



香港岩土及岩土環境工程專業協會

ASSOCIATION OF GEOTECHNICAL & GEOENVIRONMENTAL SPECIALISTS (HONG KONG)

AGS (HK) NEWSLETTER

The Editorial

Welcome to the latest issue of the AGS (HK) Newsletter! Throughout the year, the AGS (HK) has held a number of well-attended professional forums, seminars, and technical visits for our members. One of the exciting events was the international field trip in November 2011 when our members visited Singapore and studied the local infrastructure development projects. Further details about that trip can be found in the newsletter. The Association thanks the members of the previous Executive Committee for their hard work.

In April 2011 and April 2012, the Association published and circulated among the geotechnical community two Ground Investigation Guidelines (GIGs) on "Natural Terrain Mitigation Works" and "Horizontal Directional Coring". These professional guidelines are to provide the general geotechnical practitioners in Hong Kong with an introduction to the critical aspects for the mitigation works against the natural terrain hazards, and the techniques and working principles of horizontal directional coring for ground investigation in the tunnel projects. The new GIGs on "Geology for Engineering Project" and "Tunnelling Instrumentation", as well as the new Tunnel Construction Guidelines (TCGs) on "Grouting and Ground Treatment" and "Rock Mass Classification" will be prepared for publication in late 2012.

Dr Angus MAXWELL has completed a highly successful two-year term as the Chairman of the AGS (HK). Under his remarkable leadership, the Association actively engaged the geotechnical community through various professional forums, seminars, and technical visits, and the publication of construction guidelines. The Association thanks Dr MAXWELL for his contributions to the field and wishes him well in his future endeavours. The Association also thanks Dr Yu-Hsing WANG, who just stepped down from the Executive Committee for his hard work and service over the years.

In 2012, Mr Barry SUM of the AECOM Asia Company Ltd. succeeded Dr Angus MAXWELL as the new Chairman of the AGS (HK). Mr Chris LEE of the C M Wong & Associates Ltd. continues as the Honorary Treasurer and Dr Siew-wei LEE of the Geotechnical Consulting Group (Asia) Ltd. acts as the Honorary Secretary to the Association. In addition, Dr Yu WANG

of the City University of Hong Kong, Mr David SEIN of the Lambeth Associates Ltd., Ms Wylie TSANG of the Ove Arup & Partners Hong Kong Ltd., Dr Jui-pin WANG of the Hong Kong University of Science and Technology, Mr John COWLAND of the Geosystems Ltd., Mr Graham KITE of the Maxwell Geosystems Ltd. and Mr Sai-chung TSE of the Mass Transit Railway Corporation Ltd., have joined the Executive Committee, bringing invaluable skills and experiences and helping the Association to move forward.

Barry SUM is going to share with us his vision through the 2012 Chairman's address.

The AGS (HK) is deeply committed to promoting the interests of its member organisations. Please feel free to share with us how the Association can best serve the fast-growing geotechnical and geoenvironmental profession. We always welcome volunteers in future activities of the AGS (HK).

Suggestions

Please send your suggestions to:
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2012 Chairman's Address

Dear Members,

In early 2012, it was my great honour to take up the Chairman role of this well established society. My predecessor (Dr Angus MAXWELL) done a very good job to exert the objectives and function of the Association. Nevertheless, I am very pleased to have a team of committee members from various member companies and local institutions to support me in running this association. All my fellow committee members and myself are committed to revitalize our industry.



Unlike other learned societies in Hong Kong, the AGS (HK) is a practical society promoting and advancing good practice in geotechnical engineering, underground works, engineering geology as well as environmental disciplines. The Association provides a platform for training our young engineers and geologists, and sharing of good and practical experience among our industry.

The AGS (HK) will continue to organize professional forums, seminars and technical visits, and encourage continued professional development. The topics aim to be of particular relevance to the current and near future issues facing the industry. Our objective is to stimulate and lead the discussion so that the experience gained by our members, no matter good or bad, can be shared and disseminated as widely as possible.

The AGS (HK) has also produced some very useful professional guidelines on ground investigation in the past. These guidelines are well received by our young practitioners. We will continue to develop more guidelines on various subjects of ground investigation. As our industry has accumulated some good tunnelling experiences in the recent years, we will also develop another series of guideline on topics related to the underground engineering and construction.

The AGS (HK) will continue to provide feedback to the Government on all engineering related issues and policies, which will affect the interests of our members. We will continue to liaise with the Government and other regulatory bodies concerning all matters in connection with the geotechnical and geoenvironmental engineering.

Last but not least, the AGS (HK) will continue to support the local Universities by providing scholarships to those students showing particular interest in the disciplines of geotechnical engineering, underground works, engineering geology as well as environmental science. The objective of the awards is to encourage more graduates to enter the geotechnical engineering field so that the industry will have a continued supply of new blood. The awards are always gratefully received by our new entrants.

On behalf of the Committee, we look forward to seeing you and having your support throughout the year.

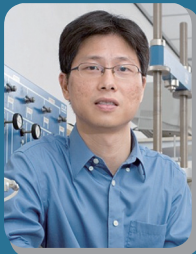
Yours truly,
Barry SUM

New Faces

The Association warmly welcomes the following new faces to the Executive Committee:

Dr Yu WANG (City University of Hong Kong)

Yu WANG obtained his PhD degree in geotechnical engineering from Cornell University, USA, and he has research and teaching experiences in both Hong Kong and USA. His research efforts have focused on geotechnical risk and reliability (e.g., probabilistic slope stability analysis), soil-



structure interaction (e.g., responses of buried utility pipelines to ground displacement induced by seismic strong motions or urban underground construction activities such as tunnelling), soil property characterization using laboratory and field tests, and seismic risk assessment of critical civil infrastructure systems. He is a member of several international Technical Committees (TCs), including an ASCE Geo-Institute TC on Risk and two ISSMGE TCs on Risk and In-Situ Testing, respectively.

Mr David SEIN (Lambeth Associates Ltd.)

David SEIN is an Engineering Manager with Lambeth Associates Ltd., the in-house design arm of Gammon Construction Ltd.. David has lived in Hong Kong for more than 16 years, and is a Chartered Engineer in the civil and geotechnical discipline. David has extensive experience in the design and construction aspects of tunnelling and deep excavation projects in Hong Kong and Singapore. He is proficient in the practical application of geotechnical instrumentation and monitoring works as a tool to manage risks during underground construction works. David has a keen interest in the design and predicted performance of large scale geotechnical construction works.



Mr John COWLAND (Personal Member – Geosystems Ltd.)

John COWLAND is an Independent Geotechnical Engineering Consultant, with nearly 40 years of experience. John has provided advice to numerous government and private sector clients throughout the Asia Pacific region on geotechnical and environmental projects; including dams, tunnels, mines, slopes, soft ground, coastal reclamations, solid waste landfills, liquid storage and disposal of contaminated soil. He has advised on the use of geosynthetics in all these areas. John has also provided advice on project management for projects up to \$ 80 billion in value. John is a Council Member of the International Geosynthetics Society (IGS) and he is an invited Member of the Environmental Geotechnics Committee TC 215 of the International Society for Soil Mechanics and Geotechnical Engineering. He has published 46 technical papers on geosynthetics and geotechnical engineering.



Dr Jui-pin WANG (The Hong Kong University of Science and Technology)

Dr WANG is a Registered Engineering Geologist in Taiwan certificated by the Public Construction Commission Taiwan since year 2000. He went to Columbia University for his PhD study in geotechnical engineering during 2004-2007. Then he worked for an engineering consultancy in the area of probabilistic, performance-based earthquake resistant design for critical structures like nuclear power plants, until joining the Hong Kong University of Science and Technology



in 2010 as Assistant Professor, which is also his current post. Dr WANG's current research focuses on geotechnical probabilistic analyses and earthquake engineering. More details can be found on his homepage <http://home.ust.hk/~jpwang/>.

Ms Wylie TSANG (Ove Arup & Partners Hong Kong Ltd.)

Wylie TSANG is an Engineering Geologist with Ove Arup & Partners Hong Kong Ltd.. She has over nine years' experience on various projects in Hong Kong, China, Macau, South Korea and the Philippines. Her key experience includes engineering geological assessments for site formation, foundation, slope upgrading, tunnel and cavern works, as well as natural terrain hazard studies. She has also considerable experience in blasting and rock excavation works, as well as site investigation and ground improvement works and practice in China.



Mr Graham KITE (Personal Member – Maxwell Geosystems Ltd.)

Graham KITE is an Engineering Geologist with fourteen years' experience in a variety of engineering sector disciplines including oil and gas, mineral exploration and civil engineering. He was worked as field specialist, consultant and contractor in both technical and managerial roles in the UK, Middle East and Hong Kong. Graham is an Associate of Maxwell Geosystems Ltd. and leads the business development, tendering and contractual teams.



Mr Sai-chung TSE (Personal Member – Mass Transit Railway Corporation Ltd.)

Sai-chung TSE obtained his BEng in The University of Sheffield, UK in 2003 and MSc in the Hong Kong University of Science and Technology in 2006 respectively. He joined the Mass Transit Railway Corporation Ltd. in 2011. Before that he was worked as an Engineer in Geotechnical Consulting Group (Asia) Ltd.. He is a Chartered Engineer and has experience in foundation, deep excavation, tunnelling, and site investigation works for a number of building and civil engineering projects.



Seminar on “The Fundamental Principles and Applications of Centrifuge Modelling in Engineering Practice”

On Monday, February 28, 2011, the AGS (HK) held an evening seminar on “The Fundamental Principles and Applications of

Centrifuge Modelling in Engineering Practice” at the Mariners' Club in Tsim Sha Tsui.

This seminar was initiated after a site visit by AGS (HK) members to the Geotechnical Centrifuge Facility (GCF) at the Hong Kong University of Science and Technology (HKUST) on August 21, 2010.

Prof Charles W. W. NG of HKUST gave a fascinating presentation about the rapid development of the geotechnical centrifuge modelling technology in many countries worldwide, especially in China. Centrifuge testing has now become a preferred method of physical experiment for many geotechnical and geoenvironmental applications. Prof NG discussed the theoretical principles and practical applications of geotechnical centrifuge modelling in resolving a number of slope instability problems and soil-structure interactions such as tunnelling effects on pile groups, and geological fault movements on ground deformations.

Prof NG's presentation was well-received by the audiences. More than fifty members attended the event and engaged in a lively discussion with the speaker.



Dr Angus MAXWELL (left) presented a souvenir to Prof Charles W. W. NG on behalf of the AGS (HK).

Article by Mr Chris LEE (C M Wong & Associates Ltd.)

Seminar on “Fault Zone and their Influence on Construction”

On Saturday, March 19, 2011, a 200-strong audience attended the AGS (HK) one-day seminar on “Fault Zones and their Influences on Construction”. The seminar was delivered by 12 prominent engineers and engineering geologists, presenting local and overseas construction projects involving faults and other challenging geological features. Dr Samuel NG of the GEO and Mr Barry SUM of the AECOM chaired the morning and afternoon panel sessions, respectively.



The seminar was well attended with more than 200 members.

To set the scene, Dr Rod SEWELL of the GEO presented, “Tectonic Setting of Hong Kong Fault Systems and their Characteristics”, a topic of great interest to the members. The regional tectonic setting of Hong Kong’s faults, and supplemented the presentation with detailed photo illustrations. He dated the fault movement and examined its impacts on Hong Kong, documenting earthquakes on known and unknown faults throughout the world, and surveying historical earthquakes in the region around HK.

Mr Sam HO of the GCG (Asia) Ltd. presented “Weak Zones in HK Rocks and their Engineering Implication”. Drawing on his 35-year geological research and extensive photo collection, Mr HO surveyed the occurrences of weak zones in hard rocks in HK, and discussed the geotechnical problems posed by faults as revealed during construction. He drew attention the specific behaviours of weak zones, and called for the need to handle these fault problems with particular inputs from different parties of a construction project.

Mr Bruce CUNNINGHAM and Ms Janice TAM of the AECOM presented “Use of HDC to Identify Problematic Ground in Tunnel Projects and Past Project References”. They explained the nature of the horizontal directional coring (HDC) technique, the planning procedures involved in HDC, and the use of HDC in geological model assessment. They referred to special case histories in HK where HDC was used at the Route 8 Eagle’s Nest Tunnel, and the Po Shan Road Drainage Tunnel and HATS 2A. The techniques and working principles of HDC in these projects revealed the importance of carrying out water inflow field tests and impression packer tests while carrying out in HDC.

Mr Pawel BARMUTA of the Maxwell Geosystems Ltd. gave a talk on “Detecting Faults Ahead of the Tunnel Face during

Construction”. He explained the characteristics of fault zones in HK, the particular methods for detecting weak zones with reference to a number of HK tunnelling projects, the automated recording of drilling parameters and their statistical analysis involving normalisation and scaling procedures, and the processing of large amount of data from drill holes using computer programmes for visual presentation.

Mr Timothy MAGUB of the Arup presented “TBM versus Drill & Blast – Key Selection Criteria”. He covered the selection criteria for the excavation method, and highlighted some potential problems when working on TBM and Drill & Blast (D&B) penetrating fault zones. He also discussed the design of blast patterns, compared the procurement process and set-up time between the two methods, and explored how to choose TBM and D&B with respect to the production cost, time, and other technical considerations.

The seminar was adjourned for lunch.



From left: Mr Timothy MAGUB, Mr Pawel BARMUTA, Ms Janice TAM, Mr Bruce CUNNINGHAM, Mr Sam HO and Dr Rod SEWELL at the AGS (HK) Seminar on “Fault Zone and their Influence on Construction”

Dr Chi-wen YU of the Sinotech Engineering Consultant Inc. from Taiwan presented “Design Challenges for Tunnel Support in Fault Zone – Taiwan Experience”. His case study of the formation of geological faults in Taiwan was quite insightful. The technical problems of constructing any tunnel in Taiwan such as structural failure, water inflow, and squeezing and creep of rock materials, are best shown in the faults at Freeway No.3 in 2010 and Chi-chi earthquake in 1999. Dr YU shared with us his in-depth laboratory investigation of the creep behaviour of rock materials, the use/derivation of various mathematical constitutive models, and the careful design of primary and secondary tunnel lining supports in Taiwan’s fault zones.

Mr Knut F GARSHOL of the AECOM presented “Fault Zones and Tunnelling – Enhancing Forward Stability using Pre-treatment and Reinforcement and Effective Water Control”. Based on his vast experience worldwide, he covered the requirements for pre-treatment, background information on pre-excavation grouting (PEG) and its application to the Arrowhead East Tunnel in Ontario, California, and the Penalva Twin Rail Tunnels in Portugal’s Lisbon. He also referred to other methods of tunnel construction such as using concrete to fill voids in Holsfjorden Water Supply Tunnel and the Laerdal Road Tunnel, both in Norway.

Mr Derek WILLIAMS of the Gammon gave a presentation on “SSDS Tunnel F and the Tolo Channel Fault”. He gave detailed background information on the Strategic Sewage Disposal Scheme (SSDS) Stage 1 in the 1990s, the extent of ground investigation (GI) carried out during the pre-tender stage, the use of Skanska’s tunnel boring machine (TBM) to deal with a fractured rhyolite dyke zone and the challenge of excavating through the Tolo Channel Fault while strengthening the tunnel support system.

Mr Steve WILLIAMSON of the AECOM talked about “Fault Zones and Site Formations”. With reference to the site formation work for Route 8 Shatin Heights Tunnel Toll Plaza, he reviewed the geological fault-lines of the site, the technical works required to stabilize the faults, and the related seepage and stability problems.

Mr Mark WALLACE of the Arup drew on the case study of Kowloon Station package 7 of the International Commerce Centre (ICC) Tower to present “Foundation Designs Influenced by Faulted Ground”. The unique feature of this project was to undertake gravity survey method to establish a feasible geological model for building the H-piles, bored piles, bored piles and barrettes, and barrettes/bored piles inside cofferdams and diaphragm walls.

Mr John W TATTERSALL of the AECOM addressed “Faults, Deep Tunnels and Suspension Bridges”. As the principal author of GEO Publication No. 1/2007, Engineering Geological Practice in Hong Kong, he referred to the numerous studies of HATS Stage 1 Tunnel and West Rail Tai Lam Tunnel (crossing of the Sham Tseng fault) to explain the importance of a good geo-engineering model. He discussed the ground stabilisation methods by using pre-reinforcement of tunnel face with forepole umbrella, fibreglass dowels and injection grouting and numerical analyses carried out to compute the effect of the width of a fault zone on the tunnel stability. He also presented the design of suspension bridge rock anchorages with consideration of adversely orientated weakness planes at Hong Kong’s Tsing Ma Bridge and Tsing Lung Bridge – Route 10, and South Korea’s Yi Sun-sin Bridge.



From left: Mr John W TATTERSALL, Mr Steve WILLIAMSON, Mr Mark WALLACE, Mr Derek WILLIAMS, Mr Knut F GARSHOL and Dr Chi-wen YU at the AGS (HK) Seminar on “Fault Zone and their Influence on Construction”

Given the wide ranges of topics under discussion and the enthusiasm of the audience, this one-day seminar was a great success. During the Q&A sessions, the audience discussed a variety of practical and scientific questions concerning the effects of adverse geological conditions on geotechnical design and construction.



Mr Barry SUM (right) presented the appreciation souvenir to Dr Chi-wen YU on behalf of the AGS (HK)

Article by Dr Siew-wei LEE (Geotechnical Consulting Group (Asia) Ltd.)

Technical Tour to the “Highways Department Contract HY/2008/09 – Widening of Tolo Highway/ Fanling Highway between Island House Interchange and Fanling”



Cost-effective design of an inclined base retaining wall

On March 26, 2011, 23 members visited the site of the Tolo Highway/ Fanling Highway linking Island House Interchange and Ma Wo.

Mr Edwin CHUNG, Mr Wilson LAM, and Mr Kelvin LAW of the RSS gave the group a brief introduction followed by a site tour.

The widening of the Tolo Highway is designed to alleviate the current traffic congestion and cope with the increasing transportation demands in the New Territories. This contract which cost as high as HK\$4.23 billion consisted of two stages and is expected to be completed by the end of 2013. Stage 1 focused on the section between Island House Interchange and Ma Wo, whereas Stage 2 dealt with the section between Ma Wo and Tai Hang. The project involved the widening of the Tolo Highway, the modification and reconstruction of certain segments of highway and vehicular bridges, and the improvement of nearby roads, drainage system, landscaping, and lighting works.

There are several construction constraints. The construction site is located near a steep slope, a high speed railway, and many sensitive structures including the MTR tracks. Therefore, the Automatic Deformation Monitoring System (ADMS), the protective catch fence and an intrusion warning system are installed to monitor the level of settlement and ensure work safety. If the settlement during construction reaches certain level, the warning systems will alert the staff.

Geology is another major problem when it comes to cut slopes and undertaking filling works. The decomposed siltstone is not

favourable for compaction. With limited stockpiling area, cut / backfill materials have to be transported on and off site. In addition, the slope-work is very close to the Tolo Highway, raising the safety concern for road users.

Faced with these construction challenges, the engineers chose a cost-effective solution by building an inclined base retaining wall instead of a bored pile supported one.

The field visit was a valuable experience for our members. We thanked Mr Edwin CHUNG, Mr Wilson LAM, and Mr Kelvin LAW of the RSS for the wonderful arrangement.

Article by Ms Sai-shun TO (Lambeth Associates Ltd.)

Technical Tour of the “Drainage Services Department Contract DC/2007/10 – Design and Construction of Hong Kong West Drainage Tunnel”

The AGS (HK) arranged another visit of the Hong Kong West Drainage Tunnel for 21 members on April 30, 2011. This is a Drainage Services Department (DSD) Contract to relieve the flooding problem in the northern part of Hong Kong Island. The Contract is undertaken by the Dragages-Nishimatsu Joint Venture under the direct supervision of the Ove Arup & Partners Hong Kong Ltd.

The project consists of building a 11km-long drainage tunnel extending from Tai Hang to Cyberport, 34 intakes and a total of 8km adits connecting the intakes with the drainage tunnel at a total cost of HK\$3,044.7 million. The newly-built drainage tunnel will divert storm-water from uphill at the Mid-Levels to the sea near Cyberport. The project is being carried out in several phases and due for completion in 2012.

The main tunnel is constructed by the two double shields Tunnel Boring Machines (TBMs) while adits are mainly excavated by the drill and blast method. Most of the rock excavation at drop shafts is carried out underground by using the Raise Boring Machine (RBM) to minimise nuisance at the ground level.

Ms Priscilla HUONG of Arup welcomed us and began the technical tour with a brief introduction of the scope of the work, and the construction constraints of building the tunnels and shafts in urban areas.

Then they took our group to the tunnel portal at Cyberport for a closer inspection of the ongoing tunnel excavation works. The tour ended with a lively discussion between the hosts and participants, who expressed a particular interest in the design and construction of the tunnels by the application of the double shield TBM.

Technical Visit to “MTR West Island Line Contract 705 – Kennedy Town Station and Overrun Tunnel”

A half-day visit to the MTR West Island Line Contract 705 – Kennedy Town Station and Overrun Tunnel was held on September 17, 2011. This is one of the contracts for the construction of the MTR West Island Line which extends the existing MTR Island Line from Sheung Wan to Kennedy Town. The Contractor of this Contract is Gammon Construction Ltd. with target for completion of the Contract in mid of 2014.

The works under this contract involved the construction of Kennedy Town Station, overrun tunnel to the west of Kennedy Town Station and ventilation shaft. The contract also included demolition of the existing Kennedy Town Swimming Pool and two residential blocks of the Ex-Police Quarters at Ka Wai Man Road. The site is located at the densely populated areas of Western District, where the congested working space posed a great challenge for the project.

A delegation of 26 people attended this technical visit. It began with a site walk around the construction site to allow the members having a better understanding of the soft/ mixed ground tunnel construction, excavation and lateral supports adopted for the station construction, the rock shaft construction as well as temporary support and instrumentation monitoring for two historical tree walls. The site walk was then followed by a presentation by Mr Terry CHAN from Gammon with a detailed account of the construction works for the project.

We would like to thank Mr Terry CHAN and Gammon Construction Ltd. for their arrangements, that our members were given an opportunity to learn about the recent construction techniques and for an infrastructure construction project in Hong Kong.

Article by Ms Wylie TSANG (Ove Arup & Partners Hong Kong Ltd.)

Seminar on the “Monitoring of Ground Vibration during Construction”

The AGS (HK) organized an evening seminar at the Conference Room of Tsim Sha Tsui’s Mariners’ Club on October 20, 2011.

Chaired by Dr Siew-wei LEE of the AGS (HK), three distinguished speakers, Mr Timothy MAGUB (Leighton Asia Ltd.), Mr Guy BRIDGES (AECOM Asia Company Ltd.), and Ms Argoon CHUANG (Ove Arup & Partners HK Ltd.) kindly shared their views on the construction-induced vibrations in Hong Kong. The seminar

attracted more than 80 participants from various government departments, business clients, consultants, contractors and universities. During the Q&A session, the participants raised many questions about the current vibration limits in Hong Kong, empiricalism on the design equation, the monitoring of ground vibration, and the application of GIS during tunnel construction.



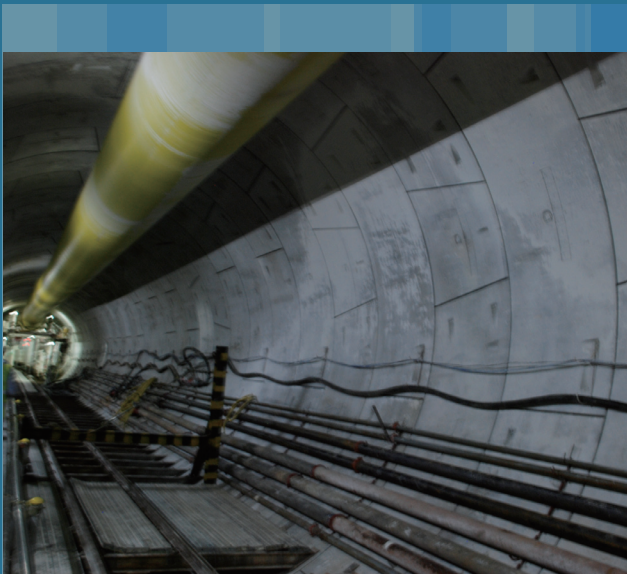
From left: Ms Argoon CHUANG, Mr Guy BRIDGES and Mr Timothy MAGUB at the AGS (HK) seminar on “Monitoring of Ground Vibration during Construction”

Article by Dr Ryan YAN (The University of Hong Kong)

International Technical Visit to Singapore

The AGS (HK) organised the first international technical visit to Singapore on November 18-20, 2011. Led by Dr Angus MAXWELL, Mr Chris LEE, Mr Tse-hung LEE, Dr Siew-wei LEE, Dr Ryan YAN and Ms Wylie TSANG, this trip enabled our 20 young engineers to gain a first-hand understanding of the fast going infrastructure construction projects in Singapore.

On November 19, the delegation first visited two of the Land Transport Authority (LTA) civil contract sites for Downtown Line Stage 2 (DTL2), namely (i) Contract 916 – Design and Construction of Stations at Beauty World and Tunnels and (ii) Contract 918 – Design and Construction of Tan Kah Kee Station and Tunnels. Contract 916 has been awarded to the McConnell Dowell S.E.A. Pte Ltd., and Contract 918 (together with Contract 917) is to be carried out by the Alpine Bau GmbH, a major civil engineering contractor from Austria. Contract 916 involves the design and construction of two of the Mass Rapid Transit (MRT) tunnels (i.e., 1100m bored tunnels with an internal diameter of 5.8m), 135m long cut-and-cover tunnels and a new underground station at Beauty World.



Completed section of TBM tunnel for Downtown Line Stage 2, Contract 917 and 918

The two sections of DTL2 under the respective contract 917 and 918 involve the construction of three new metro stations and single-track metro tunnels in a length of 5.72km (TBM) and 445m (cut & cover). The geotechnical conditions and the diameter of the new tunnel require an extensive use of tunnel boring machines. All these new stations at Beauty World, King Albert Park, Sixth Avenue, and Tan Kah Kee will also serve as Civil Defence shelters. The construction works, commenced in 2010, are due for completion in 2015. During the technical visit, the AGS (HK) delegates learned from the Singaporean operations team about the geotechnical challenges and various site constraints for constructing the metro stations and tunnels.

In the afternoon of November 19, the delegation visited the Semakau Landfill, the world's first offshore landfill site. The landfill was created by reclaiming land between two small islands 8km off the coast of Singapore. These islands of Pulau Sakeng and Pulau Semakau were previously home to small fishing villages, but are now joined by a 7km perimeter bund, which encloses part of the eastern sea area around them. The entire perimeter bund is lined with an impermeable membrane, marine clay and rock layers which keep the surrounding water pollution free for compaction of the waste within it. Any leachate generated within the site is treated in a dedicated leachate treatment plant to ensure that the landfill is clean, free of odours and aesthetically scenic. The marine ecosystem on and around Semakau landfill is well protected and properly monitored during the operation of landfill.

Semakau island was created entirely from the sea space at a cost of SG\$610 million. It has been in operation since April 1, 1999 and underscores Singapore's commitment to strike a balance between urban development and nature conservation. With a capacity of 63 million cubic metres, it is expected to meet Singapore's need for landfill space beyond 2040.



A group photograph of the attendees and the Organizing Committee Members at the Semakau Landfill site

Partly subsidized by the AGS (HK), the visit concluded with a dinner hosted by the AGS (HK) at Clarke Quay on November 19.

Seminar on the “Observational Method (OM) and its Applicability to Hong Kong”

On February 4, 2012, a one-day seminar on “The Observational Method (OM) and its Applicability to Hong Kong” was jointly organised by the AGS (HK), HKGES and HKIE (GD) at The Salisbury YMCA Hong Kong in Tsim Sha Tsui. The seminar was well attended by almost 200 attendees from Hong Kong's geotechnical community including those with influential policy experience from Government, Academic, Clients, Consultants and Contractors. Seven enlightening papers were presented at the seminar enabling attendees to gain a better understanding of OM applications, limitations, and the potential benefits and pitfalls. The seminar also explored how OM initiatives might be taken forward within the unique context of the Hong Kong construction industry.

Two notable overseas speakers contributed to the seminar. Attendees were given the privilege to hear from Mr Alan POWDERHAM, Director of Transportation, Mott MacDonald Group who is a world renowned proponent of the Observational Method having written numerous papers on the topic. Alan's achievements have been well recognised by the Industry through awards including the Quality in Construction 'Champion of the Decade', the ICE Gold Medal and the Royal Academy of Engineering Sustained Achievement Award. The seminar was also honoured by a contribution from Prof Harry POULOS, Senior Principal at Coffey Partners International and Emeritus Professor at the University of Sydney. Prof POULOS is a familiar face to many in Hong Kong having made countless and varied contributions to the industry and has been recognised as the Australian Civil Engineer of the Year by the Institution of Engineers Australia, and as the inaugural Geotechnical Practitioner of the Year.



Notable overseas speakers - Alan POWDERHAM (left) and Prof Harry POULOS (right)

Local Hong Kong contributions were led by Prof John ENDICOTT, who is an AECOM fellow and a well known and highly regarded all round geotechnical practitioner in Southeast Asia with experience dating back to the 1970s. This was followed by four other respected local speakers, Mr Herman SHIU, Mr Terence YAU, Dr Angus MAXWELL and Mr David SEIN.

Mr Alan POWDERHAM presented his paper “The Observational Method – Using Safety as a driver for Innovation” and shared his experience adopting OM in cofferdams and tunnel jacking works. Alan conveyed his convictions that OM, which emphasises on communication and feedback, could become a catalyst to drive safety and innovative design. This is contrary to some perceptions that safety is a constraint to innovation. Prof POULOS presented his paper on “Predicting Tunnelling Side Effects – an Essential Component of the Observational Method”. During the talk, Prof POULOS provided an approach to analyse the ground movement effects on existing pile foundations in response to nearby tunnelling operations. Some practical examples and design charts were also discussed. Prof John ENDICOTT presented the topic “Back Analysis – an Essential Component of the Observational Method”, emphasising its importance using examples and lessons learned from the catastrophic collapse of the Nicholl Highway project in Singapore. He reminded the audience that when observing monitoring data in flexible retaining walls, interpretation of the wall curvatures in addition to the absolute deflections is imperative to correctly interpret measured performance.

In the afternoon session, several speakers presented their views on the Observational Method, as well as its applicability and limitations in Hong Kong. Mr Herman SHIU, Chief Geotechnical Engineer from the Geotechnical Engineering Office provided an overview of the history and the current practice of the method in Hong Kong. Herman provided references to various literature and guidance documents on the application of OM in Hong Kong which could be of practical use to the audience. Mr Terence YAU shared his extensive experiences of applying the C580 approach in Hong Kong with particular focus on the degree of

conservatism in typical Hong Kong designs based on measured versus predicted data. Dr Angus MAXWELL, Chairman of the Organising Committee, gave a talk on “Safe Control Systems for Observational Engineering”, the accuracy and reliability of which are crucial in order to obtain meaningful back analysis data of observed performance on site. Dr MAXWELL also emphasised the importance of correctly interpreting the results. Mr David SEIN, Engineering Manager of Lambeth Associates Ltd., presented a paper on “Reducing Risk in Hong Kong Construction through Observational Engineering”. David attempted to counter the misconception that OM is a risky design method, and that safety is, in fact, enhanced by the use of OM through continual review, involvement of the designer and an increased level of understanding. David also shared his learning experiences of adopting the method at a recent project in Hong Kong.

In the late afternoon session, Dr Eric LI, Managing Director of Hyder Consulting Ltd., moderated a lively workshop and discussion session between the audience and a discussion panel. The speakers, Mr Alan POWDERHAM, Prof Harry POULOS and Mr Herman SHIU participated on the panel together with other eminent geotechnical practitioners in Hong Kong; Dr Jack PAPPIN, an Arup Fellow and renowned expert in geotechnics; Dr Victor LI, a celebrated Hong Kong pioneer in innovative geotechnical techniques; and Mr Phil GUNNING, currently leading the Contractor’s engineering and risk management at West Island Line Contract 704 and who has decades of experience in geotechnical engineering implementation from a Contractor’s perspective. Based on the lively discussions from the panel and from the floor, there was little doubt that the Hong Kong geotechnical industry is widely supportive of adopting OM approaches. It was recognised that there are some hurdles which need to be overcome, however with the support of all sectors of the industry it was hoped that Observational Methods could be taken forwards in the future.

The Organising Committee from the AGS (HK), HKGES and HKIE (GD) would like to thank all those who contributed to and attended the informative seminar to make it a success. It is hoped the seminar will provide a catalyst for the implementation of Observational Methods in Hong Kong in the not too distant future.



A group photograph of the speakers and the Organizing Committee Members

**Article by Mr Joseph Fai-hau WONG
(Lambeth Associates Ltd.)**

2011 AGS (HK) Annual General Meeting and Ground Forum on “Application of the AGS Data in Hong Kong”

On December 7, 2011, the AGS (HK) held its Annual General Meeting (AGM) and a ground forum on “Application of the AGS Data in Hong Kong” at the Hong Kong Football in Happy Valley.

Dr Angus MAXWELL started the AGM by briefly reviewing all the professional activities and achievements for 2010/ 2011. He thanked the Executive Committee and all the contributors and reported that the Association remained financially sound with a balance of approximately HK\$405,000. His motion to re-appoint the Anthony Kam and Co. as the account auditor, and the Acctax Company Secretary Ltd. as the company secretary was accepted unanimously by the members. He then welcomed Dr Yu WANG, Mr David SEIN, Dr Jui-pin WANG, Ms Wylie TSANG, Mr John COWLAND, Mr Graham KITE, and Mr Sai-chung TSE to the Executive Committee and thanked Dr Yu-hsing WANG who recently stepped down from the Executive Committee.



Dr Angus MAXWELL provided a brief overview of the AGS (HK) activities and achievements over the 2010/2011 session.

After the AGM, a ground forum on “Application of the AGS Data in Hong Kong” was moderated by Dr Roger CHANDLER of the Keynetix Ltd., Mr C T SO, Anthony of the GEO, Ms Jennifer HAMBLING of the Ove Arup & Partners Hong Kong Ltd. and Mr Simon PYLE of the Furgo Geotechnical Services.

Dr Roger CHANDLER presented “Consultant’s Guide to using AGS Data”, using the AGS data to provide a means of transferring

geotechnical and geovironmental data between the parties. He discussed the various approaches of how consultants could check the AGS data with the automated Excel charts and AutoCAD drawings.

Mr C T SO, Anthony presented “The Status of AGS data in GIU of CEDD”, documenting the history and current status of the AGS data and its availability in Hong Kong. The AGS data in Hong Kong has been specifically used by engineers in the ground investigation and laboratory testing works since the early 1990s. He compared the quality of old data and new data in GIU of CEDD, and reported the ways to provide the data to practitioners.

Ms Jennifer HAMBLING shifted the focus of discussion to the use of the AGS data in the U.K. She referred to the benefits of using the AGS data format to ensure efficient data transfer and processing for the construction project, and explained the best way to manage the ground investigation information and produce the AGS data for geological development.

Mr Simon PYLE looked at the practical application in his presentation “AGS4 – Does Hong Kong need it?”. Although the AGS data format has been in use in Hong Kong ground investigation since the 1990s, the specification of the data is not well practiced and formalized. The AGS data is only treated as an addition to the ground investigation report, and its data is not as complete as the report. Simon proposed to promote the AGS4 in Hong Kong and to specify the precise requirement for the AGS data to be delivered.

The forum was followed by a lively and engaging Q&A session chaired by Dr Angus MAXWELL, and the event attracted over 50 members.



The seminar was well attended with over 50 members.

Recipients of the AGS (HK) Scholarship

The AGS (HK) offers merit-based scholarships to the outstanding students who pursue postgraduate studies in the geotechnical and geoenvironmental fields at local universities. A scholarship in the amount of HK\$10,000 for 2010-2011 was shared between Ms Hong ZHU and Mr Kai-xiang WOON of the Hong Kong University of Science and Technology (HKUST) and another HK\$10,000 scholarship was given to Mr Alan Ying-lun HO of the University of Hong Kong (HKU). What follows are the responses from the recipients.

Ms Hong ZHU

It is my great honour to receive the AGS Scholarship (2010-2011), as I am currently doing my Ph.-D. at Department of Civil and Environmental Engineering in HKUST. I would like to thank the AGS (HK), my academic supervisor and all other professors at HKUST. My research focuses on the reliability analysis and design of bio-engineered slopes, and I appreciate the great opportunity to pursue graduate study in Hong Kong.



Dr Siew-wei LEE (right) presented a HK\$5,000 AGS (HK) scholarship to Ms Hong ZHU for her research at HKUST.

Mr Kai-xiang WOON

I am grateful for being nominated as a recipient of the AGS Scholarship (2010-2011). As I am pursuing my M.-Phil. in Civil Engineering at HKUST, I have benefited considerably from the generous support and intellectual guidance of Prof Charles W. W. Ng, my supervisor, and the nurturing that I have received through other dedicated professors, staff members, and colleagues.

I wish to thank those who generously provided me and other students with the AGS (HK) Scholarships. Through the recognition given by the AGS (HK), I feel very inspired to pursue my academic goals in the geotechnical fields, and hope that I will be able to make a difference for others in a meaningful way in Hong Kong.



Dr Siew-wei LEE (right) presented a HK\$5,000 AGS (HK) scholarship to Mr Kai-xiang WOON towards his research for the M. Phil. degree at HKUST.

Mr Alan Ying-lun HO

It is my great honour to be awarded the AGS (HK) Scholarship in 2011. It is certainly a pleasant surprise for me and I would like to take this opportunity to express my most sincere gratitude to my family, all my professors at HKU, as well as the AGS (HK) for the sponsorship of the Prize, which is invaluable to me.

I have been working in the field of geotechnical engineering for over a decade. Studying part-time and working at the same time was a challenging task. All the courses I took over the past two years have strengthened my theoretical and practical knowledge which in turn enhanced the level of confidence and competency as a geotechnical engineer in my daily engineering works, as I have to face many challenges including ground investigation, ground improvement, excavation and lateral supports, instrumentation, slope, drill and blast tunnelling and TBM tunnelling works.

I am so thankful that I made the right decision to apply for the M.-Sc. (Eng) (Geot.) at HKU in 2009. It's never too late to go back to school and study new subjects again. I have enjoyed every moment of my postgraduate study, which proves to be a precious and fruitful experience.



Dr Angus MAXWELL (left) presented a HK\$10,000 AGS (HK) scholarship to Mr Alan Ying-lun HO for his research at HKU.

Diary Dates

(Information on the upcoming events is updated regularly on our website at www.ags-hk.org)

1. Conferences, ground forums, seminars, technical visits and workshops

Events	Date	Time	Venue	Contact / Registration
Workshop on "Geotechnical Instrumentation for Deep Excavation, Slope and Tunnelling"	29 Sep 2012 (Sat)	09:30 to 12:30	West Kowloon	Dr Angus Maxwell or asm@maxwellgeosystems.com Dr Siew-wei LEE swlee@golder.com.hk
Seminar on "Natural Terrain Hazard Mitigation Measures"	16 Oct 2012 (Tue)	09:30 to 17:30	YMCA	Dr Siew-wei LEE or swlee@golder.com.hk Mr Tse-hung LEE Tse-hung.lee@arup.com
Technical Visit to "MTR Express Rail Link (XRL), Contract C822 – Tse Uk Tsuen to Shek Yam Tunnels"	27 Oct 2012 (Sat)	09:30 to 12:30	Shek Yam	Mr David SEIN or David.Sein@lambeth.com.hk Dr Siew-wei LEE swlee@golder.com.hk
Technical Visit to "Development at Anderson Road"	Nov 2012 (tentative)	09:30 to 12:30	Choi Hung	Mr David SEIN or David.Sein@lambeth.com.hk Dr Siew-wei LEE swlee@golder.com.hk
Seminar on "Tunnels and Underground Spaces"	Nov 2012 (tentative)	09:30 to 17:30	HKU	Mr David SEIN or David.Sein@lambeth.com.hk Mr Clayton CHAN Clayton.chan@aecom.com
Technical Visit to "MTR Express Rail Link (XRL), Contract C810A – West Kowloon Terminus Station (North)"	Dec 2012 (tentative)	09:30 to 12:30	West Kowloon	Mr David SEIN or David.Sein@lambeth.com.hk Dr Siew-wei LEE swlee@golder.com.hk
Seminar on "Geotechnical Computer Modelling"	Mar 2013 (tentative)	09:30 to 12:30	To be confirmed	Dr Siew-wei LEE or swlee@golder.com.hk Mr Tse-hung LEE Tse-hung.lee@arup.com

2. Publications

Publications	Time	Contact
Ground Investigation Guideline on "Geology for Engineering Projects"	Sep 2012 (tentative)	Dr Siew-wei LEE or swlee@golder.com.hk Mr Tse-hung LEE Tse-hung.lee@arup.com
Ground Investigation Guideline on "Tunnelling Instrumentation"	Nov 2012 (tentative)	Dr Angus Maxwell or asm@maxwellgeosystems.com Dr Siew-wei LEE swlee@golder.com.hk
Tunnel Construction Guideline on "Grouting and Ground Treatment"	Dec 2012 (tentative)	Mr Barry SUM or Barry.Sum@aecom.com Dr Siew-wei LEE swlee@golder.com.hk
Tunnel Construction Guideline on "Rock Mass Classification"	Feb 2013 (tentative)	Mr Barry SUM or Barry.Sum@aecom.com Mr David SEIN David.Sein@lambeth.com.hk