Ocean Geotechnical Engineering Special Seminar

“Tell the mountain to get up and jump into the sea.”

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Scientific Conclusions

The seabed is an excellent storage of sea waters. This nature can be utilized for the changes of temperature and chemical constituents with time, thus the correlations of temperature change and seawater chemistry for about 200 years. A school wide proposal may be in order. Pre-proposal has been reviewed by experts receiving VERY GOOD and that this one is much better than ATOC project which has spent $2.5Billion.

ABSTRACT

Ocean Geotechnical Engineers cut the Mountains and fill the Seas to make Large Artificial Islands for Kansai International Airport (KIA), New Hong Kong Airport, Chubu International Airport (CIA), Fukuoka Airport, New Tokyo Airport, and many more are planned.

For Kansai International Airport, the artificial island is 4 km long and 2.5 km wide. Three mountains were excavated for 21,000,000 m$^3$ of landfill. 10,000 workers and 10 million work hours over three years, using eighty ships, were needed to complete the 30-metre layer of earth over the sea floor and inside the sea wall.

Kansai International Airport started to sink about 50 cm per year at its opening in 1994 due to consolidation of thick (about 150 m) hard clay layer on which the fill foundation was built. KIA has sank total of about 5 m and is still sinking which was compensated by built in jack ups. However, how long this seesaw game is going to last is an interesting question. Needless to say a large portion of the total KIA construction cost $20 Billion was spent for the Soils and Foundations. The Kansai International Airport was awarded the "Civil Engineering Monument of the Millennium" award by the American Society of Civil Engineers

In my seminar on Friday October 11, 11:00 am MSC 343, I will present an alternative methods to built islands and lots more

By combining the traditional geotechnical method and the cutting edge imaging technology, an accurate method of a high resolution 3-D imaging of the bearing capacity (the N-value) in the seabed has been developed, tested and applied to the foundation design of Chubu(Central) International Airport(CIA), Nagoya, Japan. The two methods are The Standard Penetration Test (SPT) and the high resolution acoustic cross-well tomography. Because of its 3-D imaging capability of the bearing layer, the foundation construction cost was cut by 42%.

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Earth Structures in the Ocean behave as diffusers of excess pore pressure through consolidation which takes forever to complete. So the manmade island airports continue to sink forever. For the case of Kansai International Airport, the 150-250 m thick Pleistocene clay layers are being consolidated. Therefore, the runways and airport buildings have to be jacked up all the time.