam: 150-250 (Pass rate: 15-40%)

Form of organization of JAGE



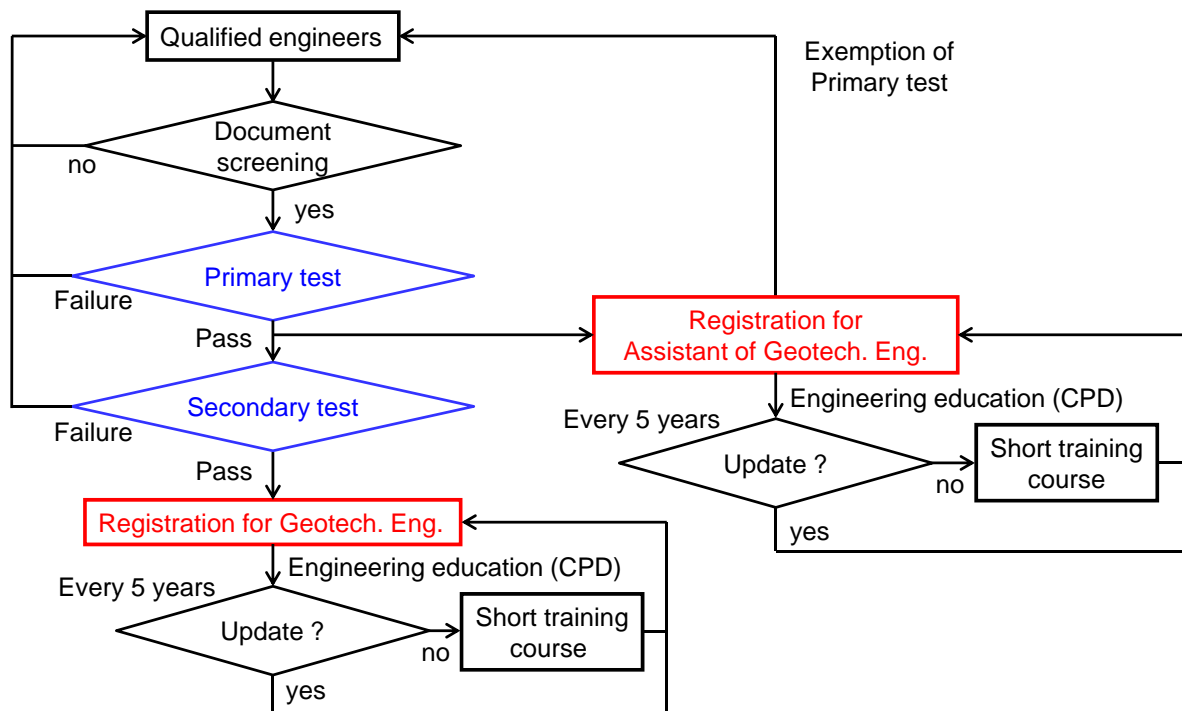
Participating organizations to JAGE

Type of Member*	Name of societies and organizations	Numbers of memberships	
		Individual members	Corporate members
Full member *1	Japanese Geotechnical Society	8,635	879
	Japan Geotechnical Consultants Association	(31,000)	441
	Ground Guarantee Inspection Association	(1,060)	40
	Association of Ground Quality for Houses	(15,000)	525
Supporting member *2	Japan Society of Civil Engineers	39,171	956
	Architectural Institute of Japan	34,127	986
	The Japan Civil engineering Consultants Association	(61,400)	426
Total		81,933	4,253

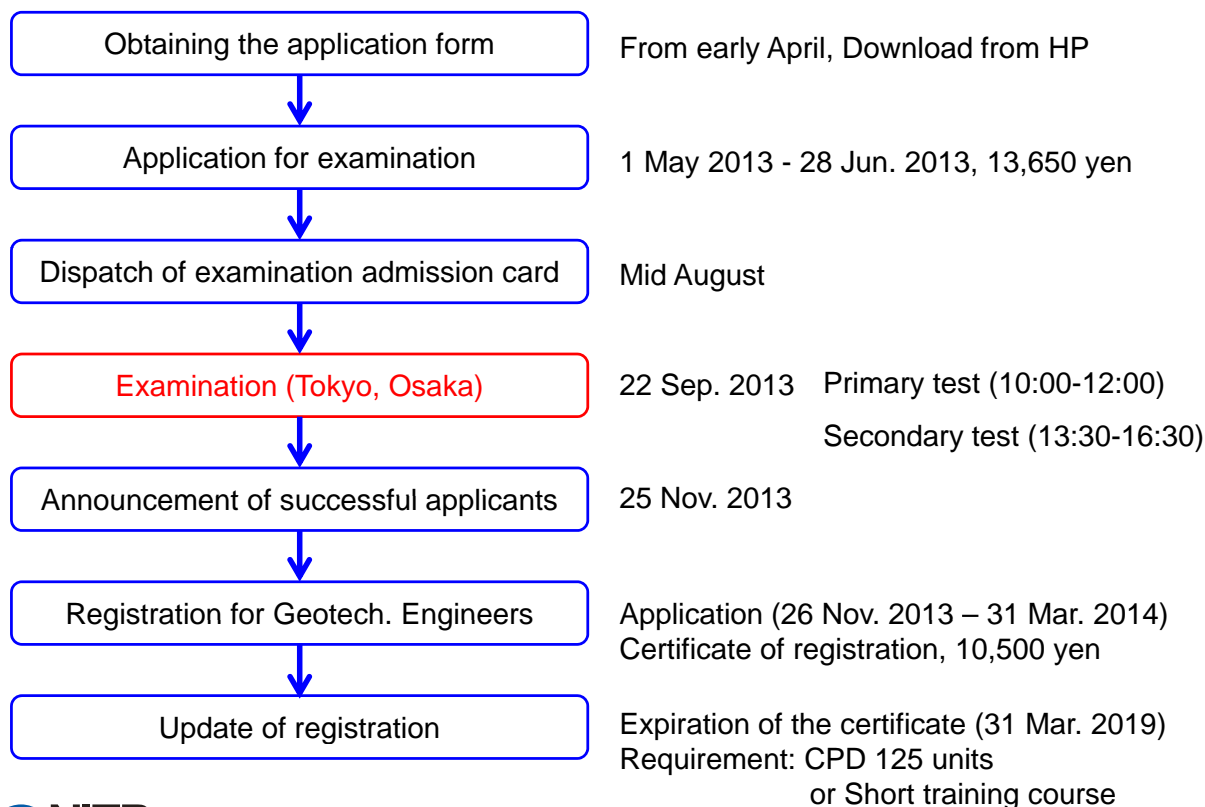
*1: Organization responsible for the business operations , 2 board members

*2: Organization to support the business operations, 1 board member

Flow of examination, registration and update



Annual schedule of the examination, 2013



Range of technical expertise required for Geotech. Engineer

	Section	Contents
①	Development of residential land	Legal system for reclamation and trading of residential land, Embankment fill, Cut slope, Retaining wall, Compaction
②	Geological and geotechnical investigation	Geology, Geomorphology, Geotechnical investigation, Drilling, Sampling, Laboratory tests
③	Foundations for houses and small structures	Shallow foundations, Pile foundations
④	Liquefaction of ground	Earthquake, Seismicity. Ground motion, Mechanism of liquefaction, Prediction of liquefaction
⑤	Stability of foundations and retaining structures, Settlement and inclination of foundations	Bearing capacity, Earth pressure, Slope stability, Stability analyses, Settlement analyses
⑥	Ground improvement, Ground reinforcement	Measures against liquefaction, settlements, slope instability
⑦	Engineering ethics	Code of conduct for engineers

Immediate tasks

- Council (JAGE)
- ◆ Improved awareness of the qualification system
 - ◆ Development of code of ethics
- Use of qualification
- ◆ Study of Geotechnical report
 - ◆ Development of the legal system
 - ◆ Cooperation in the development of technical codes, manuals
- Examination
- ◆ Successful implementation of the 2013 examination
 - ◆ Establishment of training/education system

地盤品質判定士協議会

The Japanese Association for Geotechnical Evaluation



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