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Message to ISSMGE Members
Charles W.W. Ng, Appointed Board Member of ISSMGE

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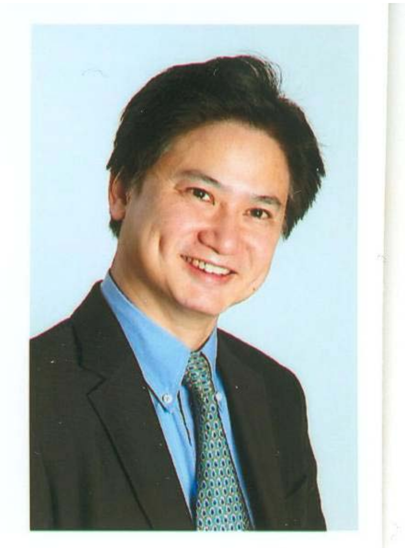

It is my great honour and pleasure to be appointed by the President – Professor JL Briaud as one of 12 Board Members to serve the community of ISSMGE. In this bulletin, I would like to share with you some of my recent experience about promoting and improving the standard of soil mechanics and geotechnical engineering in three developing countries in the Far East of Asia and a case history about one of the largest civil, geotechnical and hydraulic engineering projects in the world – the South-to-North Water Diversion Project (SNWDP), which is being planned, designed and constructed in China. This report is therefore divided into two parts, which are composed of Part A - International seminar and Part B - the SNWDP in China (geotechnical aspects).

PART A - INTERNATIONAL SEMINAR IN THE FAR EAST OF ASIA

Under the leadership of the immediate Past President of ISSMGE, Professor Pedro Pinto and the President of the Southeast Asian Geotechnical Society (SEAGS), Dr Ooi Teil Aun from Malaysia, a series of international seminars were organized and held in three developing countries including Cambodia, Laos and Myanmar, which are not yet member societies of ISSMGE. Prior to the international seminars, three days of lectures were delivered by Professors Dennes Bergado (together with Ir Dr Lai Yip Poon), Pedro Pinto and myself in Kuala Lumpur from 31 July to 2 August 2011. The contents of the lectures

Plate 1 – Five speakers in Phnom Penh seminar (with courtesy of Dr Ooi)

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covered far field seismic design, soil improvements and design case histories, and advanced unsaturated soil slope engineering. After the three-day lectures, the series of international seminars began in Phnom Penh of Cambodia on 4 August 2011. Plate 1 shows the five speakers at the Phnom Penh seminar. About 200 participants attended the seminar. Subsequently, three more one-day seminars were held in Vientiane of Laos, Yangon and Mandalay of Myanmar from 8 to 11 August 2011. Approximately 120 participants attended the one-day seminar. What I learnt from travelling and giving the seminars in these countries are (i) they are hungry for knowledge (not necessary the most advanced one but practical enough for their local conditions); (ii) they need our help and assistance to meet their rapid economic growth; (iii) ISSMGE can certainly play a major role and make an impact.

PART B - THE SOUTH-TO-NRTH WATER DIVERSION PROEJCT IN CHINA (GEOTECHNICAL ASPECTS)

B1. Introduction

In addition to the world largest hydropower project – the Three Gorges Dam in China, another mega infrastructure project being undertaken is the South-to-North Water Diversion Project (SNWDP) as shown in Figure 1. This project is intended to tackle the uneven distribution of water resources in China since the north accounts for 37% of the country's total population and 45% of cultivated land, but it only shares 12% of the total water resources. Over 80% direct water runoff in China takes place in the south. The total annual discharge of the Yangtze River in the south, is 1,000 billion m^3, about 20 times that of the Yellow River in the north. The SNWDP has therefore been proposed to carry potable water from the Yangtze River region in the south to many arid and semi-arid areas in the northern regions of China. As shown in Figure 1, three water transfer projects have been proposed, i.e., the Eastern Route, the Middle Route (or Central Route) and the Western Route. The Eastern Route starts from the lower reach of Yangtze River to supply water for the eastern Huang-Huai-Hai Plain and terminates in Tianjin and Weihai. The construction of the Eastern Route is almost completed. The Middle Route runs from Danjiangkou Reservoir in Xichuan County, Henan province and Danjiangkou City, Hubei province along the Hanjiang River, which is a tributary of the Yangtze

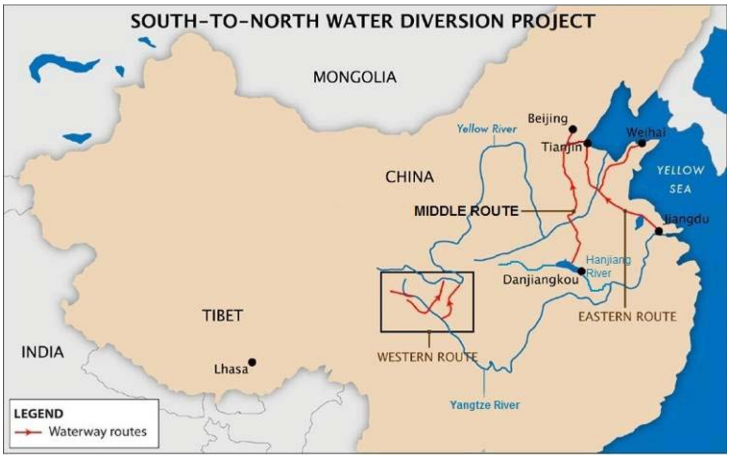

Figure 1 General layout of the South-to-North Water Diversion Project (Modified from http://www.meltdownintibet.com/images/map_diversion2_lg.gif)

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River, to Beijing and Tianjin. This route is being designed and is partly under construction. The Western Route is planned to divert water from the upper reach of the Yangtze River into the upper and middle reaches of the Yellow River. At present, this SNWDP is believed to be the largest infrastructure project in the world and the planned construction period for the entire project is about 50 years. Due to page limit, only some geotechnical challenges and research work carried out relevant to the Middle Route (MR) of SNWDP are introduced and discussed in this bulletin.

The MR is composed of two major parts: engineering structures in the water source region and the water transfer systems. The former includes Danjiangkou Dam extension on the Hanjiang River in Danjiangkou City, Hubei province, whereas the latter consists of the main trunk canal for diverting water from the Hanjiang River to Beijing and Tianjin. The total length of the MR is about 1,432km. The design water level at the start of the main trunk canal is about 147m and that at the termination is about 49m (http://www.nsbd.gov.cn/zx/english/mrp.htm). In other words, the difference in elevation along the canal is about 100m, which permits water flowing mostly under the gravity along the entire canal. Figure 2 shows the existing 60m wide intake of the main trunk canal in Nanyang, Henan. Along the MR, the shape of the open-channel canal is being finalized. It is most likely to be a trapezoidal cross section formed by cut slopes and fills.

Figure 2 Intake canal of the Middle Route in Nanyang, Henan

Figure 3 A typical failure of an expansive soil slope at Dagangpo

B2. Geotechnical challenges of the Middle Route (MR)

The MR of SNWDP passes through different geological conditions and encounters various geotechnical challenges including how to ensure the long-term slope stability of the trapezoidal shaped canal in unsaturated expansive soils and rocks, and the design and construction of the canal to cross the Yellow River. In order to connect the canal at both banks of the Yellow River, two parallel tunnels with internal diameter of about 7m were constructed across the riverbed by the shielding tunnel method. The total length of each tunnel is 4,250m. More details about the Yellow River crossing project can be found in the website: http://www.nsbd.gov.cn/nsbdgc/zxgc/ch/. Due to page limit, this report only focuses on the investigation and design of the slope stability for the trapezoidal shaped canal.

About 386.8km of the proposed main trunk canal of the MR passes through areas of unsaturated expansive soil (217.1km) and soft rock (169.7km) (Liu et al., 2011). It is well-known that expansive soil and weak rock have a potential for swelling when there is an increase in water content (Bao & Ng, 2000). The swelling in expansive soil/soft rock is mainly due to the presence of active clay minerals such as montmorillonite. Swelling-induced slope failures are often observed. Figures 3 and 4 show typical shallow retrogressive slope failures of expansive soil slopes at Dagangpo in Zaoyang, Hubei.

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Figure 4 Typical shallow retrogressive failures at Dagangpo

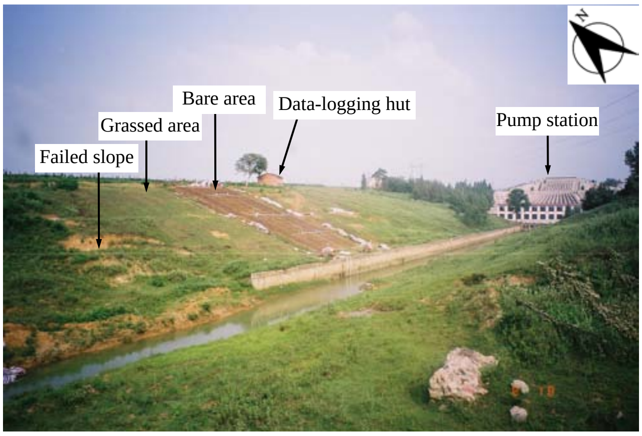

Figure 5 General layout of the test site in Zaoyang for preliminary field study

B3. Preliminary field study for the schematic design of MR

It is generally recognized that a number of landslides in unsaturated soils are triggered by rainfall infiltration during wet seasons (Bao & Ng, 2000). To assist the schematic design of canal for the MR of SNWDP in unsaturated expansive soil, a research collaboration was developed between the Hong Kong University of Science and Technology (HKUST) and the Yangtze River Scientific Research Institute (YRSRI), under the leadership of Professor C.G. Bao (the former director of YRSRI), to carry out a comprehensive field monitoring programme to investigate the fundamental mechanisms of rainfall-induced landslides in unsaturated expansive soil (Ng et al., 2003). An 11m high cut slope in a typical medium-plastic expansive clay in Zaoyang, close to the MR in Hubei, China, was selected for the well-instrumented field study. Some key monitored responses of the unsaturated expansive soil slope due to changes in both suction and net stress (i.e., two stress state variables governing unsaturated soil behaviour) are described and summarized in this bulletin.

Test site

The test site was located at the intake canal of the Dagangpo second-level pumping station in Zaoyang, Hubei. It was about 230km northwest of Wuhan and about 70km south of the intake canal for the SNWDP in Nanyang, Henan. The site is located in a semi-arid area with an average annual rainfall of about 800mm with 70% of the annual rainfall occurring between May and September.

The test site was selected on a cut slope on the northern side of the canal, as shown in Figure 5. The test site consisted of two neighbouring monitoring areas (both 16m wide by 31m long): namely a bare area and a grassed area. The bare and grassed areas may represent surface cover conditions of the real slope under different climatic conditions, such as winter and summer. The slope had an inclination angle of 22° and a height of 11m. There was a 1m wide berm at the mid-height of the slope, dividing the slope into upper and lower parts. The selected test areas had a significant depth of typical unsaturated expansive soil. The slope surface was originally grassed but no trees were present. The depths of roots observed on an excavated face ranged from 100 to 300mm. The bare area was obtained by removing the top soil to a depth of about 100mm.

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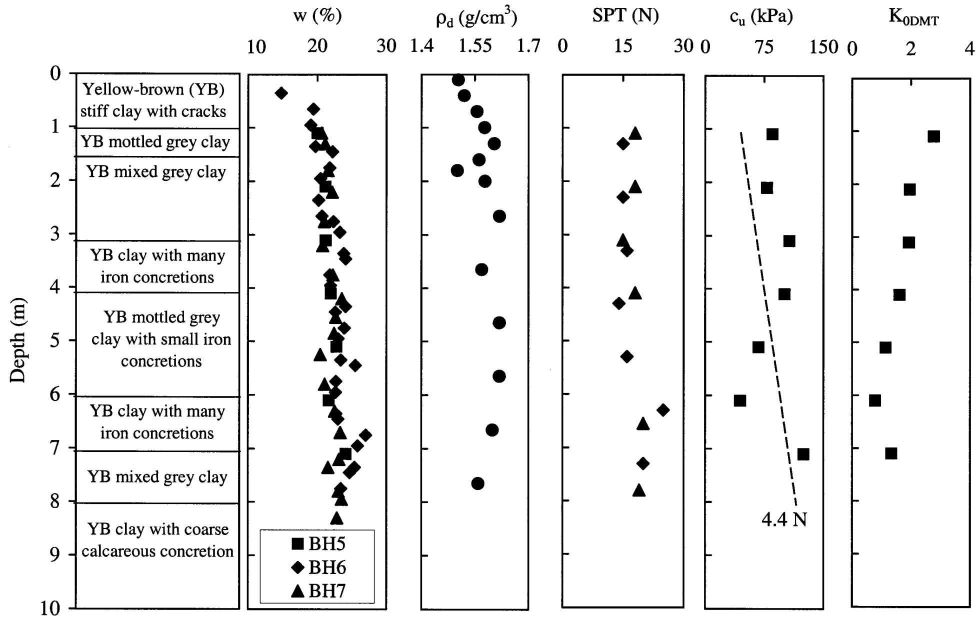

Figure 6 Soil profiles and geotechnical parameters (Ng et al., 2003)

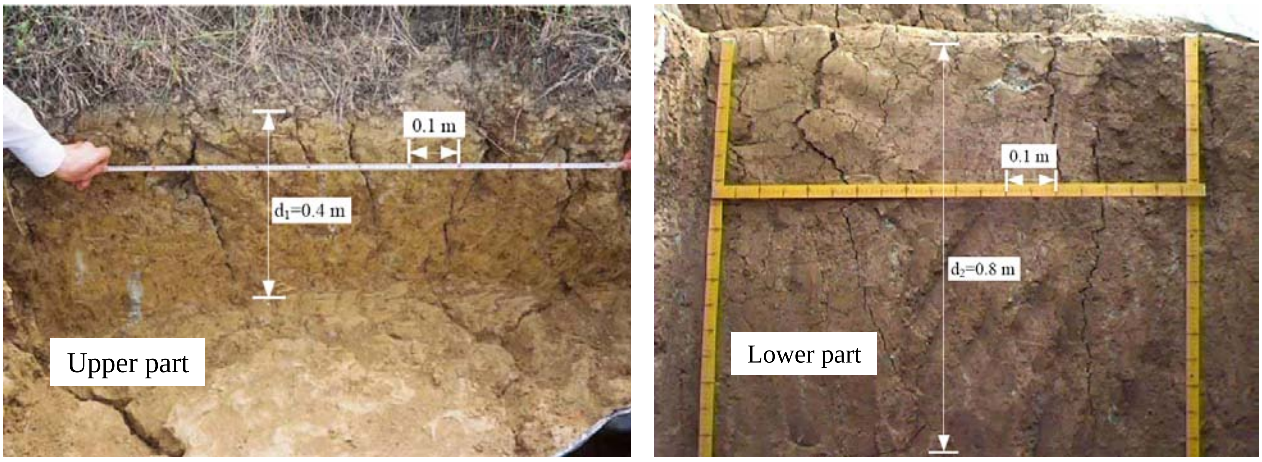

Figure 7 Cracks and fissures observed in a trial pit (Zhan et al., 2007)

Soil profile and properties

Prior to instrumentation, site investigation was carried out on the selected slope to investigate the ground conditions and soil properties. The obtained soil profile and geotechnical parameters are shown in Figure 6. The geotechnical parameters include water content (w), dry density (ρ_d), SPT N value, undrained shear strength (c_u) and K_0 value from dilatometer tests (K_{0DMT}). The predominant stratum below the slope surface is a brown-yellow mottled gray clay. The clay layer is sometimes interlayered with thin layers of gray clay or iron concretions. X-ray diffraction analyses indicated that the predominant clay minerals are illite (31%-35%) and montmorillonite (16-22%), with a small percentage of kaolinite (8%). The expansive clay is silty clay with an intermediate plasticity and a medium expansive potential.

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Figure 7 shows cracks and fissures observed on the wall of a trial pit near the monitoring areas. The maximum depth and width of the open cracks observed were estimated to be approximately 1.2m and about 10mm, respectively.

Instrumentation and rainfall simulation

The layout of instrumentation in both the bare and grassed areas and the cross section of the instrumented slope are shown in Figures 8 and 9, respectively. It can be seen that the instrumentation includes jet-filled tensiometers and thermal conductivity sensors for measuring soil suction, Theta-probes for determining water content, vibrating-wire earth pressure cells, inclinometers, movement points, tipping bucket rain gauges, vee-notch flow meters and evaporimeters. The instruments were installed in three rows in both the bare and grassed areas, i.e., R1 in the upper part, R2 in the middle part and R3 in the lower part of the slope.

Artificial rainfall was produced to accelerate the field test program. Rainfall was produced artificially using a purpose-designed sprinkler system. Two rainfall events were simulated in the bare area. The first one lasted for seven days, from the morning of 18 August 2001 to the morning of 25 August 2001, with an average daily rainfall of 62mm. The second simulated rainfall was begun from the morning of 8 September 2001 to the afternoon of 10 September 2001 with an average rainfall intensity of 45mm per day. Due to the limited length of this bulletin, only some key monitored results obtained from the bare area are reported, including soil suctions or pore-water pressures, horizontal stresses and horizontal displacements.

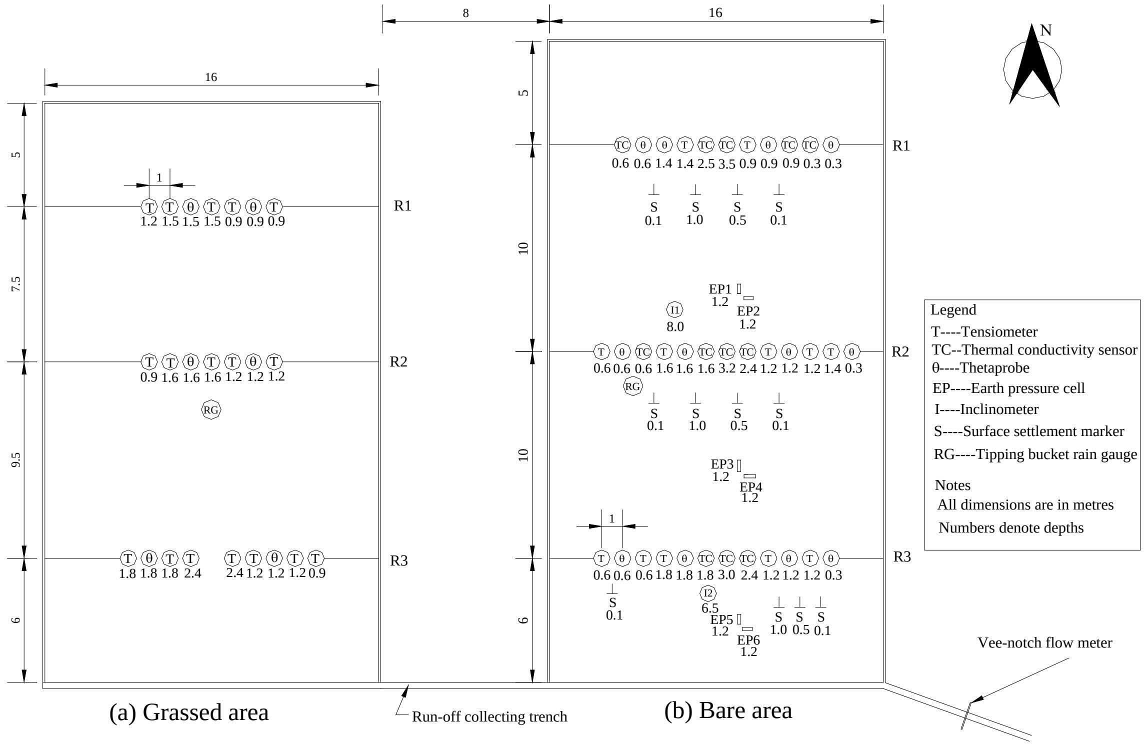

Figure 8 Layout of instruments on the expansive soil slope in: (a) Grassed area and (b) Bare area (Ng et al., 2003 and 2009)

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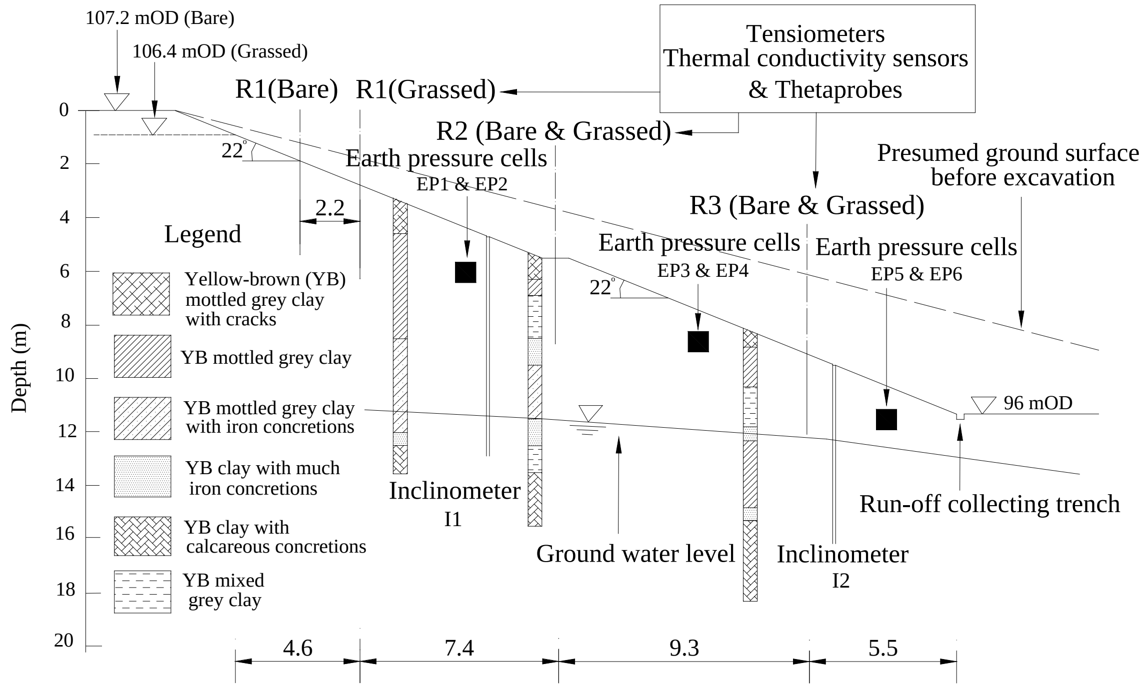

Figure 9 Cross-section of the instrumented slope (Ng et al., 2003 and 2009)

Soil suction or pore water pressure

Figure 10a shows measured negative pore-water pressures (PWPs) increased with time before the first rainfall event. This indicates that the soil was under drying conditions. As expected, the higher the elevation of the tensiometer, the higher the negative PWP. During the first two days of the first artificial rainfall event, the negative PWPs at different depths all continued to increase slightly. But they began to decrease after about two days of rainfall. In other words, there was a delay in the PWP response to rainfall infiltration.

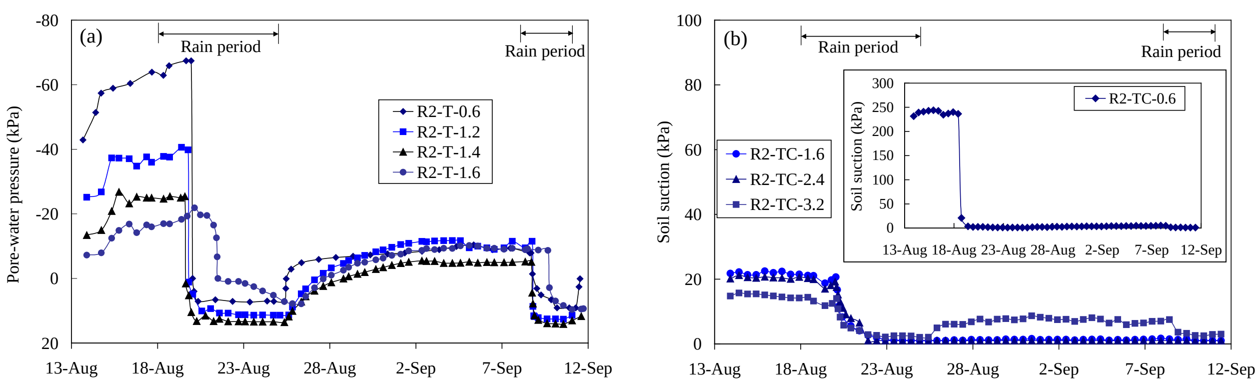

Figure 10 Variations of pore-water pressure or suction with time (Ng et al., 2003)

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After the first rainfall was completed, the four tensiometers all showed an increase (or recovery) in negative PWP and appeared to reach a steady state condition after 2 September. Unlike the responses of tensiometers in the first rainfall, the lower three tensiometers showed almost no delay in response to the second rainfall. On the other hand, the top tensiometer showed a one-day delay. However, the "final equilibrium" PWPs recorded during the second rainfall was similar to those during the first one.

Figure 10b shows the soil suction responses to the two artificial rainfalls measured by thermal conductivity sensors. The responses were similar to those recorded by the tensiometers, but the former showed a slower rate of response than the latter. The magnitudes of PWPs or suctions measured by the two different types of sensors were generally consistent, particularly at the depth of 1.6m below ground. However, the thermal conductivity sensor at 0.6m below ground showed a very high soil suction of about 250kPa before the first rainfall, which was much larger than the negative PWP of about 62kPa measured by a tensiometer. This inconsistency between the results of the two sensors may be due to the inherent limitation of tensiometers caused by cavitation at high suction.

Horizontal total stress

The horizontal total stresses (σ_h) were measured by six vibrating-wire earth pressure cells (see Figures 8 and 9) installed at a depth of 1.2m, giving rise to an estimated total vertical stress (σ_v) of 23.4kPa. Figure 11 shows the variations of the monitored total stress ratio (σ_h/σ_v) with respect to time. Pressure cells EP1, EP3 and EP5 measured the stress changes acting in the East-West (EW) direction (i.e., perpendicular to the inclination of the slope), whereas EP2, EP4 and EP6 recorded pressures acting in the North-South (NS) direction (i.e., parallel to the inclination of the slope).

Prior to the first rainfall, the total stress ratios recorded by all the pressure cells were lower than 0.3. An initial equilibrium stress ratio appeared to have been established for each pressure cell shortly before the start of the rainfall. Two out of the six pressure cells registered a small tensile stress, probably induced as a result of soil drying. After the start of the first rainfall, no earth pressure cells registered any significant change of stress for about one and a half days. The delayed response of the earth pressure cells was consistent with the PWP responses (see Figure 10a). Once the earth pressure cells started to respond, the stress ratios increased rapidly and significantly within one day and then approached a steady value during the first rainfall event. For a given pair of pressure cells located at the same elevation, the measured stress ratio in the EW direction was always larger than that in the NS direction. This was likely caused by a higher constraint imposed in the EW direction as opposed to that in the NS direction. After the end of the first rainfall, a further increase in σ_h/σ_v was observed at EP1 and EP2 during the two-week no-rain period. On the other hand, the EP3 and EP4 pressure cells showed a slight decrease in σ_h/σ_v throughout the no-rain period, and EP5 and EP6 recorded a larger reduction in σ_h/σ_v.

After the start of the second rainfall event, the responses of the three pairs of earth pressure cells were distinctly different. At EP1 and EP2, the observed σ_h/σ_v decreased. This may be attributed to the softening of the soil after prolonged swelling during the no-rain period. In the earth pressure cells near the toe of the slope (EP5 and EP6), an increase in σ_h/σ_v was recorded due to the positive PWP during the second rainfall. The performance of EP3 and EP4 fell between the former two cases. The high in-situ stress ratio due to the swelling of expansive soil upon wetting might be one of the main reasons for the retrogressive shallow failures found near the monitored slope (see Figures 3 and 4).

Slope deformations

Figure 12 shows measured horizontal displacement profiles of the slope in response to the simulated rainfalls. The measured downslope (North-to-South, NS) and lateral displacements (West-to-East, WE) are defined as negative and positive, respectively.

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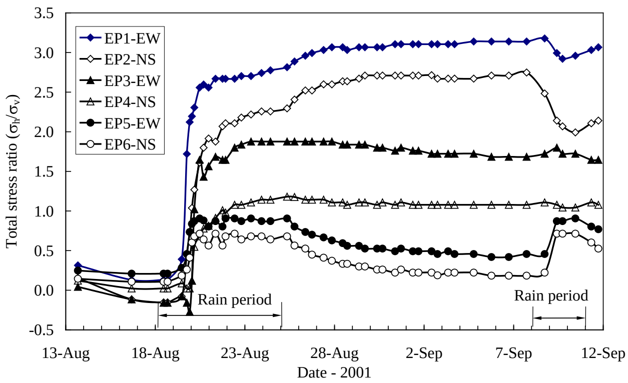

Figure 11 Variations of in-situ total stress ratio with time (Ng et al., 2003)

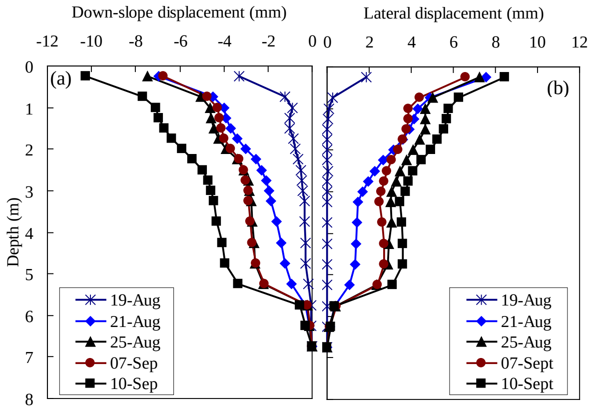

Figure 12 Observed horizontal displacement in response to rainfalls (Ng et al., 2003)

Figures 12a and b show the monitored horizontal displacements from inclinometer I2 located near the toe of the slope in the NS and EW directions, respectively. It can be seen that the magnitudes of displacement and deformed shapes observed in both directions were fairly consistent. The horizontal displacements measured on 19 August (after one day of rainfall) were small in both directions, probably because of the delayed response similar to PWP. After three days of rainfall (i.e., 21 August), there was a significant increase in horizontal displacements in both directions. After the first rainfall event, a small recovery of horizontal displacement (i.e., a shrinkage response) was observed with respect to both directions during the two-week no-rainfall period, due to the increase in soil suction. The horizontal displacements increased again after the second rainfall. A “deep-seated” mode of ground deformation was observed in both directions. The depth of influence zone was about 6m.

The results indicate that the ground moves toward the down-slope direction and towards the East direction. The observed eastern movements of the ground due to rainfall infiltration might be attributed to the direction of the sub-surface water flow from the West to the East.

B4. Field trials for the detailed design of the MR

After the success of the research collaboration between HKUST and YRSRI for the investigation of the unsaturated expansive slope in Zaoyang, the YRSRI was subsequently appointed to be the main designer of the MR of the mega SNWDP. Under the leaderships of Professors Cheng Zhan-lin, Li Qing-yun, Guo Xi-ling and Gong Bi-wei of YRSRI, a very comprehensive field trial programme was planned and carried out (Cheng et al., 2011) to investigate possible failure mechanisms of expansive soil and soft rock slopes with and without treatments and to verify design assumptions by using different protective and stabilizing schemes. Due to page constraints, theoretical design calculations are not included in this bulletin.

Two trial test sections, one for expansive soil slopes and the other one for expansive soft rock slopes, along the main trunk canal of the MR were selected for field trials. For the soft rock section, a length of 1.5km of soft rock slope of the canal in Luwangfen, Xinxiang, Henan, was instrumented and tested. The Luwangfen trial section consisted of eight test areas with different protective and stabilizing treatment schedules. Figure 13 shows a part of the Luwangfen test section for expansive rock. The bottom width of the canal is 9.5m and the heights of the trial slopes range from 15 to 42m. Depending on local geological conditions and expansibility of soft rocks, various slope angles (ratios), 1:1.5, 1:2.0, 1:2.5 and 1:3.0 were tested. More details of the field investigation on expansive rock slopes in the Luwangfen test section are given by Liu et al. (2011).

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Figure 13 Part of Luwangfen test section in expansive soft rock (with courtesy of Professor Gong Bi-wei)

Figure 14 Part of Nanyang test section in expansive soil (Cheng et al. 2011)

For expansive soil slopes, a 2.05km long trial section was designed and built in Nanyang, Henan. The Nanyang test section consisted of totally 13 test areas. Figure 14 shows a part of the Nanyang test section in expansive soil. In the medium expansive soil region in Nanyang, seven trial areas were designed to evaluate different surface protective treatment measures. The surface layer of the original expansive soil slope in Area I was replaced by non-expansive clay. The surface layer of soil slopes in Areas II and V was replaced by cemented soil. Slopes in areas III and IV were protected by using soil bags and geogrids (see Figure 15), respectively. Slope in Area VI was stabilized and protected by composite geomembrane, while that in Area VII was untreated bare slope used as a control section. The bottom width of the canal is about 22m. The heights of slope range from 5 to 17m and the trial slope angle (ratio) is 1:2. A berm with a width of about 5m was constructed to separate the lower and upper slopes in the trial section.

Under two years of natural rainfalls, large horizontal deformations were observed in Areas I to V. Figures 16a and b show horizontal displacements measured by inclinometers at the upper and lower slopes treated with soil bags (Area III), respectively. The measured horizontal displacements at the upper and lower slopes treated with geogrids (Area IV) are also shown in Figures 17a and b, respectively. Failures of the slope (landslides) occurred in the first year in the treated Area III, while landslides happened in the second year of the treated Area IV.

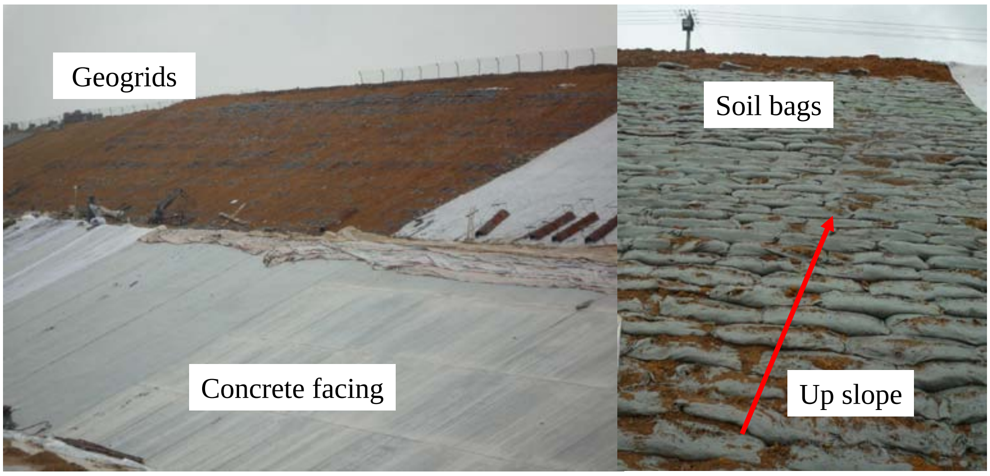

Figure 15 Use of geogrids and soil bags for surface protection and stabilization

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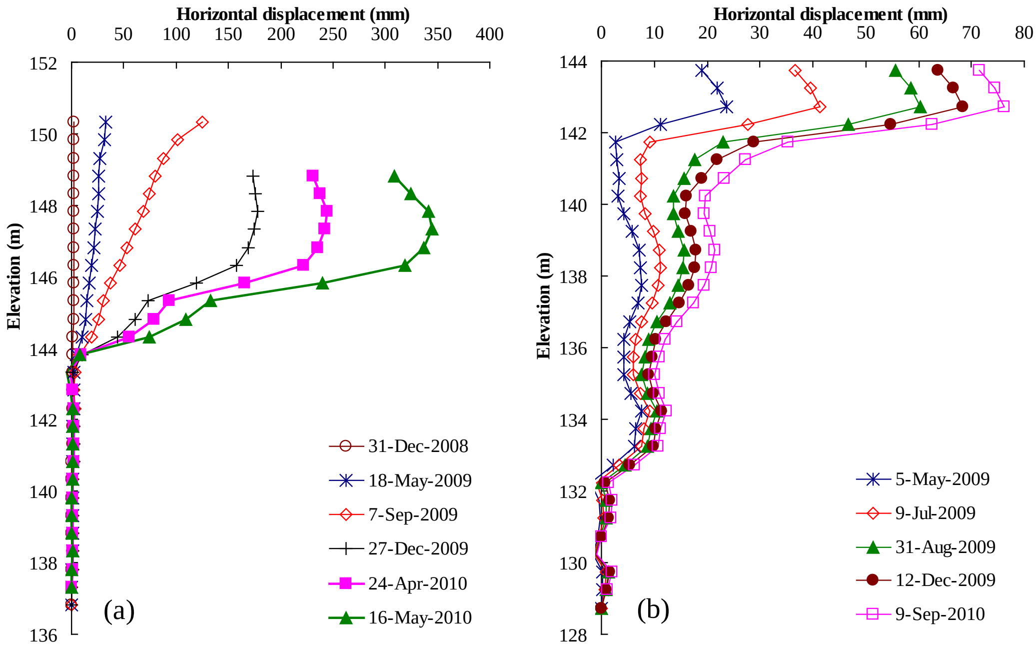

Figure 16 Measured horizontal displacements at (a) crest and (b) berm of the slope in Area III (treated with soil bags) (data from Cheng et al., 2011)

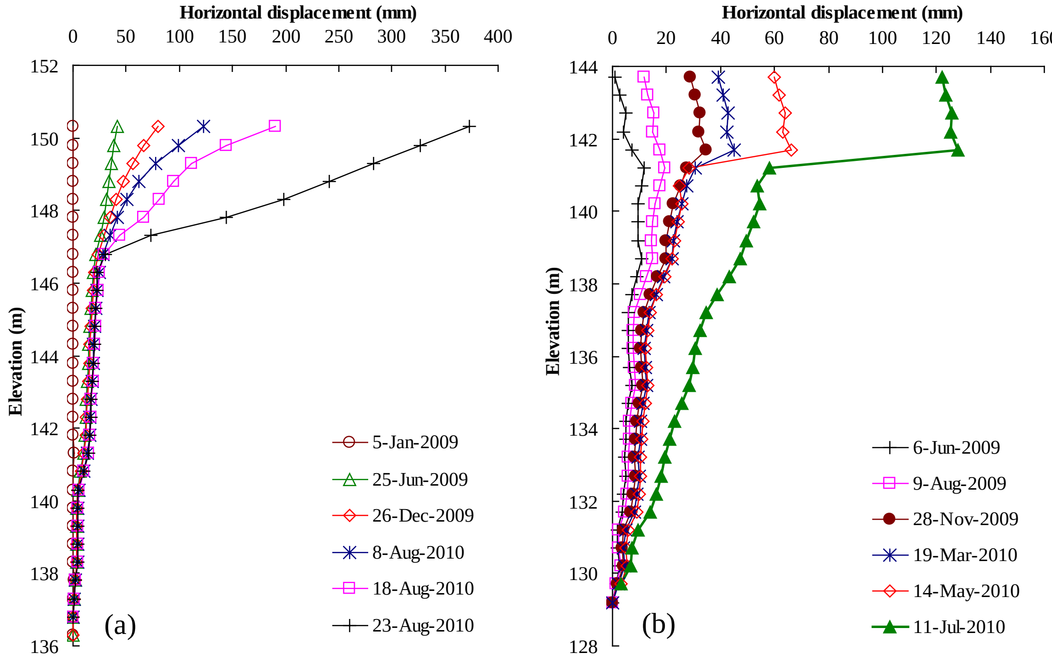

Figure 17 Measured horizontal displacements at (a) crest and (b) berm of the slope in Area IV (treated with geogrids) (data from Cheng et al., 2011)

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B5. Physical model tests for the detailed design of the MR

In addition to field trials, controlled physical model tests were carried out under one gravity (1g) at YRSRI and at elevated gravity in the geotechnical centrifuge facility at HKUST.

1g model test for the detailed design of the MR

In order to further investigate failure mechanisms of expansive soil slopes subjected to various rainfall conditions, 1g physical model tests were planned and carried out by YRSRI (Cheng et al., 2011). Figure 18 shows the setup of an expansive soil model slope together with artificial rainfall control system. The 1g model dimensions are 6.0m × 2.0m × 2.0m and the slope ratio is 1: 1.5. The model slope was prepared by moist tamping method using highly expansive soil at water content of 20% and dry density of 1,600kg/m^3. Artificial rainfall was produced using a purpose-designed sprinkler system. Sprinkler heads were arranged to simulate continuous rainfall events. Local failures were observed in shallow depths of the model slope initially and then developed to deeper depths, leading to a global slope failure eventually. The failure mechanism of the 1g model test is consistent with that observed from an untreated (bare) expansive soil slope in Area VII when it was subjected to similar artificial rainfall event in the field trial, where shallow retrogressive failures (within 2m depth) were observed after rainfall.

Figure 18 Prof. Z.L. Cheng explains an expansive soil model slope tested at 1g (with courtesy of Prof. B.W. Gong)

Centrifuge model tests for the detailed design of the MR

After the success of the research collaboration between HKUST and YRSRI for the preliminary investigation of an unsaturated expansive slope in Zaoyang (Ng et al, 2003), HKUST was commissioned by YRSRI to carry out a number of centrifuge model tests to investigate possible failure mechanisms of expansive soil slopes subjected to varying water levels in the canal and to evaluate the effectiveness of different treatment measures (Ng & Zhou, 2009). The geotechnical centrifuge facility (GCF) at HKUST was adopted. The GCF has a beam centrifuge with a rotating arm of 8.4m in diameter. The design maximum g-level is 150g and the designed maximum payload is 400g-ton. The centrifuge is the world first centrifuge equipped with two dimensional hydraulic in-flight shaking table (Ng et al., 2004) and an advanced four-axis robotic manipulator (Ng et al., 2002). Real-time monitoring and viewing test results via internet are available in this facility.

Centrifuge model test plan and instrumentation

Figure 19 shows the cross section of a centrifuge model package for an expansive soil slope. A two-dimensional model container with dimensions of 1.25m × 0.35m × 0.85m was used for four model tests at 70g. The height of each model slope was 430mm (i.e., 30.1m in prototype) and the bottom width of model canal was 115.1mm (i.e., 8.1m in prototype). A berm with a width of 71.4mm (5m) separating the upper and lower slopes was also simulated. The heights of the upper and the lower slope of each model were 295.7mm (20.7m) and 134.3mm (9.4m), respectively. The slope angle of each model was about 27°. Each model slope was compacted by moist tamping to its initial field density. The soil used was taken from a medium expansive soil taken near the main trunk canal of MR (Ng & Zhou, 2009).

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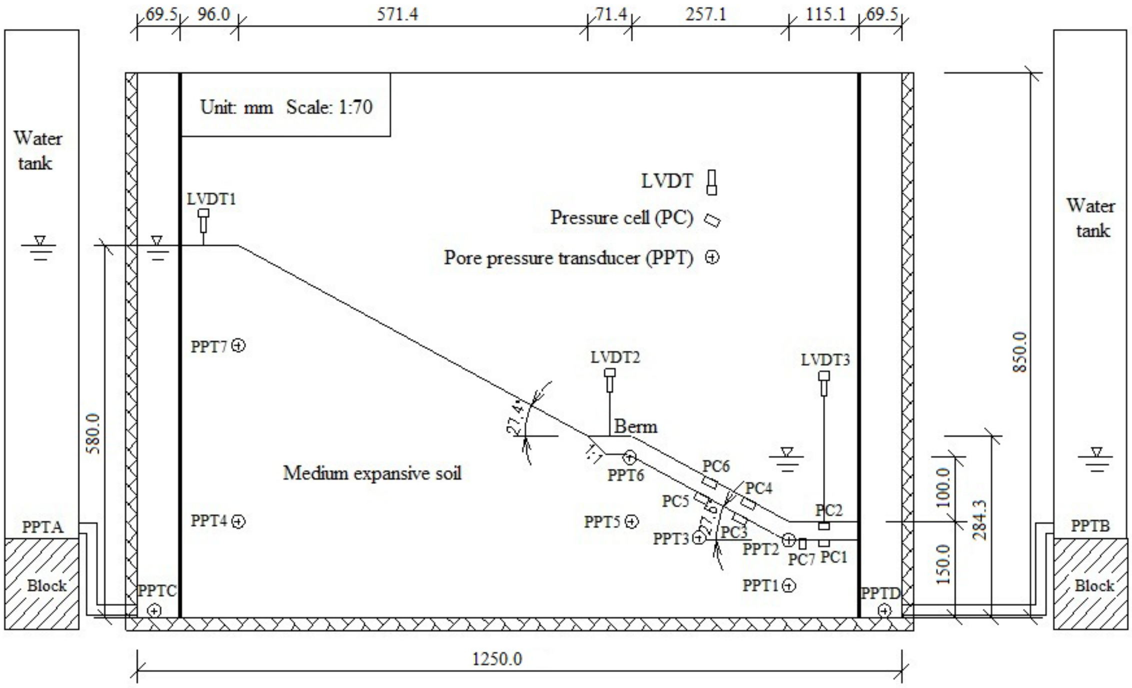

Figure 19 Cross section of a typical centrifuge model package (Ng & Zhou, 2009)

Four model tests were designed to verify design assumptions and to compare findings with field observations. These four tests included (i) one control model slope covered with a properly scaled concrete facing, (ii) a model slope that replaced top 2m (prototype scale) expansive clay with a non-expansive clay covered with a scaled concrete facing; (iii) a model slope that replaced top 3m (prototype scale) expansive clay with a non-expansive clay covered with a scaled concrete facing; (iv) a model slope that replaced top 2m expansive clay with a non-expansive clay covered with scaled concrete facing. Scaled miniature geo-grids were also installed for slope stabilization. As shown in the figure, three Linear Variable Differential Transformers (LVDTs) were installed on the surface of each model slope to measure surface settlements at the crest, the berm and the toe of each model slope. Seven earth pressure cells (PCs) were installed at the lower slope of each model to monitor changes of total stress resulting from variations of water level in the canal. Various pore pressure transducers (PPTs) were also embedded in each model slope to measure pore water pressure changes at different locations of the slope. Slope deformations were captured by using the particle image velocimetry (PIV) technique and close-range photogrammetry developed by White et al. (2003) originally. In addition, strain gauges were used for measuring tensile stresses developed in the geogrids. To control water levels in the canal properly, two water tanks were connected to the model package.

Centrifuge model test procedures and results

After each model preparation, the g-level in the centrifuge was accelerated to 70g for soil consolidation. Then, the water level at lower reach of the canal was raised up by 100mm (7m in prototype). After that, the water level at upper reach was raised up to the crest of the slope. The water levels were maintained for about 22-58 hours (model scale) to simulate the water storage condition of the canal of the MR. Subsequently, the water in the canal was drained away rapidly in 60 seconds (model scale) and the soil was allowed to consolidate again for another 15 hours (model scale). Finally, the g-level in the centrifuge was decelerated to 1g and the test was finished.

Message to ISSMGE Members (Continued)

Charles W.W. Ng, Appointed Board Member of ISSMGE

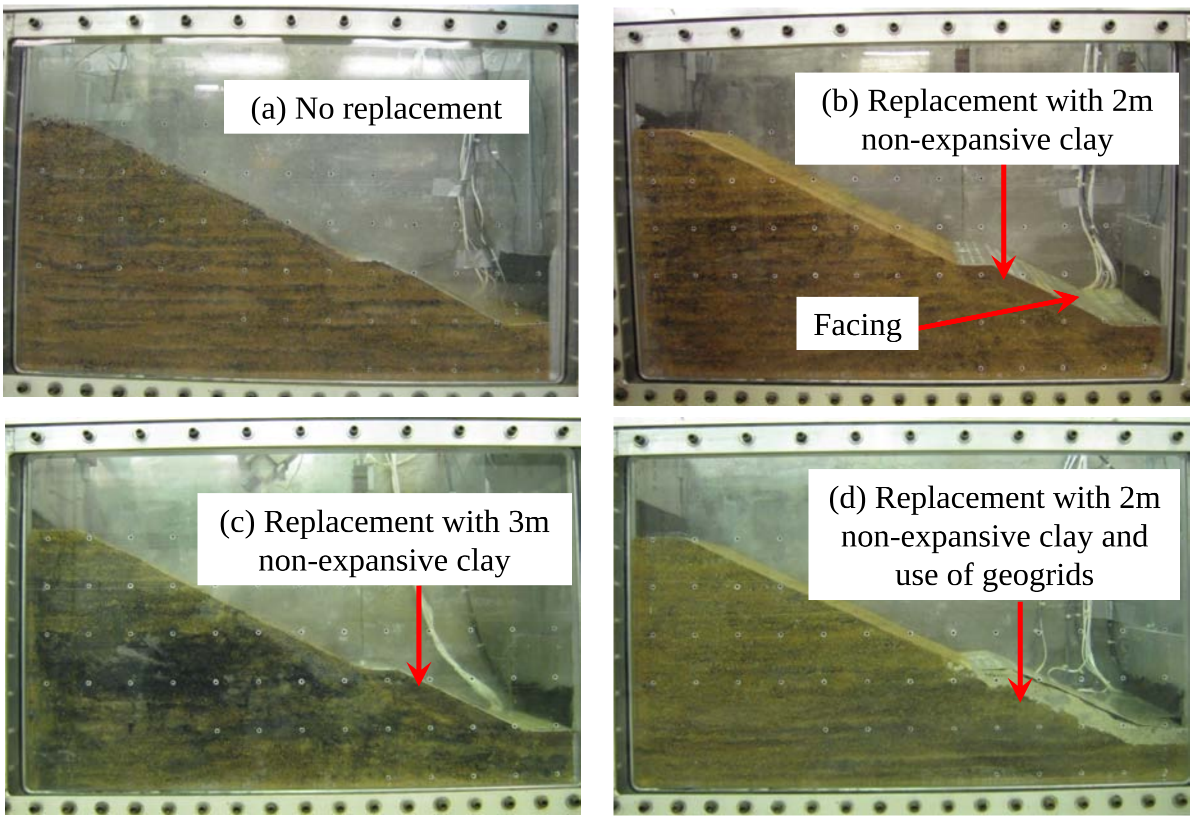

Figure 20 Four different model slopes after centrifuge tests (Ng & Zhou, 2009)

Figures 20 and 21 show the four model slopes and measured soil displacements captured by PIV after tests, respectively. No slope failure was observed for all four tests. It can be seen that the measured maximum displacements at the crest of the model expansive soil slope without replacement are larger than those of the other three treated slopes (see Figure 21). Besides, the measured increase of soil stress due to wetting in the two model slopes replaced by non-expansive compacted clay are smaller than that in the slope without clay replacement. Therefore, a replacement of expansive clay by non-expansive compacted clay is beneficial to slope stability. However, an increased thickness of replacement does not provide significant further beneficial effects. Although the deformation of the slope reinforced with geogrids is the smallest among the four tests, measured pore water pressures and soil stresses revealed that presence of geogrids may have created a preferential flow path for water seepage into the slope. This may be detrimental to the stability of an expansive soil slope.

Message to ISSMGE Members (Continued)

Charles W.W. Ng, Appointed Board Member of ISSMGE

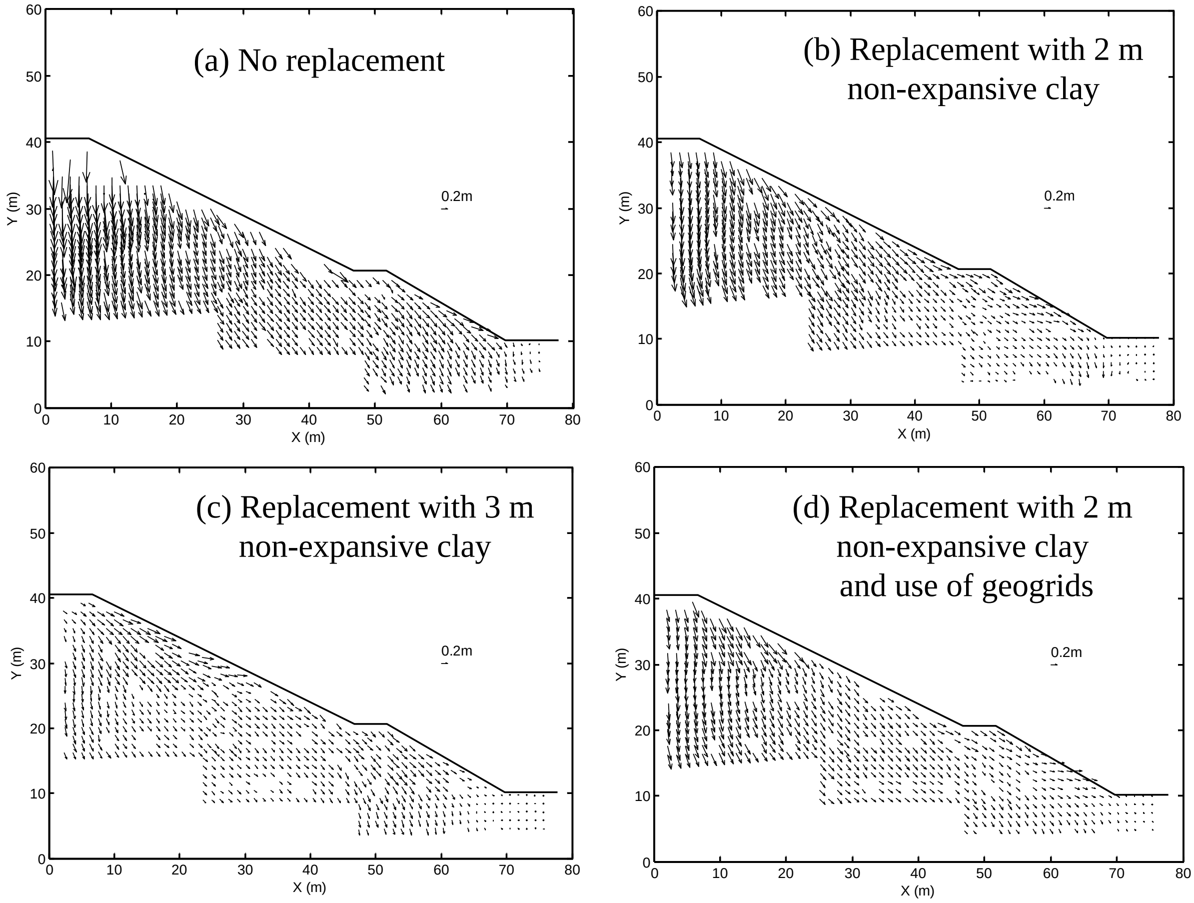

Figure 21 Measured displacement vectors in four different model slopes in centrifuge (Ng & Zhou, 2009)

B6. Conclusions

Based on theoretical design calculations (not discussed in this bulletin due to page limits), results of physical model tests at 1g and in centrifuge, and comprehensive field trials in expansive soil and soft rock slopes, it was decided to use a concrete facing together with 1 to 3m soil replacement with compacted non-expansive clay (if it is available locally). The thickness of soil replacement adopted depends on the expansibility (or swelling index) of natural expansive soil and soft rock along the MR. The designed soil slope angles (ratios) are typically 1:2.0 and 1:2.5. Geogrids are not adopted mainly because of their relatively high costs and complex construction procedures but they do not appear to offer distinctively improved stability. If non-expansive soil is not available locally for replacement, local weakly expansive soil is mixed with 3 to 4% of cement by mass for replacement. It is expected that the entire MR will be completed in 2014.

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Message to ISSMGE Members (Continued)
Charles W.W. Ng, Appointed Board Member of ISSMGE

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MESSAGES FROM ISSMGE PRESIDENT
Professor J-L. Briaud

ISSMGE President 760 days progress report

Distinguished Colleagues, Dear Friends,

This is my twenty fifth progress report after 760 days as your President. Note that previous reports are on the ISSMGE web site (http://www.issmge.org/) under "From the President" if you need them. In this report, I would like to talk to you about our upcoming webinar, a thank you on music feedback, and the results of our Council meeting in Toronto.

Webinars: We continue our successful series of webinars. The October webinar on Intelligent Compaction by Antonio Correia and George Chang was another resounding success with 56 computers connected worldwide. The next webinar will be on the geotechnical engineering code Eurocode 7 entitled "Eurocode 7 – past, present, and future" by Andrew Bond, current Chair of the Geotechnical Engineering Eurocode Committee. The webinar is scheduled for 19 Dec 2011. Please contact Hanna Prichard, my assistant, at hprichard@civil.tamu.edu if you wish to receive more information as we get closer to the date. The webinar will be $200 per computer connected (if we can solve the on line payment problem!), so find a big screen computer and get many people in the room to decrease the cost per person. We are in negotiations with 3 more speakers for the Feb, April, and June 2012 webinars. More news on this later.

Music progress report: I have received many heartwarming emails in response to my last progress reports about my love for music. Thank you so much for sharing with me your favorites, I added all of them to my collection.

Council meeting results: We had a very successful meeting of the ISSMGE Council in Toronto on 2 Oct 2011. 26 member societies were present and came with an additional 37 proxy votes. I want to thank Neil Taylor and Paloma Peers for an excellent preparation of the agenda and the detailed process, a daunting task indeed. Our Canadian hosts were impeccable as usual. Among the important issues covered, we heard regional reports from our Vice Presidents (Samuel Ejezie-Africa, Askar Zhussupbekov-Asia, Michael Davies-Australasia, Ivan Vanicek-Europe, Gabriel Auvinet-North America, and Roberto Terzariol-South America), then we heard progress reports from the Chairs of the Board Level Committees (Suzanne Lacasse-Technical Oversight, Dimitris Zekkos-Innovations and Development, Jean-Louis Briaud-member of the Students and Young Member Presidential Group, Jean-Louis Briaud-Vice Chair of the Corporate Associates Presidential Group, Charles Ng-Board liaison of the Awards Committee) as well as Ikuo Towhata on publication of Bulletin. We also heard reports on FedIGS and the ISSMGE Foundation.

Votes were taken on 4 proposals. For Israel moving to the Europe region, the vote was 52 yes, 5 no, 6 abstain. For the amendment to bylaws regarding audited financial statements, the vote was 60 yes, 1 no, 2 abstain. For changing the name of our quadrennial conference to World Conference on Soil Mechanics and Geotechnical Engineering, the vote was 25 yes, 35 no, 3 abstain. For changing the name of our society to International Society for Geotechnical Engineering, the vote was 23 yes, 39 no, 1 abstain. We had a wonderful and professional discussion on this topic which brought out the passion all of us have for our profession. One of my goals during my presidency has been to engage the membership, I believe this topic definitely contributed to that. Thank you all for a meaningful debate.

After that the budget was presented by Neil Taylor and Michael Davies (ISSMGE Treasurer) and approved by Council. Roger Frank gave us an update on our 2013 quadrennial conference in Paris 1-6 Sept 2013; the French organizing committee is doing a remarkable job and this is going to be one of the best conferences in years; I hope that all of you plan to attend. If you have cash flow problems to come to the conference in Paris in 2013, do not forget that you can ask for some help from the ISSMGE Foundation. At the end of the Council meeting, Jana Frankovska (our friendly President of the Czech and Slovak Society) and I sang the new ISSMGE song and the Council members joined in. Jana promised me that she would sing again in

MESSAGES FROM ISSMGE PRESIDENT (Continued) Professor J-L. Briaud

Paris at the end of the Council meeting on 1 Sept 2013. You will all get the song ahead of that Council meeting with the words and the music so you can prepare to sing along.

Best wishes and please relay this message to your members.

Jean-Louis BRIAUD
President of ISSMGE
International Society for Soil Mechanics and Geotechnical Engineering

ISSMGE President 790 days progress report

Distinguished Colleagues, Dear Friends,

This is my twenty sixth progress report after 790 days as your President. Note that previous reports are on the ISSMGE web site (http://www.issmge.org/) under "From the President" if you need them. In this report, I would like to talk to you about our upcoming webinars, about Corporate Associates, and about the ISSMGE song.

December 2011 Webinar on Eurocode 7: the next webinar will be free again! While we have made some progress on organizing the on line payment system, we are not there yet. I never thought that it would be that complicated in this day and age to get this sort of things organized. The next webinar is set for 19 December 2011 at UTC 3pm or 15h00 on another exciting geotechnical engineering topic: Eurocode 7. The speaker will be Dr. Andrew Bond (U.K.), chair of the Eurocode 7 committee. As you know the issue of whether geotechnical engineering should be codified or not has been a hot issue for a long time. Some say that codes stifle engineering judgment, something so important in our field. Others say that codes help raise quality and decrease risk. Which is it? Find out how Eurocode 7 has addressed these important issues by attending our next ISSMGE webinar. To register, go to https://issmge.webex.com/issmge/k2/j.php?ED=3138412&UID=0&HMAC=246ac71d98814637501b8728b3006c107270da35&RT=MiM3

February 2012 Webinar on Risk: the February webinar is on a topic that I really enjoy: Risk and Geotechnical Engineering. Professor Medina (USA) and Dr. Uzielli (Italy) will join forces to present this 90-minute webinar as a contribution from the TC on Risk Assessment and Risk Management chaired by Professor Phoon (Singapore). I share with you the following statistics on death as an indication of the probability of failure that we tolerate.

Activity	Probability of death
Heart disease	0.25
Cancer	0.23
Stroke	0.036
Car	0.012
Suicide	0.009
Fire	0.0009
Airplane	0.0002
Bicycle	0.0002
Lightening	0.00001
Earthquake	0.000009
Flood	0.000007

MESSAGES FROM ISSMGE PRESIDENT (Continued)
Professor J-L. Briaud

Corporate Associates Recruiting: Corporate Associates are companies in our field which are "associate members" of ISSMGE. The number of ISSMGE Corporate Associates is much smaller than the number for our sister societies. I noticed that a while back and created the Corporate Associates Presidential Group (CAPG) to find out how we could attract more CAs. We are making progress thanks to Michael Lisyuk (Russia), Chair of CAPG, Harry Poulos (Australia), Chair of the membership committee (MPAC), Luiz-Guilherme DeMello (Brazil), Vice chair of MPAC, and many of you working behind the scene. Thanks to you we have moved from about 20 CAs in 2009 to about 30 in 2011. My goal is to reach 50 by the end of my term in 2013. I attach a slide I show at all conferences that I attend. If your company's name is on that slide, I thank you for your contribution to our profession and I urge you to speak up to impact the future of ISSMGE. If your company's name is not on that slide, please contact me to learn more about the benefits of becoming a CA and joining the professional family.

ISSMGE Song: I mentioned in my last progress report that Jana Frankovska (President of the Czech and Slovak Society) composed a song that she proposed as the ISSMGE song. I attach the sheet music for the song and we have uploaded a recording of the song by Jana's sister in law on YouTube at http://www.youtube.com/watch?v=ga82VfjN8dg. For many of you it is a festive season and a good occasion to be with your family and sing a song: so here is your chance to practice.

MESSAGES FROM ISSMGE PRESIDENT (Continued)
Professor J-L. Briaud

Jana Frankovská

Best wishes and season's greetings.

Jean-Louis BRIAUD
President of ISSMGE
International Society for Soil Mechanics and Geotechnical Engineering

FROM ISSMGE FOUNDATION

2010-2011 REPORT

1 PURPOSE OF FOUNDATION

The Foundation of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) was created to provide financial help to geotechnical engineers throughout the world who wish to further their geotechnical engineering knowledge and enhance their practice through various activities. These activities include attending conferences, participating in continuing education events, purchasing geotechnical reference books and manuals. The financial assistance is in the form of a grant which the successful applicant can use to pay registration costs, and travel and accommodation expenses. Only applications from current members of ISSMGE are considered.

2 FOUNDATION FUNDING

Funding for the ISSMGE Foundation will be generated from companies and individuals who care about the well-being of less fortunate geotechnical engineers in the world. The funding levels are as follows:

- Diamond: $50,000 and above
- Platinum: $25,000 to $49,999
- Gold: $10,000 to $24,999
- Silver: $1000 to $9,999
- Bronze: $0 to $999

The names of the donors are recognized with the corresponding levels on the ISSMGE web site under the page dedicated to the ISSMGE Foundation (http://www.issmge.org/web/page.aspx?refid=563), and in the ISSMGE Bulletin on the page dedicated to the ISSMGE Foundation (http://www.issmge.org/web/page.aspx?refid=430). They will also be recognized at future International Conferences on Soil Mechanics and Geotechnical Engineering. To date, a total of US$ 121,401 has been contributed by 14 organizations and individuals. The names of the Donors are given below.

LIST OF DONORS TO ISSMGE FOUNDATION (As of December 2011)

Individuals

Mrs & Professor J-L. Briaud (Platinum)
Professor J. Schmertmann (Silver)
Professor I. Towhata (Silver)
Professor M. Tumay (Bronze)
Professor A. Puppala (Bronze)

Organizations

ISSMGE (Diamond)
ASCE-Geo-Institute (Gold)
Japanese Geotechnical Society (Gold)
International IGM-Dr. Marc Ballouz (Gold)
Korean Geotechnical Society (Silver)
California Geotechnical Engineers Association (Silver)
Yonsei University (Silver)
Deep Foundations Institute (Silver)
Nagadi Consultants (Bronze)

FROM ISSMGE FOUNDATION (Continued)

2010-2011 REPORT

3 PROCEDURE FOR AWARDING GRANTS

The following procedure has been developed to assess applications for ISSMGE Foundation grants:

a. Applications can be submitted twice yearly (by January 1st and July 1st), on a standard form, to the Secretary General of ISSMGE;
b. These applications are then sent to the Chair of the ISSMGE Membership, Practitioner, and Academicians Committee (MPAC). Currently this is Dr. Harry Poulos, Australia.
c. The Chair, in conjunction with the President of ISSMGE, will assess the applications on the basis of the following criteria:
   1. Demonstration of need;
   2. Quality of the activity;
   3. Cost-sharing;
   4. Potential impact of the activity on the career progress of the individual and of his or her Member Society.
d. Decisions are made and communicated by February 1st and August 1st;
e. After the successful applicant has completed his/her nominated activity, they provide a written report to the Chair of MPAC stating the benefits that they and their Society have gained from the award of the grant. This report will be published in the ISSMGE Bulletin.

4 AWARDS TO DATE

To date, a total of 7 grants have been awarded, as set out below:

Imen Said ep Graiet	Tunisia	**$233.29**	VI International Congress on Environmental Geotechnics, New Delhi, India November 2010	ISSMGE Bulletin Vol. 4. Issue 4, Dec. 2010, p.12
JL Ayala Torres	Chile	**$165.11**	V International Conference on Earthquake Geotechnical Engineering, Santiago de Chile, Chile January 2011	Vol. 5. Issue 1, Feb. 2011, p. 28, 29, &30
PA Gacitua Carcamo	Chile	**$165.11**		
MA Jara Ortiz	Chile	**$165.11**		
Dr Nadeej Hansaraj Priyankara	Sri Lanka	**$446.94**	XIV Asian Regional Conference, Hong Kong, May 2011	Vol. 5, Issue 3, June 2011, p. 17
GJ Quevedo Sotolongo	Cuba	**$570.89**	XIV Panamerican Conference /Council Meeting, Toronto, Canada, October 2011	Vol. 5, Issue 6, December 2011, p.28, 29, &30
Y Gonzalez Haramboure	Cuba	**$570.89**		

The reports of the awardees have appeared in issues of the ISSMGE Bulletin. They are available from the ISSMGE website at:
http://www.issmge.org/web/page.aspx?refid=739.

FROM ISSMGE FOUNDATION (Continued)

2010-2011 REPORT

5 IMPACT OF ISSMGE FOUNDATION

While it is still early days, it seems clear that the financial assistance provided by the ISSMGE Foundation has already started to have a very positive impact on the individuals receiving the grants and also on their Member Societies. In particular, the last two awards have the potential to influence the formation of a new Member Society in Cuba. Thus, the ISSMGE Foundation is already fulfilling its objectives.

5icege, Santiago of Chile, 2011.
Mauricio Jara Ortiz, PA Gacitua Carcamo, and JL Ayala Torres.
Civil Engineers- Master's students in Geotechnical Engineering.
Catholic University of Concepción.

Celebration of the 75th ISSMGE anniversary (November 8th, New Delhi during 6ICEG) Presentation of the Future of ISSMGE by Dr Imen SAID

2011 Pan Am CGS Geotechnical Conference in Toronto, Canada where the ISSMGE Council Meeting and the Pan-American Committee Meetings were important events for member societies, like Cuba, to exchange news & information, & enabling planning for future projects.

Working lunch at the 2011 Pan Am CGS Geotechnical Conference, 3rd October 2011 – Delegates from Cuba having the opportunity to work with other delegates from Argentina and Venezuela

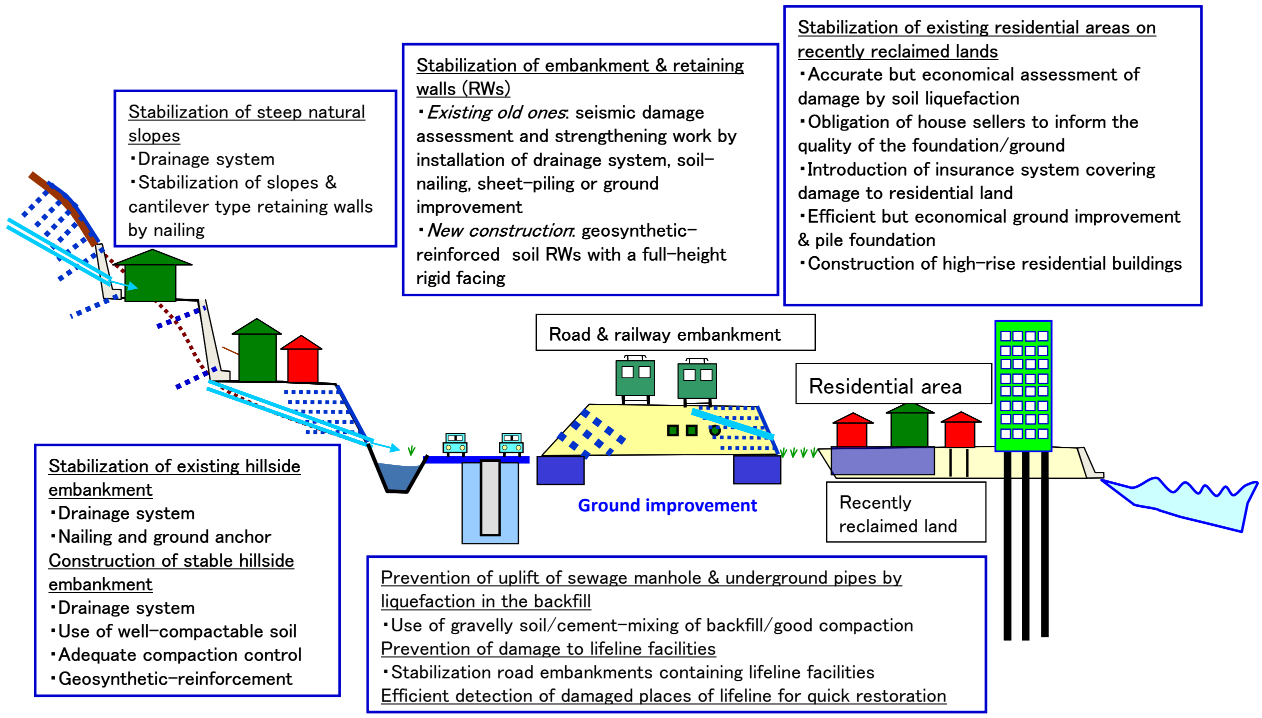
NEWS FROM MEMBER SOCIETY

The Japanese Geotechnical Society has published "Geo-hazards During Earthquakes and Mitigation Measures -Lessons and Recommendations from the 2011 Great East Japan Earthquake-". It covers the following contents and can be downloaded from:

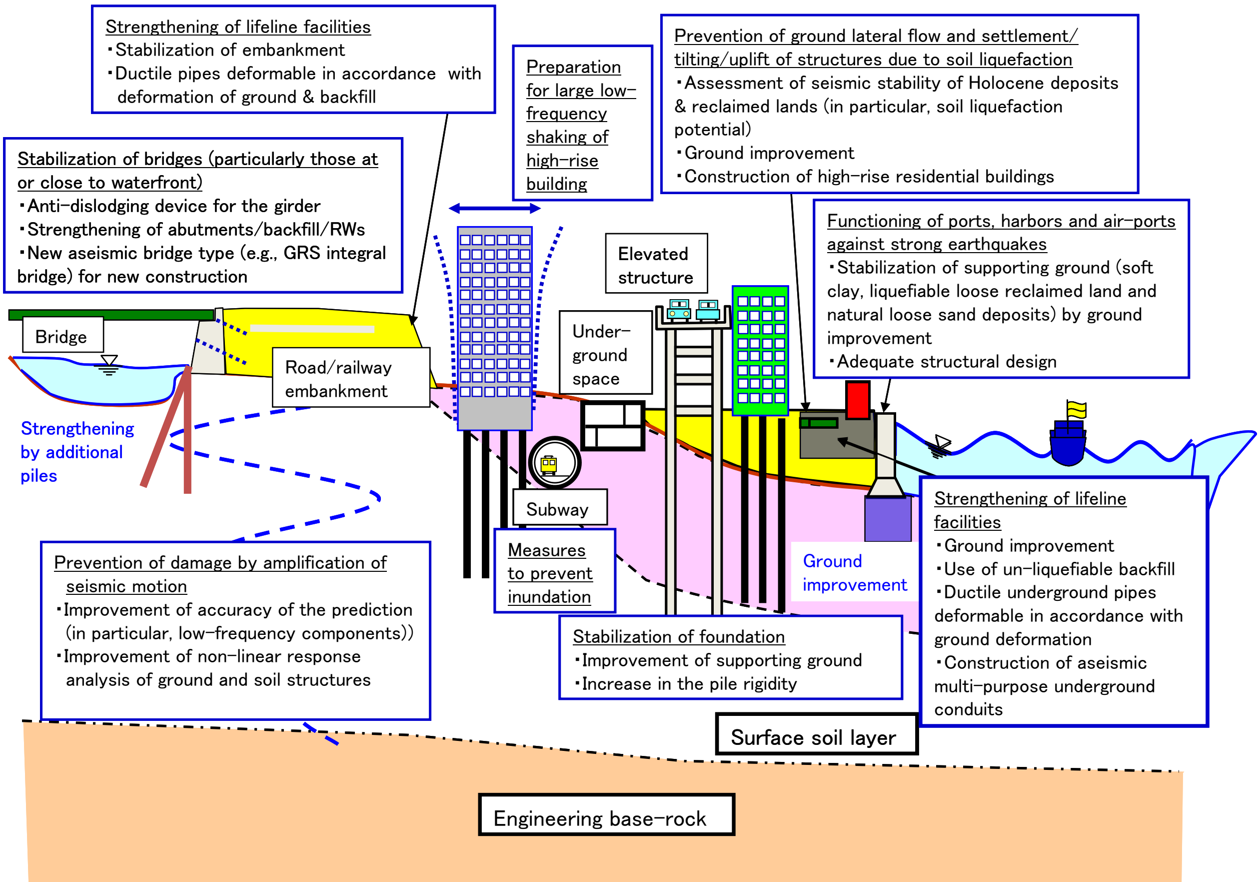
http://www.jiban.or.jp/e/disaster-survey-information-of-2011-tohoku-earthquake-2/

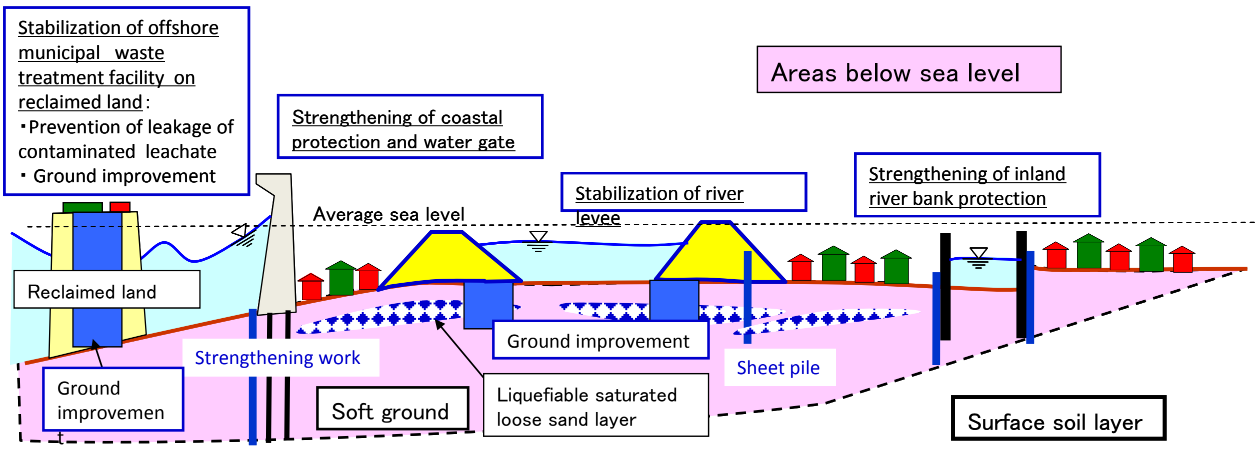
1. Introduction
2. Impact of the 2011 Great East Japan Earthquake
3. Characteristics of Geo-hazards, Issues Arising and Recommendations
4. Issues for Future Examination and Research

Application of various geotechnical technologies, as typically illustrated blow, are proposed to prevent and reduce geo-disasters.



NEWS FROM MEMBER SOCIETY (Continued)



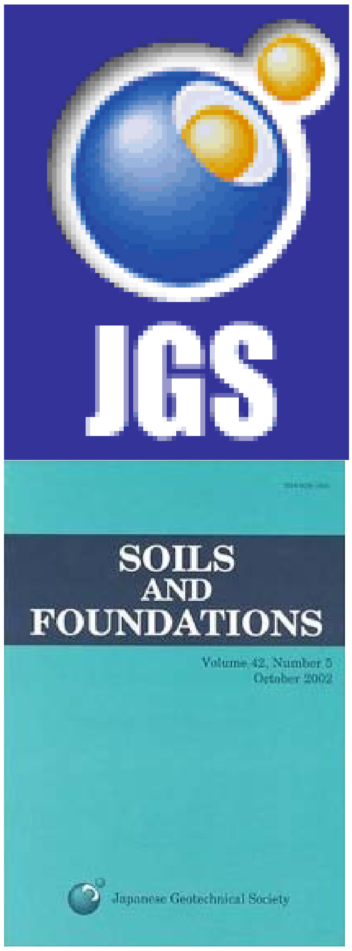


Stabilization and strengthening of coastal & inland river bank protections, river levees and water gates.

・Reliable assessment of seismic risk, including the evaluation of the risk of soil liquefaction and associated lateral ground flow
・Level up of the crest of river levees, inland river bank protections and coastal protection (including coastal dikes)
・Strengthening of the foundation by sheet piling or installing additional piles
・Ground improvement by chemical injection or compaction or cement-mixing

NOTICE FROM MEMBER SOCIETY

Soils and Foundations Available Online at ScienceDirect in 2012



The Japanese Geotechnical Society will be publishing its journal, Soils and Foundations, online from the February 2012 issue in partnership with Elsevier to reach a wider international audience via the market-leading, electronic platform ScienceDirect, which currently has more than 15 million users worldwide. In order to maintain print subscribers, online one year delayed 'open access' availability of Soils and Foundations is possible via ScienceDirect, with immediate links to/from other articles in ScienceDirect and on other platforms. Articles of Soils and Foundations will be also covered in Scopus. In the October issue in 2012, Soils and Foundations will publish the Special Issue on the Great East Japan Earthquake and this issue is free to access from the world.

Soils and Foundations is a bi-monthly journal which covers the entire field of geotechnical engineering, including related disciplines. With Volume 1, issue No.1 in print in 1960, Soils and Foundations celebrated its 50th anniversary in 2010. This journal publishes research papers, reports of important engineering experiences, state-of-the-art reports and discussions on important themes. A concerted effort is made by the editorial board members to maintain the high quality of the journal by reviewing manuscripts in a careful and fair manner. Special attention, therefore, is paid to the novelty of each submission and how the readers will benefit from reading it, as well as to the practical applicability of the content. In addition, the editorial board is happy to provide advice to the authors of manuscripts to help them improve the quality of their submissions. One of the benefits to non-English-speaking authors is that the English in all the accepted manuscripts is improved by a native English speaker who works on technical papers in the field. Authors of the outstanding papers in this journal are entitled to apply for academic awards made by the Japanese Geotechnical Society. No publication fee applies up to a specified number of pages.

Soils and Foundations is abstracted and indexed in various services, including the following:
Science Citation Index-Expanded; Current Contents/Engineering, Computing and Technology; International Civil Engineering Abstract; Earthquake Engineering Abstracts; CiNii and J-STAGE.

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We will provide a dedicated webpage on Elsevier.com, providing links to all relevant information related to the Journal, such as the Soils and Foundations homepage and Journal archive, the Guide for Authors, and the Elsevier Editorial System (example in Fig. 1).

NOTICE FROM MEMBER SOCIETY (Continued)

Soils and Foundations Available Online at ScienceDirect in 2012

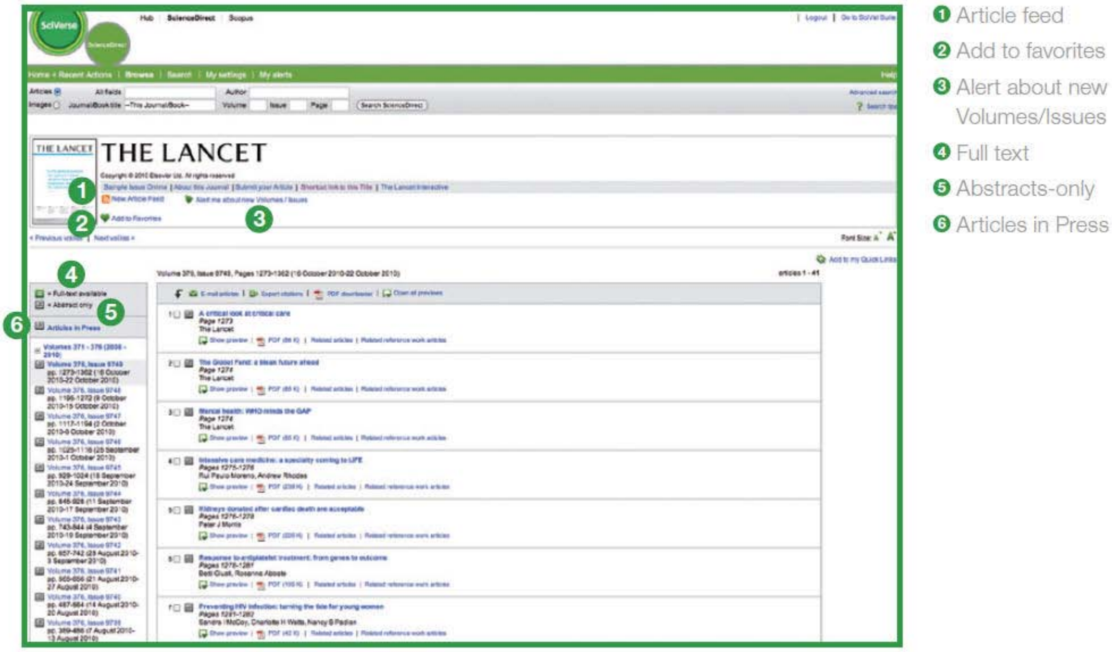


Fig. 1: Example of one of journal's top page

Elsevier has developed and customized a software system ("Elsevier Editorial System" - EES) for the use of our editorial offices which offers an integrated solution for workflow management and electronic peer review. The system is based on *Editorial Manager*, designed by Aries Systems Inc, and it ensures both standardization and portability. The system is currently being used by more than 1,300 Elsevier journals, with exceptional stability and uptime.

The system comprises a suite of customizable manuscript tracking and reporting tools for the submission and peer-review processes. It supports the following aspects of the editorial process:

- On-line commissioning of reviews and commentaries by the Editors
- On-line submission by authors to the journal
- Referee database for Editors
- On-line refereeing
- Tracking of all stages of commissioning and peer-review
- Automatic handover of accepted manuscript files to Elsevier
- Free access from within EES to Scopus, the largest abstract and citation database of peer-reviewed literature and quality web sources.

We sincerely would like to welcome and encourage you to submit your manuscripts to *Soils and Foundations*; website: http://www.jiban.or.jp/e/soils-and-foundations/ for details of submission and subscription information.

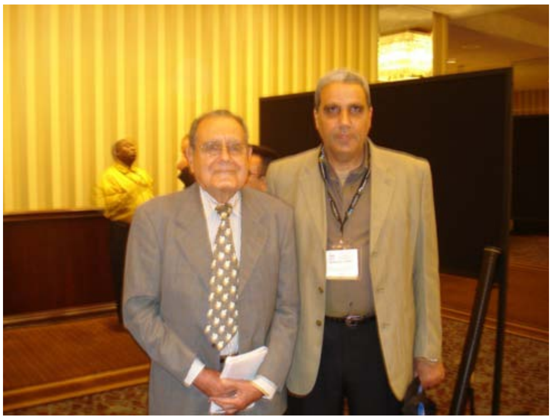
Akira Murakami
Professor of Kyoto University
Editor, Soils and Foundations

REPORT ON CONFERENCE ATTENDANCE

Recently two Cuban delegates were supported financially by ISSMGE Foundation to attend the Pan-American Conference on Soil Mechanics and Geotechnical Engineering that took place in Toronto, Canada, in early October. Two reports were submitted by those Cuban delegates to the Council meeting, and are published in what follows.

First report

Gilberto Quevedo Sotolongo
Universidad Central "Marta Abreu" de las Villas, Cuba, CTNMSIG member.



The Pan-American Conference on Soil Mechanics and Geotechnical Engineering was an excellent experience. From the original call for papers, the launch of the website, the paper selection process and referee system to the actual conference itself, all were organized with meticulous attention to detail. As far as the technical content is concerned, the presentations were organized according to themes, and within each session the four presentations were even more closely linked, enabling meaningful discussion, and allowing better networking opportunities between researchers with similar interests. I should also highlight the keynote lectures: these were on cutting edge topics delivered by world class experts.

The ISSMGE Council Meeting and the Pan-American Committee Meeting were also held at the time of the Conference. These are two important events for member societies to exchange news and information, and enabling planning for future projects.

The conference was very well complemented by a selection of social activities which encouraged interaction between participating colleagues in a less academic environment.

REPORT ON CONFERENCE ATTENDANCE (Continued)

Second Report

Yoermes González Haramboure
MSc. Ing. Secretary of the CTNMSIG from Cuba.

October 2, 2011: The Cuban delegates attended the ISSMGE Council Meeting. That day, the South and North American delegates held a working lunch, and discussed the creation of the Latin-American Journal for Geotechnics in Spanish, the venue of the next Pan-American Committee Meeting, and the venue of the next Pan-American Conference. At the meeting, the Cuban delegates reported on the recent journals that ISSMGE sent to Cuba, and on upcoming events of the National Committee in Cuba.

October 3, 2011: The Cuban delegates attended the Plenary and Technical Sessions ED1, ED2, ED3, US1, US2 and US3. On that day, the Cuban delegates had a working lunch with delegates from Argentina and Venezuela, at which they discussed the curricula of Geotechnical disciplines at their respective Universities.

October 4, 2011: The Cuban delegates attended Plenary and Technical Sessions ED4, HY1, DF1, DF2, DF3 and SF1.In the afternoon, the Cuban delegates took part in the Pan-American Societies Committee Meeting at which they discussed the amendments to the agreement for the Pan-American Conferences. At this Meeting, the members of the Pan-American Societies approved Buenos Aires as the venue for the next Pan-American Conference in October 2015.

October 5, 2011: The Cuban delegates attended Plenary and Technical Sessions DF4, DF5 and DF6, and the Special Session of Teaching and Learning of Geotechnical Engineering in the American Continent. Finally, the Cuban delegates attended the Closing Ceremony.

Photographs from Conference:

Working lunch, 2nd October 2011

REPORT ON CONFERENCE ATTENDANCE (Continued)

Working lunch, 3rd October 2011 – Delegates from Cuba, Argentina and Venezuela

Prof. Morgenstern – ISSMGE 75th Anniversary Luncheon

NEWS FROM TC 211 GROUND IMPROVEMENT

TC 211 on ground improvement is chaired by Dr. Serge Varaksin and Prof. Jan Maertens, while its secretary is Ir. Noel Huybrechts. This TC has been publishing newsletters periodically. The present article was made from the latest issue of its newsletter.

SIMSG ISSMGE TC 211

1 IS-GI Brussels 2012

1.1 Organizing Committee

After the first meeting in Lille (France) on 11 May 2011, other meetings of the Organizing Committee took place in Brussels on 17 June, 29 September and 7 December. So the Organizing Committee is working very hard to offer you all a very well organized symposium in Brussels next year. What is shown below is a picture taken during the last meeting on the 7th of December.

On-line registration has been possible since the beginning of November 2011. The deadline for early-bird registration is 15 January 2012! All the information is available at the symposium website: www.bbri.be/go/IS-GI-2012.

Photo 1 Organizing committee meeting

1.2 Sponsoring

The Organizing Committee acknowledges the support of 17 companies, subdivided as follows:

6 Platinum Sponsors, 9 Gold Sponsors, and 2 Silver Sponsors.

It has been decided to limit the number of Platinum Sponsors to 6. So actually additional sponsoring is only possible for Gold and Silver. Sponsoring conditions can be found on the symposium website: www.bbri.be/go/IS-GI-2012.

NEWS FROM TC 211 GROUND IMPROVEMENT (Continued)

2 Short Courses

Short courses are planned at the same time as the symposium. The programs for the 3 short courses on Wednesday 30th of May have been finalized and are given below. Please note that the program may be subject to minor changes. Participants will be informed accordingly.

The proceedings of the short courses will contain the power-point presentations. Participants to the short courses will only receive the proceedings of the Short Course they are attending.

SC 1: MARINE GROUND IMPROVEMENT

Coordinators:
M. Van Den Broeck, DEME, Belgium
S. Bretelle, GHD, Australia
Ph. Liausu, MÉNARD, France

PROGRAMME

09h30 – 10h00	: General Overview of Ground Improvement methods, *P. Mengé, DEME, Belgium*
10h00 – 10h30	: Overview of major geotechnical concerns, *M. Van Den Broeck, DEME, Belgium*
10h30 – 11h00	: Site investigations for Marine Ground Improvement, *S. Bretelle, GHD, Australia*
11h30 – 12h00	: Dynamic compaction and replacement, *Ph. Liausu, Ménard, France*
12h00 – 12h30	: Vibroflotation, *S. Lambert, Keller France*
12h30 – 13h00	: Rapid Impact Compaction, *J. Dykstra, COFRA, The Netherlands*
14h00 – 14h30	: Consolidation PVD, *I. Chu, Iowa State University , USA-Singapore*
14h30 – 15h00	: Vacuumconsolidation, *B. Indraratna, University of Wollongong, Australia*
15h00 – 15h30	: Soft Soil Improvement, *M. Van Den Broeck, DEME, Belgium*
16h00 – 16h30	: Reuse of dredged material, Project AMORAS
16h30 – 17h30	: Case studies, *P. Mengé and M. Van Den Broeck, DEME, Belgium*
17h40 – 17h55	: Discussion
18h00 – 20h00	: Reception

During the presentations special attention will be given to the specific issues for underwater ground improvement design and to monitoring and quality control (constraints and practical solutions).

NEWS FROM TC 211 GROUND IMPROVEMENT (Continued)

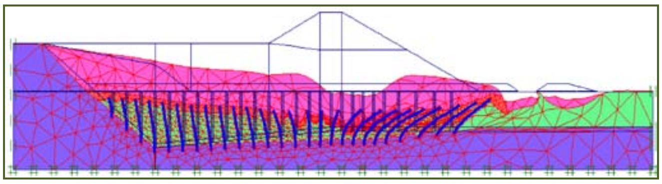
SC 2 : DEEP MIXING	***Coordinators:***
	*J. Maertens, Jan Maertens BVBA & KU Leuven, Belgium* *N. Denies and N. Huybrechts, Belgian Building Research Institute, Belgium*

PROGRAMME

09h30 – 10h15	: General Overview, *A. Puppala , University of Texas, USA*
10h15 – 11h00	: Deep Mixing in contamined soils, *A. Al-Tabbaa, Cambridge University*
11h30 – 12h30	: Deep Mixing Equipment: Bauer, *Germany* Solétanche Bachy, *France* Liebherr, *D. Quasthoff, Germany*
12h30 – 13h00	: Discussion
14h00 – 14h45	: Deep Mixing Research Belgian Building research Institute, *N. Denies*
14h45 – 15h05	: Deep Mixing Research KU Leuven, *A. Vervoort*
15h05 – 15h25	: Deep Mixing research Ghent University, *D Verastegui*
15h25 – 15h40	: Discussion
16h10 – 16h40	: Deep Mixing Design, *G. Filz, Virginia Tech, USA*
16h40 – 17h10	: Deep Mixing Monitoring, *Noel Huybrechts, BBRI, Belgium*
17h10 – 17h40	: Case study, *E. Leemans, ABEF & Soiltech, Belgium*
17h40 – 17h55	: Discussion
18h00 – 20h00	: Reception

NEWS FROM TC 211 GROUND IMPROVEMENT (Continued)

SC3: RIGID INCLUSIONS AND SOIL REINFORCEMENT



Coordinators:
T. Durgunoglu, Zetas Zemin Teknolojisi A.A., Turkey,
B. Simon, TERRASOL, France
J. Sankey, The Reinforced Earth Company, USA

PROGRAMME

RIGID INCLUSIONS

09h30 – 10h00 : Lessons from centrifuge model tests on piled embankments and foundation over soil reinforced by inclusions, *L. Thorel, IFSTTar , France*
10h00 – 10h45 : Piled embankments reinforced with Geosynthetics : model experiments and analytical model developments, *S. Van Eekelen, Deltares,The Netherlands*

11h00 – 11h30 : US practice in Load Transfer Platform design : Lessons learned, *M. Walker, GEI consultants, USA*
11h30 – 12h05 : A review of the ASIRI research project findings about behaviour and design of foundations on soil reinforced by rigid inclusions, *B. Simon, Terrasol, France*
12h05 – 12h20 : Design of spread footing on soil reinforced by rigid inclusions, *B. Simon Terrasol, France*
12h20 – 12h55 : Design of slabs on grade supported with reinforced soil by rigid inclusions and Design assessment of limiting pressure at head of inclusions, *J. Racinais, Ménard, France*

REINFORCED SOIL

14h00 – 14h45 : Introduction to Mechanically Stabilized Earth (MSE) Wall Technology, *J. Sankey, the Reinforced Earth Company, USA*
14h45 – 15h30 : Review of Inextensible and Extensible MSE Reinforcement Applications, *J. Wynn, Consultant, UK*
15h30 – 15h45 : Discussion

16h15 – 17h00 : Application of Local Country Codes for MSE Wall Design, *N. Freitag, Terre Armée, France*
17h00 – 17h45 : Combined MSE Wall Applications with Ground Improvement Technologies, *T. Durgunoglu, Zetas Zemin Teknolojisi A.S., Turkey*
17h45 – 18h00 : Discussion

18h00 – 20h00 : Reception

NEWS FROM TC 211 GROUND IMPROVEMENT (Continued)

3 Other TC 211 related events

Through committee members, TC 211 has received information on the following events:

- International Conference on Ground Improvement and Ground Control – Transport Infrastructure Development and Natural Hazard Mitigation, ICGI Wollongong 2012, 30 October – 2 November 2012, www.icgiwollongong.com. This Conference, on the Antipodes of Brusseles conference, is co-sponsored by the TC 211, and belongs to the core activity of the TC 211. Ideas and suggestions will soon be requested from all participants in the preparation of the S.O.A. report attributed to TC211.

- Technical Session "Behavior and characterization of cemented and stabilized soils" at GeoCongress 2012 in March 2012, Ramiro.VerasteguiFlores@UGent.be

4 Next Newsletter:

We will try to include in the next newsletter a list with recent references to publications and internet sites concerning the themes given in the terms of reference. Please transmit all available information to the secretary Noël Huybrechts, noel.huybrechts@bbri.be
The next newsletter will be edited in March 2012.

We wish you all the best for 2012
and hope to see you next year
at the occasion of IS-GI Brussels 2012.

TECHNICAL ARTICLE

Improved coastal geotechnics with integrated marine seismic reflection and refraction geophysics: Case studies

R. J. Whiteley & S. B. Stewart, Coffey Geotechnics Pty. Ltd.

ABSTRACT

Strong world demand for energy, mineral and agricultural products and the advent of larger transport vessels is underpinning new construction and upgrades at many Asia-Pacific and Australian ports. Overwater geotechnical investigations are required at the feasibility and design stages of these projects, directed mainly at entrance channels, pipeline routes and supporting land-based facilities. These are costly and difficult when overwater drilling is involved due to the costs of jack-up rigs and barges and restricted drilling sites within busy waterways. Consequently, there is increasing reliance on marine geophysics to provide the necessary subsurface information, typically in water depths of less than 20 metres.

Since water is acoustically transparent, continuous seismic reflection profiling (CSP) using boomer, sparker or airgun sources has been applied to these projects for many years, despite its limitations in certain conditions. From a geotechnical perspective a more important problem is that it is very difficult to determine engineering properties from single channel marine CSP data as Australia's near shore marine environment is essentially a drowned continental land mass that has experienced a wide range of both terrestrial and coastal weathering and depositional processes over an extended geological time scale. These have created wide range of materials with very different geotechnical properties and behaviours that are not easily quantified with marine seismic reflection alone. Recently, single-ended, continuous underwater seismic refraction (CUSR) with near-bottom towed equipment and air-gun sources and static USR (SUSR) systems have been developed. These provide sub-bottom seismic P-wave velocities that can be correlated with engineering properties.

We present a series of case studies to demonstrate the application and integration of CSP, CUSR and static SUSR methods using advanced geophysical analysis processes to port infrastructure and near shore construction. In Victoria, combining conventional boomer CSP and CUSR improved the definition of a submerged, buried basalt flow and assisted dredging design along the Geelong Ports navigation channels. In East Malaysia, the same technologies assisted assessment of the viability of HDD (Horizontal Directional Drilling) as a pipeline installation option in variably weathered granites. In Western Australia, SUSR imaged the granitic regolith beneath sediments and indurated layers at a proposed new berthing where deep piling was required. This allowed preferred piling sites to be identified that minimised pile lengths.

USR technologies supported by advanced processing and analysis methods have demonstrated an ability to improve marine geotechnics in a diverse range of applications and will be increasingly applied in Australia's coastal waters.

1 INTRODUCTION

In recent years population growth and increasing commodities demand have driven major port, harbour and infrastructure developments. Typical projects involve deepening and widening of navigation channels, berth and nearshore construction and require geotechnical investigations at the feasibility and design stages. These are expensive and difficult when overwater drilling is involved due to the costs of jack-up rigs and barges and restricted drilling sites within busy ports and waterways. Consequently, there is increasing reliance on marine geophysics, integrated with geotechnics, to provide this subsurface information (Whiteley, 2002).

Since water is acoustically transparent at seismic frequencies, shallow reflection using boomer, sparker or airgun sources has enjoyed considerable application to marine exploration for many years (e.g. Mosher and Simpkins, 1999). Despite their widespread use these, so called continuous seismic profiling (CSP) techniques have limitations in certain conditions, for example, in shallow water where strong multiple reflections obscure deeper primary reflections and in areas of restricted water circulation and/or rapid sedimentation when shallow gas layers form (Bertin and Chaumillon, 2005).

TECHNICAL ARTICLE (Continued)

Improved coastal geotechnics with integrated marine seismic reflection and refraction geophysics: Case studies

Also Australia's near shore marine environment is essentially a drowned continental land mass that has experienced a wide range of both terrestrial and coastal weathering and depositional processes over an extended geological time scale (Johnson, 2005). These have created materials with very different geotechnical properties and behaviours that are not easily quantified with marine reflection and has led to the increased application of static and underwater seismic refraction (USR) technologies adapted to the marine environment as these provide seismic (P-wave) velocities that are more easily related to these properties (Whiteley 1983). For example, Table 1 provides a general correlation of geological materials with seismic velocity that is applicable to the Australian marine environment.

Table 1 General Correlation of Geological Material with Seismic Velocity in the Australian Marine Environment

Material	Seismic Velocity (km/s)
Gas-filled fine sediments	0.8-1.4
Silts and soft clays	1.5-1.7
Stiff clays	1.6-1.8
Loose to dense sands	1.6-1.8
Cemented sands	1.9-2.4
Loose gravels, cemented gravels	1.8-2.4
Younger limestone (reef)	2.2-3.5
Older limestone (reef)	2.5-6.0
Calcarenite, siliceous calcarenite	2.0-3.7
Boulders/broken rock in sand	1.9-4.0
Weathered sandstone/shale	1.9-2.5
Fresh sandstone/shale	2.7-4.3
Granite	4.3-5.8
Basalt	3.0-6.5
Metamorphics	3.0-7.0

The static USR method (SUSR) is identical to the land refraction method (Whiteley, 1994) except that bottom-placed hydrophones rather than geophones are used with either a bottom-laid or floating connecting cables and multiple offset, reversed, bottom-placed, seismic sources. A continuous USR system (CUSR) has been previously described by Anderson and Ringis (1999) and involves a near-bottom, towed hydrophone array and repeatable seismic source at a single constant-offset distance. In both cases the seismic source is an air-gun. To date much of the near shore CUSR data in WA and elsewhere around Australia has been collected with relatively short hydrophone arrays (< 50m) and a single near-array source as shown in Figure 1(a) and interpreted assuming a horizontal, plane-layered earth model with a uniform velocity in each layer and velocities increasing with depth. This is clearly inadequate where "hard" cap rock, quartzitic, cemented gravel or reef layers occur within sediments or on deeply weathered bedrock rock "highs". These are typically of limited lateral extent with a higher seismic velocity than the surrounding materials (Table 1) and represent the classic seismic velocity reversal (or inversion) problem that many engineers believe to be a key limitation of the seismic refraction method (Whiteley and Greenhalgh, 1979). In the marine environment this limitation can be often overcome and improved resolution in these conditions can be achieved employing a longer underwater seismic array (100m) and multiple offset sources (a minimum of two) as shown schematically in Figure 1(b) together with improved tomographic interpretation methods.

TECHNICAL ARTICLE (Continued)

Improved coastal geotechnics with integrated marine seismic reflection and refraction geophysics: Case studies

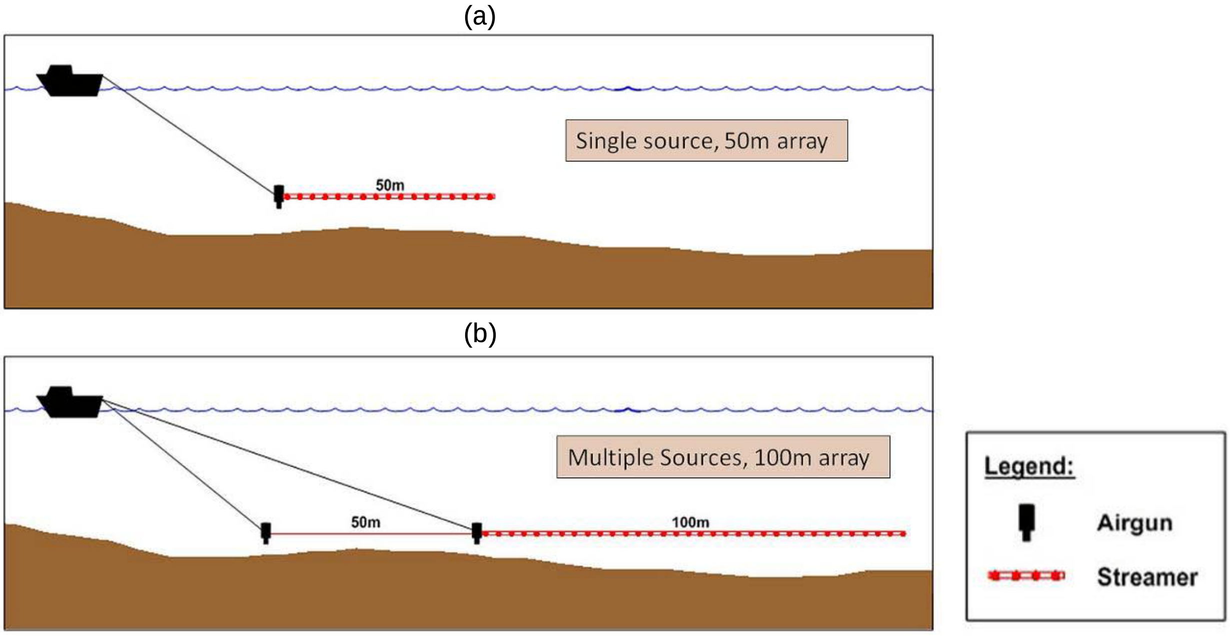


Figure 1 Schematic of single & multiple source CUSR systems

An example of the improvements that can be achieved with this approach is illustrated with multilayered synthetic model with typical seismic velocities containing a relatively thin high velocity "hard" patch or layer of limited lateral extent as shown in Figure 2(a). An actual field example from Western Australia is provided in Whiteley et al. (2010). Single- ended, CUSR first arrival times were computed through this model to a 50m source-receiver array with detectors at 2m intervals, a single source and a 10m source interval. This data was then interpreted using and the smoothed intercept-time interpretation method, that is in common use, as shown in Figure 2(b). This interpretation produces a more extensive high velocity region that has been migrated laterally in the source direction and is a considerable variance with the original model i.e. a geotechnical engineer would normally consider this to be an area of stronger rock extending to considerable depth.

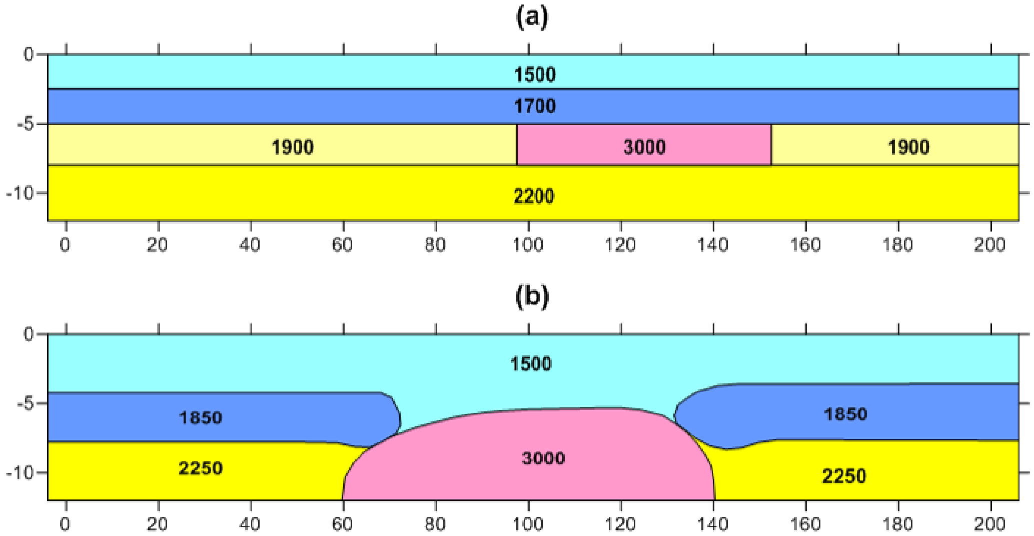


Figure 2(a) Synthetic seismic model with "hard" patch (b) interpreted seismic section from single source synthetic data

TECHNICAL ARTICLE (Continued)

Improved coastal geotechnics with integrated marine seismic reflection and refraction geophysics: Case studies

The synthetic model in Figure 2(a) was extended to include a deeper higher velocity layers (2500 and 4500m/s) representing weathered and fresh rock at depths of 15 and 20m respectively. First arrival travel-times were again computed through this model for a 100m receiver array with multiple sources at both 0m and 50m offsets and inverted using Wavepath Eikonal Tomography (WET, Schuster and Quintus-Bosz, 1993) from an initial velocity gradient model. This produces a seismic image that is continuous rather than discrete as assumed with the simple interpretation method and is increasingly used in near-surface seismic refraction on land (Whiteley and Eccleston, 2006).

The seismic tomographic image obtained is superimposed on the original synthetic model in Figure 3(a) with the colours representing the different seismic velocities (in m/s) listed on the side of this figure. As well as providing deeper information this image bears a strong resemblance to the discrete shallow model (Figure 2a) and a significant improvement on the simple interpretation of the single source data in Figure 2a, i.e. no shallow detail has been lost and both the lateral extent and depth to the top of the high velocity lens are closely defined in this image. The base is less well defined in Figure 3a but is more clearly observed on the seismic wavepath density diagram in Figure 3b that is produced by the inversion software. The wavepath densities (in paths per pixel) within this interpreted model are listed on the side of this figure. These essentially represent the seismic information content in various part of the image and show the concentration of seismic wavepaths within both the shallow "hard" patch and the deep "harder" bedrock refractor. The geotechnical engineer can easily observe both of these features in the tomographic and wavepath density images.

In the following, a series of recent marine geophysical case studies are presented to demonstrate the application of USR methods with both static and continuous deployments at a variety of sites in Australia. These methods are enhanced with advanced interpretation techniques.

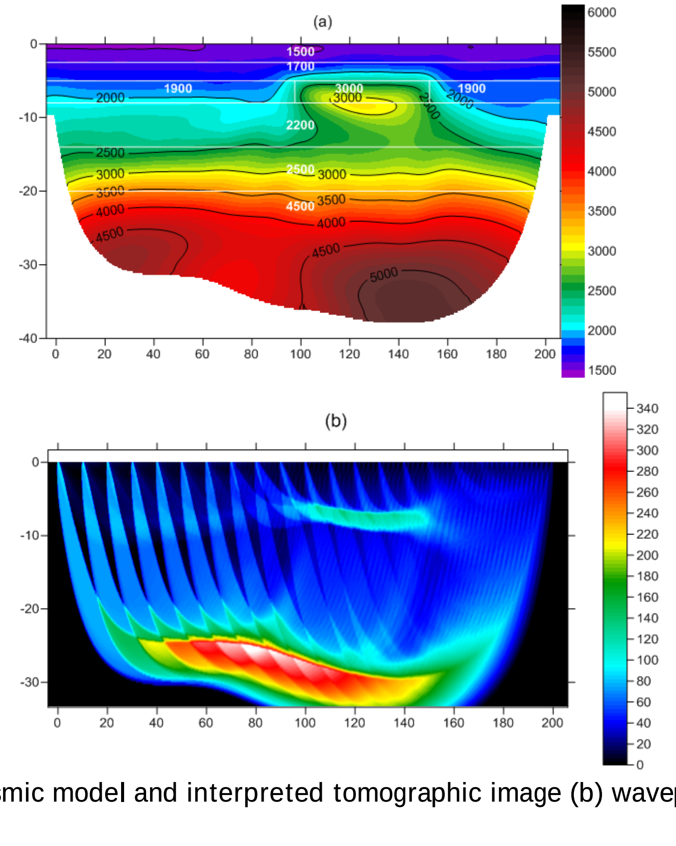


Figure 3(a) Seismic model and interpreted tomographic image (b) wavepath densities

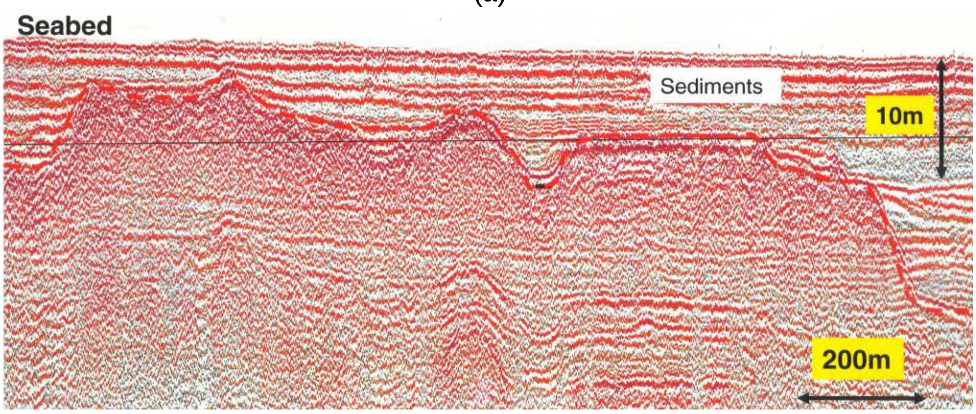
TECHNICAL ARTICLE (Continued)
Improved coastal geotechnics with integrated marine seismic reflection and refraction geophysics: Case studies

2 CASE STUDIES

2.1 NAVIGATION CHANNEL UPGRADES GEELONG PORTS, VICTORIA

Marine reflection surveys were completed as part of the navigation channel upgrades at a number of the Geelong Ports in western Port Phillip Bay. Figure 4(a) is a CSP Boomer record section from this project showing an irregular reflector interpreted as a basalt flow within the layered sediments and proposed dredged depth at some locations. The upper surface and lateral limits of this basalt flow are readily identifiable and are marked by the dashed red line in Figure 4(a). It is relatively common in this area for drowned basalt flows to be variably weathered and their upper surface and margins can consist of stiff clays. The reflection record does not readily distinguish such material from the underlying less weathered basalt.

(a)



(b)

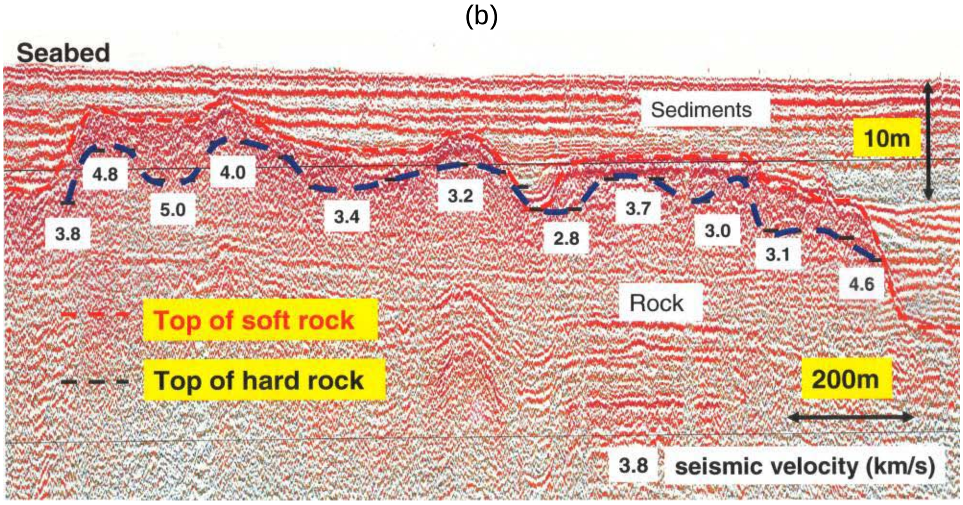


Figure 4(a) CSP Boomer record from Port Phillip Bay (b) Interpreted CSP & CUSR record showing top of "soft" and "hard" rock

TECHNICAL ARTICLE (Continued)

Improved coastal geotechnics with integrated marine seismic reflection and refraction geophysics: Case studies

A single source CUSR survey was also completed along this line and was interpreted as a simple two-layer model with the upper layer having a seismic velocity of 1650 to 1850 m/s corresponding to the bedded sediments and stiff clays and a deeper layer whose velocity varied from 3000 to 5400 m/s (2.8 to 5.0 km/s) corresponding to the strong basalt rock. This was an adequate approach for this problem. Figure 4(b) combines the CSP reflection and CUSR refraction interpretations with the “soft” and “hard” rock interfaces marked with the dashed lines and assisted design of the dredging operation and the installation of channel markers over the basalt.

2.2 PROPOSED HDD PIPELINE INSTALLATION, EAST MALAYSIA

Initial overwater drilling along the near-shore section of the alignment of a proposed oil pipeline at a refinery in East Malaysia encountered granitic bedrock beneath sediments. More detailed information was required to assist assessment of the viability of Horizontal Directional Drilling (HDD) as a pipeline installation option. CSP sections obtained in the area of the alignment clearly identified a strong, highly irregular reflector associated with the “harder” granite interface but provided no information on the likely geotechnical properties of the materials present. Also, due to relatively wide CSP line spacing and the highly variable interpreted bedrock surface a reliable 3D surface plan of the weathered granite rock interface could not be obtained from this data.

A CUSR survey was completed to provide further information on the materials along the proposed alignment and to test a number of alternative routes. Figure 5 shows a combined interpreted seismic section along the selected alignment with both the reflection and refraction interpretations. The interpreted weathered granite rock levels from the reflection interpretation generally agree well with the 2200 m/s velocity contour of the refraction data, except in a few local areas where the bedrock elevation changes rapidly. The interpreted weathered granite level from the CSP shown as the black line in Figure 5 lies mainly between the 2200 m/s and 3500 m/s velocity contours from the CUSR interpretation.

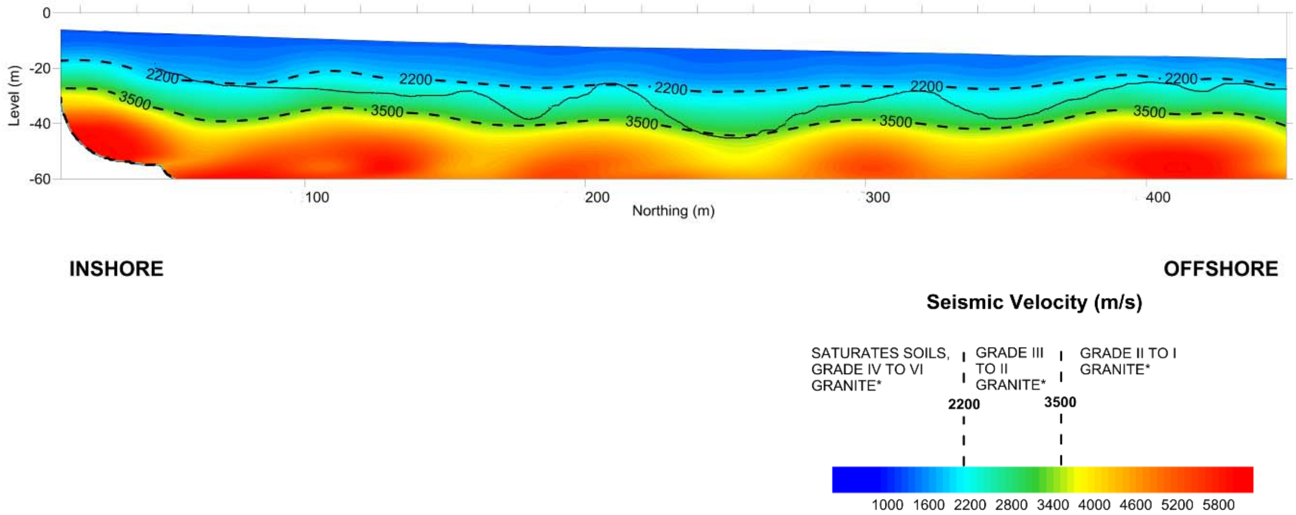


Figure 5 Interpreted CSP and CUSR seismic section along pipeline alignment

Generally four sub-seabed layers of differing seismic velocity extending from the sea floor were interpreted based on the site geology and correlation with other similar sites in Malaysia and the Asian region. Table 2 provides a correlation between seismic velocities from the CUSR interpretation and weathering grades for Hong Kong granites from Irfan and Powell (1985). On the interpreted seismic section in Figure 5 two seismic velocity contours have been highlighted i.e. 2200m/s and 3500m/s. The 2200m/s velocity contour is taken to represent the approximate interface between the saturated soils, Grade VI, V

TECHNICAL ARTICLE (Continued)

Improved coastal geotechnics with integrated marine seismic reflection and refraction geophysics: Case studies

and IV granites, and the Grade III granite boulders. The 3500m/s contour has been taken to represent the interface between the Grade III boulders and the jointed to intact Grade II to I granite rock with lower velocity zones correlating with many of the deeper bedrock features on the CSP data. The areas of interpreted deeper bedrock are believed to reflect mainly weathering variations in the granites and areas of closer discontinuity spacing and possibly the regional joint spacing. Many of these features could not easily be correlated across the CSP profiles.

Table 2: Rock Type, Weathering Grade, Seismic Velocity and estimated UCS

Material	Granite Weathering Grade	P-wave Velocity (m/s)	Estimated Range of UCS values (MPa)*
Saturated soils, Granite	V and VI	1600 – 1800	<2.5
Granite	IV	1800 – 2200	2.5 – 15
Granite (boulders and/or jointed)	III to II	2200 – 3500	5 – 225
Granite (jointed to intact)	II to I	3500 – 6000	125 – 275

* from Irfan and Powell (1985).

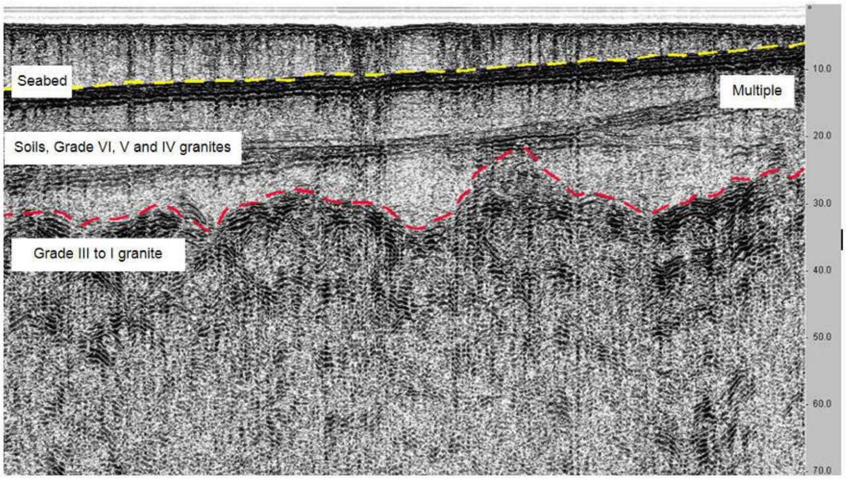


Figure 6 Sample of interpreted CSP line from the pipeline area

Figure 6 is a segment (~ 150m) of an interpreted CSP line from the pipeline area with the geological information from Table 2 included. This clearly shows the seabed reflector (dashed yellow line) over an irregular underlying reflector (dashed red line). The seabed reflector consists of almost acoustically transparent materials with some sub-planar reflectors interpreted as sandy sediments and/or extremely weathered bedrock. The underlying sub-planar reflector that is near the multiple represents the bases of the sediments above extremely weathered granite then the irregular reflector representing the less weathered granite and corestones. The complexity of this interface and the seismic variability of the underlying weathered granite is the result of a long period of weathering. This causes the reflected seismic pulse to scatter and diffract from this interface. This scattering and diffraction character means that side reflections can be projected into the seismic data, resulting in a smoothed interpreted level. Also when rock levels decrease abruptly due to a deeper weathering in areas of reduced discontinuity spacing and/or erosion prior to inundation and burial the weathered granite interface may not be clearly observed.

TECHNICAL ARTICLE (Continued)

Improved coastal geotechnics with integrated marine seismic reflection and refraction geophysics: Case studies

2.3 DEEP PILING DESIGN, IRON ORE BERTH, WESTERN AUSTRALIA

Construction or upgrade of new mineral commodity berths or berth upgrades frequently involve deep piling to weathered or fresh rock at sub-bottom depths exceeding 50m. This requires mapping the drowned regolith beneath sediments and indurated layers. Static USR is applied to provide this information in these conditions as the existing berth can remain in operation while the geophysical work proceeds, which is not normally the case with over water drilling.

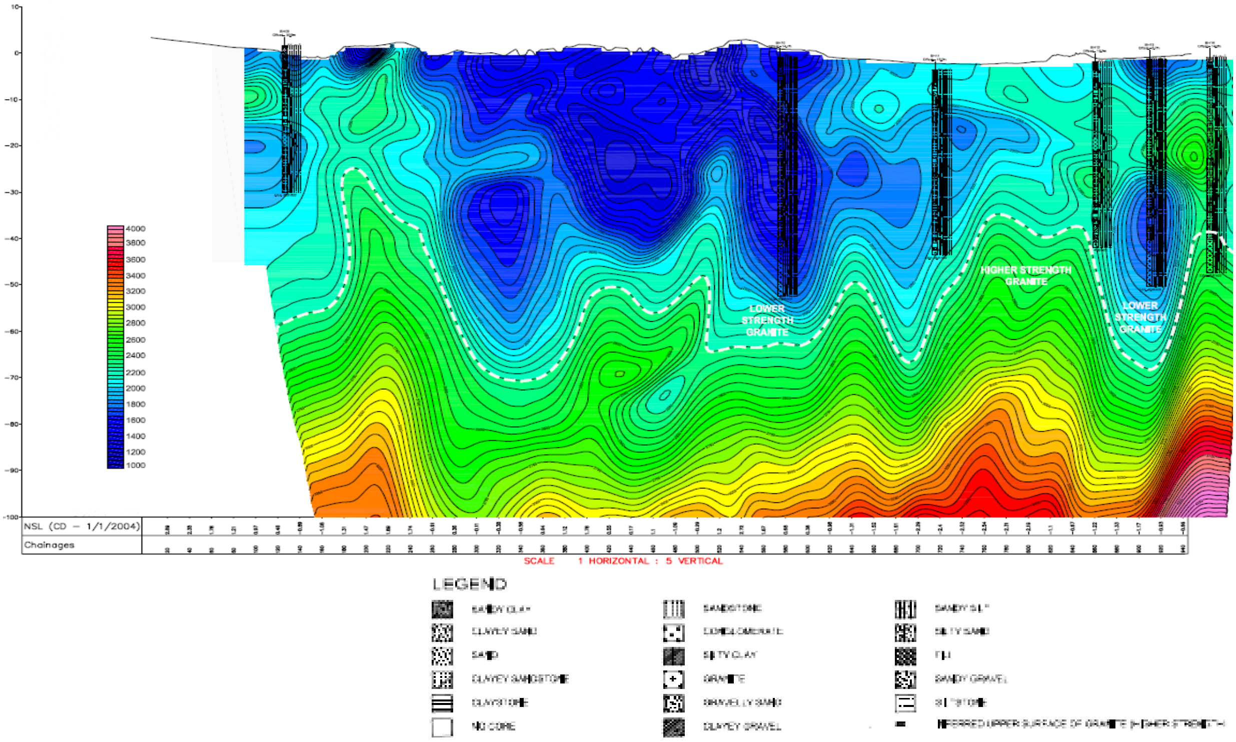


Figure 7 SUSR interpreted seismic tomographic image along berth with geotechnical boreholes

Figure 7 shows an interpreted seismic tomographic image along a SUSR line adjacent to one such berth on the northwest shelf in Western Australia. This was to be sited on variably weathered granite, and the geotechnical boreholes that were drilled along the shoreline have been projected onto this interpreted seismic image, which is about 850 m long and extends to a depth of approximately 100m. Most of the boreholes shown on Figure 7 terminated in weathered, lower strength granite at a depth where the seismic velocities increase rapidly with depth. The irregular upper surface of the fresh, higher strength granite (i.e., the base of the regolith) at greater depth has also been marked on the seismic image. The general separation between the less weathered granite "pinnacles" corresponded with the regional major joint spacing for this rock. The higher velocity regions in some parts of the shallower section also corresponded with areas of indurated calcareous sediments (calcarenites, Table 1), possibly the location of ancient reefs around the granite "pinnacles". These locations were identified as preferred piling sites to reduce overall pile lengths.

TECHNICAL ARTICLE (Continued)

Improved coastal geotechnics with integrated marine seismic reflection and refraction geophysics: Case studies

3 CONCLUSIONS

Appropriately deployed underwater seismic refraction (USR) technologies supported by advanced processing and analysis methods have demonstrated the ability to improve marine geotechnics in a diverse range of applications and represent a cost-effective enhancement of current over water geophysical and geotechnical practice. It is expected that these technologies will be increasingly applied in Australia's coastal waters.

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Editor's note: This article was originally presented during the Australian Geomechanics Society Sydney Chapter Symposium in October 2011.

TECHNICAL NEWS
Commonwealth games village, Delhi – Liquefaction study

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1 INTRODUCTION

The Commonwealth Games -2010 were held in New Delhi, India in October 2010. The various sporting events were organized in different venues / stadiums all over the city. Sportspersons from over 70 countries participated in the Games that lasted for over 10 days.

The event was inaugurated at the Jawaharlal Nehru Stadium by Prince Charles of Great Britain in the presence of the Indian President, Her Excellency Mrs. Pratibha Patil and Prime Minister, Dr. Manmohan Singh.

To accommodate over 8500 athletes and officials during the event, the Commonwealth Games-2010 Village were constructed in the heart of Delhi (India) near I.P Estate and the Akshardham Temple on a 40-acre land. It is on the east bank of the River Yamuna. Fig. 1 presents the location of the village and Fig. 2 presents the Master Plan of the village complex.

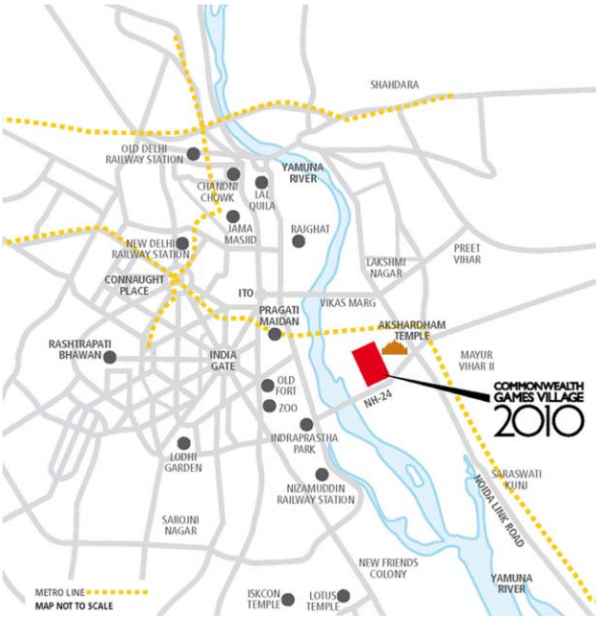

Figure 1 Site Location

Buildings Constructed

The structures constructed include a multi-storied housing complex with stilts, and upper floors ranging from 5 to 9 storeys in different towers. A total of 34 towers were constructed. A single basement is planned in the tower blocks, while the non-tower blocks are without basement. Badminton courts, a swimming pool, golf greens, promenade and food plaza, landscaped gardens, beautiful fountains, water bodies, etc. add to the elegance and charm of the area.

The site is fairly level with ground levels ranging from RL 201.9 m to RL 202.8 m. The average ground level is fixed as RL 202.5 m as per architectural plans.

2 GENERAL SITE CONDITIONS

Geological Setting

The project site is in East Delhi adjoining the Yamuna riverbed. The soils at the project site belong to the "*Indo Gangetic Alluvium*" and are river deposits of the Yamuna and its tributaries. The Pleistocene and Recent Deposits of the Indo-Gangetic Basin (Krishnan, 1986) are composed of gravels, sands, silts and clays. The newer alluvium, deposited in the areas close to the river, is locally called "*Khadar*" and consists primarily of fine sand, Yamuna Sand, that is often loose in condition to about 4-10 m below the ground surface.

Scope of Geotechnical Investigation

The scope of the geotechnical investigation included 14 boreholes to 30 m depth and 8 static cone penetrometer tests (SCPT). Also, 23 shear wave velocity tests were conducted using Spectral Analysis of

TECHNICAL NEWS (Continued)
Commonwealth games village, Delhi – Liquefaction study

Surface Waves (SASW) technique along six spreads across the site. Fig. 3 presents the locations of the investigation program.

Figure 2 Master Plan of the Complex

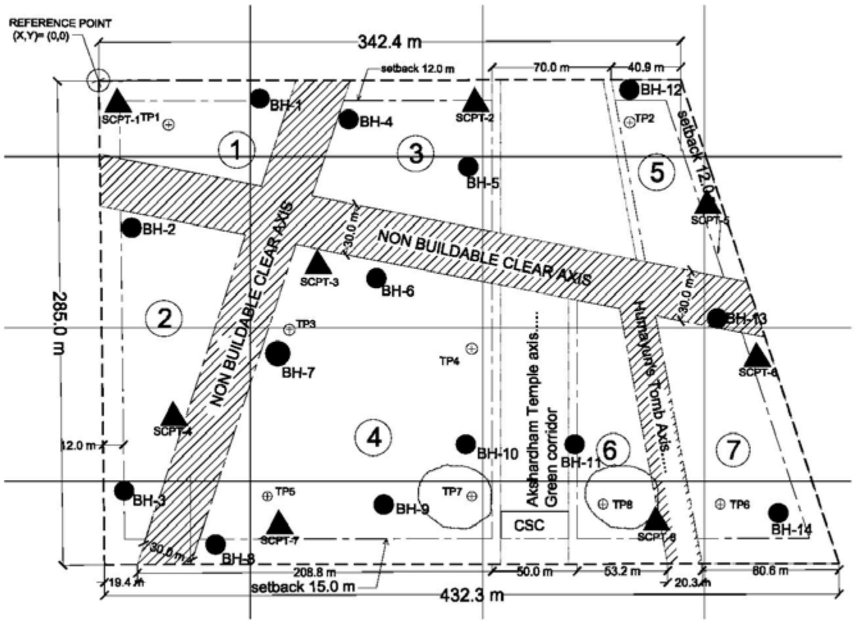

Figure 3 Plan of Field Investigation

TECHNICAL NEWS (Continued)
Commonwealth games village, Delhi – Liquefaction study

Site Stratigraphy

The surficial soils at the site consist primarily of sandy silt / clayey silt to about 0.5 to 2.0 m depth. This is underlain by sand / silty sand to the final explored depth of 30 m. In general, the sands are fine-grained with fines content ranging from 4 to 12 percent. A discontinuous zone of hard clayey silt / sandy silt varying in thickness from 2 to 8 m is met below 15-18 m depth at some borehole locations. A summary of selected borehole profiles is illustrated in Fig. 4.

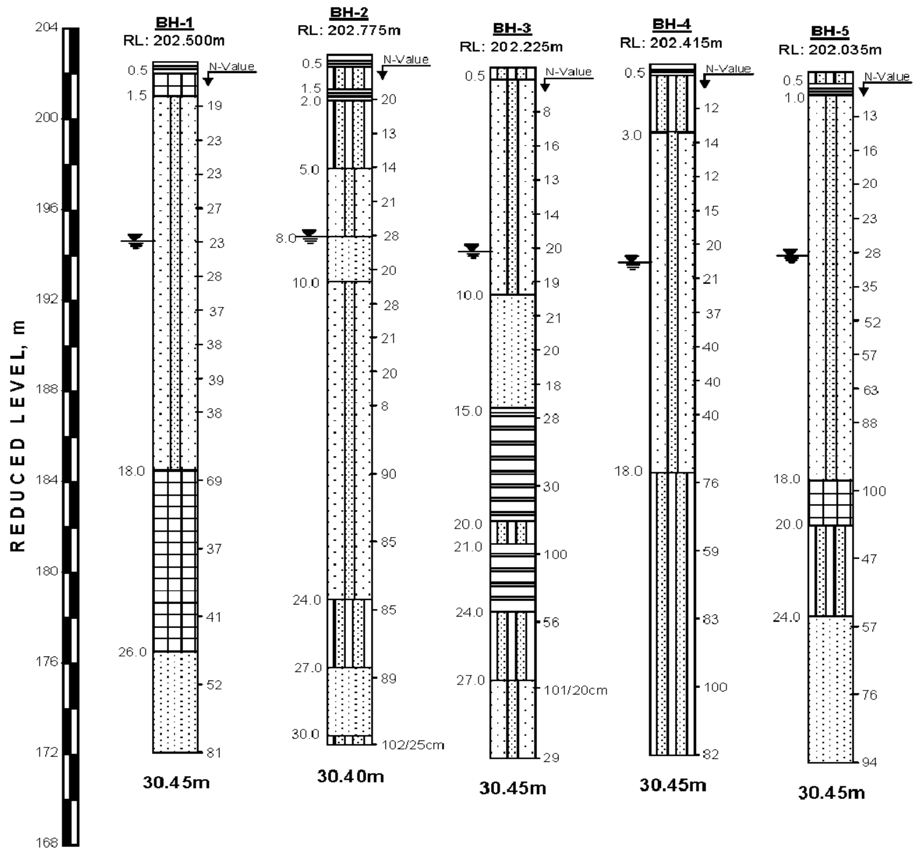

Figure 4 Site Stratigraphy

Field Tests

SPT was performed using an automatic trip hammer. Field SPT values range from 8 to 20 to about 5.0 m depth and from 15 to 30 to about 8.0 m depth. Below this, SPT values increase with depth, ranging from 25 to 40 at 10.0 m depth to 50 to 90 at 18.0 m depth. In the underlying soils, SPT values range from 50 to refusal (N ≥100) to the maximum explored depth of 30 m.

SCPT results indicate cone tip resistances (q_c) of 35 to 70 kg/cm^2 to 4.0 m depth, and 40 to 80 kg/cm^2 to 9.5 m depth. Below this, q_c values range from 60 to 160 kg/cm^2 to 12.0 m depth, 60 to 130 kg/cm^2 to 15 m depth, 100 to 200 kg/cm^2 to 17 m depth, and 120 to 250 kg/cm^2 to the maximum depth of 20 m.

The shear wave velocity at the site was measured using SASW tests conducted along six lines across the site. These tests were conducted using Freedom NDT PC, along with pairs of geophones having natural frequencies of 1 Hz and 4.5 Hz. A sledgehammer (20 kg) was used to generate the source. Plots of measured SPT, cone tip resistance and shear wave velocity with depth, as well as respective design profiles used for design, are presented in Fig. 5.

TECHNICAL NEWS (Continued)
Commonwealth games village, Delhi – Liquefaction study

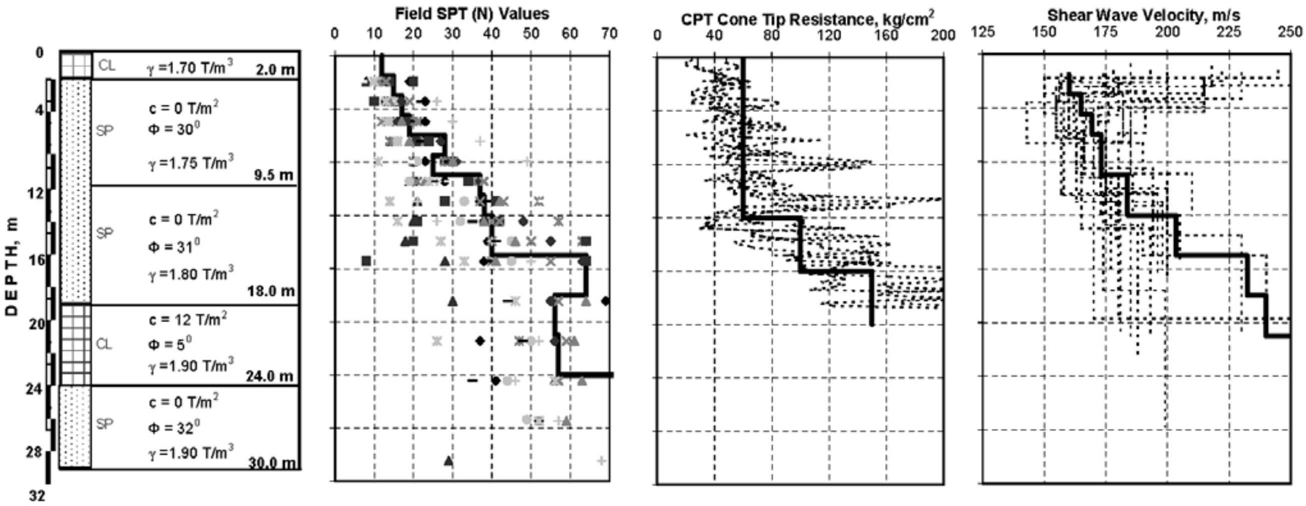

Figure 5 Design Soil Profile

Groundwater

As measured in the completed boreholes, groundwater was met at about 7.1 to 8.8 m depth (July 2007). Considering that the site is in the vicinity of the Yamuna River, the design groundwater table were considered at the ground surface.

3 ASSESSMENT OF LIQUEFACTION SUSCEPTIBILITY

Basic Concept

Liquefaction is defined as the transformation of a granular material from a solid to a liquefied state as a consequence of increased pore-water pressure and reduced effective stress (Marcuson, 1978). Increased pore pressure may be induced by the tendency of granular materials to compact when subjected to cyclic shear deformation, such as in the event of an earthquake.

Methodology and Design Parameters

As per Indian Standard Code IS:1893 (Part-1):2002, Table-1 liquefaction is likely in fine sands below water table with corrected SPT values less than 15 to about 5.0 m depth and less than or equal to 25 below 10.0 m depth (for Seismic Zone Levels III, IV and V). For values of depths between 5 m to 10 m, linear interpolation is recommended. As per the IS Code guidelines, there is a potential for liquefaction of the soils to about 14.0~16.0 m depth.

Detailed liquefaction analysis were carried out for the site. The methodology is based on the simplified procedure developed by Seed and Idriss (1971), as described in the NCEER Summary Report (2001). As per the project specifications, the analysis were carried out for design earthquake magnitudes of 6.7 and peak ground accelerations of 0.24 g.

TECHNICAL NEWS (Continued)
Commonwealth games village, Delhi – Liquefaction study

Cyclic Stress Ratio

In this analysis, the cyclic stress ratio (CSR) were calculated for the selected peak horizontal ground accelerations at various depths using the following equations-

$$CSR = \left(\frac{\tau_{av}}{\sigma'_{vo}}\right) = 0.65 r_d \left(\frac{\sigma_{vo}}{\sigma'_{vo}}\right)\frac{a_{max}}{g} \qquad (1)$$

where:

τ_{av} = Average horizontal shear stress acting on soil element during earthquake shaking
r_d = Stress reduction coefficient, based on Liao and Whitman (1986)
σ_{vo} = Total vertical overburden stresses
$\sigma_{vo'}$ = Effective vertical overburden stresses (based on design groundwater depth of 0.0 m)
g = Acceleration due to gravity
a_{max} = Peak horizontal ground acceleration (PGA)
z = Depth below ground surface, meters

Cyclic Resistance Ratio

The cyclic resistance ratio (CRR) at the site were computed based on SPT values, CPT values, and Shear Wave Velocity (V_s) values. A Magnitude Scaling Factor (MSF) of 1.334 (based on Revised Idriss Scaling Factors recommended by the NCEER Summary Report, 2001) was applied to the CRR values, to adjust the clean sand curves to the design earthquake magnitude of 6.7.

Plots of field and corrected SPT values, as well as CSR and CRR (based on median SPT values) versus depth, are presented in Fig. 6. Plots of field and corrected cone tip values, as well as CSR and CRR (based on median q_c values) versus depth, are presented in Fig. 7. Profiles of field and corrected shear wave velocity, CSR and CRR (based on design V_s values), are presented in Fig. 8.

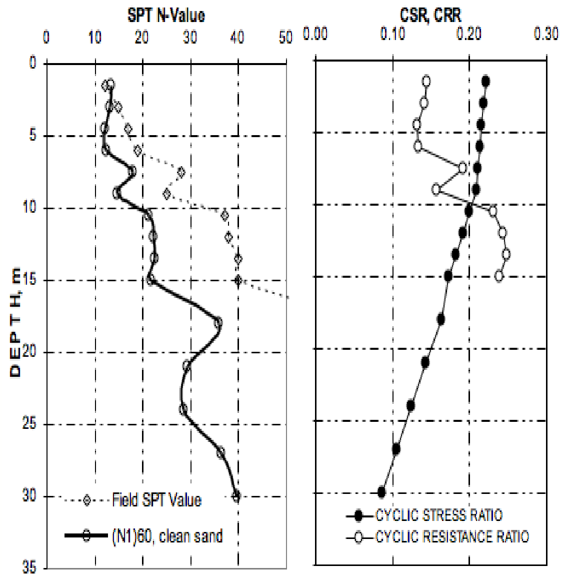

Figure 6 SPT-based Liquefaction Curves

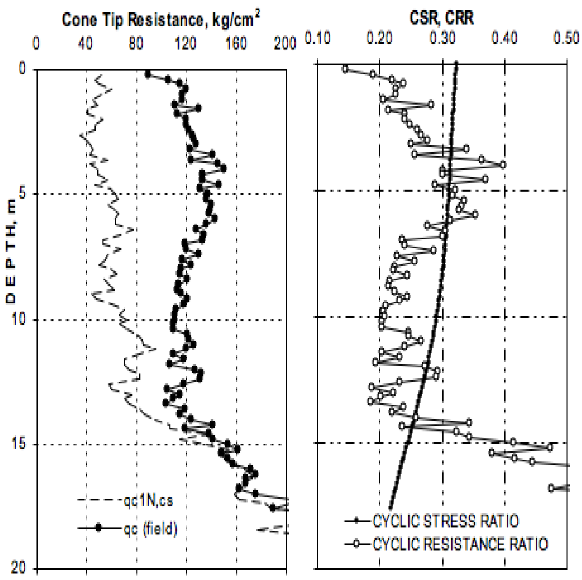

Figure 7 CPT-based Liquefaction Curves

TECHNICAL NEWS (Continued)
Commonwealth games village, Delhi – Liquefaction study

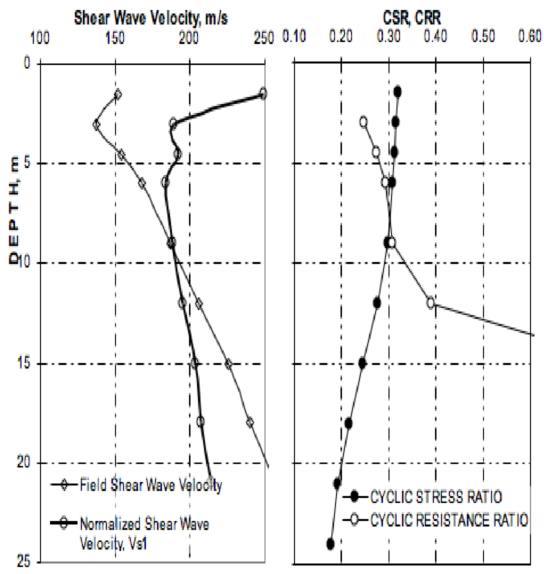

Figure 8 Vs-based Liquefaction Curves

4 RESULTS OF ANALYSIS

Based on the detailed liquefaction analyses, the authors are of the opinion that soils to a depth of 9.5 m below original ground levels are prone to liquefaction susceptibility for an earthquake magnitude of 6.7, a peak horizontal ground acceleration of 0.24 g, and for a design groundwater table at ground level.

5 FOUNDATION SYSTEM SELECTED

In view of the potential for liquefaction, open foundations bearing on natural soils are not a feasible foundation system. It was decided to use bored cast-in-situ piles extending well below the liquefiable zone, to transfer the loads to the more stable soil strata.

Based on static analysis, the authors recommended theoretical safe pile compressive and uplift capacities of 126 tonnes and 70 tonnes, respectively, for 20 m long, 800 mm diameter bored cast-in-situ piles with a pile cut-off-level (COL) of 2.0 m under seismic conditions.

6 PILE LOAD TESTS

Six vertical and six lateral initial pile load tests were performed at the site on 500, 750 and 800 mm diameter piles of 20~22 m length below COL to assess the safe load-carrying capacity of the piles. A 600-tonne capacity load frame (Fig. 9) was used to carry out the tests on site.

The results of the load tests were in good agreement with theoretical static pile capacities calculated from soil parameters for the normal (no liquefaction) condition. Final pile capacities to be used for design were then recommended based on the above computations, taking liquefaction into account under seismic conditions.

Figure 10 is a photograph of the piling work in progress at the Commonwealth Games Village site. Fig. 11 presents a view of the constructed Commonwealth Games Village which was appreciated by the athletes and officials alike from over 70 countries. The Games was a huge success.

TECHNICAL NEWS (Continued)
Commonwealth games village, Delhi – Liquefaction study

Figure 9 Pile Load Test Setup
(See the Akshardham Temple in the background)

Figure 10 Piling in Progress at Site

Figure 11 A View of the Commonwealth Games Village Complex

TECHNICAL NEWS (Continued)
Commonwealth games village, Delhi – Liquefaction study

7 CONCLUSION

Liquefaction is a major consideration affecting foundation design in many parts of India. Often, the delicate balance of project costs, schedules and long-term success hinges on the geotechnical engineer's ability to predict, assess and deal with liquefaction susceptibility effectively. A major thrust in this direction is required from academia and industry alike to standardize and raise the industry standard in this respect, so that future disasters may be averted by the use of safe and economical design practices.

ACKNOWLEDGEMENTS

The authors thank Prof. G.V. Ramana for his kind assistance in conducting the SASW tests and for his guidance in interpreting the test results. The authors also thank M/s. Emar MGF for giving Cengrs Geotechnica Pvt. Ltd. an opportunity to perform this study.

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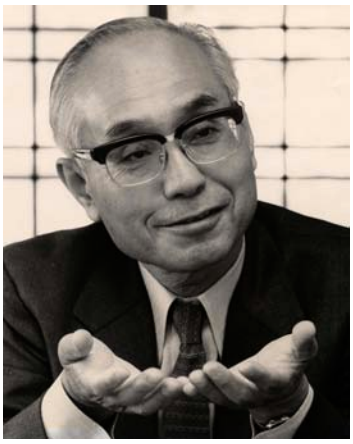
OBITUARY

Toshio Aboshi (1925-2011)

By Kenji Ishihara



Professor T. Aboshi passed away on January 20th in 2011 at the age of 86 a few days after tumbling down the stairs at his home. His death has deprived the geotechnical community of the distinguished scholar and engineer who was well known for his life-long dedication to the soft soil engineering particularly associated with large-scale construction of man-made islands for airports.

Professor Aboshi graduated from the University of Tokyo, Department of Aeronautical Engineering, in 1945. That was the year of social confusion and disaster in Japan after the end of the World War II. It was the hardest time to find a job opportunity particularly for the young elites who specialized the aeronautical engineering. After graduating from the university, he spent some period of time in the soil mechanics laboratory at the Civil Engineering Department, University of Tokyo, under the guidance of Professor Takeo Mogami.

Professor Aboshi changed the expertise of his pursuit to civil engineering and embarked on his illustrious career at the Hiroshima University, western part of Japan Mainland. During the period of recovery from the war-wrecked era and extensive development in industries along the coastal area, he was actively involved in the studies of settlements and stability of soft soil ground created by reclamation. In 1950, the Japan's first ground improvement by sand drain method was carried out in the highway construction project in Okayama prefecture. Professor Aboshi measured the horizontal coefficient of consolidation c_h, using a special consolidation test apparatus which he developed. The result that c_h=(6-8)c_v for natural undisturbed clays were published in the 1st Asian Regional Conference on Soil Mechanics and Foundation Engineering in 1960. In 1962, he supervised two ground improvement works of reclaimed lands in Hiroshima Prefecture, which were the first cases in the world regarding application of prefabricated vertical drain method. He developed the band drain made of papers, which was named "paper drain" at that time. The machine for the installation of the drain and the method of observation and control were developed by Professor Aboshi. His works triggered the prevalent use of various types of vertical drain methods in the coastal development projects in 1960s-1980s.

The focus of Professor Aboshi's interest was directed to examine the H^2 rule of Terzaghi's consolidation theory. To this aim, he carried out the long term consolidation test of clay samples with different thicknesses. The outcome of the study contributed greatly to the discussion on how to apply Terzaghi's theory to the consolidation problem of actual clay layers, that is, so-called A, B and C hypothesis. The prolonged settlements due to the secondary consolidation were the subject of his extensive studies as well and substantial progress was made by his coherent efforts. These studies were always advanced by means of series of laboratory tests which were coupled with field observation of settlements at numerous sites of reclamation along the long stretches of coastal line in the inland sea.

The efforts as above in the formative period of his career culminated in his heavy involvement in the design and construction of the island of Kansai airport in Osaka. In an early period of 1970's, Professor Aboshi was nominated as a member of the Technical Committee, and later on assigned chairman of the Task Force for detailed soil investigations on old Pleistocene clay deposits prevailing over the Osaka Bay area. This was necessitated to identify causes of settlements as much as 14m which was by far in excess of the settlements predicted by the conventional method of consolidation analysis. As a result of more comprehensive investigations led by Professor Aboshi, multiple layers of old Pleistocene clays sandwiched by sands were found to have produced a substantial amount of settlements due to its relatively high compressibility which is manifested when subjected to highest-ever overburden pressure. It is to be noticed that, through his efforts, the substantially compressible nature of old clays was unearthed as a result of the hugest ever field experimentation in a form of marine filling as thick as 40m. Throughout the

OBITUARY (Continued)

Toshio Aboshi (1925-2011)

decades of tremendous endeavor leading to this important cutting-edge finding, Professor Aboshi was always at the forefront of the investigations and played pivotal roles. He was the driving force behind comprehensive studies on settlements of land reclamation for the Kansai International Airport in Osaka.

In 2004, the long-time waited project got off a start for constructing a large-scale man-made fills for the 4th runway at Haneda International Airport in Tokyo. Concerned about a risk of long-term settlements of the sea-bed clay deposits which were to undergo the highest-ever overburden pressure in the area of Tokyo Bay, Professor Aboshi was kind enough to give of himself unstintingly a sage advice and precious comments regarding evaluation of consolidation characteristics of the old Pleistocene clays.

On December 14-15, 2010, International Symposium on Recent and Future Technologies in Coastal Development was held in Yokohama in commemoration of the completion of the Tokyo Haneda Airport extension work. Professor Aboshi volunteered to attend it, travelling from Hiroshima as far as to Yokohama. Everybody in attendance was very pleased to see him and cherished conversations with him. It has become unfortunately the last occasion that we could see him in a public arena.

Throughout his 42-year career at Hiroshima University, Professor Aboshi was dedicated to the highest standards of engineering education. As the dean of engineering faculty, he greatly enhanced the quality of engineering as a whole. Under his leadership, the faculty gained national statute and recognition. He was an outstanding technical leader, administrator, and recognized authority in his field of expertise. He nurtured many students who have gone on to make significant contributions in the field of civil engineering. He will be remembered as a dedicated teacher, distinguished engineer and respectable mentor over many years in future.

CONFERENCE REPORT

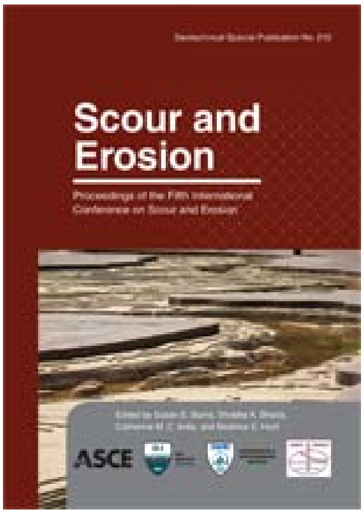
5th International Conference on Scour and Erosion (ICSE-5)

Cathy Avila, Chair ICSE-5

Venue:
ICSE-5 San Francisco, CA USA
November 7-10, 2010
Holiday Inn Golden Gateway

Conference: The conference included 7 keynote lectures and 3 concurrent sessions over 4 days with a total of 118 papers presented. The conference included over 200 participants 70 International and 140 domestic. There were 19 countries represented internationally and 31 states represented domestically.

Proceedings: We received 188 abstracts for the conference. 177 were accepted for paper submission and the final proceedings included 113 papers. Proceedings were a bound volume which is available for purchase at the ASCE website http://www.asce.org/Product.aspx?id=12884902526.



Short Courses: We held two ½ day short-courses on Sunday (November 7th) before the conference. The first was led by Dr. George Annandale titled "Scour or Rock" which provided a state-of-the art insight into analyzing scour of rock downstream of overtopping dams and in plunge pools. The second short course was led by Dr. Paul Clopper and Dr. Peter Lagasse titled "the New HEC-23: What's in it for you?" and provided an overview of significant revisions and additions to the U.S. FHWA's HEC-23 "Bridge Scour and Stream Instability Countermeasures".

TC-213 meeting: The TC-213 meeting was attended by 23 individuals.

Bay Bridge Tour: 30 participants toured the new San Francisco Oakland Bay Bridge

CONFERENCE REPORT (Continued)

5th International Conference on Scour and Erosion (ICSE-5)

Sponsors: Sponsors of this conference included ISSMGE, ASCE's Geo-Institute and ASCE's Environmental and Water Resources Institute, EWRI, and ISSMGE. Cooperating Organizations were FHWA, Caltrans and ADSC. Avila and Associates and US Engineering Solutions sponsored the event.

Exhibitors: We had 11 exhibitors at the conference including Applied University Research, Basilite Concrete Products, Cell-Crete Corporation, CURA-LAGG, Geo-Instruments, Landslide Solutions, Inc., National Highway Institute, Olson Engineering, Prati Armati SRL, Propex and U.S. Engineering Solutions.

CONFERENCE REPORT

International Symposium on Ground Technology and Geo-Information (IS-AGTG), Singapore, 1-2 Dec 2011

The International Symposium on Ground Technology and Geo-Information (IS-AGTG) was successfully held in conjunction with the Fourth Annual General Meeting of the Geotechnical Society of Singapore (GeoSS) in Singapore between 1 and 2 Dec 2011. This symposium continues the information technology theme established at the First International Conference on Information Technology in Geo-Engineering (ICITG) that was held in Shanghai, 16-17 September 2010. IS-AGTG was organized by the Geotechnical Society of Singapore, National University of Singapore, and Tongji University, China.

The growth of mega cities has been particularly dramatic across parts of Asia. The need for quality living space coupled with the increasing density of infrastructural development poses unprecedented challenges and opportunities for the geo-industry. The purpose of this international symposium is to provide a platform to showcase recent advances in ground technology and geo-information systems that can promote more creative exploitation of underground space/systems while improving safety, productivity, economy, and harmony with the natural environment.

The symposium was opened by Professor Kok-Kwang Phoon, Chair of IS-AGTG (Photo 1), Professor Yun Bai, Tongji University (Photo 2), and Professor Askar Zhussupbekov, ISSMGE Vice-President for Asia (Photo 1). It was also graced by the Chair of Joint Technical Committee 2 (JTC2) on Representation of Geo-Engineering Data in Electronic Form, Professor David Toll (Photo 3), and the Chair of Asian Technical Committee 10 (ATC10) on Urban Geo-informatics, Professor Mamoru Mimura (Photo 4). Highlights of the symposium include 8 keynote lectures and 7 invited lectures organized under the auspices of ATC10.

Photo 1
(from left to right) Professor Askar Zhussupbekov,
VP for Asia, ISSMGE, and Professor Kok-Kwang Phoon, Chair of IS-AGTG, at the opening ceremony

Photo 2
Professor Yun Bai, Tongji University delivering his keynote lecture

In the 1st morning, Professor Mamoru Mimura (Japan) delivered Keynote Lecture 1 entitled "Development of Geoinformatic Databases and their Application to Geotechnical Problems". The second keynote lecture was presented by Professor António Gomes Correia (Portugal) on "Application of Data Mining in Transportation Geotechnics". After lunch, Professor Tarek Abdoun (USA) presented an interesting Keynote Lecture 3 on "Advanced Real-time Monitoring and Health Assessment of Geotechnical Systems". Keynote Lecture 4 was presented by Professor Yun Bai (China) on "Recent Development of Underground Engineering in Shanghai".

CONFERENCE REPORT (Continued)
International Symposium on Ground Technology and Geo-Information (IS-AGTG), Singapore, 1-2 Dec 2011

Photo 3
Professor David Toll, Chair of Joint Technical Committee 2 (JTC2) on Representation of Geo-Engineering Data in Electronic Form, at one of the Q&A sessions

Photo 4
Professor Mamoru Mimura, Chair of Asian Technical Committee 10 (ATC10) on Urban Geo-Informatics, delivering Keynote Lecture 1

On the 2nd day, Keynote Lecture 5 was given by Professor Thiam-Soon Tan (Singapore) on "Innovative Approaches to Land Reclamation in Singapore". Keynote Lecture 6 was presented by Professor Tadashi Hashimoto (Japan) on "New Technologies for Shallow to Deep Underground Construction in Urban Area". Professor Chungsik Yoo (South Korea) delivered the Keynote Lecture 7 on "Bringing Information Technology into Geotechnical Engineering Practice: Concept and Development". Professor Victor Li (Hong Kong) delivered Keynote Lecture 8, in which he spoke on "Recent Development of Jacked Piling in Hong Kong". The following exhibitors also participated in the symposium: Datgel, Keller Foundations (S.E. Asia), Ryobi Geotechnique International, and Sea and Land Technologies.

The proceedings of IS-AGTG contains 58 technical papers from 17 countries (Australia, Austria, China, Germany, Hong Kong, India, Italy, Japan, Kazakhstan, Korea, Malaysia, Portugal, Singapore, Taiwan, Turkey, United Kingdom, and United States). Topics covered are: urban geo-informatics, innovative construction methods, new design method and new test technology, numerical methods for geo-engineering, data acquisition and monitoring, database and data mining, case studies with innovative technology, geo-modeling and geo-informatics, and emerging techniques in information technology.

At the closing of the symposium, Professor Jun Otani invited the delegates to the International Workshop on Information and Communications Technology in Geo-Engineering, which is scheduled to be held on 17-18 May 2012 in Kyoto, Japan. On behalf of Uzbekistan Geotechnical Society, Professor Askar Zhussupbekov invited the participants to the 4th Central Asian Geotechnical Symposium which will be held on 21-23 September 2012 in Samarkand, Uzbekistan. Professor Askar also participated in the 4th Annual General meeting of GeoSS. He made a presentation about MPAC of ISSMGE and invited corporate members from GeoSS to consider enrolling as Corporate Associates and Foundation Donors of ISSMGE.

Professor David Toll, Chairman of JTC2 (Photo 3) graciously delivered the closing address for the symposium.

NEWS

Double Honour for University of Wollongong academic elected as Fellow of ATSE and recipient of Engineers Australia Transport Medal 2011

Professor Buddhima Indraratna, Head of School of Civil, Mining and Environmental Engineering and Director of Centre for Geomechanics and Railway Engineering at the University of Wollongong has been elected as a Fellow of the Australian Academy of Technological Science and Engineering (ATSE). ATSE is the highest level of Fellowship for professional engineers in Australia, and in October 2011, 30 Australian leaders in various fields of Engineering, Water Resources, Medical Technology and other technological sciences were elected. ATSE now includes 800 Fellows with just a handful of geotechnical engineers among them since its inception.

Professor Buddhima Indraratna receives the 2011 Engineers Australia Transport Medal from the Chair of the National Committee on Transport Engineering, Clive Mottram

The awarding of this peer-nominated Fellowship was based on his research excellence in Geomechanics and close collaboration with industry in the implementation of innovative research-based solutions to practical problems. Through over 350 peer-reviewed scholarly articles and 5 well-known research-based books, Professor Indraratna has been instrumental in changing industry practices, including revisions to some Australian and International Standards. The citation recognising his Fellowship states:

"Professor Indraratna's research encompasses a wide spectrum of application to theory and practice in geomechanics over two decades. He is world-renowned for his contributions to the conceptualisation and design innovation for stabilising soft foundations and novel analytical techniques and design procedures for high speed rail tracks."

In addition, Professor Indraratna was also chosen as the recipient of the prestigious Engineers Australia Transport Medal 2011, awarded to a distinguished individual who has made an outstanding contribution to the advancement of Australian transportation engineering. Professor Indraratna received the Transport Medal at the Civil and Structural Colleges Gala Dinner and Awards Ceremony of the Institution of Engineers Australia, held at Darling Harbour on the 27th October 2011.

CONFERENCE NEWS

The 4th Central Asian Geotechnical Symposium on Geo-Engineering for Construction and Conservation of Cultural Heritage and Historical Sites - Challenges and Solutions –

Venue:
Samarkand, Uzbekistan
21-23 September 2012 (Friday - Sunday)
Symposium website: *www.geotechnics.uz*
Symposium website: *www.geotechnics.uz*

The Uzbekistan Geotechnical Society is pleased to announce the 4th Central Asian Geotechnical Symposium to be held in Samarkand, Uzbekistan from September 21-23, 2012. The previous Central Asian Geotechnical Symposia have been held in Astana, Kazakhstan, 2000; Samarkand, Uzbekistan, 2003; and Dushanbe, Tajikistan, 2006. The 4th Central Asian Geotechnical Symposium intends to discuss and exchange ideas on general characteristics of soils in the region, geotechnical problems as well as conservation of heritage and historical sites.

KEY DATE

Submission of Abstract	*March 30, 2012*
Notice to acceptance	*April 30, 2012*
Submission of full paper	*June 30, 2012*
Symposium	*September 21-23, 2012*

Post-Symposium tour will be arranged

THEME AND TOPICS OF SYMPOSIUM:

1. Regional Characterization of Soils and Foundation, and Geo-Construction
2. Adobe, Tomb and Earthen Structures, Historical Sites, and Conservation of Cultural Heritage
3. Regional and Traditional Characteristics of Foundation and Structures
4. Mosque, Minaret, Towers, Citadel, Castles, Stone Masonry, and Heritage Structures
5. Ancient Caves, Underground Construction, Tunneling, Transportation, and Infrastructures
6. Ancient and Historical Dam, Embankment, and Ancient Highways
7. Soil Dynamics and Geotechnical Earthquake Engineering
8. Ancient, Traditional, and Present Soil Improvements
9. Damages from Salting and Frost including Geoenvironmental Engineering
10. Traditional and Innovative Technologies for Geotechnical Applications

Samarkand - "Stone Fort" or "Rock Town" is the second-largest city in Uzbekistan and the capital of Samarqand Province. The city is most noted for its central position on the Silk Road between China and the West, and for being an Islamic center for scholarly study. In the 14th Century it became the capital of the empire of Timur and the site of his mausoleum. The Bibi-Khanym Mosque remains one of the city's most notable landmarks. The Registan was the ancient center of the city.

In 2001, UNESCO added the city to its World Heritage List as Samarkand – Crossroads of Cultures.

ORGANIZATIONS

- Uzbekistan geotechnical Society, Samarkand, Uzbekistan
- Uzbekistan«Geofundamentproject», Ltd, Samarkand, Uzbekistan
- ATC19 Conservation of Cultural Heritage and Historical Sites, JGS, ISSMGE
- ATC10 Urban Geo-informatics, JGS,ISSMGE,JGS,ISSMGE

CONFERENCE NEWS (Continued)

The 4th Central Asian Geotechnical Symposium on Geo-Engineering for Construction and Conservation of Cultural Heritage and Historical Sites

- Challenges and Solutions –

- ATC3 Geotechnologies for Natural Hazards, JGS,ISSMGE
- TC301 Preservation of Historic Sites, IGS, ISSMGE
- TC305 Geotechnical Infrastructure for Megacities and New Capitals, ISSMGE
- Kazakhstan Geotechnical Society, Astana, Kazakhstan
- Commission on Preservation of Ancient Sites, ISRM
- Department of Structural and Geotechnical Engineering, The Samarkand State Architectural and Civil Engineering Institute (SamGASI), Uzbekistan
- The Head of Scientific Production Management of Heritage and Historical Sites of the Republic of Uzbekistan.
- GUP «UzGASHKLITI», Tashkent, Uzbekistan

CALL FOR PAPERS

Prospective authors are asked to submit their abstracts in English of within 300 words with the following information to Mr. Zokhir Hasanov: uzssmge@gmail.com

1. Name(s) of authors
2. Title of the Paper
3. Corresponding author
4. Telephone, Fax, and E-mail address for correspondence

SYMPOSIUM FORMAT AND PUBLICATION

The symposium will include sessions for presentation and discussion. The working language is English. All papers will be published in the proceedings.

SYMPOSIUM FEES

Full registration fee for foreign participants: US$ 300
Full registration fee for CIS: US$ 200
The registration fee covers attendance of sessions, lunches, coffee & tea, a copy of the proceeding volume and a tour of heritage and historical sites in Samarkand.

For exhibitors: cost of 1 sq.m. of exhibitors' space is US $300. Standard exhibition box is 9 sq.m. Special dimension may be discussed.

CONTACTS:

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140147, Lolazor St/70, Samarkand, Uzbekistan
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Fax: +998-66 223-0016Tel: +998-66 220-28255

Event Diary

ISSMGE EVENTS

Please refer to the specific conference website for full details and latest information.

2012

Second International Conference on Performance-Based Design in Earthquake Geotechnical Engineering
Date: 28 - 30 May 2012
Location: Conference Center, Taormina, Italy
Language: English
Organizer: ISSMGE TC-203
• Contact person: Dr. Claudio Soccodato
• Address: Associazione Geotecnica Italiana (AGI), viale dell'Università, 11
00185 Roma
Italy
• Phone: 39 064465569
• Fax: 39 0644361035
• E-mail: agiroma@iol.it
Website: www.associazionegeotecnica.it/novita

TC 211 International Symposium & Short Courses "Recent Research, Advances & Execution Aspects of GROUND IMPROVEMENT WORKS"
Date: 30 May - 1 June 2012
Location: IS: Crowne Plaza Brussels , Brussels, Belgium
Language: English
Organizer: TC 211 Ground Improvement
• Contact person: BBRI - Carine Godard
• Address: Avenue P. Holoffe 21
B-1342 Limelette
Belgium
• Phone: 32 2 655 77 11
• Fax: 32 2 653 07 29
• E-mail: carine.godard@bbri.be
Website: www.bbri.be/go/IS-GI-2012

12th Baltic Sea Geotechnical Conference
Date: 31 May - 2 June 2012
Location: Stadhalle (Town Hall) Rostock, Rostock, Germany
Language: English
Organizer: German Geotechnical Society
• Contact person: German Geotechnical Society
• Address: Gutenbergstr. 43
45128 Essen
Germany
• Phone: 49 201 78 27 23
• Fax: 49 201 78 27 43
• E-mail: service@dggt.de
Website: www.12bsgc.de

Shaking the Foundations of Geo-engineering Education (SFGE) 2012
Date: 4 - 6 July 2012
Location: NUI Galway , Galway, Ireland
Language: English
Organizer: ISSMGE
• Contact person: Dr. Bryan McCabe
• Address: Civil Engineering, National University of Ireland, Galway (NUI Galway)
Galway
Ireland
• Phone: 353 91 492021
• Fax: 353 91 494507
• E-mail: bryan.mccabe@nuigalway.ie
Website: www.sfge2012.com

11th ANZ 2012 Geomechanics Conference
Date: 15 - 18 July 2012
Location: Crown Promenade Hotel, Melbourne, Victoria, Australia
Language: English
Organizer: Leishman Associates
• Contact person: Leishman Associates
• Address: 113 Harrington Street
7000 Hobart
Tasmania
Australia
• Phone: 61 36234 7844
• Fax: 61 6234 5958
• E-mail: nicole@leishman-associates.com.au
Website: www.anz2012.com.au

Event Diary (continued)

6ICSE - 6th International Conference on Scour and Erosion
Date: 28 - 31 August 2012
Location: Ecole des Arts et Métiers, Paris, France
Language:
Organizer:
• Contact person: contact@icse6-2012.com
Website: www.icse-6.com

22nd European Young Geotechnical Engineers Conference 2012
Date: 26 - 29 August 2012
Location: Chalmers Univ of Technology , Gothenburg, Sweden
Language: English
Organizer: Swedish Geotechnical Society
• Contact person: Victoria Svahn
• Address: Swedish Geotechnical Institute
412 96 Gothenburg
Sweden
• Phone: 46-31-7786568
• E-mail: eygec2012@sgf.net
Website: www.sgf.net

2nd International Conference on Transportation Geotechnics
Date: 10 - 12 September 2012
Location: Hokkaido University, Sapporo, Hokkaido, Japan
Language: English
Organizer: ISSMGE (TC202) and JGS
• Contact person: Dr. Tatsuya Ishikawa
• Address: Faculty of Engineering, Hokkaido University Kita 13, Nishi 8, Kita-ku
060-8628 Sapporo
Hokkaido
Japan
• Phone: 81-706-6202
• Fax: 81-706-6202
• E-mail: tc3conference@eng.hokudai.ac.jp
Website: congress.coop.hokudai.ac.jp/tc3conference/index.html

7th International Conference in Offshore Site Investigation and Geotechnics: Integrated Geotechnologies, Present and Future (12-14 September)
Date: 12 - 14 September 2012
Location: Royal Geographical Society , London, United Kingdom
Language: English
Organizer: TC209, SUT - OSIG
• Contact person: Peter Allan
• Address: Geomarine Ltd, A2 Grainger Prestwick Park
NE20 9SJ NEWCASTLE UPON TYNE
England
• Phone: 44 (0) 191 4537900
• E-mail: peter.allan@geomarine.co.uk; zenon@tamu.edu

The Seventh Asian Young Geotechnical Engineers Conference (7AYGEC)
Date: 12 - 14 September 2012
Location: The University of Tokushima , Tokushima, Tokushima, Japan
Language: English
Organizer: Japanese Geotechnical Society
• Contact person: Prof. Ryosuke Uzuoka
• Address: Dept. of Civil and Environmental Engineering, The University of Tokushima
2-1 Minamijyousanjima-cho
770-8506 Tokushima
Tokushima
JAPAN
• Phone: 81-88-656-7345
• E-mail: uzuoka@ce.tokushima-u.ac.jp
Website: sites.google.com/site/7aygec/

ISC'4 - 4th International Conference on Geotechnical and Geophysical Site Characterization
Date: 18 - 21 September 2012
Location: Porto de Galinhas, Pernambuco, Brazil
Language:
Organizer: TC102
• Contact person: Executive Secretary
• Address: Rua Ernesto de Paula Santos 1368, salas 603/604
Boa Viagem; Recife - PE CEP: 51021-330
Brazil
• E-mail: isc-4@factos.com.br
Website: www.isc-4.com/index.php

Event Diary (continued)

International Conference on Ground Improvement and Ground Control: Transport Infrastructure Development and Natural Hazards Mitigation
Date: 30 October - 2 November 2012
Location: University of Wollongong, Wollongong, New South Wales, Australia
Language: English
• Organizer: The Centre for Geomechanics and Railway Engineering, University of Wollongong, Australia, and the Australian Geomechanics Society (AGS)
. Contact person: Dr. Jayan Vinod
. Address: Centre for Geomechanics and Railway Engineering, Faculty of Engineering,
University of Wollongong,
2522 Wollongong,
New South Wales,
Australia.
. Phone: 61 02 4221 4089
. Fax: 61 02 4221 3238
. E-mail: icgi_2012@uow.edu.au
. Website: www.icgiwollongong.com
. Deadline for Abstract submission: 1 July 2011

Third African Young Geotechnical Engineering Conference (3AyGEC'12)
Date: 16 - 18 November 2012
Location: Engineering Auth'y Guest House, Cairo, Egypt
Language:
Organizer: Egyptian Geotechnical Soc
• Contact person: Dr. Fatma Baligh, Dr. Nagwa El-Sakhawy, Ms Yvonne Hanna
• Address: 62 El - Orouba St.
Heliopolis,
11361 Cairo
Egypt
• Phone: 202 24156573
• Fax: 20 1220071671
• E-mail: aygec3@yahoo.com

2013

4th International Seminar on Forensic Geotechnical Engineering
Date: 10 - 12 January 2013
Location: Atria Hotel , Bangalore, Karnataka, India
Language: English
Organizer: Indian Geotechnical Society
• Contact person: Prof. G L Sivakumar Babu
• Address: Department of Civil Engineering,
Indian Institute of Science, Bangalore
560012 Bangalore
KA
India
• Phone: 918022933124
• Fax: 918023600404
• E-mail: gls@civil.iisc.ernet.in

First Pan-American Conference on Unsaturated Soils (Pam-Am UNSAT 2013)
Date: 20 - 22 February 2013
Location: Convention Center, Cartagena de Indias, Colombia
Language: English
Organizer: UniAndes, UniNorte, Unal, Col
• Contact person: Diana Bolena Sánchez Melo
• Address: Carrera 1 Este No. 19A-40
Edificio Mario Laserna Piso 6
Departamento de Ingenieria Civil & Ambiental
Bogotá
Colombia
• Phone: 571 3324312
• Fax: 571 3324313
• E-mail: panamunsat2013@uniandes.edu.co
Website: panamunsat2013.uniandes.edu.co

Second International Symposium on Geotechnical Engineering for the Preservation of Monuments and Historic Sites
Date : 30 - 31 May 2013
Location : Conference Centre Federico II , Napoli, Italy
Language : English
Organizer : AGI and TC 301
• E-mail : secretariat@tc301-napoli.org
Website : www.tc301-napoli.org

5th International Symposium on Geotechnical Engineering, Disaster Prevention and Reduction, and Environmentally Sustainable Development
Date : May 15-17 May 2013
Location : Incheon, South Korea
Language : English
Contact person : Prof. Eun Chul Shin, University of Incheon, Korea
E-mail : ecshin@incheon.ac.kr

Event Diary (continued)

18th International Conference for Soil Mechanics and Geotechnical Engineering
Date: 1 - 5 September 2013
Location: Paris International Conf. Ctr , Paris, France
Language:
Organizer:
• Contact person: Violaine Gauthier
• Address: Le Public Système,
38, rue Anatole France –
92594 Levallois-Perret Cedex
France
• Phone: 33 1 70 94 65 04
• E-mail: vgauthier@lepublicsysteme.fr
Website: www.issmge2013.org/

2014

8th European Conference on Numerical Methods in Geotechnical Engineering (NUMGE14)
Date: 18 - 20 June 2014
Location: Delft University of Technology, Delft, Netherlands, The
Language: English
Organizer: Prof. Michael Hicks
• Contact person: Mrs. Hannie Zwiers
• Address: Delft University of Technology, Faculty of Civil Engineering & Geosciences
Stevinweg 1
2628 CN Delft
The Netherlands
• Phone: +31 15 2788100
• E-mail: info@numge2014.org
Website: www.numge2014.org

NON-ISSMGE SPONSORED EVENTS

2012

4th International Conference on Grouting and Deep Mixing
Date: 15 - 18 February 2012
Location: Marriott New Orleans , New Orleans, LA, United States
Language: English
Organizer: ICOG and DFI
• Contact person: Theresa Rappaport
• Address: DFI; 326 Lafayette Avenue
07506 Hawthorne
NJ
USA
• Phone: 9734234030
• Fax: 9734234031
• E-mail: trappaport@dfi.org
Website: www.grout2012.org

Geo-Congress 2012
Date: 22 - 25 March 2012
Location: Oakland, California, United States
Language: English
Organizer: Geo-Institute of ASCE
• Contact person: Rob Schweinfurth
• Address: 1801 Alexander Bell Drive
Reston, VA 20191
United States
• Phone: 1.703.295.6015
• E-mail: rschweinfurth@asce.org
Website: www.geocongress2012.org

NGM 2012. 16th Nordic Geotechnical Meeting
Date: 9 - 12 May 2012
Location: Tivoli Congress Center, Copenhagen, Denmark
Language: English
Organizer: Danish Geotechnical Society
. Contact person: Morten Jorgensen
. Address: Sortemosevej 2
DK-3450 Allerod
Copenhagen
Denmark
. Phone: +45 4810 4207 ; +45 4810 4207
. Fax: +45 4810 4300
. E-mail: moj@niras.dk
Website: www.ngm2012.dk

Event Diary (continued)

11th International & 2nd North American Symposium on Landslides
Date: 3 - 8 June 2012
Location: Fairmont Banff Springs Hotel , Banff, Alberta, Canada
Language:
Organizer: CGS, AEG, JTC1
• Contact person: Wayne Gibson, P.Eng. Conference Manager
• Address: c/o Gibson Group Association Management,
8828 Pigott Road,
V7A 2C4 Richmond
BC
Canada
• Phone: 1 (604) 241-1297
• Fax: 1 (604) 241-1399
• E-mail: info@isl-nasl2012.ca
Website: www.isl-nasl2012.ca/index.php?lang=en

Third International Conference on New Developments in Soil Mechanics and Goetechnical
Date: 28 - 30 June 2012
Location: Near East University , Nicosia, North Cyprus, Turkey
Language: English
Organizer: TNCSMGE, NEU
• Contact person: Cavit Atalar
• Address: ZM2012 Organising Committee Chair,
Third International Conference on
New Developments in Soil
Mechanics and Geotechnical
Engineering,
Department of Civil Engineering,
Near East University
Nicosia
North Cyprus
Mersin 10, TURKEY
• Phone: 90 392 223 6464
• Fax: 90 392 223 6461
• E-mail: zm2012@neu.edu.tr; zm2012@kibris.net
Website: zm2012.neu.edu.tr

34th International Geological Congress (34th IGC)
Date: 5 - 10 August 2012
Location: Convention and Exhibition Ctr , Brisbane, Queensland, Australia
Language: English
Organizer: IUGS
• Contact person: For full contact details see - http://www.34igc.org/congress-manager.php
• Address: 34th IGC, PO Box 177
Redhill
Queensland 4059
Australia
• Phone: 61 7 3368 2644
• Fax: 61 7 3369 3731
• E-mail: info@34igc.org
Website: www.34igc.org/index.php

XXI Congreso Argentino de Mecánica de Suelos e Ingeniería Geotécnica (CAMSIG XXI)
Date: 12 - 14 September 2012
Location: Salón Terrazas del Parana, Rosario, Santa Fe, Argentina
Language: Spanish
Organizer: Soc Argentina Ing Geotecnica
• Contact person: Ing Virginia Sosa
• Address: Boulevard Oroño 1572 Planta Baja
2000 Rosario
Santa Fe
Argentina
• E-mail: secretaria@camsig2012.com.ar
Website: camsig2012.com.ar

IS-Kanazawa 2012, The 9th International Conference on Testing and Design Methods for Deep Foundations
Date: 18 - 20 September 2012
Location: Kanazawa Bunka Hall , Kanazawa, Ishikawa, Japan
Language: English
Organizer: Japanese Geotechnical Society
: • Contact person: Associate Prof. Shun-ichi Kobayashi
• Address: Kanazawa University
920-1192 Kanazawa
Ishikawa
Japan
• E-mail: office@is-kanazawa2012.jp
Website: is-kanazawa2012.jp

Event Diary (continued)

International Symposium on Coastal Engineering Geology(IS-Shanghai 2012)
Date: 20 - 21 September 2012
Location: Tongji University , Shanghai, Shanghai, China
Language: English
Organizer: Tongji University
• Contact person: Feifan Ren
• Address: Department of geotechnical engineering,
1239 Siping Road
200092 Shanghai
China
• Phone: 21-65983715
• Fax: 21-65983715
• E-mail: is.shanghai2012@hotmail.com
Website: www.is-shanghai2012.org/

4th Central Asian Geotechnical Symposium: Geo-Engineering for Construction and Conservation of Cultural Heritage and Historical Sites - Challenges and Solutions
Date: 21 - 23 September 2012
Location: Samarkand, Uzbekistan
Language: English
Organizer: Uzbekistan Geotechnical Society
• Contact person: Zokhir Hasanov
• Address: Lolazor St/70
140147 Samarkand
Uzbekistan
• Phone: 998- 66 220-2825
• Fax: 998- 66 223-0016
• E-mail: uzssmge@gmail.com

37th Annual Conference on Deep Foundations: Foundations and Ground Improvement Techniques: Adapting them to an Ever Changing Environment
Date: 16 - 19 October 2012
Location: The George R. Brown Convention , Houston, TX, United States
Organizer: DFI
• Contact person: 2012 Program Chair c/o Deep Foundations Institute,
• Address: 326 Lafayette Avenue
07506 Hawthorne, NJ
United States
Website: www.dfi2012submissions.org

GA2012 - Geosynthetics Asia 2012 - 5th Asian Regional Conference on Geosynthetics
Date: 10 - 14 December 2012
Location: Centara Grand, Bangkok Conv Ct , Bangkok, Thailand
Language: English
Organizer: IGS-Thailand
• Contact person: GA2012 Secretariat
• Phone: +66-2-524-5523
• Fax: +66-2-524-6050
• E-mail: igs-thailand@ait.ac.th or acsig@ait.ac.th
Website: www.set.ait.ac.th/acsig/GA2012/

2013

Seventh International Conference on Case Histories in Geotechnical Engineering
Date: 29 April - 4 May 2013
Language: English
Organizer: Missouri S&T
• Contact person: Kay Tillman
• Address: Missouri S&T,
Distance & Continuing Ed.,
216 Centennial Hall,
300 W. 12th St.
65409 Rolla. MO
United States
• Phone: 573-341-6222
• Fax: 573-341-4992
• E-mail: 7icchge@mst.edu
Website: 7icchge.mst.edu

International Symposium on Design and Practice of Geosynthetic-Reinforced Soil Structures
Date: 14 - 16 October 2013
Location: Faculty of Engineering , Bologna, Italy
Language: English
Organizer: Tatsuoka, Gottardi, Ling, Han
• Contact person: Hoe I. Ling
• Address: 500 West 120th Street,
Columbia University
10027 New York, NY
USA
• Phone: 12128541203
• Fax: 12128546267
• E-mail: ling@civil.columbia.edu
Website: www.civil.columbia.edu/bologna2013/

FOR FURTHER DETAILS, PLEASE REFER TO THE ISSMGE WEBSITE
http://addon.webforum.com/issmge/index.asp

Corporate Associates

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Terre Armée
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TRACTEBEL DEVELOPMENT ENGINEERING S.A.
Tractebel Development Engineering SA
Transportation Division
Geotechnology Section
7 Avenue Ariane B-1200, BRUSSELS
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685 Stockton Drive 7710,
Exton PA 19341, United States

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Dolapdere cad. 255, Şişli - İstanbul 80230
TURKEY

Huesker Synthetic GmbH
Fabrikstrasse 13-15
48712 Gescher
Germany

Zetas Zemin Teknolojisi AS
Merkez Mah. Resadiye Cad. No. 69/A
Alemdag, Umraniye
Istanbul, 34794 TURKEY

Siemens Energy
Kaiserleistrasse10
63067 Offenbach
GERMANY

International I.G.M. s.a.r.l.
P.O.Box: 166129 Achrafieh
Beirut, LEBANON

Corporate Associates (continued)

TenCate Geosynthetics
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B.P. 40080
95873 Bezons Cedex
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Av. Rebouças, 3970 - 31º andar
Pinheiros CEP-05402-600
São Paulo/SP
BRAZIL

Coffey Geotechnics
8/12 Mars Road
Lane Cove West
NSW, 2066
AUSTRALIA

Tecnogeo Engenharia e Fundações Ltda
Av. Eliseu de Almeida nº 1415 – Butantã
São Paulo/SP – 05533-000
Brazil

Brasfond Fundacoes Especiais SA
Rua Olimpiadas, 200, 13º Andar
Cep: 04551-000 Vila Olímpia
São Paulo / SP
BRAZIL

A.P. van den Berg
źzerweg 4
8445 PK Heerenveen
The Netherlands

Huesker Ltda
Attn: Flavio Teixeria Montez
Rua Romualdo Davoli, 375
Cond. El Dorado
CEP 12238.577 São José dos Campos SP
BRAZIL

AECOM Asia Company Ltd
Attn: Dr Axel KL Ng
8/F, Tower 2, Grand Central Plaza
138 Shatin Rural Committee Road
Shatin, NT
Hong Kong

Novatecna Consolidações e Construções S/A
Attn: Giorgio GuatteriRua Banibás 142São Paulo/SP
Brasil

Corporate Associates (continued)

Dear ISSMGE Corporate Associates,

The International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) is eager to express its deepest gratitude for your continuous support of the society's many activities world-wide. One of the benefits offered by the MPAC (Membership, Practitioners, and Academicians Committee) in conjunction with the Editorial Board of the ISSMGE Bulletin, is a one-page article in the Bulletin as described below (An example is attached to this e-mail for reference).

The ISSMGE Bulletin is an official publication of the society, and as such has a potential readership of over 19,000 individuals. Currently, 6 issues are produced and distributed a year. Corporate associates will be invited to use one page of the bulletin once a year, in order to highlight their achievements (technical, environmental, social, etc) or maybe give an indication of any current recruitment programmes. As long as the content meets the general mission of ISSMGE, details can be decided by individual corporate associates.

You can make a draft WORD file and send it to the chief editor (Ikuo Towhata at Towhata@geot.t.u-tokyo.ac.jp) at any time. One request is that your one-page draft does not exceed approximately 300 kB in its file size so that the total size of the bulletin remains manageable. Please feel free to consult the editor, however, if you have any questions or problems.

The ISSMGE Bulletin is published with Trebuchet MS font (minimum 10 points). But you can use bigger fonts if you like. The page size is A4 and the margin size is 60 mm at the top and 20 mm at left, right, and bottom.

ISSMGE Bulletin: Volume 4, Issue 4 Page 55

Message from Corporate Associate:
Arjuna Consulting Inc.

Arjuna Consulting is a geotechnical consulting firm that is based in Kurukshetra City of Paradiseland where infrastructure construction is very active. Its majoring fields are planning of field investigation, interpretation, and application to design of foundation. Some of its recent achievements are illustrated in the pictures below. In recognition of its remarkable contributions to the public welfare for decades, Ajuna Consulting has got recently a special award from the King of Paradiseland.

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Position vacancies: We currently want Project Supervisor, Financial Director, Specialist of Numerical Analysis (Nonlinear FEM), and Geophysicist.

Contact person: Dr. Ashwathama at ashwathama@pandavas.arjunacon.co.qq
Address: P.O.Box 777, Kurukshetra, Kuru Province, 939-3704, PARADISELAND
http://www.arjunacon.co.qq

Example of Corporate Associate page

Foundation Donors

The Foundation of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) was created to provide financial help to geo-engineers throughout the world who wish to further their geo-engineering knowledge and enhance their practice through various activities which they could not otherwise afford. These activities include attending conferences, participating in continuing education events, purchasing geotechnical reference books and manuals.

- **Diamond: $50,000 and above**
  - **a.** ISSMGE-2010 http://www.issmge.org/
- **Platinum: $25,000 to $49,999**
  - a. Prof. Jean-Louis and Mrs. Janet Briaud
    https://www.briaud.com and
    http://ceprofs.tamu.edu/briaud/
- **Gold: $10,000 to $24,999**
  - a. International I-G-M
    http://www.i-igm.net/
  - b. Geo-Institute of ASCE
    http://content.geoinstitute.org/
  - c. Japanese Geotechnical Society
    http://www.jiban.or.jp/
- **Silver: $1,000 to $9,999**
  - a. Prof. John Schmertmann
  - b. Deep Foundation Institute
    www.dfi.org
  - c. Yonsei University
    http://civil.yonsei.ac.kr
  - d. Korean Geotechnical Society
    www.kgshome.or.kr
  - e. CalGeo – The California Geotechnical Engineering Association
    www.calgeo.org

Foundation Donors (continued)

f. Prof. Ikuo Towhata http://geotle.t.u-tokyo.ac.jp/ towhata@geot.t.u-tokyo.ac.jp

- **Bronze: $0 to $999**

a. Prof. Mehmet T. Tümay http://www.coe.lsu.edu/administration_tumay.html mtumay@eng.lsu.edu

b. Nagadi Consultants (P) Ltd www.nagadi.co.in

c. Professor Anand J. Puppala University of Texas Arlington (http://www.uta.edu/ce/index.php)

Message from ISSMGE Foundation

The ISSMGE Foundation is requesting donations from industries as well as individuals. The donated fund is spent to financially support promising geotechnicians who intend to further their geotechnical engineering knowledge and enhance their practice through various activities which they could not otherwise afford. These activities include attending conferences, participating in continuing education events, purchasing geotechnical reference books and manuals. All our ISSMGE members can contribute to the ISSMGE Foundation by sending President Briaud an email (briaud@tamu.edu). If you wish to apply for a grant, on the other hand, you can download the form

(http://www.issmge.org/web/page.aspx?pageid=126068),

fill it, and send it to the general secretary of ISSMGE at issmge@city.ac.uk. A request for grant above $2000 is unlikely to be successful. Smaller requests especially with indication of cost sharing have the best chance.

Foundation Donors (continued)

FROM THE EDITOR

Invitation to submission of article to ISSMGE Bulletin

ISSMGE Bulletin always welcomes contribution from readers who are interested in submitting technical and event articles. The number of subscribers in the world is more or less 19,000.

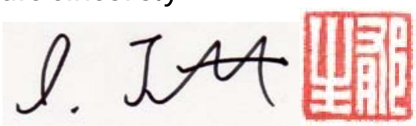
Examples of desired type of articles in recent issues have addressed "*Soil Improvement under New Levees in New Orleans*" and "*Development of New Cone Penetrometer*" as well as "*Harbour Construction in Australia*." For more idea, you can freely download past issues of the bulletin from the website of ISSMGE;
http://www.issmge.org/web/page.aspx?refid=430

Because the Bulletin is an electronic publication, there is no page limitation. Colour photographs and illustrations are highly welcome. Moreover, you can submit draft by a WORD file and there is no fixed format; the editing team will take care of formatting.

There is no fixed due date of submission. Submission is certainly free of charge. There is no peer review because the bulletin is not an academic journal but a newsletter. Only one request to authors is that the article has to be clear and easily understandable for practitioners. It is very advisable to use nice photographs and illustrations.

I would like to express my sincere thanks for you to consider this invitation in a positive manner and send me a reply at your earliest convenience. Please take this good opportunity to demonstrate to the world **HOW GOOD YOU ARE**.

Yours sincerely



Ikuo Towhata